



FCC 47 CFR PART 15 SUBPART C

ISED RSS-247 ISSUE 2

CERTIFICATION TEST REPORT

For

Videoconferencing Endpoint

MODEL: HUAWEI Box 900, HUAWEI Box 700, HUAWEI Box 500

FCC ID: QIS-BOX

IC: 6369A-BOX

REPORT NUMBER: 4788680510-1

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Prepared for

HUAWEI TECHNOLOGIES CO., LTD.

**Administration Building, Huawei Technologies Co., Ltd. Bantian, Longgang
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Revision History

Rev.	Issue Date	Revisions	Revised By
--	10/29/2018	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.....	6
2. TEST METHODOLOGY	7
3. FACILITIES AND ACCREDITATION.....	7
4. CALIBRATION AND UNCERTAINTY	8
4.1. MEASURING INSTRUMENT CALIBRATION	8
4.2. MEASUREMENT UNCERTAINTY	8
5. EQUIPMENT UNDER TEST	9
5.1. DESCRIPTION OF EUT.....	9
5.2. MAXIMUM OUTPUT POWER.....	9
5.3. CHANNEL LIST.....	10
5.4. TEST CHANNEL CONFIGURATION	10
5.5. THE WORSE CASE POWER SETTING PARAMETER.....	10
5.6. DESCRIPTION OF AVAILABLE ANTENNAS.....	11
5.7. WORST-CASE CONFIGURATIONS.....	11
5.8. TEST ENVIRONMENT.....	11
5.9. DESCRIPTION OF TEST SETUP.....	12
6. MEASURING INSTRUMENT AND SOFTWARE USED.....	13
7. MEASUREMENT METHODS.....	14
8. ANTENNA PORT TEST RESULTS	15
8.1. ON TIME AND DUTY CYCLE	15
8.2. 6 dB DTS BANDWIDTH AND 99% BANDWIDTH.....	17
8.3. PEAK CONDUCTED OUTPUT POWER.....	22
8.4. POWER SPECTRAL DENSITY	24
8.5. CONDUCTED BANDEDGE AND SPURIOUS EMISSIONS	28
9. RADIATED TEST RESULTS	35
9.1. RESTRICTED BANDEDGE	41
9.2. SPURIOUS EMISSIONS 1GHz~18GHz	45
9.3. SPURIOUS EMISSIONS 18G ~ 26GHz.....	57
9.4. SPURIOUS EMISSIONS 30M ~ 1 GHz.....	59
9.5. SPURIOUS EMISSIONS BELOW 30M.....	61



10.	AC POWER LINE CONDUCTED EMISSIONS	65
11.	ANTENNA REQUIREMENTS.....	68



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 Name: Videoconferencing Endpoint
Model: HUAWEI Box 900, HUAWEI Box 700, HUAWEI Box 500
Sample Status: Normal
Brand: HUAWEI
Sample Received: Sep. 18, 2018
Date of Tested: Sep. 19, 2018 ~ Oct. 29, 2018

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

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

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



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	Videoconferencing Endpoint	
Model Name	HUAWEI Box 900	
Band Name	HUAWEI	
Series Model	HUAWEI Box 700, HUAWEI Box 500	
Model Difference	HUAWEI Box 500 use a PCB board, HUAWEI Box 700 and HUAWEI Box 900 share another PCB boards. HUAWEI Box 500 and HUAWEI Box 700 and HUAWEI Box 900 share components such as structural parts, power supplies and fans, Box 900 has two more DVI interfaces and one HDMI interface than Box 700 and three interface chips corresponding to these three interfaces. Box 900 has two more DVI interfaces and one HDMI interface and two SDI interfaces than Box 500 and five interface chips corresponding to these five interfaces.	
Operation frequency	2402 MHz ~ 2480 MHz	
Modulation	Modulation Type	Data Rate
	GFSK	1Mbps
Power Rate (AC/DC Power Supply)	Manufacturer :VAPEL Input: 100-240Vac,50/60 Hz,3A MAX Output: 12Vdc, 35W MAX; -53.5Vdc, 130W MAX	
	Manufacturer : ASTEC Input: 100-240Vac,50/60 Hz,3A MAX Output: 12Vdc, 4.17A; -53.5Vdc, 2.43A	

5.2. MAXIMUM OUTPUT POWER

Bluetooth Mode	Frequency (MHz)	Channel Number	Max Output Power (dBm)	EIRP (dBm)
GFSK	2402-2480	0-39[40]	3.51	7.91



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		adb		
Modulation Type	Transmit Chain Number	Test Channel		
		CH 0	CH 19	CH 39
GFSK	0	default	default	default

Note: N/A means not applicable.



5.6. DESCRIPTION OF AVAILABLE ANTENNAS

Antenna manufacturer: Sheng Lu

Chain Ant.	Frequency (MHz)	Max Antenna Gain (dBi)	Antenna Type
0	2402-2480	4.4	PIFA

Antenna manufacturer: PCTEL

Chain Ant.	Frequency (MHz)	Max Antenna Gain (dBi)	Antenna Type
0	2402-2480	3.13	PIFA

Test Mode	Transmit and Receive Mode	Description
GFSK	☒ 1TX, 1RX	Chain 0 can be used as transmitting/receiving antenna.

Note: The antenna of the EUT is provided by two manufacturers. The antenna types of the two manufacturers are the same, Sheng lu antenna gain is greater, So the Sheng Lu antenna is selected for the test.

5.7. WORST-CASE CONFIGURATIONS

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

5.8. TEST ENVIRONMENT

Environment Parameter	Selected Values During Tests	
Relative Humidity	55 ~ 65%	
Atmospheric Pressure:	1025Pa	
Temperature	TN	23 ~ 28°C
Voltage :	VL	N/A
	VN	3.6Vdc, 100mA
	VH	N/A

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



5.9. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Item	Equipment	Brand Name	Model Name	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

Cable No	Port	Connector Type	Shield	Cable Length(m)	Remarks
1	RJ45	RJ45	Yes	5	/

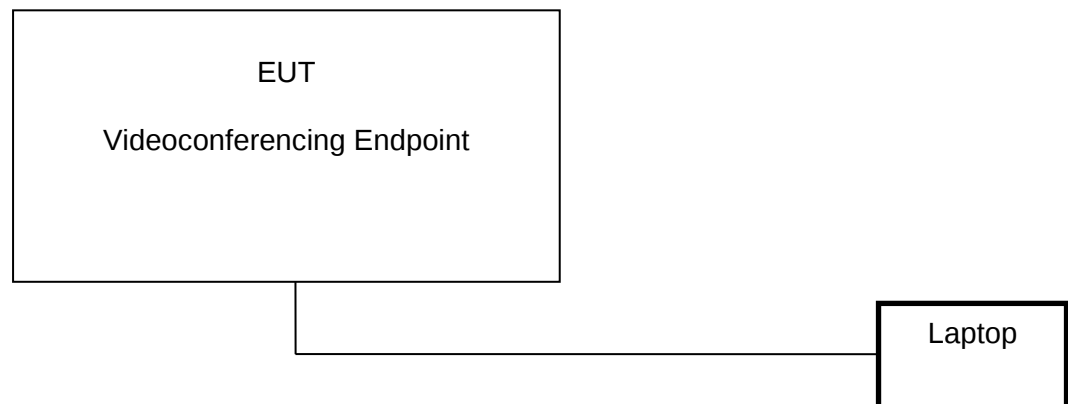
ACCESSORY

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

TEST SETUP

The EUT can work in engineering mode with the inside software.

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	MY5640003 6	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	MY5541051 2	Dec. 20, 2016	Dec.12, 2017	Dec.11, 2018
☒	Power Meter	Keysight	N9031A	MY5541602 4	Feb. 13, 2017	Dec.12, 2017	Dec.11, 2018
☒	Power Sensor	Keysight	N9323A	MY5544001 3	Feb. 13, 2017	Dec.12, 2017	Dec.11, 2018



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	23.5°C	Relative Humidity	60%
Atmosphere Pressure	101kPa	Test Voltage	AC 120V

8.1. ON TIME AND DUTY CYCLE

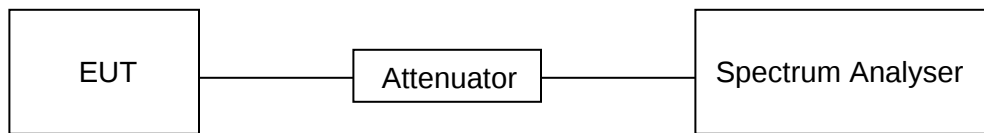
LIMITS

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)	Implemented VBW (KHz)
GFSK	0.390	0.625	0.624	62	2.05	2.56	3.00

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

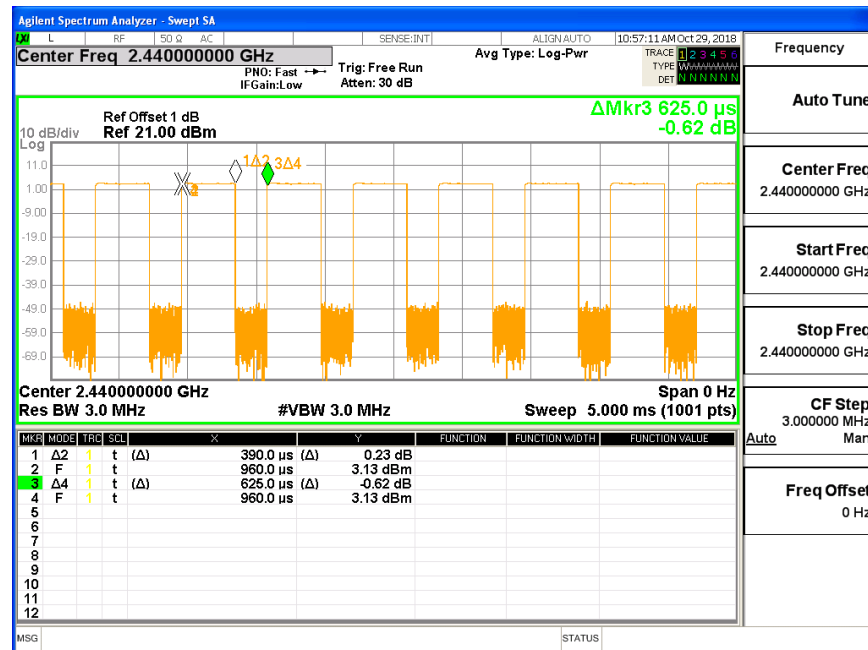
Where: x is Duty Cycle(Linear)

Where: T is On Time (transmit duration)

ON TIME AND DUTY CYCLE MID CH



Mode:GFSK



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	$\geq 500\text{KHz}$	2400-2483.5
RSS-Gen Clause 6.6	99% Bandwidth	For reporting purposes only.	2400-2483.5

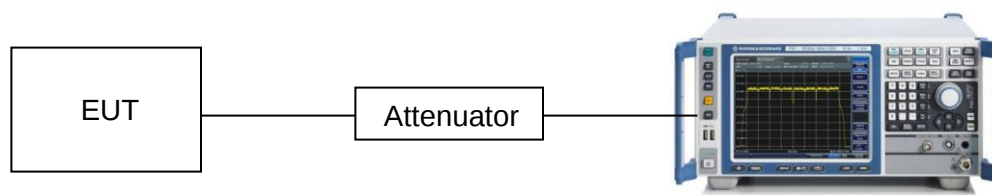
TEST PROCEDURE

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

Center Frequency	The center frequency of the channel under test
Detector	Peak
RBW	For 6 dB Bandwidth :100K For 99% Bandwidth :1% to 5% of the occupied bandwidth
VBW	For 6dB Bandwidth : $\geq 3 \times \text{RBW}$ For 99% Bandwidth : approximately $3 \times \text{RBW}$
Trace	Max hold
Sweep	Auto couple

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

TEST SETUP

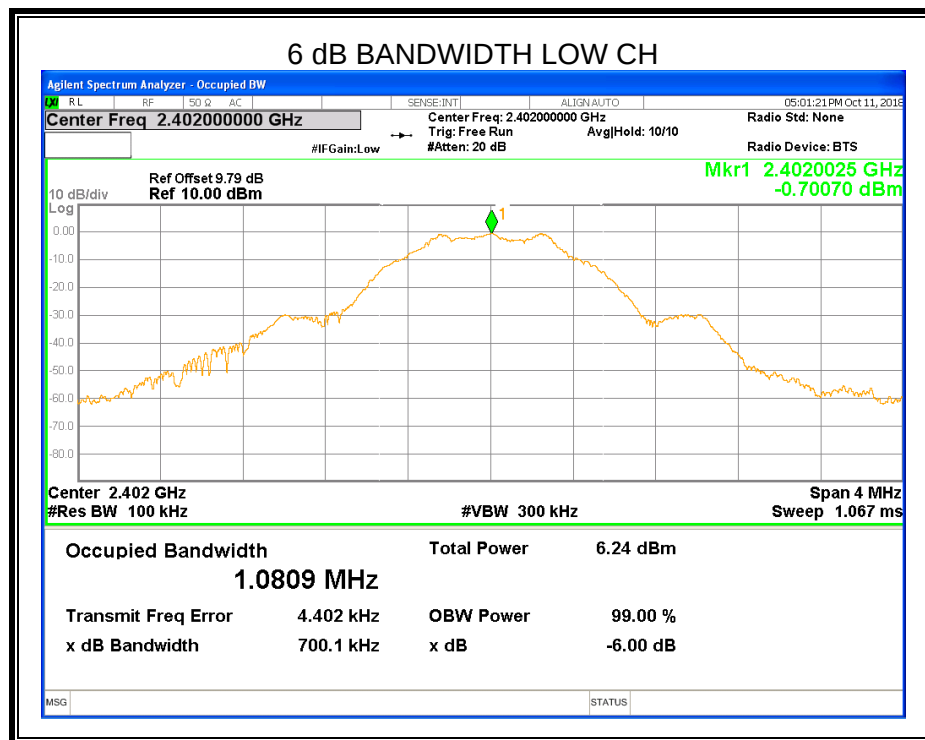


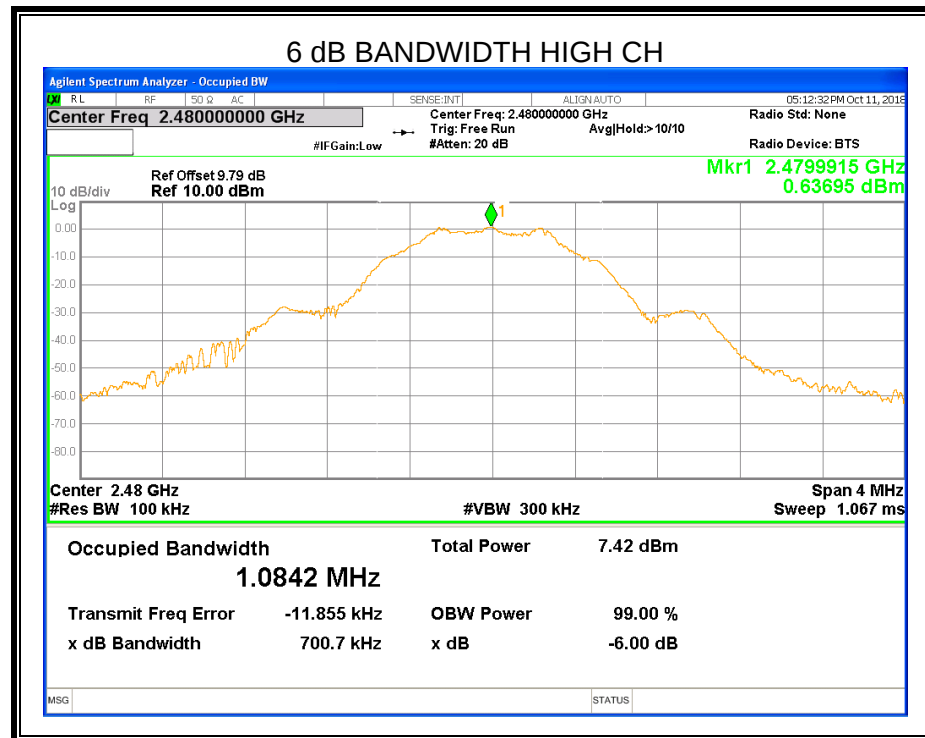
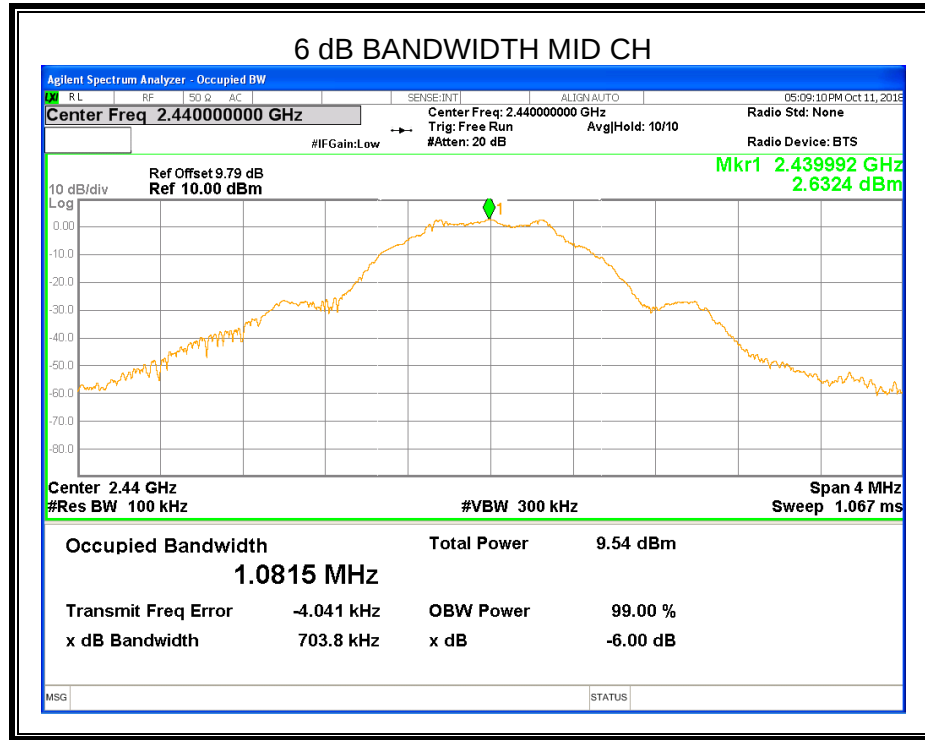


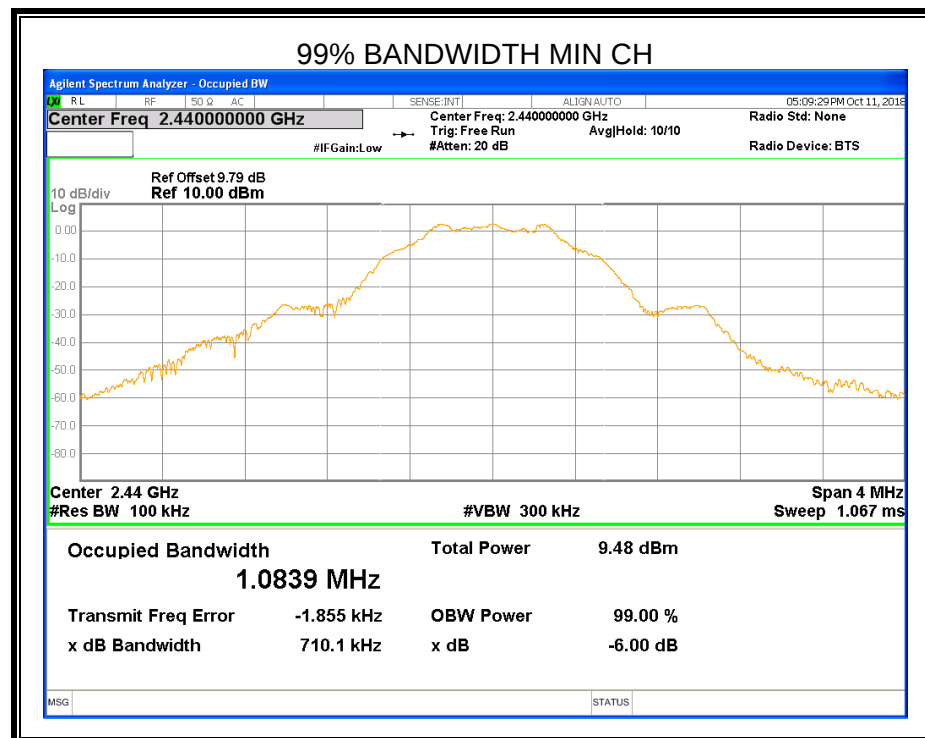
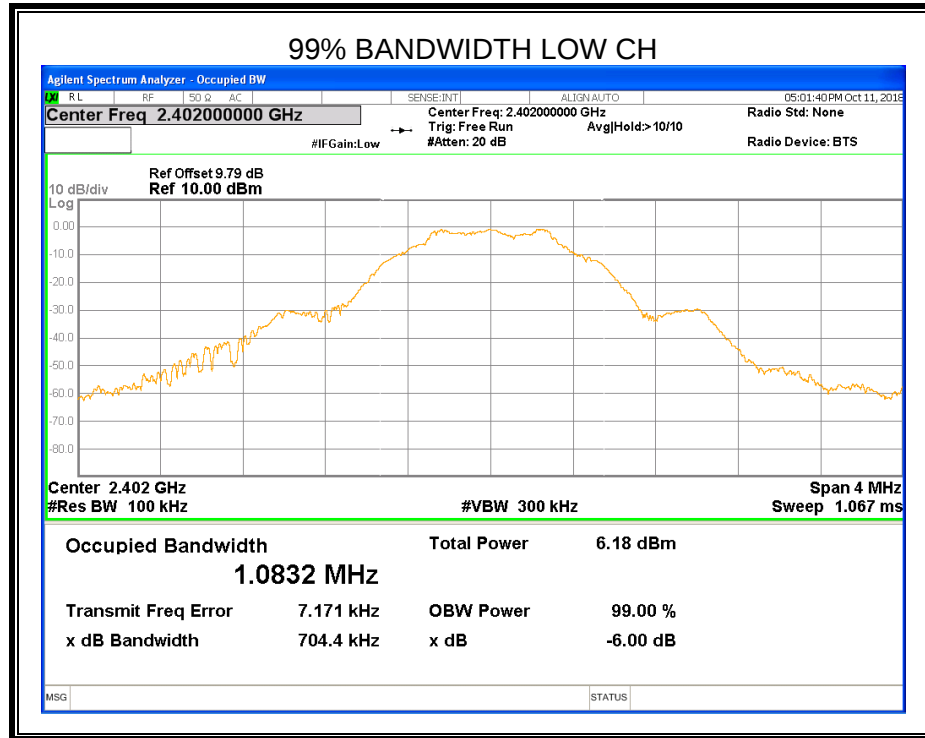
RESULTS

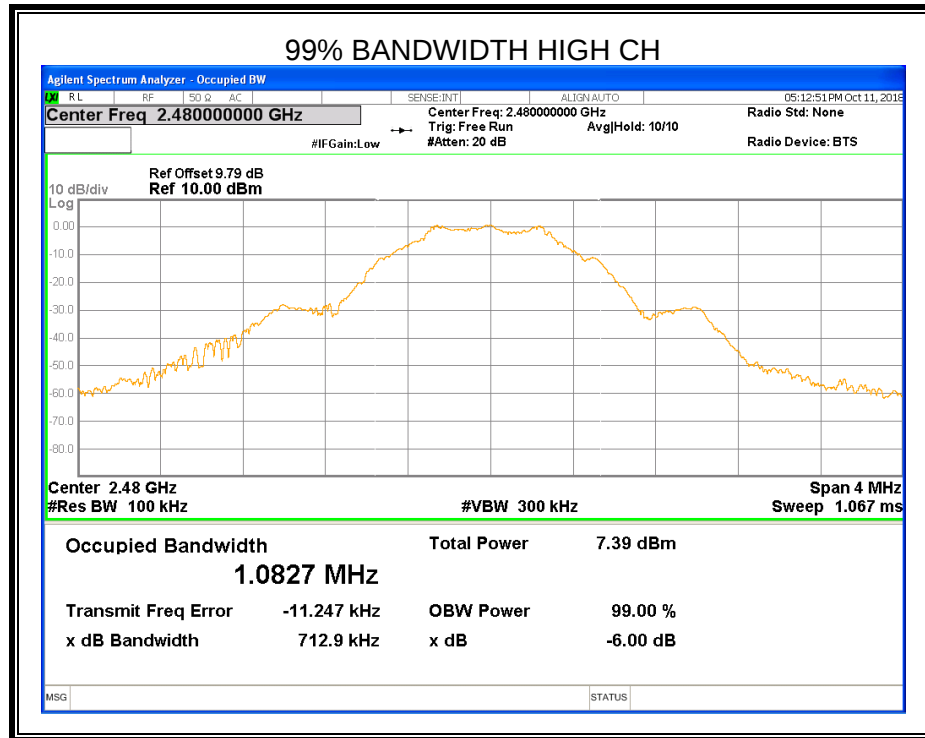
Mode: GFSK

Channel	Frequency (MHz)	6dB bandwidth (MHz)	99% bandwidth (MHz)	Limit (kHz)	Result
Low	2402	0.700	1.0832	500	Pass
Middle	2440	0.704	1.0839	500	Pass
High	2480	0.701	1.0827	500	Pass











8.3. PEAK CONDUCTED OUTPUT POWER

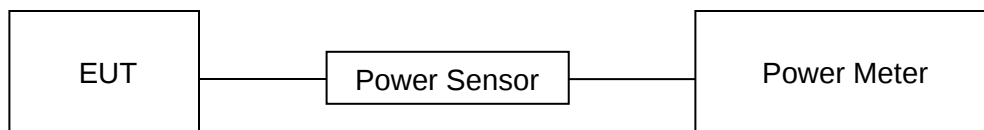
LIMITS

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

Mode: Mode: GFSK

Test Channel	Frequency	Maximum Conducted Output Power(PK)	EIRP	LIMIT
	(MHz)	(dBm)	(dBm)	dBm
CH00	2402	0.15	4.55	30
CH19	2440	3.51	7.91	30
CH39	2480	1.54	5.94	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

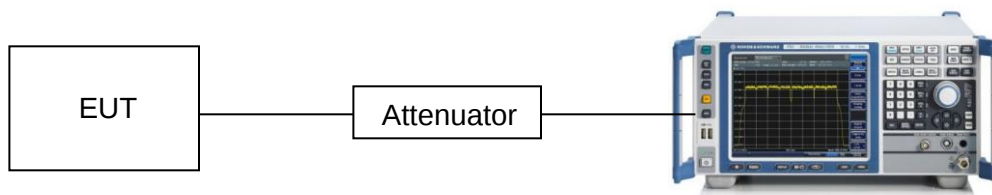
Connect the UUT to the spectrum analyser and use the following settings:

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

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

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

TEST SETUP

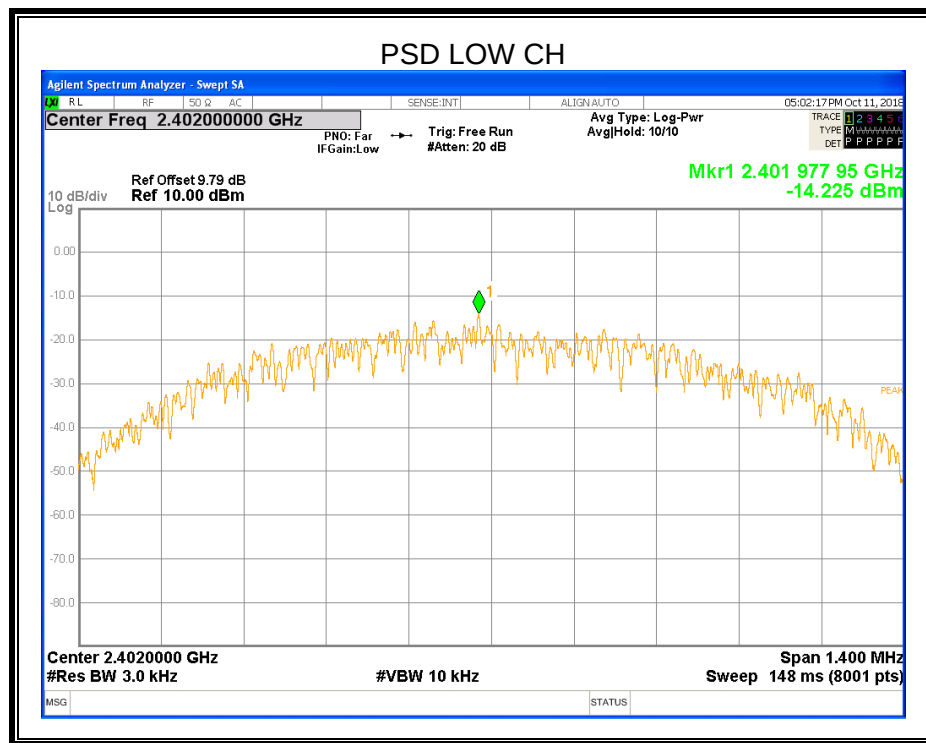


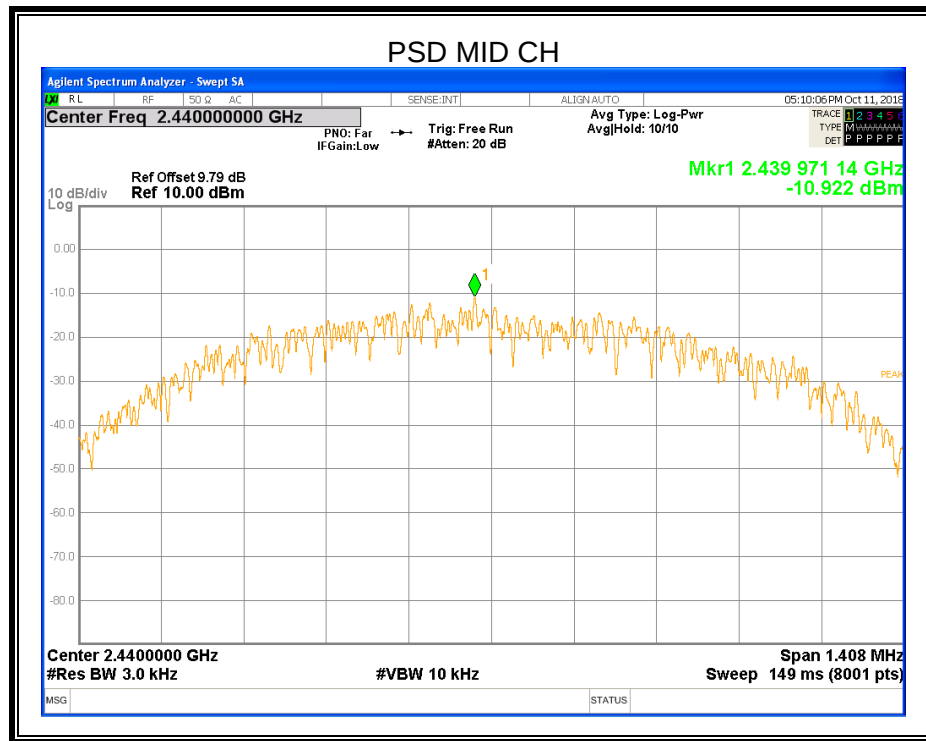


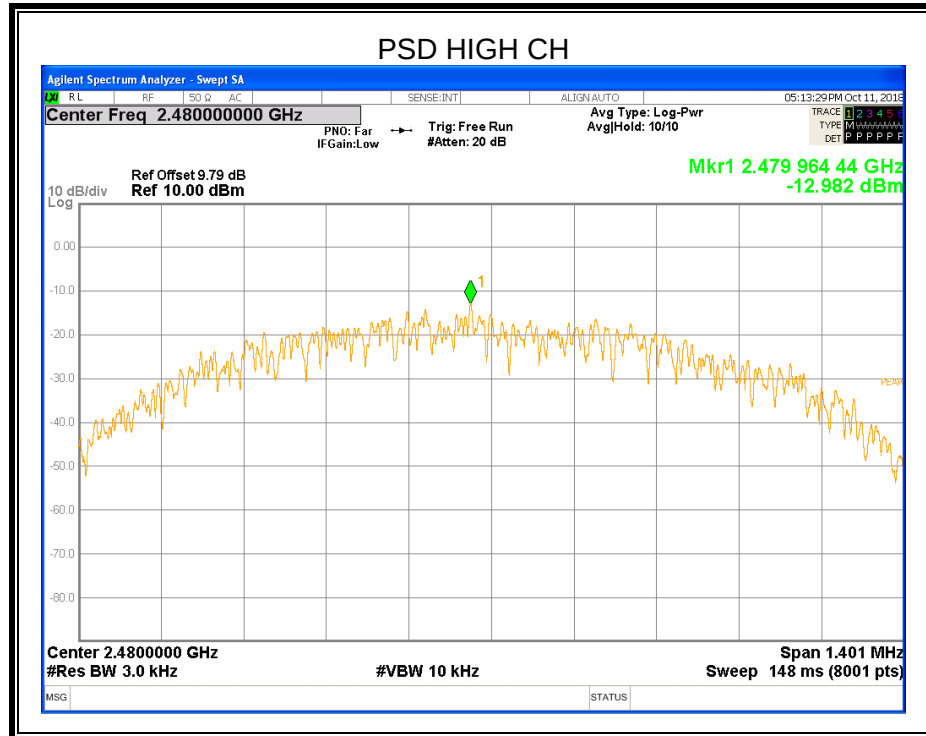
RESULTS

Mode: GFSK

Frequency	Power Spectral Density (dBm/3kHz)	Limit (dBm/3kHz)	Result
2402 MHz	-14.225	8	PASS
2440 MHz	-10.922	8	PASS
2480 MHz	-12.982	8	PASS







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:

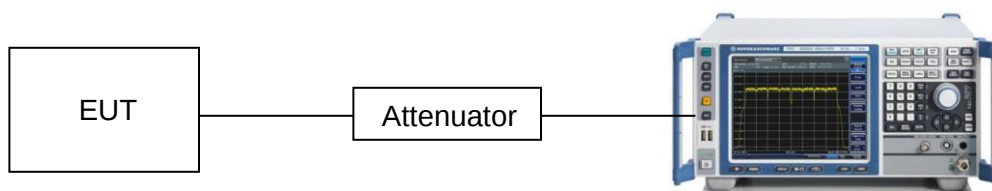
Center Frequency	The center frequency of the channel under test
Detector	Peak
RBW	100KHz
VBW	$\geq 3 \times \text{RBW}$
Span	1.5 x DTS bandwidth
Trace	Max hold
Sweep time	Auto couple.

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

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

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

TEST SETUP

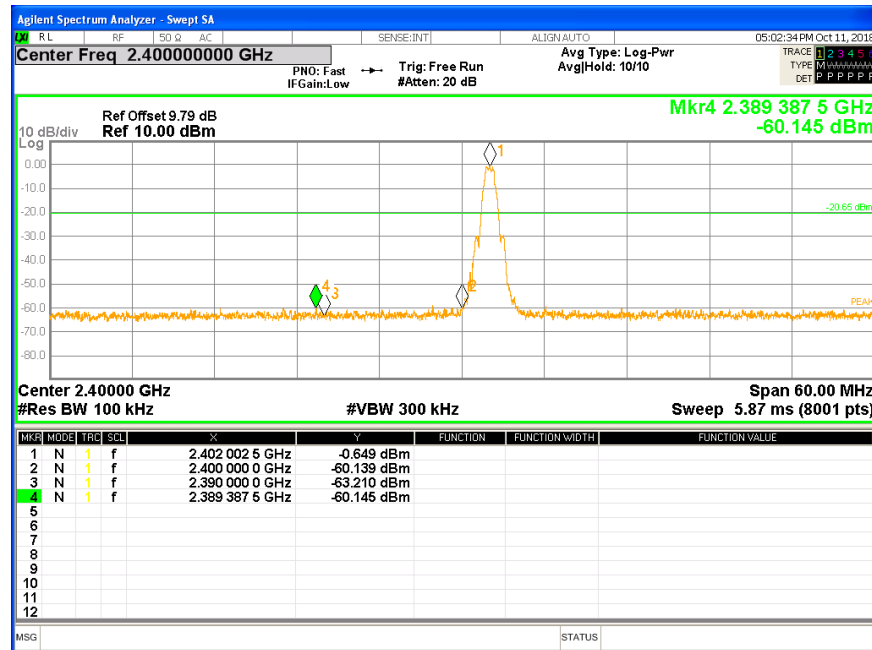




RESULTS

Mode: GFSK

Low CH Bandedge

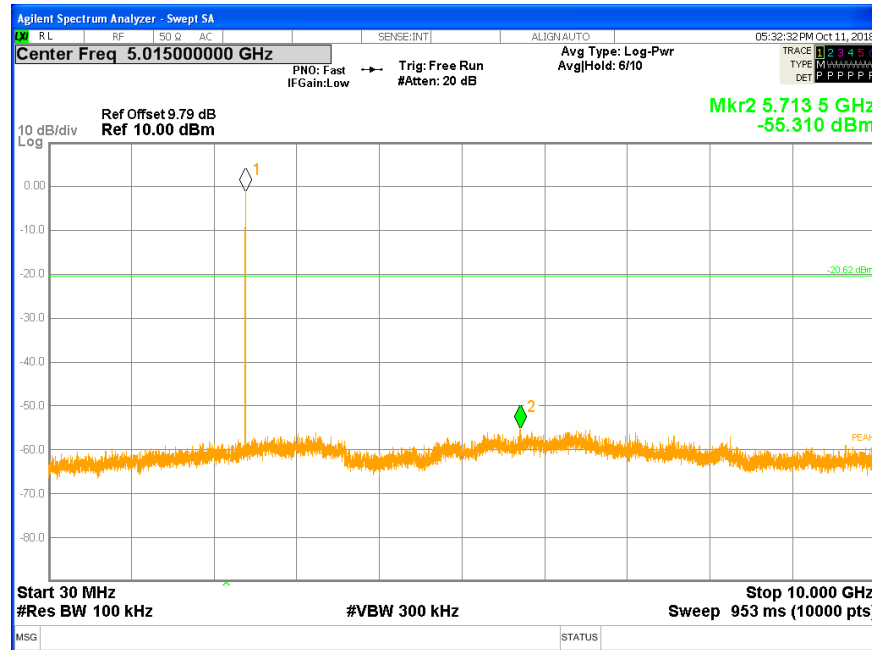


Low Unwanted Emissions In Non-restricted Frequency Bands-1

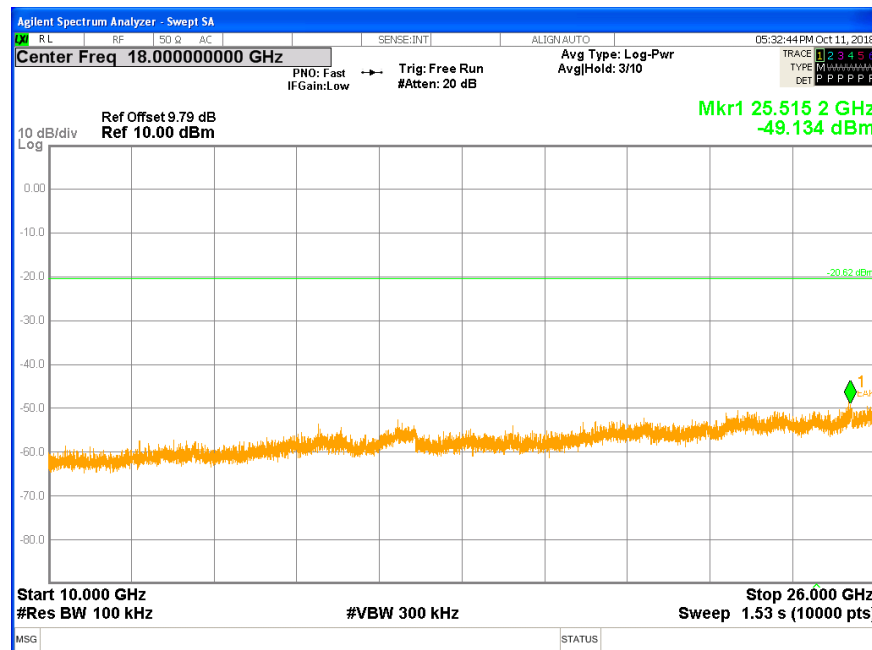




Low Unwanted Emissions In Non-restricted Frequency Bands-2



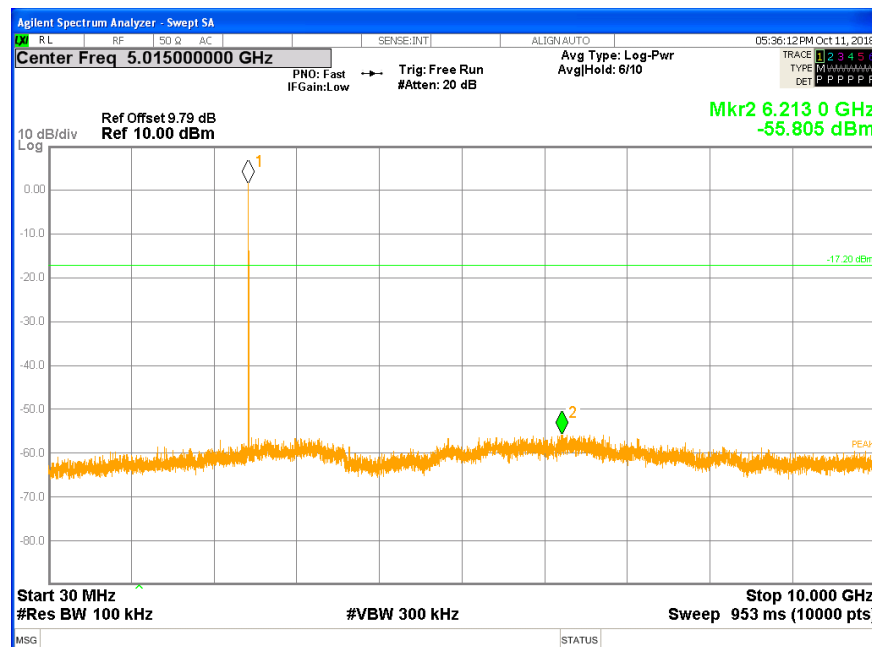
Low Unwanted Emissions In Non-restricted Frequency Bands-3



Mid Unwanted Emissions In Non-restricted Frequency Bands-1

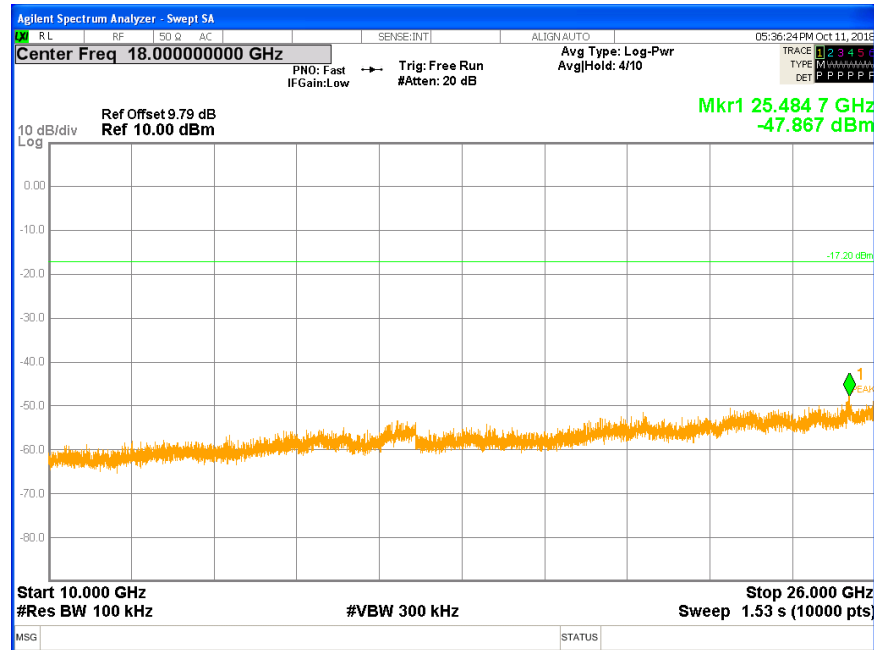


Mid Unwanted Emissions In Non-restricted Frequency Bands-2

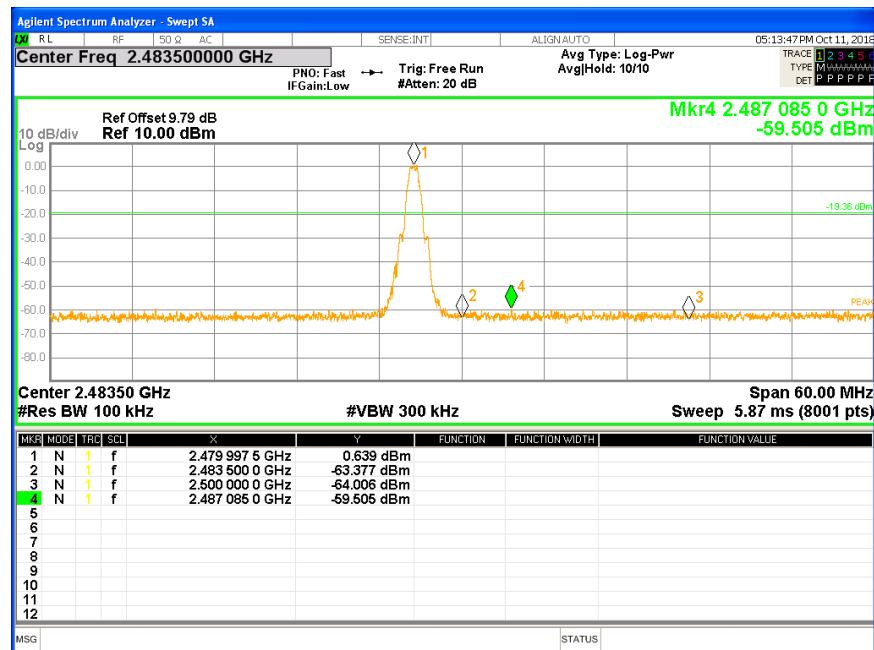




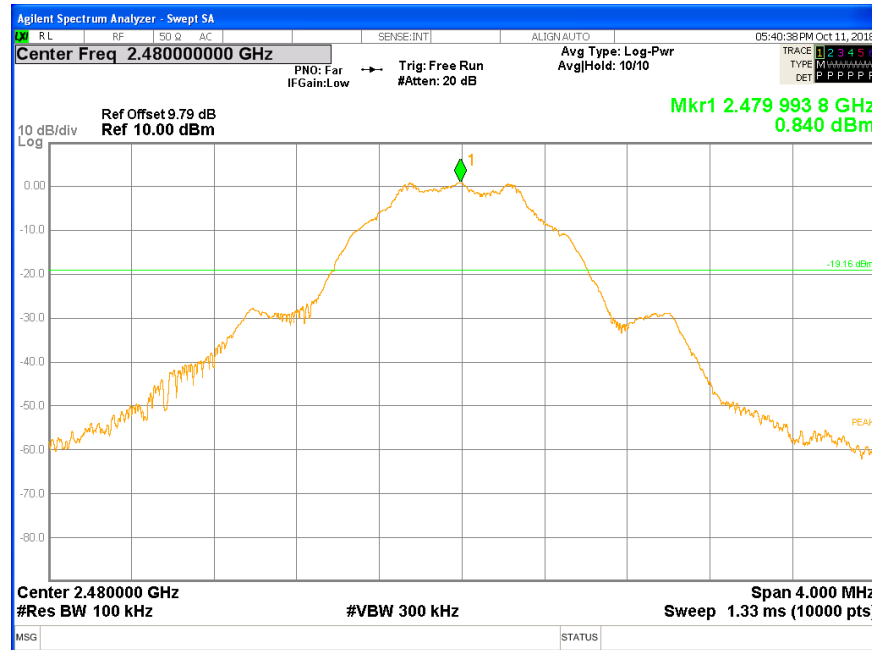
Mid Unwanted Emissions In Non-restricted Frequency Bands-3



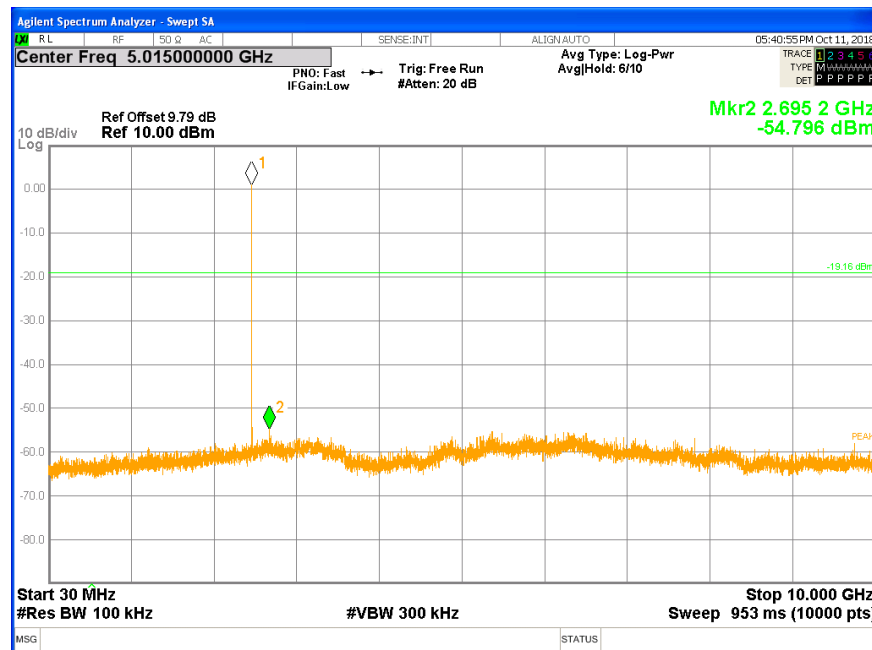
High CH Bandedge



High Unwanted Emissions In Non-restricted Frequency Bands-1

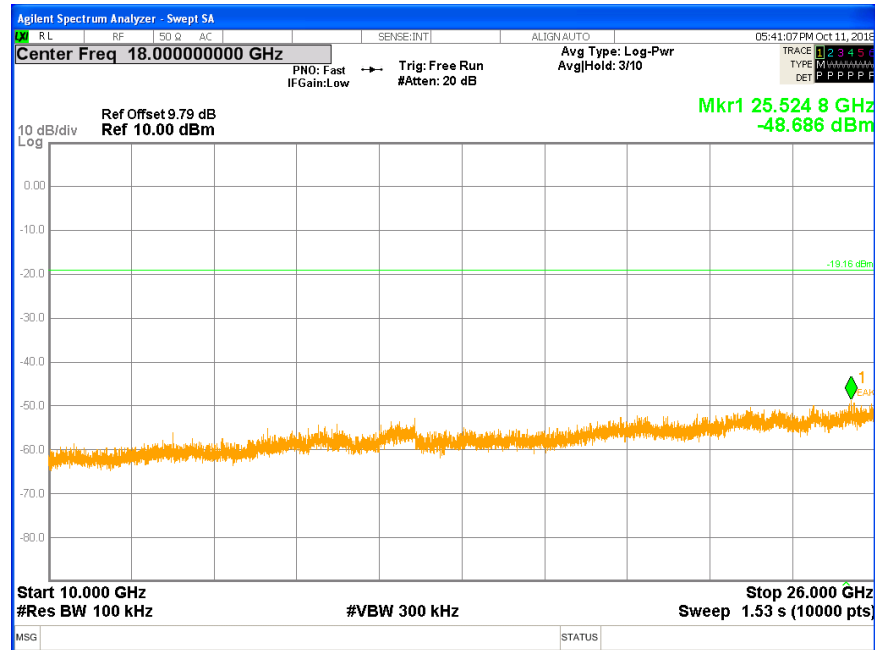


High Unwanted Emissions In Non-restricted Frequency Bands-2





High Unwanted Emissions In Non-restricted Frequency Bands-3





9. RADIATED TEST RESULTS

LIMITS

Please refer to CFR 47 FCC §15.205 and §15.209

Please refer to ISSED 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 ISSED RSS-GEN Clause 8.10

FCC Restricted bands of operation:

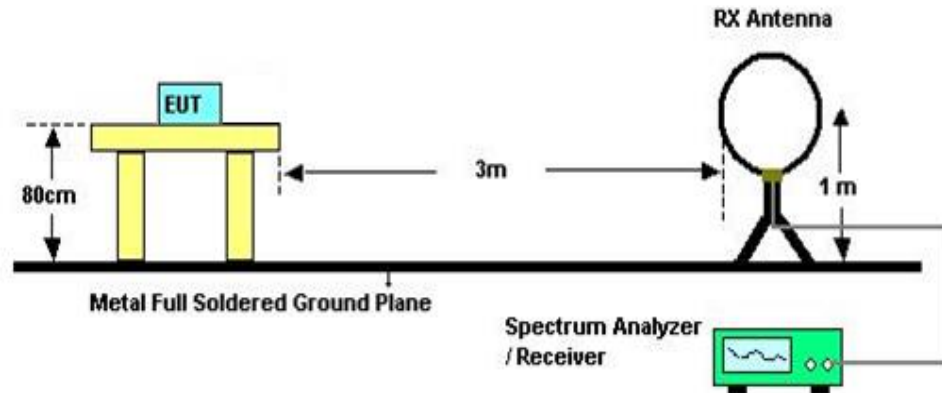
MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
¹ 0.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	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: ¹Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

²Above 38.6c

TEST SETUP AND PROCEDURE

Below 30MHz

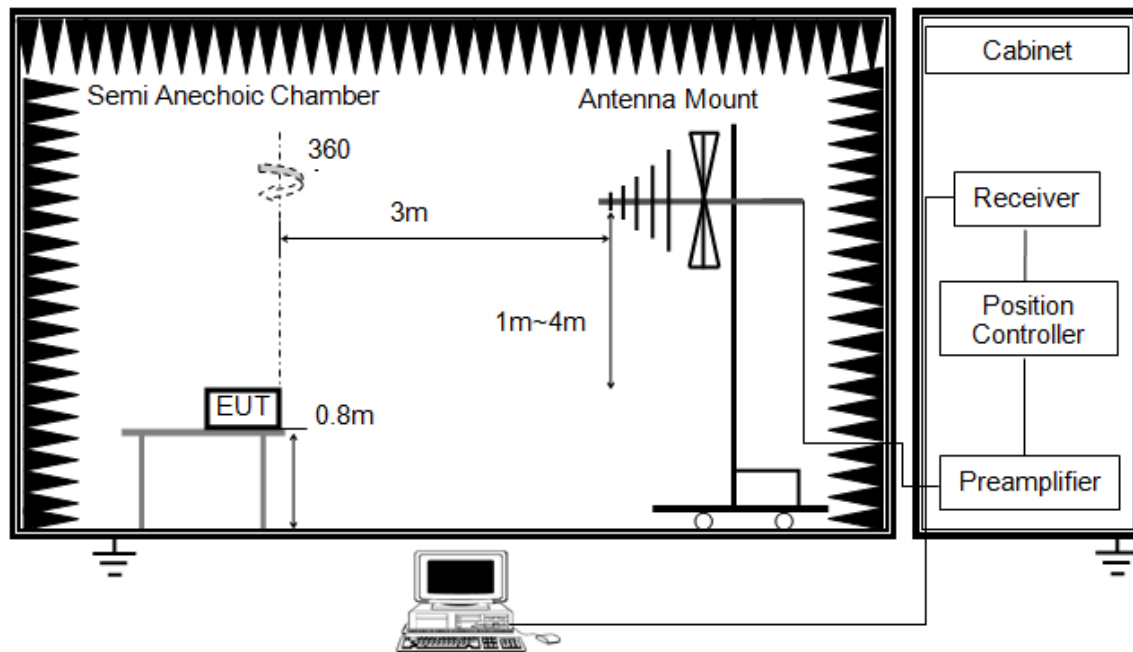


The setting of the spectrum analyser

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. For the actual test configuration, please refer to the related item in this test report (Photographs of the Test Configuration)
7. Although these tests were performed other than open area test site, adequate comparison measurements were confirmed against 30m open area 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

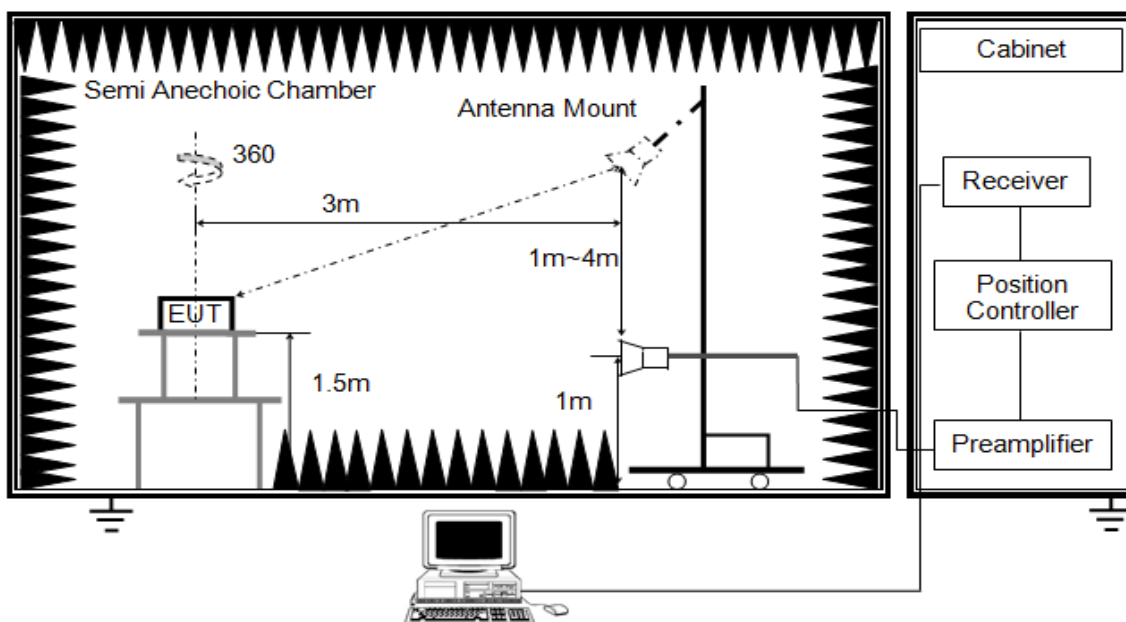


The setting of the spectrum analyser

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.



TEST ENVIRONMENT

Temperature	24.4°C	Relative Humidity	52%
Atmosphere Pressure	101kPa	Test Voltage	AC 120V

RESULTS

Note 1: For all the radiated emission testes, all the modes and antennas had been tested, but only the worst data recorded in the report.

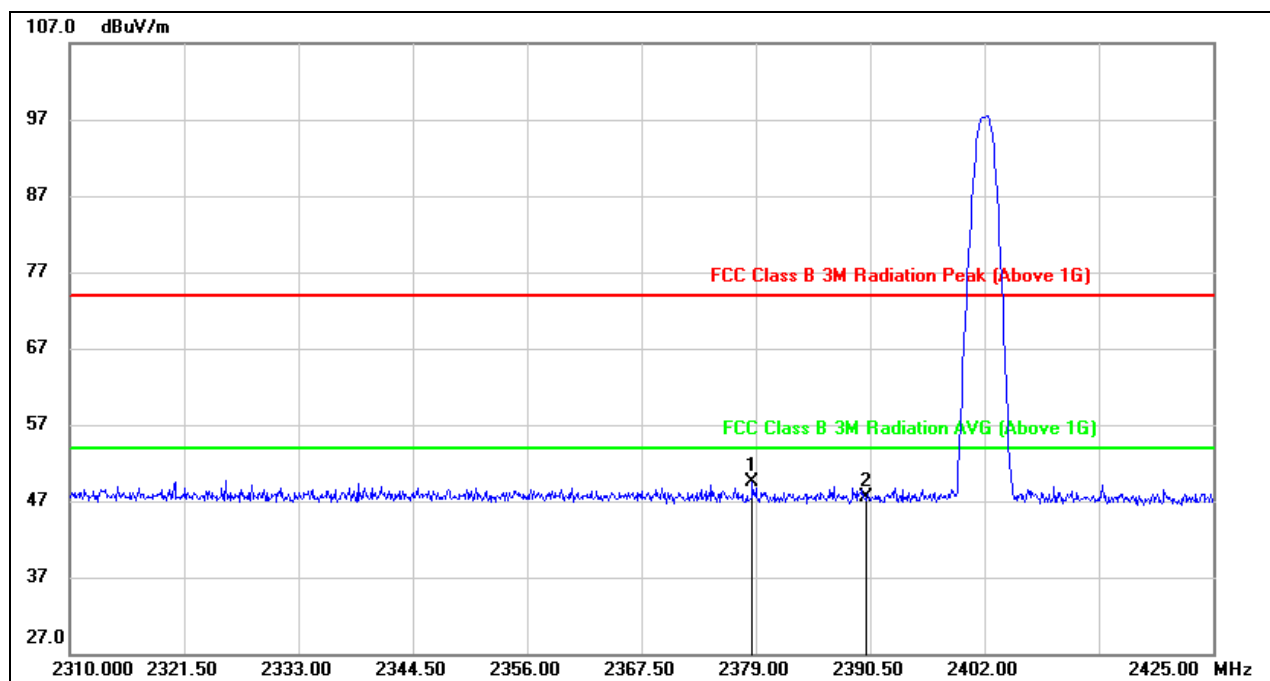
Note 2: The EUT was fully exercised with external accessories during the test. In the case of multiple accessory external ports, an external accessory shall be connected to one of each type of port.



9.1. RESTRICTED BANDEDGE

Mode: GFSK

RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)

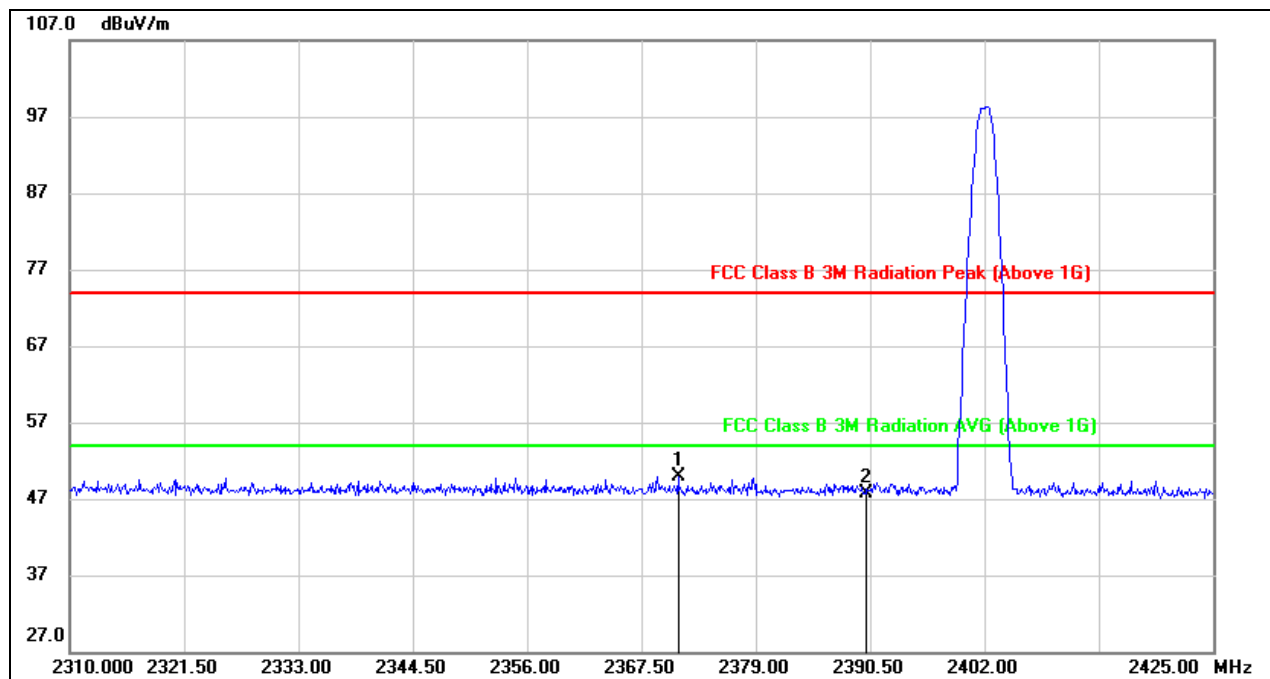


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2378.655	16.25	33.22	49.47	74.00	-24.53	peak
2	2390.000	14.38	33.14	47.52	74.00	-26.48	peak

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.



RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)

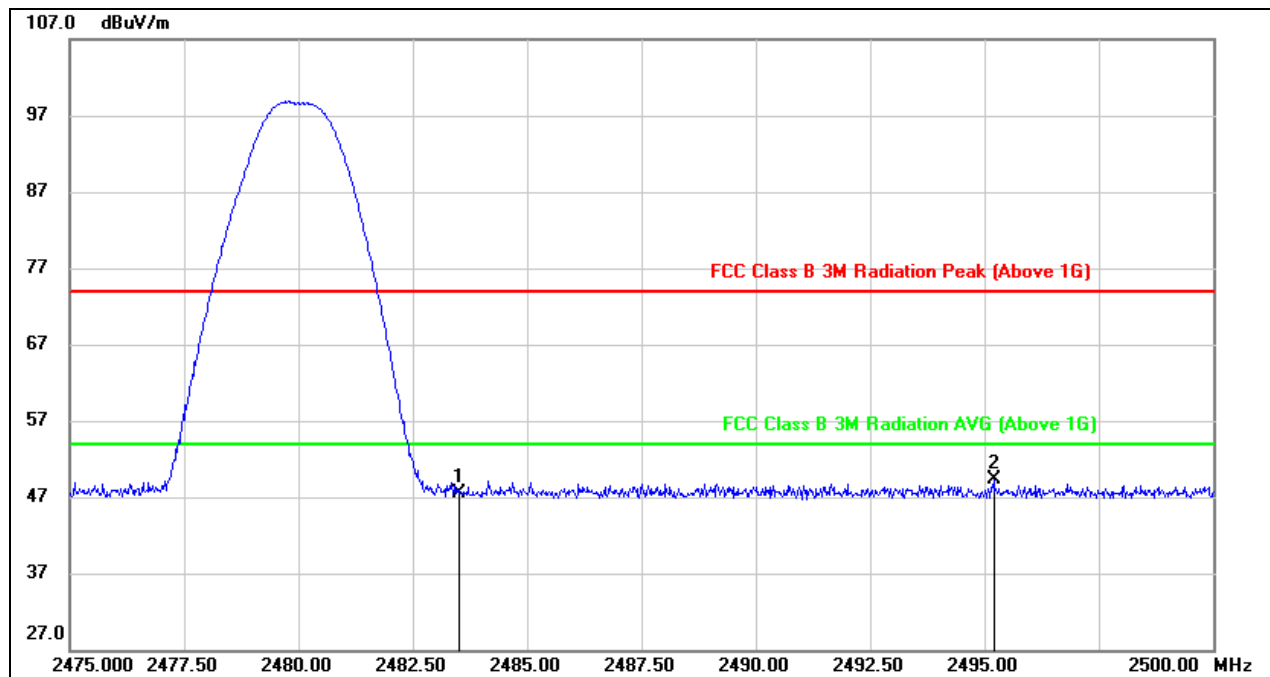


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2371.180	16.71	33.28	49.99	74.00	-24.01	peak
2	2390.000	14.62	33.24	47.86	74.00	-26.14	peak

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.



RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)

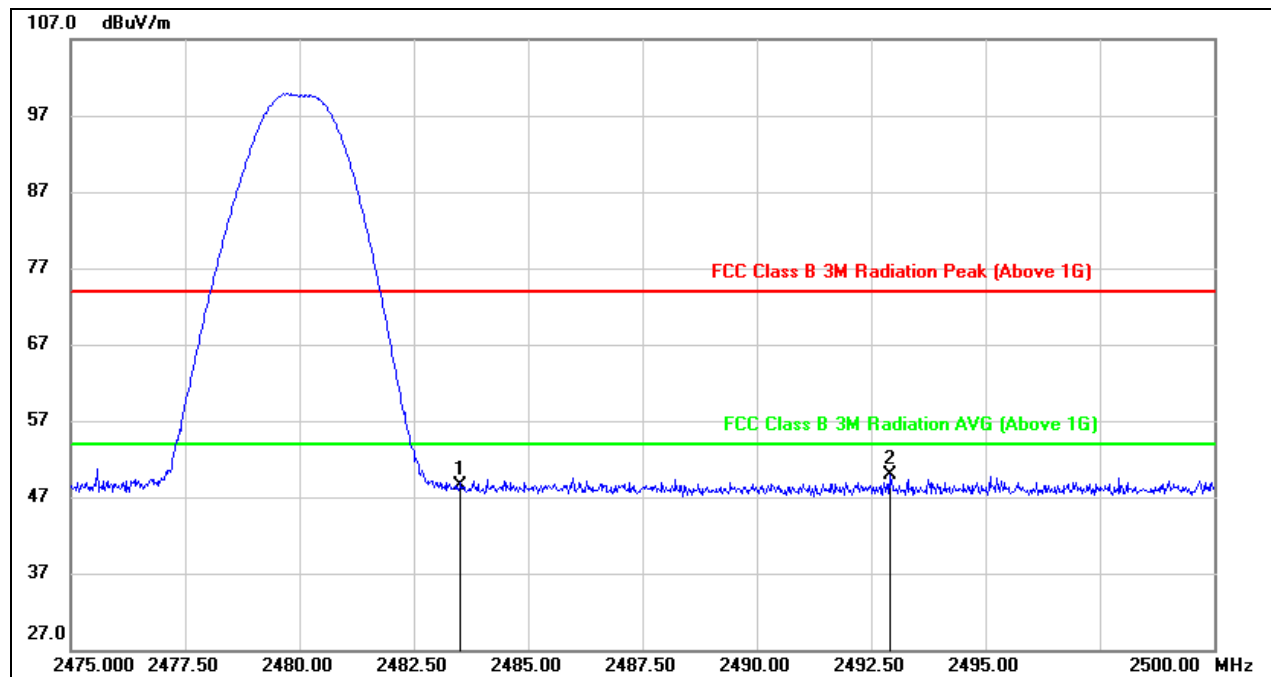


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	14.67	32.78	47.45	74.00	-26.55	peak
2	2495.200	16.46	32.78	49.24	74.00	-24.76	peak

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.



RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	15.69	32.88	48.57	74.00	-25.43	peak
2	2492.900	16.98	32.87	49.85	74.00	-24.15	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.

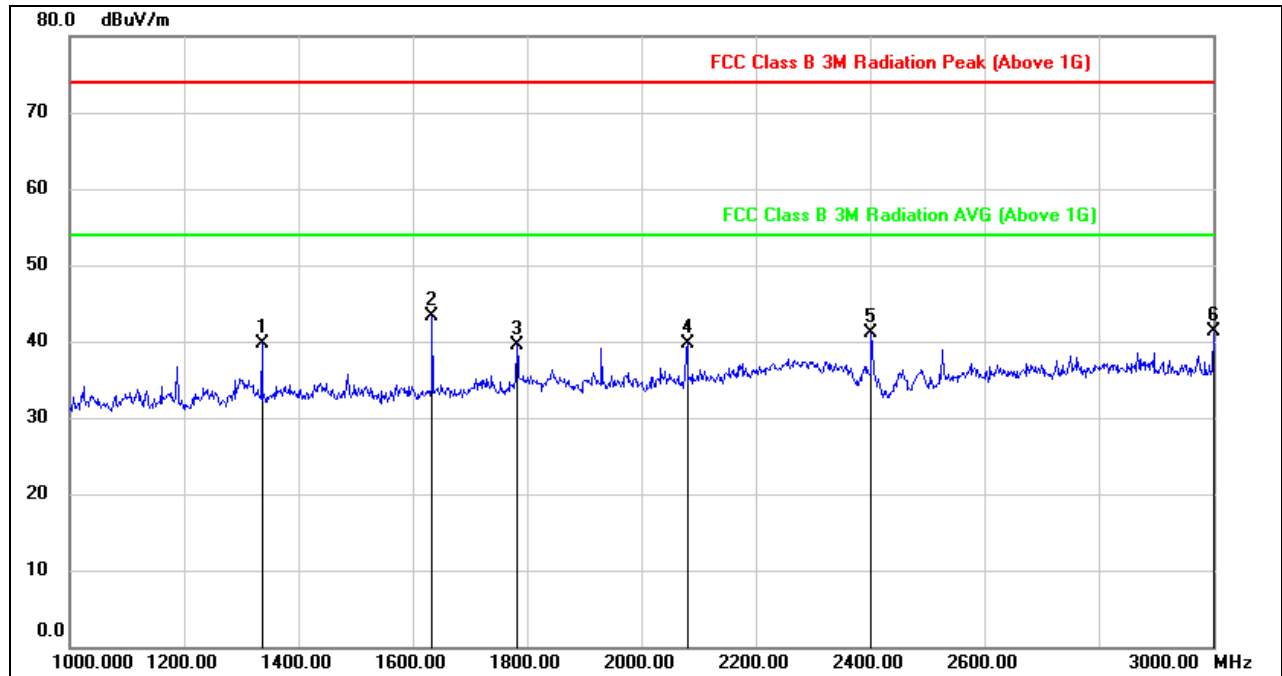


9.2. SPURIOUS EMISSIONS 1GHz~18GHz

Mode: GFSK

HARMONICS AND SPURIOUS EMISSIONS (LOW CHANNEL, HORIZONTAL)

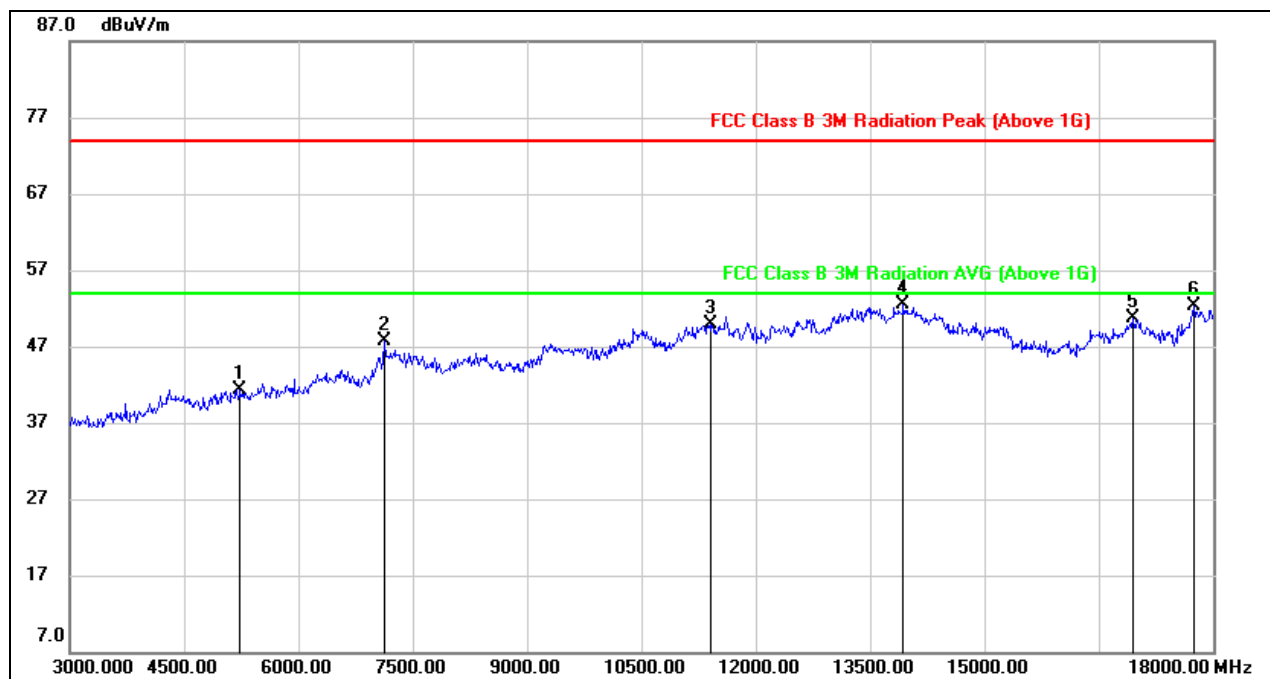
1GHz~3GHz



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1336.000	52.13	-12.37	39.76	74.00	-34.24	peak
2	1634.000	55.13	-11.83	43.30	74.00	-30.70	peak
3	1782.000	50.65	-11.19	39.46	74.00	-34.54	peak
4	2080.000	49.47	-9.82	39.65	74.00	-34.35	peak
5	2402.000	49.16	-8.11	41.05	74.00	-32.95	peak
6	3000.000	47.99	-6.60	41.39	74.00	-32.61	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



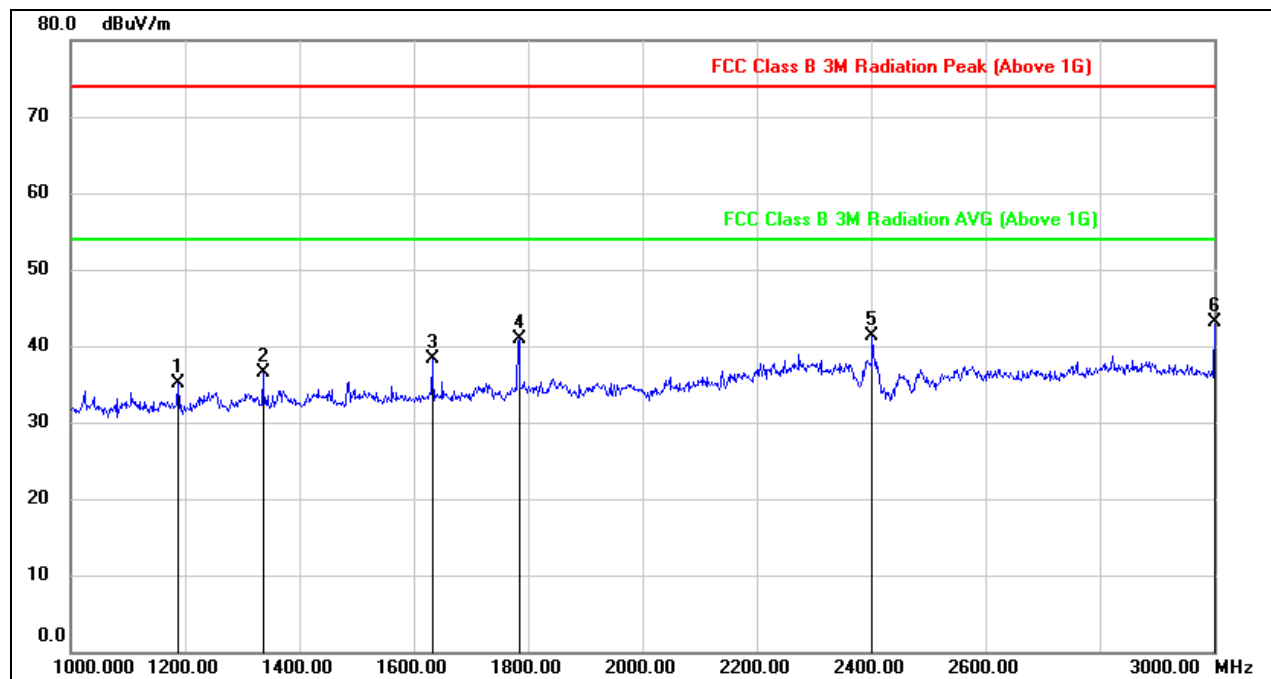
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	5235.000	40.26	1.08	41.34	74.00	-32.66	peak
2	7125.000	40.26	7.52	47.78	74.00	-26.22	peak
3	11400.000	34.17	15.69	49.86	74.00	-24.14	peak
4	13935.000	31.79	20.67	52.46	74.00	-21.54	peak
5	16950.000	29.23	21.50	50.73	74.00	-23.27	peak
6	17745.000	26.42	25.86	52.28	74.00	-21.72	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.



HARMONICS AND SPURIOUS EMISSIONS (LOW CHANNEL, VERTICAL)

1GHz~3GHz

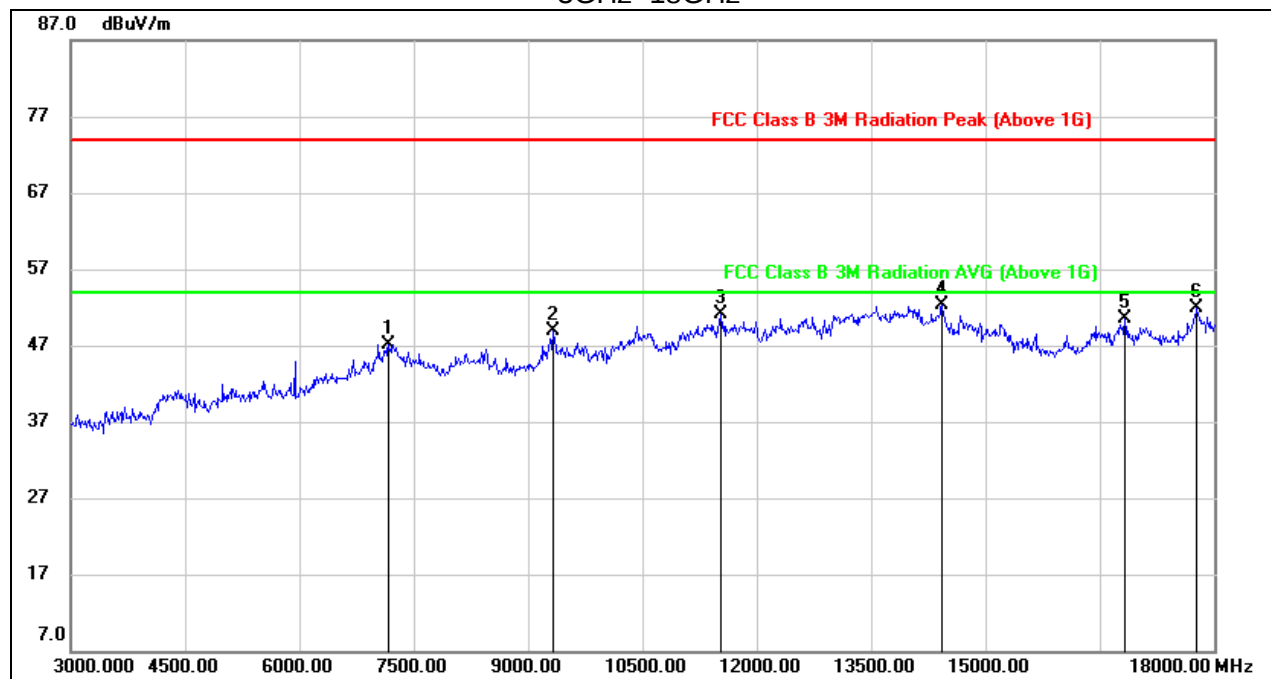


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1188.000	48.43	-13.26	35.17	74.00	-38.83	peak
2	1336.000	48.99	-12.46	36.53	74.00	-37.47	peak
3	1632.000	50.12	-11.85	38.27	74.00	-35.73	peak
4	1784.000	52.06	-11.18	40.88	74.00	-33.12	peak
5	2402.000	49.26	-8.01	41.25	74.00	-32.75	peak
6	3000.000	49.62	-6.60	43.02	74.00	-30.98	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



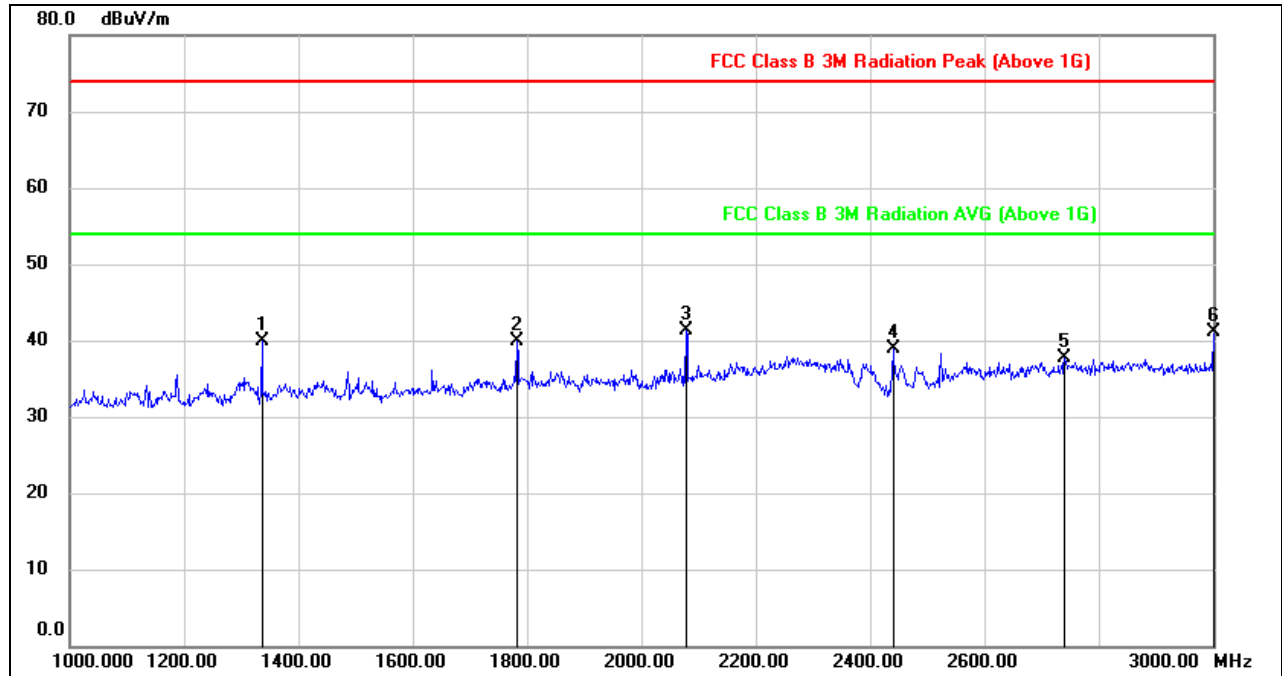
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	7170.000	39.28	7.82	47.10	74.00	-26.90	peak
2	9330.000	37.93	10.91	48.84	74.00	-25.16	peak
3	11535.000	34.82	16.23	51.05	74.00	-22.95	peak
4	14430.000	32.29	19.97	52.26	74.00	-21.74	peak
5	16830.000	29.75	20.82	50.57	74.00	-23.43	peak
6	17775.000	25.30	26.57	51.87	74.00	-22.13	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

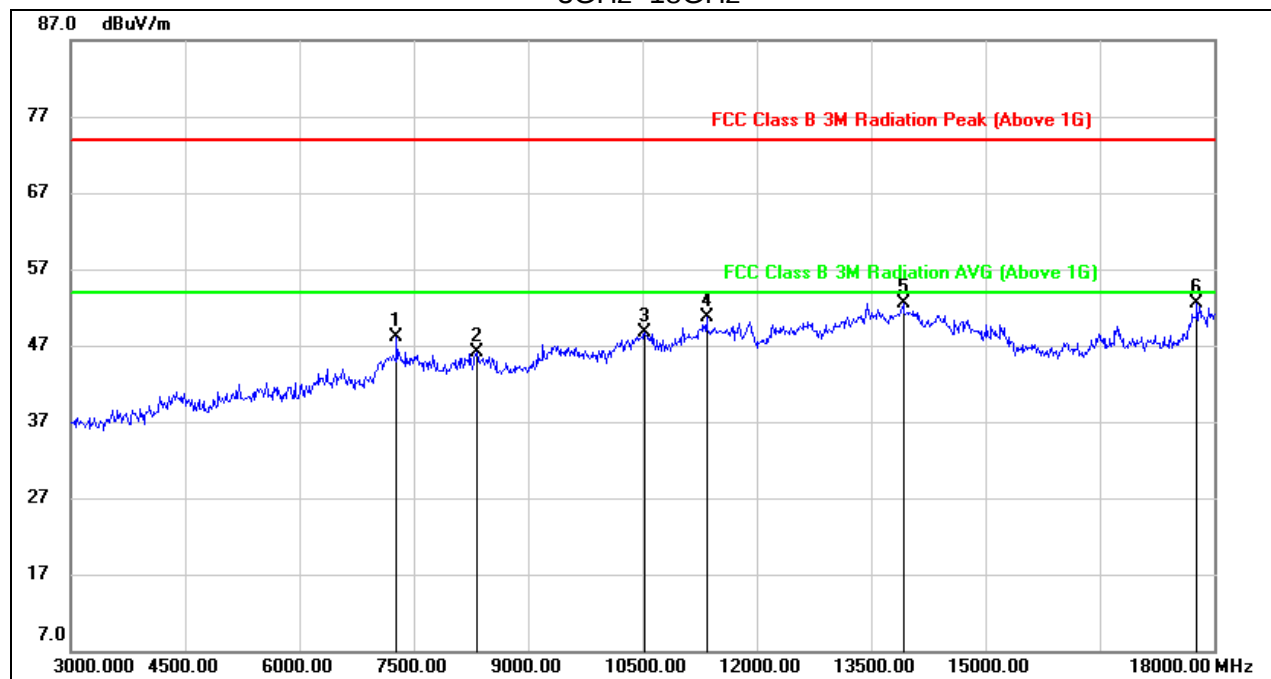


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1336.000	52.25	-12.37	39.88	74.00	-34.12	peak
2	1782.000	51.18	-11.19	39.99	74.00	-34.01	peak
3	2078.000	51.17	-9.85	41.32	74.00	-32.68	peak
4	2440.000	47.12	-8.30	38.82	74.00	-35.18	peak
5	2740.000	45.03	-7.30	37.73	74.00	-36.27	peak
6	3000.000	47.62	-6.60	41.02	74.00	-32.98	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



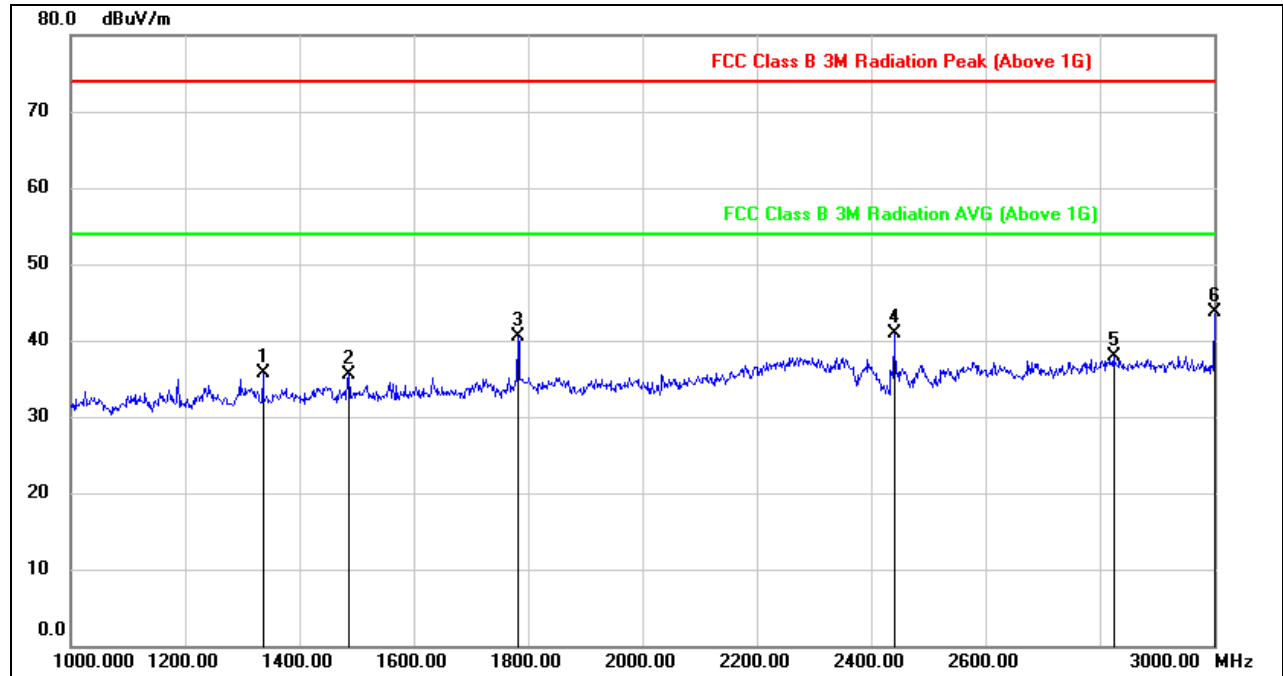
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	7275.000	40.17	7.86	48.03	74.00	-25.97	peak
2	8325.000	37.63	8.42	46.05	74.00	-27.95	peak
3	10530.000	34.90	13.76	48.66	74.00	-25.34	peak
4	11340.000	35.66	15.06	50.72	74.00	-23.28	peak
5	13920.000	31.75	20.67	52.42	74.00	-21.58	peak
6	17775.000	26.29	26.17	52.46	74.00	-21.54	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.



HARMONICS AND SPURIOUS EMISSIONS (MID CHANNEL, VERTICAL)

1GHz~3GHz

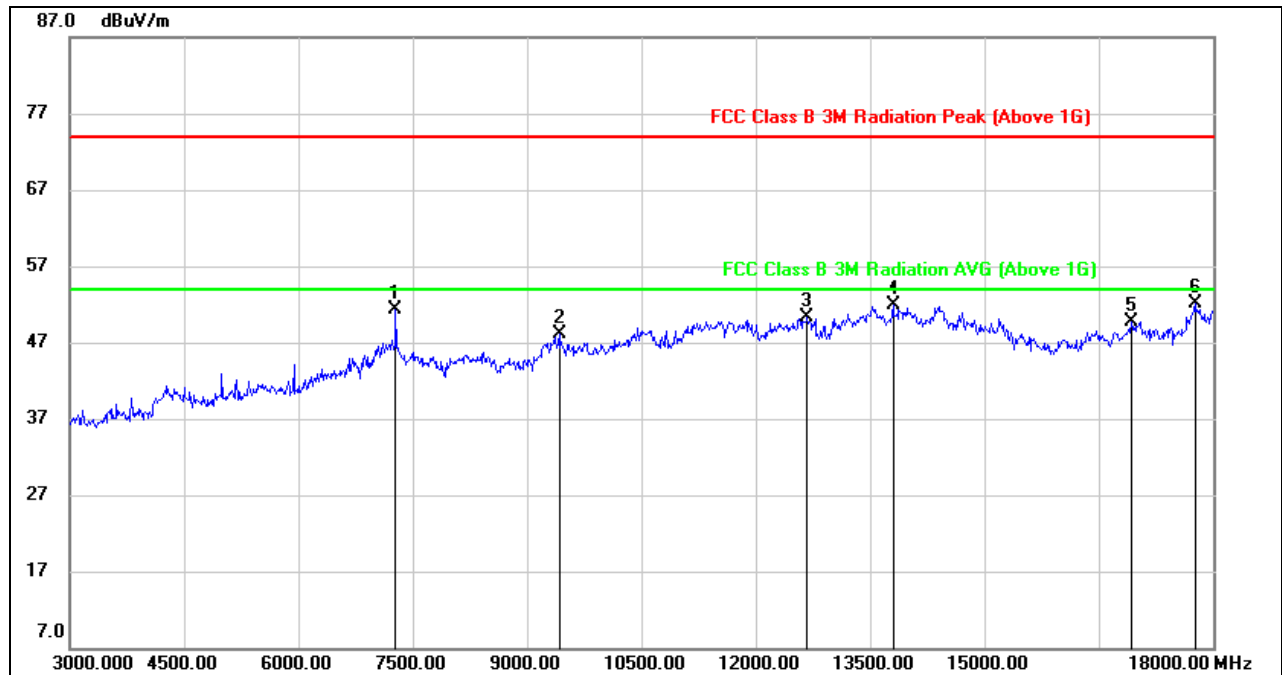


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1336.000	48.13	-12.46	35.67	74.00	-38.33	peak
2	1486.000	47.87	-12.28	35.59	74.00	-38.41	peak
3	1782.000	51.75	-11.19	40.56	74.00	-33.44	peak
4	2440.000	49.01	-8.20	40.81	74.00	-33.19	peak
5	2824.000	44.79	-6.83	37.96	74.00	-36.04	peak
6	3000.000	50.24	-6.60	43.64	74.00	-30.36	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



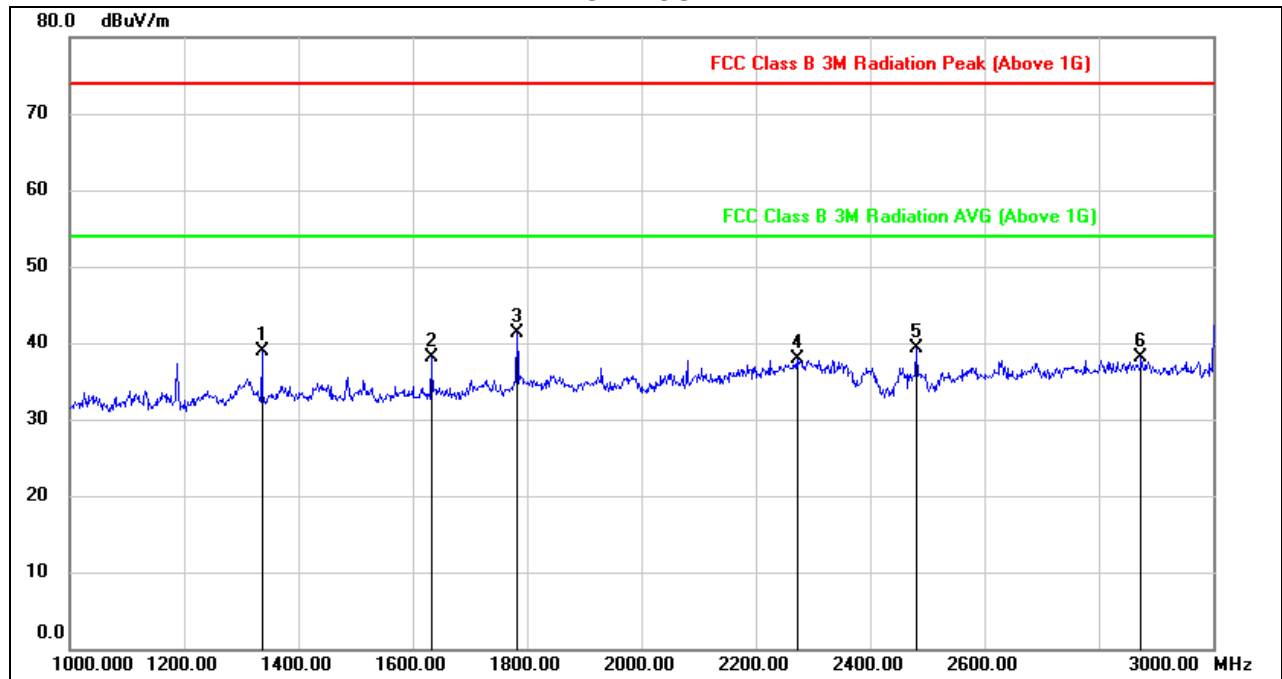
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	7275.000	43.50	7.81	51.31	74.00	-22.69	peak
2	9420.000	37.16	10.93	48.09	74.00	-25.91	peak
3	12675.000	32.88	17.37	50.25	74.00	-23.75	peak
4	13800.000	30.72	21.21	51.93	74.00	-22.07	peak
5	16935.000	28.19	21.47	49.66	74.00	-24.34	peak
6	17760.000	25.69	26.39	52.08	74.00	-21.92	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

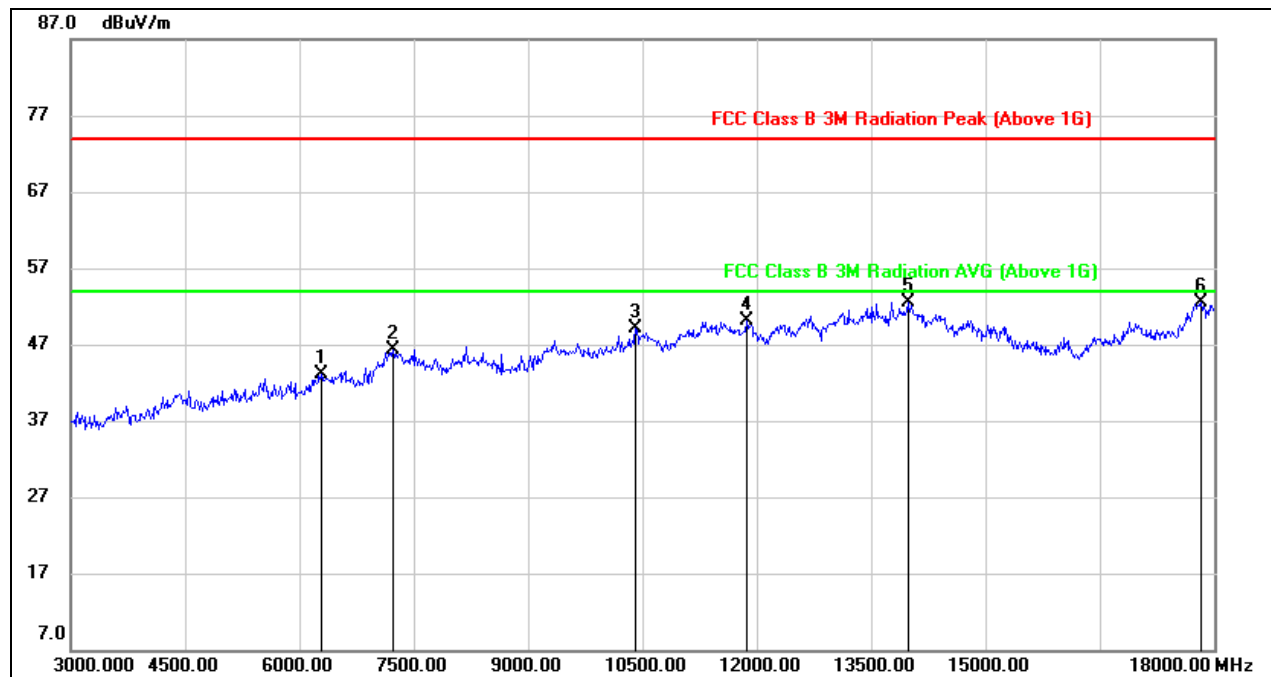


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1336.000	51.20	-12.37	38.83	74.00	-35.17	peak
2	1632.000	49.95	-11.85	38.10	74.00	-35.90	peak
3	1782.000	52.44	-11.19	41.25	74.00	-32.75	peak
4	2272.000	45.32	-7.50	37.82	74.00	-36.18	peak
5	2480.000	47.68	-8.38	39.30	74.00	-34.70	peak
6	2874.000	44.63	-6.61	38.02	74.00	-35.98	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



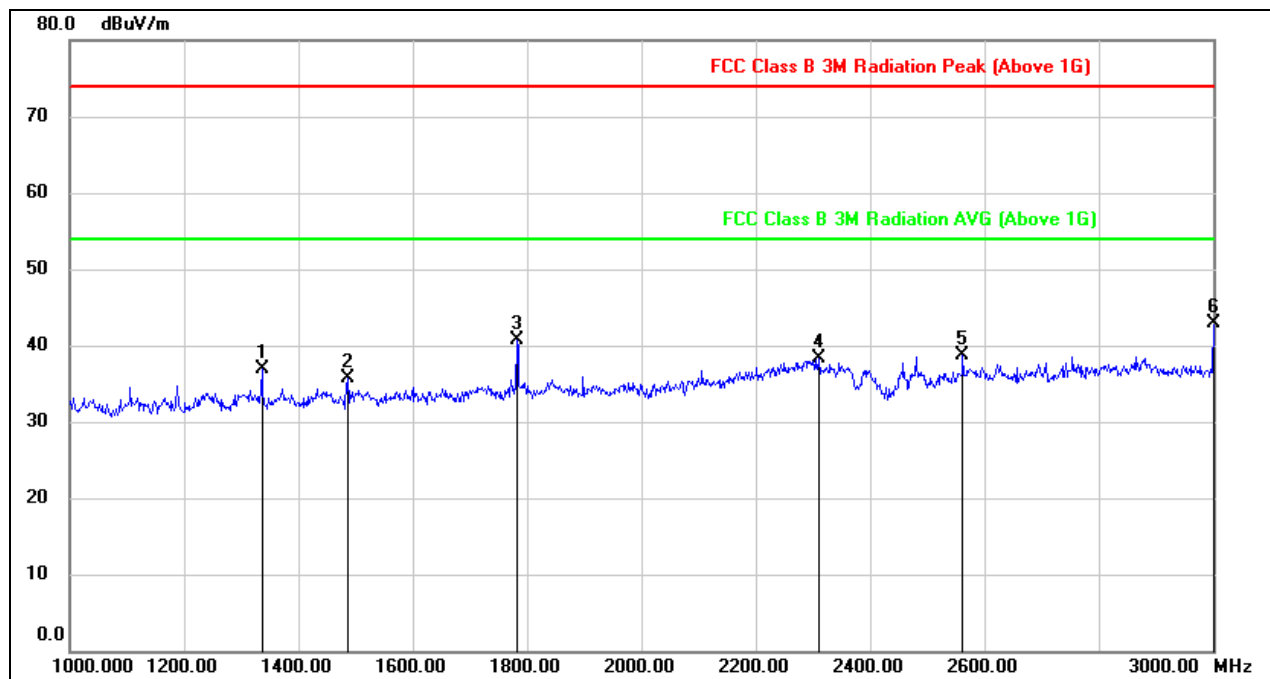
No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	6285.000	38.65	4.54	43.19	74.00	-30.81	peak
2	7230.000	38.50	7.81	46.31	74.00	-27.69	peak
3	10410.000	35.96	13.16	49.12	74.00	-24.88	peak
4	11865.000	33.64	16.44	50.08	74.00	-23.92	peak
5	13980.000	31.93	20.63	52.56	74.00	-21.44	peak
6	17835.000	25.98	26.49	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 (HIGH CHANNEL, VERTICAL)

1GHz~3GHz

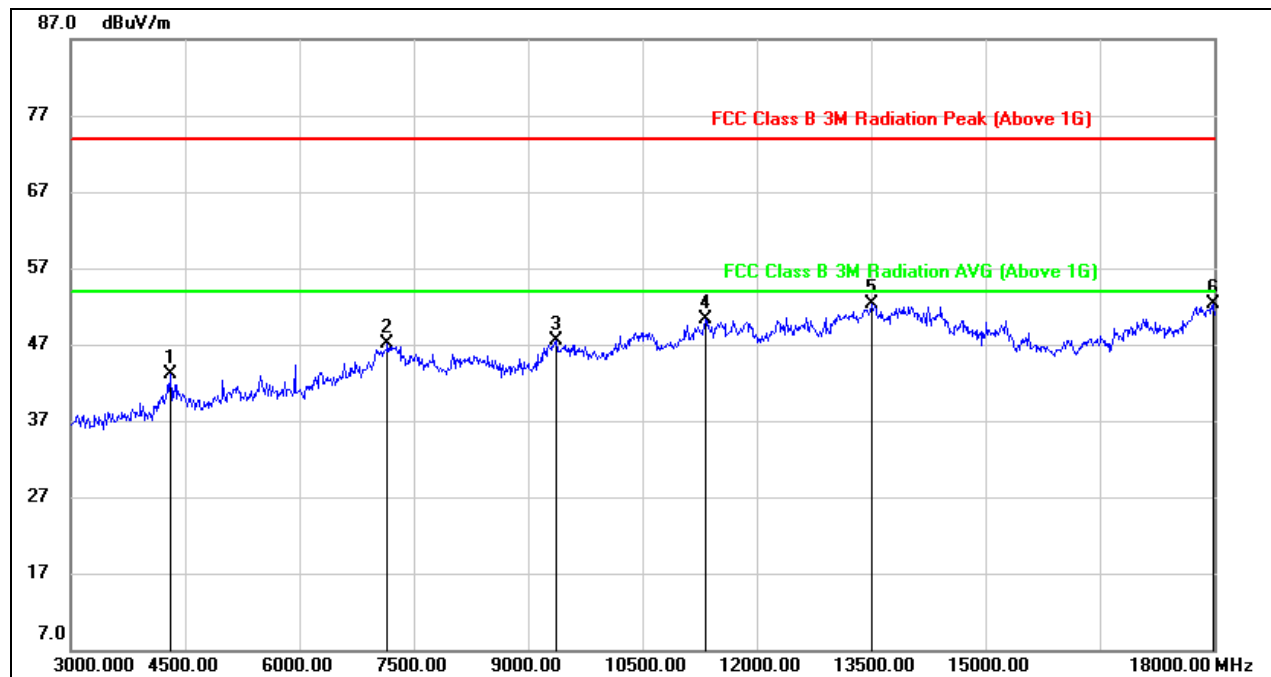


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1336.000	49.29	-12.46	36.83	74.00	-37.17	peak
2	1486.000	47.98	-12.28	35.70	74.00	-38.30	peak
3	1782.000	51.99	-11.19	40.80	74.00	-33.20	peak
4	2310.000	45.57	-7.29	38.28	74.00	-35.72	peak
5	2562.000	46.97	-8.23	38.74	74.00	-35.26	peak
6	3000.000	49.56	-6.60	42.96	74.00	-31.04	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	4305.000	44.58	-1.44	43.14	74.00	-30.86	peak
2	7155.000	39.32	7.80	47.12	74.00	-26.88	peak
3	9375.000	36.64	10.88	47.52	74.00	-26.48	peak
4	11325.000	35.10	15.30	50.40	74.00	-23.60	peak
5	13500.000	31.81	20.57	52.38	74.00	-21.62	peak
6	17985.000	25.83	26.41	52.24	74.00	-21.76	peak

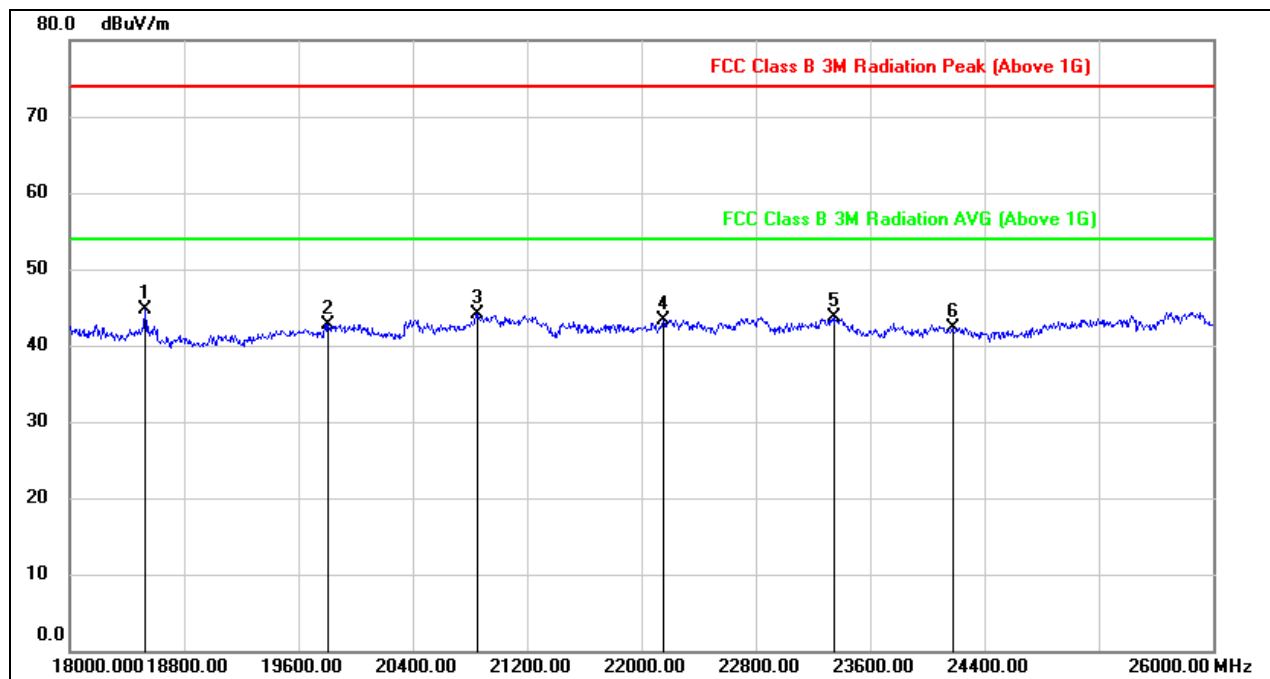
Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.



9.3. SPURIOUS EMISSIONS 18G ~ 26GHz

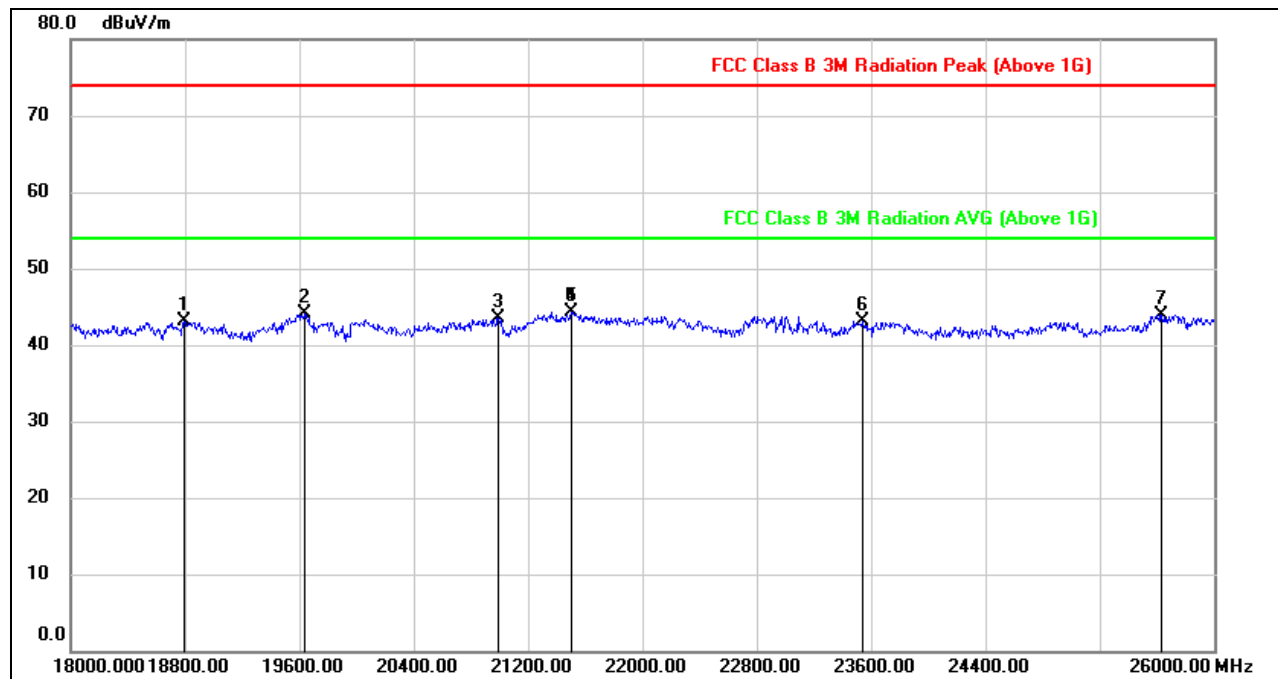
Mode: GFSK

SPURIOUS EMISSIONS (MID 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	49.91	-5.26	44.65	74.00	-29.35	peak
2	19808.000	48.09	-5.29	42.80	74.00	-31.20	peak
3	20856.000	49.05	-5.01	44.04	74.00	-29.96	peak
4	22152.000	47.72	-4.32	43.40	74.00	-30.60	peak
5	23352.000	46.91	-3.27	43.64	74.00	-30.36	peak
6	24176.000	45.19	-2.80	42.39	74.00	-31.61	peak

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

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

No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	18792.000	48.45	-5.39	43.06	74.00	-30.94	peak
2	19632.000	49.45	-5.40	44.05	74.00	-29.95	peak
3	20992.000	48.48	-4.88	43.60	74.00	-30.40	peak
4	21504.000	49.03	-4.69	44.34	74.00	-29.66	peak
5	21504.000	49.03	-4.69	44.34	74.00	-29.66	peak
6	23536.000	46.34	-3.15	43.19	74.00	-30.81	peak
7	25632.000	45.06	-1.16	43.90	74.00	-30.10	peak

Note: 1. Peak Result = Reading Level + Correct Factor.

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

3. Peak: Peak detector.

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

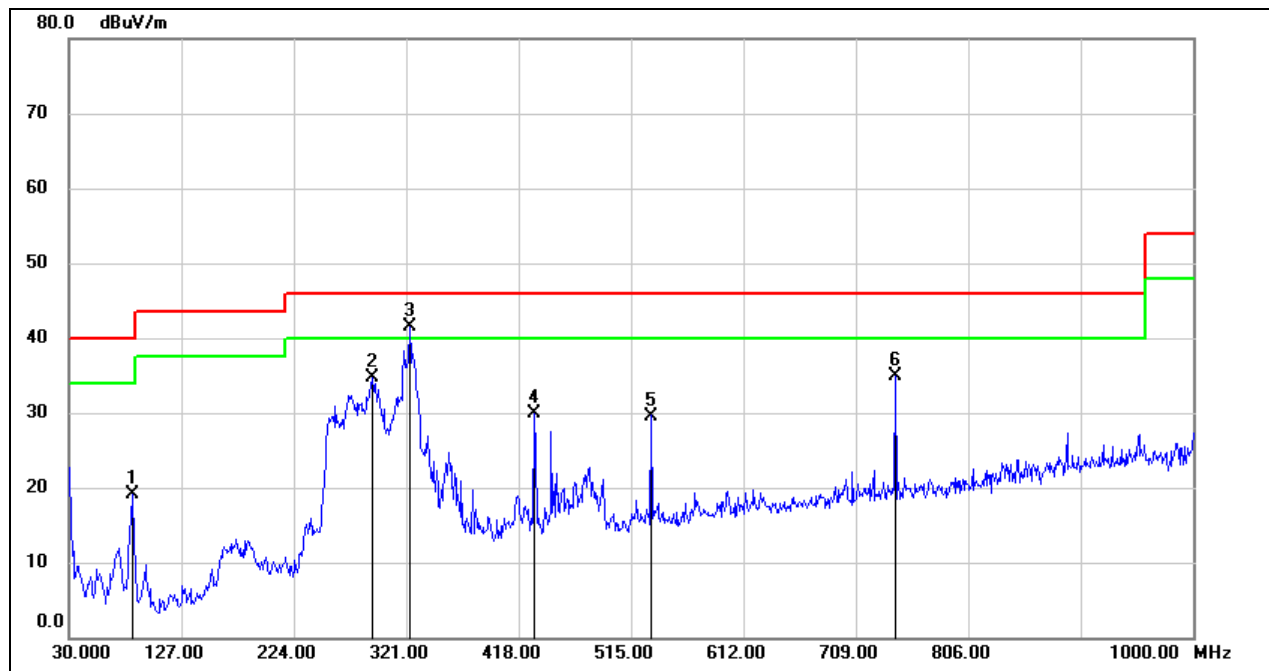


9.4. SPURIOUS EMISSIONS 30M ~ 1 GHz

Mode: GFSK

HUAWEI Box 900 with VAPEL manufacturer's power supply (WORST-CASE CONFIGURATION)

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

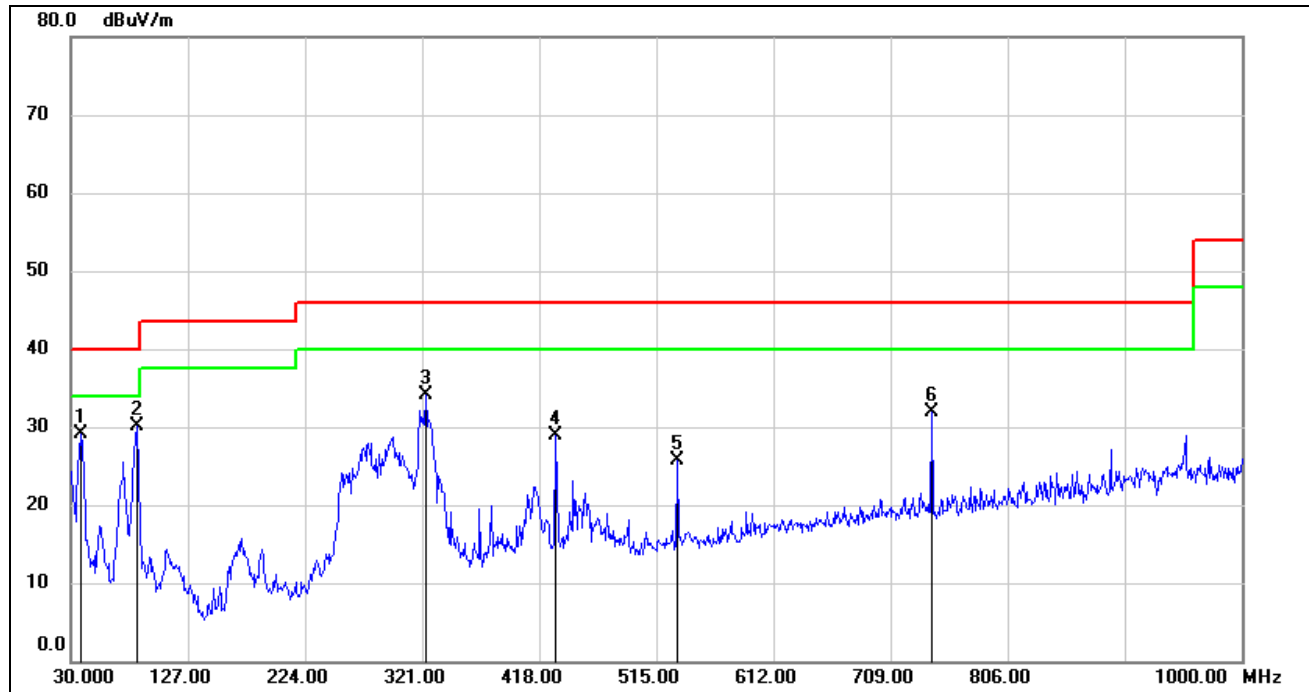


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	85.2900	40.04	-20.98	19.06	40.00	-20.94	QP
2	291.9000	49.35	-14.60	34.75	46.00	-11.25	QP
3	323.9100	55.46	-13.89	41.57	46.00	-4.43	QP
4	431.5800	41.90	-12.06	29.84	46.00	-16.16	QP
5	532.4600	39.72	-10.12	29.60	46.00	-16.40	QP
6	742.9500	41.37	-6.38	34.99	46.00	-11.01	QP

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



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



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	37.7599	46.91	-17.83	29.08	40.00	-10.92	QP
2	84.3200	51.09	-20.93	30.16	40.00	-9.84	QP
3	323.9100	48.01	-13.89	34.12	46.00	-11.88	QP
4	431.5800	40.93	-12.06	28.87	46.00	-17.13	QP
5	532.4600	35.74	-10.12	25.62	46.00	-20.38	QP
6	742.9500	38.22	-6.38	31.84	46.00	-14.16	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: VAPEL and ASTEC manufacturer's power supply were put into HUAWEI Box 900, HUAWEI Box 700 and HUAWEI Box 500 for testing, and found the VAPEL manufacturer's Power Supply and HUAWEI Box 900 combination is the worst-case configuration.



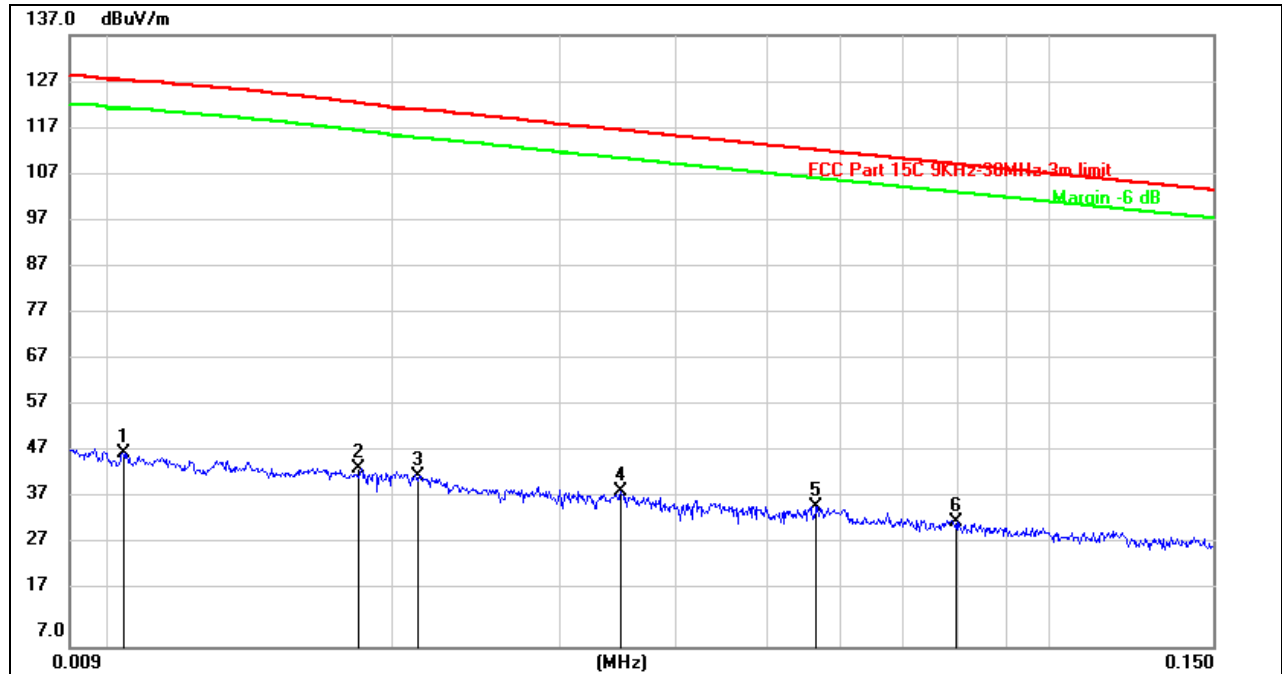
9.5. SPURIOUS EMISSIONS BELOW 30M

Mode: GFSK

HUAWEI Box 900 with VAPEL manufacturer's power supply (WORST-CASE CONFIGURATION)

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

0.09KHz~ 150KHz



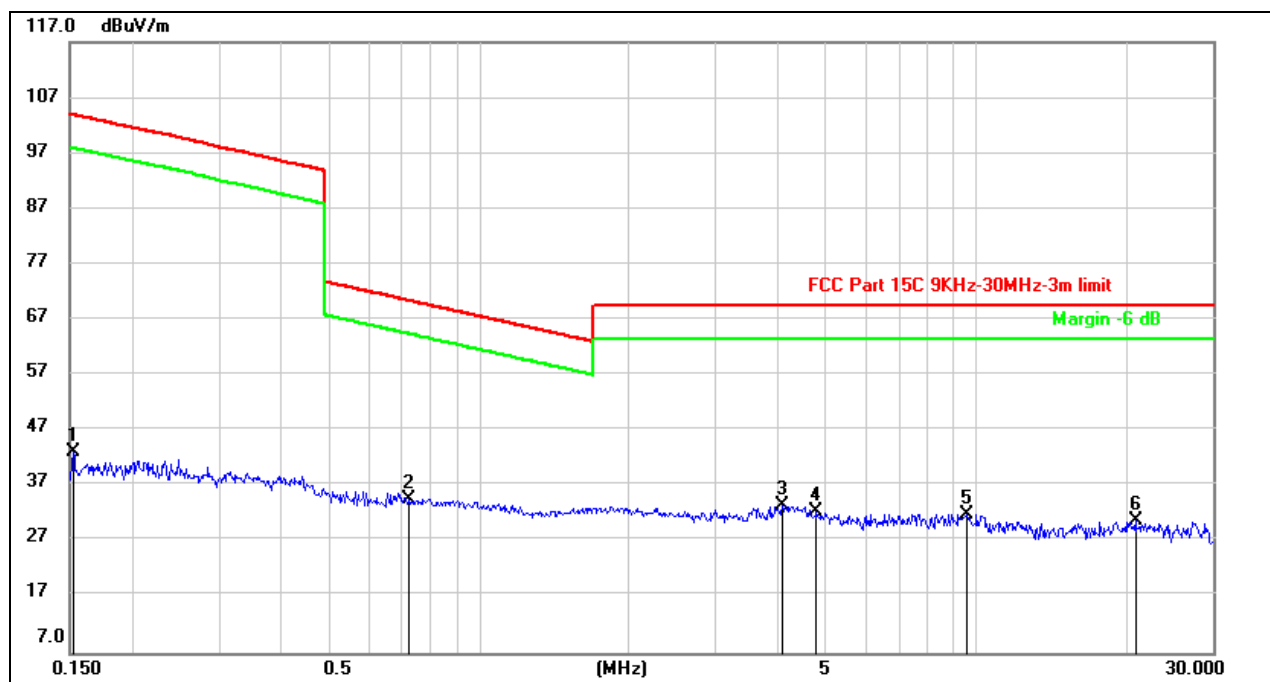
No.	Frequency (KHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	0.0103	27.82	20.21	48.03	127.42	-79.39	peak
2	0.0183	24.57	20.29	44.86	122.60	-77.74	peak
3	0.0212	22.93	20.31	43.24	121.16	-77.92	peak
4	0.0349	19.67	20.31	39.98	116.84	-76.86	peak
5	0.0565	16.57	20.31	36.88	112.59	-75.71	peak
6	0.0796	13.27	20.29	33.56	109.59	-76.03	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	0.1524	22.66	20.42	43.08	103.95	-60.87	peak
2	0.7236	14.35	20.34	34.69	70.43	-35.74	peak
3	4.0704	12.46	21.04	33.50	69.54	-36.04	peak
4	4.7716	11.45	20.88	32.33	69.54	-37.21	peak
5	9.5518	10.81	21.04	31.85	69.54	-37.69	peak
6	20.9237	9.56	21.13	30.69	69.54	-38.85	peak

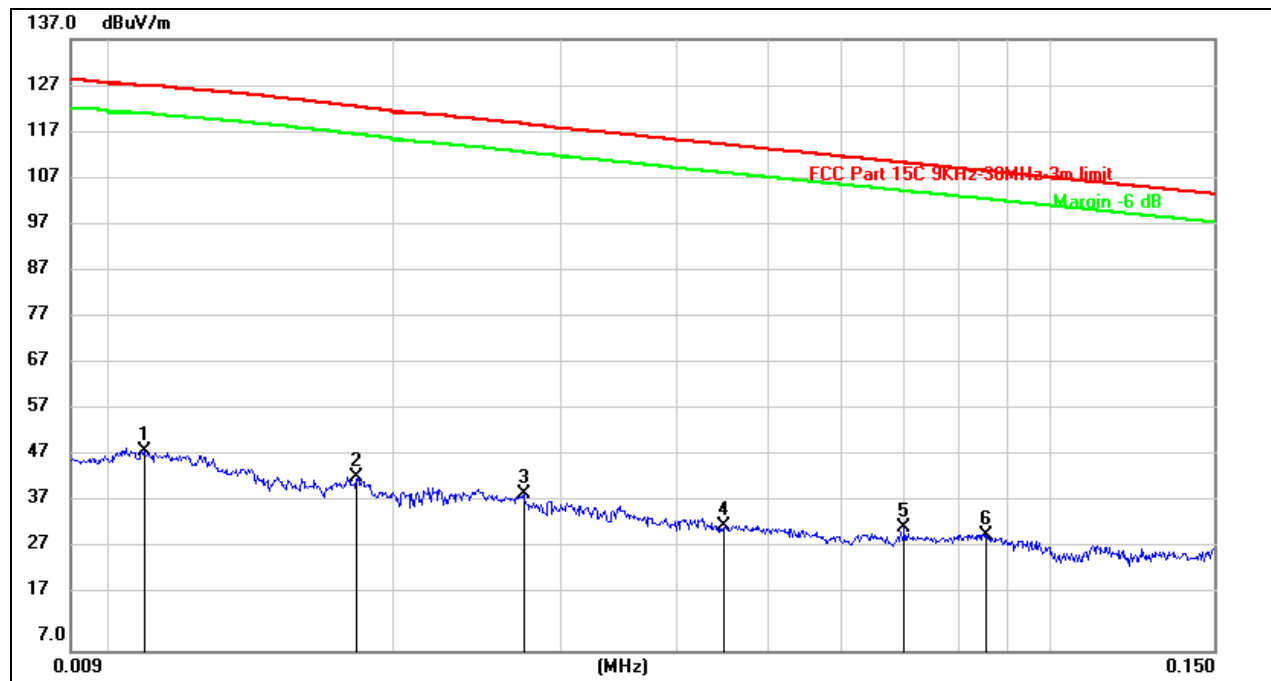
Note: 1. Measurement = Reading Level + Correct Factor.

2. If Peak Result complies with AV and QP limit, AV and QP Result are deemed to comply with AV limit.



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

0.09KHz~ 150KHz



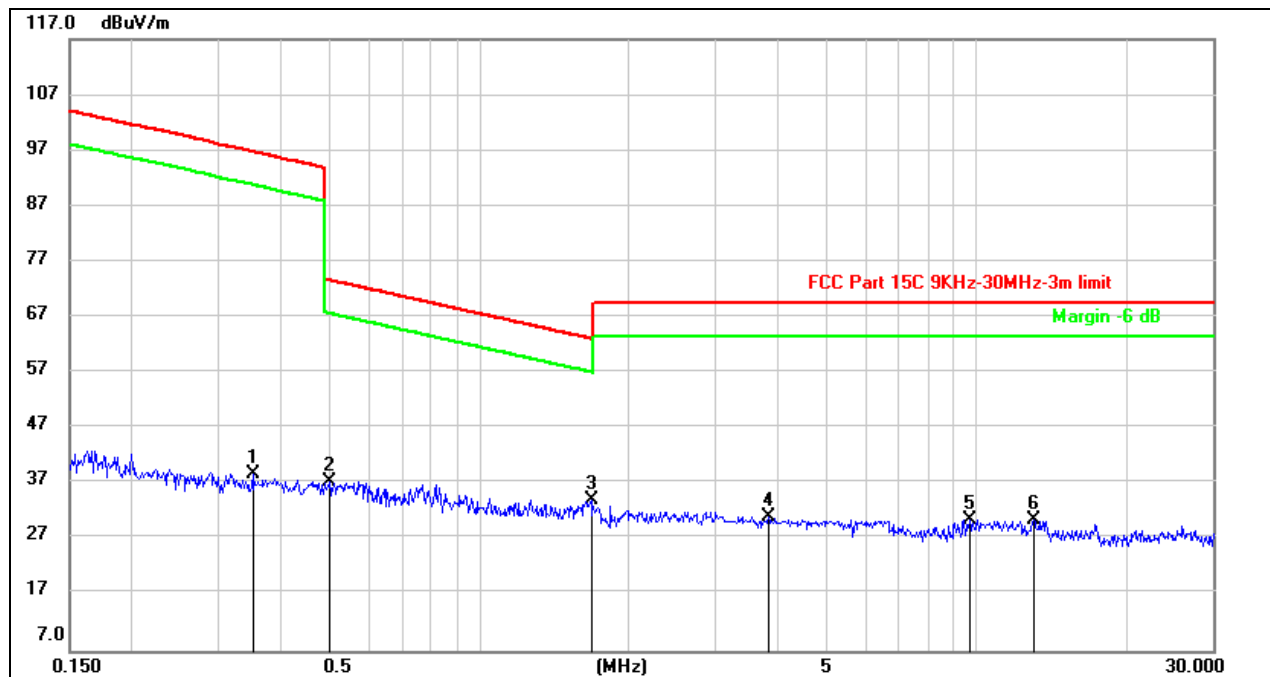
No.	Frequency (KHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	0.0108	29.16	20.22	49.38	127.12	-77.74	peak
2	0.0182	23.45	20.29	43.74	122.66	-78.92	peak
3	0.0274	20.10	20.31	40.41	118.98	-78.57	peak
4	0.0449	13.18	20.31	33.49	114.61	-81.12	peak
5	0.0700	12.90	20.31	33.21	110.70	-77.49	peak
6	0.0855	11.24	20.27	31.51	108.98	-77.47	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	0.3502	18.48	20.29	38.77	96.81	-58.04	peak
2	0.4994	17.09	20.24	37.33	73.65	-36.32	peak
3	1.6800	13.41	20.61	34.02	63.10	-29.08	peak
4	3.8195	10.09	21.03	31.12	69.54	-38.42	peak
5	9.7050	9.47	21.04	30.51	69.54	-39.03	peak
6	13.0571	9.47	20.98	30.45	69.54	-39.09	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.

Note: VAPEL and ASTEC manufacturer's power supply were put into HUAWEI Box 900, HUAWEI Box 700 and HUAWEI Box 500 for testing, and found the VAPEL manufacturer's Power Supply and HUAWEI Box 900 combination is the worst-case configuration.

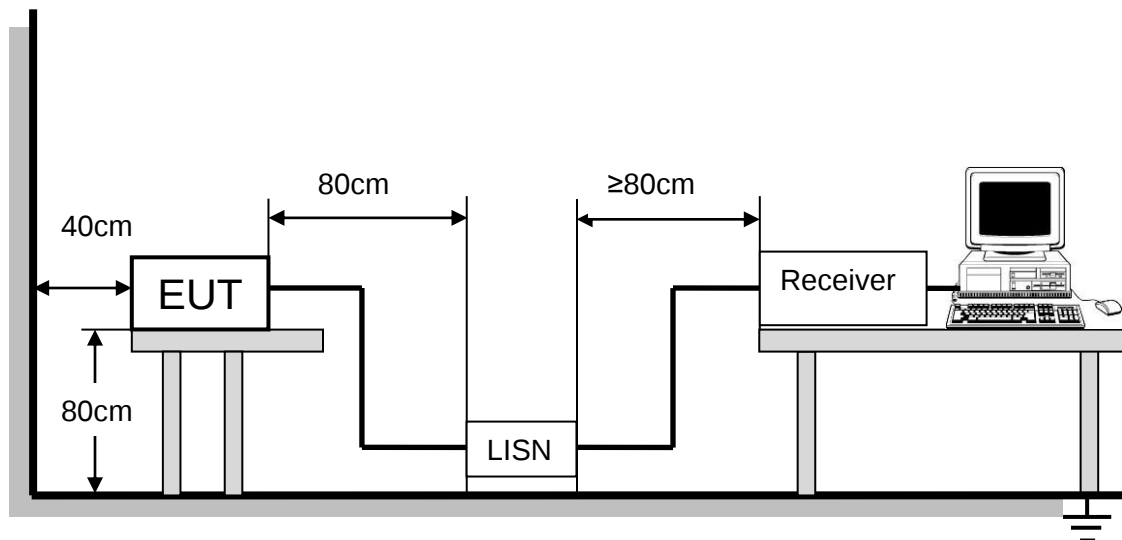
10. AC POWER LINE CONDUCTED EMISSIONS

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	24.3°C	Relative Humidity	55%
Atmosphere Pressure	101kPa	Test Voltage	AC120V

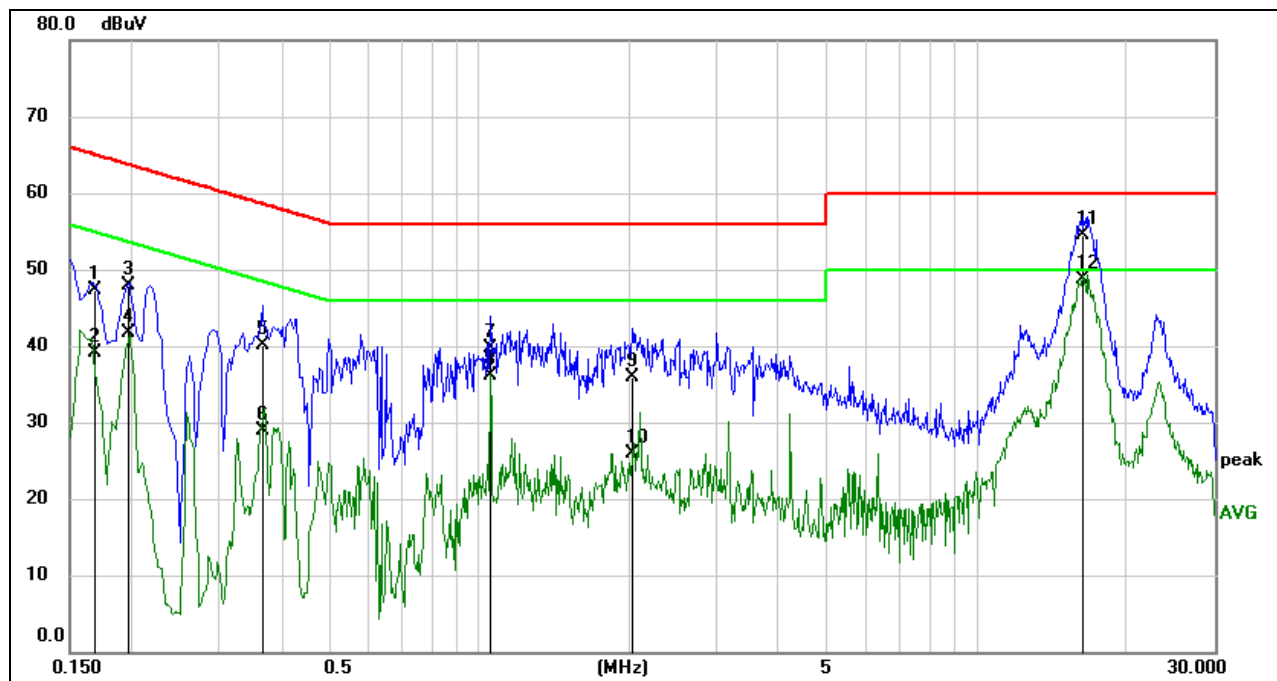


TEST RESULTS

Mode: GFSK

HUAWEI Box 900 with VAPEL manufacturer's power supply (WORST-CASE CONFIGURATION)

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



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	0.1685	37.67	9.62	47.29	65.03	-17.74	QP
2	0.1685	29.51	9.62	39.13	55.03	-15.90	AVG
3	0.1958	38.37	9.62	47.99	63.79	-15.80	QP
4	0.1958	32.04	9.62	41.66	53.79	-12.13	AVG
5	0.3667	30.56	9.63	40.19	58.58	-18.39	QP
6	0.3667	19.25	9.63	28.88	48.58	-19.70	AVG
7	1.0531	30.02	9.63	39.65	56.00	-16.35	QP
8	1.0531	26.50	9.63	36.13	46.00	-9.87	AVG
9	2.0316	26.31	9.65	35.96	56.00	-20.04	QP
10	2.0316	16.26	9.65	25.91	46.00	-20.09	AVG
11	16.3435	44.69	9.84	54.53	60.00	-5.47	QP
12	16.3435	38.87	9.84	48.71	50.00	-1.29	AVG

Note: 1. Result = Reading +Correct Factor.

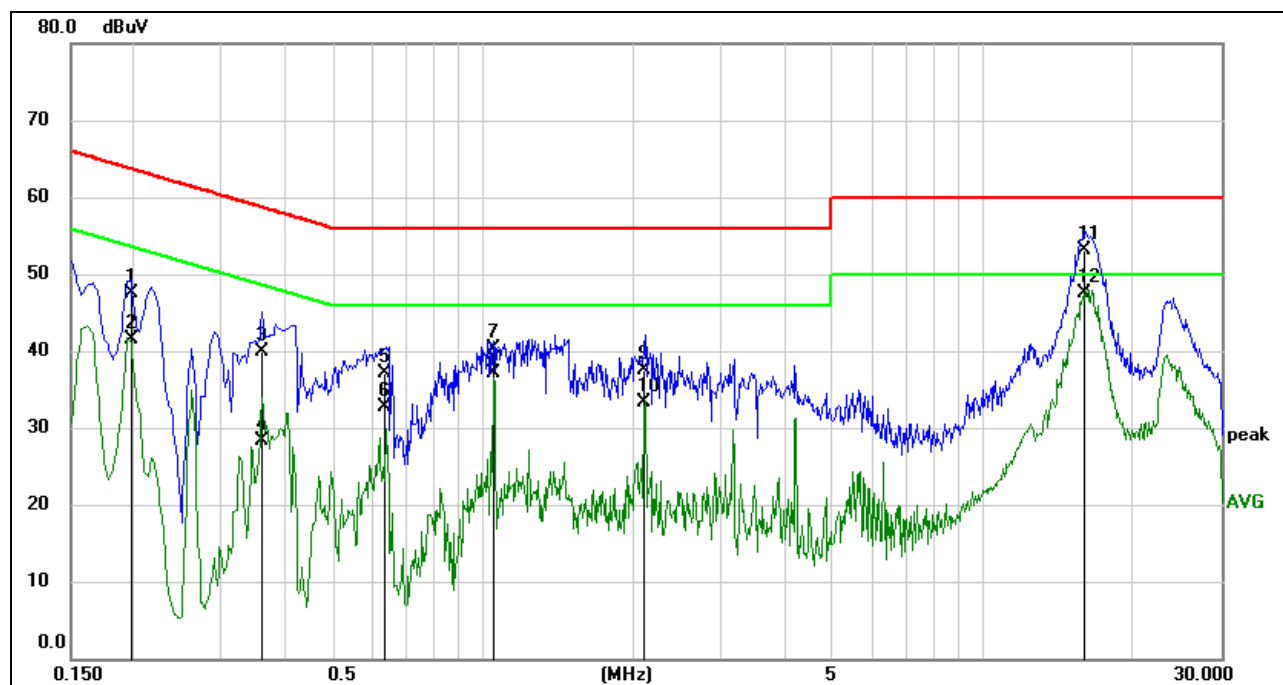
2. If QP Result complies with AV limit, AV Result is deemed to comply with AV limit.

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)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	0.1966	37.83	9.63	47.46	63.75	-16.29	QP
2	0.1966	31.79	9.63	41.42	53.75	-12.33	AVG
3	0.3633	30.19	9.63	39.82	58.65	-18.83	QP
4	0.3633	18.62	9.63	28.25	48.65	-20.40	AVG
5	0.6341	27.37	9.64	37.01	56.00	-18.99	QP
6	0.6341	22.99	9.64	32.63	46.00	-13.37	AVG
7	1.0547	30.69	9.64	40.33	56.00	-15.67	QP
8	1.0547	27.40	9.64	37.04	46.00	-8.96	AVG
9	2.1097	27.94	9.66	37.60	56.00	-18.40	QP
10	2.1097	23.66	9.66	33.32	46.00	-12.68	AVG
11	15.8877	43.34	9.82	53.16	60.00	-6.84	QP
12	15.8877	37.61	9.82	47.43	50.00	-2.57	AVG

Note: 1. Result = Reading +Correct Factor.

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

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

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

Note: VAPEL and ASTEC manufacturer's power supply were put into HUAWEI Box 900, HUAWEI Box 700 and HUAWEI Box 500 for testing, and found the VAPEL manufacturer's Power Supply and HUAWEI Box 900 combination is the worst-case configuration.



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.

ANTENNA CONNECTOR

EUT has a PIFA antenna with an IPEX connector, it is not a standard connector.

ANTENNA GAIN

Compliance.

END OF REPORT