FCC RADIO TEST REPORT
FCC 47 CFR PART 15 SUBPART C

Test Standard	**FCC : Part 15.247** **IC : RSS-247 Issue 1 and RSS-GEN Issue 4**
FCC ID	**2ACIX-DBD**
ISED No.	**11946B-DBD**
Trade name	**Bowers & Wilkins**
Product name	**Powered subwoofer**
Model No.	**DB1D,DB2D,DB3D**
Test Result	**Pass**

The test Result was tested by Compliance Certification Services Inc. The test data, data evaluation, test procedures, and equipment configurations shown in this report were given in ANSI C63.10: 2013 and compliance standards.

The test results of this report relate only to the tested sample (EUT) identified in this report.
The test Report of full or partial shall not copy. Without written approval of Compliance Certification Services Inc. (Wugu Laboratory)

The sample selected for test was production product and was provided by manufacturer.

Testing Laboratory
1309

Approved by:

Sam Chuang
Manager

Reviewed by:

Zeus Chen
Supervisor

Revision History

Rev.	Issue Date	Revisions	Revised By
00	November 24, 2016	Initial Issue	Doris Chu
01	December 27, 2016	1. Modify Test Standard in P.1	Angel Cheng
02	February 14, 2017	1. Added Bandedge Data in P. 34~41	Angel Cheng

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1. GENERAL INFORMATION

1.1 EUT INFORMATION

<table>
<tr><td>Applicant</td><td>B&W Group ltd
Dale Road Worthing, West Sussex BN11 2BH, United Kingdom</td></tr>
<tr><td>Equipment</td><td>Powered subwoofer</td></tr>
<tr><td>Model Name</td><td>DB1D, DB2D,DB3</td></tr>
<tr><td>Model Discrepancy</td><td>
<table>
<tr><td></td><td>Model no.: DB1D</td><td>Model no.: DB2D</td><td>Model no.: DB3D</td></tr>
<tr><td>Dimension</td><td>429 mm x 410 mm x 497 mm (with SPIKE)</td><td>377 mm x 360 mm x 447 mm (with SPIKE)</td><td>315.4 mm x 300 mm x 387.3 mm (with SPIKE)</td></tr>
<tr><td>Main board</td><td>1 pcs (DB MAIN-P10 PCB)</td><td>1 pcs (DB MAIN-P10 PCB)</td><td>1 pcs (DB MAIN-P10 PCB)</td></tr>
<tr><td>Power board</td><td>2 pcs</td><td>1 pcs</td><td>1 pcs</td></tr>
<tr><td>Relay board</td><td>1 pcs (DB RELAY-01 PCB)</td><td>N/A</td><td>N/A</td></tr>
<tr><td>Filter board</td><td>2 pcs</td><td>1 pcs</td><td>1 pcs</td></tr>
<tr><td>Switch board</td><td>1 pcs</td><td>1 pcs</td><td>1 pcs</td></tr>
<tr><td>Input rating</td><td>100V-120V~, 200V-240V~, 50/60Hz, 490W</td><td>100V-120V~, 200V-240V~, 50/60Hz, 490W</td><td>100V-120V~, 200V-240V~, 50/60Hz, 490W</td></tr>
<tr><td>Speaker specification</td><td>Resistance= 8Ω, Power= 1000W</td><td>Resistance= 4Ω, Power= 500W</td><td>Resistance= 4Ω, Power= 500W</td></tr>
</table>
</td></tr>
<tr><td>EUT Functions</td><td>BT : BLE</td></tr>
<tr><td>Received Date</td><td>Nov. 10, 2016</td></tr>
<tr><td>Date of Test</td><td>Nov. 15, 2016 ~ Nov 22, 2016</td></tr>
<tr><td>Output Power (W)</td><td>BLE : 0.0003</td></tr>
<tr><td>Power Operation</td><td>☒ AC Power core : 120V/60Hz
☐ DC Type :
☐ Battery
☐ DC Power Supply
☐ External DC adapter</td></tr>
</table>

Remark:

All listed models are using an identical RF module with the only differences on number of key buttons mounted for additional functions.

Due to similarity of RF product constructions of given model series, only dedicated model as described in test report with the most complexity constructions was selected for testing and record

1.2 EUT CHANNEL INFORMATION

Frequency Range	2402MHz-2480MHz
Modulation Type	GFSK for BLE-1Mbps
Number of channel	40 Channels

Remark:
Refer as ANSI 63.10:2013 clause 5.6.1 Table 4 and RSS-GEN Table A1 for test channels

Number of frequencies to be tested

Frequency range in which device operates	Number of frequencies	Location in frequency range of operation
☐ 1 MHz or less	1	Middle
☐ 1 MHz to 10 MHz	2	1 near top and 1 near bottom
☒ More than 10 MHz	3	1 near top, 1 near middle, and 1 near bottom

1.3 ANTENNA INFORMATION

Antenna Category	☒ Integral: antenna permanently attached ☐ External dedicated antennas ☐ External Unique antenna connector
Antenna Type	☐ PIFA ☒ PCB ☐ Dipole ☐ Printed ☐ Coils
Antenna Gain	For DB1D: 1.99dBi For DB2D: 0.67dBi For DB3D: 0.39dBi

1.4 MEASUREMENT UNCERTAINTY

PARAMETER	UNCERTAINTY
AC Powerline Conducted Emission	+/- 1.2575
Emission bandwidth, 20dB bandwidth	+/- 1.4003
RF output power, conducted	+/- 1.1372
Power density, conducted	+/- 1.4003
3M Semi Anechoic Chamber / 30M~200M	+/- 4.0138
3M Semi Anechoic Chamber / 200M~1000M	+/- 3.9483
3M Semi Anechoic Chamber / 1G~8G	+/- 2.5975
3M Semi Anechoic Chamber / 8G~18G	+/- 2.6112
3M Semi Anechoic Chamber / 18G~26G	+/- 2.7389
3M Semi Anechoic Chamber / 26G~40G	+/- 2.9683
3M Semi Anechoic Chamber / 40G~60G	+/- 1.8509
3M Semi Anechoic Chamber / 60G~75G	+/- 1.9869
3M Semi Anechoic Chamber / 75G~110G	+/- 2.9651
3M Semi Anechoic Chamber / 110G~170G	+/- 2.7807
3M Semi Anechoic Chamber / 170G~220G	+/- 3.6437
3M Semi Anechoic Chamber / 220G~325G	+/- 4.2982

***Remark**:*
1.This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2
2. ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report.

1.5 FACILITIES AND TEST LOCATION

All measurement facilities used to collect the measurement data are located at *No.11, Wugong 6th Rd., Wugu Dist., New Taipei City 24891, Taiwan. (R.O.C.)*

Test site	Test Engineer	Remark
AC Conduction Room	Anderson Kuo	
Radiation	Ed Chiang	
RF Conducted	Ian Tu	

Remark: *The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 and CISPR Publication 22.*

1.6 INSTRUMENT CALIBRATION

RF Conducted Test Site				
Equipment	**Manufacturer**	**Model**	**S/N**	**Cal Due**
Spectrum Analyzer	R&S	FSV 40	101073	07/31/2017

3M 966 Chamber Test Site				
Equipment	**Manufacturer**	**Model**	**S/N**	**Cal Due**
Spectrum Analyzer	Agilent	E4446A	US42510252	12/07/2016
Loop Ant	COM-POWER	AL-130	121051	02/24/2017
Bilog Antenna	Sunol Sciences	JB3	A030105	07/02/2017
Pre-Amplifier	EMEC	EM330	60609	06/07/2017
Horn Antenna	ETC	MCTD 1209	DRH13M02003	09/01/2017
Pre-Amplifier	MITEQ	AMF-6F-260400-40-8P	985646	01/13/2017
Horn Antenna	EMCO	3116	26370	01/14/2017
Antenna Tower	CCS	CC-A-1F	N/A	N.C.R
Controller	CCS	CC-C-1F	N/A	N.C.R
Turn Table	CCS	CC-T-1F	N/A	N.C.R

AC Conducted Emissions Test Site				
Equipment	**Manufacturer**	**Model**	**S/N**	**Cal Due**
LISN	R&S	ENV216	101054	05/10/2017
Receiver	R&S	ESCI	101073	08/19/2017

Remark: *Each piece of equipment is scheduled for calibration once a year.*

1.7 SUPPORT AND EUT ACCESSORIES EQUIPMENT

EUT Accessories Equipment					
No.	**Equipment**	**Brand**	**Model**	**Series No.**	**FCC ID**
	N/A				

Support Equipment					
No.	**Equipment**	**Brand**	**Model**	**Series No.**	**FCC ID**
	N/A				

1.8 Test methodology and applied standards

The test methodology, setups and results comply with all requirements in accordance with ANSI C63.10:2013, FCC Part 2, FCC Part 15.247, KDB 558074 D01 v03r05, RSS-247 Issue 1 and RSS-GEN Issue 4

1.9 Table of accreditations and listings

Country	Agency	Scope of Accreditation	Logo
USA	FCC	3M Semi Anechoic Chamber (FCC MRA: TW1039) to perform FCC Part 15 measurements	FCC MRA: TW1039
Canada	Industry Canada	3M Semi Anechoic Chamber (IC 2324G-1 / IC 2324G-2) to perform	Canada IC 2324G-1 IC 2324G-2

.

2. TEST SUMMERY

FCC Standard Section	IC Standard Section	Report Section	Test Item	Result
15.203	-	1.2	Antenna Requirement	Pass
15.207(a)	RSS-GEN 8.8	4.1	AC Conducted Emission	Pass
15.247(a)(2)	RSS-247(5.2)(1)	4.2	6 dB Bandwidth	Pass
-	RSS-GEN 6.6	4.2	Occupied Bandwidth (99%)	Pass
15.247(b)	RSS-247(5.4)(4)	4.3	Output Power Measurement	Pass
15.247(e)	RSS-247(5.2)(2)	4.4	Power Spectral Density	Pass
15.247(d)	RSS-247(5.5)	4.5	Conducted Band Edge	Pass
15.247(d)	RSS-247(5.5)	4.5	Conducted Emission	Pass
15.247(d)	RSS-247(5.5)	4.6	Radiation Band Edge	Pass
15.247(d)	RSS-247(5.5)	4.6	Radiation Spurious Emission	Pass

3. DESCRIPTION OF TEST MODES

3.1 THE WORST MODE OF OPERATING CONDITION

Operation mode	BT4.0 Mode (1Mbps)
Test Channel Frequencies	1.Lowest Channel : 2402MHz 2.Middle Channel : 2440MHz 3.Highest Channel : 2480MHz

Remark:
1. EUT pre-scanned data rate of output power for each mode, the worst data rate were recorded in this report.
2. Baseline testing was performed on the three variants(DB1D; DB2D and DB3) to determine the worst case on all conducted test and radiated test. And Three variants of circuit were the same. Therefore worst case is DB1D.
.

3.2 THE WORST MODE OF MEASUREMENT

AC Power Line Conducted Emission	
Test Condition	**AC Power line conducted emission for line and neutral**
Voltage/Hz	**120V/60Hz**
Test Mode	☒ **Mode 1:EUT power by AC power via Power cable**.
Worst Mode	☒ **Mode 1** ☐ **Mode 2** ☐ **Mode 3** ☐ **Mode 4**

Radiated Emission Measurement Above 1G	
Test Condition	**Band edge, Emission for Unwanted and Fundamental**
Voltage/Hz	**120V/60Hz**
Test Mode	☒ **Mode 1:EUT power by AC power via Power cable**.
Worst Mode	☒ **Mode 1** ☐ **Mode 2** ☐ **Mode 3** ☐ **Mode 4**
Worst Position	☐ **Placed in fixed position.** ☒ **Placed in fixed position at X-Plane (E2-Plane)** ☐ **Placed in fixed position at Y-Plane (E1-Plane)** ☐ **Placed in fixed position at Z-Plane (H-Plane)**
Worst Polarity	☒ **Horizontal** ☐ **Vertical**

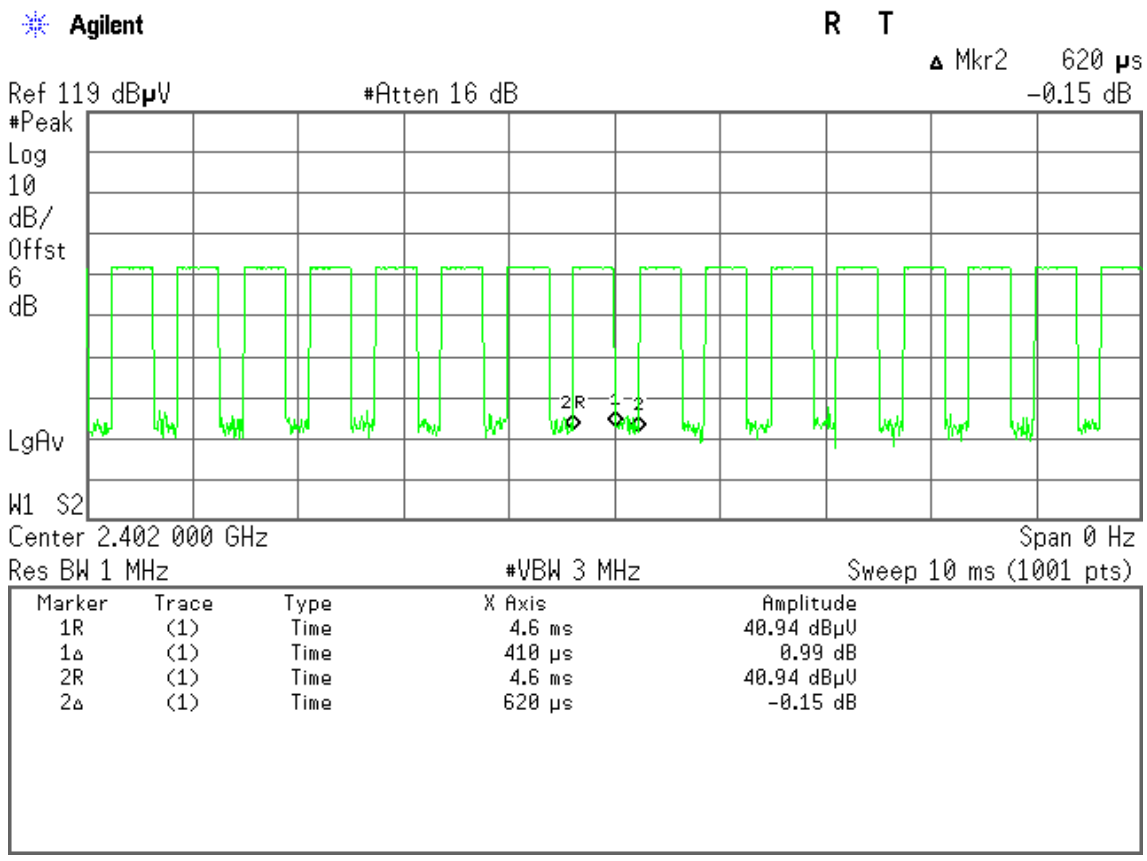
Radiated Emission Measurement Below 1G	
Test Condition	**Radiated Emission Below 1G**
Voltage/Hz	**120V/60Hz**
Test Mode	☒ **Mode 1:EUT power by AC power via Power cable**.
Worst Mode	☒ **Mode 1** ☐ **Mode 2** ☐ **Mode 3** ☐ **Mode 4**

Remark:
1. The worst mode was record in this test report.
2. EUT pre-scanned in three axis ,X,Y, Z and two polarity, Horizontal and Vertical for radiated measurement. The worst case(X-Plane and Horizontal) were recorded in this report
3.For below 1G, AC power line conducted emission and radiation emission were performed the EUT transmit at the highest output power channel as worse case.
.

3.3 EUT DUTY CYCLE

Duty Cycle				
Configuration	TX ON (ms)	TX ALL (ms)	Duty Cycle (%)	Duty Factor(dB)
BLE	0.41	0.62	69%	1.80

BLE



4. TEST RESULT

4.1 AC POWER LINE CONDUCTED EMISSION

4.1.1 Test Limit

According to §15.207(a) and RSS-GEN section 8.8,

Frequency Range (MHz)	Limits(dBμV)	
	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

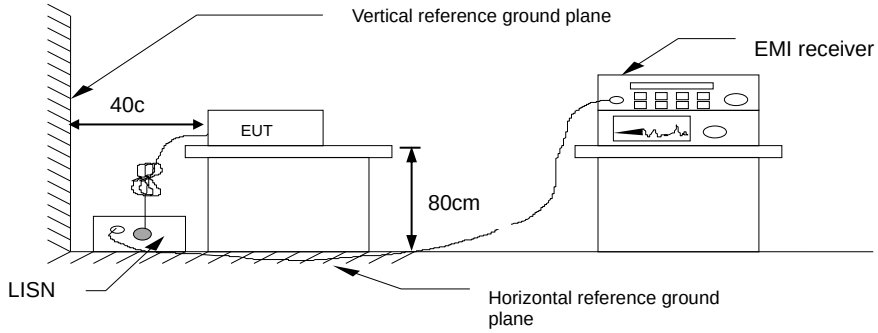
* Decreases with the logarithm of the frequency.

4.1.2 Test Procedure

Test method Refer as ANSI 63.10:2013 clause 6.2,

1. The EUT was placed on a non-conducted table, which is 0.8m above horizontal ground plane and 0.4m above vertical ground plane.
2. EUT connected to the line impedance stabilization network (LISN)
3. Receiver set RBW of 9kHz and Detector Peak, and note as quasi-peak and average.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. Recorded Line for Neutral and Line.

4.1.3 Test Setup

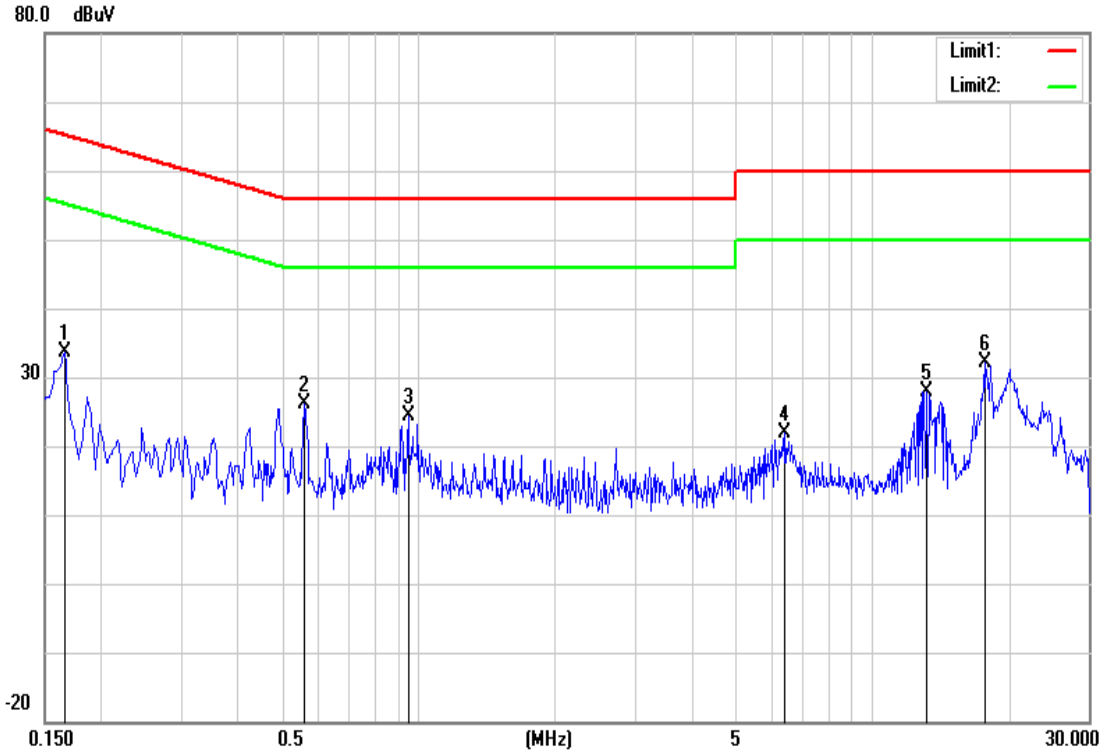


4.1.4 Test Result

Pass

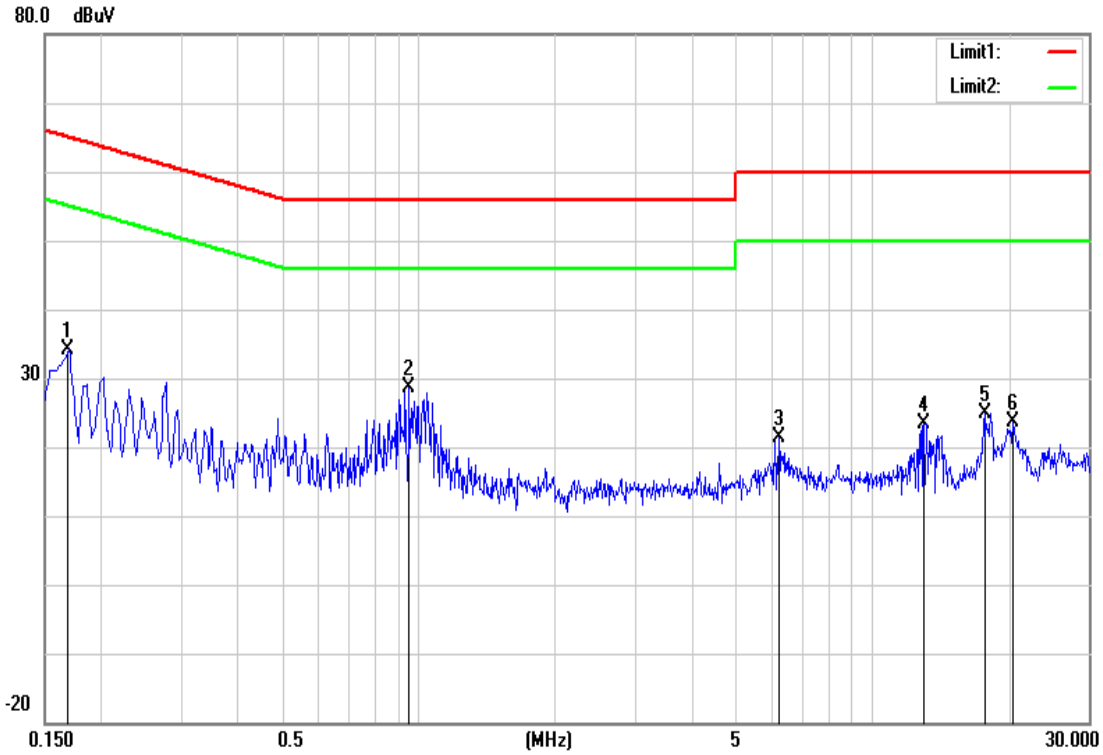
Test Data

Test Mode:	Mode 1	Temp/Hum	27(℃)/ 53%RH
Test Voltage:	120Vac / 60Hz	Test Date	Nov 15, 2016
Phase:	Line	Test Engineer	Anderson Kuo



Frequency (MHz)	Quasi Peak reading (dBuV)	Average reading (dBuV)	Correction factor (dB)	Quasi Peak result (dBuV)	Average result (dBuV)	Quasi Peak limit (dBuV)	Average limit (dBuV)	Quasi Peak margin (dB)	Average margin (dB)	Remark
0.1660	21.43	13.99	9.71	31.14	23.70	65.16	55.16	-34.02	-31.46	Pass
0.5620	13.70	8.69	9.70	23.40	18.39	56.00	46.00	-32.60	-27.61	Pass
0.9500	8.39	3.26	9.71	18.10	12.97	56.00	46.00	-37.90	-33.03	Pass
6.4460	6.04	-1.28	9.76	15.80	8.48	60.00	50.00	-44.20	-41.52	Pass
13.2420	16.28	15.42	9.82	26.10	25.24	60.00	50.00	-33.90	-24.76	Pass
17.6940	23.29	21.21	9.86	33.15	31.07	60.00	50.00	-26.85	-18.93	Pass

Test Mode:	Mode 1	Temp/Hum	27(℃)/ 53%RH
Test Voltage:	120Vac / 60Hz	Test Date	Nov 15, 2016
Phase:	Neutral	Test Engineer	Anderson Kuo



Frequency (MHz)	Quasi Peak reading (dBuV)	Average reading (dBuV)	Correction factor (dB)	Quasi Peak result (dBuV)	Average result (dBuV)	Quasi Peak limit (dBuV)	Average limit (dBuV)	Quasi Peak margin (dB)	Average margin (dB)	Remark
0.1700	21.86	15.93	9.78	31.64	25.71	64.96	54.96	-33.32	-29.25	Pass
0.9540	16.40	10.99	9.76	26.16	20.75	56.00	46.00	-29.84	-25.25	Pass
6.2380	3.86	-2.49	9.90	13.76	7.41	60.00	50.00	-46.24	-42.59	Pass
13.0380	11.53	10.32	10.10	21.63	20.42	60.00	50.00	-38.37	-29.58	Pass
17.6940	16.64	14.14	10.21	26.85	24.35	60.00	50.00	-33.15	-25.65	Pass
20.3780	10.55	4.98	10.27	20.82	15.25	60.00	50.00	-39.18	-34.75	Pass

4.2 6DB BANDWIDTH AND OCCUPIED BANDWIDTH(99%)

4.2.1 Test Limit

According to §15.247(a)(2) and RSS-247 section 5.2(1)

6 dB Bandwidth ：

Limit	Shall be at least 500kHz

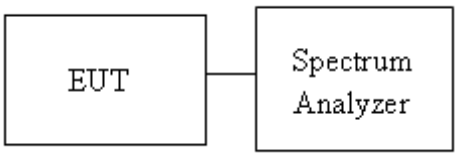
Occupied Bandwidth(99%) ： For reporting purposes only.

4.2.2 Test Procedure

Test method Refer as KDB 558074 D01 v03r05, section 8.1 and ANSI 63.10:2013 clause 6.9.2,

1. The EUT RF output connected to the spectrum analyzer by RF cable.
2. Setting maximum power transmit of EUT
3. SA set RBW = 100kHz, VBW = 300kHz and Detector = Peak, to measurement 6 dB Bandwidth and 99% Bandwidth.
4. Measure and record the result of 6 dB Bandwidth and 99% Bandwidth. in the test report.

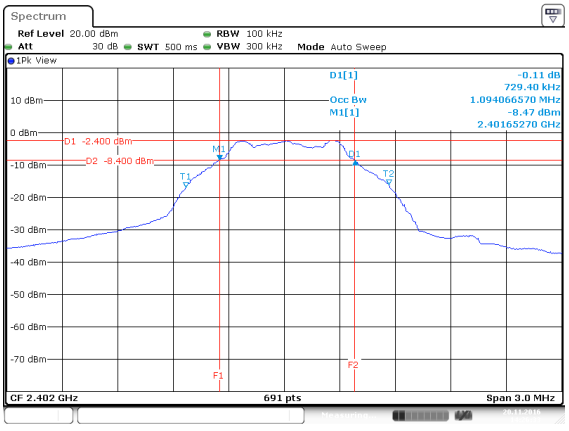
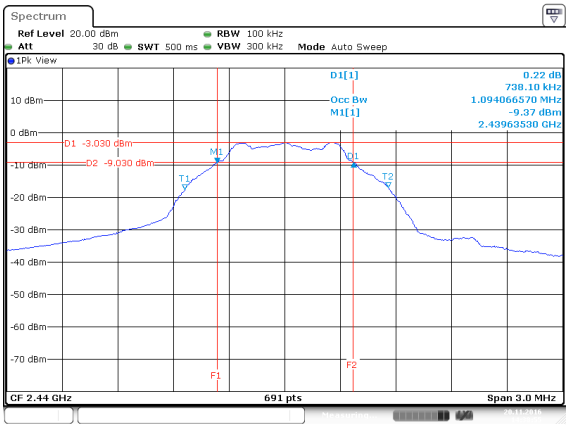
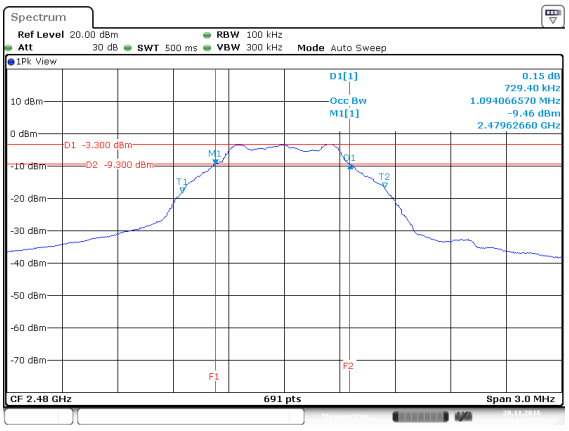
4.2.3 Test Setup



4.2.4 Test Result

Test mode: BLE mode / 2402-2480 MHz				
Channel	**Frequency (MHz)**	**OBW(99%) (MHz)**	**6dB BW (MHz)**	**6dB limit (kHz)**
Low	2402	1.0940	0.7294	>500
Mid	2440	1.0940	0.7381	
High	2480	1.0940	0.7294	

Test Data

BLE mode	
Low CH	**Mid CH**
	
High CH	
	

4.3 OUTPUT POWER MEASUREMENT

4.3.1 Test Limit

According to §15.247(b) and RSS-247 section 5.4(4)

Peak output power：

For systems using digital modulation in the 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt(30 dBm), base on the use of antennas with directional gain not exceed 6 dBi If transmitting antennas of directional gain greater than 6dBi are used the peak output power the conducted output power from the intentional radiator shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. In case of point-to-point operation, the limit has to be reduced by 1dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi.

Limit	☒ Antenna not exceed 6 dBi：30dBm ☐ Antenna with DG greater than 6 dBi [Limit = 30 – (DG – 6)] ☐ Point-to-point operation

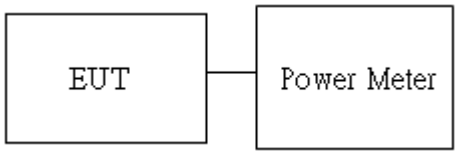
Average output power：For reporting purposes only.

4.3.2 Test Procedure

Test method Refer as KDB 558074 D01 v03r05, section 9.1.2.

1. The EUT RF output connected to the power meter by RF cable.
2. Setting maximum power transmit of EUT.
3. The path loss was compensated to the results for each measurement.
4. Measure and record the result of Peak output power and Average output power. in the test report.

4.3.3 Test Setup



4.3.4 Test Result

Peak output power：

BT_LE Mode							
Config.	CH	Freq. (MHz)	PK Power (dBm)	EIRP PK Power (dBm)	PK Power (W)	EIRP PK Power (W)	FCC/IC Limit (dBm)
BLE Data rate: 1Mbps	0	2402	-5.11	-3.11	0.0003	0.0005	30
	19	2440	-5.76	-3.76	0.0003	0.0004	
	39	2480	-6.10	-4.10	0.0002	0.0004	

Average output power：

BT_LE Mode				
Config.	CH	Freq. (MHz)	Duty Factor (dB)	AV Power (dBm)
BLE Data rate: 1Mbps	0	2402	1.80	-6.00
	19	2440	1.59	-6.51
	39	2480	1.59	-7.06

4.4 POWER SPECTRAL DENSITY

4.4.1 Test Limit

According to §15.247(e) and RSS-247 section 5.2(2)

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.

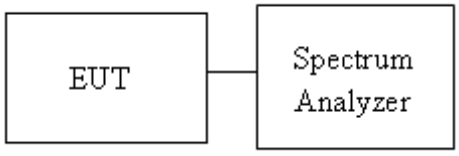
Limit	☒ Antenna not exceed 6 dBi：8dBm ☐ Antenna with DG greater than 6 dBi：8dBm [Limit = 8 – (DG – 6)] ☐ Point-to-point operation：

4.4.2 Test Procedure

Test method Refer as KDB 558074 D01 v03r05, Section 10.2

1. The EUT RF output connected to the spectrum analyzer by RF cable.
2. Setting maximum power transmit of EUT
3. SA set RBW = 3kHz, VBW = 30kHz, Span = 1.5 times DTS Bandwidth (6 dB BW), Detector = Peak, Sweep Time = Auto and Trace = Max hold.
4. The path loss and Duty Factor were compensated to the results for each measurement by SA.
5. Mark the maximum level.
6. Measure and record the result of power spectral density in the test report.

4.4.3 Test Setup



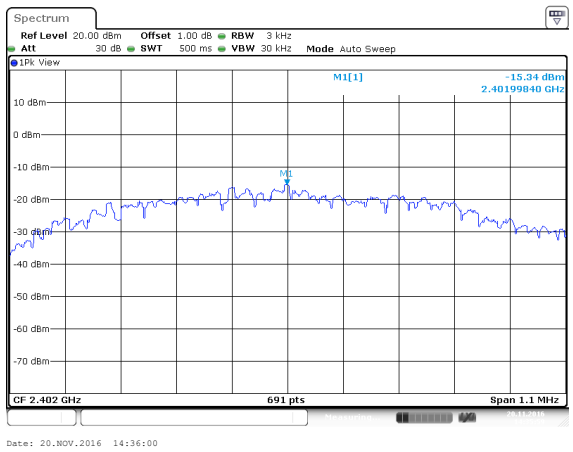
4.4.4 Test Result

Test mode: BLE mode / 2402-2480 MHz			
Channel	**Frequency (MHz)**	**PSD (dBm)**	**IC/FCC limit (dBm)**
Low	2402	-15.34	8
Mid	2440	-16.01	
High	2480	-16.05	

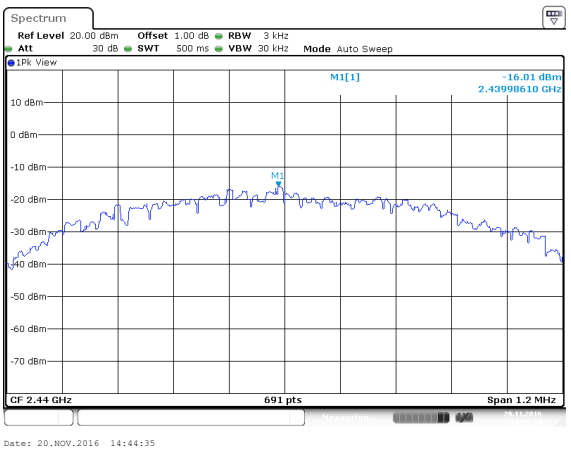
Test Data

BLE mode

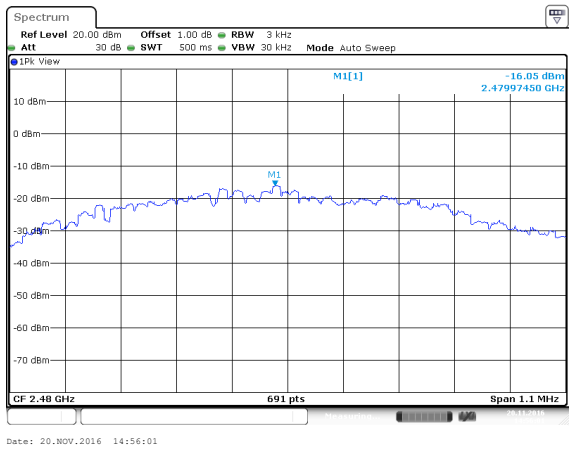
Low CH



Mid CH



High CH



4.5 CONDUCTED BAND EDGE AND SPURIOUS EMISSION

4.5.1 Test Limit

According to §15.247(d) and RSS-247 section 5.5

In any 100 kHz bandwidth outside the authorized frequency band,

Non-restricted bands shall be attenuated at least 20 dB/30 dB relative to the maximum PSD level in 100 kHz by RF conducted or a radiated measurement 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).

4.5.2 Test Procedure

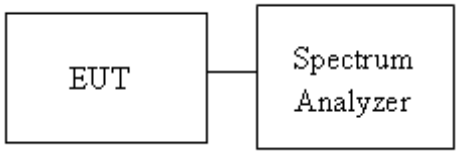
Test method Refer as KDB 558074 D01 v03r05, Section 11.

1. EUT RF output port connected to the SA by RF cable, and the path loss was compensated to result.

2. SA setting, RBW=100kHz, VBW=300kHz, Detector=Peak, Trace mode = max hold, SWT = Auto.

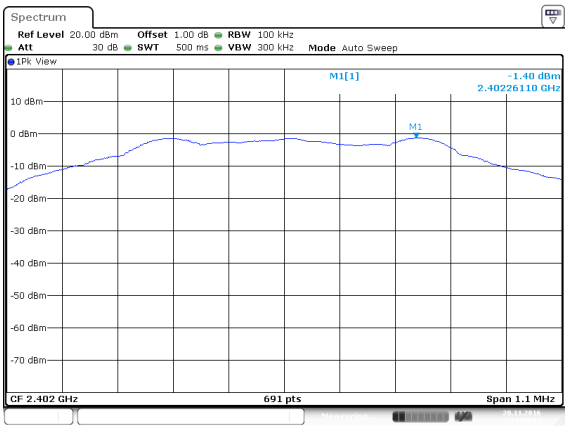
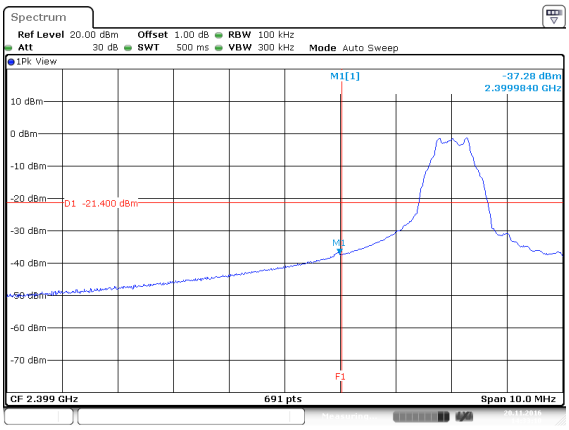
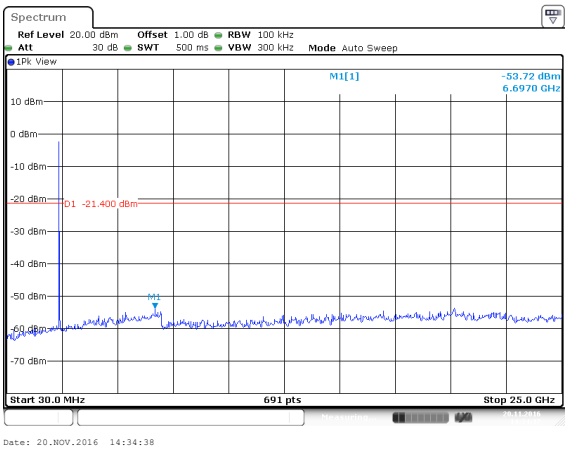
3. In any 100 kHz bandwidth outside the authorized frequency band, shall be attenuated at least 20 dB relative to the maximum in-band peak PSD level in 100 kHz when conducted power procedure is used. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, the attenuation required under this paragraph shall be 30 dB instead of 20 dB.

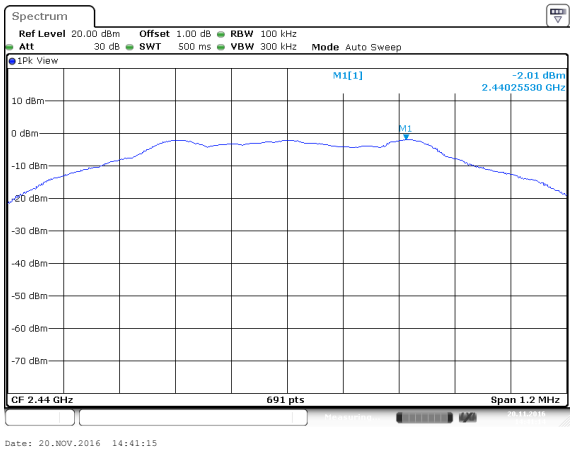
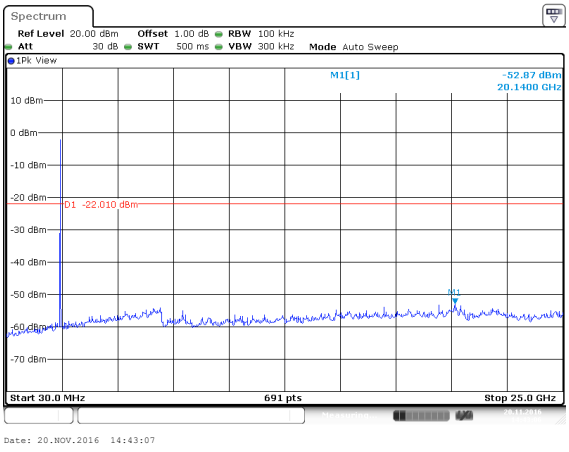
4.5.3 Test Setup



4.5.4 Test Result

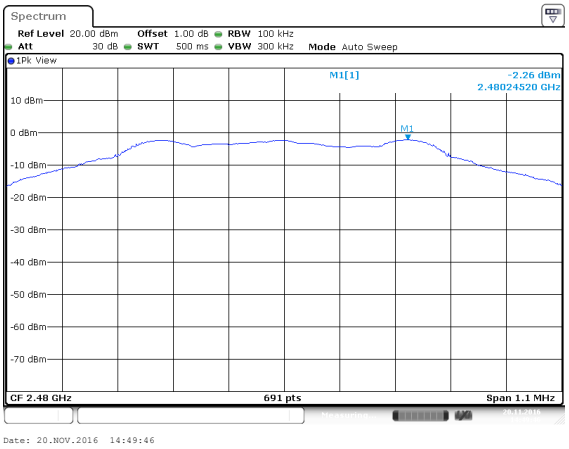
Test Data

BLE mode Low CH	
Reference Level of PSD in 100kHz	**Band Edge**
	
Spurious Emission 30MHz-25GHz	
	

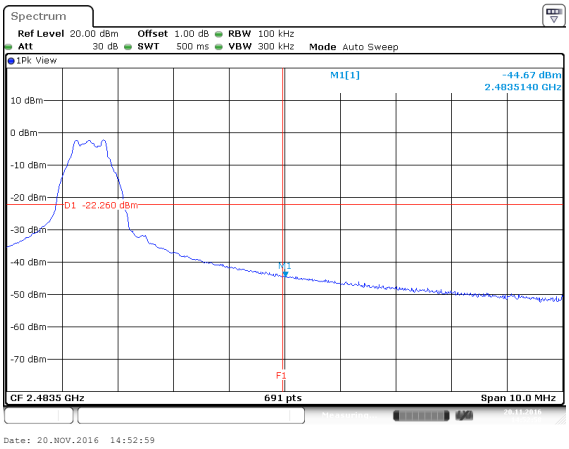
BLE mode Mid CH	
Reference Level of PSD in 100kHz	**Spurious Emission 30MHz-25GHz**
	

BLE mode High CH

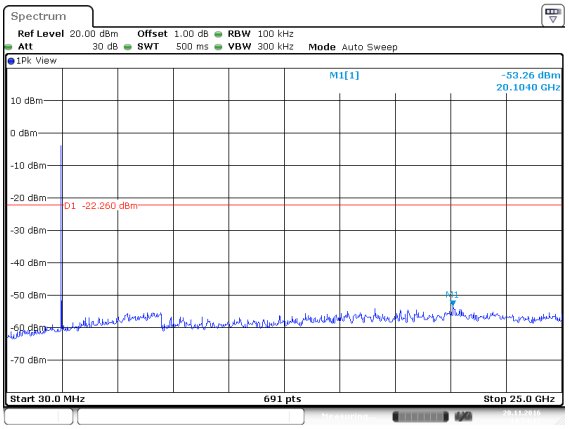
Reference Level of PSD in 100kHz



Band Edge



Spurious Emission 30MHz-25GHz



4.6 RADIATION BANDEDGE AND SPURIOUS EMISSION

4.6.1 Test Limit

FCC according to §15.247(d), §15.209 and §15.205,

IC according to RSS-247 section 5.5, RSS-Gen, Section 8.9 and 8.10

In any 100 kHz bandwidth outside the authorized frequency band, all harmonic and spurious must be least 20 dB below the highest emission level with the authorized frequency band. Radiation emission which fall in the restricted bands must also follow the FCC section 15.209 as below limit in table.

Below 30 MHz

Frequency	Field Strength (microvolts/m)	Magnetic H-Field (microamperes/m)	Measurement Distance (metres)
9-490 kHz	2,400/F (F in kHz)	2,400/F (F in kHz)	300
490-1,705 kHz	24,000/F (F in kHz)	24,000/F (F in kHz)	30
1.705-30 MHz	30	N/A	30

Above 30 MHz

Frequency (MHz)	Field Strength microvolts/m at 3 metres (watts, e.i.r.p.)	
	Transmitters	Receivers
30-88	100 (3 nW)	100 (3 nW)
88-216	150 (6.8 nW)	150 (6.8 nW)
216-960	200 (12 nW)	200 (12 nW)
Above 960	500 (75 nW)	500 (75 nW)

4.6.2 Test Procedure

Test method Refer as KDB 558074 D01 v03r05, Section 12.1.

1. The EUT is placed on a turntable, Above 1 GHz is 1.5m and below 1 GHz is 0.8m above ground plane. The EUT Configured un accordance with ANSI C63.10, and the EUT set in a continuous mode.

2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level. And EUT is set 3m away from the receiving antenna, which is scanned from 1m to 4m above the ground plane to find out the highest emissions. Measurement are made polarized in both the vertical and the horizontal positions with antenna.

3. Span shall wide enough to full capture the emission measured. The SA from 30MHz to 26.5GHz set to the low, Mid and High channels with the EUT transmit.

4. The SA setting following：

(1) Below 1G：RBW = 100kHz, VBW ≥ 3 RBW, Sweep = Auto, Detector = Peak, Trace = Max hold.

(2) Above 1G：

(2.1) For Peak measurement：RBW = 1MHz, VBW ≥ 3 RBW, Sweep = Auto, Detector = Peak, Trace = Max hold.

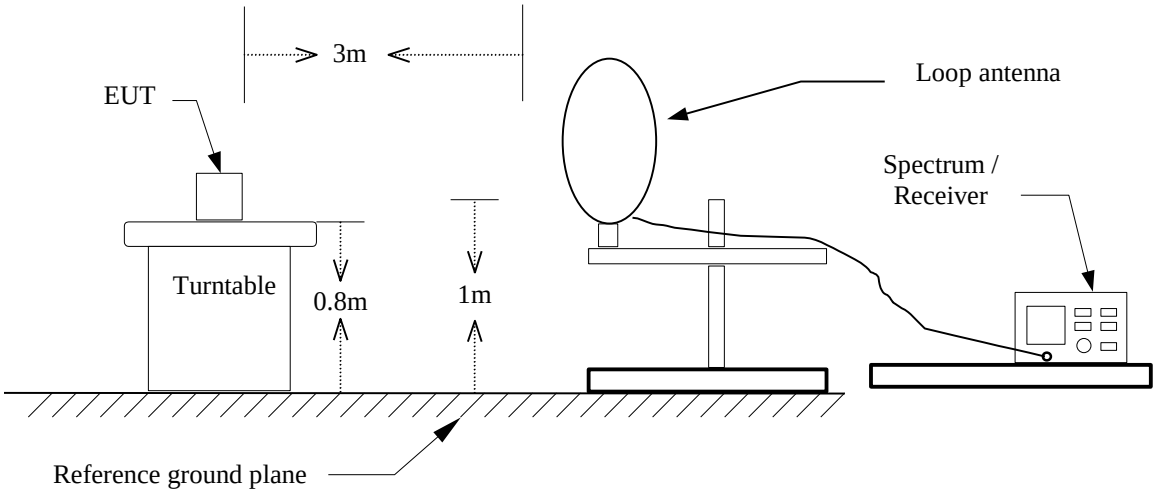
(2.2) For Average measurement：RBW = 1MHz, VBW

- If Duty Cycle ≥ 98%, VBW=10Hz.
- If Duty Cycle < 98%, VBW=1/T.

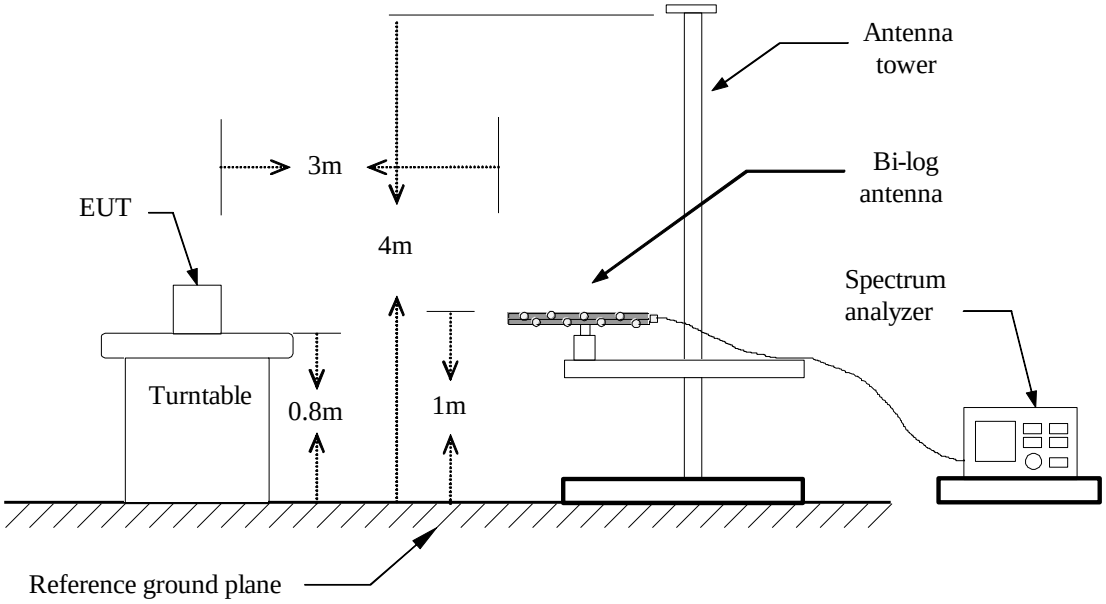
Configuration	Duty Cycle (%)	VBW
BLE	69%	2.4kHz

4.6.3 Test Setup

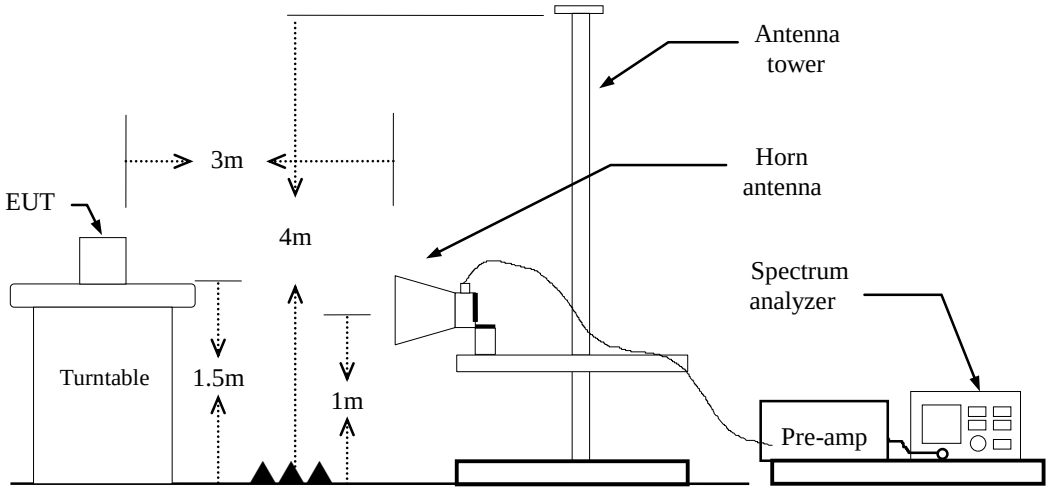
9kHz ~ 30MHz



30MHz ~ 1GHz



Above 1 GHz

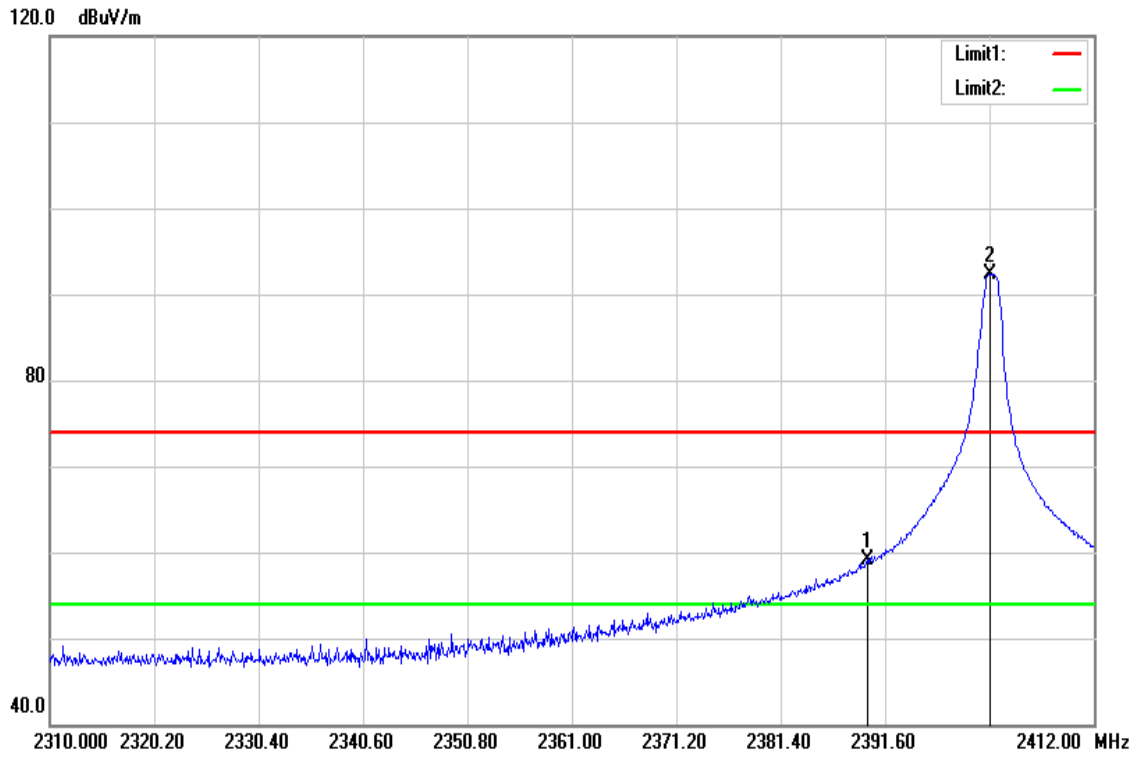


4.6.4 Test Result

Band Edge Test Data

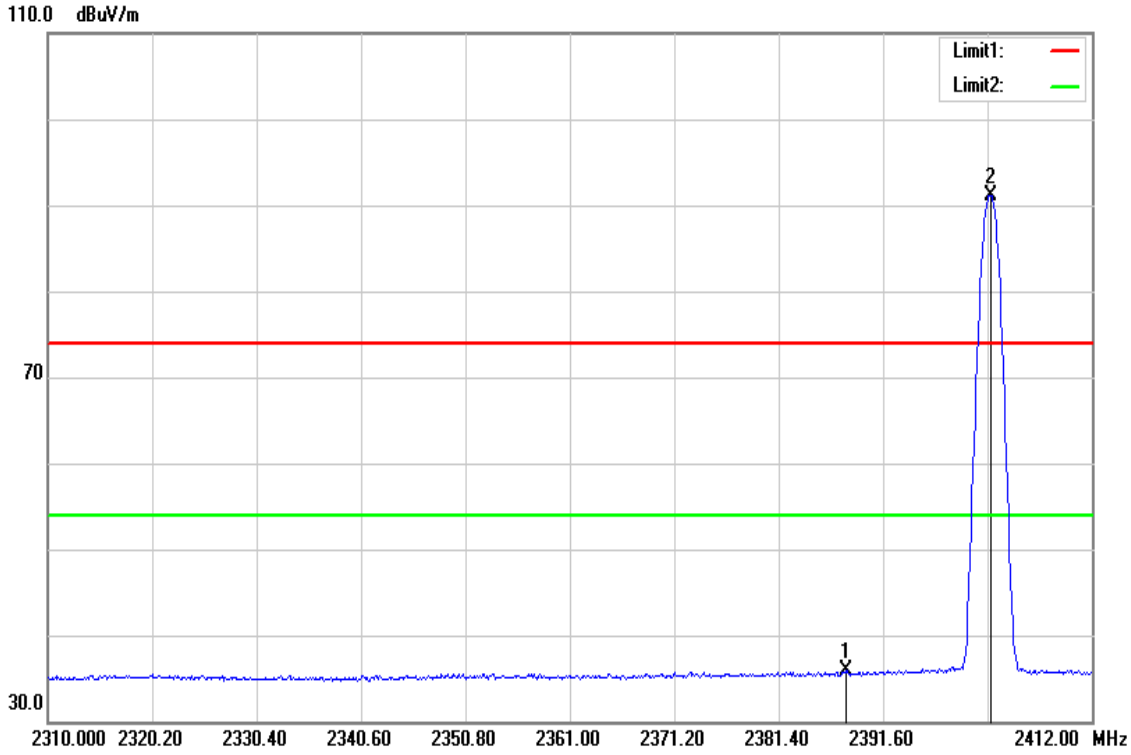
For DB1D

Test Mode:	BLE Low CH	Temp/Hum	27(℃)/ 53%RH
Test Item	Band Edge	Test Date	Nov 15, 2016
Polarize	Horizontal	Test Engineer	Ed Chiang
Detector	Peak	Test Voltage:	120Vac / 60Hz



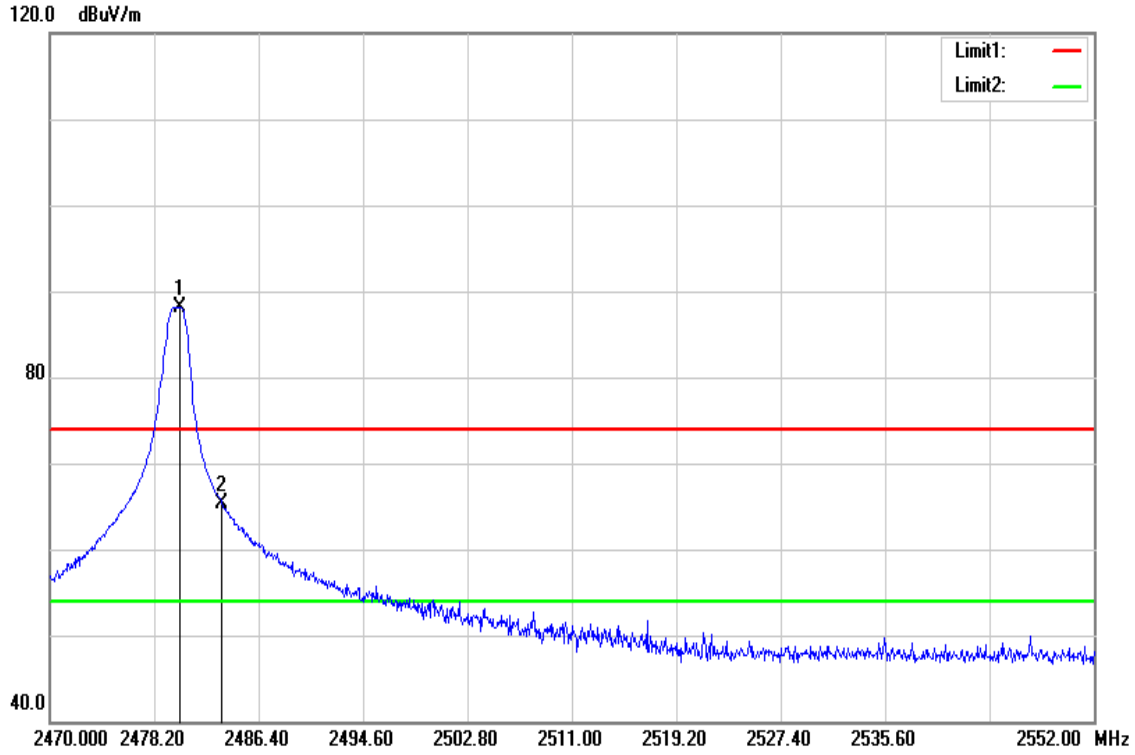
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
2389.866	61.58	-2.49	59.09	74.00	-14.91	peak
2401.800	94.76	-2.41	92.35	-	-	peak

Test Mode:	BLE Low CH	Temp/Hum	27(℃)/ 53%RH
Test Item	Band Edge	Test Date	Nov 15, 2016
Polarize	Horizontal	Test Engineer	Ed Chiang
Detector	Average	Test Voltage:	120Vac / 60Hz



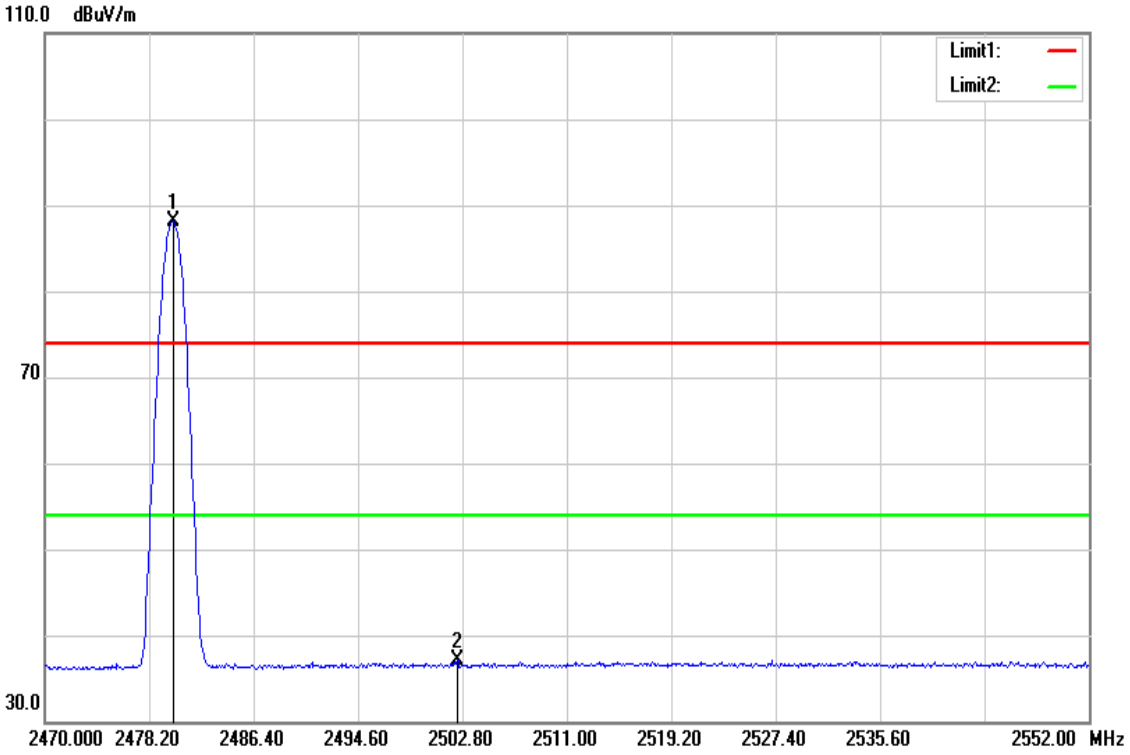
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
2388.030	38.41	-2.51	35.90	54.00	-18.10	AVG
2402.106	93.60	-2.41	91.19	-	-	AVG

Test Mode:	BLE High CH	Temp/Hum	27(℃)/ 53%RH
Test Item	Band Edge	Test Date	Nov 15, 2016
Polarize	Horizontal	Test Engineer	Ed Chiang
Detector	Peak	Test Voltage:	120Vac / 60Hz



Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
2480.250	90.21	-2.03	88.18	-	-	peak
2483.500	67.24	-1.99	65.25	74.00	-8.75	peak

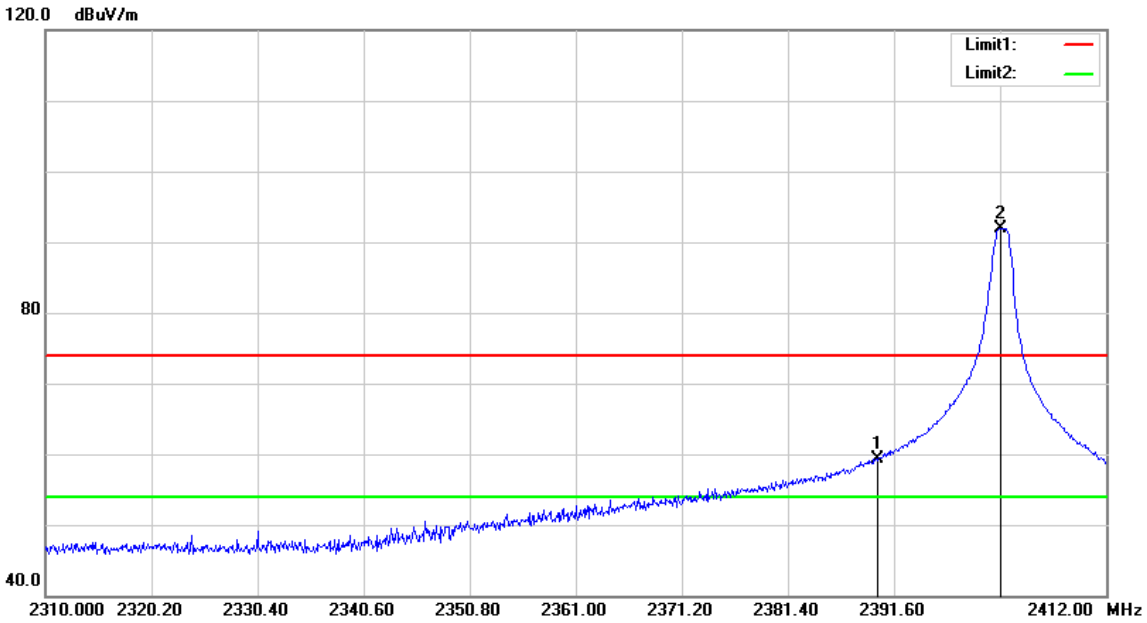
Test Mode:	BLE High CH	Temp/Hum	27(℃)/ 53%RH
Test Item	Band Edge	Test Date	Nov 15, 2016
Polarize	Horizontal	Test Engineer	Ed Chiang
Detector	Average	Test Voltage:	120Vac / 60Hz



Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
2480.086	90.13	-2.03	88.10	-	-	AVG
2502.390	38.93	-1.85	37.08	54.00	-16.92	AVG

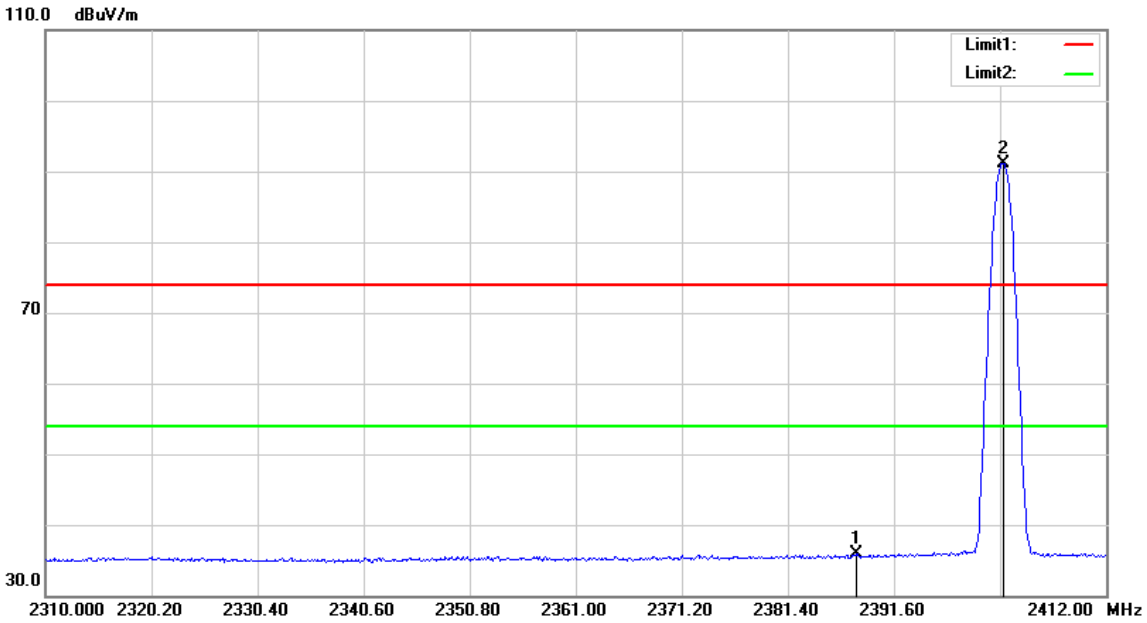
For DB2D

Test Mode:	BLE Low CH	Temp/Hum	27(℃)/ 53%RH
Test Item	Band Edge	Test Date	Nov 15, 2016
Polarize	Horizontal	Test Engineer	Ed Chiang
Detector	Peak	Test Voltage:	120Vac / 60Hz



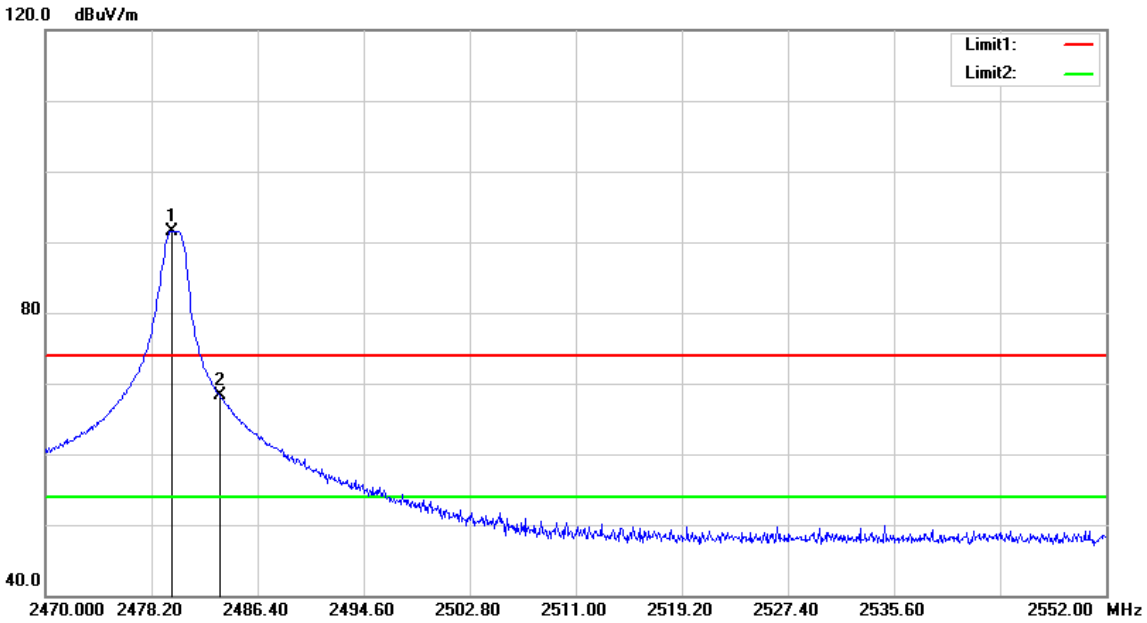
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
2389.968	61.81	-2.49	59.32	74.00	-14.68	peak
2401.800	94.41	-2.41	92.00	-	-	peak

Test Mode:	BLE Low CH	Temp/Hum	27(℃)/ 53%RH
Test Item	Band Edge	Test Date	Nov 15, 2016
Polarize	Horizontal	Test Engineer	Ed Chiang
Detector	Average	Test Voltage:	120Vac / 60Hz



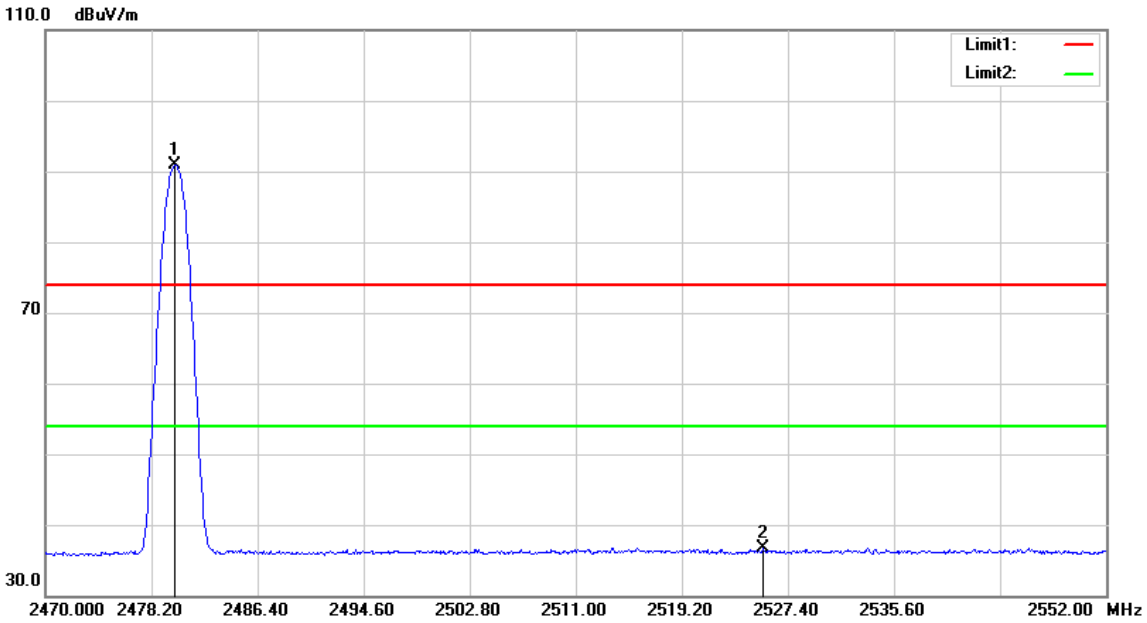
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
2388.030	38.41	-2.51	35.90	54.00	-18.10	AVG
2402.106	93.60	-2.41	91.19	-	-	AVG

Test Mode:	BLE High CH	Temp/Hum	27(℃)/ 53%RH
Test Item	Band Edge	Test Date	Nov 15, 2016
Polarize	Horizontal	Test Engineer	Ed Chiang
Detector	Peak	Test Voltage:	120Vac / 60Hz



Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
2479.758	93.61	-2.03	91.58	-	-	peak
2483.500	70.20	-1.99	68.21	74.00	-5.79	peak

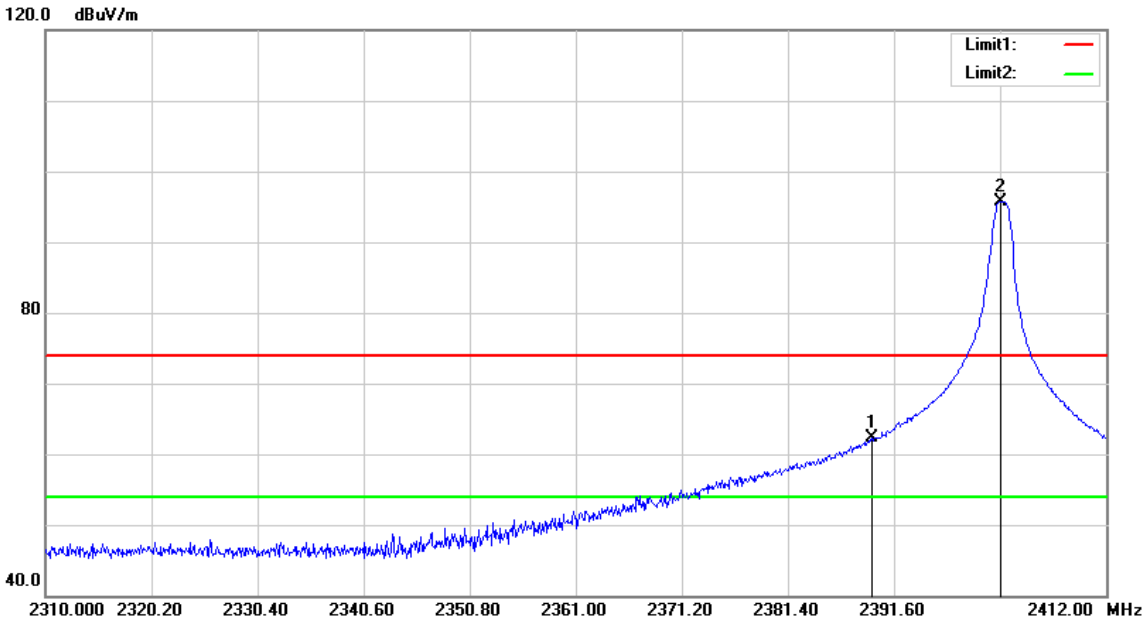
Test Mode:	BLE High CH	Temp/Hum	27(℃)/ 53%RH
Test Item	Band Edge	Test Date	Nov 15, 2016
Polarize	Horizontal	Test Engineer	Ed Chiang
Detector	Average	Test Voltage:	120Vac / 60Hz



Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
2480.004	92.91	-2.03	90.88	-	-	AVG
2525.514	38.58	-1.80	36.78	54.00	-17.22	AVG

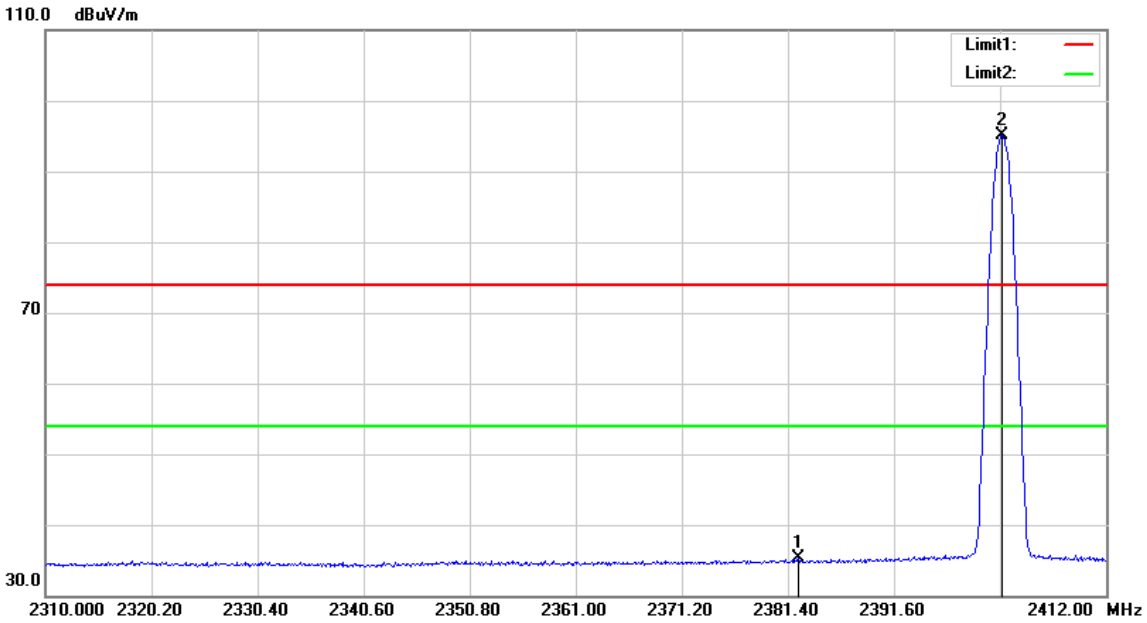
For DB3D

Test Mode:	BLE Low CH	Temp/Hum	27(℃)/ 53%RH
Test Item	Band Edge	Test Date	Nov 15, 2016
Polarize	Horizontal	Test Engineer	Ed Chiang
Detector	Peak	Test Voltage:	120Vac / 60Hz



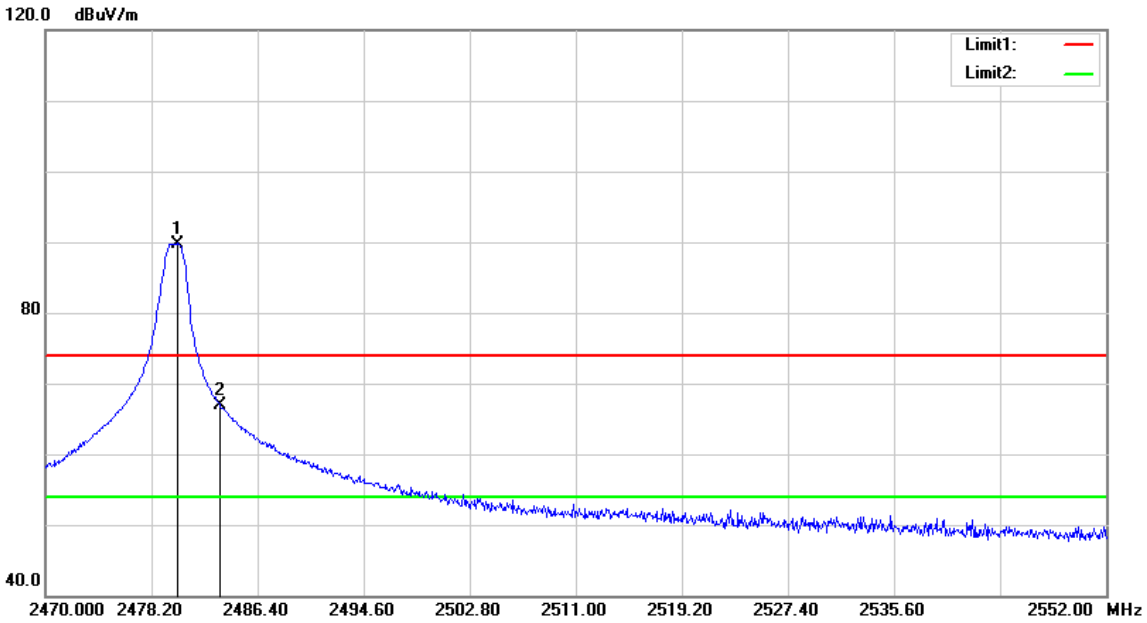
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
2389.458	64.77	-2.49	62.28	74.00	-11.72	peak
2401.800	98.13	-2.41	95.72	-	-	peak

Test Mode:	BLE Low CH	Temp/Hum	27(℃)/ 53%RH
Test Item	Band Edge	Test Date	Nov 15, 2016
Polarize	Horizontal	Test Engineer	Ed Chiang
Detector	Average	Test Voltage:	120Vac / 60Hz



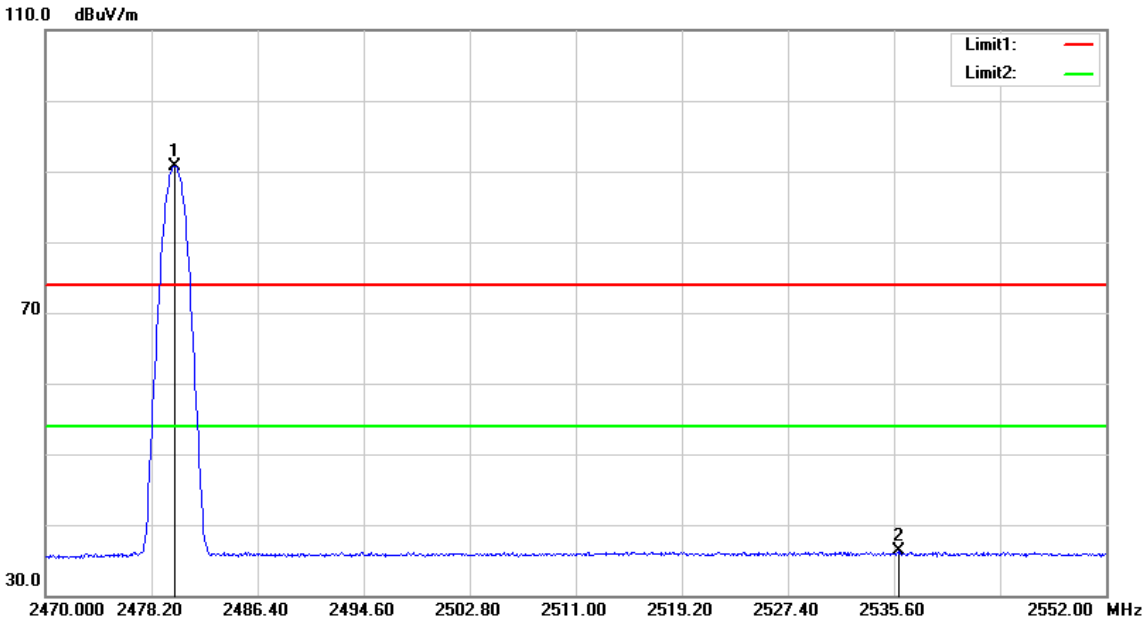
Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
2382.420	37.94	-2.56	35.38	74.00	-38.62	peak
2402.004	97.44	-2.41	95.03	-	-	peak

Test Mode:	BLE High CH	Temp/Hum	27(℃)/ 53%RH
Test Item	Band Edge	Test Date	Nov 15, 2016
Polarize	Horizontal	Test Engineer	Ed Chiang
Detector	Peak	Test Voltage:	120Vac / 60Hz



Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
2480.250	91.83	-2.03	89.80	-	-	peak
2483.500	68.91	-1.99	66.92	74.00	-7.08	peak

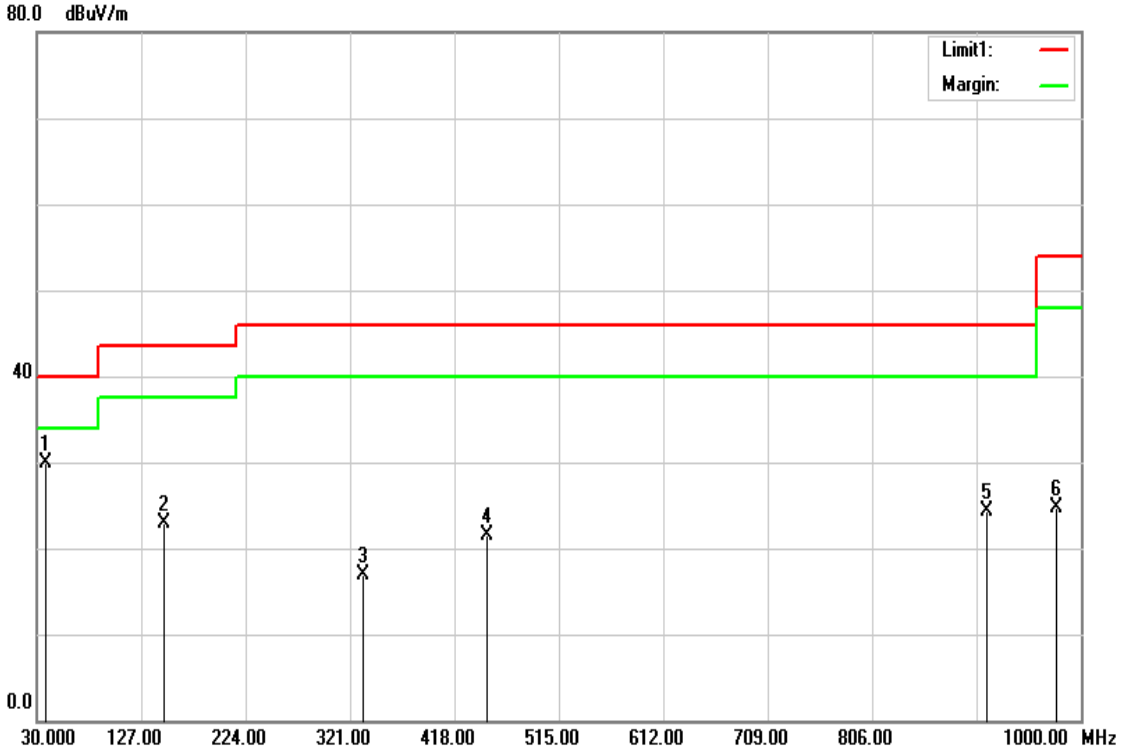
Test Mode:	BLE High CH	Temp/Hum	27(℃)/ 53%RH
Test Item	Band Edge	Test Date	Nov 15, 2016
Polarize	Horizontal	Test Engineer	Ed Chiang
Detector	Average	Test Voltage:	120Vac / 60Hz



Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
2480.004	92.70	-2.03	90.67	-	-	peak
2536.010	38.05	-1.77	36.28	74.00	-37.72	peak

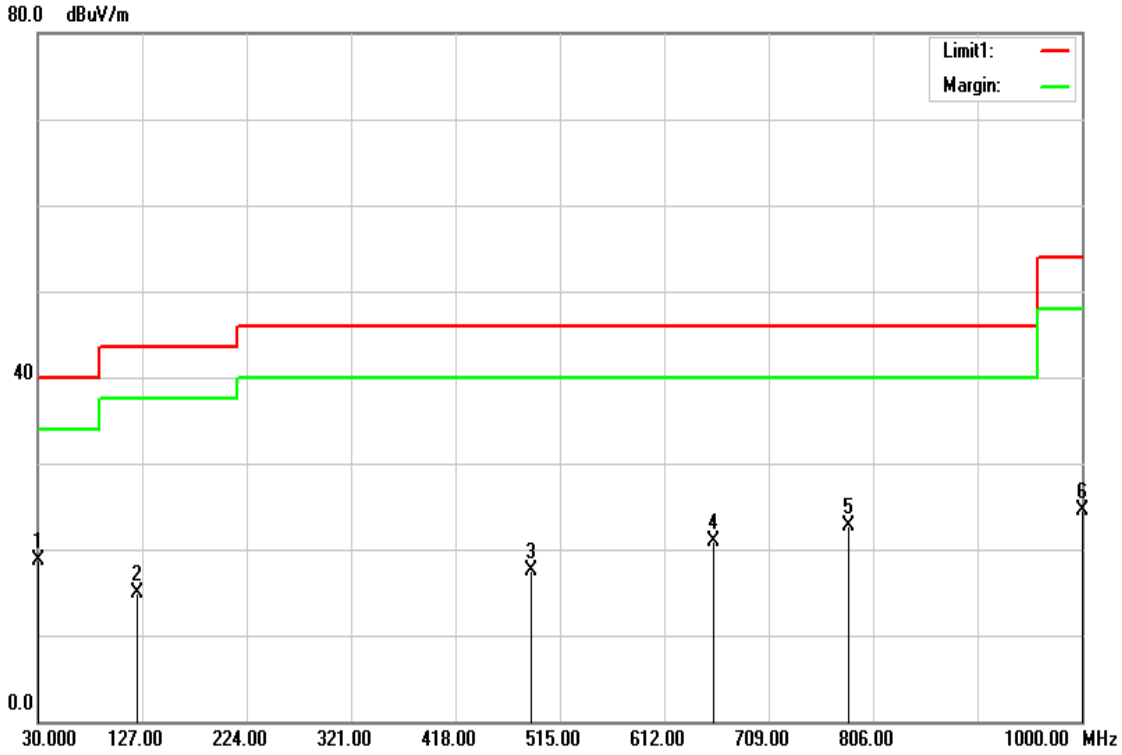
Below 1G Test Data

Test Mode:	BT Mode	Temp/Hum	27(℃)/ 53%RH
Test Item	30MHz-1GHz	Test Date	Nov 15, 2016
Polarize	Vertical	Test Engineer	Ed Chiang
Detector	Peak and Qusi-peak	Test Voltage:	120Vac / 60Hz



Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
37.7600	43.62	-13.68	29.94	40.00	-10.06	peak
148.3400	38.86	-16.02	22.84	43.50	-20.66	peak
333.6100	30.20	-13.33	16.87	46.00	-29.13	peak
448.0700	31.72	-10.25	21.47	46.00	-24.53	peak
912.7000	27.33	-2.99	24.34	46.00	-21.66	peak
977.6900	26.70	-1.95	24.75	54.00	-29.25	peak

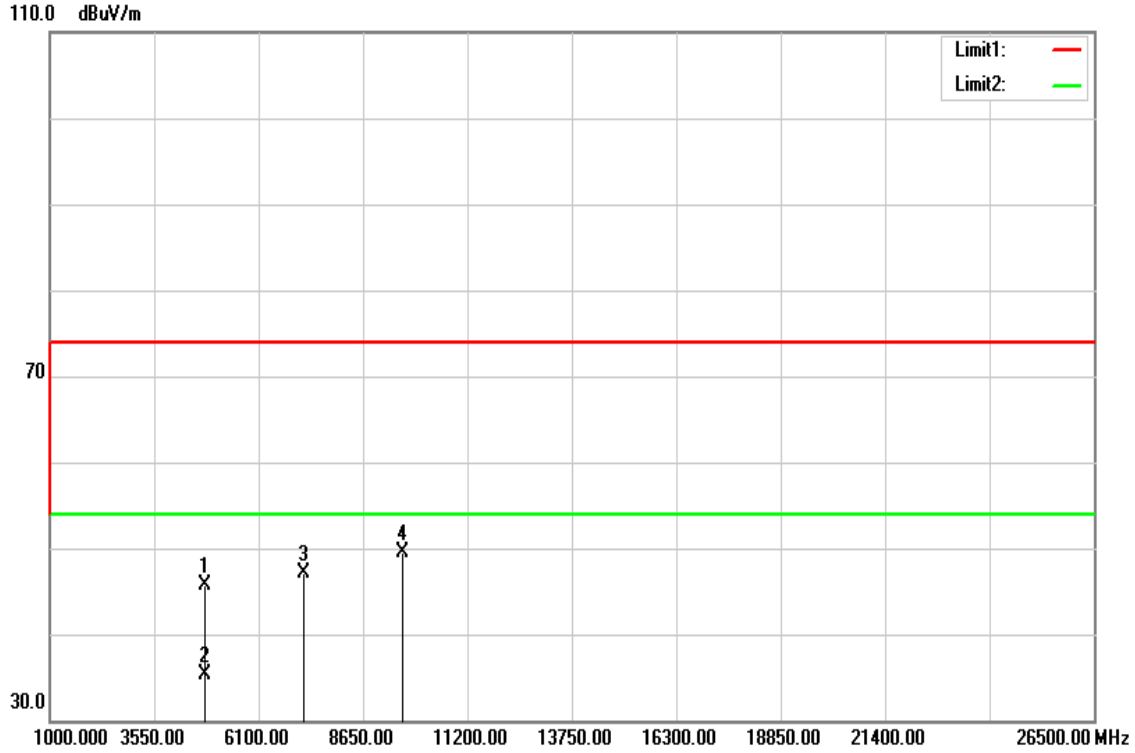
Test Mode:	BT Mode	Temp/Hum	27(℃)/ 53%RH
Test Item	30MHz-1GHz	Test Date	Nov 15, 2016
Polarize	Horizontal	Test Engineer	Ed Chiang
Detector	Peak and Qusi-peak	Test Voltage:	120Vac / 60Hz



Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
30.9700	27.37	-8.63	18.74	40.00	-21.26	peak
122.1500	30.35	-15.53	14.82	43.50	-28.68	peak
487.8400	27.02	-9.47	17.55	46.00	-28.45	peak
657.5900	27.37	-6.49	20.88	46.00	-25.12	peak
783.6900	27.27	-4.64	22.63	46.00	-23.37	peak
1000.0000	26.04	-1.58	24.46	54.00	-29.54	peak

Above 1G Test Data

Test Mode:	BLE Low CH	Temp/Hum	27(℃)/ 53%RH
Test Item	Harmonic	Test Date	Nov 15, 2016
Polarize	Vertical	Test Engineer	Ed Chiang
Detector	Peak and Average	Test Voltage:	120Vac / 60Hz

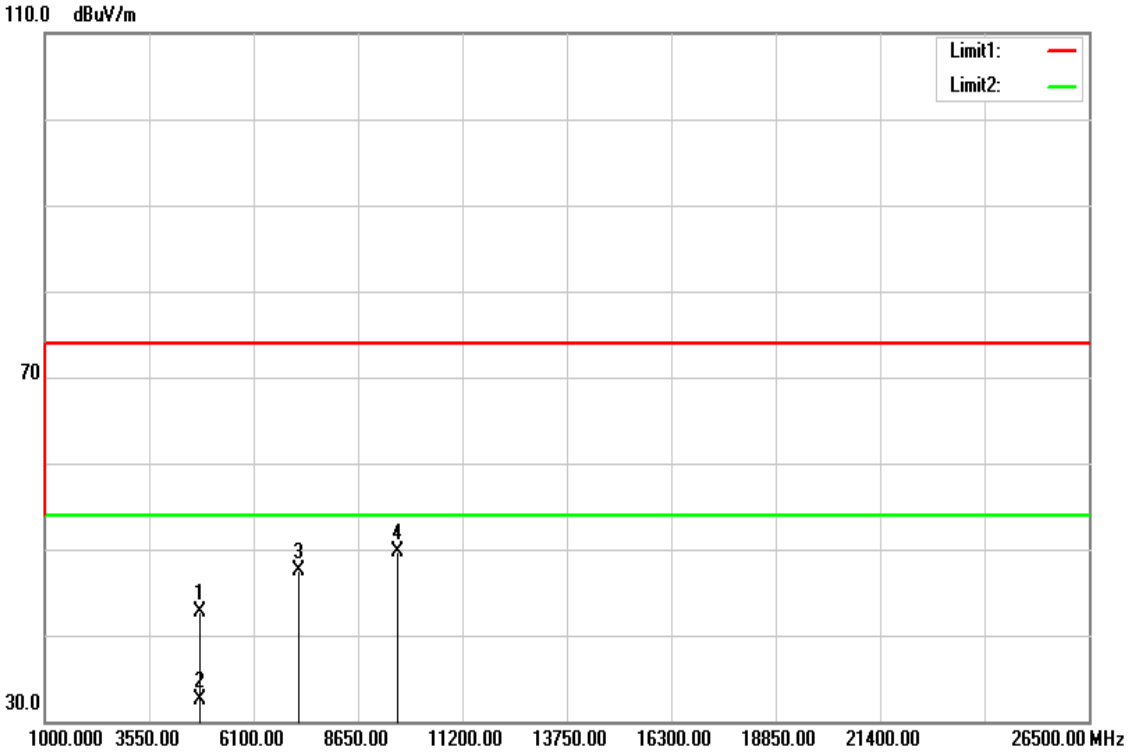


Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
4804.000	40.57	5.04	45.61	74.00	-28.39	peak
4804.000	30.19	5.04	35.23	54.00	-18.77	AVG
7206.000	34.50	12.62	47.12	74.00	-26.88	peak
9608.000	31.93	17.60	49.53	74.00	-24.47	peak

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *For above 1GHz,the EUT peak value was under average limit, therefore the Average value compliance with the average limit*

Test Mode:	BLE Low CH	Temp/Hum	27(℃)/ 53%RH
Test Item	Harmonic	Test Date	Nov 15, 2016
Polarize	Horizontal	Test Engineer	Ed Chiang
Detector	Peak and Average	Test Voltage:	120Vac / 60Hz

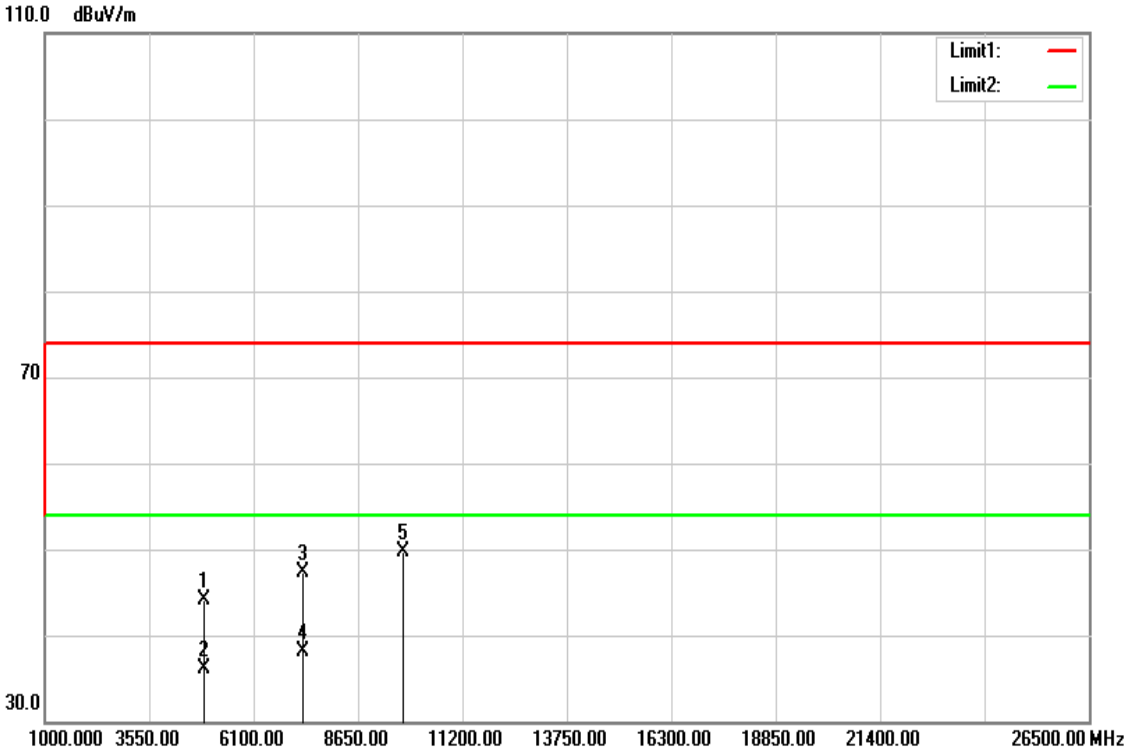


Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
4804.000	37.72	5.04	42.76	74.00	-31.24	peak
4804.000	27.41	5.04	32.45	54.00	-21.55	AVG
7206.000	34.97	12.62	47.59	74.00	-26.41	peak
9608.000	32.05	17.60	49.65	74.00	-24.35	peak

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *For above 1GHz,the EUT peak value was under average limit, therefore the Average value compliance with the average limit*

Test Mode:	BLE Mid CH	Temp/Hum	27(℃)/ 53%RH
Test Item	Harmonic	Test Date	Nov 15, 2016
Polarize	Vertical	Test Engineer	Ed Chiang
Detector	Peak and Average	Test Voltage:	120Vac / 60Hz

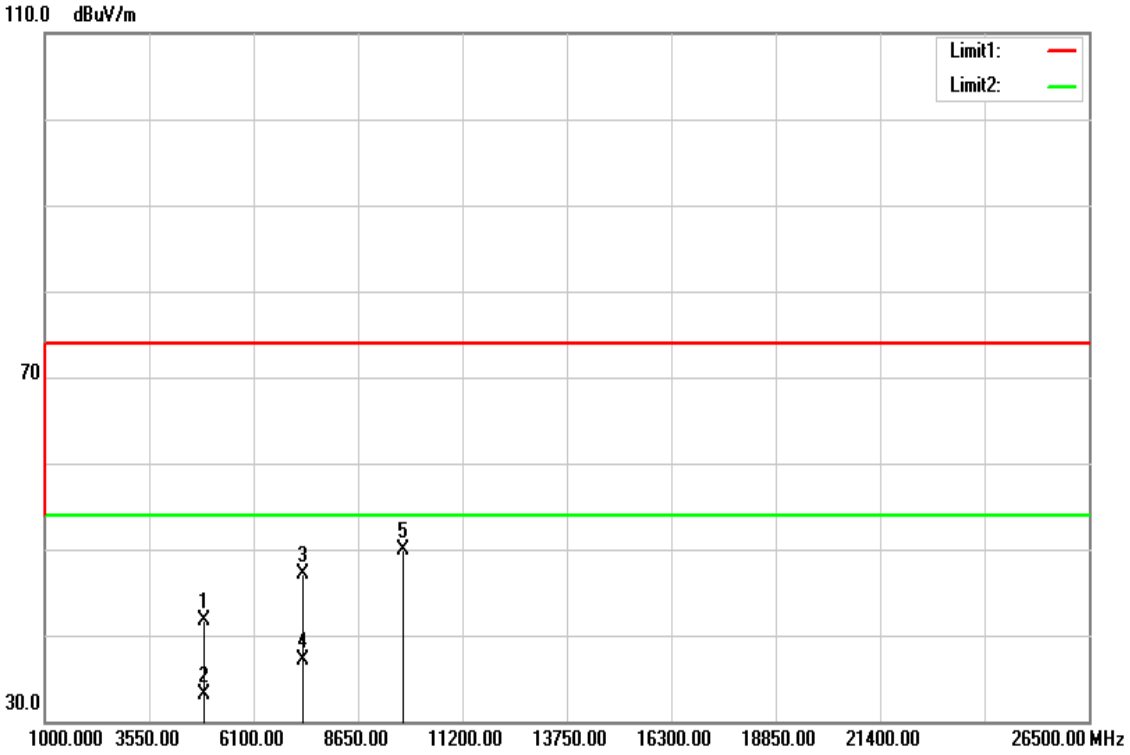


Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
4880.000	38.87	5.25	44.12	74.00	-29.88	peak
4880.000	30.89	5.25	36.14	54.00	-17.86	AVG
7320.000	34.26	12.97	47.23	74.00	-26.77	peak
7320.000	25.19	12.97	38.16	54.00	-15.84	AVG
9760.000	32.07	17.60	49.67	74.00	-24.33	peak

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *For above 1GHz,the EUT peak value was under average limit, therefore the Average value compliance with the average limit*

Test Mode:	BLE Mid CH	Temp/Hum	27(℃)/ 53%RH
Test Item	Harmonic	Test Date	Nov 15, 2016
Polarize	Horizontal	Test Engineer	Ed Chiang
Detector	Peak and Average	Test Voltage:	120Vac / 60Hz

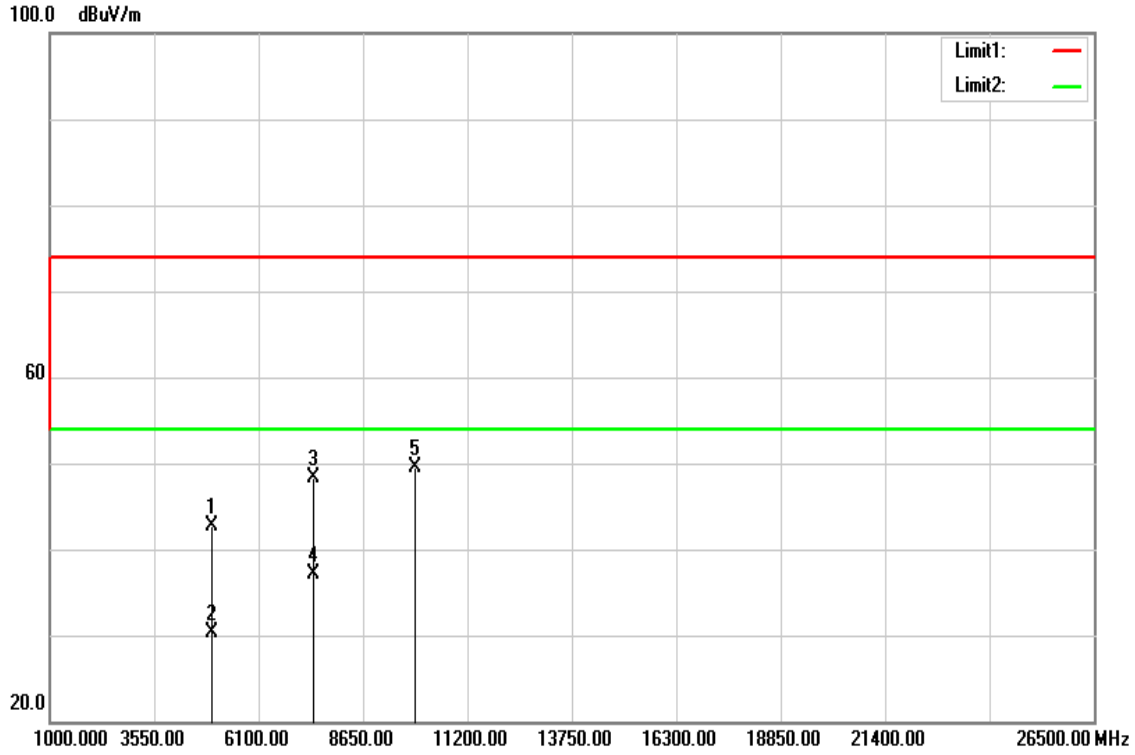


Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
4880.000	36.53	5.25	41.78	74.00	-32.22	peak
4880.000	27.93	5.25	33.18	54.00	-20.82	AVG
7320.000	34.13	12.97	47.10	74.00	-26.90	peak
7320.000	24.19	12.97	37.16	54.00	-16.84	AVG
9760.000	32.23	17.60	49.83	74.00	-24.17	peak

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *For above 1GHz,the EUT peak value was under average limit, therefore the Average value compliance with the average limit*

Test Mode:	BLE High CH	Temp/Hum	27(℃)/ 53%RH
Test Item	Harmonic	Test Date	Nov 15, 2016
Polarize	Vertical	Test Engineer	Ed Chiang
Detector	Peak and Average	Test Voltage:	120Vac / 60Hz

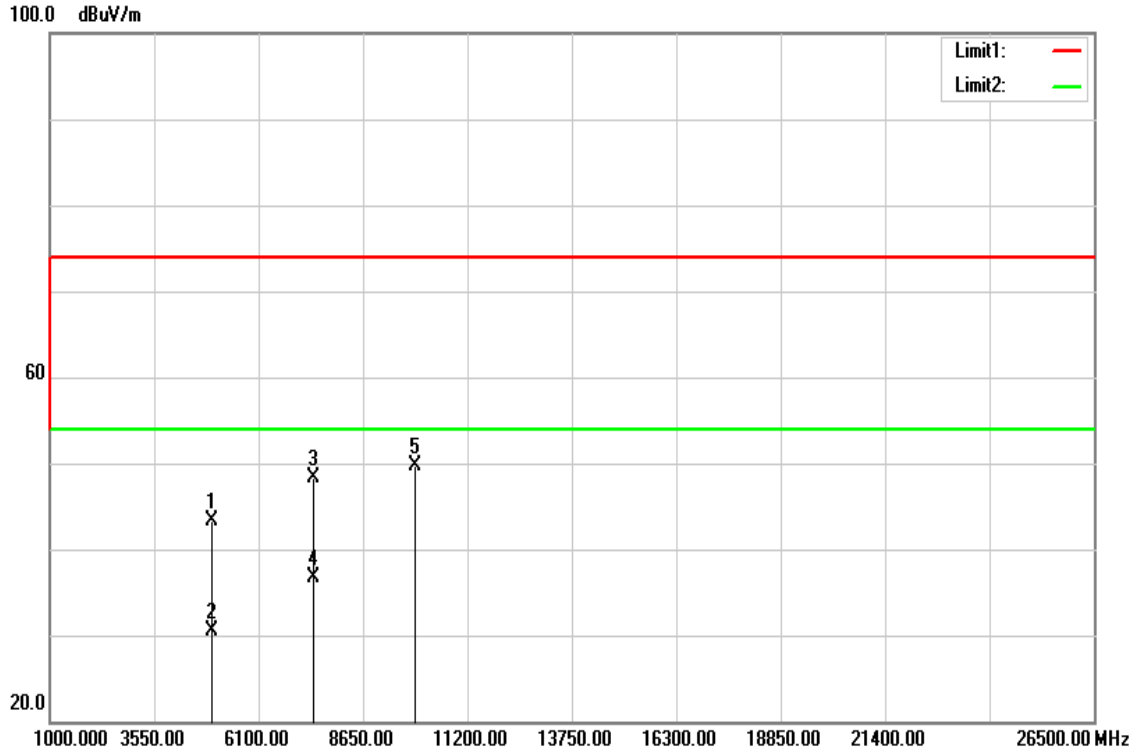


Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
4960.000	37.29	5.46	42.75	74.00	-31.25	peak
4960.000	24.84	5.46	30.30	54.00	-23.70	AVG
7440.000	35.05	13.33	48.38	74.00	-25.62	peak
7440.000	23.74	13.33	37.07	54.00	-16.93	AVG
9920.000	31.99	17.60	49.59	74.00	-24.41	peak

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *For above 1GHz,the EUT peak value was under average limit, therefore the Average value compliance with the average limit*

Test Mode:	BLE High CH	Temp/Hum	27(℃)/ 53%RH
Test Item	Harmonic	Test Date	Nov 15, 2016
Polarize	Horizontal	Test Engineer	Ed Chiang
Detector	Peak and Average	Test Voltage:	120Vac / 60Hz



Frequency (MHz)	Reading (dBuV)	Correct Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
4960.000	37.82	5.46	43.28	74.00	-30.72	peak
4960.000	25.07	5.46	30.53	54.00	-23.47	AVG
7440.000	34.88	13.33	48.21	74.00	-25.79	peak
7440.000	23.34	13.33	36.67	54.00	-17.33	AVG
9920.000	32.17	17.60	49.77	74.00	-24.23	peak

Remark:

1. *Measuring frequencies from 1 GHz to the 10th harmonic of highest fundamental frequency.*
2. *For above 1GHz,the EUT peak value was under average limit, therefore the Average value compliance with the average limit*