

NORTHWEST EMC

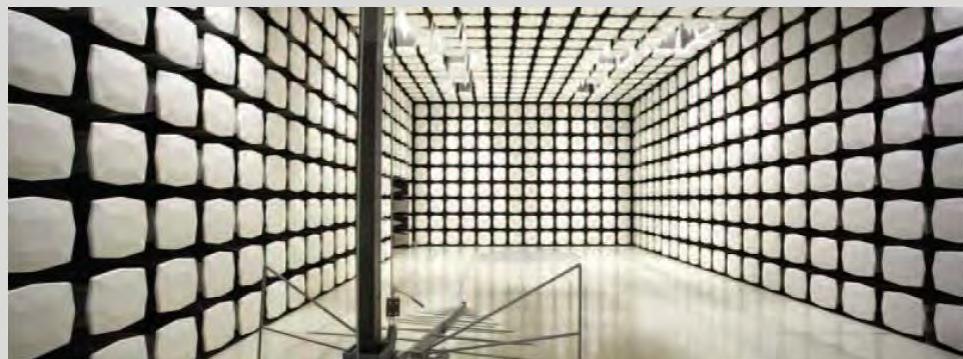
Walt Disney Parks and Resorts US, Inc.

MagicBand 2b

FCC 15.247:2016

2.4 GHz GFSK Radio Module

Report # SYNA0189.1



NVLAP[®]

NVLAP Lab Code: 200629-0

This report must not be used to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government of the United States of America.

CERTIFICATE OF TEST

Last Date of Test: May 11, 2016
Walt Disney Parks and Resorts US, Inc.
Model: MagicBand 2b

Radio Equipment Testing

Standards

| Specification | Method |
|-----------------|------------------|
| FCC 15.247:2016 | ANSI C63.10:2013 |
| | KDB 558074 |

Results

| Method Clause | Test Description | Applied | Results | Comments |
|---------------|------------------------------------|---------|---------|--|
| 6.2 | AC – Powerline Conducted Emissions | No | N/A | Not required for a battery powered EUT |
| 6.5, 6.6 | Spurious Radiated Emissions | Yes | Pass | |
| 11.6 | Duty Cycle | Yes | Pass | |
| 11.8.2 | Occupied Bandwidth | Yes | Pass | |
| 11.9.2.2.4 | Output Power | Yes | Pass | |
| 11.10.2 | Power Spectral Density | Yes | Pass | |
| 11.11 | Band Edge Compliance | Yes | Pass | |
| 11.11 | Spurious Conducted Emissions | Yes | Pass | |

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 Northwest EMC to certify transmitters to FCC and IC specifications.

NVLAP - Each laboratory is accredited by NVLAP to ISO 17025

Canada

IC - Recognized by Industry Canada as a Certification Body (CB). Certification chambers and Open Area Test Sites are filed with IC.

European Union

European Commission – Validated by the European Commission as a Notified Body under the R&TTE Directive.

Australia/New Zealand

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

Korea

MSIP / 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://www.nwemc.com/accreditations/>

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

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.

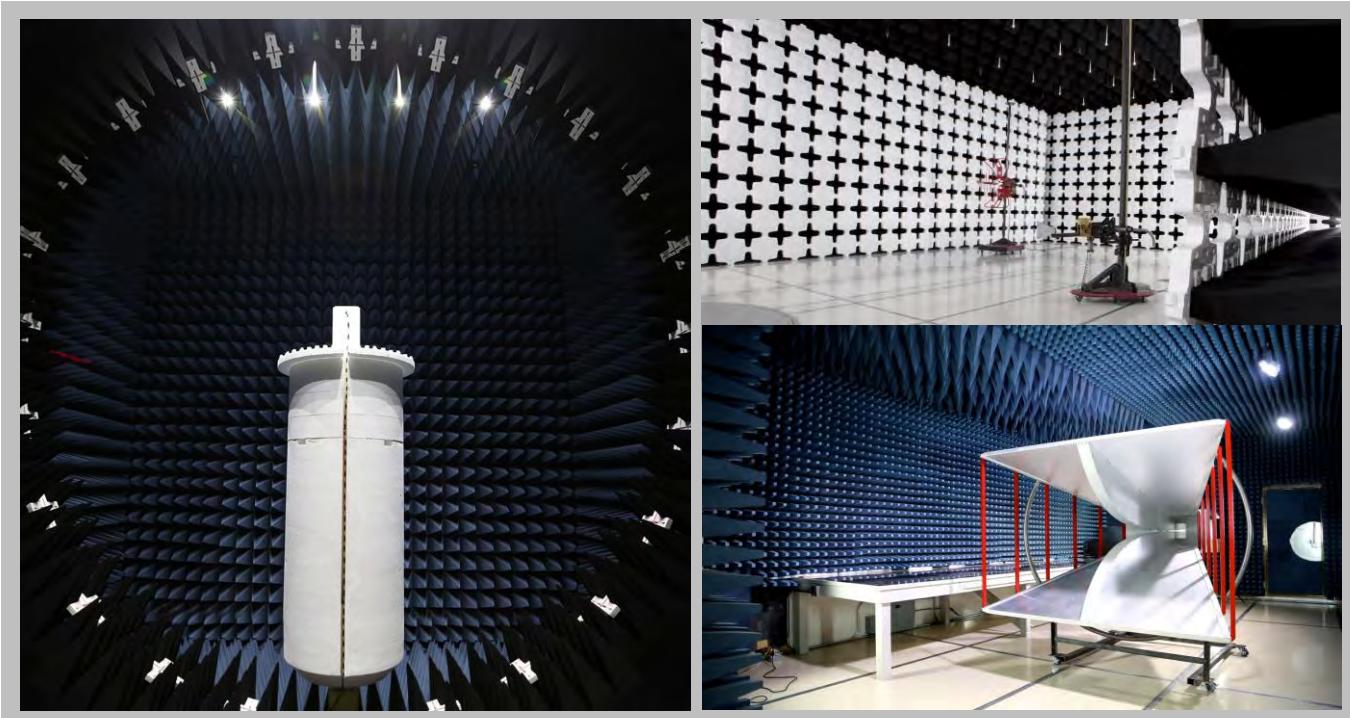
The following table represents the Measurement Uncertainty (MU) budgets for each of the tests that may be contained in this report.

| <u>Test</u> | <u>+ MU</u> | <u>- MU</u> |
|---------------------------------------|-------------|-------------|
| 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) | 5.0 dB | -5.0 dB |
| AC Powerline Conducted Emissions (dB) | 2.4 dB | -2.4 dB |

FACILITIES



| California | Minnesota | New York | Oregon | Texas | Washington |
|---|---|---|--|--|--|
| Labs OC01-13 41 Tesla Irvine, CA 92618 (949) 861-8918 | Labs MN01-08, MN10 9349 W Broadway Ave. Brooklyn Park, MN 55445 (612)-638-5136 | Labs NY01-04 4939 Jordan Rd. Elbridge, NY 13060 (315) 554-8214 | Labs EV01-12 22975 NW Evergreen Pkwy Hillsboro, OR 97124 (503) 844-4066 | Labs TX01-09 3801 E Plano Pkwy Plano, TX 75074 (469) 304-5255 | 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 |
| Industry Canada | | | | | |
| 2834B-1, 2834B-3 | 2834E-1 | 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/RRA, MIC, MOC, NCC, OFCA | | | | | |
| US0158 | US0175 | N/A | US0017 | US0191 | US0157 |



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, Florida 32830 |
| Test Requested By: | Brian Piquette of Synapse Product Development LLC on behalf of Walt Disney Parks and Resorts US, Inc. |
| Model: | MagicBand2b |
| First Date of Test: | May 11, 2016 |
| Last Date of Test: | May 11, 2016 |
| Receipt Date of Samples: | May 11, 2016 |
| Equipment Design Stage: | Production |
| Equipment Condition: | No Damage |

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 SYNA0189- 1

| EUT | | | | |
|--------------------|--|--------------------------|----------------------|--|
| Description | Manufacturer | Model/Part Number | Serial Number | |
| Identity Band | Walt Disney Parks and Resorts US, Inc. | MagicBand 2b | 0006D689FD | |
| Identity Band | Walt Disney Parks and Resorts US, Inc. | MagicBand 2b | 0006D68821 | |

Configuration SYNA0189- 3

| EUT | | | | |
|--------------------|--|--------------------------|----------------------|--|
| Description | Manufacturer | Model/Part Number | Serial Number | |
| Identity Band | Walt Disney Parks and Resorts US, Inc. | MagicBand 2b | 0006D68961 | |

Peripherals in test setup boundary

| Peripherals in test setup boundary | | | | |
|---|---------------------|--------------------------|----------------------|--|
| Description | Manufacturer | Model/Part Number | Serial Number | |
| External Battery Pack | None | None | None | |

MODIFICATIONS

Equipment Modifications

| Item | Date | Test | Modification | Note | Disposition of EUT |
|------|-----------|------------------------------|--------------------------------------|---|---|
| 1 | 5/11/2016 | Duty Cycle | Tested as delivered to Test Station. | No EMI suppression devices were added or modified during this test. | EUT remained at Northwest EMC following the test. |
| 2 | 5/11/2016 | Occupied Bandwidth | Tested as delivered to Test Station. | No EMI suppression devices were added or modified during this test. | EUT remained at Northwest EMC following the test. |
| 3 | 5/11/2016 | Output Power | Tested as delivered to Test Station. | No EMI suppression devices were added or modified during this test. | EUT remained at Northwest EMC following the test. |
| 4 | 5/11/2016 | Power Spectral Density | Tested as delivered to Test Station. | No EMI suppression devices were added or modified during this test. | EUT remained at Northwest EMC following the test. |
| 5 | 5/11/2016 | Band Edge Compliance | Tested as delivered to Test Station. | No EMI suppression devices were added or modified during this test. | EUT remained at Northwest EMC following the test. |
| 6 | 5/11/2016 | Spurious Conducted Emissions | Tested as delivered to Test Station. | No EMI suppression devices were added or modified during this test. | EUT remained at Northwest EMC following the test. |
| 7 | 5/11/2016 | 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

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. | Interval (mo) |
|------------------------------|--------------------|------------------|-----|-----------|---------------|
| Generator - Signal | Agilent | N5183A | TIA | 4/6/2016 | 24 |
| Cable | ESM Cable Corp. | TTBJ-141 KMMK-72 | NC5 | 5/6/2016 | 12 |
| Attenuator | Fairview Microwave | SA4014-20 | TKV | 3/4/2016 | 12 |
| Block - DC | Fairview Microwave | SD3379 | AMU | 5/6/2016 | 12 |
| Analyzer - Spectrum Analyzer | Agilent | E4440A | AFE | 6/22/2015 | 12 |

TEST DESCRIPTION

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. A direct connection was made between the RF output of the EUT and a spectrum analyzer. Attenuation and a DC block were used.

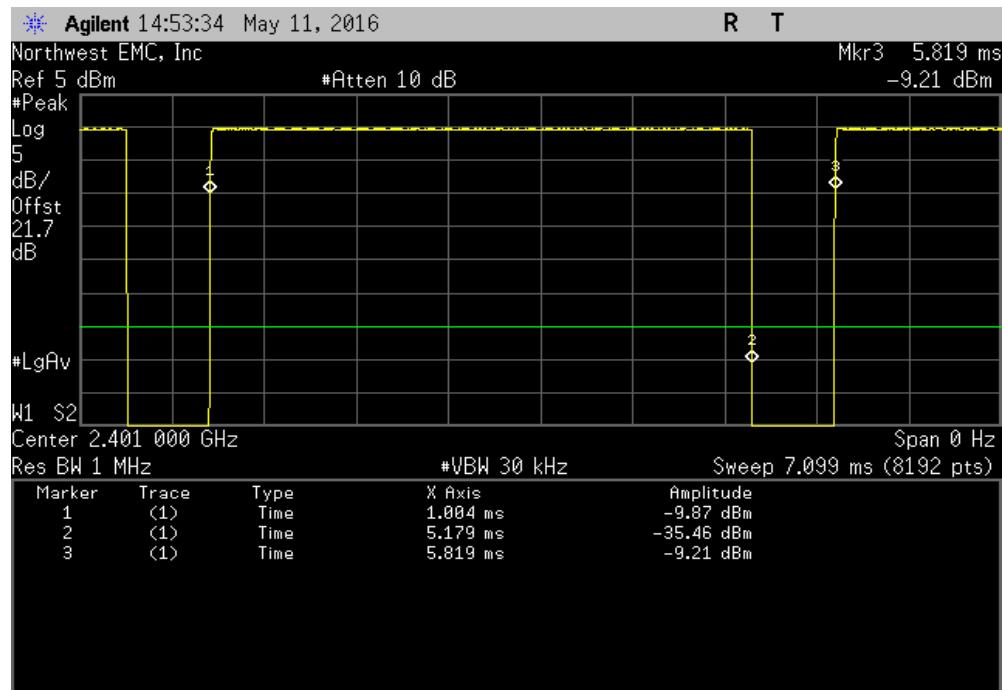
The test software provided for operation in a fixed, single channel mode allows the EUT to operate continuously at 86.7% Duty Cycle.

DUTY CYCLE

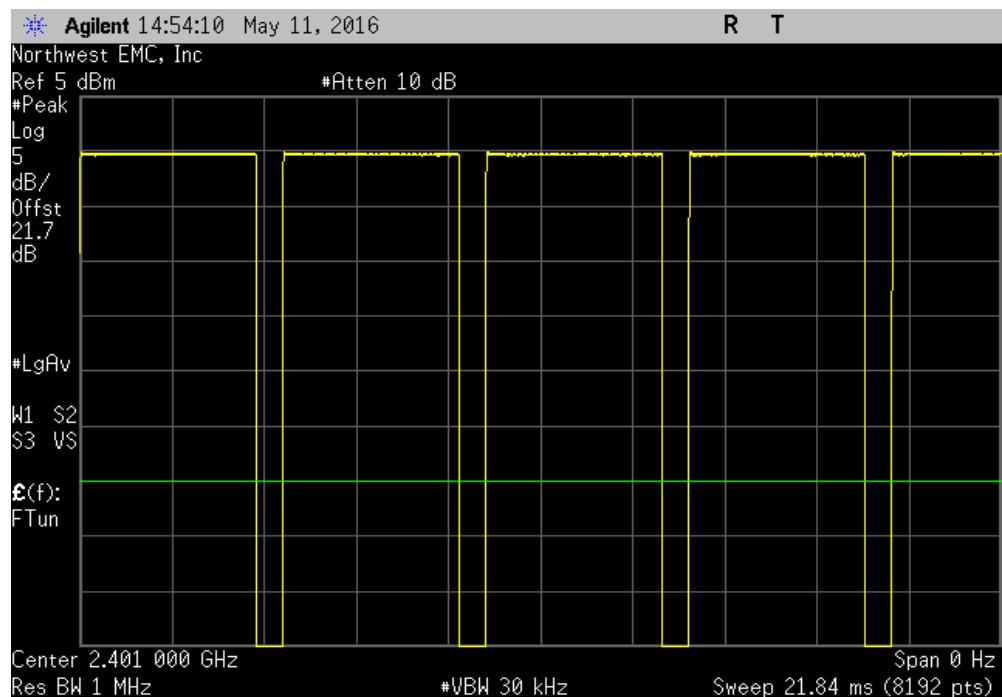
| EUT: | MagicBand 2b | | Work Order: | SYNA0189 | |
|-----------------------------------|--|-----------|-------------------------|-----------|------------------|
| Serial Number: | 0006D68961 | | Date: | 05/11/16 | |
| Customer: | Walt Disney Parks and Resorts US, Inc. | | Temperature: | 24°C | |
| Attendees: | Martha Calderon | | Humidity: | 27% | |
| Project: | None | | Barometric Pres.: | 1016 | |
| Tested by: | Matthew Barnes | Power: | Battery | Job Site: | NC02 |
| TEST SPECIFICATIONS | | | Test Method | | |
| FCC 15.247:2016 | | | ANSI C63.10:2013 | | |
| COMMENTS | | | | | |
| Powered by external battery pack. | | | | | |
| DEVIATIONS FROM TEST STANDARD | | | | | |
| None | | | | | |
| Configuration # | 3 | Signature | <i>Matthew W Barnes</i> | | |
| | | | Pulse Width | Period | Number of Pulses |
| GFSK Low Channel, 2401 MHz | | | 4.175 ms | 4.814 ms | 1 |
| GFSK Low Channel, 2401 MHz | | | N/A | N/A | 5 |
| GFSK Mid Channel, 2450 MHz | | | 4.175 ms | 4.814 ms | 1 |
| GFSK Mid Channel, 2450 MHz | | | N/A | N/A | 5 |
| GFSK High Channel, 2476 MHz | | | 4.174 ms | 4.814 ms | 1 |
| GFSK High Channel, 2476 MHz | | | N/A | N/A | 5 |
| | | | | | Value (%) |
| | | | | | Limit (%) |
| | | | | | Results |

DUTY CYCLE

| GFSK Low Channel, 2401 MHz | | | | | |
|----------------------------|----------|------------------|-----------|-----------|---------|
| Pulse Width | Period | Number of Pulses | Value (%) | Limit (%) | Results |
| 4.175 ms | 4.814 ms | 1 | 86.7 | N/A | N/A |

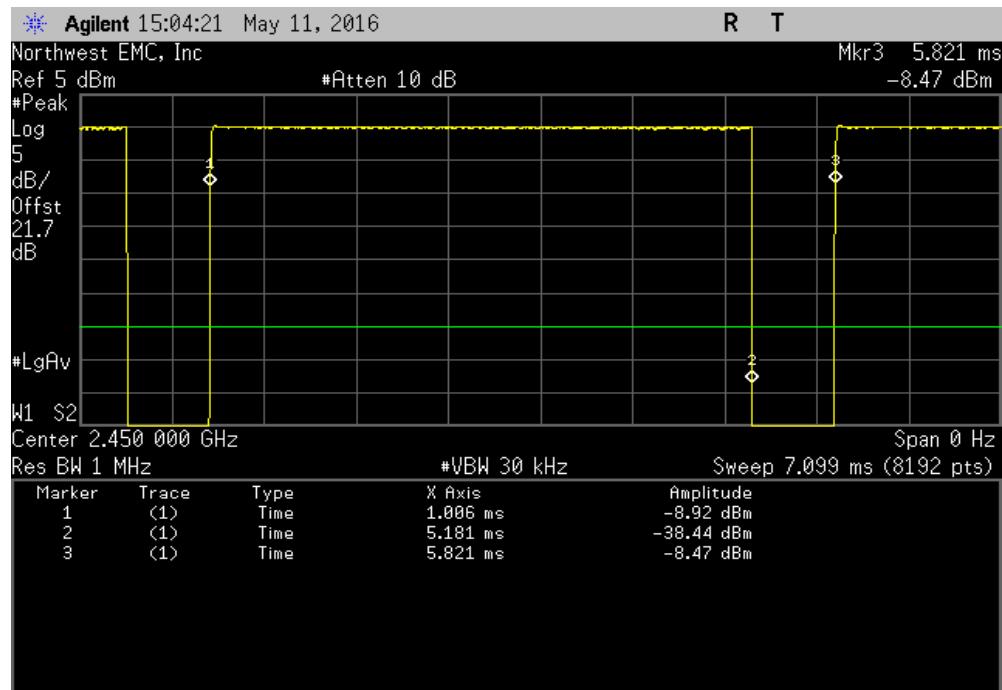


| GFSK Low Channel, 2401 MHz | | | | | |
|----------------------------|--------|------------------|-----------|-----------|---------|
| Pulse Width | Period | Number of Pulses | Value (%) | Limit (%) | Results |
| N/A | N/A | 5 | N/A | N/A | N/A |

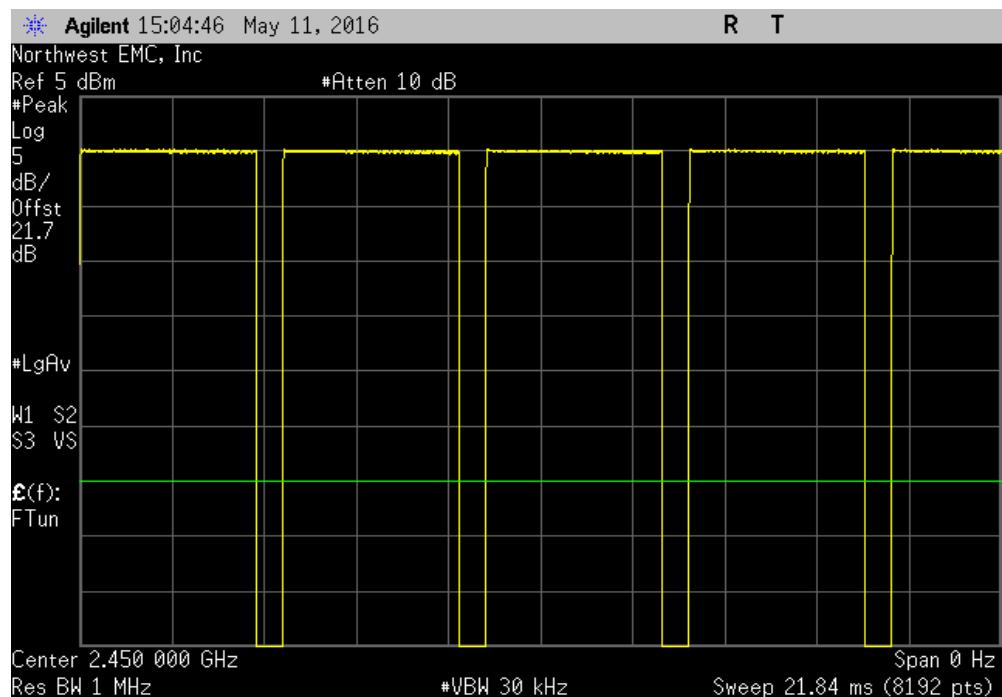


DUTY CYCLE

| GFSK Mid Channel, 2450 MHz | | | | | | |
|----------------------------|----------|------------------|-----------|-----------|---------|--|
| Pulse Width | Period | Number of Pulses | Value (%) | Limit (%) | Results | |
| 4.175 ms | 4.814 ms | 1 | 86.7 | N/A | N/A | |

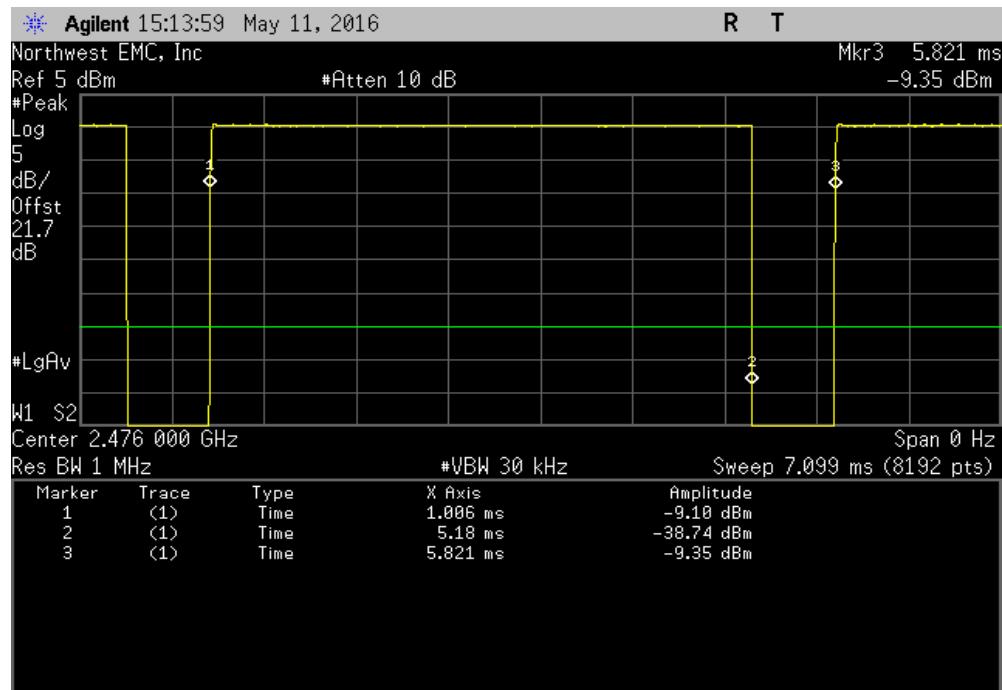


| GFSK Mid Channel, 2450 MHz | | | | | | |
|----------------------------|--------|------------------|-----------|-----------|---------|--|
| Pulse Width | Period | Number of Pulses | Value (%) | Limit (%) | Results | |
| N/A | N/A | 5 | N/A | N/A | N/A | |

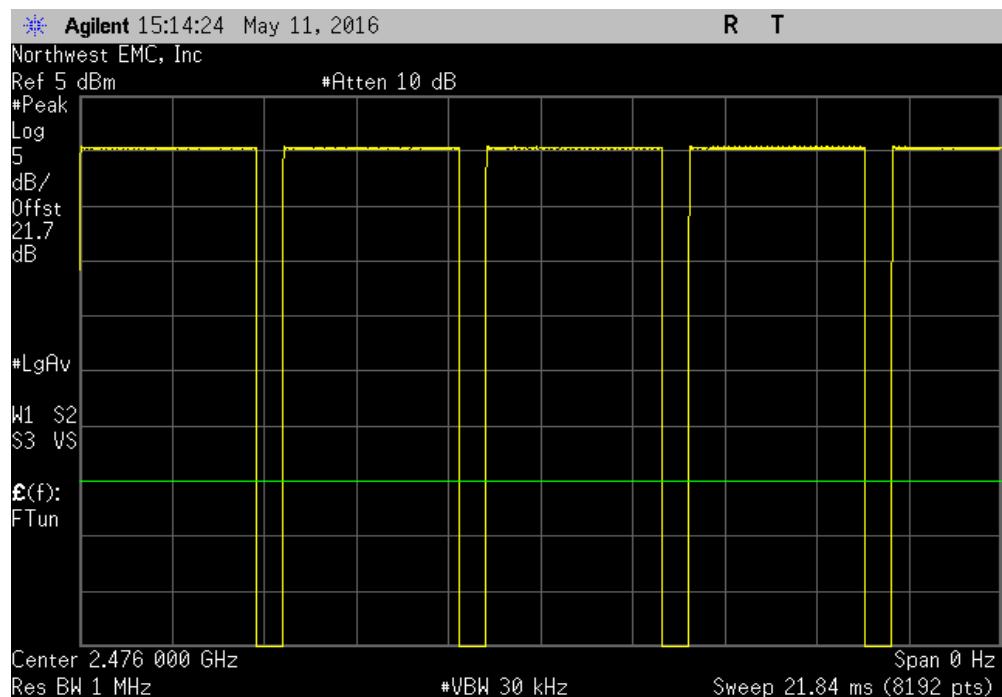


DUTY CYCLE

| GFSK High Channel, 2476 MHz | | | | | |
|-----------------------------|----------|------------------|-----------|-----------|---------|
| Pulse Width | Period | Number of Pulses | Value (%) | Limit (%) | Results |
| 4.174 ms | 4.814 ms | 1 | 86.7 | 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

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. | Interval (mo) |
|------------------------------|--------------------|------------------|-----|-----------|---------------|
| Generator - Signal | Agilent | N5183A | TIA | 4/6/2016 | 24 |
| Cable | ESM Cable Corp. | TTBJ-141 KMKM-72 | NC5 | 5/6/2016 | 12 |
| Attenuator | Fairview Microwave | SA4014-20 | TKV | 3/4/2016 | 12 |
| Block - DC | Fairview Microwave | SD3379 | AMU | 5/6/2016 | 12 |
| Analyzer - Spectrum Analyzer | Agilent | E4440A | AFE | 6/22/2015 | 12 |

TEST DESCRIPTION

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.

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

OCCUPIED BANDWIDTH

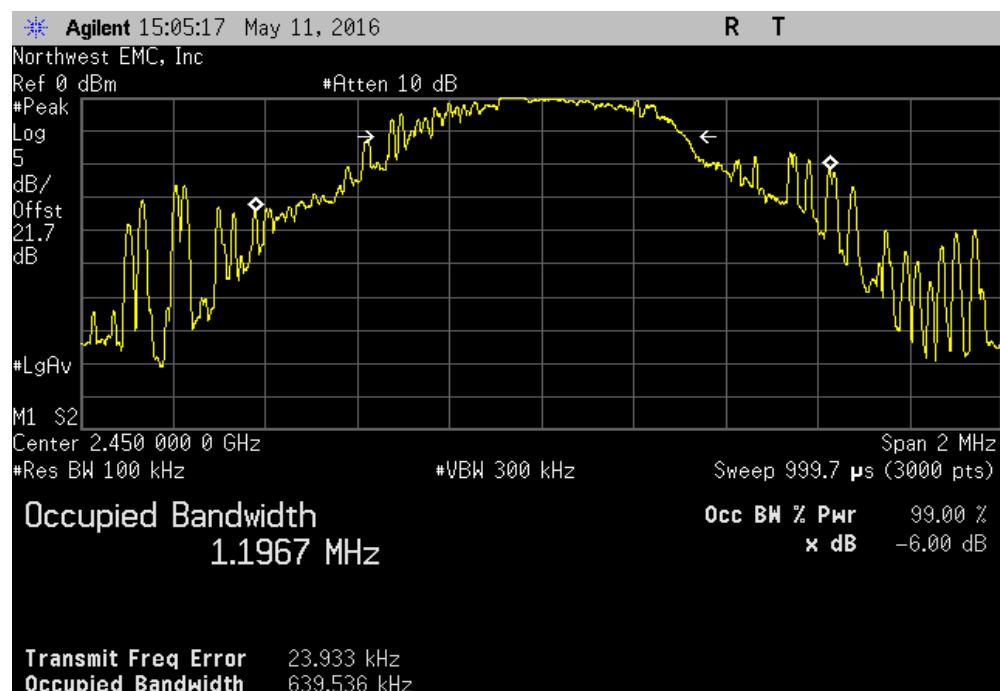
| | | | |
|-----------------------------------|--|--|--------------|
| EUT: | MagicBand 2b | Work Order: | SYNA0189 |
| Serial Number: | 0006D68961 | Date: | 05/11/16 |
| Customer: | Walt Disney Parks and Resorts US, Inc. | Temperature: | 24°C |
| Attendees: | Martha Calderon | Humidity: | 27% |
| Project: | None | Barometric Pres.: | 1016 |
| Tested by: | Matthew Barnes | Job Site: | NC02 |
| TEST SPECIFICATIONS | | Power: | Battery |
| | | Test Method | |
| FCC 15.247:2016 | | ANSI C63.10:2013 | |
| COMMENTS | | | |
| Powered by external battery pack. | | | |
| DEVIATIONS FROM TEST STANDARD | | | |
| None | | | |
| Configuration # | 3 |  Signature | |
| | | | Limit (>) |
| | | | Value |
| GFSK Low Channel, 2401 MHz | | | 565.873 kHz |
| GFSK Mid Channel, 2450 MHz | | | 639.536 kHz |
| GFSK High Channel, 2476 MHz | | | 702.522 kHz |
| | | | 500 kHz |
| | | | Pass |
| | | | 500 kHz |
| | | | Pass |
| | | | 500 kHz |
| | | | Pass |

OCCUPIED BANDWIDTH

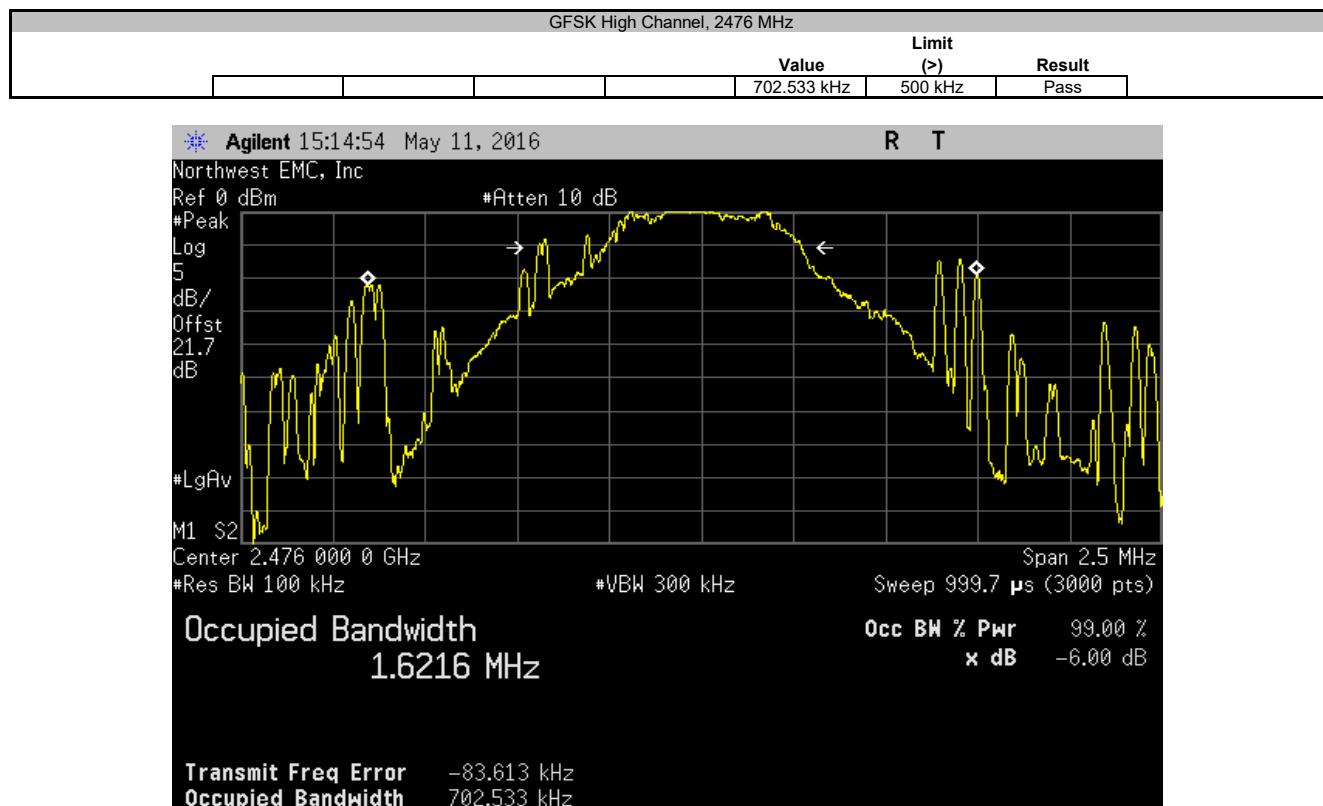
| GFSK Low Channel, 2401 MHz | | | Value | Limit | Result |
|----------------------------|--|--|-------------|-------------|--------|
| | | | 565.873 kHz | (>) 500 kHz | Pass |



| GFSK Mid Channel, 2450 MHz | | | Value | Limit | Result |
|----------------------------|--|--|-------------|-------------|--------|
| | | | 639.536 kHz | (>) 500 kHz | Pass |



OCCUPIED BANDWIDTH



OUTPUT POWER

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. | Interval (mo) |
|------------------------------|--------------------|------------------|-----|-----------|---------------|
| Generator - Signal | Agilent | N5183A | TIA | 4/6/2016 | 24 |
| Cable | ESM Cable Corp. | TTBJ-141 KMKM-72 | NC5 | 5/6/2016 | 12 |
| Attenuator | Fairview Microwave | SA4014-20 | TKV | 3/4/2016 | 12 |
| Block - DC | Fairview Microwave | SD3379 | AMU | 5/6/2016 | 12 |
| Analyzer - Spectrum Analyzer | Agilent | E4440A | AFE | 6/22/2015 | 12 |

TEST DESCRIPTION

The transmit frequency was set to the required channels in each band. The transmit power was set to its default maximum. A direct connection was made between the RF output of the EUT and a spectrum analyzer. Attenuation and a DC block were used. The reference level offset on the spectrum analyzer was adjusted to compensate for cable loss and the external attenuation used between the RF output and the spectrum analyzer input.

Prior to measuring peak transmit power the DTS bandwidth (B) and the transmission pulse duration (T) were measured. Both are required to determine the method of measuring Maximum Conducted Output Power. The transmission pulse duration (T) was measured using a zero span on the spectrum analyzer to see the pulses in the time domain.

The method found in ANSI C63.10:2013 Section 11.9.2.2.4 was used because the RBW on the analyzer was greater than the DTS Bandwidth of the radio..

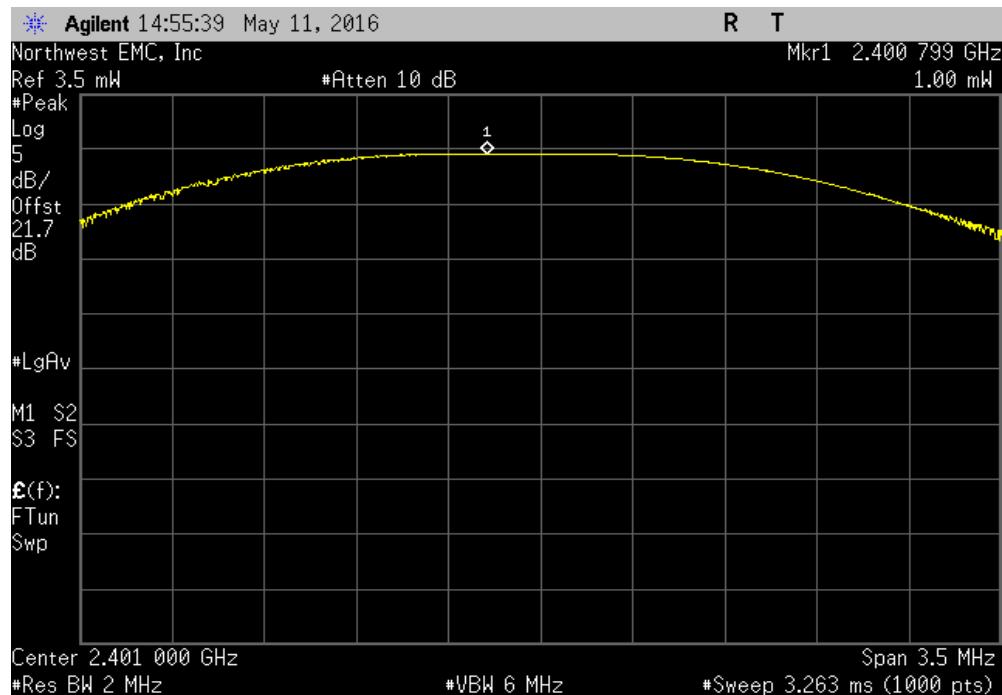
De Facto EIRP Limit: Per 47 CFR 15.247 (b)(1-3), the EUT meets the de facto EIRP limit of +36 dBm.

OUTPUT POWER

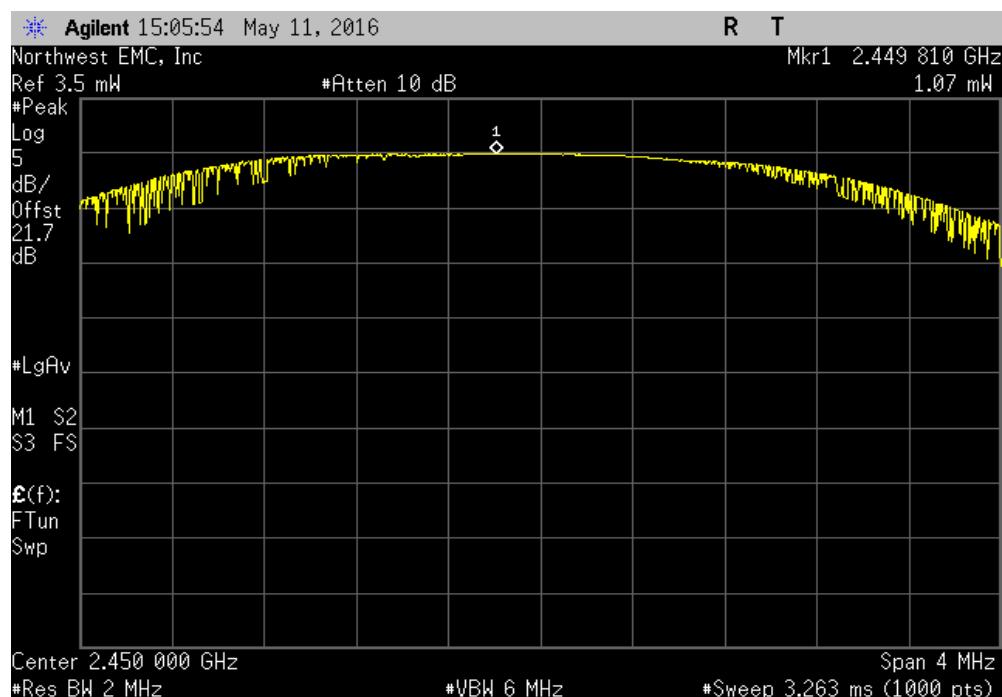
| | | | |
|-----------------------------------|--|--|---------------------------------|
| EUT: | MagicBand 2b | Work Order: | SYNA0189 |
| Serial Number: | 0006D68961 | Date: | 05/11/16 |
| Customer: | Walt Disney Parks and Resorts US, Inc. | Temperature: | 24°C |
| Attendees: | Martha Calderon | Humidity: | 27% |
| Project: | None | Barometric Pres.: | 1016 |
| Tested by: | Matthew Barnes | Job Site: | NC02 |
| TEST SPECIFICATIONS | | Power: | Battery |
| | | Test Method | |
| FCC 15.247:2016 | | ANSI C63.10:2013 | |
| COMMENTS | | | |
| Powered by external battery pack. | | | |
| DEVIATIONS FROM TEST STANDARD | | | |
| None | | | |
| Configuration # | 3 |  Signature | |
| | | | Value Limit (less than) |
| GFSK Low Channel, 2401 MHz | | | 1.001 mW 1 W Pass |
| GFSK Mid Channel, 2450 MHz | | | 1.074 mW 1 W Pass |
| CESK High Channel, 2476 MHz | | | 1.176 mW 1 W Pass |

OUTPUT POWER

| GFSK Low Channel, 2401 MHz | | |
|----------------------------|--------------|--------|
| Value | Limit (<) | Result |
| 1.001 mW | 1 W | Pass |

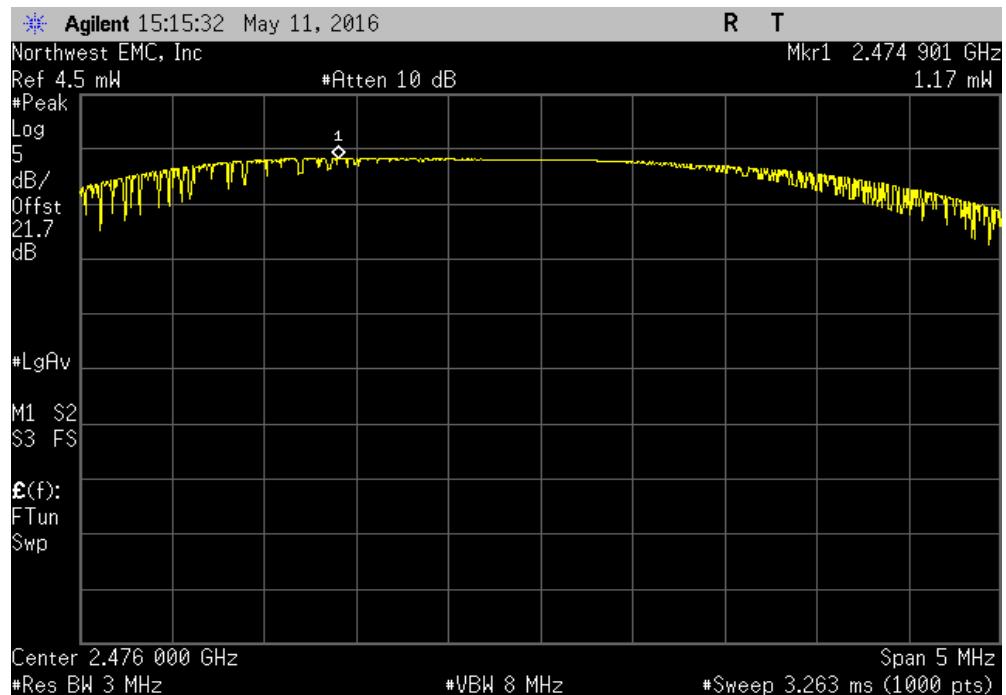


| GFSK Mid Channel, 2450 MHz | | |
|----------------------------|--------------|--------|
| Value | Limit (<) | Result |
| 1.074 mW | 1 W | Pass |



OUTPUT POWER

| GFSK High Channel, 2476 MHz | | | Value | Limit | Result |
|-----------------------------|--|--|----------|-------|--------|
| | | | (<) | | |
| | | | 1.175 mW | 1 W | Pass |



POWER SPECTRAL DENSITY

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. | Interval (mo) |
|------------------------------|--------------------|------------------|-----|-----------|---------------|
| Generator - Signal | Agilent | N5183A | TIA | 4/6/2016 | 24 |
| Cable | ESM Cable Corp. | TTBJ-141 KMKM-72 | NC5 | 5/6/2016 | 12 |
| Attenuator | Fairview Microwave | SA4014-20 | TKV | 3/4/2016 | 12 |
| Block - DC | Fairview Microwave | SD3379 | AMU | 5/6/2016 | 12 |
| Analyzer - Spectrum Analyzer | Agilent | E4440A | AFE | 6/22/2015 | 12 |

TEST DESCRIPTION

The maximum power spectral density measurements was measured using the channels and modes as called out on the following data sheets.

A direct connection was made between the RF output of the EUT and a spectrum analyzer. External attenuation and a DC block were used. The reference level offset on the spectrum analyzer was adjusted to compensate for cable loss and the external attenuation used between the RF output and the spectrum analyzer input.

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

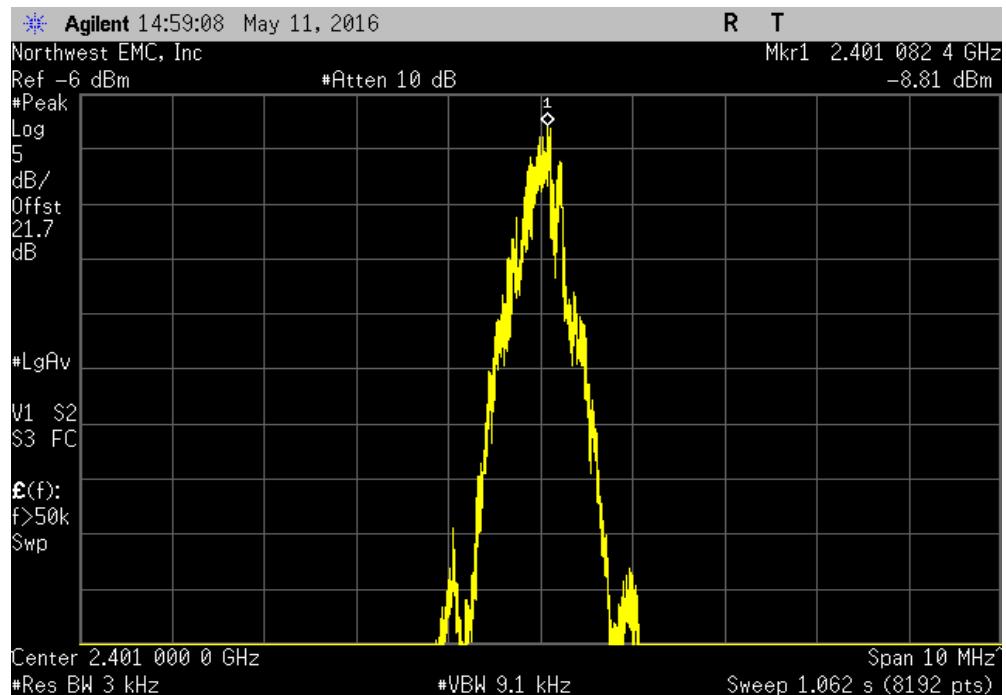
POWER SPECTRAL DENSITY

**NORTHWEST
EMC**

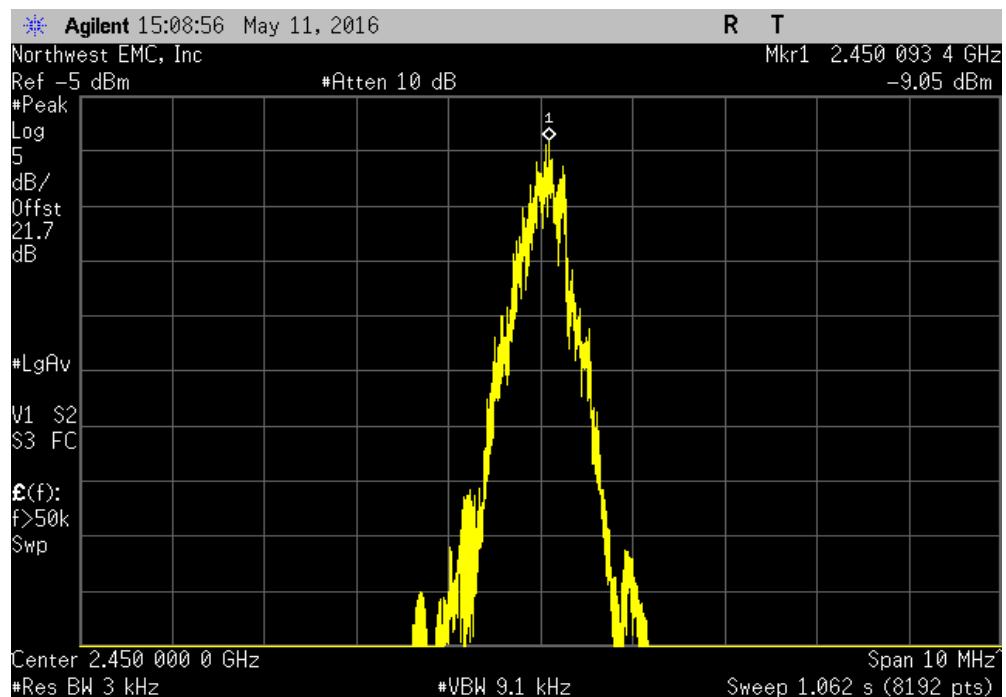
| | | | |
|-----------------------------------|--|--|------------|
| EUT: | MagicBand 2b | Work Order: | SYNA0189 |
| Serial Number: | 0006D68961 | Date: | 05/11/16 |
| Customer: | Walt Disney Parks and Resorts US, Inc. | Temperature: | 24°C |
| Attendees: | Martha Calderon | Humidity: | 27% |
| Project: | None | Barometric Pres.: | 1016 |
| Tested by: | Matthew Barnes | Job Site: | NC02 |
| TEST SPECIFICATIONS | | Power: | Battery |
| | | Test Method | |
| FCC 15.247:2016 | | ANSI C63.10:2013 | |
| COMMENTS | | | |
| Powered by external battery pack. | | | |
| DEVIATIONS FROM TEST STANDARD | | | |
| None | | | |
| Configuration # | 3 |  Signature | |
| | | Value | Limit |
| | | dBm/3kHz | < dBm/3kHz |
| | | Results | |
| GFSK Low Channel, 2401 MHz | | | |
| GFSK Mid Channel, 2450 MHz | | | |
| GFSK High Channel, 2476 MHz | | | |

POWER SPECTRAL DENSITY

| GFSK Low Channel, 2401 MHz | | | | Value dBm/3kHz | Limit < dBm/3kHz | Results |
|----------------------------|--|--|--|-------------------|---------------------|---------|
| | | | | -8.807 | 8 | Pass |

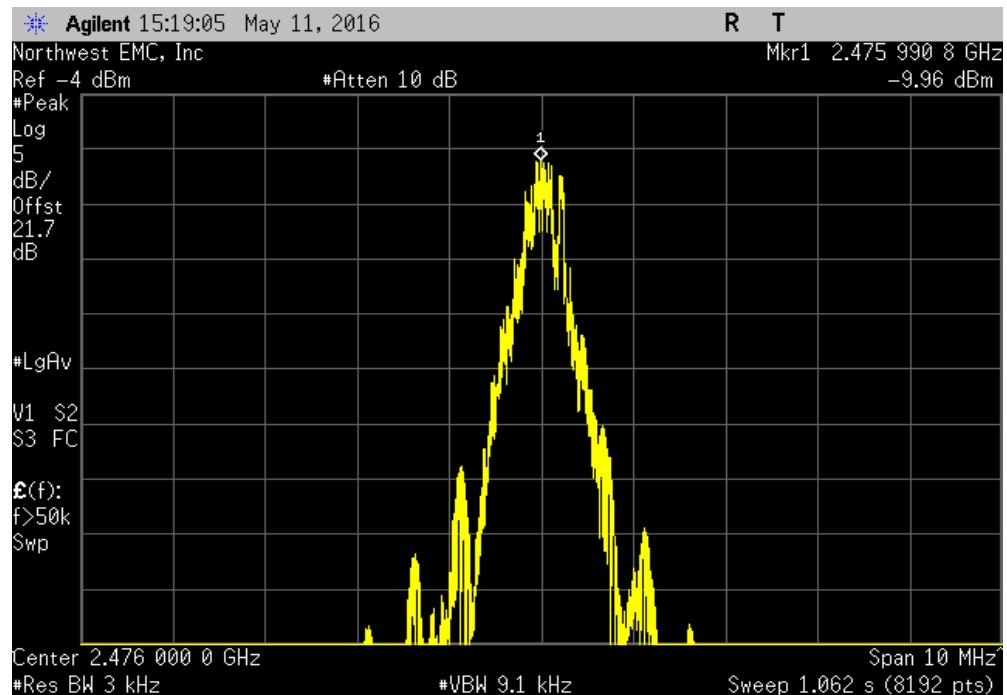


| GFSK Mid Channel, 2450 MHz | | | | Value dBm/3kHz | Limit < dBm/3kHz | Results |
|----------------------------|--|--|--|-------------------|---------------------|---------|
| | | | | -9.051 | 8 | Pass |



POWER SPECTRAL DENSITY

| GFSK High Channel, 2476 MHz | | | | Value | Limit | Results |
|-----------------------------|--|--|--|----------|------------|---------|
| | | | | dBm/3kHz | < dBm/3kHz | |
| | | | | -9.959 | 8 | Pass |



BAND EDGE COMPLIANCE

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

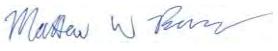
| Description | Manufacturer | Model | ID | Last Cal. | Interval (mo) |
|------------------------------|--------------------|------------------|-----|-----------|---------------|
| Generator - Signal | Agilent | N5183A | TIA | 4/6/2016 | 24 |
| Cable | ESM Cable Corp. | TTBJ-141 KMKM-72 | NC5 | 5/6/2016 | 12 |
| Attenuator | Fairview Microwave | SA4014-20 | TKV | 3/4/2016 | 12 |
| Block - DC | Fairview Microwave | SD3379 | AMU | 5/6/2016 | 12 |
| Analyzer - Spectrum Analyzer | Agilent | E4440A | AFE | 6/22/2015 | 12 |

TEST DESCRIPTION

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

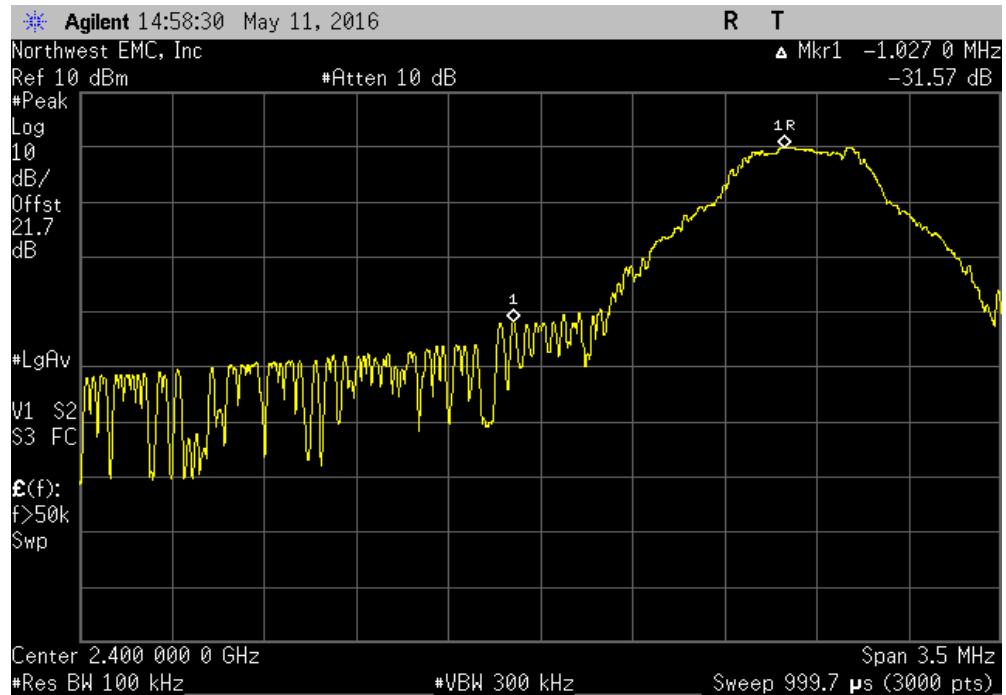
BAND EDGE COMPLIANCE

| | | | | | |
|-----------------------------------|--|-----------|---|------------------|--------|
| EUT: | MagicBand 2b | | Work Order: | SYNA0189 | |
| Serial Number: | 0006D68961 | | Date: | 05/11/16 | |
| Customer: | Walt Disney Parks and Resorts US, Inc. | | Temperature: | 24°C | |
| Attendees: | Martha Calderon | | Humidity: | 27% | |
| Project: | None | | Barometric Pres.: | 1016 | |
| Tested by: | Matthew Barnes | Power: | Battery | Job Site: | NC02 |
| TEST SPECIFICATIONS | | | Test Method | | |
| FCC 15.247:2016 | | | ANSI C63.10:2013 | | |
| COMMENTS | | | | | |
| Powered by external battery pack. | | | | | |
| DEVIATIONS FROM TEST STANDARD | | | | | |
| None | | | | | |
| Configuration # | 3 | Signature |  | | |
| | | | Value (dBc) | Limit ≤ (dBc) | Result |
| | | | -31.57 | -20 | Pass |
| | | | -49.66 | -20 | Pass |

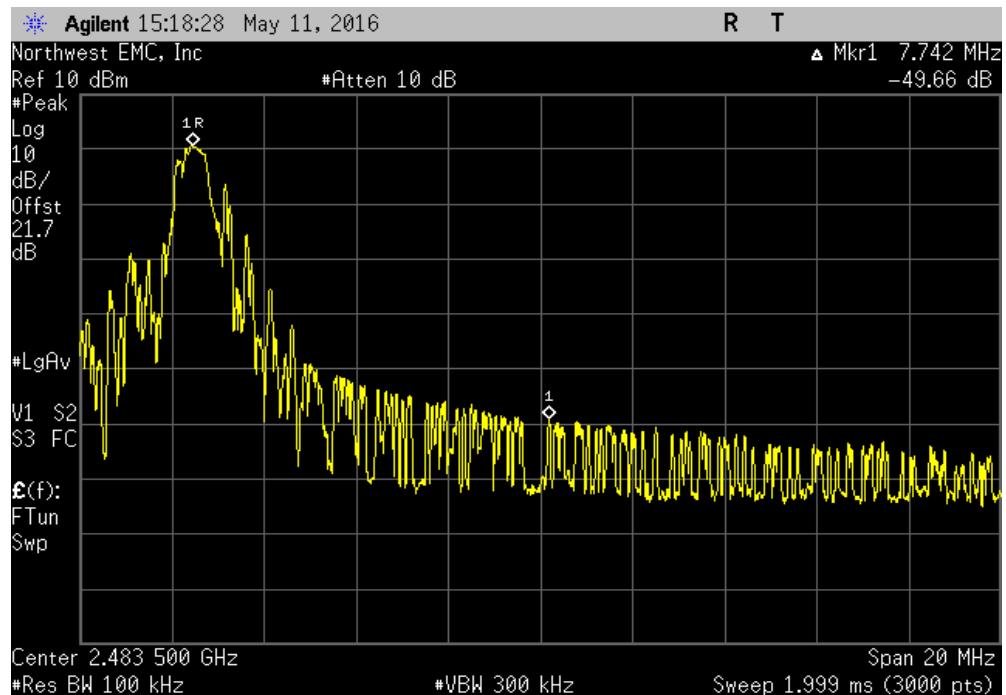
GFSK Low Channel, 2401 MHz
GFSK High Channel, 2476 MHz

BAND EDGE COMPLIANCE

| GFSK Low Channel, 2401 MHz | | | |
|----------------------------|----------------|------------------|--------|
| | Value (dBc) | Limit ≤ (dBc) | Result |
| | -31.57 | -20 | Pass |



| GFSK High Channel, 2476 MHz | | | |
|-----------------------------|----------------|------------------|--------|
| | Value (dBc) | Limit ≤ (dBc) | Result |
| | -49.66 | -20 | Pass |



SPURIOUS CONDUCTED EMISSIONS

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. | Interval (mo) |
|------------------------------|--------------------|------------------|-----|-----------|---------------|
| Generator - Signal | Agilent | N5183A | TIA | 4/6/2016 | 24 |
| Cable | ESM Cable Corp. | TTBJ-141 KMKM-72 | NC5 | 5/6/2016 | 12 |
| Attenuator | Fairview Microwave | SA4014-20 | TKV | 3/4/2016 | 12 |
| Block - DC | Fairview Microwave | SD3379 | AMU | 5/6/2016 | 12 |
| Analyzer - Spectrum Analyzer | Agilent | E4440A | AFE | 6/22/2015 | 12 |

TEST DESCRIPTION

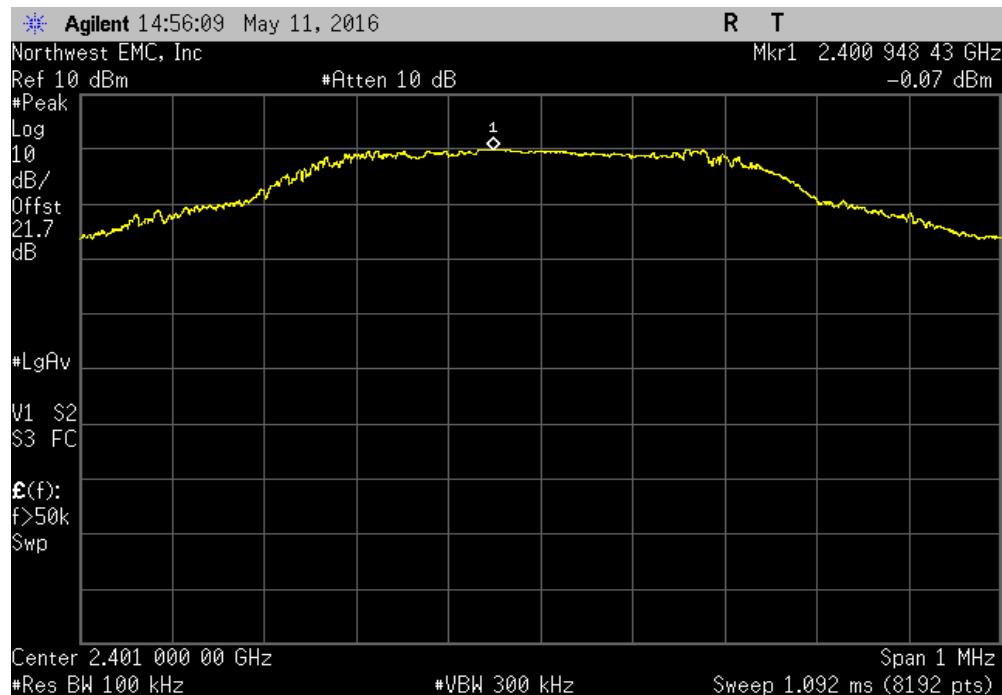
The spurious RF conducted emissions were measured with the EUT set to low, medium and high transmit frequencies. The measurements were made using a direct connection between the RF output of the EUT and the spectrum analyzer. The EUT was transmitting at the data rate(s) listed in the datasheet. For each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

SPURIOUS CONDUCTED EMISSIONS

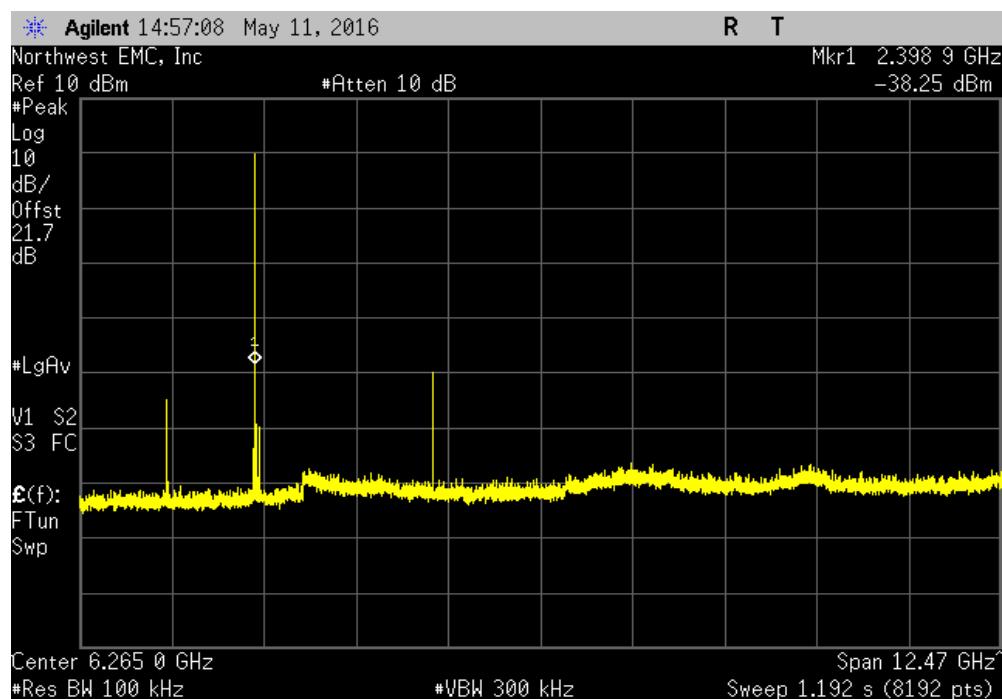
| EUT: | MagicBand 2b | | Work Order: | SYNA0189 | |
|-----------------------------------|--|-----------|---|-----------------|---------------|
| Serial Number: | 0006D68961 | | Date: | 05/11/16 | |
| Customer: | Walt Disney Parks and Resorts US, Inc. | | Temperature: | 24°C | |
| Attendees: | Martha Calderon | | Humidity: | 27% | |
| Project: | None | | Barometric Pres.: | 1016 | |
| Tested by: | Matthew Barnes | Power: | Battery | Job Site: | NC02 |
| TEST SPECIFICATIONS | | | Test Method | | |
| FCC 15.247:2016 | | | ANSI C63.10:2013 | | |
| COMMENTS | | | | | |
| Powered by external battery pack. | | | | | |
| DEVIATIONS FROM TEST STANDARD | | | | | |
| None | | | | | |
| Configuration # | 3 | Signature |  | | |
| | | | Frequency Range | Max Value (dBc) | Limit ≤ (dBc) |
| GFSK Low Channel, 2401 MHz | | | Fundamental | N/A | N/A |
| GFSK Low Channel, 2401 MHz | | | 30 MHz - 12.5 GHz | -38.18 | -20 |
| GFSK Low Channel, 2401 MHz | | | 12.5 GHz - 25 GHz | -52.28 | -20 |
| GFSK Mid Channel, 2450 MHz | | | Fundamental | N/A | N/A |
| GFSK Mid Channel, 2450 MHz | | | 30 MHz - 12.5 GHz | -41.51 | -20 |
| GFSK Mid Channel, 2450 MHz | | | 12.5 GHz - 25 GHz | -53.13 | -20 |
| GFSK High Channel, 2476 MHz | | | Fundamental | N/A | N/A |
| GFSK High Channel, 2476 MHz | | | 30 MHz - 12.5 GHz | -43.34 | -20 |
| GFSK High Channel, 2476 MHz | | | 12.5 GHz - 25 GHz | -52.96 | -20 |

SPURIOUS CONDUCTED EMISSIONS

| GFSK Low Channel, 2401 MHz | | | | | |
|----------------------------|-----------------|--------------------|--------|--|-----|
| Frequency Range | Max Value (dBc) | Limit \leq (dBc) | Result | | |
| Fundamental | N/A | N/A | | | N/A |

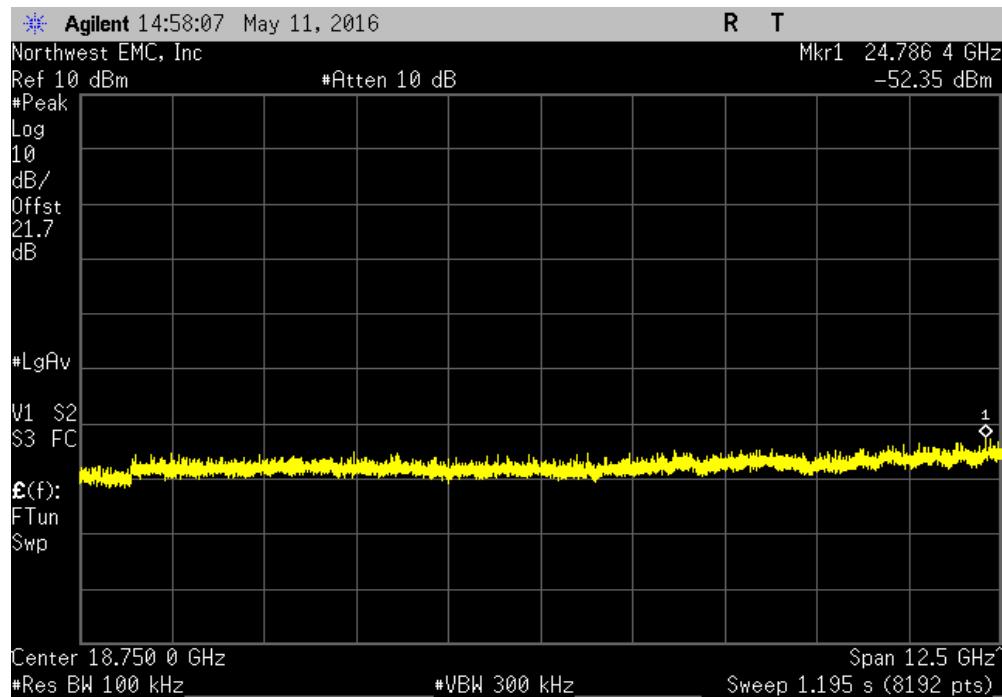


| Frequency Range | Max Value (dBc) | Limit \leq (dBc) | Result | |
|-------------------|-----------------|--------------------|--------|--|
| 30 MHz - 12.5 GHz | -38.18 | -20 | Pass | |

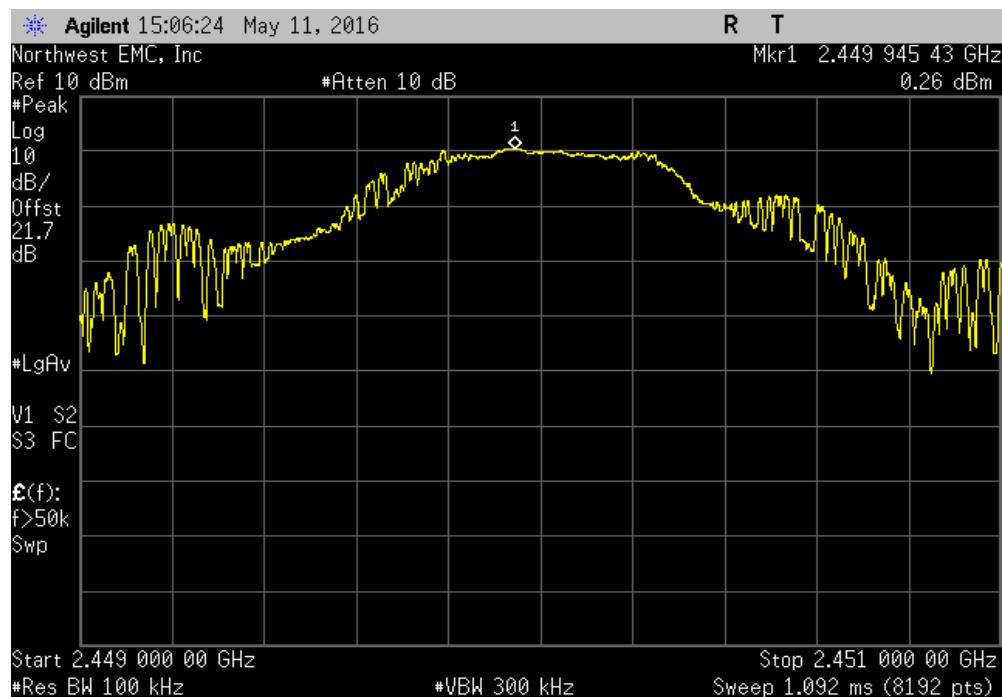


SPURIOUS CONDUCTED EMISSIONS

| GFSK Low Channel, 2401 MHz | | | |
|----------------------------|-----------------|--------------------|--------|
| Frequency Range | Max Value (dBc) | Limit \leq (dBc) | Result |
| 12.5 GHz - 25 GHz | -52.28 | -20 | Pass |

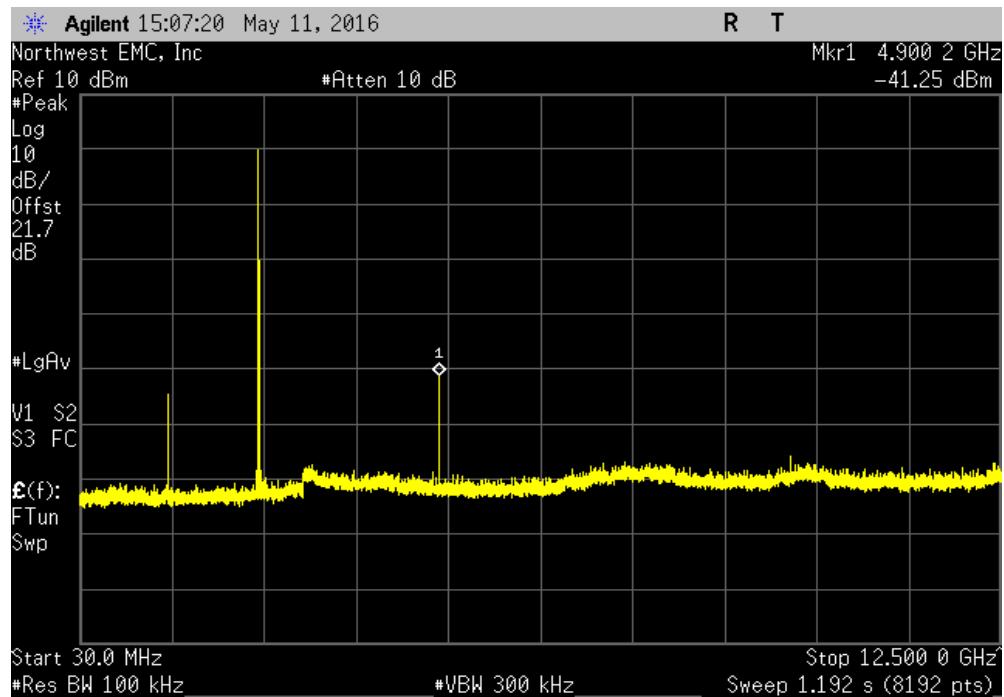


| GFSK Mid Channel, 2450 MHz | | | |
|----------------------------|-----------------|--------------------|--------|
| Frequency Range | Max Value (dBc) | Limit \leq (dBc) | Result |
| Fundamental | N/A | N/A | N/A |

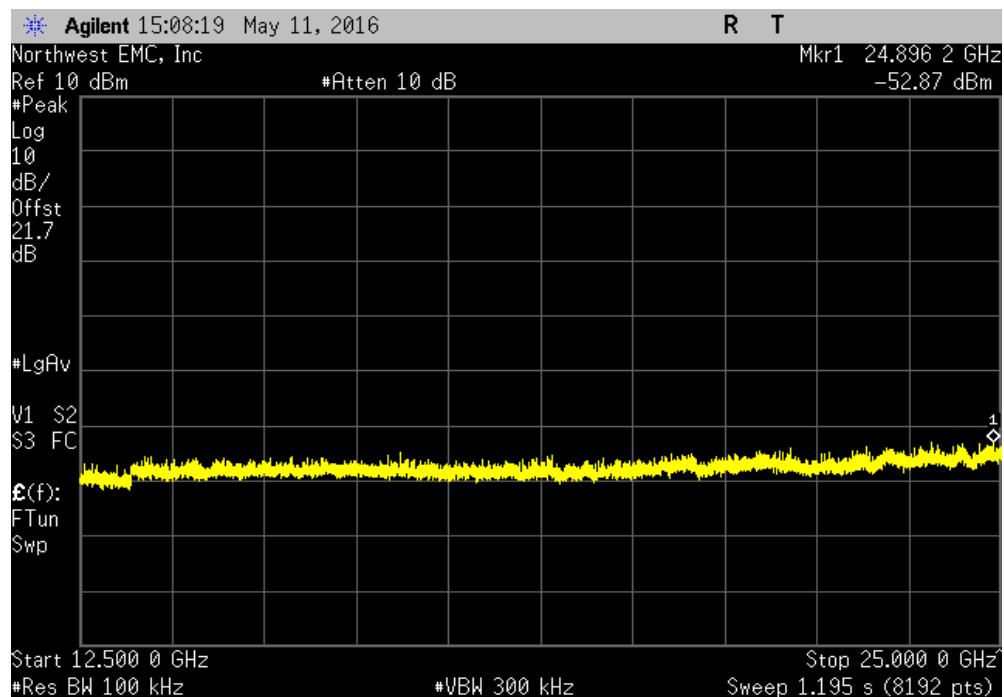


SPURIOUS CONDUCTED EMISSIONS

| GFSK Mid Channel, 2450 MHz | | | |
|----------------------------|-----------------|--------------------|--------|
| Frequency Range | Max Value (dBc) | Limit \leq (dBc) | Result |
| 30 MHz - 12.5 GHz | -41.51 | -20 | Pass |

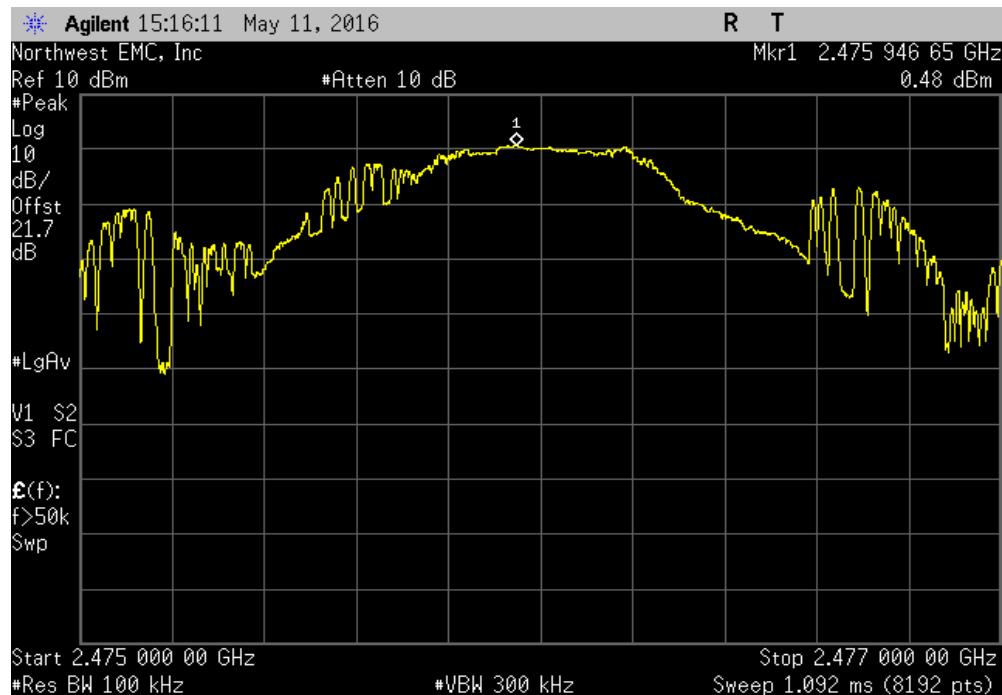


| GFSK Mid Channel, 2450 MHz | | | |
|----------------------------|-----------------|--------------------|--------|
| Frequency Range | Max Value (dBc) | Limit \leq (dBc) | Result |
| 12.5 GHz - 25 GHz | -53.13 | -20 | Pass |

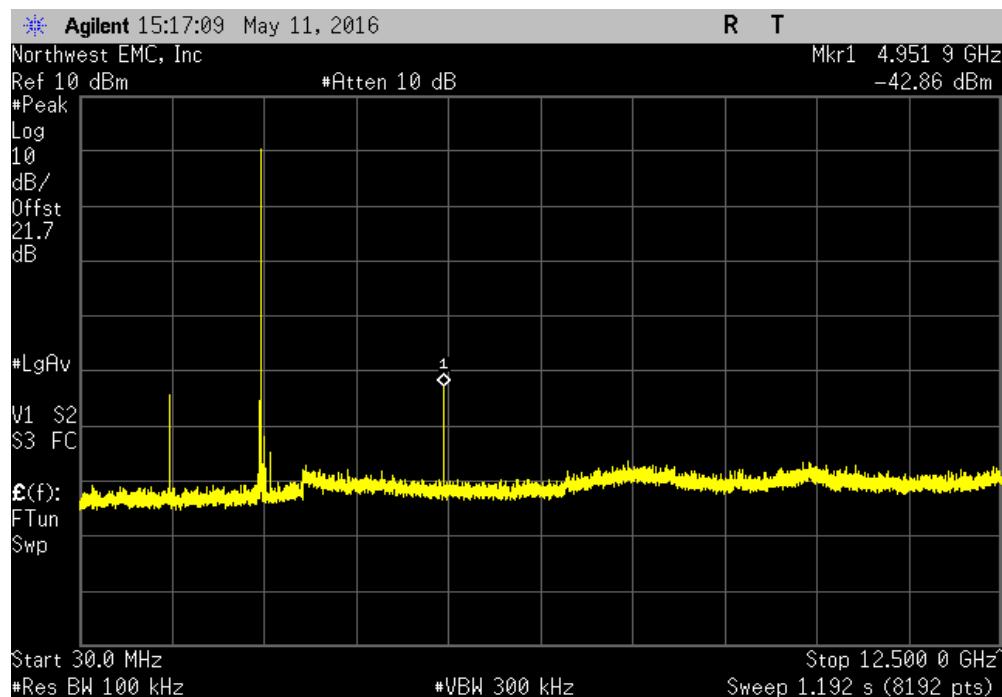


SPURIOUS CONDUCTED EMISSIONS

| GFSK High Channel, 2476 MHz | | | | | |
|-----------------------------|-----------------|--------------------|--------|--|--|
| Frequency Range | Max Value (dBc) | Limit \leq (dBc) | Result | | |
| Fundamental | N/A | N/A | N/A | | |

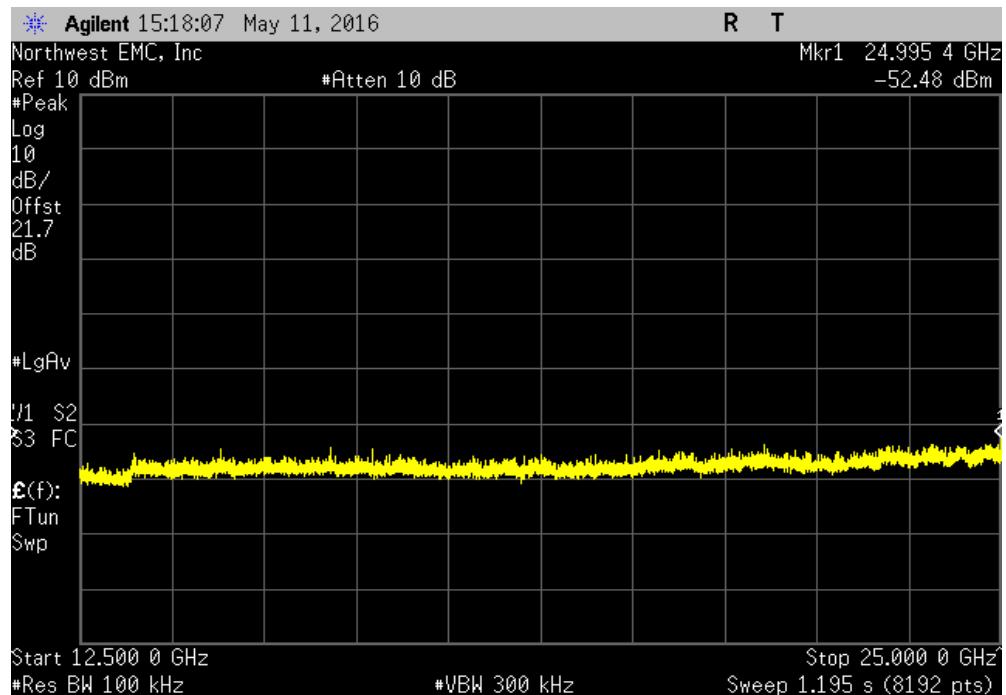


| GFSK High Channel, 2476 MHz | | | | | |
|-----------------------------|-----------------|--------------------|--------|--|--|
| Frequency Range | Max Value (dBc) | Limit \leq (dBc) | Result | | |
| 30 MHz - 12.5 GHz | -43.34 | -20 | Pass | | |



SPURIOUS CONDUCTED EMISSIONS

| GFSK High Channel, 2476 MHz | | | |
|-----------------------------|-----------------|--------------------|--------|
| Frequency Range | Max Value (dBc) | Limit \leq (dBc) | Result |
| 12.5 GHz - 25 GHz | -52.96 | -20 | Pass |



SPURIOUS RADIATED EMISSIONS

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

Low Channel - 2401 MHz - GFSK modulation

Mid Channel - 2450 MHz - GFSK modulation

High Channel - 2476 MHz - GFSK modulation

POWER SETTINGS INVESTIGATED

Battery

CONFIGURATIONS INVESTIGATED

SYNA0189 - 1

FREQUENCY RANGE INVESTIGATED

| | | | |
|-----------------|--------|----------------|-----------|
| Start Frequency | 30 MHz | Stop Frequency | 26500 MHz |
|-----------------|--------|----------------|-----------|

SAMPLE CALCULATIONS

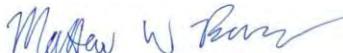
Radiated Emissions: Field Strength = Measured Level + Antenna Factor + Cable Factor - Amplifier Gain + Distance Adjustment Factor + External Attenuation

TEST EQUIPMENT

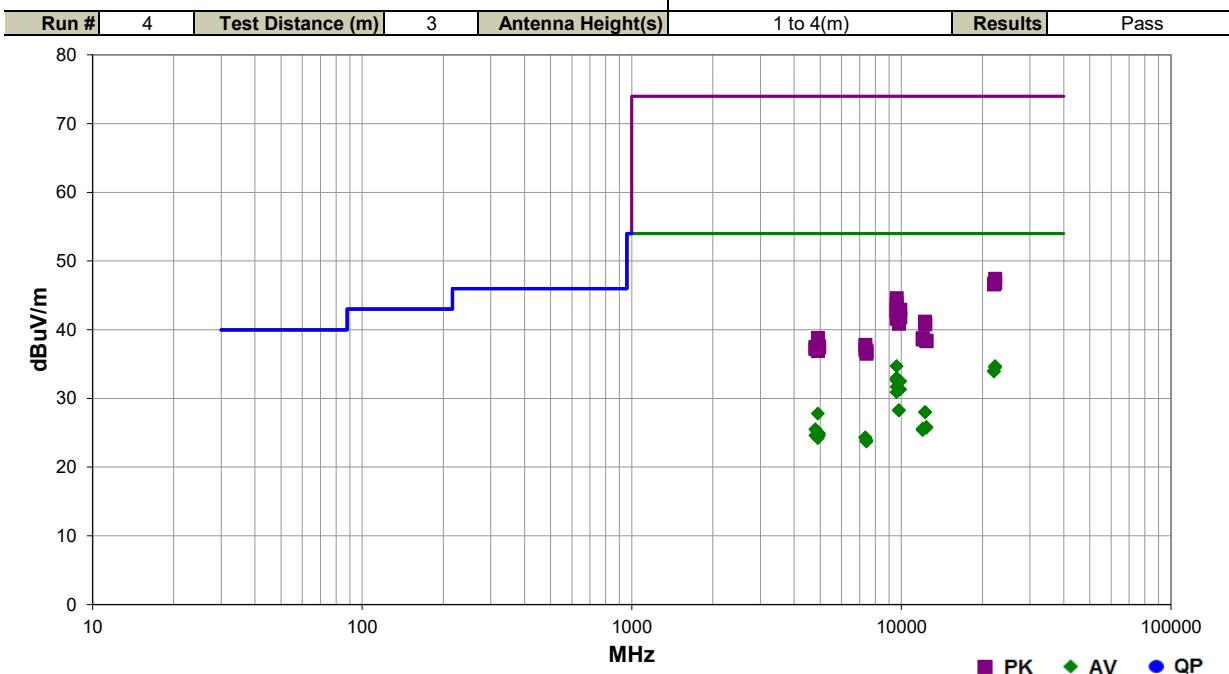
| Description | Manufacturer | Model | ID | Last Cal. | Interval (mo) |
|------------------------------|--------------------|--------------------------|-----|------------|---------------|
| Amplifier - Pre-Amplifier | Miteq | AM-1616-1000 | PAB | 7/31/2015 | 12 |
| Antenna - Biconilog | Teseq | CBL 6141B | AYL | 7/30/2015 | 12 |
| Filter - Low Pass | Micro-Tronics | LPM50004 | LFF | 1/21/2016 | 12 |
| Cable | Northwest EMC | Bilog Cables | NC1 | 8/27/2015 | 12 |
| Cable | Northwest EMC | N/A | NC8 | 6/6/2015 | 12 |
| Amplifier - Pre-Amplifier | Miteq | AMF-6F-18002650-25-10P | AOD | 6/6/2015 | 12 |
| Antenna - Standard Gain | ETS Lindgren | 3160-09 | AIY | NCR | 0 |
| Amplifier - Pre-Amplifier | Miteq | AMF-6F-12001800-30-10P | AOJ | 9/21/2015 | 12 |
| Antenna - Standard Gain | EMCO | 3160-08 | AHO | NCR | 0 |
| Cable | Northwest EMC | Standard Gain Horn Cable | NC3 | 6/17/2015 | 12 |
| Amplifier - Pre-Amplifier | Miteq | AMF-6F-08001200-30-10P | AOK | 9/21/2015 | 12 |
| Antenna - Standard Gain | EMCO | 3160-07 | AHP | NCR | 0 |
| Filter - High Pass | Micro-Tronics | HPM50111 | HHI | 10/30/2015 | 12 |
| Attenuator | Fairview Microwave | SA18E-20 | AQV | 9/28/2015 | 12 |
| Cable | Northwest EMC | 3115 Horn Cable | NC2 | 6/17/2015 | 12 |
| Amplifier - Pre-Amplifier | Miteq | AMF-3D-00100800-32-13P | AVZ | 7/31/2015 | 12 |
| Antenna - Double Ridge | EMCO | 3115 | AHM | 6/3/2014 | 24 |
| Analyzer - Spectrum Analyzer | Keysight | N9010A | AFO | 6/23/2015 | 12 |

TEST DESCRIPTION

The highest gain of each type of antenna to be used with the EUT was tested. The EUT was configured for low, mid, and high band transmit frequencies. For each configuration, the spectrum was scanned throughout the specified range. In addition, measurements were made in the restricted bands to verify compliance. While scanning, emissions from the EUT were maximized by rotating the EUT on a turntable, adjusting the position of the EUT and the EUT antenna in three orthogonal axis, and adjusting measurement antenna height and polarization. A preamp and high pass filter were used for this test in order to provide sufficient measurement sensitivity.

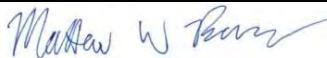
| | | | | |
|-----------------|---|-------------------|----------------|--|
| Work Order: | SYNA0189 | Date: | 05/11/16 |  |
| Project: | None | Temperature: | 22.2 °C | |
| Job Site: | NC01 | Humidity: | 34.3% RH | |
| Serial Number: | See Comments | Barometric Pres.: | 1022 mbar | |
| EUT: | MagicBand 2b | Tested by: | Matthew Barnes | |
| Configuration: | 1 | | | |
| Customer: | Walt Disney Parks and Resorts US, Inc. | | | |
| Attendees: | Martha Calderon | | | |
| EUT Power: | Battery | | | |
| Operating Mode: | See comments for transmit channel and EUT orientation, run on GFSK modulation | | | |
| Deviations: | None | | | |
| Comments: | Switching between 2 different devices, S/N: 0006D689FD and 0006D68821. | | | |

| Test Specifications | Test Method |
|---------------------|------------------|
| FCC 15.247:2016 | ANSI C63.10:2013 |

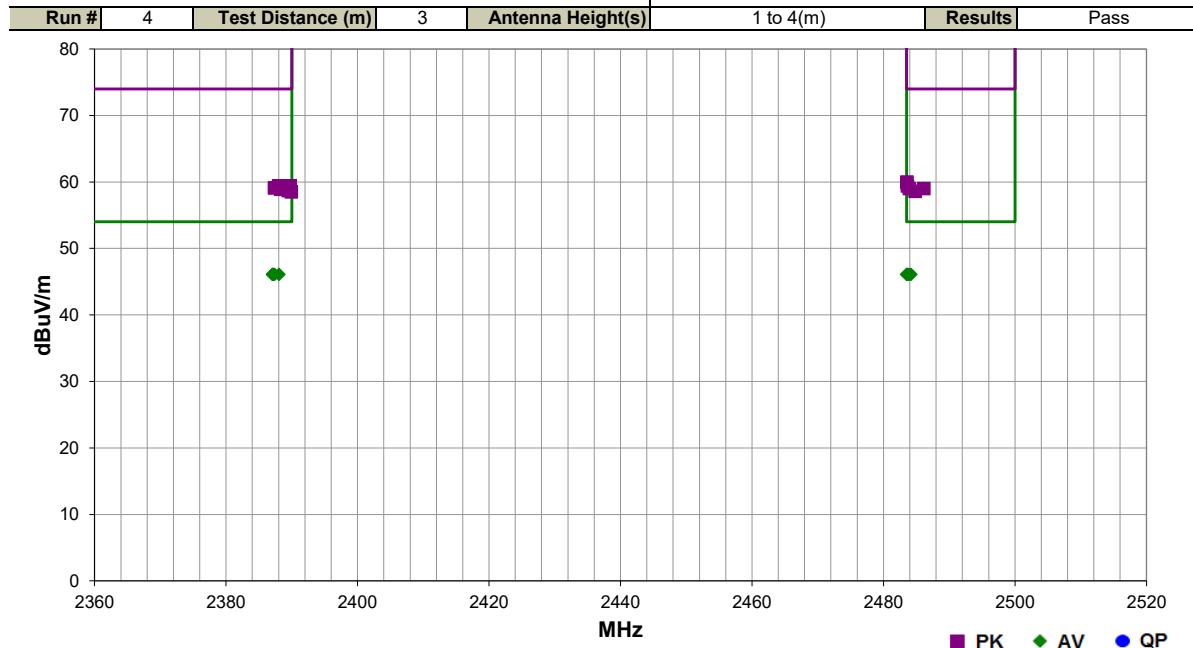


| Freq (MHz) | Amplitude (dBuV) | Factor (dB) | Antenna Height (meters) | Azimuth (degrees) | Test Distance (meters) | External Attenuation (dB) | Polarity/Transducer Type | Detector | Distance Adjustment (dB) | Adjusted (dBuV/m) | Spec. Limit (dBuV/m) | Compared to Spec. (dB) | Comments |
|------------|------------------|-------------|-------------------------|-------------------|------------------------|---------------------------|--------------------------|----------|--------------------------|-------------------|----------------------|------------------------|------------------|
| 22285.440 | 34.7 | 0.0 | 1.5 | 304.0 | 3.0 | 0.0 | Horz | AV | 0.0 | 34.7 | 54.0 | -19.3 | High Ch, On Side |
| 9604.620 | 38.5 | -3.8 | 1.0 | 266.0 | 3.0 | 0.0 | Horz | AV | 0.0 | 34.7 | 54.0 | -19.3 | Low Ch, On Side |
| 22285.500 | 34.5 | 0.0 | 1.5 | 39.0 | 3.0 | 0.0 | Vert | AV | 0.0 | 34.5 | 54.0 | -19.5 | High Ch, On Side |
| 22051.230 | 34.0 | 0.0 | 1.5 | 176.0 | 3.0 | 0.0 | Horz | AV | 0.0 | 34.0 | 54.0 | -20.0 | Mid Ch, On Side |
| 22051.400 | 33.9 | 0.0 | 1.5 | 184.0 | 3.0 | 0.0 | Vert | AV | 0.0 | 33.9 | 54.0 | -20.1 | Mid Ch, On Side |
| 9604.590 | 36.8 | -3.8 | 2.5 | 291.0 | 3.0 | 0.0 | Horz | AV | 0.0 | 33.0 | 54.0 | -21.0 | Low Ch, Flat |
| 9604.575 | 36.6 | -3.8 | 2.3 | 267.0 | 3.0 | 0.0 | Vert | AV | 0.0 | 32.8 | 54.0 | -21.2 | Low Ch, On Side |
| 9604.580 | 36.4 | -3.8 | 1.0 | 350.0 | 3.0 | 0.0 | Vert | AV | 0.0 | 32.6 | 54.0 | -21.4 | Low Ch, Flat |
| 9904.560 | 35.9 | -3.4 | 1.0 | 266.0 | 3.0 | 0.0 | Horz | AV | 0.0 | 32.5 | 54.0 | -21.5 | High Ch, On Side |
| 9604.535 | 35.5 | -3.8 | 3.6 | 227.0 | 3.0 | 0.0 | Vert | AV | 0.0 | 31.7 | 54.0 | -22.3 | Low Ch, On End |
| 9904.550 | 34.7 | -3.4 | 1.2 | 265.0 | 3.0 | 0.0 | Vert | AV | 0.0 | 31.3 | 54.0 | -22.7 | High Ch, On Side |
| 9604.540 | 34.7 | -3.8 | 3.5 | 258.0 | 3.0 | 0.0 | Horz | AV | 0.0 | 30.9 | 54.0 | -23.1 | Low Ch, On End |
| 9800.970 | 31.8 | -3.5 | 1.0 | 219.0 | 3.0 | 0.0 | Horz | AV | 0.0 | 28.3 | 54.0 | -25.7 | Mid Ch, On Side |
| 9801.220 | 31.8 | -3.5 | 1.0 | 177.0 | 3.0 | 0.0 | Vert | AV | 0.0 | 28.3 | 54.0 | -25.7 | Mid Ch, On Side |
| 12251.160 | 30.6 | -2.6 | 1.0 | 40.0 | 3.0 | 0.0 | Horz | AV | 0.0 | 28.0 | 54.0 | -26.0 | Mid Ch, On Side |
| 12250.930 | 30.6 | -2.6 | 1.0 | 237.0 | 3.0 | 0.0 | Vert | AV | 0.0 | 28.0 | 54.0 | -26.0 | Mid Ch, On Side |
| 4900.100 | 27.8 | 0.0 | 2.8 | 232.0 | 3.0 | 0.0 | Horz | AV | 0.0 | 27.8 | 54.0 | -26.2 | Mid Ch, On Side |
| 22282.530 | 47.4 | 0.0 | 1.5 | 304.0 | 3.0 | 0.0 | Horz | PK | 0.0 | 47.4 | 74.0 | -26.6 | High Ch, On Side |
| 22283.890 | 46.8 | 0.0 | 1.5 | 39.0 | 3.0 | 0.0 | Vert | PK | 0.0 | 46.8 | 74.0 | -27.2 | High Ch, On Side |
| 22050.590 | 46.7 | 0.0 | 1.5 | 184.0 | 3.0 | 0.0 | Vert | PK | 0.0 | 46.7 | 74.0 | -27.3 | Mid Ch, On Side |
| 22050.080 | 46.6 | 0.0 | 1.5 | 176.0 | 3.0 | 0.0 | Horz | PK | 0.0 | 46.6 | 74.0 | -27.4 | Mid Ch, On Side |
| 12379.140 | 28.1 | -2.3 | 1.0 | 259.0 | 3.0 | 0.0 | Vert | AV | 0.0 | 25.8 | 54.0 | -28.2 | High Ch, On Side |

| 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 |
|------------|------------------|-------------|-------------------------|-------------------|------------------------|---------------------------|--------------------------|----------|--------------------------|-------------------|----------------------|------------------------|------------------|
| | | | | | | | | | | | | | |
| 12378.640 | 28.0 | -2.3 | 1.0 | 281.0 | 3.0 | 0.0 | Horz | AV | 0.0 | 25.7 | 54.0 | -28.3 | High Ch, On Side |
| 12005.910 | 28.6 | -3.0 | 1.0 | 336.0 | 3.0 | 0.0 | Horz | AV | 0.0 | 25.6 | 54.0 | -28.4 | Low Ch, On Side |
| 4802.105 | 25.5 | 0.0 | 3.2 | 306.0 | 3.0 | 0.0 | Horz | AV | 0.0 | 25.5 | 54.0 | -28.5 | Low Ch, On Side |
| 12005.300 | 28.4 | -3.0 | 1.0 | 350.0 | 3.0 | 0.0 | Vert | AV | 0.0 | 25.4 | 54.0 | -28.6 | Low Ch, On Side |
| 4952.105 | 24.9 | 0.0 | 2.7 | 72.0 | 3.0 | 0.0 | Vert | AV | 0.0 | 24.9 | 54.0 | -29.1 | High Ch, On Side |
| 4952.065 | 24.6 | 0.0 | 1.0 | 248.0 | 3.0 | 0.0 | Horz | AV | 0.0 | 24.6 | 54.0 | -29.4 | High Ch, On Side |
| 4802.095 | 24.6 | 0.0 | 1.0 | 178.0 | 3.0 | 0.0 | Vert | AV | 0.0 | 24.6 | 54.0 | -29.4 | Low Ch, On Side |
| 9604.610 | 48.4 | -3.8 | 1.0 | 266.0 | 3.0 | 0.0 | Horz | PK | 0.0 | 44.6 | 74.0 | -29.4 | Low Ch, On Side |
| 7350.950 | 24.3 | 0.0 | 2.6 | 261.0 | 3.0 | 0.0 | Vert | AV | 0.0 | 24.3 | 54.0 | -29.7 | Mid Ch, On Side |
| 7349.465 | 24.3 | 0.0 | 1.0 | 358.0 | 3.0 | 0.0 | Horz | AV | 0.0 | 24.3 | 54.0 | -29.7 | Mid Ch, On Side |
| 4900.005 | 24.2 | 0.0 | 1.0 | 232.0 | 3.0 | 0.0 | Vert | AV | 0.0 | 24.2 | 54.0 | -29.8 | Mid Ch, On Side |
| 7428.390 | 23.9 | 0.0 | 1.0 | 268.0 | 3.0 | 0.0 | Horz | AV | 0.0 | 23.9 | 54.0 | -30.1 | High Ch, On Side |
| 9604.145 | 47.6 | -3.8 | 2.5 | 291.0 | 3.0 | 0.0 | Horz | PK | 0.0 | 43.8 | 74.0 | -30.2 | Low Ch, Flat |
| 7428.495 | 23.7 | 0.0 | 2.5 | 213.0 | 3.0 | 0.0 | Vert | AV | 0.0 | 23.7 | 54.0 | -30.3 | High Ch, On Side |
| 9603.530 | 46.8 | -3.8 | 2.3 | 267.0 | 3.0 | 0.0 | Vert | PK | 0.0 | 43.0 | 74.0 | -31.0 | Low Ch, On Side |
| 9904.745 | 46.3 | -3.4 | 1.0 | 266.0 | 3.0 | 0.0 | Horz | PK | 0.0 | 42.9 | 74.0 | -31.1 | High Ch, On Side |
| 9604.820 | 46.4 | -3.8 | 1.0 | 350.0 | 3.0 | 0.0 | Vert | PK | 0.0 | 42.6 | 74.0 | -31.4 | Low Ch, Flat |
| 9603.445 | 46.4 | -3.8 | 3.6 | 227.0 | 3.0 | 0.0 | Vert | PK | 0.0 | 42.6 | 74.0 | -31.4 | Low Ch, On End |
| 9904.615 | 45.2 | -3.4 | 1.2 | 265.0 | 3.0 | 0.0 | Vert | PK | 0.0 | 41.8 | 74.0 | -32.2 | High Ch, On Side |
| 9604.470 | 45.4 | -3.8 | 3.5 | 258.0 | 3.0 | 0.0 | Horz | PK | 0.0 | 41.6 | 74.0 | -32.4 | Low Ch, On End |
| 9799.840 | 45.1 | -3.5 | 1.0 | 177.0 | 3.0 | 0.0 | Vert | PK | 0.0 | 41.6 | 74.0 | -32.4 | Mid Ch, On Side |
| 12248.600 | 43.8 | -2.6 | 1.0 | 40.0 | 3.0 | 0.0 | Horz | PK | 0.0 | 41.2 | 74.0 | -32.8 | Mid Ch, On Side |
| 9799.135 | 44.4 | -3.5 | 1.0 | 219.0 | 3.0 | 0.0 | Horz | PK | 0.0 | 40.9 | 74.0 | -33.1 | Mid Ch, On Side |
| 12251.110 | 43.4 | -2.6 | 1.0 | 237.0 | 3.0 | 0.0 | Vert | PK | 0.0 | 40.8 | 74.0 | -33.2 | Mid Ch, On Side |
| 4900.075 | 38.8 | 0.0 | 2.8 | 232.0 | 3.0 | 0.0 | Horz | PK | 0.0 | 38.8 | 74.0 | -35.2 | Mid Ch, On Side |
| 12004.610 | 41.8 | -3.0 | 1.0 | 350.0 | 3.0 | 0.0 | Vert | PK | 0.0 | 38.8 | 74.0 | -35.2 | Low Ch, On Side |
| 12006.050 | 41.6 | -3.0 | 1.0 | 336.0 | 3.0 | 0.0 | Horz | PK | 0.0 | 38.6 | 74.0 | -35.4 | Low Ch, On Side |
| 12380.620 | 40.7 | -2.3 | 1.0 | 259.0 | 3.0 | 0.0 | Vert | PK | 0.0 | 38.4 | 74.0 | -35.6 | High Ch, On Side |
| 12378.880 | 40.6 | -2.3 | 1.0 | 281.0 | 3.0 | 0.0 | Horz | PK | 0.0 | 38.3 | 74.0 | -35.7 | High Ch, On Side |
| 7350.010 | 37.8 | 0.0 | 2.6 | 261.0 | 3.0 | 0.0 | Vert | PK | 0.0 | 37.8 | 74.0 | -36.2 | Mid Ch, On Side |
| 4951.810 | 37.6 | 0.0 | 2.7 | 72.0 | 3.0 | 0.0 | Vert | PK | 0.0 | 37.6 | 74.0 | -36.4 | High Ch, On Side |
| 4802.505 | 37.5 | 0.0 | 3.2 | 306.0 | 3.0 | 0.0 | Horz | PK | 0.0 | 37.5 | 74.0 | -36.5 | Low Ch, On Side |
| 4952.020 | 37.4 | 0.0 | 1.0 | 248.0 | 3.0 | 0.0 | Horz | PK | 0.0 | 37.4 | 74.0 | -36.6 | High Ch, On Side |
| 4801.620 | 37.2 | 0.0 | 1.0 | 178.0 | 3.0 | 0.0 | Vert | PK | 0.0 | 37.2 | 74.0 | -36.8 | Low Ch, On Side |
| 7349.165 | 37.1 | 0.0 | 1.0 | 358.0 | 3.0 | 0.0 | Horz | PK | 0.0 | 37.1 | 74.0 | -36.9 | Mid Ch, On Side |
| 7427.060 | 36.9 | 0.0 | 2.5 | 213.0 | 3.0 | 0.0 | Vert | PK | 0.0 | 36.9 | 74.0 | -37.1 | High Ch, On Side |
| 4901.025 | 36.9 | 0.0 | 1.0 | 232.0 | 3.0 | 0.0 | Vert | PK | 0.0 | 36.9 | 74.0 | -37.1 | Mid Ch, On Side |
| 7428.530 | 36.5 | 0.0 | 1.0 | 268.0 | 3.0 | 0.0 | Horz | PK | 0.0 | 36.5 | 74.0 | -37.5 | High Ch, On Side |

| | | | | | | | |
|-----------------|---|-------------------|-----------|--|--|--|--|
| Work Order: | SYNA0189 | Date: | 05/11/16 |  | | | |
| Project: | None | Temperature: | 22.2 °C | | | | |
| Job Site: | NC01 | Humidity: | 34.3% RH | | | | |
| Serial Number: | See Comments | Barometric Pres.: | 1022 mbar | Tested by: Matthew Barnes | | | |
| EUT: | MagicBand 2b | | | | | | |
| Configuration: | 1 | | | | | | |
| Customer: | Walt Disney Parks and Resorts US, Inc. | | | | | | |
| Attendees: | Martha Calderon | | | | | | |
| EUT Power: | Battery | | | | | | |
| Operating Mode: | See comments for transmit channel and EUT orientation, run on GFSK modulation | | | | | | |
| Deviations: | None | | | | | | |
| Comments: | Switching between 2 different devices, S/N: 0006D689FD and 0006D68821. | | | | | | |

| Test Specifications | Test Method |
|---------------------|------------------|
| FCC 15.247:2016 | ANSI C63.10:2013 |



| 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 |
|------------|------------------|-------------|-------------------------|-------------------|------------------------|---------------------------|--------------------------|----------|--------------------------|-------------------|----------------------|------------------------|------------------|
| 2484.195 | 26.1 | 0.0 | 3.7 | 200.0 | 3.0 | 20.0 | Horz | AV | 0.0 | 46.1 | 54.0 | -7.9 | High Ch, Flat |
| 2483.880 | 26.1 | 0.0 | 3.4 | 254.0 | 3.0 | 20.0 | Vert | AV | 0.0 | 46.1 | 54.0 | -7.9 | High Ch, On End |
| 2483.670 | 26.1 | 0.0 | 2.3 | 291.0 | 3.0 | 20.0 | Horz | AV | 0.0 | 46.1 | 54.0 | -7.9 | High Ch, On Side |
| 2483.645 | 26.1 | 0.0 | 1.0 | 241.0 | 3.0 | 20.0 | Vert | AV | 0.0 | 46.1 | 54.0 | -7.9 | High Ch, On Side |
| 2483.620 | 26.1 | 0.0 | 4.0 | 260.0 | 3.0 | 20.0 | Horz | AV | 0.0 | 46.1 | 54.0 | -7.9 | High Ch, On End |
| 2483.500 | 26.1 | 0.0 | 1.8 | 274.0 | 3.0 | 20.0 | Vert | AV | 0.0 | 46.1 | 54.0 | -7.9 | High Ch, Flat |
| 2388.060 | 26.1 | 0.0 | 1.0 | 289.0 | 3.0 | 20.0 | Horz | AV | 0.0 | 46.1 | 54.0 | -7.9 | Low Ch, On Side |
| 2387.375 | 26.1 | 0.0 | 3.3 | 300.0 | 3.0 | 20.0 | Vert | AV | 0.0 | 46.1 | 54.0 | -7.9 | Low Ch, On End |
| 2387.205 | 26.1 | 0.0 | 1.0 | 89.0 | 3.0 | 20.0 | Horz | AV | 0.0 | 46.1 | 54.0 | -7.9 | Low Ch, Flat |
| 2387.100 | 26.1 | 0.0 | 1.8 | 282.0 | 3.0 | 20.0 | Vert | AV | 0.0 | 46.1 | 54.0 | -7.9 | Low Ch, Flat |
| 2387.110 | 26.1 | 0.0 | 1.0 | 123.0 | 3.0 | 20.0 | Vert | AV | 0.0 | 46.1 | 54.0 | -7.9 | Low Ch, On Side |
| 2387.075 | 26.1 | 0.0 | 1.0 | 273.0 | 3.0 | 20.0 | Horz | AV | 0.0 | 46.1 | 54.0 | -7.9 | Low Ch, On End |
| 2483.560 | 40.0 | 0.0 | 1.8 | 274.0 | 3.0 | 20.0 | Vert | PK | 0.0 | 60.0 | 74.0 | -14.0 | High Ch, Flat |
| 2483.635 | 39.4 | 0.0 | 3.4 | 254.0 | 3.0 | 20.0 | Vert | PK | 0.0 | 59.4 | 74.0 | -14.6 | High Ch, On End |
| 2389.735 | 39.4 | 0.0 | 1.0 | 273.0 | 3.0 | 20.0 | Horz | PK | 0.0 | 59.4 | 74.0 | -14.6 | Low Ch, On End |
| 2388.000 | 39.4 | 0.0 | 1.0 | 89.0 | 3.0 | 20.0 | Horz | PK | 0.0 | 59.4 | 74.0 | -14.6 | Low Ch, Flat |
| 2387.370 | 39.1 | 0.0 | 1.8 | 282.0 | 3.0 | 20.0 | Vert | PK | 0.0 | 59.1 | 74.0 | -14.9 | Low Ch, Flat |
| 2486.130 | 39.0 | 0.0 | 3.7 | 200.0 | 3.0 | 20.0 | Horz | PK | 0.0 | 59.0 | 74.0 | -15.0 | High Ch, Flat |
| 2483.935 | 39.0 | 0.0 | 2.3 | 291.0 | 3.0 | 20.0 | Horz | PK | 0.0 | 59.0 | 74.0 | -15.0 | High Ch, On Side |
| 2388.280 | 38.9 | 0.0 | 1.0 | 123.0 | 3.0 | 20.0 | Vert | PK | 0.0 | 58.9 | 74.0 | -15.1 | Low Ch, On Side |
| 2389.455 | 38.7 | 0.0 | 3.3 | 300.0 | 3.0 | 20.0 | Vert | PK | 0.0 | 58.7 | 74.0 | -15.3 | Low Ch, On End |
| 2484.815 | 38.6 | 0.0 | 4.0 | 260.0 | 3.0 | 20.0 | Horz | PK | 0.0 | 58.6 | 74.0 | -15.4 | High Ch, On End |
| 2389.935 | 38.5 | 0.0 | 1.0 | 289.0 | 3.0 | 20.0 | Horz | PK | 0.0 | 58.5 | 74.0 | -15.5 | Low Ch, On Side |