



**FCC 47 CFR PART 15 SUBPART C  
INDUSTRY CANADA RSS-247 ISSUE 2**

**CERTIFICATION TEST REPORT**

*For*

**Speaker**

**MODEL NUMBER: AIR4**

**FCC ID: TQYETONAIR4  
IC: 6233A-ETONAIR4**

**REPORT NUMBER: 4788304691.1-3**

**ISSUE DATE: January 31, 2018**

*Prepared for*

**JAZZ HIPSTER CORPORATION  
2Fd., No.512, Yaun-San Rd. Ghang-Ho City Taiwan**

*Prepared by*

**UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch  
Room 101, Building 10, Innovation Technology Park,  
Song Shan Lake Hi tech Development Zone, Dongguan, 523808, China  
Tel: +86 769 33871725  
Fax: +86 769 33871725  
Website: [www.ul.com](http://www.ul.com)**

Revision History

Rev.	Issue Date	Revisions	Revised By
--	01/31/2018	Initial Issue	

Summary of Test Results			
Clause	Test Items	FCC/IC Rules	Test Results
1	6db DTS Bandwidth and 99% Bandwidth	FCC 15.247 (a) (2) RSS-247 Clause 5.2 (a) RSS-Gen Clause 6.6	PASS
2	Peak Conducted Power	FCC 15.247 (b) (3) RSS-247 Clause 5.4 (e)	PASS
3	Power Spectral Density	FCC 15.247 (e) RSS-247 Clause 5.2 (b)	PASS
4	Conducted Band edge And Spurious emission	FCC 15.247 (d) RSS-247 Clause 5.5	PASS
5	Radiated Band edges and Spurious emission	FCC 15.247 (d) FCC 15.209 FCC 15.205 RSS-247 Clause 5.5 RSS-GEN Clause 8.9 RSS-GEN Clause 8.10	PASS
6	Conducted Emission Test For AC Power Port	FCC 15.207 RSS-GEN Clause 8.8	PASS
7	Antenna Requirement	FCC 15.203 RSS-GEN Clause 8.3	PASS

## TABLE OF CONTENTS

<b>1. ATTESTATION OF TEST RESULTS .....</b>	<b>6</b>
<b>2. TEST METHODOLOGY .....</b>	<b>7</b>
<b>3. FACILITIES AND ACCREDITATION .....</b>	<b>7</b>
<b>4. CALIBRATION AND UNCERTAINTY .....</b>	<b>8</b>
4.1. MEASURING INSTRUMENT CALIBRATION .....	8
4.2. MEASUREMENT UNCERTAINTY .....	8
<b>5. EQUIPMENT UNDER TEST .....</b>	<b>9</b>
5.1. DESCRIPTION OF EUT .....	9
5.2. MAXIMUM OUTPUT POWER.....	9
5.3. CHANNEL LIST .....	9
5.4. TEST CHANNEL CONFIGURATION.....	10
5.5. THE WORSE CASE POWER SETTING PARAMETER.....	10
5.6. DESCRIPTION OF AVAILABLE ANTENNAS .....	10
5.7. WORST-CASE CONFIGURATIONS.....	10
5.8. TEST ENVIRONMENT .....	11
5.9. DESCRIPTION OF TEST SETUP.....	12
5.10. MEASURING INSTRUMENT AND SOFTWARE USED .....	13
<b>6. MEASUREMENT METHODS .....</b>	<b>14</b>
<b>7. ANTENNA PORT TEST RESULTS.....</b>	<b>15</b>
7.1. ON TIME AND DUTY CYCLE.....	15
7.2. 6 dB DTS BANDWIDTH AND 99% BANDWIDTH.....	17
7.3. PEAK CONDUCTED OUTPUT POWER.....	22
7.4. POWER SPECTRAL DENSITY .....	25
7.5. CONDUCTED BANDEDGE AND SPURIOUS EMISSIONS.....	28
<b>8. RADIATED TEST RESULTS.....</b>	<b>32</b>
8.1. RESTRICTED BANDEDGE .....	37
8.2. SPURIOUS EMISSIONS (1~18GHz) .....	41
8.3. SPURIOUS EMISSIONS 18G ~ 26GHz.....	53
8.4. SPURIOUS EMISSIONS 30M ~ 1 GHz .....	55
8.5. SPURIOUS EMISSIONS BELOW 30M.....	57
<b>9. AC POWER LINE CONDUCTED EMISSIONS.....</b>	<b>61</b>

---

**10. ANTENNA REQUIREMENTS .....64**

## 1. ATTESTATION OF TEST RESULTS

### Applicant Information

Company Name: JAZZ HIPSTER CORPORATION  
Address: 2Fd., No.512, Yaun-San Rd. Ghang-Ho City Taiwan

### Manufacturer Information

Company Name: ETON Deutschland Electro Acoustic GmbH  
Address: 89231 Neu - Ulm, Pfaffenweg 21, Germany

### EUT Description

Product Name: Speaker  
Brand Name: ETON  
Model Name: AIR4  
Sample ID: 1337271  
Sample Status: Good  
Sample Received date: January 03, 2018  
Date Tested: January 04~January 19, 2018

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
CFR 47 Part 15 Subpart C	PASS
ISED RSS-247 Issue 2	PASS
ISED RSS-GEN Issue 4	PASS

Tested By:

Checked By:



Miller Ma  
Engineer Project Associate  
Approved By:

Shawn Wen  
Laboratory Leader



Stephen Guo  
Laboratory Manager

## 2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with KDB414788 D01 Radiated Test Site v01, ANSI C63.10-2013, KDB558074 D01 DTS Meas Guidance v04, FCC CFR 47 Part 2, FCC CFR 47 Part 15, RSS-GEN Issue 4, and RSS-247 Issue 2.

## 3. FACILITIES AND ACCREDITATION

Accreditation Certificate	<p><b>A2LA (Certificate No.: 4102.01)</b> UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch. has been assessed and proved to be in compliance with A2LA.</p> <p><b>IAS (Lab Code: TL-702)</b> UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch. has demonstrated compliance with ISO/IEC Standard 17025:2005, General requirements for the competence of testing and calibration laboratories</p> <p><b>FCC (FCC Designation No.: CN1187)</b> 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</p> <p><b>IC(Company No.: 21320)</b> UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch. has been registered and fully described in a report filed with Industry Canada. The Company Number is 21320.</p> <p><b>VCCI (Registration No.: G-20019, R-20004, C-20012 and T-20011)</b> 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</p>
---------------------------	--

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

Note 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.

Note 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 OATS.

## 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 recognize 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
Uncertainty for Conduction emission test	2.90dB
Uncertainty for Radiation Emission test(include Fundamental emission) (9KHz-30MHz)	2.2dB
Uncertainty for Radiation Emission test(include Fundamental emission) (30MHz-1GHz)	4.52dB
Uncertainty for Radiation Emission test (1GHz to 26GHz)( include Fundamental emission)	5.04dB(1-6GHz)
	5.30dB (6GHz-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

Equipment	Speaker		
Model Name	AIR4		
Product Description	Operation Frequency	2402 MHz ~ 2480 MHz	
	Modulation Type		Data Rate
	GFSK		1Mbps
Power Supply	AC120V/60Hz		
Bluetooth Version	Bluetooth V4.1 LE+EDR		
Hardware Version	V1.0		
Software Version	V1.0		

### 5.2. MAXIMUM OUTPUT POWER

Bluetooth Mode	Frequency (MHz)	Channel Number	Max Output Power (dBm)	EIRP (dBm)
BLE	2402-2480	0-39[40]	6.21	11.19

### 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. TEST CHANNEL CONFIGURATION

Test Mode	Test Channel	Frequency
GFSK	CH 0, CH 19, CH 39	2402MHz, 2440MHz, 2480MHz

#### 5.5. THE WORSE CASE POWER SETTING PARAMETER

The Worse Case Power Setting Parameter under 2400 ~ 2483.5MHz Band				
Test Software		DutApi_w8887_BrdigeEth		
Modulation Type	Transmit Antenna Number	Test Channel		
		CH 00	CH 19	CH 39
GFSK	1	8	8	8
GFSK	2	8	8	8

#### 5.6. DESCRIPTION OF AVAILABLE ANTENNAS

Ant.	Frequency (MHz)	Antenna Type	Antenna Gain (dBi)
1	2402-2480	FPC+CABLE	4.97
2	2402-2480	FPC+CABLE	4.23

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

Note1: Equipment with 2 diversity antennas but only 1 antenna active at any moment in time.  
Note 2: The circuit before the two difference antenna are the same, the two antenna types are the same and the gain of antenna 1 is larger, antenna 1 was found to the worst case and recorded.

#### 5.7. WORST-CASE CONFIGURATIONS

Bluetooth Mode	Modulation Technology	Modulation Type	Data Rate (Mbps)
BLE	DTS	GFSK	1Mbit/s

## 5.8. TEST ENVIRONMENT

Environment Parameter	Selected Values During Tests	
Relative Humidity	55 ~ 65%	
Atmospheric Pressure:	1025Pa	
Temperature	TN	23 ~ 28°C
Voltage :	VL	N/A
	VN	AC 120V 60Hz
	VH	N/A

Note: VL= Lower Extreme Test Voltage  
VN= Nominal Voltage  
VH= Upper Extreme Test Voltage  
TN= Normal Temperature

## 5.9. DESCRIPTION OF TEST SETUP

### SUPPORT EQUIPMENT

Item	Equipment	Brand Name	Model Name	FCC ID
1	Table PC	ThinkPad	T410	N/A
2	Router	ASUS	RT-AC68U	N/A
3	USB to TTL Serial Cable	N/A	N/A	N/A
4	USB 2.0 Ethernet Network Adapter	UGREEN	20254	N/A

### I/O CABLES

Cable No	Port	Connector Type	Cable Type	Cable Length(m)	Remarks
C-1	RJ45	RJ45	RJ45	1.5	N/A
C-2	RJ45	RJ45	RJ45	1.5	N/A
C-3	USB	USB	USB	1.5	N/A

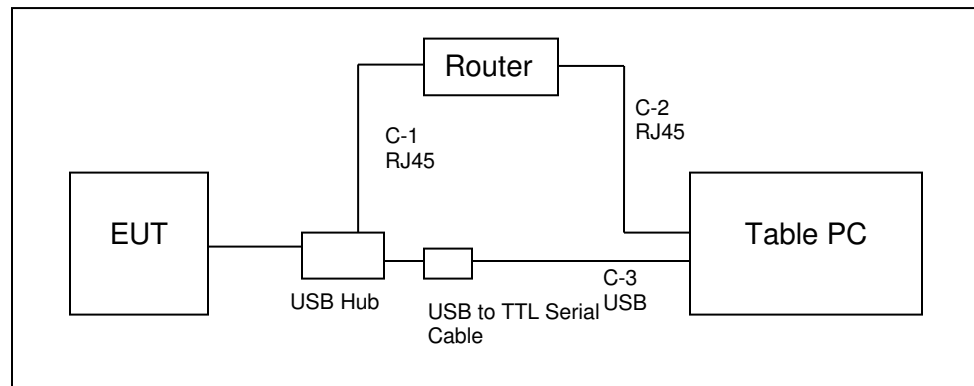
### ACCESSORY

Item	Accessory	Brand Name	Model Name	Description
1	Remote controller	ETON	N/A	N/A

### TEST SETUP

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

### SETUP DIAGRAM FOR TEST



## 5.10. MEASURING INSTRUMENT AND SOFTWARE USED

Conducted Emissions						
Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
<input checked="" type="checkbox"/>	EMI Test Receiver	R&S	ESR3	101961	Dec.12, 2017	Dec.12, 2018
<input checked="" type="checkbox"/>	Two-Line V-Network	R&S	ENV216	101982	Jan.16, 2018	Jan.16, 2019
<input checked="" type="checkbox"/>	Artificial Mains Networks	Schwarzbeck	NSLK 8126	8126465	Dec.12, 2017	Dec.12, 2018
Software						
Used	Description		Manufacturer	Name		Version
<input checked="" type="checkbox"/>	Test Software for Conducted disturbance		UL	Antenna port		Ver. 7.2
Radiated Emissions						
Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
<input checked="" type="checkbox"/>	MXE EMI Receiver	KESIGHT	N9038A	MY56400036	Dec.12, 2017	Dec.12, 2018
<input checked="" type="checkbox"/>	Hybrid Log Periodic Antenna	TDK	HLP-3003C	130960	Jan.09, 2016	Jan.09, 2019
<input checked="" type="checkbox"/>	Preamplifier	HP	8447D	2944A09099	Feb. 13, 2017	Dec.12, 2018
<input checked="" type="checkbox"/>	EMI Measurement Receiver	R&S	ESR26	101377	Dec. 12, 2017	Dec.12, 2018
<input checked="" type="checkbox"/>	Horn Antenna	TDK	HRN-0118	130939	Jan. 09, 2016	Jan. 09, 2019
<input checked="" type="checkbox"/>	High Gain Horn Antenna	Schwarzbeck	BBHA-9170	691	Jan.06, 2016	Jan.06, 2019
<input checked="" type="checkbox"/>	Preamplifier	TDK	PA-02-0118	TRS-305-00066	Dec.12, 2017	Dec.12, 2018
<input checked="" type="checkbox"/>	Preamplifier	TDK	PA-02-2	TRS-307-00003	Dec.12, 2017	Dec.12, 2018
<input checked="" type="checkbox"/>	Loop antenna	Schwarzbeck	1519B	00008	Mar. 26, 2016	Mar. 26, 2019
<input checked="" type="checkbox"/>	Band Reject Filter	Wainwright	WRCJV8-2350-2400-2483.5-2533.5-40SS	4	Dec. 20, 2016	Dec.12, 2018
Software						
Used	Description		Manufacturer	Name		Version
<input checked="" type="checkbox"/>	Test Software for Radiated disturbance		Farad	EZ-EMC		Ver. UL-3A1
Other instruments						
Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
<input checked="" type="checkbox"/>	Spectrum Analyzer	Keysight	N9030A	MY55410512	Dec. 12, 2017	Dec.12, 2018
<input checked="" type="checkbox"/>	Power Meter	Keysight	N9031A	MY55416024	Feb. 13, 2017	Dec.12, 2018
<input checked="" type="checkbox"/>	Power Sensor	Keysight	N9323A	MY55440013	Feb. 13, 2017	Dec.12, 2018

## 6. MEASUREMENT METHODS

No.	Test Item	KDB Name	Section
1	6 dB Bandwidth	KDB 558074 D01 DTS Meas Guidance v04	8.0
2	Peak Output Power	KDB 558074 D01 DTS Meas Guidance v04	9.1.1
3	Power Spectral Density	KDB 558074 D01 DTS Meas Guidance v04	10.2
4	Out-of-band emissions in non-restricted bands	KDB 558074 D01 DTS Meas Guidance v04	11.0
5	Out-of-band emissions in restricted bands	KDB 558074 D01 DTS Meas Guidance v04	12.1
6	Band-edge	KDB 558074 D01 DTS Meas Guidance v04	13.3.2
7	Conducted Emission Test For AC Power Port	ANSI C63.10-2013	7.3

## 7. ANTENNA PORT TEST RESULTS

### 7.1. ON TIME AND DUTY CYCLE

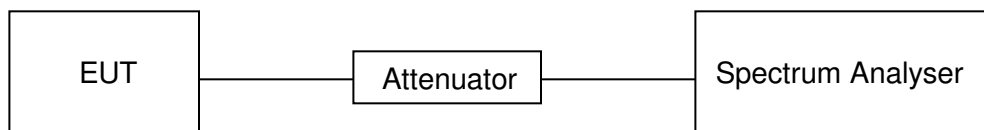
#### LIMITS

None; for reporting purposes only

#### PROCEDURE

KDB 558074 Zero-Span Spectrum Analyzer Method

#### TEST SETUP



#### RESULTS

##### ANTENNA1

Mode	On Time (msec)	Period (msec)	Duty Cycle x (Linear)	Duty Cycle (%)	Duty Cycle Correction Factor (db)	1/T Minimum VBW (KHz)
BLE	0.3863	0.6245	0.619	62	2.09	2.59

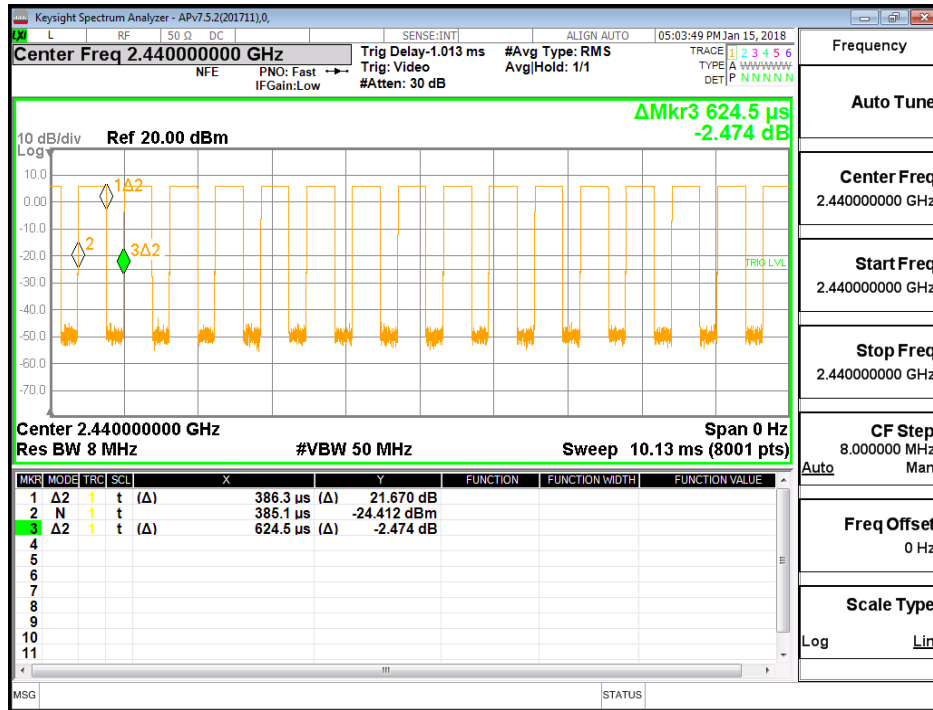
Note: Duty Cycle Correction Factor= $10\log(1/x)$ .

Where: x is Duty Cycle(Linear)

Where: T is On Time (transmit duration)

The Duty cycle of antenna 1 and antenna 2 is the same.

ON TIME AND DUTY CYCLE MID CH





## 7.2. 6 dB DTS BANDWIDTH AND 99% BANDWIDTH

### LIMITS

FCC Part15 (15.247) Subpart C RSS-247 ISSUE 2			
Section	Test Item	Limit	Frequency Range (MHz)
FCC 15.247(a)(2) RSS-247 5.2 (a)	6dB Bandwidth	$\geq 500\text{KHz}$	2400-2483.5
RSS-Gen Clause 6.6	99% Bandwidth	For reporting purposes only.	2400-2483.5

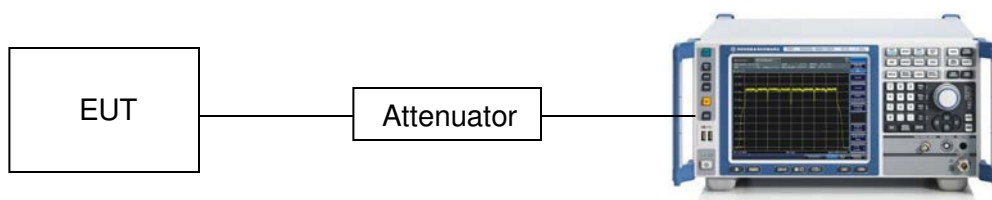
### TEST PROCEDURE

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	For 6 dB Bandwidth :100K For 99% Bandwidth :1% to 5% of the occupied bandwidth
VBW	For 6dB Bandwidth : $\geq 3 \times \text{RBW}$ For 99% Bandwidth : approximately $3 \times \text{RBW}$
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 relative to the maximum level measured in the fundamental emission.

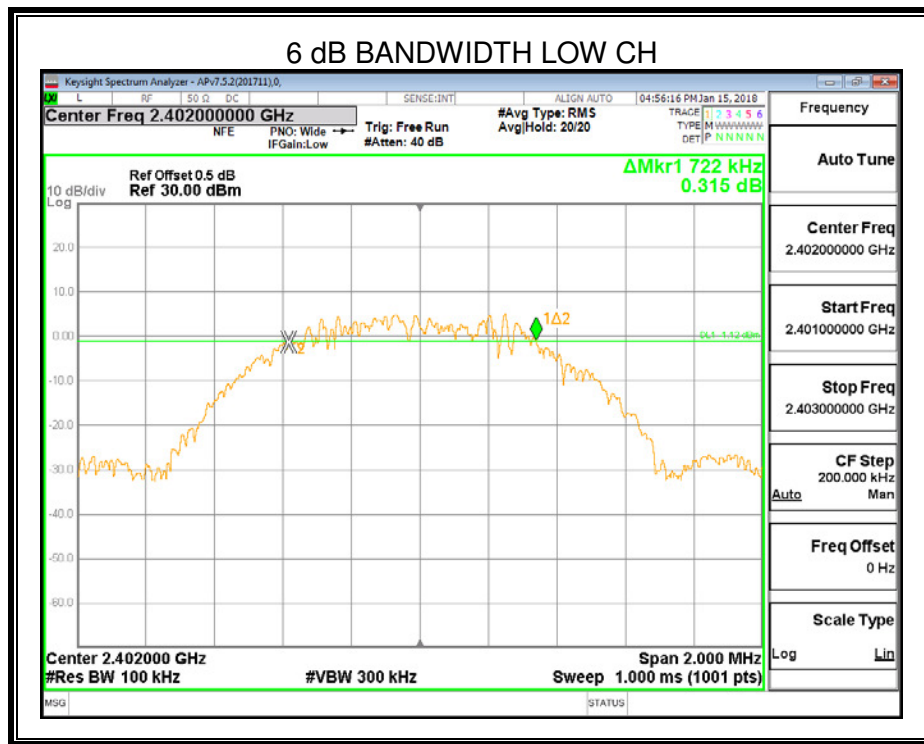
### TEST SETUP

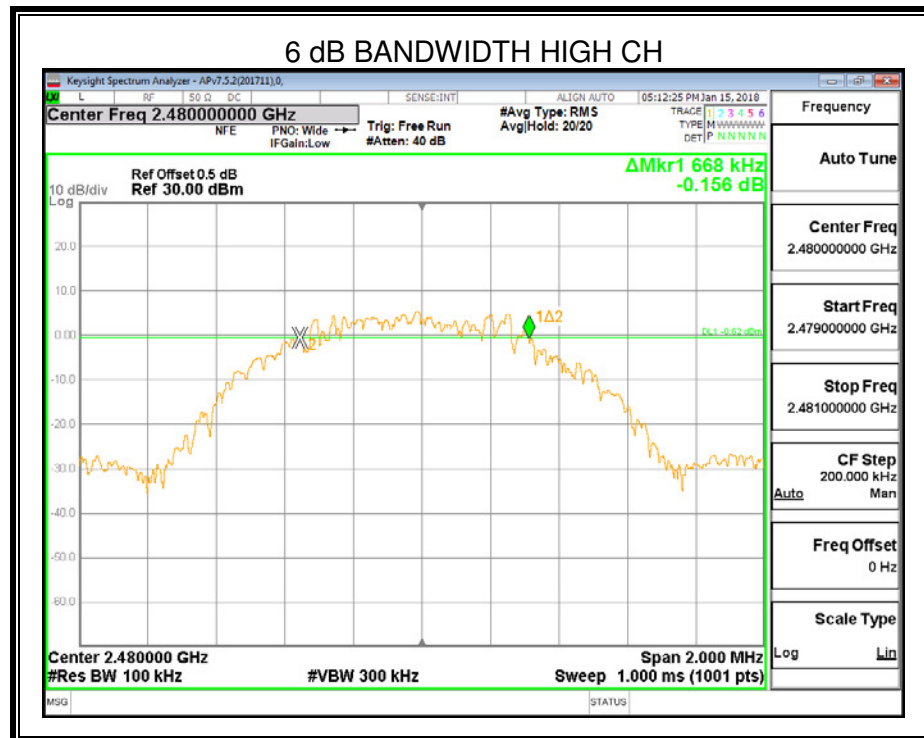
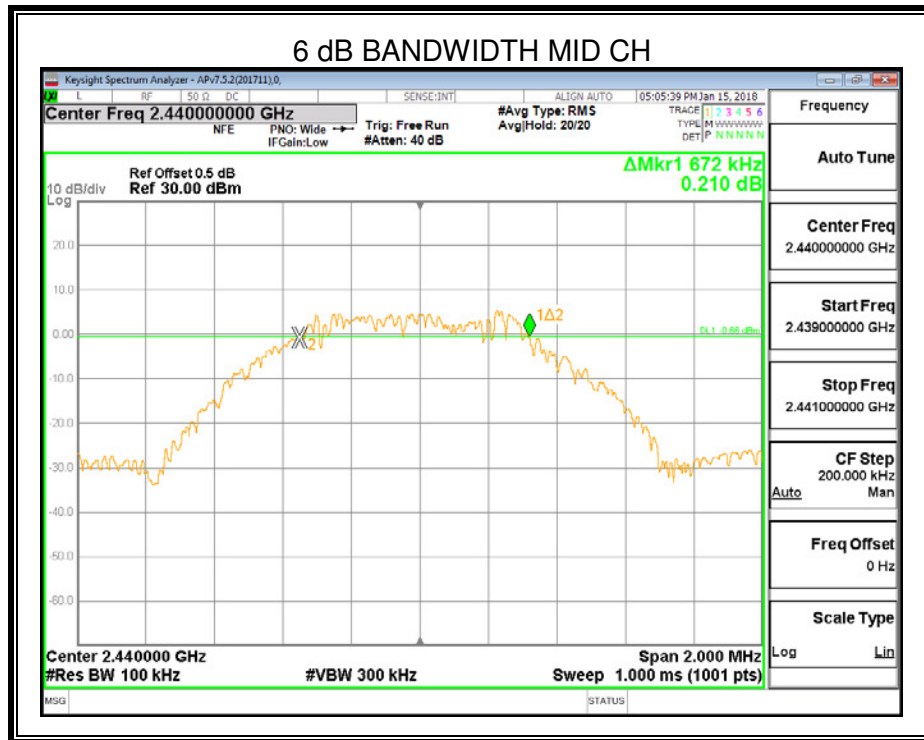


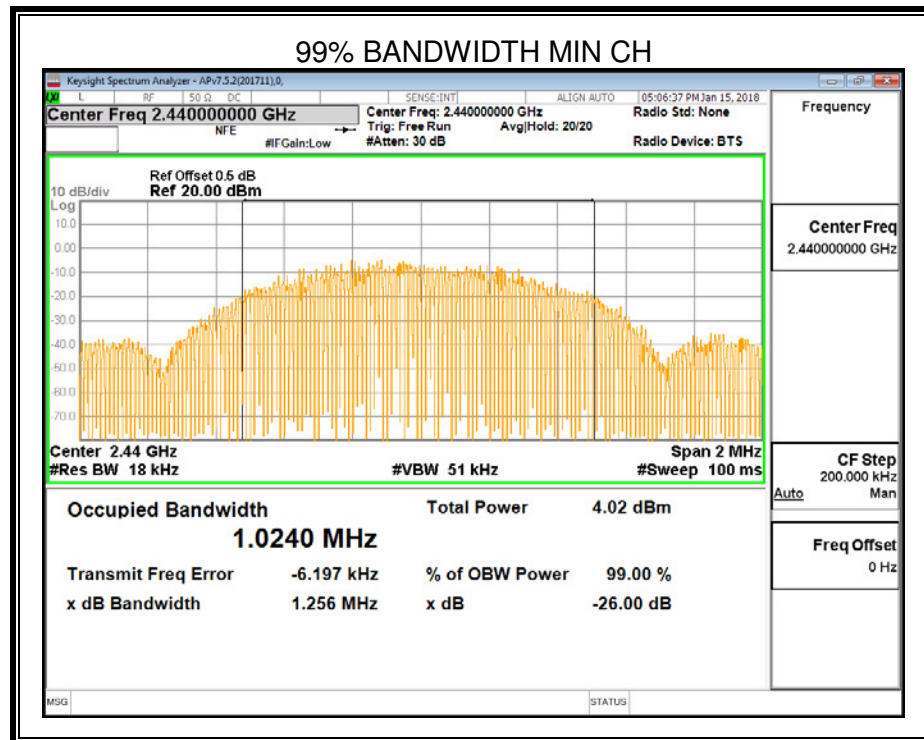
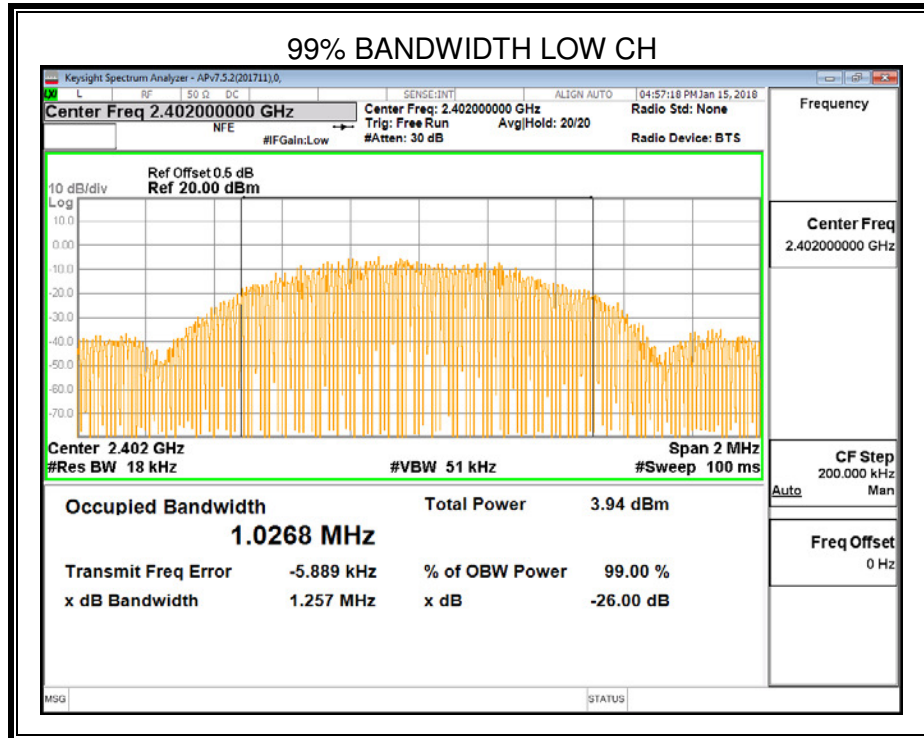
## RESULTS

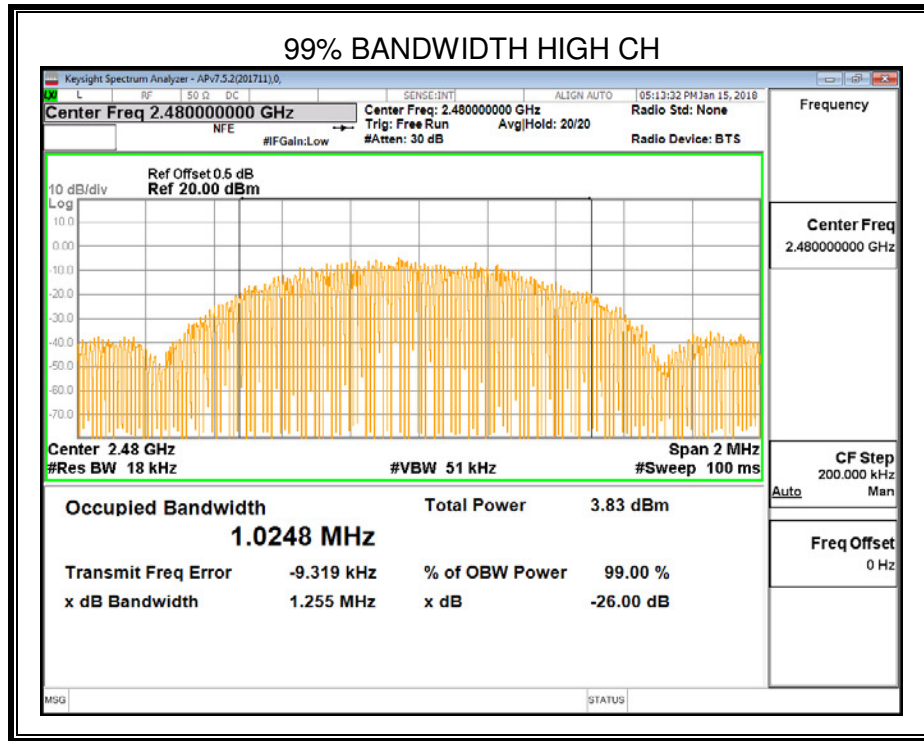
### ANTENNA1

Channel	Frequency (MHz)	6dB bandwidth (MHz)	99% bandwidth (MHz)	Limit (kHz)	Result
Low	2402	0.722	1.027	500	Pass
Middle	2440	0.672	1.024	500	Pass
High	2480	0.668	1.025	500	Pass









### 7.3. PEAK CONDUCTED OUTPUT POWER

#### LIMITS

FCC Part15 (15.247) Subpart C RSS-247 ISSUE 2			
Section	Test Item	Limit	Frequency Range (MHz)
FCC 15.247(b)(3) RSS-247 5.4 (e)	Peak Output Power	1 watt or 30dBm	2400-2483.5

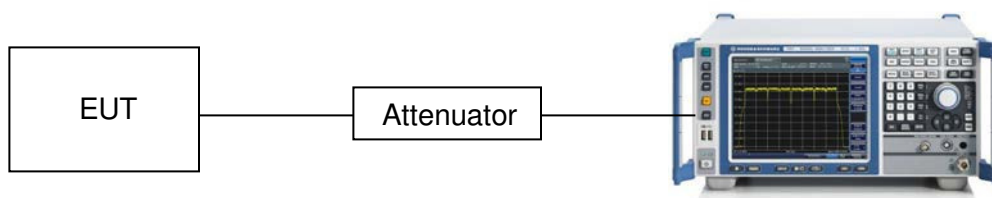
#### TEST PROCEDURE

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	$\geq$ DTS bandwidth(e.g. 1 MHz for BLE)
VBW	$\geq 3 \times$ RBW
Span	$3 \times$ RBW
Trace	Max hold
Sweep time	Auto couple.

Allow trace to fully stabilize and use peak marker function to determine the peak amplitude level.

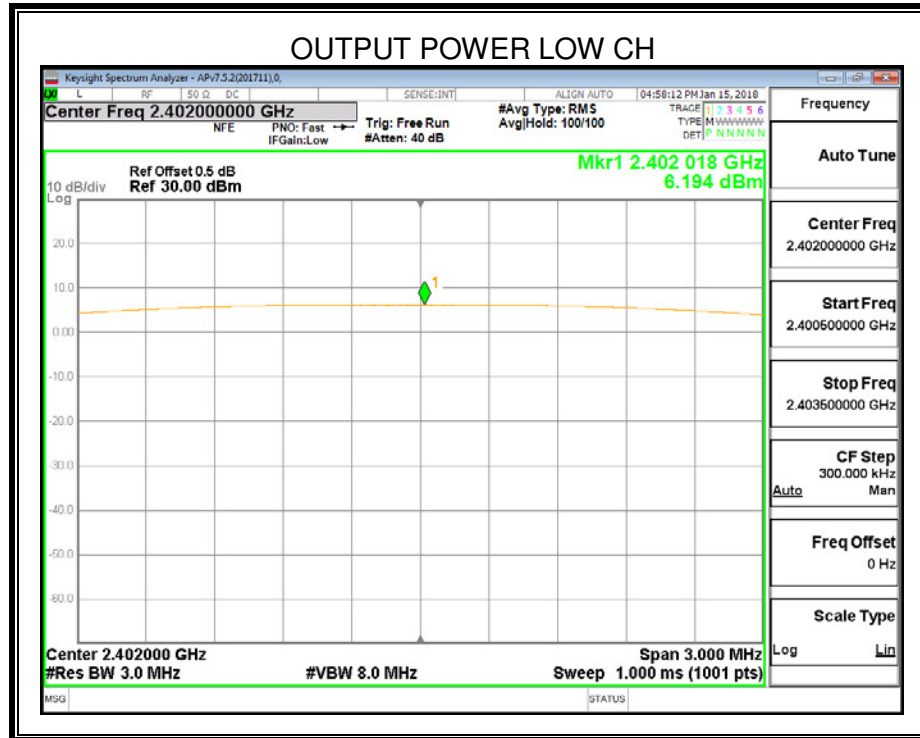
#### TEST SETUP



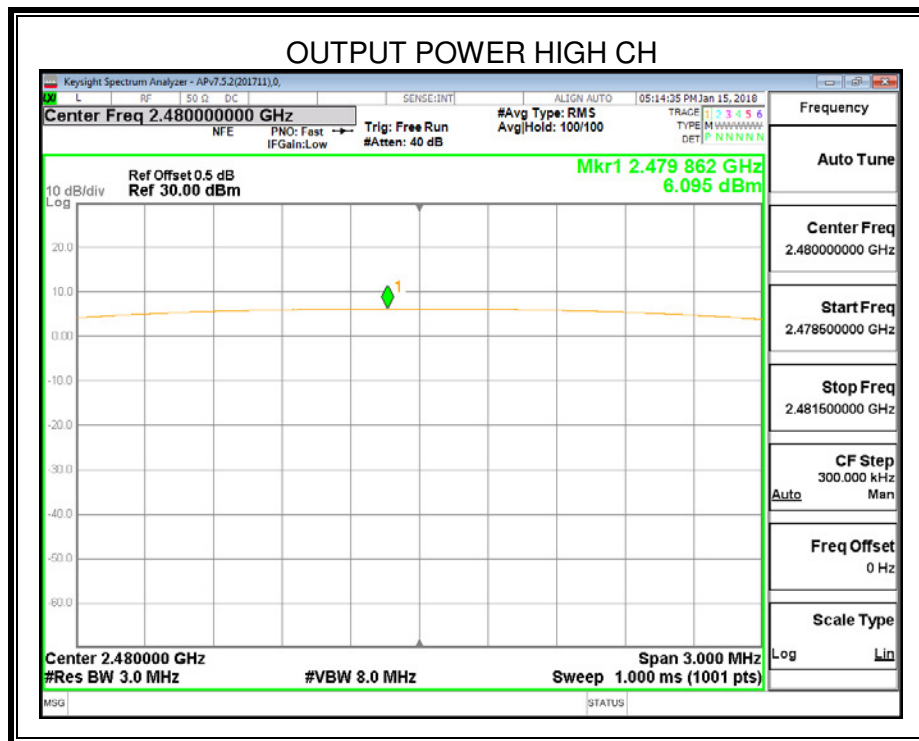
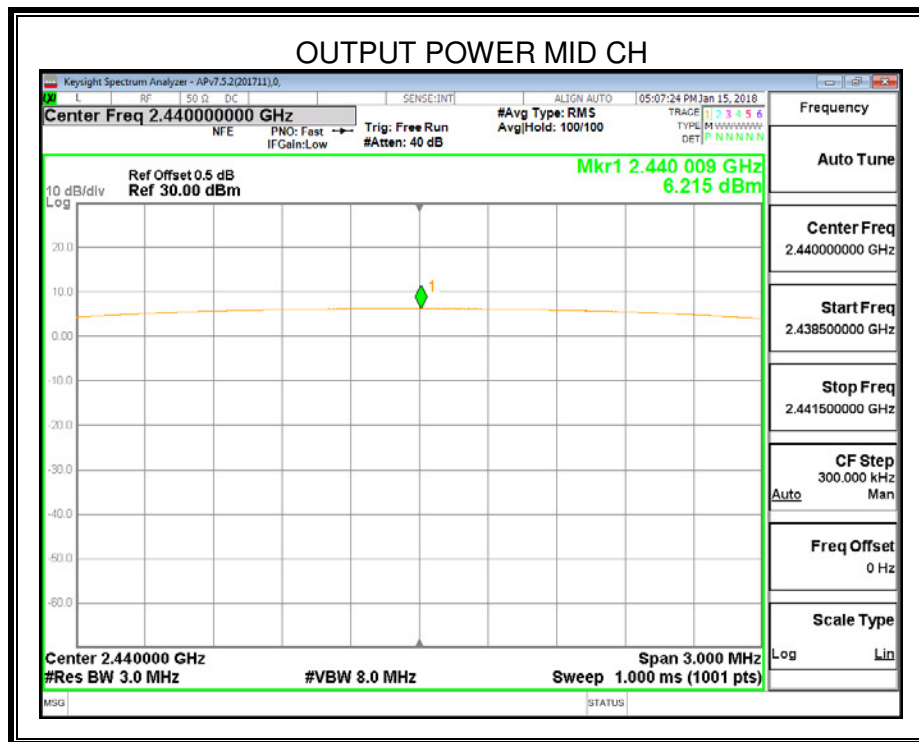
## RESULTS

### ANTENNA1

Test Channel	Frequency	Maximum Conducted Output Power(PK)	EIRP	LIMIT
	(MHz)	(dBm)	(dBm)	dBm
CH00	2402	6.19	11.16	30
CH19	2440	6.22	11.19	30
CH39	2480	6.10	11.07	30









## 7.4. POWER SPECTRAL DENSITY1

### LIMITS

FCC Part15 (15.247) Subpart C RSS-247 ISSUE 2			
Section	Test Item	Limit	Frequency Range (MHz)
FCC §15.247 (e) RSS-247 5.2 (b)	Power Spectral Density	8 dBm in any 3 kHz band	2400-2483.5

### TEST PROCEDURE

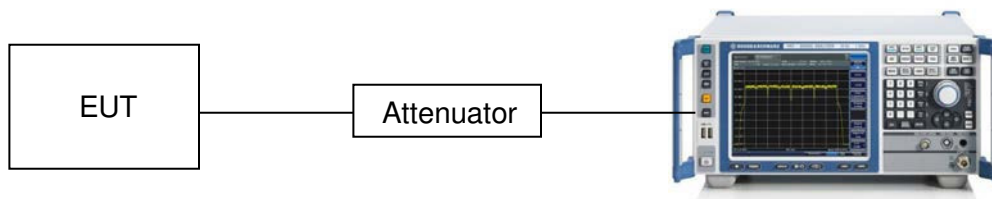
Connect the UUT to the spectrum analyser and use the following settings:

Center Frequency	The center frequency of the channel under test
Detector	Peak
RBW	$3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$
VBW	$\geq 3 \times \text{RBW}$
Span	$1.5 \times \text{DTS bandwidth}$
Trace	Max hold
Sweep time	Auto couple.

Allow trace to fully stabilize and use the peak marker function to determine the maximum amplitude level within the RBW.

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

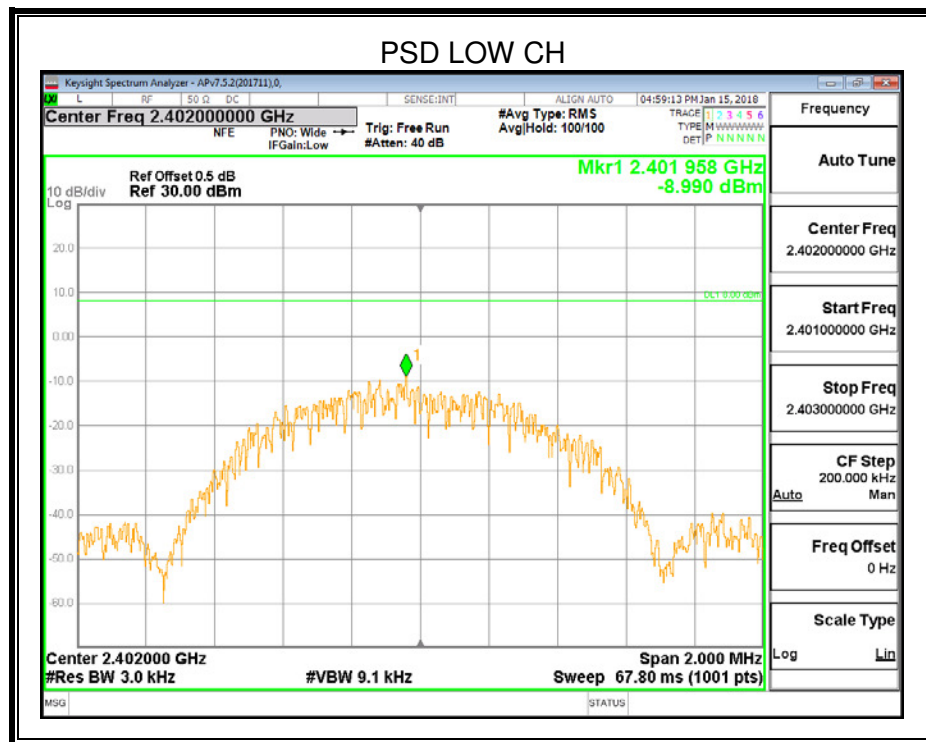
### TEST SETUP

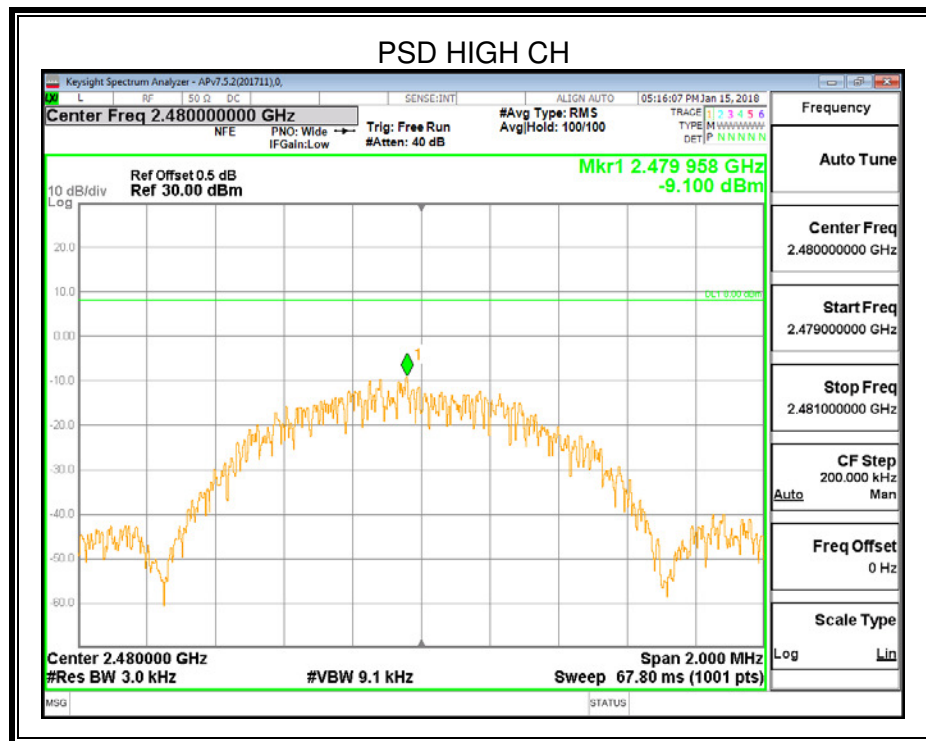
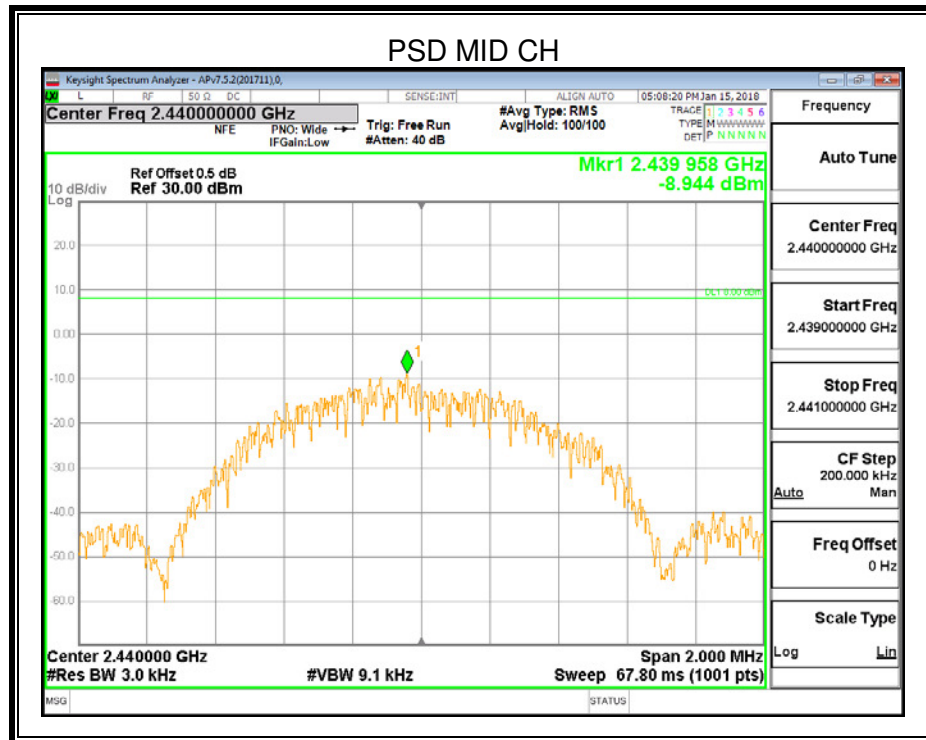


## RESULTS

### ANTENNA1

Frequency	Power Spectral Density (dBm/3kHz)	Limit (dBm/3kHz)	Result
2402 MHz	-8.99	8	PASS
2440 MHz	-8.94	8	PASS
2480 MHz	-9.10	8	PASS





## 7.5. CONDUCTED BANDEGE AND SPURIOUS EMISSIONS

### LIMITS

FCC Part15 (15.247) Subpart C RSS-247 ISSUE 2		
Section	Test Item	Limit
FCC §15.247 (d) RSS-247 5.5	Conducted Bandedge and Spurious Emissions	at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power

### TEST PROCEDURE

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

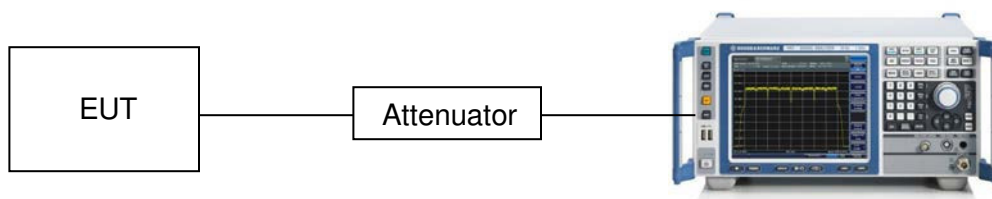
Center Frequency	The center frequency of the channel under test
Detector	Peak
RBW	100K
VBW	$\geq 3 \times \text{RBW}$
Span	1.5 x DTS bandwidth
Trace	Max hold
Sweep time	Auto couple.

Use the peak marker function to determine the maximum PSD level.

Span	Set the center frequency and span to encompass frequency range to be measured
Detector	Peak
RBW	100K
VBW	$\geq 3 \times \text{RBW}$
measurement points	$\geq \text{span}/\text{RBW}$
Trace	Max hold
Sweep time	Auto couple.

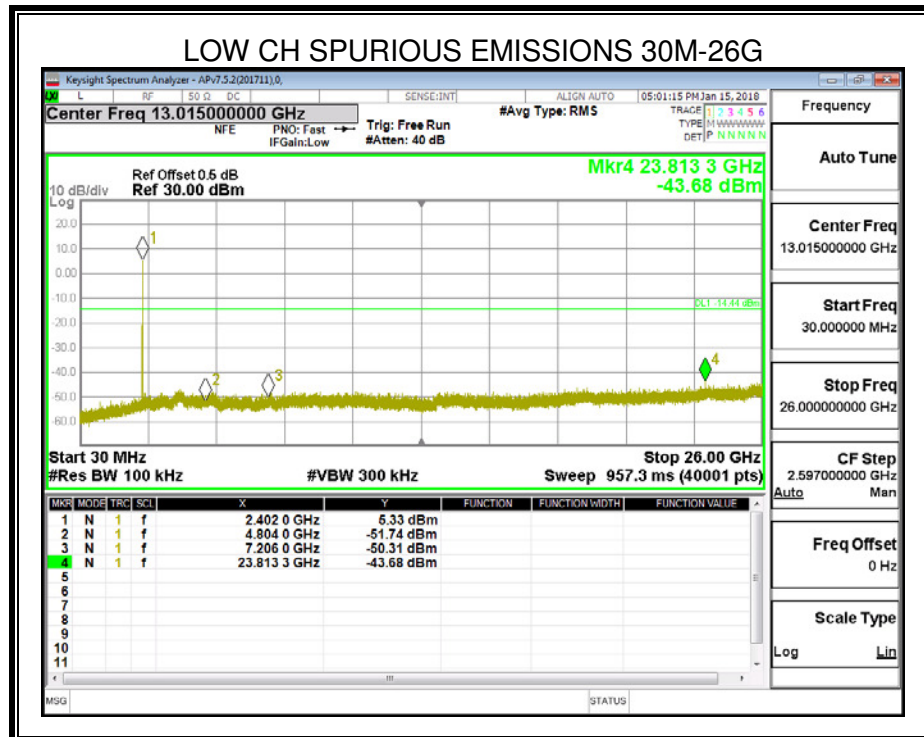
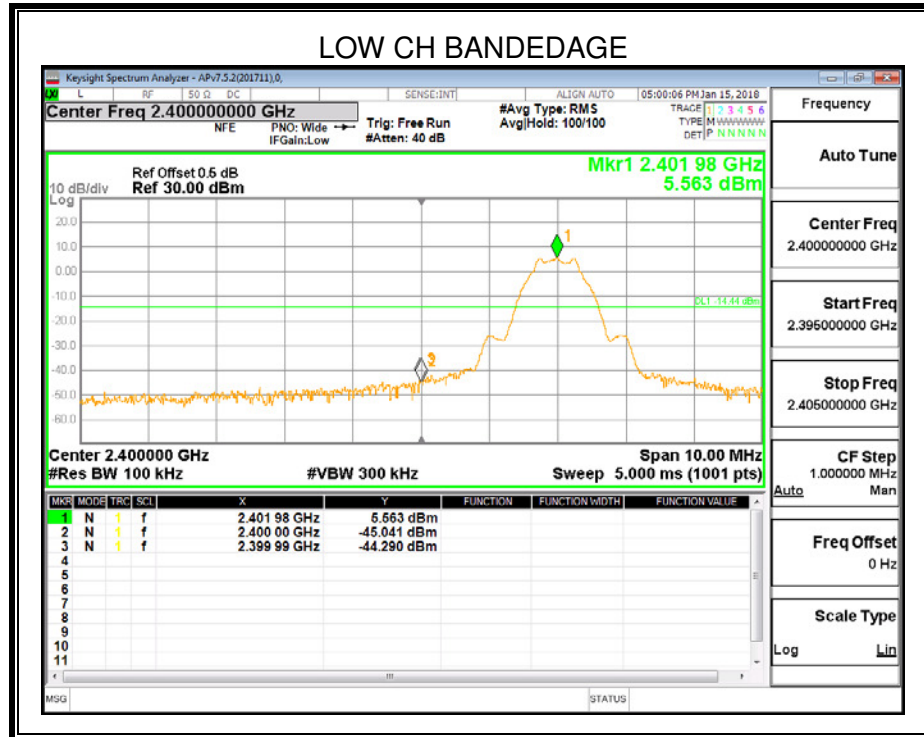
Use the peak marker function to determine the maximum amplitude level.

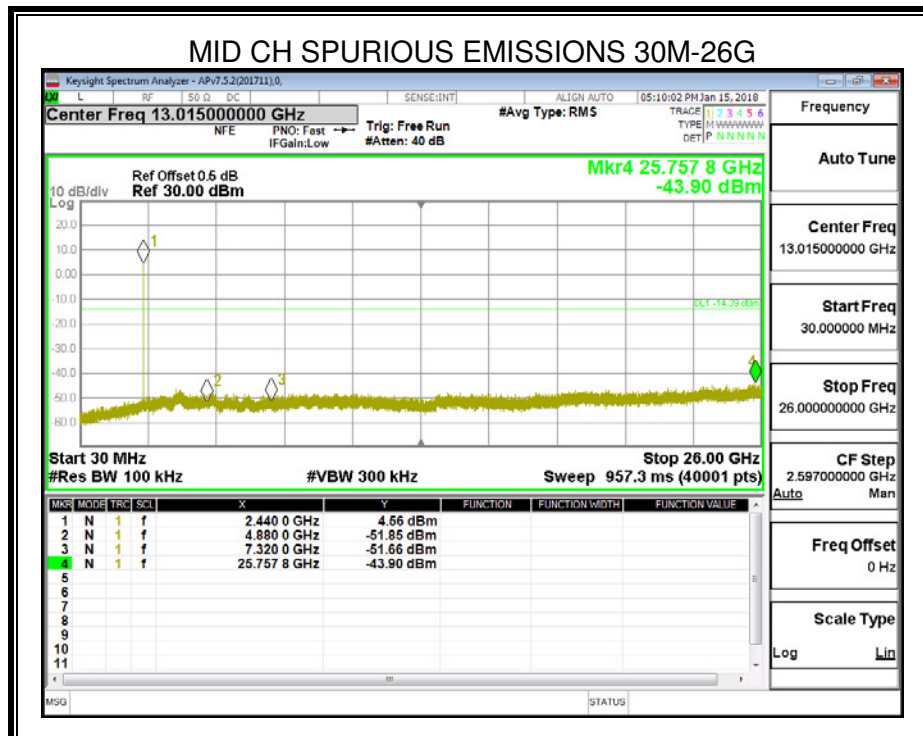
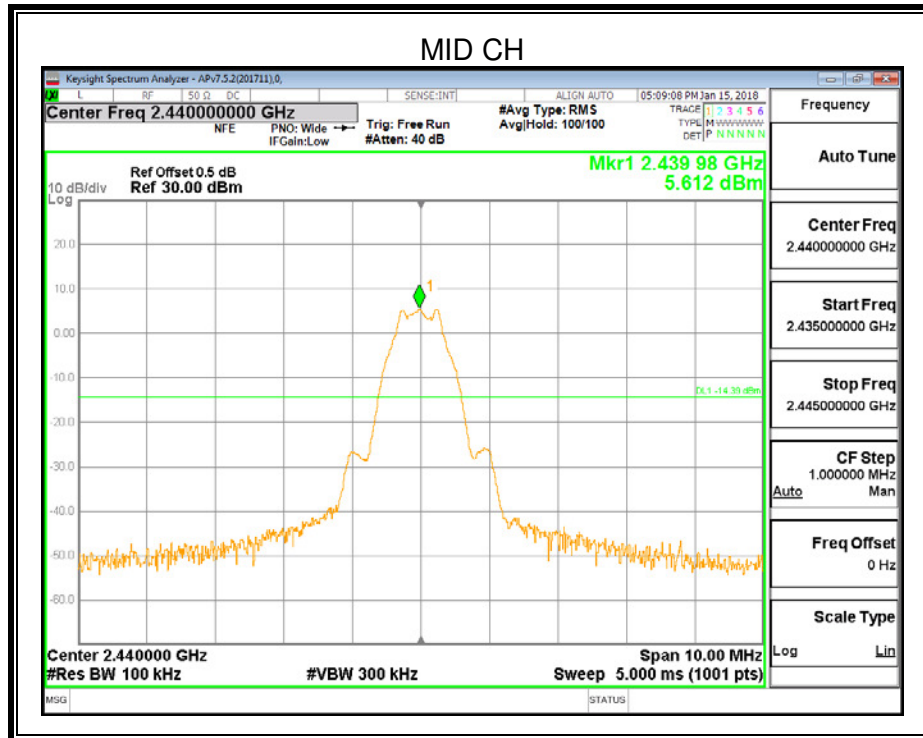
### TEST SETUP



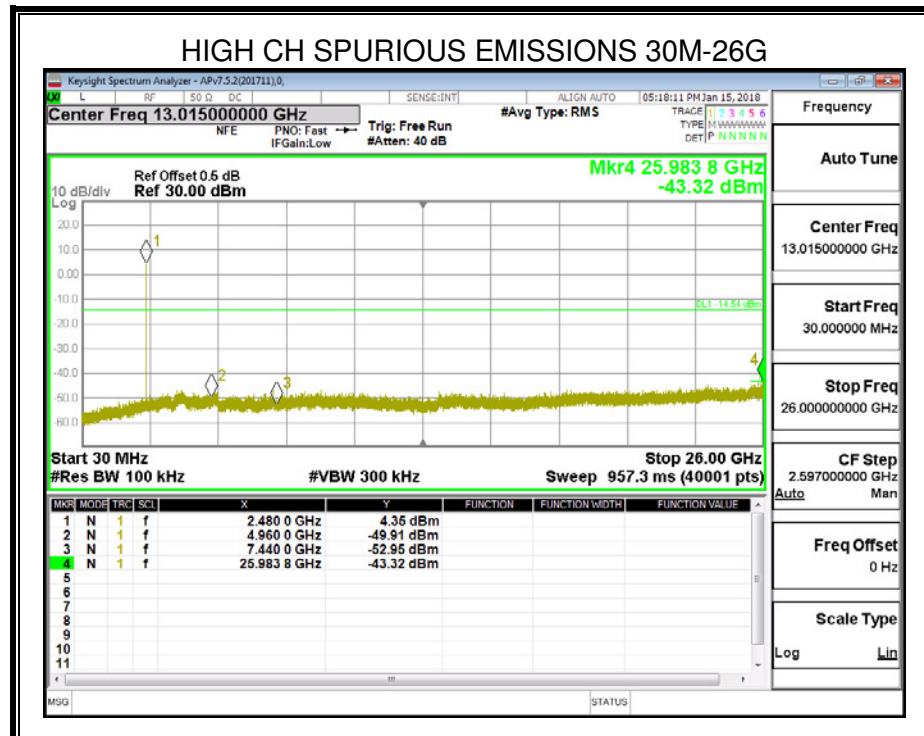
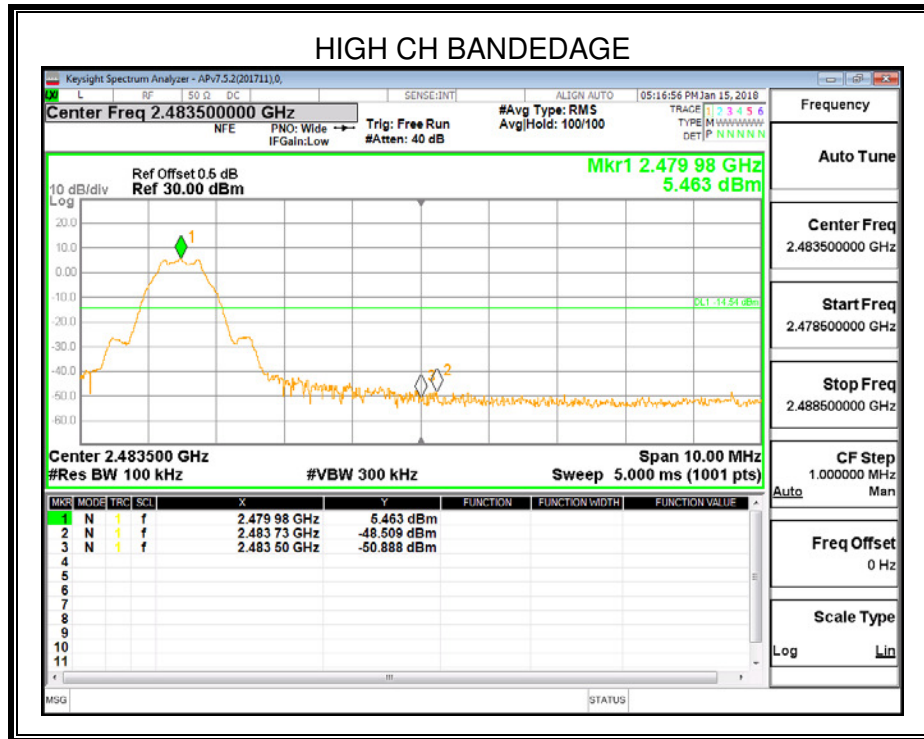
## RESULTS

### ANTENNA1









## 8. RADIATED TEST RESULTS

### LIMITS

Please refer to FCC §15.205 and §15.209

Please refer to RSS-GEN Clause 8.9 and Clause 8.10

Radiation Disturbance Test Limit for FCC (Class B)(9KHz-1GHz)

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009~0.490	2400/F(KHz)	300
0.490~1.705	24000/F(KHz)	30
1.705~30.0	30	30
30~88	100	3
88~216	150	3
216~960	200	3
960~1000	500	3

Note: 1) At frequencies at or above 30 MHz, measurements may be performed at a distance other than what is specified provided: measurements are not made in the near field except where it can be shown that near field measurements are appropriate due to the characteristics of the device; and it can be demonstrated that the signal levels needed to be measured at the distance employed can be detected by the measurement equipment. Measurements shall not be performed at a distance greater than 30 meters unless it can be further demonstrated that measurements at a distance of 30 meters or less are impractical. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade (inverse linear-distance for field strength measurements; inverse-linear-distance-squared for power density measurements).

(2) At frequencies below 30 MHz, measurements may be performed at a distance closer than that specified in the regulations; however, an attempt should be made to avoid making measurements in the near field. Pending the development of an appropriate measurement procedure for measurements performed below 30 MHz, when performing measurements at a closer distance than specified, the results shall be extrapolated to the specified distance by either making measurements at a minimum of two distances on at least one radial to determine the proper extrapolation factor or by using the square of an inverse linear distance extrapolation factor (40 dB/decade). This paragraph (f) shall not apply to Access BPL devices operating below 30 MHz.



Radiation Disturbance Test Limit for FCC (Above 1G)

Frequency (MHz)	dB(uV/m) (at 3 meters)	
	Peak	Average
Above 1000	74	54

Restricted bands of operation

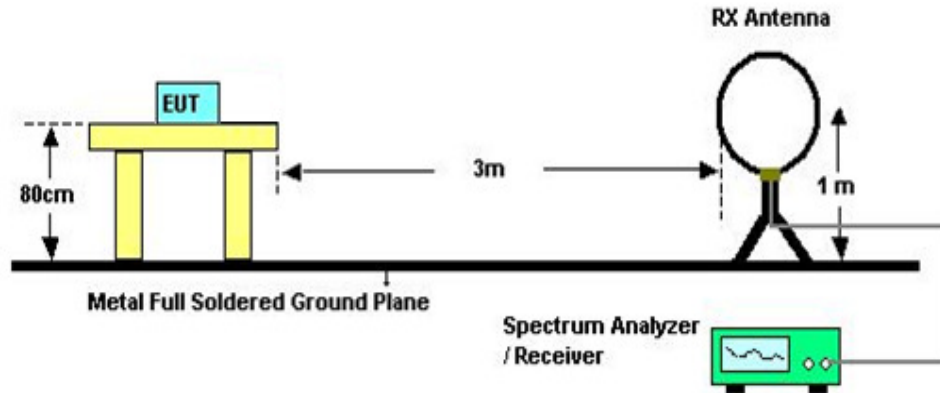
MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
<sup>1</sup> 0.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5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

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

<sup>2</sup>Above 38.6c

## TEST SETUP AND PROCEDURE

Below 30MHz

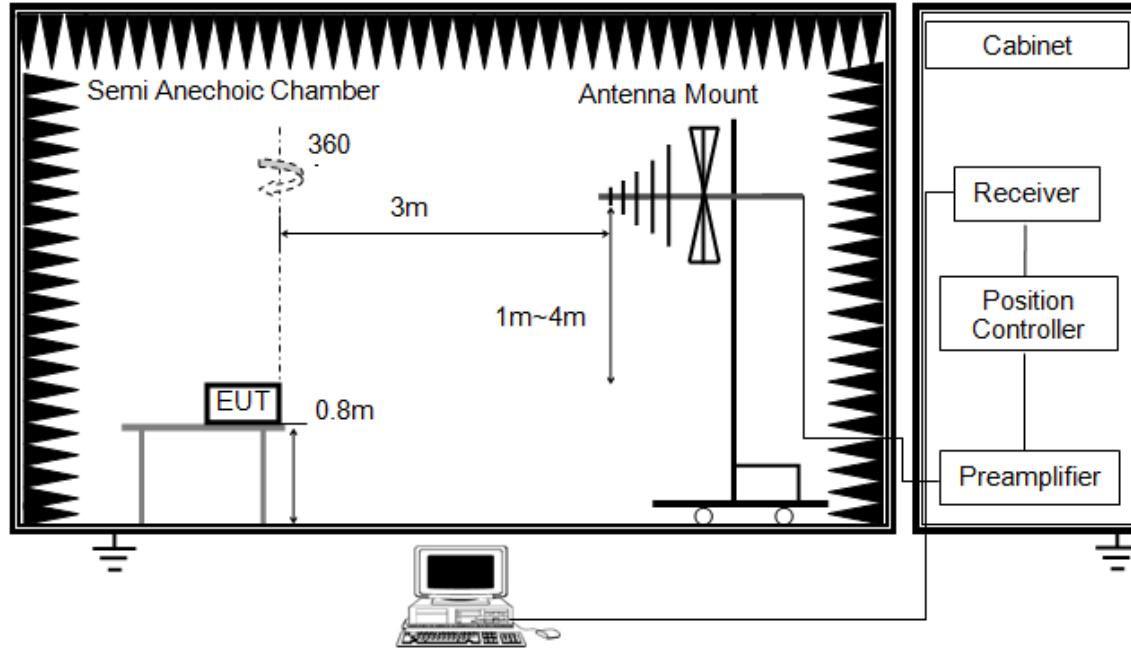


The setting of the spectrum analyser

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
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 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. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
5. 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 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.
6. For measurement below 1GHz, 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 and average detector mode re-measured. If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak and average detector and reported.
7. For the actual test configuration, please refer to the related item in this test report (Photographs of the Test Configuration)

Below 1G and above 30MHz

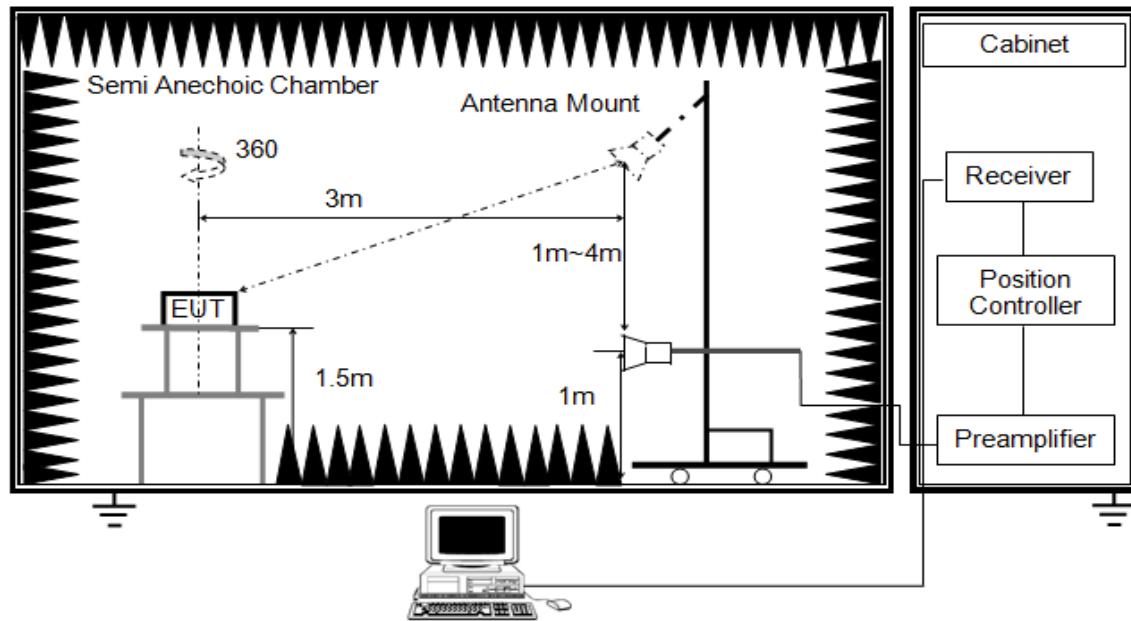


The setting of the spectrum analyser

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. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
5. For measurement below 1GHz, 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. If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.
6. For the actual test configuration, please refer to the related item in this test report (Photographs of the Test Configuration)

Above 1G

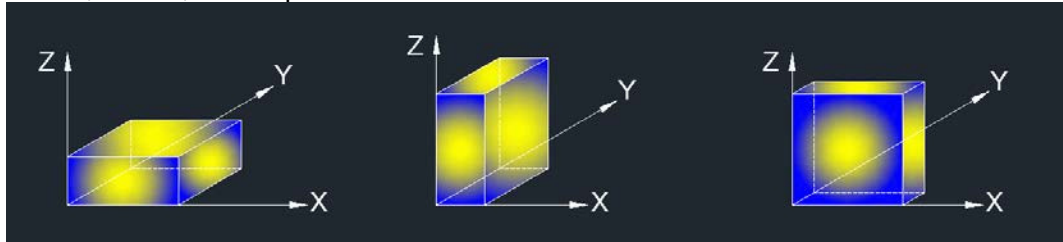


The setting of the spectrum analyser

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 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. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
5. For measurement above 1GHz, the emission measurement will be measured by the peak detector. This peak level, once corrected, must comply with the limit specified in Section 15.209.
6. 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 the Duty Cycle and Correction Factor please refer to clause 7.1.ON TIME AND DUTY CYCLE.
7. For the actual test configuration, please refer to the related Item in this test report (Photographs of the Test Configuration)

X axis, Y axis, Z axis positions:

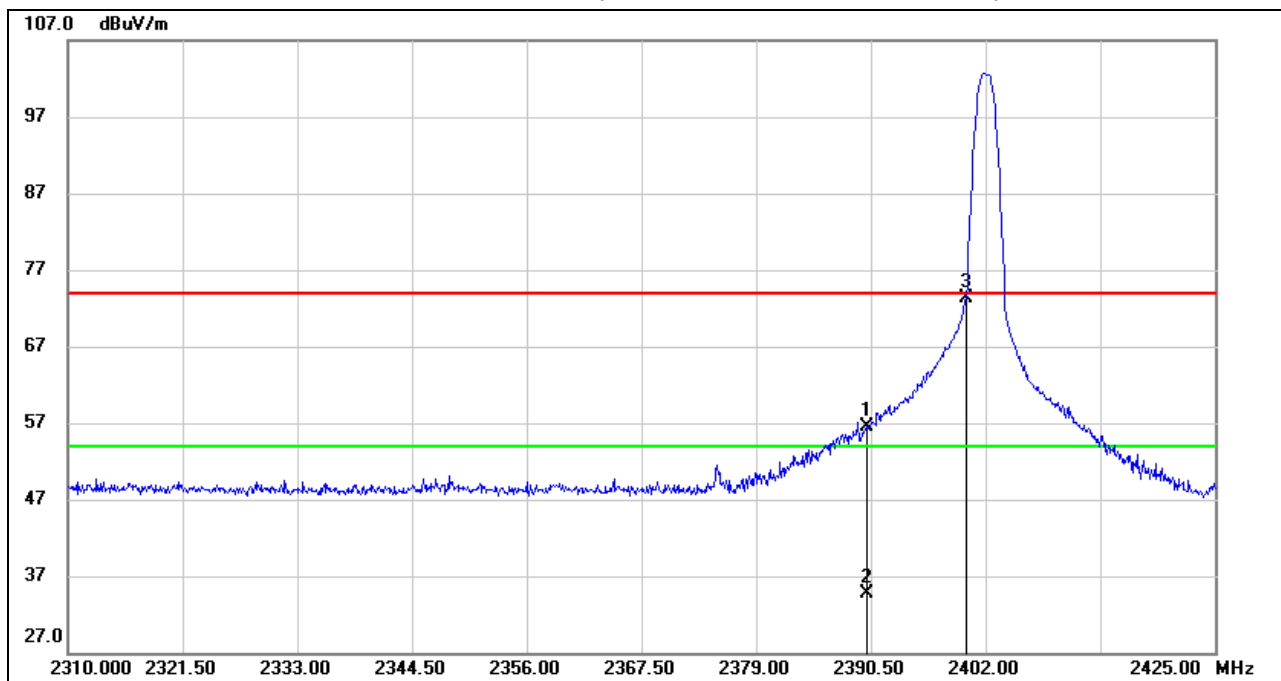


Note: For all radiated test, EUT in each of three orthogonal axis emissions had been tested, but only the worst case (Y axis) data recorded in the report.

## 8.1. RESTRICTED BANDEDGE

### ANTENNA1 (WORST-CASE CONFIGURATION)

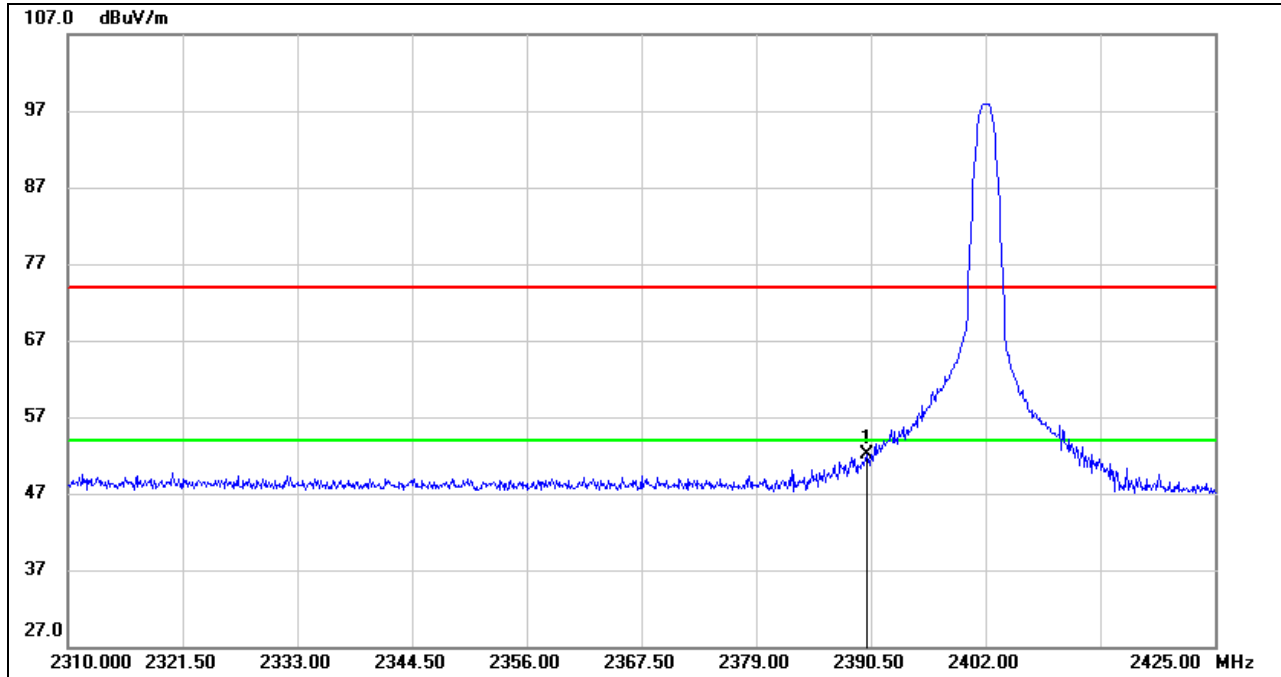
#### RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2390.000	23.45	33.14	56.59	74.00	-17.41	peak
2	2390.000	1.63	33.14	34.77	54.00	-19.23	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/T.  
5. For transmit duration, please refer to clause 7.1.

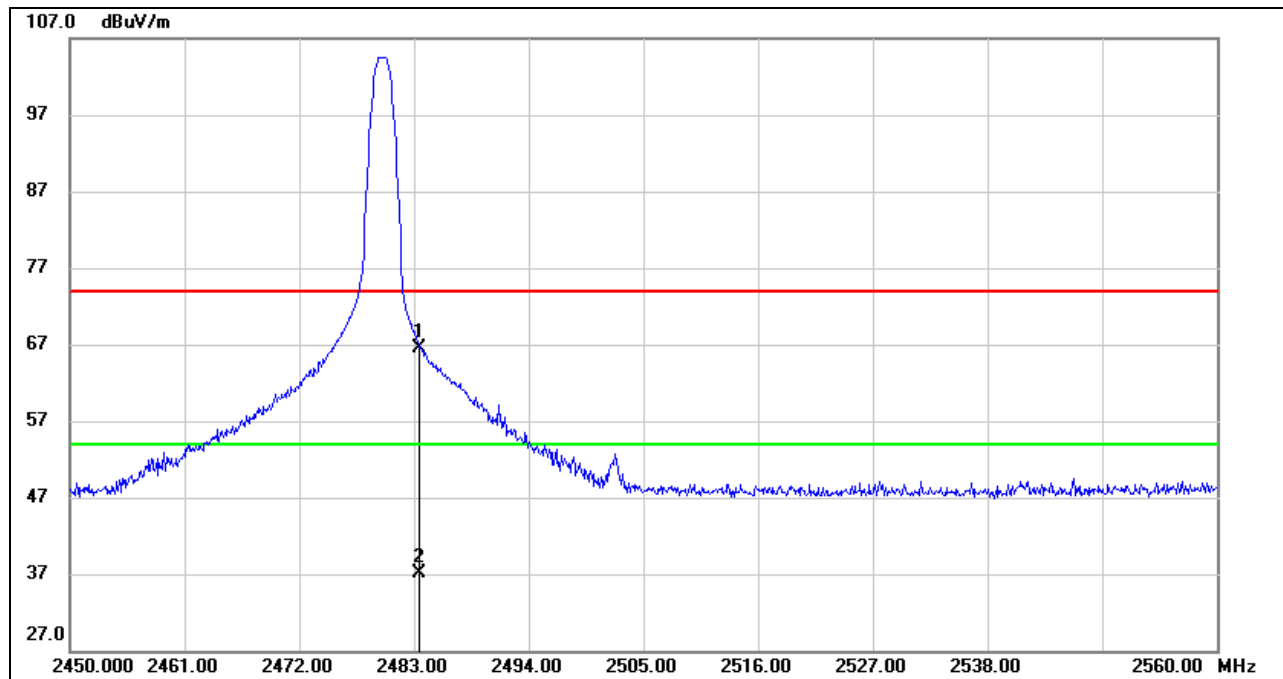
**RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)**



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2390.000	18.87	33.24	52.11	74.00	-21.89	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/T.  
 5. For transmit duration, please refer to clause 7.1.

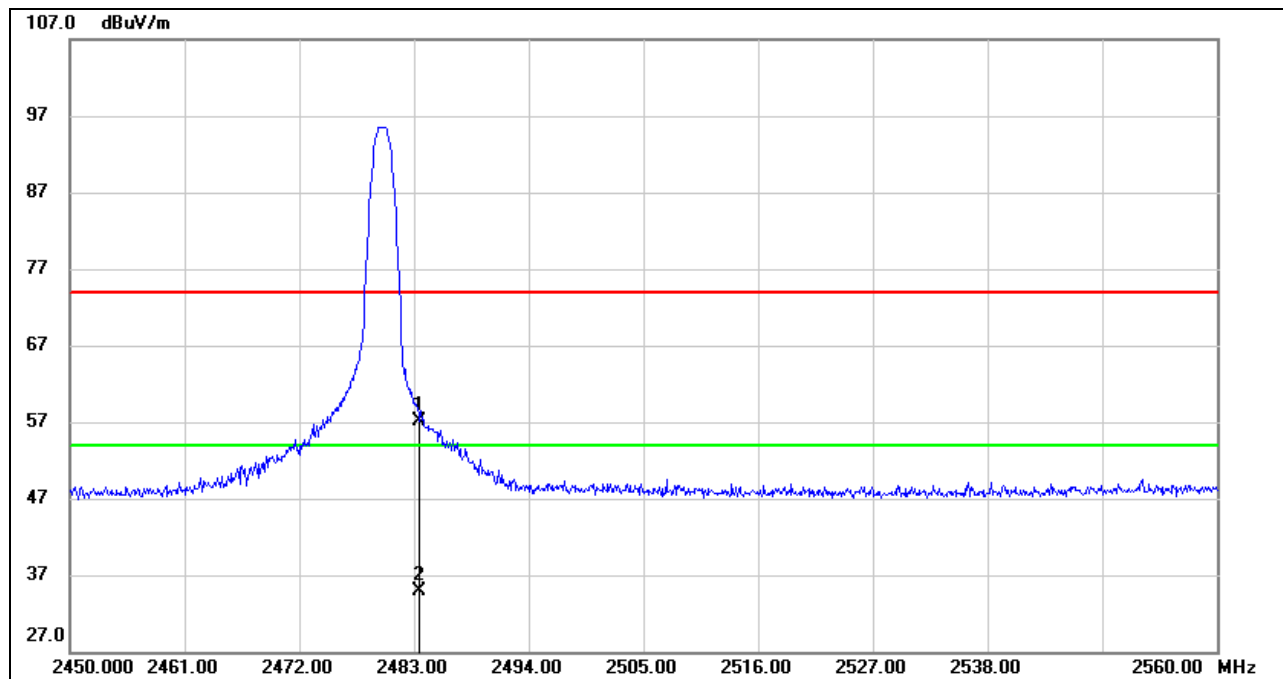
**RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)**



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	33.77	32.78	66.55	74.00	-7.45	peak
2	2483.500	4.30	32.78	37.08	54.00	-16.92	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/T.  
 5. For transmit duration, please refer to clause 7.1.

**RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)**



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	24.32	32.88	57.20	74.00	-16.80	peak
2	2483.500	1.97	32.88	34.85	54.00	-19.15	AVG

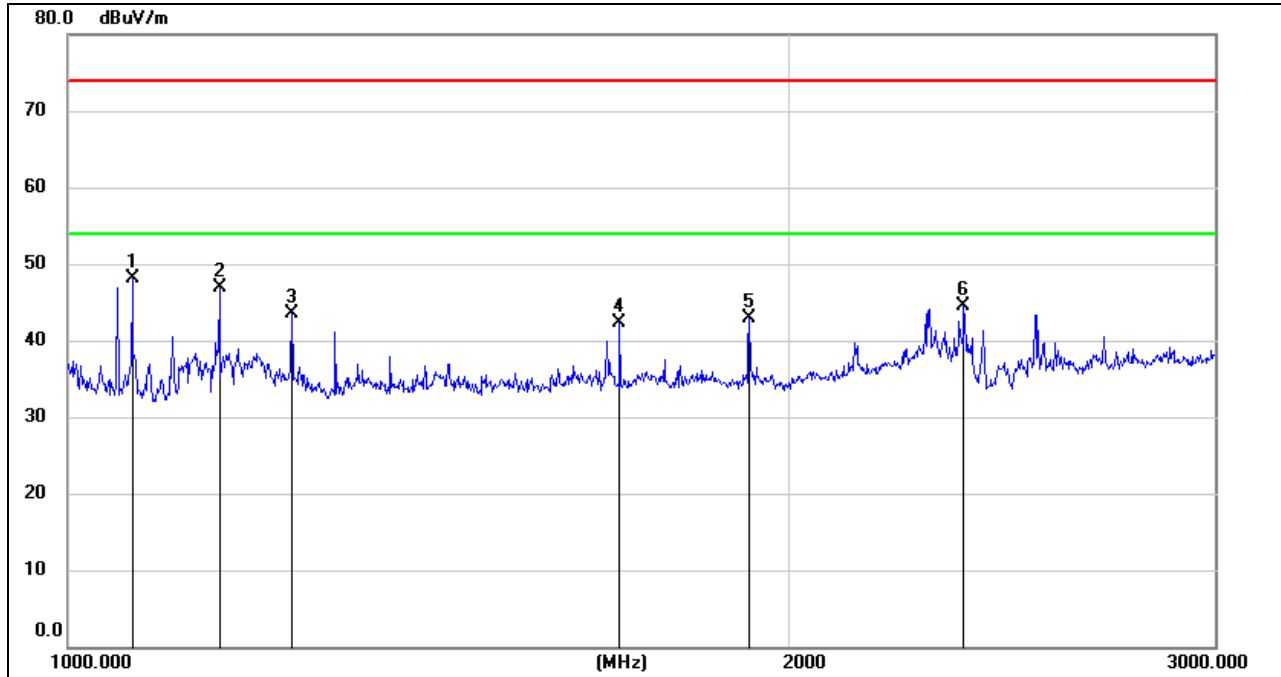
Note: 1. Measurement = Reading Level + Correct Factor.  
 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.  
 3. Peak: Peak detector.  
 4. AVG: VBW=1/T.  
 5. For transmit duration, please refer to clause 7.1.



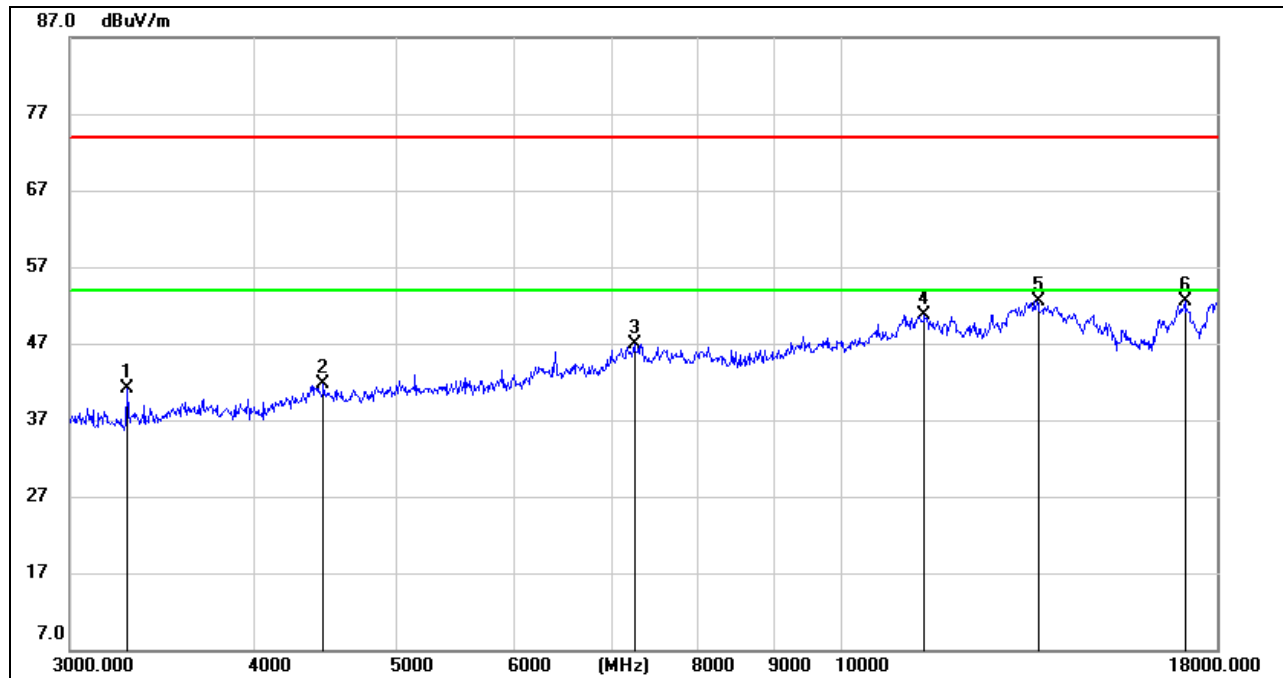
## 8.2. SPURIOUS EMISSIONS (1~18GHz)

### ANTENNA1 (WORST-CASE CONFIGURATION)

#### HARMONICS AND SPURIOUS EMISSIONS (LOW CHANNEL, HORIZONTAL)



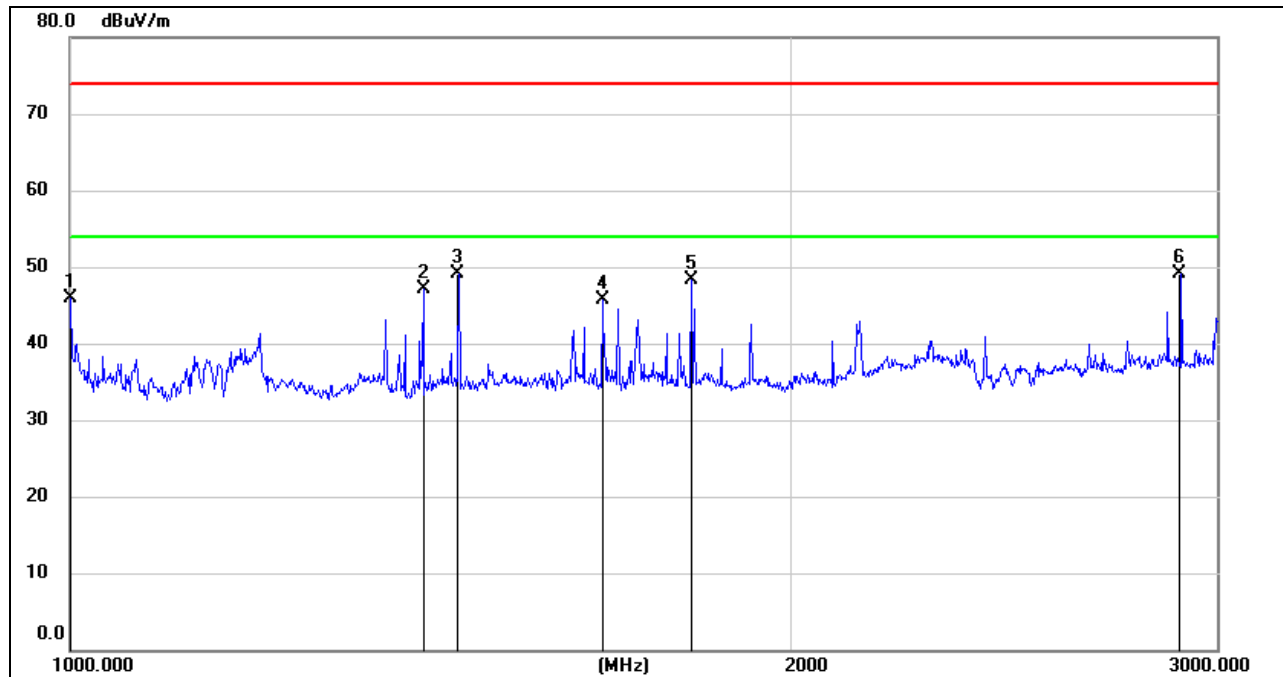
No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1064.623	61.74	-13.62	48.12	74.00	-25.88	peak
2	1156.059	60.28	-13.34	46.94	74.00	-27.06	peak
3	1238.907	56.43	-12.87	43.56	74.00	-30.44	peak
4	1696.271	53.78	-11.54	42.24	74.00	-31.76	peak
5	1920.481	53.67	-10.72	42.95	74.00	-31.05	peak
6	2361.070	52.29	-7.83	44.46	74.00	-29.54	peak



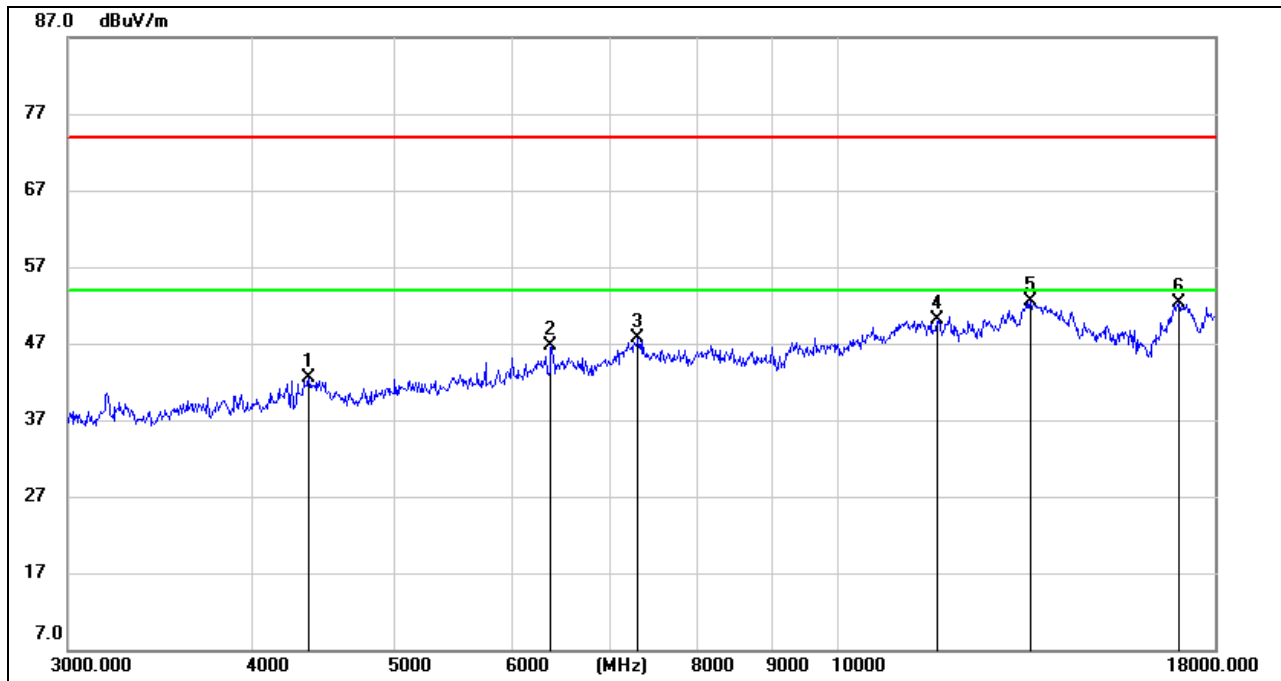
No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	3281.171	45.95	-4.86	41.09	74.00	-32.91	peak
2	4457.514	42.54	-0.83	41.71	74.00	-32.29	peak
3	7243.887	39.06	7.84	46.90	74.00	-27.10	peak
4	11398.401	35.06	15.67	50.73	74.00	-23.27	peak
5	13610.714	31.98	20.53	52.51	74.00	-21.49	peak
6	17119.232	30.08	22.40	52.48	74.00	-21.52	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. AVG: VBW=1/T.  
5. For transmit duration, please refer to clause 7.1.

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



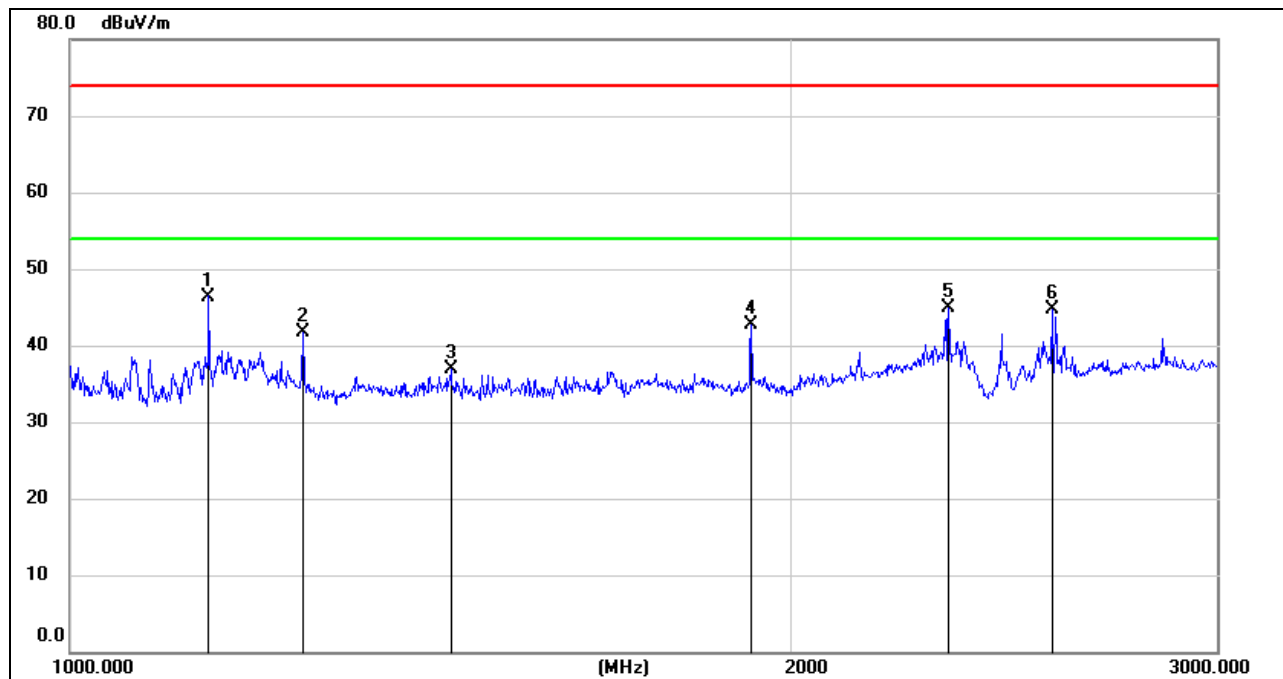
No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1001.099	59.91	-14.01	45.90	74.00	-28.10	peak
2	1402.663	59.56	-12.44	47.12	74.00	-26.88	peak
3	1451.256	61.42	-12.27	49.15	74.00	-24.85	peak
4	1666.715	57.34	-11.67	45.67	74.00	-28.33	peak
5	1813.843	59.35	-11.06	48.29	74.00	-25.71	peak
6	2899.549	55.64	-6.53	49.11	74.00	-24.89	peak



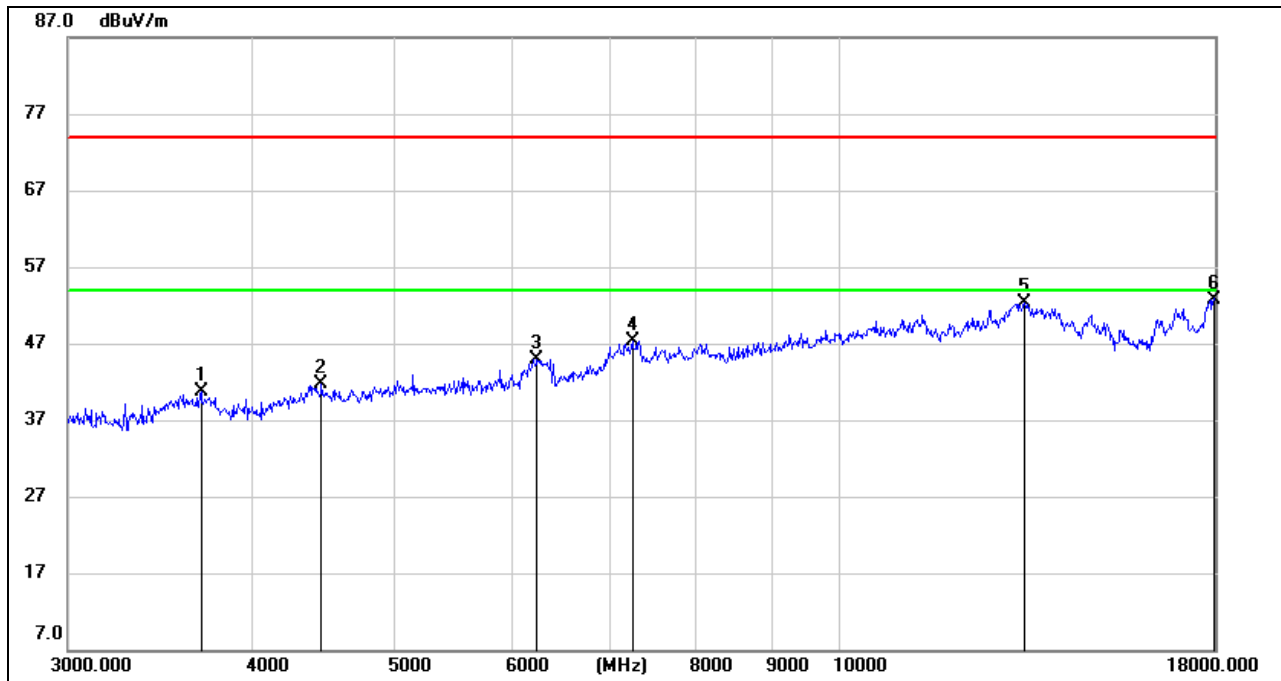
No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4370.519	43.40	-0.98	42.42	74.00	-31.58	peak
2	6390.003	41.93	4.73	46.66	74.00	-27.34	peak
3	7309.075	40.02	7.77	47.79	74.00	-26.21	peak
4	11687.942	33.43	16.58	50.01	74.00	-23.99	peak
5	13513.514	31.82	20.66	52.48	74.00	-21.52	peak
6	16996.976	30.15	22.25	52.40	74.00	-21.60	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. AVG: VBW=1/T.  
5. For transmit duration, please refer to clause 7.1.

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



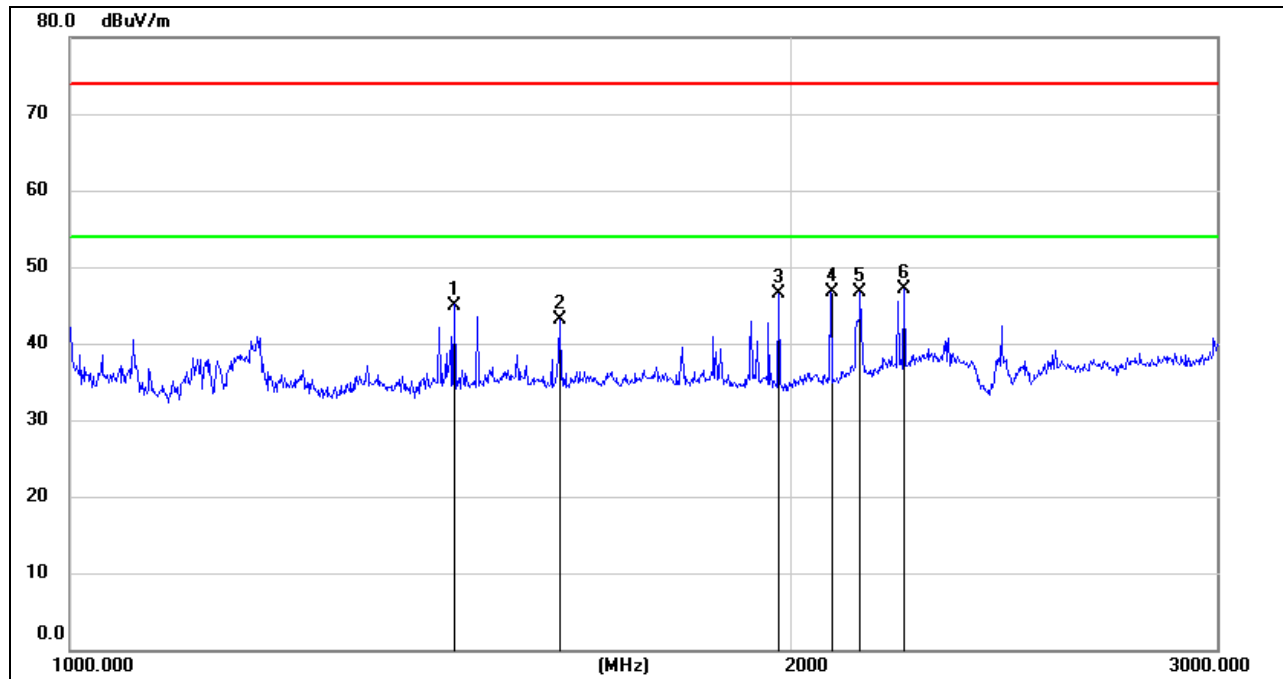
No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1142.172	59.80	-13.40	46.40	74.00	-27.60	peak
2	1249.843	54.44	-12.83	41.61	74.00	-32.39	peak
3	1440.139	49.10	-12.22	36.88	74.00	-37.12	peak
4	1920.481	53.34	-10.72	42.62	74.00	-31.38	peak
5	2319.930	52.39	-7.54	44.85	74.00	-29.15	peak
6	2563.852	52.89	-8.28	44.61	74.00	-29.39	peak



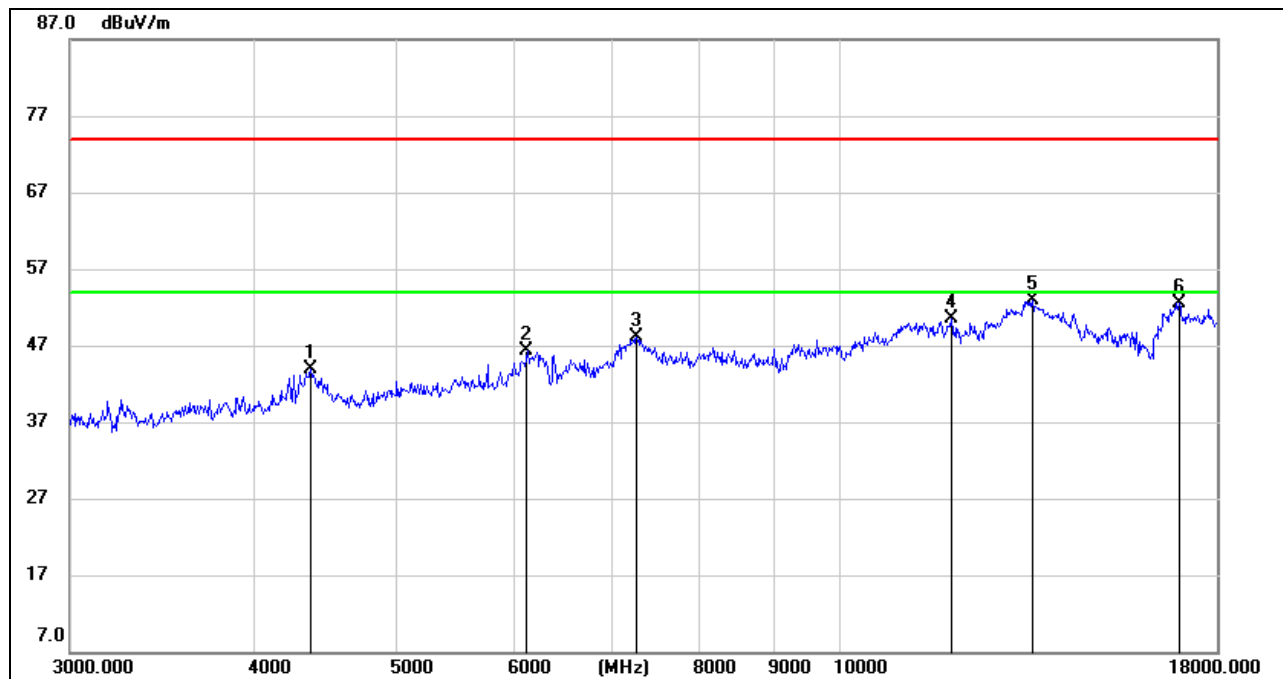
No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	3693.064	44.35	-3.71	40.64	74.00	-33.36	peak
2	4457.514	42.54	-0.83	41.71	74.00	-32.29	peak
3	6242.882	40.65	4.33	44.98	74.00	-29.02	peak
4	7243.887	39.56	7.84	47.40	74.00	-26.60	peak
5	13369.015	32.92	19.42	52.34	74.00	-21.66	peak
6	17967.777	25.76	27.04	52.80	74.00	-21.20	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. AVG: VBW=1/T.  
 5. For transmit duration, please refer to clause 7.1.

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



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1444.893	57.28	-12.28	45.00	74.00	-29.00	peak
2	1598.567	55.13	-12.06	43.07	74.00	-30.93	peak
3	1973.959	57.24	-10.71	46.53	74.00	-27.47	peak
4	2073.999	56.76	-9.99	46.77	74.00	-27.23	peak
5	2131.751	55.90	-9.26	46.64	74.00	-27.36	peak
6	2222.630	55.13	-7.98	47.15	74.00	-26.85	peak

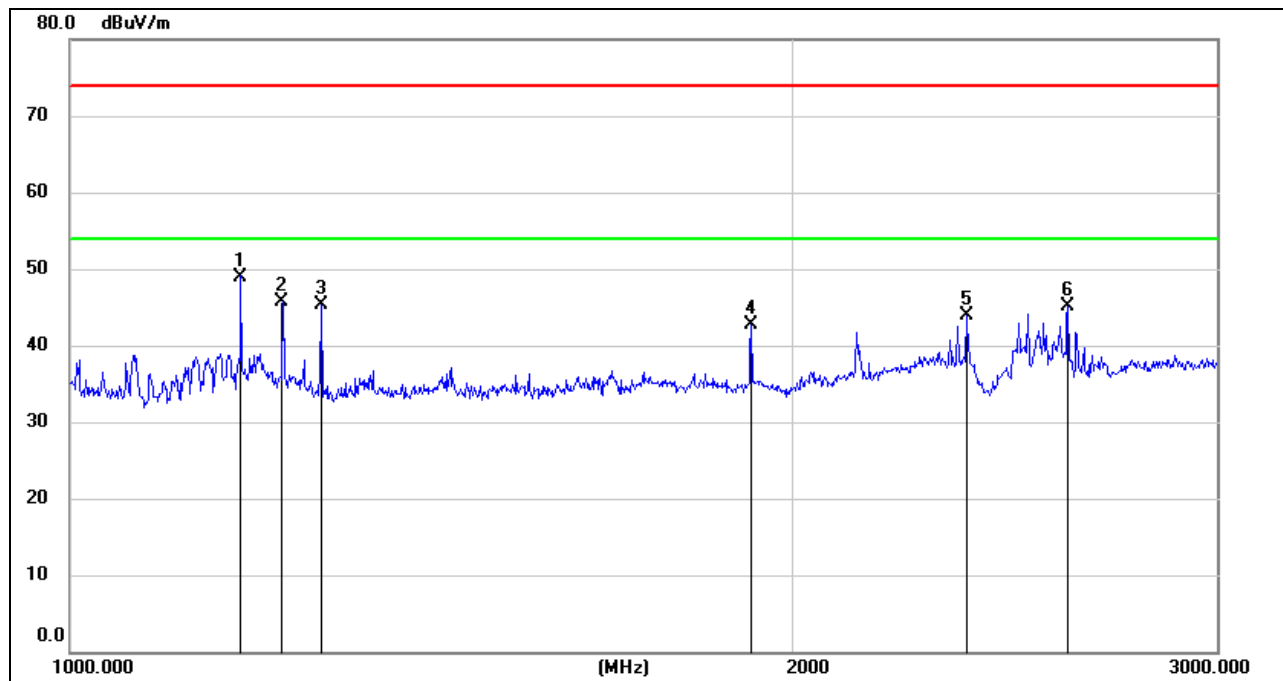


No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4370.519	44.90	-0.98	43.92	74.00	-30.08	peak
2	6132.020	42.41	3.82	46.23	74.00	-27.77	peak
3	7269.892	40.26	7.80	48.06	74.00	-25.94	peak
4	11920.589	33.94	16.64	50.58	74.00	-23.42	peak
5	13513.514	32.32	20.66	52.98	74.00	-21.02	peak
6	16996.976	30.33	22.25	52.58	74.00	-21.42	peak

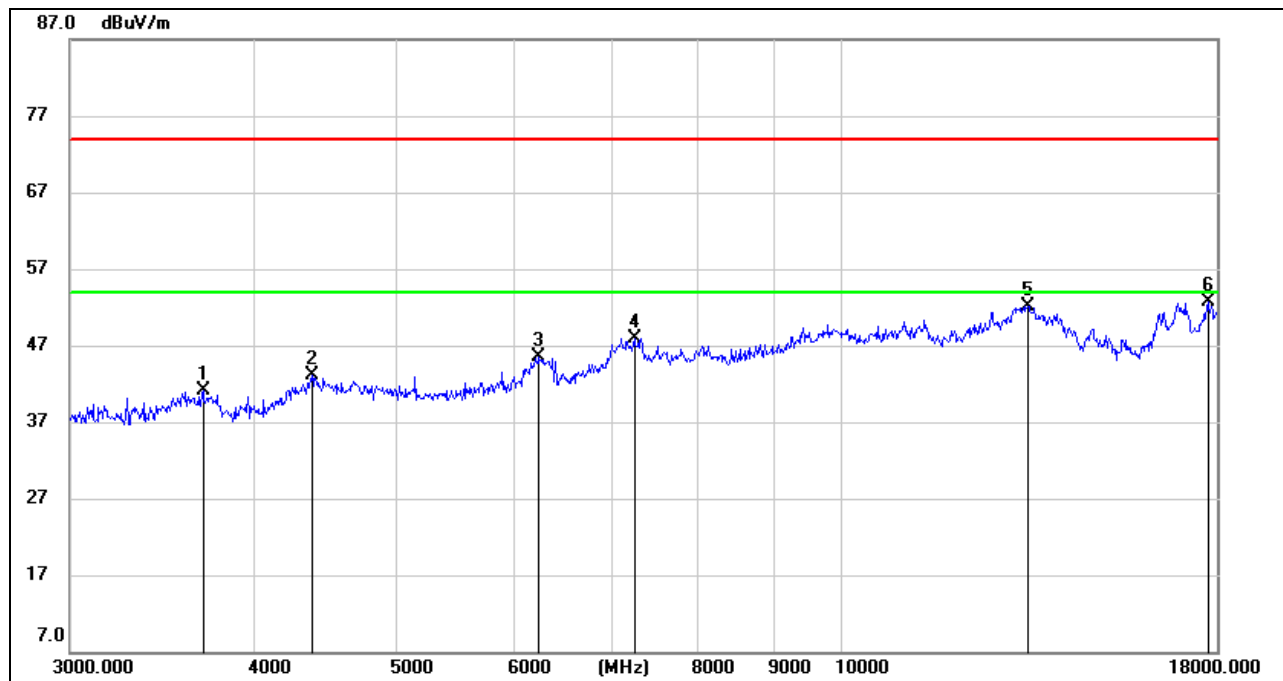
Note: 1. Peak Result = Reading Level + Correct Factor.  
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.  
3. Peak: Peak detector.  
4. AVG: VBW=1/T.  
5. For transmit duration, please refer to clause 7.1.



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



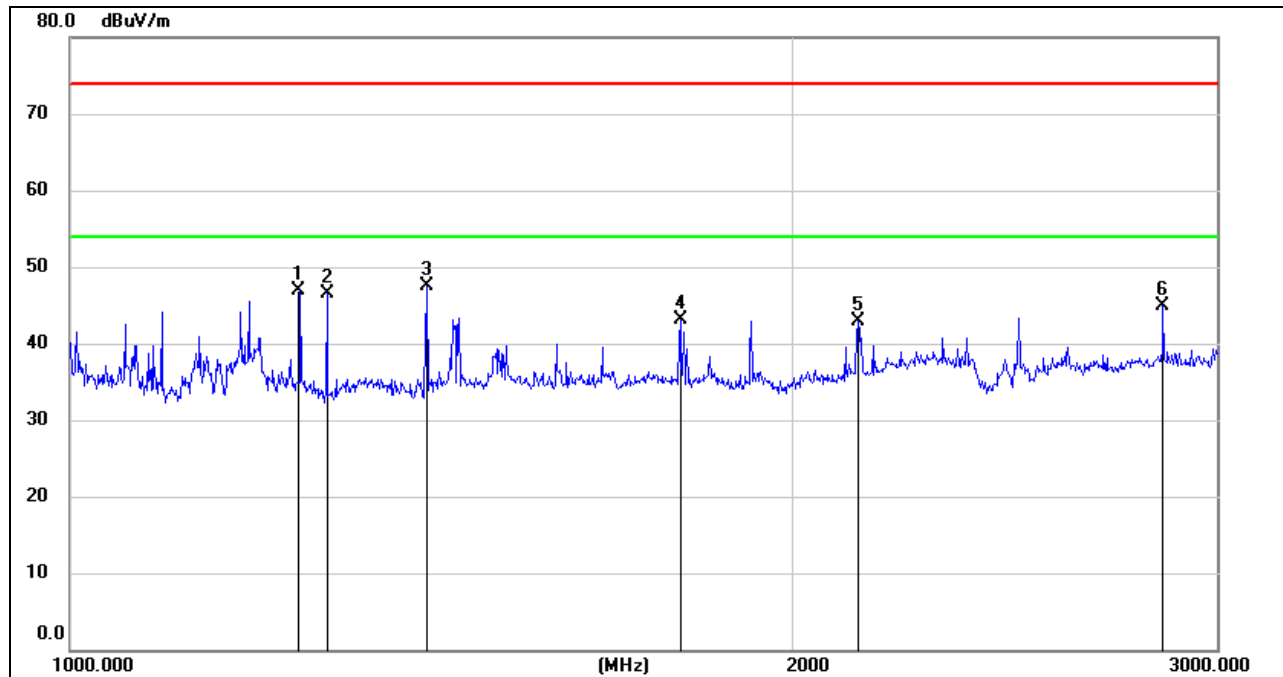
No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1177.853	62.20	-13.20	49.00	74.00	-25.00	peak
2	1226.717	58.62	-12.94	45.68	74.00	-28.32	peak
3	1273.405	58.00	-12.62	45.38	74.00	-28.62	peak
4	1920.481	53.43	-10.72	42.71	74.00	-31.29	peak
5	2363.665	51.79	-7.85	43.94	74.00	-30.06	peak
6	2600.731	53.16	-8.11	45.05	74.00	-28.95	peak



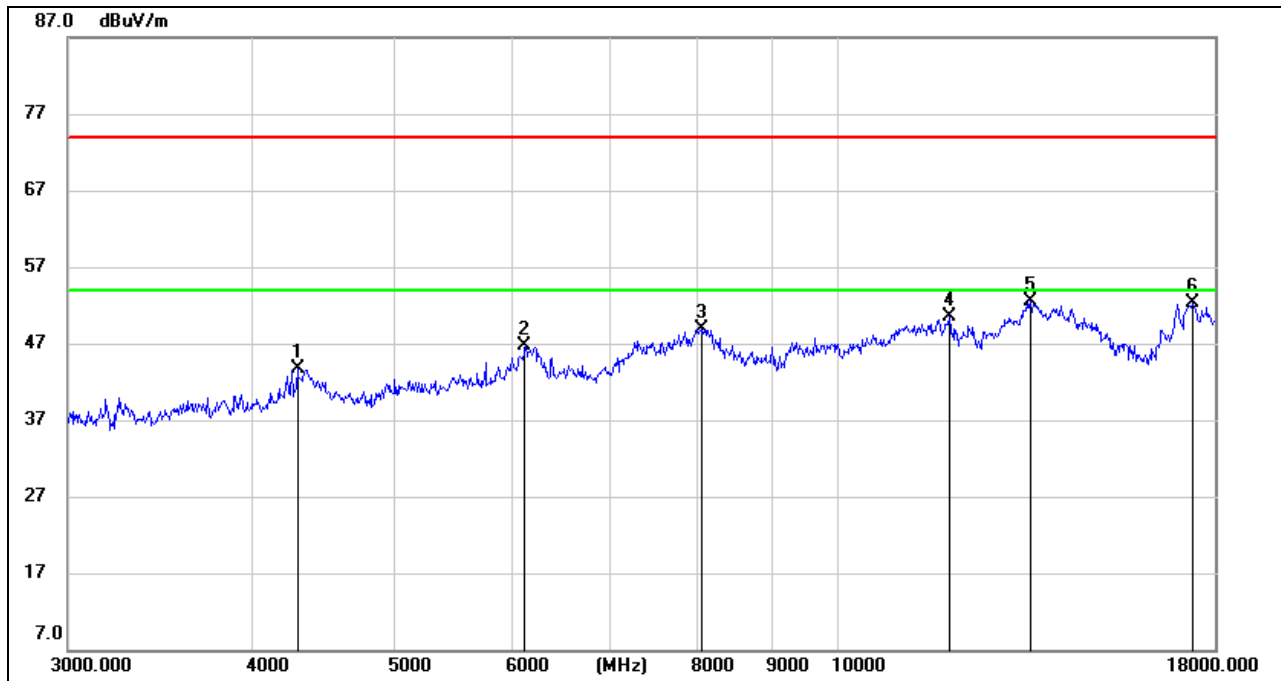
No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	3693.064	44.85	-3.71	41.14	74.00	-32.86	peak
2	4386.209	44.01	-0.99	43.02	74.00	-30.98	peak
3	6242.882	41.15	4.33	45.48	74.00	-28.52	peak
4	7243.887	40.06	7.84	47.90	74.00	-26.10	peak
5	13392.990	32.79	19.36	52.15	74.00	-21.85	peak
6	17743.827	26.90	25.85	52.75	74.00	-21.25	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. AVG: VBW=1/T.  
5. For transmit duration, please refer to clause 7.1.

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



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1247.100	59.57	-12.75	46.82	74.00	-27.18	peak
2	1279.014	59.16	-12.71	46.45	74.00	-27.55	peak
3	1407.294	59.92	-12.44	47.48	74.00	-26.52	peak
4	1795.997	54.16	-11.14	43.02	74.00	-30.98	peak
5	2127.073	52.29	-9.33	42.96	74.00	-31.04	peak
6	2849.027	51.66	-6.70	44.96	74.00	-29.04	peak



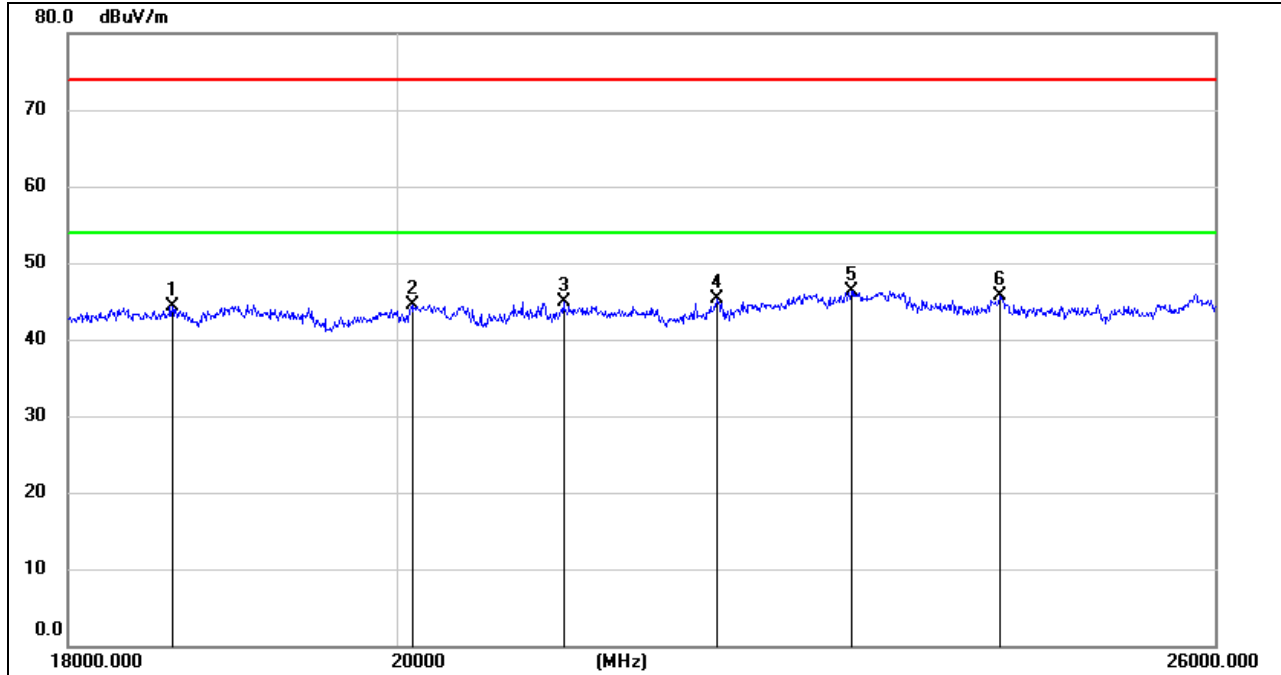
No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4292.907	45.21	-1.53	43.68	74.00	-30.32	peak
2	6132.020	42.91	3.82	46.73	74.00	-27.27	peak
3	8066.047	40.48	8.47	48.95	74.00	-25.05	peak
4	11920.589	33.94	16.64	50.58	74.00	-23.42	peak
5	13513.514	31.82	20.66	52.48	74.00	-21.52	peak
6	17397.532	28.86	23.42	52.28	74.00	-21.72	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. AVG: VBW=1/T.  
5. For transmit duration, please refer to clause 7.1.

### 8.3. SPURIOUS EMISSIONS 18G ~ 26GHz

#### ANTENNA1 (WORST-CASE CONFIGURATION)

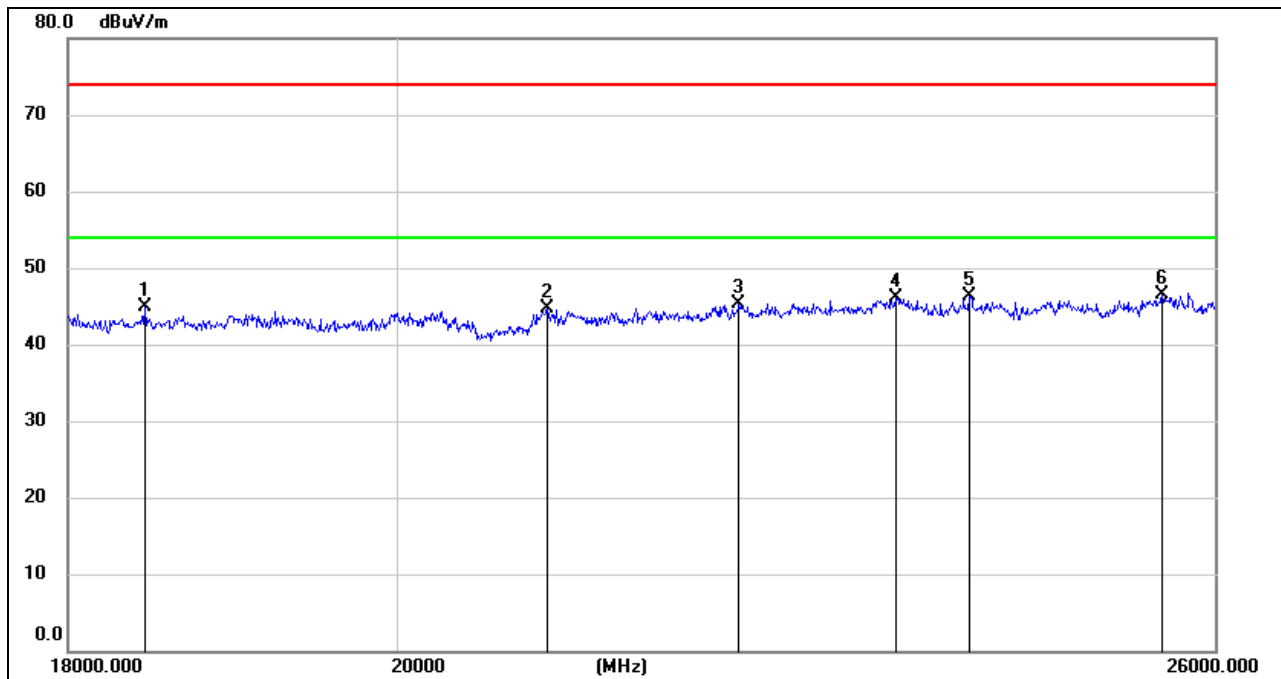
#### SPURIOUS EMISSIONS (MID CHANNEL, WORST-CASE CONFIGURATION, HORIZONTAL)



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	18612.524	49.74	-5.34	44.40	74.00	-29.60	peak
2	20099.385	49.97	-5.52	44.45	74.00	-29.55	peak
3	21099.068	49.82	-4.83	44.99	74.00	-29.01	peak
4	22164.768	49.64	-4.31	45.33	74.00	-28.67	peak
5	23139.192	49.65	-3.40	46.25	74.00	-27.75	peak
6	24263.284	48.61	-2.81	45.80	74.00	-28.20	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. All the modes had been tested, but only the worst data were recorded in the report.

**SPURIOUS EMISSIONS (MID CHANNEL, WORST-CASE CONFIGURATION, VERTICAL)**



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	18448.984	50.27	-5.32	44.95	74.00	-29.05	peak
2	20990.726	49.64	-4.88	44.76	74.00	-29.24	peak
3	22320.170	49.47	-4.13	45.34	74.00	-28.66	peak
4	23473.428	49.25	-3.17	46.08	74.00	-27.92	peak
5	24032.412	49.12	-2.75	46.37	74.00	-27.63	peak
6	25563.900	47.92	-1.48	46.44	74.00	-27.56	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.

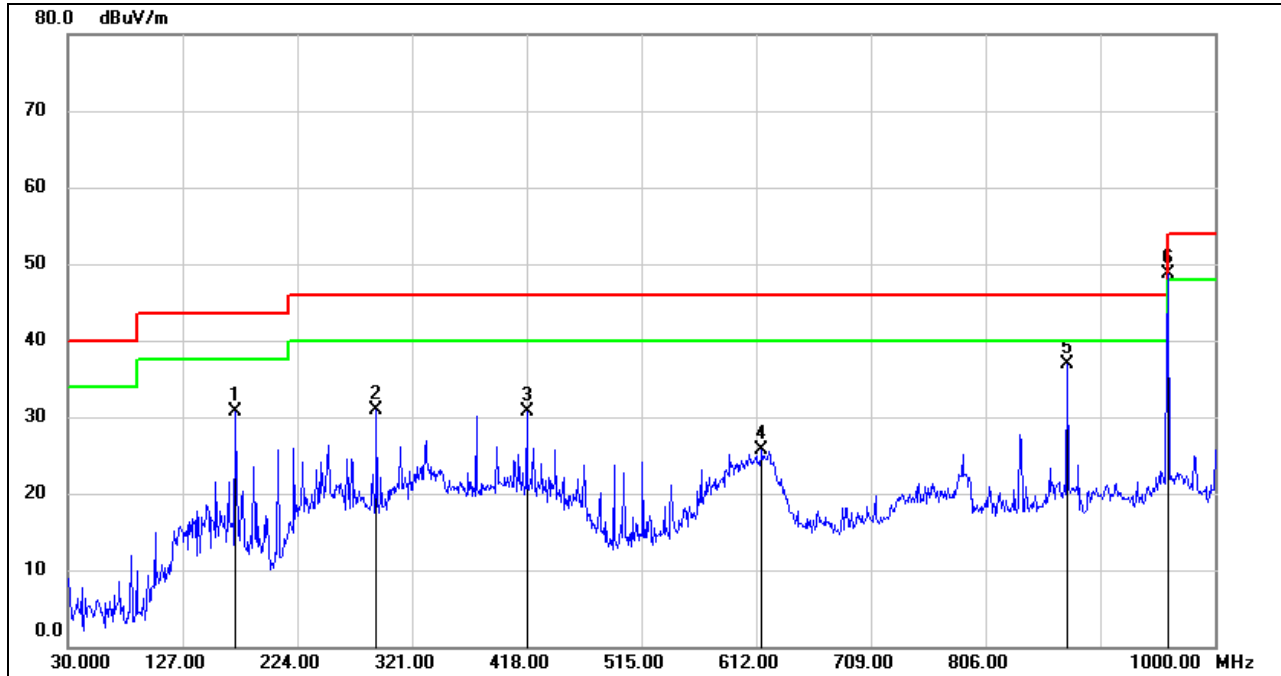
4. All the modes had been tested, but only the worst data were recorded in the report.

Note: All the channels had been tested, but only the worst data recorded in the report.

## 8.4. SPURIOUS EMISSIONS 30M ~ 1 GHz

### ANTENNA1 (WORST-CASE CONFIGURATION)

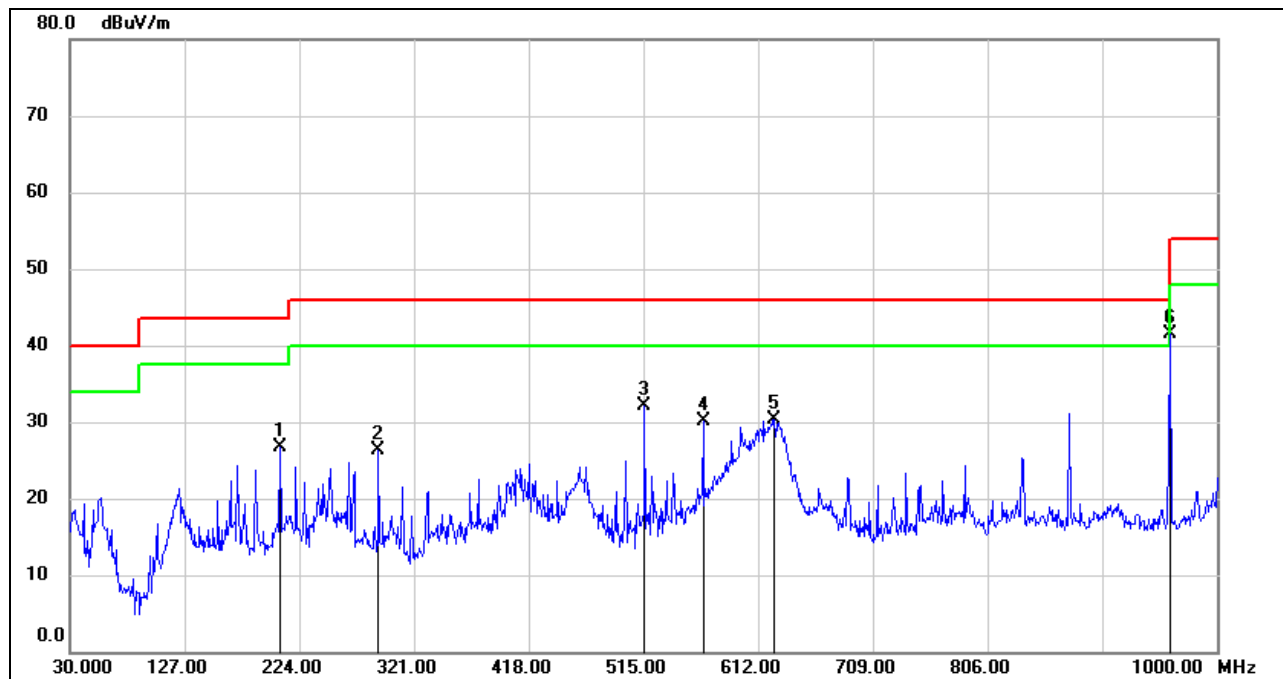
#### SPURIOUS EMISSIONS (MID CHANNEL, WORST-CASE CONFIGURATION, HORIZONTAL)



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	171.6200	58.96	-28.33	30.63	43.50	-12.87	QP
2	290.9300	59.01	-28.01	31.00	46.00	-15.00	QP
3	418.0000	55.39	-24.59	30.80	46.00	-15.20	QP
4	616.8500	46.24	-20.55	25.69	46.00	-20.31	QP
5	874.8700	54.17	-17.24	36.93	46.00	-9.07	QP
6	960.2300	64.05	-15.41	48.64	54.00	-5.36	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.  
 3. Test setup: RBW: 120 kHz, VBW: 300 kHz, Sweep time: auto.

**SPURIOUS EMISSIONS (MID CHANNEL, WORST-CASE CONFIGURATION, VERTICAL)**



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	207.5100	54.57	-27.91	26.66	43.50	-16.84	QP
2	290.9300	54.40	-28.01	26.39	46.00	-19.61	QP
3	515.9699	53.70	-21.62	32.08	46.00	-13.92	QP
4	565.4400	51.35	-21.32	30.03	46.00	-15.97	QP
5	625.5800	50.73	-20.39	30.34	46.00	-15.66	QP
6	960.2300	57.00	-15.41	41.59	54.00	-12.41	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.  
 3. Test setup: RBW: 120 kHz, VBW: 300 kHz, Sweep time: auto

Note: All the channels had been tested, but only the worst data recorded in the report.

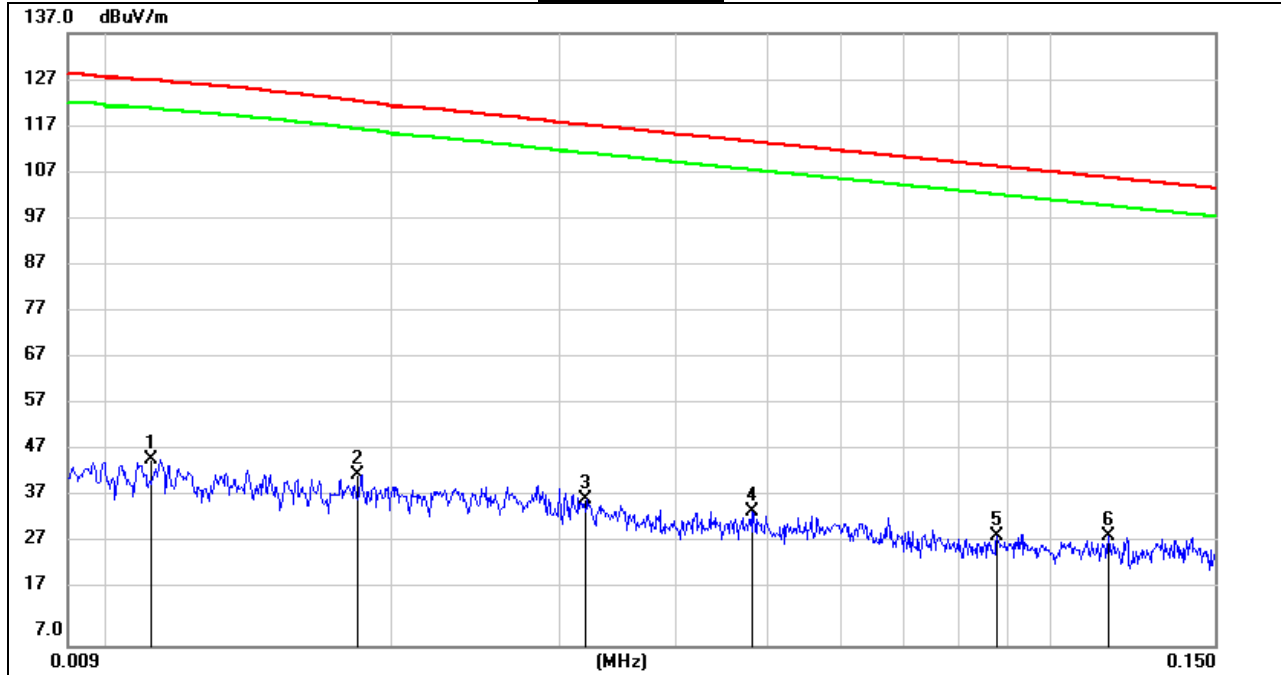


## 8.5. SPURIOUS EMISSIONS BELOW 30M

### ANTENNA1 (WORST-CASE CONFIGURATION)

#### SPURIOUS EMISSIONS (MID CHANNEL, WORST-CASE CONFIGURATION, HORIZONTAL)

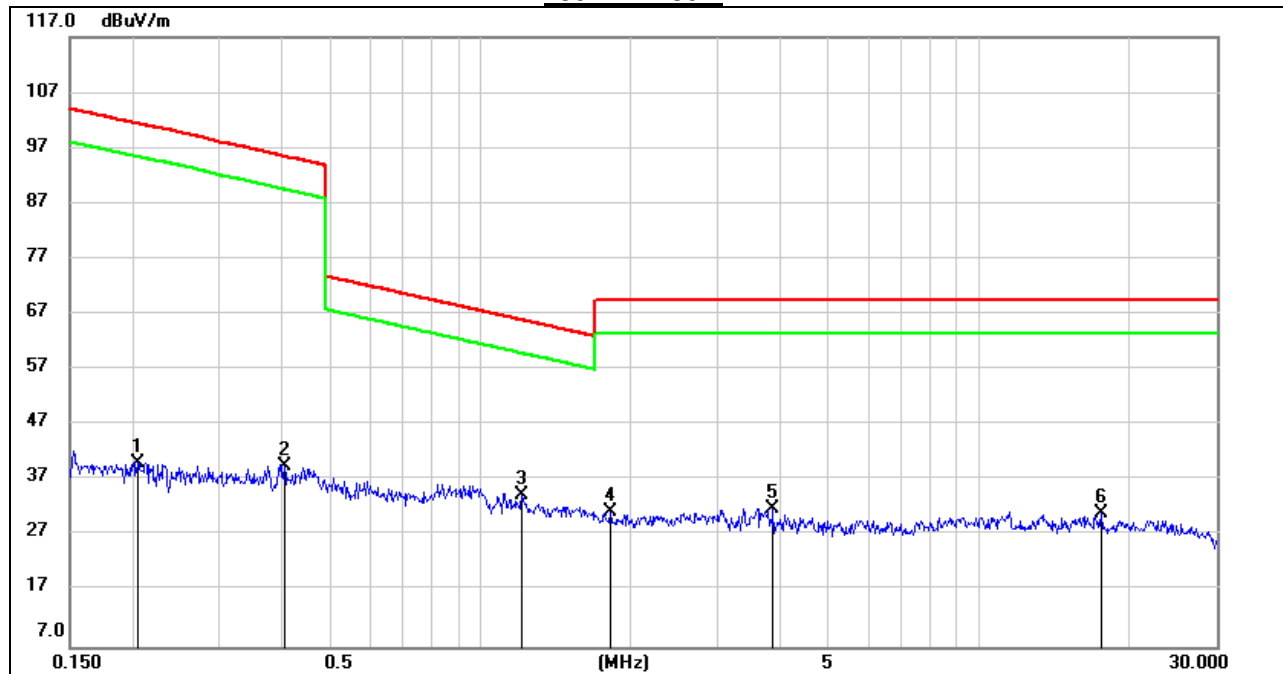
9KHz~ 150KHz



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	0.0111	26.15	20.22	46.37	126.94	-80.57	QP
2	0.0183	23.02	20.29	43.31	122.60	-79.29	QP
3	0.0320	17.67	20.31	37.98	117.56	-79.58	QP
4	0.0483	15.03	20.31	35.34	113.95	-78.61	QP
5	0.0879	10.02	20.26	30.28	108.73	-78.45	QP
6	0.1155	9.87	20.28	30.15	106.36	-76.21	QP

Note: 1. Measurement = Reading Level + Correct Factor.  
 2. All the modes had been tested, but only the worst data were recorded in the report.  
 3. If Peak Result complies with AV and QP limit, AV and QP Result are deemed to comply with AV limit.

**150KHz ~ 30M**

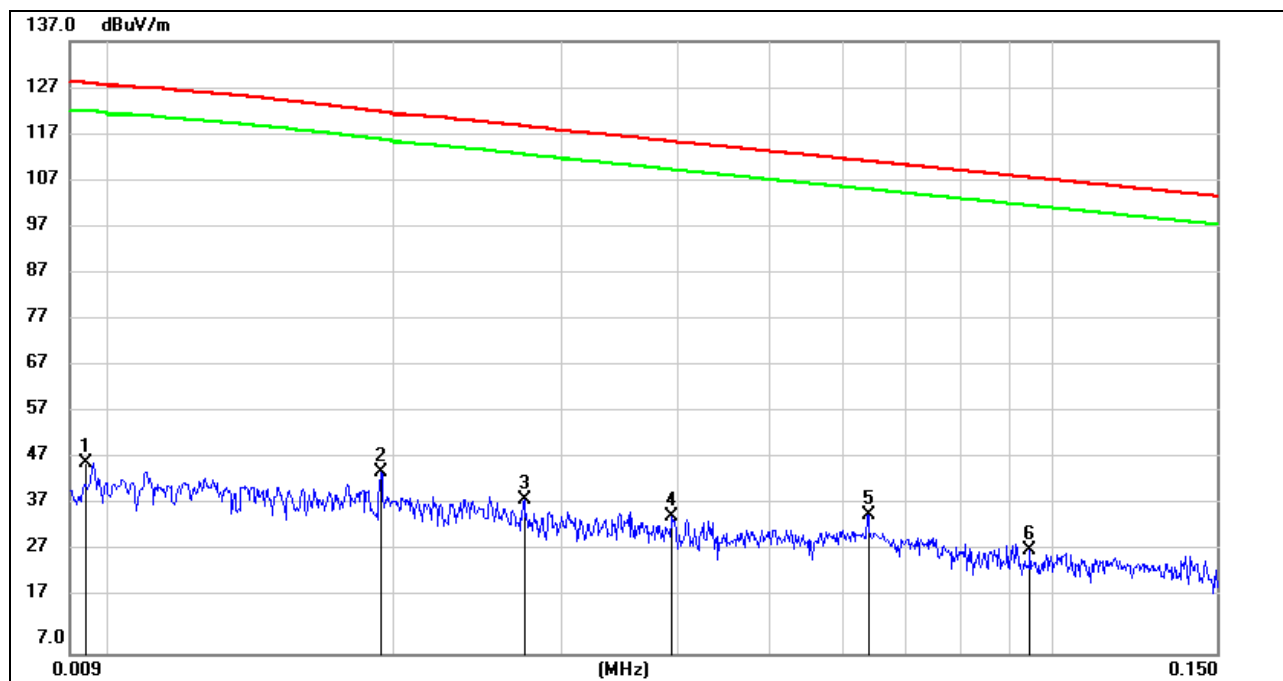


No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	0.2048	19.91	20.36	40.27	101.41	-61.14	QP
2	0.4040	19.44	20.27	39.71	95.48	-55.77	QP
3	1.2096	13.91	20.44	34.35	65.95	-31.60	QP
4	1.8185	10.54	20.67	31.21	69.54	-38.33	QP
5	3.8603	10.95	21.04	31.99	69.54	-37.55	QP
6	17.5670	9.95	20.99	30.94	69.54	-38.60	QP

Note: 1. Measurement = Reading Level + Correct Factor.  
 2. All the modes had been tested, but only the worst data were recorded in the report.  
 3. If Peak Result complies with AV and QP limit, AV and QP Result are deemed to comply with AV limit.

**SPURIOUS EMISSIONS (MID CHANNEL, WORST-CASE CONFIGURATION, VERTICAL)**

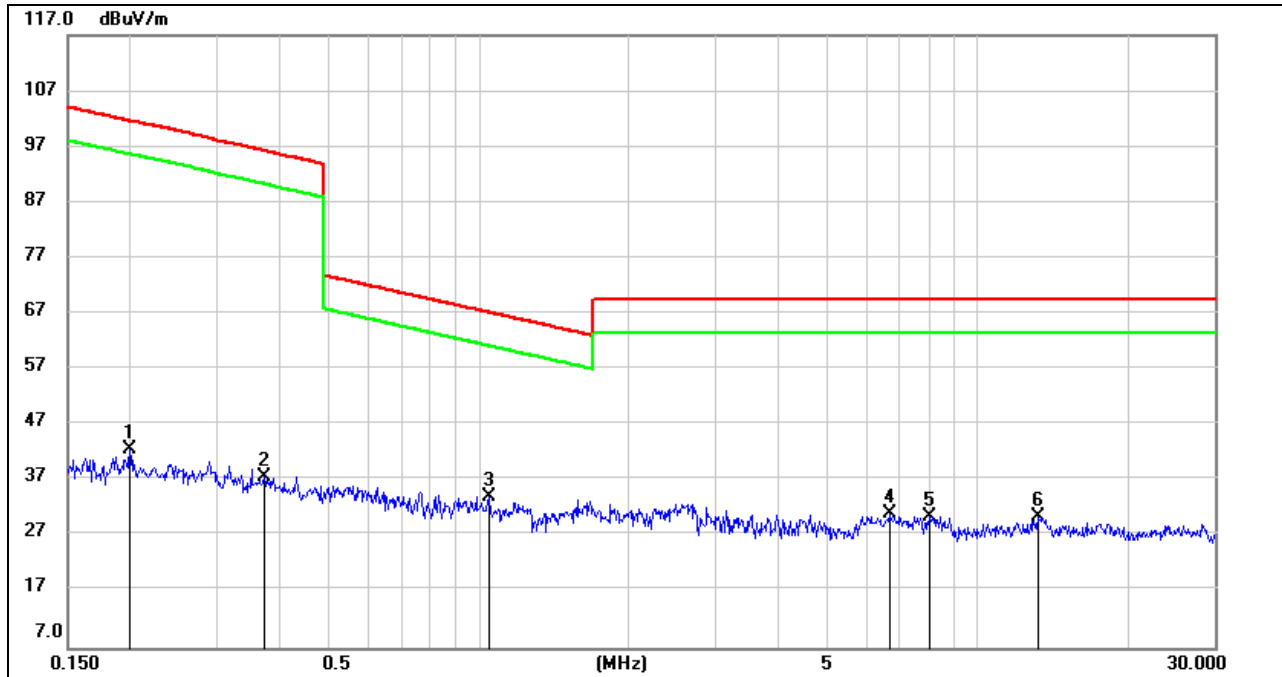
**9KHz~ 150KHz**



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	0.0094	27.08	20.26	47.34	128.06	-80.72	QP
2	0.0193	25.14	20.30	45.44	122.00	-76.56	QP
3	0.0274	19.28	20.31	39.59	118.98	-79.39	QP
4	0.0393	15.69	20.31	36.00	115.73	-79.73	QP
5	0.0637	16.06	20.31	36.37	111.54	-75.17	QP
6	0.0947	8.79	20.24	29.03	108.09	-79.06	QP

Note: 1. Measurement = Reading Level + Correct Factor.  
 2. All the modes had been tested, but only the worst data were recorded in the report.  
 3. If Peak Result complies with AV and QP limit, AV and QP Result are deemed to comply with AV limit.

**150KHz ~ 30M**



No.	Frequency (MHz)	Reading (dBuV/m)	Correct dB/m	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	0.1995	22.18	20.37	42.55	101.60	-59.05	QP
2	0.3709	17.29	20.28	37.57	96.29	-58.72	QP
3	1.0483	13.72	20.38	34.10	67.20	-33.10	QP
4	6.6623	10.04	20.90	30.94	69.54	-38.60	QP
5	8.0198	9.68	20.96	30.64	69.54	-38.90	QP
6	13.2667	9.61	20.98	30.59	69.54	-38.95	QP

Note: 1. Measurement = Reading Level + Correct Factor.  
 2. All the modes had been tested, but only the worst data were recorded in the report.  
 3. If Peak Result complies with AV and QP limit, AV and QP Result are deemed to comply with AV limit.

Note: All the channels had been tested, but only the worst data recorded in the report.

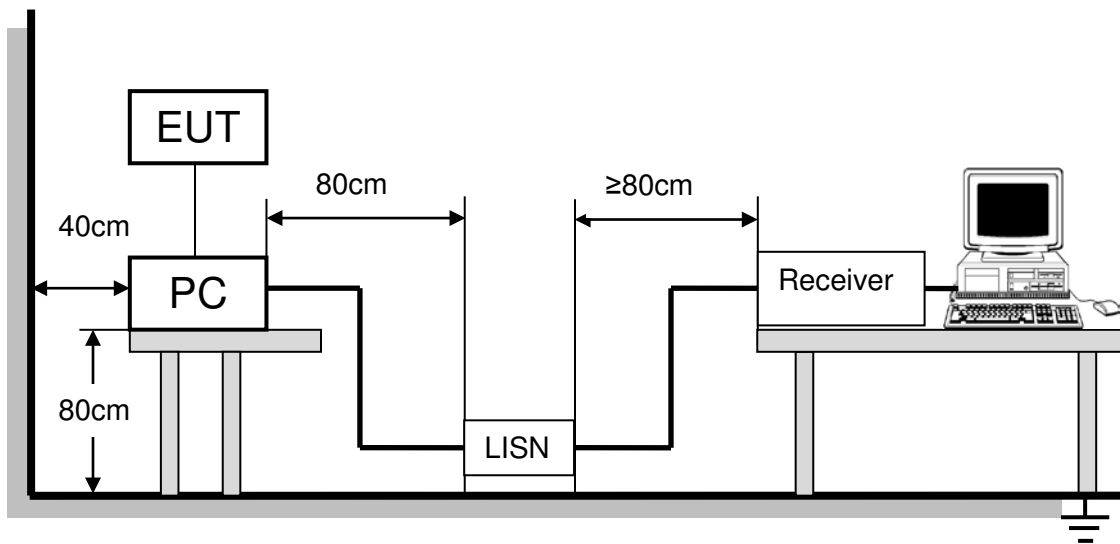
## 9. AC POWER LINE CONDUCTED EMISSIONS

### LIMITS

Please refer to FCC §15.207 (a) and RSS-Gen Clause 8.8

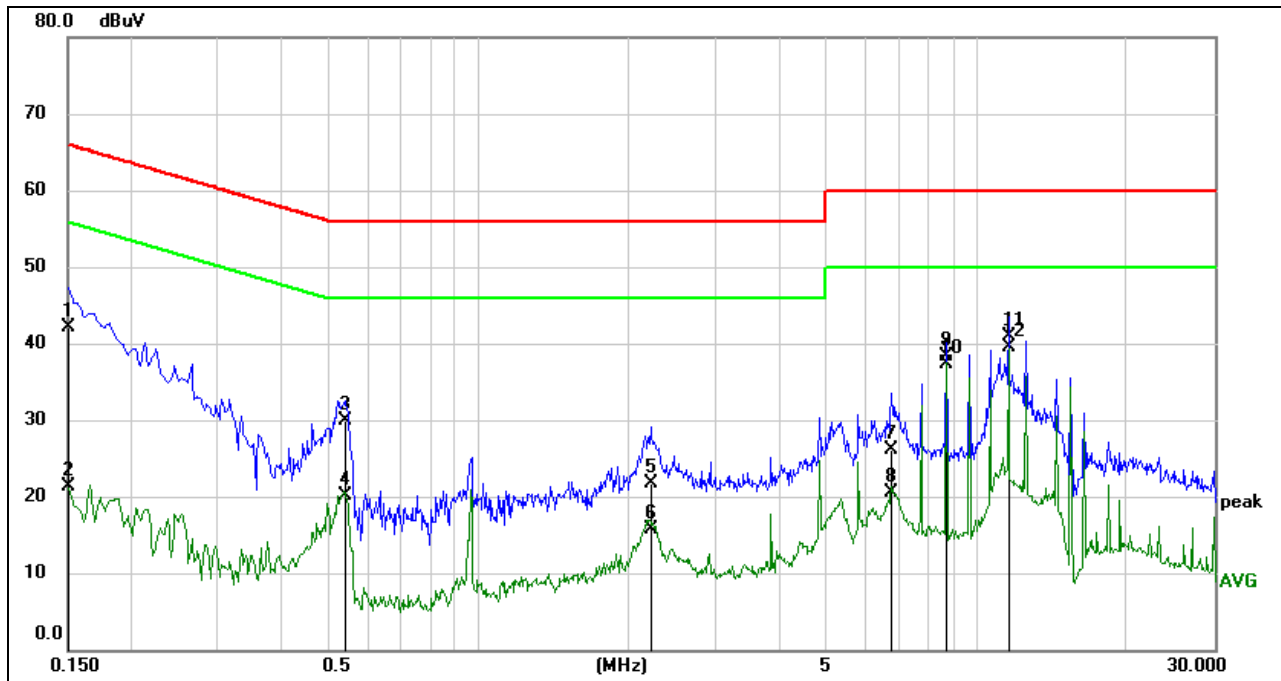
FREQUENCY (MHz)	Class A (dBuV)		Class B (dBuV)	
	Quasi-peak	Average	Quasi-peak	Average
0.15 -0.5	79.00	66.00	66 - 56 *	56 - 46 *
0.50 -5.0	73.00	60.00	56.00	46.00
5.0 -30.0	73.00	60.00	60.00	50.00

### TEST SETUP AND PROCEDURE



The EUT is put on a table of non-conducting material that is 80cm high. The vertical conducting wall of shielding is located 40cm to the rear of the EUT. The power line of the EUT is connected to the AC mains through a Artificial Mains Network (A.M.N.). A EMI Measurement Receiver (R&S Test Receiver ESR3) is used to test the emissions from both sides of AC line. According to the requirements in Section 6.2 of ANSI C63.10-2003. Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-Peak and average detector mode. The bandwidth of EMI test receiver is set at 9kHz. The arrangement of the equipment is installed to meet the standards and operating in a manner, which tends to maximize its emission characteristics in a normal application.

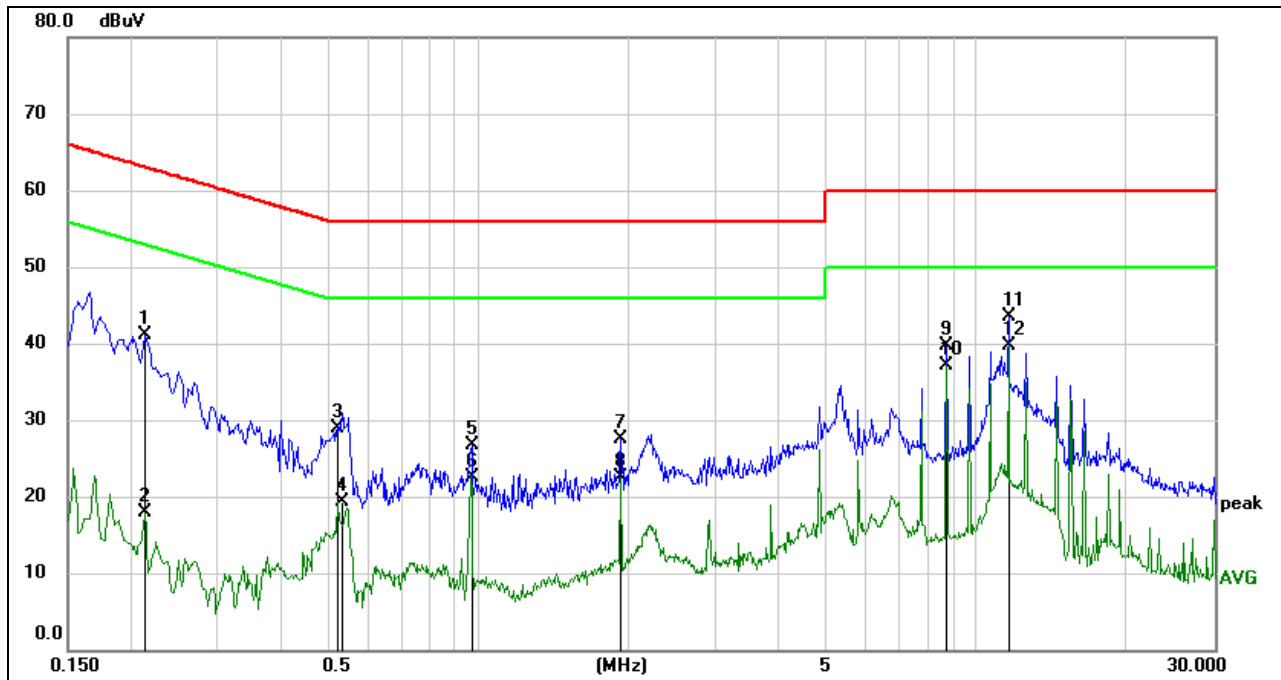
**LINE N RESULTS (LOW CHANNEL, WORST-CASE CONFIGURATION)**



No.	Frequency (MHz)	Reading (dBuV)	Correct dB	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	0.1515	32.49	9.65	42.14	65.92	-23.78	QP
2	0.1515	11.69	9.65	21.34	55.92	-34.58	AVG
3	0.5416	20.18	9.65	29.83	56.00	-26.17	QP
4	0.5416	10.43	9.65	20.08	46.00	-25.92	AVG
5	2.2232	11.94	9.67	21.61	56.00	-34.39	QP
6	2.2232	6.11	9.67	15.78	46.00	-30.22	AVG
7	6.7669	16.31	9.74	26.05	60.00	-33.95	QP
8	6.7669	10.81	9.74	20.55	50.00	-29.45	AVG
9	8.7011	28.62	9.77	38.39	60.00	-21.61	QP
10	8.7011	27.57	9.77	37.34	50.00	-12.66	AVG
11	11.6006	31.07	9.80	40.87	60.00	-19.13	QP
12	11.6006	29.78	9.80	39.58	50.00	-10.42	AVG

- Note: 1. Result = Reading + Correct Factor.  
 2. If QP Result complies with AV limit, AV Result is deemed to comply with AV limit.  
 3. Test setup: RBW: 200 Hz (9 kHz—150 kHz), 9 kHz (150 kHz—30 MHz).  
 4. Step size: 80Hz (0.009MHz-0.15MHz), 4 kHz (0.15MHz-30MHz), Scan time: auto.

**LINE L RESULTS (LOW CHANNEL, WORST-CASE CONFIGURATION)**



No.	Frequency (MHz)	Reading (dBuV)	Correct dB	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	0.2139	31.49	9.65	41.14	63.05	-21.91	QP
2	0.2139	8.33	9.65	17.98	53.05	-35.07	AVG
3	0.5220	19.16	9.65	28.81	56.00	-27.19	QP
4	0.5320	9.60	9.65	19.25	46.00	-26.75	AVG
5	0.9700	17.03	9.66	26.69	56.00	-29.31	QP
6	0.9700	12.92	9.66	22.58	46.00	-23.42	AVG
7	1.9334	17.80	9.68	27.48	56.00	-28.52	QP
8	1.9334	12.78	9.68	22.46	46.00	-23.54	AVG
9	8.7018	29.88	9.77	39.65	60.00	-20.35	QP
10	8.7018	27.35	9.77	37.12	50.00	-12.88	AVG
11	11.6019	33.61	9.80	43.41	60.00	-16.59	QP
12	11.6019	29.89	9.80	39.69	50.00	-10.31	AVG

Note: 1. Result = Reading +Correct Factor.

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

3. Test setup: RBW: 200 Hz (9 kHz—150 kHz), 9 kHz (150 kHz—30 MHz).

4. Step size: 80Hz (0.009MHz-0.15MHz), 4 kHz (0.15MHz-30MHz), Scan time: auto.

Note: All the channels had been tested, but only the worst data recorded in the report.

## 10. 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.

### Antenna Connector

EUT has an external antenna with antenna connector, it will be installed in a specific environment and users cannot change the antenna.

### Antenna Gain

The antenna gain of EUT is less than 6 dBi.

**END OF REPORT**

Page 64 of 64