

																															
MOTOROLA PENANG ADV. COMM. LABORATORY Motorola Solutions Malaysia Sdn. Bhd. Innoplex Plot 2A Medan Bayan Lepas, Mukim 12, S.W.D. 11900 Bayan Lepas, Penang, Malaysia.	FCC / IC TEST REPORT Report Revision : Rev.B																														
<table><tr><td>Date/s Tested</td><td>: 29-November-2016 - 09-January-2017</td></tr><tr><td>Report Issue Date</td><td>: 09-January-2017</td></tr><tr><td>Manufacturer/Location</td><td>: Motorola Solutions - Penang</td></tr><tr><td>Requestor</td><td>: MOHD AFIQ AZFAR JAMANI</td></tr><tr><td>Product Type</td><td>: Portable</td></tr><tr><td>Model Number</td><td>: H92UCH9PW7AN</td></tr><tr><td>Frequency Band</td><td>: 2.402 - 2.480 GHz</td></tr><tr><td>Rated / Max RF Output Power</td><td>: 8.9mWatts / 10mWatts</td></tr><tr><td>Applicant Name</td><td>: Motorola Solution Malaysia Sdn Bhd</td></tr><tr><td>Applicant Address</td><td>: Innoplex Plot 2A, Medan Bayan lepas, Mukim 12, S.W.D. 11900 Bayan Lepas, Penang, Malaysia</td></tr><tr><td>FCC Registrations</td><td>: 772092</td></tr><tr><td>IC Registrations</td><td>: 109AK</td></tr></table>  The equipment was tested accordance to the requirement listed below: <table><tr><td>(2.4GHz BT LE)</td><td>PASS</td></tr><tr><td>Part 15C</td><td></td></tr><tr><td>IC RSS 247</td><td></td></tr></table>		Date/s Tested	: 29-November-2016 - 09-January-2017	Report Issue Date	: 09-January-2017	Manufacturer/Location	: Motorola Solutions - Penang	Requestor	: MOHD AFIQ AZFAR JAMANI	Product Type	: Portable	Model Number	: H92UCH9PW7AN	Frequency Band	: 2.402 - 2.480 GHz	Rated / Max RF Output Power	: 8.9mWatts / 10mWatts	Applicant Name	: Motorola Solution Malaysia Sdn Bhd	Applicant Address	: Innoplex Plot 2A, Medan Bayan lepas, Mukim 12, S.W.D. 11900 Bayan Lepas, Penang, Malaysia	FCC Registrations	: 772092	IC Registrations	: 109AK	(2.4GHz BT LE)	PASS	Part 15C		IC RSS 247	
Date/s Tested	: 29-November-2016 - 09-January-2017																														
Report Issue Date	: 09-January-2017																														
Manufacturer/Location	: Motorola Solutions - Penang																														
Requestor	: MOHD AFIQ AZFAR JAMANI																														
Product Type	: Portable																														
Model Number	: H92UCH9PW7AN																														
Frequency Band	: 2.402 - 2.480 GHz																														
Rated / Max RF Output Power	: 8.9mWatts / 10mWatts																														
Applicant Name	: Motorola Solution Malaysia Sdn Bhd																														
Applicant Address	: Innoplex Plot 2A, Medan Bayan lepas, Mukim 12, S.W.D. 11900 Bayan Lepas, Penang, Malaysia																														
FCC Registrations	: 772092																														
IC Registrations	: 109AK																														
(2.4GHz BT LE)	PASS																														
Part 15C																															
IC RSS 247																															
This report shall not be reproduced without written approval from an officially designated representative of the Motorola Penang Adv. Comm. Laboratory. The results and statements contained in this report pertain only to the device(s) evaluated.																															
Prepared By: Jino Lim Test Personnel	Approved By: Goh Aik Hong Responsible Engineer																														

Table of Contents

1.0 General Information	3
2.0 Summary of Test Results.....	4
3.0. Measurement Uncertainty	4
4.0 Equipment List	5
5.0 Test Mode Applicability and Test Channel Detail	6
6.0 Transmitter Test Parameters.....	7
6.1 6dB Channel Bandwidth.....	7
6.1.1 Test Setup.....	7
6.1.2 Test Limits:	7
6.1.3 Test Data:	7
6.2 Maximum Peak Conducted RF Output Power	9
6.2.1 Test Setup.....	9
6.2.2 Test Limits:	9
6.2.3 Test Data:	9
6.3 Maximum Peak Power Spectral Density	10
6.3.1 Test Setup.....	10
6.3.2 Test Limits:	10
6.3.3 Test Result	11
6.4 Conducted Spurious Emission.....	12
6.4.1 Test Setup.....	12
6.4.2 Test Limits:	12
6.4.3 Test Result	12
6.5 Band edge Conducted Spurious Emission.....	17
6.5.1 Test Setup.....	17
6.5.2 Test Limits:	17
6.5.3 Test Result	17
6.6 Radiated Emission within Restricted Bands.....	19
6.6.1 Test Setup.....	19
6.6.2 Test Limits:	20
6.6.3 Test Results:.....	21
6.7 AC Powerline Conducted Emission	36
6.7.1 Test Setup.....	36
6.7.2 Test Limits:	36
6.7.3 Test Result	37

REVISION HISTORY

Revision History	Description	Date	Originator
Rev. A	Initial Report	09-January-2017	Jino Lim
Rev. B	Revise the Section 6.6.1	06-February-2017	Jino Lim

1.0 General Information

EUT Description:

Technologies	2.4GHz BT LE
TX Frequency range	2402MHz – 2480MHz
Modulation Type	GFSK
Input/Output	RF Port
Connector type	PROGRAMMING, TEST & ALIGNMENT CABLE
Antenna type	ANTENNA, CHIP, BEIDOU BT/GPS ANTENNA MODULE

Channel number and frequency information:

40 channels are provided to this EUT:

Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)
0	2402	10	2422	20	2442	30	2462
1	2404	11	2424	21	2444	31	2464
2	2406	12	2426	22	2446	32	2466
3	2408	13	2428	23	2448	33	2468
4	2410	14	2430	24	2450	34	2470
5	2412	15	2432	25	2452	35	2472
6	2414	16	2434	26	2454	36	2474
7	2416	17	2436	27	2456	37	2476
8	2418	18	2438	28	2458	38	2478
9	2420	19	2440	29	2460	39	2480

The EUT contains following accessory devices and data cable:

Item	Brand	Model or P/N
IMPRES 3000 MAH, LI-ION HIGH CAPACITY BATTERY, LOW VOLTAGE, IP68	MOTOROLA	PMNN4493A
PROGRAMMING, TEST & ALIGNMENT CABLE	MOTOROLA	PMKN4013C

General Description of Applied Standards

The EUT is a RF Product. According to the specifications of the manufacturer, the EUT is to comply with the requirements of the following standards:

ANSI C63.10-2013

2.0 Summary of Test Results

FCC Clause	IC Clause	Test Item	Result	Remark
15.247 (b)(1)	RSS-247 5.1(2)	Conducted RF Output Power (Peak)	Pass	NA
15.247 (a)(1)	RSS-247 5.1(1) RSS-247 5.1(2)	(1) 20dB Channel Bandwidth (2) Channel Separation	Pass	NA
15.247(a)(1)(iii)	RSS-247 5.1(4)	Number of hopping Frequency used	Pass	NA
15.247(a)(1)(iii)	RSS-247 5.1(4)	Dwell time on each channel	Pass	NA
15.247 (d)	RSS-247 5.5	Band Edge Conducted Spurious Emission	Pass	NA
15.247 (d)	RSS-247 5.5	Conducted Spurious Emission	Pass	NA
15.205, 15.209, 15.247 (d)	RSS-247 5.5	Radiated Emission within Restricted Bands	Pass	NA
15.207	RSS-Gen 8.8	AC Powerline Conducted Emission	NA	Testing is not required, radio shall turn off during charging mode
15.203	-	Antenna Requirement	NA	Internal antenna is not accessible to the end-user

3.0. Measurement Uncertainty

Measurement	Frequency	Expended Uncertainty (k=1.96) (±)
AC Power Line Conducted Spurious Emission	150KHz ~ 30MHz	3.43
Radiated Emissions up to 1 GHz	30MHz ~ 200MHz	5.01
	200MHz ~ 1000MHz	5.01
Radiated Emissions above 1 GHz	1GHz ~ 18GHz	5.01
	18GHz ~ 25GHz	5.01

4.0 Equipment List

Bluetooth ATE # 1 (SW Version: Ate Main_3.1.9_R1)

Description	Model	Serial Number	Calibration Date	Calibration Due Date
POWER SUPPLY	6652A	3117A00162	6-Mar-16	6-Mar-17
SPECTRUM ANALYZER	E4445A	MY46181513	11-Dec-14	11-Dec-17
SPECTRUM ANALYZER	FSEK30	838495/014	29-Jun-15	29-Jun-17

Radiated Emission Station (SW Version: EMC FCC RE v1.5.1)

Description	Model	Serial Number	Calibration Date	Calibration Due Date
DRG HORN FREQ.	SAS-571	566	4-Sep-16	4-Sep-17
DRG HORN FREQ.	SAS-571	719	28-Apr-15	28-Apr-17
BILOG ANTENNA	CBL6112B	2964	23-Jan-15	23-Jan-17
POWER SUPPLY	6674A	3126A00133	12-Nov-15	12-Nov-17
MICROWAVE SIGNAL GENERATOR	SMP04	100127	3-Jul-16	3-Jul-17
EMI TEST RECEIVER	ESIB26	100336	19-Oct-16	19-Oct-17
SIGNAL ANALYZER	FSV40	101103	25-Jun-16	25-Jun-17
5M SEMI-ANECHOIC CHAMBER	S800-HX	J2308	29-Jul-16	29-Jul-17
BILOG ANTENNA	CBL6112D	25516	23-Jan-16	23-Jan-17
BROAD-BAND HORN ANTENNA	BBHA9170	BBHA9170143	24-Nov-14	24-Feb-17
DATA LOGGER	TM320	12249289	27-Apr-16	27-Apr-17
SYSTEM CONTROLLER	SC104V	050806-1	Not Required	Not Required
TRUNTABLE FLUSH MOUNT 2M	FM2011	NA	Not Required	Not Required
ANTENNA POSITIONNING TOWER	TLT2	NA	Not Required	Not Required
18 - 40GHz PREAMPLIFIER	BBV9721	9721-007	Not Required	Not Required
PREAMPLIFIER	PAM-0118P	361	Not Required	Not Required

5.0 Test Mode Applicability and Test Channel Detail

Radiated Emission Test (Above 1GHz)

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type
Test Mode	0 to 39	0,19,39	FHSS	GFSK

Radiated Emission Test (Below 1GHz)

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type
Test Mode	0 to 39	0,19,39	FHSS	GFSK

Power Line Conducted Emission Test

☐ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

☐ Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type
Application Mode	0 to 39	AUTO	FHSS	AUTO

Antenna Port Conducted Measurement:

☒ This item includes all test value of each mode, but only includes spectrum plot of worst value of each mode.

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

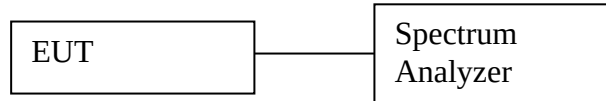
☒ Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type
Test Mode	0 to 39	0,19,39	FHSS	GFSK

6.0 Transmitter Test Parameters

6.1 6dB Channel Bandwidth

6.1.1 Test Setup



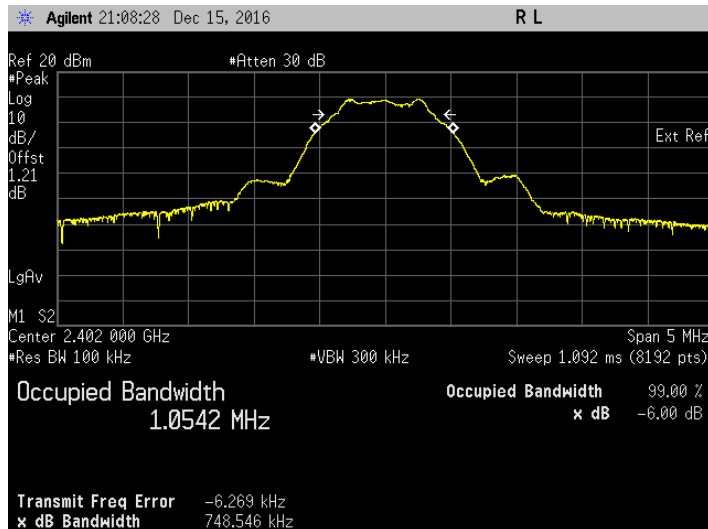
- 1) Check and ensure the spectrum analyzer well calibrate.
- 2) Turn on the DUT and set DUT to transmit maximum power.
- 3) Connect DUT's antenna terminal to spectrum analyzer with a low loss cable.
- 4) Setting of Spectrum analyzer :
 - a. RBW = 100 kHz
 - b. VBW = 300 kHz
 - c. Detector mode = Peak
 - d. Trace = Max hold
 - e. Sweep = auto
- 5) Measure the freq different of two frequencies that were attenuated 6dB from peak of the emission & record the frequency difference as the emission bandwidth.

6.1.2 Test Limits:

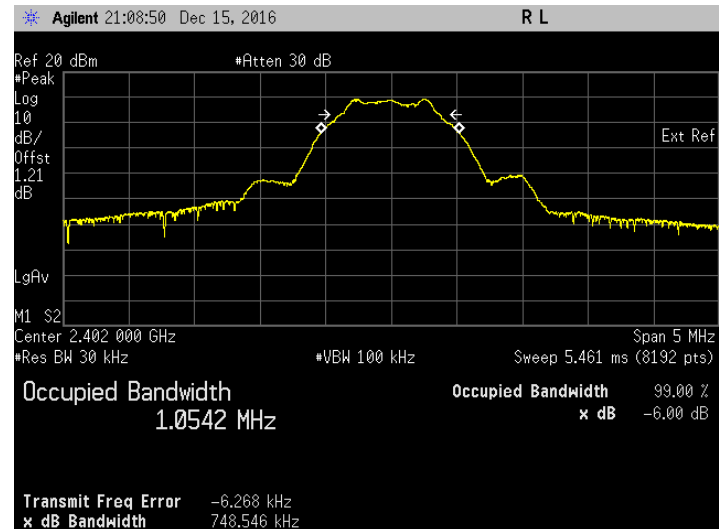
Normal Condition (25 ° C)
≥500 kHz

6.1.3 Test Data:

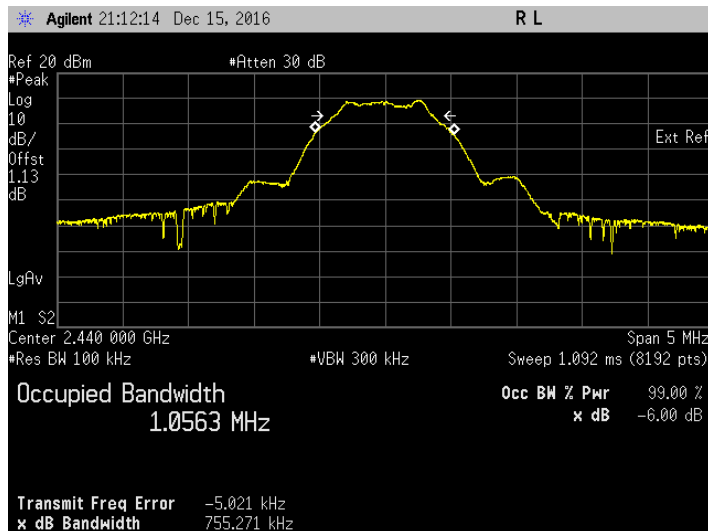
Test Conditions		Test Frequency	Results		
Standard	Modulation Type	Tx (MHz)	6dB Bandwidth (MHz)	99% Bandwidth (MHz)	Status
Bluetooth L.E	GFSK	2402	0.749	1.054	Pass
Bluetooth L.E	GFSK	2440	0.755	1.056	Pass
Bluetooth L.E	GFSK	2480	0.742	1.054	Pass



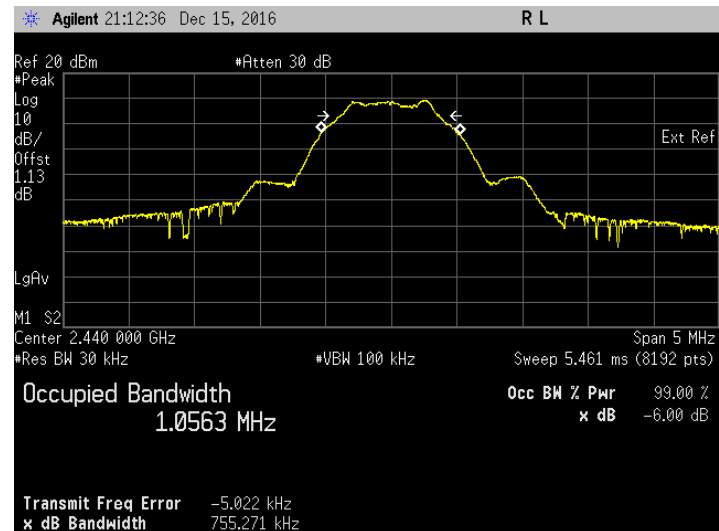
6dB Bandwidth. Bluetooth LE Frequency 2402 MHz



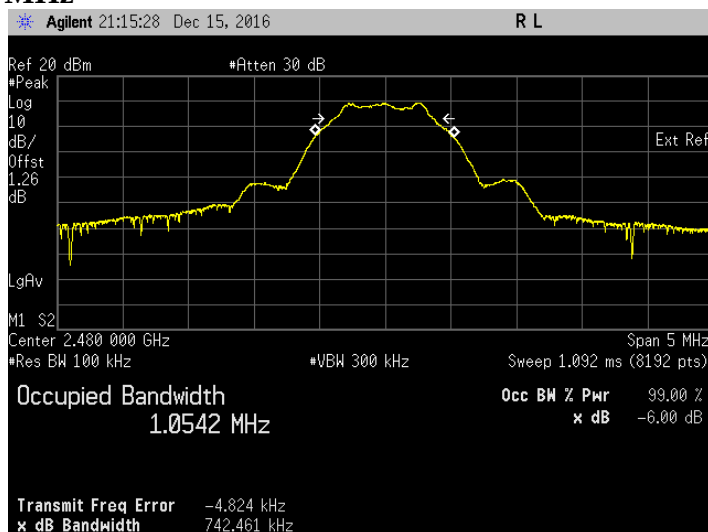
99% Bandwidth. Bluetooth LE Frequency 2402 MHz



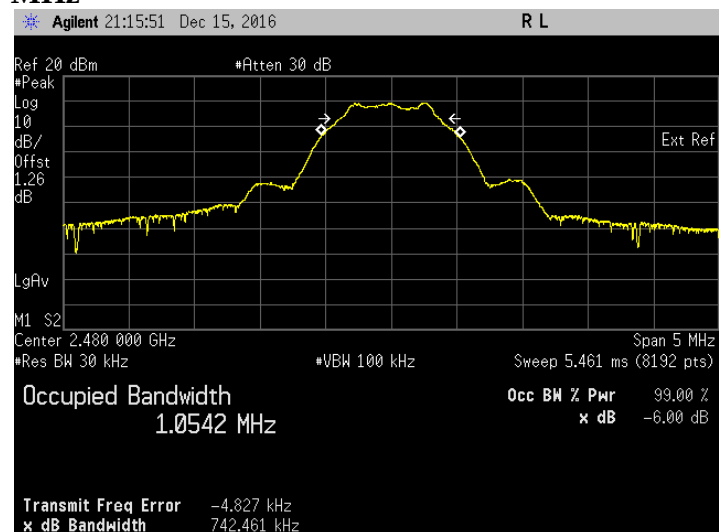
6dB Bandwidth. Bluetooth LE Frequency 2440 MHz



99% Bandwidth. Bluetooth LE Frequency 2440 MHz



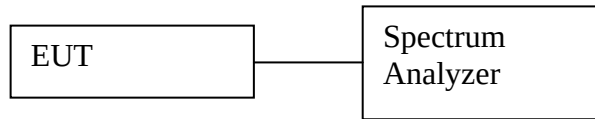
6dB Bandwidth. Bluetooth LE Frequency 2480 MHz



99% Bandwidth. Bluetooth LE Frequency 2480 MHz

6.2 Maximum Peak Conducted RF Output Power

6.2.1 Test Setup



- 1) Check and ensure the spectrum analyzer well calibrate.
- 2) Turn on the DUT and set DUT to transmit maximum power.
- 3) Connect DUT's antenna terminal to spectrum analyzer with a low loss cable.
- 4) Setting of Spectrum analyzer :
 - a. Set the RBW $\geq$ DTS bandwidth.
 - b. Set the VBW $\geq [3 \times \text{RBW}]$.
 - c. Set the span $\geq [3 \times \text{RBW}]$.
 - d. Detector = peak.
 - e. Sweep time = auto couple.
 - f. Trace mode = max hold.
 - g. Allow trace to fully stabilize.
 - h. Use peak marker function to determine the peak amplitude level.

6.2.2 Test Limits:

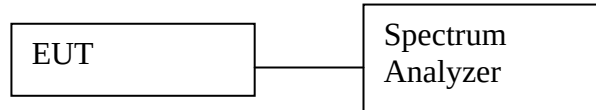
Normal Condition (25 ° C)
≤ 1 Watt(30 dBm)

6.2.3 Test Data:

Test Conditions			Test Frequency	Results
Standard	Modulation Type	Tx (MHz)	Output Power (dBm)	Status
Bluetooth L.E	GFSK	2402	9.710	Pass
Bluetooth L.E	GFSK	2440	9.480	Pass
Bluetooth L.E	GFSK	2480	9.570	Pass

6.3 Maximum Peak Power Spectral Density

6.3.1 Test Setup



Maximum Peak

- 1) Check and ensure the spectrum analyzer well calibrate.
- 2) Turn on the DUT and set DUT to transmit maximum power.
- 3) Connect DUT's antenna terminal to spectrum analyzer with a low loss cable.
- 4) Setting of Spectrum analyzer :
 - a. Set analyzer center frequency to DTS channel center frequency.
 - b. Set the span to 1.5 times the DTS bandwidth.
 - c. Set the RBW to $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$.
 - d. Set the VBW $\geq [3 \times \text{RBW}]$.
 - e. Detector = peak.
 - f. Sweep time = auto couple.
 - g. Trace mode = max hold.
 - h. Allow trace to fully stabilize.
 - i. Use the peak marker function to determine the maximum amplitude level within the RBW.
 - j. If measured value exceeds requirement, then reduce RBW (but no less than 3 kHz) and repeat.
- 5) Convert final result from (dBm/100kHz) $\rightarrow$ (dBm/3kHz).
- 6) Example of calculation :

Assume manual measured result is -6.2 dBm

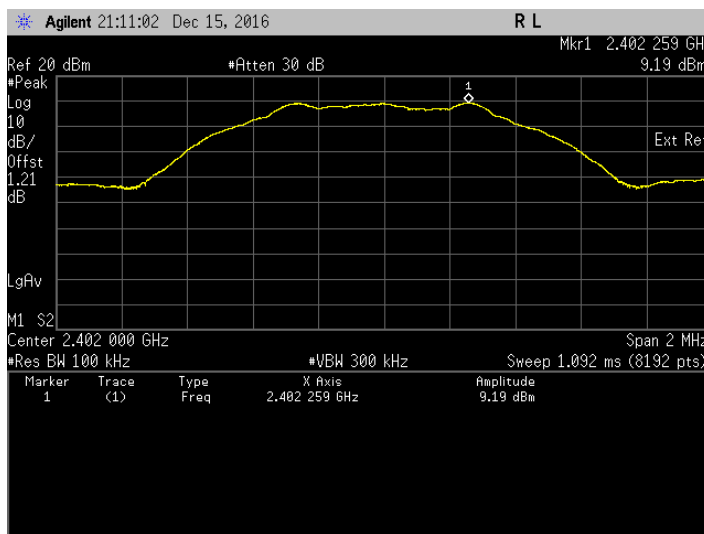
 - = -6.2 dBm - (conversion factor)
 - = -6.2 dBm - $(10 \cdot \log(100/3))$
 - = -6.2 dBm - (15.228 dB)
 - = -21.428dBm

6.3.2 Test Limits:

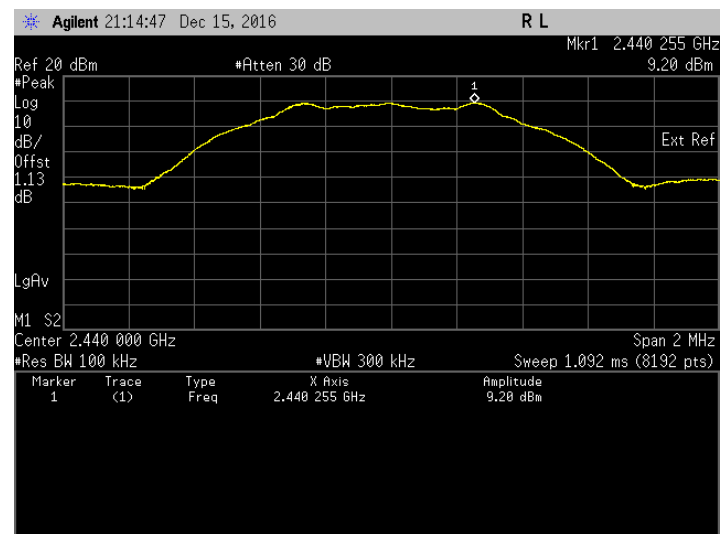
Normal Condition (25 ° C)
$\leq 8 \text{ dBm/3kHz}$

6.3.3 Test Result

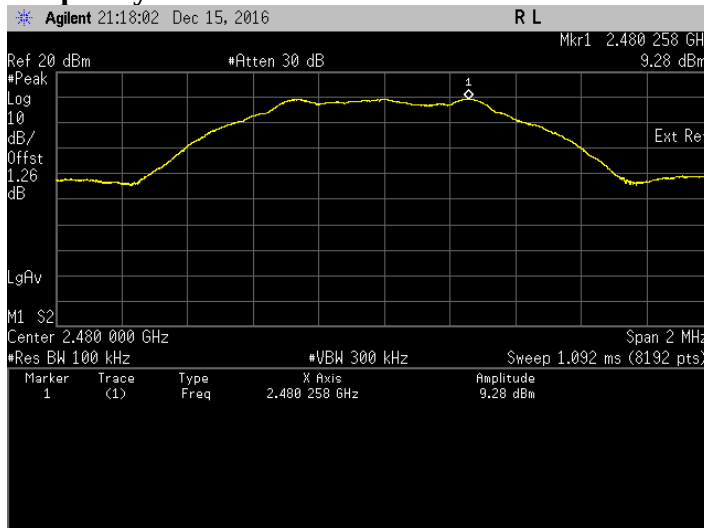
Test Conditions		Test Frequency	Results		
Standard	Modulation Type	Tx (MHz)	Power (dBm/100kHz)	Power (dBm/3kHz)	Status
Bluetooth L.E.	GFSK	2402	9.19	-6.04	Pass
Bluetooth L.E.	GFSK	2440	9.20	-6.02	Pass
Bluetooth L.E.	GFSK	2480	9.28	-5.95	Pass



Maximum Power Spectral Density. Bluetooth LE Frequency 2402 MHz



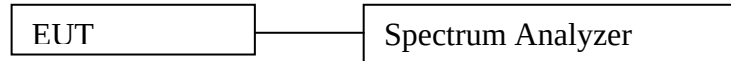
Maximum Power Spectral Density. Bluetooth LE Frequency 2440 MHz



Maximum Power Spectral Density. Bluetooth LE Frequency 2480 MHz

6.4 Conducted Spurious Emission

6.4.1 Test Setup



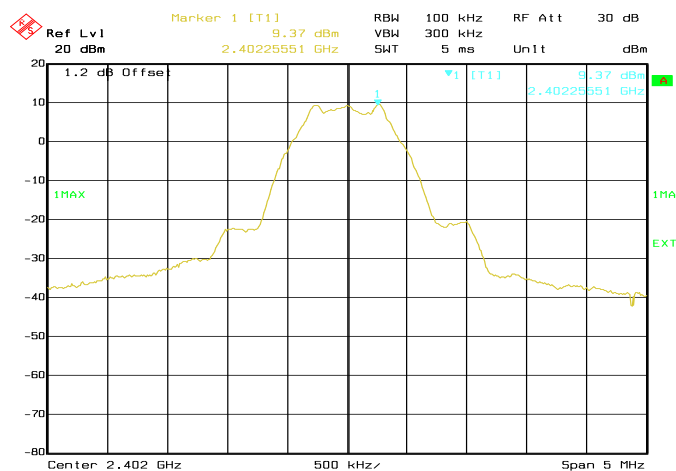
- 1) Check and ensure the spectrum analyzer well calibrate.
- 2) Turn on the DUT and set DUT to transmit maximum power.
- 3) Connect DUT's antenna terminal to spectrum analyzer with a low loss cable.
- 4) Setting of Spectrum analyzer :
 - a. RBW = 100 kHz
 - b. VBW = 300 kHz
 - c. Detector mode = Peak
 - d. Trace = Max Hold
 - e. Sweep = auto
- 5) Use the peak marker function to measure highest emission and scan up to 10th harmonic.

6.4.2 Test Limits:

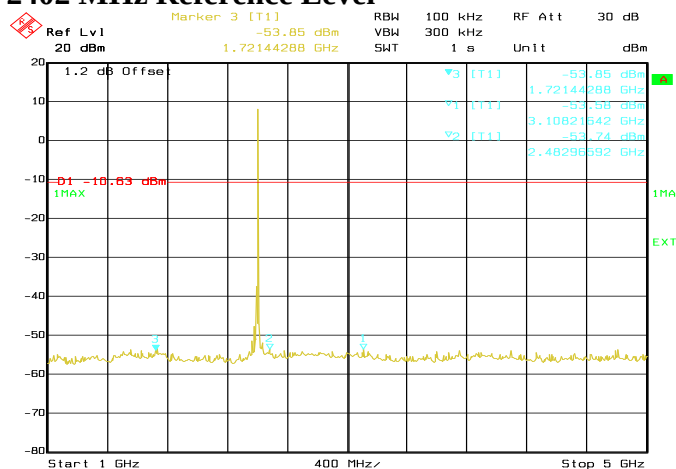
Normal Condition (25 ° C)
Shall be at least 20 dB below peak (max) power.

6.4.3 Test Result

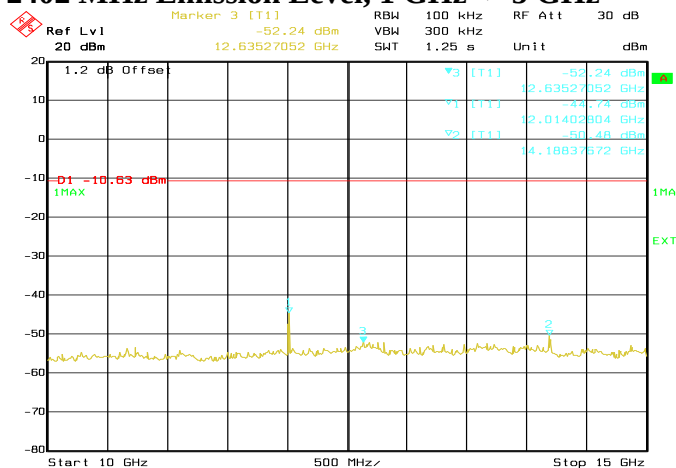
Test Conditions			Test Frequency	Results	
Standard	Modulation Type	Tx (MHz)	Spurs (MHz)	Level (dBm)	Status
Bluetooth L.E.	GFSK	2402	12014.03	-44.74	Pass
			6983.97	-50.31	Pass
			14188.38	-50.48	Pass
Bluetooth L.E.	GFSK	2440	12204.41	-46.76	Pass
			14188.38	-49.41	Pass
			6623.25	-50.49	Pass
Bluetooth L.E.	GFSK	2480	14188.38	-50.20	Pass
			12404.81	-50.61	Pass
			6683.37	-50.61	Pass



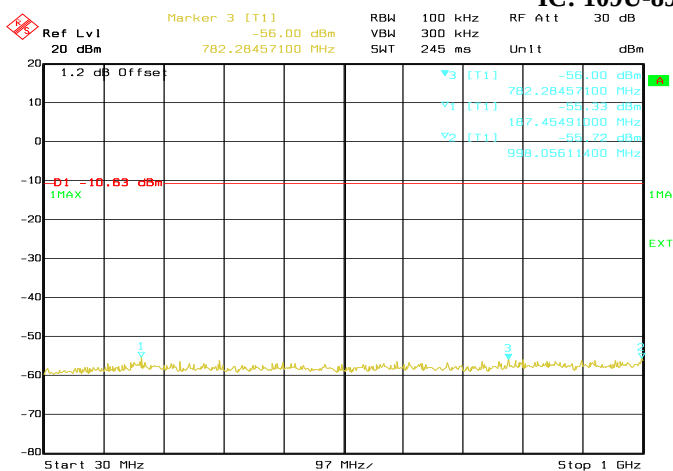
Conducted Emissions. Bluetooth LE, Frequency 2402 MHz Reference Level



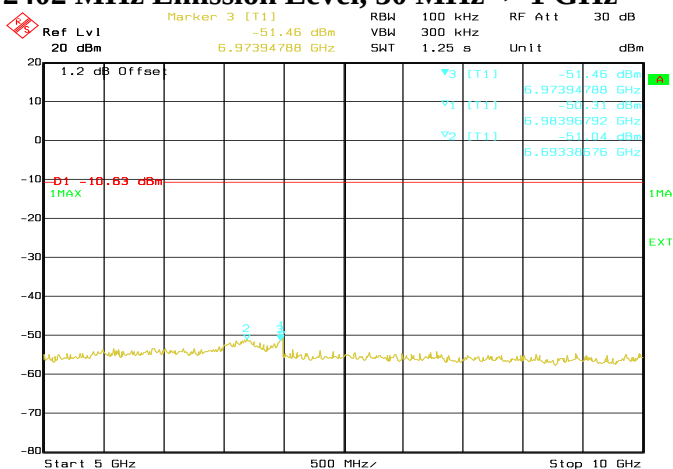
Conducted Emissions. Bluetooth LE, Frequency 2402 MHz Emission Level, 1 GHz -> 5 GHz



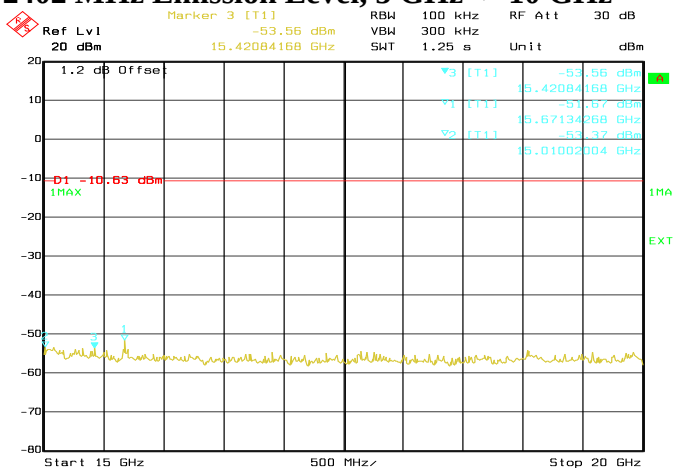
Conducted Emissions. Bluetooth LE, Frequency 2402 MHz Emission Level, 10 GHz -> 15 GHz



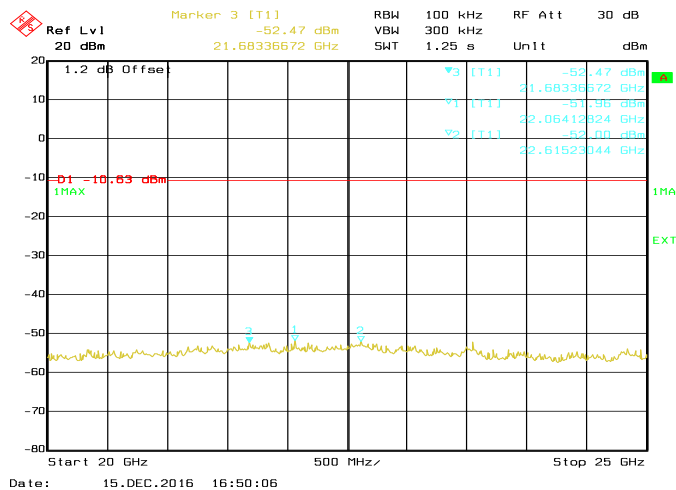
Conducted Emissions. Bluetooth LE, Frequency 2402 MHz Emission Level, 30 MHz -> 1 GHz



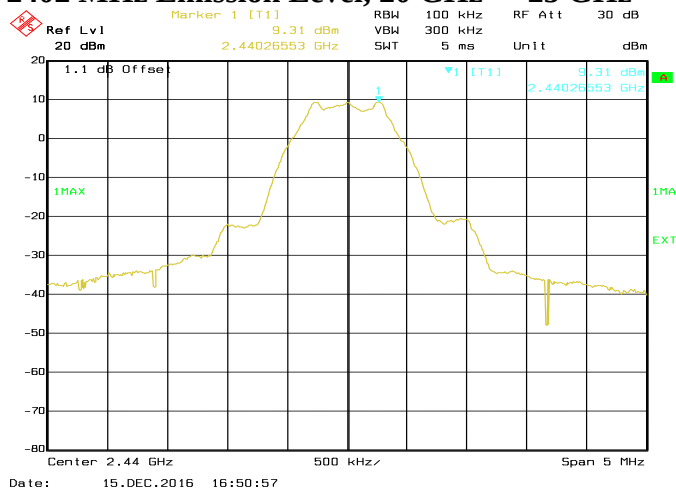
Conducted Emissions. Bluetooth LE, Frequency 2402 MHz Emission Level, 5 GHz -> 10 GHz



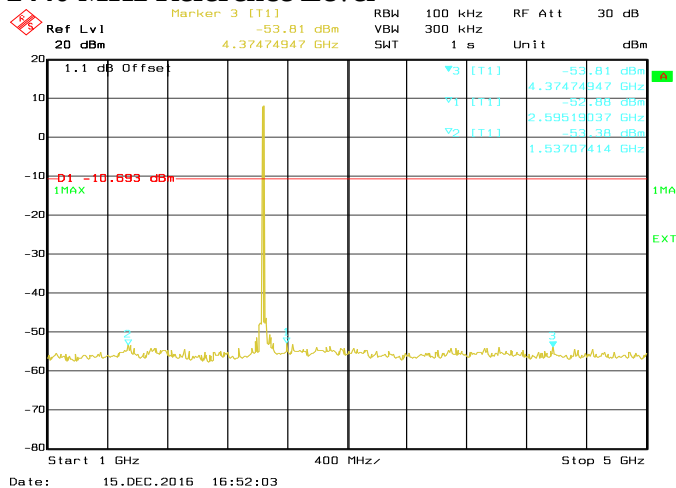
Conducted Emissions. Bluetooth LE, Frequency 2402 MHz Emission Level, 15 GHz -> 20 GHz



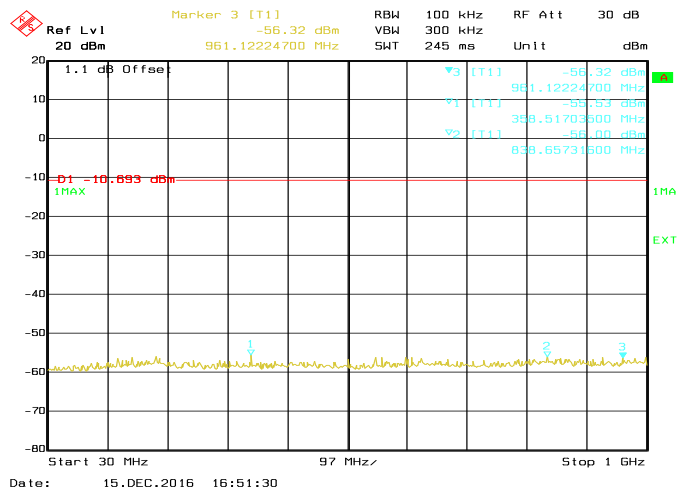
Conducted Emissions. Bluetooth LE, Frequency 2402 MHz Emission Level, 20 GHz -> 25 GHz



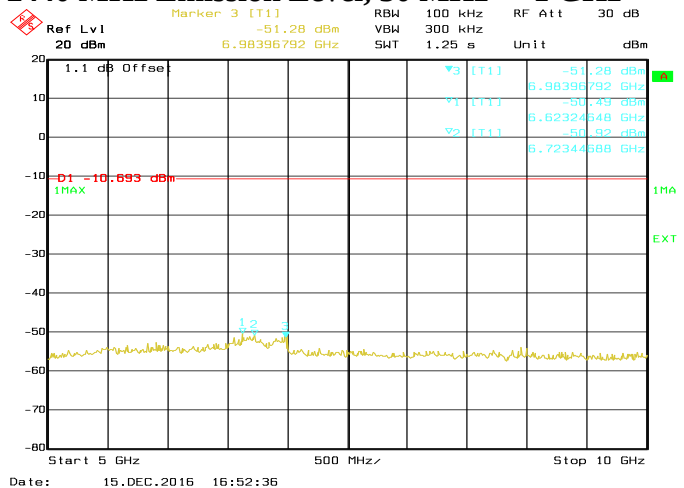
Conducted Emissions. Bluetooth LE, Frequency 2440 MHz Reference Level



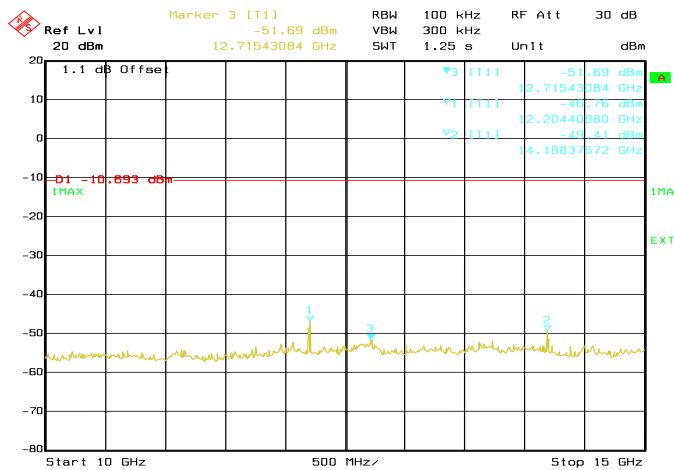
Conducted Emissions. Bluetooth LE, Frequency 2440 MHz Emission Level, 1 GHz -> 5 GHz



Conducted Emissions. Bluetooth LE, Frequency 2440 MHz Emission Level, 30 MHz -> 1 GHz

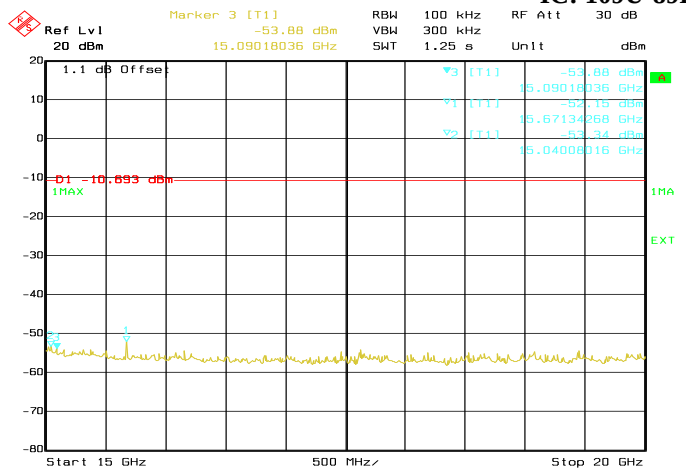


Conducted Emissions. Bluetooth LE, Frequency 2440 MHz Emission Level, 5 GHz -> 10 GHz



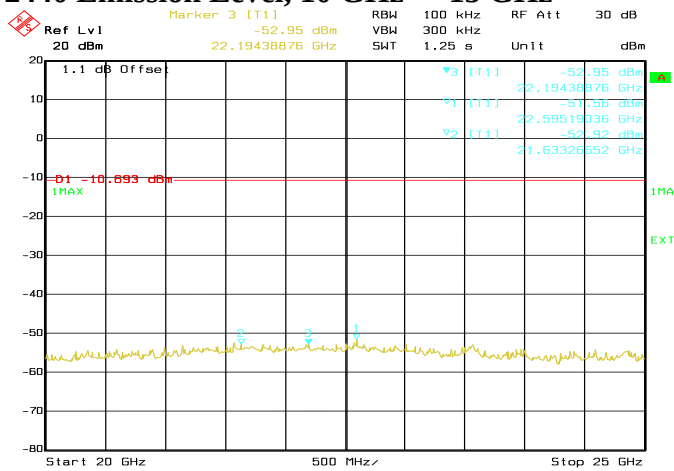
Date: 15.DEC.2016 16:53:09

Conducted Emissions. Bluetooth LE, Frequency 2440 Emission Level, 10 GHz -> 15 GHz



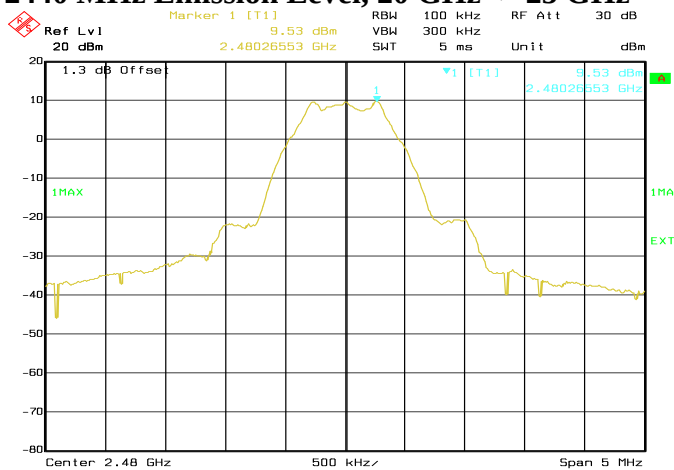
Date: 15.DEC.2016 16:53:41

Conducted Emissions. Bluetooth LE, Frequency 2440 MHz Emission Level, 15 GHz -> 20 GHz



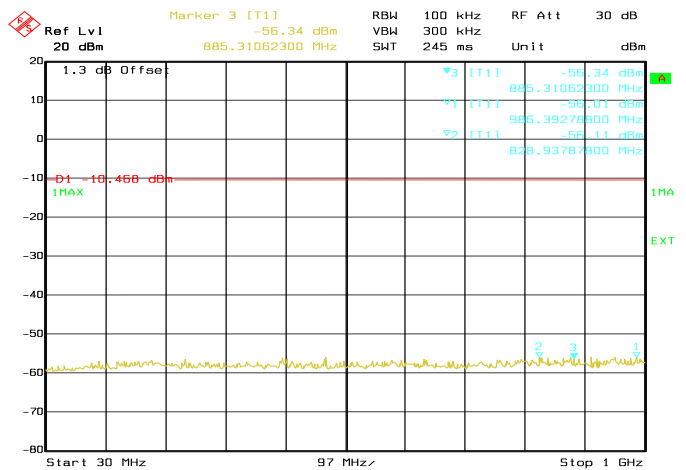
Date: 15.DEC.2016 16:54:14

Conducted Emissions. Bluetooth LE, Frequency 2440 MHz Emission Level, 20 GHz -> 25 GHz



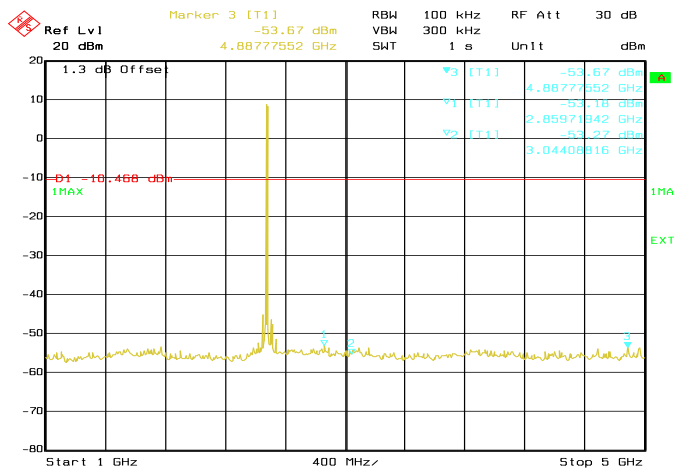
Date: 15.DEC.2016 16:55:24

Conducted Emissions. Bluetooth LE, Frequency 2480 MHz Reference Level



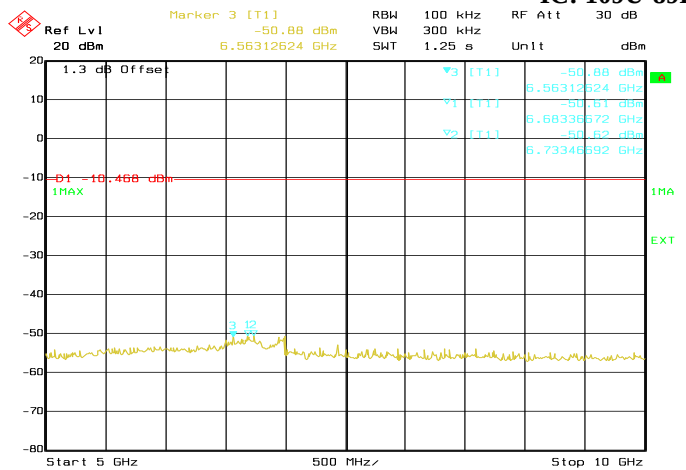
Date: 15.DEC.2016 16:55:57

Conducted Emissions. Bluetooth LE, Frequency 2480 MHz Emission Level, 30 MHz -> 1 GHz



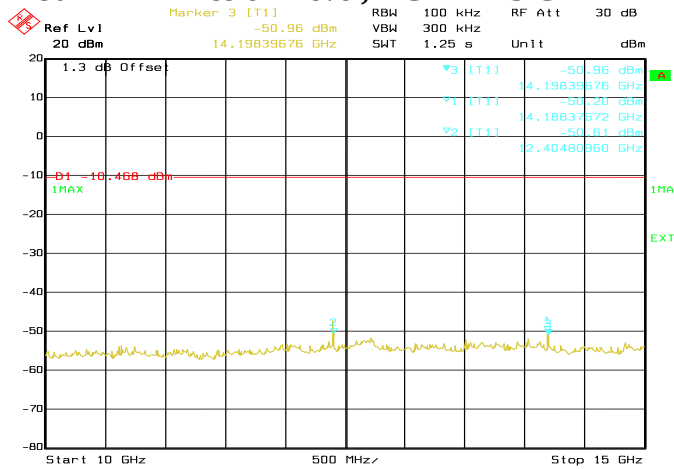
Date: 15.DEC.2016 16:56:29

Conducted Emissions. Bluetooth LE, Frequency 2480 MHz Emission Level, 1 GHz -> 5 GHz



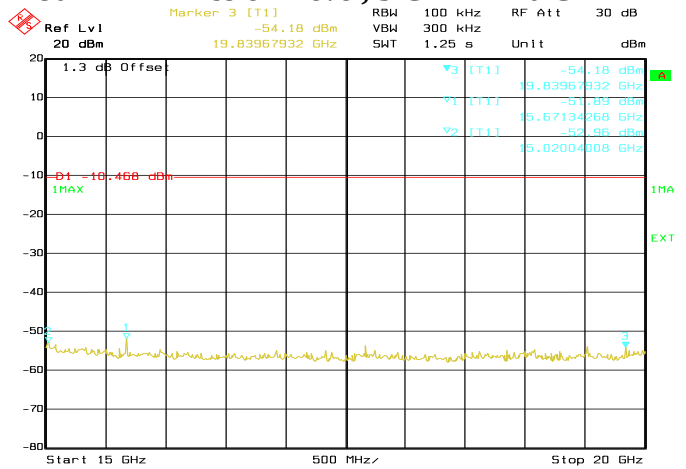
Date: 15.DEC.2016 16:57:02

Conducted Emissions. Bluetooth LE, Frequency 2480 MHz Emission Level, 5 GHz -> 10 GHz



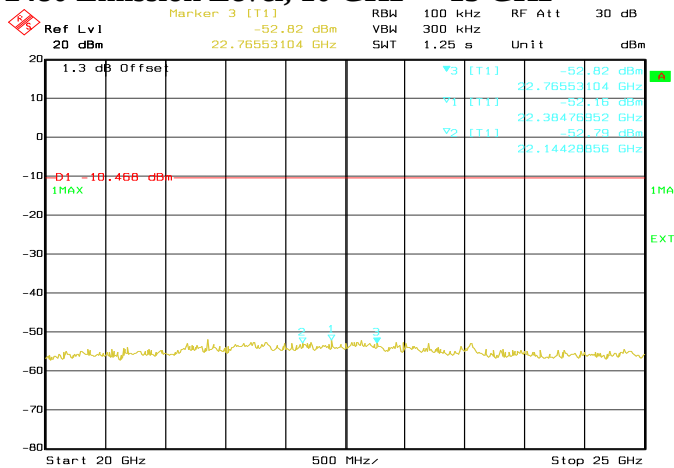
Date: 15.DEC.2016 16:57:35

Conducted Emissions. Bluetooth LE, Frequency 2480 MHz Emission Level, 10 GHz -> 15 GHz



Date: 15.DEC.2016 16:58:07

Conducted Emissions. Bluetooth LE, Frequency 2480 MHz Emission Level, 15 GHz -> 20 GHz

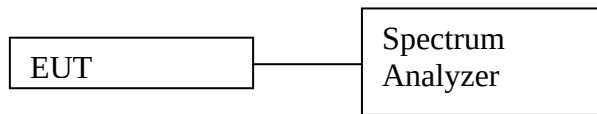


Date: 15.DEC.2016 16:58:40

Conducted Emissions. Bluetooth LE, Frequency 2480 MHz Emission Level, 20 GHz -> 25 GHz

6.5 Band edge Conducted Spurious Emission

6.5.1 Test Setup



- a) Check and ensure the spectrum analyzer well calibrate.
- b) Turn on the DUT and set DUT to transmit maximum power.
- c) Connect DUT's antenna terminal to spectrum analyzer with a low loss cable.
- d) Setting of Spectrum analyzer :
 - a. RBW = 100 kHz
 - b. VBW = 300 kHz
 - c. Detector mode = Peak
 - d. Trace = Max Hold
 - e. Sweep = auto
- e) Use the peak marker function to measure highest emission.

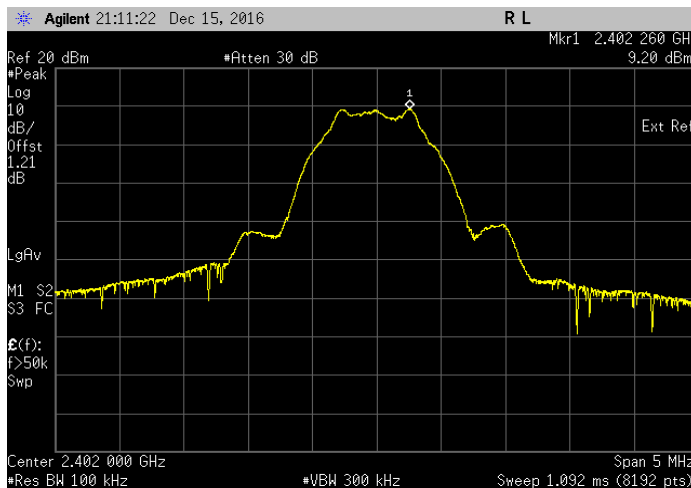
6.5.2 Test Limits:

Normal Condition (25 ° C)

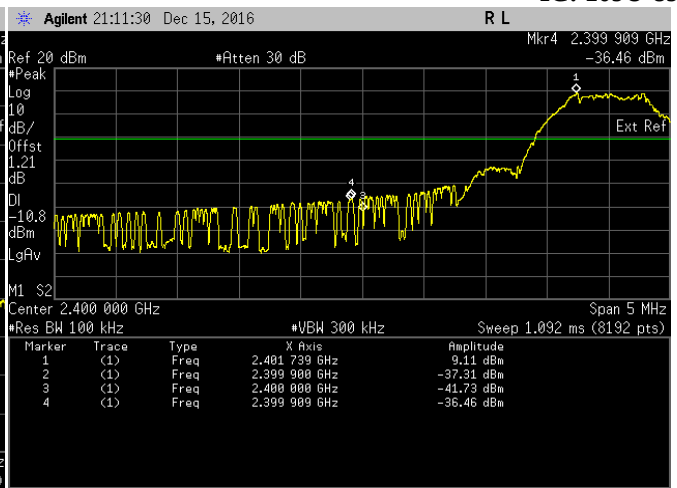
Shall be at least 20 dB below peak (max) power.

6.5.3 Test Result

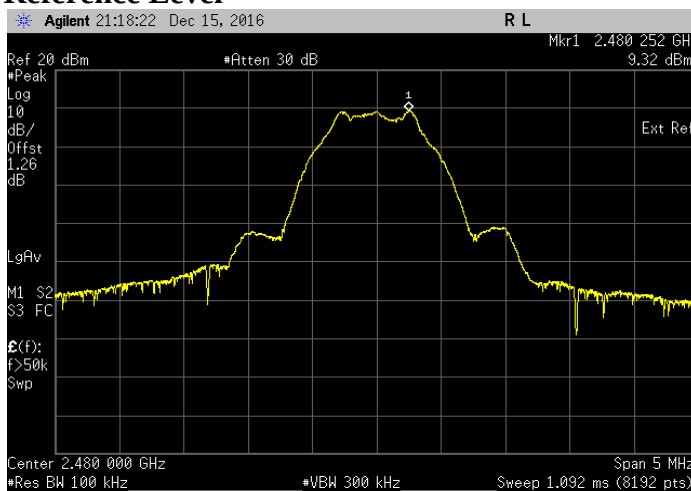
Test Conditions		Test Frequency	Results		
Standard	Modulation Type	Tx (MHz)	Frequencies (MHz)	Power (dBm)	Status
Bluetooth L.E	GFSK	2402	2399.91	-36.46	Pass
Bluetooth L.E	GFSK	2480	2483.54	-43.38	Pass



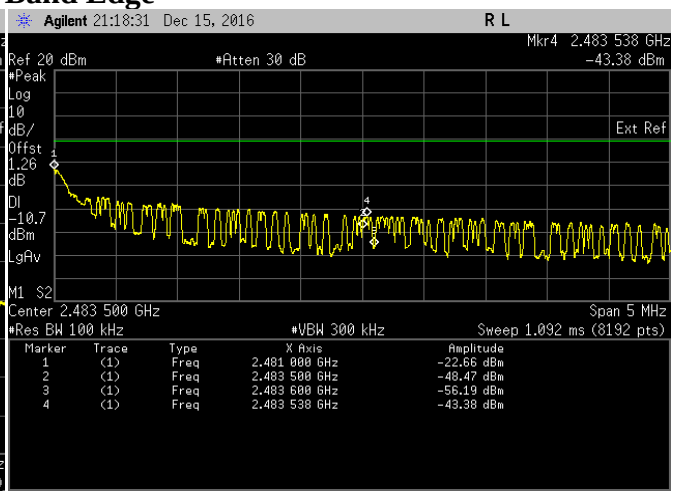
**Band Edge. Bluetooth LE Frequency 2402 MHz
Reference Level**



**Band Edge. Bluetooth LE Frequency 2402 MHz
Band Edge**



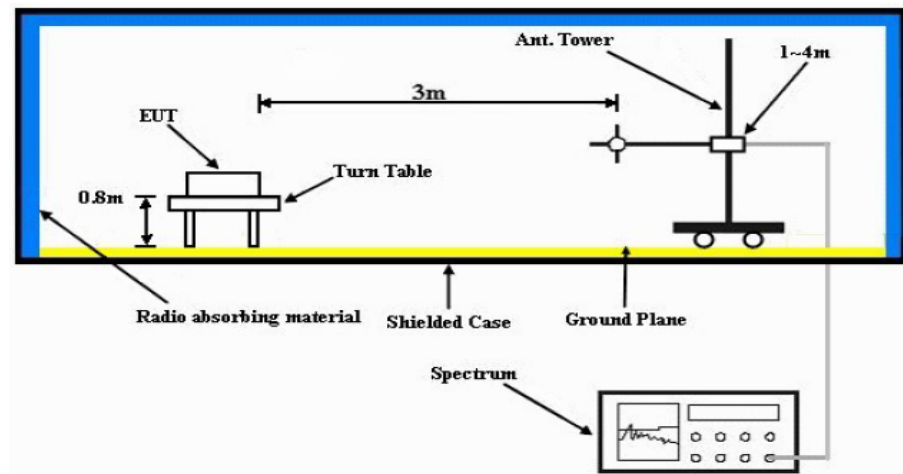
**Band Edge. Bluetooth LE Frequency 2480 MHz
Reference Level**



**Band Edge. Bluetooth LE Frequency 2480 MHz
Band Edge**

6.6 Radiated Emission within Restricted Bands

6.6.1 Test Setup



- The EUT is placed on the top of a rotating table 0.8m above the ground (<1GHz) and 1.5m above the ground (>1GHz) at a 3m semi-anechoic chamber. The table is rotated 360 degrees to determine the position of the highest radiation.
- The EUT is set 3m away from the interference-receiving antenna, which is mounted on the top of a variable-height antenna tower.
- The antenna is Bilog/Horn antenna depend on which frequency range uses, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- For each suspected emission, the EUT is arranged to its worst case and then the antenna is tuned to heights from 1m to 4m and the rotatable table is turned from 0 degrees to 360 degrees to find the maximum reading.
- The test-receiver system is set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- If the emission level of the EUT in peak mode is fall within the range of 10dB from the limit specified, the emissions would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet. Otherwise, the testing could be stopped and the peak values of the EUT would be reported.

NOTE:

- The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz for Quasi-peak detection at frequency below 1GHz.
- The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and video bandwidth is 3 MHz for Peak detection at frequency above 1 GHz.
- All modes of operation were investigated and the worst-case emissions are reported.

6.6.2 Test Limits:

Radiated emissions which fall in the restricted bands must comply with the radiated emission limits specified as below table. Other emissions shall be at least 20dB below the highest level of the desired power.

Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100**	3
88-216	150**	3
216-960	200**	3
Above 960	500	3

NOTE:

- 1) The lower limit shall apply at the transition frequencies.
- 2) Emission level (dBuV/m) = 20 log Emission level (uV/m).
- 3) For frequencies above 1000 MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.

Test: Bluetooth SAC Restricted Band Edge

EMC SR ID#: 06481-EMC-00012

Accessory: NA

Test Standard: ANSI C63.10-2013

Worst Case Plane: X-Plane (GFSK)

Vertical Radiated Emission Result

Horizontal Radiated Emission Result

Remarks:
Pass Result

Marginal Result

Fail Result

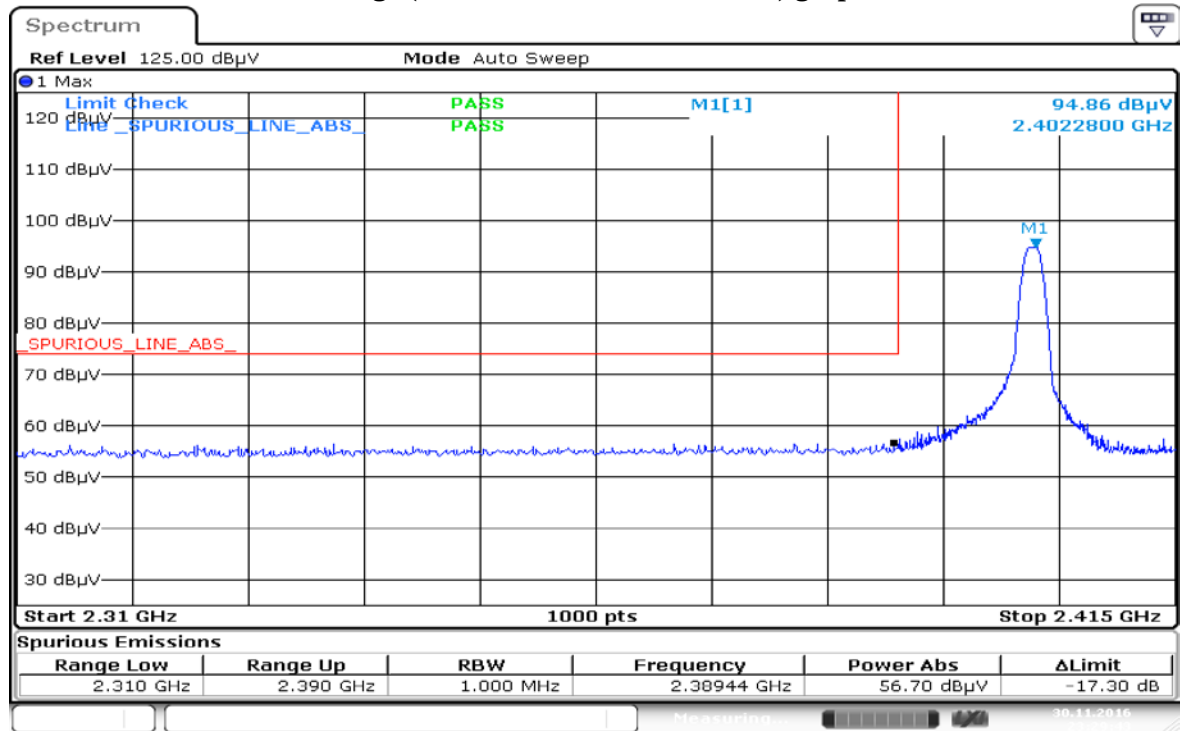
Humidity (%): 71.6

Test Date: Thu, Dec 1, 2016

Duty Cycle (%): <77%

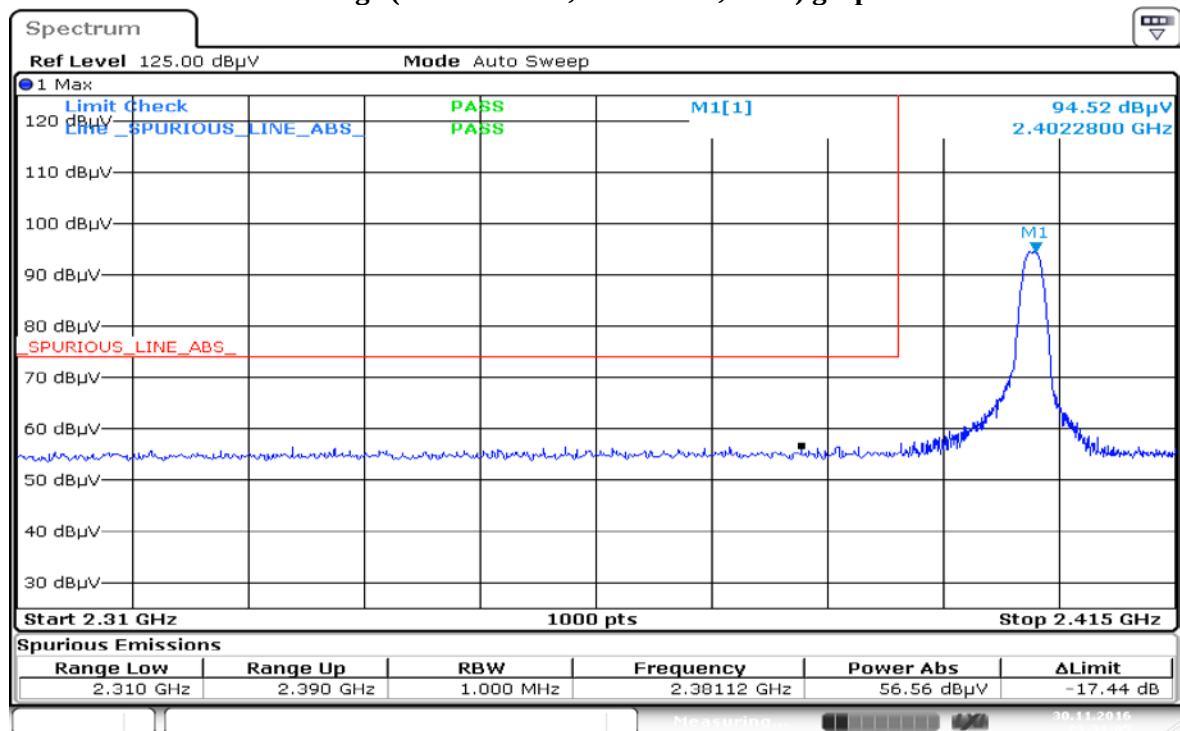
21/37

Restricted Band Edge (Low Channel, Vertical, Peak) graphical screen shot



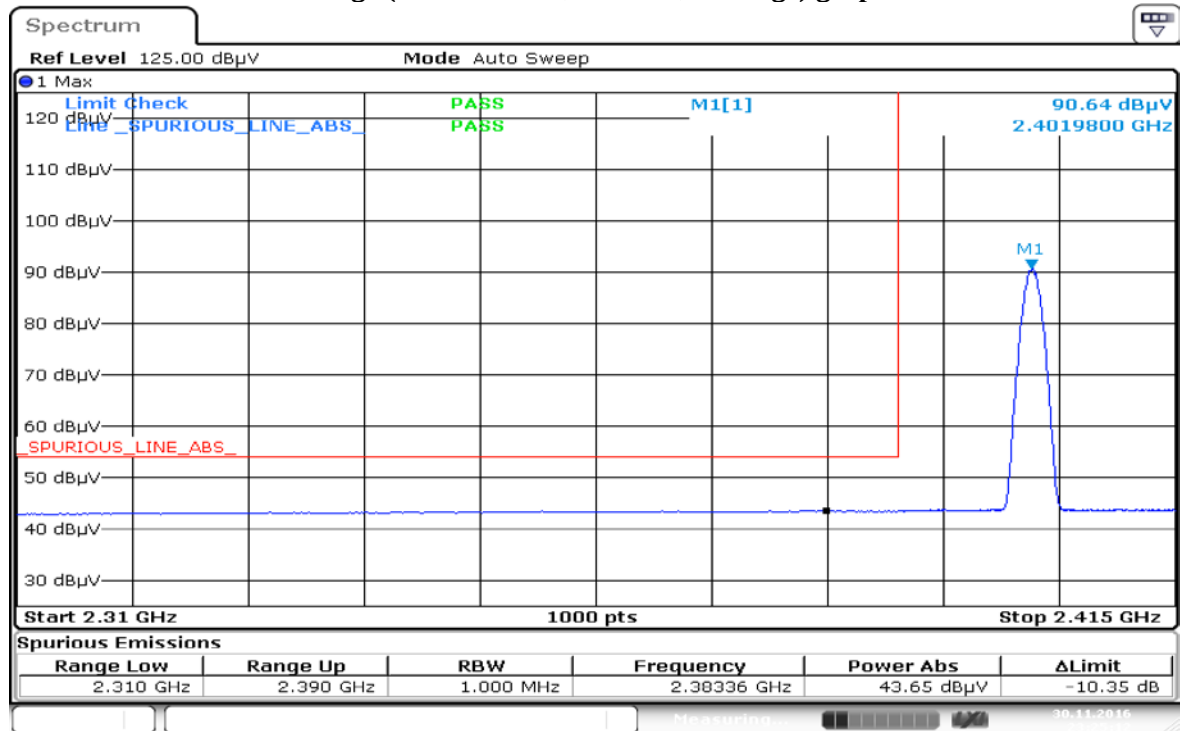
Date: 30.NOV.2016 23:29:43

Restricted Band Edge (Low Channel, Horizontal, Peak) graphical screen shot



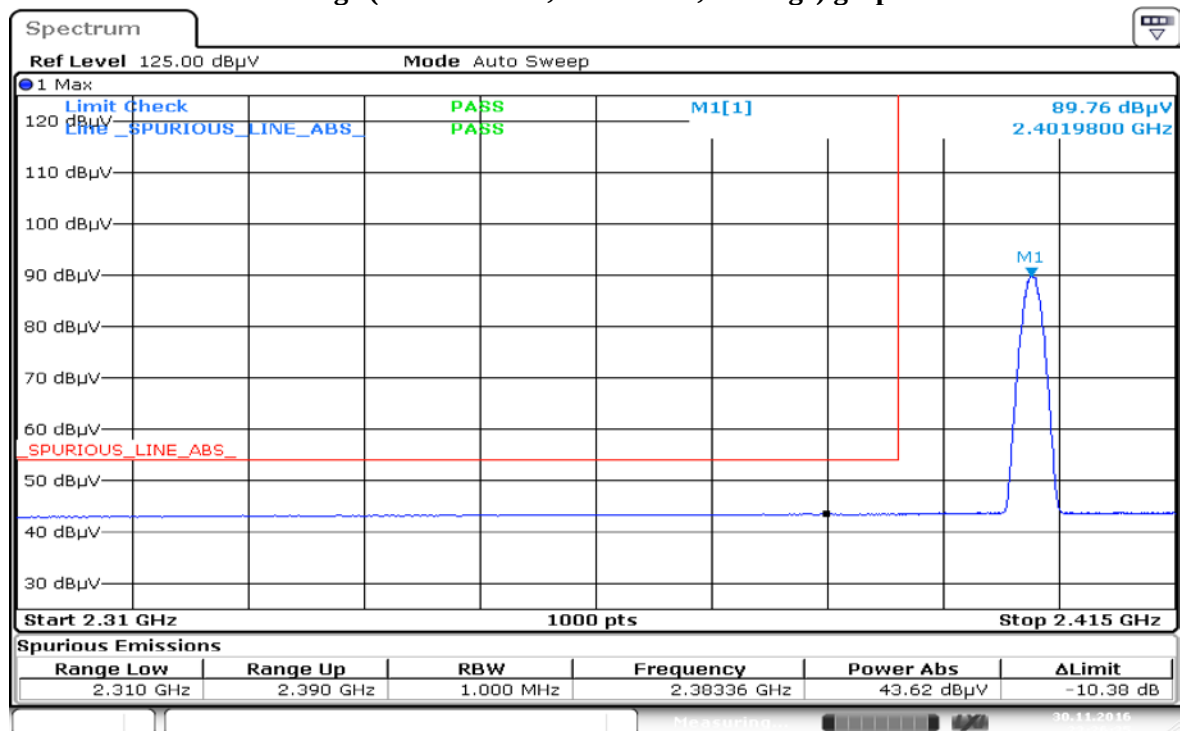
Date: 30.NOV.2016 23:31:05

Restricted Band Edge (Low Channel, Vertical, Average) graphical screen shot



Date: 30.NOV.2016 23:25:13

Restricted Band Edge (Low Channel, Horizontal, Average) graphical screen shot



Date: 30.NOV.2016 23:26:35

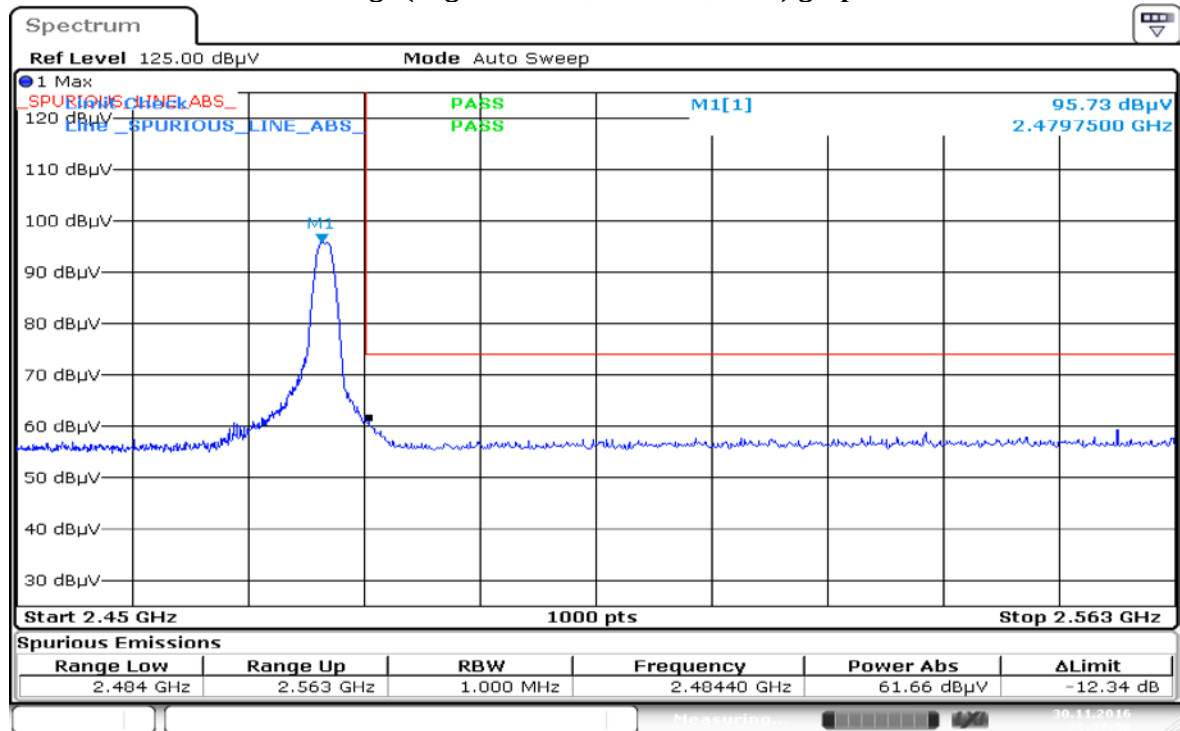
Restricted Band Edge (High Channel) tabular data

Remarks: Pass Result	Marginal Result	Fail Result
-------------------------	-----------------	-------------

Humidity (%): 71.6
Test Date: Thu, Dec 1, 2016
Duty Cycle (%): <77%

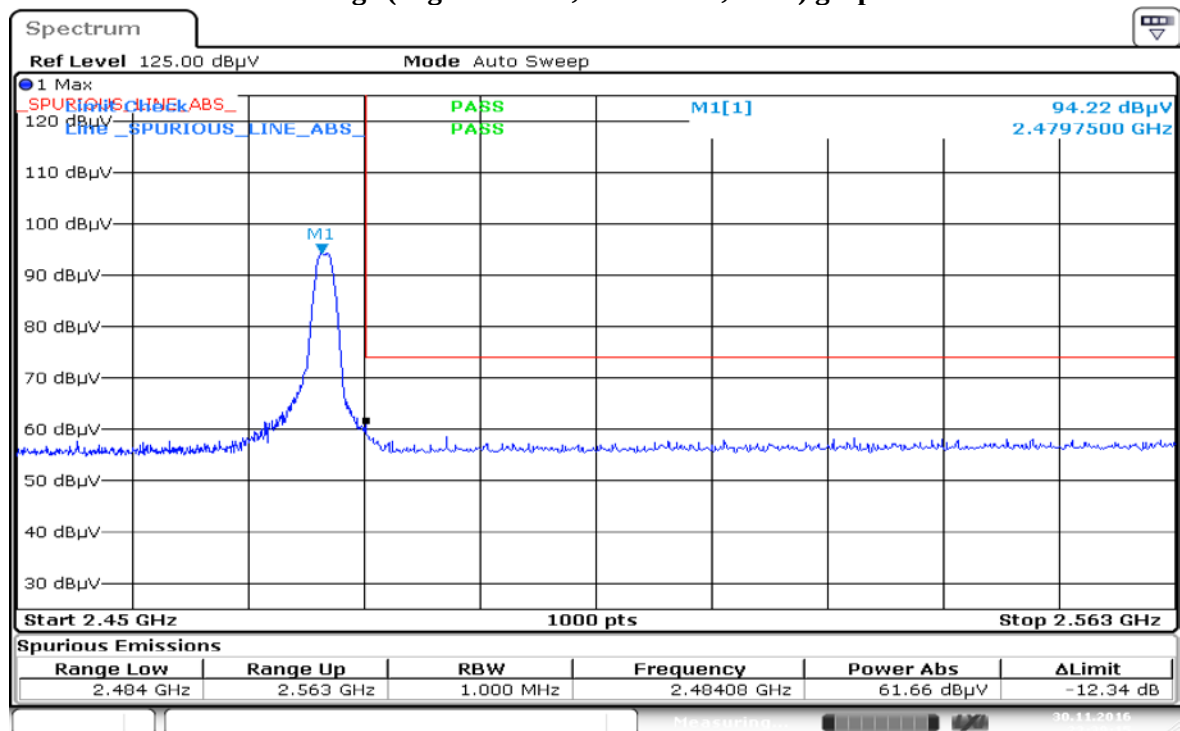
24/37

Restricted Band Edge (High Channel, Vertical, Peak) graphical screen shot



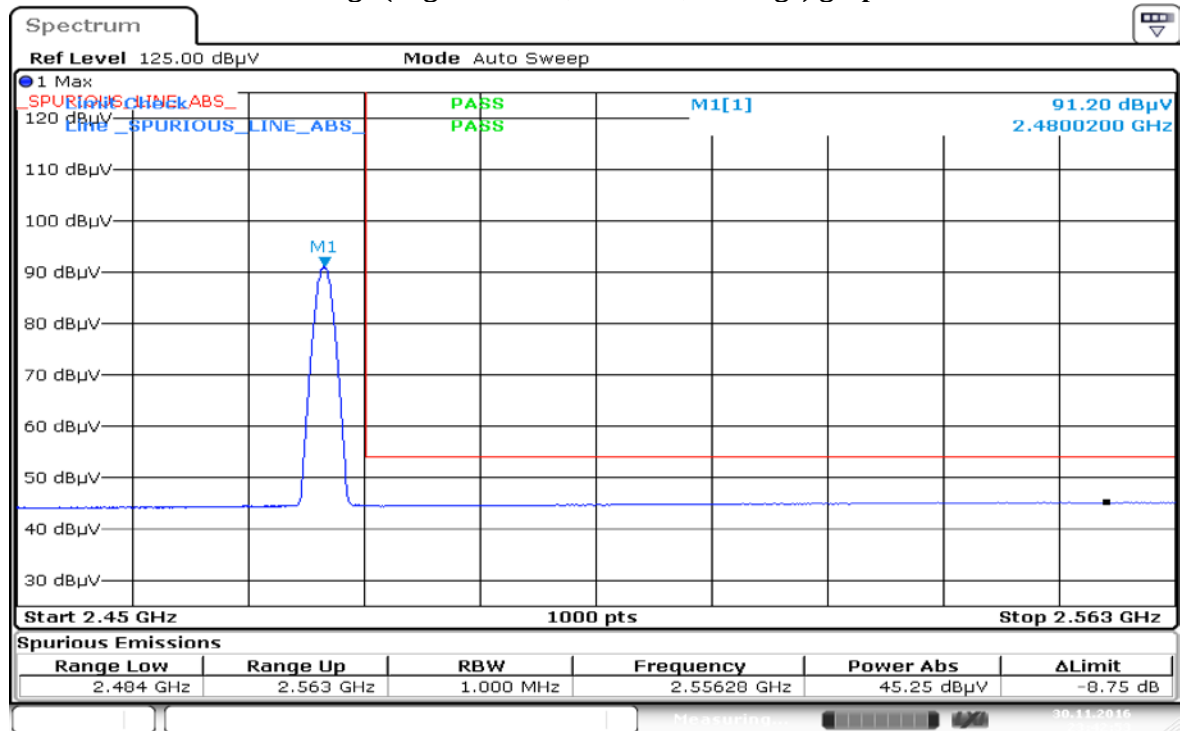
Date: 30.NOV.2016 23:37:50

Restricted Band Edge (High Channel, Horizontal, Peak) graphical screen shot



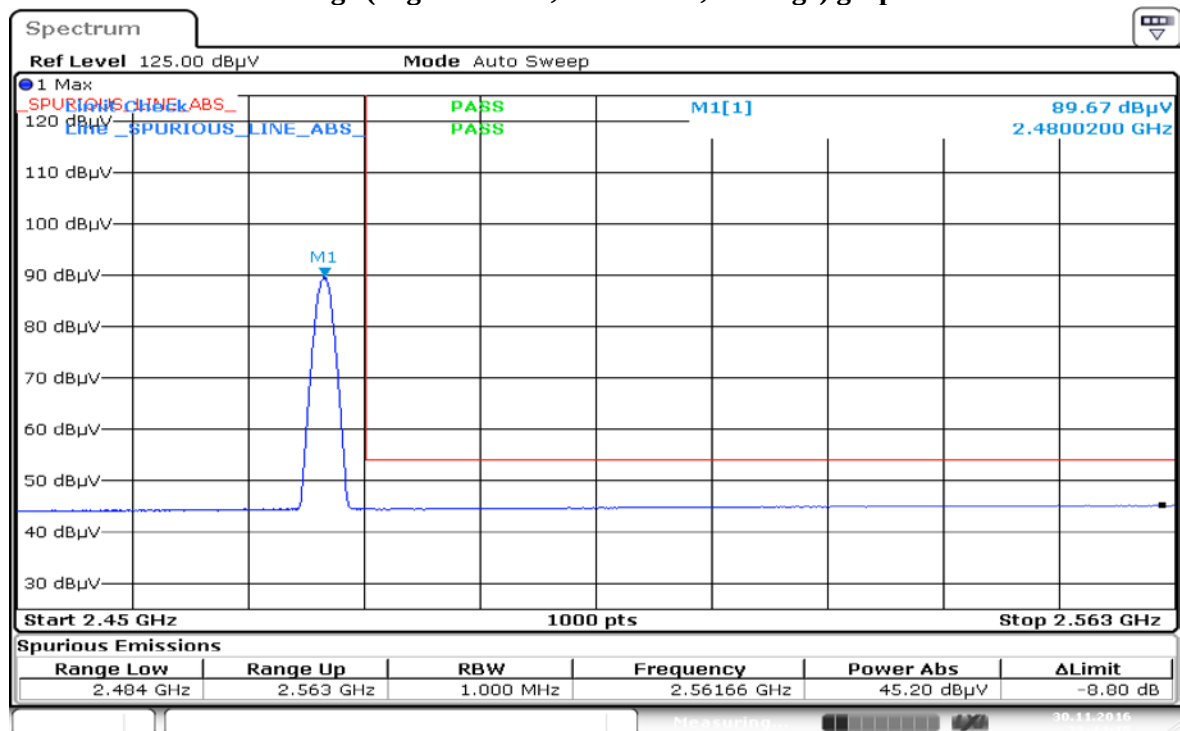
Date: 30.NOV.2016 23:39:15

Restricted Band Edge (High Channel, Vertical, Average) graphical screen shot



Date: 30.NOV.2016 23:42:53

Restricted Band Edge (High Channel, Horizontal, Average) graphical screen shot



Date: 30.NOV.2016 23:44:15

Test: Bluetooth SAC Transmitter Radiated Emission

S/N: 837TSX0488

EMC SR ID#: 06481-EMC-00012

Accessory: NA

Test Frequency: 2402.00 MHz

Test Standard: ANSI C63.10-2013

Worst Case Plane: X-Plane (GFSK)

Radiated Emission (Low Channel) tabular data

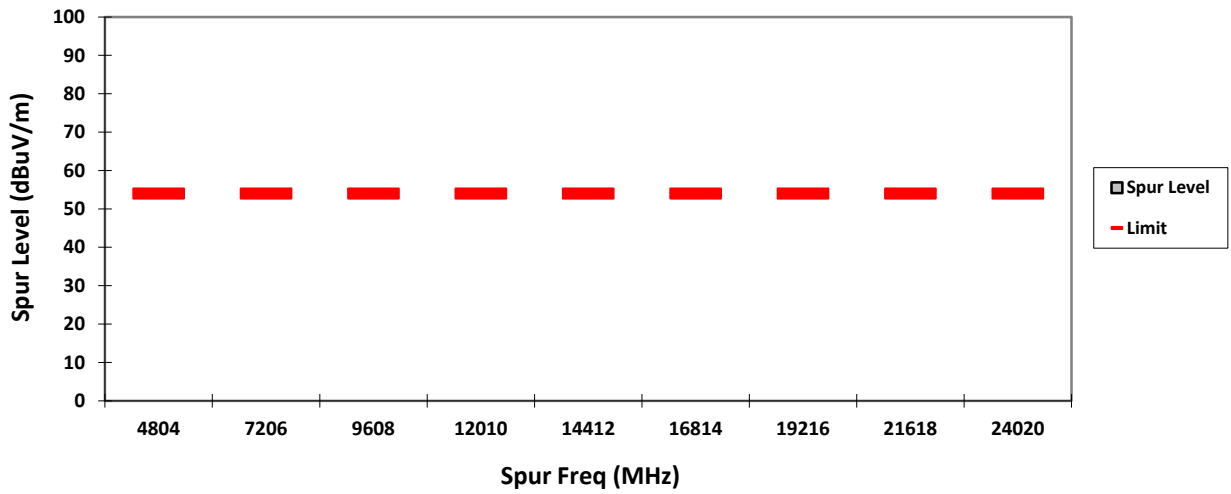
[illegible]

Remarks: Pass Result	Marginal Result	Fail Result
-------------------------	-----------------	-------------

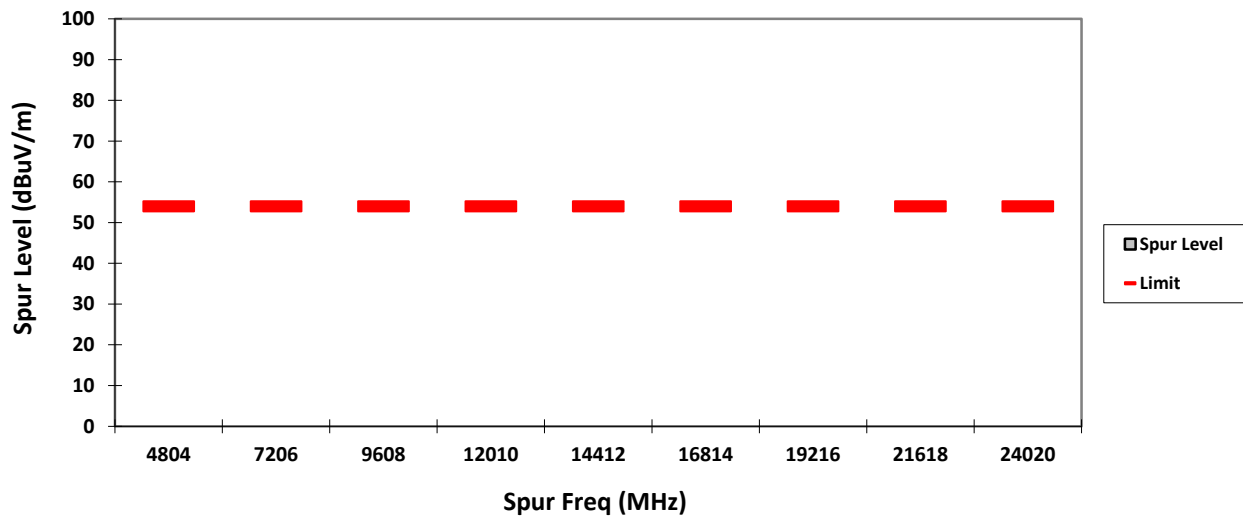
Humidity (%): 71.6
Test Date: Thu, Dec 01, 2016
Duty Cycle (%): <77%

Remarks: ** Indicates the spurious emission could not be detected due to noise limitation or ambient.

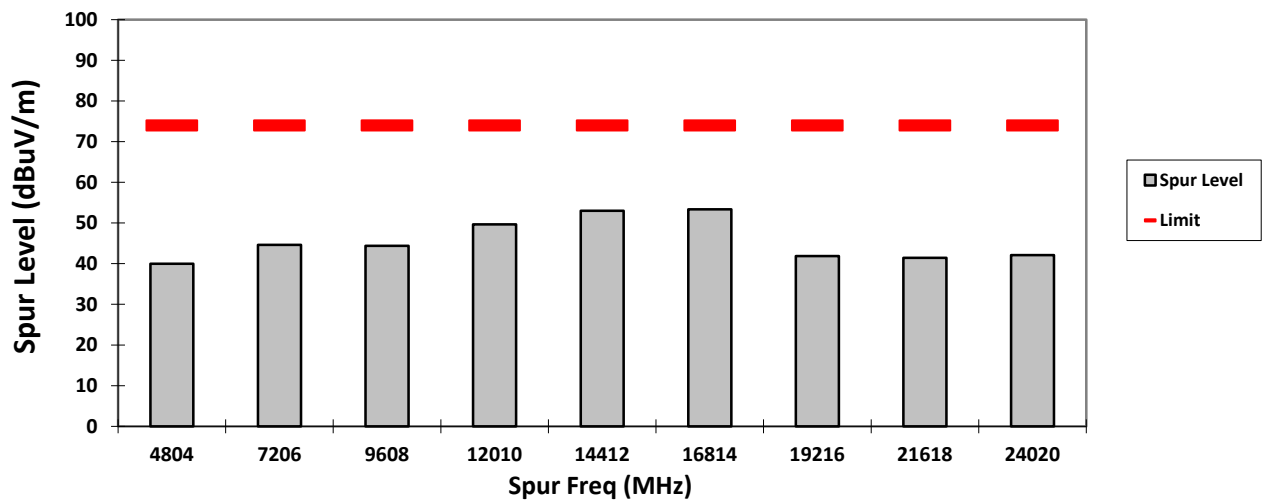
VERTICAL, QPK



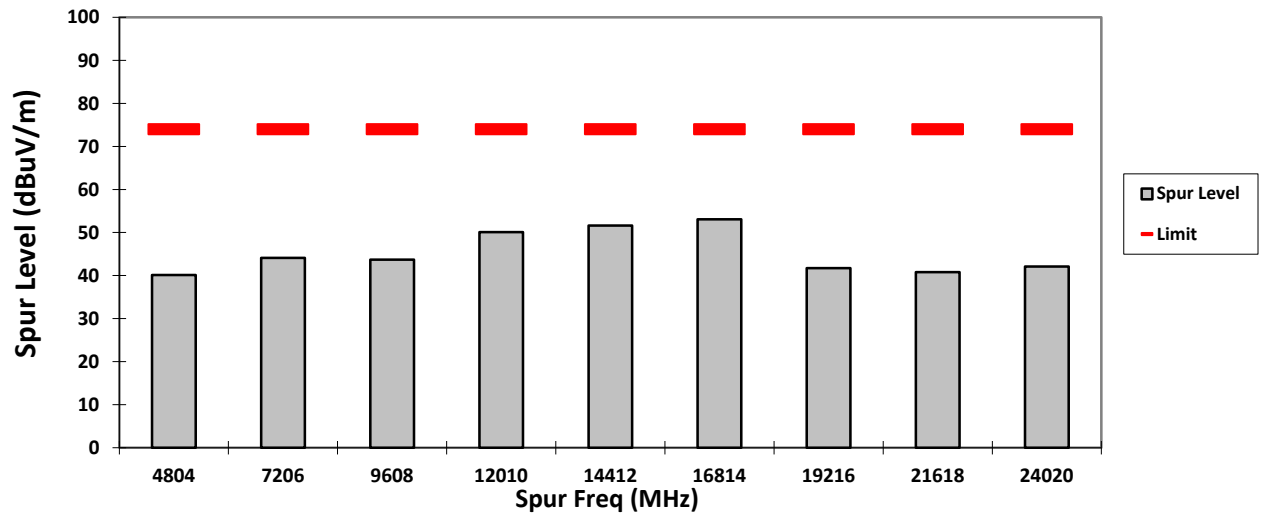
HORIZONTAL, QPK



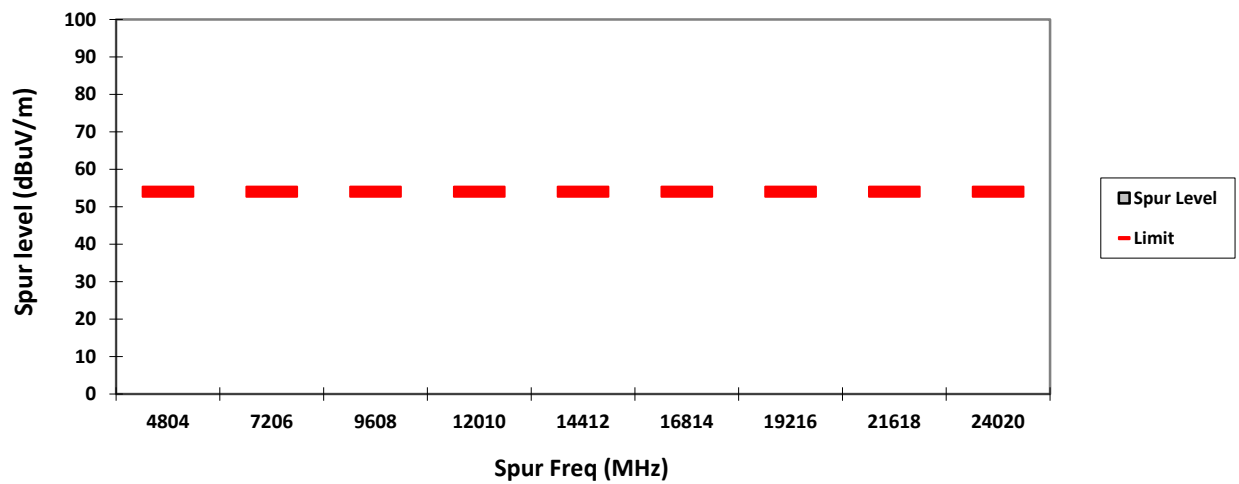
VERTICAL, PK



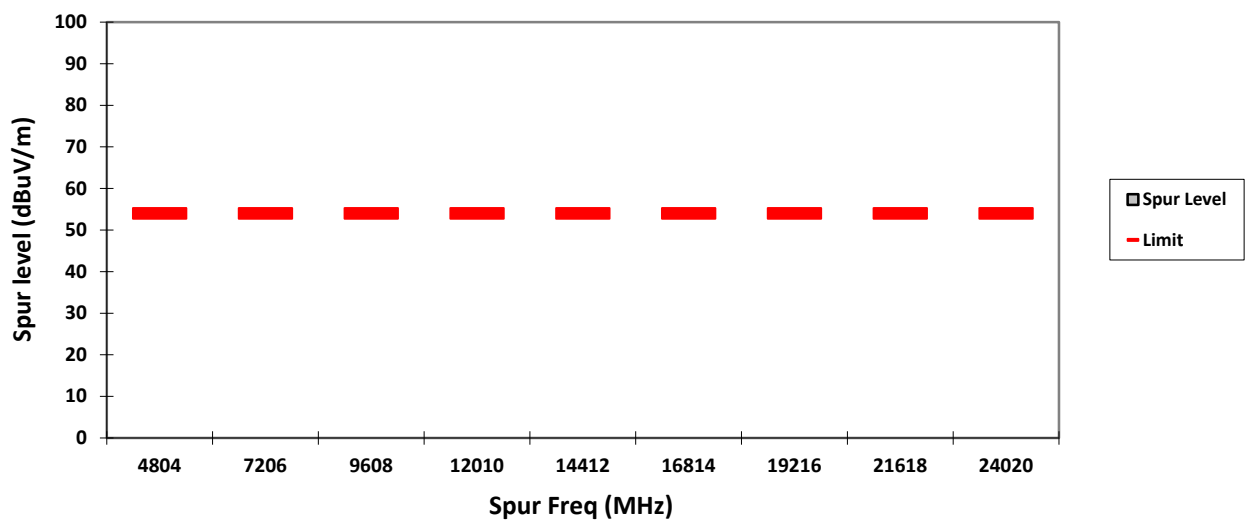
HORIZONTAL, PK



VERTICAL, AV



HORIZONTAL, AV



Test: Bluetooth SAC Transmitter Radiated Emission

S/N: 837TSX0488

EMC SR ID#: 06481-EMC-00012

Accessory: NA

Test Frequency: 2441.00 MHz

Test Standard: ANSI C63.10-2013

Worst Case Plane: X-Plane (GFSK)

Radiated Emission (Mid Channel) tabular data

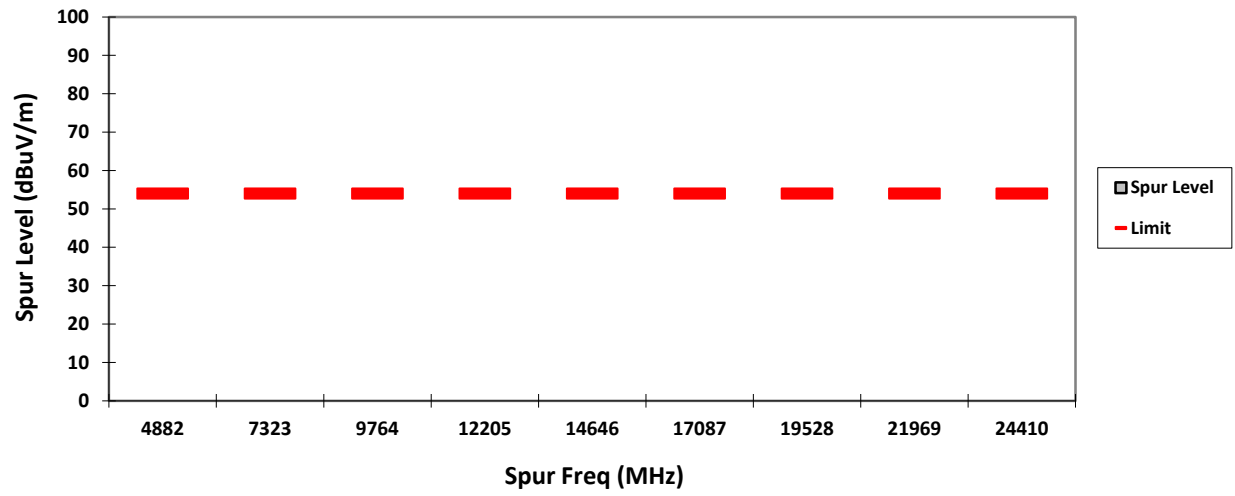
[illegible]

Remarks: Pass Result	Marginal Result	Fail Result
-------------------------	-----------------	-------------

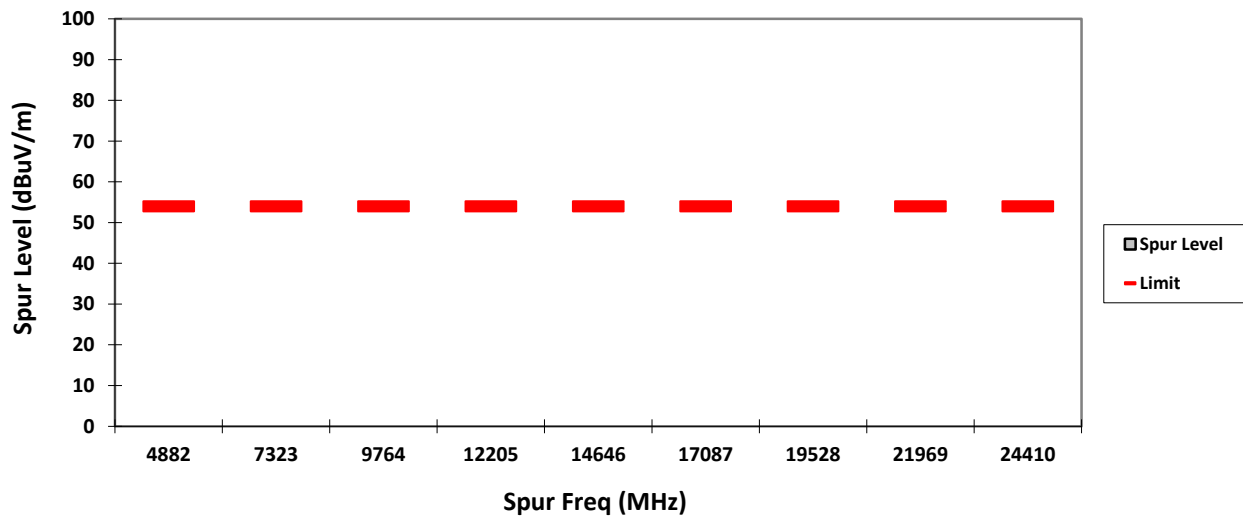
Humidity (%): 71.6
Test Date: Thu, Dec 01, 2016
Duty Cycle (%): <77%

Remarks: ** Indicates the spurious emission could not be detected due to noise limitation or ambient.

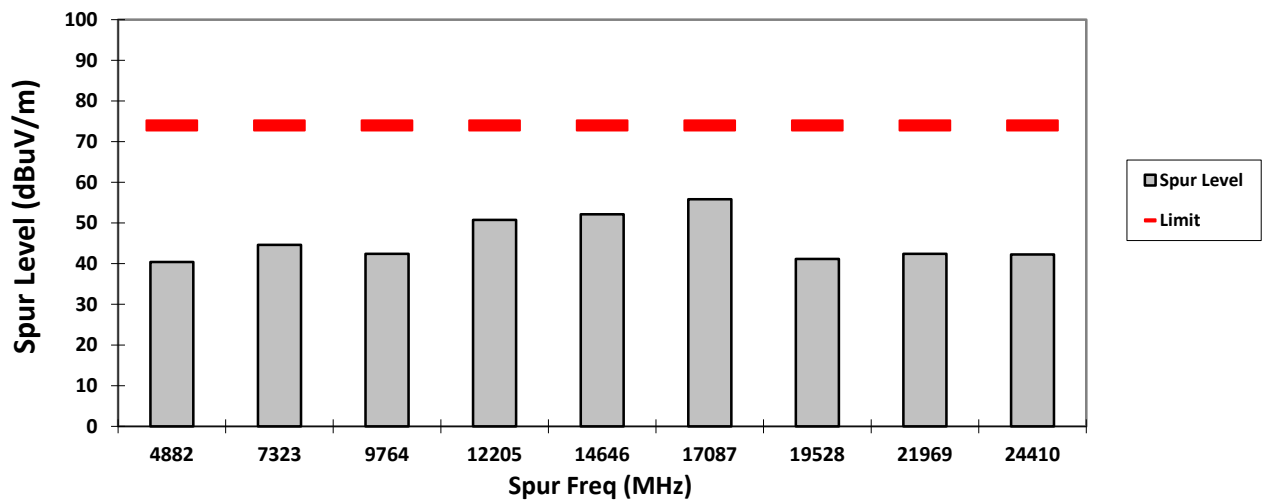
VERTICAL, QPK



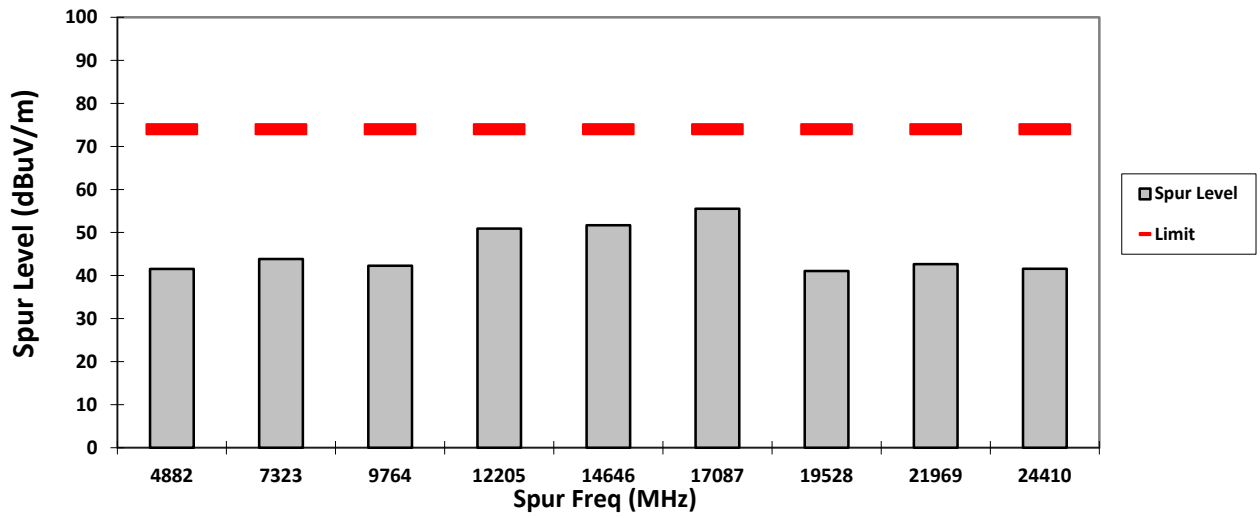
HORIZONTAL, QPK



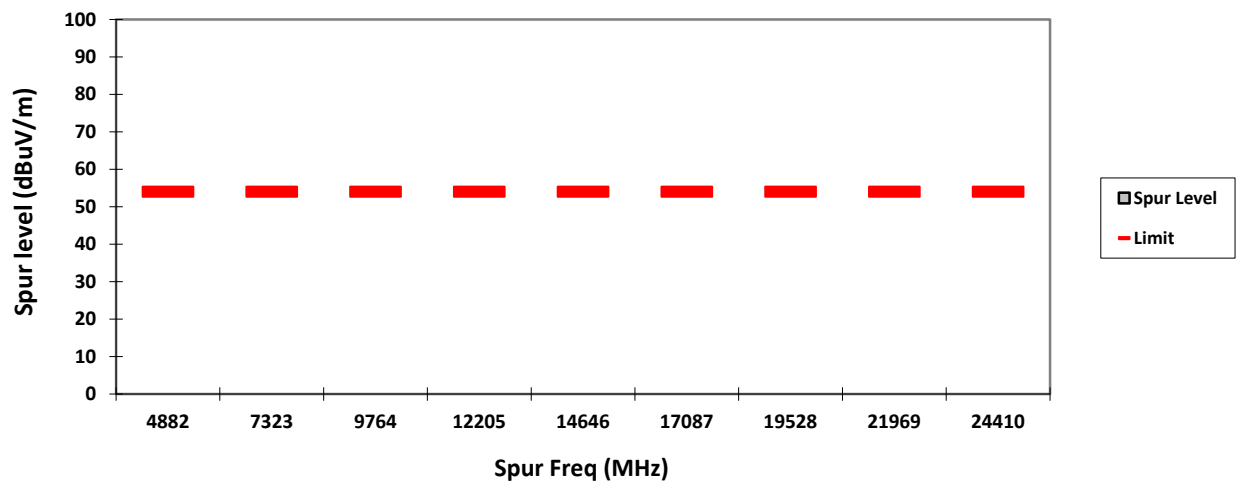
VERTICAL, PK



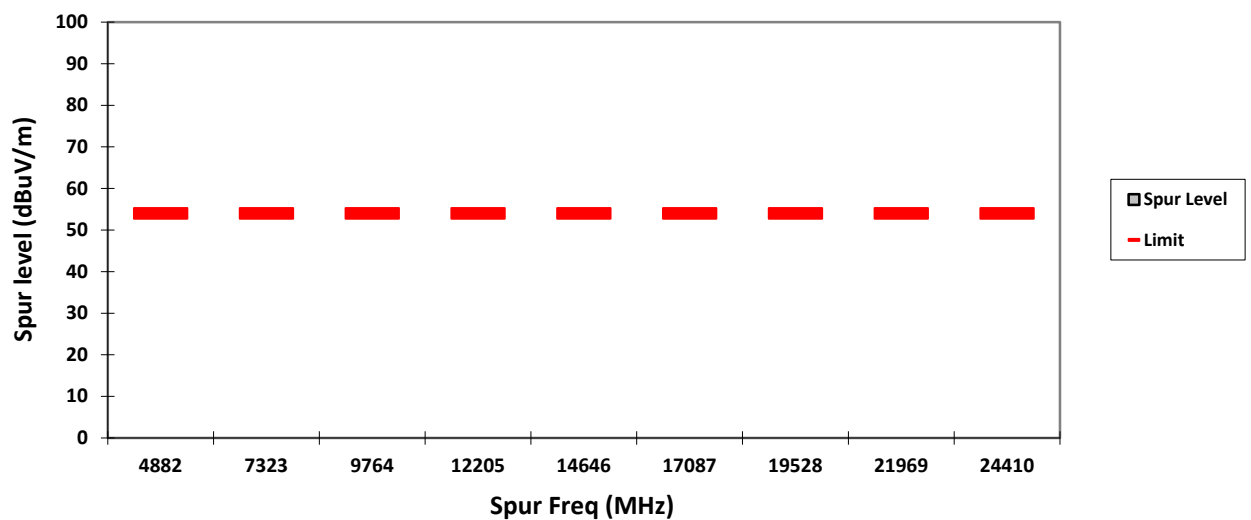
HORIZONTAL, PK



VERTICAL, AV



HORIZONTAL, AV



Test: Bluetooth SAC Transmitter Radiated Emission

S/N: 837TSX0488

EMC SR ID#: 06481-EMC-00012

Accessory: NA

Test Frequency: 2480.00 MHz

Test Standard: ANSI C63.10-2013

Worst Case Plane: X-Plane (GFSK)

Radiated Emission (High Channel) tabular data

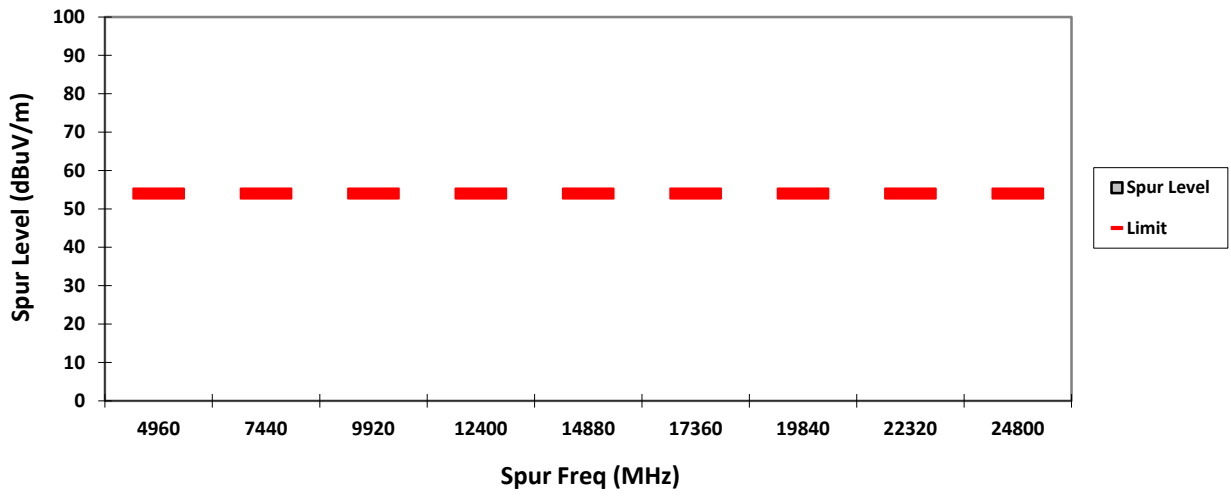
[illegible]

Remarks: Pass Result	Marginal Result	Fail Result
-------------------------	-----------------	-------------

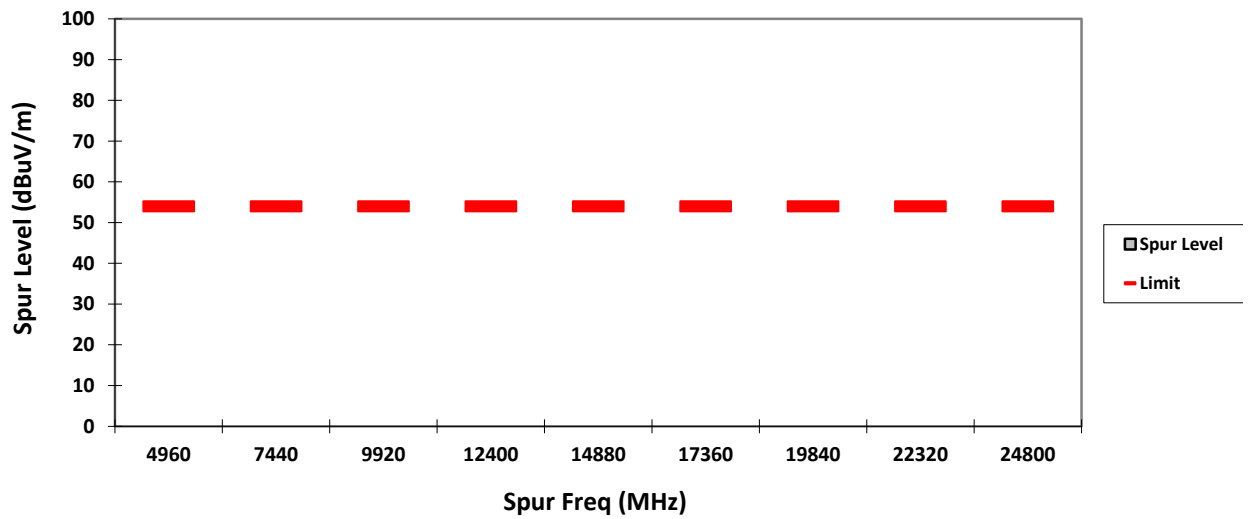
Humidity (%): 71.6
Test Date: Thu, Dec 01, 2016
Duty Cycle (%): <77%

Remarks: ** Indicates the spurious emission could not be detected due to noise limitation or ambient.

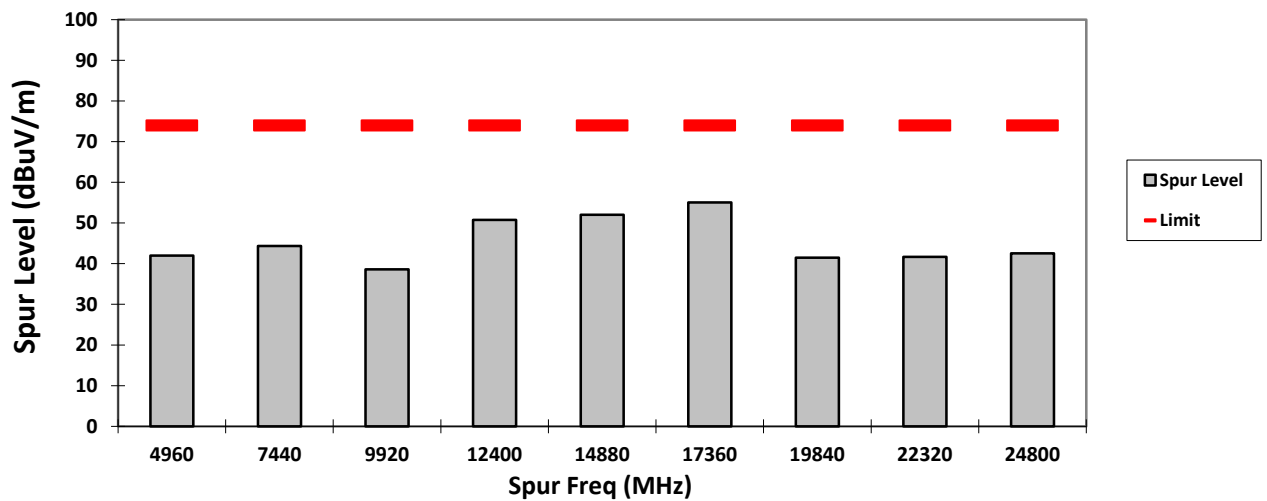
VERTICAL, QPK



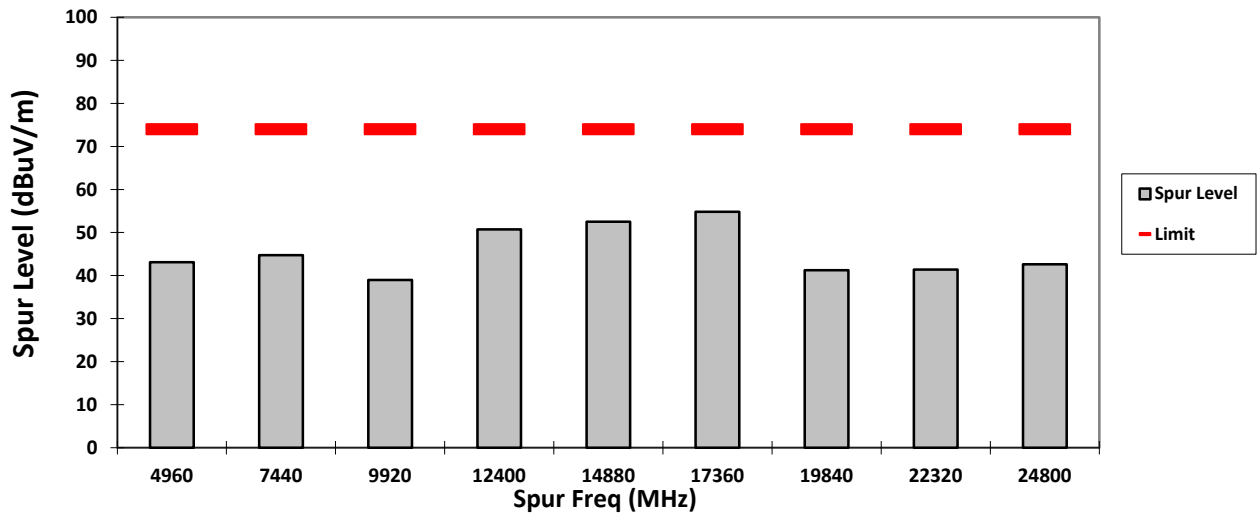
HORIZONTAL, QPK



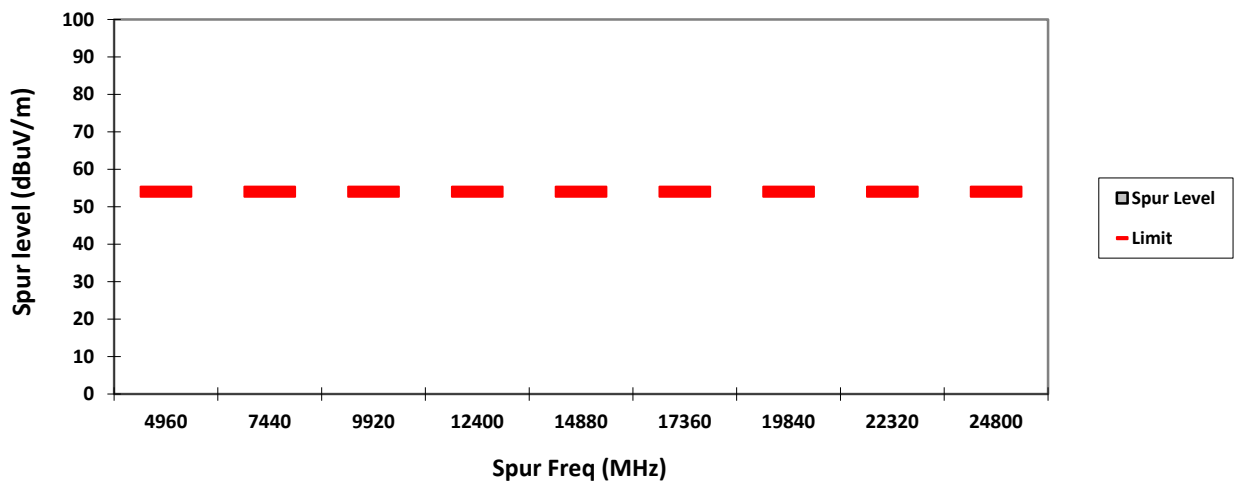
VERTICAL, PK



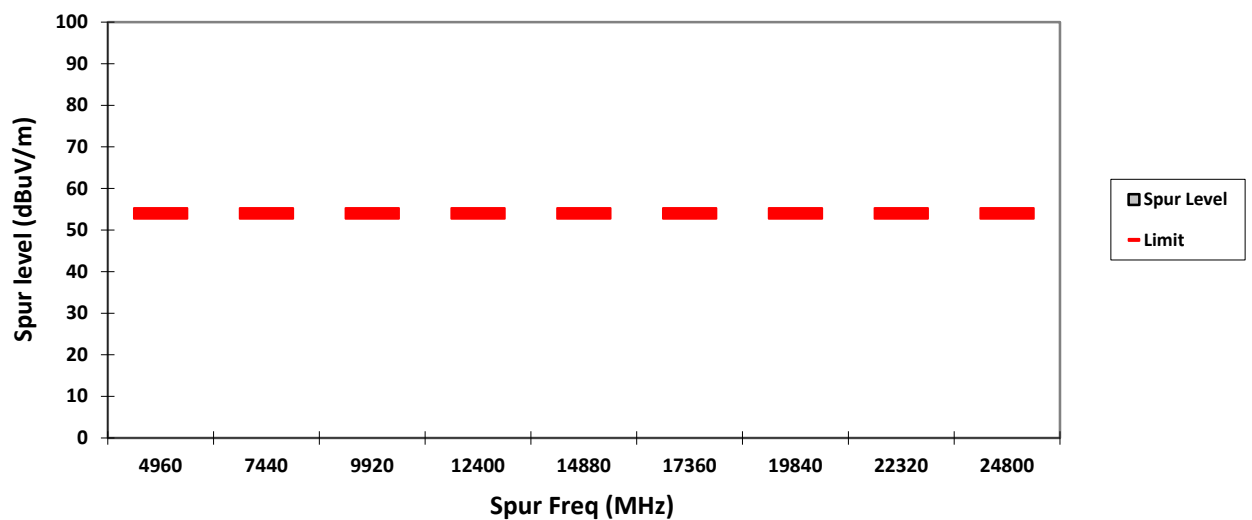
HORIZONTAL, PK



VERTICAL, AV

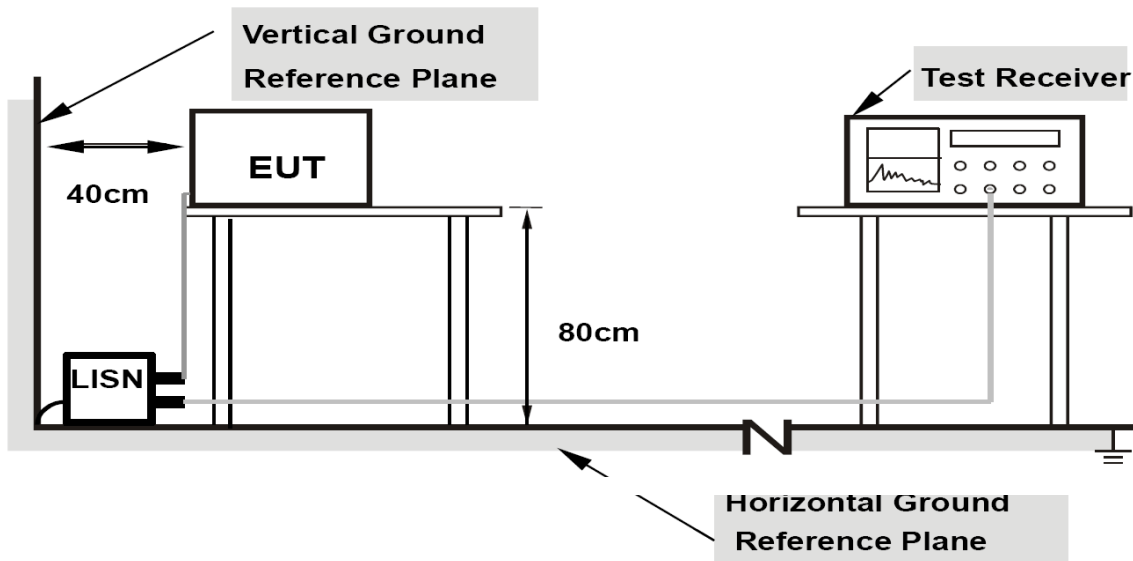


HORIZONTAL, AV



6.7 AC Powerline Conducted Emission

6.7.1 Test Setup



- 1) Tests were conducted for both Receive and Transmit Mode of the EUT.
- 2) The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/50uH of coupling impedance for the measuring instrument.
- 3) Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
- 4) The frequency range from 150 kHz to 30MHz was measured.

6.7.2 Test Limits:

For AC Power Line Conducted Test Limit can be Class A or B depends on product classification.

Limits for conducted disturbance at the mains ports
of class A ITE

Frequency range MHz	Limits dB(μV)	
	Quasi-peak	Average
0,15 to 0,50	79	66
0,50 to 30	73	60
NOTE The lower limit shall apply at the transition frequency.		

Table 1: Limits for Conducted Disturbance at the Mains Ports of Class A ITE.

**Limits for conducted disturbance at the mains ports
of class B ITE**

Frequency range MHz	Limits dB(μ V)	
	Quasi-peak	Average
0,15 to 0,50	66 to 56	56 to 46
0,50 to 5	56	46
5 to 30	60	50
NOTE 1 The lower limit shall apply at the transition frequencies. NOTE 2 The limit decreases linearly with the logarithm of the frequency in the range 0,15 MHz to 0,50 MHz.		

Table 2: Limits for Conducted Disturbance at the Mains Ports of Class B ITE

6.7.3 Test Result

Not Applicable. Testing is not required, radio shall turn off during charging mode.