



## FCC / IC Test Report

FOR:

August Home

Model Name:

ASL-02

Product Description:

Bluetooth (Low Energy)

FCC ID: 2AB6UASL2

IC ID: 12163A-ASL2

Per:

47 CFR Part 15.247 (DTS)  
RSS-247 Issue 1 (DTSs) & RSS-Gen Issue 4

REPORT #: EMC\_AUGUH\_003\_15001\_15.247\_DTS\_BTLE\_v1.3

DATE: 2015-11-11




FCC Recognized  
A2LA Accredited  
IC recognized # 3462E-1

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## 1 Assessment

The following device was evaluated against the applicable criteria specified in FCC rules Parts 15.247 of Title 47 of the Code of Federal Regulations and the relevant IC standard RSS-247.

No deviations were ascertained during the course of testing performed.

Company	Description	Model #
August Home	Automatic Door lock -remote controllable via BTLE	ASL-02


### Responsible for Testing Laboratory:

2015-11-11	Compliance	Milton Ponce de Leon (Compliance Manager)	
Date	Section	Name	Signature

### Responsible for the Report:

2015-11-11	Compliance	Anthony Planinac (EMC Engineer)	
Date	Section	Name	Signature

The test results of this test report relate exclusively to the test item specified in Section 3.  
 CETECOM Inc. USA does not assume responsibility for any conclusions and generalizations drawn from the test results with regard to other specimens or samples of the type of the equipment represented by the test item. The test report may only be reproduced or published in full. Reproduction or publication of extracts from the report requires the prior written approval of CETECOM Inc. USA.

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## 2 Administrative Data

### 2.1 Identification of the Testing Laboratory Issuing the EMC Test Report


<b>Company Name:</b>	CETECOM Inc.
<b>Department:</b>	Compliance
<b>Address:</b>	6370 Nancy Ridge Drive Suite 101-102 San Diego, CA 92121 U.S.A.
<b>Telephone:</b>	+1 (858) 362 2400
<b>Fax:</b>	+1 (408) 588 4809
<b>Manager Compliance Services:</b>	Milton Ponce de Leon
<b>Responsible Project Leader:</b>	Anthony Planinac

### 2.2 Identification of the Client

<b>Clients Name:</b>	August Home Inc.
<b>Clients Address:</b>	657 Bryant Street
<b>City/Zip Code</b>	San Francisco, CA 94107
<b>Country</b>	USA

### 2.3 Identification of the Manufacturer


<b>Manufacturer's Name:</b>	Flextronics Manufacturing (Zhuhai) Co., Ltd
<b>Manufacturers Address:</b>	Xin Qing Science & Technology Industrial Park, Jing An, Doumen Dist.
<b>City/Zip Code</b>	Zhuhai, Guangdong 519180
<b>Country</b>	China

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### 3 Equipment Under Test (EUT)

#### 3.1 EUT Specifications

Model No:	ASL-02	
HW Version :	10	
SW Version :	0.1.0-RC5+201507131601	
FCC-ID :	2AB6UASL2	
IC-ID:	12163A-ASL2	
HVIN:	ASL-02	
PMN:	August Smart Lock	
Product Description:	Automatic Door lock -remote controllable via BLE	
Regulatory Band	Lower band edge 2400MHz – upper band edge 2483.5MHz	
Channels Used	2402(ch 0) – 2480(ch 39), 40 channels	
Type(s) of Modulation:	GFSK	
Modes of Operation:	Station	
Antenna Type:	Internal PIFA	
Max. declared antenna gain	3dBi	
Max. declared conducted output power + tune-up	0dBm	Average during transmit burst
Max. measured conducted output power	-4dBm	Average during transmit burst
Power Supply	Dedicated Battery Pack	
Rated Operating Voltage Range:	Vmin: 4.0V dc/ Vnom: 6.0V dc / Vmax: 7.0V dc	
Operating Temperature Range	0 °C to 40 °C	
Other Radios included in the device:	NA	
Sample Revision	■Prototype;    □Production;    □Pre-Production	

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### 3.2 EUT Sample details

EUT #	Serial Number	HW Version	SW Version	Notes/Comments
1	L2FJR0002Y	10	0.1.0-RC5+201507131601	Radiated Unit
2	L2FJR0002X	10	0.1.0-RC5+201507131601	Conducted unit

### 3.3 Accessory Equipment (AE) details

AE #	Type	Model	Manufacturer	Serial Number
1	AC/DC Adapter	WSU060-2000	Triad	Not listed
2	Interface Board	August Home	AUG-1283PGM	Not Listed

### 3.1 Test Sample Configuration

EUT Set-up #	Combination of AE used for test set up	Comments
1	EUT#1	The radio of the EUT was stimulated directly in a test mode not accessible by the end user. The internal antenna was connected.
2	EUT#2 + AE#1	The radio of the EUT was stimulated via AE#2 powered by AE#1, the AE#2 was connected to a laptop. The output from EUT#2 was connected via a coaxial cable to a measurement equipment

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#### 4 Subject of Investigation

The objective of the measurements done by CETECOM Inc. was to assess the performance of the EUT per the relevant requirements specified in FCC rules Part 15.247 of Title 47 of the Code of Federal Regulations and Radio Standard Specification RSS-247 of Industry Canada.

This test report is to support a request for new equipment authorization under the FCC ID: 2AB6UASL2. IC ID: 12163A-ASL2

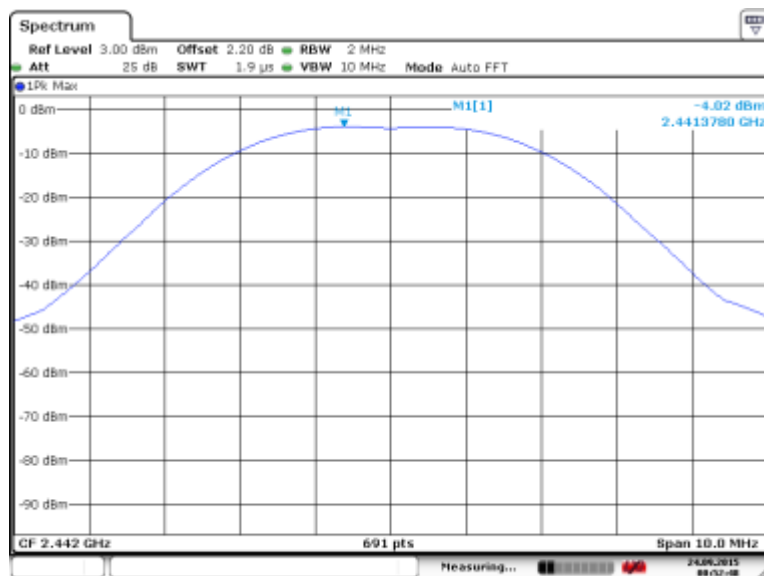
Testing procedures are based on  
558074 D01 DTS Meas Guidance v03r03  
ANSI C63.10 2013

All results are based on the EUT operating at its maximum declared peak envelope power including Tune Up tolerance as specified in 3.1.

To achieve this condition the EUT was set to the following Power Setting / Key value (0dBm/"mbt tx\_frequency\_arm COM27 1 2442 1 3 0")


An analysis over the supported modulations and bandwidths has been carried out on mid channel showing that GFSK 2MHz has the highest peak envelope power. All emission measurements in this report have been carried out in this mode.

Modulation	Nominal Bandwidth	Peak envelope power
GFSK	2MHz	-4.02 dBm



The above settings lead to a duty cycle of 100%




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## 5 Measurement Results Summary

Test Specification	Test Case	Temperature and Voltage Conditions	Mode	Pass	Fail	NA	NP	Result
§15.247(e) RSS247 5.2(2)	Power Spectral Density	Nominal	Modulation GFSK Low, Mid, High Channels	■	□	□	□	Complies
§15.247(a)(1) RSS247 5.2(1)	Emission Bandwidth	Nominal	All supported modulations Mid channel only	■	□	□	□	Complies
§15.247(b)(1) RSS247 5.4(4)	Maximum Conducted Output Power and EIRP	Nominal	Modulation GFSK Low, Mid, High Channels	■	□	□	□	Complies
§15.247/15.209/15.205 RSS-Gen 8.9/8.10	Band edge compliance- Restricted Band Edges	Nominal	Modulation GFSK With higher emission bandwidth channel closest to relevant band edge	■	□	□	□	Complies
§15.247(d) RSS247 5.5	Band edge compliance- Unrestricted Band Edges	Nominal	Modulation GFSK With higher emission bandwidth channel closest to relevant band edge	■	□	□	□	Complies
§15.247(d) §15.209 RSS-Gen 6.13	TX Spurious emissions- Radiated	Nominal	Modulation GFSK Low, Mid, High Channels	■	□	□	□	Complies
§15.207(a) RSS Gen 8.8	AC Conducted Emissions	Nominal	Not Applicable	□	□	□	■	

Note: NA= Not Applicable; NP= Not Performed.

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## 6 Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus, with 95% confidence interval (in dB delta to result), based on a coverage factor k=1.

**Radiated Measurement Uncertainty:  $\pm 3\text{dB}$**

**Conducted Measurement Uncertainty:  $\pm 0.5\text{dB}$**

## 7 Environmental Conditions During Testing:

The following environmental conditions were maintained during the course of testing:

- Ambient Temperature: 20 to 25°C
- Humidity: 40 to 60%

## 8 Dates of Testing:

2015-09-15 to 2015-09-23

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## 9 Measurement Procedures

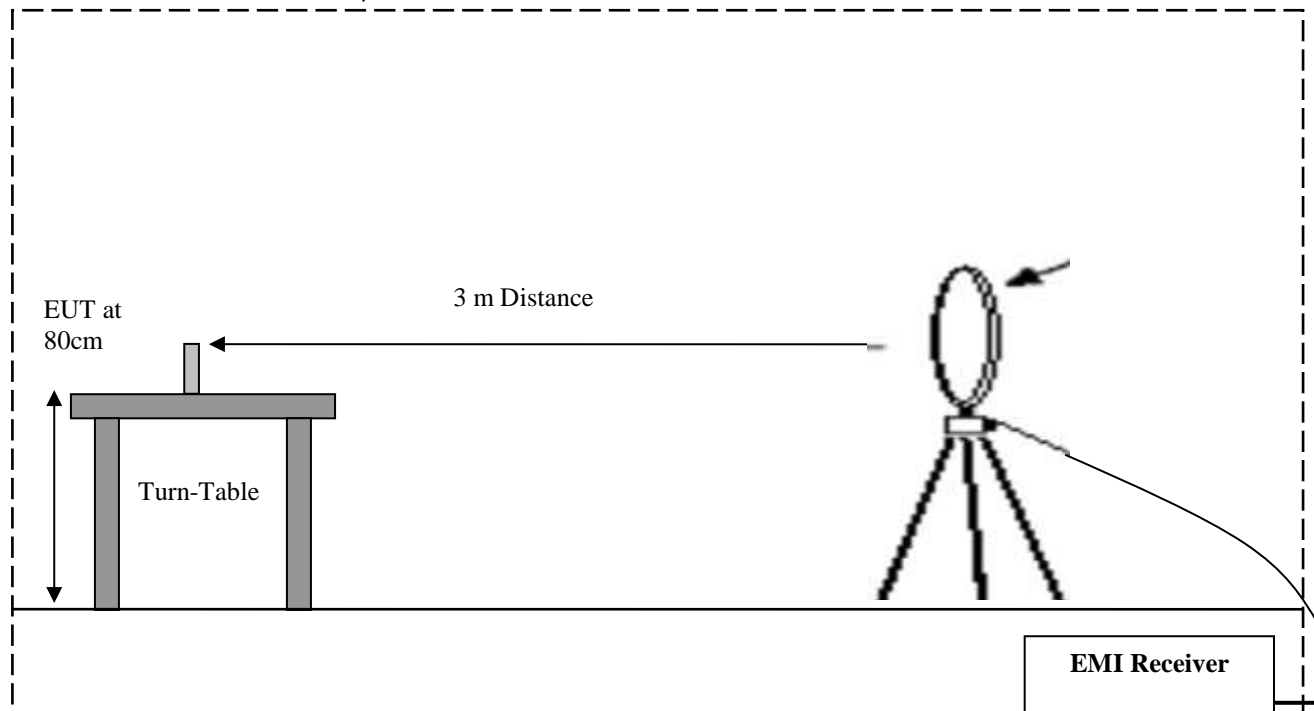
### 9.1 Radiated Measurement

The radiated measurement is performed according to:

ANSI C63.10 (2013)

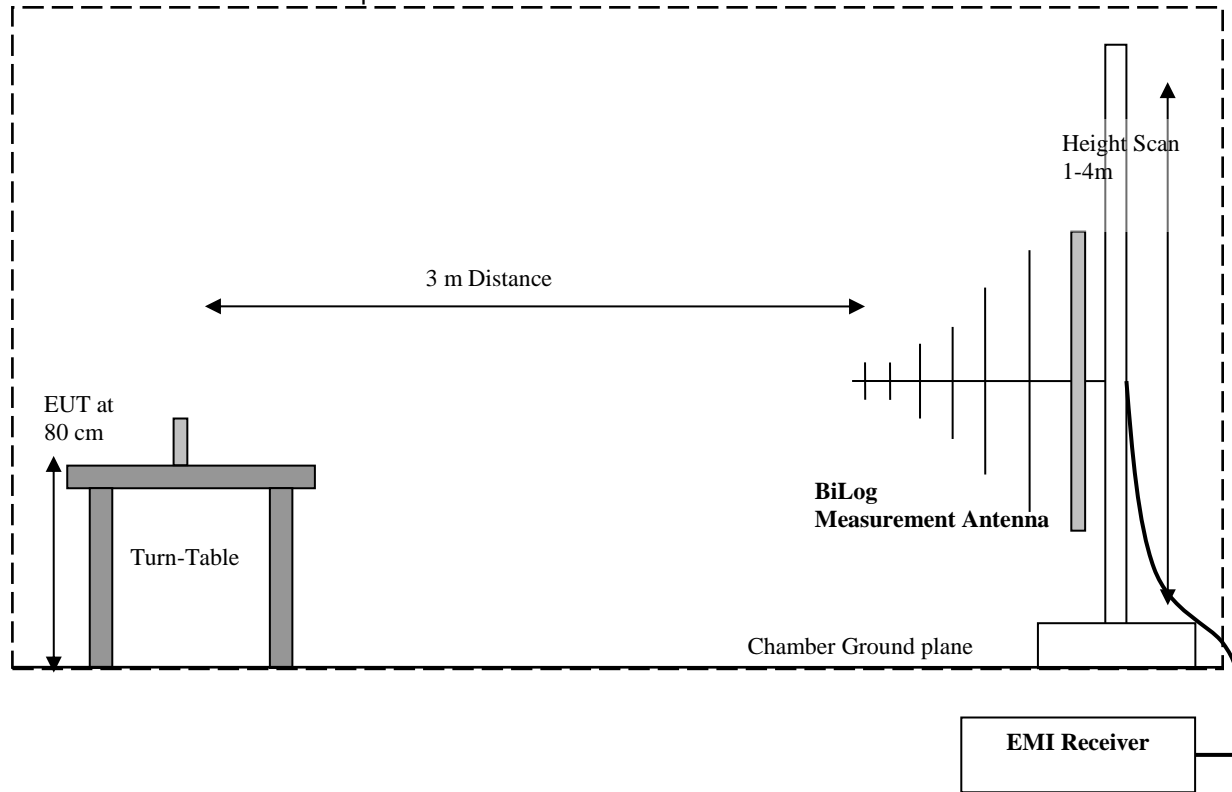
- The exploratory measurement is accomplished by running sweeps at 1 and 4m antenna heights over the required frequency range with R&S Test-SW EMC32 for both antenna polarizations. During each frequency scan the turntable rotates by no more than 10deg.
- The 10 highest emissions are selected with an automatic algorithm of EMC32 searching for peaks in the noise floor and ensuring that broadband signals are not selected multiple times.
- The maxima are then again maximized through a fine search in frequency domain, maximized in the 360deg range of the turntable, and maximized over antenna height between 1m and 4m and for positioning of the EUT.
- The above procedure is repeated for transmission low mid and high channel.
- In case there are no emissions above noise floor level only the maximum trace is reported as described above.
- The results are split up into up to 4 frequency ranges due to antenna bandwidth restrictions. A magnetic loop is used from 9 kHz to 30 MHz, a Biconilog antenna is used from 30 MHz to 1 GHz, and two different horn antennas are used to cover frequencies up to 40 GHz.

Radiated Emissions Test Setup Below 30MHz Measurements

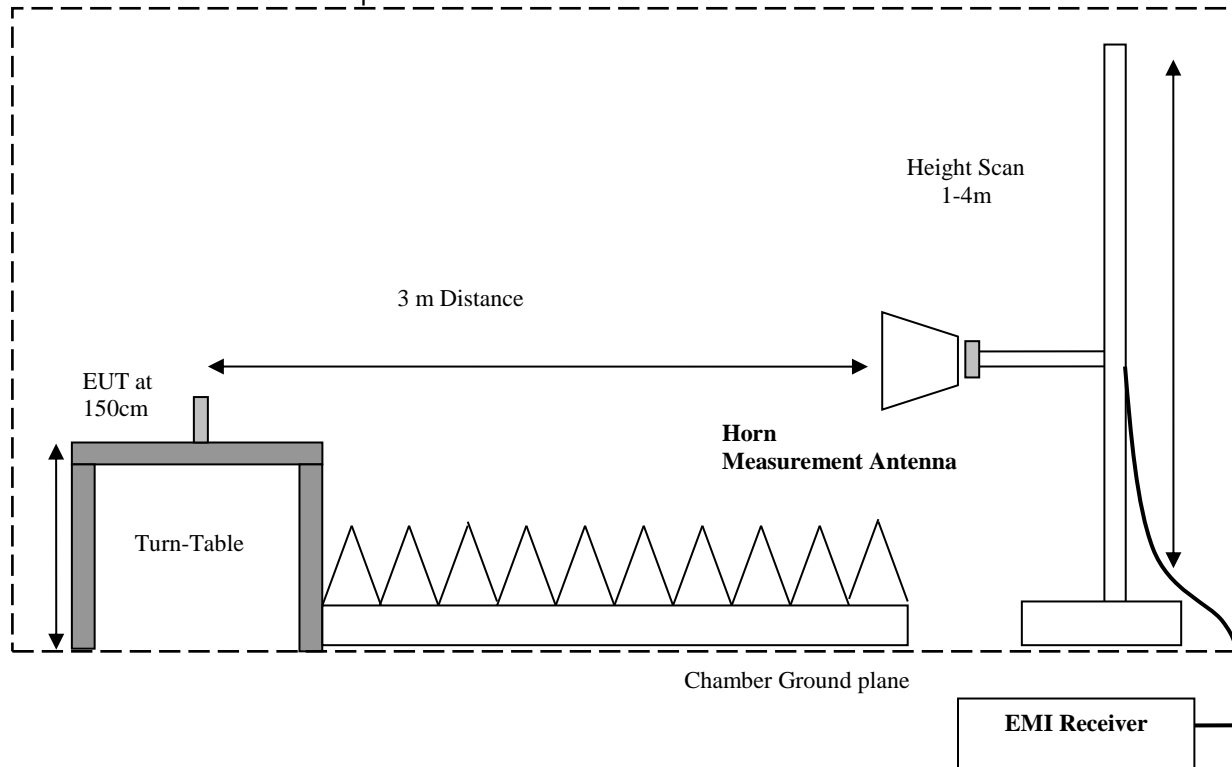



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### Radiated Emissions Test Setup 30MHz-1GHz Measurements



### Radiated Emissions Test Setup Above 1GHz Measurements



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## 9.2 Sample Calculations for Field Strength Measurements

Field Strength is calculated from the Spectrum Analyzer/ Receiver readings, taking into account the following parameters:

1. Measured reading in dB $\mu$ V
2. Cable Loss between the receiving antenna and SA in dB and
3. Antenna Factor in dB/m

All radiated measurement plots in this report are taken from a test SW that calculates the Field Strength based on the following equation:

$$FS \text{ (dB}\mu\text{V/m)} = \text{Measured Value on SA (dB}\mu\text{V)} - \text{Cable Loss (dB)} + \text{Antenna Factor (dB/m)}$$

Example:

Frequency (MHz)	Measured SA (dB $\mu$ V)	Cable Loss (dB)	Antenna Factor Correction (dB)	Field Strength Result (dB $\mu$ V/m)
1000	80.5	3.5	14	98.0

## 9.3 Power Line Conducted Measurement Procedure

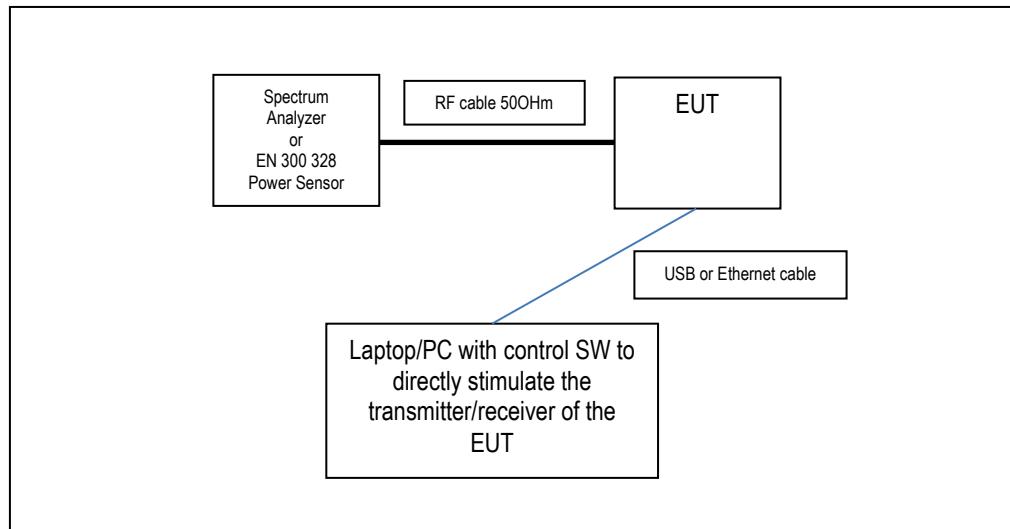
AC Power Line conducted emissions measurements performed according to:


ANSI C63.4 (2014)

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## 9.4 RF Conducted Measurement Procedure

### 9.4.1 Conducted Measurement Setup without companion device



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## 10 Maximum Peak Conducted Output Power

### 10.1 Measurement according to FCC KDB 558074 D01 V03R03

#### Spectrum Analyzer settings:

Span = approximately 5 times the 20 dB bandwidth

RBW > the 20 dB bandwidth of the emission being measured

VBW ≥ RBW

Sweep = auto

Detector function = peak

Trace = max hold

Use the marker-peak function to set the marker to the peak of the emission.

#### 10.2 Limits:

##### Maximum Peak Output Power:

FCC §15.247 (b)(1): 1W

IC RSS-247: 1W

##### EIRP:


IC RSS-247: 4W

### 10.3 Test conditions and setup:

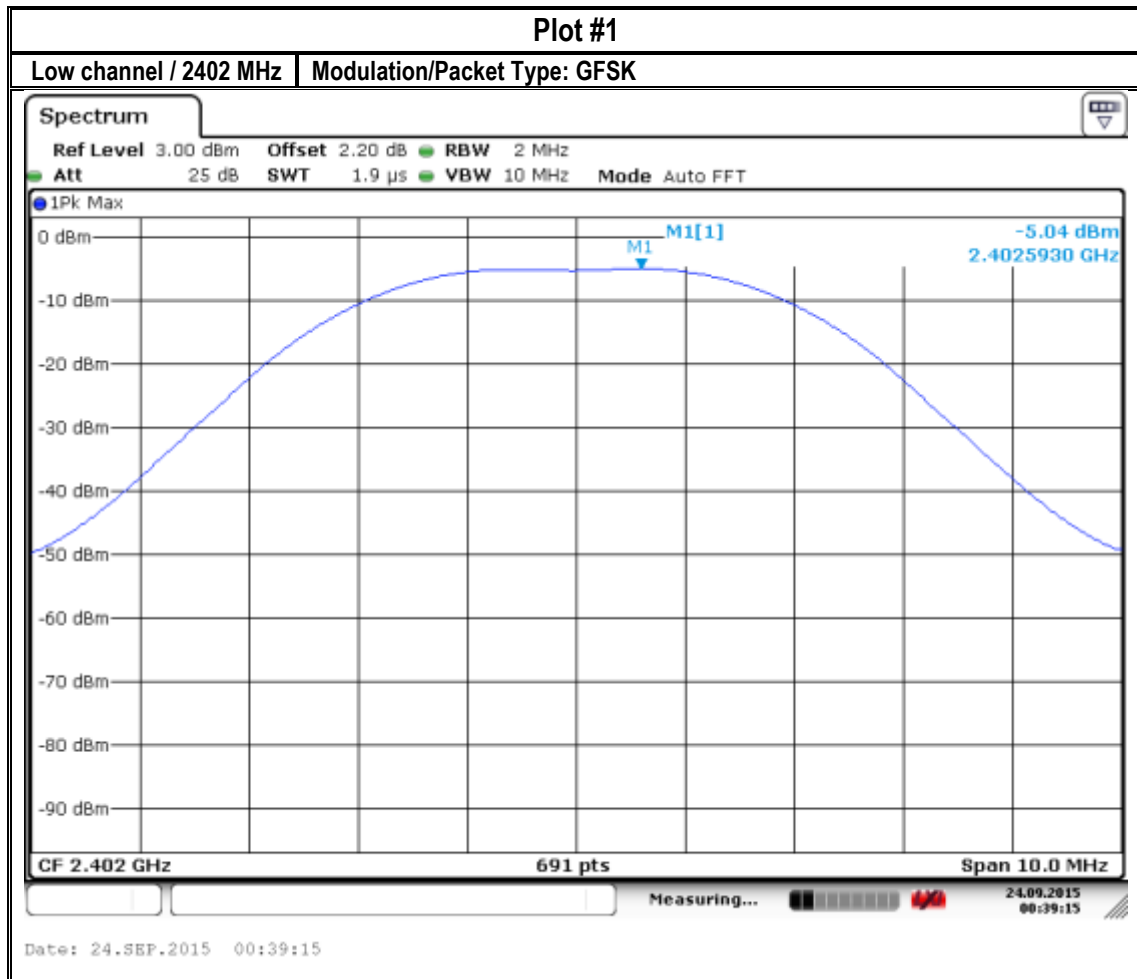
Ambient Temperature	EUT Set-Up #	EUT operating mode	Power Input	Antenna Gain (dBi)
25°C	2	BTLE	-	3dBi

### 10.4 Measurement result:


Plot #	Frequency (MHz)	Maximum Peak Conducted Output Power (dBm)	EIRP (dBm)	Limit (dBm)	Result
1	2402	-5.04	-2.04	30(Pk) / 36(EIRP)	Pass
2	2442	-4.02	-1.02	30(Pk) / 36(EIRP)	Pass
3	2480	-4.88	-1.88	30(Pk) / 36(EIRP)	Pass

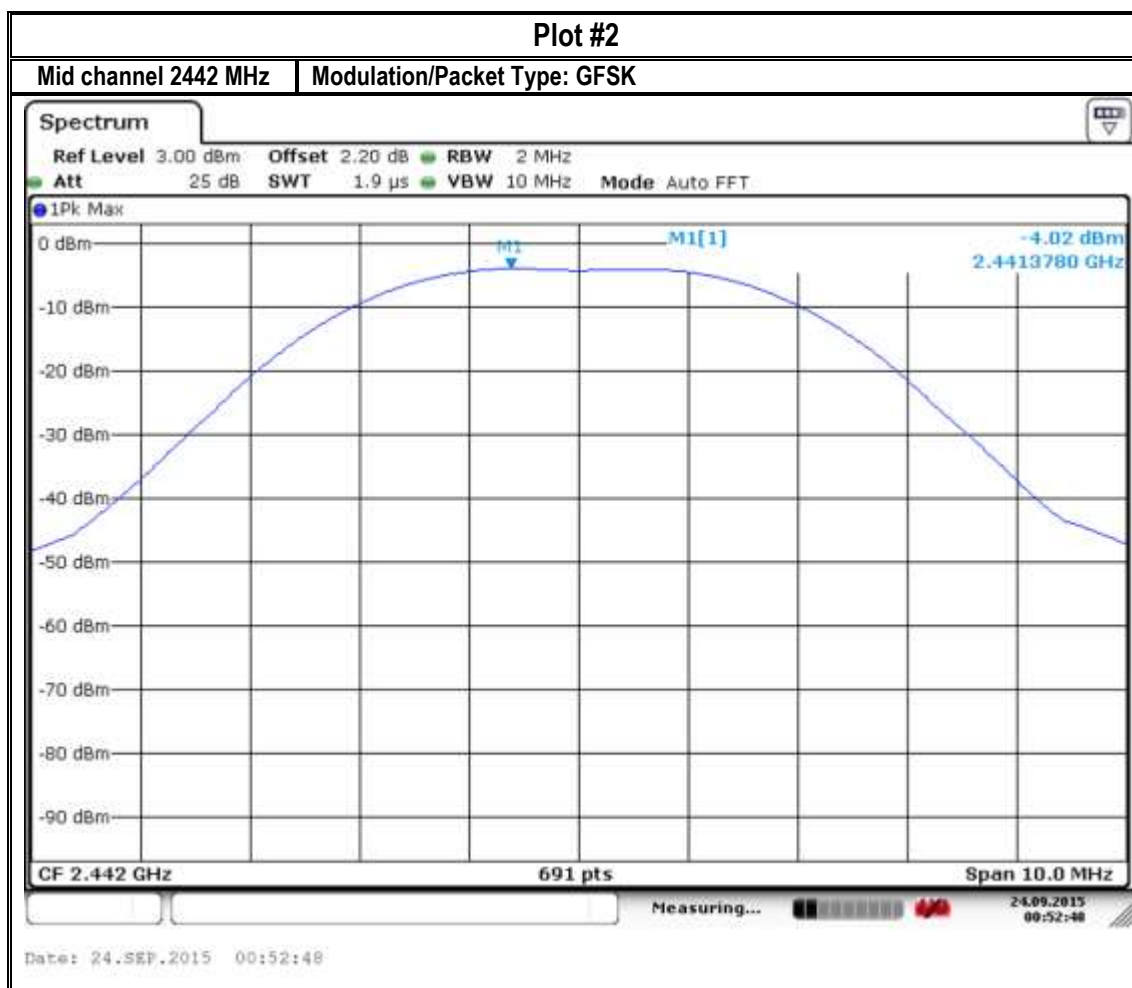
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## 10.5 Measurement Plots:

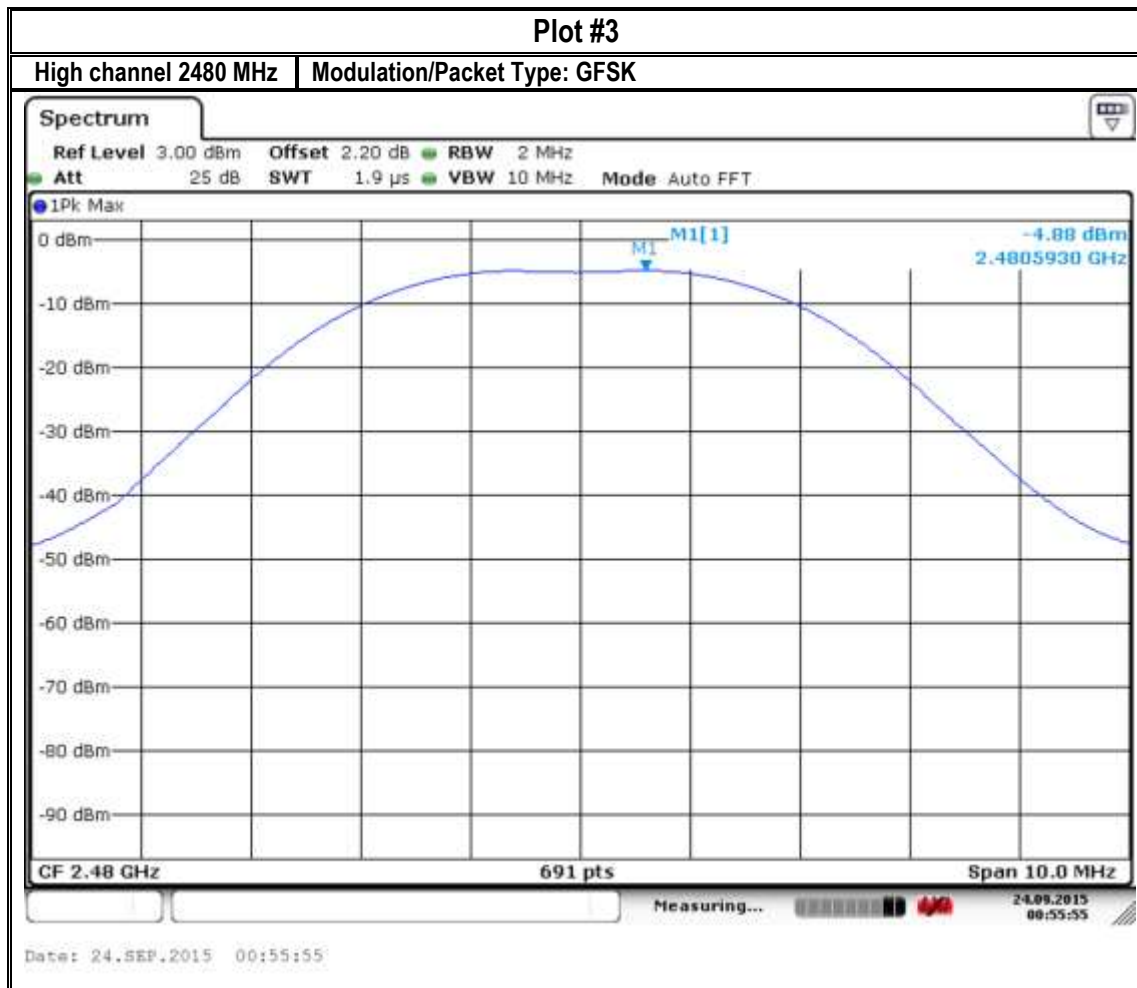





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## 11 Power Spectral Density

### 11.1 Measurement according to FCC KDB 558074 D01 V03R03

#### Spectrum Analyzer settings for Peak PSD method:

Set analyzer center frequency to DTS channel center frequency.

Set the span to 1.5 times the DTS bandwidth

Set RBW to:  $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$ .

Set the VBW  $\geq 3 \times \text{RBW}$ .

Detector = peak.

Sweep time = auto couple.

Trace mode = max hold.

Allow trace to fully stabilize.

Use the peak marker function to determine the maximum amplitude level within the RBW.

If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

### 11.2 Limits: §15.247 & RSS-247

For digitally modulated systems, the peak 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.

### 11.3 Test conditions and setup:

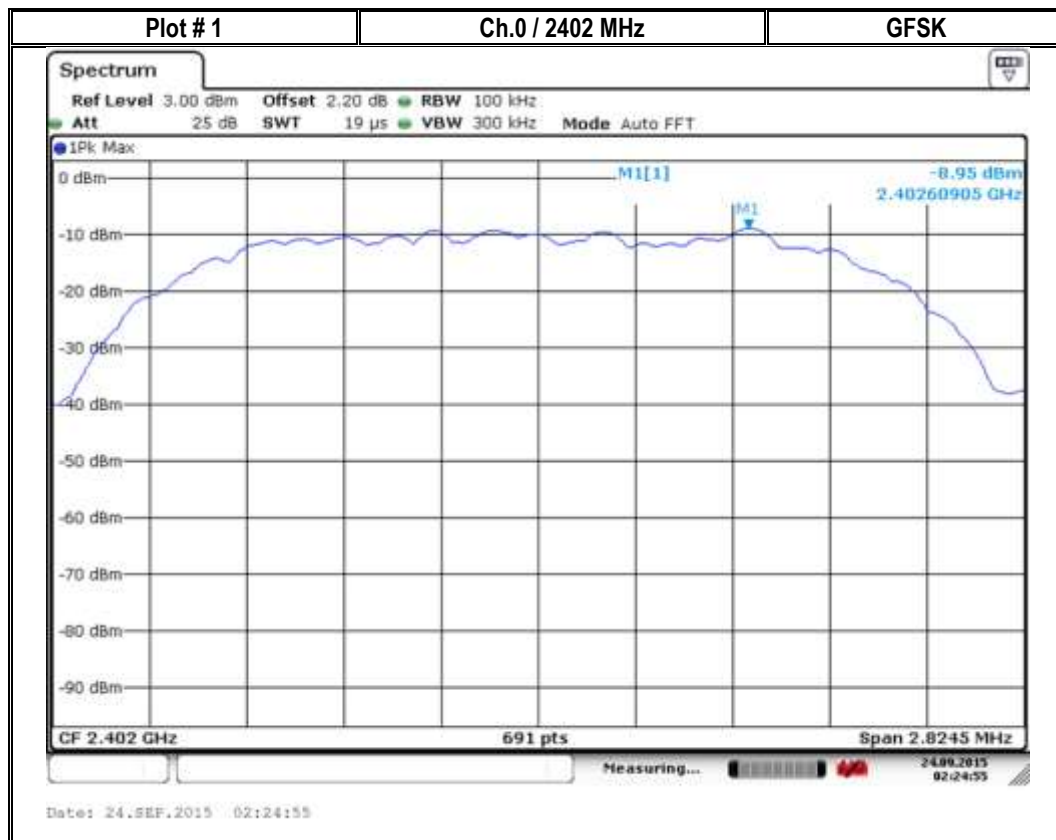
Ambient Temperature	EUT Set-Up #	EUT operating mode	Power Input
25°C	2	BTLE	-

### 11.4 Measurement result:

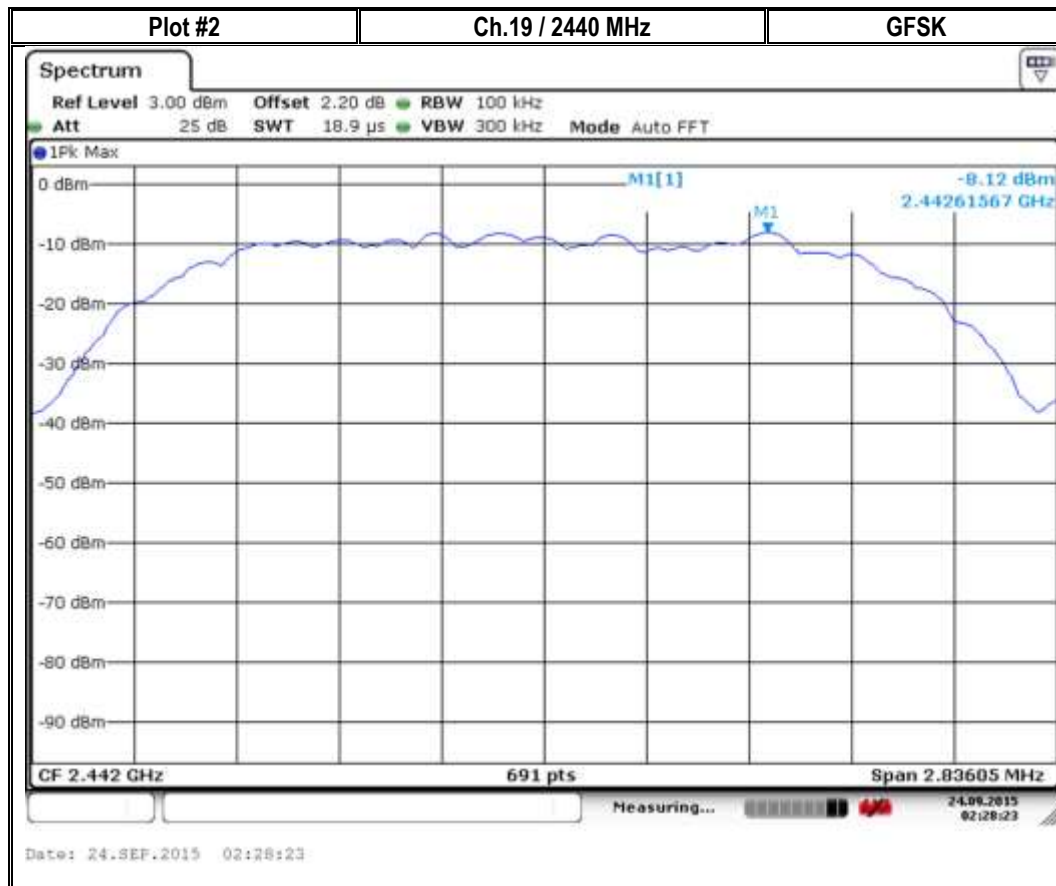
Plot #	Frequency (MHz)	Maximum Power Spectral Density (dBm/100kHz)	Limit ( dBm / 3 KHz )	Result
1	2402	-8.95	8	Pass
2	2442	-8.12	8	Pass
3	2480	-8.12	8	Pass


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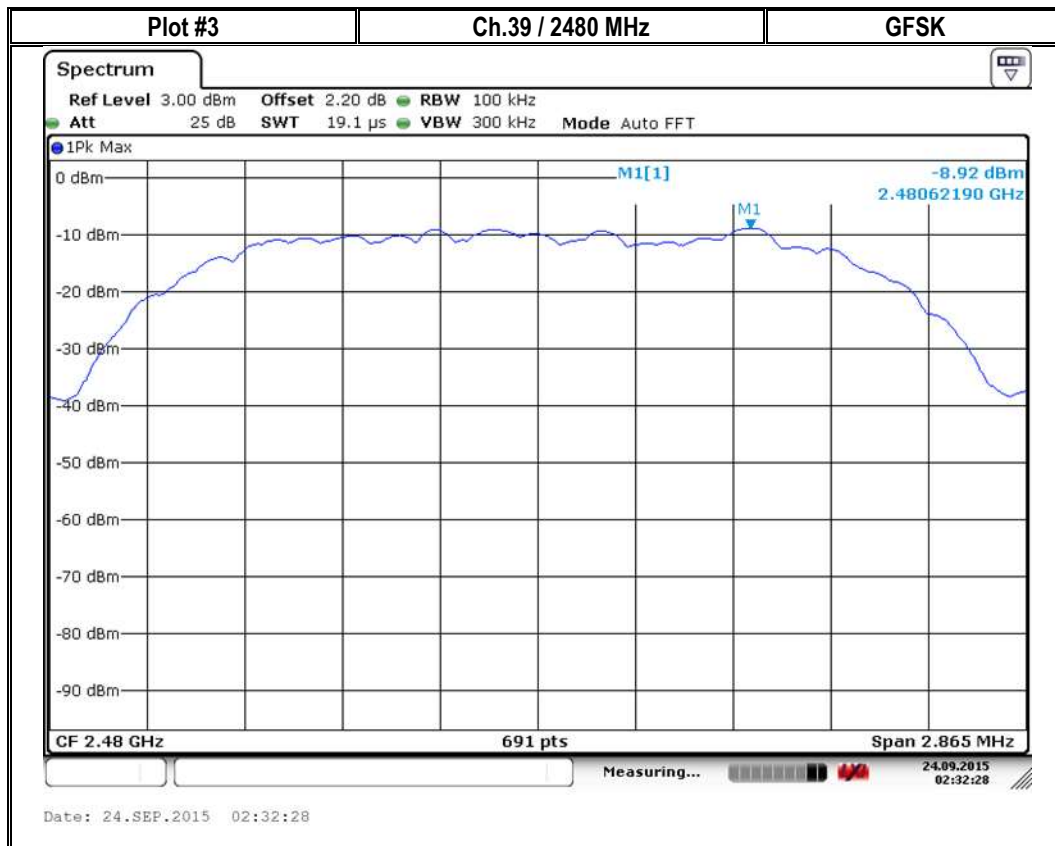
## 11.5 Measurement Plots:




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## 12 Band Edge Compliance

### 12.1 Measurement according to FCC KDB 558074 D01 v03r03

#### Spectrum Analyzer settings for band edge:

Set the center frequency and span to encompass frequency range to be measured

RBW  $\geq$  100 kHz

VBW  $\geq$  RBW

Sweep Time: Auto

Detector = peak

Trace = max hold

Allow trace to fully stabilize

Use the peak marker function to determine the maximum amplitude level

Allow the trace to stabilize. Set the marker on the emission at the band edge, or on the highest modulation product outside of the band, if this level is greater than that at the band edge.

### 12.2 Limits restricted band §15.205 and RSS-Gen 8.10

\*PEAK LIMIT= 74dB $\mu$ V/m @3m =-21.23dBm


\*AVG. LIMIT= 54dB $\mu$ V/m @3m =-41.23dBm

Start frequency & stop frequency according to frequency range specified in the restricted band table in FCC section 15.205 & RSS-Gen 8.10

Measurements with a peak detector were used to show compliance to average limits, thus showing compliance to both peak and average limits.

- (a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
<sup>1</sup> 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	( <sup>2</sup> )
13.36 - 13.41			

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### 12.3 Limits non restricted band §15.247 and RSS-247 5.5

#### FCC15.247 (d)

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)).


#### RSS-247 5/5

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 30dB instead of 20dB.

### 12.4 Test conditions and setup:

Ambient Temperature	EUT Set-Up #	EUT operating mode	Power Input	Antenna Gain (dBi)
25°C	2	BTLE	-	3dBi




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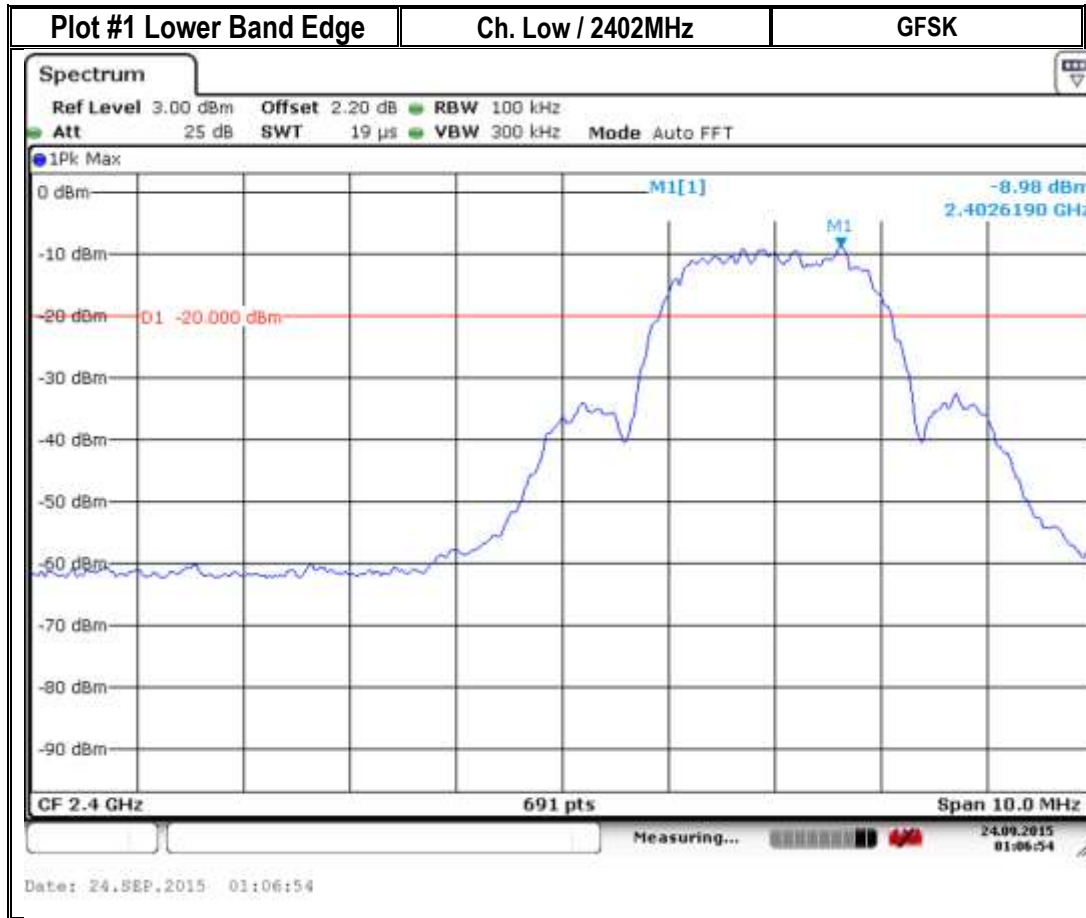
### 12.5 Measurement result:


Plot #	EUT operating mode	Band Edge	Band Edge Delta (dBc)	Limit (dBc)	Result
1	BTLE	Lower, non-restricted	17	-20 if EIRP average -30 if EIRP peak	Pass

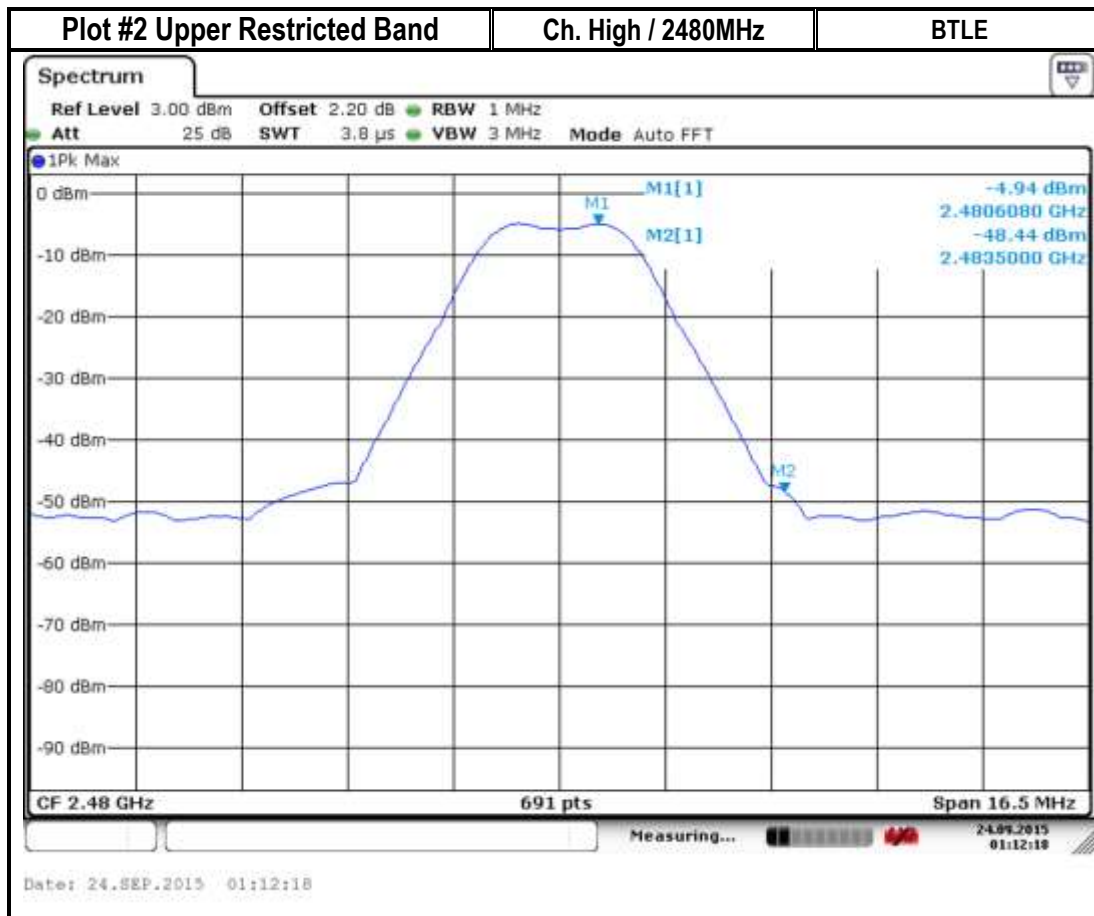
Plot #	EUT operating mode	Band Edge	Measured value	Corrected by duty cycle	Corrected by gain (min 2dBi)	Limit (dBm)	Result
2	BTLE	Upper restricted peak	-48.4dBm (pk)	Only needed for average	-46.4dBm	-41.23 peak	Pass


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## 12.6 Measurement Plots:



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### 13 Emission Bandwidth 6dB and 99% Occupied Bandwidth

#### 13.1 Measurement according to FCC KDB 558074 D01 v03r03

##### Spectrum Analyzer settings:

Set RBW = 100 kHz

Set the video bandwidth (VBW)  $\geq 3 \times$  RBW

Detector = Peak

Trace mode = max hold

Sweep = auto couple

Allow the trace to stabilize

Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

#### 13.2 Limits: §15.247

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.

#### 13.3 Test conditions and setup:

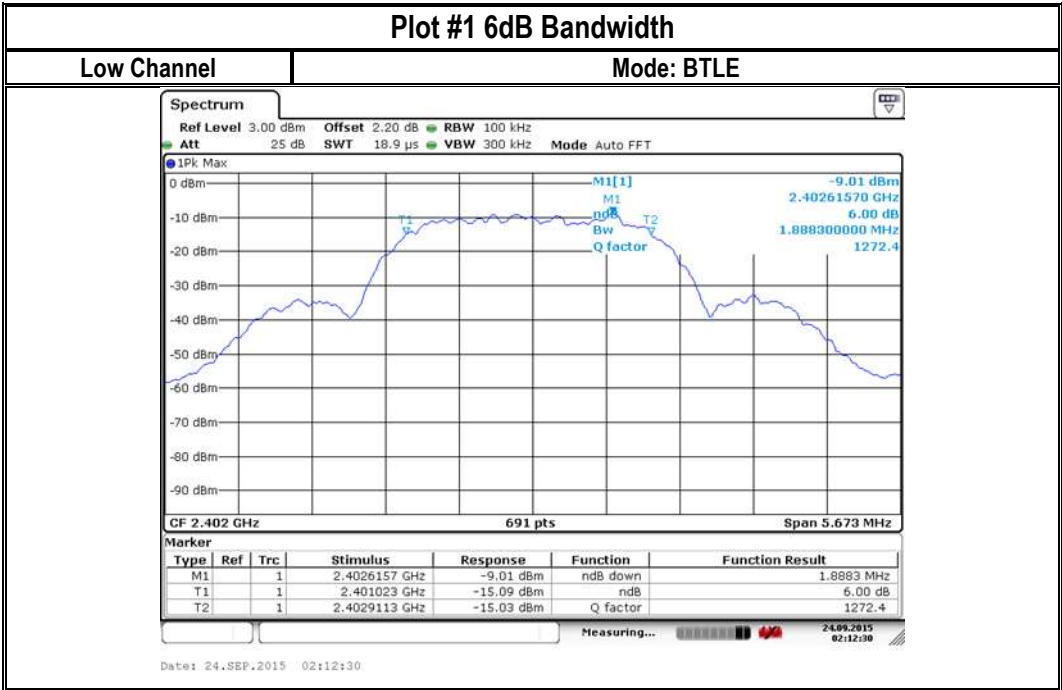
Ambient Temperature	EUT Set-Up #	EUT operating mode	Power Input
25°C	2	BTLE	-

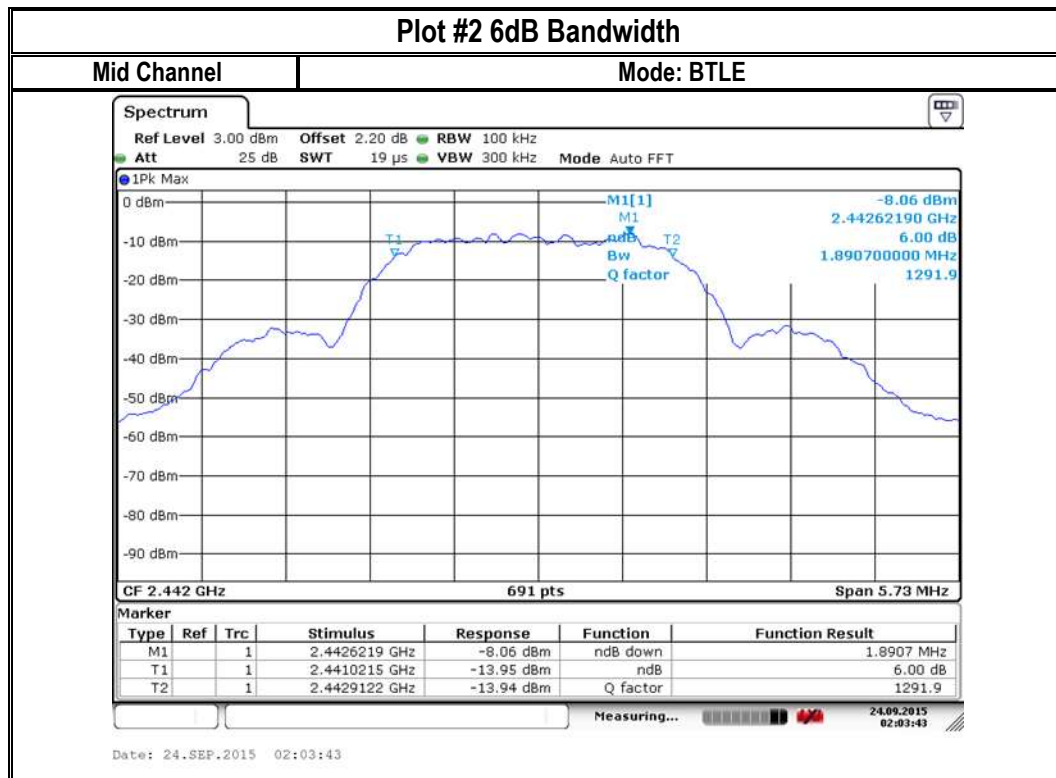
#### 13.4 Measurement result:

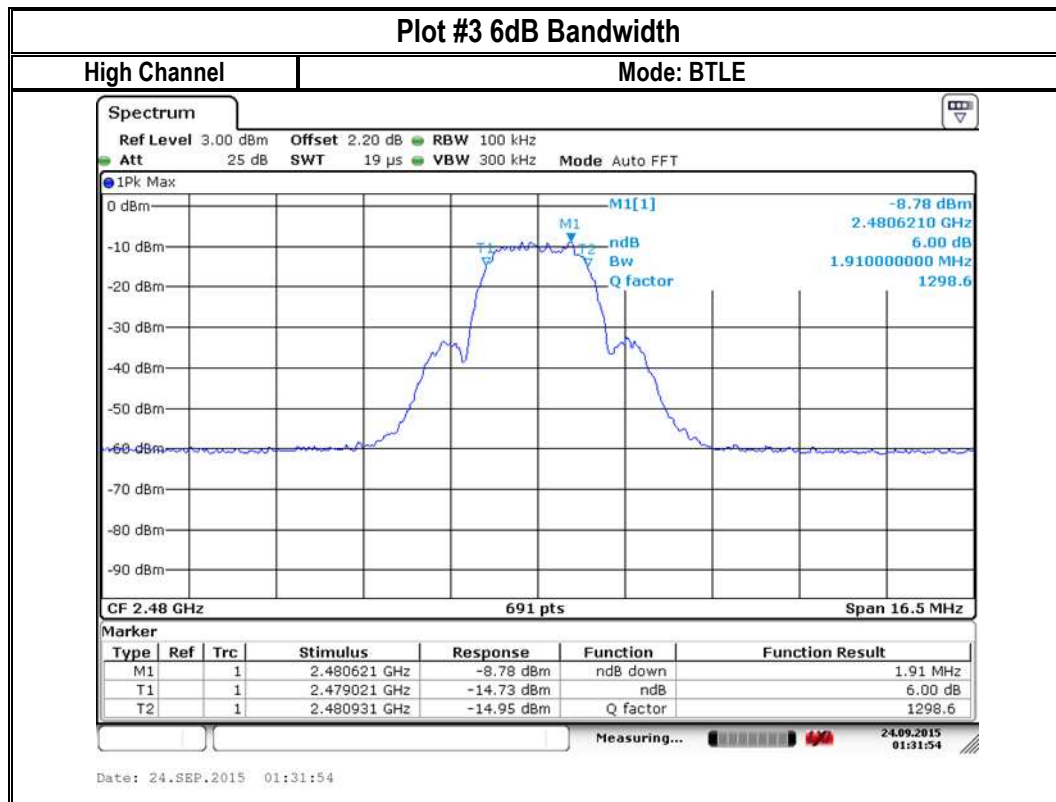
Plot #	Frequency (MHz)	Modulation / Bandwidth	6dB Emissions Bandwidth (MHz)	Limit (MHz)	Result
1	2402	GFSK	1888.3	> 0.5	Pass
2	2442	GFSK	1890.7	> 0.5	Pass
3	2480	GFSK	1910.0	> 0.5	Pass

Plot #	Frequency (MHz)	99% Occupied Bandwidth (MHz)
4	2402	2.232
5	2480	2.239

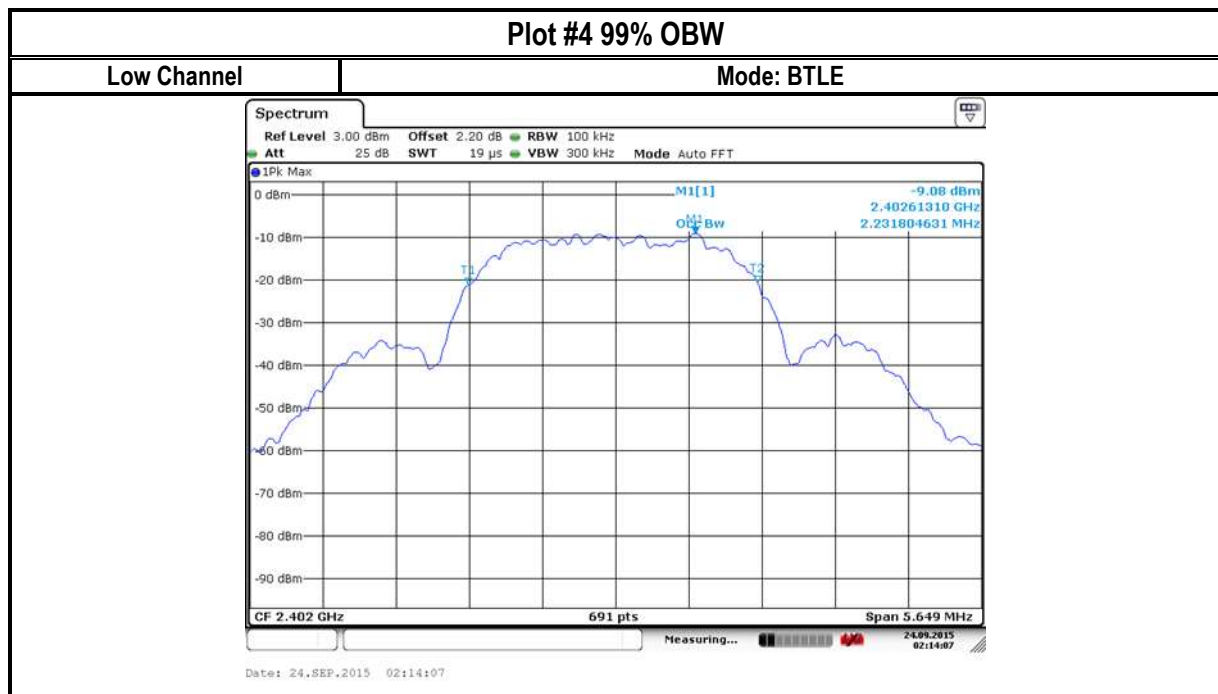
13.5 Measurement Plots:



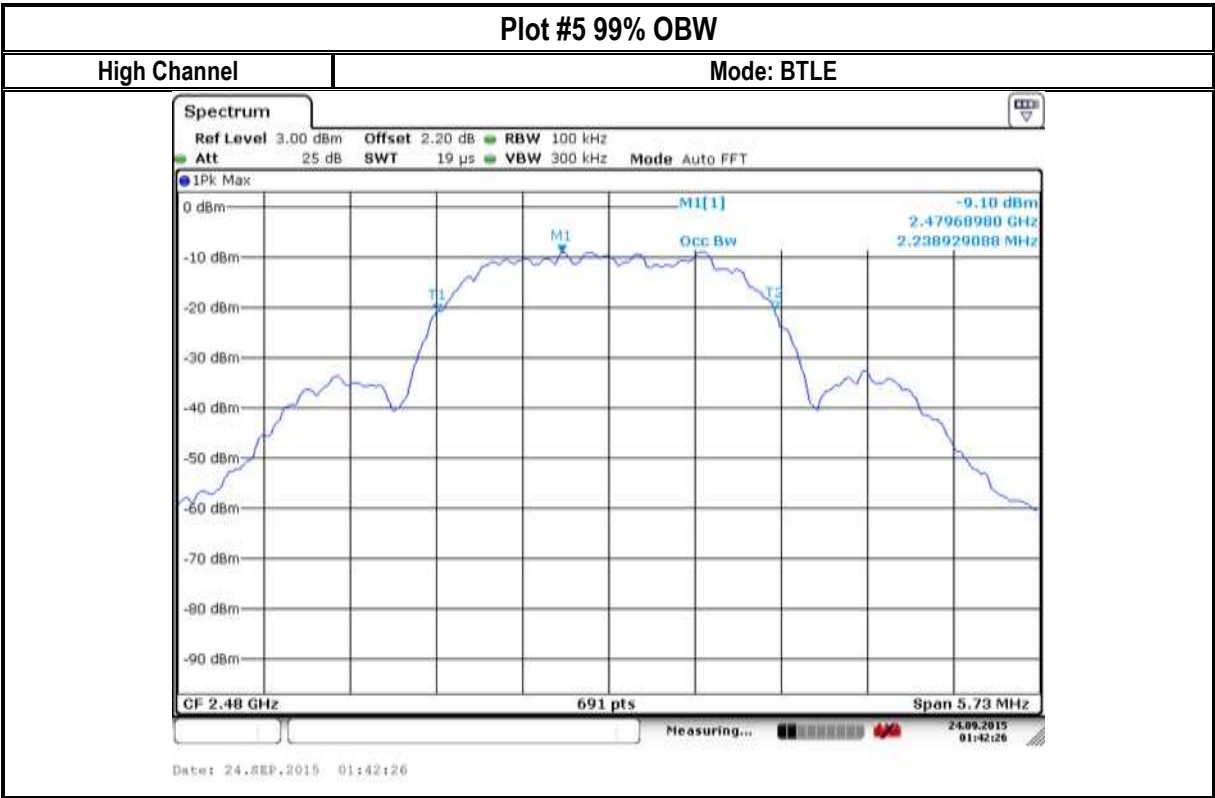





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#### **14 RF Exposure Compliance**

The max declared EIRP, considering the max. conducted power + the max antenna gain is equal to +3dBm or 2mW, this value is less than the RF exposure evaluation exclusion thresholds for fixed/mobile applications for the used frequency range according with FCC part 2.1091 (3W ERP) and IC RSS-102 i5 ( $1.31 \times 10^{-2} f^{0.6834} \text{ W}$ ) = 2.575 W.

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## 15 Radiated Transmitter Spurious Emissions and Restricted Bands

### 15.1 Measurement according to ANSI C63.10 (2013)

#### Analyzer Settings:

Frequency = 9 KHz – 30 MHz

RBW = 9 KHz

Detector: Peak

Frequency = 30 MHz – 1 GHz

Detector = Peak / Quasi-Peak

RBW=120 KHz (<1GHz)

Frequency > 1 GHz

Detector = Peak / Average


RBW= 1MHz

Plots reported here represent the worst case emissions for horizontal and vertical antenna polarizations and for three orientations of the EUT. Unless mentioned otherwise, the emissions outside the limit lines in the plots are from the transmit signal.

### 15.2 Limits: §15.247/15.205/15.209 & RSS-Gen 8.9/ 8.10 (restricted bands)

(a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
<sup>1</sup> 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	( <sup>2</sup> )
13.36 - 13.41			

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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)).

\*PEAK LIMIT= 74dBµV/m

\*AVG. LIMIT= 54dBµV/m

**Table 1:**

Frequency of emission (MHz)	Field strength @ 3m (µV/m)	Field strength @ 3m (dBµV/m)
30–88	100	40dBµV/m
88–216	150	43.5 dBµV/m
216–960	200	46 dBµV/m
Above 960	500	54 dBµV/m

**Table 2:**

Frequency of emission (MHz)	Field strength (µV/m) / (dBuV/m)	Measurement Distance (m)
0.009–0.490	2400/F(kHz) / -----	300
0.490–1.705	24000/F(kHz) / -----	30
1.705–30.0	30 / (29.5)	30

Radiated spurious emissions shall be measured for the transmit frequencies, transmit power, and data rate for the lowest, middle and highest channel in each frequency band of operation and for the highest gain antenna for each antenna type, and using the appropriate parameters and test requirements described in 5.4.

**The highest (or worst-case) data rate shall be recorded for each measurement.**

For testing at distance other than the specified in the standard, the limit conversion is calculated by using 40 dB/decade extrapolation factor as follow:

Conversion factor (CF) =  $40 \log (D/d) = 40 \log (300\text{m} / 3\text{m}) = 80\text{dB}$

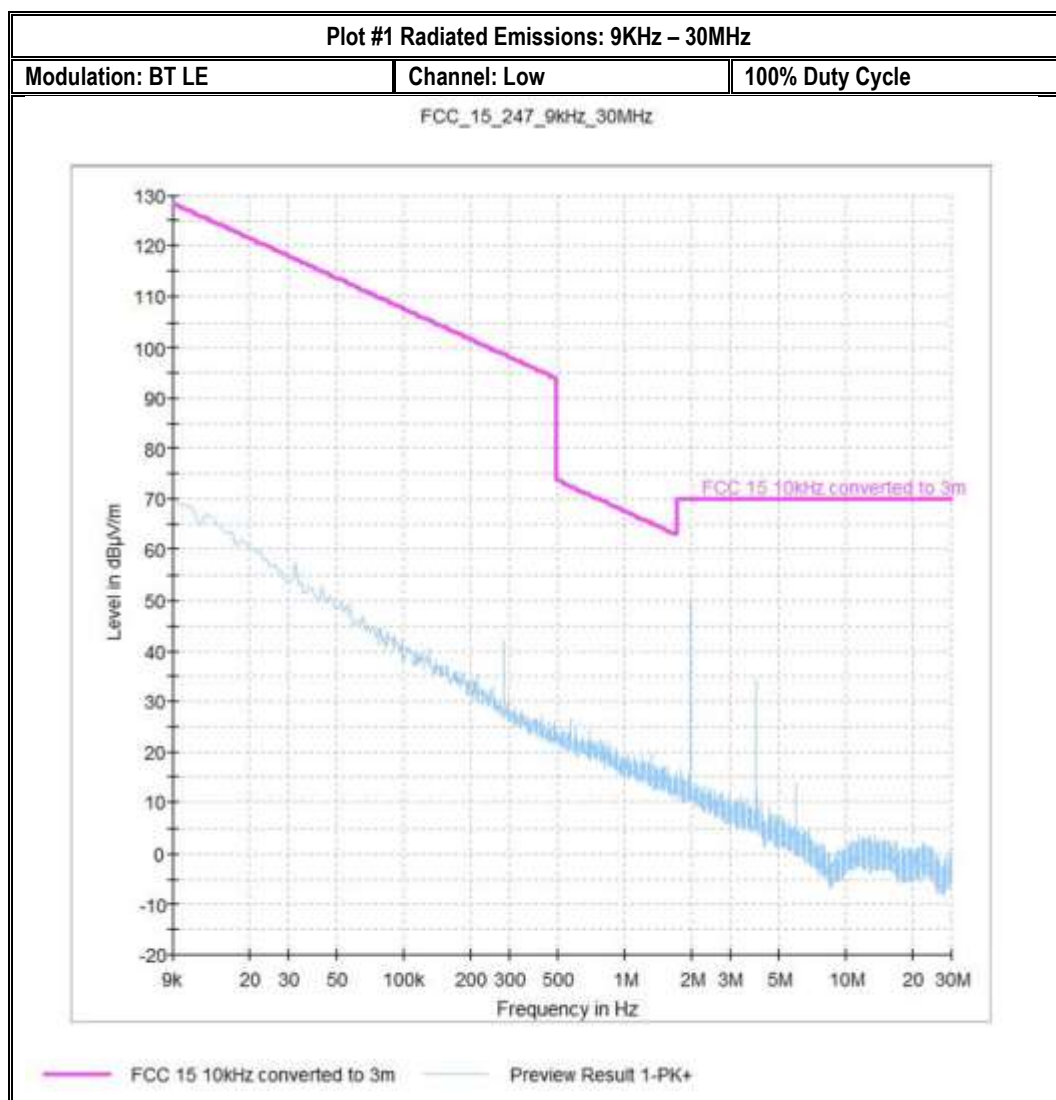
### 15.3 Test conditions and setup:

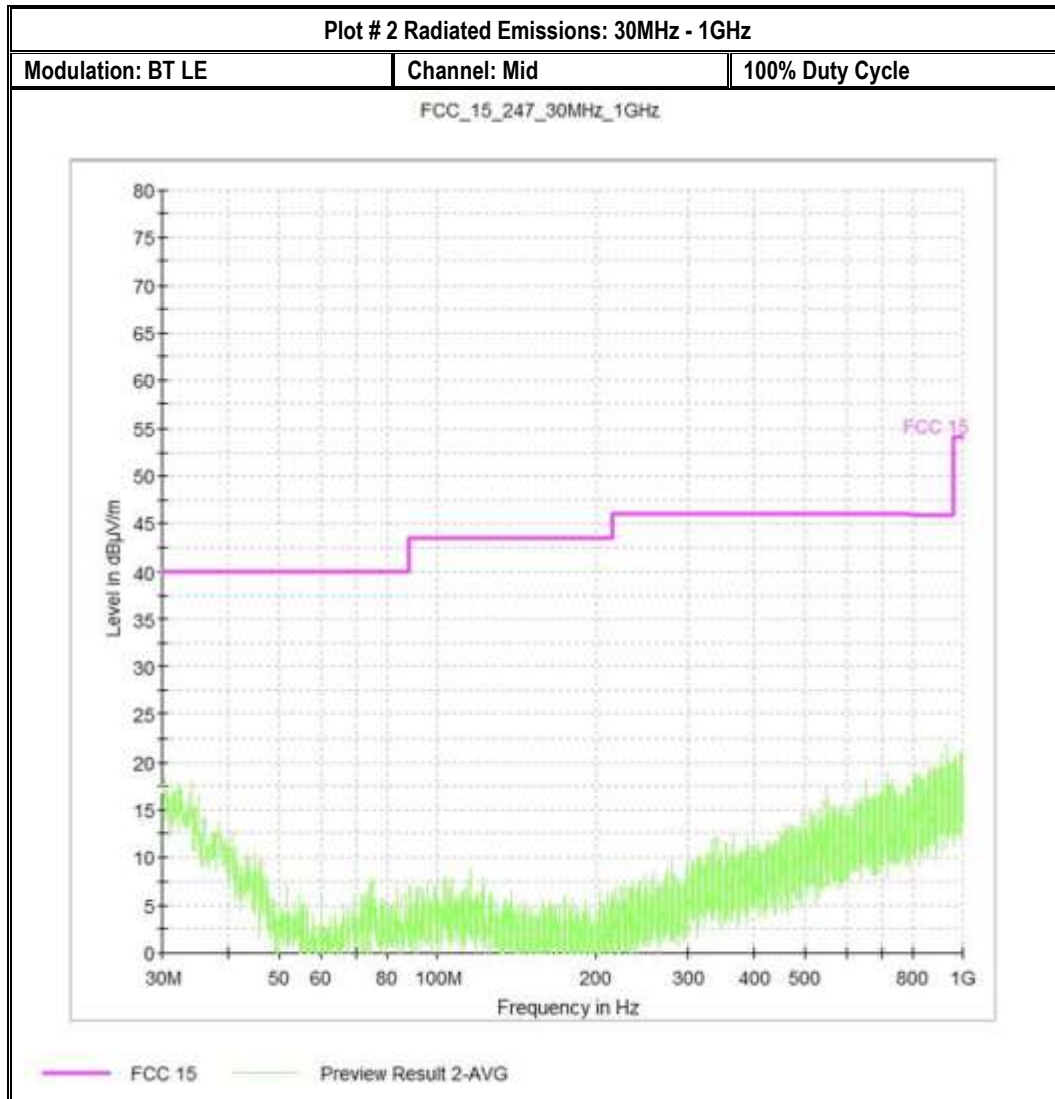
Ambient Temperature	EUT Set-Up #	EUT operating mode	Power Input
25°C	1	BTLE	-

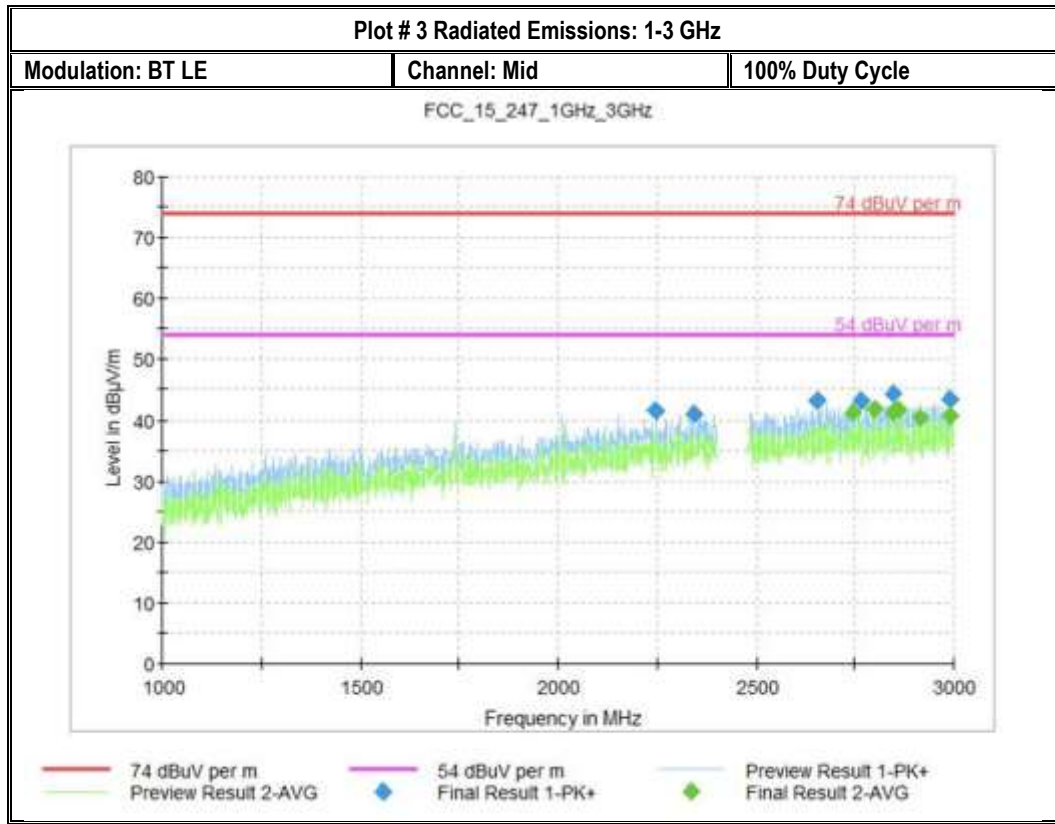
#### 15.4 Measurement result:


Plot #	Channel #	Scan Frequency	Limit	Result
1	Mid	9 kHz – 30MHz	On plot	Pass
2	Mid	30MHz – 1GHz	On plot	Pass
3	Mid	1GHz – 3GHz	On plot	Pass
4	Mid	3GHz – 18GHz	On plot	Pass
5	Mid	18GHz – 26GHz	On plot	Pass

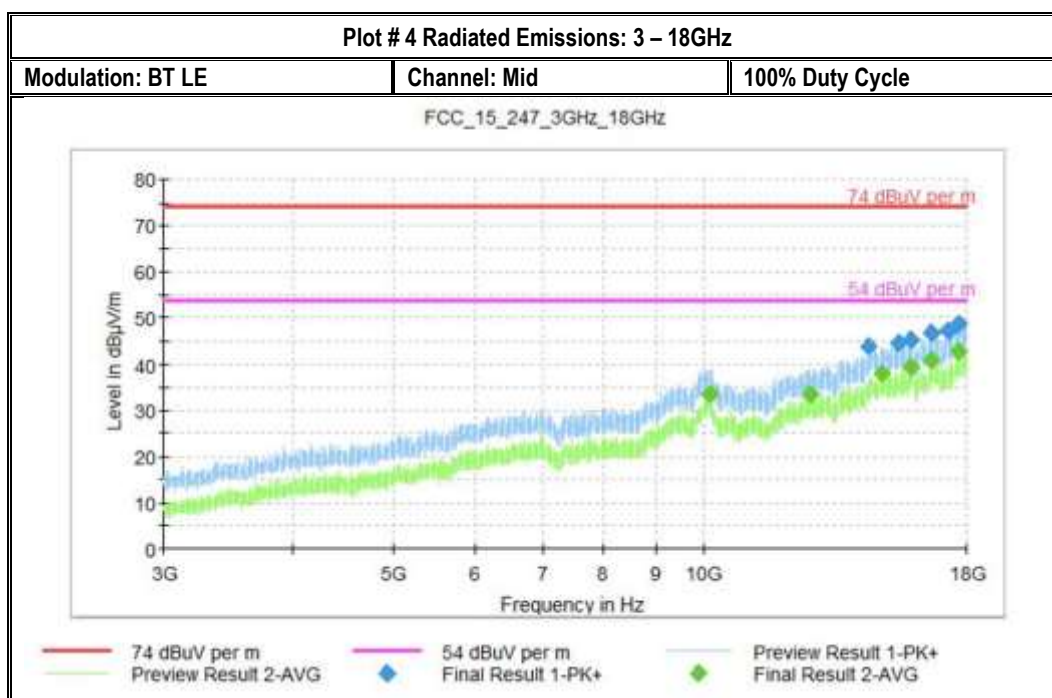
#### 15.5 Measurement Plots:





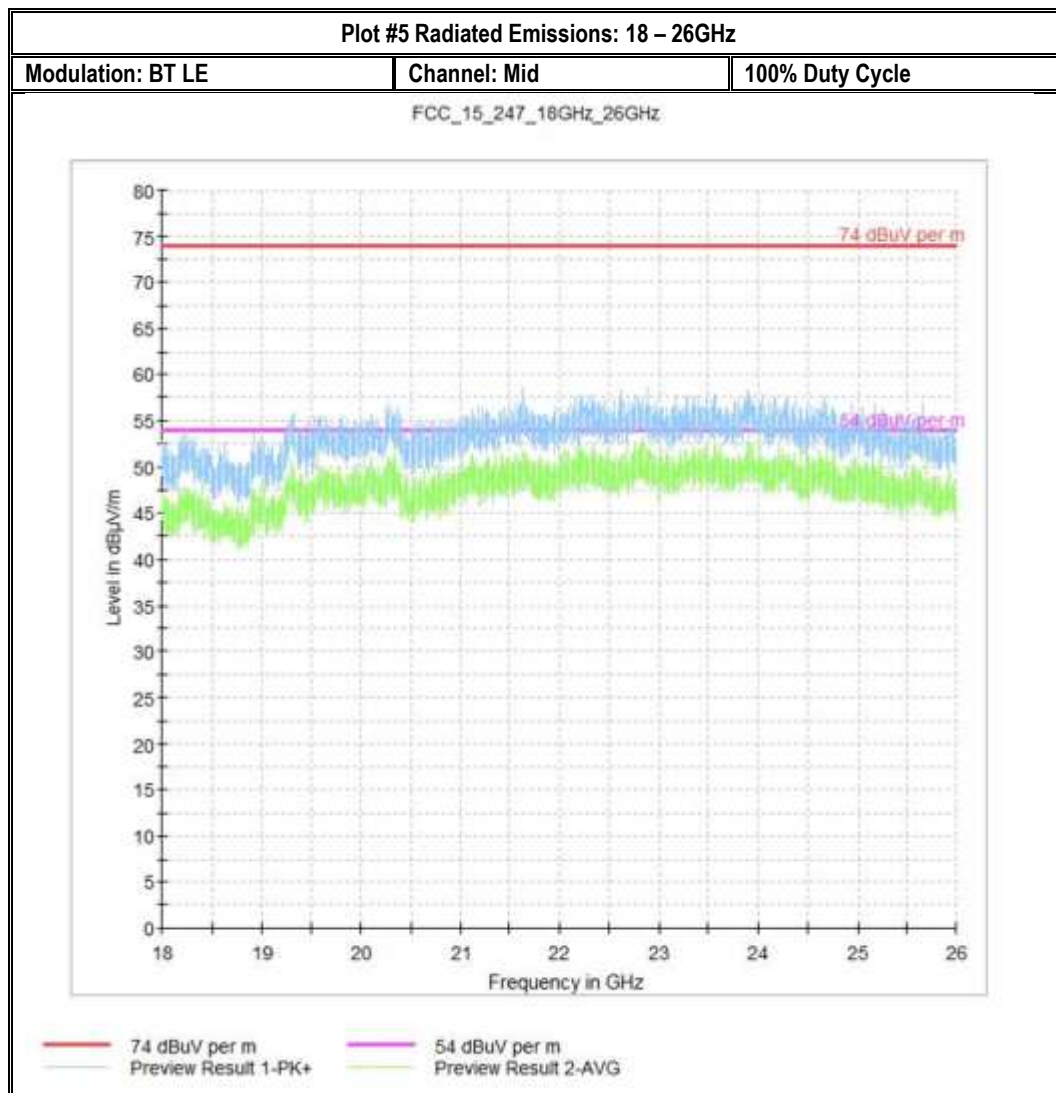



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## 16 AC Power Line Conducted Emissions

### 16.1 Measurement according to ANSI C63.10 (2013)

#### Analyzer Settings:

RBW = 9 KHz (CISPR Bandwidth)

Detector: Peak / Average for Pre-scan

Quasi-Peak/Average for Final Measurements

### 16.2 Limits: §15.207 & RSS-Gen 8.8

(a) Except as shown in paragraphs (b) and (c) of this section of the CFR, 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 (1), as measured using a 50  $\mu$ H/50 ohms 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 frequency ranges.

Table 1:

Frequency of emission (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

\*Decreases with the logarithm of the frequency.


### 16.3 Test conditions and setup:

**NOTE:** This device intent to be used only with Battery power, no AC tests were performed

Ambient Temperature (C)	EUT Set-Up #	EUT operating mode	Power line (L1, L2, L3, N)	Power Input
			Line & Neutral	

### 16.4 Measurement Result:


Plot #	Port	EUT Set-Up #:	EUT operating mode	Scan Frequency	Limit	Result
1	AC Mains			150 kHz – 30 MHz	See section 8.8.2	
2	AC Mains			150 kHz – 30 MHz	See section 8.8.2	

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## 17 Test Equipment And Ancillaries Used For Testing

Equipment Name	Manufacturer	Type/Model	Serial No.	Cal Date	Cal Interval	Next cal date
<b>3m Semi- Anechoic Chamber:</b>						
Spectrum Analyzer	Rohde und Schwarz	FSV40	101022	7/2014	3 years	7/2017
Receiver	Rohde und Schwarz	ESR3	101663	7/2015	3 years	7/2018
LISN	Rohde und Schwarz	ESV 216	101129	7/2015	3 years	7/2018
Radiocommunication Tester	Rohde and Schwarz	CMU 200	121672	7/2015	3 years	7/2018
Log Periodic Antenna	Rohde and Schwarz	HL 050	100515	4/2013	3 year	4/2016
Ultralog Antenna	Rohde and Schwarz	HL 562	100495	5/2015	3 year	5/2018
Double-ridge Horn Antenna (1G-18G)	ETS-Lindgren	3117-PA	00167061	7/2014	3 year	7/2017
Double-ridge Horn Antenna (18G-40G)	ETS-Lindgren	3116C-PA	00166821	7/2014	3 year	7/2017
Loop Antenna	ETS-Lindgren	6512	00164698	7/2014	3 year	7/2017
Open Switch Control Unit	Rohde and Schwarz	OPS 130	10085	n/a		
Extention Unit Open Switch Control Unit	Rohde and Schwarz	OSP 150	10086	n/a		
Turn Table TT	Maturo	1.5 SI	TT 1.5SI/204/60709 10	n/a		
Compact antenna Mast	Maturo	CAM 4.0-P	CAM4.0- P/067/6000910	n/a		
Multiple Control Unit	Maturo	MCU	2140910	n/a		
Pre-Amplifier	Rohde and Schwarz	TS-PR 18	100072	Part of the system calibration		
High Pass Filter	Mini-Circuits	SHP-1200+	RUU11201224			
High Pass Filter	Wainwright Instr.	WHKX 3.0/18	109			

Equipment used meets the measurement uncertainty requirements as required per applicable standards for 95% confidence levels.  
Calibration due dates, unless defined specifically, falls on the last day of the month.  
Items indicated "N/A" for cal status either do not specifically require calibration or is internally characterized before use.

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## 18 Revision History

Date	Report Name	Changes to the report	Report prepared by
2015-11-03	EMC_AUGUH_003_15001_15.247_BTLE_v1.0	release	MPDL
2015-11-03	EMC_AUGUH_003_15001_15.247_BTLE_v1.1	Remove setup pics	MPDL
2015-11-11	EMC_AUGUH_003_15001_15.247_BTLE_v1.2	Update FCC/IC IDs	MPDL
2015-11-11	EMC_AUGUH_003_15001_15.247_BTLE_v1.3	Update report name	MPDL