# CERTIFICATION TEST REPORT

**Report Number. :** 11696948-E2V4

| | | |
|---|---|---|
| **Applicant** | : | APPLE, INC.<br>1 INFINITE LOOP<br>CUPERTINO, CA 95014, U.S.A. |
| **Model** | : | A1864, A1899 |
| **FCC ID** | : | BCG-E3160A |
| **IC** | : | 579C-E3160A |
| **EUT Description** | : | SMARTPHONE |
| **Test Standard(s)** | : | FCC 47 CFR PART 15 SUBPART C<br>INDUSTRY CANADA RSS - 247 ISSUE 2 |

**Date Of Issue:**
August 23, 2017

**Prepared by:**
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NVLAP LAB CODE 200065-0

Revision History

| Rev. | Issue Date | Revisions | Revised By |
|---|---|---|---|
| V1 | 7/14/2017 | Initial Issue | -- |
| V2 | 7/25/2017 | Address TCB's Questions | Hung Thai |
| V3 | 8/02/2017 | Updated Section 2, 7.1, fixed typo on page 72 | Tina Chu |
| V4 | 8/21/2017 | Address TCB's Questions | Tri Pham |


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# 1. ATTESTATION OF TEST RESULTS

**COMPANY NAME:** APPLE, INC.
1 INFINITE LOOP
CUPERTINO, CA 95014, U.S.A.

**EUT DESCRIPTION:** SMARTPHONE

**MODEL:** A1864, A1899

**SERIAL NUMBER:** C39TQ00FJ6KP

**DATE TESTED:** MARCH 08, 2017 – JUNE 22, 2017

| APPLICABLE STANDARDS | |
|---|---|
| **STANDARD** | **TEST RESULTS** |
| CFR 47 Part 15 Subpart C | Pass |
| INDUSTRY CANADA RSS-247 Issue 2 | Pass |
| INDUSTRY CANADA RSS-GEN Issue 4 | Pass |

UL Verification Services Inc. tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by UL Verification Services Inc. based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

**Note:** The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by UL Verification Services Inc. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL Verification Services Inc. will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, any agency of the Federal Government, or any agency of any government.

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# 2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with FCC CFR 47 Part 2, FCC CFR 47 Part 15, KDB 558074 D01 v04, ANSI C63.10-2013, RSS-GEN Issue 4, and RSS-247 Issue 2.

# 3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 47173 and 47266 Benicia Street, Fremont, California, USA. Line conducted emissions are measured only at the 47173 address. The following table identifies which facilities were utilized for radiated emission measurements documented in this report. Specific facilities are also identified in the test results sections.

| 47173 Benicia Street | 47266 Benicia Street |
|---|---|
| ☒ Chamber A (IC:2324B-1) | ☒ Chamber D (IC:22541-1) |
| ☐ Chamber B (IC:2324B-2) | ☐ Chamber E (IC:22541-2) |
| ☐ Chamber C (IC:2324B-3) | ☐ Chamber F (IC:22541-3) |
| | ☒ Chamber G (IC:22541-4) |
| | ☒ Chamber H (IC:22541-5) |

The above test sites and facilities are covered under FCC Test Firm Registration # 208313.

UL Verification Services Inc. is accredited by NVLAP, Laboratory Code 200065-0. The full scope of accreditation can be viewed at http://ts.nist.gov/standards/scopes/2000650.htm.


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# 4. CALIBRATION AND UNCERTAINTY

## 4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

## 4.2. SAMPLE CALCULATION

Where relevant, the following sample calculation is provided:

Field Strength (dBuV/m) = Measured Voltage (dBuV) + Antenna Factor (dB/m) + Cable Loss (dB) – Preamp Gain (dB)
36.5 dBuV + 18.7 dB/m + 0.6 dB – 26.9 dB = 28.9 dBuV/m

## 4.3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

| Parameter | Uncertainty |
|---|---|
| Worst Case Conducted Disturbance, 9KHz to 0.15 MHz | 3.84 dB |
| Worst Case Conducted Disturbance, 0.15 to 30 MHz | 3.65 dB |
| Worst Case Radiated Disturbance, 9KHz to 30 MHz | 3.15 dB |
| Worst Case Radiated Disturbance, 30 to 1000 MHz | 5.36 dB |
| Worst Case Radiated Disturbance, 1000 to 18000 MHz | 4.32 dB |
| Worst Case Radiated Disturbance, 18000 to 26000 MHz | 4.45 dB |
| Worst Case Radiated Disturbance, 26000 to 40000 MHz | 5.24 dB |
| Occupied Channel Bandwidth | ±0.39 % |

Uncertainty figures are valid to a confidence level of 95%.


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# 5. EQUIPMENT UNDER TEST

## 5.1. DESCRIPTION OF EUT

The equipment under Test is a mobile phone with GSM, GPRS, EGPRS, UMTS, LTE and TD-SCDMA technologies. It also supports IEEE 802.11a/b/g/n/ac, Bluetooth®, GPS and NFC. The device has a built-in inductive charging receiver which is not user accessible. The rechargeable battery is not user accessible.

## 5.2. DIFFERENCE IN MODEL NUMBER

Model A1864 and A1899 are exactly the same. Two models numbers are allocated for marketing and logistic purpose only

## 5.3. MAXIMUM OUTPUT POWER

The transmitter has a maximum peak conducted output power as follows:

| Antenna | Configuration | Frequency Range (MHz) | Mode | Output Power (dBm) | Output Power (mW) |
|---|---|---|---|---|---|
| UAT 1 | Pmax | 2402 - 2480 | BLE 1M | 20.21 | 104.95 |
| | Plow | | | 10.24 | 10.57 |
| | Pmax | | BLE 2M | 19.89 | 97.50 |
| | Plow | | | 9.88 | 9.73 |
| LAT 3 | Pmax | 2402 - 2480 | BLE 1M | 20.14 | 103.28 |
| | Plow | | | 10.08 | 10.19 |
| | Pmax | | BLE 2M | 20.12 | 102.80 |
| | Plow | | | 9.87 | 9.71 |

## 5.4. DESCRIPTION OF AVAILABLE ANTENNAS

| Frequency Band (GHz) | Antenna Gain (dBi) | |
|---|---|---|
| 2.4 | UAT 1 Primary | LAT 3 Diversity |
| | 1.01 | -2.24 |

## 5.5. SOFTWARE AND FIRMWARE

The firmware installed in the EUT during testing was version 15.1.40.176.


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## 5.6. WORST-CASE CONFIGURATION AND MODE

Radiated band edge, harmonic, and spurious emissions from 1GHz to 18GHz were performed with the EUT set to transmit at highest power on Low/Middle/High channels.

Radiated emissions below 30MHz, below 1GHz, above 18GHz and power line conducted emissions were performed with the EUT transmits at the channel with the highest output power as worst-case scenario.

The fundamental of the EUT was investigated in three orthogonal orientations, X (Flatbed), Y (Landscape), and Z (Portrait), on both primary and diversity antennas. In addition, the EUT was also investigated with and without AC/DC charger, headphones & laptop, it was determined that Y (Landscape) orientation was the worst-case orientation on both UAT 1 and LAT 3. Therefore, all final radiated testing was performed with the EUT in Y-orientation.

Worst-case data rate as provided by the client and baseline scan was:
BLE: 1Mbps.

BLE 1Mbps mode has been verified to have the highest power.

There are two vendors of the WiFi/Bluetooth radio modules: variant 1 and variant 2. The Wi-Fi/Bluetooth radio modules have the same mechanical outline (e.g., the same package dimension and pin-out layout), use the same on-board antenna matching circuit, have an identical antenna structure, and are built and tested to conform to the same specifications and to operate within the same tolerances.

Baseline testing was performed on the two variants to determine the worst case on all conducted power and radiated emissions.

For simultaneous transmission of multiple channels from the same antenna LAT 3 in the 2.4GHz BLE and 5GHz bands, tests were conducted for various configurations having the highest power. No noticeable new emission was found.


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## 5.7. DESCRIPTION OF TEST SETUP

**SUPPORT EQUIPMENT**

| Support Equipment List | | | | |
|---|---|---|---|---|
| Description | Manufacturer | Model | Serial Number | FCC ID |
| Laptop AC/DC adapter | Liteon Technology | PA-1450-BA1 | B123 | NA |
| Laptop | Apple | MackBook Air 4 | NA | NA |

**I/O CABLES (CONDUCTED TEST)**

| I/O Cable List | | | | | | |
|---|---|---|---|---|---|---|
| Cable No | Port | # of identical ports | Connector Type | Cable Type | Cable Length (m) | Remarks |
| 1 | Antenna | 1 | SMA | Un-Shielded | 0.2 | To spectrum Analyzer |
| 2 | USB | 1 | USB | Shielded | 1 | N/A |
| 3 | AC | 1 | AC | Un-shielded | 3 | N/A |

**I/O CABLES (RADIATED ABOVE 1 GHZ)**

| I/O Cable List | | | | | | |
|---|---|---|---|---|---|---|
| Cable No | Port | # of identical ports | Connector Type | Cable Type | Cable Length (m) | Remarks |
| NA | | | | | | |

**I/O CABLES (AC POWER CONDUCTED TEST AND BELOW 1 GHZ)**

| I/O Cable List | | | | | | |
|---|---|---|---|---|---|---|
| Cable No | Port | # of identical ports | Connector Type | Cable Type | Cable Length (m) | Remarks |
| 1 | AC | 1 | AC | Un-shielded | 3 | N/A |

**I/O CABLES (AC LINE CONDUCTED: LAPTOP CONFIGUARTION)**

| I/O Cable List | | | | | | |
|---|---|---|---|---|---|---|
| Cable No | Port | # of identical | Connector Type | Cable Type | Cable Length (m) | Remarks |
| 1 | AC | 1 | AC | Un-shielded | 3 | N/A |
| 2 | USB | 1 | USB | Shielded | 1 | N/A |


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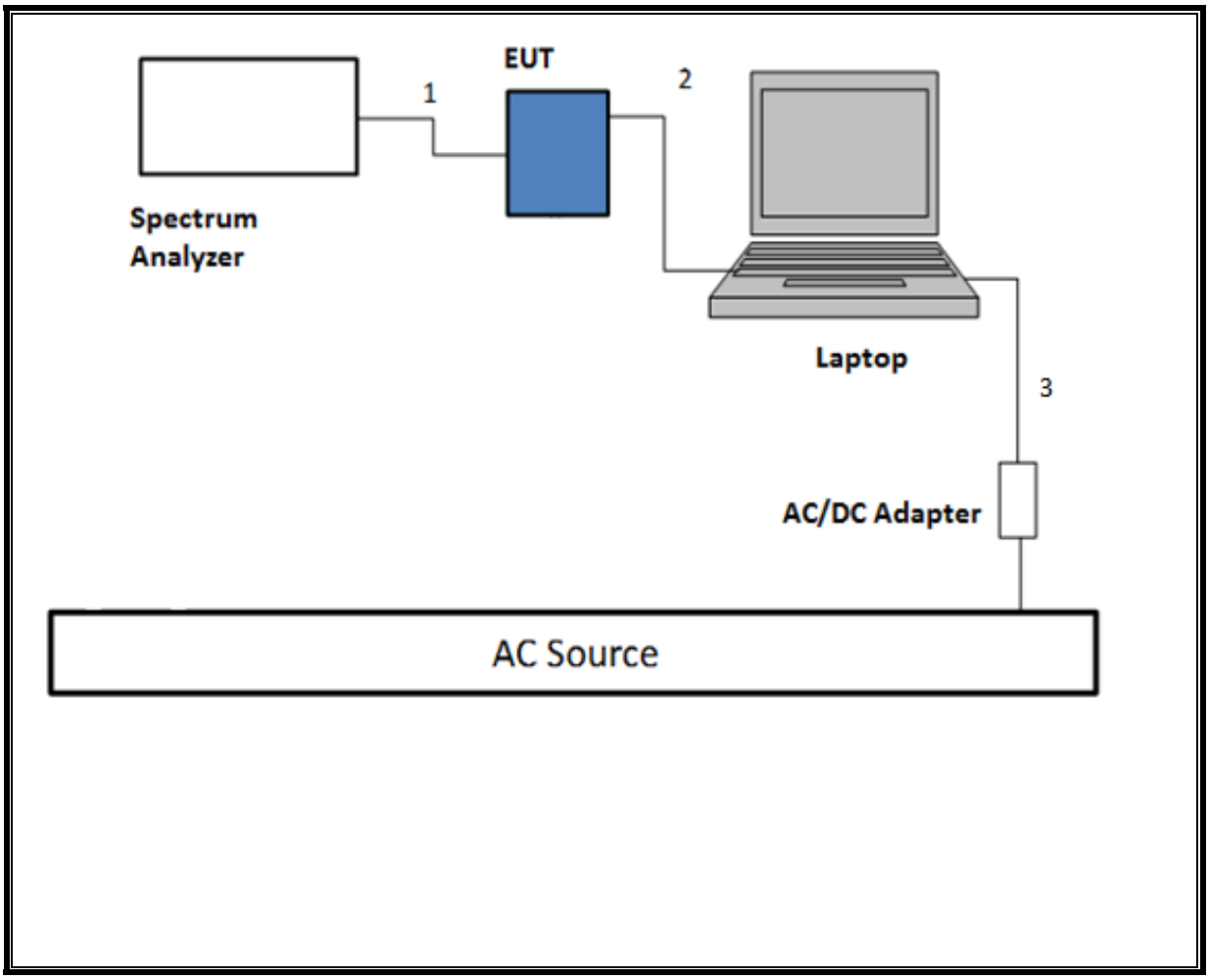
**TEST SETUP**

The EUT was tested connected to a host Laptop via USB cable adapter and spectrum analyzer to antenna port. Test software exercised the EUT.

**SETUP DIAGRAM**





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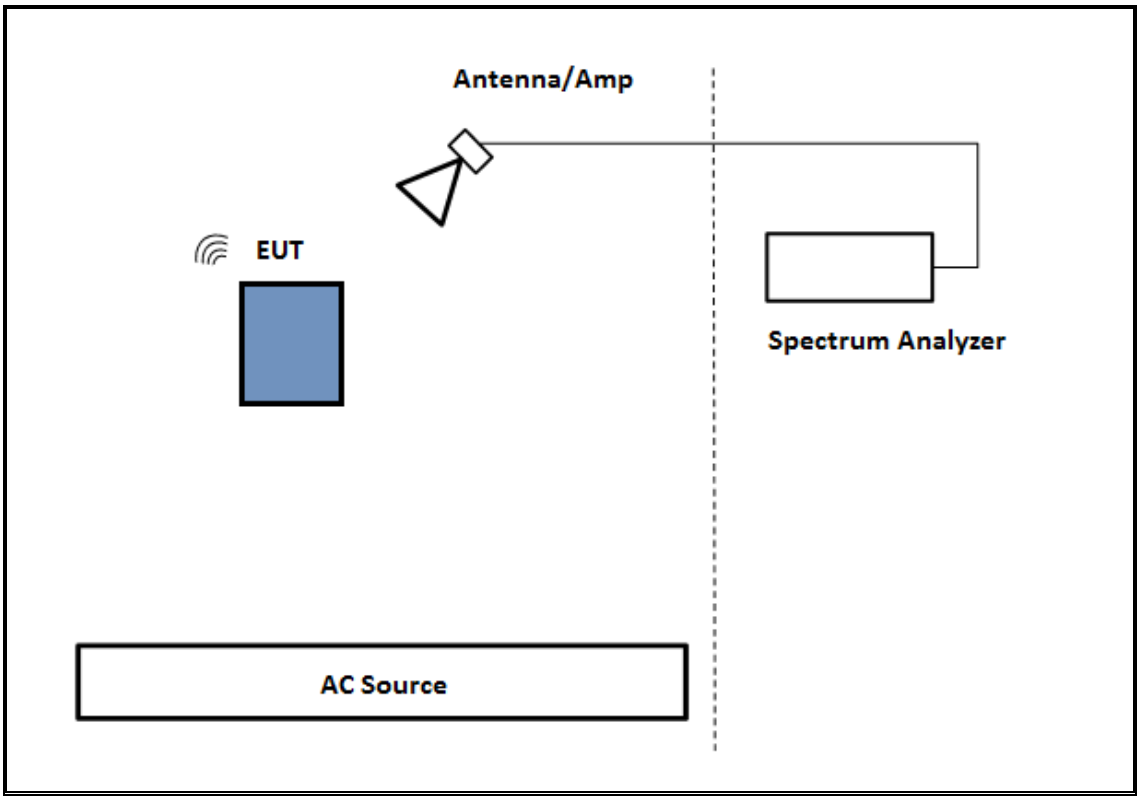
**TEST SETUP- RADIATED-ABOVE 1 GHZ**

The EUT was powered by battery. Test software exercised the EUT.

**SETUP DIAGRAM**





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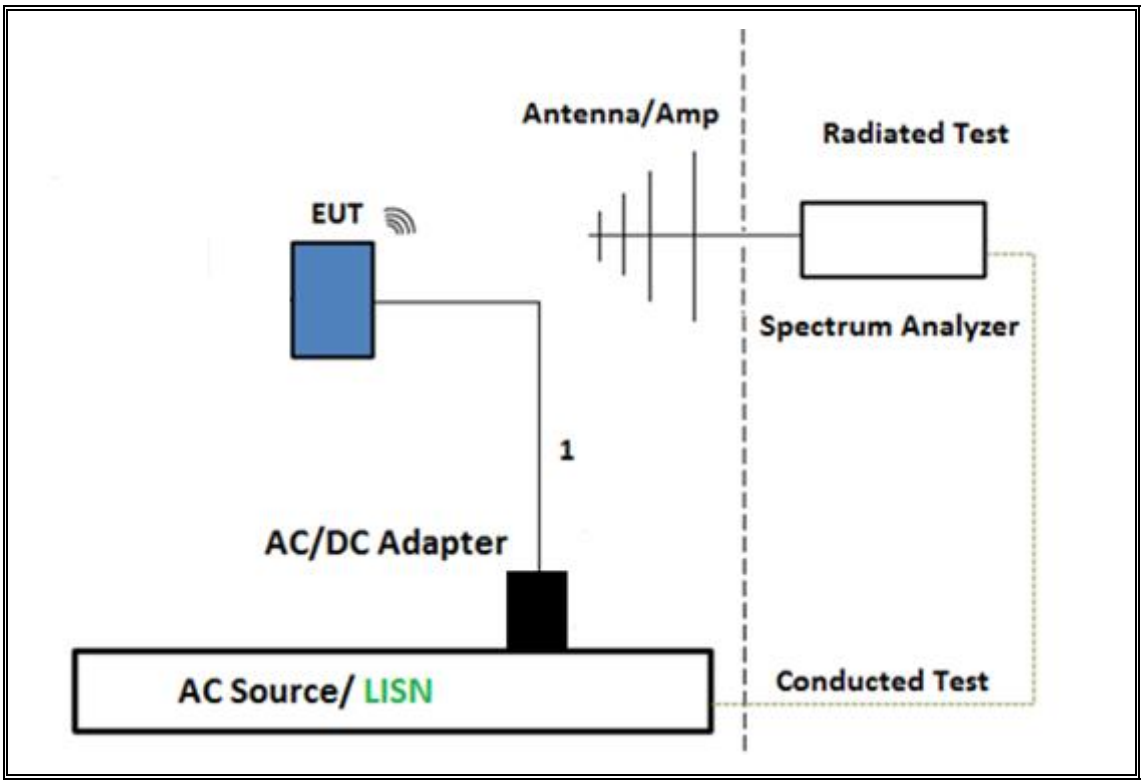
**TEST SETUP- BELOW 1GHZ & AC LINE CONDUCTED TESTS**

The EUT was powered by AC/DC adapter. Test software exercised the EUT.

**SETUP DIAGRAM**





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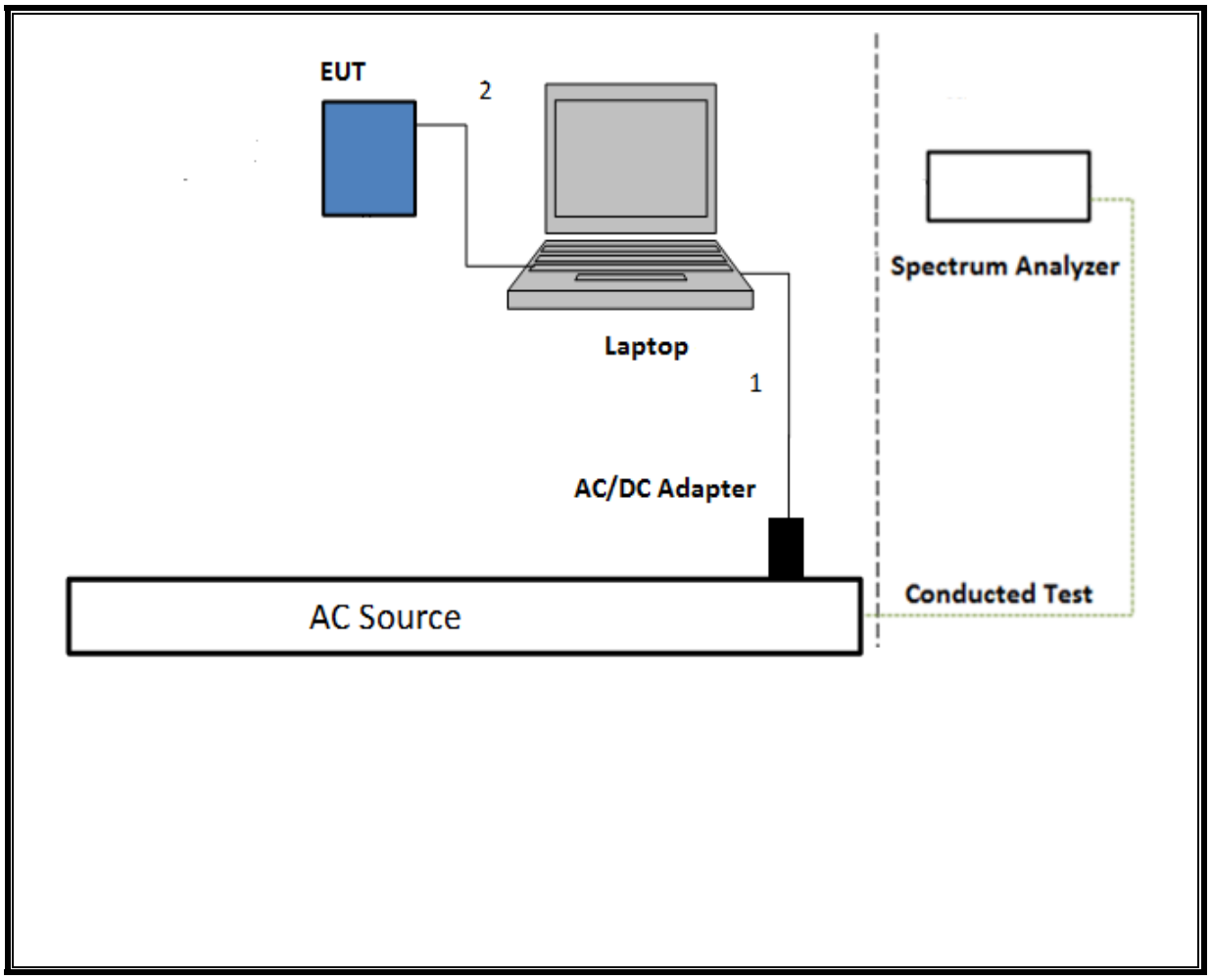
**TEST SETUP- AC LINE CONDUCTED TEST (LAPTOP CONFIGURATION)**

The EUT was tested connected to a host Laptop via USB cable adapter and spectrum analyzer to antenna port. Test software exercised the EUT.

**SETUP DIAGRAM**





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# 6. TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

| TEST EQUIPMENT LIST | | | | |
|---|---|---|---|---|
| **Description** | **Manufacturer** | **Model** | **Asset** | **Cal Due** |
| Spectrum Analyzer, PXA 3Hz to 44GHz | Keysight | N9030A | T340 | 12/14/2017 |
| *Antenna, Horn 1-18GHz | ETS Lindgren | 3117 | T862 | 4/10/2017 |
| Antenna, Broadband Hybrid, 30MHz to 2000MHz | Sunol Sciences | JB1 | T243 | 10/11/2017 |
| Amplifier, 1 to 18GHz | Miteq | AFS42-00101800-25-S-42 | T742 | 11/29/2017 |
| *Amplifier, 10KHz to 1GHz, 32dB | Sonoma | 310N | T834 | 6/17/2017 |
| Spectrum Analyzer, PXA 3Hz to 44GHz | Keysight | N9030A-544 | T341 | 10/25/2017 |
| Antenna, Horn 1-18GHz | ETS Lindgren | 3117 | T344 | 4/20/2018 |
| Amplifier, 1 to 18GHz, 35dB | Amplical | AMP1G18-35 | T1569 | 9/15/2017 |
| *Antenna Horn, 18 to 26GHz | ARA | MWH-1826 | T447 | 6/16/2017 |
| Spectrum Analyzer, 40GHz | Agilent | 8564E | T106 | 9/7/2017 |
| *Pre-Amp 18-26GHz | Agilent Technology | 8449B | T404 | 7/5/2017 |
| Spectrum Analyzer, PXA 3Hz to 44GHz | Keysight | N9030A | T1613 | 12/2/2017 |
| Power Sensor | Keysight | N1921A | T750 | 10/1/2017 |
| Spectrum Analyzer, PXA, 3Hz to 44GHz | Agilent (Keysight) Technologies | N9030A | T340 | 12/14/2017 |
| **AC Line Conducted** | | | | |
| EMI Test Receiver 9Khz-7GHz | Rohde & Schwarz | ESCI7 | T1436 | 1/06/2018 |
| *LISN for Conducted Emissions CISPR-16 | Fischer | 50/250-25-2-01 | T1310 | 06/08/2017 |
| LISN for Conducted Emissions CISPR-16 | Fischer | 50/250-25-2-01 | T1310 | 06/15/2018 |
| Power Cable, Line Conducted Emissions | UL | PG1 | T861 | 9/1/2017 |
| **UL AUTOMATION SOFTWARE** | | | | |
| Radiated Software | UL | UL EMC | Ver 9.5, April 26, 2016 | |
| Conducted Software | UL | UL EMC | Ver 5.4, October 13, 2016 | |
| AC Line Conducted Software | UL | UL EMC | Ver 9.5, May 26, 2015 | |

NOTE: *testing is completed before equipment calibration expiration date.


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# 7. ANTENNA PORT TEST RESULTS

## 7.1. MEASUREMENT METHODS

6 dB BW: KDB 558074 D01 v04, Section 8.1.

Output Power: KDB 558074 D01 v04, Section 9.1.3.

Power Spectral Density: KDB 558074 D01 v04, Section 10.2.

Out-of-band emissions in non-restricted bands: KDB 558074 D01 v04, Section 11.0.

Out-of-band emissions in restricted bands: KDB 558074 D01 v04, Section 12.1.

Band-edge: KDB 558074 D01 v04, Section 12.1.

Conducted line emissions: C63.10, Clause 6.2


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## 7.2. ON TIME, DUTY CYCLE

**LIMITS**

None; for reporting purposes only.

**PROCEDURE**

KDB 558074 Zero-Span Spectrum Analyzer Method.

**ON TIME AND DUTY CYCLE RESULTS**

| Mode | ON Time B (msec) | Period (msec) | Duty Cycle x (linear) | Duty Cycle (%) | Duty Cycle Correction Factor (dB) | 1/B Minimum VBW (khz) |
|---|---|---|---|---|---|---|
| BLE Pmax | 128 | 128 | 1.000 | 100% | 0.00 | 0.010 |
| BLE PLow | 128 | 128 | 1.000 | 100% | 0.00 | 0.010 |


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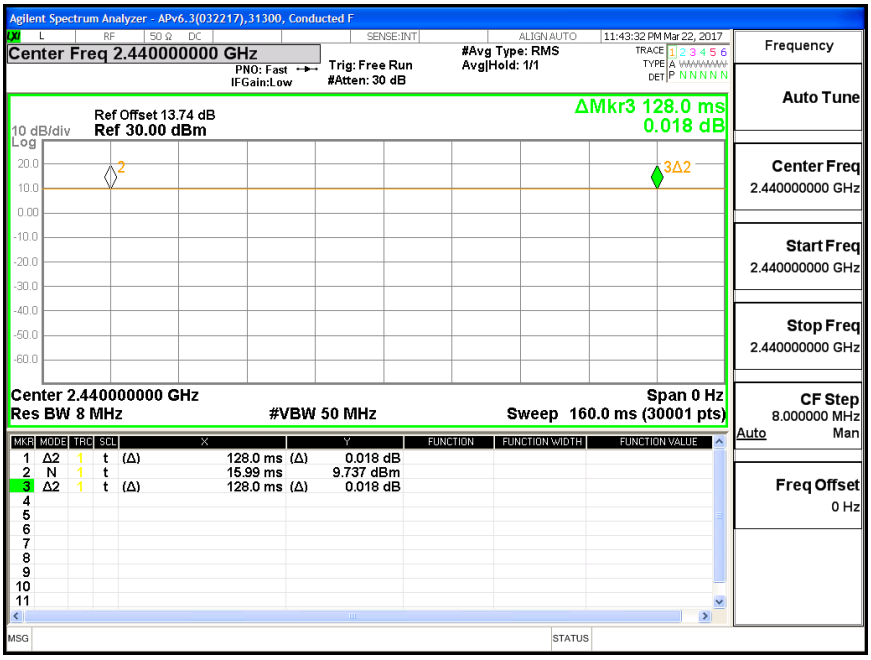
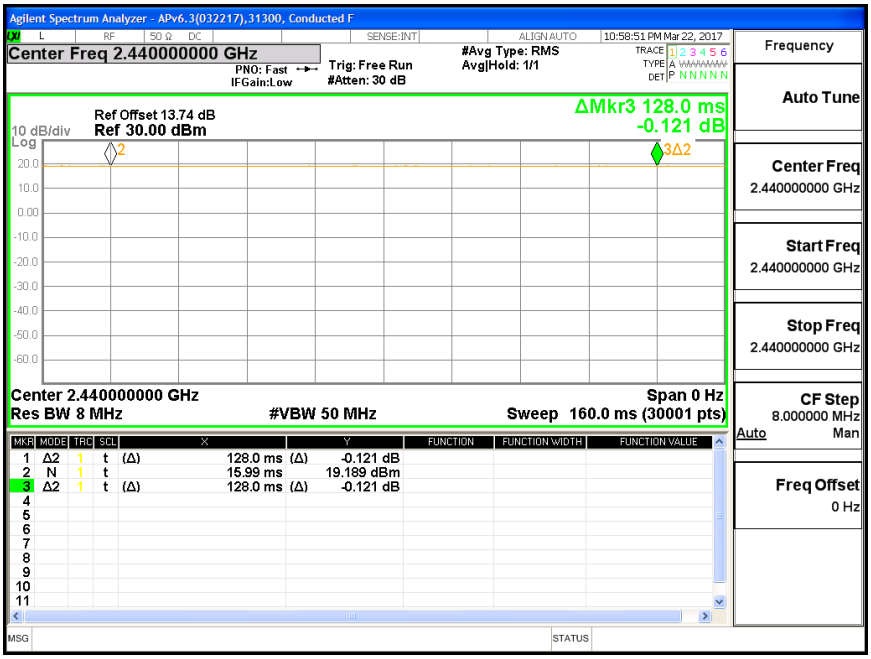
**DUTY CYCLE PLOTS**

DUTY CYCLE BLE PMAX MODE




DUTY CYCLE BLE PLOW MODE





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## 7.3. UAT 1 BLE 1M Pmax

### 7.3.1. 6 dB BANDWIDTH

**LIMITS**

FCC §15.247 (a) (2)

IC RSS-247 (5.2) (a)

The minimum 6 dB bandwidth shall be at least 500 kHz.

**RESULTS**

| Channel | Frequency | 6 dB Bandwidth (MHz) | Minimum Limit (MHz) |
|---|---|---|---|
| Low | 2402 | 0.678 | 0.5 |
| Middle | 2440 | 0.636 | 0.5 |
| High | 2480 | 0.702 | 0.5 |


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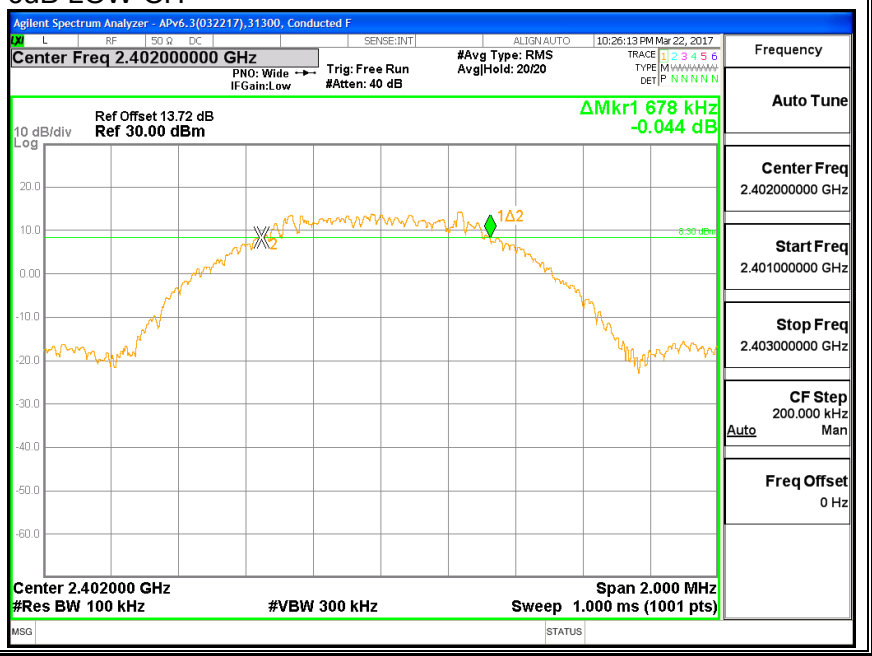
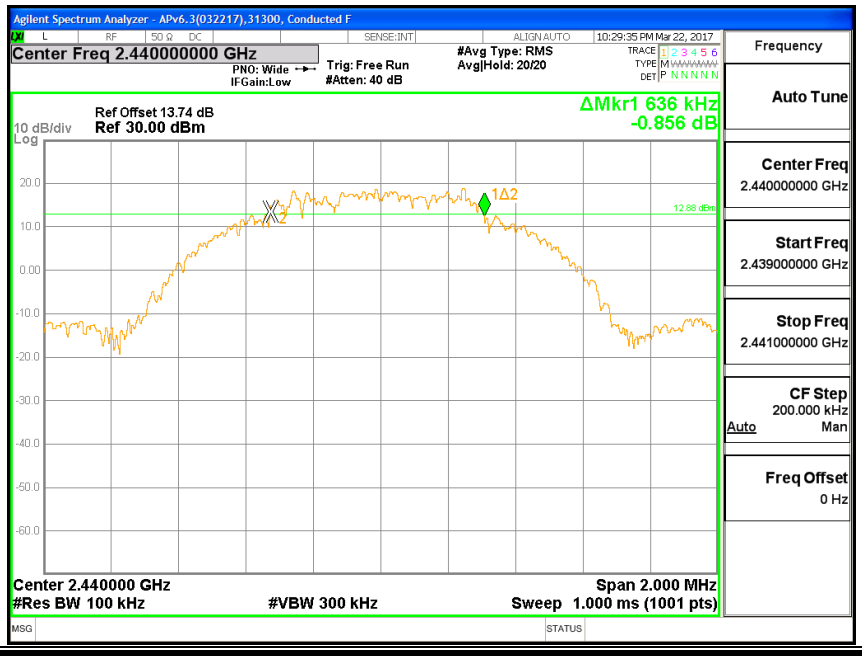
6dB LOW CH




6dB MID CH





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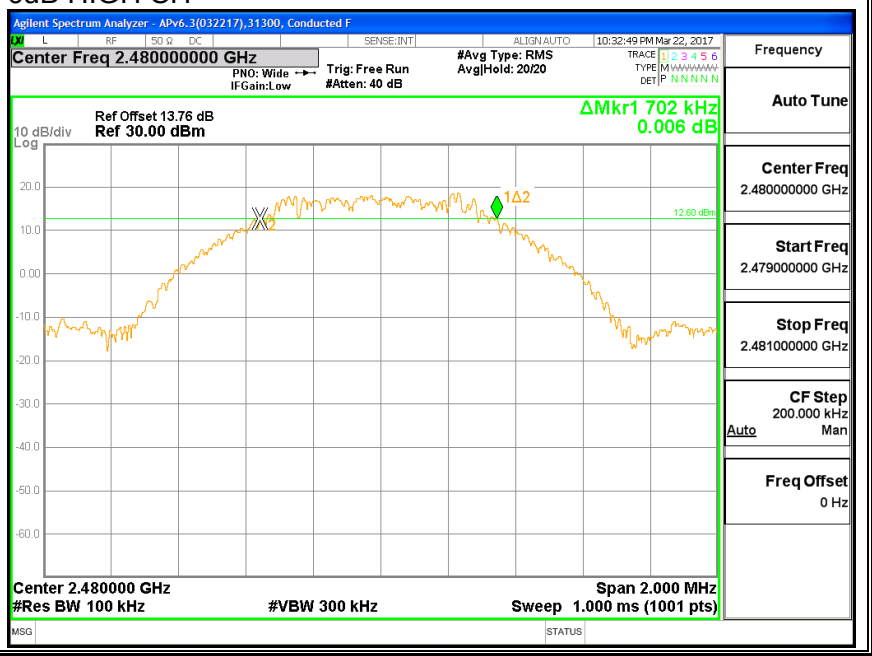
6dB HIGH CH





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### 7.3.2. 99% BANDWIDTH

**LIMITS**

None; for reporting purposes only.

**Test Procedure**

The transmitter output is connected to the spectrum analyzer. The RBW is set to 1% to 3% of the 99 % bandwidth and to 1% of the span. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal 99% bandwidth function is utilized.

**RESULTS**

| Channel | Frequency (MHz) | 99% Bandwidth (MHz) |
|---|---|---|
| Low | 2402 | 1.0562 |
| Middle | 2440 | 1.0572 |
| High | 2480 | 1.0583 |


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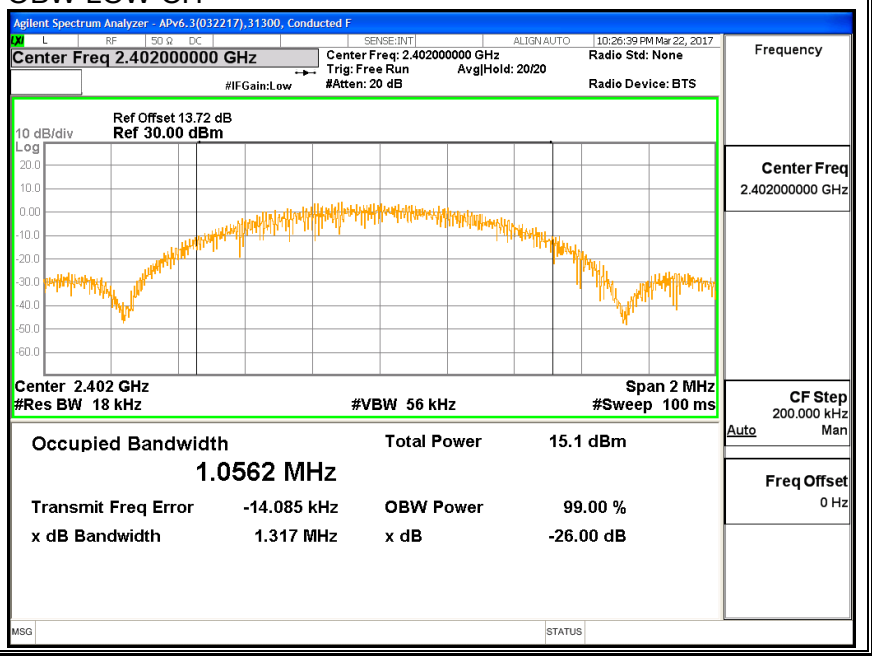
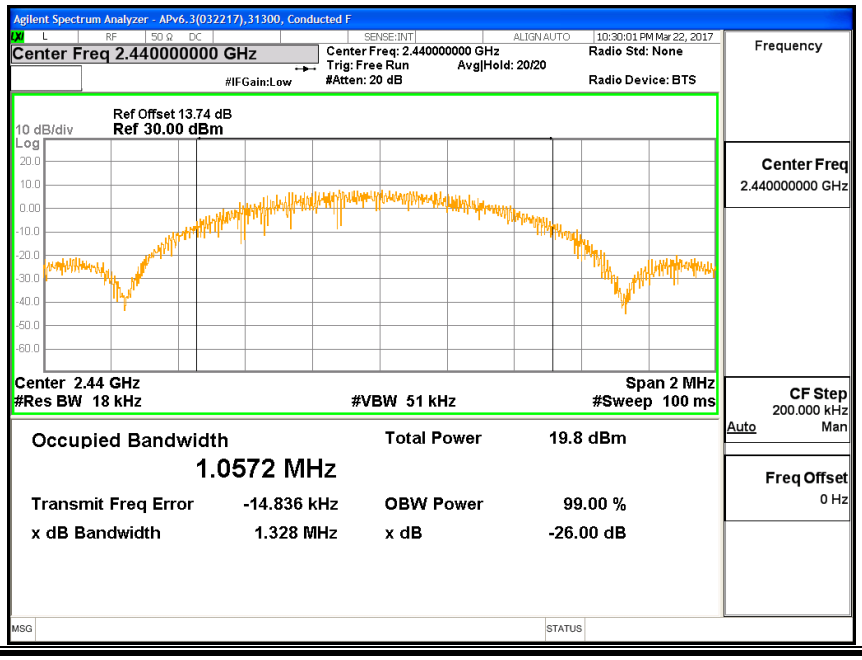
OBW LOW CH




OBW MID CH





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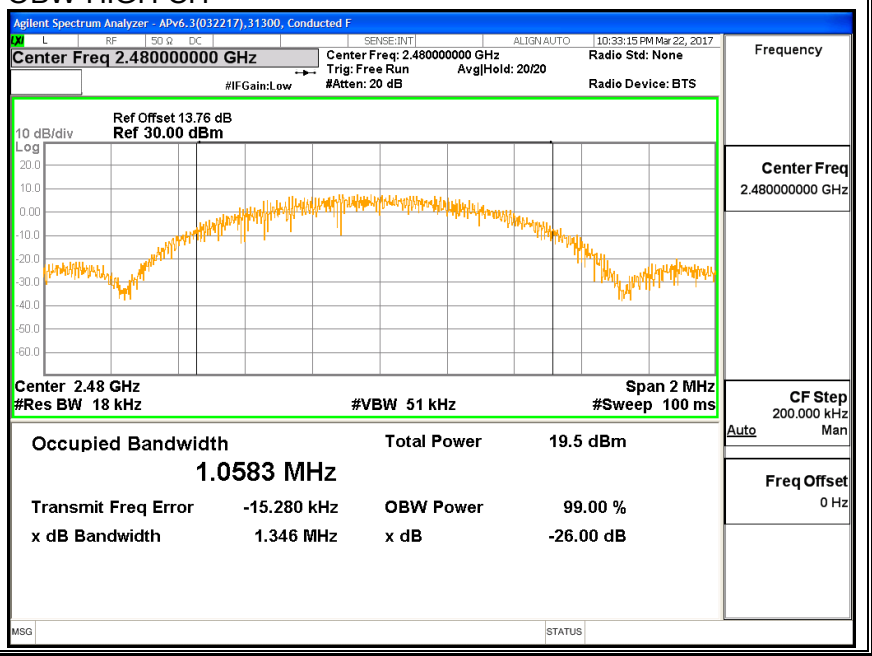
OBW HIGH CH





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### 7.3.3. AVERAGE POWER

| ID: | 30554 | Date: | 6/14/2017 |
|---|---|---|---|

**LIMITS**

None; for reporting purposes only.

The cable assembly insertion loss of 11 dB (including 10 dB pad and 1 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

**RESULTS**

| Channel | Frequency (MHz) | AV Power (MHz) |
|---|---|---|
| Low | 2402 | 19.25 |
| Middle | 2440 | 19.87 |
| High | 2480 | 19.65 |


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## 7.3.4. OUTPUT POWER

| ID: | 30554 | Date: | 6/14/2017 |
|---|---|---|---|

**LIMITS**

FCC §15.247 (b)

IC RSS-247 (5.4) (d)

The maximum antenna gain is less than or equal to 6 dBi, therefore the limit is 30 dBm.

**RESULTS**

| Channel | Frequency (MHz) | Peak Power Reading (dBm) | Limit (dBm) | Margin (dB) |
|---|---|---|---|---|
| Low | 2402 | 19.59 | 30 | -10.52 |
| Middle | 2440 | 20.21 | 30 | -10.14 |
| High | 2480 | 19.98 | 30 | -10.42 |


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## 7.3.5. POWER SPECTRAL DENSITY

**LIMITS**

FCC §15.247 (e)

IC RSS-247 (5.2) (b)

The power spectral density conducted from the transmitter to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

**RESULTS**

| Channel | Frequency (MHz) | PSD (dBm/3kHz) | Limit (dBm/3kHz) | Margin (dB) |
|---|---|---|---|---|
| Low | 2402 | 0.824 | 8 | -7.176 |
| Middle | 2440 | 3.453 | 8 | -4.547 |
| High | 2480 | 2.914 | 8 | -5.086 |


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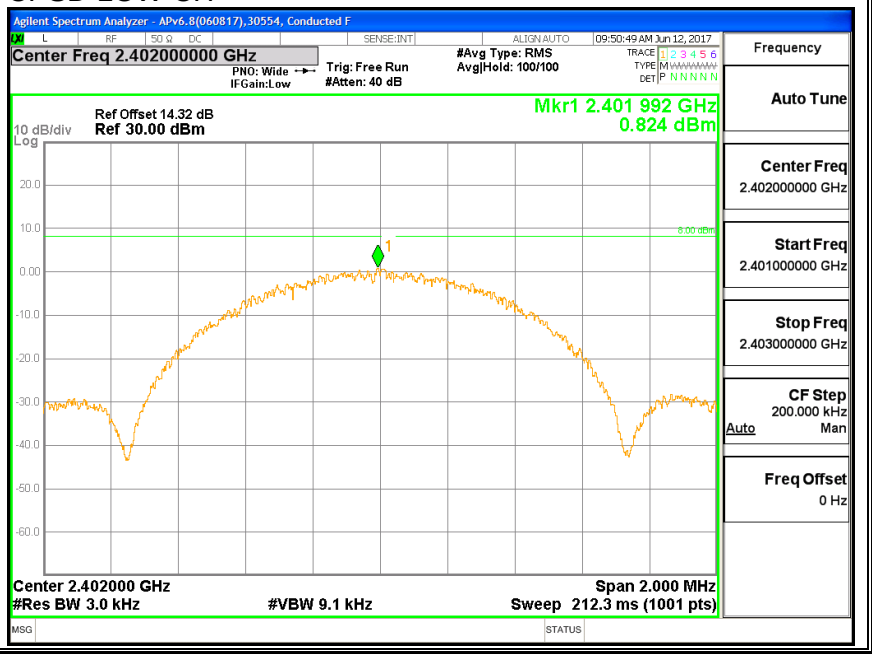
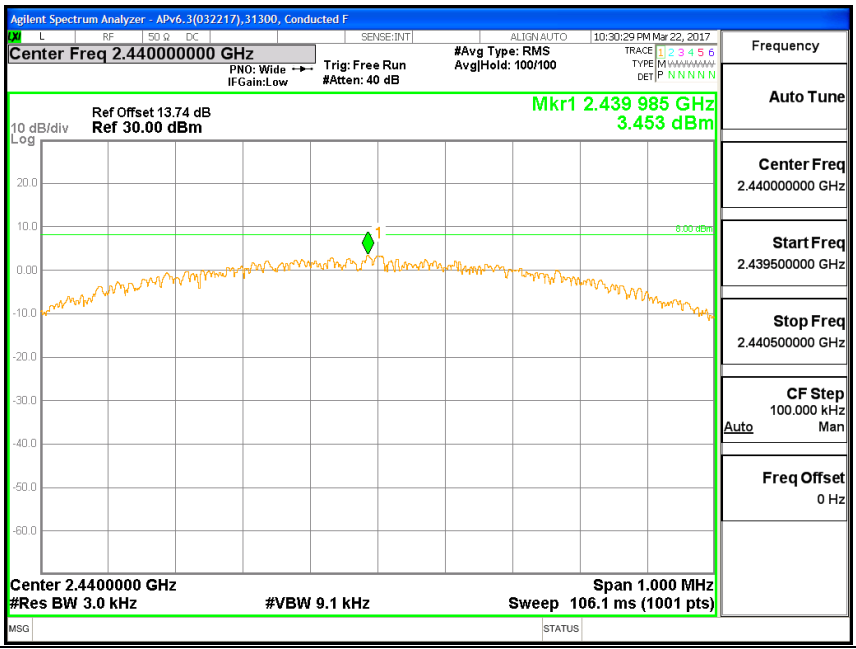
CPSD LOW CH




CPSD MID CH





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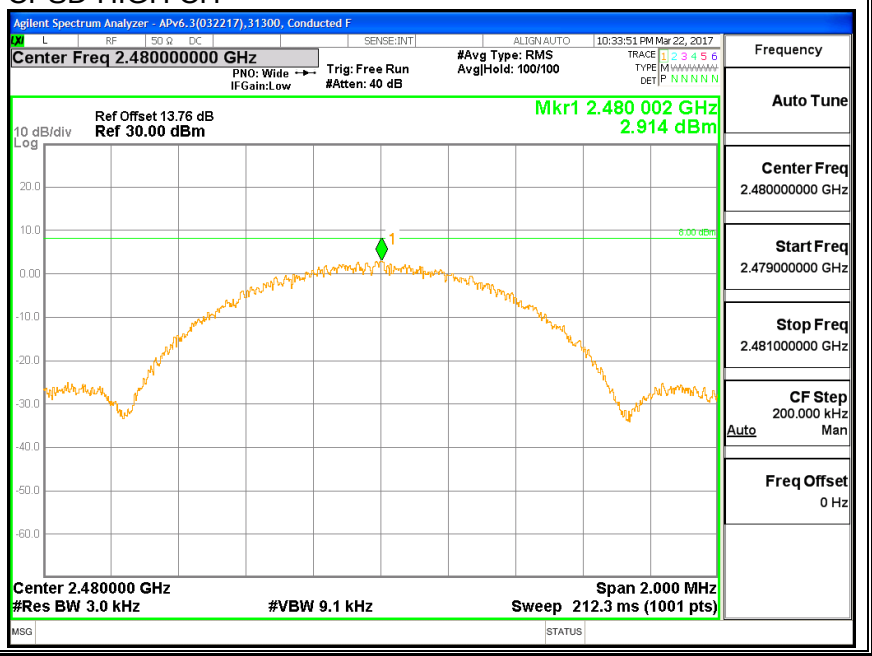
CPSD HIGH CH





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## 7.3.6. CONDUCTED BANDEDGE AND SPURIOUS EMISSIONS

**LIMITS**

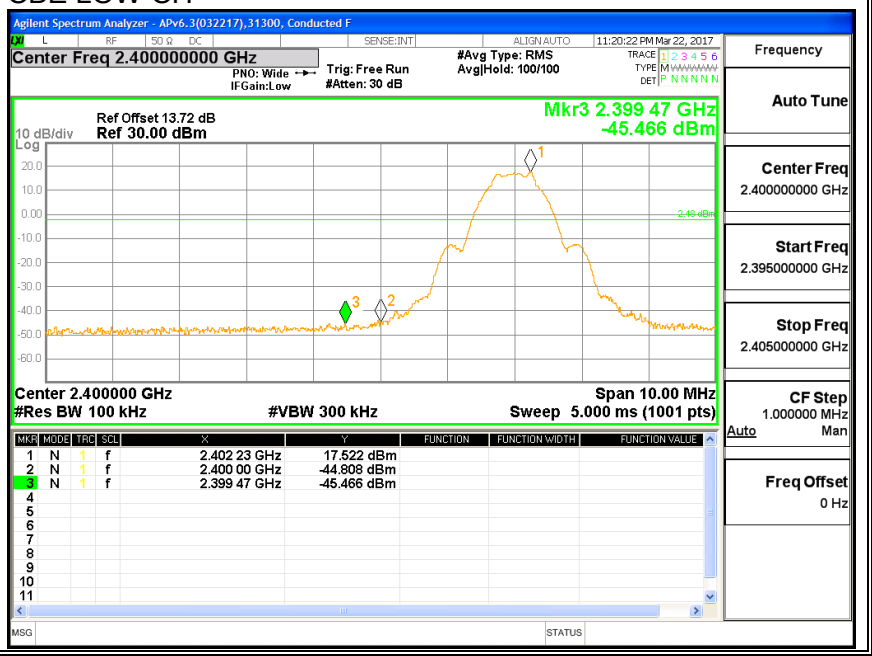
FCC §15.247 (d)

IC RSS-247 (5.5)

Output power was measured based on the use of a peak measurement, therefore the required attenuation is 20 dB.

**RESULTS**

CBE LOW CH





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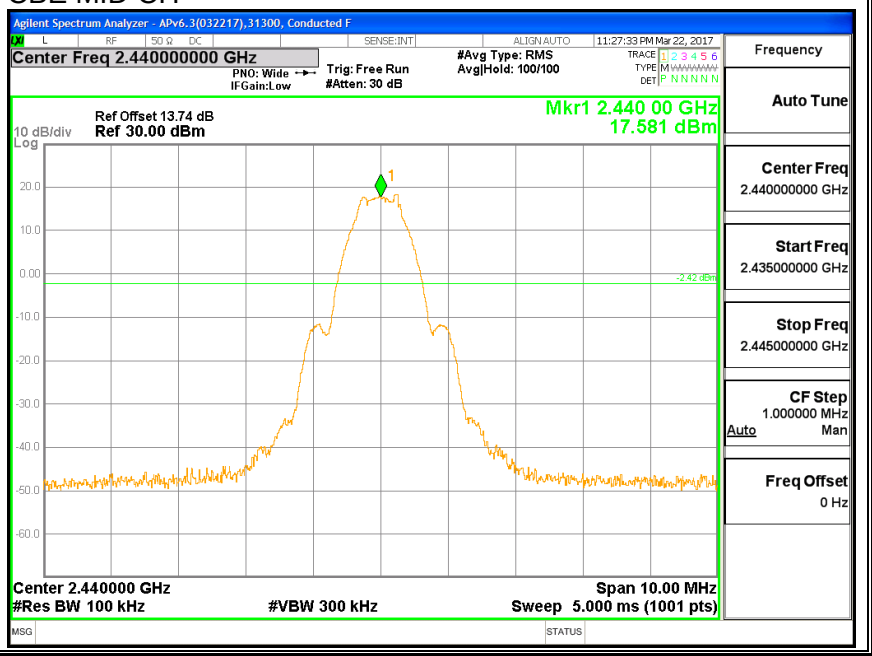
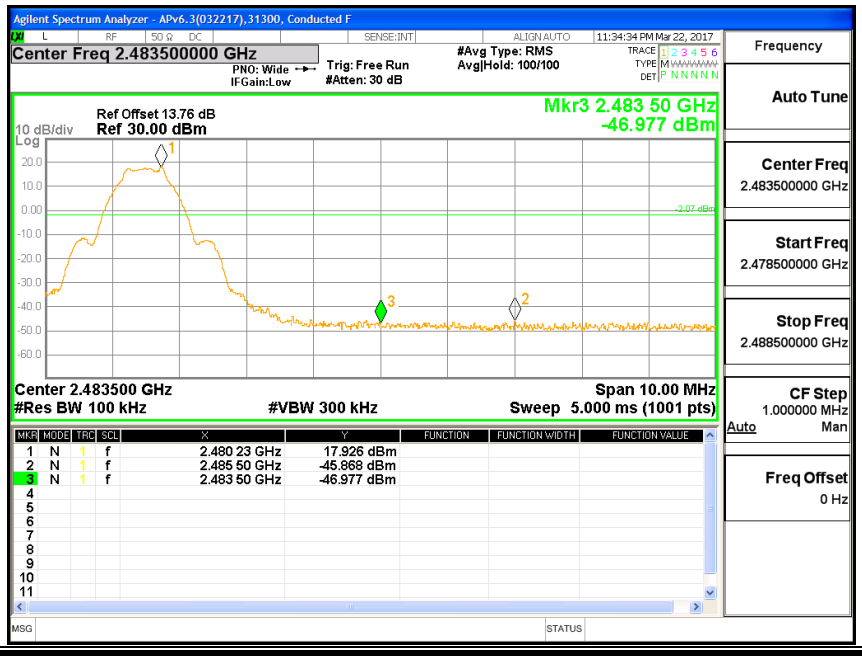
CBE MID CH




CBE HIGH CH





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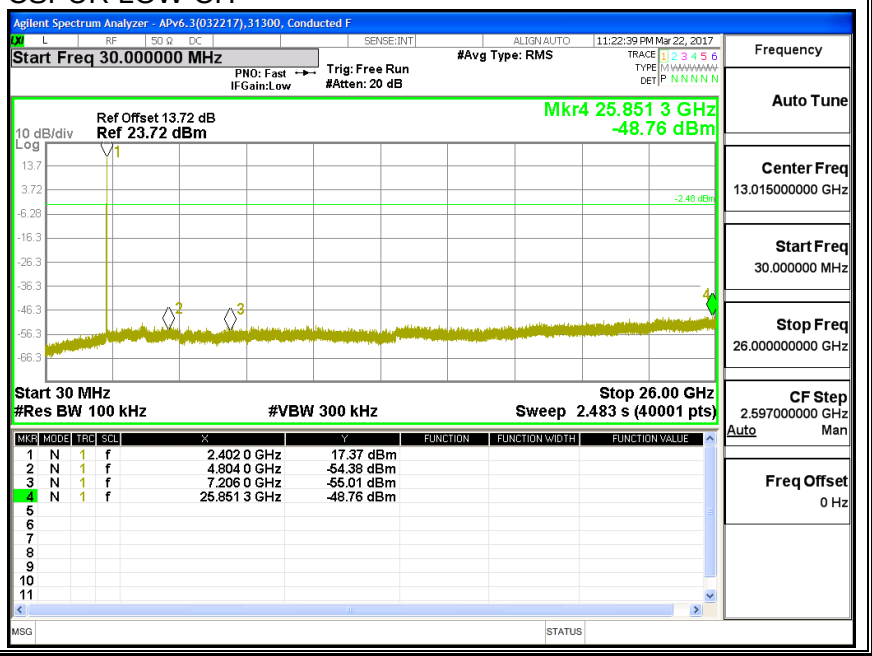
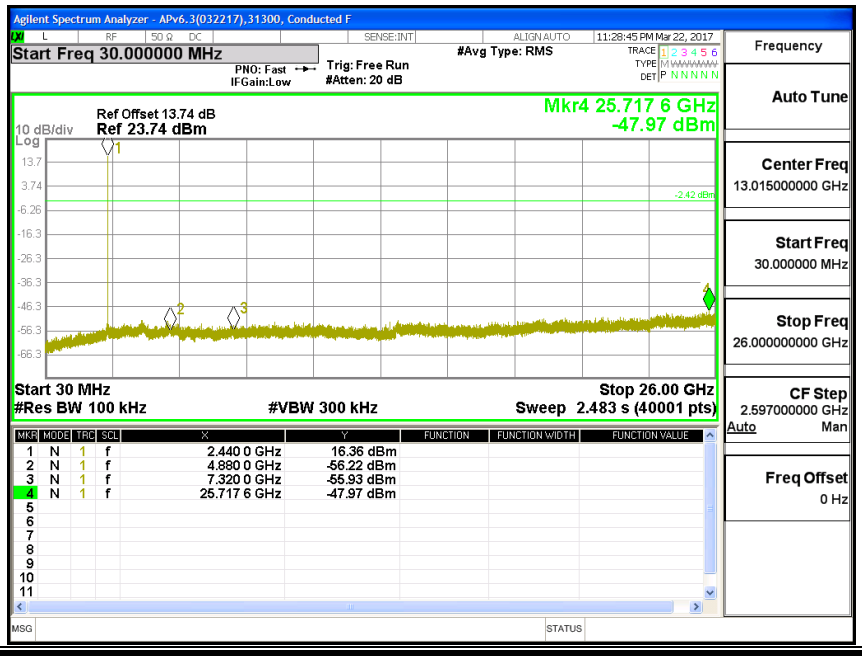
CSPUR LOW CH




CSPUR MID CH





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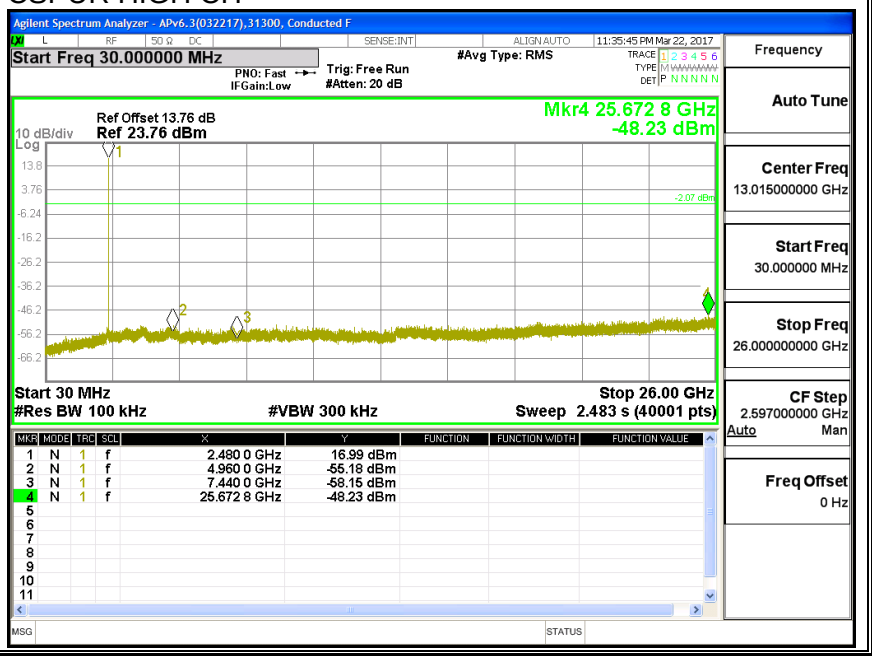
CSPUR HIGH CH





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## 7.4. UAT 1 BLE 1M Plow

### 7.4.1. 6 dB BANDWIDTH

**LIMITS**

FCC §15.247 (a) (2)

IC RSS-247 (5.2) (a)

The minimum 6 dB bandwidth shall be at least 500 kHz.

**RESULTS**

| Channel | Frequency | 6 dB Bandwidth (MHz) | Minimum Limit (MHz) |
|---|---|---|---|
| Low | 2402 | 0.734 | 0.5 |
| Middle | 2440 | 0.728 | 0.5 |
| High | 2480 | 0.728 | 0.5 |


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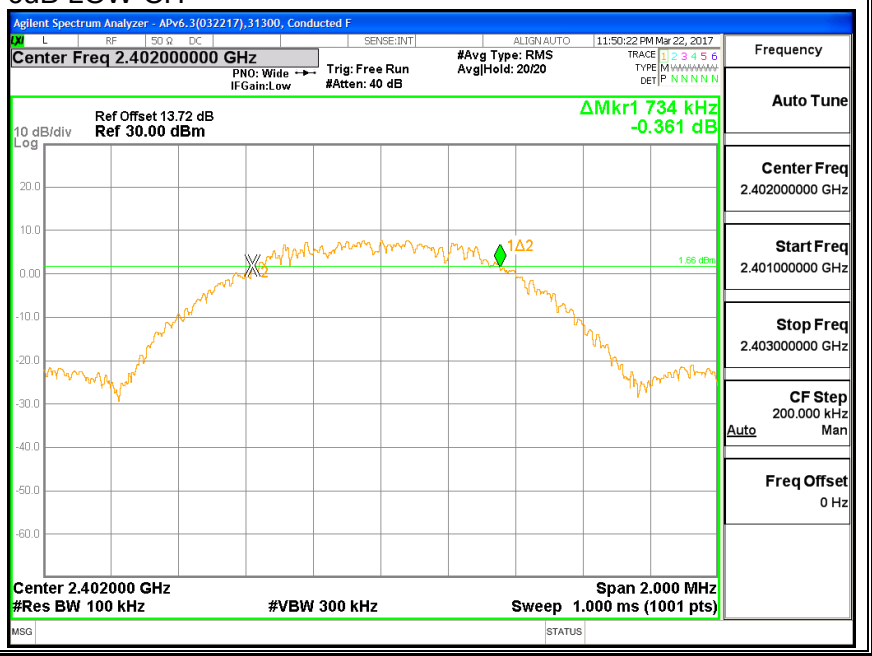
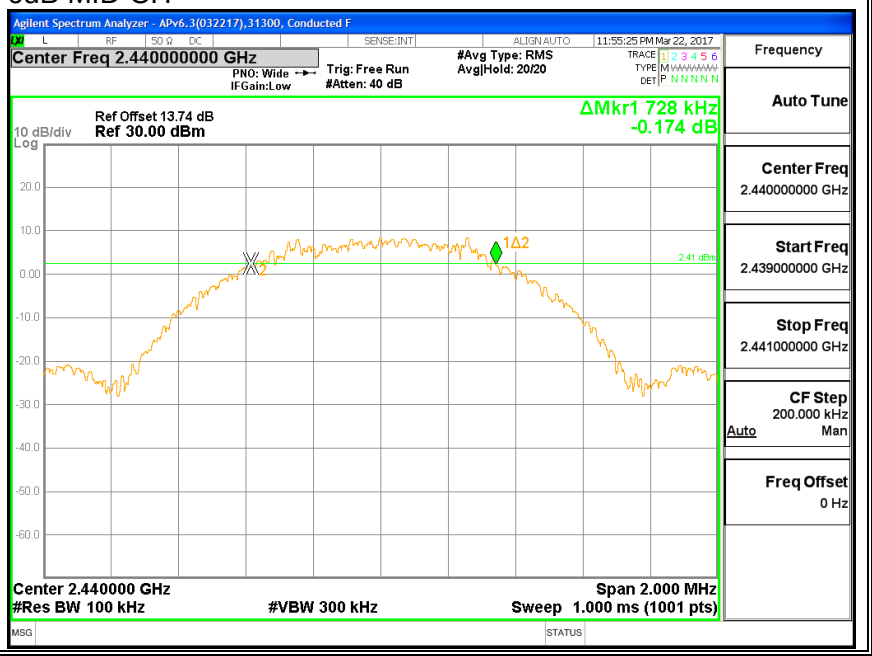
6dB LOW CH




6dB MID CH





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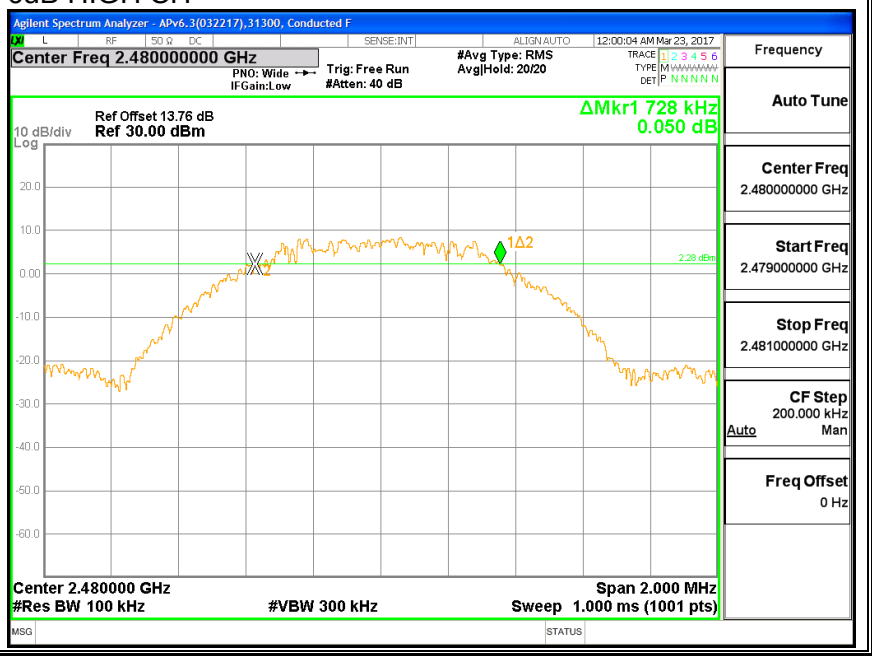
6dB HIGH CH





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### 7.4.2. 99% BANDWIDTH

**LIMITS**

None; for reporting purposes only.

**Test Procedure**

The transmitter output is connected to the spectrum analyzer. The RBW is set to 1% to 3% of the 99 % bandwidth and to 1% of the span. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal 99% bandwidth function is utilized.

**RESULTS**

| Channel | Frequency (MHz) | 99% Bandwidth (MHz) |
|---|---|---|
| Low | 2402 | 1.0613 |
| Middle | 2440 | 1.0533 |
| High | 2480 | 1.0563 |


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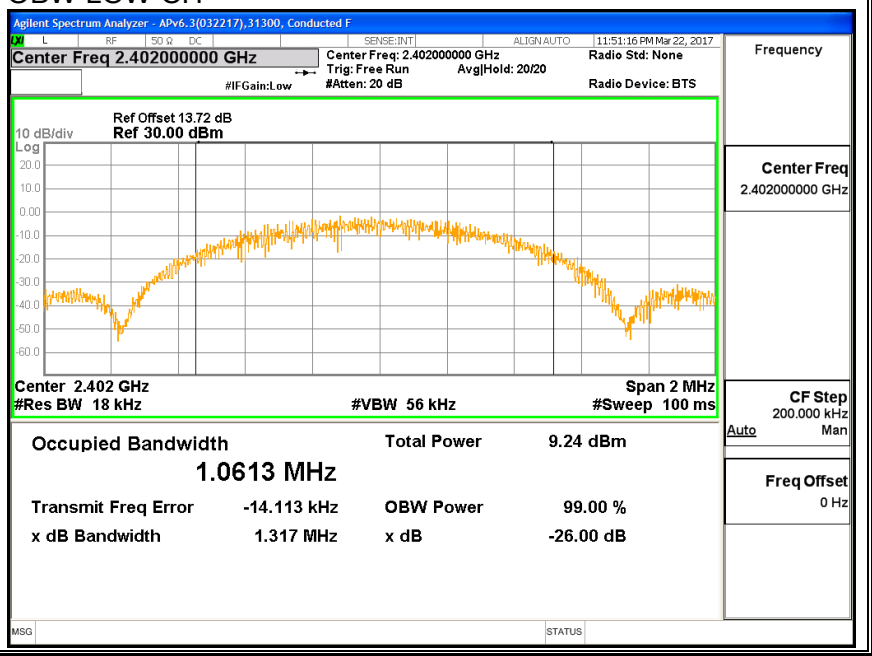
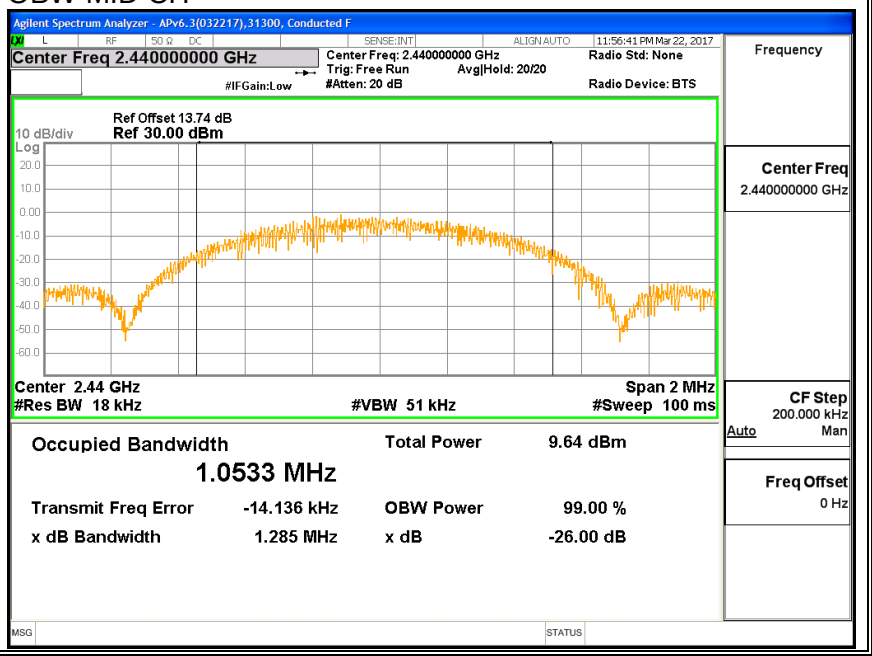
OBW LOW CH




OBW MID CH





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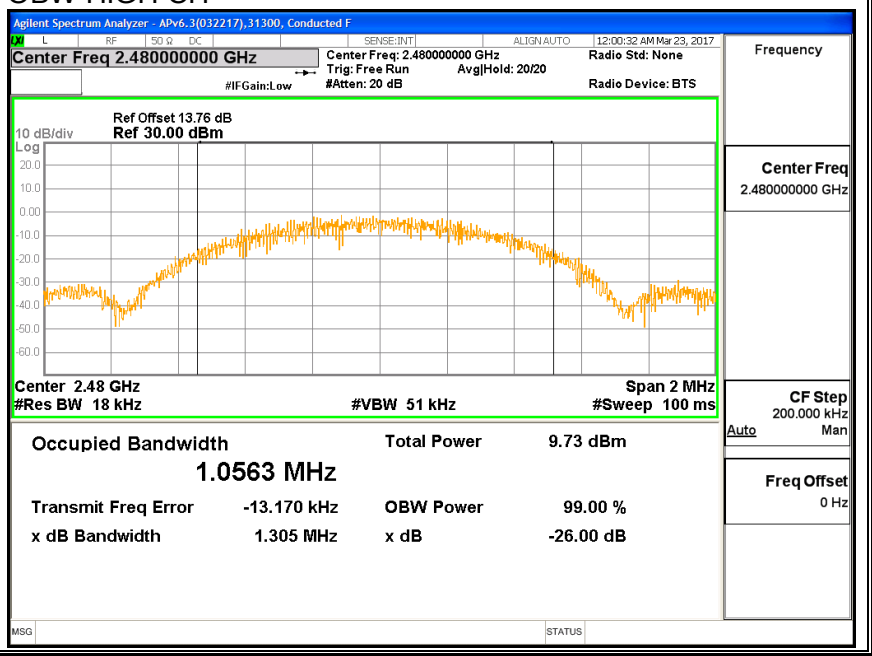
OBW HIGH CH





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## 7.4.3. AVERAGE POWER

| ID: | 30554 | Date: | 6/14/2017 |
|---|---|---|---|

**LIMITS**

None; for reporting purposes only.

The cable assembly insertion loss of 11 dB (including 10 dB pad and 1 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

**RESULTS**

| Channel | Frequency (MHz) | AV Power (MHz) |
|---|---|---|
| Low | 2402 | 9.10 |
| Middle | 2440 | 9.90 |
| High | 2480 | 9.87 |


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### 7.4.4. OUTPUT POWER

| ID: | 30554 | Date: | 6/14/2017 |
|---|---|---|---|

**LIMITS**

FCC §15.247 (b)

IC RSS-247 (5.4) (d)

The maximum antenna gain is less than or equal to 6 dBi, therefore the limit is 30 dBm.

**RESULTS**

| Channel | Frequency (MHz) | Peak Power Reading (dBm) | Limit (dBm) | Margin (dB) |
|---|---|---|---|---|
| Low | 2402 | 9.43 | 30 | -20.57 |
| Middle | 2440 | 10.24 | 30 | -19.76 |
| High | 2480 | 10.21 | 30 | -19.79 |


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## 7.4.5. POWER SPECTRAL DENSITY

**LIMITS**

FCC §15.247 (e)

IC RSS-247 (5.2) (b)

The power spectral density conducted from the transmitter to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

**RESULTS**

| Channel | Frequency (MHz) | PSD (dBm/3kHz) | Limit (dBm/3kHz) | Margin (dB) |
|---|---|---|---|---|
| Low | 2402 | -7.204 | 8 | -15.204 |
| Middle | 2440 | -6.894 | 8 | -14.894 |
| High | 2480 | -6.843 | 8 | -14.843 |


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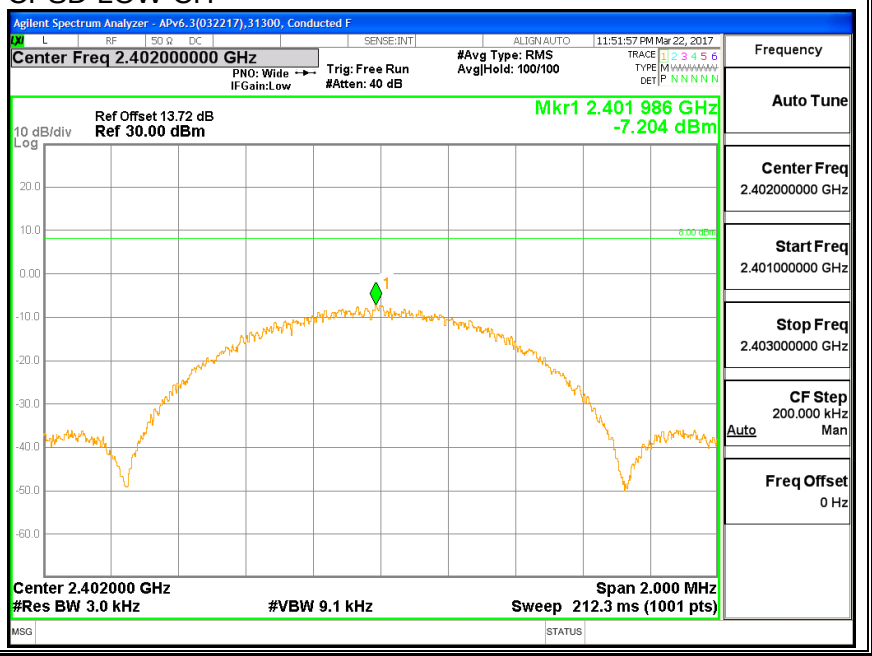
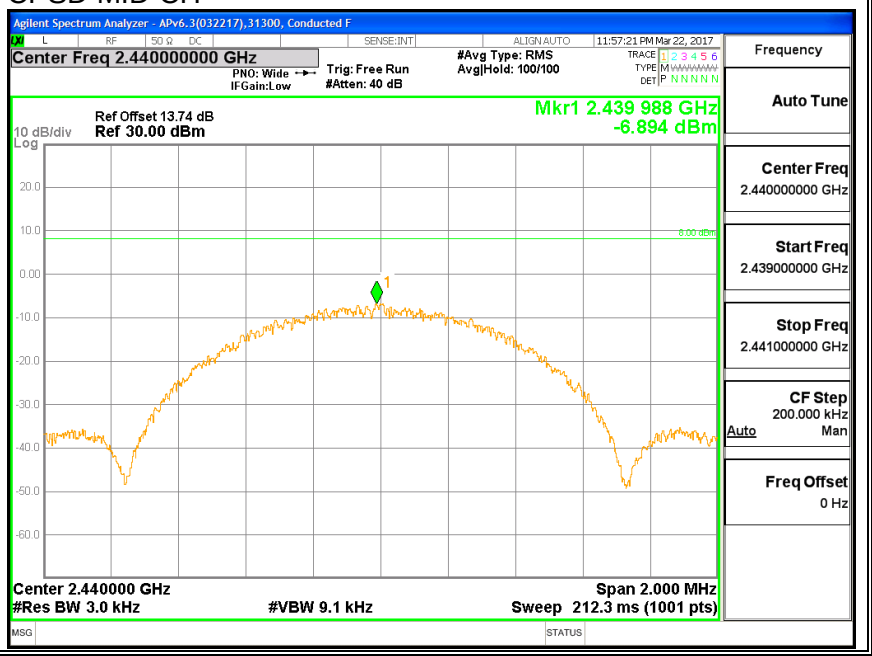
CPSD LOW CH




CPSD MID CH





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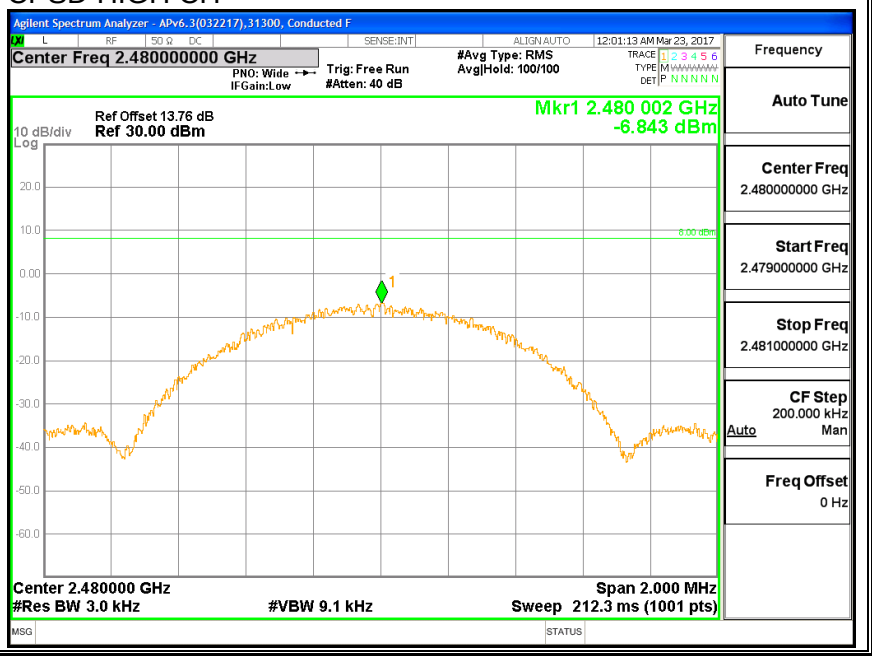
CPSD HIGH CH





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## 7.4.6. CONDUCTED BANDEDGE AND SPURIOUS EMISSIONS

**LIMITS**

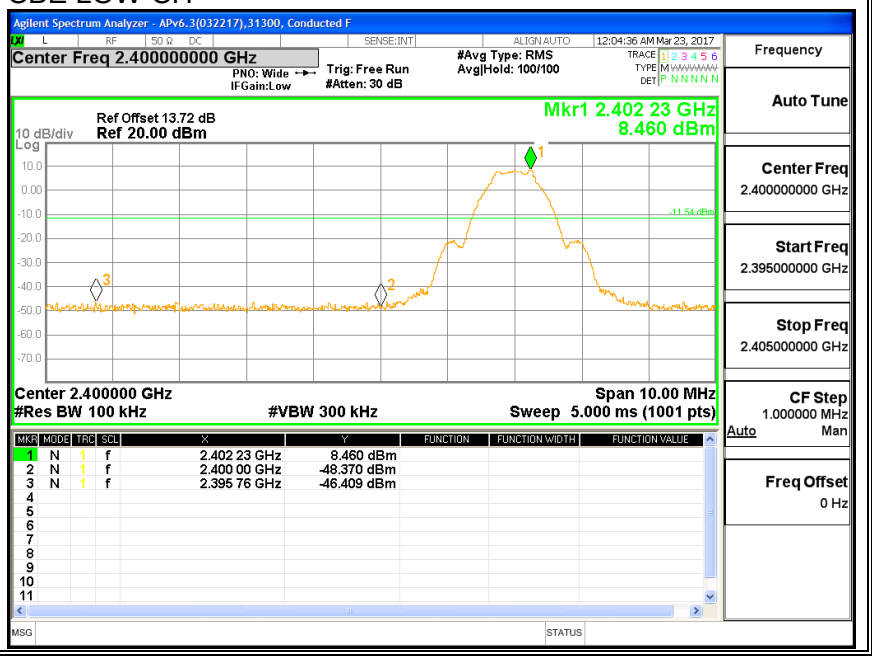
FCC §15.247 (d)

IC RSS-247 (5.5)

Output power was measured based on the use of a peak measurement, therefore the required attenuation is 20 dB.

**RESULTS**

CBE LOW CH





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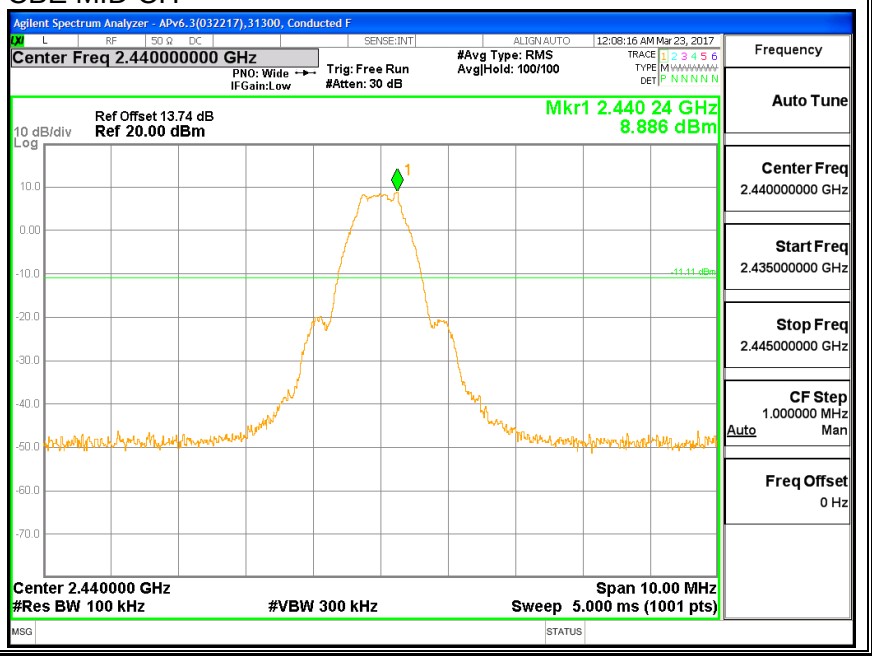
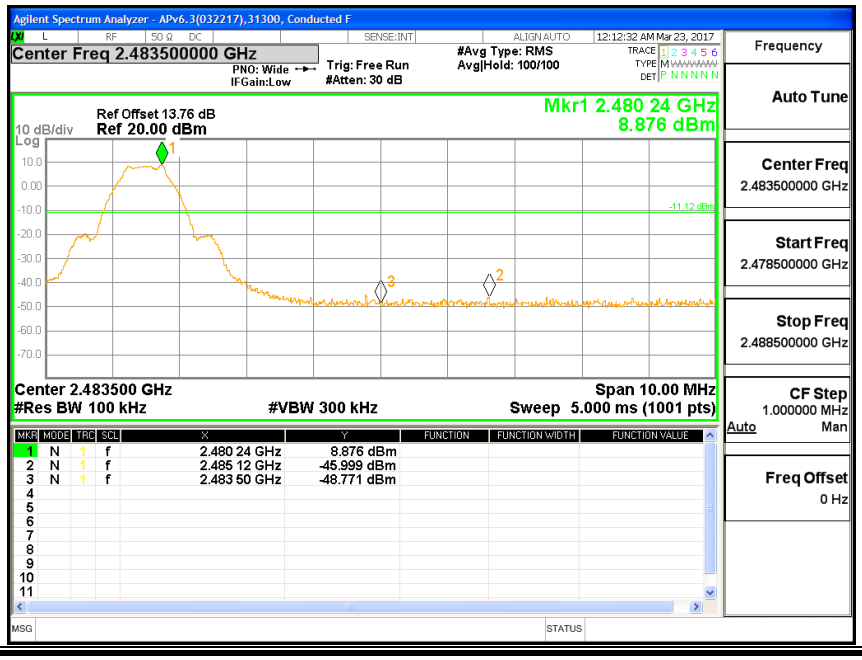
CBE MID CH




CBE HIGH CH





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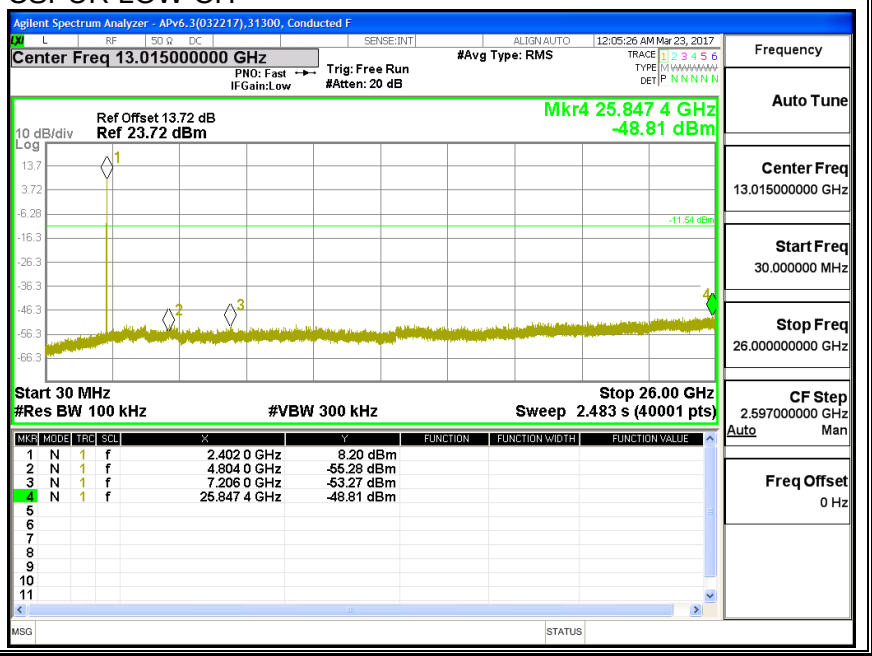
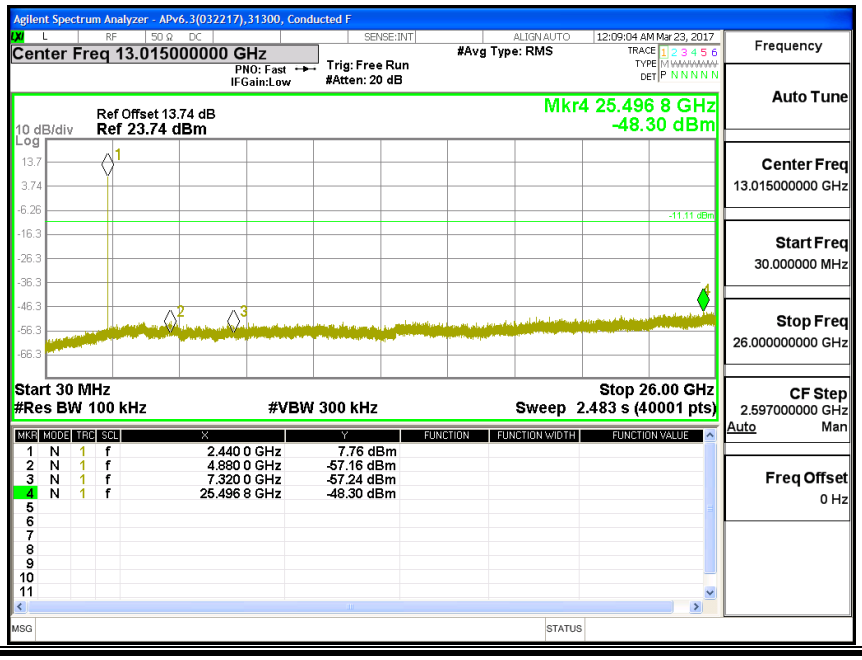
CSPUR LOW CH




CSPUR MID CH





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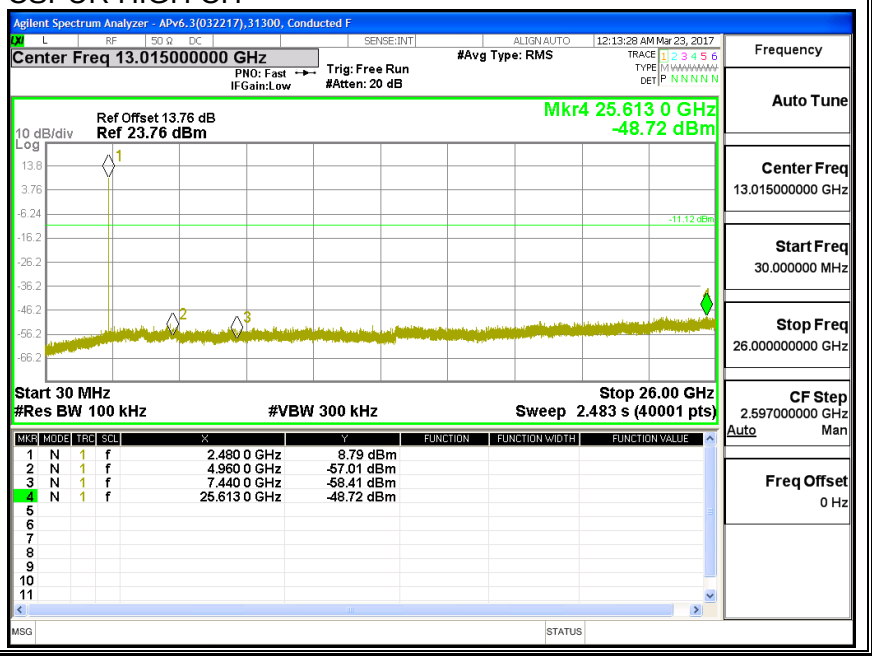
CSPUR HIGH CH





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## 7.5. UAT 1 BLE 2M Pmax

### 7.5.1. AVERAGE POWER

| ID: | 30554 | Date: | 6/14/2017 |
|---|---|---|---|

**LIMITS**

None; for reporting purposes only.

The cable assembly insertion loss of 11 dB (including 10 dB pad and 1 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

**RESULTS**

| Channel | Frequency (MHz) | AV Power (MHz) |
|---|---|---|
| Low | 2402 | 19.01 |
| Middle | 2440 | 19.58 |
| High | 2480 | 19.37 |


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### 7.5.2. OUTPUT POWER

| ID: | 30554 | Date: | 6/14/2017 |
|---|---|---|---|

**LIMITS**

FCC §15.247 (b)

IC RSS-247 (5.4) (d)

The maximum antenna gain is less than or equal to 6 dBi, therefore the limit is 30 dBm.

**TEST PROCEDURE**

The transmitter output is connected to a broadband Peak/average RF power meter

**RESULTS**

| Channel | Frequency (MHz) | Peak Power Reading (dBm) | Limit (dBm) | Margin (dB) |
|---|---|---|---|---|
| Low | 2402 | 19.24 | 30 | -10.76 |
| Middle | 2440 | 19.89 | 30 | -10.11 |
| High | 2480 | 19.70 | 30 | -10.30 |


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## 7.6. UAT 1 BLE 2M Plow

### 7.6.1. AVERAGE POWER

| ID: | 30554 | Date: | 6/14/2017 |
|---|---|---|---|

**LIMITS**

None; for reporting purposes only.

The cable assembly insertion loss of 11 dB (including 10 dB pad and 1 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

**RESULTS**

| Channel | Frequency (MHz) | AV Power (MHz) |
|---|---|---|
| Low | 2402 | 8.94 |
| Middle | 2440 | 9.68 |
| High | 2480 | 9.62 |


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### 7.6.2. OUTPUT POWER

| ID: | 30554 | Date: | 6/14/2017 |
|---|---|---|---|

**LIMITS**

FCC §15.247 (b)

IC RSS-247 (5.4) (d)

The maximum antenna gain is less than or equal to 6 dBi, therefore the limit is 30 dBm.

**TEST PROCEDURE**

The transmitter output is connected to a broadband Peak/average RF power meter

**RESULTS**

| Channel | Frequency (MHz) | Peak Power Reading (dBm) | Limit (dBm) | Margin (dB) |
|---|---|---|---|---|
| Low | 2402 | 9.12 | 30 | -20.88 |
| Middle | 2440 | 9.88 | 30 | -20.12 |
| High | 2480 | 9.83 | 30 | -20.17 |


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## 7.7. LAT 3 BLE 1M Pmax

### 7.7.1. 6 dB BANDWIDTH

**LIMITS**

FCC §15.247 (a) (2)

IC RSS-247 (5.2) (a)

The minimum 6 dB bandwidth shall be at least 500 kHz.

**RESULTS**

| Channel | Frequency | 6 dB Bandwidth (MHz) | Minimum Limit (MHz) |
|---|---|---|---|
| Low | 2402 | 0.688 | 0.5 |
| Middle | 2440 | 0.688 | 0.5 |
| High | 2480 | 0.686 | 0.5 |


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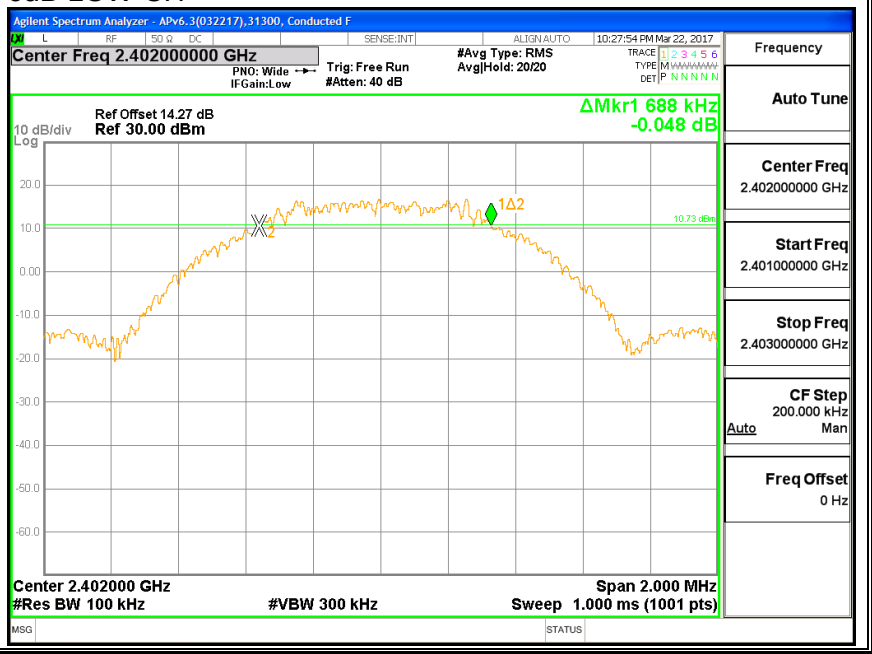
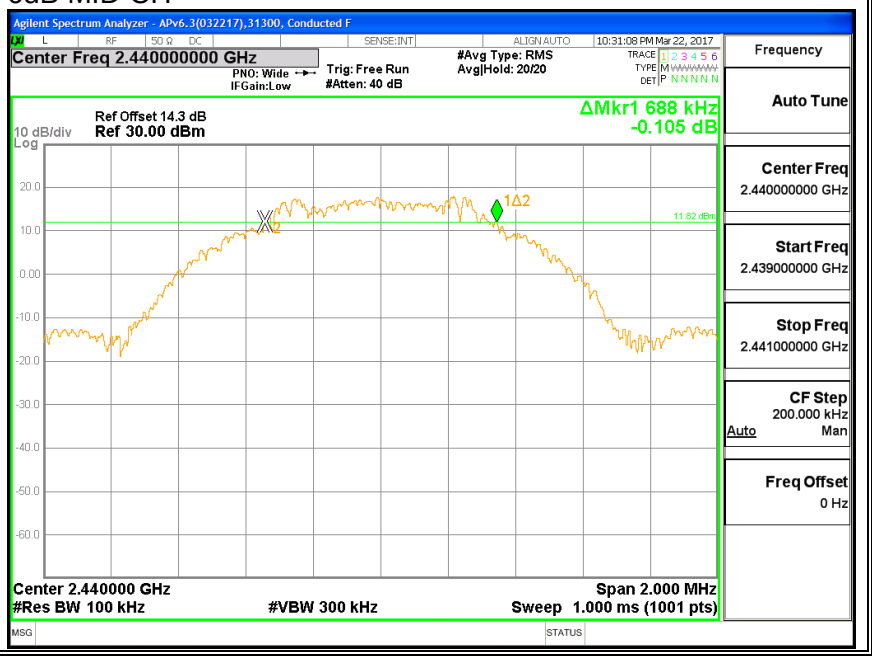
6dB LOW CH




6dB MID CH





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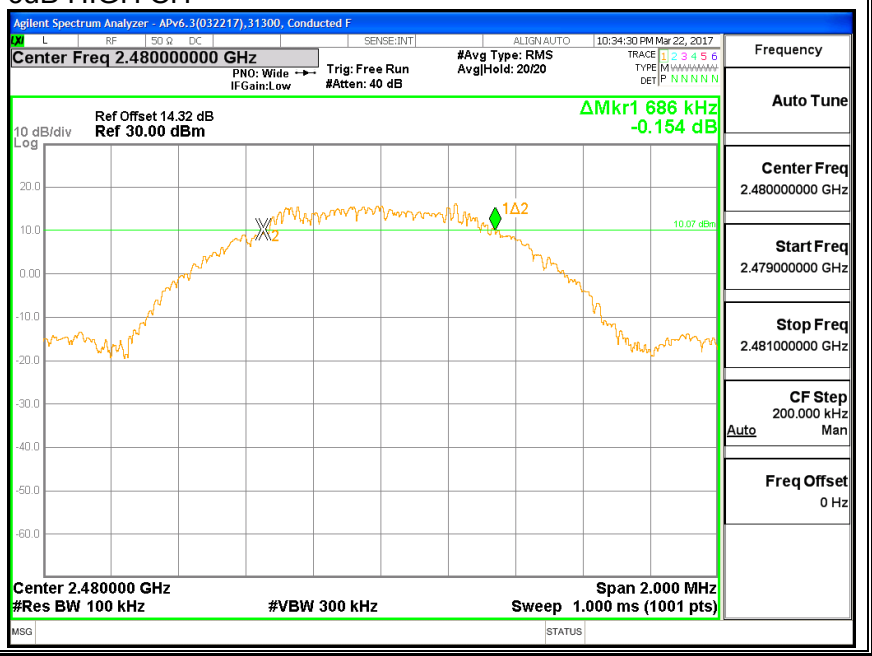
6dB HIGH CH





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### 7.7.2. 99% BANDWIDTH

**LIMITS**

None; for reporting purposes only.

**Test Procedure**

The transmitter output is connected to the spectrum analyzer. The RBW is set to 1% to 3% of the 99 % bandwidth and to 1% of the span. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal 99% bandwidth function is utilized.

**RESULTS**

| Channel | Frequency (MHz) | 99% Bandwidth (MHz) |
|---|---|---|
| Low | 2402 | 1.0572 |
| Middle | 2440 | 1.0584 |
| High | 2480 | 1.0562 |


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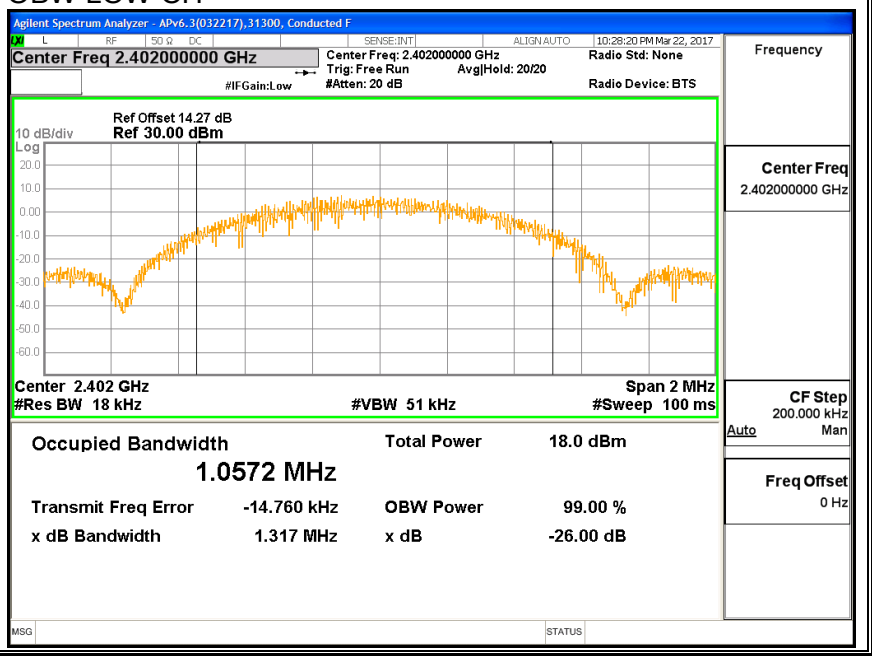
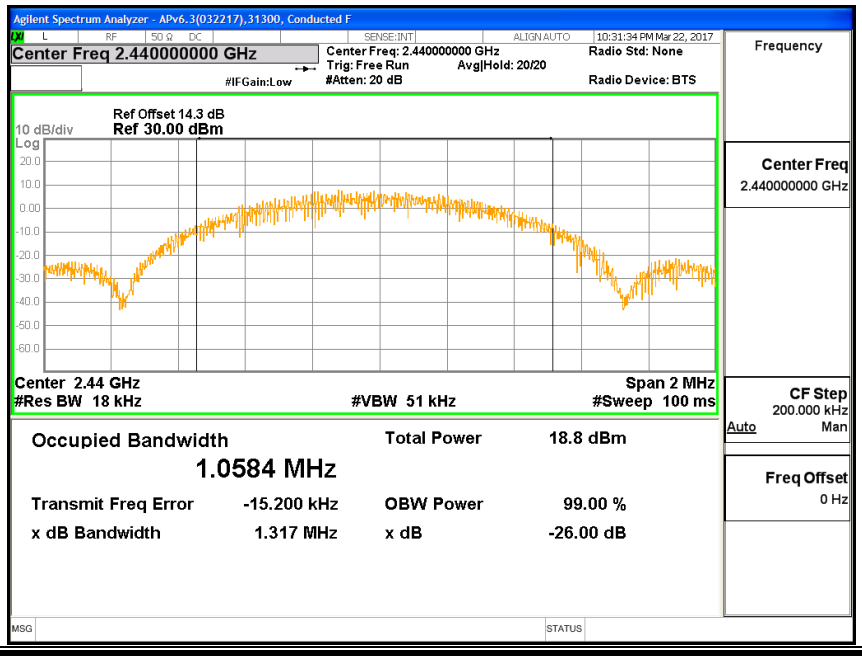
OBW LOW CH




OBW MID CH





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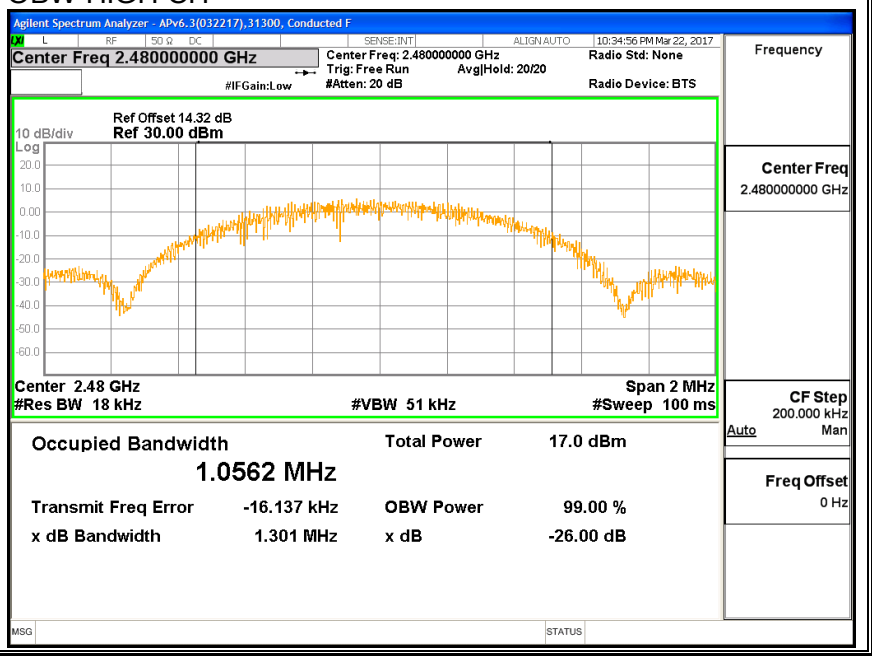
OBW HIGH CH





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### 7.7.3. AVERAGE POWER

| ID: | 30554 | Date: | 6/14/2017 |
|---|---|---|---|

**LIMITS**

None; for reporting purposes only.

The cable assembly insertion loss of 11 dB (including 10 dB pad and 1 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

**RESULTS**

| Channel | Frequency (MHz) | AV Power (MHz) |
|---|---|---|
| Low | 2402 | 19.72 |
| Middle | 2440 | 19.80 |
| High | 2480 | 19.64 |


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## 7.7.4. OUTPUT POWER

| ID: | 30554 | Date: | 6/14/2017 |
|---|---|---|---|

**LIMITS**

FCC §15.247 (b)

IC RSS-247 (5.4) (d)

The maximum antenna gain is less than or equal to 6 dBi, therefore the limit is 30 dBm.

**RESULTS**

| Channel | Frequency (MHz) | Peak Power Reading (dBm) | Limit (dBm) | Margin (dB) |
|---|---|---|---|---|
| Low | 2402 | 20.05 | 30 | -9.98 |
| Middle | 2440 | 20.14 | 30 | -9.95 |
| High | 2480 | 19.98 | 30 | -9.86 |


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## 7.7.5. POWER SPECTRAL DENSITY

**LIMITS**

FCC §15.247 (e)

IC RSS-247 (5.2) (b)

The power spectral density conducted from the transmitter to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

**RESULTS**

| Channel | Frequency (MHz) | PSD (dBm/3kHz) | Limit (dBm/3kHz) | Margin (dB) |
|---|---|---|---|---|
| Low | 2402 | 1.418 | 8 | -6.582 |
| Middle | 2440 | 2.348 | 8 | -5.652 |
| High | 2480 | 1.001 | 8 | -6.999 |


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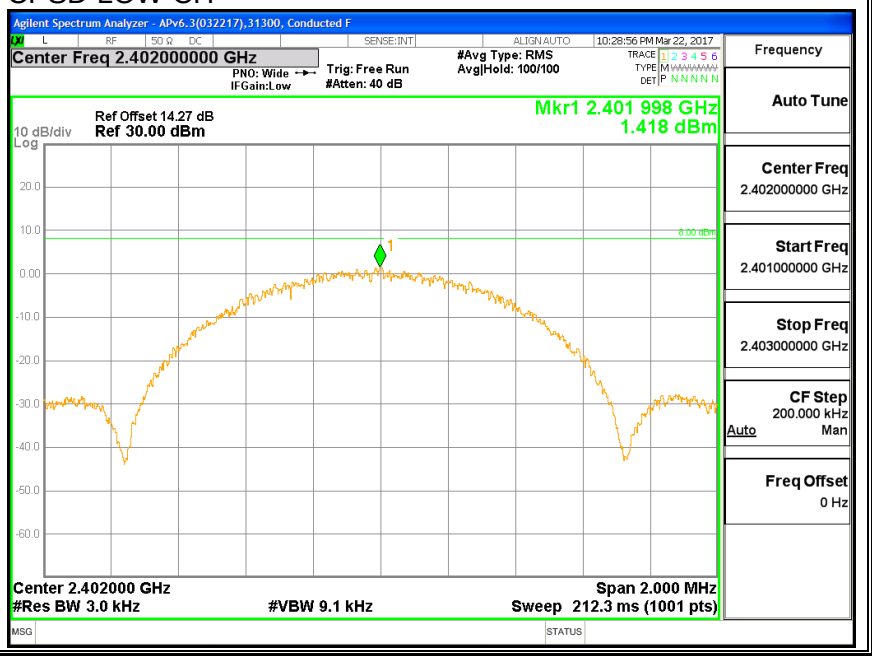
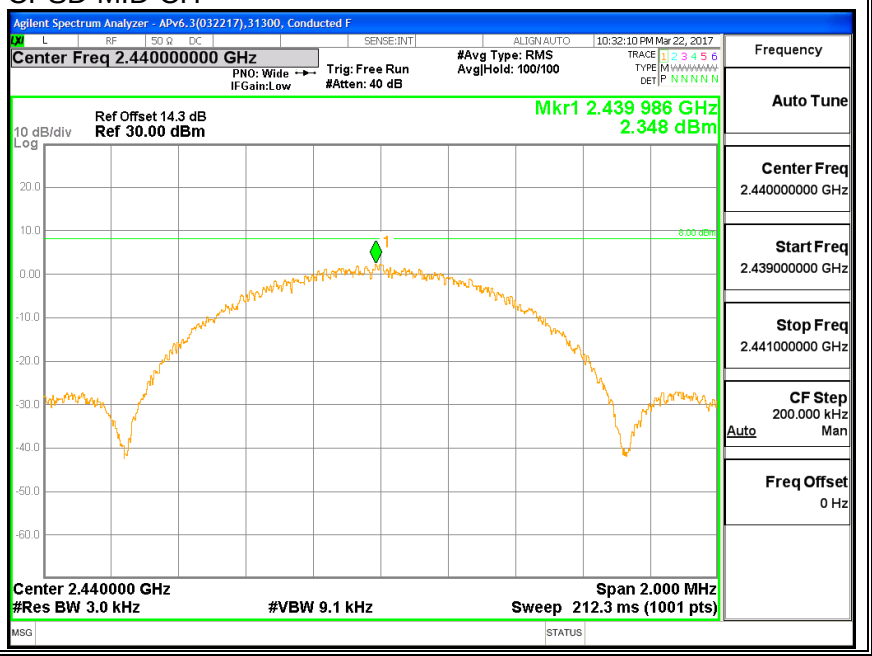
CPSD LOW CH




CPSD MID CH





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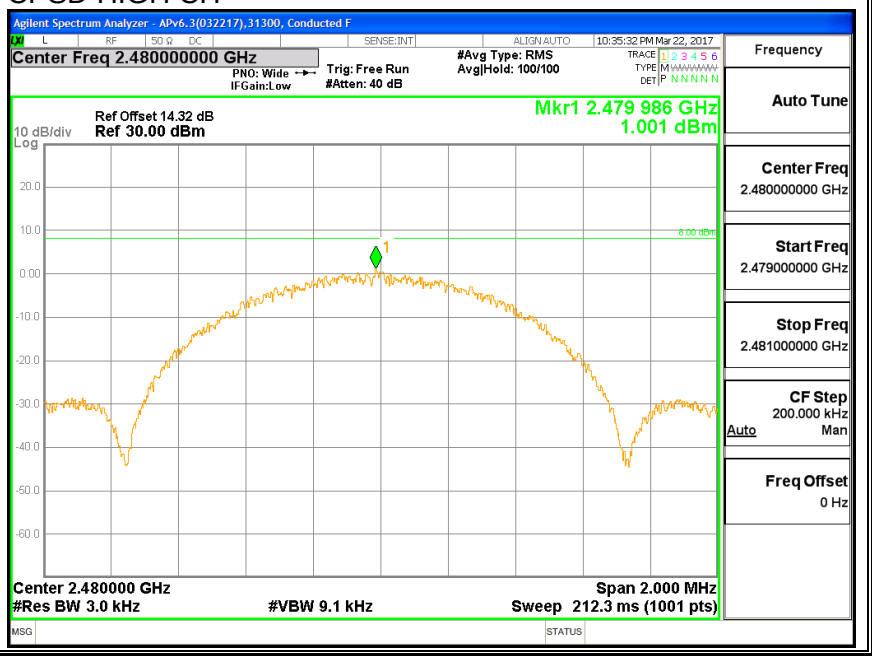
CPSD HIGH CH





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## 7.7.6. CONDUCTED BANDEDGE AND SPURIOUS EMISSIONS

**LIMITS**

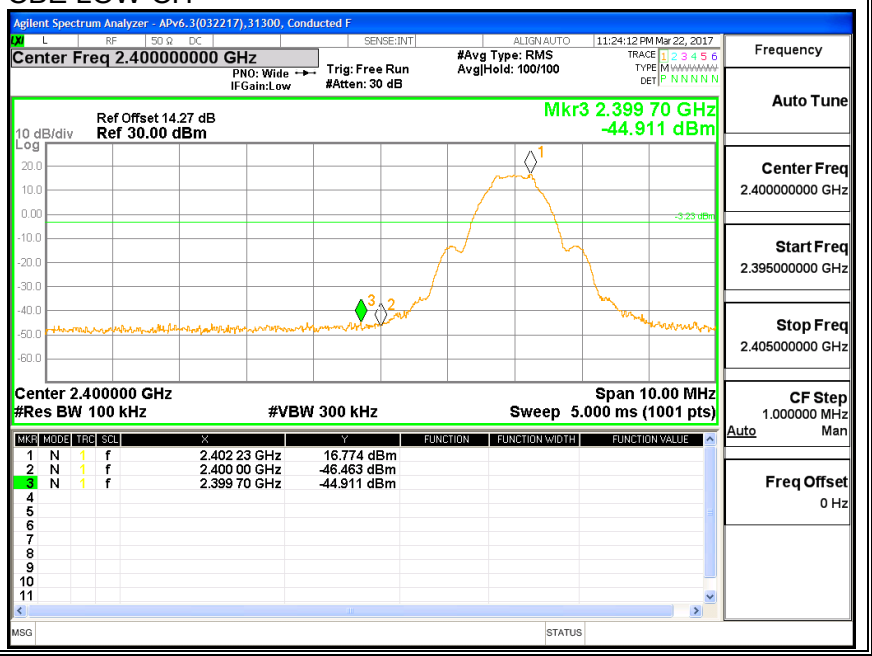
FCC §15.247 (d)

IC RSS-247 (5.5)

Output power was measured based on the use of a peak measurement, therefore the required attenuation is 20 dB.

**RESULTS**

CBE LOW CH





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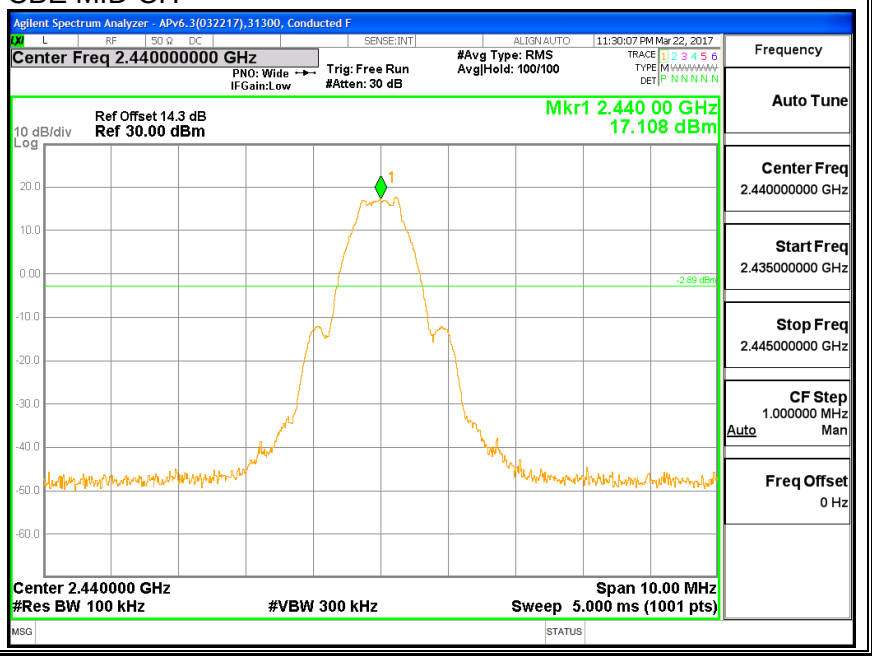
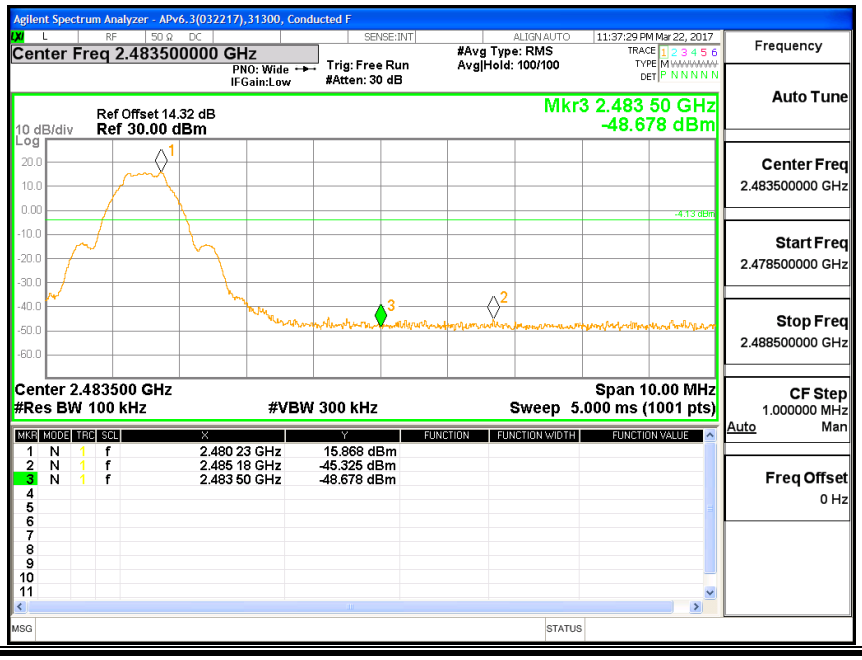
CBE MID CH




CBE HIGH CH





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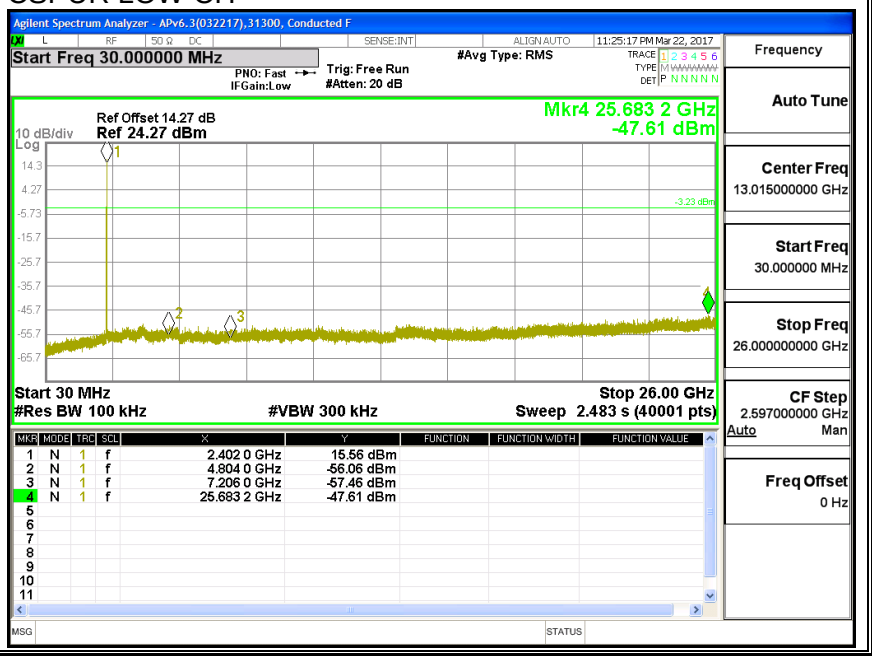
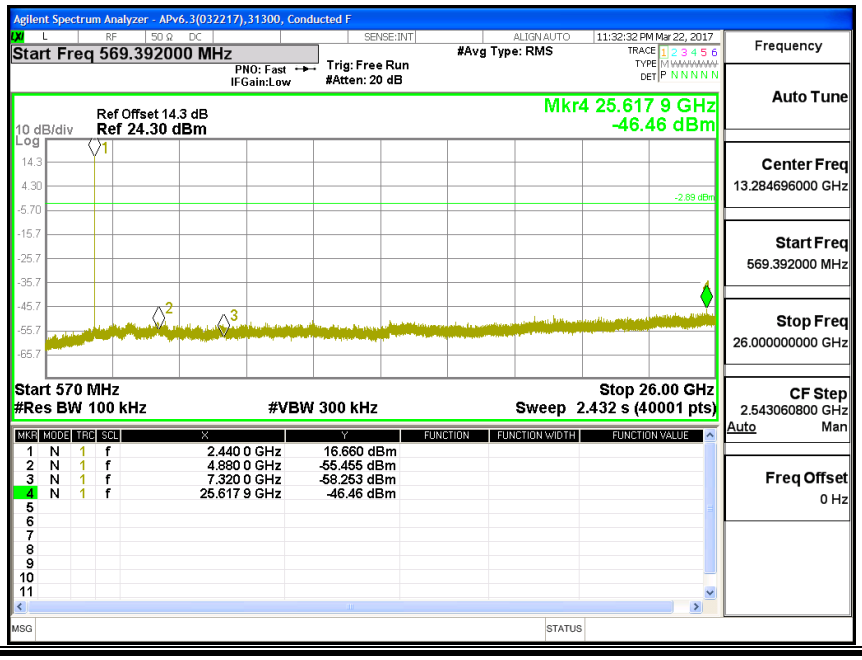
CSPUR LOW CH




CSPUR MID CH





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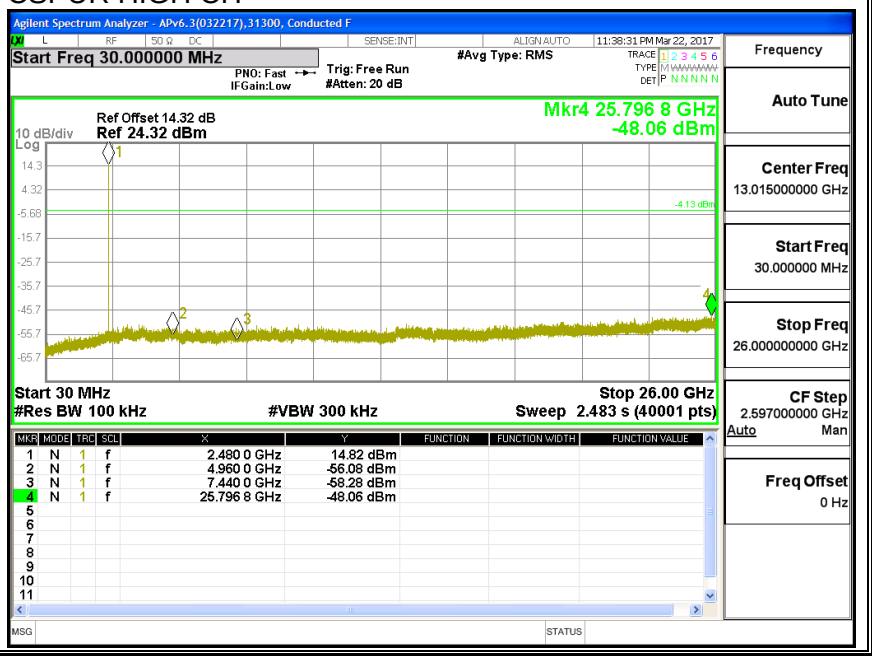
CSPUR HIGH CH





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## 7.8. LAT 3 BLE 1M Plow

### 7.8.1. 6 dB BANDWIDTH

**LIMITS**

FCC §15.247 (a) (2)

IC RSS-247 (5.2) (a)

The minimum 6 dB bandwidth shall be at least 500 kHz.

**RESULTS**

| Channel | Frequency | 6 dB Bandwidth (MHz) | Minimum Limit (MHz) |
|---|---|---|---|
| Low | 2402 | 0.706 | 0.5 |
| Middle | 2440 | 0.708 | 0.5 |
| High | 2480 | 0.742 | 0.5 |


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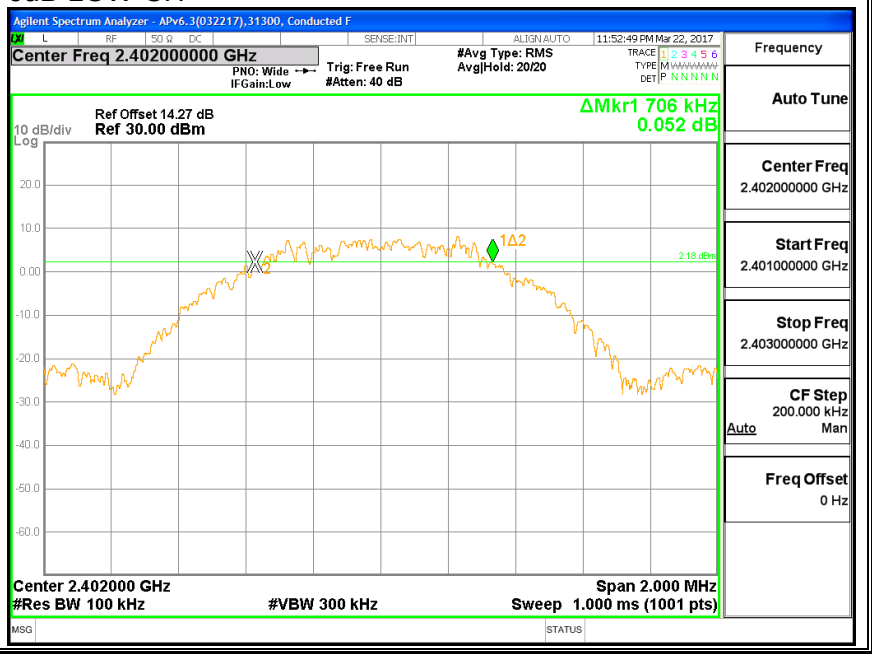
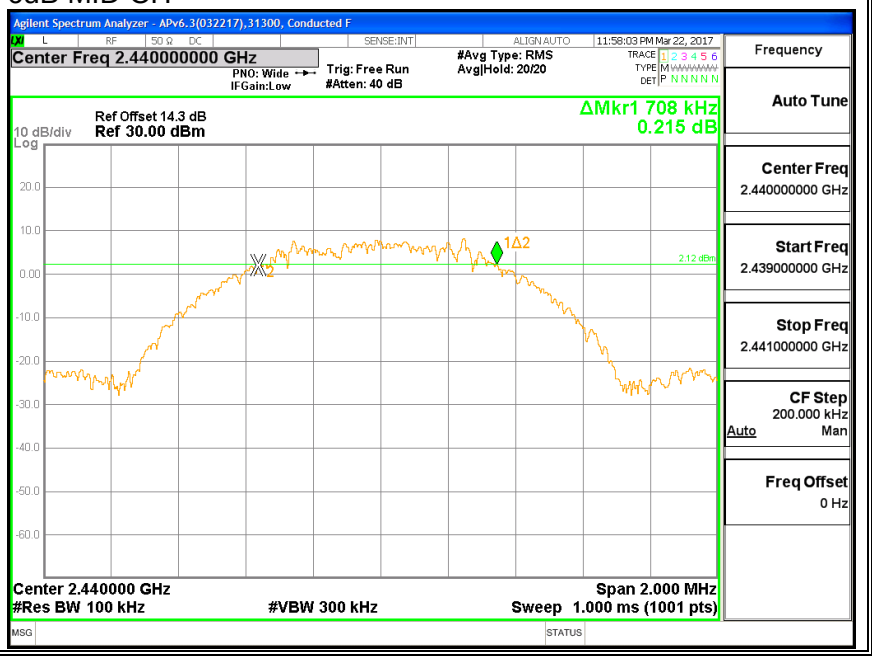
6dB LOW CH




6dB MID CH





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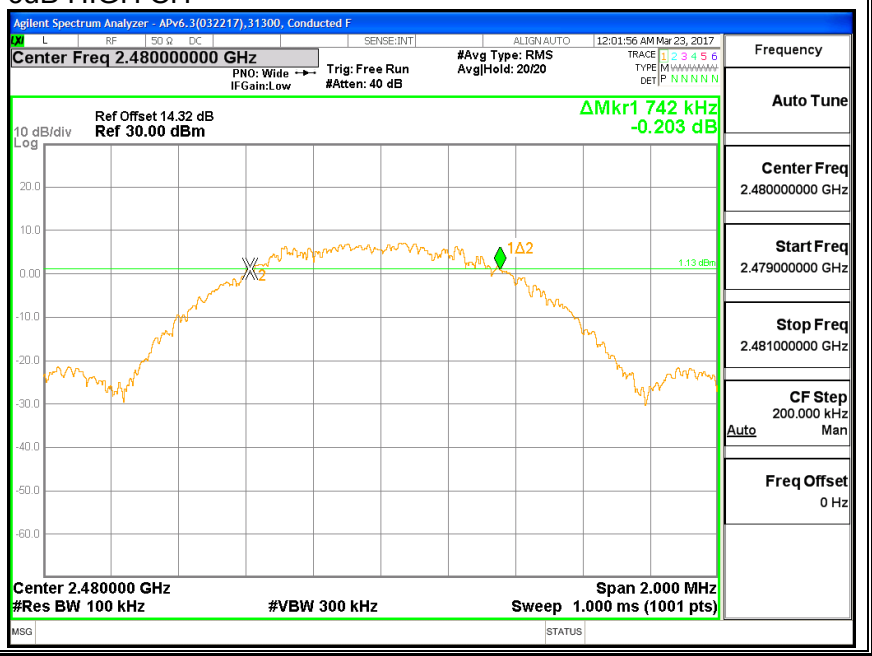
6dB HIGH CH





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### 7.8.2. 99% BANDWIDTH

**LIMITS**

None; for reporting purposes only.

**Test Procedure**

The transmitter output is connected to the spectrum analyzer. The RBW is set to 1% to 3% of the 99 % bandwidth and to 1% of the span. The VBW is set to 3 times the RBW. The sweep time is coupled. The spectrum analyzer internal 99% bandwidth function is utilized.

**RESULTS**

| Channel | Frequency (MHz) | 99% Bandwidth (MHz) |
|---|---|---|
| Low | 2402 | 1.0533 |
| Middle | 2440 | 1.0594 |
| High | 2480 | 1.0585 |


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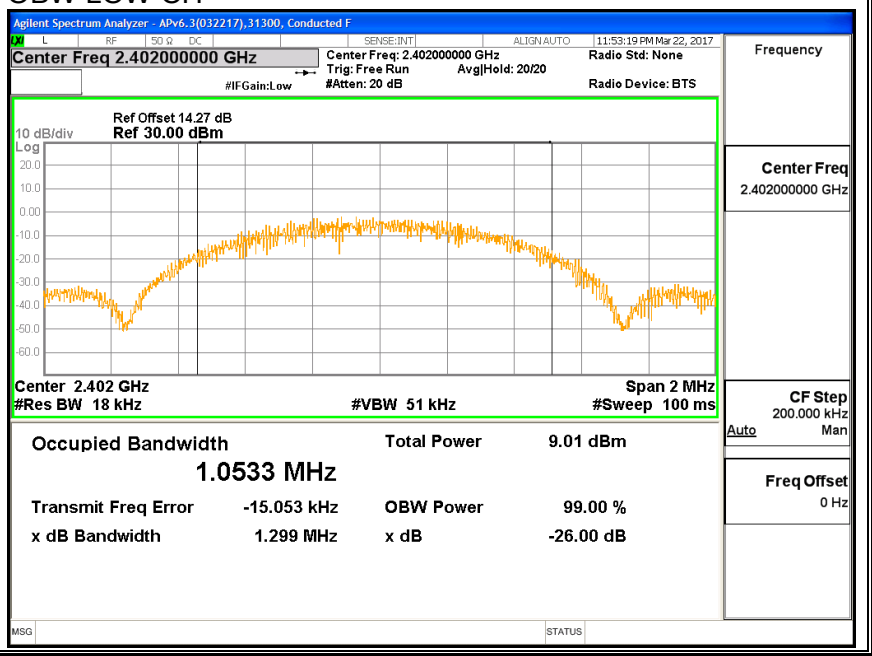
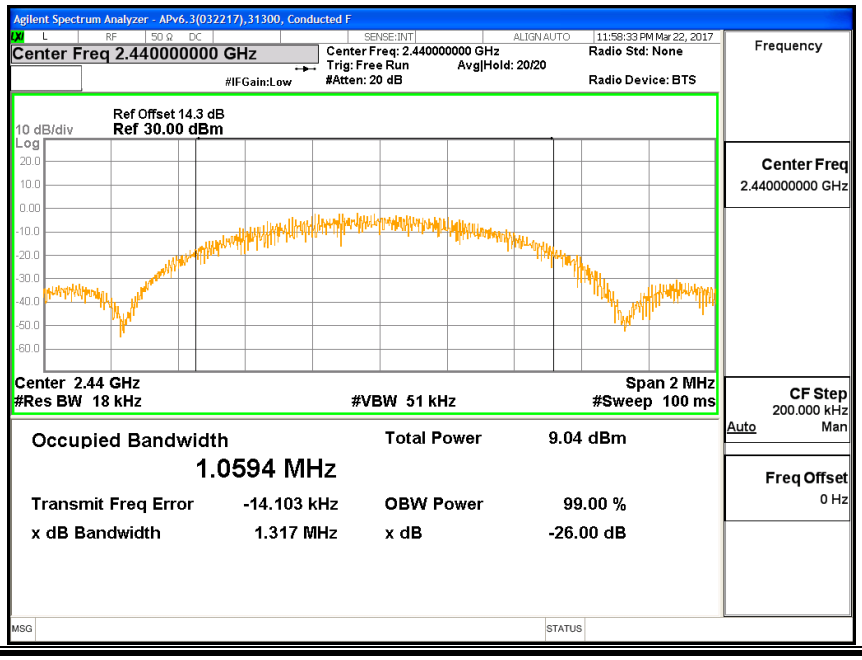
OBW LOW CH




OBW MID CH





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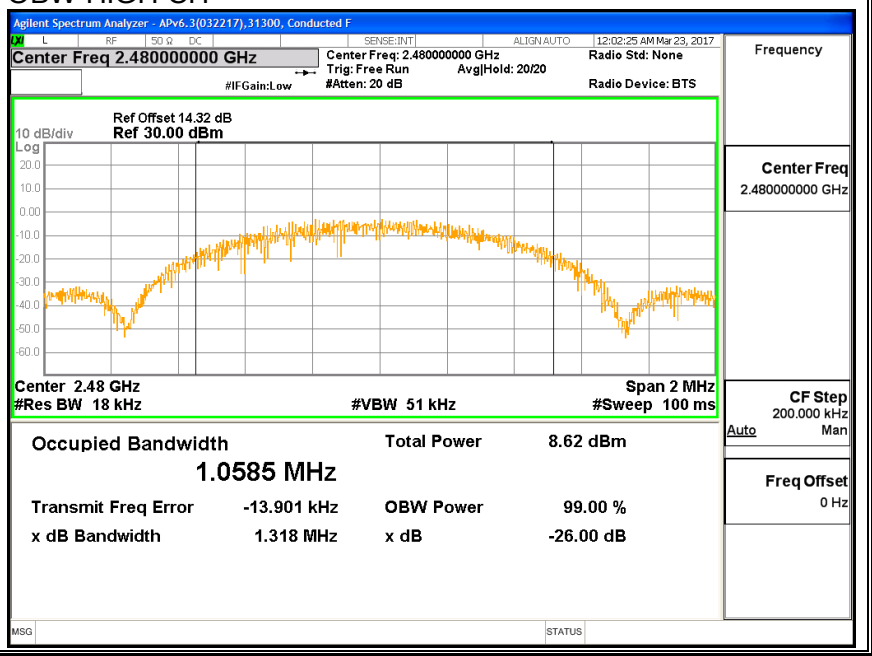
OBW HIGH CH





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### 7.8.3. AVERAGE POWER

| ID: | 30554 | Date: | 6/14/2017 |
|---|---|---|---|

**LIMITS**

None; for reporting purposes only.

The cable assembly insertion loss of 11 dB (including 10 dB pad and 1 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

**RESULTS**

| Channel | Frequency (MHz) | AV Power (MHz) |
|---|---|---|
| Low | 2402 | 9.61 |
| Middle | 2440 | 9.75 |
| High | 2480 | 9.53 |


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## 7.8.4. OUTPUT POWER

| ID: | 30554 | Date: | 6/14/2017 |
|---|---|---|---|

**LIMITS**

FCC §15.247 (b)

IC RSS-247 (5.4) (d)

The maximum antenna gain is less than or equal to 6 dBi, therefore the limit is 30 dBm.

**RESULTS**

| Channel | Frequency (MHz) | Peak Power Reading (dBm) | Limit (dBm) | Margin (dB) |
|---|---|---|---|---|
| Low | 2402 | 9.95 | 30 | -20.05 |
| Middle | 2440 | 10.08 | 30 | -19.92 |
| High | 2480 | 9.87 | 30 | -20.13 |


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## 7.8.5. POWER SPECTRAL DENSITY

**LIMITS**

FCC §15.247 (e)

IC RSS-247 (5.2) (b)

The power spectral density conducted from the transmitter to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

**RESULTS**

| Channel | Frequency (MHz) | PSD (dBm/3kHz) | Limit (dBm/3kHz) | Margin (dB) |
|---|---|---|---|---|
| Low | 2402 | -7.503 | 8 | -15.503 |
| Middle | 2440 | -7.505 | 8 | -15.505 |
| High | 2480 | -7.933 | 8 | -15.933 |


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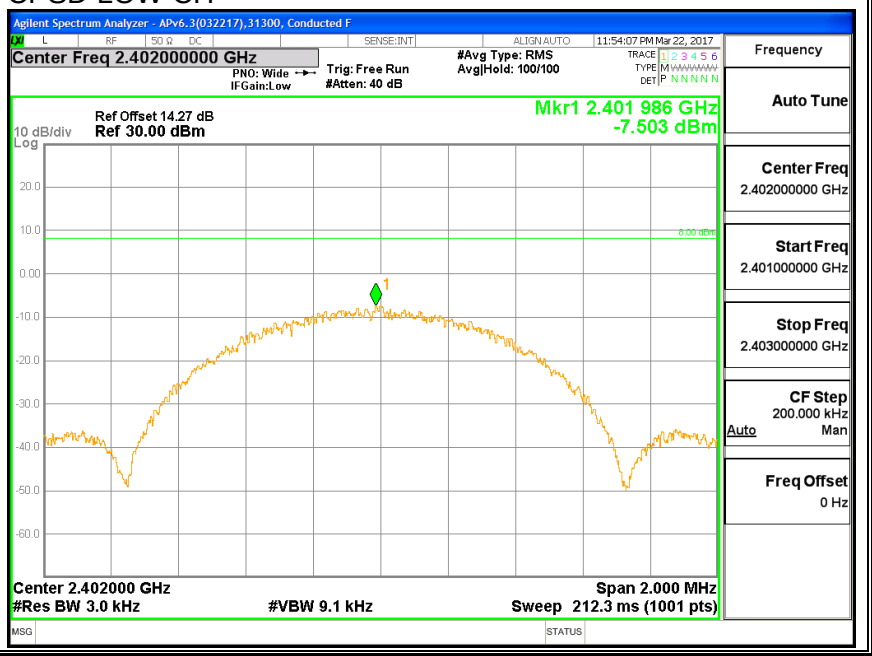
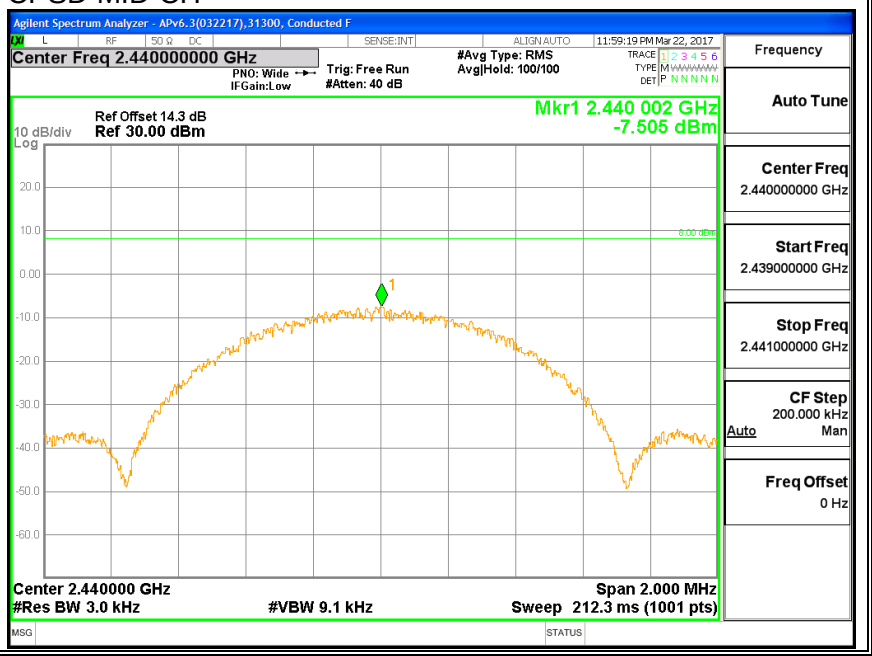
CPSD LOW CH




CPSD MID CH





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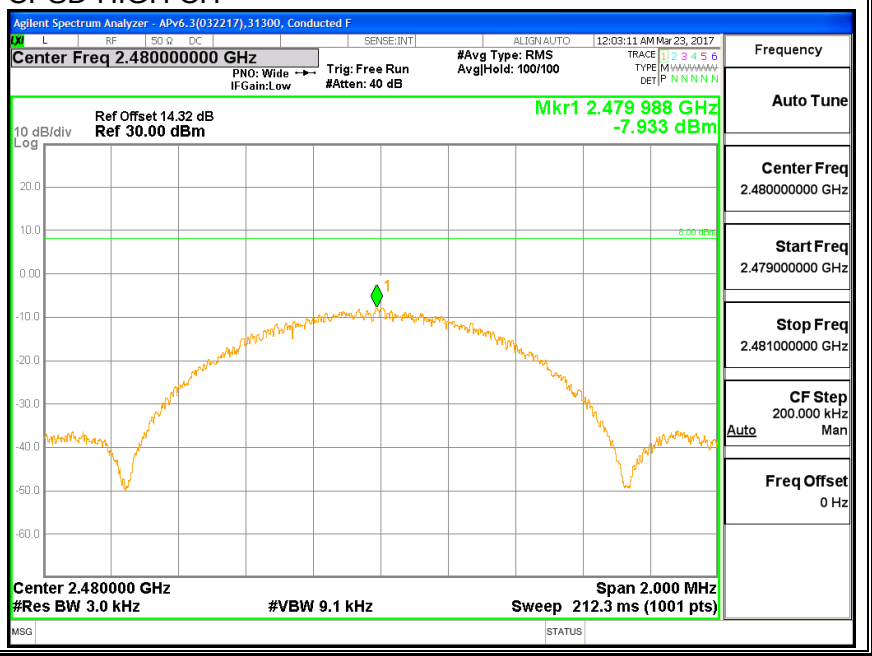
CPSD HIGH CH





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## 7.8.6. CONDUCTED BANDEDGE AND SPURIOUS EMISSIONS

**LIMITS**

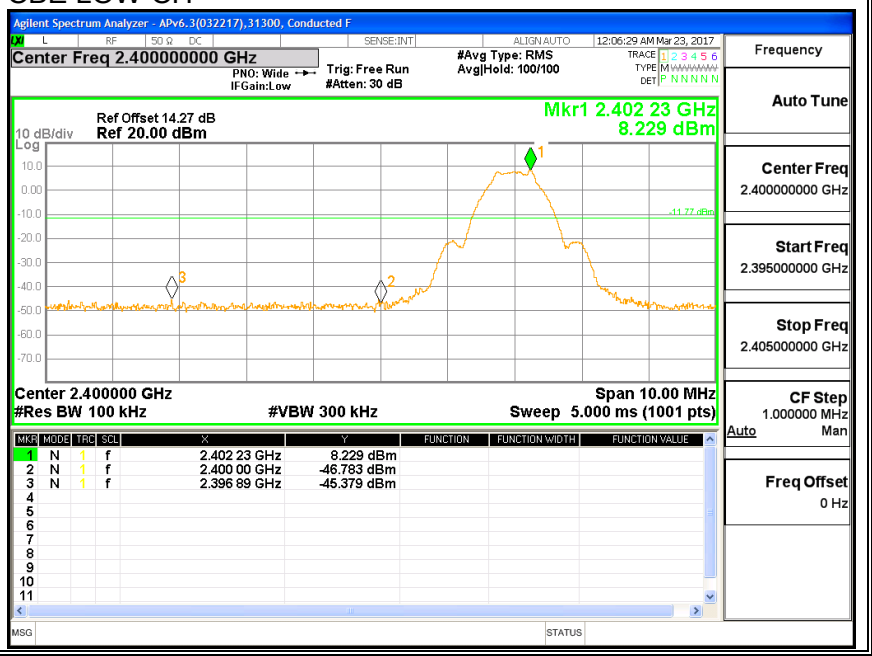
FCC §15.247 (d)

IC RSS-247 (5.5)

Output power was measured based on the use of a peak measurement, therefore the required attenuation is 20 dB.

**RESULTS**

CBE LOW CH





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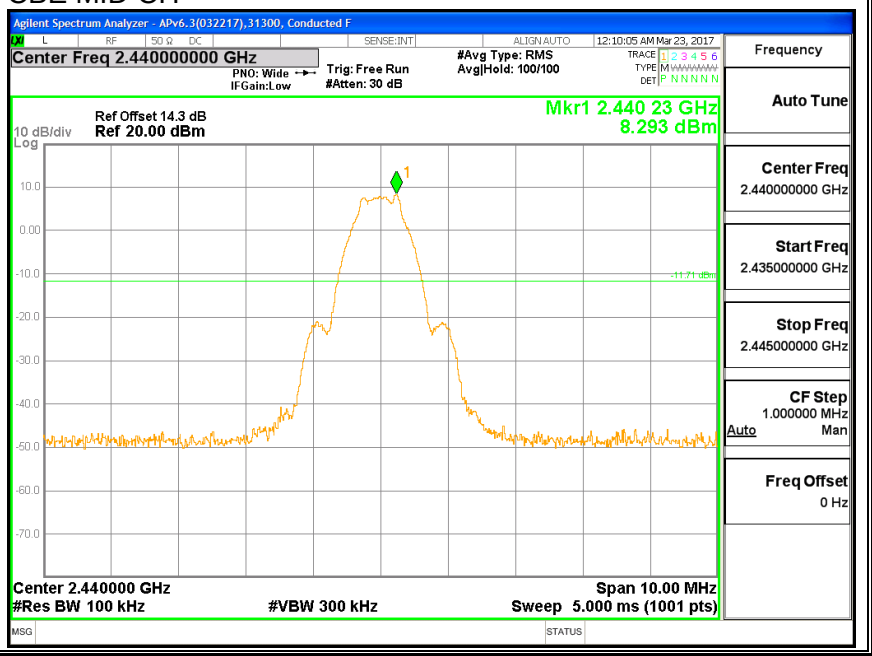
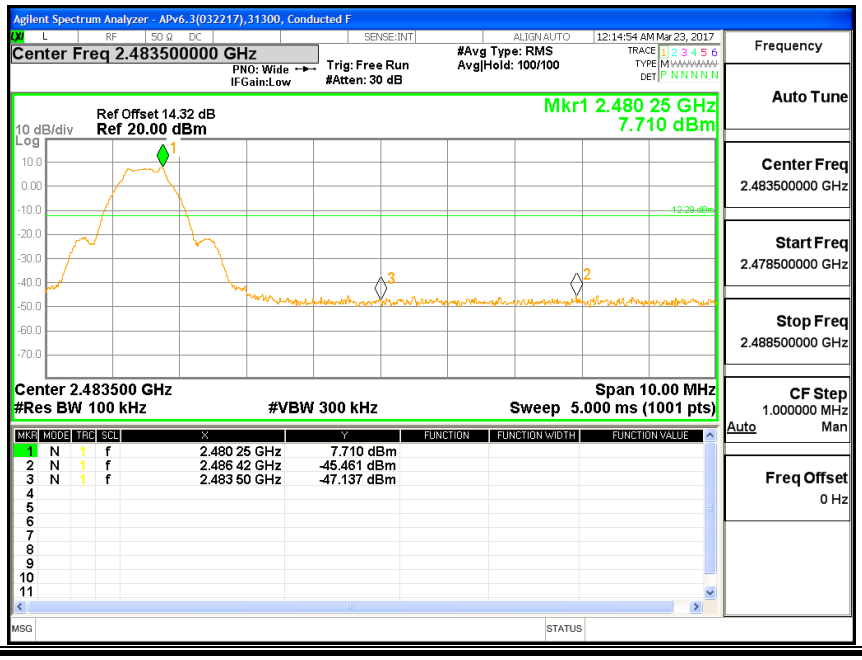
CBE MID CH




CBE HIGH CH





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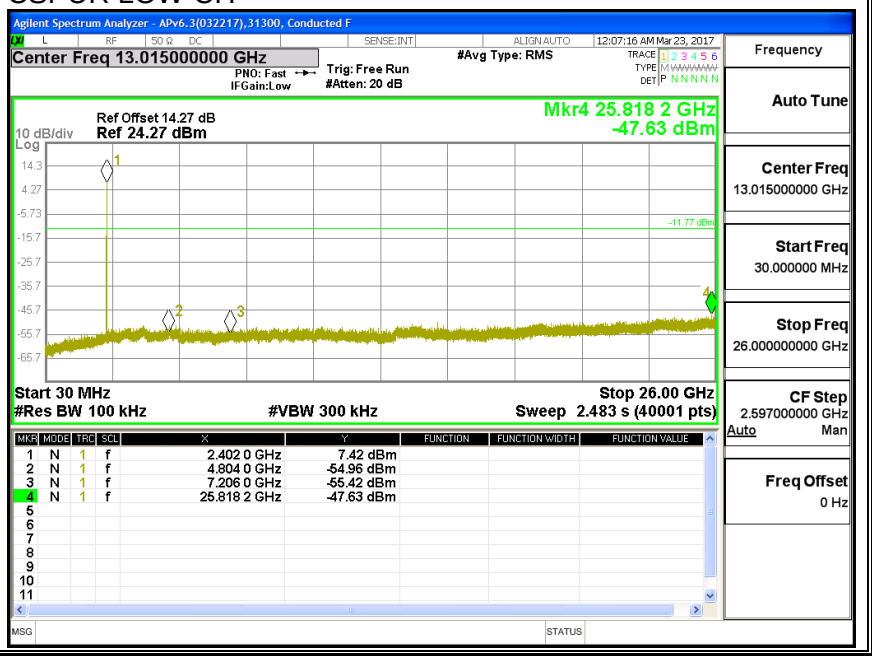
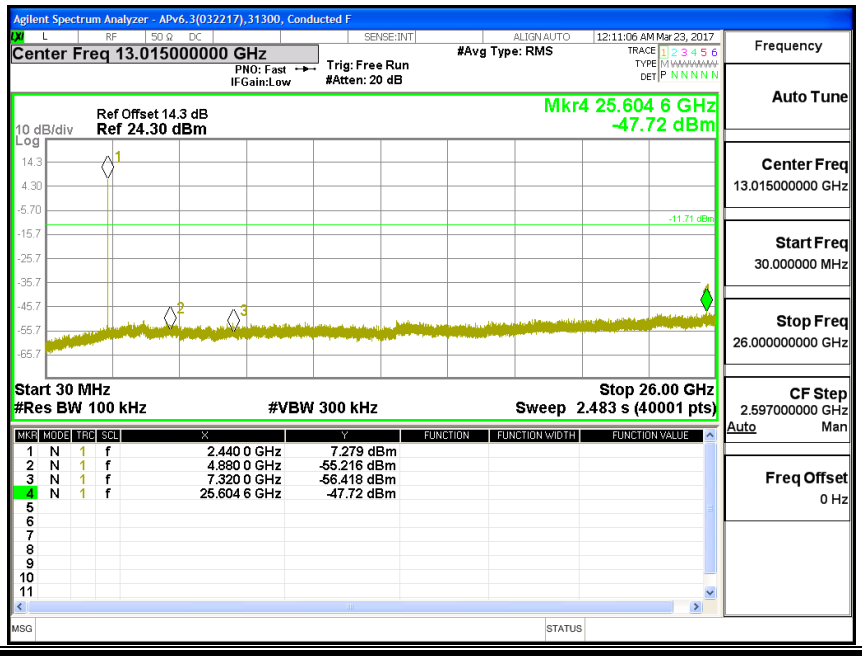
CSPUR LOW CH




CSPUR MID CH





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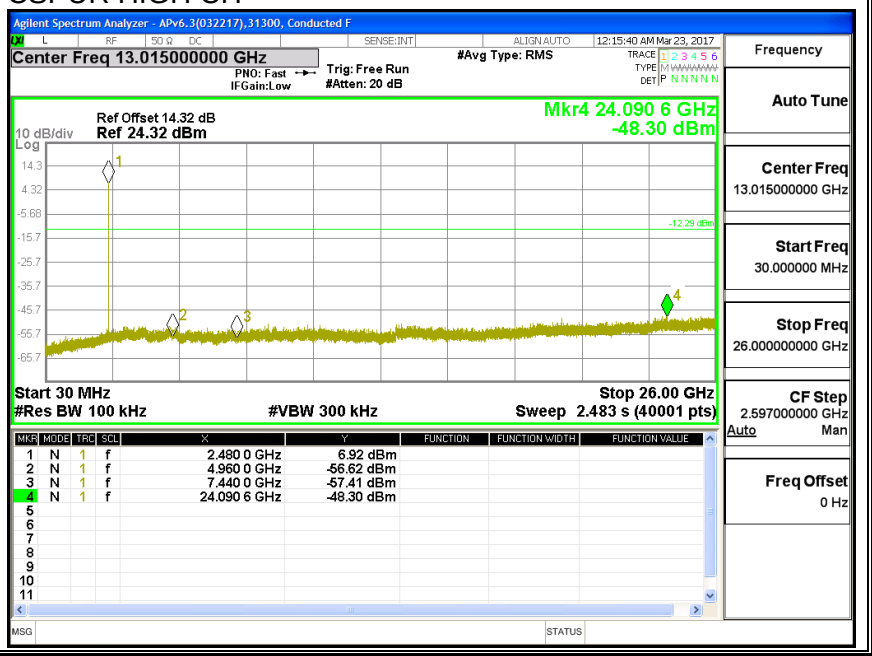
CSPUR HIGH CH





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## 7.9. LAT 3 BLE 2M Pmax

### 7.9.1. AVERAGE POWER

| ID: | 30554 | Date: | 6/14/2017 |
|---|---|---|---|

**LIMITS**

None; for reporting purposes only.

The cable assembly insertion loss of 11 dB (including 10 dB pad and 1 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

**RESULTS**

| Channel | Frequency (MHz) | AV Power (MHz) |
|---|---|---|
| Low | 2402 | 19.48 |
| Middle | 2440 | 19.54 |
| High | 2480 | 19.38 |


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### 7.9.2. OUTPUT POWER

| ID: | 30554 | Date: | 6/14/2017 |
|---|---|---|---|

**LIMITS**

FCC §15.247 (b)

IC RSS-247 (5.4) (d)

The maximum antenna gain is less than or equal to 6 dBi, therefore the limit is 30 dBm.

**TEST PROCEDURE**

The transmitter output is connected to a broadband Peak/average RF power meter

**RESULTS**

| Channel | Frequency (MHz) | Peak Power Reading (dBm) | Limit (dBm) | Margin (dB) |
|---|---|---|---|---|
| Low | 2402 | 20.12 | 30 | -9.88 |
| Middle | 2440 | 19.87 | 30 | -10.13 |
| High | 2480 | 19.68 | 30 | -10.32 |


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## 7.10. LAT 3 BLE 2M Plow

### 7.10.1. AVERAGE POWER

| ID: | 30554 | Date: | 6/14/2017 |
|---|---|---|---|

**LIMITS**

None; for reporting purposes only.

The cable assembly insertion loss of 11 dB (including 10 dB pad and 1 dB cable) was entered as an offset in the power meter to allow for direct reading of power.

**RESULTS**

| Channel | Frequency (MHz) | AV Power (MHz) |
|---|---|---|
| Low | 2402 | 9.38 |
| Middle | 2440 | 9.51 |
| High | 2480 | 9.32 |


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### 7.10.2. OUTPUT POWER

| ID: | 30554 | Date: | 6/14/2017 |
|---|---|---|---|

**LIMITS**

FCC §15.247 (b)

IC RSS-247 (5.4) (d)

The maximum antenna gain is less than or equal to 6 dBi, therefore the limit is 30 dBm.

**TEST PROCEDURE**

The transmitter output is connected to a broadband Peak/average RF power meter

**RESULTS**

| Channel | Frequency (MHz) | Peak Power Reading (dBm) | Limit (dBm) | Margin (dB) |
|---|---|---|---|---|
| Low | 2402 | 9.62 | 30 | -20.38 |
| Middle | 2440 | 9.87 | 30 | -20.13 |
| High | 2480 | 9.57 | 30 | -20.43 |


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# 8. RADIATED TEST RESULTS

## 8.1. LIMITS AND PROCEDURE

**LIMITS**

FCC §15.205 and §15.209

IC RSS-GEN, Section 8.9 and 8.10.

| Frequency Range (MHz) | Field Strength Limit (uV/m) at 3 m | Field Strength Limit (dBuV/m) at 3 m |
|---|---|---|
| 30 - 88 | 100 | 40 |
| 88 - 216 | 150 | 43.5 |
| 216 - 960 | 200 | 46 |
| Above 960 | 500 | 54 |

**TEST PROCEDURE**

The EUT is placed on a non-conducting table 80 cm above the ground plane for measurement below 1GHz; 1.5 m above the ground plane for measurement above 1GHz. The antenna to EUT distance is 3 meters. The EUT is configured in accordance with ANSI C63.10. The EUT is set to transmit in a continuous mode.

For measurements below 1 GHz the resolution bandwidth is set to 100 kHz for peak detection measurements or 120 kHz for quasi-peak detection measurements. Peak detection is used unless otherwise noted as quasi-peak.

For pre-scans above 1 GHz the resolution bandwidth is set to 1 MHz; the video bandwidth is set to 30 KHz for peak measurements.

For final measurements above 1 GHz the resolution bandwidth is set to 1 MHz; the video bandwidth is set to 3 MHz for peak measurements and as applicable for average measurements.

The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized in both the vertical and the horizontal positions.


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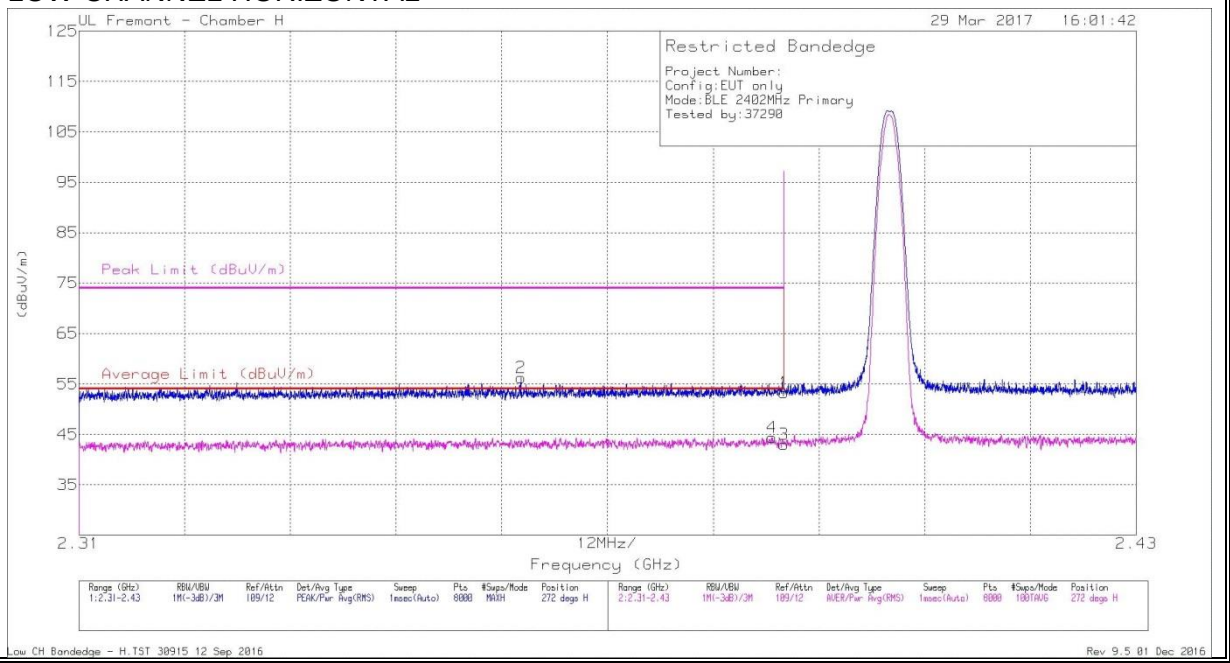
## 8.2. UAT 1 BLE 1M Pmax

### 8.2.1. RESTRICTED BANDEDGE (LOW CHANNEL)

LOW CHANNEL HORIZONTAL




| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det | AF T120 (dB/m) | Amp/Cbl/Fltr/Pad (dB) | Corrected Reading (dBuV/m) | Average Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | * 2.36 | 41.08 | Pk | 31.8 | -16.6 | 56.28 | - | - | 74 | -17.72 | 272 | 115 | H |
| 4 | * 2.389 | 29.07 | RMS | 31.9 | -16.6 | 44.37 | 54 | -9.63 | - | - | 272 | 115 | H |
| 1 | * 2.39 | 37.95 | Pk | 31.9 | -16.6 | 53.25 | - | - | 74 | -20.75 | 272 | 115 | H |
| 3 | * 2.39 | 27.78 | RMS | 31.9 | -16.6 | 43.08 | 54 | -10.92 | - | - | 272 | 115 | H |

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
RMS - RMS detection
Low CH Bandedge - H.TST 30915 12 Sep 2016
Rev 9.5 01 Dec 2016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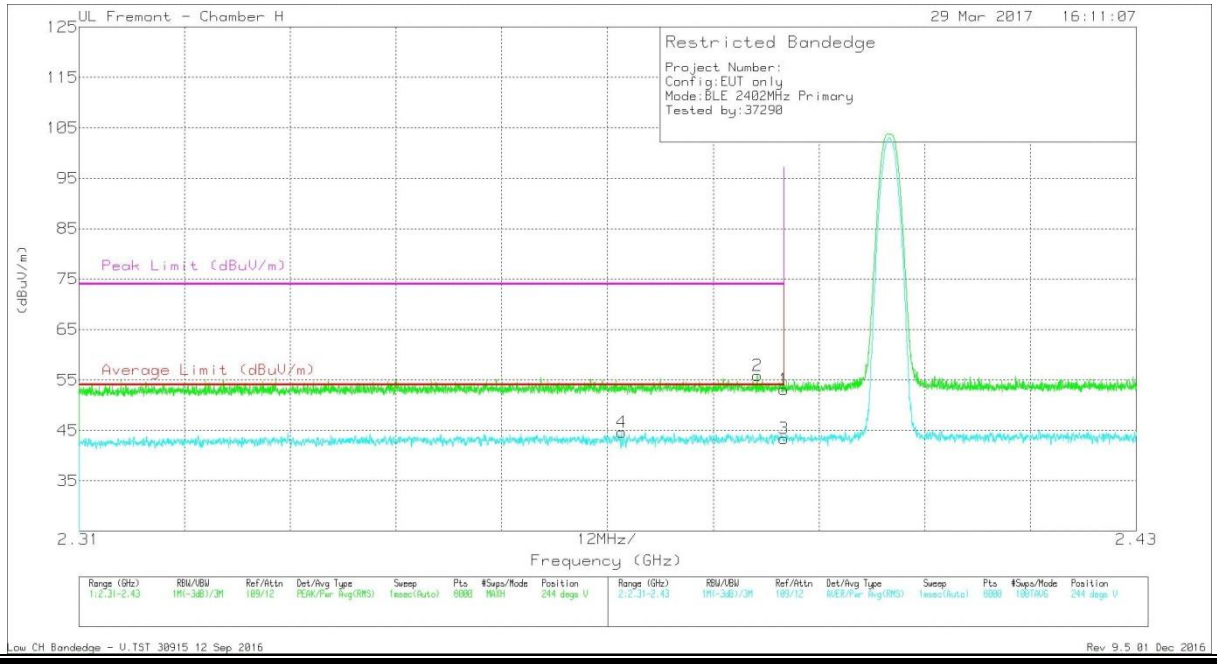
LOW CHANNEL VERTICAL




| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det | AF T120 (dB/m) | Amp/Cbl/Fltr/Pad (dB) | Corrected Reading (dBuV/m) | Average Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4 | * 2.372 | 29.4 | RMS | 31.8 | -16.6 | 44.6 | 54 | -9.4 | - | - | 244 | 333 | V |
| 2 | * 2.387 | 40.54 | Pk | 31.9 | -16.5 | 55.94 | - | - | 74 | -18.06 | 244 | 333 | V |
| 1 | * 2.39 | 37.85 | Pk | 31.9 | -16.6 | 53.15 | - | - | 74 | -20.85 | 244 | 333 | V |
| 3 | * 2.39 | 28.06 | RMS | 31.9 | -16.6 | 43.36 | 54 | -10.64 | - | - | 244 | 333 | V |

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
RMS - RMS detection
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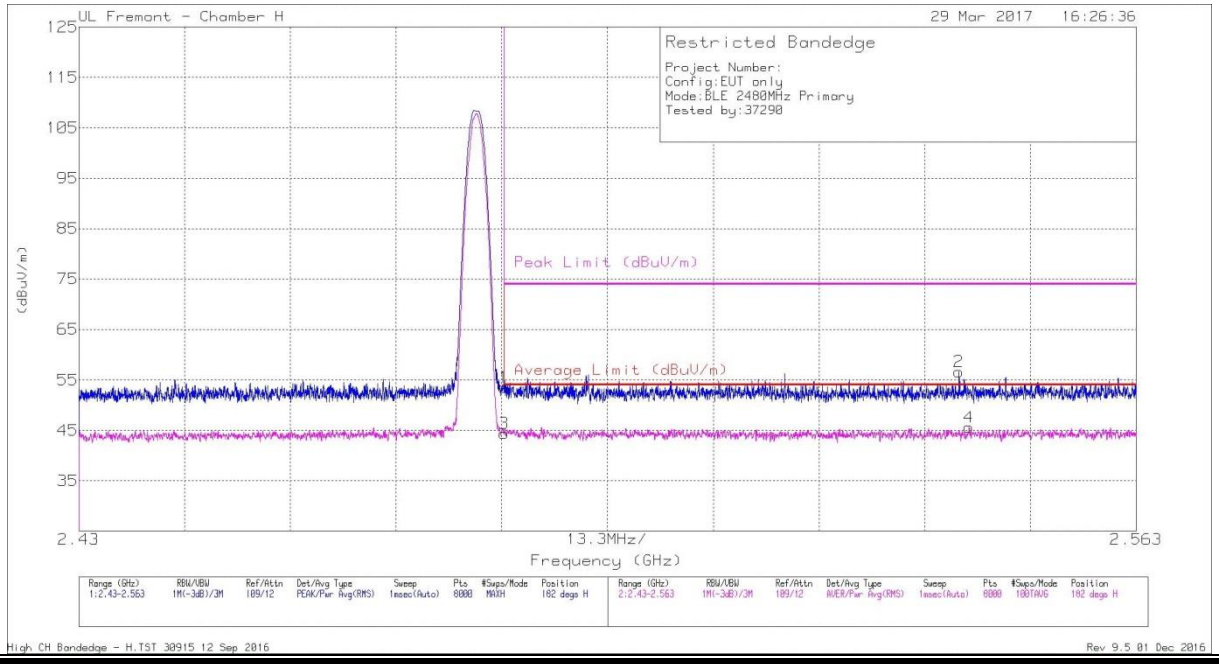
## 8.2.2. AUTHORIZED BANDEDGE (HIGH CHANNEL)

HIGH CHANNEL HORIZONTAL




| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det | AF T120 (dB/m) | Amp/Cbl/Fltr/Pad (dB) | Corrected Reading (dBuV/m) | Average Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | * 2.484 | 37.73 | Pk | 32.2 | -16.4 | 53.53 | - | - | 74 | -20.47 | 182 | 117 | H |
| 3 | * 2.484 | 28.59 | RMS | 32.2 | -16.4 | 44.39 | 54 | -9.61 | - | - | 182 | 117 | H |
| 2 | 2.541 | 40.62 | Pk | 32.2 | -16.2 | 56.62 | - | - | 74 | -17.38 | 182 | 117 | H |
| 4 | 2.542 | 29.69 | RMS | 32.2 | -16.3 | 45.59 | 54 | -8.41 | - | - | 182 | 117 | H |

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
RMS - RMS detection
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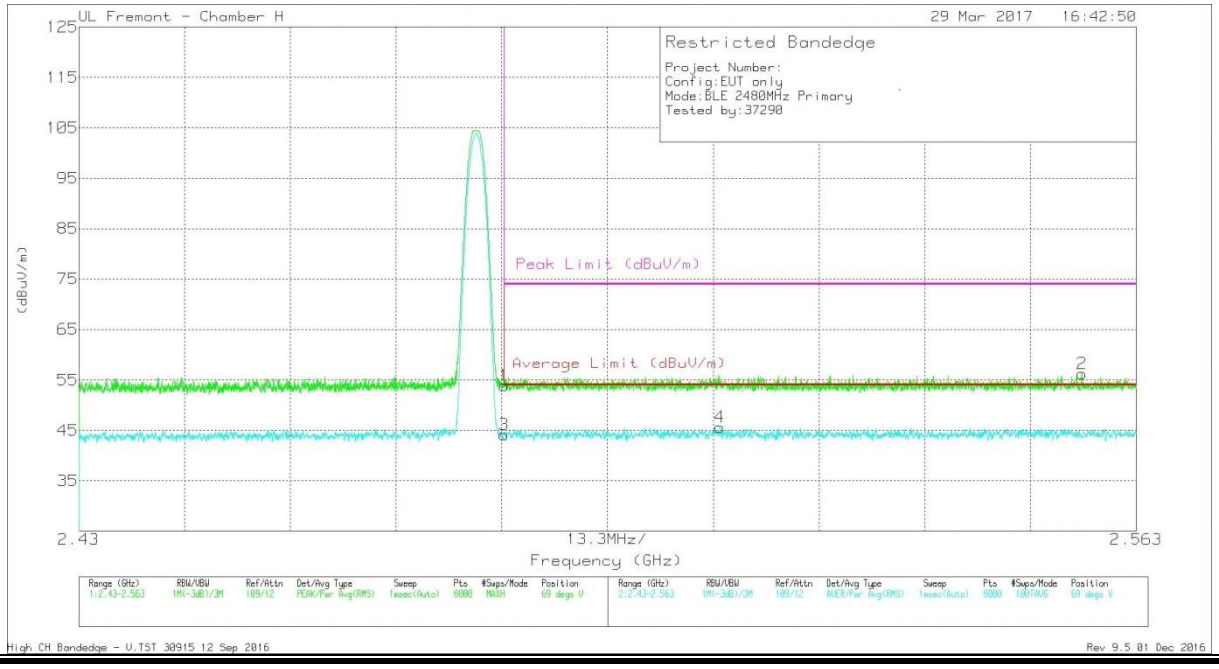
HIGH CHANNEL VERTICAL




| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det | AF T120 (dB/m) | Amp/Cbl/Fltr/Pad (dB) | Corrected Reading (dBuV/m) | Average Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | * 2.484 | 38.14 | Pk | 32.2 | -16.4 | 53.94 | - | - | 74 | -20.06 | 69 | 351 | V |
| 3 | * 2.484 | 28.3 | RMS | 32.2 | -16.4 | 44.1 | 54 | -9.9 | - | - | 69 | 351 | V |
| 4 | 2.511 | 29.7 | RMS | 32.2 | -16.3 | 45.6 | 54 | -8.4 | - | - | 69 | 351 | V |
| 2 | 2.556 | 40.38 | Pk | 32.2 | -16.3 | 56.28 | - | - | 74 | -17.72 | 69 | 351 | V |

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
RMS - RMS detection
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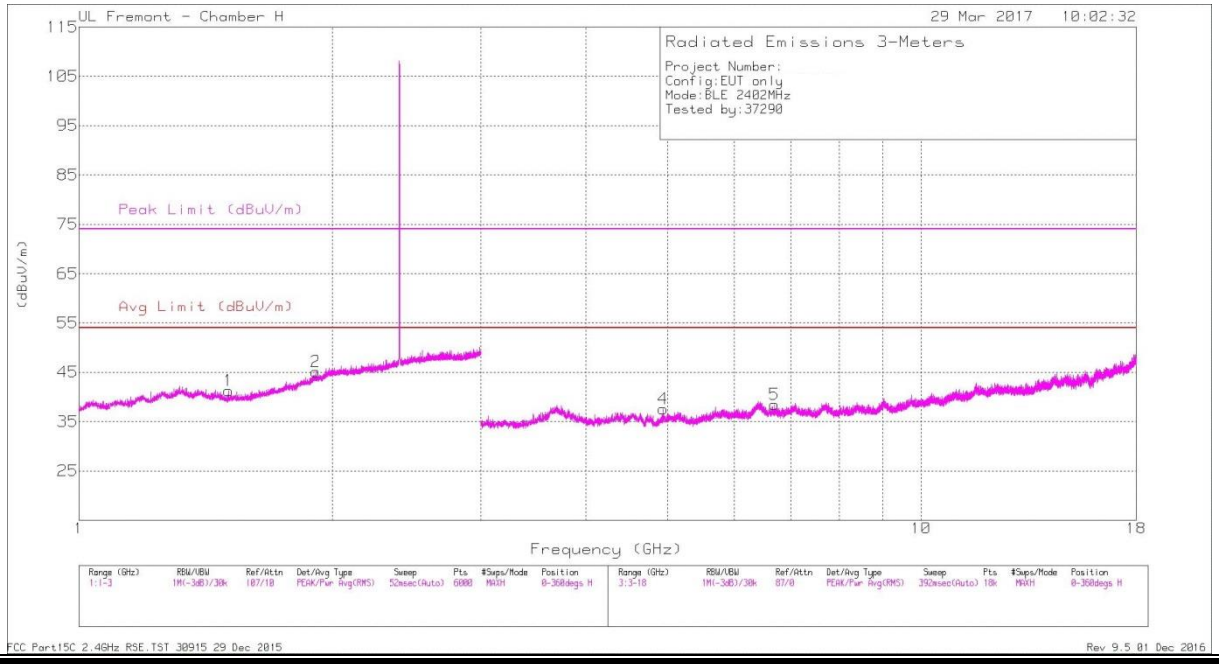
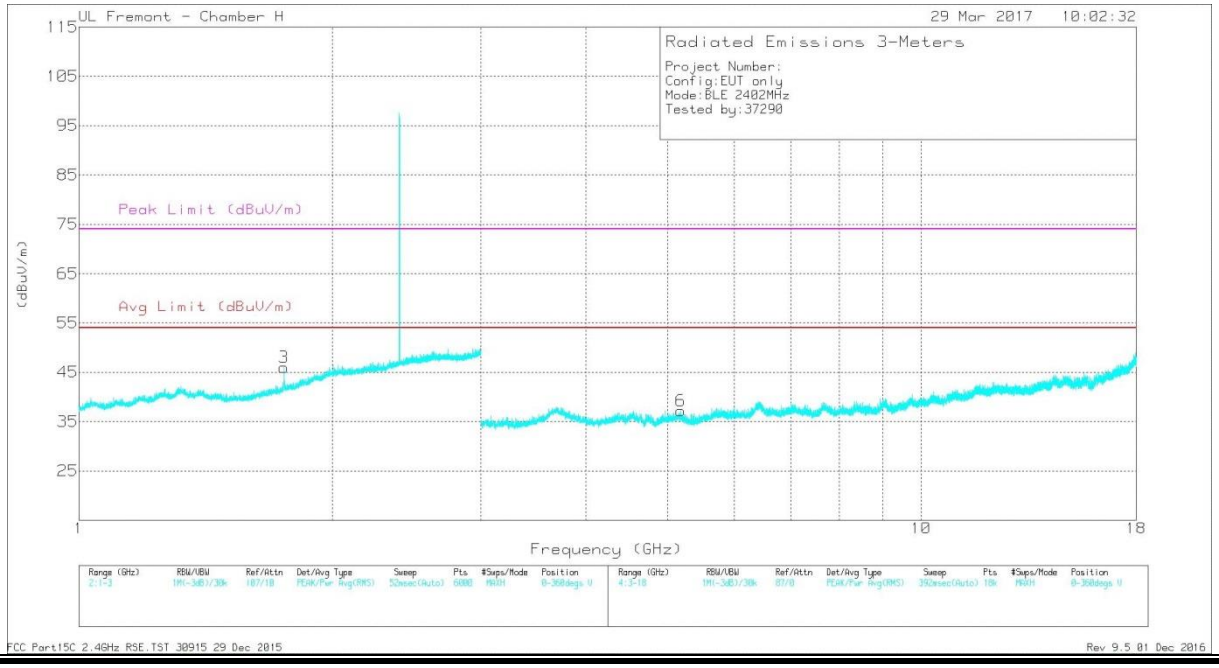
## 8.2.3. HARMONICS AND SPURIOUS EMISSIONS

LOW CHANNEL HORIZONTAL




LOW CHANNEL VERTICAL





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DATA

| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det | AF T120 (dB/m) | Amp/Cbl/Fltr/Pad (dB) | Corrected Reading (dBuV/m) | Avg Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | * 1.502 | 37.86 | PK2 | 28 | -18.1 | 47.76 | - | - | 74 | -26.24 | 357 | 363 | H |
| | * 1.51 | 25.27 | MAv1 | 28 | -18 | 35.27 | 54 | -18.73 | - | - | 357 | 363 | H |
| 4 | * 4.943 | 44.18 | PK2 | 34 | -34.3 | 43.88 | - | - | 74 | -30.12 | 175 | 287 | H |
| | * 4.943 | 32.33 | MAv1 | 34 | -34.3 | 32.03 | 54 | -21.97 | - | - | 175 | 287 | H |
| 3 | 1.754 | 37.98 | PK2 | 29.4 | -17.6 | 49.78 | - | - | - | - | 357 | 202 | V |
| | 1.754 | 26.08 | MAv1 | 29.4 | -17.6 | 37.88 | - | - | - | - | 357 | 202 | V |
| 2 | 1.911 | 26.25 | MAv1 | 31.1 | -17.7 | 39.65 | - | - | - | - | 357 | 100 | H |
| | 1.912 | 37.77 | PK2 | 31.1 | -17.7 | 51.17 | - | - | - | - | 357 | 100 | H |
| 6 | 5.178 | 31.63 | MAv1 | 34.4 | -34.2 | 31.83 | - | - | - | - | 175 | 202 | V |
| | 5.181 | 42.37 | PK2 | 34.4 | -34.1 | 42.67 | - | - | - | - | 175 | 202 | V |
| 5 | 6.699 | 39.25 | PK2 | 35.8 | -31.1 | 43.95 | - | - | - | - | 175 | 100 | H |
| | 6.699 | 28.49 | MAv1 | 35.8 | -31.1 | 33.19 | - | - | - | - | 175 | 100 | H |

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

PK2 - KDB558074 Method: Maximum Peak

MAv1 - KDB558074 Option 1 Maximum RMS Average

FCC Part15C 2.4GHz RSE.TST 30915 29 Dec 2015
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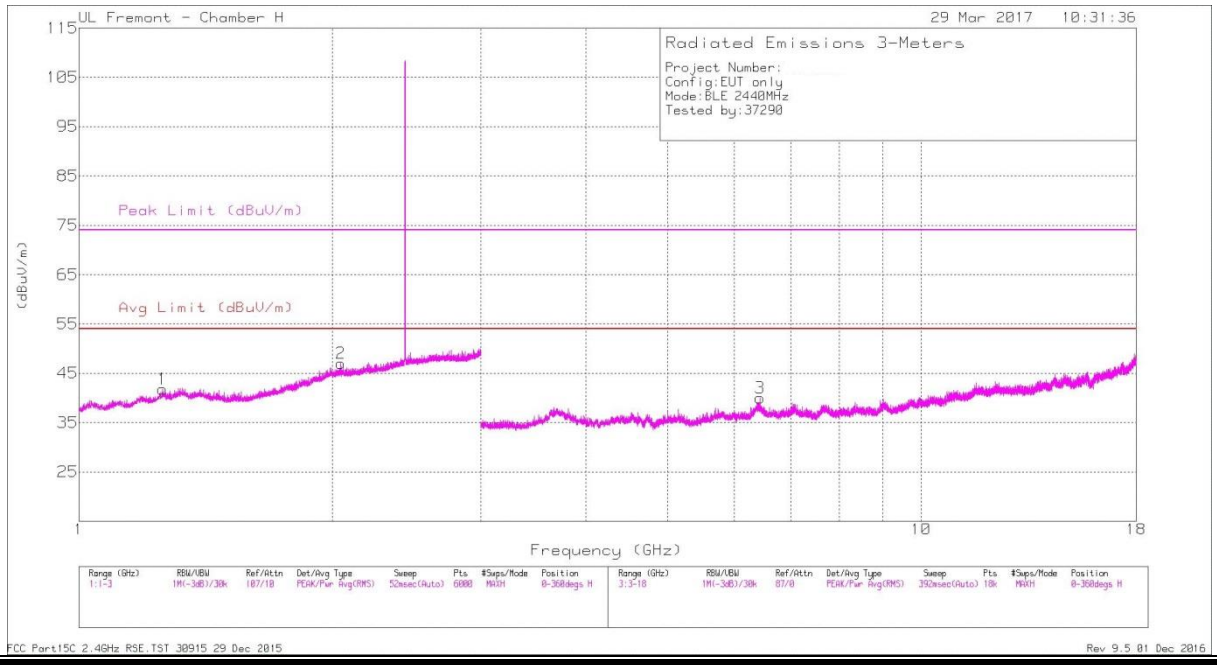
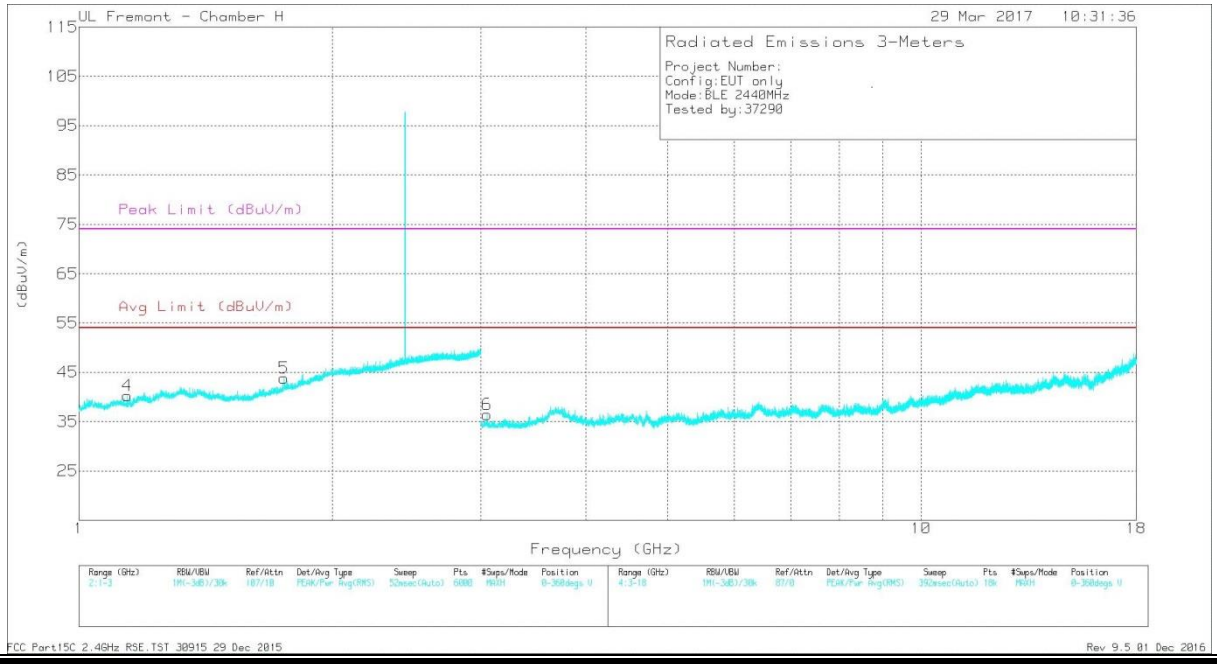
MID CHANNEL HORIZONTAL




MID CHANNEL VERTICAL





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DATA

| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det | AF T120 (dB/m) | Amp/Cbl/Fltr/Pad (dB) | Corrected Reading (dBuV/m) | Avg Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | * 1.257 | 38.27 | PK2 | 29.3 | -18.8 | 48.77 | - | - | 74 | -25.23 | 0 | 100 | H |
| | * 1.258 | 26.22 | MAv1 | 29.3 | -18.8 | 36.72 | 54 | -17.28 | - | - | 0 | 100 | H |
| 4 | * 1.141 | 37.33 | PK2 | 28.2 | -18.8 | 46.73 | - | - | 74 | -27.27 | 0 | 100 | V |
| | * 1.145 | 25.37 | MAv1 | 28.2 | -18.8 | 34.77 | 54 | -19.23 | - | - | 0 | 100 | V |
| | 1.752 | 37.68 | PK2 | 29.4 | -17.7 | 49.38 | - | - | - | - | 0 | 202 | V |
| | 1.752 | 26.04 | MAv1 | 29.4 | -17.7 | 37.74 | - | - | - | - | 0 | 202 | V |
| | 2.047 | 38.94 | PK2 | 31.7 | -17.3 | 53.34 | - | - | - | - | 0 | 201 | H |
| | 2.049 | 26.5 | MAv1 | 31.7 | -17.3 | 40.9 | - | - | - | - | 0 | 201 | H |
| | 3.053 | 34.77 | MAv1 | 33.1 | -36.6 | 31.27 | - | - | - | - | 0 | 202 | V |
| | 3.054 | 46.46 | PK2 | 33.1 | -36.6 | 42.96 | - | - | - | - | 0 | 202 | V |
| | 6.434 | 40.64 | PK2 | 35.7 | -31.3 | 45.04 | - | - | - | - | 0 | 202 | H |
| | 6.436 | 29.88 | MAv1 | 35.7 | -31.3 | 34.28 | - | - | - | - | 0 | 202 | H |

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

PK2 - KDB558074 Method: Maximum Peak

MAv1 - KDB558074 Option 1 Maximum RMS Average

FCC Part15C 2.4GHz RSE.TST 30915 29 Dec 2015
Rev 9.5 01 Dec 2016


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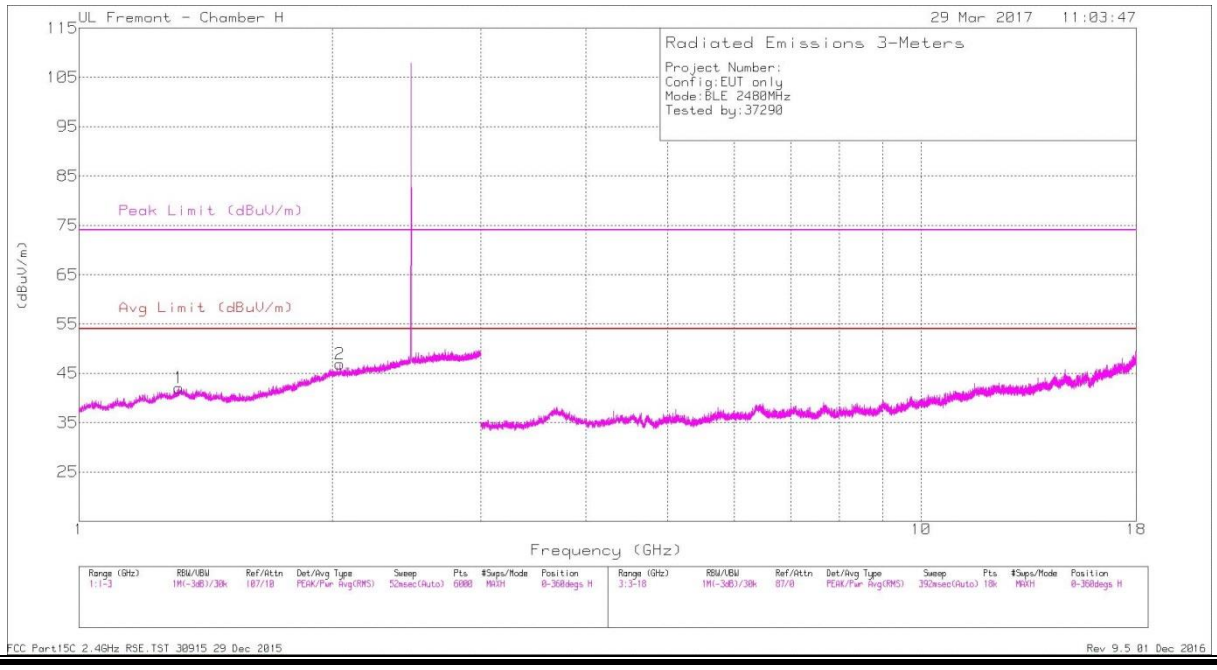
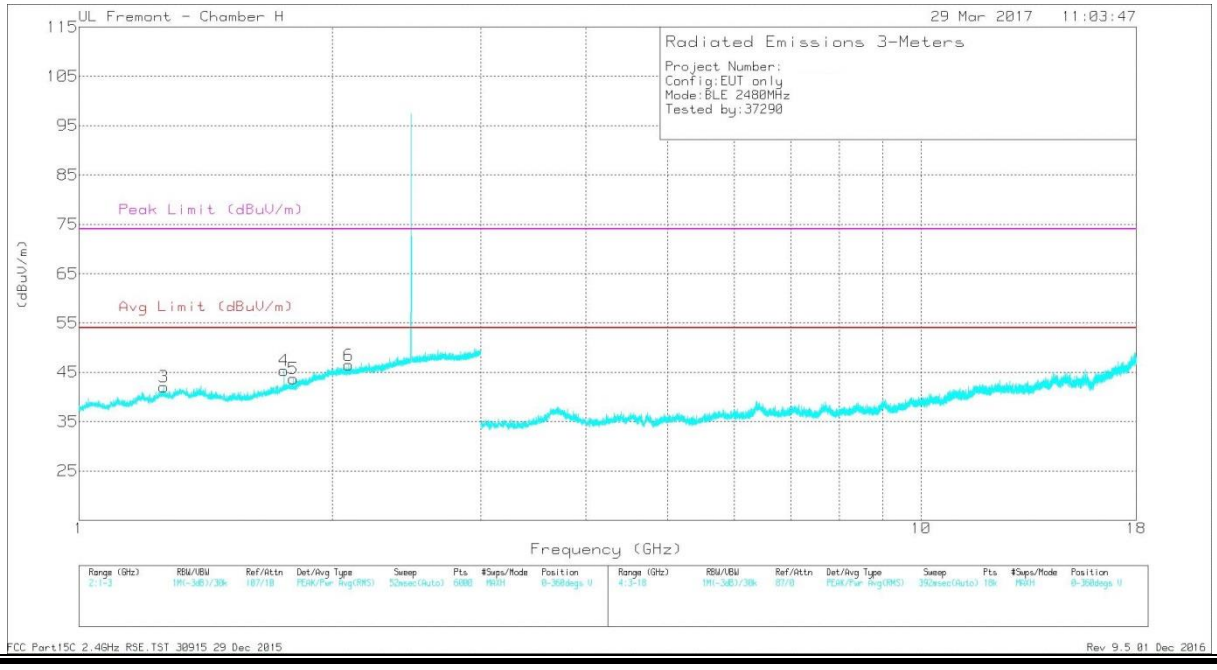
HIGH CHANNEL HORIZONTAL




HIGH CHANNEL VERTICAL





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DATA

| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det | AF T120 (dB/m) | Amp/Cbl/Fltr/Pad (dB) | Corrected Reading (dBuV/m) | Avg Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | * 1.314 | 37.75 | PK2 | 29.7 | -18.7 | 48.75 | - | - | 74 | -25.25 | 0 | 201 | H |
| | * 1.316 | 26.04 | MAv1 | 29.7 | -18.7 | 37.04 | 54 | -16.96 | - | - | 0 | 201 | H |
| 3 | * 1.263 | 37.74 | PK2 | 29.4 | -18.7 | 48.44 | - | - | 74 | -25.56 | 0 | 202 | V |
| | * 1.262 | 26.3 | MAv1 | 29.4 | -18.7 | 37 | 54 | -17 | - | - | 0 | 202 | V |
| 4 | 1.752 | 37.9 | PK2 | 29.4 | -17.7 | 49.6 | - | - | - | - | 0 | 202 | V |
| | 1.752 | 26.15 | MAv1 | 29.4 | -17.7 | 37.85 | - | - | - | - | 0 | 202 | V |
| 5 | 1.799 | 37.58 | PK2 | 29.9 | -17.7 | 49.78 | - | - | - | - | 0 | 100 | V |
| | 1.799 | 25.75 | MAv1 | 29.9 | -17.7 | 37.95 | - | - | - | - | 0 | 100 | V |
| 2 | 2.04 | 38.39 | PK2 | 31.7 | -17.3 | 52.79 | - | - | - | - | 0 | 100 | H |
| | 2.04 | 26.46 | MAv1 | 31.7 | -17.3 | 40.86 | - | - | - | - | 0 | 100 | H |
| 6 | 2.091 | 37.86 | PK2 | 31.5 | -17.2 | 52.16 | - | - | - | - | 0 | 202 | V |
| | 2.093 | 26.5 | MAv1 | 31.5 | -17.2 | 40.8 | - | - | - | - | 0 | 202 | V |

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band

PK2 - KDB558074 Method: Maximum Peak

MAv1 - KDB558074 Option 1 Maximum RMS Average

FCC Part15C 2.4GHz RSE.TST 30915 29 Dec 2015

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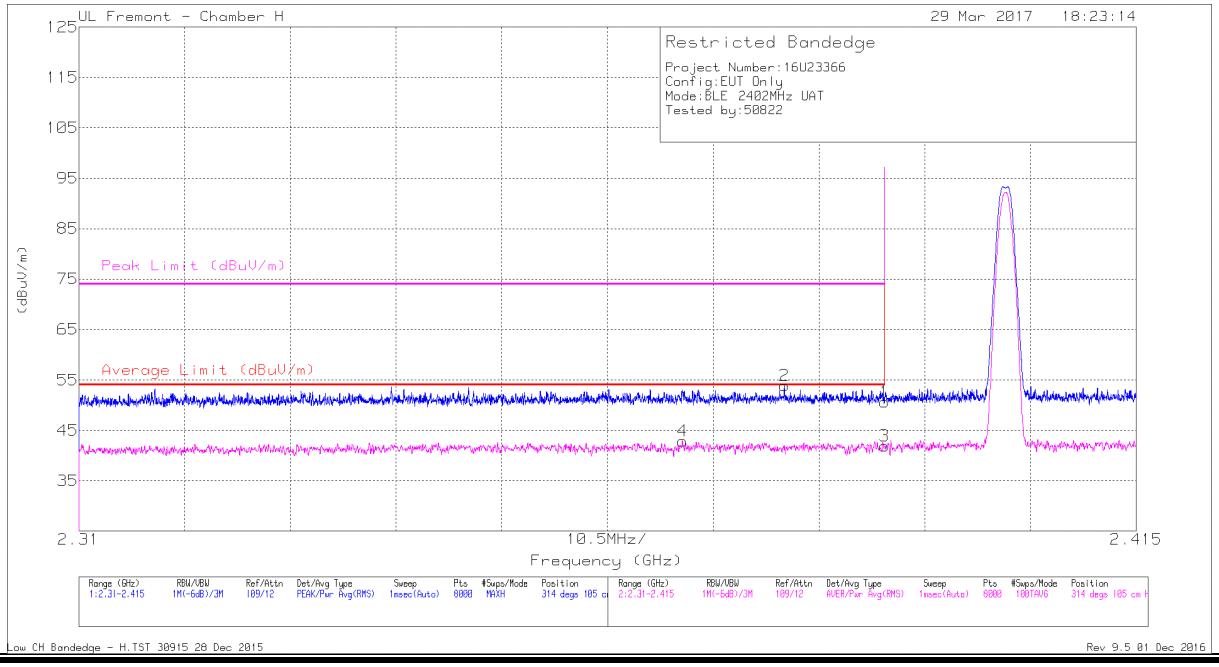
## 8.3. UAT 1 BLE 1M Plow

### 8.3.1. RESTRICTED BANDEDGE (LOW CHANNEL)

LOW CHANNEL HORIZONTAL




| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det | AF T120 (dB/m) | Amp/Cbl/Fltr/Pad (dB) | Corrected Reading (dBuV/m) | Average Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 4 | * 2.37 | 27.75 | RMS | 31.8 | -16.6 | 42.95 | 54 | -11.05 | - | - | 314 | 105 | H |
| 2 | * 2.38 | 38.64 | Pk | 31.9 | -16.6 | 53.94 | - | - | 74 | -20.06 | 314 | 105 | H |
| 1 | * 2.39 | 35.31 | Pk | 31.9 | -16.6 | 50.61 | - | - | 74 | -23.39 | 314 | 105 | H |
| 3 | * 2.39 | 26.61 | RMS | 31.9 | -16.6 | 41.91 | 54 | -12.09 | - | - | 314 | 105 | H |

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
RMS - RMS detection
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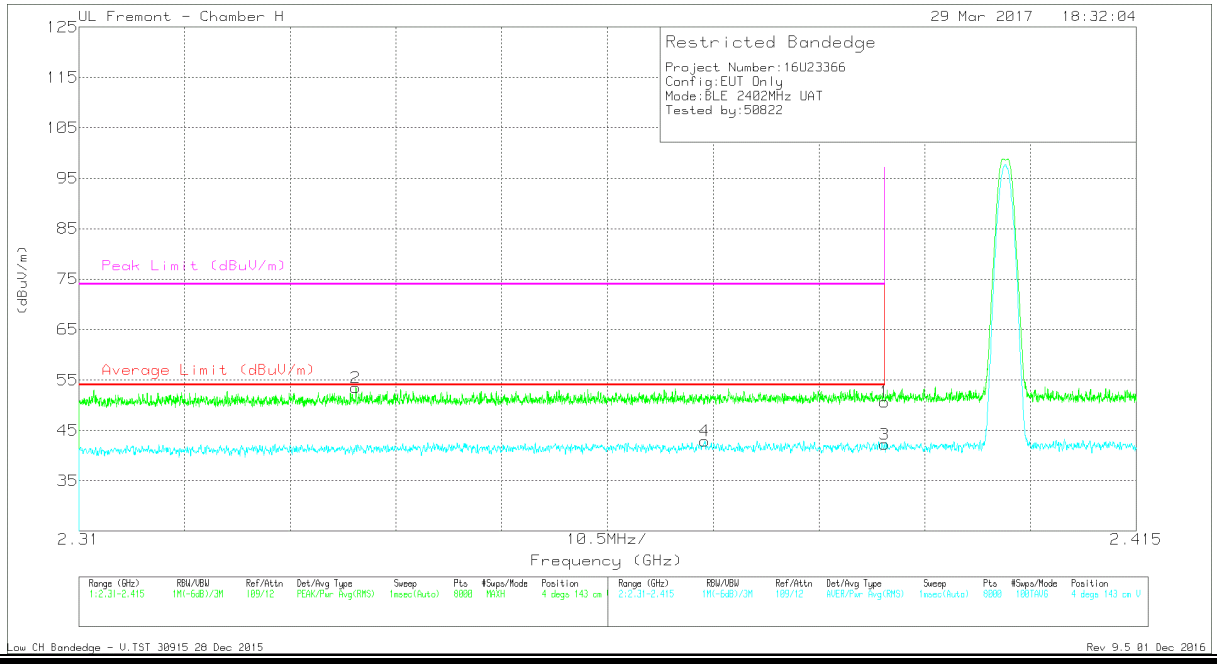
LOW CHANNEL VERTICAL




| Marker | Frequency (GHz) | Meter Reading (dBuV) | Det | AF T120 (dB/m) | Amp/Cbl/Fltr/Pad (dB) | Corrected Reading (dBuV/m) | Average Limit (dBuV/m) | Margin (dB) | Peak Limit (dBuV/m) | PK Margin (dB) | Azimuth (Degs) | Height (cm) | Polarity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2 | * 2.338 | 38.45 | Pk | 31.7 | -16.7 | 53.45 | - | - | 74 | -20.55 | 4 | 143 | V |
| 4 | * 2.372 | 27.69 | RMS | 31.8 | -16.6 | 42.89 | 54 | -11.11 | - | - | 4 | 143 | V |
| 1 | * 2.39 | 35.29 | Pk | 31.9 | -16.6 | 50.59 | - | - | 74 | -23.41 | 4 | 143 | V |
| 3 | * 2.39 | 26.92 | RMS | 31.9 | -16.6 | 42.22 | 54 | -11.78 | - | - | 4 | 143 | V |

* - indicates frequency in CFR47 Pt 15 / IC RSS-Restricted Band
Pk - Peak detector
RMS - RMS detection
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