FCC PART 15 SUBPART C
ISED RSS-247 ISSUE 2

CERTIFICATION TEST REPORT

For

Bluetooth Headset

MODEL NUMBER: LIVE650BTNC

FCC ID:APILIVE650BTNC

IC: 6132A-LIVE650BTNC

REPORT NUMBER: 4788562047.1-5

ISSUE DATE: July 24, 2018

Prepared for

Harman International Industries, Incorporated
8500 Balboa Boulevard, Northridge, CA 91329, UNITED STATES

Prepared by

UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch
Room 101, Building 10, Innovation Technology Park,
Song Shan Lake Hi tech Development Zone, Dongguan, 523808, China
Tel: +86 769 33817100
Fax: +86 769 33244054
Website: www.ul.com

Revision History

Rev.	Issue Date	Revisions	Revised By
--	07/24/2018	Initial Issue	

Summary of Test Results			
Clause	Test Items	FCC/IC Rules	Test Results
1	6db DTS Bandwidth	FCC 15.247 (a) (2) IC RSS-247 Clause 5.1 (1)	Pass
2	Peak Conducted Power	FCC 15.247 (b) (3) IC RSS-247 Clause 5.4 (4)	Pass
3	Power Spectral Density	FCC 15.247 (3) IC RSS-247 Clause 5.2 (2)	Pass
4	Conducted Band edge And Spurious emission	FCC 15.247 (d) IC RSS-247 Clause 5.5	Pass
5	Radiated Band edges and Spurious emission	FCC 15.247 (d) FCC 15.209 FCC 15.205 IC RSS-247 Clause 5.5 IC RSS-GEN Clause 8.9	Pass
6	Conducted Emission Test For AC Power Port	FCC 15.207 RSS-GEN Clause 8.8	Pass
7	Antenna Requirement	FCC 15.203 RSS-GEN Clause 8.3	Pass

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1. ATTESTATION OF TEST RESULTS

Applicant Information

Company Name:	Harman International Industries, Incorporated
Address:	8500 Balboa Boulevard, Northridge, CA 91329, UNITED STATES

Manufacturer Information

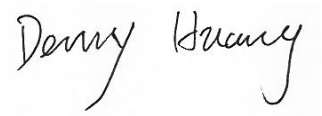
Company Name:	Harman International Industries, Incorporated
Address:	8500 Balboa Boulevard, Northridge, CA 91329, UNITED STATES

EUT Description

Product Name	Bluetooth Headset
Brand Name	JBL
Model Name	LIVE650BTNC
Sample ID	1716859
Sample Status	Normal
Sample Received date	July 16, 2018
Date Tested	July 16, 2018 ~July 20, 2018

APPLICABLE STANDARDS	
STANDARD	**TEST RESULTS**
FCC Part 15 Subpart C	**PASS**
ISED RSS-247 Issue 2	**PASS**
ISED RSS-GEN Issue 5	**PASS**

Prepared By:



Denny Huang
Engineer Project Associate

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 558074 D01 DTS Meas Guidance v04, 414788 D01 Radiated Test Site v01, FCC CFR 47 Part 2, FCC CFR 47 Part 15 and ANSI C63.10-2013.

3. FACILITIES AND ACCREDITATION

Accreditation Certificate	**A2LA (Certificate No.: 4102.01)** UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch. has been assessed and proved to be in compliance with A2LA. **IAS (Lab Code: TL-702)** UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch. has demonstrated compliance with ISO/IEC Standard 17025:2005, General requirements for the competence of testing and calibration laboratories **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 Delcaration of Conformity (DoC) and Certification rules **IC(Company No.: 21320)** UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch. has been registered and fully described in a report filed with ISED. The Company Number is 21320. **VCCI (Registration No.: G-20019, R-20004, C-20012 and T-20011)** UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch. has been assessed and proved to be in compliance with VCCI, the Membership No. is 3793. Facility Name: Chamber D, the VCCI registration No. is G-20019 and R-20004 Shielding Room B , the VCCI registration No. is C-20012 and T-20011

Note:

1. All tests measurement facilities use to collect the measurement data are located at Building 10, Innovation Technology Park, Song Shan Lake Hi tech Development Zone, Dongguan, 523808, China

2. The test anechoic chamber in UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch had been calibrated and compared to the open field sites and the test anechoic chamber is shown to be equivalent to or worst case from the open field site.

3. For below 30MHz, lab had performed measurements at test anechoic chamber and comparing to measurements obtained on an open field site. And these measurements below 30MHz had been correlated to measurements performed on an OATS.

4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to 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
Uncertainty for Conduction emission test	2.90dB
Uncertainty for Radiation Emission test(include Fundamental emission) (9KHz-30MHz)	2.2dB
Uncertainty for Radiation Emission test(include Fundamental emission) (30MHz-1GHz)	4.52dB
Uncertainty for Radiation Emission test (1GHz to 26GHz)(include Fundamental emission)	5.04dB(1-6GHz)
	5.30dB (6GHz-18Gz)
	5.23dB (18GHz-26Gz)
Note: This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.	

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

EUT Name	Bluetooth Headset		
Model	LIVE650BTNC		
Product Description (Bluetooth)	Operation Frequency	2402 MHz ~ 2480 MHz	
	Modulation Type		Data Rate
	GFSK		1Mbps
Rated Input	DC 5V		
Battery	DC 3.7 V, 700mAh		
Bluetooth Version	BT V4.2		

5.2. MAXIMUM OUTPUT POWER

Frequency Range (MHz)	Number of Transmit Chains (NTX)	Bluetooth Mode	Frequency (MHz)	Channel Number	Max PK Conducted Power (dBm)	EIRP (dBm)
2400-2483.5	1	BLE	2402-2480	0-39[40]	-10.337	-6.937

5.3. CHANNEL LIST

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
00	2402	11	2424	22	2446	33	2468
01	2404	12	2426	23	2448	34	2470
02	2406	13	2428	24	2450	35	2472
03	2408	14	2430	25	2452	36	2474
04	2410	15	2432	26	2454	37	2476
05	2412	16	2434	27	2456	38	2478
06	2414	17	2436	28	2458	39	2480
07	2416	18	2438	29	2460		
08	2418	19	2440	30	2462		
09	2420	20	2442	31	2464		
10	2422	21	2444	32	2466		

5.4. TEST CHANNEL CONFIGURATION

Test Mode	Test Channel	Frequency
GFSK	CH 00, CH 19, CH 39	2402MHz, 2440MHz, 2480MHz

5.5. THE WORSE CASE POWER SETTING PARAMETER

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

5.6. DESCRIPTION OF AVAILABLE ANTENNAS

Ant.	Frequency (MHz)	Antenna Type	Antenna Gain (dBi)
1	2402-2480	PCB Antenna	3.4

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

5.7. WORST-CASE CONFIGURATIONS

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

5.8. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Item	Equipment	Brand Name	Model Name	P/N
1	Laptop	ThinkPad	T460S	SL10K24796 JS
2	USB TO UART	/	/	/

I/O CABLES

Cable No	Port	Connector Type	Cable Type	Cable Length(m)	Remarks
1	USB	USB	Unshielded	1.2	/
2	Aux in	AUX	Unshielded	1.2	/

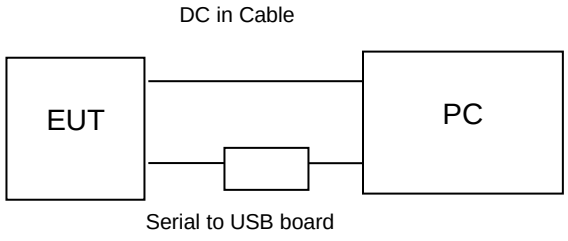
ACCESSORY

Item	Accessory	Brand Name	Model Name	Description
1	/	/	/	/

TEST SETUP

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

SETUP DIAGRAM FOR TESTS



6. MEASURING INSTRUMENT AND SOFTWARE USED

Conducted Emissions							
Instrument							
Used	Equipment	Manufacturer	Model No.	Serial No.	Upper Last Cal.	Last Cal.	Next Cal.
☑	EMI Test Receiver	R&S	ESR3	101961	Dec.20, 2016	Dec.12, 2017	Dec.11, 2018
☑	Two-Line V-Network	R&S	ENV216	101983	Dec.20, 2016	Dec.12, 2017	Dec.11, 2018
☑	Artificial Mains Networks	Schwarzbeck	NSLK 8126	8126465	Feb.10, 2017	Dec.12, 2017	Dec.11, 2018
Software							
Used	Description			Manufacturer	Name	Version	
☑	Test Software for Conducted disturbance			Farad	EZ-EMC	Ver. UL-3A1	
Radiated Emissions							
Instrument							
Used	Equipment	Manufacturer	Model No.	Serial No.	Upper Last Cal.	Last Cal.	Next Cal.
☑	MXE EMI Receiver	KESIGHT	N9038A	MY56400036	Feb. 24, 2017	Dec.12, 2017	Dec.11, 2018
☑	Hybrid Log Periodic Antenna	TDK	HLP-3003C	130960	Jan.09, 2016	Jan.09, 2016	Jan.09, 2019
☑	Preamplifier	HP	8447D	2944A09099	Feb. 13, 2017	Dec.12, 2017	Dec.11, 2018
☑	EMI Measurement Receiver	R&S	ESR26	101377	Dec. 20, 2016	Dec.12, 2017	Dec.11, 2018
☑	Horn Antenna	TDK	HRN-0118	130939	Jan. 09, 2016	Jan. 09, 2016	Jan. 09, 2019
☑	High Gain Horn Antenna	Schwarzbeck	BBHA-9170	691	Jan.06, 2016	Jan.06, 2016	Jan.06, 2019
☑	Preamplifier	TDK	PA-02-0118	TRS-305-00066	Jan. 14, 2017	Dec.12, 2017	Dec.11, 2018
☑	Preamplifier	TDK	PA-02-2	TRS-307-00003	Dec. 20, 2016	Dec.12, 2017	Dec.11, 2018
☑	Loop antenna	Schwarzbeck	1519B	00008	Mar. 26, 2016	Mar. 26, 2016	Mar. 26, 2019
Software							
Used	Description			Manufacturer	Name	Version	
☑	Test Software for Radiated disturbance			Farad	EZ-EMC	Ver. UL-3A1	
Other instruments							
Used	Equipment	Manufacturer	Model No.	Serial No.	Upper Last Cal.	Last Cal.	Next Cal.
☑	Spectrum Analyzer	Keysight	N9030A	MY55410512	Dec. 20, 2016	Dec.12, 2017	Dec.11, 2018
☑	Power Meter	Keysight	N9031A	MY55416024	Feb. 13, 2017	Dec.12, 2017	Dec.11, 2018
☑	Power Sensor	Keysight	N9323A	MY55440013	Feb. 13, 2017	Dec.12, 2017	Dec.11, 2018

7. MEASUREMENT METHODS

No.	Test Item	KDB Name	Section
1	6dB Bandwidth and 99% Bandwidth	KDB 558074 D01 DTS Meas Guidance v04	8.0
2	Peak Output Power	KDB 558074 D01 DTS Meas Guidance v04	9.1.3
3	Power Spectral Density	KDB 558074 D01 DTS Meas Guidance v04	10.2
4	Out-of-band emissions in non-restricted bands	KDB 558074 D01 DTS Meas Guidance v04	11.0
5	Out-of-band emissions in restricted bands	KDB 558074 D01 DTS Meas Guidance v04	12.1
6	Band-edge	KDB 558074 D01 DTS Meas Guidance v04	13.3.2
7	Conducted Emission Test For AC Power Port	ANSI C63.10-2013	6.7

8. ANTENNA PORT TEST RESULTS

8.1. ON TIME AND DUTY CYCLE

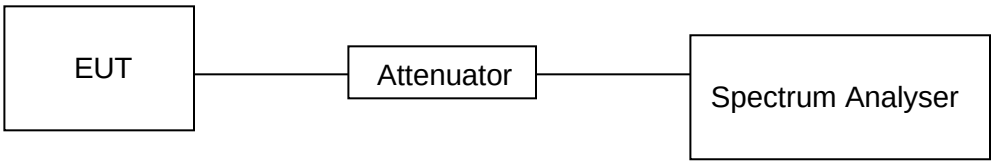
LIMITS

None; for reporting purposes only

PROCEDURE

KDB 558074 Zero-Span Spectrum Analyzer Method

TEST SETUP



TEST ENVIRONMENT

Temperature	22.3°C	Relative Humidity	63%
Atmosphere Pressure	101kPa	Test Voltage	DC 3.7V

RESULTS

Mode	On Time (msec)	Period (msec)	Duty Cycle x (Linear)	Duty Cycle (%)	Duty Cycle Correction Factor (db)
GFSK	0.399	0.625	0.638	63.8	1.95

Note: Duty Cycle Correction Factor=10log(1/x).
Where: x is Duty Cycle(Linear)

ON TIME AND DUTY CYCLE MID CH

8.2. 6 dB BANDWIDTH & 99% BANDWIDTH

LIMITS

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

TEST PROCEDURE

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

Center Frequency	The centre frequency of the channel under test
Detector	Peak
RBW	For 6 dB Bandwidth :100K For 99% Bandwidth :1% to 5% of the occupied bandwidth
VBW	For 6dB Bandwidth : ≥3 × RBW For 99% Bandwidth : approximately 3×RBW
Trace	Max hold
Sweep	Auto couple

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

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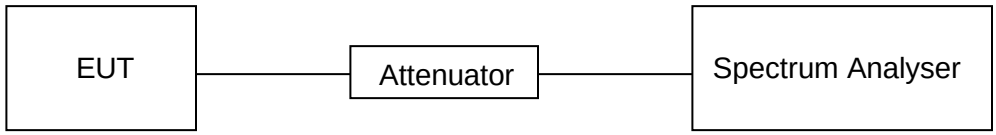
TEST SETUP



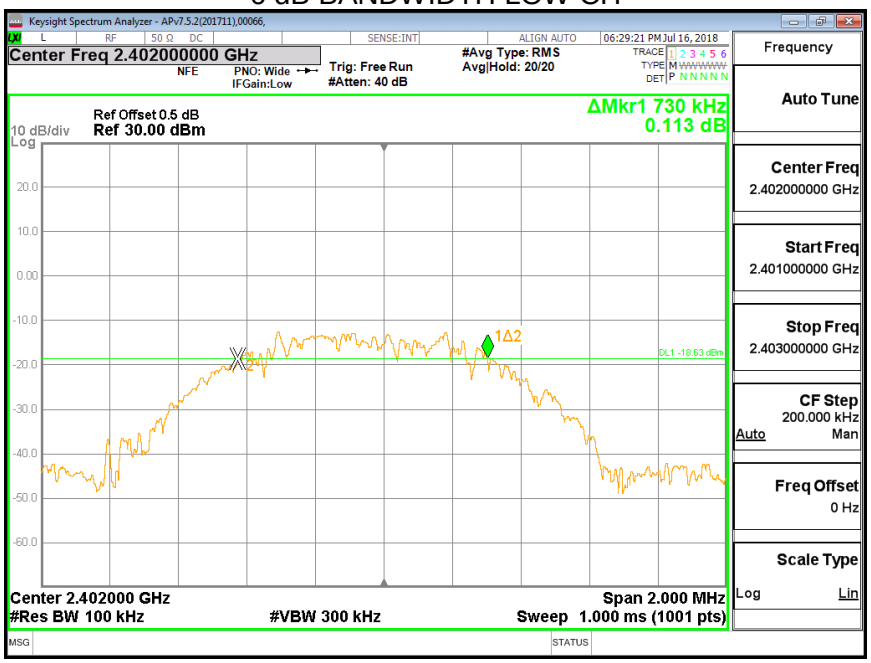
TEST ENVIRONMENT

Temperature	22.3°C	Relative Humidity	63%
Atmosphere Pressure	101kPa	Test Voltage	DC 3.7V

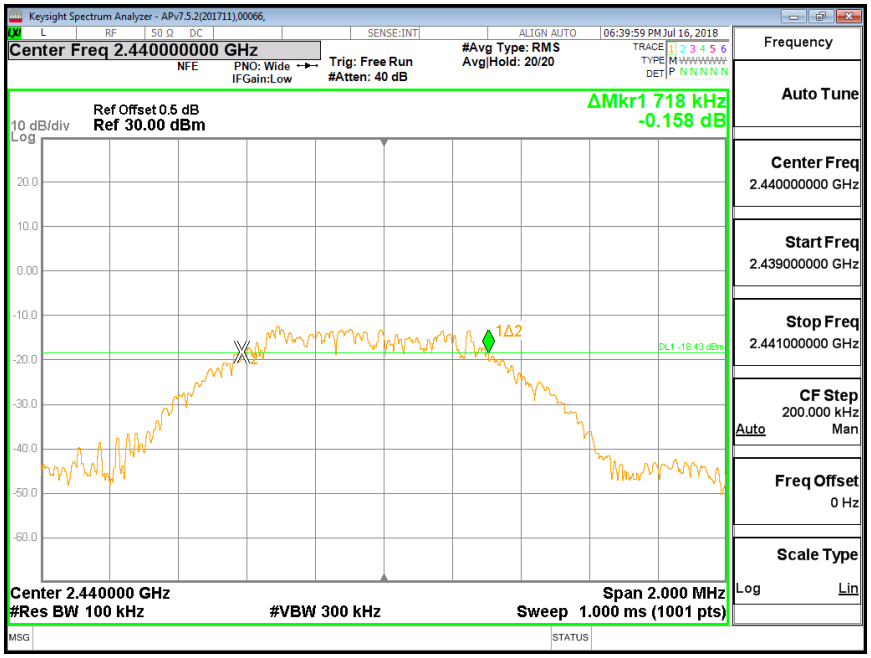
RESULTS

Channel	Frequency (MHz)	6dB bandwidth (MHz)	99% bandwidth (MHz)	Limit (kHz)	Result
Low	2412	0.730	1.030	500	Pass
Middle	2437	0.718	1.030	500	Pass
High	2462	0.730	1.029	500	Pass

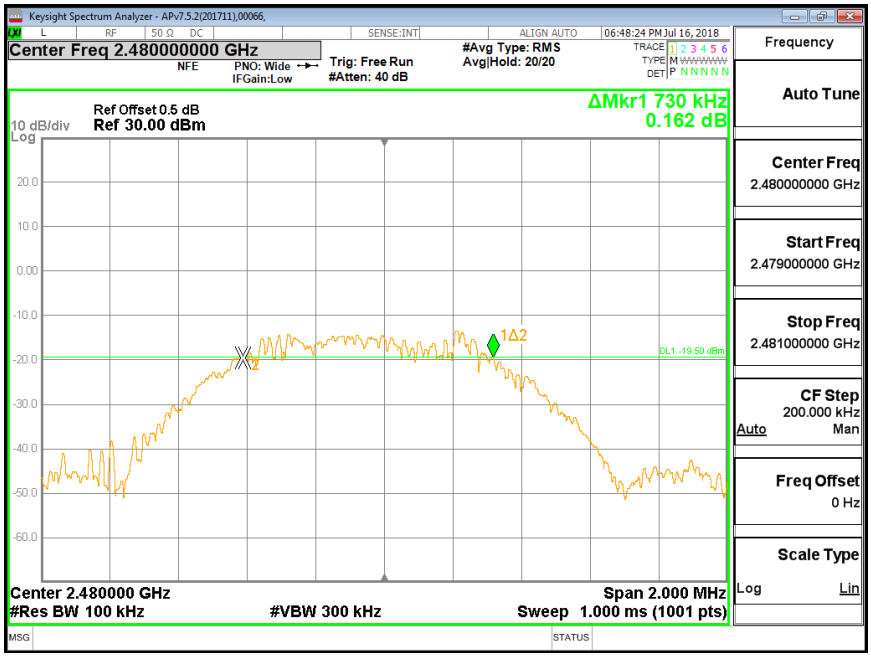
6 dB BANDWIDTH LOW CH



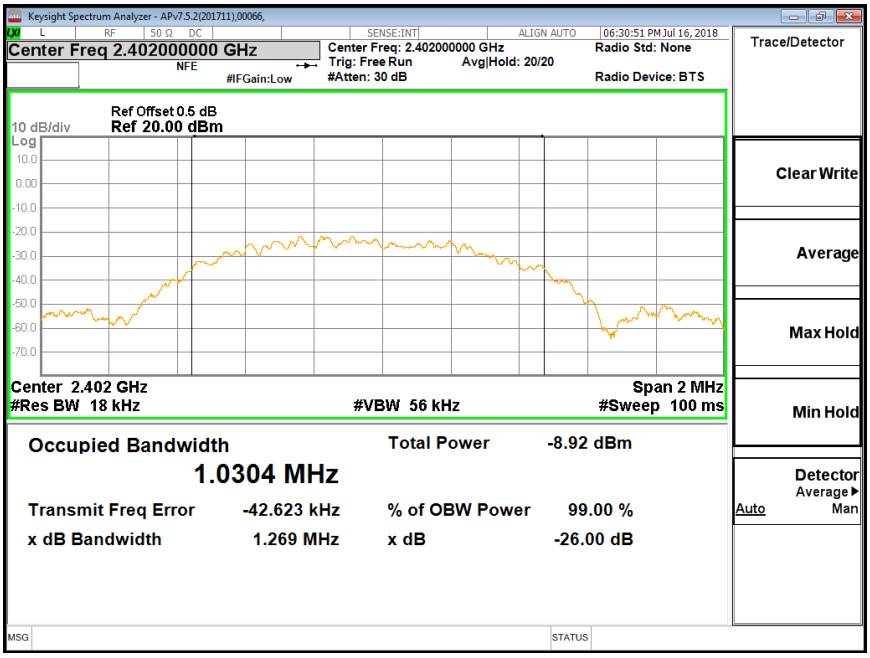
6 dB BANDWIDTH MID CH



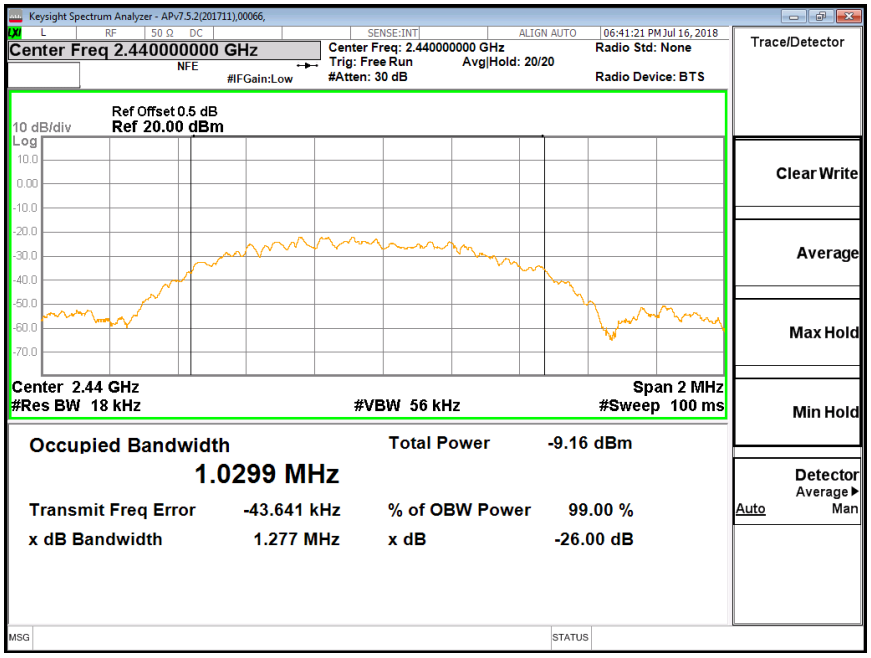
6 dB BANDWIDTH HIGH CH



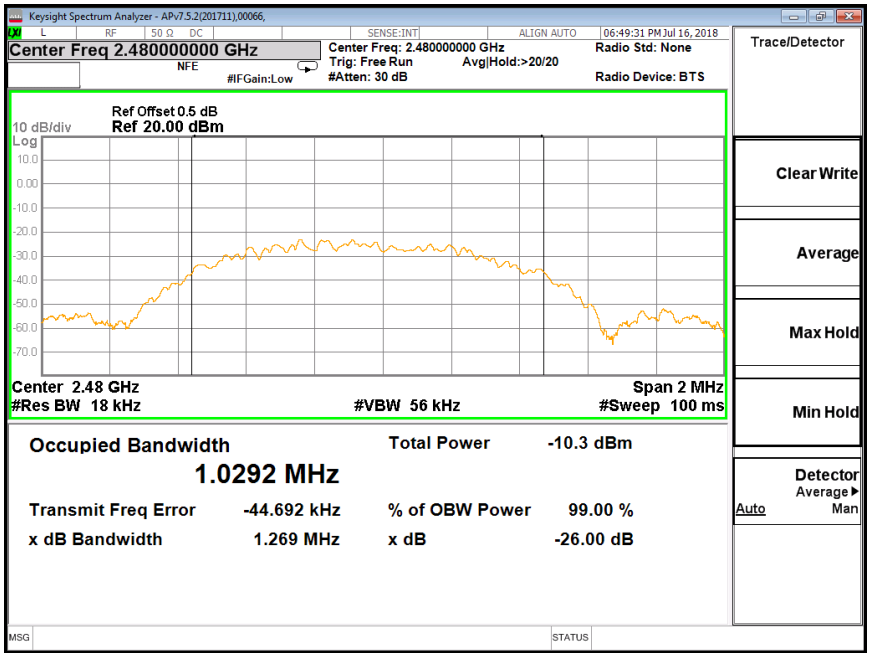
99% BANDWIDTH LOW CH



99% BANDWIDTH MID CH



99% BANDWIDTH HIGH CH



8.3. PEAK CONDUCTED OUTPUT POWER

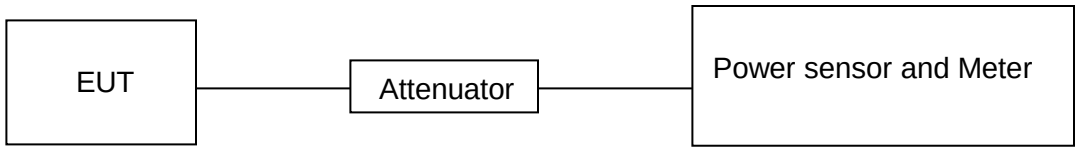
LIMITS

FCC Part15 (15.247) , Subpart C IC RSS-247 ISSUE 2			
Section	Test Item	Limit	Frequency Range (MHz)
FCC 15.247(b)(3) IC RSS-247 5.4 (4)	Peak Output Power	1 watt or 30dBm	2400-2483.5

TEST PROCEDURE

Place the EUT on the table and set it in the transmitting mode.
Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the Power sensor.
Measure peak power each channel.

TEST SETUP



TEST ENVIRONMENT

Temperature	22.3°C	Relative Humidity	63%
Atmosphere Pressure	101kPa	Test Voltage	DC 3.7V

RESULTS

Channel	Frequency	Maximum Conducted Output Power(PK)	Maximum Conducted Output Power(AVG)	PK EIRP	Result
	(MHz)	(dBm)		(dBm)	
Low	2402	-10.337	-12.13	-6.937	Pass
Middle	2441	-10.814	-12.42	-7.414	Pass
High	2480	-11.902	-13.33	-8.502	Pass

8.4. POWER SPECTRAL DENSITY

LIMITS

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

TEST PROCEDURE

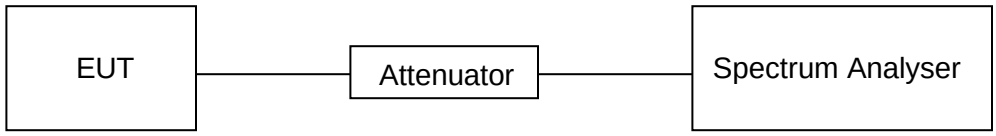
Connect the UUT to the spectrum analyser and use the following settings:

Center Frequency	The centre frequency of the channel under test
Detector	Peak
RBW	3 kHz ≤ RBW ≤ 100kHz
VBW	≥3 × 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 amplitude level within the RBW.

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

TEST SETUP



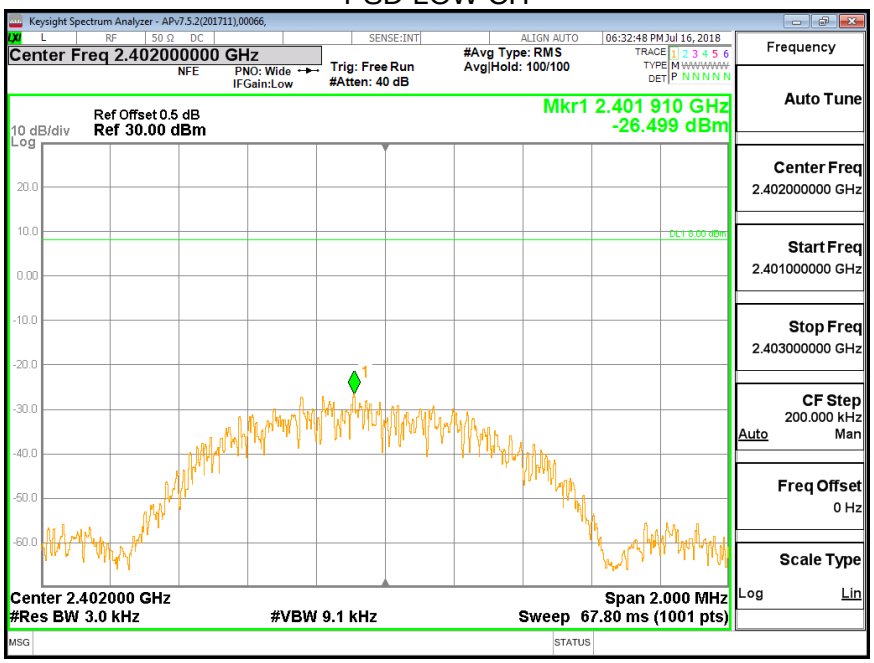
TEST ENVIRONMENT

Temperature	22.3°C	Relative Humidity	63%
Atmosphere Pressure	101kPa	Test Voltage	DC 3.7V

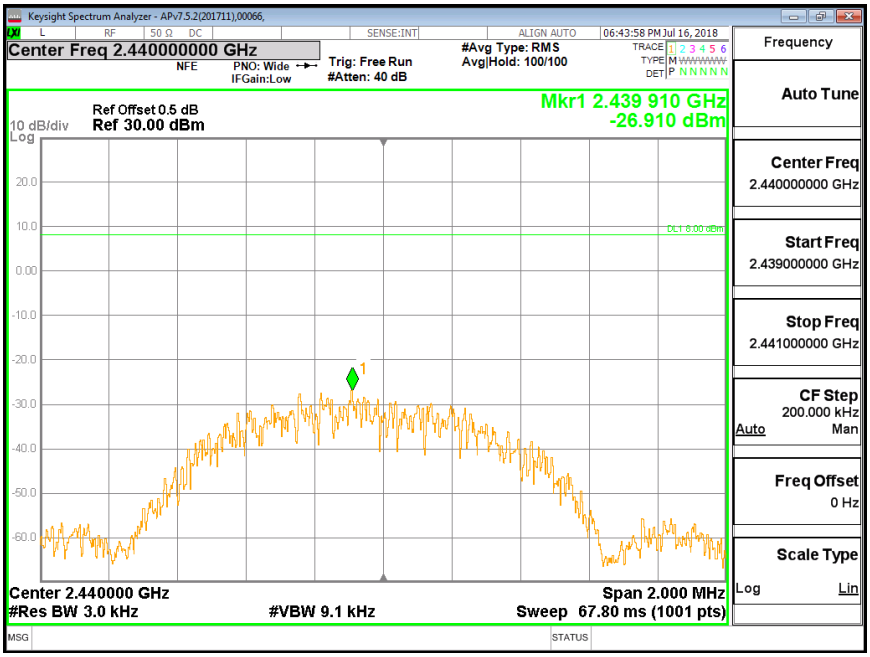
RESULTS

Test Channel	Frequency	Power Spectral Density (dBm/3kHz)	Limit (dBm/3kHz)	Result
Low	2412MHz	-26.499	8	PASS
Middle	2437MHz	-26.910	8	PASS
High	2462MHz	-28.057	8	PASS

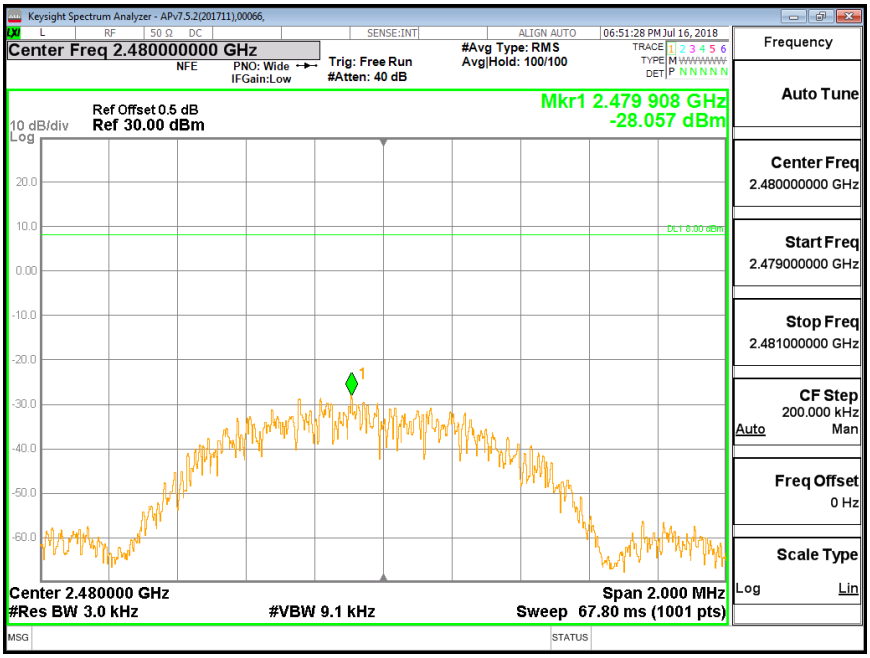
PSD LOW CH



PSD MID CH



PSD HIGH CH



8.5. CONDUCTED BANDEDGE AND SPURIOUS EMISSIONS

LIMITS

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

TEST PROCEDURE

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

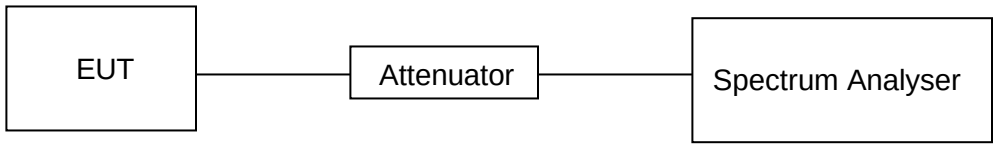
Center Frequency	The centre frequency of the channel under test
Detector	Peak
RBW	100K
VBW	≥3 × RBW
Span	1.5 x DTS bandwidth
Trace	Max hold
Sweep time	Auto couple.

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

Span	Set the center frequency and span to encompass frequency range to be measured
Detector	Peak
RBW	100K
VBW	≥3 × RBW
measurement points	≥span/RBW
Trace	Max hold
Sweep time	Auto couple.

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

TEST SETUP

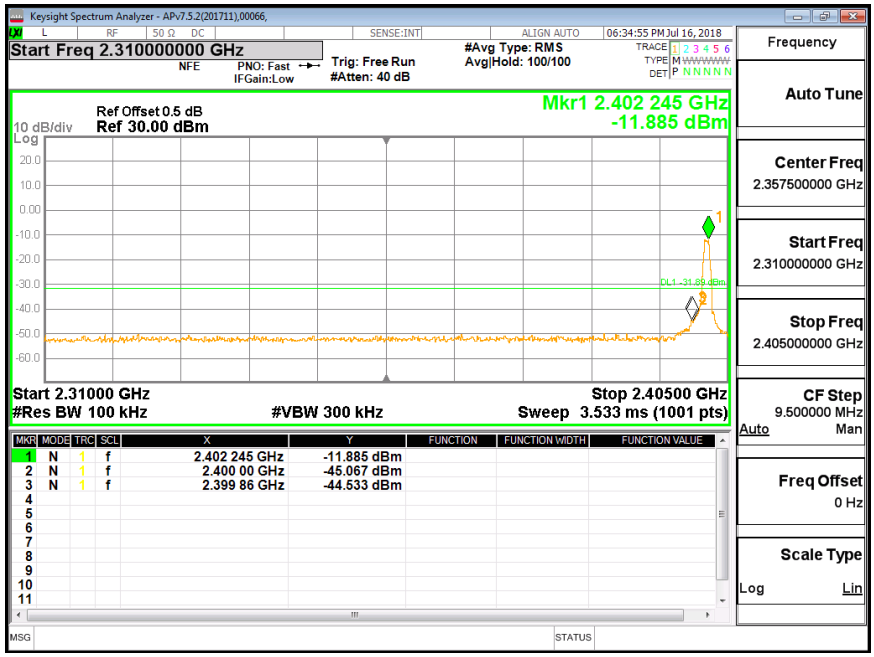


TEST ENVIRONMENT

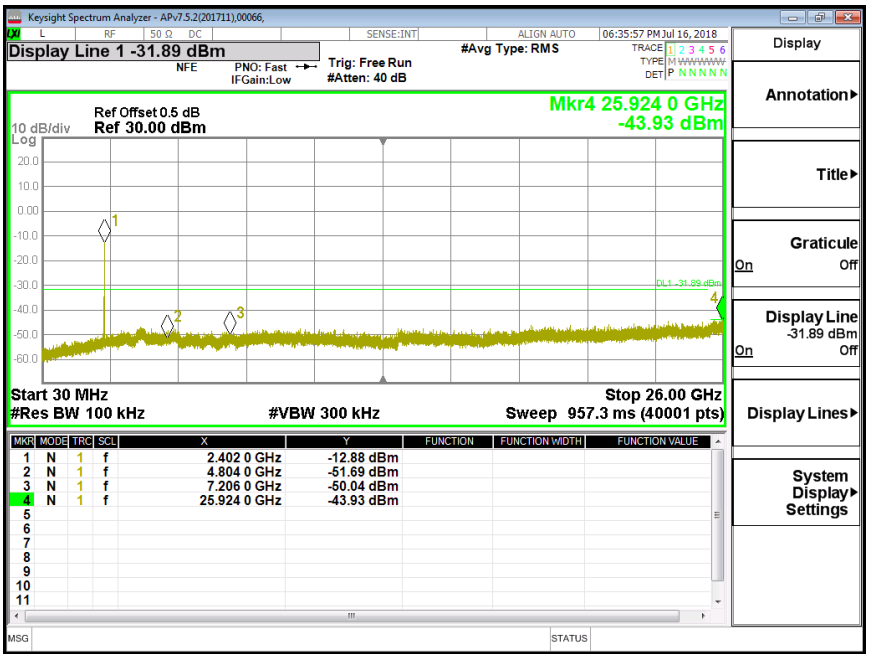
Temperature	22.3°C	Relative Humidity	63%
Atmosphere Pressure	101kPa	Test Voltage	DC 3.7V

RESULTS

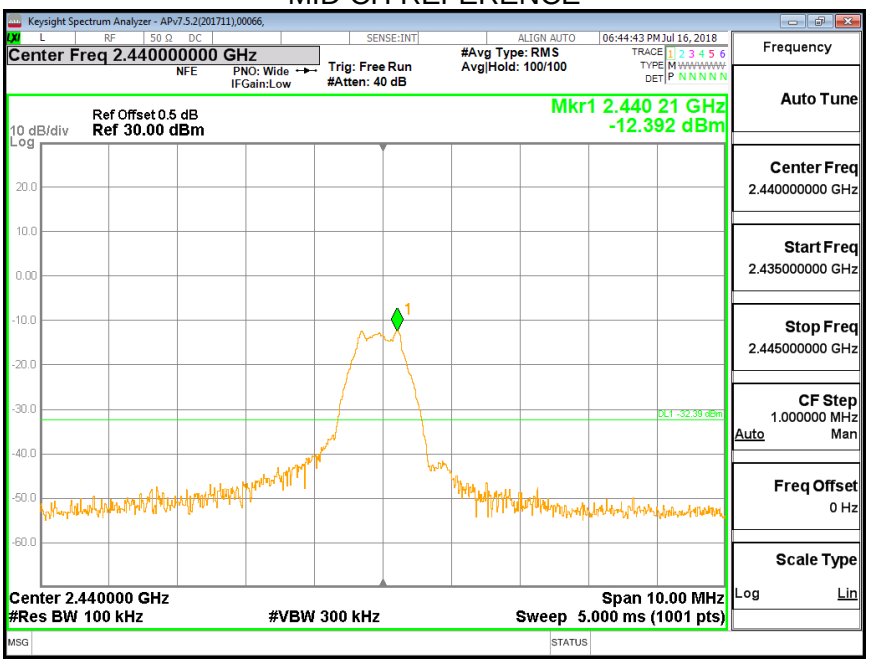
LOW CH BANDEDAGE



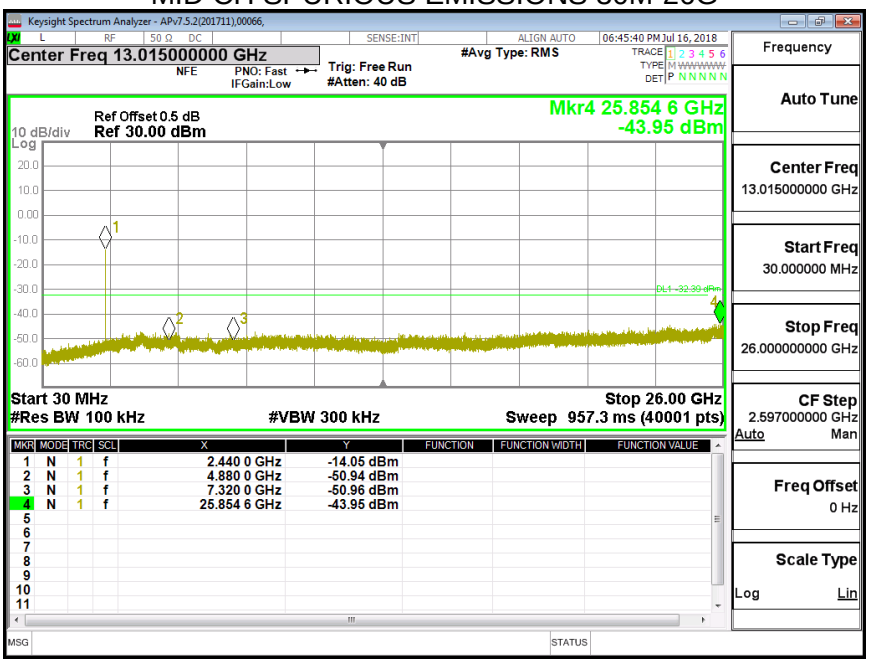
LOW CH SPURIOUS EMISSIONS 30M-26G



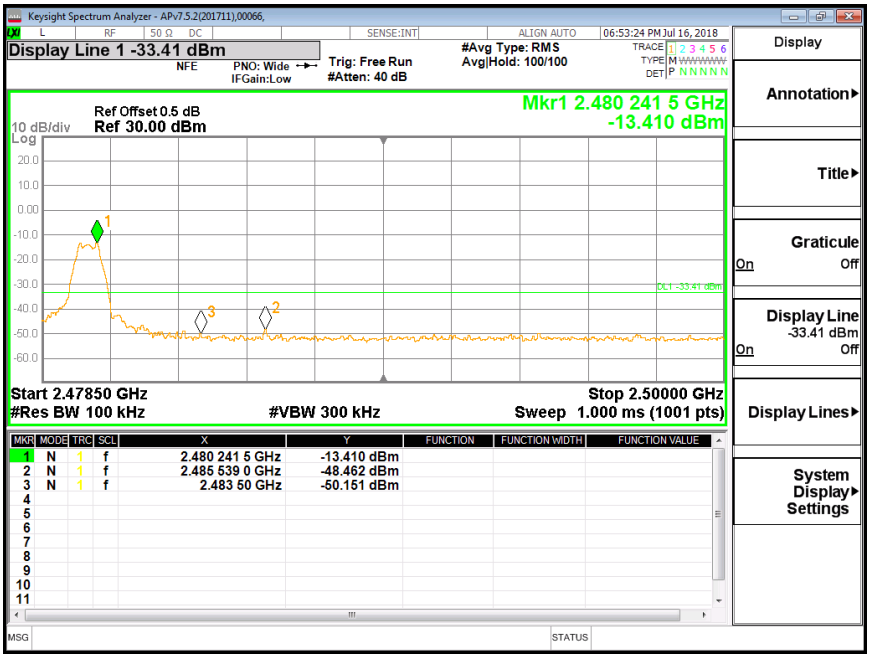
MID CH REFERENCE



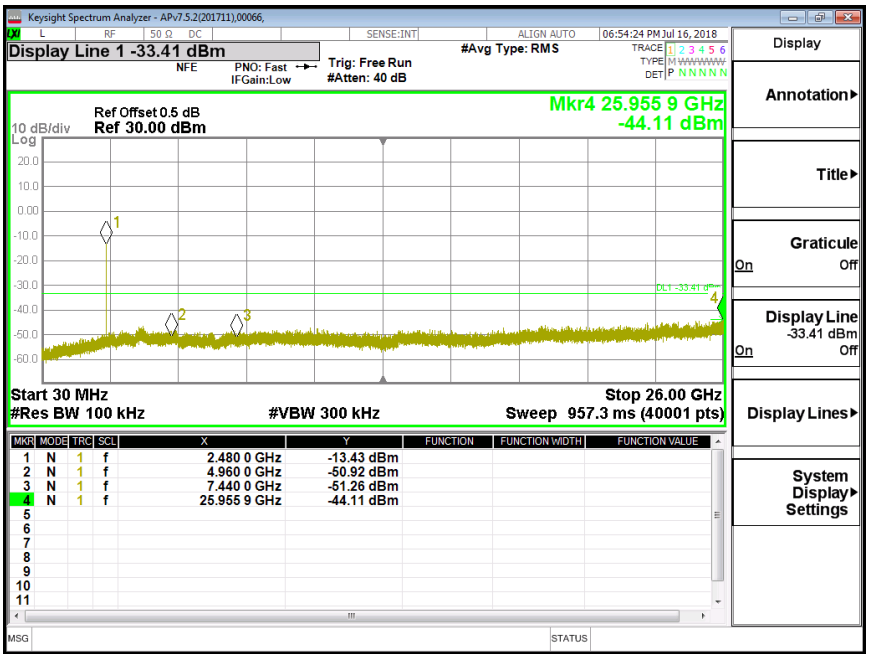
MID CH SPURIOUS EMISSIONS 30M-26G



HIGH CH BANDEDAGE



HIGH CH SPURIOUS EMISSIONS 30M-26G



9. RADIATED TEST RESULTS

9.1. LIMITS AND PROCEDURE

Please refer to FCC §15.205 and §15.209

Please refer to RSS-GEN Clause 8.9 (Transmitter)

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

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

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

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

Radiation Disturbance Test Limit for FCC (Above 1G)

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

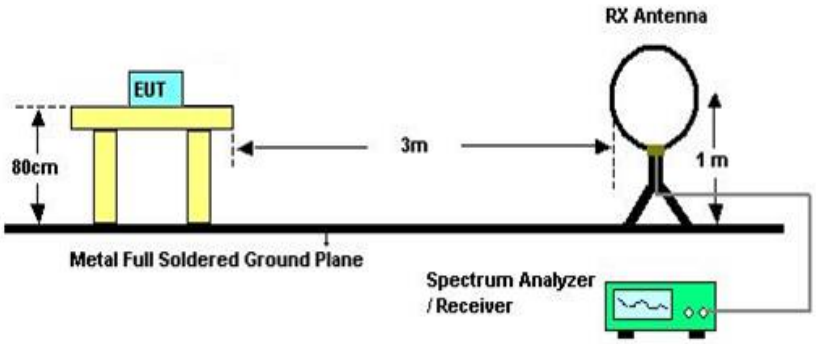
Restricted bands of operation

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
[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: [1]Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.
[2]Above 38.6c

TEST SETUP AND PROCEDURE

Below 30MHz



The setting of the spectrum analyser

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

1. The testing follows the guidelines in ANSI C63.10-2013 and 414788 D01 Radiated Test Site v01.

2. The EUT was arranged to its worst case and then turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

3. The EUT was placed on a turntable with 80cm meter above ground.

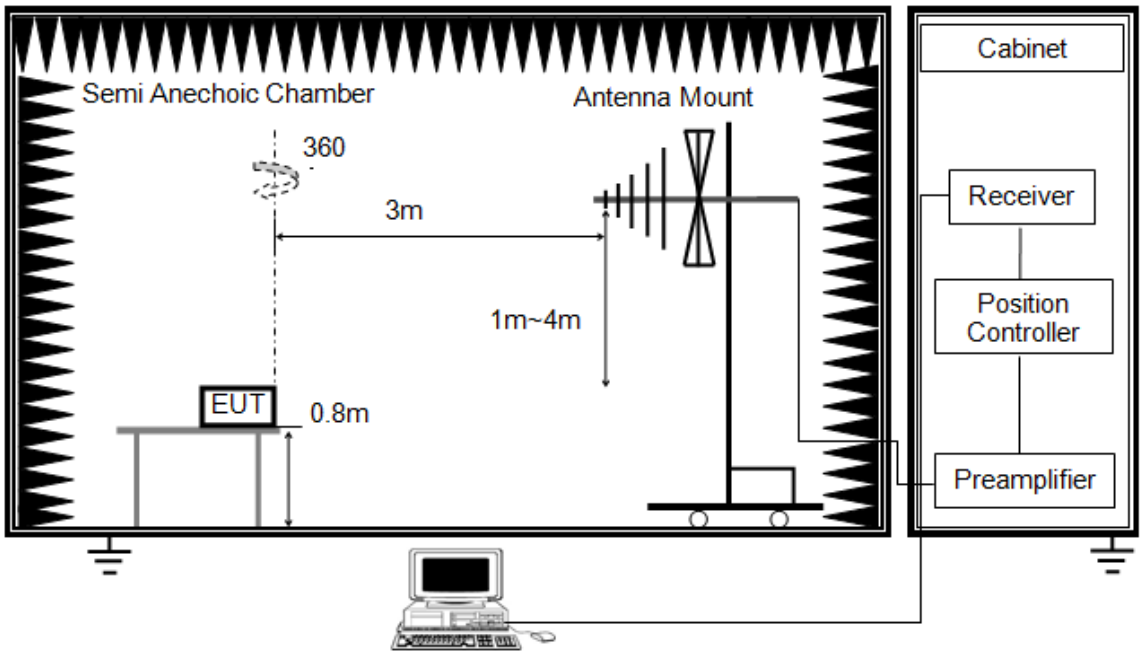
4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.

5. The radiated emission limits are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.

6. For measurement below 1GHz, the initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak 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.

7. Although these tests were performed other than open area test site, adequate comparison measurements were confirmed against 30m open are test 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 based on KDB 414788.

Below 1G



The setting of the spectrum analyser

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

1. The testing follows the guidelines in ANSI C63.10-2013.

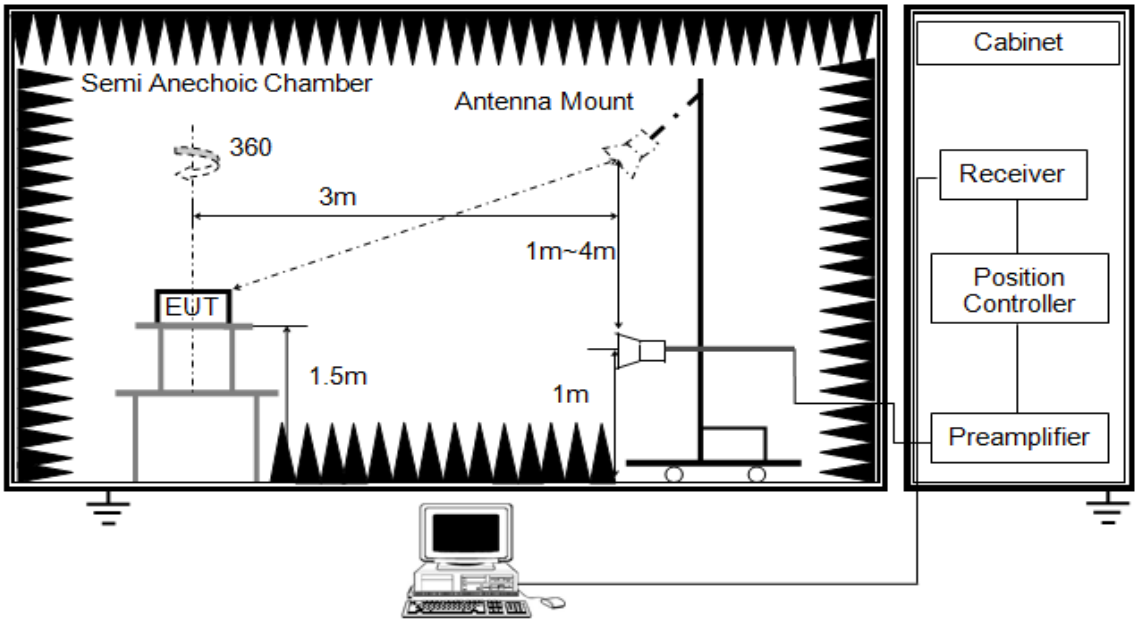
2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

3. The EUT was placed on a turntable with 0.8 meter above ground.

4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.

5. For measurement below 1GHz, the initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured. If the emission level of the EUT measured by the peak detector is 3 dB lower than the applicable limit, the peak emission level will be reported. Otherwise, the emission measurement will be repeated using the quasi-peak detector and reported.

ABOVE 1G



The setting of the spectrum analyser

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

1. The testing follows the guidelines in ANSI C63.10-2013.

2. The EUT was arranged to its worst case and then tune the antenna tower (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.

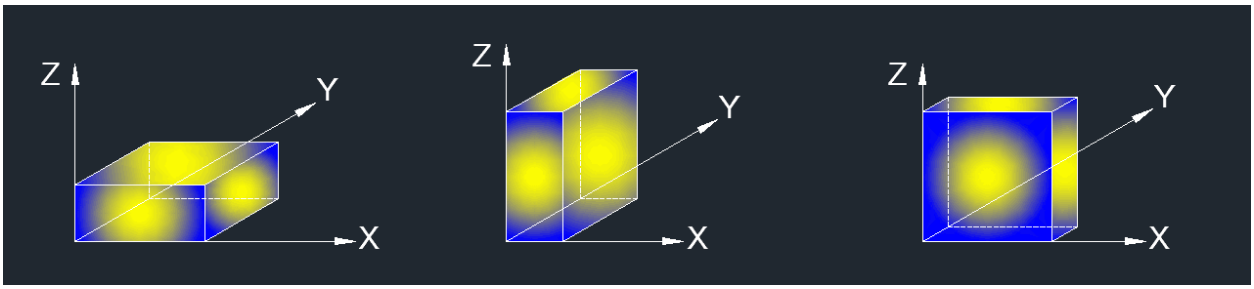
3. The EUT was placed on a turntable with 1.5m above ground.

4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.

5. For measurement above 1GHz, the emission measurement will be measured by the peak detector. This peak level, once corrected, must comply with the limit specified in Section 15.209.

6. For average power measurement, set the Detector to RMS, averaging type shall be set for linear voltage averaging, while maintaining all of the other instrument settings, if the duty cycle of the EUT is less than 98%, the Duty Cycle Correction Factor shall be added to the measured emission levels. For the Duty Cycle and Correction Factor please refer to clause 8.1.ON TIME AND DUTY CYCLE.

X axis, Y axis, Z axis positions:

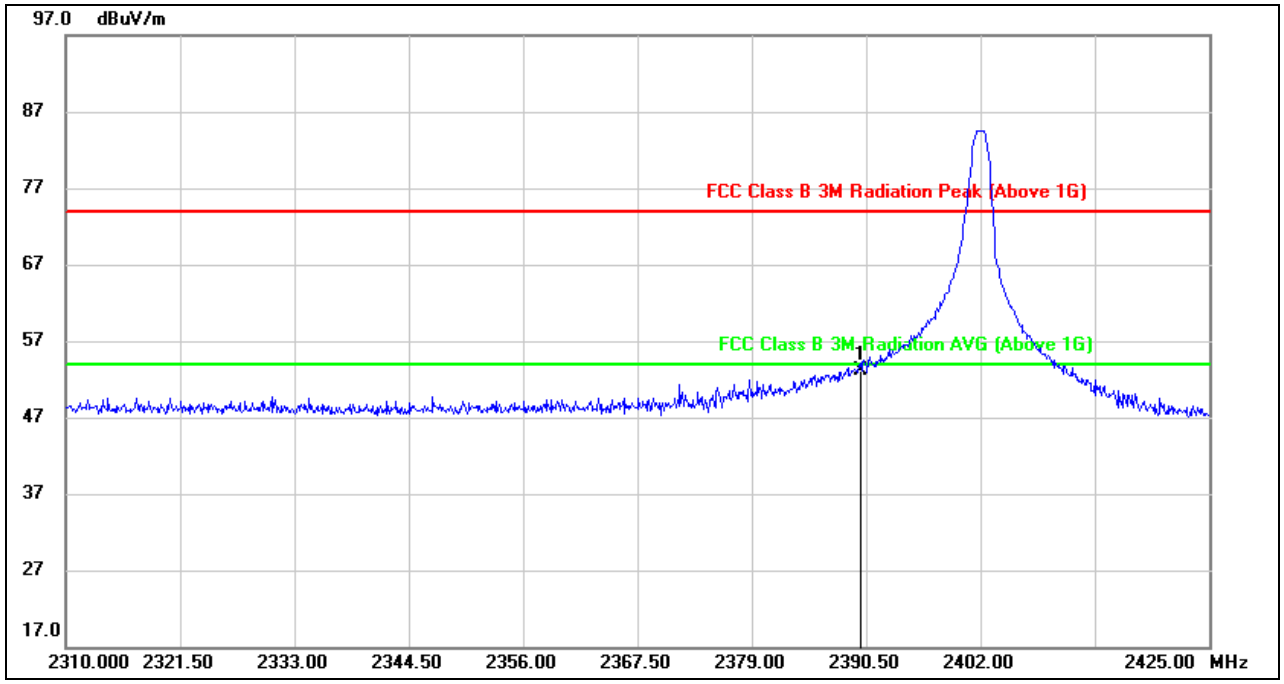


TEST ENVIRONMENT

Temperature	22.3°C	Relative Humidity	63%
Atmosphere Pressure	101kPa	Test Voltage	DC 3.7V

9.2. RESTRICTED BANDEDGE

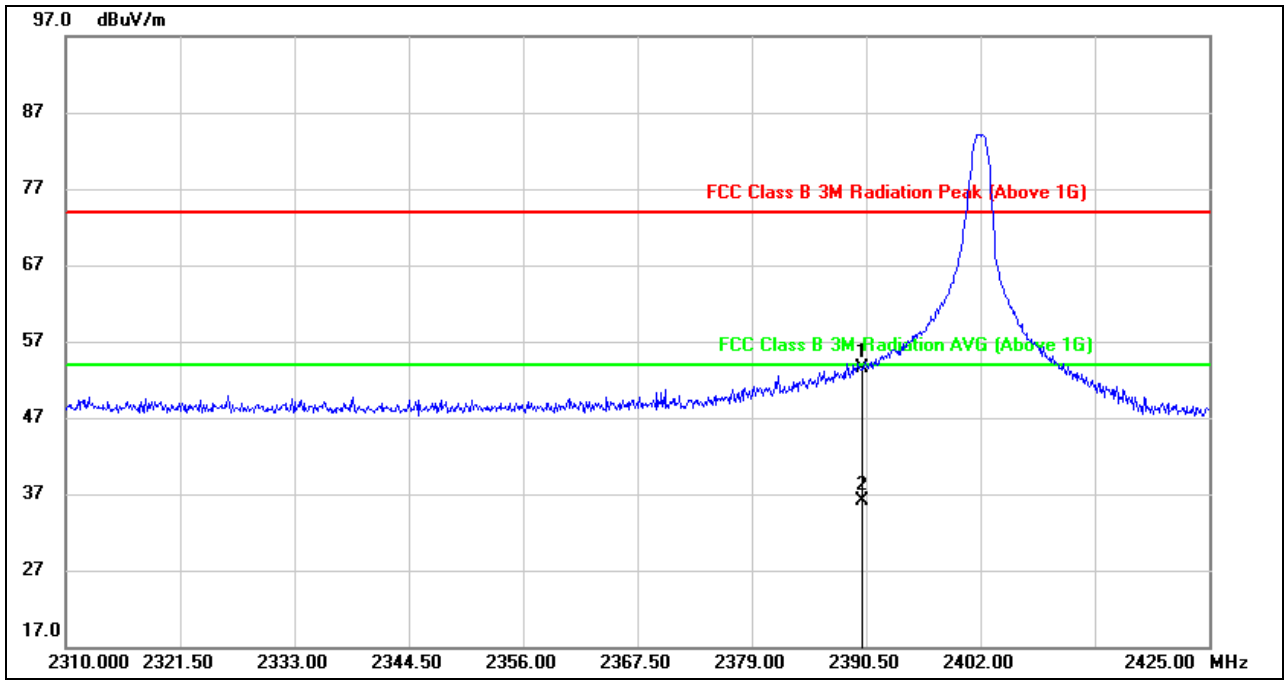
RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	2390.000	19.88	33.14	53.02	74.00	-20.98	peak

Note: 1. Measurement = Reading Level + Correct Factor.
2. Only the worst case emission recorded in the report, if Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.

RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)

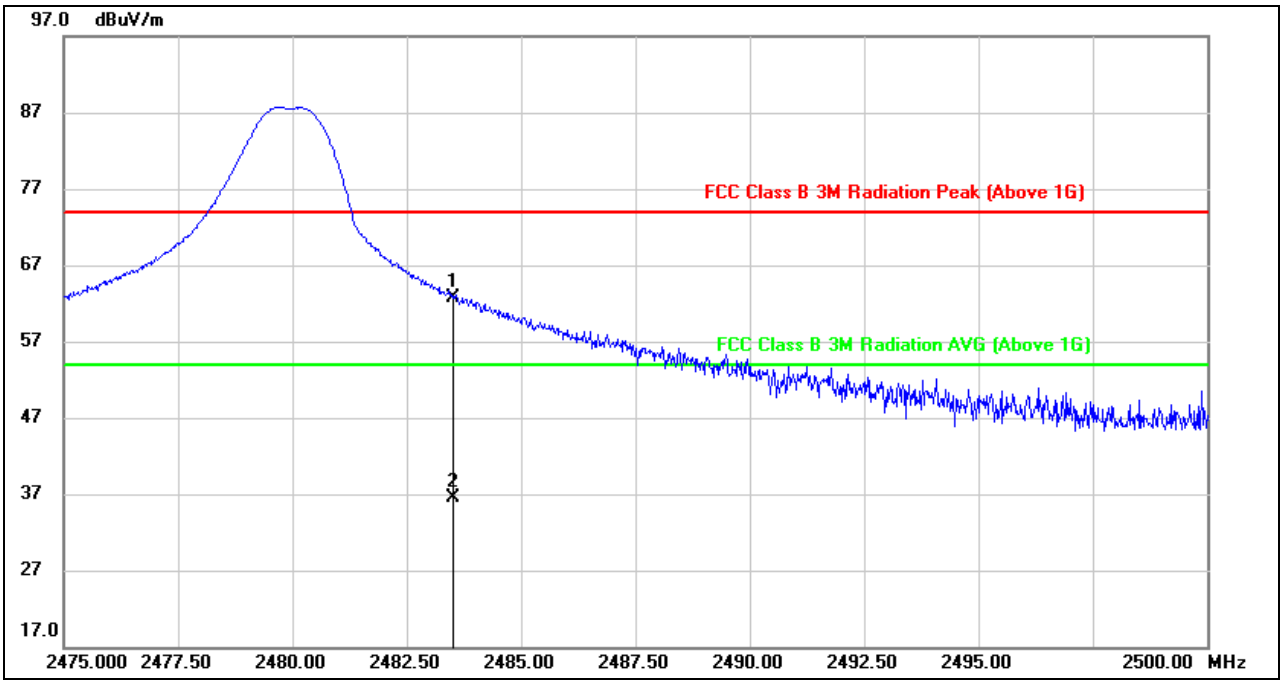


No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	2390.000	20.20	33.24	53.44	74.00	-20.56	peak
2	2390.000	2.92	35.19	38.11	54.00	-15.89	AVG

Note: 1. Measurement = Reading Level + Correct Factor.
2. Only the worst case emission recorded in the report, if Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. AVG: RMS detector, the detector and averaging type may be set for linear voltage averaging.
5. DCCF: Duty Cycle Correction Factor (Please refer to clause 8.1.ON TIME AND DUTY CYCLE)
6. The DCCF already added in Correct Factor.

.

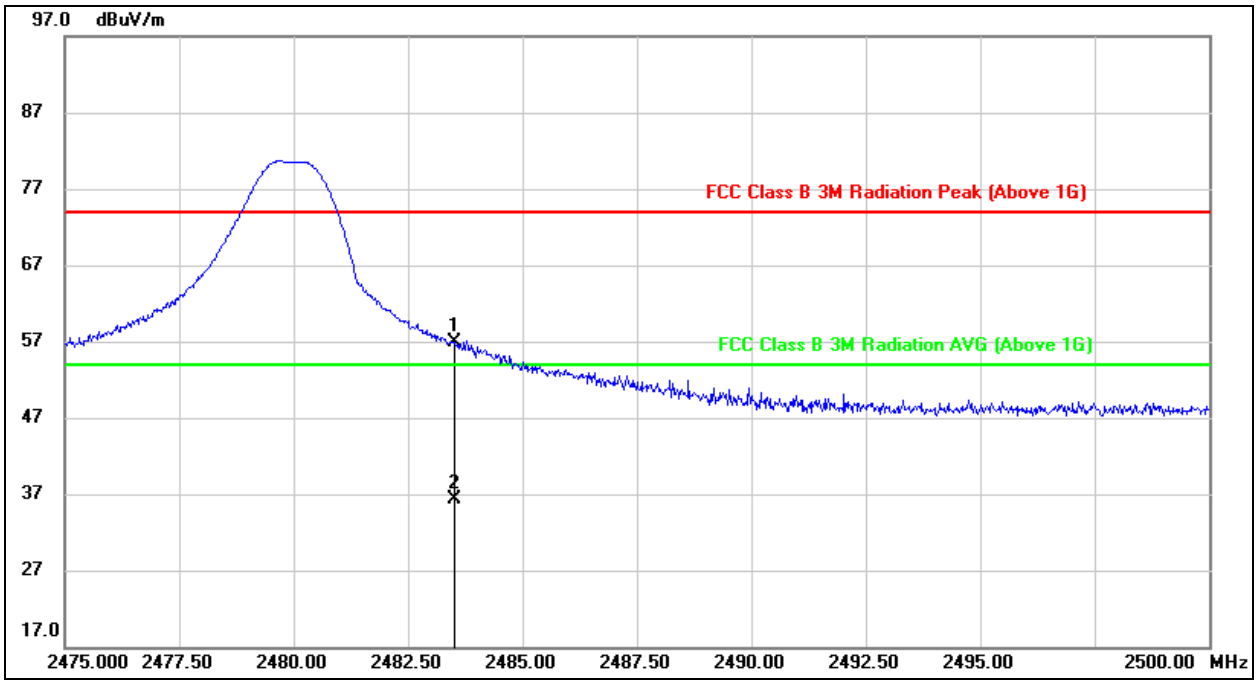
RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	2483.500	29.91	32.78	62.69	74.00	-11.31	peak
2	2483.500	3.81	34.73	38.54	54.00	-15.46	AVG

Note: 1. Measurement = Reading Level + Correct Factor.
2. Only the worst case emission recorded in the report, if Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. AVG: RMS detector, the detector and averaging type may be set for linear voltage averaging.
5. DCCF: Duty Cycle Correction Factor (Please refer to clause 8.1.ON TIME AND DUTY CYCLE)
6. The DCCF already added in Correct Factor.

RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	2483.500	23.98	32.88	56.86	74.00	-17.14	peak
2	2483.500	3.38	34.83	38.21	54.00	-15.79	AVG

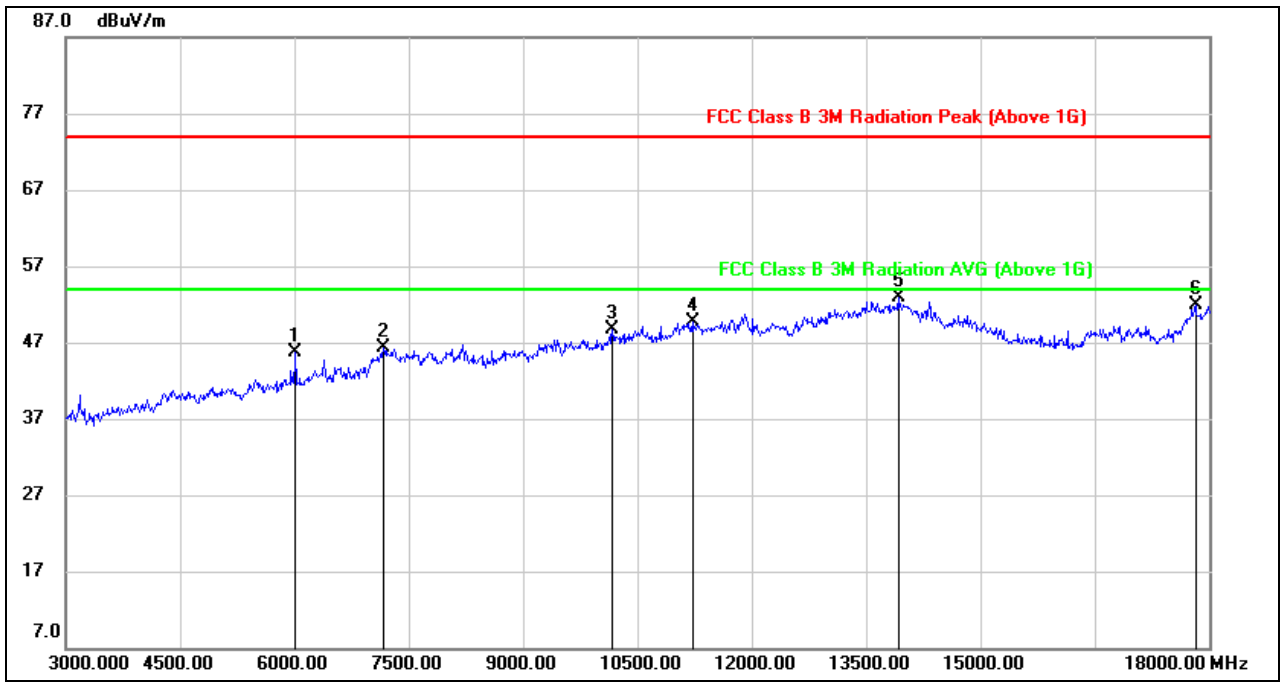
Note: 1. Measurement = Reading Level + Correct Factor.
2. Only the worst case emission recorded in the report, if Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. AVG: RMS detector, the detector and averaging type may be set for linear voltage averaging.
5. DCCF: Duty Cycle Correction Factor (Please refer to clause 8.1.ON TIME AND DUTY CYCLE)
6. The DCCF already added in Correct Factor.

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

9.3. SPURIOUS EMISSIONS 1~18GHz

HARMONICS AND SPURIOUS EMISSIONS (LOW CHANNEL, HORIZONTAL)

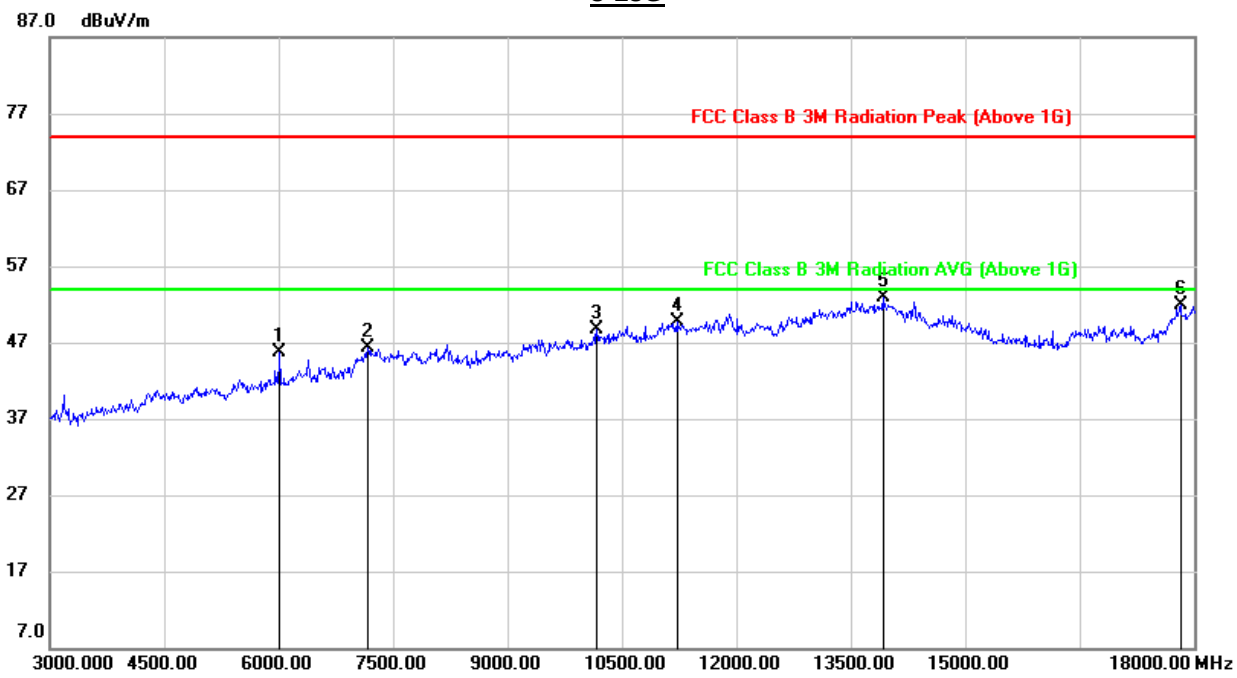
1-3G



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	6015.000	42.54	3.25	45.79	74.00	-28.21	peak
2	7170.000	38.64	7.72	46.36	74.00	-27.64	peak
3	10170.000	36.10	12.54	48.64	74.00	-25.36	peak
4	11220.000	34.78	14.88	49.66	74.00	-24.34	peak
5	13920.000	32.26	20.67	52.93	74.00	-21.07	peak
6	17820.000	25.42	26.48	51.90	74.00	-22.10	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.

3-18G

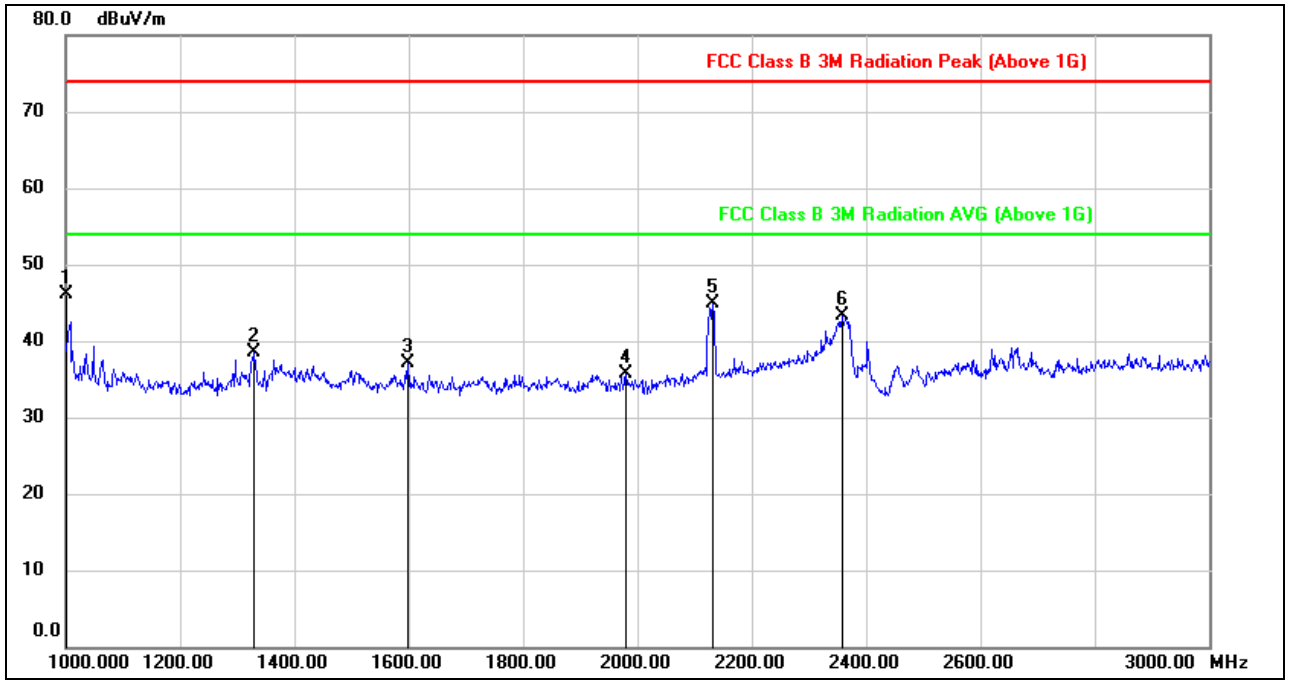


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	6015.000	42.54	3.25	45.79	74.00	-28.21	peak
2	7170.000	38.64	7.72	46.36	74.00	-27.64	peak
3	10170.000	36.10	12.54	48.64	74.00	-25.36	peak
4	11220.000	34.78	14.88	49.66	74.00	-24.34	peak
5	13920.000	32.26	20.67	52.93	74.00	-21.07	peak
6	17820.000	25.42	26.48	51.90	74.00	-22.10	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 (LOW CHANNEL, VERTICAL)

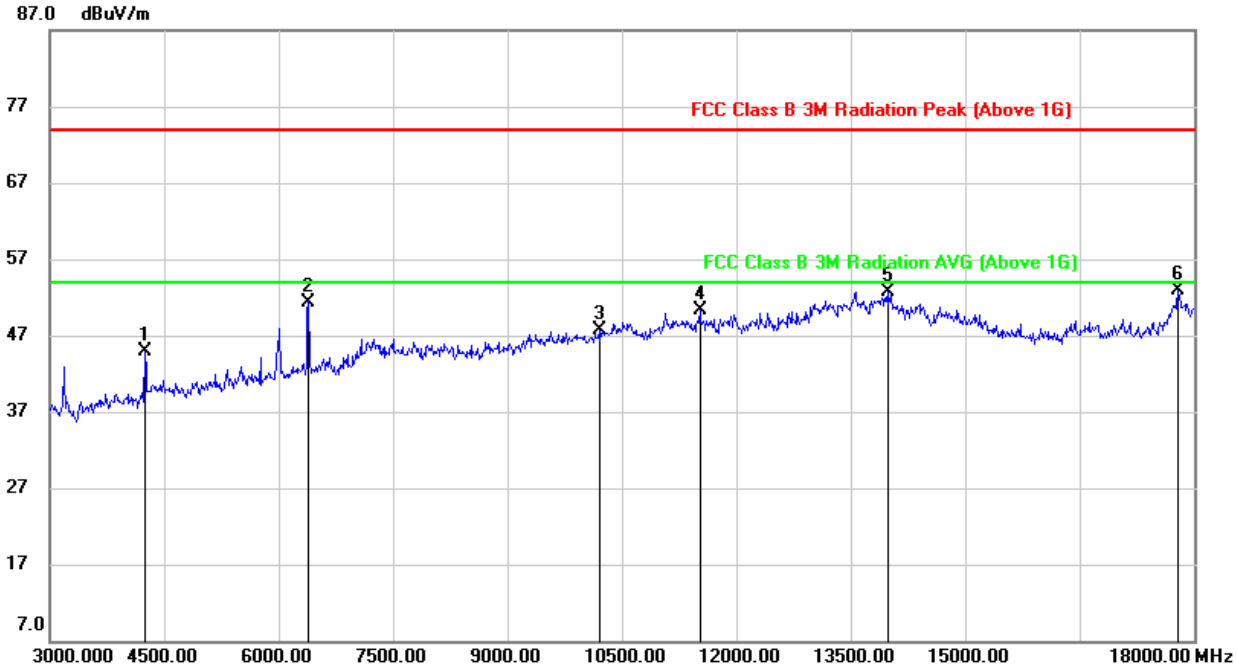
1-3G



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1000.0000	60.12	-14.01	46.11	74.00	-27.89	peak
2	1328.000	51.00	-12.51	38.49	74.00	-35.51	peak
3	1598.000	49.23	-12.06	37.17	74.00	-36.83	peak
4	1980.000	46.35	-10.69	35.66	74.00	-38.34	peak
5	2132.000	54.13	-9.26	44.87	74.00	-29.13	peak
6	2358.000	50.98	-7.70	43.28	74.00	-30.72	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.

3-18G

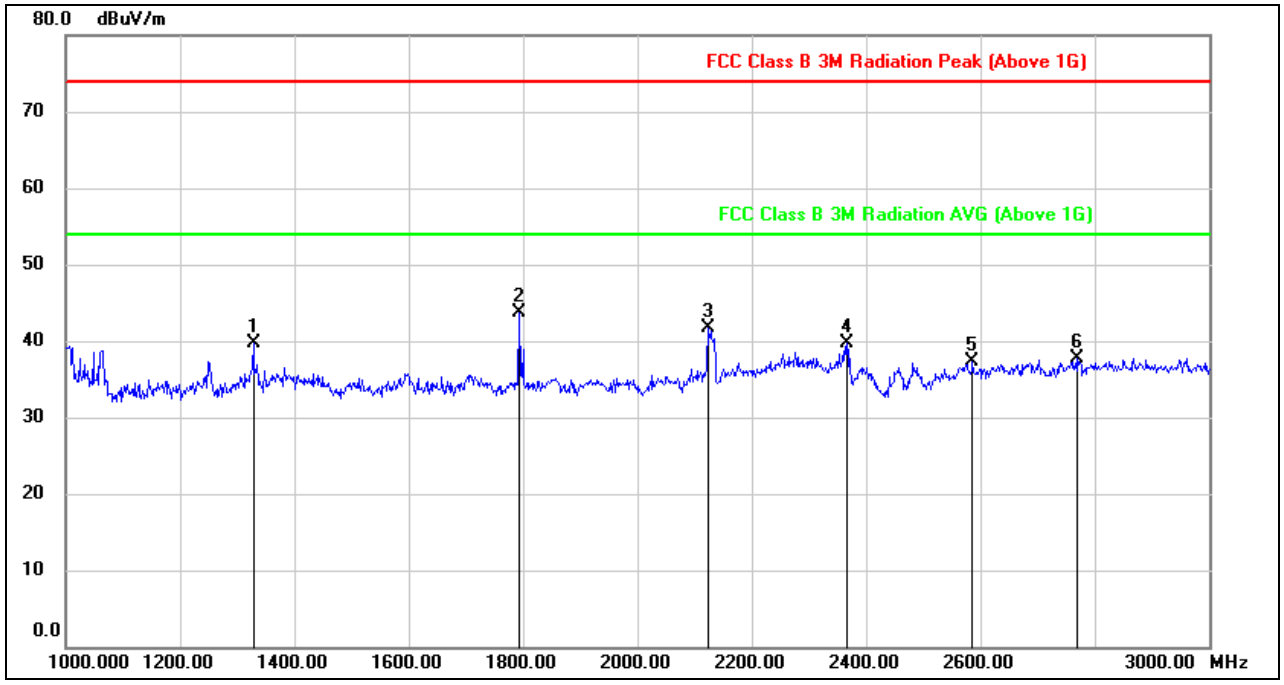


No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	4245.000	46.74	-1.92	44.82	74.00	-29.18	peak
2	6390.000	46.67	4.73	51.40	74.00	-22.60	peak
3	10200.000	34.95	12.71	47.66	74.00	-26.34	peak
4	11520.000	34.01	16.25	50.26	74.00	-23.74	peak
5	13980.000	32.04	20.73	52.77	74.00	-21.23	peak
6	17790.000	26.13	26.76	52.89	74.00	-21.11	peak

Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.

HARMONICS AND SPURIOUS EMISSIONS (MID CHANNEL, HORIZONTAL)

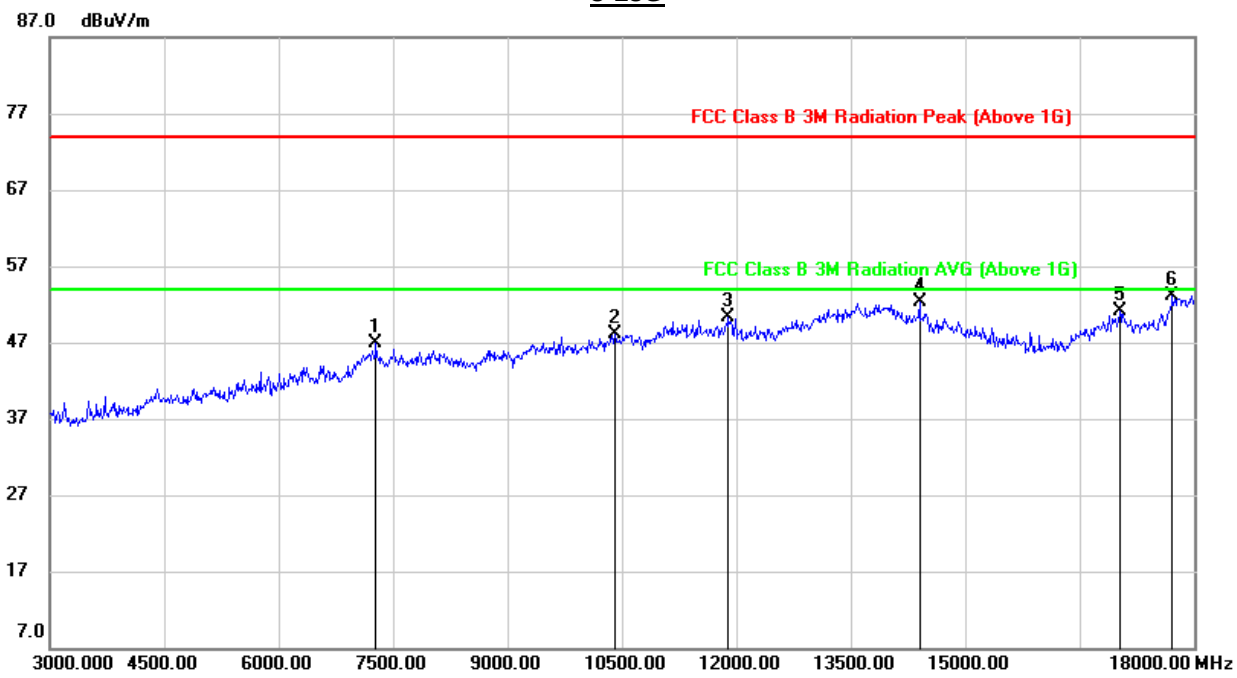
1-3G



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1328.000	52.00	-12.38	39.62	74.00	-34.38	peak
2	1792.000	54.88	-11.16	43.72	74.00	-30.28	peak
3	2124.000	50.91	-9.26	41.65	74.00	-32.35	peak
4	2366.000	47.49	-7.87	39.62	74.00	-34.38	peak
5	2586.000	45.55	-8.19	37.36	74.00	-36.64	peak
6	2768.000	44.89	-7.14	37.75	74.00	-36.25	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.

3-18G

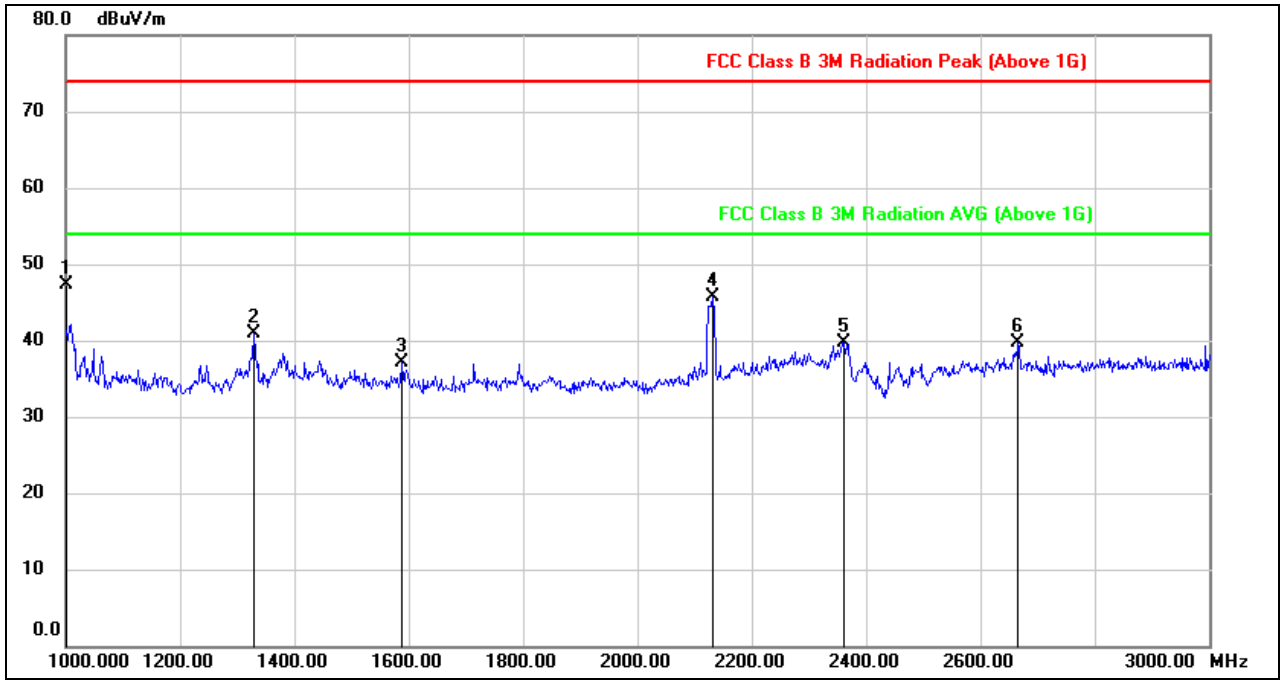


No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	7275.000	38.99	7.86	46.85	74.00	-27.15	peak
2	10410.000	34.91	13.16	48.07	74.00	-25.93	peak
3	11895.000	33.24	17.04	50.28	74.00	-23.72	peak
4	14400.000	32.34	20.00	52.34	74.00	-21.66	peak
5	17025.000	29.03	22.03	51.06	74.00	-22.94	peak
6	17715.000	27.31	25.79	53.10	74.00	-20.90	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 (MID CHANNEL, VERTICAL)

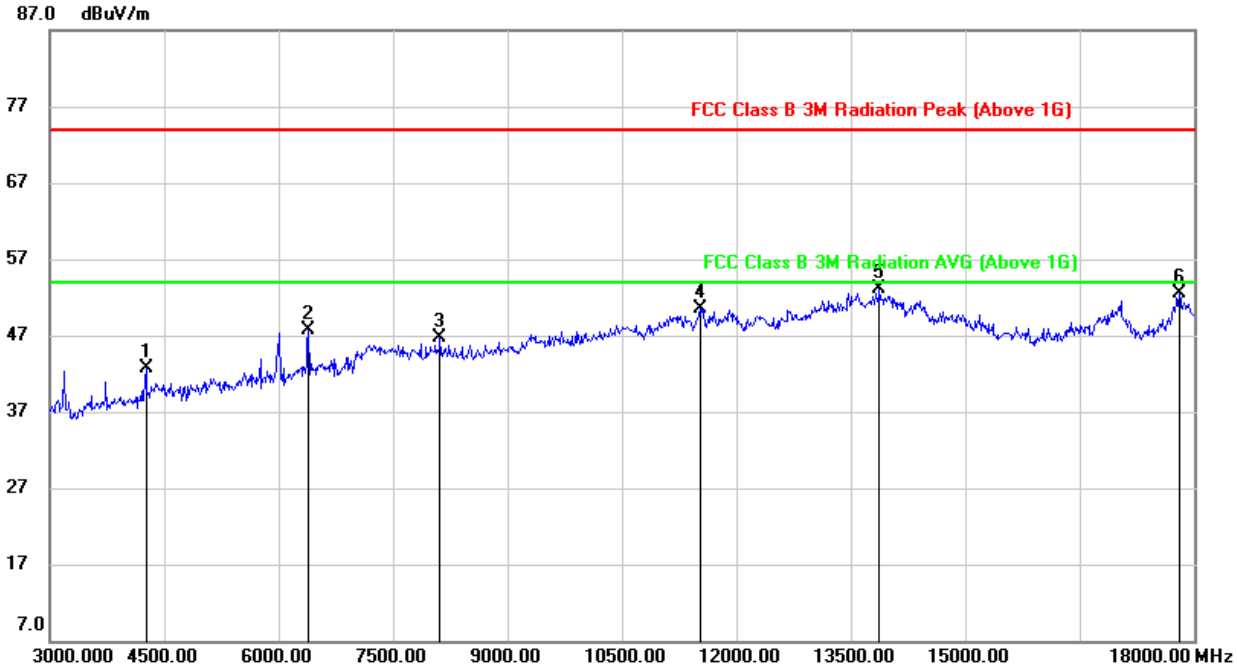
1-3G



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1000.0000	61.29	-14.01	47.28	74.00	-26.72	peak
2	1328.000	53.46	-12.51	40.95	74.00	-33.05	peak
3	1588.000	49.22	-12.11	37.11	74.00	-36.89	peak
4	2132.000	55.01	-9.26	45.75	74.00	-28.25	peak
5	2362.000	47.40	-7.74	39.66	74.00	-34.34	peak
6	2666.000	47.62	-7.84	39.78	74.00	-34.22	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.

3-18G

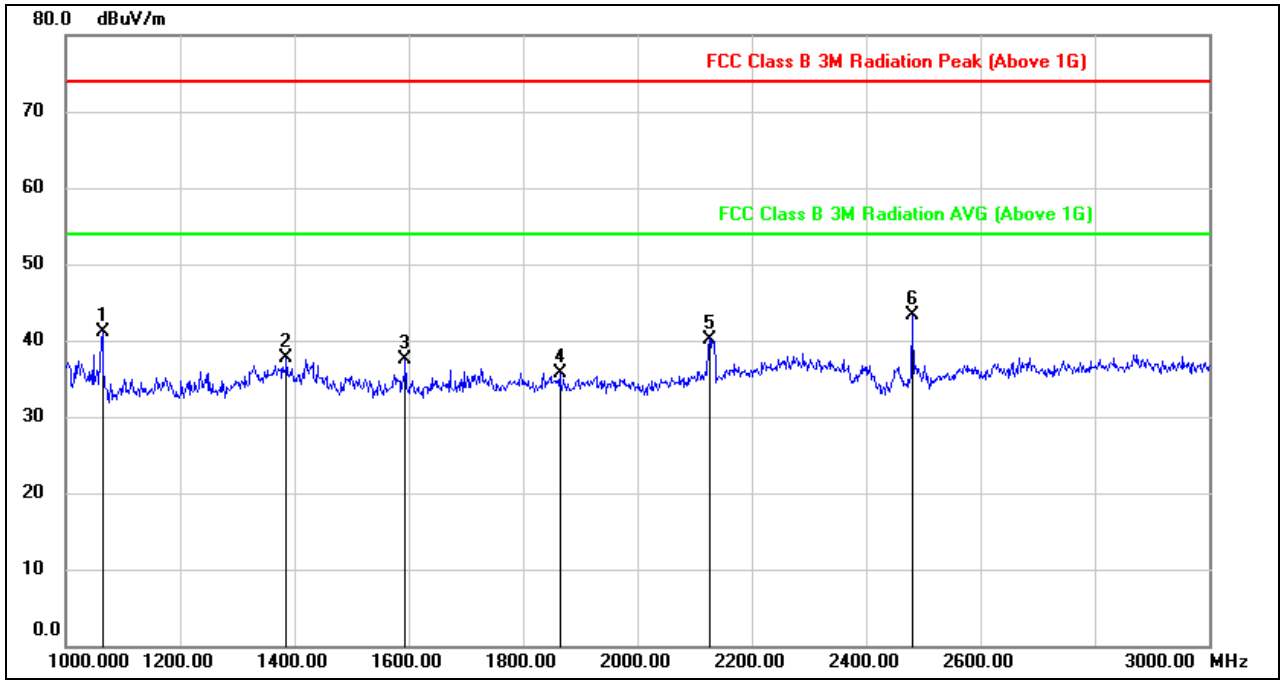


No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	4260.000	44.46	-1.80	42.66	74.00	-31.34	peak
2	6390.000	43.00	4.73	47.73	74.00	-26.27	peak
3	8115.000	38.27	8.48	46.75	74.00	-27.25	peak
4	11520.000	34.24	16.25	50.49	74.00	-23.51	peak
5	13875.000	32.24	20.89	53.13	74.00	-20.87	peak
6	17805.000	25.79	26.80	52.59	74.00	-21.41	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 (HIGH CHANNEL, HORIZONTAL)

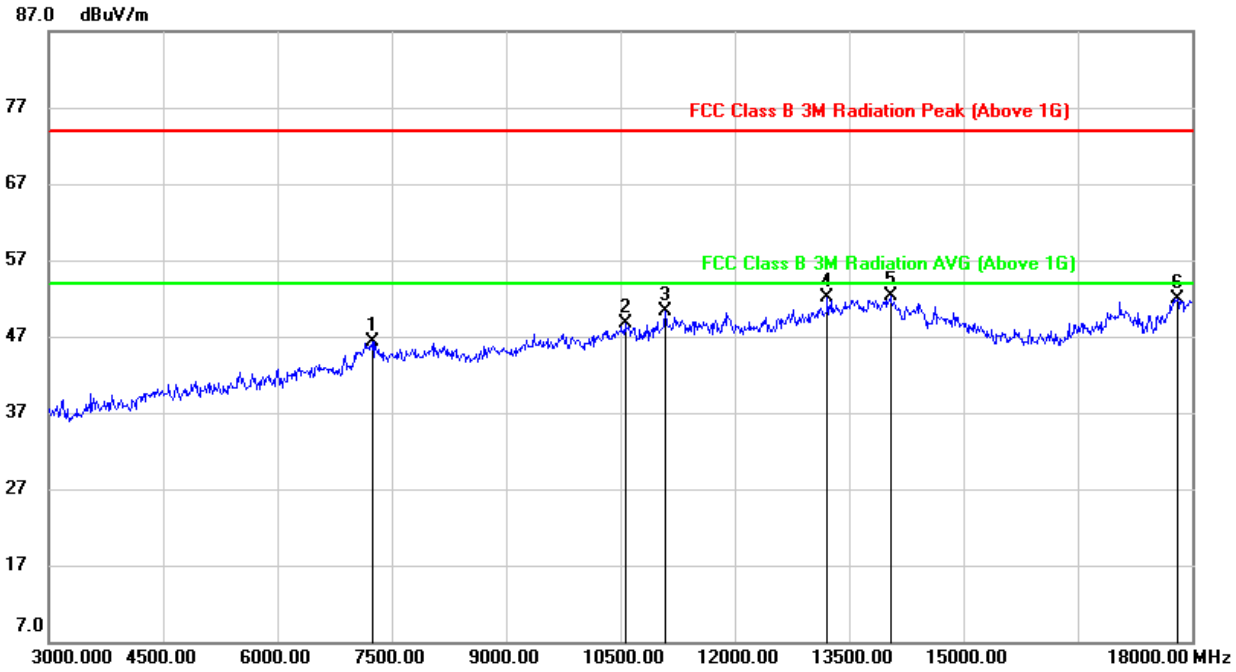
1-3G



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	1064.000	54.72	-13.62	41.10	74.00	-32.90	peak
2	1386.000	49.88	-12.15	37.73	74.00	-36.27	peak
3	1594.000	49.64	-12.09	37.55	74.00	-36.45	peak
4	1864.000	46.62	-10.85	35.77	74.00	-38.23	peak
5	2126.000	49.44	-9.24	40.20	74.00	-33.80	peak
6	2480.000	51.59	-8.38	43.21	74.00	-30.79	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.

3-18G

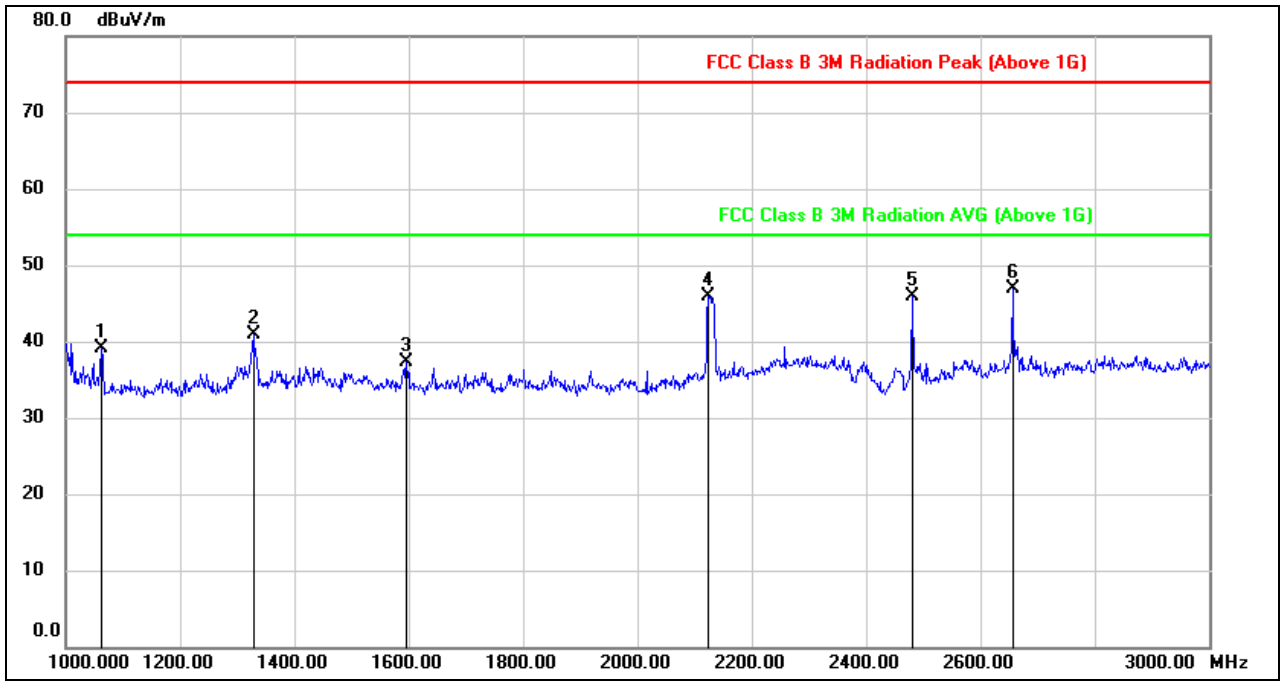


No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	7245.000	38.53	7.84	46.37	74.00	-27.63	peak
2	10560.000	35.00	13.76	48.76	74.00	-25.24	peak
3	11085.000	35.34	14.89	50.23	74.00	-23.77	peak
4	13215.000	32.92	19.11	52.03	74.00	-21.97	peak
5	14040.000	31.68	20.64	52.32	74.00	-21.68	peak
6	17805.000	25.47	26.48	51.95	74.00	-22.05	peak

Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.

HARMONICS AND SPURIOUS EMISSIONS (HIGH CHANNEL, VERTICAL)

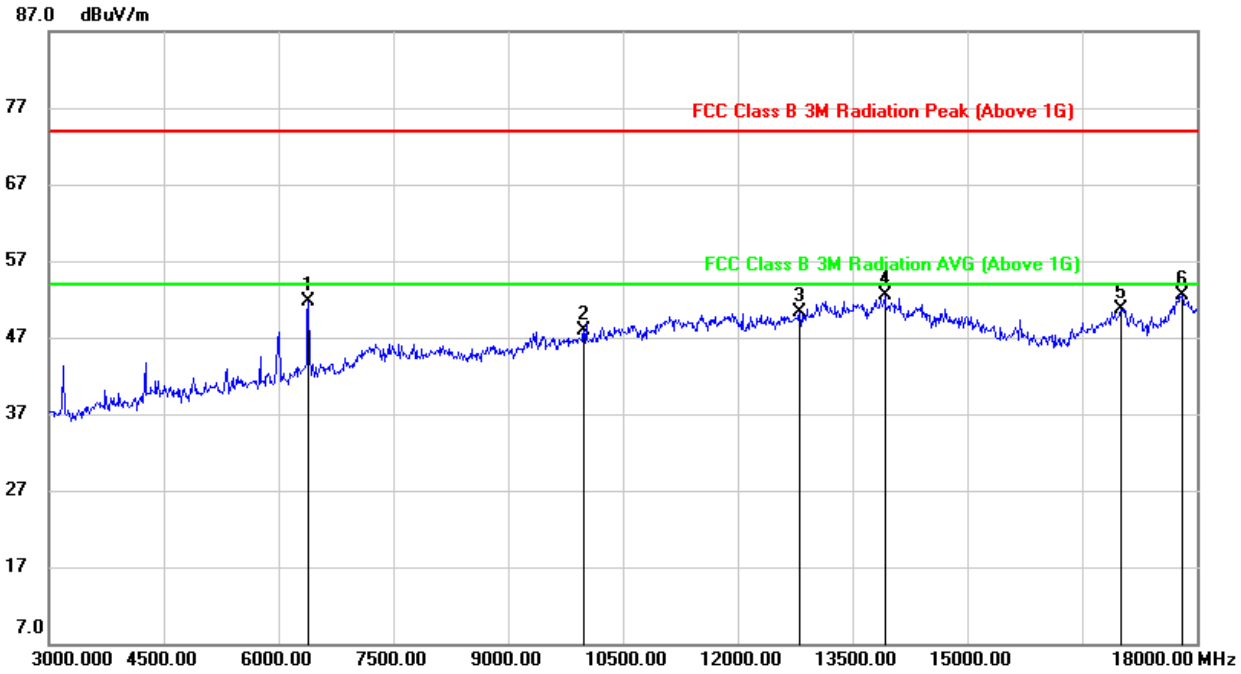
1-3G



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1062.000	52.96	-13.92	39.04	74.00	-34.96	peak
2	1328.000	53.40	-12.51	40.89	74.00	-33.11	peak
3	1596.000	49.46	-12.08	37.38	74.00	-36.62	peak
4	2124.000	55.35	-9.36	45.99	74.00	-28.01	peak
5	2480.000	54.19	-8.28	45.91	74.00	-28.09	peak
6	2656.000	54.75	-7.91	46.84	74.00	-27.16	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.

3-18G



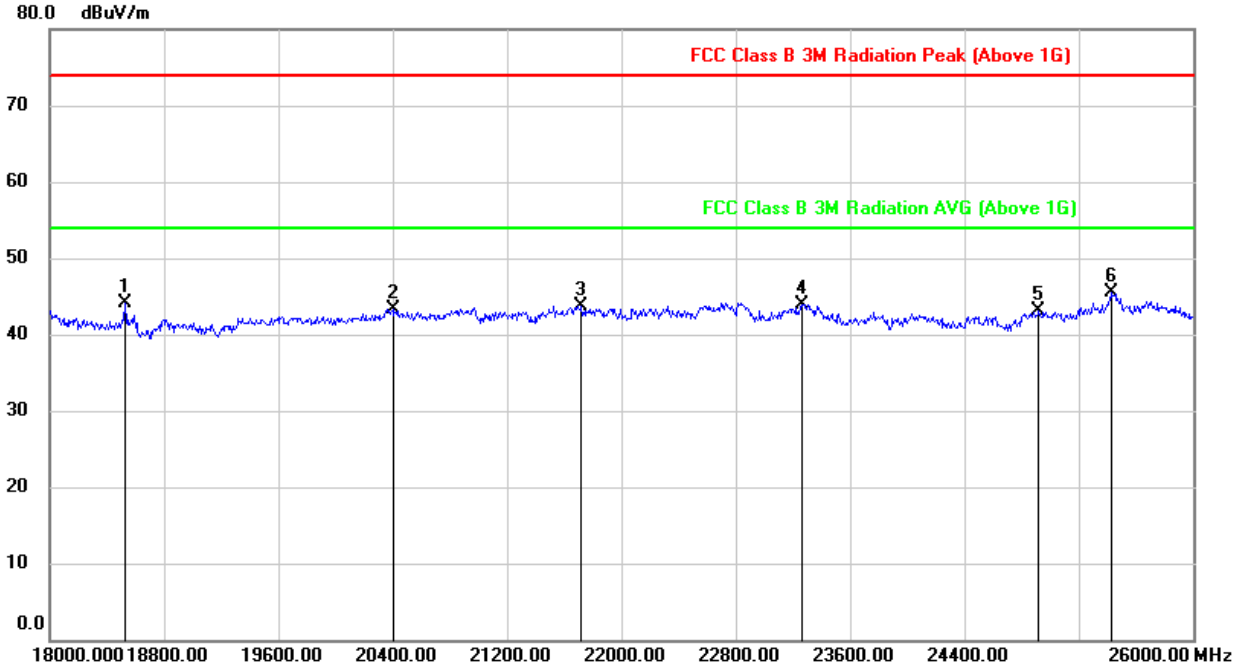
No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	6390.000	46.97	4.73	51.70	74.00	-22.30	peak
2	9990.000	35.71	12.15	47.86	74.00	-26.14	peak
3	12810.000	32.45	17.83	50.28	74.00	-23.72	peak
4	13920.000	31.70	20.83	52.53	74.00	-21.47	peak
5	17010.000	28.38	22.36	50.74	74.00	-23.26	peak
6	17805.000	25.79	26.80	52.59	74.00	-21.41	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.

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

9.4. SPURIOUS EMISSIONS 18G ~ 26GHz

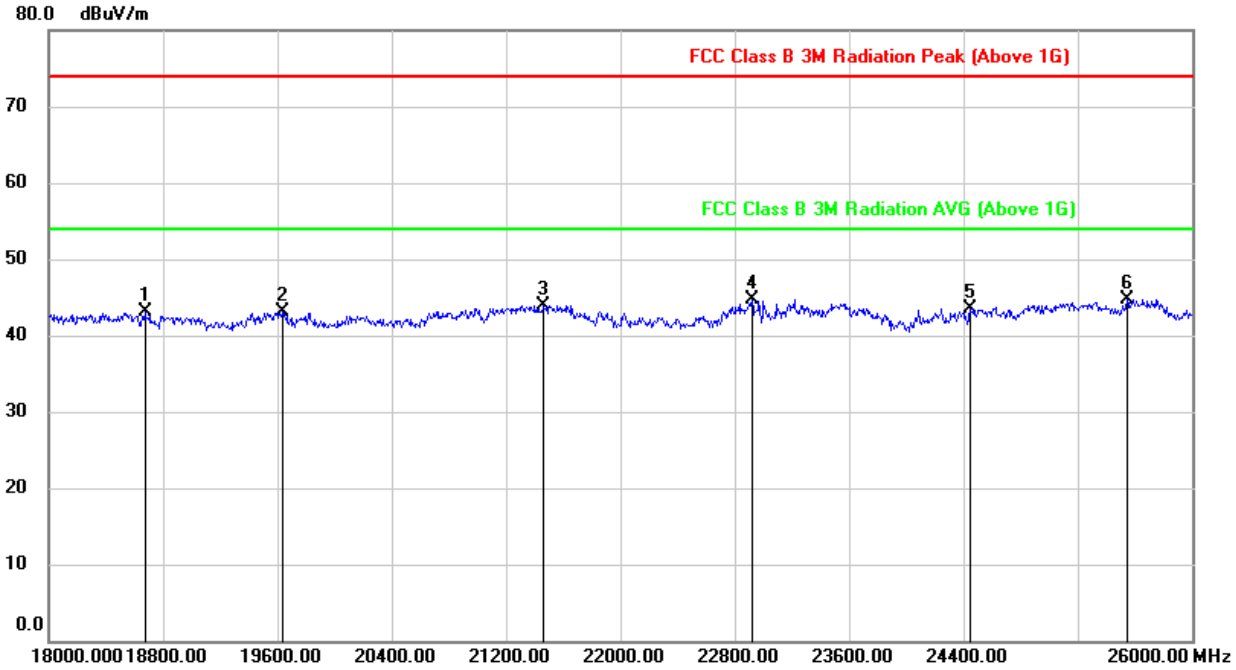
SPURIOUS EMISSIONS (LOW CHANNEL, WORST-CASE CONFIGURATION, HORIZONTAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	18528.000	49.41	-5.26	44.15	74.00	-29.85	peak
2	20400.000	48.70	-5.46	43.24	74.00	-30.76	peak
3	21720.000	48.11	-4.37	43.74	74.00	-30.26	peak
4	23264.000	47.34	-3.36	43.98	74.00	-30.02	peak
5	24920.000	45.26	-2.18	43.08	74.00	-30.92	peak
6	25432.000	47.21	-1.75	45.46	74.00	-28.54	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.

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

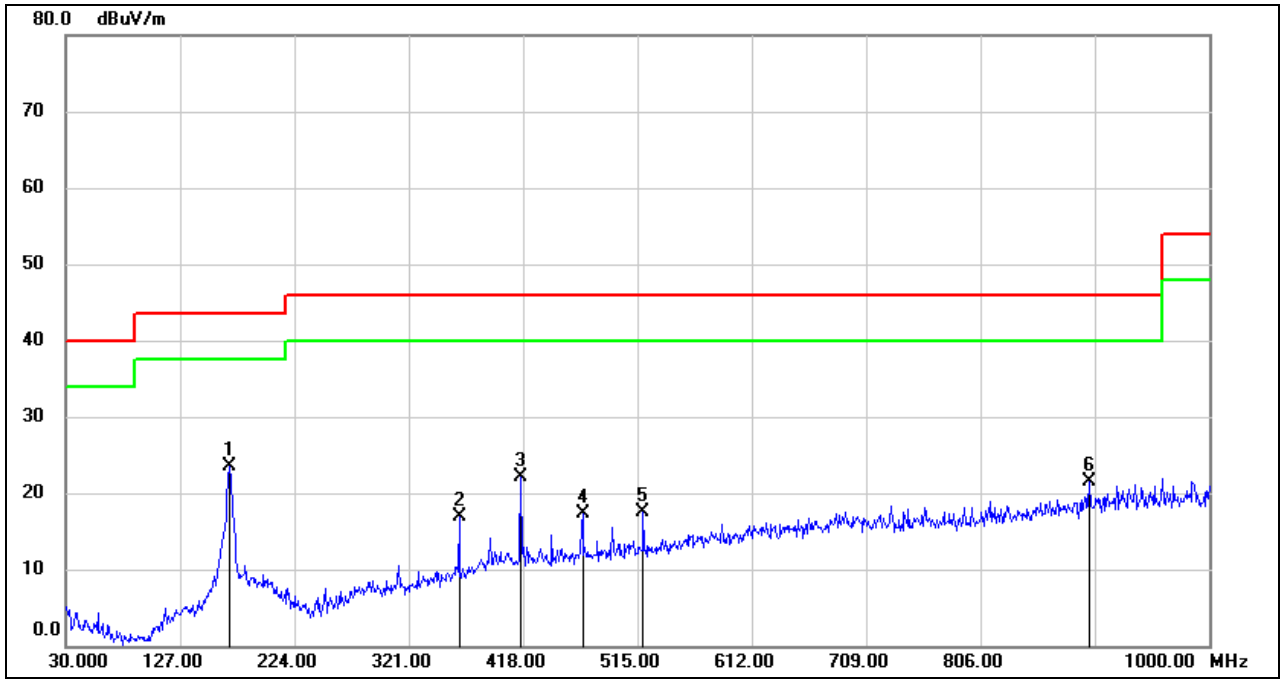


No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	18672.000	48.39	-5.38	43.01	74.00	-30.99	peak
2	19632.000	48.45	-5.40	43.05	74.00	-30.95	peak
3	21464.000	48.60	-4.70	43.90	74.00	-30.10	peak
4	22920.000	48.30	-3.52	44.78	74.00	-29.22	peak
5	24448.000	45.92	-2.42	43.50	74.00	-30.50	peak
6	25544.000	46.24	-1.58	44.66	74.00	-29.34	peak

Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.

9.5. SPURIOUS EMISSIONS 30M ~ 1 GHz

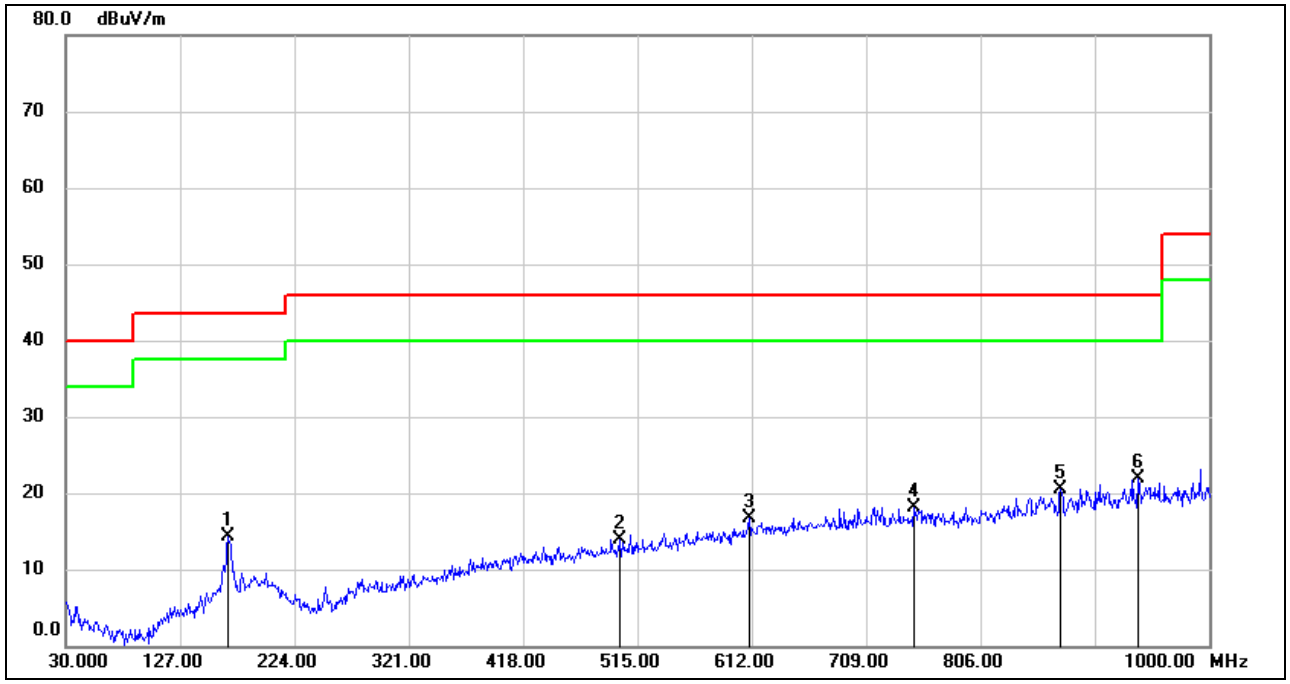
SPURIOUS EMISSIONS (LOW CHANNEL, WORST-CASE CONFIGURATION, HORIZONTAL)



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	168.7100	39.21	-15.67	23.54	43.50	-19.96	QP
2	363.6800	30.30	-13.38	16.92	46.00	-29.08	QP
3	416.0600	34.18	-12.13	22.05	46.00	-23.95	QP
4	468.4400	28.70	-11.47	17.23	46.00	-28.77	QP
5	519.8500	28.10	-10.69	17.41	46.00	-28.59	QP
6	898.1500	26.76	-5.33	21.43	46.00	-24.57	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	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	167.7400	30.05	-15.82	14.23	43.50	-29.27	QP
2	500.4500	25.09	-11.11	13.98	46.00	-32.02	QP
3	610.0600	25.73	-8.96	16.77	46.00	-29.23	QP
4	749.7400	25.72	-7.52	18.20	46.00	-27.80	QP
5	873.9000	26.23	-5.72	20.51	46.00	-25.49	QP
6	939.8600	26.85	-4.99	21.86	46.00	-24.14	QP

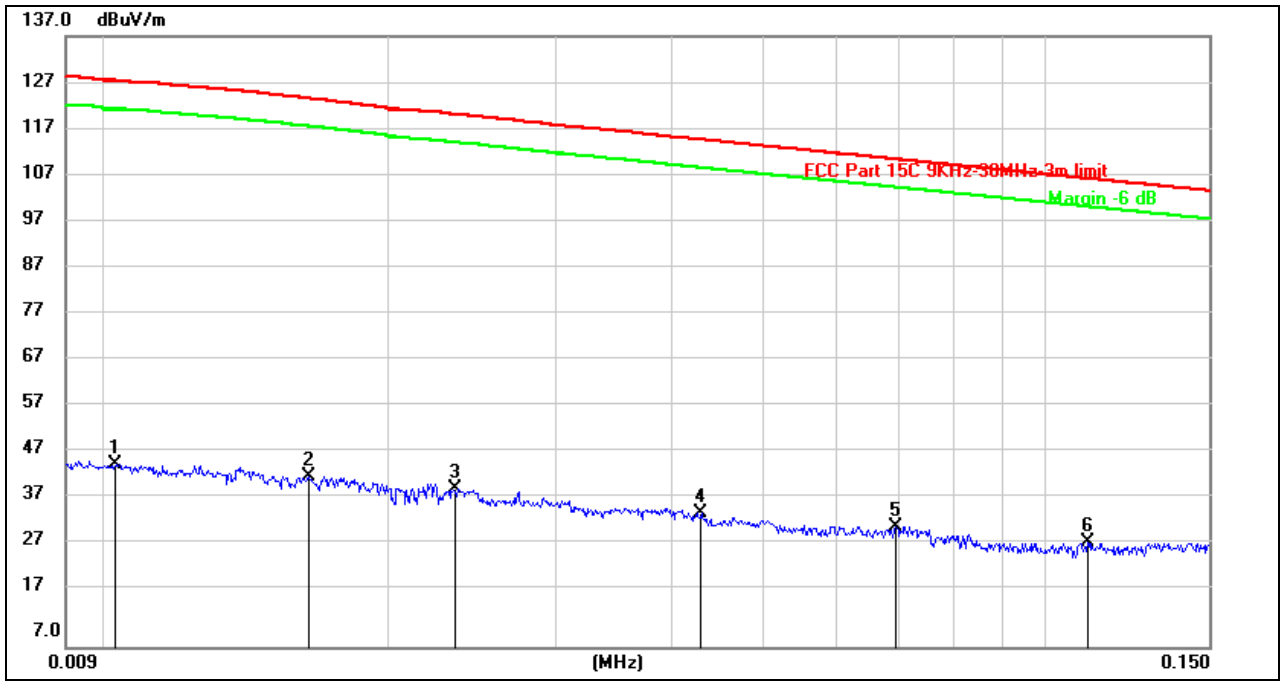
Note: 1. Result Level = Read Level + Correct Factor.
2. If Peak Result complies with QP limit, QP Result is deemed to comply with QP limit.
3. Test setup: RBW: 120 kHz, VBW: 300 kHz, Sweep time: auto

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

9.6. SPURIOUS EMISSIONS BELOW 30M

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

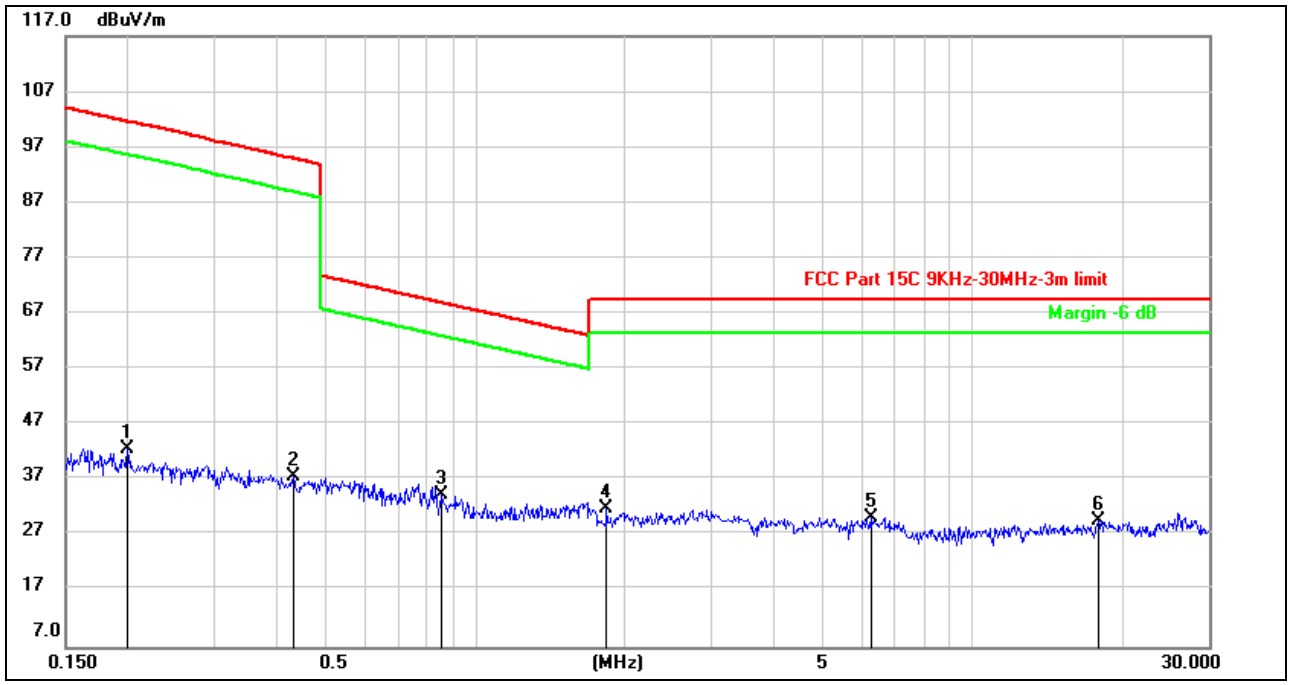
0.09KHz~ 150KHz



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	0.0102	25.64	20.21	45.85	127.48	-81.63	peak
2	0.0164	22.96	20.27	43.23	123.75	-80.52	peak
3	0.0235	20.18	20.31	40.49	120.35	-79.86	peak
4	0.0429	15.26	20.31	35.57	115.00	-79.43	peak
5	0.0694	12.33	20.31	32.64	110.78	-78.14	peak
6	0.1111	8.93	20.26	29.19	106.70	-77.51	peak

Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.

150KHz ~ 30M

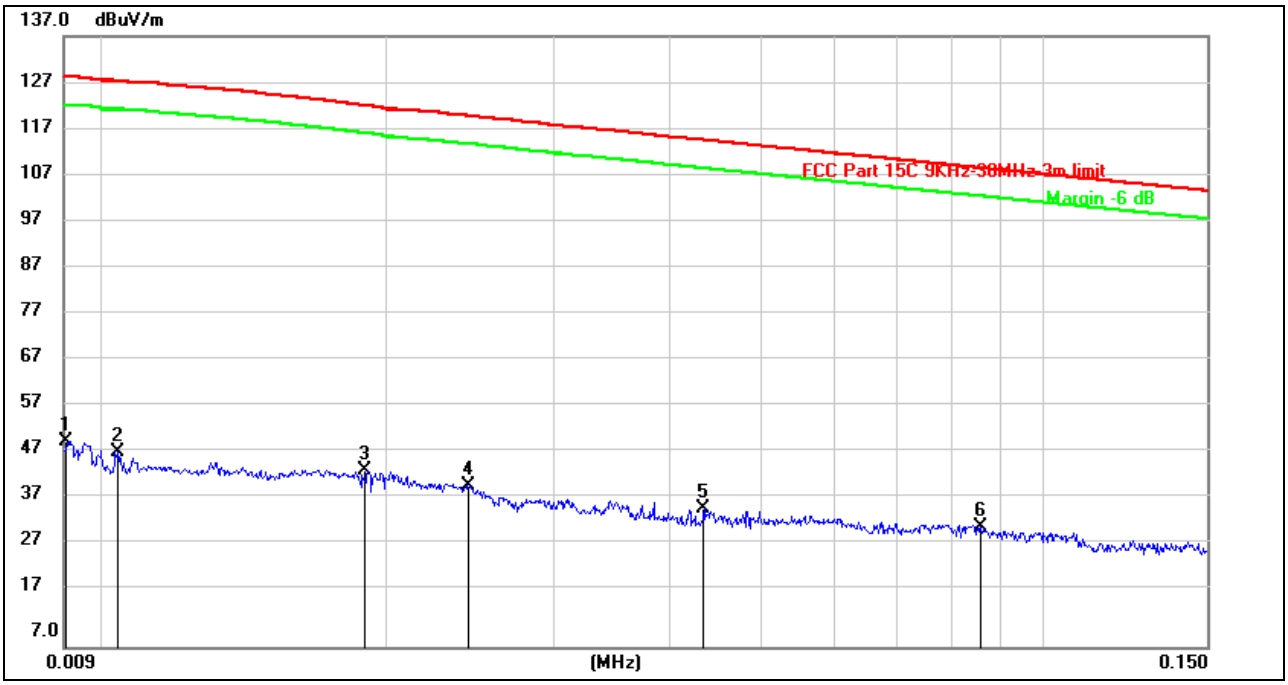


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	0.1995	22.35	20.37	42.72	101.60	-58.88	peak
2	0.4304	17.43	20.27	37.70	94.97	-57.27	peak
3	0.8568	13.90	20.36	34.26	68.96	-34.70	peak
4	1.8386	11.28	20.67	31.95	69.54	-37.59	peak
5	6.2519	9.34	20.89	30.23	69.54	-39.31	peak
6	17.9435	8.72	20.99	29.71	69.54	-39.83	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.

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

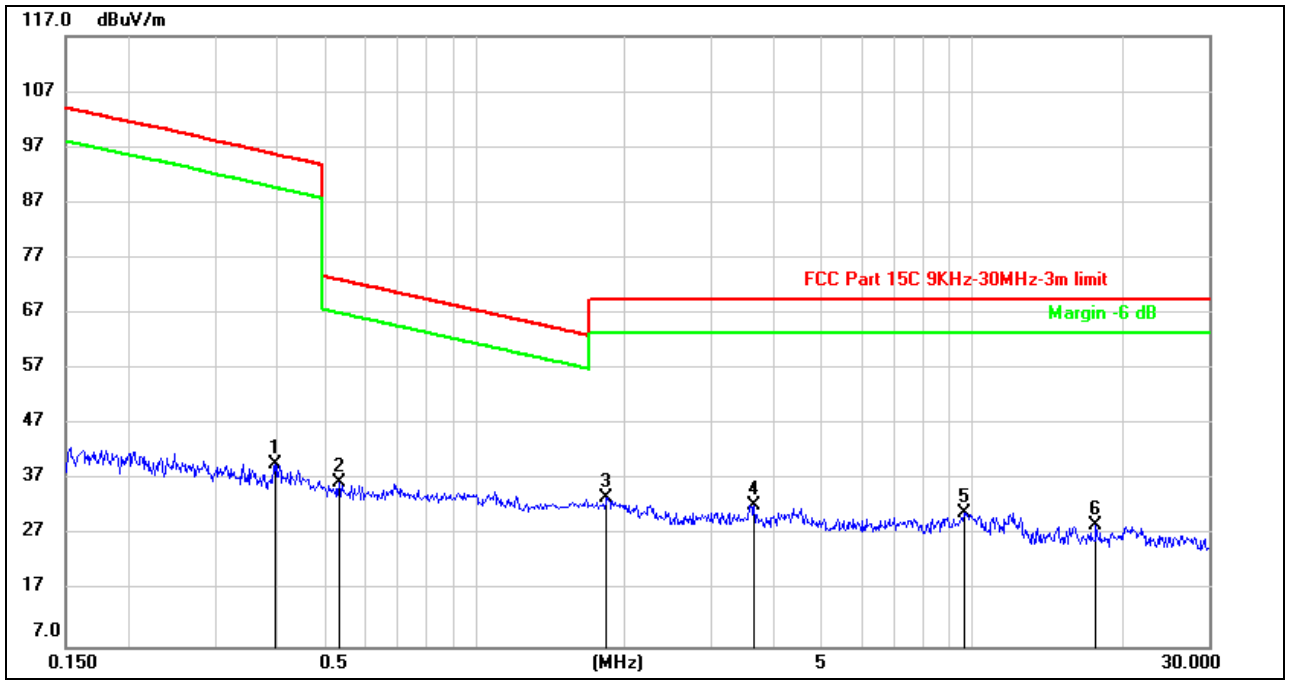
0.09KHz~ 150KHz



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	0.0091	30.35	20.28	50.63	128.29	-77.66	peak
2	0.0103	28.19	20.21	48.40	127.42	-79.02	peak
3	0.0189	24.24	20.30	44.54	122.24	-77.70	peak
4	0.0244	20.96	20.31	41.27	120.03	-78.76	peak
5	0.0434	16.13	20.31	36.44	114.90	-78.46	peak
6	0.0859	12.27	20.27	32.54	108.94	-76.40	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.

150KHz ~ 30M



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	0.3955	19.49	20.27	39.76	95.67	-55.91	peak
2	0.5322	16.25	20.25	36.50	73.12	-36.62	peak
3	1.8386	13.16	20.67	33.83	69.54	-35.71	peak
4	3.6417	11.49	21.00	32.49	69.54	-37.05	peak
5	9.6539	10.08	21.04	31.12	69.54	-38.42	peak
6	17.7545	7.98	20.99	28.97	69.54	-40.57	peak

Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.

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

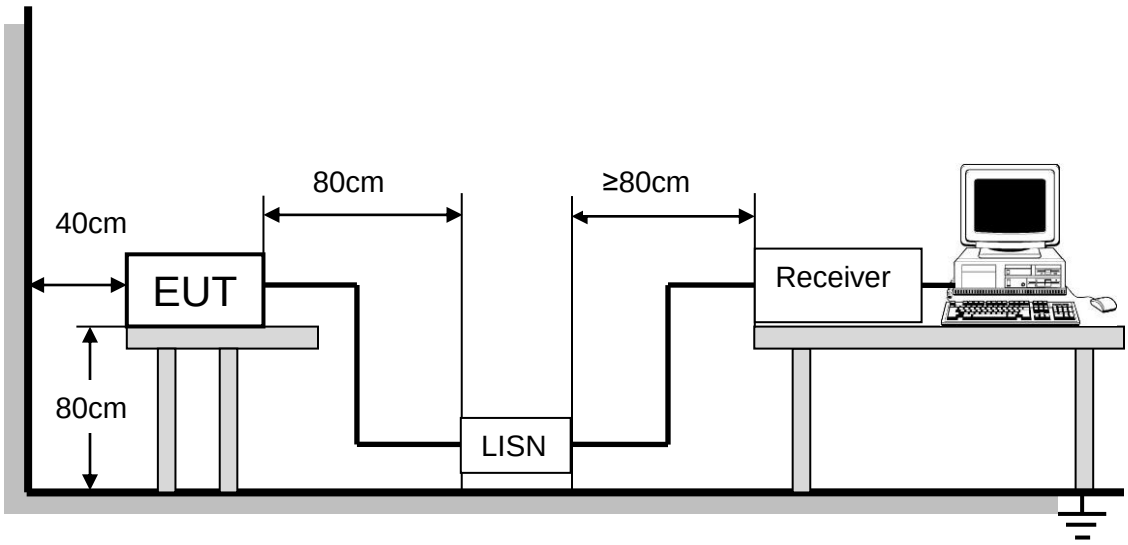
10. AC POWER LINE CONDUCTED EMISSIONS

LIMITS

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

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

TEST SETUP AND PROCEDURE



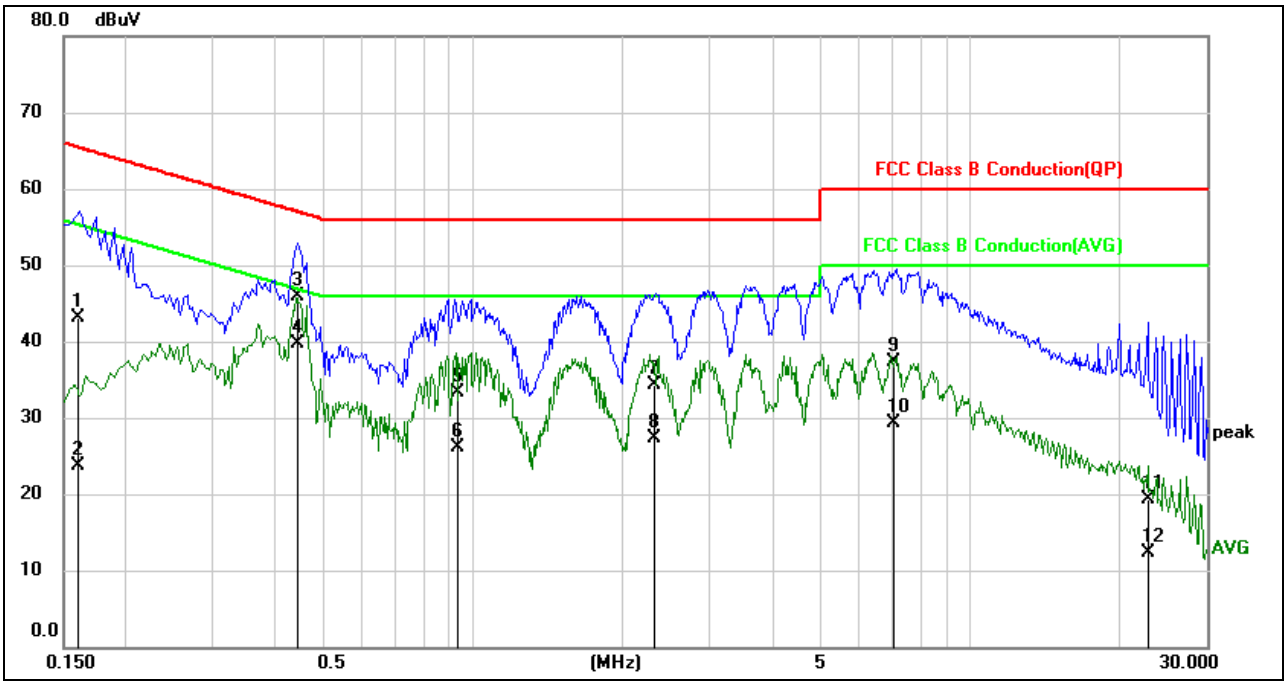
The EUT is put on a table of non-conducting material that is 80cm high. The vertical conducting wall of shielding is located 40cm to the rear of the EUT. The power line of the EUT is connected to the AC mains through a Artificial Mains Network (A.M.N.). A EMI Measurement Receiver (R&S Test Receiver ESR3) is used to test the emissions from both sides of AC line. According to the requirements in Section 7 and 13 of ANSI C63.10-2013.Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-Peak and average detector mode. The bandwidth of EMI test receiver is set at 9kHz.

The arrangement of the equipment is installed to meet the standards and operating in a manner, which tends to maximize its emission characteristics in a normal application.

TEST ENVIRONMENT

Temperature	22.3°C	Relative Humidity	63%
Atmosphere Pressure	101kPa	Test Voltage	DC 3.7V

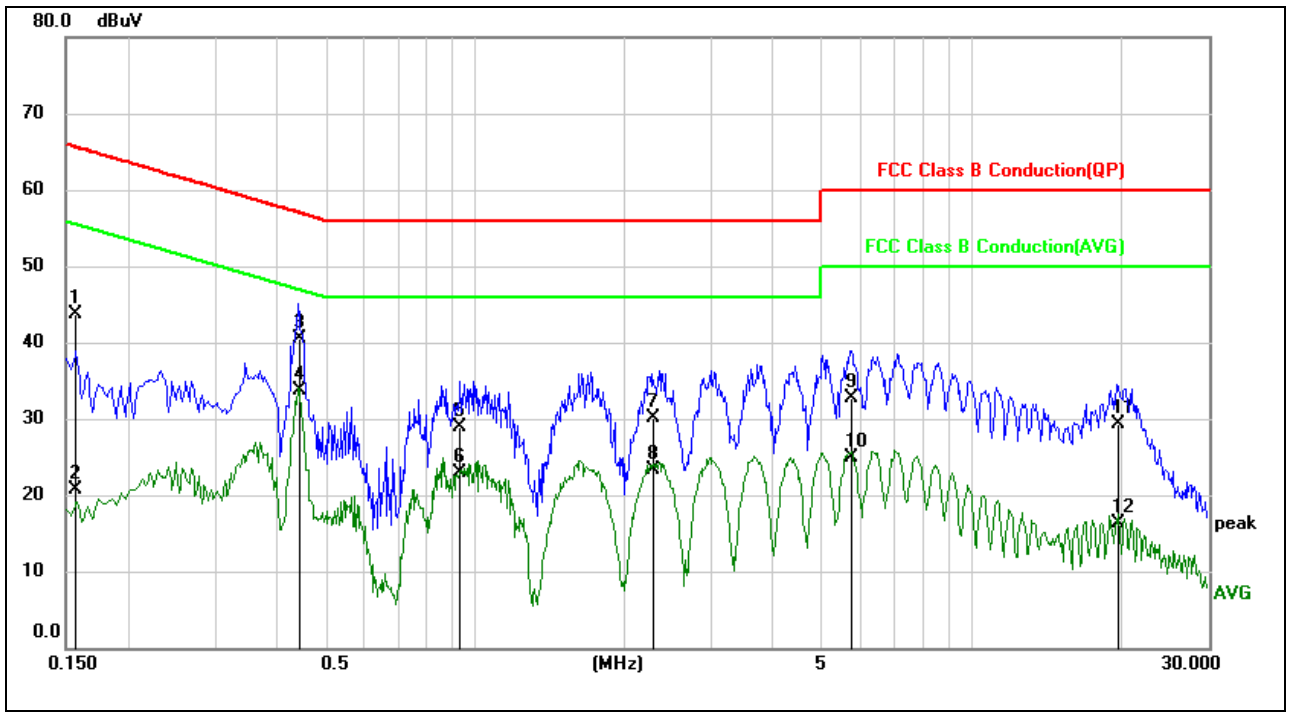
LINE N RESULTS (HIGH CHANNEL, WORST-CASE CONFIGURATION, HORIZONTAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	0.1601	33.48	9.62	43.10	65.46	-22.36	QP
2	0.1601	14.08	9.62	23.70	55.46	-31.76	AVG
3	0.4423	36.18	9.63	45.81	57.02	-11.21	QP
4	0.4423	30.06	9.63	39.69	47.02	-7.33	AVG
5	0.9415	23.57	9.64	33.21	56.00	-22.79	QP
6	0.9415	16.49	9.64	26.13	46.00	-19.87	AVG
7	2.3148	24.55	9.66	34.21	56.00	-21.79	QP
8	2.3148	17.74	9.66	27.40	46.00	-18.60	AVG
9	7.0452	27.63	9.77	37.40	60.00	-22.60	QP
10	7.0452	19.45	9.77	29.22	50.00	-20.78	AVG
11	22.7440	9.36	9.93	19.29	60.00	-40.71	QP
12	22.7440	2.29	9.93	12.22	50.00	-37.78	AVG

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

LINE L RESULTS (HIGH CHANNEL, WORST-CASE CONFIGURATION, HORIZONTAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	0.1573	33.97	9.64	43.61	65.61	-22.00	QP
2	0.1573	11.14	9.64	20.78	55.61	-34.83	AVG
3	0.4432	30.83	9.63	40.46	57.00	-16.54	QP
4	0.4432	24.07	9.63	33.70	47.00	-13.30	AVG
5	0.9414	19.33	9.64	28.97	56.00	-27.03	QP
6	0.9414	13.35	9.64	22.99	46.00	-23.01	AVG
7	2.2992	20.52	9.67	30.19	56.00	-25.81	QP
8	2.2992	13.73	9.67	23.40	46.00	-22.60	AVG
9	5.7087	23.06	9.74	32.80	60.00	-27.20	QP
10	5.7087	15.07	9.74	24.81	50.00	-25.19	AVG
11	19.7090	19.54	9.86	29.40	60.00	-30.60	QP
12	19.7090	6.53	9.86	16.39	50.00	-33.61	AVG

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

11. ANTENNA REQUIREMENTS

APPLICABLE REQUIREMENTS

Please refer to FCC §15.203

If directional gain of transmitting antennas is greater than 6dBi, the power shall be reduced by the same level in dB comparing to gain minus 6dBi. For the fixed point-to-point operation, the power shall be reduced by one dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi. 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 FCC rule.

ANTENNA CONNECTOR

EUT has a PCB antenna without antenna connector.

ANTENNA GAIN

The antenna gain of EUT is less than 6 dBi.

END OF REPORT