



Walt Disney Parks and Resorts US, Inc.

RadioNode

FCC 15.247:2021

Bluetooth

Report: SYNA0309, Issue Date: March 25, 2021



NVLAP LAB CODE: 200629-0
NVLAP LAB CODE: 200676-0



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CERTIFICATE OF TEST

Last Date of Test: January 5, 2021
Walt Disney Parks and Resorts US, Inc.
EUT: RadioNode

Radio Equipment Testing

Standards

Specification	Method
FCC 15.247:2020	ANSI C63.10:2013, KDB 558074

Results

Method Clause	Test Description	Applied	Results	Comments
6.2	Powerline Conducted Emissions	No	N/A	Not required.
11.6	Duty Cycle	No	N/A	Not required.
11.8.2	Occupied Bandwidth	No	N/A	Not required.
11.9.1.1	Output Power	Yes	Pass	
11.9.1.1	Equivalent Isotropic Radiated Power	No	N/A	Not required.
11.10.2	Power Spectral Density	No	N/A	Not required.
11.11	Band Edge Compliance	No	N/A	Not required.
11.11	Spurious Conducted Emissions	No	N/A	Not required.
11.12.1, 11.13.2, 6.5, 6.6	Spurious Radiated Emissions	Yes	Pass	

Deviations From Test Standards

None

Approved By:



Kyle Holgate, Operations Manager

Product compliance is the responsibility of the client; therefore, the tests and equipment modes of operation represented in this report were agreed upon by the client, prior to testing. The results of this test pertain only to the sample(s) tested. The specific description is noted in each of the individual sections of the test report supporting this certificate of test. This report reflects only those tests from the referenced standards shown in the certificate of test. It does not include inspection or verification of labels, identification, marking or user information. As indicated in the Statement of Work sent with the quotation, Element's standard process is to always use the latest published version of the test methods even when earlier versions are cited in the test specification. Issuance of a purchase order was de facto acceptance of this approach. Otherwise, the client would have advised Element in writing of the specific version of the test methods they wanted applied to the subject testing.

REVISION HISTORY



Revision Number	Description	Date (yyyy-mm-dd)	Page Number
00	None		

ACCREDITATIONS AND AUTHORIZATIONS



United States

FCC - Designated by the FCC as a Telecommunications Certification Body (TCB). Certification chambers, Open Area Test Sites, and conducted measurement facilities are listed with the FCC.

A2LA - Accredited by A2LA to ISO / IEC 17065 as a product certifier. This allows Element to certify transmitters to FCC and IC specifications.

NVLAP - Each laboratory is accredited by NVLAP to ISO 17025

Canada

ISED - Recognized by Innovation, Science and Economic Development Canada as a Certification Body (CB) and as a CAB for the acceptance of test data.

European Union

European Commission – Within Element, we have a EU Notified Body validated for the EMCD and RED Directives.

Australia/New Zealand

ACMA - Recognized by ACMA as a CAB for the acceptance of test data.

Korea

MSIT / RRA - Recognized by KCC's RRA as a CAB for the acceptance of test data.

Japan

VCCI - Associate Member of the VCCI. Conducted and radiated measurement facilities are registered.

Taiwan

BSMI – Recognized by BSMI as a CAB for the acceptance of test data.

NCC - Recognized by NCC as a CAB for the acceptance of test data.

Singapore

IDA – Recognized by IDA as a CAB for the acceptance of test data.

Israel

MOC – Recognized by MOC as a CAB for the acceptance of test data.

Hong Kong

OFCA – Recognized by OFCA as a CAB for the acceptance of test data.

Vietnam

MIC – Recognized by MIC as a CAB for the acceptance of test data.

SCOPE

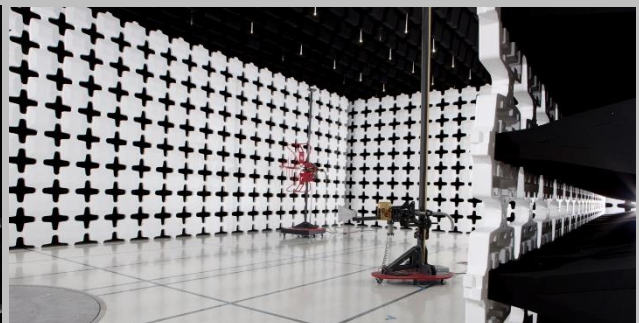
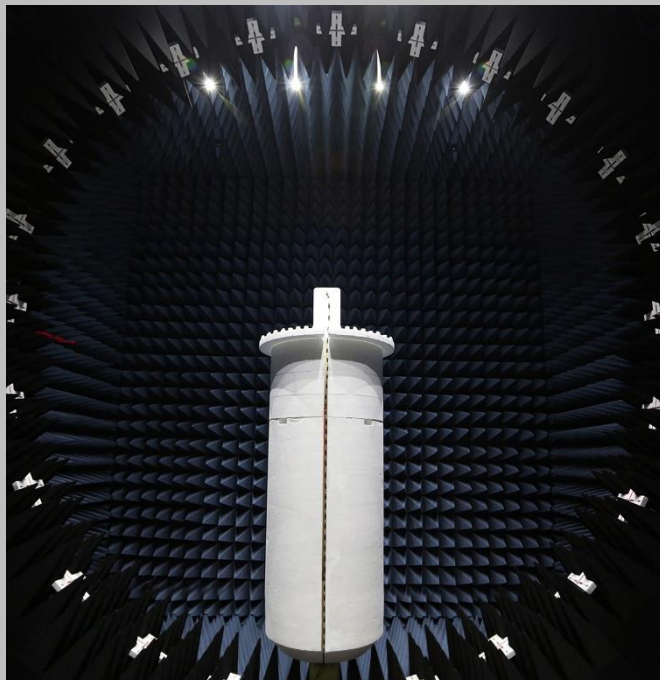
For details on the Scopes of our Accreditations, please visit:

<https://www.nwemc.com/emc-testing-accreditations>

FACILITIES



California Labs OC01-17 41 Tesla Irvine, CA 92618 (949) 861-8918	Minnesota Labs MN01-10 9349 W Broadway Ave. Brooklyn Park, MN 55445 (612)-638-5136	Oregon Labs EV01-12 6775 NE Evergreen Pkwy #400 Hillsboro, OR 97124 (503) 844-4066	Texas Labs TX01-09 3801 E Plano Pkwy Plano, TX 75074 (469) 304-5255	Washington Labs NC01-05 19201 120 th Ave NE Bothell, WA 98011 (425)984-6600
NVLAP				
NVLAP Lab Code: 200676-0	NVLAP Lab Code: 200881-0	NVLAP Lab Code: 200630-0	NVLAP Lab Code:201049-0	NVLAP Lab Code: 200629-0
Innovation, Science and Economic Development Canada				
2834B-1, 2834B-3	2834E-1, 2834E-3	2834D-1	2834G-1	2834F-1
BSMI				
SL2-IN-E-1154R	SL2-IN-E-1152R	SL2-IN-E-1017	SL2-IN-E-1158R	SL2-IN-E-1153R
VCCI				
A-0029	A-0109	A-0108	A-0201	A-0110
Recognized Phase I CAB for ISED, ACMA, BSMI, IDA, KCC/RRR, MIC, MOC, NCC, OFCA				
US0158	US0175	US0017	US0191	US0157



MEASUREMENT UNCERTAINTY

Measurement Uncertainty

When a measurement is made, the result will be different from the true or theoretically correct value. The difference is the result of tolerances in the measurement system that cannot be completely eliminated. To the extent that technology allows us, it has been our aim to minimize this error. Measurement uncertainty is a statistical expression of measurement error qualified by a probability distribution.

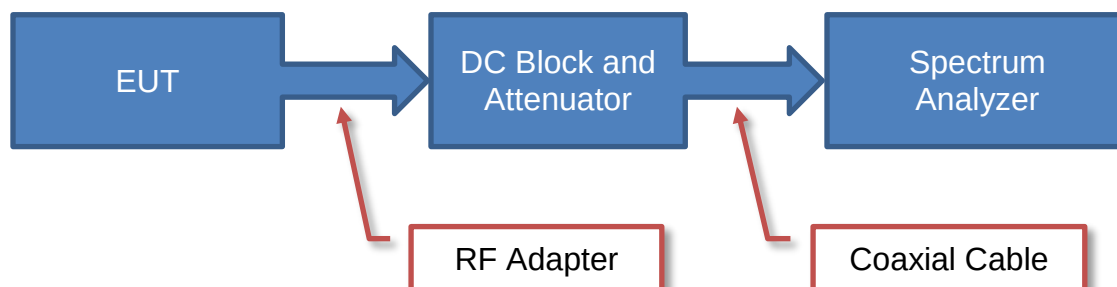
A measurement uncertainty estimation has been performed for each test per our internal quality document QM205.4.6. The estimation is used to compare the measured result with its "true" or theoretically correct value. The expanded measurement uncertainty (K=2) can be found included as part of the applicable test description page. Our measurement data meets or exceeds the measurement uncertainty requirements of the applicable specification; therefore, the test data can be compared directly to the specification limit to determine compliance. The calculations for estimating measurement uncertainty are based upon ETSI TR 100 028 (or CISPR 16-4-2 as applicable), and are available upon request.

The following table represents the Measurement Uncertainty (MU) budgets for each of the tests that may be contained in this report.

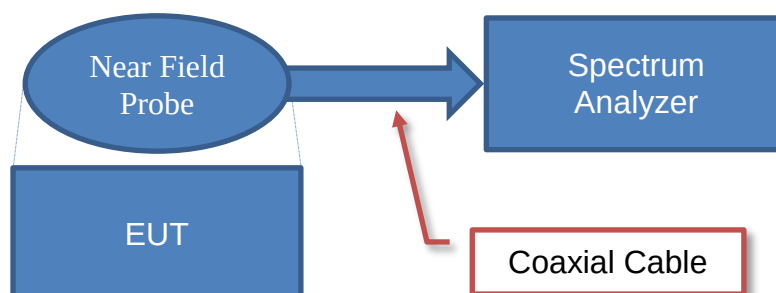
Test	+ MU	- MU
Frequency Accuracy	0.0007%	-0.0007%
Amplitude Accuracy (dB)	1.2 dB	-1.2 dB
Conducted Power (dB)	1.2 dB	-1.2 dB
Radiated Power via Substitution (dB)	0.7 dB	-0.7 dB
Temperature (degrees C)	0.7°C	-0.7°C
Humidity (% RH)	2.5% RH	-2.5% RH
Voltage (AC)	1.0%	-1.0%
Voltage (DC)	0.7%	-0.7%
Field Strength (dB)	5.2 dB	-5.2 dB
AC Powerline Conducted Emissions (dB)	2.6 dB	-2.6 dB

Test Setup Block Diagrams

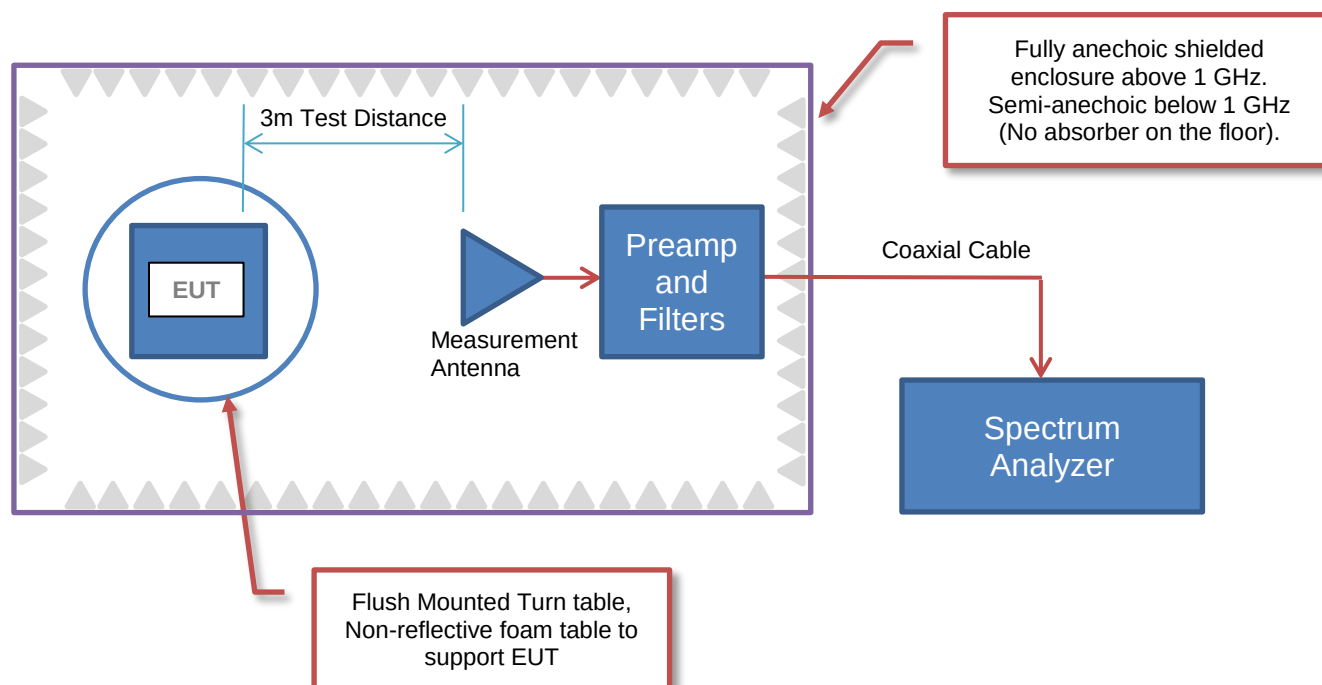
Antenna Port Conducted Measurements



Near Field Test Fixture Measurements



Spurious Radiated Emissions



PRODUCT DESCRIPTION



Client and Equipment Under Test (EUT) Information

Company Name:	Walt Disney Parks and Resorts US, Inc.
Address:	PO Box 10000
City, State, Zip:	Lake Buena Vista, FL 32830
Test Requested By:	Hattie Spetla
EUT:	RadioNode
First Date of Test:	August 25, 2020
Last Date of Test:	January 5, 2021
Receipt Date of Samples:	August 25, 2020
Equipment Design Stage:	Production
Equipment Condition:	No Damage
Purchase Authorization:	Verified

Information Provided by the Party Requesting the Test

Functional Description of the EUT:

Device is a multi port BLE and a proprietary single channel radio operating at 2.482 GHz radio. It provides two transmitters and multiple receivers to collect data. This data can be then sent over a wired Ethernet connection to server side systems to act on the collected data. Additional external interface include POE, DMX, RS-232, RS-485, audio output, USB2.0 (2), Relays (2) and Opto-isolated Inputs(2) for general purpose peripheral control. The device is powered either by Power over Ethernet Plus, following the IEEE 802.3at standard, or a 24VDC supply.

Testing Objective:

To demonstrate compliance of the Bluetooth radio to FCC 15.247 requirements.

CONFIGURATIONS



Configuration SYNA0306- 4

Software/Firmware Running during test	
Description	Version
Radio Tool	08/02/2018

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
RadioNode	Walt Disney Parks and Resorts US, Inc.	300-004195	Rev. 10 - 002

Peripherals in test setup boundary			
Description	Manufacturer	Model/Part Number	Serial Number
AC/DC Power Adapter - Switch	Netgear	NUA3-6540240-11	N/A
Switch	Netgear	GS108pp	58617ADUA11A9

Remote Equipment Outside of Test Setup Boundary			
Description	Manufacturer	Model/Part Number	Serial Number
AC/DC Power Adapter - Laptop	HP	608428-001	2306691807
Laptop	HP	ProBook 4540s	2CE3201RB4

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
DC Power Cable - Laptop	No	2m	Yes	Laptop	AC/DC Power Adapter - Laptop
AC Power Cable - Laptop	No	2m	No	AC/DC Power Adapter - Laptop	AC Mains
DC Power Cable - Switch	No	1.5m	No	Switch	AC/DC Power Adapter - Switch
AC Power Cable - Switch	No	2m	No	AC/DC Power Adapter - Switch	AC Mains
Ethernet Cable	No	7.5m	No	RadioNode	Switch
Ethernet Cable	No	1m	No	Switch	Laptop

CONFIGURATIONS



Configuration SYNA0309- 1

Software/Firmware Running during test	
Description	Version
Radio Tool	08/02/2018

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
RadioNode	Walt Disney Parks and Resorts US, Inc.	300-004195	Rev. 10 - 002
Dipole Antenna	Linx	ANT-2.4-CW-HWR-SMA	N/A

Peripherals in test setup boundary			
Description	Manufacturer	Model/Part Number	Serial Number
Audio Peripheral	Synapse Product Development, Inc.	Two	N/A
AC/DC Power Adapter - Switch	Netgear	NUA3-6540240-11	N/A
Switch	Netgear	GS108pp	58617ADUA11A9

Remote Equipment Outside of Test Setup Boundary			
Description	Manufacturer	Model/Part Number	Serial Number
AC/DC Power Adapter - Laptop	HP	608428-001	2306691807
Laptop	HP	ProBook 4540s	2CE3201RB4

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
DC Power Cable - Laptop	No	2m	Yes	Laptop	AC/DC Power Adapter - Laptop
AC Power Cable - Laptop	No	2m	No	AC/DC Power Adapter - Laptop	AC Mains
DC Power Cable - Switch	No	1.5m	No	Switch	AC/DC Power Adapter - Switch
AC Power Cable - Switch	No	2m	No	AC/DC Power Adapter - Switch	AC Mains
Relay & DC Out Cable	No	1.5m	No	Audio Peripheral	RadioNode
Audio DMX Cable	No	3m	No	Audio Peripheral	RadioNode
Ethernet Cable	No	7.5m	No	RadioNode	Switch
Ethernet Cable	No	1m	No	Switch	Laptop
Ethernet Cable	No	1m	No	RadioNode	Unterminated
USB Cable	No	1.6m	No	RadioNode	Unterminated
USB Cable	No	1m	No	RadioNode	Unterminated

CONFIGURATIONS



Configuration SYNA0309- 2

Software/Firmware Running during test	
Description	Version
Radio Tool	08/02/2018

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
RadioNode	Walt Disney Parks and Resorts US, Inc.	300-004195	Rev. 10 - 002
Dipole Antenna	Linx	ANT-2.4-CW-HWR-SMA	N/A

Peripherals in test setup boundary			
Description	Manufacturer	Model/Part Number	Serial Number
Audio Peripheral	Synapse Product Development, Inc.	Two	N/A
DC Power Supply	Tektronix	PS280	TW55636

Remote Equipment Outside of Test Setup Boundary			
Description	Manufacturer	Model/Part Number	Serial Number
AC/DC Power Adapter - Laptop	HP	608428-001	2306691807
Laptop	HP	ProBook 4540s	2CE3201RB4

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
DC Power Cable - Laptop	No	2m	Yes	Laptop	AC/DC Power Adapter - Laptop
AC Power Cable - Laptop	No	2m	No	AC/DC Power Adapter - Laptop	AC Mains
Relay & DC Out Cable	No	1.5m	No	Audio Peripheral	RadioNode
Audio DMX Cable	No	3m	No	Audio Peripheral	RadioNode
Ethernet Cable	No	7.5m	No	RadioNode	Switch
Ethernet Cable	No	1m	No	RadioNode	Unterminated
USB Cable	No	1.6m	No	RadioNode	Unterminated
USB Cable	No	1m	No	RadioNode	Unterminated
DC Power Supply Cable	No	1.6m	No	DC Power Supply	AC Mains

CONFIGURATIONS



Configuration SYNA0309- 3

Software/Firmware Running during test	
Description	Version
Radio Tool	08/02/2018

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
RadioNode	Walt Disney Parks and Resorts US, Inc.	300-004195	Rev. 10 - 002
Dipole Antenna	Taoglas	GW.26.0111	N/A

Peripherals in test setup boundary			
Description	Manufacturer	Model/Part Number	Serial Number
Audio Peripheral	Synapse Product Development, Inc.	Two	N/A
AC/DC Power Adapter - Switch	Netgear	NUA3-6540240-11	N/A
Switch	Netgear	GS108pp	58617ADUA11A9

Remote Equipment Outside of Test Setup Boundary			
Description	Manufacturer	Model/Part Number	Serial Number
AC/DC Power Adapter - Laptop	HP	608428-001	2306691807
Laptop	HP	ProBook 4540s	2CE3201RB4

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
DC Power Cable - Laptop	No	2m	Yes	Laptop	AC/DC Power Adapter - Laptop
AC Power Cable - Laptop	No	2m	No	AC/DC Power Adapter - Laptop	AC Mains
DC Power Cable - Switch	No	1.5m	No	Switch	AC/DC Power Adapter - Switch
AC Power Cable - Switch	No	2m	No	AC/DC Power Adapter - Switch	AC Mains
Relay & DC Out Cable	No	1.5m	No	Audio Peripheral	RadioNode
Audio DMX Cable	No	3m	No	Audio Peripheral	RadioNode
Ethernet Cable	No	7.5m	No	RadioNode	Switch
Ethernet Cable	No	1m	No	Switch	Laptop
Ethernet Cable	No	1m	No	RadioNode	Unterminated
USB Cable	No	1.6m	No	RadioNode	Unterminated
USB Cable	No	1m	No	RadioNode	Unterminated

CONFIGURATIONS



Configuration SYNA0309- 4

Software/Firmware Running during test	
Description	Version
Radio Tool	08/02/2018

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
RadioNode	Walt Disney Parks and Resorts US, Inc.	300-004195	Rev. 10 - 002
Dipole Antenna	Taoglas	GW.26.0111	N/A

Peripherals in test setup boundary			
Description	Manufacturer	Model/Part Number	Serial Number
Audio Peripheral	Synapse Product Development, Inc.	Two	N/A
DC Power Supply	Tektronix	PS280	TW55636

Remote Equipment Outside of Test Setup Boundary			
Description	Manufacturer	Model/Part Number	Serial Number
AC/DC Power Adapter - Laptop	HP	608428-001	2306691807
Laptop	HP	ProBook 4540s	2CE3201RB4

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
DC Power Cable - Laptop	No	2m	Yes	Laptop	AC/DC Power Adapter - Laptop
AC Power Cable - Laptop	No	2m	No	AC/DC Power Adapter - Laptop	AC Mains
Relay & DC Out Cable	No	1.5m	No	Audio Peripheral	RadioNode
Audio DMX Cable	No	3m	No	Audio Peripheral	RadioNode
Ethernet Cable	No	7.5m	No	RadioNode	Switch
Ethernet Cable	No	1m	No	RadioNode	Unterminated
USB Cable	No	1.6m	No	RadioNode	Unterminated
USB Cable	No	1m	No	RadioNode	Unterminated
DC Power Supply Cable	No	1.6m	No	DC Power Supply	AC Mains

CONFIGURATIONS



Configuration SYNA0309- 5

Software/Firmware Running during test	
Description	Version
Radio Tool	08/02/2018

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
RadioNode	Walt Disney Parks and Resorts US, Inc.	300-004195	Rev. 10 - 002
Single Element Patch Antenna	L-com	RE09P-NM	N/A

Peripherals in test setup boundary			
Description	Manufacturer	Model/Part Number	Serial Number
Audio Peripheral	Synapse Product Development, Inc.	Two	N/A
AC/DC Power Adapter - Switch	Netgear	NUA3-6540240-11	N/A
Switch	Netgear	GS108pp	58617ADUA11A9

Remote Equipment Outside of Test Setup Boundary			
Description	Manufacturer	Model/Part Number	Serial Number
AC/DC Power Adapter - Laptop	HP	608428-001	2306691807
Laptop	HP	ProBook 4540s	2CE3201RB4

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
DC Power Cable - Laptop	No	2m	Yes	Laptop	AC/DC Power Adapter - Laptop
AC Power Cable - Laptop	No	2m	No	AC/DC Power Adapter - Laptop	AC Mains
DC Power Cable - Switch	No	1.5m	No	Switch	AC/DC Power Adapter - Switch
AC Power Cable - Switch	No	2m	No	AC/DC Power Adapter - Switch	AC Mains
Relay & DC Out Cable	No	1.5m	No	Audio Peripheral	RadioNode
Audio DMX Cable	No	3m	No	Audio Peripheral	RadioNode
Ethernet Cable	No	7.5m	No	RadioNode	Switch
Ethernet Cable	No	1m	No	Switch	Laptop
Ethernet Cable	No	1m	No	RadioNode	Unterminated
USB Cable	No	1.6m	No	RadioNode	Unterminated
USB Cable	No	1m	No	RadioNode	Unterminated
Antenna Patch Cable	Yes	1.25m	No	RadioNode	Single Element Patch Antenna

CONFIGURATIONS



Configuration SYNA0309- 6

Software/Firmware Running during test	
Description	Version
Radio Tool	08/02/2018

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
RadioNode	Walt Disney Parks and Resorts US, Inc.	300-004195	Rev. 10 - 002
Single Element Patch Antenna	L-com	RE09P-NM	N/A

Peripherals in test setup boundary			
Description	Manufacturer	Model/Part Number	Serial Number
Audio Peripheral	Synapse Product Development, Inc.	Two	N/A
DC Power Supply	Tektronix	PS280	TW55636

Remote Equipment Outside of Test Setup Boundary			
Description	Manufacturer	Model/Part Number	Serial Number
AC/DC Power Adapter - Laptop	HP	608428-001	2306691807
Laptop	HP	ProBook 4540s	2CE3201RB4

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
DC Power Cable - Laptop	No	2m	Yes	Laptop	AC/DC Power Adapter - Laptop
AC Power Cable - Laptop	No	2m	No	AC/DC Power Adapter - Laptop	AC Mains
Relay & DC Out Cable	No	1.5m	No	Audio Peripheral	RadioNode
Audio DMX Cable	No	3m	No	Audio Peripheral	RadioNode
Ethernet Cable	No	7.5m	No	RadioNode	Switch
Ethernet Cable	No	1m	No	RadioNode	Unterminated
USB Cable	No	1.6m	No	RadioNode	Unterminated
USB Cable	No	1m	No	RadioNode	Unterminated
DC Power Supply Cable	No	1.6m	No	DC Power Supply	AC Mains
Antenna Patch Cable	Yes	1.25m	No	RadioNode	Single Element Patch Antenna

CONFIGURATIONS



Configuration SYNA0309- 7

Software/Firmware Running during test	
Description	Version
Radio Tool	08/02/2018

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
RadioNode	Walt Disney Parks and Resorts US, Inc.	300-004195	Rev. 10 - 002
Yagi Antenna	Disney	C3EY	N/A

Peripherals in test setup boundary			
Description	Manufacturer	Model/Part Number	Serial Number
Audio Peripheral	Synapse Product Development, Inc.	Two	N/A
AC/DC Power Adapter - Switch	Netgear	NUA3-6540240-11	N/A
Switch	Netgear	GS108pp	58617ADUA11A9

Remote Equipment Outside of Test Setup Boundary			
Description	Manufacturer	Model/Part Number	Serial Number
AC/DC Power Adapter - Laptop	HP	608428-001	2306691807
Laptop	HP	ProBook 4540s	2CE3201RB4

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
DC Power Cable - Laptop	No	2m	Yes	Laptop	AC/DC Power Adapter - Laptop
AC Power Cable - Laptop	No	2m	No	AC/DC Power Adapter - Laptop	AC Mains
DC Power Cable - Switch	No	1.5m	No	Switch	AC/DC Power Adapter - Switch
AC Power Cable - Switch	No	2m	No	AC/DC Power Adapter - Switch	AC Mains
Relay & DC Out Cable	No	1.5m	No	Audio Peripheral	RadioNode
Audio DMX Cable	No	3m	No	Audio Peripheral	RadioNode
Ethernet Cable	No	7.5m	No	RadioNode	Switch
Ethernet Cable	No	1m	No	Switch	Laptop
Ethernet Cable	No	1m	No	RadioNode	Unterminated
USB Cable	No	1.6m	No	RadioNode	Unterminated
USB Cable	No	1m	No	RadioNode	Unterminated
Coaxial Cable	Yes	0.9m	No	RadioNode	Yagi Antenna

CONFIGURATIONS



Configuration SYNA0309- 8

Software/Firmware Running during test	
Description	Version
Radio Tool	08/02/2018

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
RadioNode	Walt Disney Parks and Resorts US, Inc.	300-004195	Rev. 10 - 002
Yagi Antenna	Disney	C3EY	N/A

Peripherals in test setup boundary			
Description	Manufacturer	Model/Part Number	Serial Number
Audio Peripheral	Synapse Product Development, Inc.	Two	N/A
DC Power Supply	Tektronix	PS280	TW55636

Remote Equipment Outside of Test Setup Boundary			
Description	Manufacturer	Model/Part Number	Serial Number
AC/DC Power Adapter - Laptop	HP	608428-001	2306691807
Laptop	HP	ProBook 4540s	2CE3201RB4

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
DC Power Cable - Laptop	No	2m	Yes	Laptop	AC/DC Power Adapter - Laptop
AC Power Cable - Laptop	No	2m	No	AC/DC Power Adapter - Laptop	AC Mains
Relay & DC Out Cable	No	1.5m	No	Audio Peripheral	RadioNode
Audio DMX Cable	No	3m	No	Audio Peripheral	RadioNode
Ethernet Cable	No	7.5m	No	RadioNode	Switch
Ethernet Cable	No	1m	No	RadioNode	Unterminated
USB Cable	No	1.6m	No	RadioNode	Unterminated
USB Cable	No	1m	No	RadioNode	Unterminated
DC Power Supply Cable	No	1.6m	No	DC Power Supply	AC Mains
Coaxial Cable	Yes	0.9m	No	RadioNode	Yagi Antenna

CONFIGURATIONS



Configuration SYNA0309- 9

Software/Firmware Running during test	
Description	Version
Radio Tool	08/02/2018

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
RadioNode	Walt Disney Parks and Resorts US, Inc.	300-004195	Rev. 10 - 002
Dipole Antenna	Taoglas	WSA.2400.A.101151	N/A

Peripherals in test setup boundary			
Description	Manufacturer	Model/Part Number	Serial Number
Audio Peripheral	Synapse Product Development, Inc.	Two	N/A
AC/DC Power Adapter - Switch	Netgear	NUA3-6540240-11	N/A
Switch	Netgear	GS108pp	58617ADUA11A9

Remote Equipment Outside of Test Setup Boundary			
Description	Manufacturer	Model/Part Number	Serial Number
AC/DC Power Adapter - Laptop	HP	608428-001	2306691807
Laptop	HP	ProBook 4540s	2CE3201RB4

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
DC Power Cable - Laptop	No	2m	Yes	Laptop	AC/DC Power Adapter - Laptop
AC Power Cable - Laptop	No	2m	No	AC/DC Power Adapter - Laptop	AC Mains
DC Power Cable - Switch	No	1.5m	No	Switch	AC/DC Power Adapter - Switch
AC Power Cable - Switch	No	2m	No	AC/DC Power Adapter - Switch	AC Mains
Relay & DC Out Cable	No	1.5m	No	Audio Peripheral	RadioNode
Audio DMX Cable	No	3m	No	Audio Peripheral	RadioNode
Ethernet Cable	No	7.5m	No	RadioNode	Switch
Ethernet Cable	No	1m	No	Switch	Laptop
Ethernet Cable	No	1m	No	RadioNode	Unterminated
USB Cable	No	1.6m	No	RadioNode	Unterminated
USB Cable	No	1m	No	RadioNode	Unterminated

CONFIGURATIONS



Configuration SYNA0309- 10

Software/Firmware Running during test	
Description	Version
Radio Tool	08/02/2018

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
RadioNode	Walt Disney Parks and Resorts US, Inc.	300-004195	Rev. 10 - 002
Dipole Antenna	Taoglas	WSA.2400.A.101151	N/A

Peripherals in test setup boundary			
Description	Manufacturer	Model/Part Number	Serial Number
Audio Peripheral	Synapse Product Development, Inc.	Two	N/A
DC Power Supply	Tektronix	PS280	TW55636

Remote Equipment Outside of Test Setup Boundary			
Description	Manufacturer	Model/Part Number	Serial Number
AC/DC Power Adapter - Laptop	HP	608428-001	2306691807
Laptop	HP	ProBook 4540s	2CE3201RB4

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
DC Power Cable - Laptop	No	2m	Yes	Laptop	AC/DC Power Adapter - Laptop
AC Power Cable - Laptop	No	2m	No	AC/DC Power Adapter - Laptop	AC Mains
Relay & DC Out Cable	No	1.5m	No	Audio Peripheral	RadioNode
Audio DMX Cable	No	3m	No	Audio Peripheral	RadioNode
Ethernet Cable	No	7.5m	No	RadioNode	Switch
Ethernet Cable	No	1m	No	RadioNode	Unterminated
USB Cable	No	1.6m	No	RadioNode	Unterminated
USB Cable	No	1m	No	RadioNode	Unterminated
DC Power Supply Cable	No	1.6m	No	DC Power Supply	AC Mains

CONFIGURATIONS



Configuration SYNA0309- 11

Software/Firmware Running during test	
Description	Version
Radio Tool	08/02/2018

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
RadioNode	Walt Disney Parks and Resorts US, Inc.	300-004195	Rev. 10 - 007

Peripherals in test setup boundary			
Description	Manufacturer	Model/Part Number	Serial Number
Audio Peripheral	Synapse Product Development, Inc.	Two	N/A

Remote Equipment Outside of Test Setup Boundary			
Description	Manufacturer	Model/Part Number	Serial Number
AC/DC Power Adapter - Laptop	HP	608428-001	2306691807
Laptop	HP	ProBook 4540s	2CE3201RB4

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
DC Power Cable - Laptop	No	2m	Yes	Laptop	AC/DC Power Adapter - Laptop
AC Power Cable - Laptop	No	2m	No	AC/DC Power Adapter - Laptop	AC Mains
Relay & DC Out Cable	No	1.5m	No	Audio Peripheral	RadioNode
Audio DMX Cable	No	3m	No	Audio Peripheral	RadioNode
Ethernet Cable	No	1m	No	RadioNode	Laptop

CONFIGURATIONS



Configuration SYNA0309- 12

Software/Firmware Running during test	
Description	Version
Radio Tool	08/02/2018

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
4-Element Patch Array Antenna	Ventev	T24130P10006GT	N/A
RadioNode	Walt Disney Parks and Resorts US, Inc.	300-004195	Rev. 10 - 004

Peripherals in test setup boundary			
Description	Manufacturer	Model/Part Number	Serial Number
Audio Peripheral	Synapse Product Development, Inc.	Two	N/A
AC/DC Power Adapter - Switch	Netgear	NUA3-6540240-11	N/A
Switch	Netgear	GS108pp	58617ADUA11A9
Laptop PC (ASUS)	ASUS	UL20FT	A8N0AS133997328
AC/DC Power Adapter - Laptop PC (ASUS)	ASUS	ADP-65JH	660W0BB0J5T

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
DC Power Cable - Switch	No	1.5m	No	Switch	AC/DC Power Adapter - Switch
AC Power Cable - Switch	No	2m	No	AC/DC Power Adapter - Switch	AC Mains
Relay & DC Out Cable	No	1.5m	No	Audio Peripheral	RadioNode
Audio DMX Cable	No	3m	No	Audio Peripheral	RadioNode
Ethernet Cable	No	7.5m	No	RadioNode	Switch
Ethernet Cable	No	1m	No	Switch	Laptop
Ethernet Cable	No	1m	No	RadioNode	Unterminated
USB Cable	No	1.6m	No	RadioNode	Unterminated
USB Cable	No	1m	No	RadioNode	Unterminated
DC Power Cable - Laptop (ASUS)	No	1.8m	Yes	Laptop PC (ASUS)	AC/DC Power Adapter - Laptop PC (ASUS)
AC Power Cable - Laptop (ASUS)	No	1.5m	No	AC/DC Power Adapter - Laptop PC (ASUS)	AC Mains

CONFIGURATIONS



Configuration SYNA0309- 13

Software/Firmware Running during test	
Description	Version
Radio Tool	08/02/2018

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
4-Element Patch Array Antenna	Ventev	T24130P10006GT	N/A
RadioNode	Walt Disney Parks and Resorts US, Inc.	300-004195	Rev. 10 - 012

Peripherals in test setup boundary			
Description	Manufacturer	Model/Part Number	Serial Number
Audio Peripheral	Synapse Product Development, Inc.	Two	N/A
Laptop PC (ASUS)	ASUS	UL20FT	A8N0AS133997328
AC/DC Power Adapter - Laptop PC (ASUS)	ASUS	ADP-65JH	660W0BB0J5T

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
Relay & DC Out Cable	No	1.5m	No	Audio Peripheral	RadioNode
Audio DMX Cable	No	3m	No	Audio Peripheral	RadioNode
Ethernet Cable	No	1m	No	RadioNode	Unterminated
USB Cable	No	1.6m	No	RadioNode	Unterminated
USB Cable	No	1m	No	RadioNode	Unterminated
DC Power Cable - Laptop (ASUS)	No	1.8m	Yes	Laptop PC (ASUS)	AC/DC Power Adapter - Laptop PC (ASUS)
AC Power Cable - Laptop (ASUS)	No	1.5m	No	AC/DC Power Adapter - Laptop PC (ASUS)	AC Mains
Ethernet Cable	No	7.5m	No	RadioNode	Laptop

CONFIGURATIONS

Configuration SYNA0309- 14

Software/Firmware Running during test	
Description	Version
Radio Tool	08/02/2018

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
Patch Array - 3x3 (9 elements) Antenna	Disney	3x3	N/A
RadioNode	Walt Disney Parks and Resorts US, Inc.	300-004195	Rev. 10 - 004

Peripherals in test setup boundary			
Description	Manufacturer	Model/Part Number	Serial Number
Audio Peripheral	Synapse Product Development, Inc.	Two	N/A
AC/DC Power Adapter - Switch	Netgear	NUA3-6540240-11	N/A
Switch	Netgear	GS108pp	58617ADUA11A9
Laptop PC (ASUS)	ASUS	UL20FT	A8N0AS133997328
AC/DC Power Adapter - Laptop PC (ASUS)	ASUS	ADP-65JH	660W0BB0J5T

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
DC Power Cable - Switch	No	1.5m	No	Switch	AC/DC Power Adapter - Switch
AC Power Cable - Switch	No	2m	No	AC/DC Power Adapter - Switch	AC Mains
Relay & DC Out Cable	No	1.5m	No	Audio Peripheral	RadioNode
Ethernet Cable	No	7.5m	No	RadioNode	Switch
Ethernet Cable	No	1m	No	Switch	Laptop
Ethernet Cable	No	1m	No	RadioNode	Unterminated
USB Cable	No	1.6m	No	RadioNode	Unterminated
USB Cable	No	1m	No	RadioNode	Unterminated
DC Power Cable - Laptop (ASUS)	No	1.8m	Yes	Laptop PC (ASUS)	AC/DC Power Adapter - Laptop PC (ASUS)
AC Power Cable - Laptop (ASUS)	No	1.5m	No	AC/DC Power Adapter - Laptop PC (ASUS)	AC Mains

CONFIGURATIONS



Configuration SYNA0309- 15

Software/Firmware Running during test	
Description	Version
Radio Tool	08/02/2018

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
Patch Array - 3x3 (9 elements) Antenna	Disney	3x3	N/A
RadioNode	Walt Disney Parks and Resorts US, Inc.	300-004195	Rev. 10 - 012

Peripherals in test setup boundary			
Description	Manufacturer	Model/Part Number	Serial Number
Audio Peripheral	Synapse Product Development, Inc.	Two	N/A
Laptop PC (ASUS)	ASUS	UL20FT	A8N0AS133997328
AC/DC Power Adapter - Laptop PC (ASUS)	ASUS	ADP-65JH	660W0BB0J5T

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
Relay & DC Out Cable	No	1.5m	No	Audio Peripheral	RadioNode
Audio DMX Cable	No	3m	No	Audio Peripheral	RadioNode
Ethernet Cable	No	1m	No	RadioNode	Unterminated
USB Cable	No	1.6m	No	RadioNode	Unterminated
USB Cable	No	1m	No	RadioNode	Unterminated
DC Power Cable - Laptop (ASUS)	No	1.8m	Yes	Laptop PC (ASUS)	AC/DC Power Adapter - Laptop PC (ASUS)
AC Power Cable - Laptop (ASUS)	No	1.5m	No	AC/DC Power Adapter - Laptop PC (ASUS)	AC Mains
Ethernet Cable	No	7.5m	No	RadioNode	Laptop

CONFIGURATIONS



Configuration SYNA0309- 16

Software/Firmware Running during test	
Description	Version
Radio Tool	08/02/2018

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
4-Element Patch Array Antenna	Ventev	T24130P10006GT	N/A
RadioNode	Walt Disney Parks and Resorts US, Inc.	300-004195	Rev. 10 - 004

Peripherals in test setup boundary			
Description	Manufacturer	Model/Part Number	Serial Number
Audio Peripheral	Synapse Product Development, Inc.	Two	N/A
Laptop PC (ASUS)	ASUS	UL20FT	A8N0AS133997328
AC/DC Power Adapter - Laptop PC (ASUS)	ASUS	ADP-65JH	660W0BB0J5T

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
Relay & DC Out Cable	No	1.5m	No	Audio Peripheral	RadioNode
Audio DMX Cable	No	3m	No	Audio Peripheral	RadioNode
Ethernet Cable	No	1m	No	RadioNode	Unterminated
USB Cable	No	1.6m	No	RadioNode	Unterminated
USB Cable	No	1m	No	RadioNode	Unterminated
DC Power Cable - Laptop (ASUS)	No	1.8m	Yes	Laptop PC (ASUS)	AC/DC Power Adapter - Laptop PC (ASUS)
AC Power Cable - Laptop (ASUS)	No	1.5m	No	AC/DC Power Adapter - Laptop PC (ASUS)	AC Mains
Ethernet Cable	No	7.5m	No	RadioNode	Laptop

CONFIGURATIONS



Configuration SYNA0309- 17

Software/Firmware Running during test	
Description	Version
Radio Tool	08/02/2018

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
Patch Array - 3x3 (9 elements) Antenna	Disney	3x3	N/A
RadioNode	Walt Disney Parks and Resorts US, Inc.	300-004195	Rev. 10 - 012

Peripherals in test setup boundary			
Description	Manufacturer	Model/Part Number	Serial Number
Audio Peripheral	Synapse Product Development, Inc.	Two	N/A
Laptop PC (ASUS)	ASUS	UL20FT	A8N0AS133997328
AC/DC Power Adapter - Laptop PC (ASUS)	ASUS	ADP-65JH	660W0BB0J5T

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
Relay & DC Out Cable	No	1.5m	No	Audio Peripheral	RadioNode
Audio DMX Cable	No	3m	No	Audio Peripheral	RadioNode
Ethernet Cable	No	1m	No	RadioNode	Unterminated
USB Cable	No	1.6m	No	RadioNode	Unterminated
USB Cable	No	1m	No	RadioNode	Unterminated
DC Power Cable - Laptop (ASUS)	No	1.8m	Yes	Laptop PC (ASUS)	AC/DC Power Adapter - Laptop PC (ASUS)
AC Power Cable - Laptop (ASUS)	No	1.5m	No	AC/DC Power Adapter - Laptop PC (ASUS)	AC Mains
Ethernet Cable	No	7.5m	No	RadioNode	Laptop

CONFIGURATIONS



Configuration SYNA0309- 18

Software/Firmware Running during test	
Description	Version
Radio Tool	08/02/2018

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
RadioNode	Walt Disney Parks and Resorts US, Inc.	300-004195	Rev. 10 - 012
Panel Antenna	Ventev	T24190P10006GT	N/A

Peripherals in test setup boundary			
Description	Manufacturer	Model/Part Number	Serial Number
Audio Peripheral	Synapse Product Development, Inc.	Two	N/A
Laptop PC (ASUS)	ASUS	UL20FT	A8N0AS133997328
AC/DC Power Adapter - Laptop PC (ASUS)	ASUS	ADP-65JH	660W0BB0J5T

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
Relay & DC Out Cable	No	1.5m	No	Audio Peripheral	RadioNode
Audio DMX Cable	No	3m	No	Audio Peripheral	RadioNode
Ethernet Cable	No	1m	No	RadioNode	Unterminated
USB Cable	No	1.6m	No	RadioNode	Unterminated
USB Cable	No	1m	No	RadioNode	Unterminated
Antenna Patch Cable	Yes	1.25m	No	RadioNode	Panel Antenna
DC Power Cable - Laptop (ASUS)	No	1.8m	Yes	Laptop PC (ASUS)	AC/DC Power Adapter - Laptop PC (ASUS)
AC Power Cable - Laptop (ASUS)	No	1.5m	No	AC/DC Power Adapter - Laptop PC (ASUS)	AC Mains
Ethernet Cable	No	7.5m	No	RadioNode	Laptop

CONFIGURATIONS



Configuration SYNA0309- 19

Software/Firmware Running during test	
Description	Version
Radio Tool	08/02/2018

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
RadioNode	Walt Disney Parks and Resorts US, Inc.	300-004195	Rev. 10 - 012
Panel Antenna	Ventev	T24190P10006GT	N/A

Peripherals in test setup boundary			
Description	Manufacturer	Model/Part Number	Serial Number
Audio Peripheral	Synapse Product Development, Inc.	Two	N/A
AC/DC Power Adapter - Switch	Netgear	NUA3-6540240-11	N/A
Switch	Netgear	GS108pp	58617ADUA11A9
Laptop PC (ASUS)	ASUS	UL20FT	A8N0AS133997328
AC/DC Power Adapter - Laptop PC (ASUS)	ASUS	ADP-65JH	660W0BB0J5T

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
DC Power Cable - Switch	No	1.5m	No	Switch	AC/DC Power Adapter - Switch
AC Power Cable - Switch	No	2m	No	AC/DC Power Adapter - Switch	AC Mains
Relay & DC Out Cable	No	1.5m	No	Audio Peripheral	RadioNode
Audio DMX Cable	No	3m	No	Audio Peripheral	RadioNode
Ethernet Cable	No	7.5m	No	RadioNode	Switch
Ethernet Cable	No	1m	No	Switch	Laptop
Ethernet Cable	No	1m	No	RadioNode	Unterminated
USB Cable	No	1.6m	No	RadioNode	Unterminated
USB Cable	No	1m	No	RadioNode	Unterminated
Antenna Patch Cable	Yes	1.25m	No	RadioNode	Panel Antenna
DC Power Cable - Laptop (ASUS)	No	1.8m	Yes	Laptop PC (ASUS)	AC/DC Power Adapter - Laptop PC (ASUS)
AC Power Cable - Laptop (ASUS)	No	1.5m	No	AC/DC Power Adapter - Laptop PC (ASUS)	AC Mains

CONFIGURATIONS



Configuration SYNA0313- 1

Software/Firmware Running during test	
Description	Version
Radio Tool	08/02/2018

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
RadioNode	Walt Disney Parks and Resorts US, Inc.	300-004195	Rev. 10 - 007
Dual Port Monopole Antenna	Taoglas	MA510.C.CG.005	N/A

Peripherals in test setup boundary			
Description	Manufacturer	Model/Part Number	Serial Number
Audio Peripheral	Synapse Product Development, Inc.	Two	N/A

Remote Equipment Outside of Test Setup Boundary			
Description	Manufacturer	Model/Part Number	Serial Number
AC/DC Power Adapter - Laptop	HP	608428-001	2306691807
Laptop	HP	ProBook 4540s	2CE3201RB4
AC/DC Power Adapter - Switch	Netgear	NUA3-6540240-11	N/A
Switch	Netgear	GS108pp	58617ADUA11A9

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
DC Power Cable - Laptop	No	2m	Yes	Laptop	AC/DC Power Adapter - Laptop
AC Power Cable - Laptop	No	2m	No	AC/DC Power Adapter - Laptop	AC Mains
DC Power Cable - Switch	No	1.5m	No	Switch	AC/DC Power Adapter - Switch
AC Power Cable - Switch	No	2m	No	AC/DC Power Adapter - Switch	AC Mains
Relay & DC Out Cable	No	1.5m	No	Audio Peripheral	RadioNode
Audio DMX Cable	No	3m	No	Audio Peripheral	RadioNode
Ethernet Cable	No	7.5m	No	RadioNode	Switch
Ethernet Cable	No	1m	No	Switch	Laptop
USB Cable	No	1.6m	No	RadioNode	Unterminated
USB Cable	No	1m	No	RadioNode	Unterminated
Coaxial Cable x2	Yes	0.8m	No	RadioNode	MA510.C.CG.005 Antenna

CONFIGURATIONS



Configuration SYNA0313- 2

Software/Firmware Running during test	
Description	Version
Radio Tool	08/02/2018

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
RadioNode	Walt Disney Parks and Resorts US, Inc.	300-004195	Rev. 10 - 007
Dual Port Monopole Antenna	Taoglas	MA510.C.CG.005	N/A

Peripherals in test setup boundary			
Description	Manufacturer	Model/Part Number	Serial Number
Audio Peripheral	Synapse Product Development, Inc.	Two	N/A
DC Power Supply	Tektronix	PS280	TW55636

Remote Equipment Outside of Test Setup Boundary			
Description	Manufacturer	Model/Part Number	Serial Number
AC/DC Power Adapter - Laptop	HP	608428-001	2306691807
Laptop	HP	ProBook 4540s	2CE3201RB4

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
DC Power Cable - Laptop	No	2m	Yes	Laptop	AC/DC Power Adapter - Laptop
AC Power Cable - Laptop	No	2m	No	AC/DC Power Adapter - Laptop	AC Mains
Relay & DC Out Cable	No	1.5m	No	Audio Peripheral	RadioNode
Audio DMX Cable	No	3m	No	Audio Peripheral	RadioNode
Ethernet Cable	No	1m	No	RadioNode	Unterminated
USB Cable	No	1.6m	No	RadioNode	Unterminated
USB Cable	No	1m	No	RadioNode	Unterminated
DC Power Supply Cable	No	1.6m	No	DC Power Supply	AC Mains
Ethernet Cable	No	7.5m	No	RadioNode	Laptop
Coaxial Cable x2	Yes	0.8m	No	RadioNode	MA510.C.CG.005 Antenna

CONFIGURATIONS



Configuration SYNA0317- 1

Software/Firmware Running during test	
Description	Version
Radio Tool	08/02/2018

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
RadioNode	Walt Disney Parks and Resorts US, Inc.	300-004195	Rev. 10 - 007
4-Element Patch Array Antenna	Ventev	T24130P10006GT	N/A

Peripherals in test setup boundary			
Description	Manufacturer	Model/Part Number	Serial Number
Audio Peripheral	Synapse Product Development, Inc.	Two	N/A

Remote Equipment Outside of Test Setup Boundary			
Description	Manufacturer	Model/Part Number	Serial Number
AC/DC Power Adapter - Laptop	HP	608428-001	2306691807
Laptop	HP	ProBook 4540s	2CE3201RB4
AC/DC Power Adapter - Switch	Netgear	NUA3-6540240-11	N/A
Switch	Netgear	GS108pp	58617ADUA11A9

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
DC Power Cable - Laptop	No	2m	Yes	Laptop	AC/DC Power Adapter - Laptop
AC Power Cable - Laptop	No	2m	No	AC/DC Power Adapter - Laptop	AC Mains
DC Power Cable - Switch	No	1.5m	No	Switch	AC/DC Power Adapter - Switch
AC Power Cable - Switch	No	2m	No	AC/DC Power Adapter - Switch	AC Mains
Relay & DC Out Cable	No	1.5m	No	Audio Peripheral/DC Power Supply	RadioNode
Audio DMX Cable	No	3m	No	Audio Peripheral	RadioNode
Ethernet Cable	No	7.5m	No	RadioNode	Switch
Ethernet Cable	No	1m	No	Switch	Laptop
Ethernet Cable	No	1m	No	RadioNode	Unterminated
USB Cable	No	1.6m	No	RadioNode	Unterminated
USB Cable	No	1m	No	RadioNode	Unterminated
Antenna Patch Cable	Yes	1.25m	No	RadioNode	Panel Antenna

CONFIGURATIONS



Configuration SYNA0317- 2

Software/Firmware Running during test	
Description	Version
Radio Tool	08/02/2018

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
RadioNode	Walt Disney Parks and Resorts US, Inc.	300-004195	Rev. 10 - 007
4-Element Patch Array Antenna	Ventev	T24130P10006GT	N/A

Peripherals in test setup boundary			
Description	Manufacturer	Model/Part Number	Serial Number
Audio Peripheral	Synapse Product Development, Inc.	Two	N/A
DC Power Supply	Tektronix	PS280	TW55636

Remote Equipment Outside of Test Setup Boundary			
Description	Manufacturer	Model/Part Number	Serial Number
AC/DC Power Adapter - Laptop	HP	608428-001	2306691807
Laptop	HP	ProBook 4540s	2CE3201RB4

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
DC Power Cable - Laptop	No	2m	Yes	Laptop	AC/DC Power Adapter - Laptop
AC Power Cable - Laptop	No	2m	No	AC/DC Power Adapter - Laptop	AC Mains
Relay & DC Out Cable	No	1.5m	No	Audio Peripheral/DC Power Supply	RadioNode
Audio DMX Cable	No	3m	No	Audio Peripheral	RadioNode
Ethernet Cable	No	1m	No	RadioNode	Unterminated
USB Cable	No	1.6m	No	RadioNode	Unterminated
USB Cable	No	1m	No	RadioNode	Unterminated
DC Power Supply Cable	No	1.6m	No	DC Power Supply	AC Mains
Ethernet Cable	No	1m	No	RadioNode	Laptop
Antenna Patch Cable	Yes	1.25m	No	RadioNode	Panel Antenna
Ethernet Cable	No	7.5m	No	RadioNode	Laptop

CONFIGURATIONS



Configuration SYNA0317- 3

Software/Firmware Running during test	
Description	Version
Radio Tool	08/02/2018

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
RadioNode	Walt Disney Parks and Resorts US, Inc.	300-004195	Rev. 10 - 007
Panel Antenna	Ventev	T24190P10006GT	N/A

Peripherals in test setup boundary			
Description	Manufacturer	Model/Part Number	Serial Number
Audio Peripheral	Synapse Product Development, Inc.	Two	N/A

Remote Equipment Outside of Test Setup Boundary			
Description	Manufacturer	Model/Part Number	Serial Number
AC/DC Power Adapter - Laptop	HP	608428-001	2306691807
Laptop	HP	ProBook 4540s	2CE3201RB4
AC/DC Power Adapter - Switch	Netgear	NUA3-6540240-11	N/A
Switch	Netgear	GS108pp	58617ADUA11A9

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
DC Power Cable - Laptop	No	2m	Yes	Laptop	AC/DC Power Adapter - Laptop
AC Power Cable - Laptop	No	2m	No	AC/DC Power Adapter - Laptop	AC Mains
DC Power Cable - Switch	No	1.5m	No	Switch	AC/DC Power Adapter - Switch
AC Power Cable - Switch	No	2m	No	AC/DC Power Adapter - Switch	AC Mains
Relay & DC Out Cable	No	1.5m	No	Audio Peripheral/DC Power Supply	RadioNode
Audio DMX Cable	No	3m	No	Audio Peripheral	RadioNode
Ethernet Cable	No	7.5m	No	RadioNode	Switch
Ethernet Cable	No	1m	No	Switch	Laptop
Ethernet Cable	No	1m	No	RadioNode	Unterminated
USB Cable	No	1.6m	No	RadioNode	Unterminated
USB Cable	No	1m	No	RadioNode	Unterminated
Antenna Patch Cable	Yes	1.25m	No	RadioNode	Panel Antenna

CONFIGURATIONS



Configuration SYNA0317- 4

Software/Firmware Running during test	
Description	Version
Radio Tool	08/02/2018

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
RadioNode	Walt Disney Parks and Resorts US, Inc.	300-004195	Rev. 10 - 007
Panel Antenna	Ventev	T24190P10006GT	N/A

Peripherals in test setup boundary			
Description	Manufacturer	Model/Part Number	Serial Number
Audio Peripheral	Synapse Product Development, Inc.	Two	N/A
DC Power Supply	Tektronix	PS280	TW55636

Remote Equipment Outside of Test Setup Boundary			
Description	Manufacturer	Model/Part Number	Serial Number
AC/DC Power Adapter - Laptop	HP	608428-001	2306691807
Laptop	HP	ProBook 4540s	2CE3201RB4

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
DC Power Cable - Laptop	No	2m	Yes	Laptop	AC/DC Power Adapter - Laptop
AC Power Cable - Laptop	No	2m	No	AC/DC Power Adapter - Laptop	AC Mains
Relay & DC Out Cable	No	1.5m	No	Audio Peripheral/DC Power Supply	RadioNode
Audio DMX Cable	No	3m	No	Audio Peripheral	RadioNode
Ethernet Cable	No	1m	No	RadioNode	Unterminated
USB Cable	No	1.6m	No	RadioNode	Unterminated
USB Cable	No	1m	No	RadioNode	Unterminated
DC Power Supply Cable	No	1.6m	No	DC Power Supply	AC Mains
Ethernet Cable	No	1m	No	RadioNode	Laptop
Antenna Patch Cable	Yes	1.25m	No	RadioNode	Panel Antenna
Ethernet Cable	No	7.5m	No	RadioNode	Laptop

CONFIGURATIONS



Configuration SYNA0317- 5

Software/Firmware Running during test	
Description	Version
Radio Tool	08/02/2018

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
RadioNode	Walt Disney Parks and Resorts US, Inc.	300-004195	Rev. 10 - 007

Peripherals in test setup boundary			
Description	Manufacturer	Model/Part Number	Serial Number
Audio Peripheral	Synapse Product Development, Inc.	Two	N/A
DC Power Supply	Tektronix	PS280	TW55636

Remote Equipment Outside of Test Setup Boundary			
Description	Manufacturer	Model/Part Number	Serial Number
AC/DC Power Adapter - Laptop	HP	608428-001	2306691807
Laptop	HP	ProBook 4540s	2CE3201RB4

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
DC Power Cable - Laptop	No	2m	Yes	Laptop	AC/DC Power Adapter - Laptop
AC Power Cable - Laptop	No	2m	No	AC/DC Power Adapter - Laptop	AC Mains
Relay & DC Out Cable	No	1.5m	No	Audio Peripheral/DC Power Supply	RadioNode
Audio DMX Cable	No	3m	No	Audio Peripheral	RadioNode
DC Power Supply Cable	No	1.6m	No	DC Power Supply	AC Mains
Ethernet Cable	No	7.5m	No	RadioNode	Laptop

MODIFICATIONS

Equipment Modifications

Item	Date	Test	Modification	Note	Disposition of EUT
1	2020-08-25	Output Power, 0dBm	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
2	2020-09-26	Spurious Radiated Emissions, ANT-2.4-CW-HWR-SMA	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
3	2020-09-26	Spurious Radiated Emissions, GW.26.0111	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
4	2020-09-28	Spurious Radiated Emissions, RE09-p-NM	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
5	2020-09-30	Spurious Radiated Emissions, C3EY	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
6	2020-10-05	Spurious Radiated Emissions, WSA.2400.A.101151	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
7	2020-10-14	Output Power, -4dBm	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
8	2020-10-27	Spurious Radiated Emissions, 3x3	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
9	2020-11-20	Spurious Radiated Emissions, T24130P10006GT	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
10	2020-11-23	Spurious Radiated Emissions, T24190P10006GT	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
11	2020-11-24	Output Power, -8dBm	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
12	2020-12-16	Spurious Radiated Emissions, MA510.C.CG.005	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.

MODIFICATIONS

13	2020-12-21	Output Power, -4dBm	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
14	2021-01-04	Spurious Radiated Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT remained at Element following the test.
15	2021-01-05	Spurious Radiated Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	Scheduled testing was completed.

POWER SETTINGS AND ANTENNAS



The power settings, antenna gain value(s) and cable loss (if applicable) used for the testing contained in this report were provided by the customer and will affect the validity of the results. Element assumes no responsibility for the accuracy of this information.

ANTENNA GAIN (dBi)

Type	Provided by:	Frequency Range (MHz)	Gain (dBi)
Dipole	Linx, PN: ANT-2.4-CW-HWR-SMA	2300-2600	3.2
Patch Array – 3x3 (9 elements)	Disney, PN: 3x3	2400-2500	12
Yagi	Disney, PN: C3EY	2400-2500	6.3
Dipole	Taoglas, PN: GW.26.011	2400-2500	1.2
Dipole	Taoglas, PN: WSA.2400.A.101151	2400-2500	3.2
Patch Array (4 elements)	Ventev, PN: T24130P10006GT	2400-2500	13
Patch Array (16 elements)	Ventev, PN: T24190P10006GT	2400-2500	19
Patch (single element)	L-com, PN: RE09P-NM	2400-2500	8
Dipole	Taoglas, PN: MA510.C.CG.005	2400-2500	3.9

The EUT was tested using the power settings provided by the manufacturer:

SETTINGS FOR ALL TESTS IN THIS REPORT

ANT-2.4-CW-HWR-SMA, C3EY, GW.26.011, WSA.2400.A.101151, RE09P-NM, MA510.C.CG.005

Modulation Types / Data Rates	Type	Channel	Frequency (MHz)	Power Setting
BLE/1 Mbps	DTS	0	2402	0 dBm
		20	2442	0 dBm
		39	2480	0 dBm

3x3 & T24190P10006GT

Modulation Types / Data Rates	Type	Channel	Frequency (MHz)	Power Setting
BLE/1 Mbps	DTS	0	2402	-4 dBm
		20	2442	-4 dBm
		39	2480	-4 dBm

T24130P10006GT

Modulation Types / Data Rates	Type	Channel	Frequency (MHz)	Power Setting
BLE/1 Mbps	DTS	0	2402	-8 dBm
		20	2442	-8 dBm
		39	2480	-8 dBm

OUTPUT POWER



XMIT 2020.03.25.0

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Attenuator	Weinschel	54A-20	TYR	17-Jan-20	17-Jan-21
Block - DC	Weinschel Corp.	7006	AMS	17-Jan-20	17-Jan-21
Cable	ESM Cable Corp.	TTBJ141-KMKM-72	NCS	17-Jan-20	17-Jan-21
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFO	25-Jun-20	25-Jun-21
Generator - Signal	Agilent	N5183A	TIA	19-Jun-20	19-Jun-22

TEST DESCRIPTION

The transmit frequency was set to the required channels in each band. The transmit power was set to its default maximum.

Prior to measuring peak transmit power the DTS bandwidth (B) was measured.

The method found in ANSI C63.10:2013 Section 11.9.1.1 was used because the RBW on the analyzer was greater than the DTS Bandwidth of the radio.

OUTPUT POWER



TSTx 2019.08.30.0 XMR 2020.03.25.0

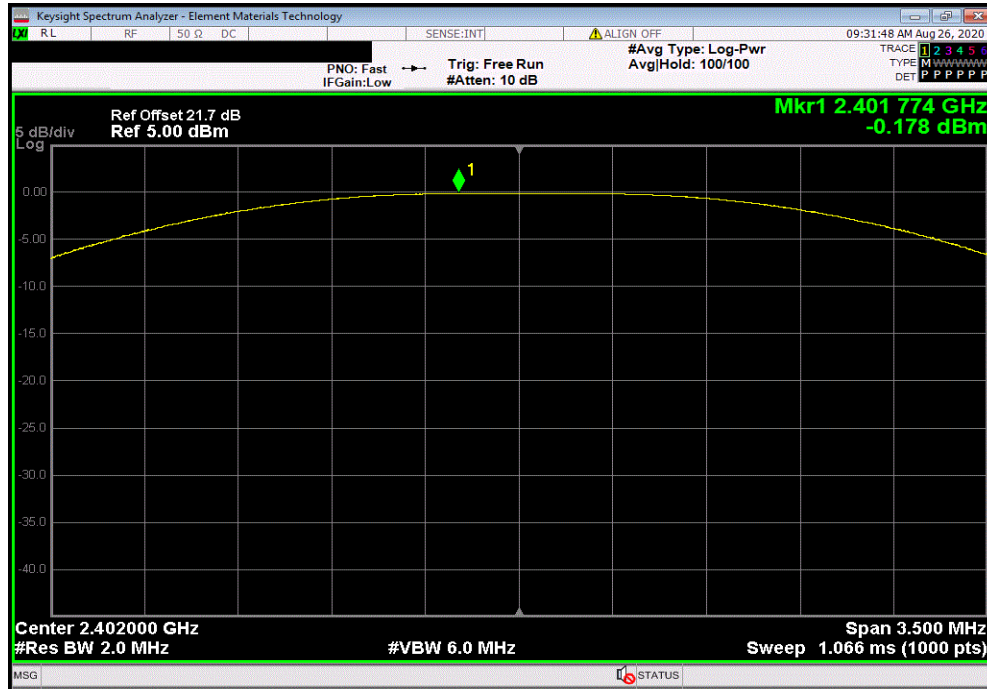
EUT: RadioNode		Work Order: SYNA0306	
Serial Number: Rev. 10 - 002		Date: 25-Aug-20	
Customer: Walt Disney Parks and Resorts US, Inc.		Temperature: 23.2 °C	
Attendees: None		Humidity: 46.6% RH	
Project: None		Barometric Pres.: 1017 mbar	
Tested by: Brian Fahey		Power: POE	
		Job Site: NC06	
TEST SPECIFICATIONS		Test Method	
FCC 15.247:2020		ANSI C63.10:2013	
COMMENTS			
Reference level offset includes DC Block, 20 dB attenuator, and RF measurement cable. Power setting = 0 dBm. The date on the spectrum analyzer was set incorrectly and log files based on the Microsoft clock on the PC running the test show the actual date was 8/25/20.			
DEVIATIONS FROM TEST STANDARD			
None			
Configuration #	4	Signature 	
		Out Pwr (dBm)	Limit (dBm)
			Result
Antenna Port 7			
	BLE/GFSK 1 Mbps Low Channel, 2402 MHz	-0.178	30
	BLE/GFSK 1 Mbps Mid Channel, 2442 MHz	-0.277	30
	BLE/GFSK 1 Mbps High Channel, 2480 MHz	-0.416	30
Antenna Port 8			
	BLE/GFSK 1 Mbps Low Channel, 2402 MHz	0.145	30
	BLE/GFSK 1 Mbps Mid Channel, 2442 MHz	0.055	30
	BLE/GFSK 1 Mbps High Channel, 2480 MHz	-0.071	30

OUTPUT POWER

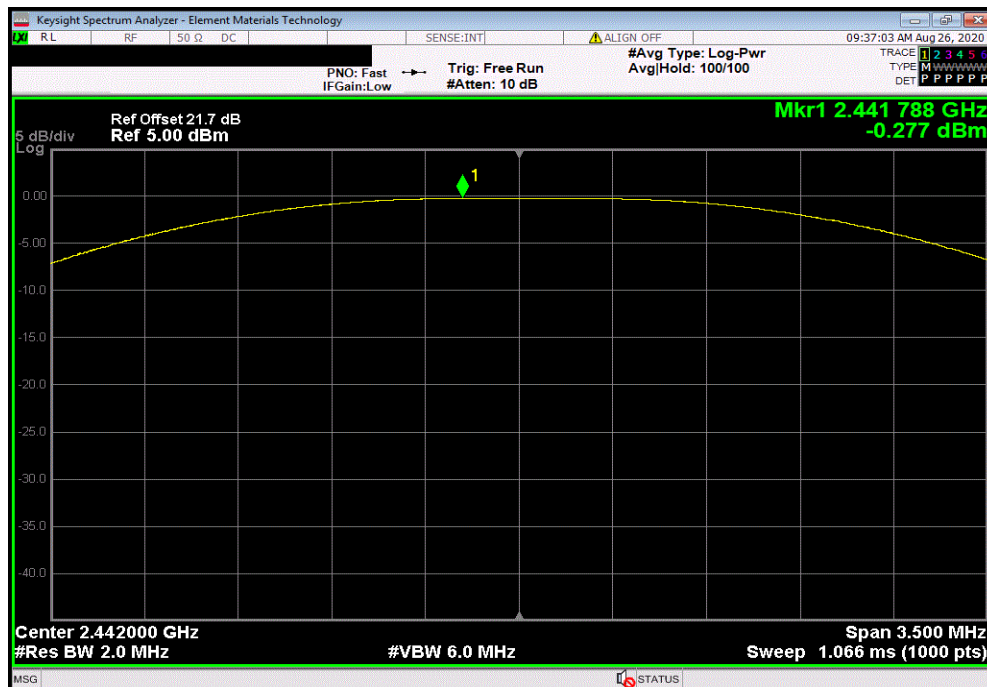


TbTx 2019.08.30.0 XMt 2020.03.25.0

Antenna Port 7, BLE/GFSK 1 Mbps Low Channel, 2402 MHz						
				Out Pwr (dBm)	Limit (dBm)	Result
				-0.178	30	Pass



Antenna Port 7, BLE/GFSK 1 Mbps Mid Channel, 2442 MHz						
				Out Pwr (dBm)	Limit (dBm)	Result
				-0.277	30	Pass

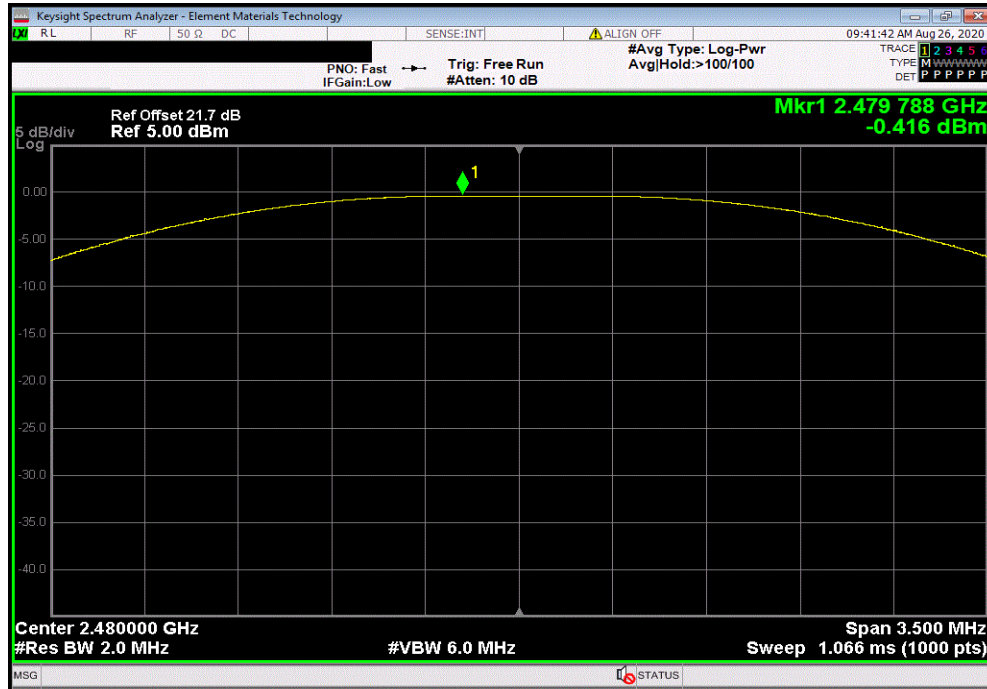


OUTPUT POWER

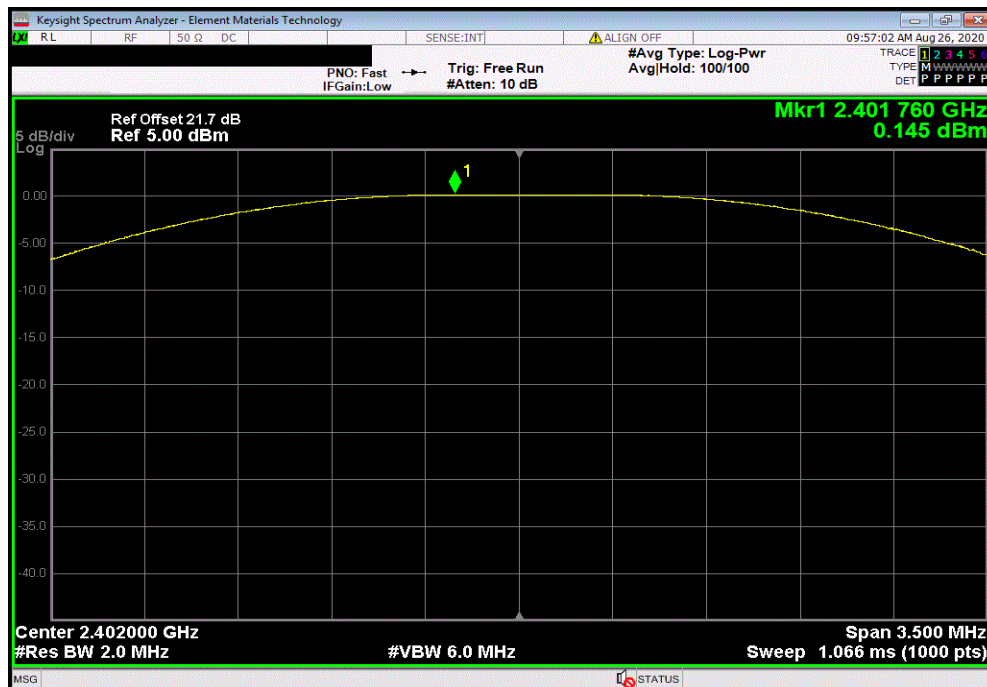


TbTx 2019.08.30.0 XMt 2020.03.25.0

Antenna Port 7, BLE/GFSK 1 Mbps High Channel, 2480 MHz						
				Out Pwr (dBm)	Limit (dBm)	Result
				-0.416	30	Pass



Antenna Port 8, BLE/GFSK 1 Mbps Low Channel, 2402 MHz						
				Out Pwr (dBm)	Limit (dBm)	Result
				0.145	30	Pass

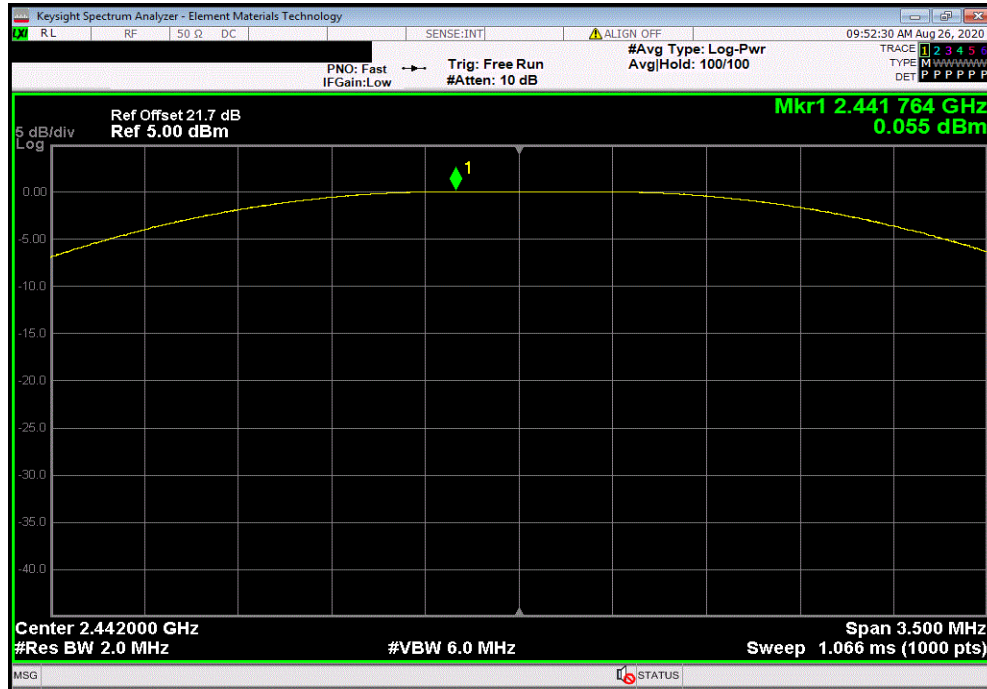


OUTPUT POWER

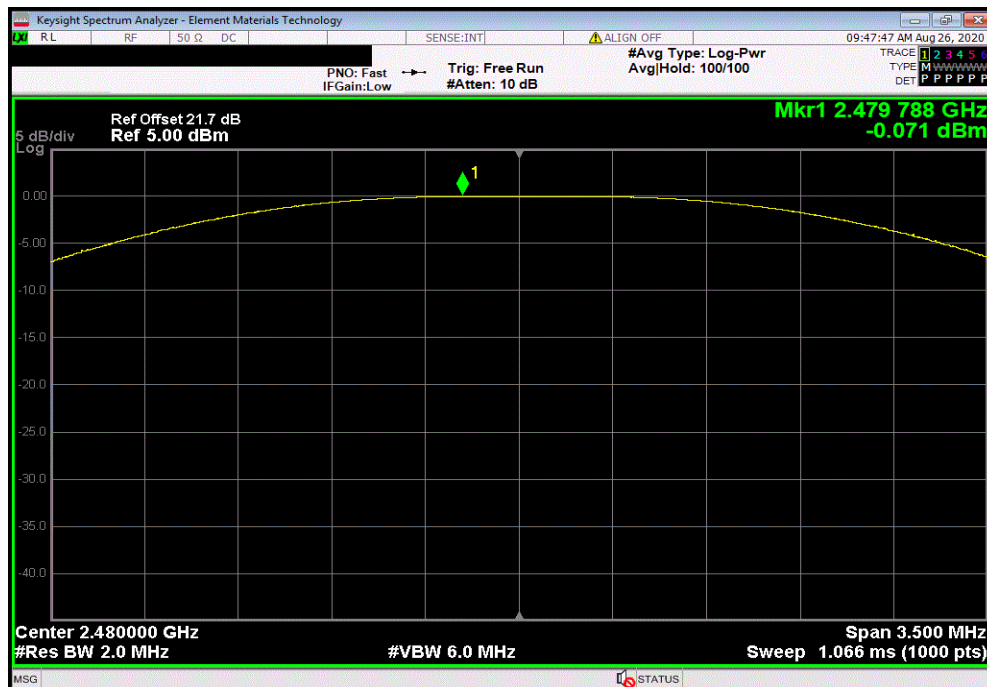


TbTx 2019.08.30.0 XMt 2020.03.25.0

Antenna Port 8, BLE/GFSK 1 Mbps Mid Channel, 2442 MHz						
				Out Pwr (dBm)	Limit (dBm)	Result
				0.055	30	Pass



Antenna Port 8, BLE/GFSK 1 Mbps High Channel, 2480 MHz						
				Out Pwr (dBm)	Limit (dBm)	Result
				-0.071	30	Pass



OUTPUT POWER



XMIT 2020.03.25.0

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Block - DC	Weinschel Corp.	7006	AMS	17-Jan-20	17-Jan-21
Attenuator	Weinschel	54A-20	TYR	17-Jan-20	17-Jan-21
Cable	Micro-Coax	UFD150A-1-0720-200200	NCS	17-Jan-20	17-Jan-21
Generator - Signal	Agilent	E4422B	TGR	11-Aug-20	11-Aug-23
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFO	25-Jun-20	25-Jun-21

TEST DESCRIPTION

The transmit frequency was set to the required channels in each band. The transmit power was set to its default maximum.

Prior to measuring peak transmit power the DTS bandwidth (B) was measured.

The method found in ANSI C63.10:2013 Section 11.9.1.1 was used because the RBW on the analyzer was greater than the DTS Bandwidth of the radio.

OUTPUT POWER



TSTx 2019.08.30.0 XMR 2020.03.25.0

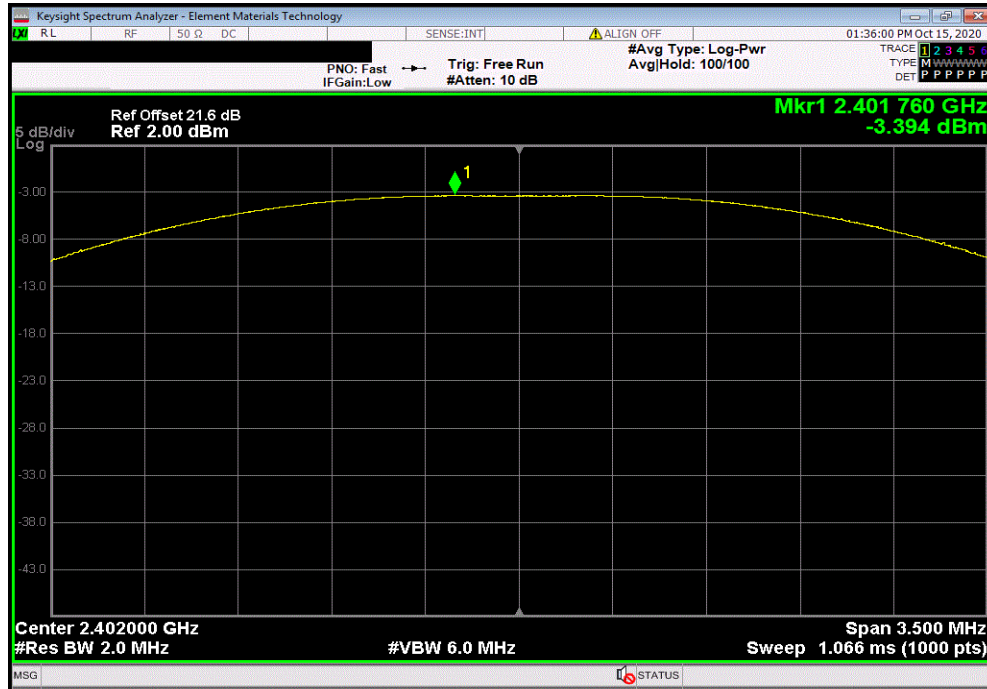
EUT: RadioNode		Work Order: SYNA0309	
Serial Number: Rev. 10 - 007		Date: 14-Oct-20	
Customer: Walt Disney Parks and Resorts US, Inc.		Temperature: 23 °C	
Attendees: None		Humidity: 43.9% RH	
Project: None		Barometric Pres.: 1031 mbar	
Tested by: Brian Fahey		Power: 24VDC via 120VAC/60Hz	
		Job Site: NC0A	
TEST SPECIFICATIONS			
FCC 15.247:2020		Test Method	
		ANSI C63.10:2013	
COMMENTS			
Reference level offset includes RF measurement cable, DC block, and 20 dB attenuator. Power setting = -4 dBm. The date on the spectrum analyzer was set incorrectly and log files based on the Microsoft clock on the PC running the test show the actual date was 10/14/20.			
DEVIATIONS FROM TEST STANDARD			
None			
Configuration #	11	Signature 	
		Out Pwr (dBm)	Limit (dBm)
Port 7, BLE/GFSK 1 Mbps Low Channel, 2402 MHz		-3.394	30
Port 7, BLE/GFSK 1 Mbps Mid Channel, 2442 MHz		-3.586	30
Port 7, BLE/GFSK 1 Mbps High Channel, 2480 MHz		-3.801	30
Port 8, BLE/GFSK 1 Mbps Low Channel, 2402 MHz		-3.935	30
Port 8, BLE/GFSK 1 Mbps Mid Channel, 2442 MHz		-4.093	30
Port 8, BLE/GFSK 1 Mbps High Channel, 2480 MHz		-4.322	30
			Result
			Pass
			Pass
			Pass
			Pass
			Pass

OUTPUT POWER

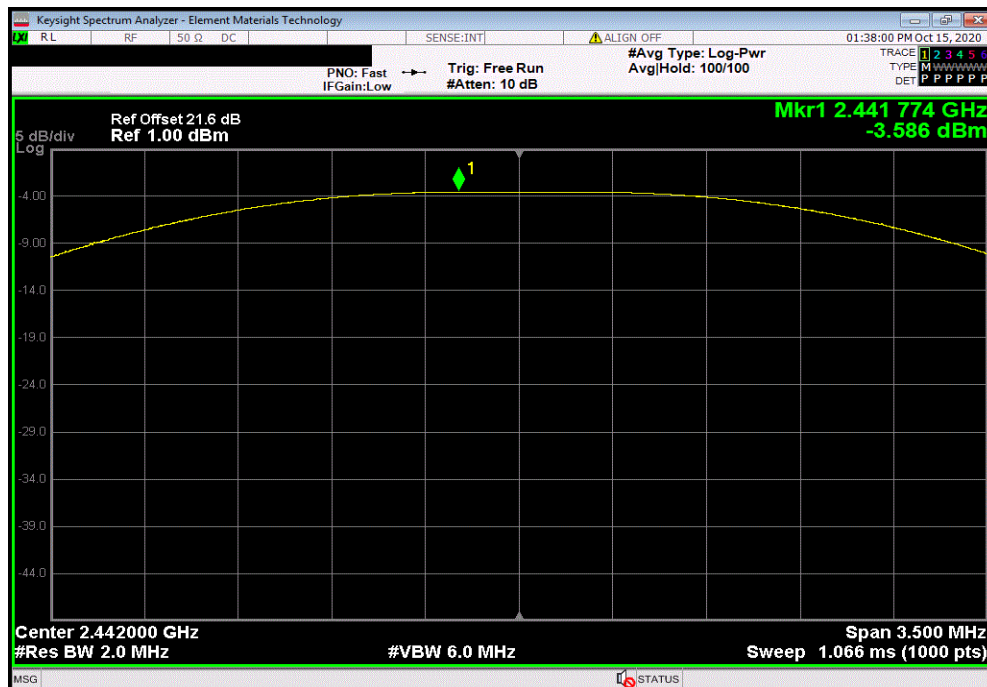


TbTtx 2019.08.30.0 XMt 2020.03.25.0

BLE/GFSK 1 Mbps Low Channel, 2402 MHz						
				Out Pwr (dBm)	Limit (dBm)	Result
				-3.394	30	Pass



BLE/GFSK 1 Mbps Mid Channel, 2442 MHz						
				Out Pwr (dBm)	Limit (dBm)	Result
				-3.586	30	Pass

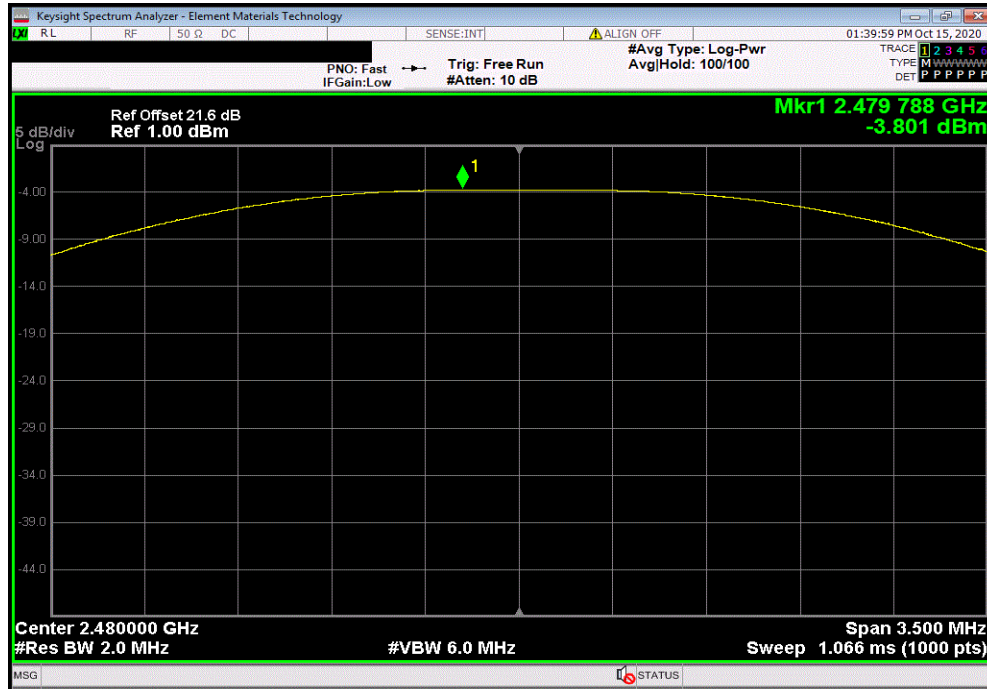


OUTPUT POWER

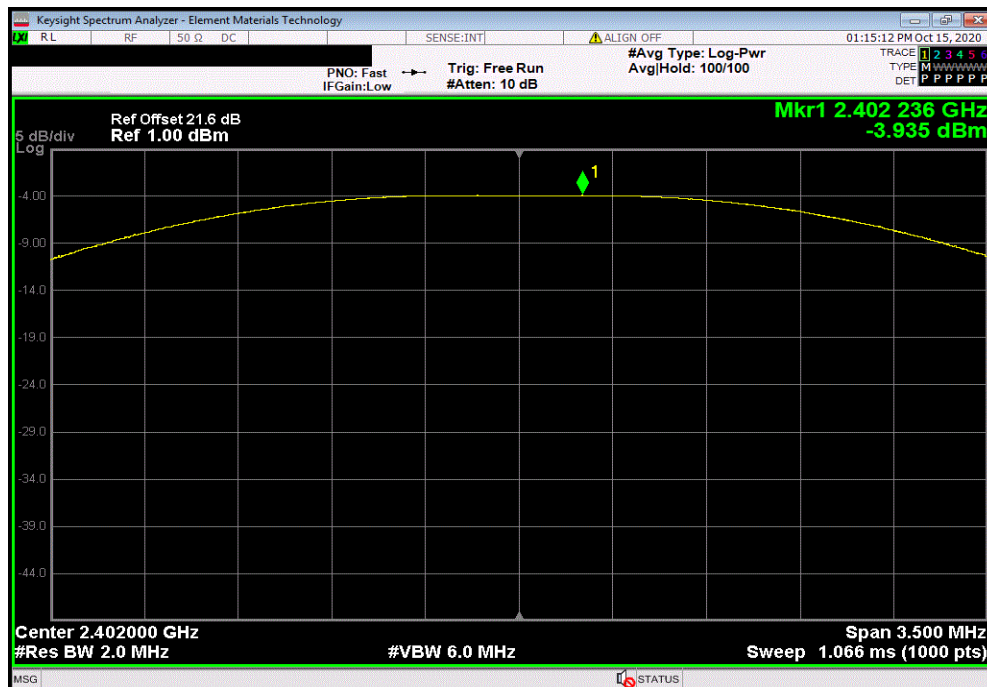


TbTx 2019.08.30.0 XMt 2020.03.25.0

BLE/GFSK 1 Mbps High Channel, 2480 MHz						
				Out Pwr (dBm)	Limit (dBm)	Result
				-3.801	30	Pass



BLE/GFSK 2 Mbps Low Channel, 2402 MHz						
				Out Pwr (dBm)	Limit (dBm)	Result
				-3.935	30	Pass

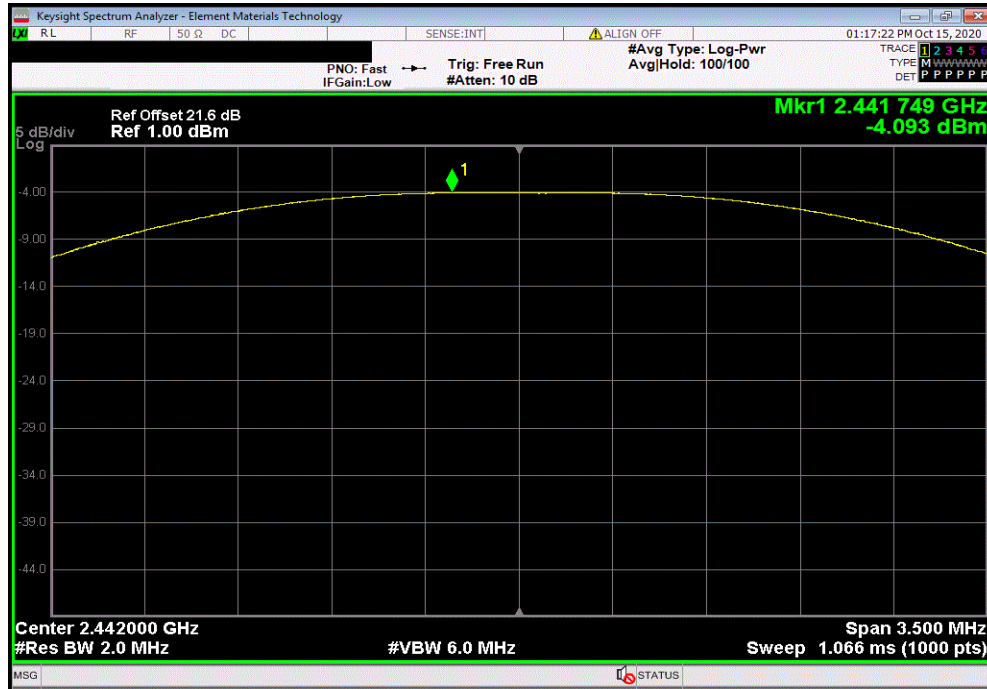


OUTPUT POWER

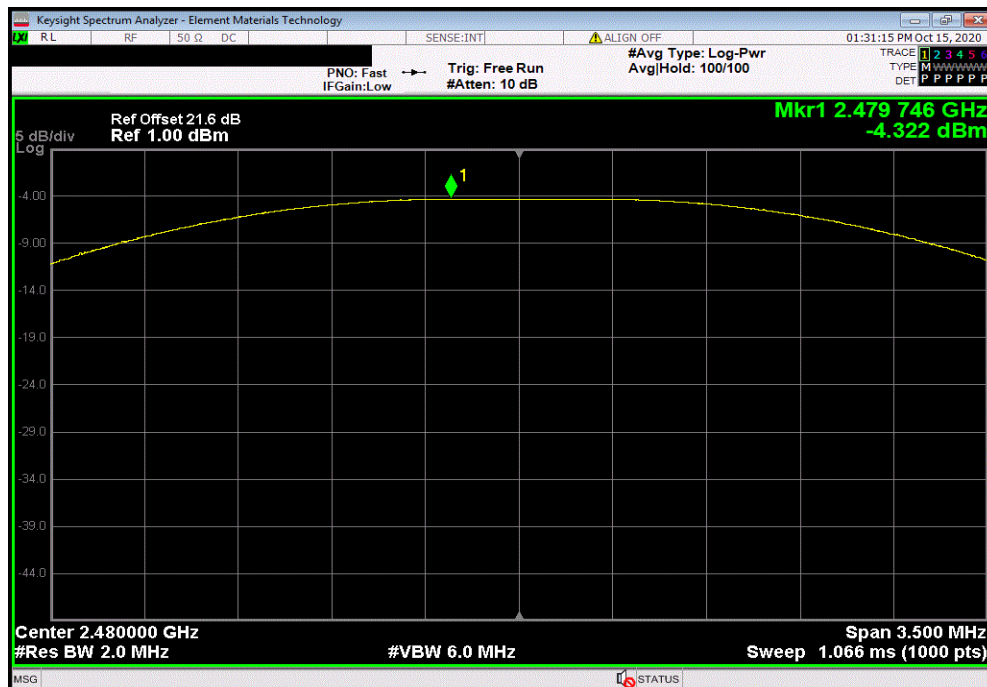


TbTtx 2019.08.30.0 XMR 2020.03.25.0

BLE/GFSK 2 Mbps Mid Channel, 2442 MHz						
				Out Pwr (dBm)	Limit (dBm)	Result
				-4.093	30	Pass



BLE/GFSK 2 Mbps High Channel, 2480 MHz						
				Out Pwr (dBm)	Limit (dBm)	Result
				-4.322	30	Pass



OUTPUT POWER



XMR 2020.03.25.0

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data.

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Cal. Due
Block - DC	Weinschel Corp.	7006	AMS	17-Jan-20	17-Jan-21
Attenuator	Weinschel	54A-20	TYR	17-Jan-20	17-Jan-21
Cable	Micro-Coax	UFD150A-1-0720-200200	NCS	17-Jan-20	17-Jan-21
Generator - Signal	Agilent	E4422B	TGR	11-Aug-20	11-Aug-23
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFO	25-Jun-20	25-Jun-21

TEST DESCRIPTION

The transmit frequency was set to the required channels in each band. The transmit power was set to its default maximum.

Prior to measuring peak transmit power the DTS bandwidth (B) was measured.

The method found in ANSI C63.10:2013 Section 11.9.1.1 was used because the RBW on the analyzer was greater than the DTS Bandwidth of the radio.

OUTPUT POWER



TSTx 2019.08.30.0 XMR 2020.03.25.0

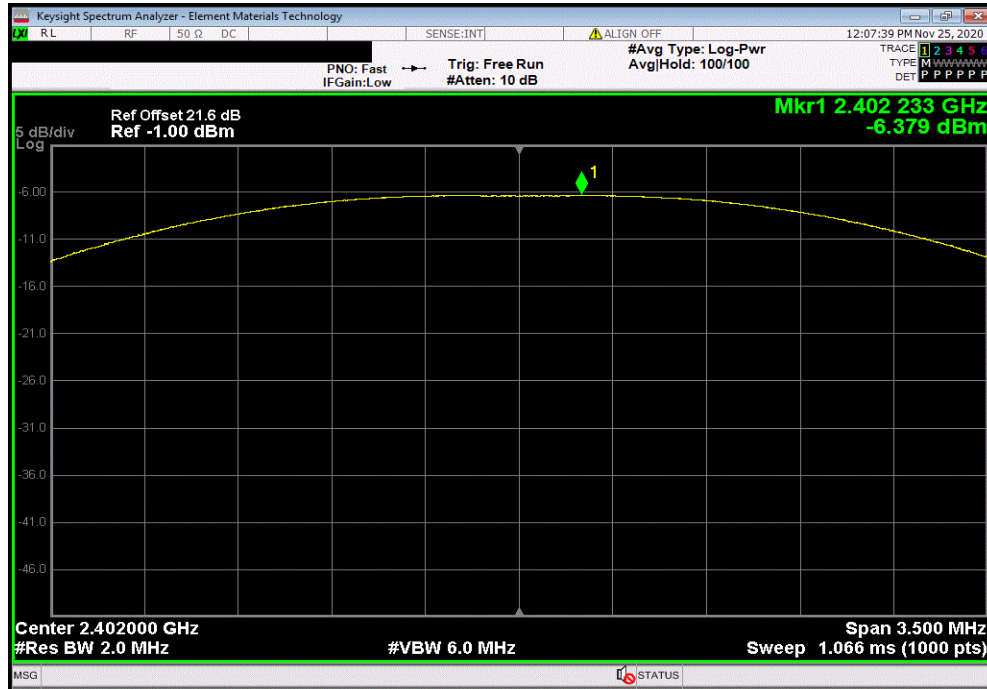
EUT: RadioNode		Work Order: SYNA0317	
Serial Number: Rev. 10 - 007		Date: 24-Nov-20	
Customer: Walt Disney Parks and Resorts US, Inc.		Temperature: 22.4 °C	
Attendees: None		Humidity: 39% RH	
Project: None		Barometric Pres.: 1015 mbar	
Tested by: Brian Fahey		Power: 24VDC via 120VAC/60Hz	
		Job Site: NC0A	
TEST SPECIFICATIONS			
FCC 15.247:2020		ANSI C63.10:2013	
TEST Method			
COMMENTS			
Reference level offset includes DC block, 20 dB attenuator, and RF measurement cable. Power setting = -8 dBm. The date on the spectrum analyzer was set incorrectly and log files based on the Microsoft clock on the PC running the test show the actual date was 11/24/20.			
DEVIATIONS FROM TEST STANDARD			
None			
Configuration #	5	Signature 	
		Out Pwr (dBm)	Limit (dBm)
Port 7, BLE/GFSK 1 Mbps Low Channel, 2402 MHz		-6.379	30
Port 7, BLE/GFSK 1 Mbps Mid Channel, 2442 MHz		-6.573	30
Port 7, BLE/GFSK 1 Mbps High Channel, 2480 MHz		-6.804	30
Port 8, BLE/GFSK 1 Mbps Low Channel, 2402 MHz		-6.897	30
Port 8, BLE/GFSK 1 Mbps Mid Channel, 2442 MHz		-7.064	30
Port 8, BLE/GFSK 1 Mbps High Channel, 2480 MHz		-7.315	30
			Result
			Pass
			Pass
			Pass
			Pass
			Pass

OUTPUT POWER

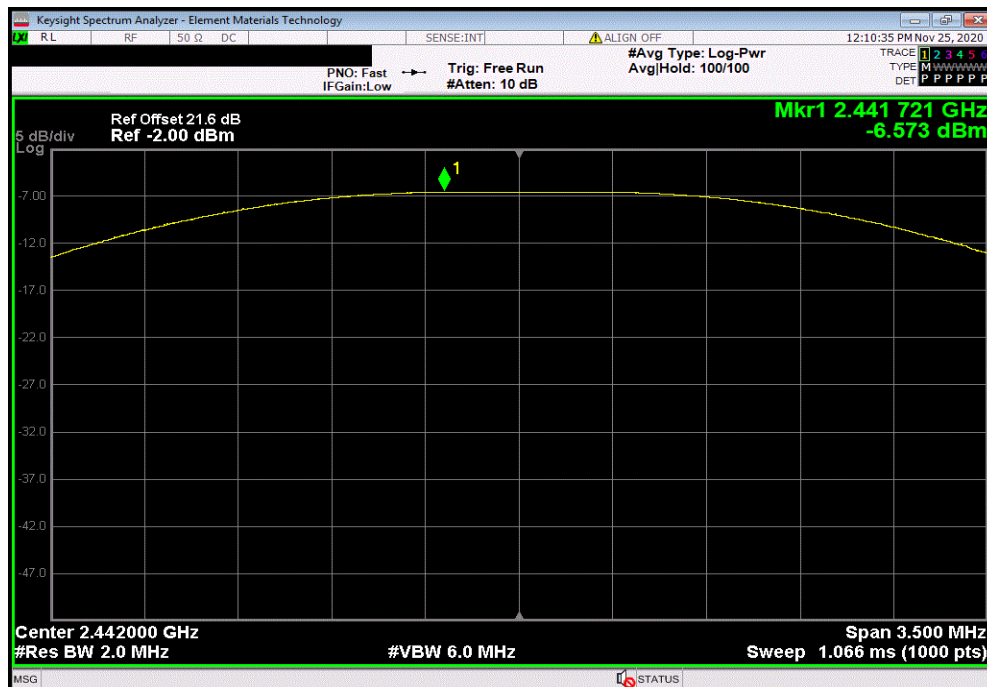


TbTtx 2019.08.30.0 XMt 2020.03.25.0

BLE/GFSK 1 Mbps Low Channel, 2402 MHz						
				Out Pwr (dBm)	Limit (dBm)	Result
				-6.379	30	Pass



BLE/GFSK 1 Mbps Mid Channel, 2442 MHz						
				Out Pwr (dBm)	Limit (dBm)	Result
				-6.573	30	Pass

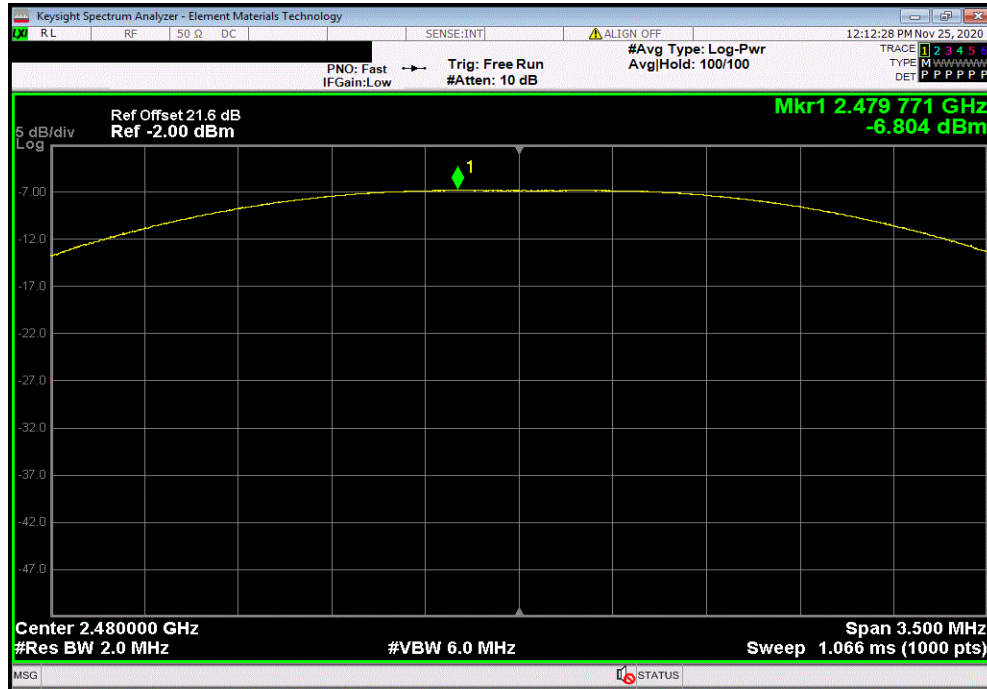


OUTPUT POWER

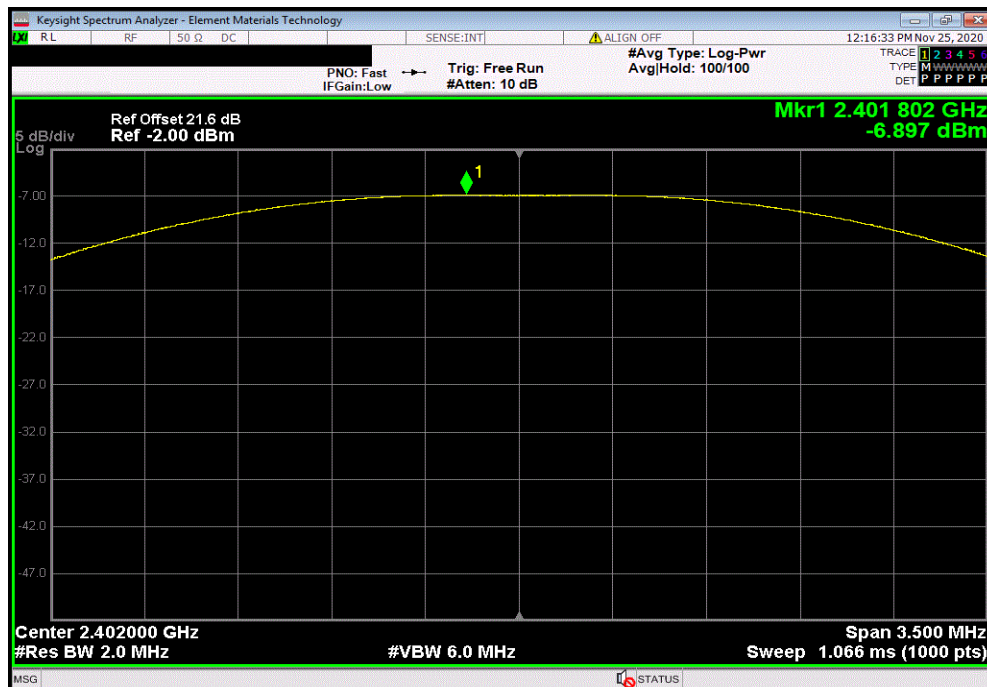


TbTx 2019.08.30.0 XbTx 2020.03.25.0

BLE/GFSK 1 Mbps High Channel, 2480 MHz						
				Out Pwr (dBm)	Limit (dBm)	Result
				-6.804	30	Pass



BLE/GFSK 1 Mbps Low Channel, 2402 MHz						
				Out Pwr (dBm)	Limit (dBm)	Result
				-6.897	30	Pass

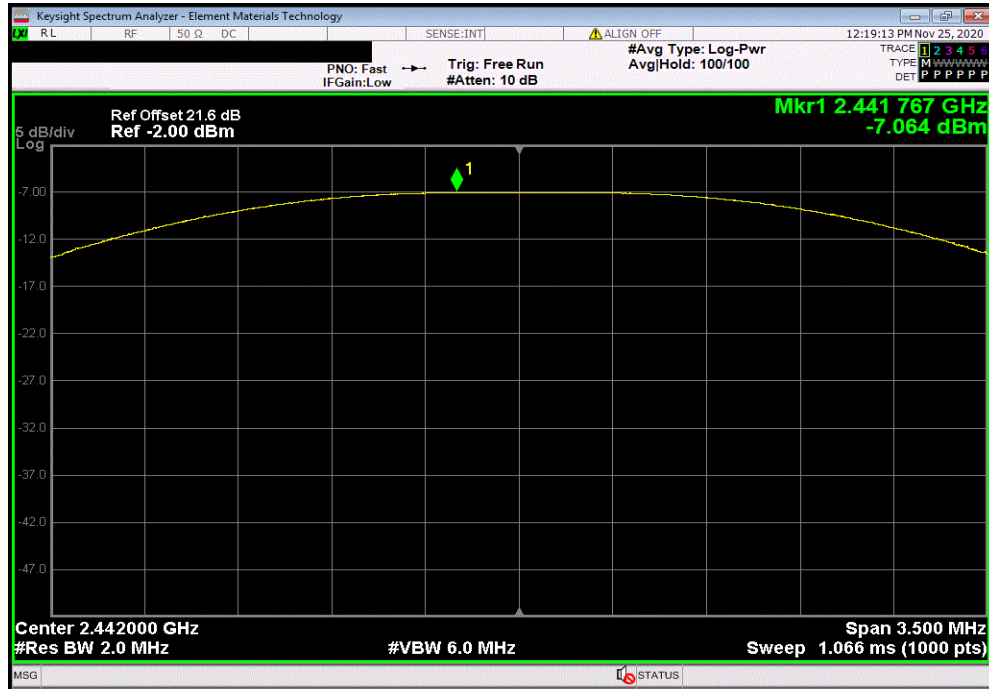


OUTPUT POWER

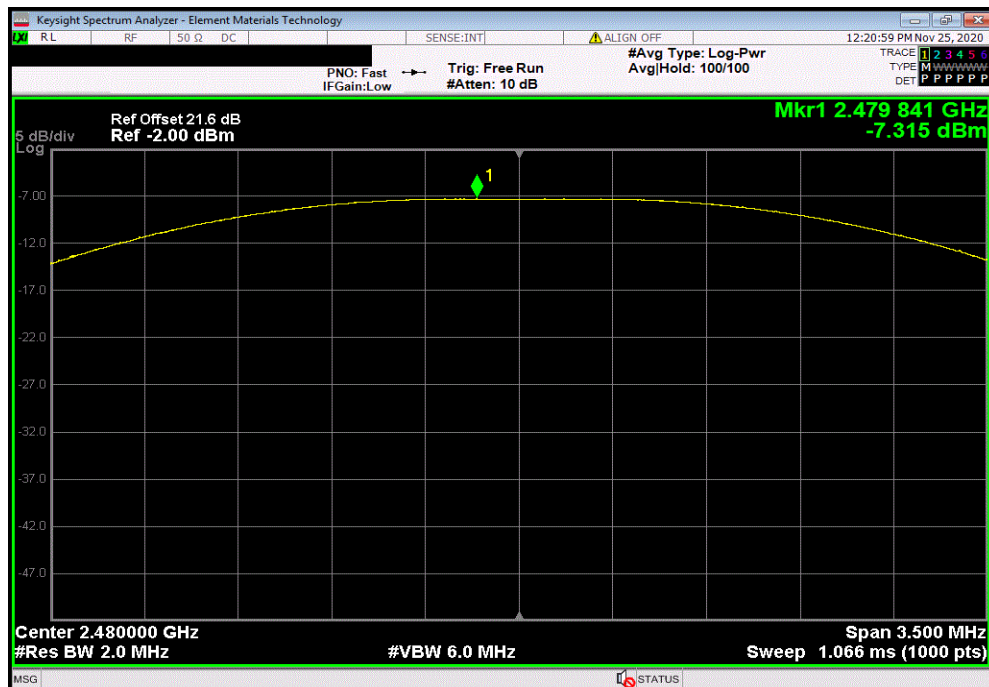


TbTx 2019.08.30.0 XMt 2020.03.25.0

BLE/GFSK 1 Mbps Mid Channel, 2442 MHz						
				Out Pwr (dBm)	Limit (dBm)	Result
				-7.064	30	Pass



BLE/GFSK 1 Mbps High Channel, 2480 MHz						
				Out Pwr (dBm)	Limit (dBm)	Result
				-7.315	30	Pass



SPURIOUS RADIATED EMISSIONS



PSA-ESCI 2020.06.24.2

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data. The test data represents the configuration / operating mode/ model that produced the highest emission levels as compared to the specification limit.

MODES OF OPERATION

Bluetooth LE Tx, Antenna PN: 3x3, GFSK, Packet Length = 63, PRBS9, 1 Mbps, Power Setting = -4 dBm, Low Channel = 2402 MHz, Mid Channel = 2442 MHz, High Channel = 2480 MHz.

Bluetooth LE Tx, Antenna PN: 3x3, GFSK, Packet Length = 63, PRBS9, 1 Mbps, Power Setting = -4 dBm, Low Channel = 2402 MHz, High Channel = 2480 MHz.

POWER SETTINGS INVESTIGATED

POE via 120VAC/60Hz

24VDC via 120VAC/60Hz

CONFIGURATIONS INVESTIGATED

SYNA0309 - 14

SYNA0309 - 17

FREQUENCY RANGE INVESTIGATED

Start Frequency	30 MHz	Stop Frequency	26000 MHz
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SAMPLE CALCULATIONS

Radiated Emissions: Field Strength = Measured Level + Antenna Factor + Cable Factor - Amplifier Gain + Distance Adjustment Factor + External Attenuation

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Spectrum Analyzer	Agilent	N9010A	AFJ	2020-01-06	12 mo
Antenna - Standard Gain	EMCO	3160-08	AHK	NCR	0 mo
Antenna - Standard Gain	ETS Lindgren	3160-07	AHX	NCR	0 mo
Antenna - Double Ridge	ETS Lindgren	3115	AIR	2020-07-07	24 mo
Antenna - Double Ridge	A.H. Systems, Inc.	SAS-574	AXV	2020-06-03	24 mo
Amplifier - Pre-Amplifier	Miteq	AMF-3D-00100800-32-13P	AVJ	2020-03-02	12 mo
Amplifier - Pre-Amplifier	Miteq	AMF-6F-08001200-30-10P	AVL	2020-03-02	12 mo
Amplifier - Pre-Amplifier	Miteq	AMF-6F-12001800-30-10P	AVP	2020-03-02	12 mo
Antenna - Biconilog	EMCO	3142	AXB	2020-04-15	24 mo
Cable	D-Coax	None	OC4	2019-12-16	12 mo
Cable	ESM Cable Corp.	30-1GHz cables	OCW	2020-05-01	12 mo
Cable	ESM Cable Corp.	1-8GHz cables	OCX	2020-03-02	12 mo
Cable	ESM Cable Corp.	8-18GHz cables	OCY	2020-03-02	12 mo
Amplifier - Pre-Amplifier	Miteq	AM-1616-1000	PAD	2020-07-01	12 mo
Amplifier - Pre-Amplifier	Miteq	JSDWK42-18004000-60-5P	PAN	2019-12-16	12 mo
Filter - High Pass	Micro-Tronics	HPM50111	HGC	2020-03-11	12 mo
Filter - Low Pass	Micro-Tronics	LPM50004	HGK	2020-01-20	12 mo
Attenuator	S.M. Electronics	SA6-20	REO	2020-01-21	12 mo

SPURIOUS RADIATED EMISSIONS



PSA-ESCI 2020.06.24.2

TEST DESCRIPTION

The highest gain antenna of each type to be used with the EUT was tested. The EUT was configured for the required transmit frequencies and the modes as showed in the data sheets.

For each configuration, the spectrum was scanned throughout the specified range as part of the exploratory investigation of the emissions. These "pre-scans" are not included in the report. Final measurements on individual emissions were then made and included in this test report.

The individual emissions from the EUT were maximized by rotating the EUT on a turntable, adjusting the position of the EUT and EUT antenna in three orthogonal axis if required, and adjusting the measurement antenna height and polarization (per ANSI C63.10). A preamp and high pass filter (and notch filter) were used for this test in order to provide sufficient measurement sensitivity.

Measurements were made with the required detectors and annotated on the data for each individual point using the following annotation:

QP = Quasi-Peak Detector
PK = Peak Detector
AV = RMS Detector

Measurements were made to satisfy the specific requirements of the test specification for out of band emissions as well as the restricted band requirements.

If there are no detectable emissions above the noise floor, the data included may show noise floor measurements for reference only.

Measurements within 2 MHz of the allowable band may have been taken using the integration method from ANSI C63.10 clause 11.13.3. This procedure uses the channel power feature of the spectrum analyzer to integrate the power of the emission within a 1 MHz bandwidth.

Where the radio test software does not provide for a duty cycle at continuous transmit conditions (> 98%) and the RMS (power average) measurements were made across the on and off times of the EUT transmissions, a duty cycle correction is added to the measurements using the formula of $10 \cdot \log(1/dc)$.

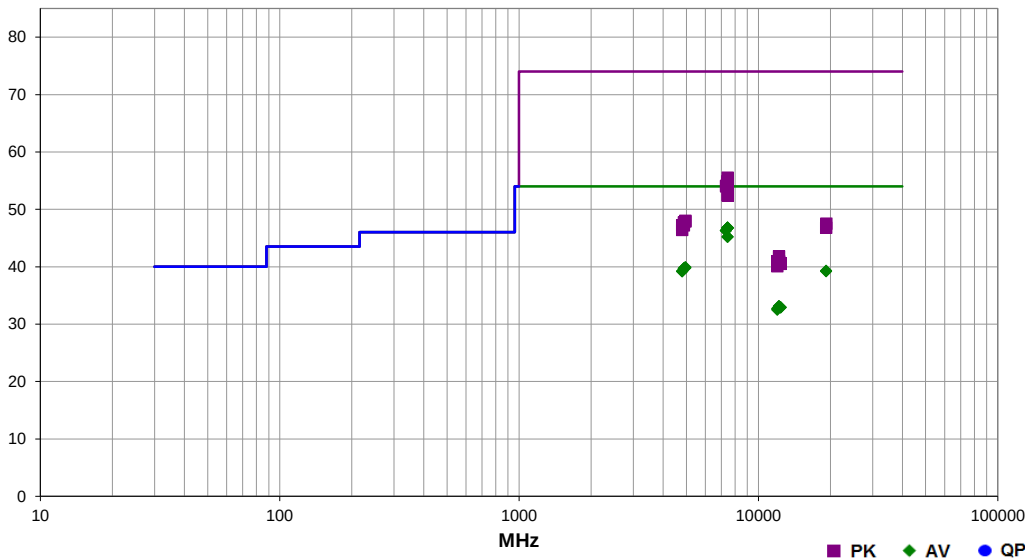
SPURIOUS RADIATED EMISSIONS



Work Order:	SYNA0309	Date:	2020-10-22	
Project:	None	Temperature:	22.7 °C	
Job Site:	OC07	Humidity:	47.9% RH	
Serial Number:	Rev. 10 - 004	Barometric Pres.:	1014 mbar	
				Tested by: Nolan De Ramos
EUT:	RadioNode			
Configuration:	14			
Customer:	Walt Disney Parks and Resorts US, Inc.			
Attendees:	None			
EUT Power:	POE via 120VAC/60Hz			
Operating Mode:	Bluetooth LE Tx, Antenna PN: 3x3, GFSK, Packet Length = 63, PRBS9, 1 Mbps, Power Setting = -4 dBm, Low Channel = 2402 MHz, Mid Channel = 2442 MHz, High Channel = 2480 MHz.			
Deviations:	None			
Comments:	See comments below for Channel, EUT orientations. The provided test software configured the radio with a duty cycle of 47.8% . Per ANSI C63.10 test methods, the RMS data was corrected with a carrier duty cycle correction factor (DCCF) of 3.2 dB. DCCF (dB) = 10*log(1/0.478).			

Test Specifications	Test Method
FCC 15.247:2020	ANSI C63.10:2013

Run #	44	Test Distance (m)	3	Antenna Height(s)	1 to 4(m)	Results	Pass
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Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (dB)	External Attenuation (dB)	Polarity/Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
7438.908	31.4	12.2	3.6	69.0	3.2	0.0	Horz	AV	0.0	46.8	54.0	-7.2	High Ch, Port 8, EUT Horz, Antenna Horz
7441.092	31.4	12.2	2.4	122.0	3.2	0.0	Vert	AV	0.0	46.8	54.0	-7.2	High Ch, Port 8, EUT Horz, Antenna Horz
7440.533	31.4	12.2	1.5	134.0	3.2	0.0	Vert	AV	0.0	46.8	54.0	-7.2	High Ch, Port 8, EUT On Side, Antenna On Side
7438.792	31.3	12.2	1.5	122.0	3.2	0.0	Horz	AV	0.0	46.7	54.0	-7.3	High Ch, Port 8, EUT Vert, Antenna Vert
7439.250	31.3	12.2	1.5	115.0	3.2	0.0	Vert	AV	0.0	46.7	54.0	-7.3	High Ch, Port 8, EUT Vert, Antenna Vert
7440.058	31.3	12.2	1.5	163.0	3.2	0.0	Horz	AV	0.0	46.7	54.0	-7.3	High Ch, Port 8, EUT On Side, Antenna On Side
7324.717	31.4	11.7	1.2	346.0	3.2	0.0	Horz	AV	0.0	46.3	54.0	-7.7	Mid Ch, Port 8, EUT Horz, Antenna Horz
7323.725	31.4	11.7	3.8	112.0	3.2	0.0	Vert	AV	0.0	46.3	54.0	-7.7	Mid Ch, Port 8, EUT Horz, Antenna Horz
7439.142	27.0	15.0	4.0	19.0	3.2	0.0	Horz	AV	0.0	45.2	54.0	-8.8	High Ch., Port 7, EUT Horz, Ant Horz
7438.817	27.0	15.0	1.5	74.0	3.2	0.0	Vert	AV	0.0	45.2	54.0	-8.8	High Ch., Port 7, EUT Horz, Ant Horz
4957.583	32.3	4.4	1.5	113.0	3.2	0.0	Vert	AV	0.0	39.9	54.0	-14.1	High Ch, Port 8, EUT Horz, Antenna Horz
4957.500	32.2	4.4	2.0	169.0	3.2	0.0	Horz	AV	0.0	39.8	54.0	-14.2	High Ch, Port 8, EUT Horz, Antenna Horz
4886.317	32.4	4.1	3.8	87.0	3.2	0.0	Horz	AV	0.0	39.7	54.0	-14.3	Mid Ch, Port 8, EUT Horz, Antenna Horz
4886.417	32.4	4.1	3.1	163.0	3.2	0.0	Vert	AV	0.0	39.7	54.0	-14.3	Mid Ch, Port 8, EUT Horz, Antenna Horz
19215.310	45.0	-8.9	1.5	348.0	3.2	0.0	Vert	AV	0.0	39.3	54.0	-14.7	High Ch, Port 8, EUT Horz, Antenna Horz
4801.508	32.0	4.0	1.5	82.0	3.2	0.0	Horz	AV	0.0	39.2	54.0	-14.8	Low Ch, Port 8, EUT Horz, Antenna Horz
4806.217	32.0	4.0	1.5	16.0	3.2	0.0	Vert	AV	0.0	39.2	54.0	-14.8	Low Ch, Port 8, EUT Horz, Antenna Horz
19214.170	44.9	-8.9	1.5	187.0	3.2	0.0	Horz	AV	0.0	39.2	54.0	-14.8	High Ch, Port 8, EUT Vert, Antenna Vert
7442.425	43.2	12.3	1.5	163.0	0.0	0.0	Horz	PK	0.0	55.5	74.0	-18.5	High Ch, Port 8, EUT On Side, Antenna On Side
7437.833	42.7	12.2	3.6	69.0	0.0	0.0	Horz	PK	0.0	54.9	74.0	-19.1	High Ch, Port 8, EUT Horz, Antenna Horz
7438.117	42.7	12.2	1.5	134.0	0.0	0.0	Vert	PK	0.0	54.9	74.0	-19.1	High Ch, Port 8, EUT On Side, Antenna On Side
7439.300	42.6	12.2	1.5	122.0	0.0	0.0	Horz	PK	0.0	54.8	74.0	-19.2	High Ch, Port 8, EUT Vert, Antenna Vert
7438.717	42.4	12.2	2.4	122.0	0.0	0.0	Vert	PK	0.0	54.6	74.0	-19.4	High Ch, Port 8, EUT Horz, Antenna Horz
7441.658	42.2	12.3	1.5	115.0	0.0	0.0	Vert	PK	0.0	54.5	74.0	-19.5	High Ch, Port 8, EUT Vert, Antenna Vert
7327.067	42.4	11.7	3.8	112.0	0.0	0.0	Vert	PK	0.0	54.1	74.0	-19.9	Mid Ch, Port 8, EUT Horz, Antenna Horz
7326.667	42.3	11.7	1.2	346.0	0.0	0.0	Horz	PK	0.0	54.0	74.0	-20.0	Mid Ch, Port 8, EUT Horz, Antenna Horz
12207.990	32.8	-2.9	1.5	156.0	3.2	0.0	Horz	AV	0.0	33.1	54.0	-20.9	Mid Ch, Port 8, EUT Horz, Antenna Horz
12207.680	32.8	-2.9	1.5	240.0	3.2	0.0	Vert	AV	0.0	33.1	54.0	-20.9	Mid Ch, Port 8, EUT Horz, Antenna Horz
12397.880	31.8	-2.1	2.5	4.0	3.2	0.0	Horz	AV	0.0	32.9	54.0	-21.1	High Ch, Port 8, EUT Horz, Antenna Horz
12397.580	31.8	-2.1	1.5	121.0	3.2	0.0	Vert	AV	0.0	32.9	54.0	-21.1	High Ch, Port 8, EUT Horz, Antenna Horz
12007.930	33.3	-3.8	2.0	32.0	3.2	0.0	Horz	AV	0.0	32.7	54.0	-21.3	Low Ch, Port 8, EUT Horz, Antenna Horz

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (dB)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
12007.530	33.1	-3.8	1.5	66.0	3.2	0.0	Vert	AV	0.0	32.5	54.0	-21.5	Low Ch, Port 8, EUT Horz, Antenna Horz
7439.508	37.5	15.0	1.5	74.0	0.0	0.0	Vert	PK	0.0	52.5	74.0	-21.5	High Ch., Port 7, EUT Horz, Ant Horz
7441.917	37.4	15.0	4.0	19.0	0.0	0.0	Horz	PK	0.0	52.4	74.0	-21.6	High Ch., Port 7, EUT Horz, Ant Horz
4958.000	43.6	4.4	2.0	169.0	0.0	0.0	Horz	PK	0.0	48.0	74.0	-26.0	High Ch, Port 8, EUT Horz, Antenna Horz
4959.317	43.5	4.4	1.5	113.0	0.0	0.0	Vert	PK	0.0	47.9	74.0	-26.1	High Ch, Port 8, EUT Horz, Antenna Horz
4885.350	43.6	4.1	3.1	163.0	0.0	0.0	Vert	PK	0.0	47.7	74.0	-26.3	Mid Ch, Port 8, EUT Horz, Antenna Horz
19216.710	56.4	-8.9	1.5	348.0	0.0	0.0	Vert	PK	0.0	47.5	74.0	-26.5	High Ch, Port 8, EUT Horz, Antenna Horz
4885.992	43.1	4.1	3.8	87.0	0.0	0.0	Horz	PK	0.0	47.2	74.0	-26.8	Mid Ch, Port 8, EUT Horz, Antenna Horz
4804.742	43.2	4.0	1.5	16.0	0.0	0.0	Vert	PK	0.0	47.2	74.0	-26.8	Low Ch, Port 8, EUT Horz, Antenna Horz
19214.290	55.7	-8.9	1.5	187.0	0.0	0.0	Horz	PK	0.0	46.8	74.0	-27.2	High Ch, Port 8, EUT Vert, Antenna Vert
4806.042	42.4	4.0	1.5	82.0	0.0	0.0	Horz	PK	0.0	46.4	74.0	-27.6	Low Ch, Port 8, EUT Horz, Antenna Horz
12208.610	44.7	-2.9	1.5	240.0	0.0	0.0	Vert	PK	0.0	41.8	74.0	-32.2	Mid Ch, Port 8, EUT Horz, Antenna Horz
12009.380	44.7	-3.8	2.0	32.0	0.0	0.0	Horz	PK	0.0	40.9	74.0	-33.1	Low Ch, Port 8, EUT Horz, Antenna Horz
12209.310	43.8	-2.9	1.5	156.0	0.0	0.0	Horz	PK	0.0	40.9	74.0	-33.1	Mid Ch, Port 8, EUT Horz, Antenna Horz
12397.730	42.7	-2.1	1.5	121.0	0.0	0.0	Vert	PK	0.0	40.6	74.0	-33.4	High Ch, Port 8, EUT Horz, Antenna Horz
12399.430	42.6	-2.1	2.5	4.0	0.0	0.0	Horz	PK	0.0	40.5	74.0	-33.5	High Ch, Port 8, EUT Horz, Antenna Horz
12007.760	43.9	-3.8	1.5	66.0	0.0	0.0	Vert	PK	0.0	40.1	74.0	-33.9	Low Ch, Port 8, EUT Horz, Antenna Horz

SPURIOUS RADIATED EMISSIONS

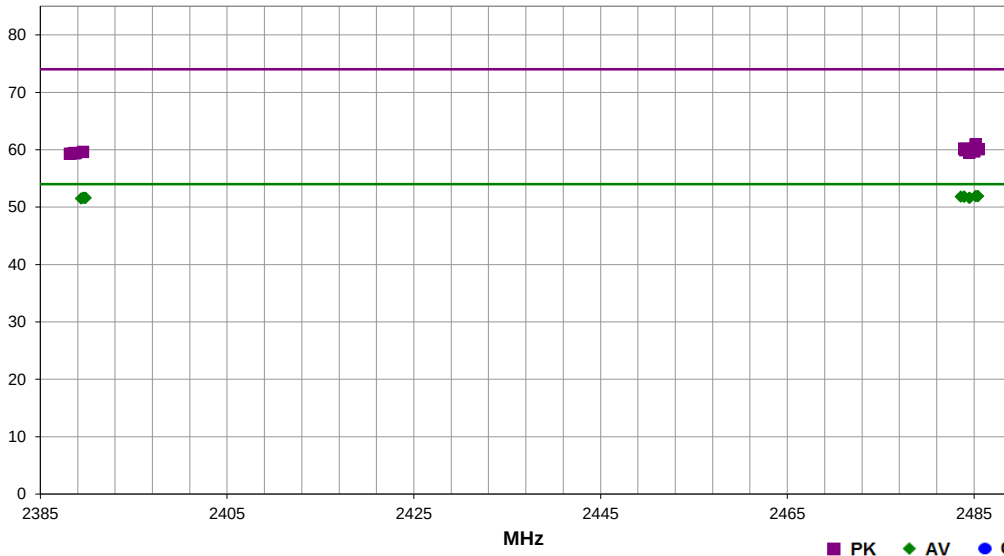


EmRS 2020.06.24.4 PSA-ESCI 2020.06.24.2

Work Order:	SYNA0309	Date:	2020-10-22	
Project:	None	Temperature:	22.7 °C	
Job Site:	OC07	Humidity:	47.9% RH	
Serial Number:	Rev. 10 - 004	Barometric Pres.:	1014 mbar	
EUT:	RadioNode			
Configuration:	14			
Customer:	Walt Disney Parks and Resorts US, Inc.			
Attendees:	None			
EUT Power:	POE via 120VAC/60Hz			
Operating Mode:	Bluetooth LE Tx, Antenna PN: 3x3, GFSK, Packet Length = 63, PRBS9, 1 Mbps, Power Setting = -4 dBm, Low Channel = 2402 MHz, High Channel = 2480 MHz.			
Deviations:	None			
Comments:	See comments below for Channel, EUT orientations. The provided test software configured the radio with a duty cycle of 47.8% . Per ANSI C63.10 test methods, the RMS data was corrected with a carrier duty cycle correction factor (DCCF) of 3.2 dB. DCCF (dB) = 10*log(1/0.478).			

Test Specifications	Test Method
FCC 15.247:2020	ANSI C63.10:2013

Run #	46	Test Distance (m)	3	Antenna Height(s)	1 to 4(m)	Results	Pass
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Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (dB)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
2485.443	32.8	-4.1	2.8	46.0	3.2	20.0	Vert	AV	0.0	51.9	54.0	-2.1	High Ch, Port 8, EUT Horz, Antenna Horz
2485.160	32.8	-4.1	1.5	86.0	3.2	20.0	Horz	AV	0.0	51.9	54.0	-2.1	High Ch, Port 8, EUT Vert, Antenna Vert
2485.343	32.8	-4.1	2.2	135.0	3.2	20.0	Vert	AV	0.0	51.9	54.0	-2.1	High Ch, Port 8, EUT On Side, Antenna On Side
2483.930	32.8	-4.2	1.5	190.0	3.2	20.0	Horz	AV	0.0	51.8	54.0	-2.2	High Ch, Port 8, EUT Horz, Antenna Horz
2483.580	32.8	-4.2	1.5	315.0	3.2	20.0	Vert	AV	0.0	51.8	54.0	-2.2	High Ch, Port 8, EUT Vert, Antenna Vert
2483.953	32.8	-4.2	1.5	13.0	3.2	20.0	Horz	AV	0.0	51.8	54.0	-2.2	High Ch, Port 8, EUT On Side, Antenna On Side
2389.583	33.1	-4.7	1.5	106.0	3.2	20.0	Vert	AV	0.0	51.6	54.0	-2.4	High Ch, Port 8, EUT Horz, Antenna Horz
2484.513	29.2	-0.8	2.0	253.0	3.2	20.0	Horz	AV	0.0	51.6	54.0	-2.4	High Ch., Port 7, EUT Vert, Ant Vert
2484.503	29.2	-0.8	1.5	200.0	3.2	20.0	Vert	AV	0.0	51.6	54.0	-2.4	High Ch., Port 7, EUT Horz, Ant Horz
2389.733	29.0	-0.6	1.4	267.0	3.2	20.0	Horz	AV	0.0	51.6	54.0	-2.4	Low Ch., Port 7, EUT Vert, Ant Vert
2389.863	29.0	-0.6	1.5	46.0	3.2	20.0	Vert	AV	0.0	51.6	54.0	-2.4	Low Ch., Port 7, EUT Horz, Ant Horz
2389.367	33.0	-4.7	3.4	72.0	3.2	20.0	Horz	AV	0.0	51.5	54.0	-2.5	High Ch, Port 8, EUT Vert, Antenna Vert
2485.170	45.0	-4.1	1.5	190.0	0.0	20.0	Horz	PK	0.0	60.9	74.0	-13.1	High Ch, Port 8, EUT Horz, Antenna Horz
2483.963	44.4	-4.2	1.5	315.0	0.0	20.0	Vert	PK	0.0	60.2	74.0	-13.8	High Ch, Port 8, EUT Vert, Antenna Vert
2485.133	44.3	-4.1	2.2	135.0	0.0	20.0	Vert	PK	0.0	60.2	74.0	-13.8	High Ch, Port 8, EUT On Side, Antenna On Side
2485.483	40.9	-0.8	1.5	200.0	0.0	20.0	Vert	PK	0.0	60.1	74.0	-13.9	High Ch., Port 7, EUT Horz, Ant Horz
2484.070	44.1	-4.2	2.8	46.0	0.0	20.0	Vert	PK	0.0	59.9	74.0	-14.1	High Ch, Port 8, EUT Horz, Antenna Horz
2484.867	44.1	-4.2	1.5	86.0	0.0	20.0	Horz	PK	0.0	59.9	74.0	-14.1	High Ch, Port 8, EUT Vert, Antenna Vert
2485.013	40.5	-0.8	2.0	253.0	0.0	20.0	Horz	PK	0.0	59.7	74.0	-14.3	High Ch., Port 7, EUT Vert, Ant Vert
2389.570	44.3	-4.7	3.4	72.0	0.0	20.0	Horz	PK	0.0	59.6	74.0	-14.4	High Ch, Port 8, EUT Vert, Antenna Vert
2484.503	43.7	-4.2	1.5	13.0	0.0	20.0	Horz	PK	0.0	59.5	74.0	-14.5	High Ch, Port 8, EUT On Side, Antenna On Side
2388.583	40.0	-0.6	1.4	267.0	0.0	20.0	Horz	PK	0.0	59.4	74.0	-14.6	Low Ch., Port 7, EUT Vert, Ant Vert
2388.763	40.0	-0.6	1.5	46.0	0.0	20.0	Vert	PK	0.0	59.4	74.0	-14.6	Low Ch., Port 7, EUT Horz, Ant Horz
2388.167	44.0	-4.7	1.5	106.0	0.0	20.0	Vert	PK	0.0	59.3	74.0	-14.7	High Ch, Port 8, EUT Horz, Antenna Horz

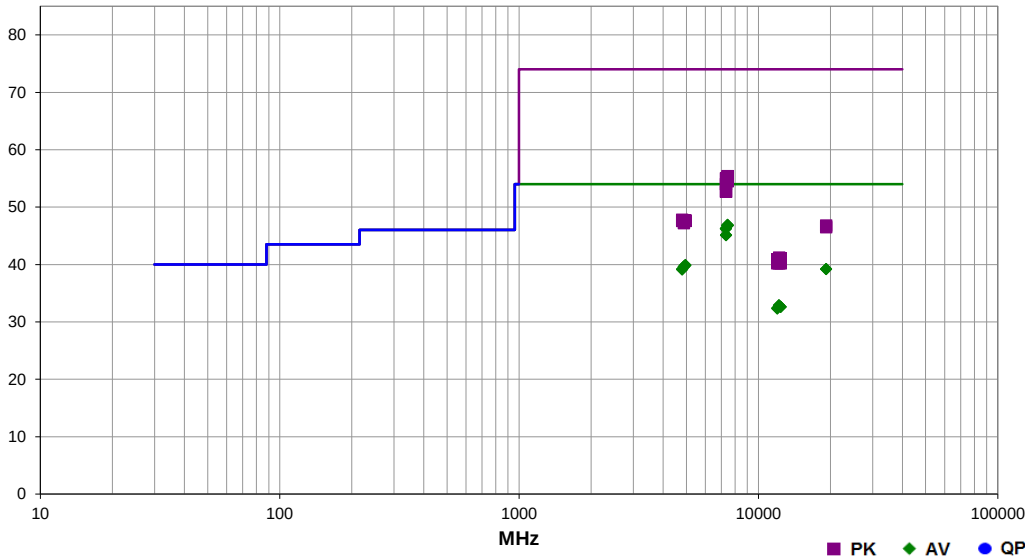
SPURIOUS RADIATED EMISSIONS



Work Order:	SYNA0309	Date:	2020-10-26	
Project:	None	Temperature:	20.5 °C	
Job Site:	OC07	Humidity:	30.9% RH	
Serial Number:	Rev. 10 - 012	Barometric Pres.:	1019 mbar	
EUT:	RadioNode			Tested by: Nolan De Ramos
Configuration:	17			
Customer:	Walt Disney Parks and Resorts US, Inc.			
Attendees:	None			
EUT Power:	24VDC			
Operating Mode:	Bluetooth LE Tx, Antenna PN: 3x3, GFSK, Packet Length = 63, PRBS9, 1 Mbps, Power Setting = -4 dBm, Low Channel = 2402 MHz, Mid Channel = 2442 MHz, High Channel = 2480 MHz.			
Deviations:	None			
Comments:	See comments below for Channel, EUT orientations. The provided test software configured the radio with a duty cycle of 47.8% . Per ANSI C63.10 test methods, the RMS data was corrected with a carrier duty cycle correction factor (DCCF) of 3.2 dB. $DCCF (dB) = 10 \cdot \log(1/0.478)$.			

Test Specifications	FCC 15.247:2020	Test Method	ANSI C63.10:2013
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Run #	97	Test Distance (m)	3	Antenna Height(s)	1 to 4(m)	Results	Pass
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Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (dB)	External Attenuation (dB)	Polarity/Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
7441.467	31.5	12.2	1.5	355.0	3.2	0.0	Horz	AV	0.0	46.9	54.0	-7.1	High Ch, Port 8, EUT Vert, Antenna Vert
7438.492	31.4	12.2	1.5	143.0	3.2	0.0	Horz	AV	0.0	46.8	54.0	-7.2	High Ch, Port 8, EUT Horz, Antenna Horz
7437.767	31.4	12.2	1.5	335.0	3.2	0.0	Vert	AV	0.0	46.8	54.0	-7.2	High Ch, Port 8, EUT Horz, Antenna Horz
7438.517	31.4	12.2	1.4	294.0	3.2	0.0	Vert	AV	0.0	46.8	54.0	-7.2	High Ch, Port 8, EUT Vert, Antenna Vert
7441.225	31.4	12.2	1.5	284.0	3.2	0.0	Horz	AV	0.0	46.8	54.0	-7.2	High Ch, Port 8, EUT On Side, Antenna On Side
7438.983	31.4	12.2	1.2	288.0	3.2	0.0	Vert	AV	0.0	46.8	54.0	-7.2	High Ch, Port 8, EUT On Side, Antenna On Side
7323.892	31.4	11.7	1.5	143.0	3.2	0.0	Vert	AV	0.0	46.3	54.0	-7.7	Mid Ch, Port 8, EUT Horz, Antenna Horz
7324.008	31.3	11.7	1.5	161.0	3.2	0.0	Horz	AV	0.0	46.2	54.0	-7.8	Mid Ch, Port 8, EUT Vert, Antenna Vert
7326.583	27.4	14.5	1.5	79.0	3.2	0.0	Horz	AV	0.0	45.1	54.0	-8.9	High Ch, Port 7, EUT Vert Ant Vert
7326.663	27.4	14.5	1.5	95.0	3.2	0.0	Vert	AV	0.0	45.1	54.0	-8.9	High Ch, Port 7, EUT Horz Ant Horz
4957.500	32.3	4.4	3.8	236.0	3.2	0.0	Vert	AV	0.0	39.9	54.0	-14.1	High Ch, Port 8, EUT Horz, Antenna Horz
4958.158	32.2	4.4	1.5	208.0	3.2	0.0	Horz	AV	0.0	39.8	54.0	-14.2	High Ch, Port 8, EUT Vert, Antenna Vert
4886.475	32.3	4.1	1.5	264.0	3.2	0.0	Vert	AV	0.0	39.6	54.0	-14.4	Mid Ch, Port 8, EUT Horz, Antenna Horz
4886.275	32.3	4.1	1.5	311.0	3.2	0.0	Horz	AV	0.0	39.6	54.0	-14.4	Mid Ch, Port 8, EUT Vert, Antenna Vert
4804.625	32.0	4.0	1.5	127.0	3.2	0.0	Horz	AV	0.0	39.2	54.0	-14.8	Low Ch, Port 8, EUT Vert, Antenna Vert
19213.870	44.9	-8.9	1.5	113.0	3.2	0.0	Horz	AV	0.0	39.2	54.0	-14.8	Low Ch, Port 8, EUT Horz, Antenna Horz
19213.560	44.9	-8.9	1.5	325.0	3.2	0.0	Vert	AV	0.0	39.2	54.0	-14.8	Low Ch, Port 8, EUT Horz, Antenna Horz
4805.317	31.9	4.0	2.1	122.0	3.2	0.0	Vert	AV	0.0	39.1	54.0	-14.9	Low Ch, Port 8, EUT Horz, Antenna Horz
7439.375	43.2	12.2	1.5	335.0	0.0	0.0	Vert	PK	0.0	55.4	74.0	-18.6	High Ch, Port 8, EUT Horz, Antenna Horz
7441.008	43.2	12.2	1.5	284.0	0.0	0.0	Horz	PK	0.0	55.4	74.0	-18.6	High Ch, Port 8, EUT On Side, Antenna On Side
7439.575	43.0	12.2	1.2	288.0	0.0	0.0	Vert	PK	0.0	55.2	74.0	-18.8	High Ch, Port 8, EUT On Side, Antenna On Side
7326.058	43.3	11.7	1.5	161.0	0.0	0.0	Horz	PK	0.0	55.0	74.0	-19.0	Mid Ch, Port 8, EUT Vert, Antenna Vert
7438.217	42.6	12.2	1.5	143.0	0.0	0.0	Horz	PK	0.0	54.8	74.0	-19.2	High Ch, Port 8, EUT Horz, Antenna Horz
7442.458	42.4	12.3	1.5	355.0	0.0	0.0	Horz	PK	0.0	54.7	74.0	-19.3	High Ch, Port 8, EUT Vert, Antenna Vert
7437.858	42.3	12.2	1.4	294.0	0.0	0.0	Vert	PK	0.0	54.5	74.0	-19.5	High Ch, Port 8, EUT Vert, Antenna Vert
7323.533	42.3	11.7	1.5	143.0	0.0	0.0	Vert	PK	0.0	54.0	74.0	-20.0	Mid Ch, Port 8, EUT Horz, Antenna Horz
12207.630	32.6	-2.9	1.5	148.0	3.2	0.0	Vert	AV	0.0	32.9	54.0	-21.1	Mid Ch, Port 8, EUT Horz, Antenna Horz
12207.500	32.5	-2.9	3.0	321.0	3.2	0.0	Horz	AV	0.0	32.8	54.0	-21.2	Mid Ch, Port 8, EUT Vert, Antenna Vert
7325.723	38.2	14.5	1.5	79.0	0.0	0.0	Horz	PK	0.0	52.7	74.0	-21.3	High Ch, Port 7, EUT Vert Ant Vert
7326.620	38.2	14.5	1.5	95.0	0.0	0.0	Vert	PK	0.0	52.7	74.0	-21.3	High Ch, Port 7, EUT Horz Ant Horz
12398.100	31.5	-2.1	3.3	8.0	3.2	0.0	Vert	AV	0.0	32.6	54.0	-21.4	High Ch, Port 8, EUT Horz, Antenna Horz

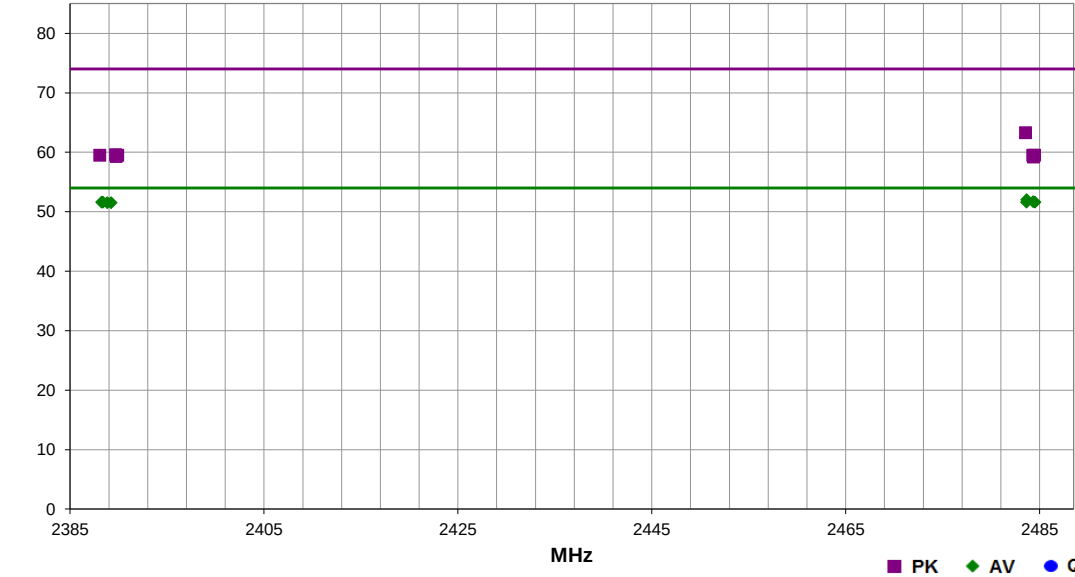
Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (dB)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
12398.740	31.5	-2.1	1.7	358.0	3.2	0.0	Horz	AV	0.0	32.6	54.0	-21.4	High Ch, Port 8, EUT Vert, Antenna Vert
12007.910	33.0	-3.8	2.3	148.0	3.2	0.0	Horz	AV	0.0	32.4	54.0	-21.6	Low Ch, Port 8, EUT Vert, Antenna Vert
12007.580	32.9	-3.8	1.0	70.0	3.2	0.0	Vert	AV	0.0	32.3	54.0	-21.7	Low Ch, Port 8, EUT Horz, Antenna Horz
4803.567	43.8	4.0	1.5	127.0	0.0	0.0	Horz	PK	0.0	47.8	74.0	-26.2	Low Ch, Port 8, EUT Vert, Antenna Vert
4958.808	43.3	4.4	3.8	236.0	0.0	0.0	Vert	PK	0.0	47.7	74.0	-26.3	High Ch, Port 8, EUT Horz, Antenna Horz
4961.450	43.2	4.4	1.5	208.0	0.0	0.0	Horz	PK	0.0	47.6	74.0	-26.4	High Ch, Port 8, EUT Vert, Antenna Vert
4884.500	43.5	4.1	1.5	264.0	0.0	0.0	Vert	PK	0.0	47.6	74.0	-26.4	Mid Ch, Port 8, EUT Horz, Antenna Horz
4805.917	43.6	4.0	2.1	122.0	0.0	0.0	Vert	PK	0.0	47.6	74.0	-26.4	Low Ch, Port 8, EUT Horz, Antenna Horz
4885.425	43.1	4.1	1.5	311.0	0.0	0.0	Horz	PK	0.0	47.2	74.0	-26.8	Mid Ch, Port 8, EUT Vert, Antenna Vert
19215.830	55.7	-8.9	1.5	325.0	0.0	0.0	Vert	PK	0.0	46.8	74.0	-27.2	Low Ch, Port 8, EUT Horz, Antenna Horz
19215.390	55.4	-8.9	1.5	113.0	0.0	0.0	Horz	PK	0.0	46.5	74.0	-27.5	Low Ch, Port 8, EUT Vert, Antenna Vert
12211.780	44.1	-2.9	1.5	148.0	0.0	0.0	Vert	PK	0.0	41.2	74.0	-32.8	Mid Ch, Port 8, EUT Horz, Antenna Horz
12397.540	43.2	-2.1	3.3	8.0	0.0	0.0	Vert	PK	0.0	41.1	74.0	-32.9	High Ch, Port 8, EUT Horz, Antenna Horz
12010.210	44.6	-3.7	1.0	70.0	0.0	0.0	Vert	PK	0.0	40.9	74.0	-33.1	Low Ch, Port 8, EUT Horz, Antenna Horz
12399.680	42.3	-2.1	1.7	358.0	0.0	0.0	Horz	PK	0.0	40.2	74.0	-33.8	High Ch, Port 8, EUT Vert, Antenna Vert
12208.880	43.1	-2.9	3.0	321.0	0.0	0.0	Horz	PK	0.0	40.2	74.0	-33.8	Mid Ch, Port 8, EUT Vert, Antenna Vert
12008.430	44.0	-3.8	2.3	148.0	0.0	0.0	Horz	PK	0.0	40.2	74.0	-33.8	Low Ch, Port 8, EUT Vert, Antenna Vert



SPURIOUS RADIATED EMISSIONS

Work Order:		SYNA0309	Date:	2020-10-27	
Project:		None	Temperature:	20.6 °C	
Job Site:		OC07	Humidity:	23.4% RH	
Serial Number:	Rev. 10 - 012	Barometric Pres.:	1020 mbar	Tested by:	
EUT: RadioNode					
Configuration: 17					
Customer: Walt Disney Parks and Resorts US, Inc.					
Attendees: None					
EUT Power: 24VDC					
Operating Mode: Bluetooth LE Tx, Antenna PN: 3x3, GFSK, Packet Length = 63, PRBS9, 1 Mbps, Power Setting = -4 dBm, Low Channel = 2402, High Channel = 2480 MHz.					
Deviations: None					
Comments: See comments below for Channel, EUT orientations. The worst case EUT orientations from the previous BTLE testing were used. The provided test software configured the radio with a duty cycle of 47.8% . Per ANSI C63.10 test methods, the RMS data was corrected with a carrier duty cycle correction factor(DCCF) of 3.2 dB. DCCF (dB) = 10*log(1/0.478).					
Test Specifications					Test Method
FCC 15.247:2020					ANSI C63.10:2013

Run #	100	Test Distance (m)	3	Antenna Height(s)	1 to 4(m)	Results	Pass
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Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (dB)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
2483.677	33.0	-4.2	3.1	197.0	3.2	20.0	Horz	AV	0.0	52.0	54.0	-2.0	High Ch, Port 8, EUT Vert, Antenna Vert
2484.347	32.7	-4.2	1.5	162.0	3.2	20.0	Vert	AV	0.0	51.7	54.0	-2.3	High Ch, Port 8, EUT Horz, Antenna Vert
2483.653	29.2	-0.8	1.5	209.0	3.2	20.0	Horz	AV	0.0	51.6	54.0	-2.4	High Ch., Port 7, EUT Vert, Ant Vert
2484.517	29.2	-0.8	1.5	226.0	3.2	20.0	Vert	AV	0.0	51.6	54.0	-2.4	High Ch., Port 7, EUT Horz, Ant Horz
2388.383	29.0	-0.6	1.5	231.0	3.2	20.0	Horz	AV	0.0	51.6	54.0	-2.4	Low Ch., Port 7, EUT Vert, Ant Vert
2388.267	29.0	-0.6	1.5	136.0	3.2	20.0	Vert	AV	0.0	51.6	54.0	-2.4	Low Ch., Port 7, EUT Horz, Ant Horz
2388.833	33.0	-4.7	2.3	259.0	3.2	20.0	Horz	AV	0.0	51.5	54.0	-2.5	Low Ch, Port 8, EUT Vert, Antenna Vert
2389.247	33.0	-4.7	3.9	137.0	3.2	20.0	Vert	AV	0.0	51.5	54.0	-2.5	Low Ch, Port 8, EUT Horz, Antenna Horz
2483.547	47.5	-4.2	3.1	197.0	0.0	20.0	Horz	PK	0.0	63.3	74.0	-10.7	High Ch, Port 8, EUT Vert, Antenna Vert
2389.697	44.3	-4.7	2.3	259.0	0.0	20.0	Horz	PK	0.0	59.6	74.0	-14.4	Low Ch, Port 8, EUT Vert, Antenna Vert
2389.907	44.2	-4.7	3.9	137.0	0.0	20.0	Vert	PK	0.0	59.5	74.0	-14.5	Low Ch, Port 8, EUT Horz, Antenna Horz
2484.470	43.7	-4.2	1.5	162.0	0.0	20.0	Vert	PK	0.0	59.5	74.0	-14.5	High Ch, Port 8, EUT Horz, Antenna Vert
2484.293	40.3	-0.8	1.5	226.0	0.0	20.0	Vert	PK	0.0	59.5	74.0	-14.5	High Ch., Port 7, EUT Horz, Ant Horz
2388.060	40.1	-0.6	1.5	231.0	0.0	20.0	Horz	PK	0.0	59.5	74.0	-14.5	Low Ch., Port 7, EUT Vert, Ant Vert
2389.747	39.9	-0.6	1.5	136.0	0.0	20.0	Vert	PK	0.0	59.3	74.0	-14.7	Low Ch., Port 7, EUT Horz, Ant Horz
2484.357	40.0	-0.8	1.5	209.0	0.0	20.0	Horz	PK	0.0	59.2	74.0	-14.8	High Ch., Port 7, EUT Vert, Ant Vert

SPURIOUS RADIATED EMISSIONS



PSA/ESCI 2020.04.03.0

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data. The test data represents the configuration / operating mode/ model that produced the highest emission levels as compared to the specification limit.

MODES OF OPERATION

BTLE Tx, Antenna PN: ANT-2.4-CW-HWR-SMA, GFSK, Packet Length = 63, PRBS9, 1 Mbps,
Low Channel = 2402 MHz, High Channel = 2480 MHz.

BTLE Tx, Antenna PN: ANT-2.4-CW-HWR-SMA, GFSK, Packet Length = 63, PRBS9, 1 Mbps,
Low Channel = 2402 MHz, Mid Channel = 2442 MHz, High Channel = 2480 MHz.

POWER SETTINGS INVESTIGATED

24VDC via 120VAC/60Hz

POE via 120VAC/60Hz

CONFIGURATIONS INVESTIGATED

SYNA0309 - 2

SYNA0309 - 1

FREQUENCY RANGE INVESTIGATED

Start Frequency 30 MHz Stop Frequency 26 GHz

SAMPLE CALCULATIONS

Radiated Emissions: Field Strength = Measured Level + Antenna Factor + Cable Factor - Amplifier Gain + Distance Adjustment Factor + External Attenuation

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Cable	Northwest EMC	N/A	NC8	2020-02-07	12 mo
Amplifier - Pre-Amplifier	Miteq	AMF-6F-18002650-25-10P	AOD	2020-02-07	12 mo
Antenna - Standard Gain	ETS Lindgren	3160-09	AIY	NCR	0 mo
Amplifier - Pre-Amplifier	Miteq	AMF-6F-12001800-30-10P	AOJ	2020-08-26	12 mo
Antenna - Standard Gain	EMCO	3160-08	AHO	NCR	0 mo
Cable	High Speed Interconnects	EW292A-NGNG-300	NC3	2020-08-28	12 mo
Amplifier - Pre-Amplifier	Miteq	AMF-6F-08001200-30-10P	AOK	2020-08-26	12 mo
Antenna - Standard Gain	EMCO	3160-07	AHP	NCR	0 mo
Filter - High Pass	Micro-Tronics	HPM50111	HHI	2020-09-25	12 mo
Attenuator	Fairview Microwave	SA18E-20	AQV	2020-07-28	12 mo
Cable	Northwest EMC	3115 Horn Cable	NC2	2020-04-20	12 mo
Amplifier - Pre-Amplifier	Miteq	AMF-3D-00100800-32-13P	AVZ	2020-04-20	12 mo
Antenna - Double Ridge	EMCO	3115	AHM	2020-07-01	24 mo
Amplifier - Pre-Amplifier	Miteq	AM-1616-1000	PAB	2020-01-28	12 mo
Antenna - Biconilog	Teseq	CBL 6141B	AYL	2019-09-25	24 mo
Cable	Northwest EMC	Bilog Cables	NC1	2020-01-28	12 mo
Filter - Low Pass	Micro-Tronics	LPM50004	LFF	2019-11-08	12 mo
Analyzer - Spectrum Analyzer	Agilent	E4440A	AAX	2020-04-15	12 mo

TEST DESCRIPTION

The highest gain antenna of each type to be used with the EUT was tested. The EUT was configured for the required transmit frequencies and the modes as showed in the data sheets.

For each configuration, the spectrum was scanned throughout the specified range as part of the exploratory investigation of the emissions. These "pre-scans" are not included in the report. Final measurements on individual emissions were then made and included in this test report.

The individual emissions from the EUT were maximized by rotating the EUT on a turntable, adjusting the position of the EUT and EUT antenna in three orthogonal axis if required, and adjusting the measurement antenna height and polarization (per ANSI C63.10). A preamp and high pass filter (and notch filter) were used for this test in order to provide sufficient measurement sensitivity.

Measurements were made with the required detectors and annotated on the data for each individual point using the following annotation:

QP = Quasi-Peak Detector
PK = Peak Detector
AV = RMS Detector

Measurements were made to satisfy the specific requirements of the test specification for out of band emissions as well as the restricted band requirements.

If there are no detectable emissions above the noise floor, the data included may show noise floor measurements for reference only.

Measurements within 2 MHz of the allowable band may have been taken using the integration method from ANSI C63.10 clause 11.13.3. This procedure uses the channel power feature of the spectrum analyzer to integrate the power of the emission within a 1 MHz bandwidth.

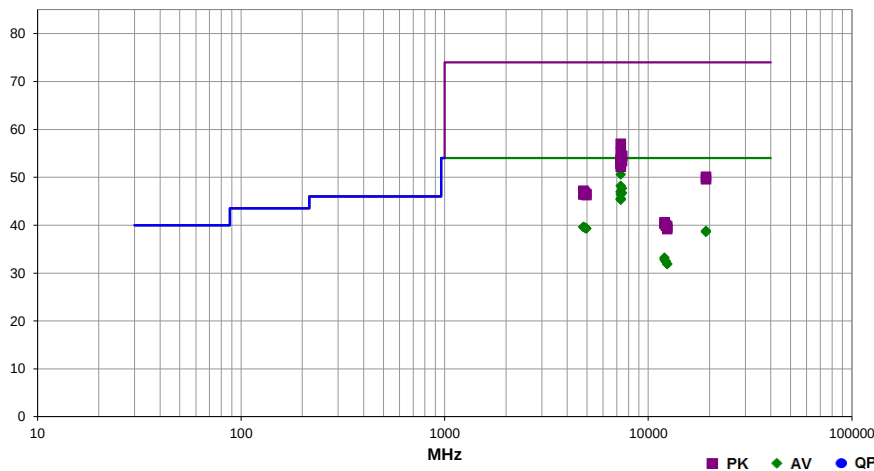
Where the radio test software does not provide for a duty cycle at continuous transmit conditions (> 98%) and the RMS (power average) measurements were made across the on and off times of the EUT transmissions, a duty cycle correction is added to the measurements using the formula of $10 \log(1/dc)$.

SPURIOUS RADIATED EMISSIONS



Work Order:		SYNA0309	Date:	2020-09-25	
Project:		None	Temperature:	22.4 °C	
Job Site:		NC01	Humidity:	56% RH	
Serial Number:		Rev. 10 - 002	Barometric Pres.:	1028 mbar	
EUT:		RadioNode			Tested by: Brian Fahey
Configuration:		1			
Customer:		Walt Disney Parks and Resorts US, Inc.			
Attendees:		None			
EUT Power:		POE via 120VAC/60Hz			
Operating Mode:		BTLE Tx, Antenna PN: ANT-2.4-CW-HWR-SMA, GFSK, Packet Length = 63, PRBS9, 1 Mbps, Low Channel = 2402 MHz, Mid Channel = 2442 MHz, High Channel = 2480 MHz. Power setting = 0 dBm.			
Deviations:		None			
Comments:		See comments below for Channel, EUT orientations. Based off of previous data, the antenna was placed in a vertical orientation for the EUT Horz and Vert orientations and was angled 90 degrees for the EUT on Side orientation. The provided test software configured the radio with a duty cycle of 47.8%. Per ANSI C63.10 test methods, the RMS data was corrected with a carrier duty cycle correction factor (DCCF) of 3.2 dB. DCCF (dB) = 10*log(1/0.478). Port 7 measurements were taken on 1/5/21.			

Test Specifications				Test Method			
FCC 15.247:2021				ANSI C63.10:2013			
Run #	12	Test Distance (m)	3	Antenna Height(s)	1 to 4(m)	Results	Pass



Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (dB)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
7325.608	32.9	14.5	2.6	83.0	3.2	0.0	Horz	AV	0.0	50.6	54.0	-3.4	Mid Ch., Port 8, EUT on Side
7325.450	30.5	14.5	2.2	244.0	3.2	0.0	Horz	AV	0.0	48.2	54.0	-5.8	Mid Ch., Port 7, EUT on Side
7439.525	29.5	15.0	2.2	172.0	3.2	0.0	Horz	AV	0.0	47.7	54.0	-6.3	High Ch., Port 8, EUT on Side
7325.467	29.3	14.5	2.7	22.0	3.2	0.0	Vert	AV	0.0	47.0	54.0	-7.0	Mid Ch., Port 8, EUT Vert
7325.642	29.2	14.5	3.4	200.0	3.2	0.0	Vert	AV	0.0	46.9	54.0	-7.1	Mid Ch., Port 8, EUT Horz
7439.658	28.5	15.0	3.1	181.0	3.2	0.0	Vert	AV	0.0	46.7	54.0	-7.3	High Ch., Port 8, EUT Vert
7326.650	28.7	14.5	3.8	344.0	3.2	0.0	Vert	AV	0.0	46.4	54.0	-7.6	Mid Ch., Port 8, EUT on Side
7325.675	27.9	14.5	1.5	177.0	3.2	0.0	Horz	AV	0.0	45.6	54.0	-8.4	Mid Ch., Port 8, EUT Horz
7326.375	27.7	14.5	1.5	208.0	3.2	0.0	Horz	AV	0.0	45.4	54.0	-8.6	Mid Ch., Port 7, EUT Vert
7323.708	27.6	14.5	2.2	54.0	3.2	0.0	Vert	AV	0.0	45.3	54.0	-8.7	Mid Ch., Port 7, EUT Vert
4802.167	26.7	9.7	3.9	32.0	3.2	0.0	Horz	AV	0.0	39.6	54.0	-14.4	Low Ch., Port 8, EUT on Side
4803.467	26.7	9.7	1.5	188.0	3.2	0.0	Vert	AV	0.0	39.6	54.0	-14.4	Low Ch., Port 8, EUT Vert
4883.917	26.5	9.8	1.5	124.0	3.2	0.0	Horz	AV	0.0	39.5	54.0	-14.5	Mid Ch., Port 8, EUT on Side
4881.625	26.5	9.8	1.5	133.0	3.2	0.0	Vert	AV	0.0	39.5	54.0	-14.5	Mid Ch., Port 8, EUT Vert
4960.242	26.6	9.5	1.5	122.0	3.2	0.0	Horz	AV	0.0	39.3	54.0	-14.7	High Ch., Port 8, EUT on Side
4959.800	26.6	9.5	1.1	98.0	3.2	0.0	Vert	AV	0.0	39.3	54.0	-14.7	High Ch., Port 8, EUT Vert
19215.030	35.0	0.6	1.6	129.0	3.2	0.0	Horz	AV	0.0	38.8	54.0	-15.2	Low Ch., Port 8, EUT on Side
19216.700	34.8	0.6	1.6	292.0	3.2	0.0	Vert	AV	0.0	38.6	54.0	-15.4	Low Ch., Port 8, EUT Vert
7325.225	42.5	14.5	2.6	83.0	0.0	0.0	Horz	PK	0.0	57.0	74.0	-17.0	Mid Ch., Port 8, EUT on Side
7326.675	40.6	14.5	2.2	244.0	0.0	0.0	Horz	PK	0.0	55.1	74.0	-18.9	Mid Ch., Port 7, EUT on Side
7440.500	39.5	15.0	2.2	172.0	0.0	0.0	Horz	PK	0.0	54.5	74.0	-19.5	High Ch., Port 8, EUT on Side
7325.925	39.4	14.5	2.7	22.0	0.0	0.0	Vert	PK	0.0	53.9	74.0	-20.1	Mid Ch., Port 8, EUT Vert
7325.483	39.1	14.5	3.4	200.0	0.0	0.0	Vert	PK	0.0	53.6	74.0	-20.4	Mid Ch., Port 8, EUT Horz
7439.358	38.4	15.0	3.1	181.0	0.0	0.0	Vert	PK	0.0	53.4	74.0	-20.6	High Ch., Port 8, EUT Vert
7325.725	38.8	14.5	3.8	344.0	0.0	0.0	Vert	PK	0.0	53.3	74.0	-20.7	Mid Ch., Port 8, EUT on Side
12011.190	27.5	2.5	1.9	110.0	3.2	0.0	Horz	AV	0.0	33.2	54.0	-20.8	Low Ch., Port 8, EUT on Side
7325.658	38.4	14.5	1.5	177.0	0.0	0.0	Horz	PK	0.0	52.9	74.0	-21.1	Mid Ch., Port 8, EUT Horz
12009.480	27.1	2.5	1.5	272.0	3.2	0.0	Vert	AV	0.0	32.8	54.0	-21.2	Low Ch., Port 8, EUT Vert
7325.717	38.3	14.5	1.5	208.0	0.0	0.0	Horz	PK	0.0	52.8	74.0	-21.2	Mid Ch., Port 8, EUT Vert
12207.580	27.3	1.9	1.5	331.0	3.2	0.0	Vert	AV	0.0	32.4	54.0	-21.6	Mid Ch., Port 8, EUT Vert
12207.870	27.3	1.9	1.5	163.0	3.2	0.0	Horz	AV	0.0	32.4	54.0	-21.6	Mid Ch., Port 8, EUT on Side
7327.000	37.7	14.5	2.2	54.0	0.0	0.0	Vert	PK	0.0	52.2	74.0	-21.8	Mid Ch., Port 7, EUT Vert
12399.770	26.7	2.0	1.5	98.0	3.2	0.0	Vert	AV	0.0	31.9	54.0	-22.1	High Ch., Port 8, EUT Vert
12398.940	26.7	2.0	1.5	216.0	3.2	0.0	Horz	AV	0.0	31.9	54.0	-22.1	High Ch., Port 8, EUT on Side
19215.170	46.3	0.6	1.6	129.0	3.2	0.0	Horz	PK	0.0	50.1	74.0	-23.9	Low Ch., Port 8, EUT on Side
19217.340	45.8	0.6	1.6	292.0	3.2	0.0	Vert	PK	0.0	49.6	74.0	-24.4	Low Ch., Port 8, EUT Vert
4804.742	37.5	9.7	3.9	32.0	0.0	0.0	Horz	PK	0.0	47.2	74.0	-26.8	Low Ch., Port 8, EUT on Side
4882.983	37.0	9.8	1.5	124.0	0.0	0.0	Horz	PK	0.0	46.8	74.0	-27.2	Mid Ch., Port 8, EUT on Side
4962.192	37.0	9.5	1.1	98.0	0.0	0.0	Vert	PK	0.0	46.5	74.0	-27.5	High Ch., Port 8, EUT Vert
4882.258	36.7	9.8	1.5	133.0	0.0	0.0	Vert	PK	0.0	46.5	74.0	-27.5	Mid Ch., Port 8, EUT Vert
4803.217	36.7	9.7	1.5	188.0	0.0	0.0	Vert	PK	0.0	46.4	74.0	-27.6	Low Ch., Port 8, EUT Vert
4960.508	36.8	9.5	1.5	122.0	0.0	0.0	Horz	PK	0.0	46.3	74.0	-27.7	High Ch., Port 8, EUT on Side
12011.450	38.1	2.5	1.9	110.0	0.0	0.0	Horz	PK	0.0	40.6	74.0	-33.4	Low Ch., Port 8, EUT on Side
12012.080	37.8	2.5	1.5	272.0	0.0	0.0	Vert	PK	0.0	40.3	74.0	-33.7	Low Ch., Port 8, EUT Vert
12209.300	38.1	1.9	1.5	163.0	0.0	0.0	Horz	PK	0.0	40.0	74.0	-34.0	Mid Ch., Port 8, EUT on Side
12211.130	38.0	1.9	1.5	331.0	0.0	0.0	Vert	PK	0.0	39.9	74.0	-34.1	Mid Ch., Port 8, EUT Vert
12399.650	37.7	2.0	1.5	216.0	0.0	0.0	Horz	PK	0.0	39.7	74.0	-34.3	High Ch., Port 8, EUT on Side
12397.660	37.2	2.0	1.5	98.0	0.0	0.0	Vert	PK	0.0	39.2	74.0	-34.8	High Ch., Port 8, EUT Vert

SPURIOUS RADIATED EMISSIONS



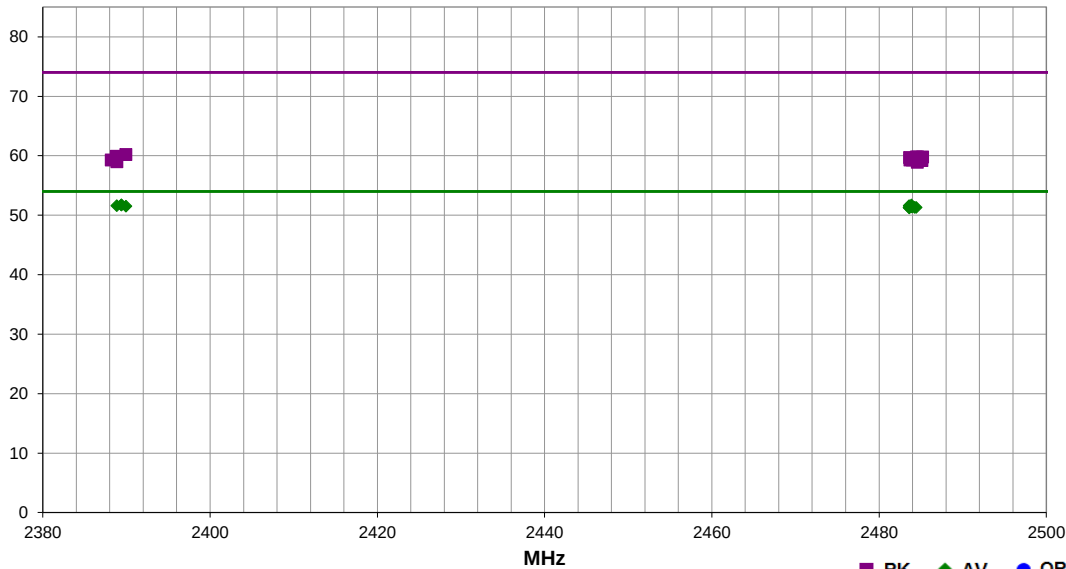
EmiRS 2020.04.20.0

PSA-ESCI 2020.04.03.0

Work Order:	SYNA0309	Date:	2020-09-25	
Project:	None	Temperature:	22.4 °C	
Job Site:	NC01	Humidity:	56% RH	
Serial Number:	Rev. 10 - 002	Barometric Pres.:	1028 mbar	
		Tested by: Brian Fahey		
EUT:	RadioNode			
Configuration:	1			
Customer:	Walt Disney Parks and Resorts US, Inc.			
Attendees:	None			
EUT Power:	POE via 120VAC/60Hz			
Operating Mode:	BTLE Tx, Antenna PN: ANT-2.4-CW-HWR-SMA, GFSK, Packet Length = 63, PRBS9, 1 Mbps, Low Channel = 2402 MHz, High Channel = 2480 MHz. Power setting = 0 dBm.			
Deviations:	None			
Comments:	See comments below for Channel, EUT orientations. Based off of previous data, the antenna was placed in a vertical orientation for the EUT Horz and Vert orientations and was angled 90 degrees for the EUT on Side orientation. The provided test software configured the radio with a duty cycle of 47.8%. Per ANSI C63.10 test methods, the RMS data was corrected with a carrier duty cycle correction factor (DCCF) of 3.2 dB. DCCF (dB) = 10*log(1/0.478). Port 7 measurements were taken on 1/5/21.			

Test Specifications	Test Method
FCC 15.247:2021	ANSI C63.10:2013

Run #	14	Test Distance (m)	3	Antenna Height(s)	1 to 4(m)	Results	Pass
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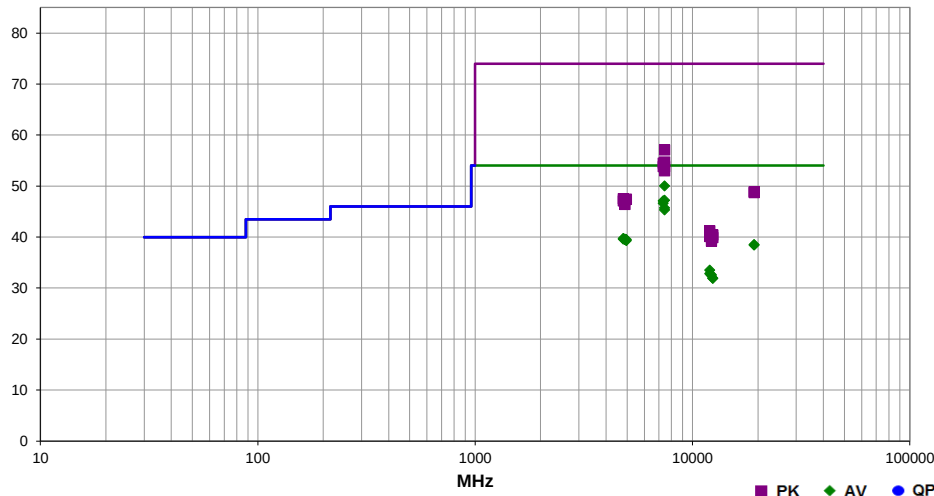
Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (dB)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
2483.880	29.3	-0.8	1.6	266.0	3.2	20.0	Horz	AV	0.0	51.7	54.0	-2.3	High Ch., Port 7, EUT Vert
2389.393	29.1	-0.6	1.5	102.0	3.2	20.0	Horz	AV	0.0	51.7	54.0	-2.3	Low Ch., Port 7, EUT Vert
2389.407	29.1	-0.6	2.1	101.0	3.2	20.0	Vert	AV	0.0	51.7	54.0	-2.3	Low Ch., Port 7, EUT Vert
2388.853	29.0	-0.6	1.5	251.0	3.2	20.0	Vert	AV	0.0	51.6	54.0	-2.4	Low Ch., Port 8, EUT Vert
2483.600	29.2	-0.8	1.5	357.0	3.2	20.0	Vert	AV	0.0	51.6	54.0	-2.4	High Ch., Port 7, EUT Vert
2389.953	28.9	-0.6	1.5	310.0	3.2	20.0	Horz	AV	0.0	51.5	54.0	-2.5	Low Ch., Port 8, EUT Vert
2483.953	29.0	-0.8	1.5	232.0	3.2	20.0	Vert	AV	0.0	51.4	54.0	-2.6	High Ch., Port 8, EUT Vert
2483.910	29.0	-0.8	1.5	84.0	3.2	20.0	Vert	AV	0.0	51.4	54.0	-2.6	High Ch., Port 8, EUT Horz
2484.437	28.9	-0.8	1.5	135.0	3.2	20.0	Vert	AV	0.0	51.3	54.0	-2.7	High Ch., Port 8, EUT on Side
2483.577	28.9	-0.8	2.1	146.0	3.2	20.0	Horz	AV	0.0	51.3	54.0	-2.7	High Ch., Port 7, EUT Vert
2484.263	28.9	-0.8	1.0	90.0	3.2	20.0	Horz	AV	0.0	51.3	54.0	-2.7	High Ch., Port 8, EUT Horz
2483.630	28.8	-0.8	1.5	7.0	3.2	20.0	Horz	AV	0.0	51.2	54.0	-2.8	High Ch., Port 8, EUT on Side
2389.913	40.8	-0.6	2.1	101.0	0.0	20.0	Vert	PK	0.0	60.2	74.0	-13.8	Low Ch., Port 7, EUT Vert
2388.777	40.5	-0.6	1.5	102.0	0.0	20.0	Horz	PK	0.0	59.9	74.0	-14.1	Low Ch., Port 7, EUT Vert
2484.613	40.6	-0.8	1.5	232.0	0.0	20.0	Vert	PK	0.0	59.8	74.0	-14.2	High Ch., Port 8, EUT Vert
2485.203	40.6	-0.8	1.0	90.0	0.0	20.0	Horz	PK	0.0	59.8	74.0	-14.2	High Ch., Port 8, EUT Horz
2484.443	40.6	-0.8	1.5	357.0	0.0	20.0	Vert	PK	0.0	59.8	74.0	-14.2	High Ch., Port 7, EUT Vert
2483.643	40.5	-0.8	1.6	266.0	0.0	20.0	Horz	PK	0.0	59.7	74.0	-14.3	High Ch., Port 7, EUT Vert
2483.987	40.1	-0.8	1.5	135.0	0.0	20.0	Vert	PK	0.0	59.3	74.0	-14.7	High Ch., Port 8, EUT on Side
2483.690	40.1	-0.8	2.1	146.0	0.0	20.0	Horz	PK	0.0	59.3	74.0	-14.7	High Ch., Port 8, EUT Vert
2388.183	39.9	-0.6	1.5	310.0	0.0	20.0	Horz	PK	0.0	59.3	74.0	-14.7	Low Ch., Port 8, EUT Vert
2485.117	40.0	-0.8	1.5	84.0	0.0	20.0	Vert	PK	0.0	59.2	74.0	-14.8	High Ch., Port 8, EUT Horz
2388.853	39.6	-0.6	1.5	251.0	0.0	20.0	Vert	PK	0.0	59.0	74.0	-15.0	Low Ch., Port 8, EUT Vert
2484.567	39.7	-0.8	1.5	7.0	0.0	20.0	Horz	PK	0.0	58.9	74.0	-15.1	High Ch., Port 8, EUT on Side

SPURIOUS RADIATED EMISSIONS



Work Order:	SYNA0309	Date:	2020-09-25	
Project:	None	Temperature:	22.4 °C	
Job Site:	NC01	Humidity:	56% RH	
Serial Number:	Rev. 10 - 002	Barometric Pres.:	1028 mbar	
EUT:	RadioNode			Tested by: Brian Fahey
Configuration:	2			
Customer:	Walt Disney Parks and Resorts US, Inc.			
Attendees:	None			
EUT Power:	24VDC via 120VAC/60Hz			
Operating Mode:	BTLE Tx, Antenna PN: ANT-2.4-CW-HWR-SMA, GFSK, Packet Length = 63, PRBS9, 1 Mbps, Low Channel = 2402 MHz, Mid Channel = 2442 MHz, High Channel = 2480 MHz. Power setting = 0 dBm.			
Deviations:	None			
Comments:	See comments below for Channel, EUT orientations. The worst case EUT orientations from the previous testing were used. The provided test software configured the radio with a duty cycle of 47.8% . Per ANSI C63.10 test methods, the RMS data was corrected with a carrier duty cycle correction factor (DCCF) of 3.2 dB. DCCF (dB) = 10*log(1/0.478). Port 7 measurements were taken on 1/5/21.			

Test Specifications				Test Method			
FCC 15.247:2021				ANSI C63.10:2013			
Run #	36	Test Distance (m)	3	Antenna Height(s)	1 to 4(m)	Results	Pass



Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (dB)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
7439.567	31.8	15.0	2.5	207.0	3.2	0.0	Horz	AV	0.0	50.0	54.0	-4.0	High Ch., Port 8, EUT on Side
7439.473	29.0	15.0	3.2	126.0	3.2	0.0	Vert	AV	0.0	47.2	54.0	-6.8	High Ch., Port 8, EUT Vert
7326.575	29.4	14.5	3.7	140.0	3.2	0.0	Vert	AV	0.0	47.1	54.0	-6.9	Mid Ch., Port 8, EUT Vert
7325.592	28.9	14.5	1.7	134.0	3.2	0.0	Horz	AV	0.0	46.6	54.0	-7.4	Mid Ch., Port 8, EUT on Side
7439.390	27.5	15.0	1.5	3.0	3.2	0.0	Horz	AV	0.0	45.7	54.0	-8.3	High Ch., Port 7, EUT on Side
7439.777	27.1	15.0	1.5	152.0	3.2	0.0	Vert	AV	0.0	45.3	54.0	-8.7	High Ch., Port 7, EUT Vert
4802.042	26.8	9.7	1.5	179.0	3.2	0.0	Horz	AV	0.0	39.7	54.0	-14.3	Low Ch., Port 8, EUT on Side
4883.642	26.6	9.8	1.5	138.0	3.2	0.0	Vert	AV	0.0	39.6	54.0	-14.4	Mid Ch., Port 8, EUT Vert
4803.533	26.7	9.7	1.5	58.0	3.2	0.0	Vert	AV	0.0	39.6	54.0	-14.4	Low Ch., Port 8, EUT Vert
4959.823	26.8	9.5	1.5	323.0	3.2	0.0	Vert	AV	0.0	39.5	54.0	-14.5	High Ch., Port 8, EUT Vert
4882.225	26.5	9.8	1.5	48.0	3.2	0.0	Horz	AV	0.0	39.5	54.0	-14.5	Mid Ch., Port 8, EUT on Side
4958.517	26.6	9.5	1.5	355.0	3.2	0.0	Horz	AV	0.0	39.3	54.0	-14.7	High Ch., Port 8, EUT on Side
19218.100	34.7	0.6	1.6	221.0	3.2	0.0	Vert	AV	0.0	38.5	54.0	-15.5	Low Ch., Port 8, EUT Vert
19216.200	34.6	0.6	1.6	319.0	3.2	0.0	Horz	AV	0.0	38.4	54.0	-15.6	Low Ch., Port 8, EUT on Side
7440.525	42.1	15.0	2.5	207.0	0.0	0.0	Horz	PK	0.0	57.1	74.0	-16.9	High Ch., Port 8, EUT on Side
7440.740	39.7	15.0	3.2	126.0	0.0	0.0	Vert	PK	0.0	54.7	74.0	-19.3	High Ch., Port 8, EUT Vert
7325.842	40.0	14.5	3.7	140.0	0.0	0.0	Vert	PK	0.0	54.5	74.0	-19.5	Mid Ch., Port 8, EUT Vert
7325.383	39.3	14.5	1.7	134.0	0.0	0.0	Horz	PK	0.0	53.8	74.0	-20.2	Mid Ch., Port 8, EUT on Side
7439.110	38.8	15.0	1.5	152.0	0.0	0.0	Vert	PK	0.0	53.8	74.0	-20.2	High Ch., Port 7, EUT Vert
12011.280	27.8	2.5	1.5	214.0	3.2	0.0	Vert	AV	0.0	33.5	54.0	-20.5	Low Ch., Port 8, EUT Vert
7439.773	38.0	15.0	1.5	3.0	0.0	0.0	Horz	PK	0.0	53.0	74.0	-21.0	High Ch., Port 7, EUT on Side
12011.570	27.1	2.5	1.5	300.0	3.2	0.0	Horz	AV	0.0	32.8	54.0	-21.2	Low Ch., Port 8, EUT on Side
12208.130	27.5	1.9	1.5	114.0	3.2	0.0	Vert	AV	0.0	32.6	54.0	-21.4	Mid Ch., Port 8, EUT Vert
12207.750	27.4	1.9	1.5	187.0	3.2	0.0	Horz	AV	0.0	32.5	54.0	-21.5	Mid Ch., Port 8, EUT on Side
12399.510	26.7	2.0	1.5	316.0	3.2	0.0	Vert	AV	0.0	31.9	54.0	-22.1	High Ch., Port 8, EUT Vert
12399.220	26.7	2.0	1.5	339.0	3.2	0.0	Horz	AV	0.0	31.9	54.0	-22.1	High Ch., Port 8, EUT on Side
19214.720	45.1	0.6	1.6	221.0	3.2	0.0	Vert	PK	0.0	48.9	74.0	-25.1	Low Ch., Port 8, EUT Vert
19216.820	44.9	0.6	1.6	319.0	3.2	0.0	Horz	PK	0.0	48.7	74.0	-25.3	Low Ch., Port 8, EUT on Side
4804.083	37.8	9.7	1.5	58.0	0.0	0.0	Vert	PK	0.0	47.5	74.0	-26.5	Low Ch., Port 8, EUT Vert
4959.093	37.9	9.5	1.5	323.0	0.0	0.0	Vert	PK	0.0	47.4	74.0	-26.6	High Ch., Port 8, EUT Vert
4958.675	37.9	9.5	1.5	355.0	0.0	0.0	Horz	PK	0.0	47.4	74.0	-26.6	High Ch., Port 8, EUT on Side
4884.750	37.5	9.8	1.5	48.0	0.0	0.0	Horz	PK	0.0	47.3	74.0	-26.7	Mid Ch., Port 8, EUT on Side
4802.000	37.4	9.7	1.5	179.0	0.0	0.0	Horz	PK	0.0	47.1	74.0	-26.9	Low Ch., Port 8, EUT on Side
4885.625	36.6	9.8	1.5	138.0	0.0	0.0	Vert	PK	0.0	46.4	74.0	-27.6	Mid Ch., Port 8, EUT Vert
12010.530	38.7	2.5	1.5	214.0	0.0	0.0	Vert	PK	0.0	41.2	74.0	-32.8	Low Ch., Port 8, EUT Vert
12399.340	38.4	2.0	1.5	339.0	0.0	0.0	Horz	PK	0.0	40.4	74.0	-33.6	High Ch., Port 8, EUT on Side
12209.760	38.3	1.9	1.5	114.0	0.0	0.0	Vert	PK	0.0	40.2	74.0	-33.8	Mid Ch., Port 8, EUT Vert
12012.420	37.6	2.5	1.5	300.0	0.0	0.0	Horz	PK	0.0	40.1	74.0	-33.9	Low Ch., Port 8, EUT on Side
12399.100	37.9	2.0	1.5	316.0	0.0	0.0	Vert	PK	0.0	39.9	74.0	-34.1	High Ch., Port 8, EUT Vert
12212.490	37.3	1.9	1.5	187.0	0.0	0.0	Horz	PK	0.0	39.2	74.0	-34.8	Mid Ch., Port 8, EUT on Side

SPURIOUS RADIATED EMISSIONS

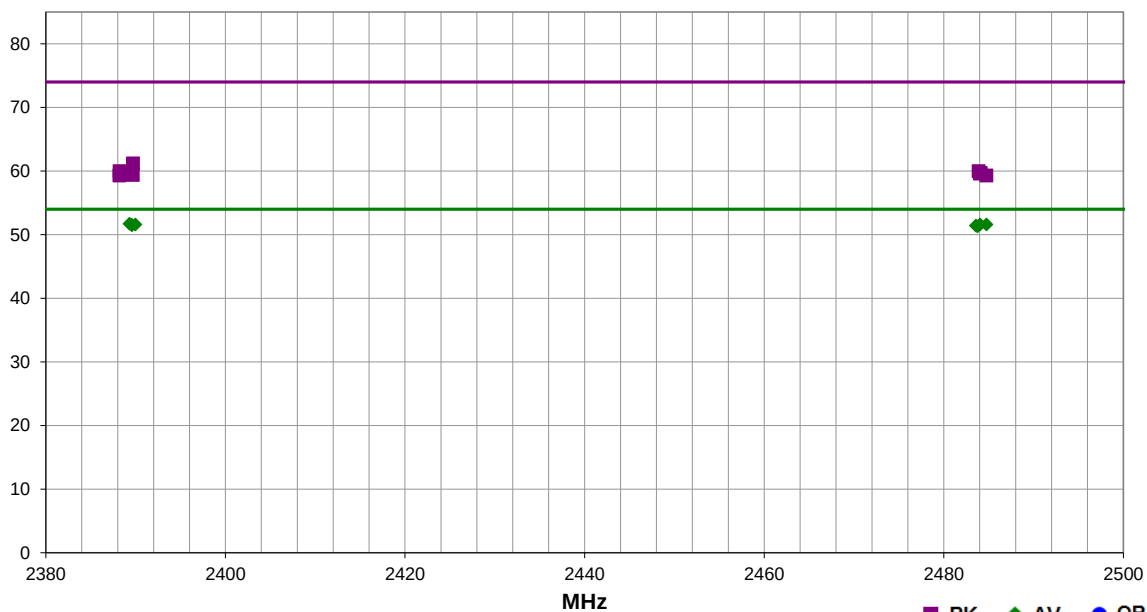


EmiR5 2020.04.20.0 PSA-ESCI 2020.04.03.0

Work Order:	SYNA0309	Date:	2020-09-25		
Project:	None	Temperature:	22.4 °C		
Job Site:	NC01	Humidity:	56% RH		
Serial Number:	Rev. 10 - 002	Barometric Pres.:	1028 mbar	Tested by:	Brian Fahey
EUT:	RadioNode				
Configuration:	2				
Customer:	Walt Disney Parks and Resorts US, Inc.				
Attendees:	None				
EUT Power:	24VDC via 120VAC/60Hz				
Operating Mode:	BTLE Tx, Antenna PN: ANT-2.4-CW-HWR-SMA, GFSK, Packet Length = 63, PRBS9, 1 Mbps, Low Channel = 2402 MHz, High Channel = 2480 MHz. Power setting = 0 dBm.				
Deviations:	None				
Comments:	See comments below for Channel, EUT orientations. The worst case EUT orientations from the previous testing were used. The provided test software configured the radio with a duty cycle of 47.8% . Per ANSI C63.10 test methods, the RMS data was corrected with a carrier duty cycle correction factor (DCCF) of 3.2 dB. DCCF (dB) = 10*log(1/0.478). Port 7 measurements were taken on 1/5/21.				

Test Specifications	Test Method
FCC 15.247:2021	ANSI C63.10:2013

Run #	38	Test Distance (m)	3	Antenna Height(s)	1 to 4(m)	Results	Pass
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Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (dB)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
2389.333	29.1	-0.6	1.5	280.0	3.2	20.0	Horz	AV	0.0	51.7	54.0	-2.3	Low Ch., Port 7, EUT Vert
2484.760	29.2	-0.8	1.5	186.0	3.2	20.0	Horz	AV	0.0	51.6	54.0	-2.4	High Ch., Port 7, EUT Vert
2484.050	29.2	-0.8	1.5	232.0	3.2	20.0	Vert	AV	0.0	51.6	54.0	-2.4	High Ch., Port 7, EUT Vert
2389.973	29.0	-0.6	1.0	245.0	3.2	20.0	Vert	AV	0.0	51.6	54.0	-2.4	Low Ch., Port 7, EUT Vert
2389.600	28.9	-0.6	2.7	327.0	3.2	20.0	Horz	AV	0.0	51.5	54.0	-2.5	Low Ch., Port 8, EUT Vert
2389.570	28.9	-0.6	1.3	2.0	3.2	20.0	Vert	AV	0.0	51.5	54.0	-2.5	Low Ch., Port 8, EUT Vert
2483.590	29.0	-0.8	3.6	231.0	3.2	20.0	Vert	AV	0.0	51.4	54.0	-2.6	High Ch., Port 8, EUT Vert
2483.770	28.9	-0.8	1.5	2.0	3.2	20.0	Horz	AV	0.0	51.3	54.0	-2.7	High Ch., Port 8, EUT Vert
2389.703	41.8	-0.6	1.0	245.0	0.0	20.0	Vert	PK	0.0	61.2	74.0	-12.8	Low Ch., Port 7, EUT Vert
2388.210	40.6	-0.6	2.7	327.0	0.0	20.0	Horz	PK	0.0	60.0	74.0	-14.0	Low Ch., Port 8, EUT Vert
2483.873	40.8	-0.8	3.6	231.0	0.0	20.0	Vert	PK	0.0	60.0	74.0	-14.0	High Ch., Port 8, EUT Vert
2484.117	40.5	-0.8	1.5	232.0	0.0	20.0	Vert	PK	0.0	59.7	74.0	-14.3	High Ch., Port 7, EUT Vert
2484.020	40.4	-0.8	1.5	186.0	0.0	20.0	Horz	PK	0.0	59.6	74.0	-14.4	High Ch., Port 7, EUT Vert
2389.683	40.0	-0.6	1.5	280.0	0.0	20.0	Horz	PK	0.0	59.4	74.0	-14.6	Low Ch., Port 7, EUT Vert
2388.183	39.9	-0.6	1.3	2.0	0.0	20.0	Vert	PK	0.0	59.3	74.0	-14.7	Low Ch., Port 8, EUT Vert
2484.737	40.1	-0.8	1.5	2.0	0.0	20.0	Horz	PK	0.0	59.3	74.0	-14.7	High Ch., Port 8, EUT Vert

SPURIOUS RADIATED EMISSIONS



PSA-ESCI 2020.04.03.0

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data. The test data represents the configuration / operating mode/ model that produced the highest emission levels as compared to the specification limit.

MODES OF OPERATION

BTLE Tx, Antenna PN: C3EY, GFSK, Packet Length = 63, PRBS9, 1 Mbps, Low Channel = 2402 MHz, High Channel = 2480 MHz.

BTLE Tx, Antenna PN: C3EY, GFSK, Packet Length = 63, PRBS9, 1 Mbps, Low Channel = 2402 MHz, Mid Channel = 2442 MHz, High Channel = 2480 MHz.

POWER SETTINGS INVESTIGATED

24VDC via 120VAC/60Hz

POE via 120VAC/60Hz

CONFIGURATIONS INVESTIGATED

SYNA0309 - 8

SYNA0309 - 7

FREQUENCY RANGE INVESTIGATED

Start Frequency	30 MHz	Stop Frequency	26 GHz
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SAMPLE CALCULATIONS

Radiated Emissions: Field Strength = Measured Level + Antenna Factor + Cable Factor - Amplifier Gain + Distance Adjustment Factor + External Attenuation

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Cable	Northwest EMC	N/A	NC8	2020-02-07	12 mo
Amplifier - Pre-Amplifier	Miteq	AMF-6F-18002650-25-10P	AOD	2020-02-07	12 mo
Antenna - Standard Gain	ETS Lindgren	3160-09	AIY	NCR	0 mo
Amplifier - Pre-Amplifier	Miteq	AMF-6F-12001800-30-10P	AOJ	2020-08-26	12 mo
Antenna - Standard Gain	EMCO	3160-08	AHO	NCR	0 mo
Cable	High Speed Interconnects	EW292A-NGNG-300	NC3	2020-08-28	12 mo
Amplifier - Pre-Amplifier	Miteq	AMF-6F-08001200-30-10P	AOK	2020-08-26	12 mo
Antenna - Standard Gain	EMCO	3160-07	AHP	NCR	0 mo
Filter - High Pass	Micro-Tronics	HPM50111	HHI	2020-09-25	12 mo
Attenuator	Fairview Microwave	SA18E-20	AQV	2020-07-28	12 mo
Cable	Northwest EMC	3115 Horn Cable	NC2	2020-04-20	12 mo
Amplifier - Pre-Amplifier	Miteq	AMF-3D-00100800-32-13P	AVZ	2020-04-20	12 mo
Antenna - Double Ridge	EMCO	3115	AHM	2020-07-01	24 mo
Amplifier - Pre-Amplifier	Miteq	AM-1616-1000	PAB	2020-01-28	12 mo
Antenna - Biconilog	Teseq	CBL 6141B	AYL	2019-09-25	24 mo
Cable	Northwest EMC	Bilog Cables	NC1	2020-01-28	12 mo
Filter - Low Pass	Micro-Tronics	LPM50004	LFF	2019-11-08	12 mo
Analyzer - Spectrum Analyzer	Agilent	E4440A	AAX	2020-04-15	12 mo

SPURIOUS RADIATED EMISSIONS



PSA-ESCI 2020.04.03.0

TEST DESCRIPTION

The highest gain antenna of each type to be used with the EUT was tested. The EUT was configured for the required transmit frequencies and the modes as showed in the data sheets.

For each configuration, the spectrum was scanned throughout the specified range as part of the exploratory investigation of the emissions. These “pre-scans” are not included in the report. Final measurements on individual emissions were then made and included in this test report.

The individual emissions from the EUT were maximized by rotating the EUT on a turntable, adjusting the position of the EUT and EUT antenna in three orthogonal axis if required, and adjusting the measurement antenna height and polarization (per ANSI C63.10). A preamp and high pass filter (and notch filter) were used for this test in order to provide sufficient measurement sensitivity.

Measurements were made with the required detectors and annotated on the data for each individual point using the following annotation:

QP = Quasi-Peak Detector
PK = Peak Detector
AV = RMS Detector

Measurements were made to satisfy the specific requirements of the test specification for out of band emissions as well as the restricted band requirements.

If there are no detectable emissions above the noise floor, the data included may show noise floor measurements for reference only.

Measurements within 2 MHz of the allowable band may have been taken using the integration method from ANSI C63.10 clause 11.13.3. This procedure uses the channel power feature of the spectrum analyzer to integrate the power of the emission within a 1 MHz bandwidth.

Where the radio test software does not provide for a duty cycle at continuous transmit conditions (> 98%) and the RMS (power average) measurements were made across the on and off times of the EUT transmissions, a duty cycle correction is added to the measurements using the formula of $10 \cdot \log(1/dc)$.

SPURIOUS RADIATED EMISSIONS

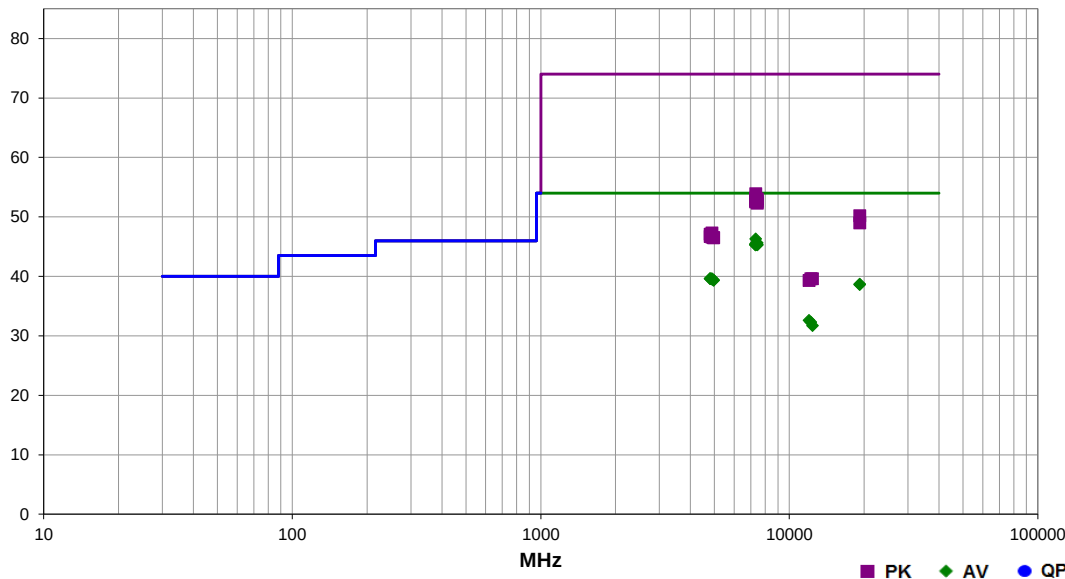


EmiRS 2020.06.24.4 PSA-ESCI 2020.04.03.0

Work Order:	SYNA0309	Date:	2020-09-30	
Project:	None	Temperature:	23.3 °C	
Job Site:	NC01	Humidity:	54.3% RH	
Serial Number:	Rev. 10 - 002	Barometric Pres.:	1024 mbar	
EUT:	RadioNode			
Configuration:	7			
Customer:	Walt Disney Parks and Resorts US, Inc.			
Attendees:	None			
EUT Power:	POE via 120VAC/60Hz			
Operating Mode:	BTLE Tx, Antenna PN: C3EY, GFSK, Packet Length = 63, PRBS9, 1 Mbps, Low Channel = 2402 MHz, Mid Channel = 2442 MHz, High Channel = 2480 MHz.			
Deviations:	None			
Comments:	See comments below for Channel, EUT orientations. The provided test software configured the radio with a duty cycle of 47.8% . Per ANSI C63.10 test methods, the RMS data was corrected with a carrier duty cycle correction factor (DCCF) of 3.2 dB. DCCF (dB) = 10*log(1/0.478).			

Test Specifications	Test Method
FCC 15.247:2020	ANSI C63.10:2013

Run #	132	Test Distance (m)	3	Antenna Height(s)	1 to 4(m)	Results	Pass
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Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (dB)	External Attenuation (dB)	Polarity/Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
7325.467	28.6	14.5	3.3	151.0	3.2	0.0	Horz	AV	0.0	46.3	54.0	-7.7	Mid Ch., Port 8, EUT on Side, Ant on Side
7439.283	27.4	15.0	1.5	95.0	3.2	0.0	Vert	AV	0.0	45.6	54.0	-8.4	High Ch., Port 8, EUT Vert, Ant Vert
7326.033	27.8	14.5	1.5	100.0	3.2	0.0	Vert	AV	0.0	45.5	54.0	-8.5	Mid Ch., Port 8, EUT Vert, Ant Vert
7325.317	27.7	14.5	2.5	126.0	3.2	0.0	Horz	AV	0.0	45.4	54.0	-8.6	Mid Ch., Port 7, EUT on Side, ANT on Side
7326.125	27.6	14.5	1.2	206.0	3.2	0.0	Horz	AV	0.0	45.3	54.0	-8.7	Mid Ch., Port 8, EUT Horz, Ant Horz
7326.675	27.6	14.5	1.5	125.0	3.2	0.0	Vert	AV	0.0	45.3	54.0	-8.7	Mid Ch., Port 8, EUT Horz, Ant Horz
7323.675	27.6	14.5	1.5	45.0	3.2	0.0	Vert	AV	0.0	45.3	54.0	-8.7	Mid Ch., Port 8, EUT on Side, Ant on Side
7323.642	27.6	14.5	3.2	41.0	3.2	0.0	Horz	AV	0.0	45.3	54.0	-8.7	Mid Ch., Port 8, EUT Vert, Ant Vert
7439.283	27.1	15.0	1.5	297.0	3.2	0.0	Horz	AV	0.0	45.3	54.0	-8.7	High Ch., Port 8, EUT on Side, Ant on Side
7441.108	27.1	15.0	1.5	143.0	3.2	0.0	Vert	AV	0.0	45.3	54.0	-8.7	High Ch., Port 7, EUT Vert, ANT Vert
4804.142	26.7	9.7	1.7	333.0	3.2	0.0	Vert	AV	0.0	39.6	54.0	-14.4	Low Ch., Port 8, EUT Vert, Ant Vert
4884.250	26.6	9.8	1.5	306.0	3.2	0.0	Horz	AV	0.0	39.6	54.0	-14.4	Mid Ch., Port 8, EUT on Side, Ant on Side
4802.467	26.7	9.7	1.5	92.0	3.2	0.0	Horz	AV	0.0	39.6	54.0	-14.4	Low Ch., Port 8, EUT on Side, Ant on Side
4881.592	26.5	9.8	4.0	347.0	3.2	0.0	Vert	AV	0.0	39.5	54.0	-14.5	Mid Ch., Port 8, EUT Vert, Ant Vert
4958.625	26.7	9.5	1.5	67.0	3.2	0.0	Vert	AV	0.0	39.4	54.0	-14.6	High Ch., Port 8, EUT Vert, Ant Vert
4961.042	26.6	9.5	1.1	40.0	3.2	0.0	Horz	AV	0.0	39.3	54.0	-14.7	High Ch., Port 8, EUT on Side, Ant on Side
19218.180	34.9	0.6	1.6	28.0	3.2	0.0	Horz	AV	0.0	38.7	54.0	-15.3	Low Ch., Port 8, EUT on Side, Ant on Side
19215.380	34.8	0.6	1.6	173.0	3.2	0.0	Vert	AV	0.0	38.6	54.0	-15.4	Low Ch., Port 8, EUT Vert, Ant Vert
7327.908	39.2	14.7	3.2	41.0	0.0	0.0	Horz	PK	0.0	53.9	74.0	-20.1	Mid Ch., Port 8, EUT Vert, Ant Vert
7325.283	38.7	14.5	3.3	151.0	0.0	0.0	Horz	PK	0.0	53.2	74.0	-20.8	Mid Ch., Port 8, EUT on Side, Ant on Side
7326.975	38.5	14.5	1.5	100.0	0.0	0.0	Vert	PK	0.0	53.0	74.0	-21.0	Mid Ch., Port 8, EUT Vert, Ant Vert
7439.125	38.0	15.0	1.5	143.0	0.0	0.0	Vert	PK	0.0	53.0	74.0	-21.0	High Ch., Port 7, EUT Vert, ANT Vert
7326.517	38.4	14.5	2.5	126.0	0.0	0.0	Horz	PK	0.0	52.9	74.0	-21.1	Mid Ch., Port 7, EUT on Side, ANT on Side
7325.183	38.2	14.5	1.2	206.0	0.0	0.0	Horz	PK	0.0	52.7	74.0	-21.3	Mid Ch., Port 8, EUT Horz, Ant Horz
7326.092	38.1	14.5	1.5	45.0	0.0	0.0	Vert	PK	0.0	52.6	74.0	-21.4	Mid Ch., Port 8, EUT on Side, Ant on Side
7439.975	37.6	15.0	1.5	95.0	0.0	0.0	Vert	PK	0.0	52.6	74.0	-21.4	High Ch., Port 8, EUT Vert, Ant Vert
12009.820	26.9	2.5	1.5	296.0	3.2	0.0	Horz	AV	0.0	32.6	54.0	-21.4	Low Ch., Port 8, EUT on Side, Ant on Side

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (dB)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
7325.708	38.0	14.5	1.5	125.0	0.0	0.0	Vert	PK	0.0	52.5	74.0	-21.5	Mid Ch., Port 8, EUT Horz, Ant Horz
12207.620	27.2	1.9	1.5	4.0	3.2	0.0	Horz	AV	0.0	32.3	54.0	-21.7	Mid Ch., Port 8, EUT on Side, Ant on Side
7441.558	37.3	15.0	1.5	297.0	0.0	0.0	Horz	PK	0.0	52.3	74.0	-21.7	High Ch., Port 8, EUT on Side, Ant on Side
12399.960	26.5	2.0	1.5	80.0	3.2	0.0	Horz	AV	0.0	31.7	54.0	-22.3	High Ch., Port 8, EUT on Side, Ant on Side
19214.680	46.4	0.6	1.6	173.0	3.2	0.0	Vert	PK	0.0	50.2	74.0	-23.8	Low Ch., Port 8, EUT Vert, Ant Vert
19216.270	45.2	0.6	1.6	28.0	3.2	0.0	Horz	PK	0.0	49.0	74.0	-25.0	Low Ch., Port 8, EUT on Side, Ant on Side
4884.333	37.5	9.8	4.0	347.0	0.0	0.0	Vert	PK	0.0	47.3	74.0	-26.7	Mid Ch., Port 8, EUT Vert, Ant Vert
4805.992	37.4	9.7	1.5	92.0	0.0	0.0	Horz	PK	0.0	47.1	74.0	-26.9	Low Ch., Port 8, EUT on Side, Ant on Side
4803.383	37.0	9.7	1.7	333.0	0.0	0.0	Vert	PK	0.0	46.7	74.0	-27.3	Low Ch., Port 8, EUT Vert, Ant Vert
4884.850	36.8	9.8	1.5	306.0	0.0	0.0	Horz	PK	0.0	46.6	74.0	-27.4	Mid Ch., Port 8, EUT on Side, Ant on Side
4958.958	37.0	9.5	1.5	67.0	0.0	0.0	Vert	PK	0.0	46.5	74.0	-27.5	High Ch., Port 8, EUT Vert, Ant Vert
4958.075	37.0	9.5	1.1	40.0	0.0	0.0	Horz	PK	0.0	46.5	74.0	-27.5	High Ch., Port 8, EUT on Side, Ant on Side
12208.380	37.7	1.9	1.5	4.0	0.0	0.0	Horz	PK	0.0	39.6	74.0	-34.4	Mid Ch., Port 8, EUT on Side, Ant on Side
12398.340	37.6	2.0	1.5	80.0	0.0	0.0	Horz	PK	0.0	39.6	74.0	-34.4	High Ch., Port 8, EUT on Side, Ant on Side
12008.500	36.8	2.5	1.5	296.0	0.0	0.0	Horz	PK	0.0	39.3	74.0	-34.7	Low Ch., Port 8, EUT on Side, Ant on Side

SPURIOUS RADIATED EMISSIONS

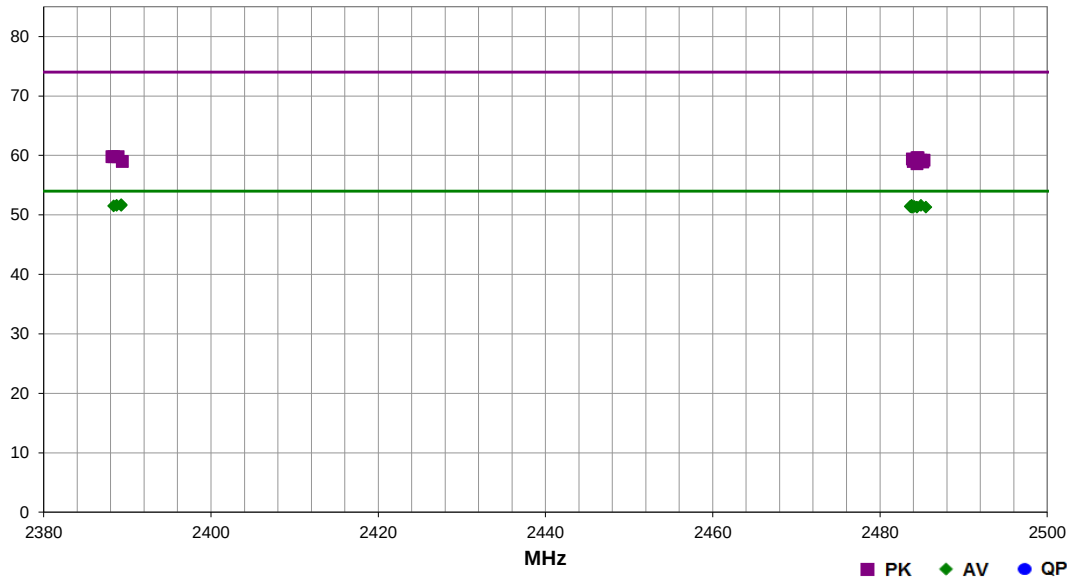


EmiRS 2020.06.24.4 PSA-ESCI 2020.04.03.0

Work Order:	SYNA0309	Date:	2020-09-30	
Project:	None	Temperature:	23.3 °C	
Job Site:	NC01	Humidity:	54.3% RH	
Serial Number:	Rev. 10 - 002	Barometric Pres.:	1024 mbar	
EUT:	RadioNode			
Configuration:	7			
Customer:	Walt Disney Parks and Resorts US, Inc.			
Attendees:	None			
EUT Power:	POE via 120VAC/60Hz			
Operating Mode:	BTLE Tx, Antenna PN: C3EY, GFSK, Packet Length = 63, PRBS9, 1 Mbps, Low Channel = 2402 MHz, High Channel = 2480 MHz.			
Deviations:	None			
Comments:	See comments below for Channel, EUT orientations. The provided test software configured the radio with a duty cycle of 47.8% . Per ANSI C63.10 test methods, the RMS data was corrected with a carrier duty cycle correction factor (DCCF) of 3.2 dB. DCCF (dB) = 10*log(1/0.478).			

Test Specifications	Test Method
FCC 15.247:2020	ANSI C63.10:2013

Run #	134	Test Distance (m)	3	Antenna Height(s)	1 to 4(m)	Results	Pass
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Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (dB)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
2389.273	29.1	-0.6	1.5	96.0	3.2	20.0	Vert	AV	0.0	51.7	54.0	-2.3	Low Ch., Port 7, EUT on Side, ANT on Side
2388.717	29.0	-0.6	1.0	285.0	3.2	20.0	Vert	AV	0.0	51.6	54.0	-2.4	Low Ch., Port 8, EUT on Side, Ant on Side
2483.787	29.2	-0.8	1.5	223.0	3.2	20.0	Vert	AV	0.0	51.6	54.0	-2.4	High Ch., Port 7, EUT on Side, ANT on Side
2389.277	29.0	-0.6	1.2	110.0	3.2	20.0	Horz	AV	0.0	51.6	54.0	-2.4	Low Ch., Port 7, EUT Vert ANT Vert
2484.907	29.2	-0.8	1.5	216.0	3.2	20.0	Horz	AV	0.0	51.6	54.0	-2.4	High Ch., Port 7, EUT Vert ANT Vert
2388.363	28.9	-0.6	4.0	261.0	3.2	20.0	Horz	AV	0.0	51.5	54.0	-2.5	Low Ch., Port 8, EUT Vert, Ant Vert
2484.103	29.0	-0.8	1.9	241.0	3.2	20.0	Horz	AV	0.0	51.4	54.0	-2.6	High Ch., Port 8, EUT Vert, Ant Vert
2483.627	29.0	-0.8	1.5	318.0	3.2	20.0	Horz	AV	0.0	51.4	54.0	-2.6	High Ch., Port 8, EUT Horz, Ant Horz
2485.493	28.9	-0.8	2.3	240.0	3.2	20.0	Horz	AV	0.0	51.3	54.0	-2.7	High Ch., Port 8, EUT on Side, Ant on Side
2484.420	28.9	-0.8	2.8	165.0	3.2	20.0	Vert	AV	0.0	51.3	54.0	-2.7	High Ch., Port 8, EUT on Side, Ant on Side
2483.757	28.9	-0.8	2.5	35.0	3.2	20.0	Vert	AV	0.0	51.3	54.0	-2.7	High Ch., Port 8, EUT Vert, Ant Vert
2483.903	28.9	-0.8	2.5	68.0	3.2	20.0	Vert	AV	0.0	51.3	54.0	-2.7	High Ch., Port 8, EUT Horz, Ant Horz
2388.897	40.4	-0.6	1.0	285.0	0.0	20.0	Vert	PK	0.0	59.8	74.0	-14.2	Low Ch., Port 8, EUT on Side, Ant on Side
2388.157	40.4	-0.6	1.5	96.0	0.0	20.0	Vert	PK	0.0	59.8	74.0	-14.2	Low Ch., Port 7, EUT on Side, ANT on Side
2388.363	40.4	-0.6	1.2	110.0	0.0	20.0	Horz	PK	0.0	59.8	74.0	-14.2	Low Ch., Port 7, EUT Vert ANT Vert
2484.427	40.4	-0.8	1.5	318.0	0.0	20.0	Horz	PK	0.0	59.6	74.0	-14.4	High Ch., Port 8, EUT Horz, Ant Horz
2484.550	40.4	-0.8	1.5	223.0	0.0	20.0	Vert	PK	0.0	59.6	74.0	-14.4	High Ch., Port 7, EUT on Side, ANT on Side
2483.873	40.2	-0.8	2.5	68.0	0.0	20.0	Vert	PK	0.0	59.4	74.0	-14.6	High Ch., Port 8, EUT Horz, Ant Horz
2485.270	40.0	-0.8	2.3	240.0	0.0	20.0	Horz	PK	0.0	59.2	74.0	-14.8	High Ch., Port 8, EUT on Side, Ant on Side
2484.907	40.0	-0.8	1.5	216.0	0.0	20.0	Horz	PK	0.0	59.2	74.0	-14.8	High Ch., Port 7, EUT Vert ANT Vert
2483.980	39.8	-0.8	2.8	165.0	0.0	20.0	Vert	PK	0.0	59.0	74.0	-15.0	High Ch., Port 8, EUT on Side, Ant on Side
2389.403	39.6	-0.6	4.0	261.0	0.0	20.0	Horz	PK	0.0	59.0	74.0	-15.0	Low Ch., Port 8, EUT Vert, Ant Vert
2485.123	39.7	-0.8	2.5	35.0	0.0	20.0	Vert	PK	0.0	58.9	74.0	-15.1	High Ch., Port 8, EUT Vert, Ant Vert
2484.433	39.4	-0.8	1.9	241.0	0.0	20.0	Horz	PK	0.0	58.6	74.0	-15.4	High Ch., Port 8, EUT Vert, Ant Vert

SPURIOUS RADIATED EMISSIONS

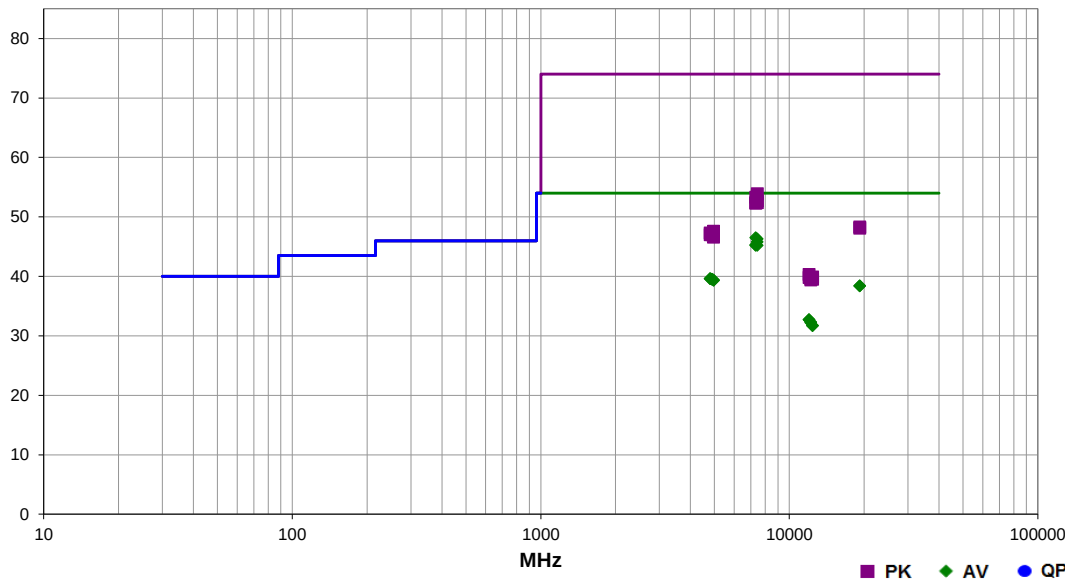


EmiRS 2020.06.24.4 PSA-ESCI 2020.04.03.0

Work Order:	SYNA0309	Date:	2020-09-30	
Project:	None	Temperature:	23.3 °C	
Job Site:	NC01	Humidity:	54.3% RH	
Serial Number:	Rev. 10 - 002	Barometric Pres.:	1024 mbar	
EUT:	RadioNode			
Configuration:	8			
Customer:	Walt Disney Parks and Resorts US, Inc.			
Attendees:	None			
EUT Power:	24VDC via 120VAC/60Hz			
Operating Mode:	BTLE Tx, Antenna PN: C3EY, GFSK, Packet Length = 63, PRBS9, 1 Mbps, Low Channel = 2402 MHz, Mid Channel = 2442 MHz, High Channel = 2480 MHz.			
Deviations:	None			
Comments:	See comments below for Channel, EUT orientations. The worst case EUT orientations from the previous testing were used. The provided test software configured the radio with a duty cycle of 47.8% . Per ANSI C63.10 test methods, the RMS data was corrected with a carrier duty cycle correction factor (DCCF) of 3.2 dB. DCCF (dB) = 10*log(1/0.478).			

Test Specifications	Test Method
FCC 15.247:2020	ANSI C63.10:2013

Run #	152	Test Distance (m)	3	Antenna Height(s)	1 to 4(m)	Results	Pass
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Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (dB)	External Attenuation (dB)	Polarity/Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
7325.625	28.8	14.5	2.7	349.0	3.2	0.0	Vert	AV	0.0	46.5	54.0	-7.5	Mid Ch., Port 8, EUT Vert, Ant Vert
7439.508	28.1	15.0	1.4	311.0	3.2	0.0	Horz	AV	0.0	46.3	54.0	-7.7	High Ch., Port 8, EUT on Side, Ant on Side
7439.850	27.6	15.0	1.5	107.0	3.2	0.0	Vert	AV	0.0	45.8	54.0	-8.2	High Ch., Port 8, EUT Vert, Ant Vert
7326.042	27.6	14.5	1.5	164.0	3.2	0.0	Horz	AV	0.0	45.3	54.0	-8.7	Mid Ch., Port 8, EUT on Side, Ant on Side
7325.967	27.5	14.5	1.5	246.0	3.2	0.0	Vert	AV	0.0	45.2	54.0	-8.8	Mid Ch., Port 7, EUT Vert, ANT Vert
7441.050	27.0	15.0	3.1	254.0	3.2	0.0	Horz	AV	0.0	45.2	54.0	-8.8	High Ch., Port 7, EUT on Side, ANT on Side
4803.700	26.7	9.7	9.7	190.0	3.2	0.0	Horz	AV	0.0	39.6	54.0	-14.4	Low Ch., Port 8, EUT on Side, Ant on Side
4803.692	26.7	9.7	2.6	156.0	3.2	0.0	Vert	AV	0.0	39.6	54.0	-14.4	Low Ch., Port 8, EUT on Vert, Ant Vert
4883.358	26.5	9.8	1.2	130.0	3.2	0.0	Horz	AV	0.0	39.5	54.0	-14.5	Mid Ch., Port 8, EUT on Side, Ant on Side
4882.292	26.5	9.8	2.6	251.0	3.2	0.0	Vert	AV	0.0	39.5	54.0	-14.5	Mid Ch., Port 8, EUT Vert, Ant Vert
4958.025	26.7	9.5	1.5	143.0	3.2	0.0	Vert	AV	0.0	39.4	54.0	-14.6	High Ch., Port 8, EUT Vert, Ant Vert
4959.867	26.6	9.5	3.9	295.0	3.2	0.0	Horz	AV	0.0	39.3	54.0	-14.7	High Ch., Port 8, EUT on Side, Ant on Side
19213.890	34.6	0.6	1.6	271.0	3.2	0.0	Vert	AV	0.0	38.4	54.0	-15.6	Low Ch., Port 8, EUT Vert, Ant Vert
19215.910	34.6	0.6	1.6	84.0	3.2	0.0	Horz	AV	0.0	38.4	54.0	-15.6	Low Ch., Port 7, EUT on Side, ANT on Side
7440.775	38.9	15.0	1.4	311.0	0.0	0.0	Horz	PK	0.0	53.9	74.0	-20.1	High Ch., Port 8, EUT on Side, Ant on Side
7325.375	38.8	14.5	2.7	349.0	0.0	0.0	Vert	PK	0.0	53.3	74.0	-20.7	Mid Ch., Port 8, EUT Vert, Ant Vert
7438.417	37.7	15.0	1.5	107.0	0.0	0.0	Vert	PK	0.0	52.7	74.0	-21.3	High Ch., Port 8, EUT Vert, Ant Vert
12009.150	27.0	2.5	1.5	121.0	3.2	0.0	Vert	AV	0.0	32.7	54.0	-21.3	Low Ch., Port 8, EUT Vert, Ant Vert
12010.780	27.0	2.5	1.5	178.0	3.2	0.0	Horz	AV	0.0	32.7	54.0	-21.3	Low Ch., Port 8, EUT on Side, Ant on Side
7323.567	37.9	14.5	1.5	246.0	0.0	0.0	Vert	PK	0.0	52.4	74.0	-21.6	Mid Ch., Port 7, EUT Vert, ANT Vert
7441.700	37.4	15.0	3.1	254.0	0.0	0.0	Horz	PK	0.0	52.4	74.0	-21.6	High Ch., Port 7, EUT on Side, ANT on Side
12207.940	27.2	1.9	1.5	77.0	3.2	0.0	Vert	AV	0.0	32.3	54.0	-21.7	Mid Ch., Port 8, EUT Vert, Ant Vert
7327.375	37.6	14.7	1.5	164.0	0.0	0.0	Horz	PK	0.0	52.3	74.0	-21.7	Mid Ch., Port 8, EUT on Side, Ant on Side
12207.660	27.1	1.9	1.5	180.0	3.2	0.0	Horz	AV	0.0	32.2	54.0	-21.8	Mid Ch., Port 8, EUT on Side, Ant on Side
12399.420	26.5	2.0	1.5	28.0	3.2	0.0	Vert	AV	0.0	31.7	54.0	-22.3	High Ch., Port 8, EUT Vert, Ant Vert
12399.880	26.5	2.0	1.5	302.0	3.2	0.0	Horz	AV	0.0	31.7	54.0	-22.3	High Ch., Port 8, EUT on Side, Ant on Side
19213.890	44.5	0.6	1.6	271.0	3.2	0.0	Vert	PK	0.0	48.3	74.0	-25.7	Low Ch., Port 8, EUT Vert, Ant Vert

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (dB)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
19217.480	44.3	0.6	1.6	84.0	3.2	0.0	Horz	PK	0.0	48.1	74.0	-25.9	Low Ch., Port 8, EUT on Side, Ant on Side
4957.883	38.1	9.5	1.5	143.0	0.0	0.0	Vert	PK	0.0	47.6	74.0	-26.4	High Ch., Port 8, EUT Vert, Ant Vert
4805.150	37.6	9.7	2.6	156.0	0.0	0.0	Vert	PK	0.0	47.3	74.0	-26.7	Low Ch., Port 8, EUT on Vert, Ant Vert
4883.908	37.4	9.8	2.6	251.0	0.0	0.0	Vert	PK	0.0	47.2	74.0	-26.8	Mid Ch., Port 8, EUT Vert, Ant Vert
4882.258	37.2	9.8	1.2	130.0	0.0	0.0	Horz	PK	0.0	47.0	74.0	-27.0	Mid Ch., Port 8, EUT on Side, Ant on Side
4804.975	37.3	9.7	3.5	190.0	0.0	0.0	Horz	PK	0.0	47.0	74.0	-27.0	Low Ch., Port 8, EUT on Side, Ant on Side
4957.967	37.1	9.5	3.9	295.0	0.0	0.0	Horz	PK	0.0	46.6	74.0	-27.4	High Ch., Port 8, EUT on Side, Ant on Side
12011.510	37.8	2.5	1.5	121.0	0.0	0.0	Vert	PK	0.0	40.3	74.0	-33.7	Low Ch., Port 8, EUT Vert, Ant Vert
12399.390	37.9	2.0	1.5	28.0	0.0	0.0	Vert	PK	0.0	39.9	74.0	-34.1	High Ch., Port 8, EUT Vert, Ant Vert
12010.750	37.3	2.5	1.5	178.0	0.0	0.0	Horz	PK	0.0	39.8	74.0	-34.2	Low Ch., Port 8, EUT on Side, Ant on Side
12207.780	37.7	1.9	1.5	77.0	0.0	0.0	Vert	PK	0.0	39.6	74.0	-34.4	Mid Ch., Port 8, EUT Vert, Ant Vert
12399.420	37.5	2.0	1.5	302.0	0.0	0.0	Horz	PK	0.0	39.5	74.0	-34.5	High Ch., Port 8, EUT on Side, Ant on Side
12212.090	37.5	1.9	1.5	180.0	0.0	0.0	Horz	PK	0.0	39.4	74.0	-34.6	Mid Ch., Port 8, EUT on Side, Ant on Side

SPURIOUS RADIATED EMISSIONS

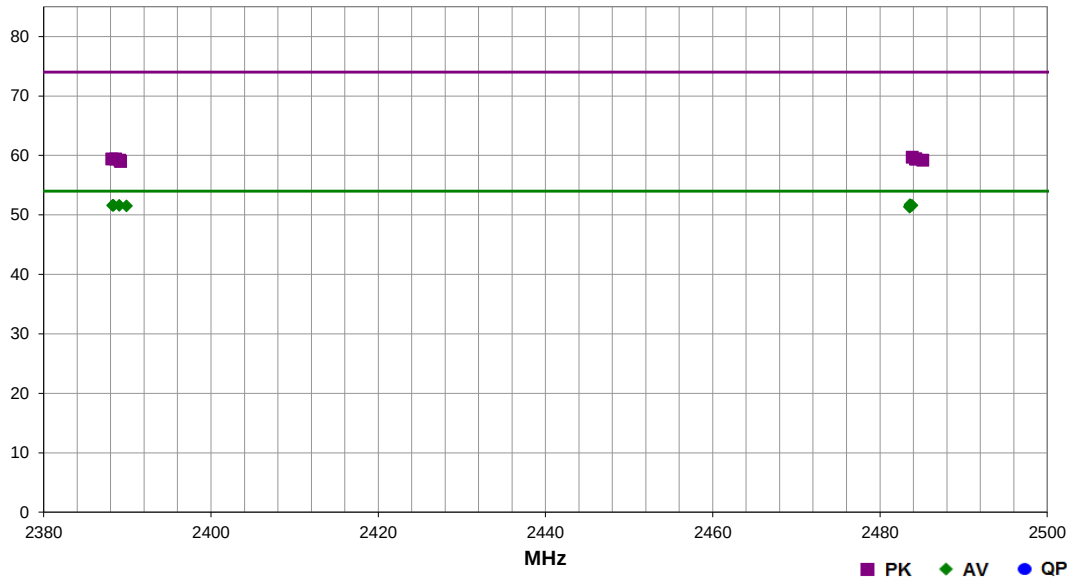


EmiRS 2020.06.24.4 PSA-ESCI 2020.04.03.0

Work Order:	SYNA0309	Date:	2020-09-30		
Project:	None	Temperature:	23.6 °C		
Job Site:	NC01	Humidity:	56% RH		
Serial Number:	Rev. 10 - 002	Barometric Pres.:	1022 mbar		
EUT:	RadioNode			Tested by:	Brian Fahey
Configuration:	8				
Customer:	Walt Disney Parks and Resorts US, Inc.				
Attendees:	None				
EUT Power:	24VDC via 120VAC/60Hz				
Operating Mode:	BTLE Tx, Antenna PN: C3EY, GFSK, Packet Length = 63, PRBS9, 1 Mbps, Low Channel = 2402 MHz, High Channel = 2480 MHz.				
Deviations:	None				
Comments:	See comments below for Channel, EUT orientations. The worst case EUT orientations from the previous testing were used. The provided test software configured the radio with a duty cycle of 47.8% . Per ANSI C63.10 test methods, the RMS data was corrected with a carrier duty cycle correction factor (DCCF) of 3.2 dB. DCCF (dB) = 10*log(1/0.478).				

Test Specifications	FCC 15.247:2020	Test Method	ANSI C63.10:2013
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Run #	154	Test Distance (m)	3	Antenna Height(s)	1 to 4(m)	Results	Pass
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Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (dB)	External Attenuation (dB)	Polarity/Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
2483.603	29.3	-0.8	1.3	129.0	3.2	20.0	Vert	AV	0.0	51.7	54.0	-2.3	High Ch., Port 7, EUT on Side, ANT on Side
2389.040	29.0	-0.6	1.5	252.0	3.2	20.0	Horz	AV	0.0	51.6	54.0	-2.4	Low Ch., Port 8, EUT Vert, Ant Vert
2483.837	29.2	-0.8	1.5	25.0	3.2	20.0	Horz	AV	0.0	51.6	54.0	-2.4	High Ch., Port 7, EUT Vert, ANT Vert
2388.240	29.0	-0.6	1.5	168.0	3.2	20.0	Horz	AV	0.0	51.6	54.0	-2.4	Low Ch., Port 7, EUT Vert, ANT Vert
2388.337	29.0	-0.6	3.9	42.0	3.2	20.0	Vert	AV	0.0	51.6	54.0	-2.4	Low Ch., Port 7, EUT on Side, ANT on Side
2389.903	28.9	-0.6	3.0	1.0	3.2	20.0	Vert	AV	0.0	51.5	54.0	-2.5	Low Ch., Port 8, EUT on Side, Ant on Side
2483.543	29.0	-0.8	1.5	55.0	3.2	20.0	Horz	AV	0.0	51.4	54.0	-2.6	High Ch., Port 8, EUT Vert, Ant Vert
2483.553	28.9	-0.8	3.0	110.0	3.2	20.0	Vert	AV	0.0	51.3	54.0	-2.7	High Ch., Port 8, EUT on Side, Ant on Side
2483.857	40.5	-0.8	1.5	25.0	0.0	20.0	Horz	PK	0.0	59.7	74.0	-14.3	High Ch., Port 7, EUT Vert, ANT Vert
2484.307	40.2	-0.8	3.0	110.0	0.0	20.0	Vert	PK	0.0	59.4	74.0	-14.6	High Ch., Port 8, EUT on Side, Ant on Side
2388.597	40.0	-0.6	3.0	1.0	0.0	20.0	Vert	PK	0.0	59.4	74.0	-14.6	Low Ch., Port 8, EUT on Side, Ant on Side
2484.253	40.2	-0.8	1.3	129.0	0.0	20.0	Vert	PK	0.0	59.4	74.0	-14.6	High Ch., Port 7, EUT on Side, ANT on Side
2388.130	40.0	-0.6	1.5	168.0	0.0	20.0	Horz	PK	0.0	59.4	74.0	-14.6	Low Ch., Port 7, EUT Vert, ANT Vert
2485.113	40.0	-0.8	1.5	55.0	0.0	20.0	Horz	PK	0.0	59.2	74.0	-14.8	High Ch., Port 8, EUT Vert, Ant Vert
2389.113	39.8	-0.6	3.9	42.0	0.0	20.0	Vert	PK	0.0	59.2	74.0	-14.8	Low Ch., Port 7, EUT on Side, ANT on Side
2389.193	39.6	-0.6	1.5	252.0	0.0	20.0	Horz	PK	0.0	59.0	74.0	-15.0	Low Ch., Port 8, EUT Vert, Ant Vert

SPURIOUS RADIATED EMISSIONS



PSA-ESCI 2020.04.03.0

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data. The test data represents the configuration / operating mode/ model that produced the highest emission levels as compared to the specification limit.

MODES OF OPERATION

BTLE Tx, Port 8, Antenna PN: GW.26.0111, GFSK, Packet Length = 63, PRBS9, 1 Mbps, Low Channel = 2402 MHz, High Channel = 2480 MHz.

BTLE Tx, Port 8, Antenna PN: GW.26.0111, GFSK, Packet Length = 63, PRBS9, 1 Mbps, Low Channel = 2402 MHz, Mid Channel = 2442 MHz, High Channel = 2480 MHz.

POWER SETTINGS INVESTIGATED

POE via 120VAC/60Hz

24VDC via 120VAC/60Hz

CONFIGURATIONS INVESTIGATED

SYNA0309 - 3

SYNA0309 - 4

FREQUENCY RANGE INVESTIGATED

Start Frequency	30 MHz	Stop Frequency	26 GHz
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SAMPLE CALCULATIONS

Radiated Emissions: Field Strength = Measured Level + Antenna Factor + Cable Factor - Amplifier Gain + Distance Adjustment Factor + External Attenuation

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Cable	Northwest EMC	N/A	NC8	2020-02-07	12 mo
Amplifier - Pre-Amplifier	Miteq	AMF-6F-18002650-25-10P	AOD	2020-02-07	12 mo
Antenna - Standard Gain	ETS Lindgren	3160-09	AIY	NCR	0 mo
Amplifier - Pre-Amplifier	Miteq	AMF-6F-12001800-30-10P	AOJ	2020-08-26	12 mo
Antenna - Standard Gain	EMCO	3160-08	AHO	NCR	0 mo
Cable	High Speed Interconnects	EW292A-NGNG-300	NC3	2020-08-28	12 mo
Amplifier - Pre-Amplifier	Miteq	AMF-6F-08001200-30-10P	AOK	2020-08-26	12 mo
Antenna - Standard Gain	EMCO	3160-07	AHP	NCR	0 mo
Filter - High Pass	Micro-Tronics	HPM50111	HHI	2020-09-25	12 mo
Attenuator	Fairview Microwave	SA18E-20	AQV	2020-07-28	12 mo
Cable	Northwest EMC	3115 Horn Cable	NC2	2020-04-20	12 mo
Amplifier - Pre-Amplifier	Miteq	AMF-3D-00100800-32-13P	AVZ	2020-04-20	12 mo
Antenna - Double Ridge	EMCO	3115	AHM	2020-07-01	24 mo
Amplifier - Pre-Amplifier	Miteq	AM-1616-1000	PAB	2020-01-28	12 mo
Antenna - Biconilog	Teseq	CBL 6141B	AYL	2019-09-25	24 mo
Cable	Northwest EMC	Bilog Cables	NC1	2020-01-28	12 mo
Filter - Low Pass	Micro-Tronics	LPM50004	LFF	2019-11-08	12 mo
Analyzer - Spectrum Analyzer	Agilent	E4440A	AAX	2020-04-15	12 mo

SPURIOUS RADIATED EMISSIONS



PSA-ESCI 2020.04.03.0

TEST DESCRIPTION

The highest gain antenna of each type to be used with the EUT was tested. The EUT was configured for the required transmit frequencies and the modes as showed in the data sheets.

For each configuration, the spectrum was scanned throughout the specified range as part of the exploratory investigation of the emissions. These “pre-scans” are not included in the report. Final measurements on individual emissions were then made and included in this test report.

The individual emissions from the EUT were maximized by rotating the EUT on a turntable, adjusting the position of the EUT and EUT antenna in three orthogonal axis if required, and adjusting the measurement antenna height and polarization (per ANSI C63.10). A preamp and high pass filter (and notch filter) were used for this test in order to provide sufficient measurement sensitivity.

Measurements were made with the required detectors and annotated on the data for each individual point using the following annotation:

QP = Quasi-Peak Detector

PK = Peak Detector

AV = RMS Detector

Measurements were made to satisfy the specific requirements of the test specification for out of band emissions as well as the restricted band requirements.

If there are no detectable emissions above the noise floor, the data included may show noise floor measurements for reference only.

Measurements within 2 MHz of the allowable band may have been taken using the integration method from ANSI C63.10 clause 11.13.3. This procedure uses the channel power feature of the spectrum analyzer to integrate the power of the emission within a 1 MHz bandwidth.

Where the radio test software does not provide for a duty cycle at continuous transmit conditions (> 98%) and the RMS (power average) measurements were made across the on and off times of the EUT transmissions, a duty cycle correction is added to the measurements using the formula of $10 \cdot \log(1/dc)$.

SPURIOUS RADIATED EMISSIONS

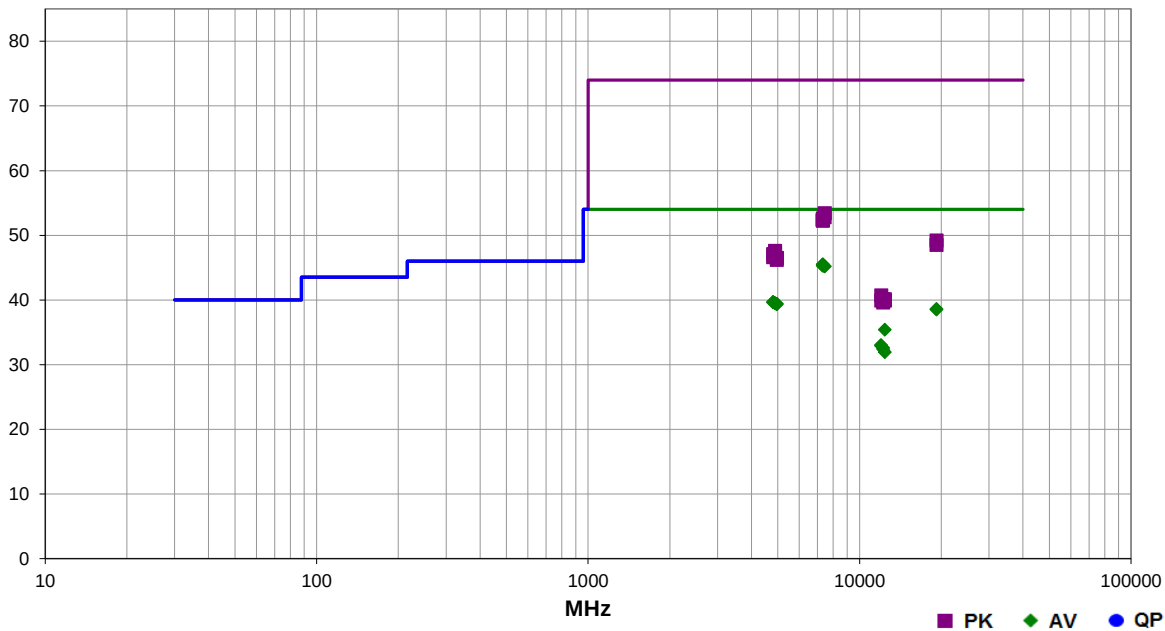


EmiR5 2020.04.20.0 PSA-ESCI 2020.04.03.0

Work Order:	SYNA0309	Date:	2020-09-26	
Project:	None	Temperature:	22.3 °C	
Job Site:	NC01	Humidity:	53.9% RH	
Serial Number:	Rev. 10 - 002	Barometric Pres.:	1028 mbar	
Tested by: Brian Fahey				
EUT:	RadioNode			
Configuration:	4			
Customer:	Walt Disney Parks and Resorts US, Inc.			
Attendees:	None			
EUT Power:	24VDC via 120VAC/60Hz			
Operating Mode:	BTLE Tx, Port 8, Antenna PN: GW.26.0111, GFSK, Packet Length = 63, PRBS9, 1 Mbps, Low Channel = 2402 MHz, Mid Channel = 2442 MHz, High Channel = 2480 MHz.			
Deviations:	None			
Comments:	EUT Vert.			

Test Specifications	Test Method
FCC 15.247:2020	ANSI C63.10:2013

Run #	50	Test Distance (m)	3	Antenna Height(s)	1 to 4(m)	Results	Pass
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Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (dB)	External Attenuation (dB)	Polarity/Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
7327.350	27.6	14.7	2.7	346.0	3.2	0.0	Horz	AV	0.0	45.5	54.0	-8.5	Mid Ch., EUT Horz
7323.525	27.7	14.5	1.5	341.0	3.2	0.0	Horz	AV	0.0	45.4	54.0	-8.6	Mid Ch., EUT Vert
7326.783	27.7	14.5	1.5	61.0	3.2	0.0	Horz	AV	0.0	45.4	54.0	-8.6	Mid Ch., EUT on Side
7326.733	27.7	14.5	1.5	101.0	3.2	0.0	Vert	AV	0.0	45.4	54.0	-8.6	Mid Ch., EUT on Side
7326.633	27.6	14.5	1.5	350.0	3.2	0.0	Vert	AV	0.0	45.3	54.0	-8.7	Mid Ch., EUT Vert
7324.117	27.6	14.5	1.5	281.0	3.2	0.0	Vert	AV	0.0	45.3	54.0	-8.7	Mid Ch., EUT Horz
7441.100	27.0	15.0	1.5	113.0	3.2	0.0	Vert	AV	0.0	45.2	54.0	-8.8	High Ch., EUT on Side
7437.883	27.0	15.0	3.6	34.0	3.2	0.0	Horz	AV	0.0	45.2	54.0	-8.8	High Ch., EUT Horz
4804.400	26.8	9.7	1.5	110.0	3.2	0.0	Vert	AV	0.0	39.7	54.0	-14.3	Low Ch., EUT on Side
4803.583	26.7	9.7	1.5	96.0	3.2	0.0	Horz	AV	0.0	39.6	54.0	-14.4	Low Ch., EUT Horz
4882.017	26.5	9.8	1.5	140.0	3.2	0.0	Vert	AV	0.0	39.5	54.0	-14.5	Mid Ch., EUT on Side
4881.550	26.5	9.8	3.1	49.0	3.2	0.0	Horz	AV	0.0	39.5	54.0	-14.5	Mid Ch., EUT Horz
4960.017	26.7	9.5	2.1	74.0	3.2	0.0	Horz	AV	0.0	39.4	54.0	-14.6	High Ch., EUT Horz
4959.558	26.6	9.5	1.5	26.0	3.2	0.0	Vert	AV	0.0	39.3	54.0	-14.7	High Ch., EUT on Side
19218.260	34.8	0.6	1.6	180.0	3.2	0.0	Vert	AV	0.0	38.6	54.0	-15.4	Low Ch., EUT on Side
19218.130	34.7	0.6	1.6	253.0	3.2	0.0	Horz	AV	0.0	38.5	54.0	-15.5	Low Ch., EUT Horz
12398.760	30.2	2.0	1.5	83.0	3.2	0.0	Vert	AV	0.0	35.4	54.0	-18.6	High Ch., EUT on Side
7439.842	38.4	15.0	1.5	113.0	0.0	0.0	Vert	PK	0.0	53.4	74.0	-20.6	High Ch., EUT on Side

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (dB)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
12007.660	27.3	2.5	1.5	96.0	3.2	0.0	Vert	AV	0.0	33.0	54.0	-21.0	Low Ch., EUT on Side
12011.480	27.2	2.5	1.5	256.0	3.2	0.0	Horz	AV	0.0	32.9	54.0	-21.1	Low Ch., EUT Horz
7439.725	37.8	15.0	3.6	34.0	0.0	0.0	Horz	PK	0.0	52.8	74.0	-21.2	High Ch., EUT Horz
7324.750	38.1	14.5	2.7	346.0	0.0	0.0	Horz	PK	0.0	52.6	74.0	-21.4	Mid Ch., EUT Horz
12207.560	27.5	1.9	1.5	157.0	3.2	0.0	Vert	AV	0.0	32.6	54.0	-21.4	Mid Ch., EUT on Side
7323.567	37.9	14.5	1.5	101.0	0.0	0.0	Vert	PK	0.0	52.4	74.0	-21.6	Mid Ch., EUT on Side
12207.820	27.3	1.9	1.5	121.0	3.2	0.0	Horz	AV	0.0	32.4	54.0	-21.6	Mid Ch., EUT Horz
7326.608	37.8	14.5	1.5	341.0	0.0	0.0	Horz	PK	0.0	52.3	74.0	-21.7	Mid Ch., EUT Vert
7327.458	37.6	14.7	1.5	350.0	0.0	0.0	Vert	PK	0.0	52.3	74.0	-21.7	Mid Ch., EUT Vert
7324.950	37.8	14.5	1.5	281.0	0.0	0.0	Vert	PK	0.0	52.3	74.0	-21.7	Mid Ch., EUT Horz
7326.333	37.8	14.5	1.5	61.0	0.0	0.0	Horz	PK	0.0	52.3	74.0	-21.7	Mid Ch., EUT on Side
12399.380	26.7	2.0	1.5	234.0	3.2	0.0	Horz	AV	0.0	31.9	54.0	-22.1	High Ch., EUT Horz
19217.880	45.4	0.6	1.6	180.0	3.2	0.0	Vert	PK	0.0	49.2	74.0	-24.8	Low Ch., EUT on Side
19217.990	44.7	0.6	1.6	253.0	3.2	0.0	Horz	PK	0.0	48.5	74.0	-25.5	Low Ch., EUT Horz
4882.108	37.8	9.8	3.1	49.0	0.0	0.0	Horz	PK	0.0	47.6	74.0	-26.4	Mid Ch., EUT Horz
4882.283	37.4	9.8	1.5	140.0	0.0	0.0	Vert	PK	0.0	47.2	74.0	-26.8	Mid Ch., EUT on Side
4803.125	37.4	9.7	1.5	110.0	0.0	0.0	Vert	PK	0.0	47.1	74.0	-26.9	Low Ch., EUT on Side
4804.433	36.9	9.7	1.5	96.0	0.0	0.0	Horz	PK	0.0	46.6	74.0	-27.4	Low Ch., EUT Horz
4961.592	37.0	9.5	2.1	74.0	0.0	0.0	Horz	PK	0.0	46.5	74.0	-27.5	High Ch., EUT Horz
4957.808	36.7	9.5	1.5	26.0	0.0	0.0	Vert	PK	0.0	46.2	74.0	-27.8	High Ch., EUT on Side
12009.230	38.2	2.5	1.5	256.0	0.0	0.0	Horz	PK	0.0	40.7	74.0	-33.3	Low Ch., EUT Horz
12211.480	38.2	1.9	1.5	121.0	0.0	0.0	Horz	PK	0.0	40.1	74.0	-33.9	Mid Ch., EUT Horz
12399.550	38.1	2.0	1.5	234.0	0.0	0.0	Horz	PK	0.0	40.1	74.0	-33.9	High Ch., EUT Horz
12399.310	37.9	2.0	1.5	83.0	0.0	0.0	Vert	PK	0.0	39.9	74.0	-34.1	High Ch., EUT on Side
12009.110	37.4	2.5	1.5	96.0	0.0	0.0	Vert	PK	0.0	39.9	74.0	-34.1	Low Ch., EUT on Side
12210.720	37.7	1.9	1.5	157.0	0.0	0.0	Vert	PK	0.0	39.6	74.0	-34.4	Mid Ch., EUT on Side

SPURIOUS RADIATED EMISSIONS

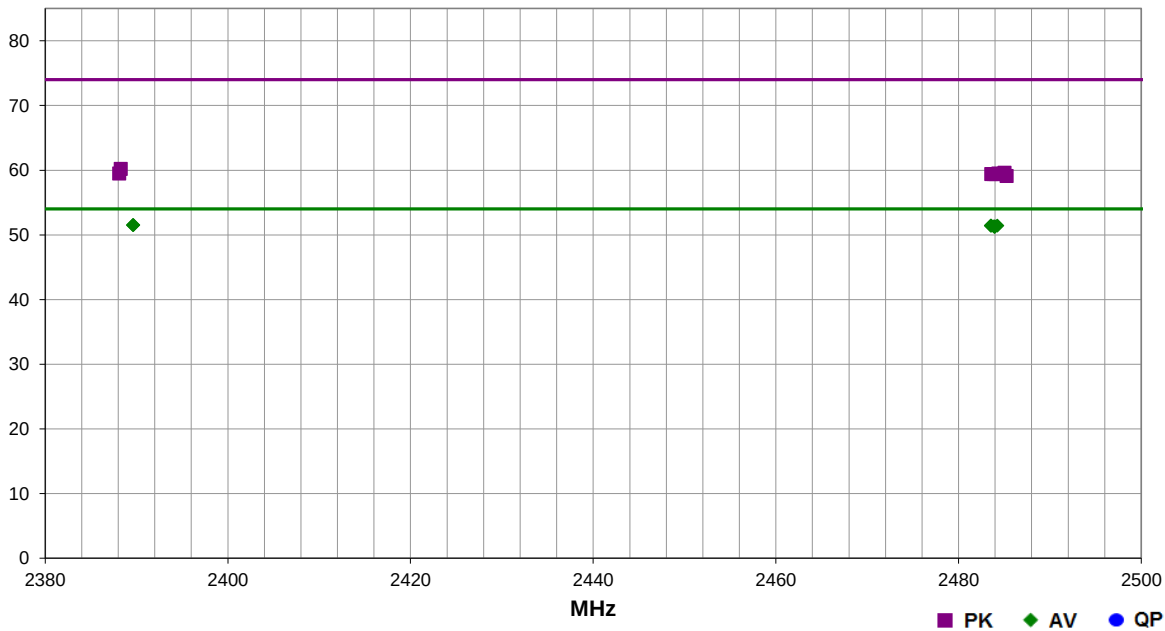


EmiR5 2020.04.20.0 PSA-ESCI 2020.04.03.0

Work Order:	SYNA0309	Date:	2020-09-26	
Project:	None	Temperature:	22.3 °C	
Job Site:	NC01	Humidity:	53.9% RH	
Serial Number:	Rev. 10 - 002	Barometric Pres.:	1028 mbar	
EUT: RadioNode				Tested by: Brian Fahey
Configuration: 4				
Customer: Walt Disney Parks and Resorts US, Inc.				
Attendees: None				
EUT Power: 24VDC via 120VAC/60Hz				
Operating Mode:	BTLE Tx, Port 8, Antenna PN: GW.26.0111, GFSK, Packet Length = 63, PRBS9, 1 Mbps, Low Channel = 2402 MHz, High Channel = 2480 MHz.			
Deviations:	None			
Comments:	See comments below for Channel, EUT orientations. The provided test software configured the radio with a duty cycle of 47.8% . Per ANSI C63.10 test methods, the RMS data was corrected with a carrier duty cycle correction factor (DCCF) of 3.2 dB. DCCF (dB) = 10*log(1/0.478).			

Test Specifications	Test Method
FCC 15.247:2020	ANSI C63.10:2013

Run #	52	Test Distance (m)	3	Antenna Height(s)	1 to 4(m)	Results	Pass
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Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (dB)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
2389.660	28.9	-0.6	1.7	68.0	3.2	20.0	Horz	AV	0.0	51.5	54.0	-2.5	Low Ch., EUT Vert
2389.623	28.9	-0.6	1.6	360.0	3.2	20.0	Vert	AV	0.0	51.5	54.0	-2.5	Low Ch., EUT Horz
2483.570	29.0	-0.8	3.6	142.0	3.2	20.0	Vert	AV	0.0	51.4	54.0	-2.6	High Ch., EUT Horz
2483.527	29.0	-0.8	1.5	345.0	3.2	20.0	Horz	AV	0.0	51.4	54.0	-2.6	High Ch., EUT Vert
2484.260	29.0	-0.8	3.1	294.0	3.2	20.0	Vert	AV	0.0	51.4	54.0	-2.6	High Ch., EUT Vert
2483.987	28.9	-0.8	1.5	360.0	3.2	20.0	Vert	AV	0.0	51.3	54.0	-2.7	High Ch., EUT on Side
2483.877	28.9	-0.8	1.5	122.0	3.2	20.0	Horz	AV	0.0	51.3	54.0	-2.7	High Ch., EUT Horz
2483.947	28.8	-0.8	1.5	99.0	3.2	20.0	Horz	AV	0.0	51.2	54.0	-2.8	High Ch., EUT on Side
2388.267	40.8	-0.6	1.6	360.0	0.0	20.0	Vert	PK	0.0	60.2	74.0	-13.8	Low Ch., EUT Horz
2485.023	40.4	-0.8	1.5	122.0	0.0	20.0	Horz	PK	0.0	59.6	74.0	-14.4	High Ch., EUT Horz
2484.360	40.3	-0.8	1.5	99.0	0.0	20.0	Horz	PK	0.0	59.5	74.0	-14.5	High Ch., EUT on Side
2388.103	40.1	-0.6	1.7	68.0	0.0	20.0	Horz	PK	0.0	59.5	74.0	-14.5	Low Ch., EUT Vert
2483.860	40.2	-0.8	3.6	142.0	0.0	20.0	Vert	PK	0.0	59.4	74.0	-14.6	High Ch., EUT Horz
2484.080	40.2	-0.8	1.5	345.0	0.0	20.0	Horz	PK	0.0	59.4	74.0	-14.6	High Ch., EUT Vert
2483.587	40.2	-0.8	3.1	294.0	0.0	20.0	Vert	PK	0.0	59.4	74.0	-14.6	High Ch., EUT Vert
2485.257	39.9	-0.8	1.5	360.0	0.0	20.0	Vert	PK	0.0	59.1	74.0	-14.9	High Ch., EUT on Side

SPURIOUS RADIATED EMISSIONS

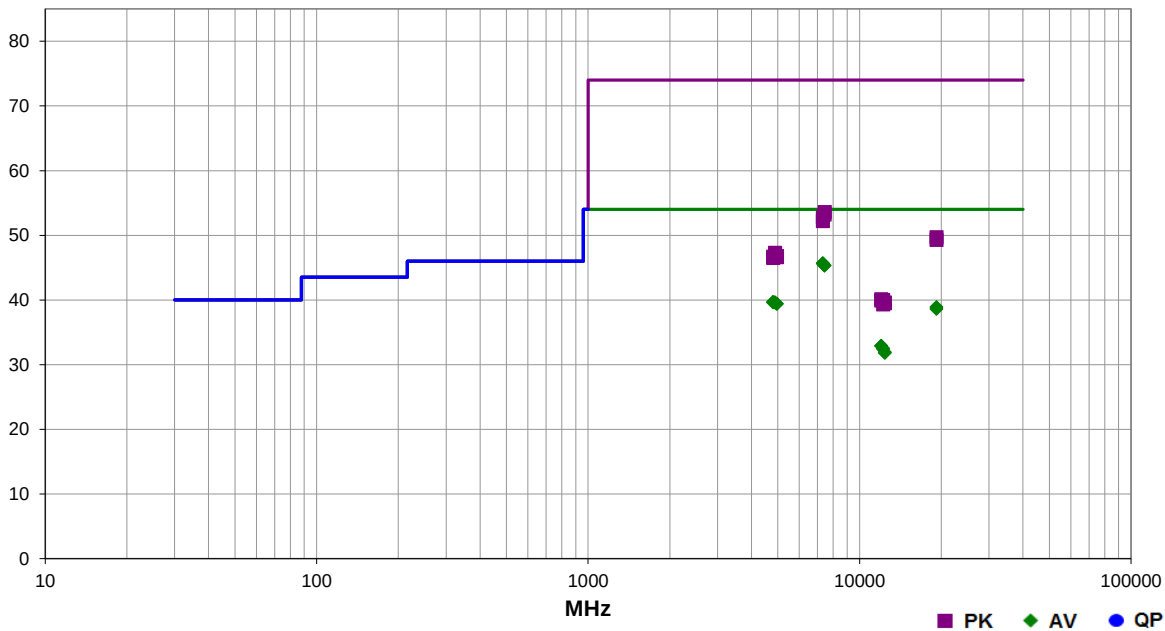


EmiR5 2020.04.20.0 PSA-ESCI 2020.04.03.0

Work Order:	SYNA0309	Date:	2020-09-26	
Project:	None	Temperature:	22.3 °C	
Job Site:	NC01	Humidity:	53.9% RH	
Serial Number:	Rev. 10 - 002	Barometric Pres.:	1028 mbar	
Tested by: Brian Fahey				
EUT:	RadioNode			
Configuration:	3			
Customer:	Walt Disney Parks and Resorts US, Inc.			
Attendees:	None			
EUT Power:	POE via 120VAC/60Hz			
Operating Mode:	BTLE Tx, Port 8, Antenna PN: GW.26.0111, GFSK, Packet Length = 63, PRBS9, 1 Mbps, Low Channel = 2402 MHz, Mid Channel = 2442 MHz, High Channel = 2480 MHz.			
Deviations:	None			
Comments:	See comments below for Channel, EUT orientations. The worst case EUT orientations from the previous testing were used. The provided test software configured the radio with a duty cycle of 47.8% . Per ANSI C63.10 test methods, the RMS data was corrected with a carrier duty cycle correction factor (DCCF) of 3.2 dB. DCCF (dB) = 10*log(1/0.478).			

Test Specifications	Test Method
FCC 15.247:2020	ANSI C63.10:2013

Run #	69	Test Distance (m)	3	Antenna Height(s)	1 to 4(m)	Results	Pass
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Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (dB)	External Attenuation (dB)	Polarity/Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
7325.375	28.0	14.5	1.8	350.0	3.2	0.0	Vert	AV	0.0	45.7	54.0	-8.3	Mid Ch., EUT on Side
7327.392	27.7	14.7	3.7	47.0	3.2	0.0	Horz	AV	0.0	45.6	54.0	-8.4	Mid Ch., EUT Horz
7437.542	27.1	15.0	1.6	242.0	3.2	0.0	Horz	AV	0.0	45.3	54.0	-8.7	High Ch., EUT Horz
7437.675	27.1	15.0	1.5	174.0	3.2	0.0	Vert	AV	0.0	45.3	54.0	-8.7	High Ch., EUT on Side
4803.925	26.8	9.7	2.6	238.0	3.2	0.0	Horz	AV	0.0	39.7	54.0	-14.3	Low Ch., EUT Horz
4882.017	26.6	9.8	1.5	18.0	3.2	0.0	Horz	AV	0.0	39.6	54.0	-14.4	Mid Ch., EUT Horz
4803.817	26.7	9.7	1.5	243.0	3.2	0.0	Vert	AV	0.0	39.6	54.0	-14.4	Low Ch., EUT on Side
4883.508	26.6	9.8	1.5	124.0	3.2	0.0	Vert	AV	0.0	39.6	54.0	-14.4	Mid Ch., EUT on Side
4958.633	26.7	9.5	1.5	95.0	3.2	0.0	Horz	AV	0.0	39.4	54.0	-14.6	High Ch., EUT Horz
4961.825	26.7	9.5	1.5	8.0	3.2	0.0	Vert	AV	0.0	39.4	54.0	-14.6	High Ch., EUT on Side
19216.830	35.1	0.6	1.6	145.0	3.2	0.0	Vert	AV	0.0	38.9	54.0	-15.1	Low Ch., EUT on Side
19217.580	34.8	0.6	1.6	223.0	3.2	0.0	Horz	AV	0.0	38.6	54.0	-15.4	Low Ch., EUT Horz
7441.517	38.6	15.0	1.6	242.0	0.0	0.0	Horz	PK	0.0	53.6	74.0	-20.4	High Ch., EUT Horz
7439.617	38.2	15.0	1.5	174.0	0.0	0.0	Vert	PK	0.0	53.2	74.0	-20.8	High Ch., EUT on Side
12010.000	27.2	2.5	1.5	211.0	3.2	0.0	Vert	AV	0.0	32.9	54.0	-21.1	Low Ch., EUT on Side
12009.660	27.2	2.5	1.5	321.0	3.2	0.0	Horz	AV	0.0	32.9	54.0	-21.1	Low Ch., EUT Horz
7324.917	38.3	14.5	1.8	350.0	0.0	0.0	Vert	PK	0.0	52.8	74.0	-21.2	Mid Ch., EUT on Side
12208.060	27.4	1.9	1.5	182.0	3.2	0.0	Vert	AV	0.0	32.5	54.0	-21.5	Mid Ch., EUT on Side

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (dB)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
12207.510	27.3	1.9	1.5	172.0	3.2	0.0	Horz	AV	0.0	32.4	54.0	-21.6	Mid Ch., EUT Horz
7326.350	37.7	14.5	3.7	47.0	0.0	0.0	Horz	PK	0.0	52.2	74.0	-21.8	Mid Ch., EUT Horz
12399.920	26.7	2.0	1.5	82.0	3.2	0.0	Vert	AV	0.0	31.9	54.0	-22.1	High Ch., EUT on Side
12400.000	26.6	2.0	1.5	141.0	3.2	0.0	Horz	AV	0.0	31.8	54.0	-22.2	High Ch., EUT Horz
19215.310	45.9	0.6	1.6	223.0	3.2	0.0	Horz	PK	0.0	49.7	74.0	-24.3	Low Ch., EUT Horz
19218.460	45.5	0.6	1.6	145.0	3.2	0.0	Vert	PK	0.0	49.3	74.0	-24.7	Low Ch., EUT on Side
4882.242	37.5	9.8	1.5	18.0	0.0	0.0	Horz	PK	0.0	47.3	74.0	-26.7	Mid Ch., EUT Horz
4883.917	37.0	9.8	1.5	124.0	0.0	0.0	Vert	PK	0.0	46.8	74.0	-27.2	Mid Ch., EUT on Side
4960.450	37.3	9.5	1.5	8.0	0.0	0.0	Vert	PK	0.0	46.8	74.0	-27.2	High Ch., EUT on Side
4804.083	37.0	9.7	2.6	238.0	0.0	0.0	Horz	PK	0.0	46.7	74.0	-27.3	Low Ch., EUT Horz
4961.083	37.1	9.5	1.5	95.0	0.0	0.0	Horz	PK	0.0	46.6	74.0	-27.4	High Ch., EUT Horz
4806.358	36.8	9.7	1.5	243.0	0.0	0.0	Vert	PK	0.0	46.5	74.0	-27.5	Low Ch., EUT on Side
12010.190	37.6	2.5	1.5	211.0	0.0	0.0	Vert	PK	0.0	40.1	74.0	-33.9	Low Ch., EUT on Side
12208.730	38.1	1.9	1.5	182.0	0.0	0.0	Vert	PK	0.0	40.0	74.0	-34.0	Mid Ch., EUT on Side
12011.780	37.4	2.5	1.5	321.0	0.0	0.0	Horz	PK	0.0	39.9	74.0	-34.1	Low Ch., EUT Horz
12398.790	37.6	2.0	1.5	82.0	0.0	0.0	Vert	PK	0.0	39.6	74.0	-34.4	High Ch., EUT on Side
12398.450	37.5	2.0	1.5	141.0	0.0	0.0	Horz	PK	0.0	39.5	74.0	-34.5	High Ch., EUT Horz
12209.610	37.4	1.9	1.5	172.0	0.0	0.0	Horz	PK	0.0	39.3	74.0	-34.7	Mid Ch., EUT Horz

SPURIOUS RADIATED EMISSIONS



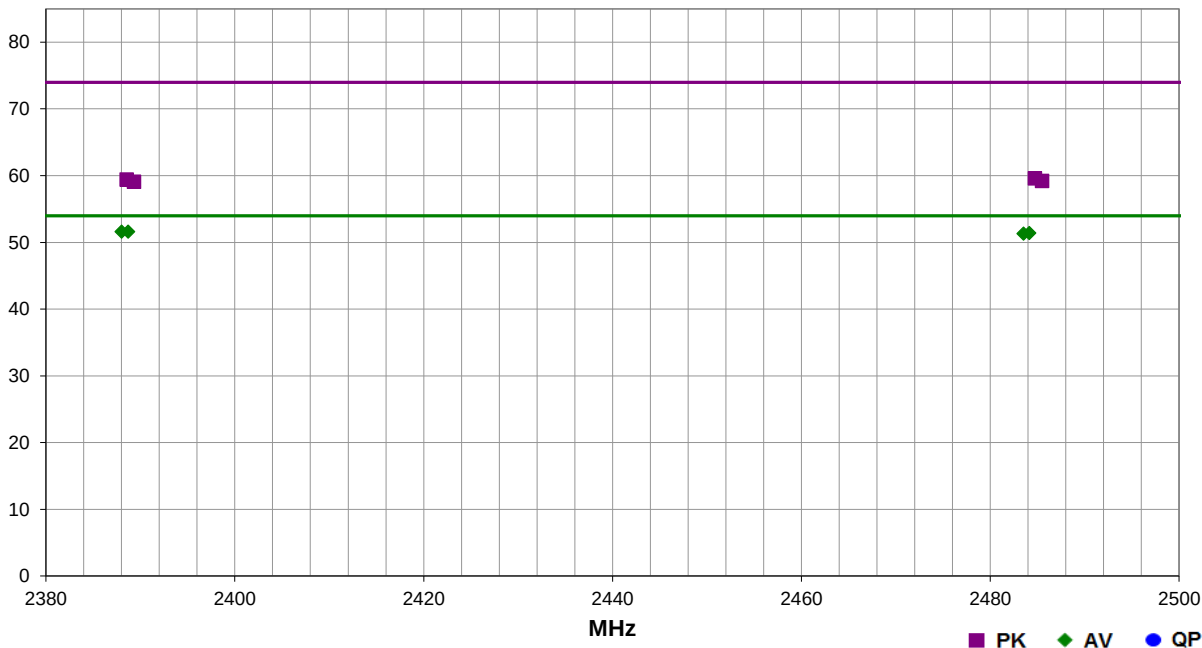
EmiR5 2020.04.20.0

PSA-ESCI 2020.04.03.0

Work Order:	SYNA0309	Date:	2020-09-26		
Project:	None	Temperature:	22.3 °C		
Job Site:	NC01	Humidity:	53.9% RH		
Serial Number:	Rev. 10 - 002	Barometric Pres.:	1028 mbar	Tested by:	Brian Fahey
EUT:	RadioNode				
Configuration:	3				
Customer:	Walt Disney Parks and Resorts US, Inc.				
Attendees:	None				
EUT Power:	POE via 120VAC/60Hz				
Operating Mode:	BTLE Tx, Port 8, Antenna PN: GW.26.0111, GFSK, Packet Length = 63, PRBS9, 1 Mbps, Low Channel = 2402 MHz, High Channel = 2480 MHz.				
Deviations:	None				
Comments:	See comments below for Channel, EUT orientations. The worst case EUT orientations from the previous testing were used. The provided test software configured the radio with a duty cycle of 47.8% . Per ANSI C63.10 test methods, the RMS data was corrected with a carrier duty cycle correction factor (DCCF) of 3.2 dB. DCCF (dB) = 10*log(1/0.478).				

Test Specifications	Test Method
FCC 15.247:2020	ANSI C63.10:2013

Run #	71	Test Distance (m)	3	Antenna Height(s)	1 to 4(m)	Results	Pass
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Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (dB)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
2388.710	29.0	-0.6	1.5	284.0	3.2	20.0	Vert	AV	0.0	51.6	54.0	-2.4	Low Ch., EUT Horz
2388.017	29.0	-0.6	1.5	329.0	3.2	20.0	Horz	AV	0.0	51.6	54.0	-2.4	Low Ch., EUT Vert
2484.147	29.0	-0.8	3.7	337.0	3.2	20.0	Horz	AV	0.0	51.4	54.0	-2.6	High Ch., EUT Vert
2483.530	28.9	-0.8	1.9	292.0	3.2	20.0	Vert	AV	0.0	51.3	54.0	-2.7	High Ch., EUT Horz
2484.730	40.4	-0.8	1.9	292.0	0.0	20.0	Vert	PK	0.0	59.6	74.0	-14.4	High Ch., EUT Horz
2388.537	40.0	-0.6	1.5	284.0	0.0	20.0	Vert	PK	0.0	59.4	74.0	-14.6	Low Ch., EUT Horz
2485.487	40.0	-0.8	3.7	337.0	0.0	20.0	Horz	PK	0.0	59.2	74.0	-14.8	High Ch., EUT Vert
2389.320	39.7	-0.6	1.5	329.0	0.0	20.0	Horz	PK	0.0	59.1	74.0	-14.9	Low Ch., EUT Vert

SPURIOUS RADIATED EMISSIONS



PSA-ESCI 2020.04.03.0

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data. The test data represents the configuration / operating mode/ model that produced the highest emission levels as compared to the specification limit.

MODES OF OPERATION

BTLE Tx, Antenna PN: RE09P-NM, GFSK, Packet Length = 63, PRBS9, 1 Mbps, Low Channel = 2402 MHz, High Channel = 2480 MHz.

BTLE Tx, Antenna PN: RE09P-NM, GFSK, Packet Length = 63, PRBS9, 1 Mbps, Low Channel = 2402 MHz, Mid Channel = 2442 MHz, High Channel = 2480 MHz.

POWER SETTINGS INVESTIGATED

24VDC via 120VAC/60Hz

POE via 120VAC/60Hz

CONFIGURATIONS INVESTIGATED

SYNA0309 - 6

SYNA0309 - 5

FREQUENCY RANGE INVESTIGATED

Start Frequency | 30 MHz

Stop Frequency | 26 GHz

SAMPLE CALCULATIONS

Radiated Emissions: Field Strength = Measured Level + Antenna Factor + Cable Factor - Amplifier Gain + Distance Adjustment Factor + External Attenuation

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Cable	Northwest EMC	N/A	NC8	2020-02-07	12 mo
Amplifier - Pre-Amplifier	Miteq	AMF-6F-18002650-25-10P	AOD	2020-02-07	12 mo
Antenna - Standard Gain	ETS Lindgren	3160-09	AIY	NCR	0 mo
Amplifier - Pre-Amplifier	Miteq	AMF-6F-12001800-30-10P	AOJ	2020-08-26	12 mo
Antenna - Standard Gain	EMCO	3160-08	AHO	NCR	0 mo
Cable	High Speed Interconnects	EW292A-NGNG-300	NC3	2020-08-28	12 mo
Amplifier - Pre-Amplifier	Miteq	AMF-6F-08001200-30-10P	AOK	2020-08-26	12 mo
Antenna - Standard Gain	EMCO	3160-07	AHP	NCR	0 mo
Filter - High Pass	Micro-Tronics	HPM50111	HHI	2020-09-25	12 mo
Attenuator	Fairview Microwave	SA18E-20	AQV	2020-07-28	12 mo
Cable	Northwest EMC	3115 Horn Cable	NC2	2020-04-20	12 mo
Amplifier - Pre-Amplifier	Miteq	AMF-3D-00100800-32-13P	AVZ	2020-04-20	12 mo
Antenna - Double Ridge	EMCO	3115	AHM	2020-07-01	24 mo
Amplifier - Pre-Amplifier	Miteq	AM-1616-1000	PAB	2020-01-28	12 mo
Antenna - Biconilog	Teseq	CBL 6141B	AYL	2019-09-25	24 mo
Cable	Northwest EMC	Bilog Cables	NC1	2020-01-28	12 mo
Filter - Low Pass	Micro-Tronics	LPM50004	LFF	2019-11-08	12 mo
Analyzer - Spectrum Analyzer	Agilent	E4440A	AAX	2020-04-15	12 mo

SPURIOUS RADIATED EMISSIONS



PSA-ESCI 2020.04.03.0

TEST DESCRIPTION

The highest gain antenna of each type to be used with the EUT was tested. The EUT was configured for the required transmit frequencies and the modes as showed in the data sheets.

For each configuration, the spectrum was scanned throughout the specified range as part of the exploratory investigation of the emissions. These “pre-scans” are not included in the report. Final measurements on individual emissions were then made and included in this test report.

The individual emissions from the EUT were maximized by rotating the EUT on a turntable, adjusting the position of the EUT and EUT antenna in three orthogonal axis if required, and adjusting the measurement antenna height and polarization (per ANSI C63.10). A preamp and high pass filter (and notch filter) were used for this test in order to provide sufficient measurement sensitivity.

Measurements were made with the required detectors and annotated on the data for each individual point using the following annotation:

QP = Quasi-Peak Detector
PK = Peak Detector
AV = RMS Detector

Measurements were made to satisfy the specific requirements of the test specification for out of band emissions as well as the restricted band requirements.

If there are no detectable emissions above the noise floor, the data included may show noise floor measurements for reference only.

Measurements within 2 MHz of the allowable band may have been taken using the integration method from ANSI C63.10 clause 11.13.3. This procedure uses the channel power feature of the spectrum analyzer to integrate the power of the emission within a 1 MHz bandwidth.

Where the radio test software does not provide for a duty cycle at continuous transmit conditions (> 98%) and the RMS (power average) measurements were made across the on and off times of the EUT transmissions, a duty cycle correction is added to the measurements using the formula of $10 \cdot \log(1/dc)$.

SPURIOUS RADIATED EMISSIONS

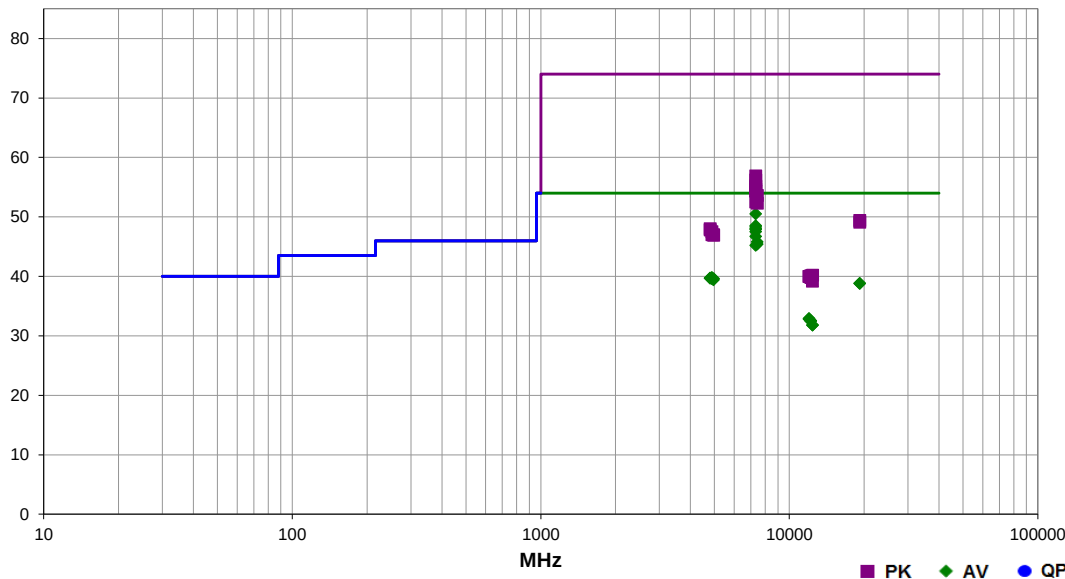


EmiRS 2020.04.20.0 PSA-ESCI 2020.04.03.0

Work Order:	SYNA0309	Date:	2020-09-28		
Project:	None	Temperature:	23.1 °C		
Job Site:	NC01	Humidity:	49.5% RH		
Serial Number:	Rev. 10 - 002	Barometric Pres.:	1028 mbar	Tested by:	Brian Fahey
EUT:	RadioNode				
Configuration:	5				
Customer:	Walt Disney Parks and Resorts US, Inc.				
Attendees:	None				
EUT Power:	POE via 120VAC/60Hz				
Operating Mode:	BTLE Tx, Antenna PN: RE09P-NM, GFSK, Packet Length = 63, PRBS9, 1 Mbps, Low Channel = 2402 MHz, Mid Channel = 2442 MHz, High Channel = 2480 MHz.				
Deviations:	None				
Comments:	See comments below for Channel, EUT, and Antenna orientations. The provided test software configured the radio with a duty cycle of 47.8% . Per ANSI C63.10 test methods, the RMS data was corrected with a carrier duty cycle correction factor (DCCF) of 3.2 dB. DCCF (dB) = 10*log(1/0.478).				

Test Specifications	FCC 15.247:2020	Test Method	ANSI C63.10:2013
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Run #	83	Test Distance (m)	3	Antenna Height(s)	1 to 4(m)	Results	Pass
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Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (dB)	External Attenuation (dB)	Polarity/Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
7325.542	32.8	14.5	2.2	89.0	3.2	0.0	Horz	AV	0.0	50.5	54.0	-3.5	Mid Ch., Port 8, EUT on Side, Ant on Side
7326.683	30.8	14.5	3.0	286.0	3.2	0.0	Vert	AV	0.0	48.5	54.0	-5.5	Mid Ch., Port 8, EUT on Side, Ant on Side
7325.617	30.6	14.5	2.2	297.0	3.2	0.0	Horz	AV	0.0	48.3	54.0	-5.7	Mid Ch., Port 7, EUT on Side, Ant on Side
7326.692	30.3	14.5	1.5	2.0	3.2	0.0	Vert	AV	0.0	48.0	54.0	-6.0	Mid Ch., Port 8, EUT Horz, Ant Horz
7325.592	30.2	14.5	2.3	62.0	3.2	0.0	Horz	AV	0.0	47.9	54.0	-6.1	Mid Ch., Port 8, EUT Vert, Ant Vert
7326.708	29.8	14.5	2.4	159.0	3.2	0.0	Vert	AV	0.0	47.5	54.0	-6.5	Mid Ch., Port 8, EUT Vert, Ant Vert
7326.608	29.0	14.5	2.5	247.0	3.2	0.0	Horz	AV	0.0	46.7	54.0	-7.3	Mid Ch., Port 8, EUT Horz, Ant Horz
7439.300	27.6	15.0	3.0	292.0	3.2	0.0	Vert	AV	0.0	45.8	54.0	-8.2	High Ch., Port 8, EUT on Side, Ant on Side
7439.658	27.2	15.0	1.5	306.0	3.2	0.0	Horz	AV	0.0	45.4	54.0	-8.6	High Ch., Port 8, EUT on Side, Ant on Side
7323.967	27.5	14.5	1.5	2.0	3.2	0.0	Vert	AV	0.0	45.2	54.0	-8.8	Mid Ch., Port 7, EUT on Side, Ant on Side
4883.733	26.8	9.8	1.5	188.0	3.2	0.0	Horz	AV	0.0	39.8	54.0	-14.2	Mid Ch., Port 8, EUT on Side, Ant on Side
4804.083	26.8	9.7	3.9	43.0	3.2	0.0	Horz	AV	0.0	39.7	54.0	-14.3	Low Ch., Port 8, EUT on Side, Ant on Side
4804.333	26.8	9.7	3.4	319.0	3.2	0.0	Vert	AV	0.0	39.7	54.0	-14.3	Low Ch., Port 8, EUT on Side, Ant on Side
4881.683	26.6	9.8	1.5	0.0	3.2	0.0	Vert	AV	0.0	39.6	54.0	-14.4	Mid Ch., Port 8, EUT on Side, Ant on Side
4959.992	26.9	9.5	2.1	55.0	3.2	0.0	Horz	AV	0.0	39.6	54.0	-14.4	High Ch., Port 8, EUT on Side, Ant on Side
4958.633	26.7	9.5	3.5	100.0	3.2	0.0	Vert	AV	0.0	39.4	54.0	-14.6	High Ch., Port 8, EUT on Side, Ant on Side
19216.730	35.0	0.6	1.6	223.0	3.2	0.0	Horz	AV	0.0	38.8	54.0	-15.2	Low Ch., Port 8, EUT on Side, Ant on Side
19217.220	35.0	0.6	1.6	126.0	3.2	0.0	Vert	AV	0.0	38.8	54.0	-15.2	Low Ch., Port 8, EUT on Side, Ant on Side
7326.517	42.4	14.5	2.2	89.0	0.0	0.0	Horz	PK	0.0	56.9	74.0	-17.1	Mid Ch., Port 8, EUT on Side, Ant on Side
7326.658	41.7	14.5	2.3	62.0	0.0	0.0	Horz	PK	0.0	56.2	74.0	-17.8	Mid Ch., Port 8, EUT Vert, Ant Vert
7325.800	40.7	14.5	3.0	286.0	0.0	0.0	Vert	PK	0.0	55.2	74.0	-18.8	Mid Ch., Port 8, EUT on Side, Ant on Side
7325.125	40.4	14.5	1.5	2.0	0.0	0.0	Vert	PK	0.0	54.9	74.0	-19.1	Mid Ch., Port 8, EUT Horz, Ant Horz
7325.408	40.2	14.5	2.4	159.0	0.0	0.0	Vert	PK	0.0	54.7	74.0	-19.3	Mid Ch., Port 8, EUT Vert, Ant Vert
7325.875	39.9	14.5	2.2	297.0	0.0	0.0	Horz	PK	0.0	54.4	74.0	-19.6	Mid Ch., Port 7, EUT on Side, Ant on Side
7326.783	39.8	14.5	2.5	247.0	0.0	0.0	Horz	PK	0.0	54.3	74.0	-19.7	Mid Ch., Port 8, EUT Horz, Ant Horz
7439.992	38.6	15.0	3.0	292.0	0.0	0.0	Vert	PK	0.0	53.6	74.0	-20.4	High Ch., Port 8, EUT on Side, Ant on Side
12007.580	27.2	2.5	1.5	308.0	3.2	0.0	Vert	AV	0.0	32.9	54.0	-21.1	Low Ch., Port 8, EUT on Side, Ant on Side

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (dB)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
12011.260	27.1	2.5	1.5	239.0	3.2	0.0	Horz	AV	0.0	32.8	54.0	-21.2	Low Ch., Port 8, EUT on Side, Ant on Side
12208.010	27.4	1.9	1.5	239.0	3.2	0.0	Horz	AV	0.0	32.5	54.0	-21.5	Mid Ch., Port 8, EUT on Side, Ant on Side
12207.550	27.4	1.9	1.5	158.0	3.2	0.0	Vert	AV	0.0	32.5	54.0	-21.5	Mid Ch., Port 8, EUT on Side, Ant on Side
7326.192	38.0	14.5	1.5	2.0	0.0	0.0	Vert	PK	0.0	52.5	74.0	-21.5	Mid Ch., Port 7, EUT on Side, Ant on Side
7442.250	37.3	15.0	1.5	306.0	0.0	0.0	Horz	PK	0.0	52.3	74.0	-21.7	High Ch., Port 8, EUT on Side, Ant on Side
12399.540	26.6	2.0	1.5	348.0	3.2	0.0	Horz	AV	0.0	31.8	54.0	-22.2	High Ch., Port 8, EUT on Side, Ant on Side
12399.610	26.6	2.0	1.5	357.0	3.2	0.0	Vert	AV	0.0	31.8	54.0	-22.2	High Ch., Port 8, EUT on Side, Ant on Side
19215.080	45.6	0.6	1.6	126.0	3.2	0.0	Vert	PK	0.0	49.4	74.0	-24.6	Low Ch., Port 8, EUT on Side, Ant on Side
19218.160	45.3	0.6	1.6	223.0	3.2	0.0	Horz	PK	0.0	49.1	74.0	-24.9	Low Ch., Port 8, EUT on Side, Ant on Side
4804.467	38.3	9.7	3.9	43.0	0.0	0.0	Horz	PK	0.0	48.0	74.0	-26.0	Low Ch., Port 8, EUT on Side, Ant on Side
4804.200	38.1	9.7	3.4	319.0	0.0	0.0	Vert	PK	0.0	47.8	74.0	-26.2	Low Ch., Port 8, EUT on Side, Ant on Side
4883.875	37.7	9.8	1.5	188.0	0.0	0.0	Horz	PK	0.0	47.5	74.0	-26.5	Mid Ch., Port 8, EUT on Side, Ant on Side
4881.608	37.2	9.8	1.5	0.0	0.0	0.0	Vert	PK	0.0	47.0	74.0	-27.0	Mid Ch., Port 8, EUT on Side, Ant on Side
4958.425	37.5	9.5	2.1	55.0	0.0	0.0	Horz	PK	0.0	47.0	74.0	-27.0	High Ch., Port 8, EUT on Side, Ant on Side
4961.200	37.4	9.5	3.5	100.0	0.0	0.0	Vert	PK	0.0	46.9	74.0	-27.1	High Ch., Port 8, EUT on Side, Ant on Side
12399.220	38.2	2.0	1.5	348.0	0.0	0.0	Horz	PK	0.0	40.2	74.0	-33.8	High Ch., Port 8, EUT on Side, Ant on Side
12210.630	38.2	1.9	1.5	158.0	0.0	0.0	Vert	PK	0.0	40.1	74.0	-33.9	Mid Ch., Port 8, EUT on Side, Ant on Side
12010.950	37.5	2.5	1.5	239.0	0.0	0.0	Horz	PK	0.0	40.0	74.0	-34.0	Low Ch., Port 8, EUT on Side, Ant on Side
12011.080	37.5	2.5	1.5	308.0	0.0	0.0	Vert	PK	0.0	40.0	74.0	-34.0	Low Ch., Port 8, EUT on Side, Ant on Side
12208.170	37.9	1.9	1.5	239.0	0.0	0.0	Horz	PK	0.0	39.8	74.0	-34.2	Mid Ch., Port 8, EUT on Side, Ant on Side
12398.640	37.2	2.0	1.5	357.0	0.0	0.0	Vert	PK	0.0	39.2	74.0	-34.8	High Ch., Port 8, EUT on Side, Ant on Side

SPURIOUS RADIATED EMISSIONS

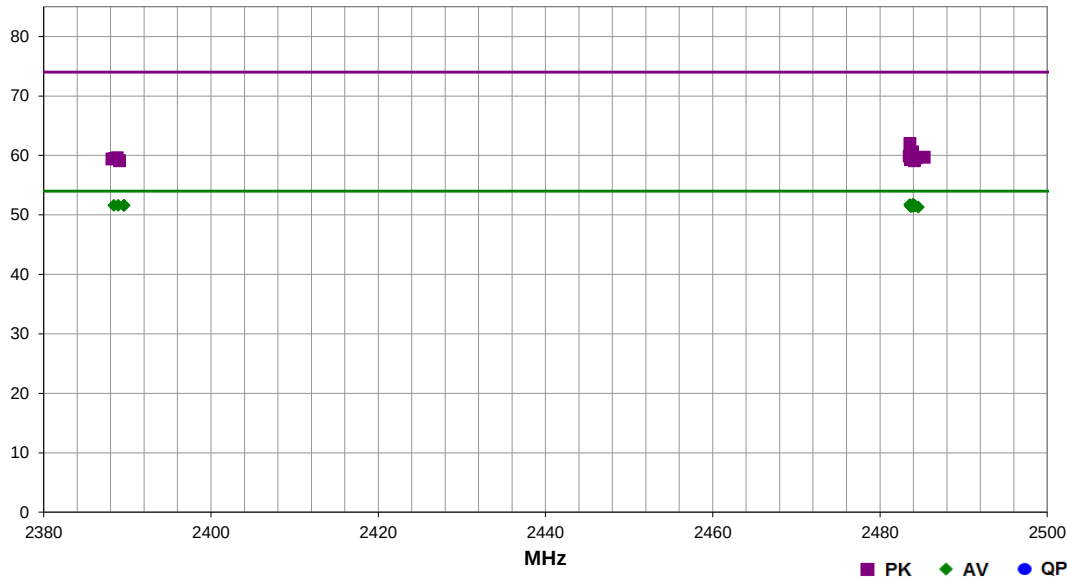


EmiRS 2020.04.20.0 PSA-ESCI 2020.04.03.0

Work Order:	SYNA0309	Date:	2020-09-28		
Project:	None	Temperature:	23.1 °C		
Job Site:	NC01	Humidity:	49.5% RH		
Serial Number:	Rev. 10 - 002	Barometric Pres.:	1028 mbar	Tested by:	Brian Fahey
EUT:	RadioNode				
Configuration:	5				
Customer:	Walt Disney Parks and Resorts US, Inc.				
Attendees:	None				
EUT Power:	POE via 120VAC/60Hz				
Operating Mode:	BTLE Tx, Antenna PN: RE09P-NM, GFSK, Packet Length = 63, PRBS9, 1 Mbps, Low Channel = 2402 MHz, High Channel = 2480 MHz.				
Deviations:	None				
Comments:	See comments below for Channel, EUT, and Antenna orientations. The provided test software configured the radio with a duty cycle of 47.8% . Per ANSI C63.10 test methods, the RMS data was corrected with a carrier duty cycle correction factor (DCCF) of 3.2 dB. DCCF (dB) = 10*log(1/0.478).				

Test Specifications	Test Method
FCC 15.247:2020	ANSI C63.10:2013

Run #	85	Test Distance (m)	3	Antenna Height(s)	1 to 4(m)	Results	Pass
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Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (dB)	External Attenuation (dB)	Polarity/Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
2483.990	29.4	-0.8	2.6	171.0	3.2	20.0	Horz	AV	0.0	51.8	54.0	-2.2	High Ch., Port 7, EUT on Side, Ant on Side
2483.557	29.3	-0.8	3.5	360.0	3.2	20.0	Horz	AV	0.0	51.7	54.0	-2.3	High Ch., Port 8, EUT on Side, Ant on Side
2389.563	29.0	-0.6	1.5	131.0	3.2	20.0	Horz	AV	0.0	51.6	54.0	-2.4	Low Ch., Port 8, EUT on Side, Ant on Side
2388.913	29.0	-0.6	2.1	2.0	3.2	20.0	Vert	AV	0.0	51.6	54.0	-2.4	Low Ch., Port 8, EUT Vert, Ant Vert
2388.393	29.0	-0.6	1.5	344.0	3.2	20.0	Horz	AV	0.0	51.6	54.0	-2.4	Low Ch., Port 7, EUT on Side, Ant on Side
2389.627	29.0	-0.6	1.5	201.0	3.2	20.0	Vert	AV	0.0	51.6	54.0	-2.4	Low Ch., Port 7, EUT Vert, Ant Vert
2483.800	29.1	-0.8	1.5	1.0	3.2	20.0	Vert	AV	0.0	51.5	54.0	-2.5	High Ch., Port 8, EUT Vert, Ant Vert
2484.237	29.1	-0.8	1.5	293.0	3.2	20.0	Vert	AV	0.0	51.5	54.0	-2.5	High Ch., Port 7, EUT Vert, Ant Vert
2483.983	29.0	-0.8	1.5	208.0	3.2	20.0	Vert	AV	0.0	51.4	54.0	-2.6	High Ch., Port 8, EUT on Side, Ant on Side
2483.677	29.0	-0.8	1.5	165.0	3.2	20.0	Horz	AV	0.0	51.4	54.0	-2.6	High Ch., Port 8, EUT Horz, Ant Horz
2483.757	29.0	-0.8	1.5	30.0	3.2	20.0	Vert	AV	0.0	51.4	54.0	-2.6	High Ch., Port 8, EUT Horz, Ant Horz
2484.593	28.9	-0.8	1.5	359.0	3.2	20.0	Horz	AV	0.0	51.3	54.0	-2.7	High Ch., Port 8, EUT Vert, Ant Vert
2483.593	42.8	-0.8	3.5	360.0	0.0	20.0	Horz	PK	0.0	62.0	74.0	-12.0	High Ch., Port 8, EUT on Side, Ant on Side
2483.893	41.4	-0.8	1.5	1.0	0.0	20.0	Vert	PK	0.0	60.6	74.0	-13.4	High Ch., Port 8, EUT Vert, Ant Vert
2483.507	40.7	-0.8	2.6	171.0	0.0	20.0	Horz	PK	0.0	59.9	74.0	-14.1	High Ch., Port 7, EUT on Side, Ant on Side
2485.293	40.5	-0.8	1.5	165.0	0.0	20.0	Horz	PK	0.0	59.7	74.0	-14.3	High Ch., Port 8, EUT Horz, Ant Horz
2484.347	40.4	-0.8	1.5	359.0	0.0	20.0	Horz	PK	0.0	59.6	74.0	-14.4	High Ch., Port 8, EUT Vert, Ant Vert
2388.787	40.2	-0.6	1.5	344.0	0.0	20.0	Horz	PK	0.0	59.6	74.0	-14.4	Low Ch., Port 7, EUT on Side, Ant on Side
2388.483	40.1	-0.6	1.5	131.0	0.0	20.0	Horz	PK	0.0	59.5	74.0	-14.5	Low Ch., Port 8, EUT on Side, Ant on Side
2388.153	40.0	-0.6	2.1	2.0	0.0	20.0	Vert	PK	0.0	59.4	74.0	-14.6	Low Ch., Port 8, EUT Vert, Ant Vert
2484.113	40.1	-0.8	1.5	208.0	0.0	20.0	Vert	PK	0.0	59.3	74.0	-14.7	High Ch., Port 8, EUT on Side, Ant on Side
2483.650	40.1	-0.8	1.5	293.0	0.0	20.0	Vert	PK	0.0	59.3	74.0	-14.7	High Ch., Port 7, EUT Vert, Ant Vert
2484.103	39.9	-0.8	1.5	30.0	0.0	20.0	Vert	PK	0.0	59.1	74.0	-14.9	High Ch., Port 8, EUT Horz, Ant Horz
2389.063	39.7	-0.6	1.5	201.0	0.0	20.0	Vert	PK	0.0	59.1	74.0	-14.9	Low Ch., Port 7, EUT Vert, Ant Vert

SPURIOUS RADIATED EMISSIONS

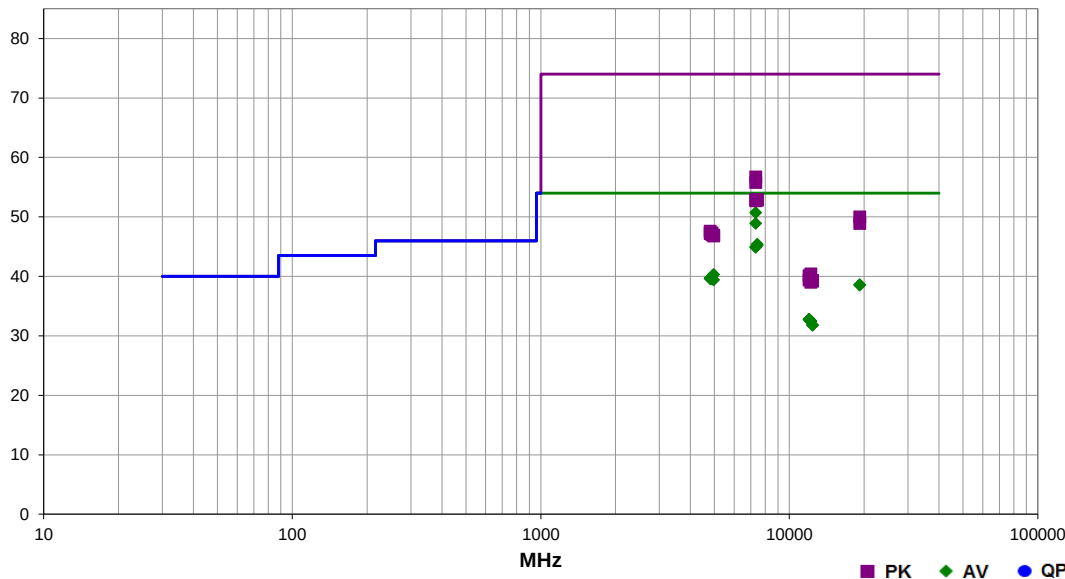


EmiRS 2020.06.24.3 PSA-ESCI 2020.04.03.0

Work Order:	SYNA0309	Date:	2020-09-28	
Project:	None	Temperature:	23.3 °C	
Job Site:	NC01	Humidity:	49.5% RH	
Serial Number:	Rev. 10 - 002	Barometric Pres.:	1021 mbar	
EUT:	RadioNode			
Configuration:	6			
Customer:	Walt Disney Parks and Resorts US, Inc.			
Attendees:	None			
EUT Power:	24VDC via 120VAC/60Hz			
Operating Mode:	BTLE Tx, Antenna PN: RE09P-NM, GFSK, Packet Length = 63, PRBS9, 1 Mbps, Low Channel = 2402 MHz, Mid Channel = 2442 MHz, High Channel = 2480 MHz.			
Deviations:	None			
Comments:	See comments below for Channel, EUT orientations. The worst case EUT orientations from the previous testing were used. The provided test software configured the radio with a duty cycle of 47.8% . Per ANSI C63.10 test methods, the RMS data was corrected with a carrier duty cycle correction factor (DCCF) of 3.2 dB. DCCF (dB) = 10*log(1/0.478).			

Test Specifications	Test Method
FCC 15.247:2020	ANSI C63.10:2013

Run #	108	Test Distance (m)	3	Antenna Height(s)	1 to 4(m)	Results	Pass
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Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (dB)	External Attenuation (dB)	Polarity/Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
7325.533	33.0	14.5	2.2	97.0	3.2	0.0	Horz	AV	0.0	50.7	54.0	-3.3	Mid Ch., Port 8, EUT on Side, Ant on Side
7326.758	31.2	14.5	3.0	288.0	3.2	0.0	Vert	AV	0.0	48.9	54.0	-5.1	Mid Ch., Port 8, EUT on Side, Ant on Side
7442.392	27.2	15.0	1.5	0.0	3.2	0.0	Horz	AV	0.0	45.4	54.0	-8.6	High Ch., Port 8, EUT on Side, Ant on Side
7437.625	27.0	15.0	1.5	332.0	3.2	0.0	Vert	AV	0.0	45.2	54.0	-8.8	High Ch., Port 8, EUT on Side, Ant on Side
7325.937	27.2	14.5	1.5	44.0	3.2	0.0	Horz	AV	0.0	44.9	54.0	-9.1	Mid Ch., Port 7, EUT on Side, Ant on Side
7326.300	27.2	14.5	4.0	309.0	3.2	0.0	Vert	AV	0.0	44.9	54.0	-9.1	Mid Ch., Port 7, EUT on Side, Ant on Side
4960.033	27.6	9.5	2.1	8.0	3.2	0.0	Horz	AV	0.0	40.3	54.0	-13.7	High Ch., Port 8, EUT on Side, Ant on Side
4883.833	26.7	9.8	3.1	6.0	3.2	0.0	Horz	AV	0.0	39.7	54.0	-14.3	Mid Ch., Port 8, EUT on Side, Ant on Side
4803.550	26.8	9.7	1.5	256.0	3.2	0.0	Horz	AV	0.0	39.7	54.0	-14.3	Low Ch., Port 8, EUT on Side, Ant on Side
4803.592	26.7	9.7	1.5	12.0	3.2	0.0	Vert	AV	0.0	39.6	54.0	-14.4	Low Ch., Port 8, EUT on Side, Ant on Side
4881.517	26.5	9.8	1.8	70.0	3.2	0.0	Vert	AV	0.0	39.5	54.0	-14.5	Mid Ch., Port 8, EUT on Side, Ant on Side
4959.800	26.7	9.5	1.7	281.0	3.2	0.0	Vert	AV	0.0	39.4	54.0	-14.6	High Ch., Port 8, EUT on Side, Ant on Side
19218.490	34.8	0.6	1.6	178.0	3.2	0.0	Horz	AV	0.0	38.6	54.0	-15.4	Low Ch., Port 8, EUT on Side, Ant on Side
19215.260	34.7	0.6	1.6	256.0	3.2	0.0	Vert	AV	0.0	38.5	54.0	-15.5	Low Ch., Port 8, EUT on Side, Ant on Side
7326.775	42.2	14.5	2.2	97.0	0.0	0.0	Horz	PK	0.0	56.7	74.0	-17.3	Mid Ch., Port 8, EUT on Side, Ant on Side
7325.767	41.3	14.5	3.0	288.0	0.0	0.0	Vert	PK	0.0	55.8	74.0	-18.2	Mid Ch., Port 8, EUT on Side, Ant on Side
7442.025	37.9	15.0	1.5	332.0	0.0	0.0	Vert	PK	0.0	52.9	74.0	-21.1	High Ch., Port 8, EUT on Side, Ant on Side
7325.990	38.4	14.5	4.0	309.0	0.0	0.0	Vert	PK	0.0	52.9	74.0	-21.1	Mid Ch., Port 7, EUT on Side, Ant on Side
12011.330	27.1	2.5	1.5	167.0	3.2	0.0	Vert	AV	0.0	32.8	54.0	-21.2	Low Ch., Port 8, EUT on Side, Ant on Side
7442.217	37.8	15.0	1.5	0.0	0.0	0.0	Horz	PK	0.0	52.8	74.0	-21.2	High Ch., Port 8, EUT on Side, Ant on Side
12011.180	27.0	2.5	1.5	193.0	3.2	0.0	Horz	AV	0.0	32.7	54.0	-21.3	Low Ch., Port 8, EUT on Side, Ant on Side
7326.850	38.2	14.5	1.5	44.0	0.0	0.0	Horz	PK	0.0	52.7	74.0	-21.3	Mid Ch., Port 7, EUT on Side, Ant on Side
12207.870	27.4	1.9	1.5	360.0	3.2	0.0	Vert	AV	0.0	32.5	54.0	-21.5	Mid Ch., Port 8, EUT on Side, Ant on Side
12208.030	27.3	1.9	1.5	42.0	3.2	0.0	Horz	AV	0.0	32.4	54.0	-21.6	Mid Ch., Port 8, EUT on Side, Ant on Side
12399.100	26.6	2.0	1.5	0.0	3.2	0.0	Horz	AV	0.0	31.8	54.0	-22.2	High Ch., Port 8, EUT on Side, Ant on Side
12399.430	26.6	2.0	1.5	275.0	3.2	0.0	Vert	AV	0.0	31.8	54.0	-22.2	High Ch., Port 8, EUT on Side, Ant on Side
19216.020	46.2	0.6	1.6	256.0	3.2	0.0	Vert	PK	0.0	50.0	74.0	-24.0	Low Ch., Port 8, EUT on Side, Ant on Side

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (dB)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
19215.660	45.1	0.6	1.6	178.0	3.2	0.0	Horz	PK	0.0	48.9	74.0	-25.1	Low Ch., Port 8, EUT on Side, Ant on Side
4802.542	37.9	9.7	1.5	256.0	0.0	0.0	Horz	PK	0.0	47.6	74.0	-26.4	Low Ch., Port 8, EUT on Side, Ant on Side
4883.642	37.5	9.8	3.1	6.0	0.0	0.0	Horz	PK	0.0	47.3	74.0	-26.7	Mid Ch., Port 8, EUT on Side, Ant on Side
4806.483	37.5	9.7	1.5	12.0	0.0	0.0	Vert	PK	0.0	47.2	74.0	-26.8	Low Ch., Port 8, EUT on Side, Ant on Side
4884.025	37.2	9.8	1.8	70.0	0.0	0.0	Vert	PK	0.0	47.0	74.0	-27.0	Mid Ch., Port 8, EUT on Side, Ant on Side
4959.667	37.4	9.5	2.1	8.0	0.0	0.0	Horz	PK	0.0	46.9	74.0	-27.1	High Ch., Port 8, EUT on Side, Ant on Side
4959.233	37.3	9.5	1.7	281.0	0.0	0.0	Vert	PK	0.0	46.8	74.0	-27.2	High Ch., Port 8, EUT on Side, Ant on Side
12211.510	38.5	1.9	1.5	42.0	0.0	0.0	Horz	PK	0.0	40.4	74.0	-33.6	Mid Ch., Port 8, EUT on Side, Ant on Side
12009.730	37.6	2.5	1.5	167.0	0.0	0.0	Vert	PK	0.0	40.1	74.0	-33.9	Low Ch., Port 8, EUT on Side, Ant on Side
12007.550	36.9	2.5	1.5	193.0	0.0	0.0	Horz	PK	0.0	39.4	74.0	-34.6	Low Ch., Port 8, EUT on Side, Ant on Side
12399.930	37.3	2.0	1.5	0.0	0.0	0.0	Horz	PK	0.0	39.3	74.0	-34.7	High Ch., Port 8, EUT on Side, Ant on Side
12398.010	37.2	2.0	1.5	275.0	0.0	0.0	Vert	PK	0.0	39.2	74.0	-34.8	High Ch., Port 8, EUT on Side, Ant on Side
12207.780	37.1	1.9	1.5	360.0	0.0	0.0	Vert	PK	0.0	39.0	74.0	-35.0	Mid Ch., Port 8, EUT on Side, Ant on Side

SPURIOUS RADIATED EMISSIONS

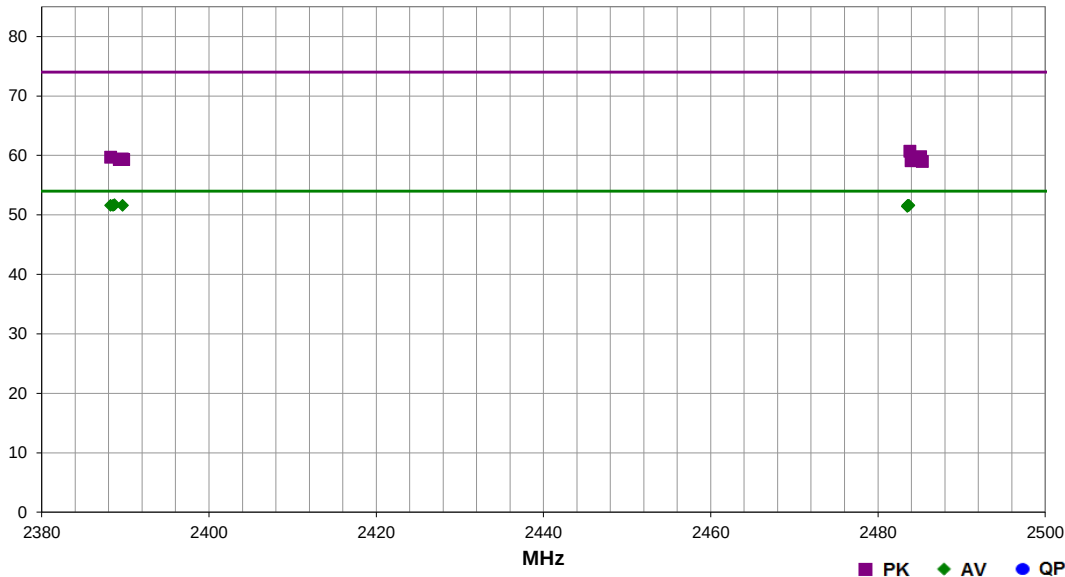


EmiRS 2020.06.24.3 PSA-ESCI 2020.04.03.0

Work Order:	SYNA0309	Date:	2020-09-28		
Project:	None	Temperature:	23.3 °C		
Job Site:	NC01	Humidity:	49.5% RH		
Serial Number:	Rev. 10 - 002	Barometric Pres.:	1021 mbar	Tested by:	Brian Fahey
EUT:	RadioNode				
Configuration:	6				
Customer:	Walt Disney Parks and Resorts US, Inc.				
Attendees:	None				
EUT Power:	24VDC via 120VAC/60Hz				
Operating Mode:	BTLE Tx, Antenna PN: RE09P-NM, GFSK, Packet Length = 63, PRBS9, 1 Mbps, Low Channel = 2402 MHz, High Channel = 2480 MHz.				
Deviations:	None				
Comments:	See comments below for Channel, EUT orientations. The worst case EUT orientations from the previous testing were used. The provided test software configured the radio with a duty cycle of 47.8% . Per ANSI C63.10 test methods, the RMS data was corrected with a carrier duty cycle correction factor (DCCF) of 3.2 dB. DCCF (dB) = 10*log(1/0.478).				

Test Specifications	FCC 15.247:2020	Test Method	ANSI C63.10:2013
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Run #	110	Test Distance (m)	3	Antenna Height(s)	1 to 4(m)	Results	Pass
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Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (dB)	External Attenuation (dB)	Polarity/Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
2388.703	29.1	-0.6	1.5	326.0	3.2	20.0	Horz	AV	0.0	51.7	54.0	-2.3	Low Ch., Port 7, EUT on Side, Ant on Side
2388.233	29.0	-0.6	1.7	109.0	3.2	20.0	Horz	AV	0.0	51.6	54.0	-2.4	Low Ch., Port 8, EUT on Side, Ant on Side
2388.533	29.0	-0.6	1.5	320.0	3.2	20.0	Vert	AV	0.0	51.6	54.0	-2.4	Low Ch., Port 8, EUT Vert, Ant Vert
2483.560	29.2	-0.8	1.5	24.0	3.2	20.0	Vert	AV	0.0	51.6	54.0	-2.4	High Ch., Port 8, EUT Vert, Ant Vert
2483.700	29.2	-0.8	1.5	286.0	3.2	20.0	Horz	AV	0.0	51.6	54.0	-2.4	High Ch., Port 7, EUT on Side, Ant on Side
2389.680	29.0	-0.6	1.5	53.0	3.2	20.0	Vert	AV	0.0	51.6	54.0	-2.4	Low Ch., Port 7, EUT Vert, Ant Vert
2483.667	29.2	-0.8	3.5	123.0	3.2	20.0	Vert	AV	0.0	51.6	54.0	-2.4	High Ch., Port 7, EUT Vert, Ant Vert
2483.530	29.0	-0.8	3.5	241.0	3.2	20.0	Horz	AV	0.0	51.4	54.0	-2.6	High Ch., Port 8, EUT on Side, Ant on Side
2483.807	41.5	-0.8	1.5	24.0	0.0	20.0	Vert	PK	0.0	60.7	74.0	-13.3	High Ch., Port 8, EUT Vert, Ant Vert
2485.107	40.6	-0.8	3.5	123.0	0.0	20.0	Vert	PK	0.0	59.8	74.0	-14.2	High Ch., Port 7, EUT Vert, Ant Vert
2388.247	40.3	-0.6	1.7	109.0	0.0	20.0	Horz	PK	0.0	59.7	74.0	-14.3	Low Ch., Port 8, EUT on Side, Ant on Side
2389.640	40.0	-0.6	1.5	53.0	0.0	20.0	Vert	PK	0.0	59.4	74.0	-14.6	Low Ch., Port 7, EUT Vert, Ant Vert
2389.790	39.9	-0.6	1.5	320.0	0.0	20.0	Vert	PK	0.0	59.3	74.0	-14.7	Low Ch., Port 8, EUT Vert, Ant Vert
2389.280	39.9	-0.6	1.5	326.0	0.0	20.0	Horz	PK	0.0	59.3	74.0	-14.7	Low Ch., Port 7, EUT on Side, Ant on Side
2483.963	39.9	-0.8	1.5	286.0	0.0	20.0	Horz	PK	0.0	59.1	74.0	-14.9	High Ch., Port 7, EUT on Side, Ant on Side
2485.303	39.8	-0.8	3.5	241.0	0.0	20.0	Horz	PK	0.0	59.0	74.0	-15.0	High Ch., Port 8, EUT on Side, Ant on Side

SPURIOUS RADIATED EMISSIONS



PSA-ESCI 2020.06.24.2

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data. The test data represents the configuration / operating mode/ model that produced the highest emission levels as compared to the specification limit.

MODES OF OPERATION

Bluetooth LE Tx, Antenna PN: T24130P10006GT, GFSK, Packet Length = 63, PRBS9, 1 Mbps, Power Setting = 0 dBm, Low Channel = 2402 MHz, Mid Channel = 2442 MHz, High Channel = 2480 MHz.

Bluetooth LE Tx, Antenna PN: T24130P10006GT, GFSK, Packet Length = 63, PRBS9, 1 Mbps, Power Setting = 0 dBm, Low Channel = 2402 MHz, High Channel = 2480 MHz.

Bluetooth LE Tx, Antenna PN: T24130P10006GT, GFSK, Packet Length = 63, PRBS9, 1 Mbps, Power Setting = -8 dBm, Low Channel = 2402 MHz, Mid Channel = 2442 MHz, High Channel = 2480 MHz.

Bluetooth LE Tx, Antenna PN: T24130P10006GT, GFSK, Packet Length = 63, PRBS9, 1 Mbps, Power Setting = -8 dBm, Low Channel = 2402 MHz, High Channel = 2480 MHz.

POWER SETTINGS INVESTIGATED

POE via 120VAC/60Hz

24VDC via 120VAC/60Hz

CONFIGURATIONS INVESTIGATED

SYNA0309 - 12

SYNA0309 - 13

SYNA0317 - 1

SYNA0317 - 2

FREQUENCY RANGE INVESTIGATED

Start Frequency	30 MHz	Stop Frequency	26000 MHz
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SAMPLE CALCULATIONS

Radiated Emissions: Field Strength = Measured Level + Antenna Factor + Cable Factor - Amplifier Gain + Distance Adjustment Factor + External Attenuation

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Attenuator	S.M. Electronics	SA6-20	REO	2020-01-21	12 mo
Filter - Low Pass	Micro-Tronics	LPM50004	HGK	2020-01-20	12 mo
Filter - High Pass	Micro-Tronics	HPM50111	HGC	2020-03-11	12 mo
Amplifier - Pre-Amplifier	Miteq	JSDWK42-18004000-60-5P	PAN	2019-12-16	12 mo
Amplifier - Pre-Amplifier	Miteq	AM-1616-1000	PAD	2020-07-01	12 mo
Cable	ESM Cable Corp.	8-18GHz cables	OCY	2020-03-02	12 mo
Cable	ESM Cable Corp.	1-8GHz cables	OCX	2020-03-02	12 mo
Cable	ESM Cable Corp.	30-1GHz cables	OCW	2020-05-01	12 mo
Cable	D-Coax	None	OC4	2019-12-16	12 mo
Antenna - Biconilog	EMCO	3142	AXB	2020-04-15	24 mo
Amplifier - Pre-Amplifier	Miteq	AMF-6F-12001800-30-10P	AVP	2020-03-02	12 mo
Amplifier - Pre-Amplifier	Miteq	AMF-6F-08001200-30-10P	AVL	2020-03-02	12 mo
Amplifier - Pre-Amplifier	Miteq	AMF-3D-00100800-32-13P	AVJ	2020-03-02	12 mo
Antenna - Double Ridge	ETS Lindgren	3115	AIR	2020-07-07	24 mo
Antenna - Double Ridge	A.H. Systems, Inc.	SAS-574	AXV	2020-06-03	24 mo
Antenna - Standard Gain	ETS Lindgren	3160-07	AHX	NCR	0 mo
Antenna - Standard Gain	EMCO	3160-08	AHK	NCR	0 mo
Antenna - Standard Gain	EMCO	3160-08	AHO	NCR	0 mo
Cable	High Speed Interconnects	EW292A-NGNG-300	NC3	2020-08-28	12 mo
Amplifier - Pre-Amplifier	Miteq	AMF-6F-08001200-30-10P	AOK	2020-08-26	12 mo
Antenna - Standard Gain	EMCO	3160-07	AHP	NCR	0 mo
Filter - High Pass	Micro-Tronics	HPM50111	HHI	2020-09-25	12 mo
Attenuator	Fairview Microwave	SA18E-20	AQV	2020-07-28	12 mo
Cable	Northwest EMC	3115 Horn Cable	NC2	2020-04-20	12 mo
Amplifier - Pre-Amplifier	Miteq	AMF-3D-00100800-32-13P	AVZ	2020-04-20	12 mo
Antenna - Double Ridge	EMCO	3115	AHM	2020-07-01	24 mo
Antenna - Biconilog	Teseq	CBL 6141B	AYL	2019-09-25	24 mo
Analyzer - Spectrum Analyzer	Agilent	E4440A	AAX	2020-04-15	12 mo

SPURIOUS RADIATED EMISSIONS



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TEST DESCRIPTION

The highest gain antenna of each type to be used with the EUT was tested. The EUT was configured for the required transmit frequencies and the modes as showed in the data sheets.

For each configuration, the spectrum was scanned throughout the specified range as part of the exploratory investigation of the emissions. These "pre-scans" are not included in the report. Final measurements on individual emissions were then made and included in this test report.

The individual emissions from the EUT were maximized by rotating the EUT on a turntable, adjusting the position of the EUT and EUT antenna in three orthogonal axis if required, and adjusting the measurement antenna height and polarization (per ANSI C63.10). A preamp and high pass filter (and notch filter) were used for this test in order to provide sufficient measurement sensitivity.

Measurements were made with the required detectors and annotated on the data for each individual point using the following annotation:

QP = Quasi-Peak Detector
PK = Peak Detector
AV = RMS Detector

Measurements were made to satisfy the specific requirements of the test specification for out of band emissions as well as the restricted band requirements.

If there are no detectable emissions above the noise floor, the data included may show noise floor measurements for reference only.

Measurements within 2 MHz of the allowable band may have been taken using the integration method from ANSI C63.10 clause 11.13.3. This procedure uses the channel power feature of the spectrum analyzer to integrate the power of the emission within a 1 MHz bandwidth.

Where the radio test software does not provide for a duty cycle at continuous transmit conditions (> 98%) and the RMS (power average) measurements were made across the on and off times of the EUT transmissions, a duty cycle correction is added to the measurements using the formula of $10 \cdot \log(1/dc)$.

SPURIOUS RADIATED EMISSIONS



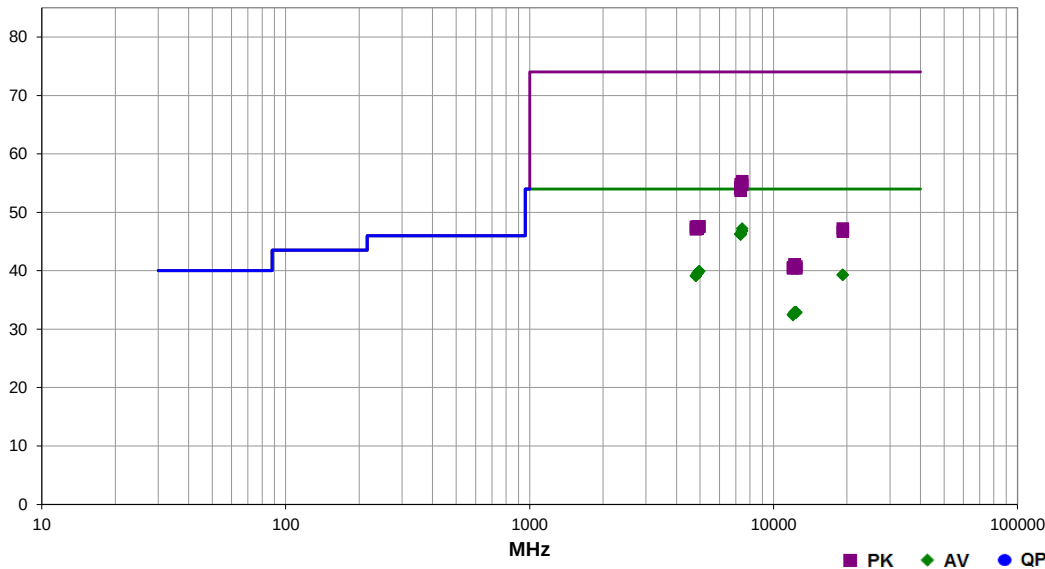
EmiRS 2020.06.24.4

PSA-ESCI 2020.06.24.2

Work Order:	SYNA0309	Date:	2020-10-20	
Project:	None	Temperature:	24.8 °C	
Job Site:	OC07	Humidity:	49% RH	
Serial Number:	Rev. 10 - 004	Barometric Pres.:	1012 mbar	
EUT: RadioNode				Tested by: Nolan De Ramos
Configuration: 12				
Customer: Walt Disney Parks and Resorts US, Inc.				
Attendees: None				
EUT Power: POE via 120VAC/60Hz				
Operating Mode: Bluetooth LE Tx, Antenna PN: T24130P10006GT, GFSK, Packet Length = 63, PRBS9, 1 Mbps, Power Setting = 0 dBm, Low Channel = 2402 MHz, Mid Channel = 2442 MHz, High Channel = 2480 MHz.				
Deviations: None				
Comments: See comments below for Channel, EUT orientations. The provided test software configured the radio with a duty cycle of 47.8% . Per ANSI C63.10 test methods, the RMS data was corrected with a carrier duty cycle correction factor (DCCF) of 3.2 dB. DCCF (dB) = 10*log(1/0.478)				

Test Specifications	Test Method
FCC 15.247:2020	ANSI C63.10:2013

Run #	24	Test Distance (m)	3	Antenna Height(s)	1 to 4(m)	Results	Pass
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Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (dB)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
7439.508	31.8	12.2	1.5	81.0	3.2	0.0	Vert	AV	0.0	47.2	54.0	-6.8	High Ch, Port 8, EUT Horz, Antenna Horz
7437.875	31.4	12.2	1.5	237.0	3.2	0.0	Horz	AV	0.0	46.8	54.0	-7.2	High Ch, Port 8, EUT Horz, Antenna Horz
7324.492	31.4	11.7	1.5	360.0	3.2	0.0	Horz	AV	0.0	46.3	54.0	-7.7	Mid Ch, Port 8, EUT Horz, Antenna Horz
7324.192	31.4	11.7	3.9	185.0	3.2	0.0	Horz	AV	0.0	46.3	54.0	-7.7	Mid Ch, Port 8, EUT Vert, Antenna Vert
7324.800	31.3	11.7	1.5	52.0	3.2	0.0	Vert	AV	0.0	46.2	54.0	-7.8	Mid Ch, Port 8, EUT Horz, Antenna Horz
7323.617	31.3	11.7	1.5	39.0	3.2	0.0	Vert	AV	0.0	46.2	54.0	-7.8	Mid Ch, Port 8, EUT Vert, Antenna Vert
7325.842	31.3	11.7	2.3	196.0	3.2	0.0	Horz	AV	0.0	46.2	54.0	-7.8	Mid Ch, Port 8, EUT On Side, Antenna On Side
7324.483	31.3	11.7	1.5	97.0	3.2	0.0	Vert	AV	0.0	46.2	54.0	-7.8	Mid Ch, Port 8, EUT On Side, Antenna On Side
4957.558	32.3	4.4	1.5	250.0	3.2	0.0	Horz	AV	0.0	39.9	54.0	-14.1	High Ch, Port 8, EUT Horz, Antenna Horz
4957.825	32.3	4.4	1.5	136.0	3.2	0.0	Vert	AV	0.0	39.9	54.0	-14.1	High Ch, Port 8, EUT Horz, Antenna Horz
4884.158	32.3	4.1	3.8	226.0	3.2	0.0	Vert	AV	0.0	39.6	54.0	-14.4	Mid Ch, Port 8, EUT Horz, Antenna Horz
4885.708	32.2	4.1	1.5	206.0	3.2	0.0	Horz	AV	0.0	39.5	54.0	-14.5	Mid Ch, Port 8, EUT Horz, Antenna Horz
19213.980	45.0	-8.9	1.5	13.0	3.2	0.0	Horz	AV	0.0	39.3	54.0	-14.7	Low Ch, Port 8, EUT Vert, Antenna Vert
19214.720	45.0	-8.9	1.5	114.0	3.2	0.0	Vert	AV	0.0	39.3	54.0	-14.7	Low Ch, Port 8, EUT Horz, Antenna Horz
4804.242	31.9	4.0	1.8	227.0	3.2	0.0	Horz	AV	0.0	39.1	54.0	-14.9	Low Ch, Port 8, EUT Horz, Antenna Horz
4803.933	31.9	4.0	1.5	122.0	3.2	0.0	Vert	AV	0.0	39.1	54.0	-14.9	Low Ch, Port 8, EUT Horz, Antenna Horz
7440.592	43.1	12.2	1.5	81.0	0.0	0.0	Vert	PK	0.0	55.3	74.0	-18.7	High Ch, Port 8, EUT Horz, Antenna Horz
7326.133	43.1	11.7	1.5	97.0	0.0	0.0	Vert	PK	0.0	54.8	74.0	-19.2	Mid Ch, Port 8, EUT On Side, Antenna On Side
7438.150	42.5	12.2	1.5	237.0	0.0	0.0	Horz	PK	0.0	54.7	74.0	-19.3	High Ch, Port 8, EUT Horz, Antenna Horz
7327.975	42.6	11.7	3.9	185.0	0.0	0.0	Horz	PK	0.0	54.3	74.0	-19.7	Mid Ch, Port 8, EUT Vert, Antenna Vert
7324.492	42.5	11.7	1.5	39.0	0.0	0.0	Vert	PK	0.0	54.2	74.0	-19.8	Mid Ch, Port 8, EUT Vert, Antenna Vert
7325.950	42.4	11.7	2.3	196.0	0.0	0.0	Horz	PK	0.0	54.1	74.0	-19.9	Mid Ch, Port 8, EUT On Side, Antenna On Side
7327.500	42.3	11.7	1.5	360.0	0.0	0.0	Horz	PK	0.0	54.0	74.0	-20.0	Mid Ch, Port 8, EUT Horz, Antenna Horz
7324.592	42.0	11.7	1.5	52.0	0.0	0.0	Vert	PK	0.0	53.7	74.0	-20.3	Mid Ch, Port 8, EUT Horz, Antenna Horz
12398.530	31.8	-2.1	1.5	169.0	3.2	0.0	Horz	AV	0.0	32.9	54.0	-21.1	High Ch, Port 8, EUT Horz, Antenna Horz
12209.450	32.6	-2.9	1.5	16.0	3.2	0.0	Horz	AV	0.0	32.9	54.0	-21.1	Mid Ch, Port 8, EUT Horz, Antenna Horz
12208.630	32.6	-2.9	1.5	24.0	3.2	0.0	Vert	AV	0.0	32.9	54.0	-21.1	Mid Ch, Port 8, EUT Horz, Antenna Horz
12398.400	31.7	-2.1	3.9	169.0	3.2	0.0	Vert	AV	0.0	32.8	54.0	-21.2	High Ch, Port 8, EUT Horz, Antenna Horz
12007.570	33.1	-3.8	1.5	200.0	3.2	0.0	Vert	AV	0.0	32.5	54.0	-21.5	Low Ch, Port 8, EUT Horz, Antenna Horz

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (dB)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
12007.670	33.0	-3.8	1.5	19.0	3.2	0.0	Horz	AV	0.0	32.4	54.0	-21.6	Low Ch, Port 8, EUT Horz, Antenna Horz
4885.167	43.5	4.1	1.5	206.0	0.0	0.0	Horz	PK	0.0	47.6	74.0	-26.4	Mid Ch, Port 8, EUT Horz, Antenna Horz
4959.617	43.2	4.4	1.5	250.0	0.0	0.0	Horz	PK	0.0	47.6	74.0	-26.4	High Ch, Port 8, EUT Horz, Antenna Horz
4802.875	43.5	4.0	1.8	227.0	0.0	0.0	Horz	PK	0.0	47.5	74.0	-26.5	Low Ch, Port 8, EUT Horz, Antenna Horz
4959.058	43.1	4.4	1.5	136.0	0.0	0.0	Vert	PK	0.0	47.5	74.0	-26.5	High Ch, Port 8, EUT Horz, Antenna Horz
4884.983	43.1	4.1	3.8	226.0	0.0	0.0	Vert	PK	0.0	47.2	74.0	-26.8	Mid Ch, Port 8, EUT Horz, Antenna Horz
19215.510	56.1	-8.9	1.5	13.0	0.0	0.0	Horz	PK	0.0	47.2	74.0	-26.8	Low Ch, Port 8, EUT Vert, Antenna Vert
4804.592	43.1	4.0	1.5	122.0	0.0	0.0	Vert	PK	0.0	47.1	74.0	-26.9	Low Ch, Port 8, EUT Horz, Antenna Horz
19215.160	55.6	-8.9	1.5	114.0	0.0	0.0	Vert	PK	0.0	46.7	74.0	-27.3	Low Ch, Port 8, EUT Horz, Antenna Horz
12210.760	44.0	-2.9	1.5	16.0	0.0	0.0	Horz	PK	0.0	41.1	74.0	-32.9	Mid Ch, Port 8, EUT Horz, Antenna Horz
12207.630	44.0	-2.9	1.5	24.0	0.0	0.0	Vert	PK	0.0	41.1	74.0	-32.9	Mid Ch, Port 8, EUT Horz, Antenna Horz
12399.930	42.8	-2.1	3.9	169.0	0.0	0.0	Vert	PK	0.0	40.7	74.0	-33.3	High Ch, Port 8, EUT Horz, Antenna Horz
12010.340	44.3	-3.7	1.5	19.0	0.0	0.0	Horz	PK	0.0	40.6	74.0	-33.4	Low Ch, Port 8, EUT Horz, Antenna Horz
12397.720	42.5	-2.1	1.5	169.0	0.0	0.0	Horz	PK	0.0	40.4	74.0	-33.6	High Ch, Port 8, EUT Horz, Antenna Horz
12011.540	44.1	-3.7	1.5	200.0	0.0	0.0	Vert	PK	0.0	40.4	74.0	-33.6	Low Ch, Port 8, EUT Horz, Antenna Horz

SPURIOUS RADIATED EMISSIONS

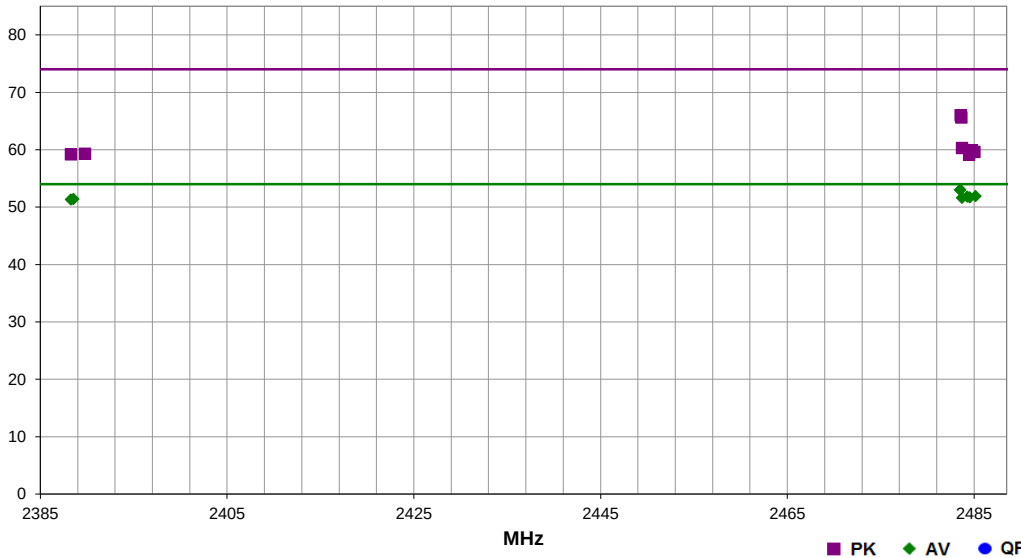


EmRS 2020.06.24.4 PSA-ESCI 2020.06.24.2

Work Order:	SYNA0309	Date:	2020-10-20	
Project:	None	Temperature:	24.8 °C	
Job Site:	OC07	Humidity:	49% RH	
Serial Number:	Rev. 10 - 004	Barometric Pres.:	1012 mbar	
EUT:	RadioNode			
Configuration:	12			
Customer:	Walt Disney Parks and Resorts US, Inc.			
Attendees:	None			
EUT Power:	POE via 120VAC/60Hz			
Operating Mode:	Bluetooth LE Tx, Antenna PN: T24130P10006GT, GFSK, Packet Length = 63, PRBS9, 1 Mbps, Power Setting = 0 dBm, Low Channel = 2402 MHz, High Channel = 2480 MHz.			
Deviations:	None			
Comments:	See comments below for Channel, EUT orientations. The provided test software configured the radio with a duty cycle of 47.8% . Per ANSI C63.10 test methods, the RMS data was corrected with a carrier duty cycle correction factor (DCCF) of 3.2 dB. DCCF (dB) = 10*log(1/0.478)			

Test Specifications	Test Method
FCC 15.247:2020	ANSI C63.10:2013

Run #	27	Test Distance (m)	3	Antenna Height(s)	1 to 4(m)	Results	Pass
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Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (dB)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
2483.520	34.0	-4.2	1.5	193.0	3.2	20.0	Vert	AV	0.0	53.0	54.0	-1.0	High Ch, Port 8, EUT Vert, Antenna Vert
2483.510	34.0	-4.2	1.6	200.0	3.2	20.0	Horz	AV	0.0	53.0	54.0	-1.0	High Ch, Port 8, EUT Vert, Antenna Vert
2485.170	32.8	-4.1	1.5	239.0	3.2	20.0	Horz	AV	0.0	51.9	54.0	-2.1	High Ch, Port 8, EUT On Side, Antenna On Side
2484.270	32.8	-4.2	1.5	332.0	3.2	20.0	Horz	AV	0.0	51.8	54.0	-2.2	High Ch, Port 8, EUT Horz, Antenna Horz
2484.537	32.7	-4.2	1.2	133.0	3.2	20.0	Vert	AV	0.0	51.7	54.0	-2.3	High Ch, Port 8, EUT Horz, Antenna Horz
2483.707	32.6	-4.2	3.1	232.0	3.2	20.0	Vert	AV	0.0	51.6	54.0	-2.4	High Ch, Port 8, EUT On Side, Antenna On Side
2388.550	32.9	-4.7	1.5	16.0	3.2	20.0	Horz	AV	0.0	51.4	54.0	-2.6	Low Ch, Port 8, EUT Vert, Antenna Vert
2388.280	32.8	-4.7	1.2	49.0	3.2	20.0	Vert	AV	0.0	51.3	54.0	-2.7	Low Ch, Port 8, EUT Vert, Antenna Vert
2483.557	50.2	-4.2	1.6	200.0	0.0	20.0	Horz	PK	0.0	66.0	74.0	-8.0	High Ch, Port 8, EUT Vert, Antenna Vert
2483.630	49.8	-4.2	1.5	193.0	0.0	20.0	Vert	PK	0.0	65.6	74.0	-8.4	High Ch, Port 8, EUT Vert, Antenna Vert
2483.717	44.5	-4.2	1.5	332.0	0.0	20.0	Horz	PK	0.0	60.3	74.0	-13.7	High Ch, Port 8, EUT Horz, Antenna Horz
2484.747	44.1	-4.2	1.2	133.0	0.0	20.0	Vert	PK	0.0	59.9	74.0	-14.1	High Ch, Port 8, EUT Horz, Antenna Horz
2485.037	43.7	-4.1	1.5	239.0	0.0	20.0	Horz	PK	0.0	59.6	74.0	-14.4	High Ch, Port 8, EUT On Side, Antenna On Side
2389.783	44.0	-4.7	1.5	16.0	0.0	20.0	Horz	PK	0.0	59.3	74.0	-14.7	Low Ch, Port 8, EUT Vert, Antenna Vert
2388.283	43.9	-4.7	1.2	49.0	0.0	20.0	Vert	PK	0.0	59.2	74.0	-14.8	Low Ch, Port 8, EUT Vert, Antenna Vert
2484.470	43.3	-4.2	3.1	232.0	0.0	20.0	Vert	PK	0.0	59.1	74.0	-14.9	High Ch, Port 8, EUT On Side, Antenna On Side

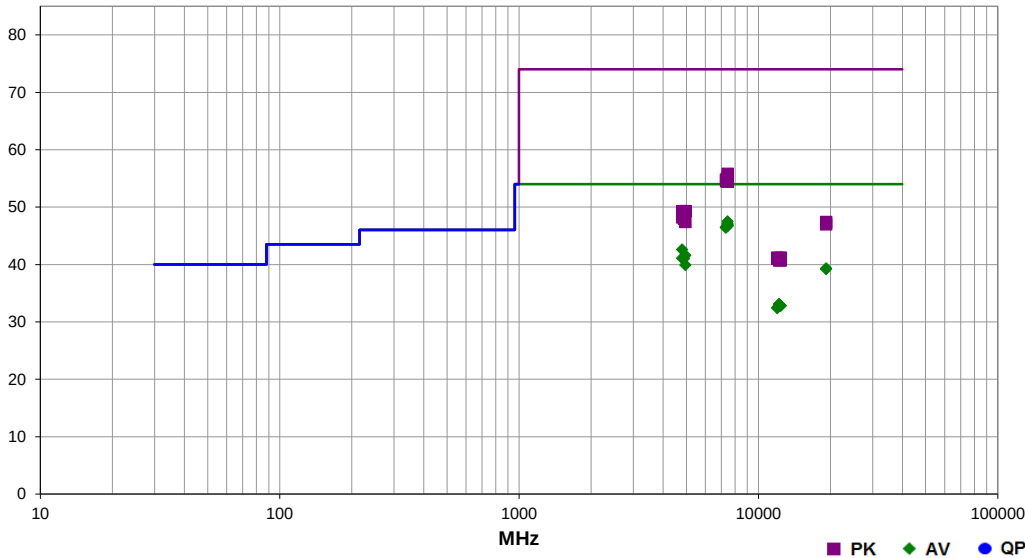
SPURIOUS RADIATED EMISSIONS



Work Order:	SYNA0309	Date:	2020-10-23	
Project:	None	Temperature:	23.3 °C	
Job Site:	OC07	Humidity:	47.7% RH	
Serial Number:	Rev. 10 - 012	Barometric Pres.:	1017 mbar	
EUT:		RadioNode		
Configuration:		13		
Customer:		Walt Disney Parks and Resorts US, Inc.		
Attendees:		None		
EUT Power:		24VDC		
Operating Mode:		Bluetooth LE Tx, Antenna PN: T24130P10006GT, GFSK, Packet Length = 63, PRBS9, 1 Mbps, Power Setting = 0 dBm, Low Channel = 2402 MHz, Mid Channel = 2442 MHz, High Channel = 2480 MHz.		
Deviations:		None		
Comments:		See comments below for Channel, EUT orientations. The provided test software configured the radio with a duty cycle of 47.8% . Per ANSI C63.10 test methods, the RMS data was corrected with a carrier duty cycle correction factor (DCCF) of 3.2 dB. $DCCF\ (dB) = 10 \cdot \log(1/0.478)$		

Test Specifications	FCC 15.247:2020	Test Method	ANSI C63.10:2013
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Run #	69	Test Distance (m)	3	Antenna Height(s)	1 to 4(m)	Results	Pass
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Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (dB)	External Attenuation (dB)	Polarity/Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
7439.442	32.1	12.2	2.1	190.0	3.2	0.0	Horz	AV	0.0	47.5	54.0	-6.5	High Ch, Port 8, EUT Vert, Antenna Vert
7440.767	31.7	12.2	1.5	350.0	3.2	0.0	Vert	AV	0.0	47.1	54.0	-6.9	High Ch, Port 8, EUT Horz, Antenna Horz
7439.042	31.5	12.2	1.9	210.0	3.2	0.0	Horz	AV	0.0	46.9	54.0	-7.1	High Ch, Port 8, EUT Horz, Antenna Horz
7439.258	31.4	12.2	1.3	58.0	3.2	0.0	Horz	AV	0.0	46.8	54.0	-7.2	High Ch, Port 8, EUT On Side, Antenna On Side
7440.275	31.4	12.2	1.7	0.0	3.2	0.0	Vert	AV	0.0	46.8	54.0	-7.2	High Ch, Port 8, EUT On Side, Antenna On Side
7440.292	31.3	12.2	1.5	82.0	3.2	0.0	Vert	AV	0.0	46.7	54.0	-7.3	High Ch, Port 8, EUT Vert, Antenna Vert
7325.650	31.6	11.7	1.5	258.0	3.2	0.0	Horz	AV	0.0	46.5	54.0	-7.5	Mid Ch, Port 8, EUT Vert, Antenna Vert
7323.592	31.5	11.7	1.5	333.0	3.2	0.0	Vert	AV	0.0	46.4	54.0	-7.6	Mid Ch, Port 8, EUT Horz, Antenna Horz
4804.250	35.4	4.0	1.9	142.0	3.2	0.0	Horz	AV	0.0	42.6	54.0	-11.4	Low Ch, Port 8, EUT Vert, Antenna Vert
4959.958	34.0	4.4	1.6	153.0	3.2	0.0	Horz	AV	0.0	41.6	54.0	-12.4	High Ch, Port 8, EUT Vert, Antenna Vert
4883.975	33.8	4.1	1.5	232.0	3.2	0.0	Horz	AV	0.0	41.1	54.0	-12.9	Mid Ch, Port 8, EUT Vert, Antenna Vert
4804.133	33.9	4.0	4.0	99.0	3.2	0.0	Vert	AV	0.0	41.1	54.0	-12.9	Low Ch, Port 8, EUT Horz, Antenna Horz
4884.025	33.7	4.1	3.3	195.0	3.2	0.0	Vert	AV	0.0	41.0	54.0	-13.0	Mid Ch, Port 8, EUT Horz, Antenna Horz
4957.675	32.3	4.4	1.4	221.0	3.2	0.0	Vert	AV	0.0	39.9	54.0	-14.1	High Ch, Port 8, EUT Horz, Antenna Horz
19213.880	45.0	-8.9	1.5	287.0	3.2	0.0	Horz	AV	0.0	39.3	54.0	-14.7	Low Ch, Port 8, EUT Vert, Antenna Vert
19213.750	44.9	-8.9	1.5	89.0	3.2	0.0	Vert	AV	0.0	39.2	54.0	-14.8	Low Ch, Port 8, EUT Horz, Antenna Horz
7439.800	43.6	12.2	2.1	190.0	0.0	0.0	Horz	PK	0.0	55.8	74.0	-18.2	High Ch, Port 8, EUT Vert, Antenna Vert
7439.125	42.9	12.2	1.3	58.0	0.0	0.0	Horz	PK	0.0	55.1	74.0	-18.9	High Ch, Port 8, EUT On Side, Antenna On Side
7442.167	42.7	12.3	1.5	350.0	0.0	0.0	Vert	PK	0.0	55.0	74.0	-19.0	High Ch, Port 8, EUT Horz, Antenna Horz
7323.633	43.1	11.7	1.5	258.0	0.0	0.0	Horz	PK	0.0	54.8	74.0	-19.2	Mid Ch, Port 8, EUT Vert, Antenna Vert
7440.308	42.5	12.2	1.9	210.0	0.0	0.0	Horz	PK	0.0	54.7	74.0	-19.3	High Ch, Port 8, EUT Horz, Antenna Horz
7441.150	42.4	12.2	1.5	82.0	0.0	0.0	Vert	PK	0.0	54.6	74.0	-19.4	High Ch, Port 8, EUT Vert, Antenna Vert
7326.450	42.8	11.7	1.5	333.0	0.0	0.0	Vert	PK	0.0	54.5	74.0	-19.5	Mid Ch, Port 8, EUT Horz, Antenna Horz
7439.742	42.2	12.2	1.7	0.0	0.0	0.0	Vert	PK	0.0	54.4	74.0	-19.6	High Ch, Port 8, EUT On Side, Antenna On Side
12207.630	32.8	-2.9	1.5	216.0	3.2	0.0	Vert	AV	0.0	33.1	54.0	-20.9	Mid Ch, Port 8, EUT Horz, Antenna Horz
12207.920	32.6	-2.9	3.1	116.0	3.2	0.0	Horz	AV	0.0	32.9	54.0	-21.1	Mid Ch, Port 8, EUT Vert, Antenna Vert
12398.060	31.7	-2.1	3.3	308.0	3.2	0.0	Horz	AV	0.0	32.8	54.0	-21.2	High Ch, Port 8, EUT Vert, Antenna Vert
12397.790	31.7	-2.1	3.4	314.0	3.2	0.0	Vert	AV	0.0	32.8	54.0	-21.2	High Ch, Port 8, EUT Horz, Antenna Horz
12007.630	33.1	-3.8	3.6	332.0	3.2	0.0	Horz	AV	0.0	32.5	54.0	-21.5	Low Ch, Port 8, EUT Vert, Antenna Vert
12009.200	33.0	-3.8	2.9	290.0	3.2	0.0	Vert	AV	0.0	32.4	54.0	-21.6	Low Ch, Port 8, EUT Horz, Antenna Horz
4960.875	44.9	4.4	1.6	153.0	0.0	0.0	Horz	PK	0.0	49.3	74.0	-24.7	High Ch, Port 8, EUT Vert, Antenna Vert

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (dB)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
4804.408	45.3	4.0	1.9	142.0	0.0	0.0	Horz	PK	0.0	49.3	74.0	-24.7	Low Ch, Port 8, EUT Vert, Antenna Vert
4884.750	44.6	4.1	1.5	232.0	0.0	0.0	Horz	PK	0.0	48.7	74.0	-25.3	Mid Ch, Port 8, EUT Vert, Antenna Vert
4804.350	44.2	4.0	4.0	99.0	0.0	0.0	Vert	PK	0.0	48.2	74.0	-25.8	Low Ch, Port 8, EUT Horz, Antenna Horz
4884.033	43.9	4.1	3.3	195.0	0.0	0.0	Vert	PK	0.0	48.0	74.0	-26.0	Mid Ch, Port 8, EUT Horz, Antenna Horz
4958.092	43.0	4.4	1.4	221.0	0.0	0.0	Vert	PK	0.0	47.4	74.0	-26.6	High Ch, Port 8, EUT Horz, Antenna Horz
19214.980	56.3	-8.9	1.5	287.0	0.0	0.0	Horz	PK	0.0	47.4	74.0	-26.6	Low Ch, Port 8, EUT Vert, Antenna Vert
19213.830	55.9	-8.9	1.5	89.0	0.0	0.0	Vert	PK	0.0	47.0	74.0	-27.0	Low Ch, Port 8, EUT Horz, Antenna Horz
12008.160	45.0	-3.8	2.9	290.0	0.0	0.0	Vert	PK	0.0	41.2	74.0	-32.8	Low Ch, Port 8, EUT Horz, Antenna Horz
12397.830	43.3	-2.1	3.4	314.0	0.0	0.0	Vert	PK	0.0	41.2	74.0	-32.8	High Ch, Port 8, EUT Horz, Antenna Horz
12008.500	44.8	-3.8	3.6	332.0	0.0	0.0	Horz	PK	0.0	41.0	74.0	-33.0	Low Ch, Port 8, EUT Vert, Antenna Vert
12210.730	43.9	-2.9	1.5	216.0	0.0	0.0	Vert	PK	0.0	41.0	74.0	-33.0	Mid Ch, Port 8, EUT Horz, Antenna Horz
12209.110	43.6	-2.9	3.1	116.0	0.0	0.0	Horz	PK	0.0	40.7	74.0	-33.3	Mid Ch, Port 8, EUT Vert, Antenna Vert
12398.180	42.8	-2.1	3.3	308.0	0.0	0.0	Horz	PK	0.0	40.7	74.0	-33.3	High Ch, Port 8, EUT Vert, Antenna Vert

SPURIOUS RADIATED EMISSIONS

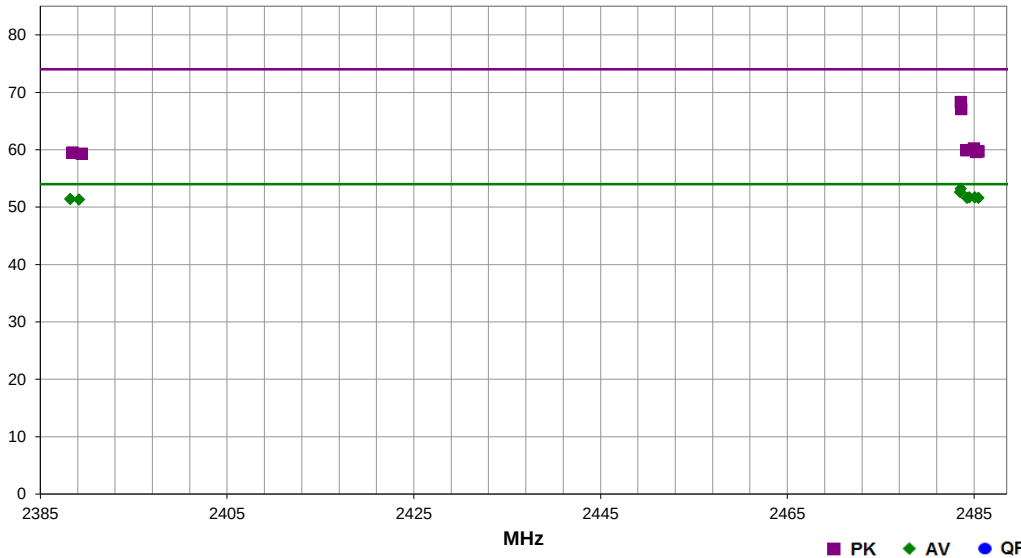


EmRS 2020.06.24.4 PSA-ESCI 2020.06.24.2

Work Order:	SYNA0309	Date:	2020-10-23	
Project:	None	Temperature:	23.3 °C	
Job Site:	OC07	Humidity:	47.7% RH	
Serial Number:	Rev. 10 - 012	Barometric Pres.:	1017 mbar	
EUT:	RadioNode			
Configuration:	13			
Customer:	Walt Disney Parks and Resorts US, Inc.			
Attendees:	None			
EUT Power:	24VDC			
Operating Mode:	Bluetooth LE Tx, Antenna PN: T24130P10006GT, GFSK, Packet Length = 63, PRBS9, 1 Mbps, Power Setting = 0 dBm, Low Channel = 2402 MHz, High Channel = 2480 MHz.			
Deviations:	None			
Comments:	See comments below for Channel, EUT orientations. The provided test software configured the radio with a duty cycle of 47.8% . Per ANSI C63.10 test methods, the RMS data was corrected with a carrier duty cycle correction factor (DCCF) of 3.2 dB. DCCF (dB) = 10*log(1/0.478)			

Test Specifications	Test Method
FCC 15.247:2020	ANSI C63.10:2013

Run #	71	Test Distance (m)	3	Antenna Height(s)	1 to 4(m)	Results	Pass
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Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (dB)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
2483.583	34.2	-4.2	1.0	188.0	3.2	20.0	Horz	AV	0.0	53.2	54.0	-0.8	High Ch, Port 8, EUT On Side, Antenna On Side
2483.507	33.6	-4.2	1.5	200.0	3.2	20.0	Vert	AV	0.0	52.6	54.0	-1.4	High Ch, Port 8, EUT Vert, Antenna Vert
2484.483	32.7	-4.2	1.5	93.0	3.2	20.0	Horz	AV	0.0	51.7	54.0	-2.3	High Ch, Port 8, EUT Horz, Antenna Horz
2485.087	32.6	-4.1	1.5	250.0	3.2	20.0	Vert	AV	0.0	51.7	54.0	-2.3	High Ch, Port 8, EUT On Side, Antenna On Side
2484.257	32.6	-4.2	1.4	102.0	3.2	20.0	Vert	AV	0.0	51.6	54.0	-2.4	High Ch, Port 8, EUT Horz, Antenna Horz
2485.467	32.5	-4.1	1.5	303.0	3.2	20.0	Horz	AV	0.0	51.6	54.0	-2.4	High Ch, Port 8, EUT Vert, Antenna Vert
2388.197	32.9	-4.7	1.5	58.0	3.2	20.0	Vert	AV	0.0	51.4	54.0	-2.6	Low Ch, Port 8, EUT Vert, Antenna Vert
2389.147	32.8	-4.7	1.5	279.0	3.2	20.0	Horz	AV	0.0	51.3	54.0	-2.7	Low Ch, Port 8, EUT On Side, Antenna On Side
2483.590	52.5	-4.2	1.0	188.0	0.0	20.0	Horz	PK	0.0	68.3	74.0	-5.7	High Ch, Port 8, EUT On Side, Antenna On Side
2483.613	51.3	-4.2	1.5	200.0	0.0	20.0	Vert	PK	0.0	67.1	74.0	-6.9	High Ch, Port 8, EUT Vert, Antenna Vert
2484.990	44.4	-4.2	1.4	102.0	0.0	20.0	Vert	PK	0.0	60.2	74.0	-13.8	High Ch, Port 8, EUT Horz, Antenna Horz
2484.183	44.1	-4.2	1.5	93.0	0.0	20.0	Horz	PK	0.0	59.9	74.0	-14.1	High Ch, Port 8, EUT Horz, Antenna Horz
2485.480	43.8	-4.1	1.5	303.0	0.0	20.0	Horz	PK	0.0	59.7	74.0	-14.3	High Ch, Port 8, EUT Vert, Antenna Vert
2485.243	43.7	-4.1	1.5	250.0	0.0	20.0	Vert	PK	0.0	59.6	74.0	-14.4	High Ch, Port 8, EUT On Side, Antenna On Side
2388.437	44.2	-4.7	1.5	58.0	0.0	20.0	Vert	PK	0.0	59.5	74.0	-14.5	Low Ch, Port 8, EUT Vert, Antenna Vert
2389.440	44.0	-4.7	1.5	279.0	0.0	20.0	Horz	PK	0.0	59.3	74.0	-14.7	Low Ch, Port 8, EUT On Side, Antenna On Side

SPURIOUS RADIATED EMISSIONS

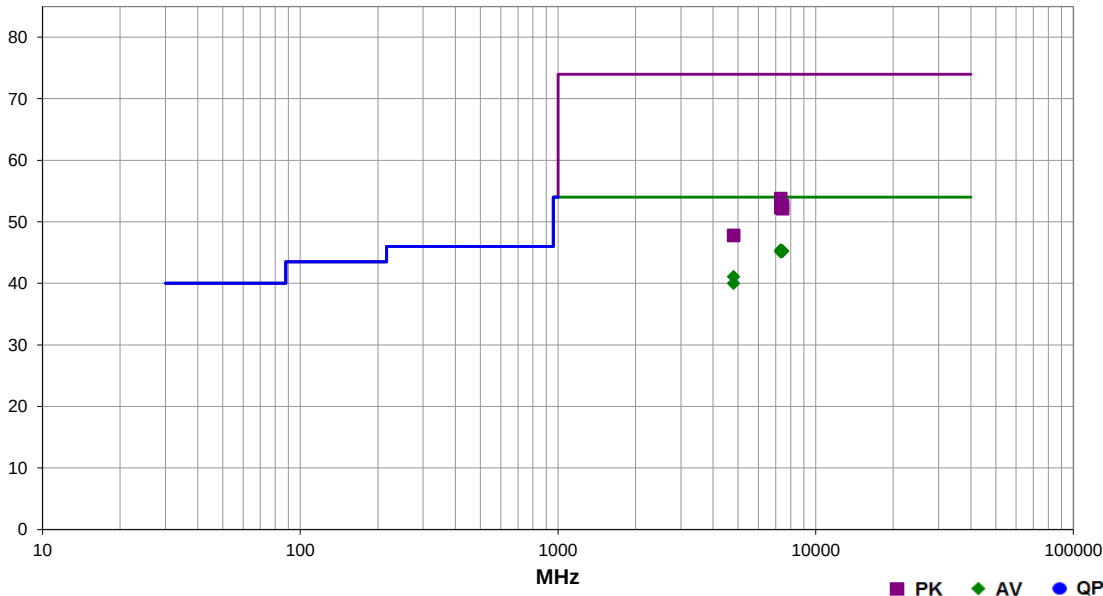


EmiRS 2020.06.24.4 PSA-ESCI 2020.06.24.2

Work Order:	SYNA0317	Date:	2020-11-20	
Project:	None	Temperature:	23.9 °C	
Job Site:	NC01	Humidity:	35.3% RH	
Serial Number:	Rev. 10 - 007	Barometric Pres.:	1033 mbar	
		Tested by: Brian Fahey		
EUT:	RadioNode			
Configuration:	2			
Customer:	Walt Disney Parks and Resorts US, Inc.			
Attendees:	None			
EUT Power:	24VDC via 120VAC/60Hz			
Operating Mode:	BLE Tx, Antenna PN: T24130P10006GT, GFSK, Packet Length = 63, PRBS9, 1 Mbps, Power Setting = -8 dBm, Low Channel = 2402 MHz, Mid Channel = 2442 MHz, High Channel = 2480 MHz.			
Deviations:	None			
Comments:	See comments below for Channel, EUT orientations. The worst case EUT orientations from the previous testing were used. Spot check for worst case harmonic from 0 dBm power setting measurements due to a reduction in power. Port 7 measurements were taken on 1/4/21.			
	The provided test software configured the radio with a duty cycle of 47.8% . Per ANSI C63.10 test methods, the RMS data was corrected with a carrier duty cycle correction factor (DCCF) of 3.2 dB. DCCF (dB) = 10*log(1/0.478).			

Test Specifications	Test Method
FCC 15.247:2021	ANSI C63.10:2013

Run #	24	Test Distance (m)	3	Antenna Height(s)	1 to 4(m)	Results	Pass
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Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (dB)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
7327.267	27.5	14.7	1.5	292.0	3.2	0.0	Horz	AV	0.0	45.4	54.0	-8.6	Mid Ch., Port 8, EUT Vert, Ant Vert
7326.690	27.6	14.5	1.9	119.0	3.2	0.0	Horz	AV	0.0	45.3	54.0	-8.7	Mid Ch., Port 7, EUT Vert, Ant Vert
7438.467	27.1	15.0	1.5	249.0	3.2	0.0	Vert	AV	0.0	45.3	54.0	-8.7	High Ch., Port 7, EUT Vert, Ant Vert
7442.333	27.0	15.0	1.5	63.0	3.2	0.0	Horz	AV	0.0	45.2	54.0	-8.8	High Ch., Port 8, EUT Vert, Ant Vert
7442.375	27.0	15.0	1.5	360.0	3.2	0.0	Vert	AV	0.0	45.2	54.0	-8.8	High Ch., Port 8, EUT Vert, Ant Vert
7324.725	27.4	14.5	1.3	325.0	3.2	0.0	Vert	AV	0.0	45.1	54.0	-8.9	Mid Ch., Port 8, EUT Vert, Ant Vert
4804.067	28.2	9.7	2.0	103.0	3.2	0.0	Horz	AV	0.0	41.1	54.0	-12.9	Low Ch., Port 8, EUT Vert, Ant Vert
4804.492	27.1	9.7	1.2	111.0	3.2	0.0	Vert	AV	0.0	40.0	54.0	-14.0	Low Ch., Port 8, EUT Vert, Ant Vert
7326.330	39.3	14.5	1.9	119.0	0.0	0.0	Horz	PK	0.0	53.8	74.0	-20.2	Mid Ch., Port 7, EUT Vert, Ant Vert
7324.358	38.3	14.5	1.5	292.0	0.0	0.0	Horz	PK	0.0	52.8	74.0	-21.2	Mid Ch., Port 8, EUT Vert, Ant Vert
7437.950	37.6	15.0	1.5	360.0	0.0	0.0	Vert	PK	0.0	52.6	74.0	-21.4	High Ch., Port 8, EUT Vert, Ant Vert
7437.658	37.6	15.0	1.5	249.0	0.0	0.0	Vert	PK	0.0	52.6	74.0	-21.4	High Ch., Port 7, EUT Vert, Ant Vert
7324.767	37.8	14.5	1.3	325.0	0.0	0.0	Vert	PK	0.0	52.3	74.0	-21.7	Mid Ch., Port 8, EUT Vert, Ant Vert

SPURIOUS RADIATED EMISSIONS

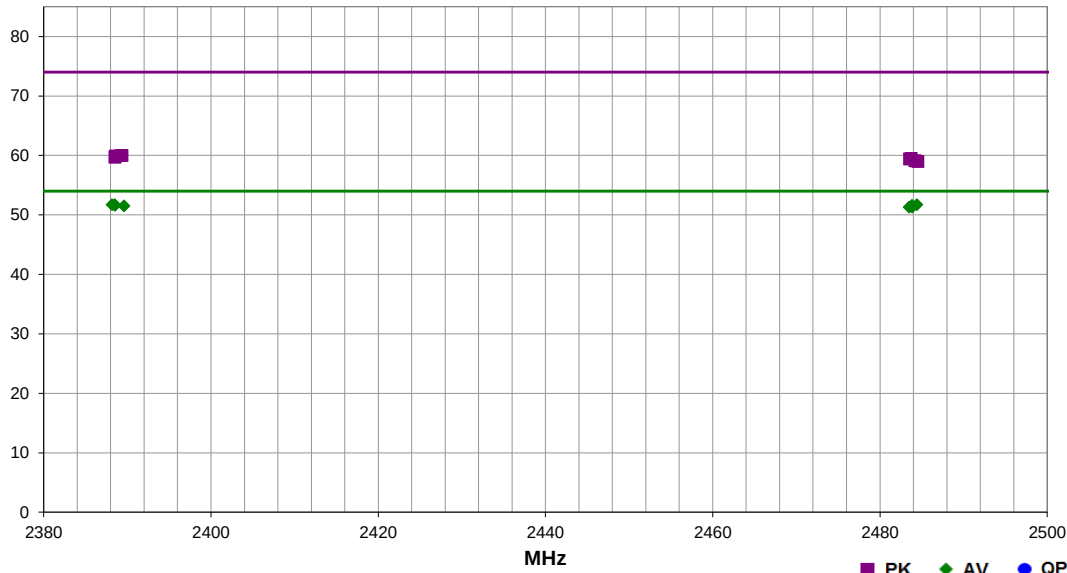


EmiRS 2020.06.24.4 PSA-ESCI 2020.06.24.2

Work Order:	SYNA0317	Date:	2020-11-20	
Project:	None	Temperature:	21.7 °C	
Job Site:	NC01	Humidity:	39.8% RH	
Serial Number:	Rev. 10 - 007	Barometric Pres.:	1032 mbar	
EUT:	RadioNode			
Configuration:	2			
Customer:	Walt Disney Parks and Resorts US, Inc.			
Attendees:	None			
EUT Power:	24VDC via 120VAC/60Hz			
Operating Mode:	BLE Tx, Antenna PN: T24130P10006GT, GFSK, Packet Length = 63, PRBS9, 1 Mbps, Power Setting = -8 dBm, Low Channel = 2402 MHz, High Channel = 2480 MHz.			
Deviations:	None			
Comments:	See comments below for Channel, EUT orientations. The worst case EUT orientations from the previous testing were used. Spot check for worst case harmonic from 0 dBm power setting measurements due to a reduction in power. Port 7 measurements were taken on 1/4/21.			

Test Specifications	Test Method
FCC 15.247:2021	ANSI C63.10:2013

Run #	25	Test Distance (m)	3	Antenna Height(s)	1 to 4(m)	Results	Pass
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Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (dB)	External Attenuation (dB)	Polarity/Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
2484.417	29.3	-0.8	1.5	281.0	3.2	20.0	Vert	AV	0.0	51.7	54.0	-2.3	High Ch., Port 7, EUT on Side, Ant on Side
2388.167	29.1	-0.6	1.5	285.0	3.2	20.0	Horz	AV	0.0	51.7	54.0	-2.3	Low Ch., Port 7, EUT on Side, Ant on Side
2388.487	29.1	-0.6	1.5	0.0	3.2	20.0	Vert	AV	0.0	51.7	54.0	-2.3	Low Ch., Port 7, EUT on Side, Ant on Side
2388.537	29.0	-0.6	1.5	123.0	3.2	20.0	Vert	AV	0.0	51.6	54.0	-2.4	Low Ch., Port 8, EUT on Side, Ant on Side
2483.833	29.2	-0.8	1.5	324.0	3.2	20.0	Horz	AV	0.0	51.6	54.0	-2.4	High Ch., Port 7, EUT on Side, Ant on Side
2389.603	28.9	-0.6	1.3	87.0	3.2	20.0	Horz	AV	0.0	51.5	54.0	-2.5	Low Ch., Port 8, EUT on Side, Ant on Side
2483.857	28.9	-0.8	1.5	328.0	3.2	20.0	Horz	AV	0.0	51.3	54.0	-2.7	High Ch., Port 8, EUT on Side, Ant on Side
2483.500	28.9	-0.8	1.5	159.0	3.2	20.0	Vert	AV	0.0	51.3	54.0	-2.7	High Ch., Port 8, EUT on Side, Ant on Side
2389.250	40.6	-0.6	1.5	285.0	0.0	20.0	Horz	PK	0.0	60.0	74.0	-14.0	Low Ch., Port 7, EUT on Side, Ant on Side

SPURIOUS RADIATED EMISSIONS

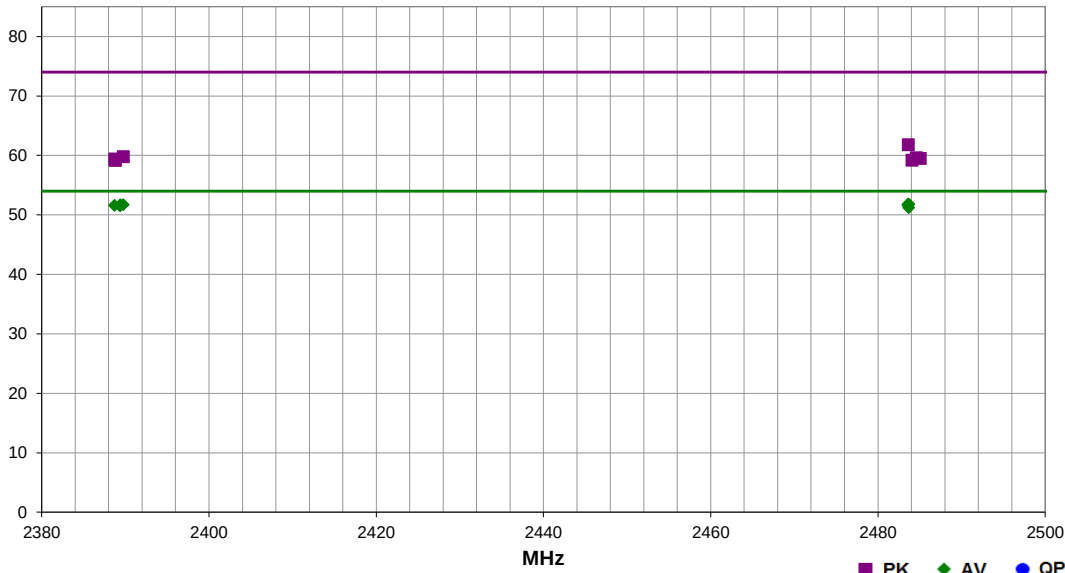


EmiRS 2020.06.24.4 PSA-ESCI 2020.06.24.2

Work Order:	SYNA0317	Date:	2020-11-20	
Project:	None	Temperature:	21.8 °C	
Job Site:	NC01	Humidity:	39.5% RH	
Serial Number:	Rev. 10 - 007	Barometric Pres.:	1032 mbar	
EUT:	RadioNode			
Configuration:	1			
Customer:	Walt Disney Parks and Resorts US, Inc.			
Attendees:	None			
EUT Power:	POE via 120VAC/60Hz			
Operating Mode:	BLE Tx, Antenna PN: T24130P10006GT, GFSK, Packet Length = 63, PRBS9, 1 Mbps, Power Setting = -8 dBm, Low Channel = 2402 MHz, High Channel = 2480 MHz			
Deviations:	None			
Comments:	See comments below for Channel, EUT orientations. The worst case EUT orientations from the previous testing were used. Spot check for worst case harmonic from 0 dBm power setting measurements due to a reduction in power. Port 7 measurements were taken on 1/4/21.			

Test Specifications	Test Method
FCC 15.247:2021	ANSI C63.10:2013

Run #	37	Test Distance (m)	3	Antenna Height(s)	1 to 4(m)	Results	Pass
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Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (dB)	External Attenuation (dB)	Polarity/Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
2483.597	29.4	-0.8	1.5	168.0	3.2	20.0	Horz	AV	0.0	51.8	54.0	-2.2	High Ch., Port 8, EUT on Side, Ant on Side
2483.700	29.4	-0.8	3.4	132.0	3.2	20.0	Vert	AV	0.0	51.8	54.0	-2.2	High Ch., Port 7, EUT on Side, Ant on Side
2389.393	29.1	-0.6	1.5	155.0	3.2	20.0	Horz	AV	0.0	51.7	54.0	-2.3	Low Ch., Port 7, EUT on Side, Ant on Side
2389.750	29.1	-0.6	3.6	195.0	3.2	20.0	Vert	AV	0.0	51.7	54.0	-2.3	Low Ch., Port 7, EUT on Side, Ant on Side
2388.697	29.0	-0.6	1.5	238.0	3.2	20.0	Horz	AV	0.0	51.6	54.0	-2.4	Low Ch., Port 8, EUT on Side, Ant on Side
2483.583	29.2	-0.8	1.5	79.0	3.2	20.0	Horz	AV	0.0	51.6	54.0	-2.4	High Ch., Port 7, EUT on Side, Ant on Side
2389.377	28.9	-0.6	1.5	79.0	3.2	20.0	Vert	AV	0.0	51.5	54.0	-2.5	Low Ch., Port 8, EUT on Side, Ant on Side
2483.693	28.8	-0.8	1.5	126.0	3.2	20.0	Vert	AV	0.0	51.2	54.0	-2.8	High Ch., Port 8, EUT on Side, Ant on Side
2483.623	42.6	-0.8	1.5	168.0	0.0	20.0	Horz	PK	0.0	61.8	74.0	-12.2	High Ch., Port 8, EUT on Side, Ant on Side

SPURIOUS RADIATED EMISSIONS

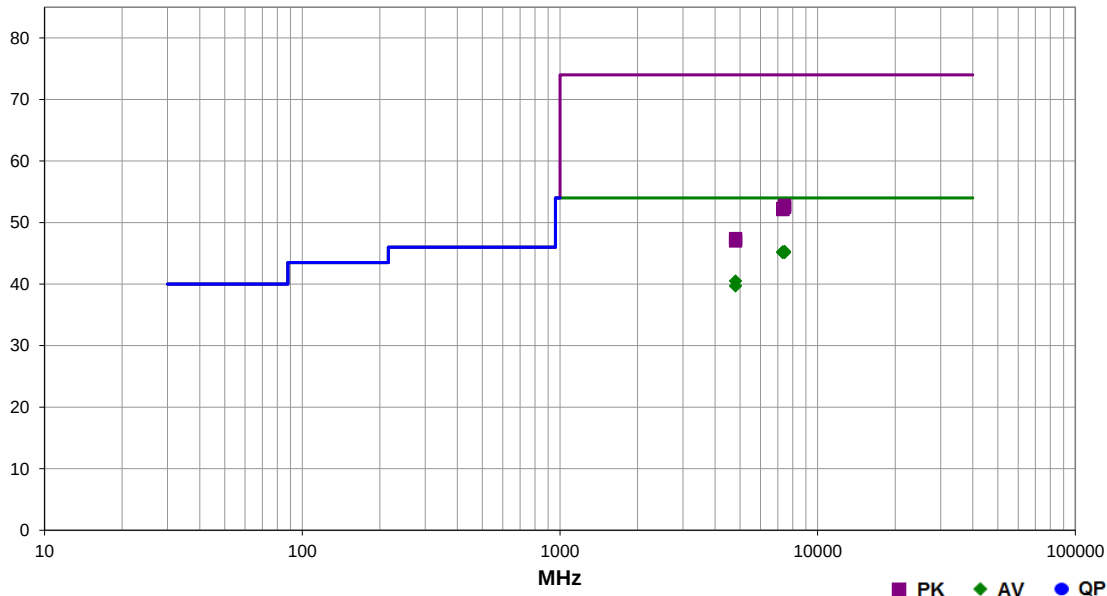


EmiRS 2020.06.24.4 PSA-ESCI 2020.06.24.2

Work Order:	SYNA0317	Date:	2020-11-20	
Project:	None	Temperature:	21.8 °C	
Job Site:	NC01	Humidity:	39.5% RH	
Serial Number:	Rev. 10 - 007	Barometric Pres.:	1032 mbar	Tested by: Brian Fahey
EUT:	RadioNode			
Configuration:	1			
Customer:	Walt Disney Parks and Resorts US, Inc.			
Attendees:	None			
EUT Power:	POE via 120VAC/60Hz			
Operating Mode:	BLE Tx, Antenna PN: T24130P10006GT, GFSK, Packet Length = 63, PRBS9, 1 Mbps, Power Setting = -8 dBm, Low Channel = 2402 MHz, Low Channel = 2402 MHz, Mid Channel = 2442 MHz, High Channel = 2480 MHz.			
Deviations:	None			
Comments:	See comments below for Channel, EUT orientations. The worst case EUT orientations from the previous testing were used. Spot check for worst case harmonic from 0 dBm power setting measurements due to a reduction in power. Port 7 measurements were taken on 1/4/21. The provided test software configured the radio with a duty cycle of 47.8% . Per ANSI C63.10 test methods, the RMS data was corrected with a carrier duty cycle correction factor (DCCF) of 3.2 dB. DCCF (dB) = 10*log(1/0.478).			

Test Specifications	FCC 15.247:2021	Test Method	ANSI C63.10:2013
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Run #	38	Test Distance (m)	3	Antenna Height(s)	1 to 4(m)	Results	Pass
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Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (dB)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
7441.325	27.1	15.0	2.4	348.0	3.2	0.0	Horz	AV	0.0	45.3	54.0	-8.7	High Ch., Port 7, EUT Vert, Ant Vert
7324.583	27.5	14.5	4.0	57.0	3.2	0.0	Vert	AV	0.0	45.2	54.0	-8.8	Mid Ch., Port 8, EUT Vert, Ant Vert
7442.058	27.0	15.0	3.6	271.0	3.2	0.0	Horz	AV	0.0	45.2	54.0	-8.8	High Ch., Port 8, EUT Vert, Ant Vert
7323.508	27.5	14.5	1.1	126.0	3.2	0.0	Vert	AV	0.0	45.2	54.0	-8.8	Mid Ch., Port 7, EUT Vert, Ant Vert
7326.208	27.4	14.5	1.5	64.0	3.2	0.0	Horz	AV	0.0	45.1	54.0	-8.9	Mid Ch., Port 8, EUT Vert, Ant Vert
7442.308	26.9	15.0	1.5	156.0	3.2	0.0	Vert	AV	0.0	45.1	54.0	-8.9	High Ch., Port 8, EUT Vert, Ant Vert
4804.208	27.6	9.7	1.8	121.0	3.2	0.0	Horz	AV	0.0	40.5	54.0	-13.5	Low Ch., Port 8, EUT Vert, Ant Vert
4804.242	26.8	9.7	1.5	187.0	3.2	0.0	Vert	AV	0.0	39.7	54.0	-14.3	Low Ch., Port 8, EUT Vert, Ant Vert
7440.608	37.8	15.0	3.6	271.0	0.0	0.0	Horz	PK	0.0	52.8	74.0	-21.2	High Ch., Port 8, EUT Vert, Ant Vert
7439.133	37.5	15.0	1.5	156.0	0.0	0.0	Vert	PK	0.0	52.5	74.0	-21.5	High Ch., Port 8, EUT Vert, Ant Vert
7438.450	37.5	15.0	2.4	348.0	0.0	0.0	Horz	PK	0.0	52.5	74.0	-21.5	High Ch., Port 7, EUT Vert, Ant Vert
7324.742	37.8	14.5	1.5	64.0	0.0	0.0	Horz	PK	0.0	52.3	74.0	-21.7	Mid Ch., Port 8, EUT Vert, Ant Vert
7323.950	37.7	14.5	1.1	126.0	0.0	0.0	Vert	PK	0.0	52.2	74.0	-21.8	Mid Ch., Port 7, EUT Vert, Ant Vert

SPURIOUS RADIATED EMISSIONS



PSA-ESCI 2020.06.24.2

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data. The test data represents the configuration / operating mode/ model that produced the highest emission levels as compared to the specification limit.

MODES OF OPERATION

Bluetooth LE Tx, Antenna PN: T24190P10006GT, Packet Length = 63, PRBS9, 1 Mbps, Power Setting = 0 dBm, Low Channel = 2402 MHz, Mid Channel = 2442 MHz, High Channel = 2480 MHz.

Bluetooth LE Tx, Antenna PN: T24190P10006GT, Packet Length = 63, PRBS9, 1 Mbps, Power Setting = 0 dBm, Low Channel = 2402 MHz, High Channel = 2480 MHz.

Bluetooth LE Tx, Antenna PN: T24190P10006GT, Packet Length = 63, PRBS9, 1 Mbps, Power Setting = -4 dBm, Low Channel = 2402 MHz, Mid Channel = 2442 MHz, High Channel = 2480 MHz.

Bluetooth LE Tx, Antenna PN: T24190P10006GT, Packet Length = 63, PRBS9, 1 Mbps, Power Setting = -4 dBm, Low Channel = 2402 MHz, High Channel = 2480 MHz.

POWER SETTINGS INVESTIGATED

POE via 120VAC/60Hz

24VDC via 120VAC/60Hz

CONFIGURATIONS INVESTIGATED

SYNA0309 - 18

SYNA0309 - 19

SYNA0317 - 3

SYNA0317 - 4

FREQUENCY RANGE INVESTIGATED

Start Frequency	30 MHz	Stop Frequency	26000 MHz
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SAMPLE CALCULATIONS

Radiated Emissions: Field Strength = Measured Level + Antenna Factor + Cable Factor - Amplifier Gain + Distance Adjustment Factor + External Attenuation

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Antenna - Standard Gain	EMCO	3160-08	AHK	NCR	0 mo
Antenna - Standard Gain	ETS Lindgren	3160-07	AHX	NCR	0 mo
Antenna - Double Ridge	ETS Lindgren	3115	AIR	2020-07-07	24 mo
Antenna - Double Ridge	A.H. Systems, Inc.	SAS-574	AXV	2020-06-03	24 mo
Amplifier - Pre-Amplifier	Miteq	AMF-3D-00100800-32-13P	AVJ	2020-03-02	12 mo
Amplifier - Pre-Amplifier	Miteq	AMF-6F-08001200-30-10P	AVL	2020-03-02	12 mo
Amplifier - Pre-Amplifier	Miteq	AMF-6F-12001800-30-10P	AVP	2020-03-02	12 mo
Antenna - Biconilog	EMCO	3142	AXB	2020-04-15	24 mo
Cable	D-Coax	None	OC4	2019-12-16	12 mo
Cable	ESM Cable Corp.	30-1GHz cables	OCW	2020-05-01	12 mo
Cable	ESM Cable Corp.	1-8GHz cables	OCX	2020-03-02	12 mo
Cable	ESM Cable Corp.	8-18GHz cables	OCY	2020-03-02	12 mo
Amplifier - Pre-Amplifier	Miteq	AM-1616-1000	PAD	2020-07-01	12 mo
Amplifier - Pre-Amplifier	Miteq	JSDWK42-18004000-60-5P	PAN	2019-12-16	12 mo
Filter - High Pass	Micro-Tronics	HPM50111	HGC	2020-03-11	12 mo
Filter - Low Pass	Micro-Tronics	LPM50004	HGK	2020-01-20	12 mo
Attenuator	S.M. Electronics	SA6-20	REO	2020-01-21	12 mo
Antenna - Standard Gain	EMCO	3160-08	AHO	NCR	0 mo
Cable	High Speed Interconnects	EW292A-NGNG-300	NC3	2020-08-28	12 mo
Amplifier - Pre-Amplifier	Miteq	AMF-6F-08001200-30-10P	AOK	2020-08-26	12 mo
Antenna - Standard Gain	EMCO	3160-07	AHP	NCR	0 mo
Filter - High Pass	Micro-Tronics	HPM50111	HHI	2020-09-25	12 mo
Attenuator	Fairview Microwave	SA18E-20	AQV	2020-07-28	12 mo
Cable	Northwest EMC	3115 Horn Cable	NC2	2020-04-20	12 mo
Amplifier - Pre-Amplifier	Miteq	AMF-3D-00100800-32-13P	AVZ	2020-04-20	12 mo
Antenna - Double Ridge	EMCO	3115	AHM	2020-07-01	24 mo
Antenna - Biconilog	Teseq	CBL 6141B	AYL	2019-09-25	24 mo
Analyzer - Spectrum Analyzer	Agilent	E4440A	AAX	2020-04-15	12 mo

SPURIOUS RADIATED EMISSIONS



PSA-ESCI 2020.06.24.2

TEST DESCRIPTION

The highest gain antenna of each type to be used with the EUT was tested. The EUT was configured for the required transmit frequencies and the modes as showed in the data sheets.

For each configuration, the spectrum was scanned throughout the specified range as part of the exploratory investigation of the emissions. These "pre-scans" are not included in the report. Final measurements on individual emissions were then made and included in this test report.

The individual emissions from the EUT were maximized by rotating the EUT on a turntable, adjusting the position of the EUT and EUT antenna in three orthogonal axis if required, and adjusting the measurement antenna height and polarization (per ANSI C63.10). A preamp and high pass filter (and notch filter) were used for this test in order to provide sufficient measurement sensitivity.

Measurements were made with the required detectors and annotated on the data for each individual point using the following annotation:

QP = Quasi-Peak Detector
PK = Peak Detector
AV = RMS Detector

Measurements were made to satisfy the specific requirements of the test specification for out of band emissions as well as the restricted band requirements.

If there are no detectable emissions above the noise floor, the data included may show noise floor measurements for reference only.

Measurements within 2 MHz of the allowable band may have been taken using the integration method from ANSI C63.10 clause 11.13.3. This procedure uses the channel power feature of the spectrum analyzer to integrate the power of the emission within a 1 MHz bandwidth.

Where the radio test software does not provide for a duty cycle at continuous transmit conditions (> 98%) and the RMS (power average) measurements were made across the on and off times of the EUT transmissions, a duty cycle correction is added to the measurements using the formula of $10 \cdot \log(1/dc)$.

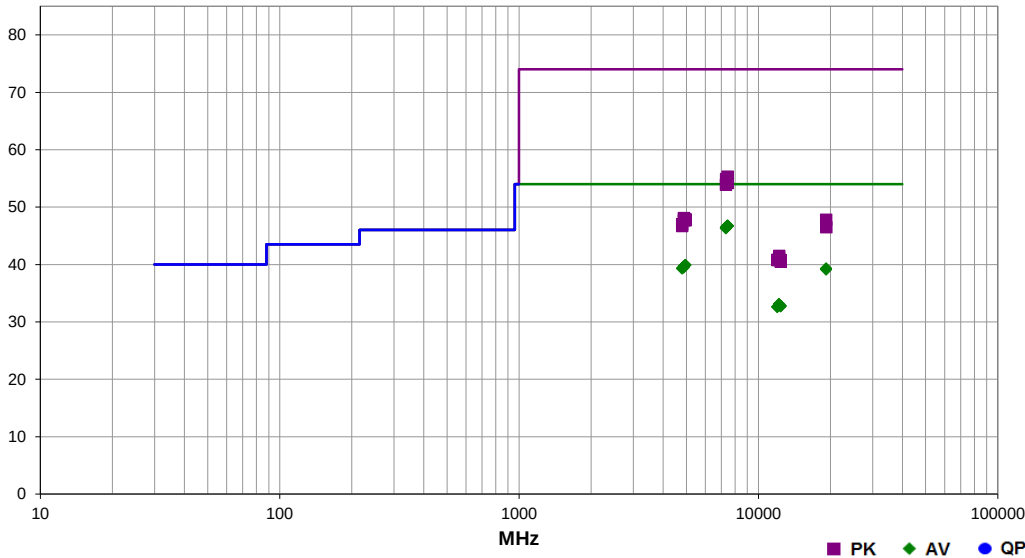
SPURIOUS RADIATED EMISSIONS



Work Order:	SYNA0309	Date:	2020-10-28	
Project:	None	Temperature:	20 °C	
Job Site:	OC07	Humidity:	33.6% RH	
Serial Number:	Rev. 10 - 012	Barometric Pres.:	1021 mbar	
EUT:	RadioNode			
Configuration:	19			
Customer:	Walt Disney Parks and Resorts US, Inc.			
Attendees:	None			
EUT Power:	POE via 120VAC/60Hz			
Operating Mode:	Bluetooth LE Tx, Antenna PN: T24190P10006GT, Packet Length = 63, PRBS9, 1 Mbps, Power Setting = 0 dBm, Low Channel = 2402 MHz, Mid Channel = 2442 MHz, High Channel = 2480 MHz.			
Deviations:	None			
Comments:	See comments below for Channel, EUT orientations. The provided test software configured the radio with a duty cycle of 47.8% . Per ANSI C63.10 test methods, the RMS data was corrected with a carrier duty cycle correction factor (DCCF) of 3.2 dB. $DCCF\ (dB) = 10 \cdot \log(1/0.478)$			

Test Specifications	FCC 15.247:2020	Test Method	ANSI C63.10:2013
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Run #	140	Test Distance (m)	3	Antenna Height(s)	1 to 4(m)	Results	Pass
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Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (dB)	External Attenuation (dB)	Polarity/Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
7440.500	31.4	12.2	3.3	19.0	3.2	0.0	Vert	AV	0.0	46.8	54.0	-7.2	High Ch, Port 8, EUT Horz, Antenna Horz
7440.108	31.3	12.2	3.4	92.0	3.2	0.0	Horz	AV	0.0	46.7	54.0	-7.3	High Ch, Port 8, EUT Vert, Antenna Vert
7441.350	31.3	12.2	2.3	360.0	3.2	0.0	Vert	AV	0.0	46.7	54.0	-7.3	High Ch, Port 8, EUT Vert, Antenna Vert
7438.783	31.3	12.2	1.5	291.0	3.2	0.0	Horz	AV	0.0	46.7	54.0	-7.3	High Ch, Port 8, EUT On Side, Antenna On Side
7437.642	31.3	12.2	1.2	183.0	3.2	0.0	Vert	AV	0.0	46.7	54.0	-7.3	High Ch, Port 8, EUT On Side, Antenna On Side
7438.383	31.3	12.2	1.5	49.0	3.2	0.0	Horz	AV	0.0	46.7	54.0	-7.3	High Ch, Port 8, EUT Horz, Antenna Horz
7323.967	31.6	11.7	1.8	215.0	3.2	0.0	Vert	AV	0.0	46.5	54.0	-7.5	Mid Ch, Port 8, EUT Horz, Antenna Horz
7325.833	31.4	11.7	2.3	345.0	3.2	0.0	Horz	AV	0.0	46.3	54.0	-7.7	Mid Ch, Port 8, EUT Vert, Antenna Vert
4957.700	32.3	4.4	1.5	38.0	3.2	0.0	Vert	AV	0.0	39.9	54.0	-14.1	High Ch, Port 8, EUT Horz, Antenna Horz
4957.608	32.3	4.4	1.5	87.0	3.2	0.0	Horz	AV	0.0	39.9	54.0	-14.1	High Ch, Port 8, EUT Vert, Antenna Vert
4886.217	32.4	4.1	1.5	322.0	3.2	0.0	Vert	AV	0.0	39.7	54.0	-14.3	Mid Ch, Port 8, EUT Horz, Antenna Horz
4884.225	32.2	4.1	1.5	203.0	3.2	0.0	Horz	AV	0.0	39.5	54.0	-14.5	Mid Ch, Port 8, EUT Vert, Antenna Vert
4803.183	32.1	4.0	1.5	269.0	3.2	0.0	Vert	AV	0.0	39.3	54.0	-14.7	Low Ch, Port 8, EUT Horz, Antenna Horz
4806.367	32.1	4.0	1.5	310.0	3.2	0.0	Horz	AV	0.0	39.3	54.0	-14.7	Low Ch, Port 8, EUT Vert, Antenna Vert
19215.810	45.0	-8.9	1.5	239.0	3.2	0.0	Horz	AV	0.0	39.3	54.0	-14.7	Low Ch, Port 8, EUT Vert, Antenna Vert
19213.890	44.8	-8.9	1.5	12.0	3.2	0.0	Vert	AV	0.0	39.1	54.0	-14.9	Low Ch, Port 8, EUT Horz, Antenna Horz
7437.642	43.1	12.2	3.3	19.0	0.0	0.0	Vert	PK	0.0	55.3	74.0	-18.7	High Ch, Port 8, EUT Horz, Antenna Horz
7441.950	42.6	12.3	2.3	360.0	0.0	0.0	Vert	PK	0.0	54.9	74.0	-19.1	High Ch, Port 8, EUT Vert, Antenna Vert
7327.425	43.2	11.7	1.8	215.0	0.0	0.0	Vert	PK	0.0	54.9	74.0	-19.1	Mid Ch, Port 8, EUT Horz, Antenna Horz
7442.450	42.5	12.3	1.5	49.0	0.0	0.0	Horz	PK	0.0	54.8	74.0	-19.2	High Ch, Port 8, EUT Vert, Antenna Vert
7441.317	42.4	12.2	1.2	183.0	0.0	0.0	Vert	PK	0.0	54.6	74.0	-19.4	High Ch, Port 8, EUT On Side, Antenna On Side
7439.675	42.1	12.2	1.5	291.0	0.0	0.0	Horz	PK	0.0	54.3	74.0	-19.7	High Ch, Port 8, EUT On Side, Antenna On Side
7440.817	42.0	12.2	3.4	92.0	0.0	0.0	Horz	PK	0.0	54.2	74.0	-19.8	High Ch, Port 8, EUT Vert, Antenna Vert
7323.792	42.2	11.7	2.3	345.0	0.0	0.0	Horz	PK	0.0	53.9	74.0	-20.1	Mid Ch, Port 8, EUT Vert, Antenna Vert
12208.410	32.8	-2.9	1.0	203.0	3.2	0.0	Vert	AV	0.0	33.1	54.0	-20.9	Mid Ch, Port 8, EUT Horz, Antenna Horz
12207.900	32.7	-2.9	1.5	265.0	3.2	0.0	Horz	AV	0.0	33.0	54.0	-21.0	Mid Ch, Port 8, EUT Vert, Antenna Vert
12397.590	31.7	-2.1	1.5	319.0	3.2	0.0	Vert	AV	0.0	32.8	54.0	-21.2	High Ch, Port 8, EUT Vert, Antenna Horz
12398.180	31.6	-2.1	1.5	122.0	3.2	0.0	Horz	AV	0.0	32.7	54.0	-21.3	High Ch, Port 8, EUT Vert, Antenna Vert
12008.130	33.2	-3.8	3.5	82.0	3.2	0.0	Horz	AV	0.0	32.6	54.0	-21.4	Low Ch, Port 8, EUT Vert, Antenna Vert
12008.100	33.2	-3.8	3.7	356.0	3.2	0.0	Vert	AV	0.0	32.6	54.0	-21.4	Low Ch, Port 8, EUT Horz, Antenna Horz
4883.583	44.0	4.1	1.5	322.0	0.0	0.0	Vert	PK	0.0	48.1	74.0	-25.9	Mid Ch, Port 8, EUT Horz, Antenna Horz

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (dB)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
4960.342	43.5	4.4	1.5	38.0	0.0	0.0	Vert	PK	0.0	47.9	74.0	-26.1	High Ch, Port 8, EUT Horz, Antenna Horz
19215.170	56.7	-8.9	1.5	239.0	0.0	0.0	Horz	PK	0.0	47.8	74.0	-26.2	Low Ch, Port 8, EUT Vert, Antenna Vert
4960.942	43.3	4.4	1.5	87.0	0.0	0.0	Horz	PK	0.0	47.7	74.0	-26.3	High Ch, Port 8, EUT Vert, Antenna Vert
4886.167	43.6	4.1	1.5	203.0	0.0	0.0	Horz	PK	0.0	47.7	74.0	-26.3	Mid Ch, Port 8, EUT Vert, Antenna Vert
4801.742	43.0	4.0	1.5	269.0	0.0	0.0	Vert	PK	0.0	47.0	74.0	-27.0	Low Ch, Port 8, EUT Horz, Antenna Horz
4805.708	42.7	4.0	1.5	310.0	0.0	0.0	Horz	PK	0.0	46.7	74.0	-27.3	Low Ch, Port 8, EUT Vert, Antenna Vert
19217.820	55.4	-8.9	1.5	12.0	0.0	0.0	Vert	PK	0.0	46.5	74.0	-27.5	Low Ch, Port 8, EUT Horz, Antenna Horz
12210.560	44.4	-2.9	1.0	203.0	0.0	0.0	Vert	PK	0.0	41.5	74.0	-32.5	Mid Ch, Port 8, EUT Horz, Antenna Horz
12212.230	44.0	-2.9	1.5	265.0	0.0	0.0	Horz	PK	0.0	41.1	74.0	-32.9	Mid Ch, Port 8, EUT Vert, Antenna Vert
12011.610	44.5	-3.7	3.5	82.0	0.0	0.0	Horz	PK	0.0	40.8	74.0	-33.2	Low Ch, Port 8, EUT Vert, Antenna Vert
12007.670	44.6	-3.8	3.7	356.0	0.0	0.0	Vert	PK	0.0	40.8	74.0	-33.2	Low Ch, Port 8, EUT Horz, Antenna Horz
12398.600	42.8	-2.1	1.5	319.0	0.0	0.0	Vert	PK	0.0	40.7	74.0	-33.3	High Ch, Port 8, EUT Horz, Antenna Horz
12398.430	42.6	-2.1	1.5	122.0	0.0	0.0	Horz	PK	0.0	40.5	74.0	-33.5	High Ch, Port 8, EUT Vert, Antenna Vert

SPURIOUS RADIATED EMISSIONS

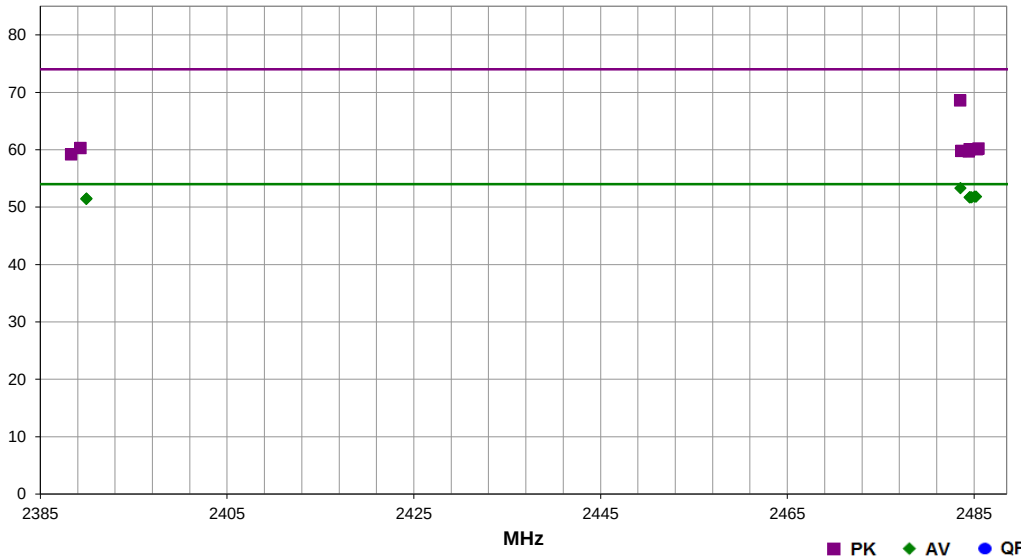


EmRS 2020.06.24.4 PSA-ESCI 2020.06.24.2

Work Order:	SYNA0309	Date:	2020-10-29	
Project:	None	Temperature:	19.5 °C	
Job Site:	OC07	Humidity:	41.8% RH	
Serial Number:	Rev. 10 - 012	Barometric Pres.:	1019 mbar	
EUT:	RadioNode			
Configuration:	19			
Customer:	Walt Disney Parks and Resorts US, Inc.			
Attendees:	None			
EUT Power:	POE via 120VAC/60Hz			
Operating Mode:	Bluetooth LE Tx, Antenna PN: T24190P10006GT, Packet Length = 63, PRBS9, 1 Mbps, Power Setting = 0 dBm, Low Channel = 2402 MHz, High Channel = 2480 MHz.			
Deviations:	None			
Comments:	See comments below for Channel, EUT orientations. The provided test software configured the radio with a duty cycle of 47.8% . Per ANSI C63.10 test methods, the RMS data was corrected with a carrier duty cycle correction factor (DCCF) of 3.2 dB. DCCF (dB) = 10*log(1/0.478)			

Test Specifications	Test Method
FCC 15.247:2020	ANSI C63.10:2013

Run #	142	Test Distance (m)	3	Antenna Height(s)	1 to 4(m)	Results	Pass
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Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (dB)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
2483.553	34.3	-4.2	1.5	196.0	3.2	20.0	Horz	AV	0.0	53.3	54.0	-0.7	High Ch, Port 8, EUT On Side, Antenna On Side
2485.220	32.7	-4.1	1.5	254.0	3.2	20.0	Vert	AV	0.0	51.8	54.0	-2.2	High Ch, Port 8, EUT Vert, Antenna Vert
2485.070	32.7	-4.1	1.1	117.0	3.2	20.0	Vert	AV	0.0	51.8	54.0	-2.2	High Ch, Port 8, EUT On Side, Antenna On Side
2484.533	32.7	-4.2	1.5	198.0	3.2	20.0	Horz	AV	0.0	51.7	54.0	-2.3	High Ch, Port 8, EUT Vert, Antenna Vert
2484.580	32.7	-4.2	1.5	20.0	3.2	20.0	Horz	AV	0.0	51.7	54.0	-2.3	High Ch, Port 8, EUT Horz, Antenna Horz
2484.753	32.7	-4.2	1.3	243.0	3.2	20.0	Vert	AV	0.0	51.7	54.0	-2.3	High Ch, Port 8, EUT Horz, Antenna Horz
2389.957	33.0	-4.7	1.5	205.0	3.2	20.0	Vert	AV	0.0	51.5	54.0	-2.5	Low Ch, Port 8, EUT Vert, Antenna Vert
2389.923	32.9	-4.7	2.2	123.0	3.2	20.0	Horz	AV	0.0	51.4	54.0	-2.6	Low Ch, Port 8, EUT On Side, Antenna On Side
2483.513	52.8	-4.2	1.5	196.0	0.0	20.0	Horz	PK	0.0	68.6	74.0	-5.4	High Ch, Port 8, EUT On Side, Antenna On Side
2389.293	45.0	-4.7	1.5	205.0	0.0	20.0	Vert	PK	0.0	60.3	74.0	-13.7	Low Ch, Port 8, EUT Vert, Antenna Vert
2485.480	44.3	-4.1	1.5	254.0	0.0	20.0	Vert	PK	0.0	60.2	74.0	-13.8	High Ch, Port 8, EUT Vert, Antenna Vert
2485.307	44.2	-4.1	1.1	117.0	0.0	20.0	Vert	PK	0.0	60.1	74.0	-13.9	High Ch, Port 8, EUT On Side, Antenna On Side
2484.530	44.3	-4.2	1.3	243.0	0.0	20.0	Vert	PK	0.0	60.1	74.0	-13.9	High Ch, Port 8, EUT Horz, Antenna Horz
2483.630	44.0	-4.2	1.5	198.0	0.0	20.0	Horz	PK	0.0	59.8	74.0	-14.2	High Ch, Port 8, EUT Vert, Antenna Vert
2484.443	43.9	-4.2	1.5	20.0	0.0	20.0	Horz	PK	0.0	59.7	74.0	-14.3	High Ch, Port 8, EUT Horz, Antenna Horz
2388.293	43.9	-4.7	2.2	123.0	0.0	20.0	Horz	PK	0.0	59.2	74.0	-14.8	Low Ch, Port 8, EUT On Side, Antenna On Side

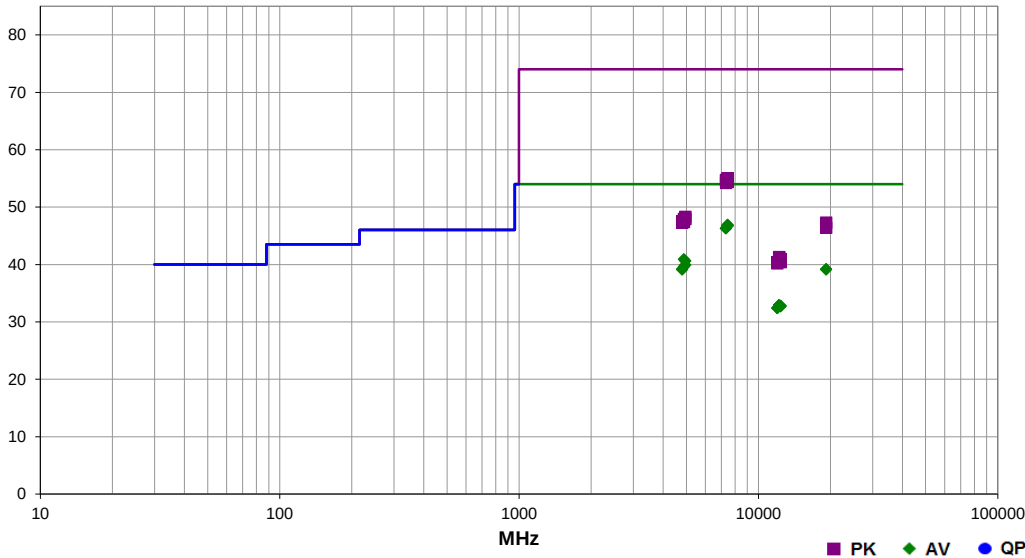
SPURIOUS RADIATED EMISSIONS



Work Order:	SYNA0309	Date:	2020-10-28	
Project:	None	Temperature:	19.7 °C	
Job Site:	OC07	Humidity:	32.5% RH	
Serial Number:	Rev. 10 - 012	Barometric Pres.:	1021 mbar	
EUT:	RadioNode			Tested by: Nolan De Ramos
Configuration:	18			
Customer:	Walt Disney Parks and Resorts US, Inc.			
Attendees:	None			
EUT Power:	24VDC			
Operating Mode:	Bluetooth LE Tx, Antenna PN: T24190P10006GT, Packet Length = 63, PRBS9, 1 Mbps, Power Setting = 0 dBm, Low Channel = 2402 MHz, Mid Channel = 2442 MHz, High Channel = 2480 MHz.			
Deviations:	None			
Comments:	See comments below for Channel, EUT orientations. The provided test software configured the radio with a duty cycle of 47.8% . Per ANSI C63.10 test methods, the RMS data was corrected with a carrier duty cycle correction factor (DCCF) of 3.2 dB. DCCF (dB) = 10*log(1/0.478)			

Test Specifications	Test Method
FCC 15.247:2020	ANSI C63.10:2013

Run #	119	Test Distance (m)	3	Antenna Height(s)	1 to 4(m)	Results	Pass
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Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (dB)	External Attenuation (dB)	Polarity/Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
7439.833	31.5	12.2	1.5	143.0	3.2	0.0	Horz	AV	0.0	46.9	54.0	-7.1	High Ch, Port 8, EUT Vert, Antenna Vert
7438.693	31.4	12.2	1.2	258.0	3.2	0.0	Vert	AV	0.0	46.8	54.0	-7.2	High Ch, Port 8, EUT Vert, Antenna Vert
7439.887	31.4	12.2	1.5	215.0	3.2	0.0	Horz	AV	0.0	46.8	54.0	-7.2	High Ch, Port 8, EUT On Side, Antenna On Side
7440.573	31.4	12.2	2.3	131.0	3.2	0.0	Vert	AV	0.0	46.8	54.0	-7.2	High Ch, Port 8, EUT On Side, Antenna On Side
7438.613	31.4	12.2	1.5	96.0	3.2	0.0	Vert	AV	0.0	46.8	54.0	-7.2	High Ch, Port 8, EUT Horz, Antenna Horz
7439.880	31.3	12.2	3.6	289.0	3.2	0.0	Horz	AV	0.0	46.7	54.0	-7.3	High Ch, Port 8, EUT Horz, Antenna Horz
7324.187	31.4	11.7	1.5	267.0	3.2	0.0	Horz	AV	0.0	46.3	54.0	-7.7	Mid Ch, Port 8, EUT Vert, Antenna Vert
7324.813	31.4	11.7	1.5	301.0	3.2	0.0	Vert	AV	0.0	46.3	54.0	-7.7	Mid Ch, Port 8, EUT Vert, Antenna Vert
4883.887	33.6	4.1	1.6	153.0	3.2	0.0	Horz	AV	0.0	40.9	54.0	-13.1	Mid Ch, Port 8, EUT Vert, Antenna Vert
4960.120	33.0	4.4	1.5	151.0	3.2	0.0	Horz	AV	0.0	40.6	54.0	-13.4	High Ch, Port 8, EUT Vert, Antenna Vert
4958.267	32.3	4.4	3.2	213.0	3.2	0.0	Vert	AV	0.0	39.9	54.0	-14.1	High Ch, Port 8, EUT Vert, Antenna Vert
4885.807	32.3	4.1	3.0	110.0	3.2	0.0	Vert	AV	0.0	39.6	54.0	-14.4	Mid Ch, Port 8, EUT Vert, Antenna Vert
4805.733	32.0	4.0	1.5	275.0	3.2	0.0	Vert	AV	0.0	39.2	54.0	-14.8	Low Ch, Port 8, EUT Vert, Antenna Vert
19213.600	44.9	-8.9	1.5	306.0	3.2	0.0	Vert	AV	0.0	39.2	54.0	-14.8	Low Ch, Port 8, EUT Horz, Antenna Horz
4802.327	31.9	4.0	3.4	342.0	3.2	0.0	Horz	AV	0.0	39.1	54.0	-14.9	Low Ch, Port 8, EUT Vert, Antenna Vert
19214.380	44.8	-8.9	1.5	195.0	3.2	0.0	Horz	AV	0.0	39.1	54.0	-14.9	Low Ch, Port 8, EUT Vert, Antenna Vert
7439.027	42.8	12.2	3.6	289.0	0.0	0.0	Horz	PK	0.0	55.0	74.0	-19.0	High Ch, Port 8, EUT Horz, Antenna Horz
7438.887	42.8	12.2	1.5	96.0	0.0	0.0	Vert	PK	0.0	55.0	74.0	-19.0	High Ch, Port 8, EUT Horz, Antenna Horz
7438.800	42.6	12.2	1.5	143.0	0.0	0.0	Horz	PK	0.0	54.8	74.0	-19.2	High Ch, Port 8, EUT Vert, Antenna Vert
7441.000	42.6	12.2	1.2	258.0	0.0	0.0	Vert	PK	0.0	54.8	74.0	-19.2	High Ch, Port 8, EUT Vert, Antenna Vert
7325.020	43.0	11.7	1.5	267.0	0.0	0.0	Horz	PK	0.0	54.7	74.0	-19.3	Mid Ch, Port 8, EUT Vert, Antenna Vert
7439.780	42.3	12.2	1.5	215.0	0.0	0.0	Horz	PK	0.0	54.5	74.0	-19.5	High Ch, Port 8, EUT On Side, Antenna On Side
7439.380	42.2	12.2	2.3	131.0	0.0	0.0	Vert	PK	0.0	54.4	74.0	-19.6	High Ch, Port 8, EUT On Side, Antenna On Side
7327.240	42.5	11.7	1.5	301.0	0.0	0.0	Vert	PK	0.0	54.2	74.0	-19.8	Mid Ch, Port 8, EUT Vert, Antenna Vert
12208.220	32.6	-2.9	1.5	121.0	3.2	0.0	Horz	AV	0.0	32.9	54.0	-21.1	Mid Ch, Port 8, EUT Vert, Antenna Vert
12208.240	32.6	-2.9	1.5	128.0	3.2	0.0	Vert	AV	0.0	32.9	54.0	-21.1	Mid Ch, Port 8, EUT Vert, Antenna Vert
12398.720	31.7	-2.1	3.9	307.0	3.2	0.0	Horz	AV	0.0	32.8	54.0	-21.2	High Ch, Port 8, EUT Vert, Antenna Vert
12398.210	31.6	-2.1	1.5	258.0	3.2	0.0	Vert	AV	0.0	32.7	54.0	-21.3	High Ch, Port 8, EUT Vert, Antenna Vert
12008.090	33.0	-3.8	1.5	13.0	3.2	0.0	Horz	AV	0.0	32.4	54.0	-21.6	Low Ch, Port 8, EUT Vert, Antenna Vert
12008.190	33.0	-3.8	1.5	67.0	3.2	0.0	Vert	AV	0.0	32.4	54.0	-21.6	Low Ch, Port 8, EUT Vert, Antenna Vert
4959.513	43.9	4.4	1.5	151.0	0.0	0.0	Horz	PK	0.0	48.3	74.0	-25.7	High Ch, Port 8, EUT Vert, Antenna Vert

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (dB)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
4959.420	43.5	4.4	3.2	213.0	0.0	0.0	Vert	PK	0.0	47.9	74.0	-26.1	High Ch, Port 8, EUT Vert, Antenna Vert
4883.933	43.8	4.1	1.6	153.0	0.0	0.0	Horz	PK	0.0	47.9	74.0	-26.1	Mid Ch, Port 8, EUT Vert, Antenna Vert
4802.580	43.5	4.0	3.4	342.0	0.0	0.0	Horz	PK	0.0	47.5	74.0	-26.5	Low Ch, Port 8, EUT Vert, Antenna Vert
4882.533	43.3	4.1	3.0	110.0	0.0	0.0	Vert	PK	0.0	47.4	74.0	-26.6	Mid Ch, Port 8, EUT Vert, Antenna Vert
4802.600	43.3	4.0	1.5	275.0	0.0	0.0	Vert	PK	0.0	47.3	74.0	-26.7	Low Ch, Port 8, EUT Vert, Antenna Vert
19214.070	56.2	-8.9	1.5	306.0	0.0	0.0	Vert	PK	0.0	47.3	74.0	-26.7	Low Ch, Port 8, EUT Horz, Antenna Horz
19213.730	55.3	-8.9	1.5	195.0	0.0	0.0	Horz	PK	0.0	46.4	74.0	-27.6	Low Ch, Port 8, EUT Vert, Antenna Vert
12211.530	44.2	-2.9	1.5	121.0	0.0	0.0	Horz	PK	0.0	41.3	74.0	-32.7	Mid Ch, Port 8, EUT Vert, Antenna Vert
12209.250	44.1	-2.9	1.5	128.0	0.0	0.0	Vert	PK	0.0	41.2	74.0	-32.8	Mid Ch, Port 8, EUT Vert, Antenna Vert
12398.150	43.0	-2.1	3.9	307.0	0.0	0.0	Horz	PK	0.0	40.9	74.0	-33.1	High Ch, Port 8, EUT Vert, Antenna Vert
12009.680	44.2	-3.8	1.5	67.0	0.0	0.0	Vert	PK	0.0	40.4	74.0	-33.6	Low Ch, Port 8, EUT Vert, Antenna Vert
12399.290	42.5	-2.1	1.5	258.0	0.0	0.0	Vert	PK	0.0	40.4	74.0	-33.6	High Ch, Port 8, EUT Vert, Antenna Vert
12009.900	44.0	-3.8	1.5	13.0	0.0	0.0	Horz	PK	0.0	40.2	74.0	-33.8	Low Ch, Port 8, EUT Vert, Antenna Vert

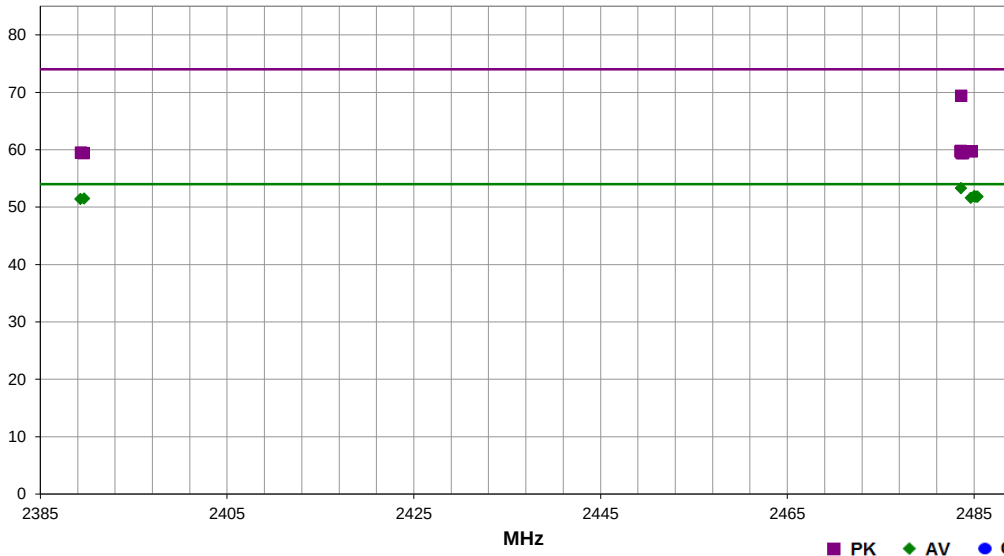
SPURIOUS RADIATED EMISSIONS



EmRS 2020.06.24.4					PSA-ESCI 2020.06.24
Work Order:	SYNA0309	Date:	2020-10-28		
Project:	None	Temperature:	19.7 °C		
Job Site:	OC07	Humidity:	32.5% RH		
Serial Number:	Rev. 10 - 012	Barometric Pres.:	1021 mbar	Tested by: Nolan De Ramos	
EUT:	RadioNode				
Configuration:	18				
Customer:	Walt Disney Parks and Resorts US, Inc.				
Attendees:	None				
EUT Power:	24VDC				
Operating Mode:	Bluetooth LE Tx, Antenna PN: T24190P10006GT, Packet Length = 63, PRBS9, 1 Mbps, Power Setting = -0dBm, Low Channel = 2402 MHz, High Channel = 2480 MHz.				
Deviations:	None				
Comments:	See comments below for Channel, EUT orientations. The provided test software configured the radio with a duty cycle of 47.8% . Per ANSI C63.10 test methods, the RMS data was corrected with a carrier duty cycle correction factor (DCCF) of 3.2 dB. DCCF (dB) = 10*log(1/0.478)				

Test Specifications	FCC 15.247:2020	Test Method	ANSI C63.10:2013
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Run #	121	Test Distance (m)	3	Antenna Height(s)	1 to 4(m)	Results	Pass
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Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (dB)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
2483.603	34.3	-4.2	1.6	199.0	3.2	20.0	Horz	AV	0.0	53.3	54.0	-0.7	High Ch, Port 8, EUT On Side, Antenna On Side
2485.017	32.8	-4.1	1.5	288.0	3.2	20.0	Horz	AV	0.0	51.9	54.0	-2.1	High Ch, Port 8, EUT Vert, Antenna Vert
2485.247	32.7	-4.1	1.5	342.0	3.2	20.0	Vert	AV	0.0	51.8	54.0	-2.2	High Ch, Port 8, EUT Vert, Antenna Vert
2485.113	32.7	-4.1	1.5	0.0	3.2	20.0	Vert	AV	0.0	51.8	54.0	-2.2	High Ch, Port 8, EUT On Side, Antenna On Side
2485.380	32.7	-4.1	1.5	165.0	3.2	20.0	Horz	AV	0.0	51.8	54.0	-2.2	High Ch, Port 8, EUT Horz, Antenna On Horz
2484.653	32.6	-4.2	3.6	87.0	3.2	20.0	Vert	AV	0.0	51.6	54.0	-2.4	High Ch, Port 8, EUT Horz, Antenna On Horz
2389.690	33.0	-4.7	1.2	78.0	3.2	20.0	Vert	AV	0.0	51.5	54.0	-2.5	Low Ch, Port 8, EUT On Side, Antenna On Side
2389.287	32.9	-4.7	1.2	222.0	3.2	20.0	Horz	AV	0.0	51.4	54.0	-2.6	Low Ch, Port 8, EUT On Side, Antenna On Side
2483.620	53.6	-4.2	1.6	199.0	0.0	20.0	Horz	PK	0.0	69.4	74.0	-4.6	High Ch, Port 8, EUT On Side, Antenna On Side
2483.583	44.0	-4.2	1.5	288.0	0.0	20.0	Horz	PK	0.0	59.8	74.0	-14.2	High Ch, Port 8, EUT Vert, Antenna Vert
2483.547	43.9	-4.2	1.5	0.0	0.0	20.0	Vert	PK	0.0	59.7	74.0	-14.3	High Ch, Port 8, EUT On Side, Antenna On Side
2484.747	43.9	-4.2	1.5	165.0	0.0	20.0	Horz	PK	0.0	59.7	74.0	-14.3	High Ch, Port 8, EUT Horz, Antenna On Horz
2389.350	44.2	-4.7	1.2	78.0	0.0	20.0	Vert	PK	0.0	59.5	74.0	-14.5	Low Ch, Port 8, EUT On Side, Antenna On Side
2483.667	43.6	-4.2	1.5	342.0	0.0	20.0	Vert	PK	0.0	59.4	74.0	-14.6	High Ch, Port 8, EUT Vert, Antenna Vert
2483.827	43.6	-4.2	3.6	87.0	0.0	20.0	Vert	PK	0.0	59.4	74.0	-14.6	High Ch, Port 8, EUT Horz, Antenna On Horz
2389.633	44.1	-4.7	1.2	222.0	0.0	20.0	Horz	PK	0.0	59.4	74.0	-14.6	Low Ch, Port 8, EUT On Side, Antenna On Side

SPURIOUS RADIATED EMISSIONS

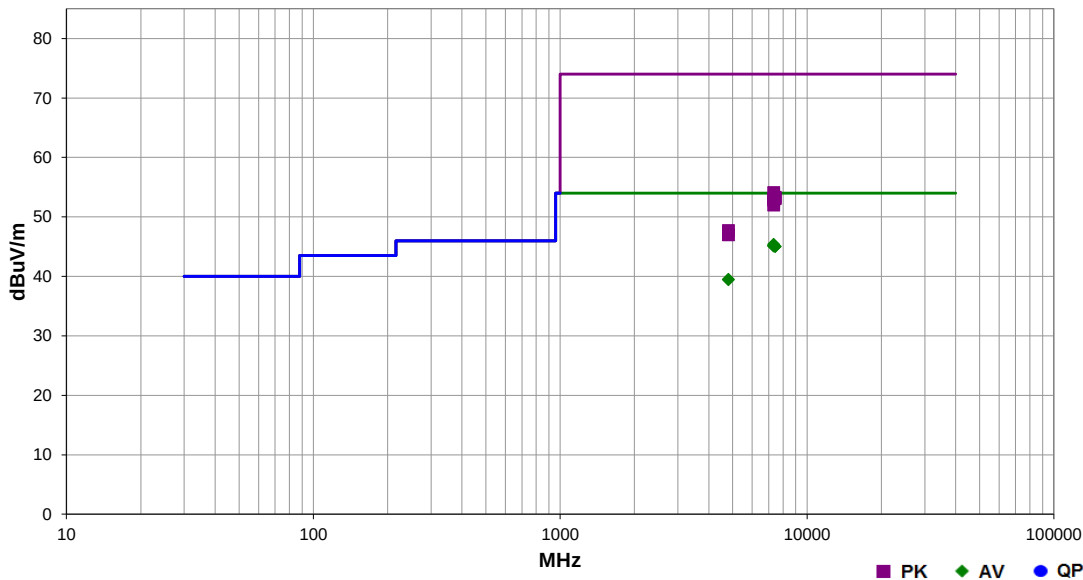


EmiRS 2020.06.24.4 PSA-ESCI 2020.06.24.2

Work Order:	SYNA0317	Date:	2020-11-23	
Project:	None	Temperature:	22 °C	
Job Site:	NC01	Humidity:	38.1% RH	
Serial Number:	Rev. 10 - 007	Barometric Pres.:	1018 mbar	
EUT:		RadioNode		
Configuration:		4		
Customer:		Walt Disney Parks and Resorts US, Inc.		
Attendees:		None		
EUT Power:		24VDC via 120VAC/60Hz		
Operating Mode:		BLE Tx, Antenna PN: T24190P10006GT, GFSK, Packet Length = 63, PRBS9, 1 Mbps, Power Setting = -4 dBm, Low Channel = 2402 MHz, Mid Channel = 2442 MHz, High Channel = 2480 MHz.		
Deviations:		None		
Comments:		See comments below for Channel, EUT orientations. The worst case EUT orientations from the previous testing were used. Spot check for worst case harmonic from 0 dBm power setting measurements. Port 7 measurements were taken on 1/4/21.		
		The provided test software configured the radio with a duty cycle of 47.8% . Per ANSI C63.10 test methods, the RMS data was corrected with a carrier duty cycle correction factor (DCCF) of 3.2 dB. DCCF (dB) = 10*log(1/0.478).		

Test Specifications	Test Method
FCC 15.247:2021	ANSI C63.10:2013

Run #	62	Test Distance (m)	3	Antenna Height(s)	1 to 4(m)	Results	Pass
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Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (dB)	External Attenuation (dB)	Polarity/Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
7327.358	27.5	14.7	2.4	33.0	3.2	0.0	Horz	AV	0.0	45.4	54.0	-8.6	Mid Ch., Port 7, EUT on Side, Ant on Side
7324.800	27.5	14.5	1.5	44.0	3.2	0.0	Vert	AV	0.0	45.2	54.0	-8.8	Mid Ch., Port 7, EUT on Side, Ant on Side
7325.037	27.4	14.5	1.5	317.0	3.2	0.0	Horz	AV	0.0	45.1	54.0	-8.9	Mid Ch., Port 8, EUT on Side, Ant on Side
7326.583	27.4	14.5	1.5	114.0	3.2	0.0	Vert	AV	0.0	45.1	54.0	-8.9	Mid Ch., Port 8, EUT on Side, Ant on Side
7440.953	26.8	15.0	1.5	7.0	3.2	0.0	Horz	AV	0.0	45.0	54.0	-9.0	High Ch., Port 8, EUT on Side, Ant on Side
7440.283	26.8	15.0	2.3	160.0	3.2	0.0	Vert	AV	0.0	45.0	54.0	-9.0	High Ch., Port 8, EUT on Side, Ant on Side
4803.597	26.6	9.7	1.5	92.0	3.2	0.0	Horz	AV	0.0	39.5	54.0	-14.5	Low Ch., Port 8, EUT on Side, Ant on Side
4803.973	26.5	9.7	1.5	159.0	3.2	0.0	Vert	AV	0.0	39.4	54.0	-14.6	Low Ch., Port 8, EUT on Side, Ant on Side
7325.633	39.6	14.5	1.5	317.0	0.0	0.0	Horz	PK	0.0	54.1	74.0	-19.9	Mid Ch., Port 8, EUT on Side, Ant on Side
7439.050	38.3	15.0	2.3	160.0	0.0	0.0	Vert	PK	0.0	53.3	74.0	-20.7	High Ch., Port 8, EUT on Side, Ant on Side
7440.990	38.1	15.0	1.5	7.0	0.0	0.0	Horz	PK	0.0	53.1	74.0	-20.9	High Ch., Port 8, EUT on Side, Ant on Side
7325.537	38.6	14.5	1.5	114.0	0.0	0.0	Vert	PK	0.0	53.1	74.0	-20.9	Mid Ch., Port 8, EUT on Side, Ant on Side
7327.275	38.1	14.7	1.5	44.0	0.0	0.0	Vert	PK	0.0	52.8	74.0	-21.2	Mid Ch., Port 7, EUT on Side, Ant on Side
7325.967	37.5	14.5	2.4	33.0	0.0	0.0	Horz	PK	0.0	52.0	74.0	-22.0	Mid Ch., Port 7, EUT on Side, Ant on Side
4804.697	38.0	9.7	1.5	92.0	0.0	0.0	Horz	PK	0.0	47.7	74.0	-26.3	Low Ch., Port 8, EUT on Side, Ant on Side
4803.713	37.3	9.7	1.5	159.0	0.0	0.0	Vert	PK	0.0	47.0	74.0	-27.0	Low Ch., Port 8, EUT on Side, Ant on Side



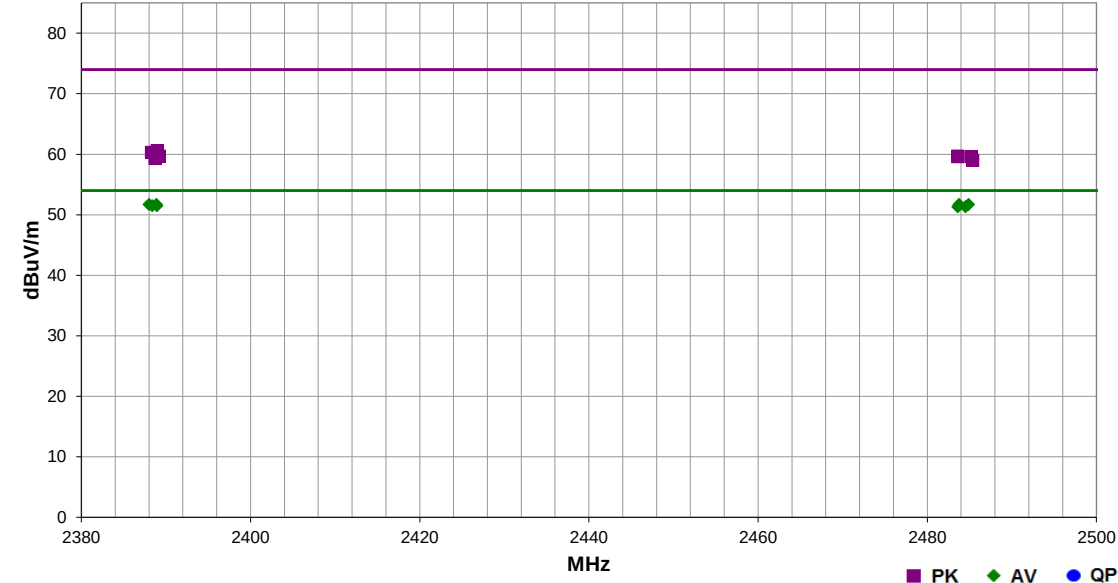
SPURIOUS RADIATED EMISSIONS

EmiRS 2020.06.24.4 PSA-ESCI 2020.06.24.2

Work Order:	SYNA0317	Date:	2020-11-23		
Project:	None	Temperature:	22 °C		
Job Site:	NC01	Humidity:	38.1% RH		
Serial Number:	Rev. 10 - 007	Barometric Pres.:	1018 mbar	Tested by:	Brian Fahey
EUT:	RadioNode				
Configuration:	4				
Customer:	Walt Disney Parks and Resorts US, Inc.				
Attendees:	None				
EUT Power:	24VDC via 120VAC/60Hz				
Operating Mode:	BLE Tx, Antenna PN: T24190P10006GT, GFSK, Packet Length = 63, PRBS9, 1 Mbps, Power Setting = -4 dBm, Low Channel = 2402 MHz, High Channel = 2480 MHz.				
Deviations:	None				
Comments:	See comments below for Channel, EUT orientations. The worst case EUT orientations from the previous testing were used. Spot check for worst case harmonic from 0 dBm power setting measurements. Port 7 measurements were taken on 1/4/21.				

Test Specifications	Test Method
FCC 15.247:2021	ANSI C63.10:2013

Run #	63	Test Distance (m)	3	Antenna Height(s)	1 to 4(m)	Results	Pass
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Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (dB)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
2483.770	29.3	-0.8	2.7	92.0	3.2	20.0	Horz	AV	0.0	51.7	54.0	-2.3	High Ch., Port 7, EUT Vert, Ant Vert
2484.877	29.3	-0.8	1.5	244.0	3.2	20.0	Vert	AV	0.0	51.7	54.0	-2.3	High Ch., Port 7, EUT Horz, Ant Horz
2388.017	29.1	-0.6	1.3	29.0	3.2	20.0	Horz	AV	0.0	51.7	54.0	-2.3	Low Ch., Port 7, EUT Vert, Ant Vert
2388.880	29.1	-0.6	1.5	119.0	3.2	20.0	Vert	AV	0.0	51.7	54.0	-2.3	Low Ch., Port 7, EUT Horz, Ant Horz
2388.943	28.9	-0.6	1.5	113.0	3.2	20.0	Horz	AV	0.0	51.5	54.0	-2.5	Low Ch., Port 8, EUT Vert, Ant Vert
2388.393	28.9	-0.6	1.0	92.0	3.2	20.0	Vert	AV	0.0	51.5	54.0	-2.5	Low Ch., Port 8, EUT Horz, Ant Horz
2484.520	28.9	-0.8	1.5	19.0	3.2	20.0	Horz	AV	0.0	51.3	54.0	-2.7	High Ch., Port 8, EUT Vert, Ant Vert
2483.613	28.9	-0.8	1.0	300.0	3.2	20.0	Vert	AV	0.0	51.3	54.0	-2.7	High Ch., Port 8, EUT Horz, Ant Horz
2388.960	41.2	-0.6	1.5	113.0	0.0	20.0	Horz	PK	0.0	60.6	74.0	-13.4	Low Ch., Port 8, EUT Vert, Ant Vert
2388.290	40.9	-0.6	1.3	29.0	0.0	20.0	Horz	PK	0.0	60.3	74.0	-13.7	Low Ch., Port 7, EUT Vert, Ant Vert
2483.593	40.5	-0.8	1.0	300.0	0.0	20.0	Vert	PK	0.0	59.7	74.0	-14.3	High Ch., Port 8, EUT Horz, Ant Horz
2389.220	40.3	-0.6	1.5	119.0	0.0	20.0	Vert	PK	0.0	59.7	74.0	-14.3	Low Ch., Port 7, EUT Horz, Ant Horz
2483.617	40.4	-0.8	2.7	92.0	0.0	20.0	Horz	PK	0.0	59.6	74.0	-14.4	High Ch., Port 7, EUT Vert, Ant Vert
2485.180	40.4	-0.8	1.5	244.0	0.0	20.0	Vert	PK	0.0	59.6	74.0	-14.4	High Ch., Port 7, EUT Horz, Ant Horz
2388.717	39.9	-0.6	1.0	92.0	0.0	20.0	Vert	PK	0.0	59.3	74.0	-14.7	Low Ch., Port 8, EUT Horz, Ant Horz
2485.363	39.8	-0.8	1.5	19.0	0.0	20.0	Horz	PK	0.0	59.0	74.0	-15.0	High Ch., Port 8, EUT Vert, Ant Vert



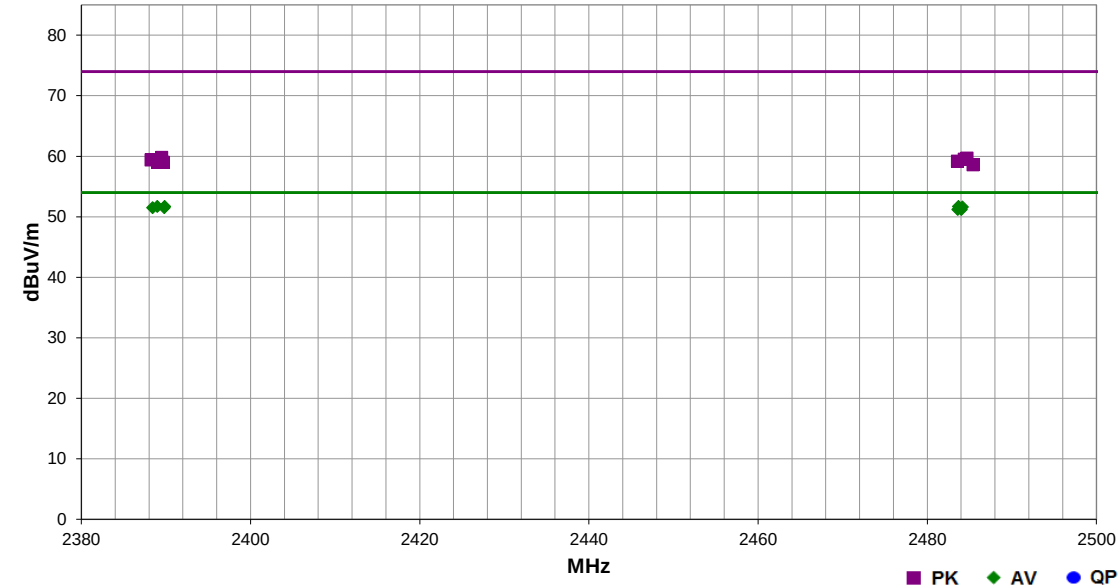
SPURIOUS RADIATED EMISSIONS

EmiR5 2020.06.24.4 PSA-ESCI 2020.06.24.2

Work Order:	SYNA0317	Date:	2020-11-23		
Project:	None	Temperature:	22 °C		
Job Site:	NC01	Humidity:	38.1% RH		
Serial Number:	Rev. 10 - 007	Barometric Pres.:	1018 mbar	Tested by:	Brian Fahey
EUT:	RadioNode				
Configuration:	3				
Customer:	Walt Disney Parks and Resorts US, Inc.				
Attendees:	None				
EUT Power:	POE via 120VAC/60Hz				
Operating Mode:	BLE Tx, Antenna PN: T24190P10006GT, GFSK, Packet Length = 63, PRBS9, 1 Mbps, Power Setting = -4 dBm, Low Channel = 2402 MHz, High Channel = 2480 MHz.				
Deviations:	None				
Comments:	See comments below for Channel, EUT orientations. The worst case EUT orientations from the previous testing were used. Spot check for worst case harmonic from 0 dBm power setting measurements. Port 7 measurements were taken on 1/4/21.				

Test Specifications	Test Method
FCC 15.247:2021	ANSI C63.10:2013

Run #	64	Test Distance (m)	3	Antenna Height(s)	1 to 4(m)	Results	Pass
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Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (dB)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
2483.690	29.3	-0.8	1.5	52.0	3.2	20.0	Horz	AV	0.0	51.7	54.0	-2.3	High Ch., Port 7, EUT Vert, Ant Vert
2388.993	29.1	-0.6	1.5	69.0	3.2	20.0	Horz	AV	0.0	51.7	54.0	-2.3	Low Ch., Port 7, EUT Vert, Ant Vert
2389.863	29.1	-0.6	1.5	19.0	3.2	20.0	Vert	AV	0.0	51.7	54.0	-2.3	Low Ch., Port 7, EUT Horz, Ant Horz
2484.173	29.2	-0.8	3.0	11.0	3.2	20.0	Vert	AV	0.0	51.6	54.0	-2.4	High Ch., Port 7, EUT Horz, Ant Horz
2388.443	28.9	-0.6	1.5	213.0	3.2	20.0	Vert	AV	0.0	51.5	54.0	-2.5	Low Ch., Port 8, EUT Horz, Ant Horz
2389.807	28.9	-0.6	1.5	140.0	3.2	20.0	Horz	AV	0.0	51.5	54.0	-2.5	Low Ch., Port 8, EUT Vert, Ant Vert
2483.613	28.8	-0.8	3.8	134.0	3.2	20.0	Vert	AV	0.0	51.2	54.0	-2.8	High Ch., Port 8, EUT Horz, Ant Horz
2484.047	28.8	-0.8	1.5	281.0	3.2	20.0	Horz	AV	0.0	51.2	54.0	-2.8	High Ch., Port 8, EUT Vert, Ant Vert
2389.487	40.4	-0.6	1.5	19.0	0.0	20.0	Vert	PK	0.0	59.8	74.0	-14.2	Low Ch., Port 7, EUT Horz, Ant Horz
2484.697	40.5	-0.8	3.0	11.0	0.0	20.0	Vert	PK	0.0	59.7	74.0	-14.3	High Ch., Port 7, EUT Horz, Ant Horz
2484.367	40.3	-0.8	1.5	281.0	0.0	20.0	Horz	PK	0.0	59.5	74.0	-14.5	High Ch., Port 8, EUT Vert, Ant Vert
2388.253	40.0	-0.6	1.5	140.0	0.0	20.0	Horz	PK	0.0	59.4	74.0	-14.6	Low Ch., Port 8, EUT Vert, Ant Vert
2483.573	40.0	-0.8	1.5	52.0	0.0	20.0	Horz	PK	0.0	59.2	74.0	-14.8	High Ch., Port 7, EUT Vert, Ant Vert
2389.040	39.6	-0.6	1.5	213.0	0.0	20.0	Vert	PK	0.0	59.0	74.0	-15.0	Low Ch., Port 8, EUT Horz, Ant Horz
2389.680	39.6	-0.6	1.5	69.0	0.0	20.0	Horz	PK	0.0	59.0	74.0	-15.0	Low Ch., Port 7, EUT Vert, Ant Vert
2485.407	39.4	-0.8	3.8	134.0	0.0	20.0	Vert	PK	0.0	58.6	74.0	-15.4	High Ch., Port 8, EUT Horz, Ant Horz

SPURIOUS RADIATED EMISSIONS

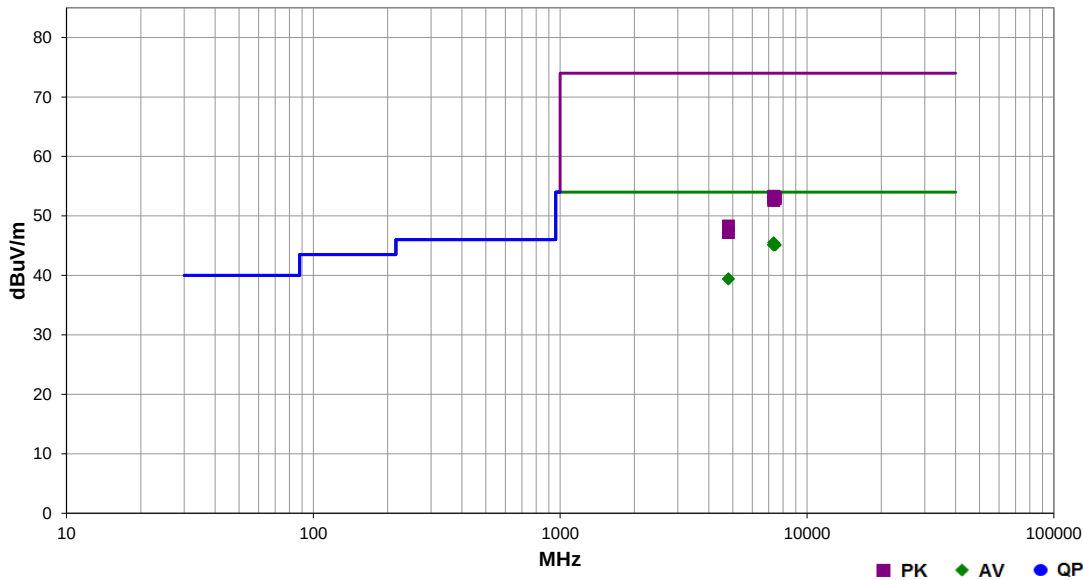


EmiRS 2020.06.24.4 PSA-ESCI 2020.06.24.2

Work Order:	SYNA0317	Date:	2020-11-23	
Project:	None	Temperature:	22 °C	
Job Site:	NC01	Humidity:	38.1% RH	
Serial Number:	Rev. 10 - 007	Barometric Pres.:	1018 mbar	
EUT:		RadioNode		
Configuration:	3			
Customer:	Walt Disney Parks and Resorts US, Inc.			
Attendees:	None			
EUT Power:	POE via 120VAC/60Hz			
Operating Mode:	BLE Tx, Antenna PN: T24190P10006GT, GFSK, Packet Length = 63, PRBS9, 1 Mbps, Power Setting = -4 dBm, Low Channel = 2402 MHz, Mid Channel = 2442 MHz, High Channel = 2480 MHz.			
Deviations:	None			
Comments:	See comments below for Channel, EUT orientations. The worst case EUT orientations from the previous testing were used. Spot check for worst case harmonic from 0 dBm power setting measurements. Port 7 measurements were taken on 1/4/21.			
	The provided test software configured the radio with a duty cycle of 47.8% . Per ANSI C63.10 test methods, the RMS data was corrected with a carrier duty cycle correction factor (DCCF) of 3.2 dB. DCCF (dB) = 10*log(1/0.478).			

Test Specifications	Test Method
FCC 15.247:2021	ANSI C63.10:2013

Run #	65	Test Distance (m)	3	Antenna Height(s)	1 to 4(m)	Results	Pass
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Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (dB)	External Attenuation (dB)	Polarity/Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
7327.792	27.6	14.7	1.5	81.0	3.2	0.0	Vert	AV	0.0	45.5	54.0	-8.5	Mid Ch., Port 7, EUT on Side, Ant on Side
7326.242	27.5	14.5	3.5	130.0	3.2	0.0	Horz	AV	0.0	45.2	54.0	-8.8	Mid Ch., Port 7, EUT on Side, Ant on Side
7325.470	27.4	14.5	1.5	312.0	3.2	0.0	Horz	AV	0.0	45.1	54.0	-8.9	Mid Ch., Port 8, EUT on Side, Ant on Side
7325.477	27.4	14.5	1.5	47.0	3.2	0.0	Vert	AV	0.0	45.1	54.0	-8.9	Mid Ch., Port 8, EUT on Side, Ant on Side
7440.433	26.9	15.0	1.5	319.0	3.2	0.0	Horz	AV	0.0	45.1	54.0	-8.9	High Ch., Port 8, EUT on Side, Ant on Side
7440.933	26.9	15.0	1.1	233.0	3.2	0.0	Vert	AV	0.0	45.1	54.0	-8.9	High Ch., Port 8, EUT on Side, Ant on Side
4804.113	26.5	9.7	1.5	100.0	3.2	0.0	Horz	AV	0.0	39.4	54.0	-14.6	Low Ch., Port 8, EUT on Side, Ant on Side
4803.927	26.5	9.7	1.5	206.0	3.2	0.0	Vert	AV	0.0	39.4	54.0	-14.6	Low Ch., Port 8, EUT on Side, Ant on Side
7325.617	38.8	14.5	1.5	312.0	0.0	0.0	Horz	PK	0.0	53.3	74.0	-20.7	Mid Ch., Port 8, EUT on Side, Ant on Side
7440.700	38.2	15.0	1.5	319.0	0.0	0.0	Horz	PK	0.0	53.2	74.0	-20.8	High Ch., Port 8, EUT on Side, Ant on Side
7324.608	38.5	14.5	3.5	130.0	0.0	0.0	Horz	PK	0.0	53.0	74.0	-21.0	Mid Ch., Port 7, EUT on Side, Ant on Side
7325.633	38.4	14.5	1.5	47.0	0.0	0.0	Vert	PK	0.0	52.9	74.0	-21.1	Mid Ch., Port 8, EUT on Side, Ant on Side
7440.763	37.9	15.0	1.1	233.0	0.0	0.0	Vert	PK	0.0	52.9	74.0	-21.1	High Ch., Port 8, EUT on Side, Ant on Side
7323.717	38.1	14.5	1.5	81.0	0.0	0.0	Vert	PK	0.0	52.6	74.0	-21.4	Mid Ch., Port 7, EUT on Side, Ant on Side
4803.440	38.6	9.7	1.5	206.0	0.0	0.0	Vert	PK	0.0	48.3	74.0	-25.7	Low Ch., Port 8, EUT on Side, Ant on Side
4803.560	37.5	9.7	1.5	100.0	0.0	0.0	Horz	PK	0.0	47.2	74.0	-26.8	Low Ch., Port 8, EUT on Side, Ant on Side

SPURIOUS RADIATED EMISSIONS



PSA-ESCI 2020.04.03.0

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data. The test data represents the configuration / operating mode/ model that produced the highest emission levels as compared to the specification limit.

MODES OF OPERATION

BTLE Tx, Port 8, Antenna PN: WSA.2400.A.101151, GFSK, Packet Length = 63, PRBS9, 1 Mbps, Low Channel = 2402 MHz, High Channel = 2480 MHz.

BTLE Tx, Port 8, Antenna PN: WSA.2400.A.101151, GFSK, Packet Length = 63, PRBS9, 1 Mbps, Low Channel = 2402 MHz, Mid Channel = 2442 MHz, High Channel = 2480 MHz.

POWER SETTINGS INVESTIGATED

POE via 120VAC/60Hz

24VDC via 120VAC/60Hz

CONFIGURATIONS INVESTIGATED

SYNA0309 - 9

SYNA0309 - 10

FREQUENCY RANGE INVESTIGATED

Start Frequency	30 MHz	Stop Frequency	26 GHz
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SAMPLE CALCULATIONS

Radiated Emissions: Field Strength = Measured Level + Antenna Factor + Cable Factor - Amplifier Gain + Distance Adjustment Factor + External Attenuation

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Cable	Northwest EMC	N/A	NC8	2020-02-07	12 mo
Amplifier - Pre-Amplifier	Miteq	AMF-6F-18002650-25-10P	AOD	2020-02-07	12 mo
Antenna - Standard Gain	ETS Lindgren	3160-09	AIY	NCR	0 mo
Amplifier - Pre-Amplifier	Miteq	AMF-6F-12001800-30-10P	AOJ	2020-08-26	12 mo
Antenna - Standard Gain	EMCO	3160-08	AHO	NCR	0 mo
Cable	High Speed Interconnects	EW292A-NGNG-300	NC3	2020-08-28	12 mo
Amplifier - Pre-Amplifier	Miteq	AMF-6F-08001200-30-10P	AOK	2020-08-26	12 mo
Antenna - Standard Gain	EMCO	3160-07	AHP	NCR	0 mo
Filter - High Pass	Micro-Tronics	HPM50111	HHI	2020-09-25	12 mo
Attenuator	Fairview Microwave	SA18E-20	AQV	2020-07-28	12 mo
Cable	Northwest EMC	3115 Horn Cable	NC2	2020-04-20	12 mo
Amplifier - Pre-Amplifier	Miteq	AMF-3D-00100800-32-13P	AVZ	2020-04-20	12 mo
Antenna - Double Ridge	EMCO	3115	AHM	2020-07-01	24 mo
Antenna - Biconilog	Teseq	CBL 6141B	AYL	2019-09-25	24 mo
Cable	Northwest EMC	Bilog Cables	NC1	2020-01-28	12 mo
Filter - Low Pass	Micro-Tronics	LPM50004	LFF	2019-11-08	12 mo
Analyzer - Spectrum Analyzer	Agilent	E4440A	AAX	2020-04-15	12 mo

SPURIOUS RADIATED EMISSIONS



PSA-ESCI 2020.04.03.0

TEST DESCRIPTION

The highest gain antenna of each type to be used with the EUT was tested. The EUT was configured for the required transmit frequencies and the modes as showed in the data sheets.

For each configuration, the spectrum was scanned throughout the specified range as part of the exploratory investigation of the emissions. These "pre-scans" are not included in the report. Final measurements on individual emissions were then made and included in this test report.

The individual emissions from the EUT were maximized by rotating the EUT on a turntable, adjusting the position of the EUT and EUT antenna in three orthogonal axis if required, and adjusting the measurement antenna height and polarization (per ANSI C63.10). A preamp and high pass filter (and notch filter) were used for this test in order to provide sufficient measurement sensitivity.

Measurements were made with the required detectors and annotated on the data for each individual point using the following annotation:

QP = Quasi-Peak Detector

PK = Peak Detector

AV = RMS Detector

Measurements were made to satisfy the specific requirements of the test specification for out of band emissions as well as the restricted band requirements.

If there are no detectable emissions above the noise floor, the data included may show noise floor measurements for reference only.

Measurements within 2 MHz of the allowable band may have been taken using the integration method from ANSI C63.10 clause 11.13.3. This procedure uses the channel power feature of the spectrum analyzer to integrate the power of the emission within a 1 MHz bandwidth.

Where the radio test software does not provide for a duty cycle at continuous transmit conditions (> 98%) and the RMS (power average) measurements were made across the on and off times of the EUT transmissions, a duty cycle correction is added to the measurements using the formula of $10 \cdot \log(1/dc)$.

SPURIOUS RADIATED EMISSIONS



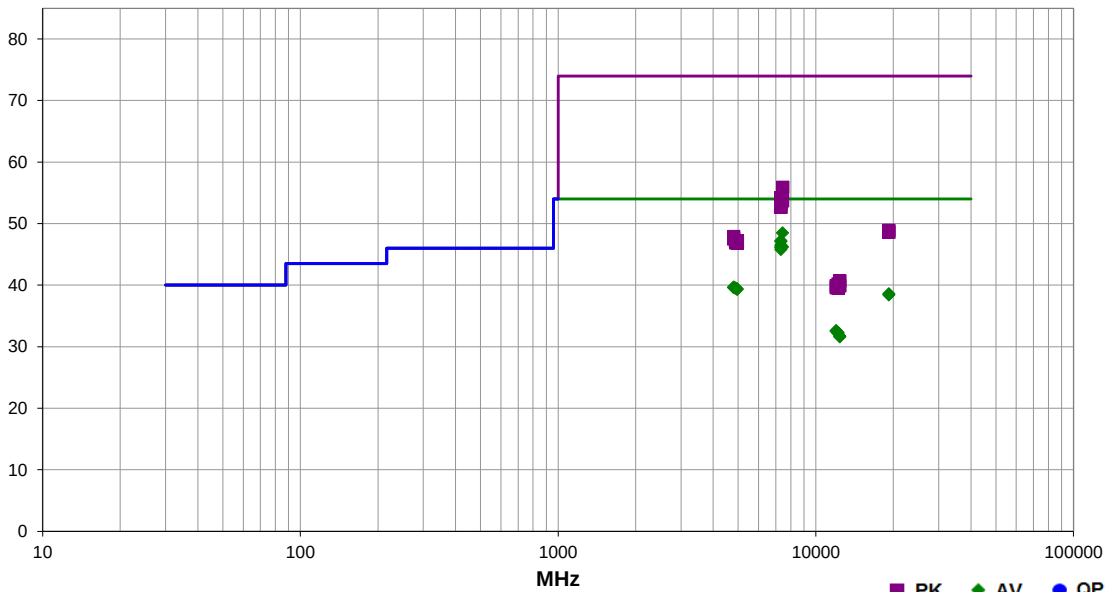
EmR5 2020.06.24.4

PSA-ESCI 2020.04.03.0

Work Order:	SYNA0309	Date:	2020-10-05	
Project:	None	Temperature:	21.9 °C	
Job Site:	NC01	Humidity:	55.9% RH	
Serial Number:	Rev. 10 - 002	Barometric Pres.:	1026 mbar	
EUT:		RadioNode		
Configuration:		10		
Customer:		Walt Disney Parks and Resorts US, Inc.		
Attendees:		None		
EUT Power:		24VDC via 120VAC/60Hz		
Operating Mode:		BTLE Tx, Port 8, Antenna PN: WSA.2400.A.101151, GFSK, Packet Length = 63, PRBS9, 1 Mbps, Low Channel = 2402 MHz, Mid Channel = 2442 MHz, High Channel = 2480 MHz.		
Deviations:		None		
Comments:		See comments below for Channel, EUT orientations. The provided test software configured the radio with a duty cycle of 47.8% . Per ANSI C63.10 test methods, the RMS data was corrected with a carrier duty cycle correction factor (DCCF) of 3.2 dB. $DCCF\ (dB) = 10 * \log(1/0.478)$.		

Test Specifications	Test Method
FCC 15.247:2020	ANSI C63.10:2013

Run #	171	Test Distance (m)	3	Antenna Height(s)	1 to 4(m)	Results	Pass
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Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (dB)	External Attenuation (dB)	Polarity/Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
7439.650	30.3	15.0	2.4	305.0	3.2	0.0	Horz	AV	0.0	48.5	54.0	-5.5	High Ch., EUT Horz, Ant Horz
7325.475	29.5	14.5	1.5	291.0	3.2	0.0	Horz	AV	0.0	47.2	54.0	-6.8	Mid Ch., EUT Horz, Ant Horz
7326.642	29.4	14.5	1.2	74.0	3.2	0.0	Vert	AV	0.0	47.1	54.0	-6.9	Mid Ch., EUT on Side, Ant on Side
7325.533	28.8	14.5	1.4	352.0	3.2	0.0	Vert	AV	0.0	46.5	54.0	-7.5	Mid Ch., EUT Horz, Ant Horz
7326.842	28.5	14.5	2.2	243.0	3.2	0.0	Horz	AV	0.0	46.2	54.0	-7.8	Mid Ch., EUT on Side, Ant on Side
7439.400	28.0	15.0	1.5	103.0	3.2	0.0	Vert	AV	0.0	46.2	54.0	-7.8	High Ch., EUT on Side, Ant on Side
7325.475	28.4	14.5	1.4	334.0	3.2	0.0	Vert	AV	0.0	46.1	54.0	-7.9	Mid Ch., EUT Vert, Ant Vert
7325.258	28.1	14.5	1.2	312.0	3.2	0.0	Horz	AV	0.0	45.8	54.0	-8.2	Mid Ch., EUT Vert, Ant Vert
4804.300	26.8	9.7	3.2	275.0	3.2	0.0	Vert	AV	0.0	39.7	54.0	-14.3	Low Ch., EUT on Side, Ant on Side
4803.933	26.7	9.7	1.5	1.0	3.2	0.0	Horz	AV	0.0	39.6	54.0	-14.4	Low Ch., EUT Horz, Ant Horz
4886.392	26.5	9.8	1.5	325.0	3.2	0.0	Vert	AV	0.0	39.5	54.0	-14.5	Mid Ch., EUT on Side, Ant on Side
4881.742	26.5	9.8	1.5	207.0	3.2	0.0	Horz	AV	0.0	39.5	54.0	-14.5	Mid Ch., EUT Horz, Ant Horz
4958.525	26.7	9.5	1.5	86.0	3.2	0.0	Vert	AV	0.0	39.4	54.0	-14.6	High Ch., EUT on Side, Ant on Side
4958.017	26.6	9.5	4.0	70.0	3.2	0.0	Horz	AV	0.0	39.3	54.0	-14.7	High Ch., EUT Horz, Ant Horz
19217.730	34.8	0.6	1.6	15.0	3.2	0.0	Vert	AV	0.0	38.6	54.0	-15.4	Low Ch., EUT on Side, Ant on Side
19217.760	34.6	0.6	1.6	111.0	3.2	0.0	Horz	AV	0.0	38.4	54.0	-15.6	Low Ch., EUT Horz, Ant Horz
7441.117	40.9	15.0	2.4	305.0	0.0	0.0	Horz	PK	0.0	55.9	74.0	-18.1	High Ch., EUT Horz, Ant Horz
7325.525	39.7	14.5	1.5	291.0	0.0	0.0	Horz	PK	0.0	54.2	74.0	-19.8	Mid Ch., EUT Horz, Ant Horz
7326.608	39.3	14.5	1.2	74.0	0.0	0.0	Vert	PK	0.0	53.8	74.0	-20.2	Mid Ch., EUT on Side, Ant on Side
7439.258	38.7	15.0	1.5	103.0	0.0	0.0	Vert	PK	0.0	53.7	74.0	-20.3	High Ch., EUT on Side, Ant on Side
7326.783	39.0	14.5	1.4	352.0	0.0	0.0	Vert	PK	0.0	53.5	74.0	-20.5	Mid Ch., EUT Horz, Ant Horz
7326.517	38.8	14.5	2.2	243.0	0.0	0.0	Horz	PK	0.0	53.3	74.0	-20.7	Mid Ch., EUT on Side, Ant on Side
7325.158	38.2	14.5	1.2	312.0	0.0	0.0	Horz	PK	0.0	52.7	74.0	-21.3	Mid Ch., EUT Vert, Ant Vert

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (dB)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
7326.350	38.2	14.5	1.4	334.0	0.0	0.0	Vert	PK	0.0	52.7	74.0	-21.3	Mid Ch., EUT Vert, Ant Vert
12008.120	26.9	2.5	1.5	35.0	3.2	0.0	Vert	AV	0.0	32.6	54.0	-21.4	Low Ch., EUT on Side, Ant on Side
12008.790	26.8	2.5	1.5	358.0	3.2	0.0	Horz	AV	0.0	32.5	54.0	-21.5	Low Ch., EUT Horz, Ant Horz
12207.830	27.2	1.9	1.5	43.0	3.2	0.0	Horz	AV	0.0	32.3	54.0	-21.7	Mid Ch., EUT Horz, Ant Horz
12208.100	27.1	1.9	1.5	0.0	3.2	0.0	Vert	AV	0.0	32.2	54.0	-21.8	Mid Ch., EUT on Side, Ant on Side
12399.130	26.5	2.0	1.5	194.0	3.2	0.0	Vert	AV	0.0	31.7	54.0	-22.3	High Ch., EUT on Side, Ant on Side
12398.780	26.4	2.0	1.5	217.0	3.2	0.0	Horz	AV	0.0	31.6	54.0	-22.4	High Ch., EUT Horz, Ant Horz
19217.480	45.1	0.6	1.6	111.0	3.2	0.0	Horz	PK	0.0	48.9	74.0	-25.1	Low Ch., EUT Horz, Ant Horz
19215.830	44.8	0.6	1.6	15.0	3.2	0.0	Vert	PK	0.0	48.6	74.0	-25.4	Low Ch., EUT on Side, Ant on Side
4802.400	38.2	9.7	3.2	275.0	0.0	0.0	Vert	PK	0.0	47.9	74.0	-26.1	Low Ch., EUT on Side, Ant on Side
4803.225	37.8	9.7	1.5	1.0	0.0	0.0	Horz	PK	0.0	47.5	74.0	-26.5	Low Ch., EUT Horz, Ant Horz
4959.183	37.7	9.5	4.0	70.0	0.0	0.0	Horz	PK	0.0	47.2	74.0	-26.8	High Ch., EUT Horz, Ant Horz
4885.700	37.3	9.8	1.5	207.0	0.0	0.0	Horz	PK	0.0	47.1	74.0	-26.9	Mid Ch., EUT Horz, Ant Horz
4886.250	37.1	9.8	1.5	325.0	0.0	0.0	Vert	PK	0.0	46.9	74.0	-27.1	Mid Ch., EUT on Side, Ant on Side
4959.267	37.3	9.5	1.5	86.0	0.0	0.0	Vert	PK	0.0	46.8	74.0	-27.2	High Ch., EUT on Side, Ant on Side
12398.030	38.7	2.0	1.5	217.0	0.0	0.0	Horz	PK	0.0	40.7	74.0	-33.3	High Ch., EUT Horz, Ant Horz
12207.680	38.3	1.9	1.5	0.0	0.0	0.0	Vert	PK	0.0	40.2	74.0	-33.8	Mid Ch., EUT on Side, Ant on Side
12011.830	37.4	2.5	1.5	358.0	0.0	0.0	Horz	PK	0.0	39.9	74.0	-34.1	Low Ch., EUT Horz, Ant Horz
12399.960	37.9	2.0	1.5	194.0	0.0	0.0	Vert	PK	0.0	39.9	74.0	-34.1	High Ch., EUT on Side, Ant on Side
12007.960	37.1	2.5	1.5	35.0	0.0	0.0	Vert	PK	0.0	39.6	74.0	-34.4	Low Ch., EUT on Side, Ant on Side
12208.510	37.6	1.9	1.5	43.0	0.0	0.0	Horz	PK	0.0	39.5	74.0	-34.5	Mid Ch., EUT Horz, Ant Horz

SPURIOUS RADIATED EMISSIONS



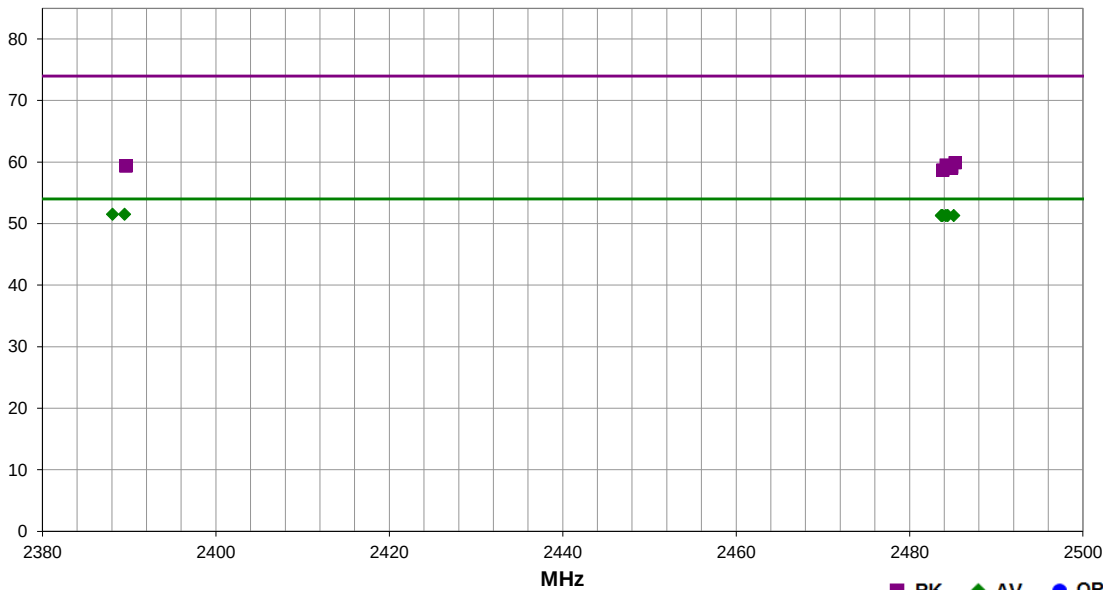
EmiRS 2020.06.24.4

PSA-ESCI 2020.04.03.0

Work Order:	SYNA0309	Date:	2020-10-05	
Project:	None	Temperature:	21.9 °C	
Job Site:	NC01	Humidity:	55.9% RH	
Serial Number:	Rev. 10 - 002	Barometric Pres.:	1026 mbar	
		Tested by: Brian Fahey		
EUT:	RadioNode			
Configuration:	10			
Customer:	Walt Disney Parks and Resorts US, Inc.			
Attendees:	None			
EUT Power:	24VDC via 120VAC/60Hz			
Operating Mode:	BTLE Tx, Port 8, Antenna PN: WSA.2400.A.101151, GFSK, Packet Length = 63, PRBS9, 1 Mbps, Low Channel = 2402 MHz, High Channel = 2480 MHz.			
Deviations:	None			
Comments:	See comments below for Channel, EUT orientations. The provided test software configured the radio with a duty cycle of 47.8% . Per ANSI C63.10 test methods, the RMS data was corrected with a carrier duty cycle correction factor (DCCF) of 3.2 dB. DCCF (dB) = 10*log(1/0.478).			

Test Specifications	Test Method
FCC 15.247:2020	ANSI C63.10:2013

Run #	173	Test Distance (m)	3	Antenna Height(s)	1 to 4(m)	Results	Pass
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Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (dB)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
2388.097	28.9	-0.6	1.5	57.0	3.2	20.0	Horz	AV	0.0	51.5	54.0	-2.5	Low Ch., EUT Horz, Ant Horz
2389.473	28.9	-0.6	1.5	189.0	3.2	20.0	Vert	AV	0.0	51.5	54.0	-2.5	Low Ch., EUT Horz, Ant Horz
2485.107	28.9	-0.8	2.7	136.0	3.2	20.0	Horz	AV	0.0	51.3	54.0	-2.7	High Ch., EUT Horz, Ant Horz
2483.817	28.9	-0.8	1.8	134.0	3.2	20.0	Vert	AV	0.0	51.3	54.0	-2.7	High Ch., EUT Horz, Ant Horz
2483.690	28.9	-0.8	1.5	239.0	3.2	20.0	Horz	AV	0.0	51.3	54.0	-2.7	High Ch., EUT Vert, Ant Vert
2483.667	28.9	-0.8	2.3	227.0	3.2	20.0	Vert	AV	0.0	51.3	54.0	-2.7	High Ch., EUT Vert, Ant Vert
2484.407	28.9	-0.8	1.5	329.0	3.2	20.0	Horz	AV	0.0	51.3	54.0	-2.7	High Ch., EUT on Side, Ant on Side
2484.203	28.9	-0.8	3.4	252.0	3.2	20.0	Vert	AV	0.0	51.3	54.0	-2.7	High Ch., EUT on Side, Ant on Side
2485.247	40.7	-0.8	2.7	136.0	0.0	20.0	Horz	PK	0.0	59.9	74.0	-14.1	High Ch., EUT Horz, Ant Horz
2484.223	40.3	-0.8	3.4	252.0	0.0	20.0	Vert	PK	0.0	59.5	74.0	-14.5	High Ch., EUT on Side, Ant on Side
2389.637	40.0	-0.6	1.5	57.0	0.0	20.0	Horz	PK	0.0	59.4	74.0	-14.6	Low Ch., EUT Horz, Ant Horz
2389.597	40.0	-0.6	1.5	189.0	0.0	20.0	Vert	PK	0.0	59.4	74.0	-14.6	Low Ch., EUT Horz, Ant Horz
2484.847	40.0	-0.8	1.8	134.0	0.0	20.0	Vert	PK	0.0	59.2	74.0	-14.8	High Ch., EUT Horz, Ant Horz
2484.723	40.0	-0.8	2.3	227.0	0.0	20.0	Vert	PK	0.0	59.2	74.0	-14.8	High Ch., EUT Vert, Ant Vert
2484.827	39.8	-0.8	1.5	329.0	0.0	20.0	Horz	PK	0.0	59.0	74.0	-15.0	High Ch., EUT on Side, Ant on Side
2483.847	39.5	-0.8	1.5	239.0	0.0	20.0	Horz	PK	0.0	58.7	74.0	-15.3	High Ch., EUT Vert, Ant Vert

SPURIOUS RADIATED EMISSIONS

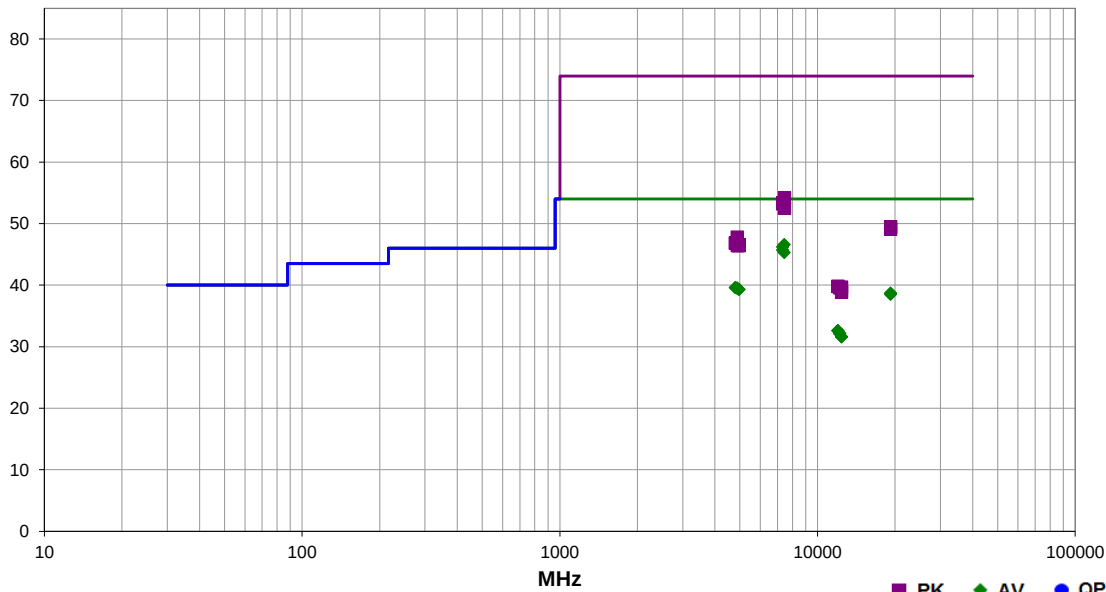


EmiRS 2020.06.24.4

PSA-ESCI 2020.04.03.0

Work Order:	SYNA0309	Date:	2020-10-05	
Project:	None	Temperature:	21.9 °C	
Job Site:	NC01	Humidity:	55.9% RH	
Serial Number:	Rev. 10 - 002	Barometric Pres.:	1026 mbar	
EUT:	RadioNode			
Configuration:	9			
Customer:	Walt Disney Parks and Resorts US, Inc.			
Attendees:	None			
EUT Power:	POE via 120VAC/60Hz			
Operating Mode:	BTLE Tx, Port 8, Antenna PN: WSA.2400.A.101151, GFSK, Packet Length = 63, PRBS9, 1 Mbps, Low Channel = 2402 MHz, Mid Channel = 2442 MHz, High Channel = 2480 MHz.			
Deviations:	None			
Comments:	See comments below for Channel, EUT orientations. The worst case EUT orientations from the previous testing were used. The provided test software configured the radio with a duty cycle of 47.8% . Per ANSI C63.10 test methods, the RMS data was corrected with a carrier duty cycle correction factor (DCCF) of 3.2 dB. DCCF (dB) = 10*log(1/0.478).			
Test Specifications				Test Method
FCC 15.247:2020				ANSI C63.10:2013

Run #	197	Test Distance (m)	3	Antenna Height(s)	1 to 4(m)	Results	Pass
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Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (dB)	External Attenuation (dB)	Polarity/Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
7439.575	28.4	15.0	1.5	94.0	3.2	0.0	Horz	AV	0.0	46.6	54.0	-7.4	High Ch., EUT Horz, Ant Horz
7326.642	28.5	14.5	1.5	277.0	3.2	0.0	Horz	AV	0.0	46.2	54.0	-7.8	Mid Ch., EUT Horz, Ant Horz
7325.750	28.0	14.5	1.5	288.0	3.2	0.0	Vert	AV	0.0	45.7	54.0	-8.3	Mid Ch., EUT on Side, Ant on Side
7437.667	27.1	15.0	1.5	352.0	3.2	0.0	Vert	AV	0.0	45.3	54.0	-8.7	High Ch., EUT on Side, Ant on Side
4804.058	26.7	9.7	1.5	165.0	3.2	0.0	Horz	AV	0.0	39.6	54.0	-14.4	Low Ch., EUT Horz, Ant Horz
4805.233	26.7	9.7	1.2	259.0	3.2	0.0	Vert	AV	0.0	39.6	54.0	-14.4	Low Ch., EUT on Side, Ant on Side
4882.108	26.5	9.8	1.5	27.0	3.2	0.0	Horz	AV	0.0	39.5	54.0	-14.5	Mid Ch., EUT Horz, Ant Horz
4885.300	26.5	9.8	1.5	279.0	3.2	0.0	Vert	AV	0.0	39.5	54.0	-14.5	Mid Ch., EUT on Side, Ant on Side
4959.167	26.6	9.5	1.5	316.0	3.2	0.0	Horz	AV	0.0	39.3	54.0	-14.7	High Ch., EUT Horz, Ant Horz
4958.950	26.6	9.5	3.8	358.0	3.2	0.0	Vert	AV	0.0	39.3	54.0	-14.7	High Ch., EUT on Side, Ant on Side
19215.930	34.9	0.6	1.6	299.0	3.2	0.0	Horz	AV	0.0	38.7	54.0	-15.3	Low Ch., EUT Horz, Ant Horz
19217.930	34.7	0.6	1.6	321.0	3.2	0.0	Vert	AV	0.0	38.5	54.0	-15.5	Low Ch., EUT on Side, Ant on Side
7440.583	39.2	15.0	1.5	94.0	0.0	0.0	Horz	PK	0.0	54.2	74.0	-19.8	High Ch., EUT Horz, Ant Horz
7324.508	38.9	14.5	1.5	277.0	0.0	0.0	Horz	PK	0.0	53.4	74.0	-20.6	Mid Ch., EUT Horz, Ant Horz
7325.608	38.7	14.5	1.5	288.0	0.0	0.0	Vert	PK	0.0	53.2	74.0	-20.8	Mid Ch., EUT on Side, Ant on Side
12011.400	26.9	2.5	1.5	197.0	3.2	0.0	Vert	AV	0.0	32.6	54.0	-21.4	Low Ch., EUT on Side, Ant on Side
12011.280	26.9	2.5	1.5	93.0	3.2	0.0	Horz	AV	0.0	32.6	54.0	-21.4	Low Ch., EUT Horz, Ant Horz
7442.425	37.5	15.0	1.5	352.0	0.0	0.0	Vert	PK	0.0	52.5	74.0	-21.5	High Ch., EUT on Side, Ant on Side
12207.850	27.1	1.9	1.5	47.0	3.2	0.0	Horz	AV	0.0	32.2	54.0	-21.8	Mid Ch., EUT Horz, Ant Horz
12207.530	27.0	1.9	1.5	341.0	3.2	0.0	Vert	AV	0.0	32.1	54.0	-21.9	Mid Ch., EUT on Side, Ant on Side
12399.300	26.4	2.0	1.5	208.0	3.2	0.0	Vert	AV	0.0	31.6	54.0	-22.4	High Ch., EUT on Side, Ant on Side
12399.930	26.4	2.0	1.5	274.0	3.2	0.0	Horz	AV	0.0	31.6	54.0	-22.4	High Ch., EUT Horz, Ant Horz
19217.680	45.7	0.6	1.6	299.0	3.2	0.0	Horz	PK	0.0	49.5	74.0	-24.5	Low Ch., EUT Horz, Ant Horz

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (dB)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
19214.230	45.3	0.6	1.6	321.0	3.2	0.0	Vert	PK	0.0	49.1	74.0	-24.9	Low Ch., EUT on Side, Ant on Side
4882.783	38.0	9.8	1.5	27.0	0.0	0.0	Horz	PK	0.0	47.8	74.0	-26.2	Mid Ch., EUT Horz, Ant Horz
4803.958	37.2	9.7	1.2	259.0	0.0	0.0	Vert	PK	0.0	46.9	74.0	-27.1	Low Ch., EUT on Side, Ant on Side
4802.467	37.1	9.7	1.5	165.0	0.0	0.0	Horz	PK	0.0	46.8	74.0	-27.2	Low Ch., EUT Horz, Ant Horz
4959.867	37.1	9.5	3.8	358.0	0.0	0.0	Vert	PK	0.0	46.6	74.0	-27.4	High Ch., EUT on Side, Ant on Side
4960.783	36.9	9.5	1.5	316.0	0.0	0.0	Horz	PK	0.0	46.4	74.0	-27.6	High Ch., EUT Horz, Ant Horz
4884.375	36.6	9.8	1.5	279.0	0.0	0.0	Vert	PK	0.0	46.4	74.0	-27.6	Mid Ch., EUT on Side, Ant on Side
12009.460	37.3	2.5	1.5	197.0	0.0	0.0	Vert	PK	0.0	39.8	74.0	-34.2	Low Ch., EUT on Side, Ant on Side
12009.670	37.3	2.5	1.5	93.0	0.0	0.0	Horz	PK	0.0	39.8	74.0	-34.2	Low Ch., EUT Horz, Ant Horz
12399.740	37.7	2.0	1.5	208.0	0.0	0.0	Vert	PK	0.0	39.7	74.0	-34.3	High Ch., EUT on Side, Ant on Side
12208.430	37.7	1.9	1.5	341.0	0.0	0.0	Vert	PK	0.0	39.6	74.0	-34.4	Mid Ch., EUT on Side, Ant on Side
12210.050	37.7	1.9	1.5	47.0	0.0	0.0	Horz	PK	0.0	39.6	74.0	-34.4	Mid Ch., EUT Horz, Ant Horz
12399.340	36.9	2.0	1.5	274.0	0.0	0.0	Horz	PK	0.0	38.9	74.0	-35.1	High Ch., EUT Horz, Ant Horz

SPURIOUS RADIATED EMISSIONS

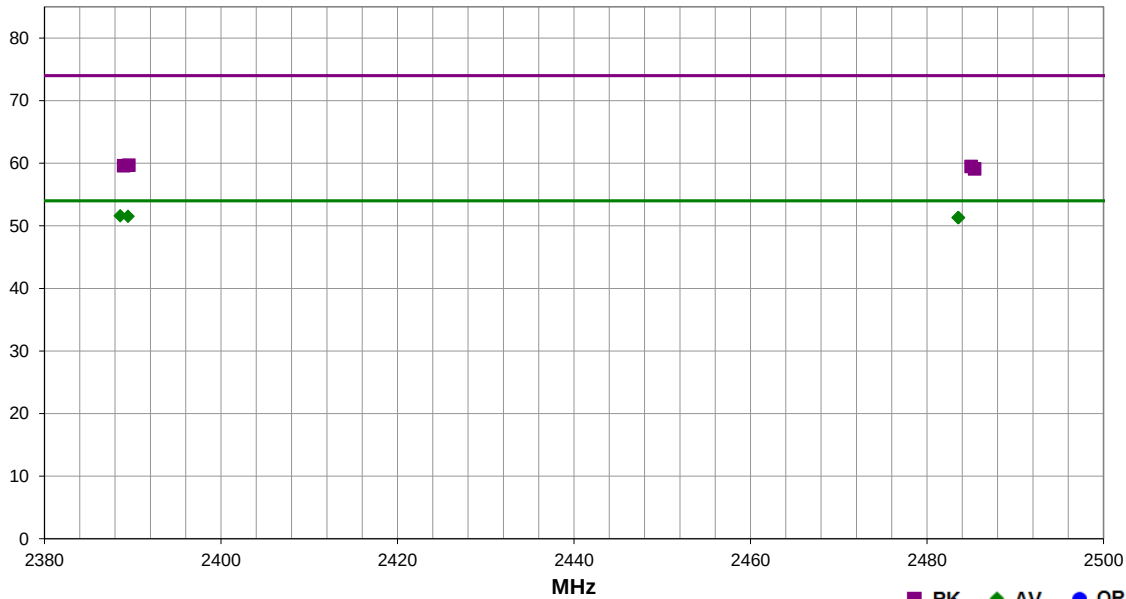


EmiRS 2020.06.24.4

PSA-ESCI 2020.04.03.0

Work Order:	SYNA0309	Date:	2020-10-05	
Project:	None	Temperature:	21.9 °C	
Job Site:	NC01	Humidity:	55.9% RH	
Serial Number:	Rev. 10 - 002	Barometric Pres.:	1026 mbar	
EUT:		RadioNode		
Configuration:	9			
Customer:	Walt Disney Parks and Resorts US, Inc.			
Attendees:	None			
EUT Power:	POE via 120VAC/60Hz			
Operating Mode:	BTLE Tx, Port 8, Antenna PN: WSA.2400.A.101151, GFSK, Packet Length = 63, PRBS9, 1 Mbps, Low Channel = 2402 MHz, High Channel = 2480 MHz.			
Deviations:	None			
Comments:	See comments below for Channel, EUT orientations. The worst case EUT orientations from the previous testing were used. The provided test software configured the radio with a duty cycle of 47.8% . Per ANSI C63.10 test methods, the RMS data was corrected with a carrier duty cycle correction factor (DCCF) of 3.2 dB. DCCF (dB) = 10*log(1/0.478).			
Test Specifications			Test Method	
FCC 15.247:2020			ANSI C63.10:2013	

Run #	199	Test Distance (m)	3	Antenna Height(s)	1 to 4(m)	Results	Pass
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Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (dB)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
2388.597	29.0	-0.6	1.0	22.0	3.2	20.0	Horz	AV	0.0	51.6	54.0	-2.4	Low Ch., EUT Horz, Ant Horz
2389.473	28.9	-0.6	1.5	122.0	3.2	20.0	Vert	AV	0.0	51.5	54.0	-2.5	Low Ch., EUT Horz, Ant Horz
2483.520	28.9	-0.8	1.5	37.0	3.2	20.0	Horz	AV	0.0	51.3	54.0	-2.7	High Ch., EUT Horz, Ant Horz
2483.580	28.9	-0.8	1.5	186.0	3.2	20.0	Vert	AV	0.0	51.3	54.0	-2.7	High Ch., EUT Horz, Ant Horz
2389.567	40.3	-0.6	1.0	22.0	0.0	20.0	Horz	PK	0.0	59.7	74.0	-14.3	Low Ch., EUT Horz, Ant Horz
2388.973	40.2	-0.6	1.5	122.0	0.0	20.0	Vert	PK	0.0	59.6	74.0	-14.4	Low Ch., EUT Horz, Ant Horz
2485.003	40.3	-0.8	1.5	186.0	0.0	20.0	Vert	PK	0.0	59.5	74.0	-14.5	High Ch., EUT Horz, Ant Horz
2485.387	39.9	-0.8	1.5	37.0	0.0	20.0	Horz	PK	0.0	59.1	74.0	-14.9	High Ch., EUT Horz, Ant Horz

SPURIOUS RADIATED EMISSIONS



PSA-ESCI 2020.06.24.2

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data. The test data represents the configuration / operating mode/ model that produced the highest emission levels as compared to the specification limit.

MODES OF OPERATION

Simultaneous Tx mode: BTLE Tx, Port 7, Ant Cable A1, Antenna PN: MA510.C.CG.005, GFSK, Packet Length = 63, PRBS9, 1 Mbps, Low Ch. = 2402 MHz, Mid Ch. = 2442 MHz, High Ch. = 2480 MHz; BTLE Tx, Port 8, Ant Cable A2, Antenna PN: MA510.C.CG.005, GFSK, Packet Length = 63, PRBS9, 1 Mbps, Low Ch. = 2402 MHz, Mid Ch. = 2442 MHz, High Ch. = 2480 MHz. BLE Power setting = 0 dBm.

Simultaneous Tx mode: BTLE Tx, Port 7, Ant Cable A1, Antenna PN: MA510.C.CG.005, GFSK, Packet Length = 63, PRBS9, 1 Mbps, High Channel = 2480 MHz; DTS Tx, Port 8, Ant Cable A2, Antenna PN: MA510.C.CG.005, GFSK, Packet Length = 63, PRBS9, 1 Mbps, Single Ch. = 2482 MHz. BLE Power setting = 0 dBm, DTS Power setting = 4 dBm.

Simultaneous Tx mode: BTLE Tx, Port 8, Ant Cable A1, Antenna PN: MA510.C.CG.005, GFSK, Packet Length = 63, PRBS9, 1 Mbps, High Channel = 2480 MHz; DTS Tx, Port 7, Ant Cable A2, Antenna PN: MA510.C.CG.005, GFSK, Packet Length = 63, PRBS9, 1 Mbps, Single Ch. = 2482 MHz. BLE Power setting = 0 dBm, DTS Power setting = 4 dBm.

POWER SETTINGS INVESTIGATED

POE via 120VAC/60Hz
24VDC via 120VAC/60Hz

CONFIGURATIONS INVESTIGATED

SYNA0313 - 1
SYNA0313 - 2

FREQUENCY RANGE INVESTIGATED

Start Frequency	30 MHz	Stop Frequency	26 GHz
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SAMPLE CALCULATIONS

Radiated Emissions: Field Strength = Measured Level + Antenna Factor + Cable Factor - Amplifier Gain + Distance Adjustment Factor + External Attenuation

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Cable	Northwest EMC	N/A	NC8	2020-02-07	12 mo
Amplifier - Pre-Amplifier	Miteq	AMF-6F-18002650-25-10P	AOD	2020-02-07	12 mo
Antenna - Standard Gain	ETS Lindgren	3160-09	AIY	NCR	0 mo
Amplifier - Pre-Amplifier	Miteq	AMF-6F-12001800-30-10P	AOJ	2020-08-26	12 mo
Antenna - Standard Gain	EMCO	3160-08	AHO	NCR	0 mo
Cable	High Speed Interconnects	EW292A-NGNG-300	NC3	2020-08-28	12 mo
Amplifier - Pre-Amplifier	Miteq	AMF-6F-08001200-30-10P	AOK	2020-08-26	12 mo
Antenna - Standard Gain	EMCO	3160-07	AHP	NCR	0 mo
Filter - High Pass	Micro-Tronics	HPM50111	HAI	2020-09-25	12 mo
Attenuator	Fairview Microwave	SA18E-20	AQV	2020-07-28	12 mo
Cable	Northwest EMC	3115 Horn Cable	NC2	2020-04-20	12 mo
Amplifier - Pre-Amplifier	Miteq	AMF-3D-00100800-32-13P	AVZ	2020-04-20	12 mo
Antenna - Double Ridge	EMCO	3115	AHM	2020-07-01	24 mo
Amplifier - Pre-Amplifier	Miteq	AM-1616-1000	PAB	2020-01-28	12 mo
Antenna - Biconilog	Teseq	CBL 6141B	AYL	2019-09-25	24 mo
Cable	Northwest EMC	Bilog Cables	NC1	2020-01-28	12 mo
Filter - Low Pass	Micro-Tronics	LPM50004	LFF	2020-11-06	12 mo
Analyzer - Spectrum Analyzer	Agilent	E4440A	AAX	2020-04-15	12 mo

SPURIOUS RADIATED EMISSIONS



PSA-ESCI 2020.06.24.2

TEST DESCRIPTION

The highest gain antenna of each type to be used with the EUT was tested. The EUT was configured for the required transmit frequencies and the modes as showed in the data sheets.

For each configuration, the spectrum was scanned throughout the specified range as part of the exploratory investigation of the emissions. These “pre-scans” are not included in the report. Final measurements on individual emissions were then made and included in this test report.

The individual emissions from the EUT were maximized by rotating the EUT on a turntable, adjusting the position of the EUT and EUT antenna in three orthogonal axis if required, and adjusting the measurement antenna height and polarization (per ANSI C63.10). A preamp and high pass filter (and notch filter) were used for this test in order to provide sufficient measurement sensitivity.

Measurements were made with the required detectors and annotated on the data for each individual point using the following annotation:

QP = Quasi-Peak Detector
PK = Peak Detector
AV = RMS Detector

Measurements were made to satisfy the specific requirements of the test specification for out of band emissions as well as the restricted band requirements.

If there are no detectable emissions above the noise floor, the data included may show noise floor measurements for reference only.

Measurements within 2 MHz of the allowable band may have been taken using the integration method from ANSI C63.10 clause 11.13.3. This procedure uses the channel power feature of the spectrum analyzer to integrate the power of the emission within a 1 MHz bandwidth. Measurements at the edges of the allowable band may be presented in an alternative method as provided for in the ANSI C63.10 Marker-Delta method. This method involves performing an in-band fundamental measurement followed by a screen capture of the fundamental and out-of-band emission using reduced measurement instrumentation bandwidths. The amplitude delta measured on this screen capture is applied to the fundamental emission value to show the out-of-band emission level as applied to the limit.

Where the radio test software does not provide for a duty cycle at continuous transmit conditions (> 98%) and the RMS (power average) measurements were made across the on and off times of the EUT transmissions, a duty cycle correction is added to the measurements using the formula of $10 \cdot \log(1/dc)$.

SPURIOUS RADIATED EMISSIONS

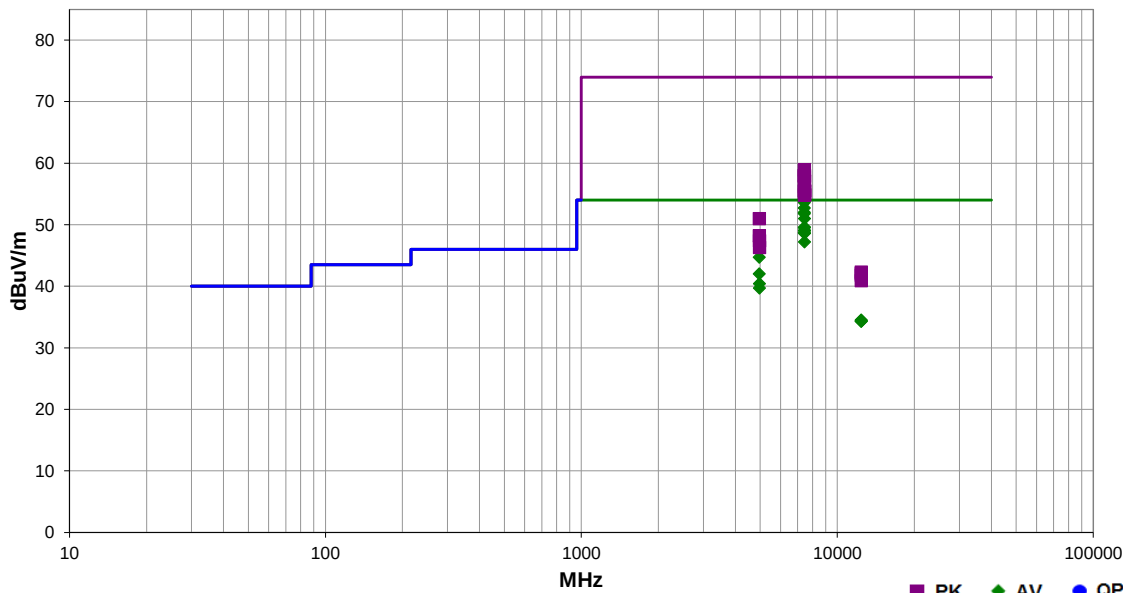


EmiRS 2020.12.09.0

PSA-ESCI 2020.06.24.2

Work Order:	SYNA0313	Date:	2020-12-14	
Project:	None	Temperature:	25.7 °C	
Job Site:	NC01	Humidity:	29.2% RH	
Serial Number:	Rev. 10 - 007	Barometric Pres.:	1026 mbar	
		Tested by: Brian Fahey		
EUT:	RadioNode			
Configuration:	2			
Customer:	Walt Disney Parks and Resorts US, Inc.			
Attendees:	None			
EUT Power:	24VDC via 120VAC/60Hz			
Operating Mode:	Simultaneous Tx mode: BTLE Tx, Port 7, Ant Cable A1, Antenna PN: MA510.C.CG.005, GFSK, Packet Length = 63, PRBS9, 1 Mbps, High Channel = 2480 MHz; DTS Tx, Port 8, Ant Cable A2, Antenna PN: MA510.C.CG.005, GFSK, Packet Length = 63, PRBS9, 1 Mbps, Single Ch. = 2482 MHz. BLE Power setting = 0 dBm, DTS Power setting = 4 dBm.			
Deviations:	None			
Comments:	See comments below for Channel, EUT orientations. The provided test software configured the radio with a duty cycle of 47.8% . Per ANSI C63.10 test methods, the RMS data was corrected with a carrier duty cycle correction factor (DCCF) of 3.2 dB. DCCF (dB) = 10*log(1/0.478).			
Test Specifications				Test Method
FCC 15.247:2020				ANSI C63.10:2013

Run #	5	Test Distance (m)	3	Antenna Height(s)	1 to 4(m)	Results	Pass
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Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (dB)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
7440.650	35.4	15.0	1.5	15.0	3.2	0.0	Horz	AV	0.0	53.6	54.0	-0.4	High Ch., EUT Horz, Ant Horz
7439.467	34.5	15.0	3.2	320.0	3.2	0.0	Vert	AV	0.0	52.7	54.0	-1.3	High Ch., EUT Vert, Ant Vert
7440.567	33.8	15.0	2.2	255.0	3.2	0.0	Horz	AV	0.0	52.0	54.0	-2.0	High Ch., EUT on Side, Ant on Side
7440.617	33.6	15.0	1.6	106.0	3.2	0.0	Horz	AV	0.0	51.8	54.0	-2.2	DTS, EUT Vert, Ant Vert
7446.708	32.8	15.0	2.0	249.0	3.2	0.0	Horz	AV	0.0	51.0	54.0	-3.0	DTS, EUT on Side, Ant on Side
7446.592	31.4	15.0	1.5	54.0	3.2	0.0	Horz	AV	0.0	49.6	54.0	-4.4	DTS, EUT Horz, Ant Horz
7440.517	31.3	15.0	1.8	27.0	3.2	0.0	Vert	AV	0.0	49.5	54.0	-4.5	High Ch., EUT Horz, Ant Horz
7446.525	30.9	15.0	1.5	357.0	3.2	0.0	Vert	AV	0.0	49.1	54.0	-4.9	DTS, EUT Vert, Ant Vert
7445.433	30.8	15.0	1.5	48.0	3.2	0.0	Vert	AV	0.0	49.0	54.0	-5.0	DTS, EUT Horz, Ant Horz
7440.775	30.5	15.0	1.4	87.0	3.2	0.0	Vert	AV	0.0	48.7	54.0	-5.3	High Ch., EUT on Side, Ant on Side
7445.542	30.4	15.0	3.1	200.0	3.2	0.0	Vert	AV	0.0	48.6	54.0	-5.4	DTS, EUT on Side, Ant on Side
7446.567	29.0	15.0	3.0	137.0	3.2	0.0	Horz	AV	0.0	47.2	54.0	-6.8	DTS, EUT Vert, Ant Vert
4959.992	32.0	9.5	1.0	54.0	3.2	0.0	Horz	AV	0.0	44.7	54.0	-9.3	High Ch., EUT Horz, Ant Horz
4960.050	29.3	9.5	3.3	149.0	3.2	0.0	Vert	AV	0.0	42.0	54.0	-12.0	High Ch., EUT Vert, Ant Vert
4964.042	27.7	9.5	1.5	355.0	3.2	0.0	Horz	AV	0.0	40.4	54.0	-13.6	DTS, EUT on Side, Ant on Side
4963.733	27.0	9.5	1.5	162.0	3.2	0.0	Vert	AV	0.0	39.7	54.0	-14.3	DTS, EUT Vert, Ant Vert
7440.767	43.9	15.0	1.5	15.0	0.0	0.0	Horz	PK	0.0	58.9	74.0	-15.1	High Ch., EUT Horz, Ant Horz
7440.125	43.0	15.0	1.6	106.0	0.0	0.0	Horz	PK	0.0	58.0	74.0	-16.0	High Ch., EUT Vert, Ant Vert
7440.517	43.0	15.0	3.2	320.0	0.0	0.0	Vert	PK	0.0	58.0	74.0	-16.0	High Ch., EUT Vert, Ant Vert
7439.242	42.8	15.0	2.2	255.0	0.0	0.0	Horz	PK	0.0	57.8	74.0	-16.2	High Ch., EUT on Side, Ant on Side
7446.525	42.1	15.0	2.0	249.0	0.0	0.0	Horz	PK	0.0	57.1	74.0	-16.9	DTS, EUT on Side, Ant on Side

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (dB)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
7440.867	41.2	15.0	1.8	27.0	0.0	0.0	Vert	PK	0.0	56.2	74.0	-17.8	High Ch., EUT Horz, Ant Horz
7445.450	40.5	15.0	1.5	54.0	0.0	0.0	Horz	PK	0.0	55.5	74.0	-18.5	DTS, EUT Horz, Ant Horz
7446.508	40.5	15.0	1.5	357.0	0.0	0.0	Vert	PK	0.0	55.5	74.0	-18.5	DTS, EUT Vert, Ant Vert
7439.292	40.5	15.0	1.4	87.0	0.0	0.0	Vert	PK	0.0	55.5	74.0	-18.5	High Ch., EUT on Side, Ant on Side
7446.858	40.0	15.0	1.5	48.0	0.0	0.0	Vert	PK	0.0	55.0	74.0	-19.0	DTS, EUT Horz, Ant Horz
7447.167	39.9	15.0	3.0	137.0	0.0	0.0	Horz	PK	0.0	54.9	74.0	-19.1	DTS, EUT Vert, Ant Vert
7446.117	39.8	15.0	3.1	200.0	0.0	0.0	Vert	PK	0.0	54.8	74.0	-19.2	DTS, EUT on Side, Ant on Side
12401.150	26.4	4.9	1.4	176.0	3.2	0.0	Vert	AV	0.0	34.5	54.0	-19.5	High Ch., EUT Vert, Ant Vert
12407.780	26.2	5.0	1.5	232.0	3.2	0.0	Horz	AV	0.0	34.4	54.0	-19.6	DTS, EUT on Side, Ant on Side
12401.540	26.2	4.9	1.5	245.0	3.2	0.0	Horz	AV	0.0	34.3	54.0	-19.7	High Ch., EUT Horz, Ant Horz
12412.230	26.1	5.0	1.5	98.0	3.2	0.0	Vert	AV	0.0	34.3	54.0	-19.7	DTS, EUT Vert, Ant Vert
4960.150	41.5	9.5	1.0	54.0	0.0	0.0	Horz	PK	0.0	51.0	74.0	-23.0	High Ch., EUT Horz, Ant Horz
4960.583	38.7	9.5	3.3	149.0	0.0	0.0	Vert	PK	0.0	48.2	74.0	-25.8	High Ch., EUT Vert, Ant Vert
4963.358	37.9	9.5	1.5	355.0	0.0	0.0	Horz	PK	0.0	47.4	74.0	-26.6	DTS, EUT on Side, Ant on Side
4966.325	36.8	9.5	1.5	162.0	0.0	0.0	Vert	PK	0.0	46.3	74.0	-27.7	DTS, EUT Vert, Ant Vert
12400.390	37.4	4.9	1.5	245.0	0.0	0.0	Horz	PK	0.0	42.3	74.0	-31.7	High Ch., EUT Horz, Ant Horz
12401.510	37.2	4.9	1.4	176.0	0.0	0.0	Vert	PK	0.0	42.1	74.0	-31.9	High Ch., EUT Vert, Ant Vert
12409.890	36.8	5.0	1.5	232.0	0.0	0.0	Horz	PK	0.0	41.8	74.0	-32.2	DTS, EUT on Side, Ant on Side
12407.930	35.9	5.0	1.5	98.0	0.0	0.0	Vert	PK	0.0	40.9	74.0	-33.1	DTS, EUT Vert, Ant Vert

SPURIOUS RADIATED EMISSIONS

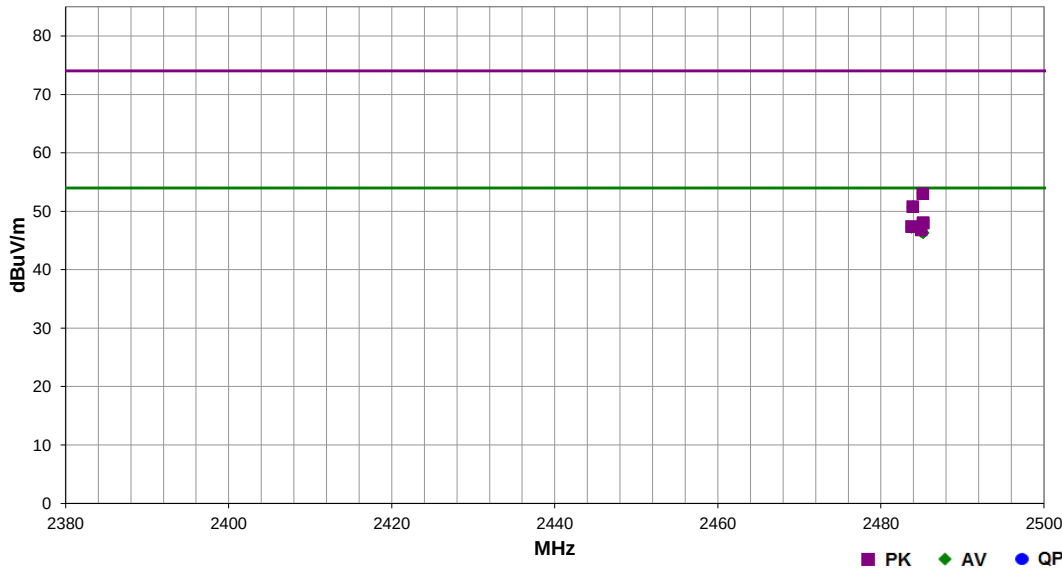


EmiRS 2020.12.09.0 PSA-ESCI 2020.06.24.2

Work Order:	SYNA0313	Date:	2020-12-14	
Project:	None	Temperature:	25.7 °C	
Job Site:	NC01	Humidity:	29.2% RH	
Serial Number:	Rev. 10 - 007	Barometric Pres.:	1026 mbar	
EUT: RadioNode				Tested by: Brian Fahey
Configuration: 2				
Customer: Walt Disney Parks and Resorts US, Inc.				
Attendees: None				
EUT Power: 24VDC via 120VAC/60Hz				
Operating Mode:	Simultaneous Tx mode: BTLE Tx, Port 7, Ant Cable A1, Antenna PN: MA510.C.CG.005, GFSK, Packet Length = 63, PRBS9, 1 Mbps, High Channel = 2480 MHz; DTS Tx, Port 8, Ant Cable A2, Antenna PN: MA510.C.CG.005, GFSK, Packet Length = 63, PRBS9, 1 Mbps, Single Ch. = 2482 MHz. BLE Power setting = 0 dBm, DTS Power setting = 4 dBm.			
Deviations:	None			
Comments:	See comments below for Channel, EUT orientations. The provided test software configured the radio with a duty cycle of 47.8% . Per ANSI C63.10 test methods, the RMS data was corrected with a carrier duty cycle correction factor (DCCF) of 3.2 dB. DCCF (dB) = 10*log(1/0.478).			

Test Specifications	Test Method
FCC 15.247:2020	ANSI C63.10:2013

Run #	7	Test Distance (m)	3	Antenna Height(s)	1 to 4(m)	Results	Pass
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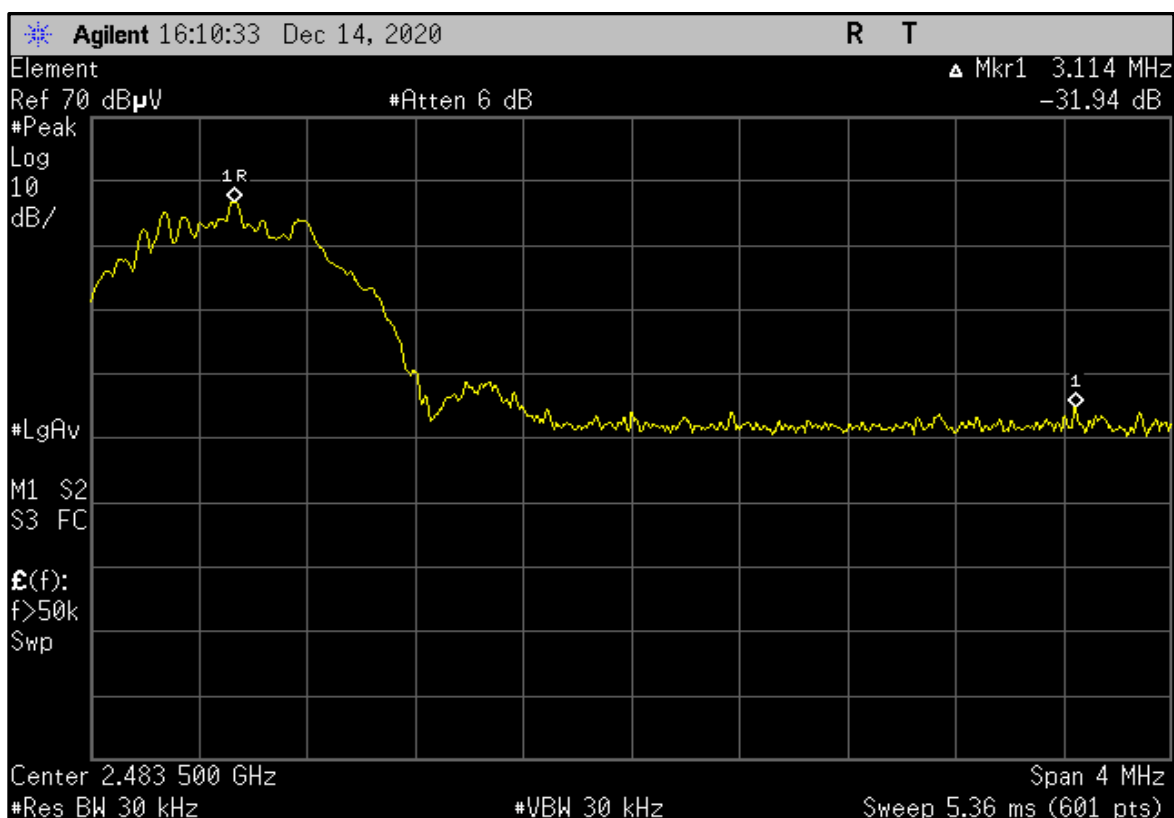
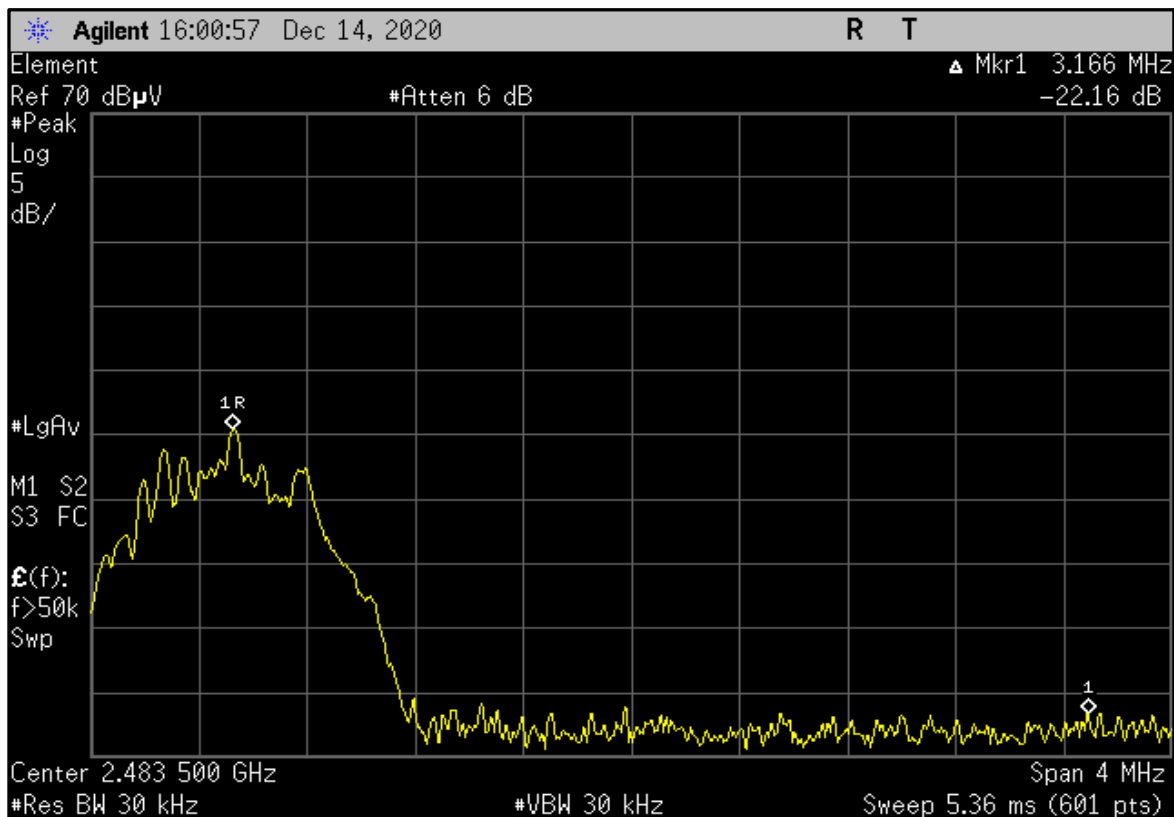
Freq (MHz)	Calculated Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (dB)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Marker Delta Comments
2485.133	30.7	-0.8	1.5	336.0	3.2	20.0	Horz	AV	0.0	53.1	54.0	-0.9	DTS, EUT Horz, Ant Horz: Fund 62.0dBuV + - 31.3dBc = 30.7dBuV (calc. amp.)
2483.900	28.4	-0.8	1.9	306.0	3.2	20.0	Horz	AV	0.0	50.8	54.0	-3.2	DTS, EUT Vert, Ant Vert: Fund 60.4dBuV + - 32.0dBc = 28.4dBuV (calc. amp.)
2485.147	25.6	-0.8	1.9	304.0	3.2	20.0	Horz	AV	0.0	48.0	54.0	-6.0	DTS, EUT on Side, Ant on Side.: Fund 57.5dBuV + - 31.9dBc = 25.6dBuV (calc. amp.)
2483.747	24.8	-0.8	1.5	157.0	3.2	20.0	Vert	AV	0.0	47.2	54.0	-6.8	DTS, EUT Vert, Ant Vert: Fund 56.9dBuV + - 32.1dBc = 24.8dBuV (calc. amp.)
2484.933	24.1	-0.8	1.5	306.0	3.2	20.0	Vert	AV	0.0	46.5	54.0	-7.5	DTS, EUT on Side, Ant on Side.: Fund 53.3dBuV + - 29.2dBc = 24.1dBuV (calc. amp.)
2485.193	23.9	-0.8	2.1	344.0	3.2	20.0	Vert	AV	0.0	46.3	54.0	-7.7	DTS, EUT Horz, Ant Horz: Fund 46.1dBuV + - 22.2dBc = 23.9dBuV (calc. amp.)
2485.133	33.8	-0.8	1.5	336.0	0.0	20.0	Horz	PK	0.0	53.0	74.0	-21.0	DTS, EUT Horz, Ant Horz: Fund 65.1dBuV + - 31.3dBc = 33.8dBuV (calc. amp.)
2483.900	31.6	-0.8	1.9	306.0	0.0	20.0	Horz	PK	0.0	50.8	74.0	-23.2	DTS, EUT Vert, Ant Vert: Fund 63.6dBuV + - 32.0dBc = 31.6dBuV (calc. amp.)
2485.193	28.8	-0.8	2.1	344.0	0.0	20.0	Vert	PK	0.0	48.0	74.0	-26.0	DTS, EUT Horz, Ant Horz: Fund 51.0dBuV + - 22.2dBc = 28.8dBuV (calc. amp.)
2485.147	28.8	-0.8	1.9	304.0	0.0	20.0	Horz	PK	0.0	48.0	74.0	-26.0	DTS, EUT on Side, Ant on Side.: Fund 60.7dBuV + - 31.9dBc = 28.8dBuV (calc. amp.)
2483.747	28.2	-0.8	1.5	157.0	0.0	20.0	Vert	PK	0.0	47.4	74.0	-26.6	DTS, EUT Vert, Ant Vert: Fund 60.3dBuV + - 32.1dBc = 28.2dBuV (calc. amp.)
2484.933	27.6	-0.8	1.5	306.0	0.0	20.0	Vert	PK	0.0	46.8	74.0	-27.2	DTS, EUT on Side, Ant on Side.: Fund 56.8dBuV + - 29.2dBc = 27.6dBuV (calc. amp.)

SPURIOUS RADIATED EMISSIONS



DTS, EUT Horz, Ant Horz

PSA-ESCI 2020.06.24.2



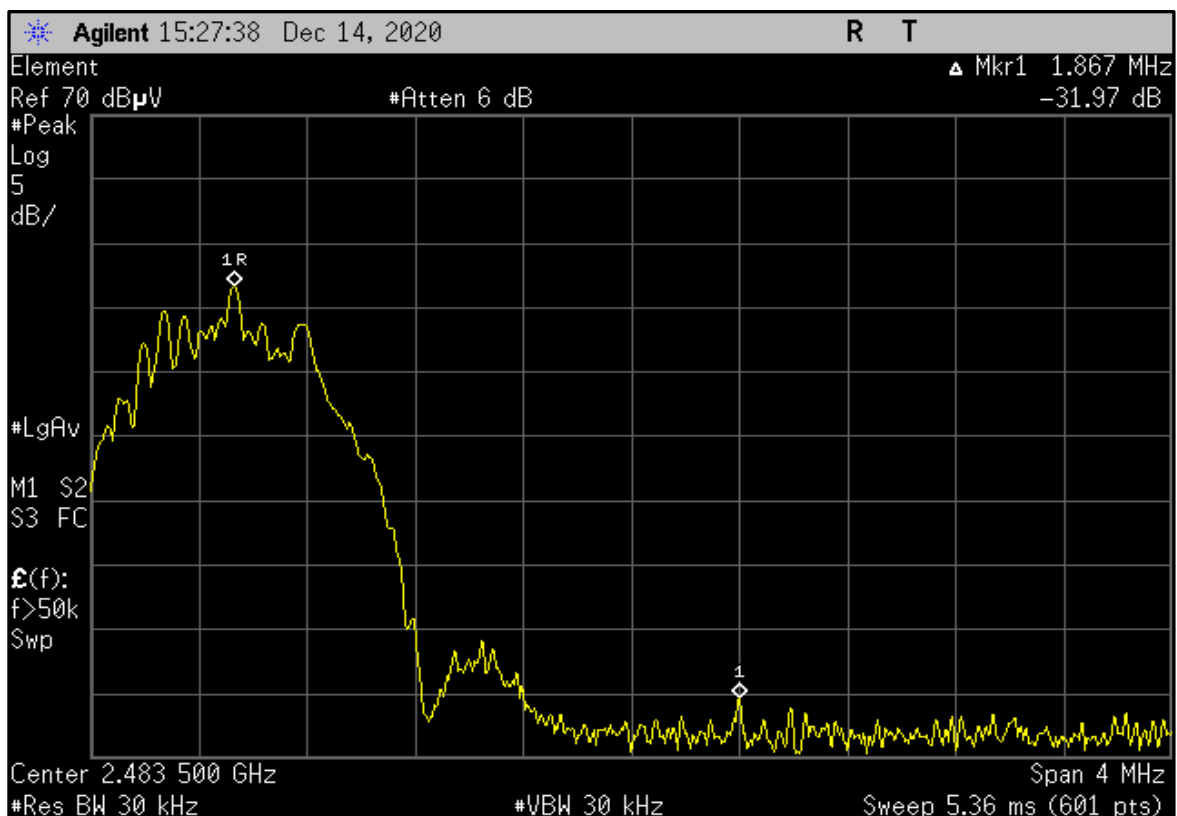
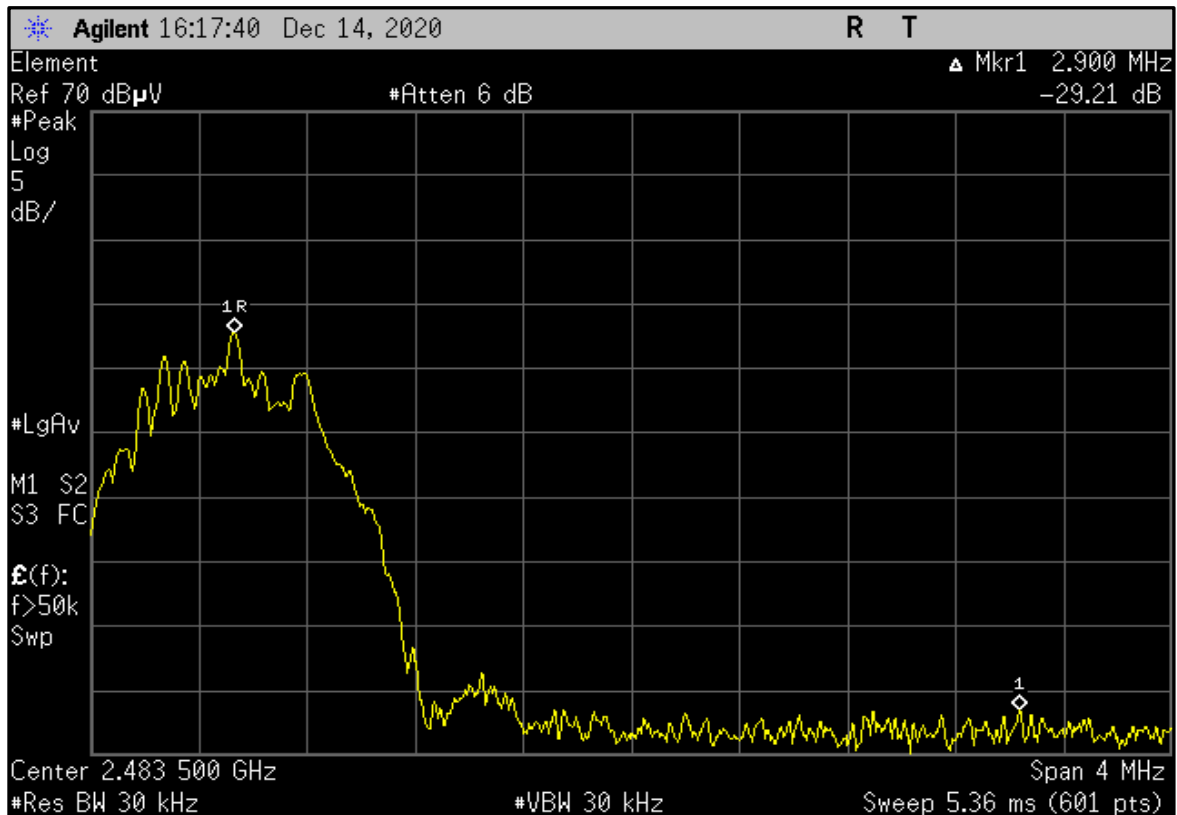
DTS, EUT on Side, Ant on Side.

SPURIOUS RADIATED EMISSIONS



DTS, EUT on Side, Ant on Side.

PSA-ESCI 2020.06.24.2



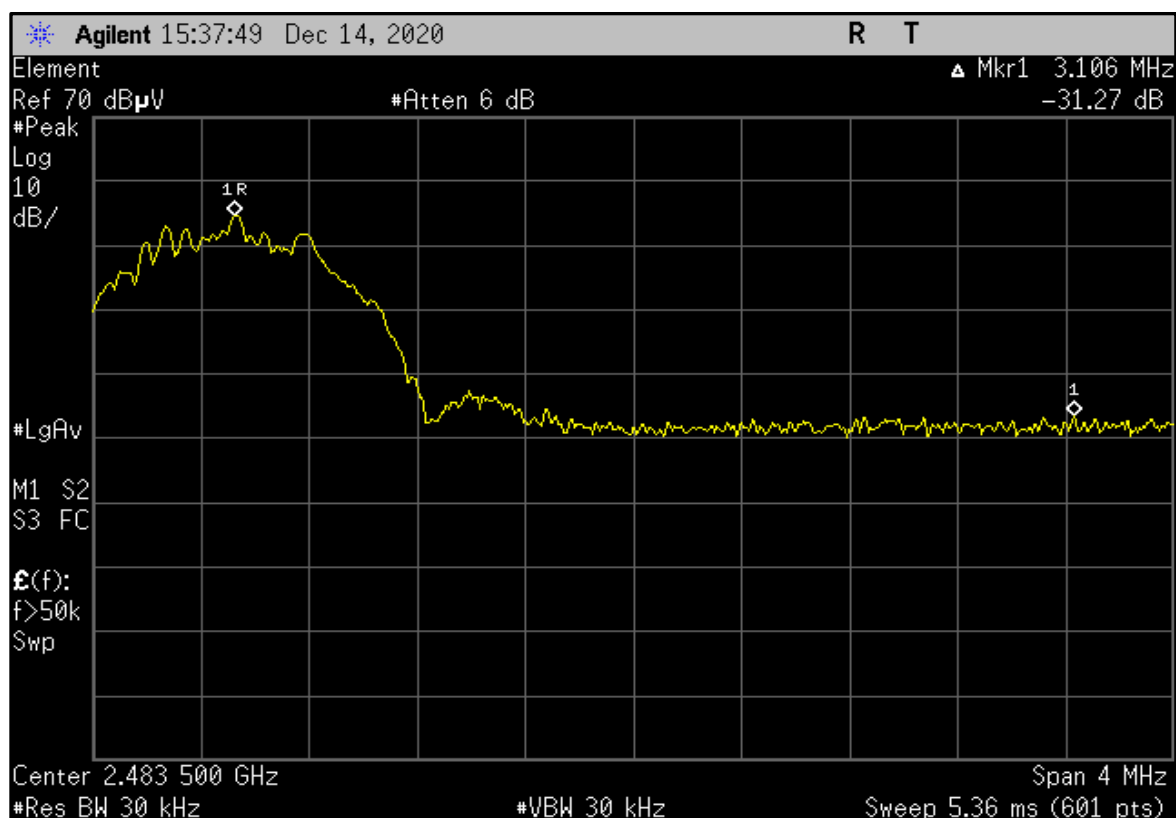
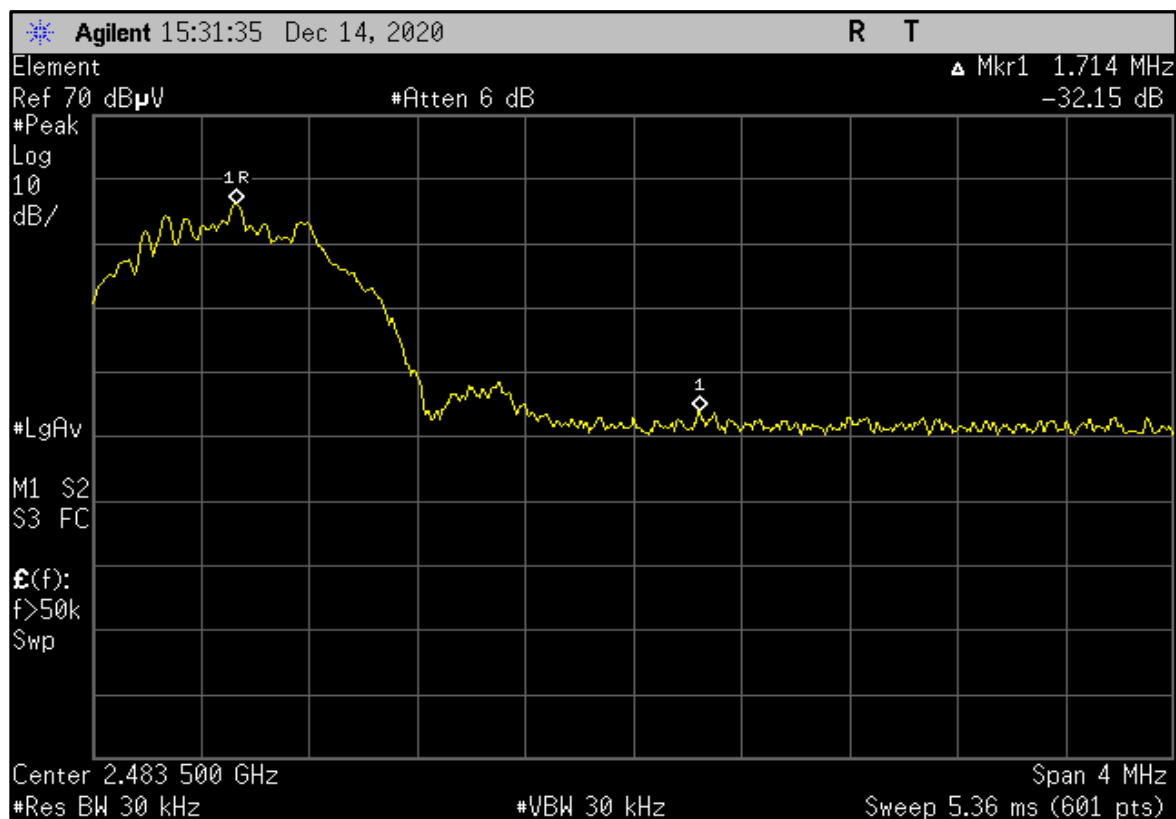
DTS, EUT Vert, Ant Vert

SPURIOUS RADIATED EMISSIONS



DTS, EUT Vert, Ant Vert

PSA-ESCI 2020.06.24.2



DTS, EUT Horz, Ant Horz

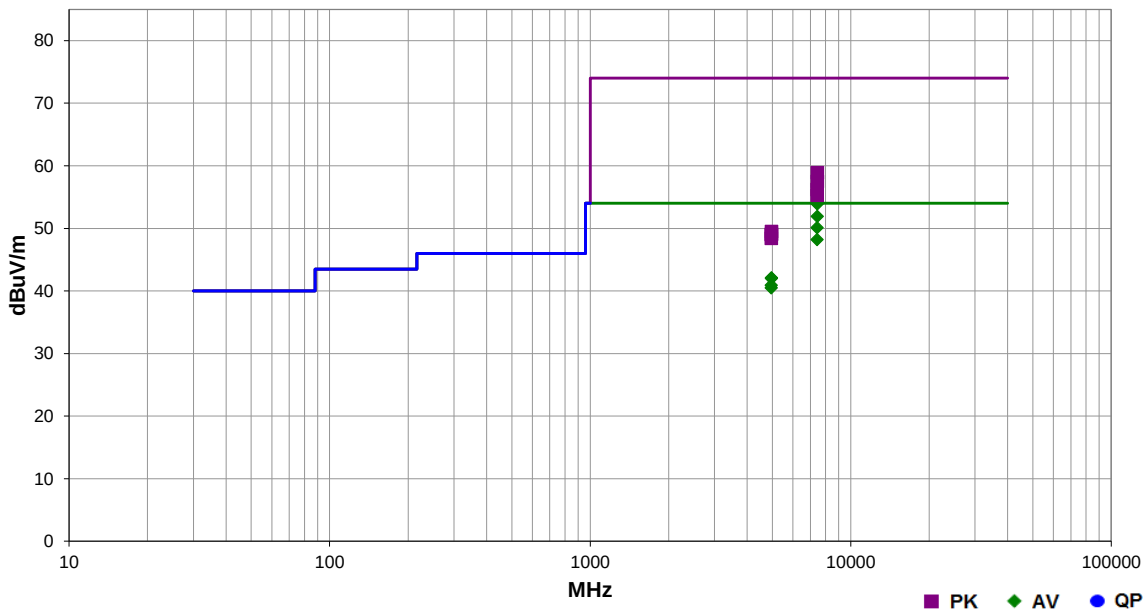
SPURIOUS RADIATED EMISSIONS



EmiR5 2020.12.09.0 PSA-ESCI 2020.06.24.2

Work Order:	SYNA0313	Date:	2020-12-14	
Project:	None	Temperature:	25.7 °C	
Job Site:	NC01	Humidity:	29.2% RH	
Serial Number:	Rev. 10 - 007	Barometric Pres.:	1026 mbar	
EUT: RadioNode				Tested by: Brian Fahey
Configuration:	2			
Customer:	Walt Disney Parks and Resorts US, Inc.			
Attendees:	None			
EUT Power:	24VDC via 120VAC/60Hz			
Operating Mode:	Simultaneous Tx mode: BTLE Tx, Port 8, Ant Cable A1, Antenna PN: MA510.C.CG.005, GFSK, Packet Length = 63, PRBS9, 1 Mbps, High Channel = 2480 MHz; DTS Tx, Port 7, Ant Cable A2, Antenna PN: MA510.C.CG.005, GFSK, Packet Length = 63, PRBS9, 1 Mbps, Single Ch. = 2482 MHz. BLE Power setting = 0 dBm, DTS Power setting = 4 dBm.			
Deviations:	None			
Comments:	See comments below for Channel, EUT orientations. The worst case EUT orientations from the previous testing were used. The provided test software configured the radio with a duty cycle of 47.8% . Per ANSI C63.10 test methods, the RMS data was corrected with a carrier duty cycle correction factor (DCCF) of 3.2 dB. DCCF (dB) = 10*log(1/0.478).			
Test Specifications	FCC 15.247:2020		Test Method	ANSI C63.10:2013

Run #	8	Test Distance (m)	3	Antenna Height(s)	1 to 4(m)	Results	Pass
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Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (dB)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
7445.458	35.7	15.0	2.2	227.0	3.2	0.0	Horz	AV	0.0	53.9	54.0	-0.1	DTS, EUT on Side, Ant on Side
7446.625	33.7	15.0	1.6	328.0	3.2	0.0	Vert	AV	0.0	51.9	54.0	-2.1	DTS, EUT Vert, Ant Vert
7440.667	31.9	15.0	1.6	33.0	3.2	0.0	Horz	AV	0.0	50.1	54.0	-3.9	High Ch., EUT Horz, Ant Horz
7440.533	30.0	15.0	1.3	248.0	3.2	0.0	Vert	AV	0.0	48.2	54.0	-5.8	High Ch., EUT Vert, Ant Vert
4964.142	29.4	9.5	1.5	8.0	3.2	0.0	Horz	AV	0.0	42.1	54.0	-11.9	DTS, EUT Horz, Ant Horz
4963.900	29.3	9.5	1.4	323.0	3.2	0.0	Vert	AV	0.0	42.0	54.0	-12.0	DTS, EUT Vert, Ant Vert
4960.075	28.2	9.5	1.5	334.0	3.2	0.0	Horz	AV	0.0	40.9	54.0	-13.1	High Ch., EUT Horz, Ant Horz
4960.008	27.8	9.5	3.6	146.0	3.2	0.0	Vert	AV	0.0	40.5	54.0	-13.5	High Ch., EUT Vert, Ant Vert
7446.867	43.9	15.0	2.2	227.0	0.0	0.0	Horz	PK	0.0	58.9	74.0	-15.1	DTS, EUT on Side, Ant on Side
7445.200	42.5	15.0	1.6	328.0	0.0	0.0	Vert	PK	0.0	57.5	74.0	-16.5	DTS, EUT Vert, Ant Vert
7440.708	41.2	15.0	1.6	33.0	0.0	0.0	Horz	PK	0.0	56.2	74.0	-17.8	High Ch., EUT Horz, Ant Horz
7439.667	40.3	15.0	1.3	248.0	0.0	0.0	Vert	PK	0.0	55.3	74.0	-18.7	High Ch., EUT Vert, Ant Vert
4963.475	40.0	9.5	1.4	323.0	0.0	0.0	Vert	PK	0.0	49.5	74.0	-24.5	DTS, EUT Vert, Ant Vert
4963.800	39.6	9.5	1.5	8.0	0.0	0.0	Horz	PK	0.0	49.1	74.0	-24.9	DTS, EUT Horz, Ant Horz
4960.808	39.5	9.5	1.5	334.0	0.0	0.0	Horz	PK	0.0	49.0	74.0	-25.0	High Ch., EUT Horz, Ant Horz
4959.983	38.9	9.5	3.6	146.0	0.0	0.0	Vert	PK	0.0	48.4	74.0	-25.6	High Ch., EUT Vert, Ant Vert

SPURIOUS RADIATED EMISSIONS

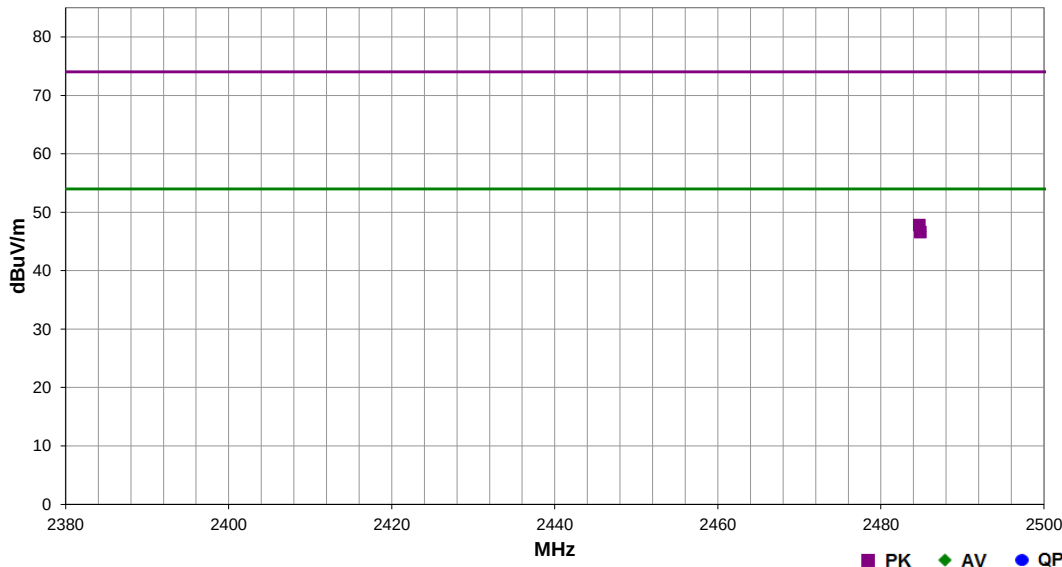


EmiRS 2020.12.09.0 PSA-ESCI 2020.06.24.2

Work Order:	SYNA0313	Date:	2020-12-14	
Project:	None	Temperature:	25.7 °C	
Job Site:	NC01	Humidity:	29.2% RH	
Serial Number:	Rev. 10 - 007	Barometric Pres.:	1026 mbar	
Tested by: Brian Fahey				
EUT:	RadioNode			
Configuration:	2			
Customer:	Walt Disney Parks and Resorts US, Inc.			
Attendees:	None			
EUT Power:	24VDC via 120VAC/60Hz			
Operating Mode:	Simultaneous Tx mode: BTLE Tx, Port 8, Ant Cable A1, Antenna PN: MA510.C.CG.005, GFSK, Packet Length = 63, PRBS9, 1 Mbps, High Channel = 2480 MHz; DTS Tx, Port 7, Ant Cable A2, Antenna PN: MA510.C.CG.005, GFSK, Packet Length = 63, PRBS9, 1 Mbps, Single Ch. = 2482 MHz. BLE Power setting = 0 dBm, DTS Power setting = 4 dBm.			
Deviations:	None			
Comments:	See comments below for Channel, EUT orientations. The worst case EUT orientations from the previous testing were used. The provided test software configured the radio with a duty cycle of 47.8% . Per ANSI C63.10 test methods, the RMS data was corrected with a carrier duty cycle correction factor (DCCF) of 3.2 dB. DCCF (dB) = 10*log(1/0.478).			

Test Specifications	FCC 15.247:2020	Test Method	ANSI C63.10:2013
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Run #	9	Test Distance (m)	3	Antenna Height(s)	1 to 4(m)	Results	Pass
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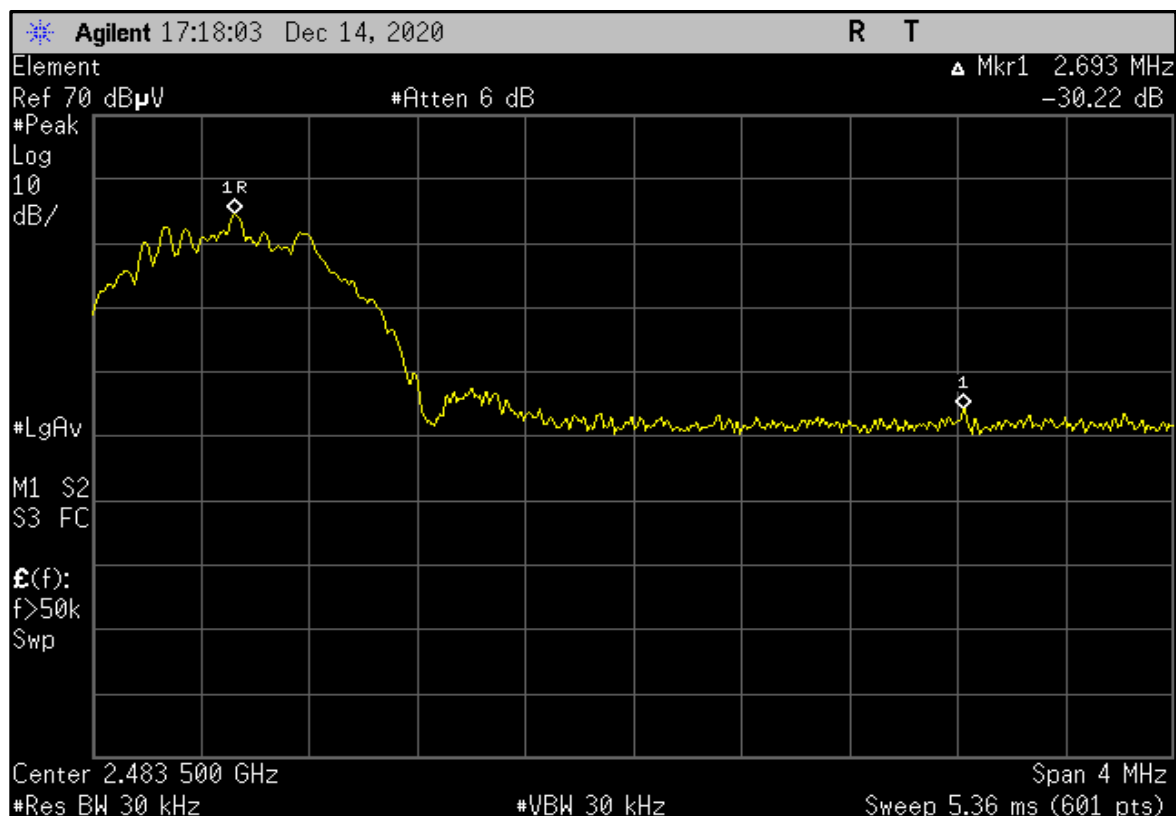
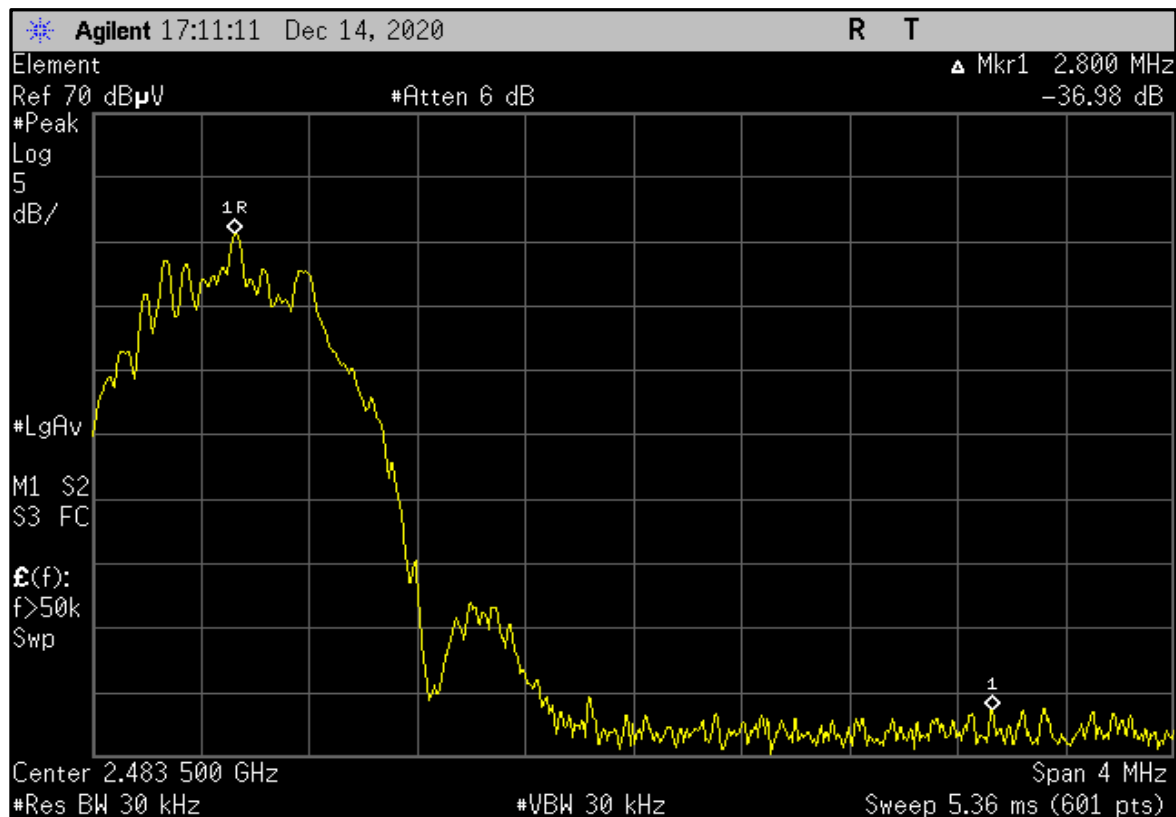
Freq (MHz)	Calculated Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (dB)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Marker Delta Comments
2484.720	24.8	-0.8	1.5	154.0	3.2	20.0	Vert	AV	0.0	47.2	54.0	-6.8	DTS, EUT Vert, Ant Vert: Fund 55.0dBuV + - 30.2dBc = 24.8dBuV (calc. amp.)
2484.827	24.3	-0.8	1.5	316.0	3.2	20.0	Horz	AV	0.0	46.7	54.0	-7.3	DTS, EUT Horz, Ant Horz: Fund 61.3dBuV + - 37.0dBc = 24.3dBuV (calc. amp.)
2484.720	28.6	-0.8	1.5	154.0	0.0	20.0	Vert	PK	0.0	47.8	74.0	-26.2	DTS, EUT Vert, Ant Vert: Fund 58.8dBuV + - 30.2dBc = 28.6dBuV (calc. amp.)
2484.827	27.4	-0.8	1.5	316.0	0.0	20.0	Horz	PK	0.0	46.6	74.0	-27.4	DTS, EUT Horz, Ant Horz: Fund 64.4dBuV + - 37.0dBc = 27.4dBuV (calc. amp.)

SPURIOUS RADIATED EMISSIONS



DTS, EUT Horz, Ant Horz

PSA-ESCI 2020.06.24.2



DTS, EUT Vert, Ant Vert

SPURIOUS RADIATED EMISSIONS

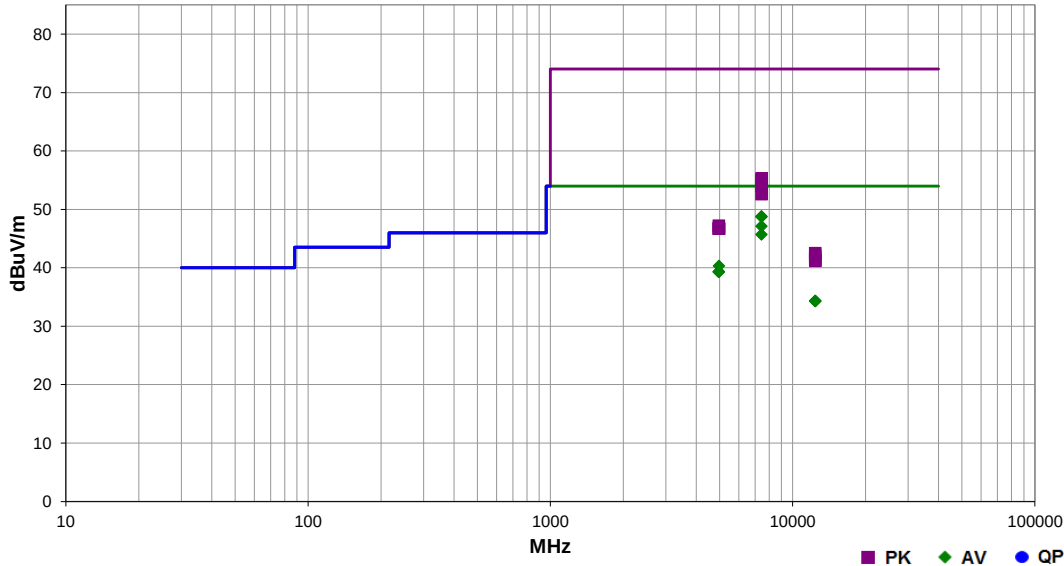


EmR5 2020.12.09.0 PSA-ESCI 2020.06.24.2

Work Order:	SYNA0313	Date:	2020-12-14		
Project:	None	Temperature:	25.7 °C		
Job Site:	NC01	Humidity:	29.2% RH		
Serial Number:	Rev. 10 - 007	Barometric Pres.:	1026 mbar	Tested by:	Brian Fahey
EUT:	RadioNode				
Configuration:	1				
Customer:	Walt Disney Parks and Resorts US, Inc.				
Attendees:	None				
EUT Power:	POE via 120VAC/60Hz				
Operating Mode:	Simultaneous Tx mode: BTLE Tx, Port 8, Ant Cable A1, Antenna PN: MA510.C.CG.005, GFSK, Packet Length = 63, PRBS9, 1 Mbps, High Channel = 2480 MHz; DTS Tx, Port 7, Ant Cable A2, Antenna PN: MA510.C.CG.005, GFSK, Packet Length = 63, PRBS9, 1 Mbps, Single Ch. = 2482 MHz. BLE Power setting = 0 dBm, DTS Power setting = 4 dBm.				
Deviations:	None				
Comments:	See comments below for Channel, EUT orientations. The worst case EUT orientations from the previous testing were used. The provided test software configured the radio with a duty cycle of 47.8% . Per ANSI C63.10 test methods, the RMS data was corrected with a carrier duty cycle correction factor (DCCF) of 3.2 dB. DCCF (dB) = 10*log(1/0.478).				

Test Specifications	FCC 15.247:2020	Test Method	ANSI C63.10:2013
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Run #	10	Test Distance (m)	3	Antenna Height(s)	1 to 4(m)	Results	Pass
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Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (dB)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
7446.633	30.6	15.0	1.5	329.0	3.2	0.0	Horz	AV	0.0	48.8	54.0	-5.2	DTS, EUT on Side, Ant on Side
7446.567	30.5	15.0	1.5	74.0	3.2	0.0	Vert	AV	0.0	48.7	54.0	-5.3	DTS, EUT Vert, Ant Vert
7439.483	28.9	15.0	1.0	10.0	3.2	0.0	Horz	AV	0.0	47.1	54.0	-6.9	High Ch., EUT Horz, Ant Horz
7440.808	27.5	15.0	1.4	64.0	3.2	0.0	Vert	AV	0.0	45.7	54.0	-8.3	High Ch., EUT Vert, Ant Vert
4963.875	27.6	9.5	3.7	159.0	3.2	0.0	Horz	AV	0.0	40.3	54.0	-13.7	DTS, EUT on Side, Ant on Side
4961.167	26.6	9.5	1.4	206.0	3.2	0.0	Vert	AV	0.0	39.3	54.0	-14.7	High Ch., EUT Vert, Ant Vert
4962.617	26.6	9.5	1.5	315.0	3.2	0.0	Vert	AV	0.0	39.3	54.0	-14.7	DTS, EUT Vert, Ant Vert
4959.608	26.6	9.5	1.5	114.0	3.2	0.0	Horz	AV	0.0	39.3	54.0	-14.7	High Ch., EUT Horz, Ant Horz
7445.308	40.3	15.0	1.5	329.0	0.0	0.0	Horz	PK	0.0	55.3	74.0	-18.7	DTS, EUT on Side, Ant on Side
7445.583	40.0	15.0	1.5	74.0	0.0	0.0	Vert	PK	0.0	55.0	74.0	-19.0	DTS, EUT Vert, Ant Vert
12401.240	26.2	4.9	1.5	86.0	3.2	0.0	Horz	AV	0.0	34.3	54.0	-19.7	High Ch., EUT Horz, Ant Horz
12407.520	26.1	5.0	1.5	301.0	3.2	0.0	Horz	AV	0.0	34.3	54.0	-19.7	DTS, EUT on Side, Ant on Side
12401.700	26.2	4.9	1.5	53.0	3.2	0.0	Vert	AV	0.0	34.3	54.0	-19.7	High Ch., EUT Vert, Ant Vert
12409.190	26.1	5.0	1.5	147.0	3.2	0.0	Vert	AV	0.0	34.3	54.0	-19.7	DTS, EUT Vert, Ant Vert
7440.892	39.0	15.0	1.0	10.0	0.0	0.0	Horz	PK	0.0	54.0	74.0	-20.0	High Ch., EUT Horz, Ant Horz
7440.183	37.6	15.0	1.4	64.0	0.0	0.0	Vert	PK	0.0	52.6	74.0	-21.4	High Ch., EUT Vert, Ant Vert
4963.442	37.7	9.5	3.7	159.0	0.0	0.0	Horz	PK	0.0	47.2	74.0	-26.8	DTS, EUT on Side, Ant on Side
4959.517	37.2	9.5	1.4	206.0	0.0	0.0	Vert	PK	0.0	46.7	74.0	-27.3	High Ch., EUT Vert, Ant Vert
4963.567	37.2	9.5	1.5	315.0	0.0	0.0	Vert	PK	0.0	46.7	74.0	-27.3	DTS, EUT Vert, Ant Vert
4960.975	37.2	9.5	1.5	114.0	0.0	0.0	Horz	PK	0.0	46.7	74.0	-27.3	High Ch., EUT Horz, Ant Horz
12401.140	37.6	4.9	1.5	53.0	0.0	0.0	Vert	PK	0.0	42.5	74.0	-31.5	High Ch., EUT Vert, Ant Vert
12401.300	37.1	4.9	1.5	86.0	0.0	0.0	Horz	PK	0.0	42.0	74.0	-32.0	High Ch., EUT Horz, Ant Horz
12408.770	36.4	5.0	1.5	147.0	0.0	0.0	Vert	PK	0.0	41.4	74.0	-32.6	DTS, EUT Vert, Ant Vert
12410.580	36.2	5.0	1.5	301.0	0.0	0.0	Horz	PK	0.0	41.2	74.0	-32.8	DTS, EUT on Side, Ant on Side

SPURIOUS RADIATED EMISSIONS

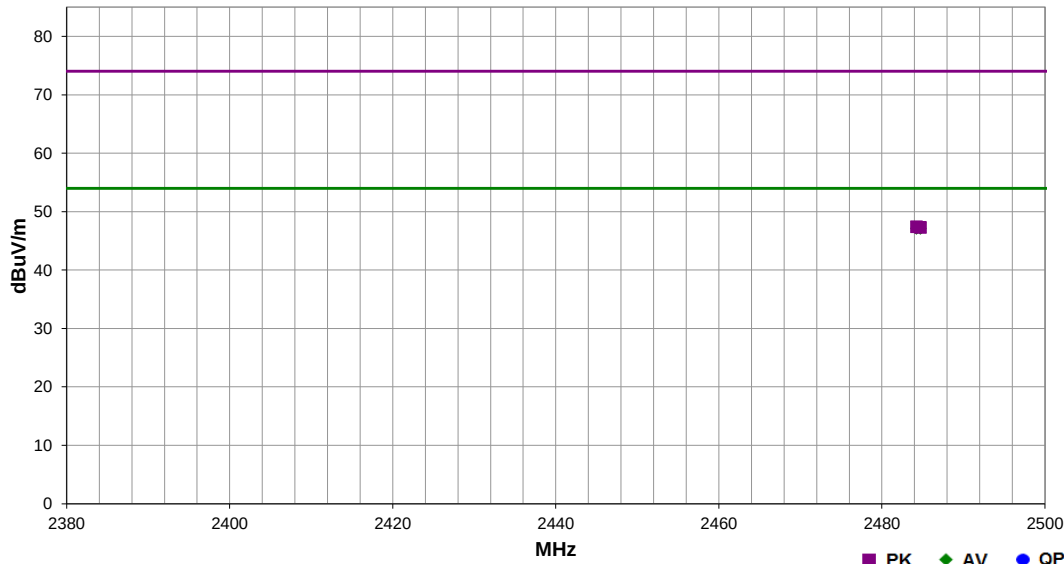


EmiRS 2020.12.09.0 PSA-ESCI 2020.06.24.2

Work Order:	SYNA0313	Date:	2020-12-14	
Project:	None	Temperature:	25.7 °C	
Job Site:	NC01	Humidity:	29.2% RH	
Serial Number:	Rev. 10 - 007	Barometric Pres.:	1026 mbar	
EUT: RadioNode				Tested by: Brian Fahey
Configuration:	1			
Customer:	Walt Disney Parks and Resorts US, Inc.			
Attendees:	None			
EUT Power:	POE via 120VAC/60Hz			
Operating Mode:	Simultaneous Tx mode: BTLE Tx, Port 7, Ant Cable A1, Antenna PN: MA510.C.CG.005, GFSK, Packet Length = 63, PRBS9, 1 Mbps, High Channel = 2480 MHz; DTS Tx, Port 8, Ant Cable A2, Antenna PN: MA510.C.CG.005, GFSK, Packet Length = 63, PRBS9, 1 Mbps, Single Ch. = 2482 MHz. BLE Power setting = 0 dBm, DTS Power setting = 4 dBm.			
Deviations:	None			
Comments:	See comments below for Channel, EUT orientations. The worst case EUT orientations from the previous testing were used. The provided test software configured the radio with a duty cycle of 47.8% . Per ANSI C63.10 test methods, the RMS data was corrected with a carrier duty cycle correction factor (DCCF) of 3.2 dB. DCCF (dB) = 10*log(1/0.478).			

Test Specifications	FCC 15.247:2020	Test Method	ANSI C63.10:2013
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Run #	12	Test Distance (m)	3	Antenna Height(s)	1 to 4(m)	Results	Pass
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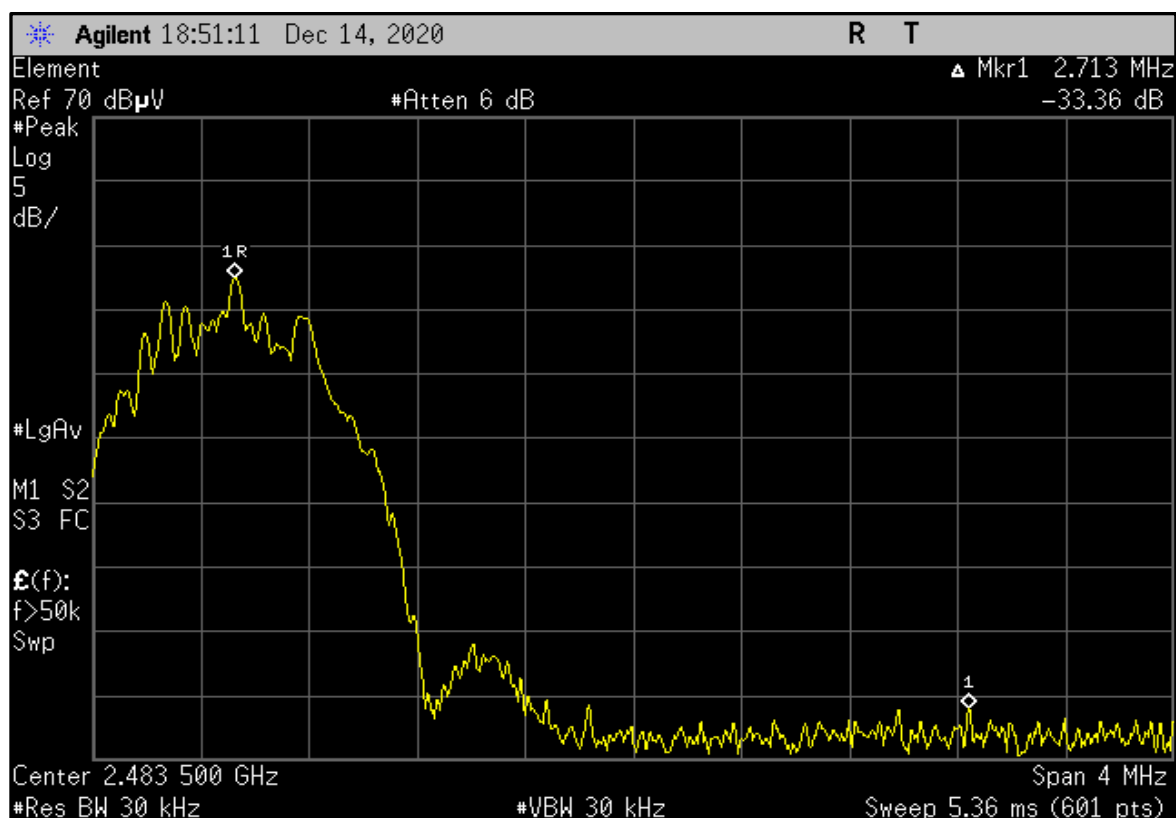
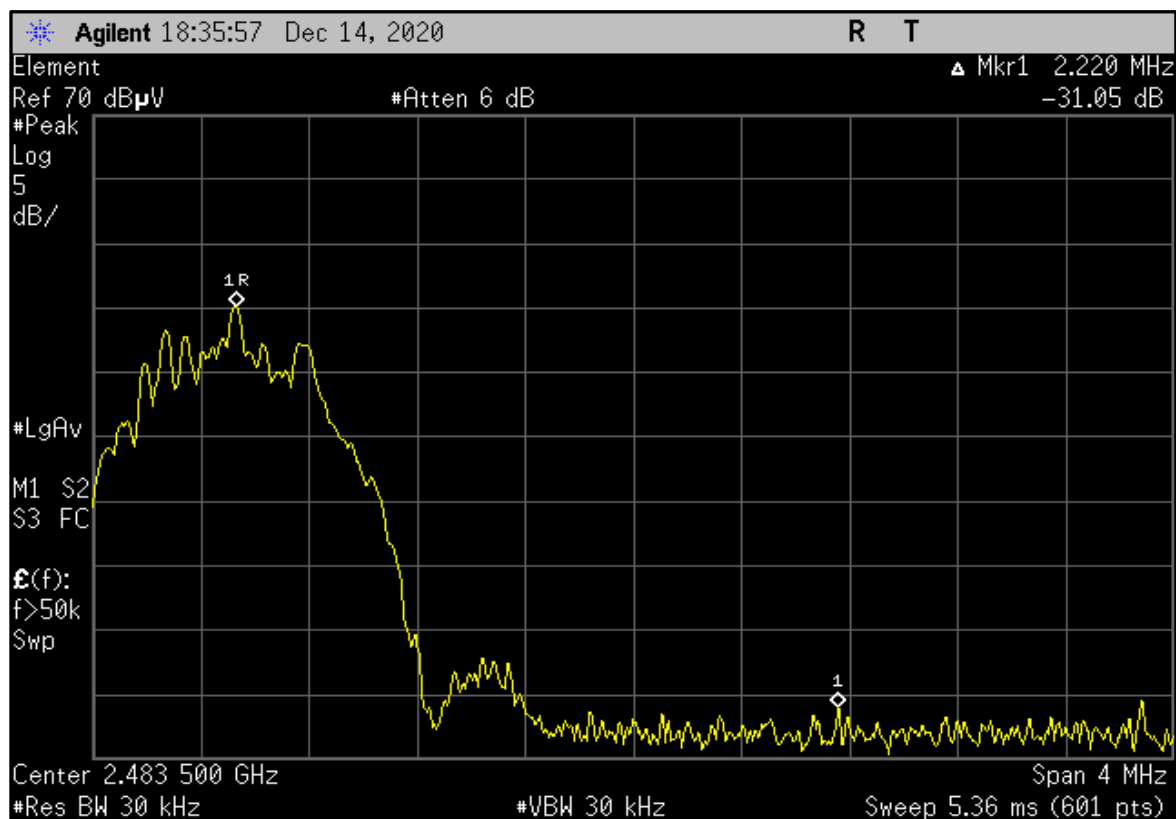
Freq (MHz)	Calculated Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (dB)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Marker Delta Comments
2484.253	24.7	-0.8	1.5	234.0	3.2	20.0	Vert	AV	0.0	47.1	54.0	-6.9	DTS, EUT Vert, Ant Vert: Fund 55.8dBuV + - 31.1dBc = 24.7dBuV (calc. amp.)
2484.740	24.7	-0.8	1.5	300.0	3.2	20.0	Horz	AV	0.0	47.1	54.0	-6.9	DTS, EUT Horz, Ant Horz: Fund 58.1dBuV + - 33.4dBc = 24.7dBuV (calc. amp.)
2484.253	28.2	-0.8	1.5	234.0	0.0	20.0	Vert	PK	0.0	47.4	74.0	-26.6	DTS, EUT Vert, Ant Vert: Fund 59.3dBuV + - 31.1dBc = 28.2dBuV (calc. amp.)
2484.740	28.1	-0.8	1.5	300.0	0.0	20.0	Horz	PK	0.0	47.3	74.0	-26.7	DTS, EUT Horz, Ant Horz: Fund 61.5dBuV + - 33.4dBc = 28.1dBuV (calc. amp.)

SPURIOUS RADIATED EMISSIONS



DTS, EUT Vert, Ant Vert

PSA-ESCI 2020.06.24.2



DTS, EUT Horz, Ant Horz

SPURIOUS RADIATED EMISSIONS

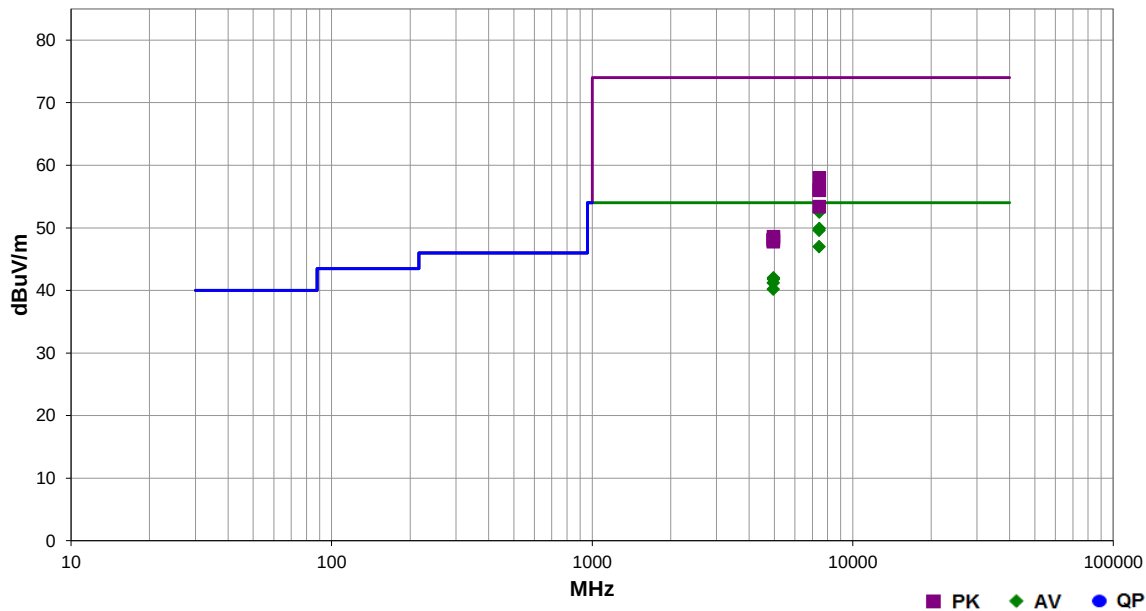


EmiR5 2020.12.09.0 PSA-ESCI 2020.06.24.2

Work Order:	SYNA0313	Date:	2020-12-14	
Project:	None	Temperature:	25.1 °C	
Job Site:	NC01	Humidity:	28.9% RH	
Serial Number:	Rev. 10 - 007	Barometric Pres.:	1016 mbar	
EUT:	RadioNode			Tested by: Brian Fahey
Configuration:	1			
Customer:	Walt Disney Parks and Resorts US, Inc.			
Attendees:	None			
EUT Power:	POE via 120VAC/60Hz			
Operating Mode:	Simultaneous Tx mode: BTLE Tx, Port 8, Ant Cable A1, Antenna PN: MA510.C.CG.005, GFSK, Packet Length = 63, PRBS9, 1 Mbps, High Channel = 2480 MHz; DTS Tx, Port 7, Ant Cable A2, Antenna PN: MA510.C.CG.005, GFSK, Packet Length = 63, PRBS9, 1 Mbps, Single Ch. = 2482 MHz. BLE Power setting = 0 dBm, DTS Power setting = 4 dBm.			
Deviations:	None			
Comments:	See comments below for Channel, EUT orientations. The worst case EUT orientations from the previous testing were used. The provided test software configured the radio with a duty cycle of 47.8% . Per ANSI C63.10 test methods, the RMS data was corrected with a carrier duty cycle correction factor (DCCF) of 3.2 dB. DCCF (dB) = 10*log(1/0.478).			

Test Specifications	Test Method
FCC 15.247:2020	ANSI C63.10:2013

Run #	16	Test Distance (m)	3	Antenna Height(s)	1 to 4(m)	Results	Pass
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Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (dB)	External Attenuation (dB)	Polarity/Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
7445.508	34.3	15.0	3.2	319.0	3.2	0.0	Horz	AV	0.0	52.5	54.0	-1.5	DTS, EUT on Side, Ant on Side
7446.683	31.7	15.0	1.5	179.0	3.2	0.0	Vert	AV	0.0	49.9	54.0	-4.1	DTS, EUT Vert, Ant Vert
7439.475	31.4	15.0	1.4	18.0	3.2	0.0	Horz	AV	0.0	49.6	54.0	-4.4	High Ch., EUT Horz, Ant Horz
7440.625	28.8	15.0	1.5	184.0	3.2	0.0	Vert	AV	0.0	47.0	54.0	-7.0	High Ch., EUT Vert, Ant Vert
4964.175	29.3	9.5	1.5	355.0	3.2	0.0	Horz	AV	0.0	42.0	54.0	-12.0	DTS, EUT on Side, Ant on Side
4963.992	29.1	9.5	2.6	328.0	3.2	0.0	Vert	AV	0.0	41.8	54.0	-12.2	DTS, EUT Vert, Ant Vert
4960.000	28.5	9.5	1.3	321.0	3.2	0.0	Horz	AV	0.0	41.2	54.0	-12.8	High Ch., EUT Vert, Ant Horz
4960.108	27.5	9.5	1.5	131.0	3.2	0.0	Vert	AV	0.0	40.2	54.0	-13.8	High Ch., EUT Vert, Ant Vert
7446.608	43.0	15.0	3.2	319.0	0.0	0.0	Horz	PK	0.0	58.0	74.0	-16.0	DTS, EUT on Side, Ant on Side
7440.700	41.1	15.0	1.4	18.0	0.0	0.0	Horz	PK	0.0	56.1	74.0	-17.9	High Ch., EUT Horz, Ant Horz
7446.825	41.0	15.0	1.5	179.0	0.0	0.0	Vert	PK	0.0	56.0	74.0	-18.0	DTS, EUT Vert, Ant Vert
7439.075	38.4	15.0	1.5	184.0	0.0	0.0	Vert	PK	0.0	53.4	74.0	-20.6	High Ch., EUT Vert, Ant Vert
4963.892	39.1	9.5	2.6	328.0	0.0	0.0	Vert	PK	0.0	48.6	74.0	-25.4	DTS, EUT Vert, Ant Vert
4962.383	38.6	9.5	1.5	355.0	0.0	0.0	Horz	PK	0.0	48.1	74.0	-25.9	DTS, EUT on Side, Ant on Side
4959.267	38.6	9.5	1.5	131.0	0.0	0.0	Vert	PK	0.0	48.1	74.0	-25.9	High Ch., EUT Vert, Ant Vert
4961.175	38.3	9.5	1.3	321.0	0.0	0.0	Horz	PK	0.0	47.8	74.0	-26.2	High Ch., EUT Horz, Ant Horz

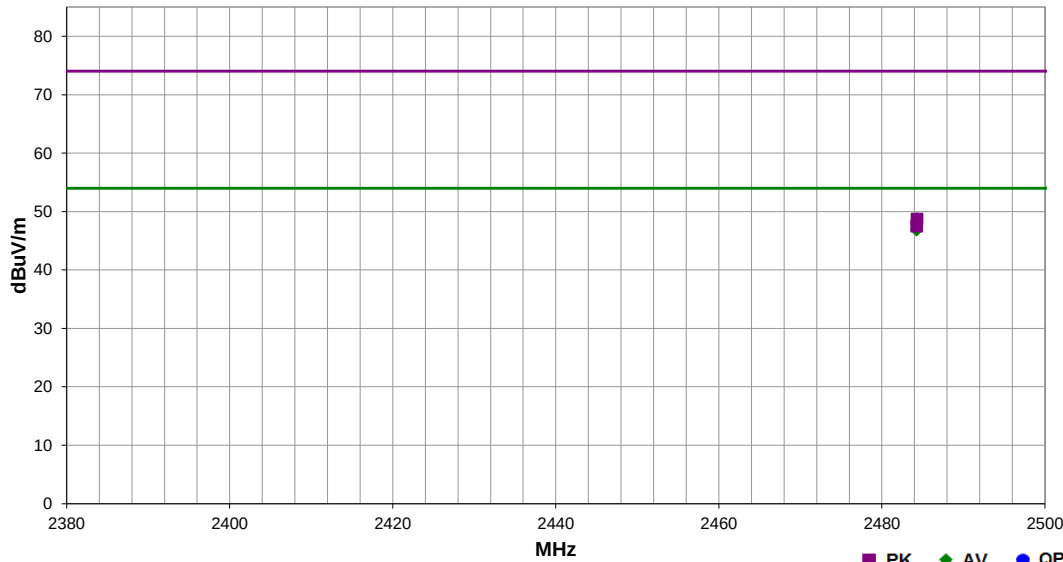
SPURIOUS RADIATED EMISSIONS



EmiRS 2020.12.09.0 PSA-ESCI 2020.06.24.2

Work Order:	SYNA0313	Date:	2020-12-14	
Project:	None	Temperature:	25.1 °C	
Job Site:	NC01	Humidity:	28.9% RH	
Serial Number:	Rev. 10 - 007	Barometric Pres.:	1016 mbar	
EUT: RadioNode				Tested by: Brian Fahey
Configuration:	1			
Customer:	Walt Disney Parks and Resorts US, Inc.			
Attendees:	None			
EUT Power:	POE via 120VAC/60Hz			
Operating Mode:	Simultaneous Tx mode: BTLE Tx, Port 8, Ant Cable A1, Antenna PN: MA510.C.CG.005, GFSK, Packet Length = 63, PRBS9, 1 Mbps, High Channel = 2480 MHz; DTS Tx, Port 7, Ant Cable A2, Antenna PN: MA510.C.CG.005, GFSK, Packet Length = 63, PRBS9, 1 Mbps, Single Ch. = 2482 MHz. BLE Power setting = 0 dBm, DTS Power setting = 4 dBm.			
Deviations:	None			
Comments:	See comments below for Channel, EUT orientations. The worst case EUT orientations from the previous testing were used. The provided test software configured the radio with a duty cycle of 47.8% . Per ANSI C63.10 test methods, the RMS data was corrected with a carrier duty cycle correction factor (DCCF) of 3.2 dB. DCCF (dB) = 10*log(1/0.478).			
Test Specifications	FCC 15.247:2020			Test Method
				ANSI C63.10:2013

Run #	17	Test Distance (m)	3	Antenna Height(s)	1 to 4(m)	Results	Pass
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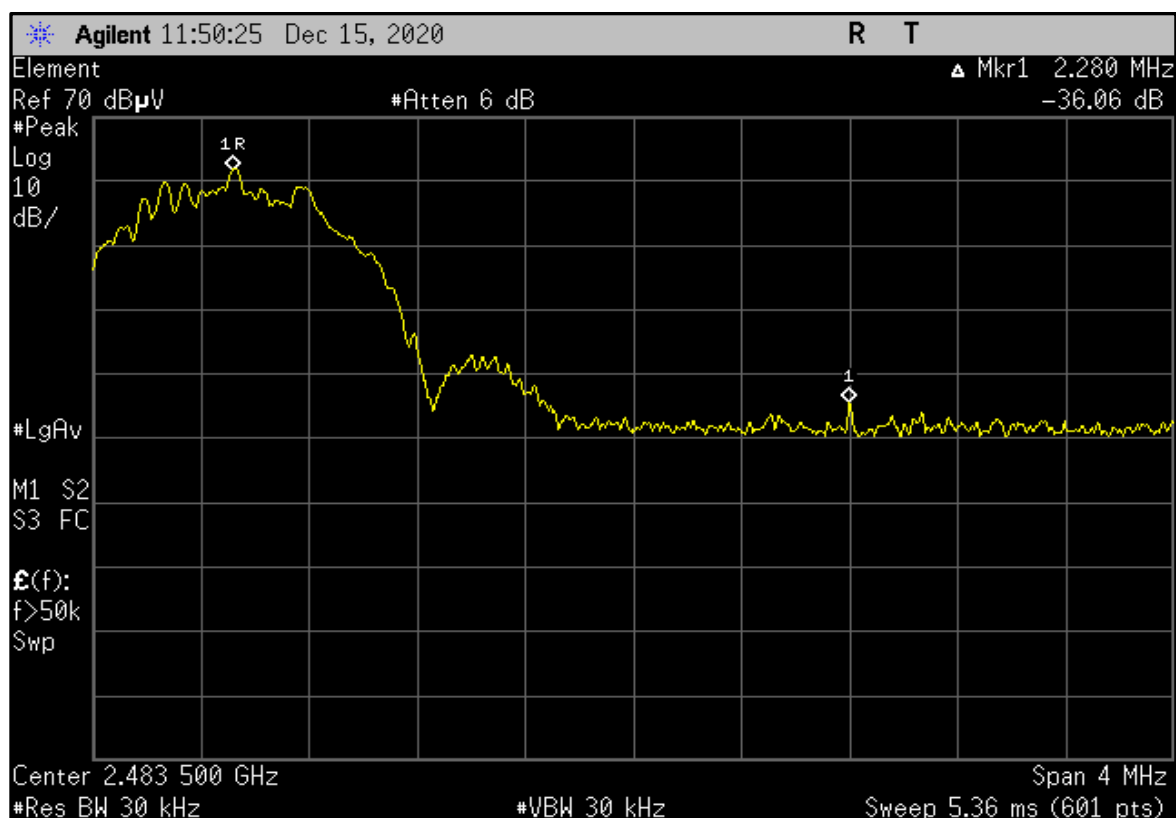
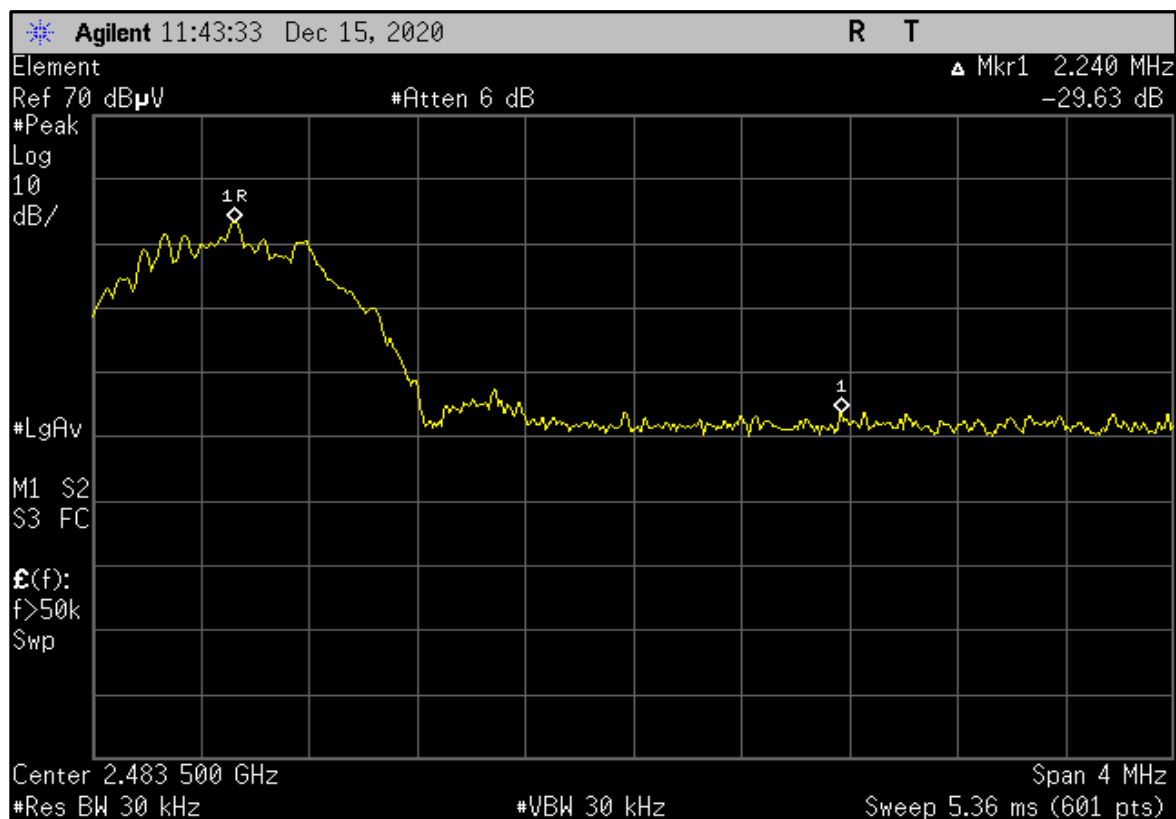
Freq (MHz)	Calculated Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (dB)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Marker Delta Comments
2484.300	26.4	-0.8	1.5	321.0	3.2	20.0	Horz	AV	0.0	48.8	54.0	-5.2	DTS, EUT Horz, Ant Horz: Fund 62.5dBuV + - 36.1dBc = 26.4dBuV (calc. amp.)
2484.267	24.4	-0.8	1.5	56.0	3.2	20.0	Vert	AV	0.0	46.8	54.0	-7.2	DTS, EUT Vert, Ant Vert: Fund 54.0dBuV + - 29.6dBc = 24.4dBuV (calc. amp.)
2484.300	29.5	-0.8	1.5	321.0	0.0	20.0	Horz	PK	0.0	48.7	74.0	-25.3	DTS, EUT Horz, Ant Horz: Fund 65.6dBuV + - 36.1dBc = 29.5dBuV (calc. amp.)
2484.267	28.3	-0.8	1.5	56.0	0.0	20.0	Vert	PK	0.0	47.5	74.0	-26.5	DTS, EUT Vert, Ant Vert: Fund 57.9dBuV + - 29.6dBc = 28.3dBuV (calc. amp.)

SPURIOUS RADIATED EMISSIONS



DTS, EUT Vert, Ant Vert

PSA-ESCI 2020.06.24.2



DTS, EUT Horz, Ant Horz

SPURIOUS RADIATED EMISSIONS



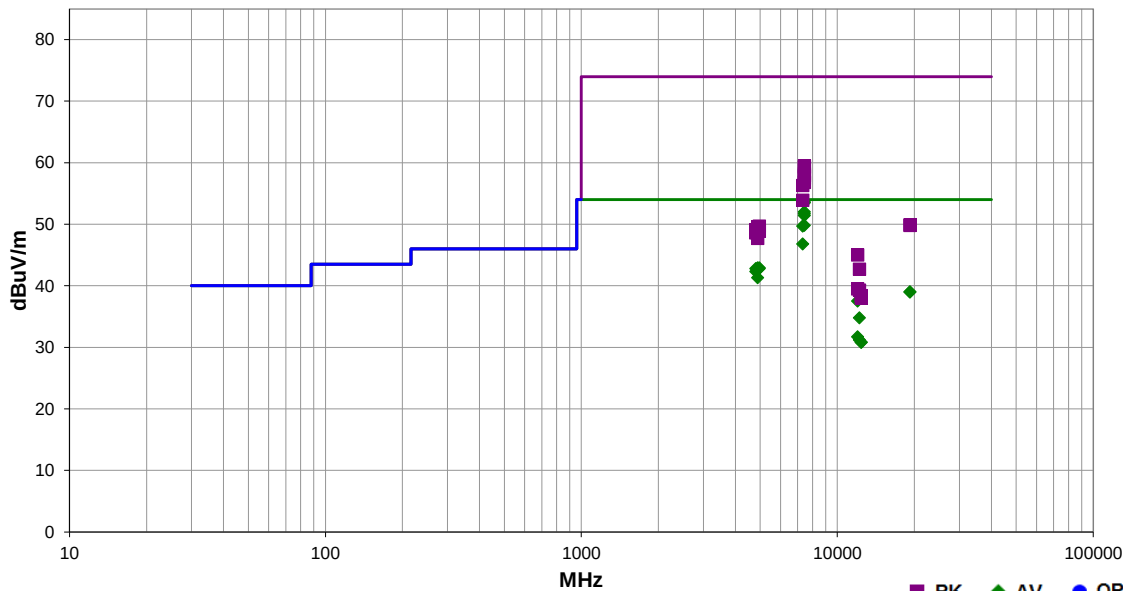
EmiRS 2020.12.09.0

PSA-ESCI 2020.06.24.2

Work Order:	SYNA0313	Date:	2020-12-14		
Project:	None	Temperature:	25.1 °C		
Job Site:	NC01	Humidity:	28.9% RH		
Serial Number:	Rev. 10 - 007	Barometric Pres.:	1016 mbar	Tested by:	Brian Fahey
EUT:	RadioNode				
Configuration:	1				
Customer:	Walt Disney Parks and Resorts US, Inc.				
Attendees:	None				
EUT Power:	POE via 120VAC/60Hz				
Operating Mode:	Simultaneous Tx mode: BTLE Tx, Port 7, Ant Cable A1, Antenna PN: MA510.C.CG.005, GFSK, Packet Length = 63, PRBS9, 1 Mbps, Low Ch. = 2402 MHz, Mid Ch. = 2442 MHz, High Ch. = 2480 MHz; BTLE Tx, Port 8, Ant Cable A2, Antenna PN: MA510.C.CG.005, GFSK, Packet Length = 63, PRBS9, 1 Mbps, Low Ch. = 2402 MHz, Mid Ch. = 2442 MHz, High Ch. = 2480 MHz. BLE Power setting = 0 dBm.				
Deviations:	None				
Comments:	See comments below for Channel, EUT orientations. The provided test software configured the radio with a duty cycle of 47.8% . Per ANSI C63.10 test methods, the RMS data was corrected with a carrier duty cycle correction factor (DCCF) of 3.2 dB. DCCF (dB) = 10*log(1/0.478).				

Test Specifications	Test Method
FCC 15.247:2020	ANSI C63.10:2013

Run #	29	Test Distance (m)	3	Antenna Height(s)	1 to 4(m)	Results	Pass
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Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (dB)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
7440.558	35.4	15.0	2.1	233.0	3.2	0.0	Horz	AV	0.0	53.6	54.0	-0.4	High Ch., EUT on Side, Ant on Side
7440.550	35.3	15.0	1.4	71.0	3.2	0.0	Horz	AV	0.0	53.5	54.0	-0.5	High Ch., EUT Horz, Ant Horz
7439.525	33.8	15.0	1.5	117.0	3.2	0.0	Horz	AV	0.0	52.0	54.0	-2.0	High Ch., EUT on Side, Ant on Side
7440.633	33.5	15.0	1.0	293.0	3.2	0.0	Vert	AV	0.0	51.7	54.0	-2.3	High Ch., EUT on Side, Ant on Side
7439.558	33.2	15.0	1.6	94.0	3.2	0.0	Vert	AV	0.0	51.4	54.0	-2.6	High Ch., EUT Vert, Ant Vert
7440.692	31.6	15.0	1.7	323.0	3.2	0.0	Vert	AV	0.0	49.8	54.0	-4.2	High Ch., EUT Horz, Ant Horz
7325.550	32.0	14.5	2.0	241.0	3.2	0.0	Horz	AV	0.0	49.7	54.0	-4.3	Mid Ch., EUT on Side, Ant on Side
7325.383	29.1	14.5	1.5	93.0	3.2	0.0	Vert	AV	0.0	46.8	54.0	-7.2	Mid Ch., EUT on Side, Ant on Side
4960.108	30.2	9.5	1.5	315.0	3.2	0.0	Vert	AV	0.0	42.9	54.0	-11.1	High Ch., EUT on Side, Ant on Side
4884.067	29.9	9.8	2.1	163.0	3.2	0.0	Horz	AV	0.0	42.9	54.0	-11.1	Mid Ch., EUT on Side, Ant on Side
4959.867	30.1	9.5	1.5	98.0	3.2	0.0	Horz	AV	0.0	42.8	54.0	-11.2	High Ch., EUT on Side, Ant on Side
4803.883	29.9	9.7	2.4	103.0	3.2	0.0	Vert	AV	0.0	42.8	54.0	-11.2	Low Ch., EUT on Side, Ant on Side
4804.058	29.4	9.7	1.6	116.0	3.2	0.0	Horz	AV	0.0	42.3	54.0	-11.7	Low Ch., EUT on Side, Ant on Side
4883.917	28.3	9.8	1.5	326.0	3.2	0.0	Vert	AV	0.0	41.3	54.0	-12.7	Mid Ch., EUT on Side, Ant on Side
7439.292	44.5	15.0	2.1	233.0	0.0	0.0	Horz	PK	0.0	59.5	74.0	-14.5	High Ch., EUT on Side, Ant on Side
7439.483	44.3	15.0	1.4	71.0	0.0	0.0	Horz	PK	0.0	59.3	74.0	-14.7	High Ch., EUT Horz, Ant Horz
19217.180	35.2	0.6	1.6	1.0	3.2	0.0	Vert	AV	0.0	39.0	54.0	-15.0	Low Ch., EUT on Side, Ant on Side
19215.960	35.2	0.6	1.6	298.0	3.2	0.0	Horz	AV	0.0	39.0	54.0	-15.0	Low Ch., EUT on Side, Ant on Side
7440.783	43.2	15.0	1.0	293.0	0.0	0.0	Vert	PK	0.0	58.2	74.0	-15.8	High Ch., EUT on Side, Ant on Side
7439.292	42.9	15.0	1.5	117.0	0.0	0.0	Horz	PK	0.0	57.9	74.0	-16.1	High Ch., EUT on Side, Ant on Side
7439.658	42.5	15.0	1.6	94.0	0.0	0.0	Vert	PK	0.0	57.5	74.0	-16.5	High Ch., EUT Vert, Ant Vert

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (dB)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
12009.020	31.8	2.5	1.7	241.0	3.2	0.0	Horz	AV	0.0	37.5	54.0	-16.5	Low Ch., EUT on Side, Ant on Side
7441.167	41.8	15.0	1.7	323.0	0.0	0.0	Vert	PK	0.0	56.8	74.0	-17.2	High Ch., EUT Horz, Ant Horz
7326.958	41.8	14.5	2.0	241.0	0.0	0.0	Horz	PK	0.0	56.3	74.0	-17.7	Mid Ch., EUT on Side, Ant on Side
12209.020	29.7	1.9	1.6	239.0	3.2	0.0	Horz	AV	0.0	34.8	54.0	-19.2	Mid Ch., EUT on Side, Ant on Side
7327.292	39.2	14.7	1.5	93.0	0.0	0.0	Vert	PK	0.0	53.9	74.0	-20.1	Mid Ch., EUT on Side, Ant on Side
12009.380	26.0	2.5	1.5	53.0	3.2	0.0	Vert	AV	0.0	31.7	54.0	-22.3	Low Ch., EUT on Side, Ant on Side
12207.590	26.1	1.9	1.5	268.0	3.2	0.0	Vert	AV	0.0	31.2	54.0	-22.8	Mid Ch., EUT on Side, Ant on Side
12398.660	25.6	2.0	1.5	116.0	3.2	0.0	Horz	AV	0.0	30.8	54.0	-23.2	High Ch., EUT on Side, Ant on Side
12399.630	25.6	2.0	1.5	8.0	3.2	0.0	Vert	AV	0.0	30.8	54.0	-23.2	High Ch., EUT on Side, Ant on Side
19215.130	46.1	0.6	1.6	298.0	3.2	0.0	Horz	PK	0.0	49.9	74.0	-24.1	Low Ch., EUT on Side, Ant on Side
19216.310	46.0	0.6	1.6	1.0	3.2	0.0	Vert	PK	0.0	49.8	74.0	-24.2	Low Ch., EUT on Side, Ant on Side
4959.883	40.2	9.5	1.5	315.0	0.0	0.0	Vert	PK	0.0	49.7	74.0	-24.3	High Ch., EUT on Side, Ant on Side
4884.242	39.8	9.8	2.1	163.0	0.0	0.0	Horz	PK	0.0	49.6	74.0	-24.4	Mid Ch., EUT on Side, Ant on Side
4804.550	39.4	9.7	2.4	103.0	0.0	0.0	Vert	PK	0.0	49.1	74.0	-24.9	Low Ch., EUT on Side, Ant on Side
4959.367	39.4	9.5	1.5	98.0	0.0	0.0	Horz	PK	0.0	48.9	74.0	-25.1	High Ch., EUT on Side, Ant on Side
4803.575	38.9	9.7	1.6	116.0	0.0	0.0	Horz	PK	0.0	48.6	74.0	-25.4	Low Ch., EUT on Side, Ant on Side
4884.067	37.9	9.8	1.5	326.0	0.0	0.0	Vert	PK	0.0	47.7	74.0	-26.3	Mid Ch., EUT on Side, Ant on Side
12010.370	42.5	2.5	1.7	241.0	0.0	0.0	Horz	PK	0.0	45.0	74.0	-29.0	Low Ch., EUT on Side, Ant on Side
12208.600	40.8	1.9	1.6	239.0	0.0	0.0	Horz	PK	0.0	42.7	74.0	-31.3	Mid Ch., EUT on Side, Ant on Side
12011.730	37.0	2.5	1.5	53.0	0.0	0.0	Vert	PK	0.0	39.5	74.0	-34.5	Low Ch., EUT on Side, Ant on Side
12209.280	37.4	1.9	1.5	268.0	0.0	0.0	Vert	PK	0.0	39.3	74.0	-34.7	Mid Ch., EUT on Side, Ant on Side
12398.700	36.4	2.0	1.5	8.0	0.0	0.0	Vert	PK	0.0	38.4	74.0	-35.6	High Ch., EUT on Side, Ant on Side
12399.080	36.0	2.0	1.5	116.0	0.0	0.0	Horz	PK	0.0	38.0	74.0	-36.0	High Ch., EUT on Side, Ant on Side

SPURIOUS RADIATED EMISSIONS



EmiRS 2020.12.09.0

PSA-ESCI 2020.06.24.2

Work Order:	SYNA0313	Date:	2020-12-14	
Project:	None	Temperature:	24.5 °C	
Job Site:	NC01	Humidity:	30.9% RH	
Serial Number:	Rev. 10 - 007	Barometric Pres.:	1017 mbar	
		Tested by:		Brian Fahey
EUT:	RadioNode			
Configuration:	1			
Customer:	Walt Disney Parks and Resorts US, Inc.			
Attendees:	None			
EUT Power:	POE via 120VAC/60Hz			
Operating Mode:	Simultaneous Tx mode: BTLE Tx, Port 7, Ant Cable A1, Antenna PN: MA510.C.CG.005, GFSK, Packet Length = 63, PRBS9, 1 Mbps, Low Ch. = 2402 MHz, Mid Ch. = 2442 MHz, High Ch. = 2480 MHz; BTLE Tx, Port 8, Ant Cable A2, Antenna PN: MA510.C.CG.005, GFSK, Packet Length = 63, PRBS9, 1 Mbps, Low Ch. = 2402 MHz, Mid Ch. = 2442 MHz, High Ch. = 2480 MHz. BLE Power setting = 0 dBm.			
Deviations:	None			
Comments:	See comments below for Channel, EUT orientations. The provided test software configured the radio with a duty cycle of 47.8% . Per ANSI C63.10 test methods, the RMS data was corrected with a carrier duty cycle correction factor (DCCF) of 3.2 dB. DCCF (dB) = 10*log(1/0.478).			
Test Specifications				Test Method
FCC 15.247:2020				ANSI C63.10:2013

Run #	31	Test Distance (m)	3	Antenna Height(s)	1 to 4(m)	Results	Pass
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MHz

■ PK ◆ AV ● QP

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (dB)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
2389.647	29.0	-0.6	2.2	354.0	3.2	20.0	Horz	AV	0.0	51.6	54.0	-2.4	Low Ch., EUT on Side, Ant on Side
2388.080	29.0	-0.6	1.5	257.0	3.2	20.0	Vert	AV	0.0	51.6	54.0	-2.4	Low Ch., EUT on Side, Ant on Side
2484.003	28.9	-0.8	1.5	34.0	3.2	20.0	Vert	AV	0.0	51.3	54.0	-2.7	High Ch., EUT on Side, Ant on Side
2484.987	28.9	-0.8	1.5	92.0	3.2	20.0	Horz	AV	0.0	51.3	54.0	-2.7	High Ch., EUT on Side, Ant on Side
2483.500	28.9	-0.8	3.0	43.0	3.2	20.0	Horz	AV	0.0	51.3	54.0	-2.7	High Ch., EUT Vert, Ant Vert
2483.530	28.9	-0.8	1.5	284.0	3.2	20.0	Vert	AV	0.0	51.3	54.0	-2.7	High Ch., EUT Vert, Ant Vert
2484.850	28.9	-0.8	1.4	103.0	3.2	20.0	Horz	AV	0.0	51.3	54.0	-2.7	High Ch., EUT Horz, Ant Horz
2483.533	28.9	-0.8	2.5	214.0	3.2	20.0	Vert	AV	0.0	51.3	54.0	-2.7	High Ch., EUT Horz, Ant Horz
2484.883	40.5	-0.8	2.5	214.0	0.0	20.0	Vert	PK	0.0	59.7	74.0	-14.3	High Ch., EUT Horz, Ant Horz
2484.133	40.4	-0.8	1.5	284.0	0.0	20.0	Vert	PK	0.0	59.6	74.0	-14.4	High Ch., EUT Vert, Ant Vert
2389.347	40.0	-0.6	2.2	354.0	0.0	20.0	Horz	PK	0.0	59.4	74.0	-14.6	Low Ch., EUT on Side, Ant on Side
2484.167	40.1	-0.8	3.0	43.0	0.0	20.0	Horz	PK	0.0	59.3	74.0	-14.7	High Ch., EUT Vert, Ant Vert
2484.617	40.1	-0.8	1.4	103.0	0.0	20.0	Horz	PK	0.0	59.3	74.0	-14.7	High Ch., EUT Horz, Ant Horz
2484.493	40.0	-0.8	1.5	34.0	0.0	20.0	Vert	PK	0.0	59.2	74.0	-14.8	High Ch., EUT on Side, Ant on Side
2389.060	39.6	-0.6	1.5	257.0	0.0	20.0	Vert	PK	0.0	59.0	74.0	-15.0	Low Ch., EUT on Side, Ant on Side
2484.540	39.5	-0.8	1.5	92.0	0.0	20.0	Horz	PK	0.0	58.7	74.0	-15.3	High Ch., EUT on Side, Ant on Side

SPURIOUS RADIATED EMISSIONS



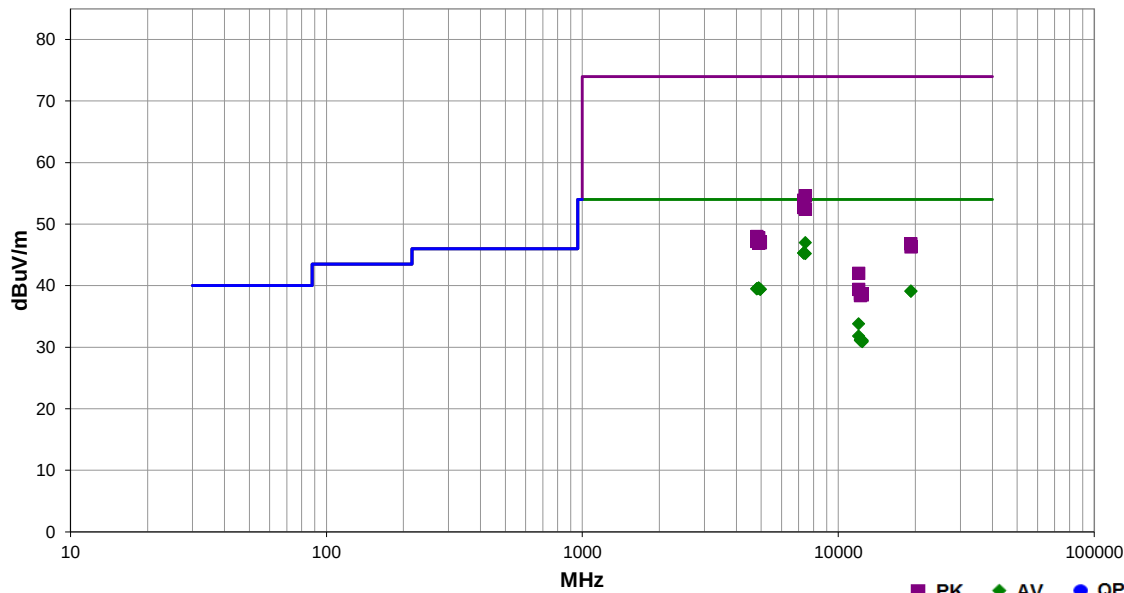
EmiRS 2020.12.09.0

PSA-ESCI 2020.06.24.2

Work Order:	SYNA0313	Date:	2020-12-14	
Project:	None	Temperature:	24.5 °C	
Job Site:	NC01	Humidity:	30.9% RH	
Serial Number:	Rev. 10 - 007	Barometric Pres.:	1017 mbar	
EUT:	RadioNode			
Configuration:	2			
Customer:	Walt Disney Parks and Resorts US, Inc.			
Attendees:	None			
EUT Power:	24VDC via 120VAC/60Hz			
Operating Mode:	Simultaneous Tx mode: BTLE Tx, Port 7, Ant Cable A1, Antenna PN: MA510.C.CG.005, GFSK, Packet Length = 63, PRBS9, 1 Mbps, Low Ch. = 2402 MHz, Mid Ch. = 2442 MHz, High Ch. = 2480 MHz; BTLE Tx, Port 8, Ant Cable A2, Antenna PN: MA510.C.CG.005, GFSK, Packet Length = 63, PRBS9, 1 Mbps, Low Ch. = 2402 MHz, Mid Ch. = 2442 MHz, High Ch. = 2480 MHz. BLE Power setting = 0 dBm.			
Deviations:	None			
Comments:	See comments below for Channel, EUT orientations. The worst case EUT orientations from the previous testing were used. The provided test software configured the radio with a duty cycle of 47.8% . Per ANSI C63.10 test methods, the RMS data was corrected with a carrier duty cycle correction factor (DCCF) of 3.2 dB. DCCF (dB) = 10*log(1/0.478).			

Test Specifications	Test Method
FCC 15.247:2020	ANSI C63.10:2013

Run #	43	Test Distance (m)	3	Antenna Height(s)	1 to 4(m)	Results	Pass
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Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (dB)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
7439.497	28.8	15.0	2.3	255.0	3.2	0.0	Horz	AV	0.0	47.0	54.0	-7.0	High Ch., EUT on Side, Ant on Side
7326.160	27.6	14.5	1.5	342.0	3.2	0.0	Horz	AV	0.0	45.3	54.0	-8.7	Mid Ch., EUT on Side, Ant on Side
7325.797	27.6	14.5	1.7	137.0	3.2	0.0	Vert	AV	0.0	45.3	54.0	-8.7	Mid Ch., EUT on Side, Ant on Side
7439.290	27.0	15.0	1.5	157.0	3.2	0.0	Vert	AV	0.0	45.2	54.0	-8.8	High Ch., EUT on Side, Ant on Side
4883.083	26.6	9.8	2.7	124.0	3.2	0.0	Horz	AV	0.0	39.6	54.0	-14.4	Mid Ch., EUT on Side, Ant on Side
4884.140	26.6	9.8	1.5	248.0	3.2	0.0	Vert	AV	0.0	39.6	54.0	-14.4	Mid Ch., EUT on Side, Ant on Side
4803.873	26.6	9.7	1.3	246.0	3.2	0.0	Horz	AV	0.0	39.5	54.0	-14.5	Low Ch., EUT on Side, Ant on Side
4803.737	26.6	9.7	1.5	278.0	3.2	0.0	Vert	AV	0.0	39.5	54.0	-14.5	Low Ch., EUT on Side, Ant on Side
4959.640	26.7	9.5	1.5	277.0	3.2	0.0	Horz	AV	0.0	39.4	54.0	-14.6	High Ch., EUT on Side, Ant on Side
4959.820	26.7	9.5	1.5	94.0	3.2	0.0	Vert	AV	0.0	39.4	54.0	-14.6	High Ch., EUT on Side, Ant on Side
19217.900	35.3	0.6	1.6	216.0	3.2	0.0	Horz	AV	0.0	39.1	54.0	-14.9	Low Ch., EUT on Side, Ant on Side
19217.260	35.3	0.6	1.6	133.0	3.2	0.0	Vert	AV	0.0	39.1	54.0	-14.9	Low Ch., EUT on Side, Ant on Side
7440.670	39.6	15.0	2.3	255.0	0.0	0.0	Horz	PK	0.0	54.6	74.0	-19.4	High Ch., EUT on Side, Ant on Side
7326.497	39.4	14.5	1.7	137.0	0.0	0.0	Vert	PK	0.0	53.9	74.0	-20.1	Mid Ch., EUT on Side, Ant on Side
12009.150	28.1	2.5	1.6	240.0	3.2	0.0	Horz	AV	0.0	33.8	54.0	-20.2	Low Ch., EUT on Side, Ant on Side
7325.690	38.2	14.5	1.5	342.0	0.0	0.0	Horz	PK	0.0	52.7	74.0	-21.3	Mid Ch., EUT on Side, Ant on Side
7439.670	37.4	15.0	1.5	157.0	0.0	0.0	Vert	PK	0.0	52.4	74.0	-21.6	High Ch., EUT on Side, Ant on Side
12010.420	26.1	2.5	1.5	68.0	3.2	0.0	Vert	AV	0.0	31.8	54.0	-22.2	Low Ch., EUT on Side, Ant on Side
12209.000	26.1	1.9	1.5	89.0	3.2	0.0	Horz	AV	0.0	31.2	54.0	-22.8	Mid Ch., EUT on Side, Ant on Side
12209.660	26.0	1.9	1.5	305.0	3.2	0.0	Vert	AV	0.0	31.1	54.0	-22.9	Mid Ch., EUT on Side, Ant on Side

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (dB)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
12399.090	25.9	2.0	1.5	199.0	3.2	0.0	Horz	AV	0.0	31.1	54.0	-22.9	High Ch., EUT on Side, Ant on Side
12399.760	25.7	2.0	1.5	291.0	3.2	0.0	Vert	AV	0.0	30.9	54.0	-23.1	High Ch., EUT on Side, Ant on Side
4803.470	38.3	9.7	1.5	278.0	0.0	0.0	Vert	PK	0.0	48.0	74.0	-26.0	Low Ch., EUT on Side, Ant on Side
4884.687	38.0	9.8	2.7	124.0	0.0	0.0	Horz	PK	0.0	47.8	74.0	-26.2	Mid Ch., EUT on Side, Ant on Side
4804.620	37.5	9.7	1.3	246.0	0.0	0.0	Horz	PK	0.0	47.2	74.0	-26.8	Low Ch., EUT on Side, Ant on Side
4960.067	37.6	9.5	1.5	277.0	0.0	0.0	Horz	PK	0.0	47.1	74.0	-26.9	High Ch., EUT on Side, Ant on Side
4959.717	37.5	9.5	1.5	94.0	0.0	0.0	Vert	PK	0.0	47.0	74.0	-27.0	High Ch., EUT on Side, Ant on Side
4883.807	37.1	9.8	1.5	248.0	0.0	0.0	Vert	PK	0.0	46.9	74.0	-27.1	Mid Ch., EUT on Side, Ant on Side
19213.720	46.2	0.6	1.6	133.0	0.0	0.0	Vert	PK	0.0	46.8	74.0	-27.2	Low Ch., EUT on Side, Ant on Side
19218.260	45.7	0.6	1.6	216.0	0.0	0.0	Horz	PK	0.0	46.3	74.0	-27.7	Low Ch., EUT on Side, Ant on Side
12010.880	39.5	2.5	1.6	240.0	0.0	0.0	Horz	PK	0.0	42.0	74.0	-32.0	Low Ch., EUT on Side, Ant on Side
12010.610	36.9	2.5	1.5	68.0	0.0	0.0	Vert	PK	0.0	39.4	74.0	-34.6	Low Ch., EUT on Side, Ant on Side
12210.740	36.8	1.9	1.5	305.0	0.0	0.0	Vert	PK	0.0	38.7	74.0	-35.3	Mid Ch., EUT on Side, Ant on Side
12399.070	36.7	2.0	1.5	199.0	0.0	0.0	Horz	PK	0.0	38.7	74.0	-35.3	High Ch., EUT on Side, Ant on Side
12399.440	36.5	2.0	1.5	291.0	0.0	0.0	Vert	PK	0.0	38.5	74.0	-35.5	High Ch., EUT on Side, Ant on Side
12209.220	36.5	1.9	1.5	89.0	0.0	0.0	Horz	PK	0.0	38.4	74.0	-35.6	Mid Ch., EUT on Side, Ant on Side

SPURIOUS RADIATED EMISSIONS



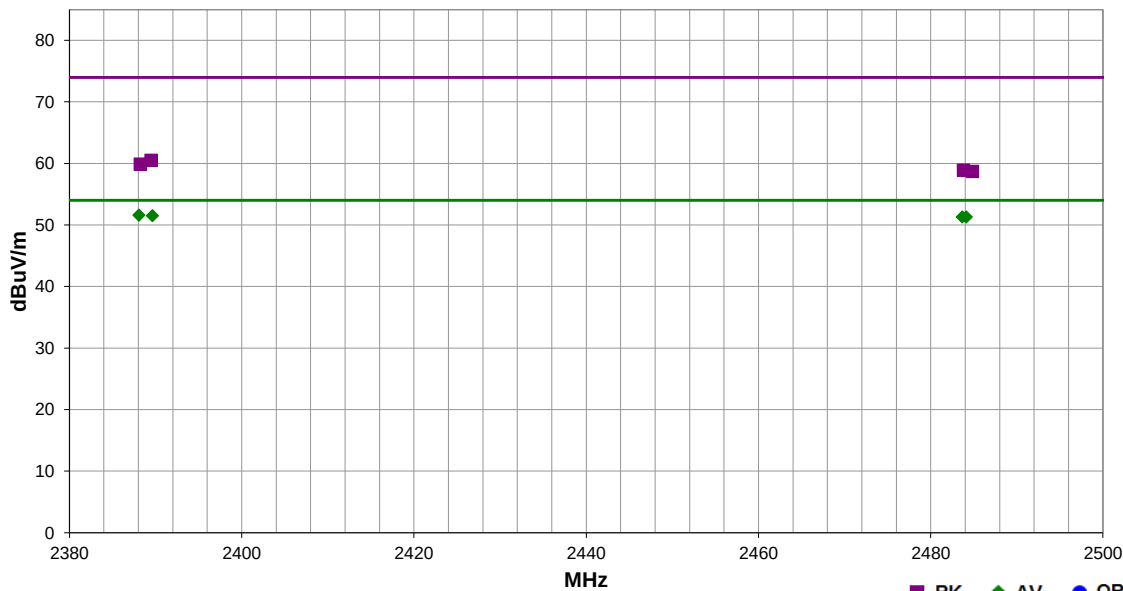
EmiRS 2020.12.09.0

PSA-ESCI 2020.06.24.2

Work Order:	SYNA0313	Date:	2020-12-14	
Project:	None	Temperature:	24.5 °C	
Job Site:	NC01	Humidity:	30.9% RH	
Serial Number:	Rev. 10 - 007	Barometric Pres.:	1017 mbar	Tested by: Brian Fahey
EUT:	RadioNode			
Configuration:	2			
Customer:	Walt Disney Parks and Resorts US, Inc.			
Attendees:	None			
EUT Power:	24VDC via 120VAC/60Hz			
Operating Mode:	Simultaneous Tx mode: BTLE Tx, Port 7, Ant Cable A1, Antenna PN: MA510.C.CG.005, GFSK, Packet Length = 63, PRBS9, 1 Mbps, Low Ch. = 2402 MHz, Mid Ch. = 2442 MHz, High Ch. = 2480 MHz; BTLE Tx, Port 8, Ant Cable A2, Antenna PN: MA510.C.CG.005, GFSK, Packet Length = 63, PRBS9, 1 Mbps, Low Ch. = 2402 MHz, Mid Ch. = 2442 MHz, High Ch. = 2480 MHz. BLE Power setting = 0 dBm.			
Deviations:	None			
Comments:	See comments below for Channel, EUT orientations. The worst case EUT orientations from the previous testing were used. The provided test software configured the radio with a duty cycle of 47.8% . Per ANSI C63.10 test methods, the RMS data was corrected with a carrier duty cycle correction factor (DCCF) of 3.2 dB. DCCF (dB) = 10*log(1/0.478).			

Test Specifications	Test Method
FCC 15.247:2020	ANSI C63.10:2013

Run #	45	Test Distance (m)	3	Antenna Height(s)	1 to 4(m)	Results	Pass
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Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (dB)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
2388.067	29.0	-0.6	1.5	270.0	3.2	20.0	Vert	AV	0.0	51.6	54.0	-2.4	Low Ch., EUT on Side, Ant on Side
2389.643	28.9	-0.6	1.5	134.0	3.2	20.0	Horz	AV	0.0	51.5	54.0	-2.5	Low Ch., EUT on Side, Ant on Side
2483.677	28.9	-0.8	2.9	166.0	3.2	20.0	Horz	AV	0.0	51.3	54.0	-2.7	High Ch., EUT on Side, Ant on Side
2484.130	28.9	-0.8	3.6	190.0	3.2	20.0	Vert	AV	0.0	51.3	54.0	-2.7	High Ch., EUT on Side, Ant on Side
2389.463	41.1	-0.6	1.5	270.0	0.0	20.0	Vert	PK	0.0	60.5	74.0	-13.5	Low Ch., EUT on Side, Ant on Side
2388.227	40.5	-0.6	1.5	134.0	0.0	20.0	Horz	PK	0.0	59.9	74.0	-14.1	Low Ch., EUT on Side, Ant on Side
2483.797	39.7	-0.8	3.6	190.0	0.0	20.0	Vert	PK	0.0	58.9	74.0	-15.1	High Ch., EUT on Side, Ant on Side
2484.840	39.5	-0.8	2.9	166.0	0.0	20.0	Horz	PK	0.0	58.7	74.0	-15.3	High Ch., EUT on Side, Ant on Side

SPURIOUS RADIATED EMISSIONS



PSA-ESCI 2020.06.24.2

Testing was performed using the mode(s) of operation and configuration(s) noted within the report. The individuals and/or the organization requesting the test provided the modes, configurations and settings used to complete the evaluation. The actual test parameters are specified in the test data, this includes items such as investigated frequency range (scanned) and test levels. The testing methods and performance specifications, as well as the test site used for the evaluation are indicated in the test data. The test data represents the configuration / operating mode/ model that produced the highest emission levels as compared to the specification limit.

MODES OF OPERATION

BTLE Tx, Port 8, Ant Cable A2, Antenna PN: MA510.C.CG.005, GFSK, Packet Length = 63, PRBS9, 1 Mbps, High Channel = 2480 MHz.

BTLE Tx, Port 7, Ant Cable A2, Antenna PN: MA510.C.CG.005, GFSK, Packet Length = 63, PRBS9, 1 Mbps, High Channel = 2480 MHz.

BTLE Tx, Port 8, Ant Cable A1, Antenna PN: MA510.C.CG.005, GFSK, Packet Length = 63, PRBS9, 1 Mbps, High Channel = 2480 MHz.

BTLE Tx, Port 7, Ant Cable A1, Antenna PN: MA510.C.CG.005, GFSK, Packet Length = 63, PRBS9, 1 Mbps, Low Channel = 2402 MHz, Mid Channel = 2442 MHz, High Channel = 2480 MHz.

POWER SETTINGS INVESTIGATED

24VDC via 120VAC/60Hz

POE via 120VAC/60Hz

CONFIGURATIONS INVESTIGATED

SYNA0313 - 2

SYNA0313 - 1

FREQUENCY RANGE INVESTIGATED

Start Frequency	30 MHz	Stop Frequency	26 GHz
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SAMPLE CALCULATIONS

Radiated Emissions: Field Strength = Measured Level + Antenna Factor + Cable Factor - Amplifier Gain + Distance Adjustment Factor + External Attenuation

TEST EQUIPMENT

Description	Manufacturer	Model	ID	Last Cal.	Interval
Cable	Northwest EMC	N/A	NC8	2020-02-07	12 mo
Amplifier - Pre-Amplifier	Miteq	AMF-6F-18002650-25-10P	AOD	2020-02-07	12 mo
Antenna - Standard Gain	ETS Lindgren	3160-09	AIY	NCR	0 mo
Amplifier - Pre-Amplifier	Miteq	AMF-6F-12001800-30-10P	AOJ	2020-08-26	12 mo
Antenna - Standard Gain	EMCO	3160-08	AHO	NCR	0 mo
Cable	High Speed Interconnects	EW292A-NGNG-300	NC3	2020-08-28	12 mo
Amplifier - Pre-Amplifier	Miteq	AMF-6F-08001200-30-10P	AOK	2020-08-26	12 mo
Antenna - Standard Gain	EMCO	3160-07	AHP	NCR	0 mo
Filter - High Pass	Micro-Tronics	HPM50111	HHI	2020-09-25	12 mo
Attenuator	Fairview Microwave	SA18E-20	AQV	2020-07-28	12 mo
Cable	Northwest EMC	3115 Horn Cable	NC2	2020-04-20	12 mo
Amplifier - Pre-Amplifier	Miteq	AMF-3D-00100800-32-13P	AVZ	2020-04-20	12 mo
Antenna - Double Ridge	EMCO	3115	AHM	2020-07-01	24 mo
Amplifier - Pre-Amplifier	Miteq	AM-1616-1000	PAB	2020-01-28	12 mo
Antenna - Biconilog	Teseq	CBL 6141B	AYL	2019-09-25	24 mo
Cable	Northwest EMC	Bilog Cables	NC1	2020-01-28	12 mo
Filter - Low Pass	Micro-Tronics	LPM50004	LFF	2020-11-06	12 mo
Analyzer - Spectrum Analyzer	Agilent	E4440A	AAX	2020-04-15	12 mo

SPURIOUS RADIATED EMISSIONS



PSA-ESCI 2020.06.24.2

TEST DESCRIPTION

The highest gain antenna of each type to be used with the EUT was tested. The EUT was configured for the required transmit frequencies and the modes as showed in the data sheets.

For each configuration, the spectrum was scanned throughout the specified range as part of the exploratory investigation of the emissions. These "pre-scans" are not included in the report. Final measurements on individual emissions were then made and included in this test report.

The individual emissions from the EUT were maximized by rotating the EUT on a turntable, adjusting the position of the EUT and EUT antenna in three orthogonal axis if required, and adjusting the measurement antenna height and polarization (per ANSI C63.10). A preamp and high pass filter (and notch filter) were used for this test in order to provide sufficient measurement sensitivity.

Measurements were made with the required detectors and annotated on the data for each individual point using the following annotation:

QP = Quasi-Peak Detector
PK = Peak Detector
AV = RMS Detector

Measurements were made to satisfy the specific requirements of the test specification for out of band emissions as well as the restricted band requirements.

If there are no detectable emissions above the noise floor, the data included may show noise floor measurements for reference only.

Measurements within 2 MHz of the allowable band may have been taken using the integration method from ANSI C63.10 clause 11.13.3. This procedure uses the channel power feature of the spectrum analyzer to integrate the power of the emission within a 1 MHz bandwidth.

Where the radio test software does not provide for a duty cycle at continuous transmit conditions (> 98%) and the RMS (power average) measurements were made across the on and off times of the EUT transmissions, a duty cycle correction is added to the measurements using the formula of $10 \cdot \log(1/dc)$.

SPURIOUS RADIATED EMISSIONS



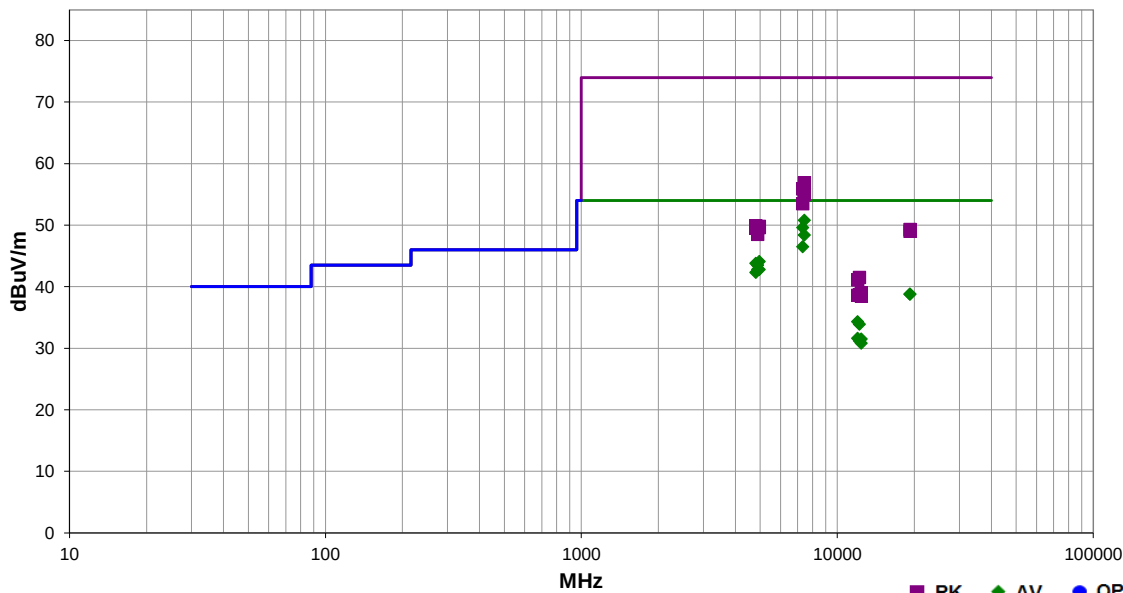
EmiRS 2020.12.09.0

PSA-ESCI 2020.06.24.2

Work Order:	SYNA0313	Date:	2020-12-16	
Project:	None	Temperature:	22.6 °C	
Job Site:	NC01	Humidity:	35.3% RH	
Serial Number:	Rev. 10 - 007	Barometric Pres.:	1018 mbar	
EUT:		RadioNode		
Configuration:	1			
Customer:	Walt Disney Parks and Resorts US, Inc.			
Attendees:	None			
EUT Power:	POE via 120VAC/60Hz			
Operating Mode:	BTLE Tx, Port 7, Ant Cable A1, Antenna PN: MA510.C.CG.005, GFSK, Packet Length = 63, PRBS9, 1 Mbps, Low Channel = 2402 MHz, Mid Channel = 2442 MHz, High Channel = 2480 MHz.			
Deviations:	None			
Comments:	See comments below for Channel, EUT orientations. Step 1, full test based on the client's test plan. The worst case EUT orientations from the previous testing were used. The provided test software configured the radio with a duty cycle of 47.8% . Per ANSI C63.10 test methods, the RMS data was corrected with a carrier duty cycle correction factor (DCCF) of 3.2 dB. DCCF (dB) = 10*log(1/0.478).			

Test Specifications	FCC 15.247:2020	Test Method	ANSI C63.10:2013
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Run #	85	Test Distance (m)	3	Antenna Height(s)	1 to 4(m)	Results	Pass
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Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (dB)	External Attenuation (dB)	Polarity/Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
7440.558	32.6	15.0	1.0	232.0	3.2	0.0	Horz	AV	0.0	50.8	54.0	-3.2	High Ch., EUT on Side, Ant on Side
7325.508	31.9	14.5	2.3	235.0	3.2	0.0	Horz	AV	0.0	49.6	54.0	-4.4	Mid Ch., EUT on Side, Ant on Side
7439.408	30.2	15.0	1.5	315.0	3.2	0.0	Vert	AV	0.0	48.4	54.0	-5.6	High Ch., EUT on Side, Ant on Side
7325.408	28.8	14.5	1.5	97.0	3.2	0.0	Vert	AV	0.0	46.5	54.0	-7.5	Mid Ch., EUT on Side, Ant on Side
4960.075	31.4	9.5	2.3	232.0	3.2	0.0	Horz	AV	0.0	44.1	54.0	-9.9	High Ch., EUT on Side, Ant on Side
4804.075	30.9	9.7	2.4	232.0	3.2	0.0	Horz	AV	0.0	43.8	54.0	-10.2	Low Ch., EUT on Side, Ant on Side
4884.083	30.5	9.8	1.0	308.0	3.2	0.0	Horz	AV	0.0	43.5	54.0	-10.5	Mid Ch., EUT on Side, Ant on Side
4960.125	30.1	9.5	1.5	306.0	3.2	0.0	Vert	AV	0.0	42.8	54.0	-11.2	High Ch., EUT on Side, Ant on Side
4884.042	29.8	9.8	1.1	292.0	3.2	0.0	Vert	AV	0.0	42.8	54.0	-11.2	Mid Ch., EUT on Side, Ant on Side
4804.233	29.4	9.7	1.4	313.0	3.2	0.0	Vert	AV	0.0	42.3	54.0	-11.7	Low Ch., EUT on Side, Ant on Side
19214.190	35.2	0.6	1.6	142.0	3.0	0.0	Horz	AV	0.0	38.8	54.0	-15.2	Low Ch., EUT on Side, Ant on Side
19218.500	35.2	0.6	1.6	216.0	3.0	0.0	Vert	AV	0.0	38.8	54.0	-15.2	Low Ch., EUT on Side, Ant on Side
7440.842	41.9	15.0	1.0	232.0	0.0	0.0	Horz	PK	0.0	56.9	74.0	-17.1	High Ch., EUT on Side, Ant on Side
7326.875	41.4	14.5	2.3	235.0	0.0	0.0	Horz	PK	0.0	55.9	74.0	-18.1	Mid Ch., EUT on Side, Ant on Side
7439.533	40.0	15.0	1.5	315.0	0.0	0.0	Vert	PK	0.0	55.0	74.0	-19.0	High Ch., EUT on Side, Ant on Side
12011.180	28.6	2.5	1.5	245.0	3.2	0.0	Horz	AV	0.0	34.3	54.0	-19.7	Low Ch., EUT on Side, Ant on Side
12209.020	28.8	1.9	1.7	236.0	3.2	0.0	Horz	AV	0.0	33.9	54.0	-20.1	Mid Ch., EUT on Side, Ant on Side
7326.725	39.0	14.5	1.5	97.0	0.0	0.0	Vert	PK	0.0	53.5	74.0	-20.5	Mid Ch., EUT on Side, Ant on Side
12008.670	25.9	2.5	1.5	294.0	3.2	0.0	Vert	AV	0.0	31.6	54.0	-22.4	Low Ch., EUT on Side, Ant on Side
12398.960	26.3	2.0	1.5	206.0	3.2	0.0	Horz	AV	0.0	31.5	54.0	-22.5	High Ch., EUT on Side, Ant on Side
12207.600	26.1	1.9	1.5	265.0	3.2	0.0	Vert	AV	0.0	31.2	54.0	-22.8	Mid Ch., EUT on Side, Ant on Side
12398.350	25.6	2.0	1.5	86.0	3.2	0.0	Vert	AV	0.0	30.8	54.0	-23.2	High Ch., EUT on Side, Ant on Side

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (dB)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
4804.242	40.2	9.7	2.4	232.0	0.0	0.0	Horz	PK	0.0	49.9	74.0	-24.1	Low Ch., EUT on Side, Ant on Side
4960.725	40.3	9.5	1.5	306.0	0.0	0.0	Vert	PK	0.0	49.8	74.0	-24.2	High Ch., EUT on Side, Ant on Side
4883.217	39.8	9.8	1.0	308.0	0.0	0.0	Horz	PK	0.0	49.6	74.0	-24.4	Mid Ch., EUT on Side, Ant on Side
4959.633	40.1	9.5	2.3	232.0	0.0	0.0	Horz	PK	0.0	49.6	74.0	-24.4	High Ch., EUT on Side, Ant on Side
4804.208	39.8	9.7	1.4	313.0	0.0	0.0	Vert	PK	0.0	49.5	74.0	-24.5	Low Ch., EUT on Side, Ant on Side
19218.280	45.7	0.6	1.6	142.0	3.0	0.0	Horz	PK	0.0	49.3	74.0	-24.7	Low Ch., EUT on Side, Ant on Side
19216.890	45.4	0.6	1.6	216.0	3.0	0.0	Vert	PK	0.0	49.0	74.0	-25.0	Low Ch., EUT on Side, Ant on Side
4883.575	38.7	9.8	1.1	292.0	0.0	0.0	Vert	PK	0.0	48.5	74.0	-25.5	Mid Ch., EUT on Side, Ant on Side
12208.830	39.6	1.9	1.7	236.0	0.0	0.0	Horz	PK	0.0	41.5	74.0	-32.5	Mid Ch., EUT on Side, Ant on Side
12011.370	38.6	2.5	1.5	245.0	0.0	0.0	Horz	PK	0.0	41.1	74.0	-32.9	Low Ch., EUT on Side, Ant on Side
12398.920	37.0	2.0	1.5	206.0	0.0	0.0	Horz	PK	0.0	39.0	74.0	-35.0	High Ch., EUT on Side, Ant on Side
12208.160	36.8	1.9	1.5	265.0	0.0	0.0	Vert	PK	0.0	38.7	74.0	-35.3	Mid Ch., EUT on Side, Ant on Side
12011.680	36.1	2.5	1.5	294.0	0.0	0.0	Vert	PK	0.0	38.6	74.0	-35.4	Low Ch., EUT on Side, Ant on Side
12397.740	36.5	2.0	1.5	86.0	0.0	0.0	Vert	PK	0.0	38.5	74.0	-35.5	High Ch., EUT on Side, Ant on Side

SPURIOUS RADIATED EMISSIONS



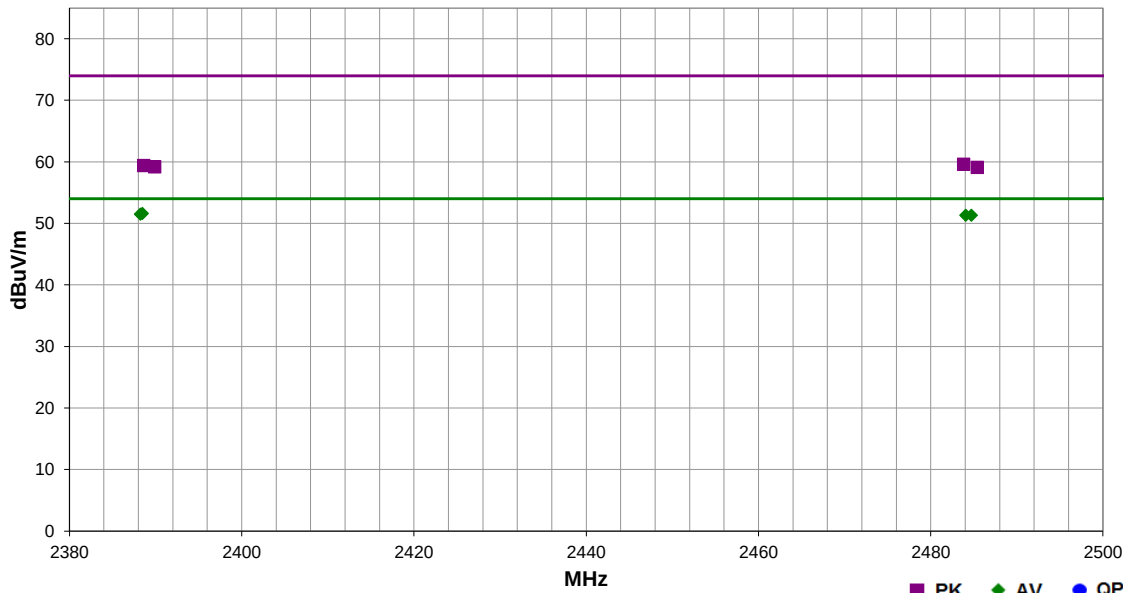
EmiRS 2020.12.09.0

PSA-ESCI 2020.06.24.2

Work Order:	SYNA0313	Date:	2020-12-16	
Project:	None	Temperature:	22.6 °C	
Job Site:	NC01	Humidity:	35.3% RH	
Serial Number:	Rev. 10 - 007	Barometric Pres.:	1018 mbar	
EUT:	RadioNode			
Configuration:	1			
Customer:	Walt Disney Parks and Resorts US, Inc.			
Attendees:	None			
EUT Power:	POE via 120VAC/60Hz			
Operating Mode:	BTLE Tx, Port 7, Ant Cable A1, Antenna PN: MA510.C.CG.005, GFSK, Packet Length = 63, PRBS9, 1 Mbps, Low Channel = 2402 MHz, Mid Channel = 2442 MHz, High Channel = 2480 MHz.			
Deviations:	None			
Comments:	See comments below for Channel, EUT orientations. Step 1, full test based on the client's test plan. The worst case EUT orientations from the previous testing were used. The provided test software configured the radio with a duty cycle of 47.8% . Per ANSI C63.10 test methods, the RMS data was corrected with a carrier duty cycle correction factor (DCCF) of 3.2 dB. DCCF (dB) = 10*log(1/0.478).			

Test Specifications	Test Method
FCC 15.247:2020	ANSI C63.10:2013

Run #	87	Test Distance (m)	3	Antenna Height(s)	1 to 4(m)	Results	Pass
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Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (dB)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
2388.473	29.0	-0.6	1.5	285.0	3.2	20.0	Vert	AV	0.0	51.6	54.0	-2.4	Low Ch., EUT on Side, Ant on Side
2388.240	28.9	-0.6	1.8	159.0	3.2	20.0	Horz	AV	0.0	51.5	54.0	-2.5	Low Ch., EUT on Side, Ant on Side
2484.067	28.9	-0.8	1.5	69.0	3.2	20.0	Horz	AV	0.0	51.3	54.0	-2.7	High Ch., EUT on Side, Ant on Side
2484.740	28.9	-0.8	1.5	122.0	3.2	20.0	Vert	AV	0.0	51.3	54.0	-2.7	High Ch., EUT on Side, Ant on Side
2483.817	40.4	-0.8	1.5	69.0	0.0	20.0	Horz	PK	0.0	59.6	74.0	-14.4	High Ch., EUT on Side, Ant on Side
2388.627	40.0	-0.6	1.5	285.0	0.0	20.0	Vert	PK	0.0	59.4	74.0	-14.6	Low Ch., EUT on Side, Ant on Side
2389.887	39.8	-0.6	1.8	159.0	0.0	20.0	Horz	PK	0.0	59.2	74.0	-14.8	Low Ch., EUT on Side, Ant on Side
2485.407	39.9	-0.8	1.5	122.0	0.0	20.0	Vert	PK	0.0	59.1	74.0	-14.9	High Ch., EUT on Side, Ant on Side

SPURIOUS RADIATED EMISSIONS



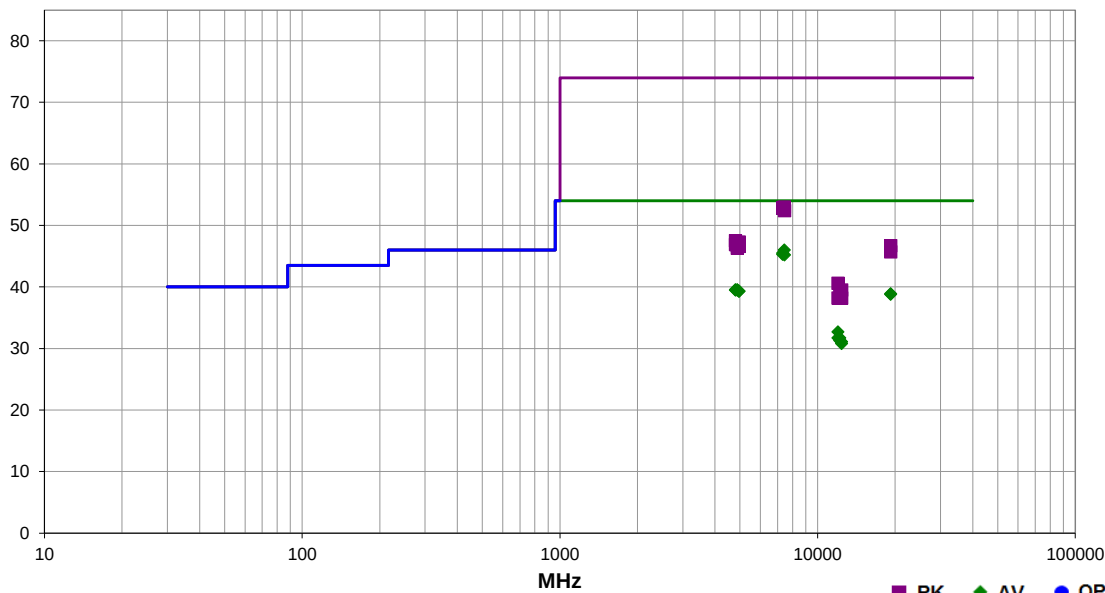
EmiRS 2020.12.09.0

PSA-ESCI 2020.06.24.2

Work Order:	SYNA0313	Date:	2020-12-15	
Project:	None	Temperature:	23 °C	
Job Site:	NC01	Humidity:	34.5% RH	
Serial Number:	Rev. 10 - 007	Barometric Pres.:	1017 mbar	
EUT:		RadioNode		
Configuration:	2			
Customer:	Walt Disney Parks and Resorts US, Inc.			
Attendees:	None			
EUT Power:	24VDC via 120VAC/60Hz			
Operating Mode:	BTLE Tx, Port 7, Ant Cable A1, Antenna PN: MA510.C.CG.005, GFSK, Packet Length = 63, PRBS9, 1 Mbps, Low Ch. = 2402 MHz, Mid Ch. = 2442 MHz, High Ch. = 2480 MHz.			
Deviations:	None			
Comments:	See comments below for Channel, EUT orientations. Step 1, full test based on the client's test plan. The worst case EUT orientations from the previous testing were used. The provided test software configured the radio with a duty cycle of 47.8% . Per ANSI C63.10 test methods, the RMS data was corrected with a carrier duty cycle correction factor (DCCF) of 3.2 dB. DCCF (dB) = 10*log(1/0.478).			

Test Specifications	FCC 15.247:2020	Test Method	ANSI C63.10:2013
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Run #	57	Test Distance (m)	3	Antenna Height(s)	1 to 4(m)	Results	Pass
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Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (dB)	External Attenuation (dB)	Polarity/Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
7439.658	27.8	15.0	1.3	21.0	3.2	0.0	Horz	AV	0.0	46.0	54.0	-8.0	High Ch., EUT on Side, Ant on Side
7325.717	27.8	14.5	1.5	62.0	3.2	0.0	Horz	AV	0.0	45.5	54.0	-8.5	Mid Ch., EUT on Side, Ant on Side
7326.833	27.6	14.5	1.5	280.0	3.2	0.0	Vert	AV	0.0	45.3	54.0	-8.7	Mid Ch., EUT on Side, Ant on Side
7442.083	27.0	15.0	1.3	341.0	3.2	0.0	Vert	AV	0.0	45.2	54.0	-8.8	High Ch., EUT on Side, Ant on Side
4883.783	26.5	9.8	1.5	168.0	3.2	0.0	Horz	AV	0.0	39.5	54.0	-14.5	Mid Ch., EUT on Side, Ant on Side
4883.458	26.5	9.8	3.3	121.0	3.2	0.0	Vert	AV	0.0	39.5	54.0	-14.5	Mid Ch., EUT on Side, Ant on Side
4804.700	26.6	9.7	1.5	223.0	3.2	0.0	Horz	AV	0.0	39.5	54.0	-14.5	Low Ch., EUT on Side, Ant on Side
4802.467	26.6	9.7	1.8	345.0	3.2	0.0	Vert	AV	0.0	39.5	54.0	-14.5	Low Ch., EUT on Side, Ant on Side
4961.058	26.6	9.5	1.5	132.0	3.2	0.0	Horz	AV	0.0	39.3	54.0	-14.7	High Ch., EUT on Side, Ant on Side
4957.883	26.6	9.5	1.5	77.0	3.2	0.0	Vert	AV	0.0	39.3	54.0	-14.7	High Ch., EUT on Side, Ant on Side
19217.650	35.1	0.6	1.6	190.0	3.2	0.0	Vert	AV	0.0	38.9	54.0	-15.1	Low Ch., EUT on Side, Ant on Side
19216.630	35.0	0.6	1.6	36.0	3.2	0.0	Horz	AV	0.0	38.8	54.0	-15.2	Low Ch., EUT on Side, Ant on Side
7439.908	38.0	15.0	1.3	21.0	0.0	0.0	Horz	PK	0.0	53.0	74.0	-21.0	High Ch., EUT on Side, Ant on Side
7324.550	38.4	14.5	1.5	62.0	0.0	0.0	Horz	PK	0.0	52.9	74.0	-21.1	Mid Ch., EUT on Side, Ant on Side
7325.517	38.3	14.5	1.5	280.0	0.0	0.0	Vert	PK	0.0	52.8	74.0	-21.2	Mid Ch., EUT on Side, Ant on Side
12009.070	27.0	2.5	1.4	241.0	3.2	0.0	Horz	AV	0.0	32.7	54.0	-21.3	Low Ch., EUT on Side, Ant on Side
7442.358	37.4	15.0	1.3	341.0	0.0	0.0	Vert	PK	0.0	52.4	74.0	-21.6	High Ch., EUT on Side, Ant on Side
12009.230	26.0	2.5	1.5	184.0	3.2	0.0	Vert	AV	0.0	31.7	54.0	-22.3	Low Ch., EUT on Side, Ant on Side
12208.910	26.6	1.9	1.5	236.0	3.2	0.0	Horz	AV	0.0	31.7	54.0	-22.3	Mid Ch., EUT on Side, Ant on Side
12207.580	26.2	1.9	1.5	221.0	3.2	0.0	Vert	AV	0.0	31.3	54.0	-22.7	Mid Ch., EUT on Side, Ant on Side
12399.370	25.9	2.0	1.1	197.0	3.2	0.0	Vert	AV	0.0	31.1	54.0	-22.9	High Ch., EUT on Side, Ant on Side
12399.760	25.6	2.0	1.5	350.0	3.2	0.0	Horz	AV	0.0	30.8	54.0	-23.2	High Ch., EUT on Side, Ant on Side

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (dB)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
4803.117	37.8	9.7	1.8	345.0	0.0	0.0	Vert	PK	0.0	47.5	74.0	-26.5	Low Ch., EUT on Side, Ant on Side
4958.892	37.8	9.5	1.5	132.0	0.0	0.0	Horz	PK	0.0	47.3	74.0	-26.7	High Ch., EUT on Side, Ant on Side
4804.958	37.2	9.7	1.5	223.0	0.0	0.0	Horz	PK	0.0	46.9	74.0	-27.1	Low Ch., EUT on Side, Ant on Side
4885.583	36.9	9.8	3.3	121.0	0.0	0.0	Vert	PK	0.0	46.7	74.0	-27.3	Mid Ch., EUT on Side, Ant on Side
19214.090	46.1	0.6	1.6	190.0	0.0	0.0	Vert	PK	0.0	46.7	74.0	-27.3	Low Ch., EUT on Side, Ant on Side
4958.775	37.1	9.5	1.5	77.0	0.0	0.0	Vert	PK	0.0	46.6	74.0	-27.4	High Ch., EUT on Side, Ant on Side
4884.275	36.5	9.8	1.5	168.0	0.0	0.0	Horz	PK	0.0	46.3	74.0	-27.7	Mid Ch., EUT on Side, Ant on Side
19215.560	45.1	0.6	1.6	36.0	0.0	0.0	Horz	PK	0.0	45.7	74.0	-28.3	Low Ch., EUT on Side, Ant on Side
12011.380	38.1	2.5	1.4	241.0	0.0	0.0	Horz	PK	0.0	40.6	74.0	-33.4	Low Ch., EUT on Side, Ant on Side
12398.980	37.5	2.0	1.1	197.0	0.0	0.0	Vert	PK	0.0	39.5	74.0	-34.5	High Ch., EUT on Side, Ant on Side
12211.440	37.1	1.9	1.5	221.0	0.0	0.0	Vert	PK	0.0	39.0	74.0	-35.0	Mid Ch., EUT on Side, Ant on Side
12211.410	36.8	1.9	1.5	236.0	0.0	0.0	Horz	PK	0.0	38.7	74.0	-35.3	Mid Ch., EUT on Side, Ant on Side
12011.210	35.7	2.5	1.5	184.0	0.0	0.0	Vert	PK	0.0	38.2	74.0	-35.8	Low Ch., EUT on Side, Ant on Side
12399.370	36.2	2.0	1.5	350.0	0.0	0.0	Horz	PK	0.0	38.2	74.0	-35.8	High Ch., EUT on Side, Ant on Side

SPURIOUS RADIATED EMISSIONS



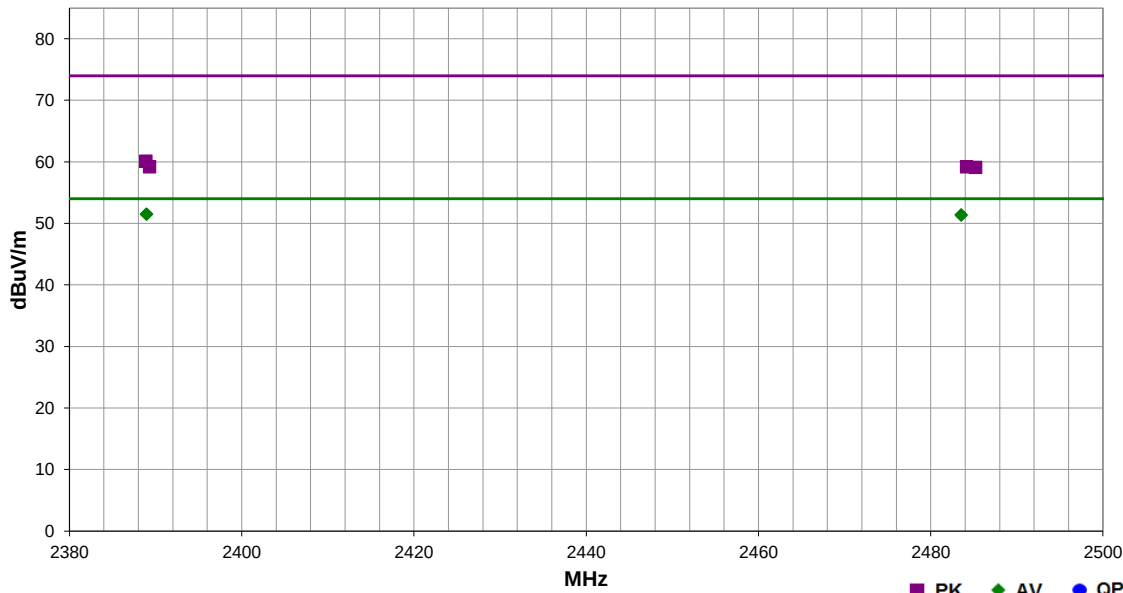
EmiRS 2020.12.09.0

PSA-ESCI 2020.06.24.2

Work Order:	SYNA0313	Date:	2020-12-15	
Project:	None	Temperature:	23 °C	
Job Site:	NC01	Humidity:	34.5% RH	
Serial Number:	Rev. 10 - 007	Barometric Pres.:	1017 mbar	
EUT:	RadioNode			
Configuration:	2			
Customer:	Walt Disney Parks and Resorts US, Inc.			
Attendees:	None			
EUT Power:	24VDC via 120VAC/60Hz			
Operating Mode:	BTLE Tx, Port 7, Ant Cable A1, Antenna PN: MA510.C.CG.005, GFSK, Packet Length = 63, PRBS9, 1 Mbps, Low Ch. = 2402 MHz, High Ch. = 2480 MHz.			
Deviations:	None			
Comments:	See comments below for Channel, EUT orientations. Step 1, full test based on the client's test plan. The worst case EUT orientations from the previous testing were used. The provided test software configured the radio with a duty cycle of 47.8% . Per ANSI C63.10 test methods, the RMS data was corrected with a carrier duty cycle correction factor (DCCF) of 3.2 dB. DCCF (dB) = 10*log(1/0.478).			

Test Specifications	Test Method
FCC 15.247:2020	ANSI C63.10:2013

Run #	59	Test Distance (m)	3	Antenna Height(s)	1 to 4(m)	Results	Pass
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Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (dB)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
2388.990	28.9	-0.6	1.5	229.0	3.2	20.0	Horz	AV	0.0	51.5	54.0	-2.5	Low Ch., EUT on Side, Ant on Side
2388.910	28.9	-0.6	1.5	248.0	3.2	20.0	Vert	AV	0.0	51.5	54.0	-2.5	Low Ch., EUT on Side, Ant on Side
2483.547	29.0	-0.8	2.8	290.0	3.2	20.0	Horz	AV	0.0	51.4	54.0	-2.6	High Ch., EUT on Side, Ant on Side
2483.540	28.9	-0.8	1.5	360.0	3.2	20.0	Vert	AV	0.0	51.3	54.0	-2.7	High Ch., EUT on Side, Ant on Side
2388.880	40.7	-0.6	1.5	229.0	0.0	20.0	Horz	PK	0.0	60.1	74.0	-13.9	Low Ch., EUT on Side, Ant on Side
2484.153	40.0	-0.8	2.8	290.0	0.0	20.0	Horz	PK	0.0	59.2	74.0	-14.8	High Ch., EUT on Side, Ant on Side
2389.297	39.8	-0.6	1.5	248.0	0.0	20.0	Vert	PK	0.0	59.2	74.0	-14.8	Low Ch., EUT on Side, Ant on Side
2485.210	39.9	-0.8	1.5	360.0	0.0	20.0	Vert	PK	0.0	59.1	74.0	-14.9	High Ch., EUT on Side, Ant on Side

SPURIOUS RADIATED EMISSIONS



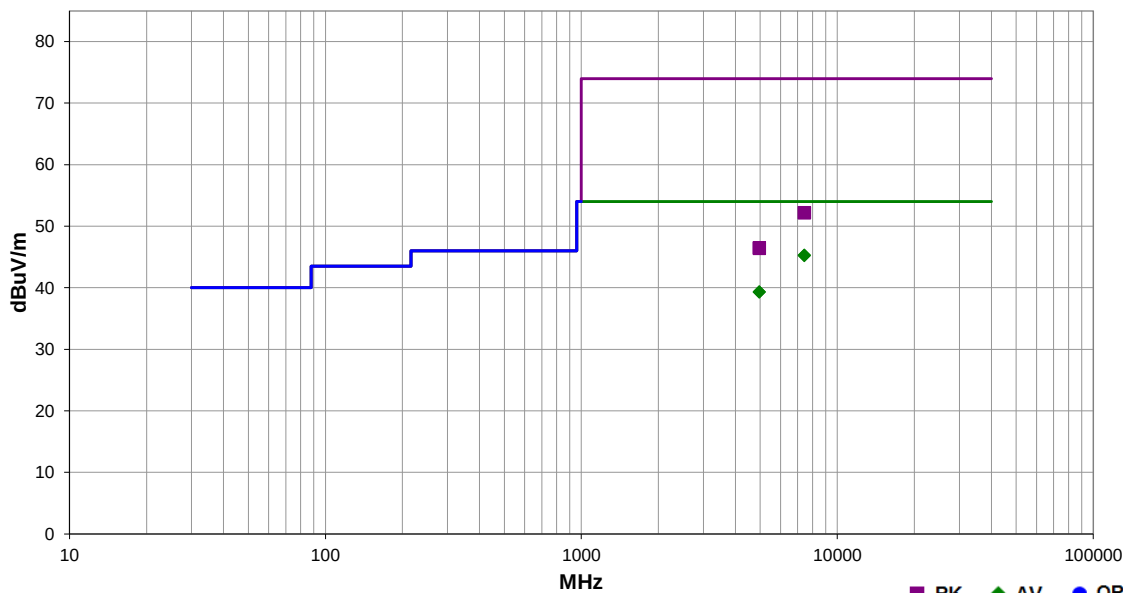
EmiRS 2020.12.09.0

PSA-ESCI 2020.06.24.2

Work Order:	SYNA0313	Date:	2020-12-16	
Project:	None	Temperature:	22.6 °C	
Job Site:	NC01	Humidity:	35.3% RH	
Serial Number:	Rev. 10 - 007	Barometric Pres.:	1018 mbar	
EUT:	RadioNode			
Configuration:	1			
Customer:	Walt Disney Parks and Resorts US, Inc.			
Attendees:	None			
EUT Power:	POE via 120VAC/60Hz			
Operating Mode:	BTLE Tx, Port 8, Ant Cable A1, Antenna PN: MA510.C.CG.005, GFSK, Packet Length = 63, PRBS9, 1 Mbps, High Channel = 2480 MHz.			
Deviations:	None			
Comments:	See comments below for Channel, EUT orientations. Step 3, spot check based on the client's test plan. The worst case EUT orientations were used from previous testing. The provided test software configured the radio with a duty cycle of 47.8% . Per ANSI C63.10 test methods, the RMS data was corrected with a carrier duty cycle correction factor (DCCF) of 3.2 dB. DCCF (dB) = 10*log(1/0.478).			

Test Specifications	Test Method
FCC 15.247:2020	ANSI C63.10:2013

Run #	88	Test Distance (m)	3	Antenna Height(s)	1 to 4(m)	Results	Pass
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Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (dB)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
7440.508	27.1	15.0	3.0	66.0	3.2	0.0	Vert	AV	0.0	45.3	54.0	-8.7	High Ch., EUT on Side, Ant on Side
7440.308	27.0	15.0	1.5	132.0	3.2	0.0	Horz	AV	0.0	45.2	54.0	-8.8	High Ch., EUT on Side, Ant on Side
4960.883	26.6	9.5	1.5	115.0	3.2	0.0	Horz	AV	0.0	39.3	54.0	-14.7	High Ch., EUT on Side, Ant on Side
4960.058	26.6	9.5	1.5	334.0	3.2	0.0	Vert	AV	0.0	39.3	54.0	-14.7	High Ch., EUT on Side, Ant on Side
7441.867	37.2	15.0	1.5	132.0	0.0	0.0	Horz	PK	0.0	52.2	74.0	-21.8	High Ch., EUT on Side, Ant on Side
7440.075	37.2	15.0	3.0	66.0	0.0	0.0	Vert	PK	0.0	52.2	74.0	-21.8	High Ch., EUT on Side, Ant on Side
4959.158	37.0	9.5	1.5	334.0	0.0	0.0	Vert	PK	0.0	46.5	74.0	-27.5	High Ch., EUT on Side, Ant on Side
4961.758	36.9	9.5	1.5	115.0	0.0	0.0	Horz	PK	0.0	46.4	74.0	-27.6	High Ch., EUT on Side, Ant on Side

SPURIOUS RADIATED EMISSIONS



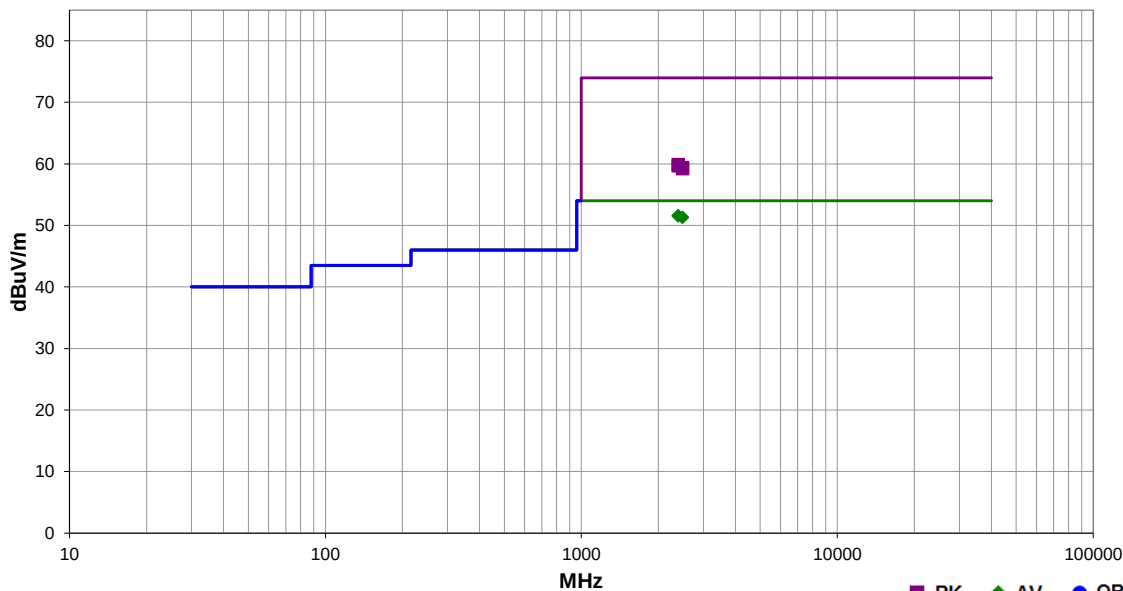
EmiRS 2020.12.09.0

PSA-ESCI 2020.06.24.2

Work Order:	SYNA0313	Date:	2020-12-16	
Project:	None	Temperature:	22.6 °C	
Job Site:	NC01	Humidity:	35.3% RH	
Serial Number:	Rev. 10 - 007	Barometric Pres.:	1018 mbar	
EUT:	RadioNode			
Configuration:	1			
Customer:	Walt Disney Parks and Resorts US, Inc.			
Attendees:	None			
EUT Power:	POE via 120VAC/60Hz			
Operating Mode:	BTLE Tx, Port 8, Ant Cable A1, Antenna PN: MA510.C.CG.005, GFSK, Packet Length = 63, PRBS9, 1 Mbps, High Channel = 2480 MHz.			
Deviations:	None			
Comments:	See comments below for Channel, EUT orientations. Step 3, spot check based on the client's test plan. The worst case EUT orientations were used from previous testing. The provided test software configured the radio with a duty cycle of 47.8% . Per ANSI C63.10 test methods, the RMS data was corrected with a carrier duty cycle correction factor (DCCF) of 3.2 dB. DCCF (dB) = 10*log(1/0.478).			

Test Specifications	Test Method
FCC 15.247:2020	ANSI C63.10:2013

Run #	89	Test Distance (m)	3	Antenna Height(s)	1 to 4(m)	Results	Pass
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Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (dB)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
2389.867	29.0	-0.6	1.5	341.0	3.2	20.0	Horz	AV	0.0	51.6	54.0	-2.4	Low Ch., EUT on Side, Ant on Side
2389.260	28.9	-0.6	1.5	70.0	3.2	20.0	Vert	AV	0.0	51.5	54.0	-2.5	Low Ch., EUT on Side, Ant on Side
2483.913	28.9	-0.8	3.1	286.0	3.2	20.0	Horz	AV	0.0	51.3	54.0	-2.7	High Ch., EUT on Side, Ant on Side
2484.090	28.9	-0.8	2.5	213.0	3.2	20.0	Vert	AV	0.0	51.3	54.0	-2.7	High Ch., EUT on Side, Ant on Side
2389.047	40.5	-0.6	1.5	341.0	0.0	20.0	Horz	PK	0.0	59.9	74.0	-14.1	Low Ch., EUT on Side, Ant on Side
2389.950	40.3	-0.6	1.5	70.0	0.0	20.0	Vert	PK	0.0	59.7	74.0	-14.3	Low Ch., EUT on Side, Ant on Side
2483.513	40.2	-0.8	2.5	213.0	0.0	20.0	Vert	PK	0.0	59.4	74.0	-14.6	High Ch., EUT on Side, Ant on Side
2483.830	40.0	-0.8	3.1	286.0	0.0	20.0	Horz	PK	0.0	59.2	74.0	-14.8	High Ch., EUT on Side, Ant on Side

SPURIOUS RADIATED EMISSIONS



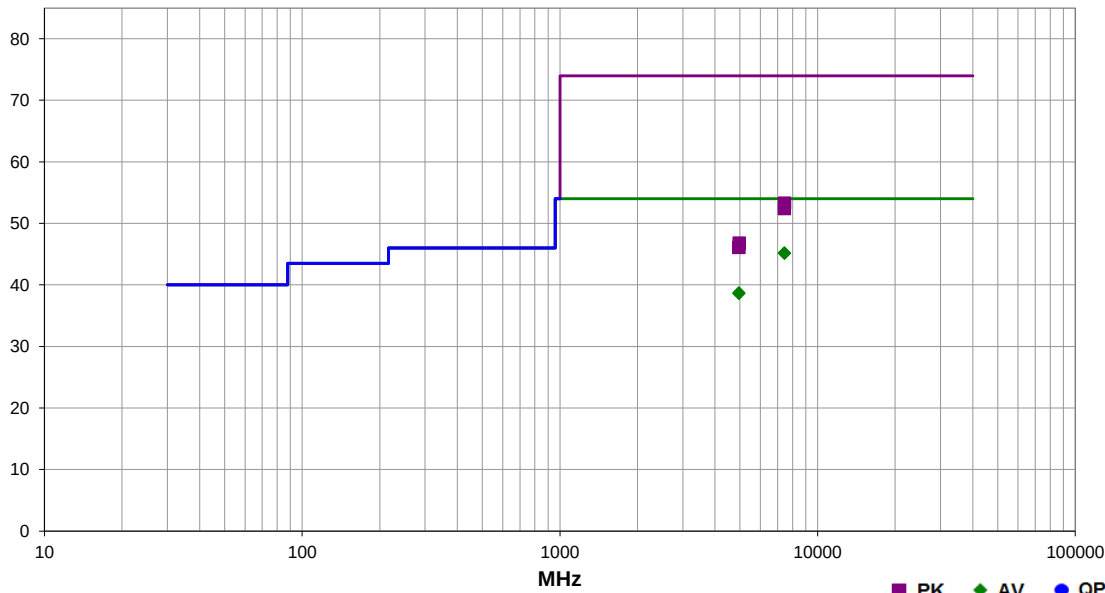
EmiRS 2020.12.09.0

PSA-ESCI 2020.06.24.2

Work Order:	SYNA0313	Date:	2020-12-16	
Project:	None	Temperature:	23.4 °C	
Job Site:	NC01	Humidity:	31% RH	
Serial Number:	Rev. 10 - 007	Barometric Pres.:	1015 mbar	
EUT:	RadioNode			
Configuration:	2			
Customer:	Walt Disney Parks and Resorts US, Inc.			
Attendees:	None			
EUT Power:	24VDC via 120VAC/60Hz			
Operating Mode:	BTLE Tx, Port 8, Ant Cable A1, Antenna PN: MA510.C.CG.005, GFSK, Packet Length = 63, PRBS9, 1 Mbps, High Ch. = 2480 MHz.			
Deviations:	None			
Comments:	See comments below for Channel, EUT orientations. Step 3, spot check based on the client's test plan. The worst case EUT orientations were used from previous testing. The provided test software configured the radio with a duty cycle of 47.8% . Per ANSI C63.10 test methods, the RMS data was corrected with a carrier duty cycle correction factor (DCCF) of 3.2 dB. DCCF (dB) = 10*log(1/0.478).			

Test Specifications	Test Method
FCC 15.247:2020	ANSI C63.10:2013

Run #	155	Test Distance (m)	3	Antenna Height(s)	1 to 4(m)	Results	Pass
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Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (dB)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
7439.592	27.0	15.0	1.5	164.0	3.2	0.0	Horz	AV	0.0	45.2	54.0	-8.8	High Ch., EUT on Side, Ant on Side
7440.500	26.9	15.0	1.5	7.0	3.2	0.0	Vert	AV	0.0	45.1	54.0	-8.9	High Ch., EUT on Side, Ant on Side
4957.950	26.0	9.5	2.9	114.0	3.2	0.0	Horz	AV	0.0	38.7	54.0	-15.3	High Ch., EUT on Side, Ant on Side
4957.558	25.9	9.5	1.8	204.0	3.2	0.0	Vert	AV	0.0	38.6	54.0	-15.4	High Ch., EUT on Side, Ant on Side
7441.933	38.3	15.0	1.5	164.0	0.0	0.0	Horz	PK	0.0	53.3	74.0	-20.7	High Ch., EUT on Side, Ant on Side
7438.500	37.4	15.0	1.5	7.0	0.0	0.0	Vert	PK	0.0	52.4	74.0	-21.6	High Ch., EUT on Side, Ant on Side
4961.867	37.3	9.5	2.9	114.0	0.0	0.0	Horz	PK	0.0	46.8	74.0	-27.2	High Ch., EUT on Side, Ant on Side
4957.825	36.6	9.5	1.8	204.0	0.0	0.0	Vert	PK	0.0	46.1	74.0	-27.9	High Ch., EUT on Side, Ant on Side

SPURIOUS RADIATED EMISSIONS



EmiRS 2020.12.09.0

PSA-ESCI 2020.06.24.2

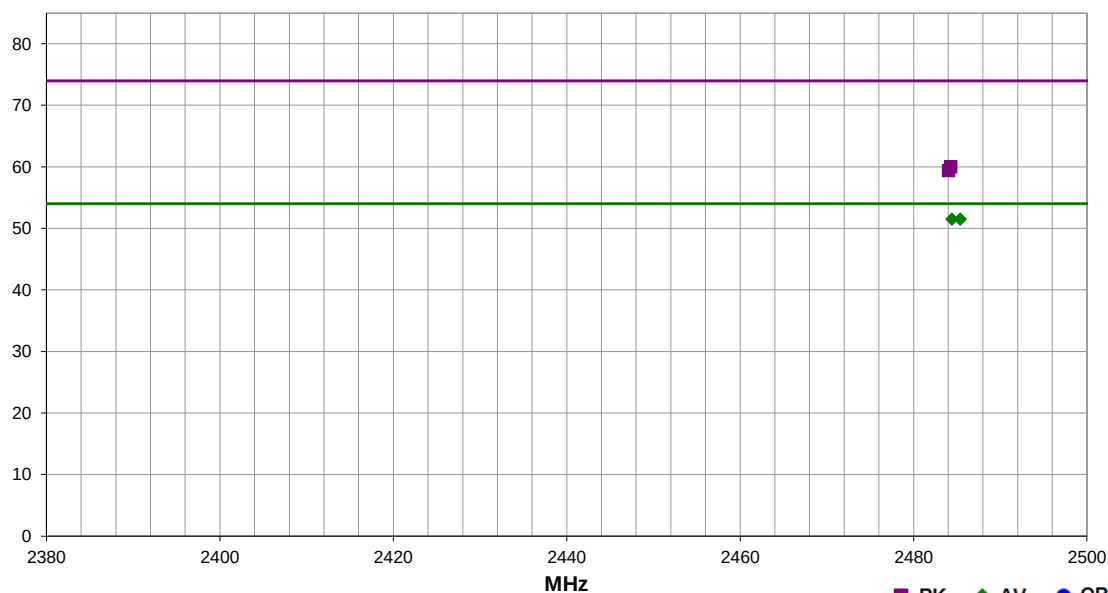
EmRS 2020.12.09.0

PSA-ESCI 2020.06.24

Work Order:	SYNA0313	Date:	2020-12-16		
Project:	None	Temperature:	23.4 °C		
Job Site:	NC01	Humidity:	31% RH		
Serial Number:	Rev. 10 - 007	Barometric Pres.:	1015 mbar	Tested by:	Brian Fahey
EUT:	RadioNode				
Configuration:	2				
Customer:	Walt Disney Parks and Resorts US, Inc.				
Attendees:	None				
EUT Power:	24VDC via 120VAC/60Hz				
Operating Mode:	BTLE Tx, Port 8, Ant Cable A1, Antenna PN: MA510.C.CG.005, GFSK, Packet Length = 63, PRBS9, 1 Mbps, High Ch. = 2480 MHz.				
Deviations:	None				
Comments:	See comments below for Channel, EUT orientations. Step 3, spot check based on the client's test plan. The worst case EUT orientations were used from previous testing. The provided test software configured the radio with a duty cycle of 47.8% . Per ANSI C63.10 test methods, the RMS data was corrected with a carrier duty cycle correction factor (DCCF) of 3.2 dB. DCCF (dB) = 10*log(1/0.478).				

Test Specifications	Test Method
FCC 15.247:2020	ANSI C63.10:2013

Run #	156	Test Distance (m)	3	Antenna Height(s)	1 to 4(m)	Results	Pass
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Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (dB)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
2484.437	29.1	-0.8	1.5	223.0	3.2	20.0	Horz	AV	0.0	51.5	54.0	-2.5	High Ch., EUT on Side, Ant on Side
2485.390	29.1	-0.8	3.2	339.0	3.2	20.0	Vert	AV	0.0	51.5	54.0	-2.5	High Ch., EUT on Side, Ant on Side
2484.283	40.8	-0.8	3.2	339.0	0.0	20.0	Vert	PK	0.0	60.0	74.0	-14.0	High Ch., EUT on Side, Ant on Side
2484.037	40.2	-0.8	1.5	223.0	0.0	20.0	Horz	PK	0.0	59.4	74.0	-14.6	High Ch., EUT on Side, Ant on Side

SPURIOUS RADIATED EMISSIONS



EmiRS 2020.12.09.0

PSA-ESCI 2020.06.24.2

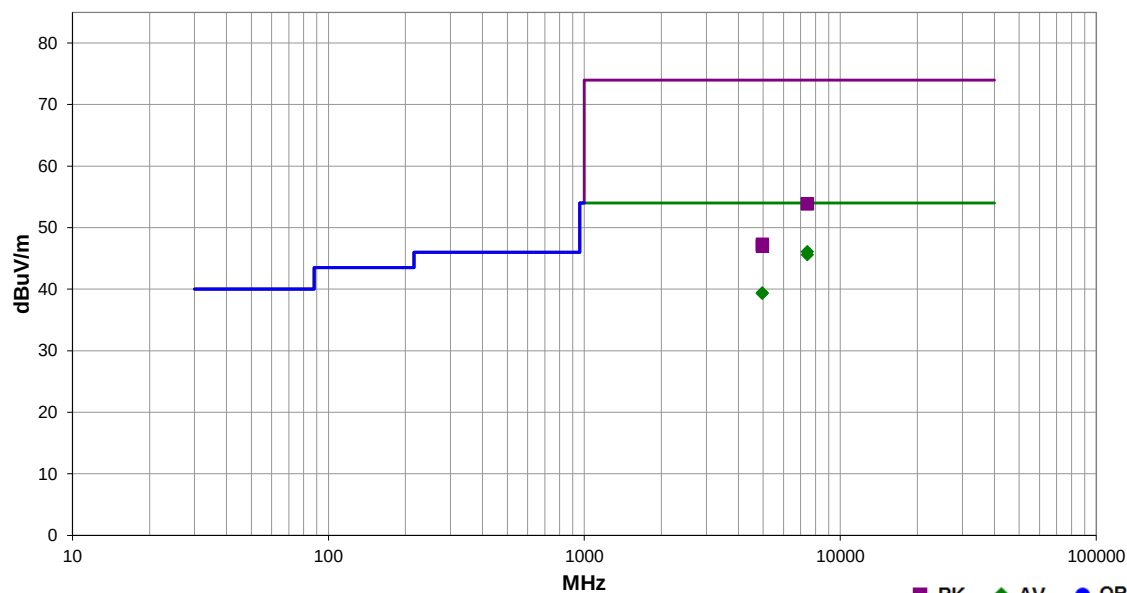
EmRS 2020.12.09.0

PSA-ESCI 2020.06.24

Work Order:	SYNA0313	Date:	2020-12-16		
Project:	None	Temperature:	22.6 °C		
Job Site:	NC01	Humidity:	35.3% RH		
Serial Number:	Rev. 10 - 007	Barometric Pres.:	1018 mbar	Tested by:	Brian Fahey
EUT:	RadioNode				
Configuration:	1				
Customer:	Walt Disney Parks and Resorts US, Inc.				
Attendees:	None				
EUT Power:	POE via 120VAC/60Hz				
Operating Mode:	BTLE Tx, Port 7, Ant Cable A2, Antenna PN: MA510.C.CG.005, GFSK, Packet Length = 63, PRBS9, 1 Mbps, High Channel = 2480 MHz.				
Deviations:	None				
Comments:	See comments below for Channel, EUT orientations. Step 5, spot check based on the client's test plan. The worst case EUT orientations were used from previous testing. The provided test software configured the radio with a duty cycle of 47.8% . Per ANSI C63.10 test methods, the RMS data was corrected with a carrier duty cycle correction factor (DCCF) of 3.2 dB. DCCF (dB) = 10*log(1/0.478).				

Test Specifications	Test Method
FCC 15.247:2020	ANSI C63.10:2013

Run #	98	Test Distance (m)	3	Antenna Height(s)	1 to 4(m)	Results	Pass
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Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (dB)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
7440.640	27.9	15.0	1.5	318.0	3.2	0.0	Horz	AV	0.0	46.1	54.0	-7.9	High Ch., EUT on Side, Ant on Side
7439.627	27.4	15.0	3.1	273.0	3.2	0.0	Vert	AV	0.0	45.6	54.0	-8.4	High Ch., EUT on Side, Ant on Side
4959.317	26.7	9.5	1.5	16.0	3.2	0.0	Horz	AV	0.0	39.4	54.0	-14.6	High Ch., EUT on Side, Ant on Side
4960.890	26.6	9.5	1.5	300.0	3.2	0.0	Vert	AV	0.0	39.3	54.0	-14.7	High Ch., EUT on Side, Ant on Side
7440.543	38.9	15.0	1.5	318.0	0.0	0.0	Horz	PK	0.0	53.9	74.0	-20.1	High Ch., EUT on Side, Ant on Side
7440.833	38.9	15.0	3.1	273.0	0.0	0.0	Vert	PK	0.0	53.9	74.0	-20.1	High Ch., EUT on Side, Ant on Side
4960.997	37.8	9.5	1.5	16.0	0.0	0.0	Horz	PK	0.0	47.3	74.0	-26.7	High Ch., EUT on Side, Ant on Side
4960.623	37.5	9.5	1.5	300.0	0.0	0.0	Vert	PK	0.0	47.0	74.0	-27.0	High Ch., EUT on Side, Ant on Side

SPURIOUS RADIATED EMISSIONS



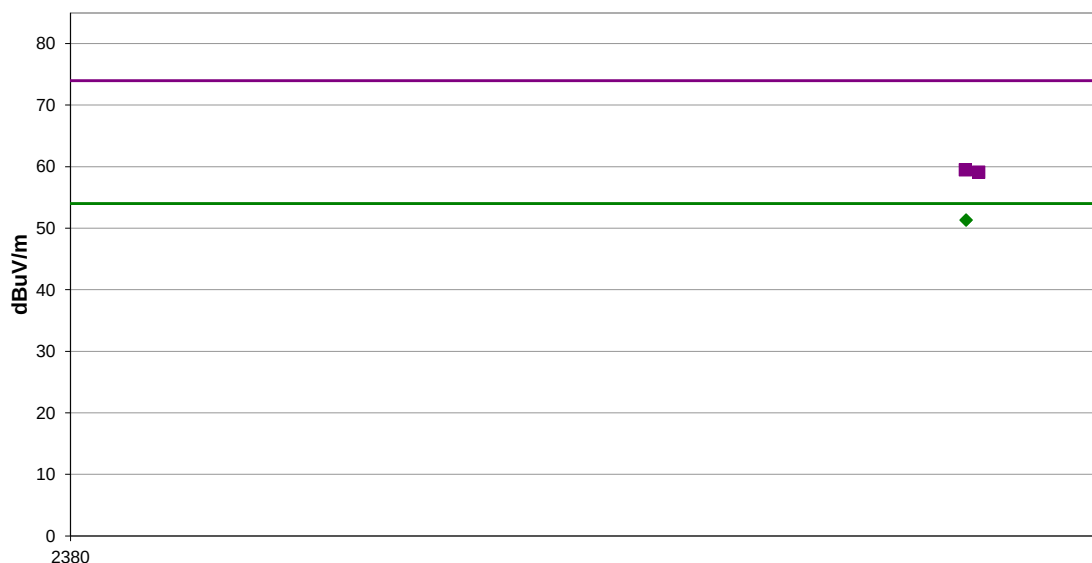
EmiRS 2020.12.09.0

PSA-ESCI 2020.06.24.2

Work Order:	SYNA0313	Date:	2020-12-16	
Project:	None	Temperature:	22.6 °C	
Job Site:	NC01	Humidity:	35.3% RH	
Serial Number:	Rev. 10 - 007	Barometric Pres.:	1018 mbar	
EUT:	RadioNode			
Configuration:	1			
Customer:	Walt Disney Parks and Resorts US, Inc.			
Attendees:	None			
EUT Power:	POE via 120VAC/60Hz			
Operating Mode:	BTLE Tx, Port 7, Ant Cable A2, Antenna PN: MA510.C.CG.005, GFSK, Packet Length = 63, PRBS9, 1 Mbps, High Channel = 2480 MHz.			
Deviations:	None			
Comments:	See comments below for Channel, EUT orientations. Step 5, spot check based on the client's test plan. The worst case EUT orientations were used from previous testing. The provided test software configured the radio with a duty cycle of 47.8% . Per ANSI C63.10 test methods, the RMS data was corrected with a carrier duty cycle correction factor (DCCF) of 3.2 dB. DCCF (dB) = 10*log(1/0.478).			

Test Specifications	Test Method
FCC 15.247:2020	ANSI C63.10:2013

Run #	99	Test Distance (m)	3	Antenna Height(s)	1 to 4(m)	Results	Pass
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Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (dB)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
2483.643	28.9	-0.8	1.5	15.0	3.2	20.0	Horz	AV	0.0	51.3	54.0	-2.7	High Ch., EUT on Side, Ant on Side
2483.673	28.9	-0.8	1.5	338.0	3.2	20.0	Vert	AV	0.0	51.3	54.0	-2.7	High Ch., EUT on Side, Ant on Side
2483.557	40.3	-0.8	1.5	338.0	0.0	20.0	Vert	PK	0.0	59.5	74.0	-14.5	High Ch., EUT on Side, Ant on Side
2485.140	39.9	-0.8	1.5	15.0	0.0	20.0	Horz	PK	0.0	59.1	74.0	-14.9	High Ch., EUT on Side, Ant on Side

SPURIOUS RADIATED EMISSIONS



EmiRS 2020.12.09.0

PSA-ESCI 2020.06.24.2

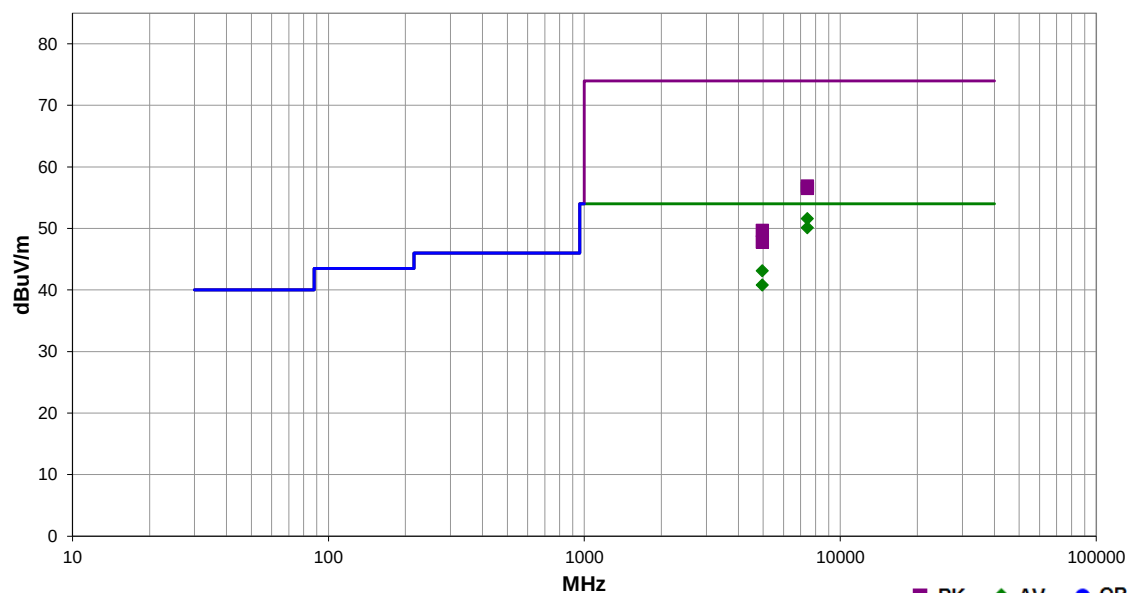
EmiRS 2020.12.09.0

PSA-ESCI 2020.06.24

Work Order:	SYNA0313	Date:	2020-12-16		
Project:	None	Temperature:	22.6 °C		
Job Site:	NC01	Humidity:	35.3% RH		
Serial Number:	Rev. 10 - 007	Barometric Pres.:	1018 mbar	Tested by:	Brian Fahey
EUT:	RadioNode				
Configuration:	2				
Customer:	Walt Disney Parks and Resorts US, Inc.				
Attendees:	None				
EUT Power:	24VDC via 120VAC/60Hz				
Operating Mode:	BTLE Tx, Port 7, Ant Cable A2, Antenna PN: MA510.C.CG.005, GFSK, Packet Length = 63, PRBS9, 1 Mbps, High Channel = 2480 MHz.				
Deviations:	None				
Comments:	See comments below for Channel, EUT orientations. Step 5, spot check based on the client's test plan. The worst case EUT orientations were used from previous testing. The provided test software configured the radio with a duty cycle of 47.8% . Per ANSI C63.10 test methods, the RMS data was corrected with a carrier duty cycle correction factor (DCCF) of 3.2 dB. DCCF (dB) = 10*log(1/0.478).				

Test Specifications	FCC 15.247:2020	Test Method	ANSI C63.10:2013
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Run #	96	Test Distance (m)	3	Antenna Height(s)	1 to 4(m)	Results	Pass
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Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (dB)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
7440.600	33.4	15.0	1.9	174.0	3.2	0.0	Horz	AV	0.0	51.6	54.0	-2.4	High Ch., EUT on Side, Ant on Side
7440.725	31.9	15.0	2.1	302.0	3.2	0.0	Vert	AV	0.0	50.1	54.0	-3.9	High Ch., EUT on Side, Ant on Side
4960.083	30.4	9.5	2.4	250.0	3.2	0.0	Horz	AV	0.0	43.1	54.0	-10.9	High Ch., EUT on Side, Ant on Side
4960.167	28.1	9.5	3.8	268.0	3.2	0.0	Vert	AV	0.0	40.8	54.0	-13.2	High Ch., EUT on Side, Ant on Side
7439.950	41.9	15.0	1.9	174.0	0.0	0.0	Horz	PK	0.0	56.9	74.0	-17.1	High Ch., EUT on Side, Ant on Side
7440.467	41.5	15.0	2.1	302.0	0.0	0.0	Vert	PK	0.0	56.5	74.0	-17.5	High Ch., EUT on Side, Ant on Side
4960.483	40.2	9.5	2.4	250.0	0.0	0.0	Horz	PK	0.0	49.7	74.0	-24.3	High Ch., EUT on Side, Ant on Side
4959.542	38.3	9.5	3.8	268.0	0.0	0.0	Vert	PK	0.0	47.8	74.0	-26.2	High Ch., EUT on Side, Ant on Side

SPURIOUS RADIATED EMISSIONS



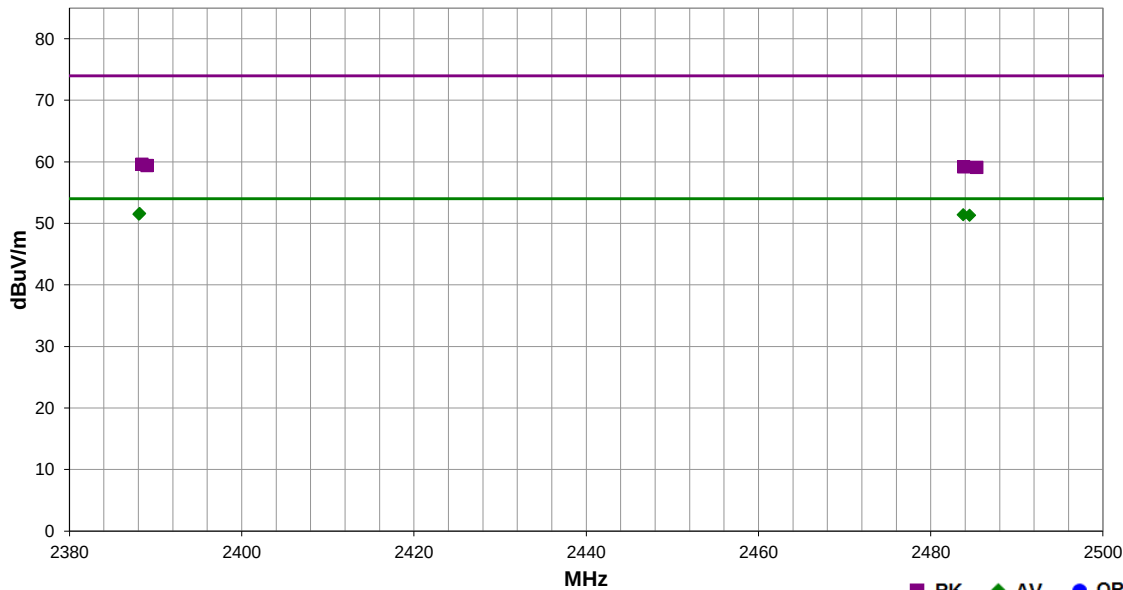
EmiRS 2020.12.09.0

PSA-ESCI 2020.06.24.2

Work Order:	SYNA0313	Date:	2020-12-16	
Project:	None	Temperature:	22.6 °C	
Job Site:	NC01	Humidity:	35.3% RH	
Serial Number:	Rev. 10 - 007	Barometric Pres.:	1018 mbar	
EUT:	RadioNode			
Configuration:	2			
Customer:	Walt Disney Parks and Resorts US, Inc.			
Attendees:	None			
EUT Power:	24VDC via 120VAC/60Hz			
Operating Mode:	BTLE Tx, Port 7, Ant Cable A2, Antenna PN: MA510.C.CG.005, GFSK, Packet Length = 63, PRBS9, 1 Mbps, High Channel = 2480 MHz.			
Deviations:	None			
Comments:	See comments below for Channel, EUT orientations. Step 5, spot check based on the client's test plan. The worst case EUT orientations were used from previous testing. The provided test software configured the radio with a duty cycle of 47.8% . Per ANSI C63.10 test methods, the RMS data was corrected with a carrier duty cycle correction factor (DCCF) of 3.2 dB. DCCF (dB) = 10*log(1/0.478).			

Test Specifications	Test Method
FCC 15.247:2020	ANSI C63.10:2013

Run #	97	Test Distance (m)	3	Antenna Height(s)	1 to 4(m)	Results	Pass
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Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (dB)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
2388.167	29.0	-0.6	1.5	349.0	3.2	20.0	Horz	AV	0.0	51.6	54.0	-2.4	Low Ch., EUT on Side, Ant on Side
2388.080	28.9	-0.6	1.5	254.0	3.2	20.0	Vert	AV	0.0	51.5	54.0	-2.5	Low Ch., EUT on Side, Ant on Side
2483.783	29.0	-0.8	1.5	260.0	3.2	20.0	Vert	AV	0.0	51.4	54.0	-2.6	High Ch., EUT on Side, Ant on Side
2484.527	28.9	-0.8	3.0	123.0	3.2	20.0	Horz	AV	0.0	51.3	54.0	-2.7	High Ch., EUT on Side, Ant on Side
2388.420	40.2	-0.6	1.5	254.0	0.0	20.0	Vert	PK	0.0	59.6	74.0	-14.4	Low Ch., EUT on Side, Ant on Side
2389.013	40.0	-0.6	1.5	349.0	0.0	20.0	Horz	PK	0.0	59.4	74.0	-14.6	Low Ch., EUT on Side, Ant on Side
2483.837	40.0	-0.8	3.0	123.0	0.0	20.0	Horz	PK	0.0	59.2	74.0	-14.8	High Ch., EUT on Side, Ant on Side
2485.347	39.9	-0.8	1.5	260.0	0.0	20.0	Vert	PK	0.0	59.1	74.0	-14.9	High Ch., EUT on Side, Ant on Side

SPURIOUS RADIATED EMISSIONS



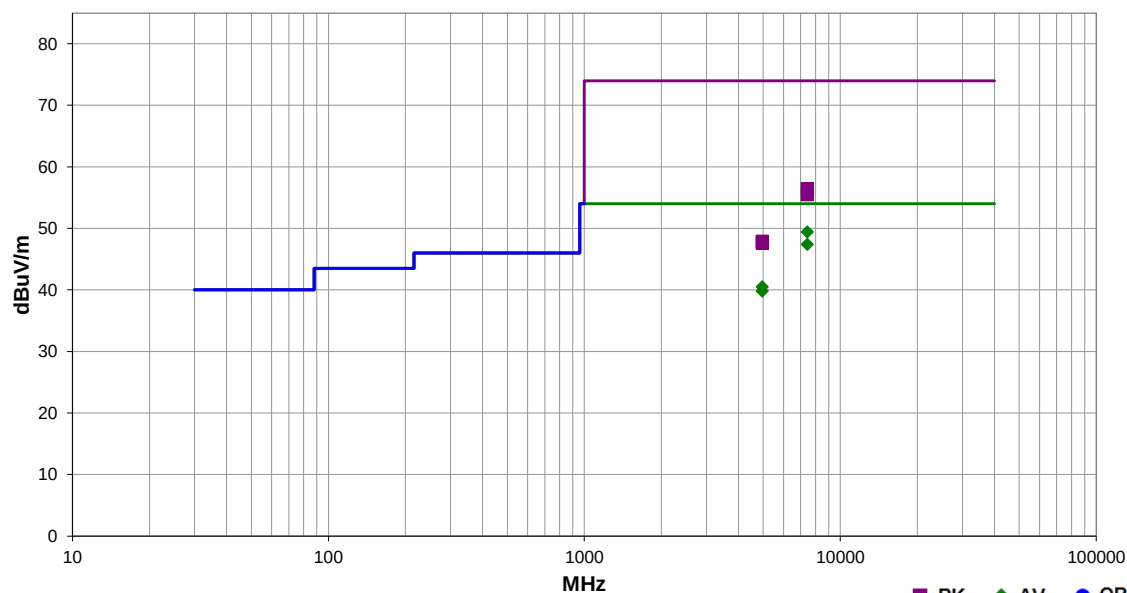
EmiRS 2020.12.09.0

PSA-ESCI 2020.06.24.2

Work Order:	SYNA0313	Date:	2020-12-16	
Project:	None	Temperature:	22.6 °C	
Job Site:	NC01	Humidity:	36.4% RH	
Serial Number:	Rev. 10 - 007	Barometric Pres.:	1006 mbar	
EUT:		RadioNode		
Configuration:	1			
Customer:	Walt Disney Parks and Resorts US, Inc.			
Attendees:	None			
EUT Power:	POE via 120VAC/60Hz			
Operating Mode:	BTLE Tx, Port 8, Ant Cable A2, Antenna PN: MA510.C.CG.005, GFSK, Packet Length = 63, PRBS9, 1 Mbps, High Channel = 2480 MHz.			
Deviations:	None			
Comments:	See comments below for Channel, EUT orientations. Step 7, spot check based on the client's test plan. The worst case EUT orientations were used from previous testing. The provided test software configured the radio with a duty cycle of 47.8% . Per ANSI C63.10 test methods, the RMS data was corrected with a carrier duty cycle correction factor (DCCF) of 3.2 dB. DCCF (dB) = 10*log(1/0.478).			

Test Specifications	FCC 15.247:2020	Test Method	ANSI C63.10:2013
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Run #	104	Test Distance (m)	3	Antenna Height(s)	1 to 4(m)	Results	Pass
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Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (dB)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
7439.503	31.2	15.0	1.8	255.0	3.2	0.0	Horz	AV	0.0	49.4	54.0	-4.6	High Ch., EUT on Side, Ant on Side
7440.463	29.2	15.0	2.5	75.0	3.2	0.0	Vert	AV	0.0	47.4	54.0	-6.6	High Ch., EUT on Side, Ant on Side
4959.723	27.8	9.5	1.3	323.0	3.2	0.0	Horz	AV	0.0	40.5	54.0	-13.5	High Ch., EUT on Side, Ant on Side
4960.073	27.1	9.5	1.4	348.0	3.2	0.0	Vert	AV	0.0	39.8	54.0	-14.2	High Ch., EUT on Side, Ant on Side
7440.860	41.4	15.0	1.8	255.0	0.0	0.0	Horz	PK	0.0	56.4	74.0	-17.6	High Ch., EUT on Side, Ant on Side
7439.643	40.5	15.0	2.5	75.0	0.0	0.0	Vert	PK	0.0	55.5	74.0	-18.5	High Ch., EUT on Side, Ant on Side
4960.017	38.4	9.5	1.4	348.0	0.0	0.0	Vert	PK	0.0	47.9	74.0	-26.1	High Ch., EUT on Side, Ant on Side
4960.043	38.1	9.5	1.3	323.0	0.0	0.0	Horz	PK	0.0	47.6	74.0	-26.4	High Ch., EUT on Side, Ant on Side

SPURIOUS RADIATED EMISSIONS



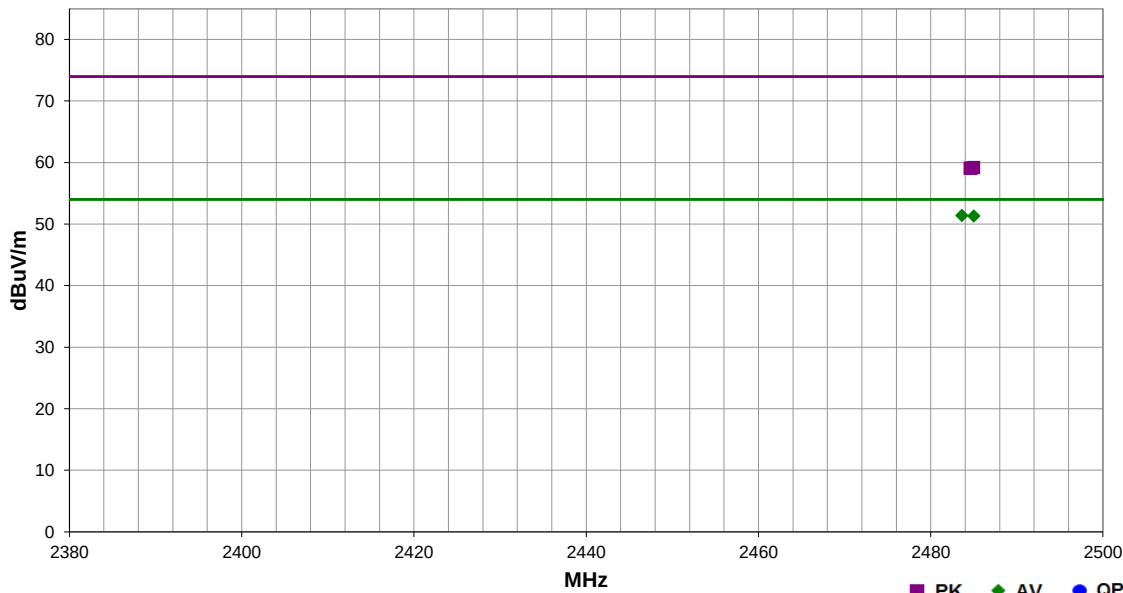
EmiRS 2020.12.09.0

PSA-ESCI 2020.06.24.2

Work Order:	SYNA0313	Date:	2020-12-16	
Project:	None	Temperature:	22.6 °C	
Job Site:	NC01	Humidity:	36.4% RH	
Serial Number:	Rev. 10 - 007	Barometric Pres.:	1006 mbar	
EUT:		RadioNode		
Configuration: 1				
Customer:		Walt Disney Parks and Resorts US, Inc.		
Attendees:		None		
EUT Power:		POE via 120VAC/60Hz		
Operating Mode:		BTLE Tx, Port 8, Ant Cable A2, Antenna PN: MA510.C.CG.005, GFSK, Packet Length = 63, PRBS9, 1 Mbps, High Channel = 2480 MHz.		
Deviations:		None		
Comments:		See comments below for Channel, EUT orientations. Step 7, spot check based on the client's test plan. The worst case EUT comments were used from previous testing. The provided test software configured the radio with a duty cycle of 47.8% . Per ANSI C63.10 test methods, the RMS data was corrected with a carrier duty cycle correction factor (DCCF) of 3.2 dB. DCCF (dB) = 10*log(1/0.478).		

Test Specifications	Test Method
FCC 15.247:2020	ANSI C63.10:2013

Run #	105	Test Distance (m)	3	Antenna Height(s)	1 to 4(m)	Results	Pass
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Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (dB)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
2483.623	29.0	-0.8	3.4	37.0	3.2	20.0	Horz	AV	0.0	51.4	54.0	-2.6	High Ch., EUT on Side, Ant on Side
2484.997	28.9	-0.8	1.5	28.0	3.2	20.0	Vert	AV	0.0	51.3	54.0	-2.7	High Ch., EUT on Side, Ant on Side
2484.963	40.0	-0.8	1.5	28.0	0.0	20.0	Vert	PK	0.0	59.2	74.0	-14.8	High Ch., EUT on Side, Ant on Side
2484.587	39.9	-0.8	3.4	37.0	0.0	20.0	Horz	PK	0.0	59.1	74.0	-14.9	High Ch., EUT on Side, Ant on Side

SPURIOUS RADIATED EMISSIONS



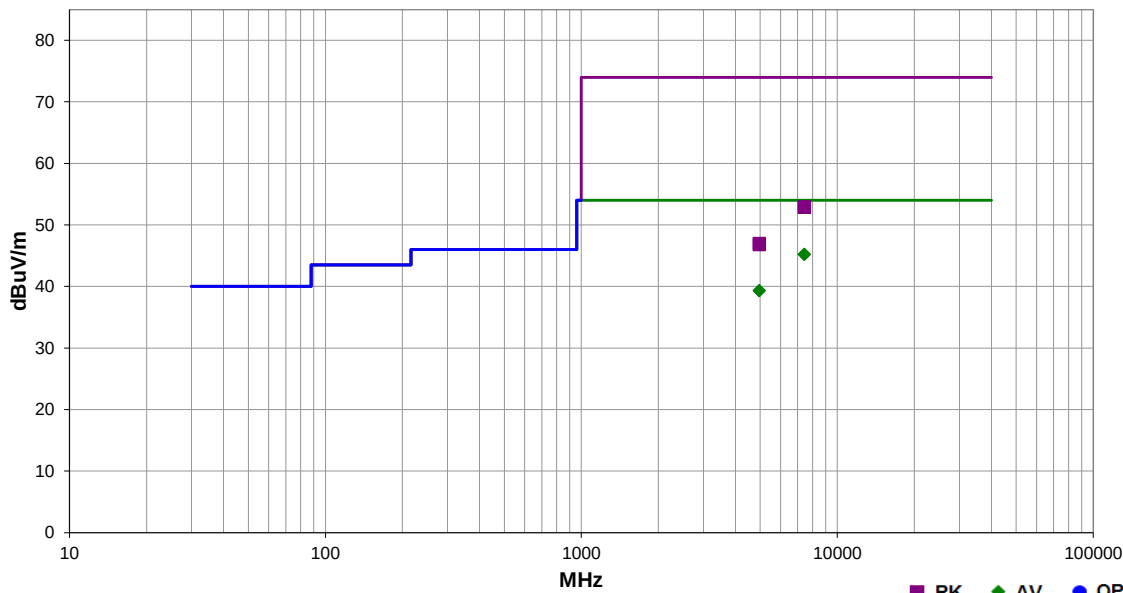
EmiRS 2020.12.09.0

PSA-ESCI 2020.06.24.2

Work Order:	SYNA0313	Date:	2020-12-16	
Project:	None	Temperature:	22.6 °C	
Job Site:	NC01	Humidity:	36.4% RH	
Serial Number:	Rev. 10 - 007	Barometric Pres.:	1006 mbar	
EUT:		RadioNode		
Configuration:	2			
Customer:	Walt Disney Parks and Resorts US, Inc.			
Attendees:	None			
EUT Power:	24VDC via 120VAC/60Hz			
Operating Mode:	BTLE Tx, Port 8, Ant Cable A2, Antenna PN: MA510.C.CG.005, GFSK, Packet Length = 63, PRBS9, 1 Mbps, High Channel = 2480 MHz.			
Deviations:	None			
Comments:	See comments below for Channel, EUT orientations. Step 7, spot check based on the client's test plan. The worst case EUT orientations were used from previous testing. The provided test software configured the radio with a duty cycle of 47.8% . Per ANSI C63.10 test methods, the RMS data was corrected with a carrier duty cycle correction factor (DCCF) of 3.2 dB. DCCF (dB) = 10*log(1/0.478).			

Test Specifications	FCC 15.247:2020	Test Method	ANSI C63.10:2013
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Run #	106	Test Distance (m)	3	Antenna Height(s)	1 to 4(m)	Results	Pass
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Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (dB)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
7439.423	27.0	15.0	1.5	7.0	3.2	0.0	Horz	AV	0.0	45.2	54.0	-8.8	High Ch., EUT on Side, Ant on Side
7440.793	27.0	15.0	1.5	182.0	3.2	0.0	Vert	AV	0.0	45.2	54.0	-8.8	High Ch., EUT on Side, Ant on Side
4959.290	26.6	9.5	1.5	225.0	3.2	0.0	Horz	AV	0.0	39.3	54.0	-14.7	High Ch., EUT on Side, Ant on Side
4959.767	26.6	9.5	1.9	110.0	3.2	0.0	Vert	AV	0.0	39.3	54.0	-14.7	High Ch., EUT on Side, Ant on Side
7440.047	37.9	15.0	1.5	7.0	0.0	0.0	Horz	PK	0.0	52.9	74.0	-21.1	High Ch., EUT on Side, Ant on Side
7439.537	37.9	15.0	1.5	182.0	0.0	0.0	Vert	PK	0.0	52.9	74.0	-21.1	High Ch., EUT on Side, Ant on Side
4959.877	37.5	9.5	1.9	110.0	0.0	0.0	Vert	PK	0.0	47.0	74.0	-27.0	High Ch., EUT on Side, Ant on Side
4959.843	37.3	9.5	1.5	225.0	0.0	0.0	Horz	PK	0.0	46.8	74.0	-27.2	High Ch., EUT on Side, Ant on Side

SPURIOUS RADIATED EMISSIONS



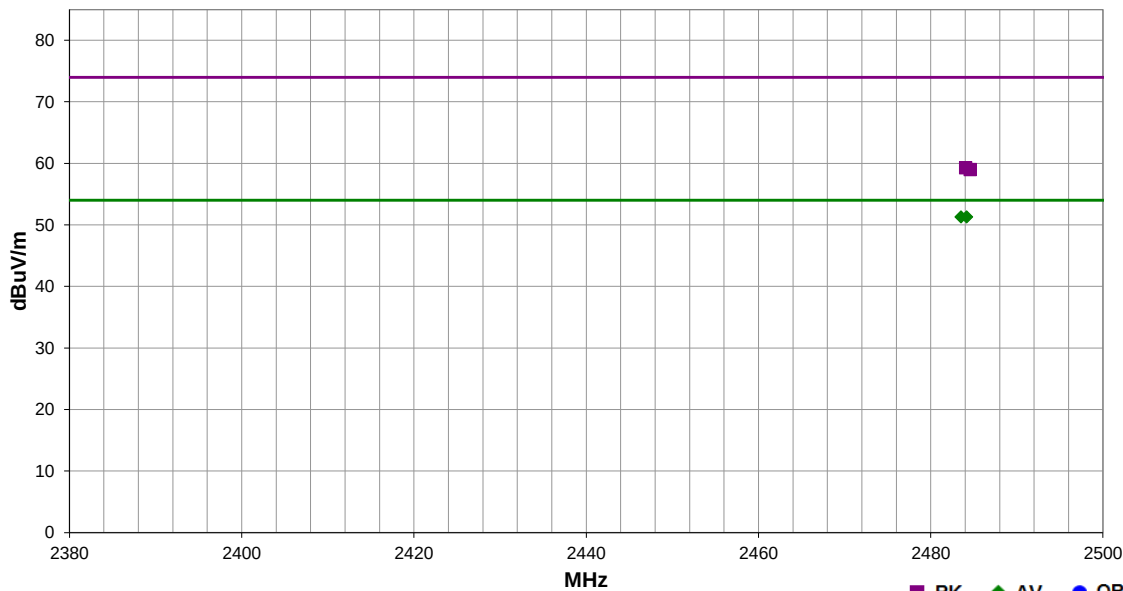
EmiRS 2020.12.09.0

PSA-ESCI 2020.06.24.2

Work Order:	SYNA0313	Date:	2020-12-16	
Project:	None	Temperature:	22.6 °C	
Job Site:	NC01	Humidity:	36.4% RH	
Serial Number:	Rev. 10 - 007	Barometric Pres.:	1006 mbar	
EUT:		RadioNode		
Configuration:	2			
Customer:	Walt Disney Parks and Resorts US, Inc.			
Attendees:	None			
EUT Power:	24VDC via 120VAC/60Hz			
Operating Mode:	BTLE Tx, Port 8, Ant Cable A2, Antenna PN: MA510.C.CG.005, GFSK, Packet Length = 63, PRBS9, 1 Mbps, High Channel = 2480 MHz.			
Deviations:	None			
Comments:	See comments below for Channel, EUT orientations. Step 7, spot check based on the client's test plan. The worst case EUT orientations were used from previous testing. The provided test software configured the radio with a duty cycle of 47.8% . Per ANSI C63.10 test methods, the RMS data was corrected with a carrier duty cycle correction factor (DCCF) of 3.2 dB. DCCF (dB) = 10*log(1/0.478).			

Test Specifications	Test Method
FCC 15.247:2020	ANSI C63.10:2013

Run #	107	Test Distance (m)	3	Antenna Height(s)	1 to 4(m)	Results	Pass
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Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Duty Cycle Correction Factor (dB)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
2483.520	28.9	-0.8	1.5	347.0	3.2	20.0	Horz	AV	0.0	51.3	54.0	-2.7	High Ch., EUT on Side, Ant on Side
2484.180	28.9	-0.8	1.5	191.0	3.2	20.0	Vert	AV	0.0	51.3	54.0	-2.7	High Ch., EUT on Side, Ant on Side
2484.057	40.1	-0.8	1.5	191.0	0.0	20.0	Vert	PK	0.0	59.3	74.0	-14.7	High Ch., EUT on Side, Ant on Side
2484.583	39.8	-0.8	1.5	347.0	0.0	20.0	Horz	PK	0.0	59.0	74.0	-15.0	High Ch., EUT on Side, Ant on Side