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

CERTIFICATION TEST REPORT

For

LED Projector

MODEL NUMBER: S2

FCC ID: MSQ-S2
IC: 3568A-S2

REPORT NUMBER: 4788623965.3-1

ISSUE DATE: September 3, 2018

Prepared for

ASUSTek Computer Inc.
4F,NO.150,Li-Te Rd. Peitou,Taipei Taiwan

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
--	9/3/2018	Initial Issue	

Summary of Test Results			
Clause	**Test Items**	FCC/IC Rules	Test Results
1	6dB Bandwidth and 99% Bandwidth	FCC 15.247 (a) (2) RSS-247 Clause 5.2 (a)	PASS
2	Peak Conducted Output 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 Bandedge and Spurious Emission	FCC 15.247 (d) RSS-247 Clause 5.5	PASS
5	Radiated Bandedge and Spurious Emission	FCC 15.247 (d) FCC 15.209 FCC 15.205 RSS-247 Clause 5.5 RSS-GEN Clause 8.9	PASS
6	Conducted Emission Test For AC Power Port	FCC 15.207 RSS-GEN Clause 8.8	PASS
7	Antenna Requirement	FCC 15.203 RSS-GEN Clause 8.3	PASS

TABLE OF CONTENTS

1. ATTESTATION OF TEST RESULTS

Applicant Information

Company Name:	ASUSTek Computer Inc.
Address:	4F,NO.150,Li-Te Rd. Peitou,Taipei Taiwan

Manufacturer Information

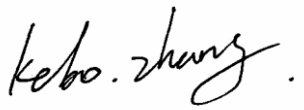
Company Name:	ASUSTek Computer Inc.
Address:	4F,NO.150,Li-Te Rd. Peitou,Taipei Taiwan

EUT Description

Product Name	LED Projector
Model Name	S2
Series model	S2E, S2C, S2M,S2Z
Model difference	The schematic and structure of each model is same, the only difference is that the name of the model is different, but it will not affect the test result.
Date Tested	August 16~ September 1, 2018

APPLICABLE STANDARDS	
STANDARD	**TEST RESULTS**
CFR 47 Part 15 Subpart C	PASS
ISED RSS-247 Issue 2	PASS
ISED RSS-GEN Issue 5	PASS

Tested By:



Kebo Zhang
Engineer

Checked By:

Shawn Wen
Laboratory Leader

Approved By:

Stephen Guo

Laboratory Manager

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with FCC CFR 47 Part 2, FCC CFR 47 Part 15, KDB558074 D01 15.247 Meas Guidance v05, ANSI C63.10-2013，KDB414788 D01 Radiated Test Site v01r01, RSS-247 Issue 2 and 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. **IAS (Lab Code: TL-702)** UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch. has demonstrated compliance with ISO/IEC Standard 17025:2005, General requirements for the competence of testing and calibration laboratories **FCC (FCC Designation No.: CN1187)** UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch. Has been recognized to perform compliance testing on equipment subject to the Commission's Delcaration of Conformity (DoC) and Certification rules **IC(Company No.: 21320)** UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch. has been registered and fully described in a report filed with ISED. The Company Number is 21320. **VCCI (Registration No.: G-20019, R-20004, C-20012 and T-20011)** UL Verification Services (Guangzhou) Co., Ltd. Song Shan Lake Branch. has been assessed and proved to be in compliance with VCCI, the Membership No. is 3793. Facility Name: Chamber D, the VCCI registration No. is G-20019 and R-20004 Shielding Room B , the VCCI registration No. is C-20012 and T-20011

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

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

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

4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognize national standards.

4.2. MEASUREMENT UNCERTAINTY

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

Test Item	Uncertainty
Uncertainty for Conduction emission test	2.90dB
Uncertainty for Radiation Emission test(include Fundamental emission) (9KHz-30MHz)	2.2dB
Uncertainty for Radiation Emission test(include Fundamental emission) (30MHz-1GHz)	4.52dB
Uncertainty for Radiation Emission test (1GHz to 26GHz)(include Fundamental emission)	5.04dB(1-6GHz)
	5.30dB (6GHz-18Gz)
	5.23dB (18GHz-26Gz)
Note: This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.	

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

Equipment	LED Projector
Model Name	S2
Series model	S2E, S2C,S2M,S2Z
Model difference	The schematic and structure of each model is same, the only difference is that the name of the model is different, but it will not affect the test result.
Radio Technology	IEEE802.11b/g/n HT20
Operation frequency	IEEE 802.11b: 2412MHz—2462MHz IEEE 802.11g: 2412MHz—2462MHz IEEE 802.11n HT20: 2412MHz—2462MHz
Modulation	IEEE 802.11b: DSSS(CCK) IEEE 802.11g: OFDM(64QAM, 16QAM, QPSK, BPSK) IEEE 802.11n HT20: OFDM (64QAM, 16QAM, QPSK,BPSK)
Power Supply	AC120V/60Hz

5.2. MAXIMUM OUTPUT POWER

Frequency Range (MHz)	Number of Transmit ANTs (NTX)	IEE Std. 802.11	Channel Number	Max Output Power (dBm)
2412-2462	1	b	1-11[11]	16.21
2412-2462	1	g	1-11[11]	15.11
2412-2462	1	n HT20	1-11[11]	14.60

5.3. CHANNEL LIST

Channel List for 802.11b/g/n (20 MHz)					
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	2412	5	2432	9	2452
2	2417	6	2437	10	2457
3	2422	7	2442	11	2462
4	2427	8	2447		

5.4. TEST CHANNEL CONFIGURATION

Test Mode	Test Channel	Frequency
WiFi TX(802.11b)	CH 1, CH 6, CH 11	2412MHz, 2437MHz, 2462MHz
WiFi TX(802.11g)	CH 1, CH 6, CH 11	2412MHz, 2437MHz, 2462MHz
WiFi TX(802.11n HT20)	CH 1, CH 6, CH 11	2412MHz, 2437MHz, 2462MHz

5.5. THE WORSE CASE CONFIGURATIONS

The Worse Case Power Setting Parameter under 2400 ~ 2483.5MHz Band							
Test Software		adb shell					
Modulation Mode	Transmit Antenna Number	Test Channel					
		NCB: 20MHz			NCB: 40MHz		
		CH 1	CH 7	CH 13	CH 3	CH 7	CH 11
802.11b	1	17	17	17	N/A		
802.11g	1	16	16	16			
802.11n HT20	1	16	16	16			

5.6. 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	AC 120V/60Hz
	VH	N/A

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

5.7. DESCRIPTION OF AVAILABLE ANTENNAS

Antenna No.	Frequency (MHz)	Antenna Type	Antenna Gain (dBi)
Antenna 1	2412-2462	FPCB	1.8

IEE Std. 802.11	Transmit and Receive Mode
802.11b	1TX/1RX
802.11g	1TX/1RX
802.11n HT20	1TX/1RX
Note: 1. WIFI 2.4G& WIFI5G can't transmit simultaneously. (declared by client)	

5.8. WORST-CASE CONFIGURATIONS

IEE Std. 802.11	Modulation Technology	Modulation Type	Data Rate (Mbps)	Worst Case (Mbps)
b	DSSS	CCK	11/5.5/2/1	1
g	OFDM	BPSK, QPSK, 16QAM, 64QAM	54/48/36/24/18/12/9/6	6
n HT20	OFDM	BPSK, QPSK, 16QAM, 64QAM	(MCS0~MCS7)	MCS0

5.9. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

Item	Equipment	Brand Name	Model Name	P/N
1	Laptop	ThinkPad	T460S	SL10K24796 JS

I/O CABLES

Cable No	Port	Connector Type	Cable Type	Cable Length(m)	Remarks
1	USB	N/A	N/A	0.5	N/A

ACCESSORY

Item	Accessory	Brand Name	Model Name	Description
1	AC ADAPTER	ASUS	ADP-65GD D	Input: 100-240 Vac, 50/60 Hz, 1.5A Output: 19Vdc, 3.42A

TEST SETUP

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

SETUP DIAGRAM FOR TESTS

5.10. MEASURING INSTRUMENT AND SOFTWARE USED

Conducted Emissions						
Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
☑	EMI Test Receiver	R&S	ESR3	101961	Dec.12, 2017	Dec.11, 2018
☑	Two-Line V-Network	R&S	ENV216	101983	Dec.12, 2017	Dec.11, 2018
☑	Artificial Mains Networks	Schwarzbeck	NSLK 8126	8126465	Dec.12, 2017	Dec.11, 2018
Software						
Used	Description		Manufacturer	Name	Version	
☑	Test Software for Conducted disturbance		UL	Antenna port	Ver. 7.2	
Radiated Emissions						
Used	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
☑	MXE EMI Receiver	KESIGHT	N9038A	MY56400036	Dec.12, 2017	Dec.11, 2018
☑	Hybrid Log Periodic Antenna	TDK	HLP-3003C	130960	Jan.09, 2016	Jan.09, 2019
☑	Preamplifier	HP	8447D	2944A09099	Dec.12, 2017	Dec.11, 2018
☑	EMI Measurement Receiver	R&S	ESR26	101377	Dec.12, 2017	Dec.11, 2018
☑	Horn Antenna	TDK	HRN-0118	130939	Jan. 09, 2016	Jan. 09, 2019
☑	High Gain Horn Antenna	Schwarzbeck	BBHA-9170	691	Jan.06, 2016	Jan.06, 2019
☑	Preamplifier	TDK	PA-02-0118	TRS-305-00066	Dec.12, 2017	Dec.11, 2018
☑	Preamplifier	TDK	PA-02-2	TRS-307-00003	Dec.12, 2017	Dec.11, 2018
☑	Loop antenna	Schwarzbeck	1519B	00008	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.	Last Cal.	Next Cal.
☑	Spectrum Analyzer	Keysight	N9030A	MY55410512	Dec.12, 2017	Dec.11, 2018
☑	Power Meter	Keysight	N9031A	MY55416024	Dec.12, 2017	Dec.11, 2018
☑	Power Sensor	Keysight	N9323A	MY55440013	Dec.12, 2017	Dec.11, 2018
☑	Power Sensor	Keysight	U2021XA	MY57030004	Dec.12, 2017	Dec.11, 2018

6. MEASUREMENT METHODS

No.	Test Item	KDB Name	Section
1	6dB Bandwidth	KDB 558074 D01 DTS Meas Guidance v05	8.2
2	Peak Output Power	KDB 558074 D01 DTS Meas Guidance v05	8.3.1.3/8.3.2.3
3	Power Spectral Density	KDB 558074 D01 DTS Meas Guidance v05	8.4
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

7. ANTENNA PORT TEST RESULTS

7.1. ON TIME AND DUTY CYCLE

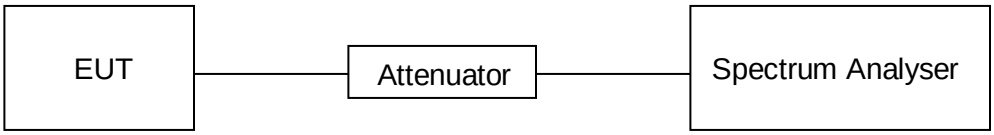
LIMITS

None; for reporting purposes only

PROCEDURE

KDB 558074 Zero-Span Spectrum Analyzer Method

TEST SETUP



TEST ENVIRONMENT

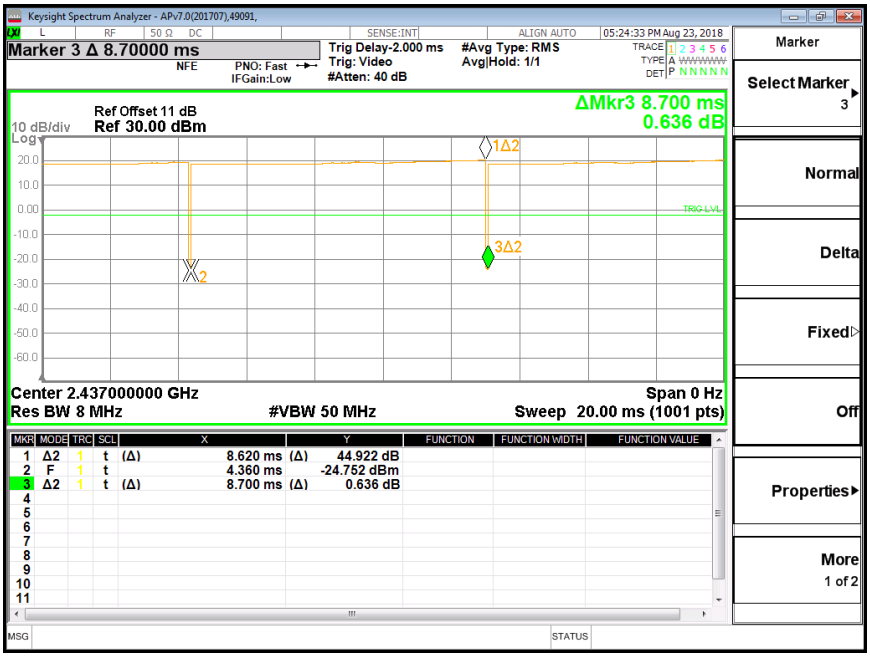
Temperature	24.2°C	Relative Humidity	58%
Atmosphere Pressure	101kPa	Test Voltage	AC 120V

RESULTS

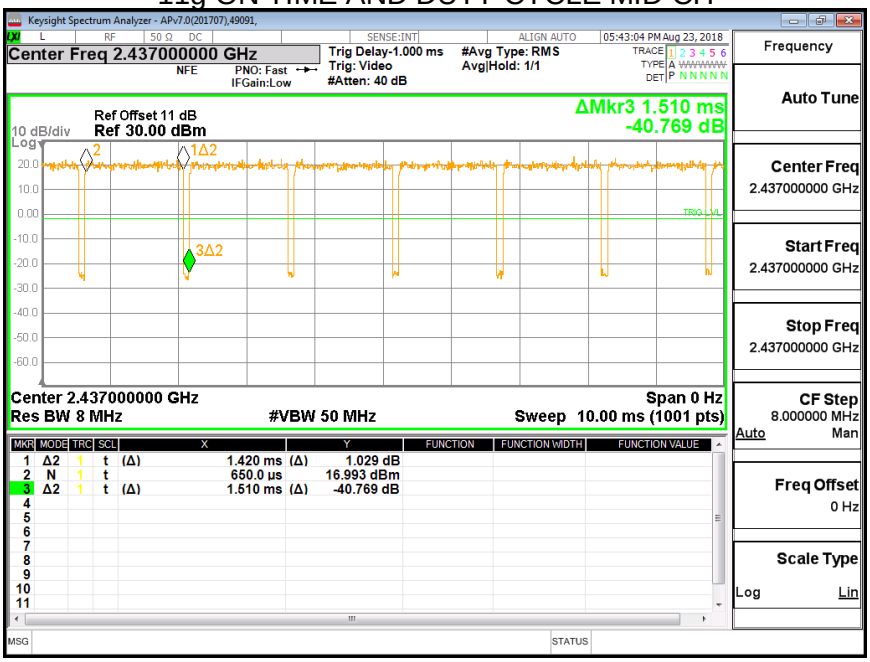
Mode	On Time (msec)	Period (msec)	Duty Cycle x (Linear)	Duty Cycle (%)	Duty Cycle Correction Factor (db)	1/B Minimum VBW (KHz)
11b	8.620	8.700	0.9908	99.08	0.040	1
11g	1.420	1.510	0.9404	94.04	0.267	1
11n20	1.330	1.420	0.9366	93.66	0.284	1

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

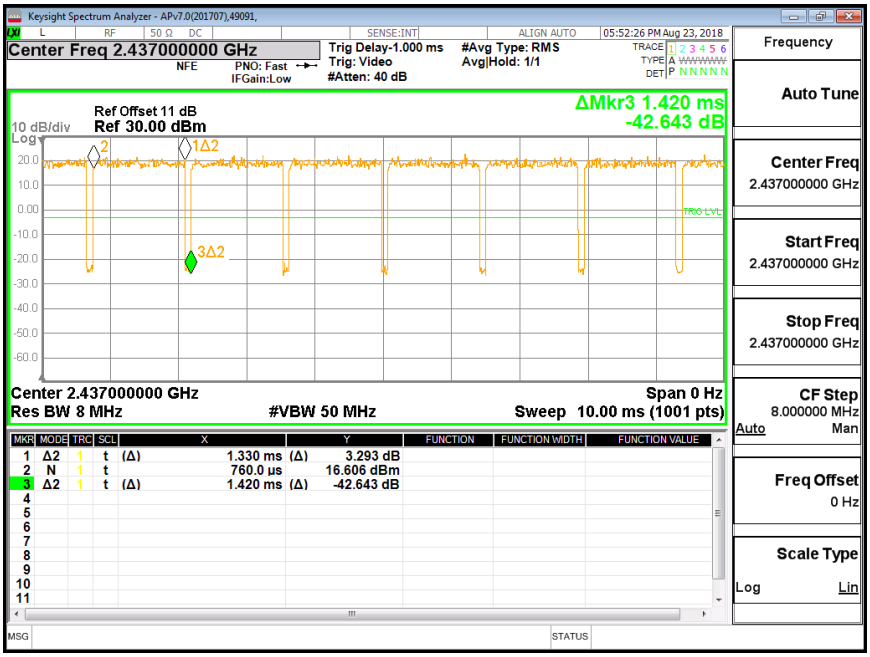
11b ON TIME AND DUTY CYCLE MID CH



11g ON TIME AND DUTY CYCLE MID CH



11n20 ON TIME AND DUTY CYCLE MID CH



7.2. 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 5.1 (a)	6 dB Bandwidth	>= 500KHz	2400-2483.5
RSS-Gen Clause 6.6	99% Bandwidth	For reporting purposes only.	2400-2483.5

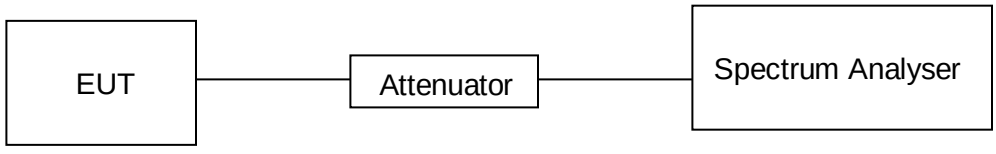
TEST PROCEDURE

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 6dB Bandwidth :100K For 99% Bandwidth :1% to 5% of the occupied bandwidth
VBW	For 6dB Bandwidth : ≥3 × RBW For 99% Bandwidth : approximately 3×RBW
Trace	Max hold
Sweep	Auto couple

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

TEST SETUP

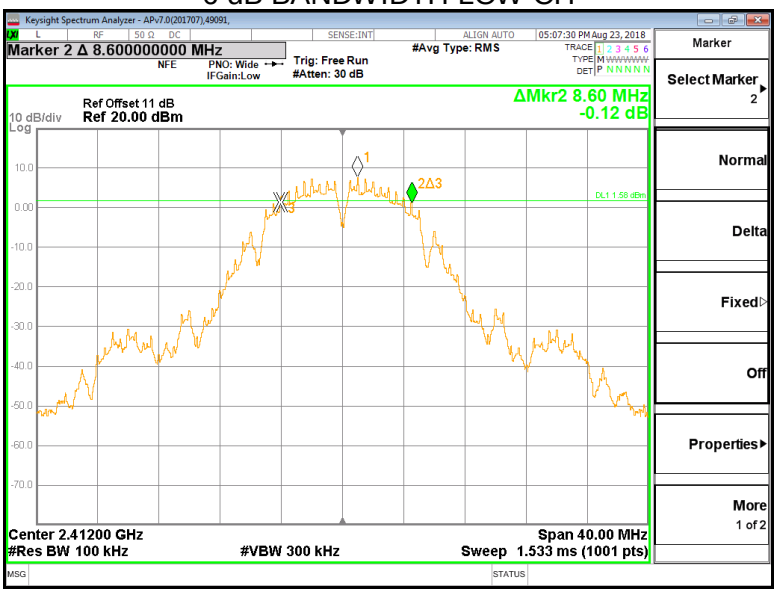


RESULTS

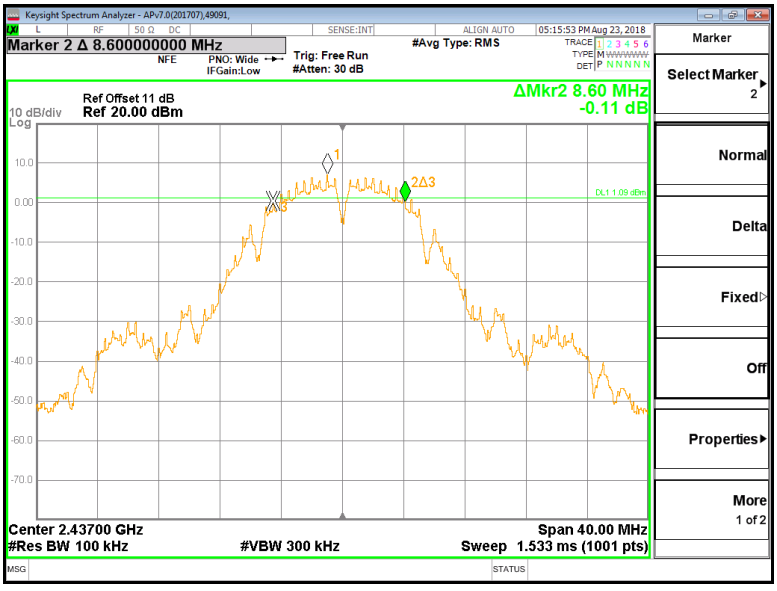
7.2.1. 802.11b MODE

Frequency (MHz)	6dB bandwidth (MHz)	99% bandwidth (MHz)	Limit For 6dB (kHz)	Result
2412	8.60	12.022	500	Pass
2437	8.60	12.030	500	Pass
2462	9.08	12.073	500	Pass

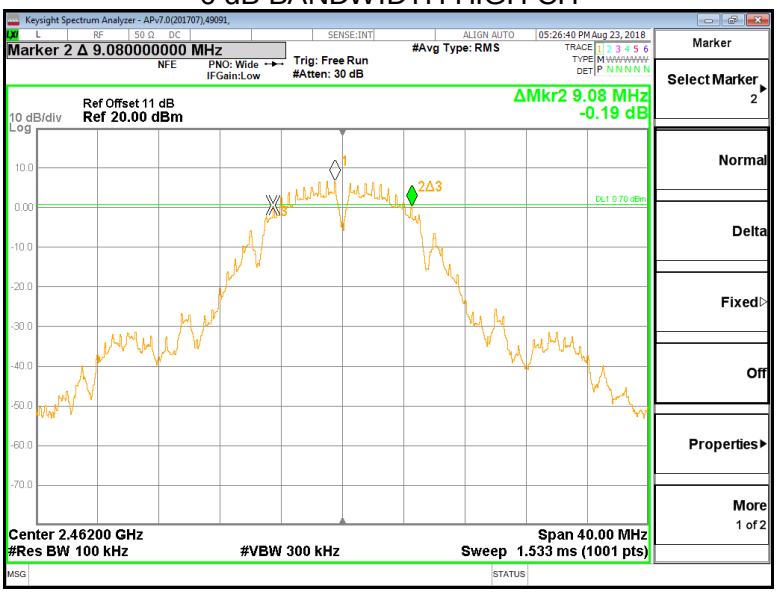
6 dB BANDWIDTH LOW CH



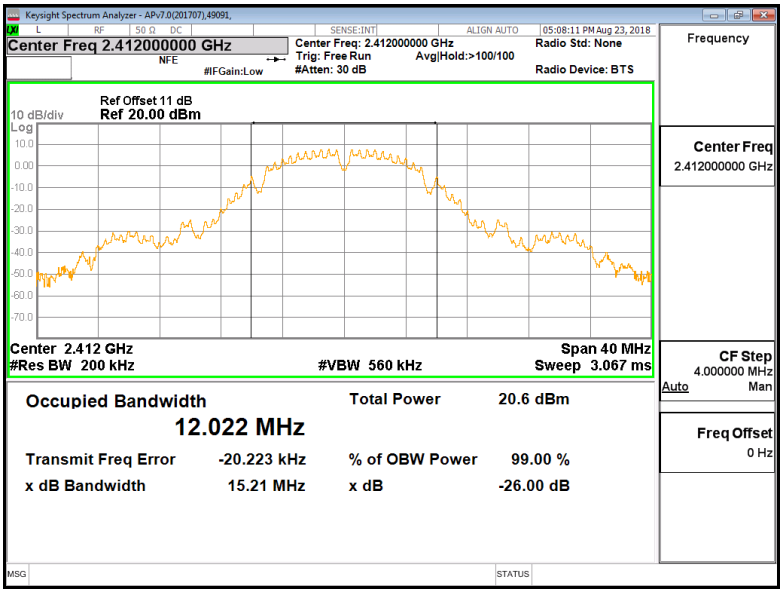
6 dB BANDWIDTH MID CH



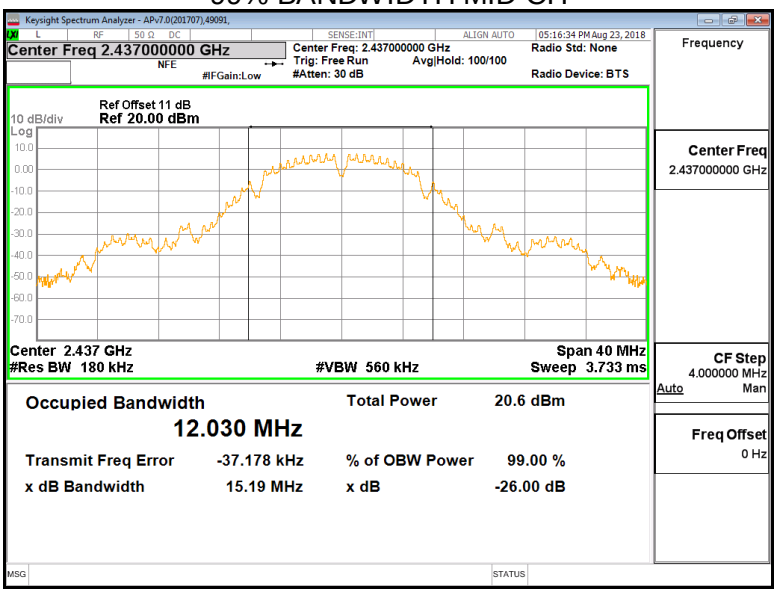
6 dB BANDWIDTH HIGH CH



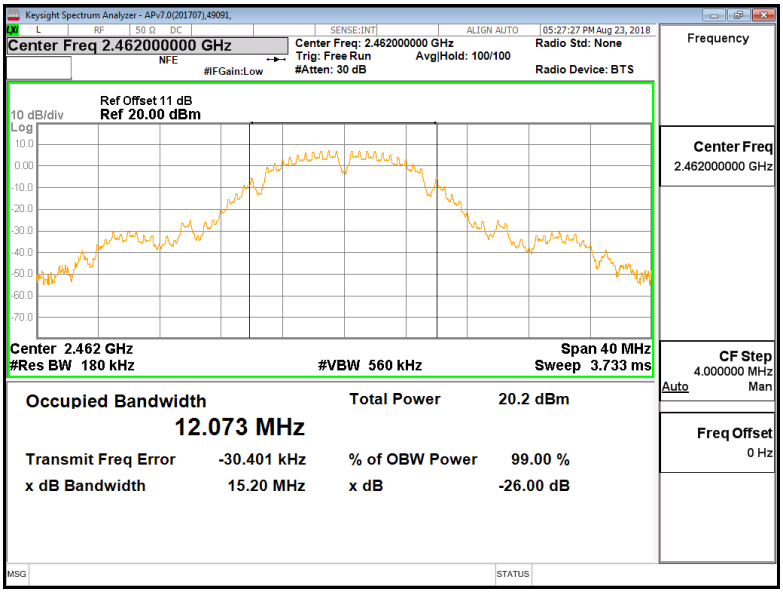
99% BANDWIDTH LOW CH



99% BANDWIDTH MID CH



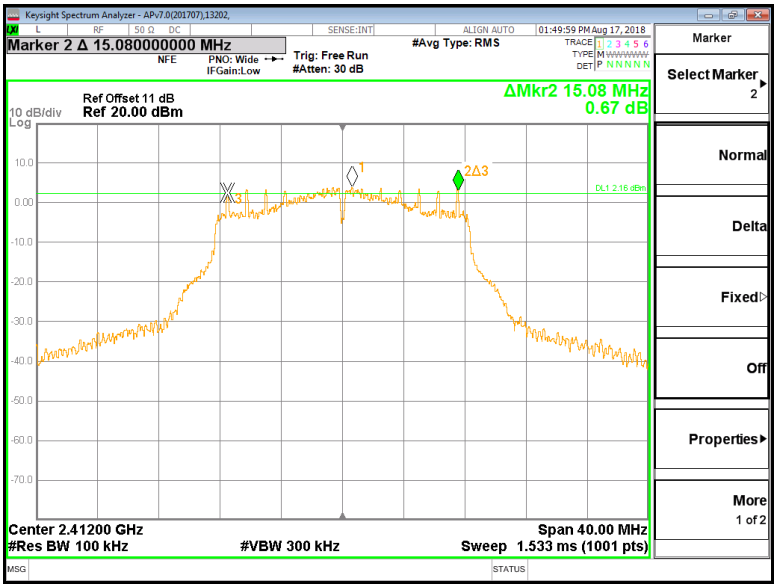
99% BANDWIDTH HIGH CH



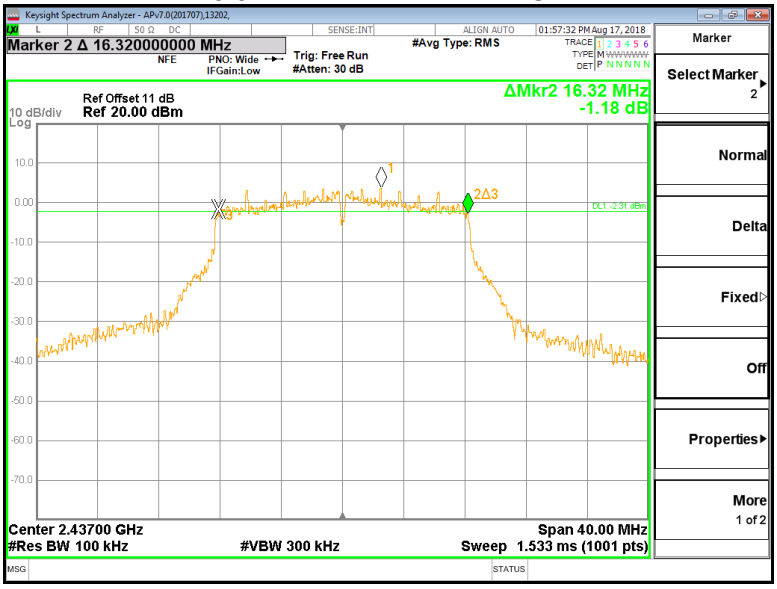
7.2.2. 802.11g MODE

Frequency (MHz)	6dB bandwidth (MHz)	99% bandwidth (MHz)	Limit For 6dB (kHz)	Result
2412	15.08	16.705	500	Pass
2437	16.32	17.058	500	Pass
2462	16.04	16.796	500	Pass

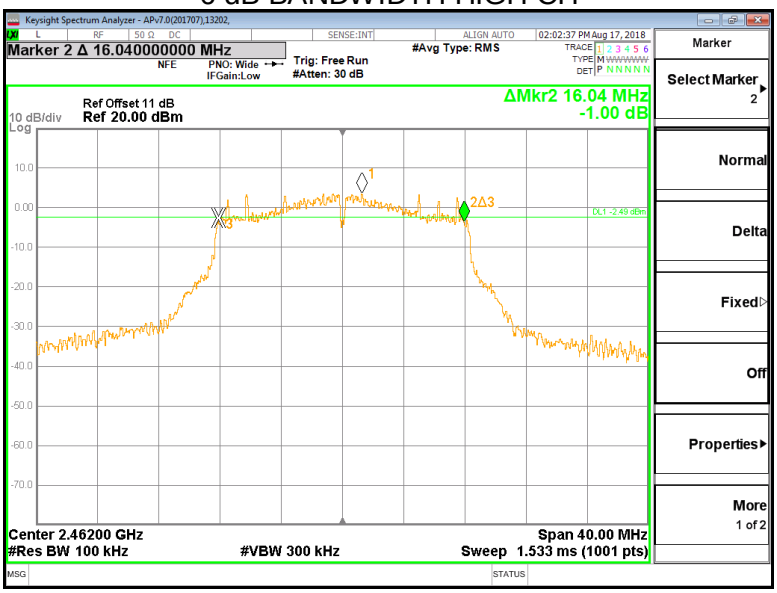
6 dB BANDWIDTH LOW CH



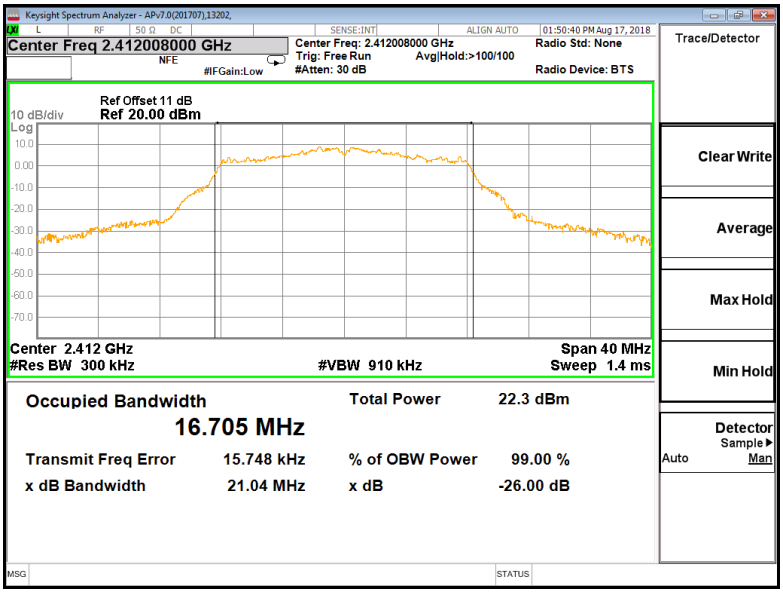
6 dB BANDWIDTH MID CH



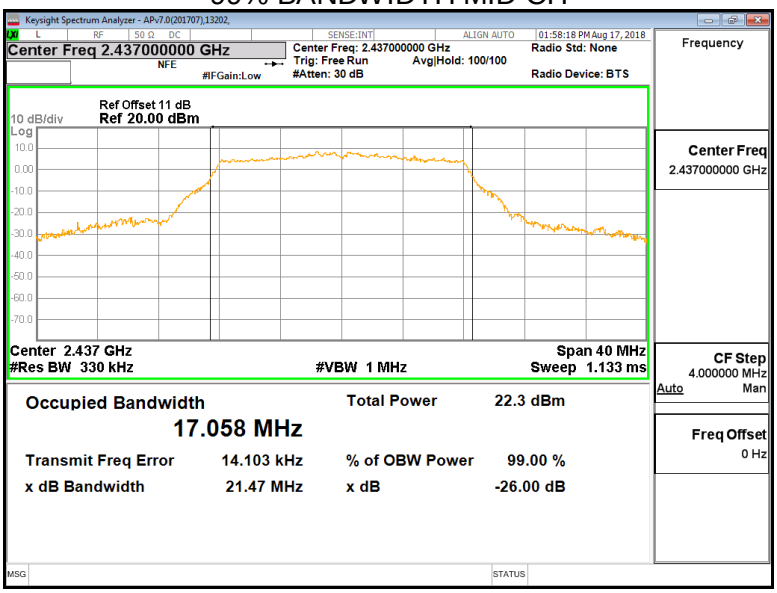
6 dB BANDWIDTH HIGH CH



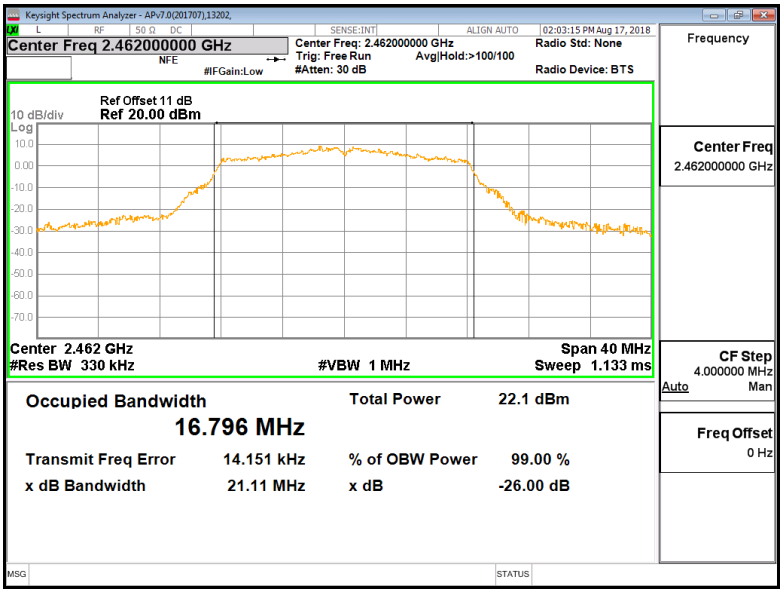
99% BANDWIDTH LOW CH



99% BANDWIDTH MID CH



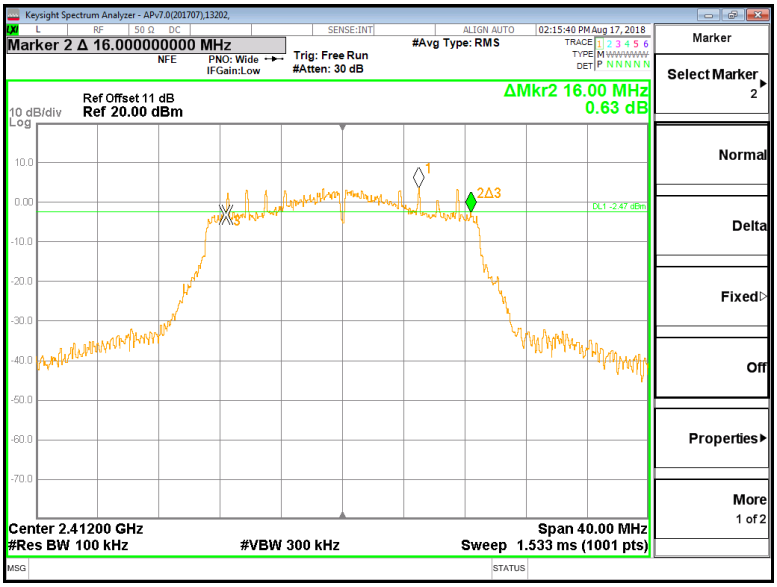
99% BANDWIDTH HIGH CH



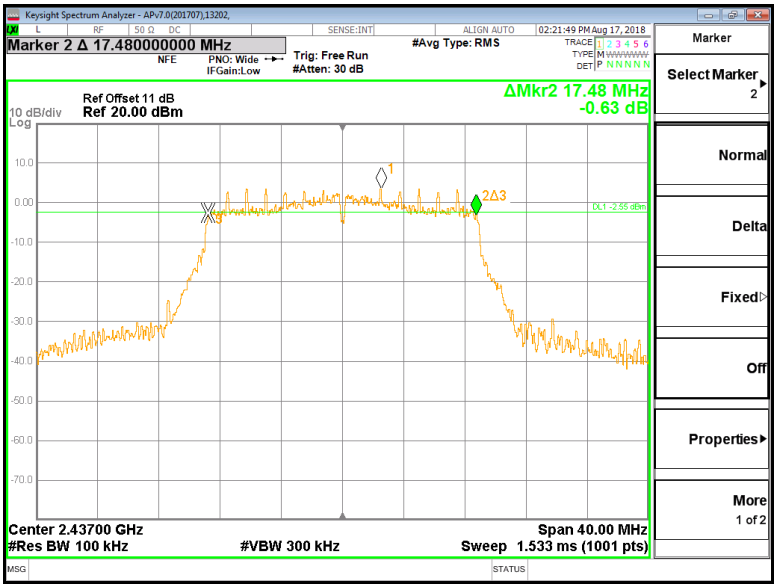
7.2.3. 802.11n20 MODE

Frequency (MHz)	6dB bandwidth (MHz)	99% bandwidth (MHz)	Limit For 6dB (kHz)	Result
2412	16.00	17.787	500	Pass
2437	17.48	18.107	500	Pass
2462	15.52	17.843	500	Pass

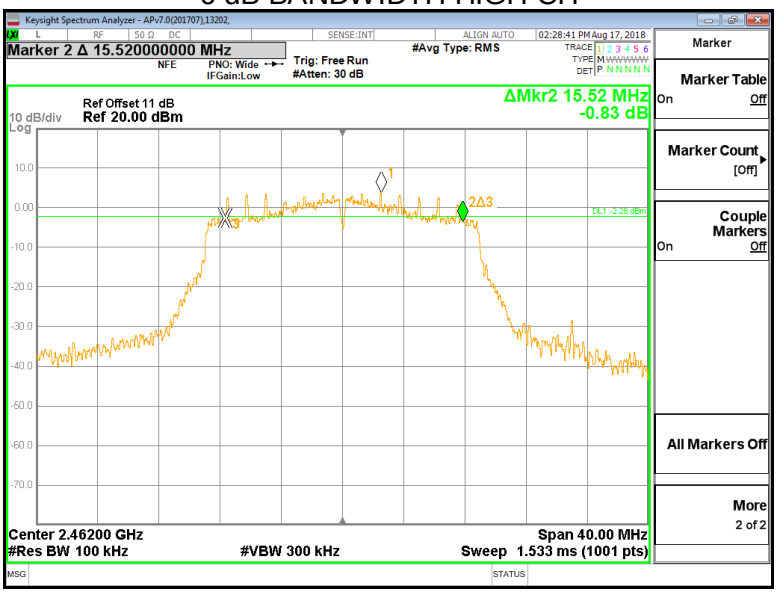
6 dB BANDWIDTH LOW CH



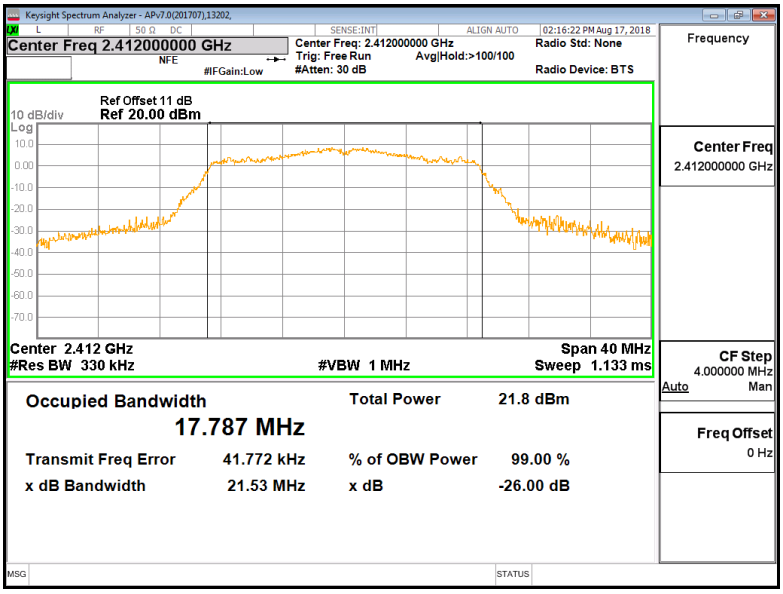
6 dB BANDWIDTH MID CH



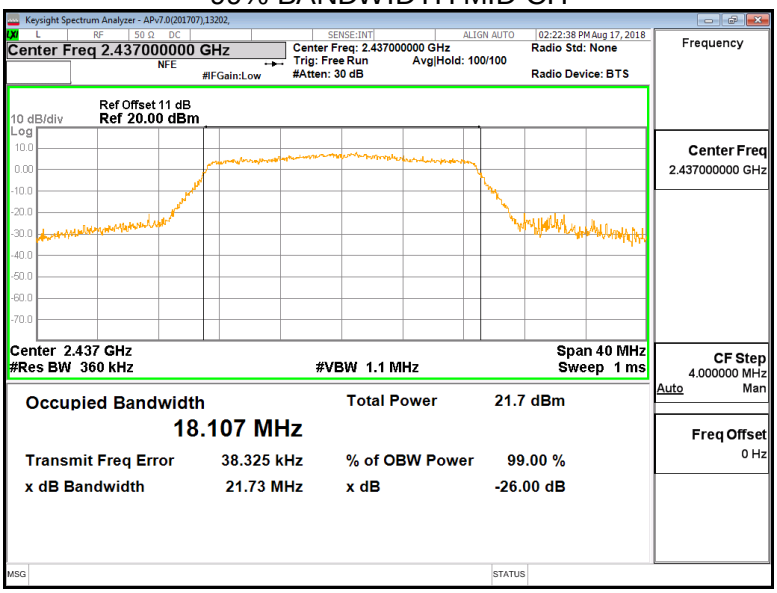
6 dB BANDWIDTH HIGH CH



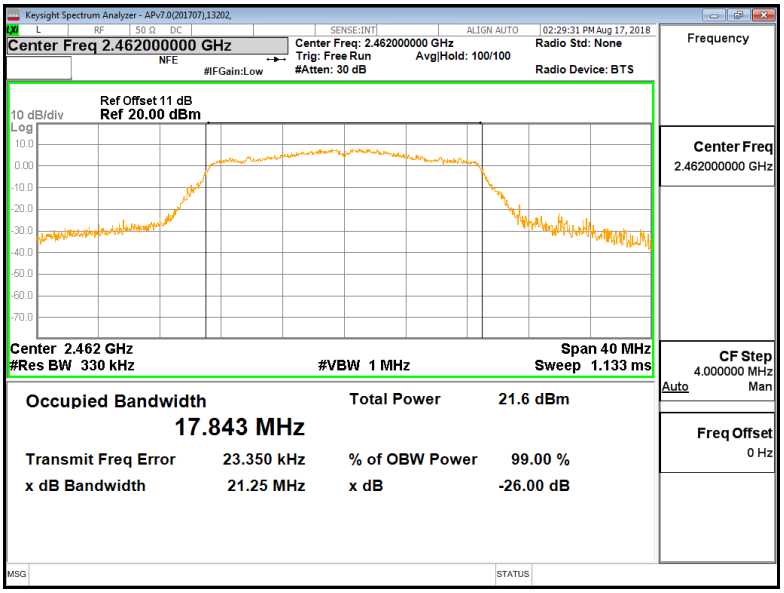
99% BANDWIDTH LOW CH



99% BANDWIDTH MID CH



99% BANDWIDTH HIGH CH



7.3. PEAK CONDUCTED OUTPUT POWER

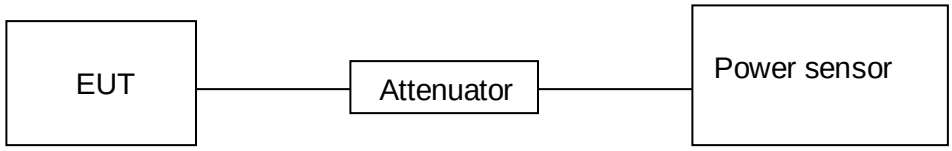
LIMITS

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

7.3.1. 802.11b MODE

Mode	Frequency (MHz)	ANT	Maximum PK Conducted Output Power (dBm)		Result
			Single	Total	
802.11b	2412	1	19.10	N/A	PASS
	2437	1	19.28		
	2462	1	19.47		

Mode	Frequency (MHz)	ANT	Maximum AVG Conducted Output Power (dBm)		Result
			Single	Total	
802.11b	2412	1	16.15	N/A	PASS
	2437	1	16.21		
	2462	1	16.07		

7.3.2. 802.11g MODE

Mode	Frequency (MHz)	ANT	Maximum PK Conducted Output Power (dBm)		Result
			Single	Total	
802.11g	2412	1	24.78	N/A	PASS
	2437	1	24.06		
	2462	1	25.07		

Mode	Frequency (MHz)	ANT	Maximum AVG Conducted Output Power (dBm)		Result
			Single	Total	
802.11g	2412	1	15.08	N/A	PASS
	2437	1	14.97		
	2462	1	15.11		

7.3.3. 802.11n HT20 MODE

Mode	Frequency (MHz)	ANT	Maximum PK Conducted Output Power (dBm)		Result
			Single	Total	
802.11n20	2412	1	25.80	NA	PASS
	2437	1	25.72		
	2462	1	25.69		

Mode	Frequency (MHz)	ANT	Maximum AVG Conducted Output Power (dBm)		Result
			Single	Total	
802.11n20	2412	1	14.53	NA	PASS
	2437	1	14.60		
	2462	1	14.50		

7.4. 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

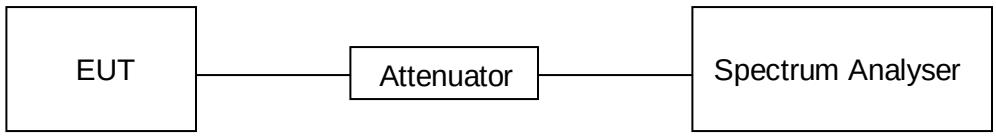
TEST PROCEDURE

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

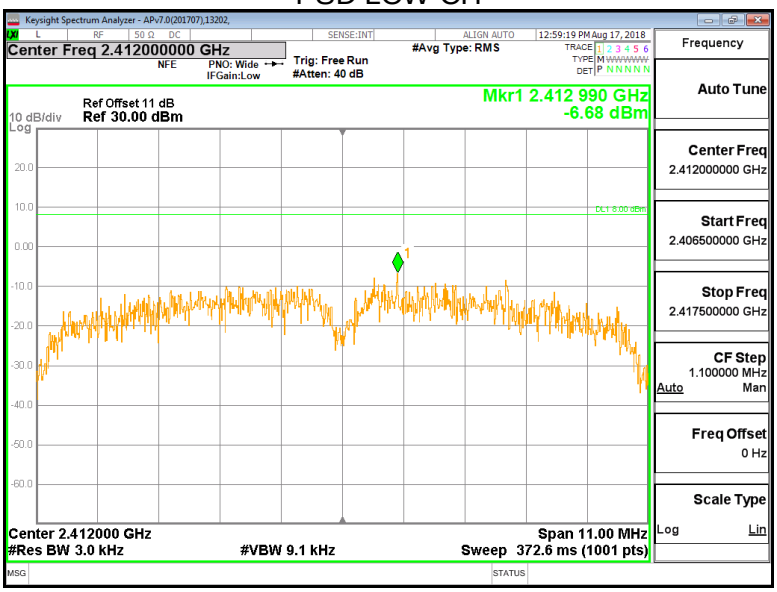


RESULTS

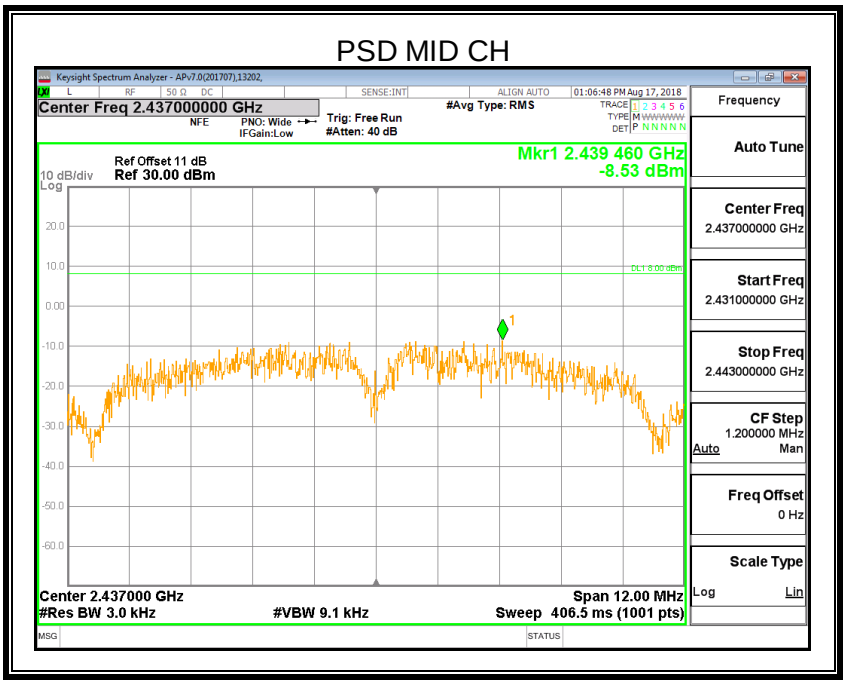
7.4.1. 802.11b MODE

Frequency (MHz)	ANT	Power Spectral Density (dBm/3kHz)		Limit (dBm/3kHz)
		Single	Total	
2412	1	-6.68	N/A	8
2437	1	-8.53		
2462	1	-8.92		

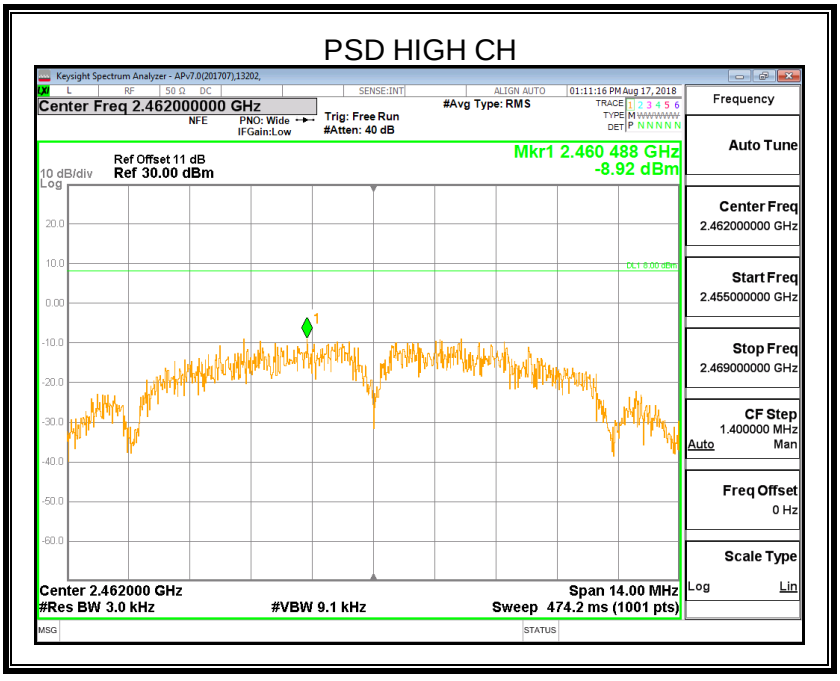
PSD LOW CH



PSD MID CH



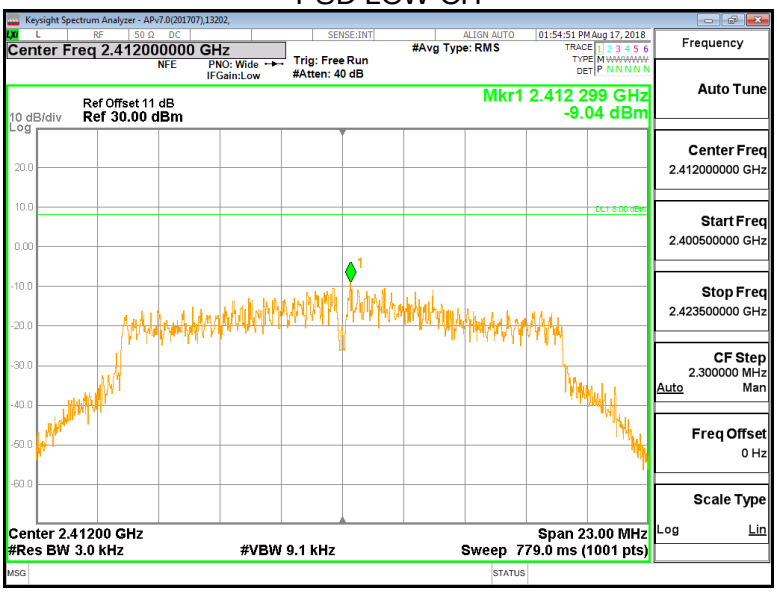
PSD HIGH CH



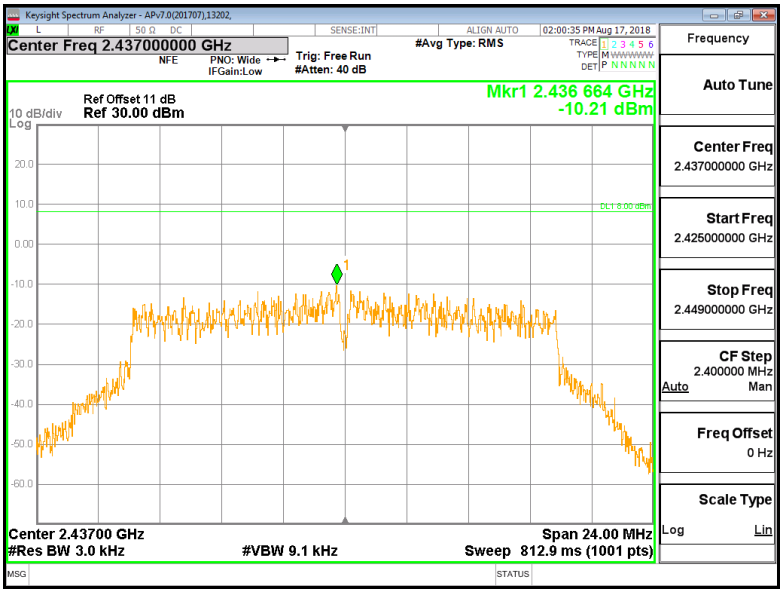
7.4.2. 802.11g MODE

Frequency (MHz)	ANT	Power Spectral Density (dBm/3kHz)		Limit (dBm/3kHz)
		Single	Total	
2412	1	-9.04	N/A	8
2437	1	-10.21		
2462	1	-9.85		

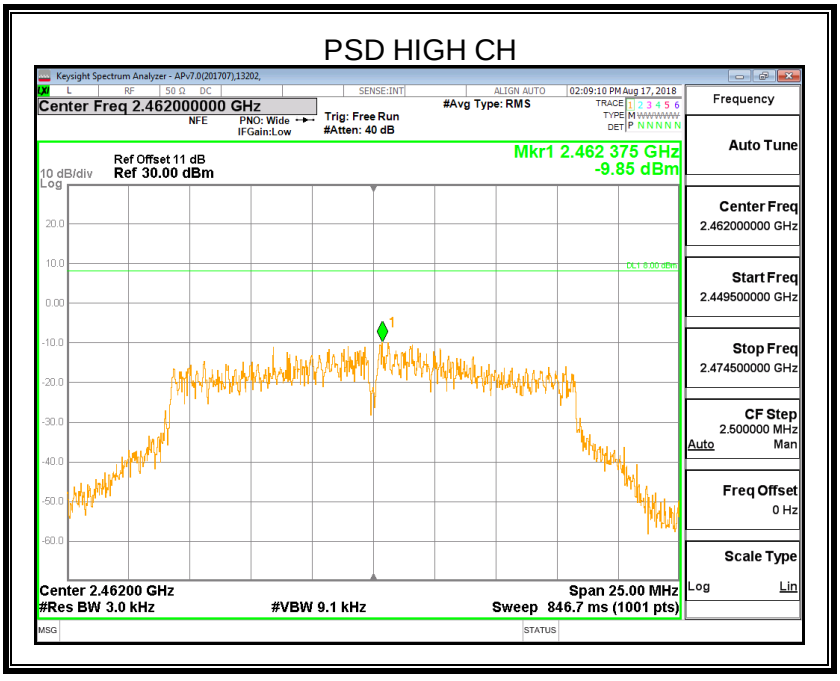
PSD LOW CH



PSD MID CH



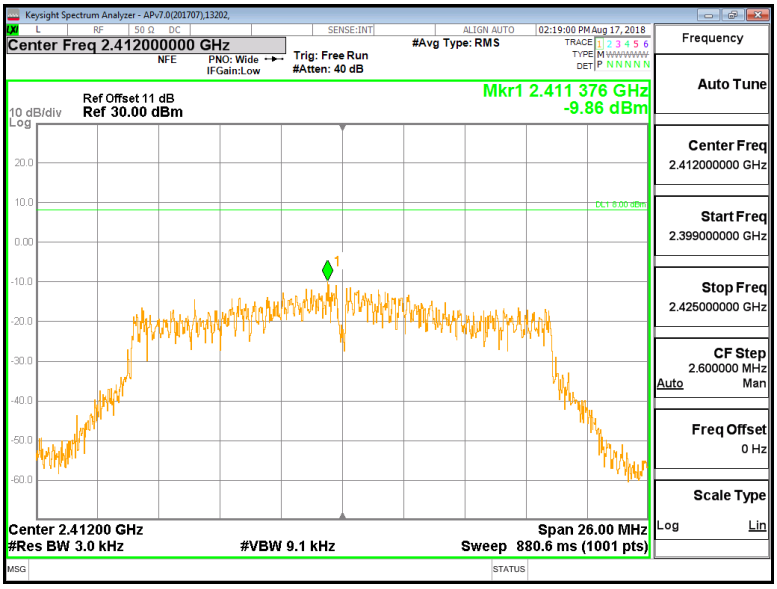
PSD HIGH CH



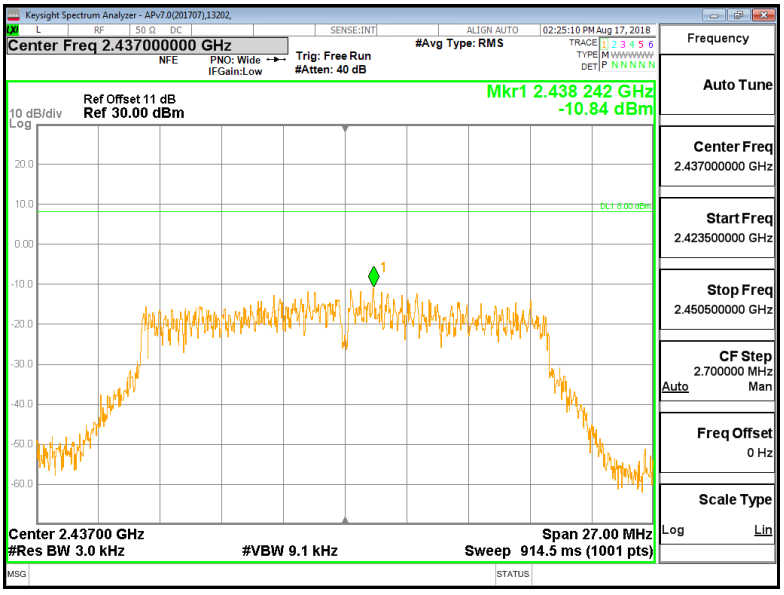
7.2.2 802.11n20 MODE

Frequency (MHz)	ANT	Power Spectral Density (dBm/3kHz)		Limit (dBm/3kHz)
		Single	Total	
2412	1	-9.86	NA	8
2437	1	-10.84		
2462	1	-9.70		

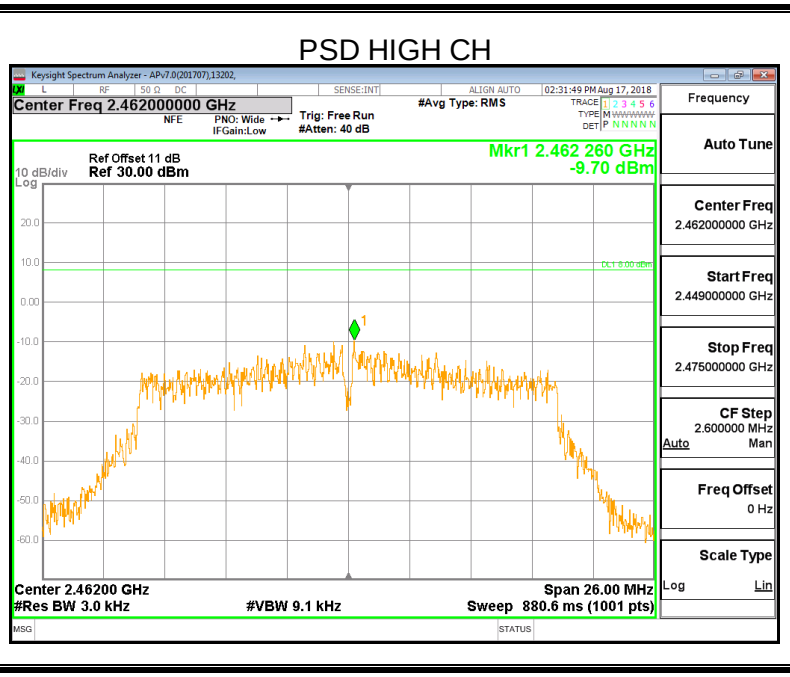
PSD LOW CH



PSD MID CH



PSD HIGH CH



7.5. 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:

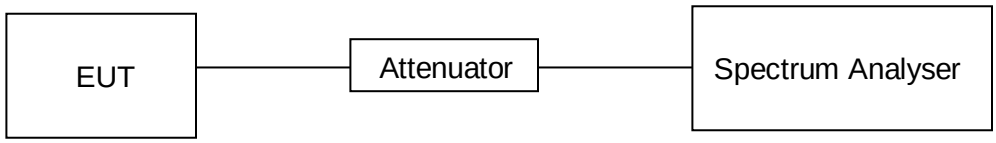
Center Frequency	The center frequency of the channel under test
Detector	Peak
RBW	100K
VBW	≥3 × RBW
Span	1.5 x DTS bandwidth
Trace	Max hold
Sweep time	Auto couple.

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

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

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

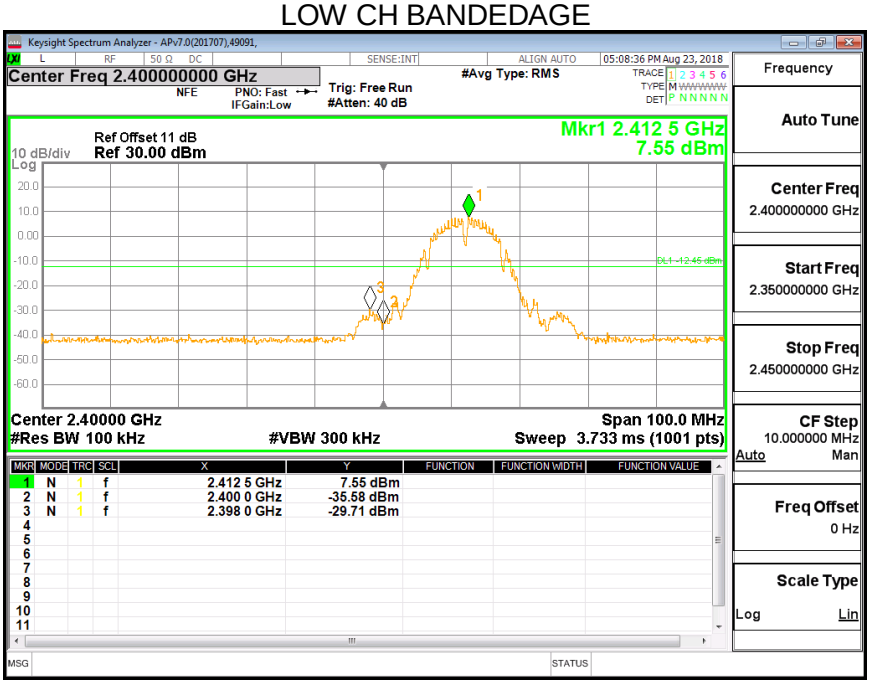
TEST SETUP



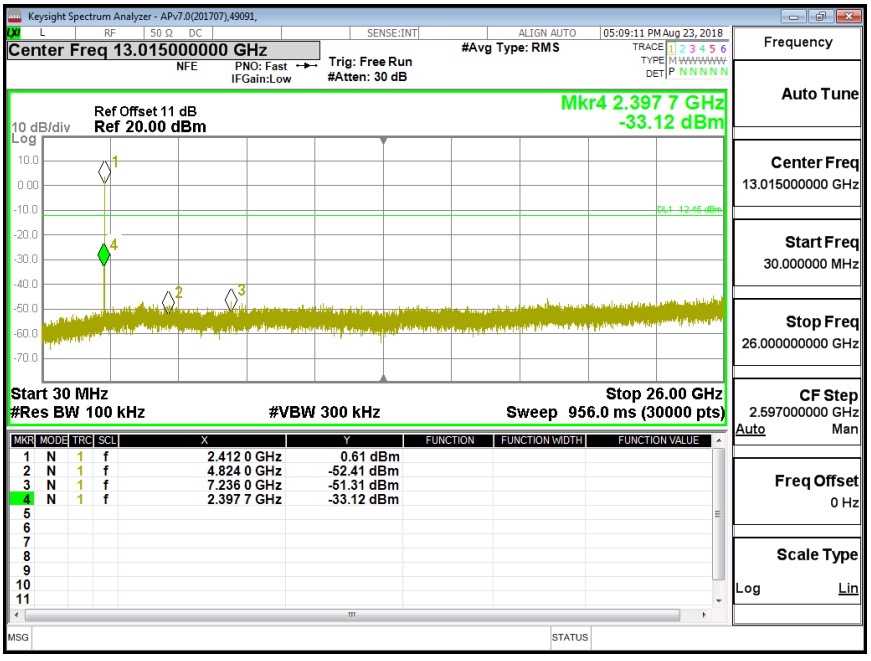
RESULTS

7.5.1. 802.11b MODE

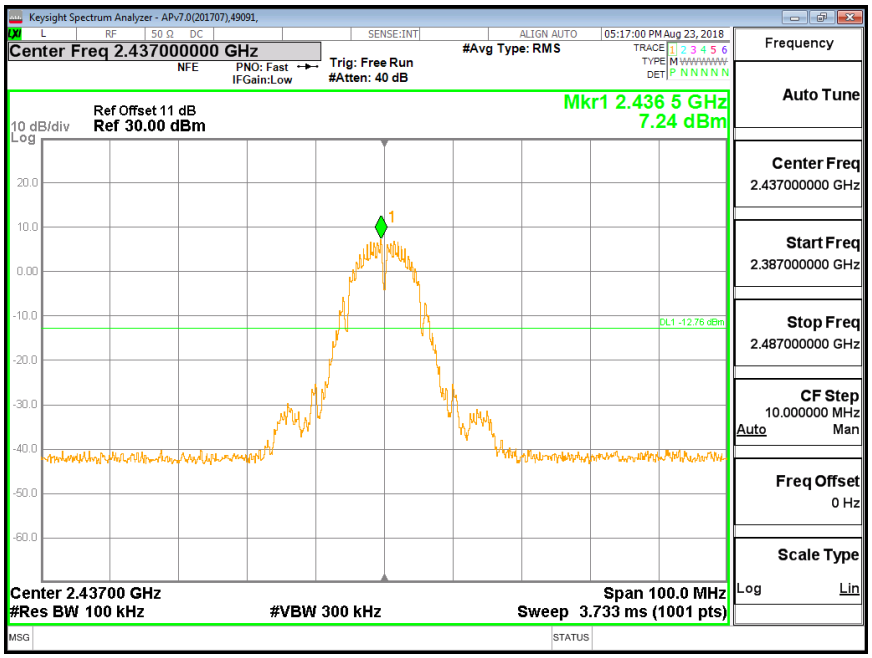
LOW CH BANDEDAGE



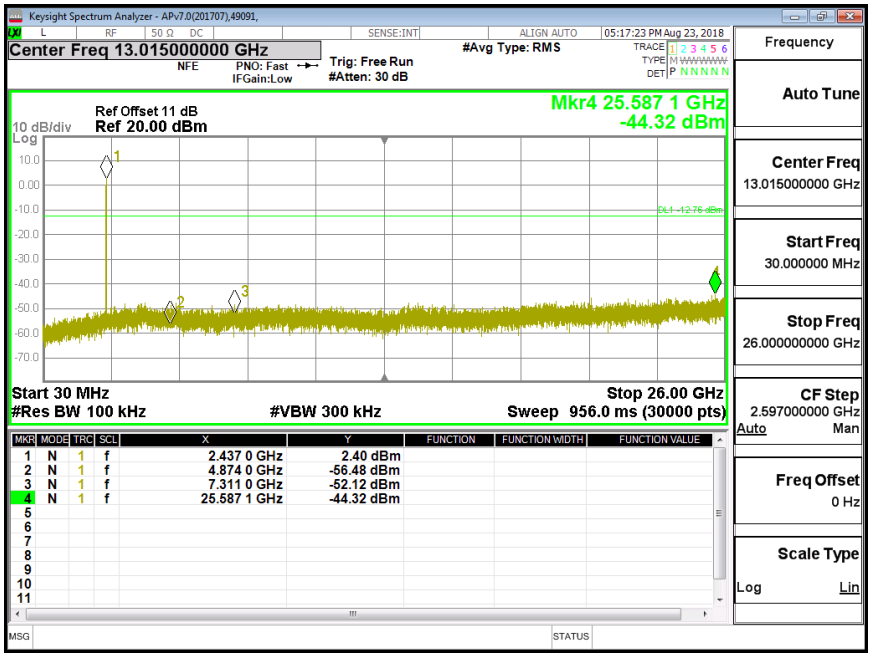
LOW CH SPURIOUS EMISSIONS



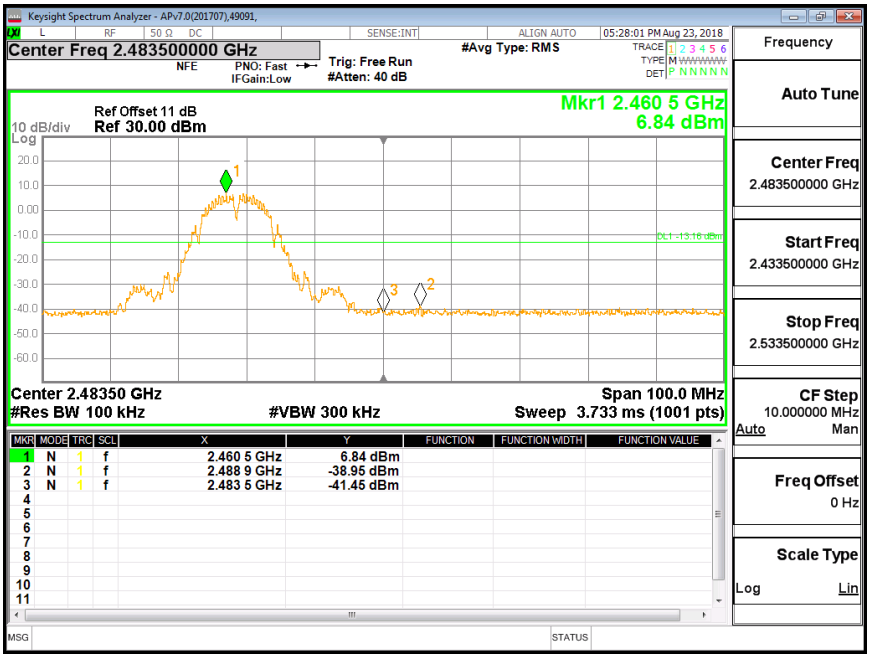
MID CH BANDEDAGE



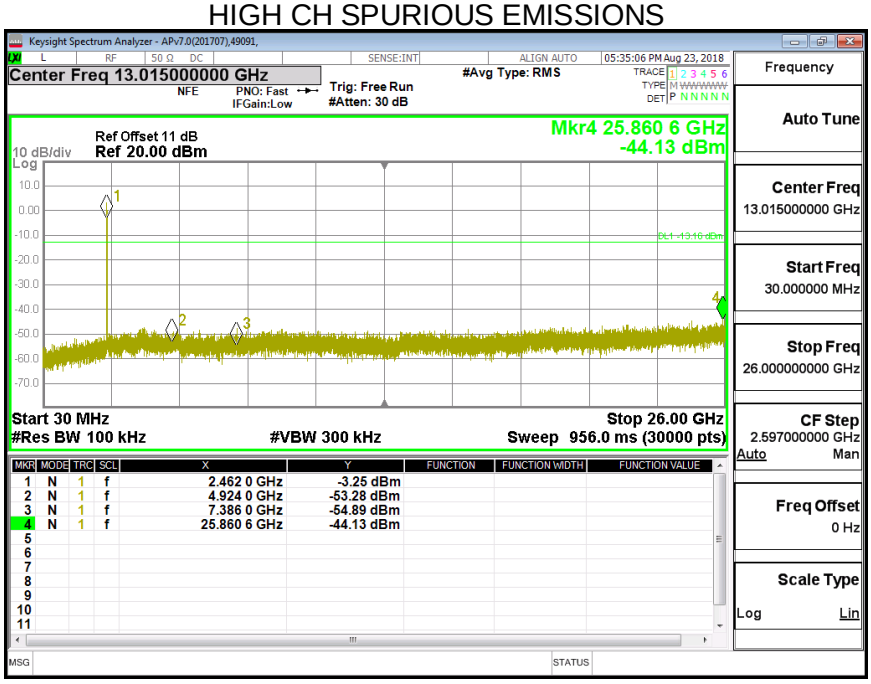
MID CH SPURIOUS EMISSIONS



HIGH CH BANDEDAGE

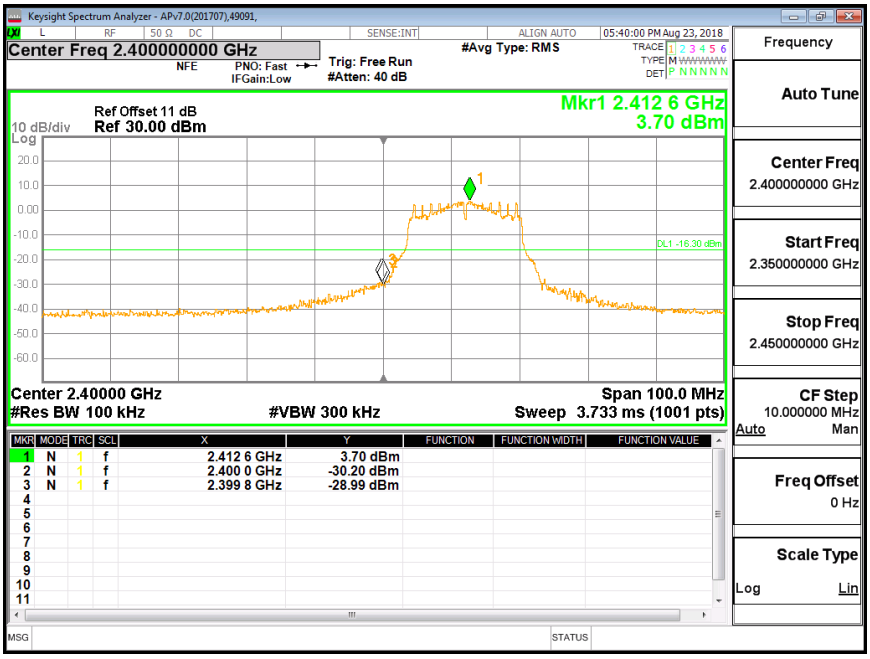


HIGH CH SPURIOUS EMISSIONS

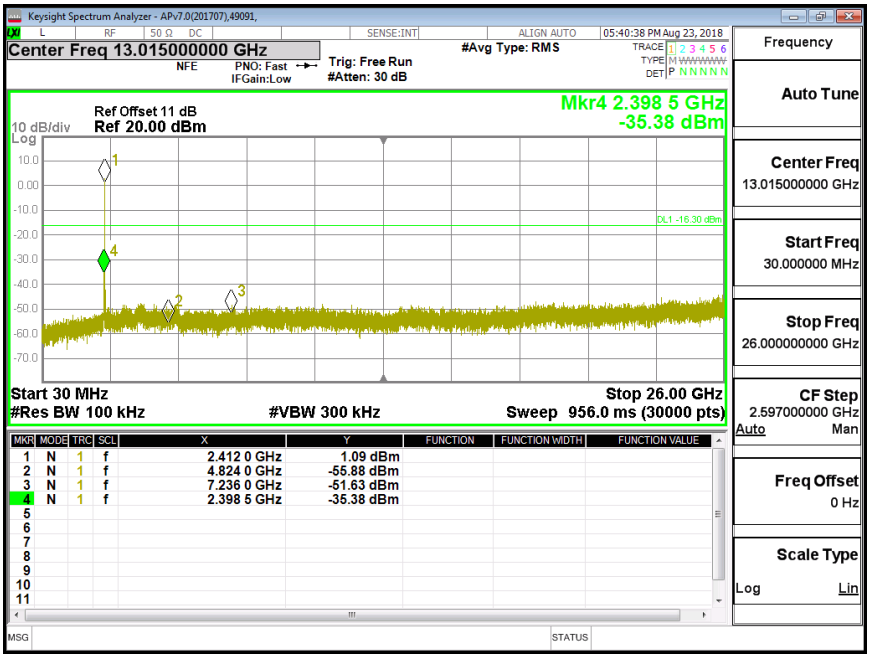


7.5.2. 802.11g MODE

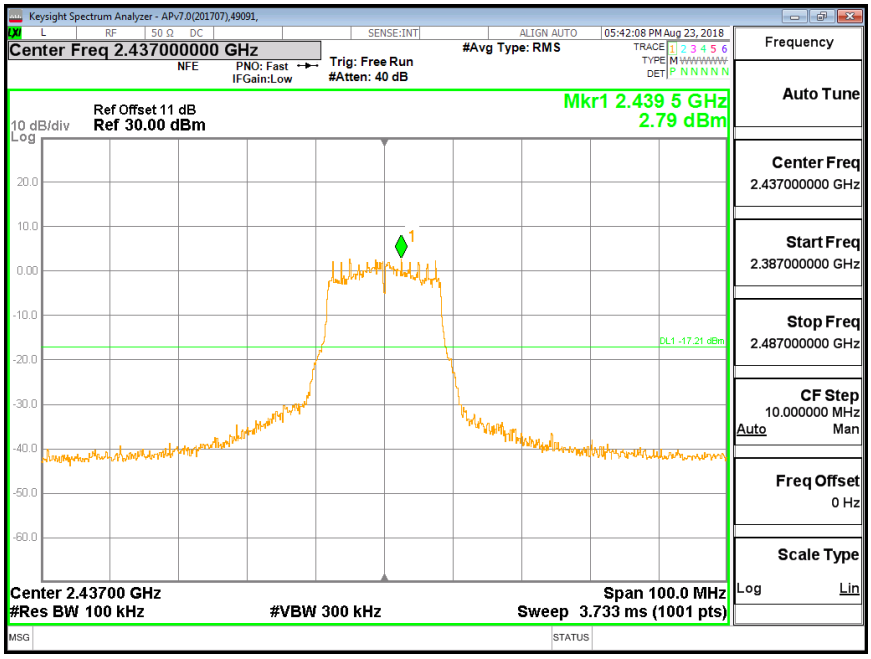
LOW CH BANDEDAGE



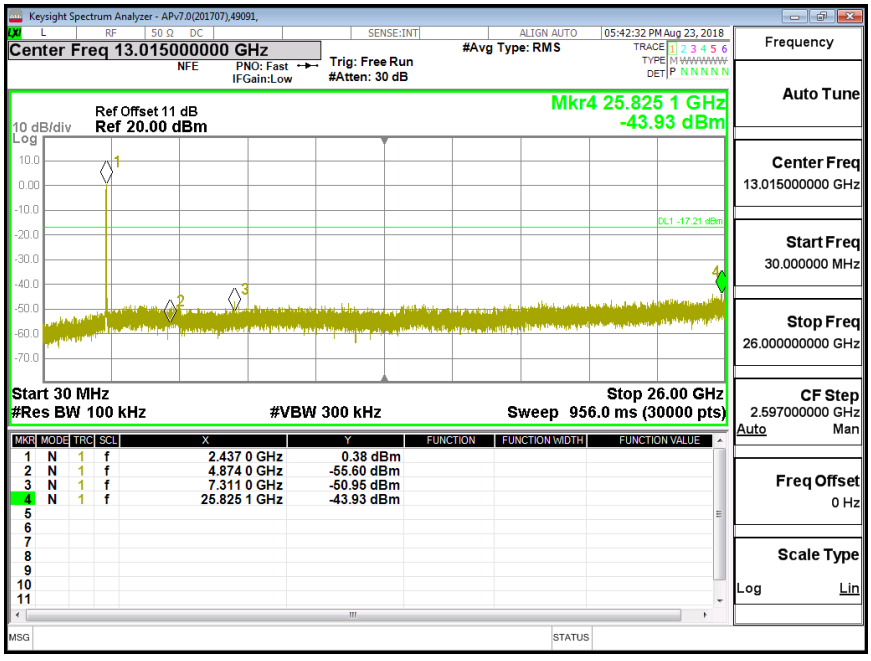
LOW CH SPURIOUS EMISSIONS



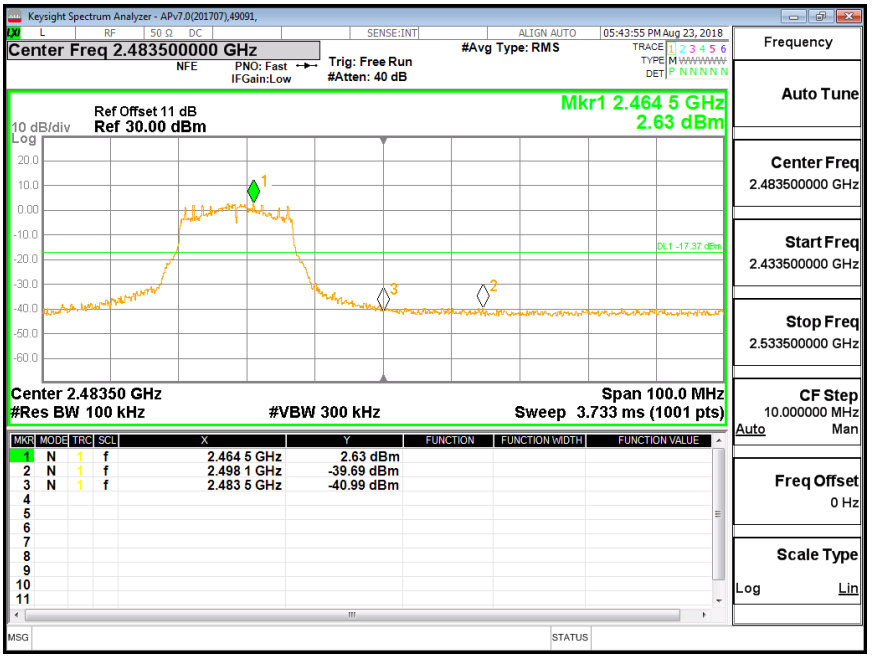
MID CH BANDEDAGE



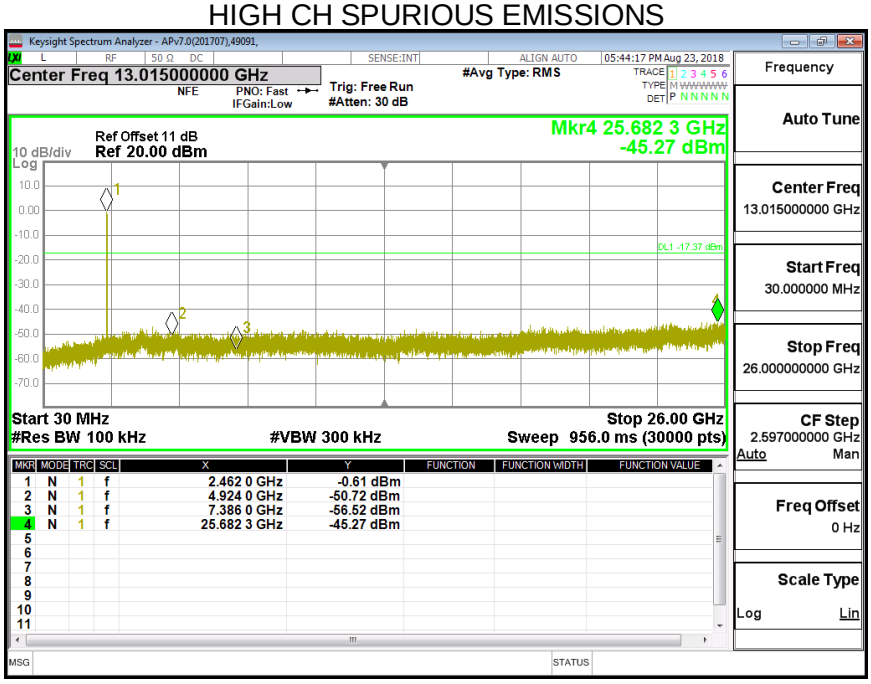
MID CH SPURIOUS EMISSIONS



HIGH CH BANDEDAGE

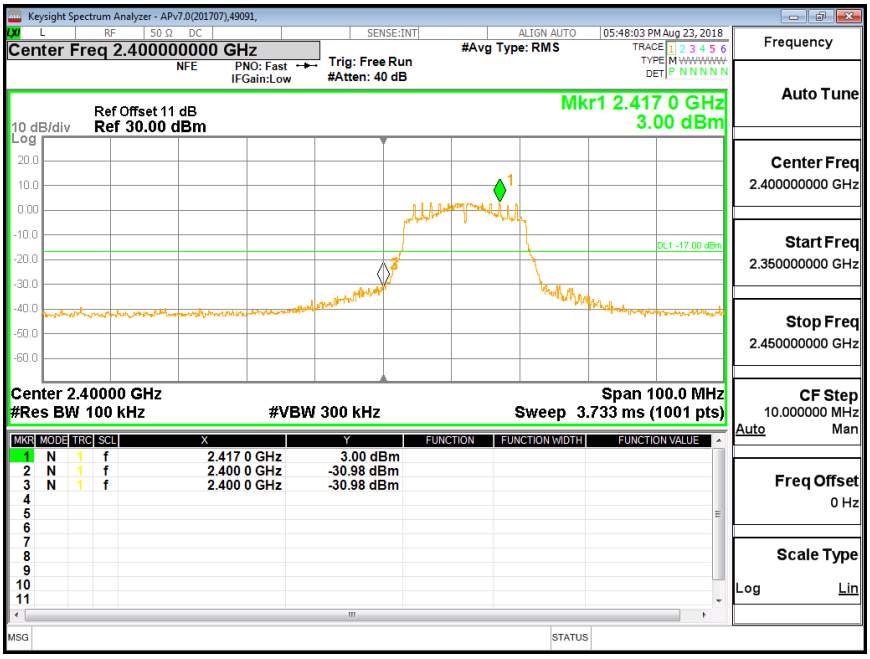


HIGH CH SPURIOUS EMISSIONS

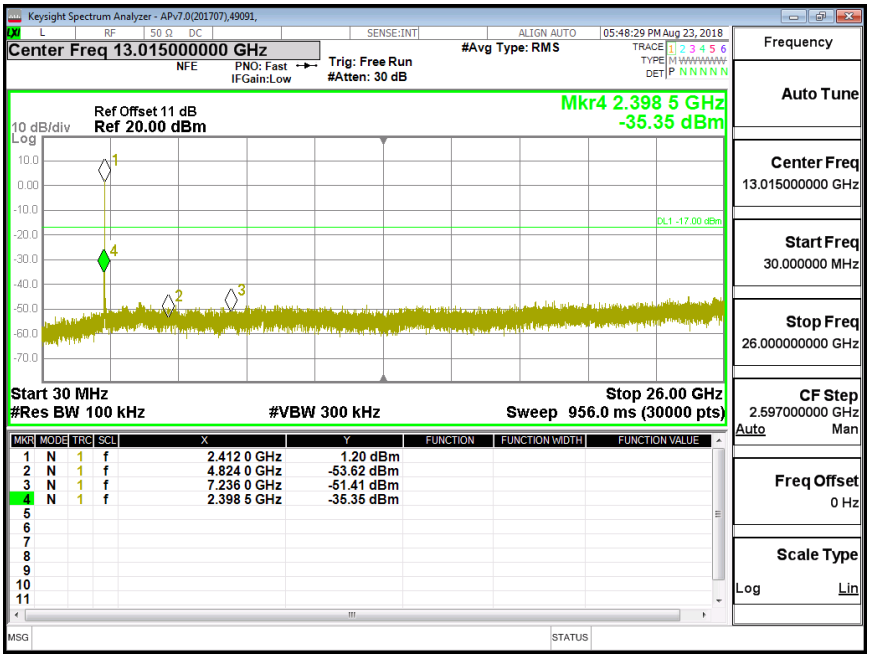


7.5.3. 802.11n20 MODE

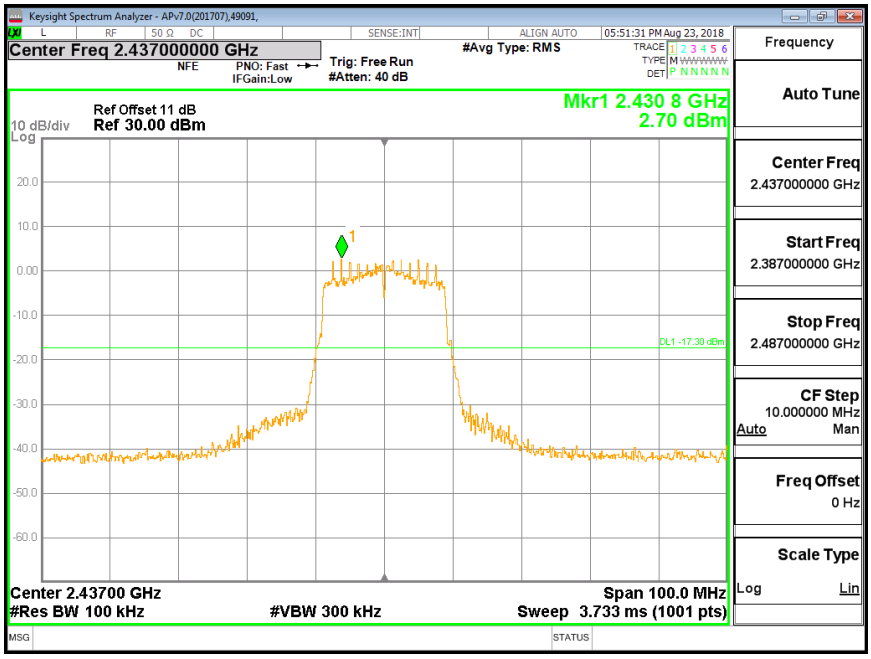
LOW CH BANDEDAGE



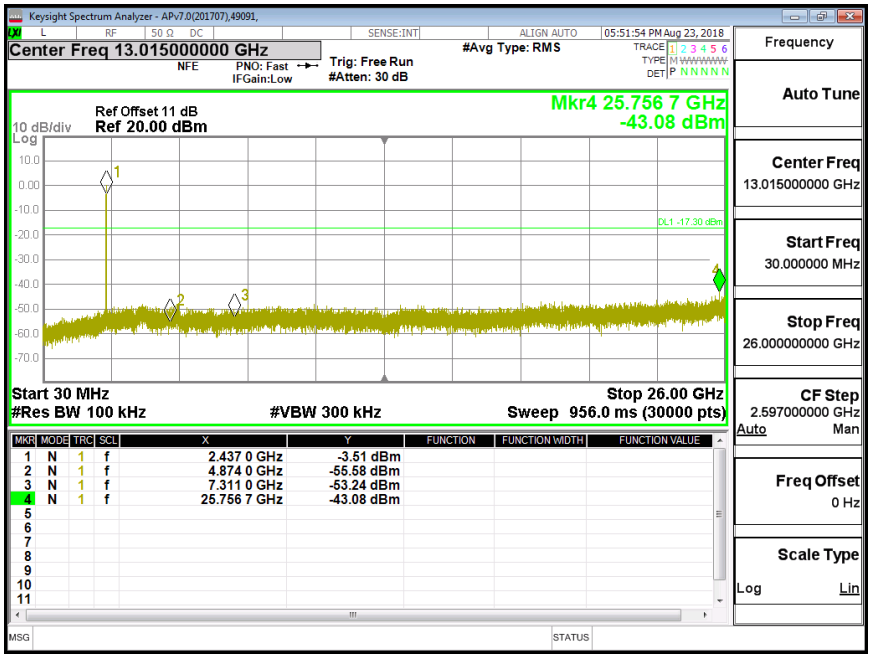
LOW CH SPURIOUS EMISSIONS



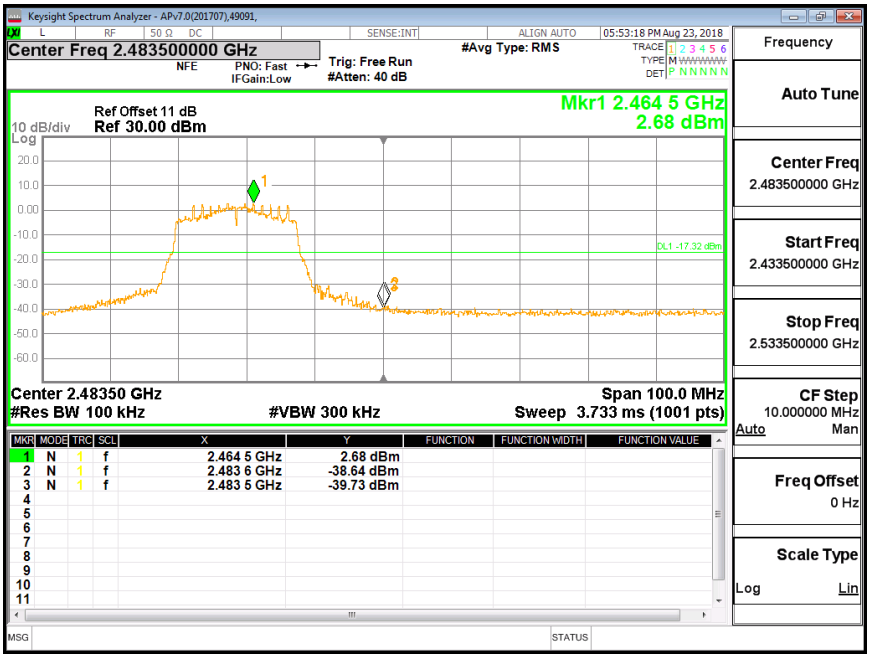
MID CH BANDEDAGE



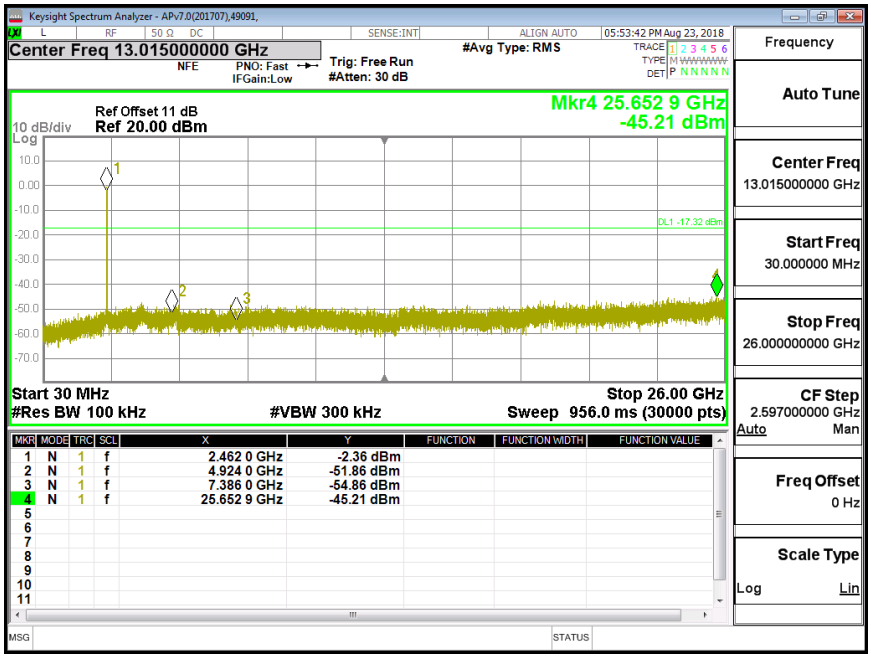
MID CH SPURIOUS EMISSIONS



HIGH CH BANDEDAGE



HIGH CH SPURIOUS EMISSIONS



8. RADIATED TEST RESULTS

LIMITS

Please refer to FCC §15.205 and §15.209
Please refer to RSS-GEN Clause 8.9

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.

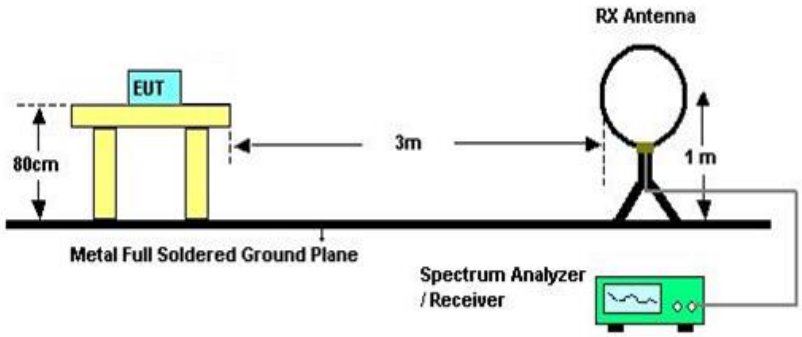
Radiation Disturbance Test Limit for FCC (Above 1G)

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

About Restricted bands of operation please refer to RSS-Gen section 8.10 and FCC §15.205 (a)

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.

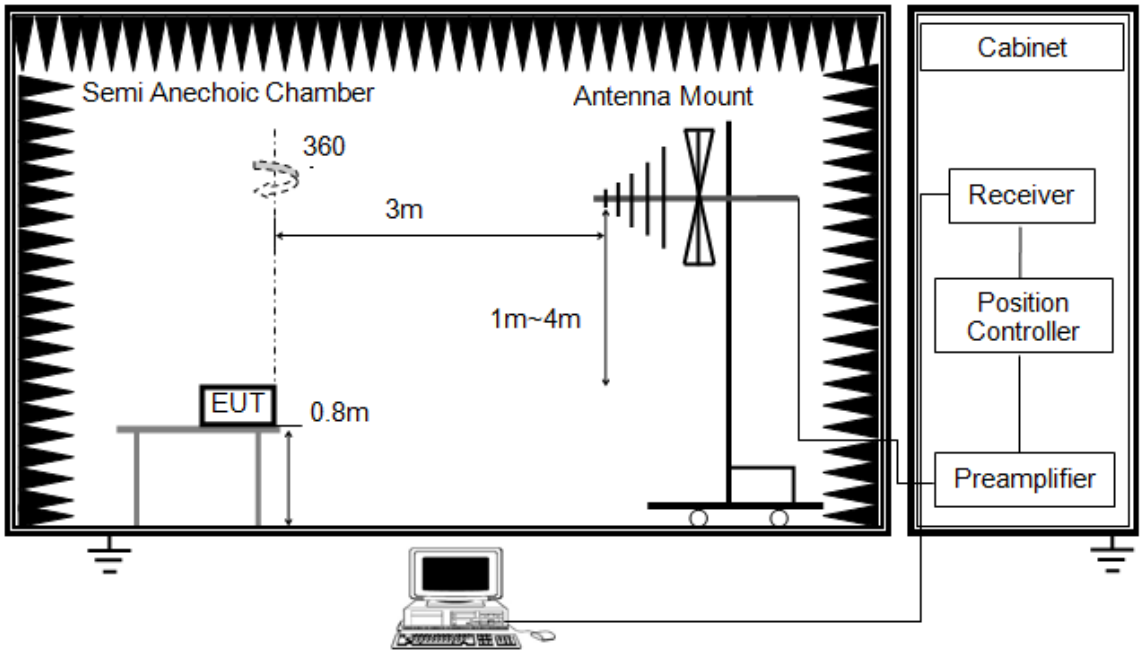
4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.

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 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.

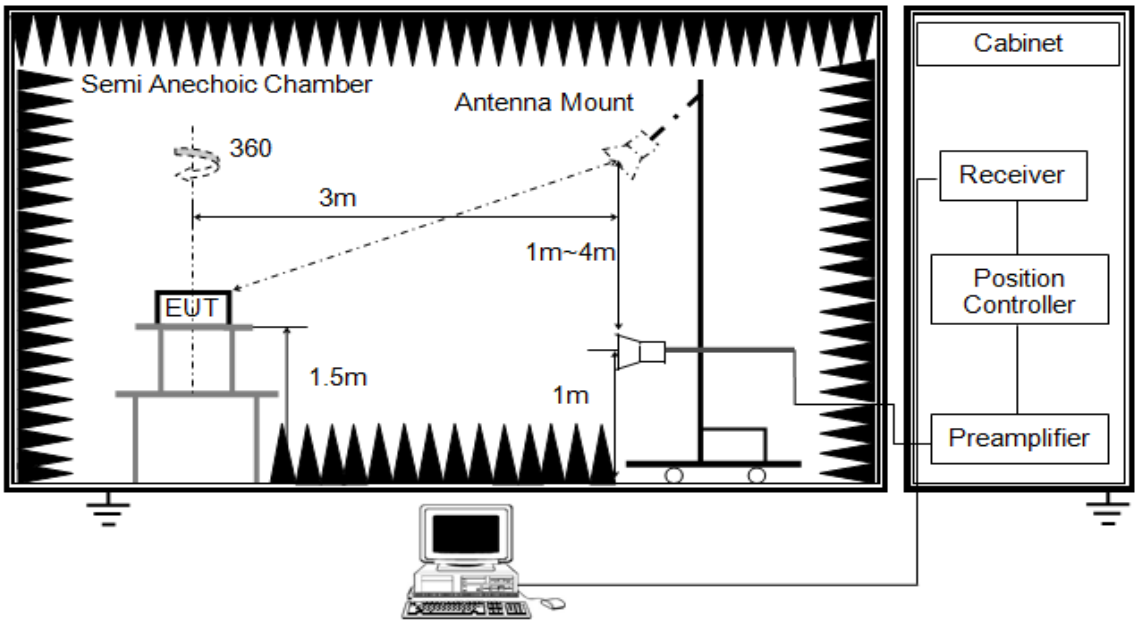
2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level. Both horizontal and vertical polarizations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

6. For the actual test configuration, please refer to the related Item in this test report (Photographs of the Test Configuration)



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. If the transmit with D ≥ 98%, then set VBW ≤ RBW / 100, but not less than 10 Hz.

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

If that calculated VBW is not available on the analyzer then the next higher value should be used.
The following value will be used:
802.11b: 10Hz(D ≥ 98%)

802.11g: 1KHz

802.11n20: 1KHz

7. For the actual test configuration, please refer to the related item in this test report (Photographs of the Test Configuration)

Note1: The manufacturer has recommended that the EUT only be used in the desktop (horizontal)orientation; therefore, all radiated testing was performed in desktop orientation. The EUT was placed on normal orientation and all radiated emissions were performed with the EUT shown on the setup photo.

Note2: 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.

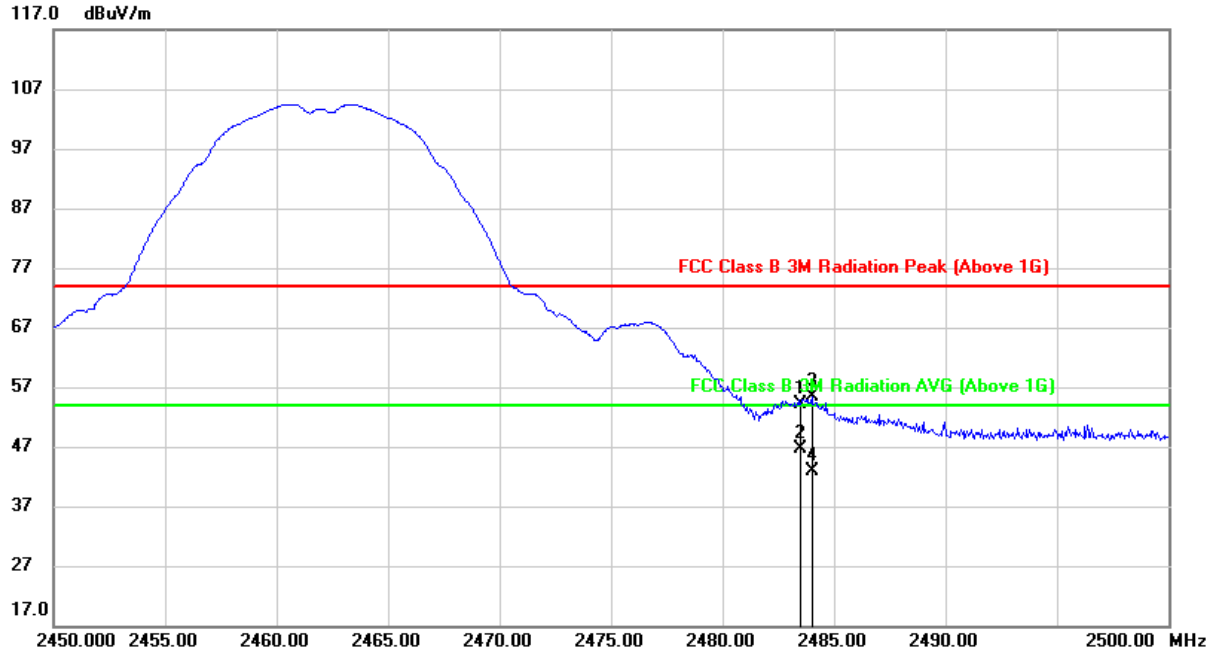
8.1. RESTRICTED BANDEDGE

8.1.1. 802.11b MODE

(WORST-CASE CONFIGURATION)

RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)

PEAK

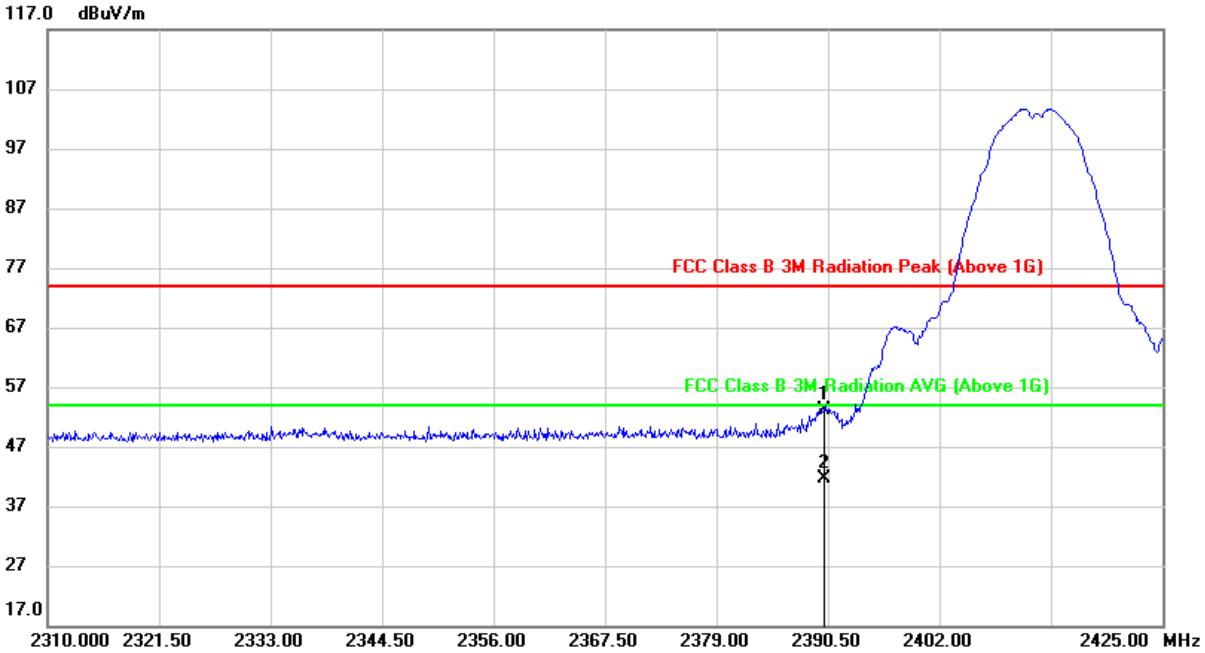


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	21.44	32.78	54.22	74.00	-19.78	peak
2	2483.500	13.83	32.78	46.61	54.00	-7.39	AVG
3	2484.000	22.59	32.78	55.37	74.00	-18.63	peak
4	2484.000	10.12	32.78	42.90	54.00	-11.10	AVG

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. AVG: VBW=1/Ton where: ton is transmit duration.
5. For transmit duration, please refer to clause 7.1.
6. Only the worst case emission will be recorder, if it complies with the limit, the other emissions deemed to comply with the limit.

RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)

PEAK

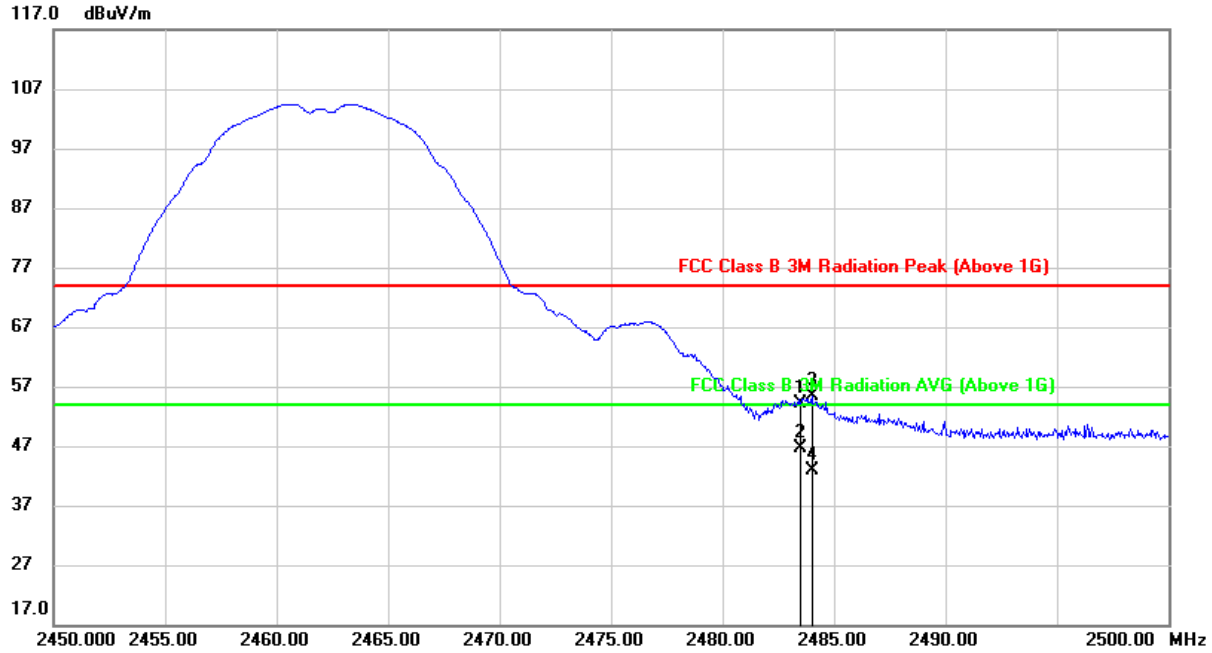


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2390.000	19.79	33.24	53.03	74.00	-20.97	peak
2	2390.000	8.49	33.24	41.73	54.00	-12.27	AVG

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. AVG: VBW=1/Ton where: ton is transmit duration.
5. For transmit duration, please refer to clause 7.1.
6. Only the worst case emission will be recorder, if it complies with the limit, the other emissions deemed to comply with the limit.

RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)

PEAK

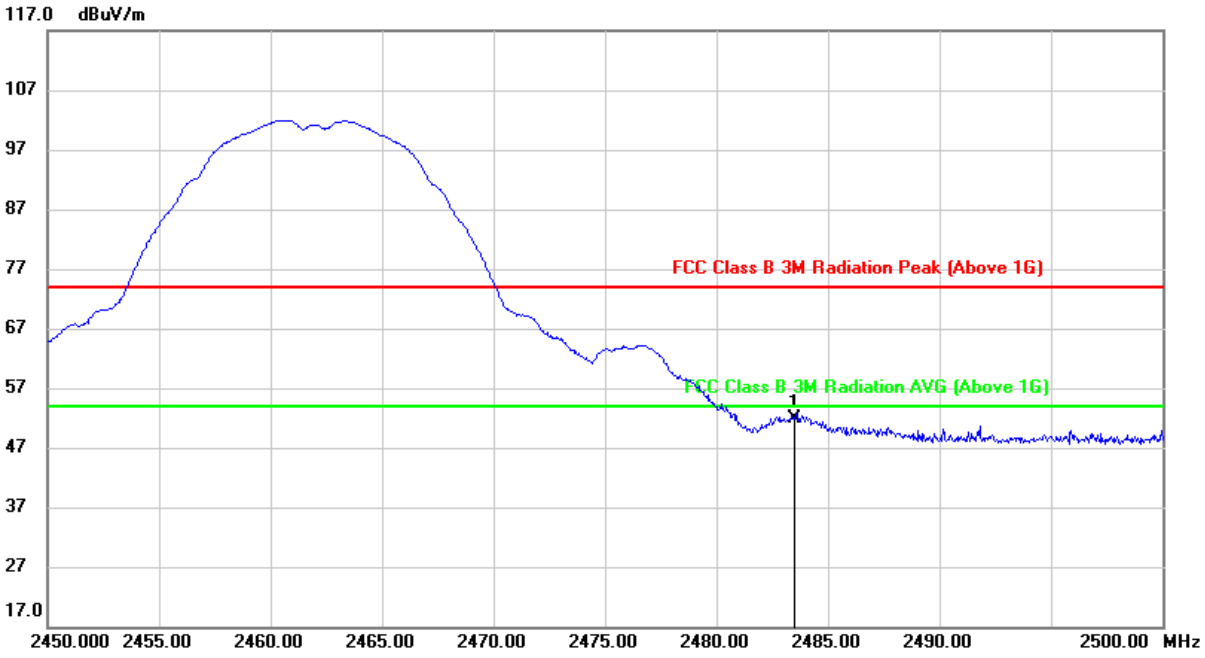


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	21.44	32.78	54.22	74.00	-19.78	peak
2	2483.500	13.83	32.78	46.61	54.00	-7.39	AVG
3	2484.000	22.59	32.78	55.37	74.00	-18.63	peak
4	2484.000	10.12	32.78	42.90	54.00	-11.10	AVG

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. AVG: VBW=1/Ton where: ton is transmit duration.
5. For transmit duration, please refer to clause 7.1.
6. Only the worst case emission will be recorder, if it complies with the limit, the other emissions deemed to comply with the limit.

RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)

PEAK



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	19.08	32.88	51.96	74.00	-22.04	peak

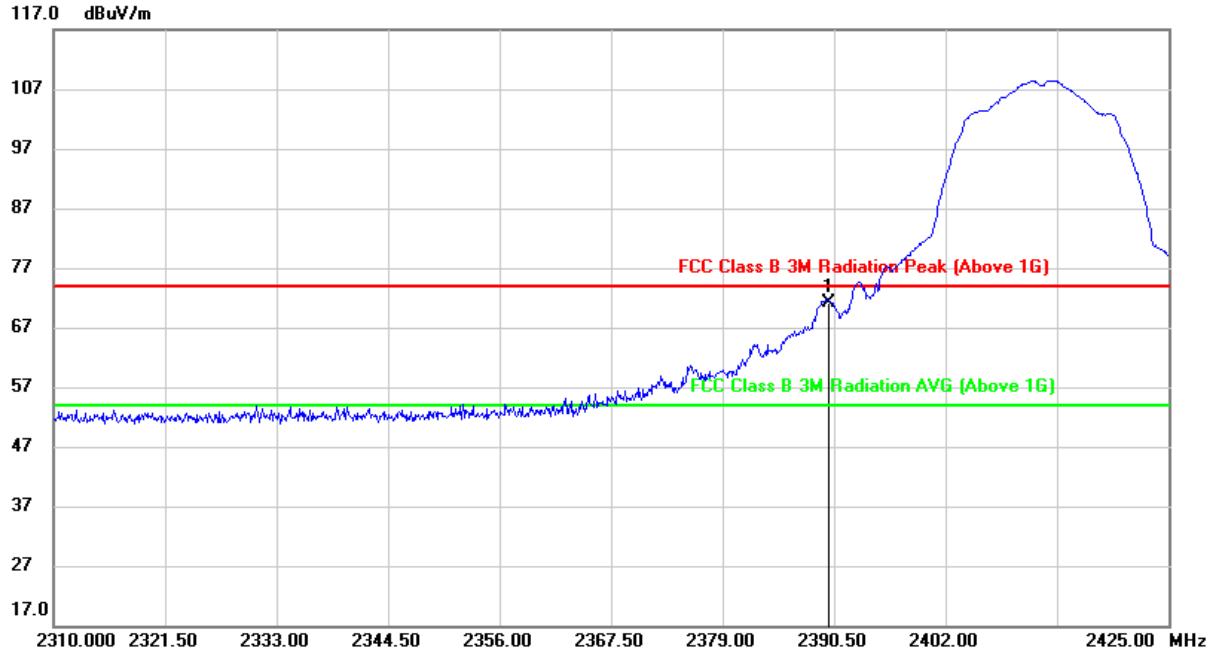
Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4. AVG: VBW=1/Ton where: ton is transmit duration.
5. For transmit duration, please refer to clause 7.1.
6. Only the worst case emission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

8.1.2. 802.11g MODE

(WORST-CASE CONFIGURATION)

RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)

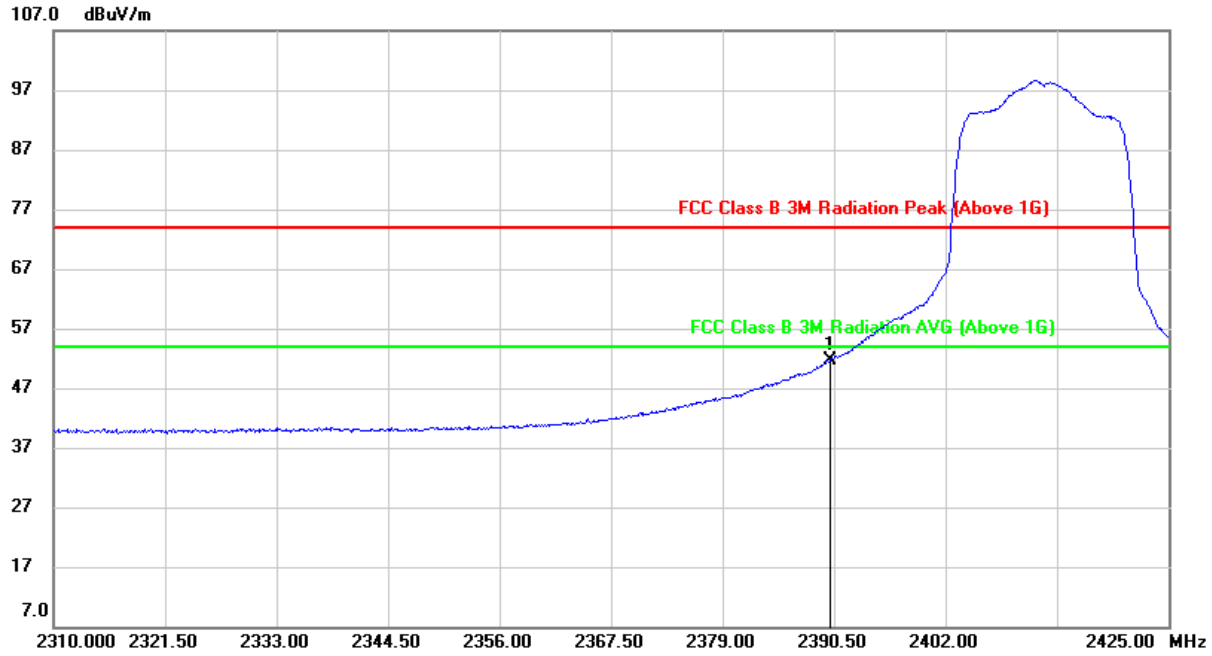
PEAK



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2390.000	38.11	33.14	71.25	74.00	-2.75	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 will be recorder, if it complies with the limit, the other emissions deemed to comply with the limit.

AVG

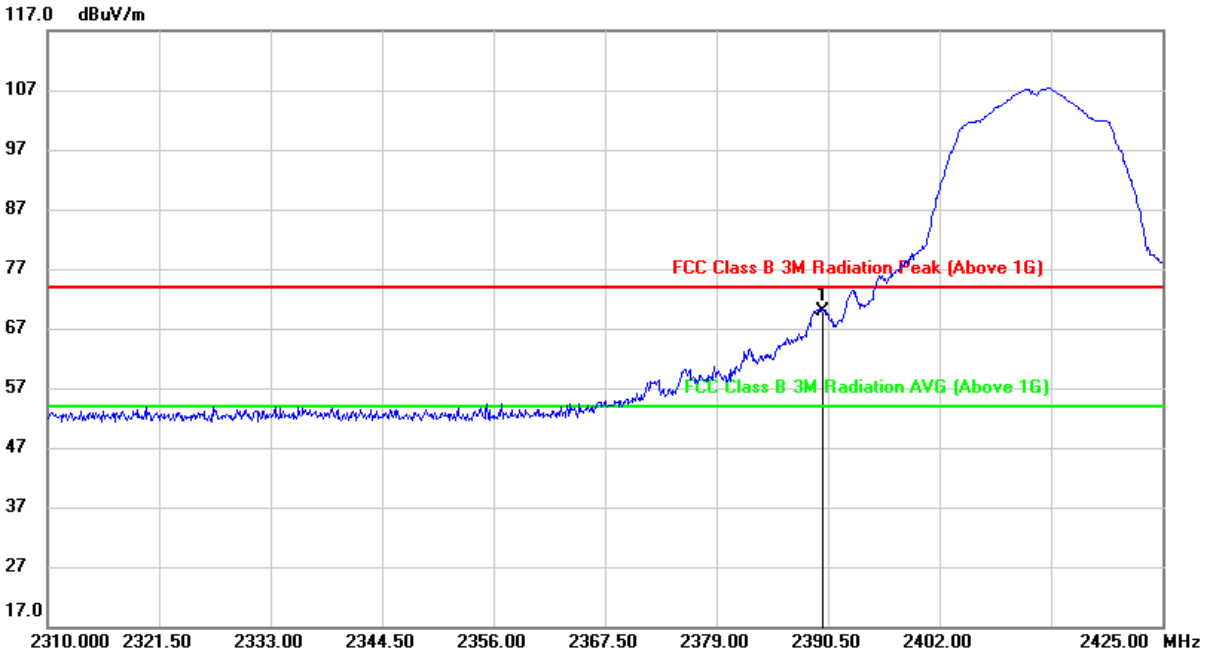


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2390.000	18.56	33.14	51.70	54.00	-2.30	AVG

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. AVG: VBW=1/Ton where: ton is transmit duration.
4. For transmit duration, please refer to clause 7.1.
5. Only the worst case emission will be recorder, if it complies with the limit, the other emissions deemed to comply with the limit.

RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)

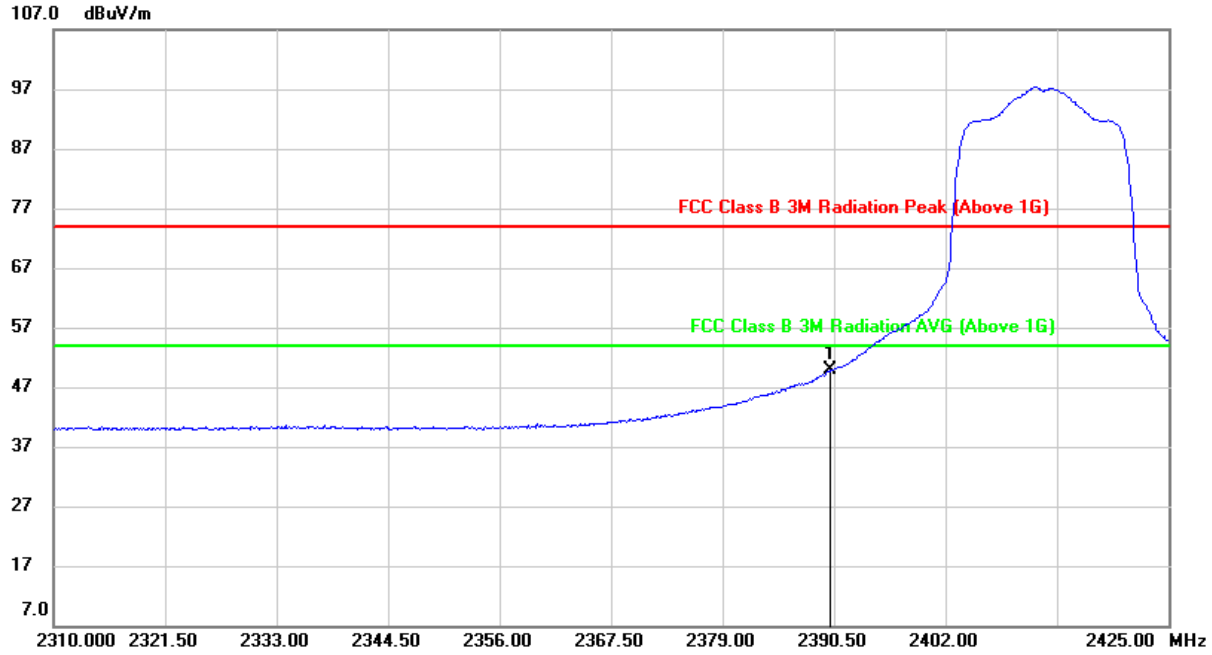
PEAK



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2390.000	36.71	33.24	69.95	74.00	-4.05	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.
4. Only the worst case emission will be recorder, if it complies with the limit, the other emissions deemed to comply with the limit.

AVG

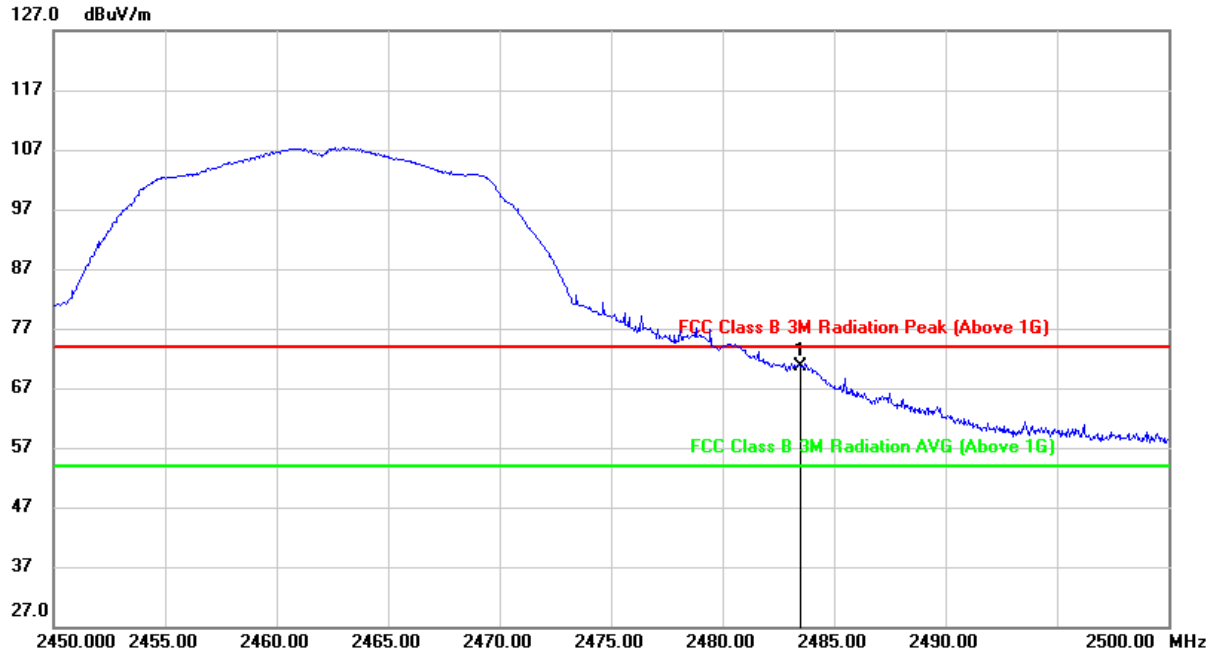


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2390.000	16.59	33.24	49.83	54.00	-4.17	AVG

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. AVG: VBW=1/Ton where: ton is transmit duration.
4. For transmit duration, please refer to clause 7.1.
5. Only the worst case emission will be recorder, if it complies with the limit, the other emissions deemed to comply with the limit.

RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)

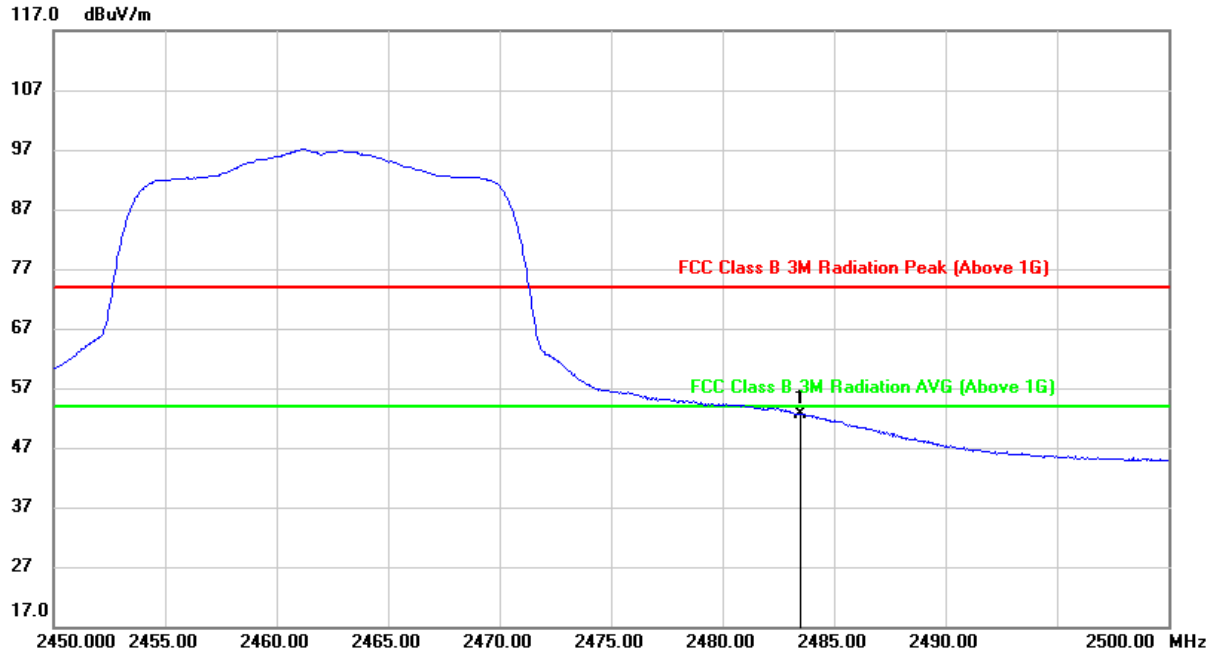
PEAK



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	37.87	32.78	70.65	74.00	-3.35	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 will be recorder, if it complies with the limit, the other emissions deemed to comply with the limit.

AVG

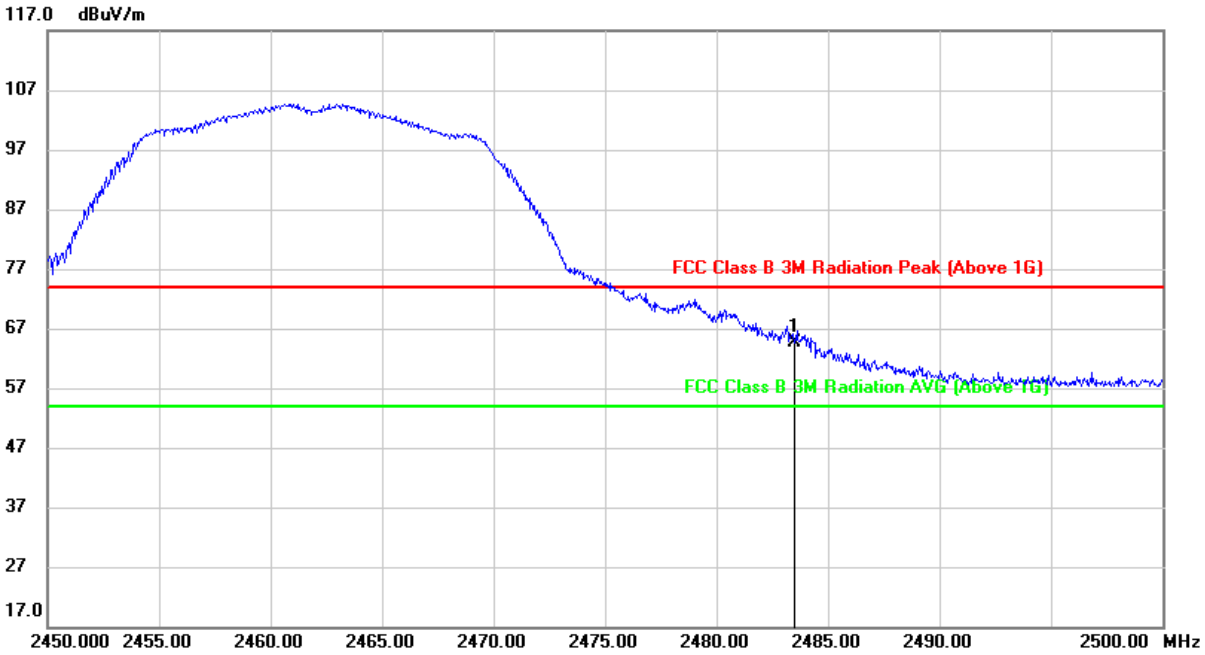


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	19.75	32.78	52.53	54.00	-1.47	AVG

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. AVG: VBW=1/Ton where: ton is transmit duration.
4. For transmit duration, please refer to clause 7.1.
5. Only the worst case emission will be recorder, if it complies with the limit, the other emissions deemed to comply with the limit.

RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)

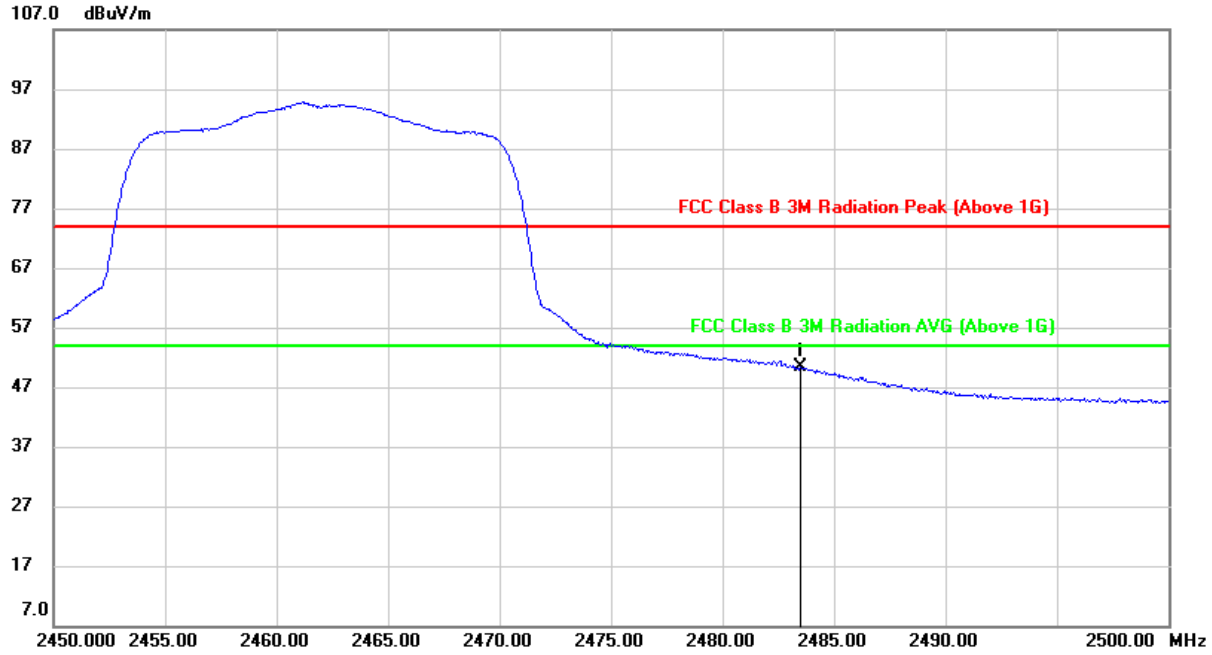
PEAK



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	31.76	32.88	64.64	74.00	-9.36	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.
4. Only the worst case emission will be recorder, if it complies with the limit, the other emissions deemed to comply with the limit.

AVG



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	17.45	32.88	50.33	54.00	-3.67	AVG

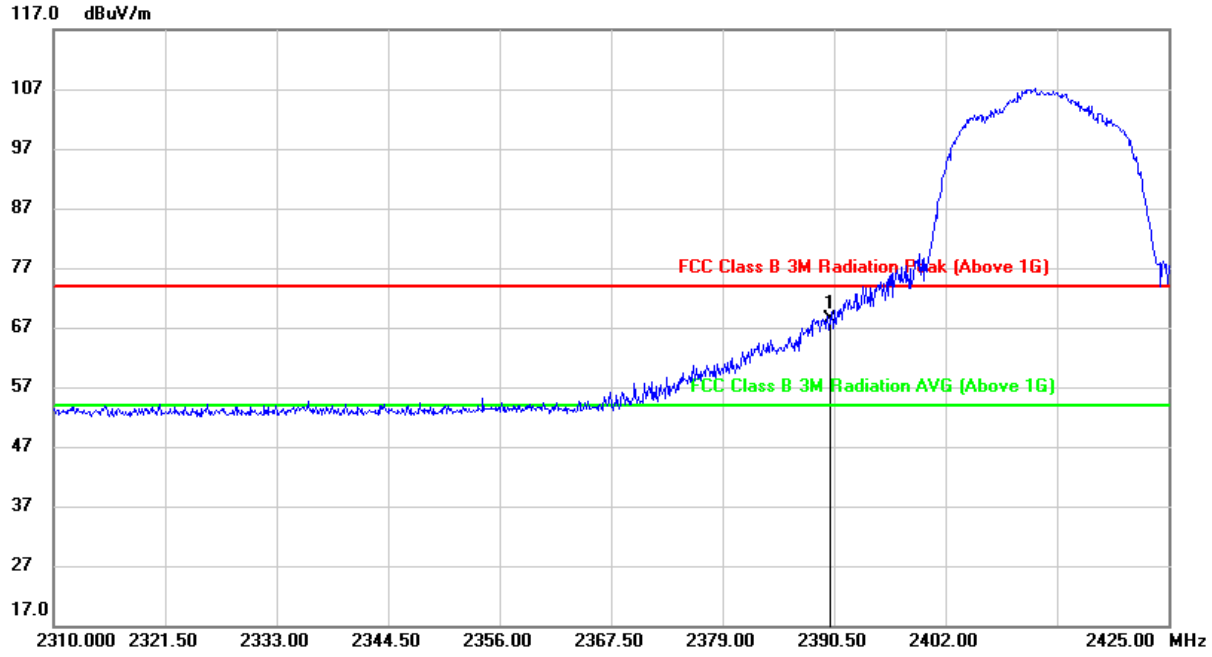
Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. AVG: VBW=1/Ton where: ton is transmit duration.
4. For transmit duration, please refer to clause 7.1.
5. Only the worst case emission will be recorder, if it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

8.1.3. 802.11n20 MODE

(WORST-CASE CONFIGURATION)

RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)

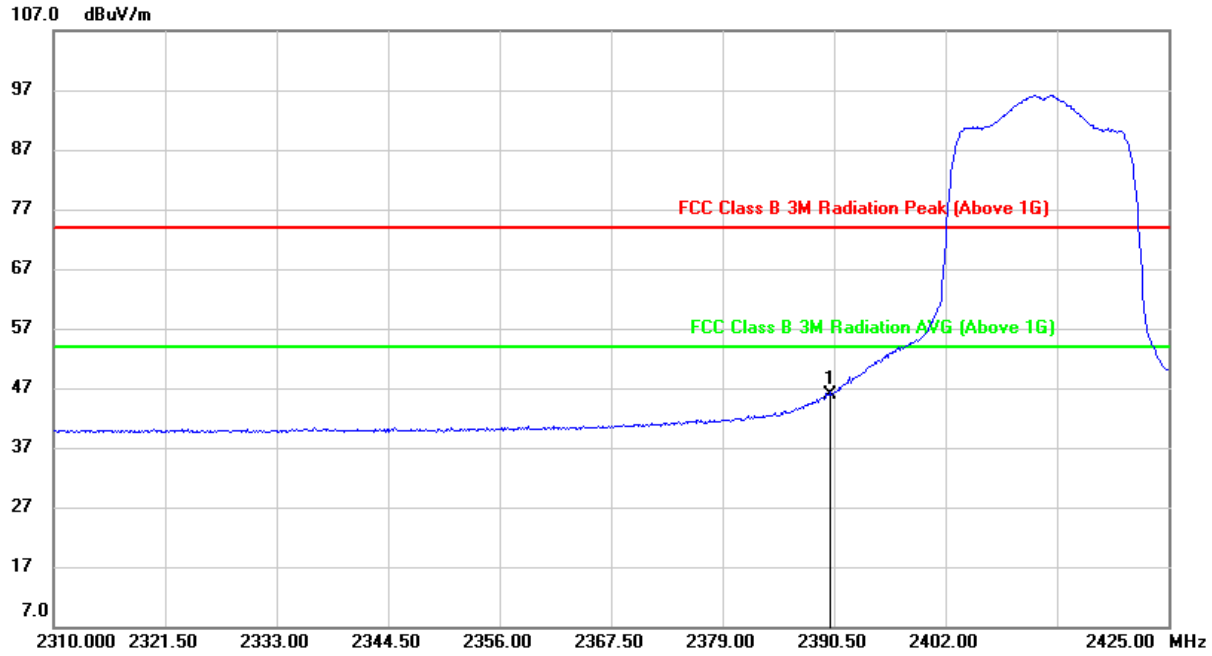
PEAK



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2390.000	35.19	33.14	68.33	74.00	-5.67	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 will be recorder, if it complies with the limit, the other emissions deemed to comply with the limit.

AVG

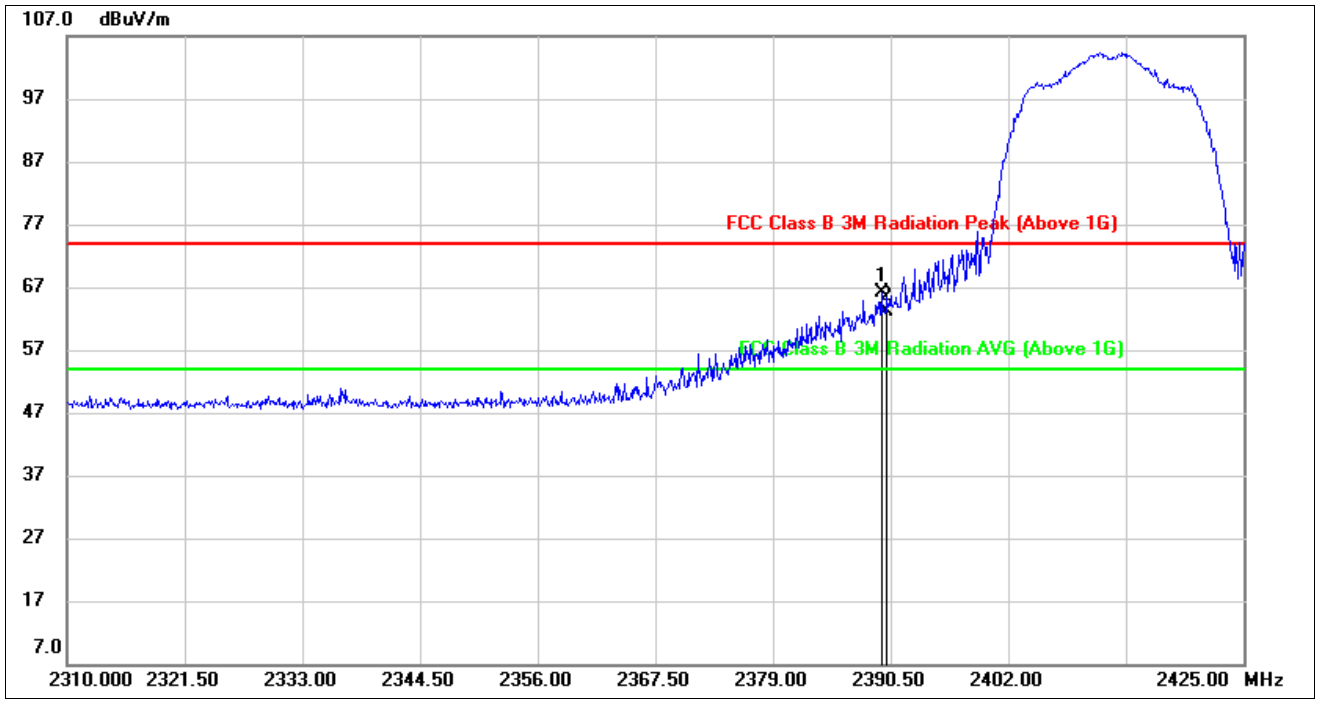


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2390.000	12.81	33.14	45.95	54.00	-8.05	AVG

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

RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)

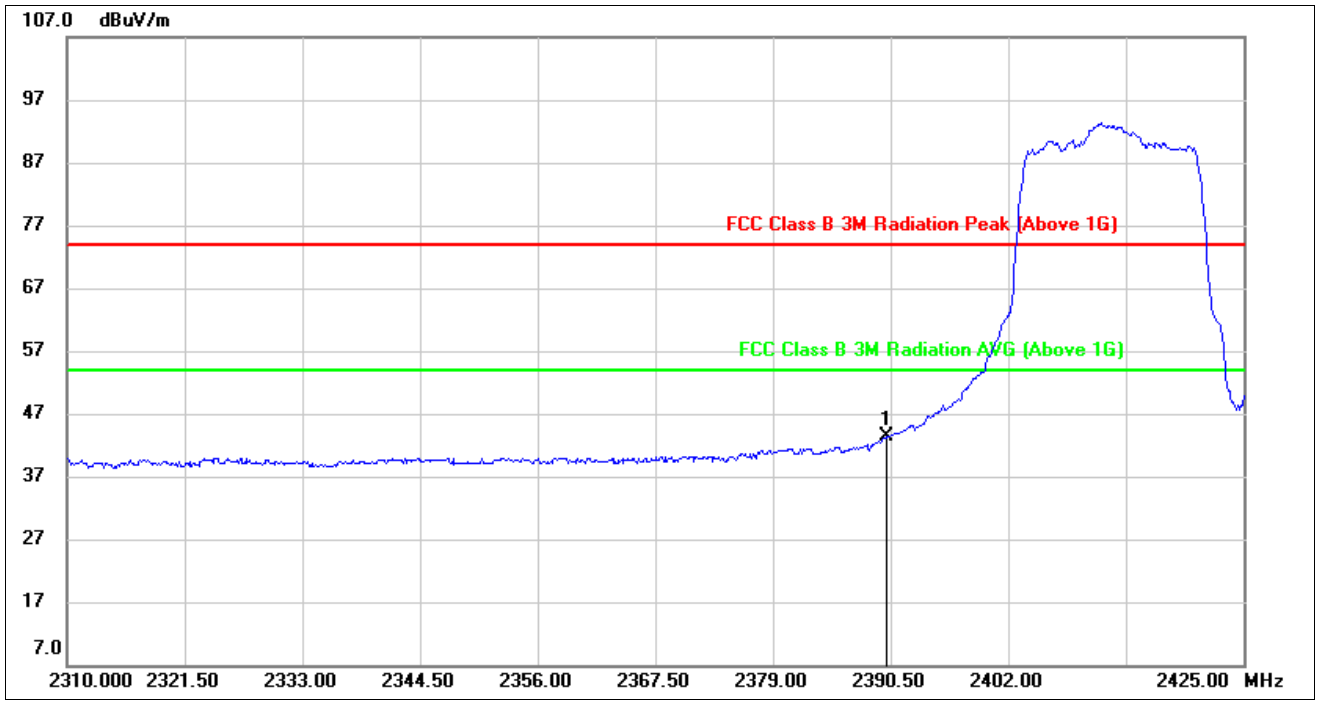
PEAK



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2389.580	32.80	33.24	66.04	74.00	-7.96	peak
2	2390.000	29.84	33.24	63.08	74.00	-10.92	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.
4. Only the worst case emission will be recorder, if it complies with the limit, the other emissions deemed to comply with the limit.

AVG

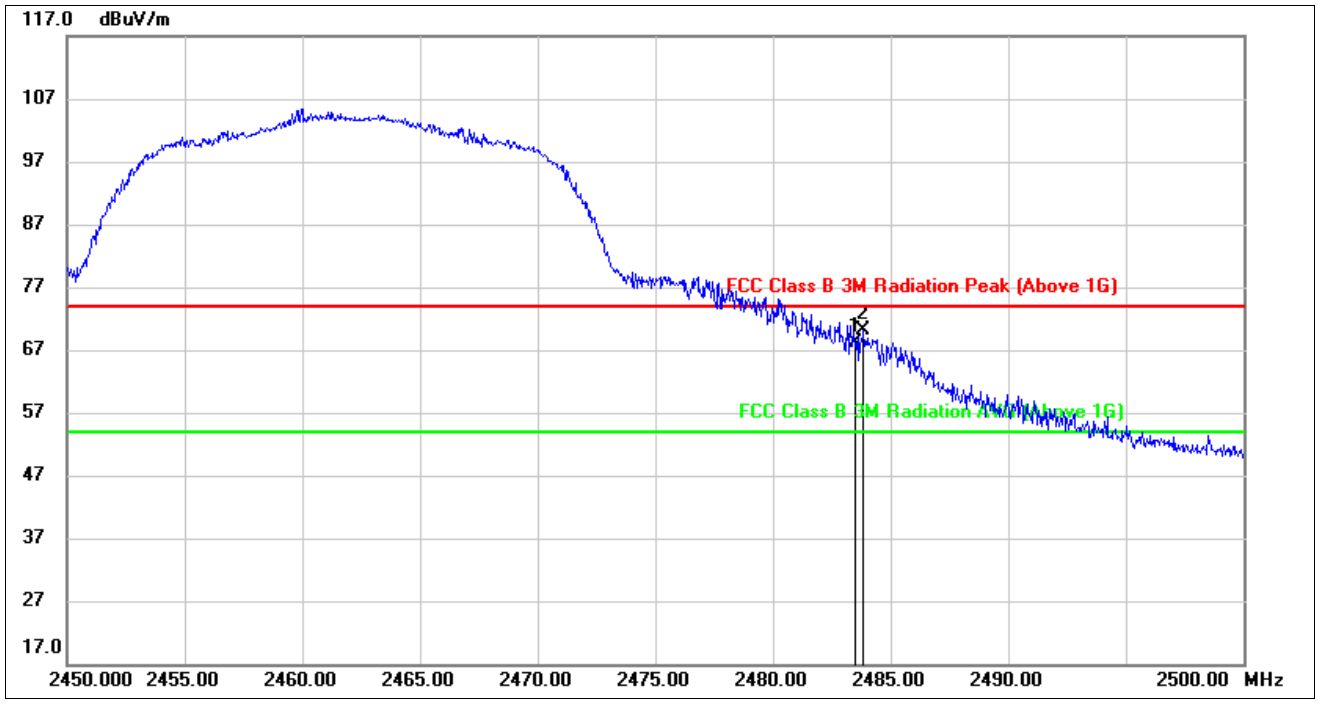


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2390.000	10.09	33.24	43.33	74.00	-30.67	peak

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

RESTRICTED BANDEDGE (HIGH CHANNEL, HORIZONTAL)

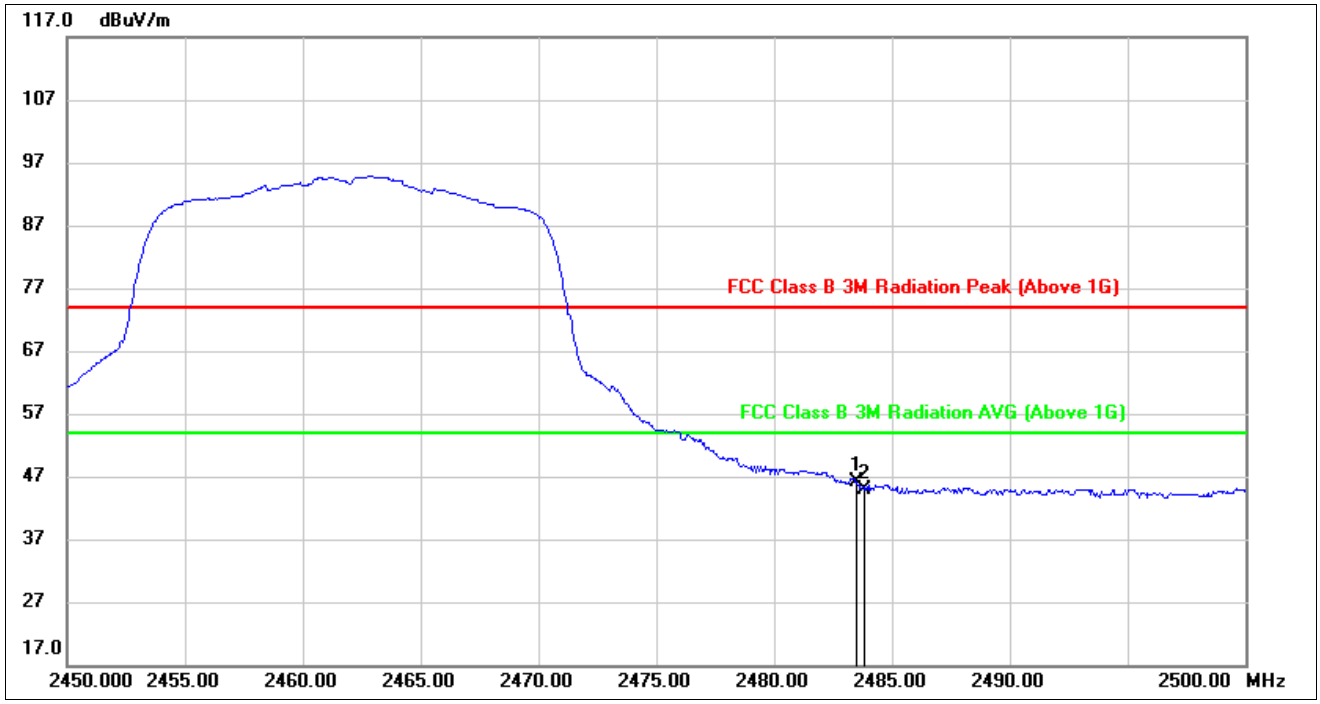
PEAK



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	35.34	32.78	68.12	74.00	-5.88	peak
2	2483.850	37.30	32.78	70.08	74.00	-3.92	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.
4. Only the worst case emission will be recorder, if it complies with the limit, the other emissions deemed to comply with the limit.

AVG

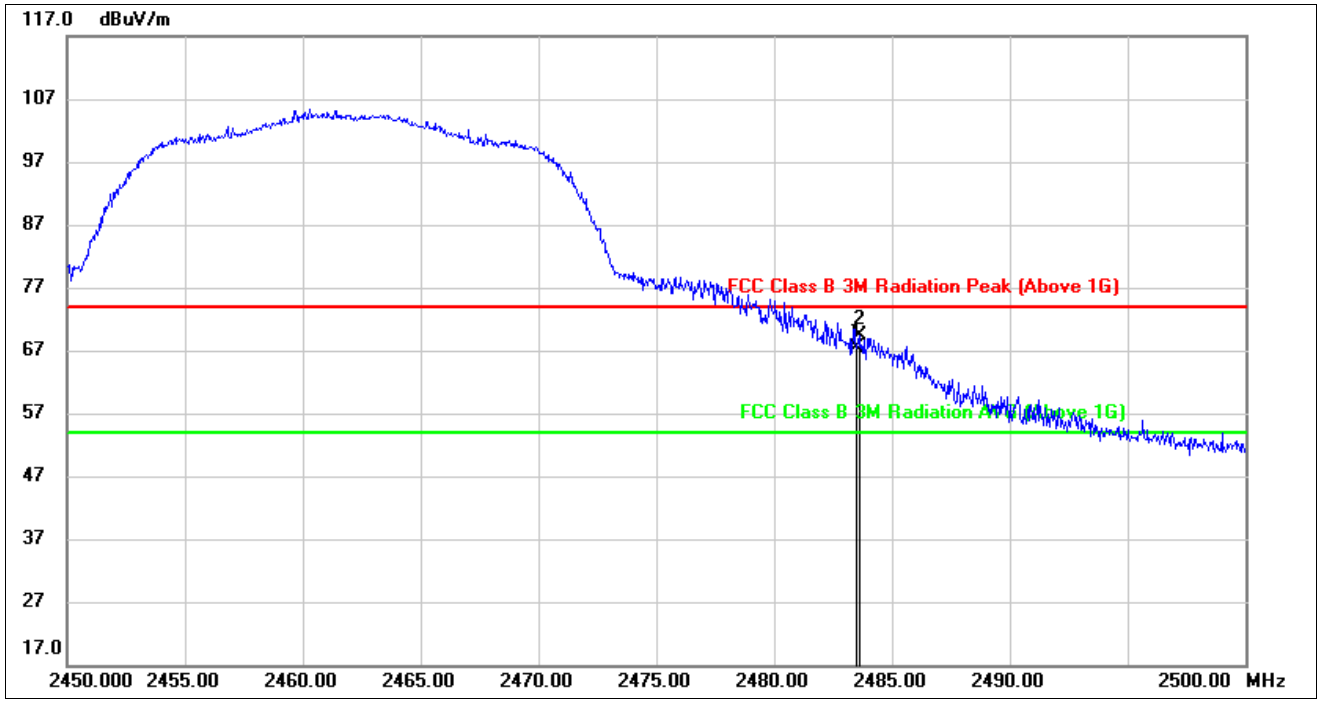


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	13.28	32.78	46.06	54.00	-7.94	AVG
2	2483.850	12.16	32.78	44.94	54.00	-9.06	AVG

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

RESTRICTED BANDEDGE (HIGH CHANNEL, VERTICAL)

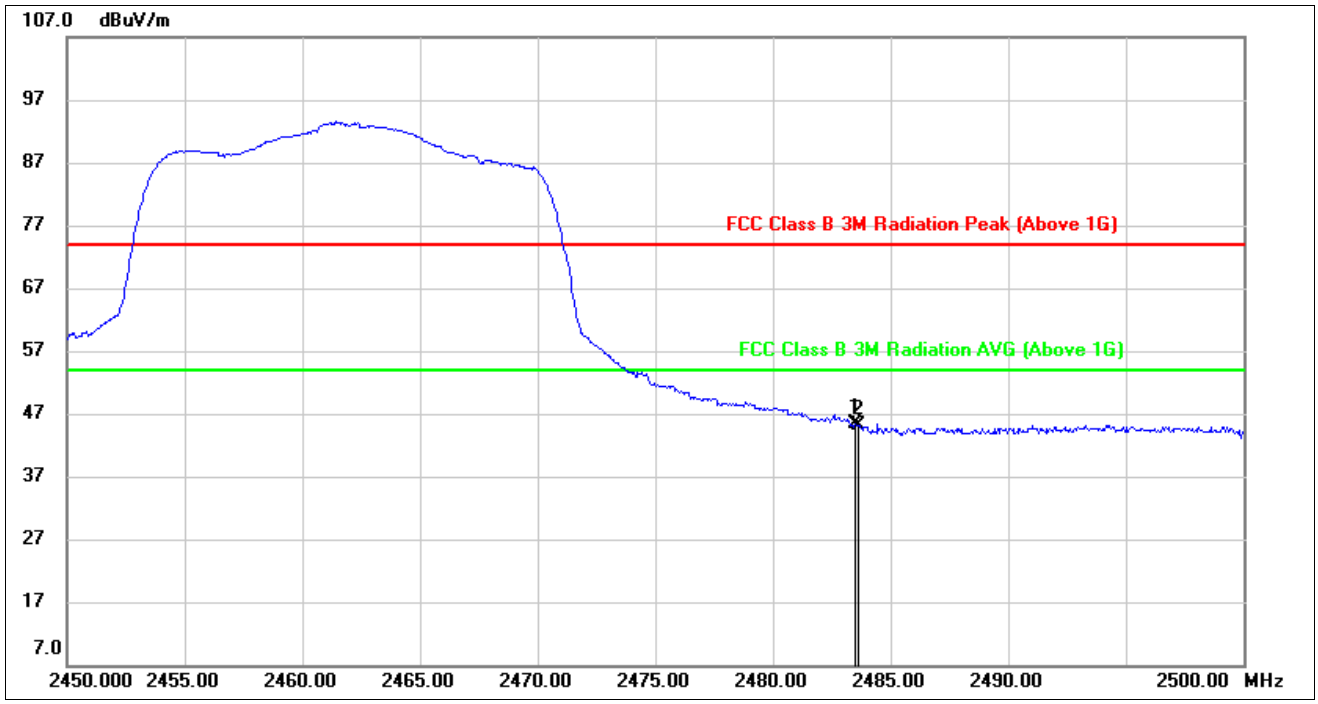
PEAK



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	34.61	32.88	67.49	74.00	-6.51	peak
2	2483.600	36.56	32.88	69.44	74.00	-4.56	peak

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

AVG



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2483.500	12.45	32.88	45.33	54.00	-8.67	AVG
2	2483.600	12.15	32.88	45.03	54.00	-8.97	AVG

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

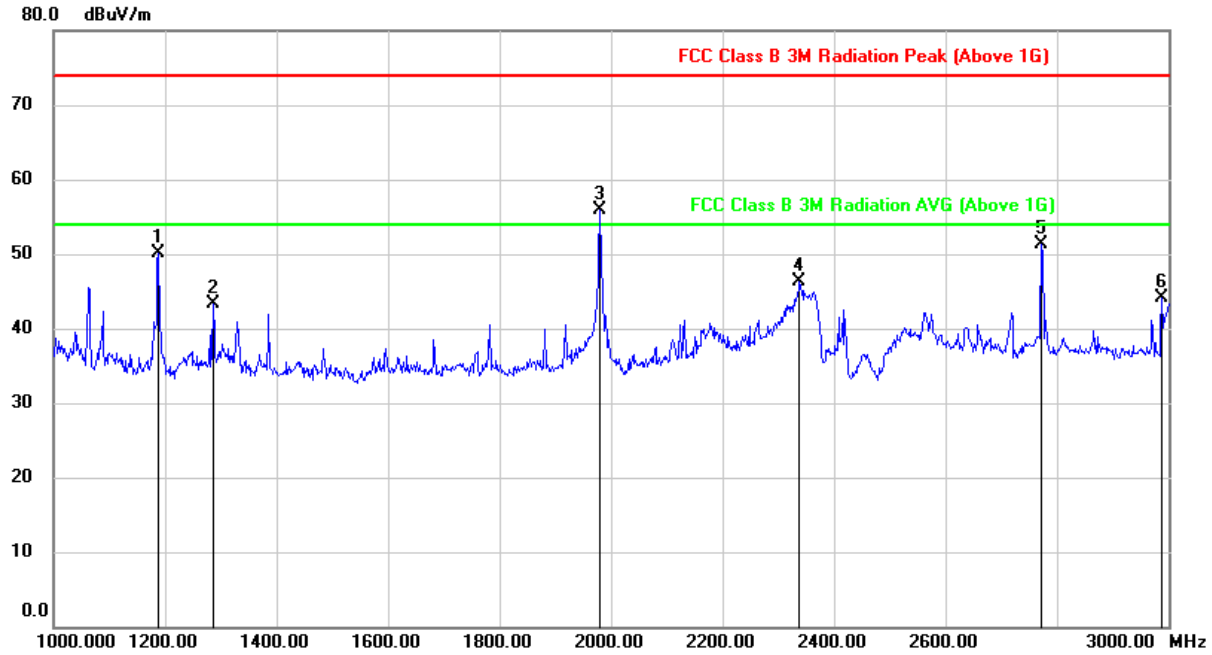
8.2. SPURIOUS EMISSIONS (1~18GHz)

8.2.1. 802.11b MODE

(WORST-CASE CONFIGURATION)

HARMONICS AND SPURIOUS EMISSIONS (LOW CHANNEL, HORIZONTAL)

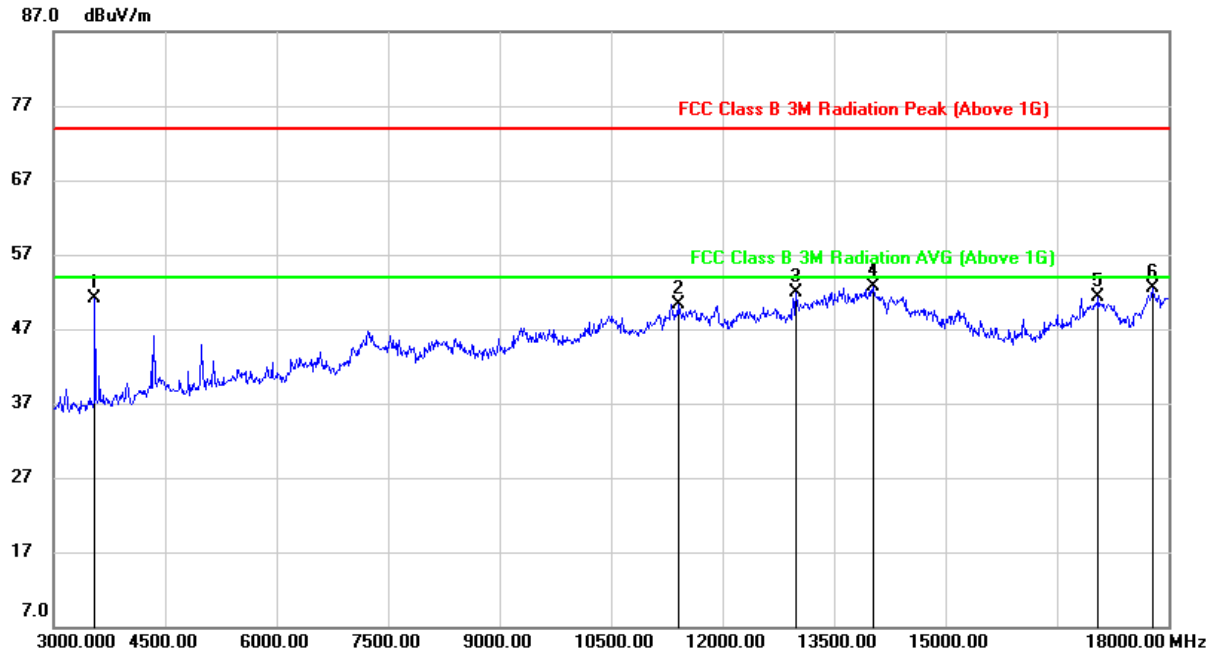
1-3GHz



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1188.000	63.33	-13.14	50.19	74.00	-23.81	peak
2	1286.000	55.84	-12.51	43.33	74.00	-30.67	peak
3*	1980.000	66.65	-10.65	56.00	-	-	peak
4	2338.000	54.01	-7.66	46.35	74.00	-27.65	peak
5	2772.000	58.34	-7.11	51.23	74.00	-22.77	peak
6	2988.000	50.75	-6.60	44.15	74.00	-29.85	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.* - indicates frequency outside the Restricted Band in CFR15.205/RSS-Gen 8.10

3-18GHz

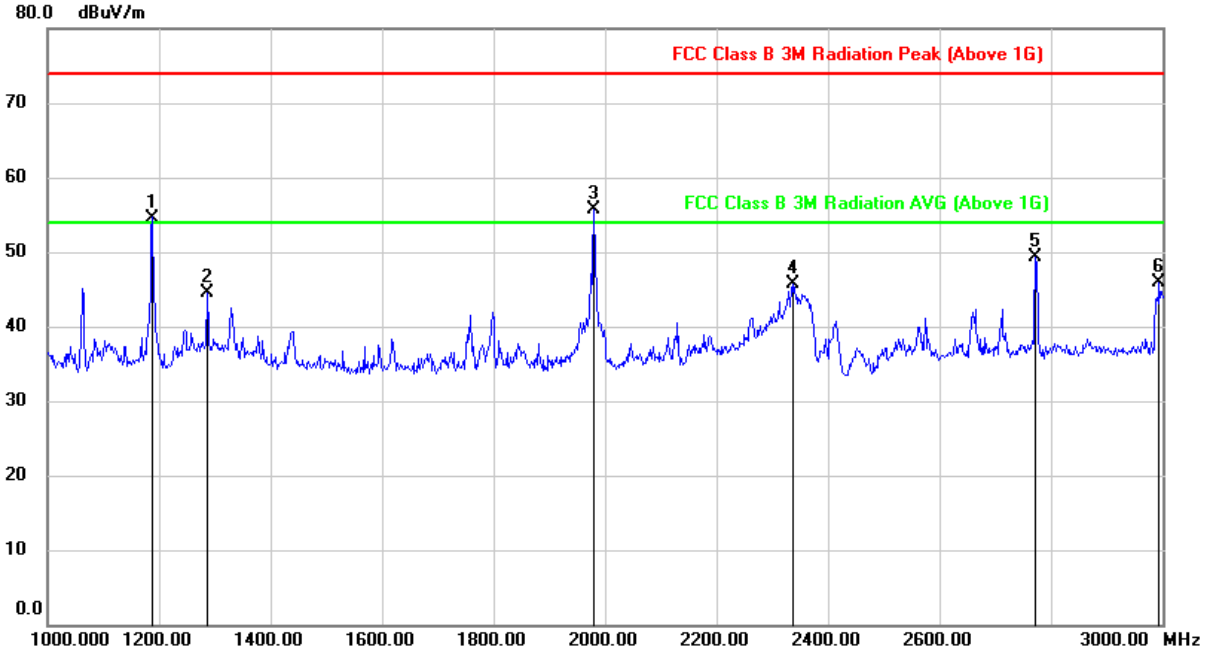


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	3555.000	55.21	-4.20	51.01	74.00	-22.99	peak
2	11400.000	34.58	15.69	50.27	74.00	-23.73	peak
3	12990.000	33.21	18.68	51.89	74.00	-22.11	peak
4	14025.000	32.13	20.62	52.75	74.00	-21.25	peak
5	17055.000	29.07	22.17	51.24	74.00	-22.76	peak
6	17790.000	26.09	26.36	52.45	74.00	-21.55	peak

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

HARMONICS AND SPURIOUS EMISSIONS (LOW CHANNEL, VERTICAL)

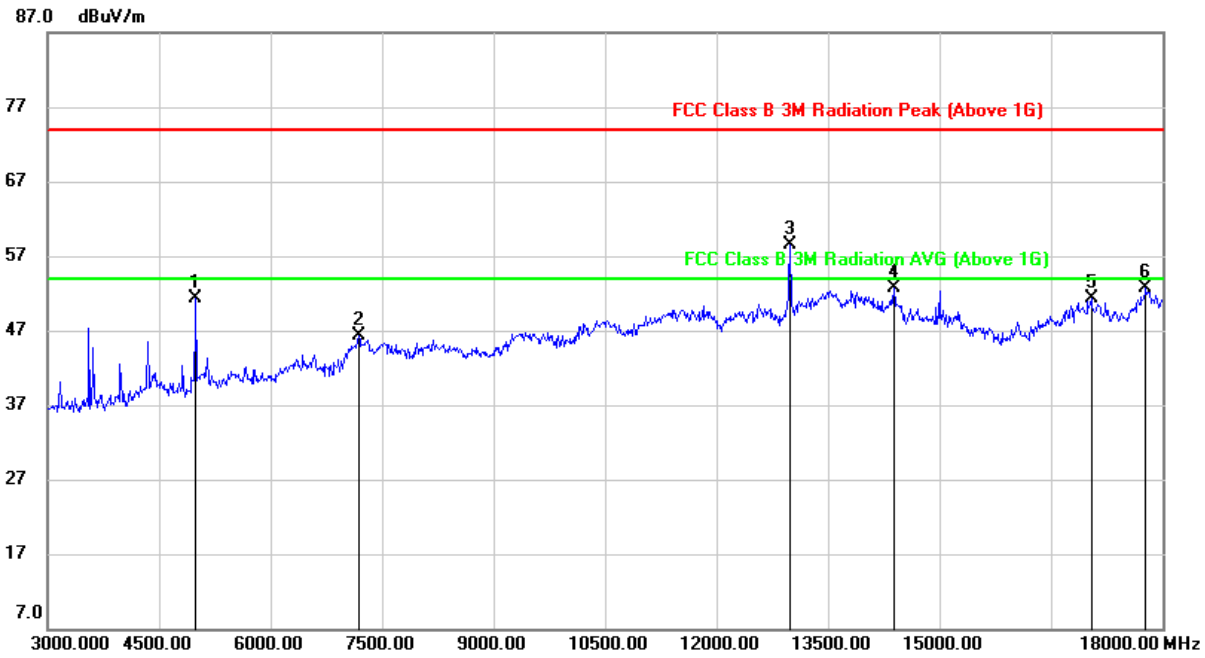
1-3GHz



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1*	1188.000	67.86	-13.26	54.60	-	-	peak
2	1286.000	57.11	-12.70	44.41	74.00	-29.59	peak
3*	1980.000	66.42	-10.69	55.73	-	-	peak
4	2338.000	53.15	-7.54	45.61	74.00	-28.39	peak
5	2772.000	56.53	-7.17	49.36	74.00	-24.64	peak
6	2994.000	52.51	-6.59	45.92	74.00	-28.08	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.* - indicates frequency outside the Restricted Band in CFR15.205/RSS-Gen 8.10

3-18GHz

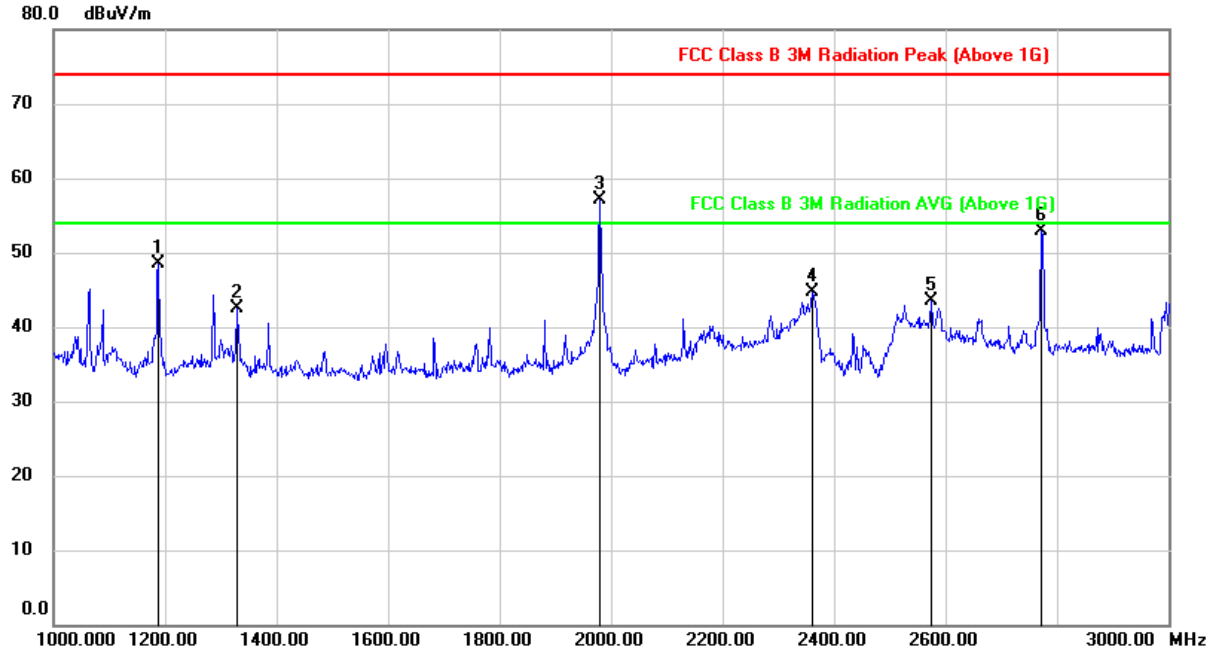


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4995.000	50.77	0.57	51.34	74.00	-22.66	peak
2	7185.000	38.52	7.83	46.35	74.00	-27.65	peak
3*	12990.000	39.73	18.82	58.55	-	-	peak
4	14385.000	32.33	20.37	52.70	74.00	-21.30	peak
5	17040.000	28.75	22.59	51.34	74.00	-22.66	peak
6	17775.000	26.05	26.57	52.62	74.00	-21.38	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.* - indicates frequency outside the Restricted Band in CFR15.205/RSS-Gen 8.10

HARMONICS AND SPURIOUS EMISSIONS (MID CHANNEL, HORIZONTAL)

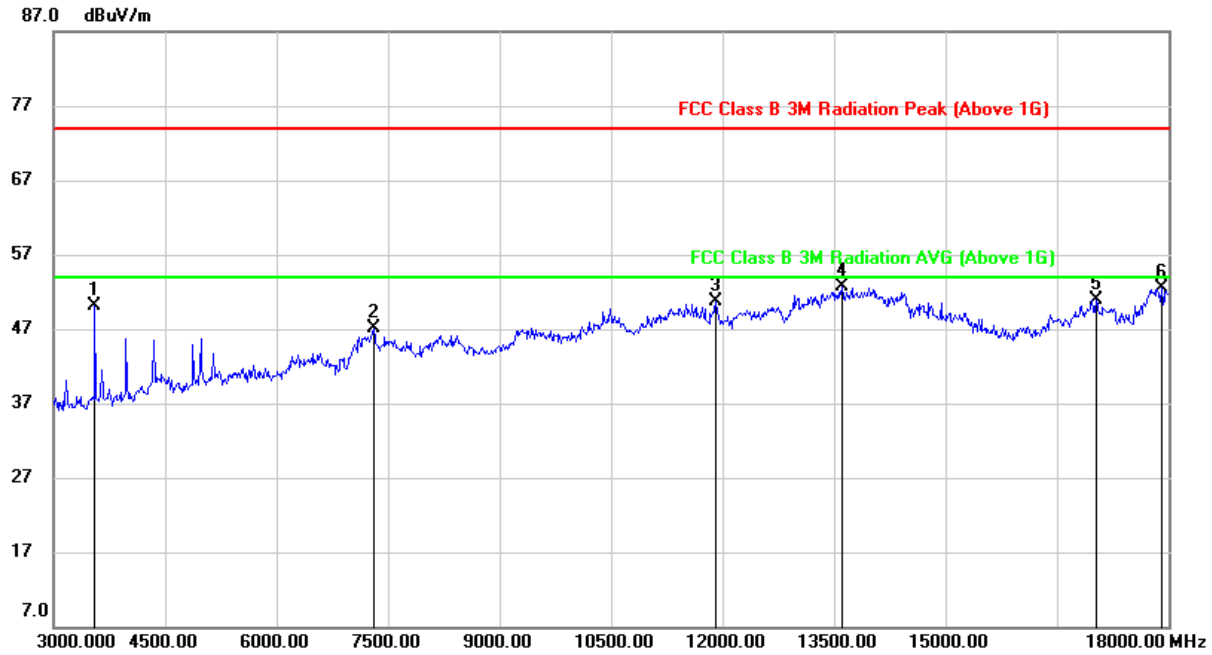
1-3GHz



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1188.000	61.69	-13.14	48.55	74.00	-25.45	peak
2	1328.000	54.82	-12.38	42.44	74.00	-31.56	peak
3*	1980.000	67.77	-10.65	57.12	-	-	peak
4	2360.000	52.50	-7.82	44.68	74.00	-29.32	peak
5	2574.000	51.82	-8.23	43.59	74.00	-30.41	peak
6	2772.000	59.94	-7.11	52.83	74.00	-21.17	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.* - indicates frequency outside the Restricted Band in CFR15.205/RSS-Gen 8.10

3-18GHz

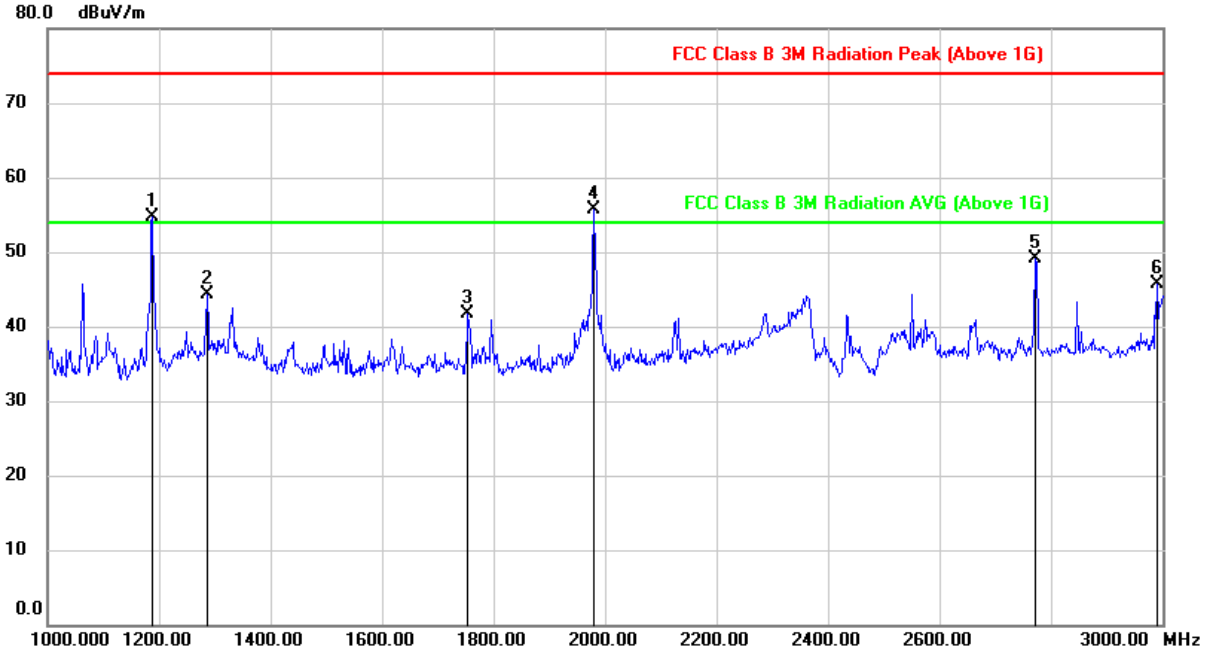


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	3555.000	54.26	-4.20	50.06	74.00	-23.94	peak
2	7305.000	39.35	7.80	47.15	74.00	-26.85	peak
3	11910.000	33.65	16.98	50.63	74.00	-23.37	peak
4	13605.000	32.13	20.54	52.67	74.00	-21.33	peak
5	17025.000	28.93	22.03	50.96	74.00	-23.04	peak
6	17910.000	26.16	26.37	52.53	74.00	-21.47	peak

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

HARMONICS AND SPURIOUS EMISSIONS (MID CHANNEL, VERTICAL)

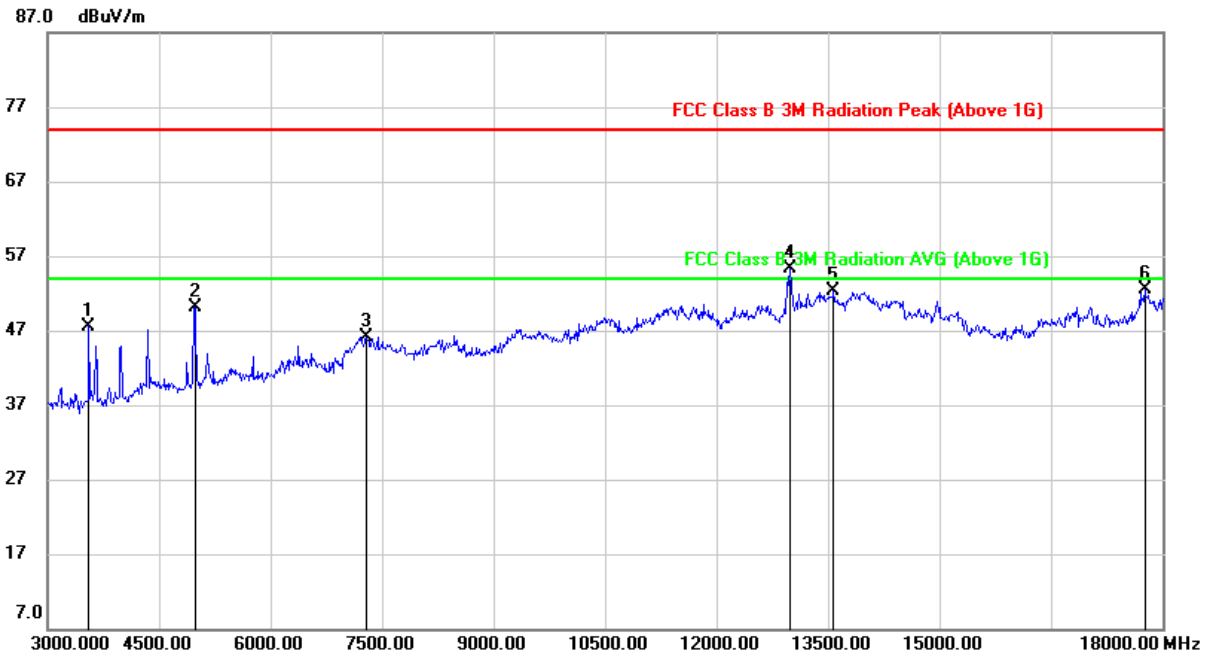
1-3GHz



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1*	1188.000	67.91	-13.26	54.65			peak
2	1286.000	56.92	-12.70	44.22	74.00	-29.78	peak
3	1754.000	53.01	-11.27	41.74	74.00	-32.26	peak
4*	1980.000	66.47	-10.69	55.78			peak
5	2772.000	56.24	-7.17	49.07	74.00	-24.93	peak
6	2990.000	52.20	-6.59	45.61	74.00	-28.39	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.
4.* - indicates frequency outside the Restricted Band in CFR15.205/RSS-Gen 8.10

3-18GHz

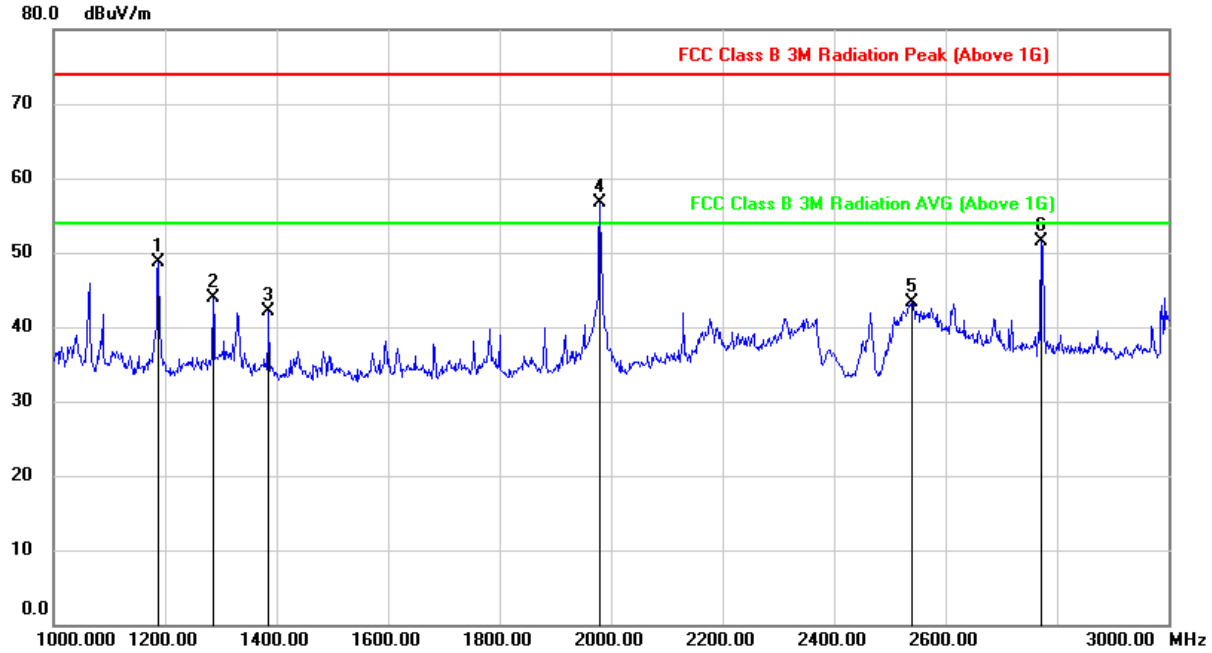


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	3555.000	51.79	-4.19	47.60	74.00	-26.40	peak
2	4980.000	49.43	0.58	50.01	74.00	-23.99	peak
3	7290.000	38.27	7.84	46.11	74.00	-27.89	peak
4*	12990.000	36.43	18.82	55.25	-	-	peak
5	13575.000	31.67	20.63	52.30	74.00	-21.70	peak
6	17760.000	26.21	26.39	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.
4.* - indicates frequency outside the Restricted Band in CFR15.205/RSS-Gen 8.10

HARMONICS AND SPURIOUS EMISSIONS (HIGH CHANNEL, HORIZONTAL)

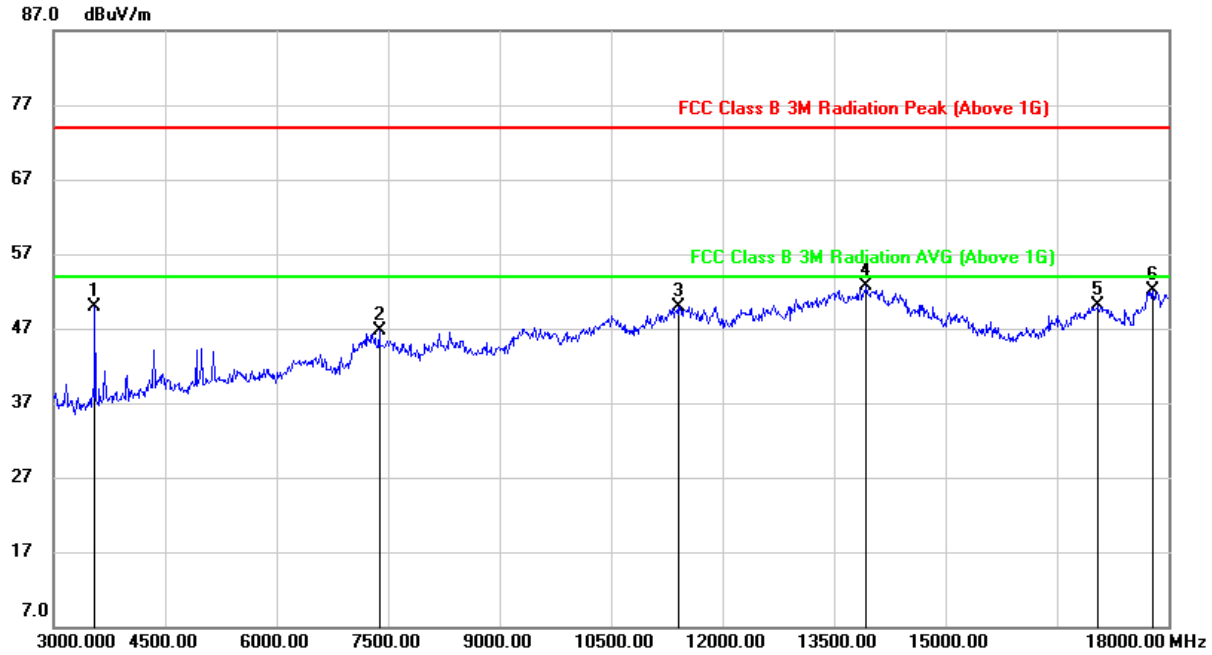
1-3GHz



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1188.000	61.78	-13.14	48.64	74.00	-25.36	peak
2	1286.000	56.51	-12.51	44.00	74.00	-30.00	peak
3	1386.000	54.27	-12.15	42.12	74.00	-31.88	peak
4*	1980.000	67.34	-10.65	56.69	-	-	peak
5	2540.000	51.70	-8.36	43.34	74.00	-30.66	peak
6	2772.000	58.52	-7.11	51.41	74.00	-22.59	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.* - indicates frequency outside the Restricted Band in CFR15.205/RSS-Gen 8.10

3-18GHz

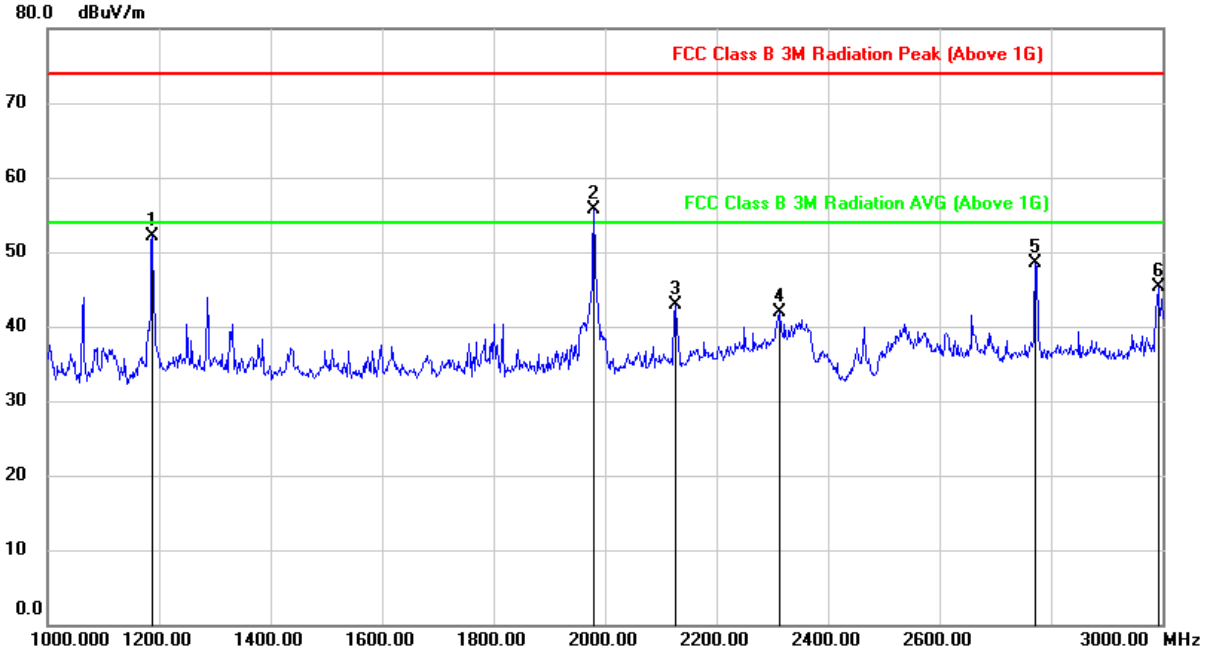


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	3555.000	54.19	-4.20	49.99	74.00	-24.01	peak
2	7380.000	39.69	7.10	46.79	74.00	-27.21	peak
3	11400.000	34.28	15.69	49.97	74.00	-24.03	peak
4	13935.000	31.95	20.67	52.62	74.00	-21.38	peak
5	17055.000	27.99	22.17	50.16	74.00	-23.84	peak
6	17790.000	25.79	26.36	52.15	74.00	-21.85	peak

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

HARMONICS AND SPURIOUS EMISSIONS (HIGH CHANNEL, VERTICAL)

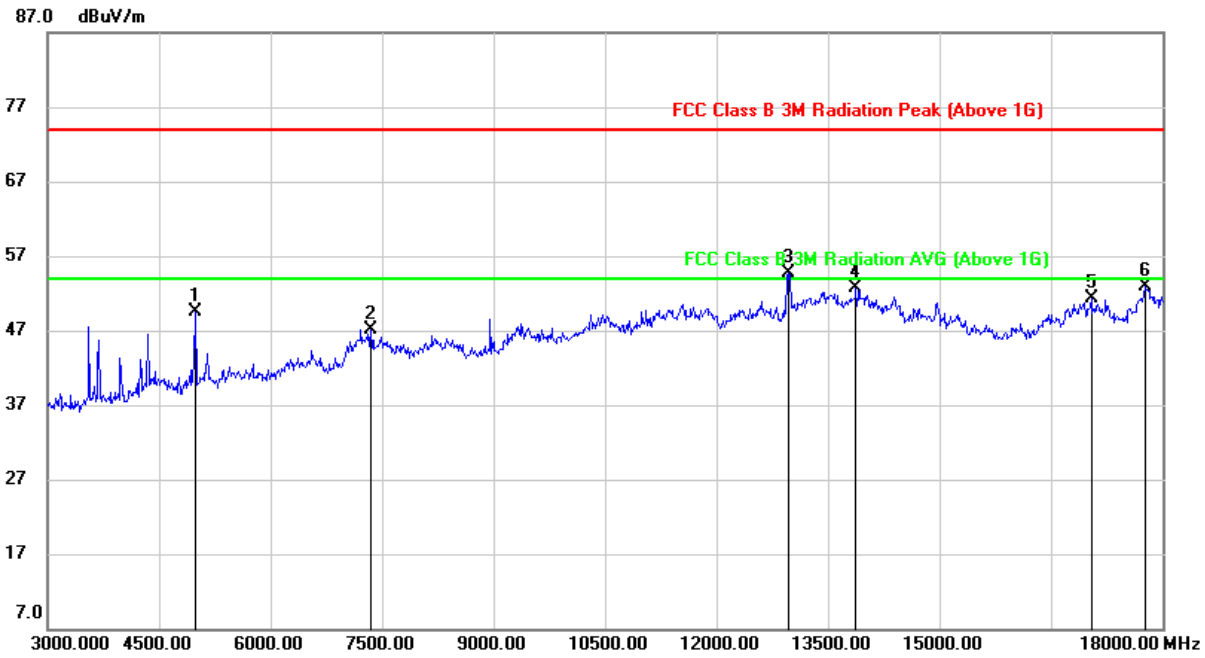
1-3GHz



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1188.000	65.39	-13.26	52.13	74.00	-21.87	peak
2*	1980.000	66.45	-10.69	55.76	-	-	peak
3	2126.000	52.19	-9.34	42.85	74.00	-31.15	peak
4	2314.000	49.20	-7.32	41.88	74.00	-32.12	peak
5	2772.000	55.75	-7.17	48.58	74.00	-25.42	peak
6	2992.000	51.82	-6.59	45.23	74.00	-28.77	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.* - indicates frequency outside the Restricted Band in CFR15.205/RSS-Gen 8.10

3-18GHz



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4995.000	48.87	0.57	49.44	74.00	-24.56	peak
2	7350.000	39.72	7.38	47.10	74.00	-26.90	peak
3*	12960.000	36.02	18.64	54.66	-	-	peak
4	13875.000	31.72	20.89	52.61	74.00	-21.39	peak
5	17040.000	28.69	22.59	51.28	74.00	-22.72	peak
6	17775.000	26.42	26.57	52.99	74.00	-21.01	peak

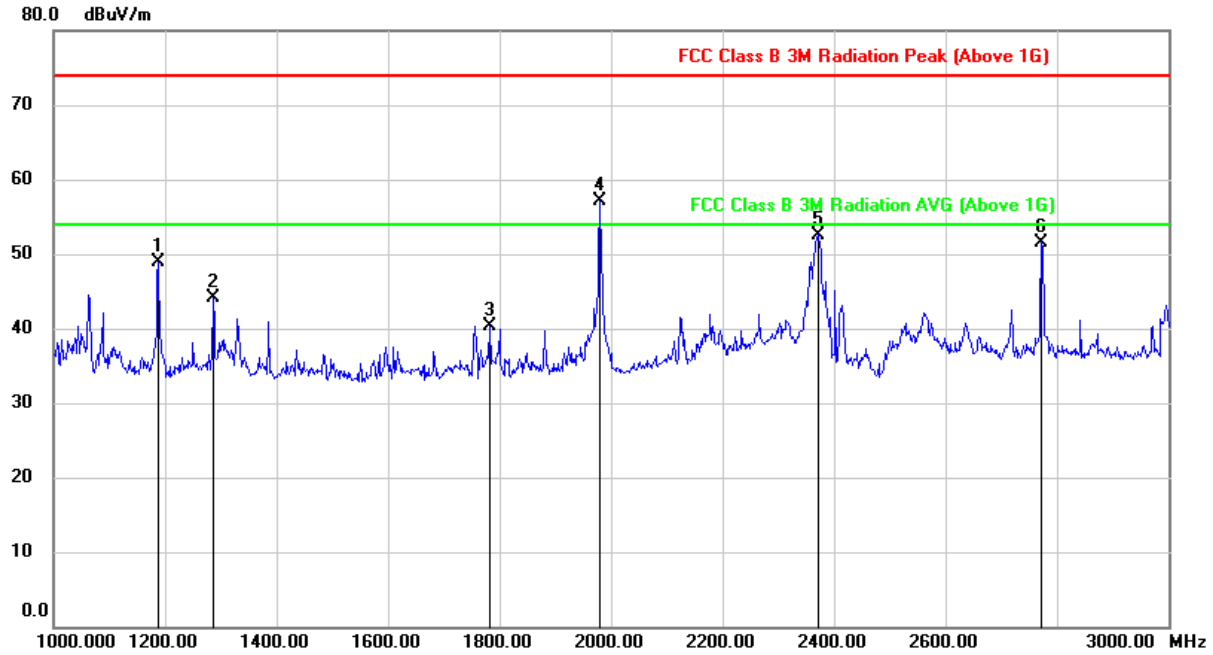
Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4.* - indicates frequency outside the Restricted Band in CFR15.205/RSS-Gen 8.10

8.2.2. 802.11g MODE

(WORST-CASE CONFIGURATION)

HARMONICS AND SPURIOUS EMISSIONS (LOW CHANNEL, HORIZONTAL)

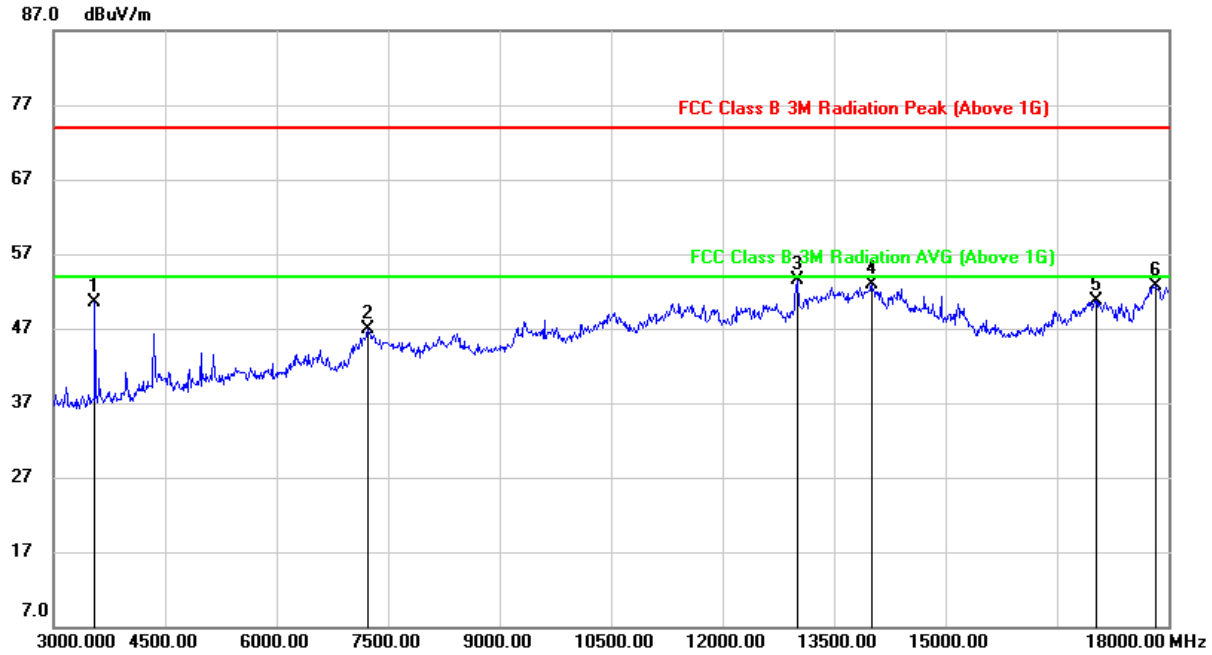
1-3GHz



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1188.000	62.07	-13.14	48.93	74.00	-25.07	peak
2	1286.000	56.71	-12.51	44.20	74.00	-29.80	peak
3	1782.000	51.54	-11.19	40.35	74.00	-33.65	peak
4*	1980.000	67.67	-10.65	57.02	-	-	peak
5	2372.000	60.50	-7.90	52.60	74.00	-21.40	peak
6	2772.000	58.71	-7.11	51.60	74.00	-22.40	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.
4.* - indicates frequency outside the Restricted Band in CFR15.205/RSS-Gen 8.10

3-18GHz

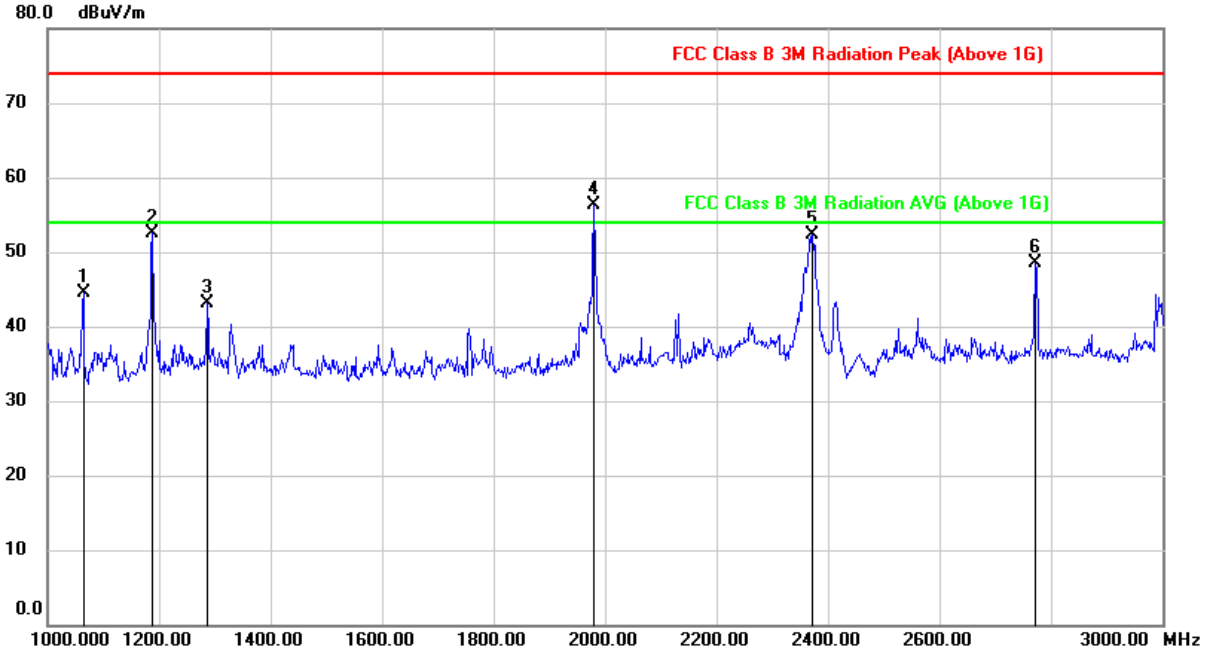


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	3555.000	54.64	-4.20	50.44	74.00	-23.56	peak
2	7230.000	39.05	7.81	46.86	74.00	-27.14	peak
3	13005.000	34.87	18.65	53.52	74.00	-20.48	peak
4	14010.000	32.21	20.61	52.82	74.00	-21.18	peak
5	17025.000	28.74	22.03	50.77	74.00	-23.23	peak
6	17820.000	26.30	26.48	52.78	74.00	-21.22	peak

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

HARMONICS AND SPURIOUS EMISSIONS (LOW CHANNEL, VERTICAL)

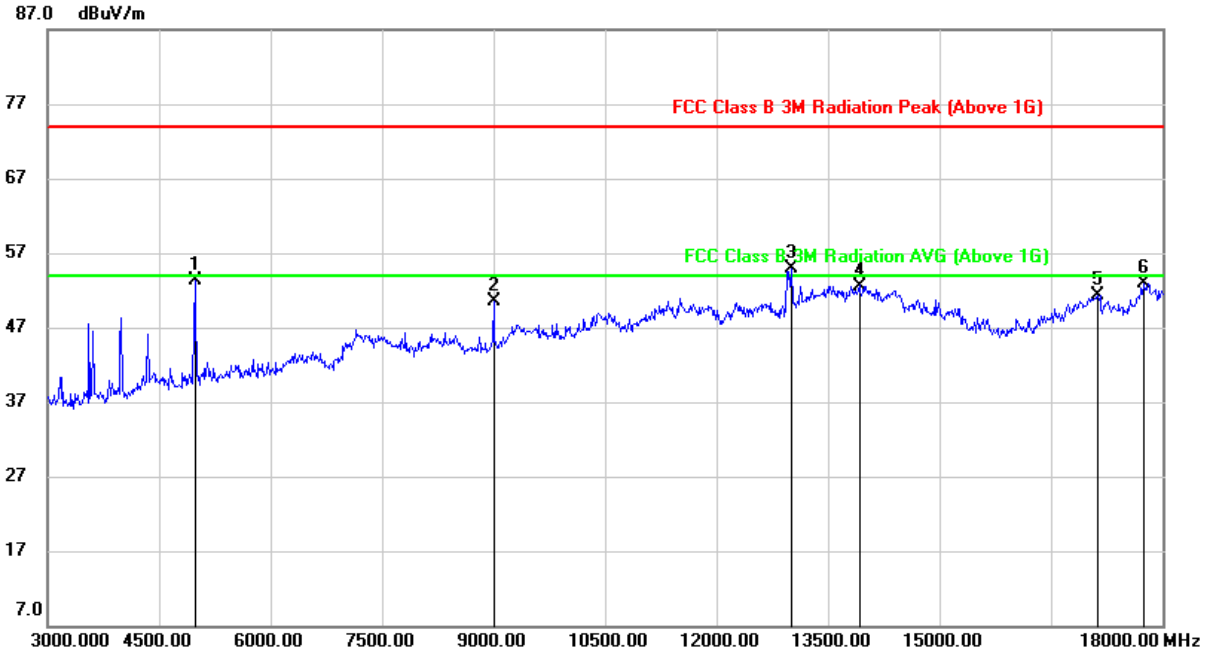
1-3GHz



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1064.000	58.40	-13.92	44.48	74.00	-29.52	peak
2	1188.000	65.76	-13.26	52.50	74.00	-21.50	peak
3	1286.000	55.78	-12.70	43.08	74.00	-30.92	peak
4*	1980.000	66.98	-10.69	56.29	-	-	peak
5	2372.000	60.05	-7.80	52.25	74.00	-21.75	peak
6	2772.000	55.58	-7.17	48.41	74.00	-25.59	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.* - indicates frequency outside the Restricted Band in CFR15.205/RSS-Gen 8.10

3-18GHz

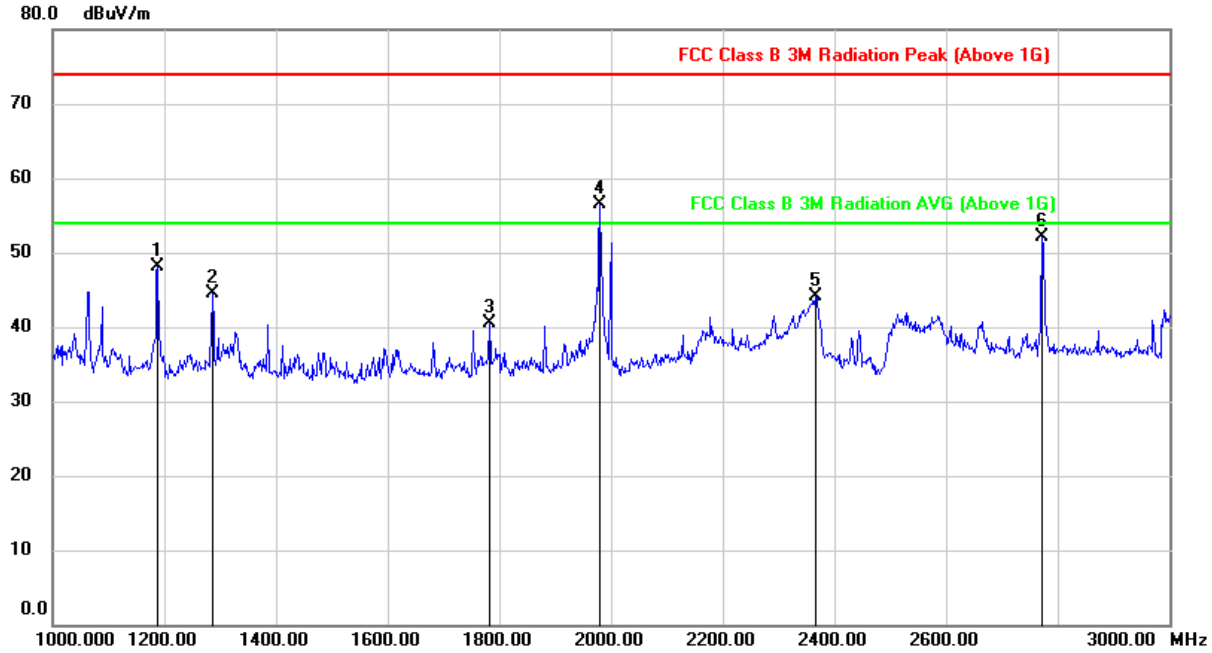


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4980.000	52.72	0.58	53.30	74.00	-20.70	peak
2	9000.000	40.82	9.60	50.42	74.00	-23.58	peak
3*	13005.000	36.12	18.84	54.96	74.00	-19.04	peak
4	13920.000	31.77	20.83	52.60	74.00	-21.40	peak
5	17130.000	28.37	22.86	51.23	74.00	-22.77	peak
6	17745.000	26.63	26.21	52.84	74.00	-21.16	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.
4.* - indicates frequency outside the Restricted Band in CFR15.205/RSS-Gen 8.10

HARMONICS AND SPURIOUS EMISSIONS (MID CHANNEL, HORIZONTAL)

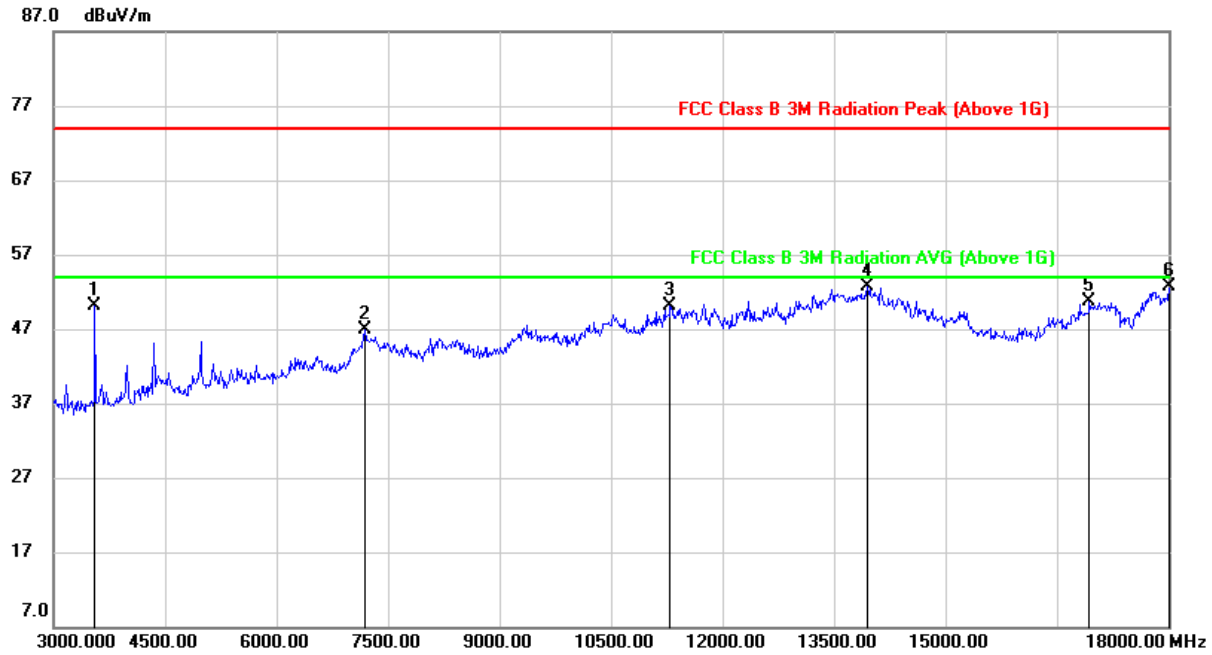
1-3GHz



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1188.000	61.33	-13.14	48.19	74.00	-25.81	peak
2	1286.000	57.10	-12.51	44.59	74.00	-29.41	peak
3	1782.000	51.71	-11.19	40.52	74.00	-33.48	peak
4*	1980.000	67.22	-10.65	56.57	-	-	peak
5	2366.000	52.03	-7.87	44.16	74.00	-29.84	peak
6	2772.000	59.23	-7.11	52.12	74.00	-21.88	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.* - indicates frequency outside the Restricted Band in CFR15.205/RSS-Gen 8.10

3-18GHz

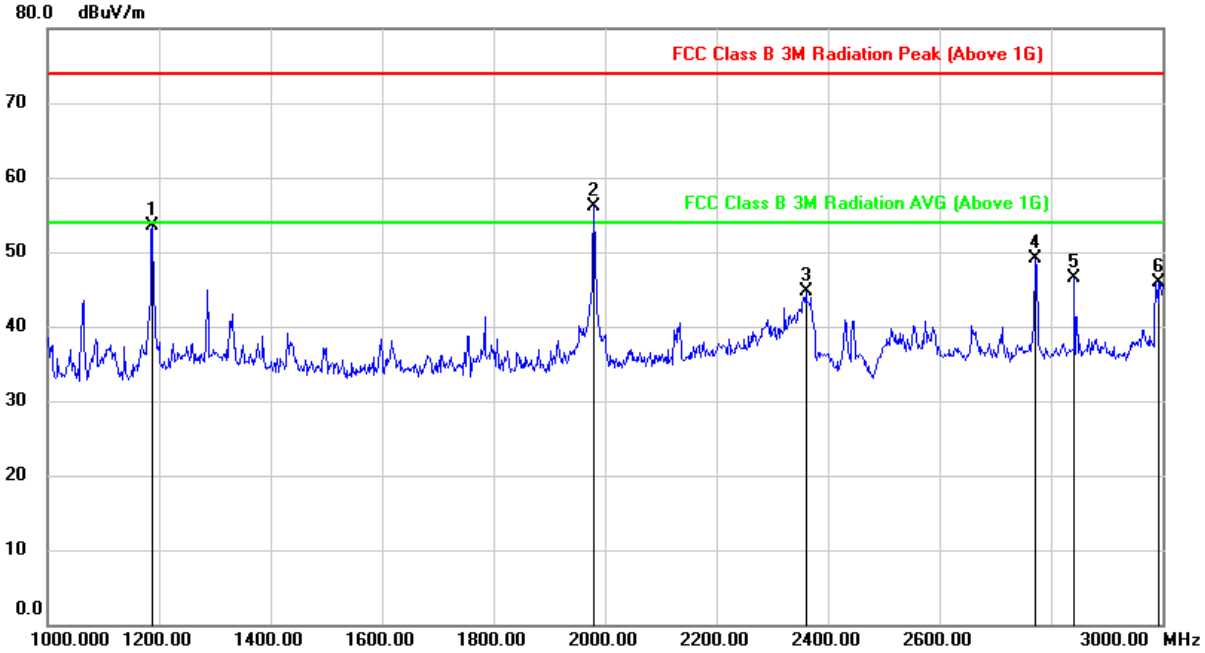


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	3555.000	54.30	-4.20	50.10	74.00	-23.90	peak
2	7185.000	39.17	7.73	46.90	74.00	-27.10	peak
3	11295.000	34.53	15.53	50.06	74.00	-23.94	peak
4	13950.000	32.00	20.68	52.68	74.00	-21.32	peak
5	16935.000	29.29	21.34	50.63	74.00	-23.37	peak
6	18000.000	25.70	27.06	52.76	74.00	-21.24	peak

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

HARMONICS AND SPURIOUS EMISSIONS (MID CHANNEL, VERTICAL)

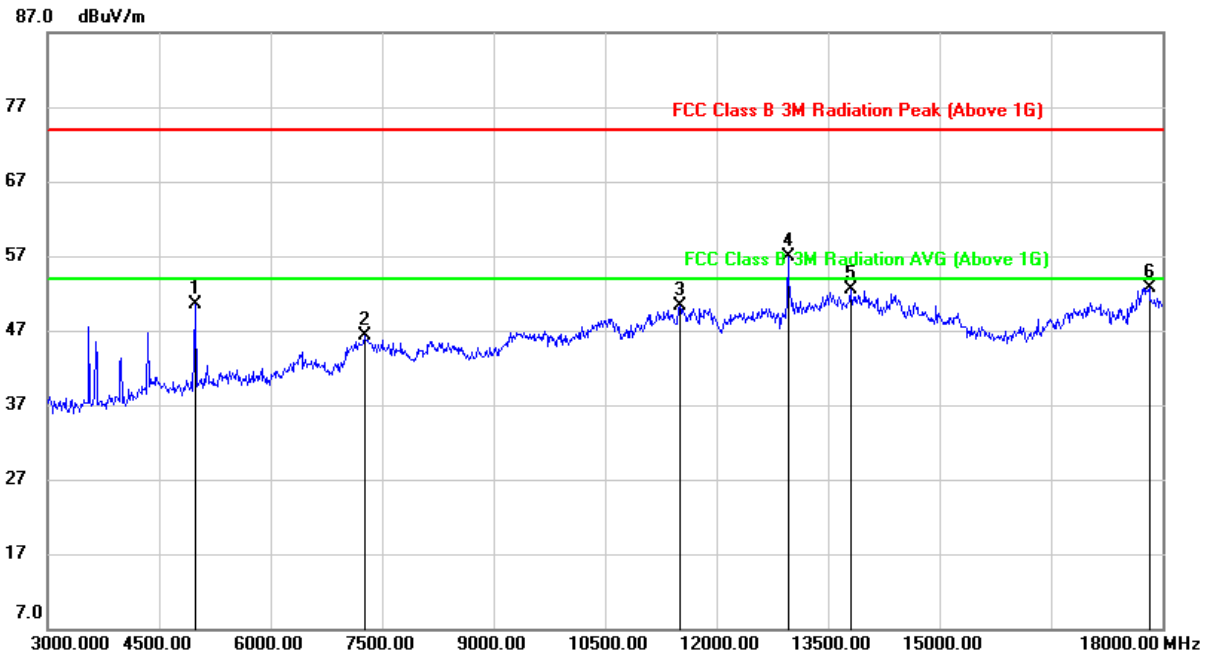
1-3GHz



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1188.000	66.82	-13.26	53.56	74.00	-20.44	peak
2*	1980.000	66.85	-10.69	56.16	-	-	peak
3	2360.000	52.35	-7.72	44.63	74.00	-29.37	peak
4	2772.000	56.31	-7.17	49.14	74.00	-24.86	peak
5	2842.000	53.29	-6.74	46.55	74.00	-27.45	peak
6	2994.000	52.47	-6.59	45.88	74.00	-28.12	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.* - indicates frequency outside the Restricted Band in CFR15.205/RSS-Gen 8.10

3-18GHz

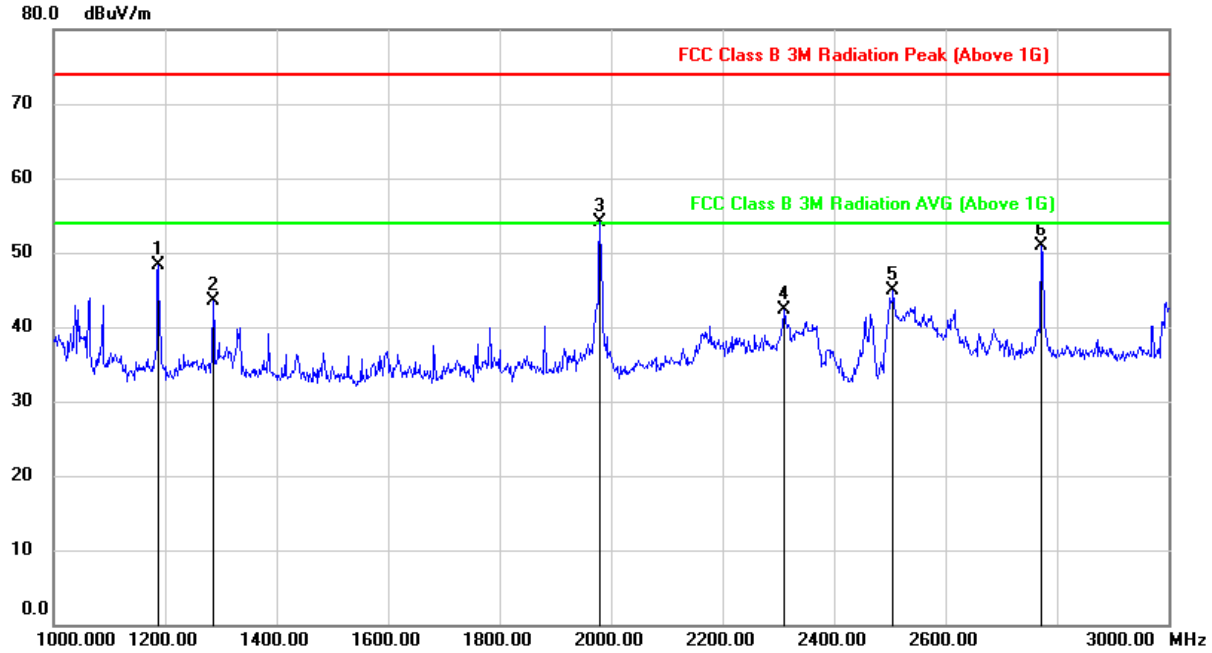


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4980.000	50.00	0.58	50.58	74.00	-23.42	peak
2	7260.000	38.53	7.78	46.31	74.00	-27.69	peak
3	11505.000	34.13	16.26	50.39	74.00	-23.61	peak
4*	12960.000	38.34	18.64	56.98	-	-	peak
5	13800.000	31.36	21.21	52.57	74.00	-21.43	peak
6	17820.000	26.19	26.56	52.75	74.00	-21.25	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.* - indicates frequency outside the Restricted Band in CFR15.205/RSS-Gen 8.10

HARMONICS AND SPURIOUS EMISSIONS (HIGH CHANNEL, HORIZONTAL)

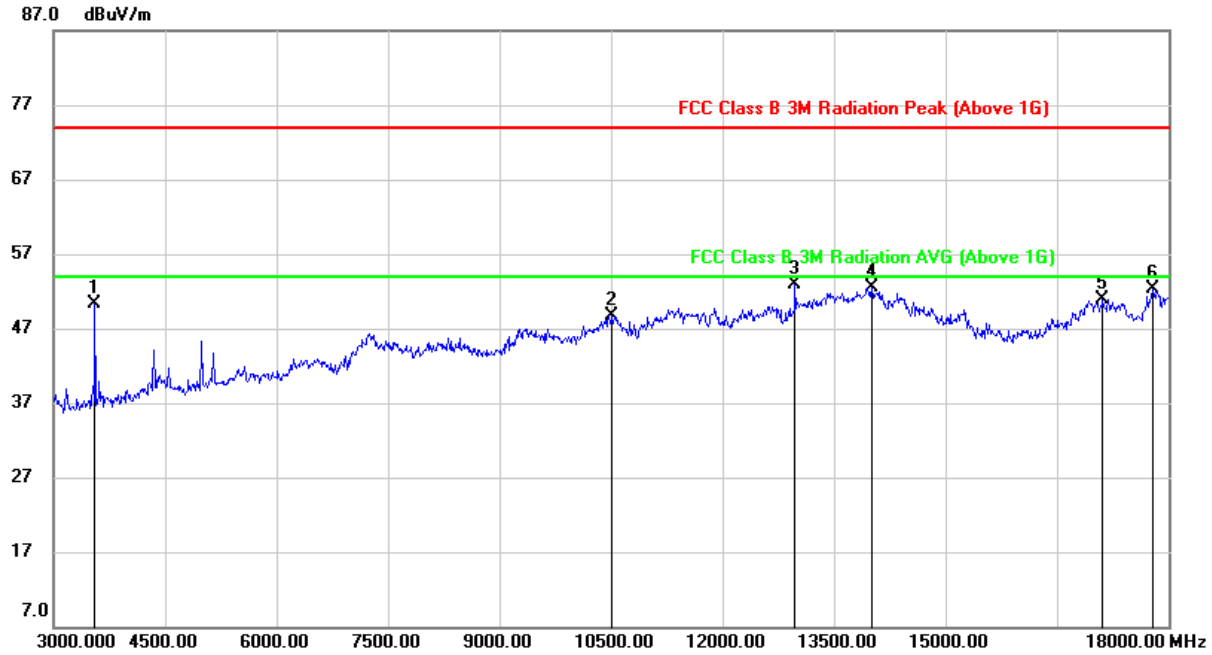
1-3GHz



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1188.000	61.44	-13.14	48.30	74.00	-25.70	peak
2	1286.000	55.94	-12.51	43.43	74.00	-30.57	peak
3*	1980.000	64.77	-10.65	54.12	-	-	peak
4	2310.000	49.78	-7.47	42.31	74.00	-31.69	peak
5	2506.000	53.35	-8.40	44.95	74.00	-29.05	peak
6	2772.000	57.93	-7.11	50.82	74.00	-23.18	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.* - indicates frequency outside the Restricted Band in CFR15.205/RSS-Gen 8.10

3-18GHz

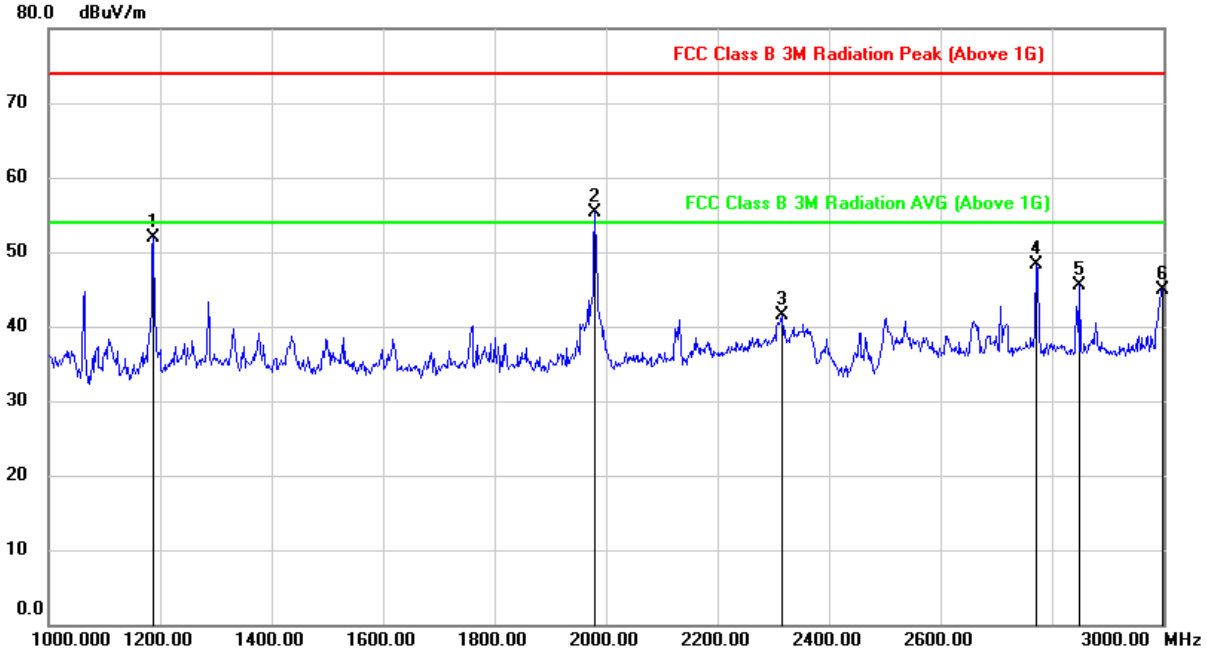


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	3555.000	54.46	-4.20	50.26	74.00	-23.74	peak
2	10500.000	34.97	13.71	48.68	74.00	-25.32	peak
3	12975.000	34.20	18.68	52.88	74.00	-21.12	peak
4	14010.000	31.96	20.61	52.57	74.00	-21.43	peak
5	17115.000	28.58	22.37	50.95	74.00	-23.05	peak
6	17790.000	25.93	26.36	52.29	74.00	-21.71	peak

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

HARMONICS AND SPURIOUS EMISSIONS (HIGH CHANNEL, VERTICAL)

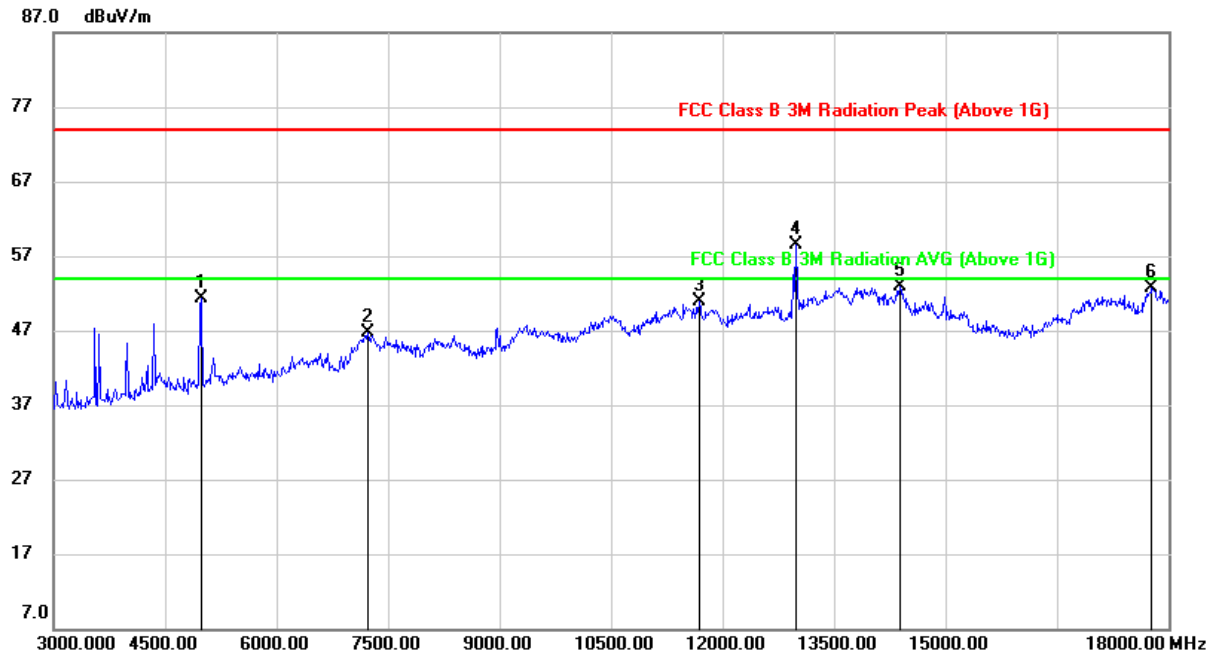
1-3GHz



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1188.000	65.21	-13.26	51.95	74.00	-22.05	peak
2*	1980.000	66.05	-10.69	55.36	-	-	peak
3	2316.000	48.94	-7.34	41.60	74.00	-32.40	peak
4	2772.000	55.51	-7.17	48.34	74.00	-25.66	peak
5	2850.000	52.10	-6.69	45.41	74.00	-28.59	peak
6	2998.000	51.47	-6.60	44.87	74.00	-29.13	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.
4.* - indicates frequency outside the Restricted Band in CFR15.205/RSS-Gen 8.10

3-18GHz



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4980.000	50.69	0.58	51.27	74.00	-22.73	peak
2	7230.000	38.95	7.79	46.74	74.00	-27.26	peak
3	11685.000	34.39	16.55	50.94	74.00	-23.06	peak
4*	12990.000	39.60	18.82	58.42	-	-	peak
5	14385.000	32.60	20.37	52.97	74.00	-21.03	peak
6	17775.000	26.18	26.57	52.75	74.00	-21.25	peak

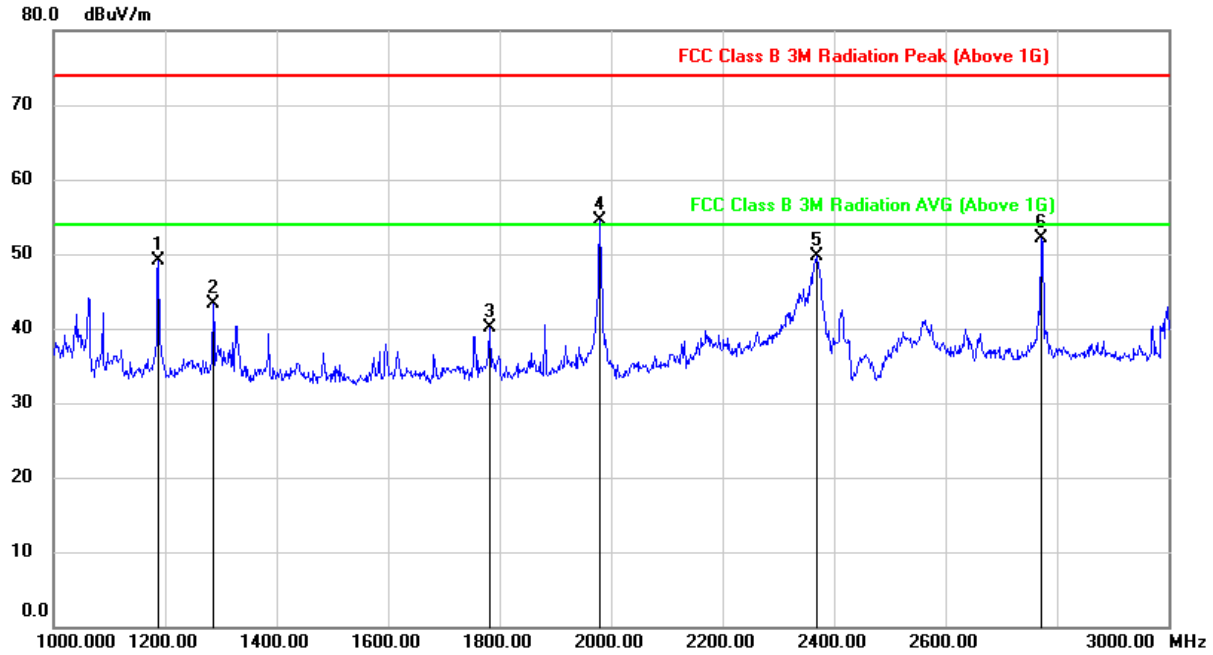
Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4.* - indicates frequency outside the Restricted Band in CFR15.205/RSS-Gen 8.10

8.2.3. 802.11n20 MODE

(WORST-CASE CONFIGURATION)

HARMONICS AND SPURIOUS EMISSIONS (LOW CHANNEL, HORIZONTAL)

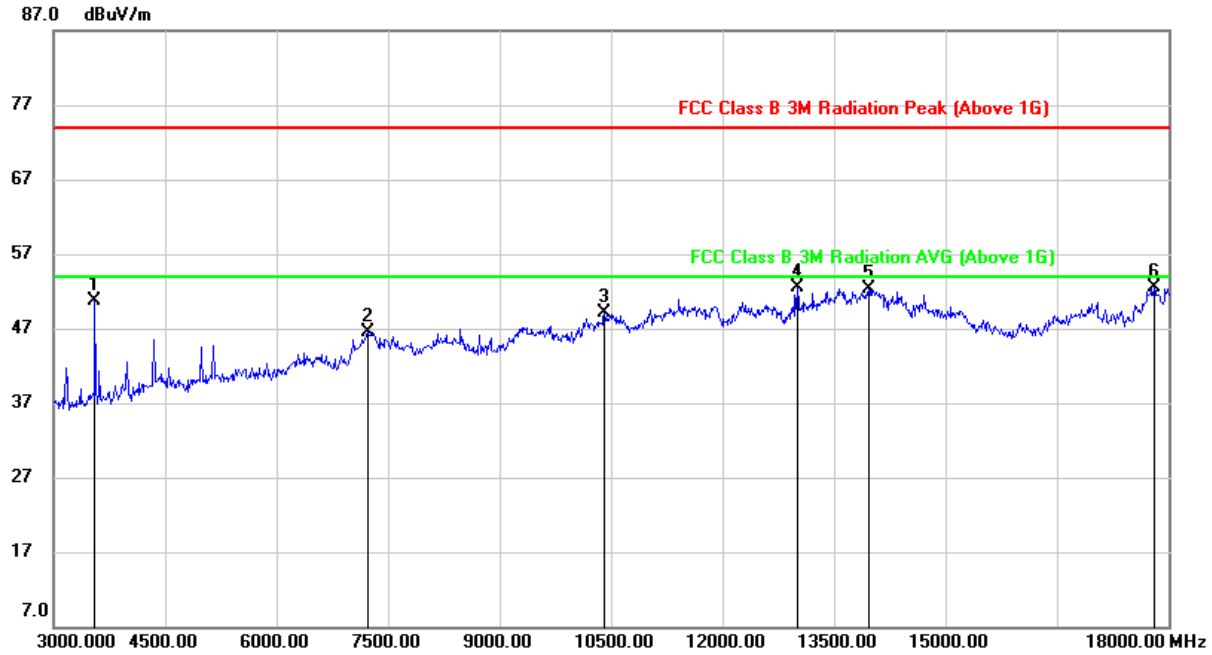
1-3GHz



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1188.000	62.22	-13.14	49.08	74.00	-24.92	peak
2	1286.000	55.85	-12.51	43.34	74.00	-30.66	peak
3	1782.000	51.32	-11.19	40.13	74.00	-33.87	peak
4*	1980.000	65.23	-10.65	54.58	-	-	peak
5	2370.000	57.59	-7.89	49.70	74.00	-24.30	peak
6	2772.000	59.17	-7.11	52.06	74.00	-21.94	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.* - indicates frequency outside the Restricted Band in CFR15.205/RSS-Gen 8.10

3-18GHz

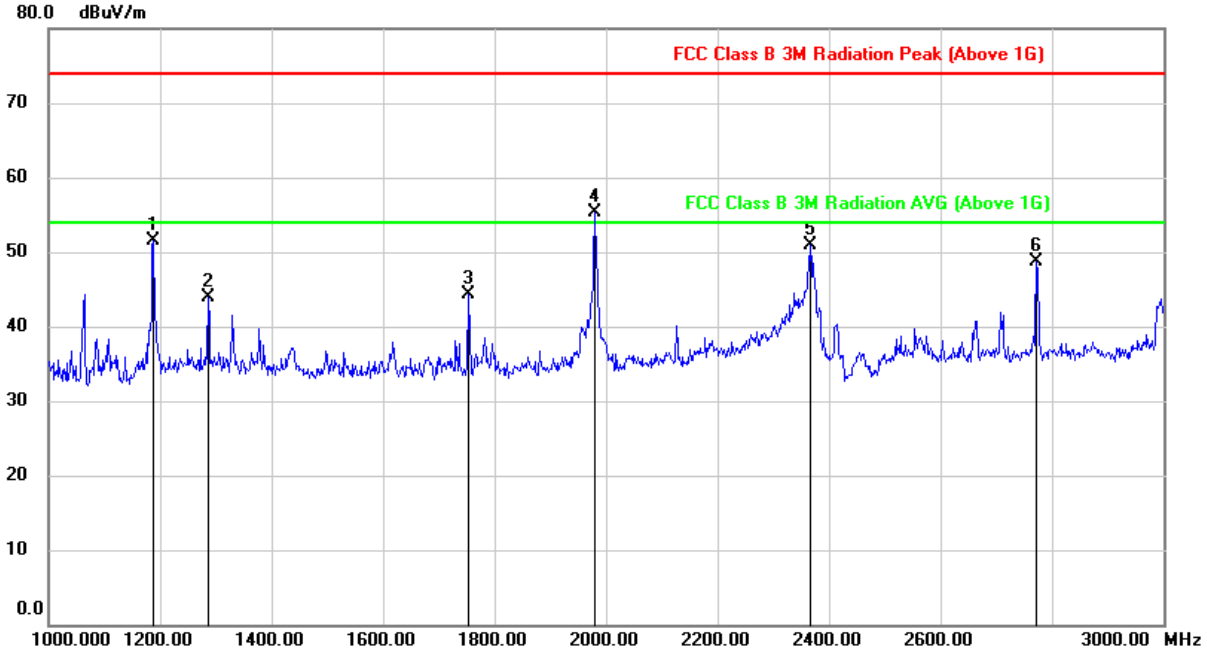


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	3555.000	54.95	-4.20	50.75	74.00	-23.25	peak
2	7230.000	38.76	7.81	46.57	74.00	-27.43	peak
3	10410.000	35.92	13.16	49.08	74.00	-24.92	peak
4	13005.000	33.90	18.65	52.55	74.00	-21.45	peak
5	13965.000	31.60	20.66	52.26	74.00	-21.74	peak
6	17805.000	26.11	26.48	52.59	74.00	-21.41	peak

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

HARMONICS AND SPURIOUS EMISSIONS (LOW CHANNEL, VERTICAL)

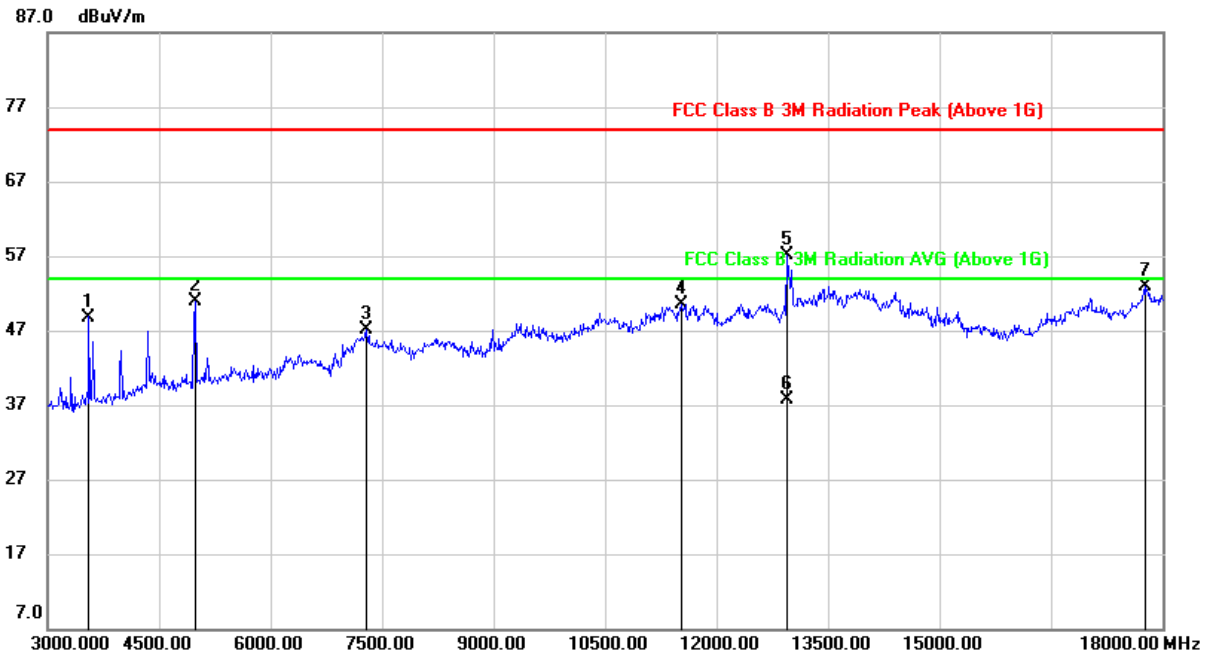
1-3GHz



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1188.000	64.85	-13.26	51.59	74.00	-22.41	peak
2	1286.000	56.58	-12.70	43.88	74.00	-30.12	peak
3	1754.000	55.61	-11.27	44.34	74.00	-29.66	peak
4*	1980.000	65.94	-10.69	55.25	-	-	peak
5	2366.000	58.71	-7.77	50.94	74.00	-23.06	peak
6	2772.000	55.90	-7.17	48.73	74.00	-25.27	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.
4.* - indicates frequency outside the Restricted Band in CFR15.205/RSS-Gen 8.10

3-18GHz

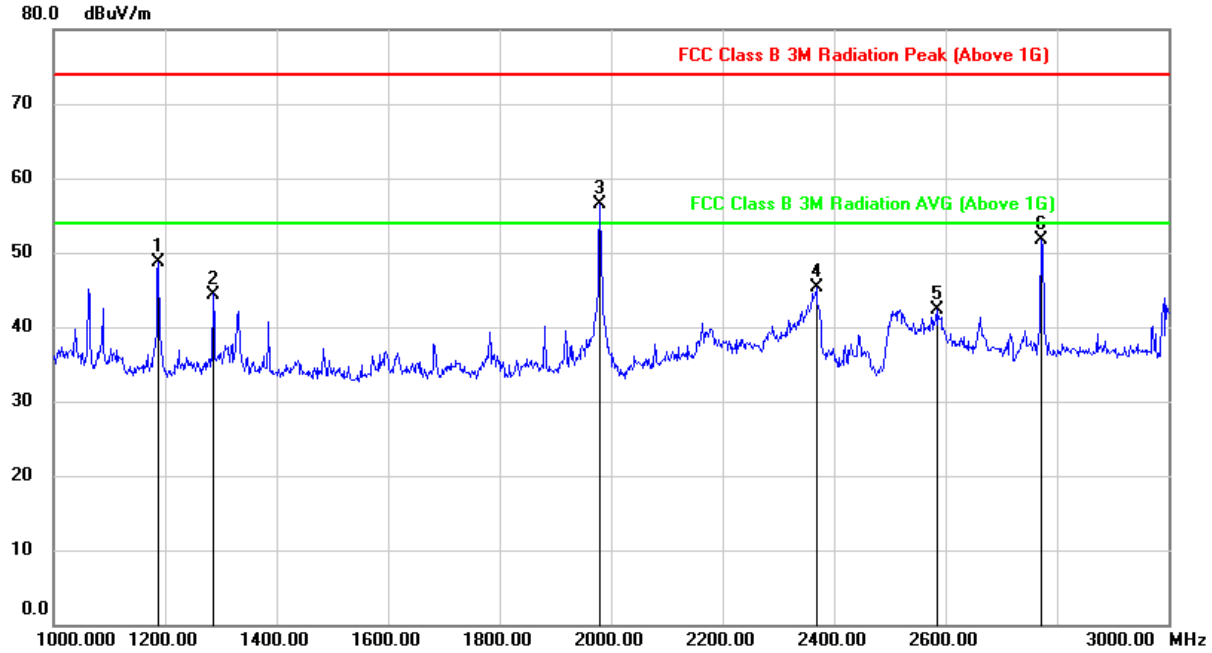


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	3555.000	52.99	-4.19	48.80	74.00	-25.20	peak
2	4980.000	50.39	0.58	50.97	74.00	-23.03	peak
3	7290.000	39.19	7.84	47.03	74.00	-26.97	peak
4	11535.000	34.25	16.23	50.48	74.00	-23.52	peak
5	12945.000	38.49	18.56	57.05	74.00	-16.95	peak
6	12945.140	19.08	18.56	37.64	54.00	-16.36	AVG
7	17760.000	26.43	26.39	52.82	74.00	-21.18	peak

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

HARMONICS AND SPURIOUS EMISSIONS (MID CHANNEL, HORIZONTAL)

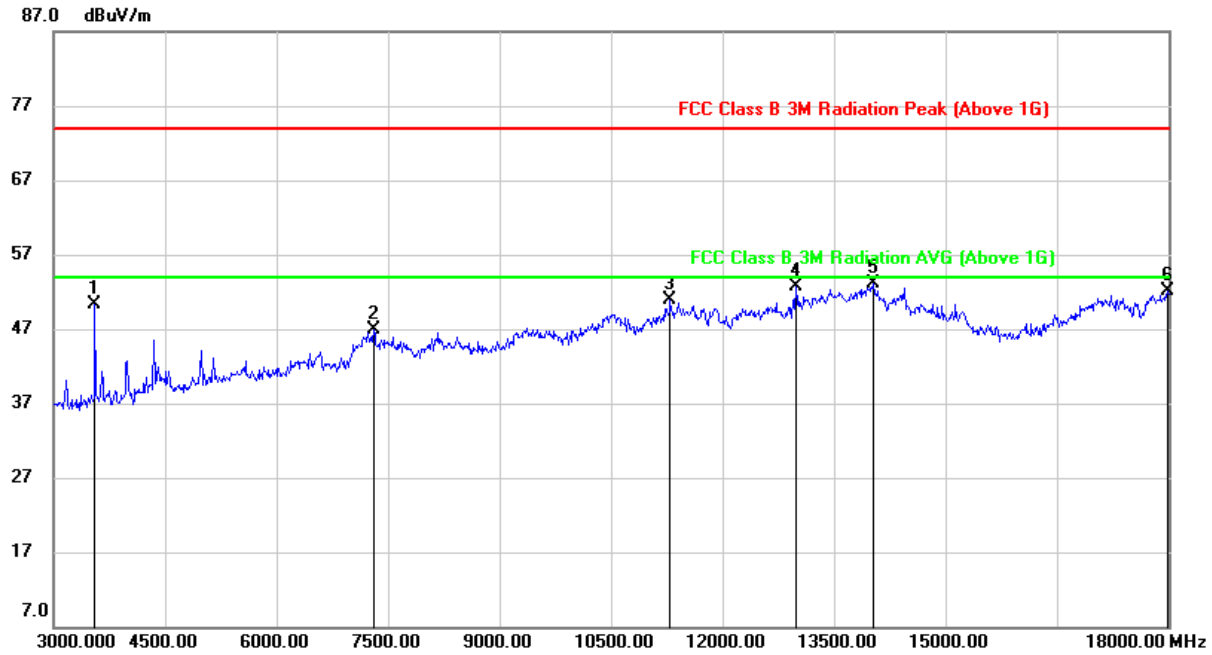
1-3GHz



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1188.000	61.78	-13.14	48.64	74.00	-25.36	peak
2	1286.000	56.91	-12.51	44.40	74.00	-29.60	peak
3*	1980.000	67.22	-10.65	56.57	-	-	peak
4	2368.000	53.09	-7.88	45.21	74.00	-28.79	peak
5	2584.000	50.58	-8.19	42.39	74.00	-31.61	peak
6	2772.000	58.86	-7.11	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.* - indicates frequency outside the Restricted Band in CFR15.205/RSS-Gen 8.10

3-18GHz

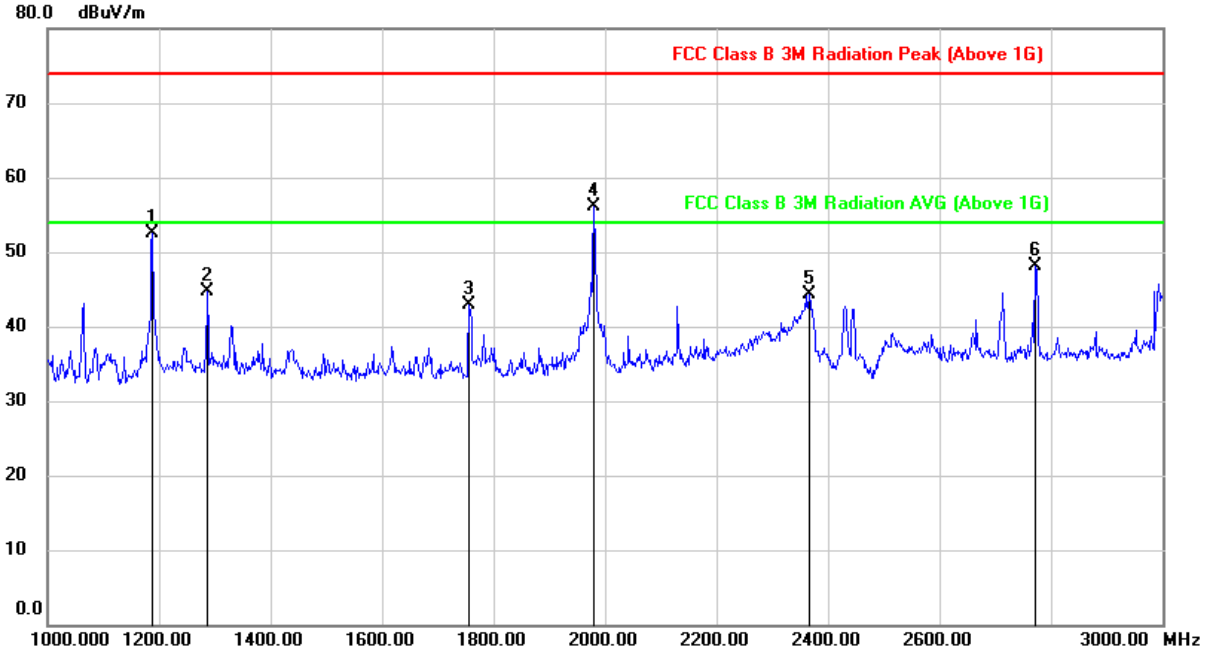


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	3555.000	54.48	-4.20	50.28	74.00	-23.72	peak
2	7305.000	39.11	7.80	46.91	74.00	-27.09	peak
3	11295.000	35.46	15.53	50.99	74.00	-23.01	peak
4	12990.000	33.97	18.68	52.65	74.00	-21.35	peak
5	14025.000	32.52	20.62	53.14	74.00	-20.86	peak
6	17985.000	25.07	27.05	52.12	74.00	-21.88	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.

HARMONICS AND SPURIOUS EMISSIONS (MID CHANNEL, VERTICAL)

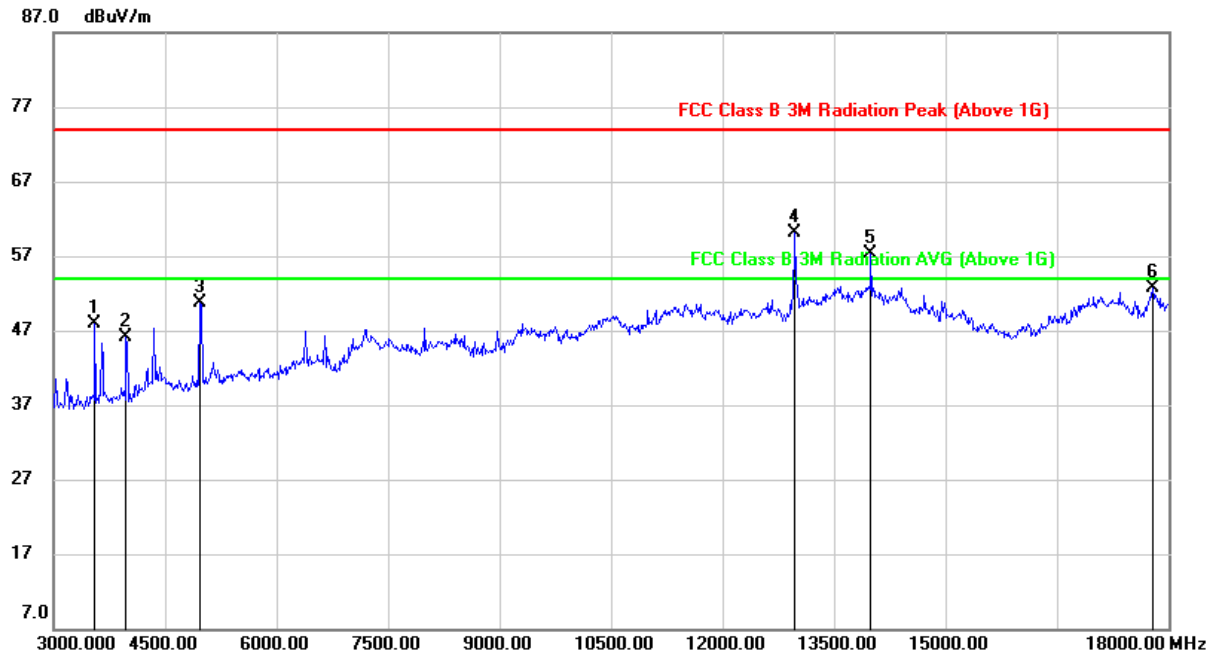
1-3GHz



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1188.000	65.79	-13.26	52.53	74.00	-21.47	peak
2	1286.000	57.43	-12.70	44.73	74.00	-29.27	peak
3	1756.000	54.18	-11.26	42.92	74.00	-31.08	peak
4*	1980.000	66.83	-10.69	56.14	-	-	peak
5	2366.000	52.06	-7.77	44.29	74.00	-29.71	peak
6	2772.000	55.34	-7.17	48.17	74.00	-25.83	peak

Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4.* - indicates frequency outside the Restricted Band in CFR15.205/RSS-Gen 8.10

3-18GHz

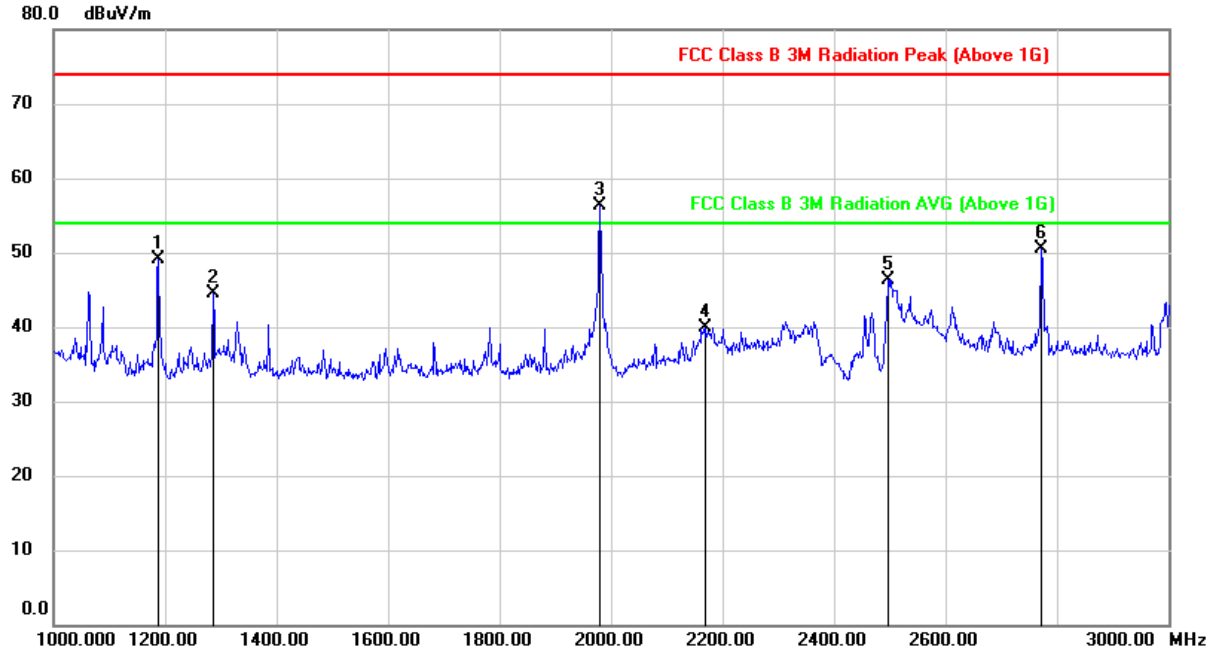


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	3555.000	52.18	-4.19	47.99	74.00	-26.01	peak
2	3975.000	49.14	-3.02	46.12	74.00	-27.88	peak
3	4965.000	50.14	0.59	50.73	74.00	-23.27	peak
4*	12975.000	41.28	18.73	60.01	-	-	peak
5*	13995.000	36.53	20.72	57.25	-	-	peak
6	17790.000	25.98	26.76	52.74	74.00	-21.26	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.* - indicates frequency outside the Restricted Band in CFR15.205/RSS-Gen 8.10

HARMONICS AND SPURIOUS EMISSIONS (HIGH CHANNEL, HORIZONTAL)

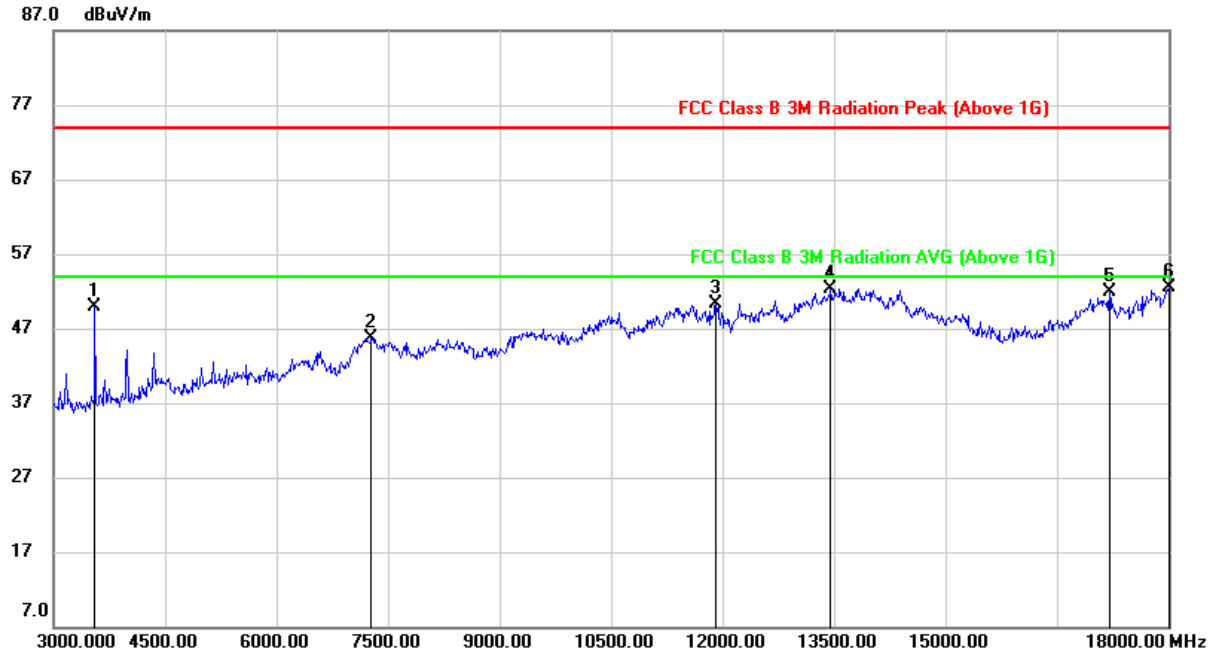
1-3GHz



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1188.000	62.20	-13.14	49.06	74.00	-24.94	peak
2	1286.000	57.01	-12.51	44.50	74.00	-29.50	peak
3*	1980.000	66.94	-10.65	56.29	-	-	peak
4	2170.000	48.60	-8.67	39.93	74.00	-34.07	peak
5	2496.000	54.77	-8.39	46.38	74.00	-27.62	peak
6	2772.000	57.52	-7.11	50.41	74.00	-23.59	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.* - indicates frequency outside the Restricted Band in CFR15.205/RSS-Gen 8.10

3-18GHz

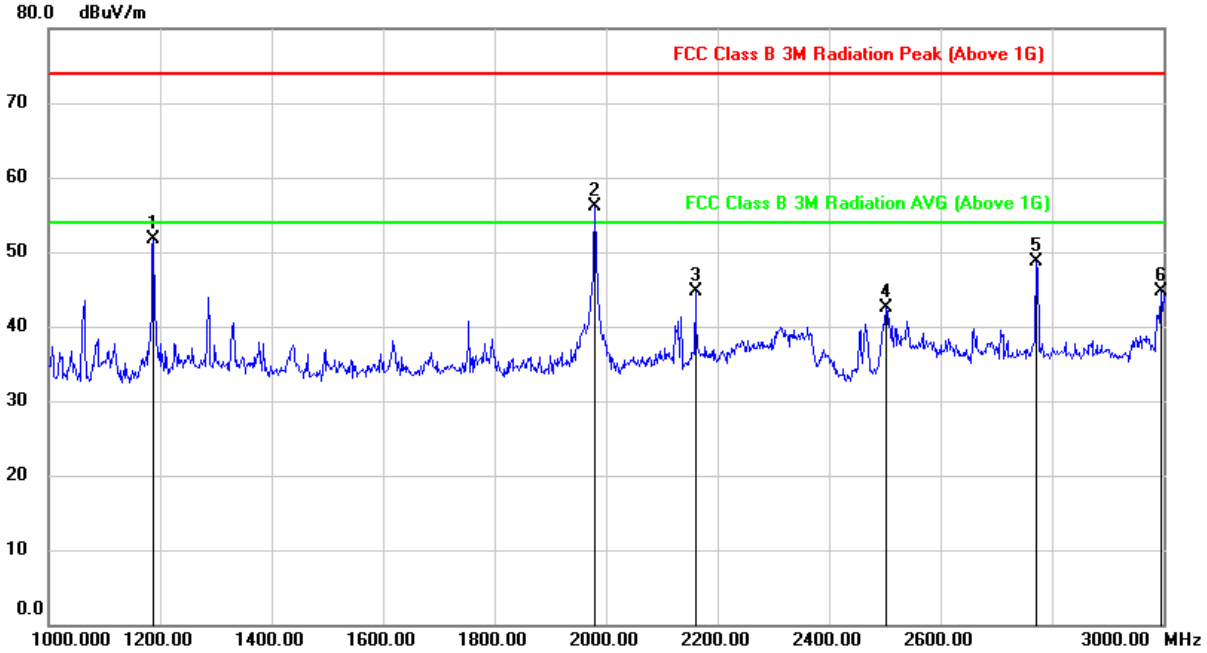


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	3555.000	54.15	-4.20	49.95	74.00	-24.05	peak
2	7275.000	37.92	7.86	45.78	74.00	-28.22	peak
3	11910.000	33.31	16.98	50.29	74.00	-23.71	peak
4	13455.000	32.19	20.11	52.30	74.00	-21.70	peak
5	17205.000	29.07	22.78	51.85	74.00	-22.15	peak
6	18000.000	25.50	27.06	52.56	74.00	-21.44	peak

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

HARMONICS AND SPURIOUS EMISSIONS (HIGH CHANNEL, VERTICAL)

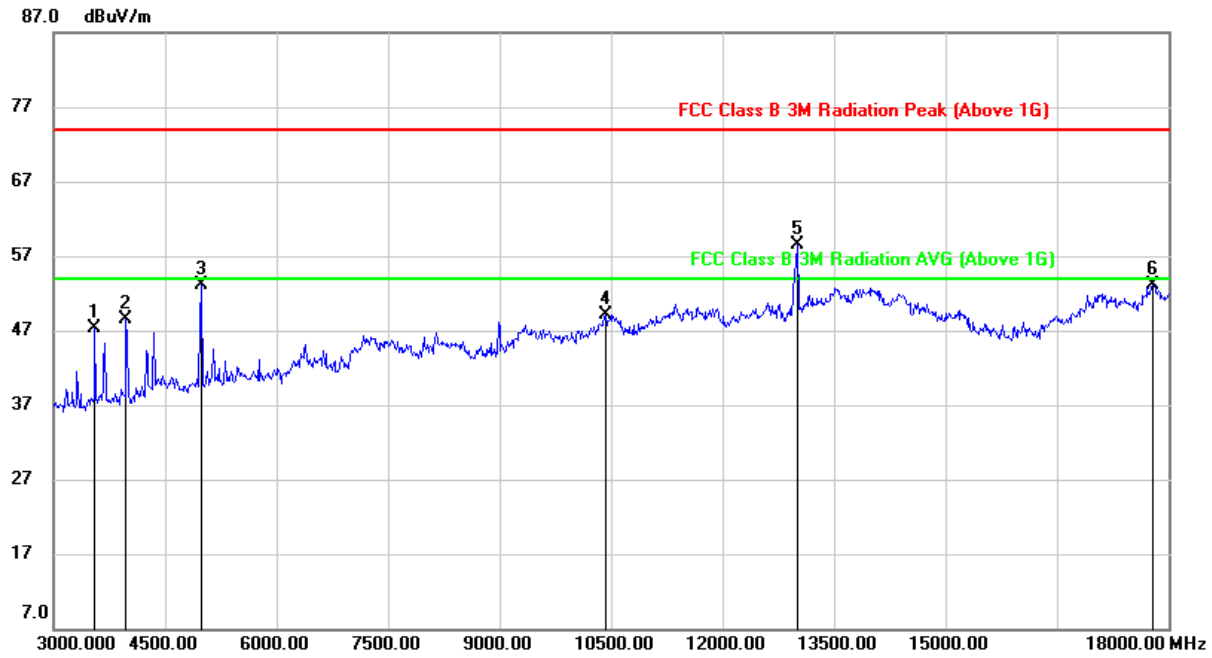
1-3GHz



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1188.000	64.96	-13.26	51.70	74.00	-22.30	peak
2*	1980.000	66.80	-10.69	56.11	-	-	peak
3	2160.000	53.58	-8.88	44.70	74.00	-29.30	peak
4	2502.000	50.71	-8.30	42.41	74.00	-31.59	peak
5	2772.000	55.94	-7.17	48.77	74.00	-25.23	peak
6	2996.000	51.26	-6.60	44.66	74.00	-29.34	peak

Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4.* - indicates frequency outside the Restricted Band in CFR15.205/RSS-Gen 8.10

3-18GHz



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	3555.000	51.42	-4.19	47.23	74.00	-26.77	peak
2	3975.000	51.50	-3.02	48.48	74.00	-25.52	peak
3	4980.000	52.48	0.58	53.06	74.00	-20.94	peak
4	10425.000	35.83	13.35	49.18	74.00	-24.82	peak
5*	13005.000	39.62	18.84	58.46	-	-	peak
6	17790.000	26.25	26.76	53.01	74.00	-20.99	peak

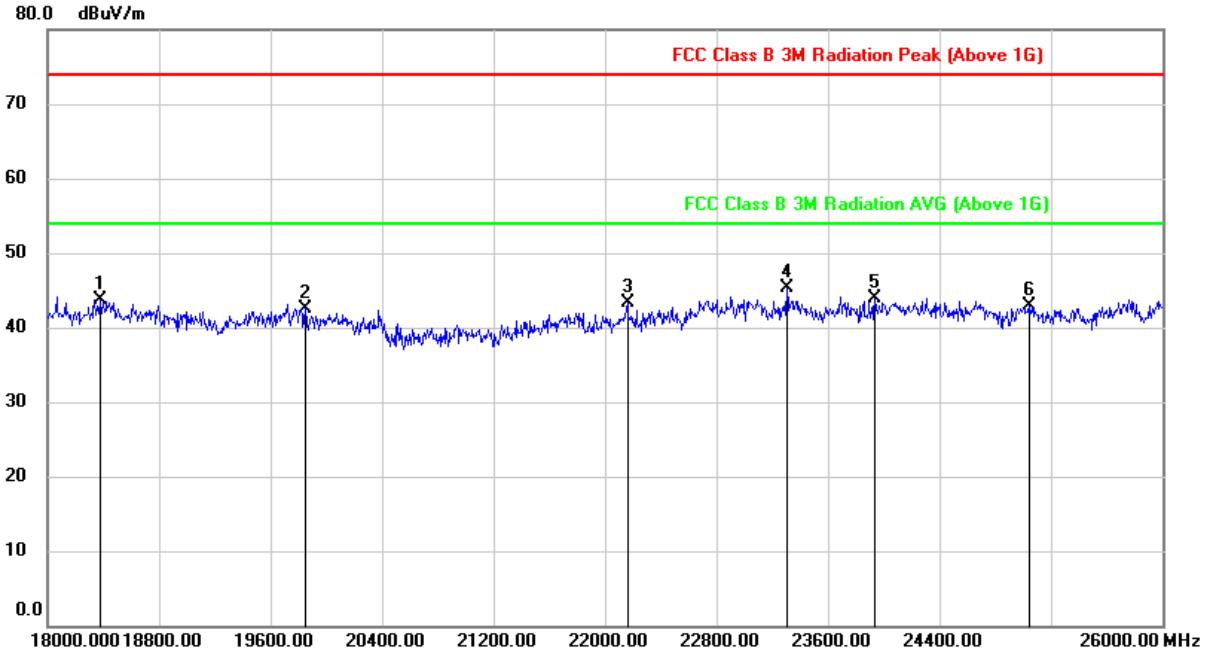
Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV limit, AV Result is deemed to comply with AV limit.
3. Peak: Peak detector.
4.* - indicates frequency outside the Restricted Band in CFR15.205/RSS-Gen 8.10

8.3. SPURIOUS EMISSIONS (18~26GHz)

8.3.1. 802.11n HT20 MODE

(WORST-CASE CONFIGURATION)

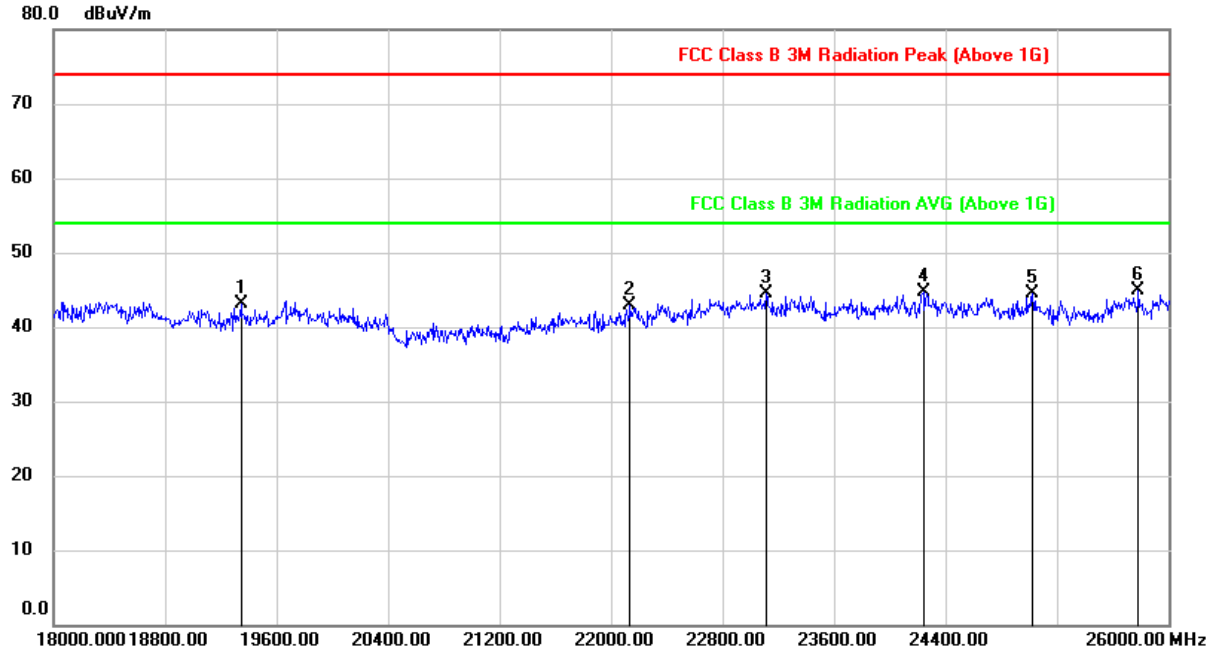
SPURIOUS EMISSIONS (HIGH CHANNEL, WORST-CASE CONFIGURATION, HORIZONTAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	18376.000	48.03	-4.35	43.68	74.00	-30.32	peak
2	19848.000	46.61	-4.01	42.60	74.00	-31.40	peak
3	22160.000	48.47	-5.26	43.21	74.00	-30.79	peak
4	23304.000	49.00	-3.64	45.36	74.00	-28.64	peak
5	23936.000	47.32	-3.44	43.88	74.00	-30.12	peak
6	25040.000	45.85	-2.88	42.97	74.00	-31.03	peak

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

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



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	19344.000	47.91	-4.86	43.05	74.00	-30.95	peak
2	22136.000	48.26	-5.32	42.94	74.00	-31.06	peak
3	23112.000	48.25	-3.65	44.60	74.00	-29.40	peak
4	24240.000	48.09	-3.48	44.61	74.00	-29.39	peak
5	25024.000	47.45	-2.88	44.57	74.00	-29.43	peak
6	25784.000	47.40	-2.49	44.91	74.00	-29.09	peak

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

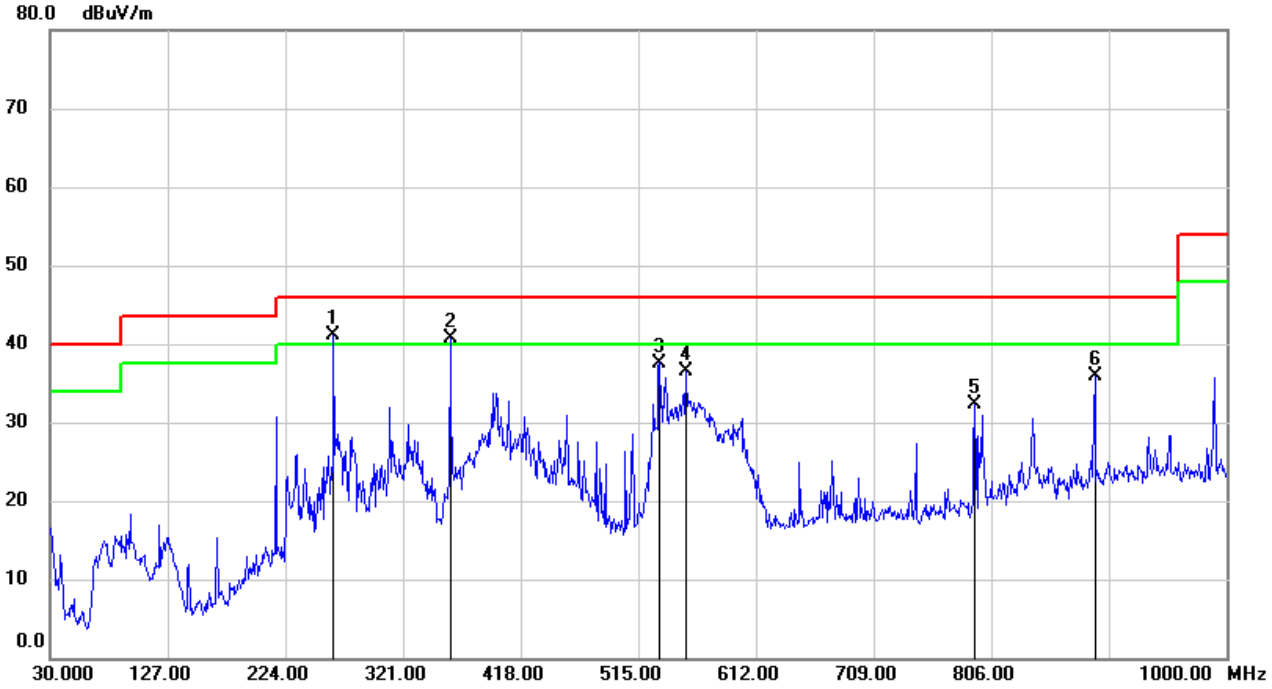
Note: All the modes had been tested, but only the worst data were recorded in the report.

8.4. SPURIOUS EMISSIONS (30M ~ 1 GHz)

8.4.1. 802.11n HT20 MODE

(WORST-CASE CONFIGURATION)

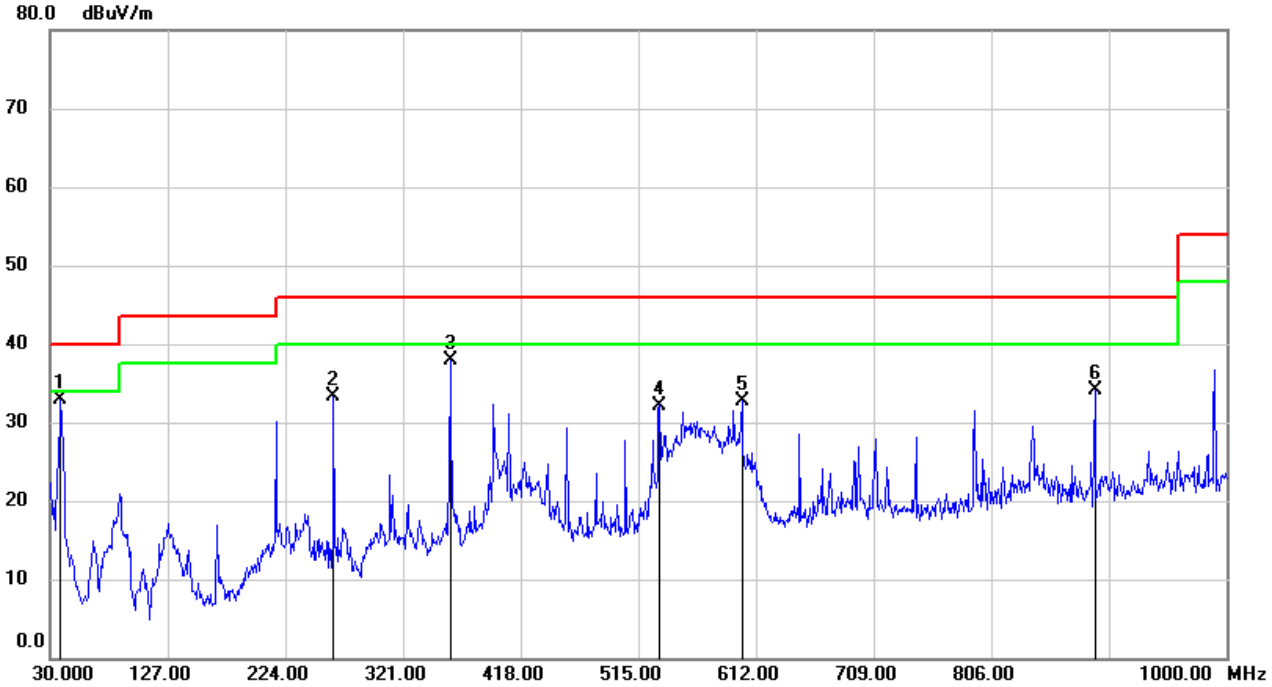
SPURIOUS EMISSIONS (LOW CHANNEL, WORST-CASE CONFIGURATION, HORIZONTAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	263.7700	57.29	-16.11	41.18	46.00	-4.82	QP
2	359.8000	54.34	-13.71	40.63	46.00	-5.37	QP
3	532.4600	48.08	-10.48	37.60	46.00	-8.40	QP
4	553.8000	46.73	-10.15	36.58	46.00	-9.42	QP
5	792.4200	38.38	-6.08	32.30	46.00	-13.70	QP
6	891.3600	40.59	-4.66	35.93	46.00	-10.07	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	38.7300	50.94	-18.11	32.83	40.00	-7.17	QP
2	263.7700	49.42	-16.11	33.31	46.00	-12.69	QP
3	359.8000	51.65	-13.71	37.94	46.00	-8.06	QP
4	532.4600	42.68	-10.48	32.20	46.00	-13.80	QP
5	600.3600	41.86	-9.10	32.76	46.00	-13.24	QP
6	891.3600	38.76	-4.66	34.10	46.00	-11.90	QP

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

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

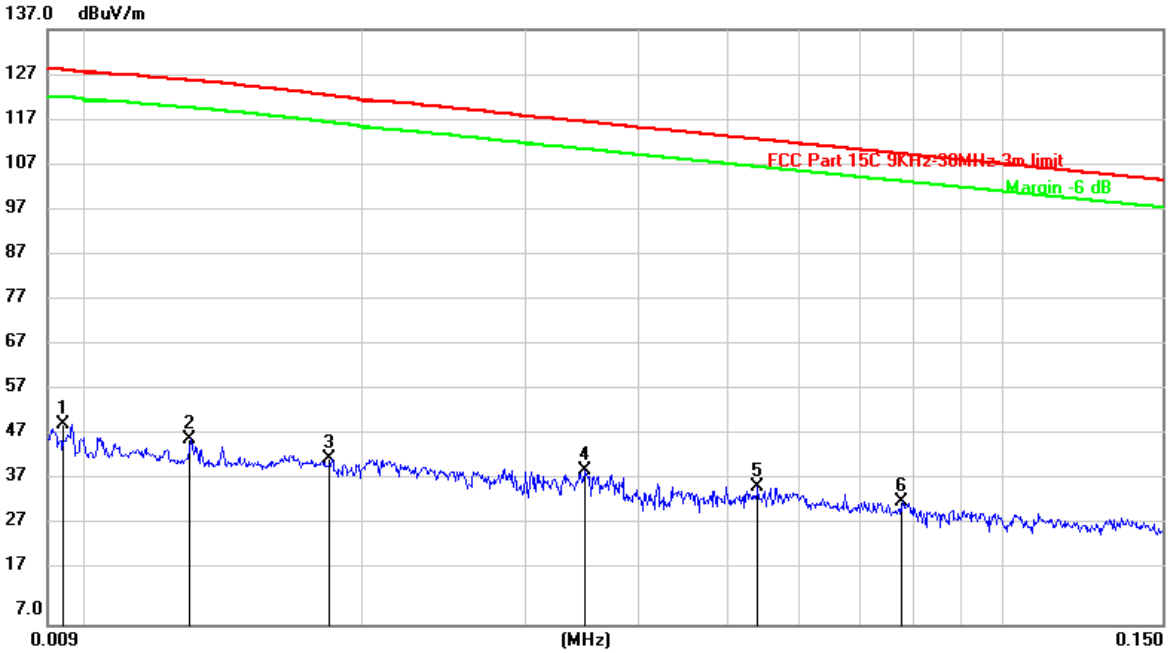
8.5. SPURIOUS EMISSIONS BELOW 30M

8.5.1. 802.11n HT20 MODE

(WORST-CASE CONFIGURATION)

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

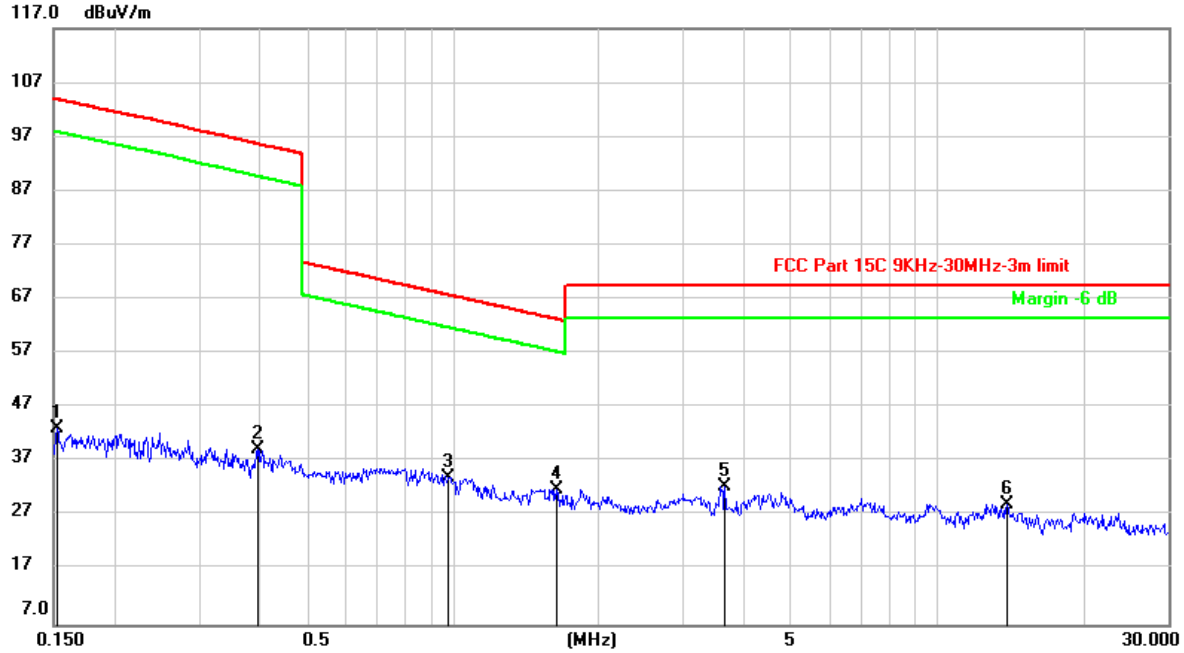
9KHz~ 150KHz



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	0.0094	30.49	20.26	50.75	128.06	-77.31	peak
2	0.0129	27.31	20.24	47.55	125.85	-78.30	peak
3	0.0183	23.07	20.29	43.36	122.60	-79.24	peak
4	0.0349	20.17	20.31	40.48	116.84	-76.36	peak
5	0.0539	16.63	20.31	36.94	113.00	-76.06	peak
6	0.0777	13.54	20.30	33.84	109.81	-75.97	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

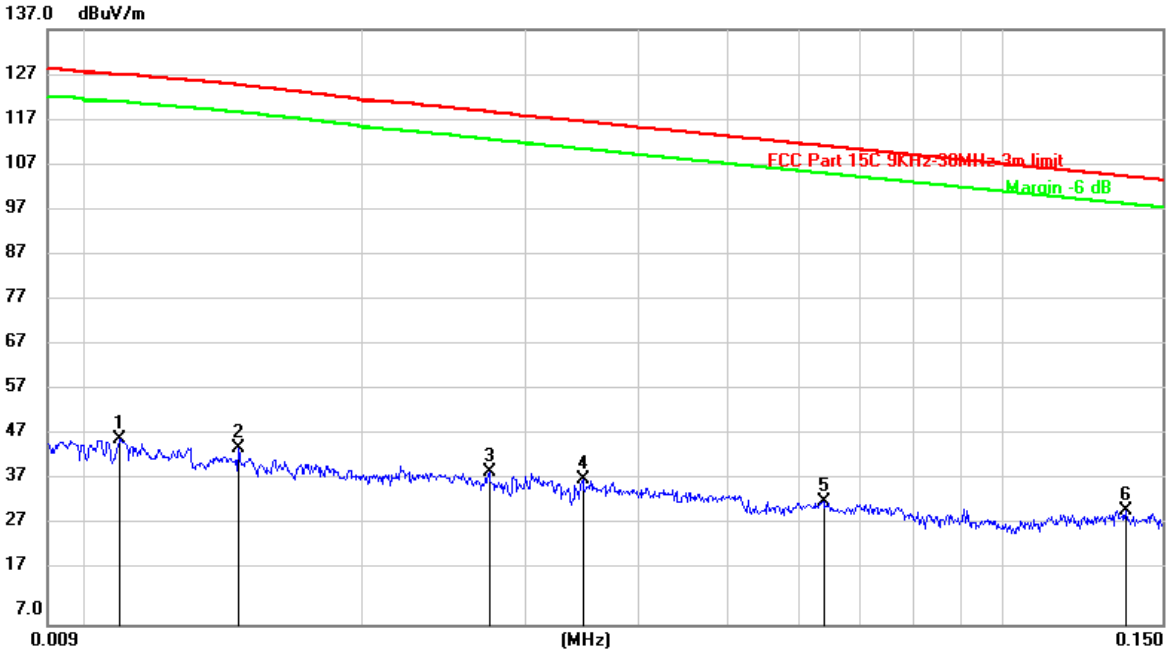


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	0.1524	22.66	20.42	43.08	103.95	-60.87	peak
2	0.3955	18.99	20.27	39.26	95.67	-56.41	peak
3	0.9787	13.78	20.37	34.15	67.80	-33.65	peak
4	1.6363	11.31	20.60	31.91	63.33	-31.42	peak
5	3.6417	11.49	21.00	32.49	69.54	-37.05	peak
6	13.9146	8.14	20.95	29.09	69.54	-40.45	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)

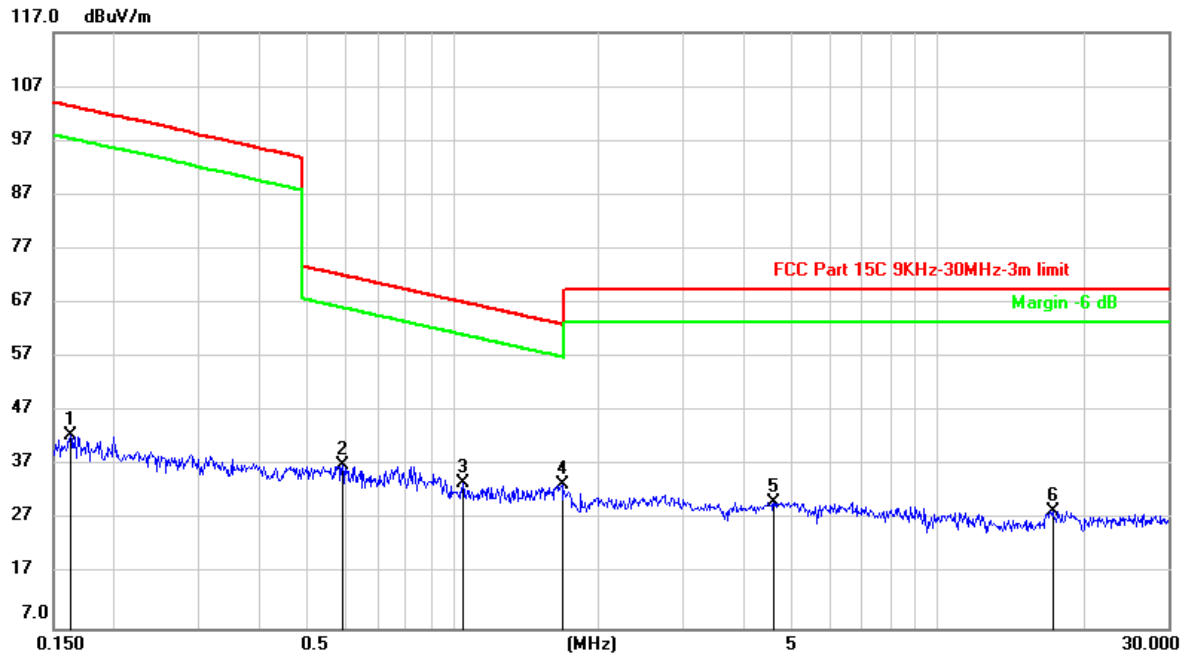
9KHz~ 150KHz



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	0.0108	27.24	20.22	47.46	127.12	-79.66	peak
2	0.0146	25.23	20.26	45.49	124.83	-79.34	peak
3	0.0274	20.10	20.31	40.41	118.98	-78.57	peak
4	0.0347	18.36	20.31	38.67	116.89	-78.22	peak
5	0.0637	13.38	20.31	33.69	111.54	-77.85	peak
6	0.1365	11.43	20.37	31.80	104.91	-73.11	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	0.1621	22.11	20.41	42.52	103.41	-60.89	peak
2	0.5916	16.69	20.29	36.98	72.17	-35.19	peak
3	1.0483	13.39	20.38	33.77	67.20	-33.43	peak
4	1.6800	12.91	20.61	33.52	63.10	-29.58	peak
5	4.5979	9.26	20.92	30.18	69.54	-39.36	peak
6	17.2908	7.61	20.98	28.59	69.54	-40.95	peak

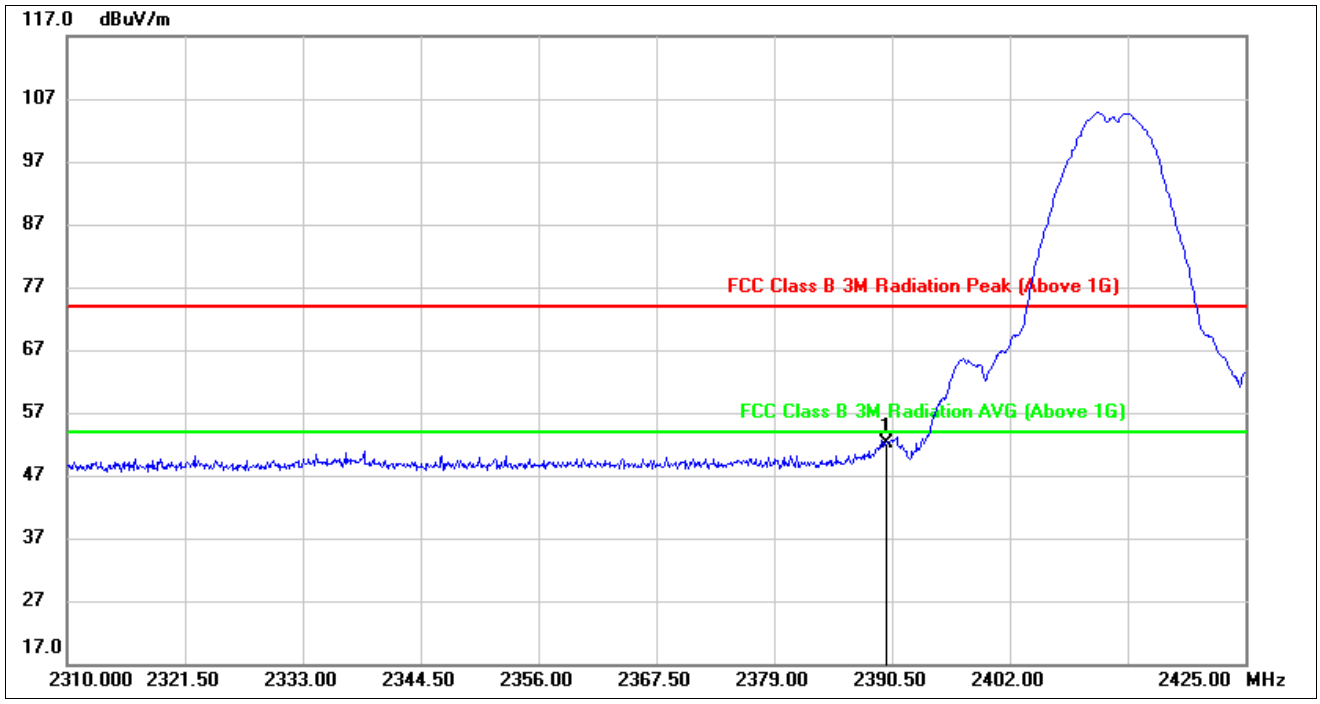
Note: 1. Measurement = Reading Level + Correct Factor.
2. If Peak Result complies with AV and QP limit, AV and QP Result are deemed to comply with AV limit.

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

8.6. RADATED TEST DATA WITH ALL ACCESSORIES

(WORST-CASE CONFIGURATION-802.11b)

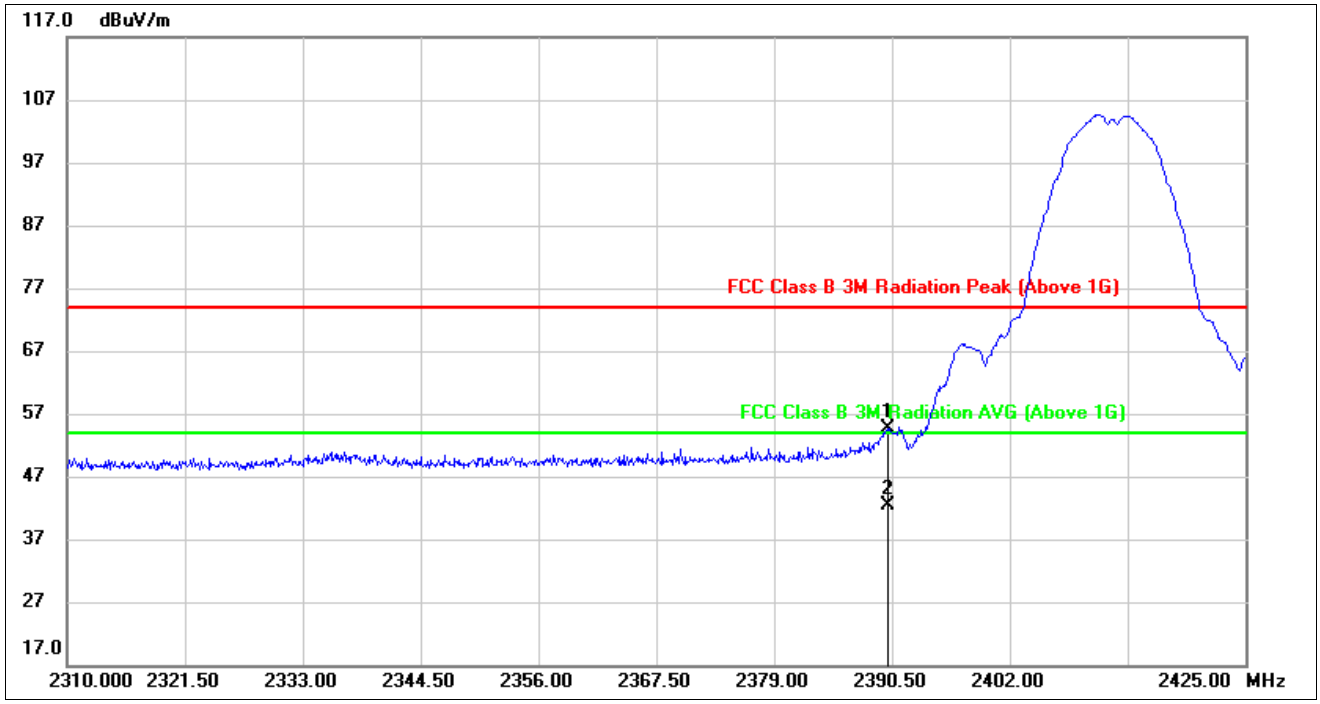
RESTRICTED BANDEDGE (LOW CHANNEL, HORIZONTAL)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2390.000	18.97	33.14	52.11	74.00	-21.89	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.
4. Only the worst case emission will be recorder, if it complies with the limit, the other emissions deemed to comply with the limit.

RESTRICTED BANDEDGE (LOW CHANNEL, VERTICAL)

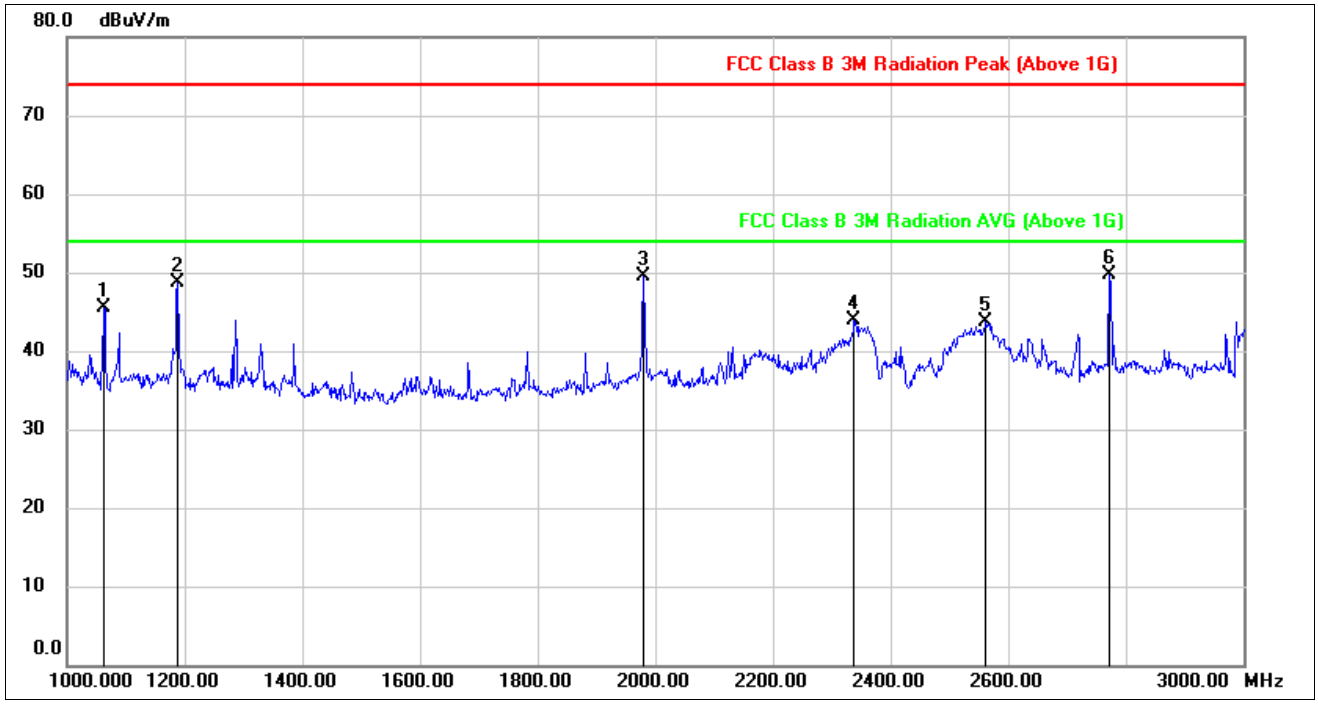


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	2390.000	21.37	33.24	54.61	74.00	-19.39	peak
2	2390.000	9.14	33.24	42.38	54.00	-11.62	AVG

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. AVG: VBW=1/Ton where: ton is transmit duration.
5. For transmit duration, please refer to clause 7.1.
6. Only the worst case emission will be recorder, if it complies with the limit, the other emissions deemed to comply with the limit.

HARMONICS AND SPURIOUS EMISSIONS (LOW CHANNEL, HORIZONTAL)

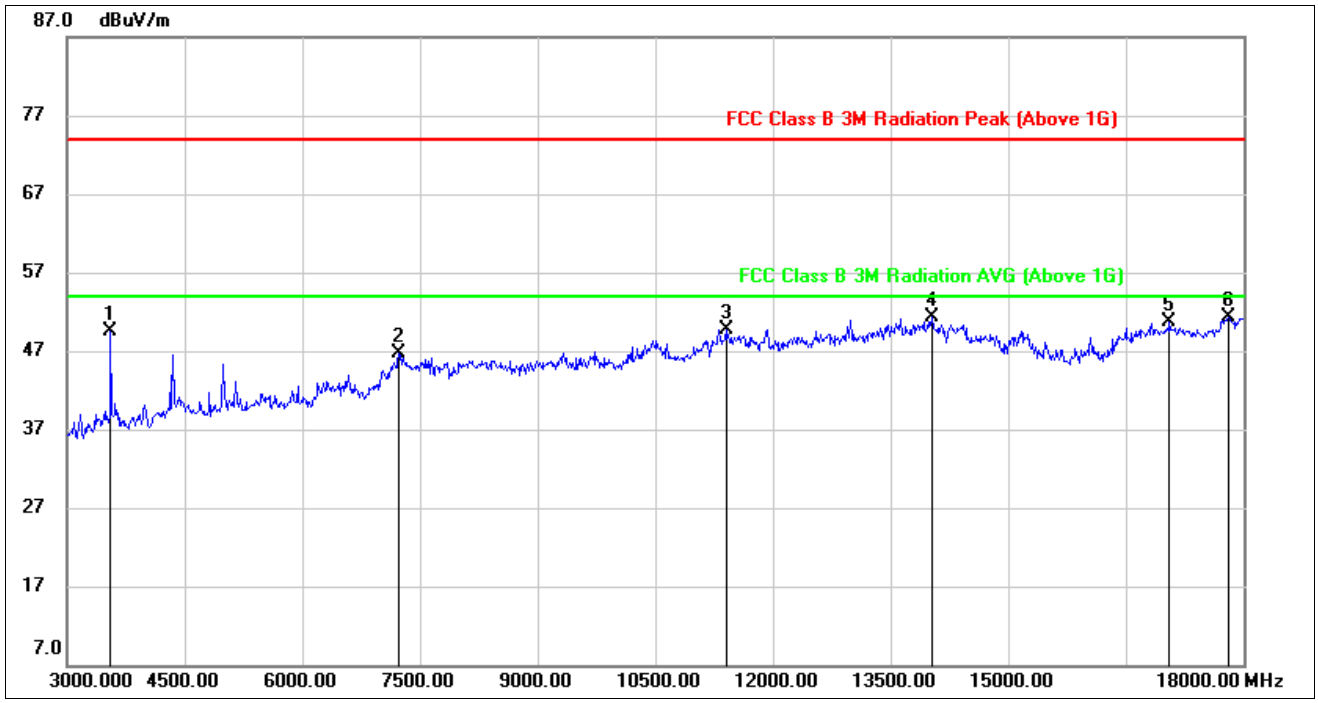
1-3GHz



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1062.000	59.08	-13.62	45.46	74.00	-28.54	peak
2	1188.000	61.83	-13.14	48.69	74.00	-25.31	peak
3	1980.000	60.15	-10.65	49.50	74.00	-24.50	peak
4	2338.000	51.51	-7.66	43.85	74.00	-30.15	peak
5	2562.000	51.99	-8.30	43.69	74.00	-30.31	peak
6	2772.000	56.84	-7.11	49.73	74.00	-24.27	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.

3-18GHz

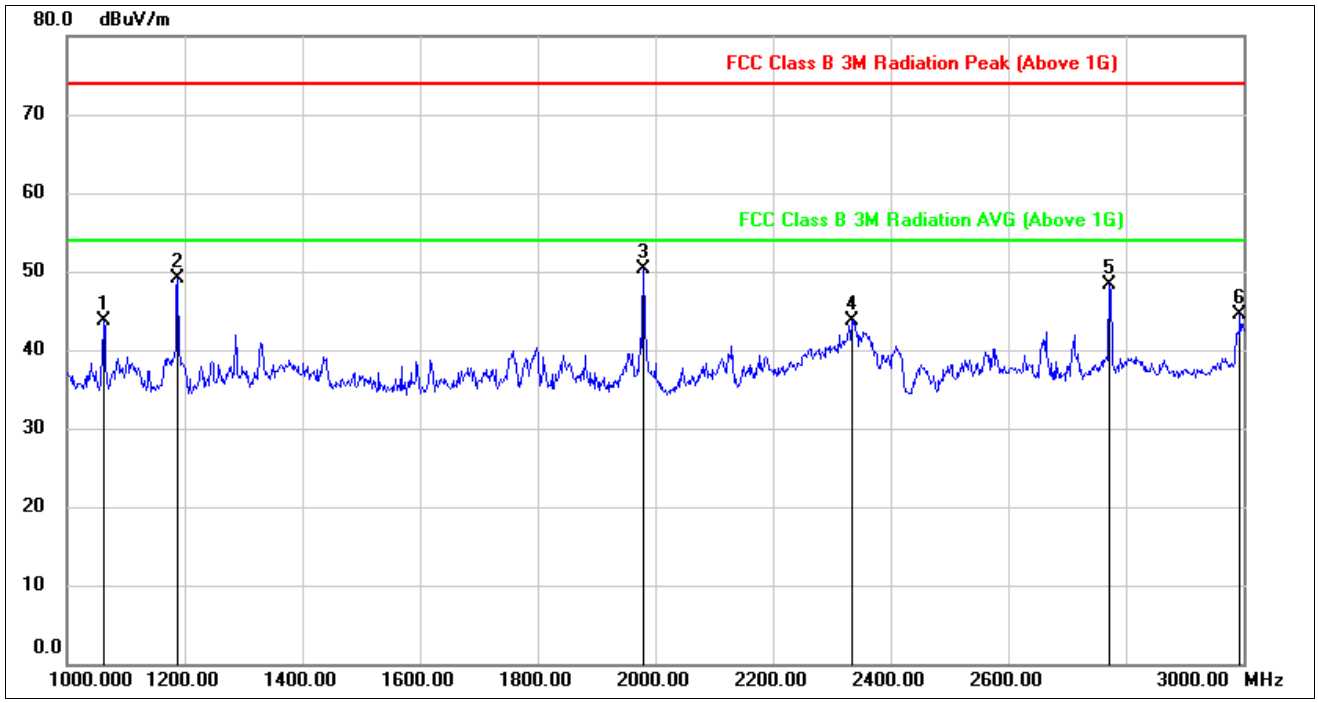


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	3555.000	53.71	-4.20	49.51	74.00	-24.49	peak
2	7230.000	38.98	7.81	46.79	74.00	-27.21	peak
3	11400.000	34.08	15.69	49.77	74.00	-24.23	peak
4	14025.000	30.63	20.62	51.25	74.00	-22.75	peak
5	17055.000	28.57	22.17	50.74	74.00	-23.26	peak
6	17805.000	24.73	26.48	51.21	74.00	-22.79	peak

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

HARMONICS AND SPURIOUS EMISSIONS (LOW CHANNEL, VERTICAL)

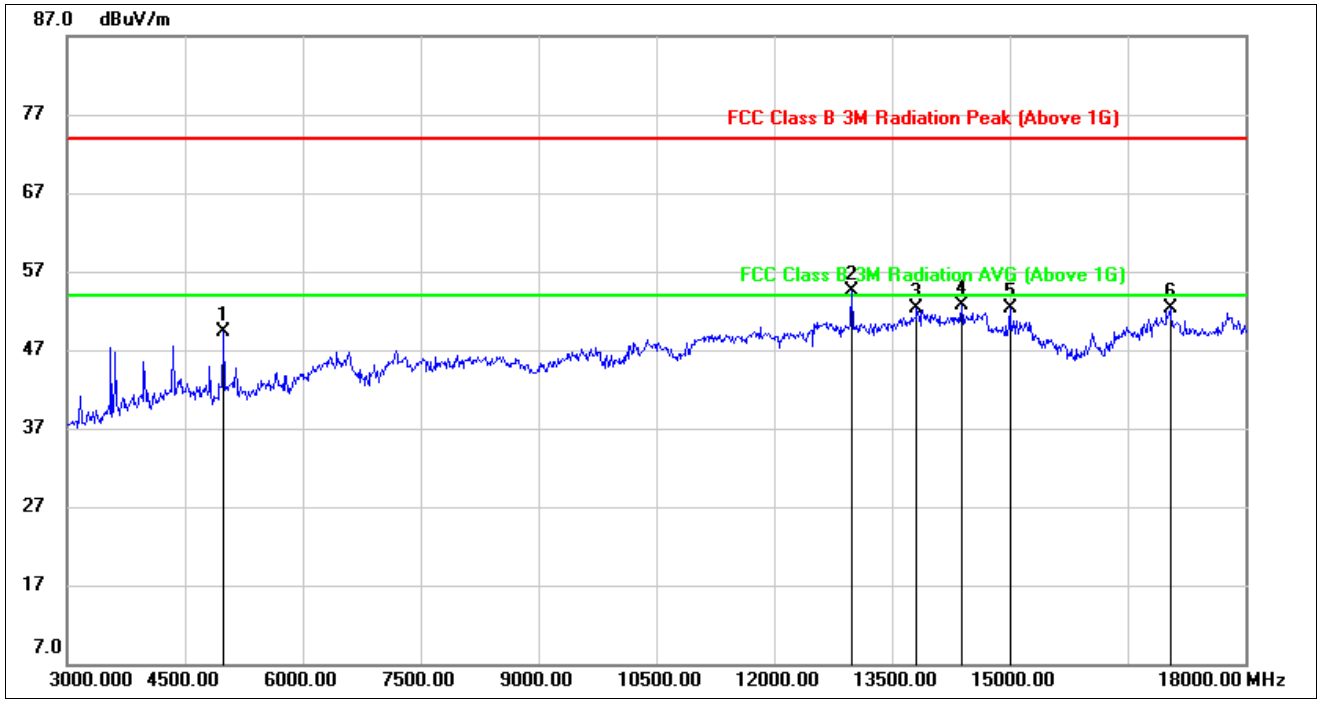
1-3GHz



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	1062.000	57.54	-13.92	43.62	74.00	-30.38	peak
2	1188.000	62.36	-13.26	49.10	74.00	-24.90	peak
3	1980.000	60.92	-10.69	50.23	74.00	-23.77	peak
4	2334.000	51.26	-7.50	43.76	74.00	-30.24	peak
5	2772.000	55.53	-7.17	48.36	74.00	-25.64	peak
6	2994.000	51.01	-6.59	44.42	74.00	-29.58	peak

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

3-18GHz

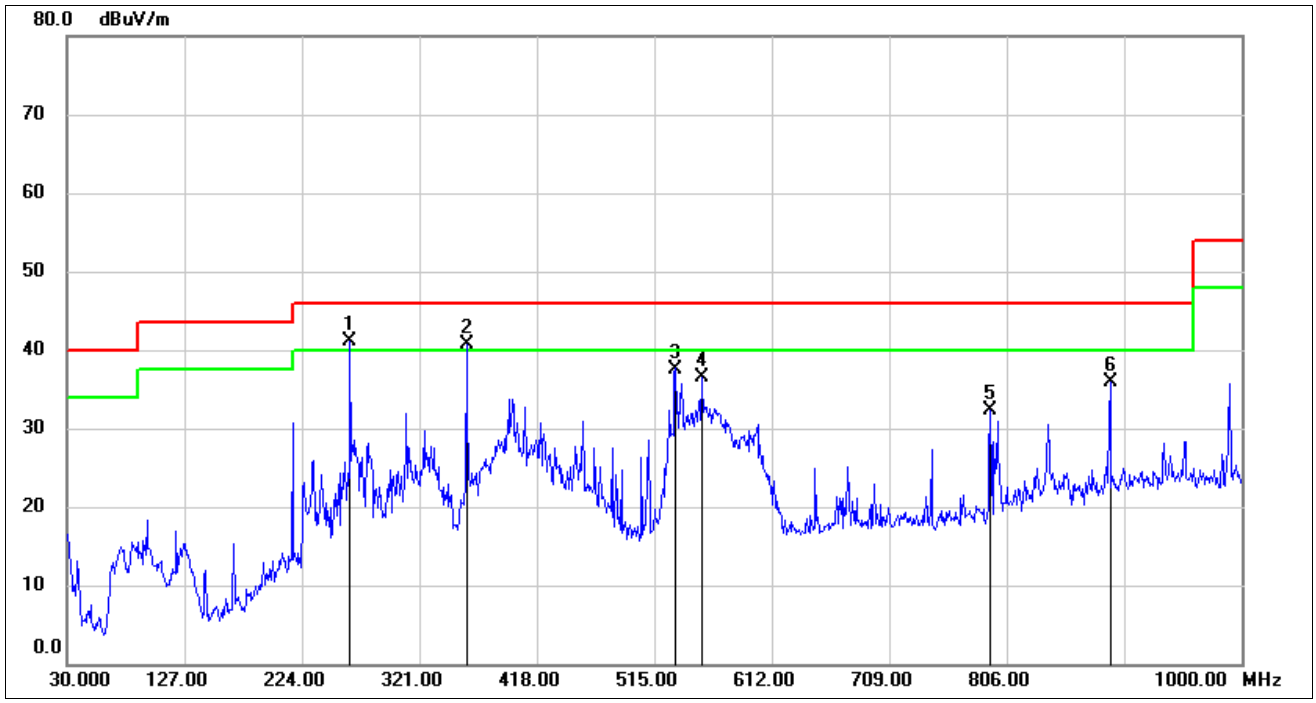


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	4995.000	48.77	0.57	49.34	74.00	-24.66	peak
2	12990.000	35.73	18.82	54.55	74.00	-19.45	peak
3	13815.000	31.19	21.12	52.31	74.00	-21.69	peak
4	14385.000	32.33	20.37	52.70	74.00	-21.30	peak
5	15000.000	33.67	18.66	52.33	74.00	-21.67	peak
6	17040.000	29.75	22.59	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.

SPURIOUS EMISSIONS (LOW CHANNEL, VERTICAL)

30-1GHz

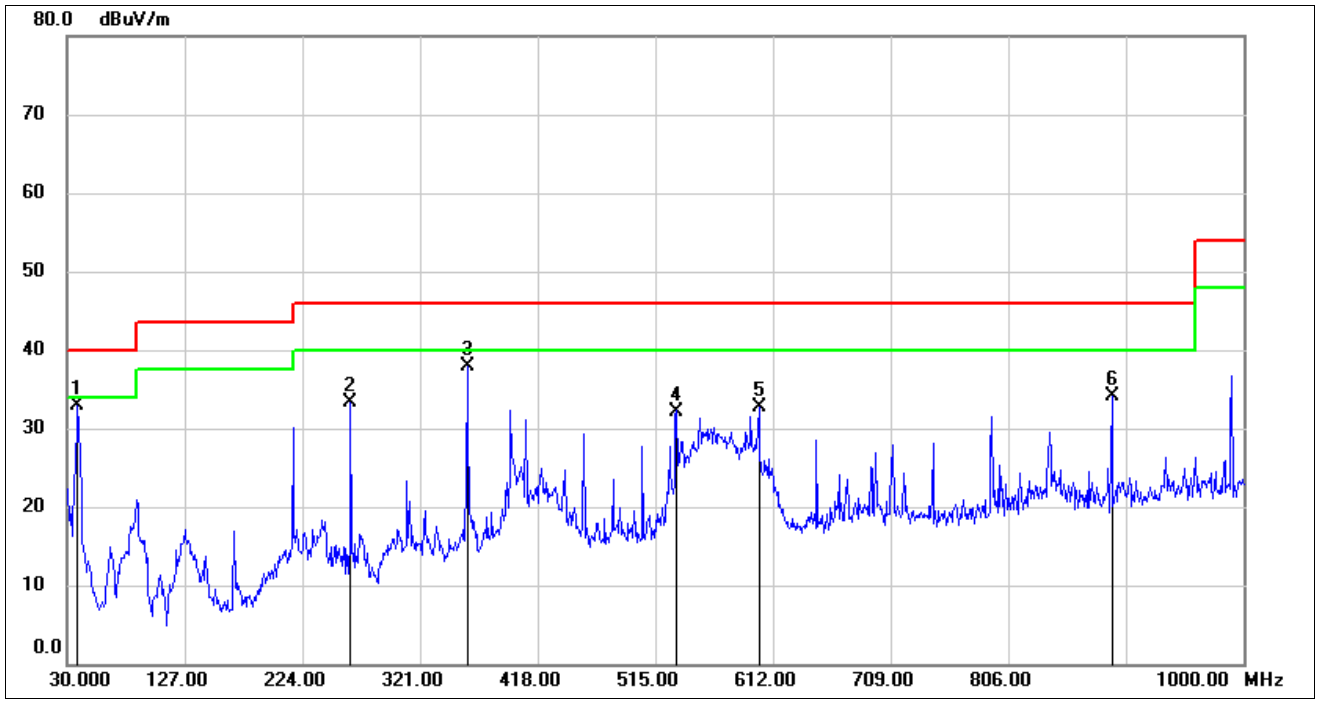


No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	263.7700	57.29	-16.11	41.18	46.00	-4.82	QP
2	359.8000	54.34	-13.71	40.63	46.00	-5.37	QP
3	532.4600	48.08	-10.48	37.60	46.00	-8.40	QP
4	553.8000	46.73	-10.15	36.58	46.00	-9.42	QP
5	792.4200	38.38	-6.08	32.30	46.00	-13.70	QP
6	891.3600	40.59	-4.66	35.93	46.00	-10.07	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, HORIZONTAL)

30-1GHz



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
1	38.7300	50.94	-18.11	32.83	40.00	-7.17	QP
2	263.7700	49.42	-16.11	33.31	46.00	-12.69	QP
3	359.8000	51.65	-13.71	37.94	46.00	-8.06	QP
4	532.4600	42.68	-10.48	32.20	46.00	-13.80	QP
5	600.3600	41.86	-9.10	32.76	46.00	-13.24	QP
6	891.3600	38.76	-4.66	34.10	46.00	-11.90	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.

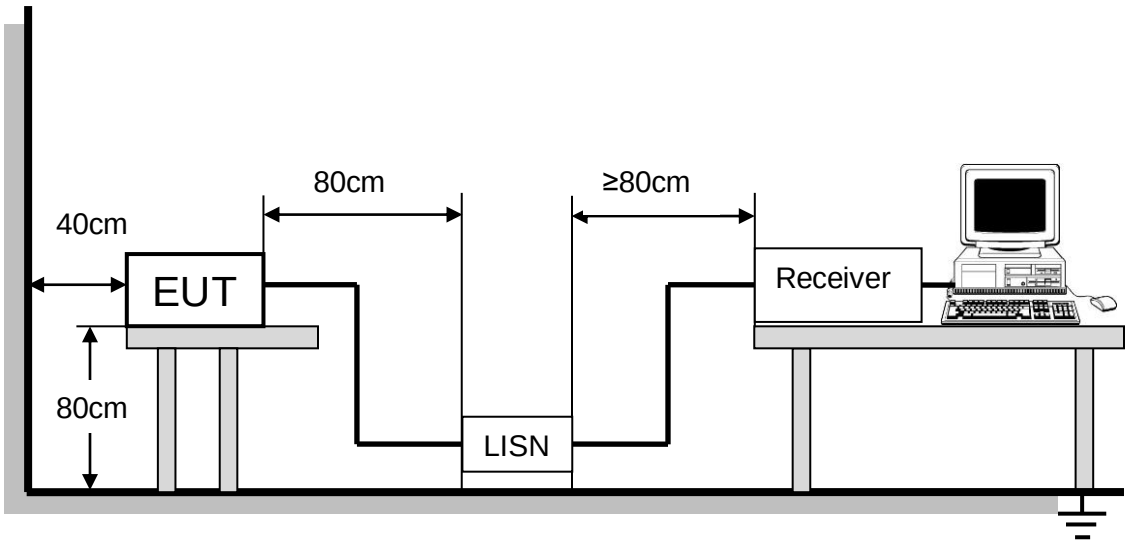
9. AC POWER LINE CONDUCTED EMISSIONS

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



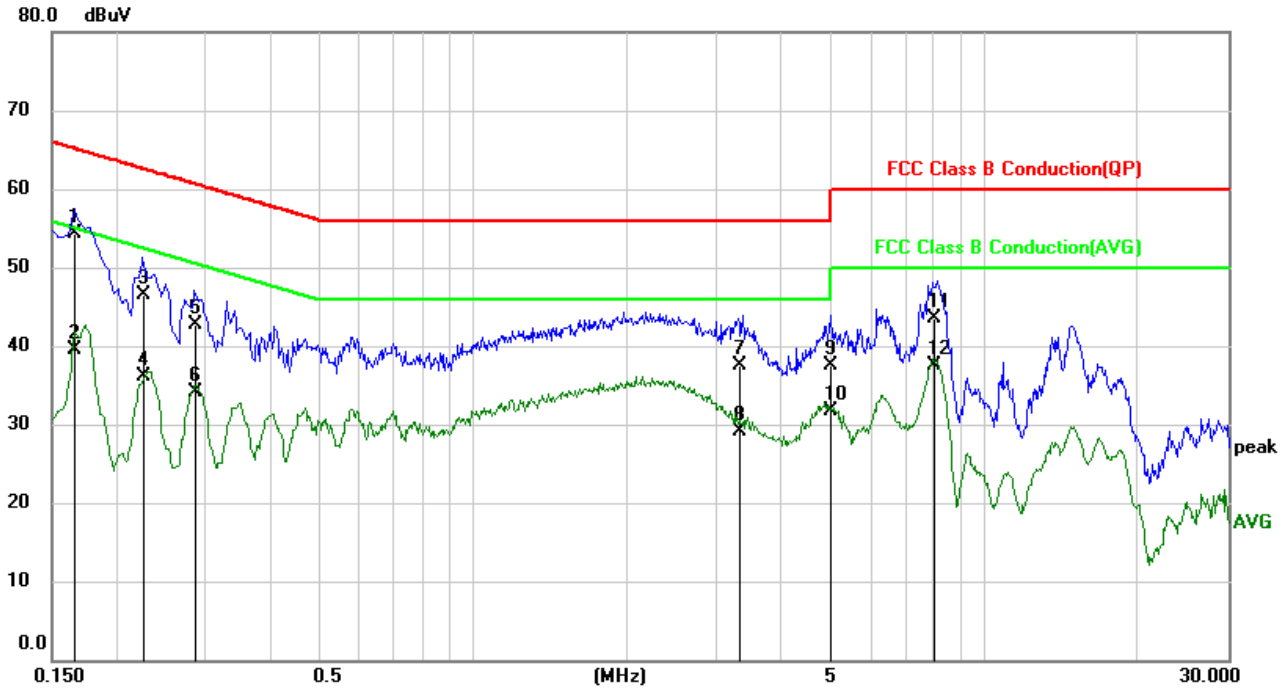
The EUT is put on a table of non-conducting material that is 80cm high. The vertical conducting wall of shielding is located 40cm to the rear of the EUT. The power line of the EUT is connected to the AC mains through an Artificial Mains Network (A.M.N.). A EMI Measurement Receiver (R&S Test Receiver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

9.1.1. 802.11n20 MODE

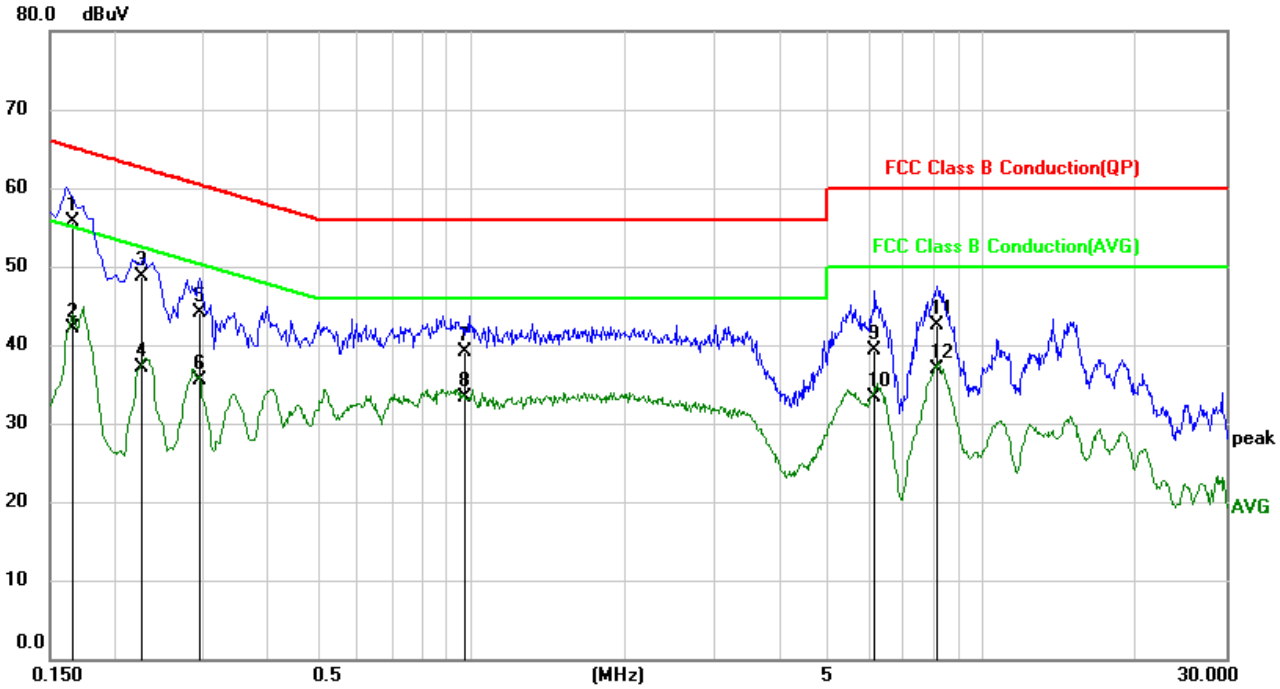
LINE N RESULTS (LOW CHANNEL, WORST-CASE CONFIGURATION)



No.	Frequency (MHz)	Reading (dBuV)	Correct (dB)	Result (dBuV)	Limit (dBuV)	Margin (dB)	Remark
1	0.1663	44.71	9.62	54.33	65.14	-10.81	QP
2	0.1663	29.81	9.62	39.43	55.14	-15.71	AVG
3	0.2276	36.79	9.63	46.42	62.54	-16.12	QP
4	0.2276	26.38	9.63	36.01	52.54	-16.53	AVG
5	0.2875	33.02	9.62	42.64	60.60	-17.96	QP
6	0.2875	24.56	9.62	34.18	50.60	-16.42	AVG
7	3.3257	27.80	9.68	37.48	56.00	-18.52	QP
8	3.3257	19.39	9.68	29.07	46.00	-16.93	AVG
9	4.9827	27.82	9.70	37.52	56.00	-18.48	QP
10	4.9827	22.09	9.70	31.79	46.00	-14.21	AVG
11	8.0373	33.66	9.88	43.54	60.00	-16.46	QP
12	8.0373	27.65	9.88	37.53	50.00	-12.47	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	0.1660	46.10	9.63	55.73	65.16	-9.43	QP
2	0.1660	32.46	9.63	42.09	55.16	-13.07	AVG
3	0.2266	39.01	9.63	48.64	62.57	-13.93	QP
4	0.2266	27.47	9.63	37.10	52.57	-15.47	AVG
5	0.2940	34.48	9.63	44.11	60.41	-16.30	QP
6	0.2940	25.80	9.63	35.43	50.41	-14.98	AVG
7	0.9815	29.51	9.64	39.15	56.00	-16.85	QP
8	0.9815	23.57	9.64	33.21	46.00	-12.79	AVG
9	6.1555	29.56	9.76	39.32	60.00	-20.68	QP
10	6.1555	23.45	9.76	33.21	50.00	-16.79	AVG
11	8.1332	32.67	9.90	42.57	60.00	-17.43	QP
12	8.1332	26.93	9.90	36.83	50.00	-13.17	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: All the modes had been tested, but only the worst data were recorded in the report.

10. ANTENNA REQUIREMENTS

APPLICABLE REQUIREMENTS

Please refer to FCC §15.203
An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

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

ANTENNA CONNECTOR

EUT has a FPCB antenna with antenna connector, it will be installed in a specific environment and users cannot change the antenna.

ANTENNA GAIN

The antenna gain of EUT is less than 6 dBi.

END OF REPORT