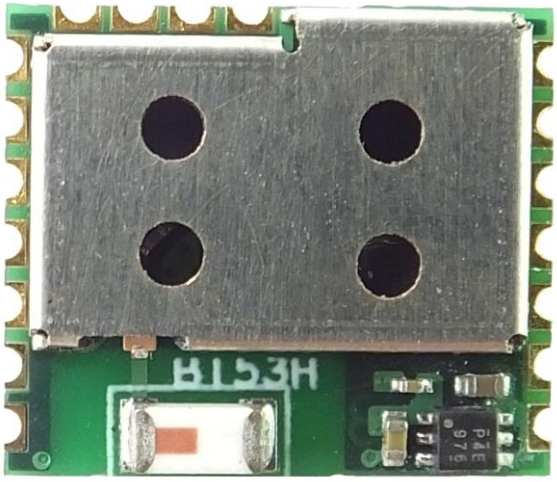
Prüfbericht-Nr.: *Test Report No.*:	**15078515 001**	**Auftrags-Nr.:** *Order No.*:	154082117	Seite 1 von 72 *Page 1 of 72*
Kunden-Referenz-Nr.: *Client Reference No.*:	490858	**Auftragsdatum:** *Order date*:	16.10.2014	
Auftraggeber: *Client*:	Amp'ed RF Technology, Inc. 1879 Lundy Ave, Suite 138, San Jose, CA, 95131, United States			
Prüfgegenstand: *Test item*:	Bluetooth Module			
Bezeichnung / Typ-Nr.: *Identification / Type No.*:	BT53 FCC ID: X3ZBTMOD8 IC: 8828A-MOD8			
Auftrags-Inhalt: *Order content*:	Complete test			
Prüfgrundlage: *Test specification*:	FCC CFR47 Part 15, Subpart C ANSI C63.4-2009 KDB 558074 D01 DTS Meas Guidance v03r02 Public Notice DA 00-705: Filing and Measurement Guidelines for Frequency Hopping Spread Spectrum Systems (March 30, 2000) RSS-Gen Issue 3, December 2010 RSS-210 Issue 8, December 2010			

Wareneingangsdatum: *Date of receipt*:	16.10.2014
Prüfmuster-Nr.: *Test sample No.*:	A000152374 002
Prüfzeitraum: *Testing period*:	06.11.2014 - 13.11.2014
Ort der Prüfung: *Place of testing*:	MRT Technology (Suzhou) Co., Ltd
Prüflaboratorium: *Testing laboratory*:	TÜV Rheinland (Shanghai) Co., Ltd.
Prüfergebnis*: *Test result**:	Pass



geprüft von / *tested by*:			**kontrolliert von /** *reviewed by*:		
19.12.2014	Adrian Shi / PE	Adrian Shi	19.12.2014	Shi Li / Reviewer	Shi Li
Datum *Date*	**Name / Stellung** *Name / Position*	**Unterschrift** *Signature*	**Datum** *Date*	**Name / Stellung** *Name / Position*	**Unterschrift** *Signature*

Sonstiges / *Other*:

Zustand des Prüfgegenstandes bei Anlieferung: *Condition of the test item at delivery*: Prüfmuster vollständig und unbeschädigt *Test item complete and undamaged*

* Legende:	1 = sehr gut	2 = gut	3 = befriedigend	4 = ausreichend	5 = mangelhaft
	P(ass) = entspricht o.g. Prüfgrundlage(n)		F(ail) = entspricht nicht o.g. Prüfgrundlage(n)	N/A = nicht anwendbar	N/T = nicht getestet
Legend:	*1 = very good*	*2 = good*	*3 = satisfactory*	*4 = sufficient*	*5 = poor*
	P(ass) = passed a.m. test specification(s)		*F(ail) = failed a.m. test specification(s)*	*N/A = not applicable*	*N/T = not tested*

TEST SUMMARY

5.1.1 ANTENNA REQUIREMENT
RESULT: *Pass*

5.1.2 PEAK OUTPUT POWER
RESULT: *Pass*

5.1.3 20DB BANDWIDTH AND 99% BANDWIDTH
RESULT: *Pass*

5.1.4 6DB BANDWIDTH AND 99% BANDWIDTH
RESULT: *Pass*

5.1.5 CONDUCTED SPURIOUS EMISSIONS MEASURED
RESULT: *Pass*

5.1.6 POWER SPECTRAL DENSITY
RESULT: *Pass*

5.1.7 SPURIOUS EMISSION
RESULT: *Pass*

5.1.8 FREQUENCY SEPARATION
RESULT: *Pass*

5.1.9 NUMBER OF HOPPING FREQUENCY
RESULT: *Pass*

5.1.10 TIME OF OCCUPANCY
RESULT: *Pass*

5.1.11 CONDUCTED EMISSIONS
RESULT: *Pass*

Contents

1. General Remarks

1.1 Complementary Materials

None.

2. Test Sites

2.1 Test Facilities

MRT Technology (Suzhou) Co., Ltd.

D8 Building, Youxin Industrial Park, No.2 Tian'edang Rd., Wuzhong Economic Development Zone, Suzhou, China

The used test equipment is in accordance with CISPR 16 for measurement of radio interference.

The Federal Communications Commission has reviewed the technical characteristics of the radiated and conducted emission facility, and has found these test facilities to be in compliance with the requirements of section 2.948 of the FCC rules. The description of the test facility is listed under FCC registration number 809388.

The Industry Canada has reviewed the technical characteristics of the radiated and conducted emission facility, and has found these test facilities to be in compliance. The description of the test facility is listed under chambers filing number 11384A.

2.2 List of Test and Measurement Instruments

Table 1: List of Test and Measurement Equipment

Conducted Emissions

Instrument	Manufacturer	Type No.	Serial No.	Cali. Interval	Cali. Due Date
EMI Test Receiver	R&S	ESR7	101209	1 year	2015/11/07
Two-Line V-Network	R&S	ENV216	101683	1 year	2015/11/07
Two-Line V-Network	R&S	ENV216	101684	1 year	2015/11/07
Temperature/ Meter Humidity	Anymetre	TH101B	SR2-01	1 year	2015/11/15

Radiated Emission

Spectrum Analyzer	Agilent	N9010A	MY5144016A	1 year	2015/01/04
Preamplifier	MRT	AP01G18	1310002	1 year	2015/10/06
Loop Antenna	Schwarzbeck	FMZB1519	1519-041	1 year	2015/11/08
TRILOG Antenna	Schwarzbeck	VULB9162	9162-047	1 year	2015/11/08
Broad-Band Horn Antenna	Schwarzbeck	BBHA9120D	9120D-1167	1 year	2015/11/08
Broadband Horn Antenna	Schwarzbeck	BBHA9170	9170-549	1 year	2014/12/11
Temperature/Humidity Meter	Anymetre	TH101B	AC1-01	1 year	2015/11/15

Conducted Test Equipment

Spectrum Analyzer	Agilent	N9010A	MY5144016A	1 year	2015/01/04
Power Sensor	Agilent	U2021XA	MY52450003	1 year	2014/12/14
Temperature/Humidity Meter	Anymetre	TH101B	TR3-01	1 year	2015/11/15

2.3 Traceability

All measurement equipment calibrations are traceable to NIST or where calibration is performed outside the United States, to equivalent nationally recognized standards organizations.

2.4 Calibration

Equipment requiring calibration is calibrated periodically by the manufacturer or according to manufacturer's specifications. Additionally all equipment is verified for proper performance on a regular basics using in house standards or comparisons.

2.5 Measurement Uncertainty

Table 2: Measurement Uncertainty

Measurement Type	Frequency	Uncertainty
Antenna Port Conducted Emission	< 1GHz	±0.39dB
	> 1GHz	±0.68dB
Radiated Emission	30MHz - 1GHz	±5.34dB
	> 1GHz	±5.40dB

3. General Product Information

3.1 Product Function and Intended Use

The EUT (Equipment Under Test) is a Bluetooth Module which supports both Bluetooth Classic and Low Energy, version 4.0.

For details refer to the User Manual and Circuit Diagram.

3.2 Ratings and System Details

Kind of Equipment	Bluetooth Module
Type Designation	BT53
Bluetooth version	4.0 dual mode
Operating Frequency band	2402 – 2480MHz
Channel separation	BDR/EDR: 1MHz BLE: 2MHz
Modulation	BDR/EDR: GFSK, 8DPSK, $\pi/4$ DQPSK BLE: GFSK
Antenna Type	Chip antenna
Antenna Gain	0.5dBi
Extreme Temperature Range	-40~+85℃
Operation Voltage	DC 2.5V

3.3 Independent Operation Modes

The basic operation modes are:

A. On
   1. Bluetooth mode (BDR & EDR mode)
      a. Transmitting
         i. Low Channel
         ii. Middle Channel
         iii. High Channel
      b. Receiving
   2. Bluetooth mode (BLE mode)
      a. Transmitting
         i. Low Channel
         ii. Middle Channel
         iii. High Channel
      b. Receiving
B. Standby
C. Off

3.4 Noise Generating and Noise Suppressing Parts

Refer to the Circuit Diagram.

3.5 Submitted Documents

- Bill of Material
- Circuit Diagram
- PCB Layout
- Instruction Manual
- Photo Document
- Rating Label

4. Test Set-up and Operation Modes

4.1 Principle of Configuration Selection

The equipment under test (EUT) was configured to measure its maximum power level. The test modes were adapted accordingly in reference to the instructions for use.

4.2 Test Operation and Test Software

Test operation refers to test setup in chapter 5. All testing were performed according to the procedures in ANSI C63.4:2009.

4.3 Special Accessories and Auxiliary Equipment

The EUT was tested together with the following accessories:

Description	Manufacturer	Part No.	S/N
Laptop	DELL	PP11L	QDS-BRCM1017

4.4 Countermeasures to achieve EMC Compliance

The test sample which has been tested contained the noise suppression parts as described in the Constructional Data Form or the Technical Construction File. No additional measures were employed to achieve compliance.

4.5 Test Setup Diagram

Diagram of Measurement Configuration for Radiation Test

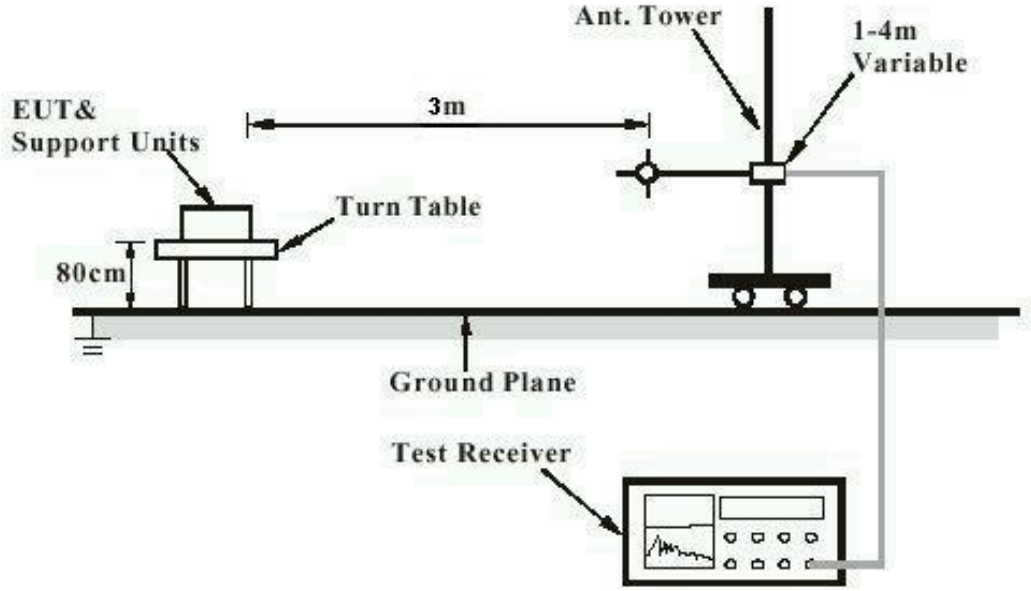


Diagram of Measurement Equipment Configuration for Conduction Measurement

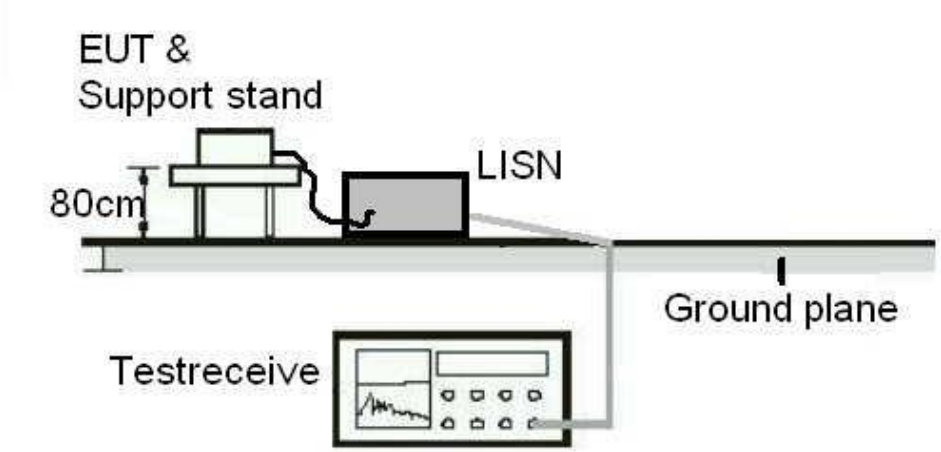
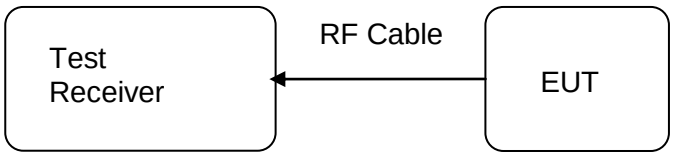


Diagram of Measurement Equipment Configuration for Transmitter Measurement



5. Test Results

5.1 Transmitter Requirement & Test Suites

5.1.1 Antenna Requirement

RESULT: **Pass**

Test standard	:	FCC Part 15.247(b)(4) and Part 15.203 RSS-Gen 7.1.4
Limit		The use of antennas with directional gains that do not exceed 6dBi

According to the manufacturer declared, the EUT has one chip antenna, the directional gain of antenna is 0.5dBi and the antenna connector is designed with permanent attachment and no consideration of replacement. Therefore the EUT is considered sufficient to comply with the provision.

5.1.2 Peak Output Power

RESULT: **Pass**

Test date	:	2014-11-08
Test standard	:	FCC Part 15.247(b)(1) FCC Part 15.247(b)(3) RSS-210 A8.4(2) RSS-210 A8.4(4)
Basic standard	:	ANSI C63.4: 2009 Clause 9.1 of KDB 558074 v03r02
Limit	:	125mW, 1W
Kind of test site	:	Shielded room

Test setup

Test Channel	:	Low/ Middle/ High
Operation Mode	:	A.1.a, A.2.a
Ambient temperature	:	25℃
Relative humidity	:	52%
Atmospheric pressure	:	101kPa

Table 3: Test result of Peak Output Power of Buletooth (BDR mode)

Channel	Channel Frequency (MHz)	Peak Output Power (dBm)	Limit (dBm)
Low Channel	2402	11.53	30
Middle Channel	2441	11.53	30
High Channel	2480	11.52	30

Table 4: Test result of Peak Output Power of Bluetooth (EDR mode)

Channel	Channel Frequency (MHz)	Peak Output Power (dBm)	Limit (dBm)
Low Channel	2402	11.54	21
Middle Channel	2441	11.52	21
High Channel	2480	11.52	21

Table 5: Test result of Peak Output Power of Bluetooth (BLE mode)

Channel	Channel Frequency (MHz)	Peak Output Power (dBm)	Limit (dBm)
Low Channel	2402	8.66	30
Middle Channel	2440	8.54	30
High Channel	2480	8.32	30

5.1.3 20dB Bandwidth and 99% Bandwidth

RESULT: **Pass**

Date of testing	:	2014-11-08
Test standard	:	FCC Part 15.247(a)(1) RSS-210 A8.1(a)
Basic standard	:	ANSI C63.4: 2009 Public Notice DA 00-705
Kind of test site	:	Shielded room

Test setup

Test Channel	:	Low/ Middle/ High
Operation Mode	:	A.1.a
Ambient temperature	:	25℃
Relative humidity	:	52%
Atmospheric pressure	:	101kPa

Table 6: Test result of 20dB & 99% Bandwidth (BDR mode)

Channel	Channel Frequency (MHz)	20dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low Channel	2402	0.891	0.844
Mid Channel	2441	0.892	0.836
High Channel	2480	0.917	0.849

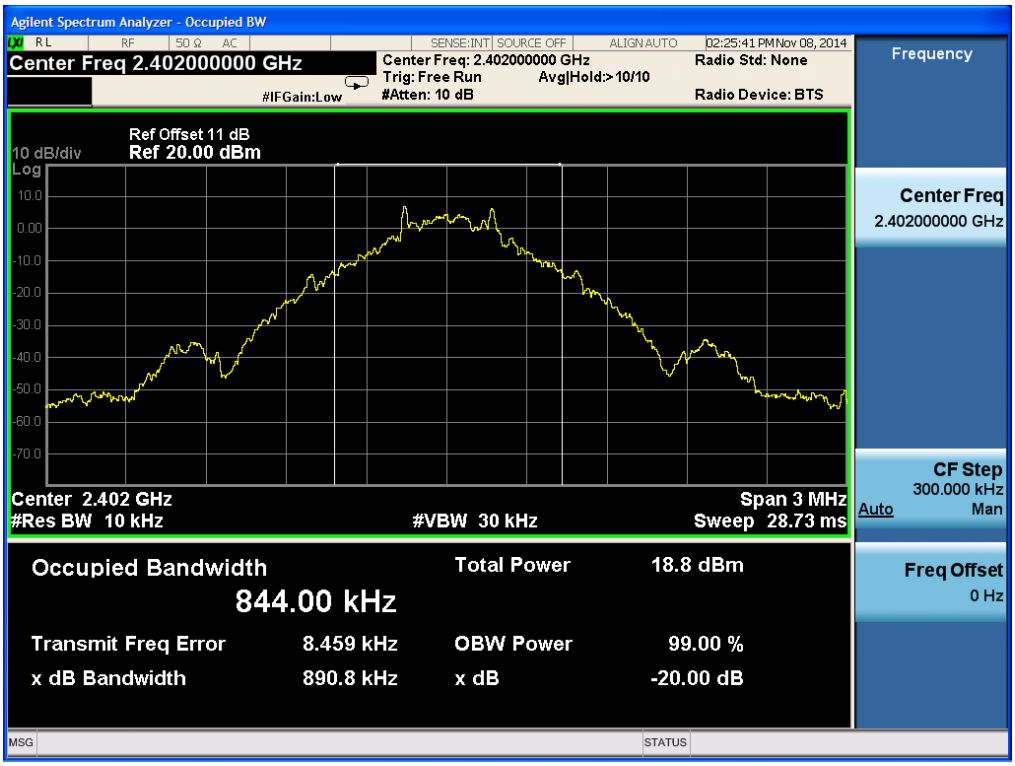
Table 7: Test result of 20dB & 99% Bandwidth (EDR mode)

Channel	Channel Frequency (MHz)	20dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low Channel	2402	1.303	1.188
Mid Channel	2441	1.318	1.195
High Channel	2480	1.295	1.190

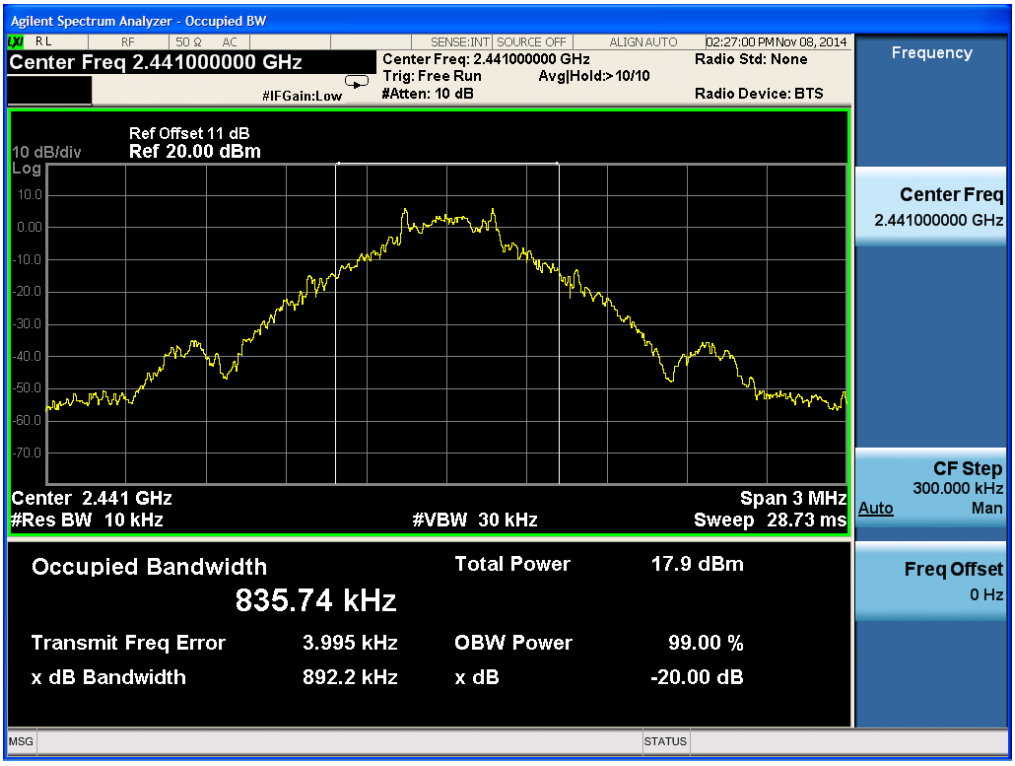
For details refer to following test plot.

Test Plot of Bandwidth measured in 10kHz Bandwidth of BDR mode

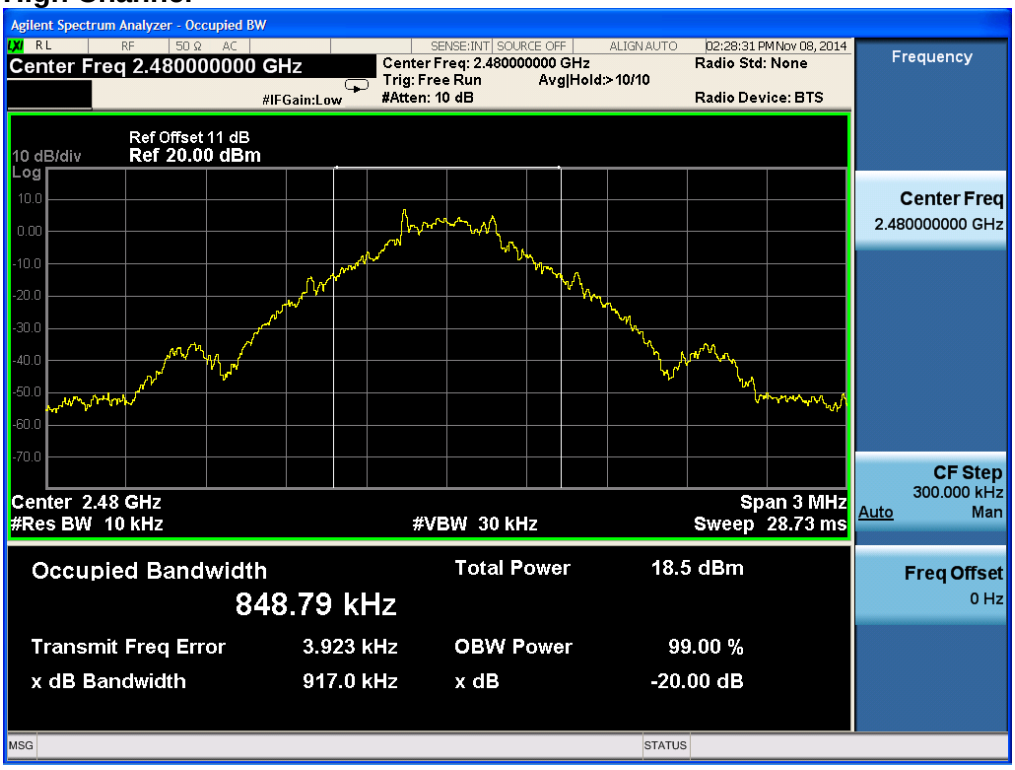
Low Channel



Middle Channel



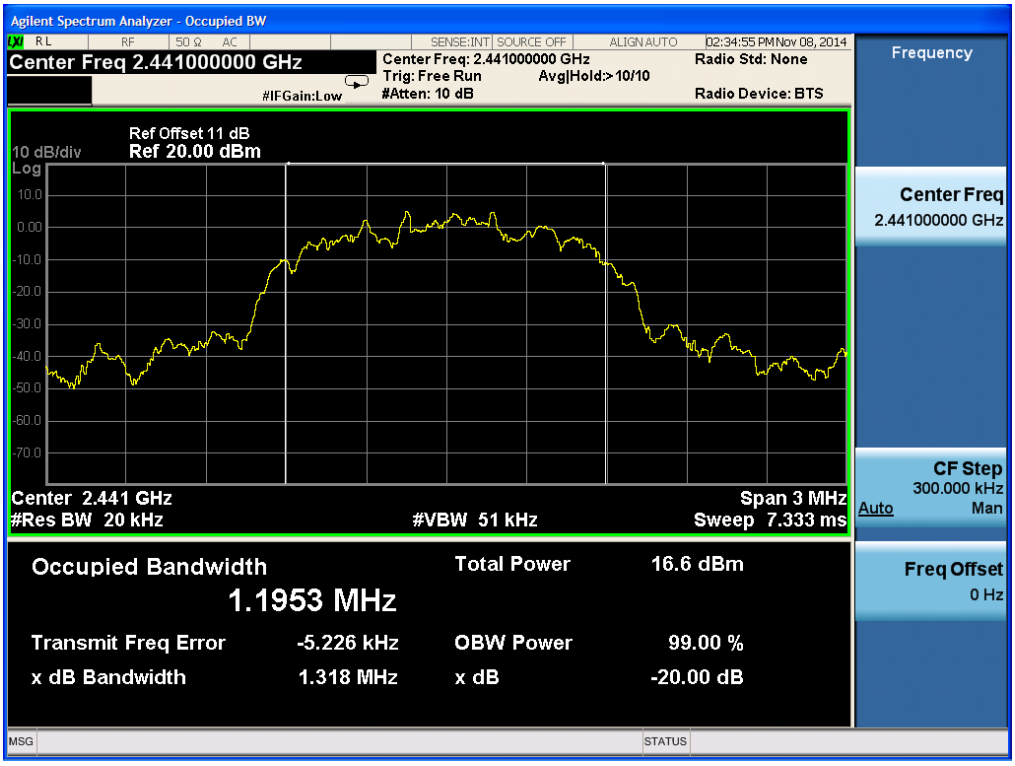
High Channel



Test Plot of Bandwidth measured in 20kHz Bandwidth of EDR mode

Low Channel

Middle Channel



High Channel

5.1.4 6dB Bandwidth and 99% Bandwidth

RESULT: **Pass**

Date of testing	:	2013-11-08
Test standard	:	FCC Part 15.247(a)(2) RSS-210 A8.2(a)
Basic standard	:	ANSI C63.4: 2009 Clause 8 of KDB 558074 v03r02
Kind of test site	:	Shielded room

Test setup

Test Channel	:	Low/ Middle/ High
Operation Mode	:	A.2.a
Ambient temperature	:	25℃
Relative humidity	:	52%
Atmospheric pressure	:	101kPa

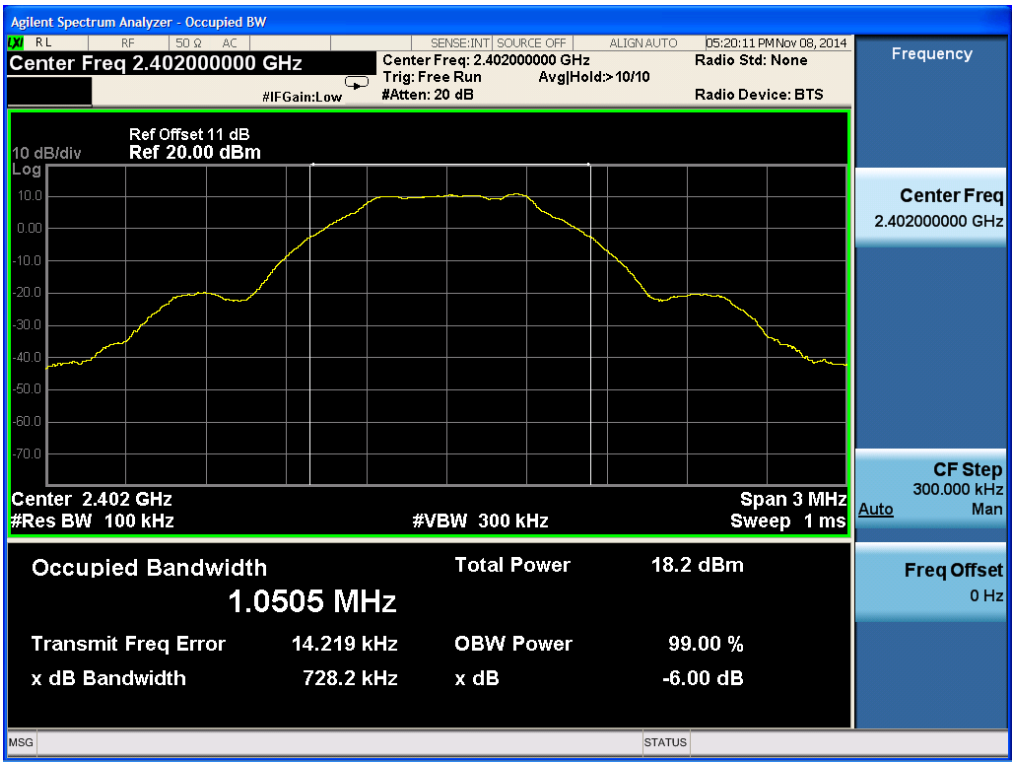
Table 8: Test result of 6dB & 99% Bandwidth (BLE mode)

Channel	Channel Frequency (MHz)	6dB Bandwidth (MHz)	99% Bandwidth (MHz)
Low Channel	2402	0.728	1.050
Mid Channel	2440	0.730	1.045
High Channel	2480	0.731	1.050

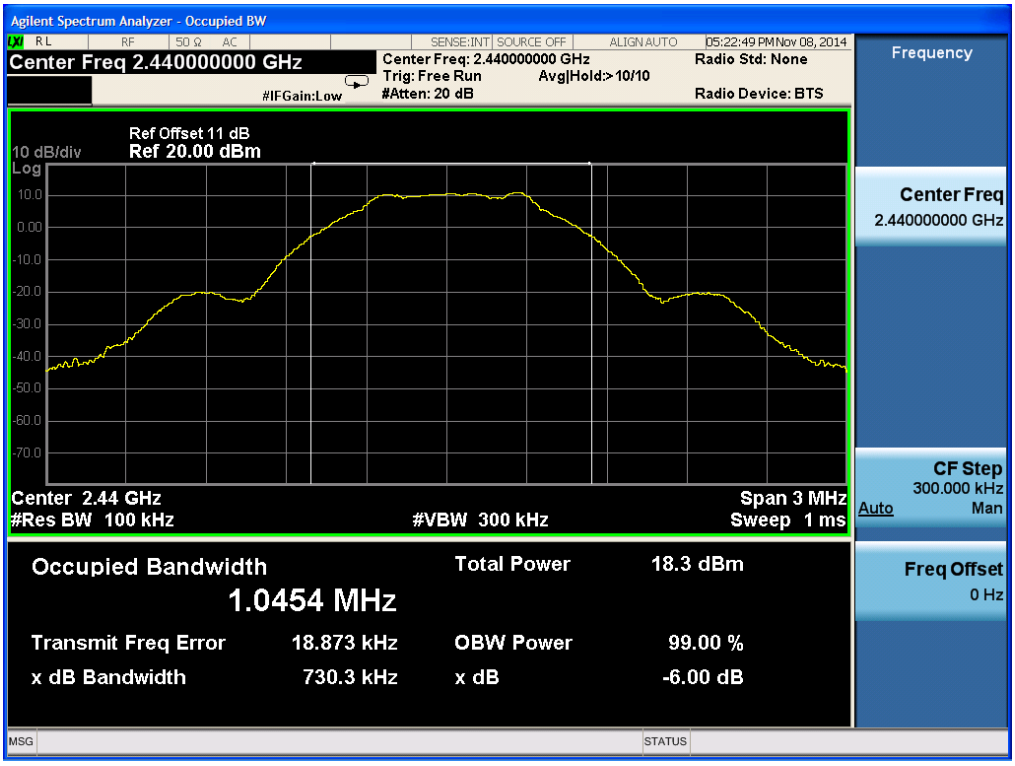
For details refer to following test plot.

Test Plot of Bandwidth measured in 100kHz Bandwidth of BLE mode

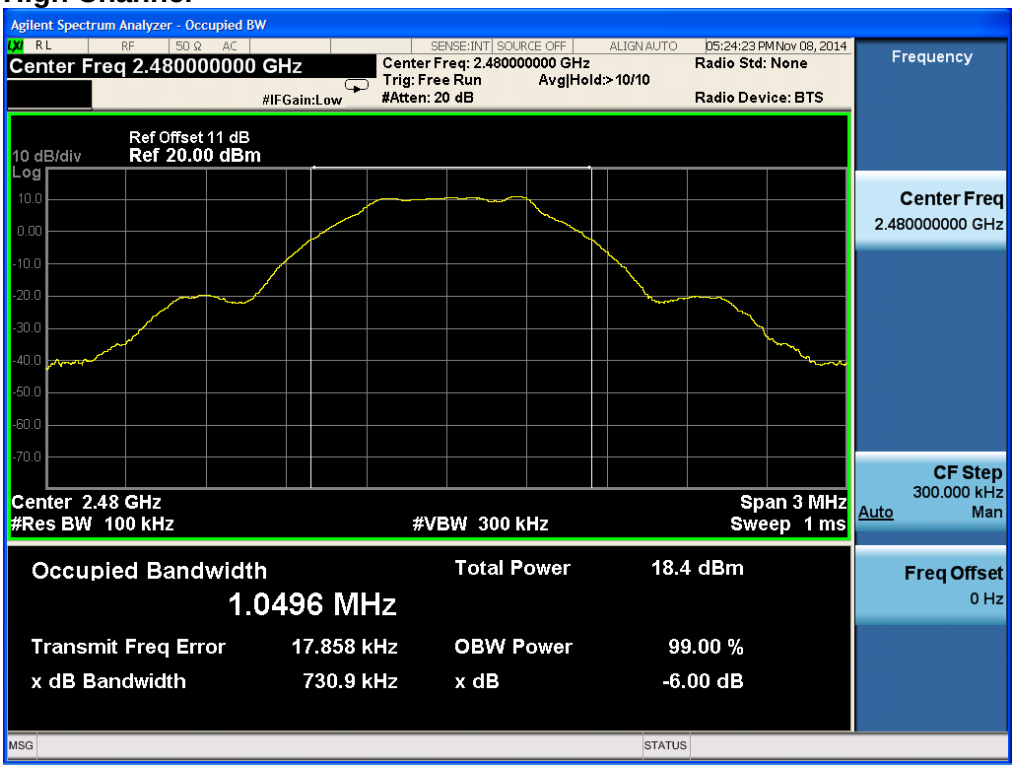
Low Channel



Middle Channel



High Channel



5.1.5 Conducted Spurious Emissions measured

RESULT: **Pass**

Date of testing	:	2014-11-08
Test standard	:	FCC part 15.247(d) RSS-210 A8.5
Basic standard	:	ANSI C63.4: 2009
Limit	:	20dB (below that in the 100kHz bandwidth within the band that contains the highest level of the desired power);
Kind of test site	:	Shield room

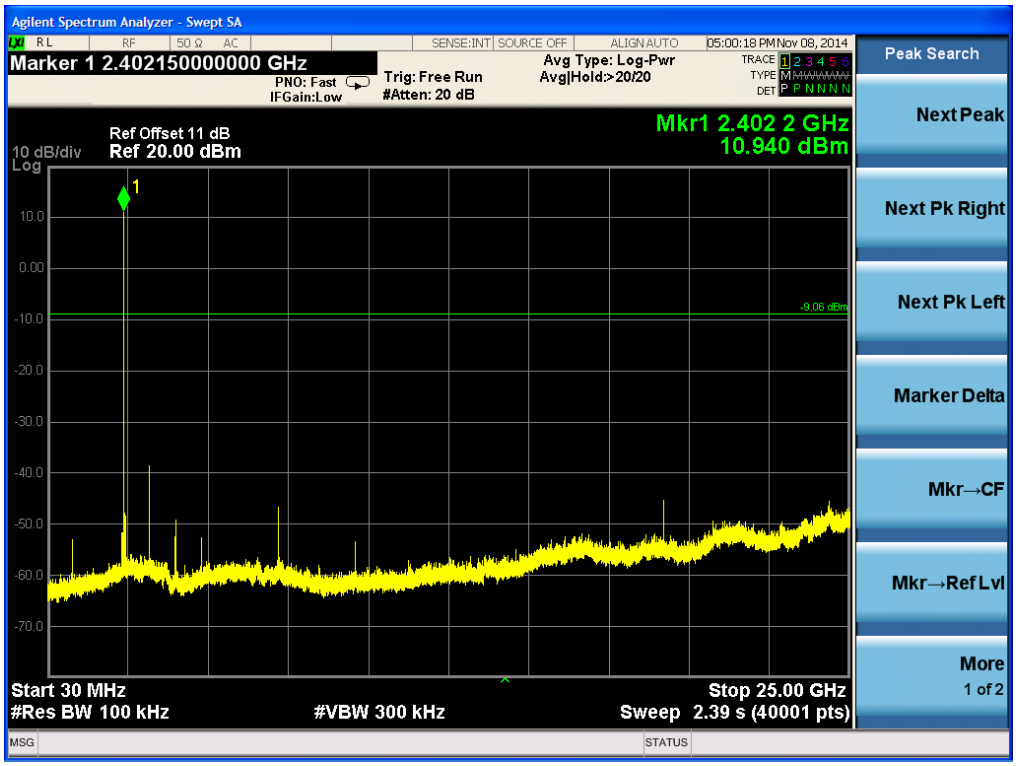
Test setup

Test Channel	:	Low/ Middle/ High
Operation mode	:	A.1.a, A.2.a
Ambient temperature	:	25℃
Relative humidity	:	52%
Atmospheric pressure	:	101kPa

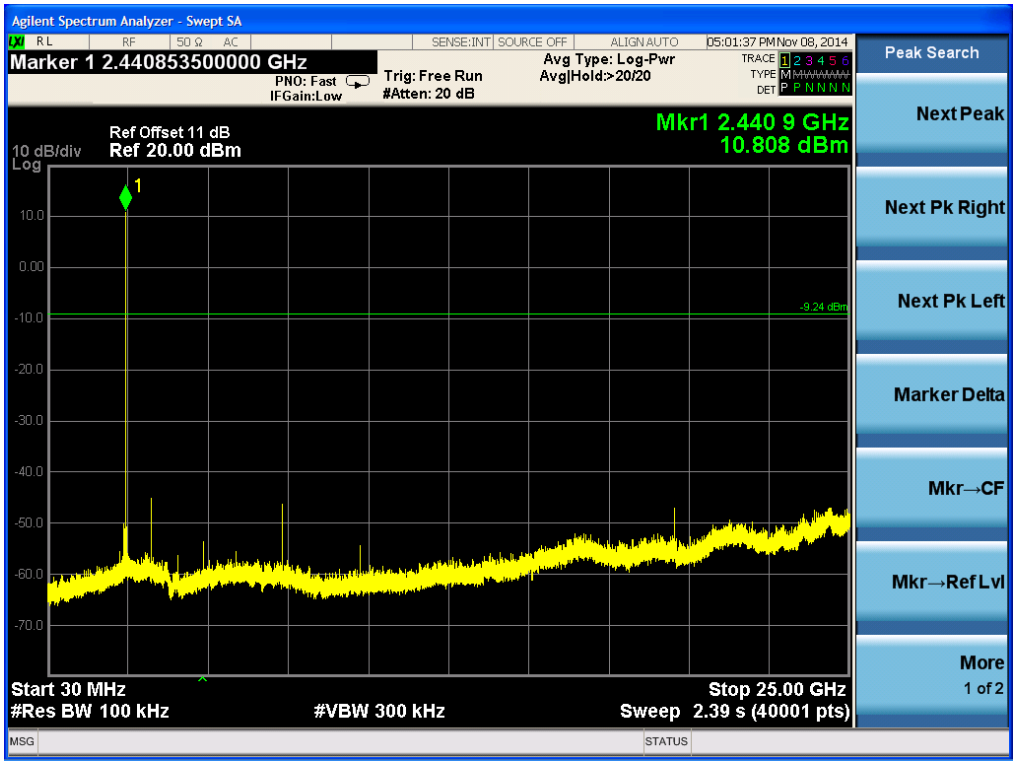
For details refer to following test plot.

Test Plot of Conducted spurious emissions measured in 100kHz Bandwidth of BDR mode

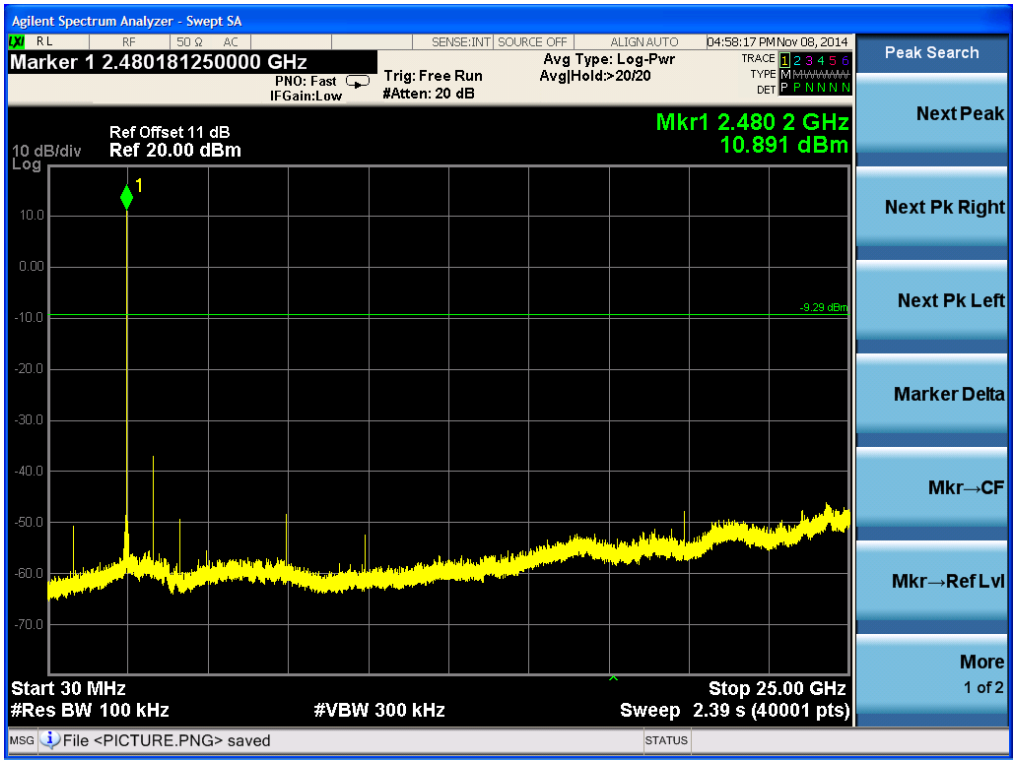
Low Channel



Middle Channel

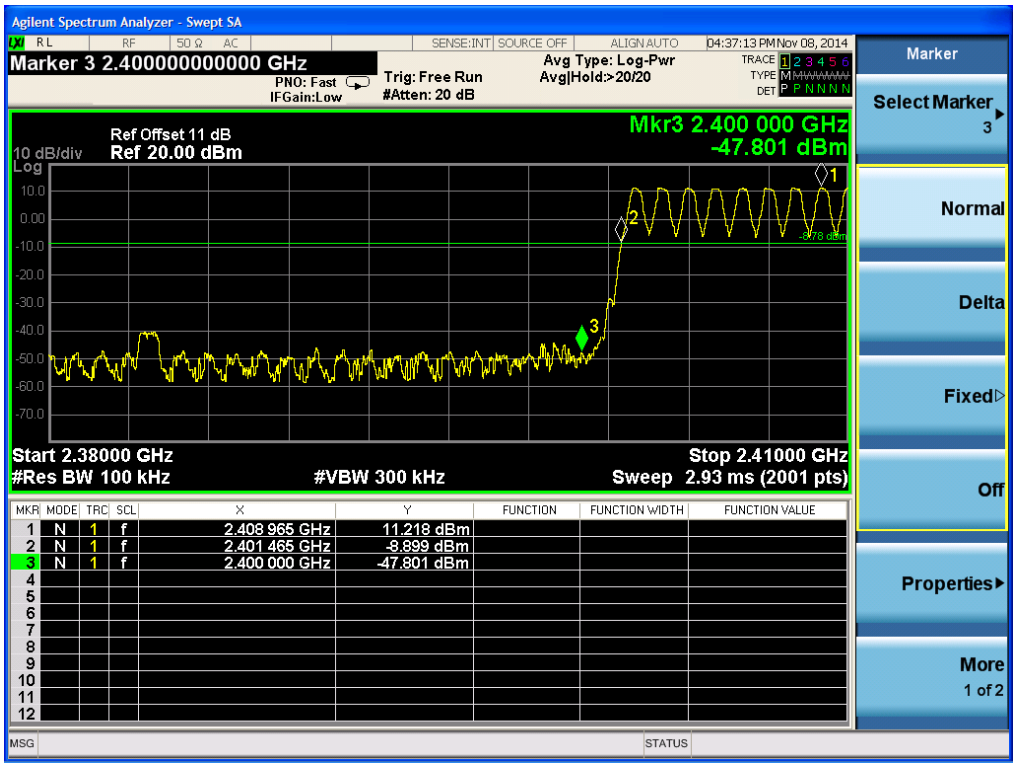


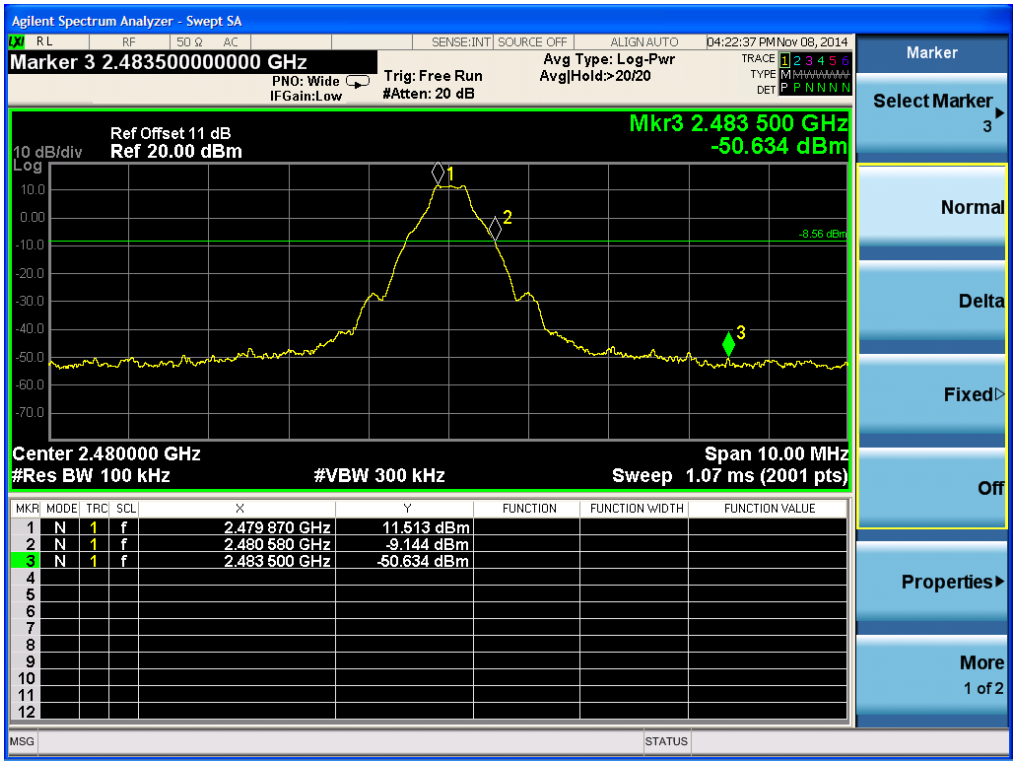
High Channel

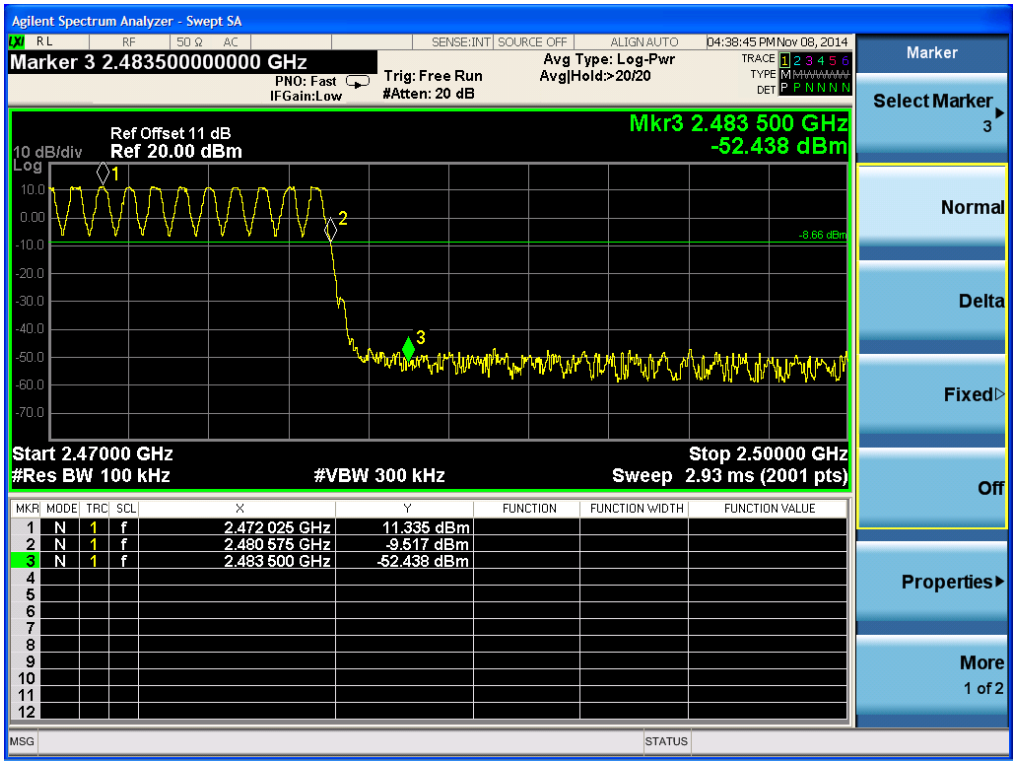


Band Edge


Agilent Spectrum Analyzer - Swept SA
Marker 3 2.400000000000 GHz
PNO: Wide
IFGain:Low
Trig: Free Run
#Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold:>20/20
04:21:18 PM Nov 08, 2014
Ref Offset 11 dB
10 dB/div
Ref 20.00 dBm
Mkr3 2.400 000 0 GHz
-48.240 dBm
-8.57 dBm
Center 2.402000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 5.000 MHz
Sweep 1.07 ms (2001 pts)
1 N 1 f 2.402 177 5 GHz 11.440 dBm
2 N 1 f 2.401 462 5 GHz -8.284 dBm
3 N 1 f 2.400 000 0 GHz -48.240 dBm
Marker
Select Marker
3
Normal
Delta
Fixed
Off
Properties
More
1 of 2
MSG
STATUS

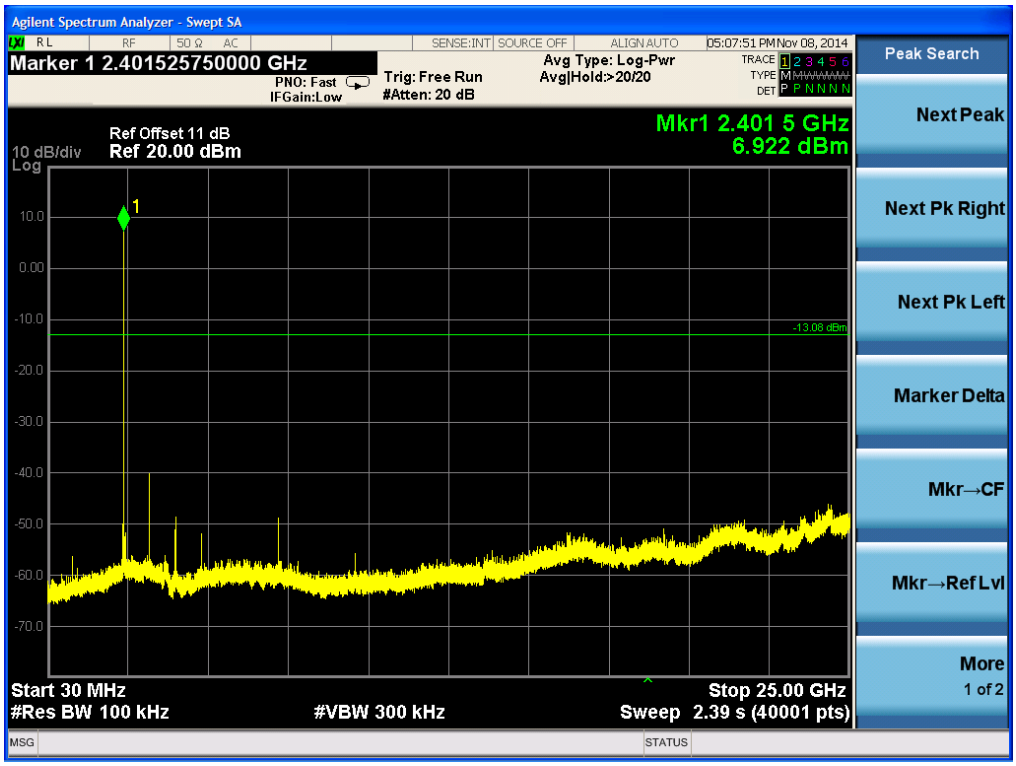

Agilent Spectrum Analyzer - Swept SA
Marker 3 2.400000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold:>20/20
04:37:13 PM Nov 08, 2014
Ref Offset 11 dB
10 dB/div
Ref 20.00 dBm
Mkr3 2.400 000 GHz
-47.801 dBm
Start 2.38000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 2.41000 GHz
Sweep 2.93 ms (2001 pts)
1 N 1 f 2.408 965 GHz 11.218 dBm
2 N 1 f 2.401 465 GHz -8.899 dBm
3 N 1 f 2.400 000 GHz -47.801 dBm
Marker
Select Marker
3
Normal
Delta
Fixed
Off
Properties
More
1 of 2
MSG
STATUS


Agilent Spectrum Analyzer - Swept SA
Marker 3 2.483500000000 GHz
PNO: Wide
IFGain:Low
Trig: Free Run
#Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold:>20/20
04:22:37 PM Nov 08, 2014
Ref Offset 11 dB
10 dB/div
Ref 20.00 dBm
Mkr3 2.483 500 GHz
-50.634 dBm
-8.56 dBm
Center 2.480000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 10.00 MHz
Sweep 1.07 ms (2001 pts)
1 N 1 f 2.479 870 GHz 11.513 dBm
2 N 1 f 2.480 580 GHz -9.144 dBm
3 N 1 f 2.483 500 GHz -50.634 dBm
Marker
Select Marker 3
Normal
Delta
Fixed
Off
Properties
More 1 of 2

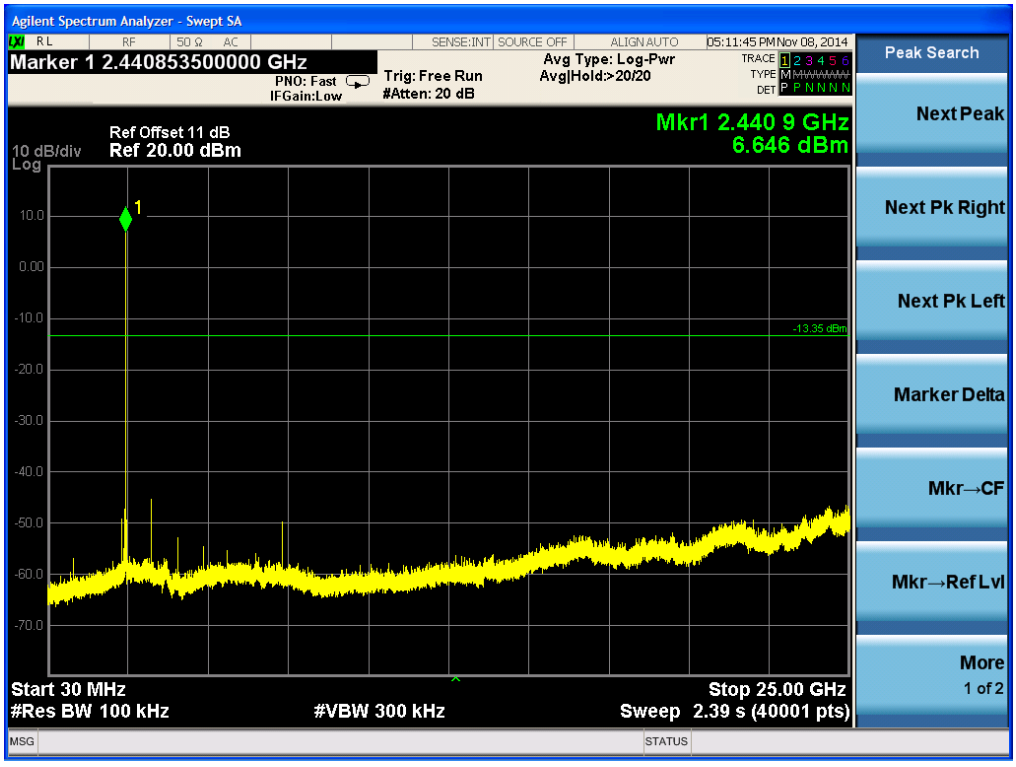

Agilent Spectrum Analyzer - Swept SA
Marker 3 2.483500000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold:>20/20
04:38:45 PM Nov 08, 2014
Ref Offset 11 dB
10 dB/div
Ref 20.00 dBm
Mkr3 2.483 500 GHz
-52.438 dBm
-8.66 dBm
Start 2.47000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 2.50000 GHz
Sweep 2.93 ms (2001 pts)
1 N 1 f 2.472 025 GHz 11.335 dBm
2 N 1 f 2.480 575 GHz -9.517 dBm
3 N 1 f 2.483 500 GHz -52.438 dBm
Marker
Select Marker 3
Normal
Delta
Fixed
Off
Properties
More 1 of 2

Test Plot of Conducted spurious emissions measured in 100kHz Bandwidth of EDR mode

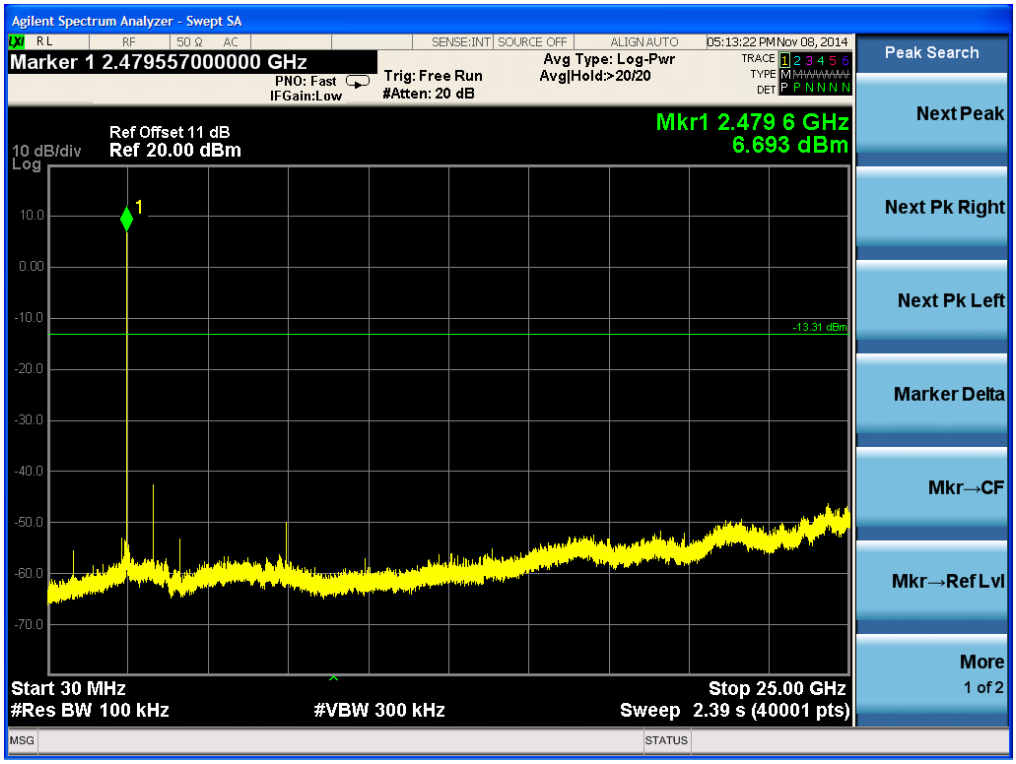
Low Channel



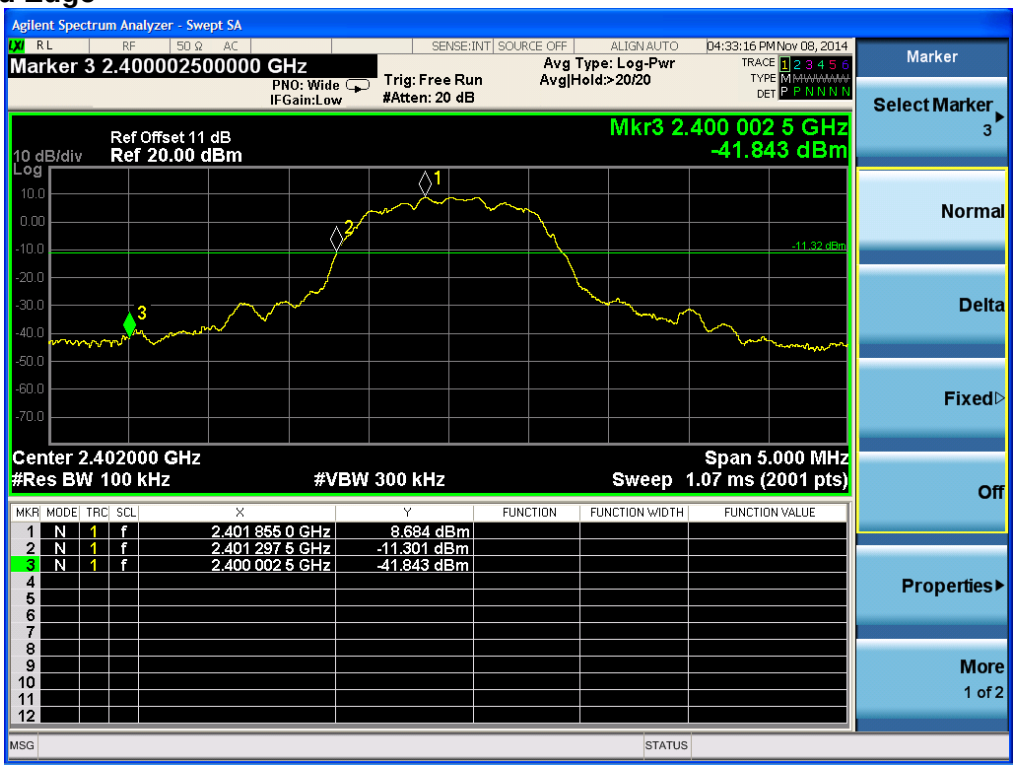
Middle Channel



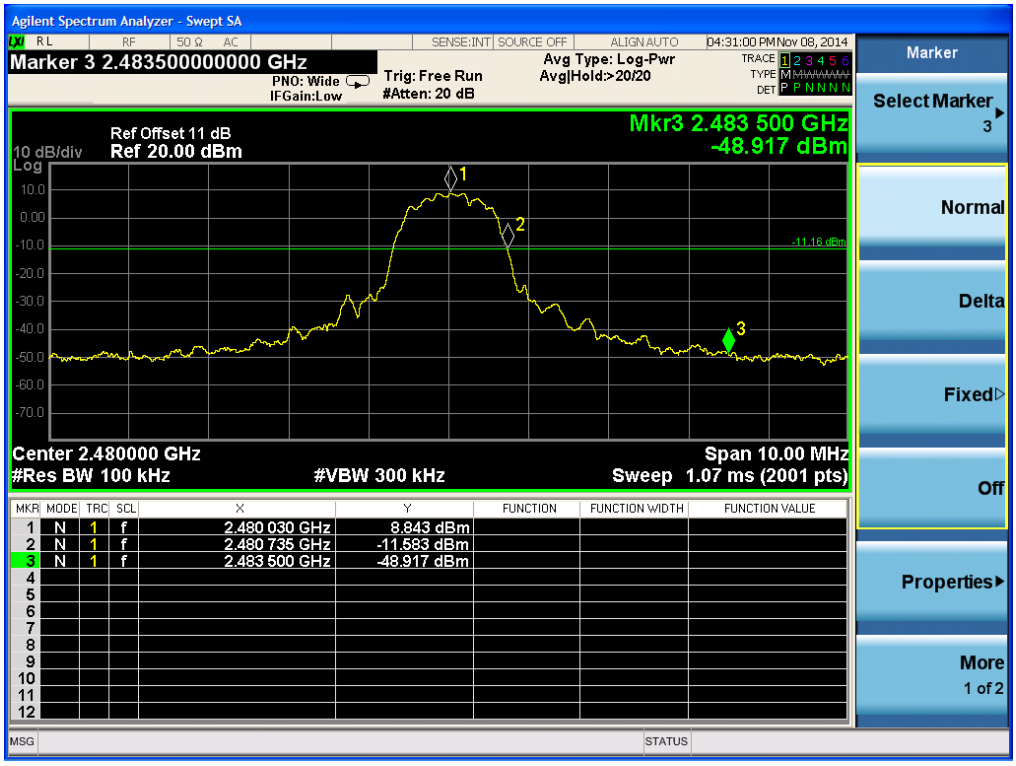
High Channel

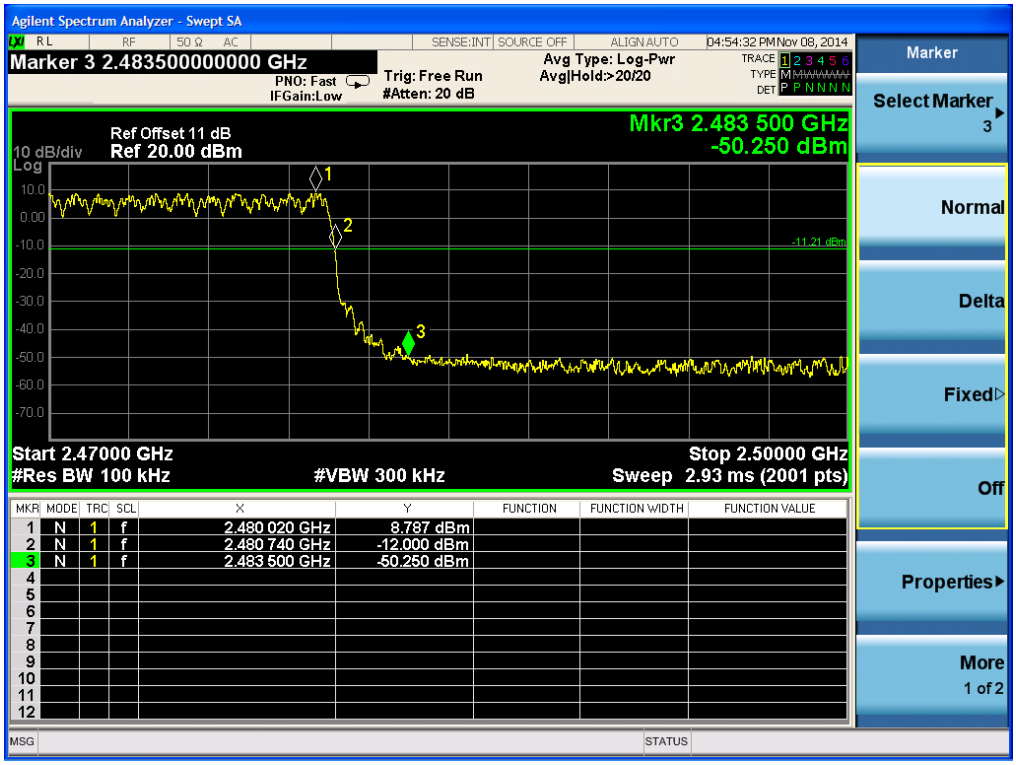


Band Edge


Agilent Spectrum Analyzer - Swept SA
Marker 3 2.400002500000 GHz
PNO: Wide
IFGain:Low
Trig: Free Run
#Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold:>20/20
04:33:16 PM Nov 08, 2014
Ref Offset 11 dB
10 dB/div
Ref 20.00 dBm
Mkr3 2.400 002 5 GHz
-41.843 dBm
-11.32 dBm
Center 2.402000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 5.000 MHz
Sweep 1.07 ms (2001 pts)
1 N 1 f 2.401 855 0 GHz 8.684 dBm
2 N 1 f 2.401 297 5 GHz -11.301 dBm
3 N 1 f 2.400 002 5 GHz -41.843 dBm
Marker
Select Marker 3
Normal
Delta
Fixed
Off
Properties
More 1 of 2

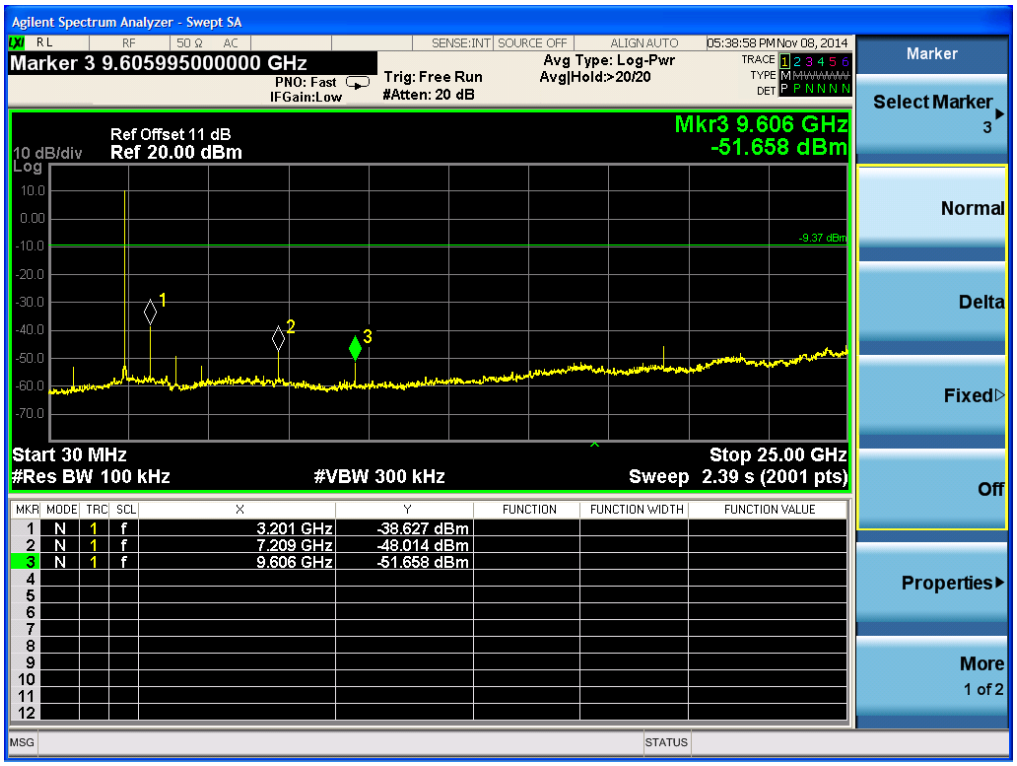

Agilent Spectrum Analyzer - Swept SA
Marker 3 2.400000000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold:>20/20
04:51:04 PM Nov 08, 2014
Ref Offset 11 dB
10 dB/div
Ref 20.00 dBm
Mkr3 2.400 000 GHz
-41.734 dBm
-11.29 dBm
Start 2.38000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 2.41000 GHz
Sweep 2.93 ms (2001 pts)
1 N 1 f 2.404 870 GHz 8.713 dBm
2 N 1 f 2.401 285 GHz -12.577 dBm
3 N 1 f 2.400 000 GHz -41.734 dBm
Marker
Select Marker 3
Normal
Delta
Fixed
Off
Properties
More 1 of 2


Agilent Spectrum Analyzer - Swept SA
Marker 3 2.483500000000 GHz
PNO: Wide
IFGain:Low
Trig: Free Run
#Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold:>20/20
04:31:00 PM Nov 08, 2014
Ref Offset 11 dB
10 dB/div
Ref 20.00 dBm
Mkr3 2.483 500 GHz
-48.917 dBm
-11.16 dBm
Center 2.480000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 10.00 MHz
Sweep 1.07 ms (2001 pts)
1 N 1 f 2.480 030 GHz 8.843 dBm
2 N 1 f 2.480 735 GHz -11.583 dBm
3 N 1 f 2.483 500 GHz -48.917 dBm
Marker
Select Marker 3
Normal
Delta
Fixed
Off
Properties
More 1 of 2

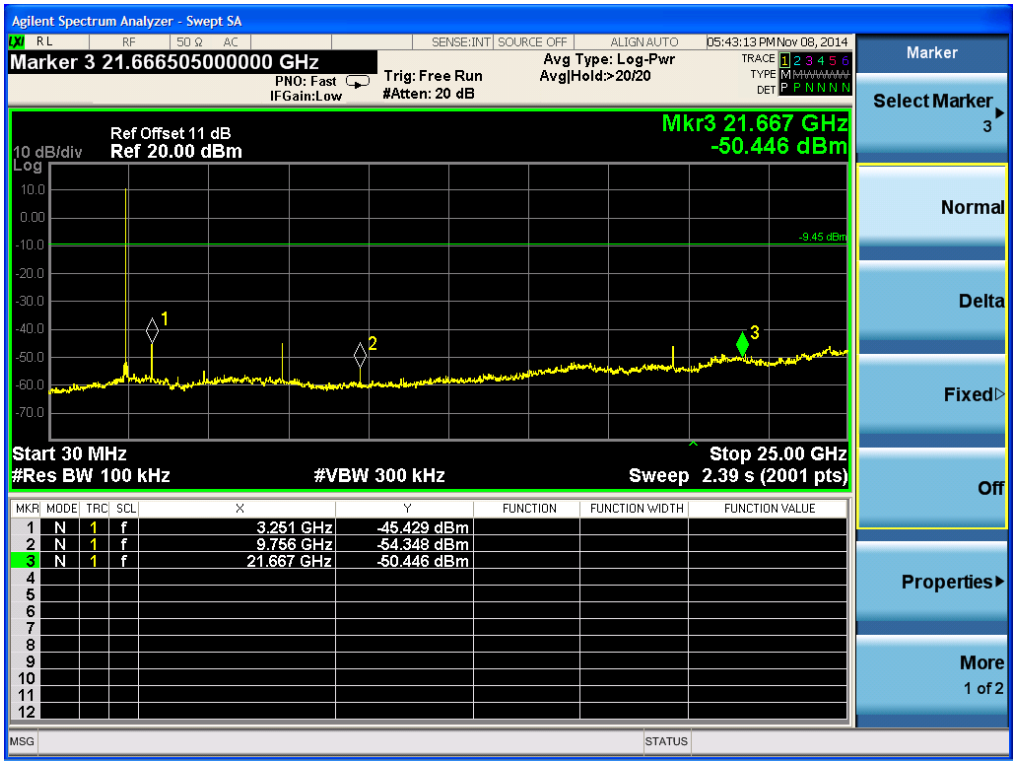

Agilent Spectrum Analyzer - Swept SA
Marker 3 2.483500000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold:>20/20
04:54:32 PM Nov 08, 2014
Ref Offset 11 dB
10 dB/div
Ref 20.00 dBm
Mkr3 2.483 500 GHz
-50.250 dBm
-11.21 dBm
Start 2.47000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Stop 2.50000 GHz
Sweep 2.93 ms (2001 pts)
1 N 1 f 2.480 020 GHz 8.787 dBm
2 N 1 f 2.480 740 GHz -12.000 dBm
3 N 1 f 2.483 500 GHz -50.250 dBm
Marker
Select Marker 3
Normal
Delta
Fixed
Off
Properties
More 1 of 2

Test Plot of Conducted spurious emissions measured in 100kHz Bandwidth of BLE mode

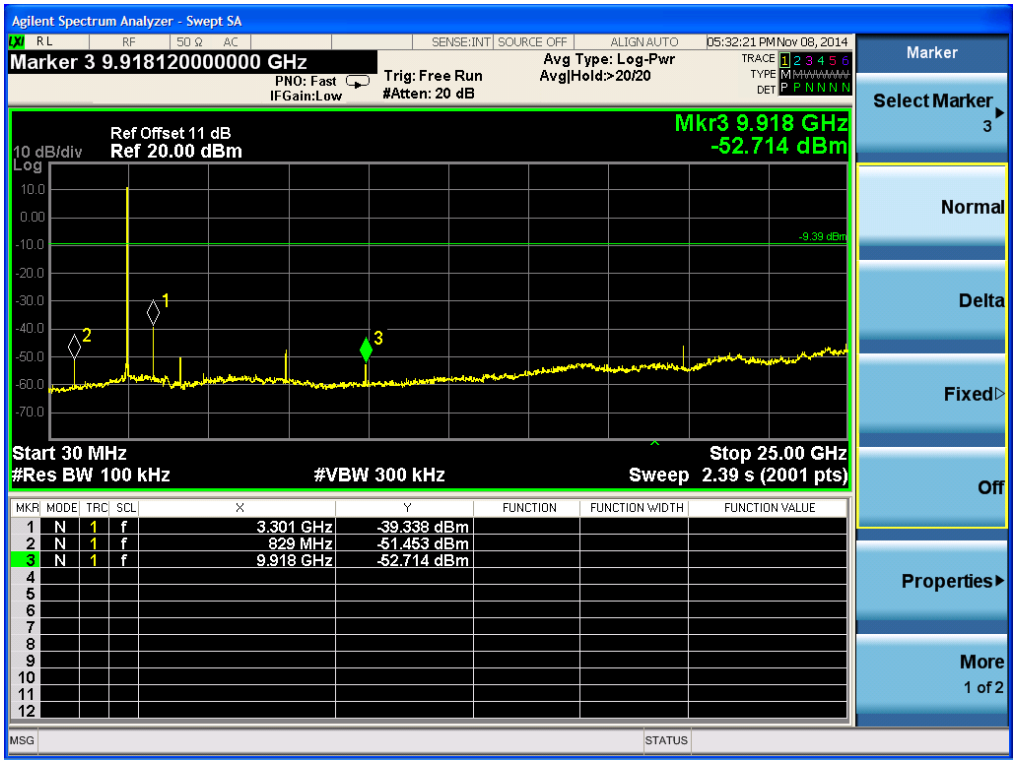
Low Channel



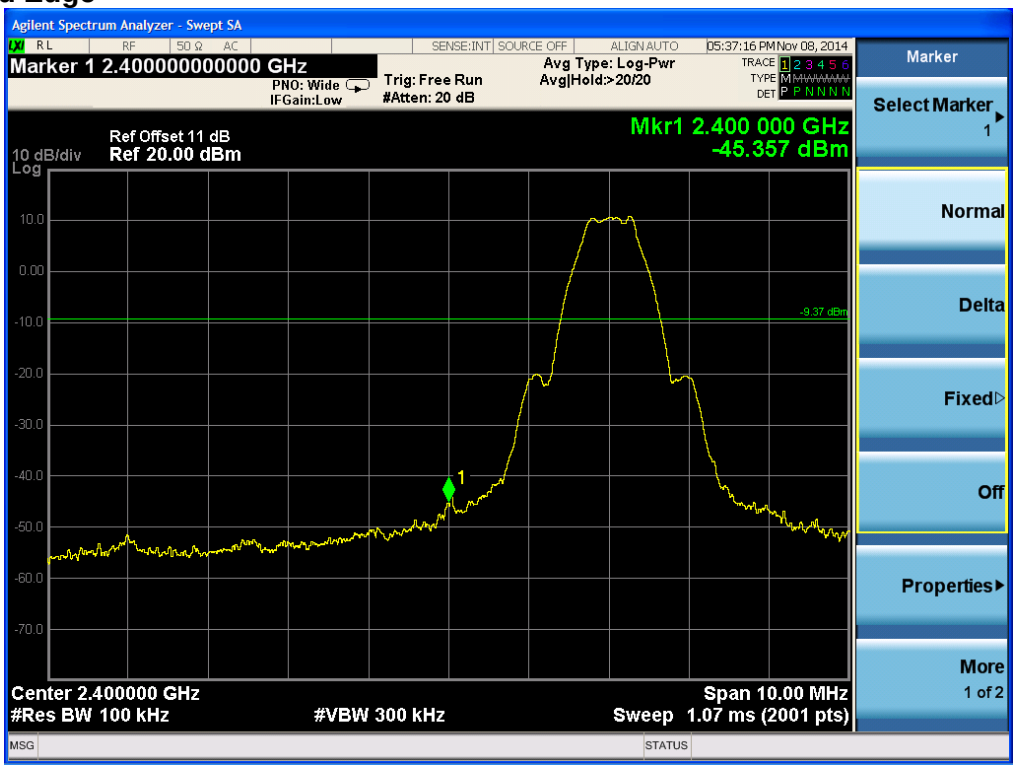
Middle Channel

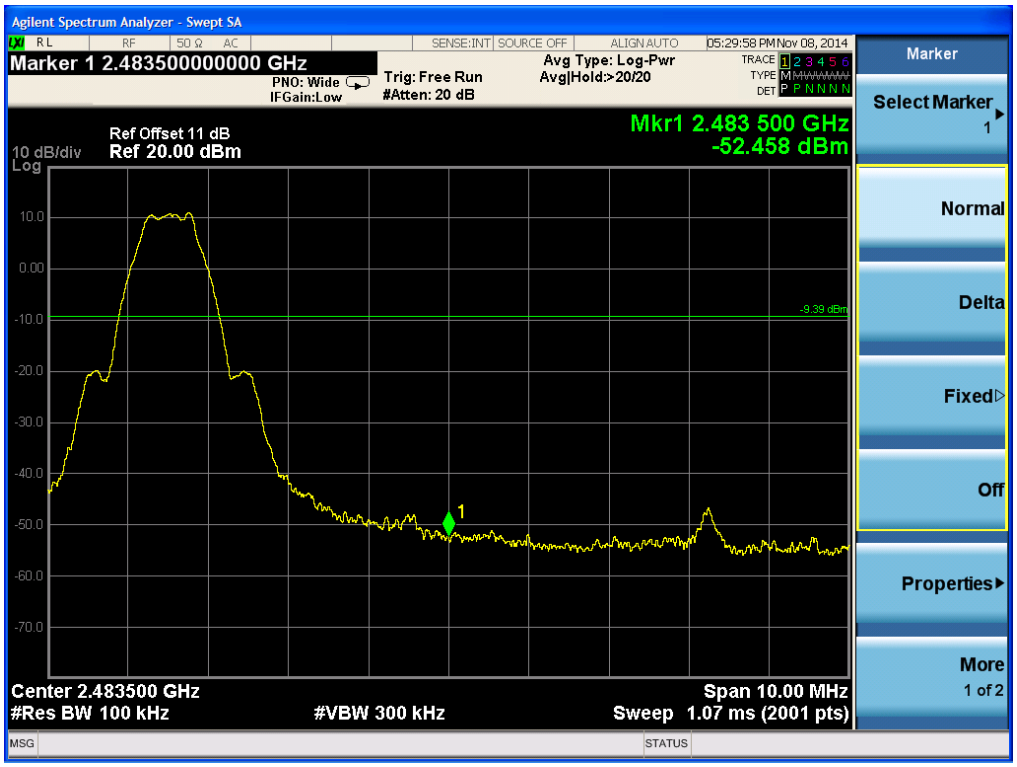


High Channel



Band Edge


Agilent Spectrum Analyzer - Swept SA
Marker 1 2.400000000000 GHz
PNO: Wide
IFGain:Low
Trig: Free Run
#Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold:>20/20
05:37:16 PM Nov 08, 2014
Ref Offset 11 dB
10 dB/div
Ref 20.00 dBm
Log
Mkr1 2.400 000 GHz
-45.357 dBm
-9.37 dBm
Center 2.400000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 10.00 MHz
Sweep 1.07 ms (2001 pts)
Marker
Select Marker
Normal
Delta
Fixed
Off
Properties
More
1 of 2
MSG
STATUS


Agilent Spectrum Analyzer - Swept SA
Marker 1 2.483500000000 GHz
PNO: Wide
IFGain:Low
Trig: Free Run
#Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold:>20/20
05:29:58 PM Nov 08, 2014
Ref Offset 11 dB
10 dB/div
Ref 20.00 dBm
Log
Mkr1 2.483 500 GHz
-52.458 dBm
-9.39 dBm
Center 2.483500 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 10.00 MHz
Sweep 1.07 ms (2001 pts)
Marker
Select Marker
Normal
Delta
Fixed
Off
Properties
More
1 of 2
MSG
STATUS

5.1.6 Power spectral density

RESULT: **Pass**

Date of testing	:	2014-11-08
Test standard	:	FCC part 15.247(e) RSS-210 A8.2
Basic standard	:	ANSI C63.4: 2009 Clause 10 of KDB 558074 v03r02
Limit	:	8dBm/3kHz
Kind of test site	:	Shield room

Test setup

Test Channel	:	Low/ Middle/ High
Operation mode	:	A.2.a
Ambient temperature	:	25℃
Relative humidity	:	52%
Atmospheric pressure	:	101kPa

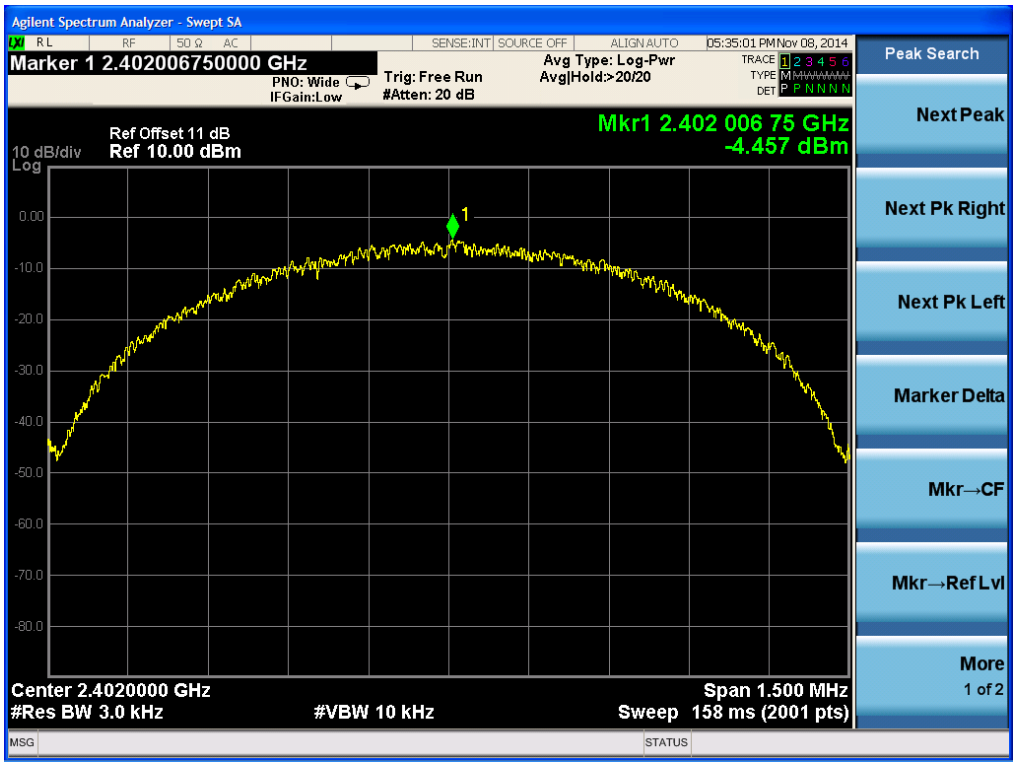
Table 9: Test result of power spectral density:

Mode	Channel (MHz)	Result (dBm/3kHz)	Limit (dBm/3kHz)	Conclusion
BLE	2402	-4.457	8	Pass
	2440	-4.431	8	Pass
	2480	-4.249	8	Pass

For details refer to following test plot.

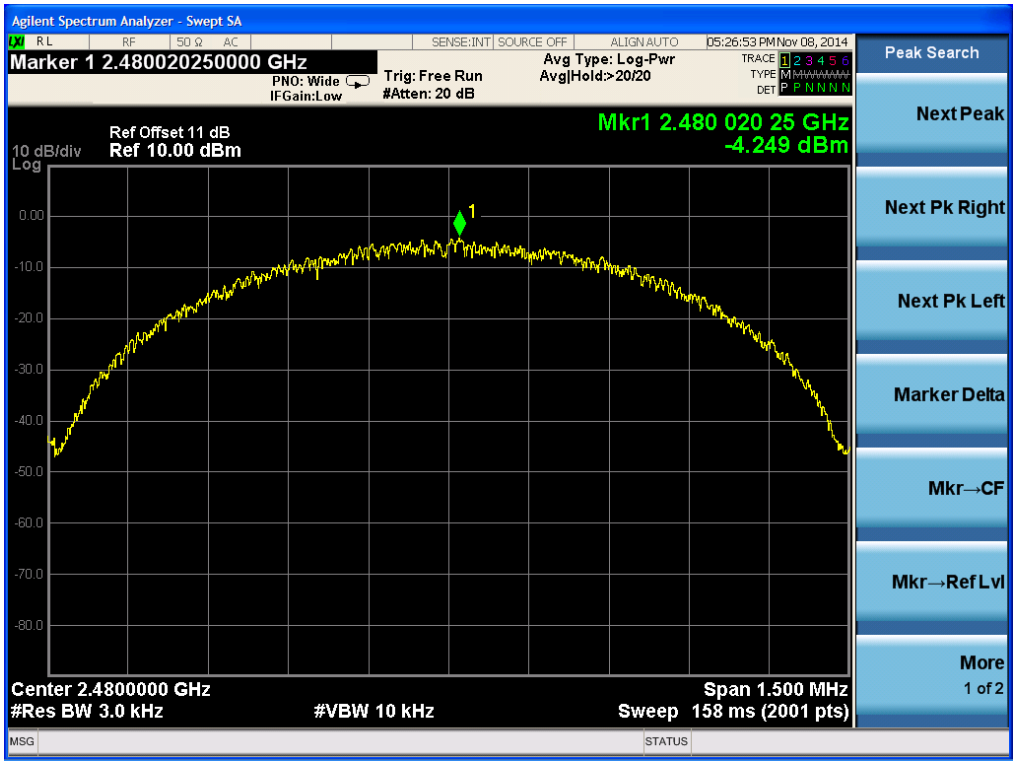
Test Plot of Power spectral density measured in 3kHz Bandwidth of BLE mode

Low Channel



Middle Channel

High Channel



5.1.7 Spurious Emission

RESULT: **Pass**

Date of testing	:	2014-11-10
Test standard	:	FCC part 15.247(d) RSS-210 Clause 2.2
Basic standard	:	ANSI C63.4: 2009 Clause 11 of KDB 558074 v03r02
Limits	:	FCC part 15.209(a)
Kind of test site	:	3m Semi-Anechoic Chamber

Test setup

Test Channel	:	Low/ Middle/ High
Operation mode	:	A.1, A.2
Ambient temperature	:	25℃
Relative humidity	:	52%
Atmospheric pressure	:	101kPa

Table 10: Test result of Spurious Emission of transmitting of Bluetooth (BDR mode)

Channel	Freq. (MHz)	Measure Level (dB μ V/m)	Reading (dB μ V)	Margin (dB)	Limit (dB μ V/m)	Correct Factor (dB)	Detector	Polar
Low	142.035	30.653	21.512	-12.847	43.500	9.141	PEAK	H
	251.160	33.336	20.026	-12.664	46.000	13.310	PEAK	
	4413.000	41.929	36.422	-32.071	74.000	5.507	PEAK	
	4808.000	51.626	45.257	-22.374	74.000	6.369	PEAK	
	5364.000	43.348	36.502	-30.652	74.000	6.846	PEAK	
	9610.500	56.496	41.109	-23.128	79.624	15.387	PEAK	
	251.160	30.777	17.467	-15.223	46.000	13.310	PEAK	V
	301.600	27.517	13.354	-18.483	46.000	14.163	PEAK	
	4214.000	41.001	36.144	-32.999	74.000	4.858	PEAK	
	4799.500	51.472	45.130	-22.528	74.000	6.342	PEAK	
	4936.000	43.334	36.594	-30.666	74.000	6.740	PEAK	
	9610.500	58.932	43.545	-20.692	79.624	15.387	PEAK	
Middle	142.520	31.293	22.153	-12.207	43.500	9.140	PEAK	H
	251.160	34.713	21.403	-11.287	46.000	13.310	PEAK	
	4425.000	42.900	37.394	-31.100	74.000	5.507	PEAK	
	4884.500	46.610	39.960	-27.390	74.000	6.651	PEAK	
	7448.000	49.088	34.922	-24.912	74.000	14.167	PEAK	
	9763.500	55.422	39.171	-24.016	79.438	16.250	PEAK	
	183.260	25.975	15.103	-17.525	43.500	10.872	PEAK	V
	251.160	30.093	16.783	-15.907	46.000	13.310	PEAK	
	4427.000	41.727	36.221	-32.273	74.000	5.505	PEAK	
	4884.500	49.979	43.329	-24.021	74.000	6.651	PEAK	
	7516.000	49.435	34.883	-24.565	74.000	14.552	PEAK	
	9763.500	56.481	40.230	-22.957	79.438	16.250	PEAK	
High	220.120	31.972	19.675	-14.028	46.000	12.297	PEAK	H
	251.160	34.116	20.806	-11.884	46.000	13.310	PEAK	
	3548.000	39.910	35.853	-34.090	74.000	4.057	PEAK	
	4416.000	42.794	37.285	-31.206	74.000	5.508	PEAK	
	4961.000	46.669	39.879	-27.331	74.000	6.790	PEAK	
	5459.000	44.450	37.451	-29.550	74.000	6.999	PEAK	
	251.160	31.441	18.131	-14.559	46.000	13.310	PEAK	V
	299.175	30.485	16.374	-15.515	46.000	14.111	PEAK	
	4415.000	42.830	37.322	-31.170	74.000	5.509	PEAK	
	4961.000	52.336	45.546	-21.664	74.000	6.790	PEAK	
	7443.000	51.458	37.290	-22.542	74.000	14.168	PEAK	
	7963.000	48.974	33.944	-25.026	74.000	15.031	PEAK	

For 9 kHz ~ 30 MHz, the amplitude of spurious emissions that are attenuated by more than 20dB below the permissible. The value has no need to be reported.

Table 11: Test result of Spurious Emission of transmitting of Buletooth (EDR mode)

Channel	Freq. (MHz)	Measure Level (dB μ V/m)	Reading (dB μ V)	Margin (dB)	Limit (dB μ V/m)	Correct Factor (dB)	Detector	Polar
Low	251.160	36.406	23.096	-9.594	46.000	13.310	PEAK	H
	299.660	32.666	18.548	-13.334	46.000	14.118	PEAK	
	4419.000	41.825	36.317	-32.175	74.000	5.508	PEAK	
	4799.500	51.030	44.688	-22.970	74.000	6.342	PEAK	
	7609.000	48.629	34.059	-25.371	74.000	14.570	PEAK	
	9610.500	54.593	39.206	-19.407	74.000	15.387	PEAK	
	250.190	31.649	18.365	-14.351	46.000	13.284	PEAK	V
	310.330	28.620	14.248	-17.380	46.000	14.372	PEAK	
	4441.000	42.135	36.624	-31.865	74.000	5.512	PEAK	
	4799.500	49.273	42.931	-24.727	74.000	6.342	PEAK	
	7469.000	49.294	35.078	-24.706	74.000	14.217	PEAK	
	9610.500	58.141	42.754	-21.074	79.215	15.387	PEAK	
Middle	251.160	32.539	19.229	-13.461	46.000	13.310	PEAK	H
	299.175	32.096	17.985	-13.904	46.000	14.111	PEAK	
	4439.000	42.058	36.549	-31.942	74.000	5.510	PEAK	
	4884.500	47.062	40.412	-26.938	74.000	6.651	PEAK	
	5432.000	45.222	38.201	-28.778	74.000	7.021	PEAK	
	9763.500	54.136	37.885	-25.757	79.893	16.250	PEAK	
	251.160	32.684	19.374	-13.316	46.000	13.310	PEAK	V
	308.390	28.327	13.999	-17.673	46.000	14.328	PEAK	
	4419.000	42.586	37.078	-31.414	74.000	5.508	PEAK	
	4884.500	48.548	41.898	-25.452	74.000	6.651	PEAK	
	7569.000	48.791	34.110	-25.209	74.000	14.682	PEAK	
	9763.500	55.140	38.889	-24.753	79.893	16.250	PEAK	
High	251.160	36.103	22.793	-9.897	46.000	13.310	PEAK	H
	306.935	31.813	17.517	-14.187	46.000	14.296	PEAK	
	3427.000	39.693	36.270	-34.307	74.000	3.423	PEAK	
	4427.000	42.130	36.624	-31.870	74.000	5.505	PEAK	
	4961.000	47.951	41.161	-26.049	74.000	6.790	PEAK	
	7440.000	48.540	34.372	-25.460	74.000	14.168	PEAK	
	250.190	32.817	19.533	-13.183	46.000	13.284	PEAK	V
	304.510	28.437	14.196	-17.563	46.000	14.241	PEAK	
	3419.000	39.725	36.341	-34.275	74.000	3.383	PEAK	
	4427.000	41.962	36.456	-32.038	74.000	5.505	PEAK	
	4961.000	52.171	45.381	-21.829	74.000	6.790	PEAK	
	7440.000	49.822	35.654	-24.178	74.000	14.168	PEAK	

For 9 kHz ~ 30 MHz, the amplitude of spurious emissions that are attenuated by more than 20dB below the permissible. The value has no need to be reported.

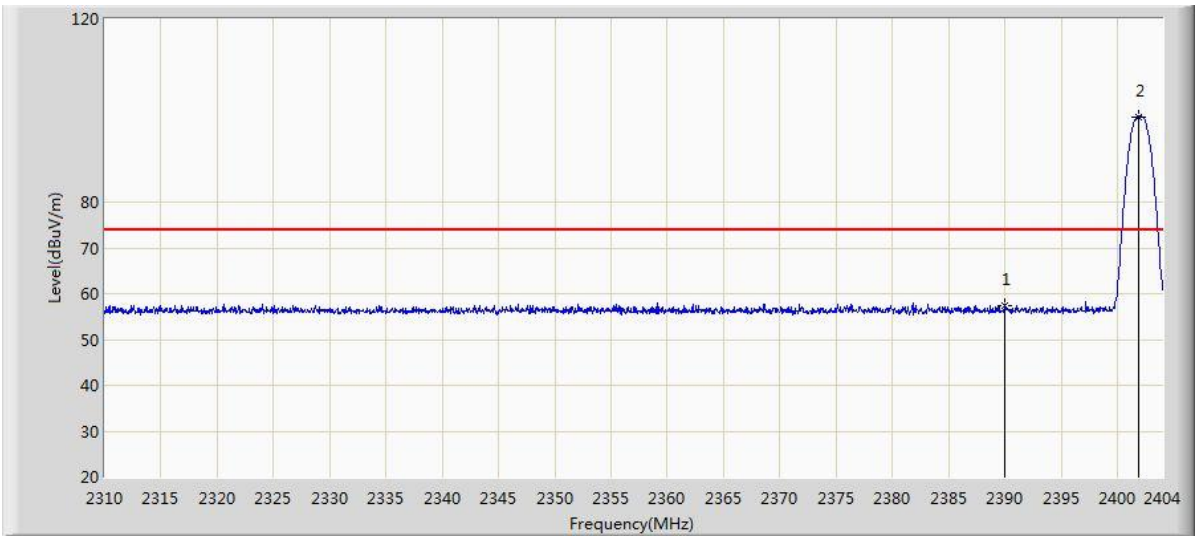
Table 12: Test result of Spurious Emission of transmitting of Buletooth (BLE mode)

Channel	Freq. (MHz)	Measure Level (dB μ V/m)	Reading (dB μ V)	Margin (dB)	Limit (dB μ V/m)	Correct Factor (dB)	Detector	Polar
Low	251.160	32.929	19.619	-13.071	46.000	13.310	PEAK	H
	301.600	31.253	17.090	-14.747	46.000	14.163	PEAK	
	4439.000	42.201	36.692	-31.799	74.000	5.510	PEAK	
	4799.500	50.711	44.369	-23.289	74.000	6.342	PEAK	
	7548.000	49.462	34.795	-24.538	74.000	14.667	PEAK	
	9602.000	57.218	41.849	-18.722	75.940	15.369	PEAK	
	250.190	32.675	19.391	-13.325	46.000	13.284	PEAK	V
	311.785	27.819	13.413	-18.181	46.000	14.406	PEAK	
	4423.000	43.742	38.235	-30.258	74.000	5.507	PEAK	
	4799.500	49.489	43.147	-24.511	74.000	6.342	PEAK	
	7205.000	53.163	39.530	-20.837	74.000	13.633	PEAK	
	9602.000	65.291	49.922	-10.649	75.940	15.369	PEAK	
Middle	142.035	30.516	21.375	-12.984	43.500	9.141	PEAK	H
	250.675	35.191	21.894	-10.809	46.000	13.297	PEAK	
	4439.000	42.078	36.569	-31.922	74.000	5.510	PEAK	
	4884.500	48.519	41.869	-25.481	74.000	6.651	PEAK	
	7498.000	49.726	35.282	-24.274	74.000	14.444	PEAK	
	9763.500	54.567	38.316	-20.325	74.892	16.250	PEAK	
	182.290	26.039	15.252	-17.461	43.500	10.787	PEAK	V
	250.675	31.403	18.106	-14.597	46.000	13.297	PEAK	
	4419.000	42.358	36.850	-31.642	74.000	5.508	PEAK	
	4995.000	46.056	39.209	-27.944	74.000	6.847	PEAK	
	5269.000	42.614	35.996	-31.386	74.000	6.618	PEAK	
	7389.000	49.241	35.136	-24.759	74.000	14.105	PEAK	
High	143.005	30.790	21.646	-12.710	43.500	9.144	PEAK	H
	251.160	33.294	19.984	-12.706	46.000	13.310	PEAK	
	4426.000	42.584	37.078	-31.416	74.000	5.505	PEAK	
	4961.000	50.996	44.206	-23.004	74.000	6.790	PEAK	
	7400.500	51.154	37.016	-22.846	74.000	14.138	PEAK	
	7796.000	49.655	34.638	-24.345	74.000	15.016	PEAK	
	250.190	30.430	17.146	-15.570	46.000	13.284	PEAK	V
	565.440	29.065	10.201	-16.935	46.000	18.864	PEAK	
	4429.000	42.220	36.715	-31.780	74.000	5.504	PEAK	
	4961.000	47.212	40.422	-26.788	74.000	6.790	PEAK	
	5239.000	43.348	36.650	-30.652	74.000	6.698	PEAK	
	7589.000	49.764	35.126	-24.236	74.000	14.637	PEAK	

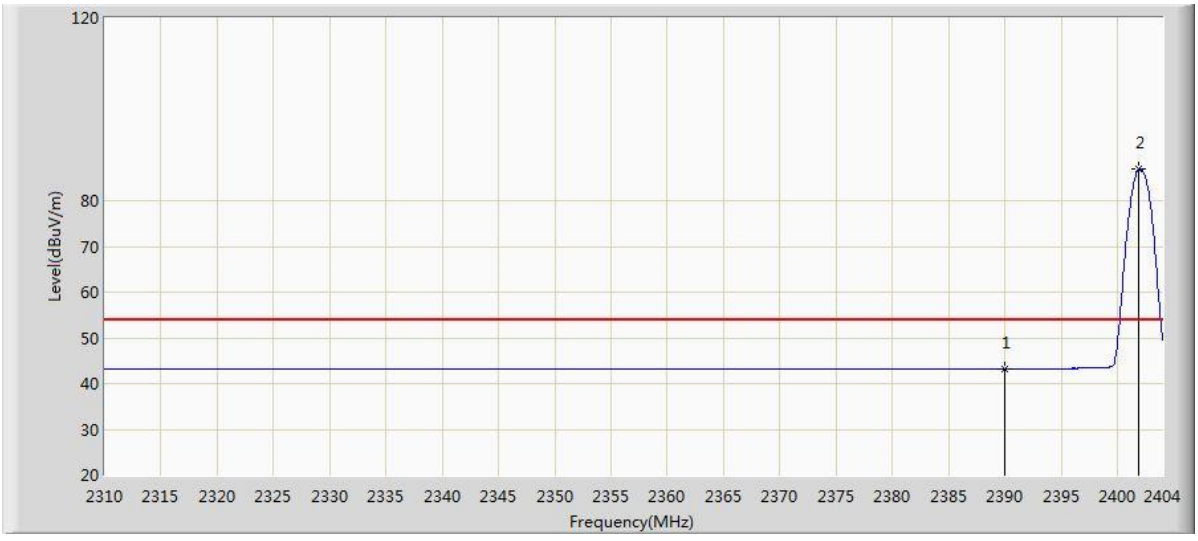
For 9 kHz ~ 30 MHz, the amplitude of spurious emissions that are attenuated by more than 20dB below the permissible. The value has no need to be reported.

Test Plot of Frequency Band Edge of Bluetooth BDR mode

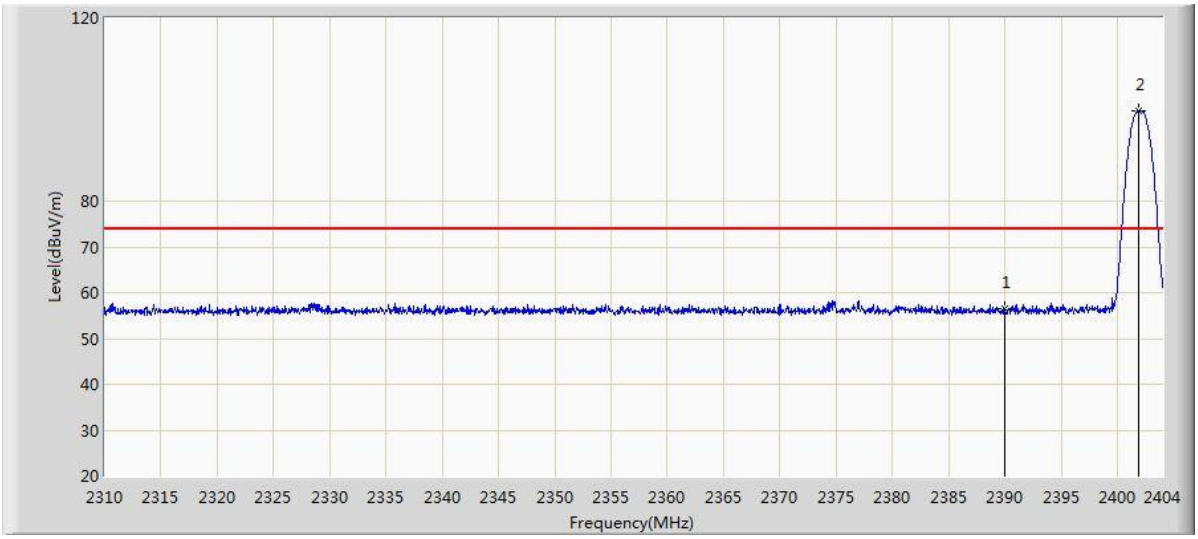
Low Channel



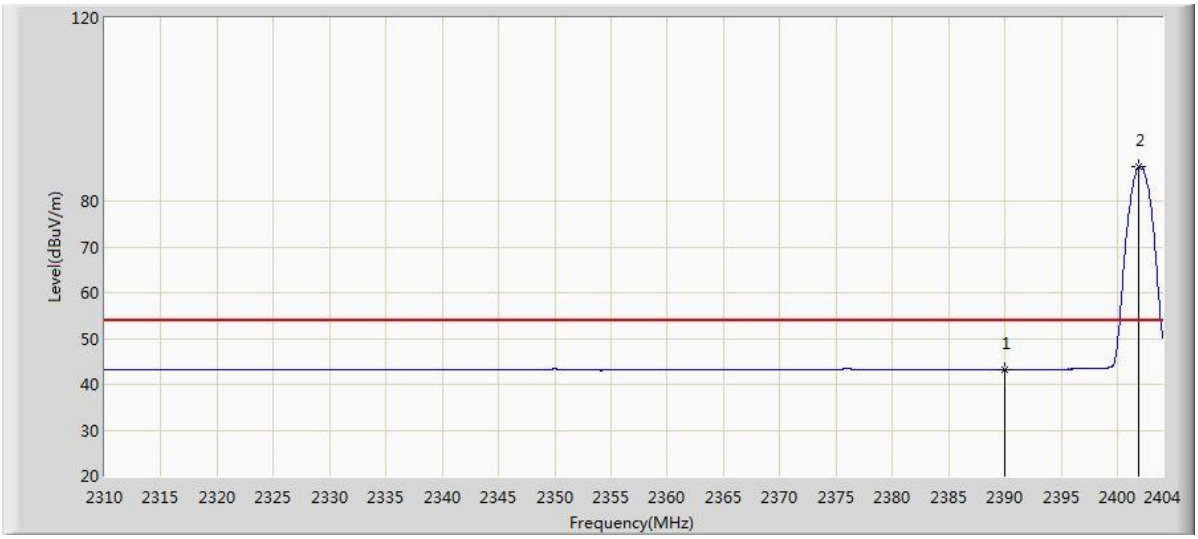
Freq. (MHz)	Measure Level (dB μ V/m)	Reading (dB μ V)	Margin (dB)	Limit (dB μ V/m)	Correct Factor (dB)	Detector	Polar
2390.000	57.494	26.810	-16.506	74.000	30.684	PK	H
2401.885	98.693	68.032	24.693	74.000	30.661	PK	



Freq. (MHz)	Measure Level (dB μ V/m)	Reading (dB μ V)	Margin (dB)	Limit (dB μ V/m)	Correct Factor (dB)	Detector	Polar
2390.000	43.173	12.489	-10.827	54.000	30.684	AV	H
2401.932	86.929	56.268	32.929	54.000	30.662	AV	

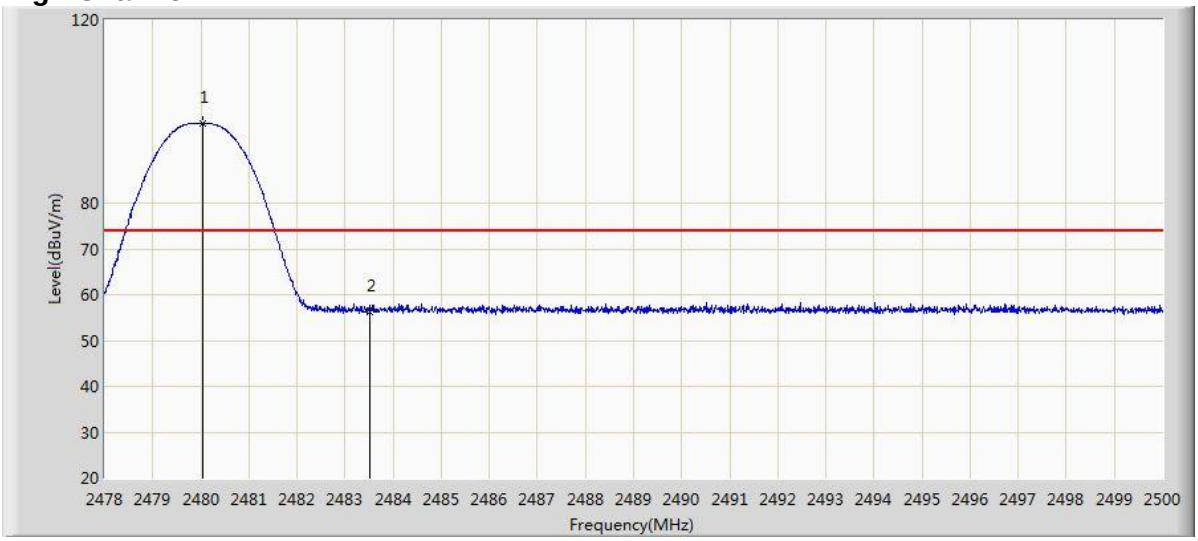


Freq. (MHz)	Measure Level (dB μ V/m)	Reading (dB μ V)	Margin (dB)	Limit (dB μ V/m)	Correct Factor (dB)	Detector	Polar
2390.000	56.452	25.768	-17.548	74.000	30.684	PK	V
2401.885	99.624	68.963	25.624	74.000	30.661	PK	

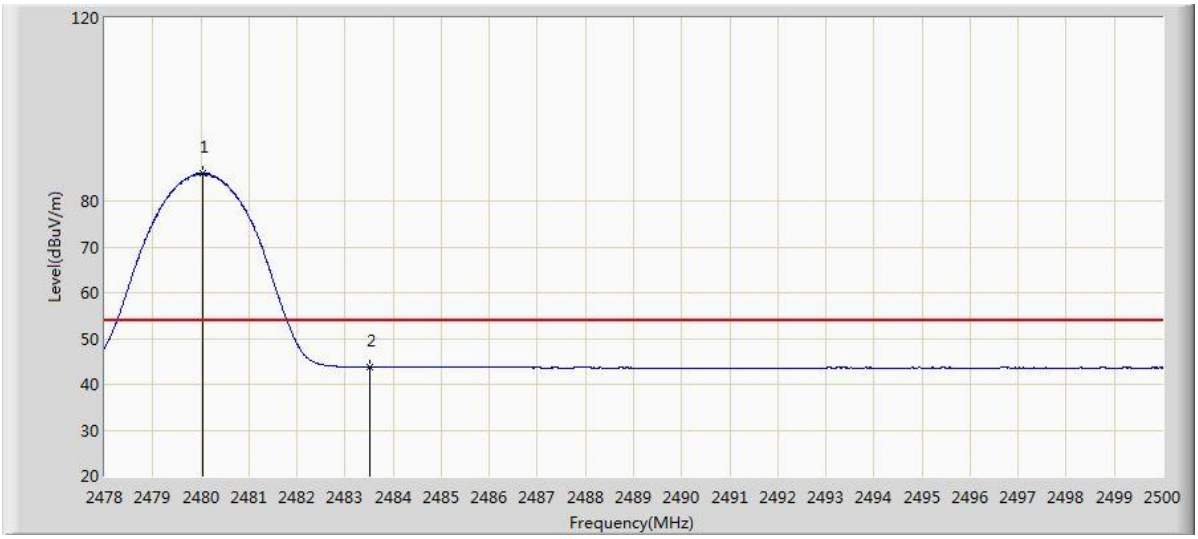


Freq. (MHz)	Measure Level (dB μ V/m)	Reading (dB μ V)	Margin (dB)	Limit (dB μ V/m)	Correct Factor (dB)	Detector	Polar
2390.000	43.211	12.527	-10.789	54.000	30.684	AV	V
2401.932	87.580	56.919	33.580	54.000	30.662	AV	

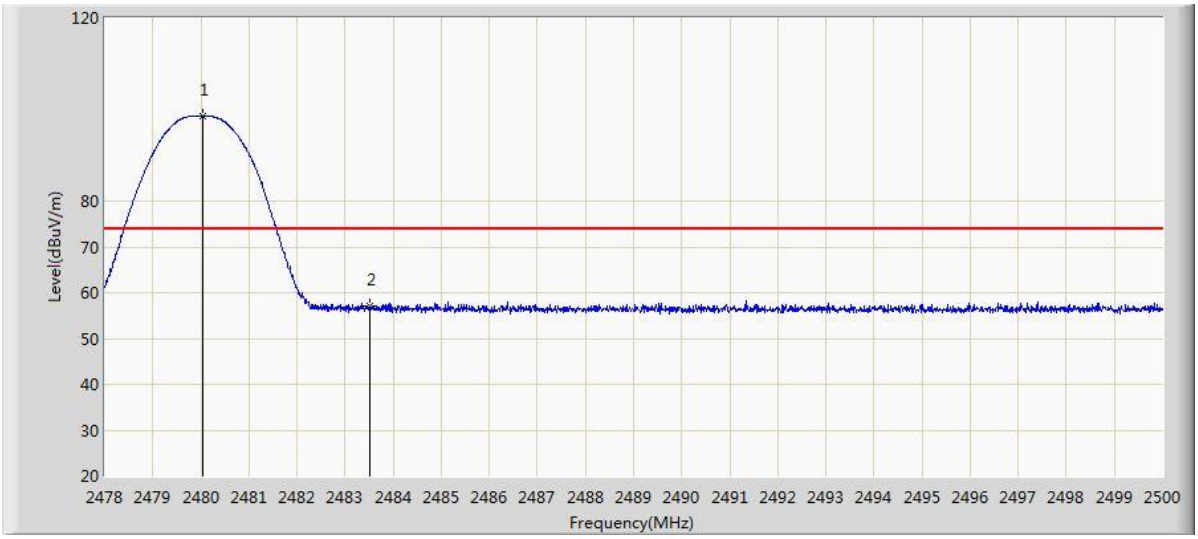
High Channel



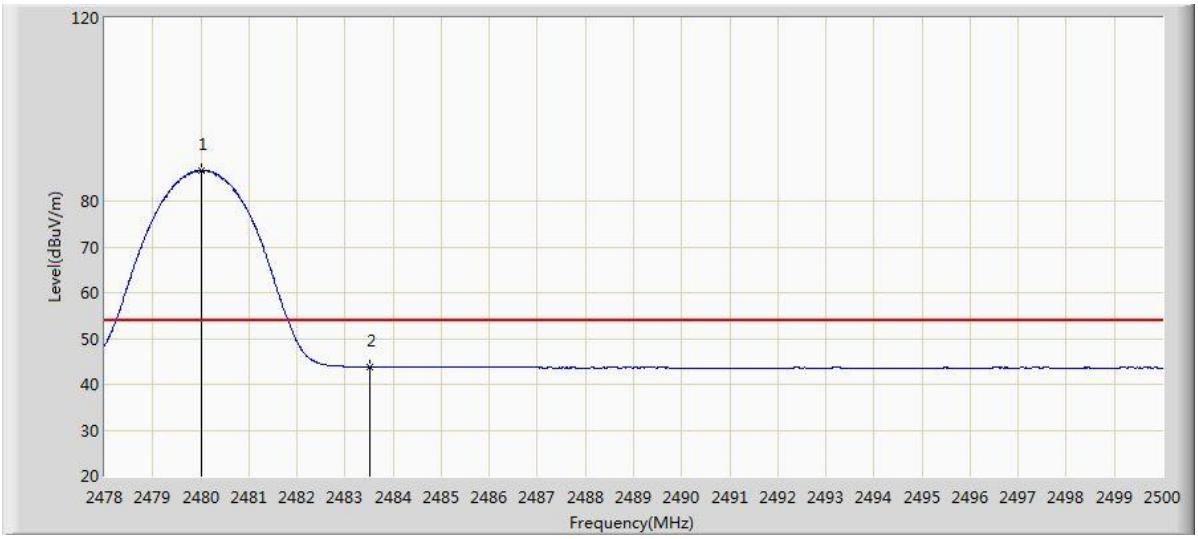
Freq. (MHz)	Measure Level (dB μ V/m)	Reading (dB μ V)	Margin (dB)	Limit (dB μ V/m)	Correct Factor (dB)	Detector	Polar
2480.046	97.325	66.662	23.325	74.000	30.662	PK	H
2483.500	56.160	25.487	-17.840	74.000	30.673	PK	



Freq. (MHz)	Measure Level (dB μ V/m)	Reading (dB μ V)	Margin (dB)	Limit (dB μ V/m)	Correct Factor (dB)	Detector	Polar
2480.035	85.994	55.331	31.994	54.000	30.662	AV	H
2483.500	43.706	13.033	-10.294	54.000	30.673	AV	



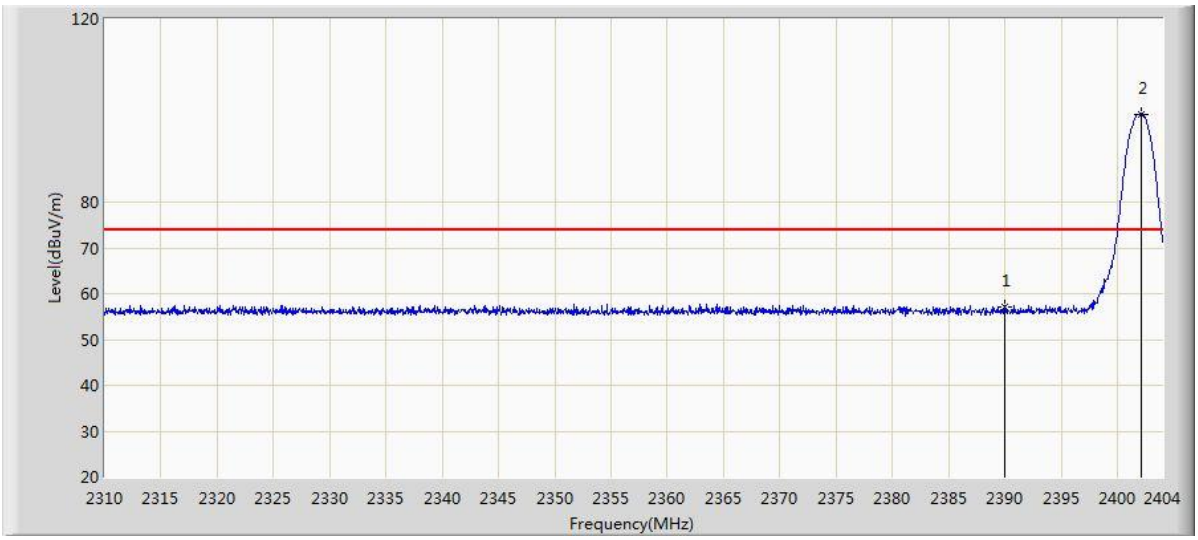
Freq. (MHz)	Measure Level (dB μ V/m)	Reading (dB μ V)	Margin (dB)	Limit (dB μ V/m)	Correct Factor (dB)	Detector	Polar
2480.046	98.486	67.823	24.486	74.000	30.662	PK	V
2483.500	57.189	26.516	-16.811	74.000	30.673	PK	



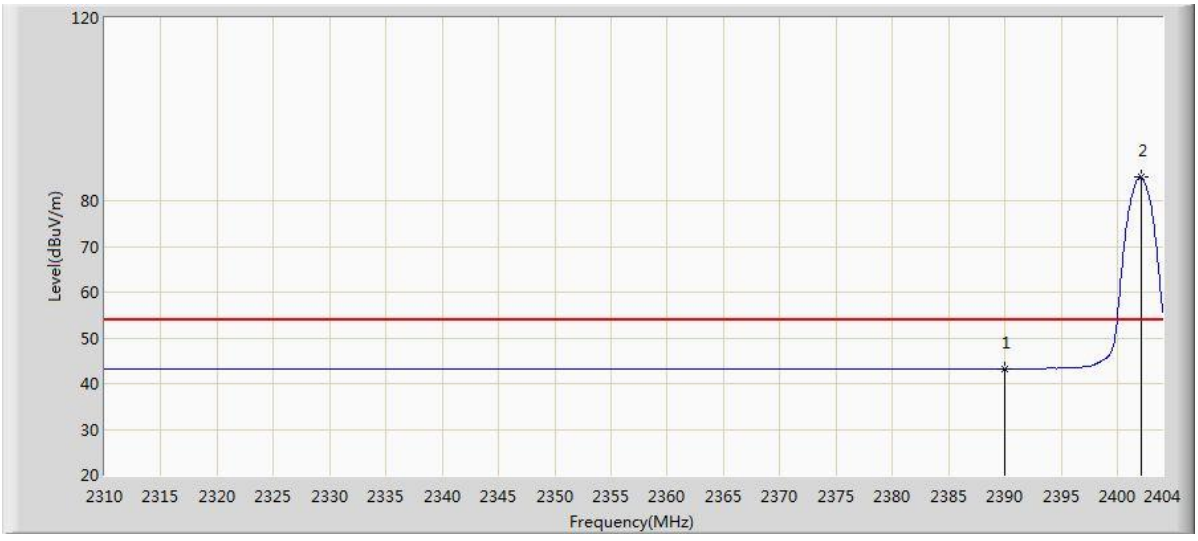
Freq. (MHz)	Measure Level (dB μ V/m)	Reading (dB μ V)	Margin (dB)	Limit (dB μ V/m)	Correct Factor (dB)	Detector	Polar
2480.002	86.763	56.101	32.763	54.000	30.662	AV	V
2483.500	43.756	13.083	-10.244	54.000	30.673	AV	

Test Plot of Frequency Band Edge of Bluetooth EDR mode

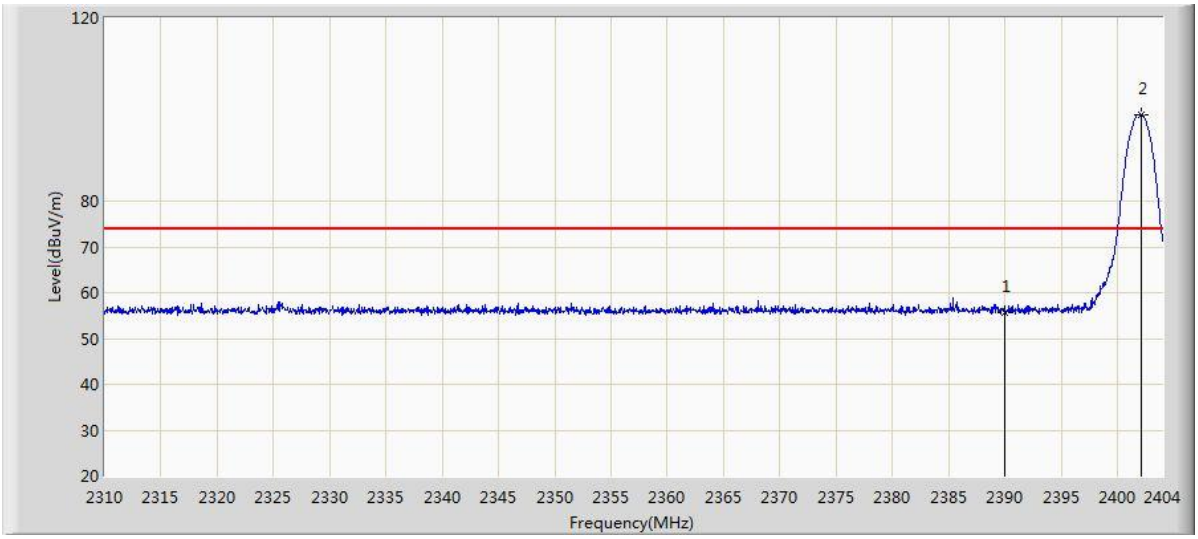
Low Channel



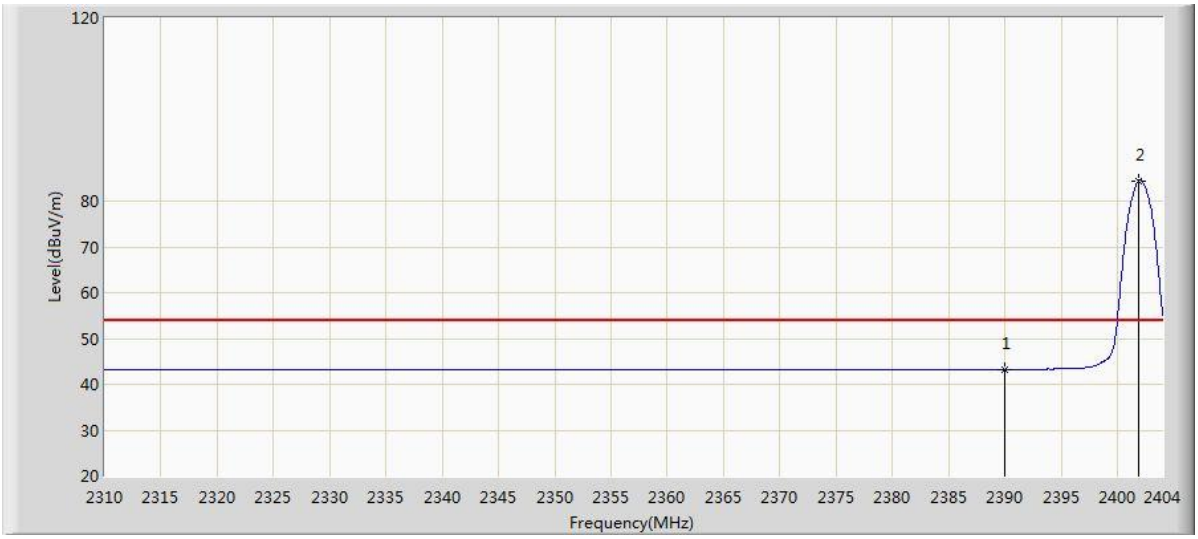
Freq. (MHz)	Measure Level (dB μ V/m)	Reading (dB μ V)	Margin (dB)	Limit (dB μ V/m)	Correct Factor (dB)	Detector	Polar
2390.000	57.126	26.442	-16.874	74.000	30.684	PK	H
2402.073	99.215	68.554	25.215	74.000	30.661	PK	



Freq. (MHz)	Measure Level (dB μ V/m)	Reading (dB μ V)	Margin (dB)	Limit (dB μ V/m)	Correct Factor (dB)	Detector	Polar
2390.000	43.224	12.540	-10.776	54.000	30.684	AV	H
2402.073	85.157	54.496	31.157	54.000	30.661	AV	

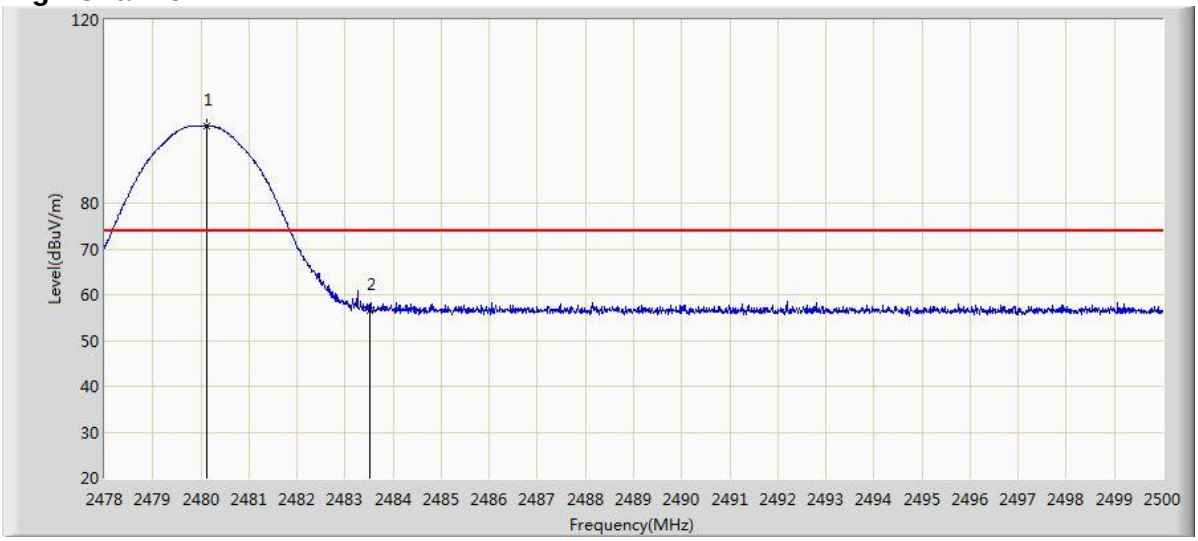


Freq. (MHz)	Measure Level (dB μ V/m)	Reading (dB μ V)	Margin (dB)	Limit (dB μ V/m)	Correct Factor (dB)	Detector	Polar
2390.000	55.720	25.036	-18.280	74.000	30.684	PK	V
2402.073	98.811	68.150	24.811	74.000	30.661	PK	

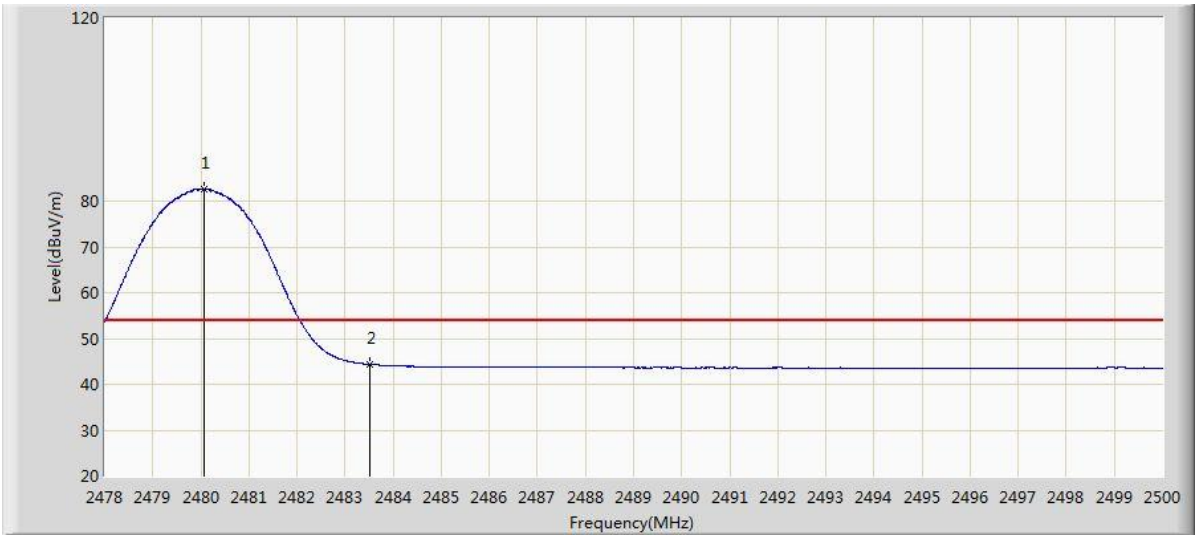


Freq. (MHz)	Measure Level (dB μ V/m)	Reading (dB μ V)	Margin (dB)	Limit (dB μ V/m)	Correct Factor (dB)	Detector	Polar
2390.000	43.223	12.539	-10.777	54.000	30.684	AV	V
2401.885	84.455	53.794	30.455	54.000	30.661	AV	

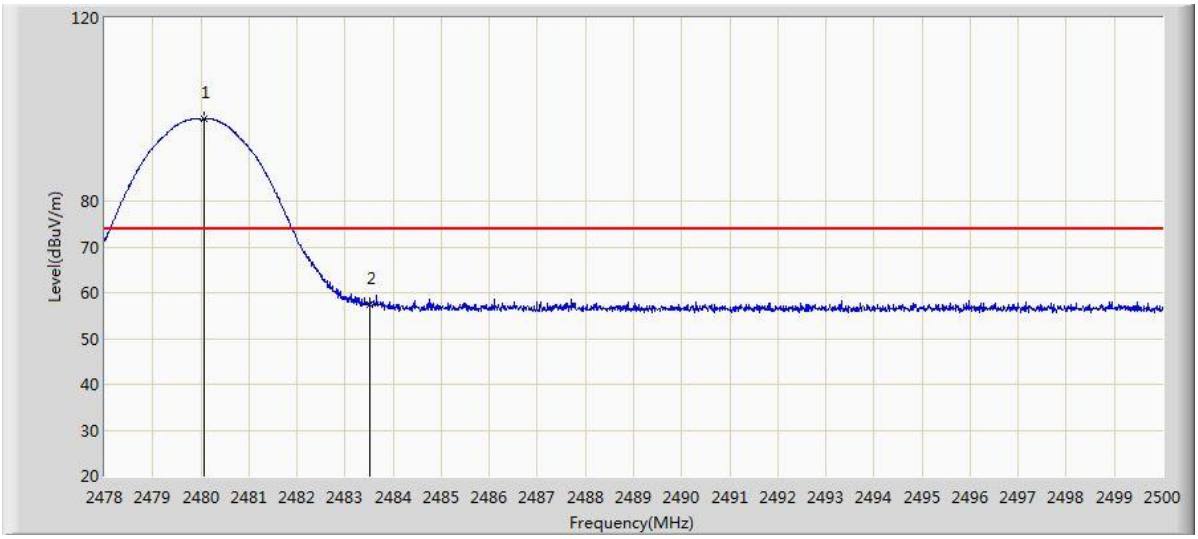
High Channel



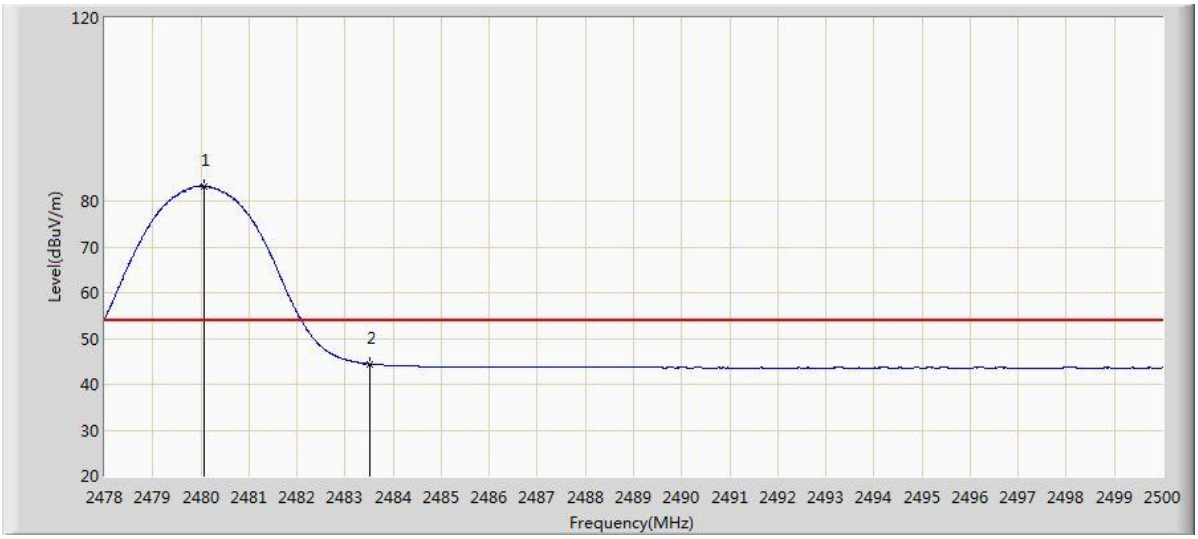
Freq. (MHz)	Measure Level (dB μ V/m)	Reading (dB μ V)	Margin (dB)	Limit (dB μ V/m)	Correct Factor (dB)	Detector	Polar
2480.112	96.927	66.264	22.927	74.000	30.662	PK	H
2483.500	56.450	25.777	-17.550	74.000	30.673	PK	



Freq. (MHz)	Measure Level (dB μ V/m)	Reading (dB μ V)	Margin (dB)	Limit (dB μ V/m)	Correct Factor (dB)	Detector	Polar
2480.057	82.688	52.025	28.688	54.000	30.662	AV	H
2483.500	44.367	13.694	-9.633	54.000	30.673	AV	



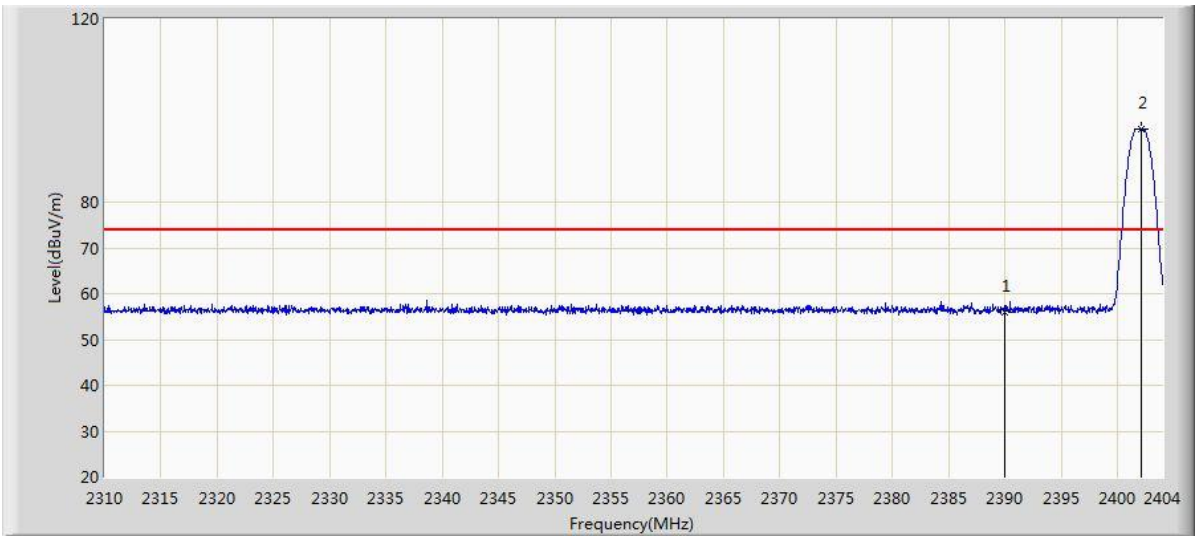
Freq. (MHz)	Measure Level (dB µ V/m)	Reading (dB µ V)	Margin (dB)	Limit (dB µ V/m)	Correct Factor (dB)	Detector	Polar
2480.079	97.952	67.289	23.952	74.000	30.662	PK	V
2483.500	57.352	26.679	-16.648	74.000	30.673	PK	



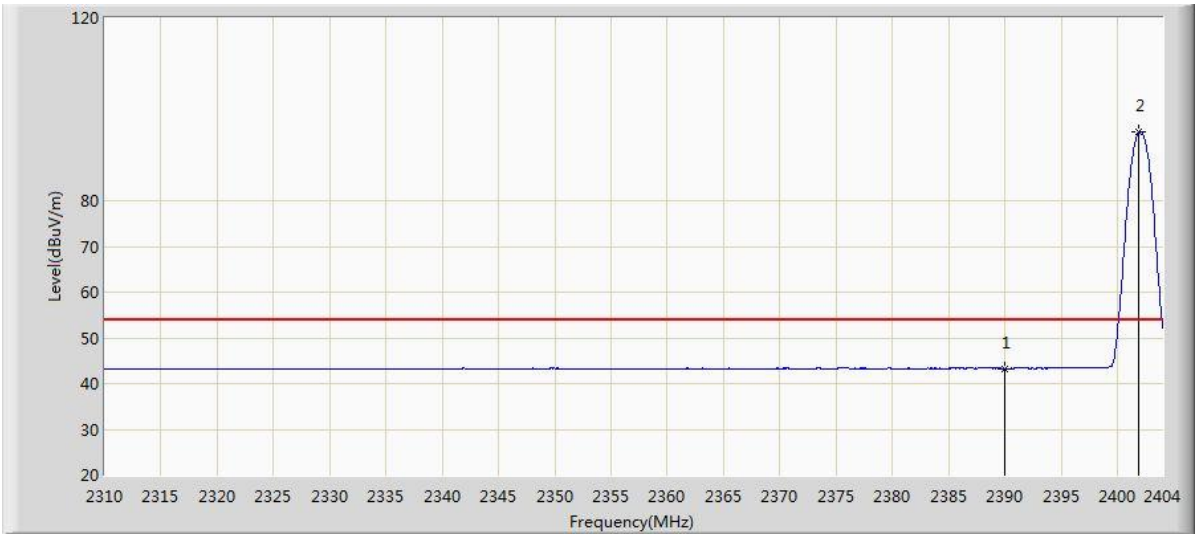
Freq. (MHz)	Measure Level (dB µ V/m)	Reading (dB µ V)	Margin (dB)	Limit (dB µ V/m)	Correct Factor (dB)	Detector	Polar
2480.079	83.302	52.639	29.302	54.000	30.662	AV	V
2483.500	44.473	13.800	-9.527	54.000	30.673	AV	

Test Plot of Frequency Band Edge of Bluetooth BLE mode

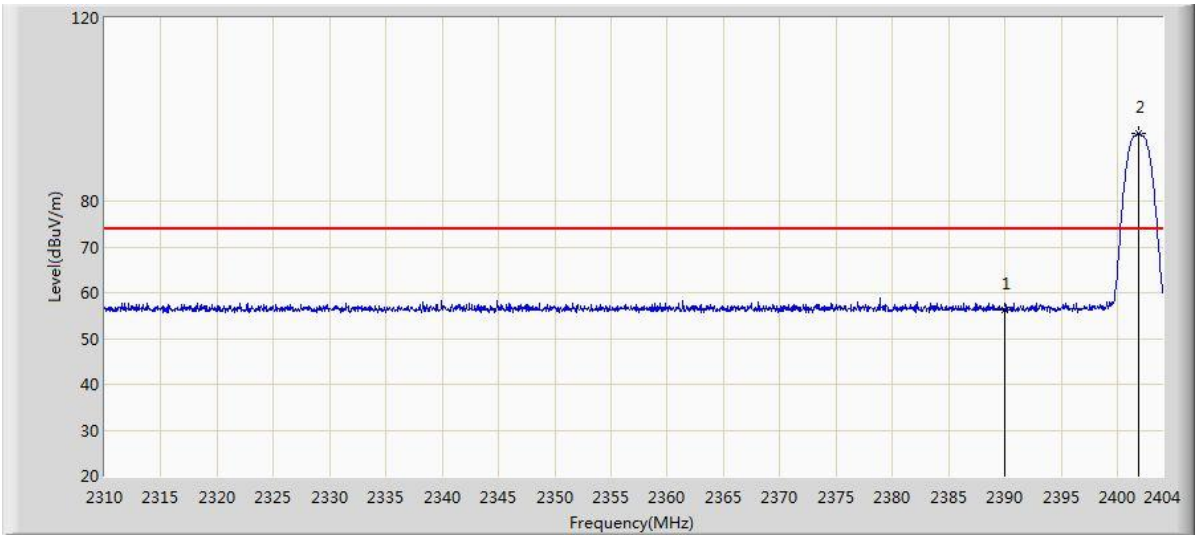
Low Channel



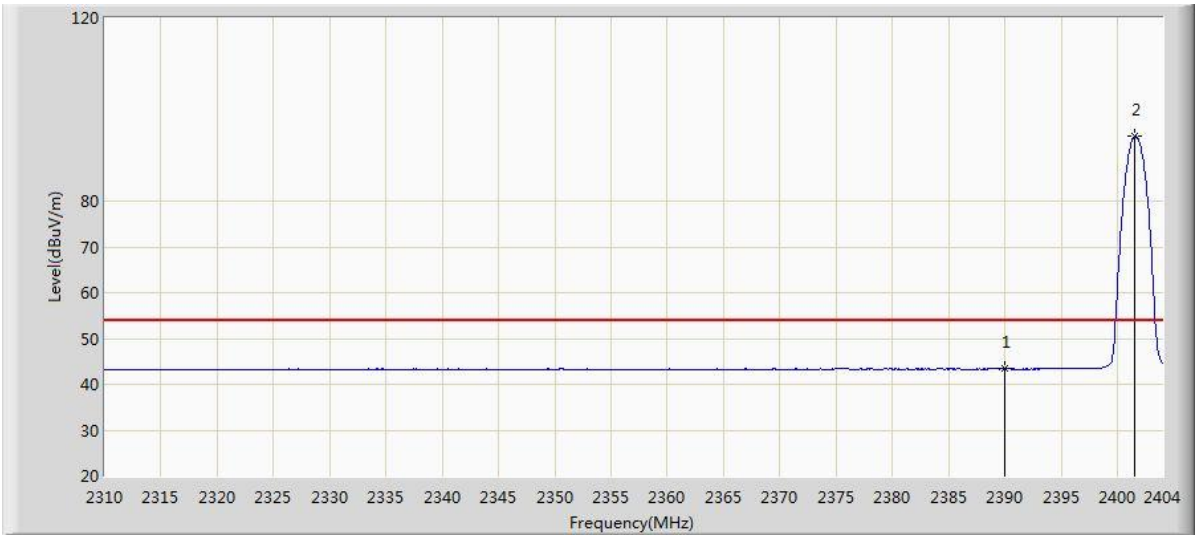
Freq. (MHz)	Measure Level (dB μ V/m)	Reading (dB μ V)	Margin (dB)	Limit (dB μ V/m)	Correct Factor (dB)	Detector	Polar
2390.000	56.007	25.323	-17.993	74.000	30.684	PK	H
2402.167	95.940	65.279	21.940	74.000	30.661	PK	



Freq. (MHz)	Measure Level (dB μ V/m)	Reading (dB μ V)	Margin (dB)	Limit (dB μ V/m)	Correct Factor (dB)	Detector	Polar
2390.000	43.312	12.628	-10.688	54.000	30.684	AV	H
2401.932	95.000	64.339	41.000	54.000	30.662	AV	

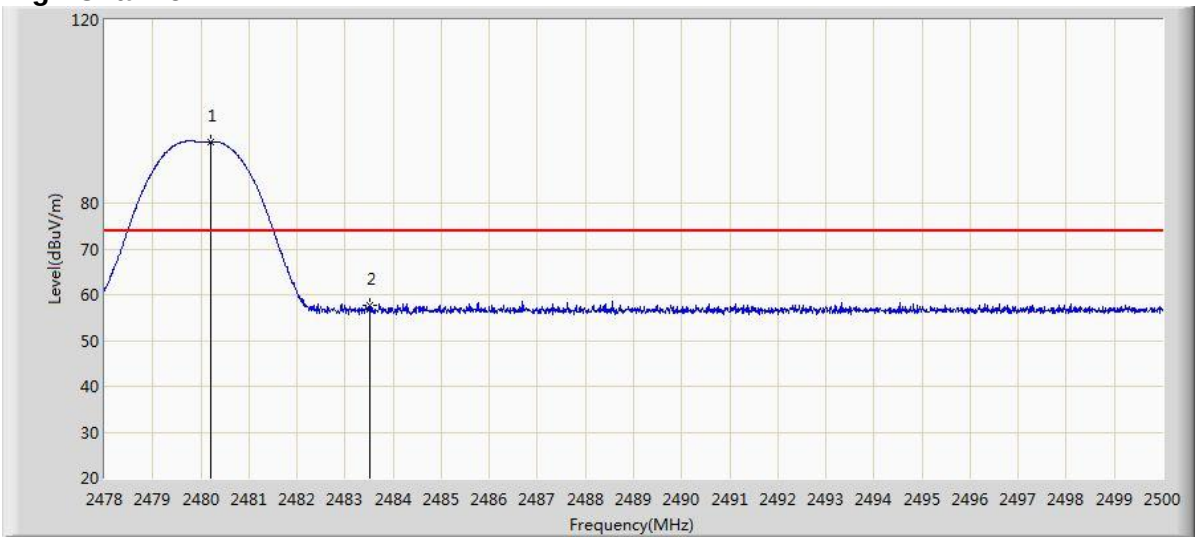


Freq. (MHz)	Measure Level (dB μ V/m)	Reading (dB μ V)	Margin (dB)	Limit (dB μ V/m)	Correct Factor (dB)	Detector	Polar
2390.000	56.329	25.645	-17.671	74.000	30.684	PK	V
2401.885	94.738	64.077	20.738	74.000	30.661	PK	

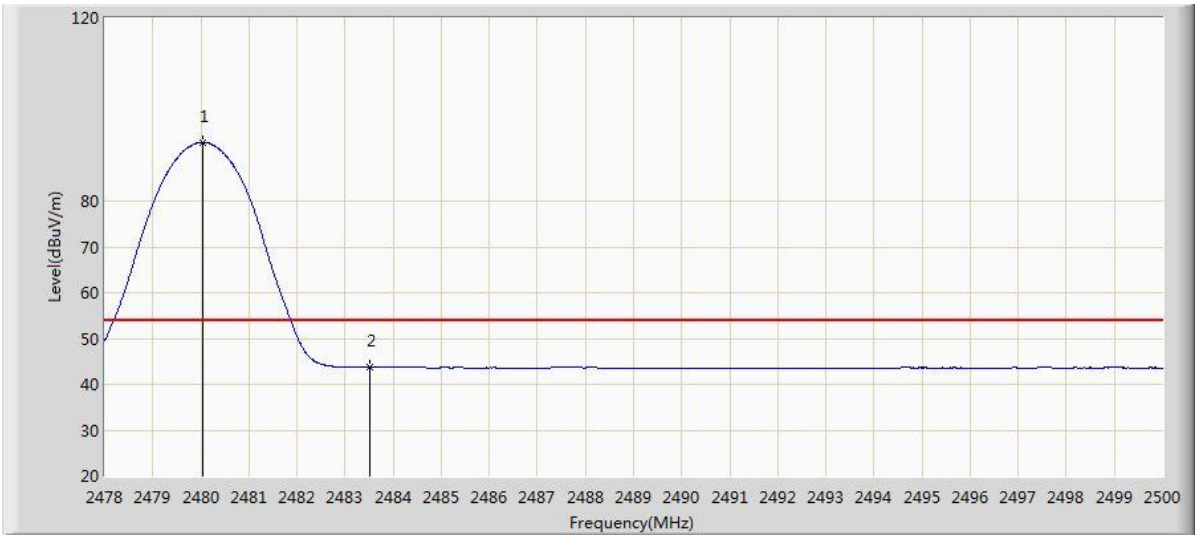


Freq. (MHz)	Measure Level (dB μ V/m)	Reading (dB μ V)	Margin (dB)	Limit (dB μ V/m)	Correct Factor (dB)	Detector	Polar
2390.000	43.355	12.671	-10.645	54.000	30.684	AV	V
2401.556	94.100	63.438	40.100	54.000	30.662	AV	

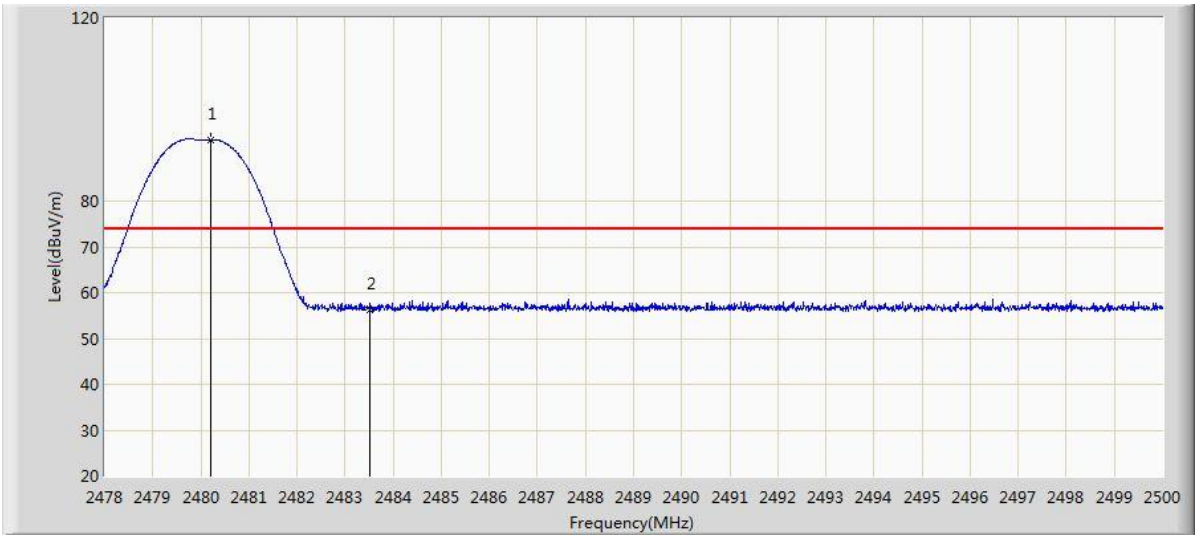
High Channel



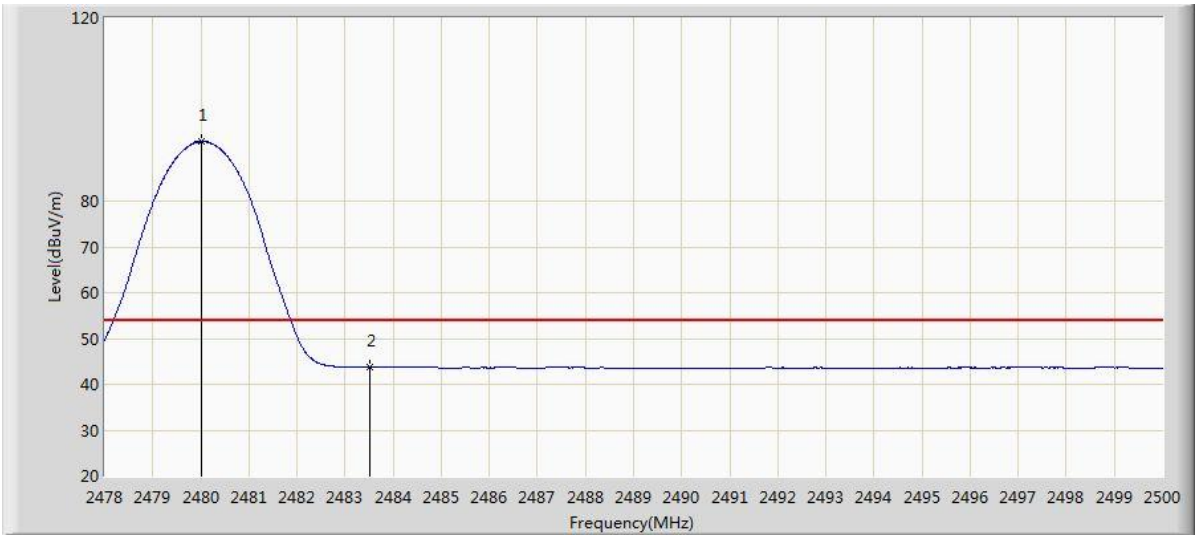
Freq. (MHz)	Measure Level (dB μ V/m)	Reading (dB μ V)	Margin (dB)	Limit (dB μ V/m)	Correct Factor (dB)	Detector	Polar
2480.211	93.459	62.796	19.459	74.000	30.663	PK	H
2483.500	57.537	26.864	-16.463	74.000	30.673	PK	



Freq. (MHz)	Measure Level (dB μ V/m)	Reading (dB μ V)	Margin (dB)	Limit (dB μ V/m)	Correct Factor (dB)	Detector	Polar
2480.046	92.773	62.110	38.773	54.000	30.662	AV	H
2483.500	43.695	13.022	-10.305	54.000	30.673	AV	



Freq. (MHz)	Measure Level (dB μ V/m)	Reading (dB μ V)	Margin (dB)	Limit (dB μ V/m)	Correct Factor (dB)	Detector	Polar
2480.200	93.460	62.797	19.460	74.000	30.663	PK	V
2483.500	56.304	25.631	-17.696	74.000	30.673	PK	



Freq. (MHz)	Measure Level (dB μ V/m)	Reading (dB μ V)	Margin (dB)	Limit (dB μ V/m)	Correct Factor (dB)	Detector	Polar
2480.002	92.953	62.291	38.953	54.000	30.662	AV	V
2483.500	43.684	13.011	-10.316	54.000	30.673	AV	

5.1.8 Frequency Separation

RESULT: **Pass**

Date of testing	:	2014-11-08
Test standard	:	FCC part 15.247(a)(1) RSS-210 A8.1(b)
Basic standard	:	ANSI C63.4: 2009
Limit	:	≥ 25kHz or two-thirds of 20dB bandwidth, whichever is greater
Kind of test site	:	Shield room

Test setup

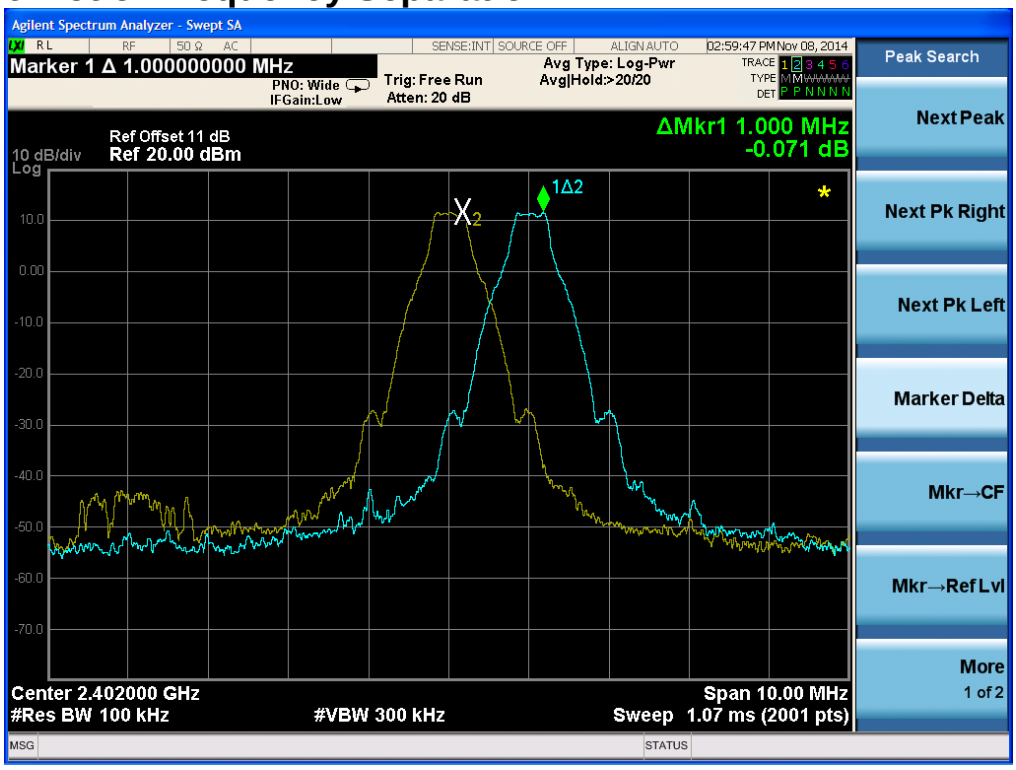
Test Channel	:	Low/ Middle/ High
Operation Mode	:	A.1.a
Ambient temperature	:	25℃
Relative humidity	:	52%
Atmospheric pressure	:	101kPa

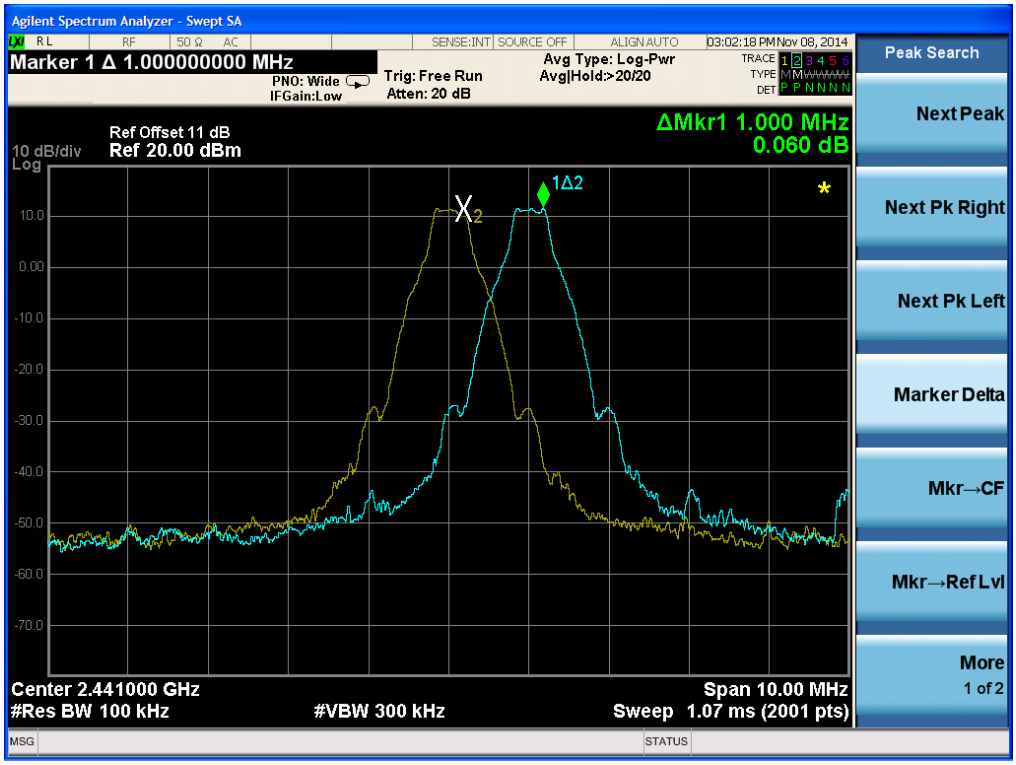
Table 13: Test result of Frequency Separation

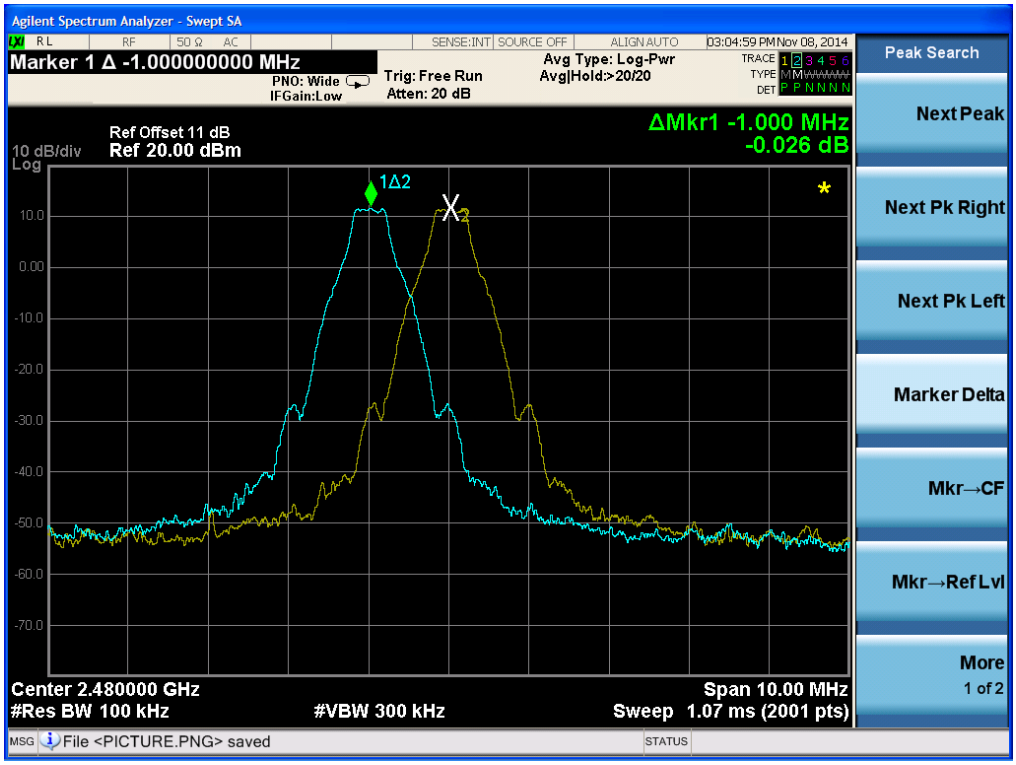
Channel	Channel Frequency (MHz)	Measured Channel Separation (MHz)	Limit (kHz)	Result
Low Channel	2402	1.000	≥ 25kHz or two-thirds of 20dB bandwidth	Pass
Adjacency Channel	2403			
Mid Channel	2441	1.000	≥ 25kHz or two-thirds of 20dB bandwidth	Pass
Adjacency Channel	2442			
High Channel	2479	1.000	≥ 25kHz or two-thirds of 20dB bandwidth	Pass
Adjacency Channel	2480			

For details refer to following test plot.

Test Plot of Frequency Separation






Agilent Spectrum Analyzer - Swept SA
Marker 1 Δ -1.000000000 MHz
PNO: Wide
IFGain:Low
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold:>20/20
03:04:59 PM Nov 08, 2014
Ref Offset 11 dB
10 dB/div
Ref 20.00 dBm
ΔMkr1 -1.000 MHz
-0.026 dB
Center 2.480000 GHz
#Res BW 100 kHz
#VBW 300 kHz
Span 10.00 MHz
Sweep 1.07 ms (2001 pts)
Peak Search
Next Peak
Next Pk Right
Next Pk Left
Marker Delta
Mkr→CF
Mkr→Ref Lvl
More
1 of 2
File <PICTURE.PNG> saved

5.1.9 Number of hopping frequency

RESULT: **Pass**

Date of testing	:	2014-11-08
Test standard	:	FCC part 15.247(a)(1)(iii) RSS-210 A8.1(d)
Basic standard	:	ANSI C63.4: 2009
Limits	:	≥ 15 non-overlapping channels
Kind of test site	:	Shield room

Test setup

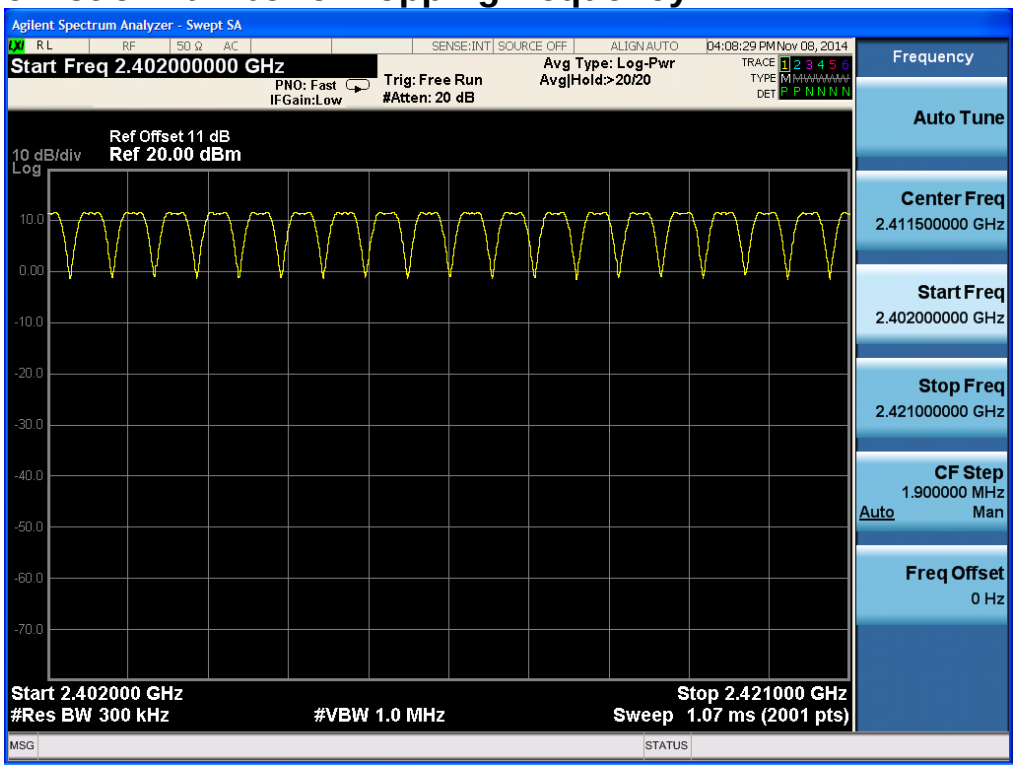
Test Channel	:	79
Operation Mode	:	A.1.a
Ambient temperature	:	25℃
Relative humidity	:	52%
Atmospheric pressure	:	101kPa

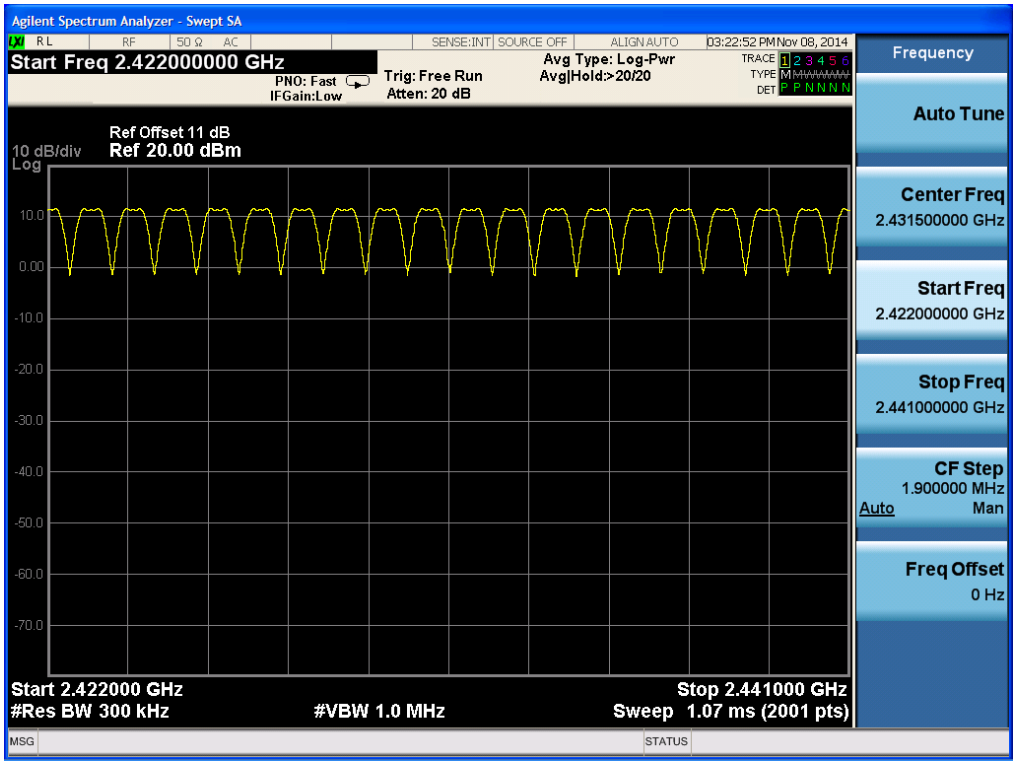
Table 14: Test result of Number of hopping frequency

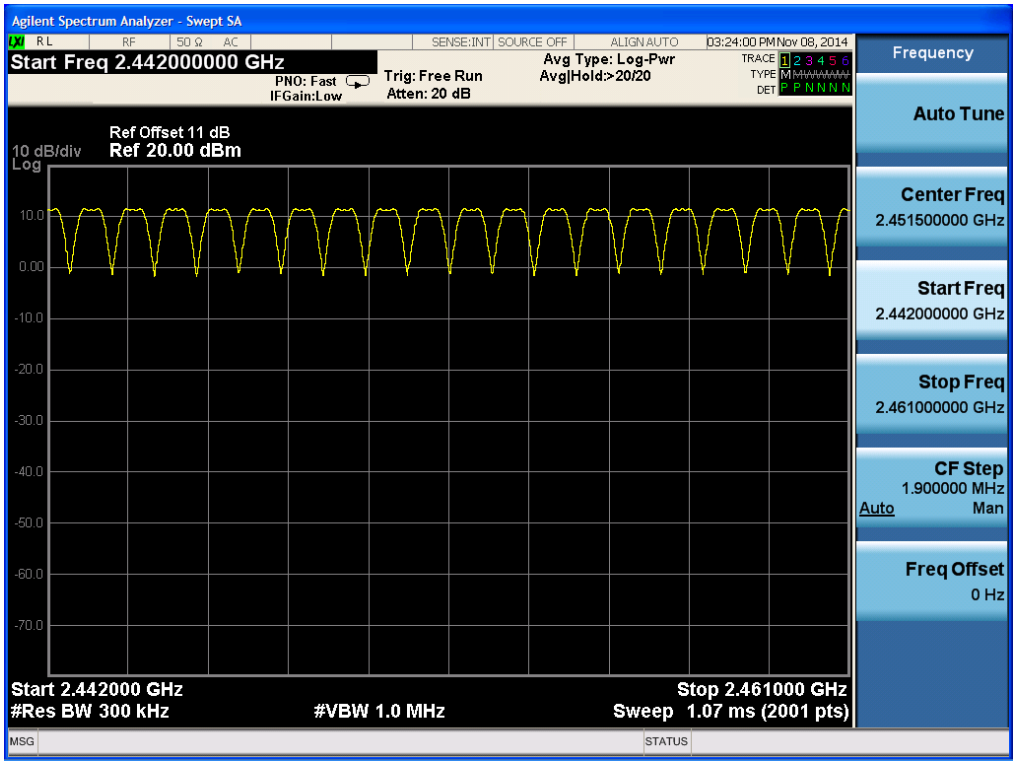
Frequency Range	Measured Quantity of Hopping Channel	Limit	Result
2402 to 2480MHz	79	≥15	Pass

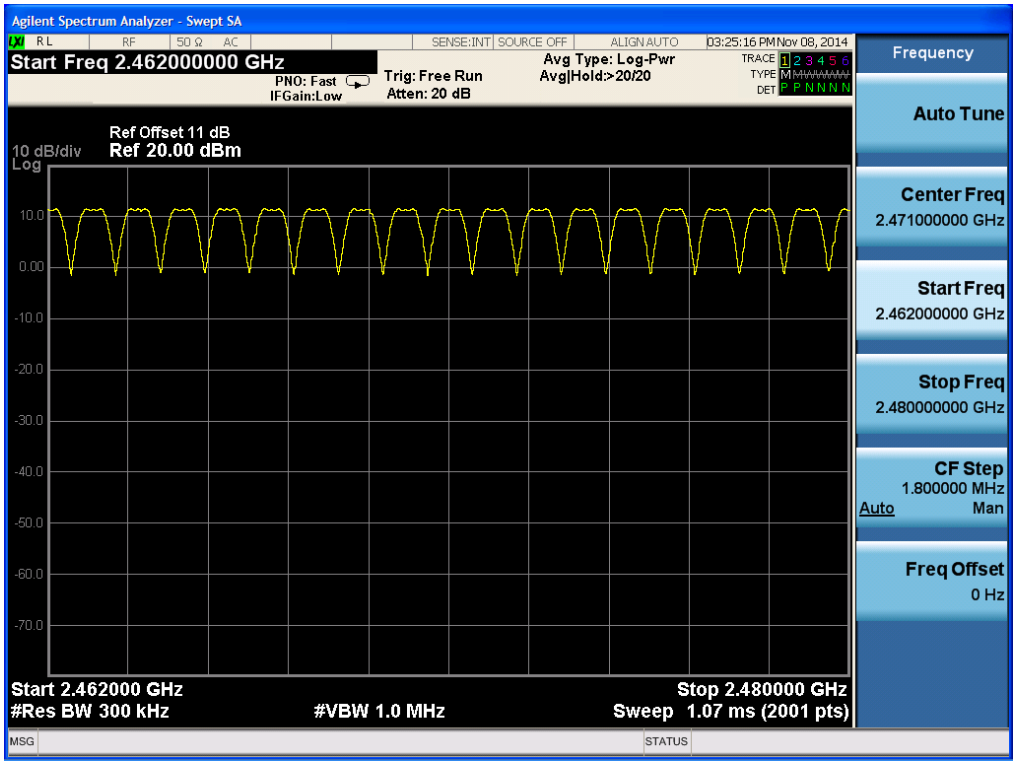
For details refer to following test plot.

Test Plot of Number of hopping frequency






Agilent Spectrum Analyzer - Swept SA
Start Freq 2.442000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold:>20/20
03:24:00 PM Nov 08, 2014
Ref Offset 11 dB
10 dB/div
Ref 20.00 dBm
Log
Start 2.442000 GHz
#Res BW 300 kHz
#VBW 1.0 MHz
Stop 2.461000 GHz
Sweep 1.07 ms (2001 pts)
Frequency
Auto Tune
Center Freq
2.451500000 GHz
Start Freq
2.442000000 GHz
Stop Freq
2.461000000 GHz
CF Step
1.900000 MHz
Auto
Man
Freq Offset
0 Hz
MSG
STATUS


Agilent Spectrum Analyzer - Swept SA
Start Freq 2.462000000 GHz
PNO: Fast
IFGain:Low
Trig: Free Run
Atten: 20 dB
Avg Type: Log-Pwr
Avg|Hold:>20/20
03:25:16 PM Nov 08, 2014
Ref Offset 11 dB
10 dB/div
Ref 20.00 dBm
Log
Start 2.462000 GHz
#Res BW 300 kHz
#VBW 1.0 MHz
Stop 2.480000 GHz
Sweep 1.07 ms (2001 pts)
Frequency
Auto Tune
Center Freq
2.471000000 GHz
Start Freq
2.462000000 GHz
Stop Freq
2.480000000 GHz
CF Step
1.800000 MHz
Auto
Man
Freq Offset
0 Hz
MSG
STATUS

5.1.10 Time of Occupancy

RESULT: **Pass**

Date of testing	:	2014-11-08
Test standard	:	FCC part 15.247(a)(1)(iii) RSS-210 A8.1(d)
Basic standard	:	ANSI C63.4: 2009
Limits	:	0.4s
Kind of test site	:	Shield room

Test setup

Test Channel	:	Middle
Operation Mode	:	A.1.a
Ambient temperature	:	25℃
Relative humidity	:	52%
Atmospheric pressure	:	101kPa

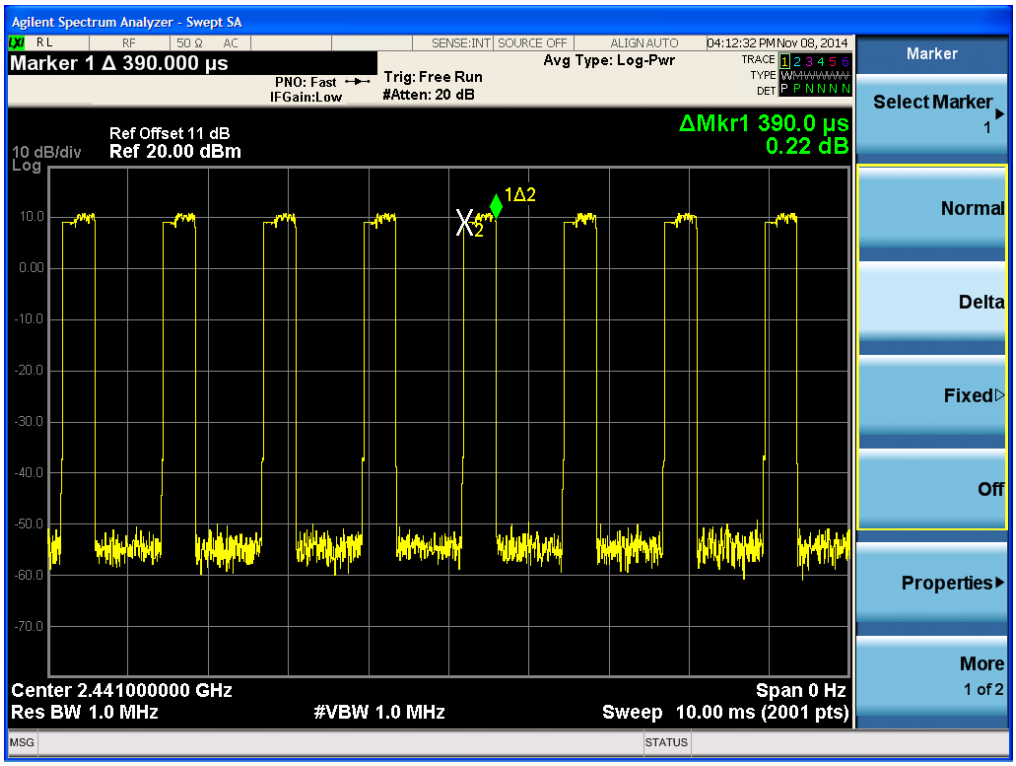
Table 15: Test result of Time of Occupancy

Mode	Packet Type	Channel Frequency (MHz)	Packet Duration [ms]	Number of Hops per Channel	Dwell Time (ms)	Limit (ms)
EDR	DH1	2441	0.39	320	124.80	400
	DH3	2441	1.64	160	257.60	400
	DH5	2441	2.89	104	300.56	400

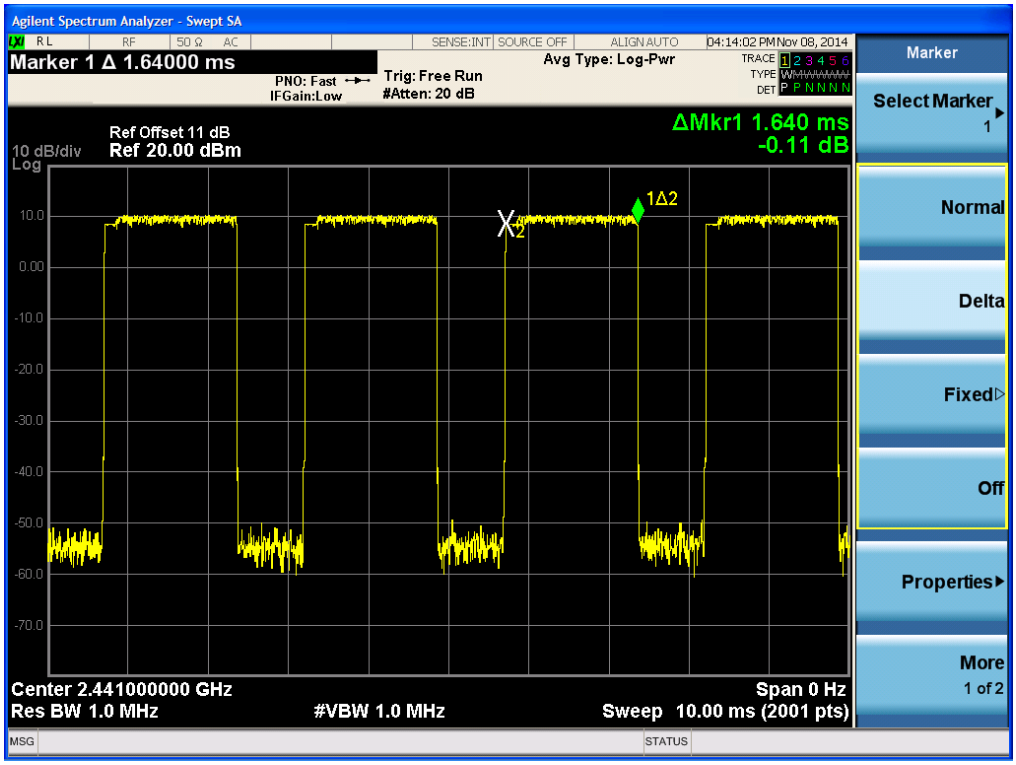
For details refer to following test plot.

Test Plot of Number of hopping frequency

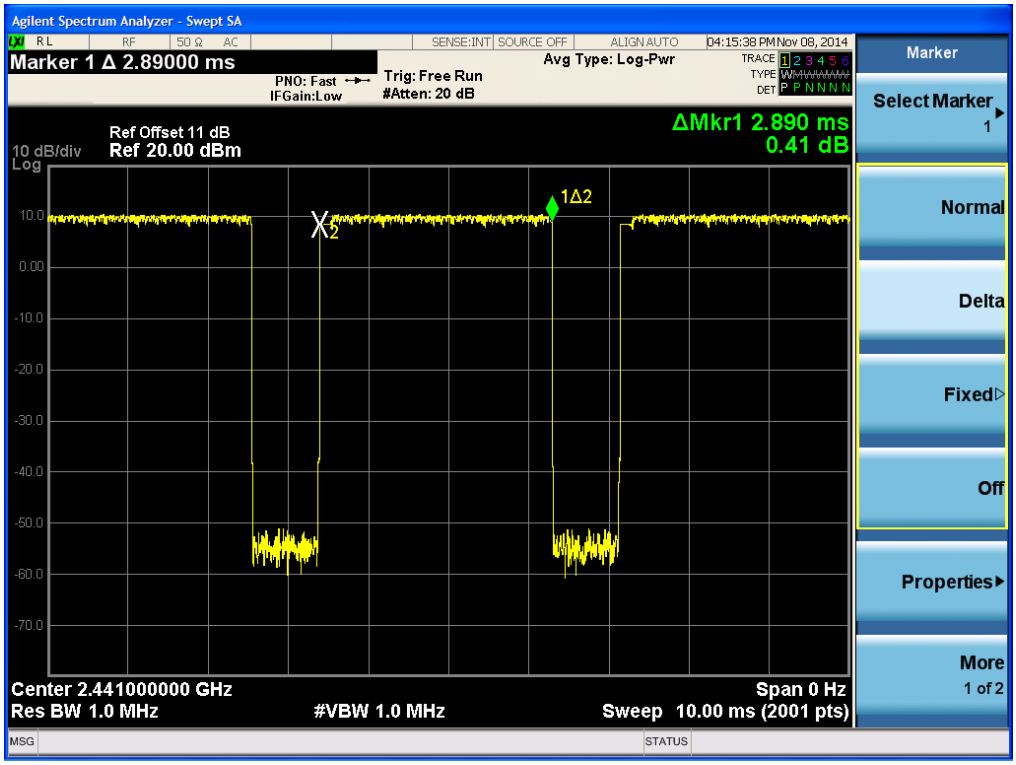
DH1



DH3



DH5


Agilent Spectrum Analyzer - Swept SA
Marker 1 Δ 2.89000 ms
PNO: Fast
IFGain:Low
Trig: Free Run
#Atten: 20 dB
Avg Type: Log-Pwr
04:15:38 PM Nov 08, 2014
Ref Offset 11 dB
10 dB/div
Log
Ref 20.00 dBm
ΔMkr1 2.890 ms
0.41 dB
1Δ2
Center 2.441000000 GHz
Res BW 1.0 MHz
#VBW 1.0 MHz
Span 0 Hz
Sweep 10.00 ms (2001 pts)
Marker
Select Marker
Normal
Delta
Fixed
Off
Properties
More
1 of 2
MSG
STATUS

5.1.11 Conducted emissions

RESULT: **Pass**

Date of testing	:	2014-11-13
Test standard	:	FCC Part 15.207 RSS-210 Clause 2.6
Basic standard	:	ANSI C63.4: 2009
Frequency range	:	0.15 – 30MHz
Limits	:	FCC Part 15.207
Kind of test site	:	Shield room

Test setup

Input Voltage	:	AC 120V, 60Hz
Operation Mode	:	A.1, A.2
Earthing	:	Not Connected
Ambient temperature	:	25℃
Relative humidity	:	52%
Atmospheric pressure	:	101kPa

Table 16: Test result of Conducted Emission of Buletooth (BDR/EDR mode)

L Phase

Frequency (MHz)	Measure Level (dBuV)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV)	Factor	Type	Comment
0.154	53.469	42.729	-12.313	65.781	10.740	QP	PASS
0.154	41.710	30.971	-14.071	55.781	10.740	AV	PASS
0.186	35.818	25.779	-28.395	64.213	10.039	QP	PASS
0.186	18.566	8.527	-35.647	54.213	10.039	AV	PASS
0.542	25.446	15.301	-30.554	56.000	10.145	QP	PASS
0.542	16.871	6.726	-29.129	46.000	10.145	AV	PASS
8.514	23.144	12.962	-36.856	60.000	10.182	QP	PASS
8.514	16.397	6.216	-33.603	50.000	10.182	AV	PASS
19.178	21.549	11.422	-38.451	60.000	10.127	QP	PASS
19.178	13.552	3.425	-36.448	50.000	10.127	AV	PASS
21.426	21.319	11.158	-38.681	60.000	10.161	QP	PASS
21.426	14.680	4.519	-35.320	50.000	10.161	AV	PASS

N Phase

Frequency (MHz)	Measure Level (dBuV)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV)	Factor	Type	Comment
0.150	54.439	43.296	-11.561	66.000	11.142	QP	PASS
0.150	41.049	29.907	-14.951	56.000	11.142	AV	PASS
0.166	46.649	36.578	-18.509	65.158	10.071	QP	PASS
0.166	27.462	17.390	-27.697	55.158	10.071	AV	PASS
0.570	24.603	14.456	-31.397	56.000	10.148	QP	PASS
0.570	13.436	3.289	-32.564	46.000	10.148	AV	PASS
0.902	22.449	12.485	-33.551	56.000	9.963	QP	PASS
0.902	9.301	-0.662	-36.699	46.000	9.963	AV	PASS
8.874	21.876	11.705	-38.124	60.000	10.171	QP	PASS
8.874	14.955	4.784	-35.045	50.000	10.171	AV	PASS
27.194	22.567	12.198	-37.433	60.000	10.369	QP	PASS
27.194	16.946	6.577	-33.054	50.000	10.369	AV	PASS

Table 17: Test result of Conducted Emission of Buletooth (BLE mode)

L Phase

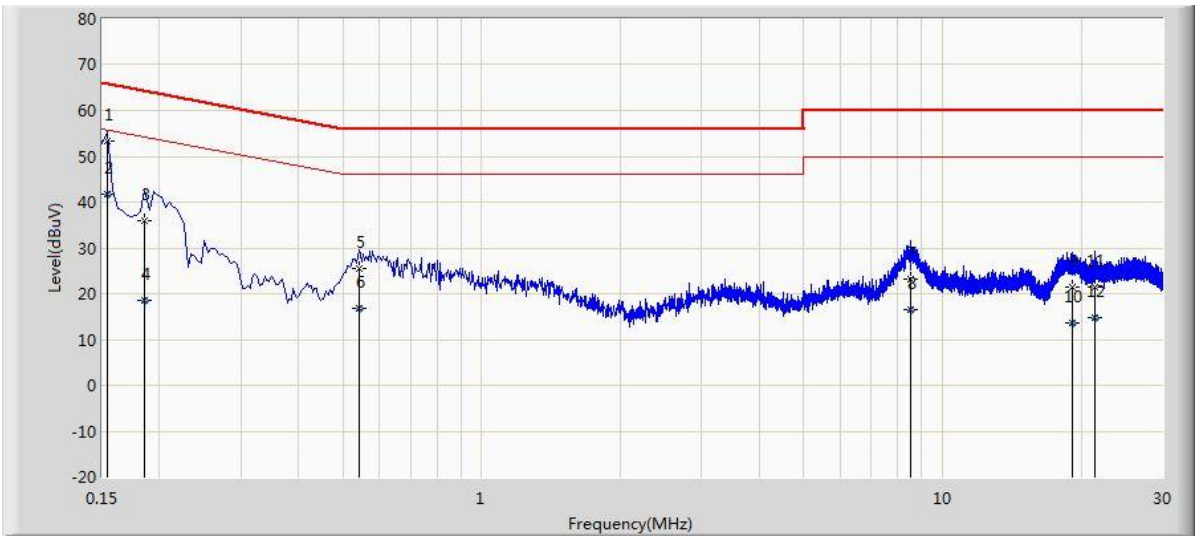
Frequency (MHz)	Measure Level (dBuV)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV)	Factor	Type	Comment
0.150	45.407	34.238	-20.593	66.000	11.168	QP	PASS
0.150	40.092	28.924	-15.908	56.000	11.168	AV	PASS
0.198	37.423	27.418	-26.271	63.694	10.005	QP	PASS
0.198	31.052	21.047	-22.642	53.694	10.005	AV	PASS
0.246	34.873	24.912	-27.019	61.891	9.961	QP	PASS
0.246	30.202	20.241	-21.690	51.891	9.961	AV	PASS
0.390	46.384	36.307	-11.680	58.064	10.077	QP	PASS
0.390	44.054	33.977	-4.010	48.064	10.077	AV	PASS
0.986	30.169	20.253	-25.831	56.000	9.916	QP	PASS
0.986	26.012	16.096	-19.988	46.000	9.916	AV	PASS
16.454	27.900	17.826	-32.100	60.000	10.075	QP	PASS
16.454	22.282	12.207	-27.718	50.000	10.075	AV	PASS

N Phase

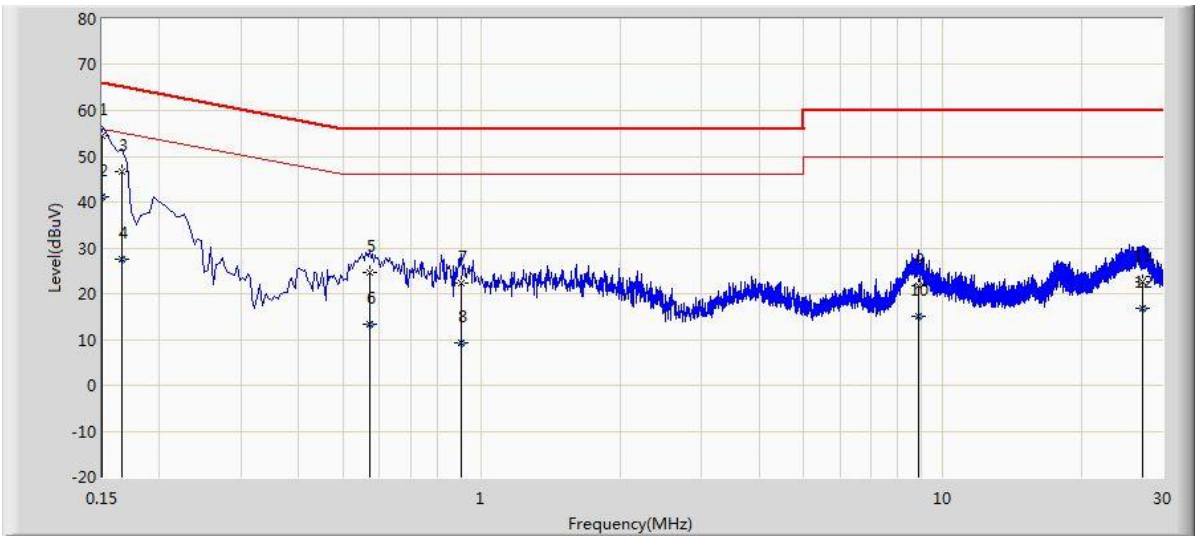
Frequency (MHz)	Measure Level (dBuV)	Reading Level (dBuV)	Over Limit (dB)	Limit (dBuV)	Factor	Type	Comment
0.154	44.597	33.881	-21.184	65.781	10.716	QP	PASS
0.154	39.936	29.220	-15.845	55.781	10.716	AV	PASS
0.218	36.781	26.800	-26.114	62.895	9.981	QP	PASS
0.218	29.770	19.789	-23.124	52.895	9.981	AV	PASS
0.342	40.484	30.416	-18.670	59.155	10.069	QP	PASS
0.342	27.445	17.376	-21.710	49.155	10.069	AV	PASS
0.390	46.253	36.148	-11.811	58.064	10.105	QP	PASS
0.390	44.386	34.282	-3.677	48.064	10.105	AV	PASS
2.006	29.209	19.336	-26.791	56.000	9.873	QP	PASS
2.006	21.941	12.068	-24.059	46.000	9.873	AV	PASS
16.170	23.246	13.125	-36.754	60.000	10.121	QP	PASS
16.170	17.894	7.773	-32.106	50.000	10.121	AV	PASS

Test Plot of Conducted Emission of BDR/EDR mode

L Phase

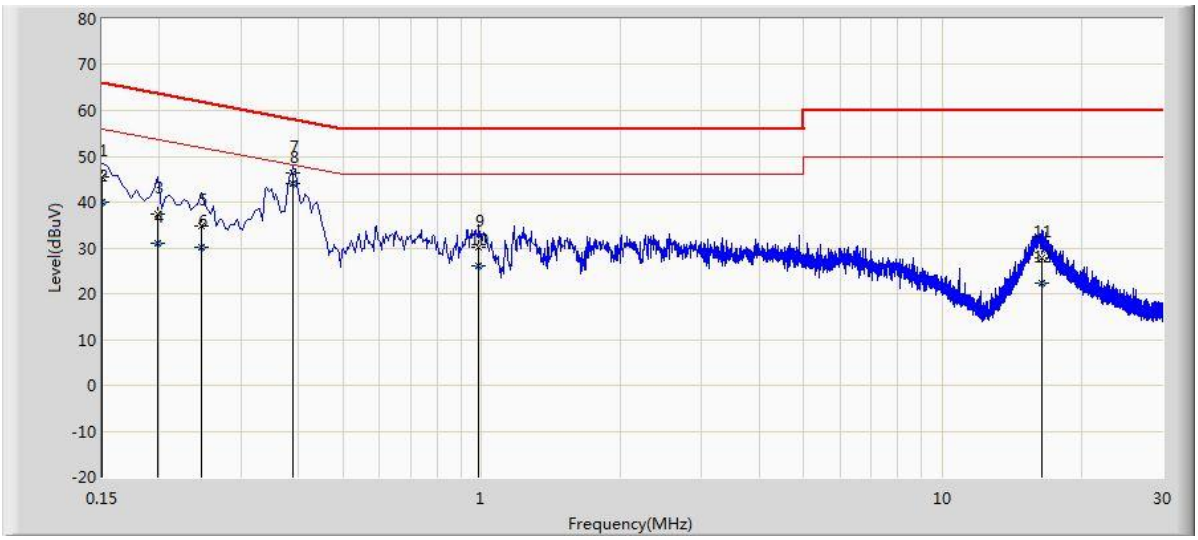


N Phase

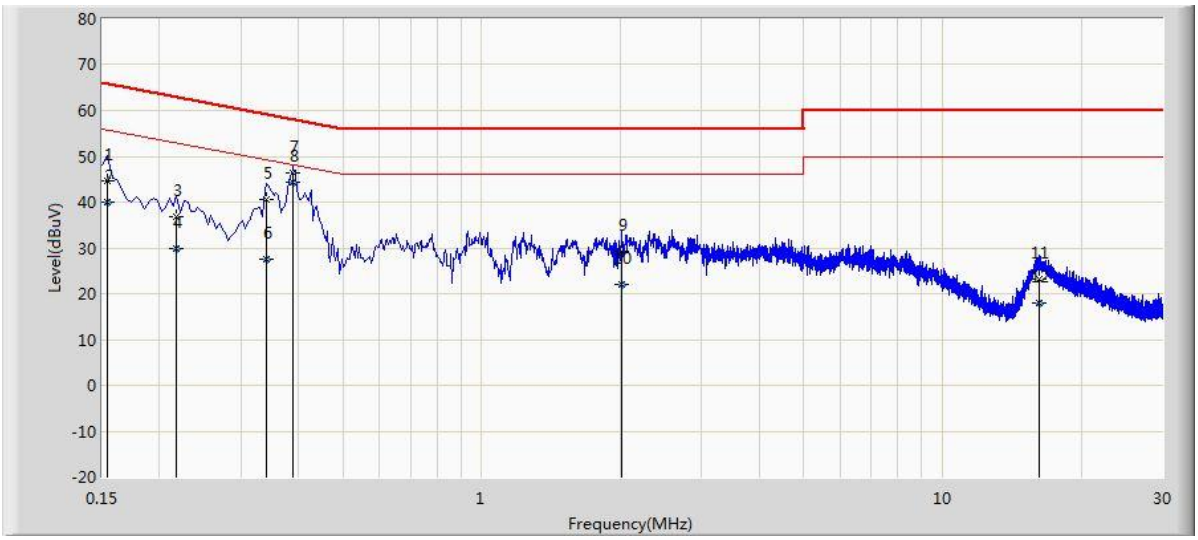


Test Plot of Conducted Emission of BLE mode

L Phase



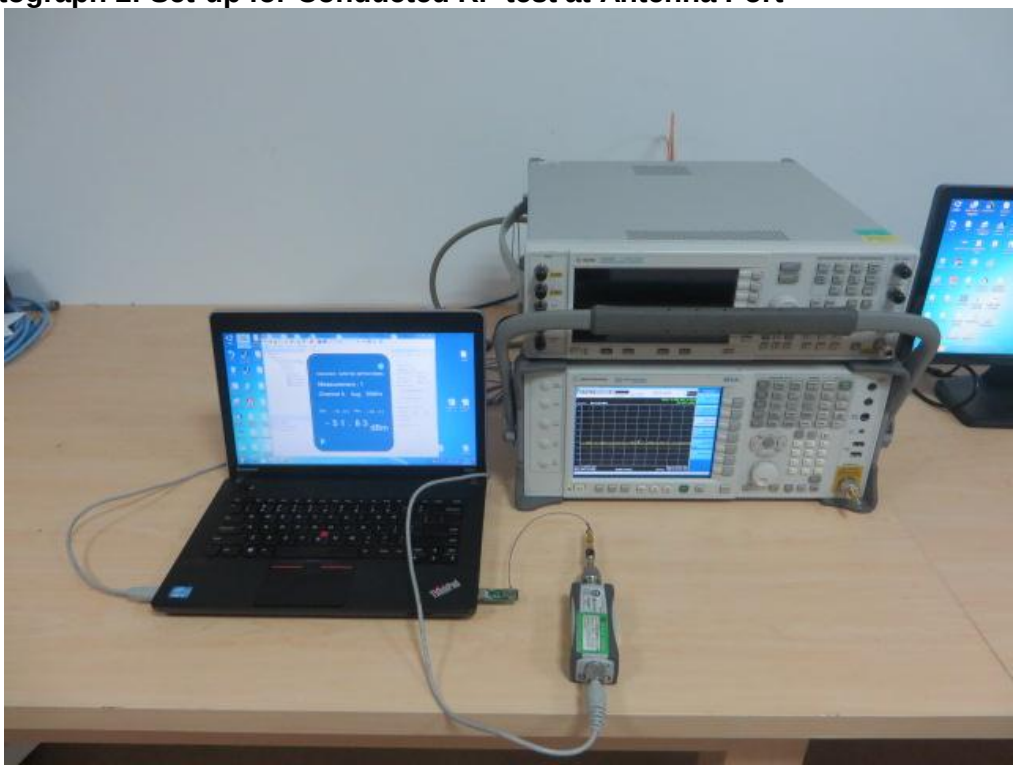
N Phase



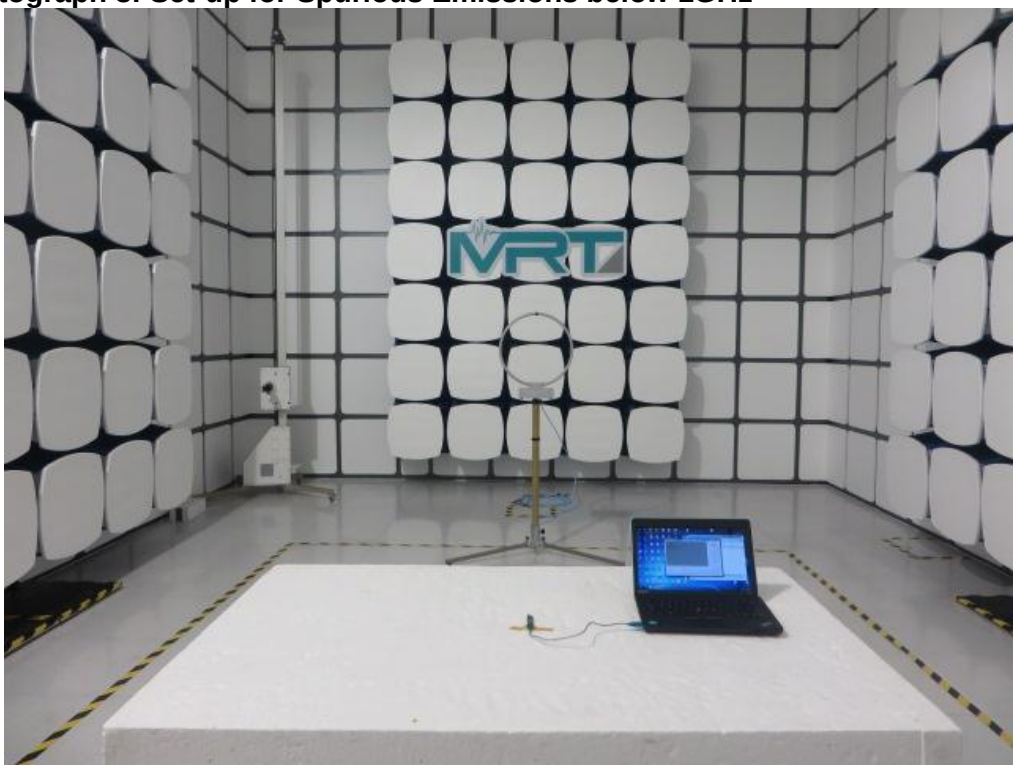
6. Photographs of the Test Set-Up

Photograph 1: Set-up for Conducted Emissions

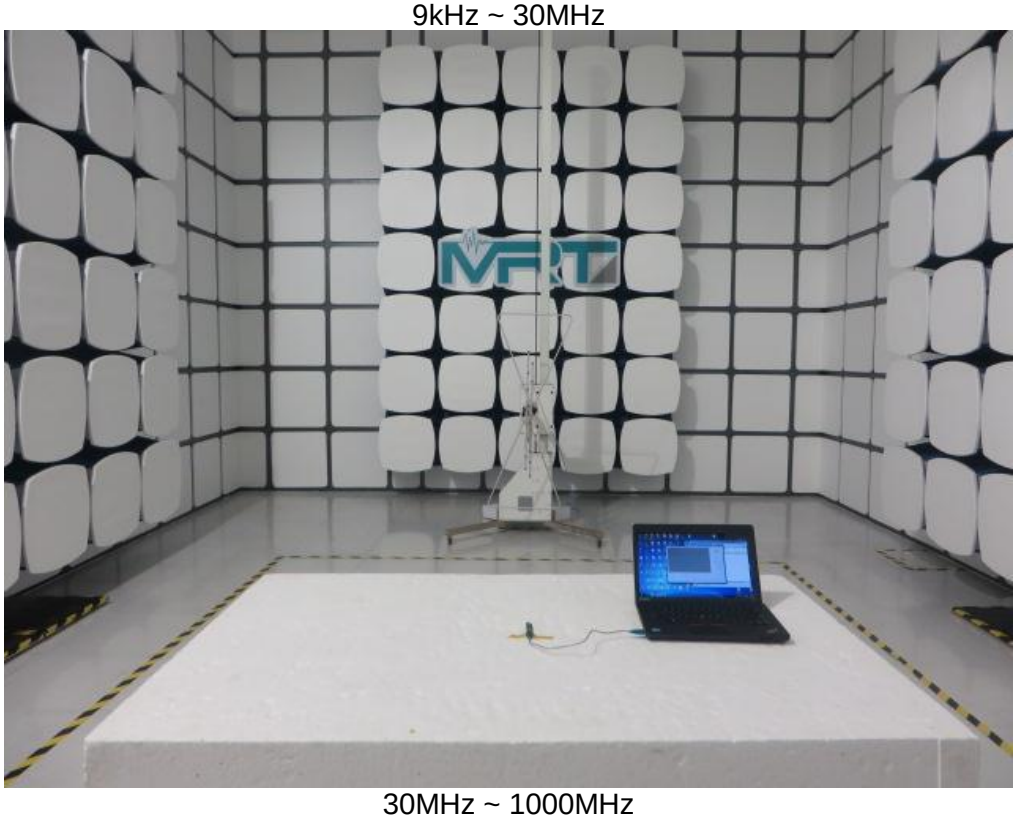
Photograph 2: Set-up for Conducted RF test at Antenna Port



Photograph 3: Set-up for Spurious Emissions below 1GHz

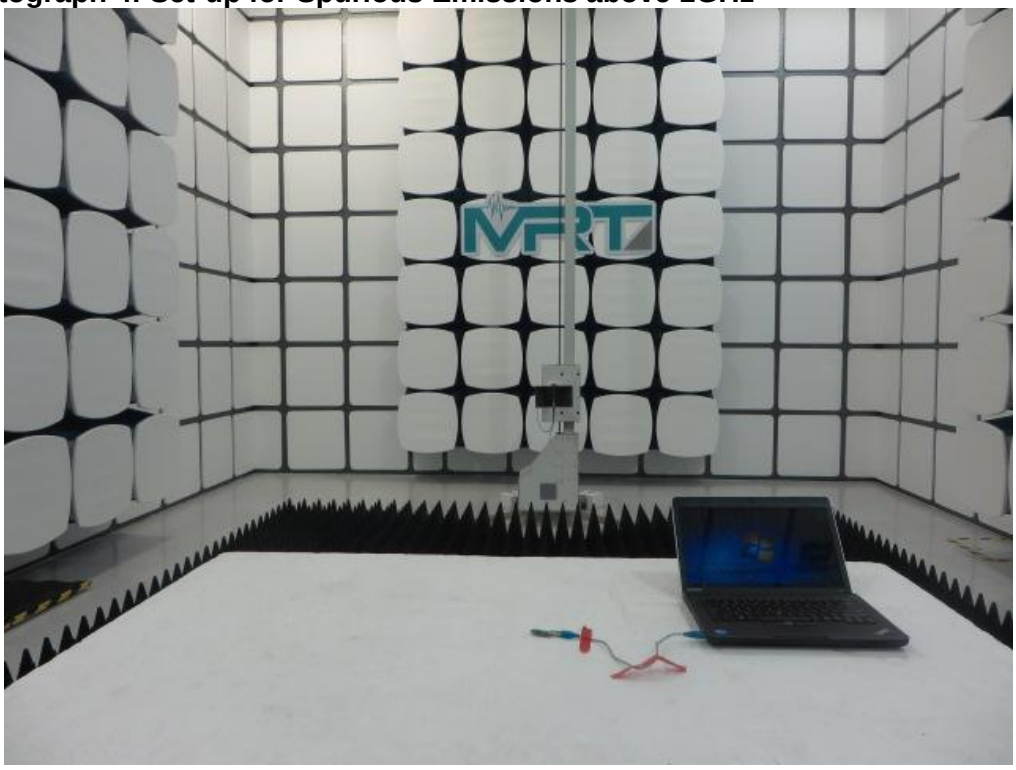


9kHz ~ 30MHz

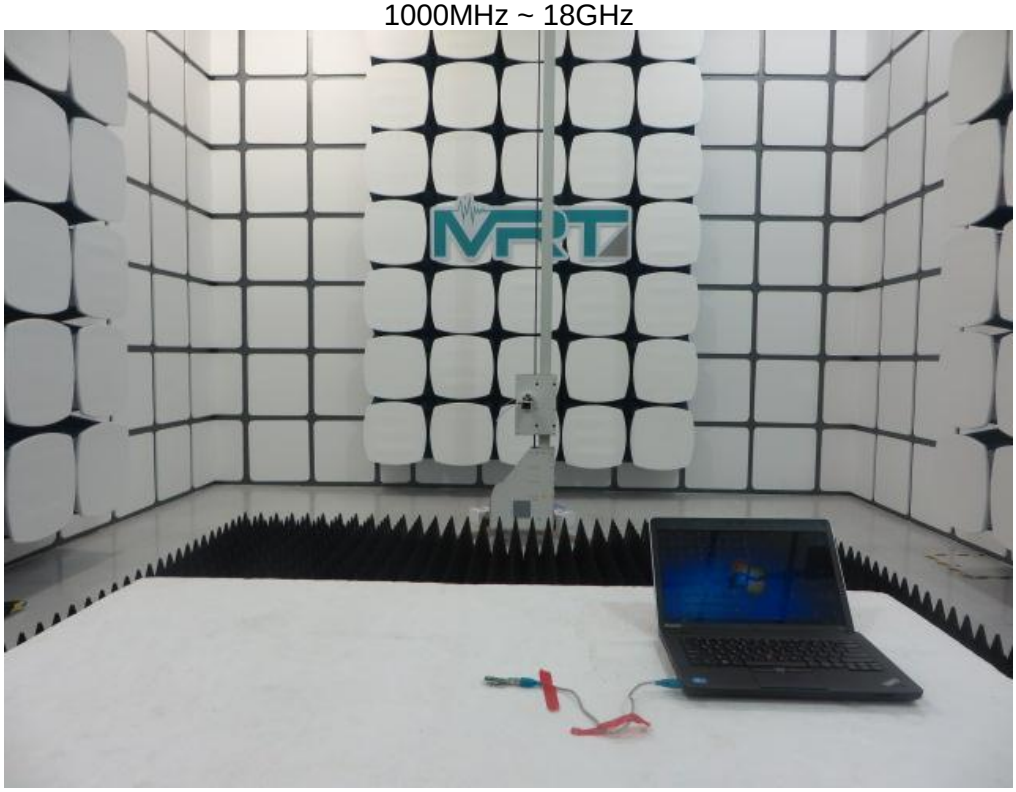


30MHz ~ 1000MHz

Photograph 4: Set-up for Spurious Emissions above 1GHz



1000MHz ~ 18GHz



Above 18GHz

7. List of Tables

8. List of Photographs

9. Appendix I

RF Exposure statement

FCC Requirement

According to FCC 2.1091, mobile equipment must comply with the following applicable limit for maximum permissible exposure (MPE) specified in FCC 1.1310:

Equipment Use	Frequency Range	Power Density [mW/cm^2]	Average Time [min]
General Population / Uncontrolled Exposure	1.5 – 100GHz	1	6

IC Requirement

According to RSS-102 (Issue 4), clause 2.5.2, no routine RF exposure evaluation is required if the transmitter power (e.i.r.p.) is below the following threshold:

Frequency Range	SAR Limitation [W]
Above 1.5GHz	5

Measurement Result

The maximum measured transmitter power is the following:

Conducted Output Power Pout [dBm]	Conducted Output Power Pout [mW]	Maximum Antenna Gain [dBi]	Pout EIRP [mW]	Power Density at 20cm [mW/cm2]
11.54	14.26	0.5	16.00	0.003

Note:

The power density S in mW/cm^2 is calculated according to the Friis formula:

$$S = (P_{out} \cdot G) / (4\pi \cdot D^2),$$

where
S = power density in mW/cm^2
P_{out} = antenna conducted output power in mW
G = antenna gain in linear scale (here: 0.5dBi=10log(G))
D = distance between observation point and radiating structure in cm (here: 20cm)

Conclusion

The device complies with the FCC and IC RF exposure requirements since the maximum transmitter power density is below the FCC limit and the e.i.r.p. power is below the IC RF exposure evaluation exemption threshold.