

# Test report

**293786-1TRFWL**

Date of issue: September 30, 2015

Applicant:

**Mitel Networks Corporation**

Product:

**IP Phone**

Model:

**6873i**

Model variant:

FCC ID:

**EHQAUA**

IC Registration number:

**173A-AUA**

Specifications:

◆ **FCC 47 CFR Part 15 Subpart C, §15.247**

Operation in the 902–928 MHz, 2400–2483.5 MHz, 5725–5850 MHz

◆ **RSS-247, Issue 1, May 2015, Section 5**

Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSs)  
and Licence-Exempt Local Area Network (LE-LAN) Devices

#### Test location

|              |                                                      |
|--------------|------------------------------------------------------|
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| Province     | Ontario                                              |
| Postal code  | K1V 1H2                                              |
| Country      | Canada                                               |
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| Toll free    | +1 800 563 6336                                      |
| Website      | www.nemko.com                                        |
| Site number  | FCC: 176392; IC: 2040A-4 (3 m semi anechoic chamber) |

|                    |                                                                                     |
|--------------------|-------------------------------------------------------------------------------------|
| Tested by          | Andrey Adelberg, Senior Wireless/EMC Specialist                                     |
| Reviewed by        | Kevin Rose, Wireless/EMC Specialist                                                 |
| Review date        | September 30, 2015                                                                  |
| Reviewer signature |  |

#### Limits of responsibility

Note that the results contained in this report relate only to the items tested and were obtained in the period between the date of initial receipt of samples and the date of issue of the report.

This test report has been completed in accordance with the requirements of ISO/IEC 17025. All results contain in this report are within Nemko Canada's ISO/IEC 17025 accreditation.

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## Section 1. Report summary

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### 1.1 Applicant and manufacturer

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|                 |                            |
|-----------------|----------------------------|
| Company name    | Mitel Networks Corporation |
| Address         | 350 Legget Drive           |
| City            | Kanata                     |
| Province/State  | Ontario                    |
| Postal/Zip code | K2K 2W7                    |
| Country         | Canada                     |

### 1.2 Test specifications

---

|                                              |                                                                                                                              |
|----------------------------------------------|------------------------------------------------------------------------------------------------------------------------------|
| FCC 47 CFR Part 15, Subpart C, Clause 15.247 | Operation in the 902–928 MHz, 2400–2483.5 MHz                                                                                |
| RSS-247, Issue 1, May 2015, Section 5        | Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSs) and Licence-Exempt Local Area Network (LE-LAN) Devices |

### 1.3 Test methods

---

|                                                       |                                                                                                               |
|-------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|
| 558074 D01 DTS Meas Guidance v03r03<br>(June 9, 2015) | Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247 |
| ANSI C63.10 v2013                                     | American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices                |

### 1.4 Statement of compliance

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In the configuration tested, the EUT was found compliant.

Testing was completed against all relevant requirements of the test standard. Results obtained indicate that the product under test complies in full with the requirements tested. The test results relate only to the items tested.

See “Summary of test results” for full details.

### 1.5 Exclusions

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None

### 1.6 Test report revision history

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| Revision # | Details of changes made to test report |
|------------|----------------------------------------|
| TRF        | Original report issued                 |

## Section 2. Summary of test results

### 2.1 FCC Part 15 Subpart C, general requirements test results

| Part       | Test description          | Verdict           |
|------------|---------------------------|-------------------|
| §15.207(a) | Conducted limits          | Pass              |
| §15.31(e)  | Variation of power source | Pass <sup>1</sup> |
| §15.203    | Antenna requirement       | Pass <sup>2</sup> |

Notes: <sup>1</sup> Measurements of the variation of the input power or the radiated signal level of the fundamental frequency component of the emission, as appropriate, was performed with the supply voltage varied between 85 % and 115 % of the nominal rated supply voltage. No noticeable output power variation was observed

<sup>2</sup> The Antenna is located within the enclosure of EUT and is non-detachable.

### 2.2 FCC Part 15 Subpart C, intentional radiators test results

| Part               | Test description                                                                                                           | Verdict        |
|--------------------|----------------------------------------------------------------------------------------------------------------------------|----------------|
| §15.247(a)(1)(i)   | Frequency hopping systems operating in the 902–928 MHz band                                                                | Not applicable |
| §15.247(a)(1)(ii)  | Frequency hopping systems operating in the 5725–5850 MHz band                                                              | Not applicable |
| §15.247(a)(1)(iii) | Frequency hopping systems operating in the 2400–2483.5 MHz band                                                            | Pass           |
| §15.247(a)(2)      | Minimum 6 dB bandwidth for systems using digital modulation techniques                                                     | Pass           |
| §15.247(b)(1)      | Maximum peak output power of frequency hopping systems operating in the 2400–2483.5 MHz band and 5725–5850 MHz band        | Pass           |
| §15.247(b)(2)      | Maximum peak output power of Frequency hopping systems operating in the 902–928 MHz band                                   | Not applicable |
| §15.247(b)(3)      | Maximum peak output power of systems using digital modulation in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands | Pass           |
| §15.247(c)(1)      | Fixed point-to-point operation with directional antenna gains greater than 6 dBi                                           | Not applicable |
| §15.247(c)(2)      | Transmitters operating in the 2400–2483.5 MHz band that emit multiple directional beams                                    | Not applicable |
| §15.247(d)         | Spurious emissions                                                                                                         | Pass           |
| §15.247(e)         | Power spectral density for digitally modulated devices                                                                     | Pass           |
| §15.247(f)         | Time of occupancy for hybrid systems                                                                                       | Not applicable |

Note: EUT operates in two modes: frequency hopping device (BT) and digitally modulated device (BLE)

### 2.3 IC RSS-GEN, Issue 4, test results

| Part  | Test description                                                         | Verdict        |
|-------|--------------------------------------------------------------------------|----------------|
| 7.1.2 | Receiver radiated emission limits                                        | Not applicable |
| 7.1.3 | Receiver conducted emission limits                                       | Not applicable |
| 8.8   | Power Line Conducted Emissions Limits for Licence-Exempt Radio Apparatus | Pass           |

Notes: <sup>1</sup> According to sections 5.2 and 5.3 of RSS-Gen, Issue 4 the EUT does not have a stand-alone receiver neither scanner receiver, therefore exempt from receiver requirements.

## 2.4 IC RSS-247, Issue 1, test results

| Part    | Test description                                                                       | Verdict        |
|---------|----------------------------------------------------------------------------------------|----------------|
| 5.1     | Frequency Hopping Systems (FHSs)                                                       |                |
| 5.1 (1) | Bandwidth of a frequency hopping channel                                               | Pass           |
| 5.1 (2) | Minimum channel spacing for frequency hopping systems                                  | Pass           |
| 5.1 (3) | Frequency hopping systems operating in the 902–928 MHz band                            | Not applicable |
| 5.1 (4) | Frequency hopping systems operating in the 2400–2483.5 MHz band                        | Pass           |
| 5.1 (5) | Frequency hopping systems operating in the 5725–5850 MHz band                          | Not applicable |
| 5.2     | Digital Transmission Systems (DTSS)                                                    |                |
| 5.2 (1) | Minimum 6 dB bandwidth                                                                 | Pass           |
| 5.2 (2) | Maximum power spectral density                                                         | Pass           |
| 5.3     | Hybrid Systems                                                                         |                |
| 5.3 (1) | Digital modulation turned off                                                          | Not applicable |
| 5.3 (2) | Frequency hopping turned off                                                           | Not applicable |
| 5.4     | Transmitter output power and e.i.r.p. requirements                                     |                |
| 5.4 (1) | Frequency hopping systems operating in the 902–928 MHz band                            | Not applicable |
| 5.4 (2) | Frequency hopping systems operating in the 2400–2483.5 MHz band                        | Pass           |
| 5.4 (3) | Frequency hopping systems operating in the 5725–5850 MHz                               | Not applicable |
| 5.4 (4) | Systems employing digital modulation techniques                                        | Pass           |
| 5.4 (5) | Point-to-point systems in 2400–2483.5 MHz and 5725–5850 MHz band                       | Not applicable |
| 5.4 (6) | Transmitters which operate in the 2400–2483.5 MHz band with multiple directional beams | Not applicable |
| 5.5     | Out-of-band emissions                                                                  | Pass           |

Notes: EUT operates in two modes: frequency hopping device (BT) and digitally modulated device (BLE)

## Section 3. Equipment under test (EUT) details

### 3.1 Sample information

|                        |                   |
|------------------------|-------------------|
| Receipt date           | September 8, 2015 |
| Nemko sample ID number | 1                 |

### 3.2 EUT information

|               |                                                                 |
|---------------|-----------------------------------------------------------------|
| Product name  | IP phone                                                        |
| Model         | 6873i                                                           |
| Model variant | N/A                                                             |
| Serial number | 2EHFW153400U (conducted sample); 2EHFW153401Z (radiated sample) |

### 3.3 Technical information

|                                         |                                                                                                                                                                                      |
|-----------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Applicant IC company number             | 173A                                                                                                                                                                                 |
| IC UPN number                           | AQUA                                                                                                                                                                                 |
| All used IC test site(s) Reg. number    | 2040A-4                                                                                                                                                                              |
| RSS number and Issue number             | RSS-247 Issue 1, May 2015                                                                                                                                                            |
| Frequency band                          | 2400–2483.5 MHz                                                                                                                                                                      |
| Frequency Min (MHz)                     | 2402                                                                                                                                                                                 |
| Frequency Max (MHz)                     | 2480                                                                                                                                                                                 |
| RF power BT (W), Conducted              | 0.00177 (2.48 dBm)                                                                                                                                                                   |
| RF power BLE (W), Conducted             | 0.00192 (2.83 dBm)                                                                                                                                                                   |
| Field strength, Units @ distance        | N/A                                                                                                                                                                                  |
| Measured BW (kHz) (20 dB for BT)        | 899                                                                                                                                                                                  |
| Measured BW (kHz) (6 dB for BLE)        | 701.92                                                                                                                                                                               |
| Calculated BW (kHz), as per TRC-43      | N/A                                                                                                                                                                                  |
| Type of modulation                      | EDR and BLE                                                                                                                                                                          |
| Emission classification (F1D, G1D, D1D) | F1D                                                                                                                                                                                  |
| Transmitter spurious, Units @ distance  | 53.27 dBμV/m average at 2483.5 MHz @ 3 m                                                                                                                                             |
| Power requirements                      | 120 V <sub>AC</sub> 60 Hz via power adapter                                                                                                                                          |
| Antenna information                     | SMD Antenna, EIA 1210, Detuning resilient, Edge Mount P/N 2450AT18D0100 1.5 dBi gain.<br>The EUT uses a unique antenna coupling/ non-detachable antenna to the intentional radiator. |

### 3.4 Product description and theory of operation

EUT is an IP phone with Bluetooth BT and BLE connectivity.

### 3.5 EUT exercise details

EUT was connected to a laptop via Ethernet switch and TeraTerm session was utilized to control RF module.

3.6 EUT setup diagram

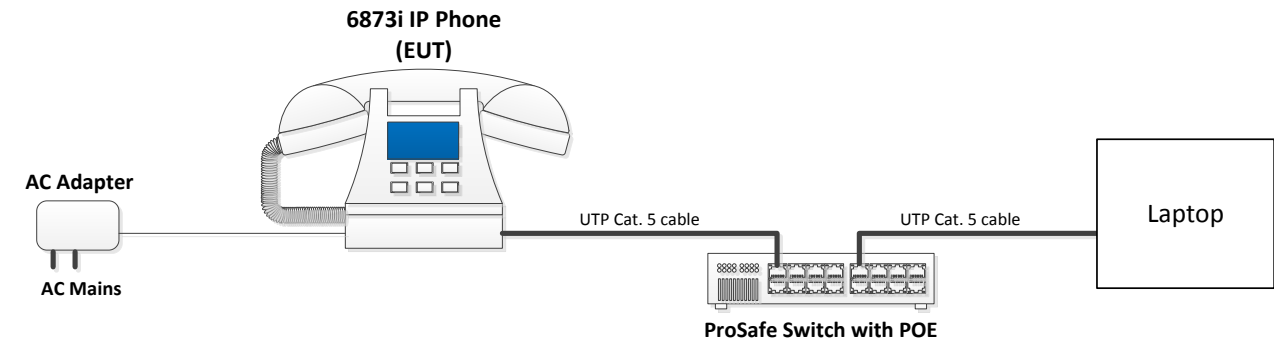


Figure 3.6-1: Setup diagram

3.7 EUT sub assemblies

Table 3.7-1: EUT sub assemblies

| Description             | Brand name   | Model/Part number | Serial number |
|-------------------------|--------------|-------------------|---------------|
| ProSafe Switch with POE | Netgear      | FS108P            | 16A2563F0029F |
| AC Adapter              | Adapter Tech | ATS036T-W480V     | None          |

**Section 4.**   Engineering considerations

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**4.1**   Modifications incorporated in the EUT

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There were no modifications performed to the EUT during this assessment.

**4.2**   Technical judgment

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None

**4.3**   Deviations from laboratory tests procedures

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No deviations were made from laboratory procedures.

# Section 5. Test conditions

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## 5.1 Atmospheric conditions

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|                   |               |
|-------------------|---------------|
| Temperature       | 15–30 °C      |
| Relative humidity | 20–75 %       |
| Air pressure      | 860–1060 mbar |

When it is impracticable to carry out tests under these conditions, a note to this effect stating the ambient temperature and relative humidity during the tests shall be recorded and stated.

## 5.2 Power supply range

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The normal test voltage for equipment to be connected to the mains shall be the nominal mains voltage. For the purpose of the present document, the nominal voltage shall be the declared voltage, or any of the declared voltages  $\pm 5\%$ , for which the equipment was designed.



# Section 6. Measurement uncertainty

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## 6.1 Uncertainty of measurement

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Measurement uncertainty budgets for the tests are detailed below. Measurement uncertainty calculations assume a coverage factor of  $K = 2$  with 95% certainty.

| Test name                         | Measurement uncertainty, dB |
|-----------------------------------|-----------------------------|
| All antenna port measurements     | 0.55                        |
| Conducted spurious emissions      | 1.13                        |
| Radiated spurious emissions       | 3.78                        |
| AC power line conducted emissions | 3.55                        |

## Section 7. Test equipment

### 7.1 Test equipment list

*Table 7.1-1: Equipment list*

| Equipment                   | Manufacturer           | Model no.    | Asset no. | Cal cycle | Next cal.  |
|-----------------------------|------------------------|--------------|-----------|-----------|------------|
| 3 m EMI test chamber        | TDK                    | SAC-3        | FA002047  | 1 year    | Feb. 25/16 |
| Flush mount turntable       | Sunol                  | FM2022       | FA002082  | —         | NCR        |
| Controller                  | Sunol                  | SC104V       | FA002060  | —         | NCR        |
| Antenna mast                | Sunol                  | TLT2         | FA002061  | —         | NCR        |
| Power source                | California Instruments | 3001i        | FA001021  | 1 year    | Aug. 27/16 |
| Receiver/spectrum analyzer  | Rohde & Schwarz        | ESU 26       | FA002043  | 1 year    | Jan. 07/16 |
| Bilog antenna (20–3000 MHz) | Sunol                  | JB3          | FA002108  | 1 year    | Apr. 12/16 |
| Horn antenna (1–18 GHz)     | EMCO                   | 3115         | FA000825  | 1 year    | Apr. 01/16 |
| Horn antenna (18–26.5 GHz)  | Electro-metrics        | SH-50/60-1   | FA000479  | —         | VOU        |
| Pre-amplifier (1–18 GHz)    | JCA                    | JCA118-503   | FA002091  | 1 year    | May 05/16  |
| Pre-amplifier (18–26 GHz)   | Narda                  | BBS-1826N612 | FA001550  | —         | VOU        |
| Spectrum analyzer           | Rohde & Schwarz        | FSU          | FA001877  | 1 year    | Mar. 27/16 |
| LISN                        | Rohde & Schwarz        | ENV216       | FA002023  | 1 year    | Jan. 09/16 |

Note: NCR - no calibration required, VOU - verify on use

## Section 8. Testing data

### 8.1 FCC 15.207(a) and RSS-Gen 8.8 AC power line conducted emissions limits

#### 8.1.1 Definitions and limits

**FCC:**

Except as shown in paragraphs (b) and (c) of this section, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50  $\mu$ H/50  $\Omega$  line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequency ranges.

**IC:**

A radio apparatus that is designed to be connected to the public utility (AC) power line shall ensure that the radio frequency voltage, which is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz, shall not exceed the limits in table below.

Unless the requirements applicable to a given device state otherwise, for any radio apparatus equipped to operate from the public utility AC power supply either directly or indirectly (such as with a battery charger), the radio frequency voltage of emissions conducted back onto the AC power lines in the frequency range of 0.15 MHz to 30 MHz shall not exceed the limits shown in table below. The more stringent limit applies at the frequency range boundaries.

**Table 8.1-1: Conducted emissions limit**

| Frequency of emission,<br>MHz | Conducted limit, dB $\mu$ V |           |
|-------------------------------|-----------------------------|-----------|
|                               | Quasi-peak                  | Average** |
| 0.15–0.5                      | 66 to 56*                   | 56 to 46* |
| 0.5–5                         | 56                          | 46        |
| 5–30                          | 60                          | 50        |

Note: \* - The level decreases linearly with the logarithm of the frequency.

\*\* - A linear average detector is required.

#### 8.1.2 Test summary

|               |                   |                   |           |
|---------------|-------------------|-------------------|-----------|
| Test date     | September 4, 2015 | Temperature       | 22 °C     |
| Test engineer | Shawn He          | Air pressure      | 1010 mbar |
| Verdict       | Pass              | Relative humidity | 51 %      |

8.1.3 Observations, settings and special notes

---

The EUT was set up as tabletop configuration.

The spectral scan has been corrected with transducer factors (i.e. cable loss, LISN factors, and attenuators) for determination of compliance.

A preview measurement was generated with the receiver in continuous scan mode. Emissions detected within 6 dB or above limit were re-measured with the appropriate detector against the correlating limit and recorded as the final measurement.

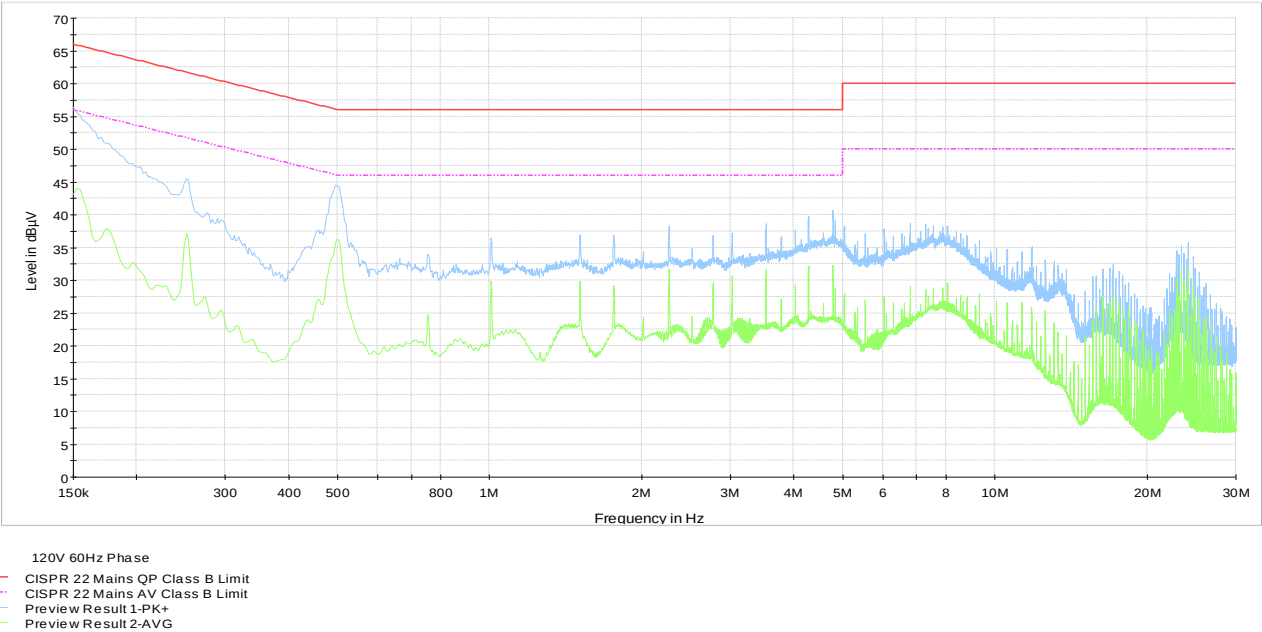
Receiver settings for preview measurements:

|                      |                  |
|----------------------|------------------|
| Resolution bandwidth | 9 kHz            |
| Video bandwidth      | 30 kHz           |
| Detector mode        | Peak and Average |
| Trace mode           | Max Hold         |
| Measurement time     | 1000 ms          |

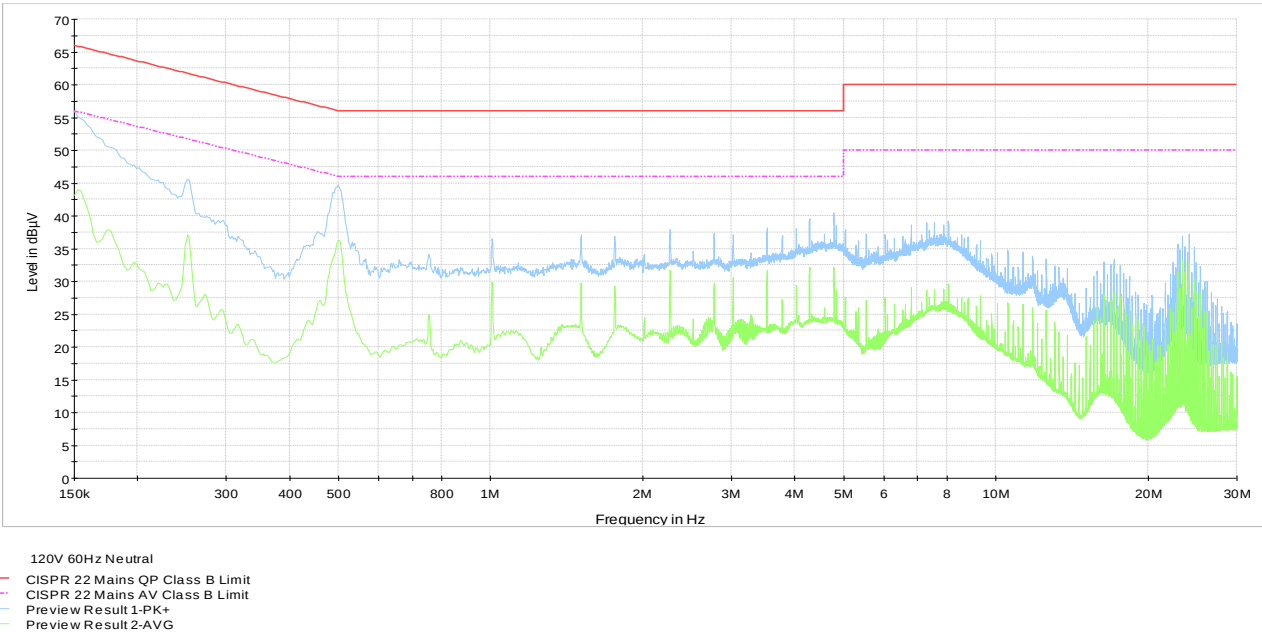
Receiver settings for final measurements:

|                      |                        |
|----------------------|------------------------|
| Resolution bandwidth | 9 kHz                  |
| Video bandwidth      | 30 kHz                 |
| Detector mode        | Quasi-Peak and Average |
| Trace mode           | Max Hold               |
| Measurement time     | 1000 ms                |

8.1.4 Test data



Plot 8.1-1: Conducted emissions on phase line



Plot 8.1-2: Conducted emissions on neutral line

## 8.2 FCC 15.247(a)(2) and RSS-247 5.2(1) Minimum 6 dB bandwidth for systems using digital modulation techniques

### 8.2.1 Definitions and limits

#### FCC and IC:

- (a) Operation under the provisions of this Section is limited to frequency hopping and digitally modulated intentional radiators that comply with the following provisions:
- (2) Systems using digital modulation techniques may operate in the 902–928 MHz, 2400–2483.5 MHz and 5725–5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

### 8.2.2 Test summary

|               |                    |                   |           |
|---------------|--------------------|-------------------|-----------|
| Test date     | September 10, 2015 | Temperature       | 23 °C     |
| Test engineer | Andrey Adelberg    | Air pressure      | 1008 mbar |
| Verdict       | Pass               | Relative humidity | 33 %      |

### 8.2.3 Observations, settings and special notes

EUT was set to transmit in BLE mode. Spectrum analyser settings:

|                      |                            |
|----------------------|----------------------------|
| Resolution bandwidth | 100 kHz                    |
| Video bandwidth      | $\geq 3 \times \text{RBW}$ |
| Frequency span       | 2 MHz                      |
| Detector mode        | Peak                       |
| Trace mode           | Max Hold                   |

### 8.2.4 Test data

**Table 8.2-1: 6 dB bandwidth results**

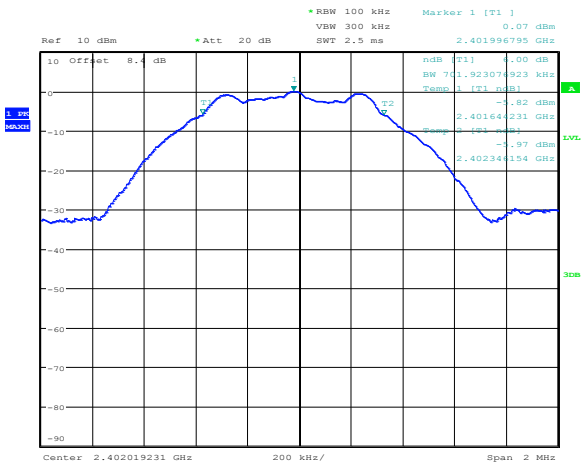
| Frequency, MHz | 6 dB bandwidth, kHz | Limit, kHz | Margin, kHz |
|----------------|---------------------|------------|-------------|
| 2402           | 701.92              | 500.00     | 201.92      |
| 2440           | 698.72              | 500.00     | 198.72      |
| 2480           | 701.92              | 500.00     | 201.92      |

Section 8

Test name

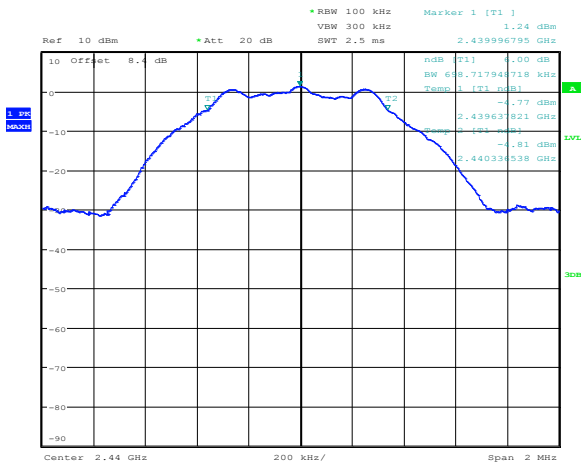
Specification

Testing data  
FCC 15.247(a)(2) and RSS-247 5.2(1) Minimum 6 dB bandwidth for systems using digital modulation techniques  
FCC Part 15 Subpart C and RSS-247, Issue 1



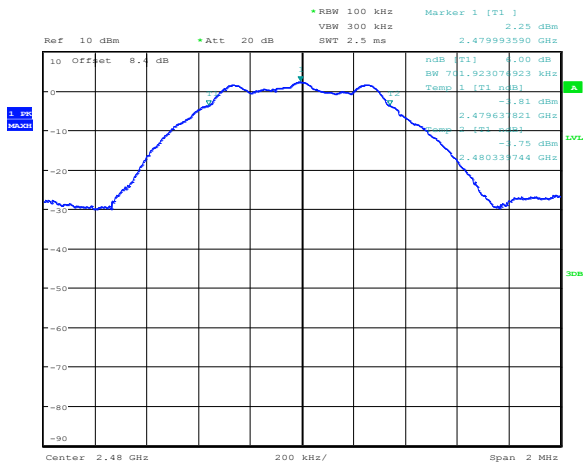
Date: 10.SEP.2015 13:36:47

Figure 8.2-1: 6 dB bandwidth on low channel



Date: 10.SEP.2015 13:37:21

Figure 8.2-2: 6 dB bandwidth on mid channel



Date: 10.SEP.2015 13:37:50

Figure 8.2-3: 6 dB bandwidth on high channel

## 8.3 FCC 15.247(a)(1) and RSS-247 5.1(1) Frequency Hopping Systems requirements

### 8.3.1 Definitions and limits

**FCC:**

- (1) Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. The system shall hop to channel frequencies that are selected at the system hopping rate from a pseudo randomly ordered list of hopping frequencies. Each frequency must be used equally on the average by each transmitter. The system receivers shall have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shall shift frequencies in synchronization with the transmitted signals.
- (iii) Frequency hopping systems in the 2400–2483.5 MHz band shall use at least 15 channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used.

**IC:**

1. The bandwidth of a frequency hopping channel is the –20 dB emission bandwidth, measured with the hopping stopped. The system's radio frequency (RF) bandwidth is equal to the channel bandwidth multiplied by the number of channels in the hopset. The hopset shall be such that the near-term distribution of frequencies appears random, with sequential hops randomly distributed in both direction and magnitude of change in the hopset, whereas the long-term distribution appears evenly distributed.
2. FHSs shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the –20 dB bandwidth of the hopping channel, whichever is greater. The system receivers shall have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shall shift frequencies in synchronization with the transmitted signals.
4. FHSs operating in the band 2400–2483.5 MHz shall use at least 15 hopping channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds, multiplied by the number of hopping channels employed. Transmissions on particular hopping frequencies may be avoided or suppressed provided that at least 15 hopping channels are used.

### 8.3.2 Test summary

|               |                   |                   |           |
|---------------|-------------------|-------------------|-----------|
| Test date     | September 8, 2015 | Temperature       | 23 °C     |
| Test engineer | Andrey Adelberg   | Air pressure      | 1007 mbar |
| Verdict       | Pass              | Relative humidity | 36 %      |

### 8.3.3 Observations, settings and special notes

The EUT was set to transmit in BT mode.  
Spectrum analyser settings for carrier frequency separation:

|                      |                                                           |
|----------------------|-----------------------------------------------------------|
| Resolution bandwidth | 100 kHz                                                   |
| Video bandwidth      | ≥ RBW                                                     |
| Frequency span       | wide enough to capture the peaks of two adjacent channels |
| Detector mode        | Peak                                                      |
| Trace mode           | Max Hold                                                  |

Spectrum analyser settings for number of hopping frequencies:

|                      |                                 |
|----------------------|---------------------------------|
| Resolution bandwidth | 100 kHz                         |
| Video bandwidth      | ≥ RBW                           |
| Frequency span       | the frequency band of operation |
| Detector mode        | Peak                            |
| Trace mode           | Max Hold                        |

Spectrum analyser settings for time of occupancy (dwell time):

|                      |           |
|----------------------|-----------|
| Resolution bandwidth | 1 MHz     |
| Video bandwidth      | ≥ RBW     |
| Frequency span       | Zero span |
| Detector mode        | Peak      |
| Trace mode           | Max Hold  |

Spectrum analyser settings for 20 dB bandwidth:

|                      |          |
|----------------------|----------|
| Resolution bandwidth | 30 kHz   |
| Video bandwidth      | ≥ RBW    |
| Frequency span       | 3 MHz    |
| Detector mode        | Peak     |
| Trace mode           | Max Hold |

#### 8.3.4 Test data

**Table 8.3-1: 20 dB bandwidth results**

| Frequency, MHz | 20 dB bandwidth, MHz |
|----------------|----------------------|
| 2402           | 0.899                |
| 2441           | 0.894                |
| 2480           | 0.894                |

**Table 8.3-2: Carrier frequency separation results**

| Carrier frequency separation, MHz | Minimum limit, MHz | Margin, MHz |
|-----------------------------------|--------------------|-------------|
| 1.00                              | 0.899              | 0.101       |

**Table 8.3-3: Number of hopping frequencies results**

| Number of hopping frequencies | Minimum limit | Margin |
|-------------------------------|---------------|--------|
| 79                            | 15            | 64     |

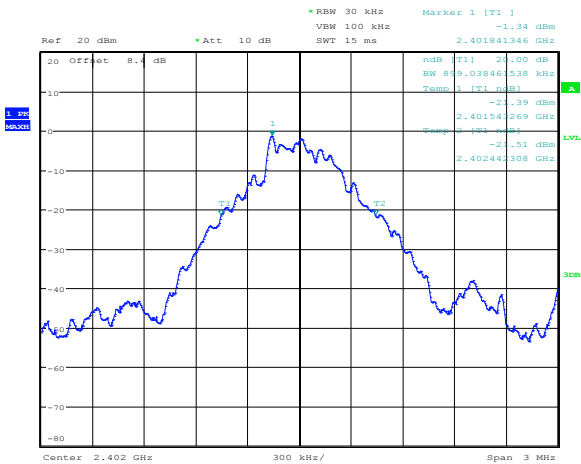
**Table 8.3-4: Average time of occupancy results**

| Dwell time of each pulse, ms | Number of pulses within period | Total dwell time within period, ms | Limit, ms | Margin, ms |
|------------------------------|--------------------------------|------------------------------------|-----------|------------|
| 0.388                        | 316                            | 122.6                              | 400.00    | 277.4      |

Measurement Period is 79 channels × 0.4 s = 31.6 s

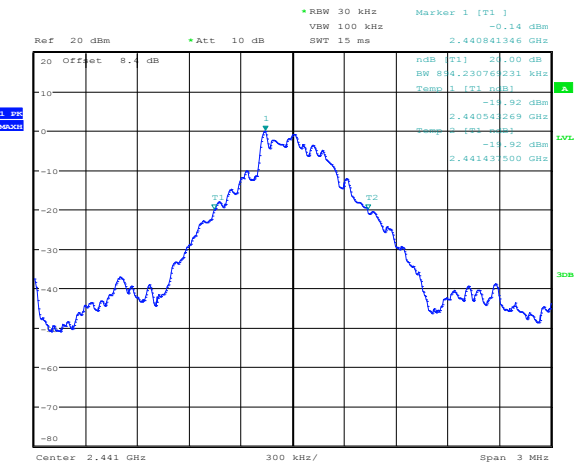
Section 8  
Test name  
Specification

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FCC 15.247(a)(1) and RSS-247 5.1(1) Frequency Hopping Systems requirements  
FCC Part 15 Subpart C and RSS-247, Issue 1



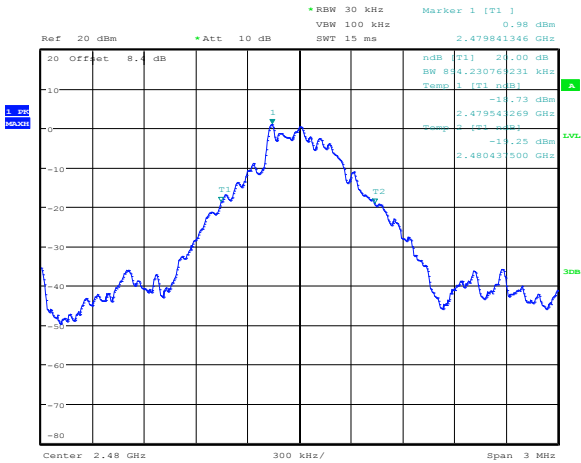
Date: 8.SEP.2015 11:15:38

Figure 8.3-1: 20 dB bandwidth on low channel



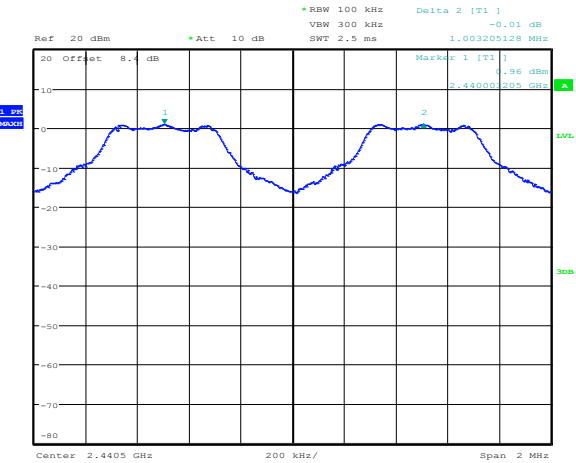
Date: 8.SEP.2015 11:14:00

Figure 8.3-2: 20 dB bandwidth on mid channel



Date: 8.SEP.2015 11:14:38

Figure 8.3-3: 20 dB bandwidth on high channel

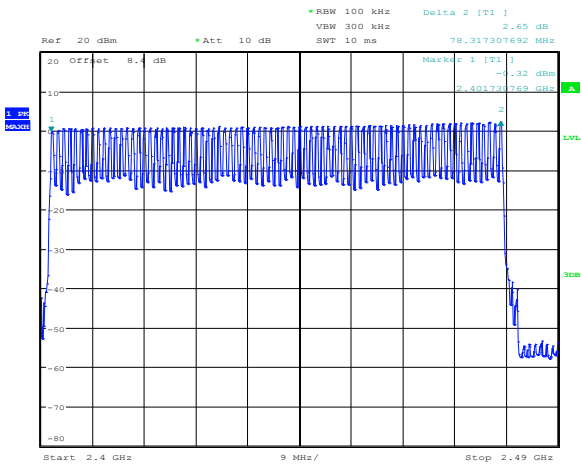


Date: 8.SEP.2015 10:53:02

Figure 8.3-4: Carrier frequency separation

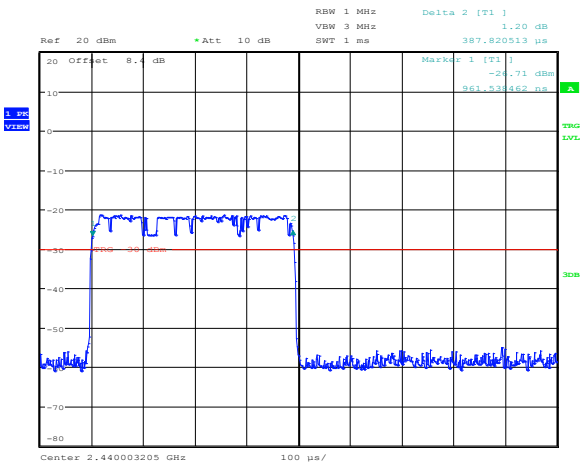
Section 8  
Test name  
Specification

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FCC 15.247(a)(1) and RSS-247 5.1(1) Frequency Hopping Systems requirements  
FCC Part 15 Subpart C and RSS-247, Issue 1



Date: 8.SEP.2015 11:07:22

Figure 8.3-5: Number of hopping channels



Date: 8.SEP.2015 10:55:29

Figure 8.3-6: Dwell time

## 8.4 FCC 15.247(b) and RSS-247 5.4 (4) Transmitter output power and e.i.r.p. requirements

### 8.4.1 Definitions and limits

#### FCC:

- (b) The maximum peak conducted output power of the intentional radiator shall not exceed the following:
- (3) For systems using digital modulation in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands: 1 W (30 dBm). As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power. Maximum Conducted Output Power is defined as the total transmit power delivered to all antennas and antenna elements averaged across all symbols in the signaling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or is transmitting at a reduced power level. If multiple modes of operation are possible (e.g., alternative modulation methods), the maximum conducted output power is the highest total transmit power occurring in any mode.
  - (4) The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

#### IC:

For DTSs employing digital modulation techniques operating in the bands 902–928 MHz and 2400–2483.5 MHz, the maximum peak conducted output power shall not exceed 1W. Except as provided in Section 5.4(5), the e.i.r.p. shall not exceed 4 W.

Fixed point-to-point systems in the bands 2400-2483.5 MHz and 5725-5850 MHz are permitted to have an e.i.r.p. higher than 4 W provided that the higher e.i.r.p. is achieved by employing higher gain directional antennas and not higher transmitter output powers. Point-to-multipoint systems, omnidirectional applications and multiple co-located transmitters transmitting the same information are prohibited from exceeding an e.i.r.p. of 4 W.

### 8.4.2 Test summary

|               |                    |                   |           |
|---------------|--------------------|-------------------|-----------|
| Test date     | September 10, 2015 | Temperature       | 23 °C     |
| Test engineer | Andrey Adelberg    | Air pressure      | 1008 mbar |
| Verdict       | Pass               | Relative humidity | 33 %      |

### 8.4.3 Observations, settings and special notes

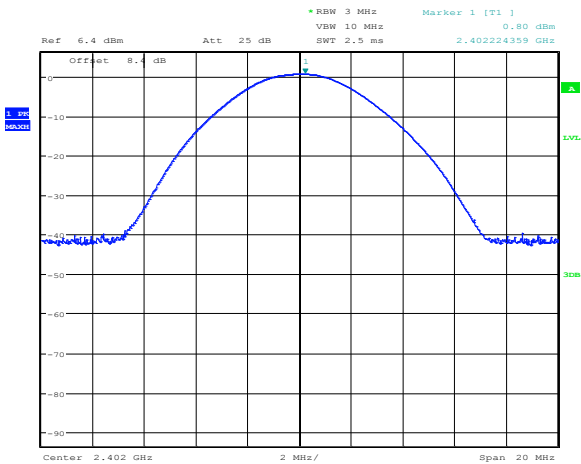
EUT was set to transmit in BLE mode. The test was performed according to DTS guidelines section 9.1.1: Maximum peak conducted output power. Spectrum analyzer settings:

|                      |          |
|----------------------|----------|
| Resolution bandwidth | 3 MHz    |
| Video bandwidth      | ≥3 × RBW |
| Frequency span       | 20 MHz   |
| Detector mode        | Peak     |
| Trace mode           | Max Hold |

### 8.4.4 Test data

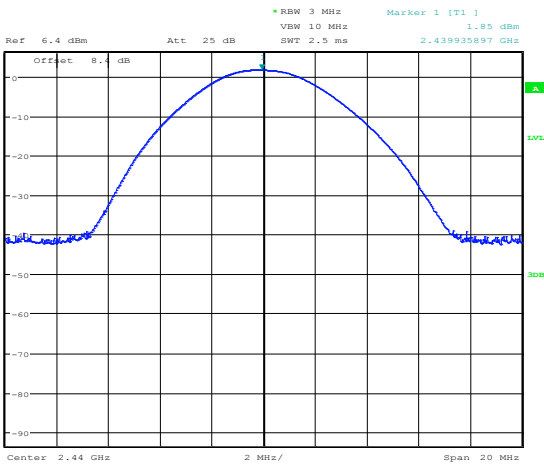
**Table 8.4-1: Output power measurements results**

| Frequency,<br>MHz | Conducted output power, dBm |       | Margin, dB | Antenna gain,<br>dBi | EIRP,<br>dBm | EIRP limit,<br>dBm | EIRP margin, dB |
|-------------------|-----------------------------|-------|------------|----------------------|--------------|--------------------|-----------------|
|                   | Measured                    | Limit |            |                      |              |                    |                 |
| 2402              | 0.80                        | 30.00 | 29.20      | 1.50                 | 2.30         | 36.00              | 33.70           |
| 2440              | 1.85                        | 30.00 | 28.15      | 1.50                 | 3.35         | 36.00              | 32.65           |
| 2480              | 2.83                        | 30.00 | 27.17      | 1.50                 | 4.33         | 36.00              | 31.67           |



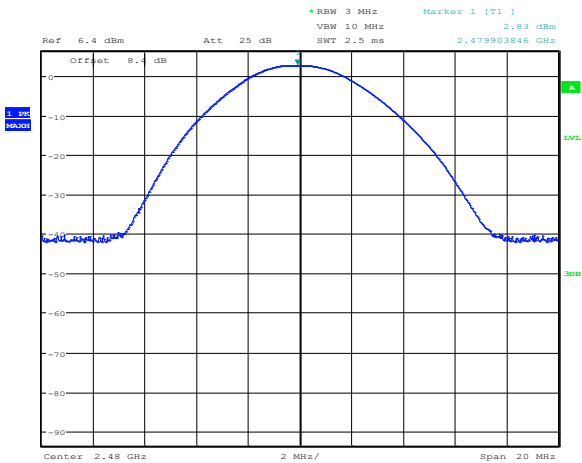
Date: 10.SEP.2015 13:32:51

Figure 8.4-1: Output power on low channel



Date: 10.SEP.2015 13:33:25

Figure 8.4-2: Output power on mid channel



Date: 10.SEP.2015 13:33:56

Figure 8.4-3: Output power on high channel

## 8.5 FCC 15.247(b) and RSS-247 5.4 (2) Transmitter output power and e.i.r.p. requirements

### 8.5.1 Definitions and limits

**FCC:**

- (b) The maximum peak conducted output power of the intentional radiator shall not exceed the following:
- (1) 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 5725–5850 MHz band: 1 watt (30 dBm). For all other frequency hopping systems in the 2400–2483.5 MHz band: 0.125 watts (21 dBm).
  - (4) The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

**IC:**

For FHSs operating in the band 2400–2483.5 MHz, the maximum peak conducted output power shall not exceed 1.0 W (30 dBm) and the e.i.r.p. shall not exceed 4 W (36 dBm) if the hopset uses 75 or more hopping channels; the maximum peak conducted output power shall not exceed 0.125 W (21 dBm) and the e.i.r.p. shall not exceed 0.5 W (27 dBm) if the hopset uses less than 75 hopping channels.

### 8.5.2 Test summary

|               |                   |                   |           |
|---------------|-------------------|-------------------|-----------|
| Test date     | September 8, 2015 | Temperature       | 23 °C     |
| Test engineer | Andrey Adelberg   | Air pressure      | 1007 mbar |
| Verdict       | Pass              | Relative humidity | 36 %      |

### 8.5.3 Observations, settings and special notes

EUT was set to transmit in BT mode. Spectrum analyser settings for output power:

|                      |          |
|----------------------|----------|
| Resolution bandwidth | 3 MHz    |
| Video bandwidth      | ≥ RBW    |
| Frequency span       | 20 MHz   |
| Detector mode        | Peak     |
| Trace mode           | Max Hold |

### 8.5.4 Test data

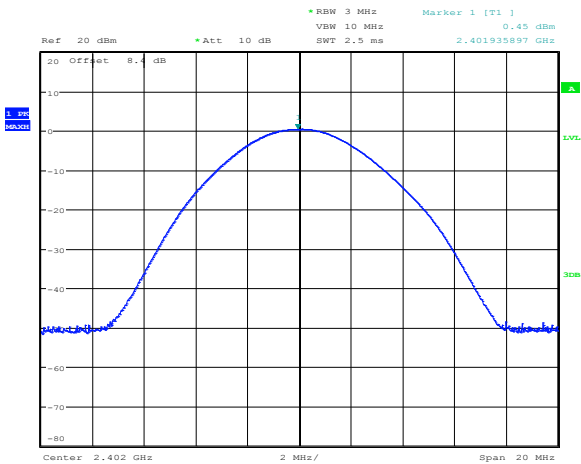
**Table 8.5-1: Output power and EIRP results**

| Frequency, MHz | Output power, dBm | Output power limit, dBm | Margin, dB | Antenna gain, dBi | EIRP, dBm | EIRP limit, dBm | EIRP margin, dB |
|----------------|-------------------|-------------------------|------------|-------------------|-----------|-----------------|-----------------|
| 2402           | 0.45              | 30.00                   | 29.55      | 1.50              | 1.95      | 36.00           | 34.05           |
| 2441           | 1.34              | 30.00                   | 28.66      | 1.50              | 2.84      | 36.00           | 33.16           |
| 2480           | 2.48              | 30.00                   | 27.52      | 1.50              | 3.98      | 36.00           | 32.02           |

EIRP = Output power + Antenna gain

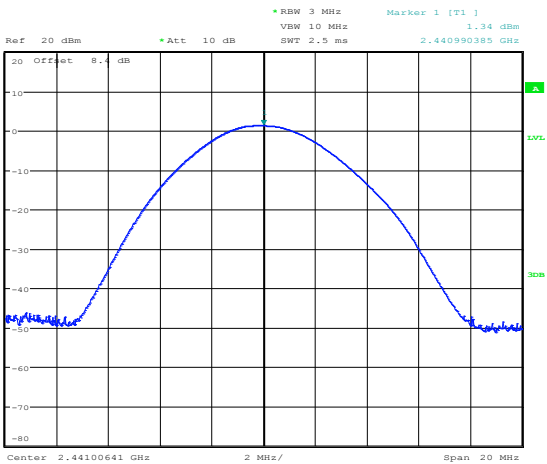
Section 8  
Test name  
Specification

Testing data  
FCC 15.247(b) and RSS-247 5.4 (2) Transmitter output power and e.i.r.p. requirements  
FCC Part 15 Subpart C and RSS-247, Issue 1



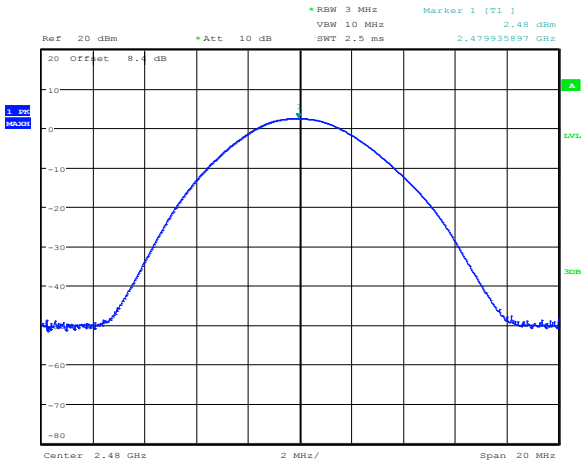
Date: 8.SEP.2015 10:21:14

Figure 8.5-1: Output power on low channel



Date: 8.SEP.2015 10:15:56

Figure 8.5-2: Output power on mid channel



Date: 8.SEP.2015 10:26:53

Figure 8.5-3: Output power on high channel

## 8.6 FCC 15.247(d) and RSS-247 5.5 Spurious (out-of-band) emissions

### 8.6.1 Definitions and limits

#### FCC:

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

#### IC:

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the RF power that is produced shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided that the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of root-mean-square averaging over a time interval, as permitted under Section 5.4(4), the attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general field strength limits specified in RSS-Gen is not required.

**Table 8.6-1: FCC §15.209 and RSS-Gen – Radiated emission limits**

| Frequency,<br>MHz | Field strength of emissions |                                 | Measurement distance, m |
|-------------------|-----------------------------|---------------------------------|-------------------------|
|                   | µV/m                        | dBµV/m                          |                         |
| 0.009–0.490       | 2400/F                      | $67.6 - 20 \times \log_{10}(F)$ | 300                     |
| 0.490–1.705       | 24000/F                     | $87.6 - 20 \times \log_{10}(F)$ | 30                      |
| 1.705–30.0        | 30                          | 29.5                            | 30                      |
| 30–88             | 100                         | 40.0                            | 3                       |
| 88–216            | 150                         | 43.5                            | 3                       |
| 216–960           | 200                         | 46.0                            | 3                       |
| above 960         | 500                         | 54.0                            | 3                       |

Notes: In the emission table above, the tighter limit applies at the band edges.

For frequencies above 1 GHz the limit on peak RF emissions is 20 dB above the maximum permitted average emission limit applicable to the equipment under test

**Table 8.6-2: IC restricted frequency bands**

| MHz             | MHz                 | MHz           | GHz         |
|-----------------|---------------------|---------------|-------------|
| 0.090–0.110     | 12.51975–12.52025   | 399.9–410     | 5.35–5.46   |
| 2.1735–2.1905   | 12.57675–12.57725   | 608–614       | 7.25–7.75   |
| 3.020–3.026     | 13.36–13.41         | 960–1427      | 8.025–8.5   |
| 4.125–4.128     | 16.42–16.423        | 1435–1626.5   | 9.0–9.2     |
| 4.17725–4.17775 | 16.69475–16.69525   | 1645.5–1646.5 | 9.3–9.5     |
| 4.20725–4.20775 | 16.80425–16.80475   | 1660–1710     | 10.6–12.7   |
| 5.677–5.683     | 25.5–25.67          | 1718.8–1722.2 | 13.25–13.4  |
| 6.215–6.218     | 37.5–38.25          | 2200–2300     | 14.47–14.5  |
| 6.26775–6.26825 | 73–74.6             | 2310–2390     | 15.35–16.2  |
| 6.31175–6.31225 | 74.8–75.2           | 2655–2900     | 17.7–21.4   |
| 8.291–8.294     | 108–138             | 3260–3267     | 22.01–23.12 |
| 8.362–8.366     | 156.52475–156.52525 | 3332–3339     | 23.6–24.0   |
| 8.37625–8.38675 | 156.7–156.9         | 3345.8–3358   | 31.2–31.8   |
| 8.41425–8.41475 | 240–285             | 3500–4400     | 36.43–36.5  |
| 12.29–12.293    | 322–335.4           | 4500–5150     | Above 38.6  |

Note: Certain frequency bands listed in Table 8.6-2 and above 38.6 GHz are designated for low-power licence-exempt applications. These frequency bands and the requirements that apply to the devices are set out in this Standard

**Table 8.6-3: FCC restricted frequency bands**

| MHz               | MHz                 | MHz           | GHz         |
|-------------------|---------------------|---------------|-------------|
| 0.090–0.110       | 16.42–16.423        | 399.9–410     | 4.5–5.15    |
| 0.495–0.505       | 16.69475–16.69525   | 608–614       | 5.35–5.46   |
| 2.1735–2.1905     | 16.80425–16.80475   | 960–1240      | 7.25–7.75   |
| 4.125–4.128       | 25.5–25.67          | 1300–1427     | 8.025–8.5   |
| 4.17725–4.17775   | 37.5–38.25          | 1435–1626.5   | 9.0–9.2     |
| 4.20725–4.20775   | 73–74.6             | 1645.5–1646.5 | 9.3–9.5     |
| 6.215–6.218       | 74.8–75.2           | 1660–1710     | 10.6–12.7   |
| 6.26775–6.26825   | 108–121.94          | 1718.8–1722.2 | 13.25–13.4  |
| 6.31175–6.31225   | 123–138             | 2200–2300     | 14.47–14.5  |
| 8.291–8.294       | 149.9–150.05        | 2310–2390     | 15.35–16.2  |
| 8.362–8.366       | 156.52475–156.52525 | 2483.5–2500   | 17.7–21.4   |
| 8.37625–8.38675   | 156.7–156.9         | 2690–2900     | 22.01–23.12 |
| 8.41425–8.41475   | 162.0125–167.17     | 3260–3267     | 23.6–24.0   |
| 12.29–12.293      | 167.72–173.2        | 3332–3339     | 31.2–31.8   |
| 12.51975–12.52025 | 240–285             | 3345.8–3358   | 36.43–36.5  |
| 12.57675–12.57725 | 322–335.4           | 3600–4400     | Above 38.6  |
| 13.36–13.41       |                     |               |             |

## 8.6.2 Test summary

|               |                   |                   |           |
|---------------|-------------------|-------------------|-----------|
| Test date     | September 8, 2015 | Temperature       | 23 °C     |
| Test engineer | Andrey Adelberg   | Air pressure      | 1007 mbar |
| Verdict       | Pass              | Relative humidity | 36 %      |

## 8.6.3 Observations, settings and special notes

The spectrum was searched from 30 MHz to the 10<sup>th</sup> harmonic.  
Radiated measurements were performed at a distance of 3 m.  
Since fundamental power was tested using peak method, the spurious emissions limit is –20 dBc/100 kHz

Spectrum analyser settings for radiated measurements within restricted bands below 1 GHz:

|                       |          |
|-----------------------|----------|
| Resolution bandwidth: | 100 kHz  |
| Video bandwidth:      | 300 kHz  |
| Detector mode:        | Peak     |
| Trace mode:           | Max Hold |

Spectrum analyser settings for peak radiated measurements within restricted bands above 1 GHz:

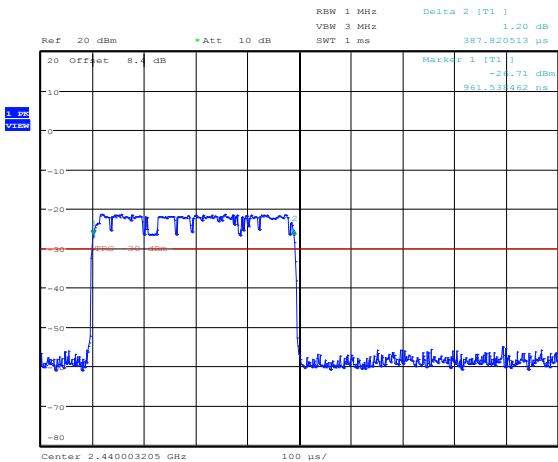
|                       |          |
|-----------------------|----------|
| Resolution bandwidth: | 1 MHz    |
| Video bandwidth:      | 3 MHz    |
| Detector mode:        | Peak     |
| Trace mode:           | Max Hold |

Spectrum analyser settings for average radiated measurements within restricted bands above 1 GHz:

|                       |          |
|-----------------------|----------|
| Resolution bandwidth: | 1 MHz    |
| Video bandwidth:      | 10 Hz    |
| Detector mode:        | Peak     |
| Trace mode:           | Max Hold |

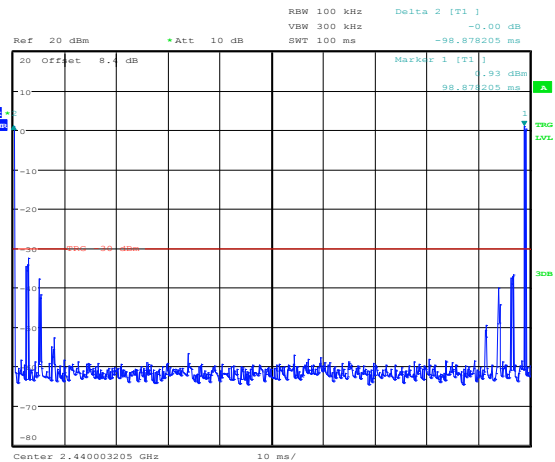
Spectrum analyser settings for conducted spurious emissions measurements:

|                       |          |
|-----------------------|----------|
| Resolution bandwidth: | 100 kHz  |
| Video bandwidth:      | 300 kHz  |
| Detector mode:        | Peak     |
| Trace mode:           | Max Hold |



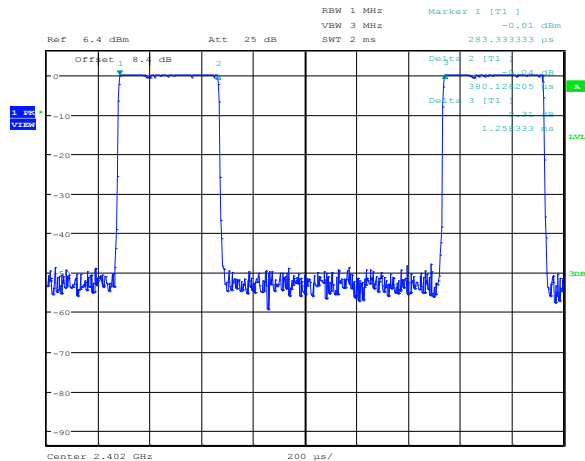
Date: 8.SEP.2015 10:55:29

Figure 8.6-1: Pulse width for BT



Date: 8.SEP.2015 10:54:14

Figure 8.6-2: Number of pulses for BT within 100 ms time frame



Date: 10.SEP.2015 14:12:22

Figure 8.6-3: Pulse width for BLE

Duty cycle correction factor for BT:  $20 \times \log_{10} [(0.388 \times 2) / 100] = -42.2 \text{ dB}$

Duty cycle correction factor for BLE:  $20 \times \log_{10} [0.389 / 0.652] = -4.5 \text{ dB}$

#### 8.6.4 Test data

**Table 8.6-4:** Radiated field strength measurement results for BT

| Channel | Frequency, MHz | Peak Field strength, dBμV/m |       | Margin, dB | Average Field strength, dBμV/m |       | Margin, dB |
|---------|----------------|-----------------------------|-------|------------|--------------------------------|-------|------------|
|         |                | Measured                    | Limit |            | Calculated                     | Limit |            |
| Low     | 2390.0         | 51.92                       | 74.00 | 22.08      | 9.72                           | 54.00 | 44.28      |
| Low     | 4804.0         | 55.95                       | 74.00 | 18.05      | 13.75                          | 54.00 | 40.25      |
| Mid     | 4882.0         | 55.80                       | 74.00 | 18.21      | 13.59                          | 54.00 | 40.41      |
| High    | 2483.5         | 59.78                       | 74.00 | 14.22      | 17.58                          | 54.00 | 36.42      |
| High    | 4960.0         | 56.27                       | 74.00 | 18.36      | 13.44                          | 54.00 | 40.56      |

Notes: Field strength includes correction factor of antenna, cable loss, amplifier, and attenuators where applicable. Average field strength calculation was performed using the following formula: Average Field strength = Peak Field strength + Duty cycle correction factor for BT

**Table 8.6-5:** Radiated field strength measurement results for BLE

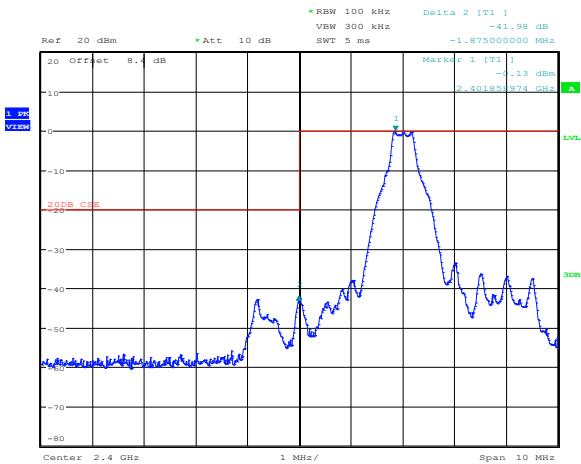
| Channel | Frequency, MHz | Peak Field strength, dBμV/m |       | Margin, dB | Average Field strength, dBμV/m |       | Margin, dB |
|---------|----------------|-----------------------------|-------|------------|--------------------------------|-------|------------|
|         |                | Measured                    | Limit |            | Calculated                     | Limit |            |
| Low     | 2390.0         | 52.59                       | 74.00 | 21.41      | 48.09                          | 54.00 | 5.91       |
| Low     | 4804.0         | 55.88                       | 74.00 | 18.12      | 51.38                          | 54.00 | 2.62       |
| Mid     | 4880.0         | 55.59                       | 74.00 | 18.41      | 51.09                          | 54.00 | 2.91       |
| High    | 2483.5         | 57.77                       | 74.00 | 16.23      | 53.27                          | 54.00 | 0.73       |
| High    | 4960.0         | 55.70                       | 74.00 | 18.30      | 51.20                          | 54.00 | 2.80       |

Notes: Field strength includes correction factor of antenna, cable loss, amplifier, and attenuators where applicable. Average field strength calculation was performed using the following formula: Average Field strength = Peak Field strength + Duty cycle correction factor for BLE



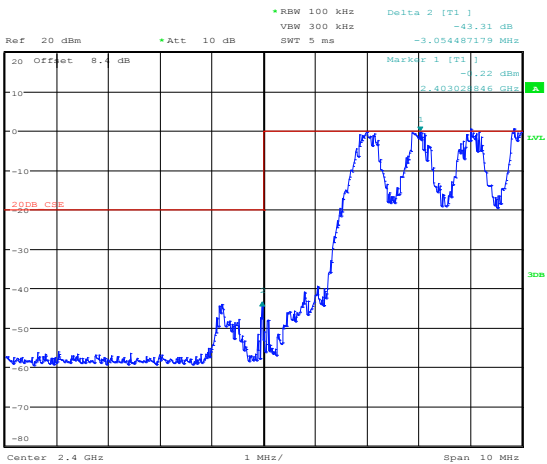
Section 8  
Test name  
Specification

Testing data  
FCC 15.247(d) and RSS-247 5.5 Spurious (out-of-band) emissions  
FCC Part 15 Subpart C and RSS-247, Issue 1



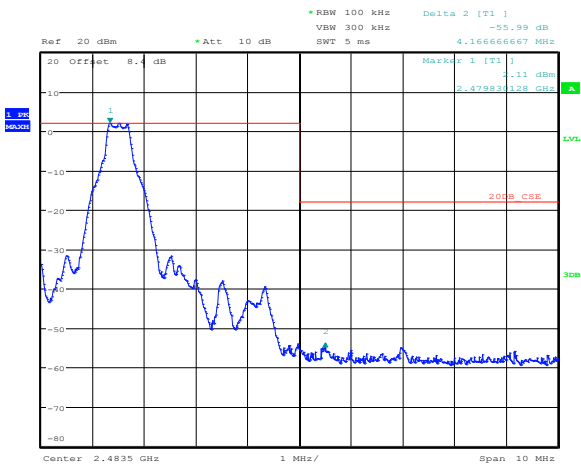
Date: 8.SEP.2015 10:22:58

Figure 8.6-8: Lower band edge emission for BT, hopping is turned off



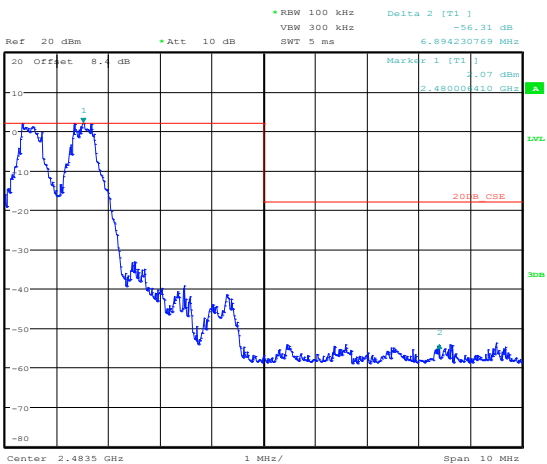
Date: 8.SEP.2015 10:36:45

Figure 8.6-9: Lower band edge emission for BT, hopping is turned on



Date: 8.SEP.2015 10:25:31

Figure 8.6-10: Upper band edge emission for BT, hopping is turned off



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Figure 8.6-11: Upper band edge emission for BT, hopping is turned on

Section 8  
Test name  
Specification

Testing data  
FCC 15.247(d) and RSS-247 5.5 Spurious (out-of-band) emissions  
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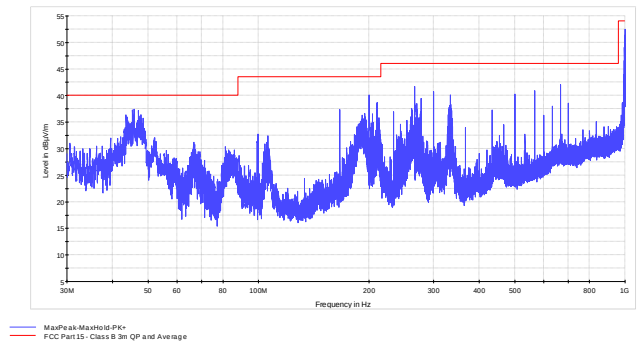


Figure 8.6-12: Radiated spurious emissions below 1 GHz for BT, low channel

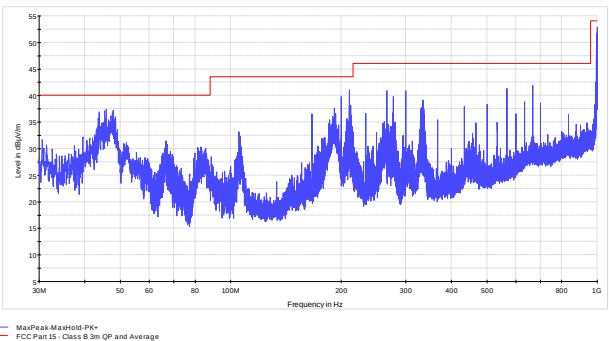


Figure 8.6-13: Radiated spurious emissions below 1 GHz for BT, high channel

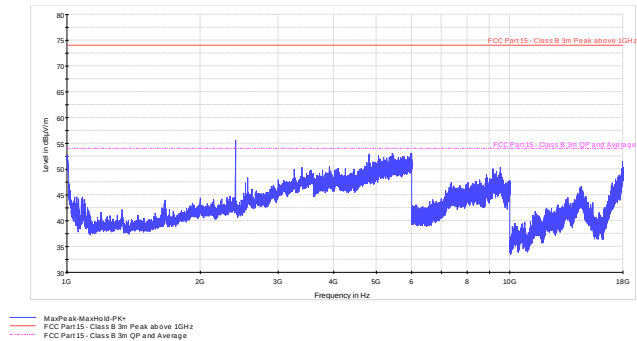


Figure 8.6-14: Radiated spurious emissions above 1 GHz for BT, low channel

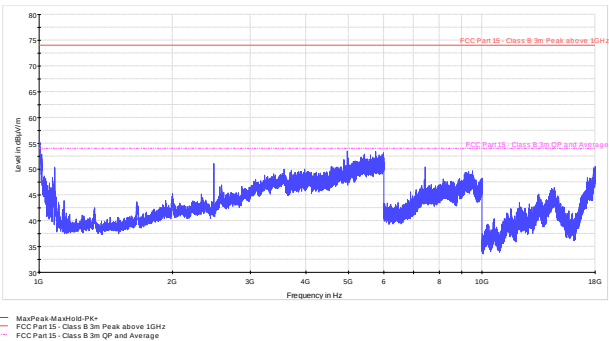
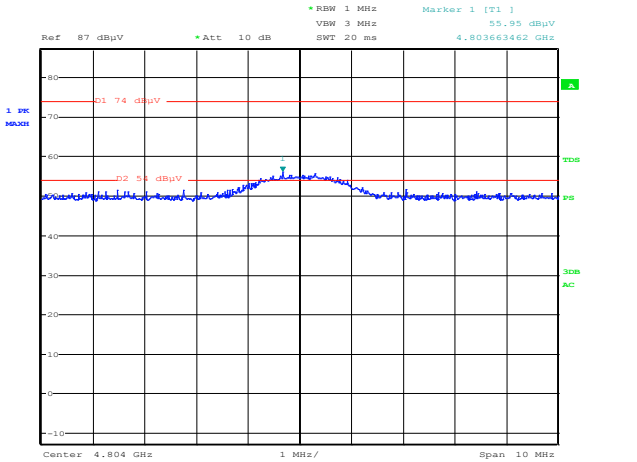
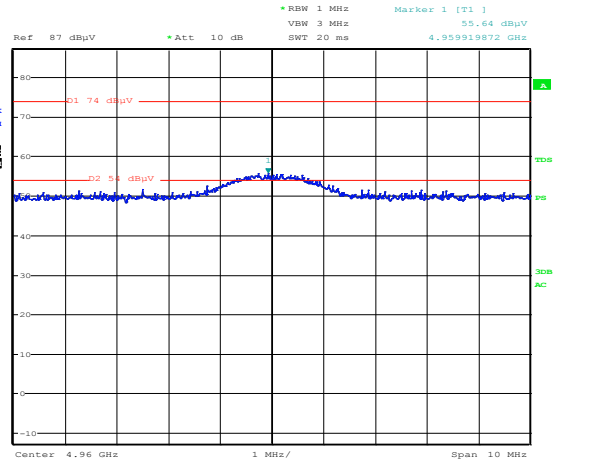


Figure 8.6-15: Radiated spurious emissions above 1 GHz for BT, high channel



Date: 10.SEP.2015 13:55:58

Figure 8.6-16: 2<sup>nd</sup> harmonic peak level for BT, low channel

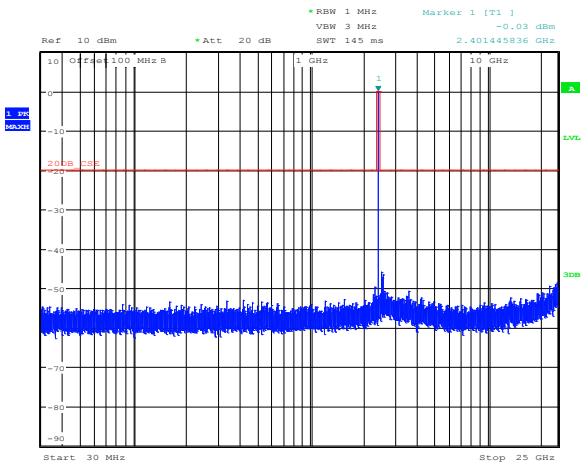


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Figure 8.6-17: 2<sup>nd</sup> harmonic peak level for BT, high channel

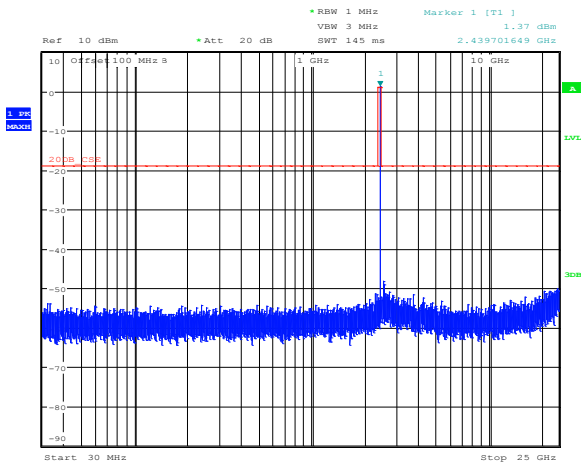
Section 8  
Test name  
Specification

Testing data  
FCC 15.247(d) and RSS-247 5.5 Spurious (out-of-band) emissions  
FCC Part 15 Subpart C and RSS-247, Issue 1



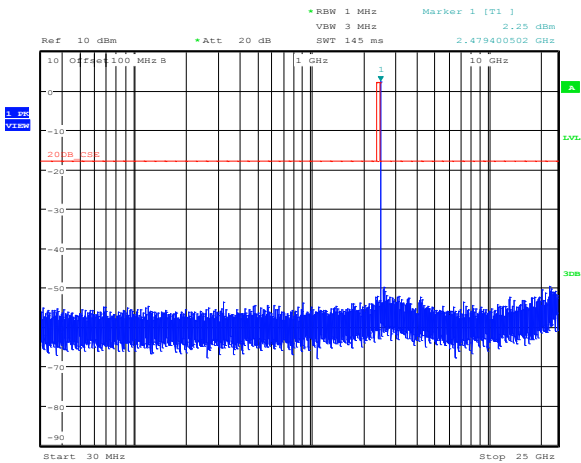
Date: 10.SEP.2015 13:41:12

Figure 8.6-18: Conducted spurious emissions for BLE, low channel



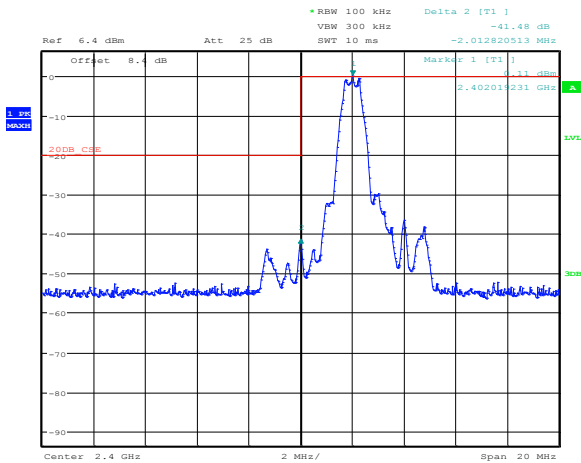
Date: 10.SEP.2015 13:41:52

Figure 8.6-19: Conducted spurious emissions for BLE, mid channel



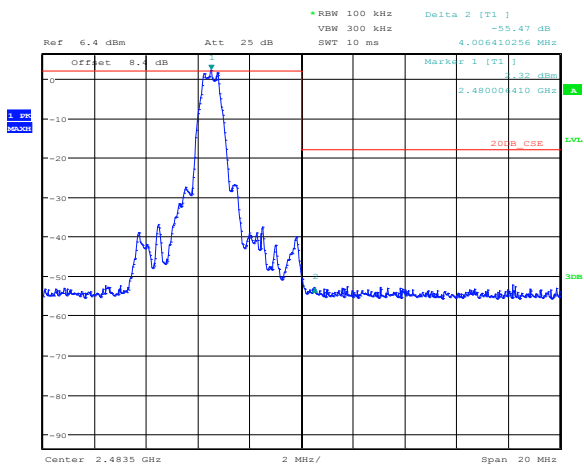
Date: 10.SEP.2015 13:43:47

Figure 8.6-20: Conducted spurious emissions for BLE, high channel



Date: 10.SEP.2015 13:35:53

Figure 8.6-21: Lower band edge emission for BLE



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Figure 8.6-22: Upper band edge emission for BLE

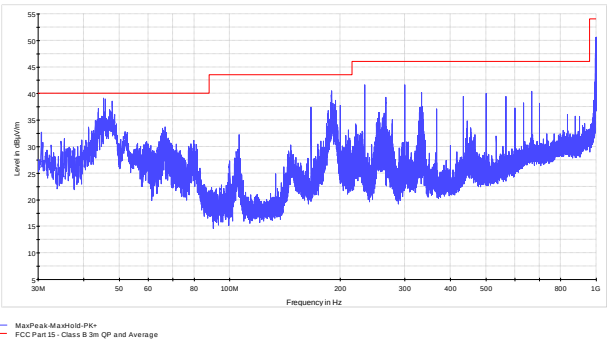


Figure 8.6-23: Radiated spurious emissions below 1 GHz for BLE, low channel

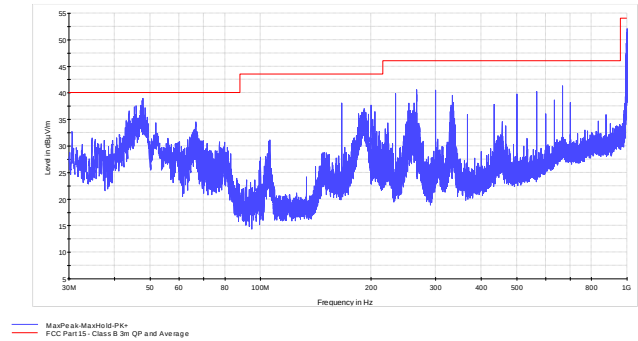


Figure 8.6-24: Radiated spurious emissions below 1 GHz for BLE, high channel

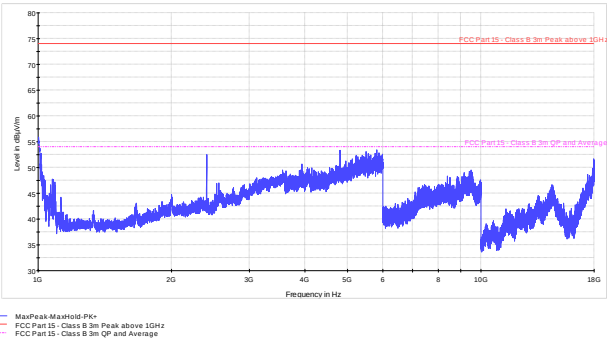


Figure 8.6-25: Radiated spurious emissions above 1 GHz for BLE, low channel

Section 8  
Test name  
Specification

Testing data  
FCC 15.247(d) and RSS-247 5.5 Spurious (out-of-band) emissions  
FCC Part 15 Subpart C and RSS-247, Issue 1

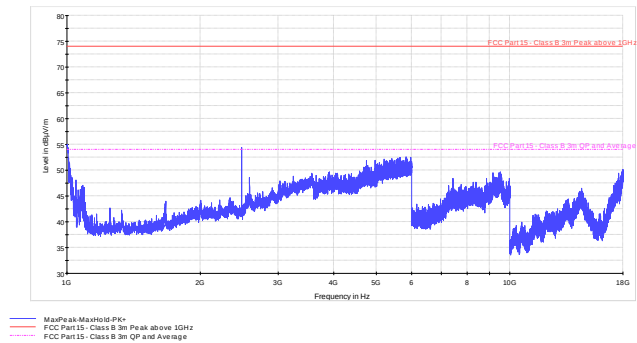


Figure 8.6-26: Radiated spurious emissions above 1 GHz for BLE, high channel

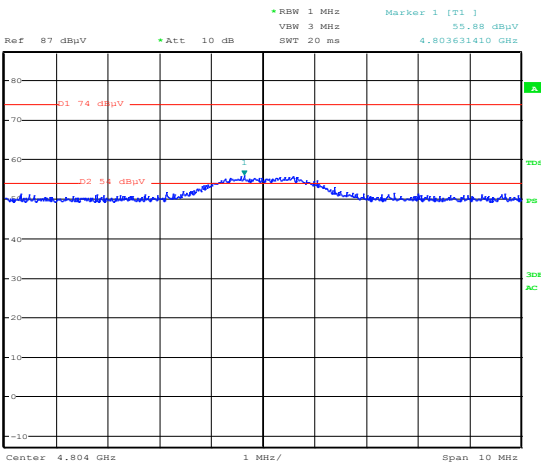


Figure 8.6-27: 2<sup>nd</sup> harmonic peak level for BLE, low channel

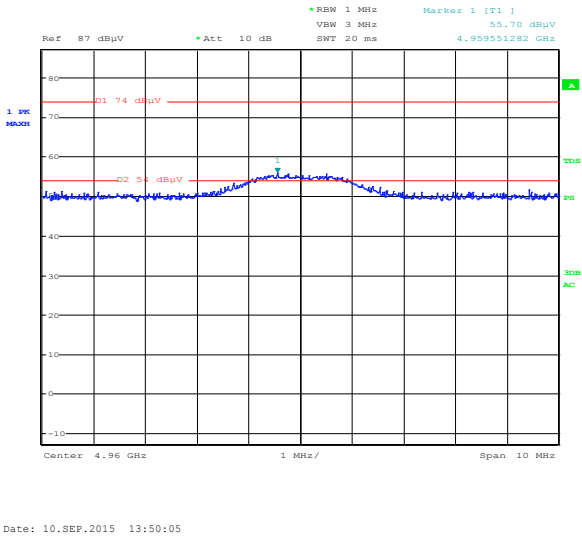


Figure 8.6-28: 2<sup>nd</sup> harmonic peak level for BLE, high channel

## 8.7 FCC 15.247(e) and RSS-247 5.2(2) Power spectral density for digitally modulated devices

### 8.7.1 Definitions and limits

**FCC:**  
For digitally modulated systems, 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. This power spectral density shall be determined in accordance with the provisions of paragraph (b) of this section. The same method of determining the conducted output power shall be used to determine the power spectral density.

**IC:**  
The transmitter power spectral density conducted from the transmitter to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of Section 5.4(4), (i.e. the power spectral density shall be determined using the same method as is used to determine the conducted output power).

### 8.7.2 Test summary

|               |                    |                   |           |
|---------------|--------------------|-------------------|-----------|
| Test date     | September 10, 2015 | Temperature       | 23 °C     |
| Test engineer | Andrey Adelberg    | Air pressure      | 1008 mbar |
| Verdict       | Pass               | Relative humidity | 33 %      |

### 8.7.3 Observations, settings and special notes

EUT was set to transmit in BLE mode. The test was performed using method described in section 10.2 Method PKPSD (peak PSD). Spectrum analyser settings:

|                       |          |
|-----------------------|----------|
| Resolution bandwidth: | 3 kHz    |
| Video bandwidth:      | 10 kHz   |
| Frequency span:       | 2 MHz    |
| Detector mode:        | Peak     |
| Trace mode:           | Max Hold |

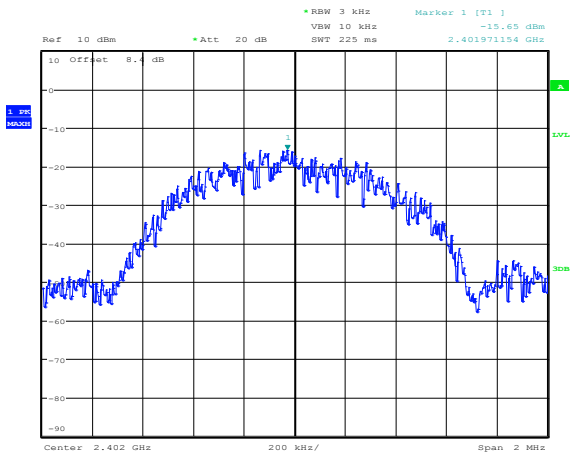
### 8.7.4 Test data

**Table 8.7-1: PSD measurements results for BLE**

| Frequency, MHz | PSD, dBm/3 kHz | PSD limit, dBm/3 kHz | Margin, dB |
|----------------|----------------|----------------------|------------|
| 2402           | -15.65         | 8.00                 | 23.65      |
| 2440           | -14.26         | 8.00                 | 22.26      |
| 2480           | -13.22         | 8.00                 | 21.22      |

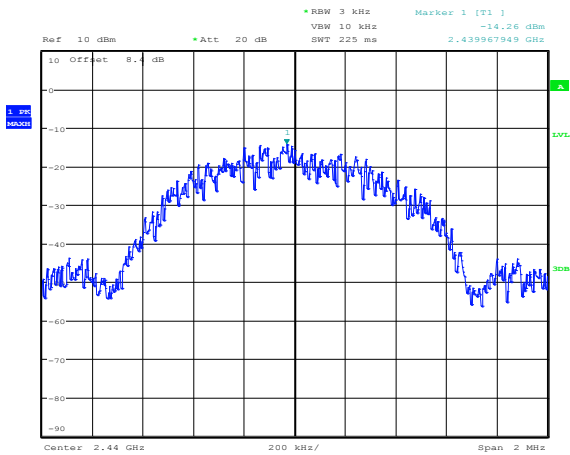
Section 8  
Test name  
Specification

Testing data  
FCC Clause 15.247(e) and RSS-247 5.2(2) Power spectral density for digitally modulated devices  
FCC Part 15 Subpart C and RSS-247, Issue 1



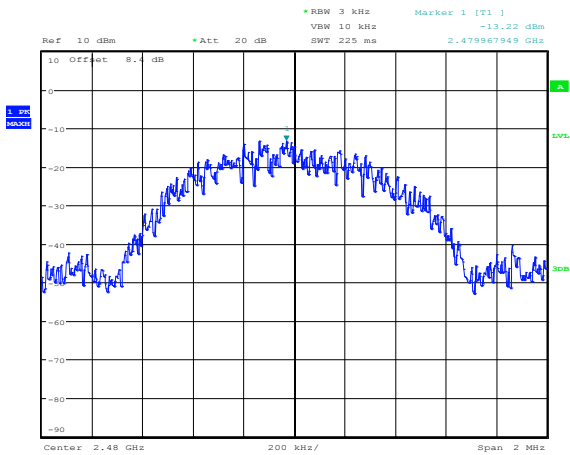
Date: 10.SEP.2015 13:39:36

Figure 8.7-1: PSD sample plot on low channel



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Figure 8.7-2: PSD sample plot on mid channel

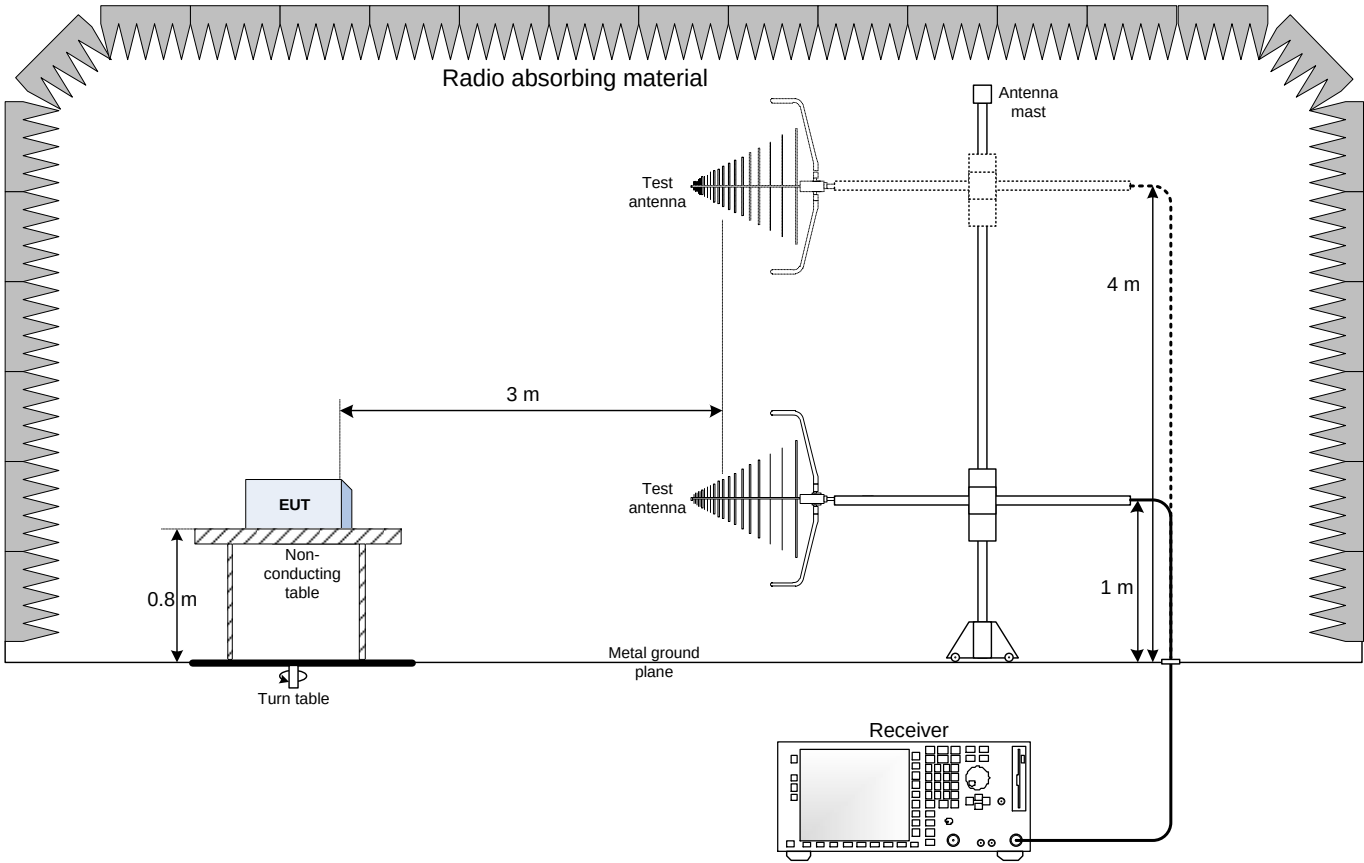


Date: 10.SEP.2015 13:38:36

Figure 8.7-3: PSD sample plot on high channel

## Section 9. Block diagrams of test set-ups

### 9.1 Radiated emissions set-up



### 9.2 Conducted emissions set-up

