



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

CERTIFICATION TEST REPORT

For

Powerlync Plug

MODEL NUMBER: PWLY-278383-A1

FCC ID: 2AHFD031707

IC: 21573-031707

REPORT NUMBER: 4789809723-1

ISSUE DATE: June 10, 2021

Prepared for

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Prepared by

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Revision History

Rev.	Issue Date	Revisions	Revised By
V0	06/10/2021	Initial Issue	

Summary of Test Results			
Clause	Test Items	FCC/ISED Rules	Test Results
1	6dB Bandwidth and 99% Occupied Bandwidth	FCC Part 15.247 (a) (2) RSS-247 Clause 5.2 (a) ISED RSS-Gen Clause 6.7	Pass
2	Peak Conducted Output Power	FCC Part 15.247 (b) (3) RSS-247 Clause 5.4 (d)	Pass
3	Power Spectral Density	FCC Part 15.247 (e) RSS-247 Clause 5.2 (b)	Pass
4	Conducted Bandedge and Spurious Emission	FCC Part 15.247 (d) RSS-247 Clause 5.5	Pass
5	Radiated Bandedge and Spurious Emission	FCC Part 15.247 (d) FCC Part 15.209 FCC Part 15.205 RSS-247 Clause 5.5 RSS-GEN Clause 8.9	Pass
6	Conducted Emission Test for AC Power Port	FCC Part 15.207 RSS-GEN Clause 8.8	Pass
7	Antenna Requirement	FCC Part 15.203 RSS-GEN Clause 6.8	Pass

Note:

1. This test report is only published to and used by the applicant, and it is not for evidence purpose in China.
2. The measurement result for the sample received is <Pass> according to < CFR 47 FCC PART 15 SUBPART C >< ISED RSS-247 > when <Accuracy Method> decision rule is applied.

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1. ATTESTATION OF TEST RESULTS

FCC

Applicant Information

Company Name: Insight Energy Ventures DBA Powerley
Address: 29488 Woodward #312 Royal Oak Michigan 48073 United States

FCC

Manufacturer Information

Company Name: Insight Energy Ventures DBA Powerley
Address: 29488 Woodward #312 Royal Oak Michigan 48073 United States

ISED

Applicant Information

Company Name: Insight Energy Ventures, LLC d/b/a Powerley
Address: 333 W. 7th Street, Suite 200 Royal Oak US 48067 United States Of America

ISED

Manufacturer Information

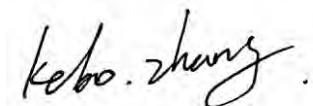
Company Name: Insight Energy Ventures, LLC d/b/a Powerley
Address: 333 W. 7th Street, Suite 200 Royal Oak US 48067 United States Of America

EUT Information

EUT Name: Powerlync Plug
Model: PWLY-278383-A1
Brand: Powerley
Sample Received Date: January 28, 2021
Sample Status: Normal
Sample ID: 3594063
Date of Tested: January 28, 2021~ June 9, 2021

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
CFR 47 FCC PART 15 SUBPART C	PASS
ISED RSS-247 Issue 2	PASS
ISED RSS-GEN Issue 5	PASS

Prepared By:



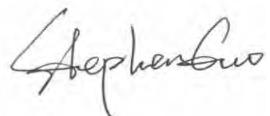
Kebo Zhang
Project Engineer

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 558074 D01 15.247 Meas Guidance v05r02, 414788 D01 Radiated Test Site v01r01, CFR 47 FCC Part 2, CFR 47 FCC Part 15, ANSI C63.10-2013, ISED RSS-247 Issue 2 and ISED RSS-GEN Issue 5.

3. FACILITIES AND ACCREDITATION

Accreditation Certificate	<p>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.</p> <p>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</p> <p>ISED (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 and the test lab Conformity Assessment Body Identifier (CABID) is CN0046.</p> <p>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.</p> <p>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>
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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 30 MHz, lab had performed measurements at test anechoic chamber and comparing to measurements obtained on an open field site. And these measurements below 30 MHz 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 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
Conduction emission	3.62 dB
Radiated Emission (Included Fundamental Emission) (9 kHz ~ 30 MHz)	2.2 dB
Radiated Emission (Included Fundamental Emission) (30 MHz ~ 1 GHz)	4.00 dB
Radiated Emission (Included Fundamental Emission) (1 GHz to 26 GHz)	5.78 dB (1 GHz ~ 18 GHz) 5.23 dB (18 GHz ~ 26 GHz)
Duty Cycle	±0.028%
DTS and 99% Occupied Bandwidth	±0.0196%
Maximum Conducted Output Power	±0.686 dB
Maximum Power Spectral Density Level	±0.743 dB
Conducted Band-edge Compliance	±1.328 dB
Conducted Unwanted Emissions In Non-restricted Frequency Bands	±0.746 dB (9 kHz ~ 1 GHz) ±1.328dB (1 GHz ~ 26 GHz)
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	Powerlync Plug		
Model	PWLY-278383-A1		
Product Description	Operation Frequency	2405 MHz ~ 2480 MHz	
	Modulation Type	Data Rate	
	O-QPSK	250kbps	
Power supply	AC120 V,60 Hz		

5.2. CHANNEL LIST

Channel	Frequency (MHz)						
11	2405	15	2425	19	2445	23	2465
12	2410	16	2430	20	2450	24	2470
13	2415	17	2435	21	2455	25	2475
14	2420	18	2440	22	2460	26	2480

5.3. MAXIMUM PEAK OUTPUT POWER

Mode	Frequency (MHz)	Channel Number	Max Output PEAK Power (dBm)
Zigbee	2405-2480	11-26 [16]	19.57

5.4. TEST CHANNEL CONFIGURATION

Test Mode	Test Channel	Frequency
Zigbee	CH 11(Low Channel), CH 19(MID Channel), CH 24(High Channel), CH25, CH 26	2405 MHz, 2445 MHz, 2470 MHz 2475 MHz, 2480 MHz

5.5. THE WORSE CASE POWER SETTING PARAMETER

The Worse Case Power Setting Parameter under 2400 ~ 2483.5MHz Band						
Test Software		UartAssis				
Modulation Type	Transmit Antenna Number	Test Channel				
		CH 11	CH 19	CH24	CH 25	CH 26
O-QPSK	1	3	3	3	-3	-9

5.6. DESCRIPTION OF AVAILABLE ANTENNAS

Ant.	Frequency (MHz)	Antenna Type	Antenna Gain (dBi)
1	2405-2480	PCB Antenna	-1.0

Test Mode	Transmit and Receive Mode	Description
Zigbee	<input checked="" type="checkbox"/> 1TX, 1RX	Chain 1 can be used as transmitting/receiving antenna.

Note: 1. The value of the antenna gain was declared by customer.

5.7. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Item	Equipment	Brand Name	Model Name	Remarks
1	Laptop	ThinkPad	X230i	/
2	USB TO UART	/	/	/
3	LED Lamp	N/A	N/A	100W

I/O CABLES

Item	Port	Connector Type	Cable Type	Cable Length(m)	Remarks
1	USB	NA	NA	1	/

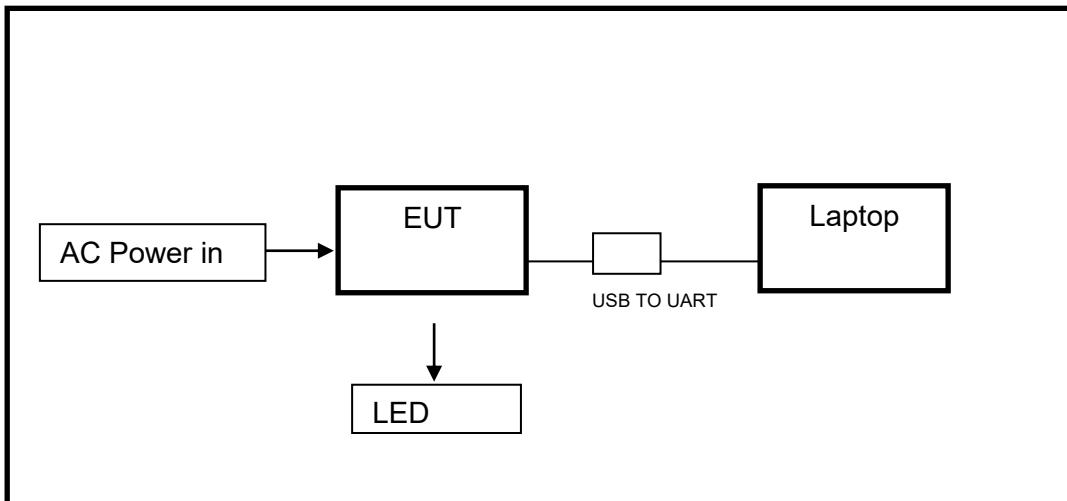
ACCESSORIES

Item	Accessory	Brand Name	Model Name	Description
/	/	/	/	/

TEST SETUP

The EUT can work in engineering mode with a software through a Laptop.

SETUP DIAGRAM FOR TESTS



6. MEASURING INSTRUMENT AND SOFTWARE USED

Conducted Emissions					
Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Due Date
EMI Test Receiver	R&S	ESR3	101961	Nov. 12, 2020	Nov. 11, 2021
Two-Line V-Network	R&S	ENV216	101983	Nov. 12, 2020	Nov. 11, 2021
Software					
Description		Manufacturer		Name	Version
Test Software for Conducted Emissions		Farad		EZ-EMC	Ver. UL-3A1

Radiated Emissions					
Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Due Date
MXE EMI Receiver	KESIGHT	N9038A	MY56400036	Nov. 12, 2020	Nov. 11, 2021
Hybrid Log Periodic Antenna	TDK	HLP-3003C	130960	Aug. 11, 2018	Aug. 10, 2021
Preamplifier	HP	8447D	2944A09099	Nov. 12, 2020	Nov. 11, 2021
EMI Measurement Receiver	R&S	ESR26	101377	Nov. 12, 2020	Nov. 11, 2021
Horn Antenna	TDK	HRN-0118	130939	Sept. 17, 2018	Sept. 17, 2021
Preamplifier	TDK	PA-02-0118	TRS-305-00067	Nov. 20, 2020	Nov. 19, 2021
Horn Antenna	Schwarzbeck	BBHA9170	#691	Aug. 11, 2018	Aug. 11, 2021
Preamplifier	TDK	PA-02-2	TRS-307-00003	Nov. 12, 2020	Nov. 11, 2021
Preamplifier	TDK	PA-02-3	TRS-308-00002	Nov. 12, 2020	Nov. 11, 2021
Loop antenna	Schwarzbeck	1519B	00008	Jan.17, 2019	Jan.17,2022
Preamplifier	TDK	PA-02-001-3000	TRS-302-00050	Nov. 12, 2020	Nov. 11, 2021
Preamplifier	Mini-Circuits	ZX60-83LN-S+	SUP01201941	Nov. 20, 2020	Nov. 19, 2021
High Pass Filter	Wi	WPKX10-2700-3000-18000-40SS	23	Nov. 12, 2020	Nov. 11, 2021
Software					
Description		Manufacturer		Name	Version
Test Software for Radiated Emissions		Farad		EZ-EMC	Ver. UL-3A1

Other instruments					
Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
Spectrum Analyzer	Keysight	N9030A	MY55410512	Nov. 20, 2020	Nov. 19, 2021
Dual Channel Power Meter	Keysight	N1912A	MY55416024	Nov. 20, 2020	Nov. 19, 2021
Power Sensor	Keysight	USB Wideband Power Sensor	MY5100022	Nov. 20, 2020	Nov. 19, 2021

7. ANTENNA PORT TEST RESULTS

7.1. ON TIME AND DUTY CYCLE

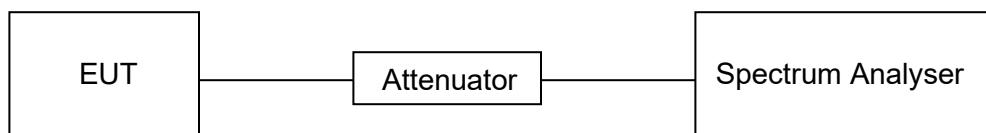
LIMITS

None; for reporting purposes only.

PROCEDURE

Refer to ANSI C63.10-2013 clause 11.6 Zero – Span Spectrum Analyzer method.

TEST SETUP



TEST ENVIRONMENT

Temperature	26.3 °C	Relative Humidity	48.2 %
Atmosphere Pressure	101 kPa	Test Voltage	AC 120V, 60 Hz

RESULTS

Please refer to appendix G.

7.2. 6 dB DTS BANDWIDTH AND 99 % OCCUPIED BANDWIDTH

LIMITS

CFR 47FCC Part15 (15.247) Subpart C ISED RSS-247 ISSUE 2			
Section	Test Item	Limit	Frequency Range (MHz)
CFR 47 FCC 15.247(a)(2) ISED RSS-247 5.2 (a)	6 dB Bandwidth	≥ 500 kHz	2400-2483.5
ISED RSS-Gen Clause 6.7	99 % Occupied Bandwidth	None; for reporting purposes only.	2400-2483.5

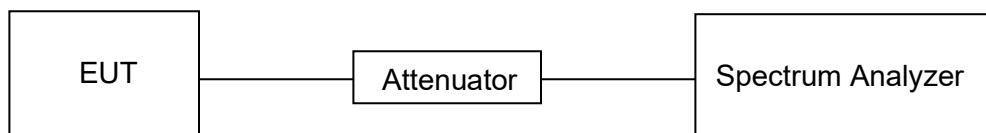
TEST PROCEDURE

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

Center Frequency	The center frequency of the channel under test
Frequency Span	For 6 dB Bandwidth: Enough to capture all products of the modulation carrier emission For 99 % Occupied Bandwidth: Between 1.5 times and 5.0 times the OBW
Detector	Peak
RBW	For 6 dB Bandwidth: 100 kHz For 99 % Occupied Bandwidth: 1 % to 5 % of the occupied bandwidth
VBW	For 6 dB Bandwidth: $\geq 3 \times$ RBW For 99 % Occupied Bandwidth: $\geq 3 \times$ RBW
Trace	Max hold
Sweep	Auto couple

- Use the 99 % power bandwidth function of the instrument, allow the trace to stabilize and report the measured bandwidth.
- 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



TEST ENVIRONMENT

Temperature	26.3 °C	Relative Humidity	48.2 %
Atmosphere Pressure	101 kPa	Test Voltage	AC 120V, 60 Hz

RESULTS

Please refer to appendix A & B.

7.3. CONDUCTED OUTPUT POWER

LIMITS

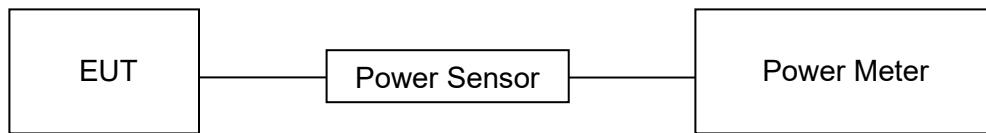
CFR 47 FCC Part15 (15.247) Subpart C ISED RSS-247 ISSUE 2			
Section	Test Item	Limit	Frequency Range (MHz)
CFR 47 FCC 15.247(b)(3) ISED RSS-247 5.4 (d)	Peak Conducted Output Power	1 watt or 30 dBm	2400-2483.5

TEST PROCEDURE

Connect the EUT to a low loss RF cable from the antenna port to the power sensor (video bandwidth is greater than the occupied bandwidth).

Measure peak emission level, the indicated level is the peak output power, after any corrections for external attenuators and cables.

TEST SETUP



TEST ENVIRONMENT

Temperature	26.3 °C	Relative Humidity	48.2 %
Atmosphere Pressure	101 kPa	Test Voltage	AC 120V, 60 Hz

RESULTS

Please refer to appendix C.

7.4. POWER SPECTRAL DENSITY

LIMITS

CFR 47 FCC Part15 (15.247) Subpart C ISED RSS-247 ISSUE 2			
Section	Test Item	Limit	Frequency Range (MHz)
CFR 47 FCC §15.247 (e) ISED RSS-247 5.2 (b)	Power Spectral Density	8 dBm in any 3 kHz band	2400-2483.5

TEST PROCEDURE

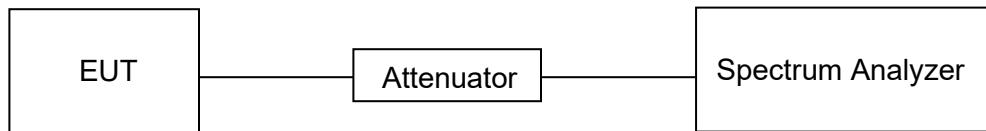
Connect the EUT to the spectrum analyser and use the following settings:

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



TEST ENVIRONMENT

Temperature	26.3 °C	Relative Humidity	48.2 %
Atmosphere Pressure	101 kPa	Test Voltage	AC 120V, 60 Hz

RESULTS

Please refer to appendix D.

7.5. CONDUCTED BANDEDGE AND SPURIOUS EMISSIONS

LIMITS

CFR 47 FCC Part15 (15.247) Subpart C ISED RSS-247 ISSUE 2		
Section	Test Item	Limit
CFR 47 FCC §15.247 (d) ISED 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 EUT to the spectrum analyser and use the following settings for reference level measurement:

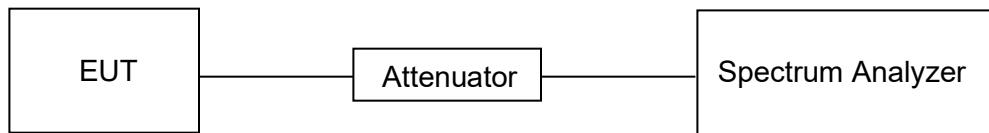
Center Frequency	The center frequency of the channel under test
Detector	Peak
RBW	100 kHz
VBW	$\geq 3 \times$ RBW
Span	1.5 x DTS bandwidth
Trace	Max hold
Sweep time	Auto couple.

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

Change the settings for emission level measurement:

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

Allow trace to fully stabilize and use the peak marker function to determine the maximum PSD level. Ensure that the amplitude of all unwanted emissions outside of the authorized frequency band (excluding restricted frequency bands) is attenuated by at least the minimum requirements specified in 11.11.

TEST SETUP**TEST ENVIRONMENT**

Temperature	26.3 °C	Relative Humidity	48.2 %
Atmosphere Pressure	101 kPa	Test Voltage	AC 120V, 60 Hz

RESULTS

Please refer to appendix E & F.

8. RADIATED TEST RESULTS

LIMITS

Please refer to CFR 47 FCC §15.205 and §15.209.

Please refer to ISED RSS-GEN Clause 8.9 and Clause 8.10.

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

Emissions radiated outside of the specified frequency bands above 30 MHz			
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

FCC Emissions radiated outside of the specified frequency bands below 30 MHz		
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

ISED General field strength limits at frequencies below 30 MHz

Table 6 – General field strength limits at frequencies below 30 MHz		
Frequency	Magnetic field strength (H-Field) (μ A/m)	Measurement distance (m)
9 - 490 kHz ^{Note 1}	6.37/F (F in kHz)	300
490 - 1705 kHz	63.7/F (F in kHz)	30
1.705 - 30 MHz	0.08	30

Note 1: The emission limits for the ranges 9-90 kHz and 110-490 kHz are based on measurements employing a linear average detector.

ISED 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 - 3.028	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
5.877 - 5.883	399.9 - 410	22.01 - 23.12
8.215 - 8.218	608 - 614	23.8 - 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 38.6
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	
108 - 138		

Note 1: Certain frequency bands listed in table 7 and in bands above 38.6 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 refer to FCC §15.205 (a):

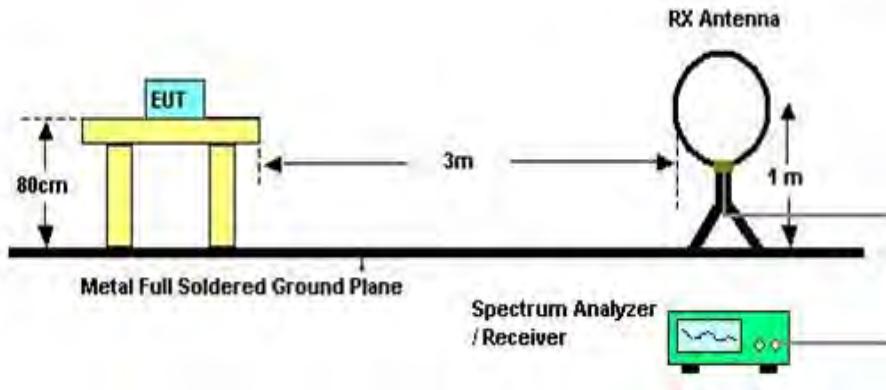
MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
¹ 0.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	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 0.490-0.510 MHz.

²Above 38.6

TEST SETUP AND PROCEDURE

Below 30 MHz

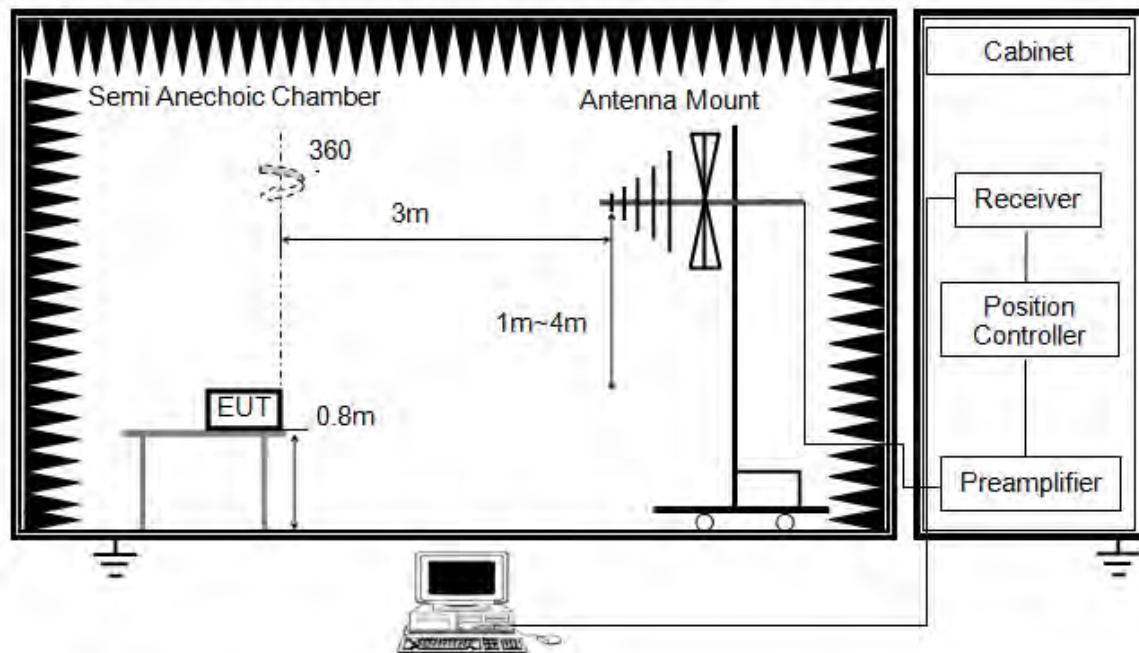


The setting of the spectrum analyser

RBW	200 Hz (From 9 kHz to 0.15 MHz)/ 9 kHz (From 0.15 MHz to 30 MHz)
VBW	200 Hz (From 9 kHz to 0.15 MHz)/ 9 kHz (From 0.15 MHz to 30 MHz)
Sweep	Auto
Trace	Max hold

1. The testing follows the guidelines in ANSI C63.10-2013 clause 6.4.
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 80 cm above ground.
4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a 1 m 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 1 GHz, 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. The limits in CFR 47, Part 15, Subpart C, paragraph 15.209 (a), are identical to those in RSS-GEN Section 8.9, Table 6, since the measurements are performed in terms of magnetic field strength and converted to electric field strength levels (as reported in the table) using the free space impedance of 377Ω . For example, the measurement frequency X KHz resulted in a level of Y dB μ V/m, which is equivalent to $Y-51.5 = Z$ dB μ A/m, which has the same margin, W dB, to the corresponding RSS-GEN Table 6 limit as it has to be 15.209(a) limit.

Below 1 GHz and above 30 MHz

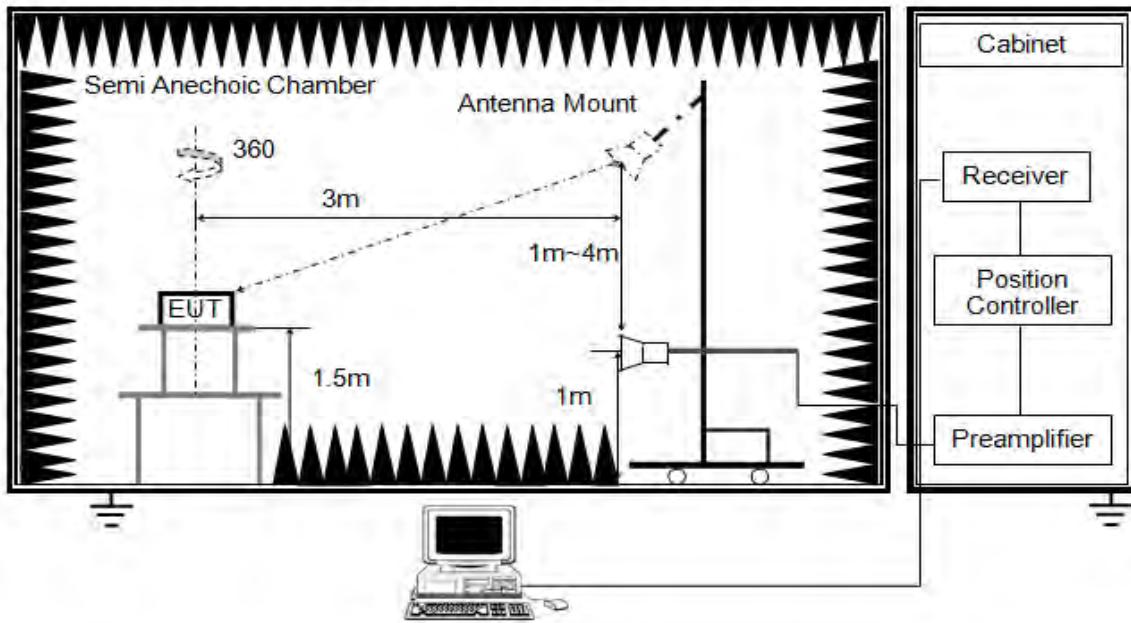


The setting of the spectrum analyser

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

1. The testing follows the guidelines in ANSI C63.10-2013 clause 6.5.
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 80 cm 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 1 GHz, 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.

Above 1 GHz

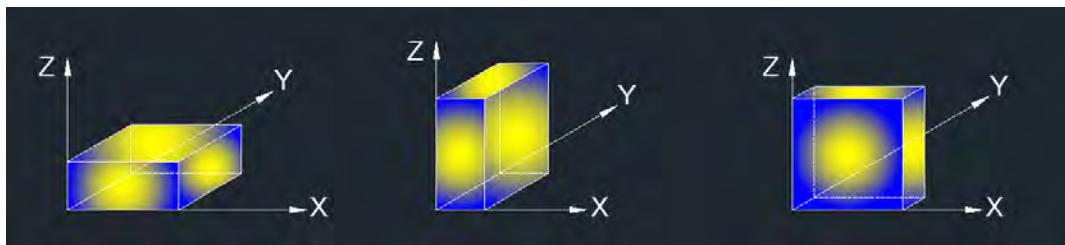


The setting of the spectrum analyser

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

1. The testing follows the guidelines in ANSI C63.10-2013 clause 6.6.
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 1.5 m 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 1 GHz, 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 average measurements. For the Duty Cycle please refer to clause 7.1.ON TIME AND DUTY CYCLE.

X axis, Y axis, Z axis positions:



Note 1: For all radiated test, EUT in each of three orthogonal axis emissions had been tested, but only the worst case (X axis) data recorded in the report.

TEST ENVIRONMENT

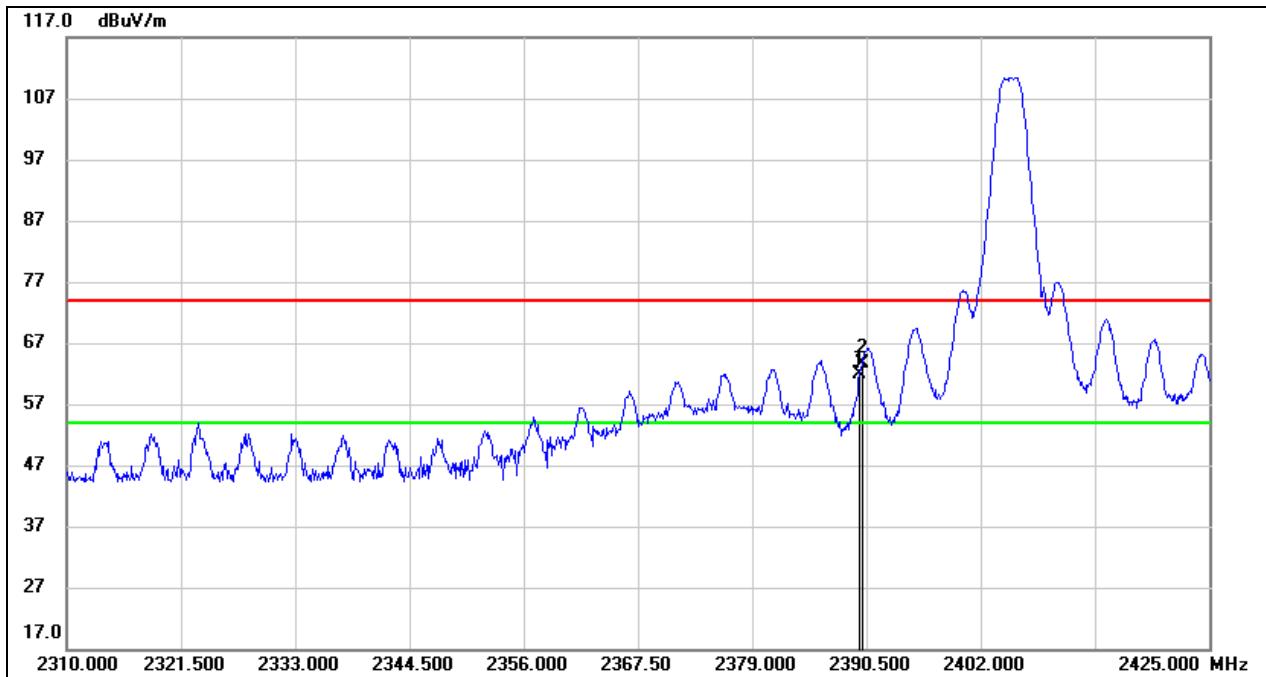
Temperature	21.3 °C	Relative Humidity	57.2 %
Atmosphere Pressure	101 kPa	Test Voltage	AC 120V, 60 Hz

RESULTS

8.1. RESTRICTED BANDEDGE

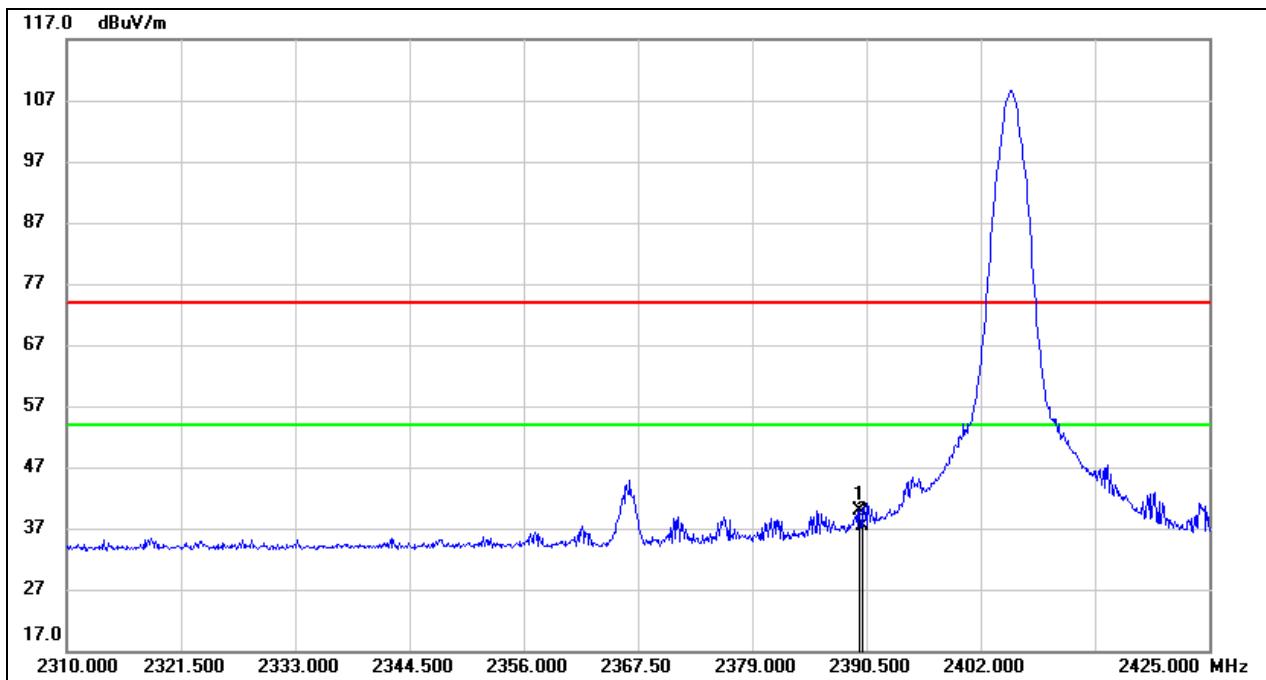
RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)

PEAK



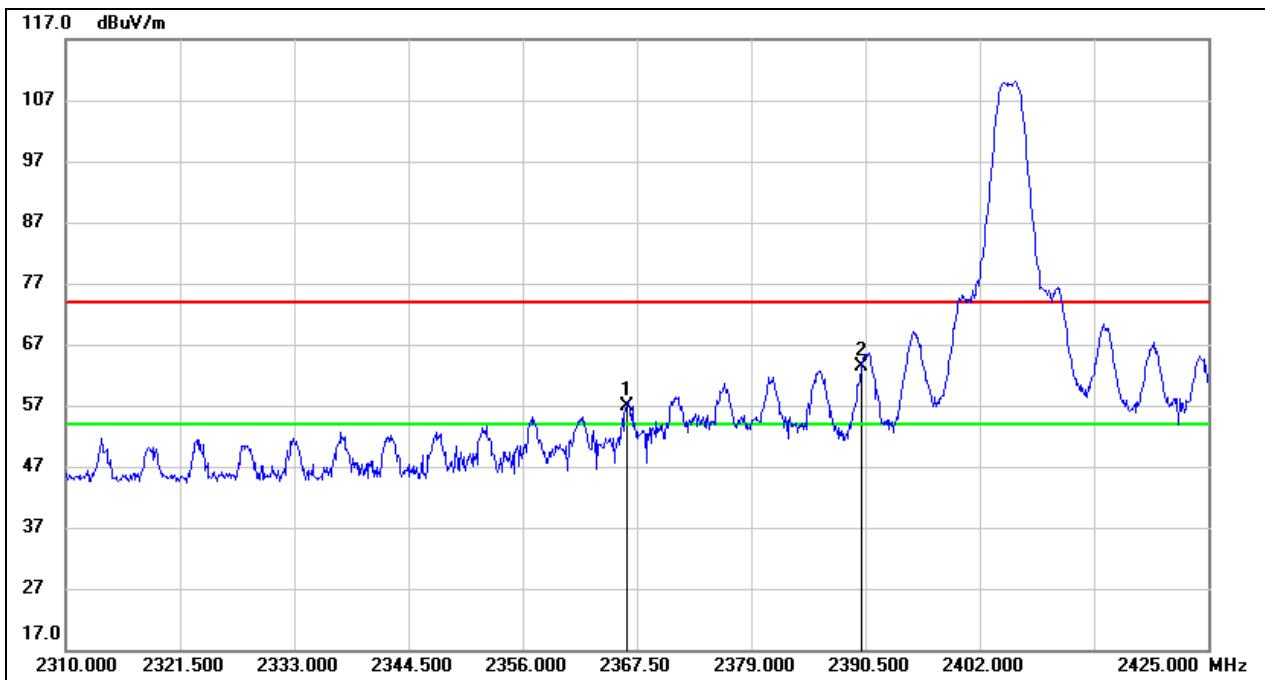
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2389.810	50.34	11.59	61.93	74.00	-12.07	peak
2	2390.000	51.99	11.59	63.58	74.00	-10.42	peak

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

AVG

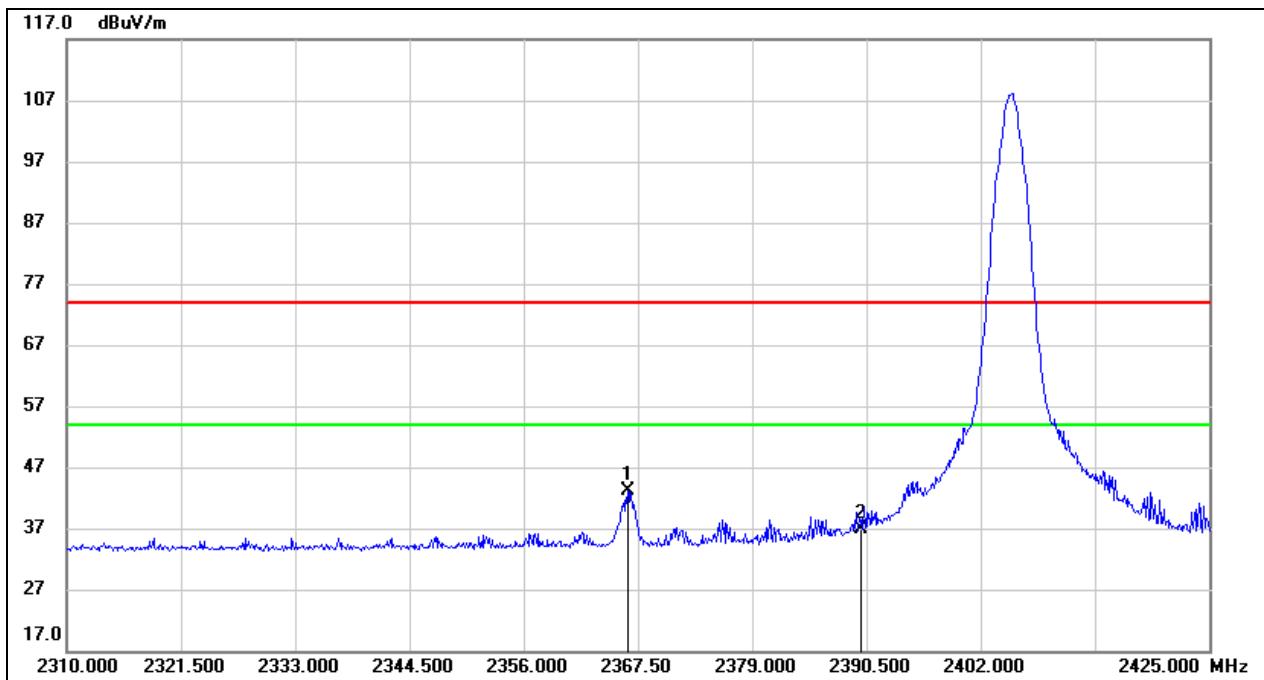
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2389.810	28.40	11.59	39.99	54.00	-14.01	AVG
2	2390.000	25.81	11.59	37.40	54.00	-16.60	AVG

Note: 1. Measurement = Reading Level + Correct Factor.
2. AVG: VBW=1/Ton, where: Ton is the transmitting duration.
3. For the transmitting duration, please refer to clause 7.1.
4. Only the worst data was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.

RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)PEAK

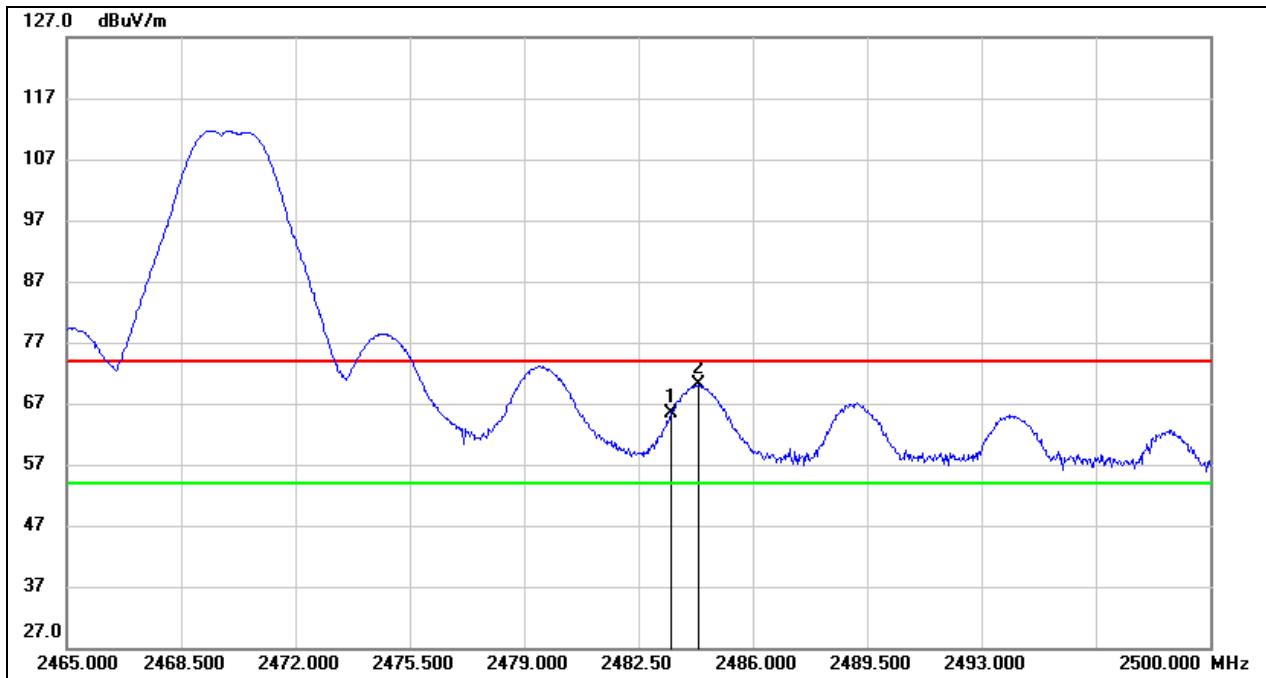
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2366.465	45.38	11.44	56.82	74.00	-17.18	peak
2	2390.000	51.80	11.59	63.39	74.00	-10.61	peak

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

AVG

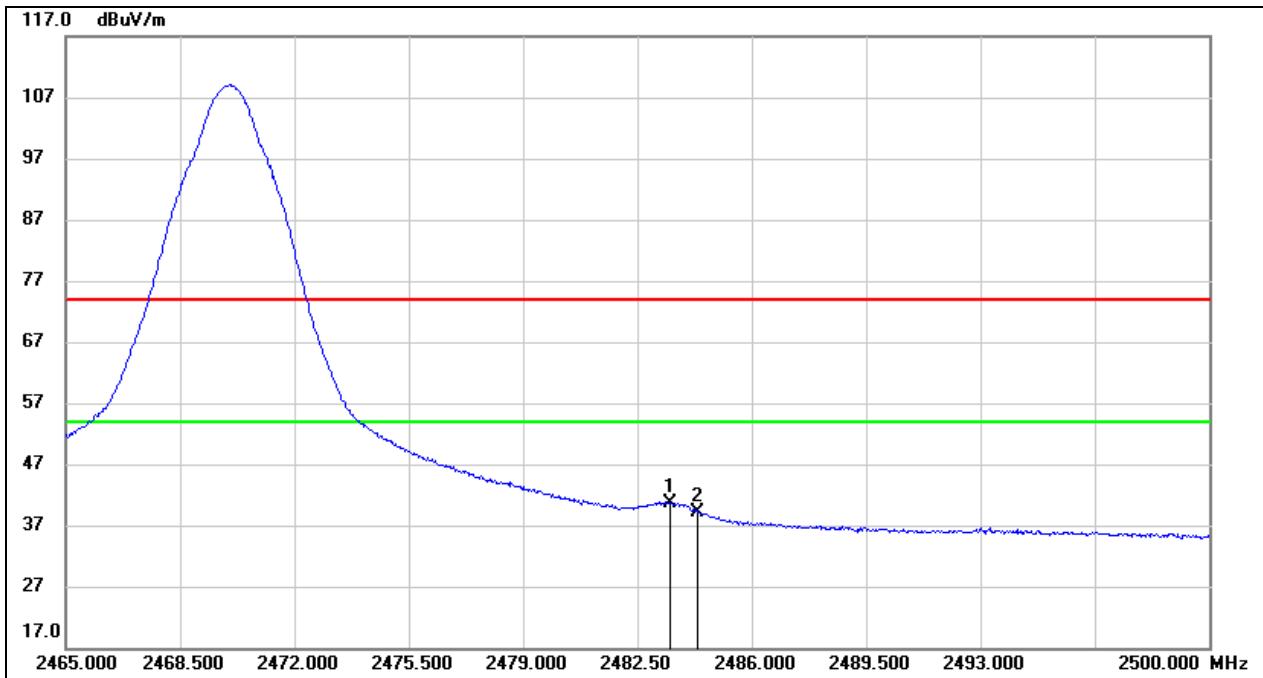
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2366.465	31.77	11.44	43.21	54.00	-10.79	AVG
2	2390.000	25.39	11.59	36.98	54.00	-17.02	AVG

Note: 1. Measurement = Reading Level + Correct Factor.
2. AVG: $VBW=1/Ton$, where: Ton is the transmitting duration.
3. For the transmitting duration, please refer to clause 7.1.
4. Only the worst data was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.

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

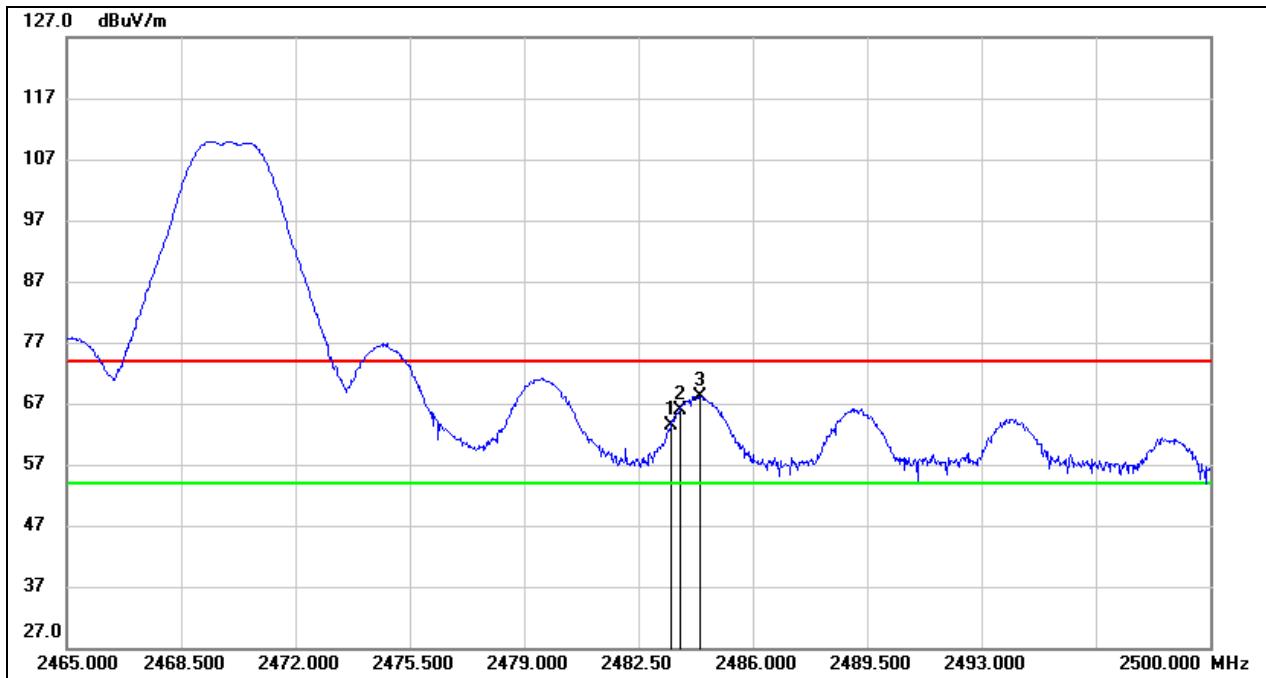
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	31.79	33.71	65.50	74.00	-8.50	peak
2	2484.320	36.37	33.71	70.08	74.00	-3.92	peak

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

AVG

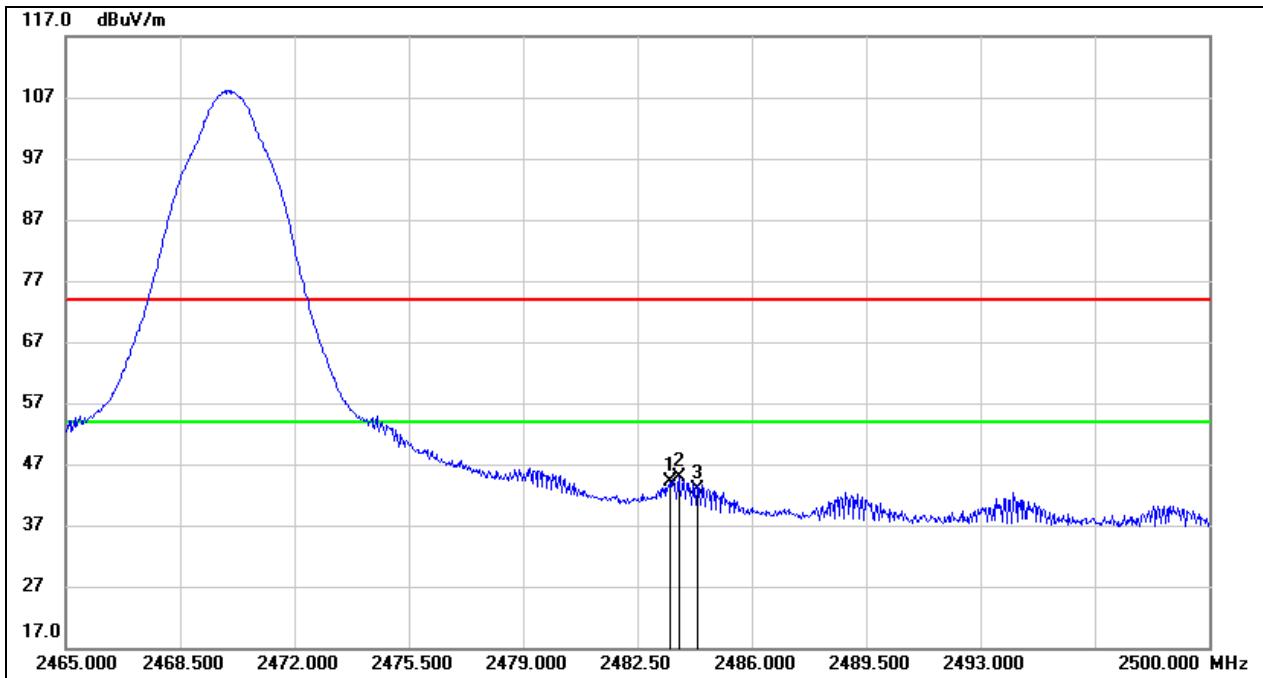
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	6.88	33.71	40.59	54.00	-13.41	AVG
2	2484.320	5.52	33.71	39.23	54.00	-14.77	AVG

Note: 1. Measurement = Reading Level + Correct Factor.
2. AVG: $VBW=1/Ton$, where: Ton is the transmitting duration.
3. For the transmitting duration, please refer to clause 7.1.
4. Only the worst data was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.

RESTRICTED BANDEdge (HIGH CHANNEL, VERTICAL)PEAK

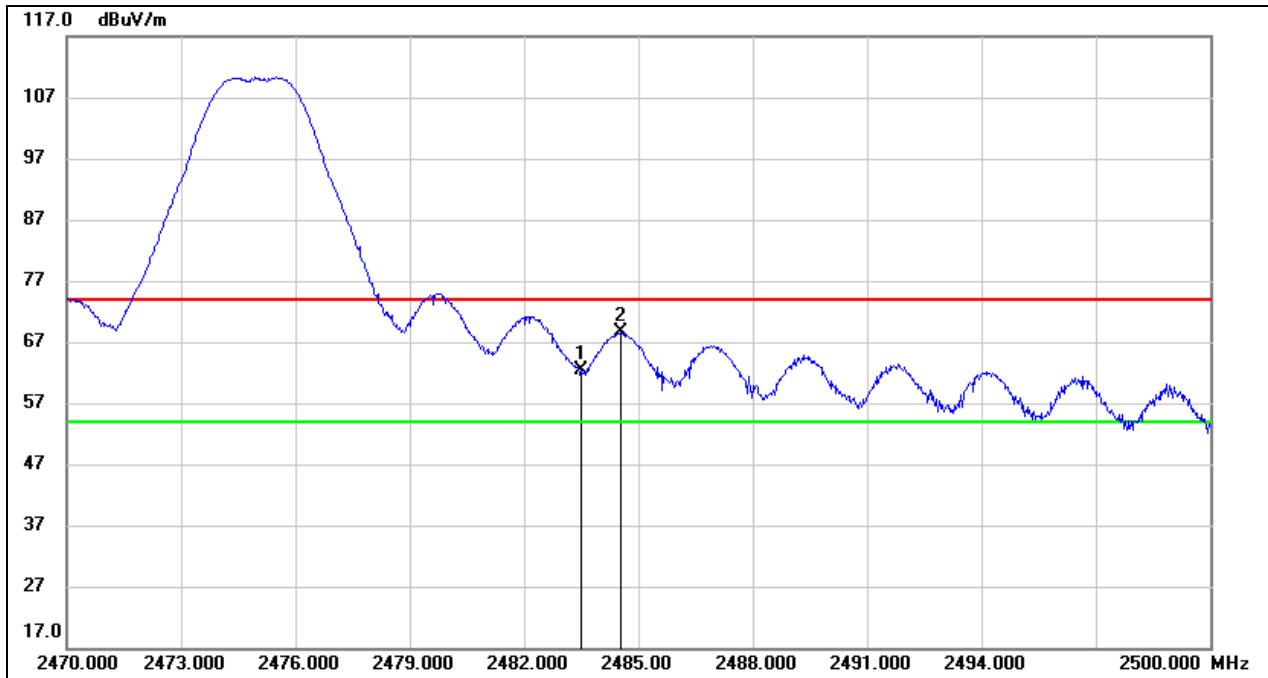
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	29.76	33.71	63.47	74.00	-10.53	peak
2	2483.760	32.15	33.71	65.86	74.00	-8.14	peak
3	2484.390	34.46	33.71	68.17	74.00	-5.83	peak

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

AVG

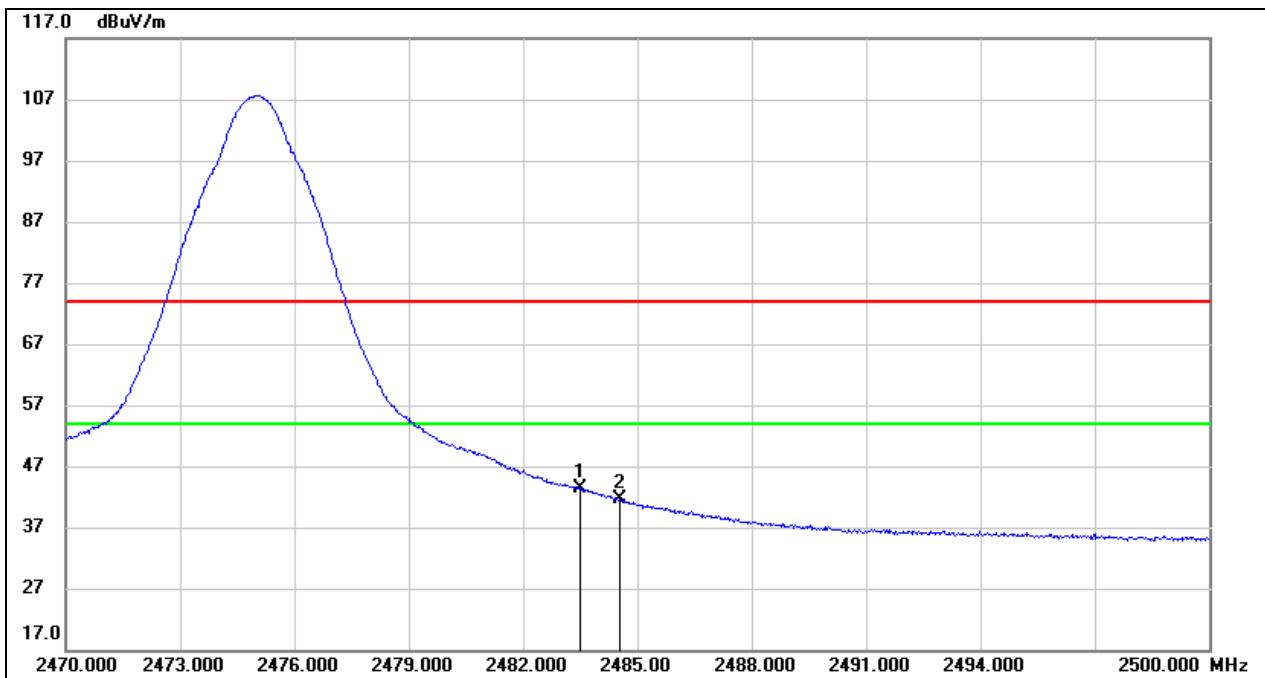
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	10.50	33.71	44.21	54.00	-9.79	AVG
2	2483.760	11.18	33.71	44.89	54.00	-9.11	AVG
3	2484.390	9.20	33.71	42.91	54.00	-11.09	AVG

Note: 1. Measurement = Reading Level + Correct Factor.
2. AVG: $VBW=1/Ton$, where: Ton is the transmitting duration.
3. For the transmitting duration, please refer to clause 7.1.
4. Only the worst data was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.

RESTRICTED BANDEDGE (CHANNEL 25, HORIZONTAL)PEAK

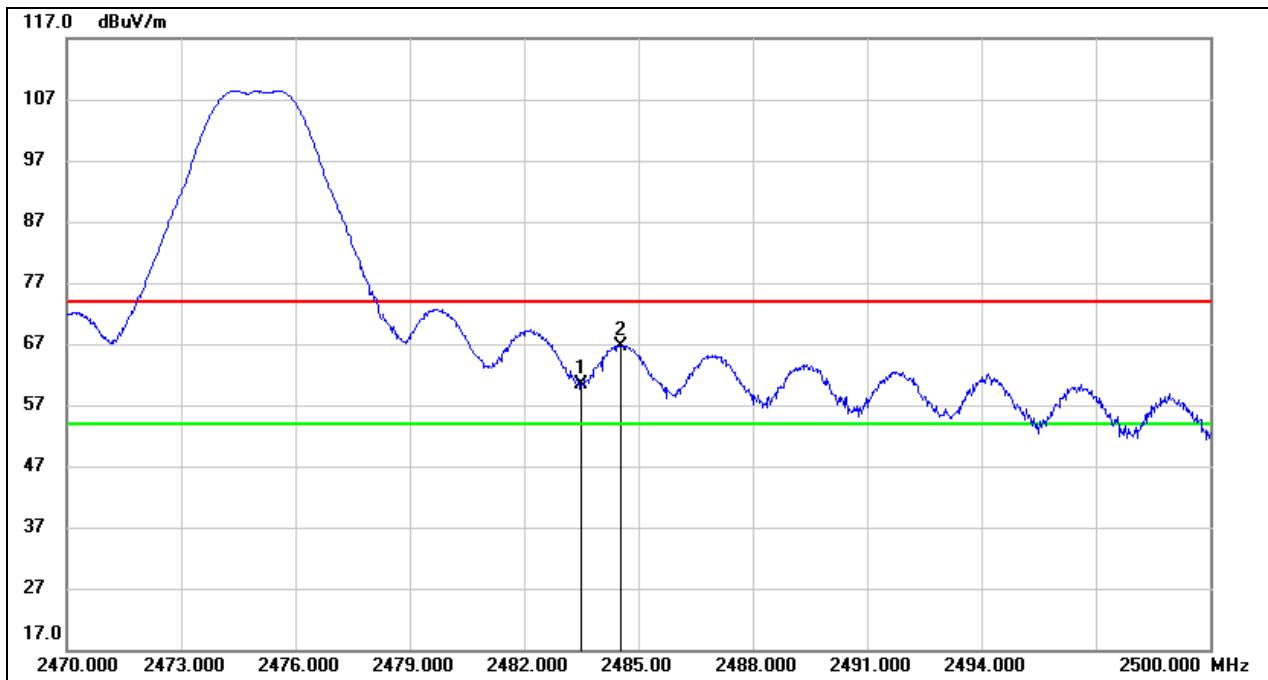
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	28.67	33.71	62.38	74.00	-11.62	peak
2	2484.550	34.82	33.71	68.53	74.00	-5.47	peak

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

AVG

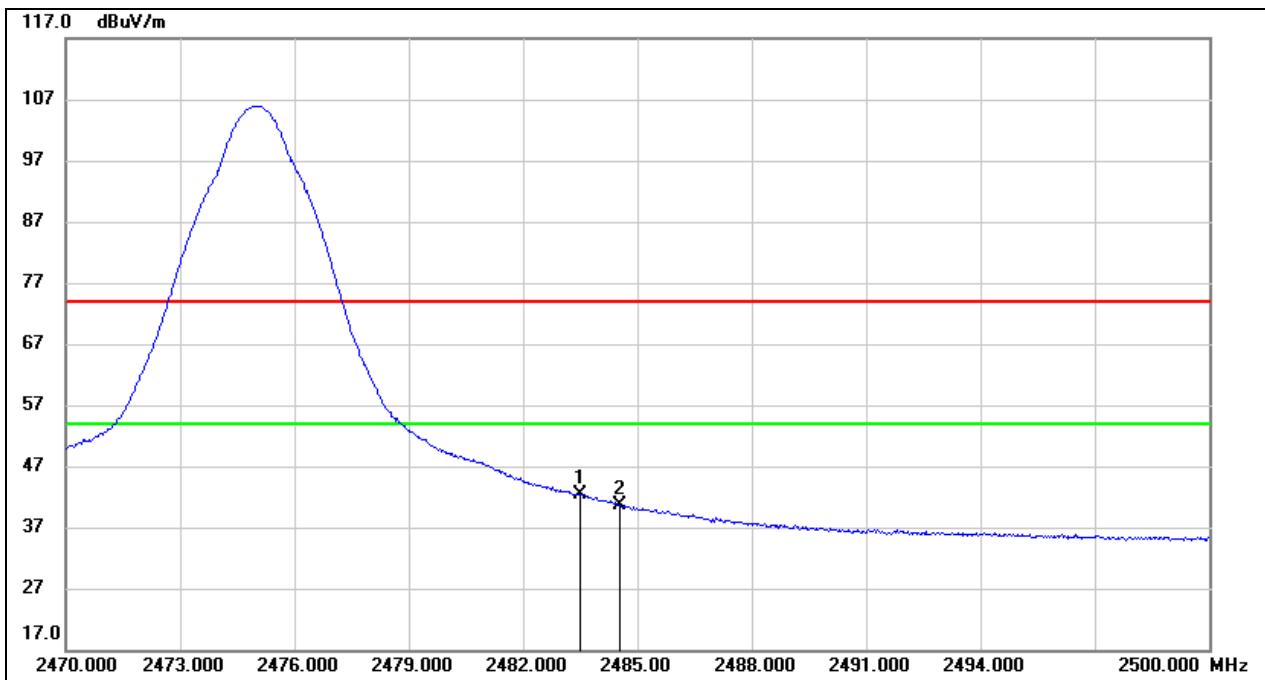
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	9.69	33.71	43.40	54.00	-10.60	AVG
2	2484.550	7.99	33.71	41.70	54.00	-12.30	AVG

Note: 1. Measurement = Reading Level + Correct Factor.
2. AVG: VBW=1/Ton where: ton is transmit duration.
3. For duty cycle, please refer to clause 7.1.
4. Only the worst case emission will be recorder, if it complies with the limit, the other emissions deemed to comply with the limit.

RESTRICTED BANDEDGE (CHANNEL 25, VERTICAL)PEAK

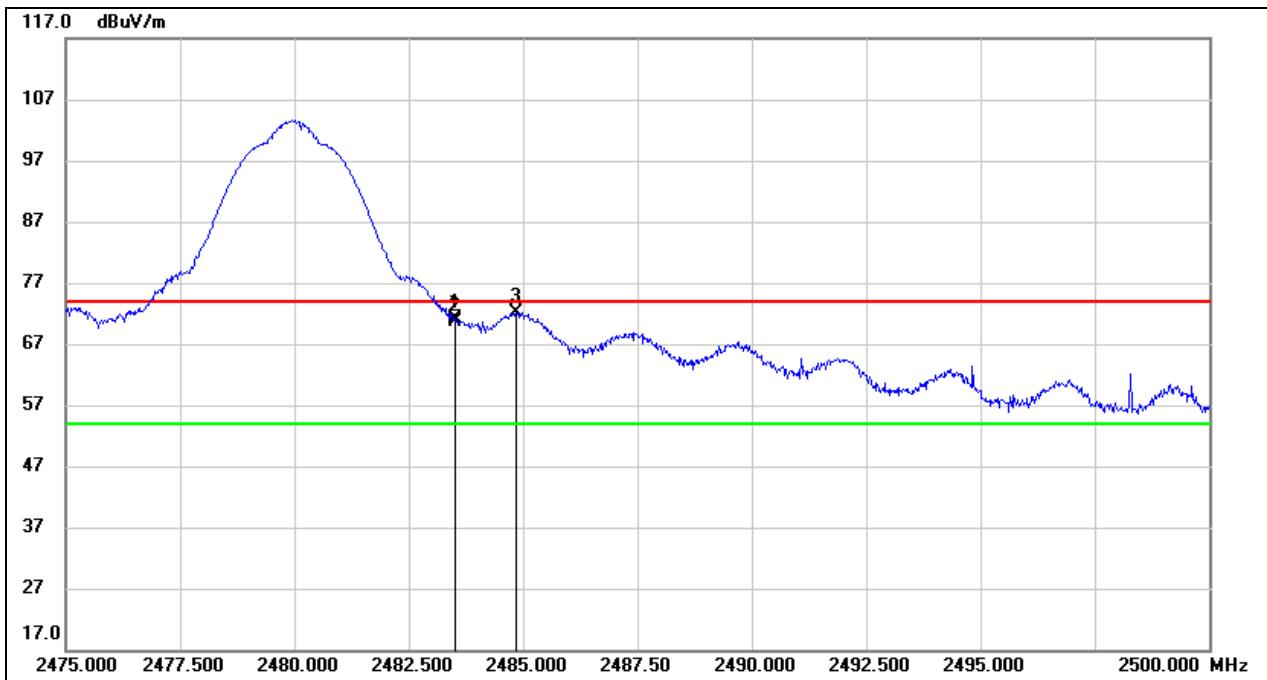
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	26.60	33.71	60.31	74.00	-13.69	peak
2	2484.520	33.03	33.71	66.74	74.00	-7.26	peak

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

AVG

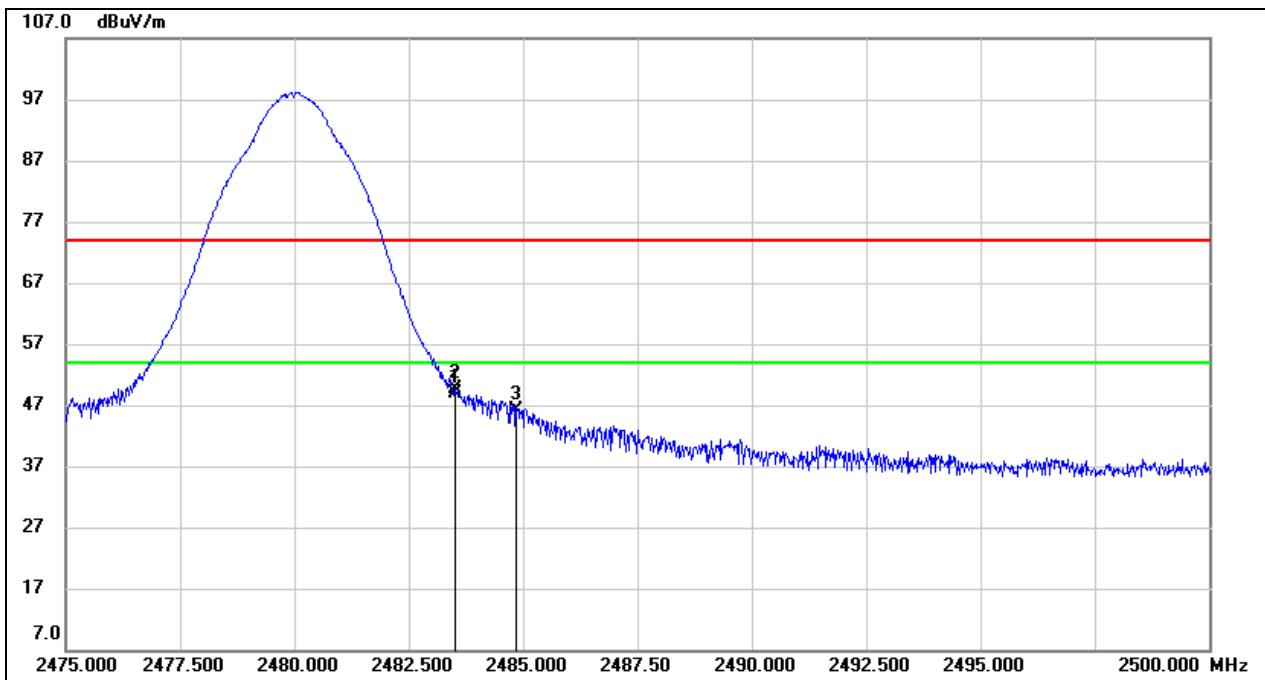
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	8.59	33.71	42.30	54.00	-11.70	AVG
2	2484.520	7.03	33.71	40.74	54.00	-13.26	AVG

Note: 1. Measurement = Reading Level + Correct Factor.
2. AVG: VBW=1/Ton where: ton is transmit duration.
3. For duty cycle, please refer to clause 7.1.
4. Only the worst case emission will be recorder, if it complies with the limit, the other emissions deemed to comply with the limit.

RESTRICTED BANDEDGE (CHANNEL 26, HORIZONTAL)PEAK

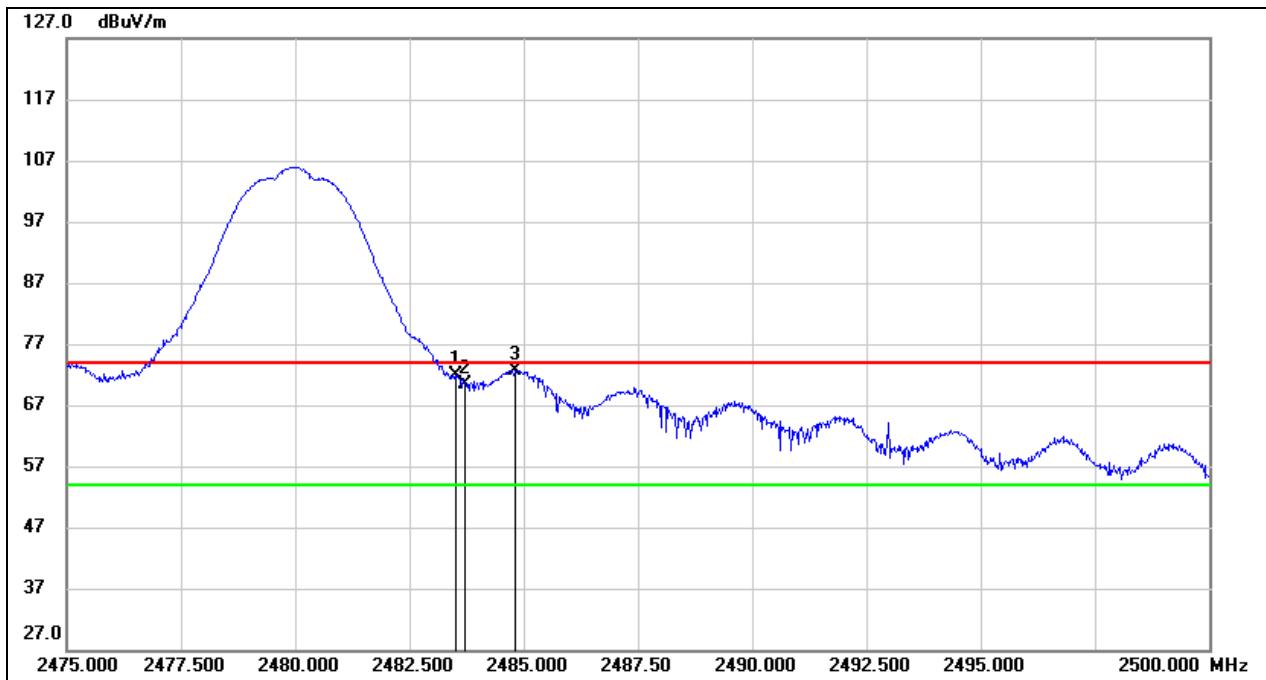
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	59.19	11.97	71.16	74.00	-2.84	peak
2	2483.525	58.67	11.97	70.64	74.00	-3.36	peak
3	2484.850	60.20	11.97	72.17	74.00	-1.83	peak

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

AVG

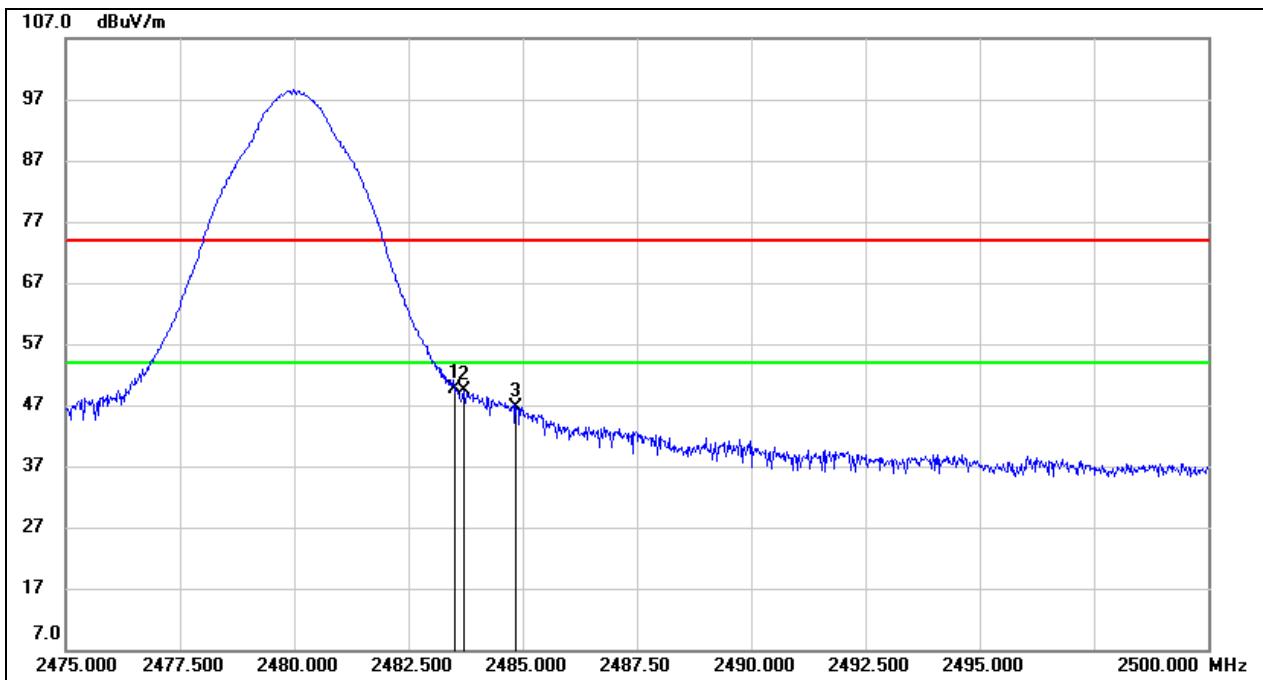
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	37.03	11.97	49.00	54.00	-5.00	AVG
2	2483.525	37.74	11.97	49.71	54.00	-4.29	AVG
3	2484.850	34.10	11.97	46.07	54.00	-7.93	AVG

Note: 1. Measurement = Reading Level + Correct Factor.
2. AVG: VBW=1/Ton where: ton is transmit duration.
3. For duty cycle, please refer to clause 7.1.
4. Only the worst case emission will be recorder, if it complies with the limit, the other emissions deemed to comply with the limit.

RESTRICTED BANDEDGE (CHANNEL 26, VERTICAL)PEAK

No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	59.96	11.97	71.93	74.00	-2.07	peak
2	2483.700	58.37	11.97	70.34	74.00	-3.66	peak
3	2484.825	60.67	11.97	72.64	74.00	-1.36	peak

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

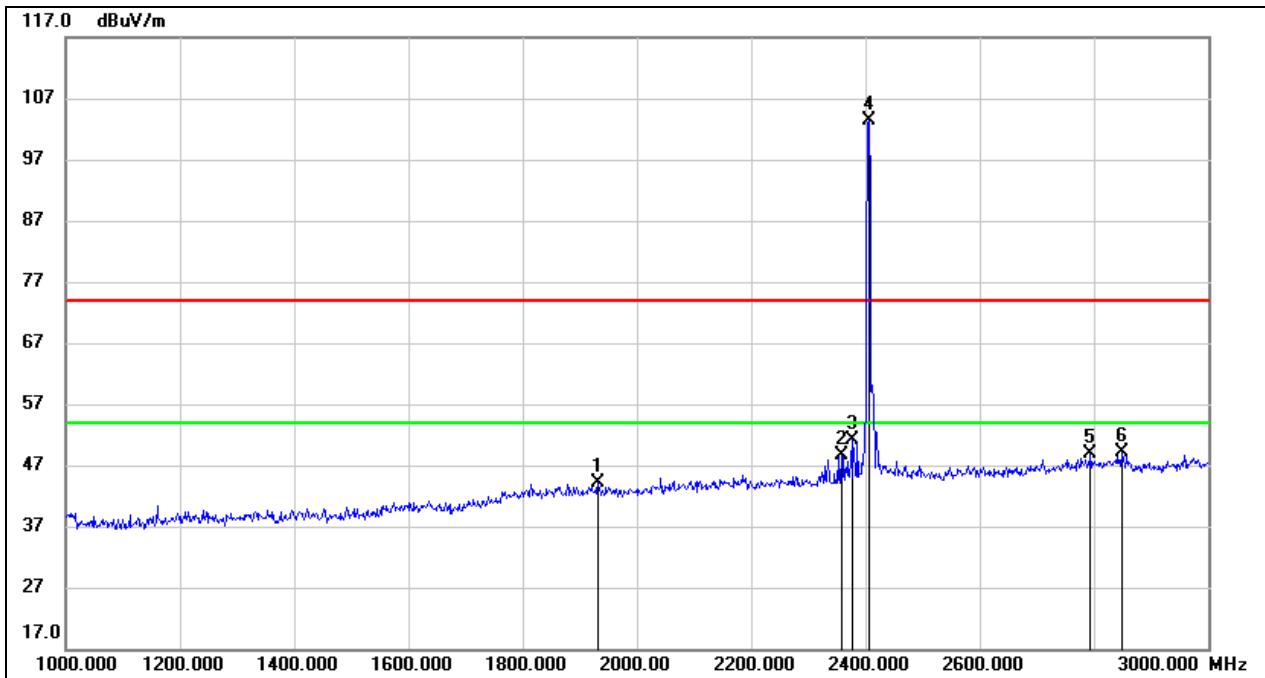
AVG

No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	37.68	11.97	49.65	54.00	-4.35	AVG
2	2483.700	37.53	11.97	49.50	54.00	-4.50	AVG
3	2484.825	34.73	11.97	46.70	54.00	-7.30	AVG

Note: 1. Measurement = Reading Level + Correct Factor.
2. AVG: VBW=1/Ton where: ton is transmit duration.
3. For duty cycle, please refer to clause 7.1.
4. Only the worst case emission will be recorder, if it complies with the limit, the other emissions deemed to comply with the limit.

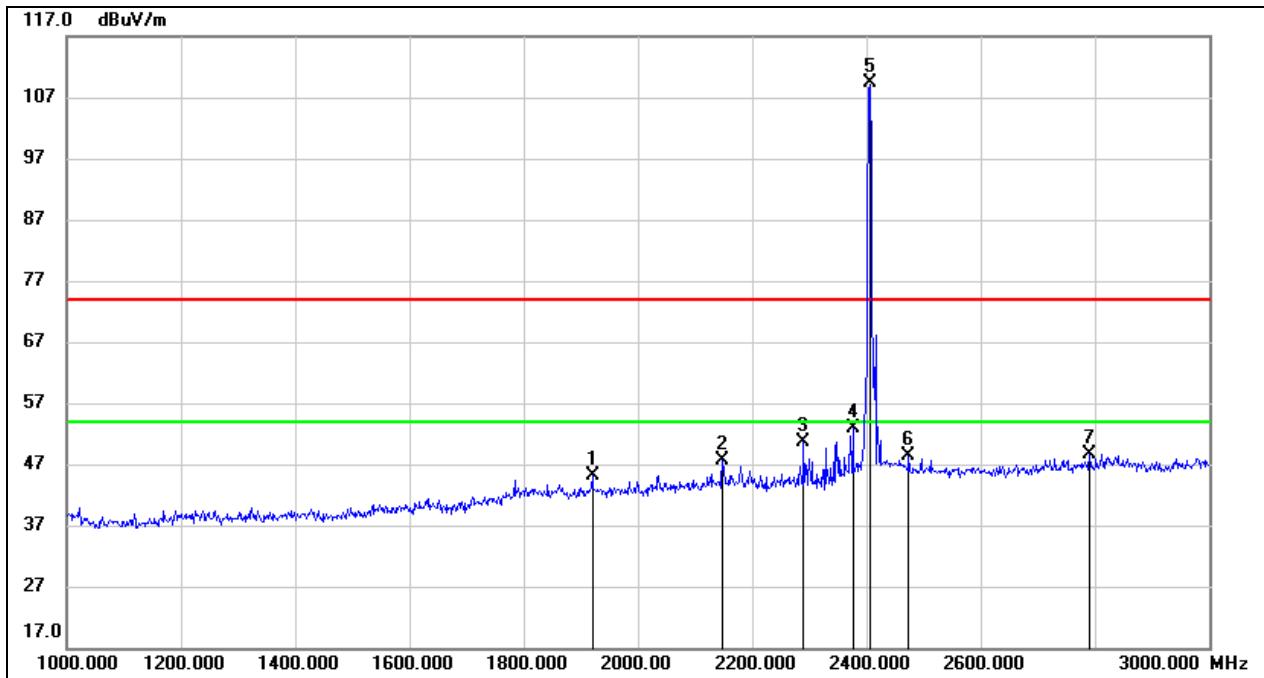
8.2. SPURIOUS EMISSIONS (1 GHz ~ 3 GHz)

HARMONICS AND SPURIOUS EMISSIONS (LOW CHANNEL, HORIZONTAL)



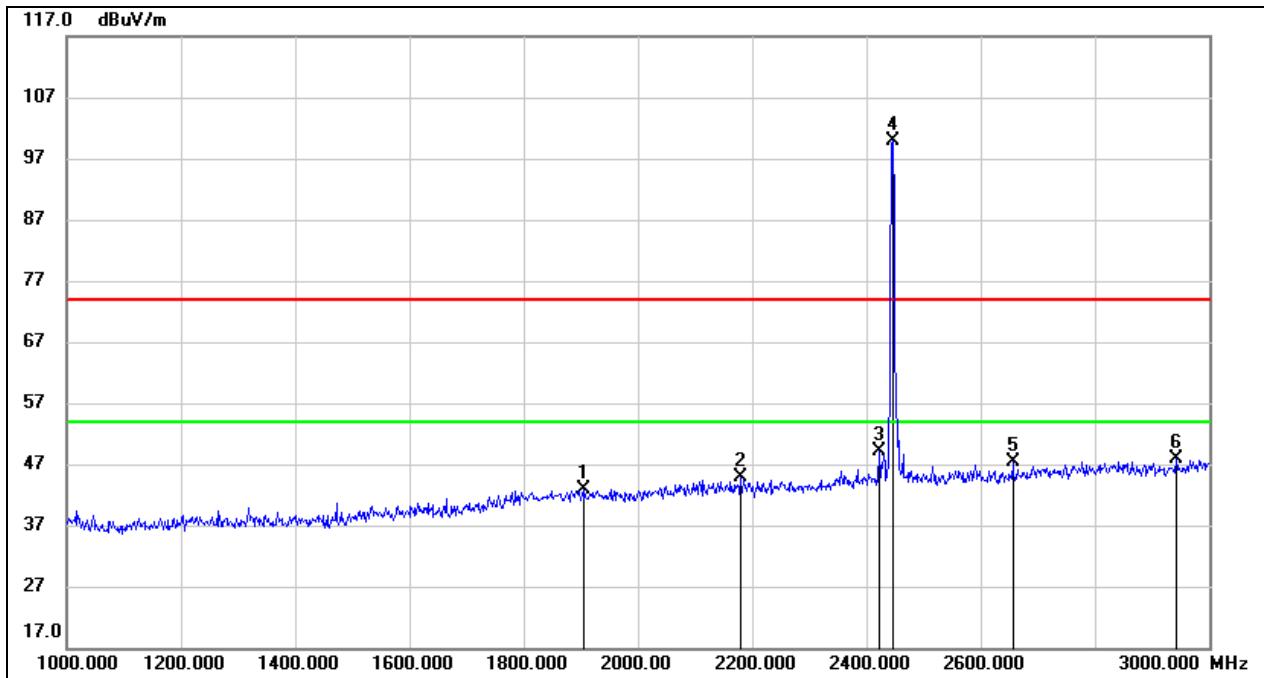
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1932.000	34.33	9.86	44.19	74.00	-29.81	peak
2	2358.000	37.20	11.37	48.57	74.00	-25.43	peak
3	2376.000	39.71	11.50	51.21	74.00	-22.79	peak
4	2405.000	91.60	11.68	103.28	/	/	fundamental
5	2794.000	35.62	13.19	48.81	74.00	-25.19	peak
6	2848.000	35.70	13.35	49.05	74.00	-24.95	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.

HARMONICS AND SPURIOUS EMISSIONS (LOW CHANNEL, VERTICAL)

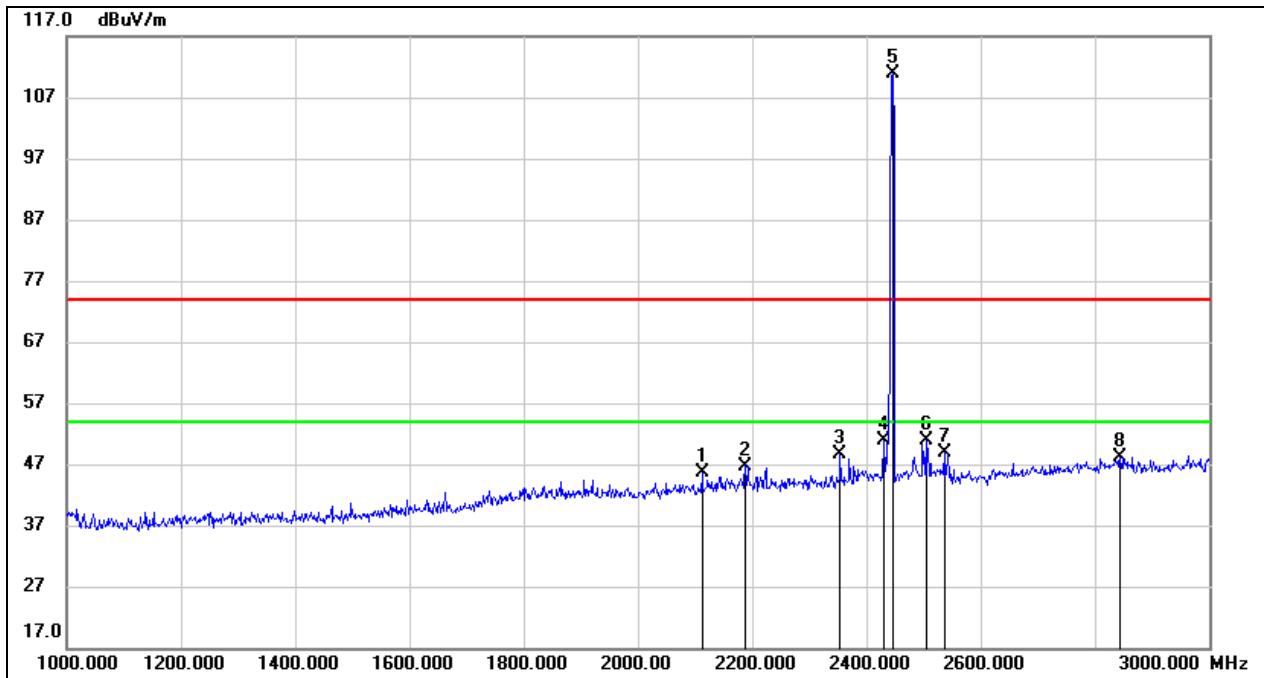
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1920.000	35.38	9.84	45.22	74.00	-28.78	peak
2	2148.000	36.62	10.90	47.52	74.00	-26.48	peak
3	2290.000	39.64	10.99	50.63	74.00	-23.37	peak
4	2376.000	41.26	11.50	52.76	74.00	-21.24	peak
5	2405.000	97.62	11.68	109.30	/	/	fundamental
6	2474.000	36.37	11.94	48.31	74.00	-25.69	peak
7	2790.000	35.47	13.16	48.63	74.00	-25.37	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.

HARMONICS AND SPURIOUS EMISSIONS (MID CHANNEL, HORIZONTAL)

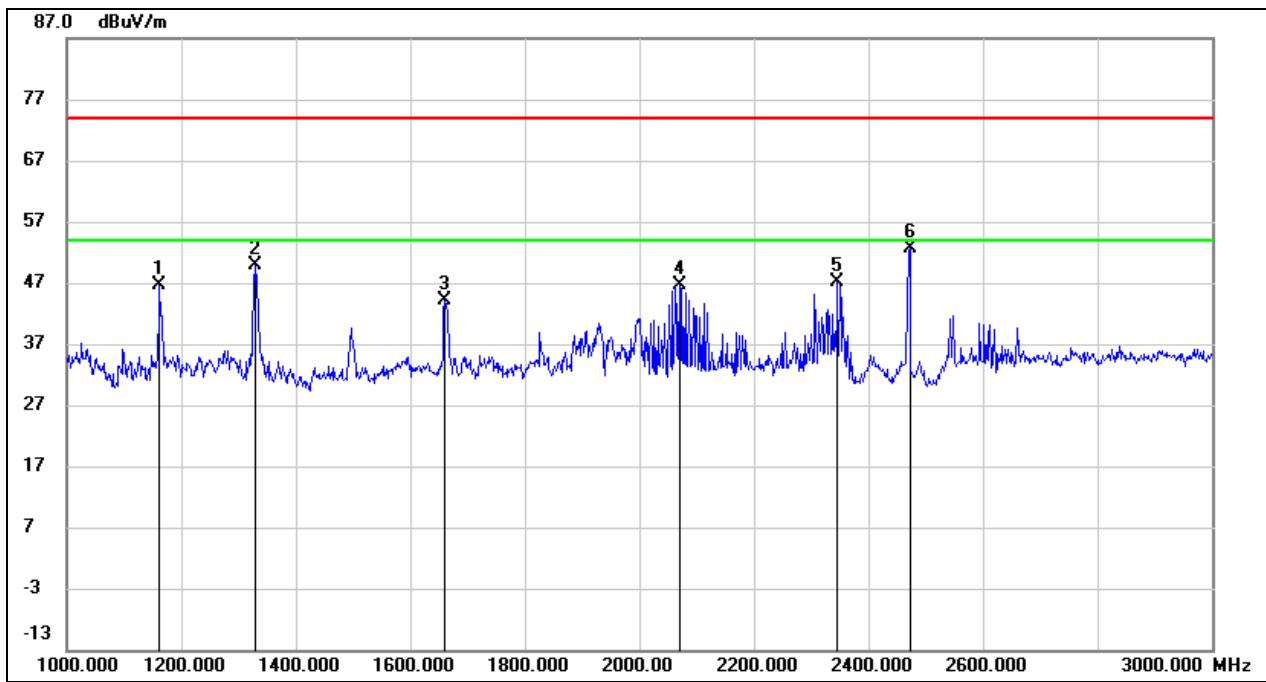
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1906.000	33.04	9.80	42.84	74.00	-31.16	peak
2	2180.000	33.91	10.97	44.88	74.00	-29.12	peak
3	2422.000	37.31	11.74	49.05	74.00	-24.95	peak
4	2445.000	88.09	11.83	99.92	/	/	fundamental
5	2656.000	35.14	12.27	47.41	74.00	-26.59	peak
6	2942.000	34.05	13.73	47.78	74.00	-26.22	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.

HARMONICS AND SPURIOUS EMISSIONS (MID CHANNEL, VERTICAL)

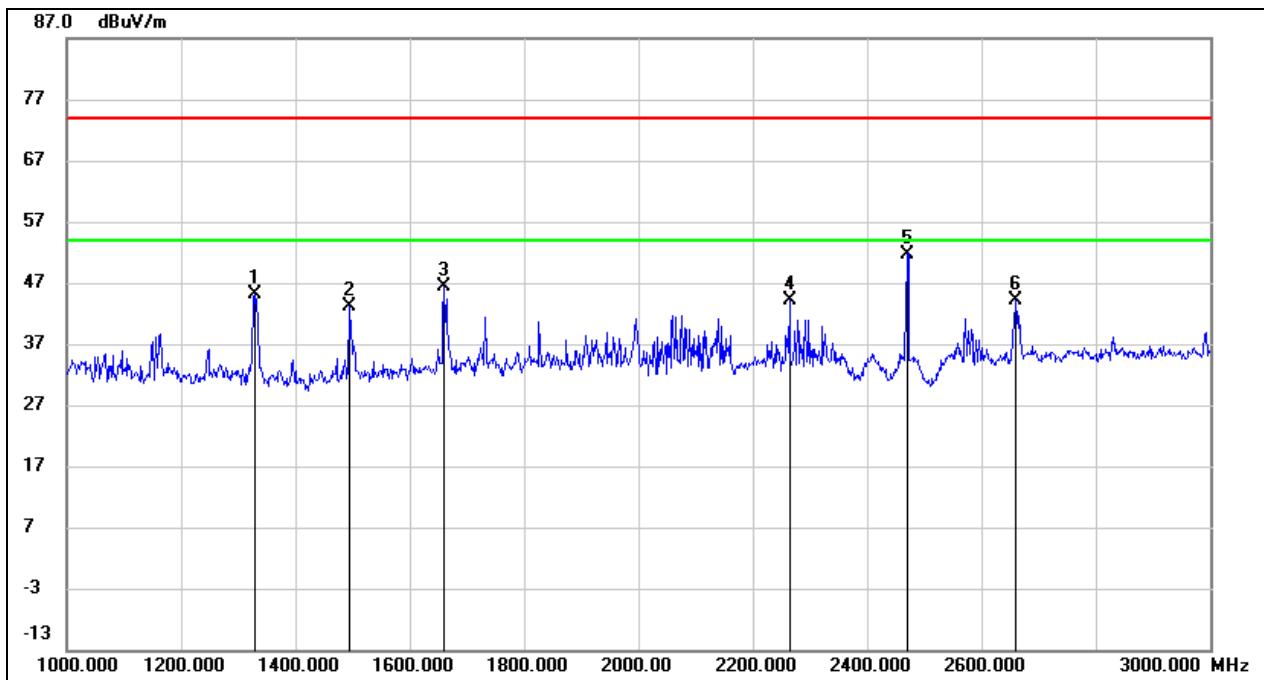
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2112.000	34.78	10.81	45.59	74.00	-28.41	peak
2	2188.000	35.75	11.00	46.75	74.00	-27.25	peak
3	2354.000	37.28	11.36	48.64	74.00	-25.36	peak
4	2430.000	39.20	11.77	50.97	74.00	-23.03	peak
5	2445.000	98.97	11.83	110.80	/	/	fundamental
6	2504.000	38.96	12.03	50.99	74.00	-23.01	peak
7	2536.000	36.80	12.01	48.81	74.00	-25.19	peak
8	2844.000	34.84	13.35	48.19	74.00	-25.81	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.

HARMONICS AND SPURIOUS EMISSIONS (HIGH CHANNEL, HORIZONTAL)

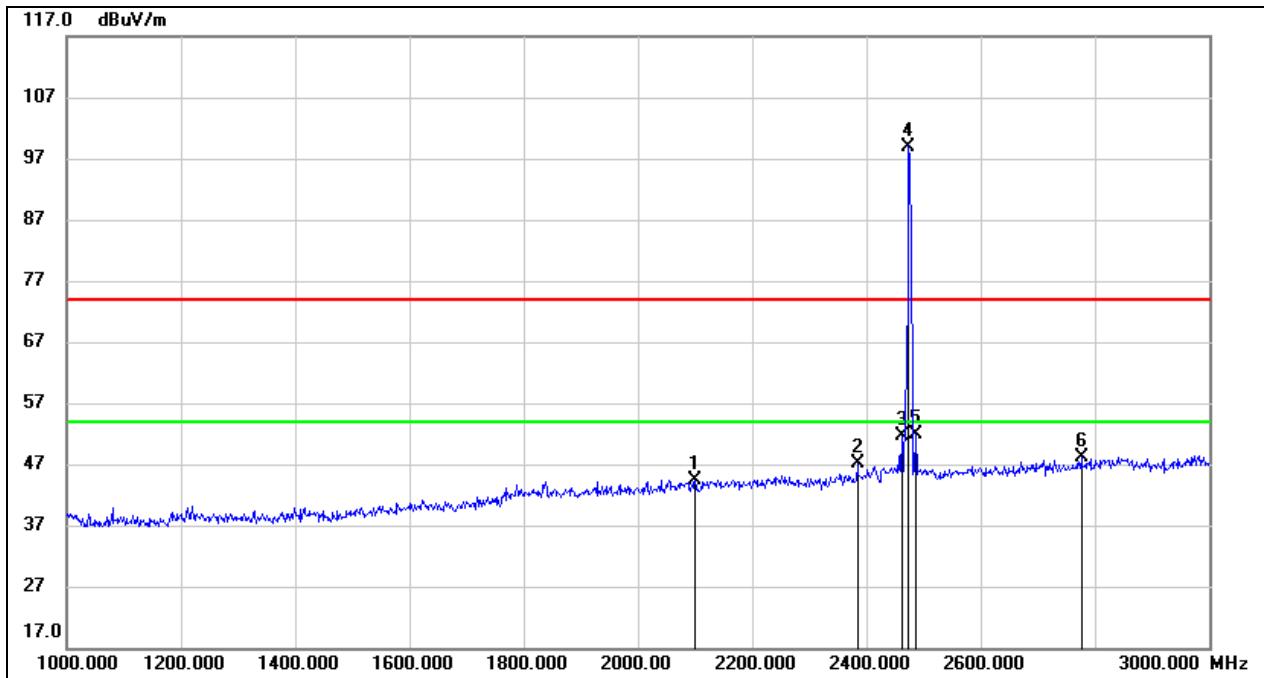
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1162.000	59.69	-13.18	46.51	74.00	-27.49	peak
2	1330.000	62.73	-12.81	49.92	74.00	-24.08	peak
3	1660.000	55.12	-11.10	44.02	74.00	-29.98	peak
4	2070.000	56.33	-9.78	46.55	74.00	-27.45	peak
5	2346.000	55.73	-8.58	47.15	74.00	-26.85	peak
6	2470.000	60.79	-8.27	52.52	/	/	fundamental

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.

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	1328.000	57.87	-12.81	45.06	74.00	-28.94	peak
2	1494.000	55.28	-12.25	43.03	74.00	-30.97	peak
3	1660.000	57.46	-11.10	46.36	74.00	-27.64	peak
4	2264.000	53.04	-8.84	44.20	74.00	-29.80	peak
5	2470.000	60.00	-8.27	51.73	/	/	fundamental
6	2660.000	51.64	-7.47	44.17	74.00	-29.83	peak

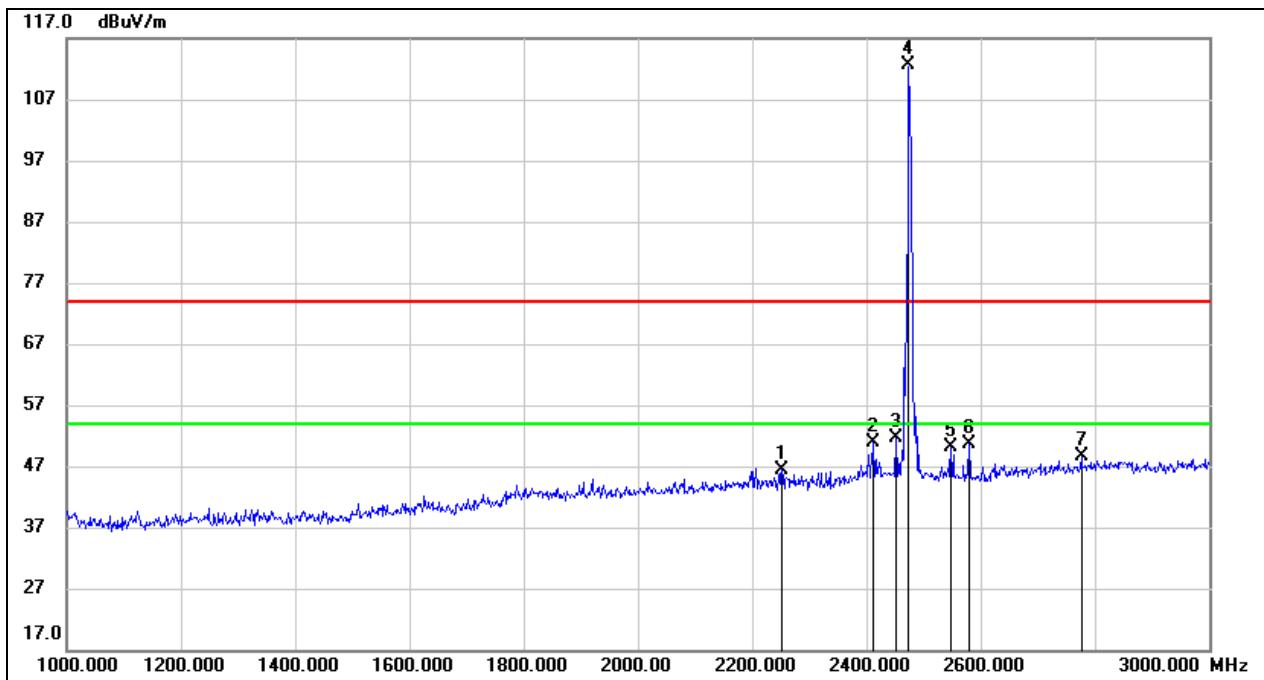
Note: 1. Peak Result = Reading Level + Correct Factor.
 2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
 3. Peak: Peak detector.
 4. Filter losses were only considered in then spurious frequency bands and the authorized band was not corrected for BRF losses.
 5.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

HARMONICS AND SPURIOUS EMISSIONS (CHANNEL25, HORIZONTAL)

No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2100.000	33.69	10.78	44.47	74.00	-29.53	peak
2	2384.000	35.46	11.55	47.01	74.00	-26.99	peak
3	2462.000	39.78	11.89	51.67	74.00	-22.33	peak
4	2475.000	87.02	11.94	98.96	/	/	fundamental
5	2486.000	39.89	11.98	51.87	74.00	-22.13	peak
6	2776.000	35.11	13.06	48.17	74.00	-25.83	peak

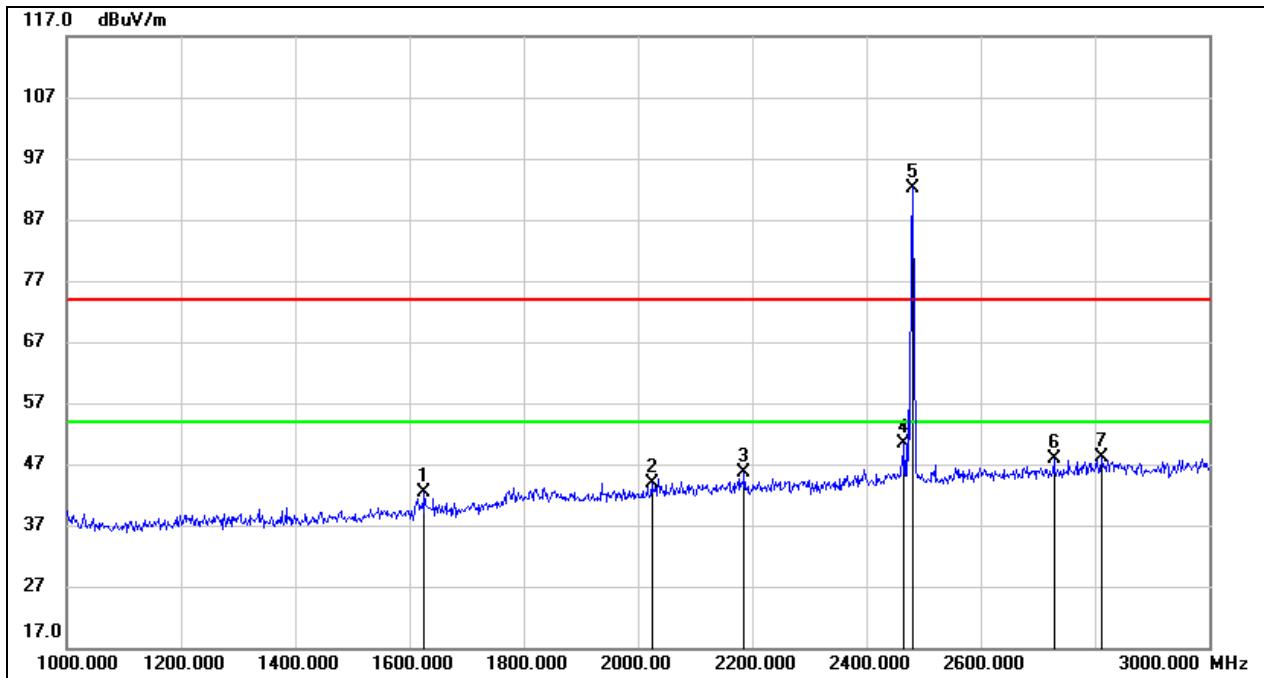
Note:

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 (CHANNEL25, VERTICAL)

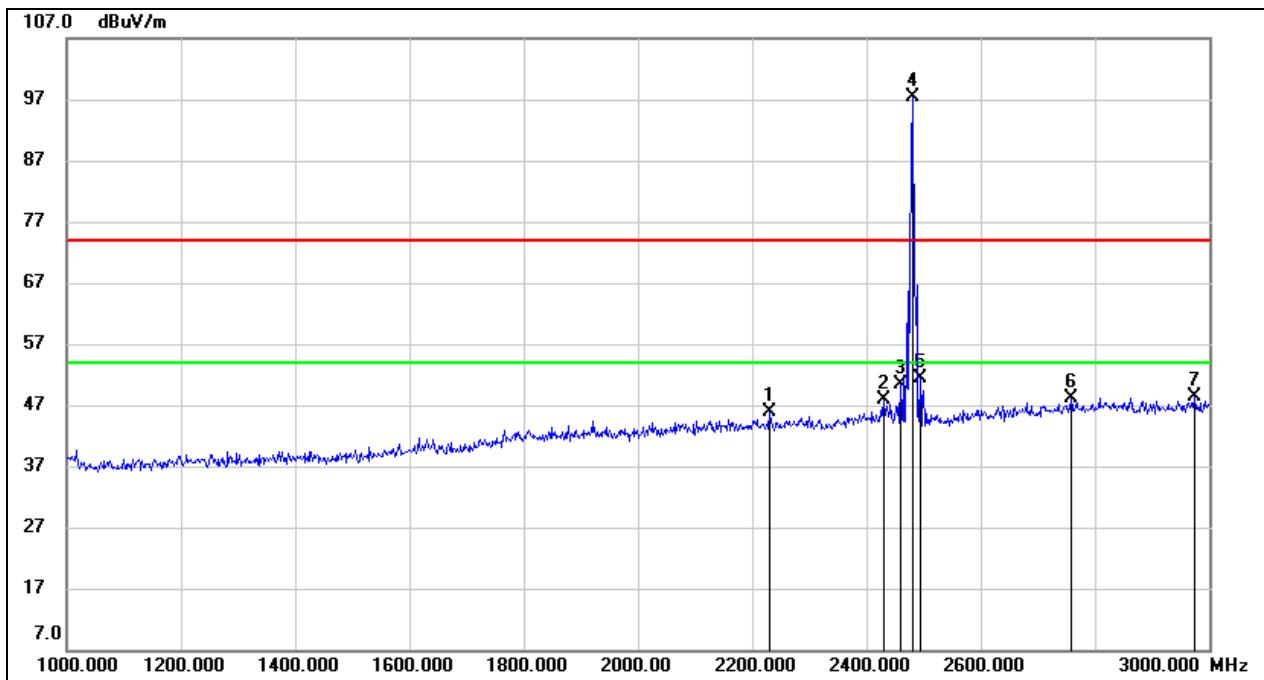
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2252.000	35.50	11.00	46.50	74.00	-27.50	peak
2	2412.000	39.07	11.71	50.78	74.00	-23.22	peak
3	2452.000	39.86	11.85	51.71	74.00	-22.29	peak
4	2475.000	100.60	11.94	112.54	/	/	fundamental
5	2548.000	38.23	12.00	50.23	74.00	-23.77	peak
6	2580.000	38.54	11.98	50.52	74.00	-23.48	peak
7	2776.000	35.50	13.06	48.56	74.00	-25.44	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.

HARMONICS AND SPURIOUS EMISSIONS (CHANNEL26, HORIZONTAL)

No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1626.000	34.36	7.96	42.32	74.00	-31.68	peak
2	2024.000	33.78	10.21	43.99	74.00	-30.01	peak
3	2186.000	34.70	10.98	45.68	74.00	-28.32	peak
4	2466.000	38.57	11.91	50.48	74.00	-23.52	peak
5	2480.000	80.15	11.95	92.10	/	/	fundamental
6	2728.000	35.16	12.71	47.87	74.00	-26.13	peak
7	2812.000	34.90	13.26	48.16	74.00	-25.84	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.

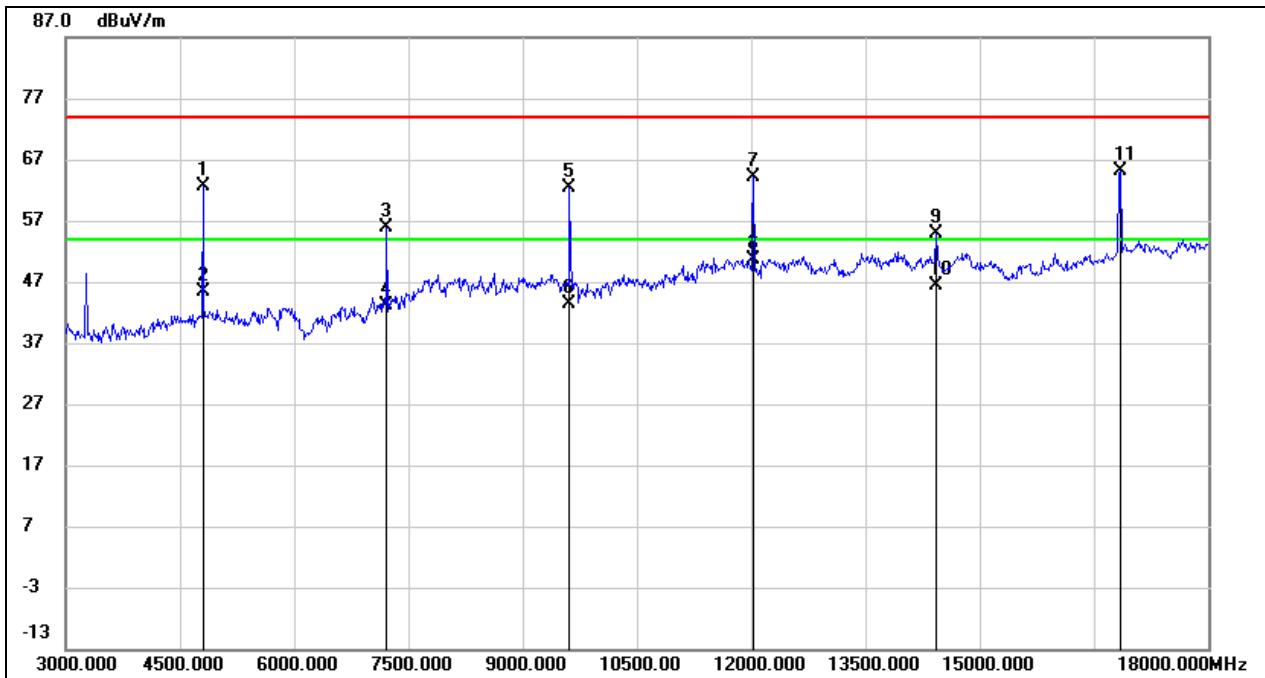
HARMONICS AND SPURIOUS EMISSIONS (CHANNEL26, VERTICAL)

No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2230.000	34.75	11.01	45.76	74.00	-28.24	peak
2	2430.000	36.00	11.77	47.77	74.00	-26.23	peak
3	2460.000	38.56	11.89	50.45	74.00	-23.55	peak
4	2480.000	85.47	11.95	97.42	/	/	fundamental
5	2494.000	39.46	12.01	51.47	74.00	-22.53	peak
6	2758.000	35.27	12.93	48.20	74.00	-25.80	peak
7	2974.000	34.51	13.93	48.44	74.00	-25.56	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.

8.3. SPURIOUS EMISSIONS (3 GHz ~ 18 GHz)

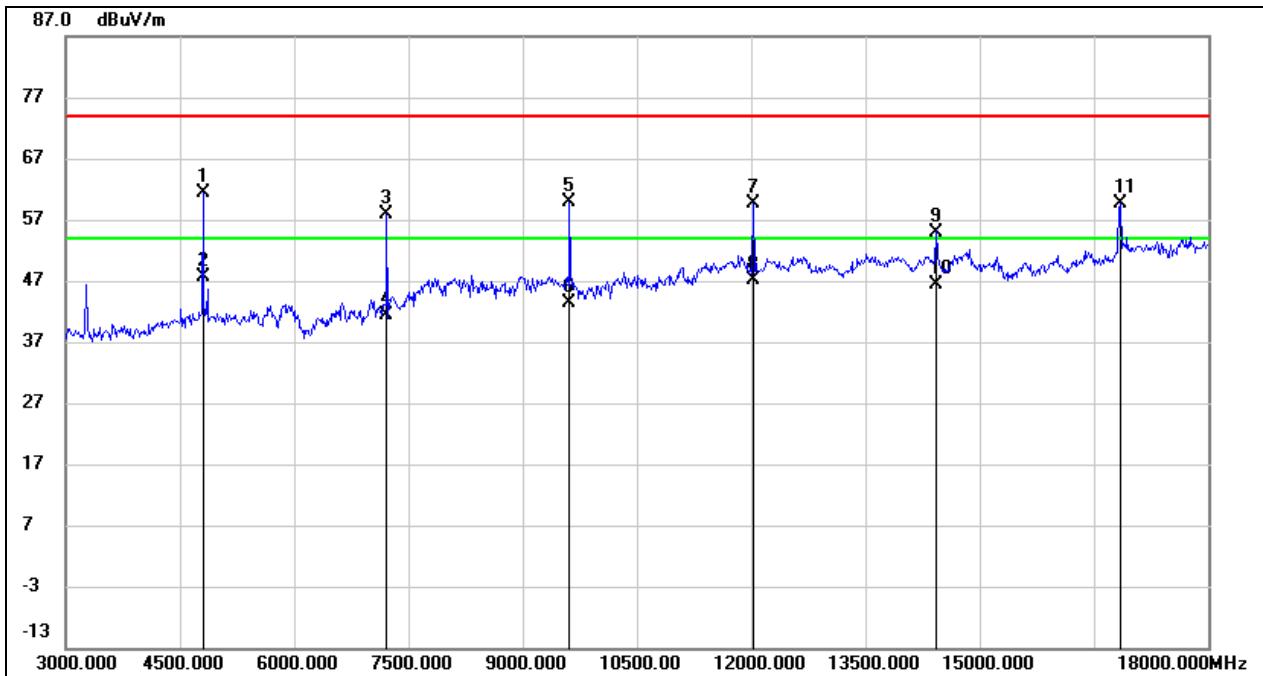
HARMONICS AND SPURIOUS EMISSIONS (LOW CHANNEL, HORIZONTAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4800.000	61.26	1.40	62.66	74.00	-11.34	peak
2	4800.000	43.99	1.40	45.39	54.00	-8.61	AVG
3	7215.000	48.47	7.32	55.79	74.00	-18.21	peak
4	7215.000	35.78	7.32	43.10	54.00	-10.90	AVG
5	9615.000	51.52	10.95	62.47	74.00	-11.53	peak
6	9615.000	32.42	10.95	43.37	54.00	-10.63	AVG
7	12030.000	48.71	15.51	64.22	74.00	-9.78	peak
8	12030.000	35.06	15.51	50.57	54.00	-3.43	AVG
9	14430.000	37.48	17.34	54.82	74.00	-19.18	peak
10	14430.000	29.01	17.34	46.35	54.00	-7.65	AVG
11*	16845.000	44.00	21.10	65.10	/	/	peak

Note:

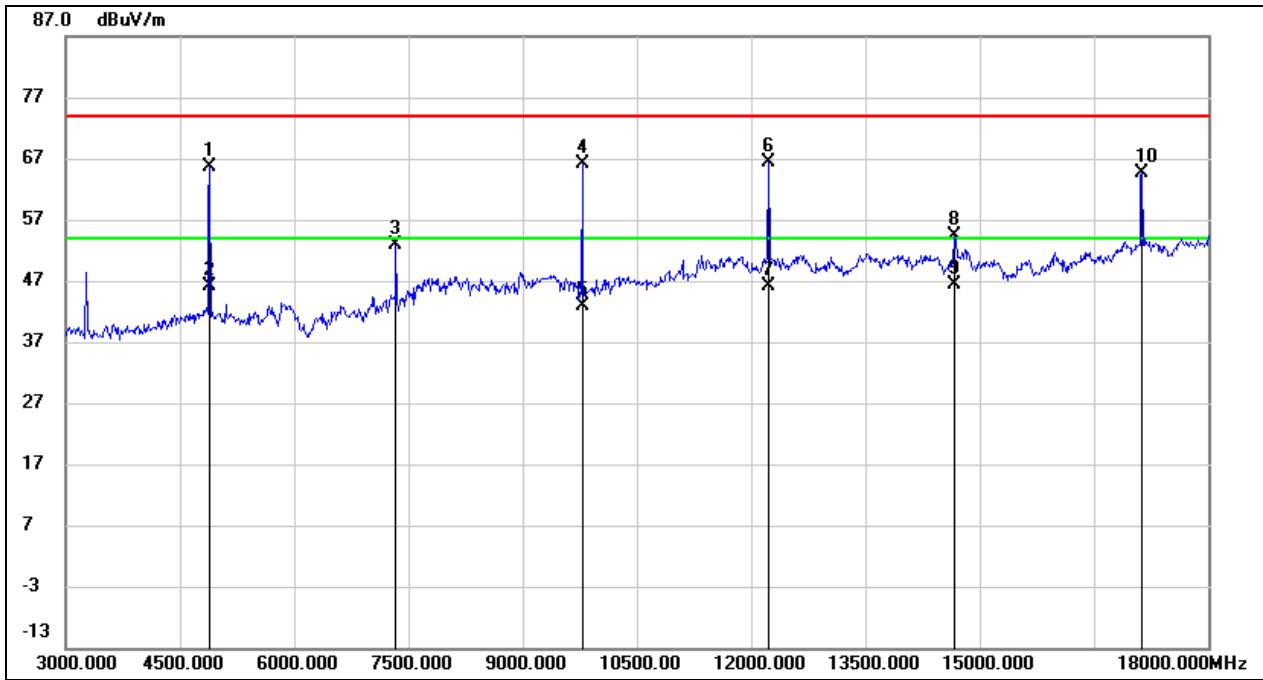
1. Peak Result = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. AVG: $VBW=1/T_{on}$, where: T_{on} is the transmitting duration.
5. For the transmitting duration, please refer to clause 7.1.
6. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.
7. Proper operation of the transmitter prior to adding the filter to the measurement chain.
8. *-indicates frequency out of 47CFR Pt 15 / ISED RSS-Restricted band.

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	59.94	1.40	61.34	74.00	-12.66	peak
2	4800.000	46.17	1.40	47.57	54.00	-6.43	AVG
3	7215.000	50.58	7.32	57.90	74.00	-16.10	peak
4	7215.000	34.08	7.32	41.40	54.00	-12.60	AVG
5	9615.000	48.91	10.95	59.86	74.00	-14.14	peak
6	9615.000	32.46	10.95	43.41	54.00	-10.59	AVG
7	12030.000	44.22	15.51	59.73	74.00	-14.27	peak
8	12030.000	31.55	15.51	47.06	54.00	-6.94	AVG
9	14430.000	37.66	17.34	55.00	74.00	-19.00	peak
10	14430.000	29.07	17.34	46.41	54.00	-7.59	AVG
11	16845.000	38.41	21.10	59.51	/	/	peak

Note:

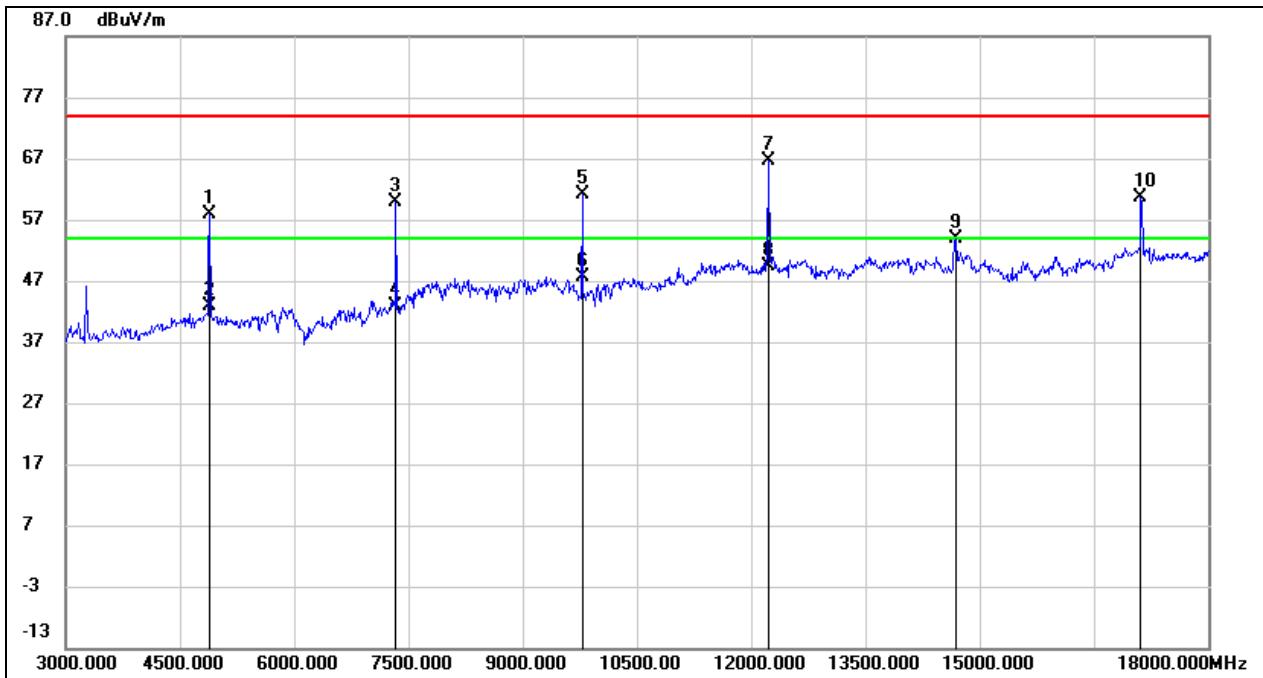
1. Peak Result = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. AVG: VBW=1/Ton, where: Ton is the transmitting duration.
5. For the transmitting duration, please refer to clause 7.1.
6. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.
7. Proper operation of the transmitter prior to adding the filter to the measurement chain.
8. *-indicates frequency out of 47CFR Pt 15 / ISED RSS-Restricted band.

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	4890.000	64.21	1.30	65.51	74.00	-8.49	peak
2	4890.000	44.88	1.30	46.18	54.00	-7.82	AVG
3	7335.000	45.44	7.41	52.85	74.00	-21.15	peak
4	9780.000	56.07	10.16	66.23	74.00	-7.77	peak
5	9780.000	32.60	10.16	42.76	54.00	-11.24	AVG
6	12225.000	50.46	15.99	66.45	74.00	-7.55	peak
7	12225.000	30.10	15.99	46.09	54.00	-7.91	AVG
8	14670.000	36.91	17.59	54.50	74.00	-19.50	peak
9	14670.000	28.76	17.59	46.35	54.00	-7.65	AVG
10	17130.000	42.79	21.92	64.71	/	/	peak

Note:

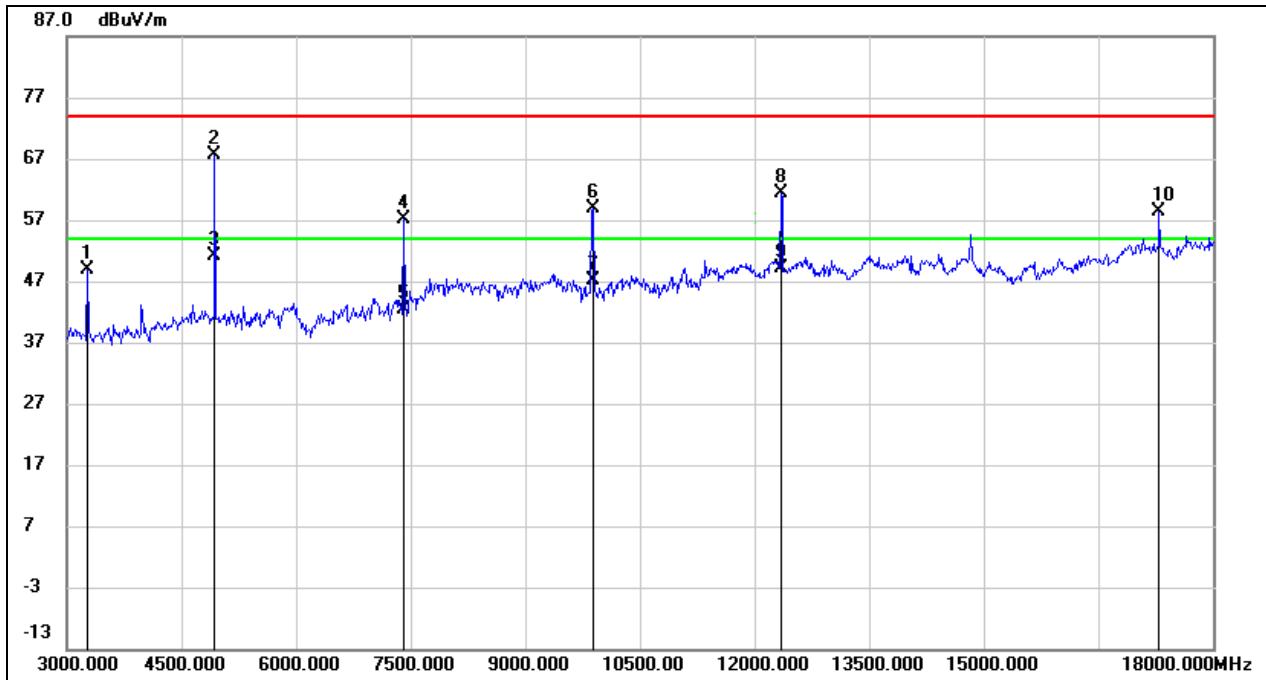
1. Peak Result = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. AVG: VBW=1/Ton, where: Ton is the transmitting duration.
5. For the transmitting duration, please refer to clause 7.1.
6. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.
7. Proper operation of the transmitter prior to adding the filter to the measurement chain.
8. *-indicates frequency out of 47CFR Pt 15 / ISED RSS-Restricted band.

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	4890.000	56.64	1.30	57.94	74.00	-16.06	peak
2	4890.000	41.64	1.30	42.94	54.00	-11.06	AVG
3	7335.000	52.50	7.41	59.91	74.00	-14.09	peak
4	7335.000	35.39	7.41	42.80	54.00	-11.20	AVG
5	9780.000	51.07	10.16	61.23	74.00	-12.77	peak
6	9780.000	37.44	10.16	47.60	54.00	-6.40	AVG
7	12225.000	50.75	15.99	66.74	74.00	-7.26	peak
8	12225.000	33.29	15.99	49.28	54.00	-4.72	AVG
9	14685.000	36.19	17.64	53.83	74.00	-20.17	peak
10*	17115.000	38.84	21.91	60.75	/	/	peak

Note:

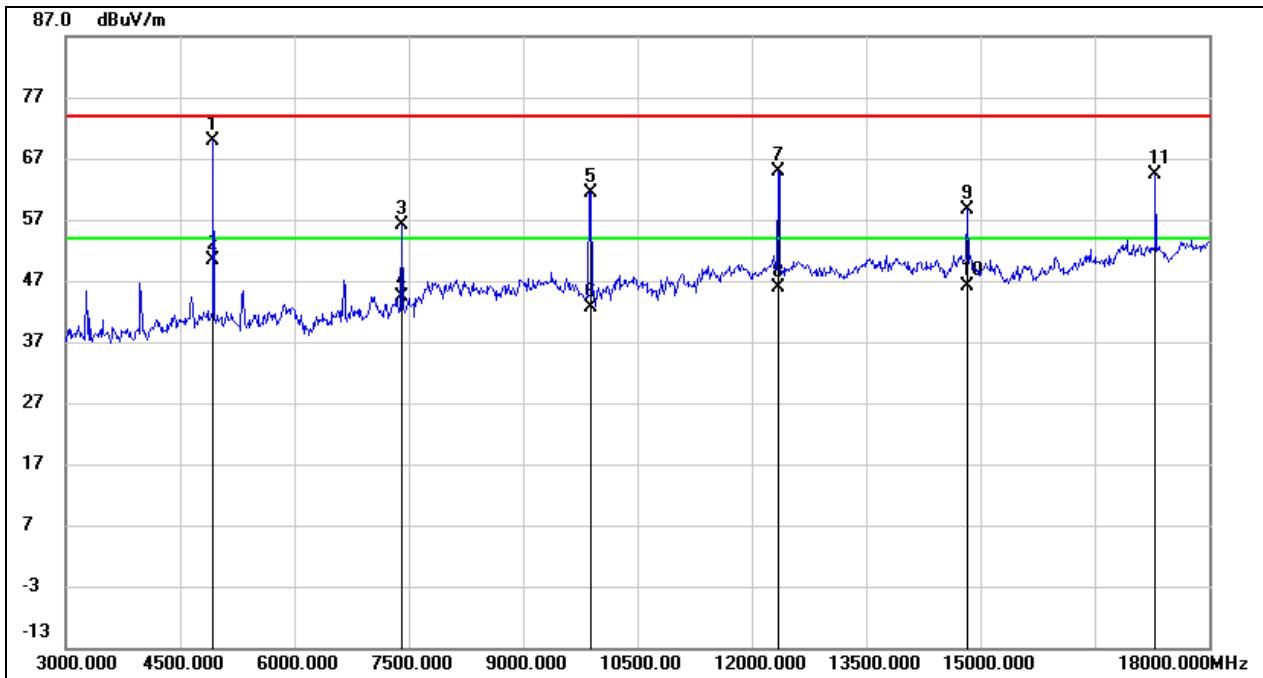
1. Peak Result = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. AVG: VBW=1/Ton, where: Ton is the transmitting duration.
5. For the transmitting duration, please refer to clause 7.1.
6. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.
7. Proper operation of the transmitter prior to adding the filter to the measurement chain.
8. *-indicates frequency out of 47CFR Pt 15 / ISED RSS-Restricted band.

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	3270.000	52.67	-3.70	48.97	74.00	-25.03	peak
2	4935.000	66.06	1.59	67.65	74.00	-6.35	peak
3	4935.000	49.54	1.59	51.13	54.00	-2.87	AVG
4	7410.000	49.03	8.02	57.05	74.00	-16.95	peak
5	7410.000	34.27	8.02	42.29	54.00	-11.71	AVG
6	9885.000	47.84	10.96	58.80	74.00	-15.20	peak
7	9885.000	36.29	10.96	47.25	54.00	-6.75	AVG
8	12345.000	45.42	16.03	61.45	74.00	-12.55	peak
9	12345.000	33.00	16.03	49.03	54.00	-4.97	AVG
10*	17295.000	35.73	22.58	58.31	/	/	peak

Note:

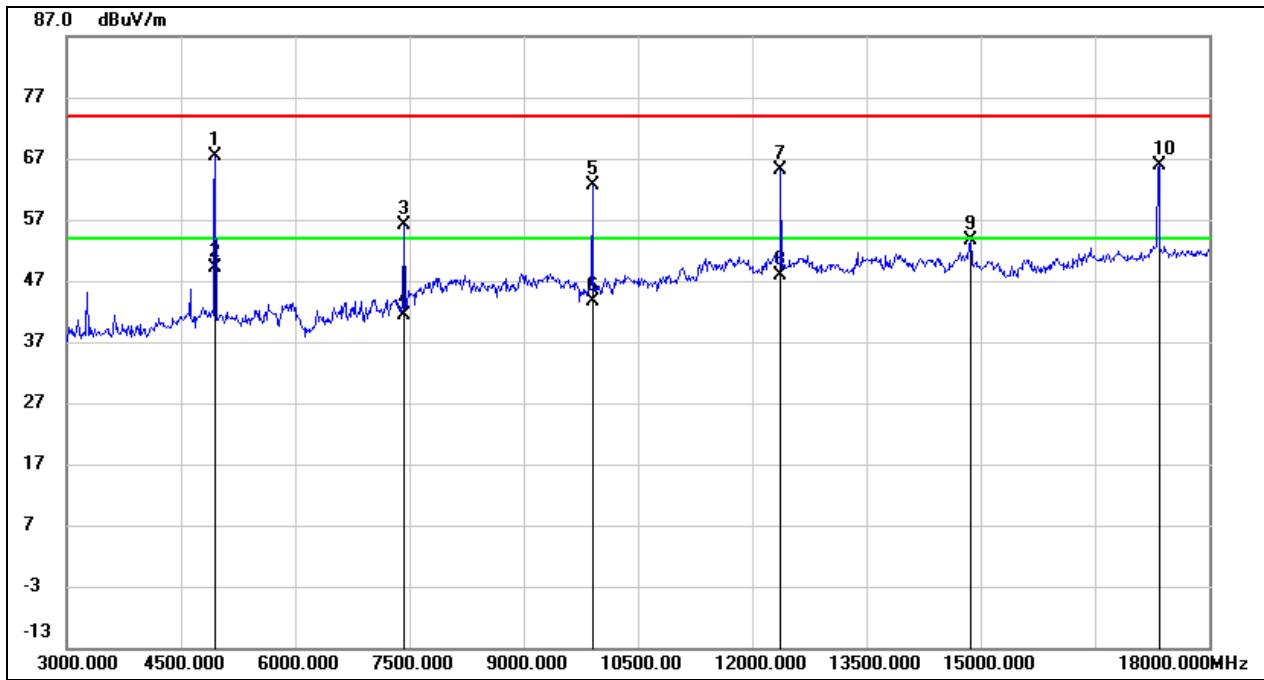
1. Peak Result = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. AVG: $VBW=1/Ton$, where: Ton is the transmitting duration.
5. For the transmitting duration, please refer to clause 7.1.
6. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.
7. Proper operation of the transmitter prior to adding the filter to the measurement chain.
8. *-indicates frequency out of 47CFR Pt 15 / ISED RSS-Restricted band.

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	4935.000	68.26	1.59	69.85	74.00	-4.15	peak
2	4935.000	48.82	1.59	50.41	54.00	-3.59	AVG
3	7410.000	48.04	8.02	56.06	74.00	-17.94	peak
4	7410.000	36.24	8.02	44.26	54.00	-9.74	AVG
5	9885.000	50.45	10.96	61.41	74.00	-12.59	peak
6	9885.000	31.79	10.96	42.75	54.00	-11.25	AVG
7	12345.000	48.87	16.03	64.90	74.00	-9.10	peak
8	12345.000	29.73	16.03	45.76	54.00	-8.24	AVG
9	14820.000	40.70	17.91	58.61	74.00	-15.39	peak
10	14820.000	28.34	17.91	46.25	54.00	-7.75	AVG
11	17295.000	41.90	22.58	64.48	/	/	peak

Note:

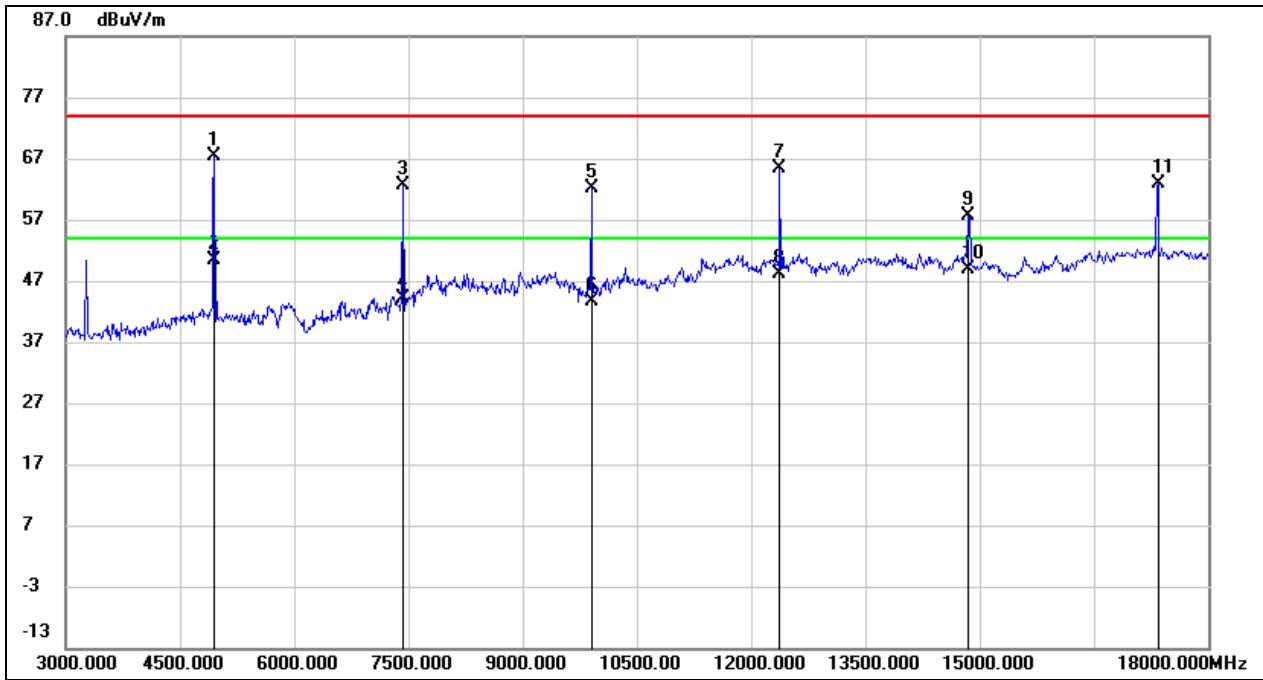
1. Peak Result = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. AVG: VBW=1/Ton, where: Ton is the transmitting duration.
5. For the transmitting duration, please refer to clause 7.1.
6. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.
7. Proper operation of the transmitter prior to adding the filter to the measurement chain.
8. *-indicates frequency out of 47CFR Pt 15 / ISED RSS-Restricted band.

HARMONICS AND SPURIOUS EMISSIONS (CHANNEL 25, HORIZONTAL)

No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4950.000	65.73	1.71	67.44	74.00	-6.56	peak
2	4950.000	47.33	1.71	49.04	54.00	-4.96	AVG
3	7425.000	48.00	8.07	56.07	74.00	-17.93	peak
4	7425.000	33.23	8.07	41.30	54.00	-12.70	AVG
5	9900.000	51.41	11.11	62.52	74.00	-11.48	peak
6	9900.000	32.61	11.11	43.72	54.00	-10.28	AVG
7	12375.000	49.15	15.99	65.14	74.00	-8.86	peak
8	12375.000	31.98	15.99	47.97	54.00	-6.03	AVG
9	14865.000	36.06	17.61	53.67	74.00	-20.33	peak
10*	17340.000	43.58	22.31	65.89	/	/	peak

Note:

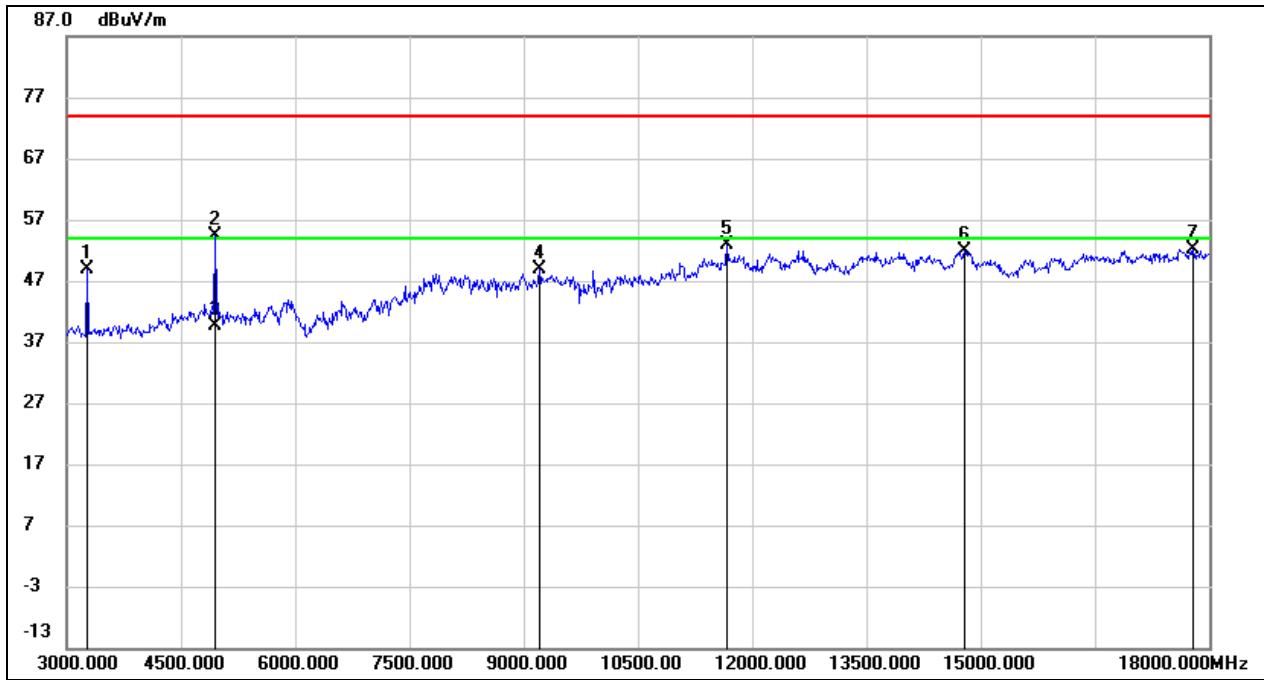
1. Peak Result = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. AVG: VBW=1/Ton, where: Ton is the transmitting duration.
5. For the transmitting duration, please refer to clause 7.1.
6. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.
7. Proper operation of the transmitter prior to adding the filter to the measurement chain.
8. *-indicates frequency out of 47CFR Pt 15 / ISED RSS-Restricted band.

HARMONICS AND SPURIOUS EMISSIONS (CHANNEL 25, VERTICAL)

No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4950.000	65.76	1.71	67.47	74.00	-6.53	peak
2	4950.000	48.62	1.71	50.33	54.00	-3.67	AVG
3	7425.000	54.67	8.07	62.74	74.00	-11.26	peak
4	7425.000	35.97	8.07	44.04	54.00	-9.96	AVG
5	9900.000	51.05	11.11	62.16	74.00	-11.84	peak
6	9900.000	32.47	11.11	43.58	54.00	-10.42	AVG
7	12375.000	49.36	15.99	65.35	74.00	-8.65	peak
8	12375.000	32.13	15.99	48.12	54.00	-5.88	AVG
9	14850.000	39.80	17.71	57.51	74.00	-16.49	peak
10	14850.000	31.28	17.71	48.99	54.00	-5.01	AVG
11*	17340.000	40.67	22.31	62.98	/	/	peak

Note:

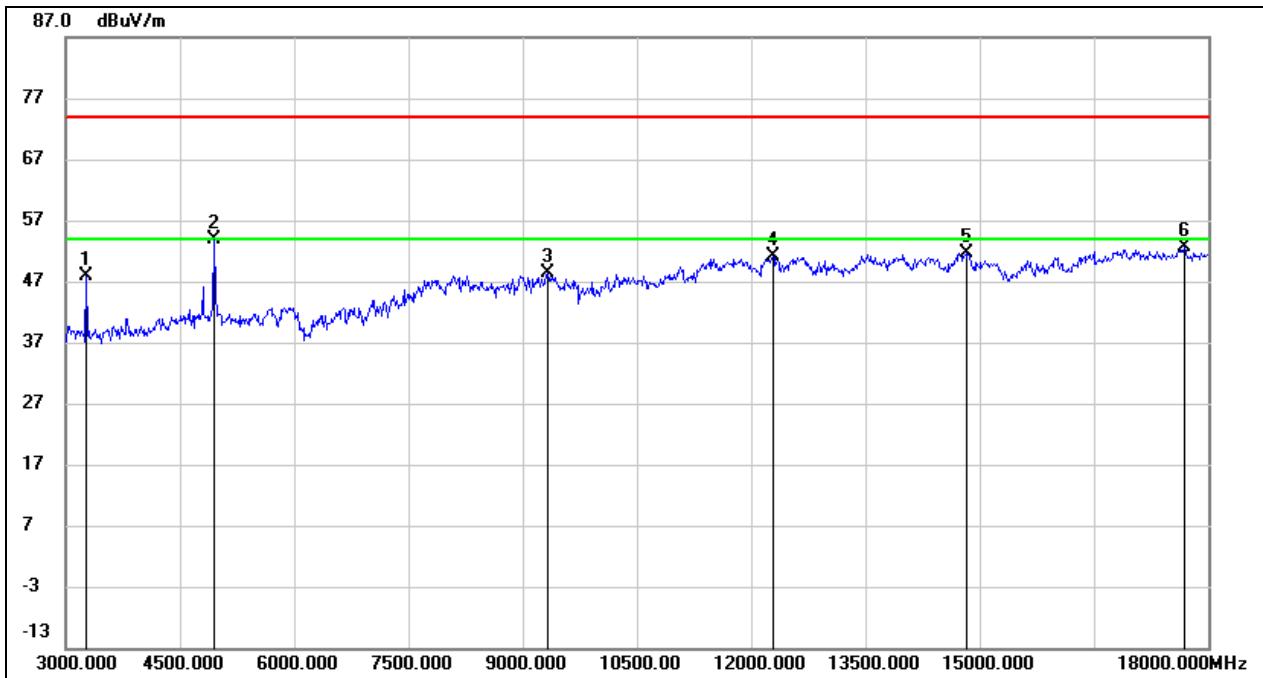
1. Peak Result = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. AVG: $VBW=1/T_{on}$, where: T_{on} is the transmitting duration.
5. For the transmitting duration, please refer to clause 7.1.
6. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.
7. Proper operation of the transmitter prior to adding the filter to the measurement chain.
8. *-indicates frequency out of 47CFR Pt 15 / ISED RSS-Restricted band.

HARMONICS AND SPURIOUS EMISSIONS (CHANNEL 26, HORIZONTAL)

No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	3270.000	52.59	-3.70	48.89	74.00	-25.11	peak
2	4950.000	52.77	1.71	54.48	74.00	-19.52	peak
3	4950.000	37.83	1.71	39.54	54.00	-14.46	AVG
4	9210.000	39.04	9.95	48.99	74.00	-25.01	peak
5	11670.000	37.68	15.16	52.84	74.00	-21.16	peak
6	14790.000	33.90	18.01	51.91	74.00	-22.09	peak
7	17790.000	28.20	23.99	52.19	74.00	-21.81	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/Ton, where: Ton is the transmitting duration.
5. For the transmitting duration, please refer to clause 7.1.
6. Filter losses were only considered in the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.
7. Proper operation of the transmitter prior to adding the filter to the measurement chain.
8. *-indicates frequency out of 47CFR Pt 15 / ISED RSS-Restricted band.

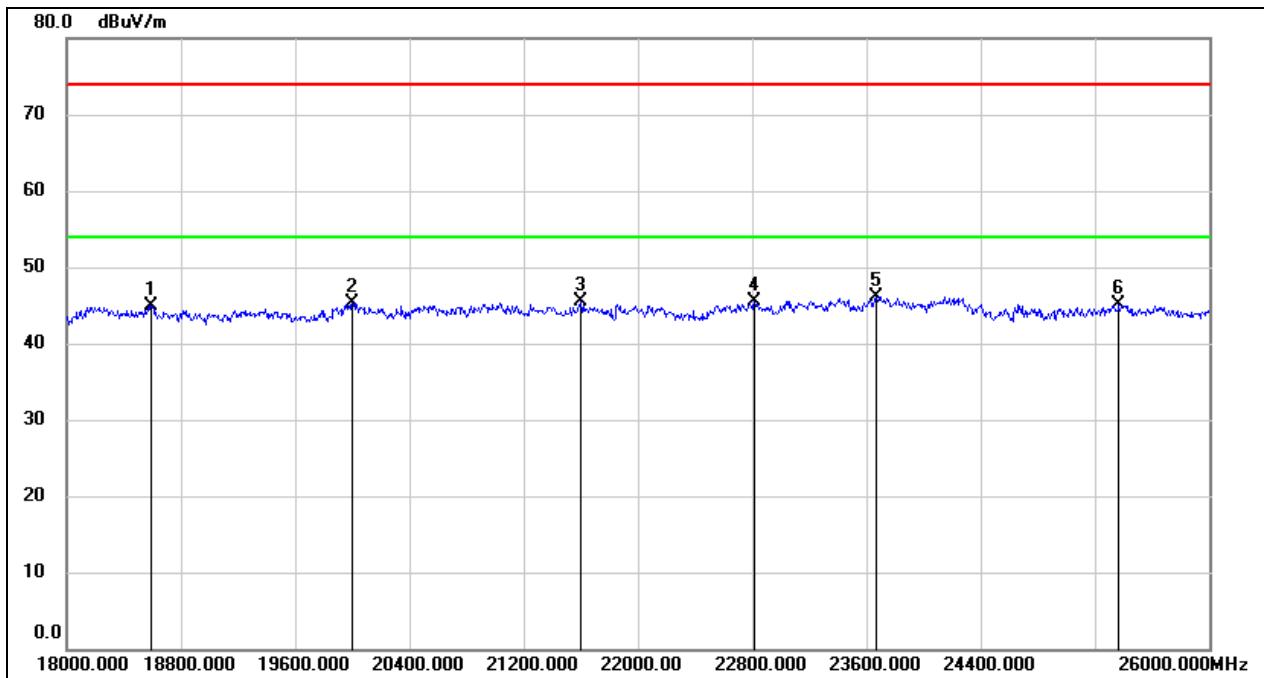
HARMONICS AND SPURIOUS EMISSIONS (CHANNEL 26, VERTICAL)

No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	3270.000	51.52	-3.70	47.82	74.00	-26.18	peak
2	4950.000	52.07	1.71	53.78	74.00	-20.22	peak
3	9330.000	37.77	10.57	48.34	74.00	-25.66	peak
4	12285.000	34.95	16.08	51.03	74.00	-22.97	peak
5	14820.000	33.78	17.91	51.69	74.00	-22.31	peak
6	17685.000	29.36	23.36	52.72	74.00	-21.28	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 the spurious frequency bands and the authorized band was not corrected for High Pass Filter losses.
5. Proper operation of the transmitter prior to adding the filter to the measurement chain.
6. *-indicates frequency out of 47CFR Pt 15 / ISED RSS-Restricted band.

8.4. SPURIOUS EMISSIONS (18 GHz ~ 26 GHz)

SPURIOUS EMISSIONS (LOW CHANNEL, WORST-CASE CONFIGURATION, HORIZONTAL)

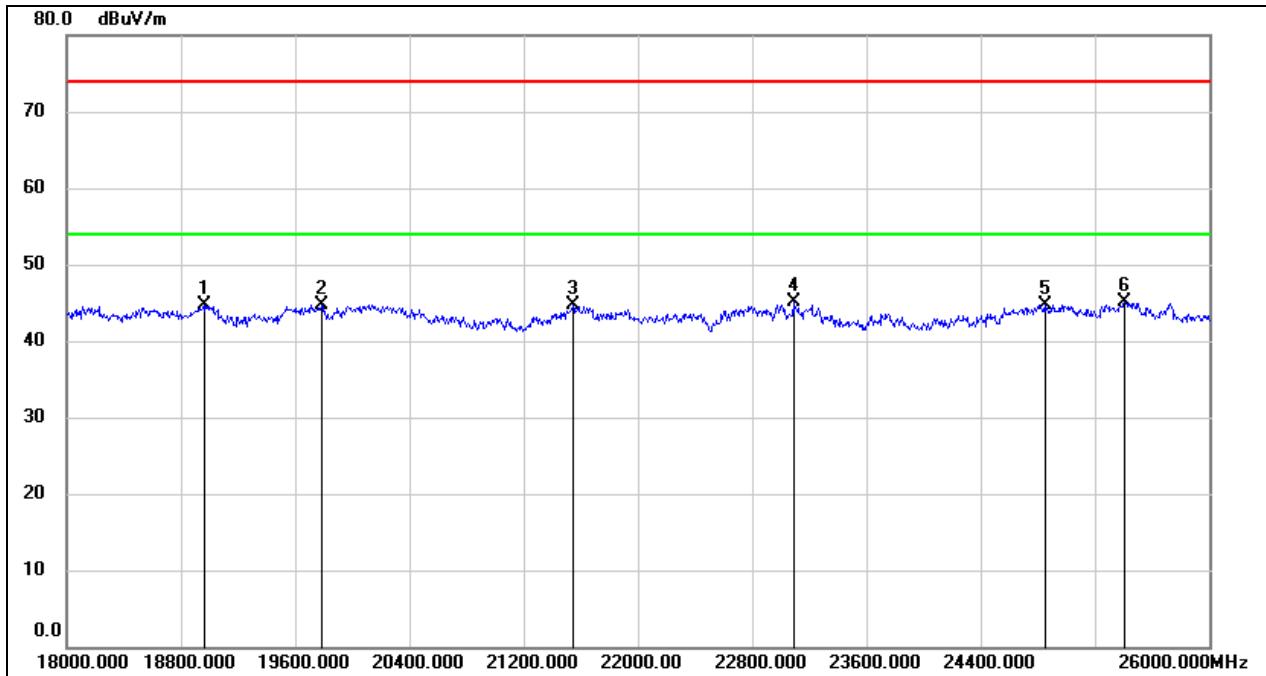


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	18592.000	50.25	-5.31	44.94	74.00	-29.06	peak
2	20000.000	50.81	-5.45	45.36	74.00	-28.64	peak
3	21600.000	50.02	-4.54	45.48	74.00	-28.52	peak
4	22816.000	49.16	-3.63	45.53	74.00	-28.47	peak
5	23664.000	49.32	-3.18	46.14	74.00	-27.86	peak
6	25368.000	46.73	-1.72	45.01	74.00	-28.99	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.

SPURIOUS EMISSIONS (LOW CHANNEL, WORST-CASE CONFIGURATION, VERTICAL)

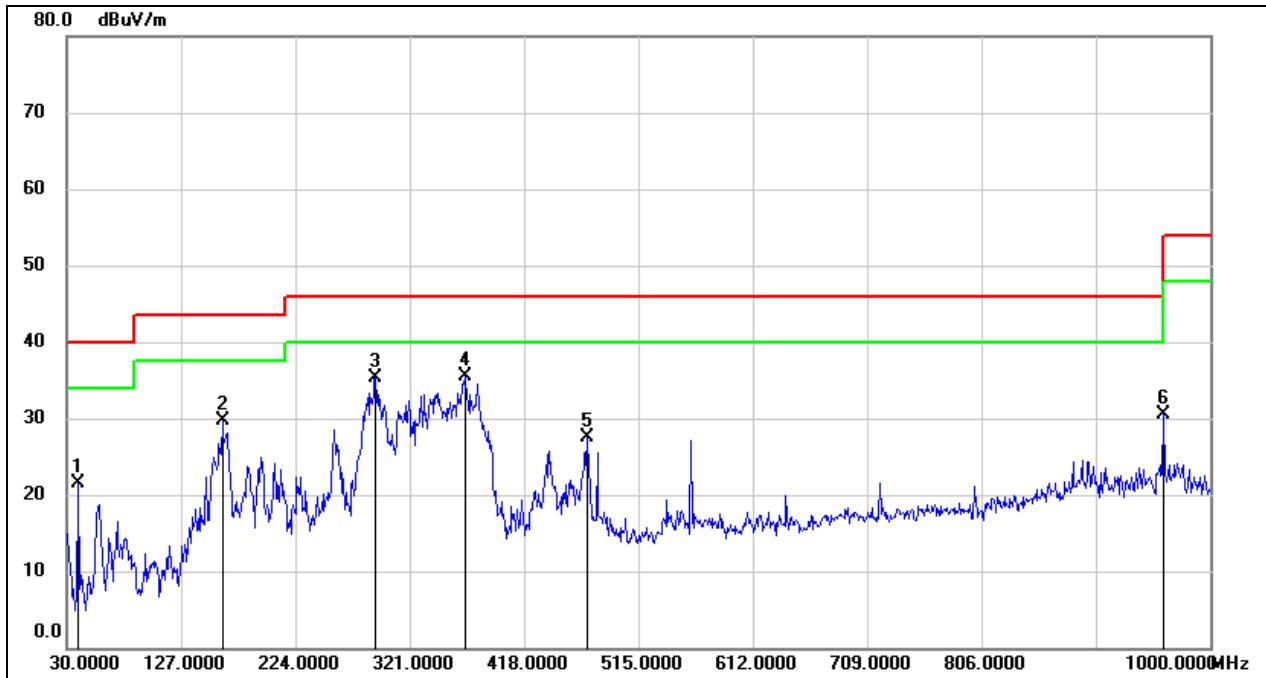
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	18960.000	50.01	-5.25	44.76	74.00	-29.24	peak
2	19784.000	50.07	-5.28	44.79	74.00	-29.21	peak
3	21544.000	49.26	-4.63	44.63	74.00	-29.37	peak
4	23088.000	48.52	-3.41	45.11	74.00	-28.89	peak
5	24848.000	46.96	-2.23	44.73	74.00	-29.27	peak
6	25408.000	46.78	-1.73	45.05	74.00	-28.95	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.

Note: All the channels have been tested, only the worst data was recorded in the report.

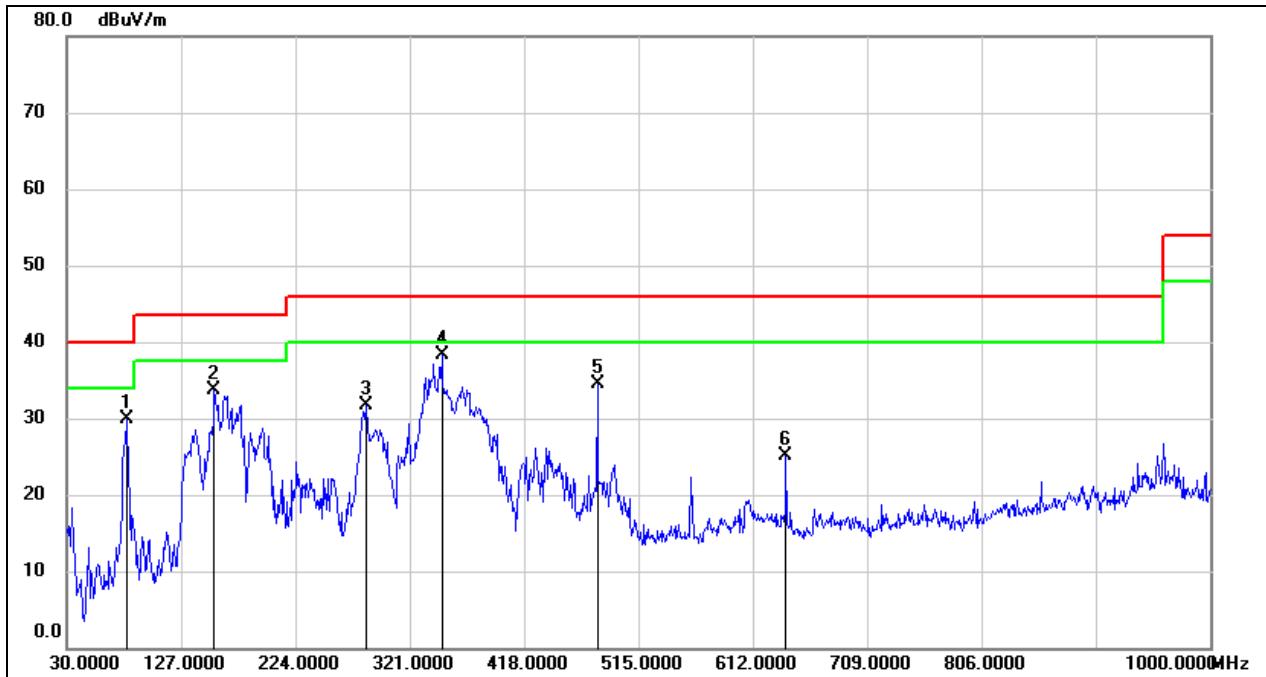
8.5. SPURIOUS EMISSIONS (30 MHz ~ 1 GHz)

SPURIOUS EMISSIONS (LOW CHANNEL, WORST-CASE CONFIGURATION, HORIZONTAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	39.7000	41.45	-19.96	21.49	40.00	-18.51	QP
2	161.9200	47.30	-17.67	29.63	43.50	-13.87	QP
3	291.9000	51.15	-15.80	35.35	46.00	-10.65	QP
4	367.5600	49.56	-14.00	35.56	46.00	-10.44	QP
5	471.3500	39.44	-12.00	27.44	46.00	-18.56	QP
6	960.2300	35.05	-4.54	30.51	54.00	-23.49	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 (LOW CHANNEL, WORST-CASE CONFIGURATION, VERTICAL)

No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	80.4400	51.33	-21.38	29.95	40.00	-10.05	QP
2	155.1300	51.73	-18.01	33.72	43.50	-9.78	QP
3	284.1400	47.97	-16.36	31.61	46.00	-14.39	QP
4	348.1600	52.62	-14.34	38.28	46.00	-7.72	QP
5	480.0800	46.23	-11.79	34.44	46.00	-11.56	QP
6	640.1300	34.18	-9.03	25.15	46.00	-20.85	QP

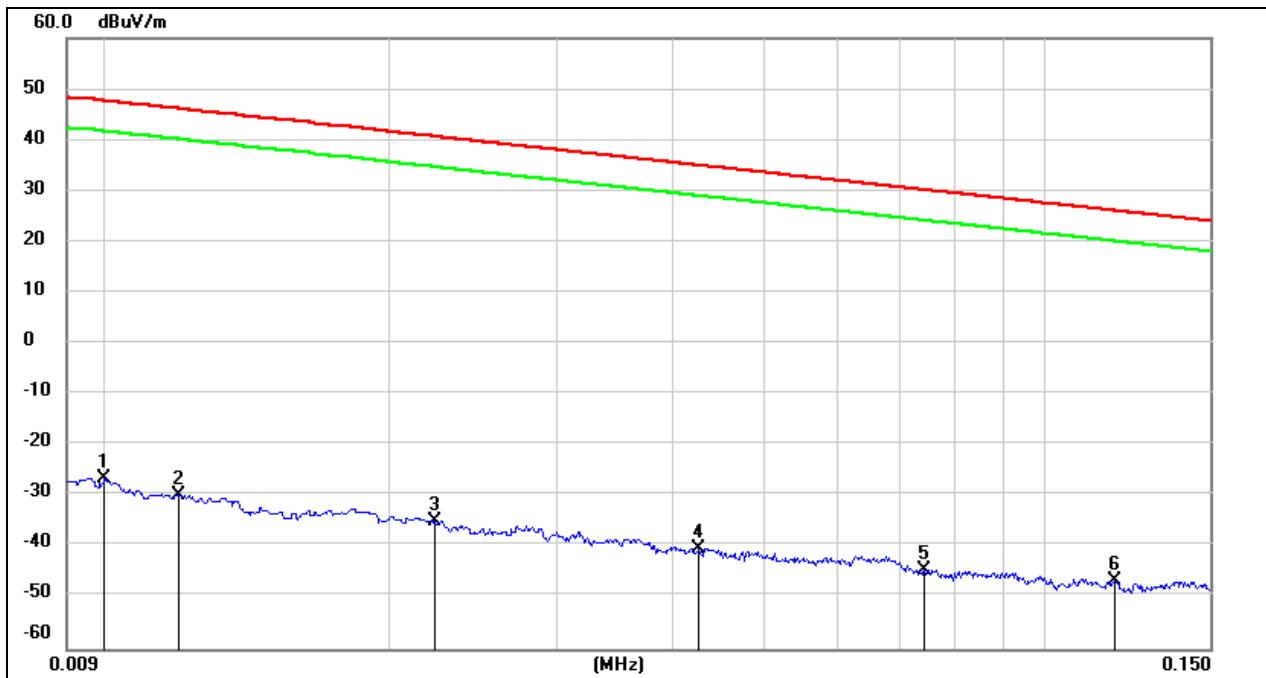
Note: 1. Result Level = Read Level + Correct Factor.
2. If Peak Result complies with QP limit, QP Result is deemed to comply with QP limit.
3. Test setup: RBW: 120 kHz, VBW: 300 kHz, Sweep time: auto

Note: All the channels have been tested, only the worst data was recorded in the report.

8.6. SPURIOUS EMISSIONS BELOW 30 MHz

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

9 kHz~ 150 kHz

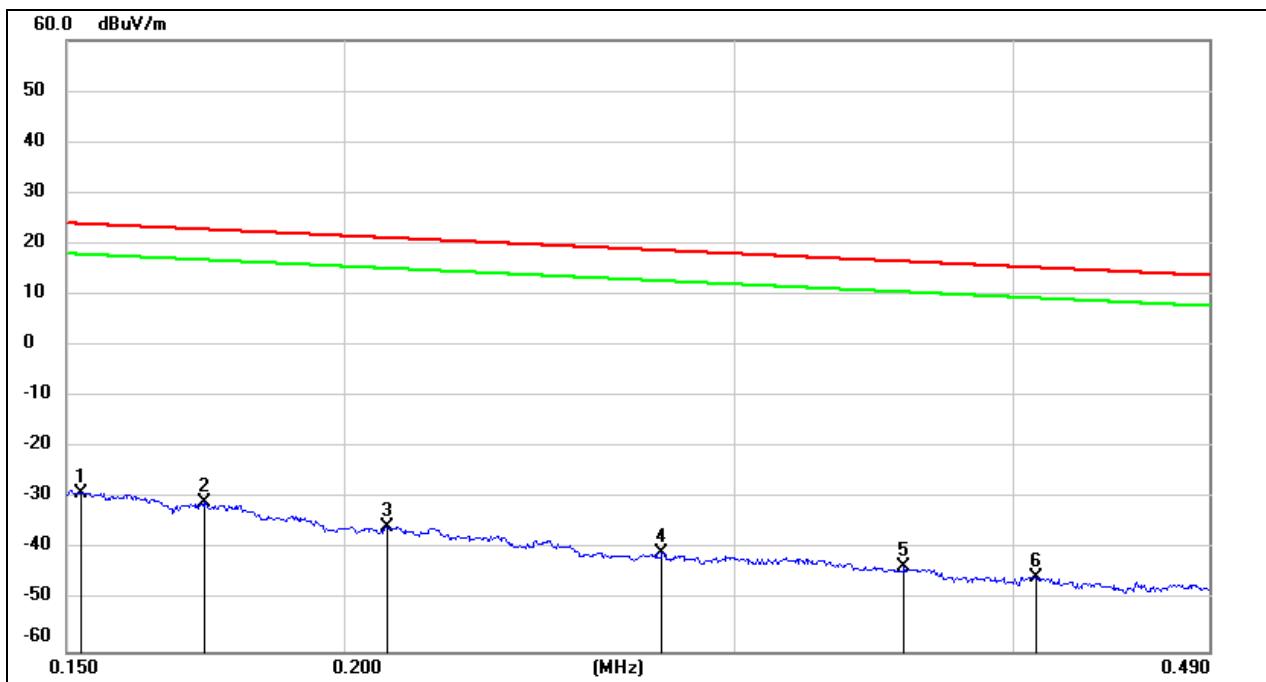


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	FCC Result (dBuV/m)	FCC Limit (dBuV/m)	ISED Result (dBuA/m)	ISED Limit (dBuA/m)	Margin (dB)	Remark
1	0.0100	74.72	-101.40	-26.68	47.6	-78.18	-3.90	-74.28	peak
2	0.0119	71.66	-101.39	-29.73	46.09	-81.23	-5.41	-75.82	peak
3	0.0223	66.29	-101.35	-35.06	40.63	-86.56	-10.87	-75.69	peak
4	0.0427	61.14	-101.45	-40.31	34.99	-91.81	-16.51	-75.30	peak
5	0.0743	57.08	-101.59	-44.51	30.18	-96.01	-21.32	-74.69	peak
6	0.1188	55.06	-101.74	-46.68	26.11	-98.18	-25.39	-72.79	peak

Note: 1. Measurement = Reading Level + Correct Factor (dBuA/m= dBuV/m- 20Log10[120π] = dBuV/m- 51.5).

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.

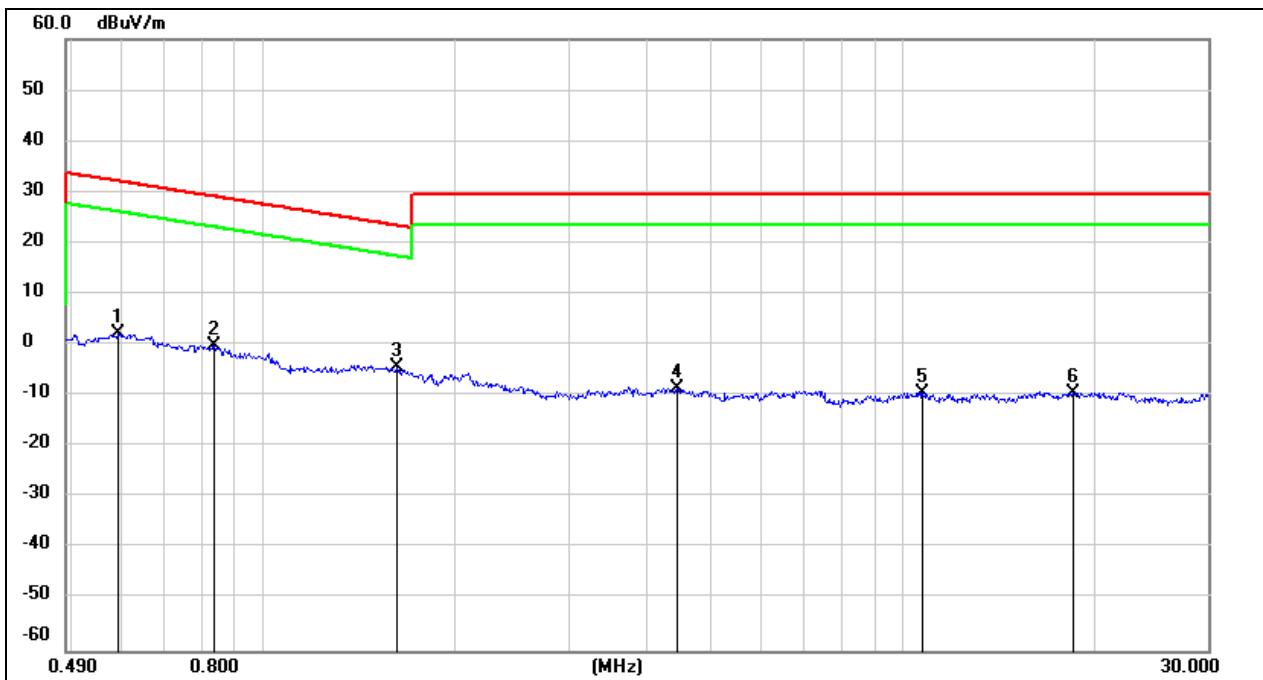
150 kHz ~ 490 kHz

No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	FCC Result (dBuV/m)	FCC Limit (dBuV/m)	ISED Result (dBuA/m)	ISED Limit (dBuA/m)	Margin (dB)	Remark
1	0.1524	72.80	-101.63	-28.83	23.94	-80.33	-27.56	-52.77	peak
2	0.1731	70.96	-101.67	-30.71	22.84	-82.21	-28.66	-53.55	peak
3	0.2091	66.32	-101.73	-35.41	21.19	-86.91	-30.31	-56.60	peak
4	0.2782	61.29	-101.83	-40.54	18.71	-92.04	-32.79	-59.25	peak
5	0.3573	58.58	-101.91	-43.33	16.54	-94.83	-34.96	-59.87	peak
6	0.4097	56.52	-101.97	-45.45	15.35	-96.95	-36.15	-60.80	peak

Note: 1. Measurement = Reading Level + Correct Factor (dBuA/m= dBuV/m- $20\log_{10}[120\pi]$ = dBuV/m- 51.5).

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.

490 kHz ~ 30 MHz

No.	Frequency	Reading	Correct	FCC Result	FCC Limit	ISED Result	ISED Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dBuA/m)	(dBuA/m)	(dB)	
1	0.5917	64.24	-62.08	2.16	32.16	-49.34	-19.34	-30.00	peak
2	0.8366	62.12	-62.17	-0.05	29.15	-51.55	-22.35	-29.20	peak
3	1.6149	57.62	-62.00	-4.38	23.44	-55.88	-28.06	-27.82	peak
4	4.4443	52.79	-61.40	-8.61	29.54	-60.11	-21.96	-38.15	peak
5	10.7299	51.48	-60.83	-9.35	29.54	-60.85	-21.96	-38.89	peak
6	18.4908	51.55	-60.89	-9.34	29.54	-60.84	-21.96	-38.88	peak

Note: 1. Measurement = Reading Level + Correct Factor (dBuA/m= dBuV/m- 20Log10[120π] = dBuV/m- 51.5).

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 the channels have been tested, only the worst data was recorded in the report.

9. AC POWER LINE CONDUCTED EMISSIONS

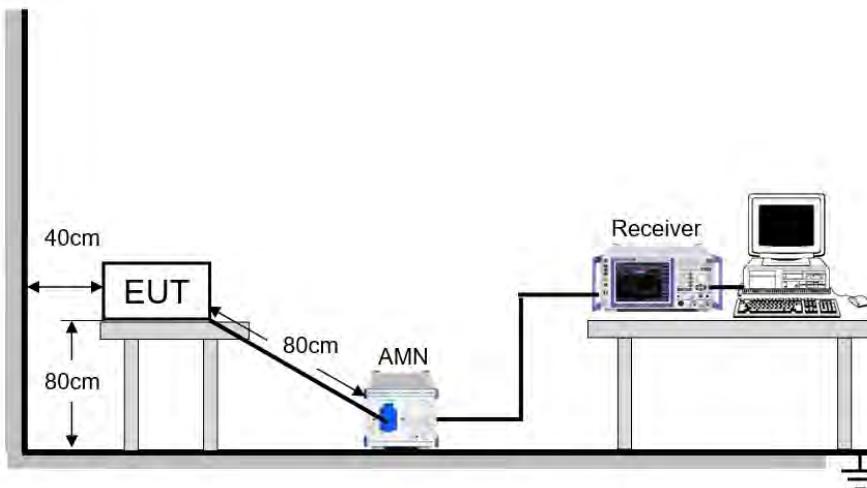
LIMITS

Please refer to CFR 47 FCC §15.207 (a) and ISED RSS-Gen Clause 8.8

FREQUENCY (MHz)	Quasi-peak	Average
0.15 -0.5	66 - 56 *	56 - 46 *
0.50 -5.0	56.00	46.00
5.0 -30.0	60.00	50.00

TEST SETUP AND PROCEDURE

Refer to ANSI C63.10-2013 clause 6.2.

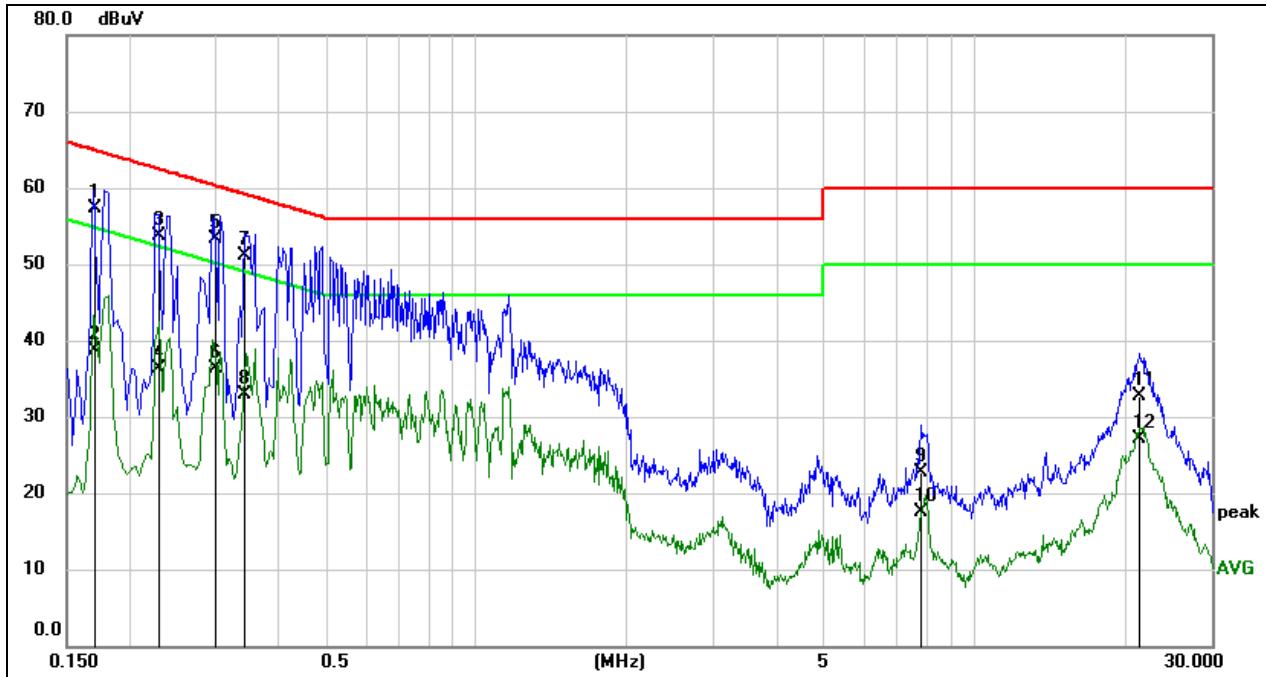


The EUT is put on a table of non-conducting material that is 80 cm high. The vertical conducting wall of shielding is located 40 cm to the rear of the EUT. The power line of the EUT is connected to the AC mains through a Artificial Mains Network (A.M.N.). A EMI Measurement Receiver (R&S Test Receiver ESR3) is used to test the emissions from both sides of AC line. According to the requirements in Section 6.2 of ANSI C63.10-2013. Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30 MHz using CISPR Quasi-Peak and average detector mode. The bandwidth of EMI test receiver is set at 9 kHz.

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.

TEST ENVIRONMENT

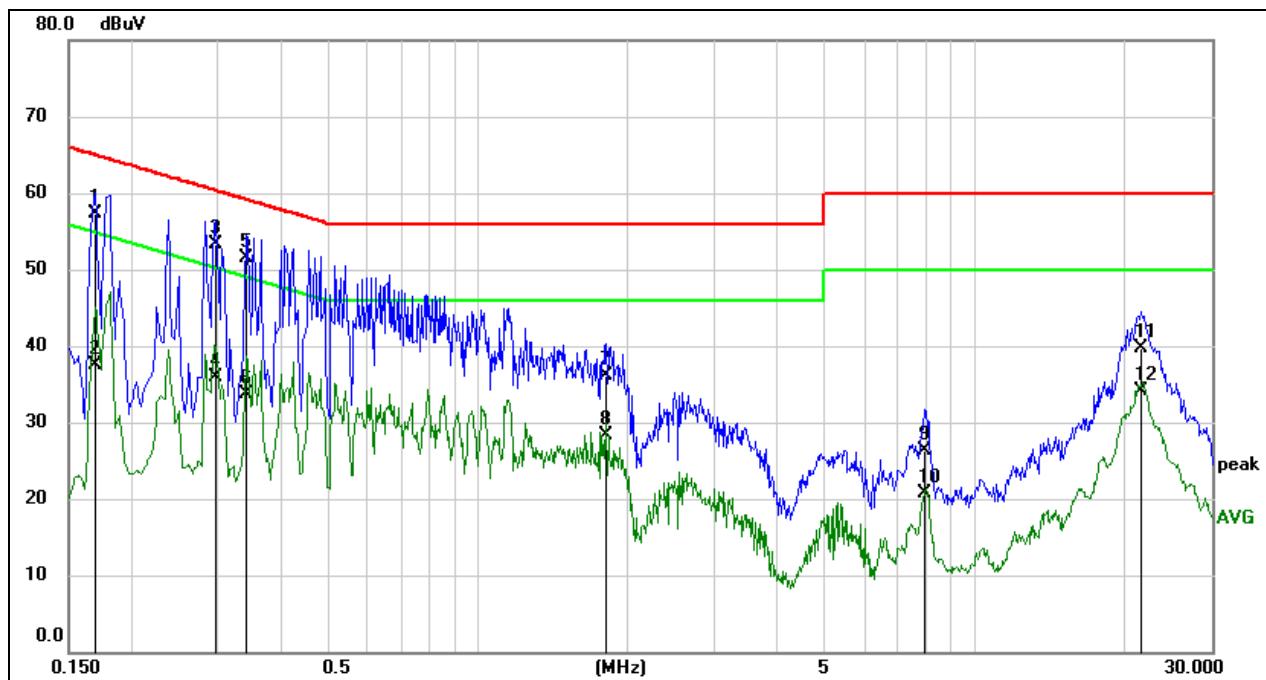
Temperature	26.3 °C	Relative Humidity	48.2 %
Atmosphere Pressure	101 kPa	Test Voltage	AC120 V,60 Hz

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

No.	Frequency (MHz)	Reading (dBuV)	Correct (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	0.1709	47.81	9.59	57.40	64.92	-7.52	QP
2	0.1709	29.05	9.59	38.64	54.92	-16.28	AVG
3	0.2302	44.07	9.59	53.66	62.44	-8.78	QP
4	0.2302	26.75	9.59	36.34	52.44	-16.10	AVG
5	0.2999	43.65	9.59	53.24	60.25	-7.01	QP
6	0.2999	26.66	9.59	36.25	50.25	-14.00	AVG
7	0.3407	41.51	9.59	51.10	59.19	-8.09	QP
8	0.3407	23.33	9.59	32.92	49.19	-16.27	AVG
9	7.8795	13.19	9.61	22.80	60.00	-37.20	QP
10	7.8795	7.96	9.61	17.57	50.00	-32.43	AVG
11	21.5874	23.05	9.75	32.80	60.00	-27.20	QP
12	21.5874	17.35	9.75	27.10	50.00	-22.90	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: 80 Hz (0.009 MHz ~ 0.15 MHz), 4 kHz (0.15 MHz ~ 30 MHz), 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	0.1699	47.64	9.59	57.23	64.97	-7.74	QP
2	0.1699	27.89	9.59	37.48	54.97	-17.49	AVG
3	0.2982	43.75	9.59	53.34	60.29	-6.95	QP
4	0.2982	26.22	9.59	35.81	50.29	-14.48	AVG
5	0.3412	41.98	9.59	51.57	59.17	-7.60	QP
6	0.3412	24.06	9.59	33.65	49.17	-15.52	AVG
7	1.8135	26.39	9.62	36.01	56.00	-19.99	QP
8	1.8135	18.73	9.62	28.35	46.00	-17.65	AVG
9	7.9560	16.64	9.61	26.25	60.00	-33.75	QP
10	7.9560	11.10	9.61	20.71	50.00	-29.29	AVG
11	21.6929	29.81	9.86	39.67	60.00	-20.33	QP
12	21.6929	24.15	9.86	34.01	50.00	-15.99	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: 80 Hz (0.009 MHz ~ 0.15 MHz), 4 kHz (0.15 MHz ~ 30 MHz), Scan time: auto.

Note: All the modes and channels had been tested, but only the worst data was 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.

RESULTS

Complies

11. APPENDIX

11.1. Appendix A: DTS Bandwidth

11.1.1. Test Result

Test Mode	Antenna	Channel	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
ZIGBEE	Ant1	2405	1.620	2404.175	2405.795	0.5	PASS
		2445	1.740	2444.170	2445.910	0.5	PASS
		2470	1.575	2469.200	2470.775	0.5	PASS
		2475	1.745	2474.150	2475.895	0.5	PASS
		2480	1.630	2479.170	2480.800	0.5	PASS

11.1.2. Test Graphs



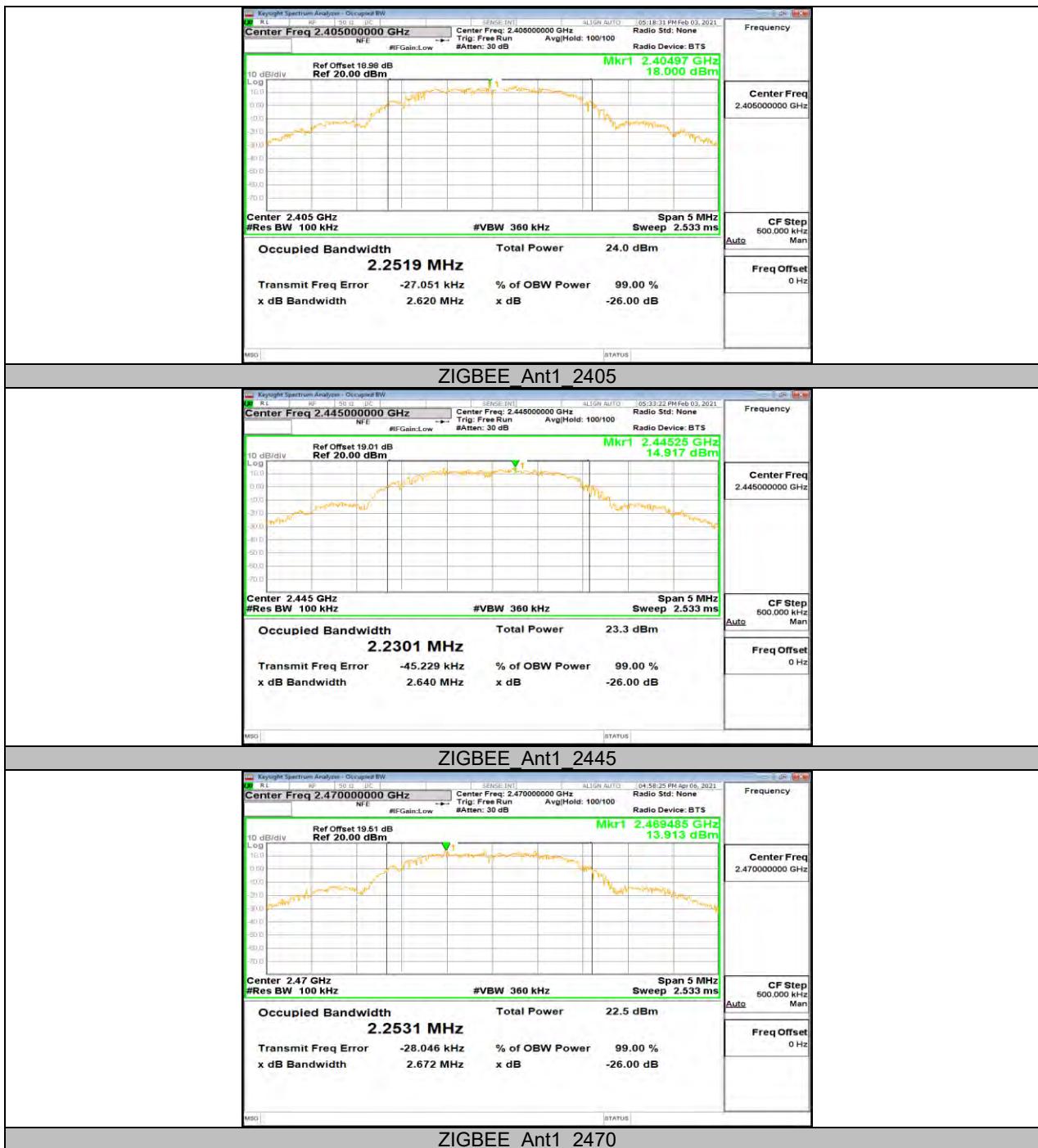


11.2. Appendix B: Occupied Channel Bandwidth

11.2.1. Test Result

Test Mode	Antenna	Channel	OCB [MHz]	FL[MHz]	FH[MHz]	Verdict
ZIGBEE	Ant1	2405	2.2519	2403.847	2406.099	PASS
		2445	2.2301	2443.840	2446.070	PASS
		2470	2.2531	2468.845	2471.099	PASS
		2475	2.2391	2473.836	2476.075	PASS
		2480	2.2700	2478.827	2481.097	PASS

11.2.2. Test Graphs





11.3. Appendix C: Maximum conducted output power

11.3.1. Test Result

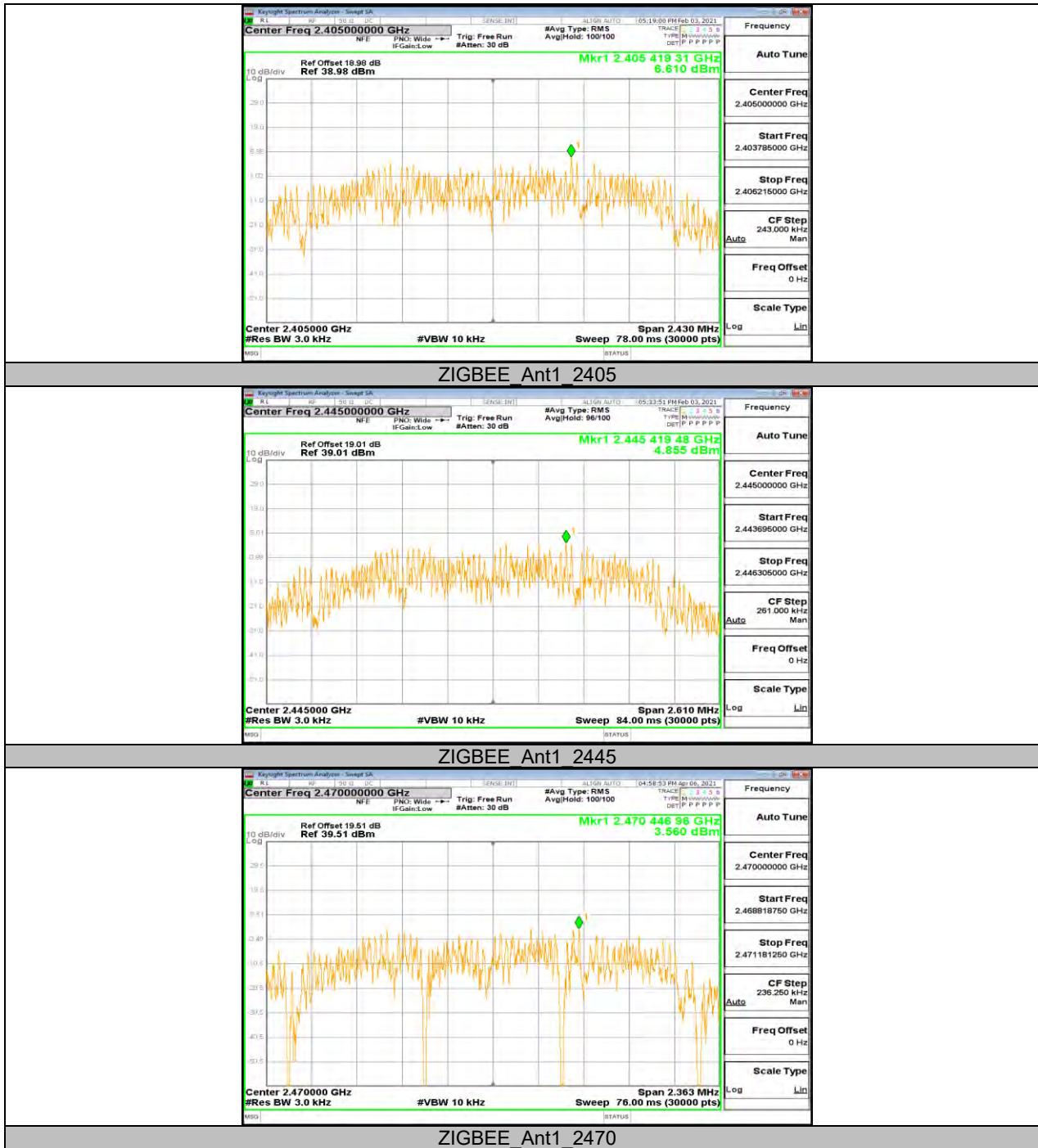
Test Mode	Antenna	Channel	Result[dBm]	Limit[dBm]	Verdict
ZIGBEE	Ant1	2405	19.36	<=30	PASS
		2445	18.35	<=30	PASS
		2470	17.57	<=30	PASS
		2475	16.49	<=30	PASS
		2480	8.36	<=30	PASS

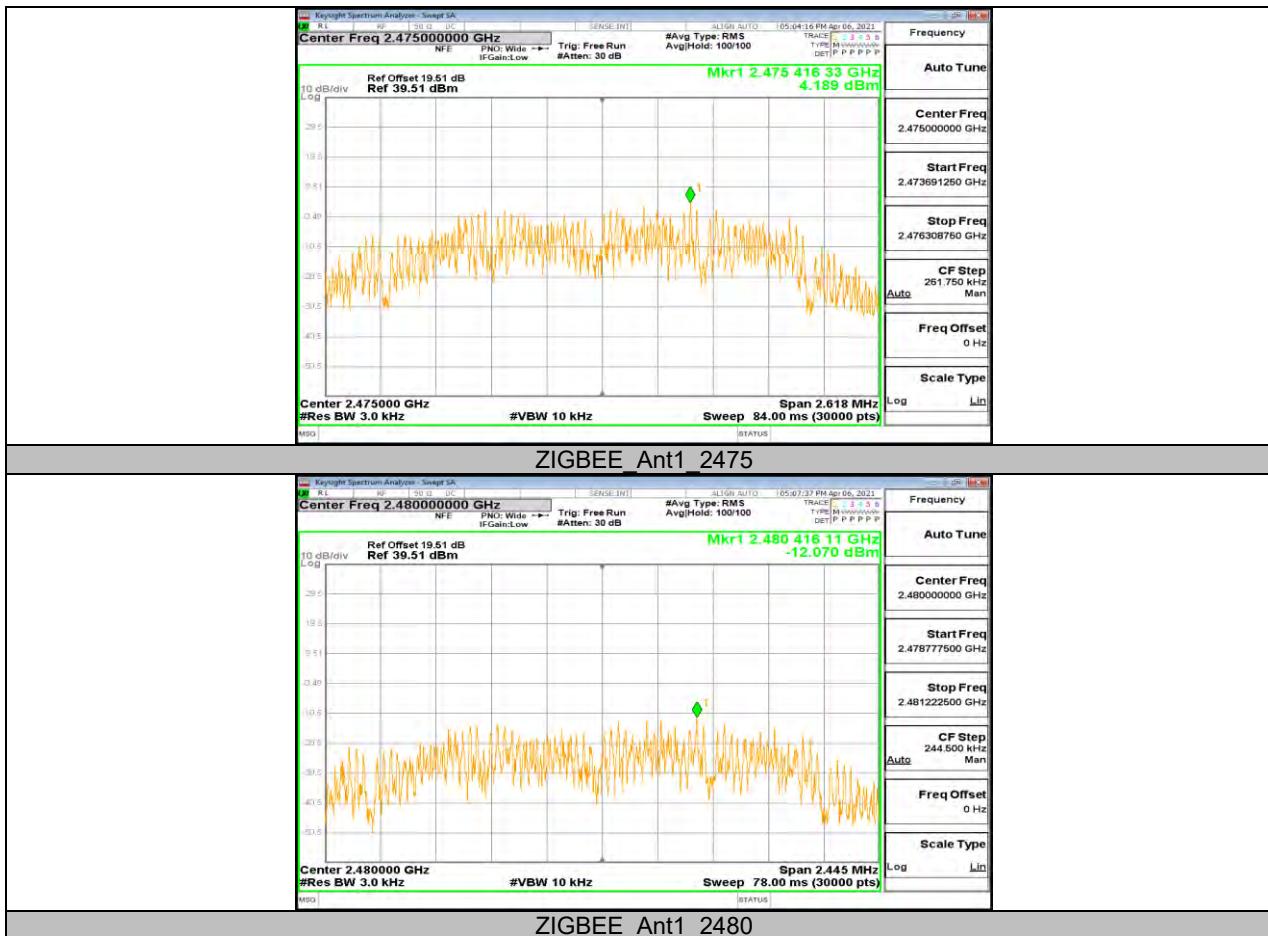
11.4. Appendix D: Maximum power spectral density

11.4.1. Test Result

Test Mode	Antenna	Channel	Result[dBm/3kHz]	Limit[dBm/3kHz]	Verdict
ZIGBEE	Ant1	2405	6.61	<=8	PASS
		2445	4.86	<=8	PASS
		2470	3.56	<=8	PASS
		2475	4.19	<=8	PASS
		2480	-12.07	<=8	PASS

11.4.2. Test Graphs





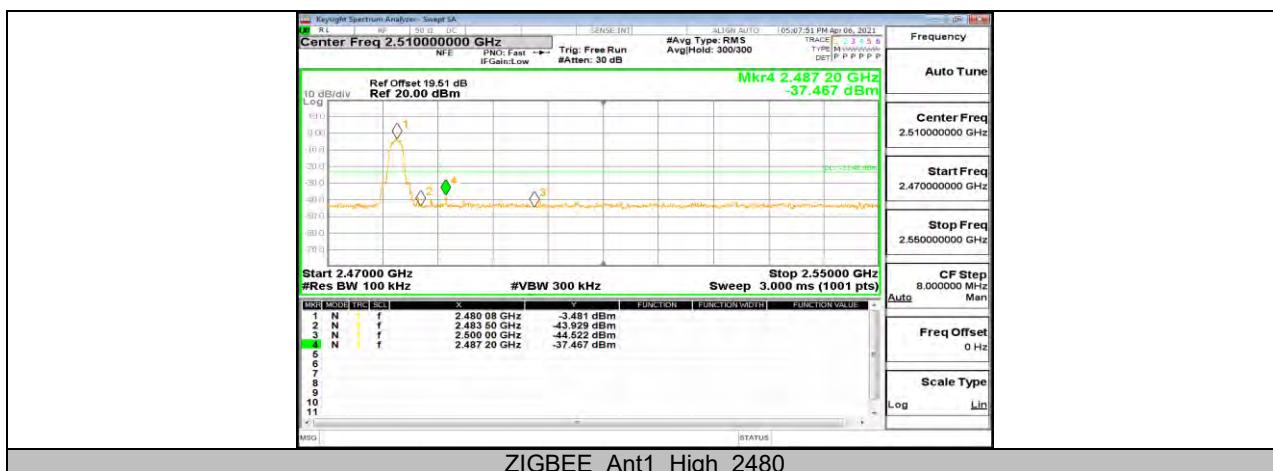
11.5. Appendix E: Band edge measurements

11.5.1. Test Result

Test Mode	Antenna	ChName	Channel	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
ZIGBEE	Ant1	Low	2405	14.68	-40.11	<=-5.32	PASS
		High	2470	12.98	-40.4	<=-7.02	PASS
			2475	11.38	-40.77	<=-8.62	PASS
			2480	-3.48	-37.47	<=-23.48	PASS

11.5.2. Test Graphs



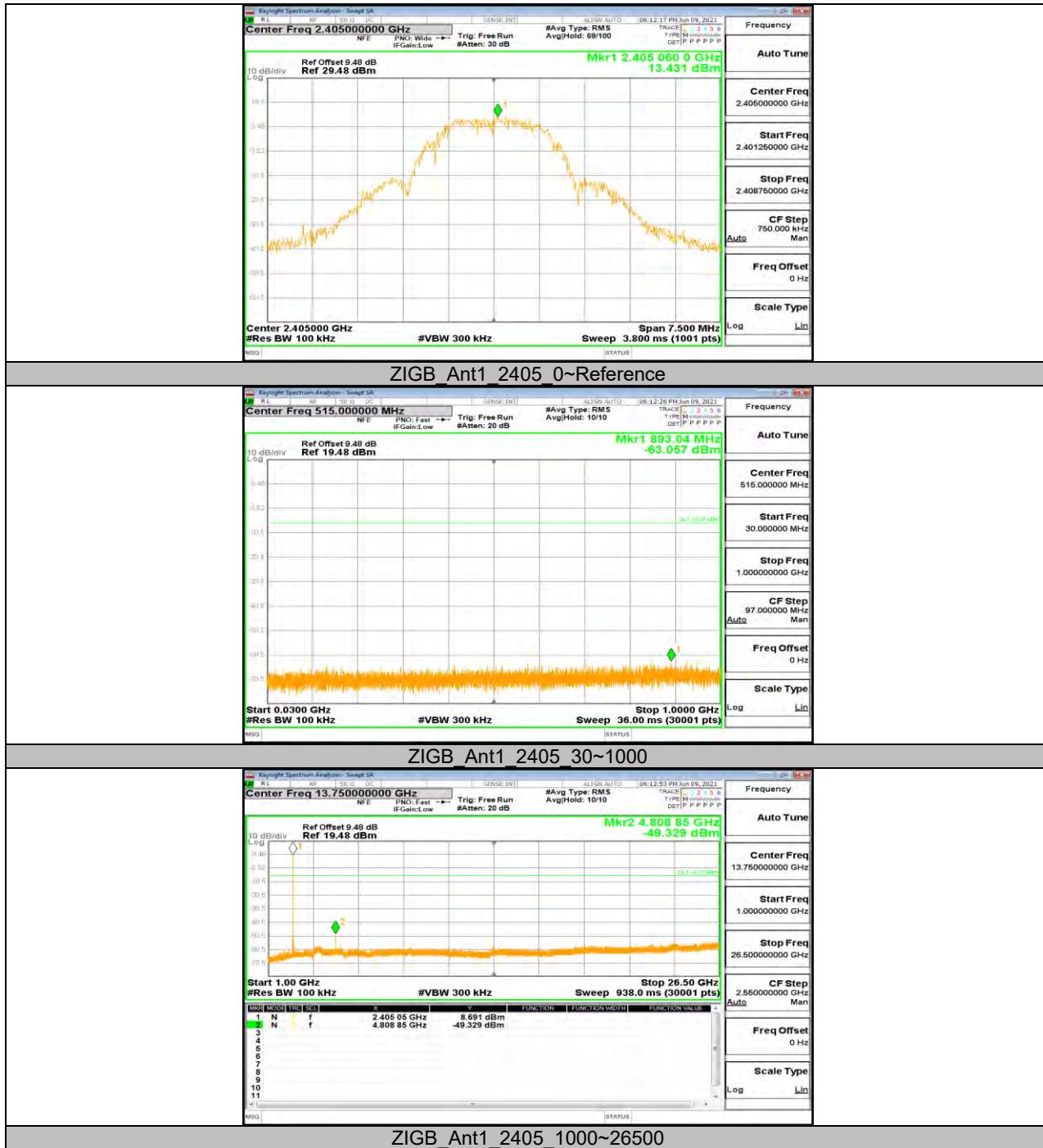


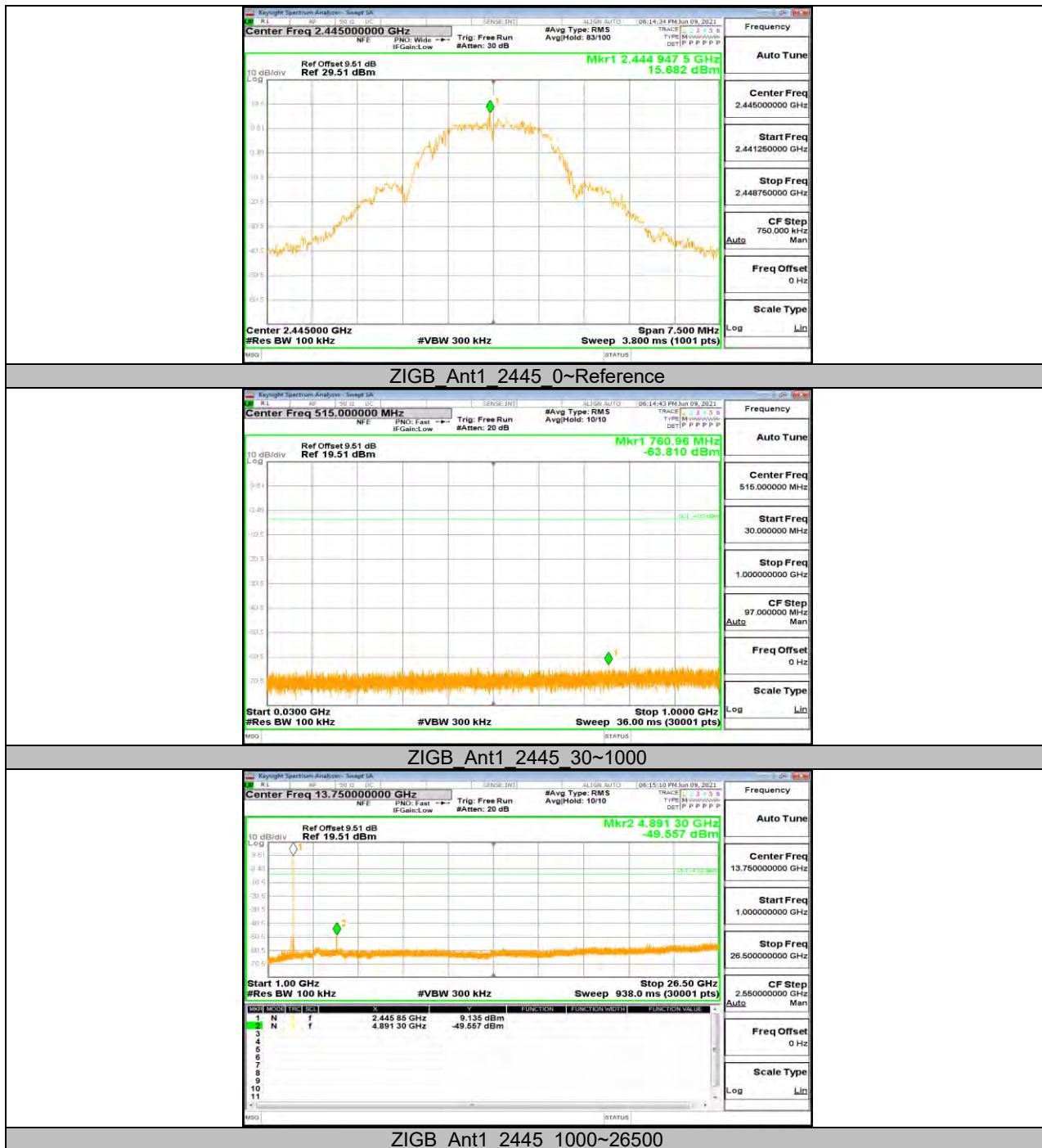
11.6. Appendix F: Conducted Spurious Emission

11.6.1. Test Result

Test Mode	Antenna	Channel	Freq Range [MHz]	RefLevel [dBm]	Result[dBm]	Limit[dBm]	Verdict
ZIGBEE	Ant1	2405	Reference	13.43	13.43	---	PASS
			30~1000	13.43	-63.06	<=-6.57	PASS
			1000~26500	13.43	-49.33	<=-6.57	PASS
		2445	Reference	15.68	15.68	---	PASS
			30~1000	15.68	-63.81	<=-4.32	PASS
			1000~26500	15.68	-49.56	<=-4.32	PASS
		2470	Reference	13.53	13.53	---	PASS
			30~1000	13.53	-63.25	<=-6.48	PASS
			1000~26500	13.53	-51.37	<=-6.48	PASS
		2475	Reference	12.41	12.41	---	PASS
			30~1000	12.41	-63.17	<=-7.59	PASS
			1000~26500	12.41	-49.56	<=-7.59	PASS
		2480	Reference	11.92	11.92	---	PASS
			30~1000	11.92	-63.21	<=-8.08	PASS
			1000~26500	11.92	-50.82	<=-8.08	PASS

11.6.1. Test Graphs











11.7. Appendix G: Duty Cycle

11.7.1. Test Result

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)
ZIGBEE	2.82	22.93	0.1230	12.30	9.10	0.35	0.5

Note:

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

Where: x is Duty Cycle (Linear)

Where: T is On Time

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

11.7.2. Test Graphs



END OF REPORT