



Walt Disney Parks and Resorts US, Inc.

TPv2/300-004278

FCC 15.247:2018

2.4 GHz DTS Radio

Report # SYNA0242.3



NVLAP LAB CODE: 200629-0



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CERTIFICATE OF TEST

Last Date of Test: June 6, 2018
Walt Disney Parks and Resorts US, Inc.
Model: TPv2/300-004278

Radio Equipment Testing

Standards

Specification	Method
FCC 15.247:2018	ANSI C63.10:2013, KDB 558074

Results

Method Clause	Test Description	Applied	Results	Comments
6.2	Powerline Conducted Emissions	No	N/A	Not required for evaluation of a Permissive Change due to a change of enclosure.
11.12.1, 11.13.2, 6.5, 6.6	Spurious Radiated Emissions	Yes	Pass	
11.6	Duty Cycle	Yes	Pass	
11.8.2	Occupied Bandwidth	Yes	Pass	
11.9.1.1	Output Power	Yes	Pass	
11.10.2	Power Spectral Density	No	N/A	Not required for evaluation of a Permissive Change due to a change of enclosure.
11.11	Band Edge Compliance	No	N/A	Not required for evaluation of a Permissive Change due to a change of enclosure.
11.11	Spurious Conducted Emissions	No	N/A	Not required for evaluation of a Permissive Change due to a change of enclosure.

Deviations From Test Standards

None

Approved By:



Rod Munro, 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.

REVISION HISTORY



Revision Number	Description	Date	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). Certification chambers and Open Area Test Sites are filed with ISED.

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:

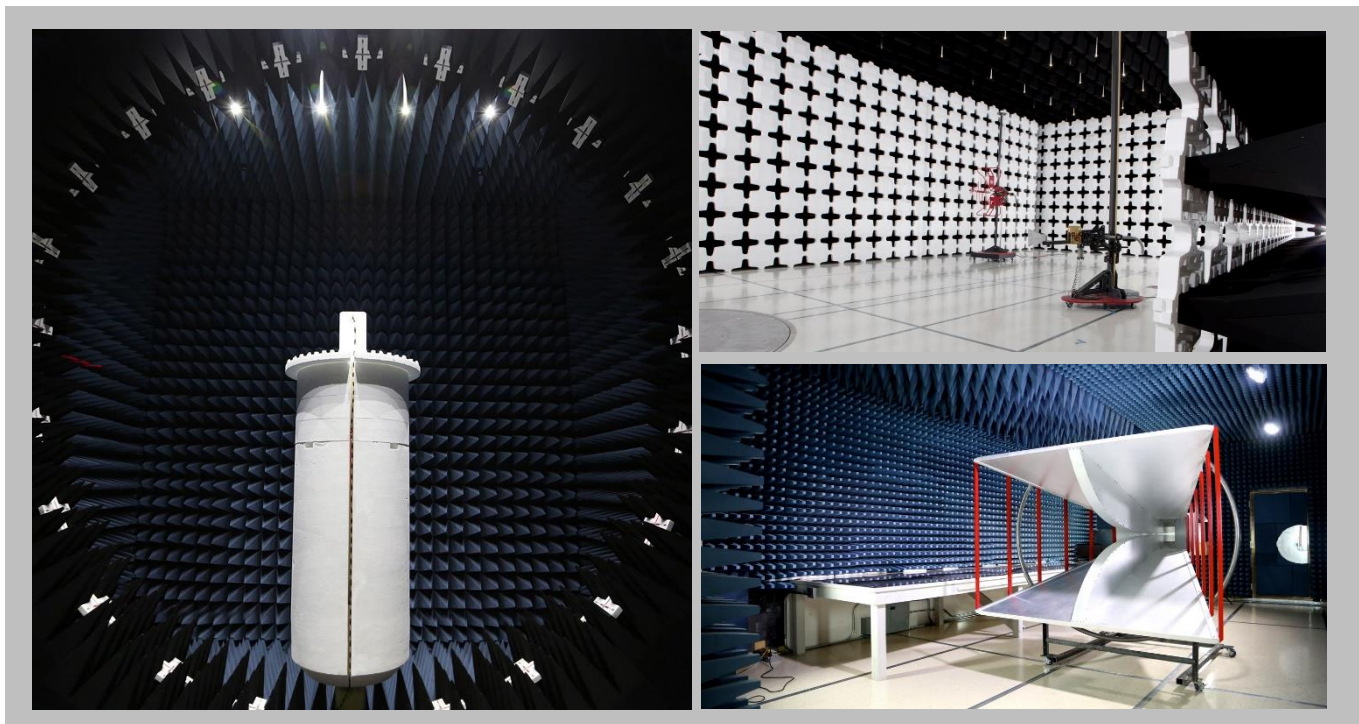
<http://portlandcustomer.element.com/ts/scope/scope.htm>

<http://gsi.nist.gov/global/docs/cabs/designations.html>

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	New York Labs NY01-04 4939 Jordan Rd. Elbridge, NY 13060 (315) 554-8214	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: 200761-0	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	N/A	2834D-1, 2834D-2	2834G-1	2834F-1
BSMI					
SL2-IN-E-1154R	SL2-IN-E-1152R	N/A	SL2-IN-E-1017	SL2-IN-E-1158R	SL2-IN-E-1153R
VCCI					
A-0029	A-0109	N/A	A-0108	A-0201	A-0110
Recognized Phase I CAB for ACMA, BSMI, IDA, KCC/RRR, MIC, MOC, NCC, OFCA					
US0158	US0175	N/A	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.

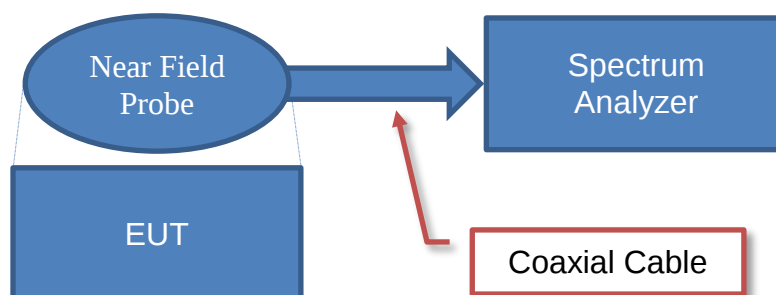
Test	+ MU	- MU
Frequency Accuracy (Hz)	0.0007%	-0.0007%
Amplitude Accuracy (dB)	1.2 dB	-1.2 dB
Conducted Power (dB)	0.3 dB	-0.3 dB
Radiated Power via Substitution (dB)	0.7 dB	-0.7 dB
Temperature (degrees C)	0.7°C	-0.7°C
Humidity (% RH)	2.5% RH	-2.5% RH
Voltage (AC)	1.0%	-1.0%
Voltage (DC)	0.7%	-0.7%
Field Strength (dB)	0	0
AC Powerline Conducted Emissions (dB)	0	0

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 1000
City, State, Zip:	Lake Buena Vista, Florida 32830
Test Requested By:	Brian Piquette of Synapse Product Development on behalf of Walt Disney Parks and Resorts US, Inc.
Model:	TPv2/300-004278
First Date of Test:	June 4, 2018
Last Date of Test:	June 6, 2018
Receipt Date of Samples:	June 4, 2018
Equipment Design Stage:	Production
Equipment Condition:	No Damage
Purchase Authorization:	Verified

Information Provided by the Party Requesting the Test

Functional Description of the EUT:
Multi-ticket media reader with Ethernet network interface Device containing an HF RFID reader (ISO 14443), UHF RFID Reader (ISO 18000), BT/BLE Radio, and proprietary 2.4GHz DTS radio.
Testing Objective:
To demonstrate compliance of the 2.4 GHz SRD radio to FCC 15.247 requirements for a Permissive Change under FCC ID: 2AJS4-TP-R1G2.

CONFIGURATIONS



Configuration SYNA0242- 3

Software/Firmware Running during test	
Description	Version
Radio-CLI	N/A

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
Access Point	Walt Disney Parks and Resorts US, Inc.	TPv2/300-004278	SN03

Peripherals in test setup boundary			
Description	Manufacturer	Model/Part Number	Serial Number
Laptop PC	Apple	MacBook Pro	None
DC Power Supply	Mastech	HY3003D-2	None

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
DC Power	No	0.7m	No	DC Power Supply	Access Point
3v3 FTDI Cable	No	1.0m	No	Access Point	Laptop PC
AC Power	No	1.8m	No	AC Mains	DC Power Supply

CONFIGURATIONS



Configuration SYNA0242- 6

Software/Firmware Running during test	
Description	Version
Radio-CLI	N/A

EUT			
Description	Manufacturer	Model/Part Number	Serial Number
Access Point	Walt Disney Parks and Resorts US, Inc.	TPv2/300-004278	SN05

Remote Equipment Outside of Test Setup Boundary			
Description	Manufacturer	Model/Part Number	Serial Number
Laptop PC	Apple	MacBook Pro	None
DC Power Supply	Mastech	HY3003D-2	None

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
AC Power	No	1.8m	No	AC Mains	DC Power Supply
DC Power	No	3.0m	No	DC Power Supply	Access Point
Ethernet	No	5.0m	No	Access Point	Laptop PC

MODIFICATIONS



Equipment Modifications

Item	Date	Test	Modification	Note	Disposition of EUT
1	6/4/2018	Duty Cycle	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	6/4/2018	Output Power	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	6/4/2018	Occupied Bandwidth	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	EUT was taken home by the client before the next scheduled test.
4	6/6/2018	Spurious Radiated Emissions	Tested as delivered to Test Station.	No EMI suppression devices were added or modified during this test.	Scheduled testing was completed.

DUTY CYCLE



XMI 2017.12.13

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
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFO	1-May-18	1-May-19
Cable	Micro-Coax	UFD150A-1-0720-200200	NCS	19-Feb-18	19-Feb-19
Attenuator	Fairview Microwave	SA4014-20	TKV	19-Feb-18	19-Feb-19
Block - DC	Fairview Microwave	SD3379	AMU	19-Feb-18	19-Feb-19
Generator - Signal	Agilent	N5183A	TIA	25-Apr-18	25-Apr-20

TEST DESCRIPTION

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer. The Duty Cycle (x) of the single channel operation of the radio as controlled by the provided test software was measured for each of the EUT operating modes.

There is no compliance requirement to be met by this test, so therefore no Pass / Fail criteria.

The measurements were made using a zero span on the spectrum analyzer to see the pulses in the time domain. The transmit power was set to its default maximum.

The duty cycle was calculated by dividing the transmission pulse duration (T) by the total period of a single on and total off time.

If the transmit duty cycle < 98 percent, burst gating may have been used during some of the other tests in this report to only take the measurement during the burst duration.

DUTY CYCLE



TMTx 2018.01.25 BETA XMM 2017.12.13

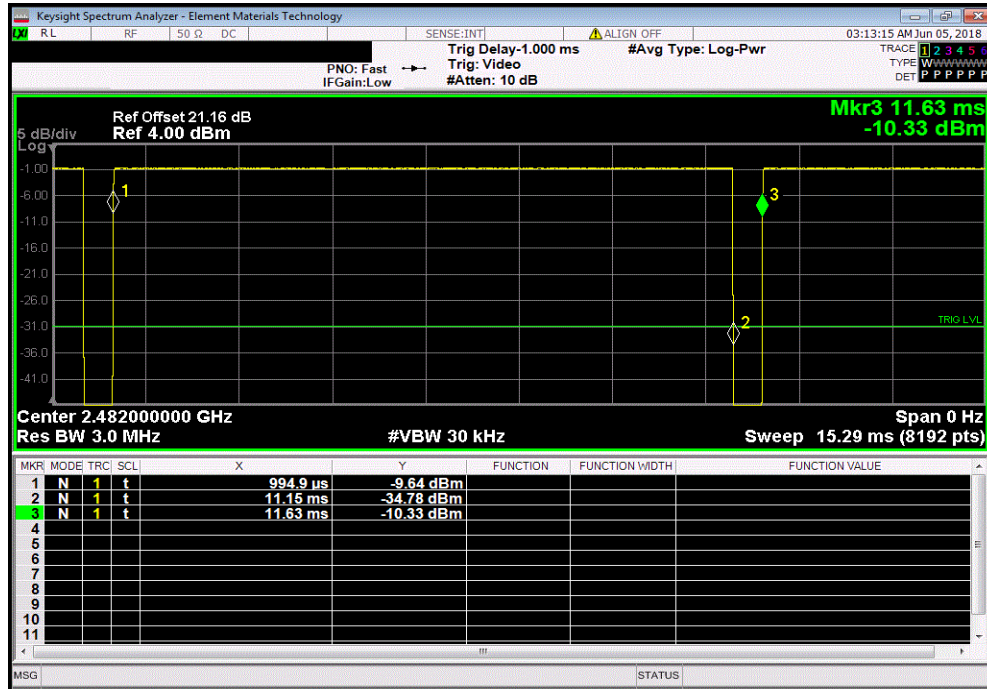
EUT: TPv2/300-004278		Work Order: SYNA0242	
Serial Number: SN03		Date: 4-Jun-18	
Customer: Walt Disney Parks and Resorts US, Inc.		Temperature: 22.4 °C	
Attendees: Reily Blackner		Humidity: 42.4% RH	
Project: None		Barometric Pres.: 1022 mbar	
Tested by: Richard Mellroth		Power: 24 VDC	
Job Site: NC02			
TEST SPECIFICATIONS		Test Method	
FCC 15.247:2018		ANSI C63.10:2013	
COMMENTS			
Power Setting = Default Max			
DEVIATIONS FROM TEST STANDARD			
None			
Configuration #	3	Signature <i>Rust</i>	
		Pulse Width	Period
		Number of Pulses	Value (%)
		Limit (%)	Results
2.4 GHz Radio			
GFSK Modulation			
Single Transmit Channel, 2482 MHz		10.153 ms	10.636 ms
Single Transmit Channel, 2482 MHz		N/A	N/A
		1	95.5
		5	N/A
		N/A	N/A
		N/A	N/A

DUTY CYCLE

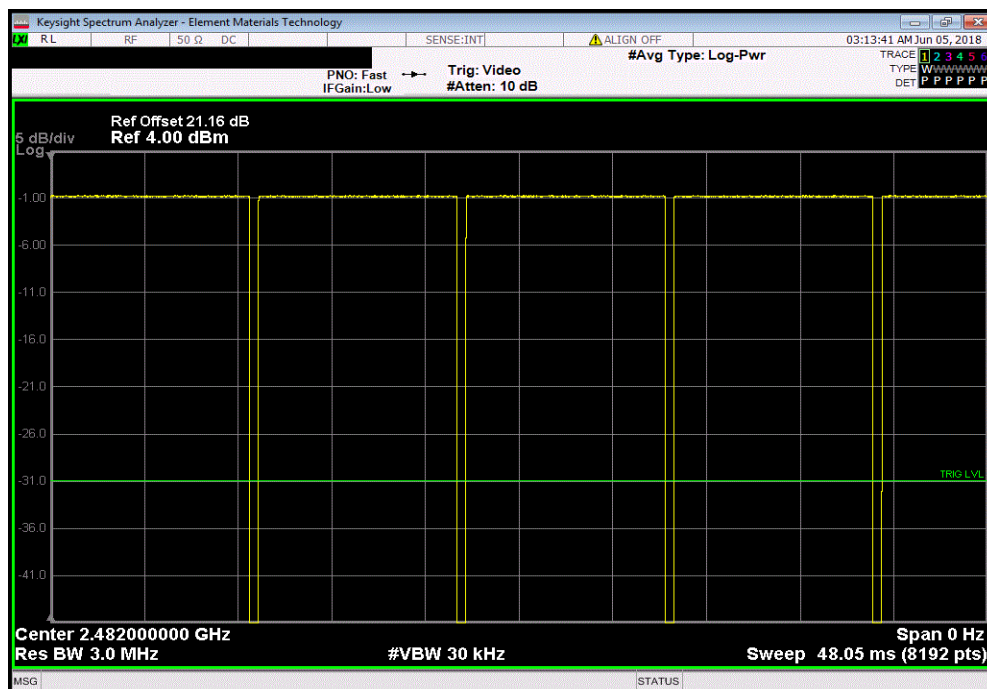


TxtTx 2018.01.25 BETA XMI 2017.12.13

2.4 GHz Radio, GFSK Modulation, Single Transmit Channel, 2482 MHz						
Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results	
10.153 ms	10.636 ms	1	95.5	N/A	N/A	



2.4 GHz Radio, GFSK Modulation, Single Transmit Channel, 2482 MHz						
Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results	
N/A	N/A	5	N/A	N/A	N/A	



OCCUPIED BANDWIDTH



XMit 2017.12.13

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
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFO	1-May-18	1-May-19
Cable	Micro-Coax	UFD150A-1-0720-200200	NCS	19-Feb-18	19-Feb-19
Attenuator	Fairview Microwave	SA4014-20	TKV	19-Feb-18	19-Feb-19
Block - DC	Fairview Microwave	SD3379	AMU	19-Feb-18	19-Feb-19
Generator - Signal	Agilent	N5183A	TIA	25-Apr-18	25-Apr-20

TEST DESCRIPTION

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer. The EUT was set to the channels and modes listed in the datasheet.

The 6dB occupied bandwidth was measured using 100 kHz resolution bandwidth and 300 kHz video bandwidth. The 99.0% occupied bandwidth was also measured at the same time which can be needed during Output Power depending on the applicable method.

OCCUPIED BANDWIDTH



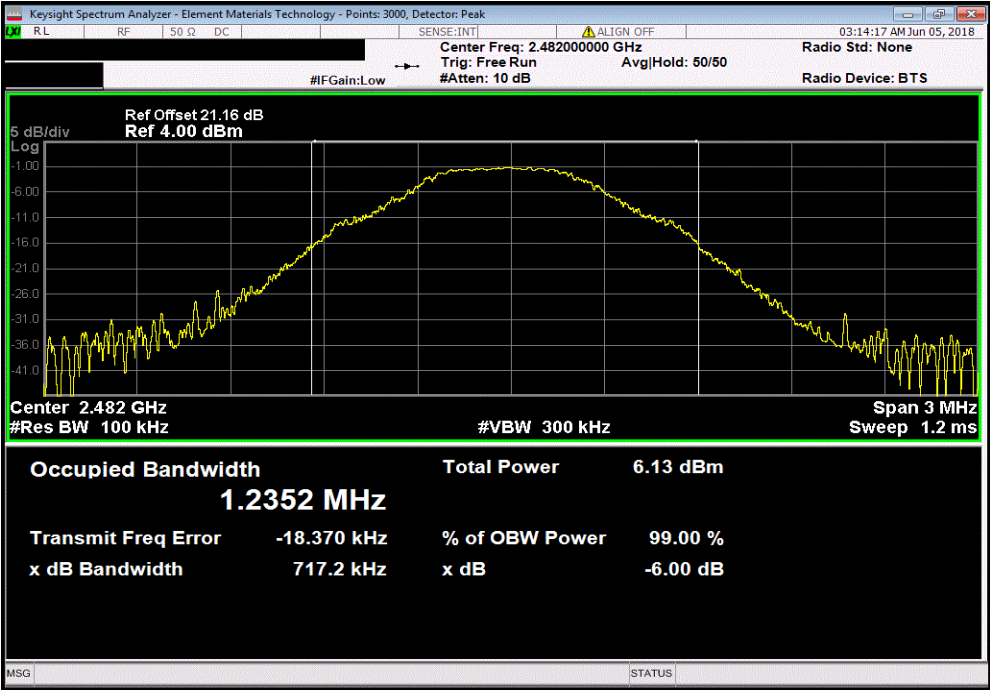
EUT: TPv2/300-004278		Work Order: SYNA0242	
Serial Number: SN03		Date: 4-Jun-18	
Customer: Walt Disney Parks and Resorts US, Inc.		Temperature: 22.3 °C	
Attendees: Reily Blackner		Humidity: 42.4% RH	
Project: None		Barometric Pres.: 1022 mbar	
Tested by: Richard Mellroth		Power: 24 VDC	
Job Site: NC02			
TEST SPECIFICATIONS		Test Method	
FCC 15.247:2018		ANSI C63.10:2013	
COMMENTS			
Power Setting = Default Max			
DEVIATIONS FROM TEST STANDARD			
None			
Configuration #	3	Signature <i>Rustle</i>	
		Value	Limit (±) Result
2.4 GHz Radio			
GFSK Modulation			
Single Transmit Channel, 2482 MHz		717.178 kHz	500 kHz Pass

OCCUPIED BANDWIDTH



TxtTx 2018.01.25 BETA XMI 2017.12.13

2.4 GHz Radio, GFSK Modulation, Single Transmit Channel, 2482 MHz						
Value				Limit	Result	
				(≥)		
			717.178 kHz	500 kHz	Pass	



OUTPUT POWER



XMIT 2017.12.13

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
Analyzer - Spectrum Analyzer	Keysight	N9010A	AFO	1-May-18	1-May-19
Cable	Micro-Coax	UFD150A-1-0720-200200	NCS	19-Feb-18	19-Feb-19
Attenuator	Fairview Microwave	SA4014-20	TKV	19-Feb-18	19-Feb-19
Block - DC	Fairview Microwave	SD3379	AMU	19-Feb-18	19-Feb-19
Generator - Signal	Agilent	N5183A	TIA	25-Apr-18	25-Apr-20

TEST DESCRIPTION

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer. 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.

De Facto EIRP Limit: The EUT meets the de facto EIRP limit of +36 dBm.

OUTPUT POWER



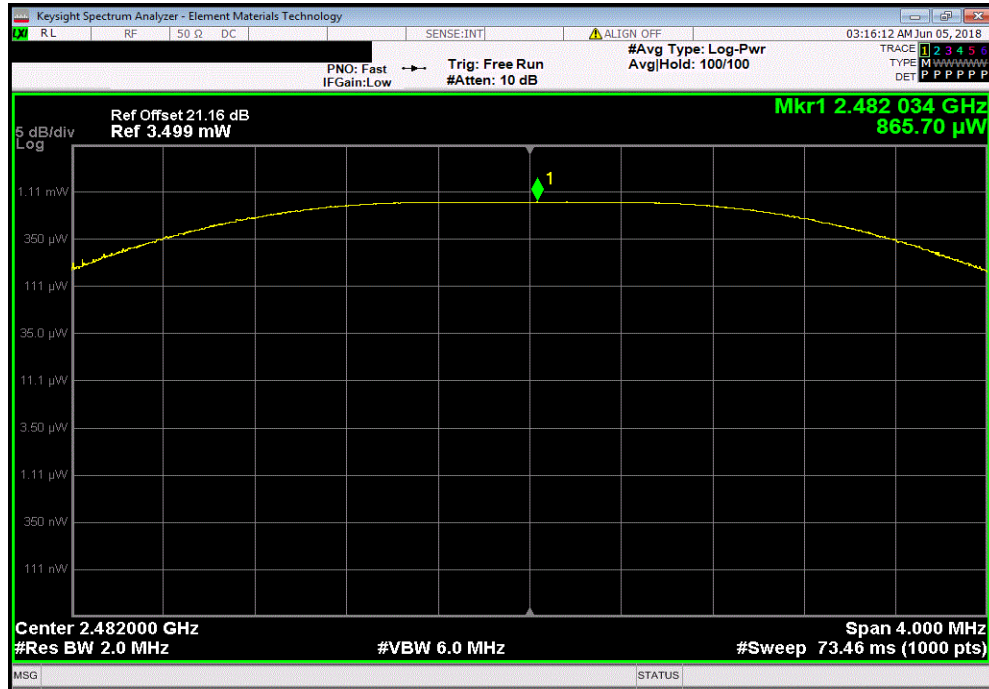
EUT: TPv2/300-004278		Work Order: SYNA0242	
Serial Number: SN03		Date: 4-Jun-18	
Customer: Walt Disney Parks and Resorts US, Inc.		Temperature: 22.3 °C	
Attendees: Reily Blackner		Humidity: 42.4% RH	
Project: None		Barometric Pres.: 1022 mbar	
Tested by: Richard Mellroth		Power: 24 VDC	
Job Site: NC02			
TEST SPECIFICATIONS		Test Method	
FCC 15.247:2018		ANSI C63.10:2013	
COMMENTS			
Power Setting = Default Max			
DEVIATIONS FROM TEST STANDARD			
None			
Configuration #	3	Signature <i>Rustle</i>	
		Value	Limit (<) Result
2.4 GHz Radio			
GFSK Modulation			
Single Transmit Channel, 2482 MHz		865.7 uW	1 W Pass

OUTPUT POWER



TxtTx 2018.01.25 BETA XMI 2017.12.13

2.4 GHz Radio, GFSK Modulation, Single Transmit Channel, 2482 MHz						
				Value	Limit	Result
				($\leq$)		
				865.7 μ W	1 W	Pass



SPURIOUS RADIATED EMISSIONS



PSA-ESCI 2018.05.04

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

Transmitting 2.4 GHz DTS Radio at Default Max Power, GFSK Modulation, Single High Channel, 2482 MHz.

POWER SETTINGS INVESTIGATED

24 VDC

CONFIGURATIONS INVESTIGATED

SYNA0242 - 6

FREQUENCY RANGE INVESTIGATED

Start Frequency | 30 MHz | Stop Frequency | 26.5 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
Analyzer - Spectrum Analyzer	Agilent	E4440A	AFE	24-Jun-2017	12 mo
Filter - High Pass	Micro-Tronics	HPM50111	HHI	19-Oct-2017	12 mo
Filter - Low Pass	Micro-Tronics	LPM50004	LFF	13-Dec-2017	12 mo
Antenna - Biconilog	Teseq	CBL 6141B	AYL	11-Aug-2017	24 mo
Antenna - Double Ridge	ETS Lindgren	3115	AHW	12-Jul-2016	24 mo
Antenna - Standard Gain	EMCO	3160-07	AHP	NCR	0 mo
Antenna - Standard Gain	EMCO	3160-08	AHO	NCR	0 mo
Antenna - Standard Gain	ETS Lindgren	3160-09	AIY	NCR	0 mo
Amplifier - Pre-Amplifier	Miteq	AM-1616-1000	PAB	11-Jul-2017	12 mo
Amplifier - Pre-Amplifier	Miteq	AMF-3D-00100800-32-13P	AVZ	4-May-2018	12 mo
Amplifier - Pre-Amplifier	Miteq	AMF-6F-08001200-30-10P	AOK	18-Aug-2017	12 mo
Amplifier - Pre-Amplifier	Miteq	AMF-6F-12001800-30-10P	AOJ	18-Aug-2017	12 mo
Amplifier - Pre-Amplifier	Miteq	AMF-6F-18002650-25-10P	AOD	9-Mar-2018	12 mo
Cable	Northwest EMC	Bilog Cables	NC1	11-Jul-2017	12 mo
Cable	Northwest EMC	3115 Horn Cable	NC2	4-May-2018	12 mo
Cable	Northwest EMC	Standard Gain Horn Cable	NC3	4-May-2018	12 mo
Cable	Northwest EMC	N/A	NC8	9-Mar-2018	12 mo

MEASUREMENT BANDWIDTHS

Frequency Range (MHz)	Peak Data (kHz)	Quasi-Peak Data (kHz)	Average Data (kHz)
0.01 - 0.15	1.0	0.2	0.2
0.15 - 30.0	10.0	9.0	9.0
30.0 - 1000	100.0	120.0	120.0
Above 1000	1000.0	N/A	1000.0

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 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 $10 \cdot \text{LOG}(\text{dc})$.

SPURIOUS RADIATED EMISSIONS



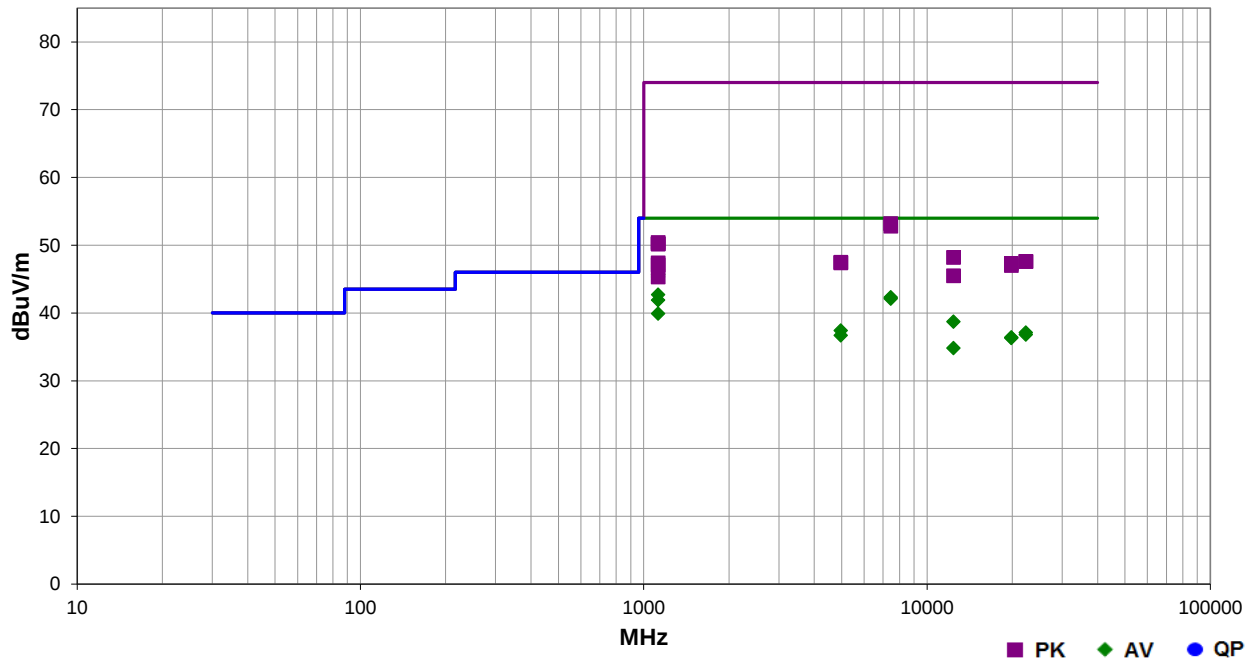
EmiRS 2018.05.07

PSA-ESCI 2018.05.04

Work Order:	SYNA0242	Date:	6-Jun-2018	
Project:	None	Temperature:	21.9 °C	
Job Site:	NC01	Humidity:	40.9% RH	
Serial Number:	SN05	Barometric Pres.:	1018 mbar	Tested by: Richard Mellroth
EUT:	TPV2/300-004278			
Configuration:	6			
Customer:	Walt Disney Parks and Resorts US, Inc.			
Attendees:	Reily Blackner			
EUT Power:	24 VDC			
Operating Mode:	Transmitting 2.4 GHz DTS Radio at Default Max Power, GFSK Modulation, Single High Channel, 2482 MHz.			
Deviations:	None			
Comments:	None			

Test Specifications	FCC 15.247:2018	Test Method	ANSI C63.10:2013
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Run #	32,33,67	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)	Test Distance (meters)	External Attenuation (dB)	Polarity/Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
1124.950	51.5	-5.8	1.6	203.0	3.0	0.0	Horz	AV	0.0	45.7	54.0	-8.3	EUT on Back
1124.995	51.4	-5.8	1.0	199.0	3.0	0.0	Horz	AV	0.0	45.6	54.0	-8.4	EUT on Side
1125.040	51.1	-5.8	1.0	196.0	3.0	0.0	Horz	AV	0.0	45.3	54.0	-8.7	EUT Normal
1124.960	48.5	-5.8	1.6	245.0	3.0	0.0	Vert	AV	0.0	42.7	54.0	-11.3	EUT on Side
7445.670	28.1	14.2	1.6	335.0	3.0	0.0	Horz	AV	0.0	42.3	54.0	-11.7	EUT on Back
7445.840	27.9	14.2	1.6	342.0	3.0	0.0	Vert	AV	0.0	42.1	54.0	-11.9	EUT on Side
1125.030	47.7	-5.8	3.3	163.0	3.0	0.0	Vert	AV	0.0	41.9	54.0	-12.1	EUT on Back
1124.985	45.7	-5.8	1.6	253.0	3.0	0.0	Vert	AV	0.0	39.9	54.0	-14.1	EUT Normal
12409.830	34.8	3.9	1.4	359.0	3.0	0.0	Horz	AV	0.0	38.7	54.0	-15.3	EUT on Back
4963.805	28.2	9.2	1.6	0.0	3.0	0.0	Vert	AV	0.0	37.4	54.0	-16.6	EUT on Side
22338.980	38.3	-1.2	1.5	353.0	3.0	0.0	Horz	AV	0.0	37.1	54.0	-16.9	EUT on Back
22336.960	38.0	-1.2	1.5	177.0	3.0	0.0	Vert	AV	0.0	36.8	54.0	-17.2	EUT on Side
4964.105	27.5	9.2	3.3	327.0	3.0	0.0	Horz	AV	0.0	36.7	54.0	-17.3	EUT on Back
19855.720	35.8	0.6	1.5	355.0	3.0	0.0	Horz	AV	0.0	36.4	54.0	-17.6	EUT on Back

Freq (MHz)	Amplitude (dBuV)	Factor (dB)	Antenna Height (meters)	Azimuth (degrees)	Test Distance (meters)	External Attenuation (dB)	Polarity/ Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
19855.980	35.7	0.6	1.5	99.0	3.0	0.0	Vert	AV	0.0	36.3	54.0	-17.7	EUT on Side
12409.800	30.9	3.9	1.6	132.0	3.0	0.0	Vert	AV	0.0	34.8	54.0	-19.2	EUT on Side
7444.875	39.0	14.2	1.6	335.0	3.0	0.0	Horz	PK	0.0	53.2	74.0	-20.8	EUT on Back
7446.695	38.6	14.2	1.6	342.0	3.0	0.0	Vert	PK	0.0	52.8	74.0	-21.2	EUT on Side
1124.970	56.2	-5.8	1.6	203.0	3.0	0.0	Horz	PK	0.0	50.4	74.0	-23.6	EUT on Back
1125.085	56.0	-5.8	1.0	196.0	3.0	0.0	Horz	PK	0.0	50.2	74.0	-23.8	EUT Normal
1124.840	56.0	-5.8	1.0	199.0	3.0	0.0	Horz	PK	0.0	50.2	74.0	-23.8	EUT on Side
12410.540	44.3	3.9	1.4	359.0	3.0	0.0	Horz	PK	0.0	48.2	74.0	-25.8	EUT on Back
22339.110	48.8	-1.2	1.5	177.0	3.0	0.0	Vert	PK	0.0	47.6	74.0	-26.4	EUT on Side
22337.340	48.8	-1.2	1.5	353.0	3.0	0.0	Horz	PK	0.0	47.6	74.0	-26.4	EUT on Back
4964.585	38.3	9.2	3.3	327.0	3.0	0.0	Horz	PK	0.0	47.5	74.0	-26.5	EUT on Back
1124.945	53.2	-5.8	1.6	245.0	3.0	0.0	Vert	PK	0.0	47.4	74.0	-26.6	EUT on Side
4963.875	38.2	9.2	1.6	0.0	3.0	0.0	Vert	PK	0.0	47.4	74.0	-26.6	EUT on Side
19857.380	46.7	0.6	1.5	99.0	3.0	0.0	Vert	PK	0.0	47.3	74.0	-26.7	EUT on Side
1125.035	52.9	-5.8	3.3	163.0	3.0	0.0	Vert	PK	0.0	47.1	74.0	-26.9	EUT on Back
19855.860	46.4	0.6	1.5	355.0	3.0	0.0	Horz	PK	0.0	47.0	74.0	-27.0	EUT on Back
12410.830	41.6	3.9	1.6	132.0	3.0	0.0	Vert	PK	0.0	45.5	74.0	-28.5	EUT on Side
1124.890	51.1	-5.8	1.6	253.0	3.0	0.0	Vert	PK	0.0	45.3	74.0	-28.7	EUT Normal

SPURIOUS RADIATED EMISSIONS



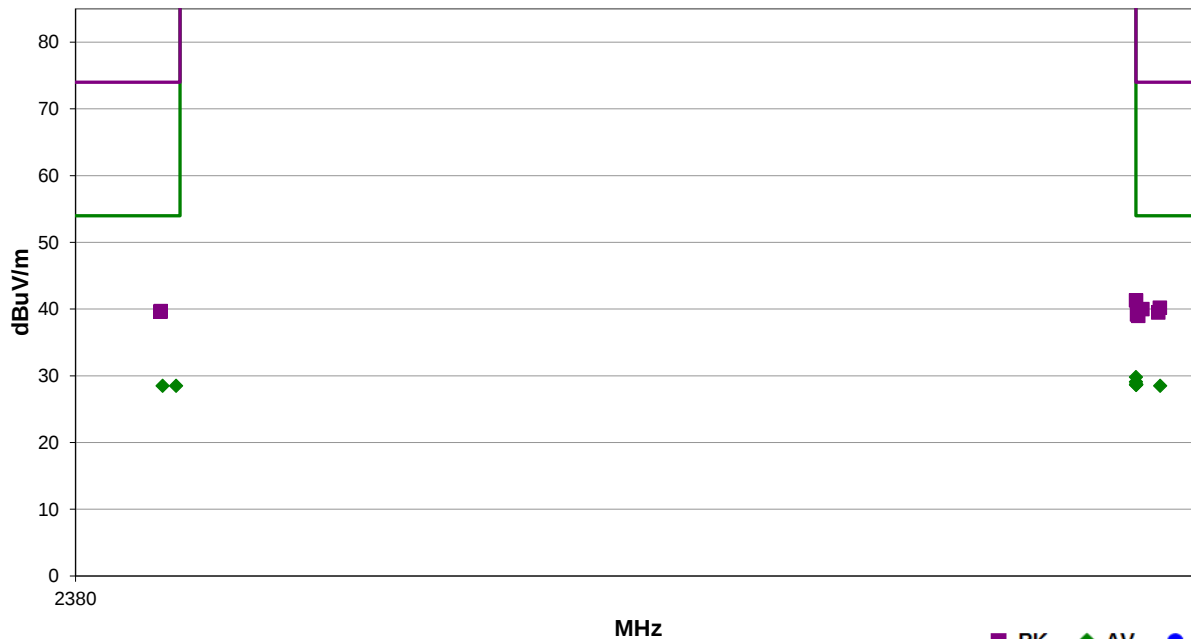
EmiRS 2018.05.07

PSA-ESCI 2018.05.04

Work Order:	SYNA0242	Date:	6-Jun-2018		
Project:	None	Temperature:	21.9 °C		
Job Site:	NC01	Humidity:	40.9% RH		
Serial Number:	SN05	Barometric Pres.:	1018 mbar	Tested by:	Richard Mellroth
EUT:	TPv2/300-004278				
Configuration:	6				
Customer:	Walt Disney Parks and Resorts US, Inc.				
Attendees:	Reily Blackner				
EUT Power:	24 VDC				
Operating Mode:	Transmitting 2.4 GHz DTS Radio at Default Max Power, GFSK Modulation, Single High Channel, 2482 MHz.				
Deviations:	None				
Comments:	None				

Test Specifications	Test Method
FCC 15.247:2018	ANSI C63.10:2013

Run #	31	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)	Test Distance (meters)	External Attenuation (dB)	Polarity/Transducer Type	Detector	Distance Adjustment (dB)	Adjusted (dBuV/m)	Spec. Limit (dBuV/m)	Compared to Spec. (dB)	Comments
2483.500	30.6	-0.8	1.6	199.0	3.0	0.0	Horz	AV	0.0	29.8	54.0	-24.2	EUT Normal
2483.500	29.9	-0.8	1.6	136.0	3.0	0.0	Vert	AV	0.0	29.1	54.0	-24.9	EUT on Side
2483.505	29.5	-0.8	3.6	143.0	3.0	0.0	Horz	AV	0.0	28.7	54.0	-25.3	EUT on Side
2483.540	29.5	-0.8	1.6	328.0	3.0	0.0	Vert	AV	0.0	28.7	54.0	-25.3	EUT on Back
2483.520	29.4	-0.8	1.6	260.0	3.0	0.0	Horz	AV	0.0	28.6	54.0	-25.4	EUT on Back
2485.915	29.3	-0.8	1.6	239.0	3.0	0.0	Vert	AV	0.0	28.5	54.0	-25.5	EUT Normal
2388.335	29.1	-0.6	1.6	57.0	3.0	0.0	Horz	AV	0.0	28.5	54.0	-25.5	EUT Normal
2389.635	29.1	-0.6	1.6	88.0	3.0	0.0	Vert	AV	0.0	28.5	54.0	-25.5	EUT Normal
2483.505	42.1	-0.8	1.6	199.0	3.0	0.0	Horz	PK	0.0	41.3	74.0	-32.7	EUT Normal
2485.880	41.0	-0.8	1.6	260.0	3.0	0.0	Horz	PK	0.0	40.2	74.0	-33.8	EUT on Back
2484.145	40.8	-0.8	3.6	143.0	3.0	0.0	Horz	PK	0.0	40.0	74.0	-34.0	EUT on Side
2388.150	40.3	-0.6	1.6	88.0	3.0	0.0	Vert	PK	0.0	39.7	74.0	-34.3	EUT Normal
2388.130	40.2	-0.6	1.6	57.0	3.0	0.0	Horz	PK	0.0	39.6	74.0	-34.4	EUT Normal
2485.730	40.3	-0.8	1.6	328.0	3.0	0.0	Vert	PK	0.0	39.5	74.0	-34.5	EUT on Back
2483.605	40.0	-0.8	1.6	136.0	3.0	0.0	Vert	PK	0.0	39.2	74.0	-34.8	EUT on Side
2483.730	39.8	-0.8	1.6	239.0	3.0	0.0	Vert	PK	0.0	39.0	74.0	-35.0	EUT Normal