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# Report On

FCC Testing of the Sharp SHF32 Quad-band GSM (850/900/1800/1900) & Dual-band UMTS (FDDI, FDDV) & Dual-band LTE (B1, B26) multi mode cellular phone with Bluetooth, WLAN, SRD(FeliCa) and GPS
In accordance with FCC 47 CFR Part 15C (WLAN and Bluetooth Low Energy)

COMMERCIAL-IN-CONFIDENCE
FCC ID: APYHRO00224

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**REPORT ON**

FCC Testing of the
Sharp SHF32 Quad-band GSM (850/900/1800/1900) & Dual-band UMTS (FDDI, FDDV) & Dual-band LTE (B1, B26) multi mode cellular phone with Bluetooth, WLAN, SRD(FeliCa) and GPS
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Document 75930192 Report 11 Issue 1

June 2015

**PREPARED FOR**

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**PREPARED BY**

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Senior Administrator, Project Support

**APPROVED BY**

**Simon Bennett**
Authorised Signatory

**DATED** 19 June 2015

ENGINEERING STATEMENT

The measurements shown in this report were made in accordance with the procedures described on test pages. All reported testing was carried out on a sample equipment to demonstrate limited compliance with FCC 47 CFR Part 15C. The sample tested was found to comply with the requirements defined in the applied rules.

Test Engineer(s);

G Lawler M Russell

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**SECTION 1**

**REPORT SUMMARY**

FCC Testing of the
Sharp SHF32 Quad-band GSM (850/900/1800/1900) & Dual-band UMTS (FDDI, FDDV) & Dual-band LTE (B1, B26) multi mode cellular phone with Bluetooth, WLAN, SRD(FeliCa) and GPS
In accordance with FCC 47 CFR Part 15C (WLAN and Bluetooth Low Energy)

## 1.1 INTRODUCTION

The information contained in this report is intended to show the verification of FCC Testing of the Sharp SHF32 Quad-band GSM (850/900/1800/1900) & Dual-band UMTS (FDDI, FDDV) & Dual-band LTE (B1, B26) multi mode cellular phone with Bluetooth, WLAN, SRD(FeliCa) and GPS to the requirements of FCC 47 CFR Part 15C.

| | |
|---|---|
| Objective | To perform FCC Testing to determine the Equipment Under Test's (EUT's) compliance with the Test Specification, for the series of tests carried out. |
| Manufacturer | Sharp Corporation |
| Model Number(s) | SHF32 |
| Serial Number(s) | IMEI 004401115362408<br>IMEI 004401115362465<br>IMEI 004401115362481 |
| Number of Samples Tested | 3 |
| Test Specification/Issue/Date | FCC 47 CFR Part 15C (2014) |
| Incoming Release<br>Date | Application Form<br>15 May 2015 |
| Disposal<br>Reference Number<br>Date | Held Pending Disposal<br>Not Applicable<br>Not Applicable |
| Order Number<br>Date | 10534<br>17 April 2015 |
| Start of Test | 29 May 2015 |
| Finish of Test | 9 June 2015 |
| Name of Engineer(s) | G Lawler<br>M Russell |
| Related Document(s) | ANSI C63.10: 2009 |

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## 1.2 BRIEF SUMMARY OF RESULTS

A brief summary of the tests carried out in accordance with FCC 47 CFR Part 15C is shown below.

| Section | Specification Clause | Test Description | Result | Comments/Base Standard |
|---|---|---|---|---|
| 802.11b | | | | |
| 2.1 | 15.207 | AC Line Conducted Emissions | Pass | |
| 2.2 | 15.247 (a)(2) | 6 dB Bandwidth | Pass | |
| 2.3 | 15.247 (b)(3) | Maximum Conducted Output Power | Pass | |
| 2.4 | 15.247 (d) and 15.205 | Spurious Radiated Emissions | Pass | |
| 2.5 | 15.205 | Restricted Band Edges | Pass | |
| 2.6 | 15.247 (d) | Authorised Band Edges | Pass | |
| 2.7 | 15.247 (e) | Power Spectral Density | Pass | |
| 802.11g | | | | |
| 2.2 | 15.247 (a)(2) | 6 dB Bandwidth | Pass | |
| 2.3 | 15.247 (b)(3) | Maximum Conducted Output Power | Pass | |
| 2.4 | 15.247 (d) and 15.205 | Spurious Radiated Emissions | Pass | |
| 2.5 | 15.205 | Restricted Band Edges | Pass | |
| 2.6 | 15.247 (d) | Authorised Band Edges | Pass | |
| 2.7 | 15.247 (e) | Power Spectral Density | Pass | |

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| Section | Specification Clause | Test Description | Result | Comments/Base Standard |
|---|---|---|---|---|
| 802.11n | | | | |
| 2.2 | 15.247 (a)(2) | 6 dB Bandwidth | Pass | |
| 2.3 | 15.247 (b)(3) | Maximum Conducted Output Power | Pass | |
| 2.4 | 15.247 (d) and 15.205 | Spurious Radiated Emissions | Pass | |
| 2.5 | 15.205 | Restricted Band Edges | Pass | |
| 2.6 | 15.247 (d) | Authorised Band Edges | Pass | |
| 2.7 | 15.247 (e) | Power Spectral Density | Pass | |
| Bluetooth Low Energy | | | | |
| 2.2 | 15.247 (a)(2) | 6 dB Bandwidth | Pass | |
| 2.3 | 15.247 (b)(3) | Maximum Conducted Output Power | Pass | |
| 2.4 | 15.247 (d) and 15.205 | Spurious Radiated Emissions | Pass | |
| 2.5 | 15.205 | Restricted Band Edges | Pass | |
| 2.6 | 15.247 (d) | Authorised Band Edges | Pass | |
| 2.7 | 15.247 (e) | Power Spectral Density | Pass | |

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## 1.3 APPLICATION FORM

| EQUIPMENT DESCRIPTION | |
|---|---|
| Model Name/Number | SHF32 |
| Part Number | CA287 |
| FCC ID (if applicable) | APYHRO00224 |
| Industry Canada ID (if applicable) | N/A |
| Technical Description (Please provide a brief description of the intended use of the equipment) | Dual-band LTE(B1/B26), Dual-band WCDMA(FDD-I/V), Quad-band GSM(850/900/1800/1900), Multimode Smartphone with BT, WLAN, SRD and GPS. |

| Types of Modulations used by the Equipment | |
|---|---|
| ☒ | FHSS |
| ☒ | Other forms of modulation |
| **In case of FHSS Modulation** | |
| In case of non-Adaptive Frequency Hopping equipment: | |
| | Number of Hopping Frequencies: N/A |
| In case of Adaptive Frequency Hopping Equipment: | |
| | Maximum number of Hopping Frequencies: Bluetooth(BR/EDR):79,LE:40 |
| | Minimum number of Hopping Frequencies: 20 |
| Dwell Time: 3.75ms | |
| Minimum Channel Occupation Time: 1.25ms (5.5ms maximum) | |
| **Adaptive / non-adaptive equipment:** | |
| ☐ | non-adaptive Equipment |
| ☒ | adaptive Equipment without the possibility to switch to a non-adaptive mode |
| ☐ | adaptive Equipment which can also operate in a non-adaptive mode |
| **In case of adaptive equipment:** | |
| The Channel Occupancy Time implemented by the equipment: 13 ms | |
| ☒ | The equipment has implemented an LBT based DAA mechanism |
| In case of equipment using modulation different from FHSS: | |
| ☐ | The equipment is Frame Based equipment |
| ☐ | The equipment is Load Based equipment |
| ☒ | The equipment can switch dynamically between Frame Based and Load Based equipment |
| The CCA time implemented by the equipment: 34 µs | |
| The value q as referred to in clause 4.3.2.5.2.2.2 is: q = 32 | |
| ☐ | The equipment has implemented an non-LBT based DAA mechanism |
| ☐ | The equipment can operate in more than one adaptive mode |

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| | |
|---|---|
| **In case of non-adaptive Equipment:** | |
| The maximum RF Output Power (e.i.r.p.): dBm | |
| The maximum (corresponding) Duty Cycle: % | |
| Equipment with dynamic behaviour, that behaviour is described here. (e.g. the different combinations of duty cycle and corresponding power levels to be declared): | |
| | |
| **The worst case operational mode for each of the following tests:** | |
| RF Output Power: Max:8dBm / Nominal:5dBm (Blutooth Power Class:1),Max:17dBm (IEEE802.11b) | |
| Power Spectral Density: | |
| Duty cycle, Tx-Sequence, Tx-gap: | |
| Dwell time, Minimum Frequency Occupation & Hopping Sequence (only for FHSS equipment): To be determined by test lab | |
| Hopping Frequency Separation (only for FHSS equipment): To be determined by test lab | |
| Medium Utilisation: To be determined by test lab | |
| Adaptivity & Receiver Blocking: To be determined by test lab | |
| Occupied Channel Bandwidth: To be determined by test lab | |
| Transmitter unwanted emissions in the OOB domain: To be determined by test lab | |
| Transmitter unwanted emissions in the spurious domain: To be determined by test lab | |
| Receiver spurious emissions: To be determined by test lab | |
| **The different transmit operating modes (tick all that apply):** | |
| ☒ | Operating mode 1: Single Antenna Equipment |
| ☒ | Equipment with only 1 antenna |
| ☐ | Equipment with 2 diversity antennas but only 1 antenna active at any moment in time |
| ☐ | Smart Antenna Systems with 2 or more antennas, but operating in a (legacy) mode where only 1 antenna is used. (e.g. IEEE 802.11™ [i.3] legacy mode in smart antenna systems) |
| ☐ | Operating mode 2: Smart Antenna Systems - Multiple Antennas without beam forming |
| ☐ | Single spatial stream / Standard throughput / (e.g. IEEE 802.11™ [i.3] legacy mode) |
| ☐ | High Throughput (> 1 spatial stream) using Occupied Channel Bandwidth 1 |
| ☐ | High Throughput (> 1 spatial stream) using Occupied Channel Bandwidth 2 |
| *NOTE: Add more lines if more channel bandwidths are supported.* | |
| ☐ | Operating mode 3: Smart Antenna Systems - Multiple Antennas with beam forming |
| ☐ | Single spatial stream / Standard throughput (e.g. IEEE 802.11™ [i.3] legacy mode) |
| ☐ | High Throughput (> 1 spatial stream) using Occupied Channel Bandwidth 1 |
| ☐ | High Throughput (> 1 spatial stream) using Occupied Channel Bandwidth 2 |
| *NOTE: Add more lines if more channel bandwidths are supported.* | |
| **In case of Smart Antenna Systems:** | |
| The number of Receive chains: | |
| The number of Transmit chains: | |
| ☐ | symmetrical power distribution |
| ☐ | asymmetrical power distribution |
| In case of beam forming, the maximum beam forming gain: | |
| *NOTE: Beam forming gain does not include the basic gain of a single antenna.* | |

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| Operating Frequency Range(s) of the equipment: | |
|---|---|
| Operating Frequency Range 1: 2402 MHz to 2480 MHz | Bluetooth (e.g Bluetooth for EU) |
| Operating Frequency Range 2: 2412 MHz to 2472 MHz | WLAN for EU (e.g WLAN for EU) |
| Operating Frequency Range 3: MHz to MHz | (e.g Bluetooth for FCC and/or Industry Canada) |
| Operating Frequency Range 4: MHz to MHz | (e.g WLAN for FCC and/or Industry Canada) |
| *NOTE: Add more lines if more Frequency Ranges are supported.* | |
| **Occupied Channel Bandwidth(s):** | |
| Occupied Channel Bandwidth1: 1 MHz to 2(LE) MHz | |
| Occupied Channel Bandwidth2: 20 MHz to MHz | |
| *NOTE: Add more lines if more channel bandwidths are supported.* | |
| **Type of Equipment (stand-alone, combined, plug-in radio device, etc.):** | |
| ☒ Stand-alone | |
| ☐ Combined Equipment (Equipment where the radio part is fully integrated within another type of equipment) | |
| ☐ Plug-in radio device (Equipment intended for a variety of host systems) | |
| ☐ Other | |
| **The extreme operating conditions that apply to the equipment:** | |
| Operating temperature range: -10 °C to 55 °C | |
| Operating voltage range: 3.7 V to 4.0 V | ☐ AC ☒ DC |
| Details provided are for the: | |
| ☒ stand-alone equipment | |
| ☐ combined (or host) equipment | |
| ☐ test jig | |

Product Service

| **The intended combination(s) of the radio equipment power settings and one or more antenna assemblies and their corresponding e.i.r.p levels:** | | | |
|---|---|---|---|
| Antenna Type: | | | |
| ☒ Integral Antenna | | | |
| Antenna Gain: 0 dBi | | | |
| If applicable, additional beamforming gain (excluding basic antenna gain): dB | | | |
| ☒ Temporary RF connector provided | | | |
| ☐ No temporary RF connector provided | | | |
| ☐ Dedicated Antennas (equipment with antenna connector) | | | |
| ☐ Single power level with corresponding antenna(s) | | | |
| ☐ Multiple power settings and corresponding antenna(s) | | | |
| Number of different Power Levels: | | | |
| Power Level 1: dBm | | | |
| Power Level 2: dBm | | | |
| Power Level 3: dBm | | | |
| Power Level 4: dBm | | | |
| *NOTE 1: Add more lines in case the equipment has more power levels.* | | | |
| *NOTE 2: These power levels are conducted power levels (at antenna connector).* | | | |
| For each of the Power Levels, provide the intended antenna assemblies, their corresponding gains (G) and the resulting e.i.r.p. levels also taking into account the beamforming gain (Y) if applicable | | | |
| Power Level 1: dBm | | | |
| Number of antenna assemblies provided for this power level: | | | |
| **Assembly #** | **Gain (dBi)** | **e.i.r.p (dBm)** | **Part number or model number** |
| **1** | | | |
| **2** | | | |
| **3** | | | |
| **4** | | | |
| *NOTE: Add more rows in case more antenna assemblies are supported for this power level.* | | | |
| Power Level 2: dBm | | | |
| Number of antenna assemblies provided for this power level: | | | |
| **Assembly #** | **Gain (dBi)** | **e.i.r.p (dBm)** | **Part number or model number** |
| **1** | | | |
| **2** | | | |
| **3** | | | |
| **4** | | | |
| *NOTE: Add more rows in case more antenna assemblies are supported for this power level.* | | | |
| Power Level 3: dBm | | | |
| Number of antenna assemblies provided for this power level: | | | |
| **Assembly #** | **Gain (dBi)** | **e.i.r.p (dBm)** | **Part number or model number** |
| **1** | | | |
| **2** | | | |
| **3** | | | |
| **4** | | | |
| *NOTE: Add more rows in case more antenna assemblies are supported for this power level.* | | | |
| **The nominal voltages of the stand-alone radio equipment or the nominal voltages of the combined (host) equipment or test** | | | |

Product Service

| | |
|---|---|
| **jig in case of plug-in devices:** | |
| Details provided are for the: ☒ stand-alone equipment | |
| ☐ combined (or host) equipment | |
| ☐ test jig | |
| Supply Voltage ☐ AC mains State AC voltage | |
| ☒ State DC voltage 4.0 | |
| In case of DC, indicate the type of power source | |
| ☐ Internal Power Supply | |
| ☐ External Power Supply or AC/DC adapter | |
| ☒ Battery | |
| ☒ Other: Dummy battery from external DC supply (4.0V) | |
| **Describe the test modes available which can facilitate testing:** | |
| Teraterm | |
| **The equipment type (e.g. Bluetooth®, IEEE 802.11™ [i.3], proprietary, etc.):** | |
| Bluetooth Ver4.0, IEEE 802.11b/g/n | |
| **Combination for testing (see clause 5.1.3.3 of EN 300 328 V1.8.1)** | |
| From all combinations of conducted power settings and intended antenna assembly(ies) specified in clause 3.1 m), specify the combination resulting in the highest e.i.r.p. for the radio equipment.<br><br>Unless otherwise specified in EN 300 328, this power setting is to be used for testing against the requirements of EN 300 328. In case there is more than one such conducted power setting resulting in the same (highest) e.i.r.p. level, the highest power setting is to be used for testing. See also EN 300 328, clause 5.1.3.3. | |
| Highest overall e.i.r.p. value: dBm | |
| Corresponding Antenna assembly gain: dBi | Antenna Assembly #: |
| Corresponding conducted power setting: dBm | Listed as Power Setting #: |
| (also the power level to be used for testing) | |
| **Additional information provided by the applicant** | |
| **Modulation** | |
| ITU Class(es) of emission: | |
| Can the transmitter operate unmodulated? ☐ Yes ☐ No | |
| **Duty Cycle** | |
| The transmitter is intended for: | |
| ☐ Continuous duty | |
| ☐ Intermittent duty | |
| ☒ Continuous operation possible for testing purposes | |
| **About the UUT** | |
| ☐ The equipment submitted are representative production models | |
| ☐ If not, the equipment submitted are pre-production models ? | |
| ☒ If pre-production equipment are submitted, the final production equipment will be identical in all respects with the equipment tested | |
| ☐ If not, supply full details | |
| ☐ The equipment submitted is CE marked | |
| ☐ In addition to the CE mark, the Class-II identifier (Alert Sign) is affixed. | |

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| | Additional items and/or supporting equipment provided |
|---|---|
| ☐ | Spare batteries (e.g. for portable equipment) |
| ☒ | Battery charging device |
| ☐ | External Power Supply or AC/DC adapter |
| ☐ | Test Jig or interface box |
| ☐ | RF test fixture (for equipment with integrated antennas) |
| ☐ | Host System |
| | Manufacturer |
| | Model |
| | Model Name |
| ☐ | Combined equipment |
| | Manufacturer |
| | Model |
| | Model Name |
| ☐ | User Manual |
| ☐ | Technical documentation (Handbook and circuit diagrams) |

I hereby declare that I am entitled to sign on behalf of the applicant and that the information supplied is correct and complete.

Signature:  Name: Kiyoharu Kaidoh

Position held: Chief Date: 15th May, 2015

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## 1.4 PRODUCT INFORMATION

### 1.4.1 Technical Description

The Equipment Under Test (EUT) was a Sharp SHF32 Quad-band GSM (850/900/1800/1900) & Dual-band UMTS (FDDI, FDDV) & Dual-band LTE (B1, B26) multi mode cellular phone with Bluetooth, WLAN, SRD(FeliCa) and GPS. A full technical description can be found in the manufacturer's documentation.

## 1.5 TEST CONDITIONS

For all tests the EUT was set up in accordance with the relevant test standard and to represent typical operating conditions.

The EUT was powered from a 4.0 V DC supply.

FCC Measurement Facility Registration Number
90987 Octagon House, Fareham Test Laboratory

## 1.6 DEVIATIONS FROM THE STANDARD

No deviations from the applicable test standard or test plan were made during testing.

## 1.7 MODIFICATION RECORD

Modification 0 - No modifications were made to the test sample during testing.

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**SECTION 2**

**TEST DETAILS**

FCC Testing of the
Sharp SHF32 Quad-band GSM (850/900/1800/1900) & Dual-band UMTS (FDDI, FDDV) & Dual-band LTE (B1, B26) multi mode cellular phone with Bluetooth, WLAN, SRD(FeliCa) and GPS
In accordance with FCC 47 CFR Part 15C (WLAN and Bluetooth Low Energy)

## 2.1 AC LINE CONDUCTED EMISSIONS

### 2.1.1 Specification Reference

FCC 47 CFR Part 15C, Clause 15.207

### 2.1.2 Equipment Under Test and Modification State

SHF32 S/N: IMEI 004401115362408 - Modification State 0

### 2.1.3 Date of Test

9 June 2015

### 2.1.4 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

### 2.1.5 Test Procedure

The test was performed in accordance with ANSI C63.10, clause 6.2.

Remarks

A mains supply cable of 1 m length was used to supply mains power to the EUT from the LISN.

All final measurements were assessed against the Class B emission limits in Clause 15.207 of FCC 47 CFR Part 15.

### 2.1.6 Environmental Conditions

| | |
|---|---|
| Ambient Temperature | 20.4°C |
| Relative Humidity | 35.0% |

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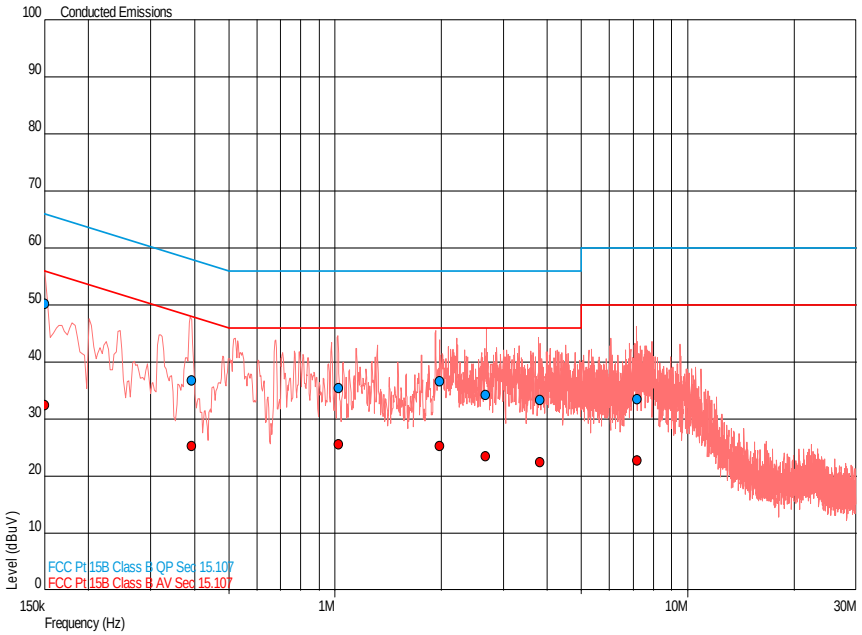
### 2.1.7 Test Results

802.11b, Live Line, AC Line Conducted Emissions Result

| Frequency (MHz) | QP Level (dBµV) | QP Limit (dBµV) | QP Margin (dBµV) | AV Level (dBµV) | AV Limit (dBµV) | AV Margin (dBµV) |
|---|---|---|---|---|---|---|
| 0.150 | 50.2 | 66.0 | -15.8 | 32.4 | 56.0 | -23.6 |
| 0.393 | 36.7 | 58.0 | -21.3 | 25.3 | 48.0 | -22.7 |
| 1.027 | 35.5 | 56.0 | -20.5 | 25.6 | 46.0 | -20.4 |
| 1.978 | 36.6 | 56.0 | -19.4 | 25.2 | 46.0 | -20.8 |
| 2.666 | 34.2 | 56.0 | -21.8 | 23.4 | 46.0 | -22.6 |
| 3.813 | 33.4 | 56.0 | -22.6 | 22.5 | 46.0 | -23.5 |
| 7.192 | 33.5 | 60.0 | -26.5 | 22.8 | 50.0 | -27.2 |

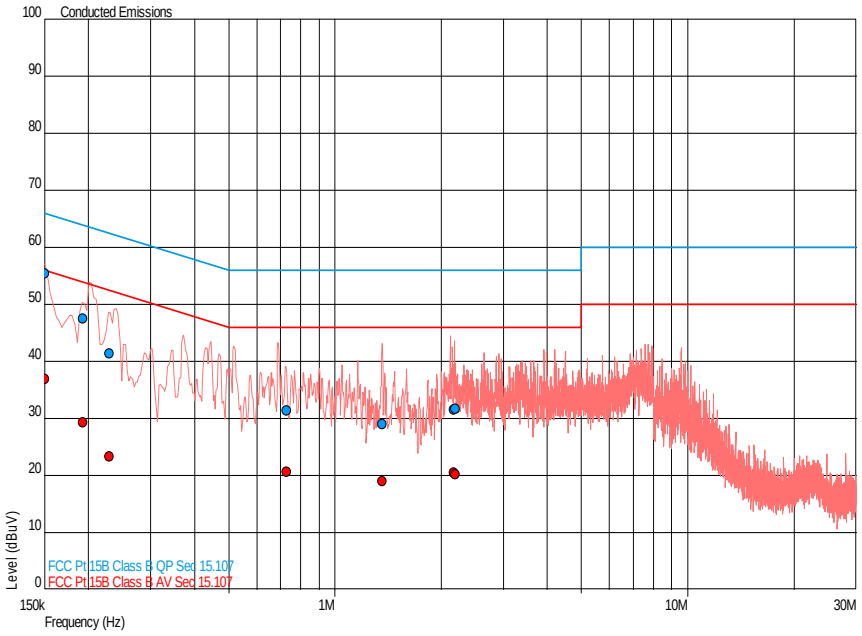
802.11b, Live Line, AC Line Conducted Emissions Plot



802.11b, Neutral Line, AC Line Conducted Emissions Result

| Frequency (MHz) | QP Level (dBµV) | QP Limit (dBµV) | QP Margin (dBµV) | AV Level (dBµV) | AV Limit (dBµV) | AV Margin (dBµV) |
|---|---|---|---|---|---|---|
| 0.150 | 55.5 | 66.0 | -10.5 | 36.9 | 56.0 | -19.1 |
| 0.193 | 47.5 | 63.9 | -16.4 | 29.4 | 53.9 | -24.5 |
| 0.229 | 41.5 | 62.5 | -21.0 | 23.3 | 52.5 | -29.2 |
| 0.730 | 31.5 | 56.0 | -24.5 | 20.6 | 46.0 | -25.4 |
| 1.363 | 29.1 | 56.0 | -26.9 | 19.1 | 46.0 | -26.9 |
| 2.171 | 31.5 | 56.0 | -24.5 | 20.5 | 46.0 | -25.5 |
| 2.193 | 31.6 | 56.0 | -24.4 | 20.2 | 46.0 | -25.8 |

802.11b, Neutral Line, AC Line Conducted Emissions Plot




FCC 47 CFR Part 15, Limit Clause 15.207

| Frequency of Emission (MHz) | Conducted Limit (dBµV) | |
|---|---|---|
| | Quasi-Peak | Average |
| 0.15 to 0.5 | 66 to 56* | 56 to 46* |
| 0.5 to 5 | 56 | 46 |
| 5 to 30 | 60 | 50 |

*Decreases with the logarithm of the frequency.

## 2.2 6 dB BANDWIDTH

### 2.2.1 Specification Reference

FCC 47 CFR Part 15C, Clause 15.247 (a)(2)

### 2.2.2 Equipment Under Test and Modification State

SHF32 S/N: IMEI 004401115362465 - Modification State 0
SHF32 S/N: IMEI 004401115362408 - Modification State 0

### 2.2.3 Date of Test

29 May 2015 & 4 June 2015

### 2.2.4 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

### 2.2.5 Test Procedure

This test was performed in accordance with FCC KDB 558074 v03r02, clause 8.2.

### 2.2.6 Environmental Conditions

| | |
|---|---|
| Ambient Temperature | 26.6°C |
| Relative Humidity | 25.9 - 28.9% |

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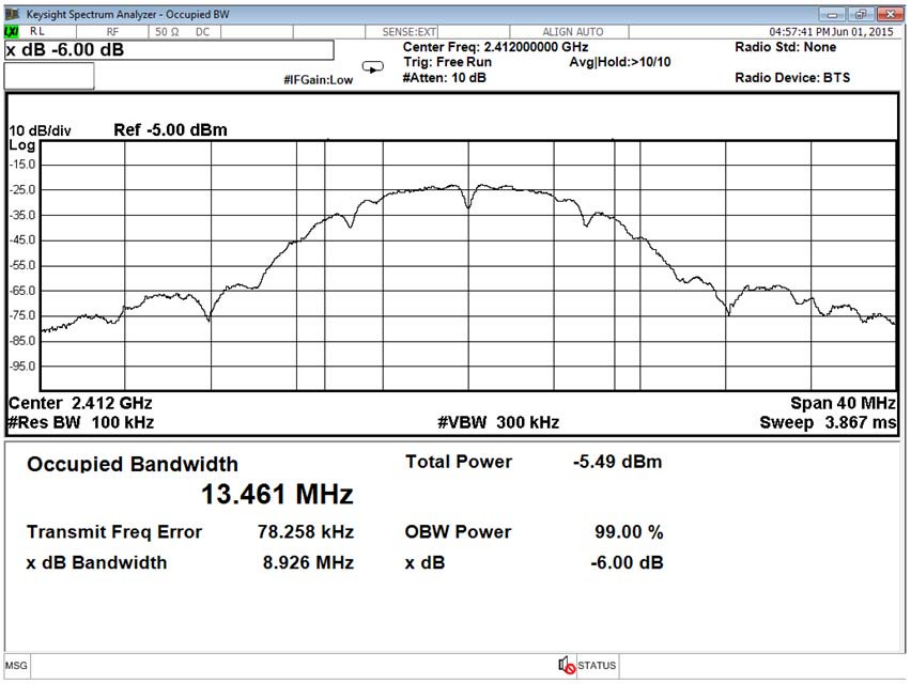
### 2.2.7 Test Results

4.0 V DC Supply

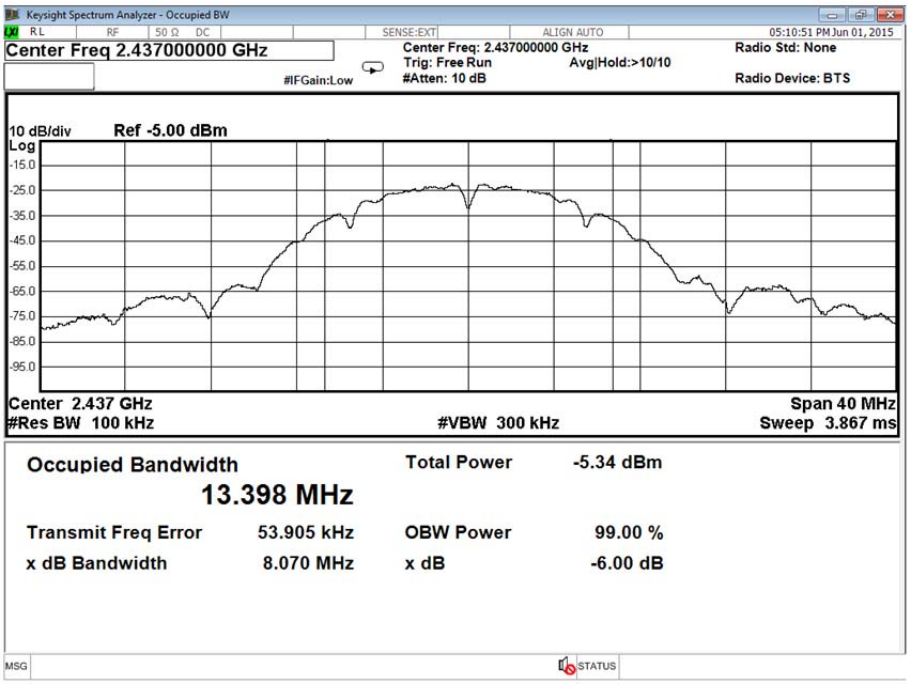
802.11b, DSSS, 2 Mbps, 6 dB Bandwidth Results

| 2412 MHz | 2437 MHz | 2462 MHz |
|---|---|---|
| kHz | kHz | kHz |
| 8926 | 8070 | 8102 |

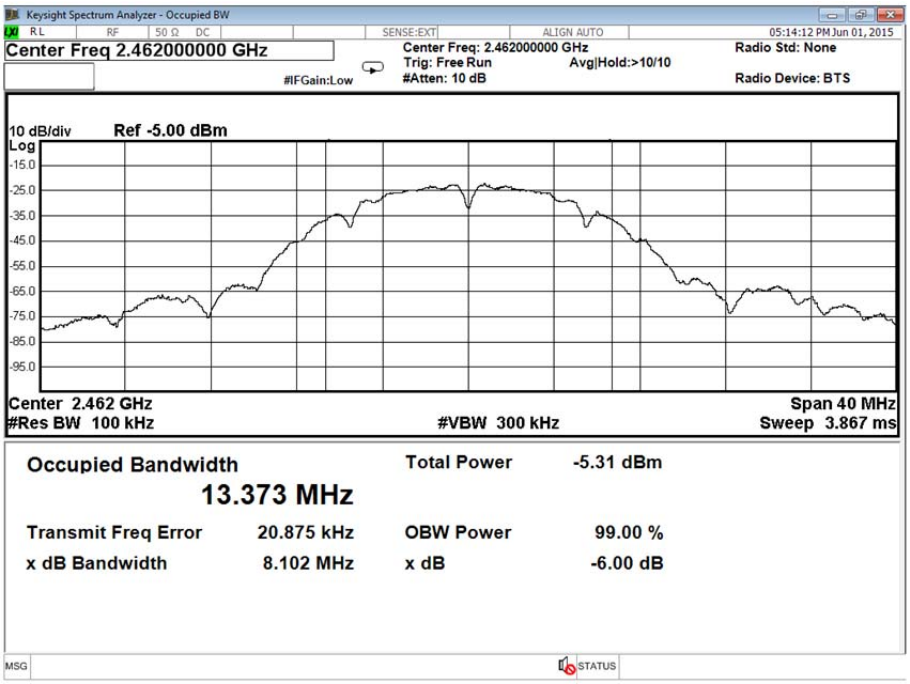
802.11b, 2412 MHz, DSSS, 2 Mbps, 6 dB Bandwidth Plot



802.11b, 2437 MHz, DSSS, 2 Mbps, 6 dB Bandwidth Plot




802.11b, 2462 MHz, DSSS, 2 Mbps, 6 dB Bandwidth Plot




Remarks

Pre-testing was performed on each data rate for 802.11b. Testing was then completed on the data rate which resulted in the widest bandwidth. For 802.11b this data rate was 2 Mbps. It was confirmed that all data rates complied with the minimum 6 dB bandwidth requirement of 500 kHz.

FCC 47 CFR Part 15, Limit Clause 15.247 (a)(2)

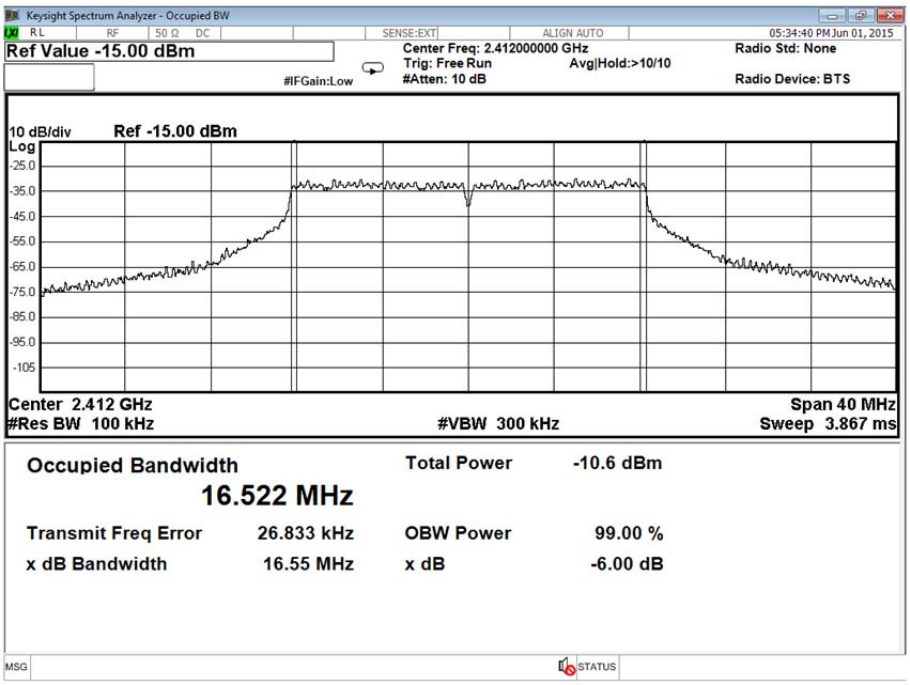
The minimum 6 dB Bandwidth shall be at least 500 kHz.

4.0 V DC Supply

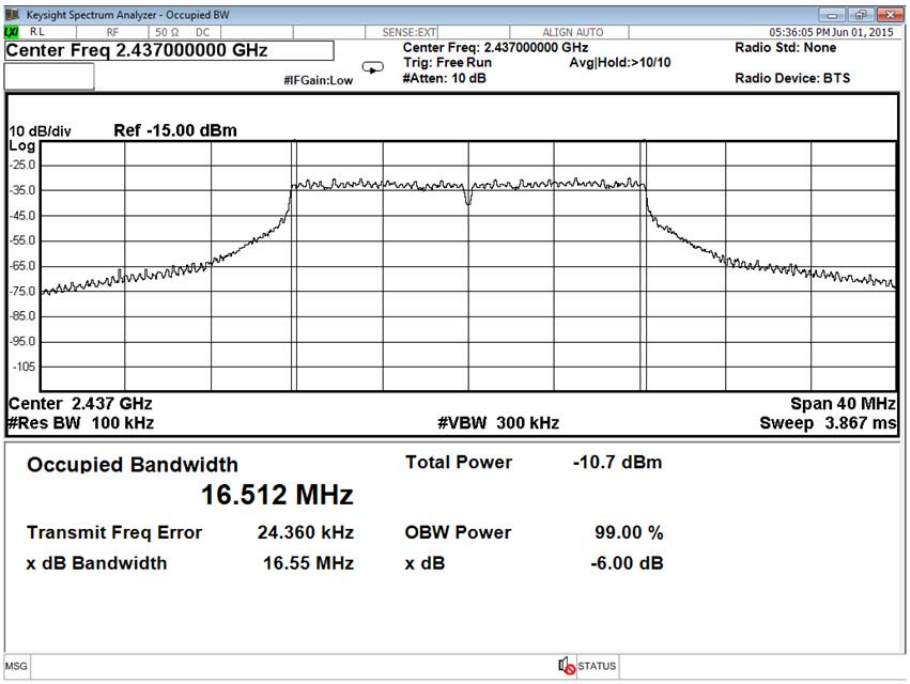
802.11g, OFDM, 54 Mbps, 6 dB Bandwidth Results

| 2412 MHz | 2437 MHz | 2462 MHz |
|---|---|---|
| kHz | kHz | kHz |
| 16550 | 16550 | 16540 |

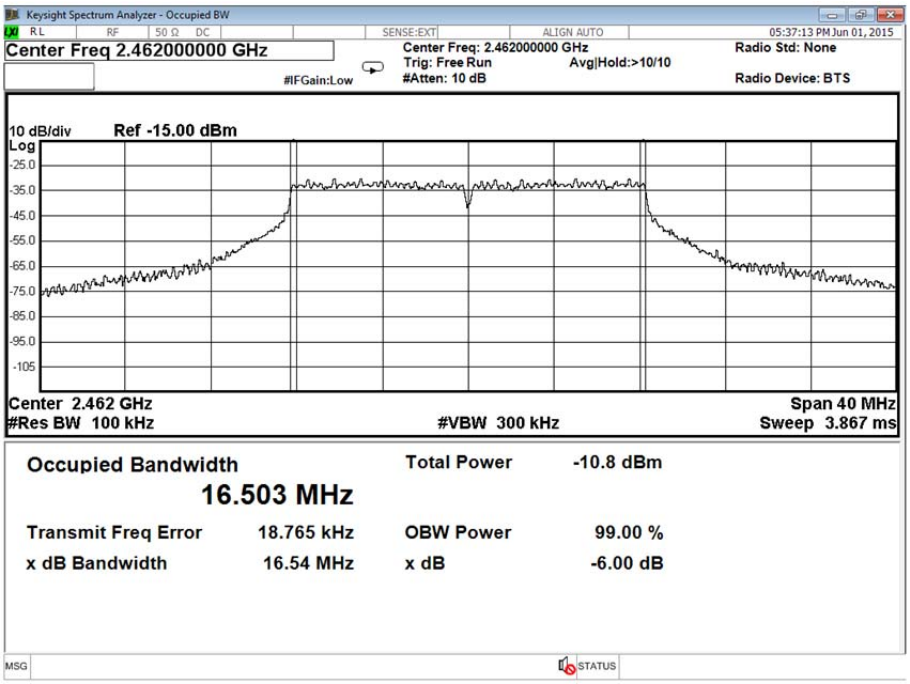
802.11g, 2412 MHz, OFDM, 54 Mbps, 6 dB Bandwidth Plot



802.11g, 2437 MHz, OFDM, 54 Mbps, 6 dB Bandwidth Plot




802.11g, 2462 MHz, OFDM, 54 Mbps, 6 dB Bandwidth Plot




Remarks

Pre-testing was performed on each data rate for 802.11g. Testing was then completed on the data rate which resulted in the widest bandwidth. For 802.11g this data rate was 54 Mbps. It was confirmed that all data rates complied with the minimum 6 dB bandwidth requirement of 500 kHz.

FCC 47 CFR Part 15, Limit Clause 15.247 (a)(2)

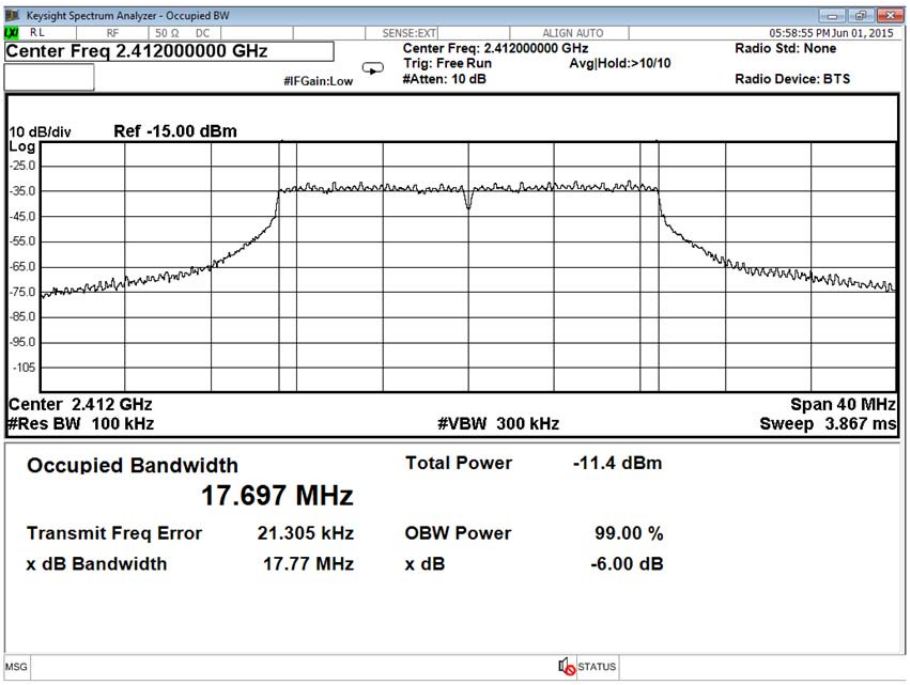
The minimum 6 dB Bandwidth shall be at least 500 kHz.

4.0 V DC Supply

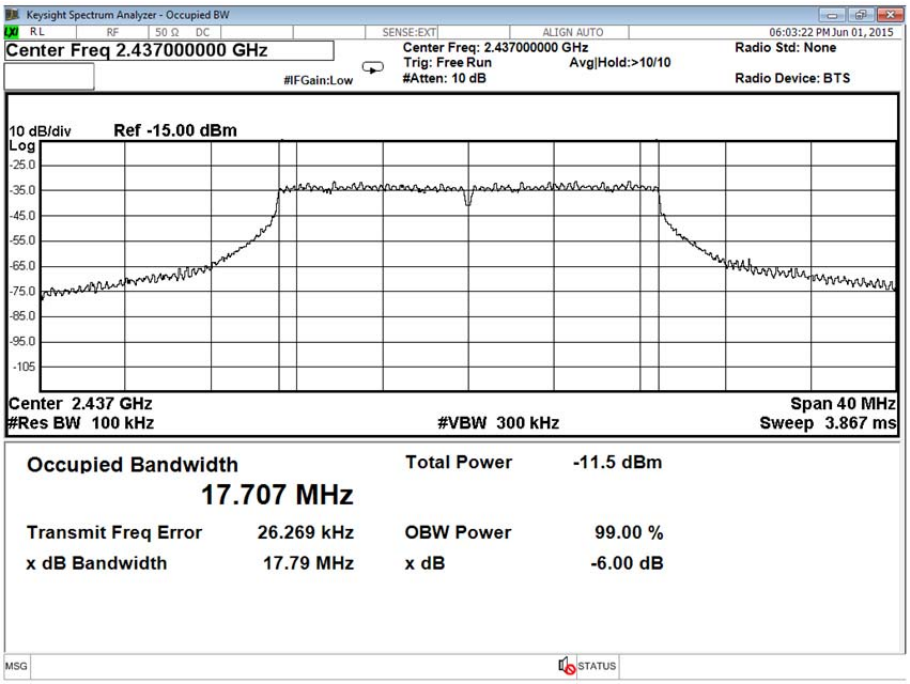
802.11n, OFDM, MCS6, 6 dB Bandwidth Results

| 2412 MHz | 2437 MHz | 2462 MHz |
|---|---|---|
| kHz | kHz | kHz |
| 17770 | 17790 | 17780 |

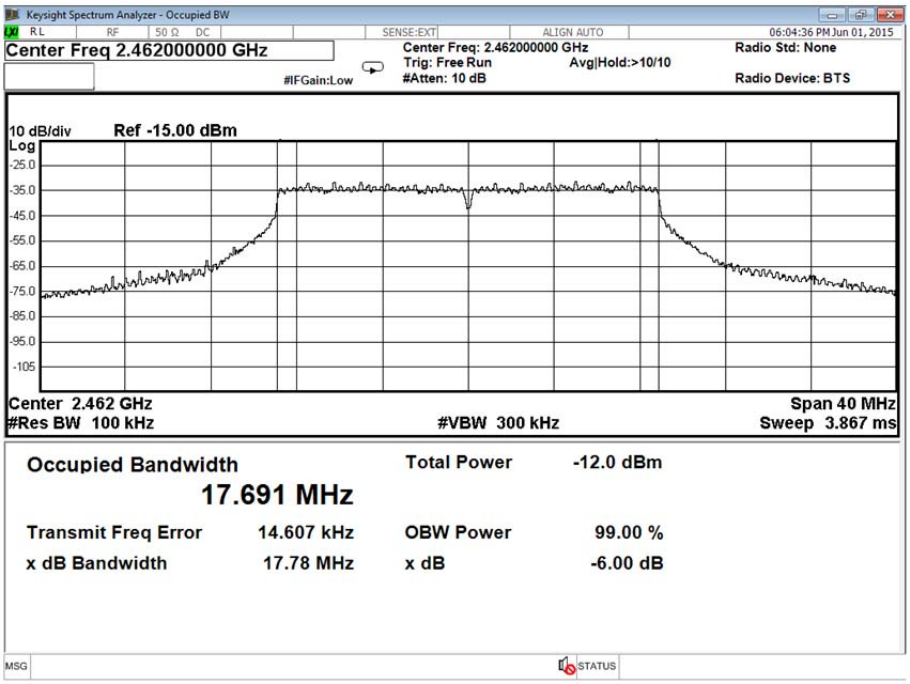
802.11n, 2412 MHz, OFDM, MCS6, 6 dB Bandwidth Plot



802.11n, 2437 MHz, OFDM, MCS6, 6 dB Bandwidth Plot




802.11n, 2462 MHz, OFDM, MCS6, 6 dB Bandwidth Plot




Remarks

Pre-testing was performed on each data rate for 802.11n. Testing was then completed on the data rate which resulted in the widest bandwidth. For 802.11n this data rate was MCS6. It was confirmed that all data rates complied with the minimum 6 dB bandwidth requirement of 500 kHz.

FCC 47 CFR Part 15, Limit Clause 15.247 (a)(2)

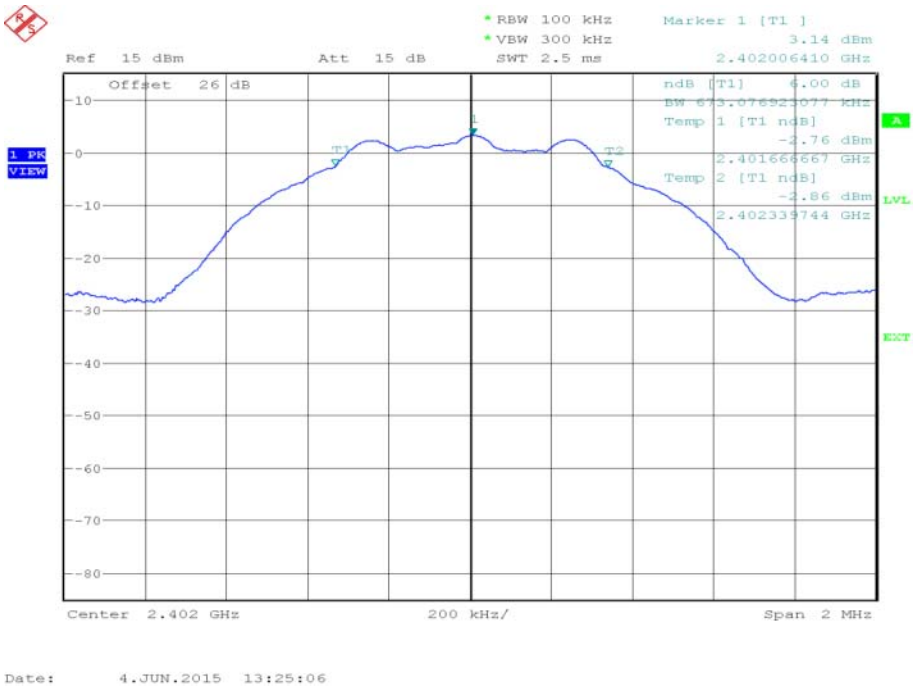
The minimum 6 dB Bandwidth shall be at least 500 kHz.

4.0 V DC Supply

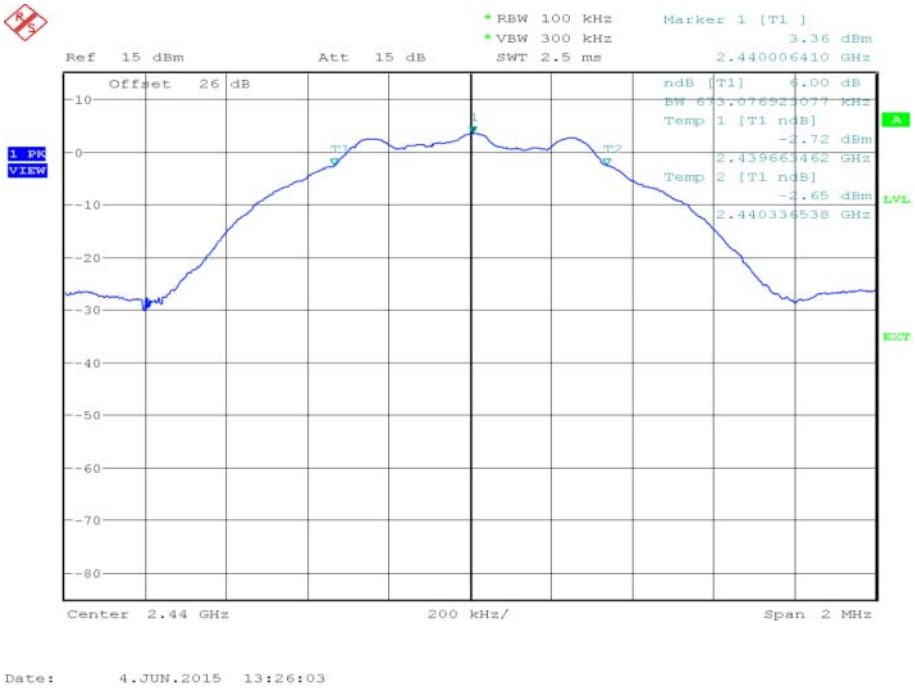
Bluetooth Low Energy, GFSK, 6 dB Bandwidth Results

| 2402 MHz | 2440 MHz | 2480 MHz |
|---|---|---|
| kHz | kHz | kHz |
| 673 | 673 | 670 |

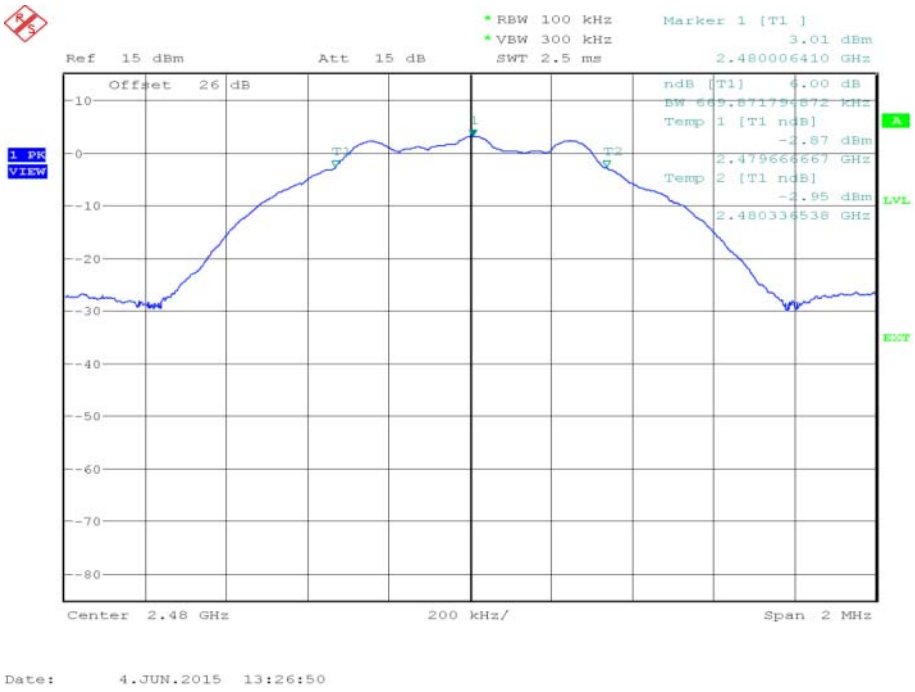
Bluetooth Low Energy, 2402 MHz, GFSK, 6 dB Bandwidth Plot



Bluetooth Low Energy, 2440 MHz, GFSK, 6 dB Bandwidth Plot




Bluetooth Low Energy, 2480 MHz, GFSK, 6 dB Bandwidth Plot




FCC 47 CFR Part 15, Limit Clause 15.247 (a)(2)

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

## 2.3 MAXIMUM CONDUCTED OUTPUT POWER

### 2.3.1 Specification Reference

FCC 47 CFR Part 15C, Clause 15.247 (b)(3)

### 2.3.2 Equipment Under Test and Modification State

SHF32 S/N: IMEI 004401115362481 - Modification State 0
SHF32 S/N: IMEI 004401115362408 - Modification State 0

### 2.3.3 Date of Test

29 May 2015 & 4 June 2015

### 2.3.4 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

### 2.3.5 Test Procedure

This test was performed in accordance with FCC KDB 558074 D01 v03r02, clause 9.2.3.2.

### 2.3.6 Environmental Conditions

| | |
|---|---|
| Ambient Temperature | 26.5 - 26.6°C |
| Relative Humidity | 26.9 - 28.9% |

Product Service

### 2.3.7 Test Results

4.0 V DC Supply

802.11b, 1 Mbps, Maximum Conducted Output Power Results

| 2412 MHz | | 2437 MHz | | 2462 MHz | |
|---|---|---|---|---|---|
| dBm | mW | dBm | mW | dBm | mW |
| 15.25 | 33.50 | 15.09 | 32.29 | 15.21 | 33.19 |

FCC 47 CFR Part 15, Limit Clause 15.247 (b)

The maximum peak conducted output power of the intentional radiator shall not exceed the following:

For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non overlapping hopping channels, and all frequency hopping systems in the 5725-5850MHz band: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts.

For systems using digital modulation in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands: 1 Watt.

4.0 V DC Supply

802.11g, 18 Mbps, Maximum Conducted Output Power Results

| 2412 MHz | | 2437 MHz | | 2462 MHz | |
|---|---|---|---|---|---|
| dBm | mW | dBm | mW | dBm | mW |
| 9.88 | 9.73 | 9.73 | 9.40 | 9.89 | 9.75 |

FCC 47 CFR Part 15, Limit Clause 15.247 (b)

The maximum peak conducted output power of the intentional radiator shall not exceed the following:

For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non overlapping hopping channels, and all frequency hopping systems in the 5725-5850MHz band: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts.

For systems using digital modulation in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands: 1 Watt.

4.0 V DC Supply

802.11n, MCS0, Maximum Conducted Output Power Results

| 2412 MHz | | 2437 MHz | | 2462 MHz | |
|---|---|---|---|---|---|
| dBm | mW | dBm | mW | dBm | mW |
| 8.89 | 7.74 | 8.92 | 7.80 | 8.95 | 7.85 |

FCC 47 CFR Part 15, Limit Clause 15.247 (b)

The maximum peak conducted output power of the intentional radiator shall not exceed the following:

For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non overlapping hopping channels, and all frequency hopping systems in the 5725-5850MHz band: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts.

For systems using digital modulation in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands: 1 Watt.

Bluetooth Low Energy

4.0 V DC Supply

Bluetooth Low Energy, Maximum Conducted Output Power Results

| 2402 MHz | | 2440 MHz | | 2480 MHz | |
|---|---|---|---|---|---|
| dBm | mW | dBm | mW | dBm | mW |
| 5.73 | 3.74 | 5.96 | 3.94 | 5.66 | 3.68 |

FCC 47 CFR Part 15, Limit Clause 15.247 (b)

The maximum peak conducted output power of the intentional radiator shall not exceed the following:

For frequency hopping systems operating in the 2400-2483.5 MHz band employing at least 75 non overlapping hopping channels, and all frequency hopping systems in the 5725-5850MHz band: 1 watt. For all other frequency hopping systems in the 2400-2483.5 MHz band: 0.125 watts.

For systems using digital modulation in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands: 1 Watt.

## 2.4 SPURIOUS RADIATED EMISSIONS

### 2.4.1 Specification Reference

FCC 47 CFR Part 15C, Clause 15.247 (d) and 15.205

### 2.4.2 Equipment Under Test and Modification State

SHF32 S/N: IMEI 004401115362408 - Modification State 0

### 2.4.3 Date of Test

2 June 2015, 3 June 2015, 7 June 2015, 8 June 2015 & 9 June 2015

### 2.4.4 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

### 2.4.5 Test Procedure

The test was performed in accordance with KDB 558074 D01 v03r02, clause 11.0 and 12.0 and ANSI C63.10, clause 6.3, 6.5 and 6.6.

### 2.4.6 Environmental Conditions

| | |
|---|---|
| Ambient Temperature | 20.0 - 22.0°C |
| Relative Humidity | 32.0 - 43.0% |

Product Service

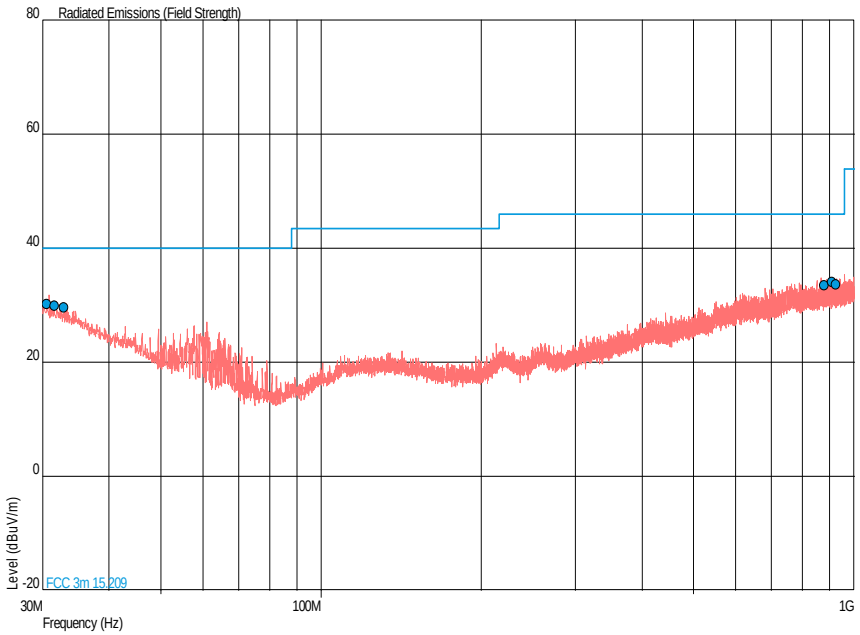
### 2.4.7 Test Results

4.0 V DC Supply

802.11b, 2412 MHz, 1 Mbps, 30 MHz to 1 GHz, Spurious Radiated Emissions Results

| Frequency (MHz) | QP Level (dBµV/m) | QP Margin (dBµV/m) | QP Level (µV/m) | QP Margin (µV/m) | Angle (°) | Height (m) | Polarisation |
|---|---|---|---|---|---|---|---|
| 30.582 | 30.2 | -9.8 | 32.4 | -67.6 | 180 | 1.00 | Vertical |
| 31.601 | 30.0 | -10.0 | 31.6 | -68.4 | 90 | 1.00 | Vertical |
| 32.862 | 29.6 | -10.4 | 30.2 | -69.8 | 180 | 1.00 | Vertical |
| 878.653 | 33.6 | -12.4 | 47.9 | -152.1 | 270 | 1.00 | Vertical |
| 909.014 | 34.1 | -11.9 | 50.7 | -149.3 | 180 | 1.00 | Vertical |
| 924.825 | 33.7 | -12.3 | 48.4 | -151.6 | 180 | 1.00 | Vertical |

802.11b, 2412 MHz, 1 Mbps, 30 MHz to 1 GHz, Spurious Radiated Emissions Plot

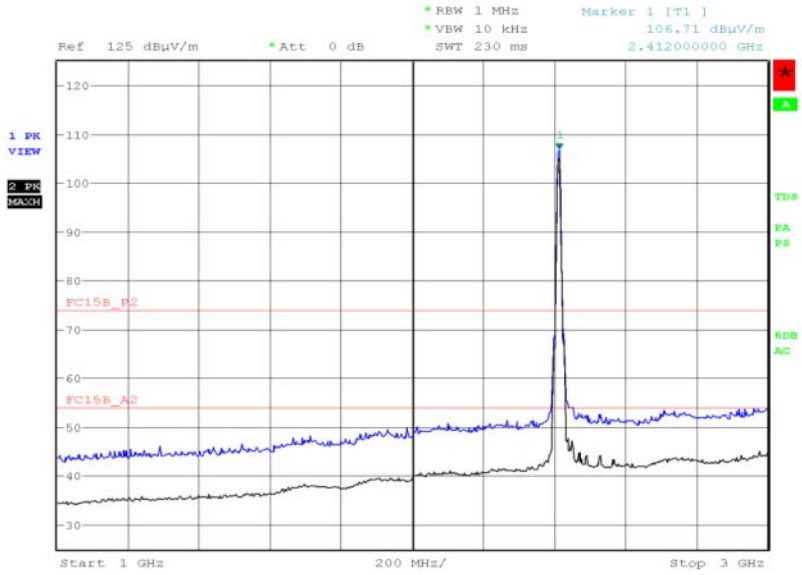


802.11b, 2412 MHz, 1 Mbps, 1 GHz to 25 GHz, Spurious Radiated Emissions Results

| Frequency (MHz) | Final Peak (dBµV/m) | Final Average (dBµV/m) | Final Peak (µV/m) | Final Average (µV/m) | Angle (°) | Height (m) | Polarisation |
|---|---|---|---|---|---|---|---|
| * | | | | | | | |

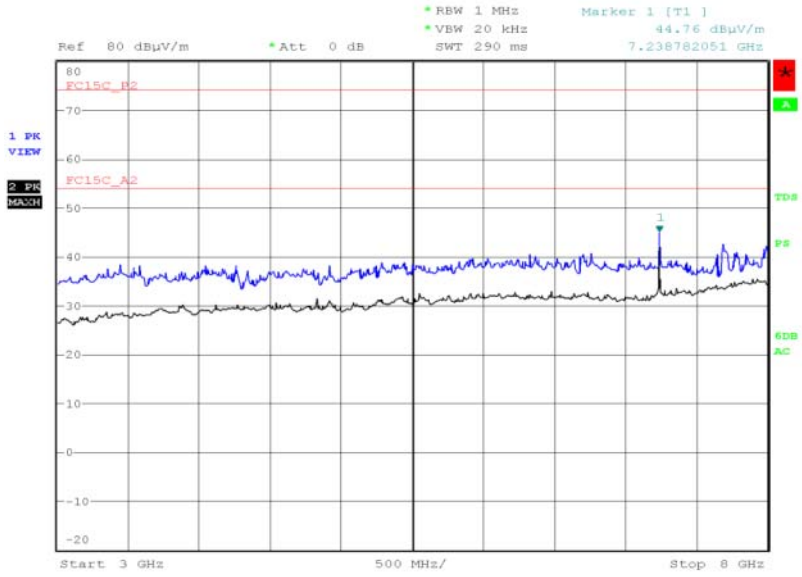
*No emissions were detected within 10 dBof the limit.

802.11b, 2412 MHz, 1 Mbps, 1 GHz to 3 GHz, Spurious Radiated Emissions Plot



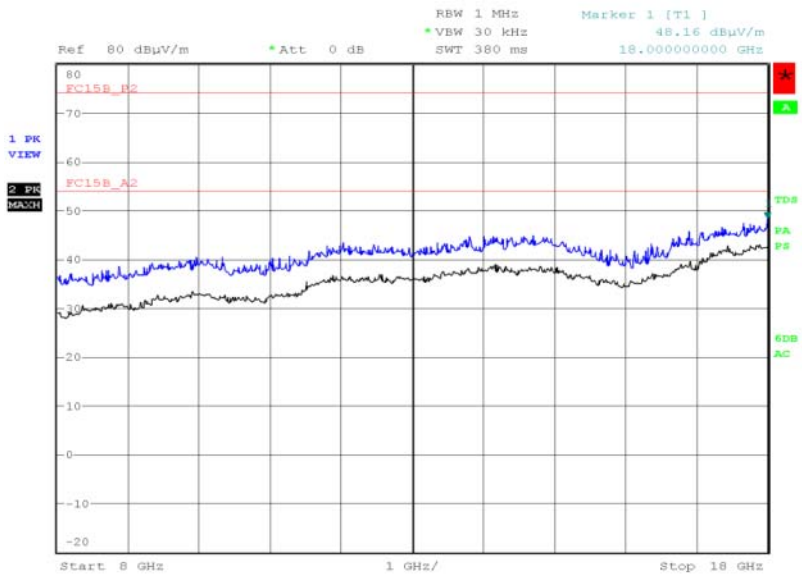

Date: 2.JUN.2015 18:54:27

802.11b, 2412 MHz,1 Mbps,  3 GHz to 8 GHz, Spurious Radiated Emissions Plot



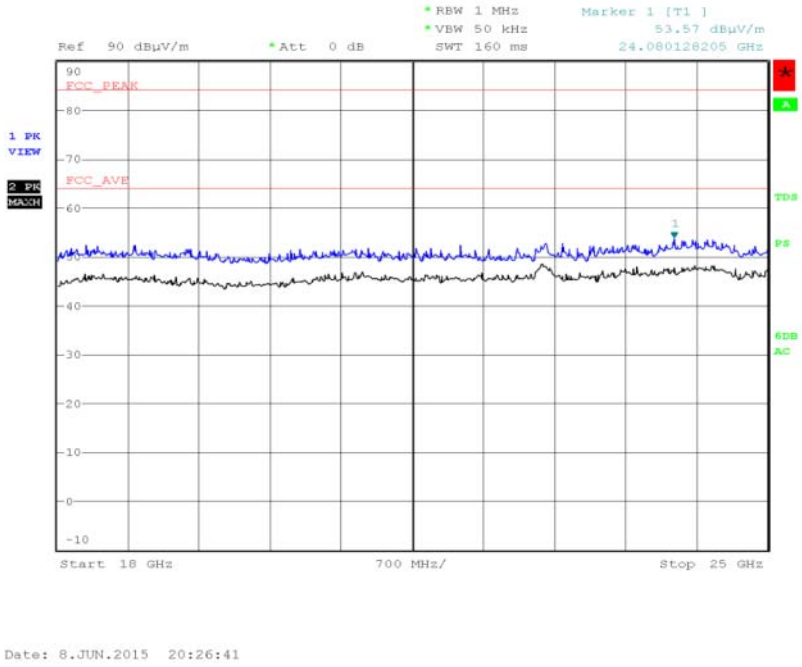

Date: 8.JUN.2015 17:40:30

802.11b, 2412 MHz,1 Mbps,  8 GHz to 18 GHz, Spurious Radiated Emissions Plot




Date: 7.JUN.2015 11:20:31

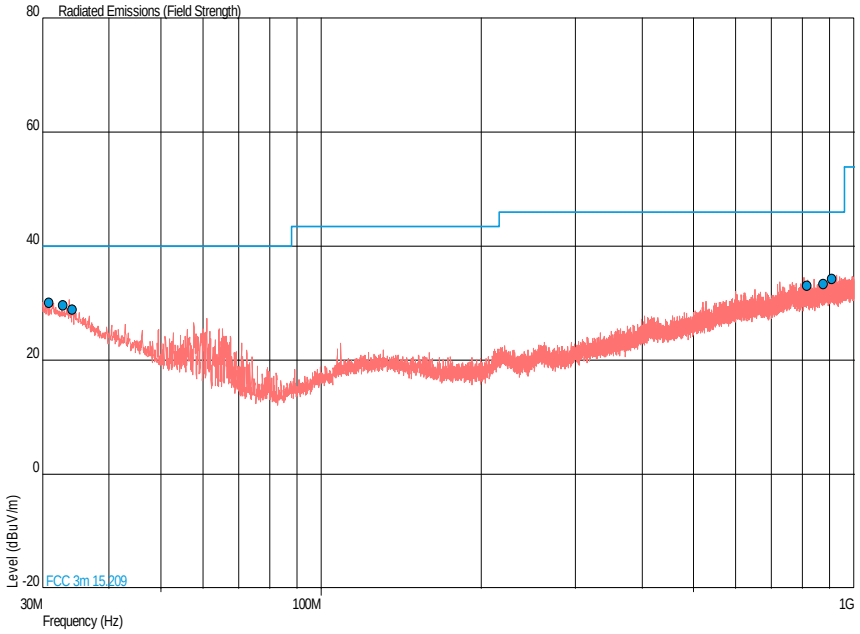
802.11b, 2412 MHz, 1 Mbps, 18 GHz to 25 GHz, Spurious Radiated Emissions Plot



802.11b, 2437 MHz, 1 Mbps, 30 MHz to 1 GHz, Spurious Radiated Emissions Results

| Frequency (MHz) | QP Level (dBµV/m) | QP Margin (dBµV/m) | QP Level (µV/m) | QP Margin (µV/m) | Angle (°) | Height (m) | Polarisation |
|---|---|---|---|---|---|---|---|
| 30.825 | 30.1 | -9.9 | 32.0 | -68.0 | 180 | 1.00 | Vertical |
| 32.813 | 29.6 | -10.4 | 30.2 | -69.8 | 90 | 1.00 | Vertical |
| 34.123 | 29.0 | -11.0 | 28.2 | -71.8 | 90 | 1.00 | Vertical |
| 816.816 | 33.1 | -12.9 | 45.2 | -154.8 | 270 | 1.00 | Vertical |
| 876.956 | 33.4 | -12.6 | 46.8 | -153.2 | 270 | 1.00 | Vertical |
| 908.044 | 34.2 | -11.8 | 51.3 | -148.7 | 270 | 1.00 | Vertical |

802.11b, 2437 MHz, 1 Mbps, 30 MHz to 1 GHz, Spurious Radiated Emissions Plot

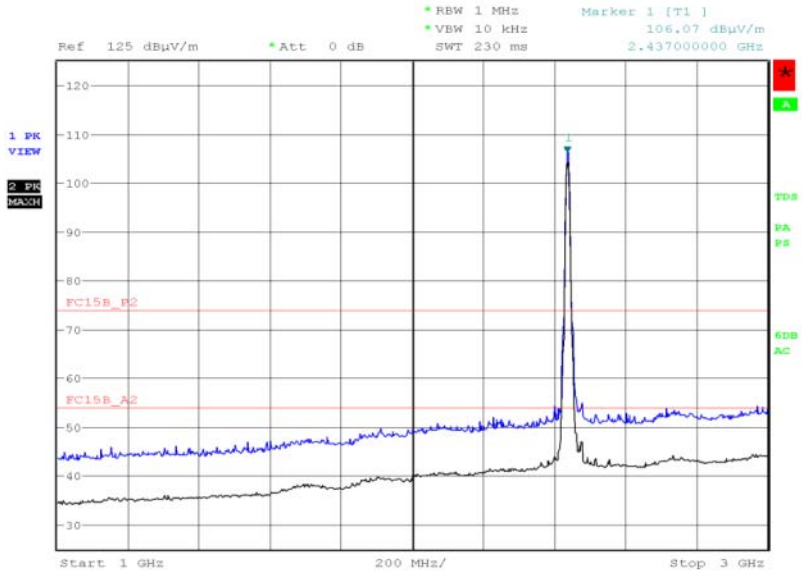


802.11b, 2437 MHz, 1 Mbps, 1 GHz to 25 GHz, Spurious Radiated Emissions Results

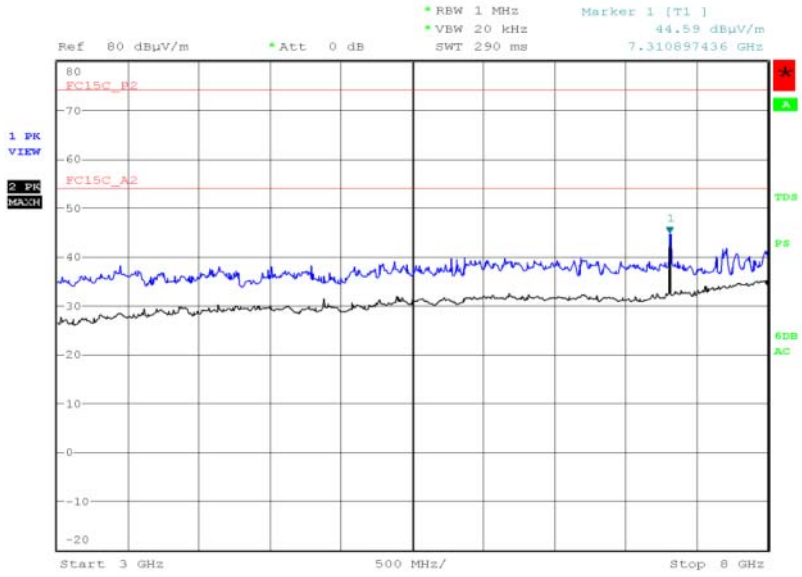
| Frequency (MHz) | Final Peak (dBµV/m) | Final Average (dBµV/m) | Final Peak (µV/m) | Final Average (µV/m) | Angle (°) | Height (m) | Polarisation |
|---|---|---|---|---|---|---|---|
| * | | | | | | | |

*No emissions were detected within 10 dB of the limit.

802.11b, 2437 MHz, 1 Mbps, 1 GHz to 3 GHz, Spurious Radiated Emissions Plot

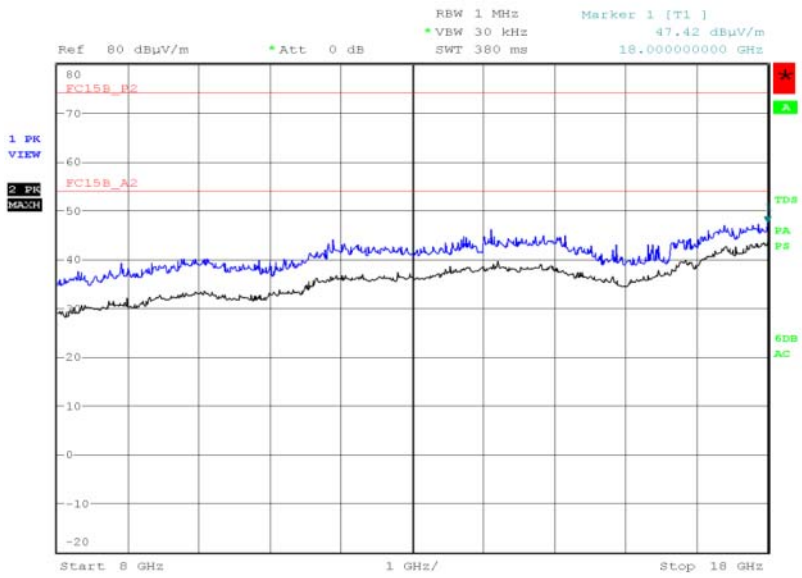


802.11b, 2437 MHz, 1 Mbps, 3 GHz to 8 GHz, Spurious Radiated Emissions Plot



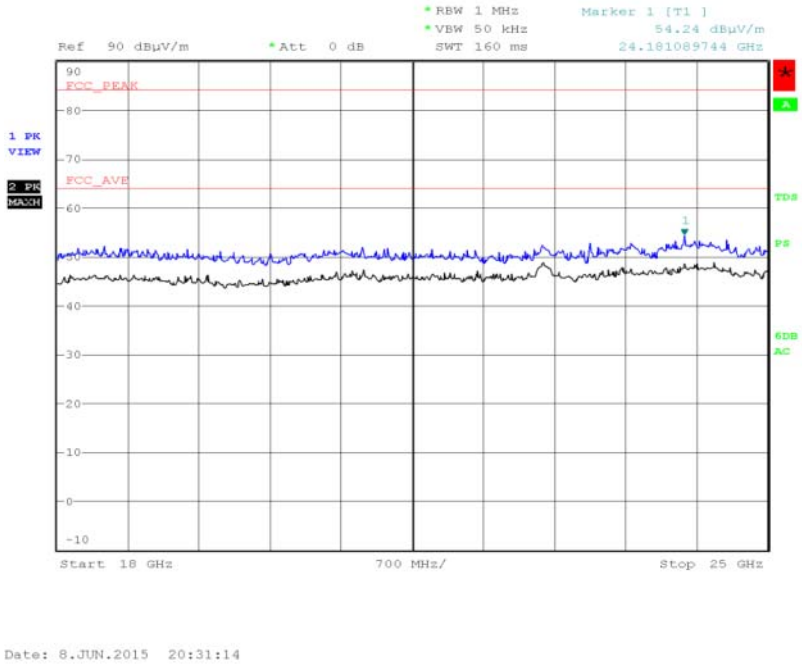

Date: 8.JUN.2015 17:53:54

802.11b, 2437 MHz, 1 Mbps, 8 GHz to 18 GHz, Spurious Radiated Emissions Plot




Date: 7.JUN.2015 11:32:39

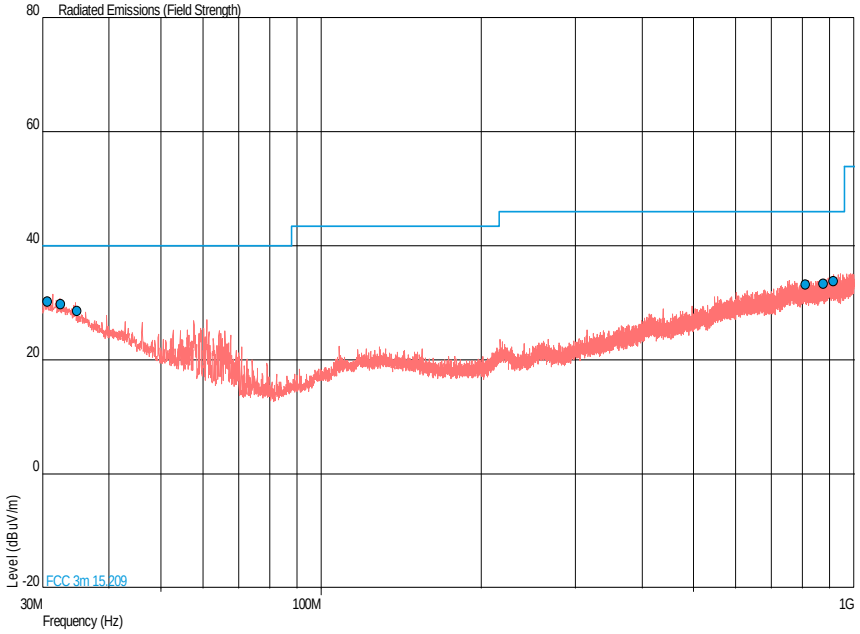
802.11b, 2437 MHz, 1 Mbps, 18 GHz to 25 GHz, Spurious Radiated Emissions Plot



802.11b, 2462 MHz, 1 Mbps, 30 MHz to 1 GHz, Spurious Radiated Emissions Results

| Frequency (MHz) | QP Level (dBµV/m) | QP Margin (dBµV/m) | QP Level (µV/m) | QP Margin (µV/m) | Angle (°) | Height (m) | Polarisation |
|---|---|---|---|---|---|---|---|
| 30.631 | 30.2 | -9.8 | 32.4 | -67.6 | 90 | 1.00 | Vertical |
| 32.474 | 29.7 | -10.3 | 30.5 | -69.5 | 270 | 1.00 | Vertical |
| 34.802 | 28.6 | -11.4 | 26.9 | -73.1 | 90 | 1.00 | Horizontal |
| 810.802 | 33.3 | -12.7 | 46.2 | -153.8 | 180 | 1.00 | Vertical |
| 877.198 | 33.4 | -12.6 | 46.8 | -153.2 | 270 | 1.00 | Horizontal |
| 916.241 | 33.8 | -12.2 | 49.0 | -151.0 | 180 | 1.00 | Vertical |

802.11b, 2462 MHz, 1 Mbps, 30 MHz to 1 GHz, Spurious Radiated Emissions Plot

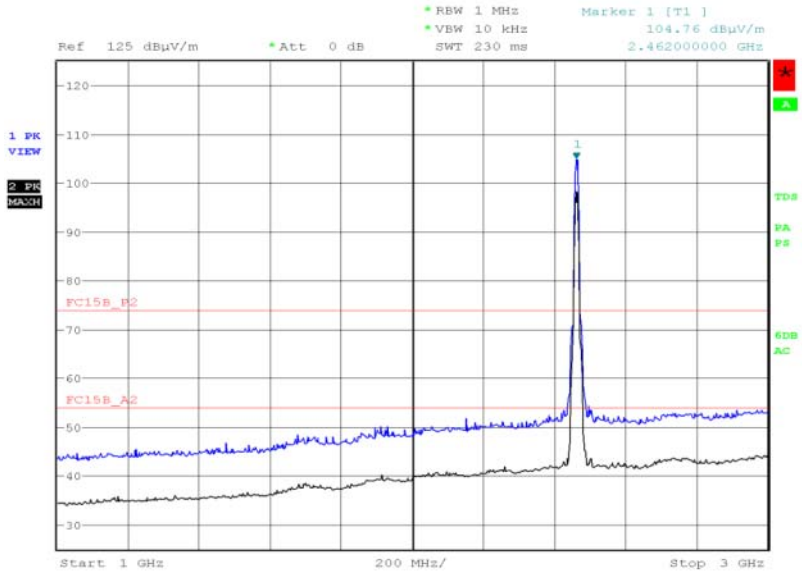


802.11b, 2462 MHz, 1 Mbps, 1 GHz to 25 GHz, Spurious Radiated Emissions Results

| Frequency (MHz) | Final Peak (dBµV/m) | Final Average (dBµV/m) | Final Peak (µV/m) | Final Average (µV/m) | Angle (°) | Height (m) | Polarisation |
|---|---|---|---|---|---|---|---|
| * | | | | | | | |

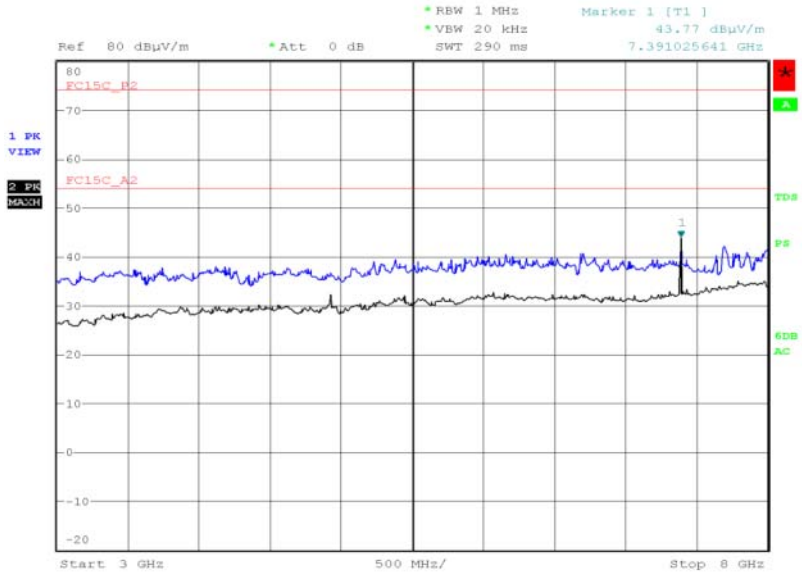
*No emissions were detected within 10 dB of the limit.

802.11b, 2462 MHz, 1 Mbps, 1 GHz to 3 GHz, Spurious Radiated Emissions Plot



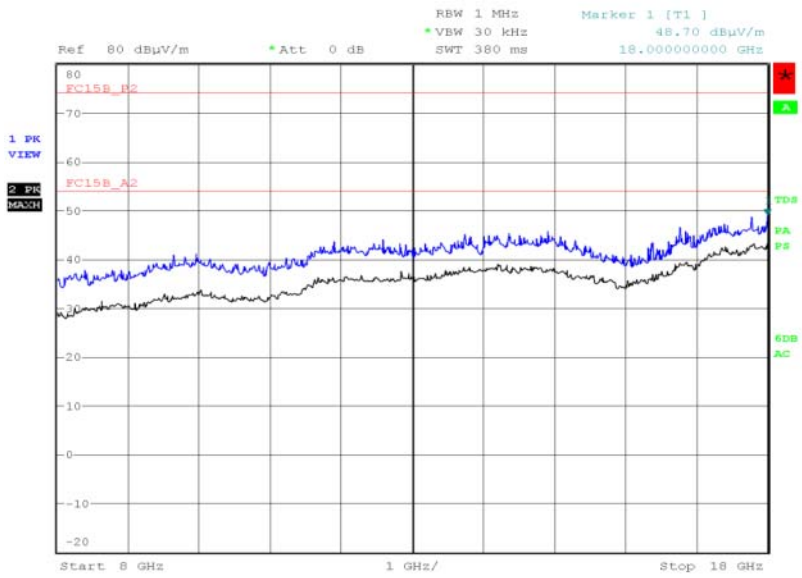

Date: 2.JUN.2015 19:44:05

802.11b, 2462 MHz, 1 Mbps, 3 GHz to 8 GHz, Spurious Radiated Emissions Plot



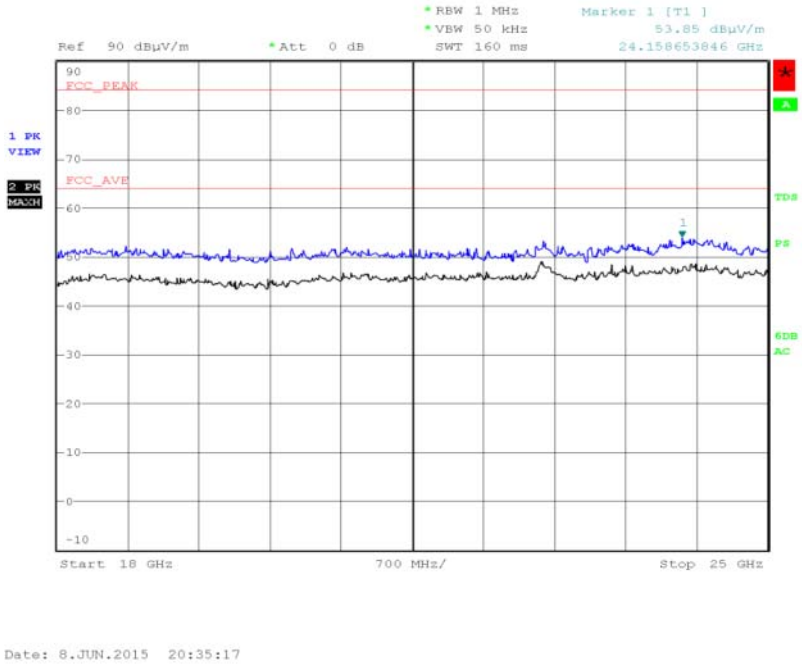

Date: 8.JUN.2015 18:00:17

802.11b, 2462 MHz, 1 Mbps, 8 GHz to 18 GHz, Spurious Radiated Emissions Plot




Date: 7.JUN.2015 11:43:56

802.11b, 2462 MHz, 1 Mbps, 18 GHz to 25 GHz, Spurious Radiated Emissions Plot




FCC 47 CFR Part 15, Limit Clause 15.247 (d)

Emissions outside the restricted bands shall be at least 20 dB below the fundamental measured in a 100 kHz bandwidth using a peak detector. If the transmitter complies with the conducted power limits, based on the use of RMS averaging over a time interval, the attenuation required shall be 30 dB below the fundamental instead of 20 dB.

FCC 47 CFR Part 15, Limit Clause 15.205

| | Peak (dBµV/m) | Average (dBµV/m) |
|---|---|---|
| Restricted Bands of Operation | 74 | 54 |

FCC 47 CFR Part 15, Limit Clause 15.209

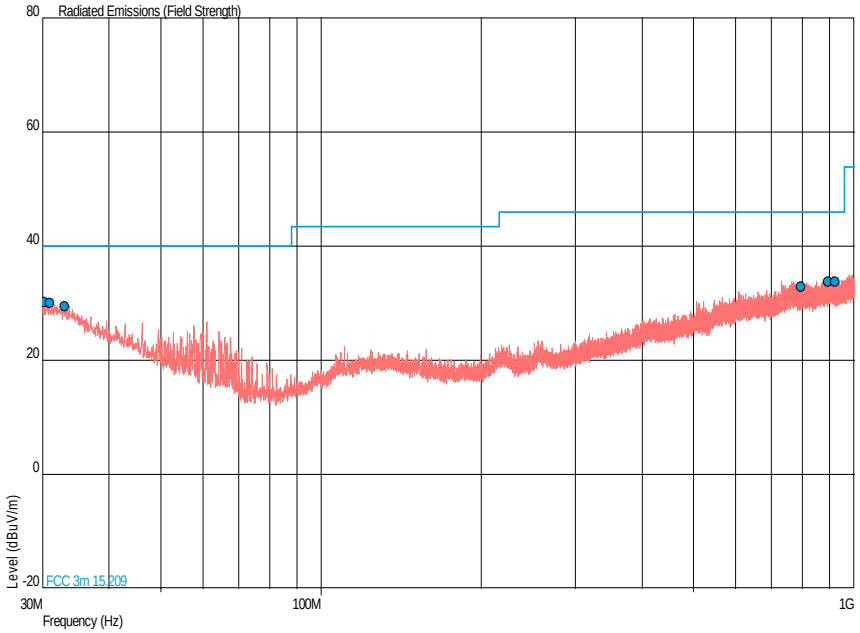
| Frequency (MHz) | Field Strength | | | Measurement Distance (m) |
|---|---|---|---|---|
| | (µV/m) | Average (dBµV/m) | Peak (dBµV/m) | |
| 30-88 | 100 | 40.0 | 60.0 | 3 |
| 88-216 | 150 | 43.5 | 63.5 | 3 |
| 216-960 | 200 | 46.0 | 66.0 | 3 |
| Above 960 | 500 | 54.0 | 74.0 | 3 |

4.0 V DC Supply

802.11g, 2412 MHz, 18 Mbps, 30 MHz to 1 GHz, Spurious Radiated Emissions Results

| Frequency (MHz) | QP Level (dBµV/m) | QP Margin (dBµV/m) | QP Level (µV/m) | QP Margin (µV/m) | Angle (°) | Height (m) | Polarisation |
|---|---|---|---|---|---|---|---|
| 30.291 | 30.2 | -9.8 | 32.4 | -67.6 | 180 | 1.00 | Horizontal |
| 30.922 | 30.1 | -9.9 | 32.0 | -68.0 | 180 | 1.00 | Vertical |
| 33.056 | 29.5 | -10.5 | 29.9 | -70.1 | 180 | 1.00 | Horizontal |
| 794.942 | 32.9 | -13.1 | 44.2 | -155.8 | 0 | 1.00 | Horizontal |
| 892.185 | 33.8 | -12.2 | 49.0 | -151.0 | 0 | 1.00 | Vertical |
| 921.285 | 33.8 | -12.2 | 49.0 | -151.0 | 180 | 1.00 | Vertical |

802.11g, 2412 MHz, 18 Mbps, 30 MHz to 1 GHz, Spurious Radiated Emissions Plot

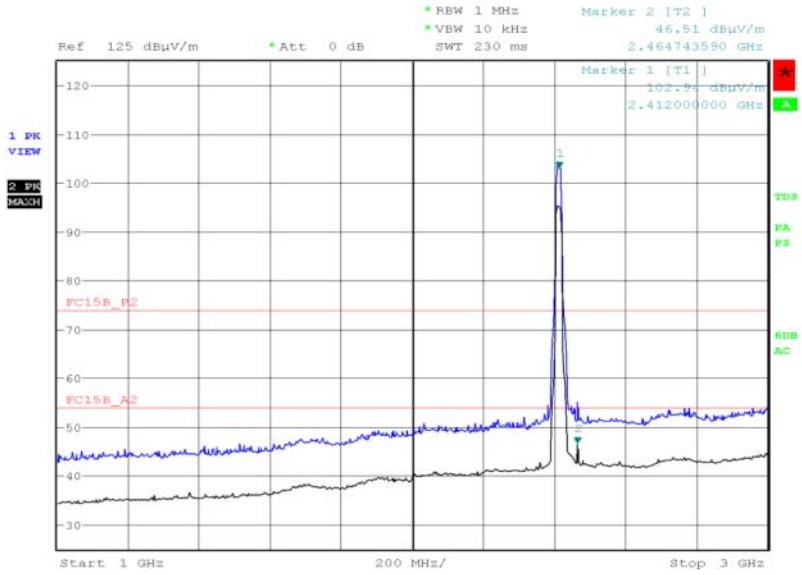


802.11g, 2412 MHz, 18 Mbps, 1 GHz to 25 GHz, Spurious Radiated Emissions Results

| Frequency (MHz) | Final Peak (dBµV/m) | Final Average (dBµV/m) | Final Peak (µV/m) | Final Average (µV/m) | Angle (°) | Height (m) | Polarisation |
|---|---|---|---|---|---|---|---|
| * | | | | | | | |

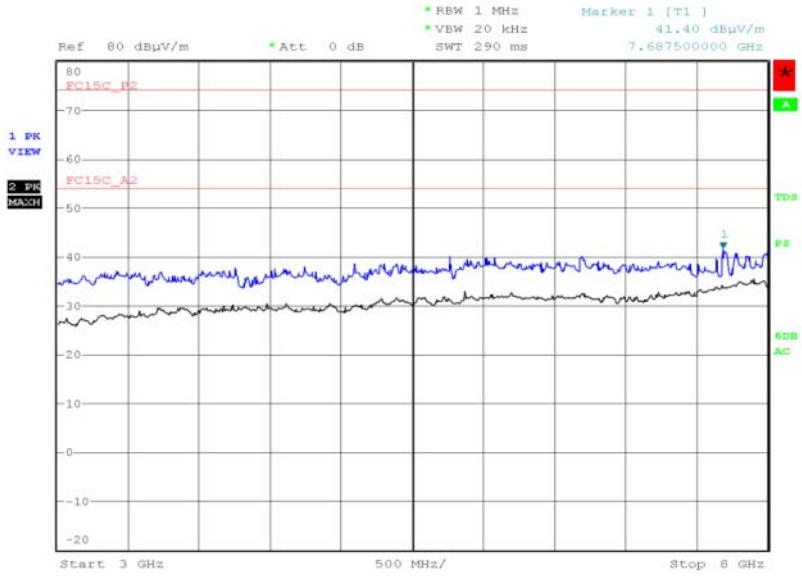
*No emissions were detected within 10 dBof the limit.

802.11g, 2412 MHz, 18 Mbps, 1 GHz to 3 GHz, Spurious Radiated Emissions Plot



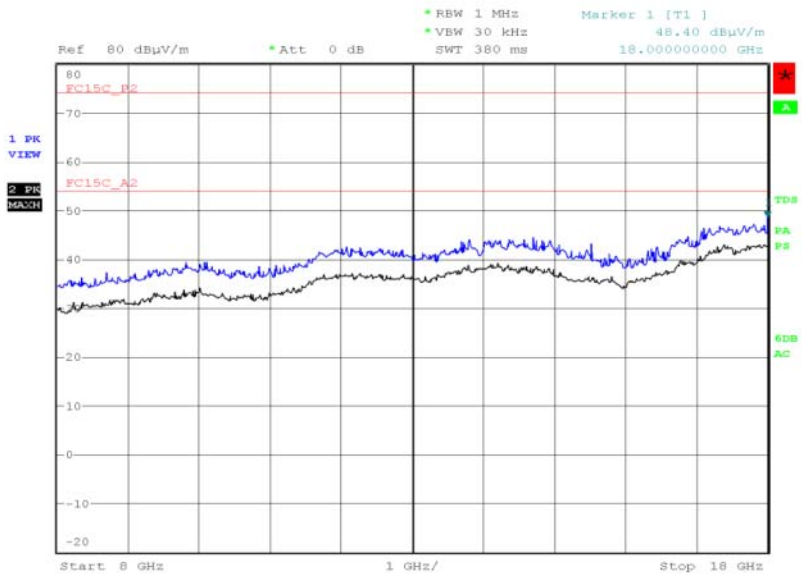

Date: 2.JUN.2015 20:43:39

802.11g, 2412 MHz,18 Mbps,  3 GHz to 8 GHz, Spurious Radiated Emissions Plot



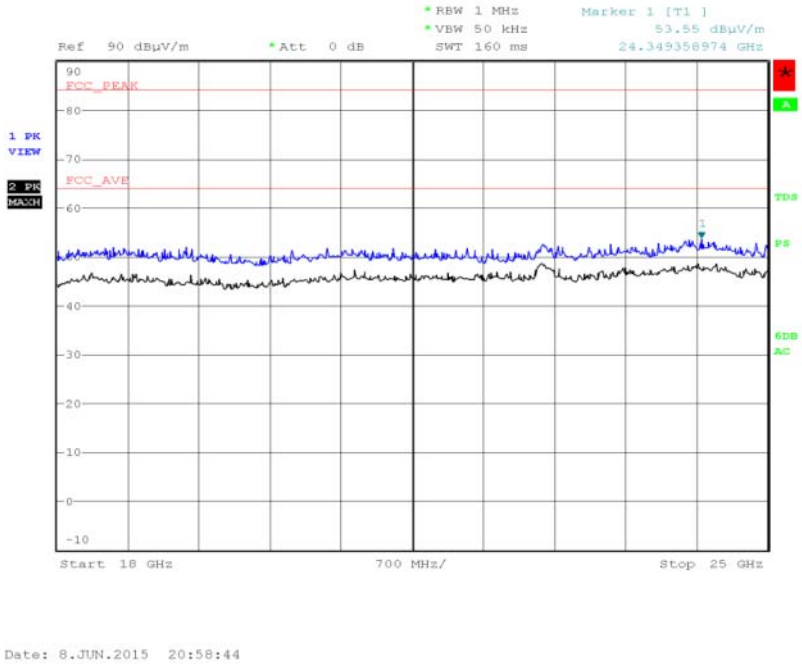

Date: 8.JUN.2015  18:04:55

802.11g, 2412 MHz,18 Mbps,  8 GHz to 18 GHz, Spurious Radiated Emissions Plot




Date: 8.JUN.2015  18:51:05

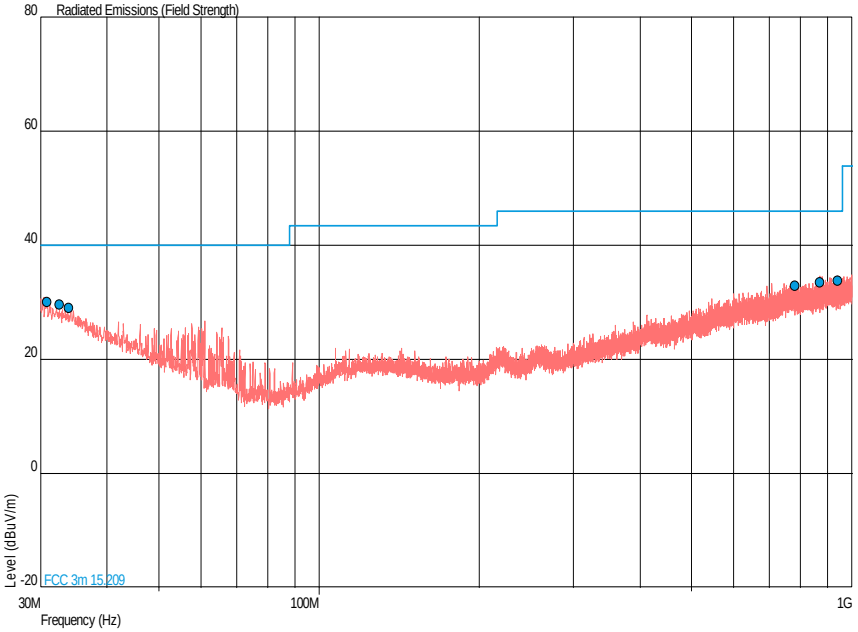
802.11g, 2412 MHz, 18 Mbps, 18 GHz to 25 GHz, Spurious Radiated Emissions Plot



802.11g, 2437 MHz, 18 Mbps, 30 MHz to 1 GHz, Spurious Radiated Emissions Results

| Frequency (MHz) | QP Level (dBµV/m) | QP Margin (dBµV/m) | QP Level (µV/m) | QP Margin (µV/m) | Angle (°) | Height (m) | Polarisation |
|---|---|---|---|---|---|---|---|
| 30.825 | 30.1 | -9.9 | 32.0 | -68.0 | 0 | 1.00 | Vertical |
| 32.619 | 29.6 | -10.4 | 30.2 | -69.8 | 180 | 1.00 | Vertical |
| 33.929 | 29.0 | -11.0 | 28.2 | -71.8 | 180 | 1.00 | Vertical |
| 780.101 | 32.9 | -13.1 | 44.2 | -155.8 | 180 | 1.00 | Vertical |
| 870.311 | 33.5 | -12.5 | 47.3 | -152.7 | 180 | 1.00 | Vertical |
| 938.405 | 33.8 | -12.2 | 49.0 | -151.0 | 0 | 1.00 | Vertical |

802.11g, 2437 MHz, 18 Mbps, 30 MHz to 1 GHz, Spurious Radiated Emissions Plot

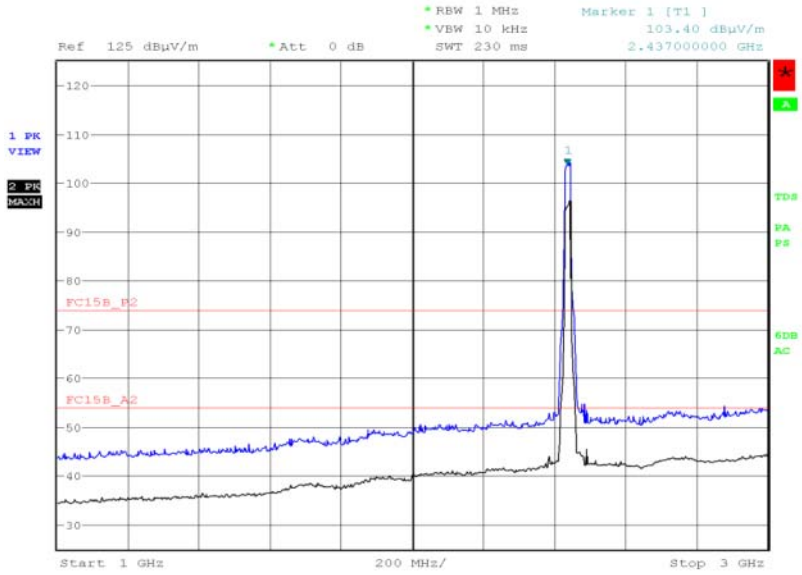


802.11g, 2437 MHz, 18 Mbps, 1 GHz to 25 GHz, Spurious Radiated Emissions Results

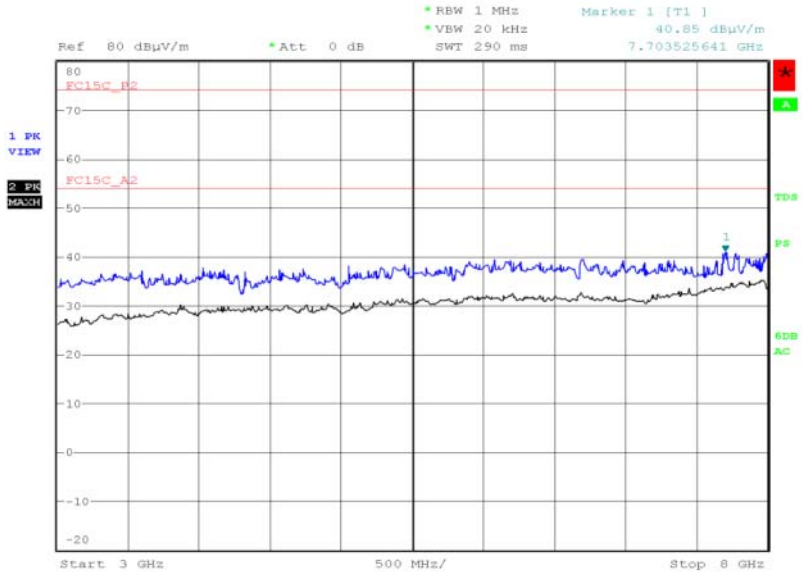
| Frequency (MHz) | Final Peak (dBµV/m) | Final Average (dBµV/m) | Final Peak (µV/m) | Final Average (µV/m) | Angle (°) | Height (m) | Polarisation |
|---|---|---|---|---|---|---|---|
| * | | | | | | | |

*No emissions were detected within 10 dB of the limit.

802.11g, 2437 MHz, 18 Mbps, 1 GHz to 3 GHz, Spurious Radiated Emissions Plot

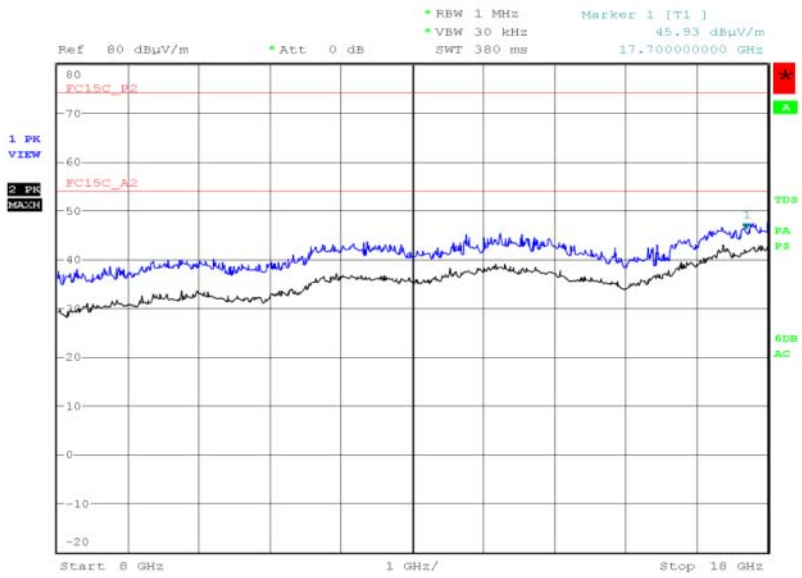


802.11g, 2437 MHz, 18 Mbps, 3 GHz to 8 GHz, Spurious Radiated Emissions Plot



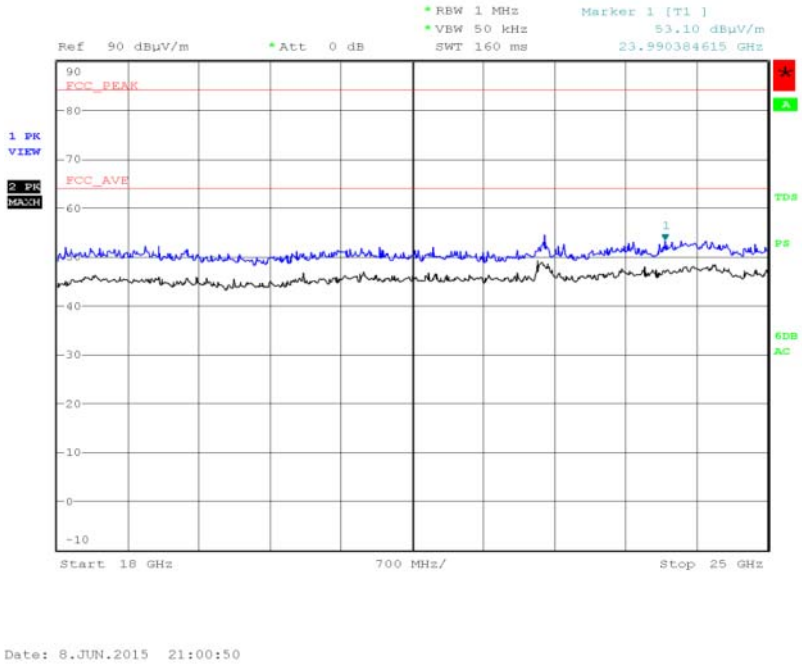

Date: 8.JUN.2015 18:07:13

802.11g, 2437 MHz, 18 Mbps, 8 GHz to 18 GHz, Spurious Radiated Emissions Plot




Date: 8.JUN.2015 18:59:56

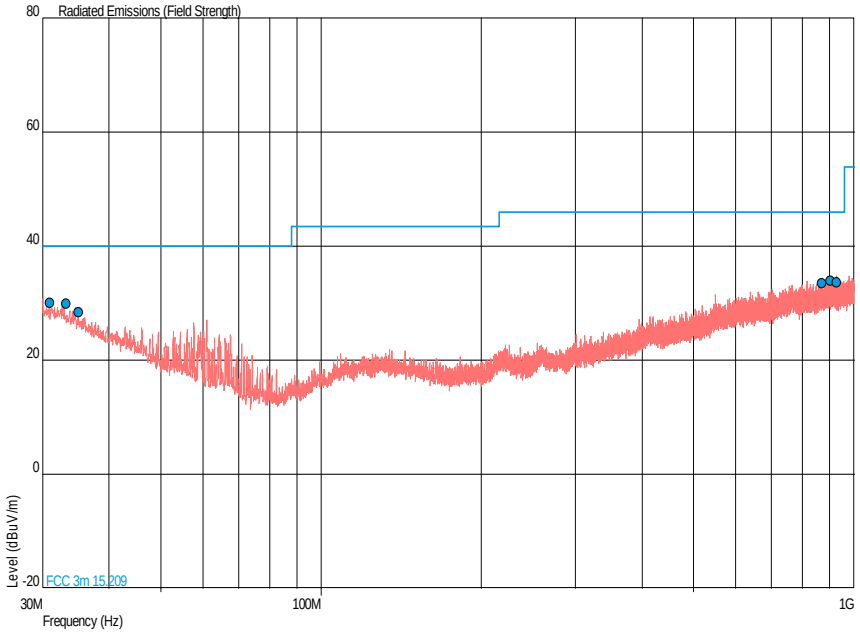
802.11g, 2437 MHz, 18 Mbps, 18 GHz to 25 GHz, Spurious Radiated Emissions Plot



802.11g, 2462 MHz, 18 Mbps, 30 MHz to 1 GHz, Spurious Radiated Emissions Results

| Frequency (MHz) | QP Level (dBµV/m) | QP Margin (dBµV/m) | QP Level (µV/m) | QP Margin (µV/m) | Angle (°) | Height (m) | Polarisation |
|---|---|---|---|---|---|---|---|
| 31.019 | 30.1 | -9.9 | 32.0 | -68.0 | 0 | 1.00 | Vertical |
| 33.201 | 29.9 | -10.1 | 31.3 | -68.7 | 0 | 1.00 | Vertical |
| 35.044 | 28.4 | -11.6 | 26.3 | -73.7 | 180 | 1.00 | Vertical |
| 870.457 | 33.5 | -12.5 | 47.3 | -152.7 | 0 | 1.00 | Vertical |
| 903.243 | 33.9 | -12.1 | 49.5 | -150.5 | 0 | 1.00 | Vertical |
| 926.474 | 33.7 | -12.3 | 48.4 | -151.6 | 180 | 1.00 | Vertical |

802.11g, 2462 MHz, 18 Mbps, 30 MHz to 1 GHz, Spurious Radiated Emissions Plot

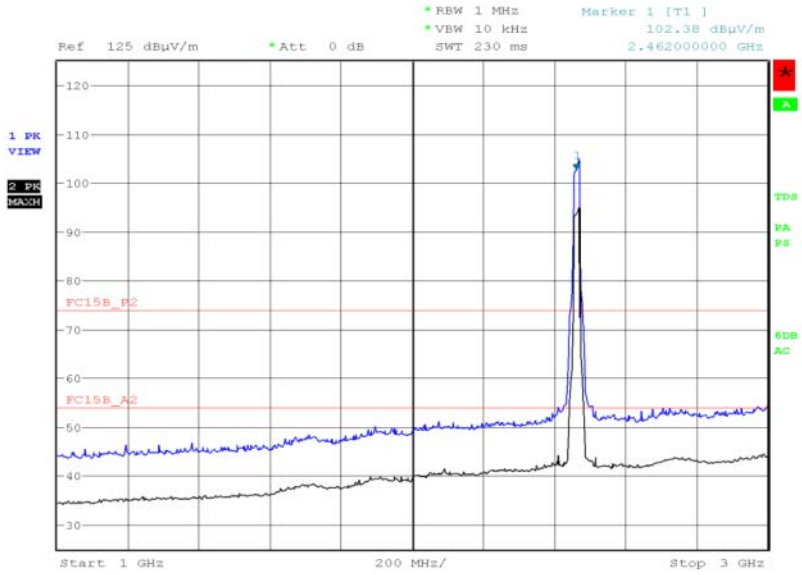


802.11g, 2462 MHz, 18 Mbps, 1 GHz to 25 GHz, Spurious Radiated Emissions Results

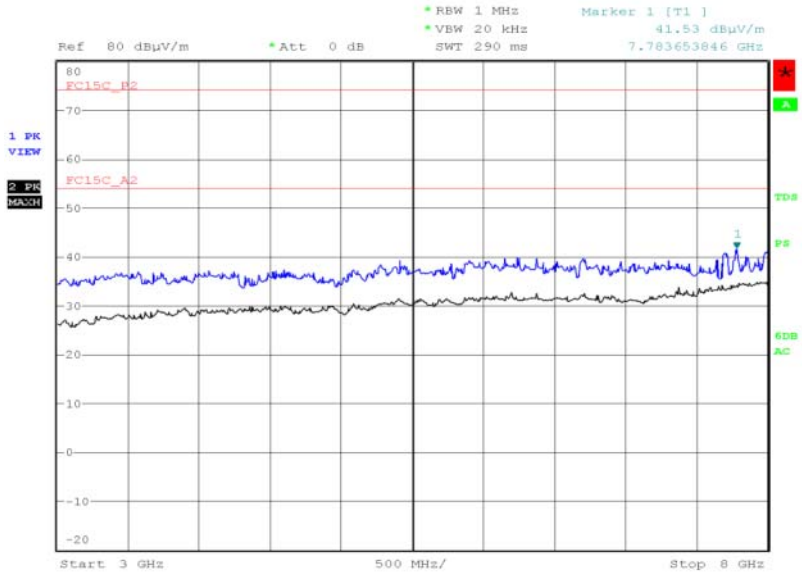
| Frequency (MHz) | Final Peak (dBµV/m) | Final Average (dBµV/m) | Final Peak (µV/m) | Final Average (µV/m) | Angle (°) | Height (m) | Polarisation |
|---|---|---|---|---|---|---|---|
| * | | | | | | | |

*No emissions were detected within 10 dB of the limit.

802.11g, 2462 MHz, 18 Mbps, 1 GHz to 3 GHz, Spurious Radiated Emissions Plot

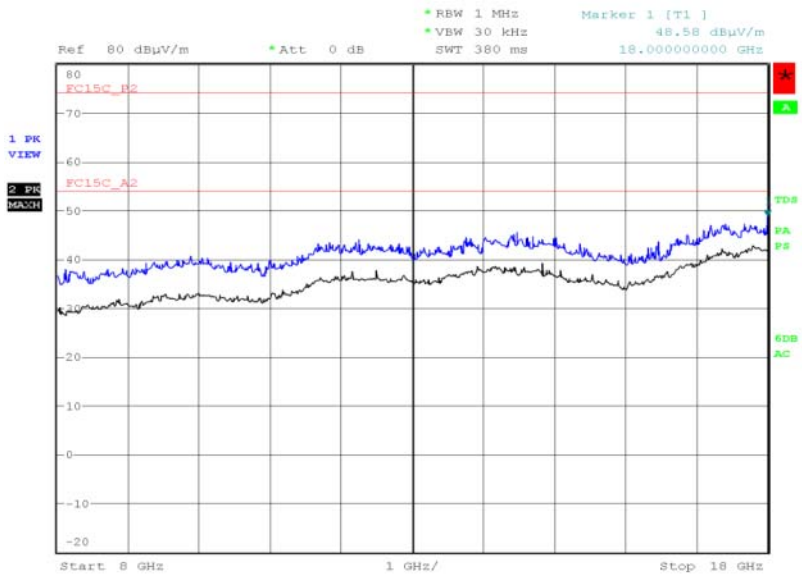


802.11g, 2462 MHz, 18 Mbps, 3 GHz to 8 GHz, Spurious Radiated Emissions Plot



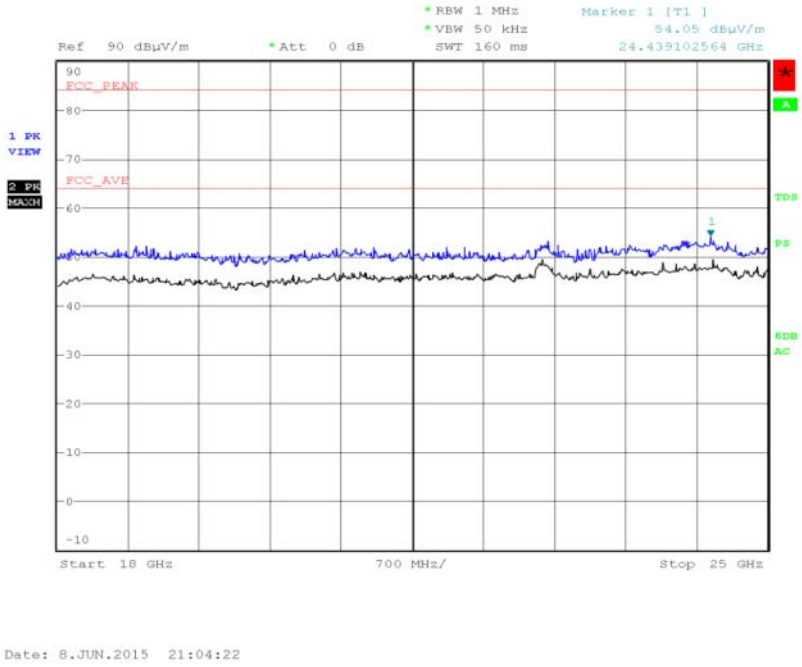

Date: 8.JUN.2015 18:09:52

802.11g, 2462 MHz, 18 Mbps, 8 GHz to 18 GHz, Spurious Radiated Emissions Plot




Date: 8.JUN.2015 19:13:54

802.11g, 2462 MHz, 18 Mbps, 18 GHz to 25 GHz, Spurious Radiated Emissions Plot




FCC 47 CFR Part 15, Limit Clause 15.247 (d)

Emissions outside the restricted bands shall be at least 20 dB below the fundamental measured in a 100 kHz bandwidth using a peak detector. If the transmitter complies with the conducted power limits, based on the use of RMS averaging over a time interval, the attenuation required shall be 30 dB below the fundamental instead of 20 dB.

FCC 47 CFR Part 15, Limit Clause 15.205

| | Peak (dBµV/m) | Average (dBµV/m) |
|---|---|---|
| Restricted Bands of Operation | 74 | 54 |

FCC 47 CFR Part 15, Limit Clause 15.209

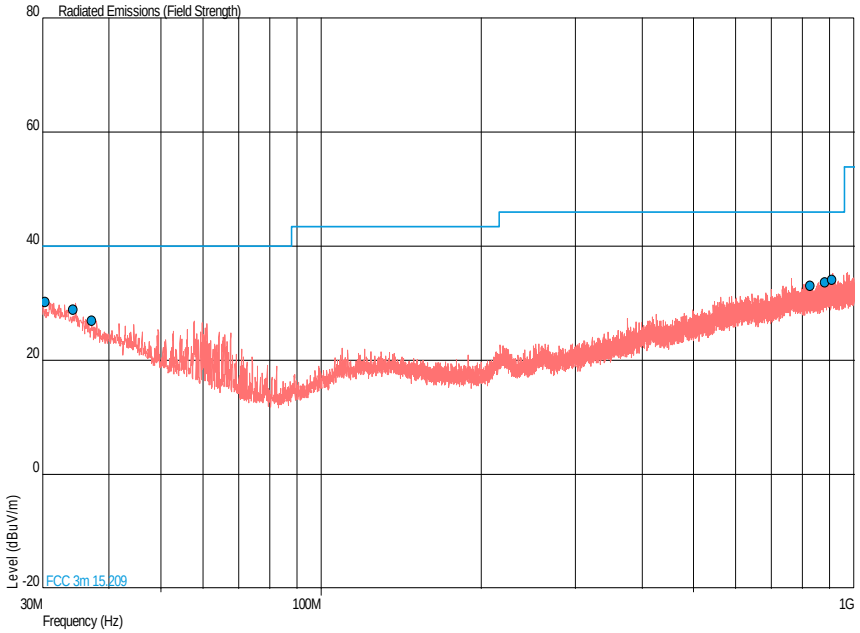
| Frequency (MHz) | Field Strength | | | Measurement Distance (m) |
|---|---|---|---|---|
| | (µV/m) | Average (dBµV/m) | Peak (dBµV/m) | |
| 30-88 | 100 | 40.0 | 60.0 | 3 |
| 88-216 | 150 | 43.5 | 63.5 | 3 |
| 216-960 | 200 | 46.0 | 66.0 | 3 |
| Above 960 | 500 | 54.0 | 74.0 | 3 |

4.0 V DC Supply

802.11n, 2412 MHz, MCS0, 30 MHz to 1 GHz, Spurious Radiated Emissions Results

| Frequency (MHz) | QP Level (dBµV/m) | QP Margin (dBµV/m) | QP Level (µV/m) | QP Margin (µV/m) | Angle (°) | Height (m) | Polarisation |
|---|---|---|---|---|---|---|---|
| 30.388 | 30.2 | -9.8 | 32.4 | -67.6 | 0 | 1.00 | Vertical |
| 34.268 | 28.9 | -11.1 | 27.9 | -72.1 | 180 | 1.00 | Vertical |
| 37.130 | 26.9 | -13.1 | 22.1 | -77.9 | 0 | 1.00 | Vertical |
| 826.273 | 33.1 | -12.9 | 45.2 | -154.8 | 0 | 1.00 | Vertical |
| 880.545 | 33.7 | -12.3 | 48.4 | -151.6 | 180 | 1.00 | Vertical |
| 910.033 | 34.1 | -11.9 | 50.7 | -149.3 | 0 | 1.00 | Vertical |

802.11n, 2412 MHz, MCS0, 30 MHz to 1 GHz, Spurious Radiated Emissions Plot

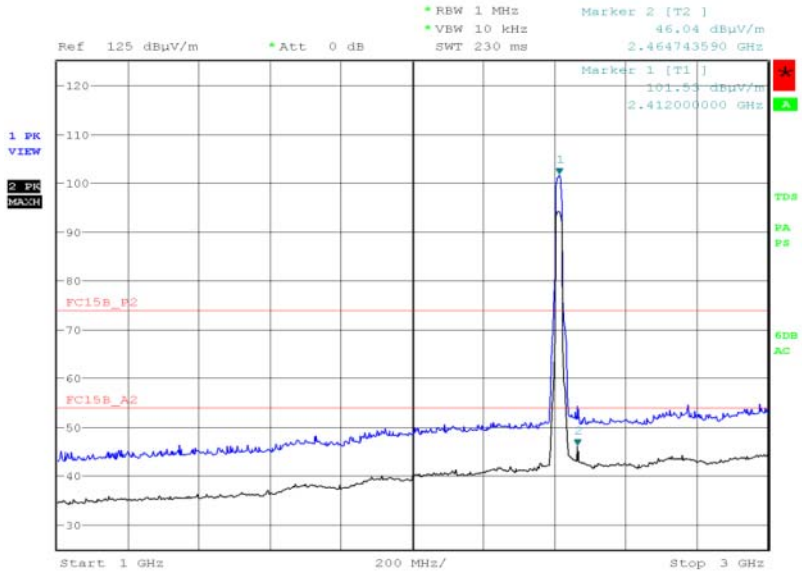


802.11n, 2412 MHz, MCS0, 1 GHz to 25 GHz, Spurious Radiated Emissions Results

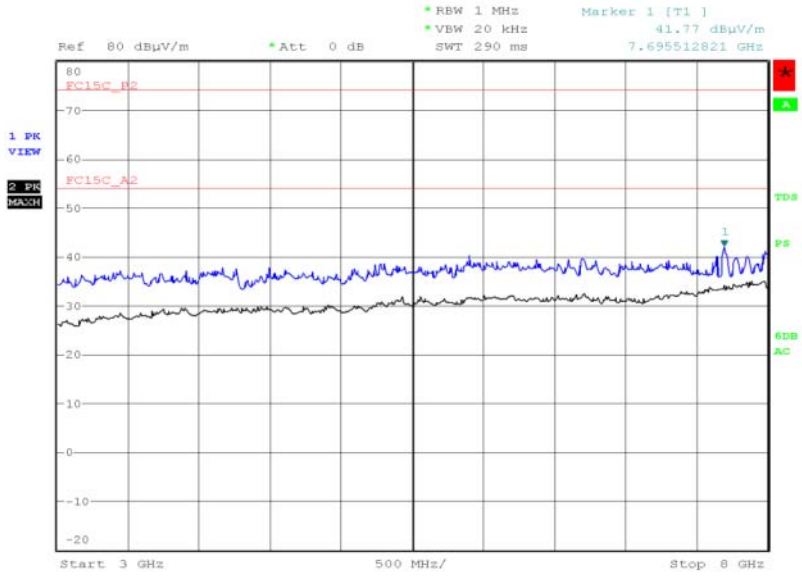
| Frequency (MHz) | Final Peak (dBµV/m) | Final Average (dBµV/m) | Final Peak (µV/m) | Final Average (µV/m) | Angle (°) | Height (m) | Polarisation |
|---|---|---|---|---|---|---|---|
| * | | | | | | | |

*No emissions were detected within 10 dBof the limit.

802.11n, 2412 MHz, MCS0, 1 GHz to 3 GHz, Spurious Radiated Emissions Plot

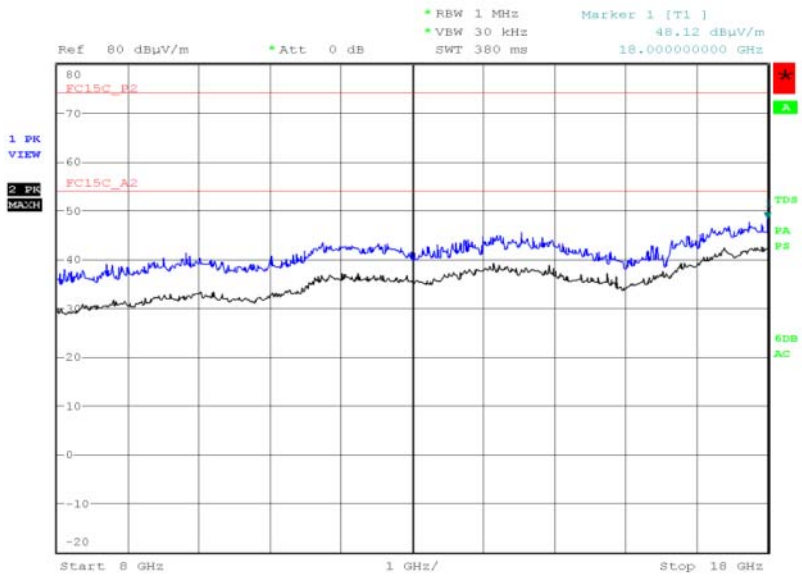


802.11n, 2412 MHz,MCS0,  3 GHz to 8 GHz, Spurious Radiated Emissions Plot



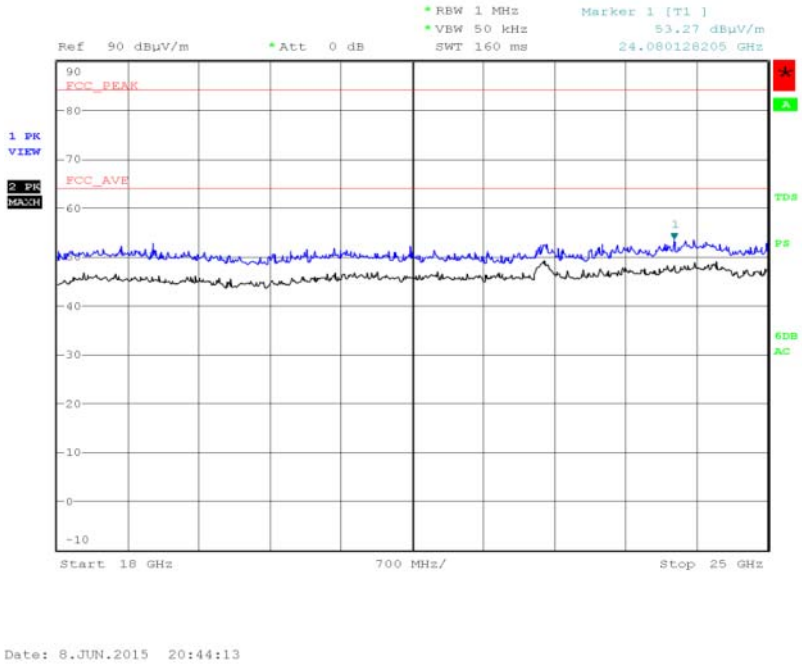

Date: 8.JUN.2015 18:12:18

802.11n, 2412 MHz,MCS0,  8 GHz to 18 GHz, Spurious Radiated Emissions Plot




Date: 8.JUN.2015 19:22:14

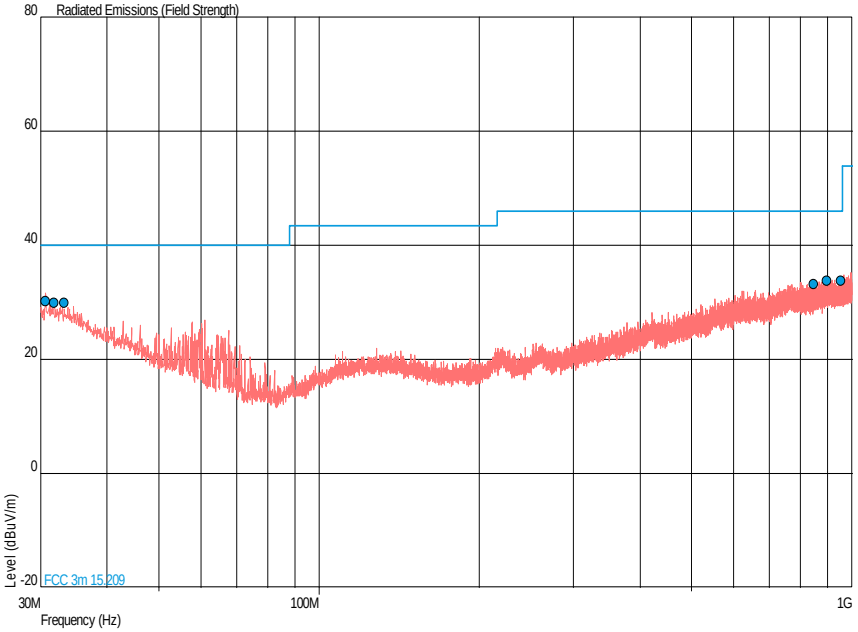
802.11n, 2412 MHz, MCS0, 18 GHz to 25 GHz, Spurious Radiated Emissions Plot



802.11n, 2437 MHz, MCS0, 30 MHz to 1 GHz, Spurious Radiated Emissions Results

| Frequency (MHz) | QP Level (dBµV/m) | QP Margin (dBµV/m) | QP Level (µV/m) | QP Margin (µV/m) | Angle (°) | Height (m) | Polarisation |
|---|---|---|---|---|---|---|---|
| 30.679 | 30.2 | -9.8 | 32.4 | -67.6 | 0 | 1.00 | Vertical |
| 31.843 | 30.0 | -10.0 | 31.6 | -68.4 | 180 | 1.00 | Vertical |
| 33.250 | 29.9 | -10.1 | 31.3 | -68.7 | 180 | 1.00 | Vertical |
| 848.050 | 33.2 | -12.8 | 45.7 | -154.3 | 0 | 1.00 | Vertical |
| 897.520 | 33.9 | -12.1 | 49.5 | -150.5 | 0 | 1.00 | Vertical |
| 951.064 | 33.9 | -12.1 | 49.5 | -150.5 | 0 | 1.00 | Vertical |

802.11n, 2437 MHz, MCS0, 30 MHz to 1 GHz, Spurious Radiated Emissions Plot

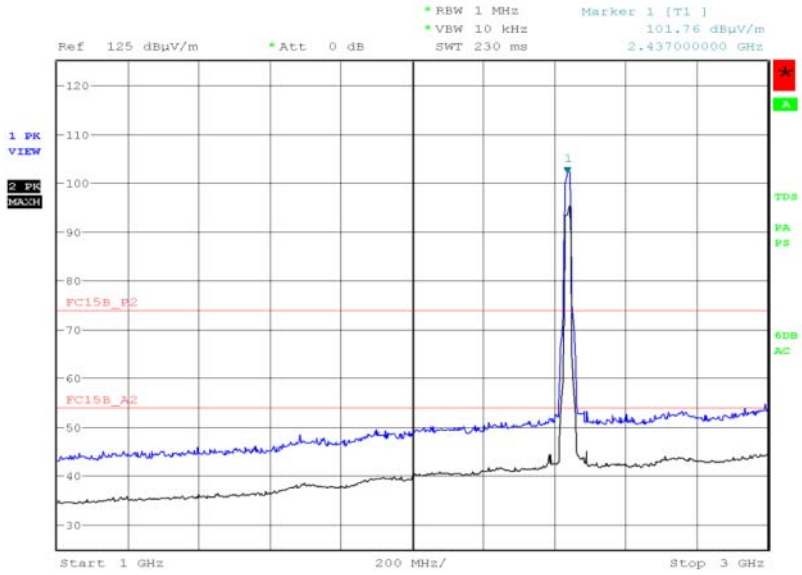


802.11n, 2437 MHz, MCS0, 1 GHz to 25 GHz, Spurious Radiated Emissions Results

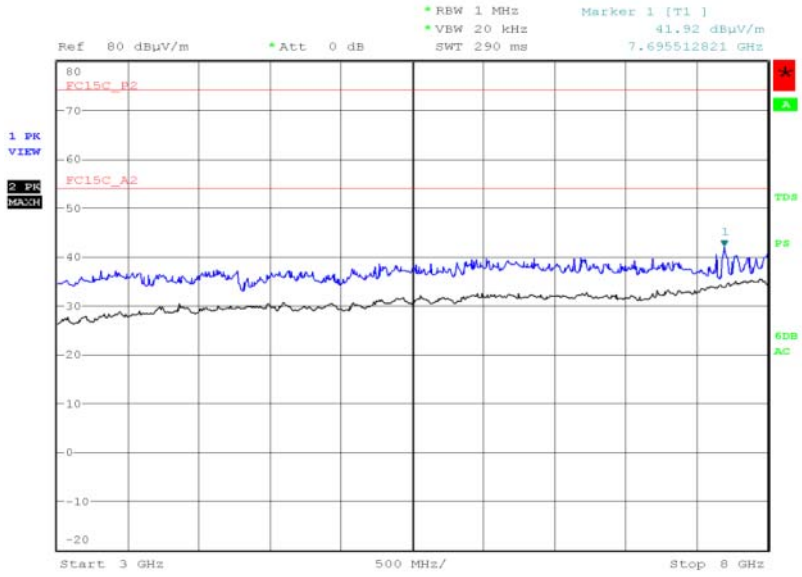
| Frequency (MHz) | Final Peak (dBµV/m) | Final Average (dBµV/m) | Final Peak (µV/m) | Final Average (µV/m) | Angle (°) | Height (m) | Polarisation |
|---|---|---|---|---|---|---|---|
| * | | | | | | | |

*No emissions were detected within 10 dB of the limit.

802.11n, 2437 MHz, MCS0, 1 GHz to 3 GHz, Spurious Radiated Emissions Plot

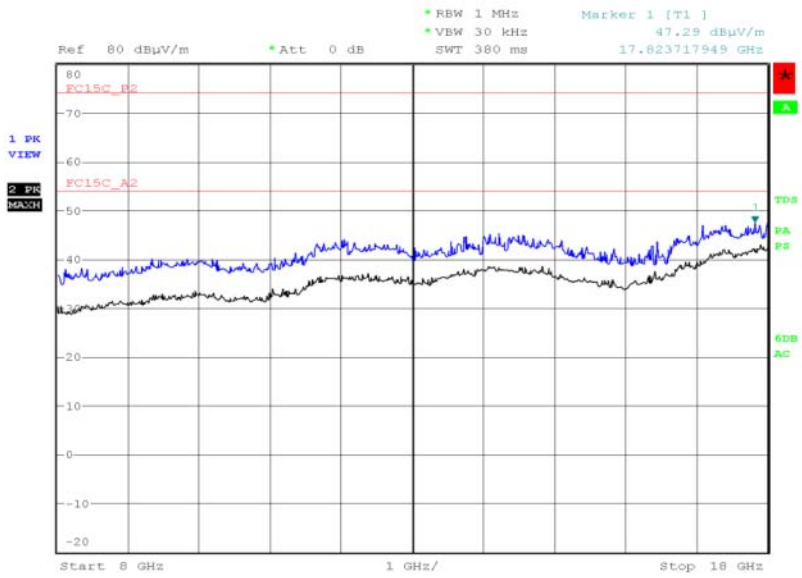


802.11n, 2437 MHz, MCS0, 3 GHz to 8 GHz, Spurious Radiated Emissions Plot



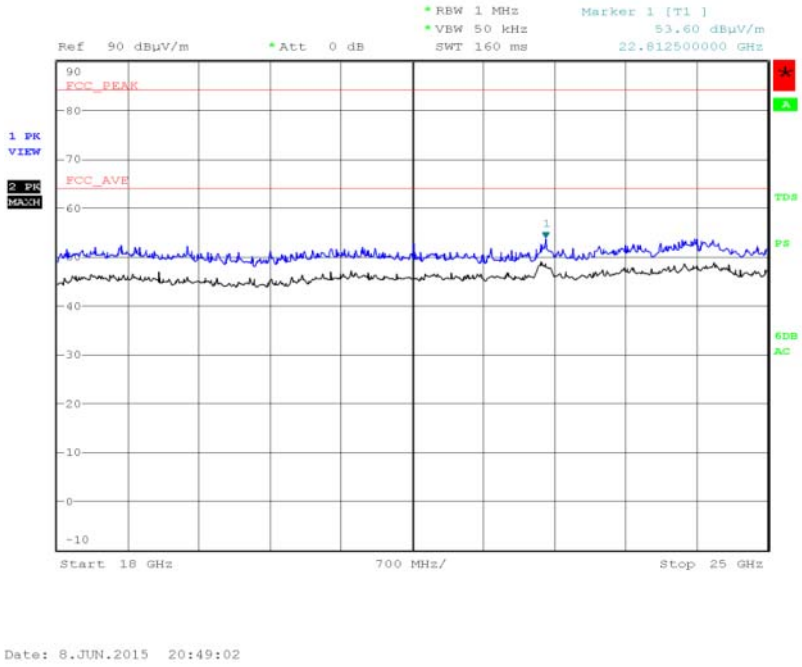

Date: 8.JUN.2015 18:19:52

802.11n, 2437 MHz, MCS0, 8 GHz to 18 GHz, Spurious Radiated Emissions Plot




Date: 8.JUN.2015 19:33:12

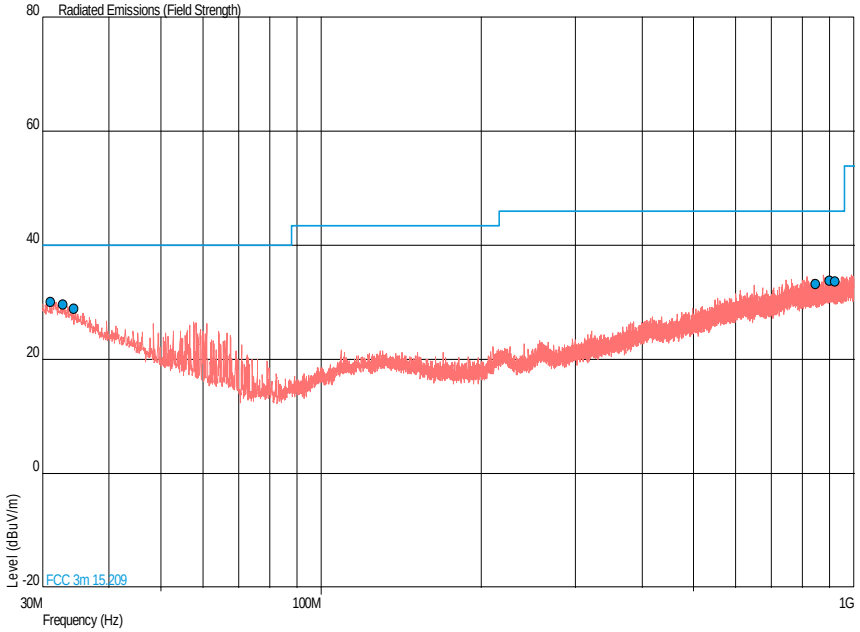
802.11n, 2437 MHz, MCS0, 18 GHz to 25 GHz, Spurious Radiated Emissions Plot



802.11n, 2462 MHz, MCS0, 30 MHz to 1 GHz, Spurious Radiated Emissions Results

| Frequency (MHz) | QP Level (dBµV/m) | QP Margin (dBµV/m) | QP Level (µV/m) | QP Margin (µV/m) | Angle (°) | Height (m) | Polarisation |
|---|---|---|---|---|---|---|---|
| 31.067 | 30.1 | -9.9 | 32.0 | -68.0 | 0 | 1.00 | Horizontal |
| 32.813 | 29.6 | -10.4 | 30.2 | -69.8 | 180 | 1.00 | Vertical |
| 34.317 | 28.9 | -11.1 | 27.9 | -72.1 | 0 | 1.00 | Vertical |
| 848.001 | 33.2 | -12.8 | 45.7 | -154.3 | 0 | 1.00 | Vertical |
| 898.490 | 33.9 | -12.1 | 49.5 | -150.5 | 180 | 1.00 | Horizontal |
| 920.897 | 33.7 | -12.3 | 48.4 | -151.6 | 0 | 1.00 | Horizontal |

802.11n, 2462 MHz, MCS0, 30 MHz to 1 GHz, Spurious Radiated Emissions Plot

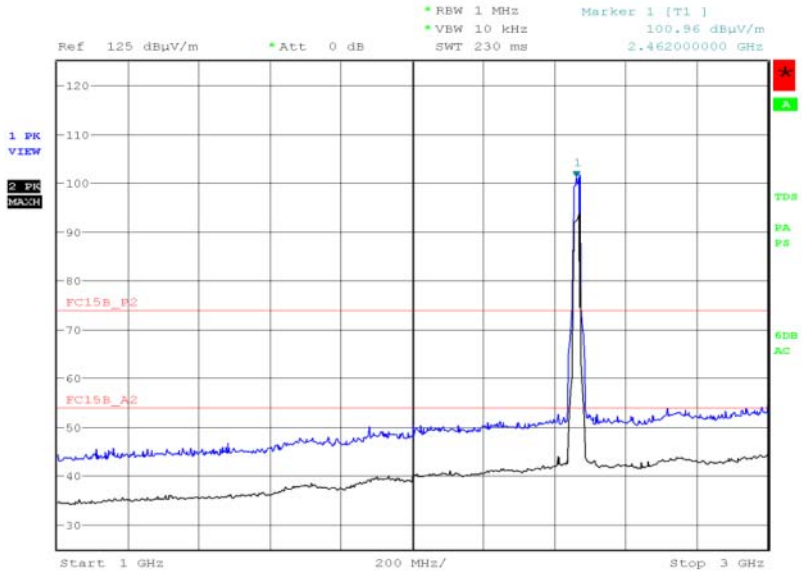


802.11n, 2462 MHz, MCS0, 1 GHz to 25 GHz, Spurious Radiated Emissions Results

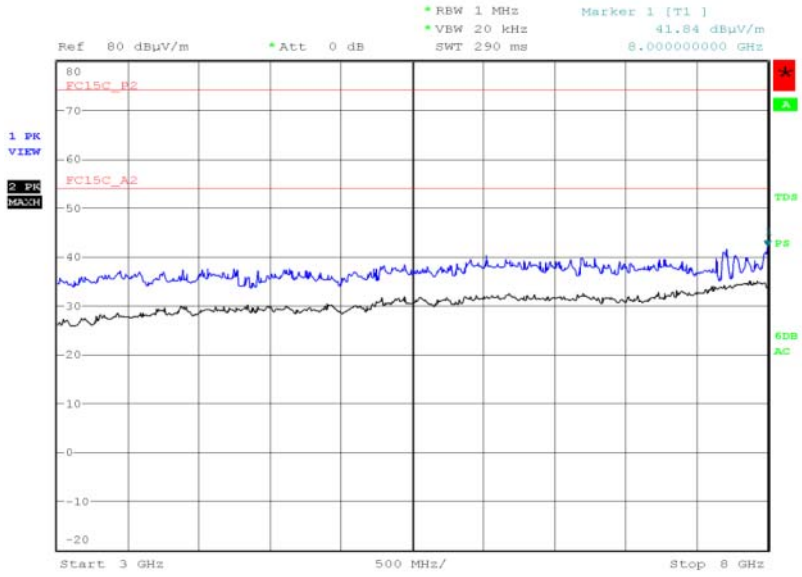
| Frequency (MHz) | Final Peak (dBµV/m) | Final Average (dBµV/m) | Final Peak (µV/m) | Final Average (µV/m) | Angle (°) | Height (m) | Polarisation |
|---|---|---|---|---|---|---|---|
| * | | | | | | | |

*No emissions were detected within 10 dB of the limit.

802.11n, 2462 MHz, MCS0, 1 GHz to 3 GHz, Spurious Radiated Emissions Plot

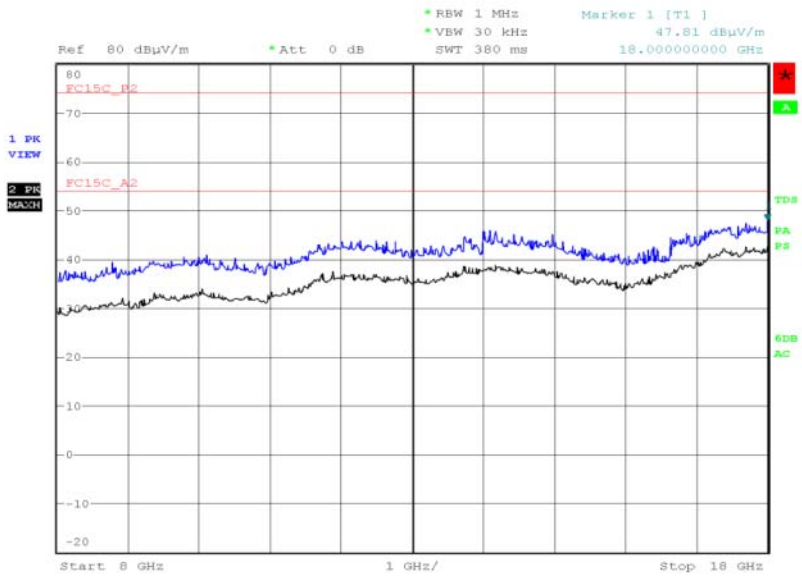


802.11n, 2462 MHz, MCS0, 3 GHz to 8 GHz, Spurious Radiated Emissions Plot



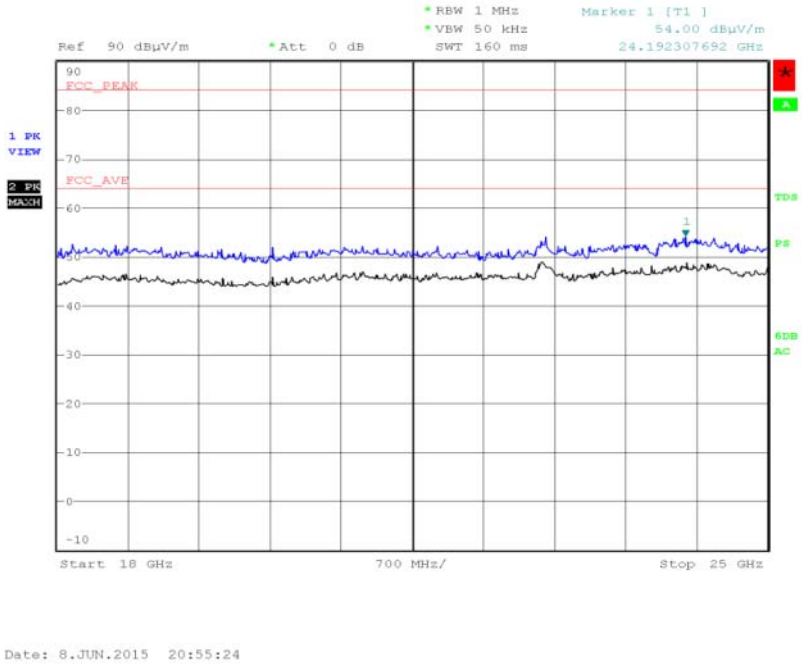

Date: 8.JUN.2015 18:23:19

802.11n, 2462 MHz, MCS0, 8 GHz to 18 GHz, Spurious Radiated Emissions Plot




Date: 8.JUN.2015 19:45:54

802.11n, 2462 MHz, MCS0, 18 GHz to 25 GHz, Spurious Radiated Emissions Plot




FCC 47 CFR Part 15, Limit Clause 15.247 (d)

Emissions outside the restricted bands shall be at least 20 dB below the fundamental measured in a 100 kHz bandwidth using a peak detector. If the transmitter complies with the conducted power limits, based on the use of RMS averaging over a time interval, the attenuation required shall be 30 dB below the fundamental instead of 20 dB.

FCC 47 CFR Part 15, Limit Clause 15.205

| | Peak (dBµV/m) | Average (dBµV/m) |
|---|---|---|
| Restricted Bands of Operation | 74 | 54 |

FCC 47 CFR Part 15, Limit Clause 15.209

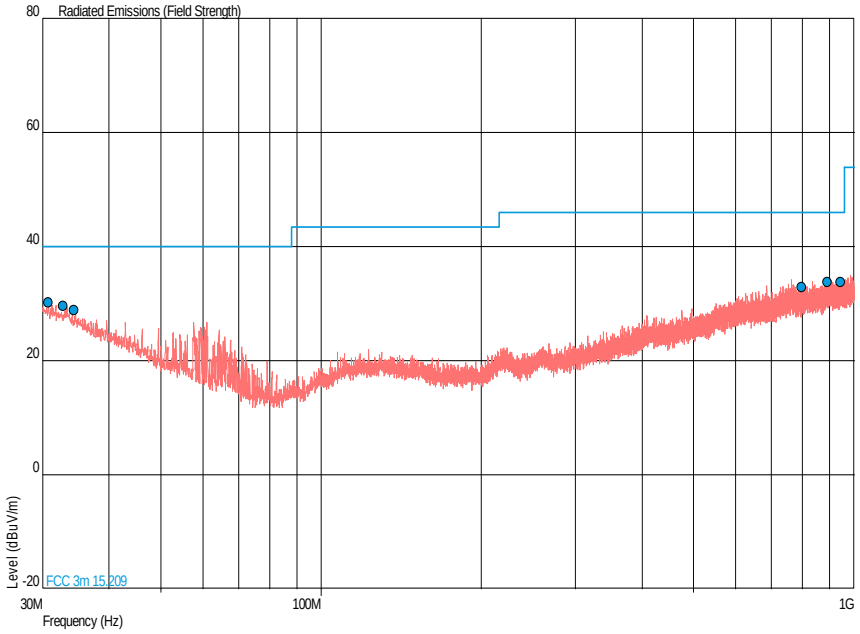
| Frequency (MHz) | Field Strength | | | Measurement Distance (m) |
|---|---|---|---|---|
| | (µV/m) | Average (dBµV/m) | Peak (dBµV/m) | |
| 30-88 | 100 | 40.0 | 60.0 | 3 |
| 88-216 | 150 | 43.5 | 63.5 | 3 |
| 216-960 | 200 | 46.0 | 66.0 | 3 |
| Above 960 | 500 | 54.0 | 74.0 | 3 |

4.0 V DC Supply

Bluetooth Low Energy, 2402 MHz, 30 MHz to 1 GHz, Spurious Radiated Emissions Results

| Frequency (MHz) | QP Level (dBµV/m) | QP Margin (dBµV/m) | QP Level (µV/m) | QP Margin (µV/m) | Angle (°) | Height (m) | Polarisation |
|---|---|---|---|---|---|---|---|
| 30.776 | 30.2 | -9.8 | 32.4 | -67.6 | 180 | 1.00 | Vertical |
| 32.813 | 29.6 | -10.4 | 30.2 | -69.8 | 0 | 1.00 | Vertical |
| 34.317 | 28.9 | -11.1 | 27.9 | -72.1 | 180 | 1.00 | Vertical |
| 797.901 | 32.9 | -13.1 | 44.2 | -155.8 | 180 | 1.00 | Vertical |
| 891.748 | 33.7 | -12.3 | 48.4 | -151.6 | 180 | 1.00 | Vertical |
| 944.468 | 33.7 | -12.3 | 48.4 | -151.6 | 180 | 1.00 | Vertical |

Bluetooth Low Energy, 2402 MHz, 30 MHz to 1 GHz, Spurious Radiated Emissions Plot

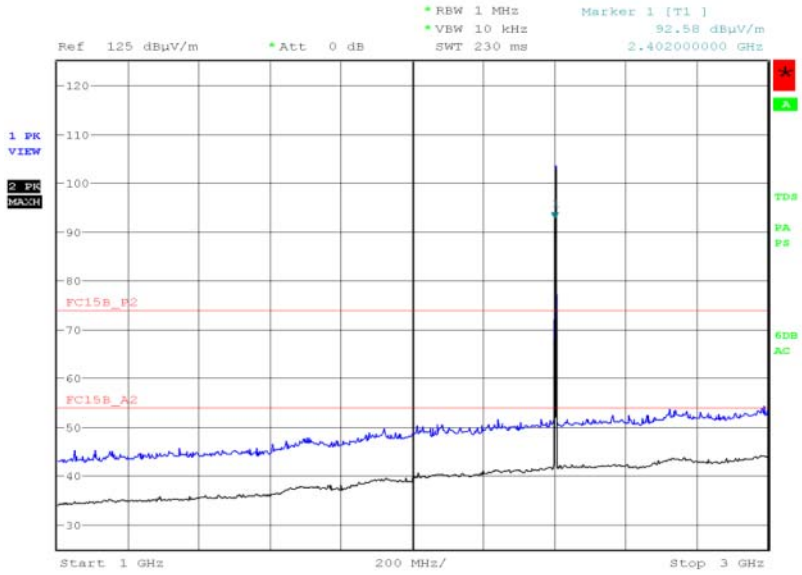


Bluetooth Low Energy, 2402 MHz, 1 GHz to 25 GHz, Spurious Radiated Emissions Results

| Frequency (MHz) | Final Peak (dBµV/m) | Final Average (dBµV/m) | Final Peak (µV/m) | Final Average (µV/m) | Angle (°) | Height (m) | Polarisation |
|---|---|---|---|---|---|---|---|
| * | | | | | | | |

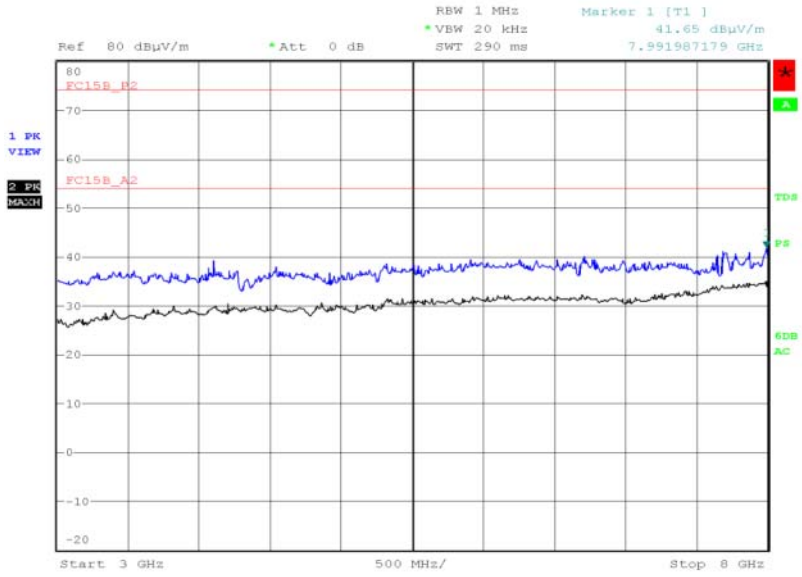
*No emissions were detected within 10 dB of the limit.

Bluetooth Low Energy, 2402 MHz, 1 GHz to 3 GHz, Spurious Radiated Emissions Plot



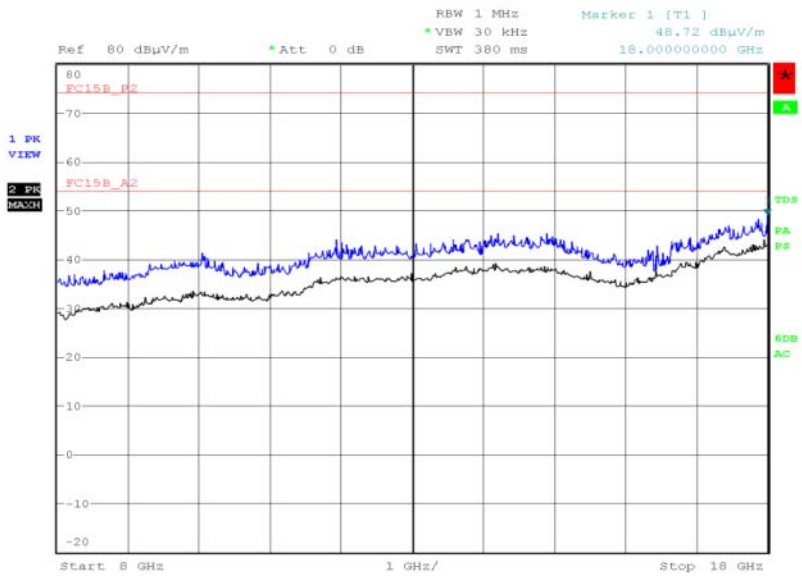
Product Service

Bluetooth Low Energy, 2402 MHz, 3 GHz to 8 GHz, Spurious Radiated Emissions Plot




Date: 7.JUN.2015 09:24:16

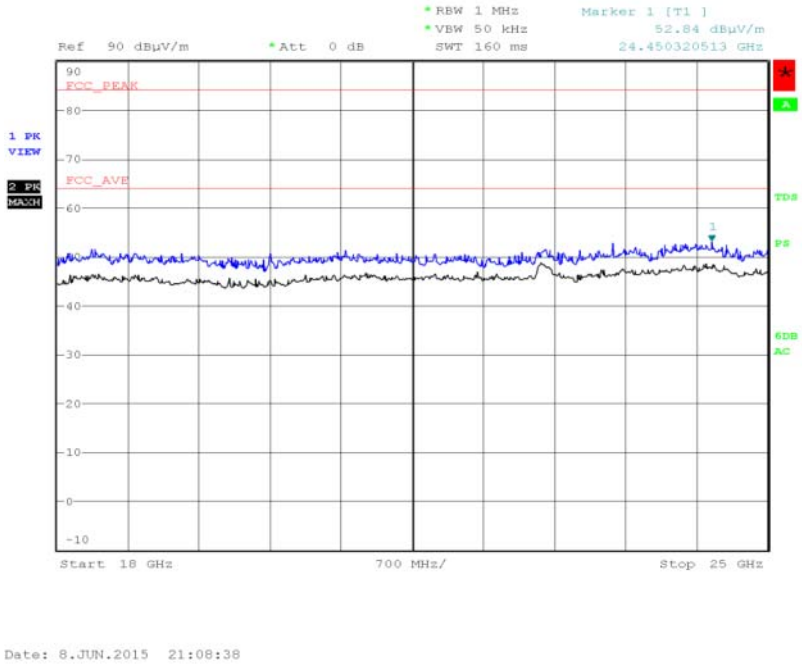
Bluetooth Low Energy, 2402 MHz, 8 GHz to 18 GHz, Spurious Radiated Emissions Plot




Date: 7.JUN.2015 10:47:47

Product Service

Bluetooth Low Energy, 2402 MHz, 18 GHz to 25 GHz, Spurious Radiated Emissions Plot

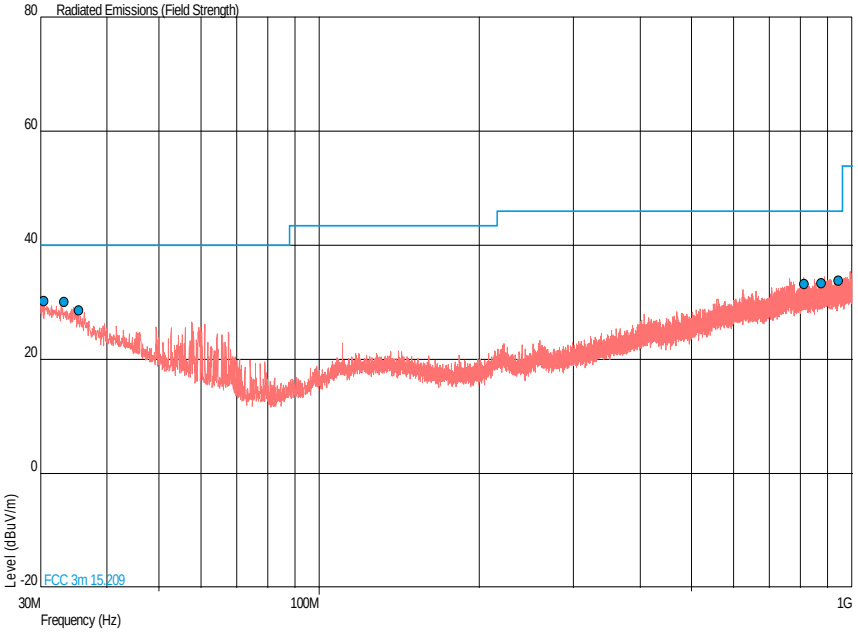


Product Service

Bluetooth Low Energy, 2440 MHz, 30 MHz to 1 GHz, Spurious Radiated Emissions Results

| Frequency (MHz) | QP Level (dBµV/m) | QP Margin (dBµV/m) | QP Level (µV/m) | QP Margin (µV/m) | Angle (°) | Height (m) | Polarisation |
|---|---|---|---|---|---|---|---|
| 30.485 | 30.2 | -9.8 | 32.4 | -67.6 | 180 | 1.00 | Vertical |
| 33.250 | 30.1 | -9.9 | 32.0 | -68.0 | 180 | 1.00 | Vertical |
| 35.432 | 28.6 | -11.4 | 26.9 | -73.1 | 0 | 1.00 | Vertical |
| 812.014 | 33.2 | -12.8 | 45.7 | -154.3 | 180 | 1.00 | Vertical |
| 875.404 | 33.4 | -12.6 | 46.8 | -153.2 | 180 | 1.00 | Vertical |
| 941.946 | 33.8 | -12.2 | 49.0 | -151.0 | 0 | 1.00 | Vertical |

Bluetooth Low Energy, 2440 MHz, 30 MHz to 1 GHz, Spurious Radiated Emissions Plot

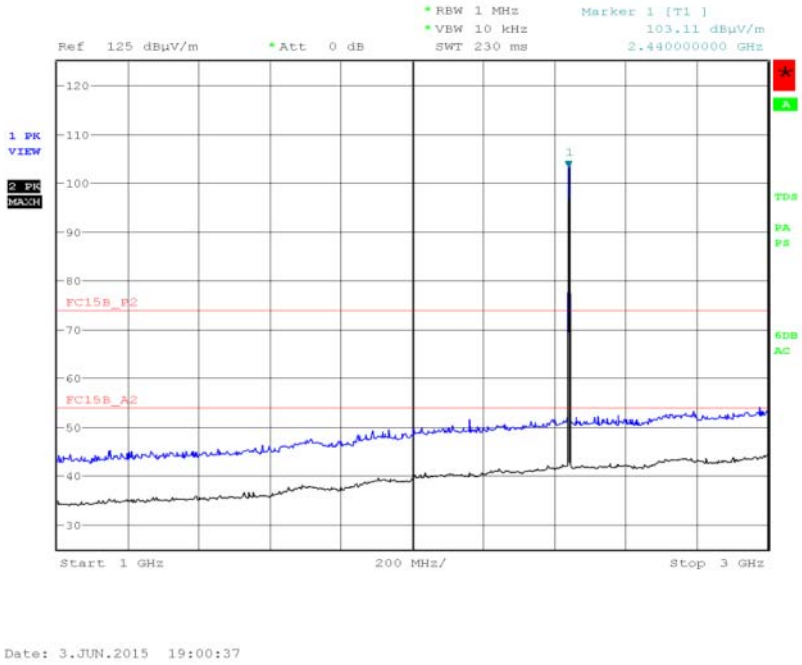


Bluetooth Low Energy, 2440 MHz, 1 GHz to 25 GHz, Spurious Radiated Emissions Results

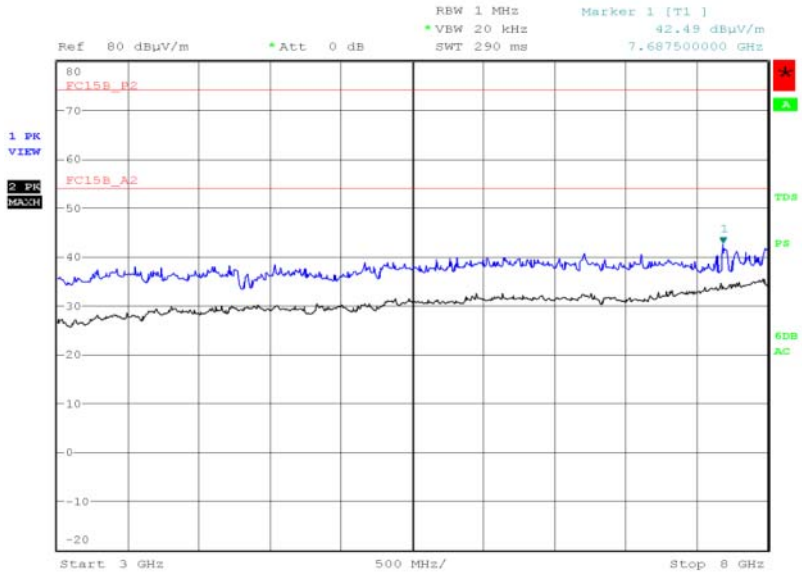
| Frequency (MHz) | Final Peak (dBµV/m) | Final Average (dBµV/m) | Final Peak (µV/m) | Final Average (µV/m) | Angle (°) | Height (m) | Polarisation |
|---|---|---|---|---|---|---|---|
| * | | | | | | | |

*No emissions were detected within 10 dB of the limit.

Bluetooth Low Energy, 2440 MHz, 1 GHz to 3 GHz, Spurious Radiated Emissions Plot

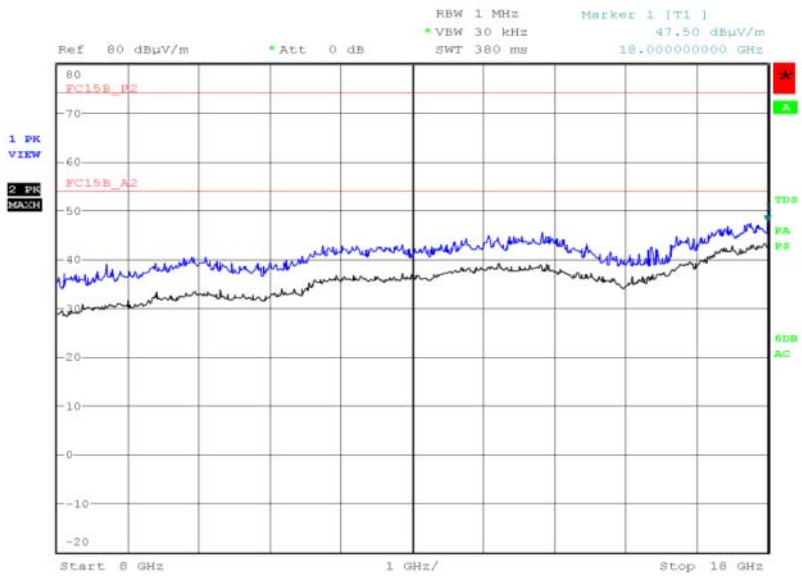


Bluetooth Low Energy, 2440 MHz, 3 GHz to 8 GHz, Spurious Radiated Emissions Plot




Date: 7.JUN.2015 09:20:19

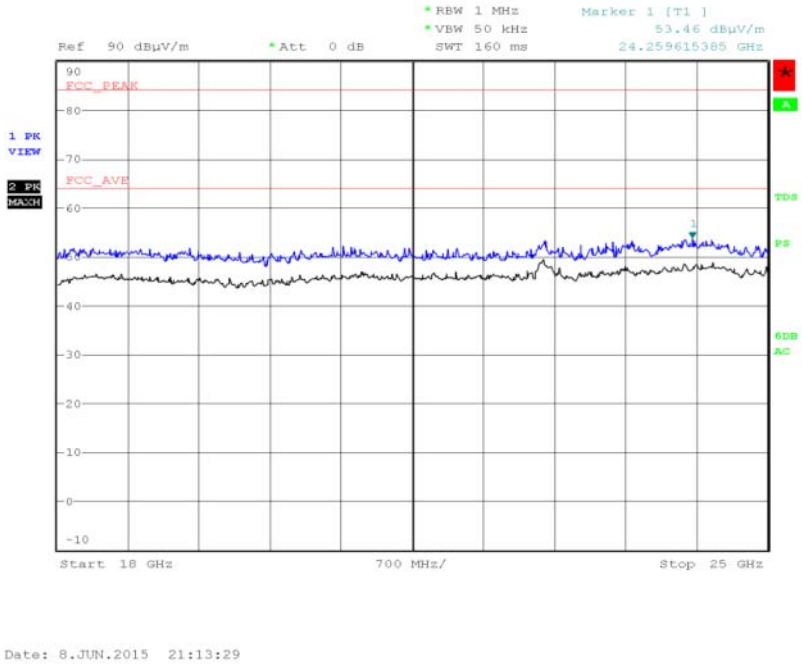
Bluetooth Low Energy, 2440 MHz, 8 GHz to 18 GHz, Spurious Radiated Emissions Plot




Date: 7.JUN.2015 10:58:35

Product Service

Bluetooth Low Energy, 2440 MHz, 18 GHz to 25 GHz, Spurious Radiated Emissions Plot

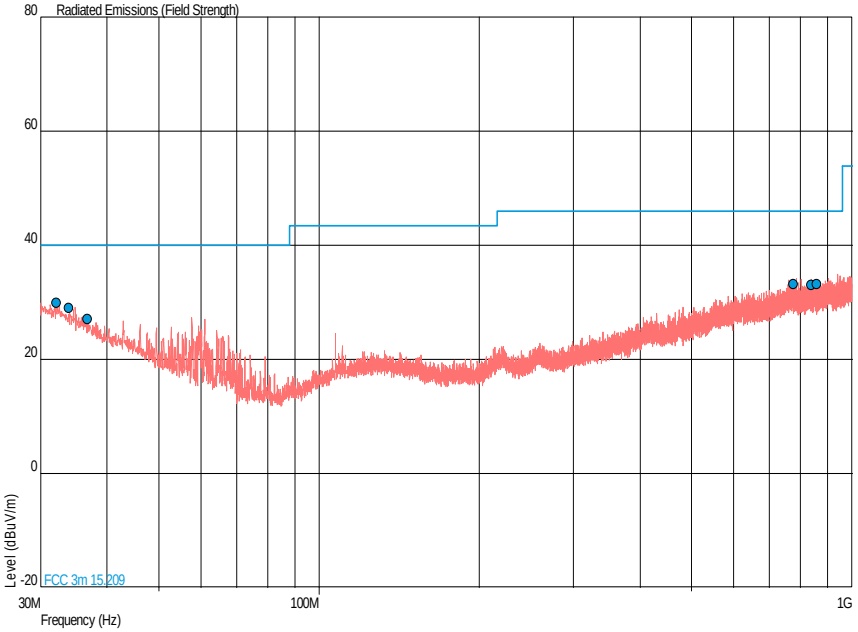



Date: 8.JUN.2015 21:13:29

Bluetooth Low Energy, 2480 MHz, 30 MHz to 1 GHz, Spurious Radiated Emissions Results

| Frequency (MHz) | QP Level (dBµV/m) | QP Margin (dBµV/m) | QP Level (µV/m) | QP Margin (µV/m) | Angle (°) | Height (m) | Polarisation |
|---|---|---|---|---|---|---|---|
| 32.134 | 29.9 | -10.1 | 31.3 | -68.7 | 0 | 1.00 | Vertical |
| 33.929 | 29.0 | -11.0 | 28.2 | -71.8 | 0 | 1.00 | Vertical |
| 36.790 | 27.1 | -12.9 | 22.6 | -77.4 | 0 | 1.00 | Vertical |
| 775.300 | 33.2 | -12.8 | 45.7 | -154.3 | 180 | 1.00 | Vertical |
| 837.622 | 33.1 | -12.9 | 45.2 | -154.8 | 180 | 1.00 | Vertical |
| 859.011 | 33.3 | -12.7 | 46.2 | -153.8 | 180 | 1.00 | Vertical |

Bluetooth Low Energy, 2480 MHz, 30 MHz to 1 GHz, Spurious Radiated Emissions Plot

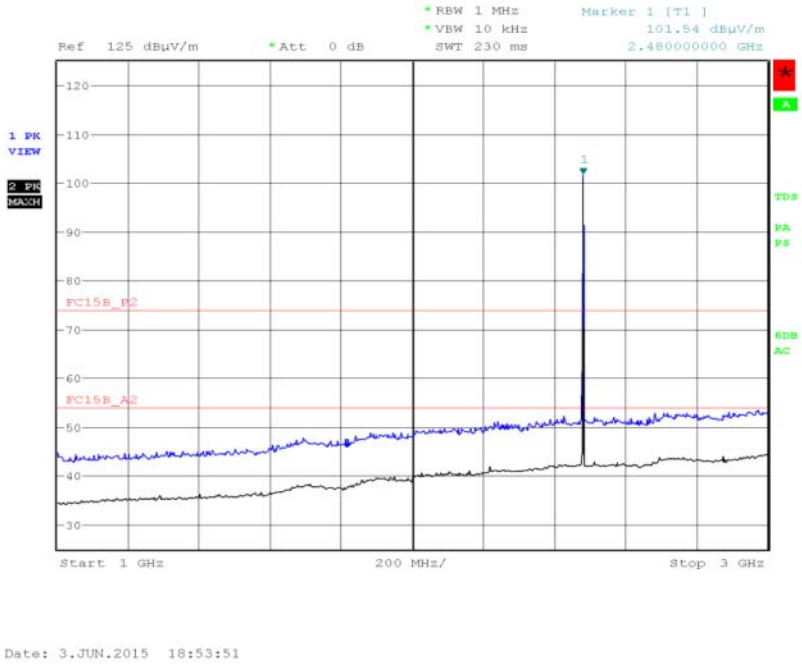


Bluetooth Low Energy, 2480 MHz, 1 GHz to 25 GHz, Spurious Radiated Emissions Results

| Frequency (MHz) | Final Peak (dBµV/m) | Final Average (dBµV/m) | Final Peak (µV/m) | Final Average (µV/m) | Angle (°) | Height (m) | Polarisation |
|---|---|---|---|---|---|---|---|
| * | | | | | | | |

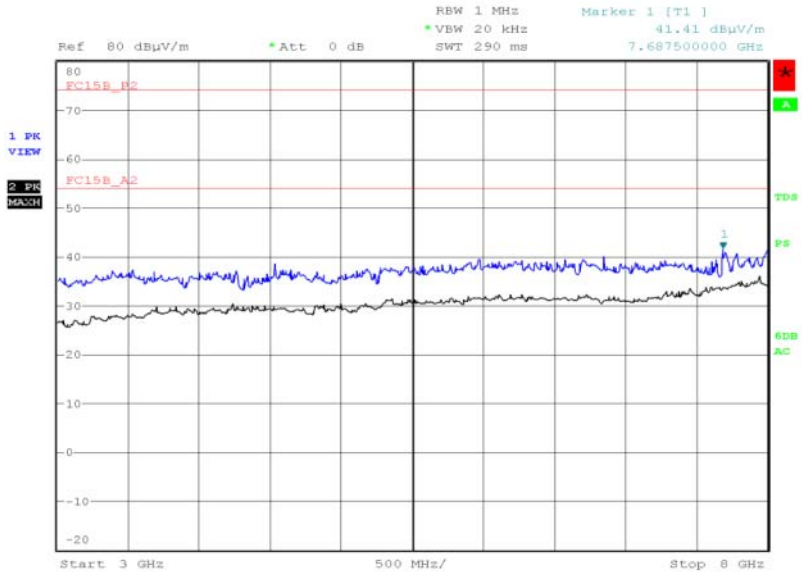
*No emissions were detected within 10 dB of the limit.

Bluetooth Low Energy, 2480 MHz, 1 GHz to 3 GHz, Spurious Radiated Emissions Plot



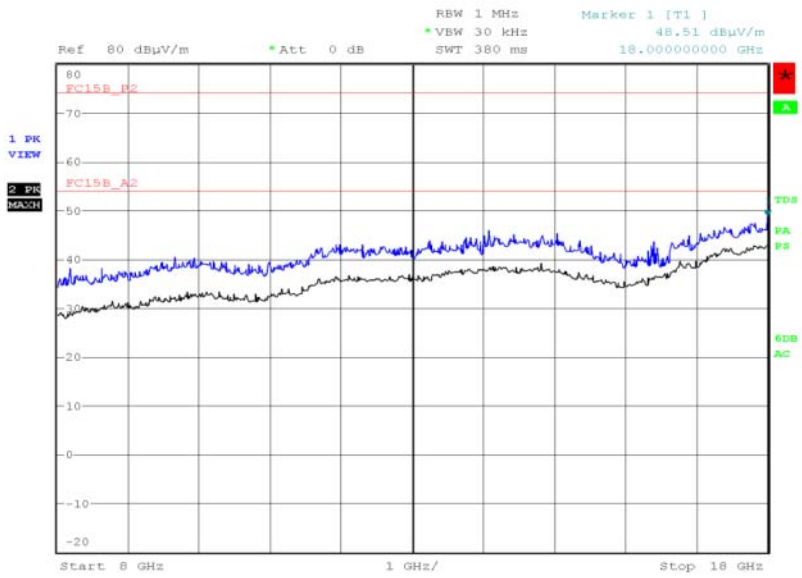
Product Service

Bluetooth Low Energy, 2480 MHz, 3 GHz to 8 GHz, Spurious Radiated Emissions Plot



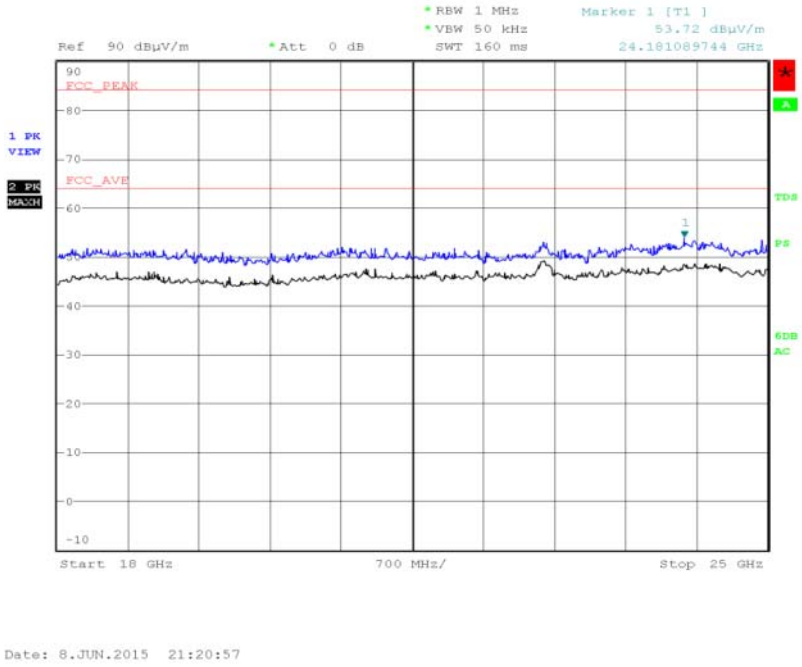

Date: 7.JUN.2015 09:12:24

Bluetooth Low Energy, 2480 MHz, 8 GHz to 18 GHz, Spurious Radiated Emissions Plot




Date: 7.JUN.2015 11:09:31

Bluetooth Low Energy, 2480 MHz, 18 GHz to 25 GHz, Spurious Radiated Emissions Plot




FCC 47 CFR Part 15, Limit Clause 15.247 (d)

Emissions outside the restricted bands shall be at least 20 dB below the fundamental measured in a 100 kHz bandwidth using a peak detector. If the transmitter complies with the conducted power limits, based on the use of RMS averaging over a time interval, the attenuation required shall be 30 dB below the fundamental instead of 20 dB.

FCC 47 CFR Part 15, Limit Clause 15.205

| | Peak (dBµV/m) | Average (dBµV/m) |
|---|---|---|
| Restricted Bands of Operation | 74 | 54 |

FCC 47 CFR Part 15, Limit Clause 15.209

| Frequency (MHz) | Field Strength | | | Measurement Distance (m) |
|---|---|---|---|---|
| | (µV/m) | Average (dBµV/m) | Peak (dBµV/m) | |
| 30-88 | 100 | 40.0 | 60.0 | 3 |
| 88-216 | 150 | 43.5 | 63.5 | 3 |
| 216-960 | 200 | 46.0 | 66.0 | 3 |
| Above 960 | 500 | 54.0 | 74.0 | 3 |

## 2.5 RESTRICTED BAND EDGES

### 2.5.1 Specification Reference

FCC 47 CFR Part 15C, Clause 15.205

### 2.5.2 Equipment Under Test and Modification State

SHF32 S/N: IMEI 004401115362408 - Modification State 0

### 2.5.3 Date of Test

2 June 2015 & 3 June 2015

### 2.5.4 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

### 2.5.5 Test Procedure

The test was performed in accordance with KDB 558074 D01 v03r02 clause 12.0 and ANSI C63.10 clause 6.3, 6.6 and 6.9

### 2.5.6 Environmental Conditions

| | |
|---|---|
| Ambient Temperature | 20.3 - 22.0°C |
| Relative Humidity | 43.0% |

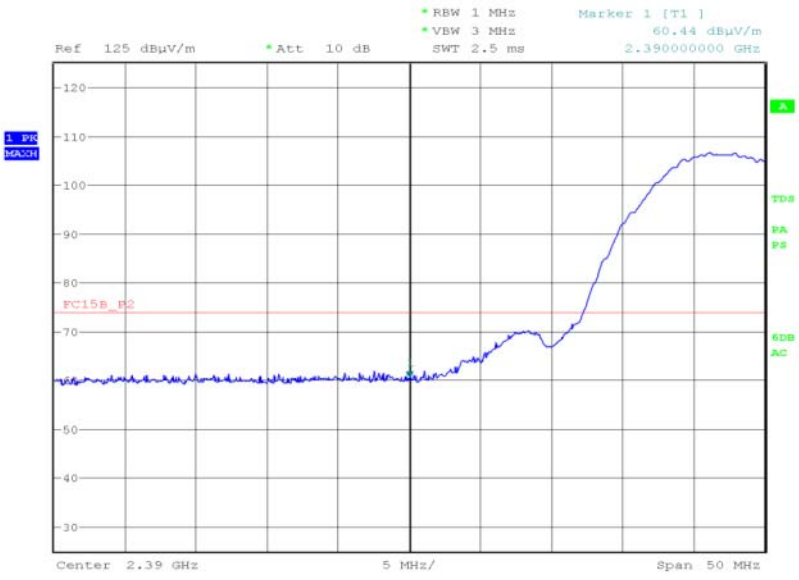
### 2.5.7 Test Results

4.0 V DC Supply

802.11b, 1 Mbps, Restricted Band Edges Results

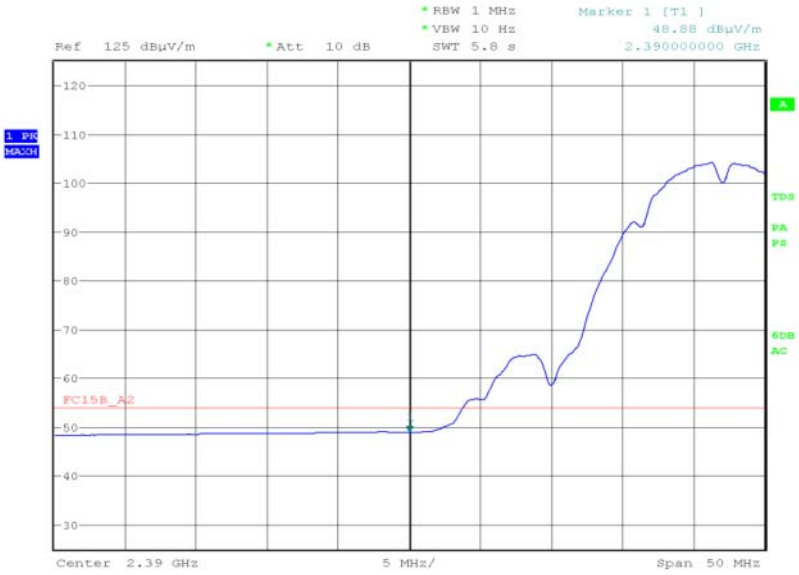
| 2412 MHz | | 2462 MHz | |
|---|---|---|---|
| Measured Frequency 2390.00 MHz | | Measured Frequency 2483.50 MHz | |
| dBµV/m | | dBµV/m | |
| Final Peak | Final Average | Final Peak | Final Average |
| 60.44 | 48.88 | 61.88 | 49.87 |

802.11b, 2412 MHz, Measured Frequency 2390 MHz, 1 Mbps, Final Peak, Restricted Band Edges Plot



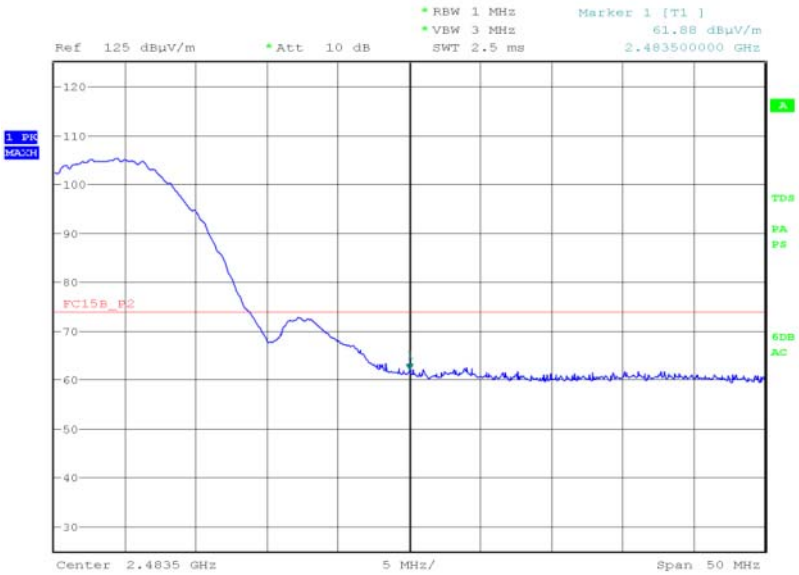

Date: 2.JUN.2015 18:49:48

802.11b, 2412 MHz, Measured Frequency 2390 MHz, 1 Mbps, Final Average, Restricted Band Edges Plot



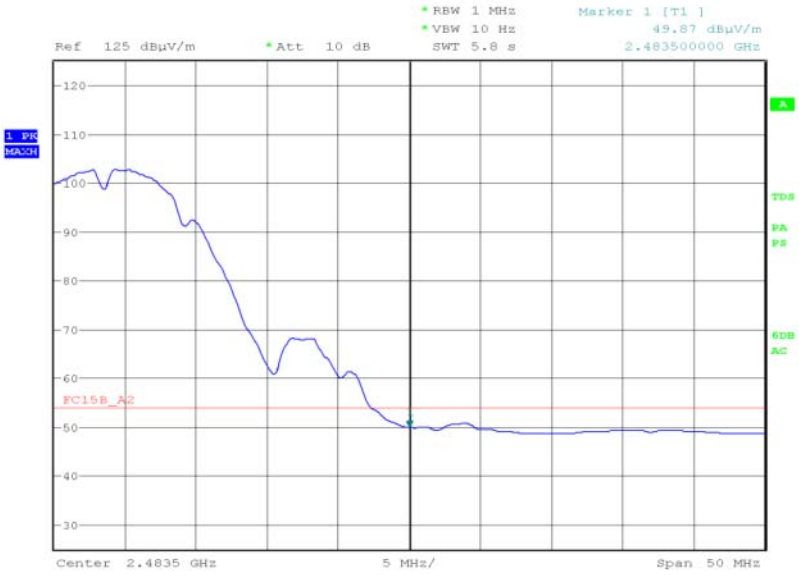

Date: 2.JUN.2015 18:50:34

802.11b, 2462 MHz, Measured Frequency 2483.5 MHz, 1 Mbps, Final Peak, Restricted Band Edges Plot




Date: 2.JUN.2015 19:58:27

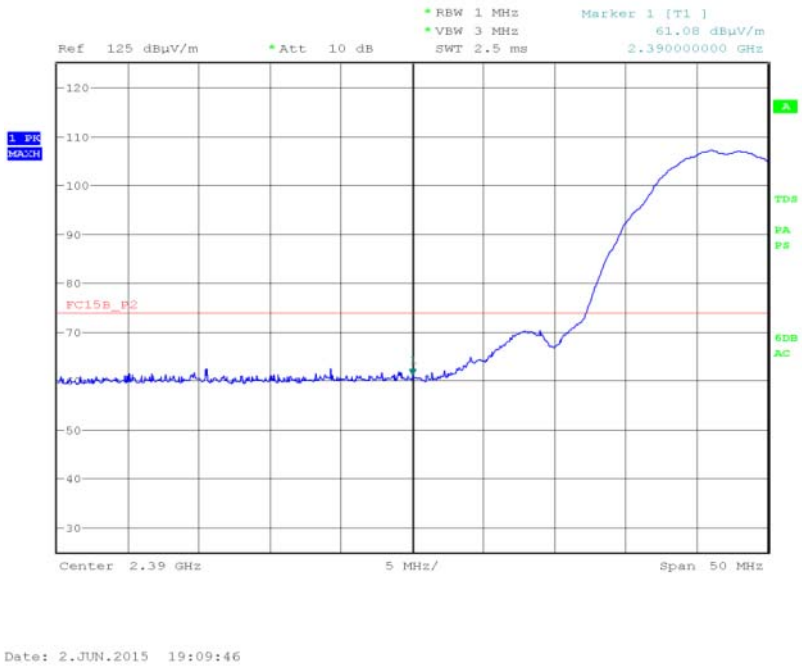
802.11b, 2462 MHz, Measured Frequency 2483.5 MHz, 1 Mbps, Final Average, Restricted Band Edges Plot



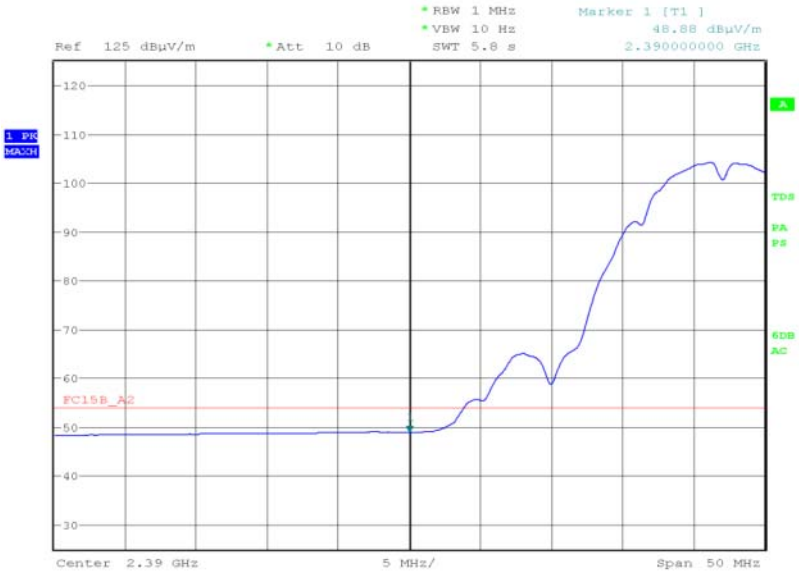
802.11b, 2 Mbps, Restricted Band Edges Results

| 2412 MHz | | 2462 MHz | |
|---|---|---|---|
| Measured Frequency 2390.00 MHz | | Measured Frequency 2483.50 MHz | |
| dBµV/m | | dBµV/m | |
| Final Peak | Final Average | Final Peak | Final Average |
| 61.08 | 48.88 | 61.31 | 49.92 |

802.11b, 2412 MHz, Measured Frequency 2390 MHz, 2 Mbps, Final Peak, Restricted Band Edges Plot

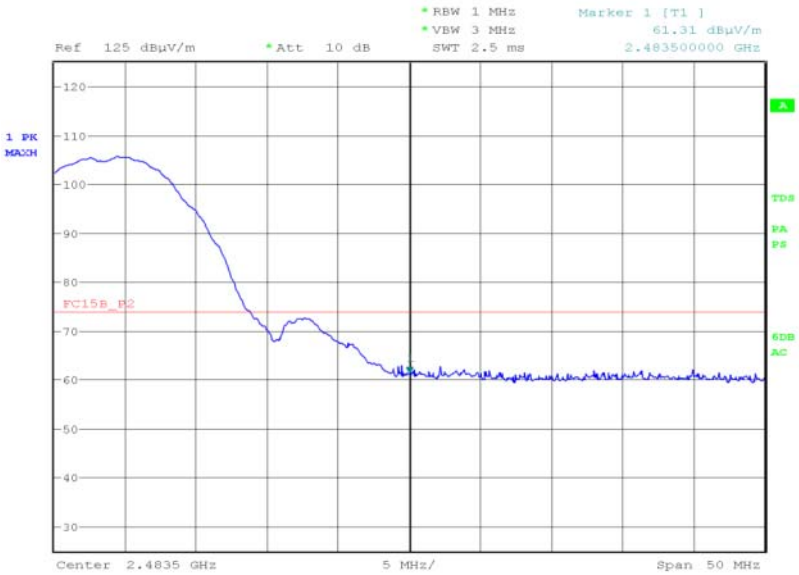


802.11b, 2412 MHz, Measured Frequency 2390 MHz, 2 Mbps, Final Average, Restricted Band Edges Plot



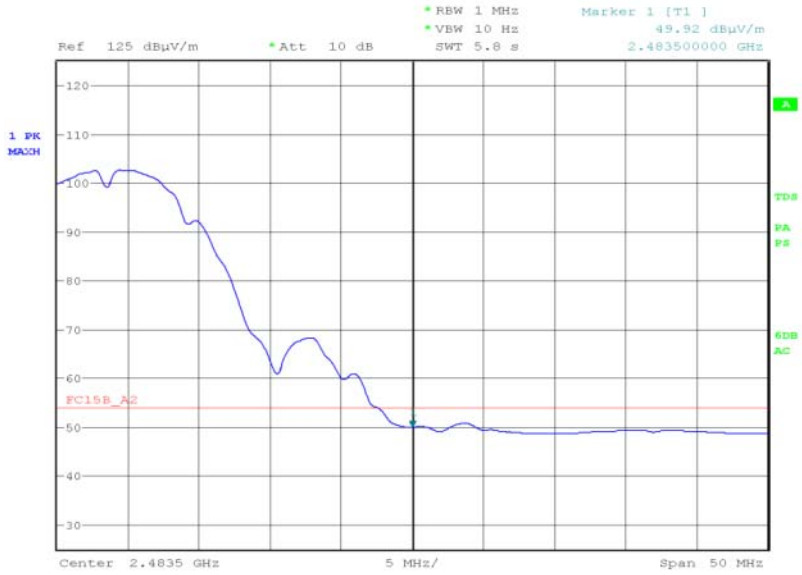

Date: 2.JUN.2015 19:10:30

802.11b, 2462 MHz, Measured Frequency 2483.5 MHz, 2 Mbps, Final Peak, Restricted Band Edges Plot




Date: 2.JUN.2015 20:07:01

802.11b, 2462 MHz, Measured Frequency 2483.5 MHz, 2 Mbps, Final Average, Restricted Band Edges Plot




Date: 2.JUN.2015 20:07:31

Remark

The test was performed on 1 Mbps because this was deemed the worst case data rate for Conducted Output Power.

The test was performed on 2 Mbps because this was deemed the worst case data rate for 6 dB Bandwidth.

FCC 47 CFR Part 15, Limit Clause 15.205

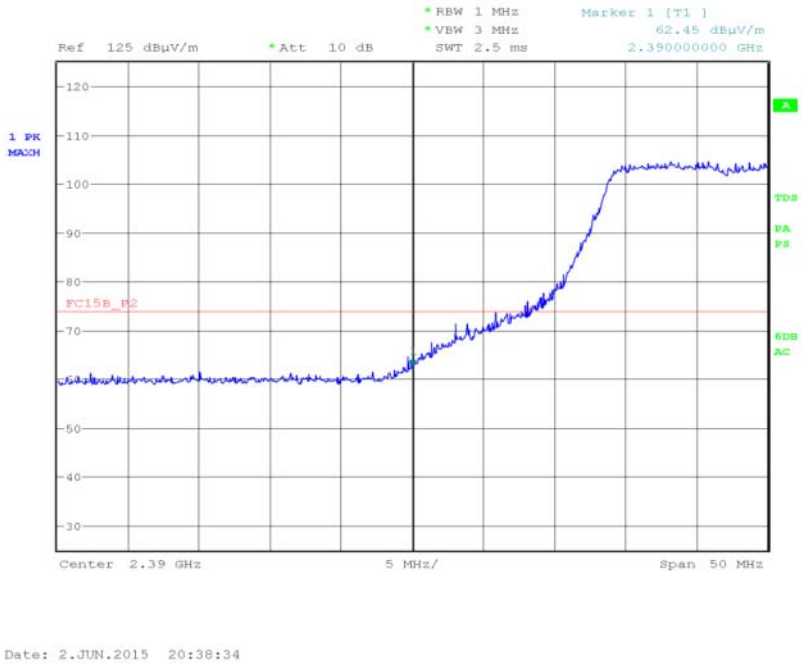
| | Peak (dBµV/m) | Average (dBµV/m) |
|---|---|---|
| Restricted Bands of Operation | 74 | 54 |

4.0 V DC Supply

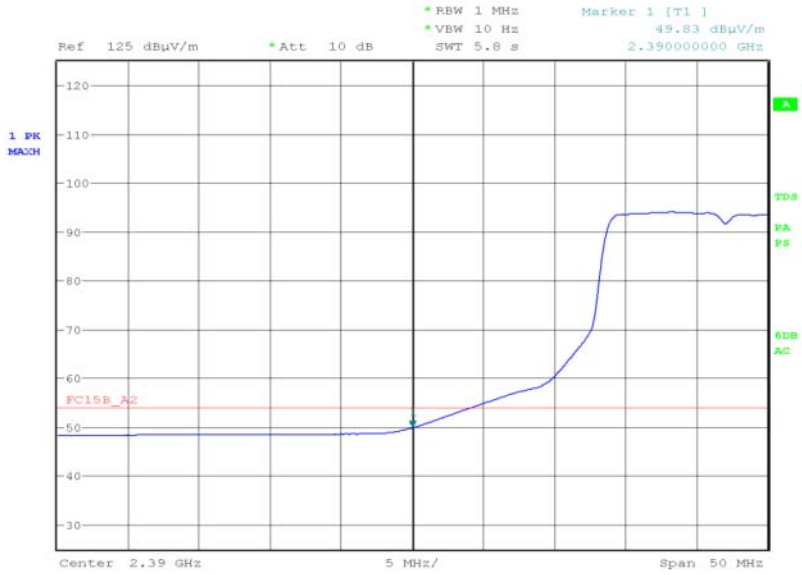
802.11g, 18 Mbps, Restricted Band Edges Results

| 2412 MHz | | 2462 MHz | |
|---|---|---|---|
| Measured Frequency 2390.00 MHz | | Measured Frequency 2483.50 MHz | |
| dBµV/m | | dBµV/m | |
| Final Peak | Final Average | Final Peak | Final Average |
| 62.45 | 49.83 | 67.09 | 51.41 |

802.11g, 2412 MHz, Measured Frequency 2390 MHz, 18 Mbps, Final Peak, Restricted Band Edges Plot

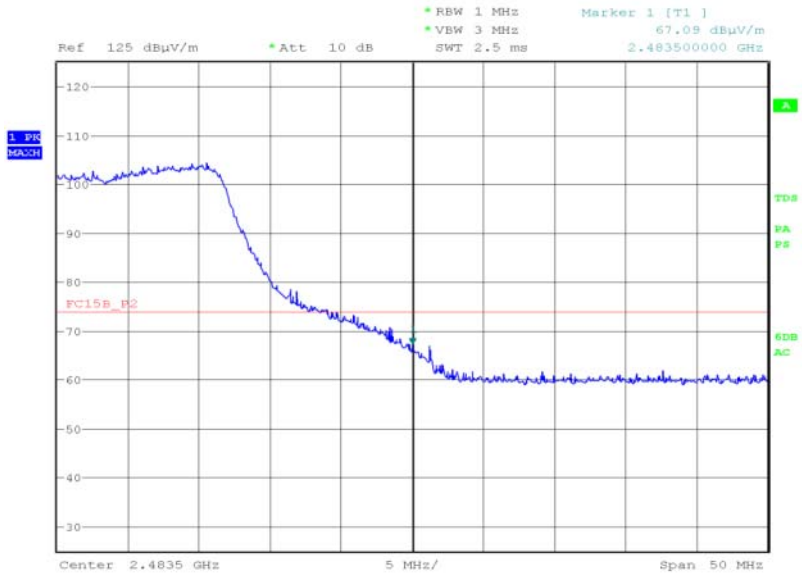


802.11g, 2412 MHz, Measured Frequency 2390 MHz, 18 Mbps, Final Average, Restricted Band Edges Plot



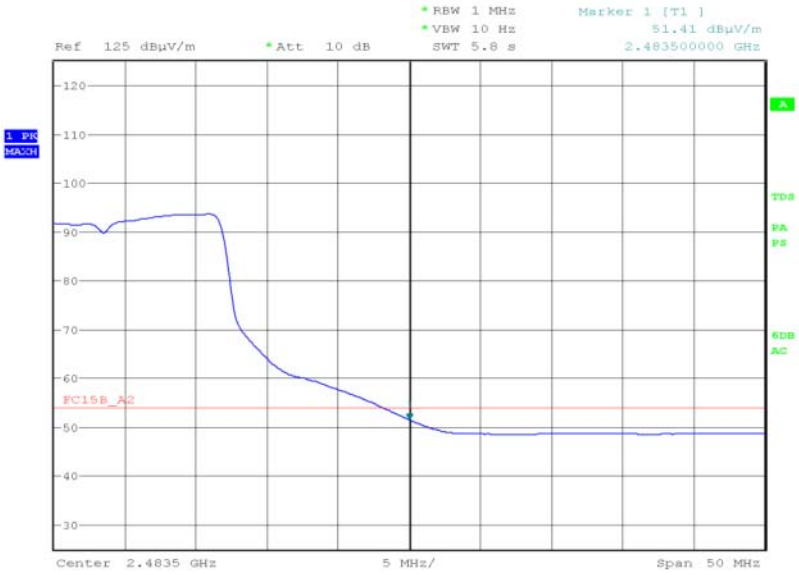

Date: 2.JUN.2015 20:39:31

802.11g, 2462 MHz, Measured Frequency 2483.5 MHz, 18 Mbps, Final Peak, Restricted Band Edges Plot




Date: 2.JUN.2015 21:10:10

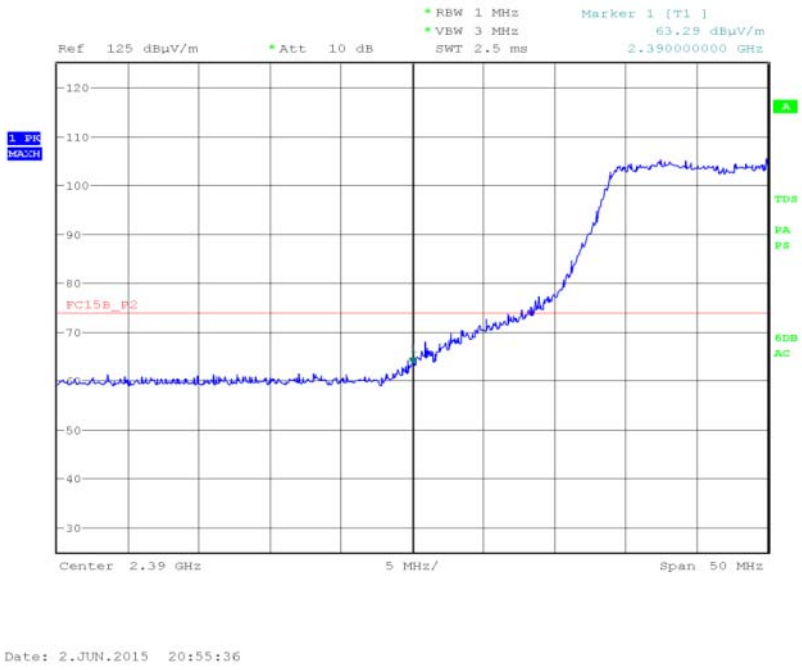
802.11g, 2462 MHz, Measured Frequency 2483.5 MHz, 18 Mbps, Final Average, Restricted Band Edges Plot



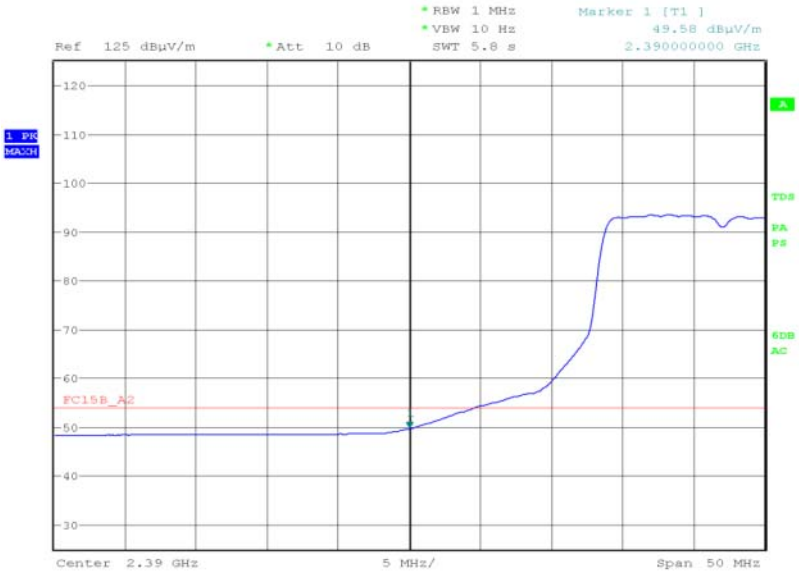
802.11g, 54 Mbps, Restricted Band Edges Results

| 2412 MHz | | 2462 MHz | |
|---|---|---|---|
| Measured Frequency 2390.00 MHz | | Measured Frequency 2483.50 MHz | |
| dBµV/m | | dBµV/m | |
| Final Peak | Final Average | Final Peak | Final Average |
| 63.29 | 49.58 | 67.89 | 51.39 |

802.11g, 2412 MHz, Measured Frequency 2390 MHz, 54 Mbps, Final Peak, Restricted Band Edges Plot

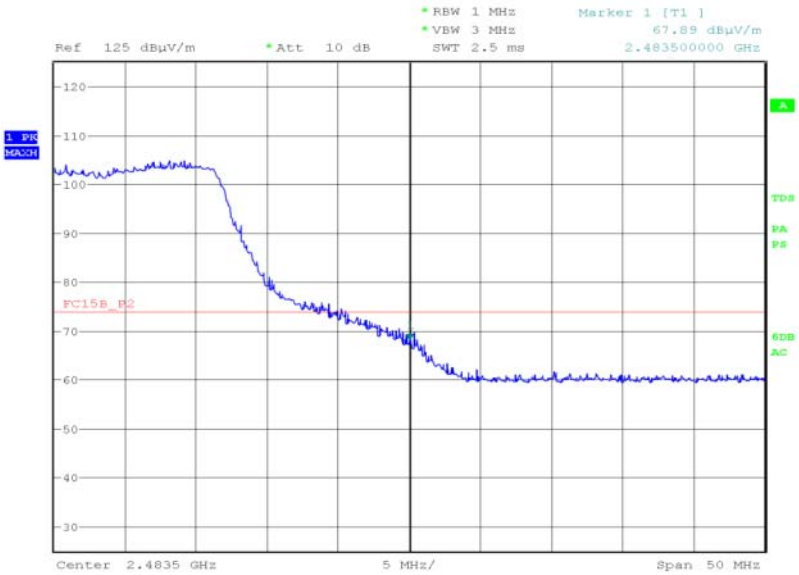


802.11g, 2412 MHz, Measured Frequency 2390 MHz, 54 Mbps, Final Average, Restricted Band Edges Plot



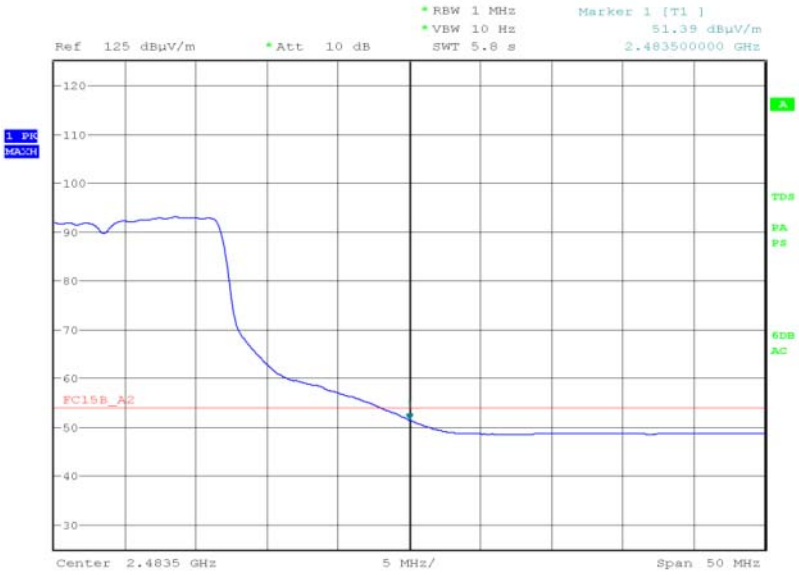

Date: 2.JUN.2015 20:56:18

802.11g, 2462 MHz, Measured Frequency 2483.5 MHz, 54 Mbps, Final Peak, Restricted Band Edges Plot




Date: 2.JUN.2015 21:15:08

802.11g, 2462 MHz, Measured Frequency 2483.5 MHz, 54 Mbps, Final Average, Restricted Band Edges Plot




Remark

The test was performed on 18 Mbps because this was deemed the worst case data rate for Conducted Output Power.

The test was performed on 54 Mbps because this was deemed the worst case data rate for 6 dB Bandwidth.

FCC 47 CFR Part 15, Limit Clause 15.205

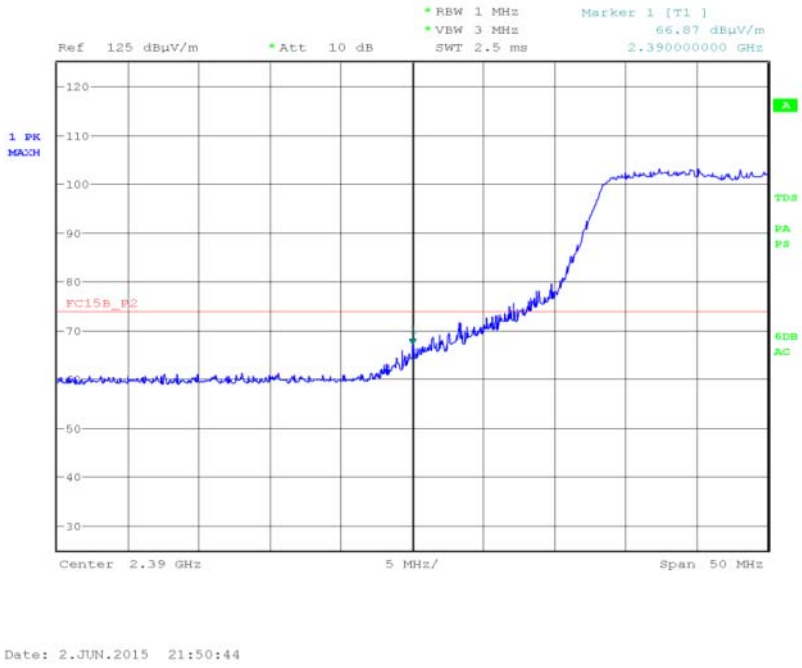
| | Peak (dBµV/m) | Average (dBµV/m) |
|---|---|---|
| Restricted Bands of Operation | 74 | 54 |

4.0 V DC Supply

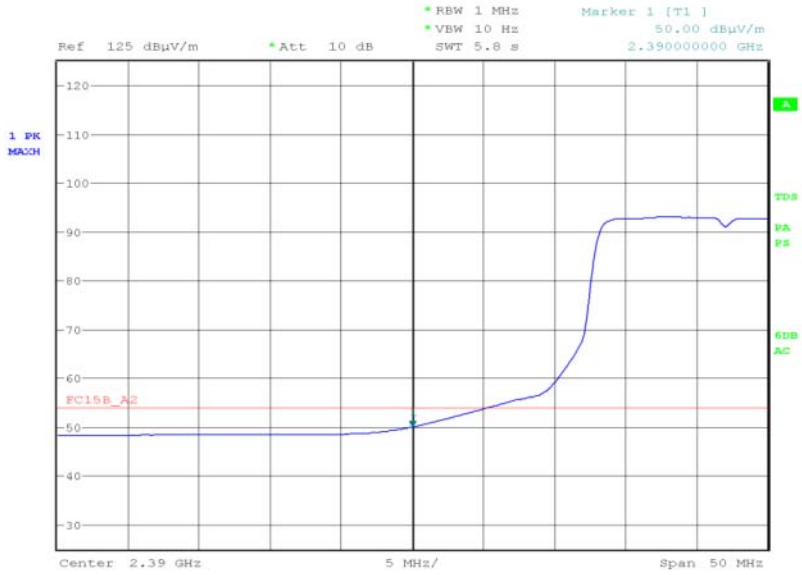
802.11n, MCS0, Restricted Band Edges Results

| 2412 MHz | | 2462 MHz | |
|---|---|---|---|
| Measured Frequency 2390.00 MHz | | Measured Frequency 2483.50 MHz | |
| dBµV/m | | dBµV/m | |
| Final Peak | Final Average | Final Peak | Final Average |
| 66.87 | 50.00 | 68.29 | 51.41 |

802.11n, 2412 MHz, Measured Frequency 2390 MHz, MCS0, Final Peak, Restricted Band Edges Plot

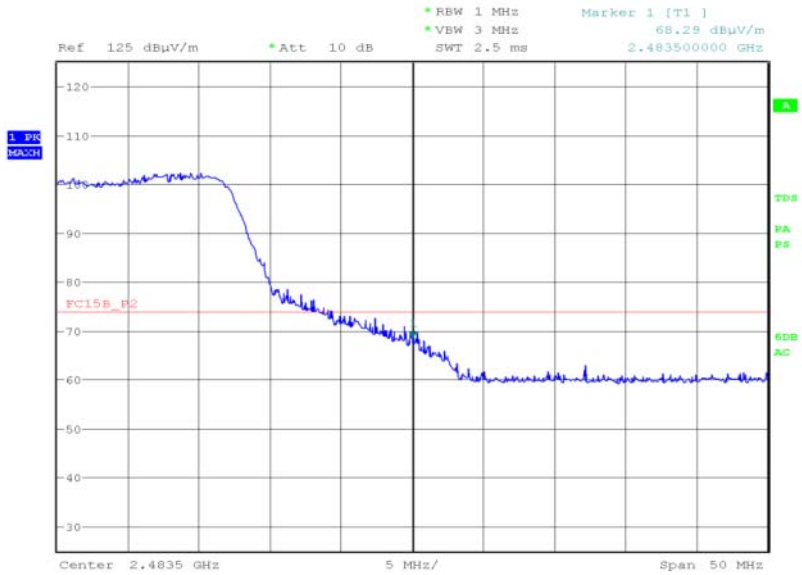


802.11n, 2412 MHz, Measured Frequency 2390 MHz, MCS0, Final Average, Restricted Band Edges Plot



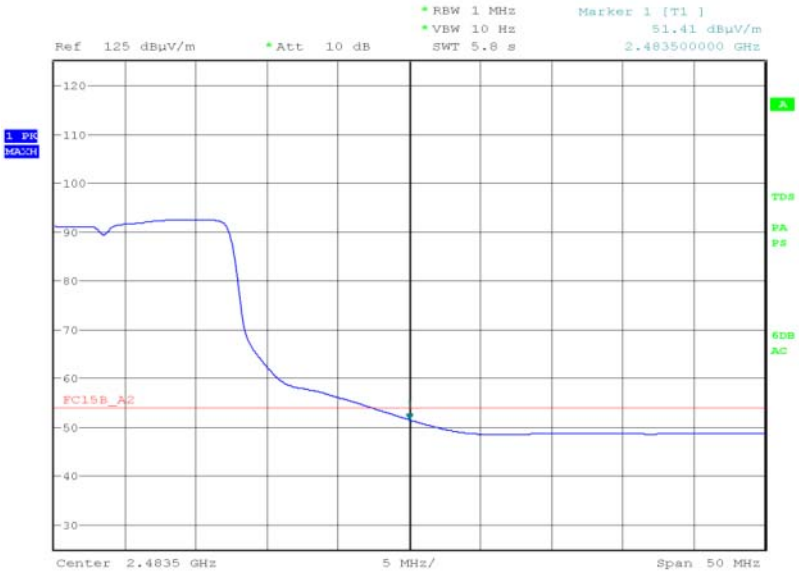

Date: 2.JUN.2015 21:51:22

802.11n, 2462 MHz, Measured Frequency 2483.5 MHz, MCS0, Final Peak, Restricted Band Edges Plot




Date: 2.JUN.2015 22:18:52

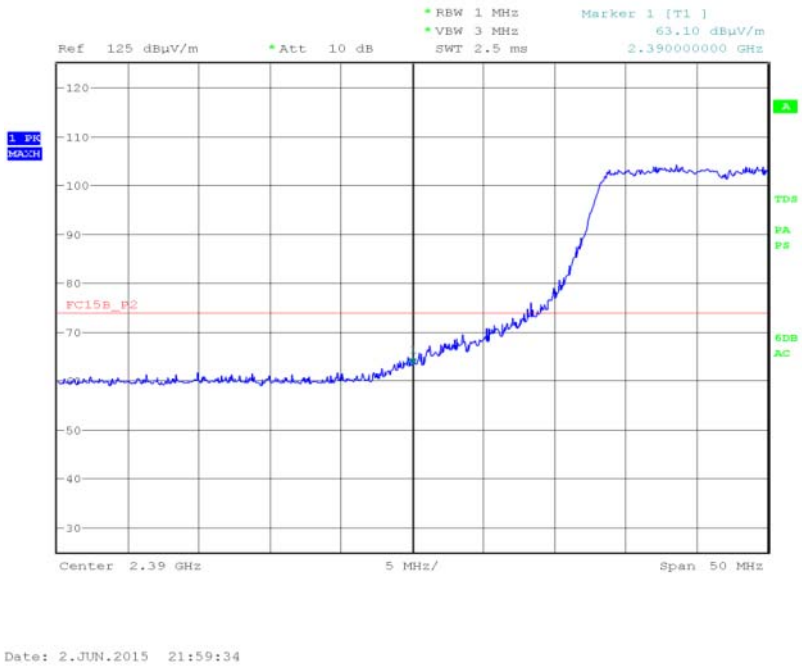
802.11n, 2462 MHz, Measured Frequency 2483.5 MHz, MCS0, Final Average, Restricted Band Edges Plot



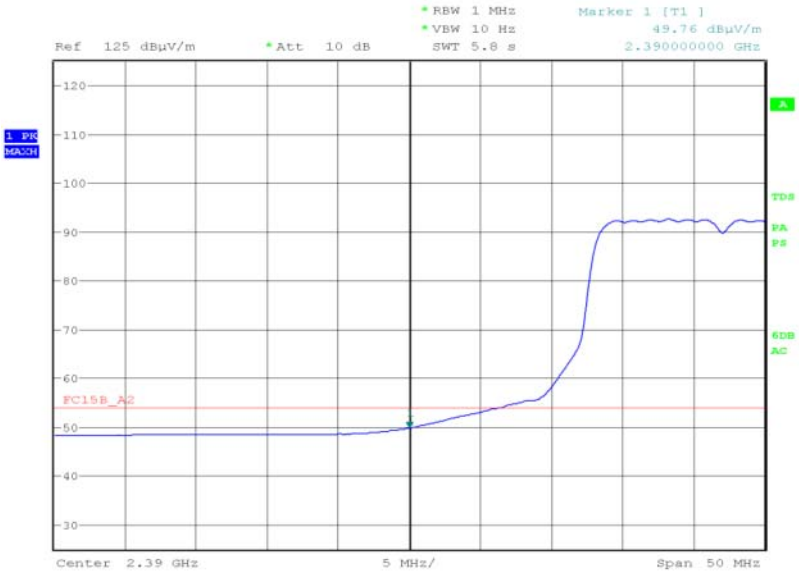
802.11n, MCS6, Restricted Band Edges Results

| 2412 MHz | | 2462 MHz | |
|---|---|---|---|
| Measured Frequency 2390.00 MHz | | Measured Frequency 2483.50 MHz | |
| dBµV/m | | dBµV/m | |
| Final Peak | Final Average | Final Peak | Final Average |
| 63.10 | 49.76 | 66.54 | 50.91 |

802.11n, 2412 MHz, Measured Frequency 2390 MHz, MCS6, Final Peak, Restricted Band Edges Plot

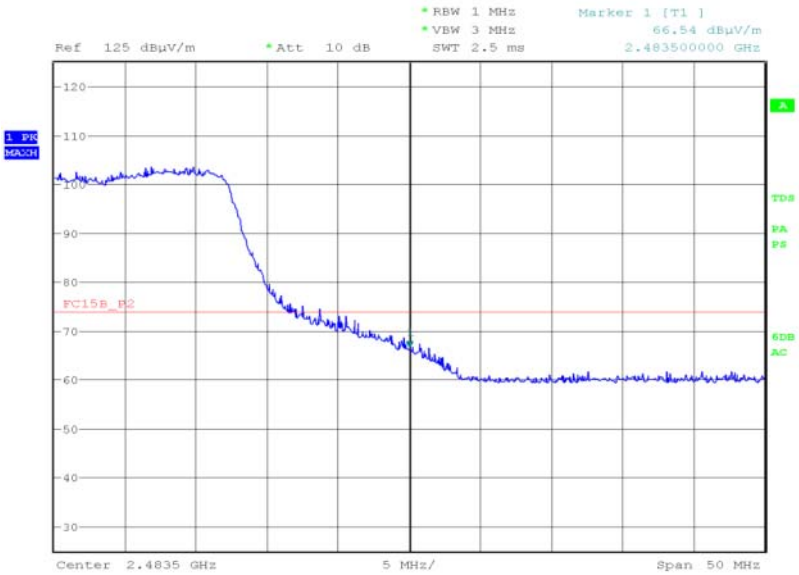


802.11n, 2412 MHz, Measured Frequency 2390 MHz, MCS6, Final Average, Restricted Band Edges Plot



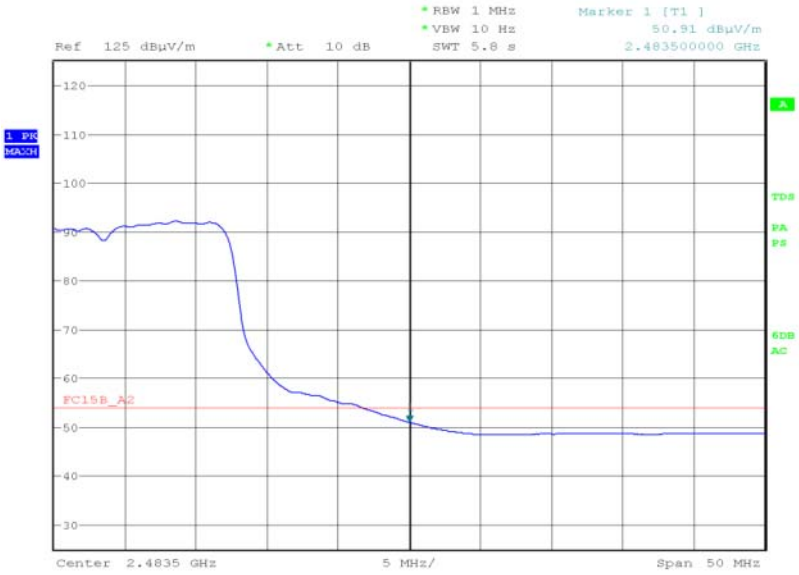

Date: 2.JUN.2015 22:00:44

802.11n, 2462 MHz, Measured Frequency 2483.5 MHz, MCS6, Final Peak, Restricted Band Edges Plot




Date: 2.JUN.2015 22:10:04

802.11n, 2462 MHz, Measured Frequency 2483.5 MHz, MCS6, Final Average, Restricted Band Edges Plot




Date: 2.JUN.2015 22:09:03

Remark

The test was performed on MCS0 because this was deemed the worst case data rate for Conducted Output Power.

The test was performed on MCS6 because this was deemed the worst case data rate for 6 dB Bandwidth.

FCC 47 CFR Part 15, Limit Clause 15.205

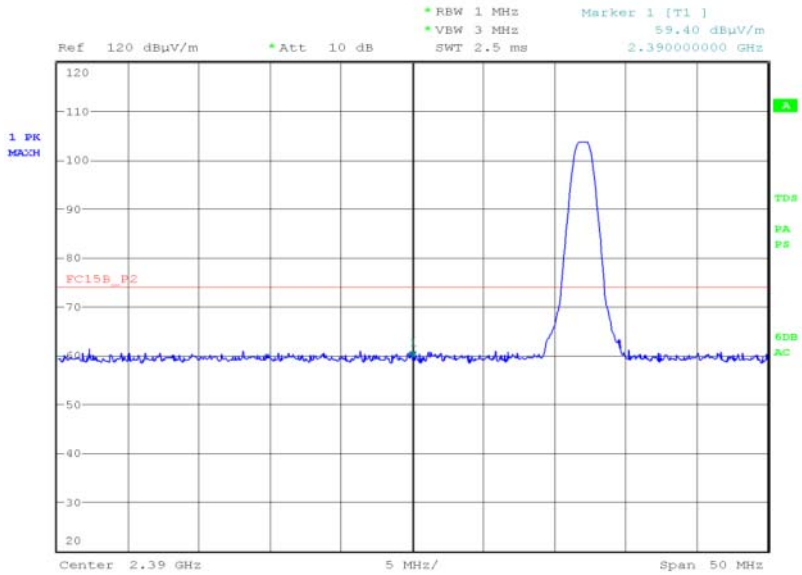
| | Peak (dBµV/m) | Average (dBµV/m) |
|---|---|---|
| Restricted Bands of Operation | 74 | 54 |

4.0 V DC Supply

Bluetooth Low Energy, GFSK, Restricted Band Edges Results

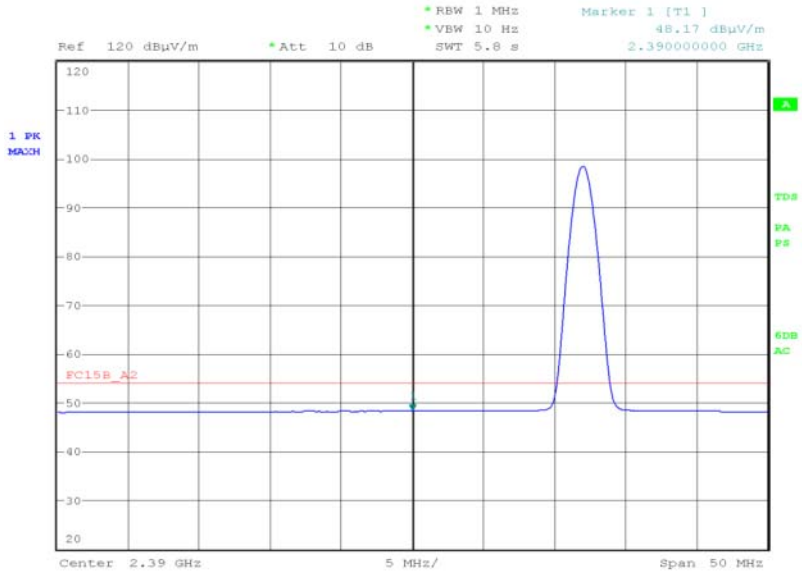
| 2402 MHz | | 2480 MHz | |
|---|---|---|---|
| Measured Frequency 2390 MHz | | Measured Frequency 2483.5 MHz | |
| dBµV/m | | dBµV/m | |
| Final Peak | Final Average | Final Peak | Final Average |
| 59.40 | 48.17 | 60.24 | 48.13 |

Bluetooth Low Energy, 2402 MHz, Measured Frequency 2390 MHz, GFSK, Final Peak, Restricted Band Edges Plot



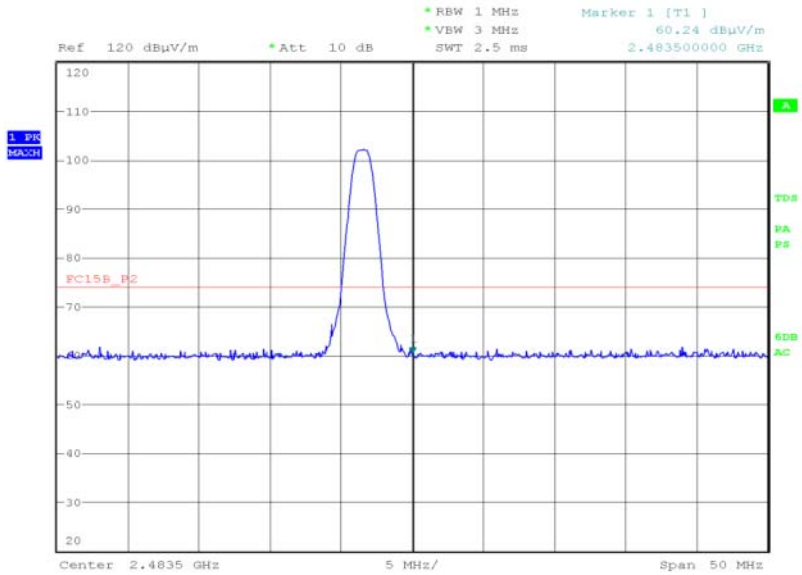
Product Service

Bluetooth Low Energy, 2402 MHz, Measured Frequency 2390 MHz, GFSK, Final Average, Restricted Band Edges Plot




Date: 3.JUN.2015 18:19:34

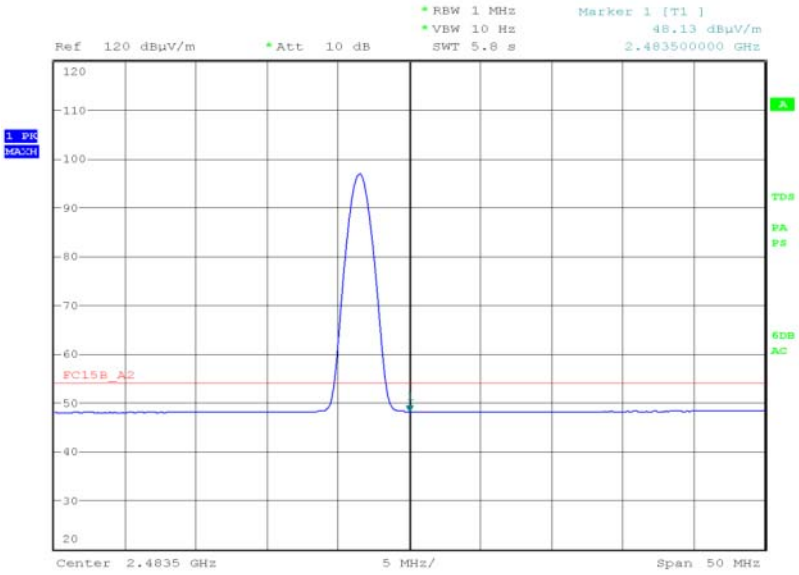
Bluetooth Low Energy, 2480 MHz, Measured Frequency 2483.5 MHz, GFSK, Final Peak, Restricted Band Edges Plot




Date: 3.JUN.2015 18:10:02

Product Service

Bluetooth Low Energy, 2480 MHz, Measured Frequency 2483.5 MHz, GFSK, Final Average, Restricted Band Edges Plot




Date: 3.JUN.2015 18:11:02

FCC 47 CFR Part 15, Limit Clause 15.205

| | Peak (dBµV/m) | Average (dBµV/m) |
|---|---|---|
| Restricted Bands of Operation | 74 | 54 |

## 2.6 AUTHORISED BAND EDGES

### 2.6.1 Specification Reference

FCC 47 CFR Part 15C, Clause 15.247 (d)

### 2.6.2 Equipment Under Test and Modification State

SHF32 S/N: IMEI 004401115362408 - Modification State 0

### 2.6.3 Date of Test

2 June 2015 & 3 June 2015

### 2.6.4 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

### 2.6.5 Test Procedure

The test was performed in accordance with KDB 558074 D01 v03r02 clause 11.0.

### 2.6.6 Environmental Conditions

| | |
|---|---|
| Ambient Temperature | 20.3 - 22.0°C |
| Relative Humidity | 43.0% |

Product Service

### 2.6.7 Test Results

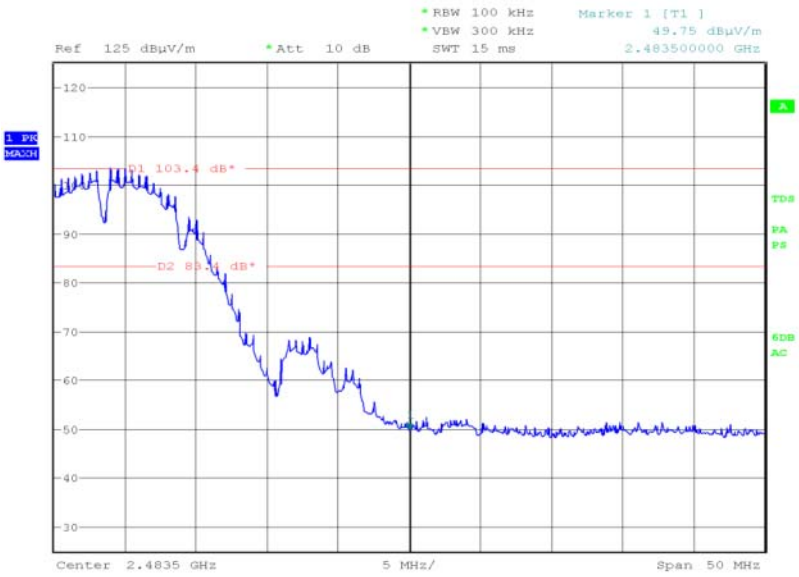
4.0 V DC Supply

802.11b, 1 Mbps, Authorised Band Edges Results

| 2412 MHz | 2462 MHz |
|---|---|
| Measured Frequency 2400.00 MHz | Measured Frequency 2483.50 MHz |
| dBµV/m | dBµV/m |
| Final Peak | Final Peak |
| 55.56 | 49.75 |

802.11b, 2412 MHz, Measured Frequency 2400.00 MHz, 1 Mbps, Final Peak, Authorised Band Edges Plot

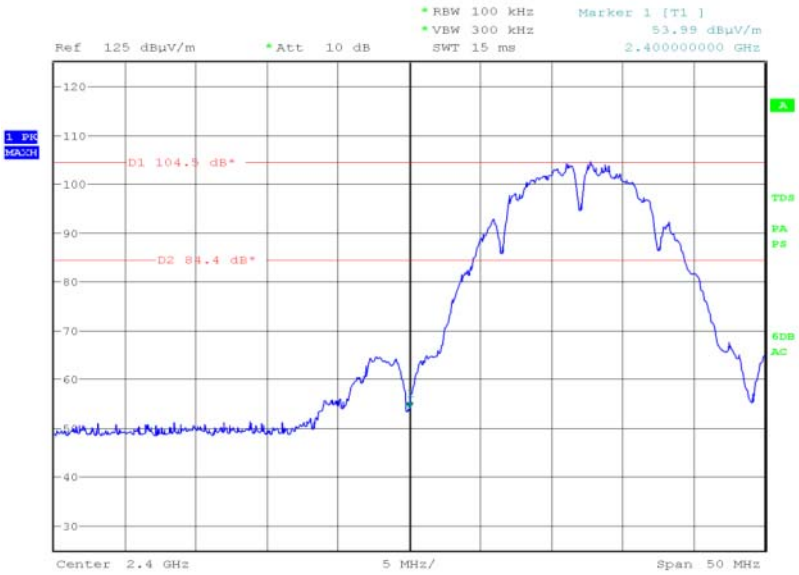
802.11b, 2462 MHz, Measured Frequency 2483.50 MHz, 1 Mbps, Final Peak, Authorised Band Edges Plot



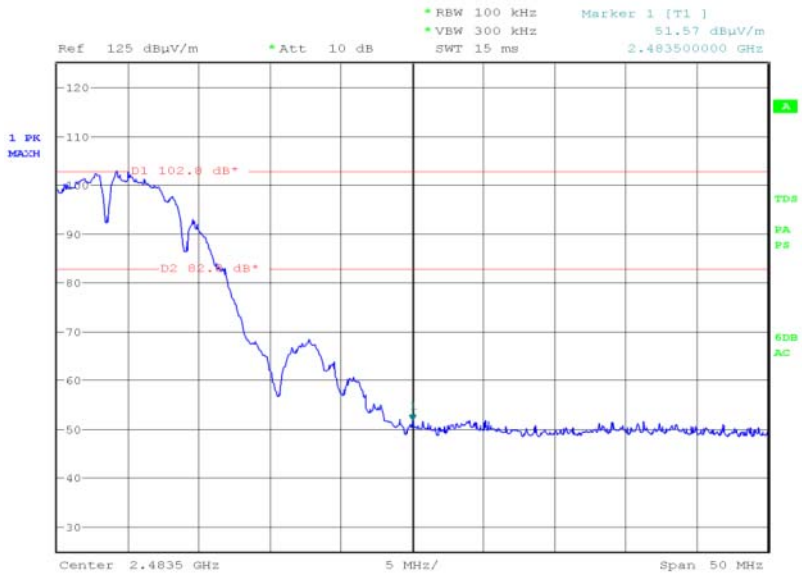
802.11b, 2 Mbps, Authorised Band Edges Results

| | |
|---|---|
| 2412 MHz | 2462 MHz |
| Measured Frequency 2400.00 MHz | Measured Frequency 2483.50 MHz |
| dBµV/m | dBµV/m |
| Final Peak | Final Peak |
| 53.99 | 51.57 |

802.11b, 2412 MHz, Measured Frequency 2400.00 MHz, 2 Mbps, Final Peak, Authorised Band Edges Plot



802.11b, 2462 MHz, Measured Frequency 2483.50 MHz, 2 Mbps, Final Peak, Authorised Band Edges Plot




Remark

The test was performed on 1 Mbps because this was deemed the worst case data rate for Conducted Output Power.

The test was performed on 2 Mbps because this was deemed the worst case data rate for 6 dB Bandwidth.

FCC 47 CFR Part 15, Limit Clause 15.247 (d)

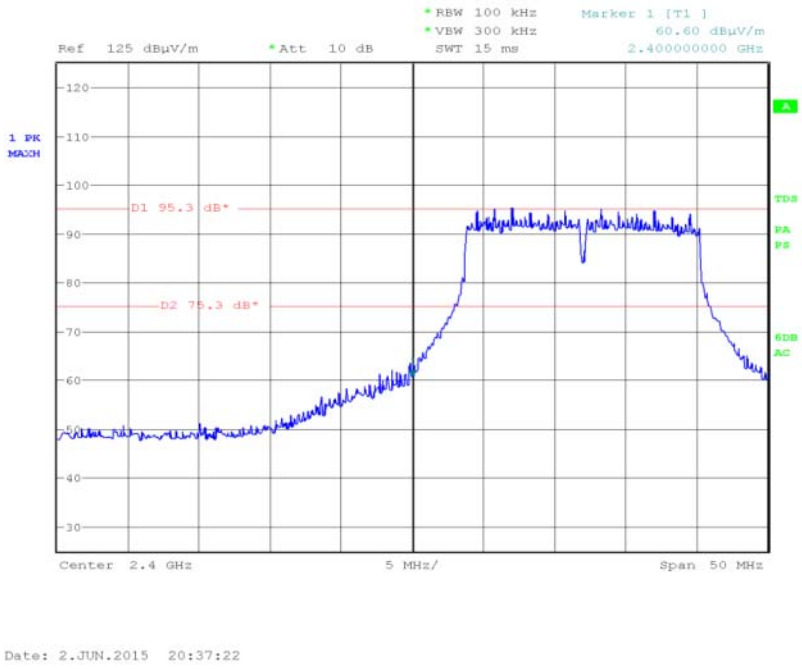
20 dB below the fundamental measured in a 100 kHz bandwidth using a peak detector. If the transmitter complies with the conducted power limits, based on the use of RMS averaging over a time interval, the attenuation required shall be 30 dB below the fundamental instead of 20 dB.

4.0 V DC Supply

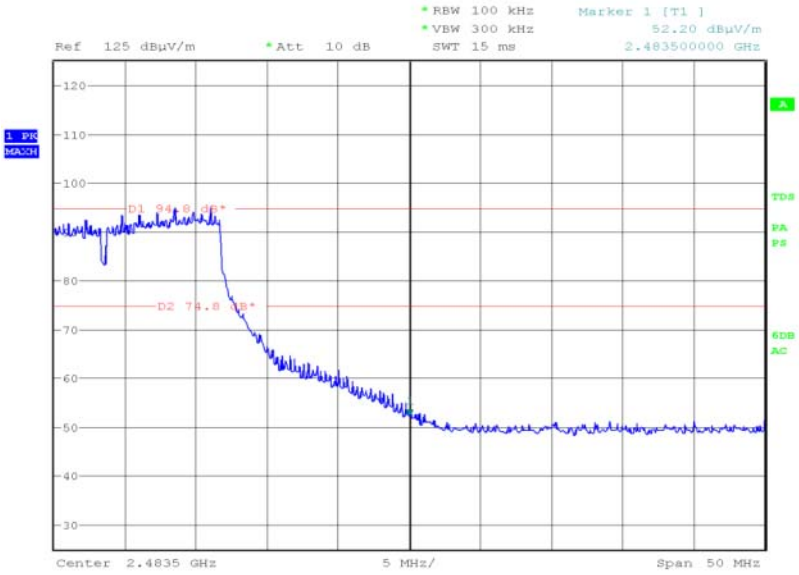
802.11g, 18 Mbps, Authorised Band Edges Results

| | |
|---|---|
| 2412 MHz | 2462 MHz |
| Measured Frequency 2400.00 MHz | Measured Frequency 2483.50 MHz |
| dBµV/m | dBµV/m |
| Final Peak | Final Peak |
| 60.60 | 52.20 |

802.11g, 2412 MHz, Measured Frequency 2400.00 MHz, 18 Mbps, Final Peak, Authorised Band Edges Plot



802.11g, 2462 MHz, Measured Frequency 2483.50 MHz, 18 Mbps, Final Peak, Authorised Band Edges Plot

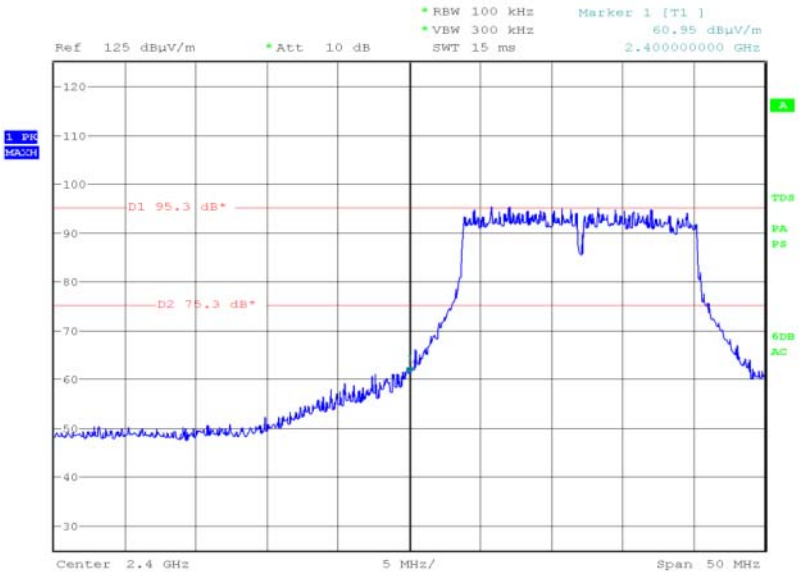



Date: 2.JUN.2015 21:09:01

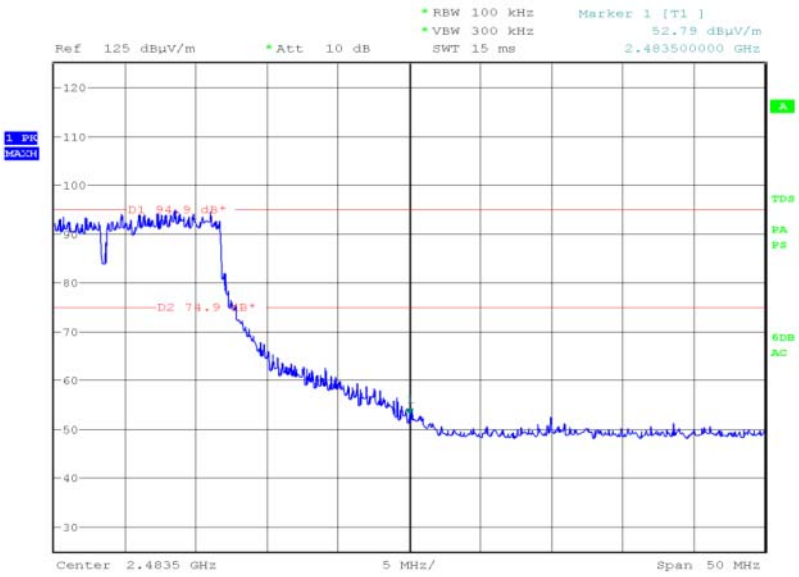
802.11g, 54 Mbps, Authorised Band Edges Results

| 2412 MHz | 2462 MHz |
|---|---|
| Measured Frequency 2400.00 MHz | Measured Frequency 2483.50 MHz |
| dBµV/m | dBµV/m |
| Final Peak | Final Peak |
| 60.95 | 52.79 |

802.11g, 2412 MHz, Measured Frequency 2400.00 MHz, 54 Mbps, Final Peak, Authorised Band Edges Plot



802.11g, 2462 MHz, Measured Frequency 2483.50 MHz, 54 Mbps, Final Peak, Authorised Band Edges Plot




Date: 2.JUN.2015 21:17:26

Remark

The test was performed on 18 Mbps because this was deemed the worst case data rate for Conducted Output Power.

The test was performed on 54 Mbps because this was deemed the worst case data rate for 6 dB Bandwidth.

FCC 47 CFR Part 15, Limit Clause 15.247 (d)

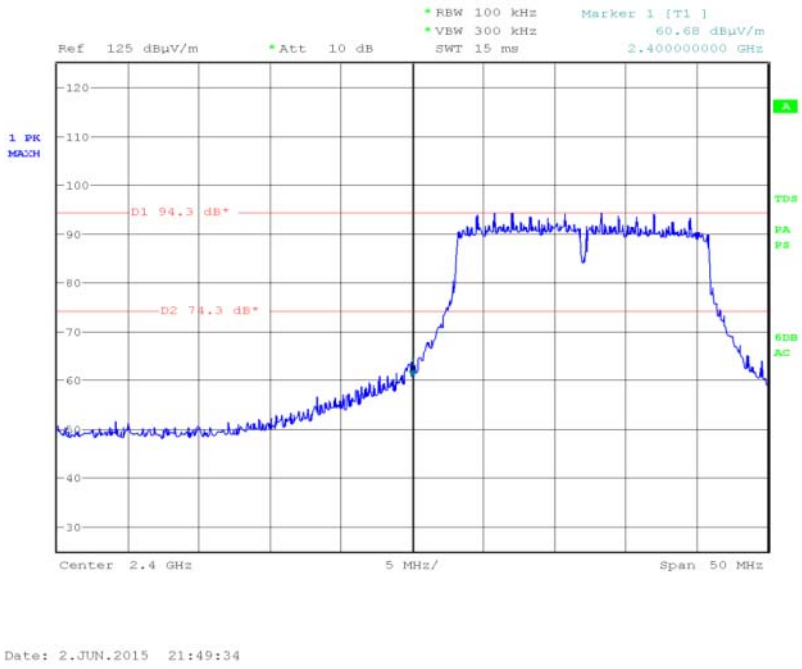
20 dB below the fundamental measured in a 100 kHz bandwidth using a peak detector. If the transmitter complies with the conducted power limits, based on the use of RMS averaging over a time interval, the attenuation required shall be 30 dB below the fundamental instead of 20 dB.

4.0 V DC Supply

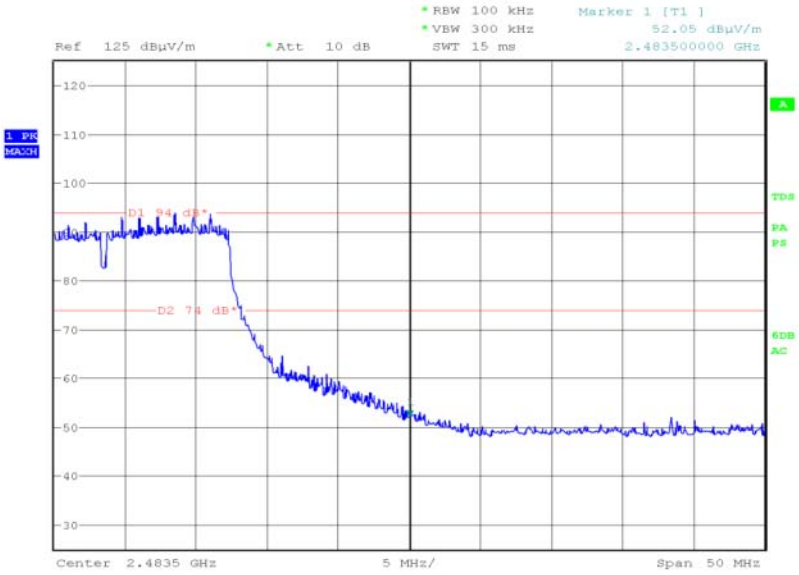
802.11n, MCS0, Authorised Band Edges Results

| | |
|---|---|
| 2412 MHz | 2462 MHz |
| Measured Frequency 2400.00 MHz | Measured Frequency 2483.50 MHz |
| dBµV/m | dBµV/m |
| Final Peak | Final Peak |
| 60.68 | 52.05 |

802.11n, 2412 MHz, Measured Frequency 2400.00 MHz, MCS0, Final Peak, Authorised Band Edges Plot



802.11n, 2462 MHz, Measured Frequency 2483.50 MHz, MCS0, Final Peak, Authorised Band Edges Plot

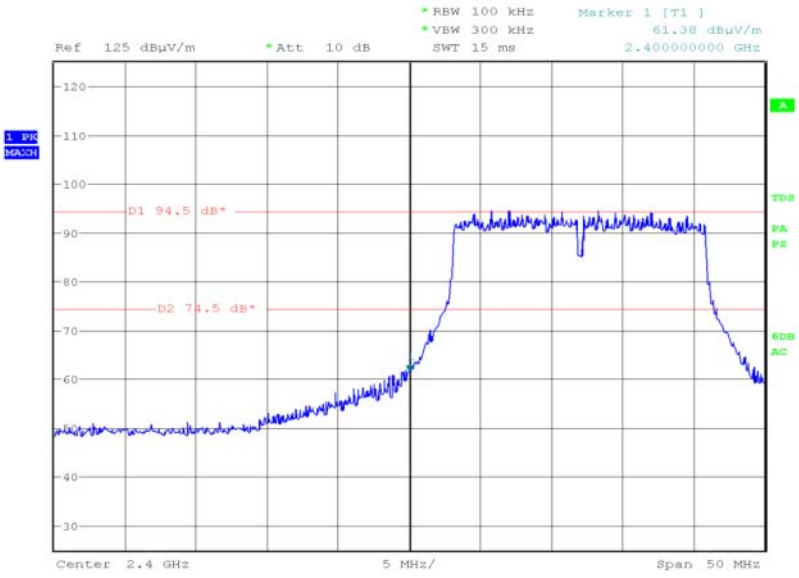



Date: 2.JUN.2015 22:17:49

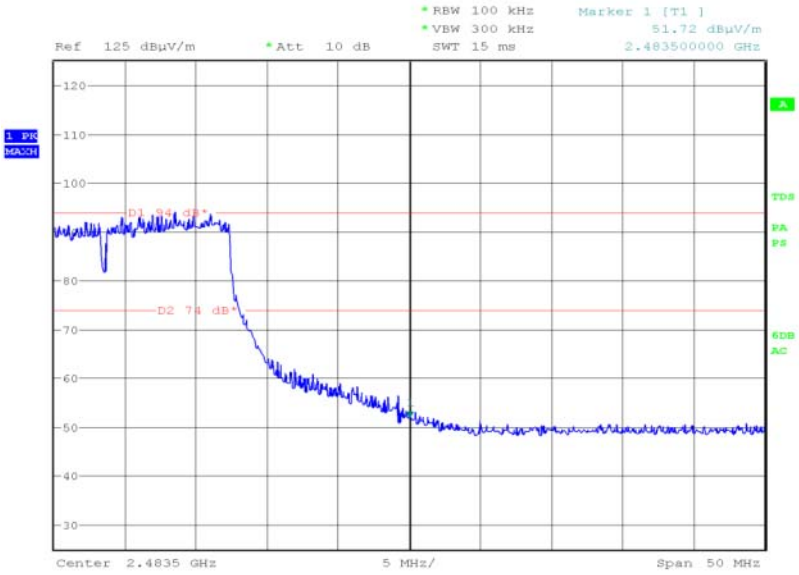
802.11n, MCS6, Authorised Band Edges Results

| | |
|---|---|
| 2412 MHz | 2462 MHz |
| Measured Frequency 2400.00 MHz | Measured Frequency 2483.50 MHz |
| dBµV/m | dBµV/m |
| Final Peak | Final Peak |
| 61.38 | 51.72 |

802.11n, 2412 MHz, Measured Frequency 2400.00 MHz, MCS6, Final Peak, Authorised Band Edges Plot



802.11n, 2462 MHz, Measured Frequency 2483.50 MHz, MCS6, Final Peak, Authorised Band Edges Plot




Remark

The test was performed on MCS0 because this was deemed the worst case data rate for Conducted Output Power.

The test was performed on MCS6 because this was deemed the worst case data rate for 6 dB Bandwidth.

FCC 47 CFR Part 15, Limit Clause 15.247 (d)

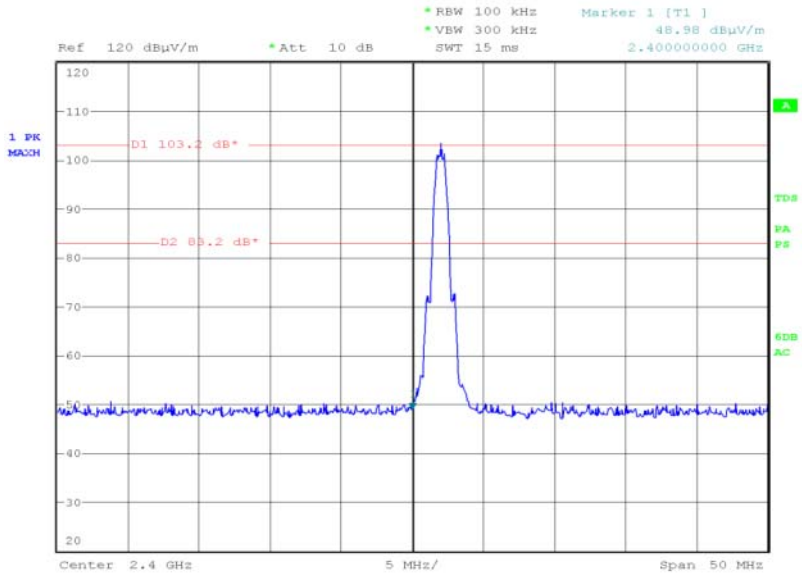
20 dB below the fundamental measured in a 100 kHz bandwidth using a peak detector. If the transmitter complies with the conducted power limits, based on the use of RMS averaging over a time interval, the attenuation required shall be 30 dB below the fundamental instead of 20 dB.

4.0 V DC Supply

Bluetooth Low Energy, GFSK, Authorised Band Edges Results

| | |
|---|---|
| 2402 MHz | 2480 MHz |
| Measured Frequency 2400.00 MHz | Measured Frequency 2483.50 MHz |
| dBµV/m | dBµV/m |
| Final Peak | Final Peak |
| 48.98 | 49.73 |

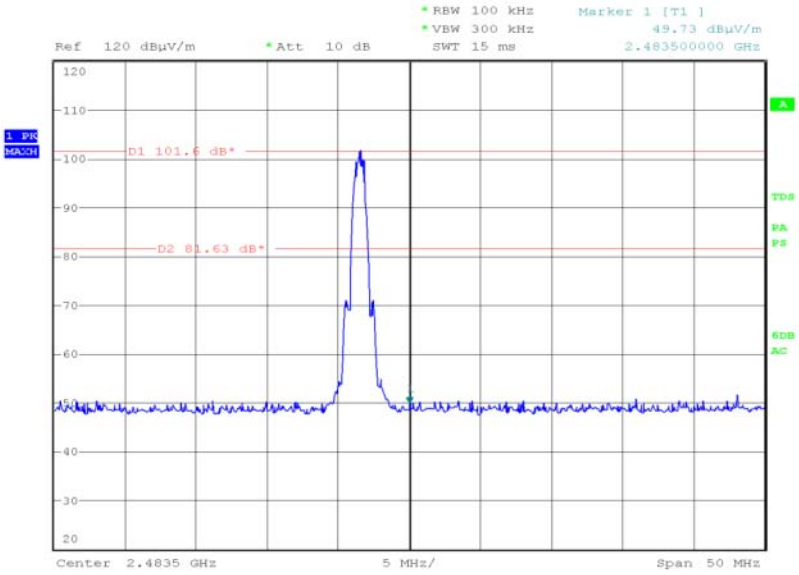
Bluetooth Low Energy, 2402 MHz, Measured Frequency 2400.00 MHz, GFSK, Final Peak, Authorised Band Edges Plot




Date: 3.JUN.2015 18:18:00

Product Service

Bluetooth Low Energy, 2480 MHz, Measured Frequency 2483.50 MHz, GFSK, Final Peak, Authorised Band Edges Plot




FCC 47 CFR Part 15, Limit Clause 15.247 (d)

20 dB below the fundamental measured in a 100 kHz bandwidth using a peak detector. If the transmitter complies with the conducted power limits, based on the use of RMS averaging over a time interval, the attenuation required shall be 30 dB below the fundamental instead of 20 dB.

## 2.7 POWER SPECTRAL DENSITY

### 2.7.1 Specification Reference

FCC 47 CFR Part 15C, Clause 15.247 (e)

### 2.7.2 Equipment Under Test and Modification State

SHF32 S/N: IMEI 004401115362465 - Modification State 0
SHF32 S/N: IMEI 004401115362408 - Modification State 0

### 2.7.3 Date of Test

4 June 2015

### 2.7.4 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

### 2.7.5 Test Procedure

802.11b - 1Mbps & 802.11n - MCS0:

The test was performed in accordance with FCC KDB 558074 D01 v03r02, clause 10.4.

802.11g - 18 Mbps, Bluetooth Low Energy:

The test was performed in accordance with FCC KDB 558074 D01 v03r02, clause 10.6.

Remarks

The duty cycle correction factor has been included in the reference level offset. The calculations were as follows:
802.11g: Duty Cycle = 95.50%, Correction factor = 0.2 dB.
Bluetooth Low Energy: Duty Cycle = 64.53%, Correction factor = 1.9 dB.

### 2.7.6 Environmental Conditions

| | |
|---|---|
| Ambient Temperature | 26.7 - 27.2°C |
| Relative Humidity | 25.0 - 26.4% |

Product Service

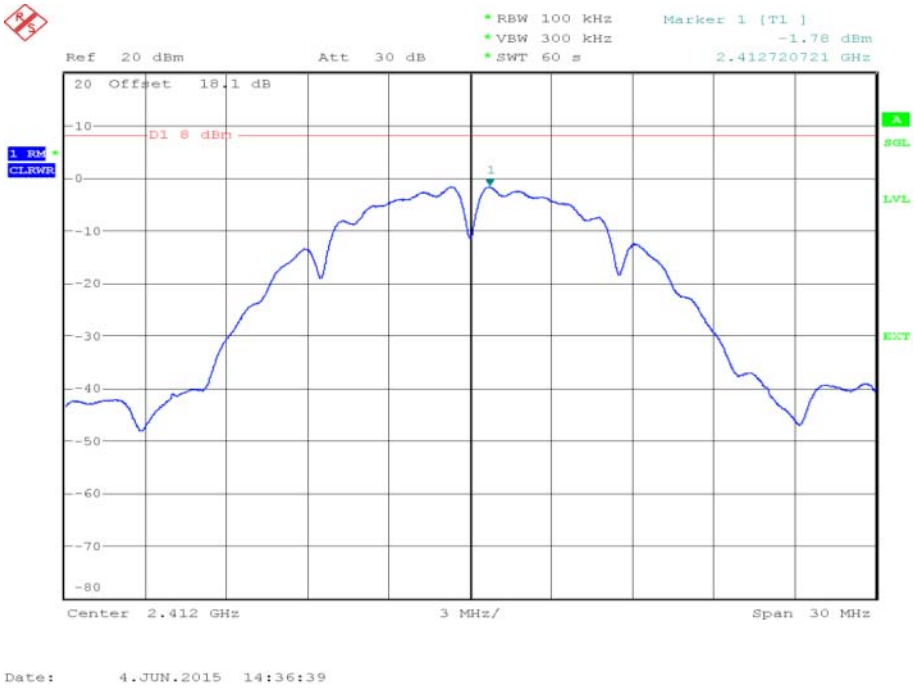
### 2.7.7 Test Results

4.0 V DC Supply

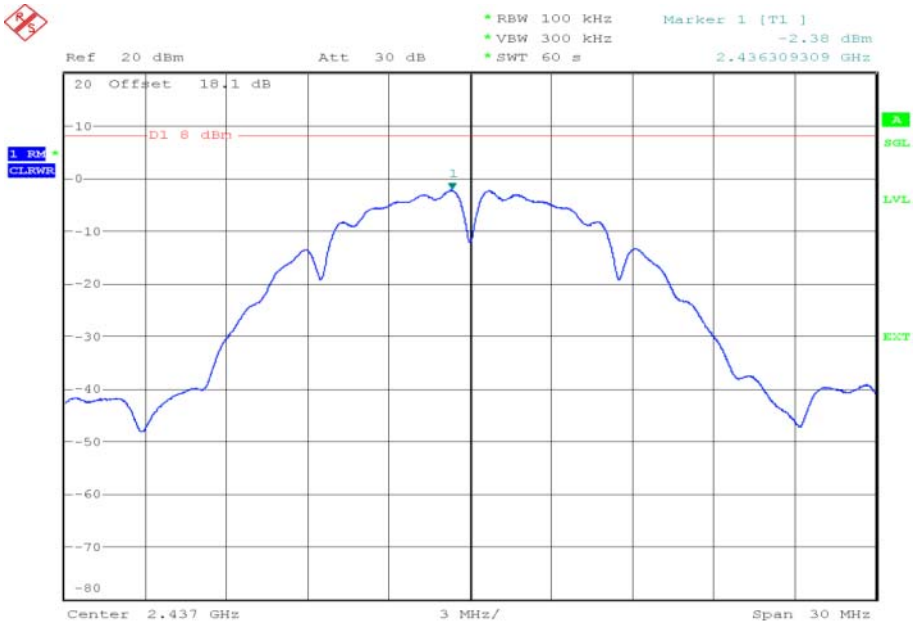
802.11b, DSSS, 1 Mbps, Power Spectral Density Results

| 2412 MHz | 2437 MHz | 2462 MHz |
|---|---|---|
| dBm | dBm | dBm |
| -1.78 | -2.38 | -1.95 |

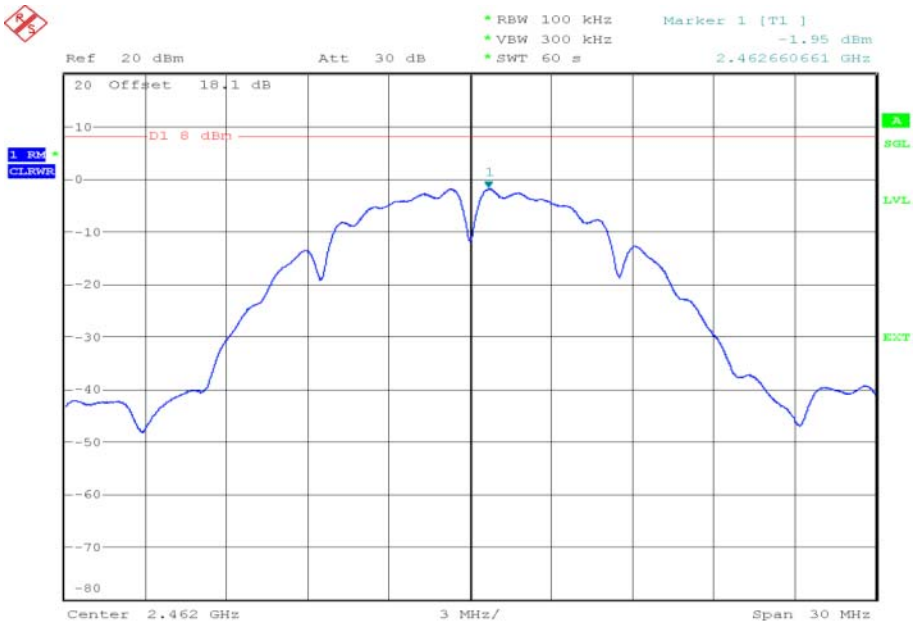
802.11b, 2412 MHz, DSSS, 1 Mbps, Power Spectral Density Plot



802.11b, 2437 MHz, DSSS, 1 Mbps, Power Spectral Density Plot




802.11b, 2462 MHz, DSSS, 1 Mbps, Power Spectral Density Plot




FCC 47 CFR Part 15, Limit Clause 15.247 (e)

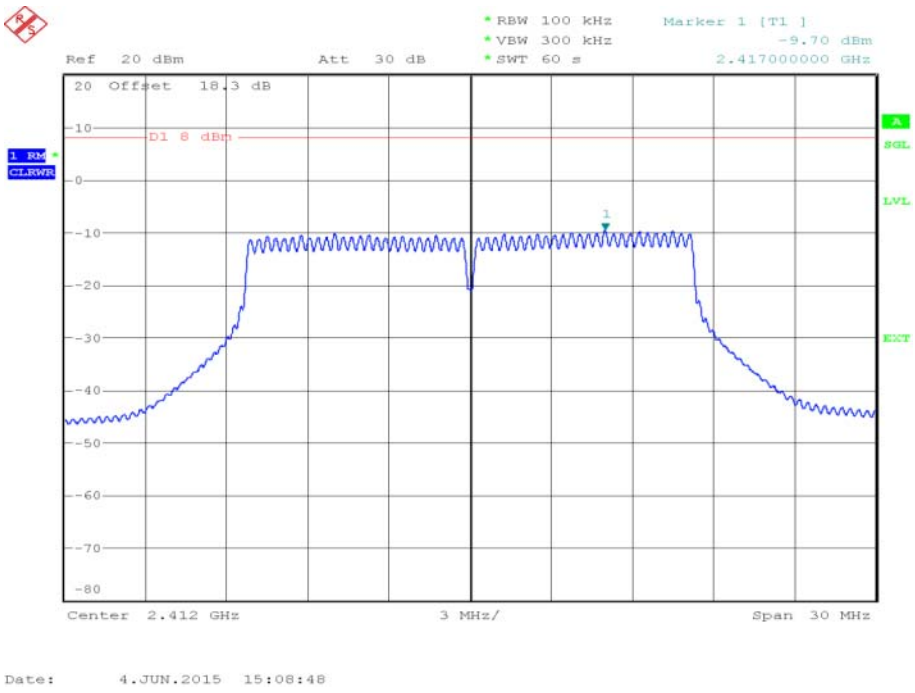
The power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

4.0 V DC Supply

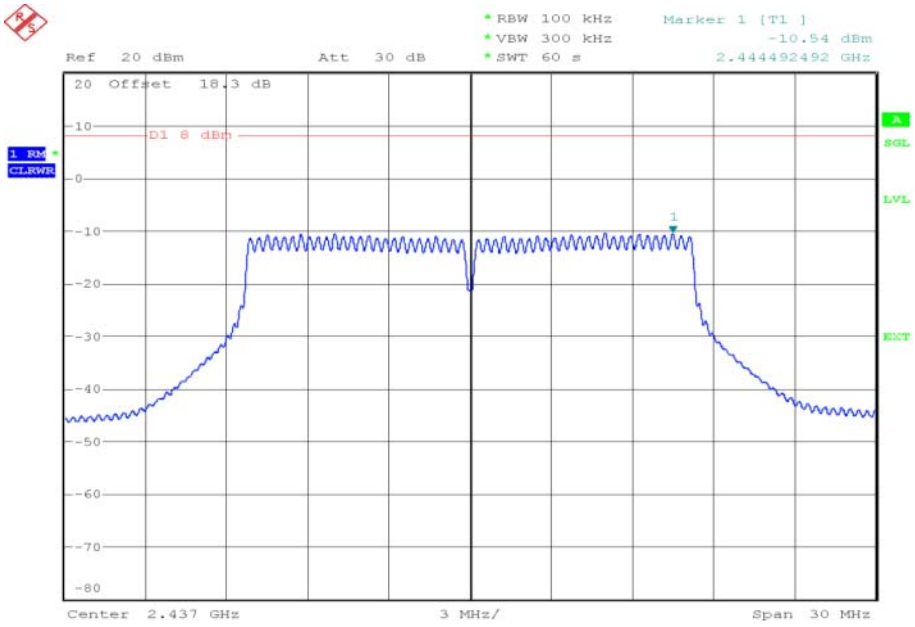
802.11g, OFDM, 18 Mbps, Power Spectral Density Results

| 2412 MHz | 2437 MHz | 2462 MHz |
|---|---|---|
| dBm | dBm | dBm |
| -9.70 | -10.54 | -9.77 |

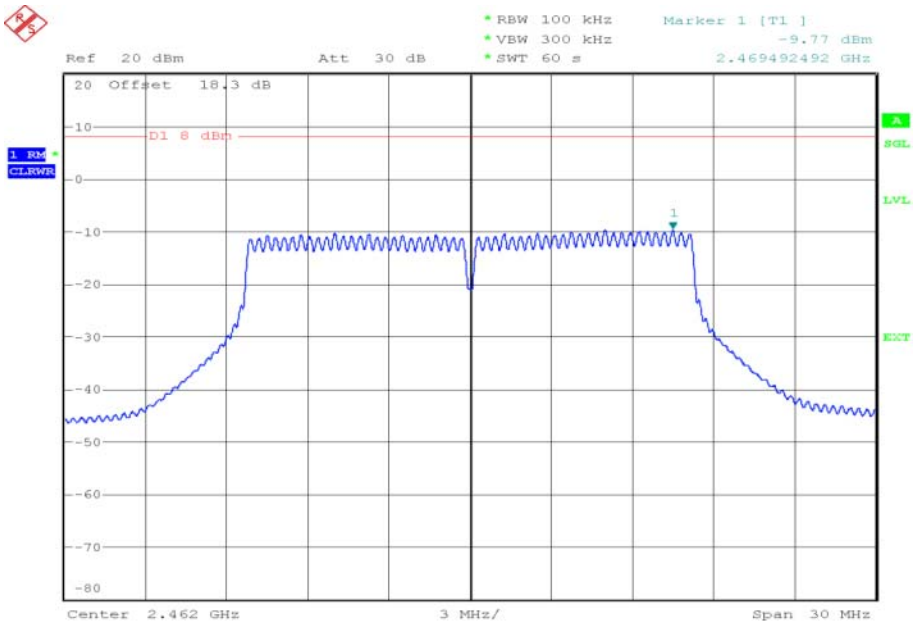
802.11g, 2412 MHz, OFDM, 18 Mbps, Power Spectral Density Plot



802.11g, 2437 MHz, OFDM, 18 Mbps, Power Spectral Density Plot




802.11g, 2462 MHz, OFDM, 18 Mbps, Power Spectral Density Plot




FCC 47 CFR Part 15, Limit Clause 15.247 (e)

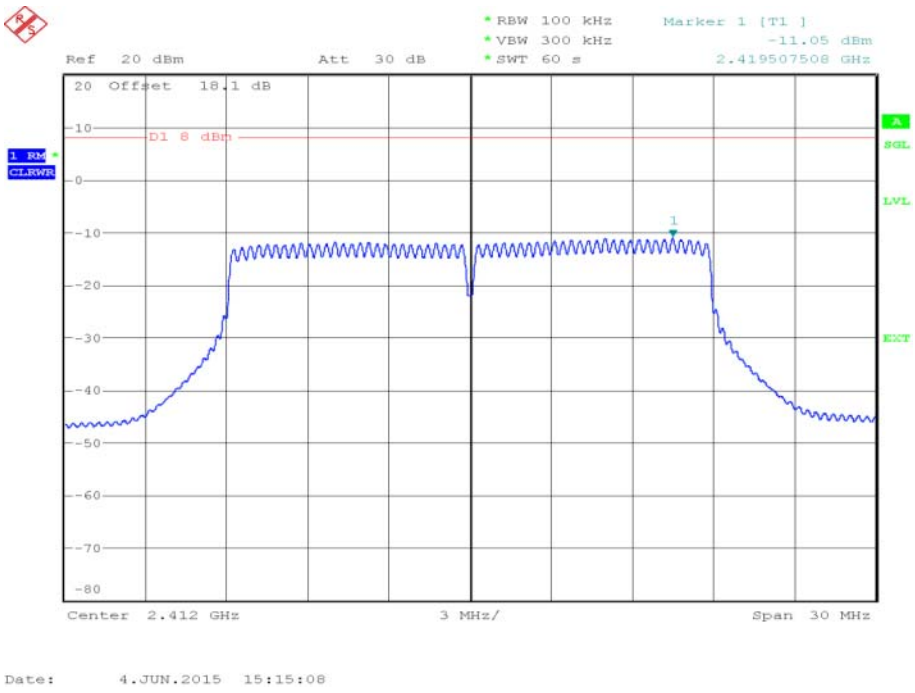
The power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

4.0 V DC Supply

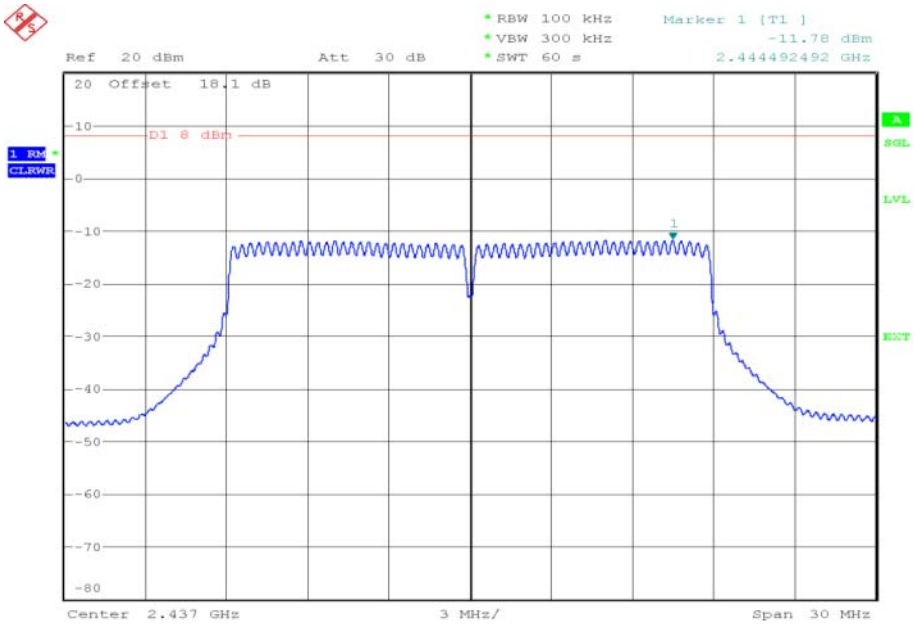
802.11n, OFDM, MCS0, Power Spectral Density Results

| 2412 MHz | 2437 MHz | 2462 MHz |
|---|---|---|
| dBm | dBm | dBm |
| -11.05 | -11.78 | -11.39 |

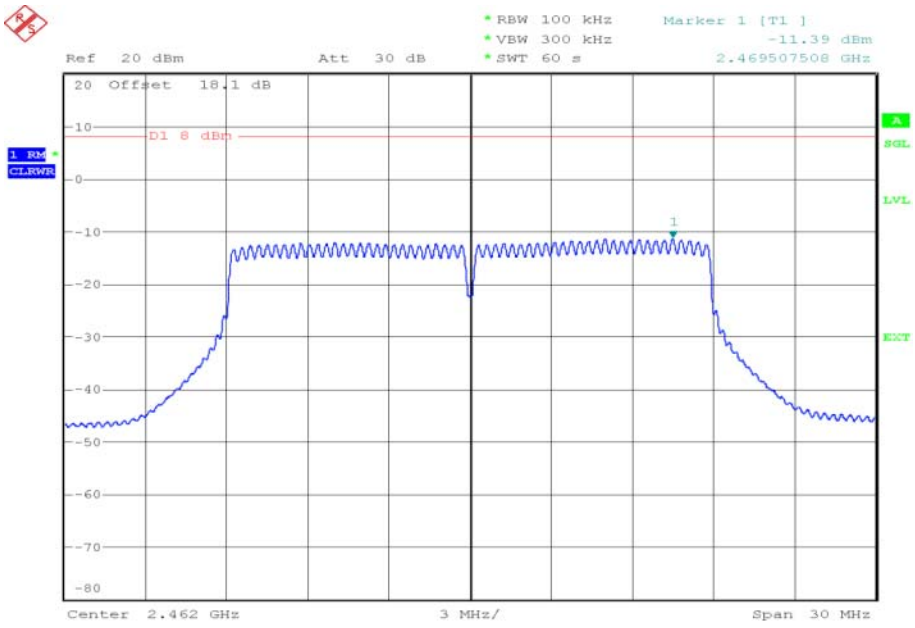
802.11n, 2412 MHz, OFDM, MCS0, Power Spectral Density Plot



802.11n, 2437 MHz, OFDM, MCS0, Power Spectral Density Plot




802.11n, 2462 MHz, OFDM, MCS0, Power Spectral Density Plot




FCC 47 CFR Part 15, Limit Clause 15.247 (e)

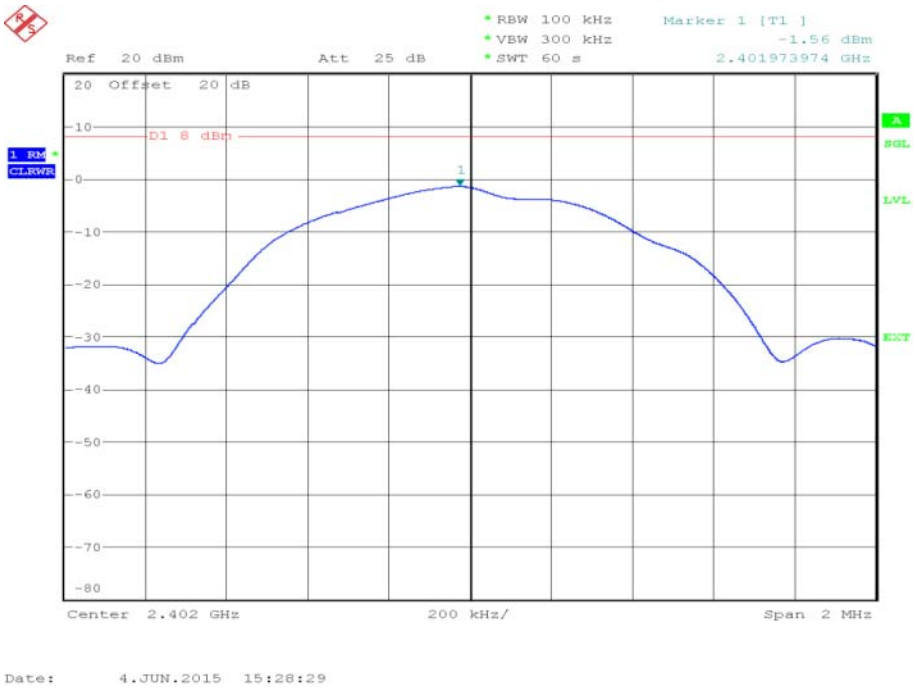
The power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

4.0 V DC Supply

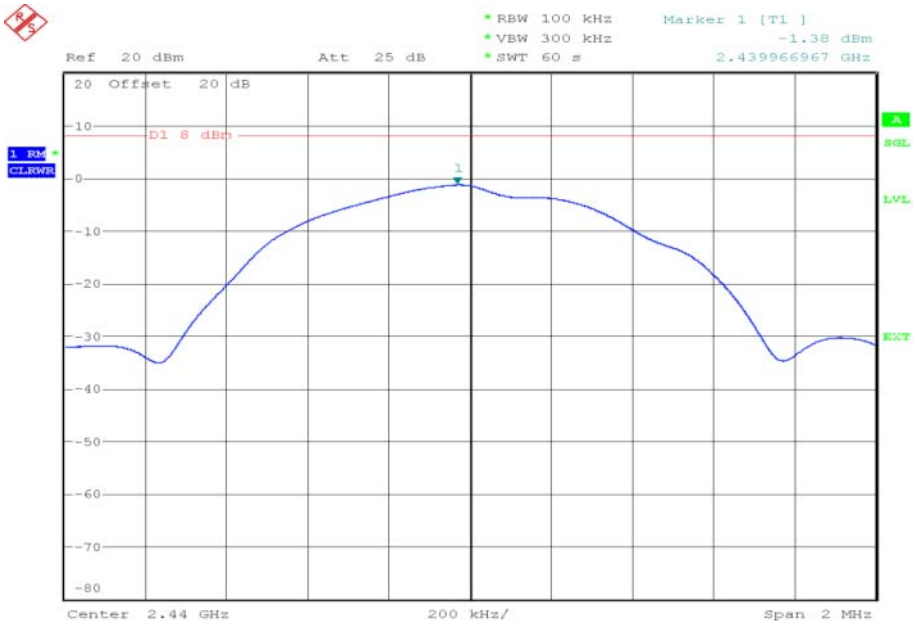
Bluetooth Low Energy, GFSK, Power Spectral Density Results

| 2402 MHz | 2440 MHz | 2480 MHz |
|---|---|---|
| dBm | dBm | dBm |
| -1.56 | -1.38 | -1.19 |

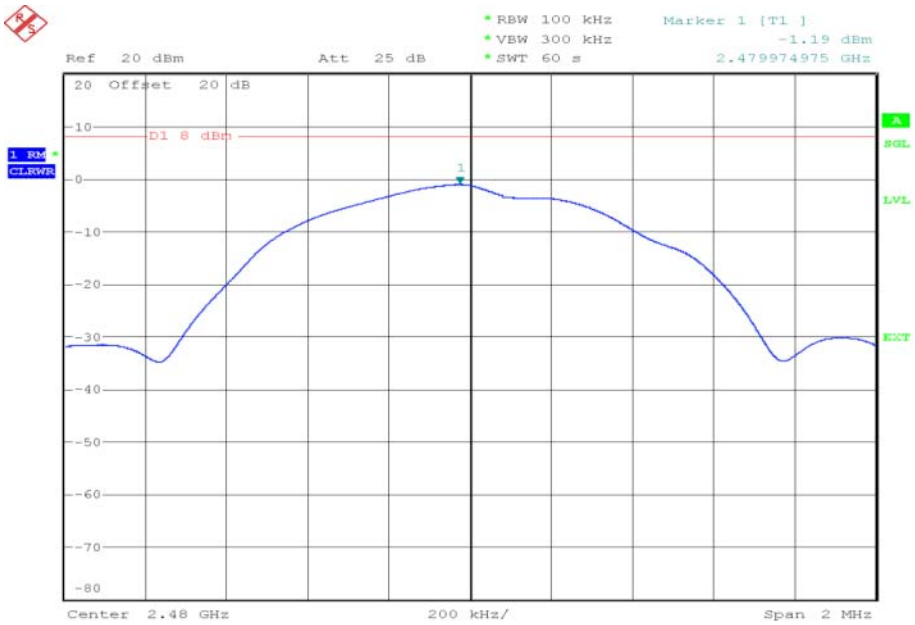
Bluetooth Low Energy, 2402 MHz, GFSK, Power Spectral Density Plot



Bluetooth Low Energy, 2440 MHz, GFSK,  Power Spectral Density Plot




Bluetooth Low Energy, 2480 MHz, GFSK, Power Spectral Density Plot




FCC 47 CFR Part 15, Limit Clause 15.247 (e)

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

Product Service

**SECTION 3**

**TEST EQUIPMENT USED**

Product Service

## 3.1 TEST EQUIPMENT USED

List of absolute measuring and other principal items of test equipment.

| Instrument | Manufacturer | Type No. | TE No. | Calibration Period (months) | Calibration Due |
|---|---|---|---|---|---|
| **Section 2.1 – AC Line Conducted Emissions** | | | | | |
| Transient Limiter | Hewlett Packard | 11947A | 15 | 12 | 16-Dec-2015 |
| LISN (1 Phase) | Chase | MN 2050 | 336 | 12 | 1-Apr-2016 |
| Screened Room (5) | Rainford | Rainford | 1545 | 24 | 26-Jun-2015 |
| Multimeter | Iso-tech | IDM101 | 2418 | 12 | 26-Sep-2015 |
| EMI Test Receiver | Rohde & Schwarz | ESU40 | 3506 | 12 | 27-Oct-2015 |
| 7m Armoured RF Cable | SSI Cable Corp. | 1501-13-13-7m WA(-) | 3600 | - | TU |
| Hygropalm Temperature and Humidity Meter | Rotronic | HP21 | 4410 | 12 | 15-Apr-2016 |
| **Section 2.2 - 6dB Bandwidth** | | | | | |
| Attenuator (10dB) | Weinschel | 47-10-34 | 481 | 12 | 1-Apr-2016 |
| Power Splitter | Weinschel | 1506A | 606 | 12 | 24-Mar-2016 |
| Power Supply Unit | Farnell | H60-25 | 1092 | - | O/P Mon |
| Multimeter | Iso-tech | IDM101 | 2419 | 12 | 7-Oct-2015 |
| Hygrometer | Rotronic | I-1000 | 2891 | 12 | 16-Jul-2015 |
| Attenuator (10dB, 50W) | Aeroflex / Weinschel | 47-10-34 | 3166 | 12 | 16-Sep-2015 |
| PXA Signal Analyser | Agilent Technologies | N9030A PXA | 4409 | 12 | 16-Feb-2016 |
| 1 metre SMA Cable | IW Microwave | 3PS-1806LC-394-3PS | 4523 | 12 | 29-Jan-2016 |
| **Section 2.3 - Maximum Conducted Output Power** | | | | | |
| Attenuator (10dB) | Weinschel | 47-10-34 | 481 | 12 | 1-Apr-2016 |
| Power Supply Unit | Farnell | H60-25 | 1092 | - | O/P Mon |
| Multimeter | Iso-tech | IDM101 | 2419 | 12 | 7-Oct-2015 |
| Hygrometer | Rotronic | I-1000 | 2891 | 12 | 16-Jul-2015 |
| Attenuator (10dB, 50W) | Aeroflex / Weinschel | 47-10-34 | 3166 | 12 | 16-Sep-2015 |
| Attenuator (10dB, 20W) | Lucas Weinschel | 1 | 3225 | 12 | 12-Dec-2015 |
| Signal Analyser | Rohde & Schwarz | FSQ 26 | 3545 | 12 | 6-Aug-2015 |
| Network Analyser | Rohde & Schwarz | ZVA 40 | 3548 | 12 | 3-Sep-2015 |
| DC - 12.4 GHz 10 dB Attenuator 1 W | Suhner | 6810.17.A | 3964 | 12 | 22-Oct-2015 |
| P-Series Power Meter | Agilent Technologies | N1911A | 3980 | 12 | 22-Sep-2015 |
| 50 MHz-18 GHz Wideband Power Sensor | Agilent Technologies | N1921A | 3982 | 12 | 22-Sep-2015 |
| Calibration Unit | Rohde & Schwarz | ZV-Z54 | 4368 | 12 | 24-Sep-2015 |
| 2 metre N-Type Cable | IW Microwave | NPS-1806LC-788-NPS | 4503 | 12 | 20-May-2016 |

| Instrument | Manufacturer | Type No. | TE No. | Calibration Period (months) | Calibration Due |
|---|---|---|---|---|---|
| **Section 2.4 - Spurious Radiated Emissions** | | | | | |
| Antenna (Double Ridge Guide) | Link Microtek Ltd | AM180HA-K-TU2 | 230 | 24 | 26-Nov-2015 |
| Antenna (Double Ridge Guide, 1GHz-18GHz) | EMCO | 3115 | 234 | 12 | 29-Apr-2016 |
| Dual Power Supply Unit | Thurlby | PL320 | 288 | - | TU |
| Pre-Amplifier | Phase One | PS04-0086 | 1533 | 12 | 23-Dec-2015 |
| Pre-Amplifier | Phase One | PSO4-0087 | 1534 | 12 | 23-Dec-2015 |
| Screened Room (5) | Rainford | Rainford | 1545 | 24 | 26-Jun-2015 |
| Turntable Controller | Inn-Co GmbH | CO 1000 | 1606 | - | TU |
| Antenna (Bilog) | Chase | CBL6143 | 2904 | 24 | 10-Jun-2015 |
| EMI Test Receiver | Rohde & Schwarz | ESU40 | 3506 | 12 | 27-Oct-2015 |
| 9m RF Cable (N Type) | Rhophase | NPS-2303-9000-NPS | 3791 | - | TU |
| Tilt Antenna Mast | maturo Gmbh | TAM 4.0-P | 3916 | - | TU |
| Mast Controller | maturo Gmbh | NCD | 3917 | - | TU |
| 1GHz to 8GHz Low Noise Amplifier | Wright Technologies | APS04-0085 | 4365 | 12 | 1-Oct-2015 |
| Hygropalm Temperature and Humidity Meter | Rotronic | HP21 | 4410 | 12 | 15-Apr-2016 |
| Suspended Substrate Highpass Filter | Advance Power Components | 11SH10-3000/X18000-O/O | 4411 | 12 | 24-Mar-2016 |
| 2m K-Type Cable (Rx) | Scott Cables | KPS-1501-2000-KPS | 4527 | 6 | 29-Jul-2015 |
| 0.5m SMA Cable (Rx) | Scott Cables | SLSLL18-SMSM-00.50M | 4528 | 6 | 29-Jul-2015 |
| **Section 2.5 - Restricted Band Edges** | | | | | |
| Antenna (Double Ridge Guide, 1GHz-18GHz) | EMCO | 3115 | 234 | 12 | 29-Apr-2016 |
| Screened Room (5) | Rainford | Rainford | 1545 | 24 | 26-Jun-2015 |
| Turntable Controller | Inn-Co GmbH | CO 1000 | 1606 | - | TU |
| EMI Test Receiver | Rohde & Schwarz | ESU40 | 3506 | 12 | 27-Oct-2015 |
| 9m RF Cable (N Type) | Rhophase | NPS-2303-9000-NPS | 3791 | - | TU |
| Tilt Antenna Mast | maturo Gmbh | TAM 4.0-P | 3916 | - | TU |
| Mast Controller | maturo Gmbh | NCD | 3917 | - | TU |
| Hygropalm Temperature and Humidity Meter | Rotronic | HP21 | 4410 | 12 | 15-Apr-2016 |
| 2m K-Type Cable (Rx) | Scott Cables | KPS-1501-2000-KPS | 4527 | 6 | 29-Jul-2015 |
| **Section 2.6 - Authorised Band Edges** | | | | | |
| Antenna (Double Ridge Guide, 1GHz-18GHz) | EMCO | 3115 | 234 | 12 | 29-Apr-2016 |
| Screened Room (5) | Rainford | Rainford | 1545 | 24 | 26-Jun-2015 |
| Turntable Controller | Inn-Co GmbH | CO 1000 | 1606 | - | TU |
| EMI Test Receiver | Rohde & Schwarz | ESU40 | 3506 | 12 | 27-Oct-2015 |
| 9m RF Cable (N Type) | Rhophase | NPS-2303-9000-NPS | 3791 | - | TU |
| Tilt Antenna Mast | maturo Gmbh | TAM 4.0-P | 3916 | - | TU |
| Mast Controller | maturo Gmbh | NCD | 3917 | - | TU |
| Hygropalm Temperature and Humidity Meter | Rotronic | HP21 | 4410 | 12 | 15-Apr-2016 |
| 2m K-Type Cable (Rx) | Scott Cables | KPS-1501-2000-KPS | 4527 | 6 | 29-Jul-2015 |

| Instrument | Manufacturer | Type No. | TE No. | Calibration Period (months) | Calibration Due |
|---|---|---|---|---|---|
| **Section 2.7 - Power Spectral Density** | | | | | |
| Attenuator (10dB) | Weinschel | 47-10-34 | 481 | 12 | 1-Apr-2016 |
| Power Splitter | Weinschel | 1506A | 606 | 12 | 24-Mar-2016 |
| Power Supply Unit | Farnell | H60-25 | 1092 | - | O/P Mon |
| Rubidium Standard | Rohde & Schwarz | XSRM | 1316 | 6 | 28-Jul-2015 |
| Multimeter | Iso-tech | IDM101 | 2419 | 12 | 7-Oct-2015 |
| Spectrum Analyser | Rohde & Schwarz | FSU26 | 2747 | 12 | 20-Jan-2016 |
| Hygrometer | Rotronic | I-1000 | 2891 | 12 | 16-Jul-2015 |
| Attenuator (10dB, 50W) | Aeroflex / Weinschel | 47-10-34 | 3166 | 12 | 16-Sep-2015 |
| Network Analyser | Rohde & Schwarz | ZVA 40 | 3548 | 12 | 3-Sep-2015 |
| Calibration Unit | Rohde & Schwarz | ZV-Z54 | 4368 | 12 | 24-Sep-2015 |
| Frequency Standard | Spectracom | Secure Sync 1200-0408-0601 | 4393 | 6 | 28-Jul-2015 |
| 1 metre SMA Cable | IW Microwave | 3PS-1806LC-394-3PS | 4523 | 12 | 29-Jan-2016 |

TU – Traceability Unscheduled
O/P MON – Output Monitored with Calibrated Equipment

Product Service

## 3.2 MEASUREMENT UNCERTAINTY

For a 95% confidence level, the measurement uncertainties for defined systems are:-

| Test Discipline | MU |
|---|---|
| 6 dB Bandwidth | ± 212.114 kHz |
| AC Line Conducted Emissions | ± 3.2 dB |
| Maximum Conducted Output Power | ± 0.70 dB |
| Power Spectral Density | ± 3.0 dB |
| Spurious Radiated Emissions | 30 MHz to 1 GHz: ± 5.1 dB<br>1 GHz to 40 GHz: ± 6.3 dB |
| Authorised Band Edges | Conducted: ± 3.08 dB<br>Radiated: 30 MHz to 1 GHz: ± 5.1 dB<br>Radiated: 1 GHz to 40 GHz: ± 6.3 dB |
| Restricted Band Edges | 30 MHz to 1 GHz: ± 5.1 dB<br>1 GHz to 40 GHz: ± 6.3 dB |

Product Service

## SECTION 4

## ACCREDITATION, DISCLAIMERS AND COPYRIGHT

## 4.1 ACCREDITATION, DISCLAIMERS AND COPYRIGHT

This report relates only to the actual item/items tested.

Our UKAS Accreditation does not cover opinions and interpretations and any expressed are outside the scope of our UKAS Accreditation.

Results of tests not covered by our UKAS Accreditation Schedule are marked NUA (Not UKAS Accredited).