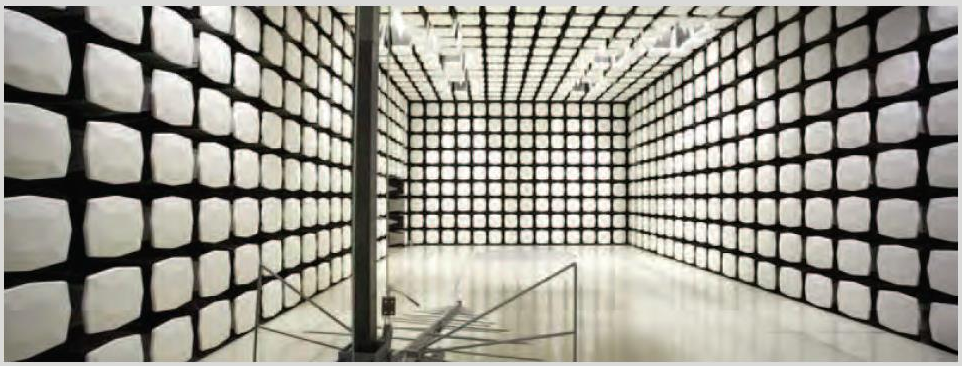
Walt Disney Parks and Resorts US, Inc.

MagicBand, BOM Rev 17

FCC 15.247:2019

2.4 GHz DTS radio

Report # SYNA0279.1



NVLAP LAB CODE: 200630-0

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CERTIFICATE OF TEST

Last Date of Test: April 2, 2019
Walt Disney Parks and Resorts US, Inc.
Model: MagicBand, BOM Rev 17

Radio Equipment Testing

Standards

Specification	Method
FCC 15.247:2019	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 a battery powered EUT.
6.5, 6.6, 11.12.1, 11.13.2	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	
11.9.1.1	Power Spectral Density	Yes	Pass	
11.10.2	Band Edge Compliance	Yes	Pass	
11.11	Spurious Conducted Emissions	Yes	Pass	
11.11	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

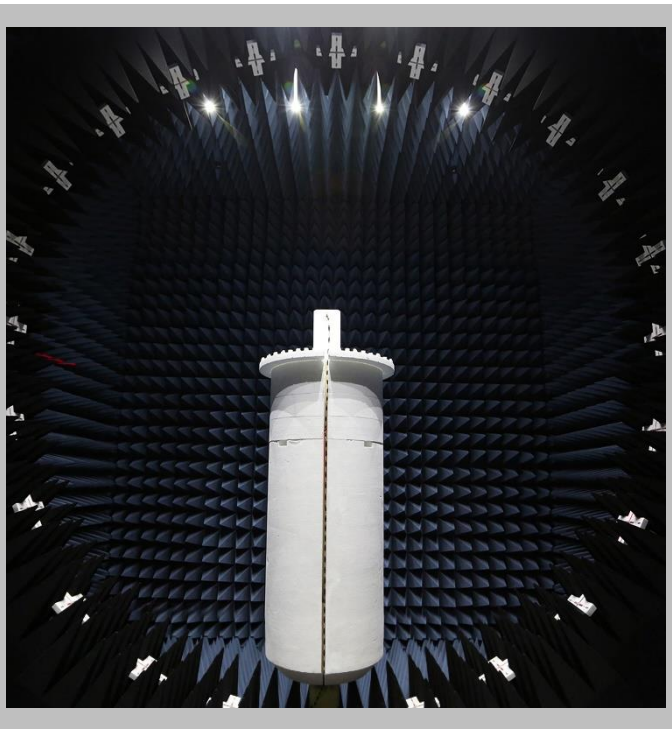
MIC – Recognized by MIC as a CAB for the acceptance of test data.

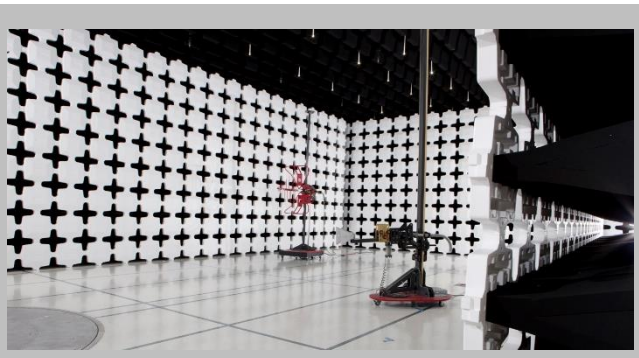
SCOPE

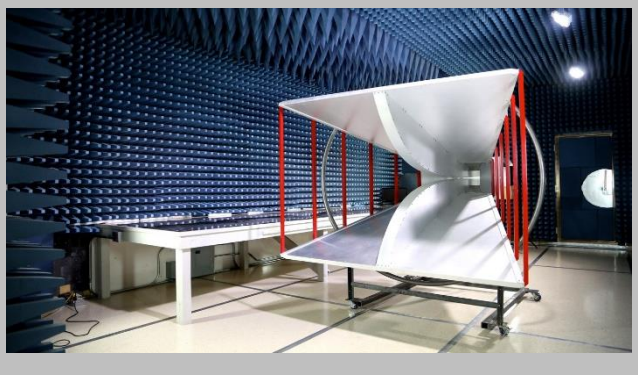
For details on the Scopes of our Accreditations, please visit:
https://www.nwemc.com/emc-testing-accreditations

FACILITIES

California	Minnesota	Oregon	Texas	Washington
Labs OC01-17 41 Tesla Irvine, CA 92618 (949) 861-8918	Labs MN01-10 9349 W Broadway Ave. Brooklyn Park, MN 55445 (612)-638-5136	Labs EV01-12 6775 NE Evergreen Pkwy #400 Hillsboro, OR 97124 (503) 844-4066	Labs TX01-09 3801 E Plano Pkwy Plano, TX 75074 (469) 304-5255	Labs NC01-05 19201 120th 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/RRA, MIC, MOC, NCC, OFCA				
US0158	US0175	US0017	US0191	US0157







MEASUREMENT UNCERTAINTY

element
TMU.2015.07.10

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.

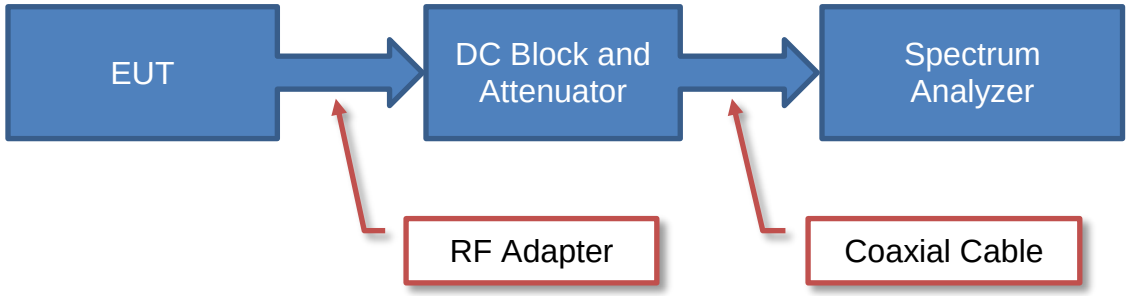
A measurement uncertainty estimation has been performed for each test per our internal quality document QM205.4.6. The estimation is used to compare the measured result with its "true" or theoretically correct value. The expanded measurement uncertainty (K=2) can be found included as part of the applicable 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.

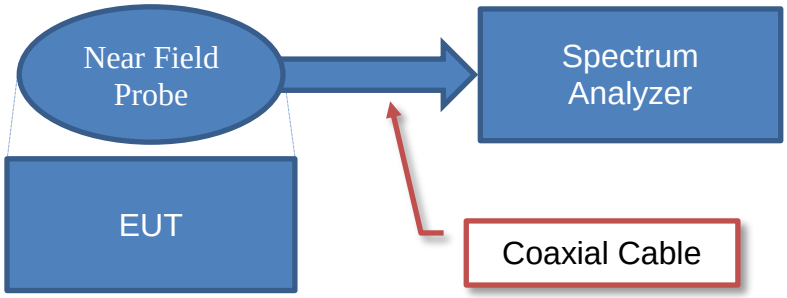
Test	+ MU	- MU
Frequency Accuracy (Hz)	0.0007%	-0.0007%
Amplitude Accuracy (dB)	1.2 dB	-1.2 dB
Conducted Power (dB)	0.3 dB	-0.3 dB
Radiated Power via Substitution (dB)	0.7 dB	-0.7 dB
Temperature (degrees C)	0.7°C	-0.7°C
Humidity (% RH)	2.5% RH	-2.5% RH
Voltage (AC)	1.0%	-1.0%
Voltage (DC)	0.7%	-0.7%
Field Strength (dB)	5.2 dB	-5.2 dB
AC Powerline Conducted Emissions (dB)	2.4 dB	-2.4 dB

Test Setup Block Diagrams

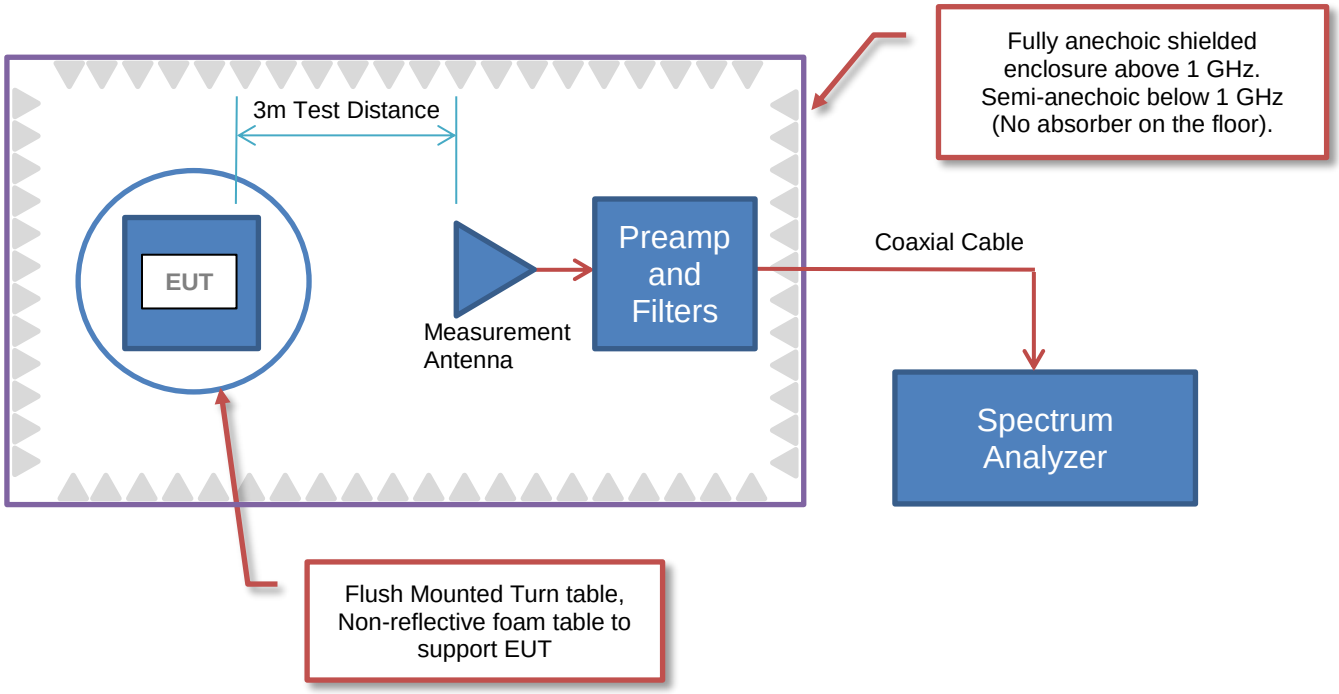
Antenna Port Conducted Measurements



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 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:	MagicBand, BOM Rev 17
First Date of Test:	April 1, 2019
Last Date of Test:	April 2, 2019
Receipt Date of Samples:	April 1, 2019
Equipment Design Stage:	Production
Equipment Condition:	No Damage
Purchase Authorization:	Verified

Information Provided by the Party Requesting the Test

Functional Description of the EUT:
Proprietary 2.4 GHz GFSK radio in a wristband form factor

Testing Objective:
To demonstrate compliance of the 2.4 GHz DTS radio to FCC 15.247 requirements.

CONFIGURATIONS

Configuration SYNA0279- 1

Software/Firmware Running during test	
Description	**Version**
Postman (Radio Control Software)	7.0.6

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Wrist Wearable Beacon System	Walt Disney Parks and Resorts US, Inc.	MagicBand, BOM Rev 17	00:0c:84:26:d7

Peripherals in test setup boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Battery Pack	Unkown	None	None

Remote Equipment Outside of Test Setup Boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Remote Laptop	HP	ProBook 4540s	Unkonwn
Radio unit	Walt Disney Parks and Resorts US, Inc.	xBR	0738
Wrist Wearable Beacon System	Walt Disney Parks and Resorts US, Inc.	MagicBand, BOM Rev 17	00:0c:81:1a:d9

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
DC Power	No	0.2 m	No	Battery Pack	Wrist Wearable Beacon System
Cat5e	no	5 m	No	Remote Laptop	Radio Unit

CONFIGURATIONS

Configuration SYNA0279- 2

Software/Firmware Running during test	
Description	**Version**
Postman (Radio Control Software)	7.0.6

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Wrist Wearable Beacon System	Walt Disney Parks and Resorts US, Inc.	MagicBand, BOM Rev 17	000c811ad9

Peripherals in test setup boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Battery Pack	Unkown	None	None

Remote Equipment Outside of Test Setup Boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Remote Laptop	HP	ProBook 4540s	Unkonwn
Radio unit	Walt Disney Parks and Resorts US, Inc.	xBR	0738
Wrist Wearable Beacon System	Walt Disney Parks and Resorts US, Inc.	MagicBand, BOM Rev 17	00:0c:81:1a:d9

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
DC Power	No	0.2 m	No	Battery Pack	Wrist Wearable Beacon System
Cat5e	no	5 m	No	Remote Laptop	Radio Unit

CONFIGURATIONS

Configuration SYNA0279- 3

Software/Firmware Running during test	
Description	**Version**
Postman (Radio Control Software)	7.0.6

EUT			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Wrist Wearable Beacon System	Walt Disney Parks and Resorts US, Inc.	MagicBand, BOM Rev 17	00:0c:81:26:21
Wrist Wearable Beacon System	Walt Disney Parks and Resorts US, Inc.	MagicBand, BOM Rev 17	00:0c:81:23:5b
Wrist Wearable Beacon System	Walt Disney Parks and Resorts US, Inc.	MagicBand, BOM Rev 17	00:0c:81:1b:fb

Remote Equipment Outside of Test Setup Boundary			
Description	**Manufacturer**	**Model/Part Number**	**Serial Number**
Remote Laptop	HP	ProBook 4540s	Unkonwn
Radio unit	Walt Disney Parks and Resorts US, Inc.	xBR	0738

Cables					
Cable Type	**Shield**	**Length (m)**	**Ferrite**	**Connection 1**	**Connection 2**
Cat5e	no	5 m	No	Remote Laptop	Radio Unit

MODIFICATIONS

Equipment Modifications

Item	Date	Test	Modification	Note	Disposition of EUT
1	2019-04-01	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	2019-04-01	Occupied Bandwidth	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	2019-04-01	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.
4	2019-04-01	Power Spectral Density	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	2019-04-01	Band Edge Compliance	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	2019-04-01	Spurious Conducted 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.
7	2019-04-02	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

XMit 2019.02.26

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
Generator - Signal	Keysight	N5182B	TFU	5-Nov-18	5-Nov-21
Cable	Micro-Coax	UFD150A-1-0720-200200	EVH	23-Apr-18	23-Apr-19
Attenuator	S.M. Electronics	SA26B-20	AUY	16-Apr-18	16-Apr-19
Block - DC	Fairview Microwave	SD3379	AMW	23-Apr-18	23-Apr-19
Analyzer - Spectrum Analyzer	Agilent	E4440A	AFD	27-Jul-18	27-Jul-19

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

element

TbtTx 2018.09.13 XMit 2019.02.26

EUT:	MagicBand, BOM Rev 17			Work Order:	SYNA0279
Serial Number:	000c811ad9			Date:	1-Apr-19
Customer:	Walt Disney Parks and Resorts US, Inc.			Temperature:	21.8 °C
Attendees:	None			Humidity:	41.4% RH
Project:	None			Barometric Pres.:	1016 mbar
Tested by:	Jeff Alcoke	Power:	Battery	Job Site:	EV01

TEST SPECIFICATIONS	Test Method
FCC 15.247:2019	ANSI C63.10:2013

COMMENTS

Reference level offset includes; DC block, 20 dB attenuator, and measurement cable.

DEVIATIONS FROM TEST STANDARD

None

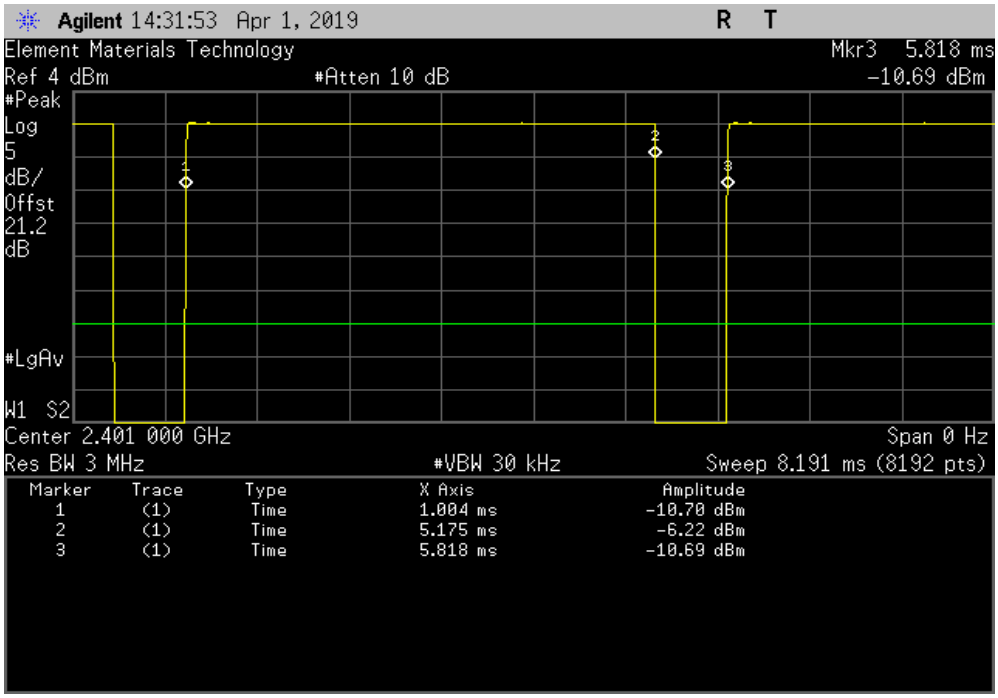
Configuration #	2	Signature

	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
GFSK Low Channel, 2401 MHz	4.171 ms	4.814 ms	1	86.6	N/A	N/A
GFSK Low Channel, 2401 MHz	N/A	N/A	5	N/A	N/A	N/A
GFSK Mid Channel, 2450 MHz	4.17 ms	4.814 ms	1	86.6	N/A	N/A
GFSK Mid Channel, 2450 MHz	N/A	N/A	5	N/A	N/A	N/A
GFSK High Channel, 2476 MHz	4.171 ms	4.814 ms	1	86.6	N/A	N/A
GFSK High Channel, 2476 MHz	N/A	N/A	5	N/A	N/A	N/A

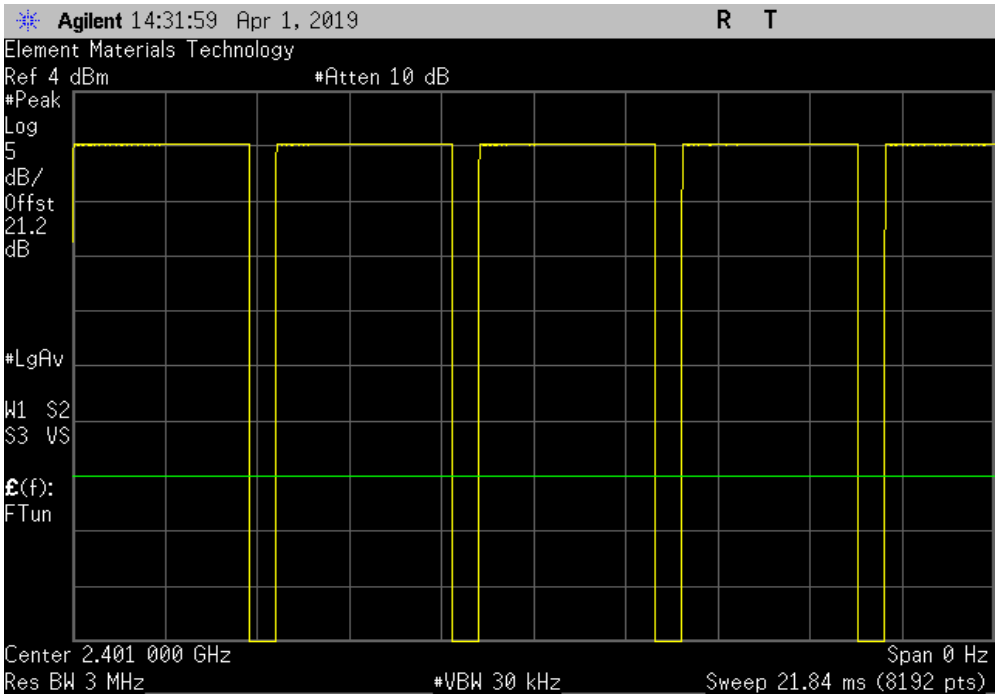
DUTY CYCLE

TbtTx 2018.09.13 XMit 2019.02.26

GFSK Low Channel, 2401 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	4.171 ms	4.814 ms	1	86.6	N/A	N/A

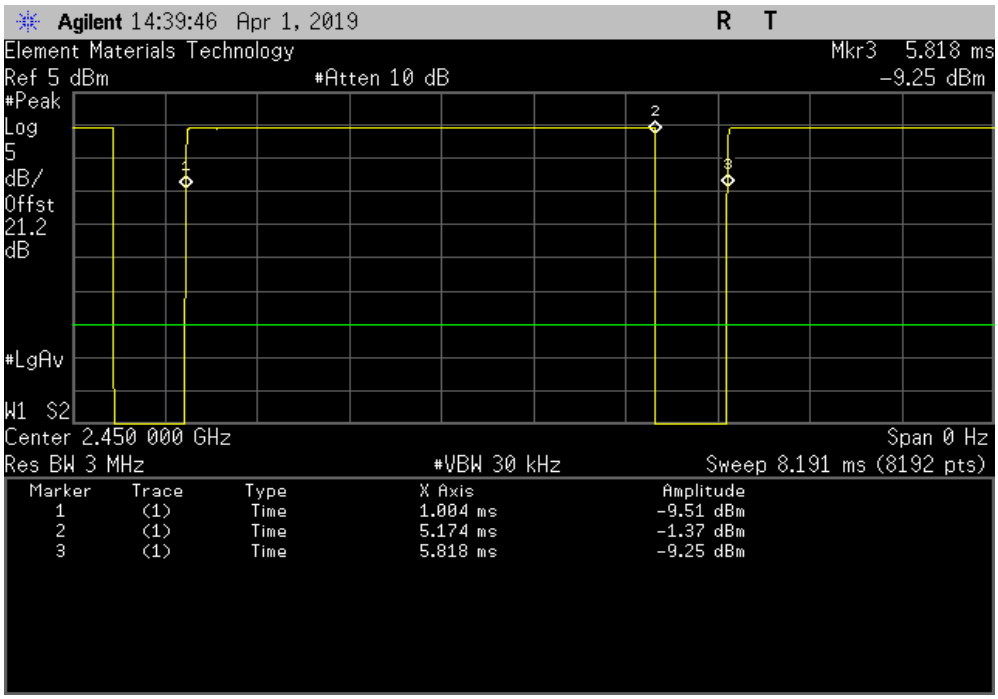


GFSK Low Channel, 2401 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	N/A	N/A	5	N/A	N/A	N/A

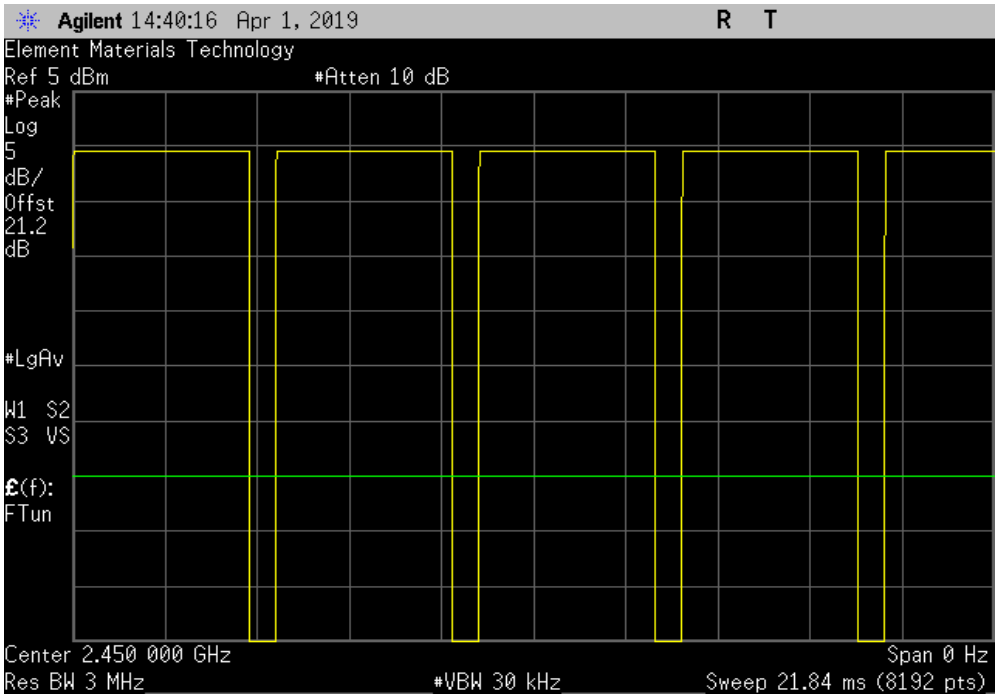


DUTY CYCLE

GFSK Mid Channel, 2450 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	4.17 ms	4.814 ms	1	86.6	N/A	N/A



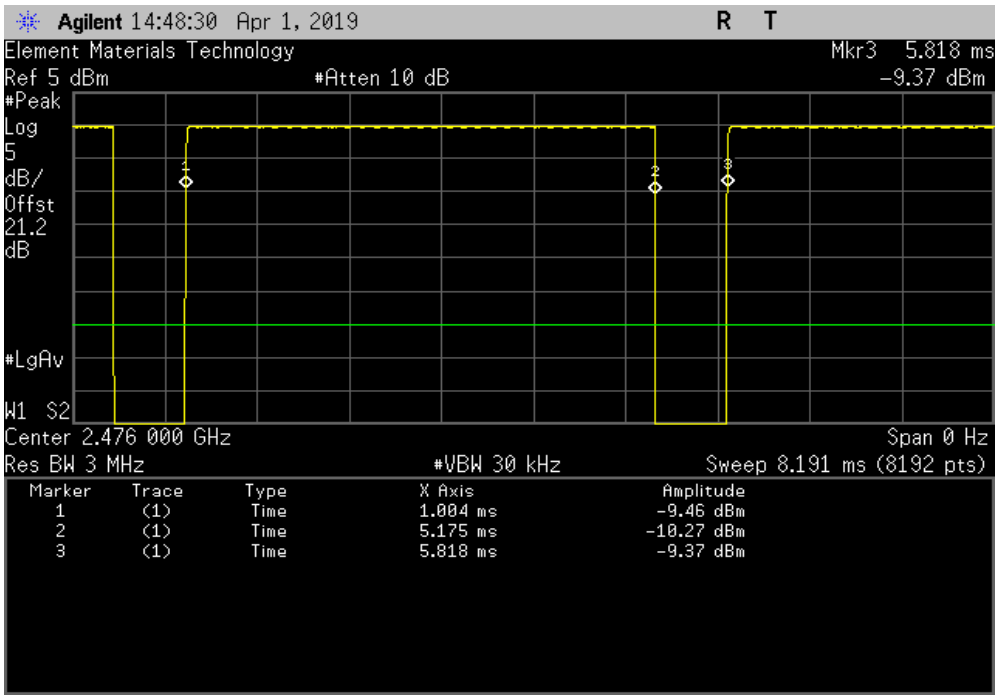
GFSK Mid Channel, 2450 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	N/A	N/A	5	N/A	N/A	N/A



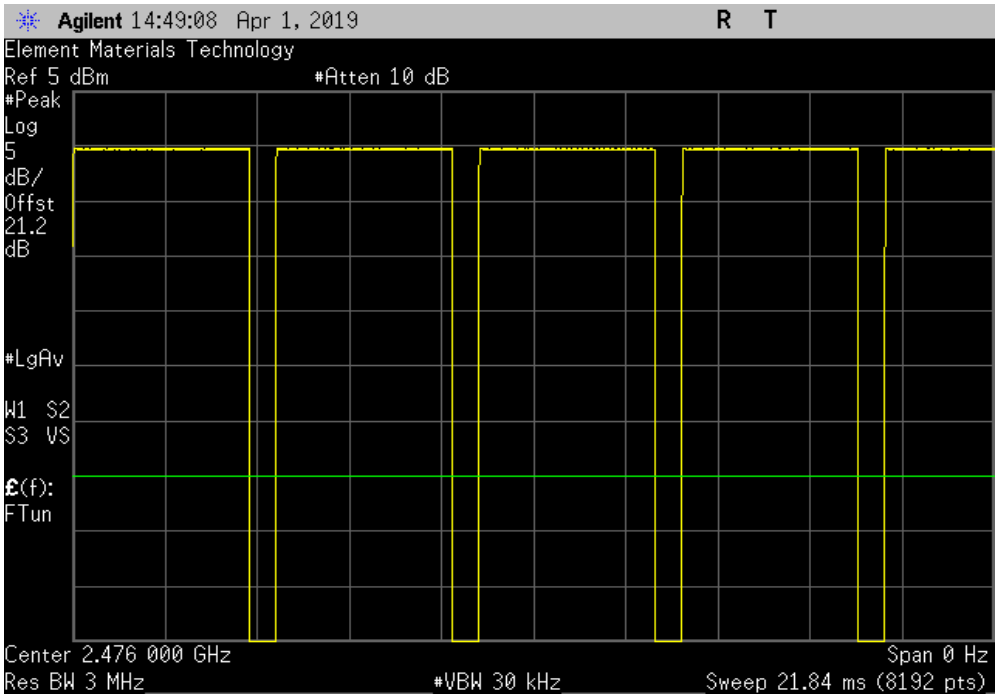
DUTY CYCLE

TbtTx 2018.09.13 XMit 2019.02.26

GFSK High Channel, 2476 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	4.171 ms	4.814 ms	1	86.6	N/A	N/A



GFSK High Channel, 2476 MHz						
	Pulse Width	Period	Number of Pulses	Value (%)	Limit (%)	Results
	N/A	N/A	5	N/A	N/A	N/A



OCCUPIED BANDWIDTH

XMit 2019.02.26

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	Agilent	E4440A	AFD	27-Jul-18	27-Jul-19
Generator - Signal	Keysight	N5182B	TFU	5-Nov-18	5-Nov-21
Cable	Micro-Coax	UFD150A-1-0720-200200	EVH	23-Apr-18	23-Apr-19
Attenuator	S.M. Electronics	SA26B-20	AUY	16-Apr-18	16-Apr-19
Block - DC	Fairview Microwave	SD3379	AMW	23-Apr-18	23-Apr-19

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

element

TbtTx 2018.09.13 XMit 2019.02.26

EUT:	MagicBand, BOM Rev 17			Work Order:	SYNA0279
Serial Number:	000c811ad9			Date:	1-Apr-19
Customer:	Walt Disney Parks and Resorts US, Inc.			Temperature:	21.8 °C
Attendees:	None			Humidity:	41.4% RH
Project:	None			Barometric Pres.:	1016 mbar
Tested by:	Jeff Alcoke	Power:	Battery	Job Site:	EV01

TEST SPECIFICATIONS	Test Method
FCC 15.247:2019	ANSI C63.10:2013

COMMENTS

Reference level offset includes; DC block, 20 dB attenuator, and measurement cable.

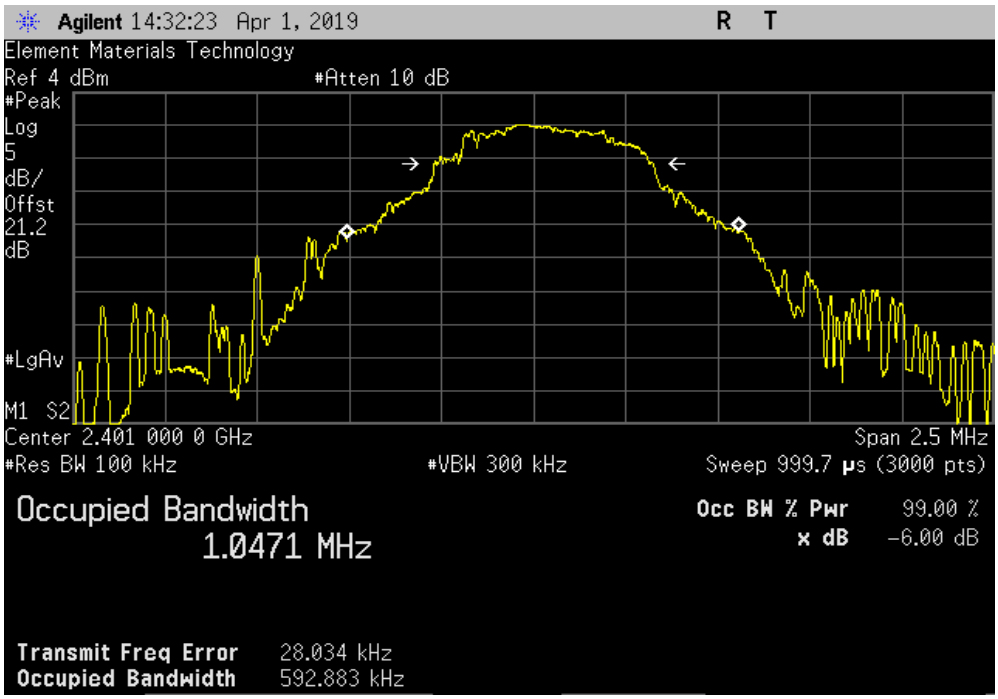
DEVIATIONS FROM TEST STANDARD

None

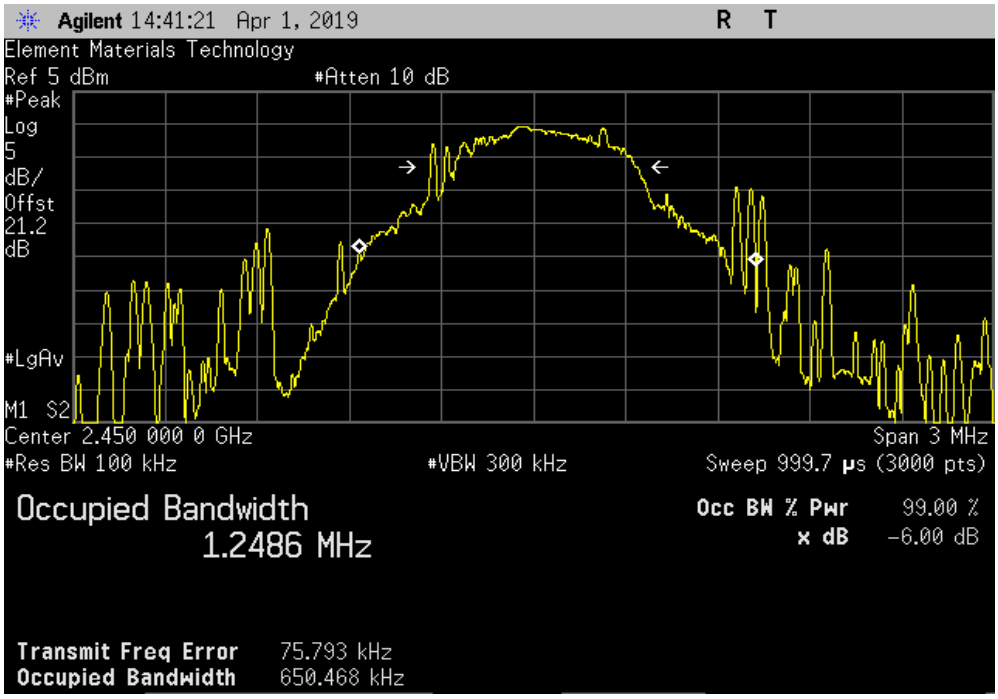
Configuration #	2	Signature

	Value	Limit (≥)	Result
GFSK Low Channel, 2401 MHz	592.883 kHz	500 kHz	Pass
GFSK Mid Channel, 2450 MHz	650.468 kHz	500 kHz	Pass
GFSK High Channel, 2476 MHz	670.246 kHz	500 kHz	Pass

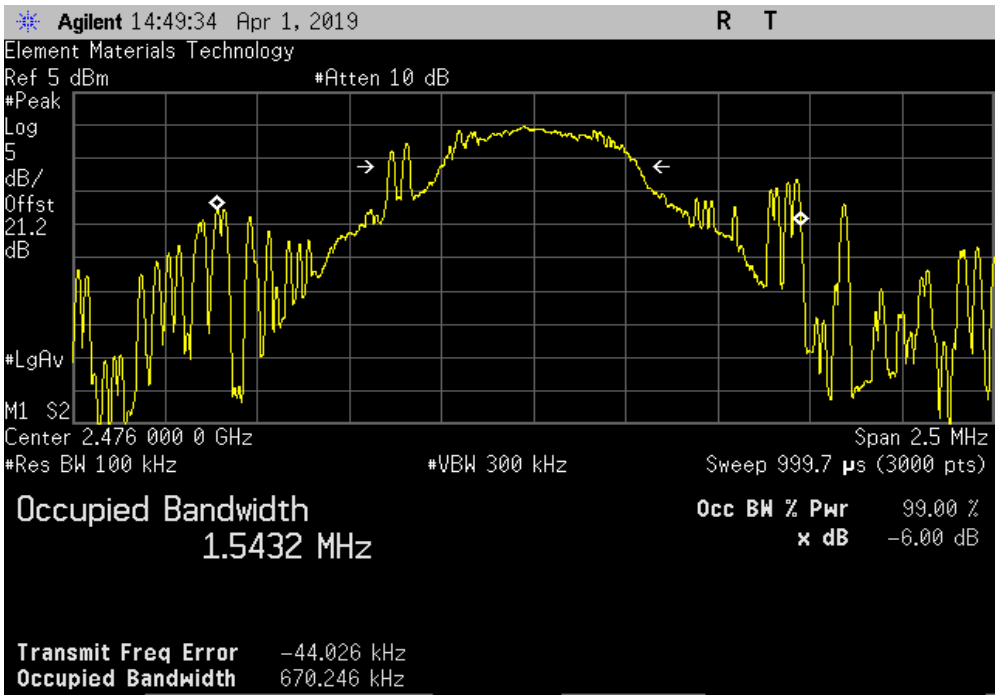
GFSK Low Channel, 2401 MHz						
				Value	Limit (≥)	Result
				592.883 kHz	500 kHz	Pass



GFSK Mid Channel, 2450 MHz						
				Value	Limit (≥)	Result
				650.468 kHz	500 kHz	Pass



GFSK High Channel, 2476 MHz						
				Value	Limit (≥)	Result
				670.246 kHz	500 kHz	Pass



OUTPUT POWER

XMit 2019.02.26

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
Generator - Signal	Keysight	N5182B	TFU	5-Nov-18	5-Nov-21
Cable	Micro-Coax	UFD150A-1-0720-200200	EVH	23-Apr-18	23-Apr-19
Attenuator	S.M. Electronics	SA26B-20	AUY	16-Apr-18	16-Apr-19
Block - DC	Fairview Microwave	SD3379	AMW	23-Apr-18	23-Apr-19
Analyzer - Spectrum Analyzer	Agilent	E4440A	AFD	27-Jul-18	27-Jul-19

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.

OUTPUT POWER

TbtTx 2018.09.13 XMit 2019.02.26

EUT:	MagicBand, BOM Rev 17			Work Order:	SYNA0279
Serial Number:	000c811ad9			Date:	1-Apr-19
Customer:	Walt Disney Parks and Resorts US, Inc.			Temperature:	21.8 °C
Attendees:	None			Humidity:	41.4% RH
Project:	None			Barometric Pres.:	1016 mbar
Tested by:	Jeff Alcoke	Power:	Battery	Job Site:	EV01

TEST SPECIFICATIONS	Test Method
FCC 15.247:2019	ANSI C63.10:2013

COMMENTS

Reference level offset includes; DC block, 20 dB attenuator, and measurement cable.

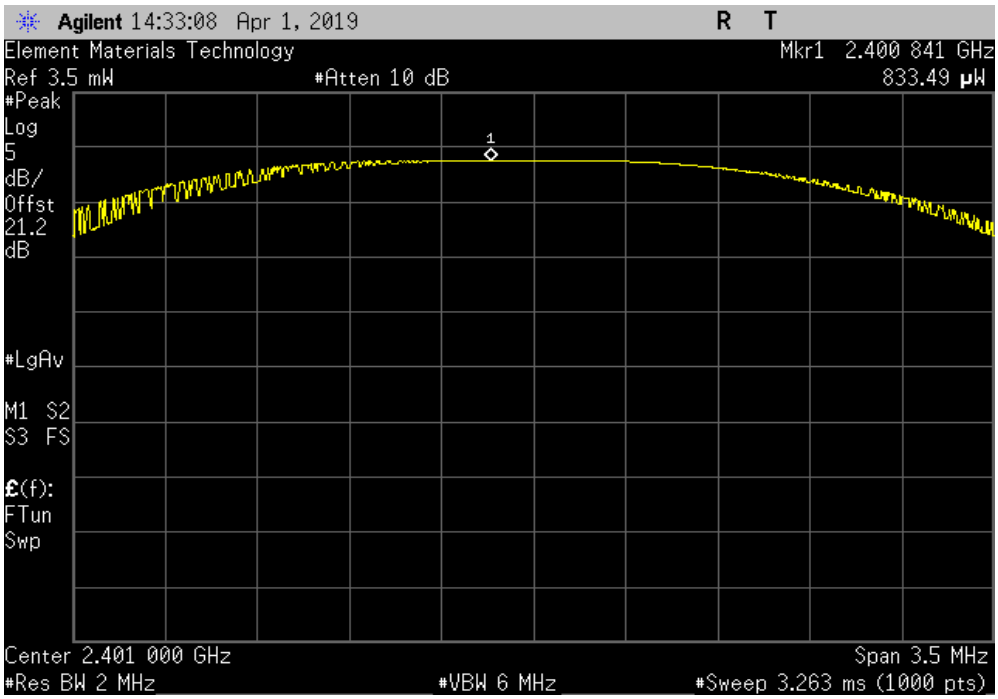
DEVIATIONS FROM TEST STANDARD

None

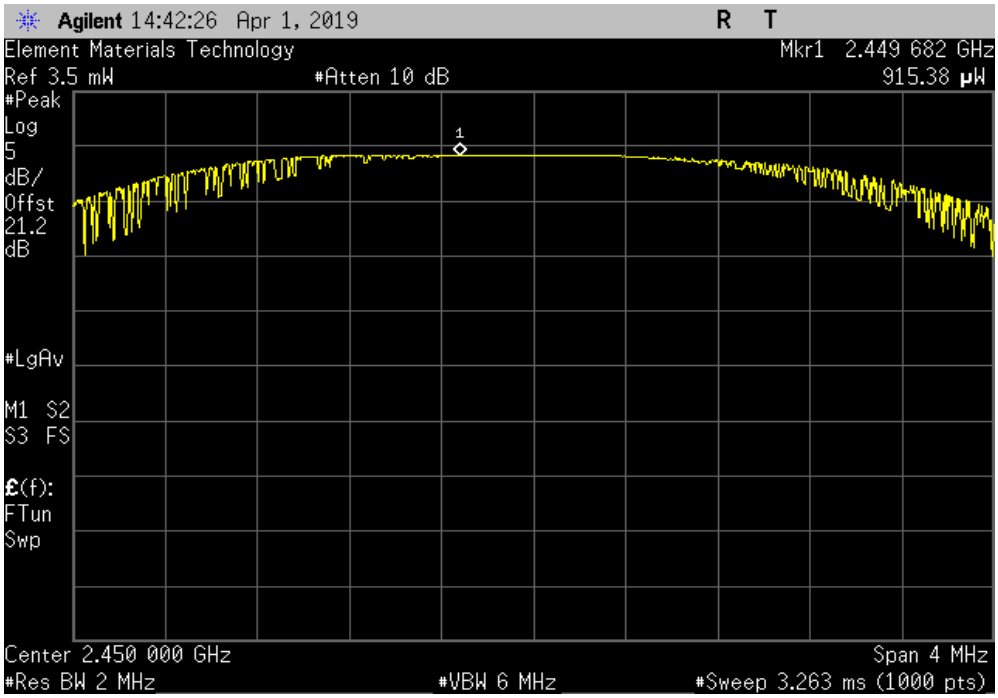
Configuration #	2	Signature

	Value	Limit (<)	Result
GFSK Low Channel, 2401 MHz	833.489 uW	1 W	Pass
GFSK Mid Channel, 2450 MHz	915.377 uW	1 W	Pass
GFSK High Channel, 2476 MHz	961.834 uW	1 W	Pass

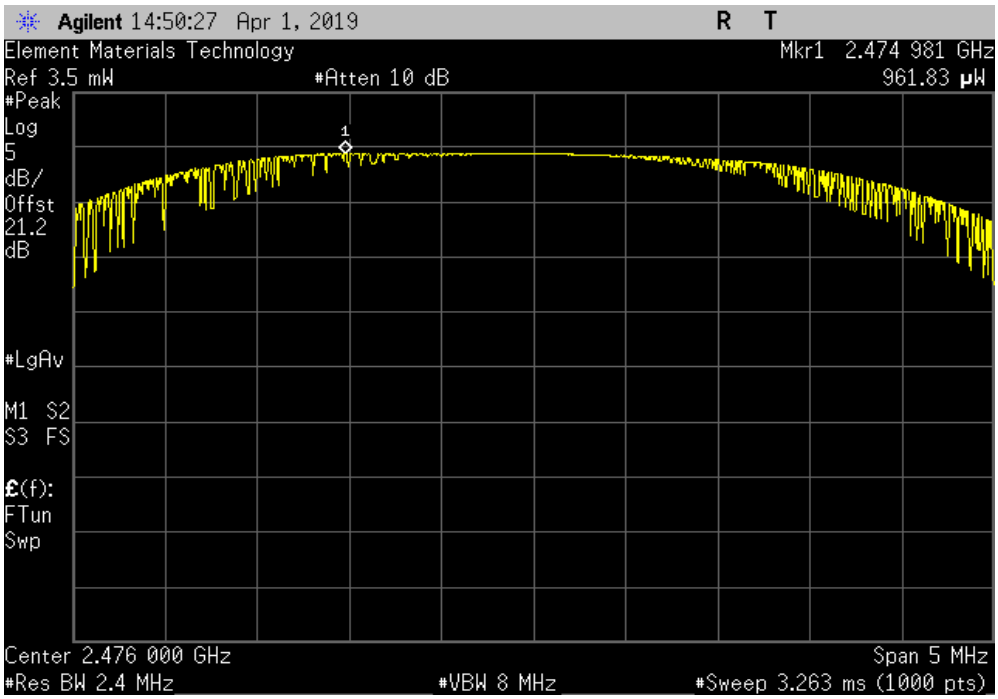
GFSK Low Channel, 2401 MHz						
				Value	Limit (<)	Result
				833.489 uW	1 W	Pass



GFSK Mid Channel, 2450 MHz						
				Value	Limit (<)	Result
				915.377 uW	1 W	Pass



GFSK High Channel, 2476 MHz						
				Value	Limit (<)	Result
				961.834 uW	1 W	Pass



POWER SPECTRAL DENSITY

XMit 2019.02.26

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
Generator - Signal	Keysight	N5182B	TFU	5-Nov-18	5-Nov-21
Cable	Micro-Coax	UFD150A-1-0720-200200	EVH	23-Apr-18	23-Apr-19
Attenuator	S.M. Electronics	SA26B-20	AUY	16-Apr-18	16-Apr-19
Block - DC	Fairview Microwave	SD3379	AMW	23-Apr-18	23-Apr-19
Analyzer - Spectrum Analyzer	Agilent	E4440A	AFD	27-Jul-18	27-Jul-19

TEST DESCRIPTION

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer. The maximum power spectral density measurements was measured using the channels and modes as called out on the following data sheets.

Per the procedure outlined in ANSI C63.10 the peak power spectral density was measured in a 3 kHz RBW.

POWER SPECTRAL DENSITY

TbtTx 2018.09.13 XMit 2019.02.26

EUT:	MagicBand, BOM Rev 17			Work Order:	SYNA0279
Serial Number:	000c811ad9			Date:	1-Apr-19
Customer:	Walt Disney Parks and Resorts US, Inc.			Temperature:	21.8 °C
Attendees:	None			Humidity:	41.4% RH
Project:	None			Barometric Pres.:	1016 mbar
Tested by:	Jeff Alcoke	Power:	Battery	Job Site:	EV01

TEST SPECIFICATIONS	Test Method
FCC 15.247:2019	ANSI C63.10:2013

COMMENTS

Reference level offset includes; DC block, 20 dB attenuator, and measurement cable.

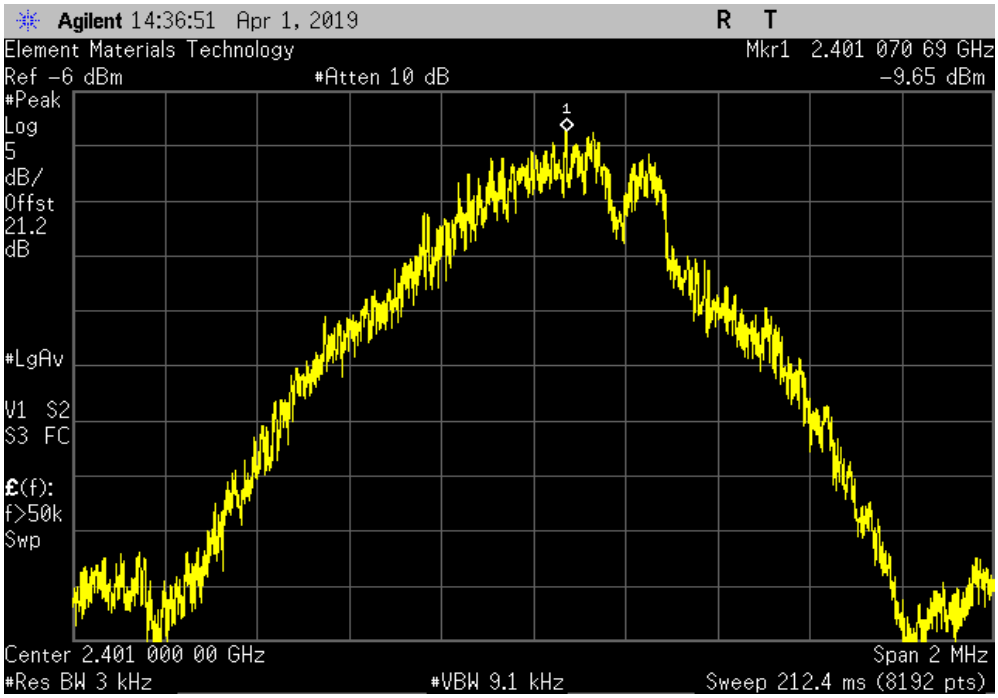
DEVIATIONS FROM TEST STANDARD

None

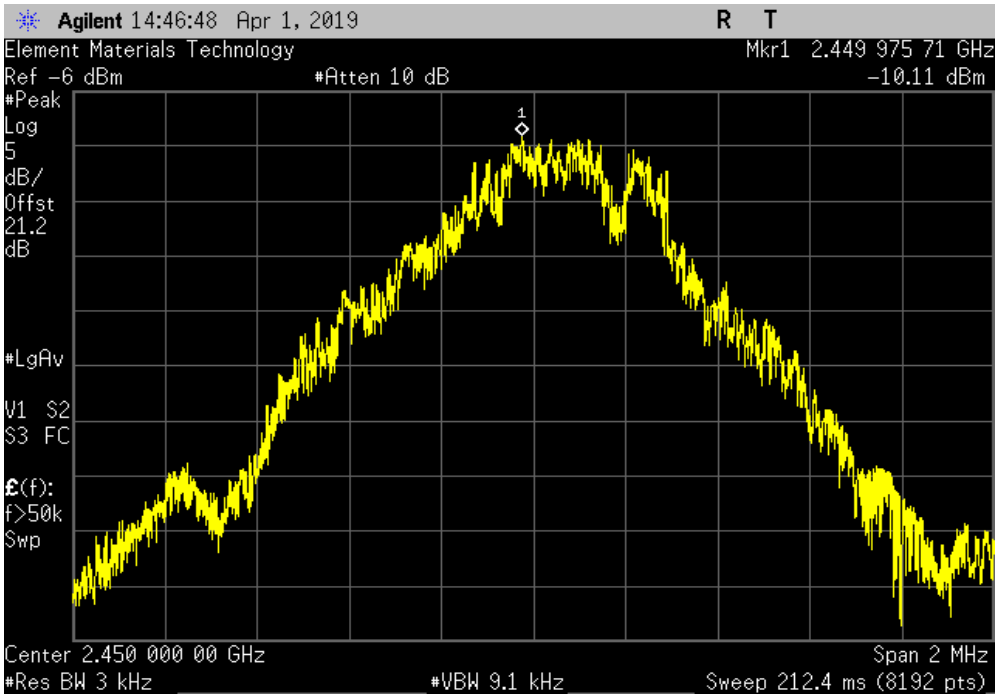
Configuration #	2	Signature

	Value dBm/3kHz	Limit < dBm/3kHz	Results
GFSK Low Channel, 2401 MHz	-9.65	8	Pass
GFSK Mid Channel, 2450 MHz	-10.11	8	Pass
GFSK High Channel, 2476 MHz	-9.155	8	Pass

GFSK Low Channel, 2401 MHz						
				Value dBm/3kHz	Limit < dBm/3kHz	Results
				-9.65	8	Pass



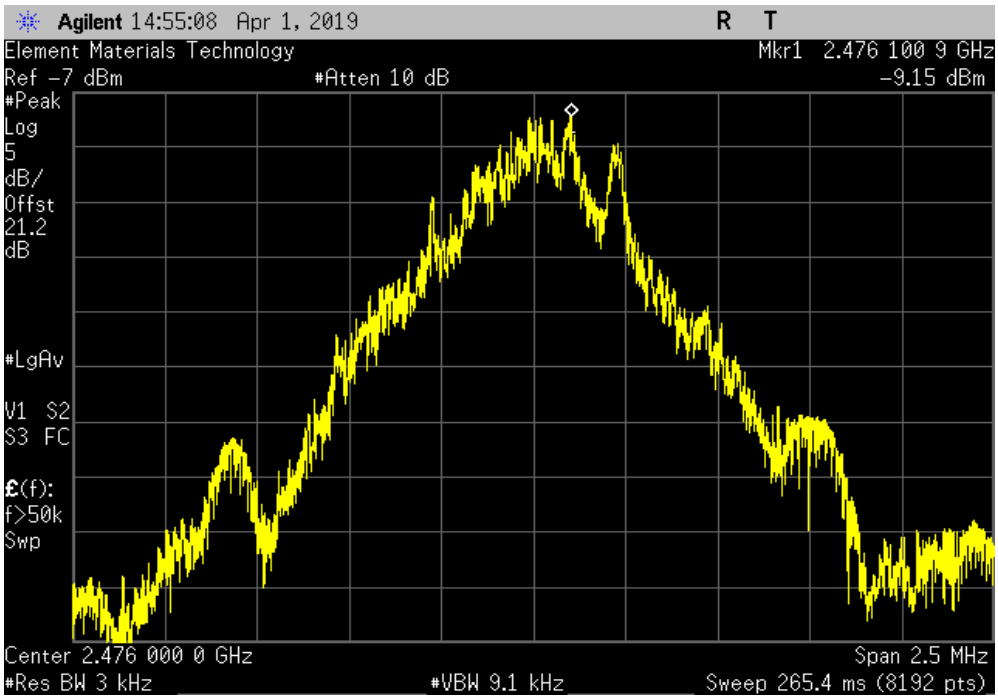
GFSK Mid Channel, 2450 MHz						
				Value dBm/3kHz	Limit < dBm/3kHz	Results
				-10.11	8	Pass



POWER SPECTRAL DENSITY

TbtTx 2018.09.13 XMit 2019.02.26

GFSK High Channel, 2476 MHz						
				Value dBm/3kHz	Limit < dBm/3kHz	Results
				-9.155	8	Pass



BAND EDGE COMPLIANCE

XMit 2019.02.26

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
Generator - Signal	Agilent	N5181A	TIG	6-Apr-17	6-Apr-20
Cable	Micro-Coax	UFD150A-1-0720-200200	EVH	23-Apr-18	23-Apr-19
Attenuator	S.M. Electronics	SA26B-20	AUY	16-Apr-18	16-Apr-19
Block - DC	Fairview Microwave	SD3379	AMW	23-Apr-18	23-Apr-19
Analyzer - Spectrum Analyzer	Agilent	E4440A	AFD	27-Jul-18	27-Jul-19

TEST DESCRIPTION

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer. The spurious RF conducted emissions at the edges of the authorized bands were measured with the EUT set to low and high transmit frequencies in each available band. The channels closest to the band edges were selected. The EUT was transmitting at the data rate(s) listed in the datasheet.

The spectrum was scanned below the lower band edge and above the higher band edge.

BAND EDGE COMPLIANCE

TbtTx 2018.09.13 XMit 2019.02.26

EUT:	MagicBand, BOM Rev 17	Work Order:	SYNA0279
Serial Number:	000c811ad9	Date:	1-Apr-19
Customer:	Walt Disney Parks and Resorts US, Inc.	Temperature:	21.8 °C
Attendees:	None	Humidity:	41.3% RH
Project:	None	Barometric Pres.:	1016 mbar
Tested by:	Jeff Alcoke	Job Site:	EV01
Power:	Battery		

TEST SPECIFICATIONS	Test Method
FCC 15.247:2019	ANSI C63.10:2013

COMMENTS

Reference level offset includes; DC block, 20 dB attenuator, and measurement cable.

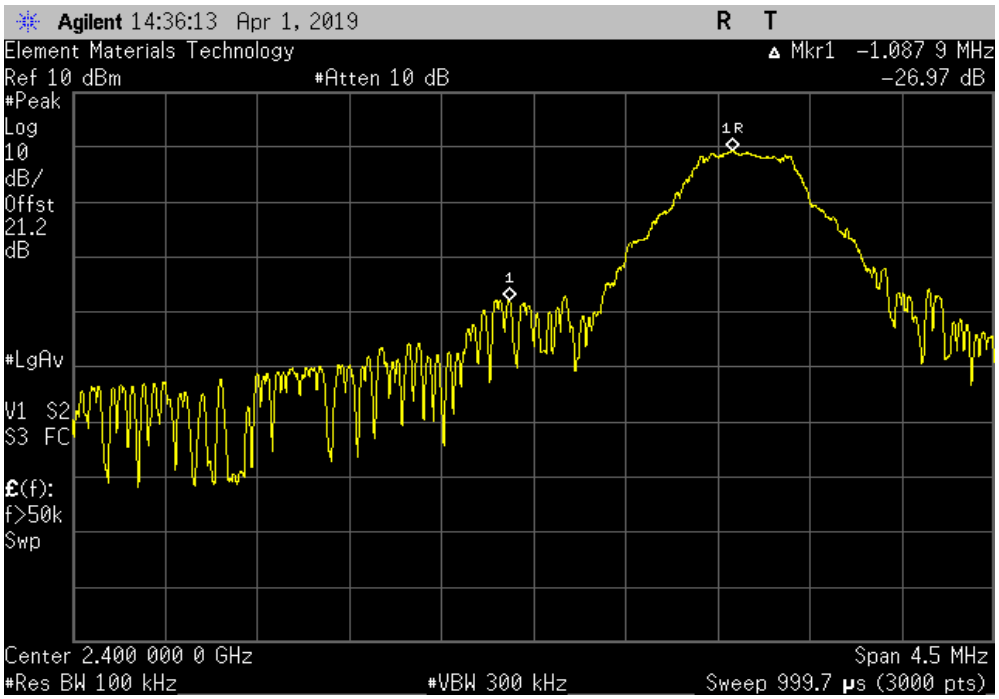
DEVIATIONS FROM TEST STANDARD

None

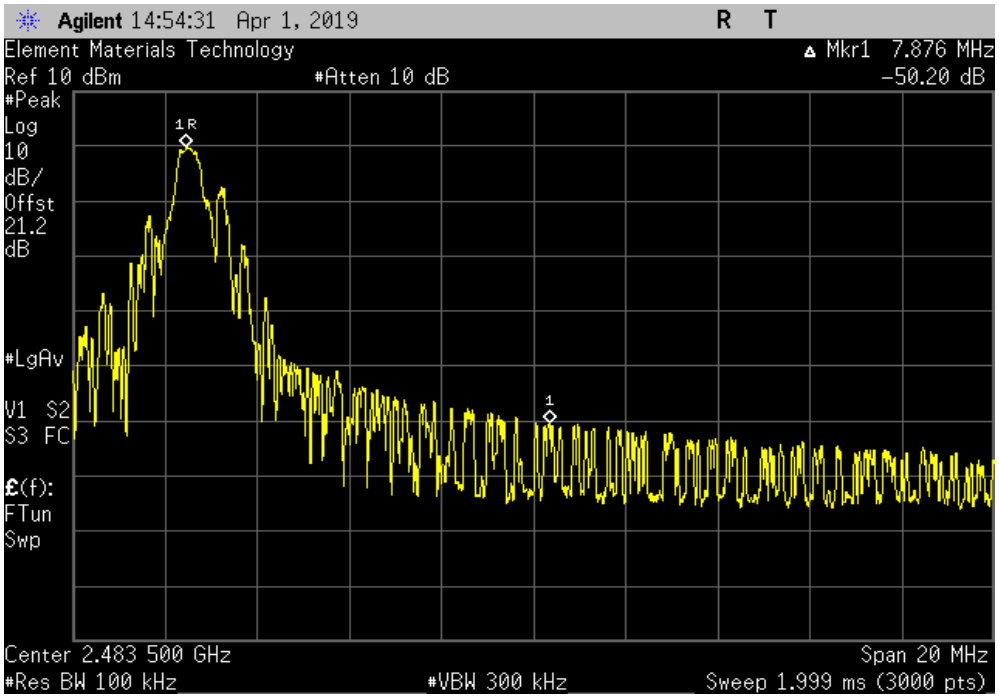
Configuration #	2	Signature

	Value (dBc)	Limit ≤ (dBc)	Result
GFSK Low Channel, 2401 MHz	-26.97	-20	Pass
GFSK High Channel, 2476 MHz	-50.2	-20	Pass

GFSK Low Channel, 2401 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-26.97	-20	Pass



GFSK High Channel, 2476 MHz						
				Value (dBc)	Limit ≤ (dBc)	Result
				-50.2	-20	Pass



SPURIOUS CONDUCTED EMISSIONS

XMit 2019.02.26

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
Generator - Signal	Keysight	N5182B	TFU	5-Nov-18	5-Nov-21
Cable	Micro-Coax	UFD150A-1-0720-200200	EVH	23-Apr-18	23-Apr-19
Attenuator	S.M. Electronics	SA26B-20	AUY	16-Apr-18	16-Apr-19
Block - DC	Fairview Microwave	SD3379	AMW	23-Apr-18	23-Apr-19
Analyzer - Spectrum Analyzer	Agilent	E4440A	AFD	27-Jul-18	27-Jul-19

TEST DESCRIPTION

The measurement was made using a direct connection between the RF output of the EUT and a spectrum analyzer. The spurious RF conducted emissions were measured with the EUT set to low, medium and high transmit frequencies. The EUT was transmitting at the data rate(s) listed in the datasheet. For each transmit frequency, the spectrum was scanned throughout the specified frequency range.

SPURIOUS CONDUCTED EMISSIONS

TbtTx 2018.09.13 XMit 2019.02.26

EUT:	MagicBand, BOM Rev 17	Work Order:	SYNA0279
Serial Number:	000c811ad9	Date:	1-Apr-19
Customer:	Walt Disney Parks and Resorts US, Inc.	Temperature:	21.8 °C
Attendees:	None	Humidity:	41.4% RH
Project:	None	Barometric Pres.:	1016 mbar
Tested by:	Jeff Alcoke	Power: Battery	Job Site: EV01

TEST SPECIFICATIONS	Test Method
FCC 15.247:2019	ANSI C63.10:2013

COMMENTS

Reference level offset includes; DC block, 20 dB attenuator, and measurement cable.

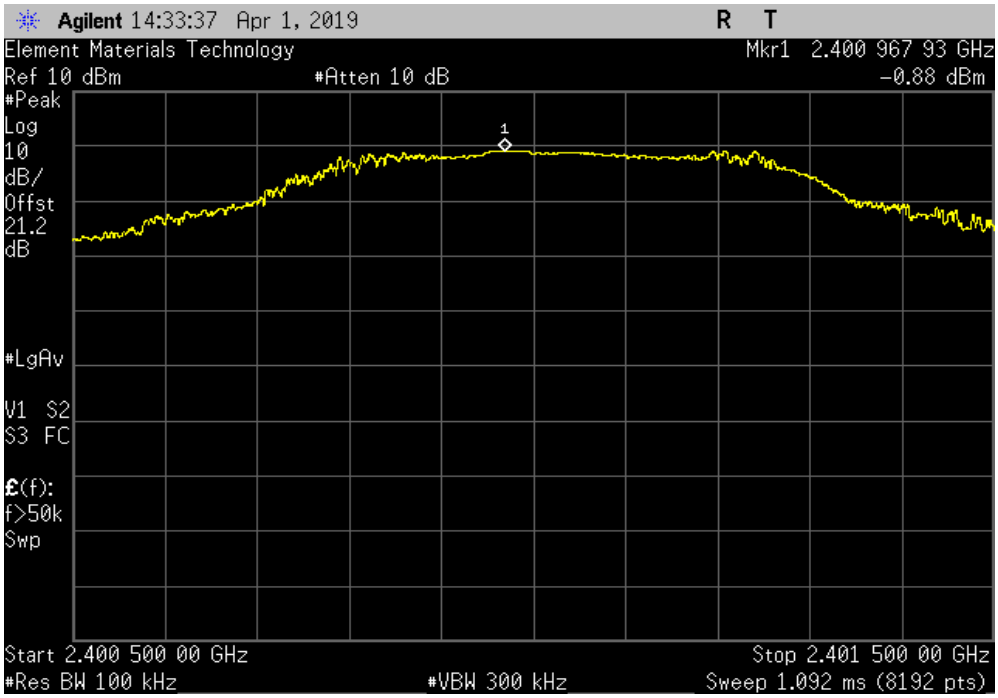
DEVIATIONS FROM TEST STANDARD

None

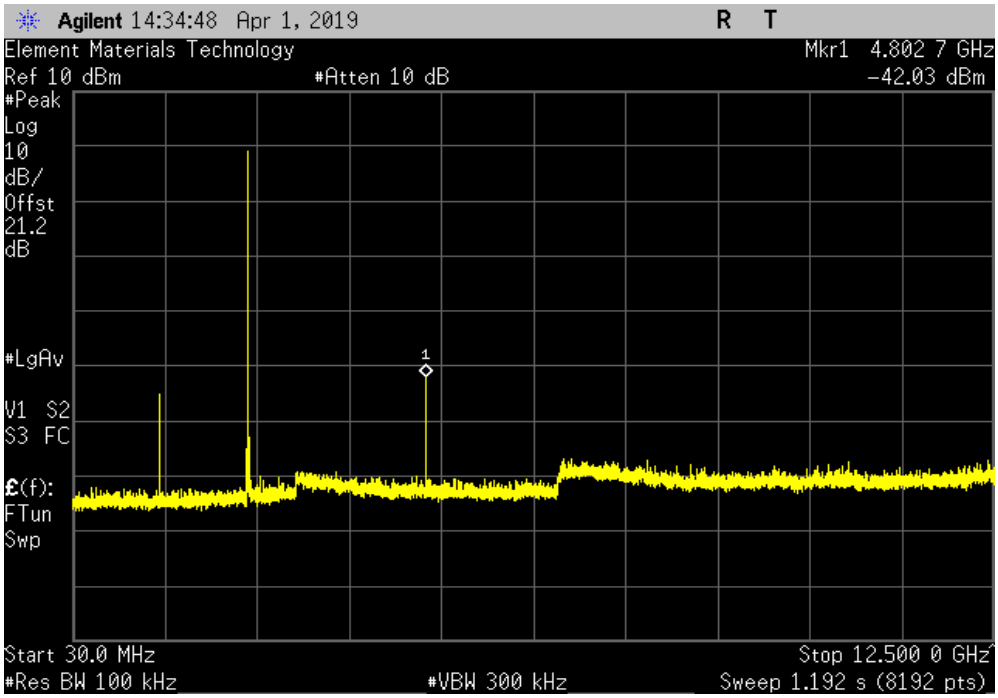
Configuration #	2	Signature

	Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
GFSK Low Channel, 2401 MHz	Fundamental	2400.97	N/A	N/A	N/A
GFSK Low Channel, 2401 MHz	30 MHz - 12.5 GHz	4802.7	-41.16	-20	Pass
GFSK Low Channel, 2401 MHz	12.5 GHz - 25 GHz	13641.5	-53.34	-20	Pass
GFSK Mid Channel, 2450 MHz	Fundamental	2449.96	N/A	N/A	N/A
GFSK Mid Channel, 2450 MHz	30 MHz - 12.5 GHz	4900.2	-43.54	-20	Pass
GFSK Mid Channel, 2450 MHz	12.5 GHz - 25 GHz	13792.6	-52.87	-20	Pass
GFSK High Channel, 2476 MHz	Fundamental	2475.96	N/A	N/A	N/A
GFSK High Channel, 2476 MHz	30 MHz - 12.5 GHz	4951.9	-44.14	-20	Pass
GFSK High Channel, 2476 MHz	12.5 GHz - 25 GHz	13652.2	-53.42	-20	Pass

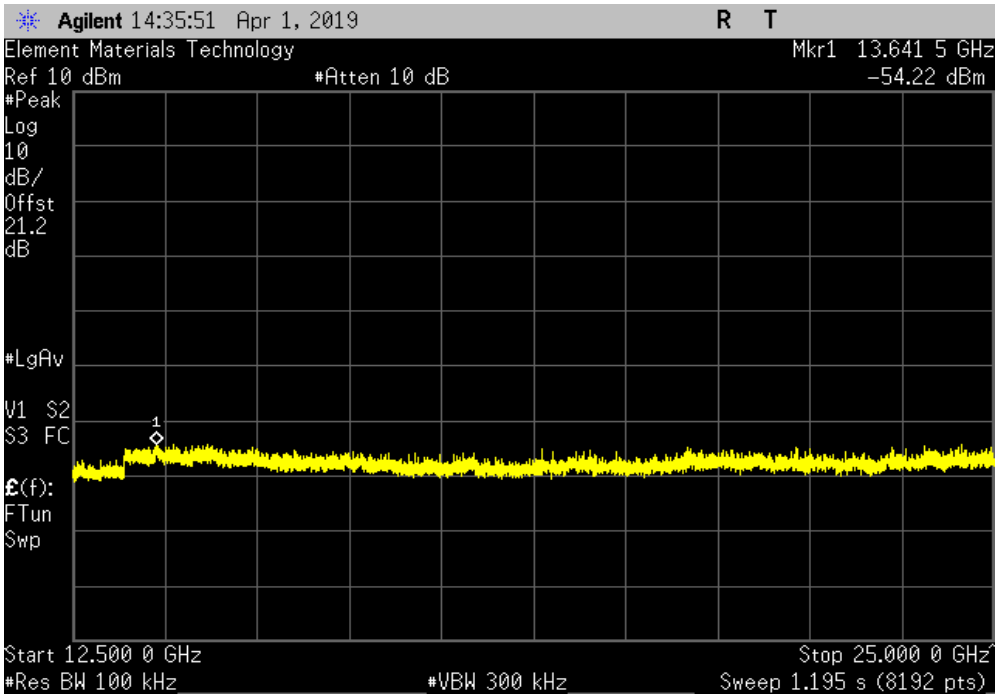
GFSK Low Channel, 2401 MHz						
	Frequency Range		Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
	Fundamental		2400.97	N/A	N/A	N/A



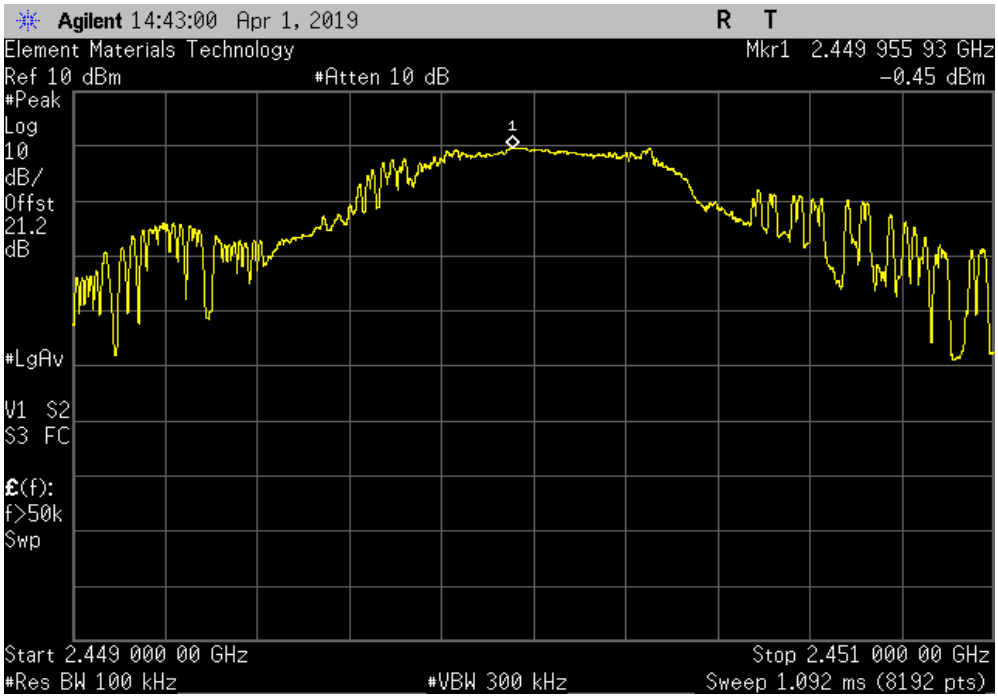
GFSK Low Channel, 2401 MHz				
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
30 MHz - 12.5 GHz	4802.7	-41.16	-20	Pass



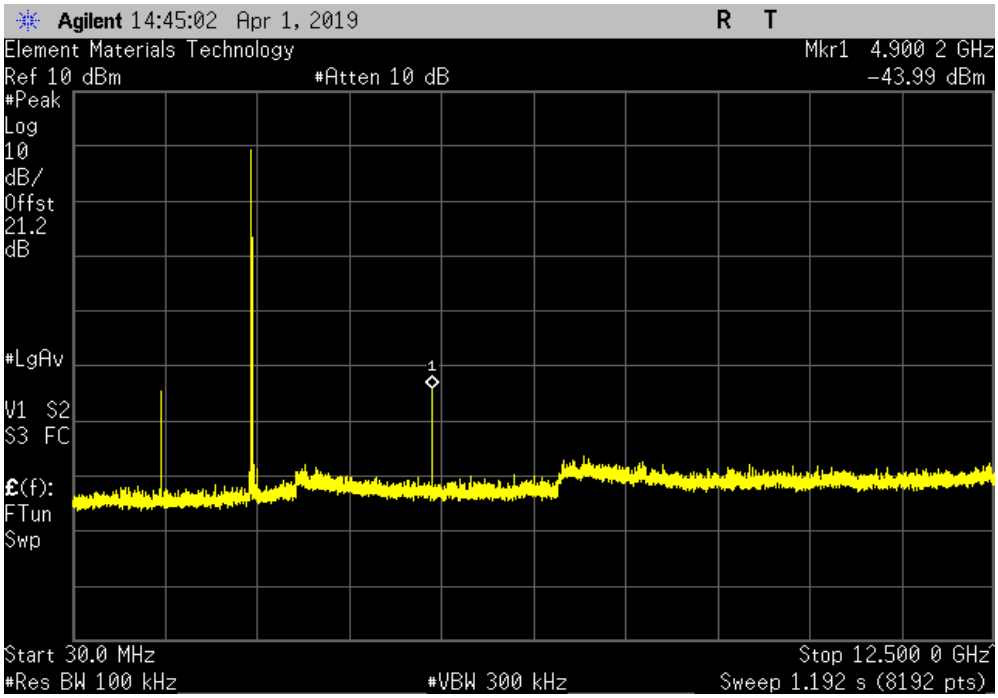
GFSK Low Channel, 2401 MHz				
Frequency Range	**Measured Freq (MHz)**	**Max Value (dBc)**	**Limit ≤ (dBc)**	**Result**
12.5 GHz - 25 GHz	13641.5	-53.34	-20	Pass



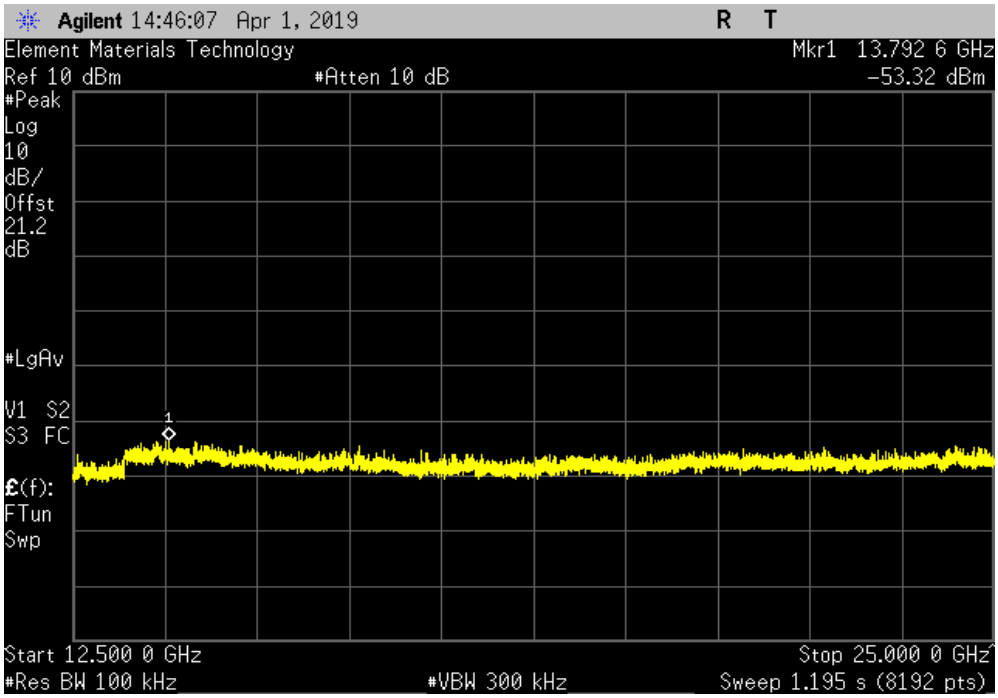
GFSK Mid Channel, 2450 MHz				
Frequency Range	**Measured Freq (MHz)**	**Max Value (dBc)**	**Limit ≤ (dBc)**	**Result**
Fundamental	2449.96	N/A	N/A	N/A



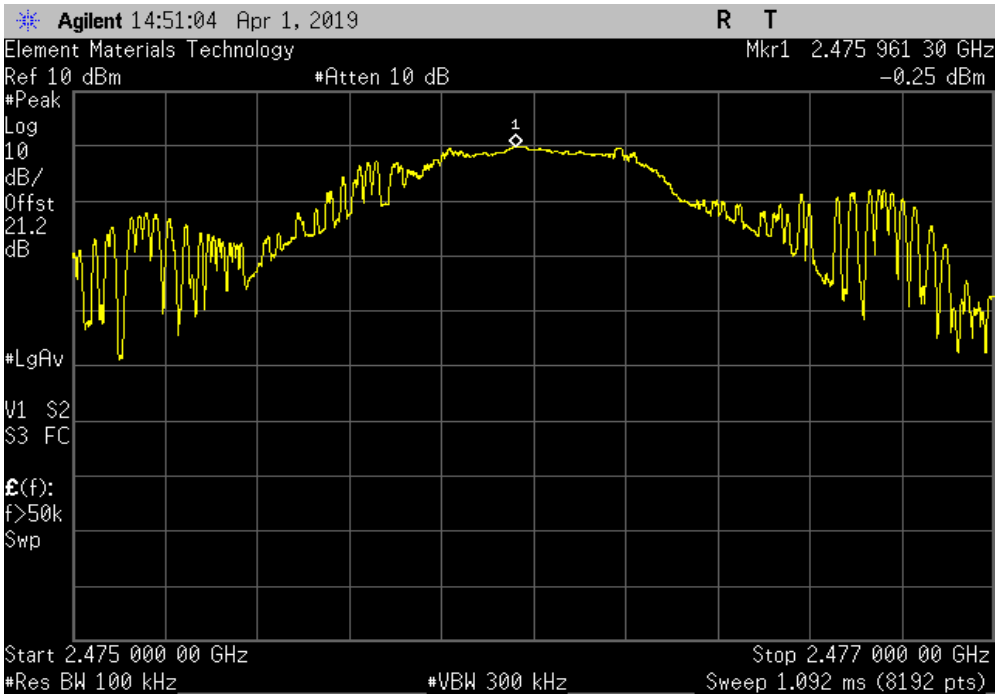
GFSK Mid Channel, 2450 MHz				
Frequency Range	**Measured Freq (MHz)**	**Max Value (dBc)**	**Limit ≤ (dBc)**	**Result**
30 MHz - 12.5 GHz	4900.2	-43.54	-20	Pass



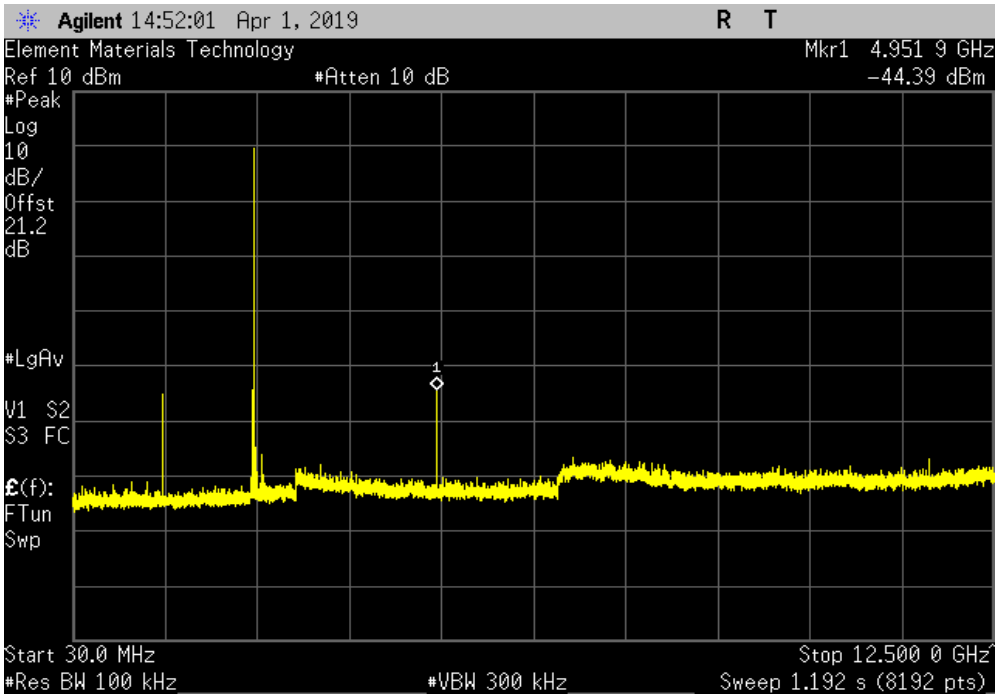
GFSK Mid Channel, 2450 MHz				
Frequency Range	**Measured Freq (MHz)**	**Max Value (dBc)**	**Limit ≤ (dBc)**	**Result**
12.5 GHz - 25 GHz	13792.6	-52.87	-20	Pass



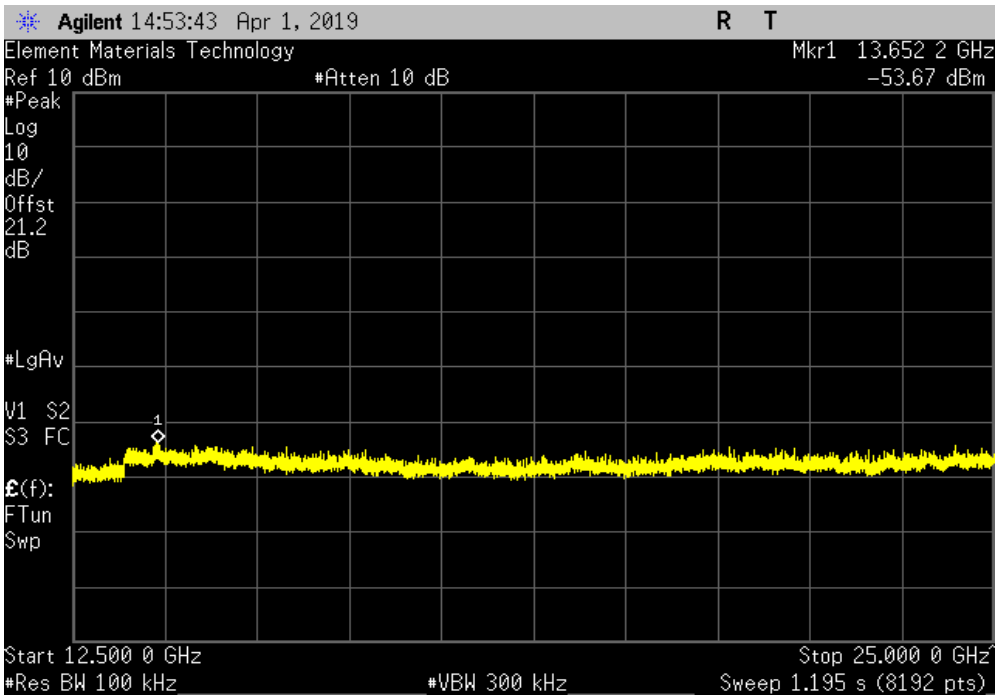
GFSK High Channel, 2476 MHz					
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
Fundamental	2475.96	N/A	N/A	N/A



GFSK High Channel, 2476 MHz				
Frequency Range	Measured Freq (MHz)	Max Value (dBc)	Limit ≤ (dBc)	Result
30 MHz - 12.5 GHz	4951.9	-44.14	-20	Pass



GFSK High Channel, 2476 MHz				
Frequency Range	**Measured Freq (MHz)**	**Max Value (dBc)**	**Limit ≤ (dBc)**	**Result**
12.5 GHz - 25 GHz	13652.2	-53.42	-20	Pass



SPURIOUS RADIATED EMISSIONS

PSA-ESCI 2019.02.26

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

Proprietary DTS radio, continuous Tx, GFSK, Low Ch. = 2401 MHz, Mid Ch = 2450 MHz, High Ch. = 2476 MHz.

POWER SETTINGS INVESTIGATED

Battery

CONFIGURATIONS INVESTIGATED

SYNA0279 - 1

SYNA0279 - 3

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
Filter - Low Pass	Micro-Tronics	LPM50004	LFD	15-Feb-2019	12 mo
Filter - High Pass	Micro-Tronics	HPM50111	HFO	11-Dec-2018	12 mo
Attenuator	Coaxicom	3910-20	AXZ	15-Feb-2019	12 mo
Cable	ESM Cable Corp.	KMKM-72	EVY	24-Aug-2018	12 mo
Cable	None	Standard Gain Horns Cable	EVF	24-Nov-2018	12 mo
Cable	N/A	Double Ridge Horn Cables	EVB	24-Nov-2018	12 mo
Cable	N/A	Bilog Cables	EVA	24-Nov-2018	12 mo
Amplifier - Pre-Amplifier	Miteq	AMF-6F-18002650-25-10P	AVU	24-Aug-2018	12 mo
Amplifier - Pre-Amplifier	Miteq	AMF-6F-12001800-30-10P	AVD	24-Nov-2018	12 mo
Amplifier - Pre-Amplifier	L-3 Narda-MITEQ	AMF-6F-08001200-30-10P	PAO	24-Nov-2018	12 mo
Amplifier - Pre-Amplifier	Miteq	AMF-3D-00100800-32-13P	PAG	24-Nov-2018	12 mo
Amplifier - Pre-Amplifier	Miteq	AM-1616-1000	AOL	24-Nov-2018	12 mo
Antenna - Standard Gain	ETS Lindgren	3160-09	AIV	NCR	0 mo
Antenna - Standard Gain	ETS Lindgren	3160-08	AHV	NCR	0 mo
Antenna - Standard Gain	ETS Lindgren	3160-07	AHU	NCR	0 mo
Antenna - Double Ridge	ETS Lindgren	3115	AIZ	7-Feb-2018	24 mo
Antenna - Biconilog	Teseq	CBL 6141B	AXR	2-Oct-2018	24 mo
Analyzer - Spectrum Analyzer	Agilent	E4446A	AAQ	24-Mar-2019	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 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*LOG(dc).

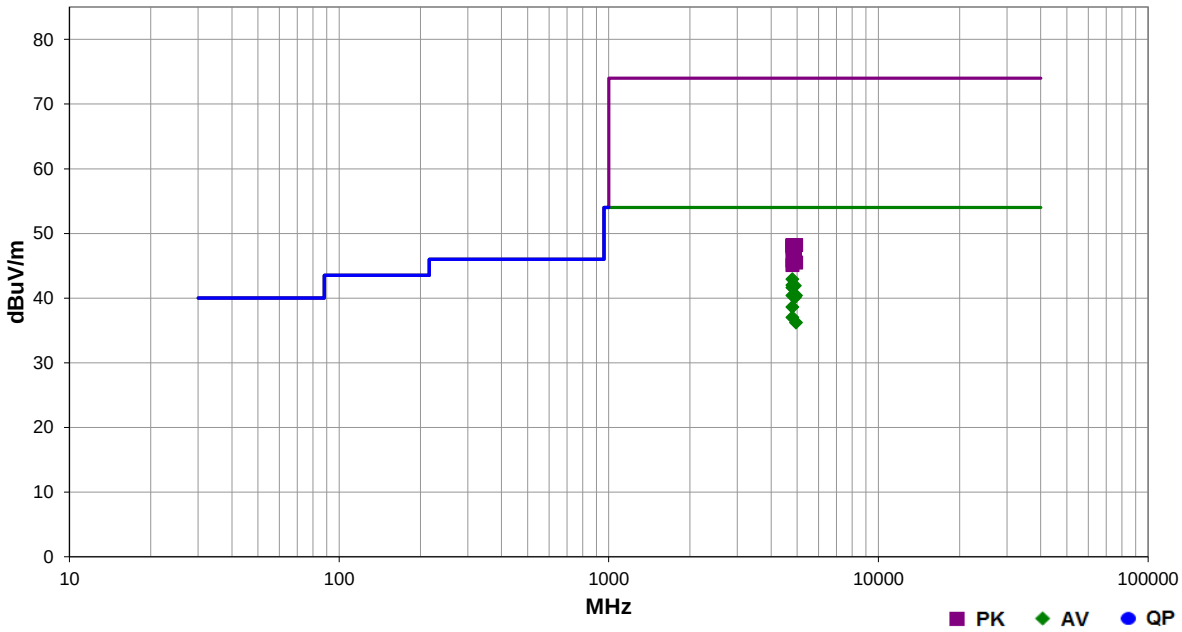
SPURIOUS RADIATED EMISSIONS

EmiR5 2018.09.26 PSA-ESCI 2019.02.26

Work Order:	SYNA0279	**Date:**	2-Apr-2019		
Project:	None	**Temperature:**	21.4 °C		
Job Site:	EV01	**Humidity:**	45.2% RH		
Serial Number:	See Comments	**Barometric Pres.:**	1011 mbar	**Tested by:**	Jody House and Jeff Alcoke
EUT:	MagicBand, BOM Rev 17				
Configuration:	3				
Customer:	Walt Disney Parks and Resorts US, Inc.				
Attendees:	Fabrice Pouani				
EUT Power:	Battery				
Operating Mode:	Proprietary DTS radio, continuous Tx, GFSK, Low Ch. = 2401 MHz, Mid Ch = 2450 MHz, High Ch. = 2476 MHz.				
Deviations:	None				
Comments:	See comments for EUT channel and orientation. High channel EUT: 00:0C:81:23:5b, Low channel EUT: 00:0C:81:26:21. Measurements taken without external battery pack due to concerns of RF coupling on to the DC leads. The compliance software configures the radio to transmit at a duty cycle of 86.6%, a 0.6 dB correction factor was applied to the AVG measurements 10*log(1/0.866) = 0.6 dB				

Test Specifications	**Test Method**
FCC 15.247:2019	ANSI C63.10:2013

Run #	20	**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
4802.150	37.8	4.5	1.0	294.0	0.6	0.0	Vert	AV	0.0	42.9	54.0	-11.1	Low Ch, EUT Horz
4802.075	36.9	4.5	3.2	247.0	0.6	0.0	Horz	AV	0.0	42.0	54.0	-12.0	Low Ch, EUT On Side
4900.000	35.8	5.5	1.0	218.0	0.6	0.0	Vert	AV	0.0	41.9	54.0	-12.1	Mid Ch, EUT Horz
4802.217	36.5	4.5	1.0	286.0	0.6	0.0	Vert	AV	0.0	41.6	54.0	-12.4	Low Ch, EUT Vert
4802.158	35.3	4.5	1.0	341.0	0.6	0.0	Horz	AV	0.0	40.4	54.0	-13.6	Low Ch, EUT Horz
4952.183	34.3	5.5	1.0	215.0	0.6	0.0	Vert	AV	0.0	40.4	54.0	-13.6	High Ch, EUT Horz
4900.075	34.0	5.5	1.0	204.0	0.6	0.0	Horz	AV	0.0	40.1	54.0	-13.9	Mid Ch, EUT On Side
4802.125	33.5	4.5	2.5	322.0	0.6	0.0	Horz	AV	0.0	38.6	54.0	-15.4	Low Ch, EUT Vert
4802.042	31.9	4.5	3.9	139.0	0.6	0.0	Vert	AV	0.0	37.0	54.0	-17.0	Low Ch, EUT On Side
4952.225	30.1	5.5	2.6	247.0	0.6	0.0	Horz	AV	0.0	36.2	54.0	-17.8	High Ch, EUT On Side
4802.233	43.7	4.5	1.0	294.0	0.0	0.0	Vert	PK	0.0	48.2	74.0	-25.8	Low Ch, EUT Horz
4954.492	42.7	5.5	1.0	215.0	0.0	0.0	Vert	PK	0.0	48.2	74.0	-25.8	High Ch, EUT Horz
4801.983	43.6	4.5	1.0	286.0	0.0	0.0	Vert	PK	0.0	48.1	74.0	-25.9	Low Ch, EUT Vert
4802.558	43.5	4.5	3.2	247.0	0.0	0.0	Horz	PK	0.0	48.0	74.0	-26.0	Low Ch, EUT On Side
4802.333	43.3	4.5	1.0	341.0	0.0	0.0	Horz	PK	0.0	47.8	74.0	-26.2	Low Ch, EUT Horz
4899.875	42.1	5.5	1.0	218.0	0.0	0.0	Vert	PK	0.0	47.6	74.0	-26.4	Mid Ch, EUT Horz
4900.475	41.3	5.5	1.0	204.0	0.0	0.0	Horz	PK	0.0	46.8	74.0	-27.2	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
4802.133	41.3	4.5	2.5	322.0	0.0	0.0	Horz	PK	0.0	45.8	74.0	-28.2	Low Ch, EUT Vert
4953.483	40.0	5.5	2.6	247.0	0.0	0.0	Horz	PK	0.0	45.5	74.0	-28.5	High Ch, EUT On Side
4802.675	40.6	4.5	3.9	139.0	0.0	0.0	Vert	PK	0.0	45.1	74.0	-28.9	Low Ch, EUT On Side

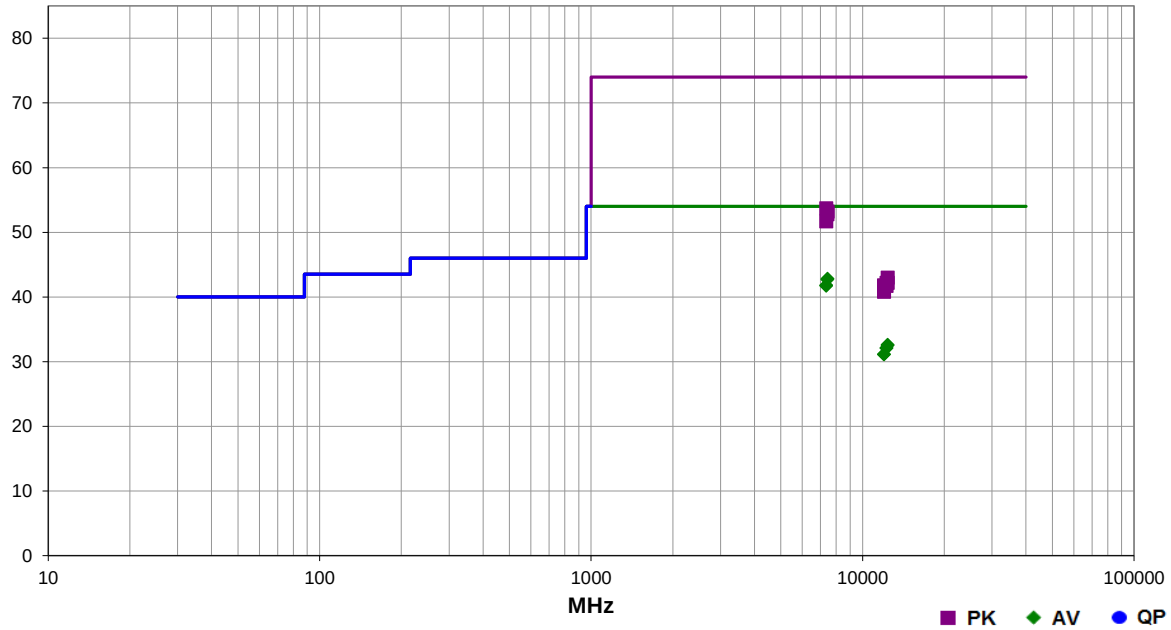
SPURIOUS RADIATED EMISSIONS

EmiR5 2018.09.26 PSA-ESCI 2019.02.26

Work Order:	SYNA0279	**Date:**	1-Apr-2019		
Project:	None	**Temperature:**	20.4 °C		
Job Site:	EV01	**Humidity:**	42% RH		
Serial Number:	000c8426d7	**Barometric Pres.:**	1019 mbar	**Tested by:**	Jeff Alcoke
EUT:	MagicBand, BOM Rev 17				
Configuration:	1				
Customer:	Walt Disney Parks and Resorts US, Inc.				
Attendees:	None				
EUT Power:	Battery				
Operating Mode:	Proprietary DTS radio, continuous Tx, GFSK, Low Ch. = 2401 MHz, Mid Ch = 2450 MHz, High Ch. = 2476 MHz.				
Deviations:	None				
Comments:	See comments below for Channel and EUT orientation. The compliance software configures the radio to transmit at a duty cycle of 86.6%, a 0.6 dB correction factor was applied to the AVG measurements 10*log(1/0.866) = 0.6 dB				

Test Specifications	**Test Method**
FCC 15.247:2019	ANSI C63.10:2013

Run #	15	**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
7427.750	27.9	14.3	4.0	338.0	0.6	0.0	Horz	AV	0.0	42.8	54.0	-11.2	High Ch, EUT on Side
7425.558	27.8	14.3	1.5	197.0	0.6	0.0	Vert	AV	0.0	42.7	54.0	-11.3	High Ch, EUT Vert
7349.325	28.0	13.2	1.0	139.0	0.6	0.0	Horz	AV	0.0	41.8	54.0	-12.2	Mid Ch, EUT on Side
7351.692	27.9	13.2	2.8	226.0	0.6	0.0	Vert	AV	0.0	41.7	54.0	-12.3	Mid Ch, EUT Vert
7350.092	40.5	13.2	2.8	226.0	0.0	0.0	Vert	PK	0.0	53.7	74.0	-20.3	Mid Ch, EUT Vert
7427.692	38.9	14.3	1.5	197.0	0.0	0.0	Vert	PK	0.0	53.2	74.0	-20.8	High Ch, EUT Vert
7427.158	38.5	14.3	4.0	338.0	0.0	0.0	Horz	PK	0.0	52.8	74.0	-21.2	High Ch, EUT on Side
12380.880	30.0	2.0	1.0	360.0	0.6	0.0	Horz	AV	0.0	32.6	54.0	-21.4	High Ch, EUT on Side
12380.930	29.9	2.0	1.7	311.0	0.6	0.0	Vert	AV	0.0	32.5	54.0	-21.5	High Ch, EUT Vert
12250.020	29.7	1.8	1.0	271.0	0.6	0.0	Horz	AV	0.0	32.1	54.0	-21.9	Mid Ch, EUT on Side
12250.220	29.7	1.8	1.5	208.0	0.6	0.0	Vert	AV	0.0	32.1	54.0	-21.9	Mid Ch, EUT Vert
7352.325	38.5	13.2	1.0	139.0	0.0	0.0	Horz	PK	0.0	51.7	74.0	-22.3	Mid Ch, EUT on Side
12003.150	29.8	0.7	1.0	289.0	0.6	0.0	Vert	AV	0.0	31.1	54.0	-22.9	Low Ch, EUT Vert
12005.490	29.8	0.7	1.0	297.0	0.6	0.0	Horz	AV	0.0	31.1	54.0	-22.9	Low Ch, EUT on Side
12381.380	41.0	2.0	1.7	311.0	0.0	0.0	Vert	PK	0.0	43.0	74.0	-31.0	High Ch, EUT Vert
12247.800	40.3	1.9	1.5	208.0	0.0	0.0	Vert	PK	0.0	42.2	74.0	-31.8	Mid Ch, EUT Vert
12379.180	40.2	2.0	1.0	360.0	0.0	0.0	Horz	PK	0.0	42.2	74.0	-31.8	High Ch, EUT on Side
12003.020	41.1	0.7	1.0	297.0	0.0	0.0	Horz	PK	0.0	41.8	74.0	-32.2	Low 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
12249.160	39.8	1.9	1.0	271.0	0.0	0.0	Horz	PK	0.0	41.7	74.0	-32.3	Mid Ch, EUT on Side
12004.470	40.1	0.7	1.0	289.0	0.0	0.0	Vert	PK	0.0	40.8	74.0	-33.2	Low Ch, EUT Vert

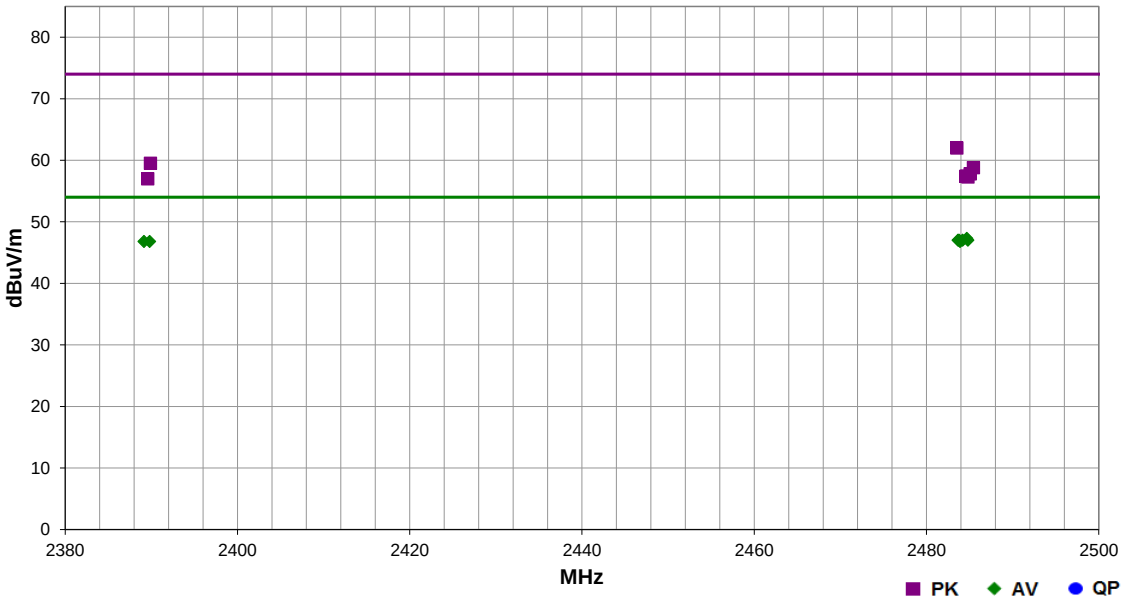
SPURIOUS RADIATED EMISSIONS

EmiR5 2018.09.26 PSA-ESCI 2019.02.26

Work Order:	SYNA0279	**Date:**	2-Apr-2019		
Project:	None	**Temperature:**	21.4 °C		
Job Site:	EV01	**Humidity:**	45.2% RH		
Serial Number:	See Comments	**Barometric Pres.:**	1011 mbar	**Tested by:**	Jody House and Jeff Alcoke
EUT:	MagicBand, BOM Rev 17				
Configuration:	3				
Customer:	Walt Disney Parks and Resorts US, Inc.				
Attendees:	Fabrice Pouani				
EUT Power:	Battery				
Operating Mode:	Proprietary DTS radio, continuous Tx, GFSK, Low Ch. = 2401 MHz, Mid Ch = 2450 MHz, High Ch. = 2476 MHz.				
Deviations:	None				
Comments:	See comments for EUT channel and orientation. High channel EUT: 00:0C:81:23:5b, Low channel EUT: 00:0C:81:26:21. Measurements taken without external battery pack due to concerns of RF coupling on to the DC leads. The compliance software configures the radio to transmit at a duty cycle of 86.6%, a 0.6 dB correction factor was applied to the AVG measurements 10*log(1/0.866) = 0.6 dB				

Test Specifications	**Test Method**
FCC 15.247:2019	ANSI C63.10:2013

Run #	19	**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
2484.697	31.5	-4.8	1.2	106.0	0.6	20.0	Horz	AV	0.0	47.3	54.0	-6.7	High Ch, EUT On Side
2483.663	31.3	-4.9	1.0	21.0	0.6	20.0	Vert	AV	0.0	47.0	54.0	-7.0	High Ch, EUT On Side
2483.797	31.3	-4.9	1.4	115.0	0.6	20.0	Horz	AV	0.0	47.0	54.0	-7.0	High Ch, EUT Horz
2484.817	31.2	-4.8	1.0	72.0	0.6	20.0	Vert	AV	0.0	47.0	54.0	-7.0	High Ch, EUT Horz
2484.203	31.2	-4.8	3.4	142.0	0.6	20.0	Horz	AV	0.0	47.0	54.0	-7.0	High Ch, EUT Vert
2483.897	31.1	-4.9	1.4	196.0	0.6	20.0	Vert	AV	0.0	46.8	54.0	-7.2	High Ch, EUT Vert
2389.800	31.3	-5.1	1.0	294.0	0.6	20.0	Horz	AV	0.0	46.8	54.0	-7.2	Low Ch, EUT On Side
2389.143	31.3	-5.1	2.4	221.0	0.6	20.0	Vert	AV	0.0	46.8	54.0	-7.2	Low Ch, EUT On Side
2483.523	46.9	-4.9	1.0	21.0	0.0	20.0	Vert	PK	0.0	62.0	74.0	-12.0	High Ch, EUT On Side
2389.883	44.6	-5.1	2.4	221.0	0.0	20.0	Vert	PK	0.0	59.5	74.0	-14.5	Low Ch, EUT On Side
2485.460	43.6	-4.8	1.4	115.0	0.0	20.0	Horz	PK	0.0	58.8	74.0	-15.2	High Ch, EUT Horz
2485.073	42.6	-4.8	1.4	196.0	0.0	20.0	Vert	PK	0.0	57.8	74.0	-16.2	High Ch, EUT Vert
2484.683	42.2	-4.8	1.2	106.0	0.0	20.0	Horz	PK	0.0	57.4	74.0	-16.6	High Ch, EUT On Side
2484.590	42.2	-4.8	1.0	72.0	0.0	20.0	Vert	PK	0.0	57.4	74.0	-16.6	High Ch, EUT Horz
2484.823	42.1	-4.8	3.4	142.0	0.0	20.0	Horz	PK	0.0	57.3	74.0	-16.7	High Ch, EUT Vert
2389.580	42.1	-5.1	1.0	294.0	0.0	20.0	Horz	PK	0.0	57.0	74.0	-17.0	Low Ch, EUT On Side