



CFR 47 FCC PART 15 SUBPART C

TEST REPORT

For

Remote Control

MODEL NUMBER: RC802V, RC80***(*can be 0~9 or A~Z or blank or -CA)**

FCC ID: W8URC802V

REPORT NUMBER: 4789191284.1-1

ISSUE DATE: November 11, 2019

Prepared for

**TTE Technology, Inc.
1860 Compton Ave Corona California 92881 United States**

Prepared by

UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch

Building 10, Innovation Technology Park, No. 1, Li Bin Road, Song Shan Lake Hi-Tech Development Zone Dongguan, 523808, People's Republic of China

Tel: +86 769 22038881

Fax: +86 769 33244054

Website: www.ul.com



Revision History

Rev.	Issue Date	Revisions	Revised By
V0	11/11/2019	Initial Issue	



Summary of Test Results			
Clause	Test Items	FCC Rules	Test Results
1	20dB Bandwidth and 99% Occupied Bandwidth	CFR 47 FCC §15.215 (c)	Pass
2	Radiated Emission	CFR 47 FCC §15.249 (a)(d)(e) CFR 47 FCC §15.205 and §15.209	Pass
3	Antenna Requirement	CFR 47 FCC §15.203	Pass
This test report is only published to and used by the applicant, and it is not for evidence purpose in China.			



TABLE OF CONTENTS

1. ATTESTATION OF TEST RESULTS	6
2. TEST METHODOLOGY	7
3. FACILITIES AND ACCREDITATION	7
4. CALIBRATION AND UNCERTAINTY	8
4.1. MEASURING INSTRUMENT CALIBRATION	8
4.2. MEASUREMENT UNCERTAINTY	8
5. EQUIPMENT UNDER TEST	9
5.1. DESCRIPTION OF EUT	9
5.2. MAXIMUM FIELD STRENGTH	9
5.3. CHANNEL LIST	9
5.4. DESCRIPTION OF AVAILABLE ANTENNAS	10
5.5. TEST CHANNEL CONFIGURATION	10
5.6. THE WORSE CASE POWER SETTING PARAMETER	10
5.7. TEST ENVIRONMENT	10
5.8. DESCRIPTION OF TEST SETUP	11
5.9. MEASURING INSTRUMENT AND SOFTWARE USED	12
6. ANTENNA PORT TEST RESULTS	13
6.1. ON TIME AND DUTY CYCLE	13
6.2. 20 dB BANDWIDTH AND 99% OCCUPIED BANDWIDTH	15
7. RADIATED TEST RESULTS	20
7.1. LIMITS AND PROCEDURE	20
7.2. RESTRICTED BANDEDGE AND FIELD STRENGTH OF INTENTIONAL EMISSIONS 27	
7.2.1. BLE 1Mbps MODE	27
7.2.2. BLE 2Mbps MODE	33
7.3. SPURIOUS EMISSIONS (1~3GHz)	39
7.3.1. BLE 1Mbps MODE	39
7.3.2. BLE 2Mbps MODE	45
7.4. SPURIOUS EMISSIONS (3~18GHz)	51
7.4.1. BLE 1Mbps MODE	51
7.4.2. BLE 2Mbps MODE	57
7.5. SPURIOUS EMISSIONS (18~26GHz)	63
7.6. SPURIOUS EMISSIONS BELOW 30MHz	65
7.7. SPURIOUS EMISSIONS BELOW 1GHz AND ABOVE 30MHz	68



8. ANTENNA REQUIREMENTS.....70



1. ATTESTATION OF TEST RESULTS

Applicant Information

Company Name: TTE Technology, Inc.
Address: 1860 Compton Ave Corona California 92881 United States

Manufacturer Information

Company Name: TTE Technology, Inc.
Address: 1860 Compton Ave Corona California 92881 United States

EUT Information

EUT Name: Remote Control
Model: RC802V
Series Model: RC80*****(*can be 0~9 or A~Z or blank or -CA)
Model difference: See section 5.1 of this report for detail
Sample Received Date: September 29, 2019
Sample Status: Normal
Sample ID: 2586441
Date of Tested: October 8, 2019 ~ November 8, 2019

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
CFR 47 FCC PART 15 SUBPART C	PASS

Prepared By:

Denny Huang
Project Engineer

Checked By:

Shawn Wen
Laboratory Leader

Approved By:

Stephen Guo
Laboratory Manager



2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with KDB 414788 D01 Radiated Test Site v01r01, FCC CFR 47 Part 2, FCC CFR 47 Part 15, ANSI C63.10-2013, ISED RSS-210 Issue 9 and RSS-GEN Issue 5.

3. FACILITIES AND ACCREDITATION

Accreditation Certificate	A2LA (Certificate No.: 4102.01) UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch. has been assessed and proved to be in compliance with A2LA. FCC (FCC Designation No.: CN1187) UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch. Has been recognized to perform compliance testing on equipment subject to the Commission's Declaration of Conformity (DoC) and Certification rules. IC (Company No.: 21320) UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch. has been registered and fully described in a report filed with ISED. The Company Number is 21320. VCCI (Registration No.: G-20019, R-20004, C-20012 and T-20011) UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch. has been assessed and proved to be in compliance with VCCI, the Membership No. is 3793. Facility Name: Chamber D, the VCCI registration No. is G-20019 and R-20004 Shielding Room B , the VCCI registration No. is C-20012 and T-20011
---------------------------	--

Note:

1. All tests measurement facilities use to collect the measurement data are located at Building 10, Innovation Technology Park, Song Shan Lake Hi tech Development Zone, Dongguan, 523808, China
2. The test anechoic chamber in UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch had been calibrated and compared to the open field sites and the test anechoic chamber is shown to be equivalent to or worst case from the open field site.
3. For below 30MHz, lab had performed measurements at test anechoic chamber and comparing to measurements obtained on an open field site. And these measurements below 30MHz had been correlated to measurements performed on an OFS.



4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations and is traceable to recognized national standards.

4.2. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

Test Item	Uncertainty
Conduction emission	3.62dB
Radiation Emission test (include Fundamental emission) (9KHz-30MHz)	2.2dB
Radiation Emission test (include Fundamental emission) (30MHz-1GHz)	4.00dB
Radiation Emission test (1GHz to 26GHz) (include Fundamental emission)	5.78dB (1GHz-18Gz)
	5.23dB (18GHz-26Gz)
Note: This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.	



5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

EUT Name	Remote Control	
Model	RC802V	
Series Model	RC80*****(*can be 0~9 or A~Z or blank or -CA)	
Model difference	RC80*****(*can be 0~9 or A~Z or blank or -CA) have the same technical construction including circuit diagram, PCB Layout, components and component layout, all electrical construction and mechanical construction with RC802V.The difference lies only the model number and color.	
Product Description	Operation Frequency	2402 MHz ~ 2480 MHz
	Modulation Type	GFSK
	Date Rate	1Mbps and 2Mbps
Rated Input	DC 3.0V by battery	

5.2. MAXIMUM FIELD STRENGTH

Frequency Range (MHz)	Mode	Frequency (MHz)	Channel Number	Max AVG field strength (dBμV/m)
2402-2480	BLE 1Mbps	2402	0[40]	92.15
2402-2480	BLE 2Mbps	2402	0[40]	92.91

5.3. CHANNEL LIST

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



5.4. DESCRIPTION OF AVAILABLE ANTENNAS

Ant.	Frequency (MHz)	Antenna Type	Antenna Gain (dBi)
1	2402~ 2480	Bended Monopole Antenna	1.0

Test Mode	Transmit and Receive Mode	Description
BLE 1Mbps	☒ 1TX, 1RX	Antenna 1 can be used as transmitting/receiving antenna.
BLE 2Mbps	☒ 1TX, 1RX	Antenna 1 can be used as transmitting/receiving antenna.

5.5. TEST CHANNEL CONFIGURATION

Test Mode	Test Channel	Frequency
BLE 1Mbps	CH 0, CH 19, CH 39	2402MHz, 2440MHz, 2480MHz
BLE 2Mbps	CH 0, CH 19, CH 39	2402MHz, 2440MHz, 2480MHz

5.6. THE WORSE CASE POWER SETTING PARAMETER

The Worse Case Power Setting Parameter under 2402-2480 Band				
Test Software		RTL8762C_RFTesTool		
Mode	Transmit Antenna Number	Test Channel		
		CH 0	CH 19	CH 39
BLE 1Mbps	1	Default	Default	Default
BLE 2Mbps	1	Default	Default	Default

5.7. TEST ENVIRONMENT

Environment Parameter	Selected Values During Tests	
Relative Humidity	55 ~ 65%	
Atmospheric Pressure:	1025Pa	
Temperature	TN	22 ~ 28°C
Voltage:	VL	/
	VN	DC 3.0V
	VH	/

Note: VL= Lower Extreme Test Voltage

VN= Nominal Voltage

VH= Upper Extreme Test Voltage

TN= Normal Temperature



5.8. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Item	Equipment	Brand Name	Model Name	P/N
1	USB TO RS232	/	/	/

I/O CABLES

Cable No	Port	Connector Type	Cable Type	Cable Length(m)	Remarks
1	/	/	/	/	/

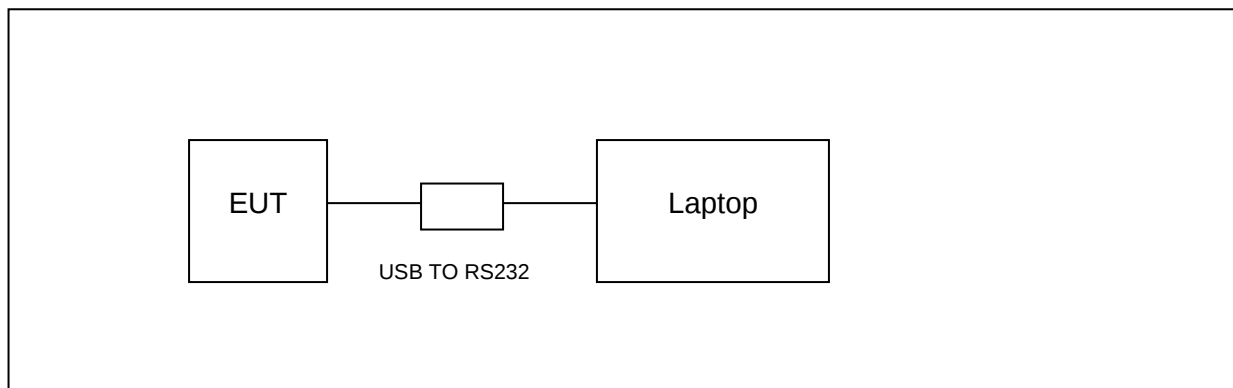
ACCESSORY

Item	Equipment	Mfr/Brand	Model/Type No.	Specification	Series No.
1	/	/	/	/	/

TEST SETUP

The EUT can work in an engineer mode with a software through a PC.

SETUP DIAGRAM FOR TEST



**5.9. MEASURING INSTRUMENT AND SOFTWARE USED**

Radiated Emissions						
Instrument						
Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
☒	MXE EMI Receiver	KESIGHT	N9038A	MY56400036	Dec.10,2018	Dec.10,2019
☒	Hybrid Log Periodic Antenna	TDK	HLP-3003C	130960	Sep.17,2018	Sep.17,2021
☒	Preamplifier	HP	8447D	2944A09099	Dec.10,2018	Dec.10,2019
☒	EMI Measurement Receiver	R&S	ESR26	101377	Dec.10,2018	Dec.10,2019
☒	Horn Antenna	TDK	HRN-0118	130939	Sep.17,2018	Sep.17,2021
☒	Preamplifier	TDK	PA-02-0118	TRS-305-00066	Dec.10,2018	Dec.10,2019
☒	High Gain Horn Antenna	Schwarzbeck	BBHA-9170	691	Aug.11,2018	Aug.11,2021
☒	Preamplifier	TDK	PA-02-2	TRS-307-00003	Dec.10,2018	Dec.10,2019
☒	Loop antenna	Schwarzbeck	1519B	00008	Jan.07,2019	Jan.07, 2022
☒	Preamplifier	TDK	PA-02-001-3000	TRS-302-00050	Jan. 07,2019	Jan.07,2020
☒	Band Reject Filter	Wainwright	WRCJV8-2350-2400-2483.5-2533.5-40SS	4	Dec.10,2018	Dec.10,2019
☒	High Pass Filter	Wi	WHKX10-2700-3000-18000-40SS	23	Dec.10,2018	Dec.10,2019
Software						
Used	Description			Manufacturer	Name	Version
☒	Test Software for Radiated disturbance			Farad	EZ-EMC	Ver. UL-3A1
Other instruments						
Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
☒	Spectrum Analyzer	Keysight	N9030A	MY55410512	Dec.10,2018	Dec.10,2019



6. ANTENNA PORT TEST RESULTS

6.1. ON TIME AND DUTY CYCLE

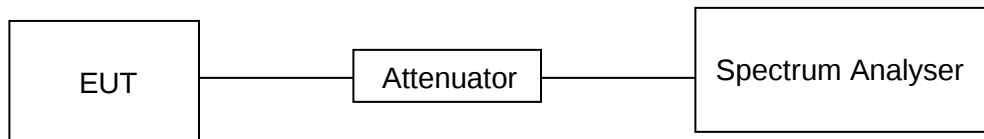
LIMITS

None; for reporting purposes only

PROCEDURE

KDB 558074 Zero-Span Spectrum Analyzer Method

TEST SETUP



TEST ENVIRONMENT

Temperature	23.5°C	Relative Humidity	62%
Atmosphere Pressure	101kPa	Test Voltage	DC 3.0V

RESULTS

Mode	On Time (msec)	Period (msec)	Duty Cycle x (Linear)	Duty Cycle (%)	Duty Cycle Correction Factor (db)	1/T Minimum VBW (KHz)	Final setting For VBW (KHz)
BLE 1Mbps	100	100	1.0	100	0	0.01	0.1
BLE 2Mbps	100	100	1.0	100	0	0.01	0.1

Note:

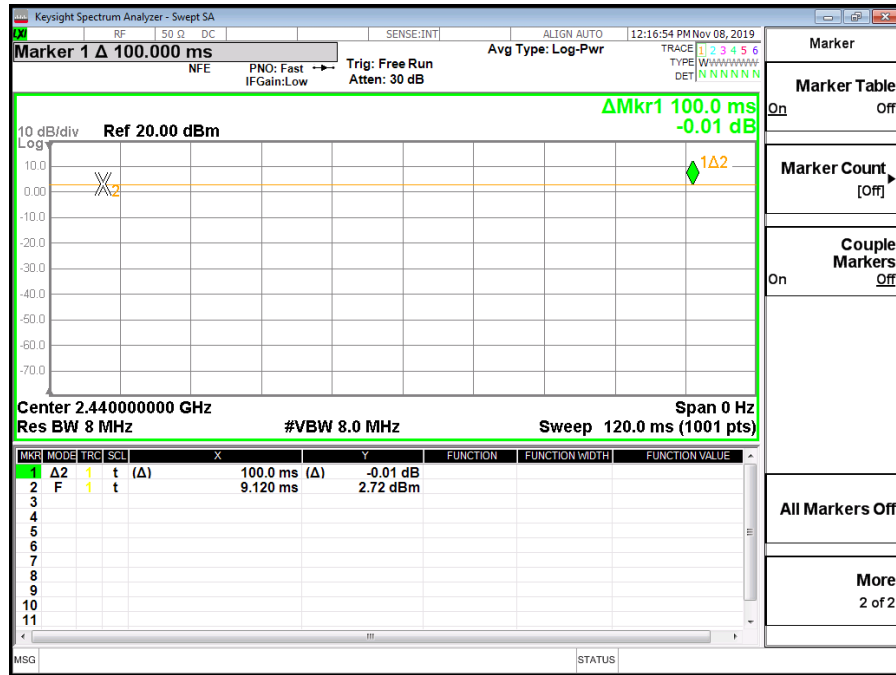
Duty Cycle Correction Factor= $10\log(1/x)$.

Where: x is Duty Cycle (Linear)

Where: T is On Time (transmitting duration)

If that calculated VBW is not available on the analyzer then the next higher value should be used.

BLE 1Mbps ON TIME AND DUTY CYCLE MID CH



BLE 2Mbps ON TIME AND DUTY CYCLE MID CH





6.2. 20 dB BANDWIDTH AND 99% OCCUPIED BANDWIDTH

LIMITS

CFR 47 FCC Part15 (15.249) Subpart C			
Section	Test Item	Limit	Frequency Range (MHz)
CFR 47 FCC §15.215 (c)	20dB Bandwidth	for reporting purposes only	2400-2483.5

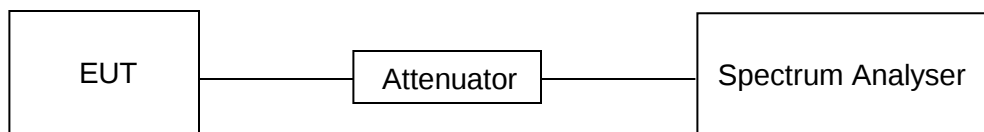
TEST PROCEDURE

Connect the UUT to the spectrum analyser and use the following settings:

Center Frequency	The center frequency of the channel under test
Detector	Peak
RBW	1% to 5% of the occupied bandwidth
VBW	approximately 3×RBW
Trace	Max hold
Sweep	Auto couple

Allow the trace to stabilize and measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB/99% relative to the maximum level measured in the fundamental emission.

TEST SETUP

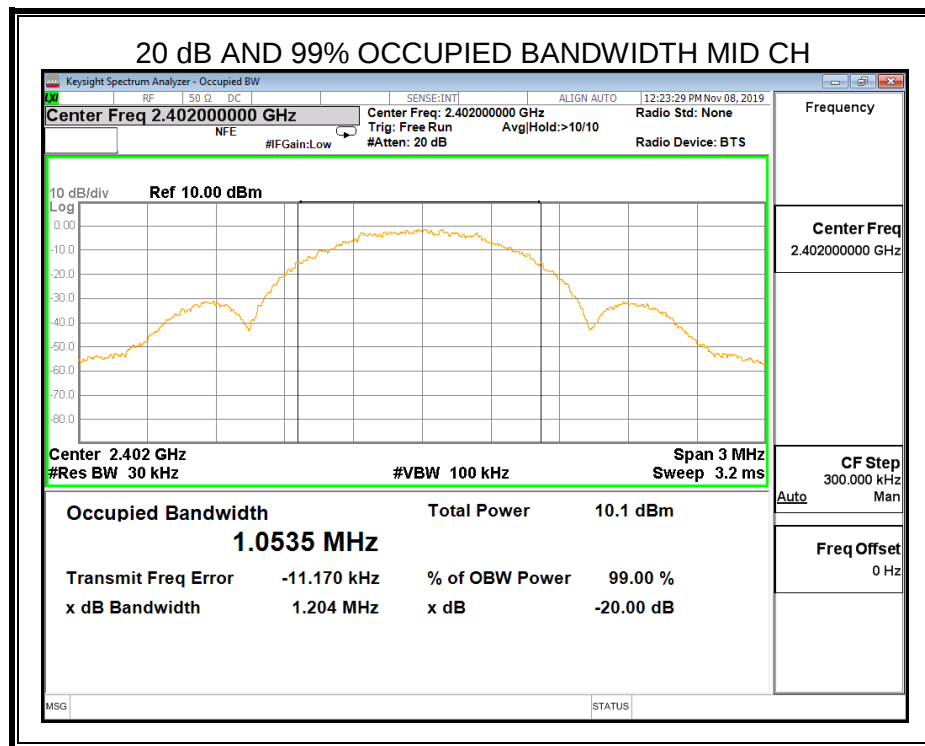


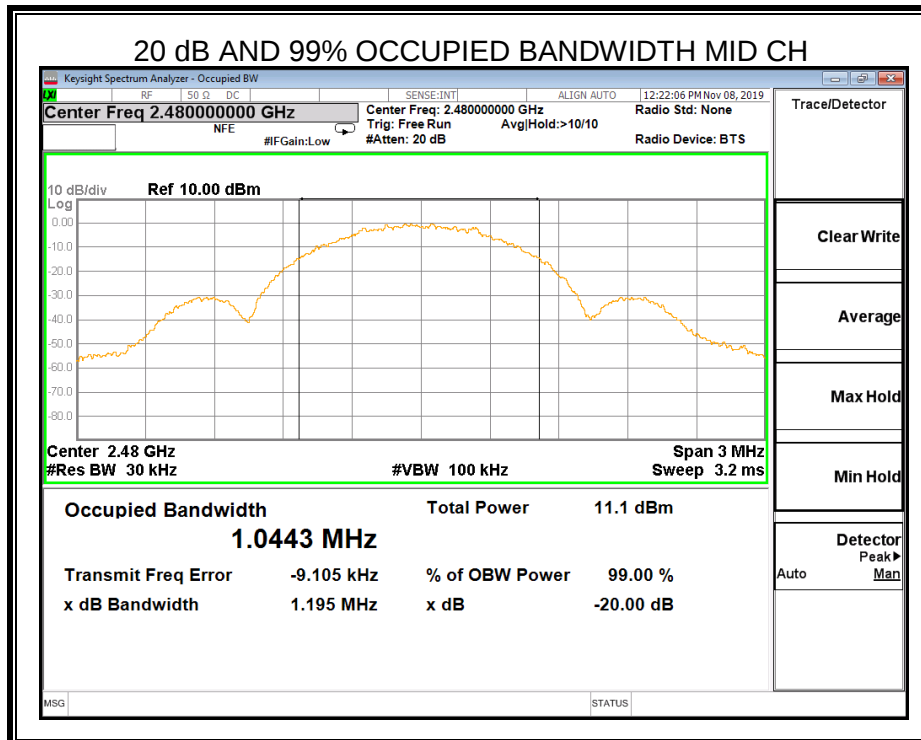
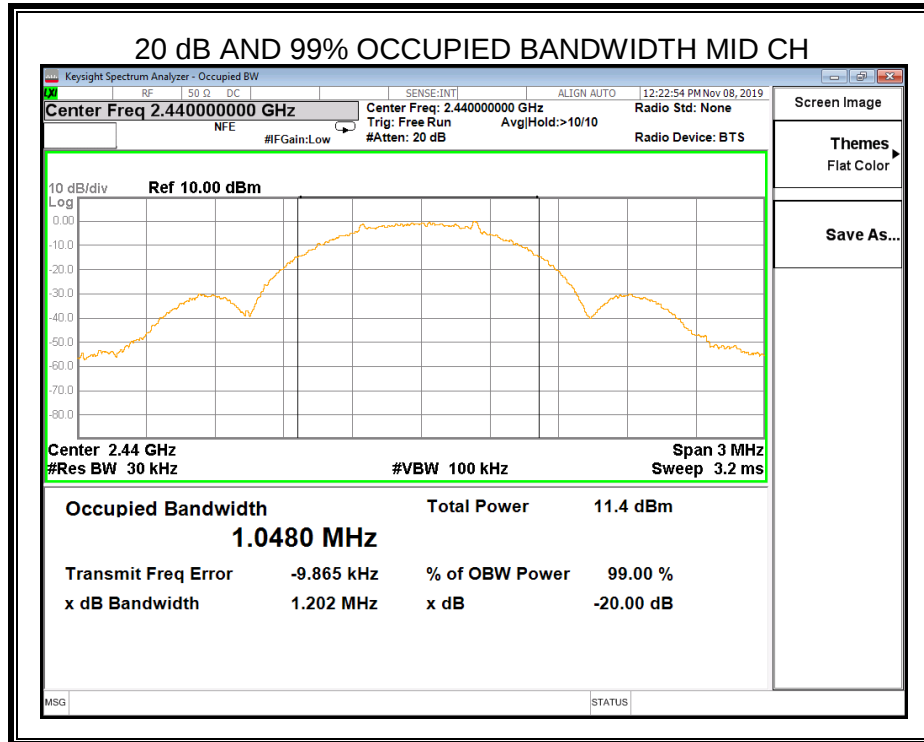
TEST ENVIRONMENT

Temperature	23.5°C	Relative Humidity	62%
Atmosphere Pressure	101kPa	Test Voltage	DC 3.0V

**RESULTS**

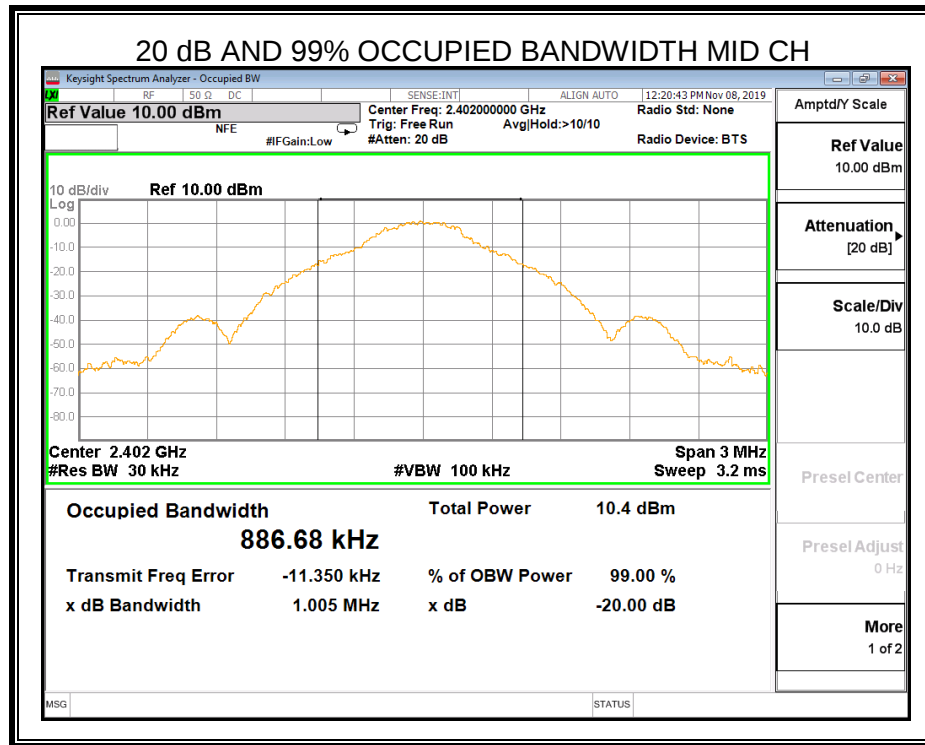
Mode	Channel	20 dB bandwidth (MHz)	99% bandwidth (MHz)	Limit (kHz)	Result
BLE 1Mbps	Low	1.204	1.0535	500	Pass
	Middle	1.202	1.0480	500	Pass
	High	1.195	1.0443	500	Pass

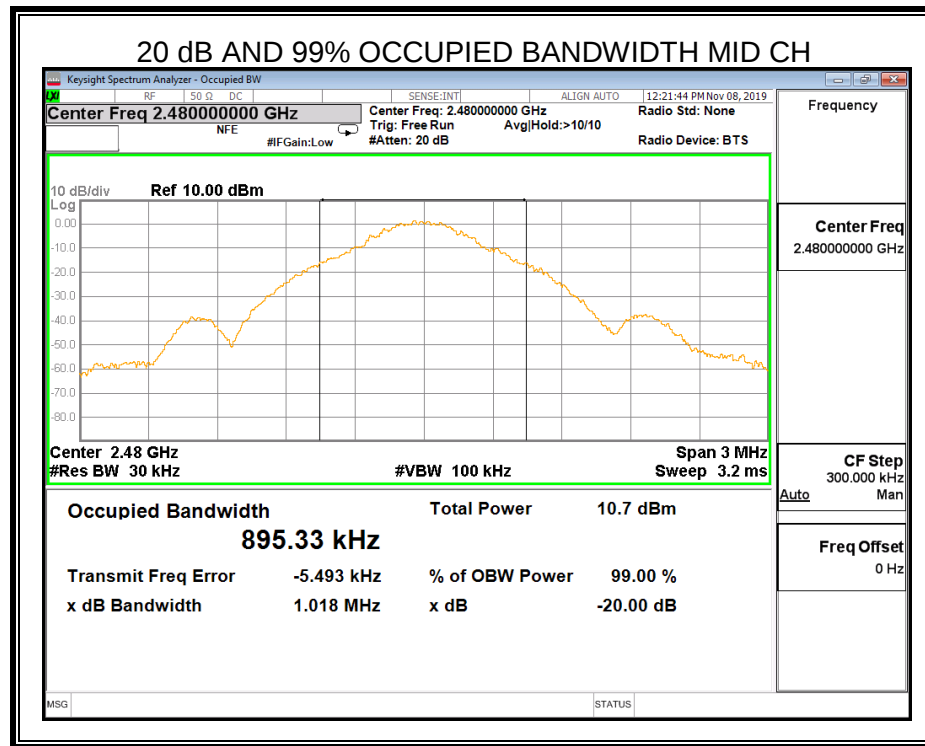
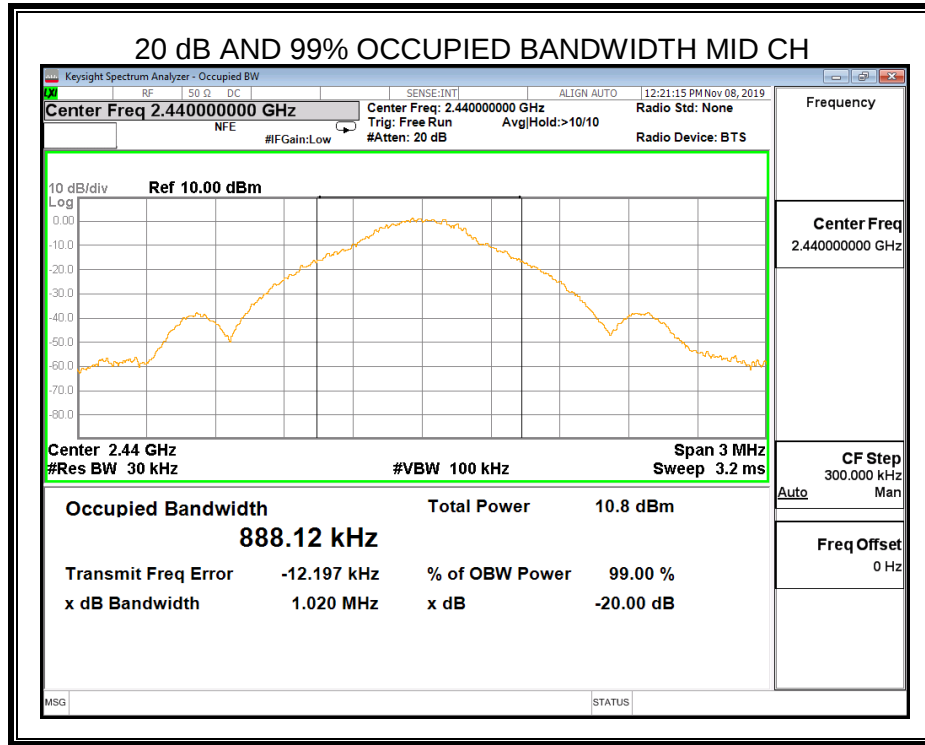






Mode	Channel	20 dB bandwidth (MHz)	99% bandwidth (MHz)	Limit (kHz)	Result
BLE 2Mbps	Low	1.005	0.88668	500	Pass
	Middle	1.020	0.88812	500	Pass
	High	1.018	0.89533	500	Pass







7. RADIATED TEST RESULTS

7.1. LIMITS AND PROCEDURE

LIMITS

CFR 47 FCC §15.205 and §15.209

CFR 47 FCC §15.249 (a)(d)(e)

ISED RSS-210 Issue 9 Annex B B.10

RSS-GEN Clause 8.9

The field strength of emissions from intentional radiators operated within these frequency bands			
Frequency (MHz)	Field strength of Fundamental	Field strength of Harmonics	Distance (m)
902 - 928	50 mV/m (94dBuV/m)	500 uV/m (54dBuV/m)	3
2400 – 2483.5	50 mV/m (94dBuV/m)	500 uV/m (54dBuV/m)	3
5725 – 5875	50 mV/m (94dBuV/m)	500 uV/m (54dBuV/m)	3

Emissions radiated outside of the specified frequency bands above 30MHz			
Frequency Range (MHz)	Field Strength Limit (uV/m) at 3 m	Field Strength Limit (dBuV/m) at 3 m	
		Quasi-Peak	
30 - 88	100	40	
88 - 216	150	43.5	
216 - 960	200	46	
Above 960	500	54	
Above 1000	500	Peak	Average
		74	54

Emissions radiated outside of the specified frequency bands below 30MHz		
Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30



IC Restricted bands please refer to ISED RSS-GEN Clause 8.10

Table 7 – Restricted frequency bands ^{Note 1}		
MHz	MHz	GHz
0.090 - 0.110	149.9 - 150.05	9.0 - 9.2
0.495 - 0.505	156.52475 - 156.52525	9.3 - 9.5
2.1735 - 2.1905	156.7 - 156.9	10.6 - 12.7
3.020 - 3.026	162.0125 - 167.17	13.25 - 13.4
4.125 - 4.128	167.72 - 173.2	14.47 - 14.5
4.17725 - 4.17775	240 - 285	15.35 - 16.2
4.20725 - 4.20775	322 - 335.4	17.7 - 21.4
5.677 - 5.683	399.9 - 410	22.01 - 23.12
6.215 - 6.218	608 - 614	23.6 - 24.0
6.26775 - 6.26825	960 - 1427	31.2 - 31.8
6.31175 - 6.31225	1435 - 1626.5	36.43 - 36.5
8.291 - 8.294	1645.5 - 1646.5	Above 36.6
8.362 - 8.366	1660 - 1710	
8.37625 - 8.38675	1718.8 - 1722.2	
8.41425 - 8.41475	2200 - 2300	
12.29 - 12.293	2310 - 2390	
12.51975 - 12.52025	2483.5 - 2500	
12.57675 - 12.57725	2655 - 2900	
13.36 - 13.41	3260 - 3267	
16.42 - 16.423	3332 - 3339	
16.69475 - 16.69525	3345.8 - 3358	
16.80425 - 16.80475	3500 - 4400	
25.5 - 25.67	4500 - 5150	
37.5 - 38.25	5350 - 5460	
73 - 74.6	7250 - 7750	
74.8 - 75.2	8025 - 8500	
106 - 138		

Note 1: Certain frequency bands listed in table 7 and in bands above 36.6 GHz are designated for licence-exempt applications. These frequency bands and the requirements that apply to related devices are set out in the 200 and 300 series of RSSs.



FCC Restricted bands of operation:

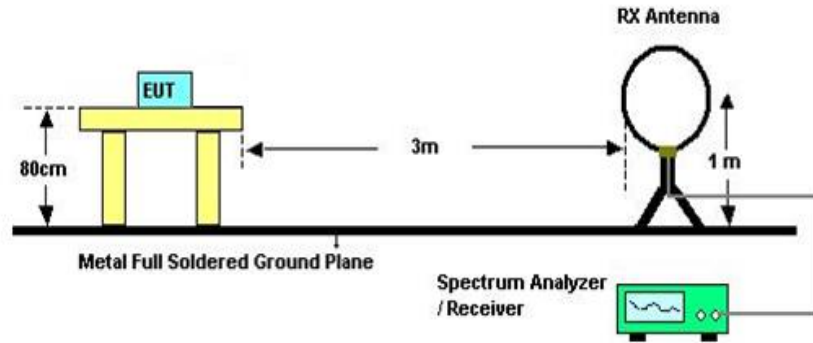
MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
¹ 0.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	(²)
13.36-13.41			

Note: ¹Until February 1, 1999, this restricted band shall be 0.490-0.510MHz.

²Above 38.6c

TEST SETUP AND PROCEDURE

Below 30MHz

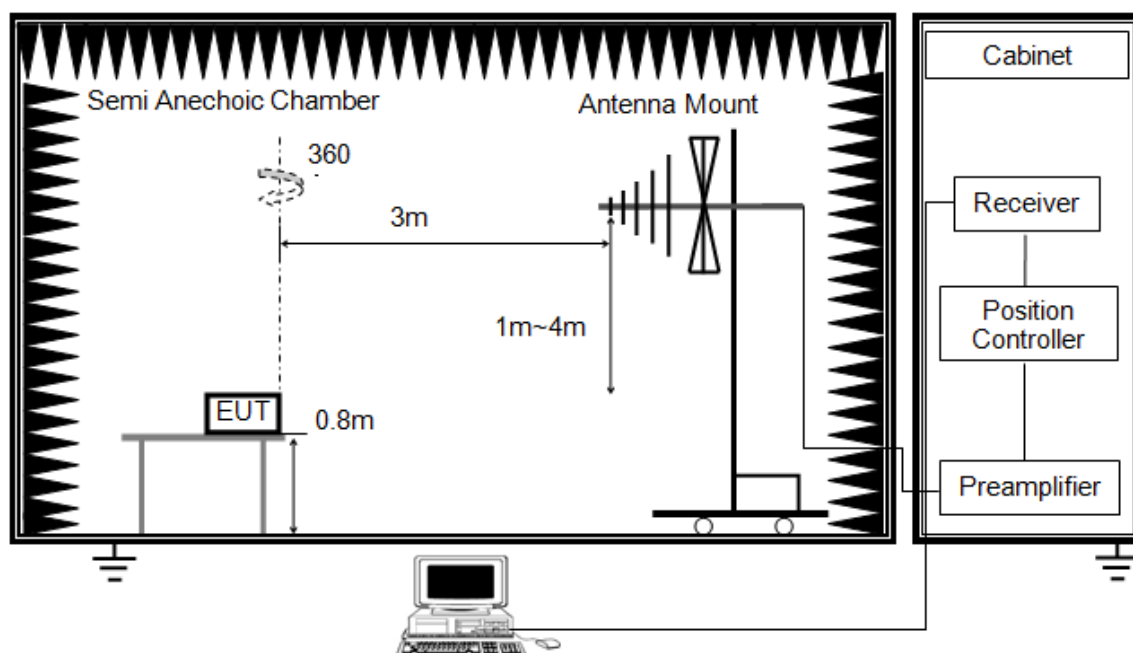


The setting of the spectrum analyser

RBW	200Hz (From 9kHz to 0.15MHz)/ 9KHz (From 0.15MHz to 30MHz)
VBW	200Hz (From 9kHz to 0.15MHz)/ 9KHz (From 0.15MHz to 30MHz)
Sweep	Auto
Detector	Peak/QP/ Average
Trace	Max hold

1. The testing follows the guidelines in ANSI C63.10-2013.
2. The EUT was arranged to its worst case and then turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level. Both Horizontal, Face-on and Face-off polarizations of the antenna are set to make the measurement.
3. The EUT was placed on a turntable with 80cm meter above ground.
4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a 1m height antenna tower.
5. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
6. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
7. The radiated emission limits are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.
8. Although these tests were performed other than open area test site, adequate comparison measurements were confirmed against 30m open field site. Therefore, the sufficient tests were made to demonstrate that the alternative site produces results that correlate with the ones of tests made in an open field based on KDB 414788.

Below 1G

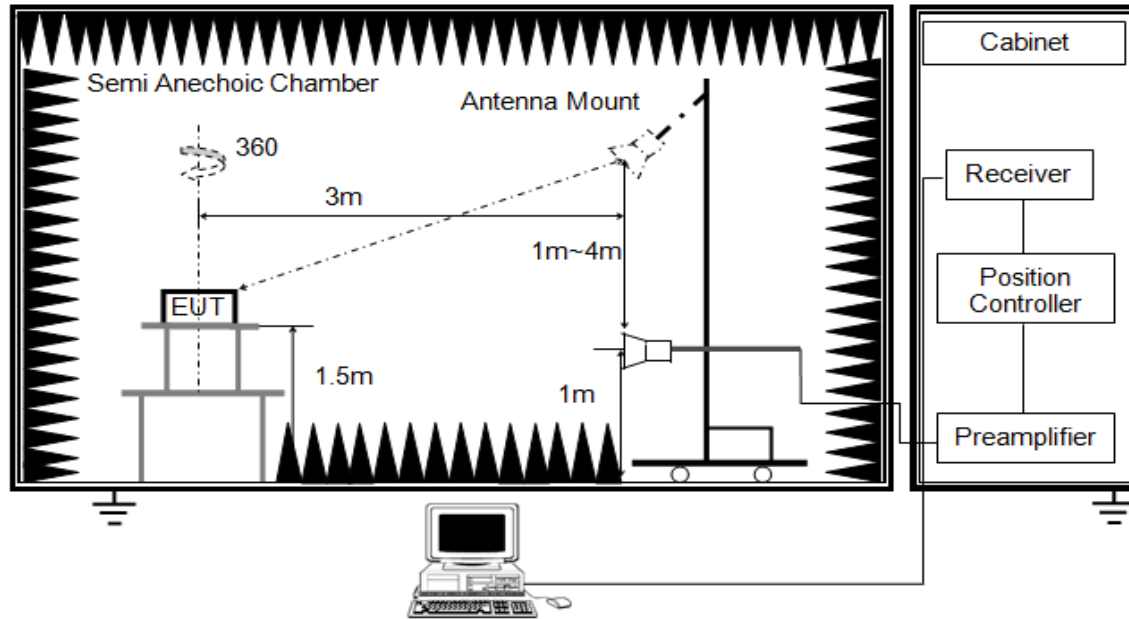


The setting of the spectrum analyser

RBW	120K
VBW	300K
Sweep	Auto
Detector	Peak/QP
Trace	Max hold

1. The testing follows the guidelines in ANSI C63.10-2013.
2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
3. The EUT was placed on a turntable with 80cm above ground.
4. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
5. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
6. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
7. The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.

Above 1G

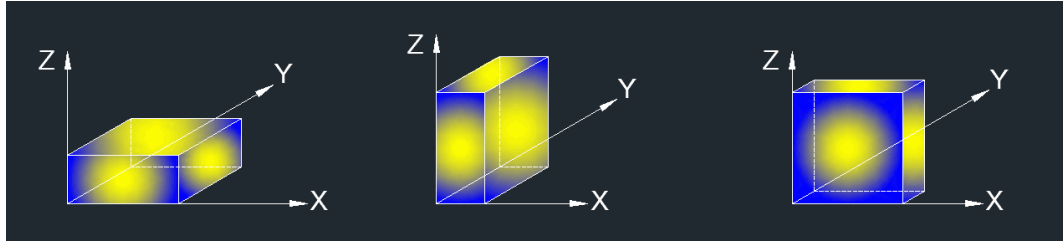


The setting of the spectrum analyser

RBW	1M
VBW	PEAK: 3M AVG: see note 6
Sweep	Auto
Detector	Peak
Trace	Max hold

1. The testing follows the guidelines in ANSI C63.10-2013.
2. The EUT was arranged to its worst case and then tune the antenna tower (1.5 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter or band reject filter are used for the test in order to get better signal level. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
3. The EUT was placed on a turntable with 80cm above ground.
4. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
5. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
6. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
7. For measurements above 1 GHz the resolution bandwidth is set to 1 MHz, then the video bandwidth is set to 3 MHz for peak measurements and 1 MHz resolution bandwidth with 1/T video bandwidth with peak detector for average measurements. For the Duty Cycle please refer to clause 6.1. ON TIME AND DUTY CYCLE.

X axis, Y axis, Z axis positions:



Note: For all radiated test, EUT in each of three orthogonal axis emissions had been tested, but only the worst case (Z axis) data recorded in the report.

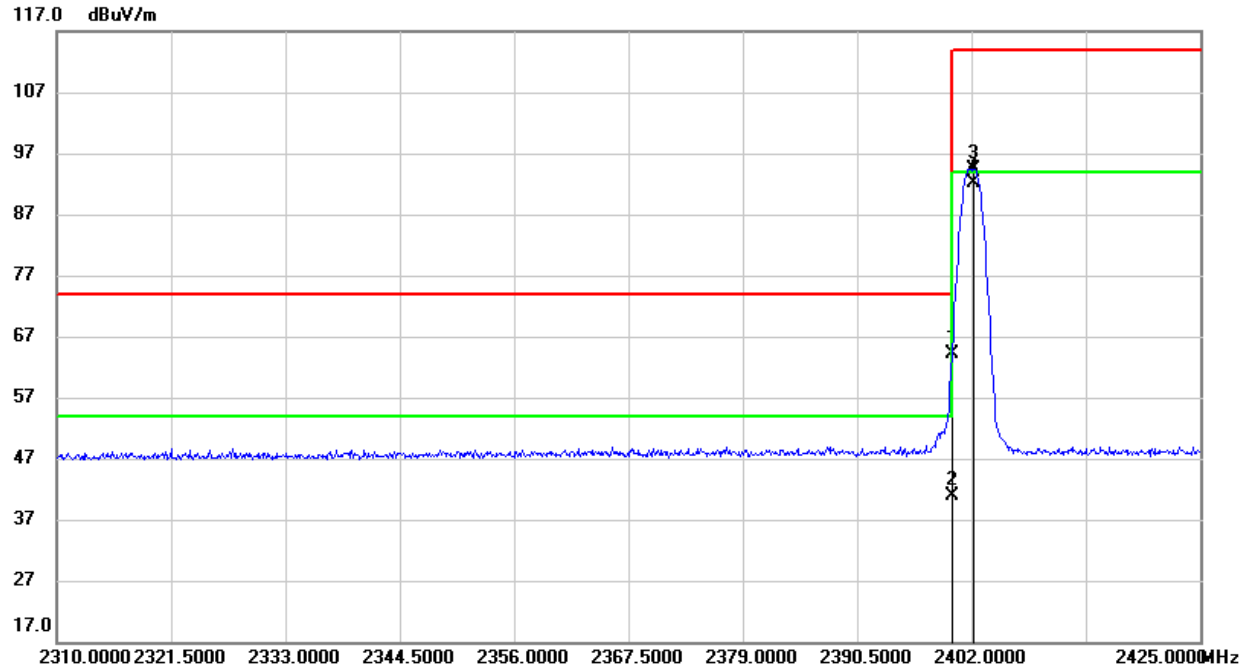
TEST ENVIRONMENT

Temperature	24.1°C	Relative Humidity	51%
Atmosphere Pressure	101kPa	Test Voltage	DC 3.0V

7.2. RESTRICTED BANDEDGE AND FIELD STRENGTH OF INTENTIONAL EMISSIONS

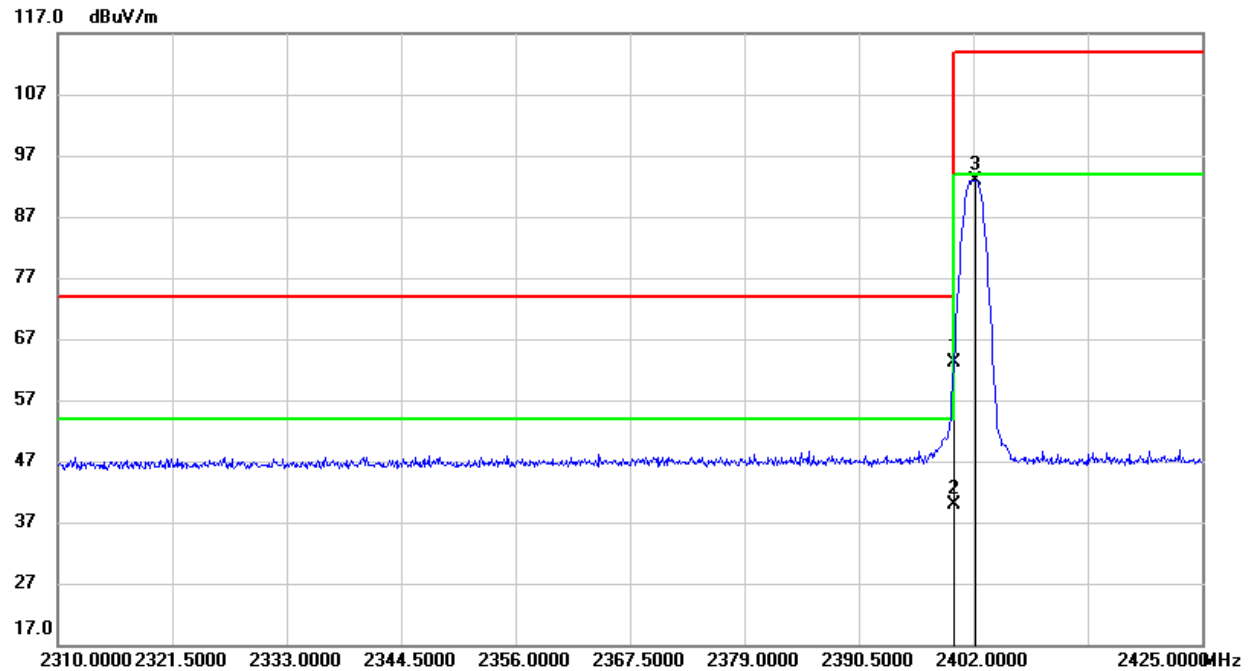
7.2.1. BLE 1Mbps MODE

RESTRICTED BANDEDGE AND FIELD STRENGTH OF INTENTIONAL EMISSIONS (LOW CHANNEL, HORIZONTAL)



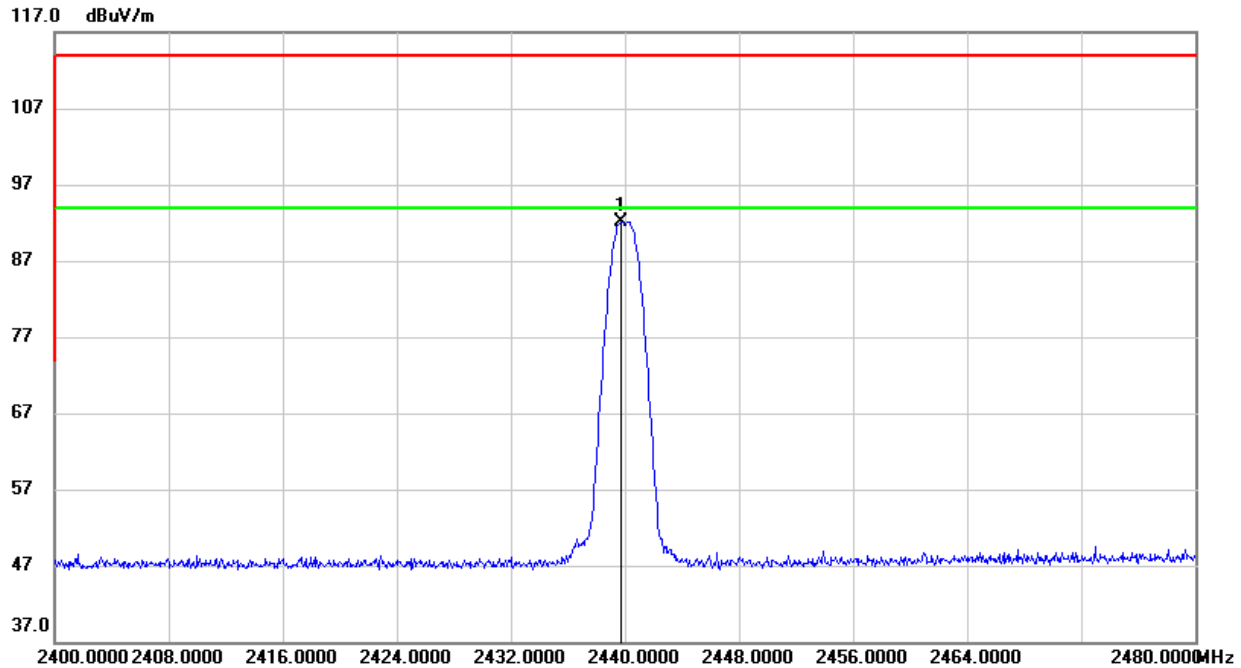
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2400.000	31.24	32.98	64.22	74.00	-9.78	peak
2	2400.000	7.86	32.98	40.84	54.00	-13.16	AVG
3	2402.230	61.37	32.99	94.36	114.00	-19.64	peak
4	2402.230	59.16	32.99	92.15	94.00	-1.85	AVG

Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. AVG: $VBW=1/Ton$, where: Ton is the transmitting duration.
5. For the transmitting duration, please refer to clause 6.1.
6. Only the worst emission was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.

**RESTRICTED BANDEDGE AND FIELD STRENGTH OF INTENTIONAL EMISSIONS (LOW CHANNEL, VERTICAL)**

No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2400.000	30.08	32.98	63.06	74.00	-10.94	peak
2	2400.000	6.93	32.98	39.91	54.00	-14.09	AVG
3	2402.230	59.90	32.99	92.89	114.00	-21.11	peak

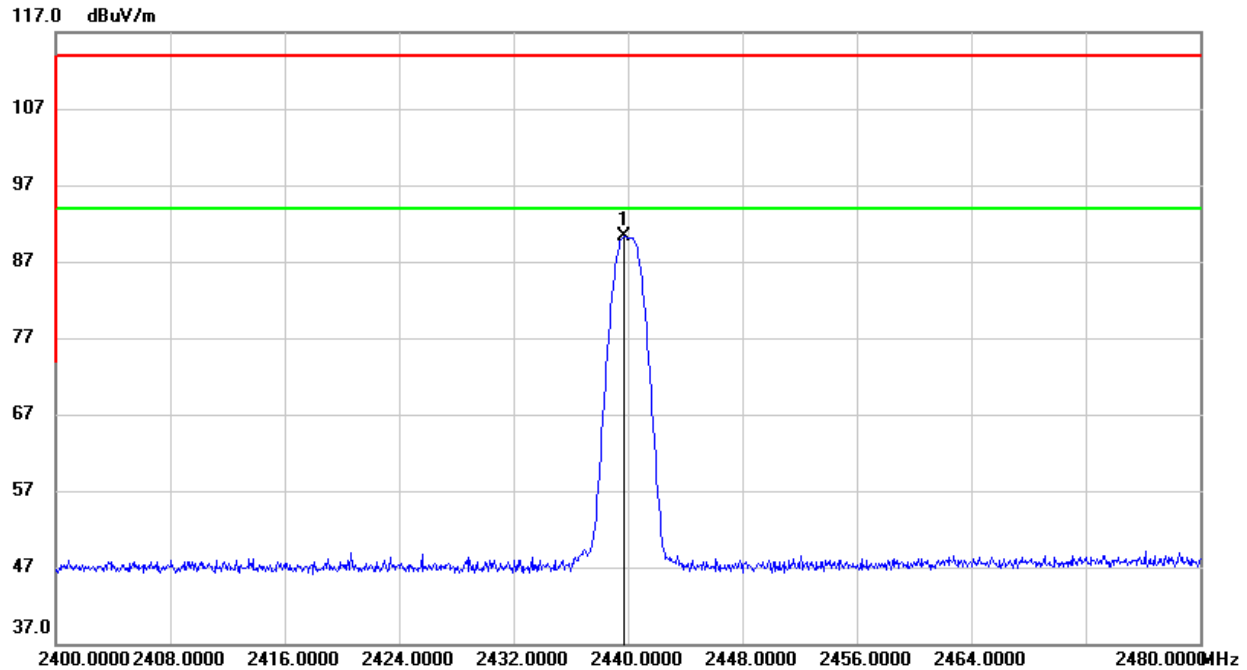
Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. AVG: VBW=1/Ton, where: Ton is the transmitting duration.
5. For the transmitting duration, please refer to clause 6.1.
6. Only the worst emission was recorded, if it complies with the limit, the other emissions deemed to comply with the limit

**FIELD STRENGTH OF INTENTIONAL EMISSIONS (MIDDLE CHANNEL, HORIZONTAL)**

No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2439.760	58.79	33.26	92.05	114.00	-21.95	peak

Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. Only the worst emission was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.

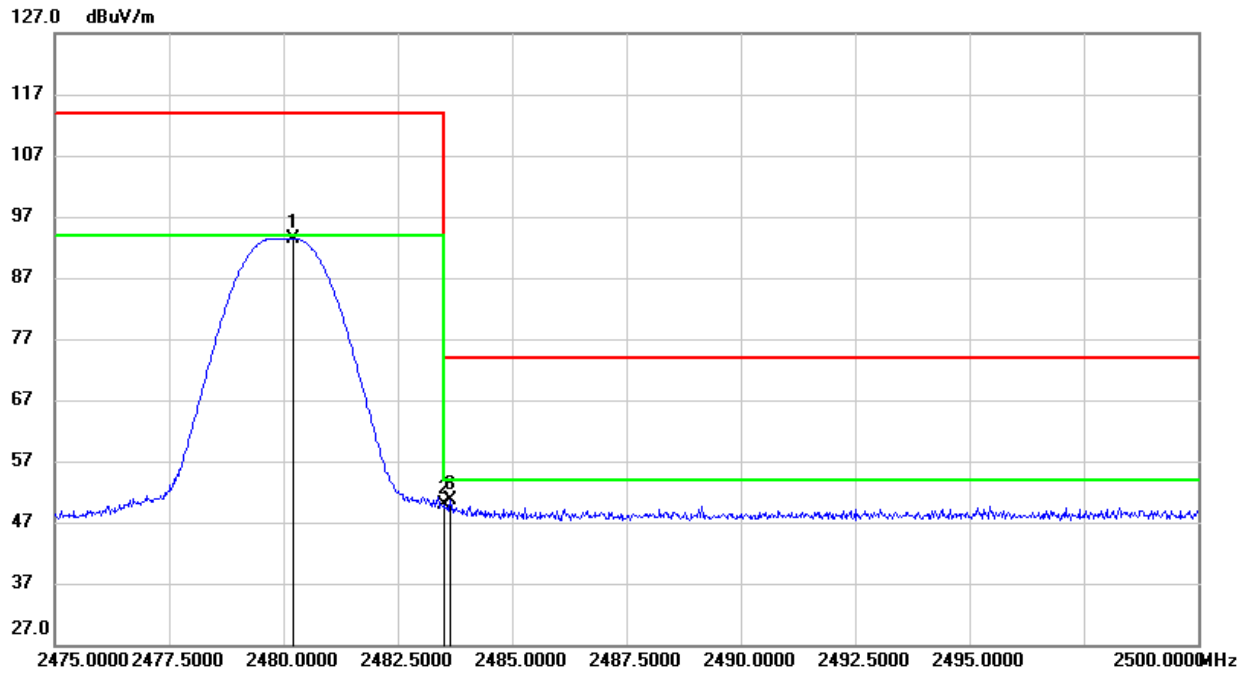
FIELD STRENGTH OF INTENTIONAL EMISSIONS (MIDDLE CHANNEL, VERTICAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2439.680	57.00	33.26	90.26	114.00	-23.74	peak

Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. Only the worst emission was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.

RESTRICTED BANDEDGE AND FIELD STRENGTH OF INTENTIONAL EMISSIONS (HIGH CHANNEL, HORIZONTAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2480.200	59.90	33.55	93.45	114.00	-20.55	peak
2	2483.500	16.38	33.58	49.96	74.00	-24.04	peak
3	2483.650	17.07	33.58	50.65	74.00	-23.35	peak

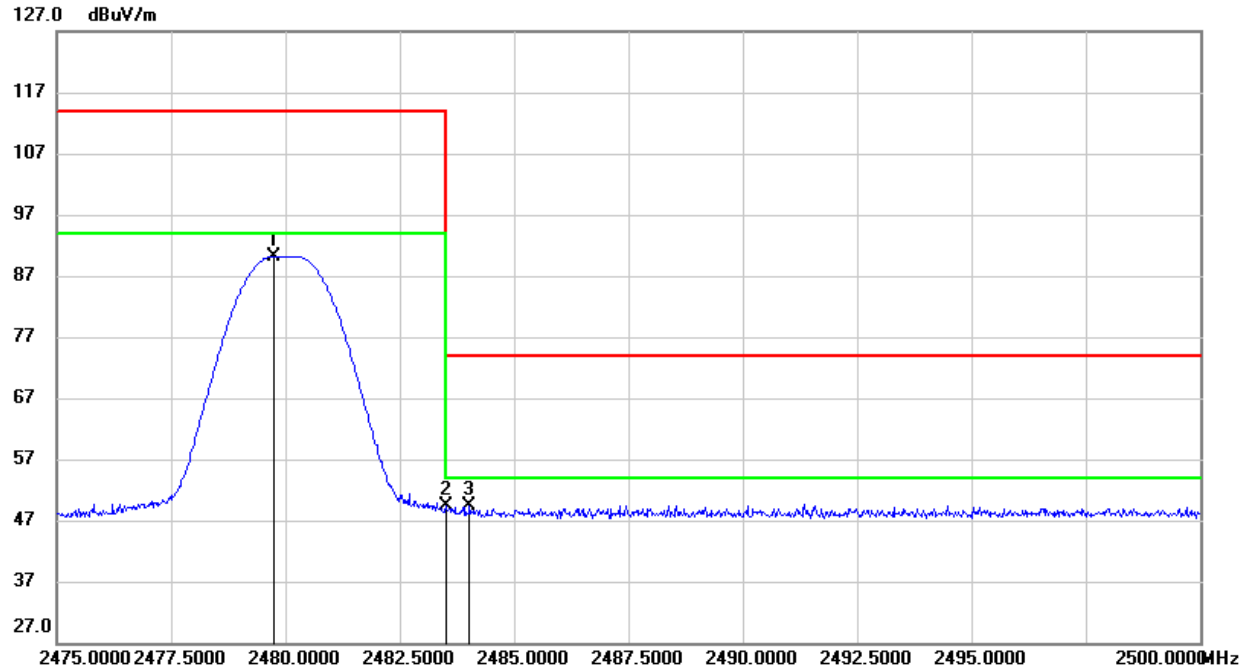
Note: 1. Measurement = Reading Level + Correct Factor.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Peak: Peak detector.

4. Only the worst emission was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.

RESTRICTED BANDEDGE AND FIELD STRENGTH OF INTENTIONAL EMISSIONS (HIGH CHANNEL, VERTICAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2479.750	56.67	33.55	90.22	114.00	-23.78	peak
2	2483.500	15.82	33.58	49.40	74.00	-24.60	peak
3	2484.025	15.91	33.58	49.49	74.00	-24.51	peak

Note: 1. Measurement = Reading Level + Correct Factor.

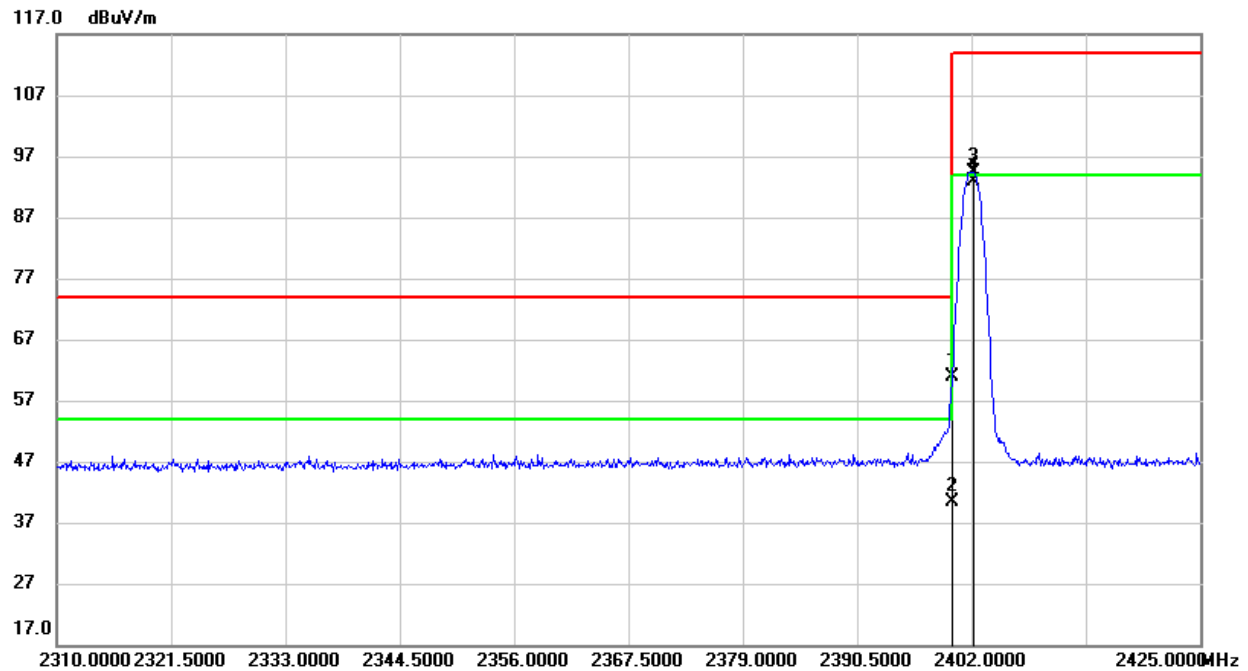
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Peak: Peak detector.

4. Only the worst emission was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.

7.2.2. BLE 2Mbps MODE

RESTRICTED BANDEDGE AND FIELD STRENGTH OF INTENTIONAL EMISSIONS (LOW CHANNEL, HORIZONTAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2400.000	27.90	32.98	60.88	74.00	-13.12	peak
2	2400.000	7.28	32.98	40.26	54.00	-13.74	AVG
3	2402.230	61.31	32.99	94.30	114.00	-19.70	peak
4	2402.230	59.92	32.99	92.91	94.00	-1.09	AVG

Note: 1. Measurement = Reading Level + Correct Factor.

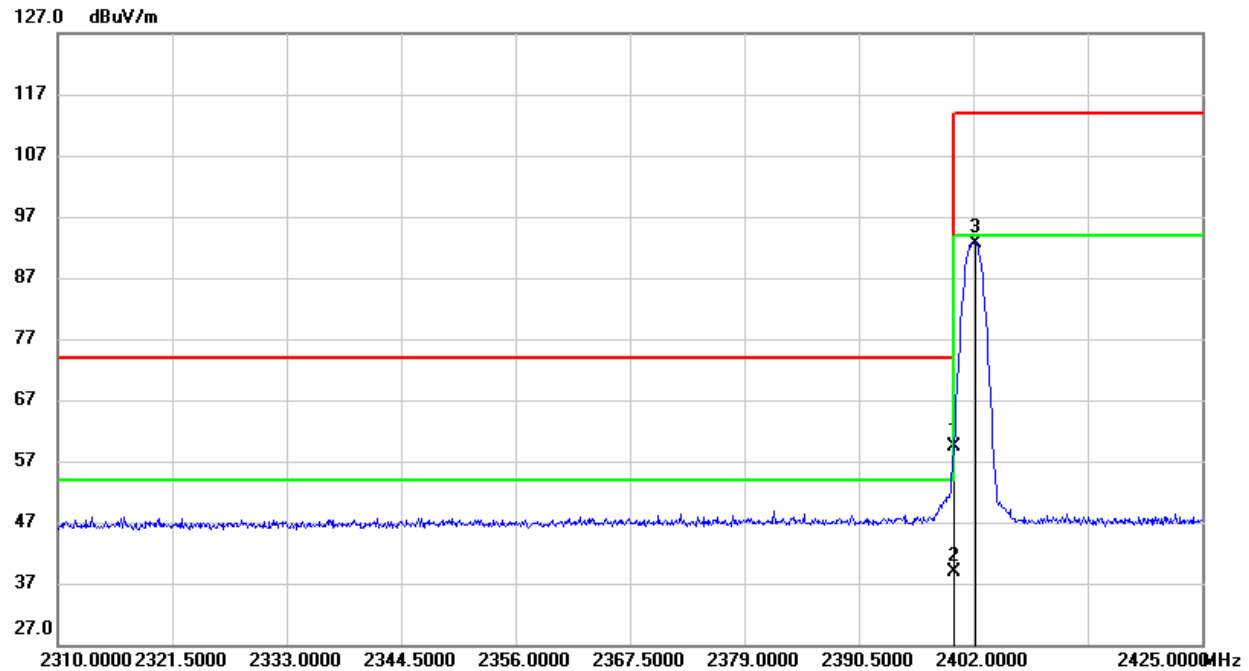
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Peak: Peak detector.

4. AVG: $VBW=1/Ton$, where: Ton is the transmitting duration.

5. For the transmitting duration, please refer to clause 6.1.

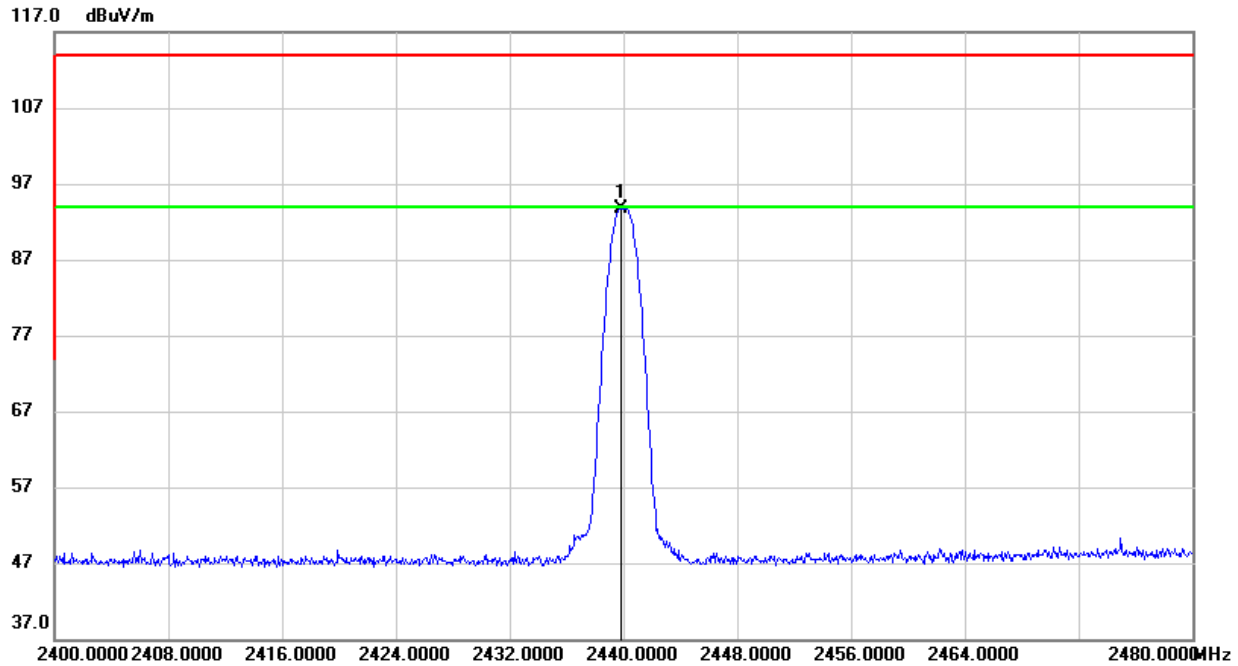
6. Only the worst emission was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.

**RESTRICTED BANDEDGE AND FIELD STRENGTH OF INTENTIONAL EMISSIONS (LOW CHANNEL, VERTICAL)**

No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2400.000	26.28	32.98	59.26	74.00	-14.74	peak
2	2400.000	5.82	32.98	38.80	54.00	-15.20	AVG
3	2402.230	59.67	32.99	92.66	114.00	-21.34	peak

Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. AVG: $VBW=1/Ton$, where: Ton is the transmitting duration.
5. For the transmitting duration, please refer to clause 6.1.
6. Only the worst emission was recorded, if it complies with the limit, the other emissions deemed to comply with the limit

FIELD STRENGTH OF INTENTIONAL EMISSIONS (MIDDLE CHANNEL, HORIZONTAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2439.840	60.50	33.27	93.77	114.00	-20.23	peak

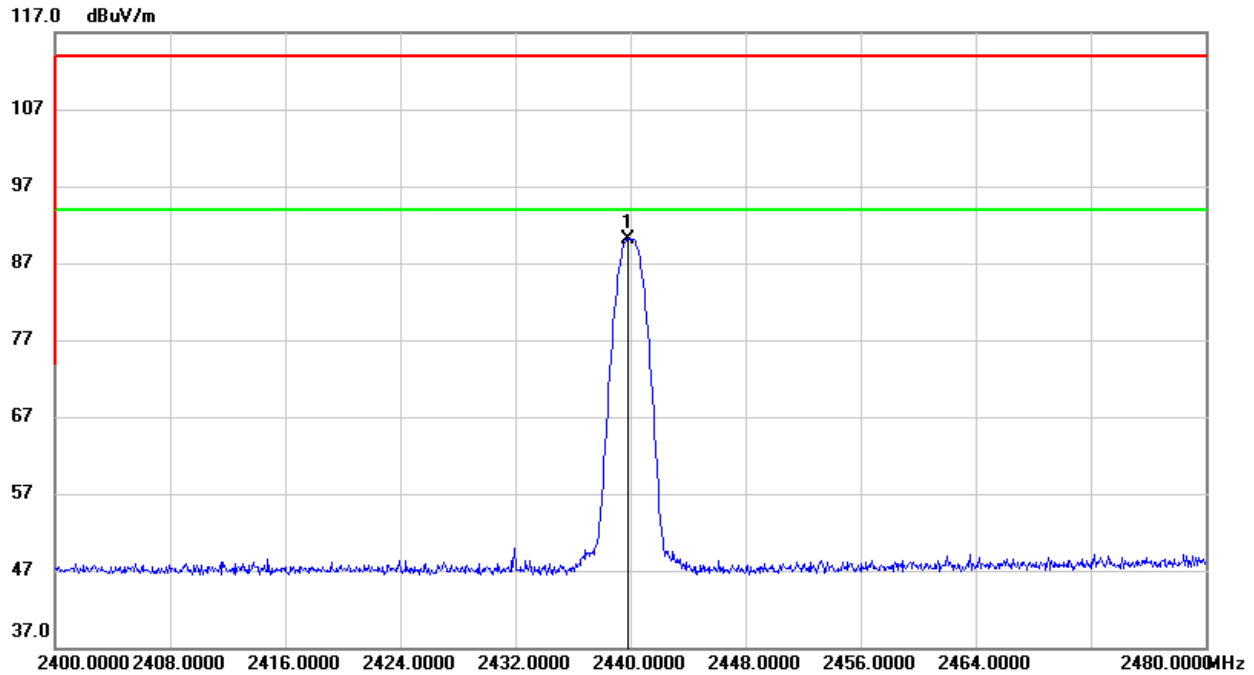
Note: 1. Measurement = Reading Level + Correct Factor.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Peak: Peak detector.

4. Only the worst emission was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.

FIELD STRENGTH OF INTENTIONAL EMISSIONS (MIDDLE CHANNEL, VERTICAL)

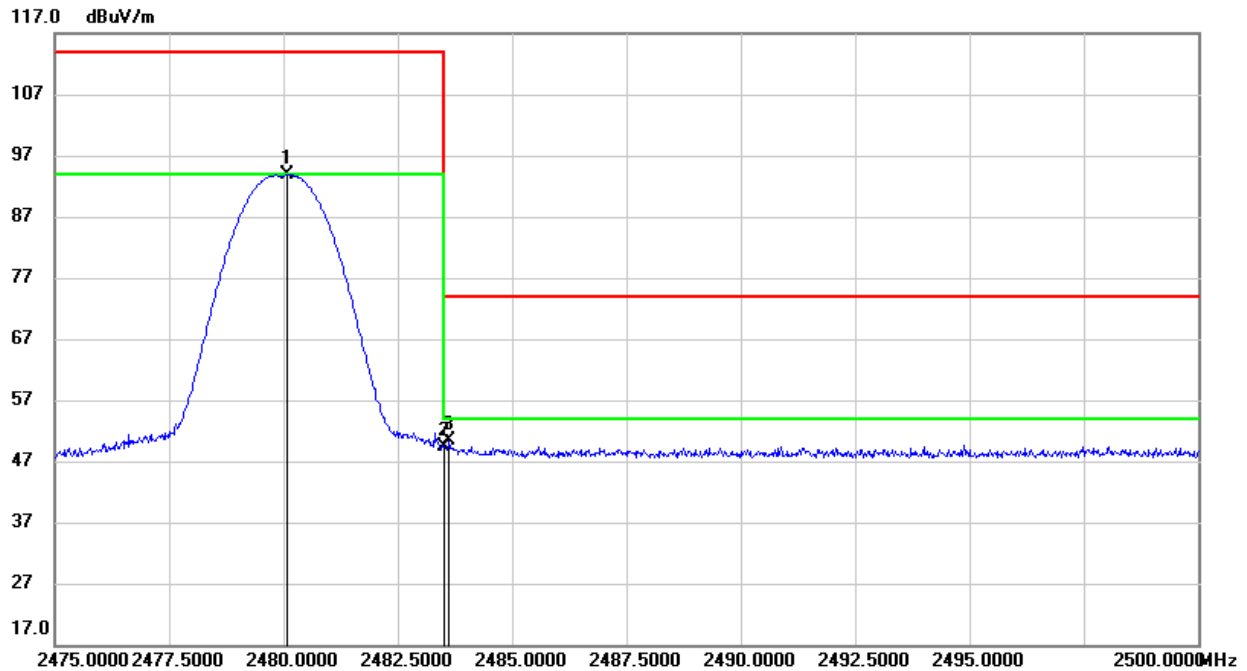


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2439.840	56.86	33.27	90.13	114.00	-23.87	peak

Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. Only the worst emission was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.



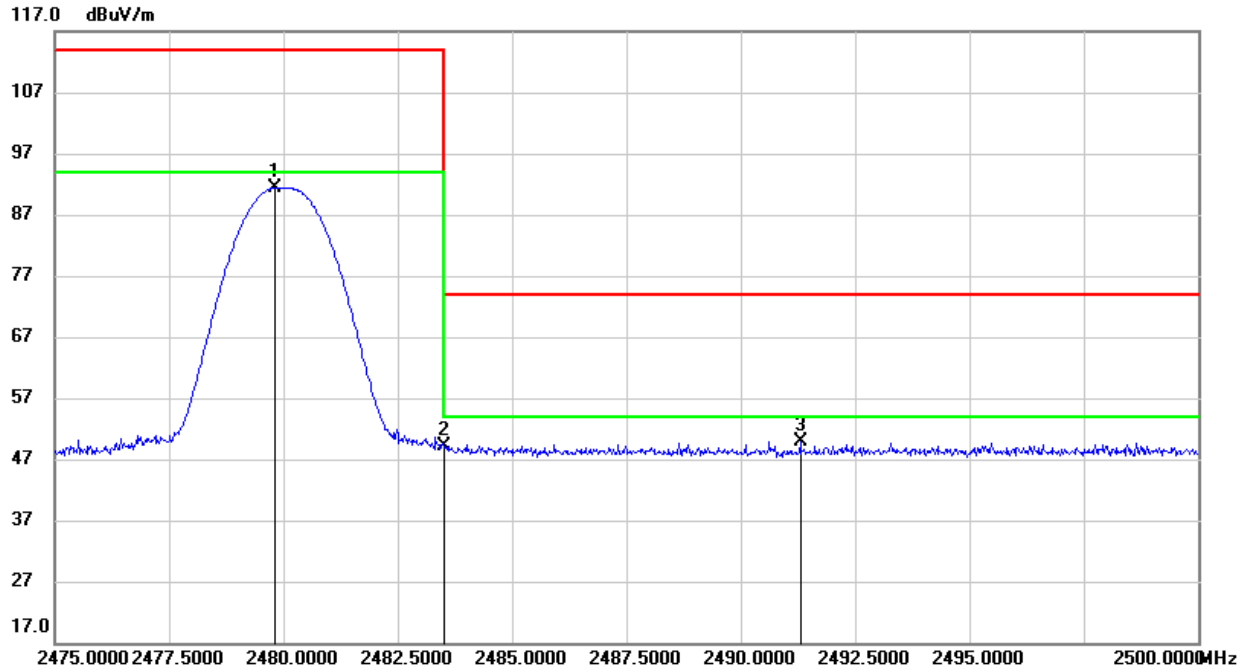
**RESTRICTED BANDEDGE AND FIELD STRENGTH OF INTENTIONAL EMISSIONS (HIGH
CHANNEL, HORIZONTAL)**



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2480.075	60.24	33.55	93.79	114.00	-20.21	peak
2	2483.500	15.88	33.58	49.46	74.00	-24.54	peak
3	2483.625	16.85	33.58	50.43	74.00	-23.57	peak

- Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. Only the worst emission was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.

RESTRICTED BANDEDGE AND FIELD STRENGTH OF INTENTIONAL EMISSIONS (HIGH CHANNEL, VERTICAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2479.825	57.78	33.55	91.33	114.00	-22.67	peak
2	2483.500	15.46	33.58	49.04	74.00	-24.96	peak
3	2491.300	16.23	33.63	49.86	74.00	-24.14	peak

Note: 1. Measurement = Reading Level + Correct Factor.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Peak: Peak detector.

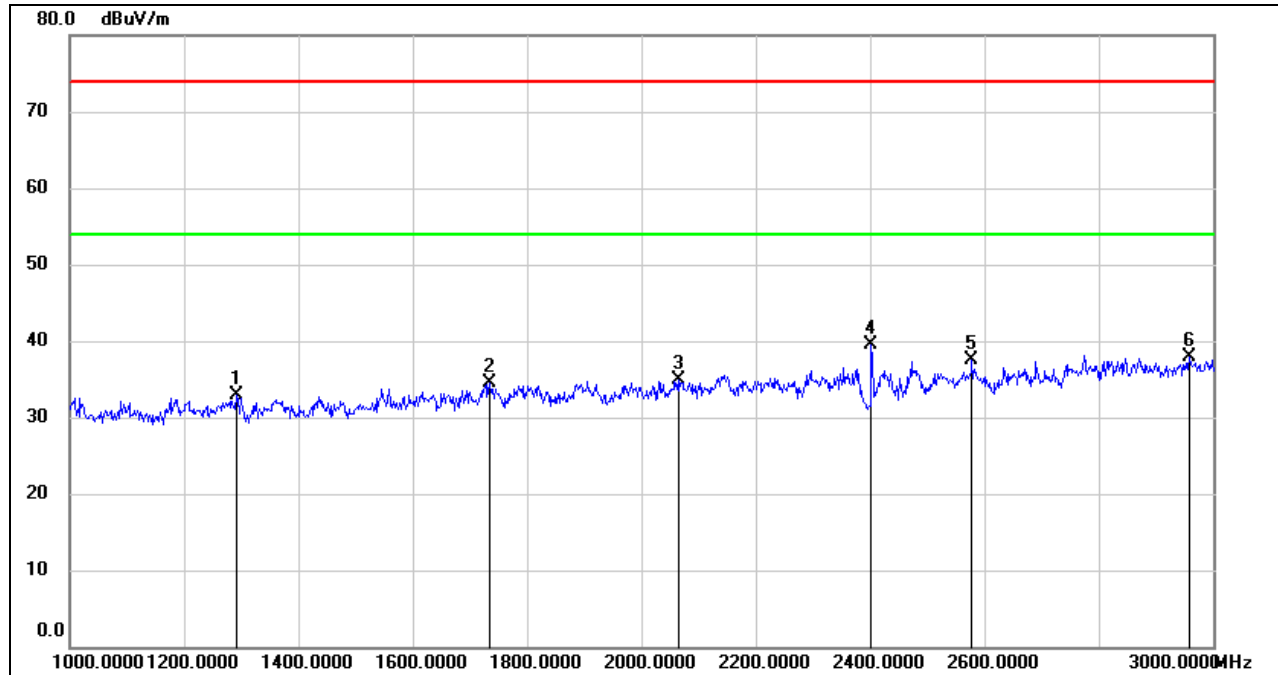
4. Only the worst emission was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.



7.3. SPURIOUS EMISSIONS (1~3GHz)

7.3.1. BLE 1Mbps MODE

HARMONICS AND SPURIOUS EMISSIONS (LOW CHANNEL, HORIZONTAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1292.000	45.47	-12.60	32.87	74.00	-41.13	peak
2	1734.000	45.26	-10.77	34.49	74.00	-39.51	peak
3	2064.000	44.42	-9.55	34.87	74.00	-39.13	peak
4	2402.000	47.37	-7.95	39.42	/	/	fundamental
5	2578.000	45.10	-7.65	37.45	74.00	-36.55	peak
6	2958.000	43.28	-5.38	37.90	74.00	-36.10	peak

Note: 1. Peak Result = Reading Level + Correct Factor.

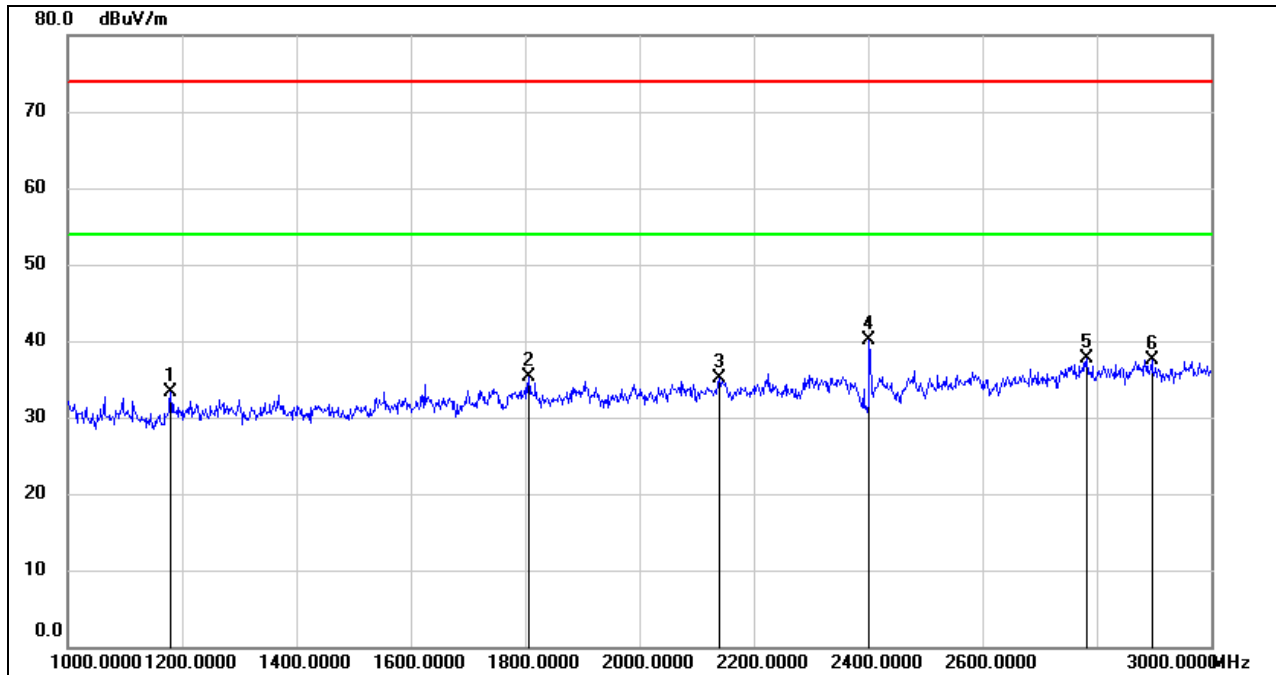
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Peak: Peak detector.

4. Filter losses were only considered in then spurious frequency bands and the authorized band was not corrected for BRF losses.

5. Proper operation of the transmitter prior to adding the filter to the measurement chain.

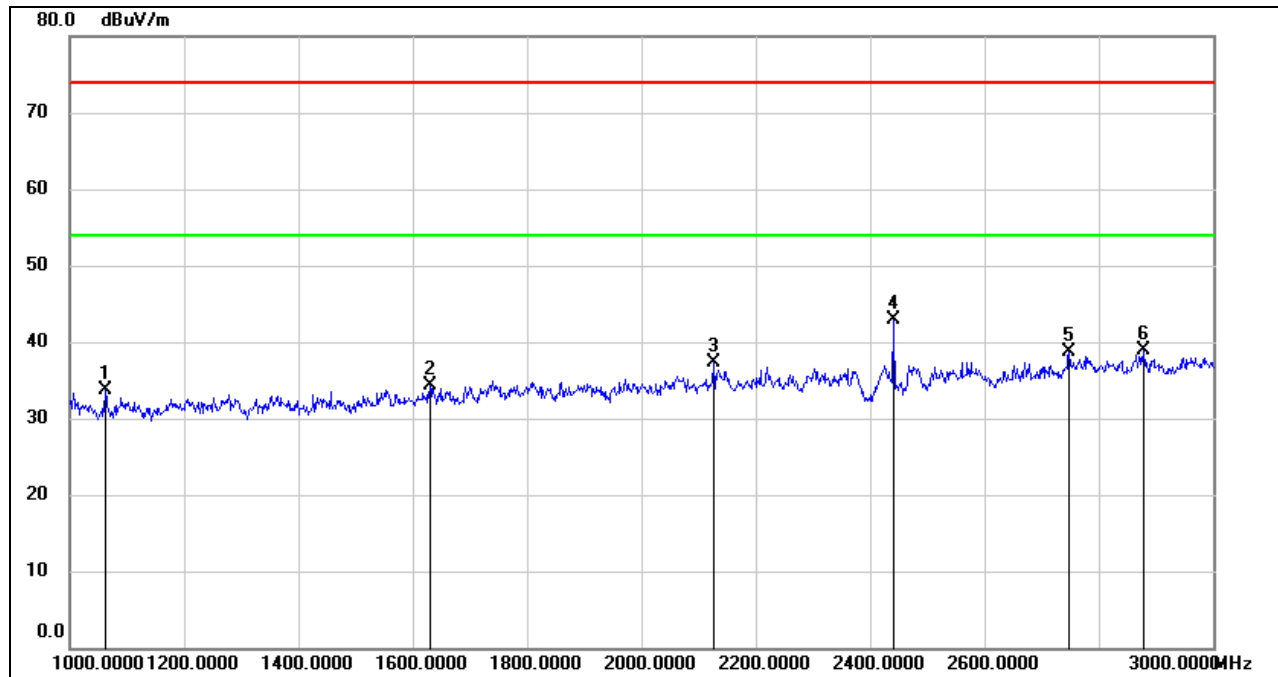
HARMONICS AND SPURIOUS EMISSIONS (LOW CHANNEL, VERTICAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1180.000	46.32	-13.10	33.22	74.00	-40.78	peak
2	1806.000	45.35	-10.11	35.24	74.00	-38.76	peak
3	2140.000	44.17	-9.12	35.05	74.00	-38.95	peak
4	2402.000	48.12	-7.95	40.17	/	/	fundamental
5	2782.000	43.99	-6.27	37.72	74.00	-36.28	peak
6	2896.000	43.13	-5.54	37.59	74.00	-36.41	peak

- Note: 1. Peak Result = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. Filter losses were only considered in then spurious frequency bands and the authorized band was not corrected for BRF losses.
5. Proper operation of the transmitter prior to adding the filter to the measurement chain.

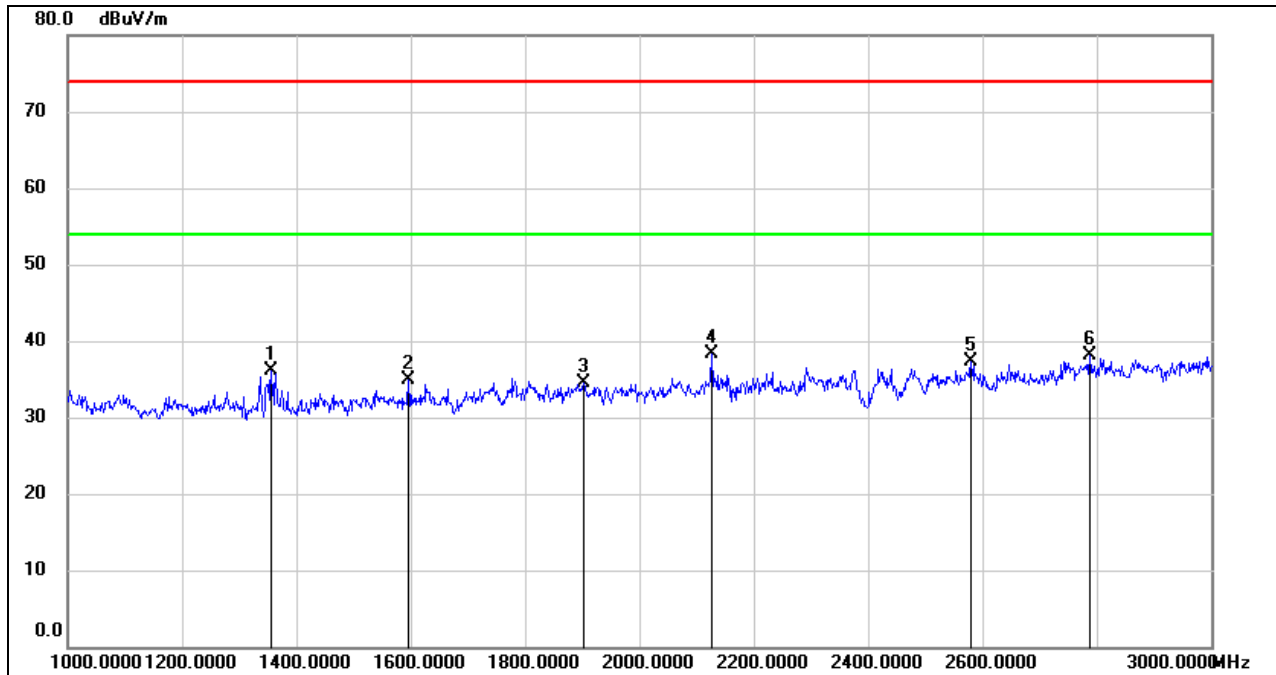
HARMONICS AND SPURIOUS EMISSIONS (MID CHANNEL, HORIZONTAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1062.000	47.52	-13.81	33.71	74.00	-40.29	peak
2	1630.000	45.67	-11.46	34.21	74.00	-39.79	peak
3	2126.000	46.49	-9.18	37.31	74.00	-36.69	peak
4	2440.000	50.63	-7.68	42.95	/	/	fundamental
5	2748.000	45.29	-6.64	38.65	74.00	-35.35	peak
6	2878.000	44.58	-5.65	38.93	74.00	-35.07	peak

- Note: 1. Peak Result = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. Filter losses were only considered in then spurious frequency bands and the authorized band was not corrected for BRF losses.
5. Proper operation of the transmitter prior to adding the filter to the measurement chain.

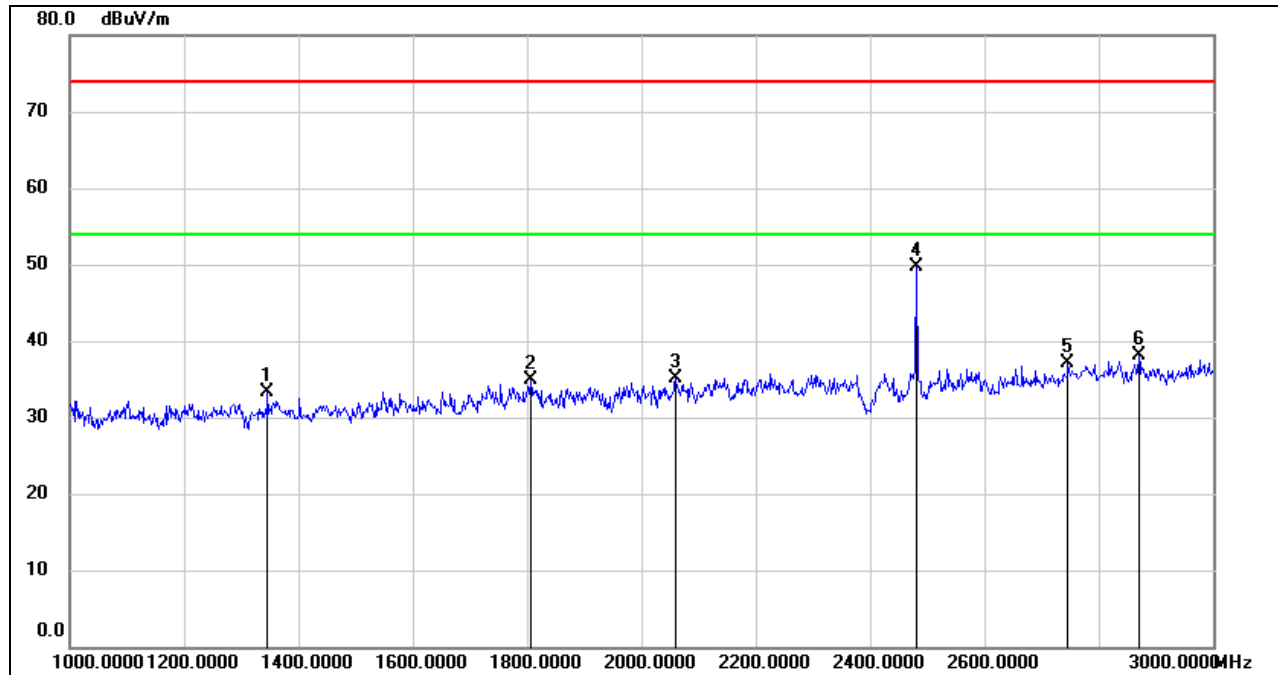
HARMONICS AND SPURIOUS EMISSIONS (MID CHANNEL, VERTICAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1356.000	48.68	-12.60	36.08	74.00	-37.92	peak
2	1596.000	46.63	-11.65	34.98	74.00	-39.02	peak
3	1902.000	44.66	-10.13	34.53	74.00	-39.47	peak
4	2126.000	47.49	-9.18	38.31	74.00	-35.69	peak
5	2580.000	44.96	-7.66	37.30	74.00	-36.70	peak
6	2788.000	44.33	-6.20	38.13	74.00	-35.87	peak

- Note: 1. Peak Result = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. Filter losses were only considered in then spurious frequency bands and the authorized band was not corrected for BRF losses.
5. Proper operation of the transmitter prior to adding the filter to the measurement chain.

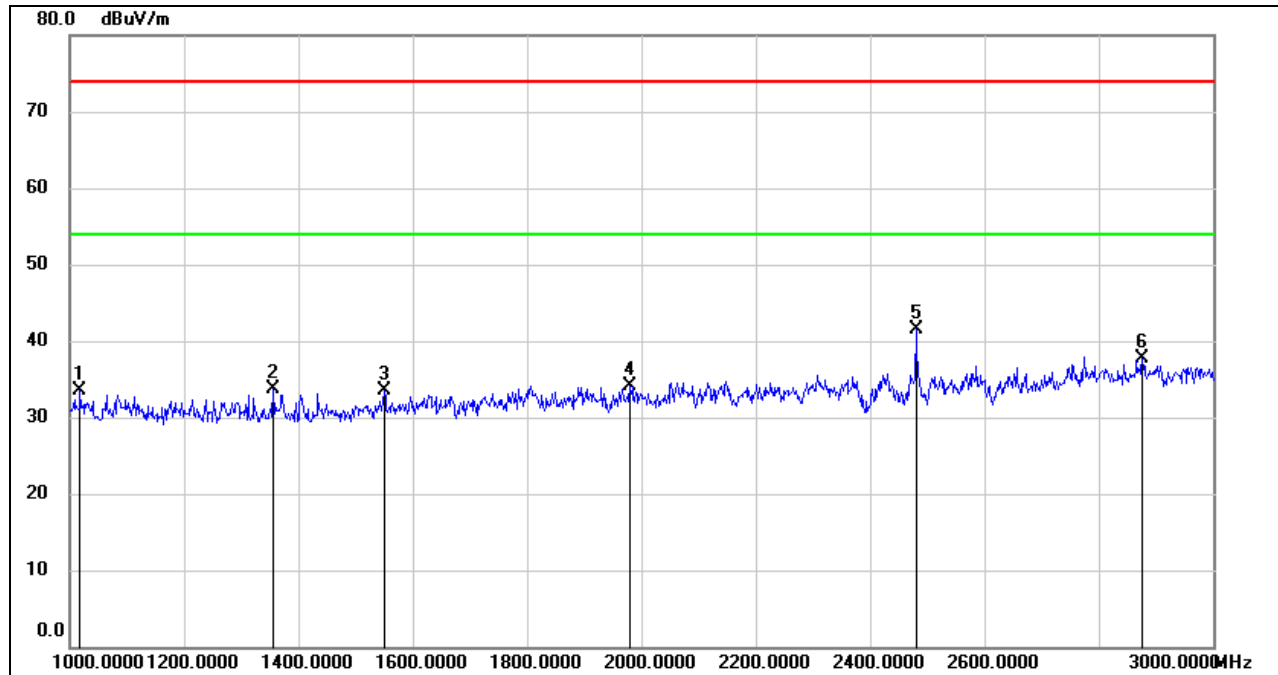
HARMONICS AND SPURIOUS EMISSIONS (HIGH CHANNEL, HORIZONTAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1346.000	45.82	-12.59	33.23	74.00	-40.77	peak
2	1806.000	45.11	-10.11	35.00	74.00	-39.00	peak
3	2060.000	44.69	-9.59	35.10	74.00	-38.90	peak
4	2480.000	57.16	-7.39	49.77	/	/	fundamental
5	2746.000	43.72	-6.67	37.05	74.00	-36.95	peak
6	2870.000	43.89	-5.69	38.20	74.00	-35.80	peak

- Note: 1. Peak Result = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. Filter losses were only considered in then spurious frequency bands and the authorized band was not corrected for BRF losses.
5. Proper operation of the transmitter prior to adding the filter to the measurement chain.

HARMONICS AND SPURIOUS EMISSIONS (HIGH CHANNEL, VERTICAL)

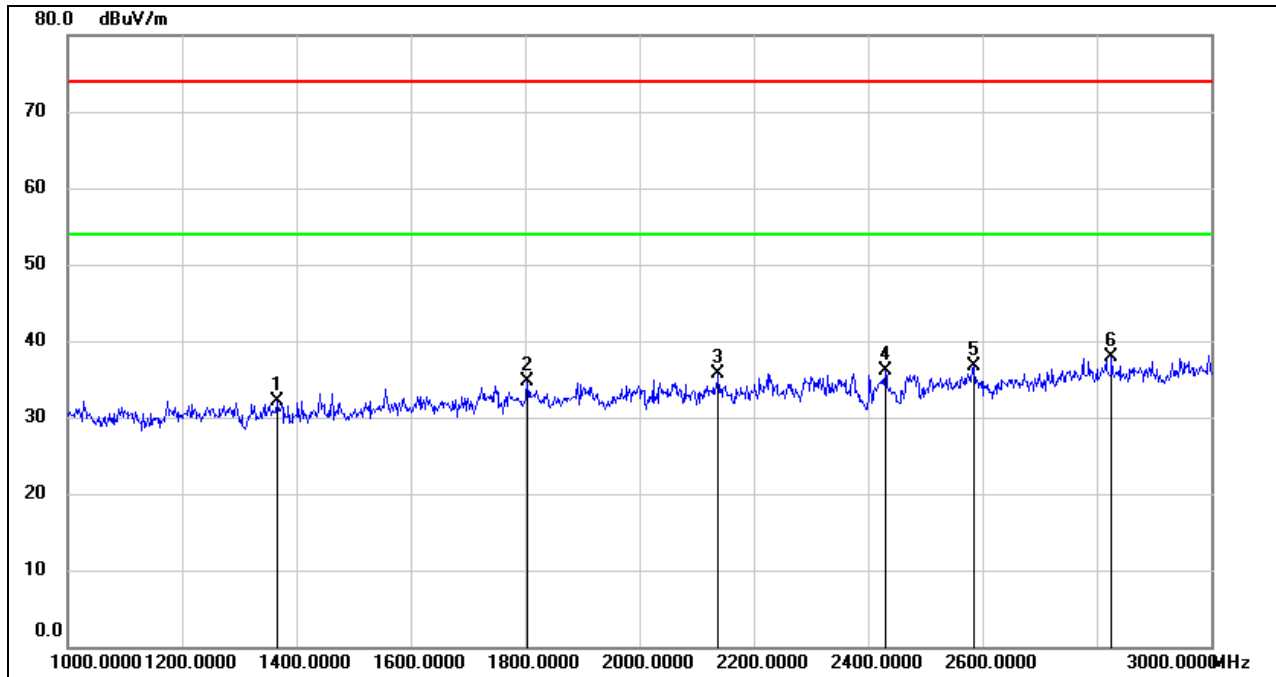


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1018.000	47.29	-13.84	33.45	74.00	-40.55	peak
2	1356.000	46.26	-12.60	33.66	74.00	-40.34	peak
3	1550.000	45.61	-12.02	33.59	74.00	-40.41	peak
4	1980.000	44.20	-10.03	34.17	74.00	-39.83	peak
5	2480.000	48.89	-7.39	41.50	/	/	fundamental
6	2876.000	43.36	-5.66	37.70	74.00	-36.30	peak

- Note: 1. Peak Result = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. Filter losses were only considered in then spurious frequency bands and the authorized band was not corrected for BRF losses.
5. Proper operation of the transmitter prior to adding the filter to the measurement chain.

7.3.2. BLE 2Mbps MODE

HARMONICS AND SPURIOUS EMISSIONS (LOW CHANNEL, HORIZONTAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1366.000	44.61	-12.60	32.01	74.00	-41.99	peak
2	1804.000	44.76	-10.11	34.65	74.00	-39.35	peak
3	2138.000	44.74	-9.12	35.62	74.00	-38.38	peak
4	2430.000	43.84	-7.75	36.09	74.00	-37.91	peak
5	2584.000	44.41	-7.68	36.73	74.00	-37.27	peak
6	2826.000	43.85	-5.94	37.91	74.00	-36.09	peak

Note: 1. Peak Result = Reading Level + Correct Factor.

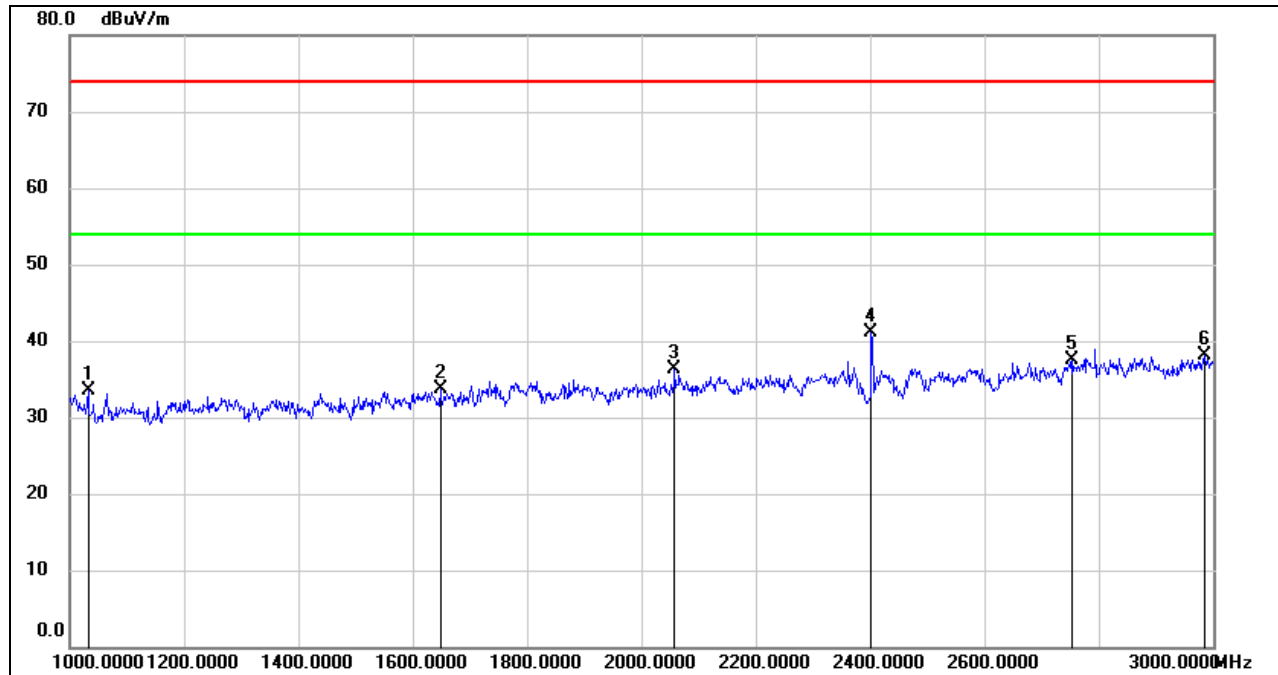
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Peak: Peak detector.

4. Filter losses were only considered in then spurious frequency bands and the authorized band was not corrected for BRF losses.

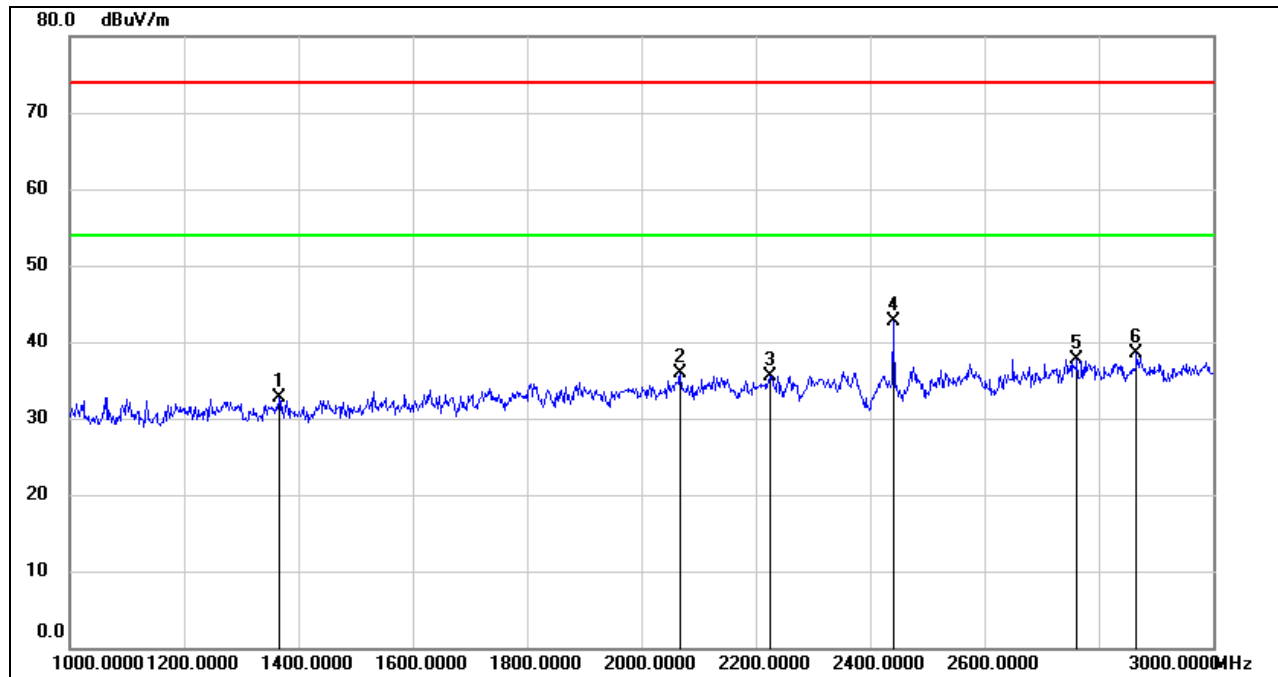
5. Proper operation of the transmitter prior to adding the filter to the measurement chain.

HARMONICS AND SPURIOUS EMISSIONS (LOW CHANNEL, VERTICAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1032.000	47.36	-13.82	33.54	74.00	-40.46	peak
2	1648.000	45.00	-11.37	33.63	74.00	-40.37	peak
3	2058.000	45.84	-9.61	36.23	74.00	-37.77	peak
4	2402.000	48.98	-7.95	41.03	/	/	fundamental
5	2754.000	43.99	-6.58	37.41	74.00	-36.59	peak
6	2986.000	43.36	-5.31	38.05	74.00	-35.95	peak

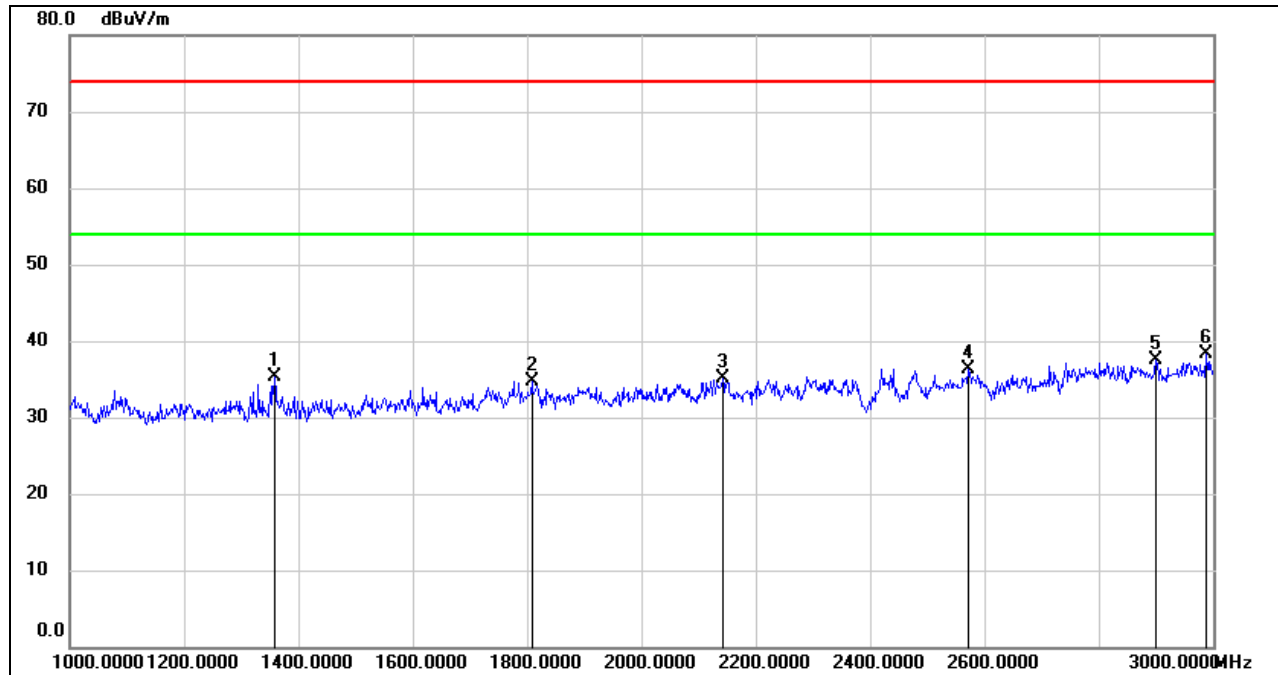
- Note: 1. Peak Result = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. Filter losses were only considered in then spurious frequency bands and the authorized band was not corrected for BRF losses.
5. Proper operation of the transmitter prior to adding the filter to the measurement chain.

**HARMONICS AND SPURIOUS EMISSIONS (MID CHANNEL, HORIZONTAL)**

No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1366.000	45.22	-12.60	32.62	74.00	-41.38	peak
2	2068.000	45.40	-9.54	35.86	74.00	-38.14	peak
3	2226.000	44.13	-8.67	35.46	74.00	-38.54	peak
4	2440.000	50.35	-7.68	42.67	/	/	fundamental
5	2762.000	44.26	-6.49	37.77	74.00	-36.23	peak
6	2866.000	44.15	-5.71	38.44	74.00	-35.56	peak

- Note: 1. Peak Result = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. Filter losses were only considered in then spurious frequency bands and the authorized band was not corrected for BRF losses.
5. Proper operation of the transmitter prior to adding the filter to the measurement chain.

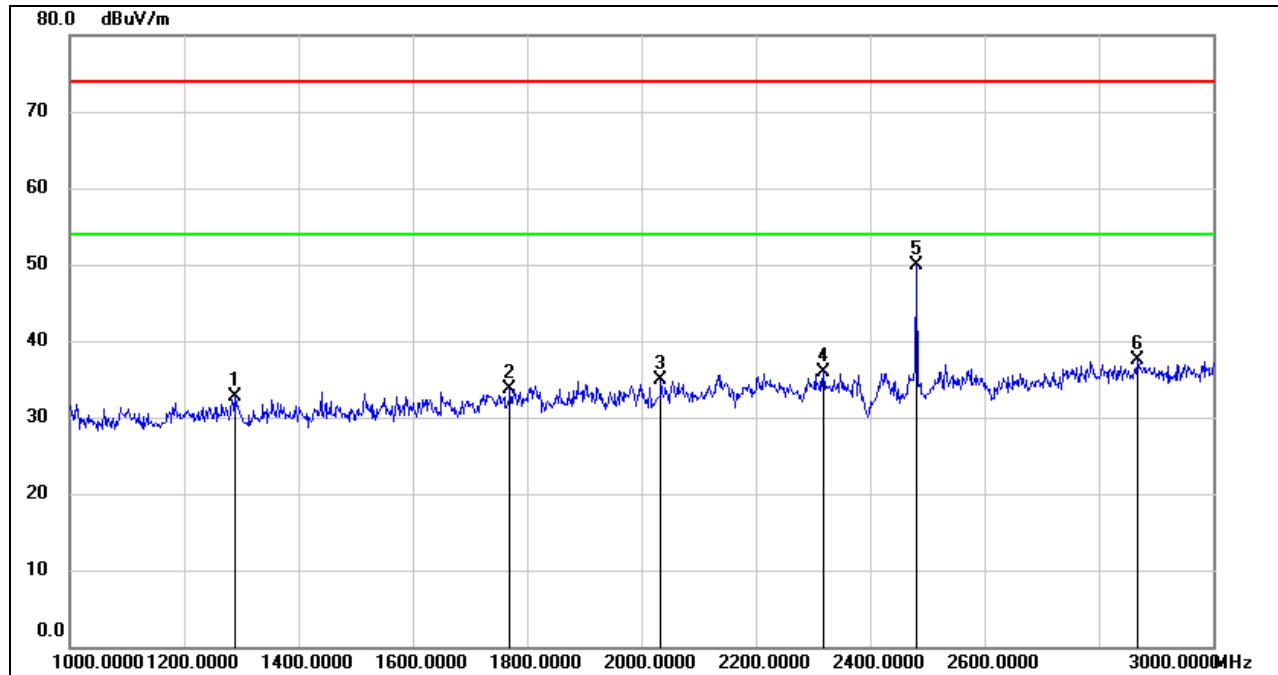
HARMONICS AND SPURIOUS EMISSIONS (MID CHANNEL, VERTICAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1358.000	47.96	-12.61	35.35	74.00	-38.65	peak
2	1808.000	44.79	-10.11	34.68	74.00	-39.32	peak
3	2142.000	44.19	-9.10	35.09	74.00	-38.91	peak
4	2572.000	43.93	-7.61	36.32	74.00	-37.68	peak
5	2900.000	42.96	-5.52	37.44	74.00	-36.56	peak
6	2988.000	43.64	-5.31	38.33	74.00	-35.67	peak

- Note: 1. Peak Result = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. Filter losses were only considered in then spurious frequency bands and the authorized band was not corrected for BRF losses.
5. Proper operation of the transmitter prior to adding the filter to the measurement chain.

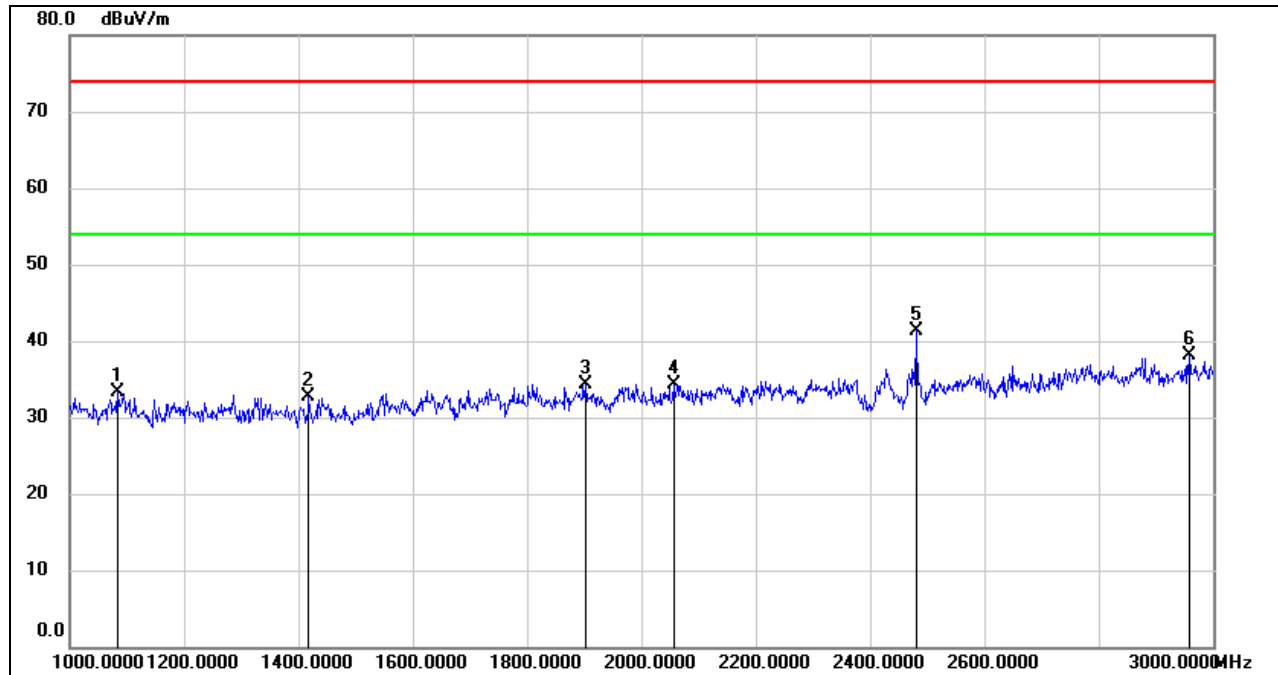
HARMONICS AND SPURIOUS EMISSIONS (HIGH CHANNEL, HORIZONTAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1288.000	45.42	-12.62	32.80	74.00	-41.20	peak
2	1770.000	44.17	-10.41	33.76	74.00	-40.24	peak
3	2034.000	44.62	-9.77	34.85	74.00	-39.15	peak
4	2318.000	44.25	-8.25	36.00	74.00	-38.00	peak
5	2480.000	57.34	-7.39	49.95	/	/	fundamental
6	2868.000	43.13	-5.71	37.42	74.00	-36.58	peak

- Note: 1. Peak Result = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. Filter losses were only considered in then spurious frequency bands and the authorized band was not corrected for BRF losses.
5. Proper operation of the transmitter prior to adding the filter to the measurement chain.

HARMONICS AND SPURIOUS EMISSIONS (HIGH CHANNEL, VERTICAL)



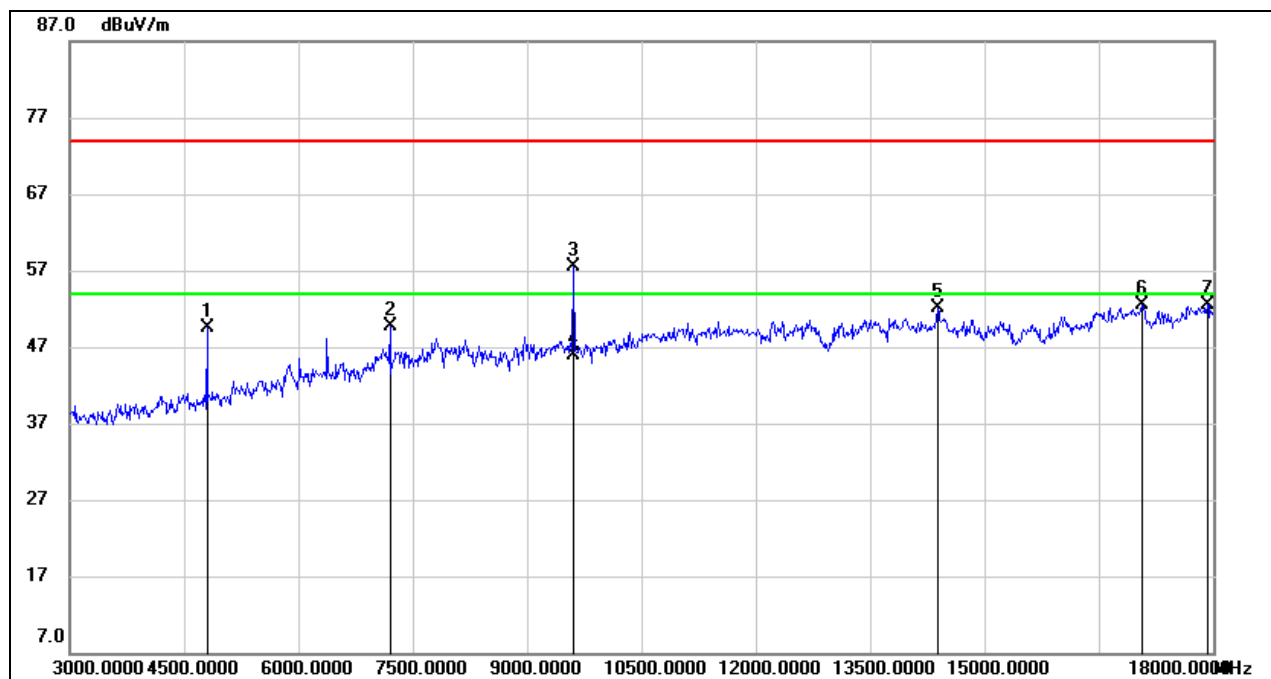
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1084.000	47.18	-13.79	33.39	74.00	-40.61	peak
2	1418.000	45.19	-12.58	32.61	74.00	-41.39	peak
3	1902.000	44.51	-10.13	34.38	74.00	-39.62	peak
4	2056.000	43.93	-9.62	34.31	74.00	-39.69	peak
5	2480.000	48.72	-7.39	41.33	/	/	fundamental
6	2958.000	43.40	-5.38	38.02	74.00	-35.98	peak

- Note: 1. Peak Result = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. Filter losses were only considered in then spurious frequency bands and the authorized band was not corrected for BRF losses.
5. Proper operation of the transmitter prior to adding the filter to the measurement chain.

7.4. SPURIOUS EMISSIONS (3~18GHz)

7.4.1. BLE 1Mbps MODE

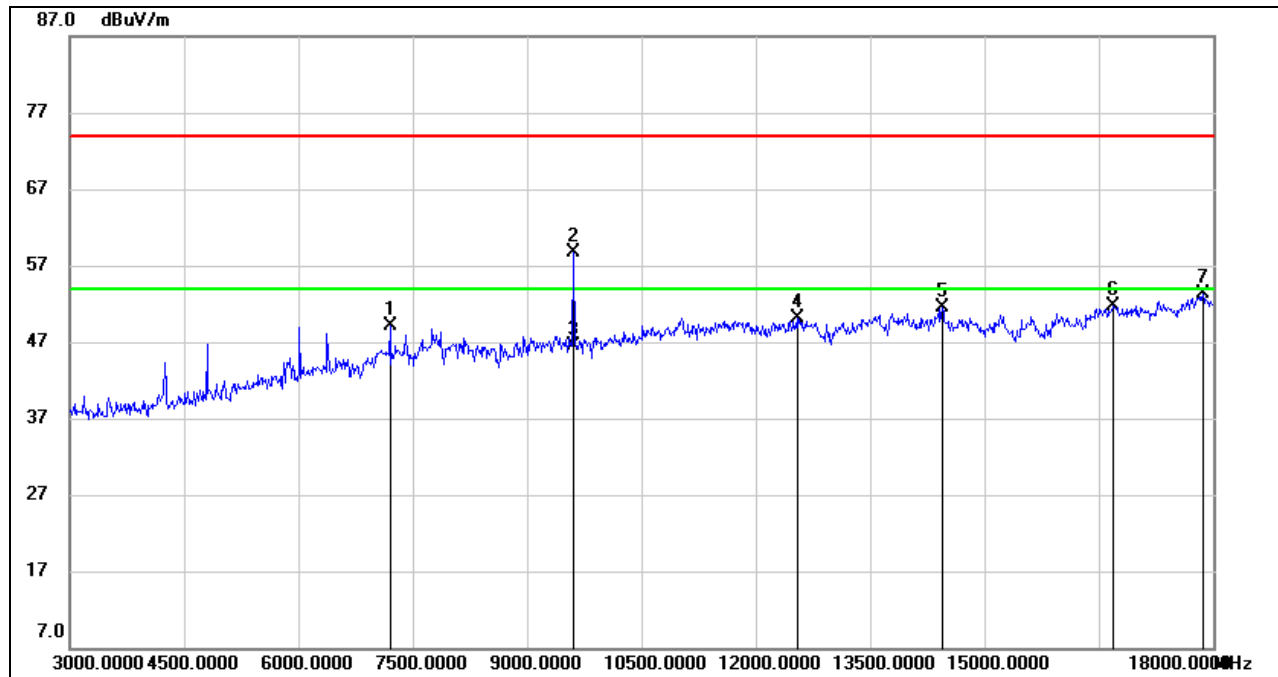
HARMONICS AND SPURIOUS EMISSIONS (LOW CHANNEL, HORIZONTAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4800.000	49.60	-0.14	49.46	74.00	-24.54	peak
2	7200.000	42.66	7.05	49.71	74.00	-24.29	peak
3	9607.952	46.85	10.65	57.50	74.00	-16.50	peak
4	9607.952	35.33	10.65	45.98	54.00	-8.02	AVG
5	14385.000	35.43	16.67	52.10	74.00	-21.90	peak
6	17070.000	31.56	20.99	52.55	74.00	-21.45	peak
7	17925.000	29.22	23.34	52.56	74.00	-21.44	peak

Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. AVG: VBW=1/Ton, where: Ton is the transmitting duration.
5. For transmitting duration, please refer to clause 6.1.
6. The high pass filter loss factor already add into the correct factor.
7. Proper operation of the transmitter prior to adding the filter to the measurement chain.
8. With the high pass filter, only the signal form 2.7GHz to 18GHz can go through the path.

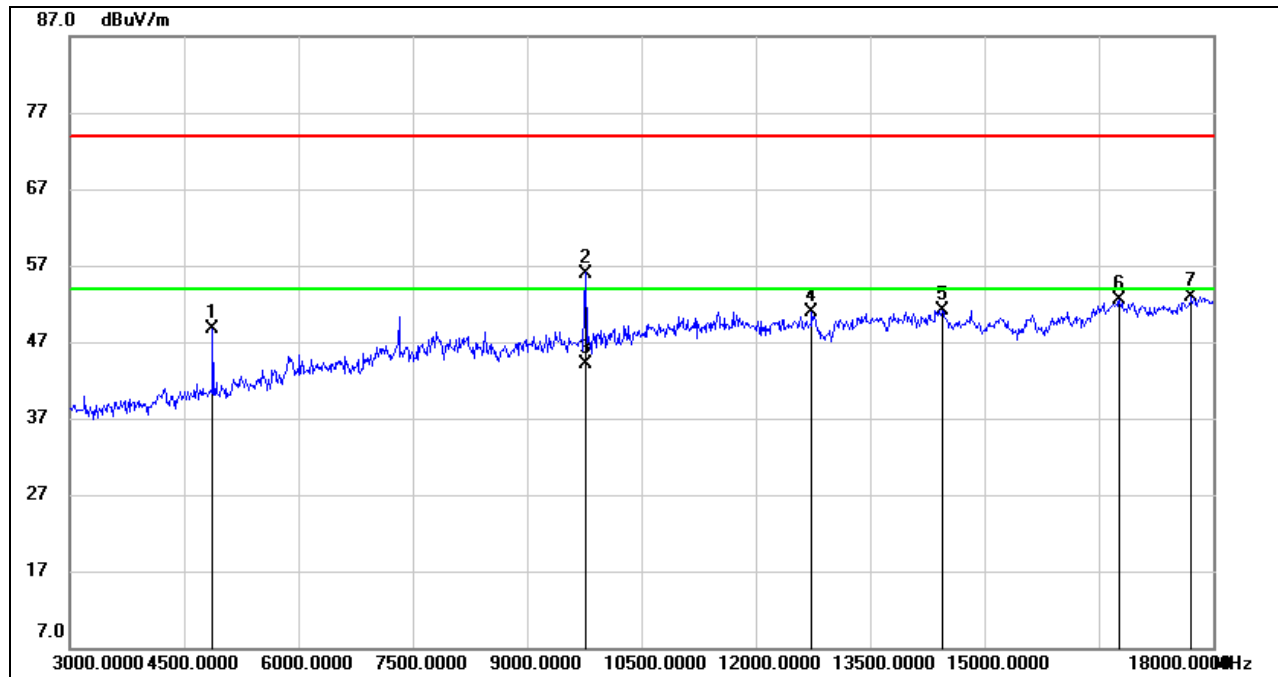
HARMONICS AND SPURIOUS EMISSIONS (LOW CHANNEL, VERTICAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	7200.000	41.99	7.05	49.04	74.00	-24.96	peak
2	9607.972	47.97	10.65	58.62	74.00	-15.38	peak
3	9607.972	35.89	10.65	46.54	54.00	-7.46	AVG
4	12540.000	35.19	14.88	50.07	74.00	-23.93	peak
5	14445.000	34.91	16.66	51.57	74.00	-22.43	peak
6	16680.000	31.63	20.12	51.75	74.00	-22.25	peak
7	17865.000	30.06	23.34	53.40	74.00	-20.60	peak

Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. AVG: VBW=1/Ton, where: Ton is the transmitting duration.
5. For transmitting duration, please refer to clause 6.1.
6. The high pass filter loss factor already add into the correct factor.
7. Proper operation of the transmitter prior to adding the filter to the measurement chain.
8. With the high pass filter, only the signal form 2.7GHz to 18GHz can go through the path.

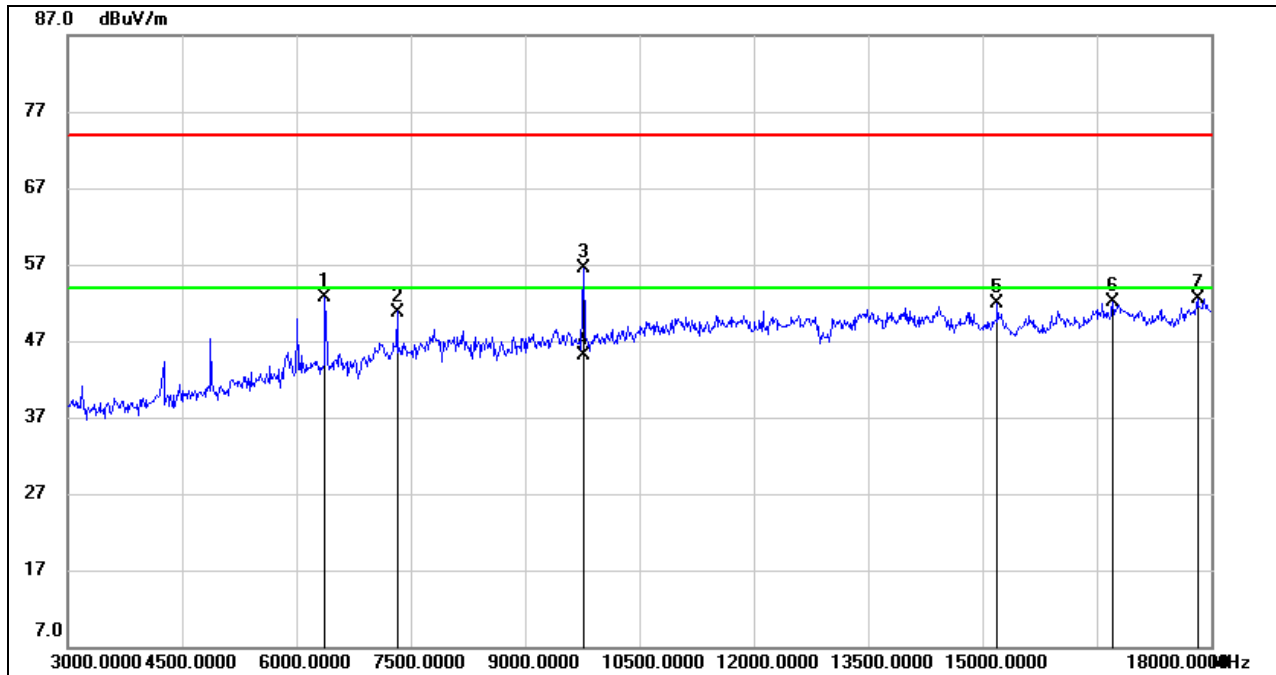
HARMONICS AND SPURIOUS EMISSIONS (MID CHANNEL, HORIZONTAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4875.000	48.62	0.10	48.72	74.00	-25.28	peak
2	9759.965	45.39	10.61	56.00	74.00	-18.00	peak
3	9759.965	33.47	10.61	44.08	54.00	-9.92	AVG
4	12735.000	35.82	15.10	50.92	74.00	-23.08	peak
5	14445.000	34.43	16.66	51.09	74.00	-22.91	peak
6	16770.000	32.24	20.28	52.52	74.00	-21.48	peak
7	17715.000	30.30	22.65	52.95	74.00	-21.05	peak

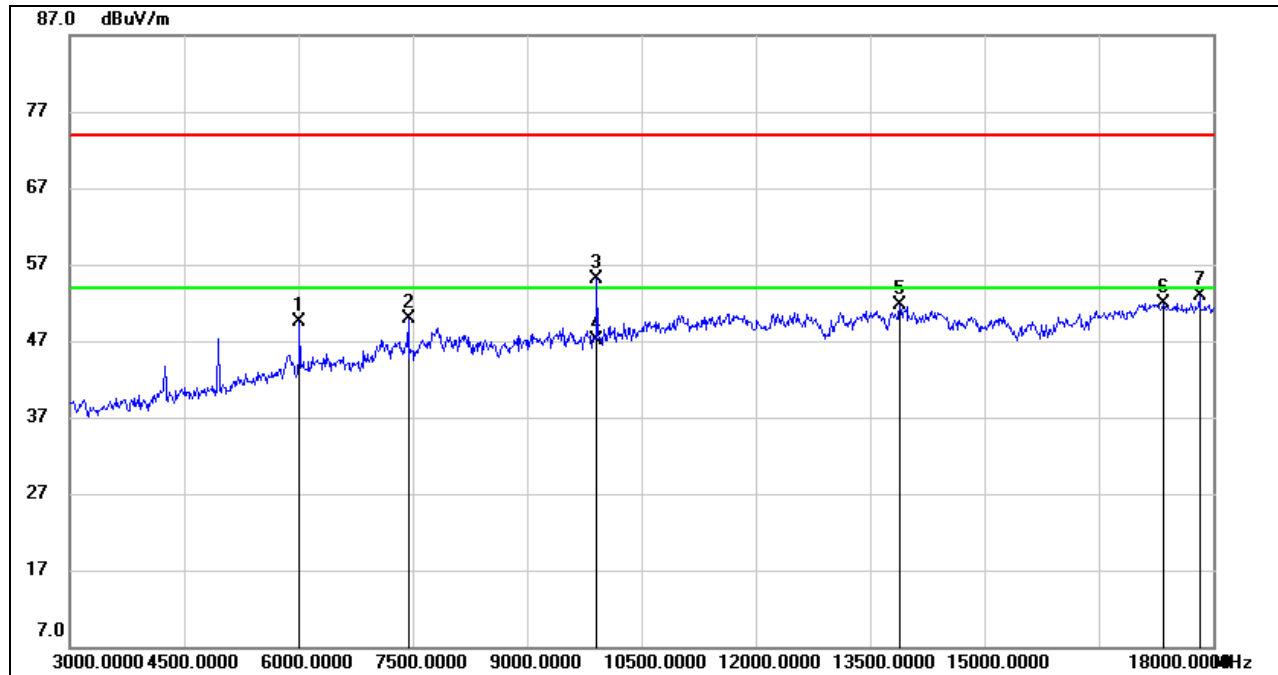
Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. AVG: VBW=1/Ton, where: Ton is the transmitting duration.
5. For transmitting duration, please refer to clause 6.1.
6. The high pass filter loss factor already add into the correct factor.
7. Proper operation of the transmitter prior to adding the filter to the measurement chain.
8. With the high pass filter, only the signal form 2.7GHz to 18GHz can go through the path.

HARMONICS AND SPURIOUS EMISSIONS (MID CHANNEL, VERTICAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	6375.000	47.68	5.08	52.76	74.00	-21.24	peak
2	7320.000	43.38	7.42	50.80	74.00	-23.20	peak
3	9759.945	45.93	10.61	56.54	74.00	-17.46	peak
4	9759.945	34.49	10.61	45.10	54.00	-8.90	AVG
5	15195.000	35.87	16.01	51.88	74.00	-22.12	peak
6	16710.000	31.96	20.23	52.19	74.00	-21.81	peak
7	17820.000	29.23	23.34	52.57	74.00	-21.43	peak

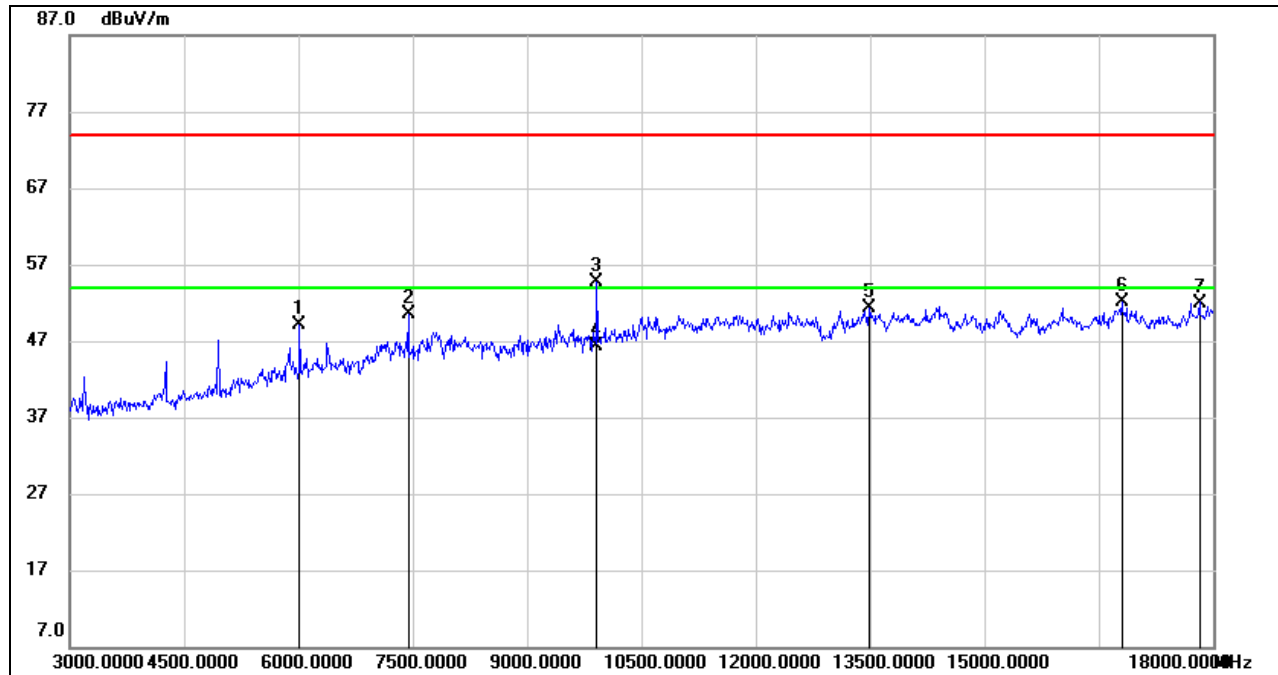
Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. AVG: $VBW=1/Ton$, where: Ton is the transmitting duration.
5. For transmitting duration, please refer to clause 6.1.
6. The high pass filter loss factor already add into the correct factor.
7. Proper operation of the transmitter prior to adding the filter to the measurement chain.
8. With the high pass filter, only the signal form 2.7GHz to 18GHz can go through the path.

**HARMONICS AND SPURIOUS EMISSIONS (HIGH CHANNEL, HORIZONTAL)**

No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	6015.000	45.52	4.01	49.53	74.00	-24.47	peak
2	7440.000	42.26	7.65	49.91	74.00	-24.09	peak
3	9920.534	44.22	10.94	55.16	74.00	-18.84	peak
4	9920.534	36.21	10.94	47.15	54.00	-6.85	AVG
5	13890.000	34.80	16.85	51.65	74.00	-22.35	peak
6	17340.000	29.95	21.89	51.84	74.00	-22.16	peak
7	17820.000	29.64	23.34	52.98	74.00	-21.02	peak

Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. AVG: VBW=1/Ton, where: Ton is the transmitting duration.
5. For transmitting duration, please refer to clause 6.1.
6. The high pass filter loss factor already add into the correct factor.
7. Proper operation of the transmitter prior to adding the filter to the measurement chain.
8. With the high pass filter, only the signal form 2.7GHz to 18GHz can go through the path.

HARMONICS AND SPURIOUS EMISSIONS (HIGH CHANNEL, VERTICAL)

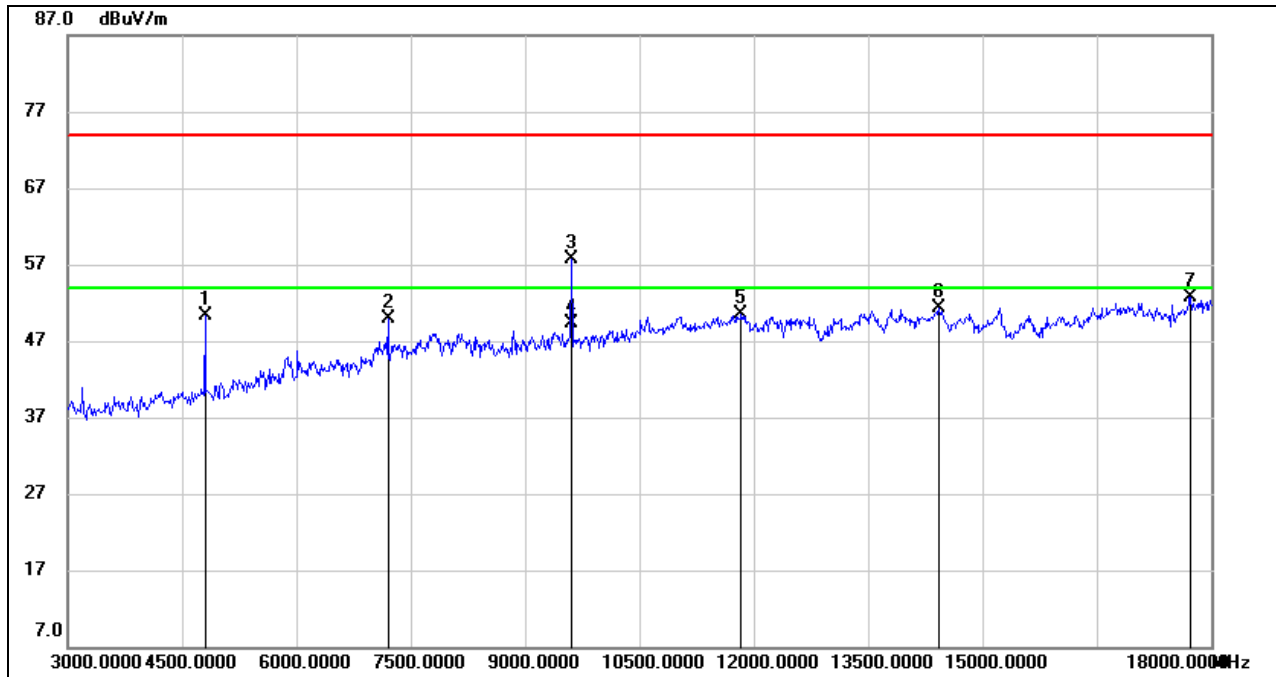


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	6015.000	45.14	4.01	49.15	74.00	-24.85	peak
2	7440.000	42.76	7.65	50.41	74.00	-23.59	peak
3	9920.635	43.78	10.94	54.72	74.00	-19.28	peak
4	9920.635	35.39	10.94	46.33	54.00	-7.67	AVG
5	13485.000	35.10	16.14	51.24	74.00	-22.76	peak
6	16800.000	31.76	20.29	52.05	74.00	-21.95	peak
7	17820.000	28.66	23.34	52.00	74.00	-22.00	peak

Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. AVG: VBW=1/Ton, where: Ton is the transmitting duration.
5. For transmitting duration, please refer to clause 6.1.
6. The high pass filter loss factor already add into the correct factor.
7. Proper operation of the transmitter prior to adding the filter to the measurement chain.
8. With the high pass filter, only the signal form 2.7GHz to 18GHz can go through the path.

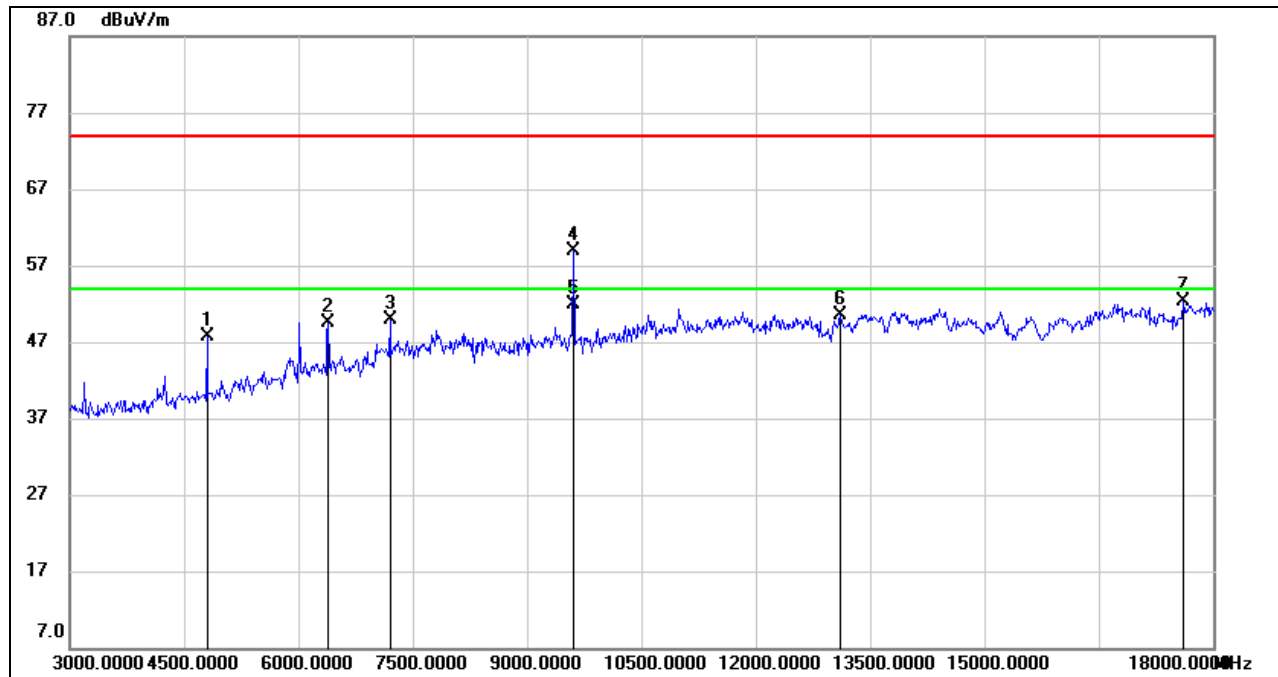
7.4.2. BLE 2Mbps MODE

HARMONICS AND SPURIOUS EMISSIONS (LOW CHANNEL, HORIZONTAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4800.000	50.48	-0.14	50.34	74.00	-23.66	peak
2	7200.000	42.83	7.05	49.88	74.00	-24.12	peak
3	9615.000	47.12	10.64	57.76	74.00	-16.24	peak
4	9615.000	38.74	10.64	49.38	54.00	-4.62	AVG
5	11835.000	36.27	14.33	50.60	74.00	-23.40	peak
6	14430.000	34.58	16.66	51.24	74.00	-22.76	peak
7	17730.000	29.94	22.78	52.72	74.00	-21.28	peak

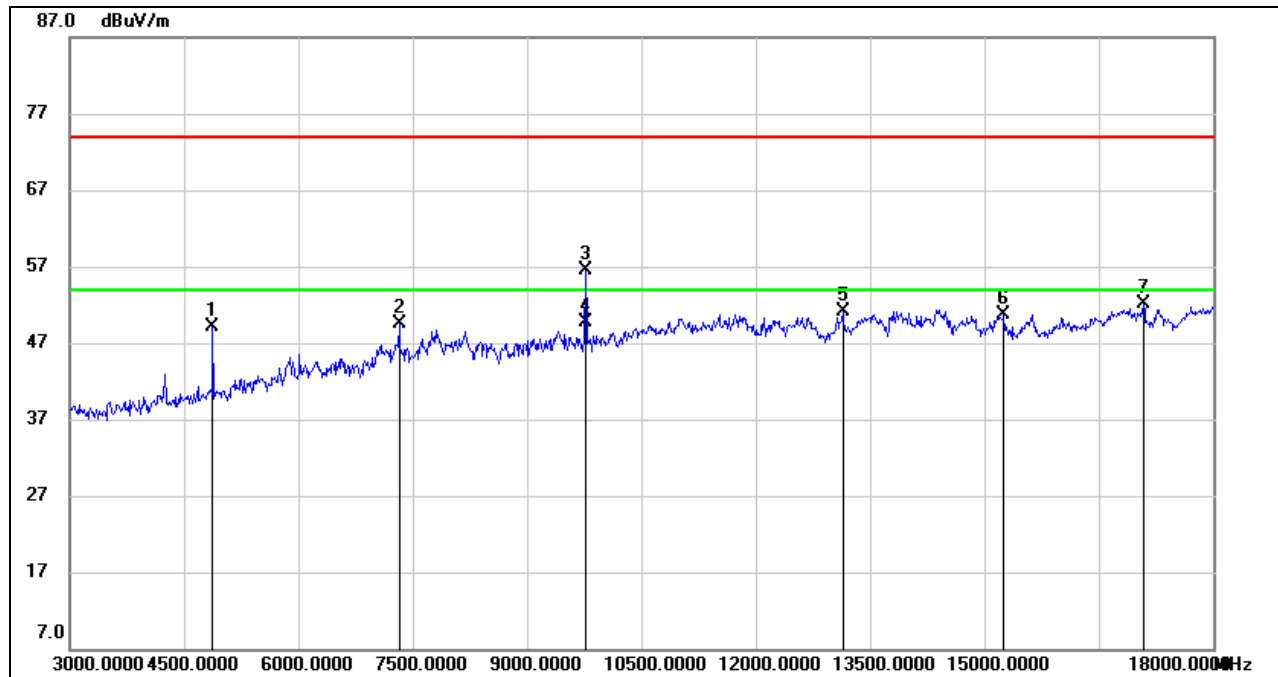
Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. AVG: $VBW=1/Ton$, where: Ton is the transmitting duration.
5. For transmitting duration, please refer to clause 6.1.
6. The high pass filter loss factor already add into the correct factor.
7. Proper operation of the transmitter prior to adding the filter to the measurement chain.
8. With the high pass filter, only the signal form 2.7GHz to 18GHz can go through the path.

**HARMONICS AND SPURIOUS EMISSIONS (LOW CHANNEL, VERTICAL)**

No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4800.000	47.87	-0.14	47.73	74.00	-26.27	peak
2	6390.000	44.35	5.15	49.50	74.00	-24.50	peak
3	7200.000	42.90	7.05	49.95	74.00	-24.05	peak
4	9608.007	48.32	10.65	58.97	74.00	-15.03	peak
5	9608.007	41.24	10.65	51.89	54.00	-2.11	AVG
6	13110.000	35.28	15.30	50.58	74.00	-23.42	peak
7	17610.000	30.40	22.00	52.40	74.00	-21.60	peak

Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. AVG: $VBW=1/Ton$, where: Ton is the transmitting duration.
5. For transmitting duration, please refer to clause 6.1.
6. The high pass filter loss factor already add into the correct factor.
7. Proper operation of the transmitter prior to adding the filter to the measurement chain.
8. With the high pass filter, only the signal form 2.7GHz to 18GHz can go through the path.

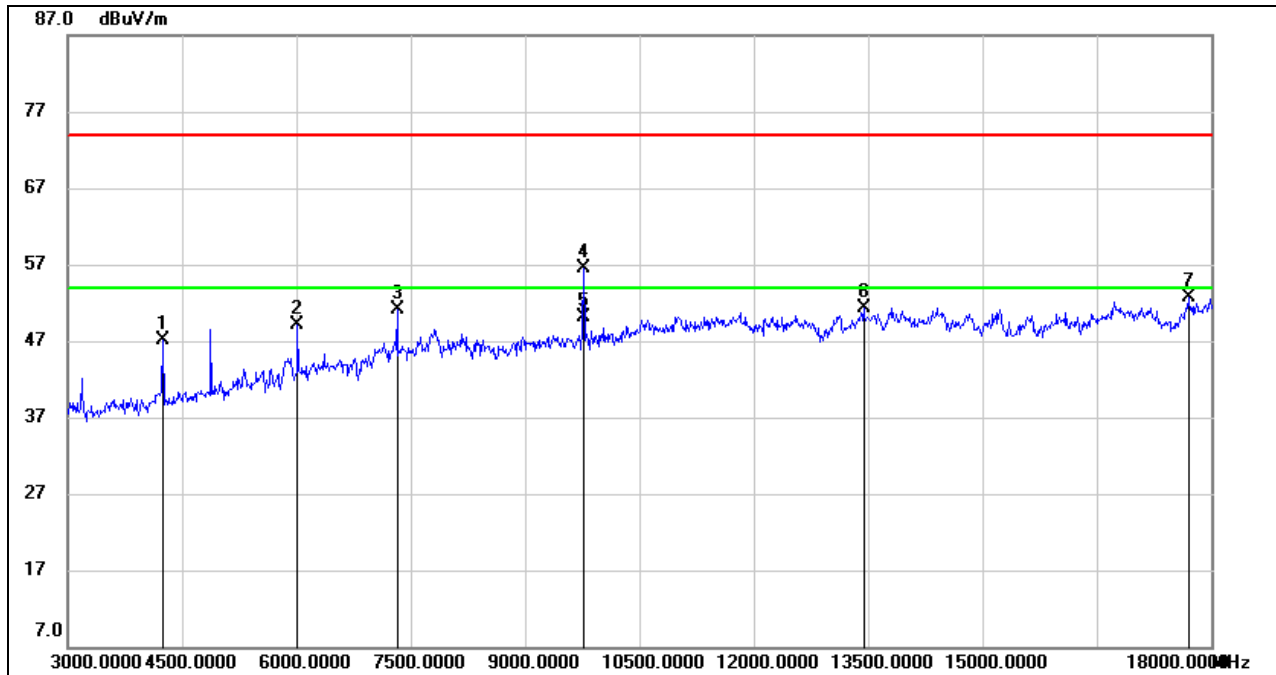
HARMONICS AND SPURIOUS EMISSIONS (MID CHANNEL, HORIZONTAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4875.000	48.95	0.10	49.05	74.00	-24.95	peak
2	7320.000	42.03	7.42	49.45	74.00	-24.55	peak
3	9765.000	45.94	10.60	56.54	74.00	-17.46	peak
4	9765.000	39.09	10.60	49.69	54.00	-4.31	AVG
5	13140.000	35.77	15.26	51.03	74.00	-22.97	peak
6	15255.000	34.55	16.12	50.67	74.00	-23.33	peak
7	17085.000	31.00	21.01	52.01	74.00	-21.99	peak

Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. AVG: VBW=1/Ton, where: Ton is the transmitting duration.
5. For transmitting duration, please refer to clause 6.1.
6. The high pass filter loss factor already add into the correct factor.
7. Proper operation of the transmitter prior to adding the filter to the measurement chain.
8. With the high pass filter, only the signal form 2.7GHz to 18GHz can go through the path.

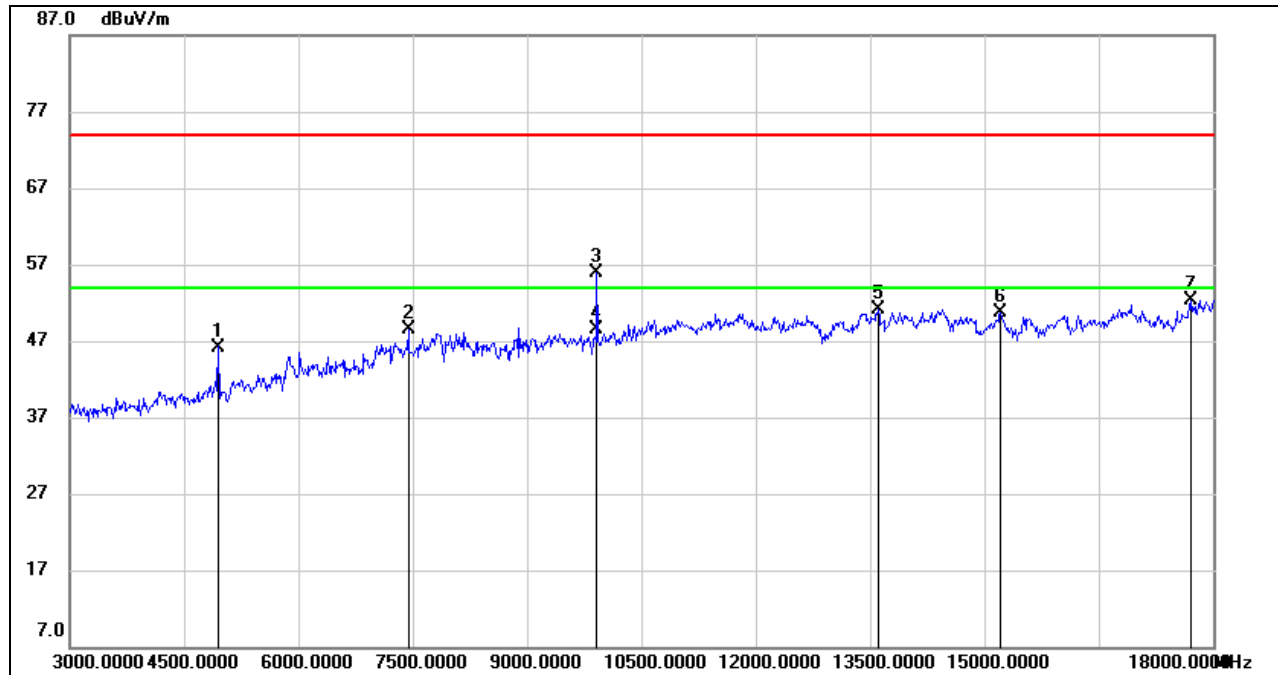
HARMONICS AND SPURIOUS EMISSIONS (MID CHANNEL, VERTICAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4245.000	48.90	-1.71	47.19	74.00	-26.81	peak
2	6015.000	45.01	4.01	49.02	74.00	-24.98	peak
3	7320.000	43.72	7.42	51.14	74.00	-22.86	peak
4	9765.000	45.98	10.60	56.58	74.00	-17.42	peak
5	9765.000	39.57	10.60	50.17	54.00	-3.83	AVG
6	13440.000	34.95	16.27	51.22	74.00	-22.78	peak
7	17700.000	30.17	22.53	52.70	74.00	-21.30	peak

Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. AVG: $VBW=1/Ton$, where: Ton is the transmitting duration.
5. For transmitting duration, please refer to clause 6.1.
6. The high pass filter loss factor already add into the correct factor.
7. Proper operation of the transmitter prior to adding the filter to the measurement chain.
8. With the high pass filter, only the signal form 2.7GHz to 18GHz can go through the path.

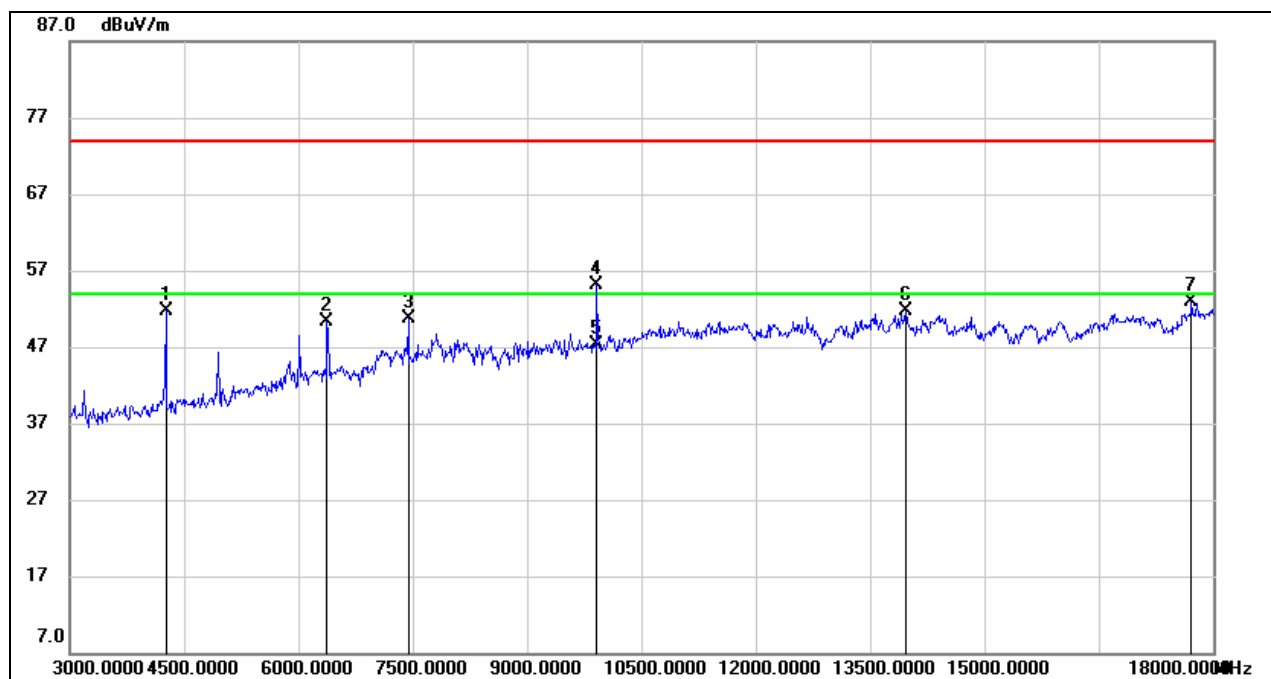
HARMONICS AND SPURIOUS EMISSIONS (HIGH CHANNEL, HORIZONTAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4950.000	45.80	0.40	46.20	74.00	-27.80	peak
2	7440.000	40.88	7.65	48.53	74.00	-25.47	peak
3	9915.000	44.89	10.95	55.84	74.00	-18.16	peak
4	9915.000	37.54	10.95	48.49	54.00	-5.51	AVG
5	13605.000	34.73	16.40	51.13	74.00	-22.87	peak
6	15210.000	34.67	16.03	50.70	74.00	-23.30	peak
7	17715.000	29.57	22.65	52.22	74.00	-21.78	peak

Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. AVG: VBW=1/Ton, where: Ton is the transmitting duration.
5. For transmitting duration, please refer to clause 6.1.
6. The high pass filter loss factor already add into the correct factor.
7. Proper operation of the transmitter prior to adding the filter to the measurement chain.
8. With the high pass filter, only the signal form 2.7GHz to 18GHz can go through the path.

HARMONICS AND SPURIOUS EMISSIONS (HIGH CHANNEL, VERTICAL)



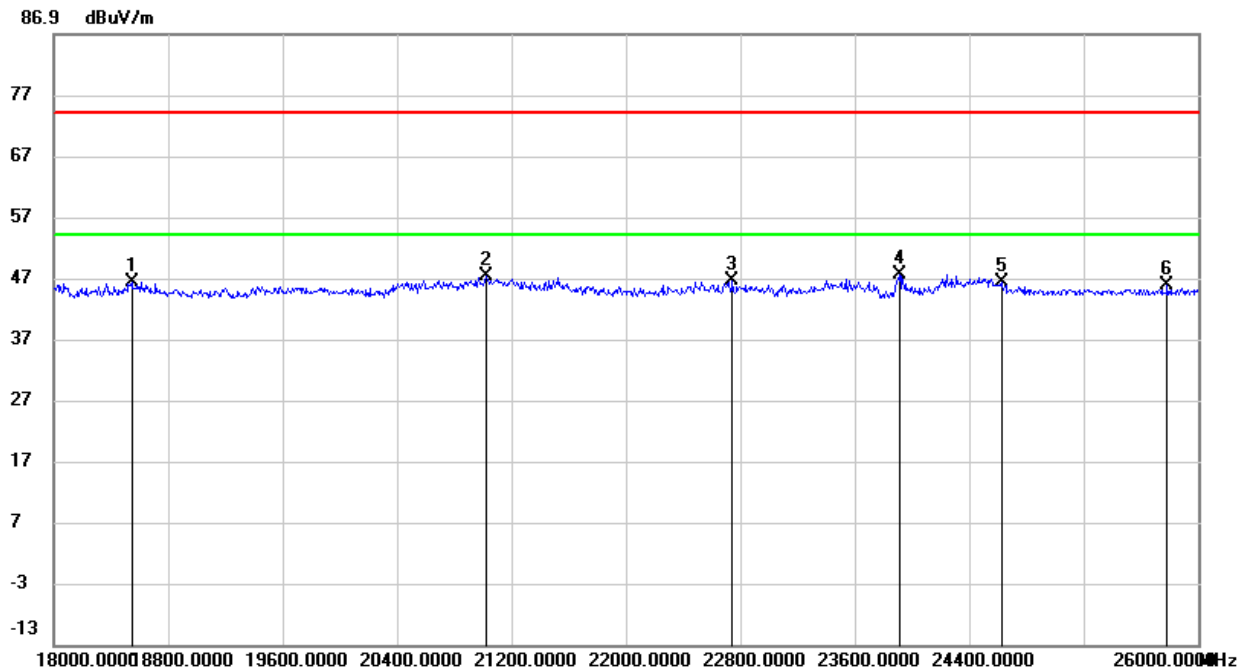
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4260.000	53.51	-1.84	51.67	74.00	-22.33	peak
2	6375.000	45.18	5.08	50.26	74.00	-23.74	peak
3	7440.000	43.10	7.65	50.75	74.00	-23.25	peak
4	9915.000	44.12	10.95	55.07	74.00	-18.93	peak
5	9915.000	36.42	10.95	47.37	54.00	-6.63	AVG
6	13965.000	35.10	16.68	51.78	74.00	-22.22	peak
7	17715.000	30.23	22.65	52.88	74.00	-21.12	peak

Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. AVG: $VBW=1/Ton$, where: Ton is the transmitting duration.
5. For transmitting duration, please refer to clause 6.1.
6. The high pass filter loss factor already add into the correct factor.
7. Proper operation of the transmitter prior to adding the filter to the measurement chain.
8. With the high pass filter, only the signal form 2.7GHz to 18GHz can go through the path.



7.5. SPURIOUS EMISSIONS (18~26GHz)

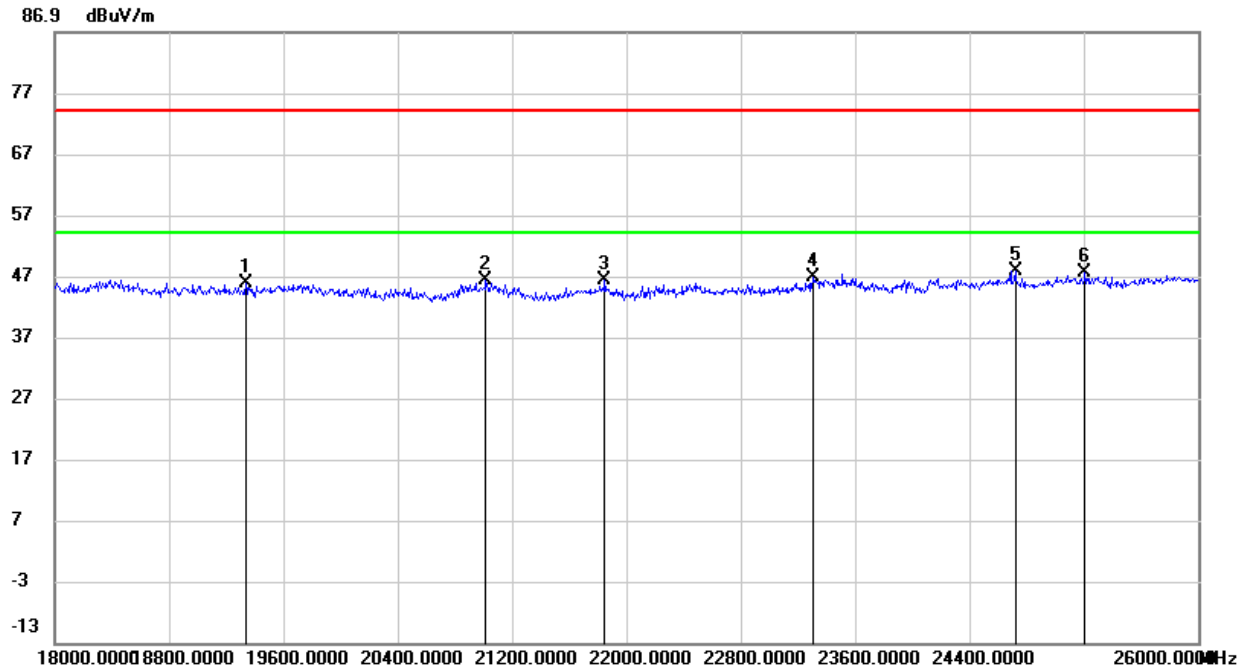
HARMONICS AND SPURIOUS EMISSIONS (BLE 1Mbps MODE, LOW CHANNEL, WORST-CASE CONFIGURATION, HORIZONTAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	18544.000	50.76	-4.46	46.30	74.00	-27.70	peak
2	21024.000	52.62	-5.30	47.32	74.00	-26.68	peak
3	22744.000	52.18	-5.74	46.44	74.00	-27.56	peak
4	23912.000	51.82	-4.23	47.59	74.00	-26.41	peak
5	24624.000	48.65	-2.27	46.38	74.00	-27.62	peak
6	25784.000	47.23	-1.49	45.74	74.00	-28.26	peak

Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. The preamplifier only effect to the above 1GHz signal and no filter was used during tested.

HARMONICS AND SPURIOUS EMISSIONS (BLE 1Mbps MODE, LOW CHANNEL, WORST-CASE CONFIGURATION, VERTICAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	19336.000	50.70	-4.97	45.73	74.00	-28.27	peak
2	21016.000	51.56	-5.29	46.27	74.00	-27.73	peak
3	21848.000	52.26	-5.95	46.31	74.00	-27.69	peak
4	23304.000	51.87	-5.16	46.71	74.00	-27.29	peak
5	24720.000	49.87	-2.02	47.85	74.00	-26.15	peak
6	25208.000	48.63	-1.16	47.47	74.00	-26.53	peak

Note: 1. Measurement = Reading Level + Correct Factor.

2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.

3. Peak: Peak detector.

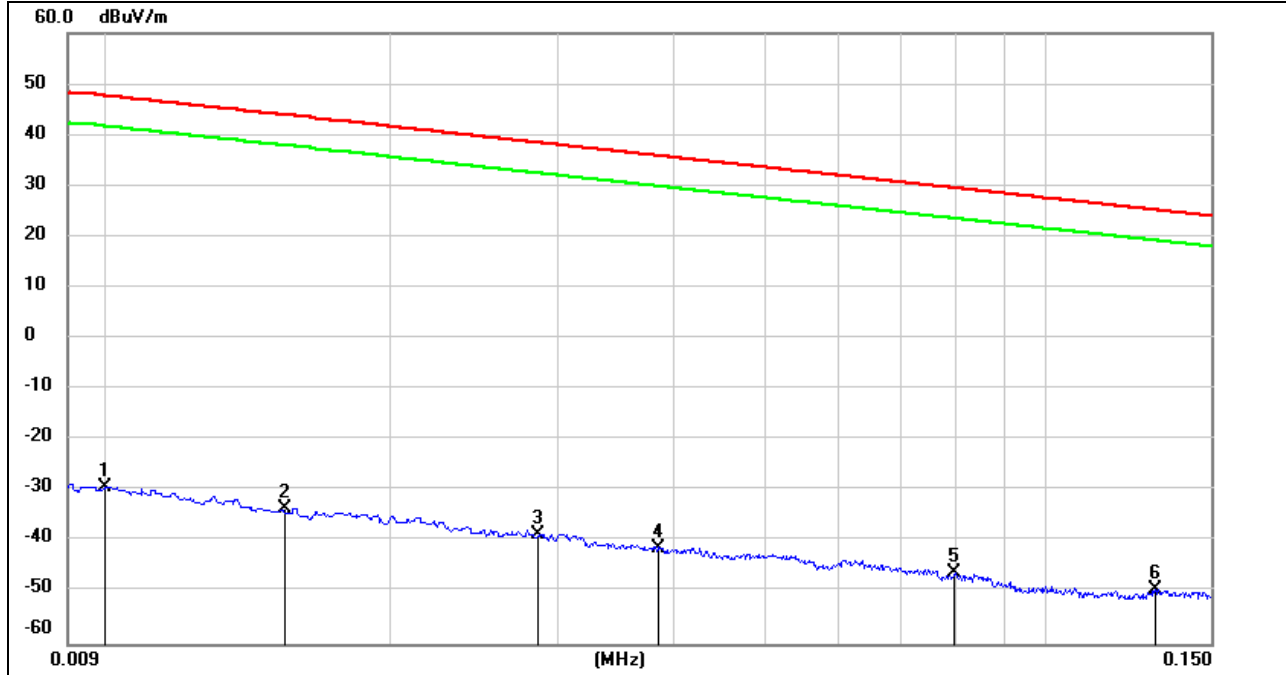
4. The preamplifier only effect to the above 1GHz signal and no filter was used during tested.

Note: All test modes had been tested, only the worst data record in the report.

7.6. SPURIOUS EMISSIONS BELOW 30MHz

SPURIOUS EMISSIONS (BLE 1Mbps MODE, LOW CHANNEL, LOOP ANTENNA FACE ON TO THE EUT, WORST-CASE CONFIGURATION)

9kHz~ 150kHz



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	0.0100	72.22	-101.40	-29.18	47.60	-76.78	peak
2	0.0154	67.94	-101.37	-33.43	43.85	-77.28	peak
3	0.0286	62.96	-101.38	-38.42	38.47	-76.89	peak
4	0.0386	60.28	-101.43	-41.15	35.87	-77.02	peak
5	0.0796	55.53	-101.63	-46.10	29.58	-75.68	peak
6	0.1307	52.27	-101.70	-49.43	25.28	-74.71	peak

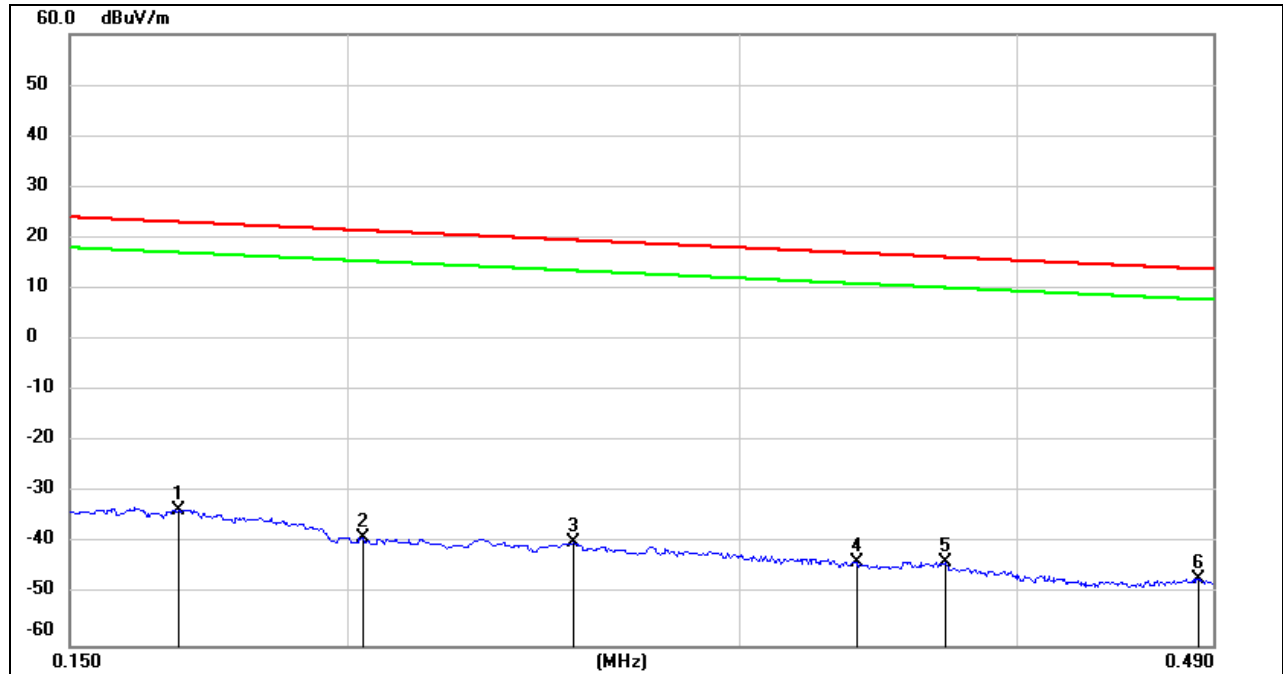
Note: 1. Measurement = Reading Level + Correct Factor.

2. If Peak Result complies with AV and QP limit, AV and QP Result are deemed to comply with AV limit.

3. All 3 polarizations (Horizontal, Face-on and Face-off) of the loop antenna had been tested, but only the worst data recorded in the report.



150kHz ~ 490kHz



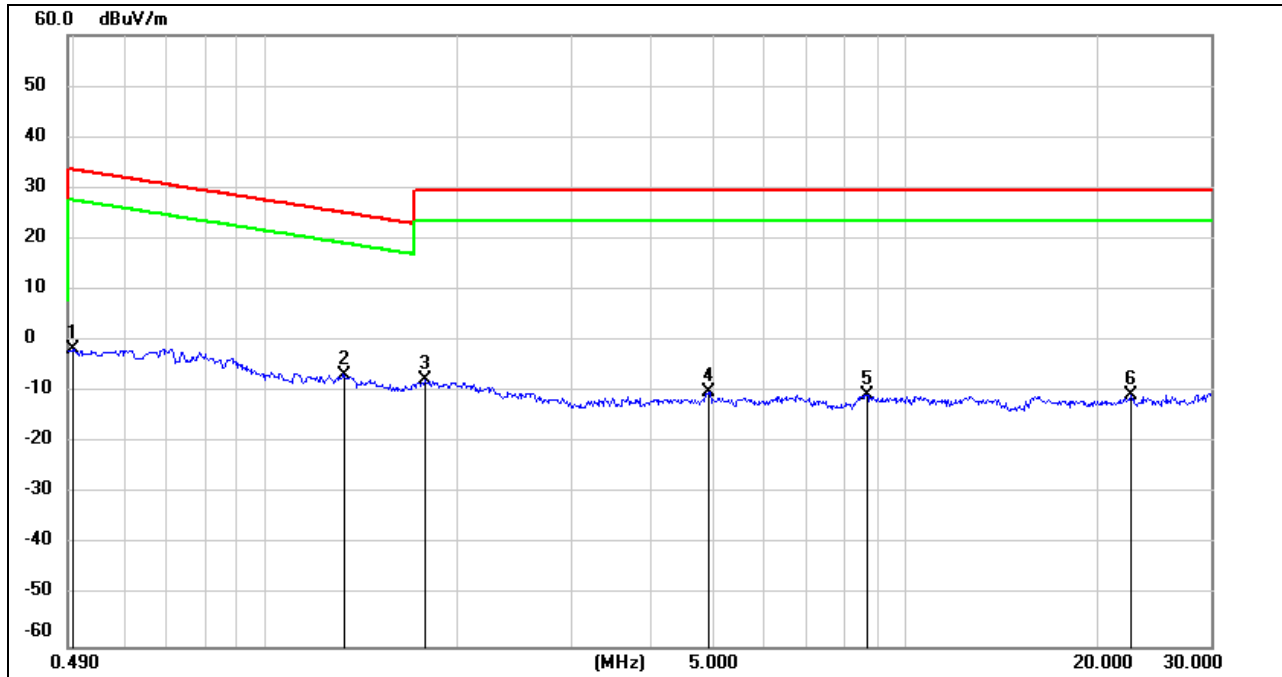
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	0.1680	68.33	-101.67	-33.34	23.10	-56.44	peak
2	0.2033	62.90	-101.72	-38.82	21.44	-60.26	peak
3	0.2530	62.09	-101.80	-39.71	19.54	-59.25	peak
4	0.3390	58.38	-101.90	-43.52	17.00	-60.52	peak
5	0.3714	58.28	-101.93	-43.65	16.20	-59.85	peak
6	0.4823	55.19	-102.04	-46.85	13.94	-60.79	peak

Note: 1. Measurement = Reading Level + Correct Factor.

2. If Peak Result complies with AV and QP limit, AV and QP Result are deemed to comply with AV limit.

3. All 3 polarizations (Horizontal, Face-on and Face-off) of the loop antenna had been tested, but only the worst data recorded in the report.

490kHz ~ 30MHz



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	0.5000	60.52	-62.07	-1.55	33.62	-35.17	peak
2	1.3263	55.48	-62.11	-6.63	25.15	-31.78	peak
3	1.7685	54.25	-61.92	-7.67	29.54	-37.21	peak
4	4.9165	51.38	-61.48	-10.10	29.54	-39.64	peak
5	8.7233	50.38	-60.98	-10.60	29.54	-40.14	peak
6	22.5045	49.88	-60.64	-10.76	29.54	-40.30	peak

Note: 1. Measurement = Reading Level + Correct Factor.

2. If Peak Result complies with AV and QP limit, AV and QP Result are deemed to comply with AV limit.

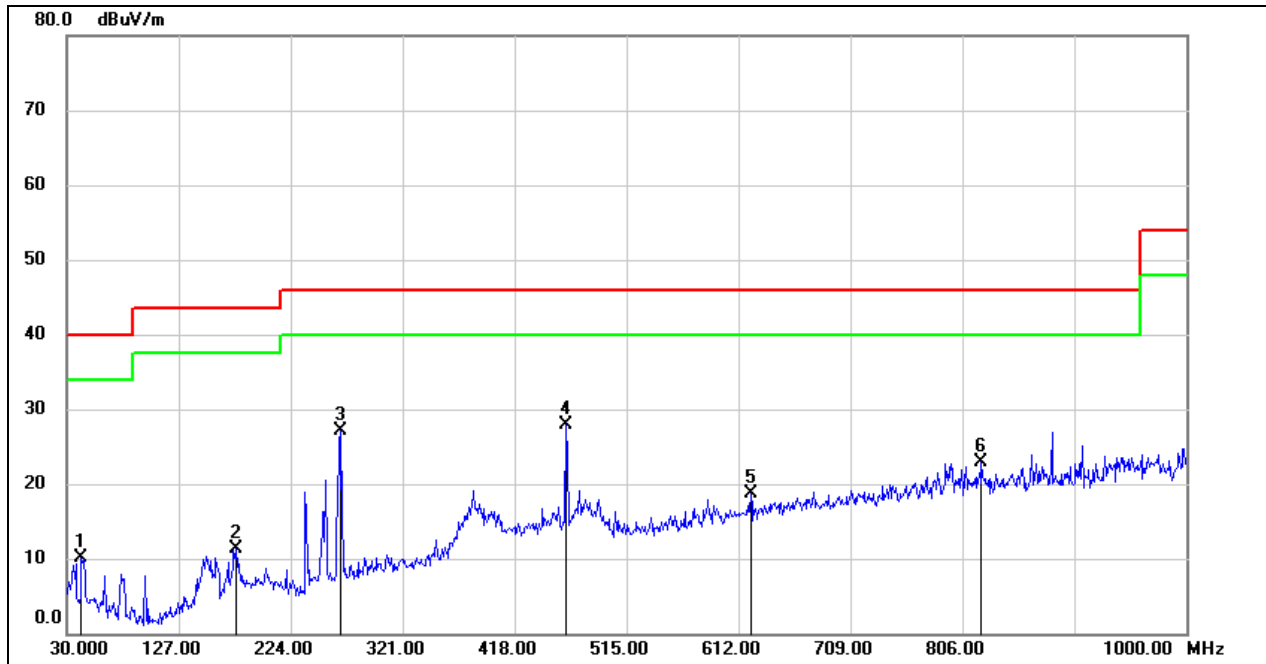
3. All 3 polarizations (Horizontal, Face-on and Face-off) of the loop antenna had been tested, but only the worst data recorded in the report.

Note: All test modes had been tested, only the worst data record in the report.



7.7. SPURIOUS EMISSIONS BELOW 1GHz AND ABOVE 30MHz

SPURIOUS EMISSIONS (BLE 1Mbps MODE, LOW CHANNEL, WORST-CASE CONFIGURATION, HORIZONTAL)



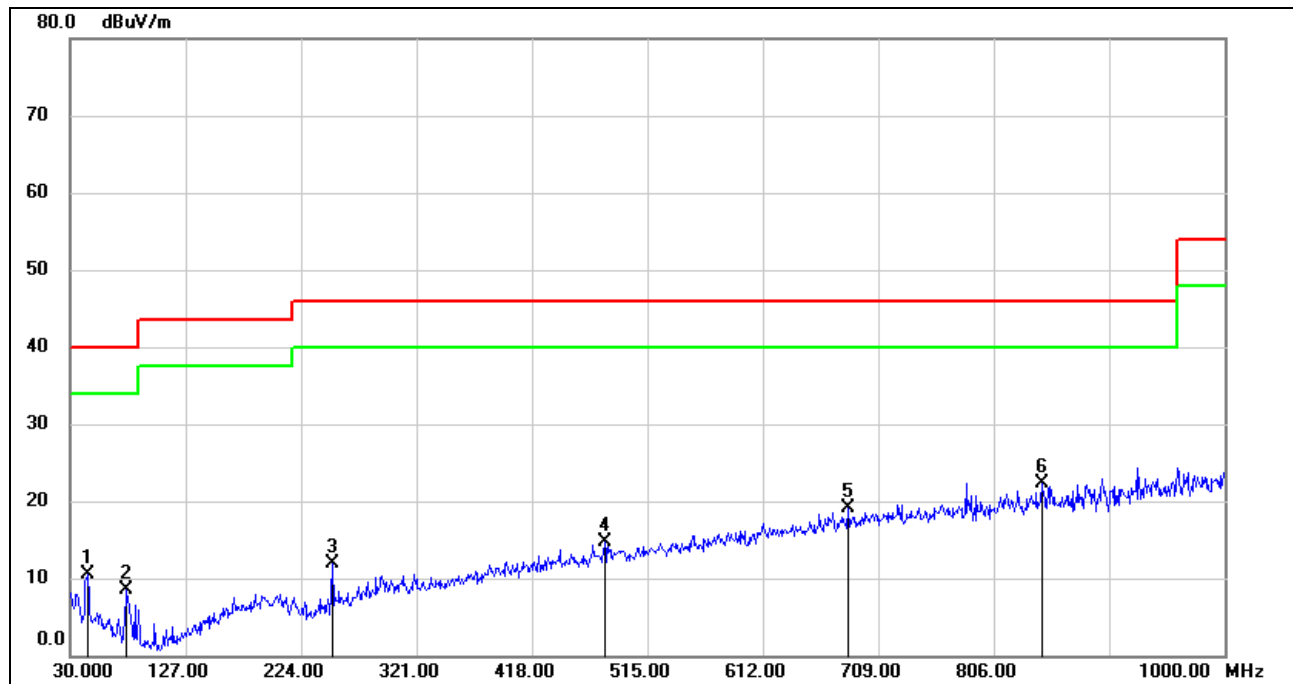
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	42.6100	28.13	-18.03	10.10	40.00	-29.90	QP
2	176.4700	28.46	-17.10	11.36	43.50	-32.14	QP
3	267.6500	42.52	-15.42	27.10	46.00	-18.90	QP
4	462.6200	39.23	-11.32	27.91	46.00	-18.09	QP
5	622.6700	26.63	-7.98	18.65	46.00	-27.35	QP
6	822.4900	27.79	-4.86	22.93	46.00	-23.07	QP

Note: 1. Result Level = Read Level + Correct Factor.

2. If Peak Result complies with QP limit, QP Result is deemed to comply with QP limit.



SPURIOUS EMISSIONS (BLE 1Mbps MODE, LOW CHANNEL, WORST-CASE CONFIGURATION, VERTICAL)



Note: 1. Result Level = Read Level + Correct Factor.

2. If Peak Result complies with QP limit, QP Result is deemed to comply with QP limit.

Note: All test modes had been tested, only the worst data record in the report.



8. ANTENNA REQUIREMENTS

APPLICABLE REQUIREMENTS

Please refer to FCC §15.203

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

Please refer to FCC §15.247(b)(4)

The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

RESULTS

Complies

END OF REPORT