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

CERTIFICATION TEST REPORT

For

Huawei STB / Huawei BOX

MODEL NUMBER: Q21F

FCC ID: QIS-Q21F

IC: 6369A-Q21F

REPORT NUMBER: 4788692075.1-2

ISSUE DATE: October 24, 2018

Prepared for

Huawei Technologies Co., Ltd.
Administration Building, Huawei Technologies Co., Ltd. Bantian, Longgang District, Shenzhen, P.R. China, 518129

Prepared by

UL Verification Services (Guangzhou) Co., Ltd, Song Shan Lake Branch
Building 10, Innovation Technology Park, No. 1, Li Bin Road, Song Shan Lake Hi-Tech Development Zone Dongguan, People's Republic of China
Tel: +86 769 22038881
Fax: +86 769 33244054
Website: www.ul.com

Revision History

Rev.	Issue Date	Revisions	Revised By
V0	10/24/2018	Initial Issue	

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

TABLE OF CONTENTS

1. ATTESTATION OF TEST RESULTS

Applicant Information

Company Name:	HUAWEI TECHNOLOGIES CO., LTD.
Address:	Administration Building, Huawei Technologies Co., Ltd. Bantian, Longgang District, Shenzhen, P.R. China, 518129

Manufacturer Information

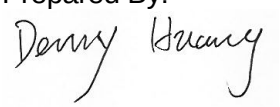
Company Name:	HUAWEI TECHNOLOGIES CO., LTD.
Address:	Administration Building, Huawei Technologies Co., Ltd. Bantian, Longgang District, Shenzhen, P.R. China, 518129

EUT Description

EUT Name:	Huawei STB / Huawei BOX
Model:	Q21F
Brand Name:	HUAWEI
Sample Status:	Normal
Sample Received Date:	September 28, 2018
Date of Tested:	October 8, 2018 ~ October 17, 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 v05, 414788 D01 Radiated Test Site v01r01, CFR 47 FCC Part 2, CFR 47 FCC Part 15, ANSI C63.10-2013, ISED RSS-247 Issue 2 and ISED RSS-GEN Issue 5.

3. FACILITIES AND ACCREDITATION

Accreditation Certificate	**A2LA (Certificate No.: 4102.01)** UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch. has been assessed and proved to be in compliance with A2LA. **FCC (FCC Designation No.: CN1187)** UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch. Has been recognized to perform compliance testing on equipment subject to the Commission's 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

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.

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) (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	Huawei STB / Huawei BOX		
Model	Q21E		
Operation frequency	2402 MHz ~ 2480 MHz		
Modulation	Modulation Type	Data Rate	
	GFSK	1Mbps	
Rated Input	DC 12V		
Power Supply	Power Adapter	Input	AC120~240V, 50/60Hz, 0.5A
		Output	DC 12V, 1.0A

5.2. MAXIMUM OUTPUT POWER

Bluetooth Mode	Frequency (MHz)	Channel Number	Max Output Power (dBm)	EIRP (dBm)
GSFK	2402-2480	0-39[40]	4.13	4.13

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 0, CH 19, CH 39	2402MHz, 2440MHz, 2480MHz

5.5. THE WORSE CASE POWER SETTING PARAMETER

The Worse Case Power Setting Parameter under 2400 ~ 2483.5MHz Band				
Test Software		Tera Term		
Modulation Type	Transmit Antenna Number	Test Channel		
		CH 0	CH 19	CH 39
GFSK	1	default	default	default

5.6. DESCRIPTION OF AVAILABLE ANTENNAS

Antenna	Frequency (MHz)	Antenna Type	Antenna Gain (dBi)
1	2402-2480	PCB Antenna	0

Test Mode	Transmit and Receive Mode	Description
GFSK	☒1TX, 1RX	Antenna 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. TEST ENVIRONMENT

Environment Parameter	Selected Values During Tests	
Relative Humidity	35 ~ 75%	
Atmospheric Pressure:	1025Pa	
Temperature	TN	18 ~ 35°C
Voltage :	VL	/
	VN	AC 120V/60Hz
	VH	/

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

5.9. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Item	Equipment	Brand Name	Model Name	P/N
1	Laptop	ThinkPad	T460S	SL10K24796 JS
2	High Pass Filter	Wi	WHKX10-2700-3000-18000-40SS	23
3	Band Reject Filter	Wainwright	WRCJV8-2350-2400-2483.5-2533.5-40SS	4

I/O CABLES

Item	Port	Connector Type	Cable Type	Cable Length(m)	Remarks
1	USB	USB	Unshielding	0.5	/

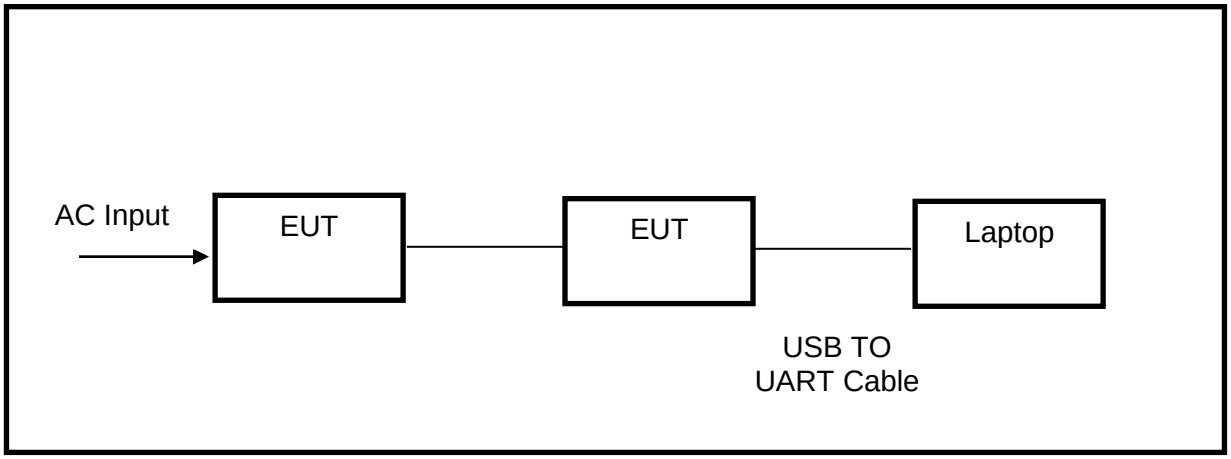
ACCESSORIES

Item	Accessory	Brand Name	Model Name	Description
1	AC ADAPTOR	HUAWEI	HW-120100E0W	Input: 100-240 Vac, 50/60 Hz, 0.5 A Output: 12Vdc, 1A
2	remote control	HUAWEI	/	/

TEST SETUP

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

SETUP DIAGRAM FOR TESTS



6. MEASURING INSTRUMENT AND SOFTWARE USED

R&S TS 8997 Test System						
Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Due. Date
☑	Power sensor, Power Meter	R&S	OSP120	100921	Dec.12,2017	Dec.11,2018
☑	Vector Signal Generator	R&S	SMBV100A	261637	Dec.12,2017	Dec.11,2018
☑	Signal Generator	R&S	SMB100A	178553	Dec.12,2017	Dec.11,2018
☑	Signal Analyzer	R&S	FSV40	A1512015	Dec.12,2017	Dec.11,2018

Software				
Used	Description	Manufacturer	Name	Version
☑	For R&S TS 8997 Test System	Rohde & Schwarz	R&S EMC 32	V1.0

RSE Test System						
Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Due. Date
☑	Spectrum Analyzer	R&S	FSV40	101117	Dec.12,2017	Dec.11,2018
☑	Broadband TRILOG Antenna	Schwarzbeck	VULB9163	81061	Jan.09,2016	Jan.08,2019
☑	Horn Antenna (1G~18GHz)	ETS-Lindgren	3117	00213191	Feb.21,2017	Feb.20,2020
☑	Preamplifier(10KHz-3GHz)	TDK	PA-02-001-3000	TRS-305-00067	Dec.12,2017	Dec.11,2018
☑	Preamplifier (1-18GHz)	ETS-Lindgren	3117-PA	00213191	Dec.12,2017	Dec.11,2018
☑	Preamplifier (18GHz to 26GHz)	TDK	PA-02-2	TRS-307-00002	Dec.12,2017	Dec.11,2018
☑	High Gain Horn Antenna 18GHz to 40GHz	Schwarzbeck	BBHA-9170	697	Jan.06,2016	Jan.05,2019

Software				
Used	Description	Manufacturer	Name	Version
☑	For TDK RSE Test System	TDK	TDK Emission lab	V10.81

Other Instrument						
Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Due. Date
☑	Temperature & Humidity Chamber	SANMOOD	SG-80-CC-2	2088	Dec.12,2017	Dec.11,2018

Tonscend SRD Test System						
Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Due. Date
☑	PXA Signal Analyzer	Keysight	N9030A	MY55410512	Dec.12,2017	Dec.11,2018
☑	MXG Vector Signal Generator	Keysight	N5182B	MY56200284	Dec.12,2017	Dec.11,2018
☑	MXG Vector Signal Generator	Keysight	N5172B	MY56200301	Dec.12,2017	Dec.11,2018
☑	RF Control Unit	Tonscend	JS0806-2	N/A	Dec.12,2017	Dec.11,2018
Software						
Used	Description	Manufacturer	Name			Version
☑	Tonscend SRD Test System	Tonscend	JS1120-3 BT/WIFI(FCC/CE) Test System			V2.6

7. MEASUREMENT METHODS

No.	Test Item	KDB Name	Section
1	6 dB Bandwidth	KDB 558074 D01 DTS Meas Guidance v05	8.2
2	Peak Output Power	KDB 558074 D01 DTS Meas Guidance v05	8.3.1
3	Power Spectral Density	KDB 558074 D01 DTS Meas Guidance v05	8.2
4	Out-of-band emissions in non-restricted bands	KDB 558074 D01 DTS Meas Guidance v05	8.5
5	Out-of-band emissions in restricted bands	KDB 558074 D01 DTS Meas Guidance v05	8.6
6	Band-edge	KDB 558074 D01 DTS Meas Guidance v05	8.7
7	Conducted Emission Test For AC Power Port	ANSI C63.10-2013	6.2

8. ANTENNA PORT TEST RESULTS

EST ENVIRONMENT

Temperature	24.3°C	Relative Humidity	58%
Atmosphere Pressure	101kPa		

8.1. ON TIME AND DUTY CYCLE

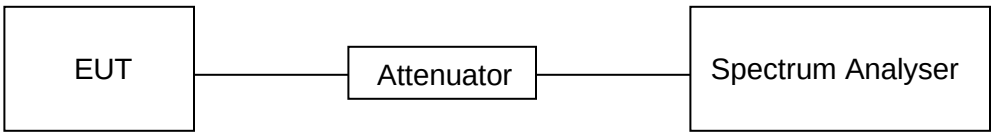
LIMITS

None; for reporting purposes only

PROCEDURE

KDB 558074 Zero-Span Spectrum Analyzer Method

TEST SETUP



RESULTS

Mode	On Time (msec)	Period (msec)	Duty Cycle x (Linear)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	1/T Minimum VBW (KHz)	Final setting For VBW (KHz)
GFSK	0.099	0.615	0.1610	16.10	7.93	10.1010	11

Note: Duty Cycle Correction Factor=10log(1/x).
Where: x is Duty Cycle(Linear)
Where: T is On Time (transmit duration)

ON TIME AND DUTY CYCLE MID CH

8.2. 6 dB DTS BANDWIDTH AND 99% BANDWIDTH

LIMITS

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

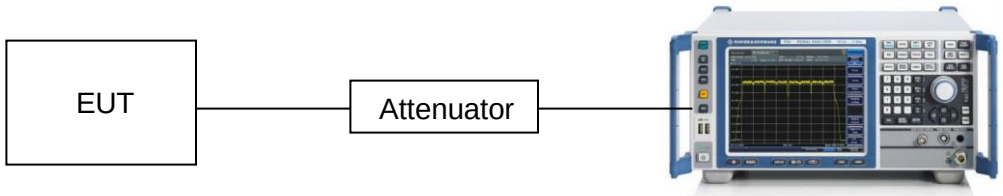
TEST PROCEDURE

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

Center Frequency	The center frequency of the channel under test
Detector	Peak
RBW	For 6 dB Bandwidth :100K For 99% Bandwidth :1% to 5% of the occupied bandwidth
VBW	For 6dB Bandwidth : ≥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 relative to the maximum level measured in the fundamental emission.

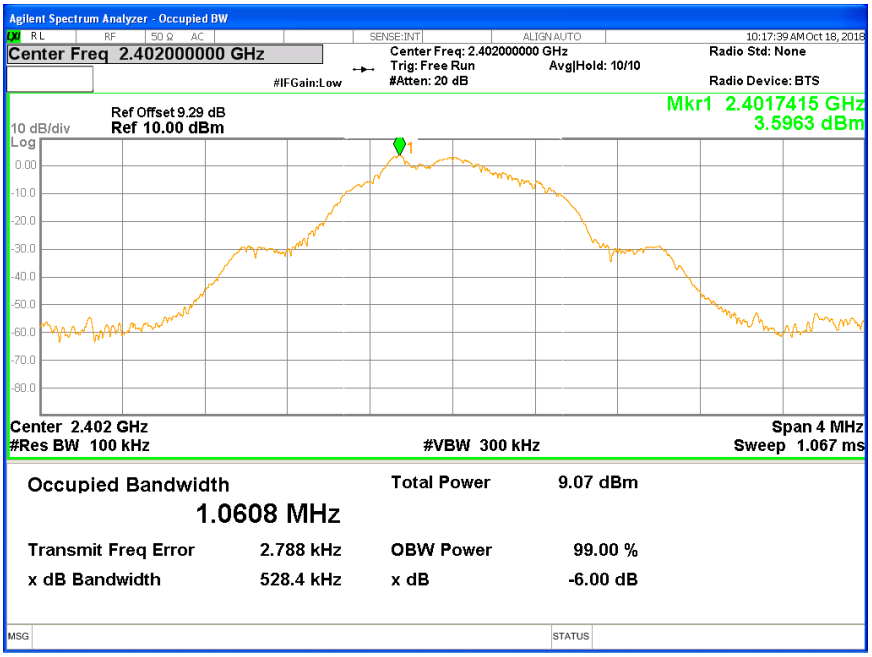
TEST SETUP



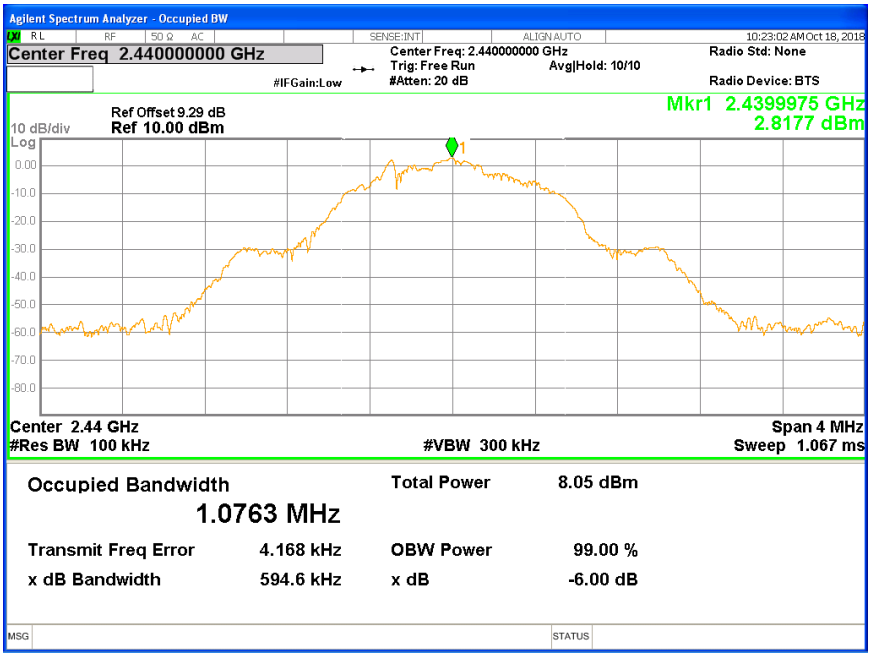
RESULTS

Channel	Frequency (MHz)	6dB bandwidth (MHz)	99% bandwidth (MHz)	Limit (kHz)	Result
Low	2402	0.528	1.0675	500	Pass
Middle	2440	0.595	1.0603	500	Pass
High	2480	0.591	1.0628	500	Pass

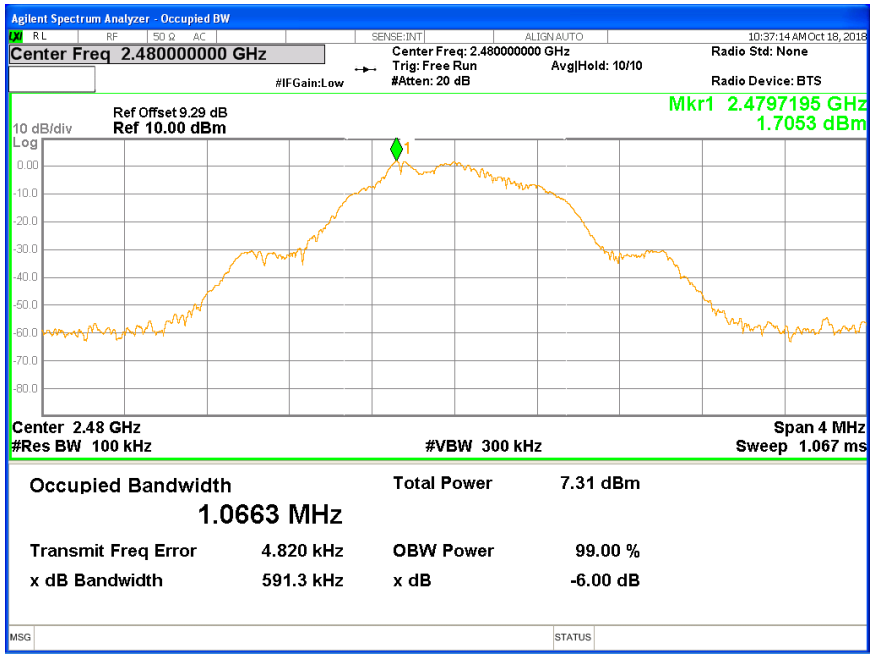
6 dB BANDWIDTH LOW CH



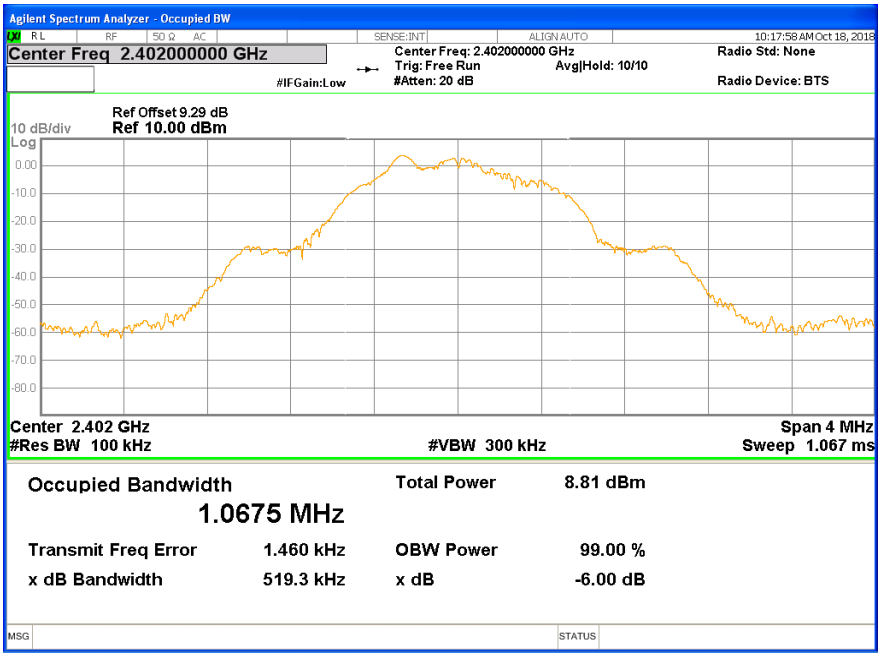
6 dB BANDWIDTH MID CH



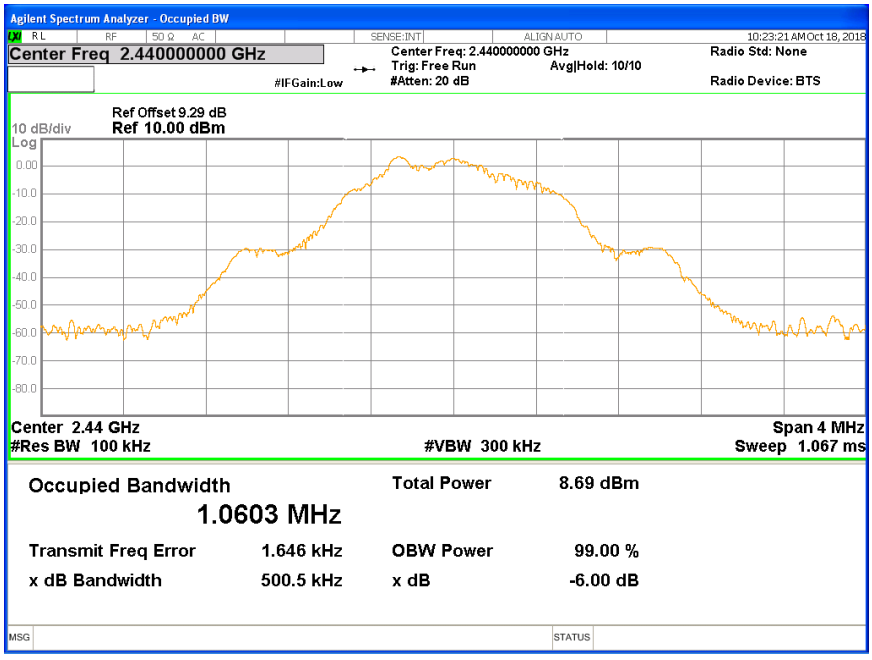
6 dB BANDWIDTH HIGH CH



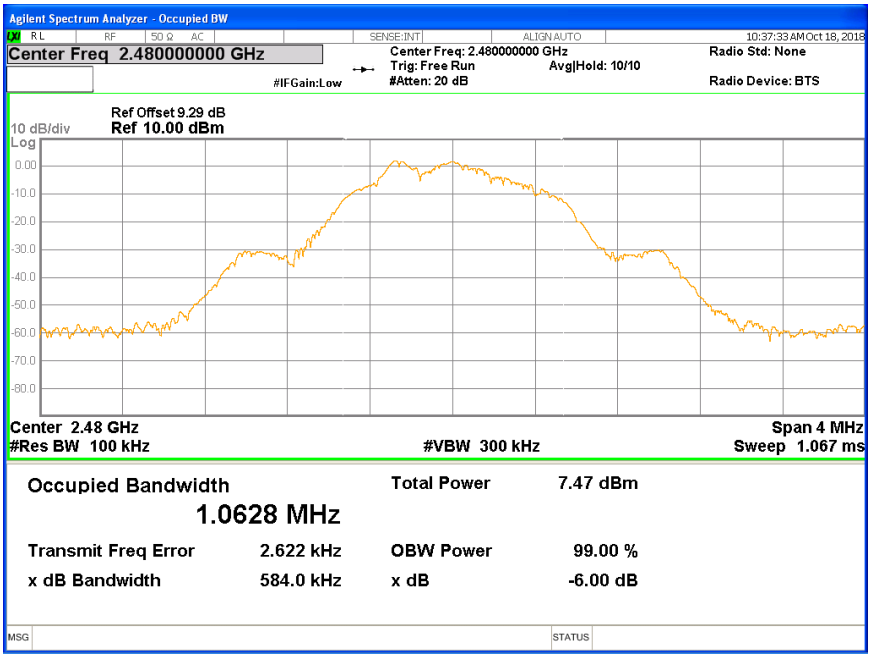
99% BANDWIDTH LOW CH



99% BANDWIDTH MIN CH



99% BANDWIDTH HIGH CH



8.3. PEAK CONDUCTED OUTPUT POWER

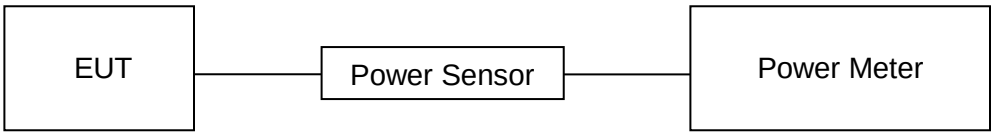
LIMITS

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

TEST PROCEDURE

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



RESULTS

Test Channel	Frequency	Maximum Conducted Output Power(PK)	EIRP	LIMIT
	(MHz)	(dBm)	(dBm)	dBm
CH00	2402	4.13	4.13	30
CH19	2440	3.81	3.81	30
CH39	2480	2.60	2.60	30

8.4. POWER SPECTRAL DENSITY

LIMITS

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

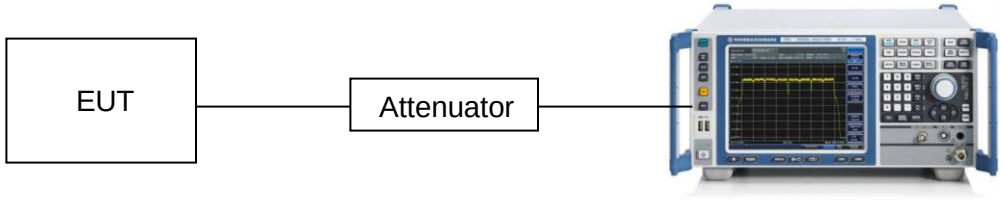
TEST PROCEDURE

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

Center Frequency	The center frequency of the channel under test
Detector	Peak
RBW	3 kHz ≤ RBW ≤ 100 kHz
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

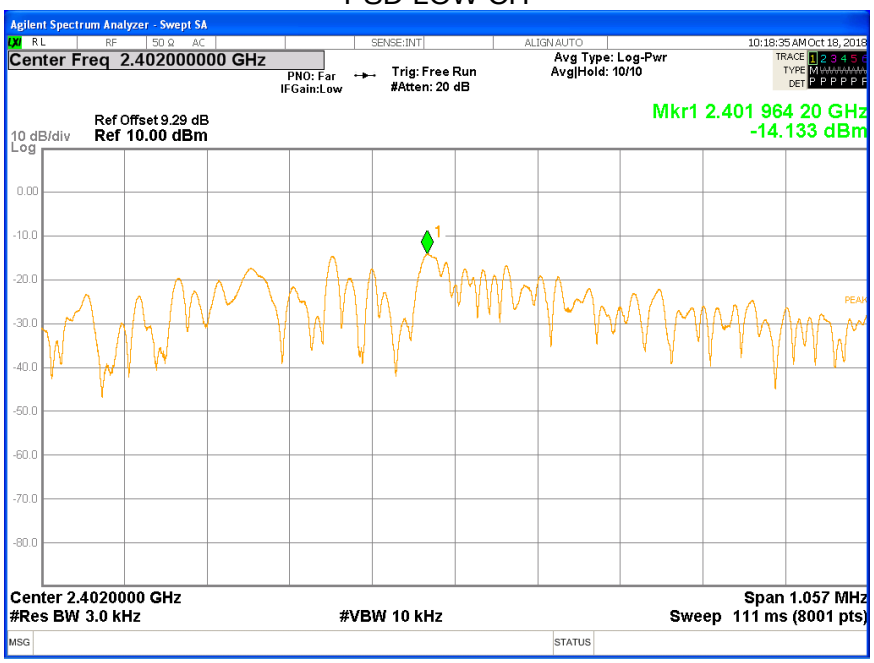


RESULTS

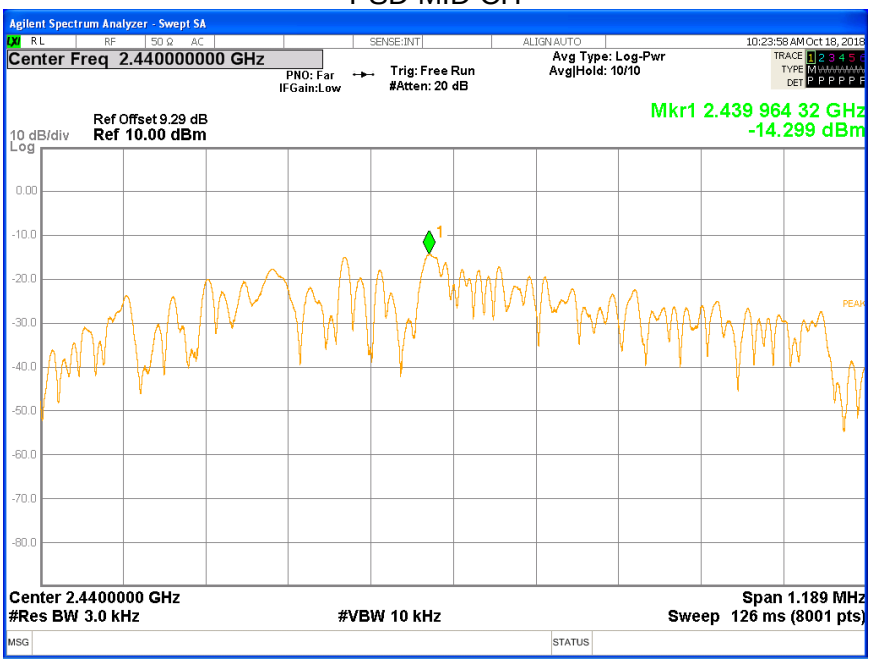
Mode: GFSK

Frequency	Power Spectral Density (dBm/3kHz)	Limit (dBm/3kHz)	Result
2402 MHz	-14.133	8	PASS
2440 MHz	-14.299	8	PASS
2480 MHz	-15.525	8	PASS

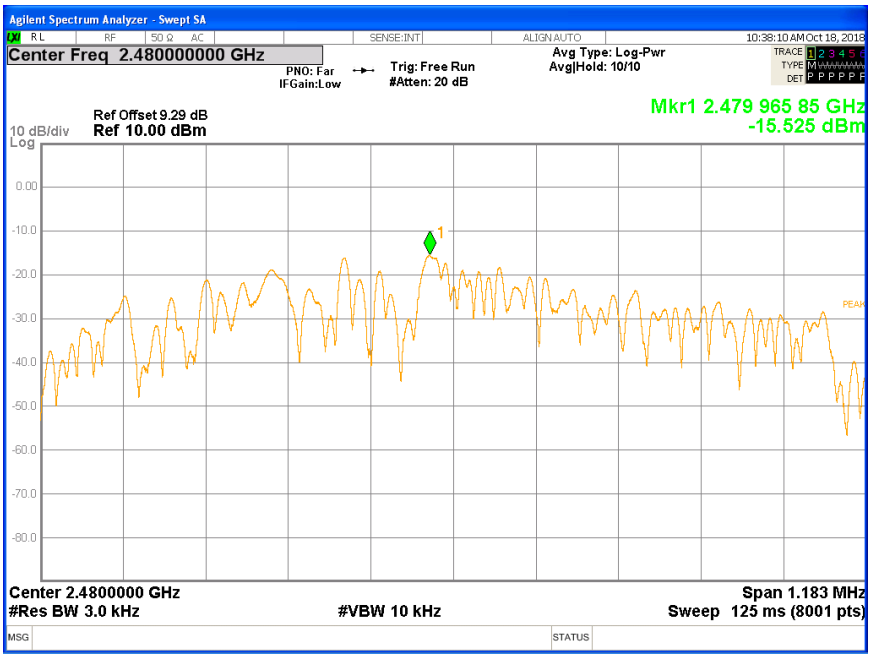
PSD LOW CH



PSD MID CH



PSD HIGH CH



8.5. CONDUCTED BANDEDGE AND SPURIOUS EMISSIONS

LIMITS

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

TEST PROCEDURE

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

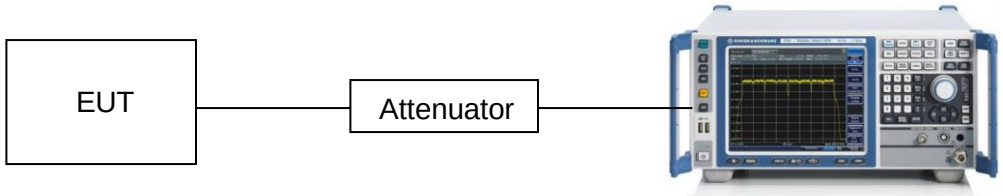
Center Frequency	The center frequency of the channel under test
Detector	Peak
RBW	100KHz
VBW	≥3 × RBW
Span	1.5 x DTS bandwidth
Trace	Max hold
Sweep time	Auto couple.

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	100KHz
VBW	≥3 × RBW
measurement points	≥span/RBW
Trace	Max hold
Sweep time	Auto couple.

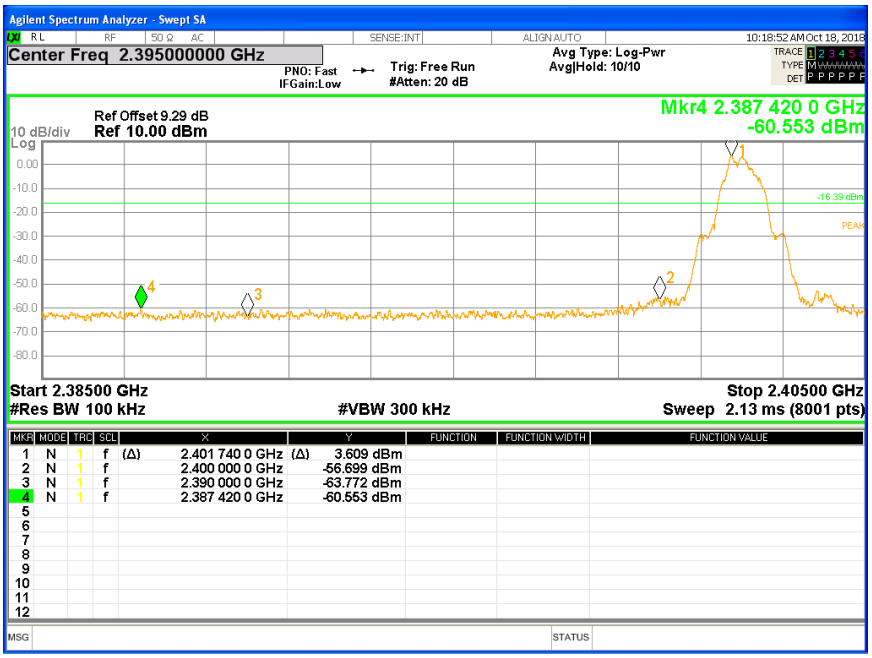
Use the peak marker function to determine the maximum amplitude level**.**

TEST SETUP

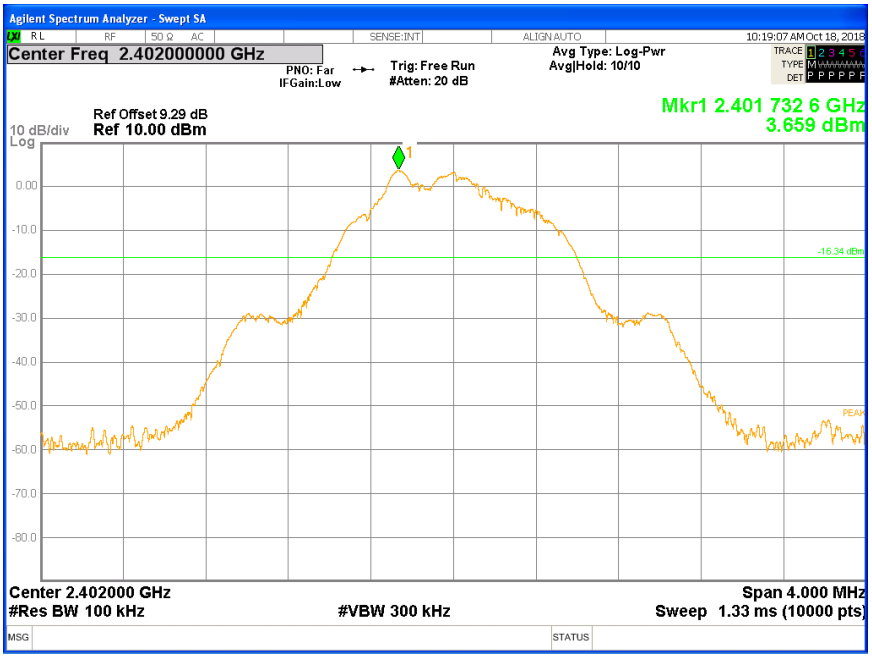


RESULTS

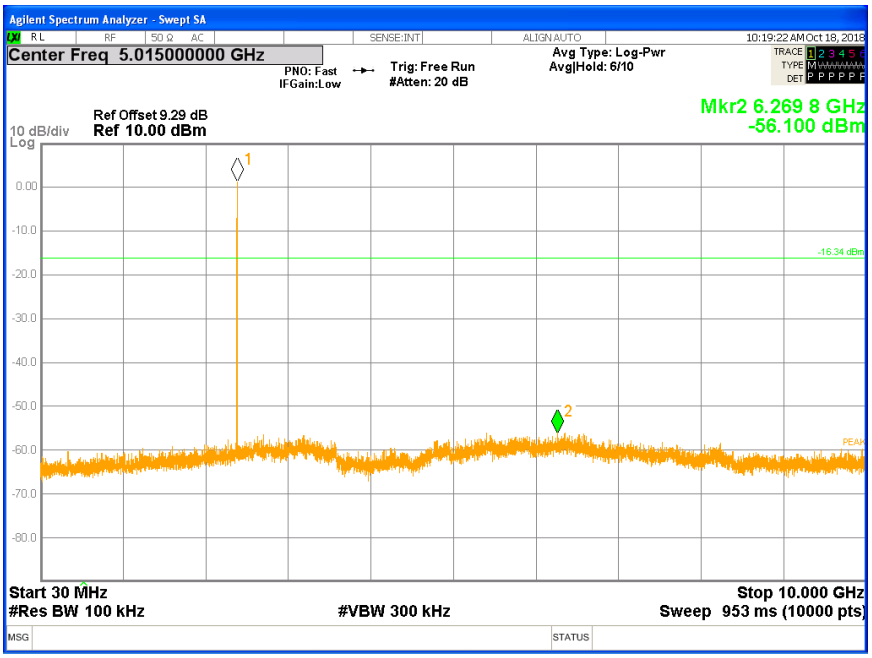
LOW CH BANDEDAGE



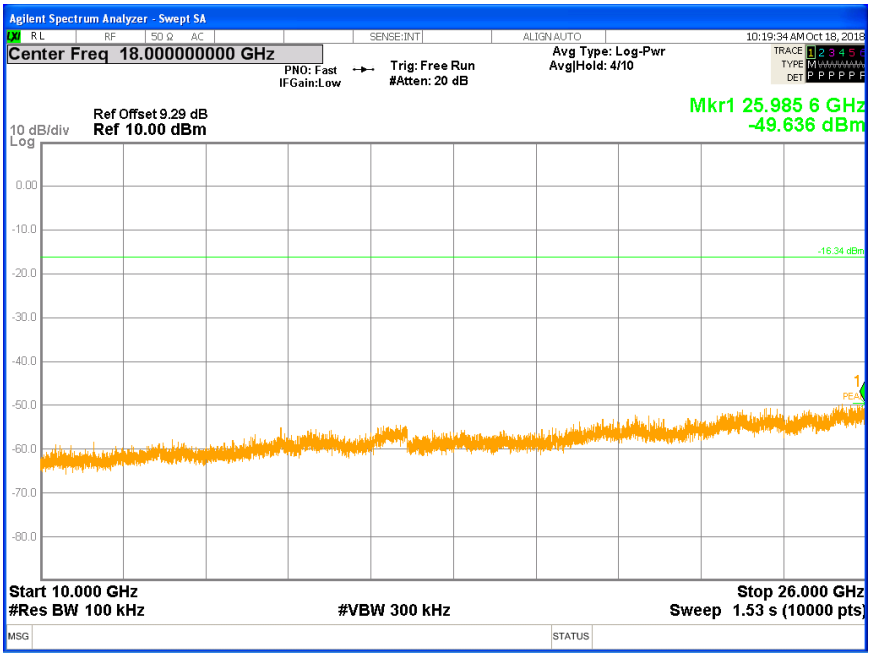
LOW CH SPURIOUS REFERNCE



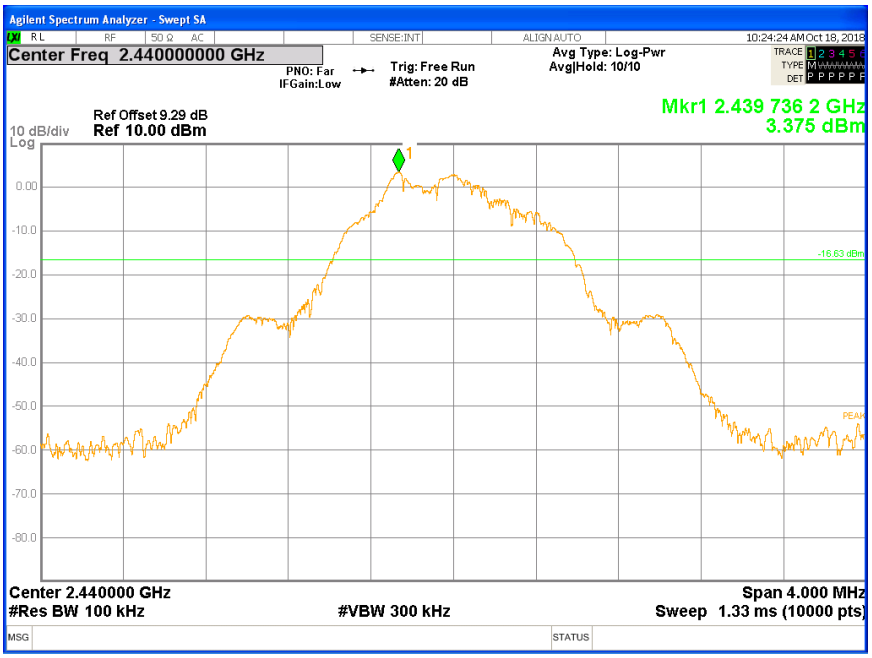
LOW CH SPURIOUS EMISSIONS 30M-10G



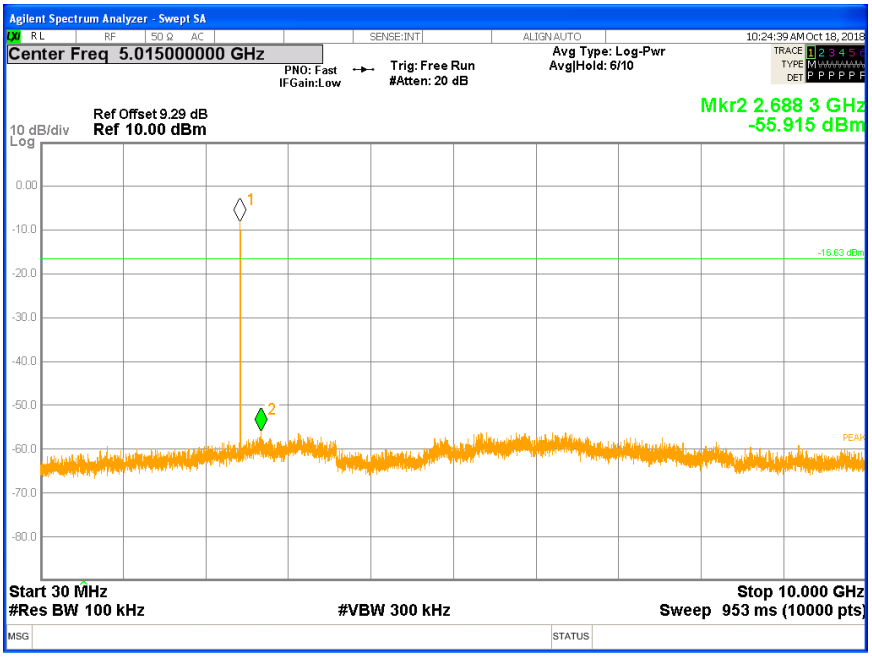
LOW CH SPURIOUS EMISSIONS 10G-26G



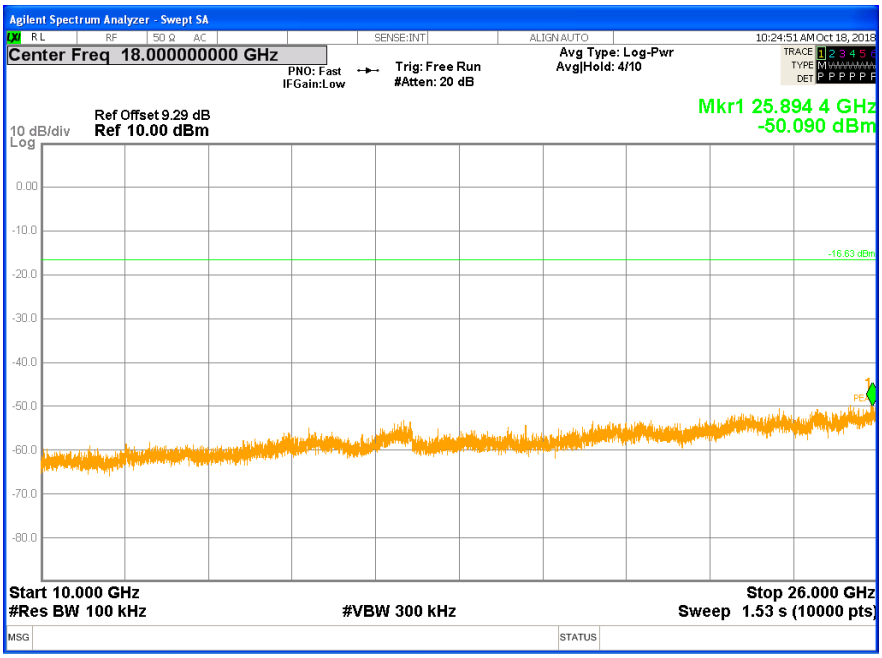
MID CH SPURIOUS REFERNCE



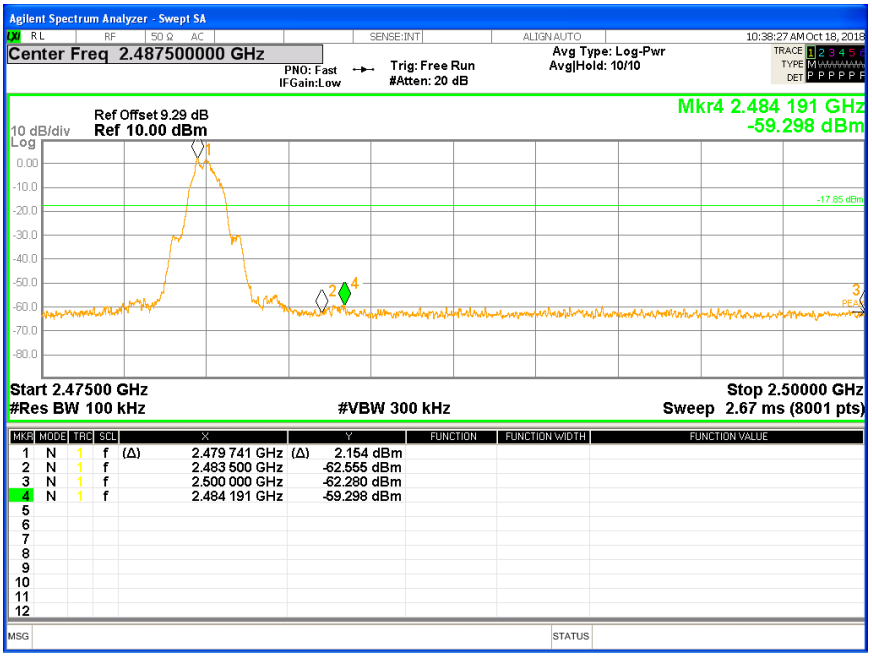
MID CH SPURIOUS EMISSIONS 30M-10G



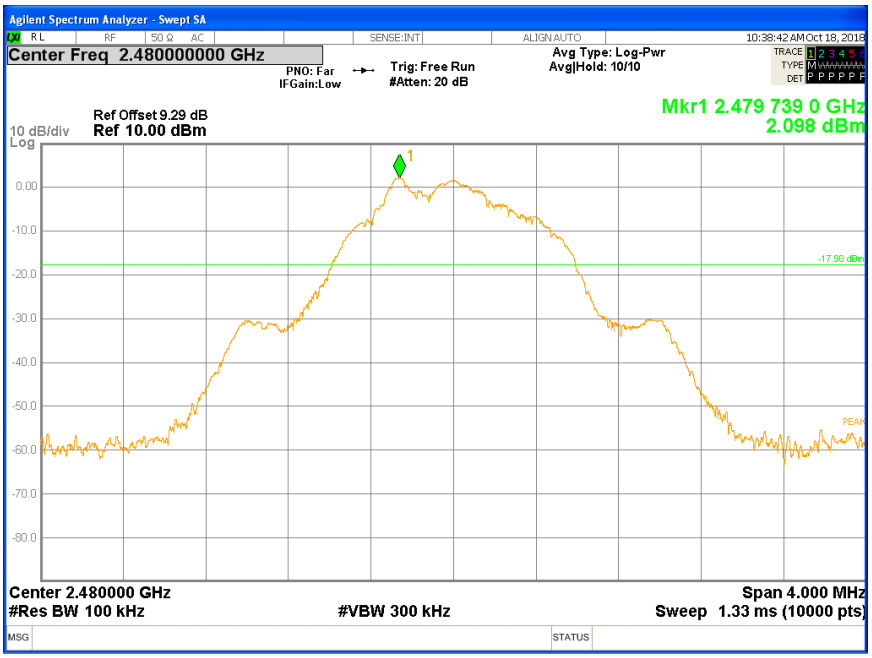
MID CH SPURIOUS EMISSIONS 10G-26G



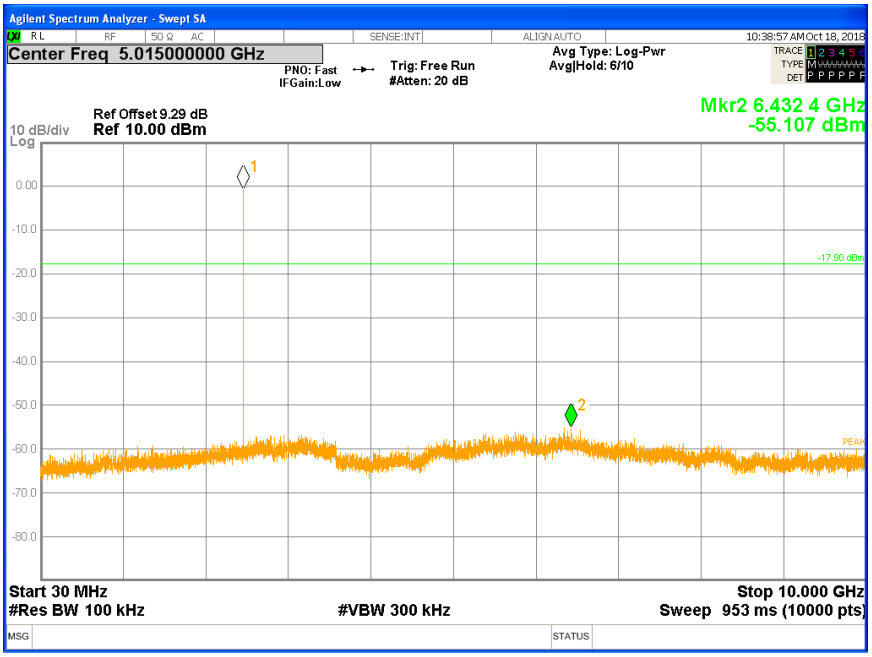
HIGH CH BANDEDAGE



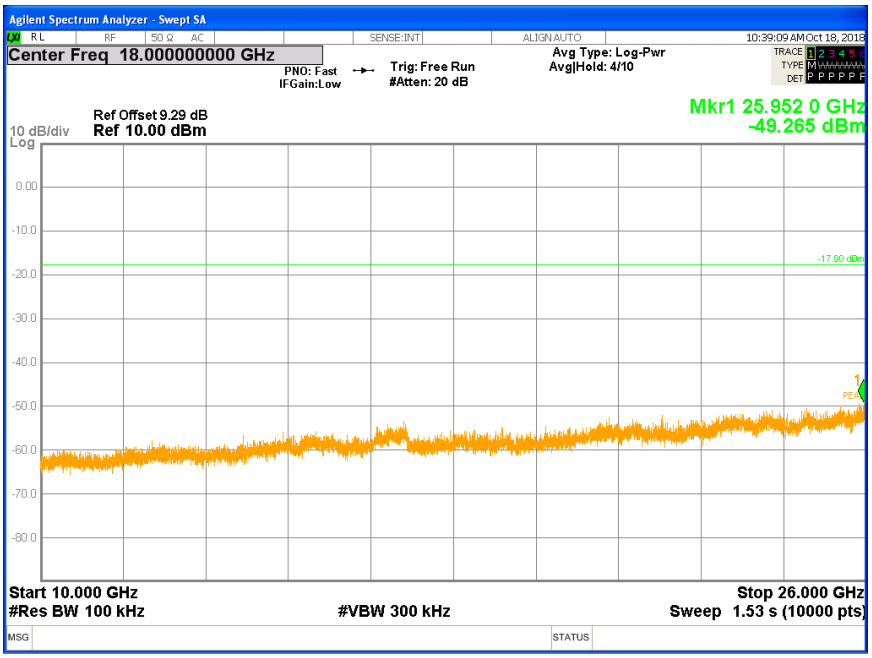
HIGH CH SPURIOUS REFERNCE



HIGH CH SPURIOUS EMISSIONS 30M-10G



HIGH CH SPURIOUS EMISSIONS 10G-26G



9. RADIATED TEST RESULTS

LIMITS

Please refer to CFR 47 FCC §15.205 and §15.209

Please refer to ISED 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

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

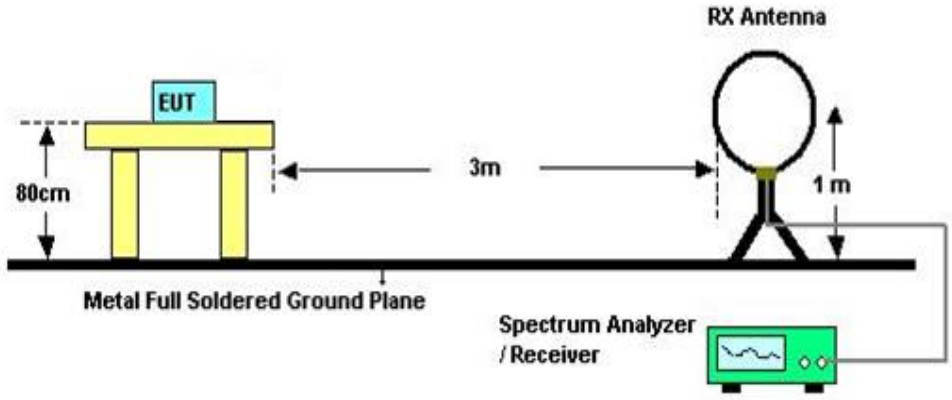
FCC Restricted bands of operation:

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

Note: [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

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.

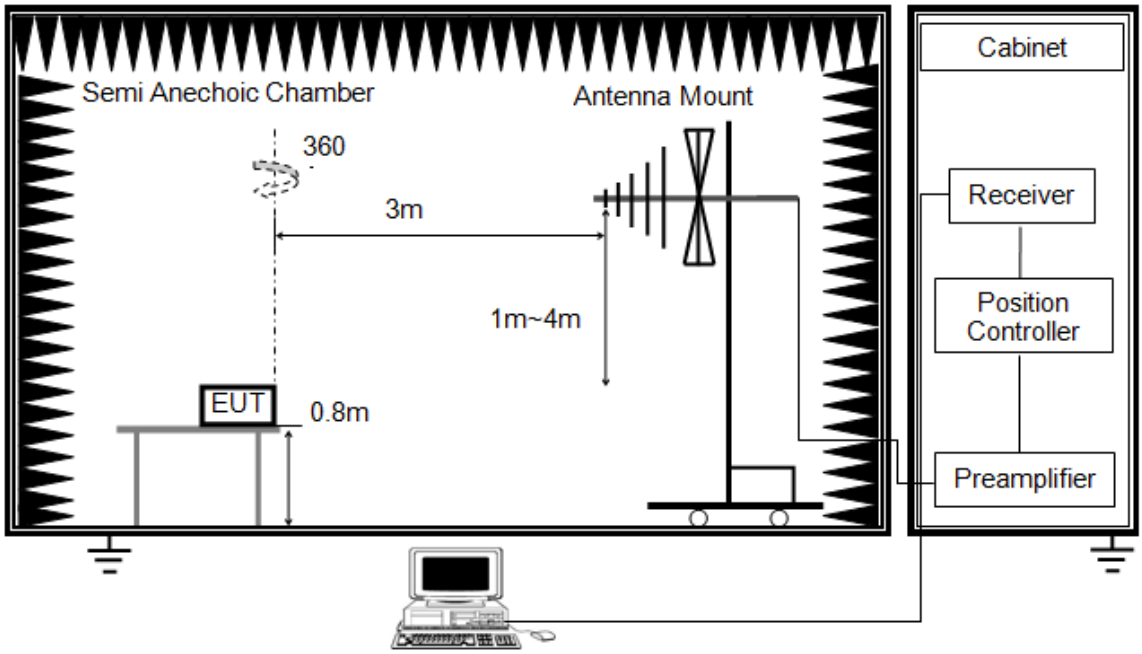
3. The EUT was placed on a turntable with 0.8 meter above ground.

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.

6. 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.

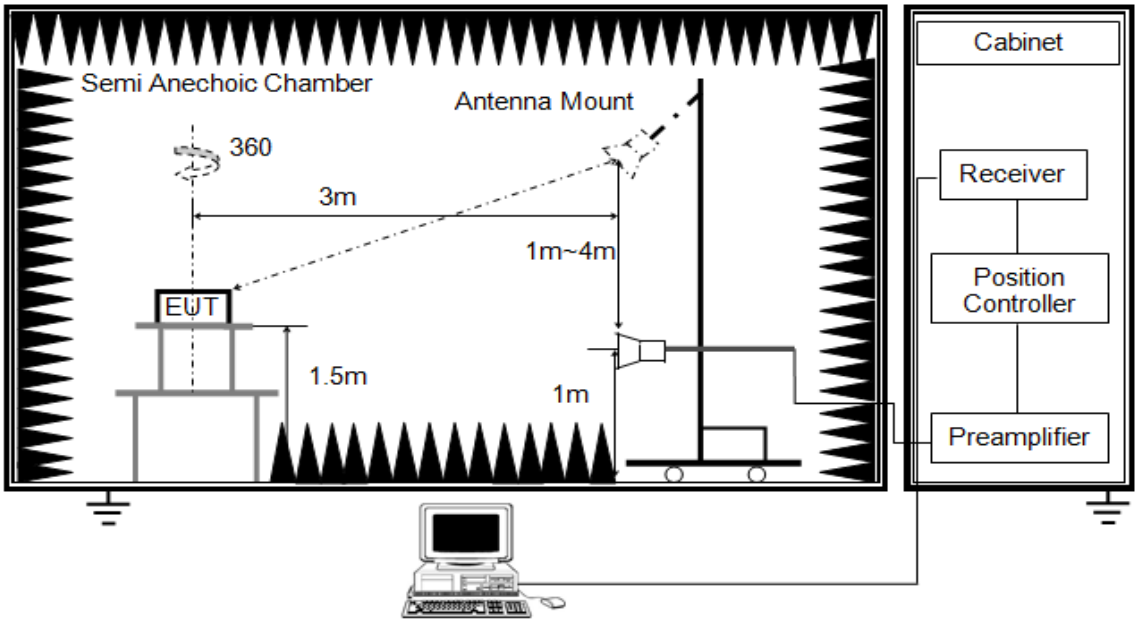
2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level. Both horizontal and vertical polarizations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

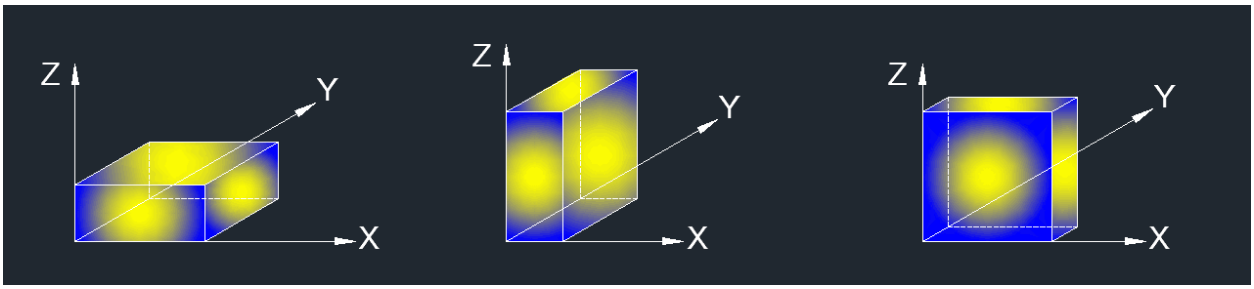
3. The EUT was placed on a turntable with 1.5m above ground.

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 measurements above 1 GHz the resolution bandwidth is set to 1 MHz, then the video bandwidth is set to 3 MHz for peak measurements and 1 MHz resolution bandwidth with 1/T video bandwidth with peak detector for average measurements. For the Duty Cycle please refer to clause 8.1.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.

Note 2: The EUT was fully exercised with external accessories during the test. In the case of multiple accessory external ports, an external accessory shall be connected to one of each type of port.

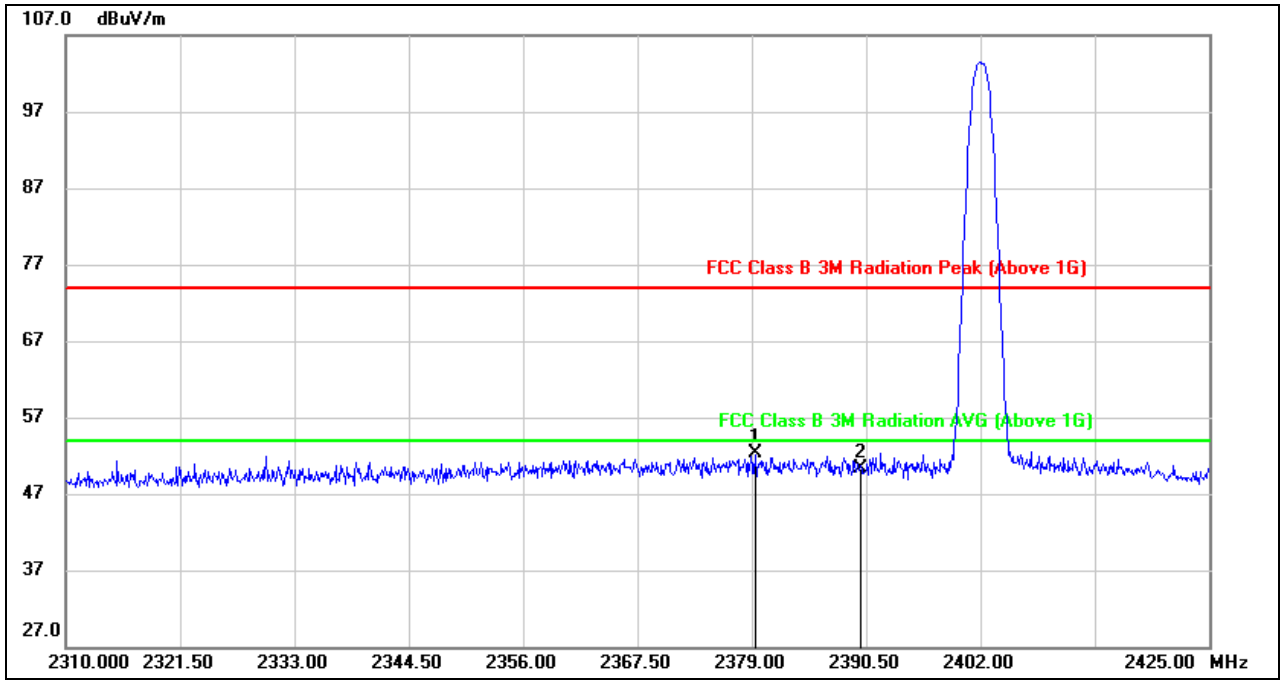
TEST ENVIRONMENT

Temperature	22.4°C	Relative Humidity	52%
Atmosphere Pressure	101kPa	Test Voltage	AC 120V/60Hz

RESULTS

9.1. RESTRICTED BANDEDGE

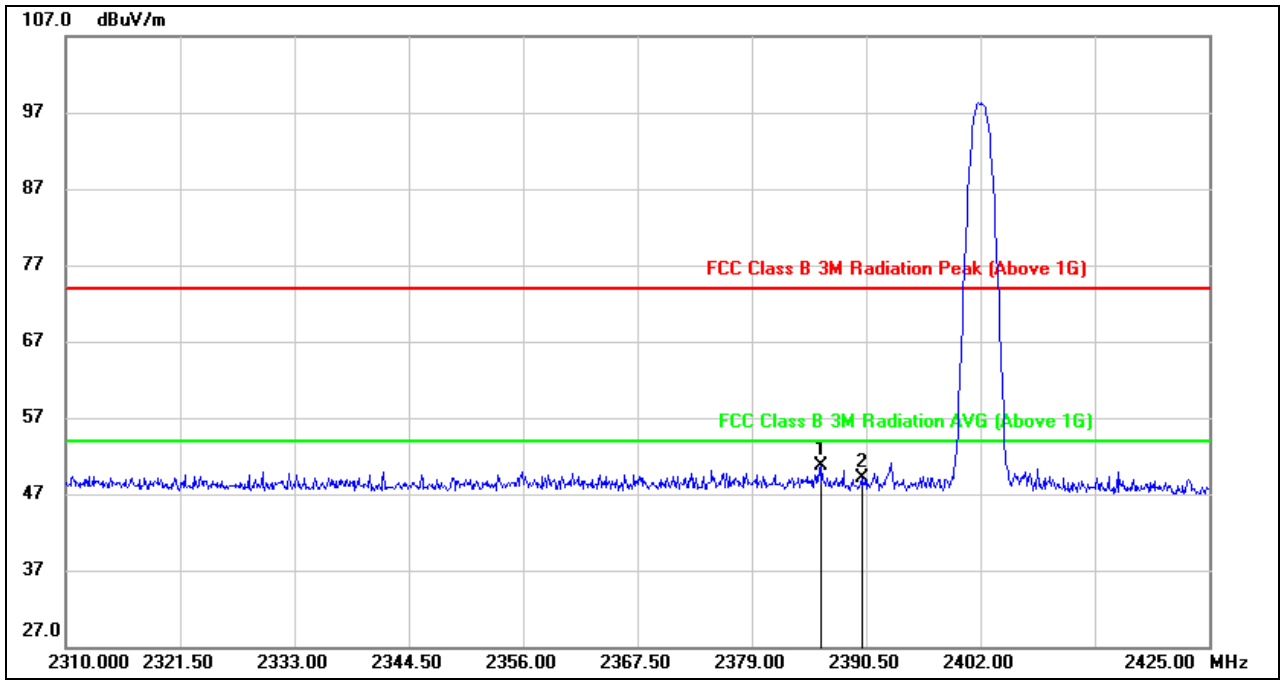
RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	2379.345	18.98	33.22	52.20	74.00	-21.80	peak
2	2390.000	17.17	33.14	50.31	74.00	-23.69	peak

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

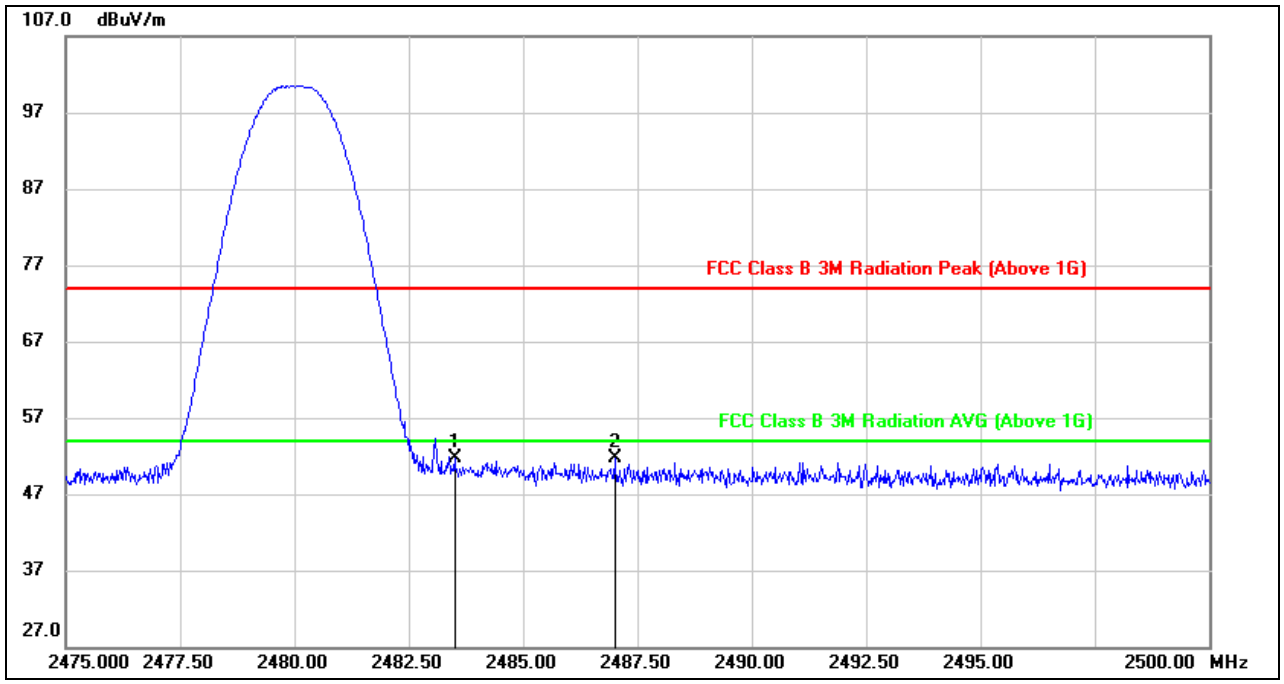
RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2386.015	17.46	33.27	50.73	74.00	-23.27	peak
2	2390.000	15.88	33.24	49.12	74.00	-24.88	peak

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

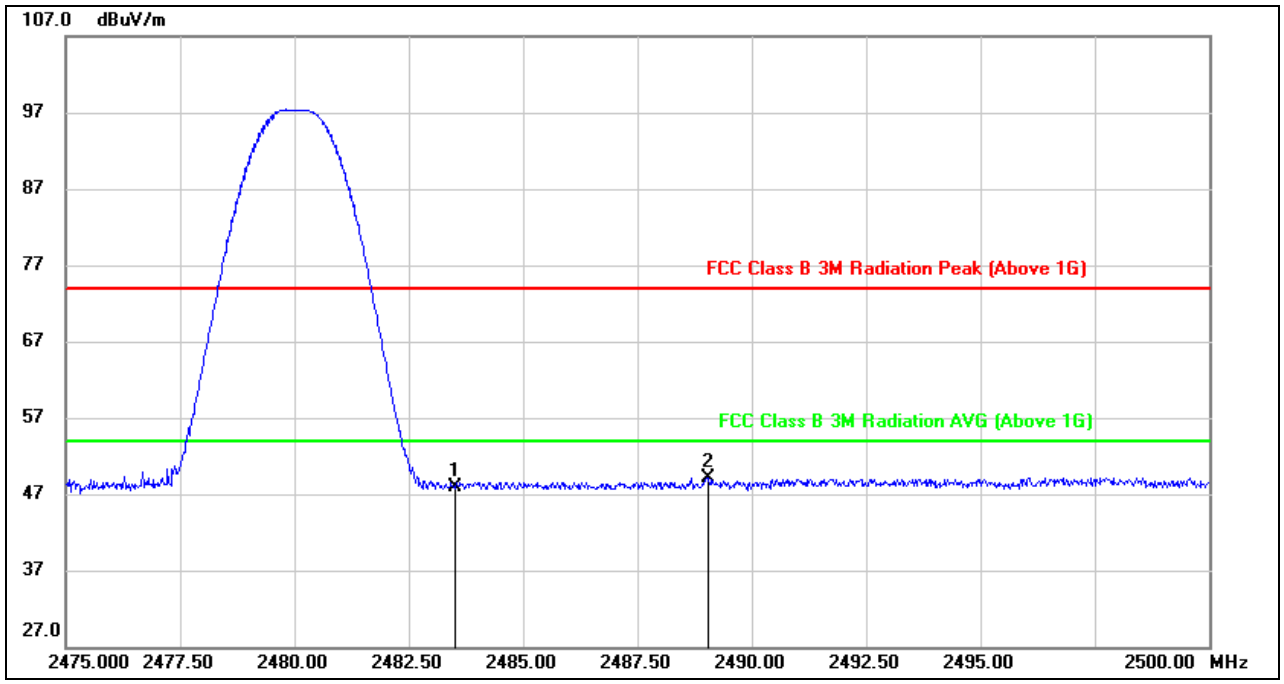
RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	2483.500	18.89	32.78	51.67	74.00	-22.33	peak
2	2487.000	18.96	32.79	51.75	74.00	-22.25	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.
4. Only the worst case emission was recorded, if it complies with the limit, the other emissions deemed to comply with the limit.

RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)



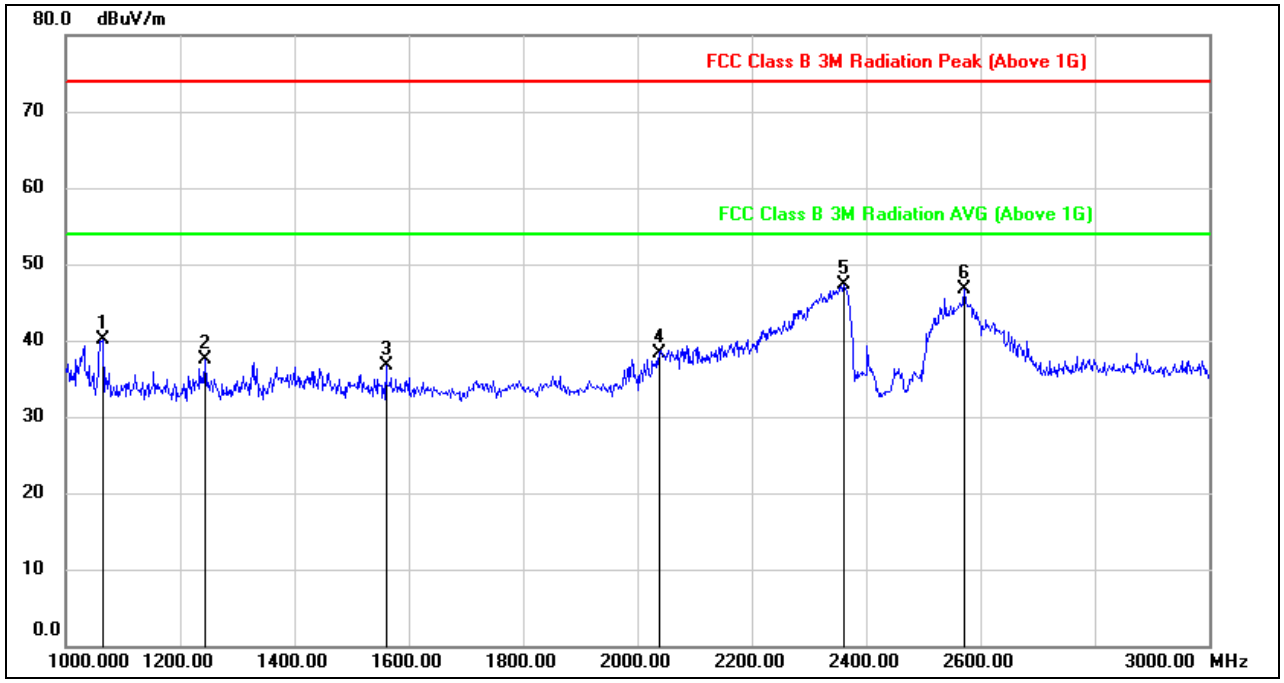
No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	2483.500	14.95	32.88	47.83	74.00	-26.17	peak
2	2489.050	16.26	32.88	49.14	74.00	-24.86	peak

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

9.2. SPURIOUS EMISSIONS 1GHz~18GHz

HARMONICS AND SPURIOUS EMISSIONS (LOW CHANNEL, HORIZONTAL)

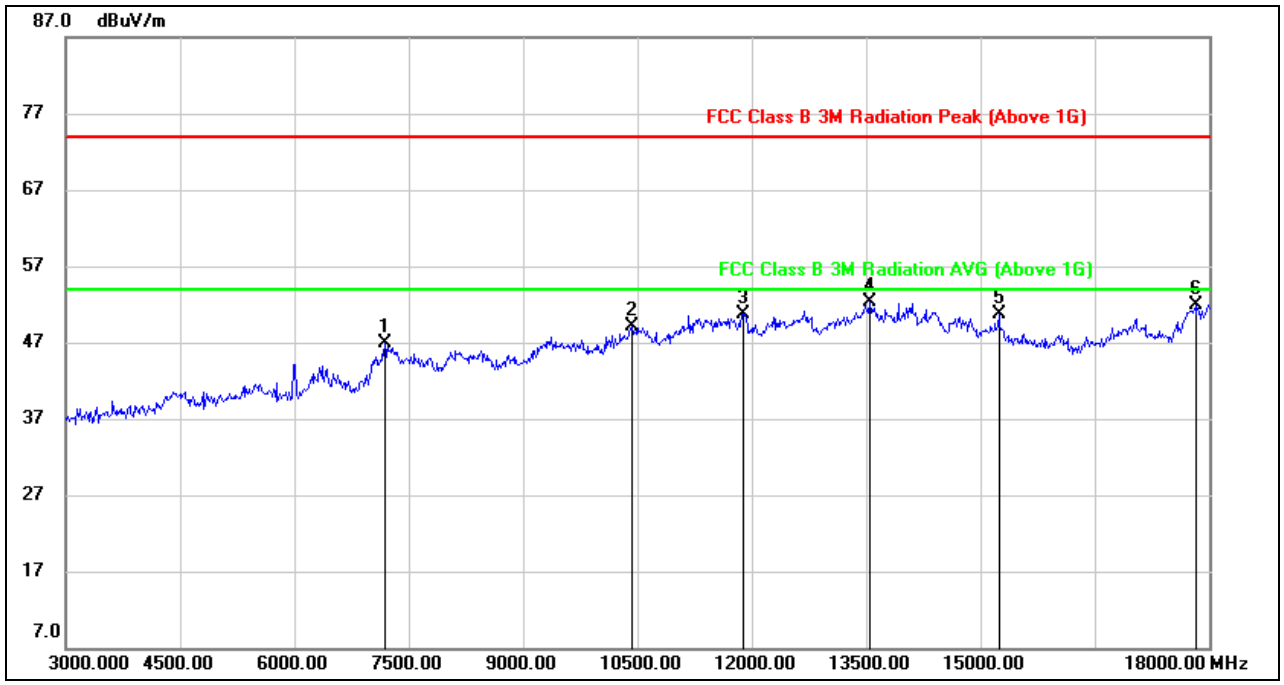
1GHz~3GHz



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1064.000	53.77	-13.62	40.15	74.00	-33.85	peak
2	1244.000	50.27	-12.85	37.42	74.00	-36.58	peak
3	1560.000	48.95	-12.31	36.64	74.00	-37.36	peak
4	2038.000	48.61	-10.30	38.31	74.00	-35.69	peak
5	2362.000	55.24	-7.84	47.40	74.00	-26.60	peak
6	2572.000	54.85	-8.24	46.61	74.00	-27.39	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.

3GHz~18GHz

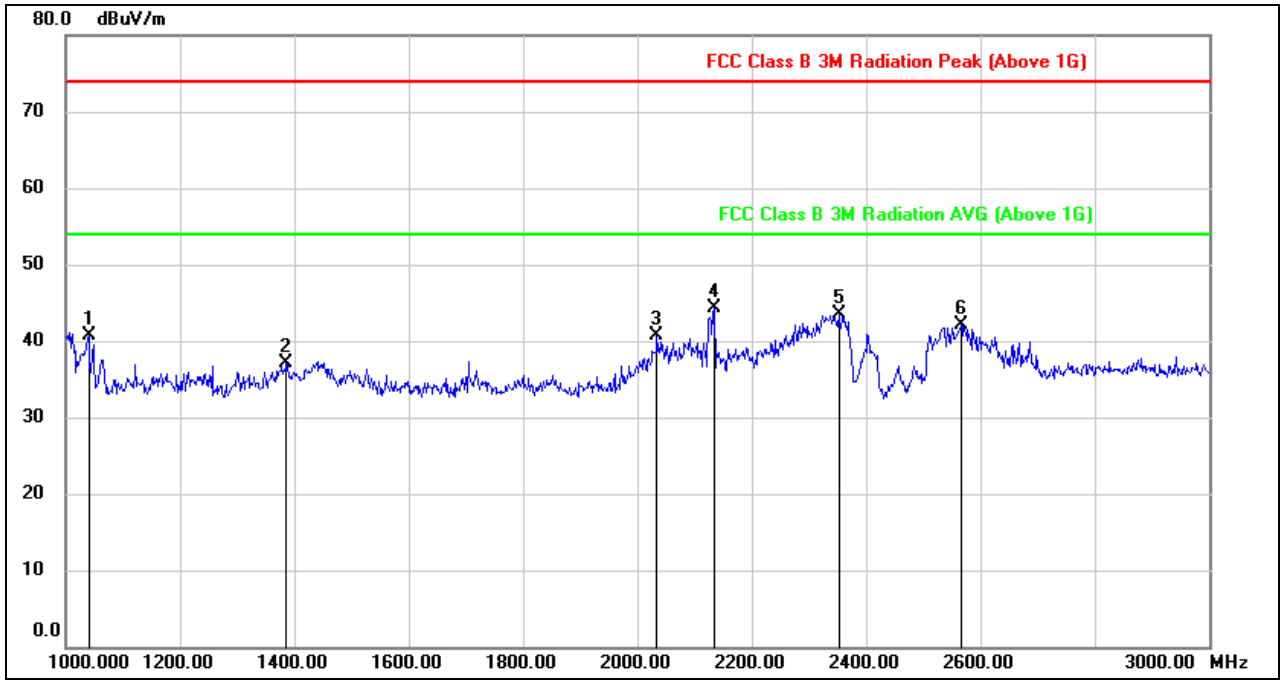


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	7185.000	39.12	7.73	46.85	74.00	-27.15	peak
2	10425.000	35.83	13.25	49.08	74.00	-24.92	peak
3	11880.000	34.02	16.74	50.76	74.00	-23.24	peak
4	13545.000	32.02	20.29	52.31	74.00	-21.69	peak
5	15240.000	32.96	17.65	50.61	74.00	-23.39	peak
6	17820.000	25.45	26.48	51.93	74.00	-22.07	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)

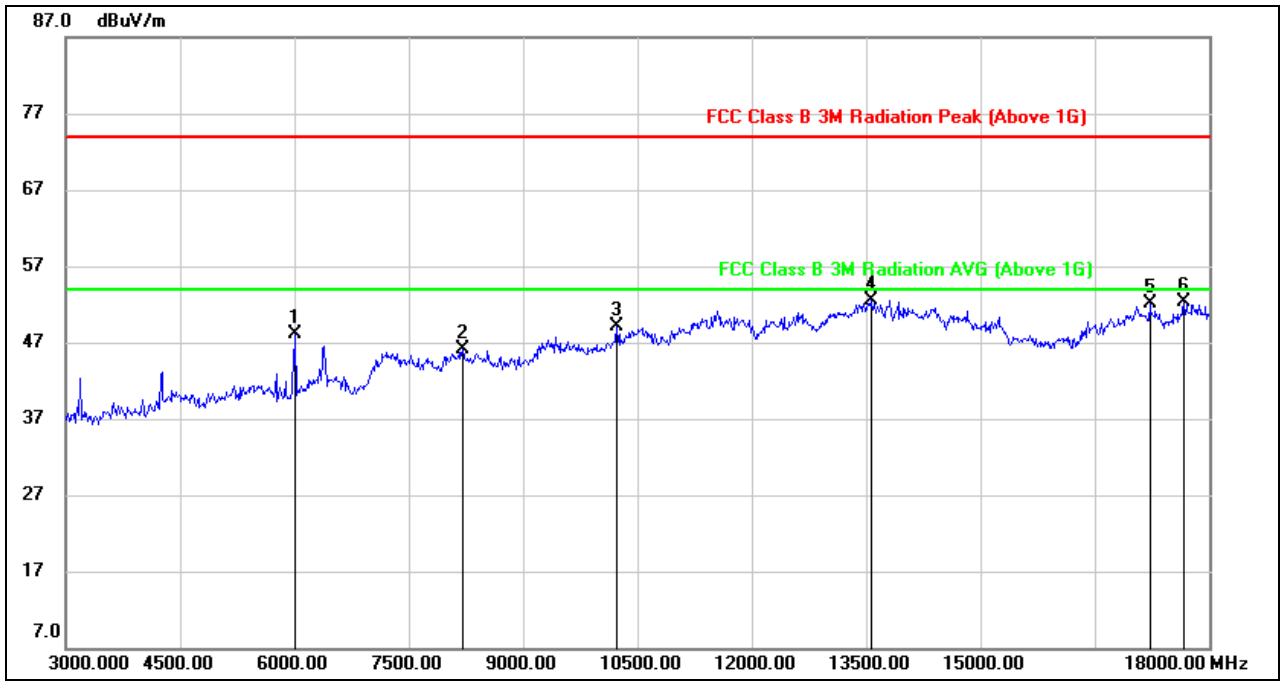
1GHz~3GHz



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1040.000	54.71	-13.95	40.76	74.00	-33.24	peak
2	1386.000	49.62	-12.43	37.19	74.00	-36.81	peak
3	2034.000	51.18	-10.40	40.78	74.00	-33.22	peak
4	2134.000	53.52	-9.23	44.29	74.00	-29.71	peak
5	2352.000	51.10	-7.66	43.44	74.00	-30.56	peak
6	2566.000	50.35	-8.21	42.14	74.00	-31.86	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.

3GHz~18GHz

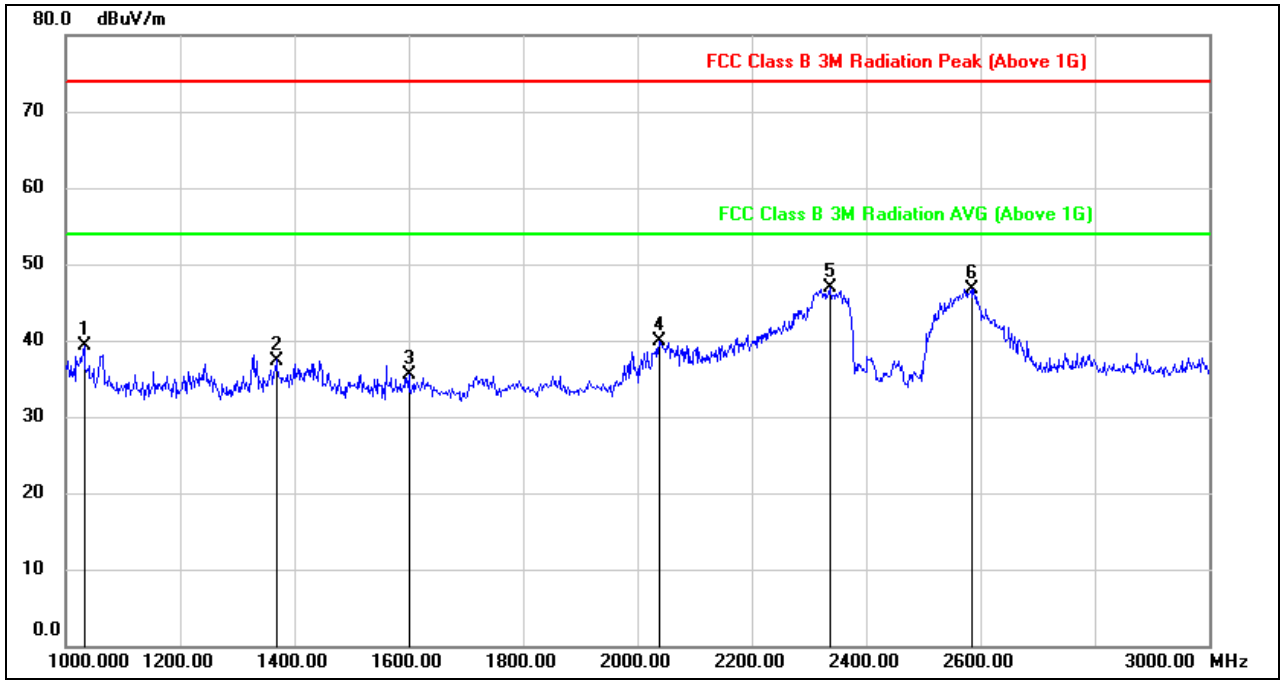


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	6015.000	44.76	3.35	48.11	74.00	-25.89	peak
2	8205.000	37.33	8.82	46.15	74.00	-27.85	peak
3	10230.000	36.32	12.72	49.04	74.00	-24.96	peak
4	13560.000	31.67	20.81	52.48	74.00	-21.52	peak
5	17220.000	29.01	23.01	52.02	74.00	-21.98	peak
6	17670.000	26.90	25.32	52.22	74.00	-21.78	peak

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

HARMONICS AND SPURIOUS EMISSIONS (MID CHANNEL, HORIZONTAL)

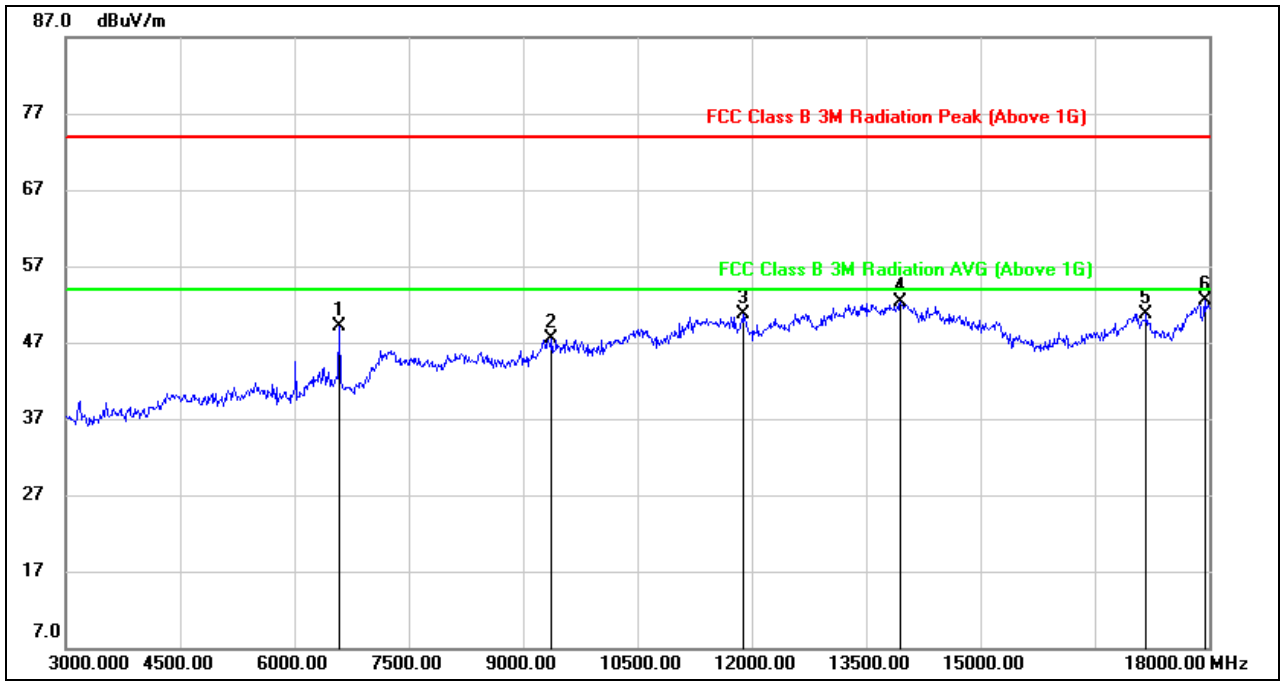
1GHz~3GHz



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1032.000	53.19	-13.84	39.35	74.00	-34.65	peak
2	1368.000	49.67	-12.27	37.40	74.00	-36.60	peak
3	1600.000	47.58	-12.06	35.52	74.00	-38.48	peak
4	2038.000	50.11	-10.30	39.81	74.00	-34.19	peak
5	2336.000	54.63	-7.65	46.98	74.00	-27.02	peak
6	2584.000	54.92	-8.19	46.73	74.00	-27.27	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.

3GHz~18GHz

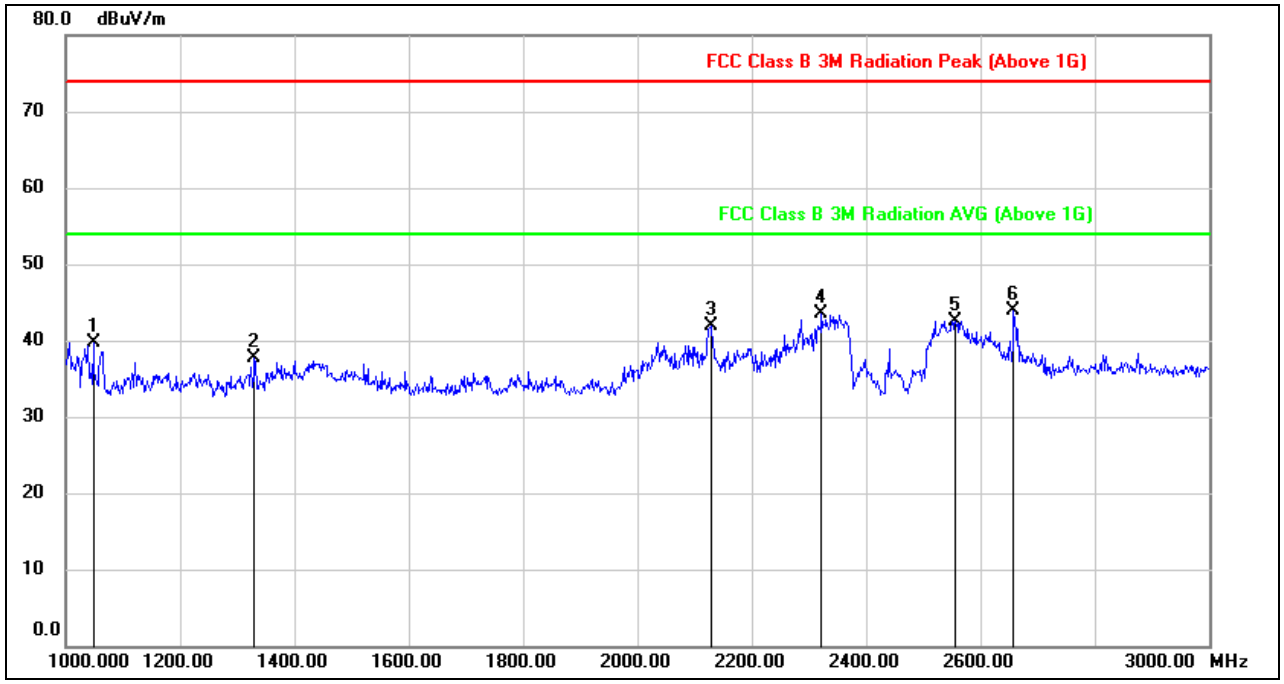


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	6585.000	43.63	5.52	49.15	74.00	-24.85	peak
2	9375.000	36.69	10.83	47.52	74.00	-26.48	peak
3	11895.000	33.64	17.04	50.68	74.00	-23.32	peak
4	13950.000	31.54	20.68	52.22	74.00	-21.78	peak
5	17175.000	28.04	22.73	50.77	74.00	-23.23	peak
6	17940.000	25.61	26.86	52.47	74.00	-21.53	peak

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

HARMONICS AND SPURIOUS EMISSIONS (MID CHANNEL, VERTICAL)

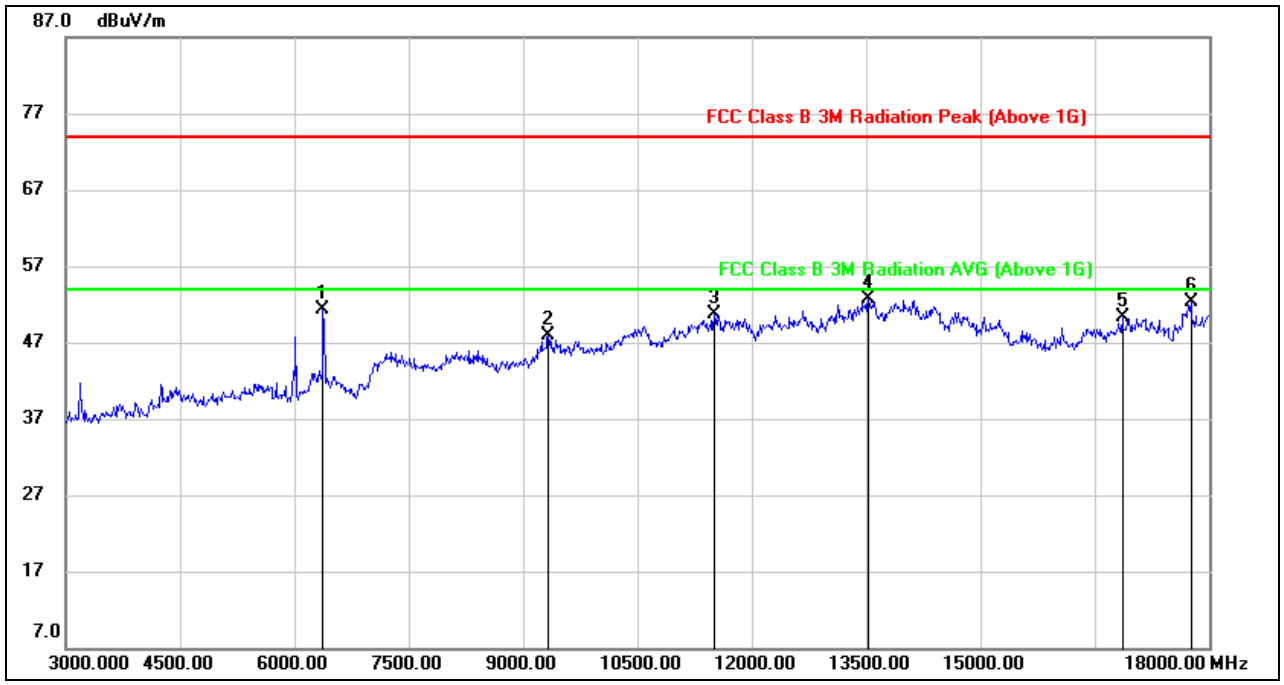
1GHz~3GHz



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1048.000	53.60	-13.93	39.67	74.00	-34.33	peak
2	1330.000	50.30	-12.50	37.80	74.00	-36.20	peak
3	2128.000	51.28	-9.31	41.97	74.00	-32.03	peak
4	2322.000	50.87	-7.40	43.47	74.00	-30.53	peak
5	2556.000	50.77	-8.24	42.53	74.00	-31.47	peak
6	2658.000	51.88	-7.90	43.98	74.00	-30.02	peak

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

3GHz~18GHz

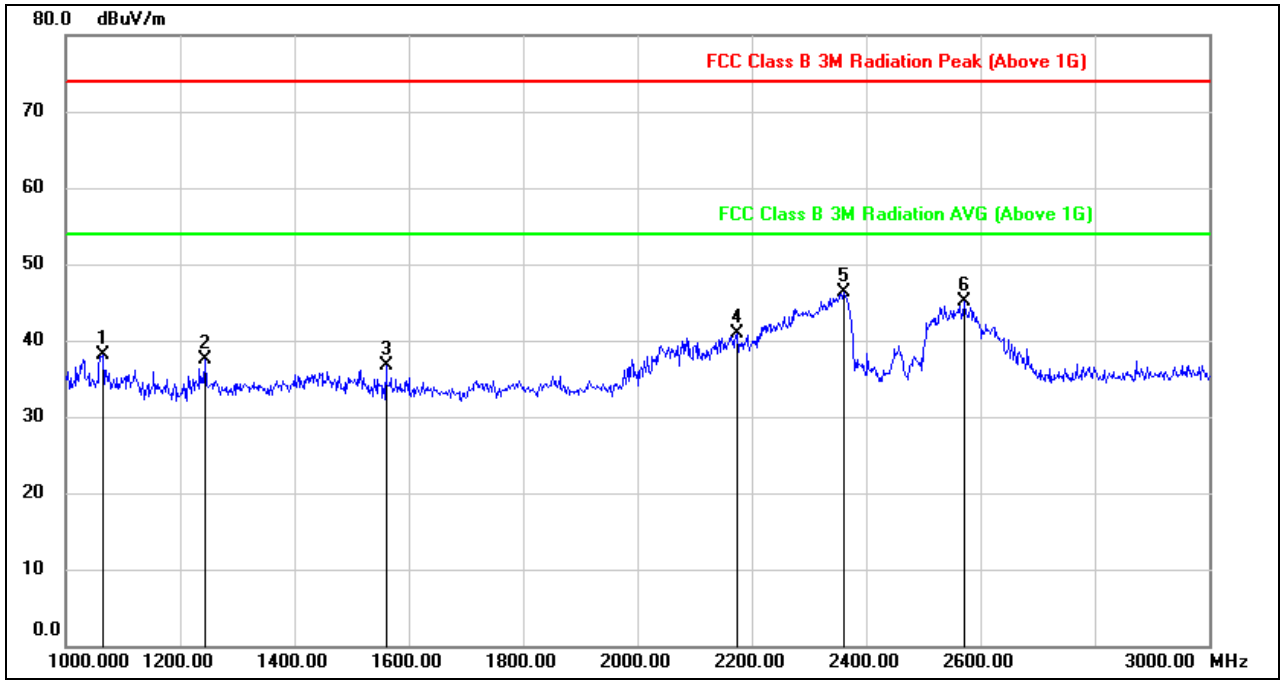


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	6375.000	46.58	4.70	51.28	74.00	-22.72	peak
2	9330.000	36.92	10.91	47.83	74.00	-26.17	peak
3	11505.000	34.38	16.26	50.64	74.00	-23.36	peak
4	13530.000	31.85	20.78	52.63	74.00	-21.37	peak
5	16860.000	29.41	20.99	50.40	74.00	-23.60	peak
6	17760.000	25.95	26.39	52.34	74.00	-21.66	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)

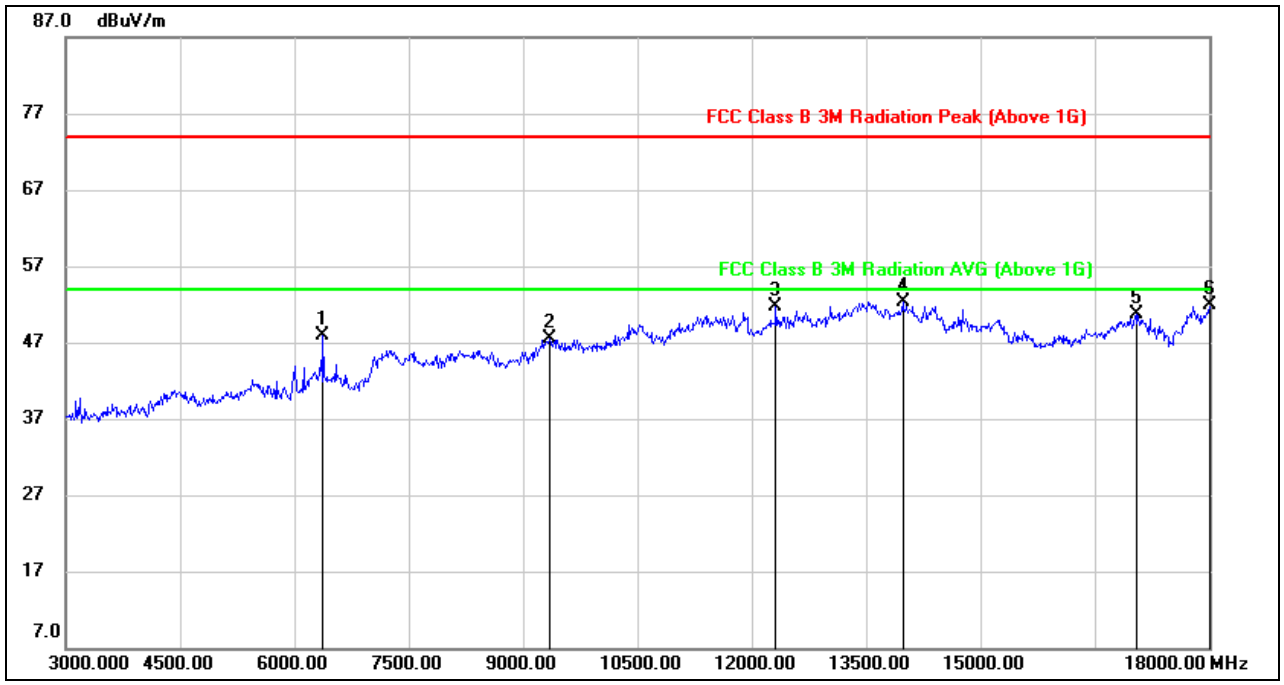
1GHz~3GHz



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1064.000	51.77	-13.62	38.15	74.00	-35.85	peak
2	1244.000	50.27	-12.85	37.42	74.00	-36.58	peak
3	1560.000	48.95	-12.31	36.64	74.00	-37.36	peak
4	2174.000	49.51	-8.62	40.89	74.00	-33.11	peak
5	2362.000	54.24	-7.84	46.40	74.00	-27.60	peak
6	2572.000	53.35	-8.24	45.11	74.00	-28.89	peak

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

3GHz~18GHz

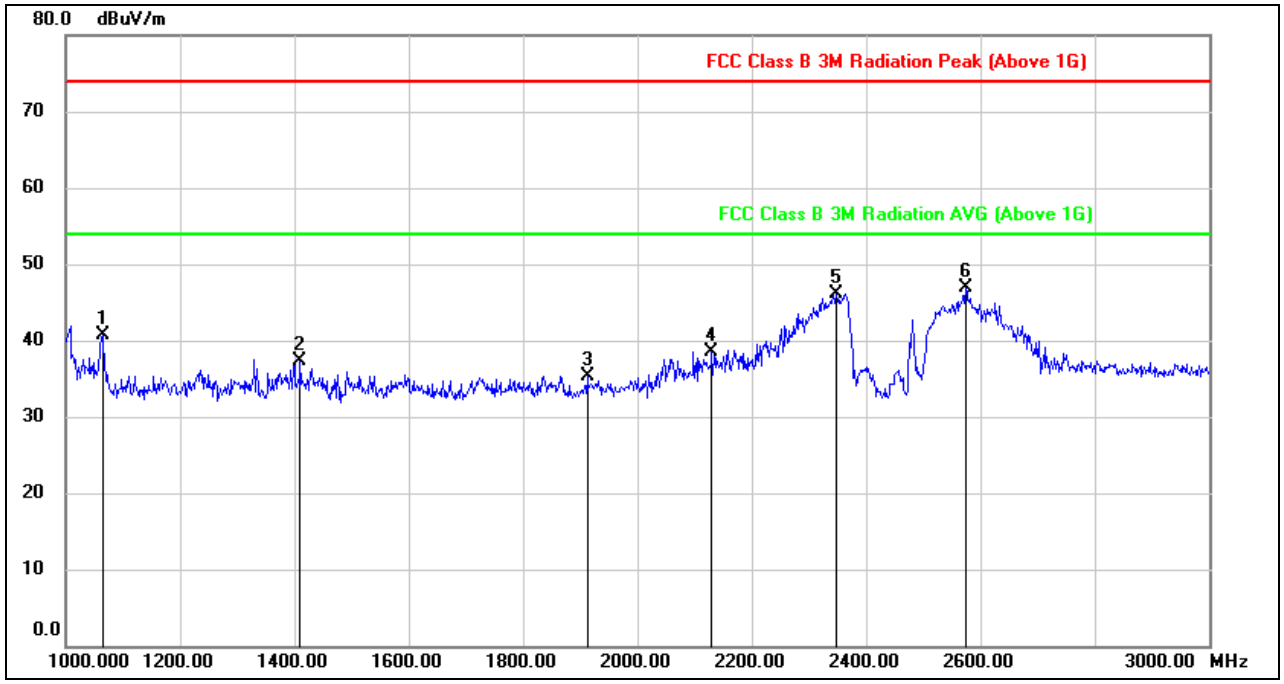


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	6375.000	43.17	4.65	47.82	74.00	-26.18	peak
2	9345.000	36.61	10.82	47.43	74.00	-26.57	peak
3	12315.000	35.46	16.19	51.65	74.00	-22.35	peak
4	13980.000	31.72	20.63	52.35	74.00	-21.65	peak
5	17040.000	28.53	22.11	50.64	74.00	-23.36	peak
6	18000.000	24.89	27.06	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)

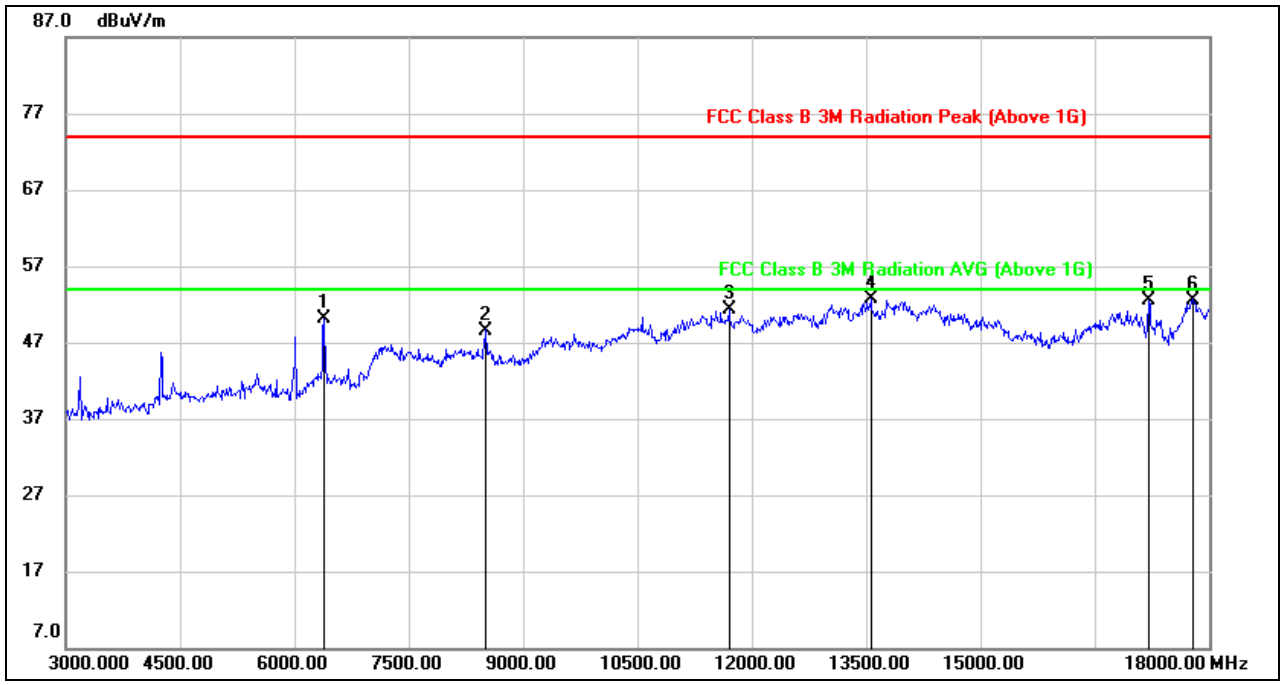
1GHz~3GHz



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1064.000	54.53	-13.92	40.61	74.00	-33.39	peak
2	1410.000	49.75	-12.42	37.33	74.00	-36.67	peak
3	1912.000	46.19	-10.83	35.36	74.00	-38.64	peak
4	2130.000	47.84	-9.28	38.56	74.00	-35.44	peak
5	2348.000	53.82	-7.64	46.18	74.00	-27.82	peak
6	2574.000	55.02	-8.18	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.

3GHz~18GHz

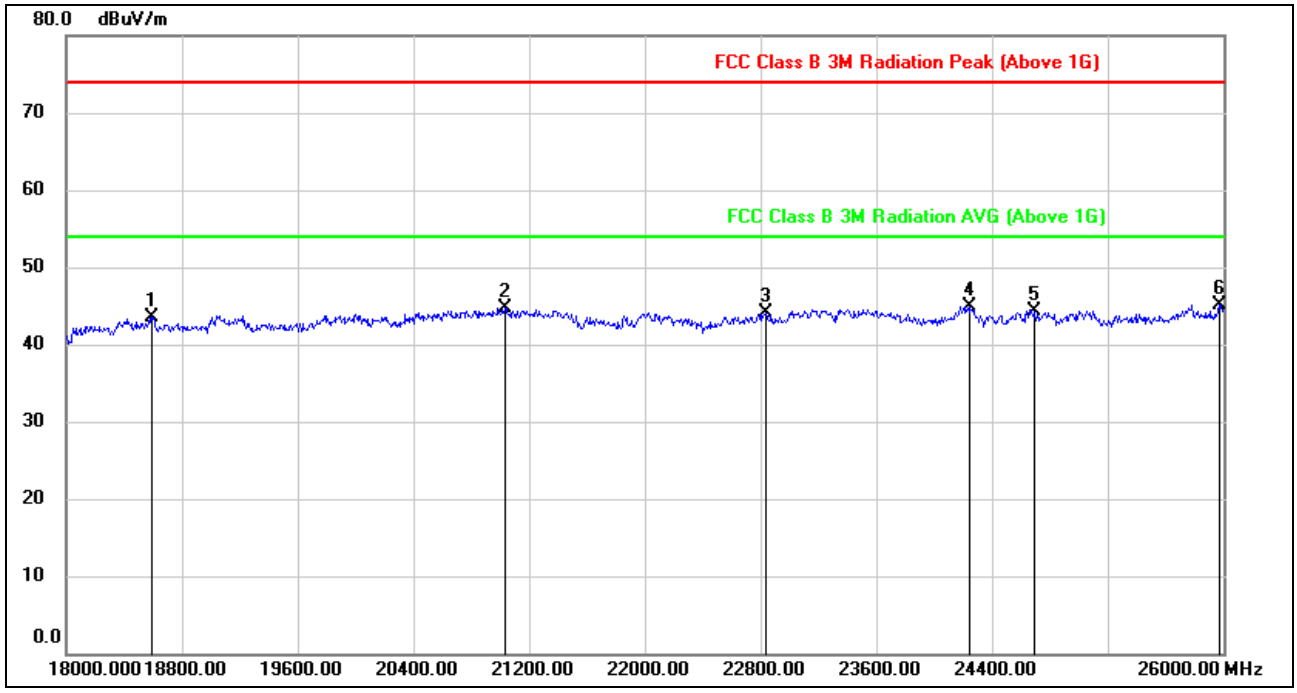


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	6390.000	45.41	4.73	50.14	74.00	-23.86	peak
2	8505.000	40.10	8.50	48.60	74.00	-25.40	peak
3	11700.000	34.62	16.67	51.29	74.00	-22.71	peak
4	13560.000	31.92	20.81	52.73	74.00	-21.27	peak
5	17205.000	29.62	22.92	52.54	74.00	-21.46	peak
6	17790.000	25.84	26.76	52.60	74.00	-21.40	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.

9.3. SPURIOUS EMISSIONS 18G ~ 26GHz

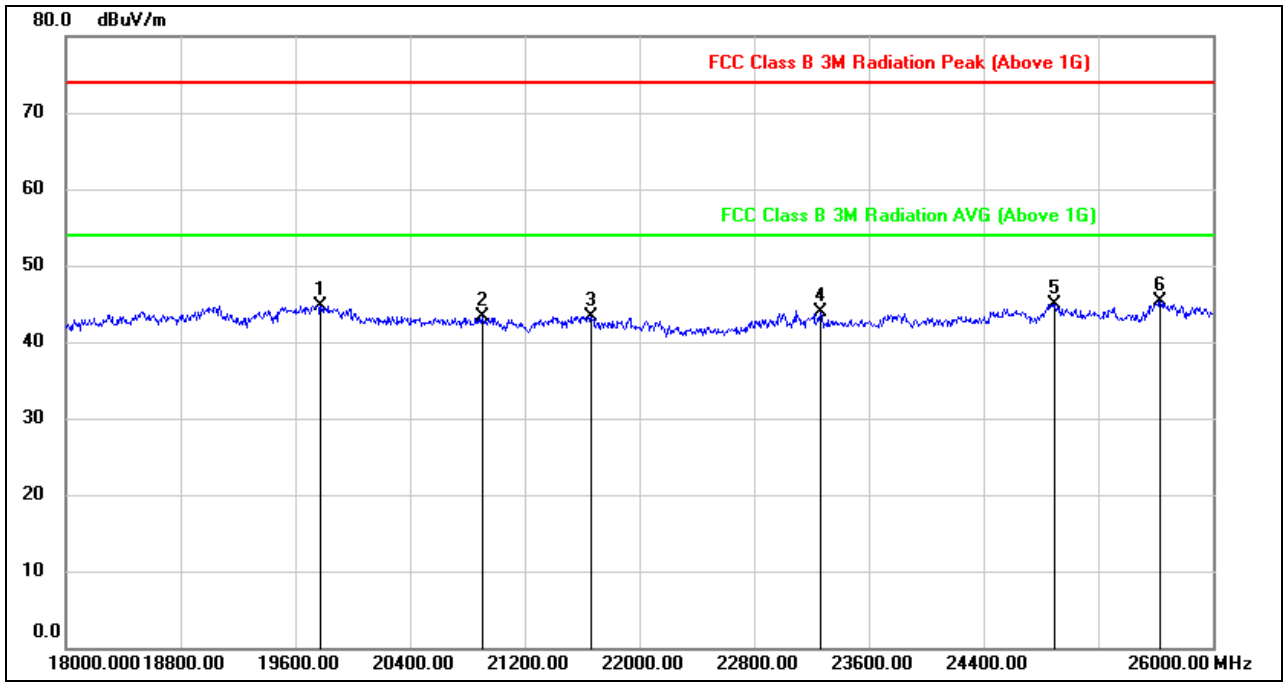
SPURIOUS EMISSIONS (LOW CHANNEL, WORST-CASE CONFIGURATION ,HORIZONTAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	18592.000	48.75	-5.31	43.44	74.00	-30.56	peak
2	21032.000	49.65	-4.87	44.78	74.00	-29.22	peak
3	22840.000	47.76	-3.60	44.16	74.00	-29.84	peak
4	24248.000	47.82	-2.83	44.99	74.00	-29.01	peak
5	24688.000	46.65	-2.32	44.33	74.00	-29.67	peak
6	25968.000	46.13	-1.00	45.13	74.00	-28.87	peak

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

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

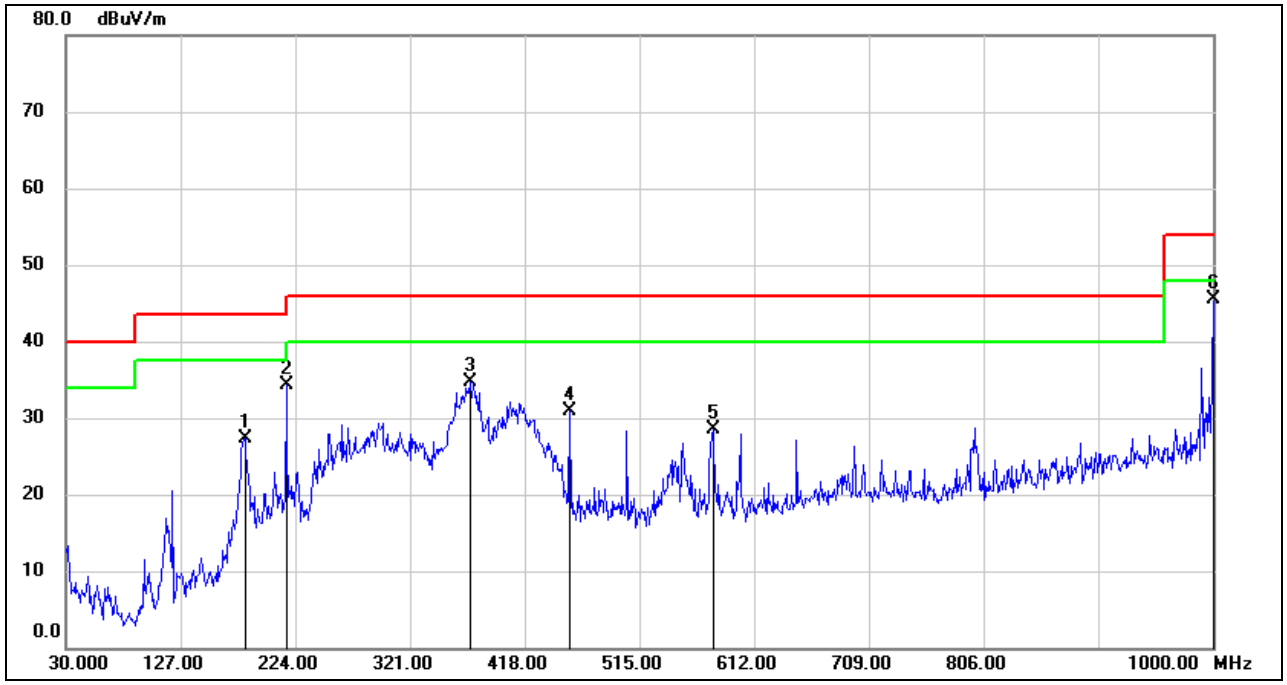


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	19776.000	49.97	-5.28	44.69	74.00	-29.31	peak
2	20904.000	48.26	-4.97	43.29	74.00	-30.71	peak
3	21664.000	47.73	-4.45	43.28	74.00	-30.72	peak
4	23264.000	47.26	-3.36	43.90	74.00	-30.10	peak
5	24896.000	47.05	-2.19	44.86	74.00	-29.14	peak
6	25632.000	46.56	-1.16	45.40	74.00	-28.60	peak
7	19776.000	49.97	-5.28	44.69	74.00	-29.31	peak

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

9.4. SPURIOUS EMISSIONS 30M ~ 1 GHz

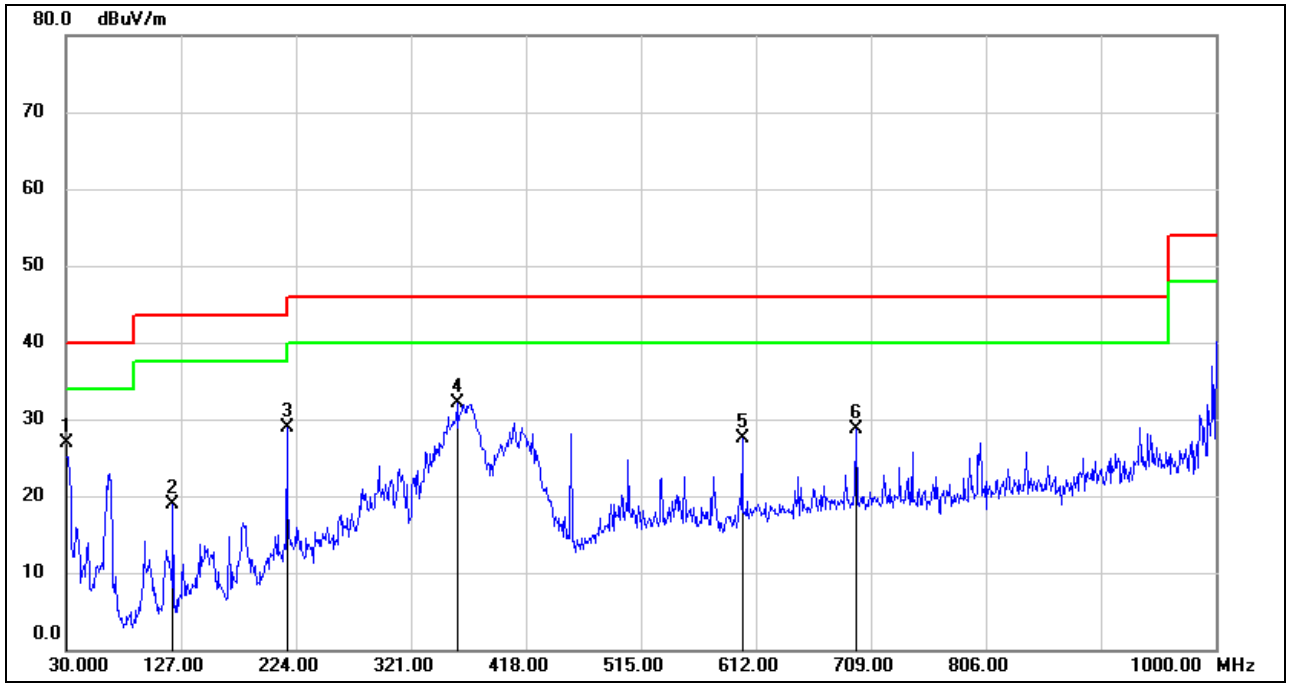
SPURIOUS EMISSIONS (LOW CHANNEL, WORST-CASE CONFIGURATION, HORIZONTAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	181.3200	43.68	-16.43	27.25	43.50	-16.25	QP
2	216.2400	51.51	-17.30	34.21	46.00	-11.79	QP
3	372.4100	47.86	-13.08	34.78	46.00	-11.22	QP
4	455.8300	42.65	-11.77	30.88	46.00	-15.12	QP
5	577.0800	37.75	-9.20	28.55	46.00	-17.45	QP
6	1000.0000	48.78	-3.21	45.57	54.00	-8.43	QP

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

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



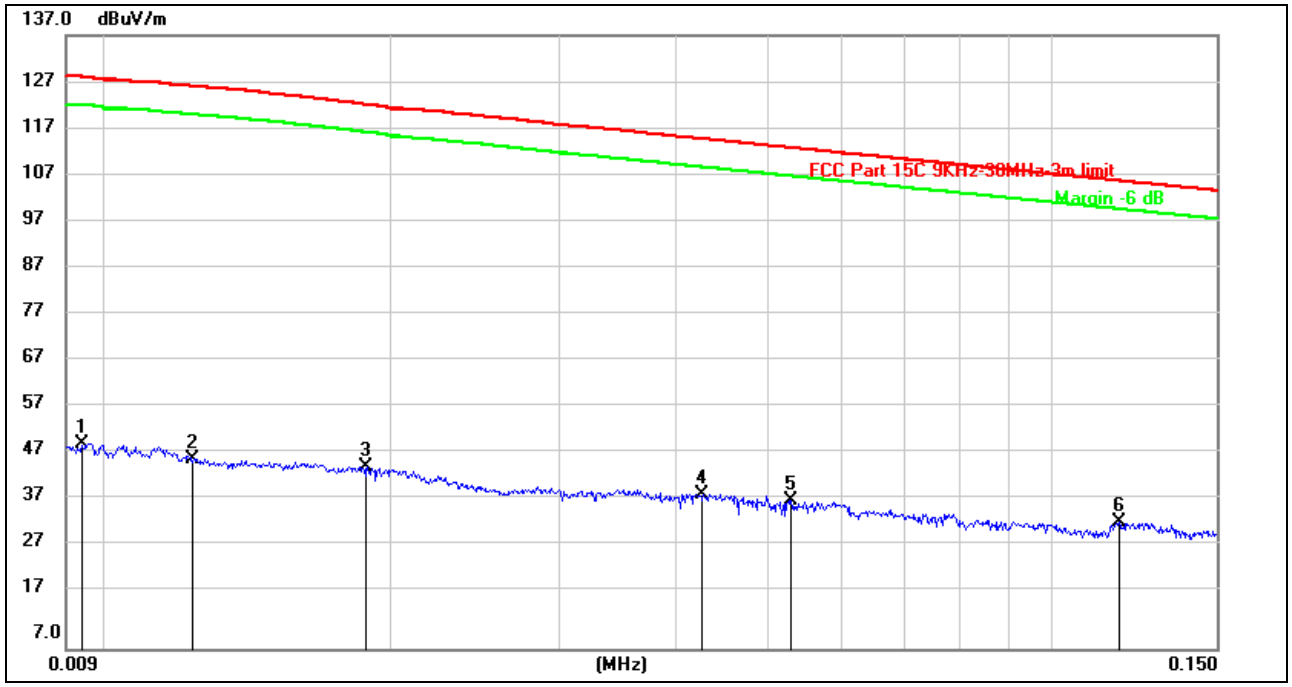
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	30.0000	44.19	-17.34	26.85	40.00	-13.15	QP
2	120.2100	39.83	-20.87	18.96	43.50	-24.54	QP
3	216.2400	46.15	-17.30	28.85	46.00	-17.15	QP
4	359.8000	45.43	-13.35	32.08	46.00	-13.92	QP
5	600.3600	36.21	-8.74	27.47	46.00	-18.53	QP
6	696.3900	35.79	-6.99	28.80	46.00	-17.20	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

9.5. SPURIOUS EMISSIONS BELOW 30M

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

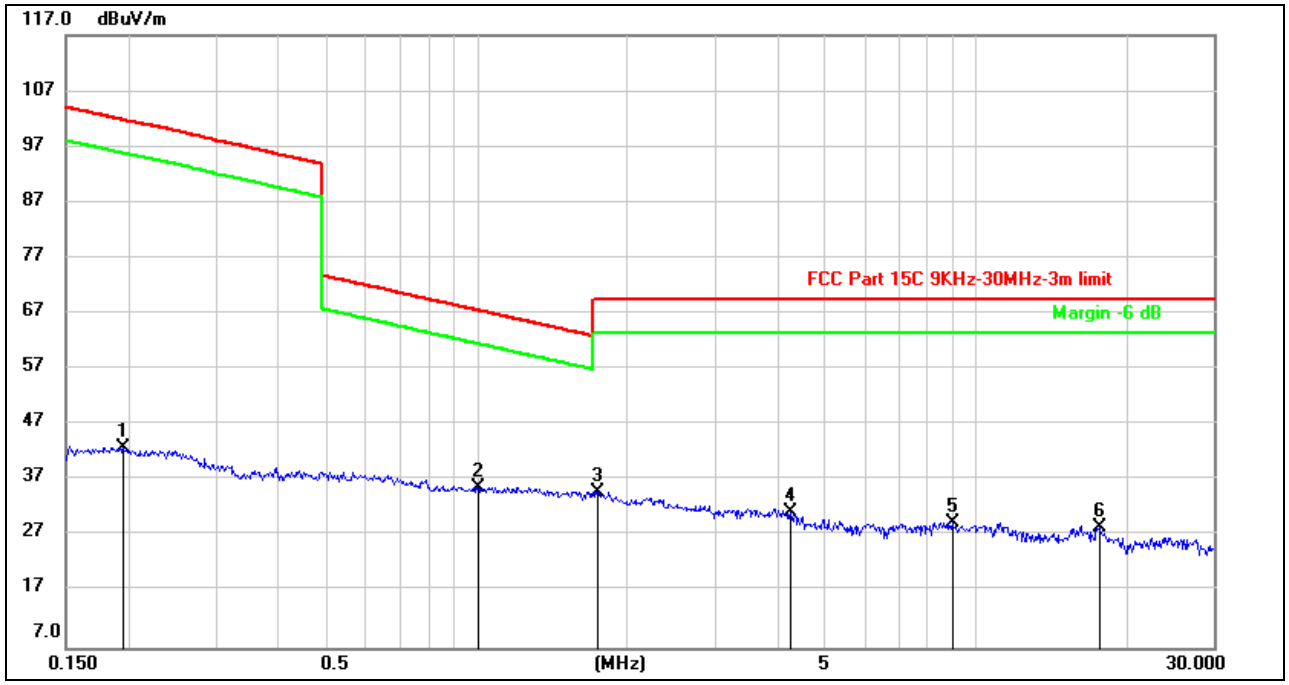
0.09KHz~ 150KHz



No.	Frequency (KHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	0.0094	30.27	20.26	50.53	128.06	-77.53	peak
2	0.0123	26.82	20.23	47.05	126.22	-79.17	peak
3	0.0188	25.20	20.30	45.50	122.30	-76.80	peak
4	0.0427	19.41	20.31	39.72	115.04	-75.32	peak
5	0.0529	18.09	20.31	38.40	113.16	-74.76	peak
6	0.1179	13.56	20.29	33.85	106.18	-72.33	peak

Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV and QP limit, AV and QP Result are deemed to comply with AV limit.

150KHz ~ 30M

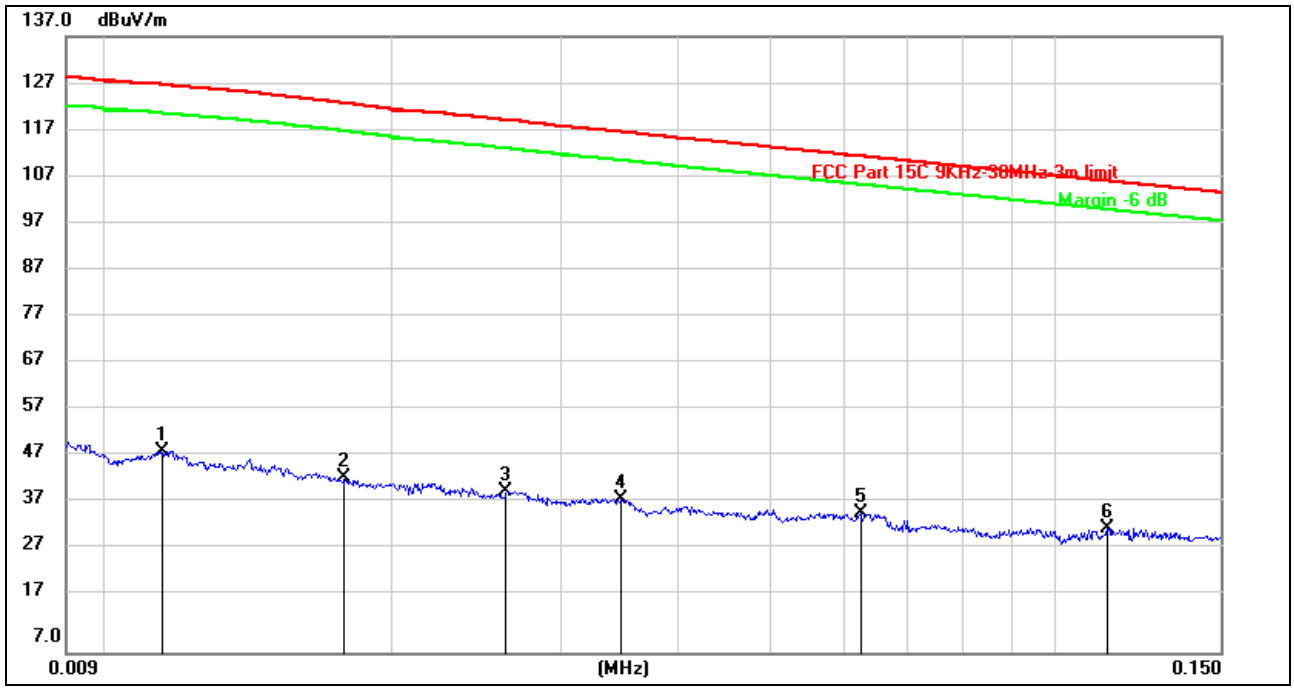


No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV)	(dB/m)	(dBuV/m)	(dBuV/m)	(dB)	
1	0.1955	22.52	20.37	42.89	101.78	-58.89	peak
2	1.0040	15.40	20.37	35.77	67.57	-31.80	peak
3	1.7437	14.26	20.64	34.90	69.54	-34.64	peak
4	4.2465	10.35	21.00	31.35	69.54	-38.19	peak
5	8.9634	8.42	21.01	29.43	69.54	-40.11	peak
6	17.7545	7.48	20.99	28.47	69.54	-41.07	peak

Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV and QP limit, AV and QP Result are deemed to comply with AV limit.

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

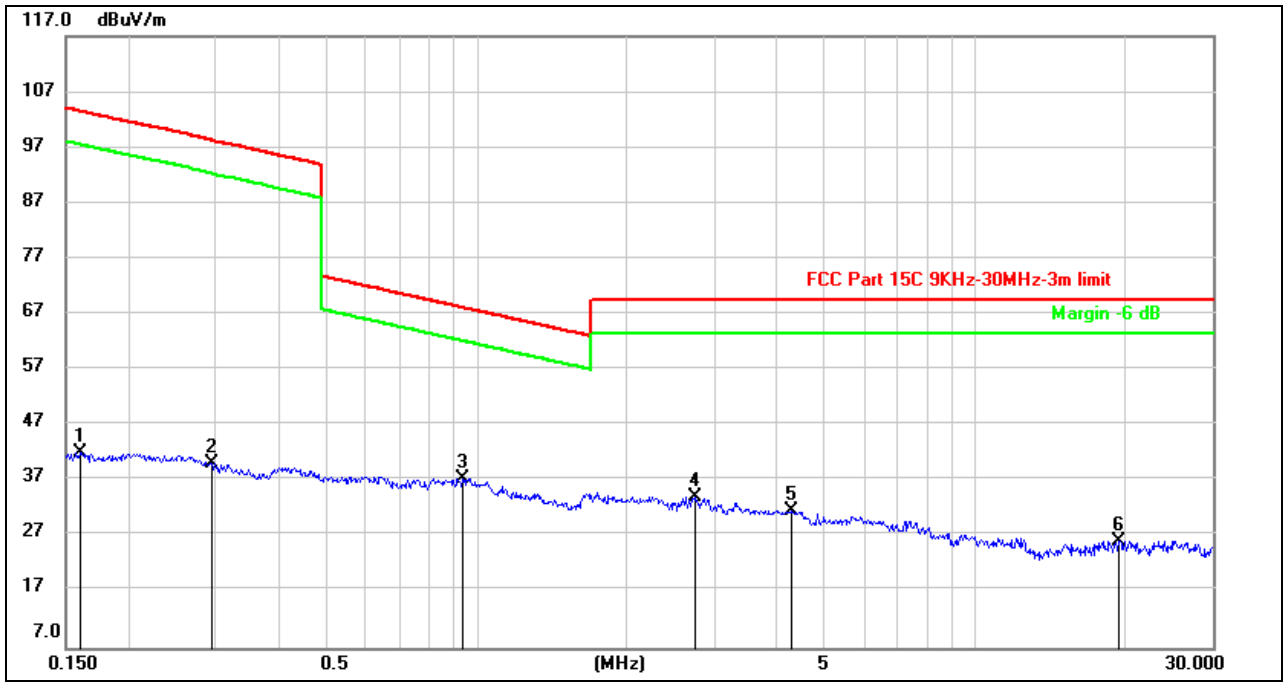
0.09KHz~ 150KHz



No.	Frequency (KHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	0.0114	29.31	20.22	49.53	126.76	-77.23	peak
2	0.0177	23.46	20.29	43.75	122.96	-79.21	peak
3	0.0263	20.69	20.31	41.00	119.36	-78.36	peak
4	0.0347	18.96	20.31	39.27	116.89	-77.62	peak
5	0.0623	16.23	20.31	36.54	111.73	-75.19	peak
6	0.1139	13.02	20.28	33.30	106.48	-73.18	peak

Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV and QP limit, AV and QP Result are deemed to comply with AV limit.

150KHz ~ 30M



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	0.1607	21.63	20.41	42.04	103.48	-61.44	peak
2	0.2938	19.92	20.31	40.23	98.28	-58.05	peak
3	0.9381	17.09	20.37	37.46	68.17	-30.71	peak
4	2.7355	13.19	20.85	34.04	69.54	-35.50	peak
5	4.2918	10.60	20.99	31.59	69.54	-37.95	peak
6	19.4283	5.21	21.03	26.24	69.54	-43.30	peak

Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV and QP limit, AV and QP Result are deemed to comply with AV limit.

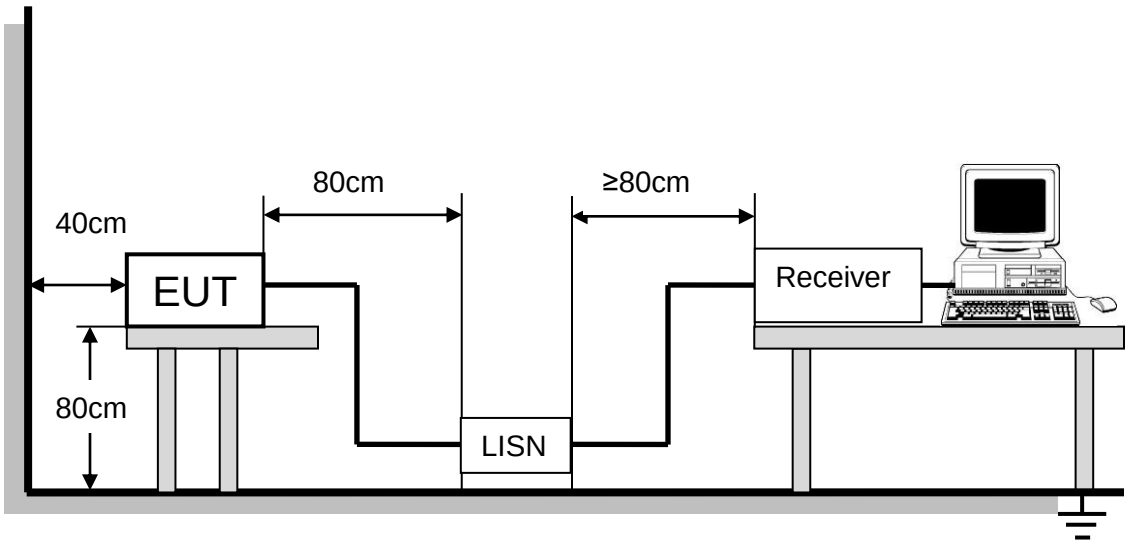
10. AC POWER LINE CONDUCTED EMISSIONS

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.

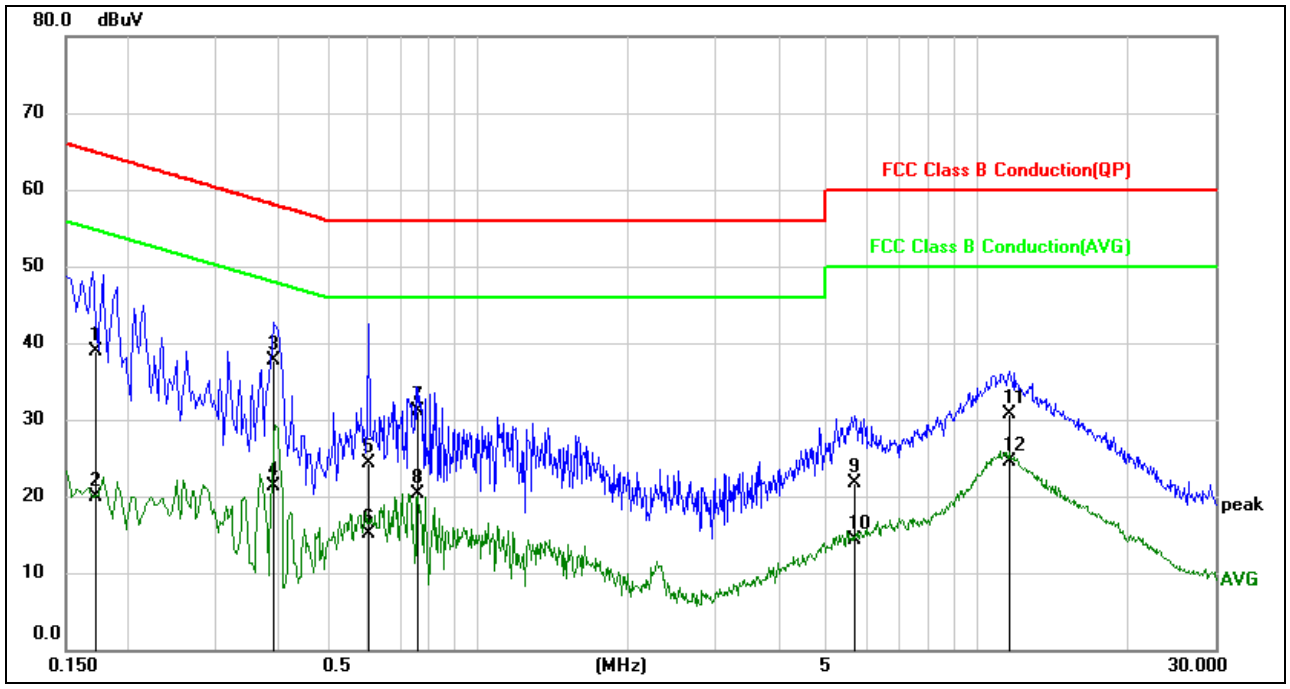
TEST ENVIRONMENT

Temperature	22.3°C	Relative Humidity	63%
Atmosphere Pressure	101kPa		

TEST RESULTS

Mode: GFSK

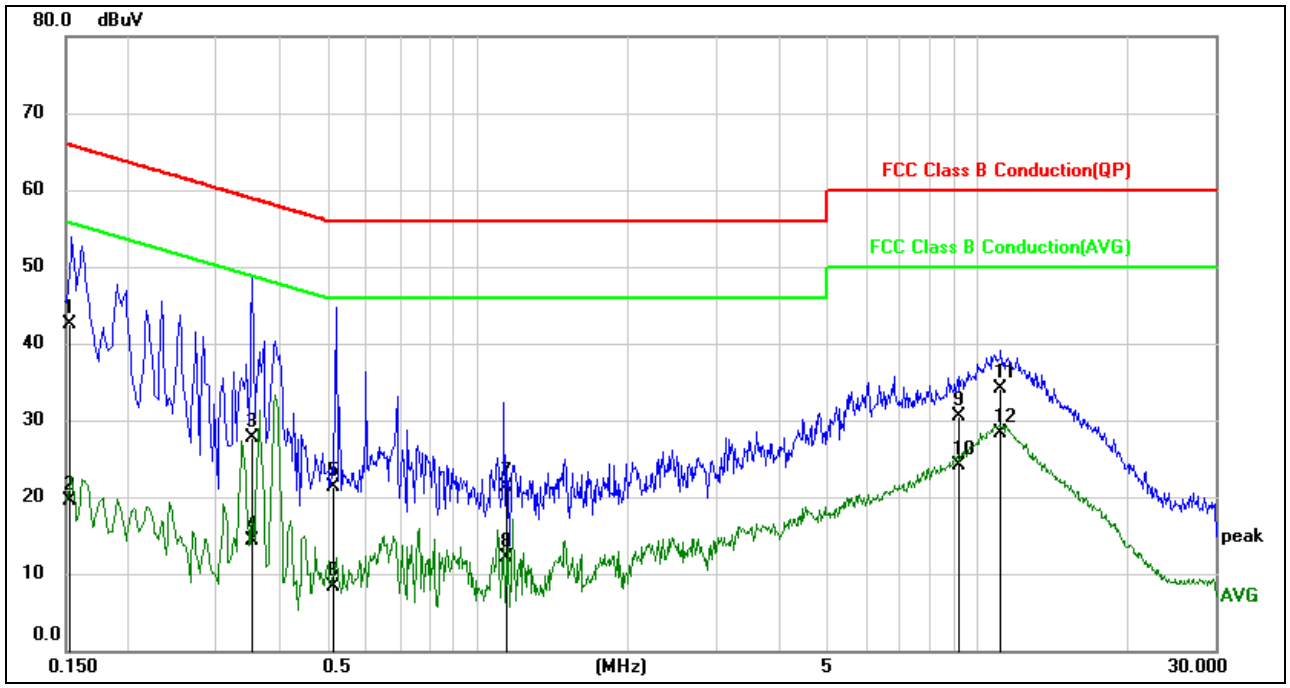
LINE N RESULTS (LOW CHANNEL, WORST-CASE CONFIGURATION)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	0.1728	29.37	9.62	38.99	64.82	-25.83	QP
2	0.1728	10.33	9.62	19.95	54.82	-34.87	AVG
3	0.3882	28.16	9.63	37.79	58.10	-20.31	QP
4	0.3882	11.65	9.63	21.28	48.10	-26.82	AVG
5	0.6053	14.70	9.63	24.33	56.00	-31.67	QP
6	0.6053	5.43	9.63	15.06	46.00	-30.94	AVG
7	0.7586	21.52	9.63	31.15	56.00	-24.85	QP
8	0.7586	10.59	9.63	20.22	46.00	-25.78	AVG
9	5.7242	12.07	9.73	21.80	60.00	-38.20	QP
10	5.7242	4.51	9.73	14.24	50.00	-35.76	AVG
11	11.5766	20.60	10.03	30.63	60.00	-29.37	QP
12	11.5766	14.42	10.03	24.45	50.00	-25.55	AVG

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

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



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	0.1522	32.77	9.64	42.41	65.88	-23.47	QP
2	0.1522	9.77	9.64	19.41	55.88	-36.47	AVG
3	0.3540	17.98	9.63	27.61	58.87	-31.26	QP
4	0.3540	4.72	9.63	14.35	48.87	-34.52	AVG
5	0.5168	11.70	9.63	21.33	56.00	-34.67	QP
6	0.5168	-1.35	9.63	8.28	46.00	-37.72	AVG
7	1.1498	11.58	9.64	21.22	56.00	-34.78	QP
8	1.1498	2.41	9.64	12.05	46.00	-33.95	AVG
9	9.1975	20.48	10.03	30.51	60.00	-29.49	QP
10	9.1975	14.03	10.03	24.06	50.00	-25.94	AVG
11	11.2294	24.06	10.04	34.10	60.00	-25.90	QP
12	11.2294	18.28	10.04	28.32	50.00	-21.68	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
An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

Please refer to FCC §15.247(b)(4)
The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

RESULTS

Complies

END OF REPORT