

**CFR 47 FCC PART 15 SUBPART C
ISED RSS-210 ISSUE 10**

TEST REPORT

For

EcoFlow OCEAN Smart Electrical Panel

MODEL NUMBER: EF-SHP-40

REPORT NUMBER: 4791873934.1-1

ISSUE DATE: July 30, 2025

**FCC ID: 2A2P9-HLKLD1039
IC: 27618-HLKLD1039**

Prepared for

EcoFlow Inc.

**RM 401, Plant #1, Runheng Industrial Zone, Fuhai Street, Bao'an District,
Shenzhen, 518000, China**

Prepared by

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

**Room 101, Building 2, No.4, Information Road, Songshan Lake, Dongguan,
Guangdong, China**

Tel: +86 769 22038881

Fax: +86 769 33244054

Website: www.ul.com

Revision History

Rev.	Issue Date	Revisions	Revised By
V0	July 30, 2025	Initial Issue	

Summary of Test Results			
Clause	Test Items	FCC/IC Rules	Test Results
1	20dB Bandwidth	CFR 47 FCC §15.215	Pass
2	99%dB Bandwidth	RSS-Gen Clause 6.7	Pass
3	Field Strength and Radiated Spurious Emissions	CFR 47 FCC §15.245 (b) ISED RSS-210 Annex F.1 CFR 47 FCC §15.205 and §15.209 RSS-GEN Clause 8.9 RSS-GEN Clause 8.10	Pass
4	Conducted Emission Test for AC Power Port	CFR 47 FCC §15.207 RSS-GEN Clause 8.8	Pass
5	Antenna Requirement	CFR 47 FCC §15.203 ISED 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. Note 2: The measurement result for the sample received is <Pass> according to < CFR 47 FCC PART 15 SUBPART C, ISED RSS-210 ISSUE 10 > when <Simple Acceptance> decision rule is applied.			

CONTENTS

1. ATTESTATION OF TEST RESULTS.....	5
2. TEST METHODOLOGY.....	6
3. FACILITIES AND ACCREDITATION.....	6
4. CALIBRATION AND UNCERTAINTY	7
4.1. <i>MEASURING INSTRUMENT CALIBRATION</i>	<i>7</i>
4.2. <i>MEASUREMENT UNCERTAINTY</i>	<i>7</i>
5. EQUIPMENT UNDER TEST	8
5.1. <i>DESCRIPTION OF EUT</i>	<i>8</i>
5.2. <i>SUPPORT UNITS FOR SYSTEM TEST.....</i>	<i>9</i>
6. MEASURING EQUIPMENT AND SOFTWARE USED.....	11
7. TEST RESULTS	13
7.1. <i>ON TIME AND DUTY CYCLE</i>	<i>13</i>
7.2. <i>20 DB BANDWIDTH AND 99 % OCCUPIED BANDWIDTH.....</i>	<i>16</i>
7.3. <i>RADIATED TEST RESULTS</i>	<i>19</i>
7.3.1. <i>RESTRICTED BANDEDGE AND FIELD STRENGTH OF FUNDAMENTAL</i>	<i>34</i>
7.3.2. <i>SPURIOUS EMISSIONS(9 kHz~30 MHz).....</i>	<i>36</i>
7.3.3. <i>SPURIOUS EMISSIONS(30 MHz~1 GHz).....</i>	<i>39</i>
7.3.4. <i>SPURIOUS EMISSIONS(1 GHz~18 GHz).....</i>	<i>41</i>
7.3.5. <i>SPURIOUS EMISSIONS(18 GHz~26 GHz).....</i>	<i>43</i>
7.3.6. <i>SPURIOUS EMISSIONS(26 GHz~40 GHz).....</i>	<i>45</i>
7.3.7. <i>SPURIOUS EMISSIONS(40 GHz ~ 60 GHz).....</i>	<i>47</i>
7.3.8. <i>SPURIOUS EMISSIONS(60 GHz ~ 90 GHz).....</i>	<i>48</i>
7.3.9. <i>SPURIOUS EMISSIONS(75 GHz ~ 110 GHz).....</i>	<i>49</i>
7.3.10. <i>WORST-CASE CO-LOCATION</i>	<i>50</i>
8. AC POWER LINE CONDUCTED EMISSION	54
9. ANTENNA REQUIREMENTS	57

1. ATTESTATION OF TEST RESULTS

Applicant Information

Company Name: EcoFlow Inc.
Address: RM 401, Plant #1, Runheng Industrial Zone, Fuhai Street, Bao'an District, Shenzhen, 518000, China

Manufacturer Information

Company Name: EcoFlow Inc.
Address: RM 401, Plant #1, Runheng Industrial Zone, Fuhai Street, Bao'an District, Shenzhen, 518000, China

EUT Description

EUT Name: EcoFlow OCEAN Smart Electrical Panel
Model: EF-SHP-40
Brand Name: ECOFLOW
Sample Status: Normal
Sample ID: 8682812-1
Sample Received Date: July 8, 2025
Date of Tested: July 10~28, 2025

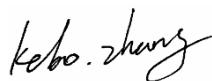
APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
CFR 47 FCC PART 15 SUBPART C	PASS
ISED RSS-210 ISSUE 10	PASS

Prepared By:



James Qin
Project Engineer

Checked By:



Kebo Zhang
Senior Project Engineer

Approved By:



Stephen Guo
Operations Manager

2. TEST METHODOLOGY

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

Note 1:

All tests measurement facilities use to collect the measurement data are located at Room 101, Building 2, No.4, Information Road, Songshan Lake, Dongguan, Guangdong, 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 recognized national standards.

4.2. MEASUREMENT UNCERTAINTY

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

Test Item	Uncertainty
Conduction emission	3.62dB
Radiation Emission test(include Fundamental emission) (9kHz-30MHz)	2.2dB
Radiation Emission test(include Fundamental emission) (30MHz-1GHz)	4.00dB
Radiation Emission test (1GHz to 26GHz)(include Fundamental emission)	5.78dB (1GHz-18Gz) 5.23dB (18GHz-26Gz)
Radiated Emission (Included Fundamental Emission) (40 GHz to 110 GHz)	5.385 dB (40 GHz ~ 60 GHz) 5.320 dB (60 GHz ~ 90 GHz) 5.312 dB (90 GHz ~ 110 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	EcoFlow OCEAN Smart Electrical Panel
Model	EF-SHP-40

Frequency Range:	10.5 ~ 10.55 GHz
Channel Number:	1
Center frequency	10.5268 GHz
Type of Modulation:	CW
Antenna Type:	Linear Antenna
Antenna Gain:	3.33 dBi
Normal Test Voltage:	DC 18 V

5.2. SUPPORT UNITS FOR SYSTEM TEST

SUPPORT EQUIPMENT

Item	Equipment	Brand Name	Model Name	P/N
/	/	/	/	/

I/O CABLES

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

ACCESSORY

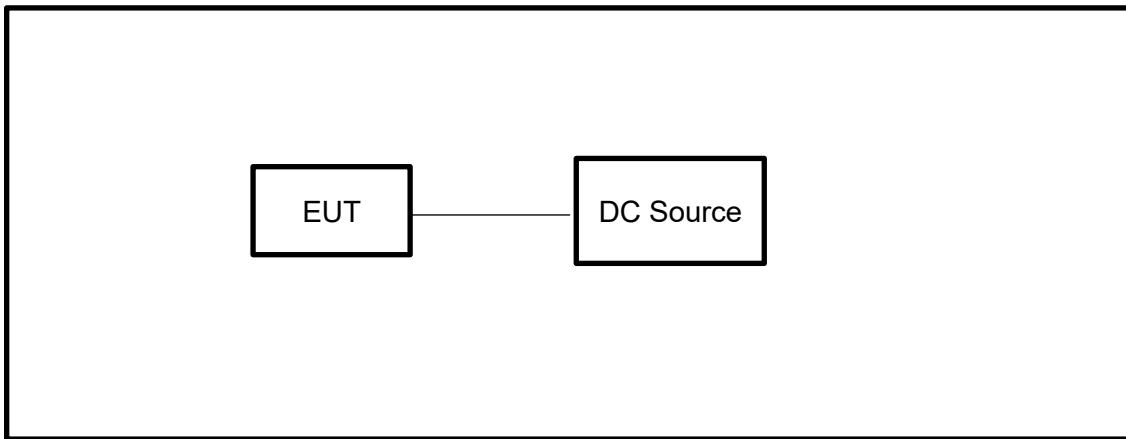
Item	Equipment	Mfr/Brand	Model/Type No.	Specification	Series No.
/	/	/	/	/	/

TEST SETUP

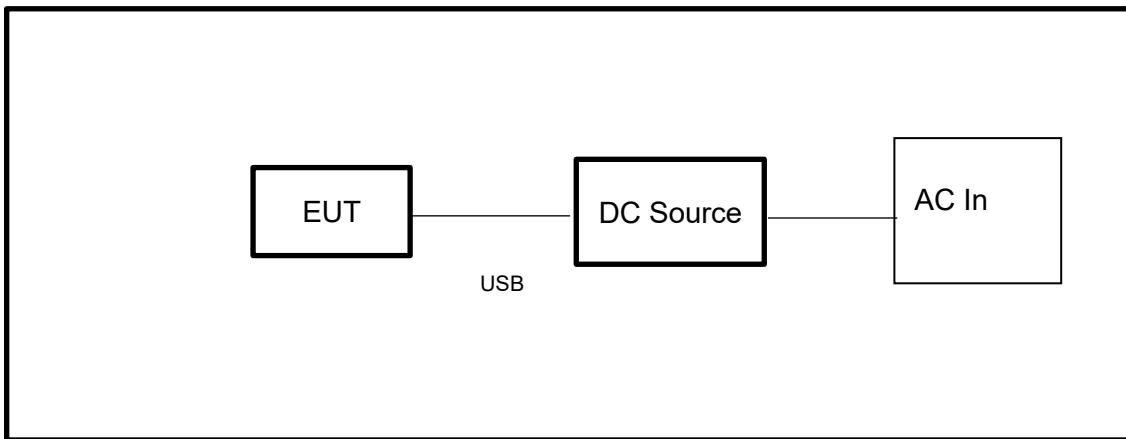
The EUT have the engineer mode inside.

SETUP DIAGRAM FOR TEST

For AC POWER LINE CONDUCTED EMISSION



For AC POWER LINE CONDUCTED EMISSION



6. MEASURING EQUIPMENT AND SOFTWARE USED

Radiated Emissions for below 40 GHz					
Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Due Date
MXE EMI Receiver	KESIGHT	N9038A	MY56400036	Sep.28, 2024	Sep.27, 2025
Hybrid Log Periodic Antenna	TDK	HLP-3003C	130960	June 28, 2024	June.27 2027
Preamplifier	HP	8447D	2944A09099	Sep.28, 2024	Sep.27, 2025
EMI Measurement Receiver	R&S	ESR26	101377	Sep.28, 2024	Sep.27, 2025
Horn Antenna	TDK	HRN-0118	130939	Apr.29, 2022	Apr.28, 2025
Preamplifier	TDK	PA-02-0118	TRS-305-00067	Sep.28, 2024	Sep.27, 2025
Horn Antenna	Schwarzbeck	BBHA9170	697	Jun 30, 2024	Jun 29, 2027
Preamplifier	TDK	PA-02-2	TRS-307-00003	Sep.28, 2024	Sep.27, 2025
Preamplifier	TDK	PA-02-3	TRS-308-00002	Sep.28, 2024	Sep.27, 2025
Loop antenna	Schwarzbeck	1519B	00008	Dec.09, 2024	Dec.08, 2027
Software					
Description		Manufacturer		Name	Version
Test Software for Radiated Emissions		Farad		EZ-EMC	Ver. UL-3A1

Radiated Emissions for above 40GHz					
Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Due. Date
MXA Signal Analyzer	KESIGHT	N9020A	MY54432249	Dec.27,2024	Dec 26,2025
Millimeter Wave Frequency Conversion Receiving Unit and Antenna (40-60GHz)	Tonscend	Tonscend MMFC-R190-L0F0	202305240000	May.14,2024	May.13,2027
Millimeter Wave Frequency Conversion Receiving Unit and Antenna (60-90GHz)	Tonscend	Tonscend MMFC-R120-L0F0	202305240000	May.14,2024	May.13,2027
Millimeter Wave Frequency Conversion Receiving Unit and Antenna (75-110GHz)	Tonscend	Tonscend MMFC-R100-L0F0	202305240000	May.14,2024	May.13,2027

Software			
Description	Manufacturer	Name	Version
mmWave Test Software	Tonscend	JS1120-mmWave Test Software	V1.0

Conducted Emissions					
Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Due Date
EMI Test Receiver	R&S	ESR3	101961	Sep.28, 2024	Sep.27, 2025
Two-Line V-Network	R&S	ENV216	101983	Sep.28, 2024	Sep.27, 2025
Artificial Mains Networks	Schwarzbeck	NSLK 8126	8126465	Sep.28, 2024	Sep.27, 2025

Software			
Description	Manufacturer	Name	Version
Test Software for Conducted Emissions	Farad	EZ-EMC	Ver. UL-3A1

7. TEST RESULTS

7.1. ON TIME AND DUTY CYCLE

LIMITS

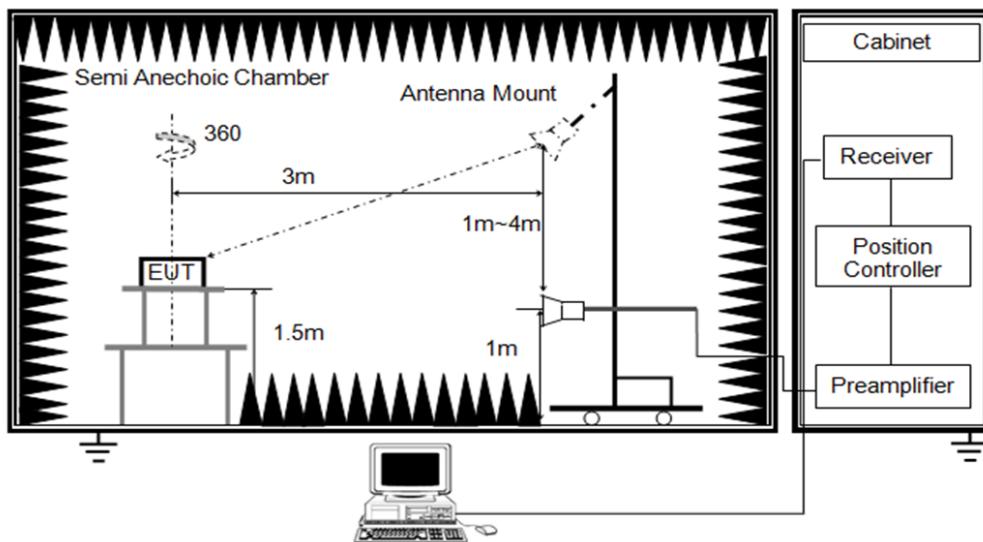
None; for reporting purposes only.

TEST PROCEDURE

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

TEST SETUP

Above 1 GHz



- Set RBW of spectrum analyzer to 8 MHz and VBW to 8 MHz.
- Use a video trigger with the trigger level set to enable triggering only on full pulses.
- Sweep Time is at least a 100 ms.
- Set the center frequency on any frequency would be measure and set the frequency span to zero span.
- Measure the maximum time duration of one single pulse.

TEST ENVIRONMENT

Temperature	23.8°C	Relative Humidity	56%
Atmosphere Pressure	101kPa	Test Voltage	DC 18 V

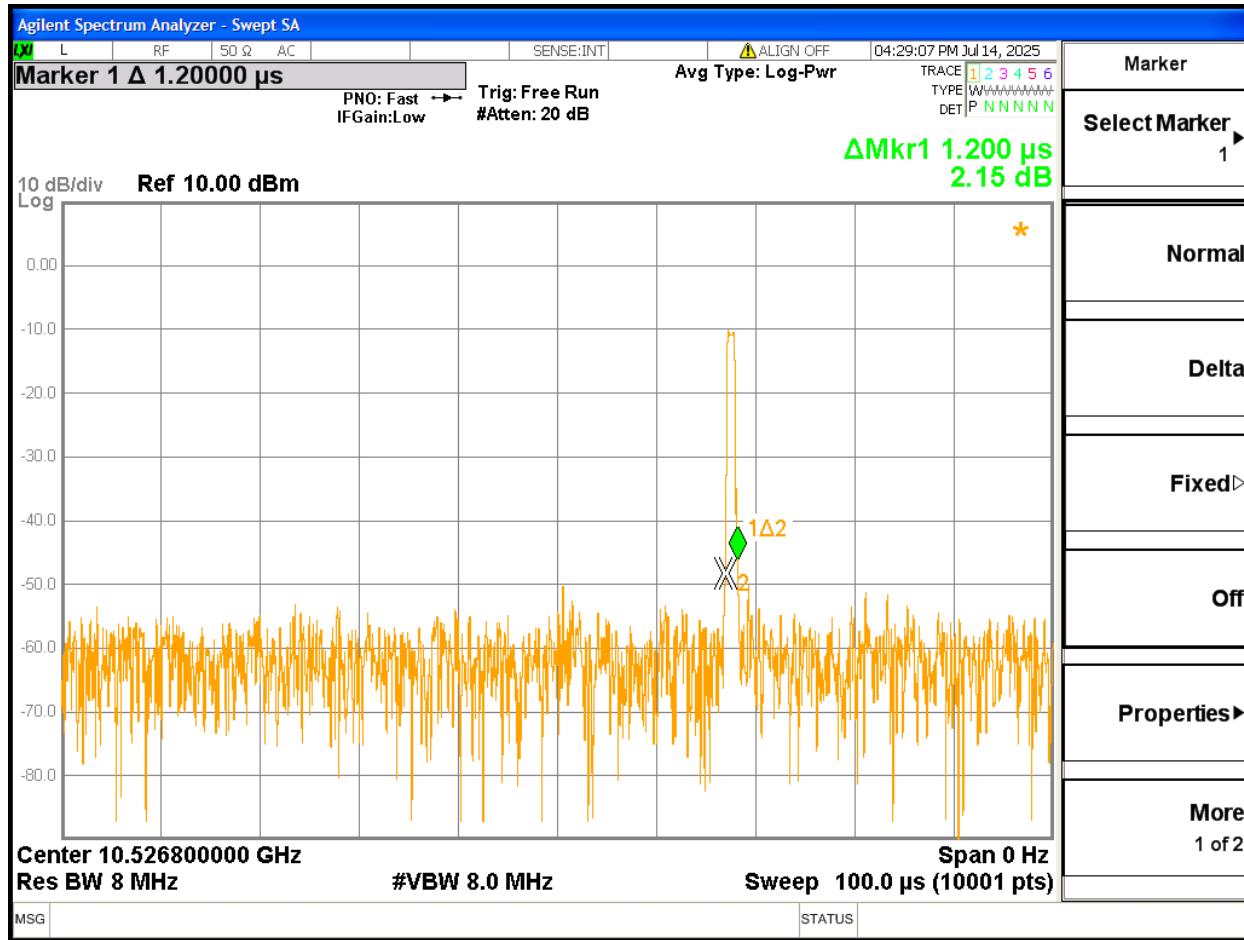
RESULTS

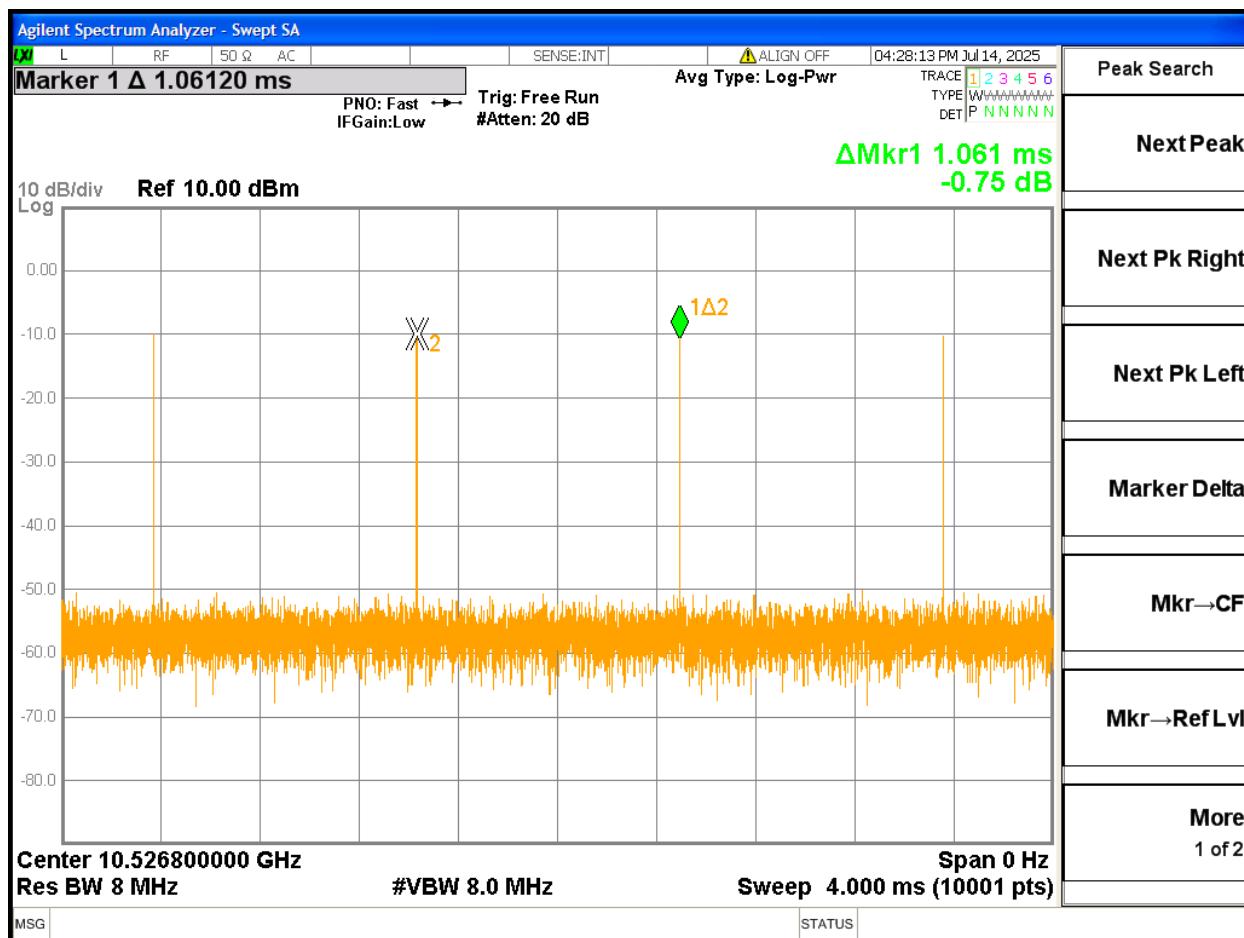
Ton times (ms)	Period (ms)	Duty Cycle (Linear)	Duty Cycle Correction Factor
0.0012	1.061	0.001	-60

Note: Duty Cycle Correction Factor=20log(x).

Where: x is Duty Cycle

Ton



Period
(ms)


7.2. 20 DB BANDWIDTH AND 99 % OCCUPIED BANDWIDTH

LIMITS

CFR 47 FCC §15.215 RSS-Gen Issue 5			
Section	Test Item	Limit	Frequency Range (GHz)
CFR 47 FCC 15.215	20dB Bandwidth	for reporting purposes only	10.5~10.55 GHz
ISED RSS-Gen Clause 6.7 Issue 5	99% Bandwidth	N/A	10.5~10.55 GHz

TEST PROCEDURE

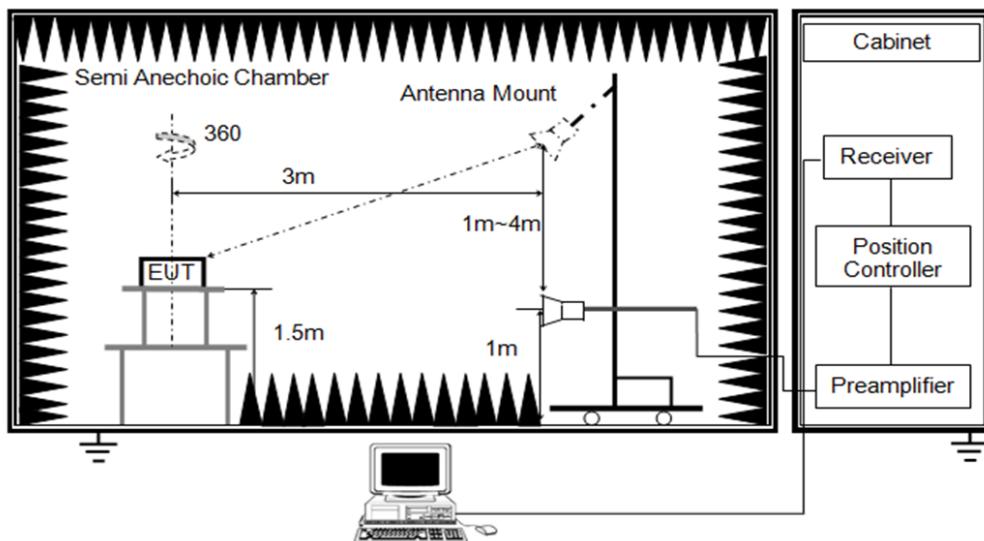
Spectrum analyzer and use the following settings:

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

Allow the trace to stabilize and measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 20 dB / 99 % relative to the maximum level measured in the fundamental emission.

TEST SETUP

Above 1 GHz



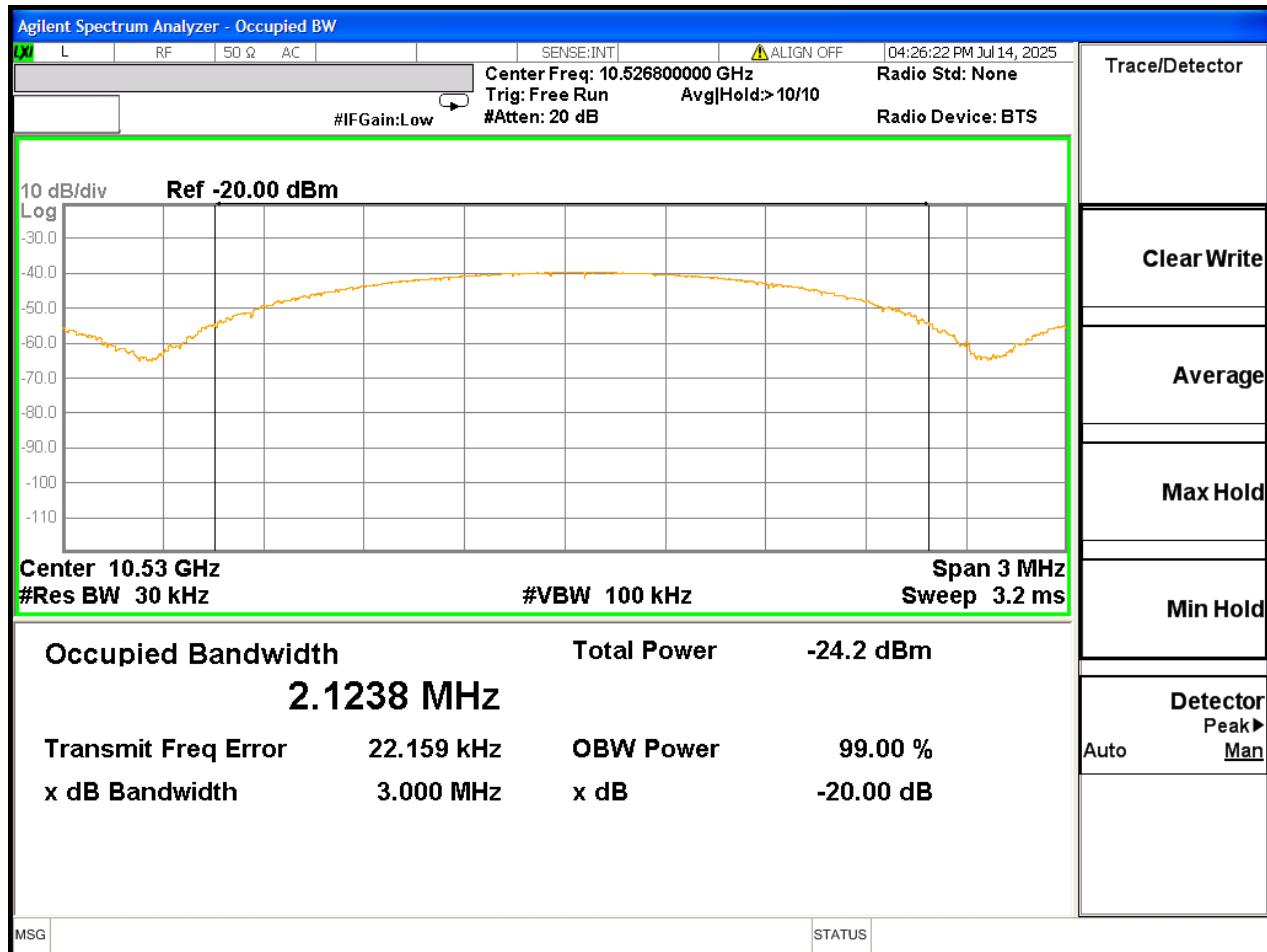
TEST ENVIRONMENT

Temperature	23.8°C	Relative Humidity	56%
Atmosphere Pressure	101 kPa	Test Voltage	DC 18 V

RESULTS

Channel	20 dB bandwidth (MHz)	99 % bandwidth (MHz)	Result
1	3.00	2.1238	PASS

BANDWIDTH LOW CH



7.3. RADIATED TEST RESULTS

LIMITS

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

CFR 47 FCC §15.245 (b) and ISED RSS-210 Issue 10 Annex F F.1

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

The field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

The field strength of emissions from intentional radiators operated within these frequency bands			
Frequency (MHz)	Average Field strength of Fundamental	Average Field strength of Harmonics	Distance (m)
10500 - 10550	2500 mV/m (127.96 dBuV/m)	25.0 mV/m (87.96 dBuV/m)	3
	Peak Field strength of Fundamental	Peak Field strength of Harmonics	Distance (m)
	147.96dBuV/m	107.96 dBuV/m	3

Frequency (MHz)	Average Field strength of Fundamental	Average Field strength of Harmonics	Distance (m)
10500 - 10550	137.50	97.50	1
	Peak Field strength of Fundamental	Peak Field strength of Harmonics	Distance (m)
	157.5	117.50	1

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in § 15.209, whichever is the lesser attenuation.

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	Field Strength Limit	Field Strength Limit	
		(dBuV/m) at 3 m	(dBuV/m) at 1 m	(dBuV/m) at 0.75 m	
		Quasi-Peak	Quasi-Peak	Quasi-Peak	
30 - 88	100	40	/	/	
88 - 216	150	43.5	/	/	
216 - 960	200	46	/	/	
Above 960	500	54	/	/	
Above 1000	500	Peak	Average	Peak	Average
		74	54	83.54	63.54
				86	66

(1) Regardless of the limits shown in the above table, harmonic emissions in the restricted bands below 17.7 GHz, as specified in § 15.205, shall not exceed the field strength limits shown in § 15.209. Harmonic emissions in the restricted bands at and above 17.7 GHz shall not exceed the following field strength limits:

- (i) For the second and third harmonics of field disturbance sensors operating in the 24075-24175 MHz band and for other field disturbance sensors designed for use only within a building or to open building doors, 25.0 mV/m.
- (ii) For all other field disturbance sensors, 7.5 mV/m.

All harmonic emission in restricted bands	Field Strength Limit (mV/m) at 3 m	Field Strength Limit (dBuV/m) at 3 m	Field Strength Limit (dBuV/m) at 1 m
< 17.7 GHz	0.5	54.0	63.5
≥ 17.7 GHz	(i) 25 (ii) 7.5	87.96 77.5	97.5 86.5

Maximum Radiated measurement distance

Refer to ANSI C63.10-2013 clause 9, All measurements shall be performed in the far-field of the measurement antenna. The distance of the far field was calculated from follow equation:

$$r = \frac{2D^2}{\lambda}$$

Where

r is the distance from the radiating element of the EUT to the edge of the far field, in m.

D is the largest dimension of the measurement antenna (horn), in m.

λ is the wavelength in m.

Frequency	Wavelength (λ)	Maximum Dimension (D)	Far Field Boundary (r)
(GHz)	(mm)	(m)	(m)
40~60	5.000	0.051	1.0
60~90	3.333	0.039	0.9
90~110	2.727	0.032	0.8

For above 40 GHz, measurement is performed at a minimum distance of 1.0m > Rfar Field)

Refer to ANSI C63.10-2013 clause 9.8, to determine the maximum measurement distance for final radiated emissions measurements as flows:

- Measure the ambient system noise floor power with the instruments set to the proper values applicable to the measurement.
- Apply all the procedures and equations applicable to the measurement, based on the measured ambient system noise floor power and a candidate measurement distance equal to the distance specified by the limit.
- If the corrected system noise floor level is 6 dB or more below the limit, then the validated maximum measurement distance is the distance specified by the limit.

The final radiated measurement was performed based on as above guide to confirm the maximum measurement distance 1m can meet the corrected system noise floor level is 6 dB or more below the limit.

Distance factor=20log (1.00 m/3.00 m) = -9.5 dB

$$E_{\text{SpecLimit}} = E_{\text{Meas}} + 20\log\left(\frac{d_{\text{Meas}}}{d_{\text{SpecLimit}}}\right) \quad (20)$$

where

$E_{\text{SpecLimit}}$ is the field strength of the emission at the distance specified by the limit, in dB μ V/m

E_{Meas} is the field strength of the emission at the measurement distance, in dB μ V/m

d_{Meas} is the measurement distance, in m

$d_{\text{SpecLimit}}$ is the distance specified by the limit, in m

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	150.7 - 156.9	10.6 - 12.7
3.020 - 3.026	162.0125 - 167.17	13.25 - 13.4
4.125 - 4.128	167.72 - 173.2	14.47 - 14.5
4.17725 - 4.17775	240 - 285	15.35 - 16.2
4.20725 - 4.20775	322 - 335.4	17.7 - 21.4
5.677 - 5.683	399.9 - 410	22.01 - 23.12
6.215 - 6.218	608 - 614	23.6 - 24.0
6.28775 - 6.28825	980 - 1427	31.2 - 31.8
6.31175 - 6.31225	1435 - 1626.5	36.43 - 36.5
8.291 - 8.294	1645.5 - 1648.5	Above 38.6
8.382 - 8.386	1660 - 1710	
8.37625 - 8.38875	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	3280 - 3287	
16.42 - 16.423	3332 - 3339	
16.80475 - 16.80925	3345.8 - 3358	
16.80425 - 16.80475	3500 - 4400	
25.5 - 25.67	4500 - 5150	
37.5 - 38.25	6350 - 5480	
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 38.6c

TEST PROCEDURE

Below 30 MHz

The setting of the spectrum analyzer

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

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. Although these tests were performed other than open field site, adequate comparison measurements were confirmed against 30m open field site. Therefore sufficient tests were made to demonstrate that the alternative site produces results that correlate with the ones of tests made in an open field site based on KDB 414788.

8. 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_{UV}/m, which is equivalent to $Y-51.5 = Z$ dB_{UA}/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 analyzer

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 to 18 GHz

The setting of the spectrum analyzer

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 average value=peak average + Duty Correction Factor

For the Duty Cycle and Correction Factor please refer to clause 7.1.ON TIME AND DUTY CYCLE.

Above 18 GHz to 90 GHz

The setting of the spectrum analyzer

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. For the maximum test distance confirmation, refer to the guidelines in ANSI C63.10-2013 clause 9.8.
3. 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.
4. The EUT was placed on a turntable with 1.5 m above ground.
5. The EUT was set 1 meter from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
6. 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.
7. For average value=peak average + Duty Correction Factor

For the Duty Cycle and Correction Factor please refer to clause 7.1.ON TIME AND DUTY CYCLE.

Above 90 GHz to 110 GHz

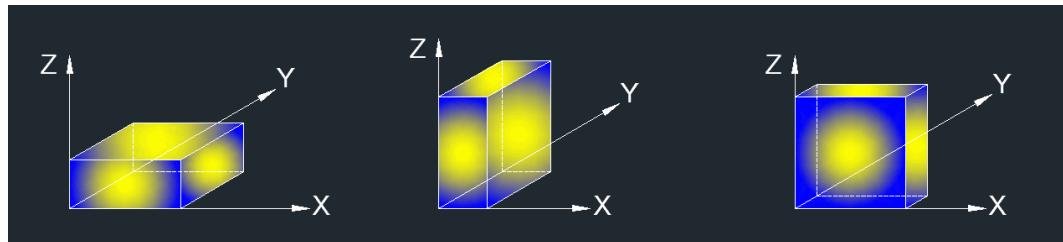
The setting of the spectrum analyzer

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. For the maximum test distance confirmation, refer to the guidelines in ANSI C63.10-2013 clause 9.8.
3. 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.
4. The EUT was placed on a turntable with 1.5 m above ground.
5. The EUT was set 1 meter from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
6. 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.
7. For average value=peak average + Duty Correction Factor

For the Duty Cycle and Correction Factor 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.

For Radiate Spurious emission (9 kHz ~ 30 MHz):

Note:

1. Measurement = Reading Level + Correct Factor.
2. If the peak values are less than the QP limit, the QP result is deemed to comply with QP 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.
4. All modes have been tested, but only the worst data was recorded in the report.
5. $\text{dBuA/m} = \text{dBuV/m} - 20\log_{10}[120\pi] = \text{dBuV/m} - 51.5$

For Radiate Spurious Emission (30 MHz ~ 1 GHz):

Note:

1. Result Level = Read Level + Correct Factor.
2. If the peak values are less than the QP limit, the QP result is deemed to comply with QP limit.
3. All modes have been tested, but only the worst data was recorded in the report.

For Radiate Spurious Emission (1 GHz ~ 3 GHz):

1. Measurement = Reading Level + Correct Factor.
2. If the peak values are less than the average limit of 54 dBuV/m, the average result is deemed to comply with average limit.
3. Peak: Peak detector.
4. AVG: $\text{VBW} = 1/\text{Ton}$, 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 Band reject filter losses.
7. Proper operation of the transmitter prior to adding the filter to the measurement chain.
8. All modes have been tested, but only the worst data was recorded in the report.

For Radiate Spurious Emission (3 GHz ~ 18 GHz):

Note:

1. Peak Result = Reading Level + Correct Factor.
2. If the peak values are less than the average limit of 54 dBuV/m, the average result is deemed to comply with average limit.
3. Peak: Peak detector.
4. AVG Result=Peak Result + Duty Cycle Correction Factor.
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. All modes have been tested, but only the worst data was recorded in the report.

For Radiate Spurious emission (18 GHz ~ 26 GHz):

Note:

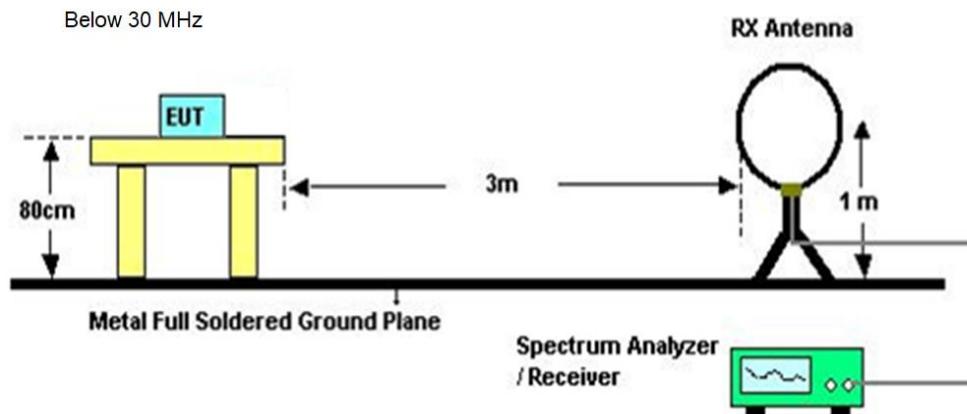
1. Measurement = Reading Level + Correct Factor.
2. If the peak values are less than the average limit of 54 dBuV/m, the average result is deemed to comply with average limit.
3. Peak: Peak detector.
4. AVG Result=Peak Result + Duty Cycle Correction Factor.
5. All modes have been tested, but only the worst data was recorded in the report.

For Radiate Spurious emission (26 GHz ~ 110 GHz):

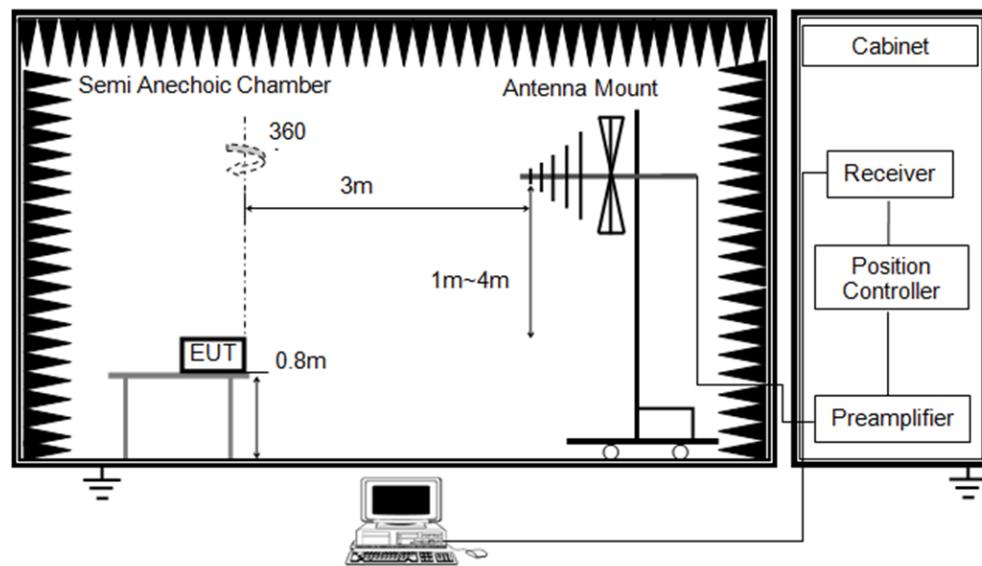
Note:

1. Measurement = Reading Level + Correct Factor.
2. If the peak values are less than the average limit of 54 dBuV/m, the average result is deemed to comply with average limit.
3. Peak: Peak detector.
4. AVG Result=Peak Result + Duty Cycle Correction Factor.
5. All modes have been tested, but only the worst data was recorded in the report.

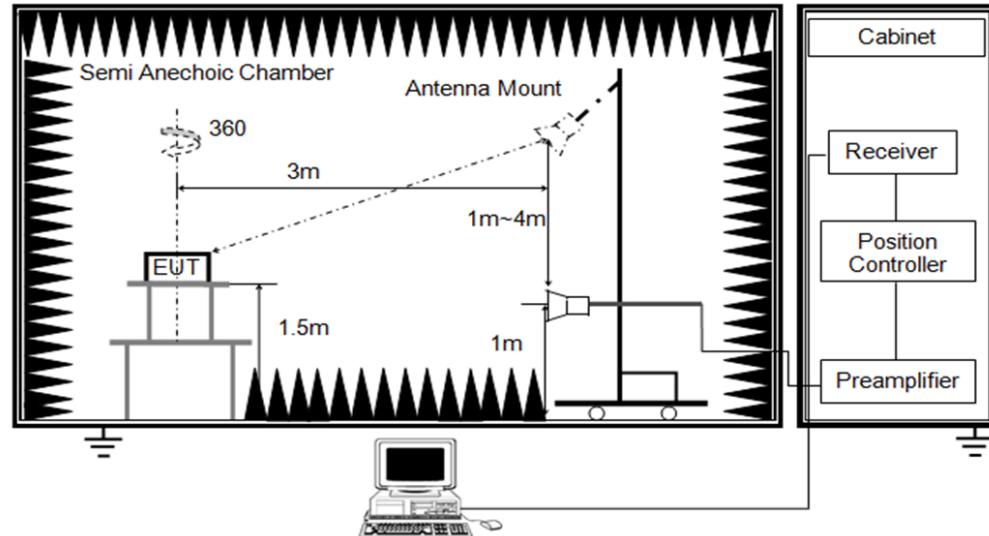
TEST SETUP



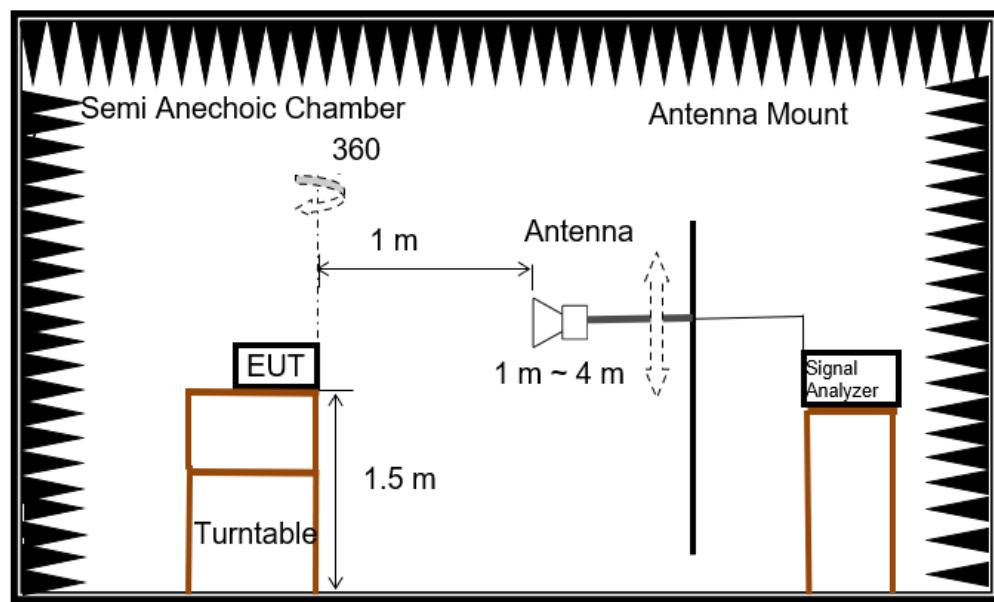
Below 1 GHz and above 30 MHz



Above 1 GHz



Above 18~110 GHz



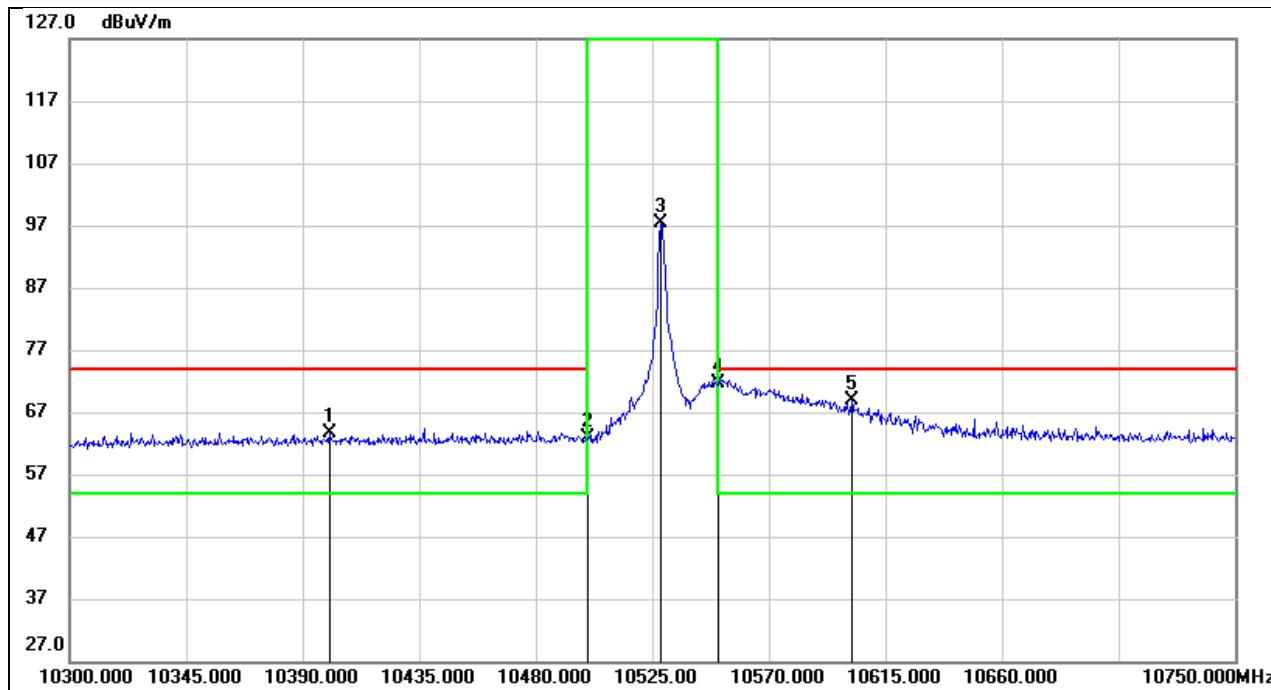
TEST ENVIRONMENT

Temperature	24.9 °C	Relative Humidity	62%
Atmosphere Pressure	101 kPa	Test Voltage	DC 18 V

TEST RESULTS

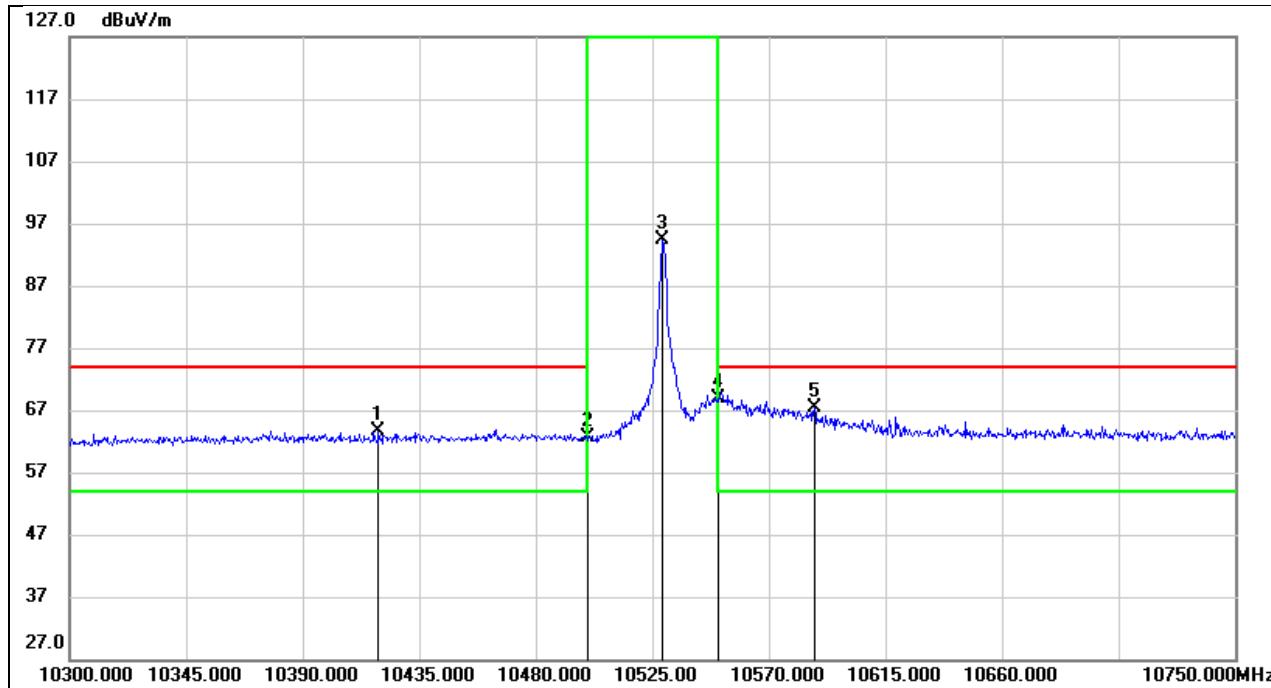
7.3.1. RESTRICTED BANDEdge AND FIELD STRENGTH OF FUNDAMENTAL

Test Mode:	CW	Test Channel:	1
Polarity:	Horizontal	Test Voltage:	DC 18 V



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	10400.35	15.83	47.91	63.74	74	-10.26	peak
/	/	/	/	3.74	54	-50.26	AVG
2	10500	14.73	48.18	62.91	74	-11.09	peak
/	/	/	/	2.91	54	-51.09	AVG
3	10528.15	49.12	48.26	97.38	147.95	-50.57	Peak Fundamental
/	/	/	/	37.38	127.95	-90.57	AVG Fundamental
4	10550	23.39	48.31	71.7	74	-2.3	peak
/	/	/	/	11.7	54	-42.3	AVG
5	10601.95	20.48	48.44	68.92	74	-5.08	peak
/	/	/	/	8.92	54	-45.08	AVG

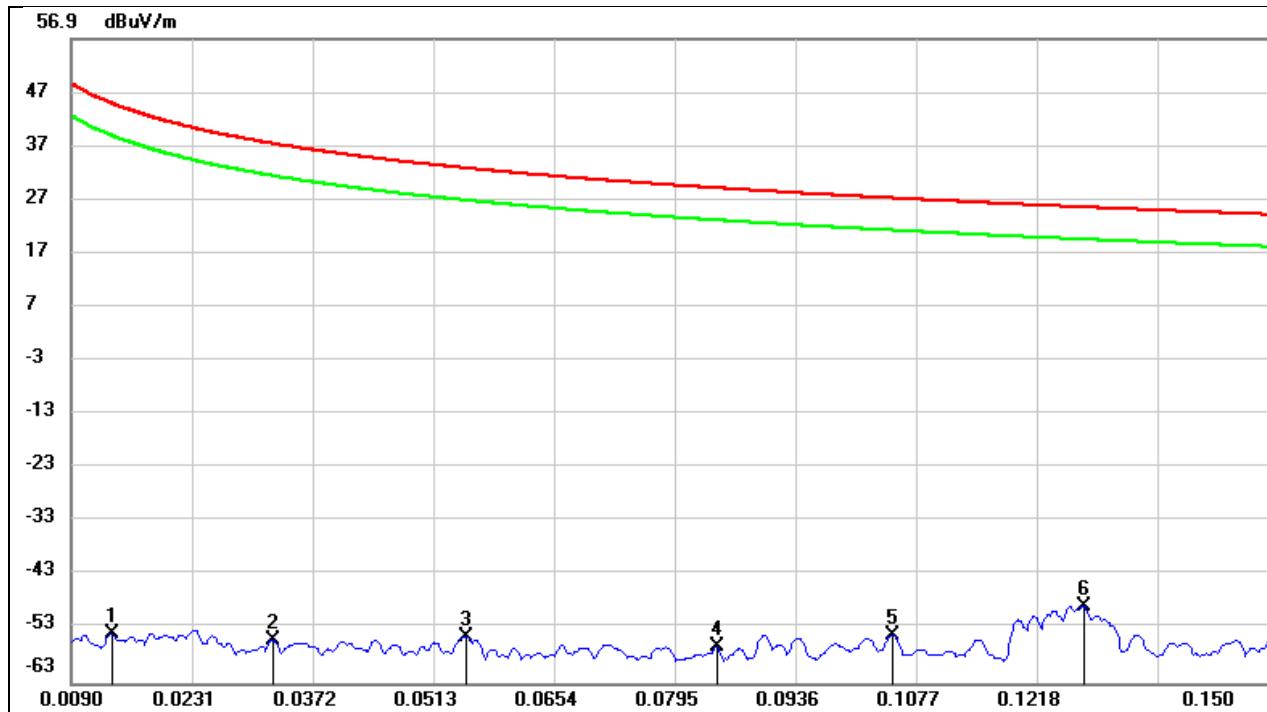
Test Mode:	CW	Test Channel:	1
Polarity:	Vertical	Test Voltage:	DC 18 V



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	10419.25	15.64	47.96	63.6	74	-10.4	peak
/	/	/	/	3.6	54	-50.4	AVG
2	10500	14.43	48.18	62.61	74	-11.39	peak
/	/	/	/	2.61	54	-51.39	AVG
3	10528.6	46.11	48.26	94.37	147.95	-53.58	peak Fundamental
/	/	/	/	34.37	127.95	-93.58	AVG Fundamental
4	10550	20.5	48.31	68.81	74	-5.19	peak
/	/	/	/	8.81	54	-45.19	AVG
5	10587.55	18.85	48.41	67.26	74	-6.74	peak
/	/	/	/	7.26	54	-46.74	AVG

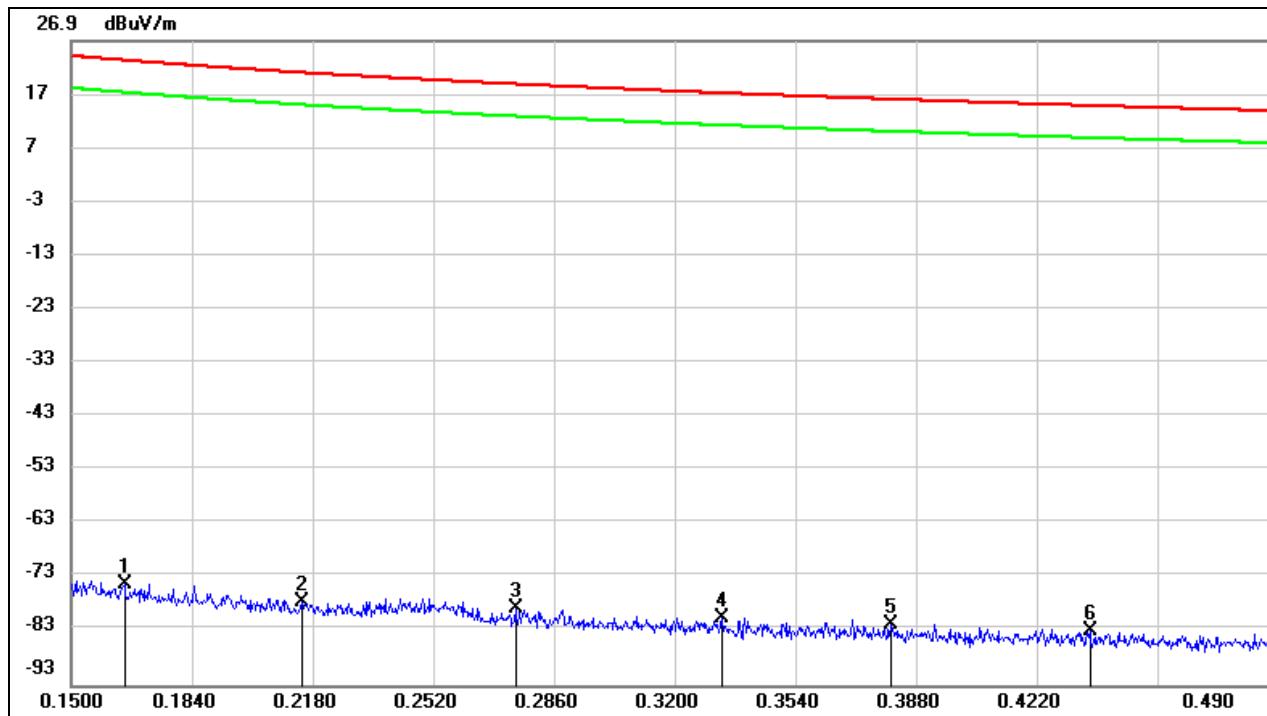
7.3.2. SPURIOUS EMISSIONS(9 kHz~30 MHz)

Test Mode:	CW	Test Channel:	1
Polarity:	Horizontal	Test Voltage:	DC 18 V



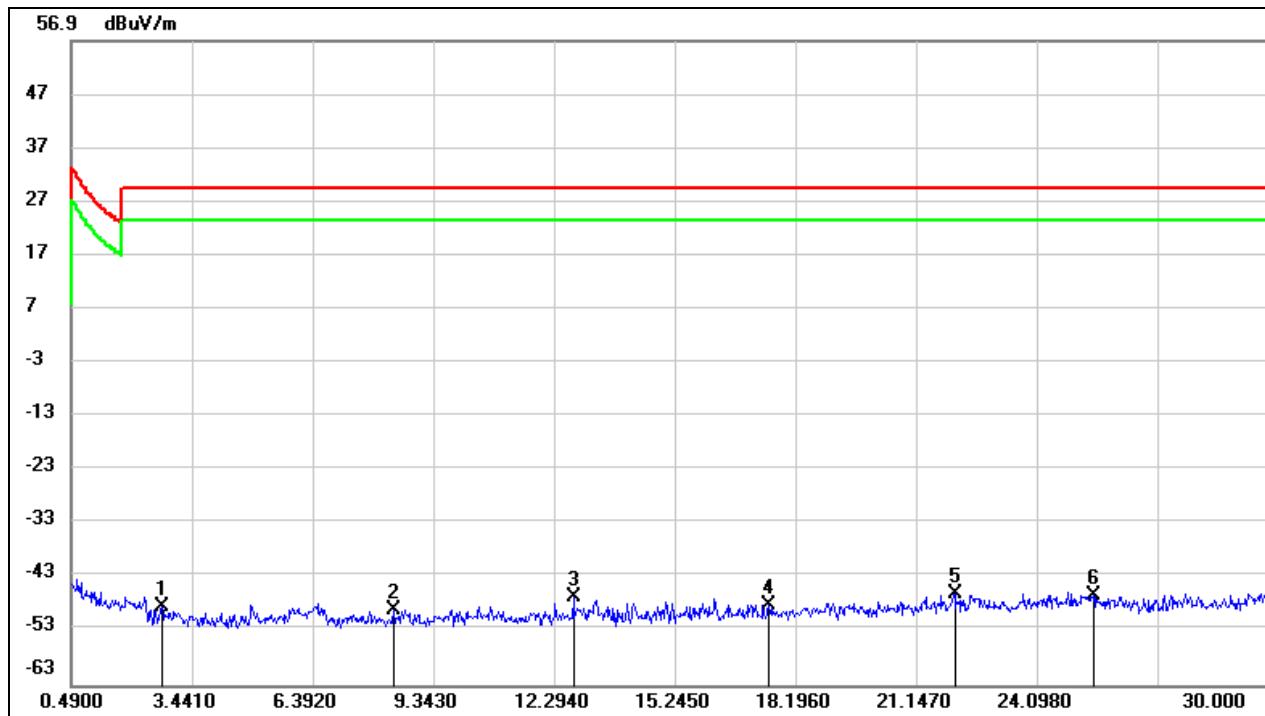
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	FCC Result (dBuV/m)	FCC Limit (dBuV/m)	ISED Result (dBuA/m)	ISED Limit (dBuA/m)	Margin (dB)	Remark
1	0.0136	35.89	-89.95	-54.06	44.93	-105.56	-6.57	-98.99	peak
2	0.0324	35.95	-91.09	-55.14	37.39	-106.64	-14.11	-92.53	peak
3	0.0551	37.51	-91.93	-54.42	32.78	-105.92	-18.72	-87.2	peak
4	0.0842	36.1	-92.6	-56.5	29.1	-108	-22.4	-85.6	peak
5	0.1048	38.32	-92.57	-54.25	27.2	-105.75	-24.3	-81.45	peak
6	0.1271	43.62	-92.42	-48.8	25.52	-100.3	-25.98	-74.32	peak

Test Mode:	CW	Test Channel:	1
Polarity:	Horizontal	Test Voltage:	DC 18 V



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	0.165	17.74	-92.18	-74.44	23.26	-125.94	-28.24	-97.7	peak
2	0.2149	14.39	-92.02	-77.63	20.96	-129.13	-30.54	-98.59	peak
3	0.2751	13.49	-92.29	-78.8	18.81	-130.3	-32.69	-97.61	peak
4	0.3333	11.7	-92.47	-80.77	17.15	-132.27	-34.35	-97.92	peak
5	0.3809	10.64	-92.56	-81.92	15.99	-133.42	-35.51	-97.91	peak
6	0.437	9.53	-92.67	-83.14	14.79	-134.64	-36.71	-97.93	peak

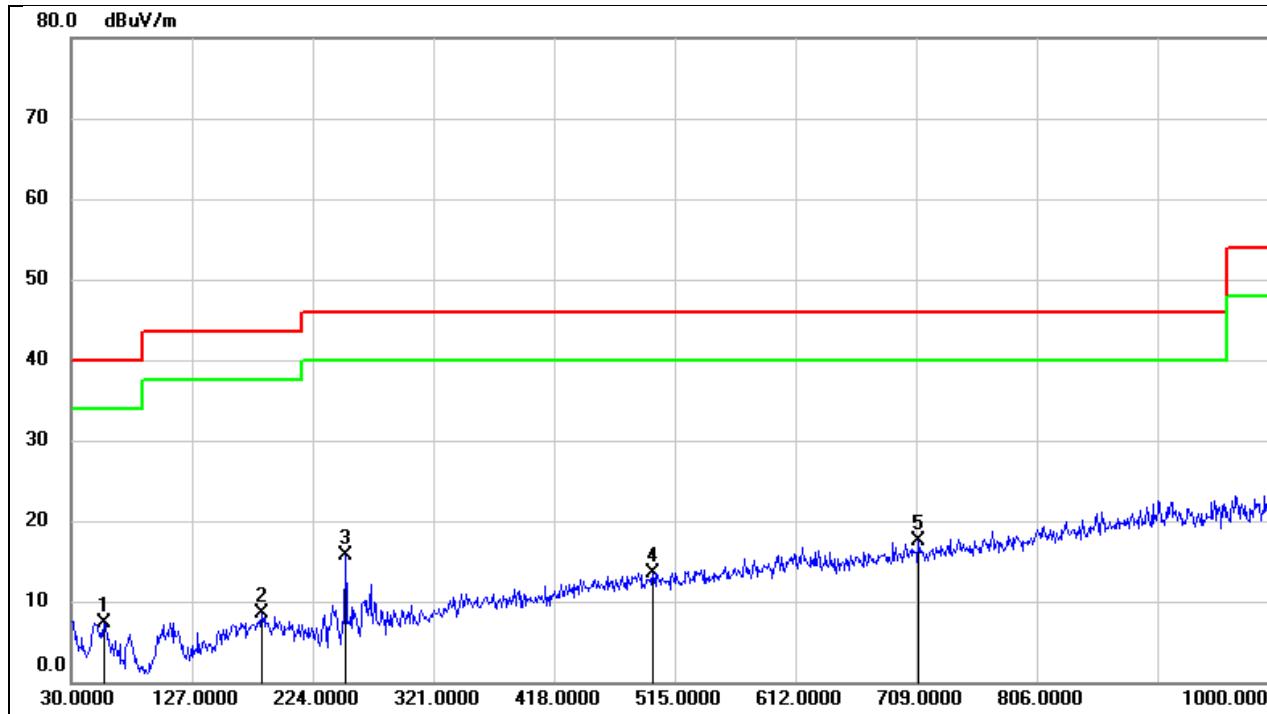
Test Mode:	CW	Test Channel:	1
Polarity:	Horizontal	Test Voltage:	DC 18 V



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	2.7033	2.67	-51.21	-48.54	29.54	-100.04	-21.96	-78.08	peak
2	8.3692	2.02	-51.07	-49.05	29.54	-100.55	-21.96	-78.59	peak
3	12.7662	4.03	-50.76	-46.73	29.54	-98.23	-21.96	-76.27	peak
4	17.5468	2.12	-50.27	-48.15	29.54	-99.65	-21.96	-77.69	peak
5	22.0912	3.62	-49.69	-46.07	29.54	-97.57	-21.96	-75.61	peak
6	25.485	3.03	-49.47	-46.44	29.54	-97.94	-21.96	-75.98	peak

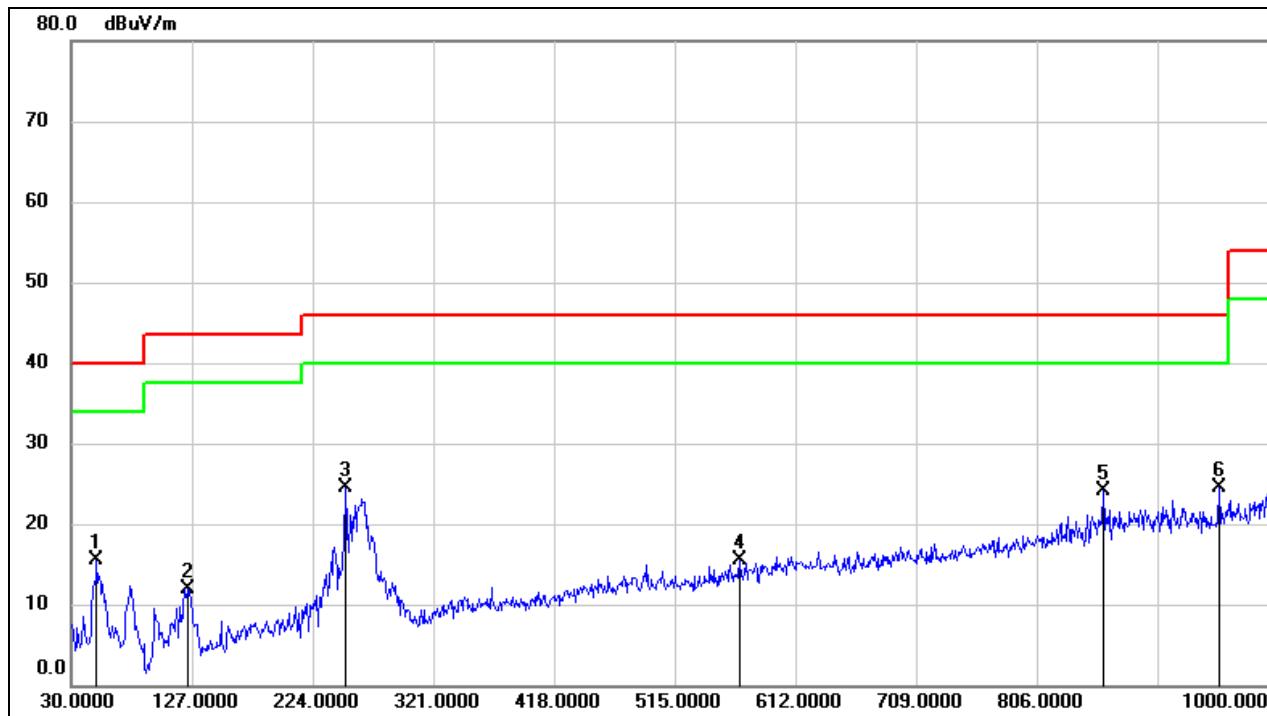
7.3.3. SPURIOUS EMISSIONS(30 MHz~1 GHz)

Test Mode:	CW	Test Channel:	1
Polarity:	Horizontal	Test Voltage:	DC 18 V



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	56.1900	27.55	-20.29	7.26	40.00	-32.74	QP
2	183.2600	24.96	-16.41	8.55	43.50	-34.95	QP
3	250.1900	34.55	-18.76	15.79	46.00	-30.21	QP
4	497.5400	24.89	-11.30	13.59	46.00	-32.41	QP
5	710.9400	25.69	-8.17	17.52	46.00	-28.48	QP
6	999.0300	28.27	-3.45	24.82	54.00	-29.18	QP

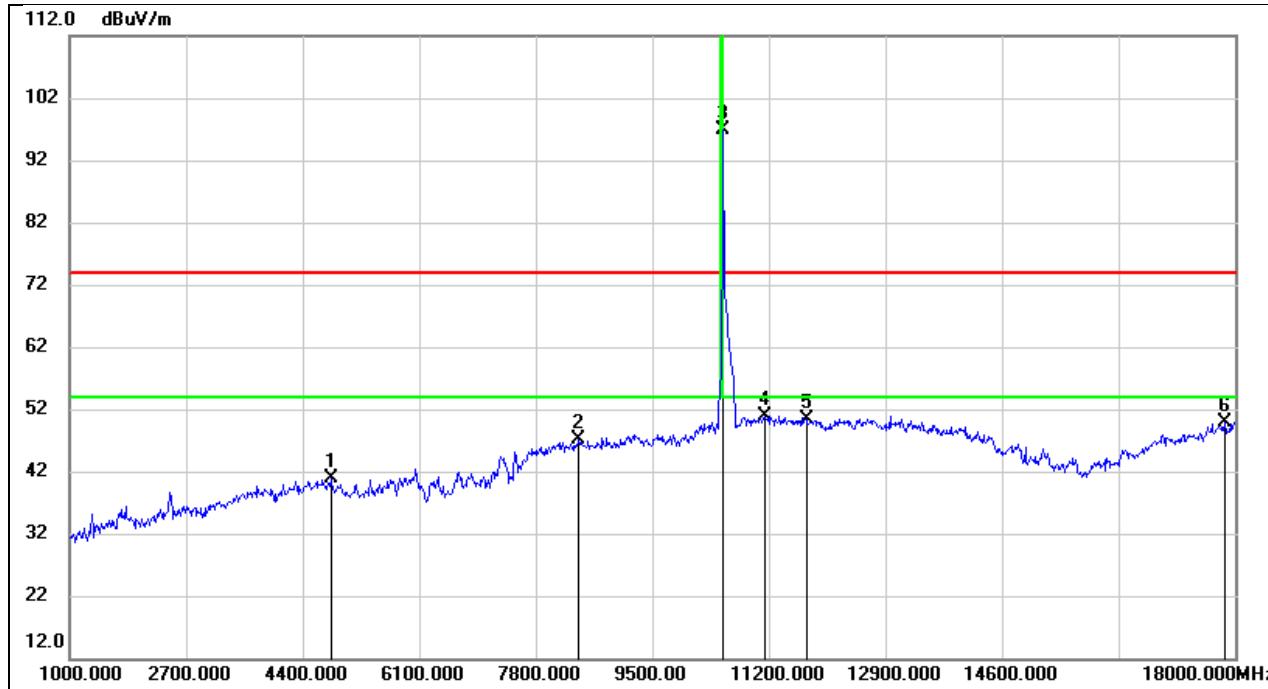
Test Mode:	CW	Test Channel:	1
Polarity:	Vertical	Test Voltage:	DC 18 V



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	50.3700	35.84	-20.35	15.49	40.00	-24.51	QP
2	124.0900	31.52	-19.54	11.98	43.50	-31.52	QP
3	250.1900	43.19	-18.76	24.43	46.00	-21.57	QP
4	567.3800	25.69	-10.12	15.57	46.00	-30.43	QP
5	859.3500	29.26	-5.12	24.14	46.00	-21.86	QP
6	952.4700	28.83	-4.38	24.45	46.00	-21.55	QP

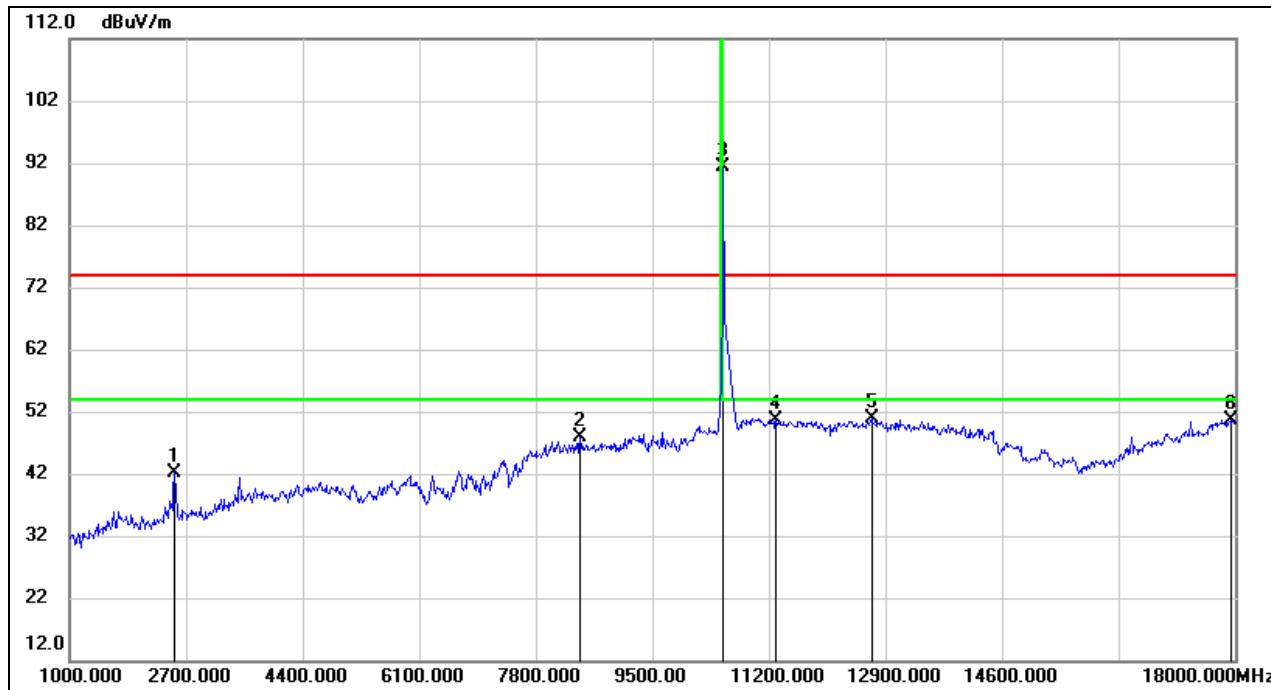
7.3.4. SPURIOUS EMISSIONS(1 GHz~18 GHz)

Test Mode:	CW	Test Channel:	1
Polarity:	Horizontal	Test Voltage:	DC 18 V



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4808.000	41.91	-1.06	40.85	74.00	-33.15	peak
2	8429.000	38.67	8.50	47.17	74.00	-26.83	peak
3	10537.000	82.52	14.35	96.87	/	/	Fundamental
4	11132.000	34.76	16.15	50.91	74.00	-23.09	peak
5	11744.000	32.15	18.33	50.48	74.00	-23.52	peak
6	17847.000	23.00	26.76	49.76	74.00	-24.24	peak

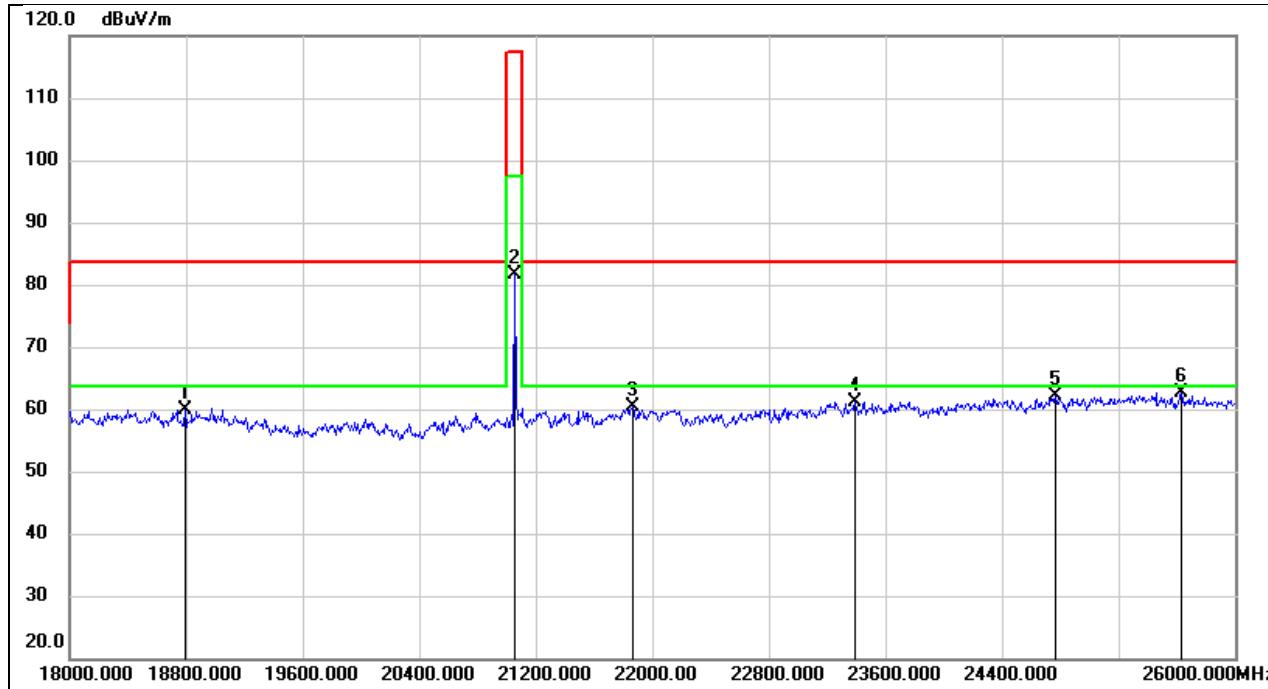
Test Mode:	CW	Test Channel:	1
Polarity:	Vertical	Test Voltage:	DC 18 V



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2530.000	50.63	-8.53	42.10	74.00	-31.90	peak
2	8446.000	39.51	8.49	48.00	74.00	-26.00	peak
3	10537.000	76.91	14.35	91.26	/	/	Fundamental
4	11302.000	33.58	17.06	50.64	74.00	-23.36	peak
5	12696.000	30.09	20.72	50.81	74.00	-23.19	peak
6	17949.000	23.18	27.57	50.75	74.00	-23.25	peak

7.3.5. SPURIOUS EMISSIONS(18 GHz~26 GHz)

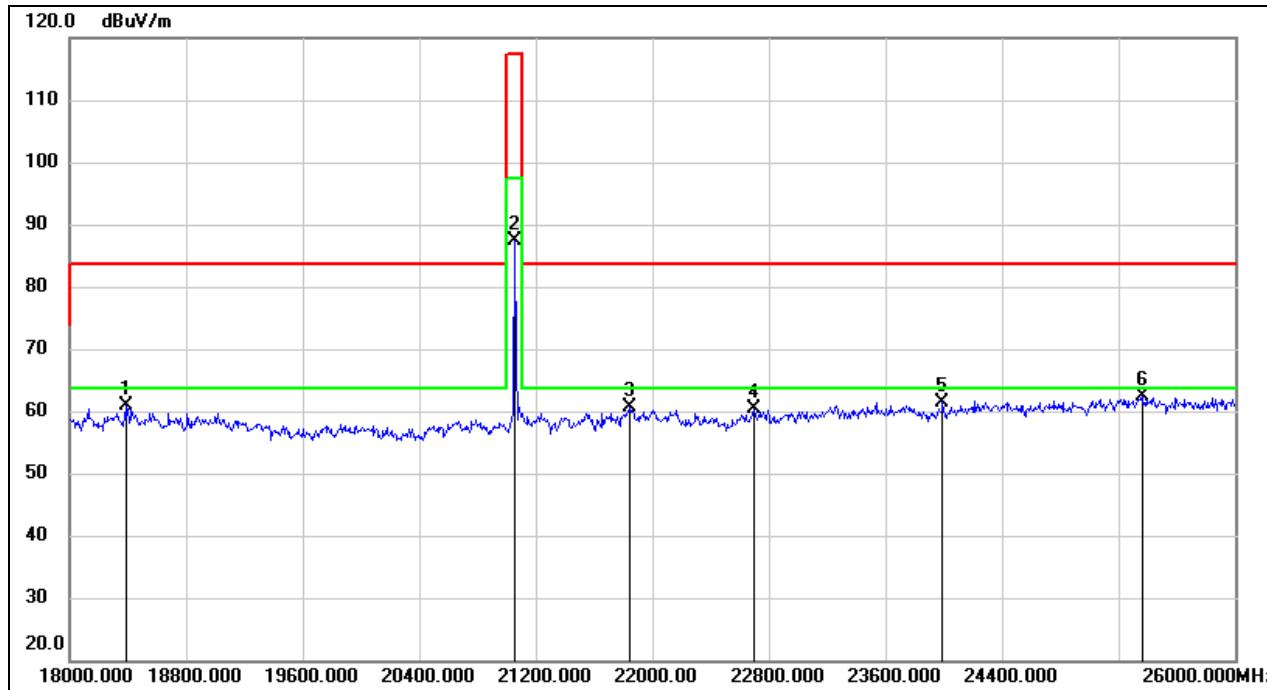
Test Mode:	CW	Test Channel:	1
Polarity:	Horizontal	Test Voltage:	DC 18 V



No.	Frequency	Reading	Correct	Result@1m	Limit@1m	Result@3m	Limit@3m	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	18792	54.35	5.45	59.8	83.54	50.3	74	-23.7	peak
2	21056	75.96	5.56	81.52	117.5	72.02	107.96	-35.94	peak
/	/	/	/	21.52	97.5	12.02	87.96	-75.94	AVG
3	21864	54.89	5.49	60.38	83.54	50.88	74	-23.12	peak
4	23392	54.83	6.37	61.2	83.54	51.7	74	-22.3	peak
5	24768	53.63	8.47	62.1	83.54	52.6	74	-21.4	peak
6	25632	54.54	8.06	62.6	83.54	53.1	74	-20.9	peak

Distance correct factor=20log (1.00 m/3.00 m) = -9.5 dB

Test Mode:	CW	Test Channel:	1
Polarity:	Vertical	Test Voltage:	DC 18 V

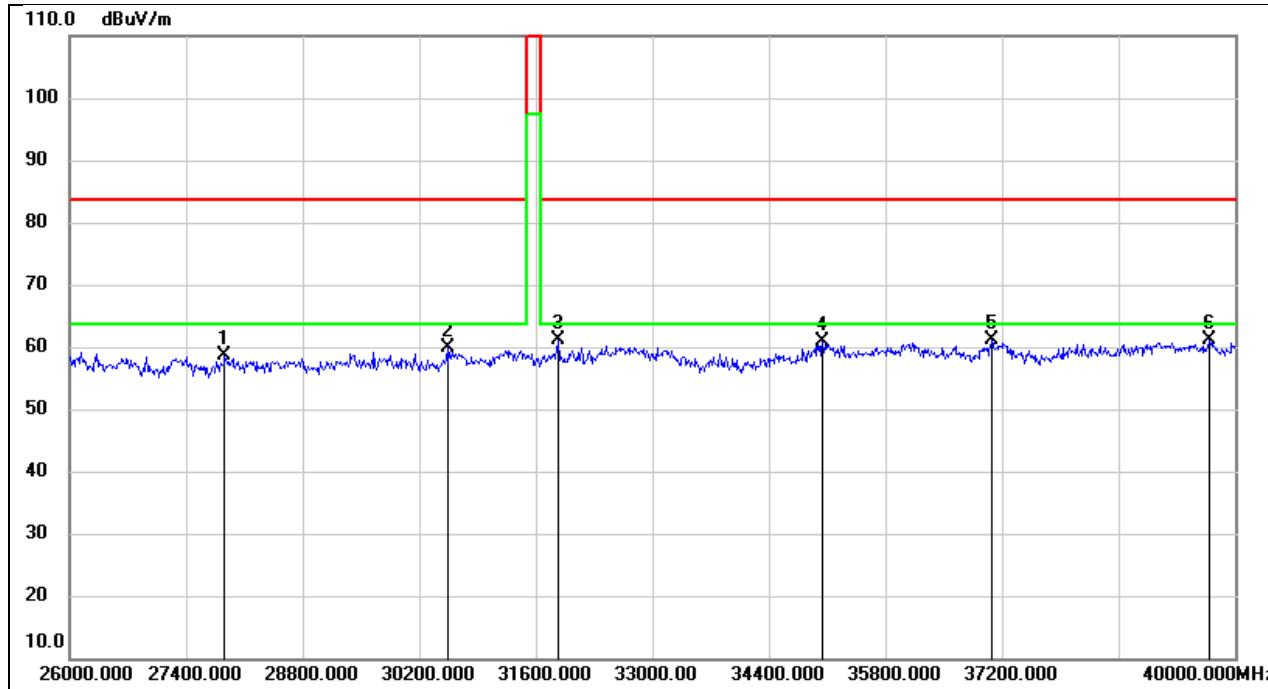


No.	Frequency	Reading	Correct	Result@1m	Limit@1m	Result@3m	Limit@3m	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	18384	55.62	5.32	60.94	83.54	51.44	74	-22.56	peak
2	21056	81.75	5.56	87.31	117.5	77.81	107.96	-30.15	peak
/	/	/	/	27.31	97.5	17.81	87.96	-70.15	AVG
3	21848	55.14	5.48	60.62	83.54	51.12	74	-22.88	peak
4	22696	55.2	5.15	60.35	83.54	50.85	74	-23.15	peak
5	23992	54.5	7	61.5	83.54	52	74	-22	peak
6	25360	54.54	7.94	62.48	83.54	52.98	74	-21.02	peak

correct factor=20log (1.00 m/3.00 m) = -9.5 dB

7.3.6. SPURIOUS EMISSIONS(26 GHz~40 GHz)

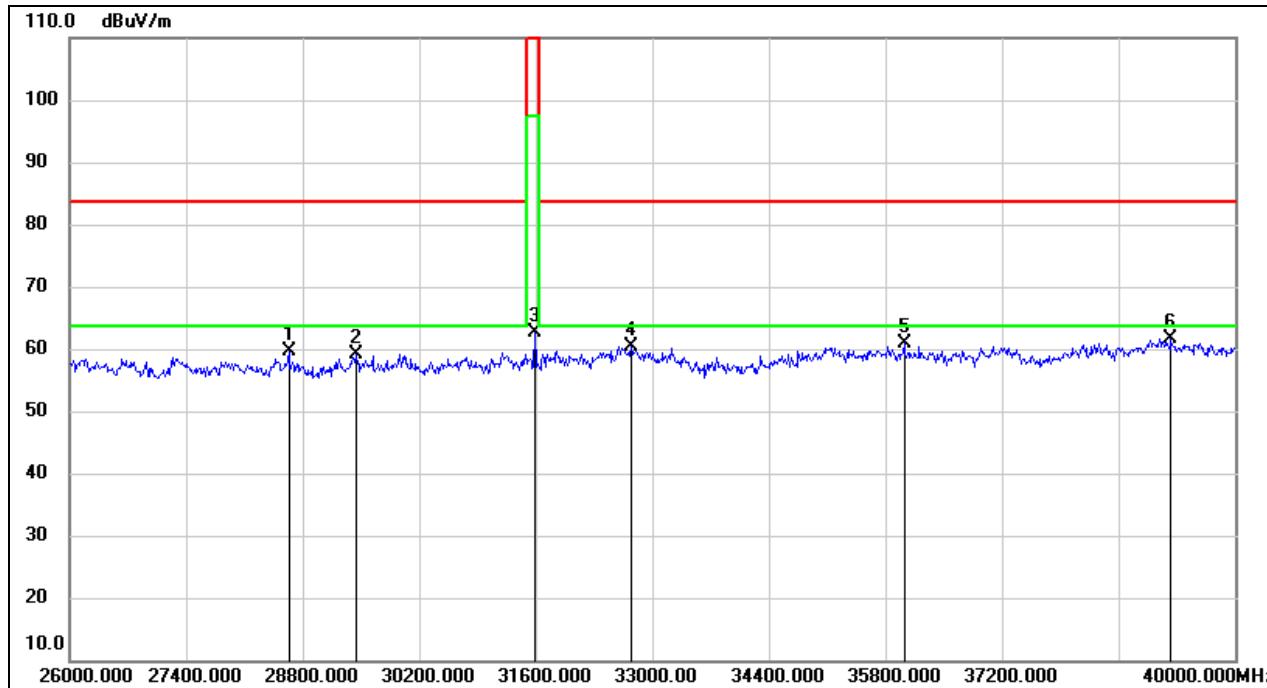
Test Mode:	CW	Test Channel:	1
Polarity:	Horizontal	Test Voltage:	DC 18 V



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result@1m (dBuV/m)	Limit@1m (dBuV/m)	Result@3m (dBuV/m)	Limit@3m (dBuV/m)	Margin (dB)	Remark
1	27862	50.85	7.78	58.63	83.54	49.13	74	-24.87	peak
2	30536	50.64	9.28	59.92	83.54	50.42	74	-23.58	peak
3	31866	51.73	9.33	61.06	83.54	51.56	74	-22.44	peak
4	35044	49.21	11.57	60.78	83.54	51.28	74	-22.72	peak
5	37074	48.49	12.55	61.04	83.54	51.54	74	-22.46	peak
6	39692	48.47	12.7	61.17	83.54	51.67	74	-22.33	peak

Distance correct factor=20log (1.00 m/3.00 m) = -9.5 dB

Test Mode:	CW	Test Channel:	1
Polarity:	Vertical	Test Voltage:	DC 18 V

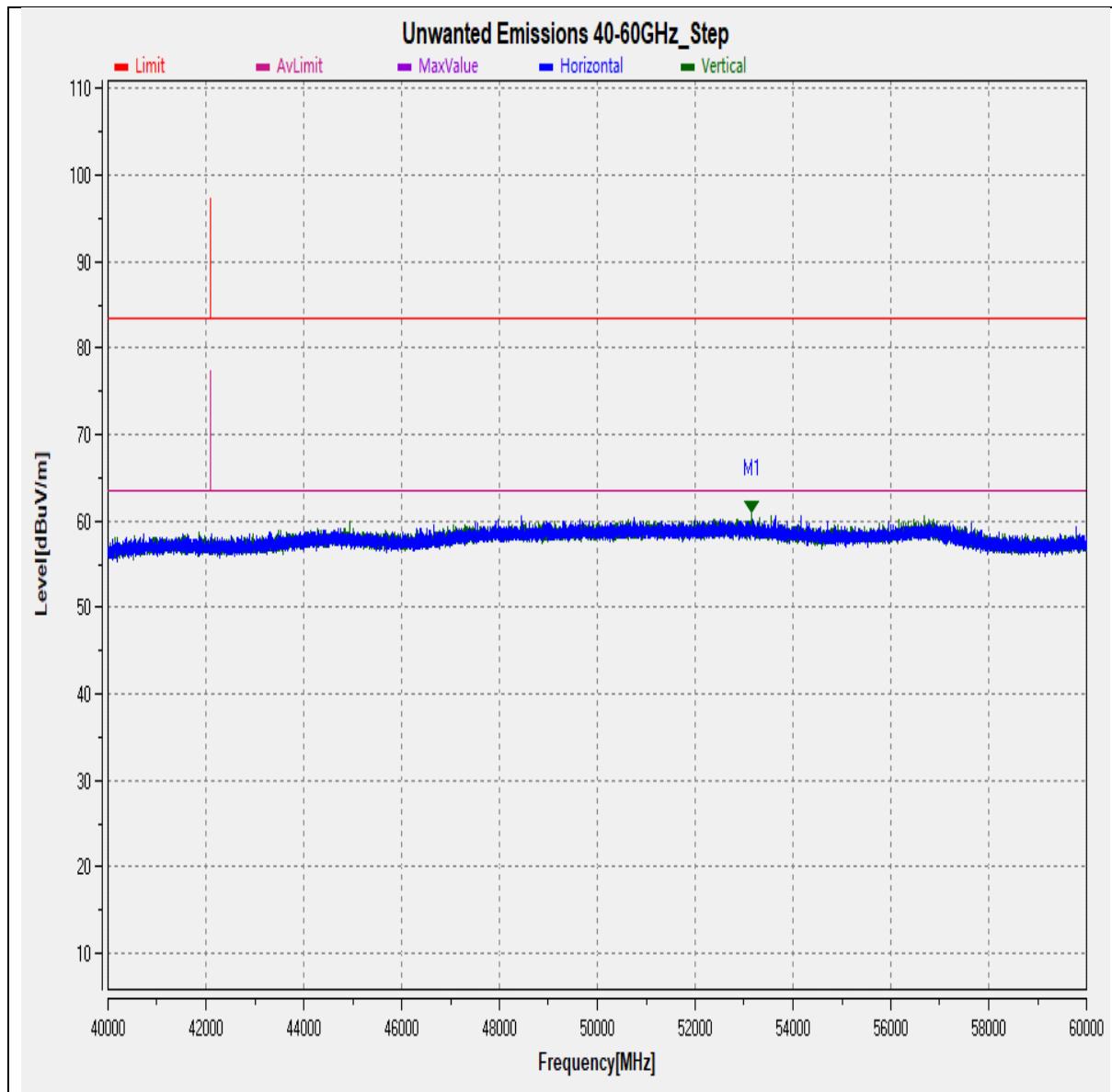


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result@1m (dBuV/m)	Limit@1m (dBuV/m)	Result@3m (dBuV/m)	Limit@3m (dBuV/m)	Margin (dB)	Remark
1	28632	50.98	8.69	59.67	83.54	50.17	74	-23.83	peak
2	29444	49.8	9.37	59.17	83.54	49.67	74	-24.33	peak
3	31586	53.52	9.19	62.71	117.5	53.21	107.96	-54.75	peak
4	32748	50	10.37	60.37	83.54	50.87	74	-23.13	peak
5	36024	47.91	12.99	60.9	83.54	51.4	74	-22.6	peak
6	39230	48.29	13.43	61.72	83.54	52.22	74	-21.78	peak

Distance correct factor=20log (1.00 m/3.00 m) = -9.5 dB

7.3.7. SPURIOUS EMISSIONS(40 GHz ~ 60 GHz)

Test Mode:	CW	Test Channel:	1
Polarity:	Horizontal & Vertical	Test Voltage:	DC 18 V



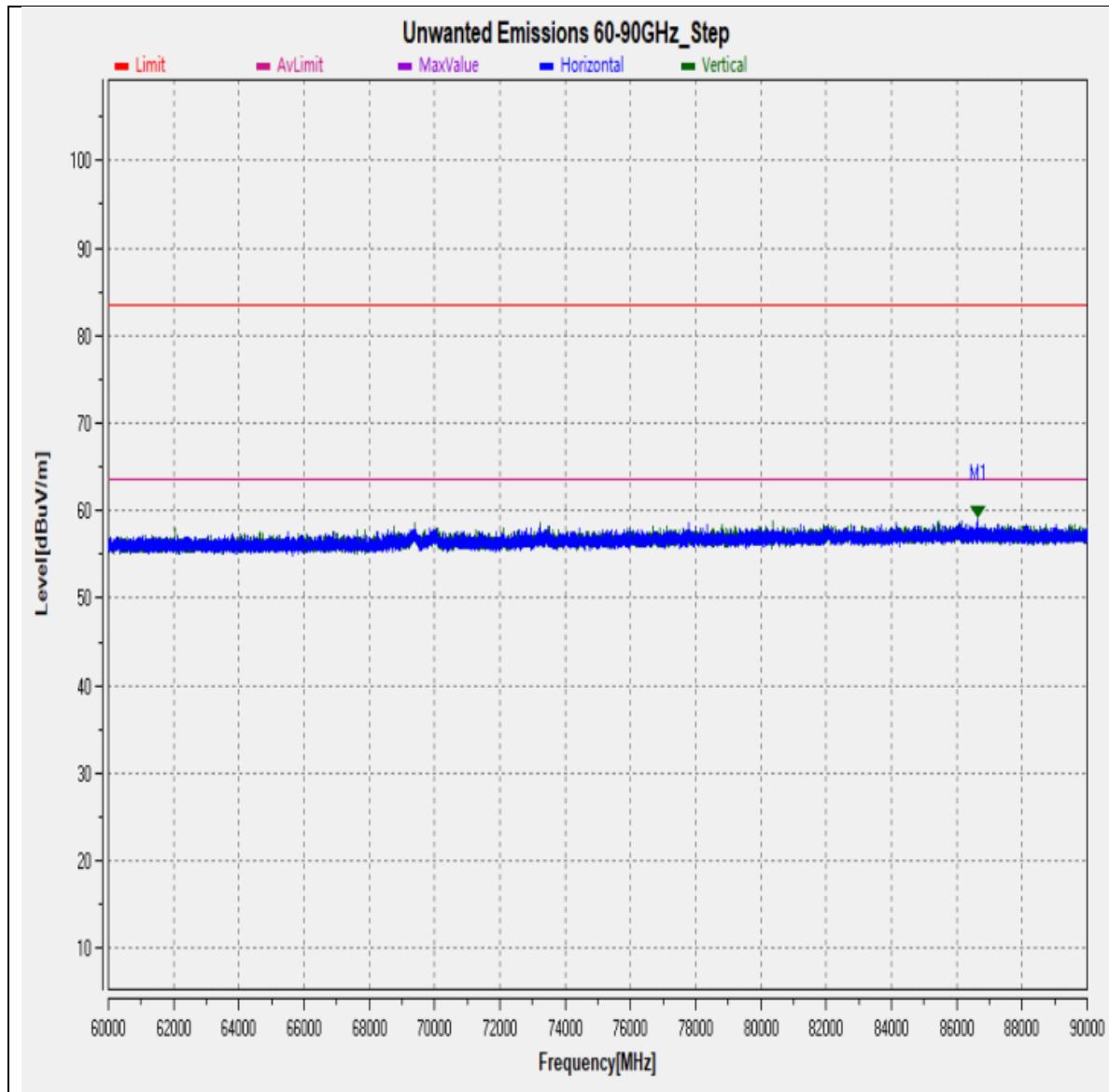
No.	Frequency	Reading	Correct	Result@1m	Limit@1m	Result@3m	Limit@3m	Margin	Remark	Polarity
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)		
1	53147	21.234	39.695	60.929	83.54	51.429	74	-22.57	peak	H

* - indicates frequency as harmonic.

Distance correct factor=20log (1.00 m/3.00 m) = -9.5 dB

7.3.8. SPURIOUS EMISSIONS(60 GHz ~ 90 GHz)

Test Mode:	CW	Test Channel:	1
Polarity:	Horizontal & Vertical	Test Voltage:	DC 18 V



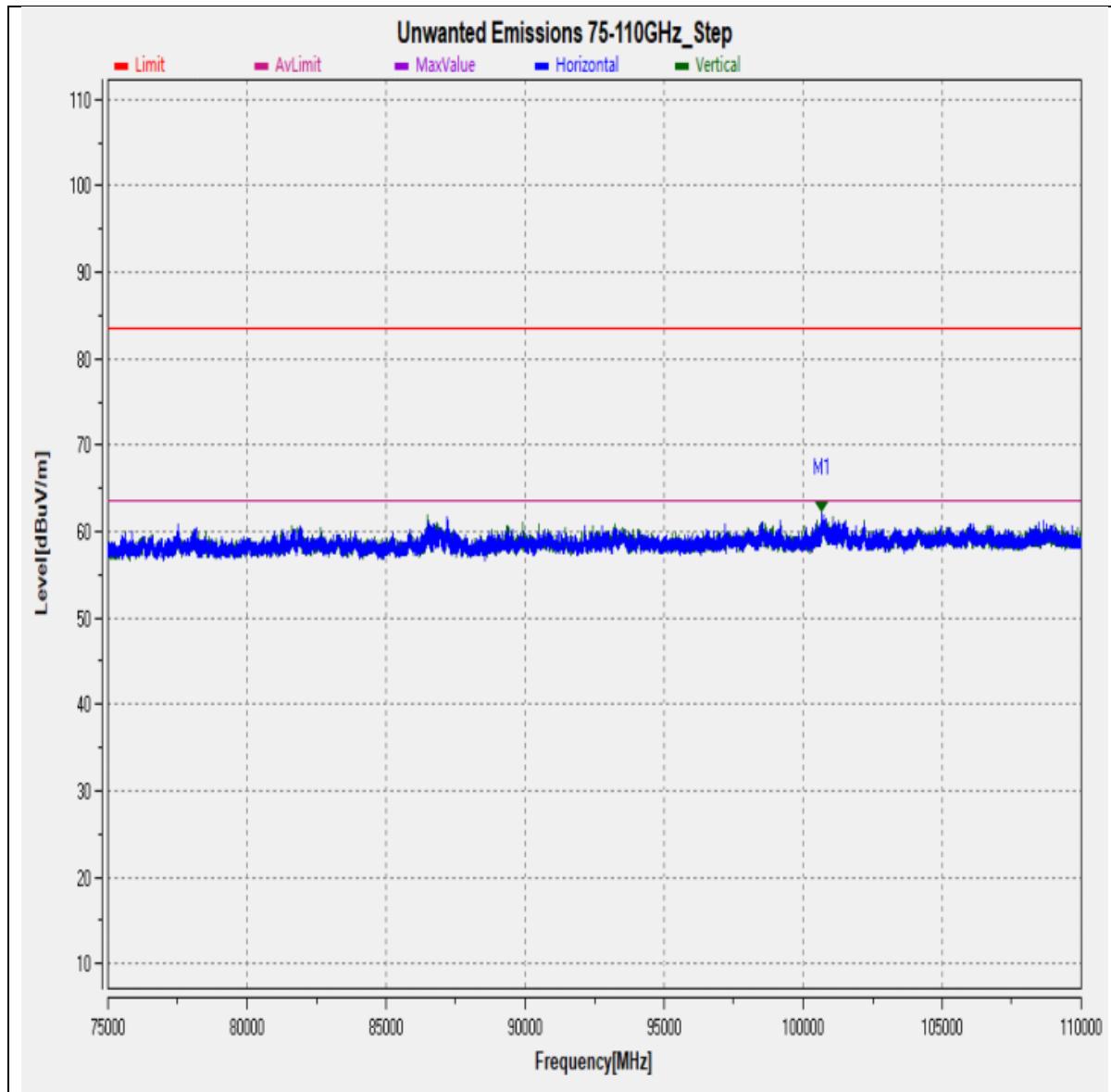
No.	Frequency	Reading	Correct	Result@1m	Limit@1m	Result@3m	Limit@3m	Margin	Remark	Polarity
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)		
1	86636	16.259	42.947	59.206	83.54	49.706	74	-24.29	peak	H

* - indicates frequency as harmonic.

Distance correct factor=20log (1.00 m/3.00 m) = -9.5 dB

7.3.9. SPURIOUS EMISSIONS(75 GHz ~ 110 GHz)

Test Mode:	CW	Test Channel:	1
Polarity:	Horizontal & Vertical	Test Voltage:	DC 18 V



No.	Frequency	Reading	Correct	Result@1m	Limit@1m	Result@3m	Limit@3m	Margin	Remark	Polarity
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)		
1	100670	17.87	44.378	62.248	83.54	52.748	74	-21.25	peak	H

* - indicates frequency as harmonic.

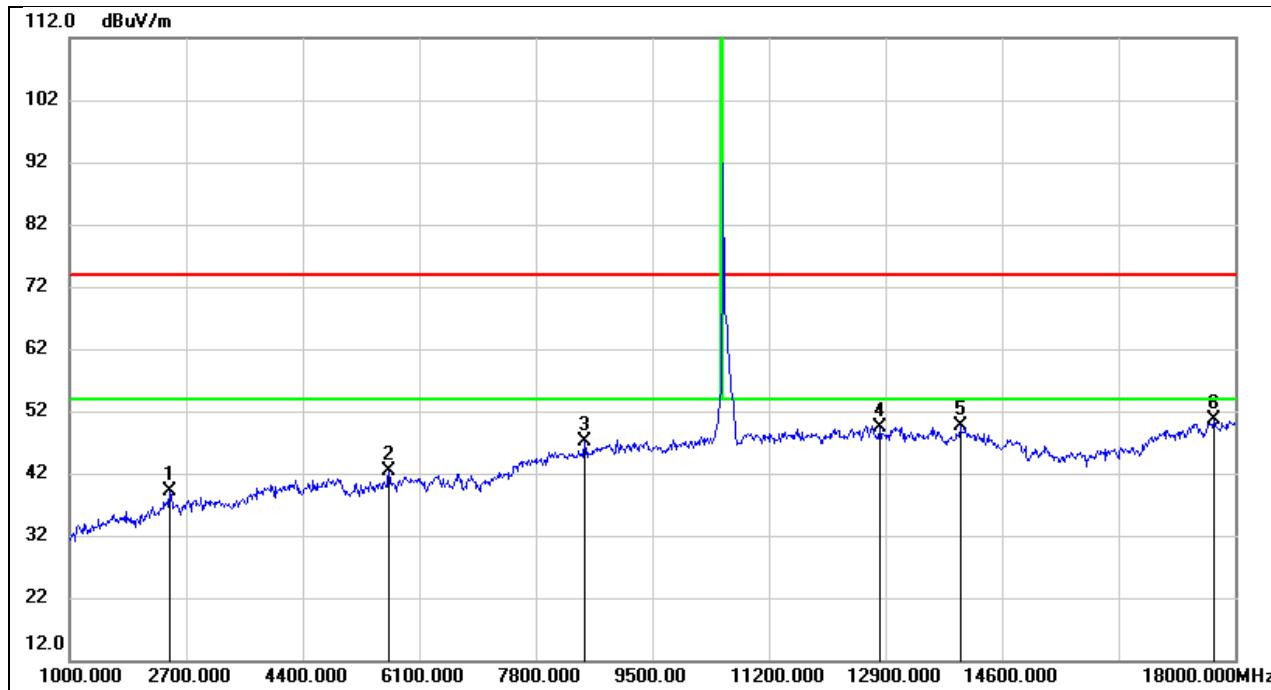
Distance correct factor=20log (1.00 m/3.00 m) = -9.5 dB

7.3.10. WORST-CASE CO-LOCATION

FDS module MODE & Wifi Module 802.11nHT20 MIMO MODE LCH

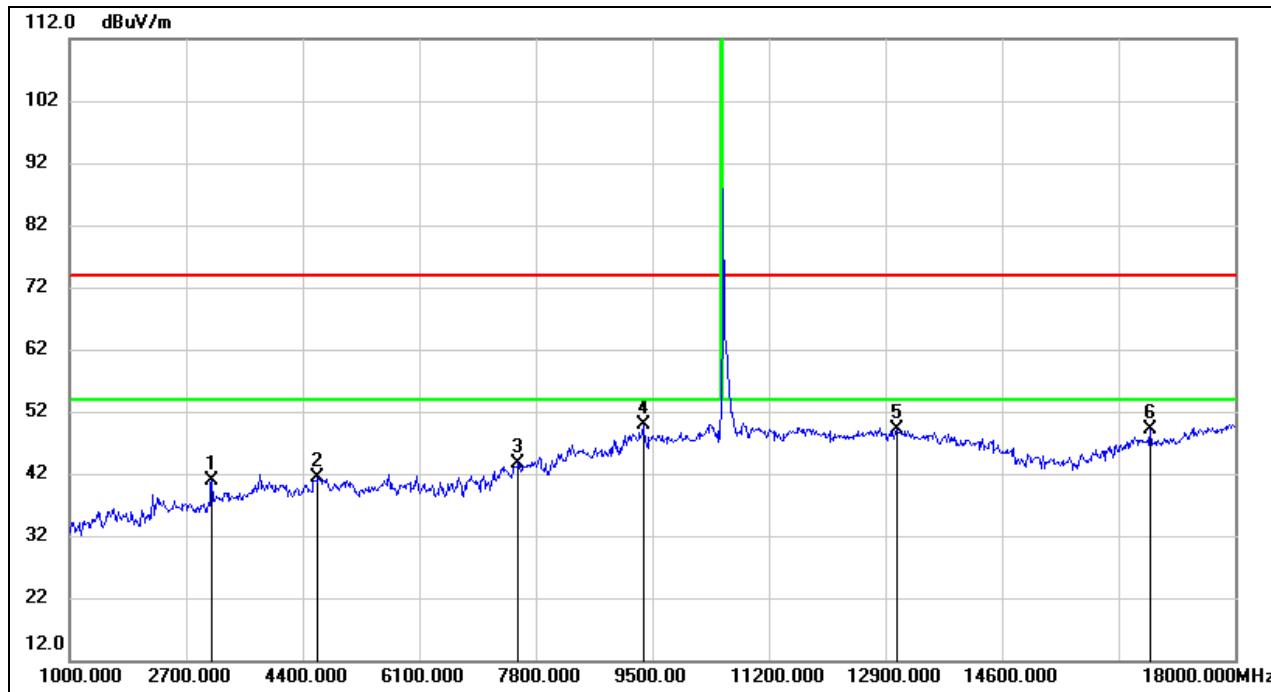
1-18 GHz

Test Mode:	CO-LOCATION	Test Channel:	CW CH1&WIFI 5G CH36
Polarity:	Horizontal	Test Voltage:	AC 120 V, 60 Hz



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2462.000	47.80	-8.79	39.01	74.00	-34.99	peak
2	5658.000	41.40	0.93	42.33	74.00	-31.67	peak
3	8514.000	38.63	8.49	47.12	74.00	-26.88	peak
4	12815.000	28.64	20.84	49.48	74.00	-24.52	peak
5	13988.000	26.05	23.67	49.72	74.00	-24.28	peak
6	17694.000	25.00	25.72	50.72	74.00	-23.28	peak

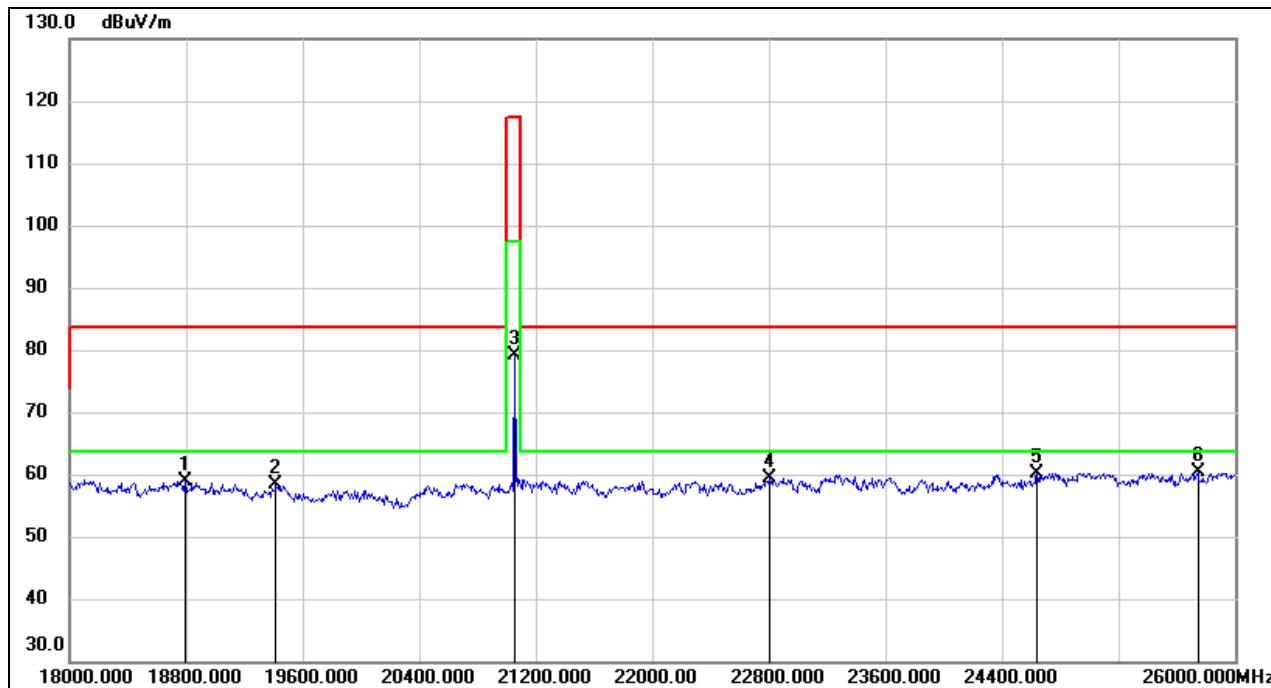
Test Mode:	CO-LOCATION	Test Channel:	CW CH1&WIFI 5G CH36
Polarity:	Vertical	Test Voltage:	AC 120 V, 60 Hz



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	3074.000	47.30	-6.42	40.88	74.00	-33.12	peak
2	4621.000	42.96	-1.50	41.46	74.00	-32.54	peak
3	7545.000	37.34	6.41	43.75	74.00	-30.25	peak
4	9364.000	39.10	10.67	49.77	74.00	-24.23	peak
5	13070.000	28.09	21.11	49.20	74.00	-24.80	peak
6	16759.000	26.95	22.15	49.10	74.00	-24.90	peak

18-26 GHz

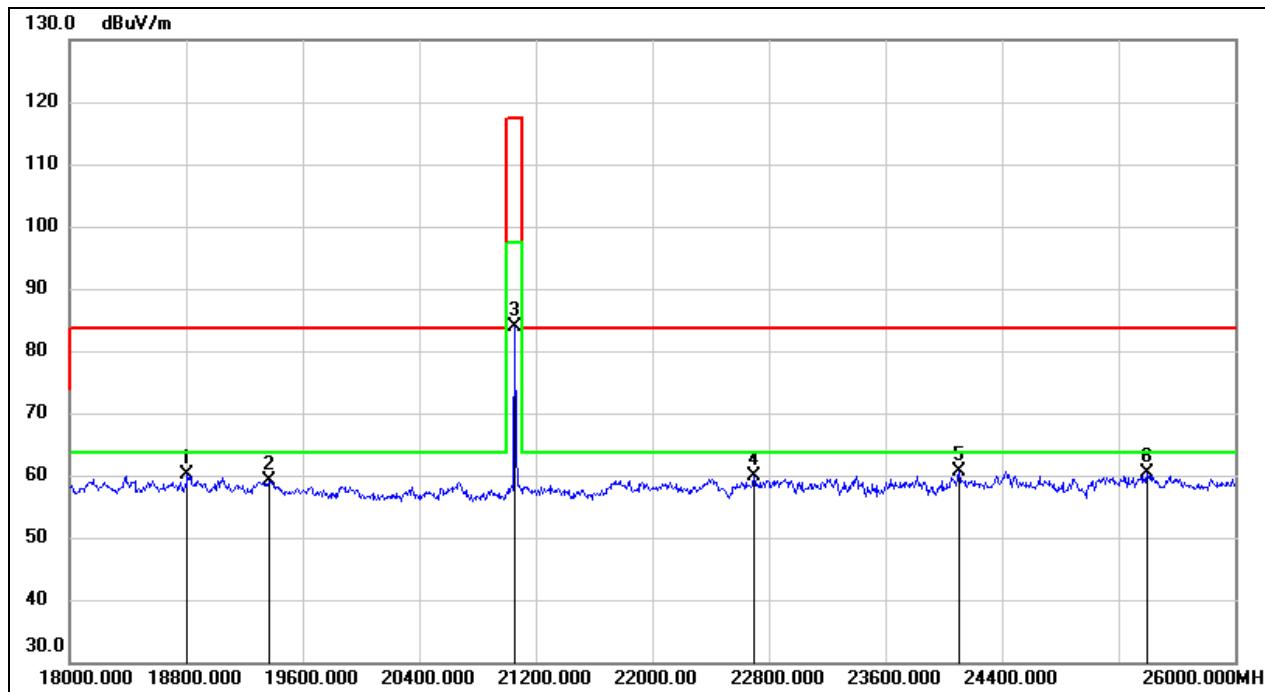
Test Mode:	CO-LOCATION	Test Channel:	CW CH1&WIFI 5G CH36
Polarity:	Horizontal	Test Voltage:	AC 120 V, 60 Hz



No.	Frequency	Reading	Correct	Result@1m	Limit@1m	Result@3m	Limit@3m	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	18792	53.35	5.45	58.8	83.54	49.3	74	-24.70	peak
2	19416	53.82	4.53	58.35	83.54	48.85	74	-25.15	peak
3	21056	73.46	5.56	79.02	117.5	69.52	107.96	-38.44	peak
/	/	/	/	19.02	97.5	9.52	87.96	-78.44	AVG
4	22800	53.94	5.34	59.28	83.54	49.78	74	-24.22	peak
5	24640	51.86	8.17	60.03	83.54	50.53	74	-23.47	peak
6	25744	52.2	8.1	60.3	83.54	50.8	74	-23.20	peak

Distance correct factor=20log (1.00 m/3.00 m) = -9.5 dB

Test Mode:	CO-LOCATION	Test Channel:	CW CH1&WIFI 5G CH36
Polarity:	Vertical	Test Voltage:	AC 120 V, 60 Hz



No.	Frequency	Reading	Correct	Result@1m	Limit@1m	Result@3m	Limit@3m	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	18808	54.75	5.47	60.22	83.54	50.72	74	-23.28	peak
2	19368	54.41	4.67	59.08	83.54	49.58	74	-24.42	peak
3	21056	78.25	5.56	83.81	117.5	74.31	107.96	-33.65	peak
/	/	/	/	23.81	97.5	14.31	87.96	-73.65	AVG
4	22696	54.7	5.15	59.85	83.54	50.35	74	-23.65	peak
5	24104	53.46	7.17	60.63	83.54	51.13	74	-22.87	peak
6	25392	52.31	7.96	60.27	83.54	50.77	74	-23.23	peak

correct factor=20log (1.00 m/3.00 m) = -9.5 dB

8. AC POWER LINE CONDUCTED EMISSION

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

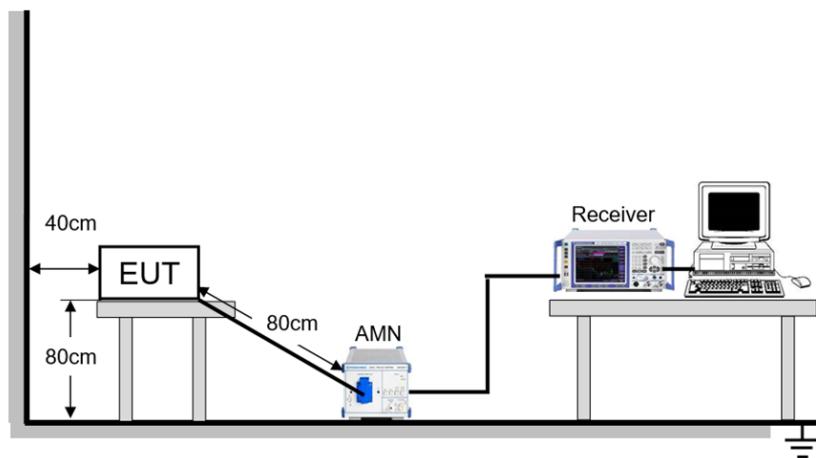
Note: *Decreases with the logarithm of the frequency.

TEST PROCEDURE

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 SETUP

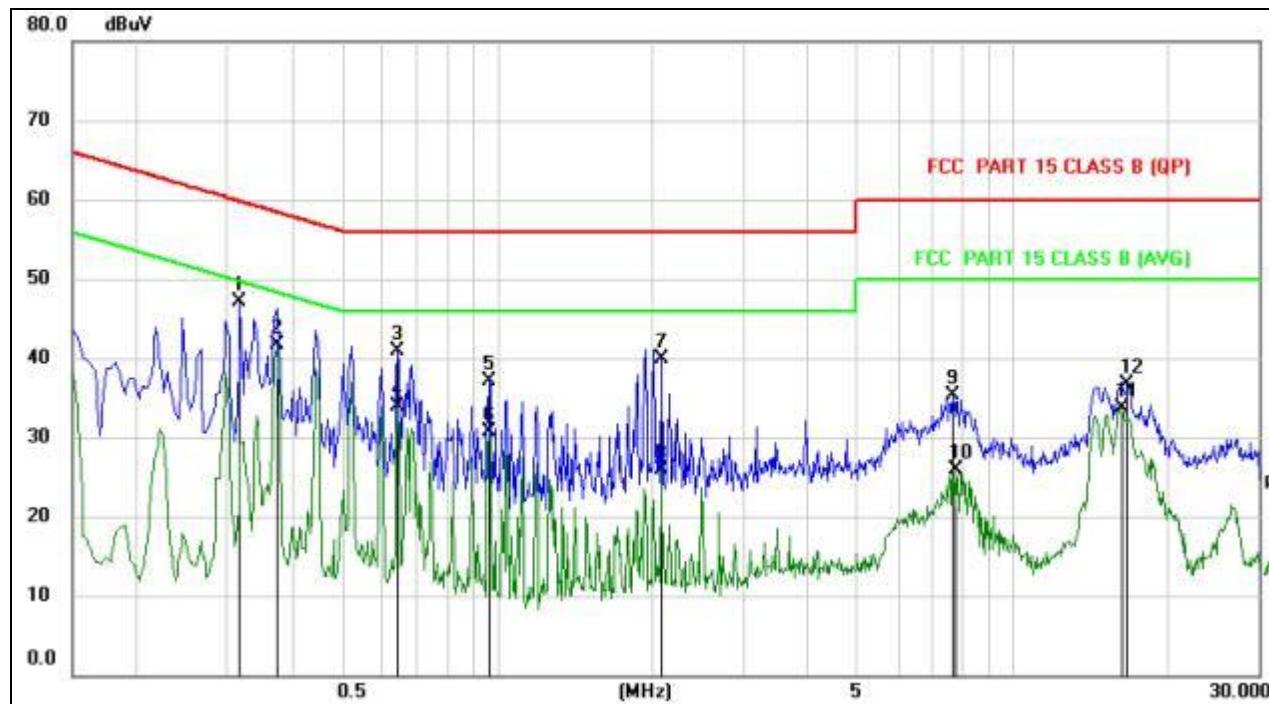


TEST ENVIRONMENT

Temperature	23.4°C	Relative Humidity	65%
Atmosphere Pressure	101kPa	Test Voltage	AC 120 V, 60 Hz

TEST RESULTS

Test Mode:	CW	Test Channel:	1
Line:	Line		

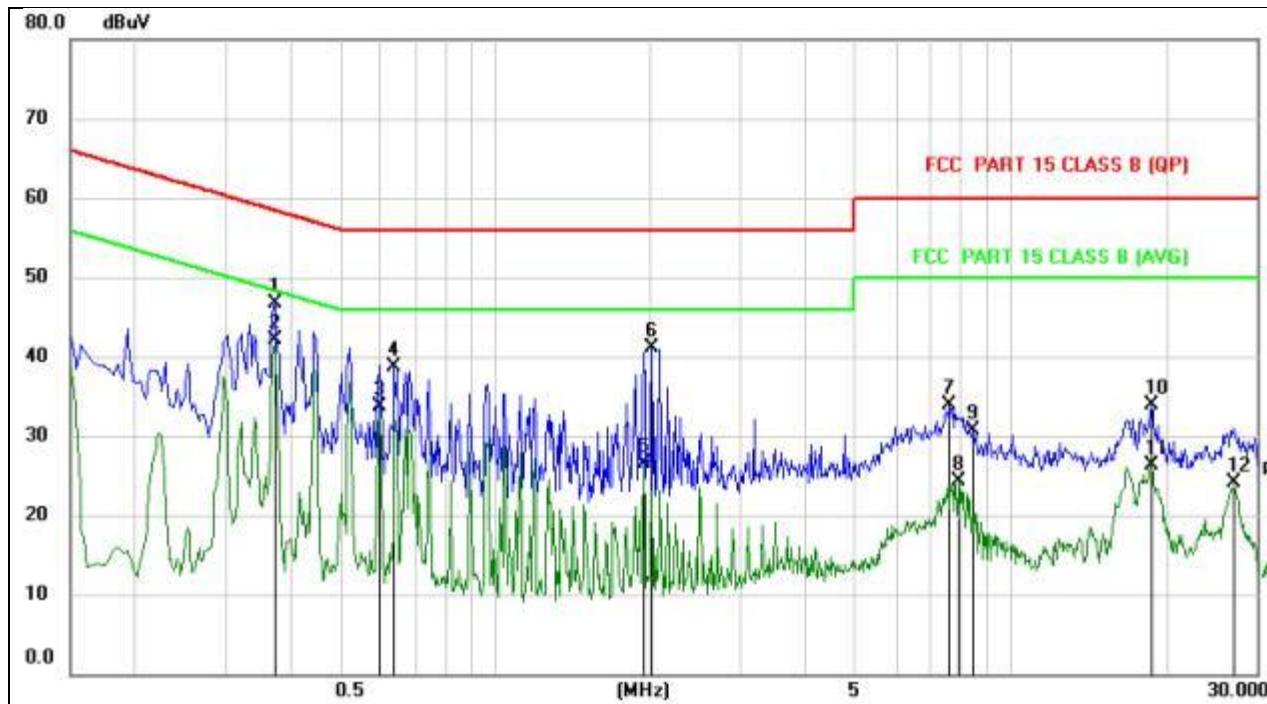


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	0.3180	36.74	10.41	47.15	59.76	-12.61	QP
2	0.3738	31.27	10.41	41.68	48.42	-6.74	AVG
3	0.6419	30.49	10.41	40.90	56.00	-15.10	QP
4	0.6419	23.43	10.41	33.84	46.00	-12.16	AVG
5	0.9657	26.67	10.42	37.09	56.00	-18.91	QP
6	0.9657	20.20	10.42	30.62	46.00	-15.38	AVG
7	2.0859	29.47	10.46	39.93	56.00	-16.07	QP
8	2.0859	15.41	10.46	25.87	46.00	-20.13	AVG
9	7.6779	24.68	10.64	35.32	60.00	-24.68	QP
10	7.7538	15.25	10.64	25.89	50.00	-24.11	AVG
11	16.3338	22.73	10.92	33.65	50.00	-16.35	AVG
12	16.6936	25.84	10.92	36.76	60.00	-23.24	QP

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.

Test Mode:	SRD 2.4GHz	Test Channel:	1
Line:	Neutral		



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	0.3731	36.39	10.41	46.80	58.43	-11.63	QP
2	0.3731	31.67	10.41	42.08	48.43	-6.35	AVG
3	0.5979	23.25	10.41	33.66	46.00	-12.34	AVG
4	0.6372	28.23	10.41	38.64	56.00	-17.36	QP
5	1.9386	16.01	10.45	26.46	46.00	-19.54	AVG
6	2.0119	30.62	10.46	41.08	56.00	-14.92	QP
7	7.6060	23.30	10.63	33.93	60.00	-26.07	QP
8	7.8934	13.60	10.65	24.25	50.00	-25.75	AVG
9	8.4115	20.06	10.70	30.76	60.00	-29.24	QP
10	18.7210	22.99	10.98	33.97	60.00	-26.03	QP
11	18.7210	15.42	10.98	26.40	50.00	-23.60	AVG
12	27.1270	12.89	11.15	24.04	50.00	-25.96	AVG
13	0.3731	36.39	10.41	46.80	58.43	-11.63	QP
14	0.3731	31.67	10.41	42.08	48.43	-6.35	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.

9. 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.

RESULTS

Complies

END OF REPORT