CFR 47 FCC PART 15 SUBPART E

TEST REPORT

For

802.11a/b/g/n/ac 867Mbps WiFi USB Module

MODEL NUMBER: BL-M8812CU2

FCC ID: 2AL6KBL-M8812CU2

REPORT NUMBER: E01A23040583F00101

ISSUE DATE: May 12, 2023

Prepared for

Shenzhen Bilian Electronic Co.,Ltd.
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Prepared by

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Revision History

Rev.	Issue Date	Revisions	Revised By
V0	May 12, 2023	Initial Issue	

Summary of Test Results			
Test Item	**Clause**	**Limit/Requirement**	**Result**
ON TIME AND DUTY CYCLE	ANSI C63.10-2013, Clause 12.2	None; for reporting purposes only.	Pass
6dB AND 26dB EMISSION BANDWIDTH AND 99% OCCUPIED BANDWIDTH	KDB 789033 D02 v02r01 Section C.1	FCC Part 15.407 (a)(2)(5),	Pass
CONDUCTED OUTPUT POWER	KDB 789033 D02 v02r01 Section E.3.a (Method PM)	FCC 15.407 (a) RSS-247 Clause 6.2	Pass
POWER SPECTRAL DENSITY	KDB 789033 D02 v02r01 Section F	FCC 15.407 (a) RSS-247 Clause 6.2	Pass
AC Power Line Conducted Emission	ANSI C63.10-2013, Clause 6.2.	FCC 15.207	Pass
Radiated Emissions and Band Edge Measurement	KDB 789033 D02 v02r01 Section G.3, G.4, G.5, and G.6	FCC 15.407 (b) FCC 15.209 FCC 15.205	Pass
FREQUENCY STABILITY		FCC 15.407 (g)	Pass
Dynamic Frequency Selection (Slave)	KDB 905462 D03 Client Without DFS New Rules v01r02	FCC Part 15.407 (h),	Pass
Dynamic Frequency Selection (Master)	KDB 905462 D02 UNII DFS Compliance Procedures New Rules v02	FCC Part 15.407 (h),	N/A
Antenna Requirement	N/A	FCC 47 CFR Part 15.203/ 15.407(a)(1) (2),	Pass

Note:
1. N/A: In this whole report not applicable.

*This test report is only published to and used by the applicant, and it is not for evidence purpose in China.
*The measurement result for the sample received is <Pass> according to <CFR 47 FCC PART 15 SUBPART E > when <Accuracy Method> decision rule is applied.

CONTENTS

1. ATTESTATION OF TEST RESULTS

Applicant Information

Company Name:	Shenzhen Bilian Electronic Co.,Ltd.
Address:	Room 501, Building 3, No. 32, Dafu Road, Zhangge Community, Fucheng Street, Longhua District, Shenzhen City, China

Manufacturer Information

Company Name:	Shenzhen Bilian Electronic Co.,Ltd.
Address:	Room 501, Building 3, No. 32, Dafu Road, Zhangge Community, Fucheng Street, Longhua District, Shenzhen City, China

EUT Information

EUT Name:	802.11a/b/g/n/ac 867Mbps WiFi USB Module
Model:	BL-M8812CU2
Sample Received Date:	April 20, 2023
Sample Status:	Normal
Sample ID:	A23040583 002
Date of Tested:	May 12, 2023 to May 12, 2023

APPLICABLE STANDARDS	
STANDARD	**TEST RESULTS**
CFR 47 FCC PART 15 SUBPART E **ISED RSS-247 ISSUE 2 (U-NII)**	**Pass**

Prepared By:

Dyson

Dyson Dai

Project Engineer

Checked By:

Duke

Duke Liu

Project Engineer

Approved By:

Tiger Xu

Laboratory Supervisor

2. TEST METHODOLOGY

All tests were performed in accordance with the standard CFR 47 FCC PART 15 SUBPART E

3. FACILITIES AND ACCREDITATION

Site Description

Name of Firm	:	Dong Guan Anci Electronic Technology Co., Ltd.
Site Location	:	1-2 Floor, Building A, No.11, Headquarters 2 Road, Songshan, Lake Hi-tech Industrial Development Zone, Dongguan City,evelopment Zone, Dongguan City, Guangdong Pr., China.

4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

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

4.2. MEASUREMENT UNCERTAINTY

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

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

Description	Limit	Uncertainties
Carrier Frequencies	±1.0E-05	±2.2E-10
Occupied Channel Bandwidth	-	±1.71 %
Power	±1.5 dB	±1.15 dB
Power Density	±1.5 dB	±1.21 dB
Transmitter unwanted emissions outside the 5 GHz RLAN bands		
30 MHz to 1 GHz	±3 dB	±0.80 dB
1 GHz to 26GHz	±3 dB	±2.42 dB
Transmitter unwanted emissions inside the 5 GHz RLAN bands		
5 150 MHz to 5 350 MHz and 5 470 MHz to 5 725 MHz	±3 dB	±1.69 dB
Receiver Spurious emission		
30 MHz to 1 GHz	±3 dB	±0.80 dB
1 GHz to 26GHz	±3 dB	±2.42 dB

Test Item	Uncertainty
Radiation Emission	4.62 dB (30 MHz ~ 1 GHz)
	3.50 dB (1 GHz ~ 18 GHz)
	4.24 dB (18 GHz ~ 26 GHz)
Note: This uncertainty represents an expanded uncertainty expressed at approximately the 95 % confidence level using a coverage factor of k=2.	

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

EUT Name		802.11a/b/g/n/ac 867Mbps WiFi USB Module
Model		BL-M8812CU2
Ratings		DC 3.3V
Power Supply	DC	3.3V

Frequency Band:	5150 MHz to 5250 MHz (U-NII-1) 5250 MHz to 5350 MHz (U-NII-2A) 5470 MHz to 5725 MHz (U-NII-2C) 5 725 MHz to 5 850 MHz (U-NII-3)
Frequency Range:	5180 MHz to 5240 MHz 5260 MHz to 5320 MHz 5500 MHz to 5700 MHz 5745 MHz to 5825 MHz
Support Standards:	IEEE 802.11a/n/ac
TPC Function:	Not Support
DFS Operational mode:	Slave without radar Interference detection function
Type of Modulation:	IEEE 802.11a: OFDM(64QAM, 16QAM, QPSK, BPSK) IEEE 802.11n: OFDM(64QAM, 16QAM, QPSK, BPSK) IEEE 802.11ac: OFDM(256QAM, 64QAM, 16QAM, QPSK, BPSK)
Channel Spacing:	IEEE 802.11a/n-HT20/ac-VHT20: 20 MHz IEEE 802.11n-HT40/ac-VHT40: 40 MHz IEEE 802.11ac-VHT80: 80 MHz
Data Rate:	IEEE 802.11a: Up to 54 Mbps IEEE 802.11n-HT20: Up to MCS15 IEEE 802.11n-HT40: Up to MCS15 IEEE 802.11ac-VHT20: Up to MCS8 IEEE 802.11ac-VHT40: Up to MCS9 IEEE 802.11ac-VHT80: Up to MCS9
Number of Channels:	5150 MHz to 5250 MHz: 4 for IEEE 802.11a/n-HT20/ac-VHT20 2 for IEEE 802.11n-HT40)/ac-VHT40 1 for IEEE 802.11acVHT80 5250 MHz to 5350 MHz: 4 for IEEE 802.11a/n-HT20/ac-VHT20 2 for IEEE 802.11n-HT40)/ac-VHT40 1 for IEEE 802.11acVHT80 5470 MHz to 5725 MHz: 11 for IEEE 802.11a/n-HT20/ac-VHT20 5 for IEEE 802.11n-HT40/ac-VHT40 2 for IEEE 802.11ac-VHT80 5725 MHz to 5850 MHz: 5 for IEEE 802.11a/n-HT20/ac-VHT20 2 for IEEE 802.11n-HT40/ac-VHT40 1 for IEEE 802.11ac-VHT80
Maximum conducted output power: (U-NII-1)	5180 MHz to 5240 MHz: 20.9 dBm 5260 MHz to 5320 MHz: 21.14 dBm 5500 MHz to 5700 MHz: 21.76 dBm

	5745 MHz to 5825 MHz: 21.29 dBm
Antenna Connector:	IPEX
Antenna Type:	External Antenna Two antenna for WIFI
Antenna Gain:	ANT0: 2.75 dBi ANT1: 2.75 dBi
Directional Gain	5 dBi

5.2. CHANNEL LIST

UNII-1 (For Bandwidth=20MHz)		UNII-1 (For Bandwidth=40MHz)		UNII-1 (For Bandwidth=80MHz)	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
36	5180	38	5190	42	5210
40	5200	46	5230		
44	5220				
48	5240				

UNII-2A (For Bandwidth=20MHz)		UNII-2A (For Bandwidth=40MHz)		UNII-2A (For Bandwidth=80MHz)	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
52	5260	54	5270	58	5290
56	5280	62	5310		
60	5300				
64	5320				

UNII-2C (For Bandwidth=20MHz)		UNII-2C (For Bandwidth=40MHz)		UNII-2C (For Bandwidth=80MHz)	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
100	5500	102	5510	106	5530
104	5520	110	5550	122	5610
108	5540	118	5590	138	5690
112	5560	126	5630		
116	5580	134	5670		
120	5600	142	5710		
124	5620				
128	5640				
132	5660				
136	5680				
140	5700				

UNII-3 (For Bandwidth=20MHz)		UNII-3 (For Bandwidth=40MHz)		UNII-3 (For Bandwidth=80MHz)	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
149	5745	151	5755	155	5775
153	5765	159	5795		
157	5785				
161	5805				

165	5825				

5.3. THE WORSE CASE POWER SETTING PARAMETER

The Worse Case Power Setting Parameter	
Test Software	Win7_MP_Kit_RTL11ac_8821CS_SDIO_v0.23_20171113(BETA)

UNII-1

Mode	Rate	Channel	Soft set value	
			ANT 1	ANT 2
11a	6M	36	1A	1A
		40	1A	1A
		48	1A	1A
11n HT20	MCS0	36	18	18
		40	18	18
		48	18	18
11n HT40	MCS0	38	1A	1A
		46	1A	1A
11ac VHT20	MCS0	36	17	17
		40	17	17
		48	17	17
11ac VHT40	MCS0	38	1A	1A
		46	1A	1A
11ac VHT80	MCS0	42	1A	1A

UNII-2A

Mode	Rate	Channel	Soft set value	
			ANT 1	ANT 2
11a	6M	52	1A	1A
		56	1A	1A
		64	1A	1A
11n HT20	MCS0	52	1A	1A
		56	1A	1A
		64	1A	1A
11n HT40	MCS0	54	1A	1A
		62	1A	1A
11ac VHT20	MCS0	52	1A	1A
		56	1A	1A
		64	1A	1A
11ac VHT40	MCS0	54	1A	1A
		62	1A	1A
11ac VHT80	MCS0	58	1A	1A

UNII-2C

Mode	Rate	Channel	Soft set value	
			ANT 1	ANT 2
11a	6M	100	1A	1A
		116	1A	1A
		140	1A	1A
11n HT20	MCS0	100	1A	1A
		116	1A	1A
		140	1A	1A
11n HT40	MCS0	102	1A	1A
		118	1A	1A
		134	1A	1A
11ac VHT20	MCS0	100	1A	1A
		116	1A	1A
		140	1A	1A
11ac VHT40	MCS0	102	1A	1A
		118	1A	1A
11ac VHT80	MCS0	106	1A	1A
		122	1A	1A

UNII-3

Mode	Rate	Channel	Soft set value	
			ANT1	ANT 2
11a	6M	149	1A	1A
		157	1A	1A
		165	1A	1A
11n HT20	MCS0	149	1A	1A
		157	1A	1A
		165	1A	1A
11n HT40	MCS0	151	1A	1A
		159	1A	1A
11ac VHT20	MCS0	149	1A	1A
		157	1A	1A
		165	1A	1A
11ac VHT40	MCS0	151	1A	1A
		159	1A	1A
11ac VHT80	MCS0	155	1A	1A

THE WORSE CASE CONFIGURATIONS

The EUT was tested in the following configuration(s):

Controlled in test mode using a software application on the EUT supplied by customer. The application was used to enable a continuous transmission and to select the mode, test channels, bandwidth, data rates as required.

Test channels referring to section 5.4.

Maximum power setting referring to section 5.6.

Worst case Data Rates declared by the customer:

802.11a 20 mode: 6 Mbps
802.11n HT20 mode: MCS0
802.11n HT40 mode: MCS0
802.11ac VHT20 mode: MCS0
802.11ac VHT40 mode: MCS0
802.11ac VHT80 mode: MCS0

802.11ac VHT20 and VHT40 mode are different from 802.11nHT20 and HT40 only in control messages, so for these 4 modes, only 802.11n HT20 and 802.11n HT40 worst case power modes radiated emission test data are recorded in the report .

802.11ac&n SISO mode and MIMO mode have the same power setting, so only the worst case power mode(MIMO) will be record in the report.

The EUT has 2 separate antennas which correspond to 2 separate antenna ports. Core 1 and Core 2 correspond to antenna 1 and antenna 2 respectively.

Antenna 1 and Antenna 2 have the same power setting, and the power test data are the same. (Declared by customer.)

The measured additional path loss was included in any path loss calculations for all RF cable used during tested.

Conducted output power, power spectral density tests separately on each port with all supported SISO & MIMO port combinations.

Conducted bandedge and spurious emissions tests were performed with SISO mode, as this port was found to have the worst case in terms of power settings amongst all supported possible SISO & MIMO port combinations.

Radiated emissions tests were performed with the MIMO modes. These were found to be the worst modulation scheme with regards to emissions after preliminary investigations and, as this mode emits the highest conducted output power level, it was deemed to be the worst case.

The EUT support rotating antennas, we have done pre-tests under different angle combinations. so only the worst measurement position (X axis) was recorded in the report only the worst as shown in the setup photo

5.4. DESCRIPTION OF AVAILABLE ANTENNAS

Antenna No.	Frequency Band	Antenna Type	Max Antenna Gain (dBi)
1	5150-5850	External Antenna	2.75
2	5150-5850	External Antenna	2.75

The EUT support Cyclic Shift Diversity(CDD) mode.

MIMO output power port and MIMO PSD port summing were performed in accordance with KDB 662911 D01. For the CDD results the Directional Gain was calculated in accordance with the following mothed.

For output power measurements:
Directional gain= GANT + Array Gain = 5.75dBi
GANT : equal to the gain of the antenna having the highest gain
Array Gain = 2.75 dB (i.e., no array gain) for $N_{ANT} \leq 4$

For power spectral density (PSD) measurements:
Directional gain= GANT + Array Gain = 5.75dBi
Array Gain = 10 log(NANT/NSS) dB.
N_{ANT} : number of transmit antennas
N_{SS} : number of spatial streams, The worst case directional gain will occur when $N_{SS} = 1$

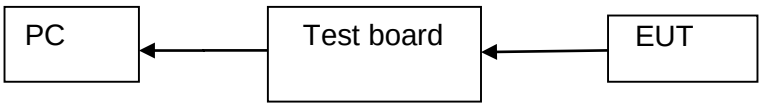
IEE Std. 802.11	Transmit and Receive Mode	Description
802.11a	☒2TX, 2RX	ANT 1 and ANT 2 can be used as transmitting/receiving antenna.
802.11n HT20	☒2TX, 2RX	ANT 1 and ANT 2 can be used as transmitting/receiving antenna.
802.11n HT40	☒2TX, 2RX	ANT 1 and ANT 2 can be used as transmitting/receiving antenna.
802.11ac VHT20	☒2TX, 2RX	ANT 1 and ANT 2 can be used as transmitting/receiving antenna.
802.11ac VHT40	☒2TX, 2RX	ANT 1 and ANT 2 can be used as transmitting/receiving antenna.
802.11ac VHT80	☒2TX, 2RX	ANT 1 and ANT 2 can be used as transmitting/receiving antenna.
Note: 1. WLAN 2.4G & WLAN 5G can't transmit simultaneously. (declared by client)		

5.5. SUPPORT UNITS FOR SYSTEM TEST

The EUT has been tested as an independent unit

Equipment	**Manufacturer**	**Model No.**
Test board	Bilian	BL-T8811CU
PC	Lenovo	T14

5.6. SETUP DIAGRAM



6. MEASURING EQUIPMENT AND SOFTWARE USED

Test Equipment of Conducted RF					
Equipment	**Manufacturer**	**Model No.**	**Serial No.**	**Last Cal.**	**Due Date**
Spectrum Analyzer	Rohde & Schwarz	FSV40	US40240623	2022-10-29	2023-10-28
MXG Vector Signal Generator	KEYSIGHT	N5182B	MY61250185	2022/10/8	2023/10/7
EXG Analog Signal Generator	KEYSIGHT	N5173B	My61252603	2022/10/8	2023/10/7
USB RF Power sensor	RadiPower	RPR3006W	17I00015SNO88	2022/10/8	2023/10/7
USB RF Power sensor	RadiPower	RPR3006W	17I00015SNO89	2022/10/8	2023/10/7
RF Test Software	MWRF-test	MTS 8310	N/A	N/A	N/A
Radio Frequency control box	MWRF-test	MW200-RFCB	MW220111ANCI	2022-05-13	2023-05-12
Radio Frequency control box	MWRF-test	MW200-RFCB 2#	/	2022-05-13	2023-05-12
temperature humidity chamber	Espec	SH-241	SH-241-2014	2022/10/8	2023/10/7

Test Equipment of Radiated emissions below 1GHz					
Equipment	**Manufacturer**	**Model No.**	**Serial No.**	**Last Cal.**	**Due Date**
EMI Test Receiver	ROHDE&SCHWARZ	ESCI	100302	2022/5/13	2023/5/12
Bilog Antenna	Schwarzbeck	VULB9163	VULB9163-1290	2022/12/12	2023/12/11
RF Cable	ZKJC	ZT06S-NJ-NJ-11M	19060398	2022/5/13	2023/5/12
RF Cable	ZKJC	ZT06S-NJ-NJ-0.5M	19060400	2022/5/13	2023/5/12
RF Cable	ZKJC	ZT06S-NJ-NJ-2.5M	19060404	2022/5/13	2023/5/12
EMI Test Receiver	ROHDE&SCHWARZ	ESPI7	100502	2022/10/8	2023/10/7
3m Semi-anechoic Chamber	Keysight	9m*6m*6m	N/A	2021/11/13	2024/11/12

Test Equipment of Radiated emissions above 1GHz					
Equipment	**Manufacturer**	**Model No.**	**Serial No.**	**Last Cal.**	**Due Date**
Low noise Amplifiers	A-INFO	LA1018N4009	J1013130524001	2022/5/13	2023/5/12
Horn antenna	A-INFO	LB-10180-SF	J2031090612123	2022/5/15	2023/5/14
RF Cable	ZKJC	ZT26-NJ-NJ-11M	19060401	2022/5/13	2023/5/12
RF Cable	ZKJC	ZT26-NJ-NJ-2.5M	19060402	2022/5/13	2023/5/12

RF Cable	ZKJC	ZT26-NJ-NJ-0.5M	19060403	2022/5/13	2023/5/12
Spectrum Analyzer	Rohde & Schwarz	FSV40	US40240623	2022-10-29	2023-10-28
3m Semi-anechoic Chamber	Keysight	9m*6m*6m	N/A	2021/11/13	2024/11/12
Test Software	Farad	EZ-EMC (Ver.FA-03A2 RE)	N/A	N/A	N/A

Test Equipment of Conducted emissions					
Equipment	**Manufacturer**	**Model No.**	**Serial No.**	**Last Cal.**	**Due Date**
EMI Test Receiver	ROHDE&SCHWARZ	ESCI	101358	2022/5/13	2023/5/12
1# Shielded Room	chengyu	8m*4m*3.3m	N/A	2022/11/22	2025/11/21
LISN	ROHDE&SCHWARZ	ENV216	101413	2022/10/8	2023/10/7
Test Software	Farad	EZ-EMC (Ver.ANCI-3A1)	N/A	N/A	N/A
RF Cable	N/A	ZT06S-NJ-NJ-2.5M	19044022	2022/05/13	2023/05/12

7. ANTENNA PORT TEST RESULTS

7.1. ON TIME AND DUTY CYCLE

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

Refer to KDB 789033 D02 General U-NII Test Procedures New Rules v02r01 section II.B.

The zero-span mode on a spectrum analyzer or EMI receiver, if the response time and spacing between bins on the sweep are sufficient to permit accurate measurements of the on and off times of the transmitted signal. Set the center frequency of the instrument to the center frequency of the transmission. Set RBW ≥ EBW if possible; otherwise, set RBW to the largest available value. Set VBW ≥ RBW. Set detector = peak or average. The zero-span measurement method shall not be used unless both RBW and VBW are > 50/T, where T is defined in II.B.1.a), and the number of sweep points across duration T exceeds 100. (For example, if VBW and/or RBW are limited to 3 MHz, then the zero-span method of measuring duty cycle shall not be used if T ≤ 16.7 microseconds.)

TEST ENVIRONMENT

Temperature	24℃	Relative Humidity	55%
Atmosphere Pressure	101kPa		

TEST RESULTS

Please refer to section "Test Data" - Appendix B

7.2. 6DB AND 26DB EMISSION BANDWIDTH AND 99% OCCUPIED BANDWIDTH

LIMITS

CFR 47 FCC Part15, Subpart E		
Test Item	Limit	Frequency Range (MHz)
26 dB Emission Bandwidth	For reporting purposes only.	5150 ~ 5250
26 dB Emission Bandwidth	For reporting purposes only.	5250 ~ 5350
26 dB Emission Bandwidth	For reporting purposes only.	5470 ~ 5725 (For FCC) 5470 ~ 5600 (For ISED) 5650 ~ 5725 (For ISED)
6 dB Emission Bandwidth	The minimum 6 dB emission bandwidth shall be 500 kHz.	5725 ~ 5850
99 % Occupied Bandwidth	For reporting purposes only.	5150 ~ 5825 (For ISED)

TEST PROCEDURE

Refer to KDB 789033 D02 General U-NII Test Procedures New Rules v02r01 section II.C1. for 26 dB Emission Bandwidth; section II.C2. for 6 dB Emission Bandwidth; section II.D. for 99 % Occupied Bandwidth.
Connect the EUT to the spectrum analyser and use the following settings:

Center Frequency	The center frequency of the channel under test
Detector	Peak
RBW	For 6 dB Emission Bandwidth: RBW=100 kHz For 26 dB Emission bandwidth: approximately 1 % of the EBW. For 99 % Occupied Bandwidth: approximately 1 % ~ 5 % of the OBW.
VBW	For 6 dB Bandwidth: ≥ 3*RBW For 26 dB Bandwidth: >3*RBW For 99 % Bandwidth: >3*RBW
Trace	Max hold
Sweep	Auto couple

a) Use the 99 % power bandwidth function of the instrument, allow the trace to stabilize and report the measured bandwidth.
b) 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 6/26 dB relative to the maximum level measured in the fundamental emission.

Calculation for 99 % Bandwidth of UNII-2C and UNII-3 Straddle Channel:

For Example: Fundamental Frequency: 5720 MHz

99 % OBW: 21.00 MHz

Turning Frequency: 5725 MHz

99 % Bandwidth of UNII-2C Band Portion = (5725-(5720-(21.00/2)) = 15.50 MHz

99 % Bandwidth of UNII-3 Band Portion = (5720+(21.00/2)-5725) = 5.50 MHz

Calculation for 26 dB Bandwidth of UNII-2C Straddle Channel:

For Example: Fundamental frequency: 5720 MHz

26 dB BW: 20.00 MHz

FL: 5710.16 MHz

FH: 5730.16 MHz

Turning Frequency: 5725 MHz

26 dB Bandwidth of UNII-2C Band Portion = 5725-5710.16=14.84 MHz

Calculation for 6dB Bandwidth of UNII-3 Straddle Channel:

For Example: Fundamental frequency: 5720 MHz

6 dB BW: 16.44 MHz

FL: 5711.76 MHz

FH: 5728.2 MHz

Turning Frequency: 5725 MHz

6 dB Bandwidth of UNII-3 band Portion = 5728.2-5725=3.2 MHz

TEST ENVIRONMENT

Temperature	24℃	Relative Humidity	55%
Atmosphere Pressure	101kPa		

TEST RESULTS

Please refer to section "Test Data" - Appendix B

7.3. CONDUCTED OUTPUT POWER

LIMITS

CFR 47 FCC Part15, Subpart E		
Test Item	Limit	Frequency Range (MHz)
Conducted Output Power	☐ Outdoor Access Point: 1 W (30 dBm) ☐ Indoor Access Point: 1 W (30 dBm) ☐ Fixed Point-To-Point Access Points: 1 W (30 dBm) ☒ Client Devices: 250 mW (24 dBm)	5150 ~ 5250
	Shall not exceed the lesser of 250 mW (24dBm) or 11 dBm + 10 log B, where B is the 26 dB emission bandwidth in megahertz.	5250 ~ 5350 5470 ~ 5725
	Shall not exceed 1 Watt (30 dBm).	5725 ~ 5850

Note:
The above limits are based upon the maximum antenna gain does not exceed 6 dBi.
If transmitting antennas of directional gain greater than 6 dBi are used, the maximum conducted output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

TEST PROCEDURE

Refer to KDB 789033 D02 General U-NII Test Procedures New Rules v02r01 section II.E.

Method SA-1 (trace averaging with the EUT transmitting at full power throughout each sweep):
(i) Set span to encompass the entire emission bandwidth (EBW) (or, alternatively, the entire 99% occupied bandwidth) of the signal.
(ii) Set RBW = 1 MHz.
(iii) Set VBW ≥ 3 MHz.
(iv) Number of points in sweep ≥ 2 × span / RBW. (This ensures that bin-to-bin spacing is ≤ RBW/2, so that narrowband signals are not lost between frequency bins.)
(v) Sweep time = auto.
(vi) Detector = power averaging (rms), if available. Otherwise, use sample detector mode.
(vii) If transmit duty cycle < 98 %, use a video trigger with the trigger level set to enable triggering only on full power pulses. Transmitter must operate at maximum power control level for the entire duration of every sweep. If the EUT transmits continuously (i.e., with no off intervals) or at duty cycle ≥ 98 %, and if each transmission is entirely at the maximum power control level, then the trigger shall be set to “free run.”
(viii) Trace average at least 100 traces in power averaging (rms) mode.
(ix) Compute power by integrating the spectrum across the EBW (or, alternatively, the entire 99% occupied bandwidth) of the signal using the instrument’s band power measurement function with band limits set equal to the EBW (or occupied bandwidth) band edges. If the instrument does not have a band power function, sum the spectrum levels (in power units) at 1 MHz intervals extending across the EBW (or, alternatively, the entire 99% occupied bandwidth) of the spectrum.

Method PM (Measurement using an RF average power meter):
(i) Measurements may be performed using a wideband RF power meter with a thermocouple detector or equivalent if all of the following conditions are satisfied:
a. The EUT is configured to transmit continuously or to transmit with a constant duty cycle.

b. At all times when the EUT is transmitting, it must be transmitting at its maximum power control level.
c. The integration period of the power meter exceeds the repetition period of the transmitted signal by at least a factor of five.
(ii) If the transmitter does not transmit continuously, measure the duty cycle, x, of the transmitter output signal as described in II.B.
(iii) Measure the average power of the transmitter. This measurement is an average over both the on and off periods of the transmitter.
(iv) Adjust the measurement in dBm by adding 10 log (1/x) where x is the duty cycle (e.g., 10 log (1/0.25) if the duty cycle is 25 %).

Method PM-G (Measurement using a gated RF average power meter):
Measurements may be performed using a wideband gated RF power meter provided that the gate parameters are adjusted such that the power is measured only when the EUT is transmitting at its maximum power control level. Since the measurement is made only during the ON time of the transmitter, no duty cycle correction factor is required.

Straddle channel power was measured using spectrum analyzer.

TEST ENVIRONMENT

Temperature	24℃	Relative Humidity	55%
Atmosphere Pressure	101kPa		

TEST RESULTS

Please refer to section "Test Data" - Appendix B

7.4. POWER SPECTRAL DENSITY

LIMITS

CFR 47 FCC Part15, Subpart E		
Test Item	Limit	Frequency Range (MHz)
Power Spectral Density	☐ Outdoor Access Point: 17 dBm/MHz ☐ Indoor Access Point: 17 dBm/MHz ☐ Fixed Point-To-Point Access Points: 17 dBm/MHz ☒ Client Devices: 11 dBm/MHz	5150 ~ 5250
	11 dBm/MHz	5250 ~ 5350 5470 ~ 5725
	30 dBm/500kHz	5725 ~ 5850

Note:
The above limits are based upon the maximum antenna gain does not exceed 6 dBi.
If transmitting antennas of directional gain greater than 6 dBi are used, maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

TEST PROCEDURE

Refer to KDB 789033 D02 General U-NII Test Procedures New Rules v02r01 section II.F.

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

For U-NII-1, U-NII-2A and U-NII-2C band:

Center Frequency	The center frequency of the channel under test
Detector	RMS
RBW	1 MHz
VBW	≥3 × RBW
Span	Encompass the entire emissions bandwidth (EBW) of the signal
Trace	Max hold
Sweep time	Auto

For U-NII-3:

Center Frequency	The center frequency of the channel under test
Detector	RMS
RBW	500 kHz
VBW	≥3 × RBW
Span	Encompass the entire emissions bandwidth (EBW) of the signal
Trace	Max hold
Sweep time	Auto

Allow trace to fully stabilize and Use the peak search function on the instrument to find the peak of the spectrum and record its value.

Add 10 log (1/x), where x is the duty cycle, to the peak of the spectrum, the result is the Maximum PSD over 1 MHz / 500 kHz reference bandwidth.

TEST ENVIRONMENT

Temperature	24℃	Relative Humidity	55%
Atmosphere Pressure	101kPa		

TEST RESULTS

Please refer to section "Test Data" - Appendix B

7.5. FREQUENCY STABILITY

LIMITS

The frequency of the carrier signal shall be maintained within band of operation.

TEST PROCEDURE

1. The EUT was placed inside an environmental chamber as the temperature in the chamber was varied between 0 °C ~ 40 °C (declared by customer).

2. The temperature was incremented by 10 °C intervals and the unit allowed to stabilize at each temperature before each measurement. The center frequency of the transmitting channel was evaluated at each temperature and the frequency deviation from the channel's center frequency was recorded.

3. The primary supply voltage is varied from 85 % to 115 % of the nominal value for non hand-carried battery and AC powered equipment. For hand-carried, battery-powered equipment, primary supply voltage is reduced to the battery operating end point which shall be specified by the manufacturer.

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

Center Frequency	The center frequency of the channel under test
Detector	Peak
RBW	10 kHz
VBW	≥3 × RBW
Span	Encompass the entire emissions bandwidth (EBW) of the signal
Trace	Max hold
Sweep time	Auto

4. While maintaining a constant temperature inside the environmental chamber, turn the EUT on and record the operating frequency at startup, and at 2 minutes, 5minutes, and 10 minutes after the EUT is energized.

5. Allow the trace to stabilize, find the peak value of the power envelope and record the frequency, then calculated the frequency drift.

TEST ENVIRONMENT

	Normal Test Conditions	Extreme Test Conditions
Relative Humidity	20 % - 75 %	/
Atmospheric Pressure	100 kPa ~102 kPa	/
Temperature	T_N (Normal Temperature): 25.1 °C	T_L (Low Temperature): -20 °C
		T_H (High Temperature): 50 °C
Supply Voltage	V_N (Normal Voltage): DC 3.3 V	V_L (Low Voltage): DC 2.805 V
		V_H (High Voltage): DC 3.795 V

TEST ENVIRONMENT

Temperature	24℃	Relative Humidity	55%
Atmosphere Pressure	101kPa		

TEST RESULTS

Please refer to section "Test Data" - Appendix B

7.6. DYNAMIC FREQUENCY SELECTION (SLAVE)

LIMITS

(1) DFS Detection Thresholds

Table 3: DFS Detection Thresholds for Master Devices and Client Devices With Radar Detection

Maximum Transmit Power	Value (See Notes 1, 2, and 3)
EIRP ≥ 200 milliwatt	-64 dBm
EIRP < 200 milliwatt and power spectral density < 10 dBm/MHz	-62 dBm
EIRP < 200 milliwatt that do not meet the power spectral density requirement	-64 dBm
Note 1: This is the level at the input of the receiver assuming a 0 dBi receive antenna. Note 2: Throughout these test procedures an additional 1 dB has been added to the amplitude of the test transmission waveforms to account for variations in measurement equipment. This will ensure that the test signal is at or above the detection threshold level to trigger a DFS response. Note3: EIRP is based on the highest antenna gain. For MIMO devices refer to KDB Publication 662911 D01.	

(2) DFS Response Requirements

Table 4: DFS Response Requirement Values

Parameter	Value
Non-occupancy period	Minimum 30 minutes
Channel Availability Check Time	60 seconds
Channel Move Time	10 seconds See Note 1.
Channel Closing Transmission Time	200 milliseconds + an aggregate of 60 milliseconds over remaining 10 second period. See Notes 1 and 2.
U-NII Detection Bandwidth	Minimum 100% of the U-NII 99% transmission power bandwidth. See Note 3.
Note 1: Channel Move Time and the Channel Closing Transmission Time should be performed with Radar Type 0. The measurement timing begins at the end of the Radar Type 0 burst. Note 2: The Channel Closing Transmission Time is comprised of 200 milliseconds starting at the beginning of the Channel Move Time plus any additional intermittent control signals required facilitating a Channel move (an aggregate of 60 milliseconds) during the remainder of the 10 second period. The aggregate duration of control signals will not count quiet periods in between transmissions. Note 3: During the U-NII Detection Bandwidth detection test, radar type 0 should be used. For each frequency step the minimum percentage of detection is 90 percent. Measurements are performed with no data traffic.	

APPLICABILITY OF DFS REQUIREMENTS

A U-NII network will employ a DFS function to detect signals from radar systems and to avoid co-channel operation with these systems. This applies to the 5250-5350 MHz and/or 5470-5725 MHz bands.
Within the context of the operation of the DFS function, a U-NII device will operate in either Master Mode or Client Mode. U-NII devices operating in Client Mode can only operate in a network controlled by a U-NII device operating in Master Mode.

Table 1: Applicability of DFS Requirements Prior to Use of a Channel

Requirement	Operational Mode		
	☐ Master	☒ Client Without Radar Detection	☐ Client With Radar Detection
Non-Occupancy Period	Yes	Not required	Yes
DFS Detection Threshold	Yes	Not required	Yes
Channel Availability Check Time	Yes	Not required	Not required
U-NII Detection Bandwidth	Yes	Not required	Yes

Table 2: Applicability of DFS requirements during normal operation

Requirement	Operational Mode	
	☐ Master Device or Client with Radar Detection	☒ Client Without Radar Detection
DFS Detection Threshold	Yes	Not required
Channel Closing Transmission Time	Yes	Yes
Channel Move Time	Yes	Yes
U-NII Detection Bandwidth	Yes	Not required

Additional requirements for devices with multiple bandwidth modes	☐ Master Device or Client with Radar Detection	☒ Client Without Radar Detection
U-NII Detection Bandwidth and Statistical Performance Check	All BW modes must be tested	Not required
Channel Move Time and Channel Closing Transmission Time	Test using widest BW mode available	Test using the widest BW mode available for the link
All other tests	Any single BW mode	Not required
Note: Frequencies selected for statistical performance check should include several frequencies within the radar detection bandwidth and frequencies near the edge of the radar detection bandwidth. For 802.11 devices it is suggested to select frequencies in each of the bonded 20 MHz channels and the channel center frequency.		

PARAMETERS OF RADAR TEST WAVEFORMS

This section provides the parameters for required test waveforms, minimum percentage of successful detections, and the minimum number of trials that must be used for determining DFS conformance. Step intervals of 0.1 microsecond for Pulse Width, 1 microsecond for PRI, 1 MHz for chirp width and 1 for the number of pulses will be utilized for the random determination of specific test waveforms.

Table 5 Short Pulse Radar Test Waveforms

Radar Type	Pulse Width (μsec)	PRI (μsec)	Number of Pulses	Minimum Percentage of Successful Detection	Minimum Number of Trials
0	1	1428	18	See Note 1	See Note 1
1	1	Test A	$\text{Roundup}\left\{\left(\frac{1}{360}\right)\cdot\left(\frac{19\cdot 10^6}{\text{PRI}_{\mu\text{sec}}}\right)\right\}$	60%	30
		Test B			
2	1-5	150-230	23-29	60%	30
3	6-10	200-500	16-18	60%	30
4	11-20	200-500	12-16	60%	30
Aggregate (Radar Types 1-4)				80%	120

Note 1: Short Pulse Radar Type 0 should be used for the detection bandwidth test, channel move time, and channel closing time tests.
Test A: 15 unique PRI values randomly selected from the list of 23 PRI values in Table 5a
Test B: 15 unique PRI values randomly selected within the range of 518-3066 μsec, with a minimum increment of 1 μsec, excluding PRI values selected in Test A

A minimum of 30 unique waveforms are required for each of the Short Pulse Radar Types 2 through 4. If more than 30 waveforms are used for Short Pulse Radar Types 2 through 4, then each additional waveform must also be unique and not repeated from the previous waveforms. If more than 30 waveforms are used for Short Pulse Radar Type 1, then each additional waveform is generated with Test B and must also be unique and not repeated from the previous waveforms in Tests A or B. Test aggregate is average of the percentage of successful detections of short pulse radar types 1-4.

TEST ENVIRONMENT

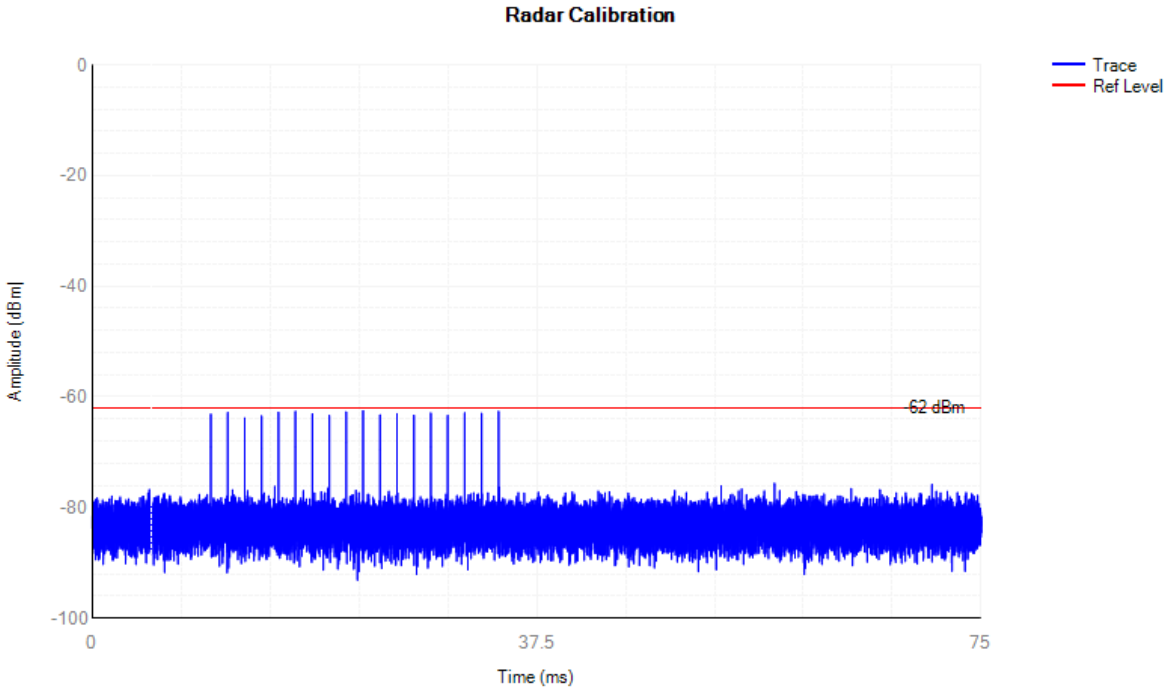
Temperature	24℃	Relative Humidity	55%
Atmosphere Pressure	101kPa		

TEST RESULTS

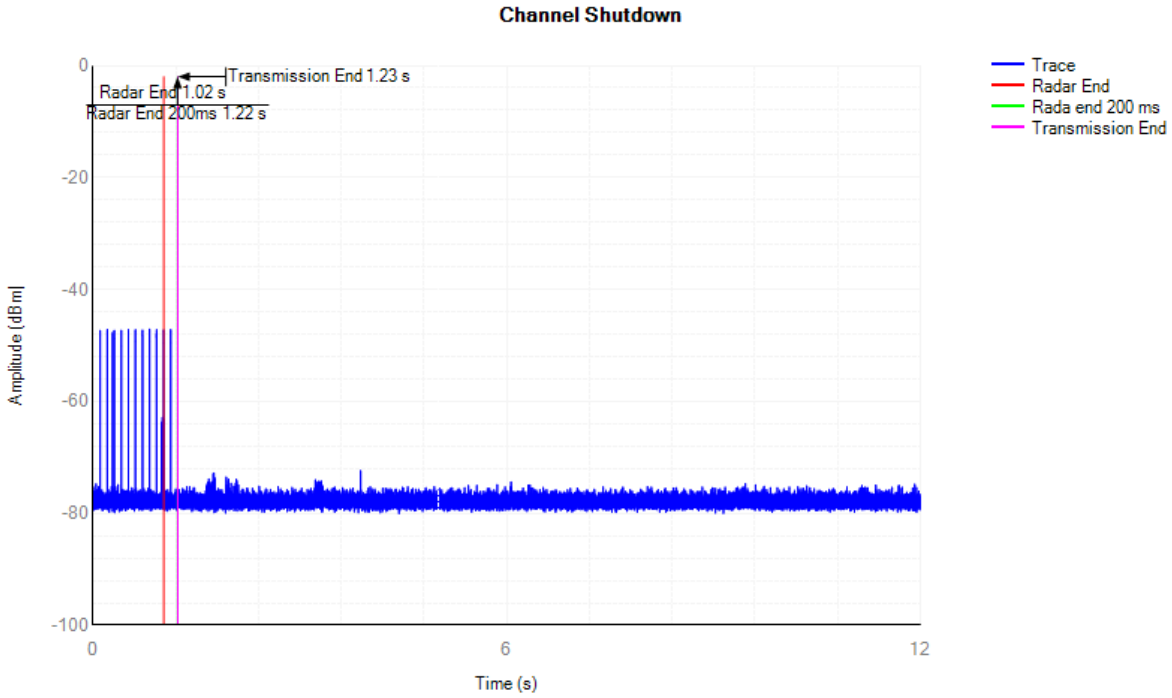
Both the Master and Client device
were set to 802.11ac / MCS0x1 with 80 MHz channel bandwidth to ensure a stable channel loading.KDB 905462 D02 v02 UNII DFS Compliance Procedures states in Table 2 the EUT should be tested at maximum channel bandwidth (80 MHz for 802.11ac mode).
Test Frequency and channel for 802.11ac (VHT80):

Transmit / Receive Channels Tested at 80 MHz Bandwidth setting:	
Channel	Frequency (MHz)
58	5290
122	5610

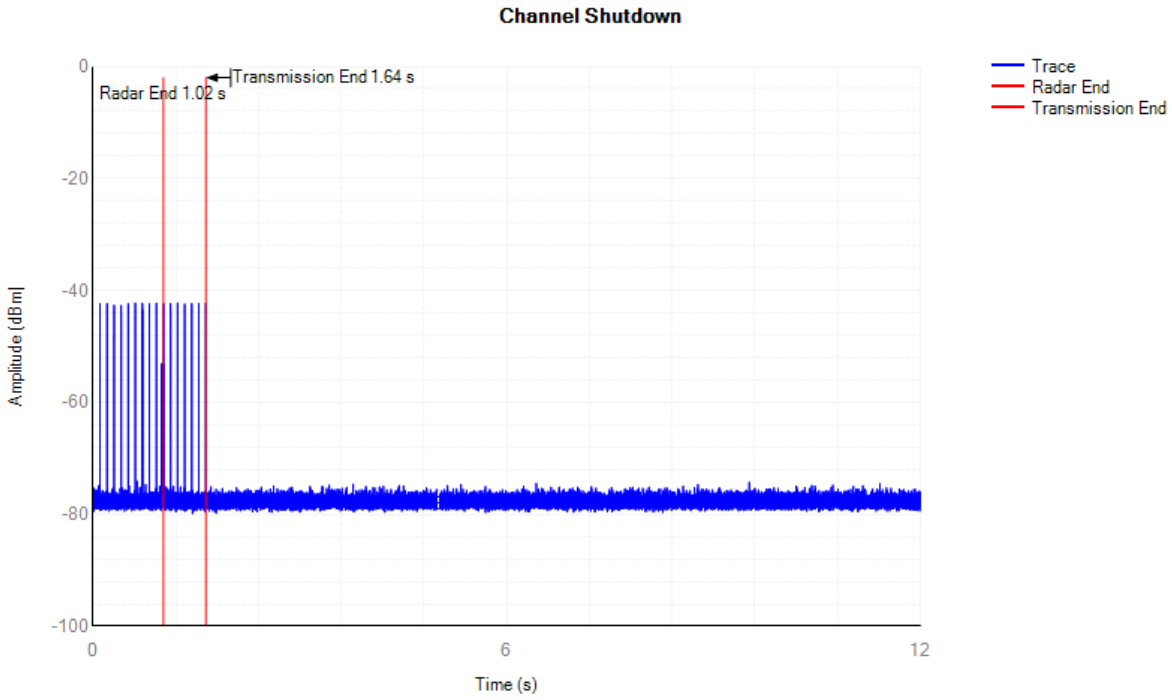
Calibration
Radar Signal 0:



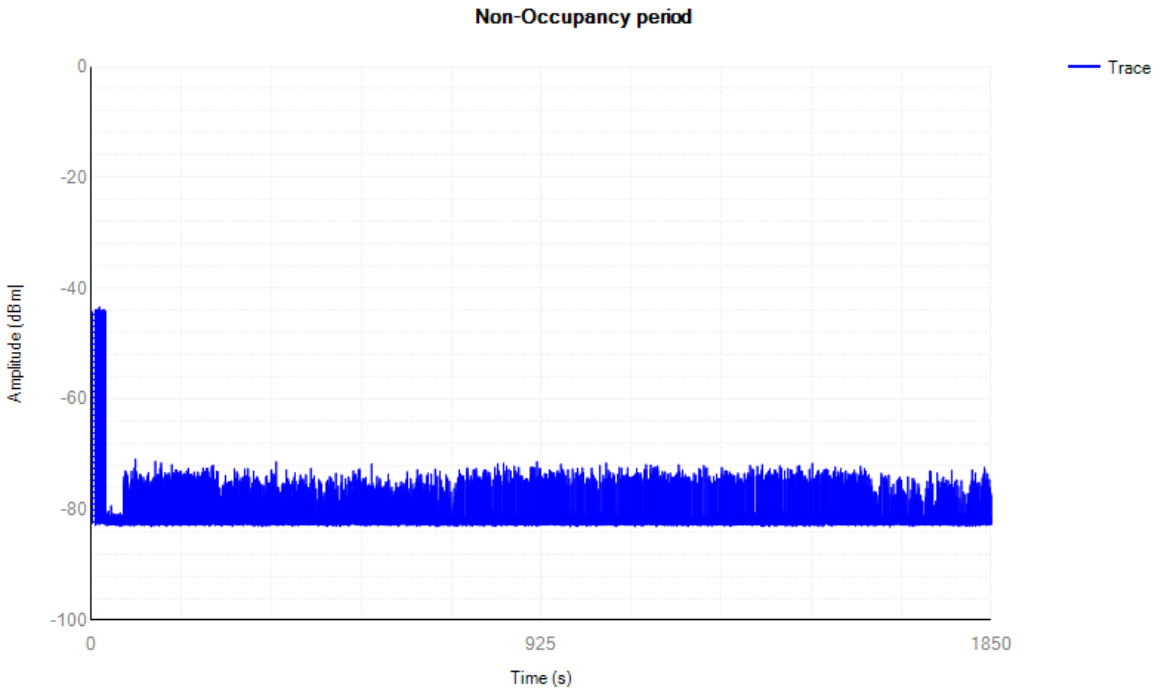
Shutdown Time
5290MHz:



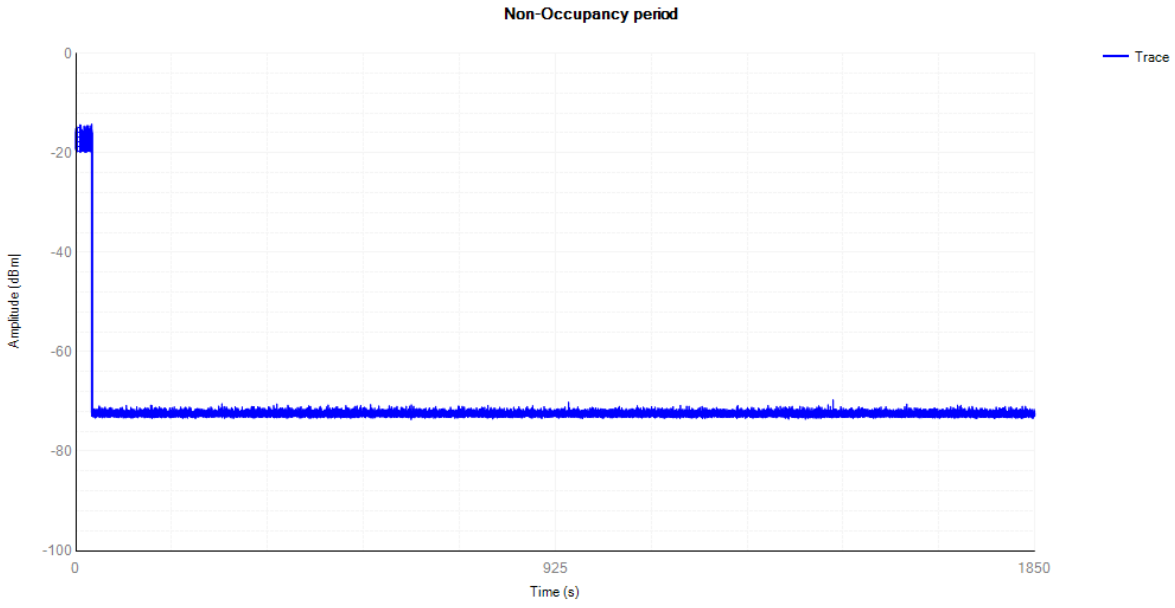
5610MHz:



Non-Occupancy
5290MHz:



5610MHz:



8. RADIATED TEST RESULTS

LIMITS

Refer to CFR 47 FCC §15.205, §15.209 and §15.407 (b).

Radiation Disturbance Test Limit for FCC (Class B) (9 kHz ~ 1 GHz)

Emissions radiated outside of the specified frequency bands above 30 MHz			
Frequency Range (MHz)	Field Strength Limit (uV/m) at 3 m	Field Strength Limit (dBuV/m) at 3 m	
		Quasi-Peak	
30 - 88	100	40	
88 - 216	150	43.5	
216 - 960	200	46	
Above 960	500	54	
Above 1000	500	Peak	Average
		74	54

FCC Emissions radiated outside of the specified frequency bands below 30 MHz		
Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30

FCC Restricted bands of operation refer to FCC §15.205 (a):

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

Note: [1]Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.
[2]Above 38.6c
Limits of unwanted/undesirable emission out of the restricted bands refer to CFR 47 FCC §15.407 (b).

LIMITS OF RADIATED EMISSION MEASUREMENT (Above 1GHz)		
Frequency Range (MHz)	EIRP Limit	Field Strength Limit (dBuV/m) at 3 m
5150~5250 MHz	PK: -27 (dBm/MHz)	PK:68.2(dBμV/m)
5250~5350 MHz		
5470~5725 MHz		
5725~5850 MHz	PK: -27 (dBm/MHz) *1 PK: 10 (dBm/MHz) *2 PK: 15.6 (dBm/MHz) *3 PK: 27 (dBm/MHz) *4	PK: 68.2(dBμV/m) *1 PK: 105.2 (dBμV/m) *2 PK: 110.8(dBμV/m) *3 PK: 122.2 (dBμV/m) *4
Note: *1 beyond 75 MHz or more above of the band edge. *2 below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above. *3 below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above. *4 from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.		

TEST PROCEDURE

Below 30 MHz

The setting of the spectrum analyser

RBW	200 Hz (From 9 kHz to 0.15 MHz)/ 9 kHz (From 0.15 MHz to 30 MHz)
VBW	200 Hz (From 9 kHz to 0.15 MHz)/ 9 kHz (From 0.15 MHz to 30 MHz)
Sweep	Auto

1. The testing follows the guidelines in ANSI C63.10-2013 clause 6.4.

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

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

4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a 1 m height antenna tower.

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

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

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

8. The limits in CFR 47, Part 15, Subpart C, paragraph 15.209 (a), are identical to those in RSS-GEN Section 8.9, Table 6, since the measurements are performed in terms of magnetic field strength and converted to electric field strength levels (as reported in the table) using the free space impedance of 377Ω. For example, the measurement frequency X KHz resulted in a level of Y dBuV/m, which is equivalent to Y-51.5 = Z dBuA/m, which has the same margin, W dB, to the corresponding RSS-GEN Table 6 limit as it has to be 15.209(a) limit.

Below 1 GHz and above 30 MHz

The setting of the spectrum analyser

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

1. The testing follows the guidelines in ANSI C63.10-2013 clause 6.5.

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

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

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

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

Above 1 GHz

The setting of the spectrum analyser

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

1. The testing follows the guidelines in KDB 789033 D02 General U-NII Test Procedures New Rules v02r01 section II.G.3 ~ II.G.6.

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

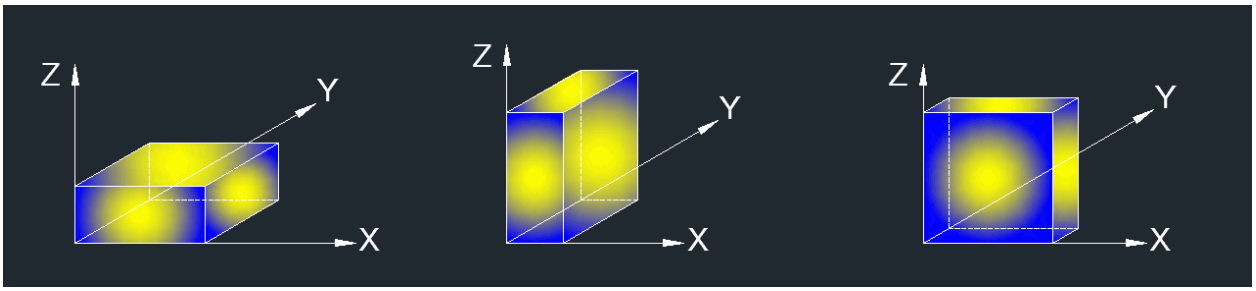
3. The EUT was placed on a turntable with 1.5 m above ground.

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

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

6. For measurements above 1 GHz the resolution bandwidth is set to 1 MHz, then the video bandwidth is set to 3 MHz for peak measurements and 1 MHz resolution bandwidth with 1/T video bandwidth with peak detector for average measurements. For the Duty Cycle please refer to clause 7.1.ON TIME AND DUTY CYCLE.

X axis, Y axis, Z axis positions:



Note 1: For all radiated test, EUT in each of three orthogonal axis emissions had been tested, but only the worst case (X axis) data recorded in the report.

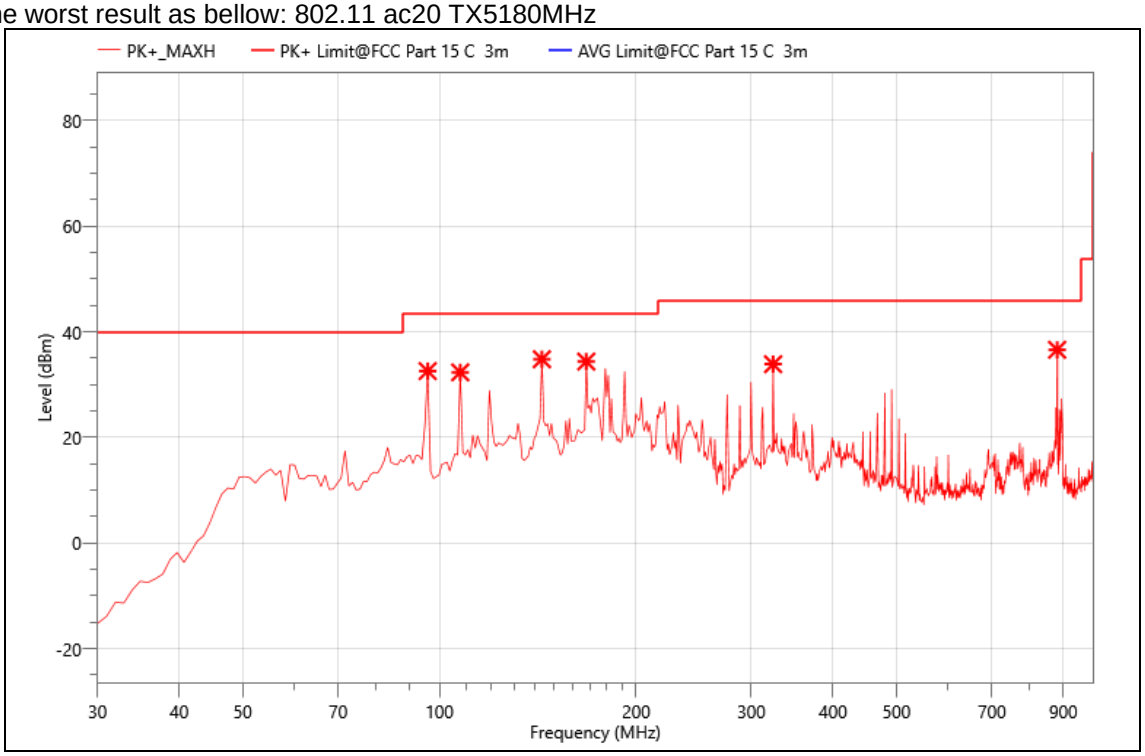
TEST ENVIRONMENT

Temperature	24℃	Relative Humidity	54%
Atmosphere Pressure	101kPa		

TEST RESULTS

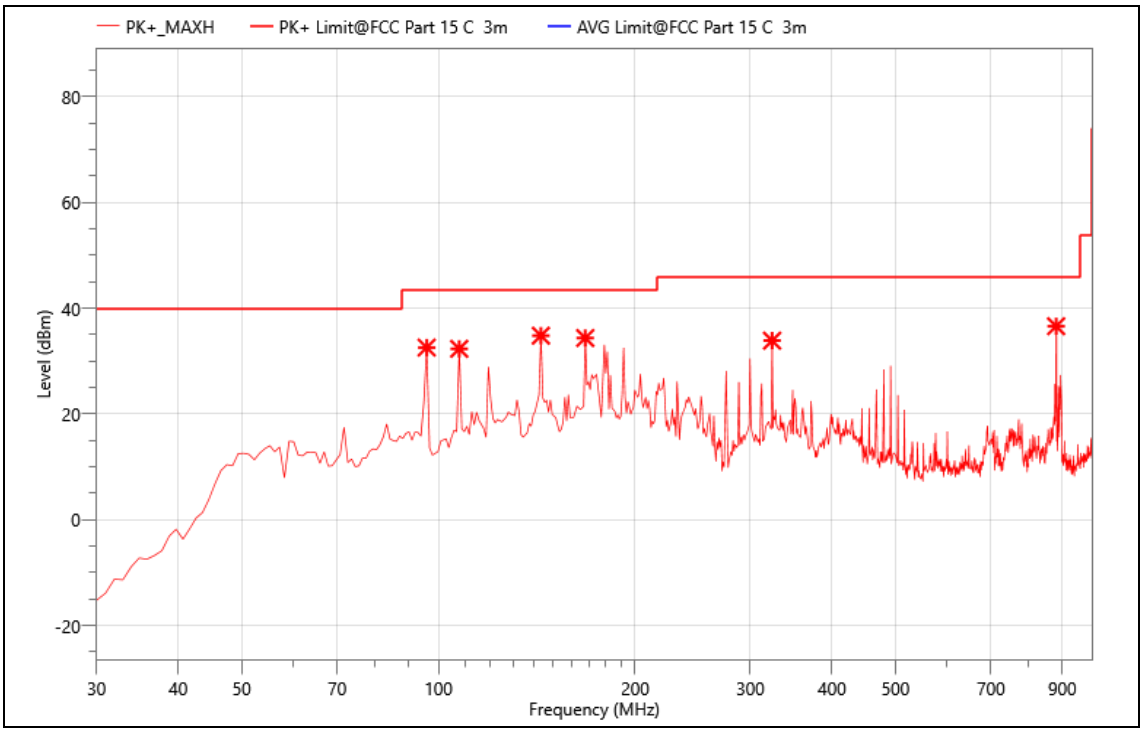
- Undesirable radiated Spurious Emission below 1GHz (30MHz to 1GHz)

The worst result as bellow: 802.11 ac20 TX5180MHz



Critical_Freqs

Freq. (MHz)	Reading (dBµV)	Meas. (dBm)	Limit (dBm)	Margin (dBm)	Det.	Height (cm)	Pol.	Azimuth (deg)	Corr. (dB)
95.96	56.29	32.58	43.50	10.92	PK+	149.9	H	360.0	-23.71
107.6	55.38	32.34	43.50	11.16	PK+	149.9	H	360.0	-23.04
143.49	55.31	34.82	43.50	8.68	PK+	149.9	H	360.0	-20.49
167.74	55.38	34.38	43.50	9.12	PK+	149.9	H	360.0	-21
323.91	52.27	33.89	46.00	12.11	PK+	149.9	H	360.0	-18.38
880.69	53.69	36.61	46.00	9.39	PK+	149.9	H	360.0	-17.08



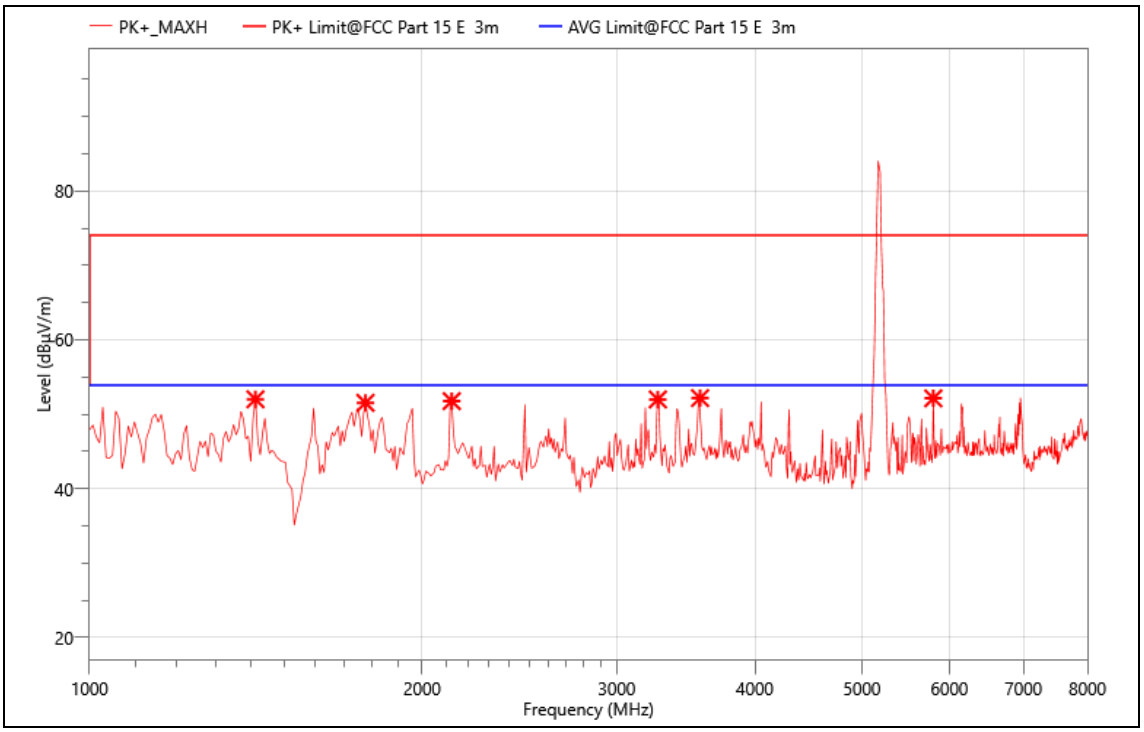
Critical_Freqs

Freq. (MHz)	Reading (dBµV)	Meas. (dBm)	Limit (dBm)	Margin (dBm)	Det.	Height (cm)	Pol.	Azimuth (deg)	Corr. (dB)
95.96	56.29	32.58	43.50	10.92	PK+	149.9	H	360.0	-23.71
107.6	55.38	32.34	43.50	11.16	PK+	149.9	H	360.0	-23.04
143.49	55.31	34.82	43.50	8.68	PK+	149.9	H	360.0	-20.49
167.74	55.38	34.38	43.50	9.12	PK+	149.9	H	360.0	-21
323.91	52.27	33.89	46.00	12.11	PK+	149.9	H	360.0	-18.38
880.69	53.69	36.61	46.00	9.39	PK+	149.9	H	360.0	-17.08

- Undesirable radiated Spurious Emission Above 1GHz (1GHz to 40GHz)

All modes has been tested and the worst result (802.11 ac20 MIMO) recorded as below:

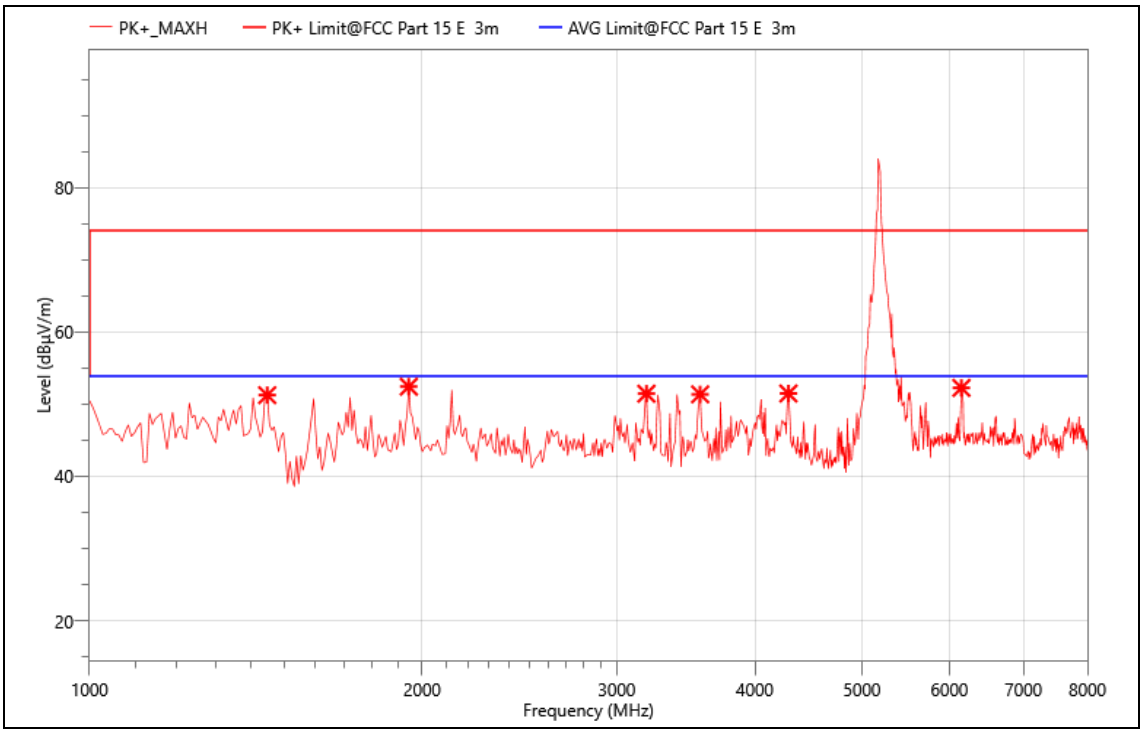
TX5180: 1-8GHz



Critical_Freqs

Freq. (MHz)	Reading (dBµV)	Meas. (dBµV/m)	Limit (dBµV/m)	Margin (dBµV/m)	Det.	Height (cm)	Pol.	Azimuth (deg)	Corr. (dB)
1413	74.6	52.01	68.2	21.99	PK+	150.1	V	360.2	-22.59
1777	71.7	51.53	68.2	22.47	PK+	150.1	V	360.2	-20.17
2127	69.81	51.76	68.2	22.24	PK+	150.1	V	360.2	-18.05
3268	66.84	51.99	68.2	22.01	PK+	150.1	V	360.2	-14.85
3569	66.24	52.17	68.2	21.83	PK+	150.1	V	360.2	-14.07
5802	60.77	52.14	68.2	21.86	PK+	150.1	V	360.2	-8.63

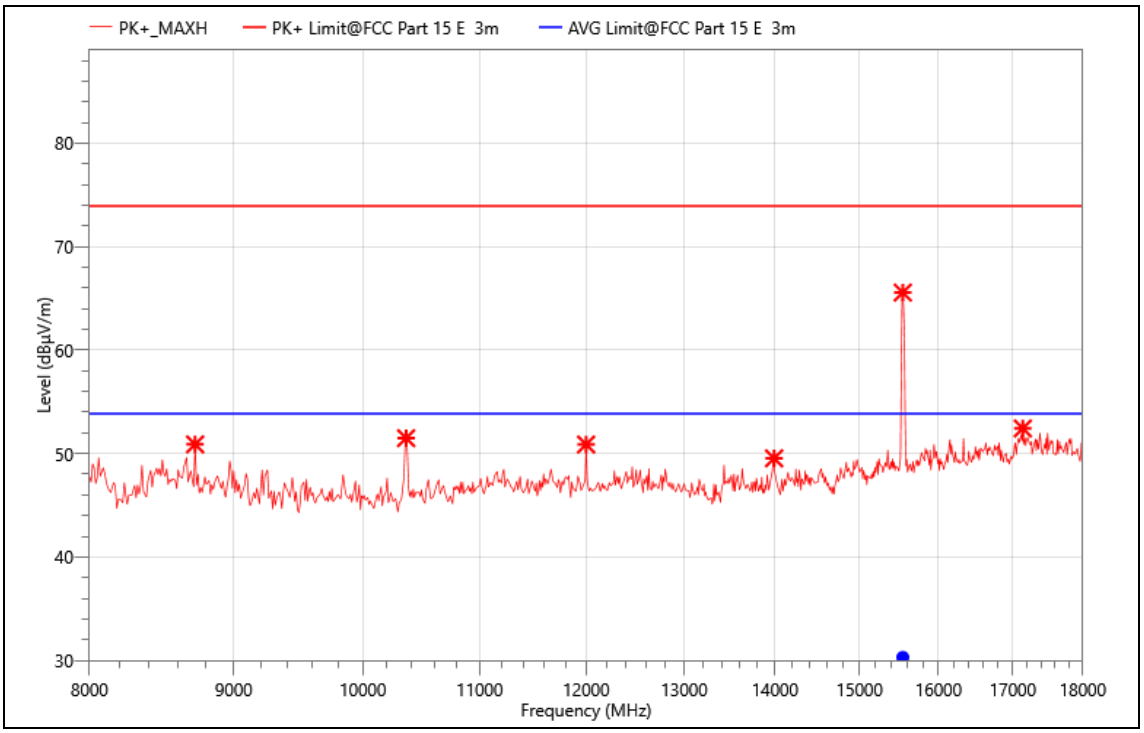
TX5180: 1-8GHz



Critical_Freqs

Freq. (MHz)	Reading (dBµV)	Meas. (dBµV/m)	Limit (dBµV/m)	Margin (dBµV/m)	Det.	Height (cm)	Pol.	Azimuth (deg)	Corr. (dB)
1448	73.83	51.26	68.2	22.74	PK+	150.1	H	0.0	-22.57
1945	71.26	52.43	68.2	21.57	PK+	150.1	H	0.0	-18.83
3191	66.58	51.46	68.2	22.54	PK+	150.1	H	0.0	-15.12
3569	65.44	51.37	68.2	22.63	PK+	150.1	H	0.0	-14.07
4290	64.16	51.49	68.2	22.51	PK+	150.1	H	0.0	-12.67
6152	59.44	52.26	68.2	21.74	PK+	150.1	H	0.0	-7.18

TX5180: 8-18GHz



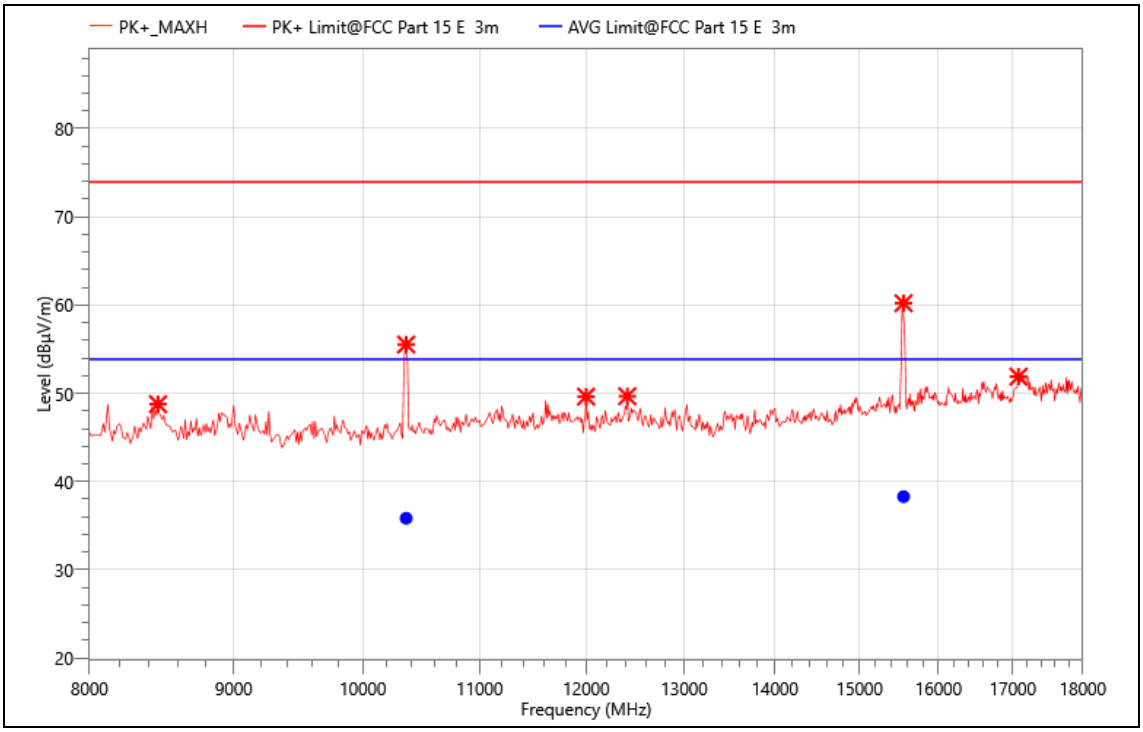
Critical_Freqs

Freq. (MHz)	Reading (dBµV)	Meas. (dBµV/m)	Limit (dBµV/m)	Margin (dBµV/m)	Det.	Height (cm)	Pol.	Azimuth (deg)	Corr. (dB)
8720	56.79	50.89	68.2	23.11	PK+	150.1	V	360.0	-5.9
10360	54.3	51.49	68.2	22.51	PK+	150.1	V	360.0	-2.81
12000	51.5	50.88	68.2	23.12	PK+	150.1	V	360.0	-0.62
13990	48.8	49.54	68.2	24.46	PK+	150.1	V	360.0	0.74
15540	62.76	65.57	68.2	8.43	PK+	150.1	V	360.0	2.81
17140	46.39	52.43	68.2	21.57	PK+	150.1	V	360.0	6.04

Final_Result

Freq. (MHz)	Reading (dBµV)	Meas. (dBµV/m)	Limit (dBµV/m)	Margin (dBµV/m)	Det.	Height (cm)	Pol.	Azimuth (deg)	Corr. (dB)	Verdict
15539.79	27.50	30.31	54	23.59	AVG	150.1	V	360.0	2.81	PASS

TX5180: 8-18GHz



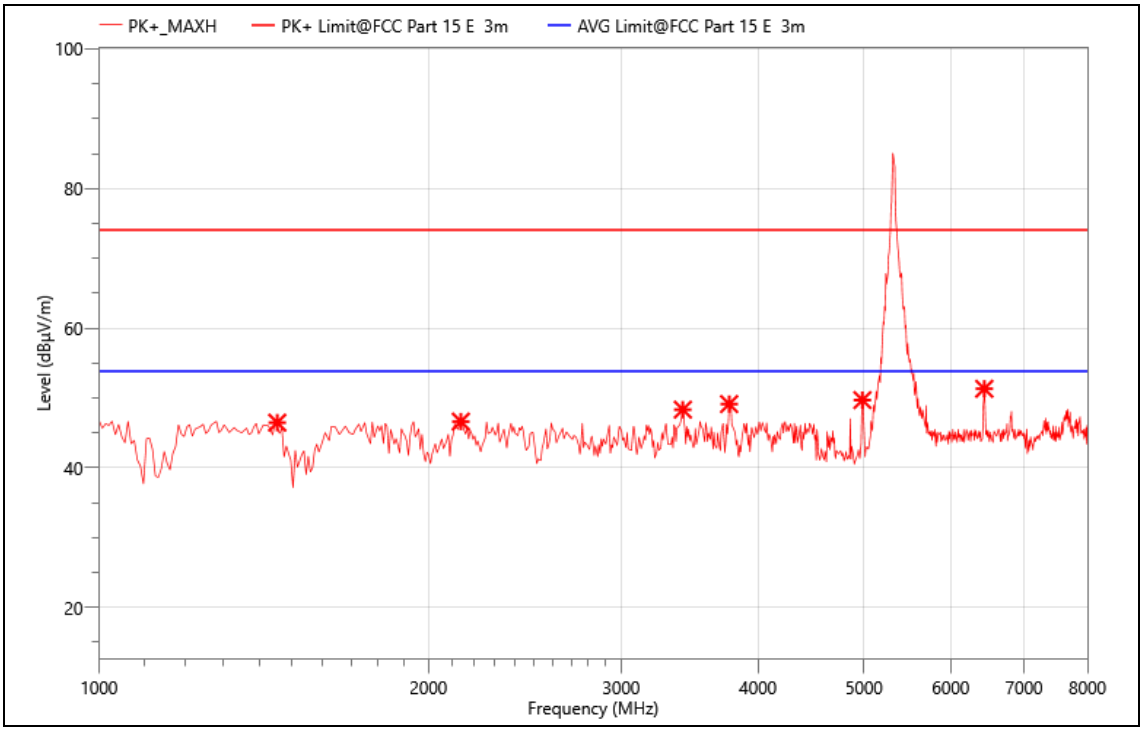
Critical_Freqs

Freq. (MHz)	Reading (dBµV)	Meas. (dBµV/m)	Limit (dBµV/m)	Margin (dBµV/m)	Det.	Height (cm)	Pol.	Azimuth (deg)	Corr. (dB)
8460	54.48	48.77	68.2	25.23	PK+	150.1	H	360.0	-5.71
10360	58.34	55.53	68.2	18.47	PK+	150.1	H	360.0	-2.81
12000	50.24	49.62	68.2	24.38	PK+	150.1	H	360.0	-0.62
12410	50.46	49.67	68.2	24.33	PK+	150.1	H	360.0	-0.79
15550	57.4	60.21	68.2	13.79	PK+	150.1	H	360.0	2.81
17080	45.56	51.89	68.2	22.11	PK+	150.1	H	360.0	6.33

Final_Result

Freq. (MHz)	Reading (dBµV)	Meas. (dBµV/m)	Limit (dBµV/m)	Margin (dBµV/m)	Det.	Height (cm)	Pol.	Azimuth (deg)	Corr. (dB)	Verdict
10359.80	38.64	35.83	54	18.07	AVG	150.1	H	360.0	-2.81	PASS
15549.83	35.48	38.29	54	15.61	AVG	150.1	H	360.0	2.81	PASS

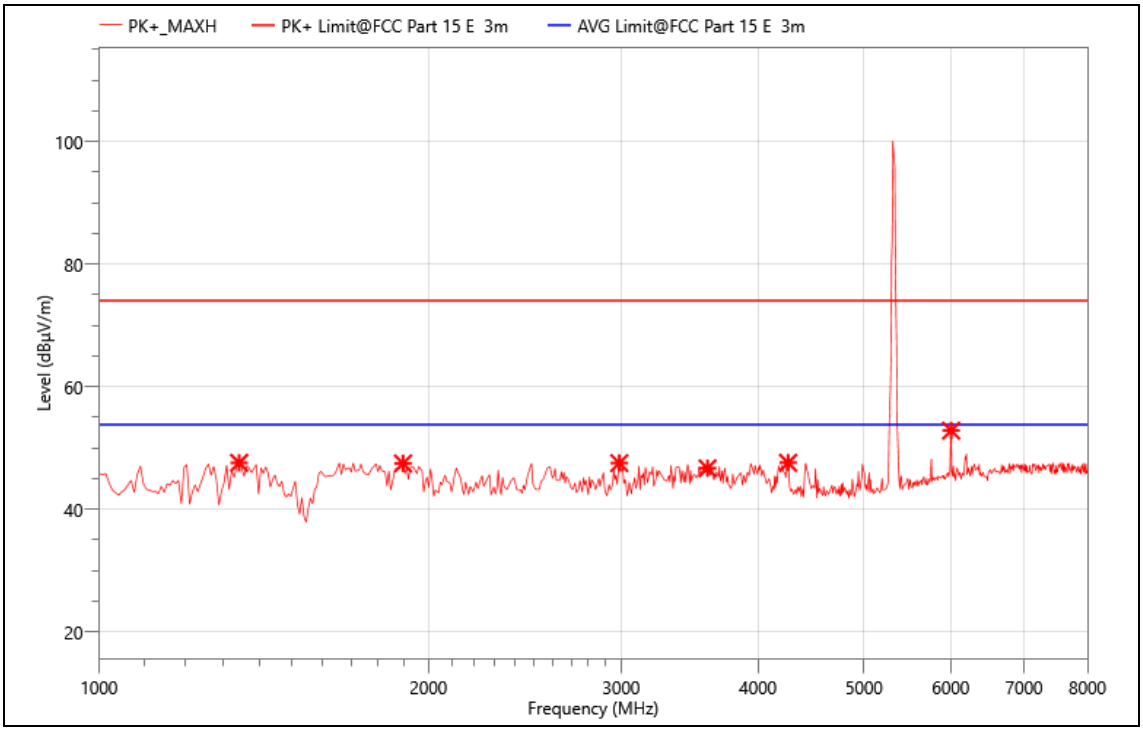
TX5320: 1-8GHz



Critical_Freqs

Freq. (MHz)	Reading (dBµV)	Meas. (dBµV/m)	Limit (dBµV/m)	Margin (dBµV/m)	Det.	Height (cm)	Pol.	Azimuth (deg)	Corr. (dB)
1455	69.04	46.47	68.2	27.53	PK+	E-S	H	-0.1	-22.57
2141	64.63	46.62	68.2	27.38	PK+	E-S	H	-0.1	-18.01
3415	62.69	48.33	68.2	25.67	PK+	E-S	H	-0.1	-14.36
3765	62.72	49.13	68.2	24.87	PK+	E-S	H	-0.1	-13.59
4983	60.86	49.7	68.2	24.3	PK+	E-S	H	-0.1	-11.16
6439	58.37	51.32	68.2	22.68	PK+	E-S	H	-0.1	-7.05

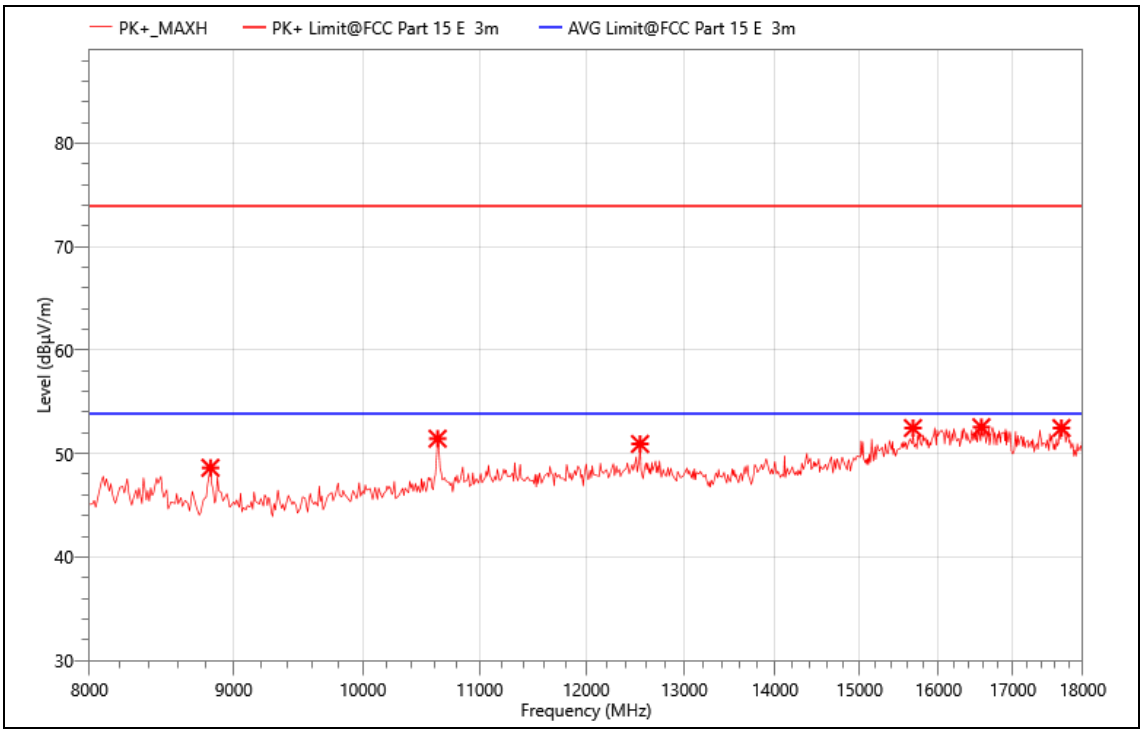
TX5320: 1-8GHz



Critical_Freqs

Freq. (MHz)	Reading (dBµV)	Meas. (dBµV/m)	Limit (dBµV/m)	Margin (dBµV/m)	Det.	Height (cm)	Pol.	Azimuth (deg)	Corr. (dB)
1343	71.02	47.58	68.2	26.42	PK+	149.9	V	0.1	-23.44
1896	67.27	47.48	68.2	26.52	PK+	149.9	V	0.1	-19.79
2988	63.86	47.54	68.2	26.46	PK+	149.9	V	0.1	-16.32
3597	60.95	46.69	68.2	27.31	PK+	149.9	V	0.1	-14.26
4262	60.63	47.59	68.2	26.41	PK+	149.9	V	0.1	-13.04
6005	60.57	52.83	68.2	21.17	PK+	149.9	V	0.1	-7.74

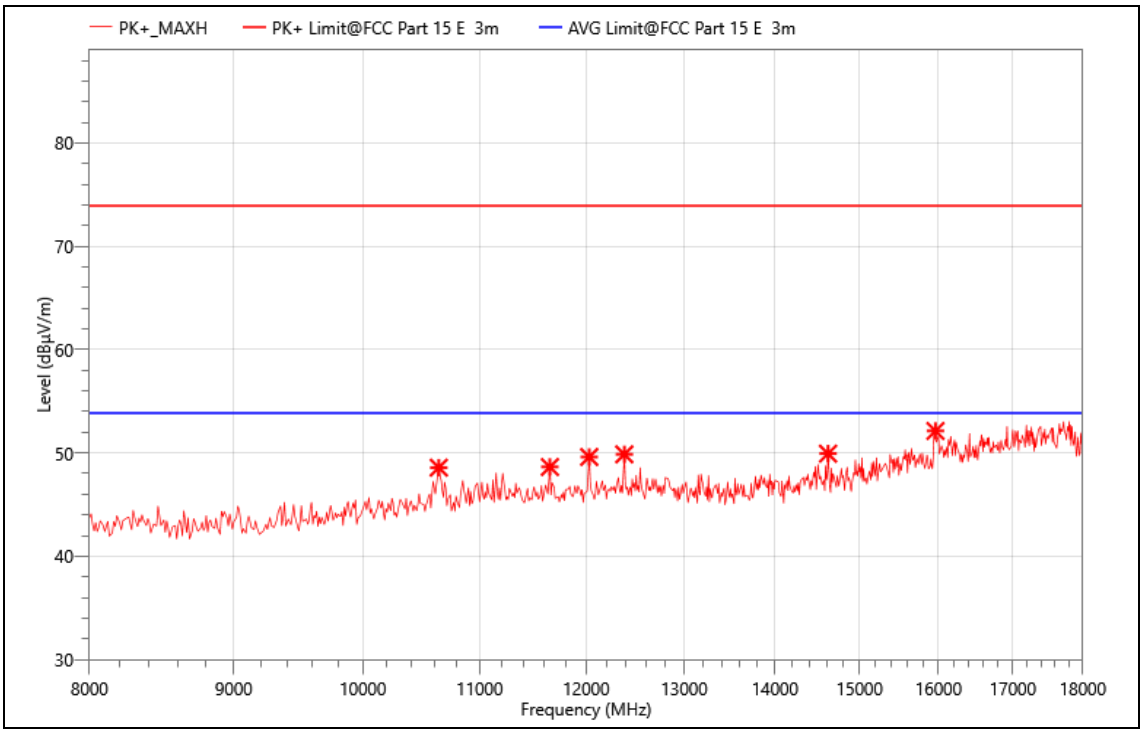
TX5320: 8-18GHz



Critical_Freqs

Freq. (MHz)	Reading (dBµV)	Meas. (dBµV/m)	Limit (dBµV/m)	Margin (dBµV/m)	Det.	Height (cm)	Pol.	Azimuth (deg)	Corr. (dB)
8830	54.52	48.62	68.2	25.38	PK+	149.9	V	90.6	-5.9
10630	52.79	51.44	68.2	22.56	PK+	149.9	V	90.6	-1.35
12540	50.28	50.93	68.2	23.07	PK+	149.9	V	90.6	0.65
15670	49.48	52.47	68.2	21.53	PK+	149.9	V	90.6	2.99
16570	47.53	52.55	68.2	21.45	PK+	149.9	V	90.6	5.02
17690	46.05	52.47	68.2	21.53	PK+	149.9	V	90.6	6.42

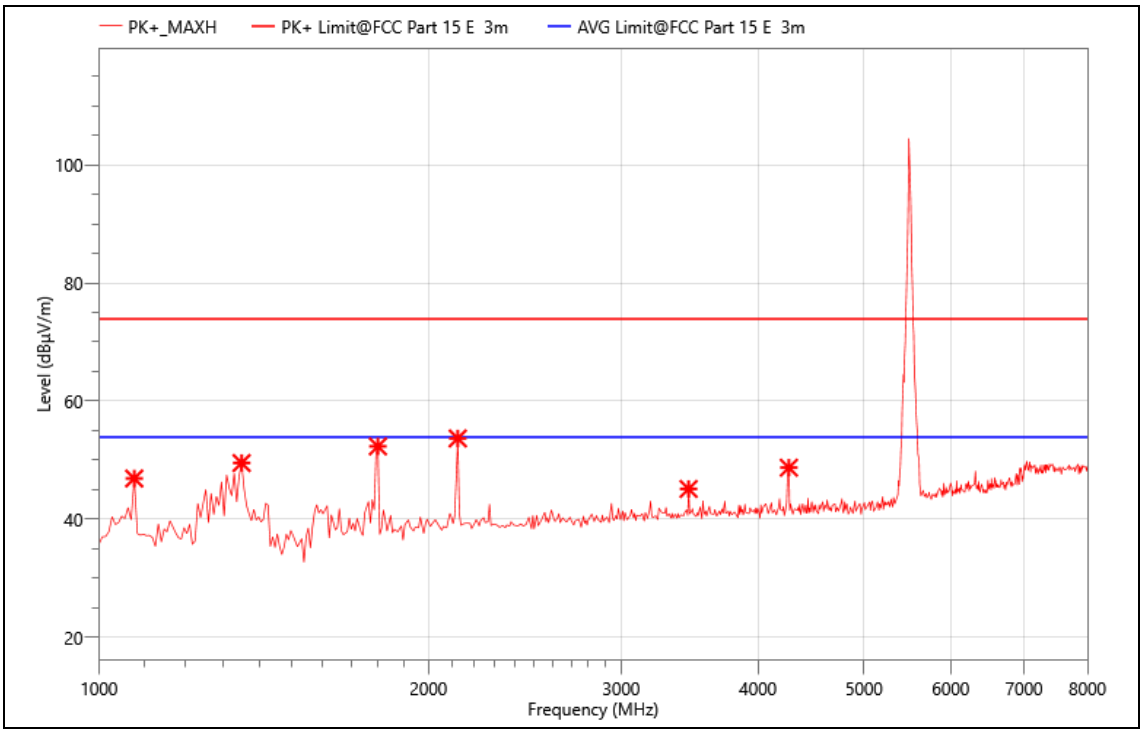
TX5320: 8-18GHz



Critical_Freqs

Freq. (MHz)	Reading (dBµV)	Meas. (dBµV/m)	Limit (dBµV/m)	Margin (dBµV/m)	Det.	Height (cm)	Pol.	Azimuth (deg)	Corr. (dB)
10640	49.75	48.58	68.2	25.42	PK+	149.9	H	180.1	-1.17
11650	49.72	48.64	68.2	25.36	PK+	149.9	H	180.1	-1.08
12030	50.36	49.61	68.2	24.39	PK+	149.9	H	180.1	-0.75
12380	50.72	49.87	68.2	24.13	PK+	149.9	H	180.1	-0.85
14620	48.97	49.93	68.2	24.07	PK+	149.9	H	180.1	0.96
15960	47.93	52.13	68.2	21.87	PK+	149.9	H	180.1	4.2

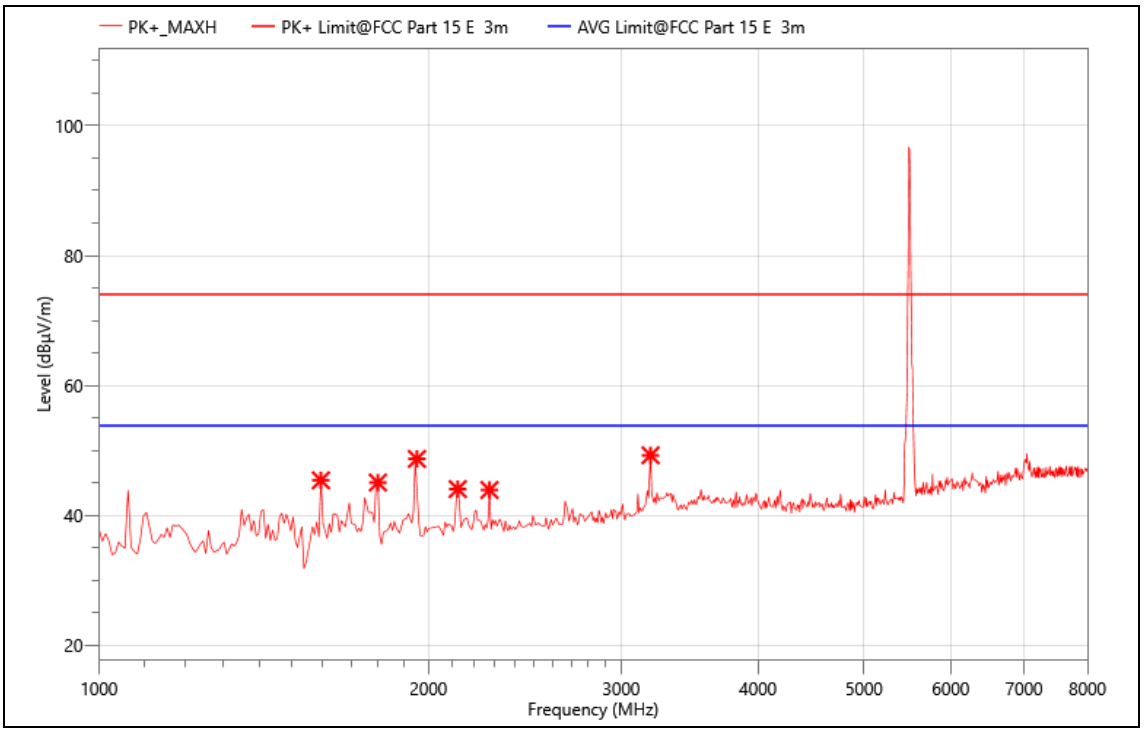
TX5500: 1-8GHz



Critical_Freqs

Freq. (MHz)	Reading (dBµV)	Meas. (dBµV/m)	Limit (dBµV/m)	Margin (dBµV/m)	Det.	Height (cm)	Pol.	Azimuth (deg)	Corr. (dB)
1077	71.02	46.88	68.2	27.12	PK+	149.9	H	360.0	-24.14
1350	72.87	49.5	68.2	24.5	PK+	149.9	H	360.0	-23.37
1798	72.91	52.31	68.2	21.69	PK+	149.9	H	360.0	-20.6
2127	72.17	53.66	68.2	20.34	PK+	149.9	H	360.0	-18.51
3457	59.82	45.11	68.2	28.89	PK+	149.9	H	360.0	-14.71
4269	61.73	48.71	68.2	25.29	PK+	149.9	H	360.0	-13.02

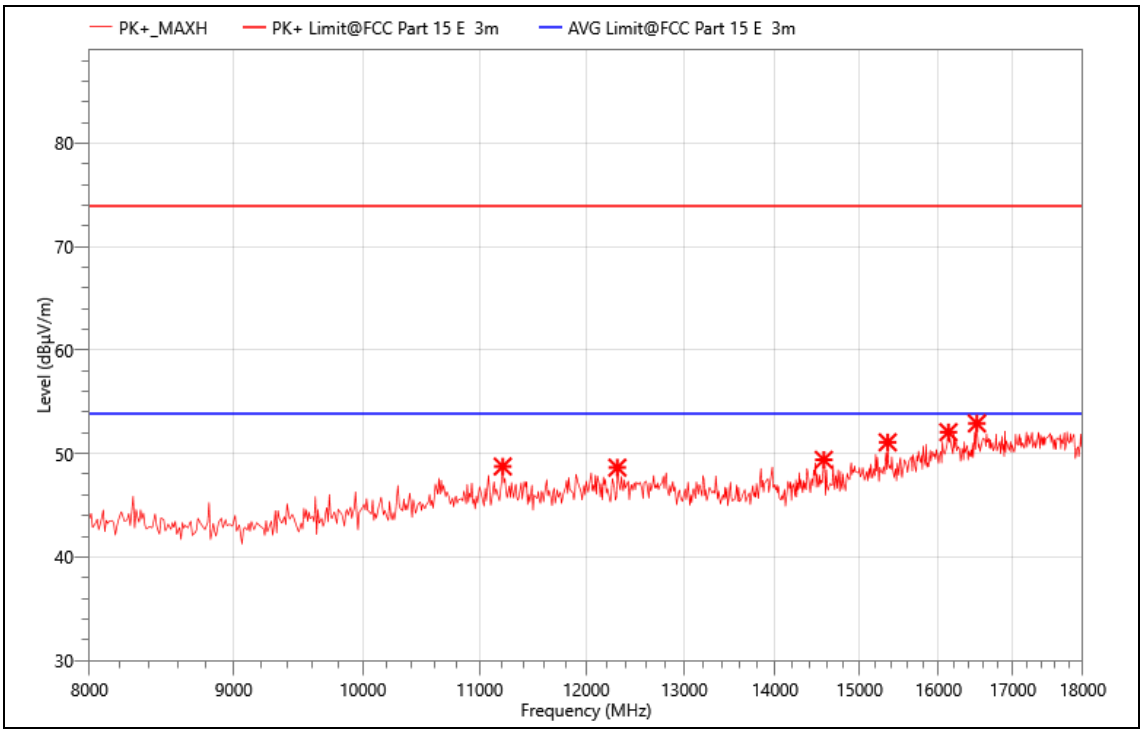
TX5500: 1-8GHz



Critical_Freqs

Freq. (MHz)	Reading (dBµV)	Meas. (dBµV/m)	Limit (dBµV/m)	Margin (dBµV/m)	Det.	Height (cm)	Pol.	Azimuth (deg)	Corr. (dB)
1595	67.74	45.42	68.2	28.58	PK+	149.9	V	360.0	-22.32
1798	65.68	45.08	68.2	28.92	PK+	149.9	V	360.0	-20.6
1952	67.96	48.72	68.2	25.28	PK+	149.9	V	360.0	-19.24
2127	62.58	44.07	68.2	29.93	PK+	149.9	V	360.0	-18.51
2274	61.95	43.93	68.2	30.07	PK+	149.9	V	360.0	-18.02
3191	64.59	49.27	68.2	24.73	PK+	149.9	V	360.0	-15.32

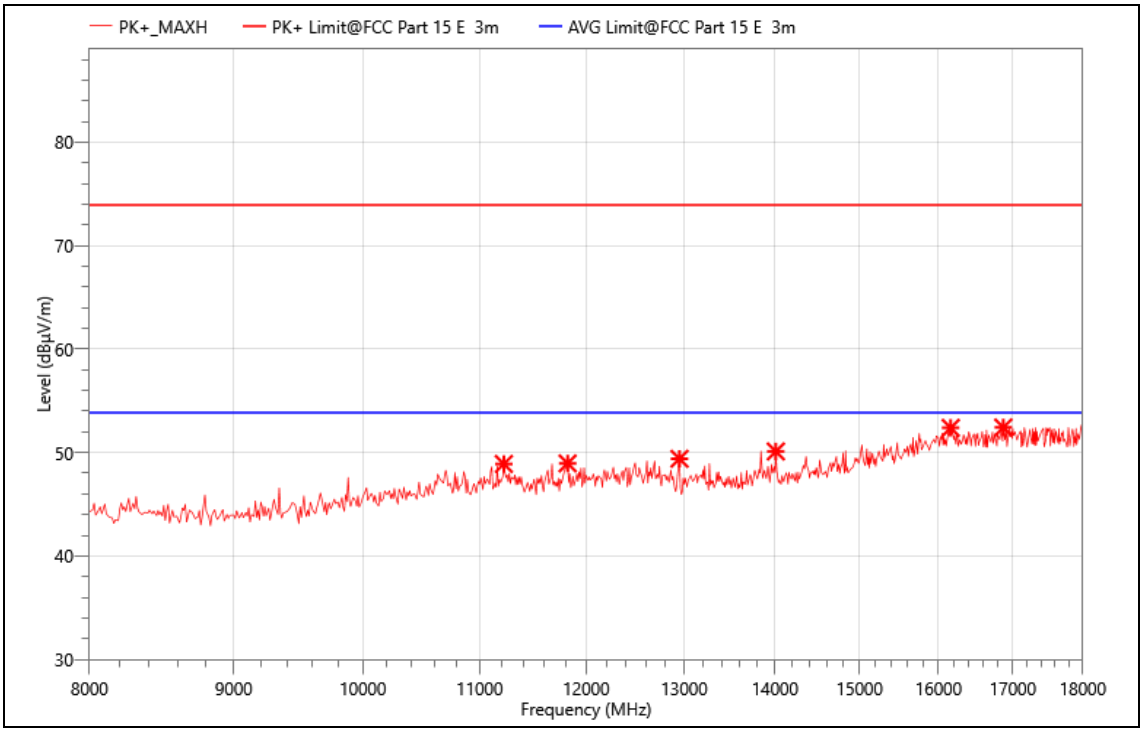
TX5500: 8-18GHz



Critical_Freqs

Freq. (MHz)	Reading (dBµV)	Meas. (dBµV/m)	Limit (dBµV/m)	Margin (dBµV/m)	Det.	Height (cm)	Pol.	Azimuth (deg)	Corr. (dB)
11210	49.45	48.75	68.2	25.25	PK+	149.9	H	180.1	-0.7
12310	48.42	48.64	68.2	25.36	PK+	149.9	H	180.1	0.22
14570	48.4	49.4	68.2	24.6	PK+	149.9	H	180.1	1
15350	48.79	51.09	68.2	22.91	PK+	149.9	H	180.1	2.3
16130	46.86	52.07	68.2	21.93	PK+	149.9	H	180.1	5.21
16510	48.55	52.92	68.2	21.08	PK+	149.9	H	180.1	4.37

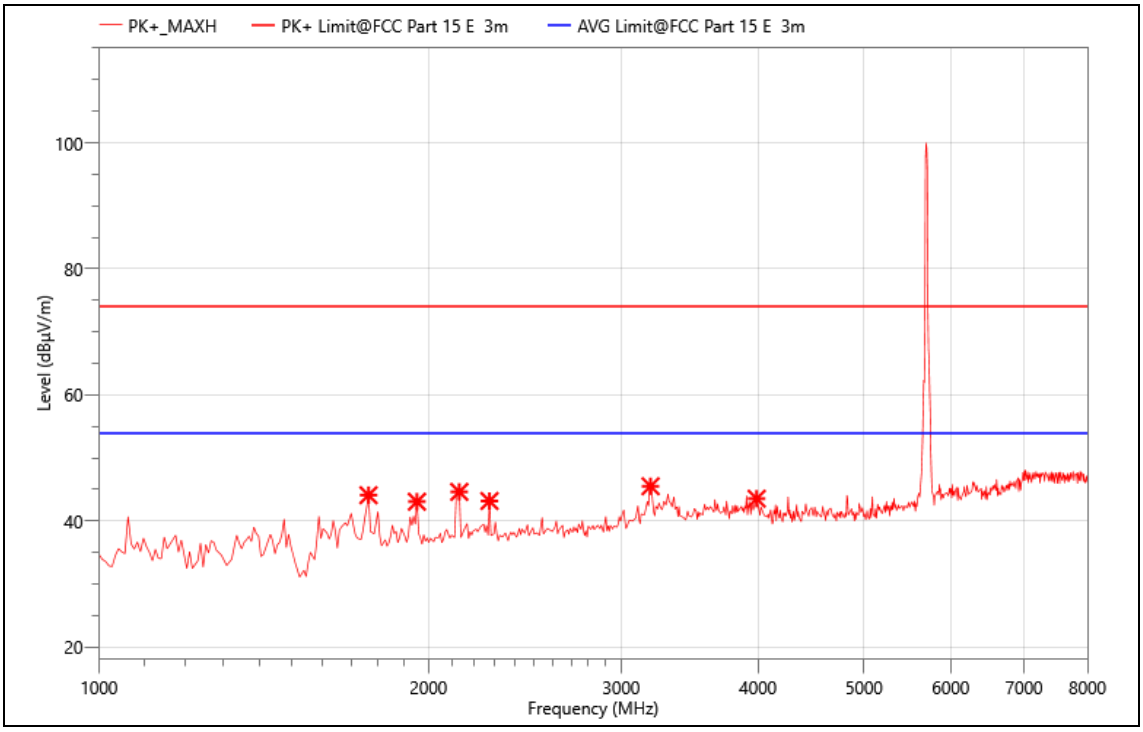
TX5500: 8-18GHz



Critical_Freqs

Freq. (MHz)	Reading (dBµV)	Meas. (dBµV/m)	Limit (dBµV/m)	Margin (dBµV/m)	Det.	Height (cm)	Pol.	Azimuth (deg)	Corr. (dB)
11220	49.56	48.9	68.2	25.1	PK+	149.9	V	180.1	-0.66
11820	49.77	48.95	68.2	25.05	PK+	149.9	V	180.1	-0.82
12950	49.6	49.4	68.2	24.6	PK+	149.9	V	180.1	-0.2
14010	49.7	50.11	68.2	23.89	PK+	149.9	V	180.1	0.41
16160	46.65	52.39	68.2	21.61	PK+	149.9	V	180.1	5.74
16870	47.05	52.43	68.2	21.57	PK+	149.9	V	180.1	5.38

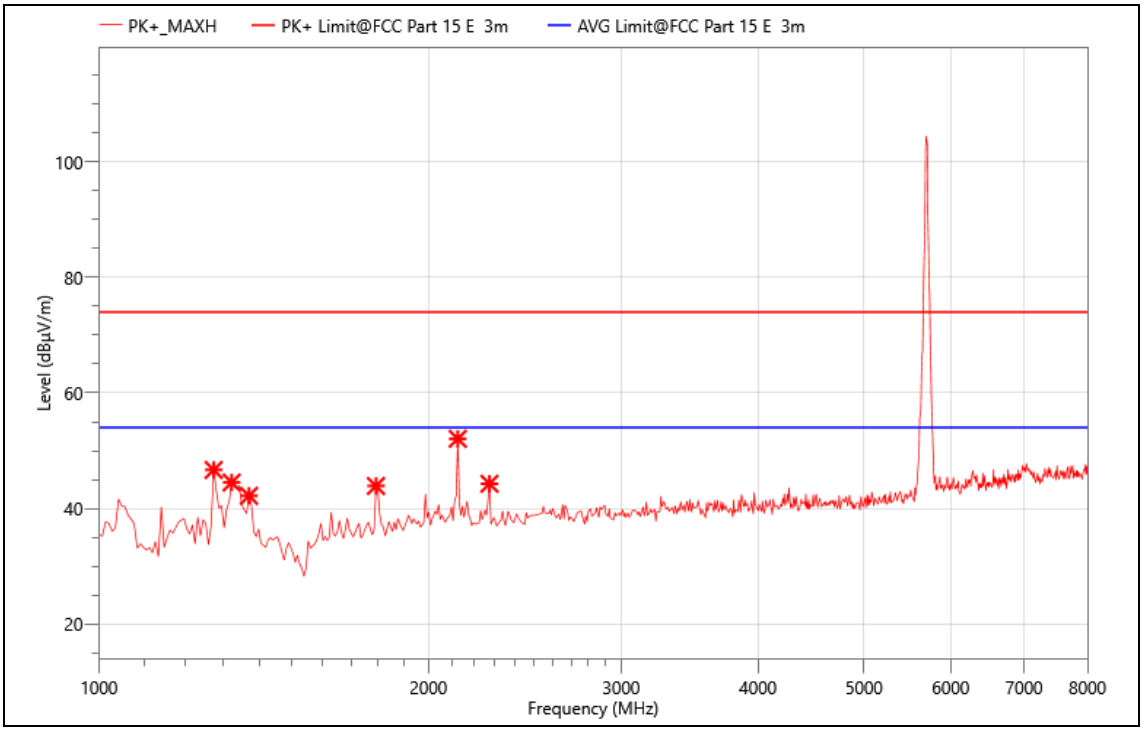
TX5700: 1-8GHz



Critical_Freqs

Freq. (MHz)	Reading (dBµV)	Meas. (dBµV/m)	Limit (dBµV/m)	Margin (dBµV/m)	Det.	Height (cm)	Pol.	Azimuth (deg)	Corr. (dB)
1763	64.96	44.09	68.2	29.91	PK+	149.9	V	360.0	-20.87
1952	62.3	43.06	68.2	30.94	PK+	149.9	V	360.0	-19.24
2134	63.1	44.62	68.2	29.38	PK+	149.9	V	360.0	-18.48
2274	61.19	43.17	68.2	30.83	PK+	149.9	V	360.0	-18.02
3191	60.83	45.51	68.2	28.49	PK+	149.9	V	360.0	-15.32
3989	57.31	43.54	68.2	30.46	PK+	149.9	V	360.0	-13.77

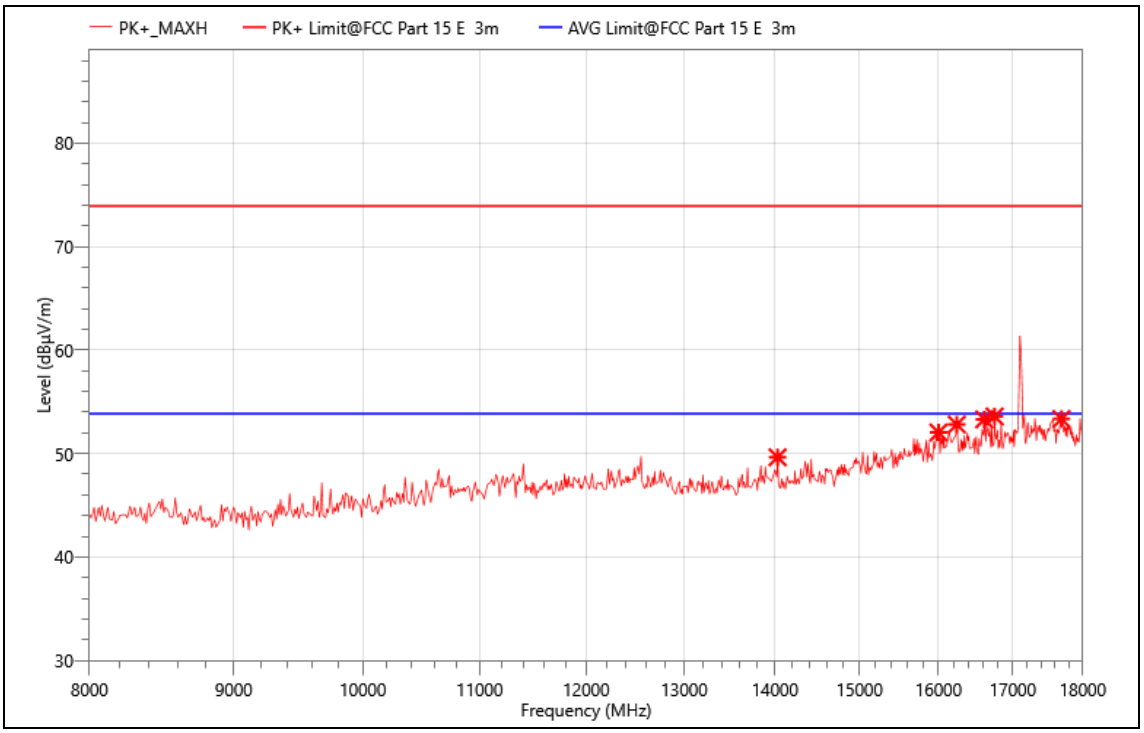
TX5700: 1-8GHz



Critical_Freqs

Freq. (MHz)	Reading (dBµV)	Meas. (dBµV/m)	Limit (dBµV/m)	Margin (dBµV/m)	Det.	Height (cm)	Pol.	Azimuth (deg)	Corr. (dB)
1273	70.29	46.66	68.2	27.34	PK+	149.9	H	360.2	-23.63
1322	68.08	44.49	68.2	29.51	PK+	149.9	H	360.2	-23.59
1371	65.54	42.18	68.2	31.82	PK+	149.9	H	360.2	-23.36
1791	64.54	43.89	68.2	30.11	PK+	149.9	H	360.2	-20.65
2127	70.56	52.05	68.2	21.95	PK+	149.9	H	360.2	-18.51
2274	62.29	44.27	68.2	29.73	PK+	149.9	H	360.2	-18.02

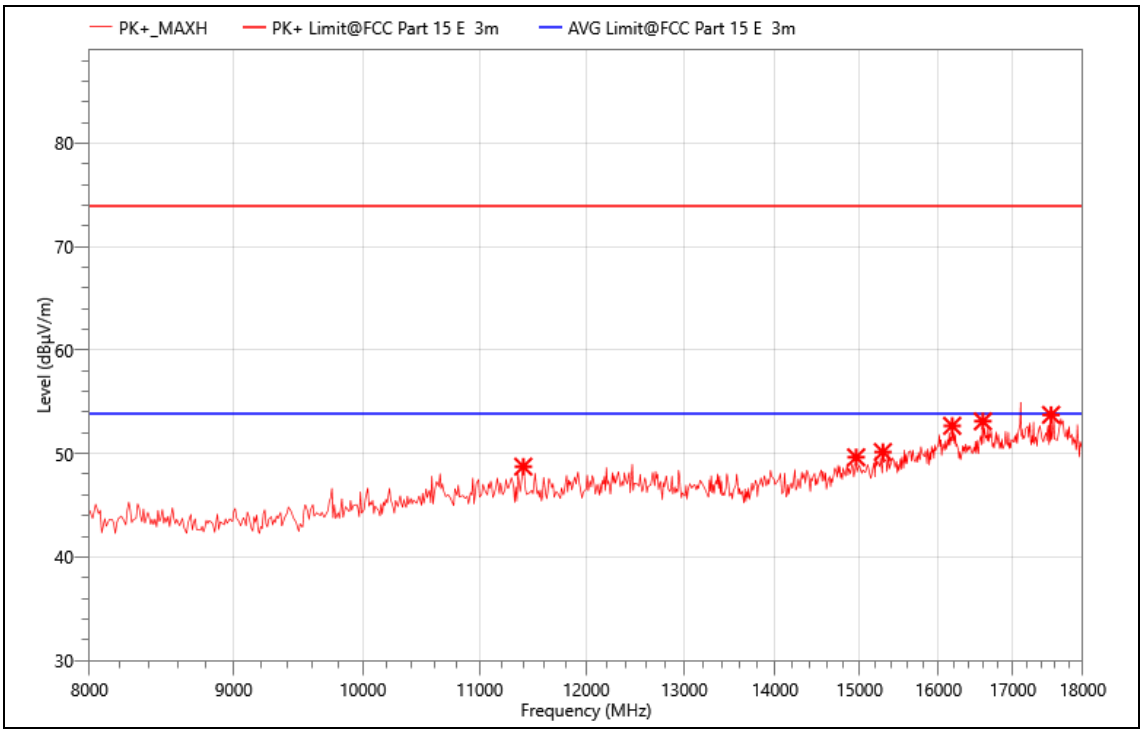
TX5700: 8-18GHz



Critical_Freqs

Freq. (MHz)	Reading (dBµV)	Meas. (dBµV/m)	Limit (dBµV/m)	Margin (dBµV/m)	Det.	Height (cm)	Pol.	Azimuth (deg)	Corr. (dB)
14030	49.29	49.64	68.2	24.36	PK+	149.9	V	360.2	0.35
16000	48.02	52.04	68.2	21.96	PK+	149.9	V	360.2	4.02
16240	48.22	52.81	68.2	21.19	PK+	149.9	V	360.2	4.59
16610	47.81	53.3	68.2	20.7	PK+	149.9	V	360.2	5.49
16750	48.42	53.59	68.2	20.41	PK+	149.9	V	360.2	5.17
17690	46.93	53.35	68.2	20.65	PK+	149.9	V	360.2	6.42

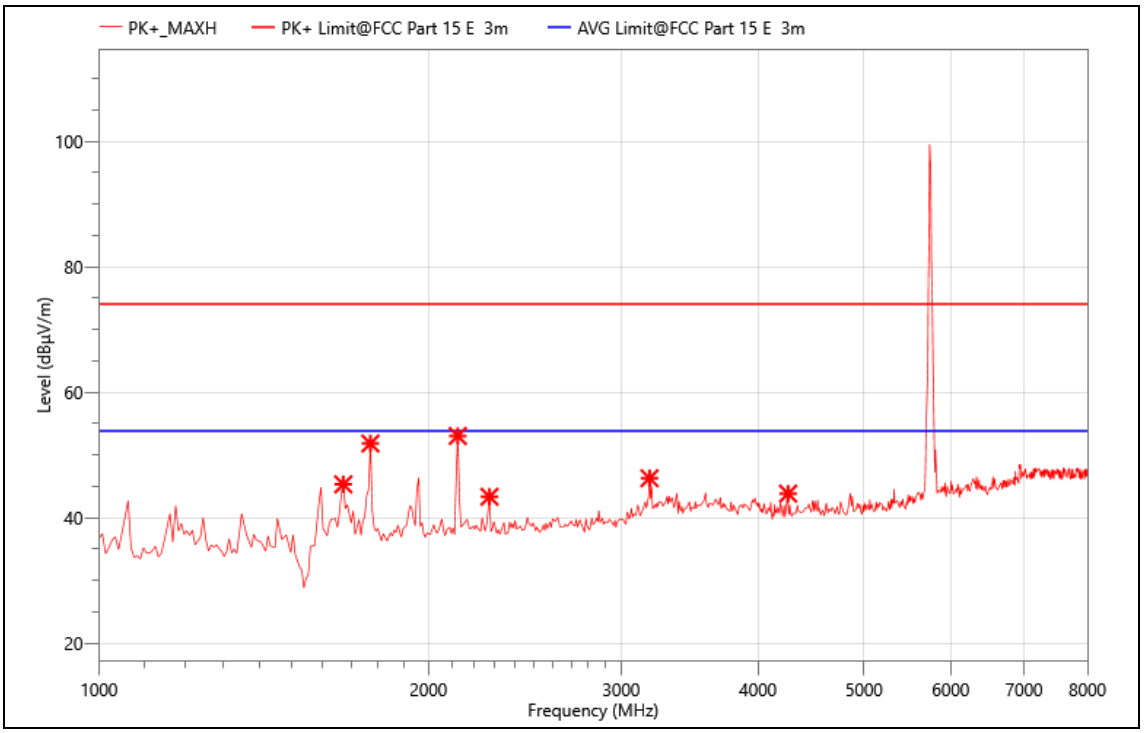
TX5700: 8-18GHz



Critical_Freqs

Freq. (MHz)	Reading (dBµV)	Meas. (dBµV/m)	Limit (dBµV/m)	Margin (dBµV/m)	Det.	Height (cm)	Pol.	Azimuth (deg)	Corr. (dB)
11400	49.61	48.74	68.2	25.26	PK+	149.9	H	360.2	-0.87
14960	47.1	49.64	68.2	24.36	PK+	149.9	H	360.2	2.54
15290	47.75	50.15	68.2	23.85	PK+	149.9	H	360.2	2.4
16180	47	52.68	68.2	21.32	PK+	149.9	H	360.2	5.68
16590	47.9	53.12	68.2	20.88	PK+	149.9	H	360.2	5.22
17540	47.16	53.74	68.2	20.26	PK+	149.9	H	360.2	6.58

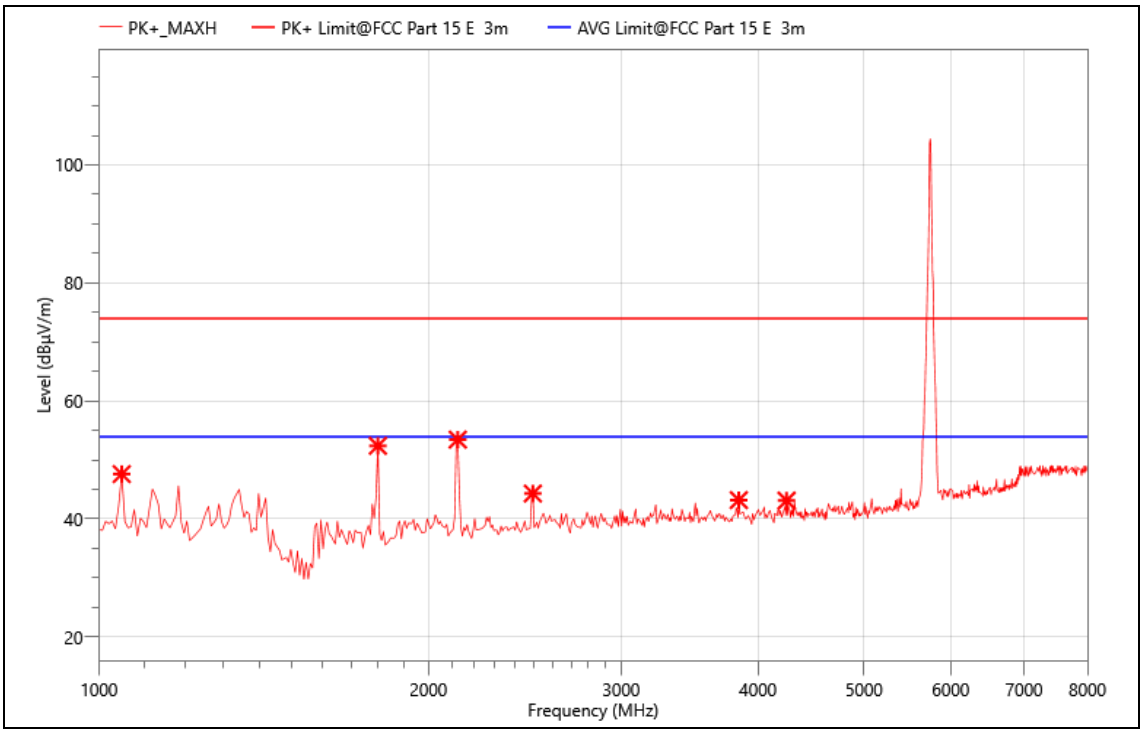
TX5745: 1-8GHz



Critical_Freqs

Freq. (MHz)	Reading (dBµV)	Meas. (dBµV/m)	Limit (dBµV/m)	Margin (dBµV/m)	Det.	Height (cm)	Pol.	Azimuth (deg)	Corr. (dB)
1672	66.93	45.3	68.2	28.7	PK+	149.9	V	360.6	-21.63
1770	72.62	51.81	68.2	22.19	PK+	149.9	V	360.6	-20.81
2127	71.52	53.01	68.2	20.99	PK+	149.9	V	360.6	-18.51
2274	61.34	43.32	68.2	30.68	PK+	149.9	V	360.6	-18.02
3184	61.61	46.28	68.2	27.72	PK+	149.9	V	360.6	-15.33
4262	56.86	43.82	68.2	30.18	PK+	149.9	V	360.6	-13.04

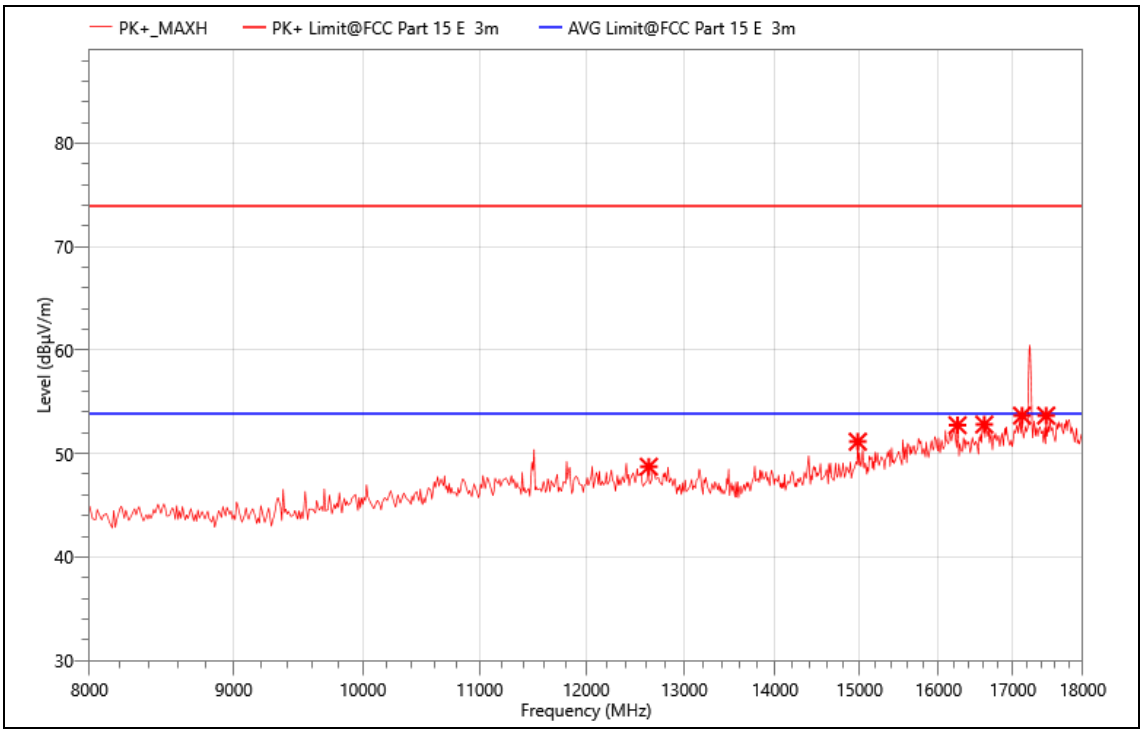
TX5745: 1-8GHz



Critical_Freqs

Freq. (MHz)	Reading (dBµV)	Meas. (dBµV/m)	Limit (dBµV/m)	Margin (dBµV/m)	Det.	Height (cm)	Pol.	Azimuth (deg)	Corr. (dB)
1049	71.77	47.6	68.2	26.4	PK+	149.9	H	360.6	-24.17
1798	72.99	52.39	68.2	21.61	PK+	149.9	H	360.6	-20.6
2127	71.96	53.45	68.2	20.55	PK+	149.9	H	360.6	-18.51
2491	62.01	44.31	68.2	29.69	PK+	149.9	H	360.6	-17.7
3842	57.11	43.19	68.2	30.81	PK+	149.9	H	360.6	-13.92
4248	56.24	43.12	68.2	30.88	PK+	149.9	H	360.6	-13.12

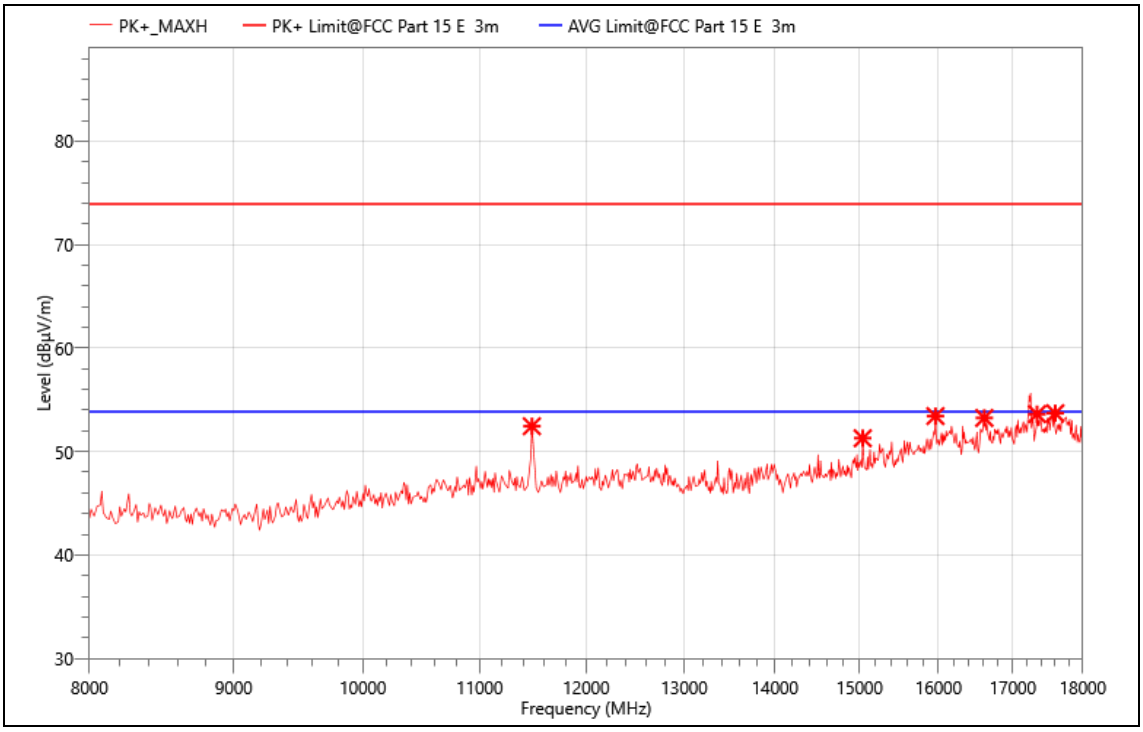
TX5745: 8-18GHz



Critical_Freqs

Freq. (MHz)	Reading (dBµV)	Meas. (dBµV/m)	Limit (dBµV/m)	Margin (dBµV/m)	Det.	Height (cm)	Pol.	Azimuth (deg)	Corr. (dB)
12630	49.03	48.73	68.2	25.27	PK+	149.9	V	360.6	-0.3
14980	48.72	51.15	68.2	22.85	PK+	149.9	V	360.6	2.43
16250	48.41	52.74	68.2	21.26	PK+	149.9	V	360.6	4.33
16610	47.32	52.81	68.2	21.19	PK+	149.9	V	360.6	5.49
17130	47.79	53.67	68.2	20.33	PK+	149.9	V	360.6	5.88
17470	47.42	53.67	68.2	20.33	PK+	149.9	V	360.6	6.25

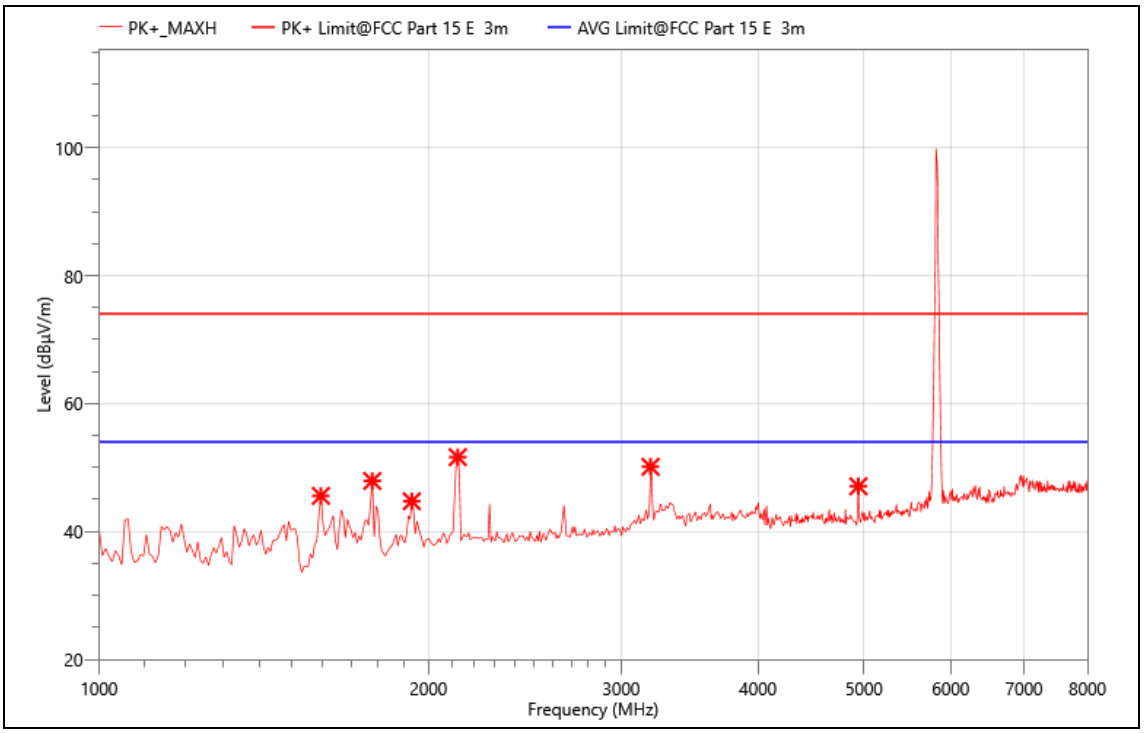
TX5745: 8-18GHz



Critical_Freqs

Freq. (MHz)	Reading (dBµV)	Meas. (dBµV/m)	Limit (dBµV/m)	Margin (dBµV/m)	Det.	Height (cm)	Pol.	Azimuth (deg)	Corr. (dB)
11480	53.25	52.45	68.2	21.55	PK+	149.9	H	360.6	-0.8
15040	49.38	51.29	68.2	22.71	PK+	149.9	H	360.6	1.91
15960	49.23	53.43	68.2	20.57	PK+	149.9	H	360.6	4.2
16610	47.76	53.25	68.2	20.75	PK+	149.9	H	360.6	5.49
17340	47.33	53.62	68.2	20.38	PK+	149.9	H	360.6	6.29
17600	47.31	53.71	68.2	20.29	PK+	149.9	H	360.6	6.4

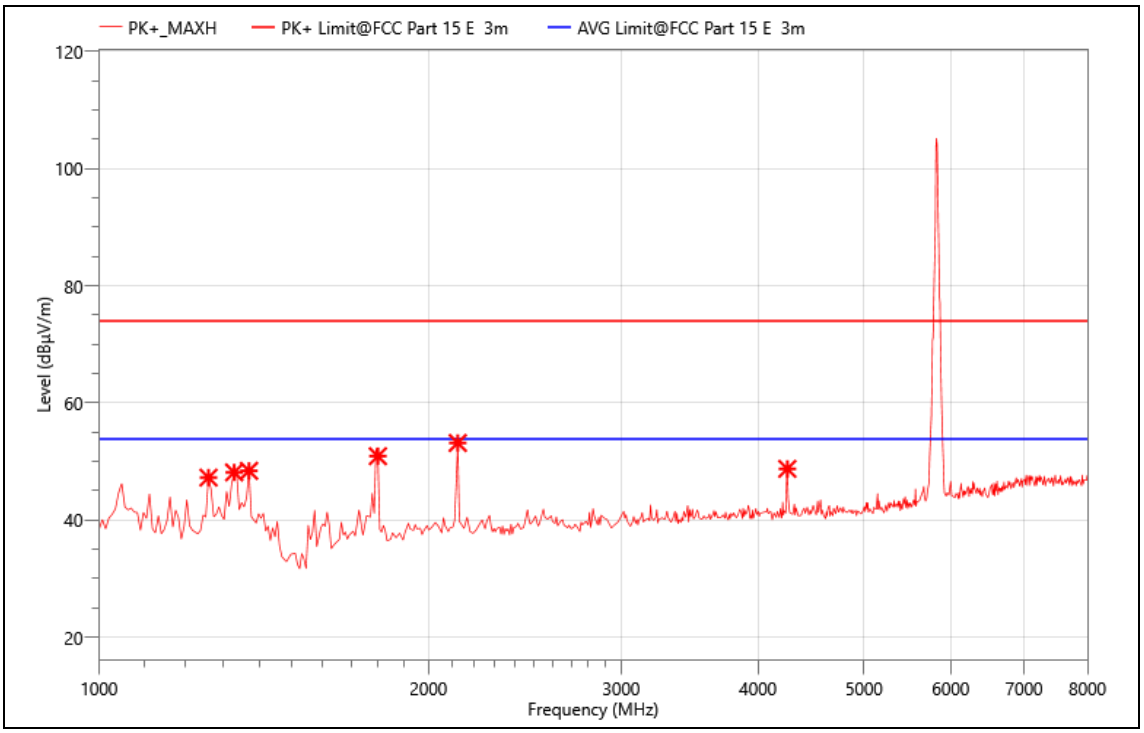
TX5825: 1-8GHz



Critical_Freqs

Freq. (MHz)	Reading (dBµV)	Meas. (dBµV/m)	Limit (dBµV/m)	Margin (dBµV/m)	Det.	Height (cm)	Pol.	Azimuth (deg)	Corr. (dB)
1595	67.88	45.56	68.2	28.44	PK+	149.9	V	360.6	-22.32
1777	68.64	47.89	68.2	26.11	PK+	149.9	V	360.6	-20.75
1931	64.15	44.72	68.2	29.28	PK+	149.9	V	360.6	-19.43
2127	70.13	51.62	68.2	22.38	PK+	149.9	V	360.6	-18.51
3191	65.43	50.11	68.2	23.89	PK+	149.9	V	360.6	-15.32
4941	58.71	47.06	68.2	26.94	PK+	149.9	V	360.6	-11.65

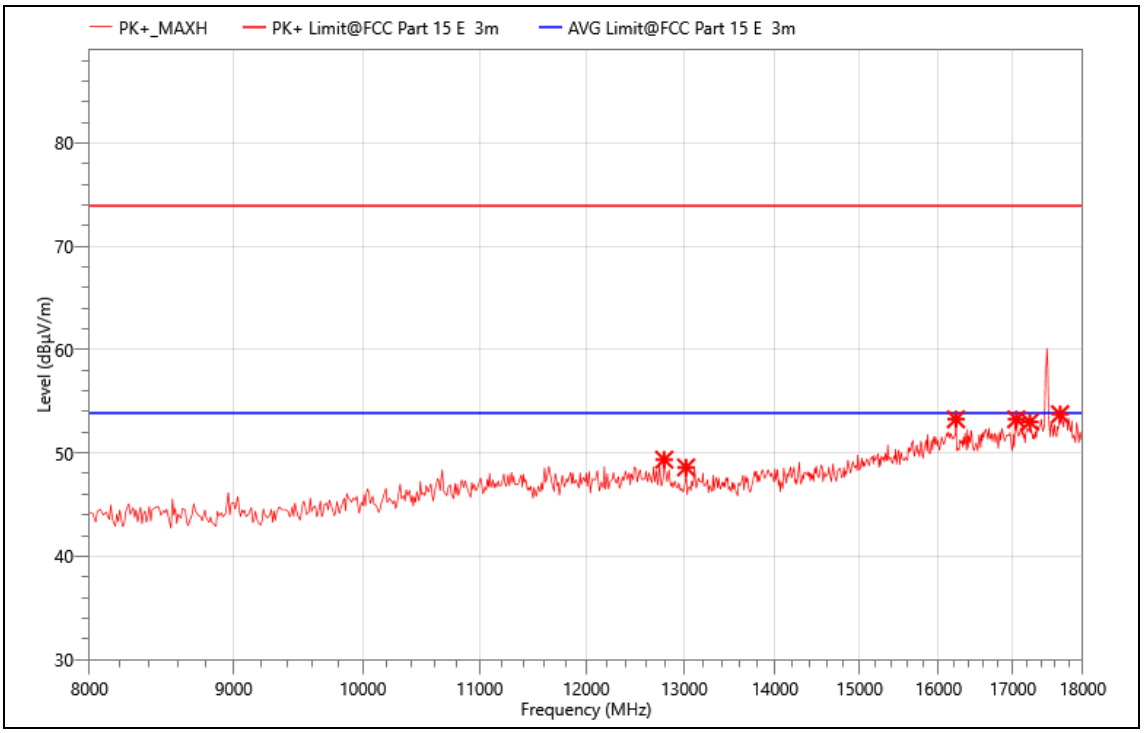
TX5825: 1-8GHz



Critical_Freqs

Freq. (MHz)	Reading (dBµV)	Meas. (dBµV/m)	Limit (dBµV/m)	Margin (dBµV/m)	Det.	Height (cm)	Pol.	Azimuth (deg)	Corr. (dB)
1259	70.99	47.27	68.2	26.73	PK+	149.9	H	360.6	-23.72
1329	71.72	48.15	68.2	25.85	PK+	149.9	H	360.6	-23.57
1371	71.78	48.42	68.2	25.58	PK+	149.9	H	360.6	-23.36
1798	71.52	50.92	68.2	23.08	PK+	149.9	H	360.6	-20.6
2127	71.69	53.18	68.2	20.82	PK+	149.9	H	360.6	-18.51
4255	61.82	48.76	68.2	25.24	PK+	149.9	H	360.6	-13.06

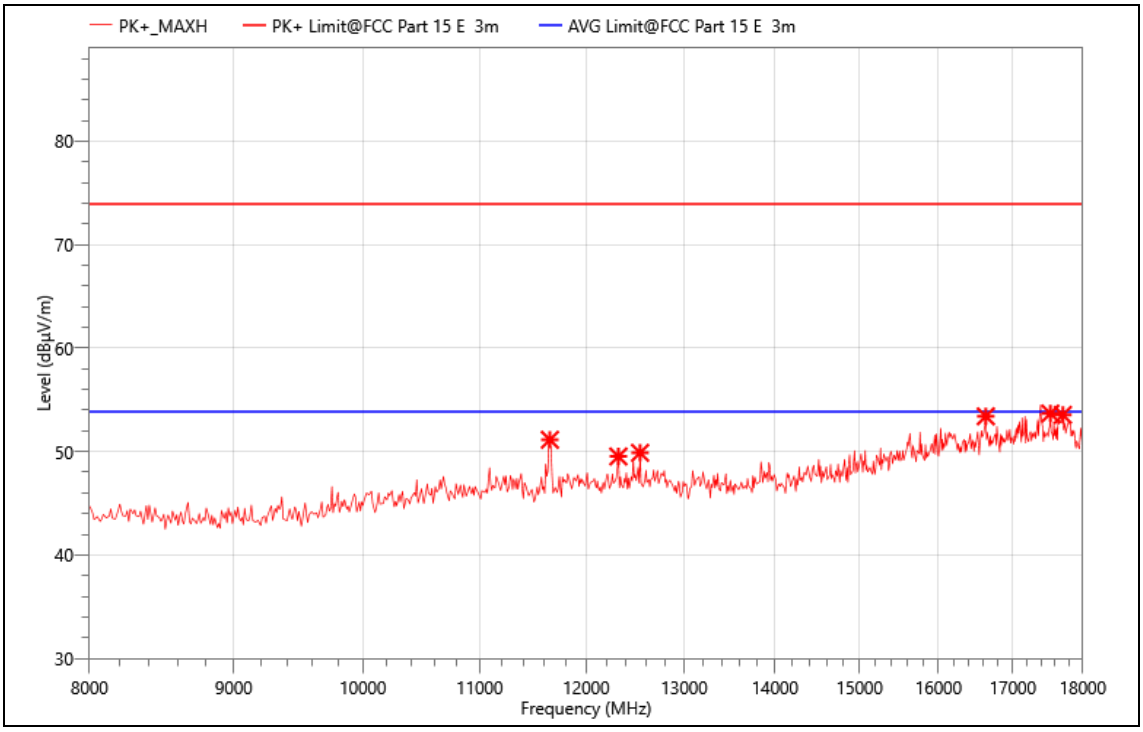
TX5825: 8-18GHz



Critical_Freqs

Freq. (MHz)	Reading (dBµV)	Meas. (dBµV/m)	Limit (dBµV/m)	Margin (dBµV/m)	Det.	Height (cm)	Pol.	Azimuth (deg)	Corr. (dB)
12790	49.62	49.35	68.2	24.65	PK+	149.9	V	360.6	-0.27
13020	49.17	48.6	68.2	25.4	PK+	149.9	V	360.6	-0.57
16230	48.41	53.26	68.2	20.74	PK+	149.9	V	360.6	4.85
17050	47.08	53.26	68.2	20.74	PK+	149.9	V	360.6	6.18
17240	47.18	53	68.2	21	PK+	149.9	V	360.6	5.82
17670	47.25	53.75	68.2	20.25	PK+	149.9	V	360.6	6.5

TX5825: 8-18GHz



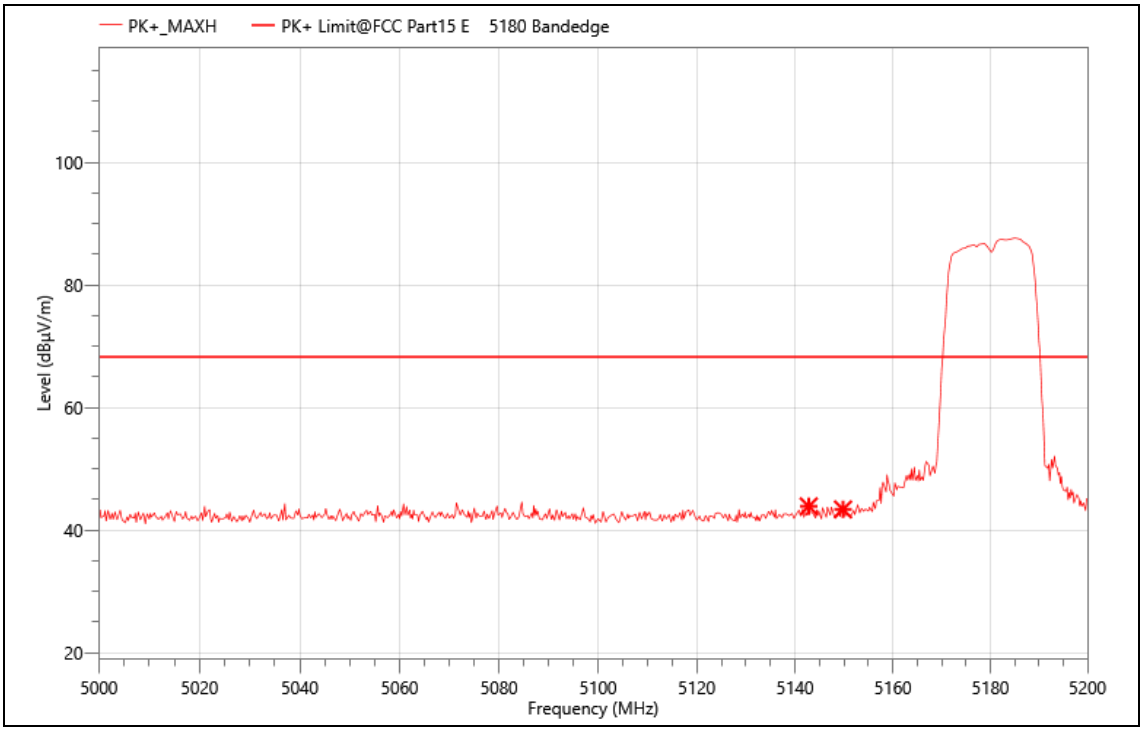
Critical_Freqs

Freq. (MHz)	Reading (dBµV)	Meas. (dBµV/m)	Limit (dBµV/m)	Margin (dBµV/m)	Det.	Height (cm)	Pol.	Azimuth (deg)	Corr. (dB)
11650	52.22	51.14	68.2	22.86	PK+	149.9	H	360.6	-1.08
12320	49.28	49.53	68.2	24.47	PK+	149.9	H	360.6	0.25
12540	49.23	49.88	68.2	24.12	PK+	149.9	H	360.6	0.65
16630	47.69	53.41	68.2	20.59	PK+	149.9	H	360.6	5.72
17530	47.16	53.68	68.2	20.32	PK+	149.9	H	360.6	6.52
17710	47.31	53.55	68.2	20.45	PK+	149.9	H	360.6	6.24

No others harmonics emissions are higher than 20 dB below the limits of 47 CFR Part 15.407.

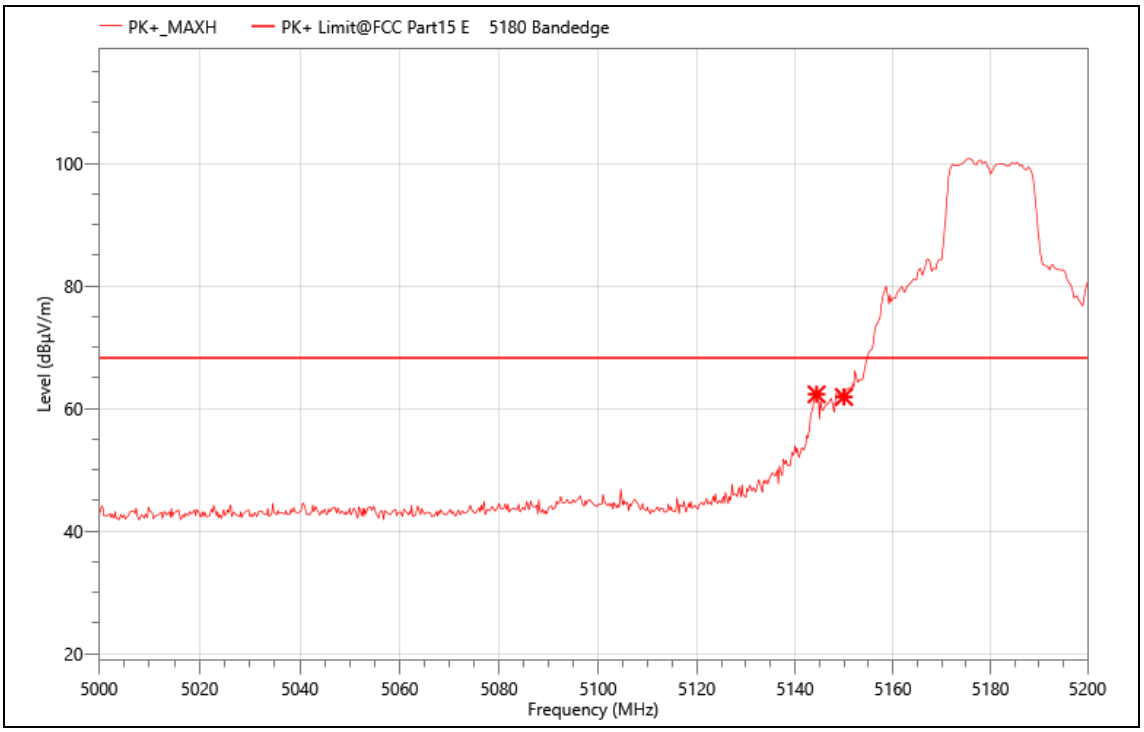
Note: (1) All Readings are Peak Value and AV.
(2) Emission Level= Reading Level+Probe Factor +Cable Loss.
(3) Data of measurement within this frequency range shown " – " in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

- Band Edge
  All modes has been tested and the worst result (802.11 ac20 MIMO) recorded as below:
  Band 5150-5350MHz



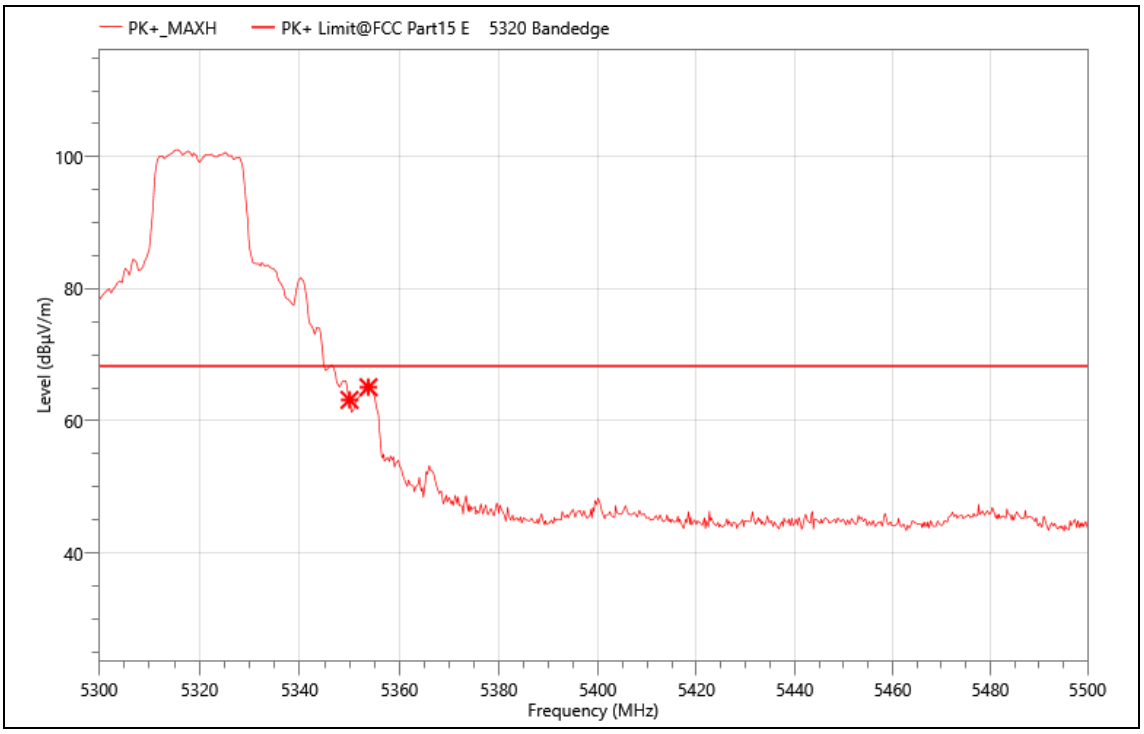
Critical_Freqs

Freq. (MHz)	Reading (dBµV)	Meas. (dBµV/m)	Limit (dBµV/m)	Margin (dBµV/m)	Det.	Height (cm)	Pol.	Azimuth (deg)	Corr. (dB)
5142.8	54.82	43.89	68.20	24.31	PK+	149.9	V	0.0	-10.93
5149.8	54.23	43.39	68.20	24.81	PK+	149.9	V	0.0	-10.84



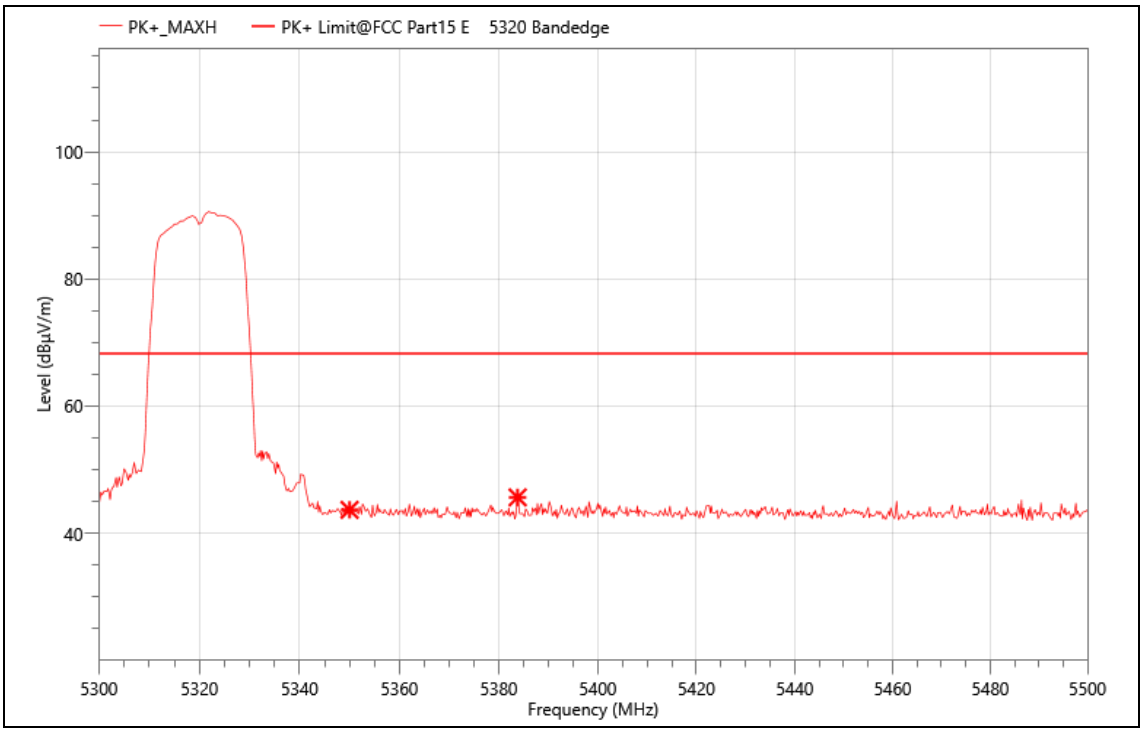
Critical_Freqs

Freq. (MHz)	Reading (dBµV)	Meas. (dBµV/m)	Limit (dBµV/m)	Margin (dBµV/m)	Det.	Height (cm)	Pol.	Azimuth (deg)	Corr. (dB)
5144.4	73.24	62.33	68.20	5.87	PK+	149.9	H	0.0	-10.91
5150	72.74	61.9	68.20	6.3	PK+	149.9	H	0.0	-10.84



Critical_Freqs

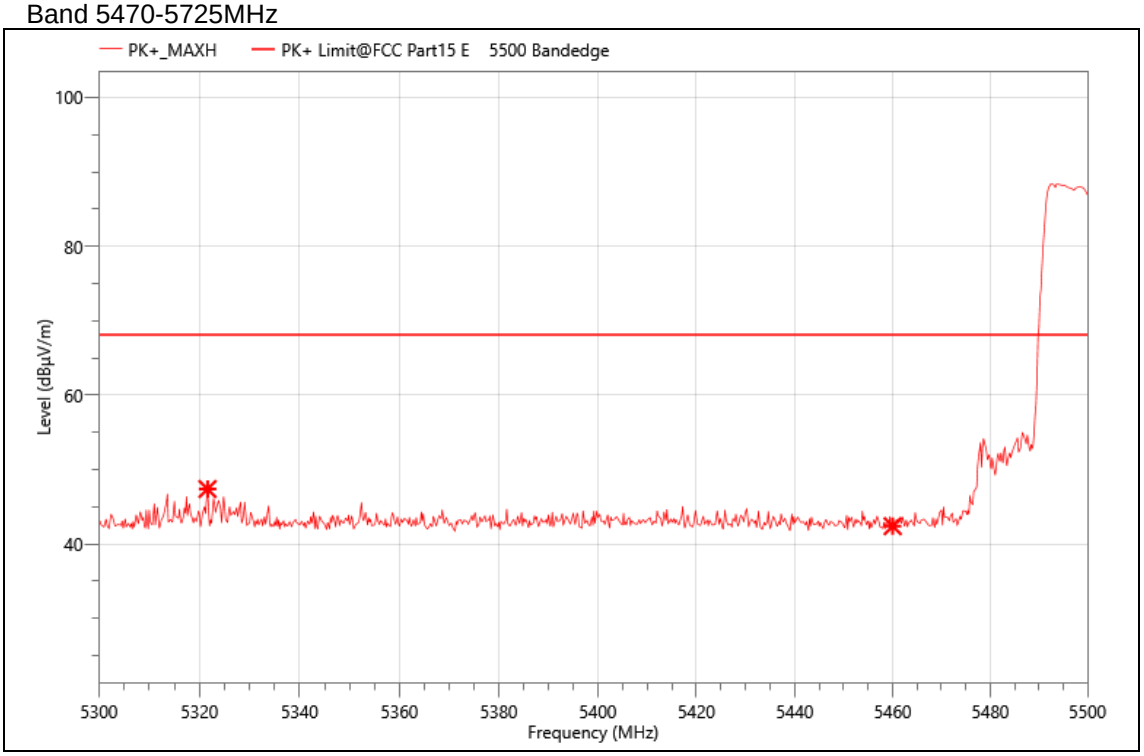
Freq. (MHz)	Reading (dBµV)	Meas. (dBµV/m)	Limit (dBµV/m)	Margin (dBµV/m)	Det.	Height (cm)	Pol.	Azimuth (deg)	Corr. (dB)
5350	73.2	63.17	68.20	5.03	PK+	149.9	V	0.0	-10.03
5353.8	75.03	65.09	68.20	3.11	PK+	149.9	V	0.0	-9.94



Critical_Freqs

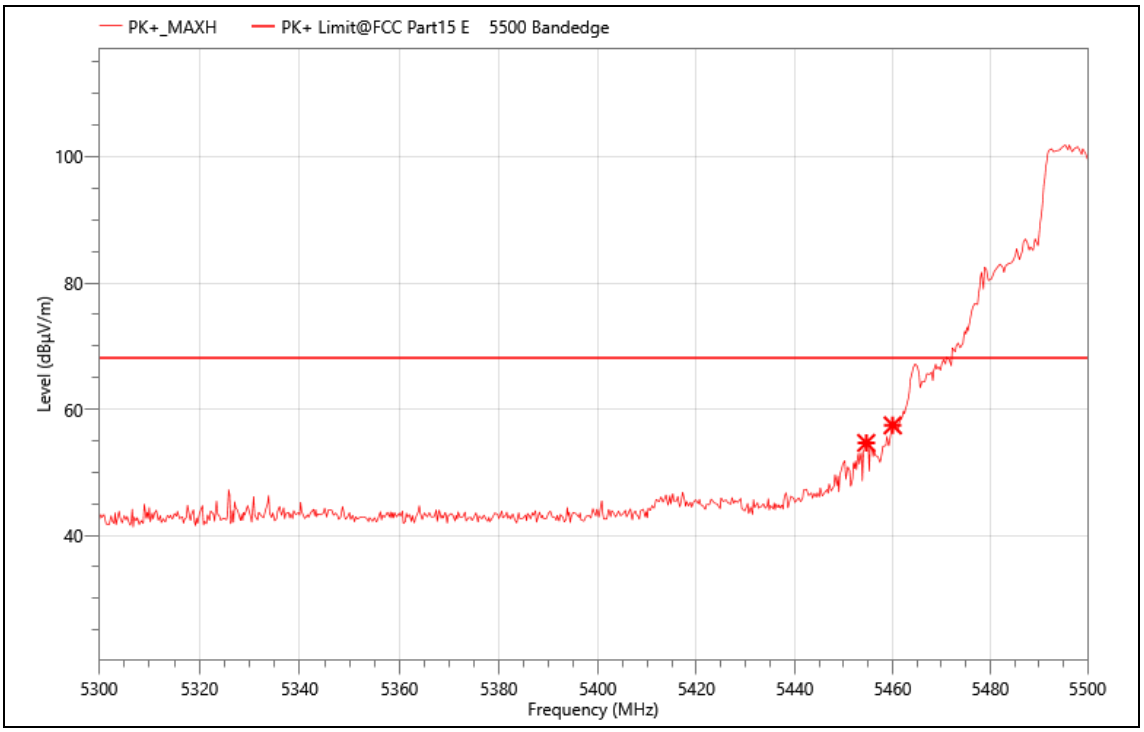
Freq. (MHz)	Reading (dBµV)	Meas. (dBµV/m)	Limit (dBµV/m)	Margin (dBµV/m)	Det.	Height (cm)	Pol.	Azimuth (deg)	Corr. (dB)
5350	53.71	43.68	68.20	24.52	PK+	149.9	V	0.0	-10.03
5383.8	55.26	45.64	68.20	22.56	PK+	149.9	V	0.0	-9.62

Band 5470-5725MHz



Critical_Freqs

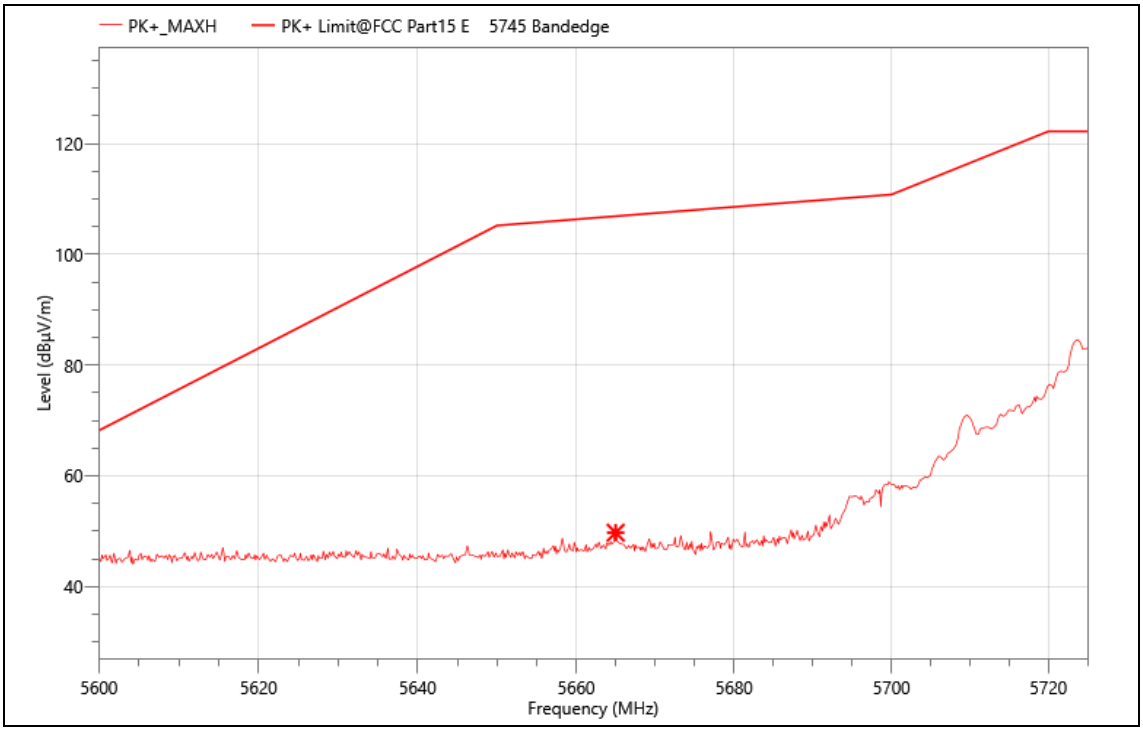
Freq. (MHz)	Reading (dBµV)	Meas. (dBµV/m)	Limit (dBµV/m)	Margin (dBµV/m)	Det.	Height (cm)	Pol.	Azimuth (deg)	Corr. (dB)
5321.6	57.76	47.38	68.20	20.82	PK+	149.9	V	0.0	-10.38
5460	52.65	42.39	68.20	25.81	PK+	149.9	V	0.0	-10.26



Critical_Freqs

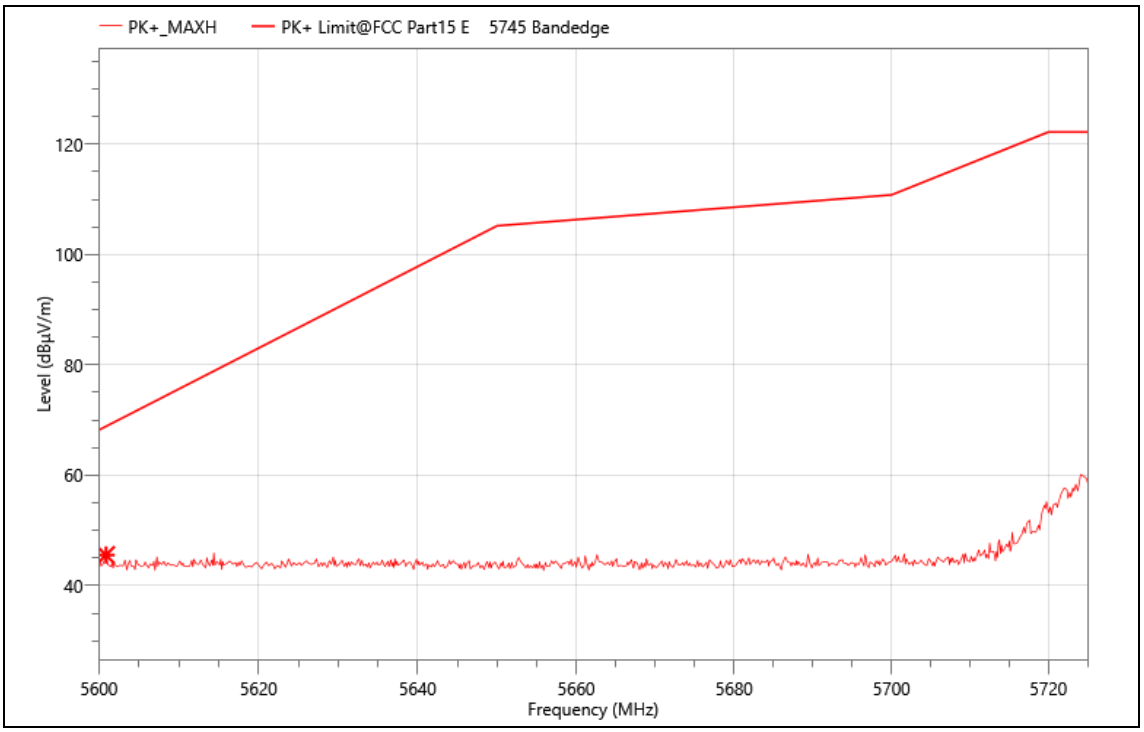
Freq. (MHz)	Reading (dBµV)	Meas. (dBµV/m)	Limit (dBµV/m)	Margin (dBµV/m)	Det.	Height (cm)	Pol.	Azimuth (deg)	Corr. (dB)
5454.6	64.94	54.66	68.20	13.54	PK+	149.9	H	0.0	-10.28
5460	67.7	57.44	68.20	10.76	PK+	149.9	H	0.0	-10.26

Band 5725-5825MHz



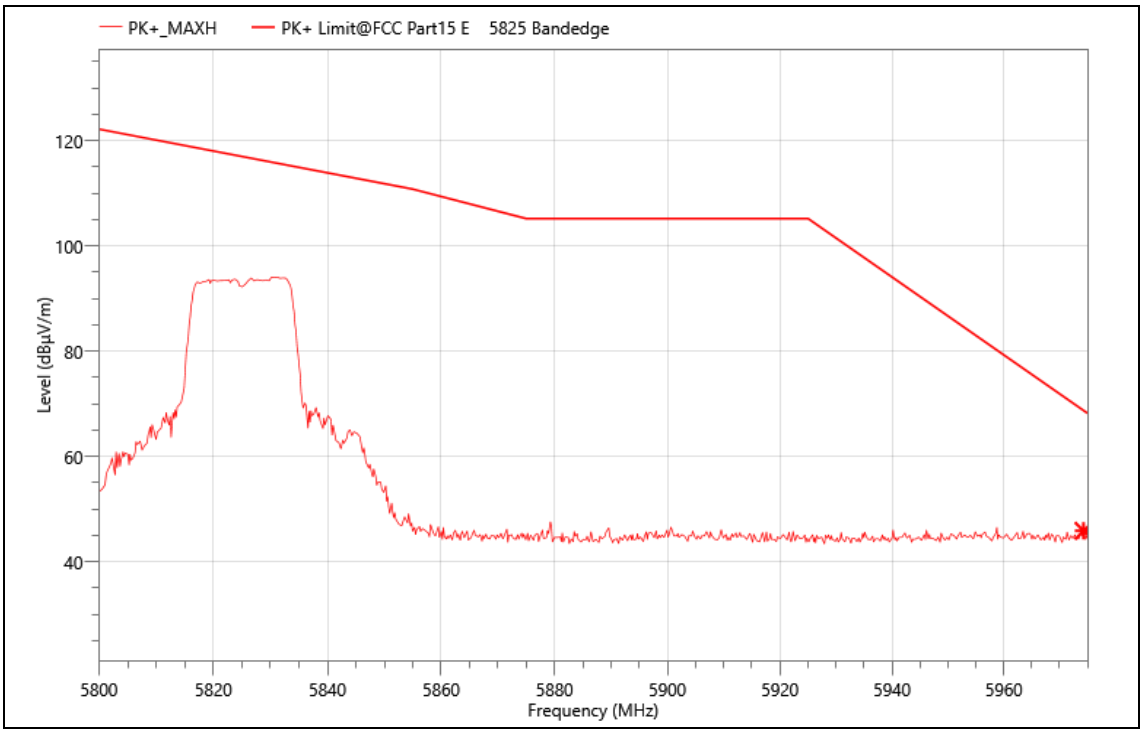
Critical_Freqs

Freq. (MHz)	Reading (dBµV)	Meas. (dBµV/m)	Limit (dBµV/m)	Margin (dBµV/m)	Det.	Height (cm)	Pol.	Azimuth (deg)	Corr. (dB)
5665	59.04	49.75	106.89	57.14	PK+	149.9	H	0.0	-9.29



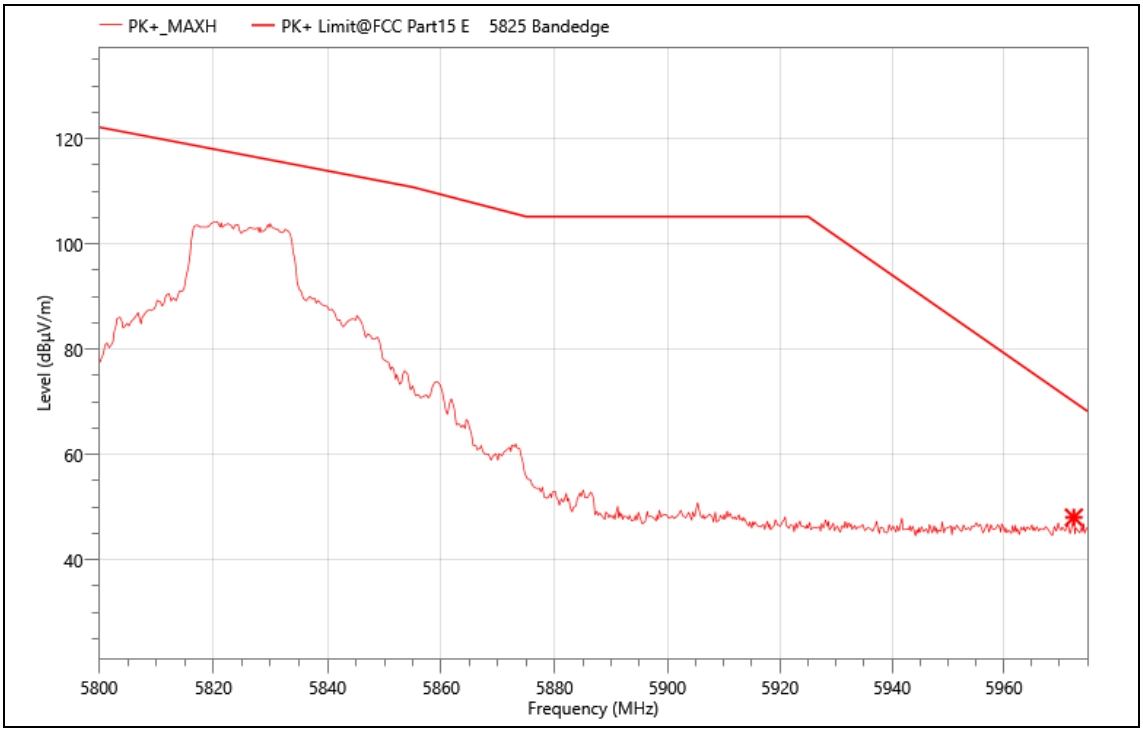
Critical_Freqs

Freq. (MHz)	Reading (dBµV)	Meas. (dBµV/m)	Limit (dBµV/m)	Margin (dBµV/m)	Det.	Height (cm)	Pol.	Azimuth (deg)	Corr. (dB)
5600.875	54.63	45.54	68.85	23.31	PK+	149.9	V	0.0	-9.09



Critical_Freqs

Freq. (MHz)	Reading (dBµV)	Meas. (dBµV/m)	Limit (dBµV/m)	Margin (dBµV/m)	Det.	Height (cm)	Pol.	Azimuth (deg)	Corr. (dB)
5974.3	53.85	45.84	68.72	22.88	PK+	149.9	V	0.0	-8.01



Critical_Freqs

Freq. (MHz)	Reading (dBµV)	Meas. (dBµV/m)	Limit (dBµV/m)	Margin (dBµV/m)	Det.	Height (cm)	Pol.	Azimuth (deg)	Corr. (dB)
5972.55	56.02	48.02	70.01	21.99	PK+	149.9	H	0.0	-8

9. AC POWER LINE CONDUCTED EMISSION

LIMITS

Please refer to CFR 47 FCC §15.207 (a) and ISED RSS-Gen Clause 8.8

FREQUENCY (MHz)	Quasi-peak	Average
0.15 -0.5	66 - 56 *	56 - 46 *
0.50 -5.0	56.00	46.00
5.0 -30.0	60.00	50.00

TEST PROCEDURE

Refer to ANSI C63.10-2013 clause 6.2.

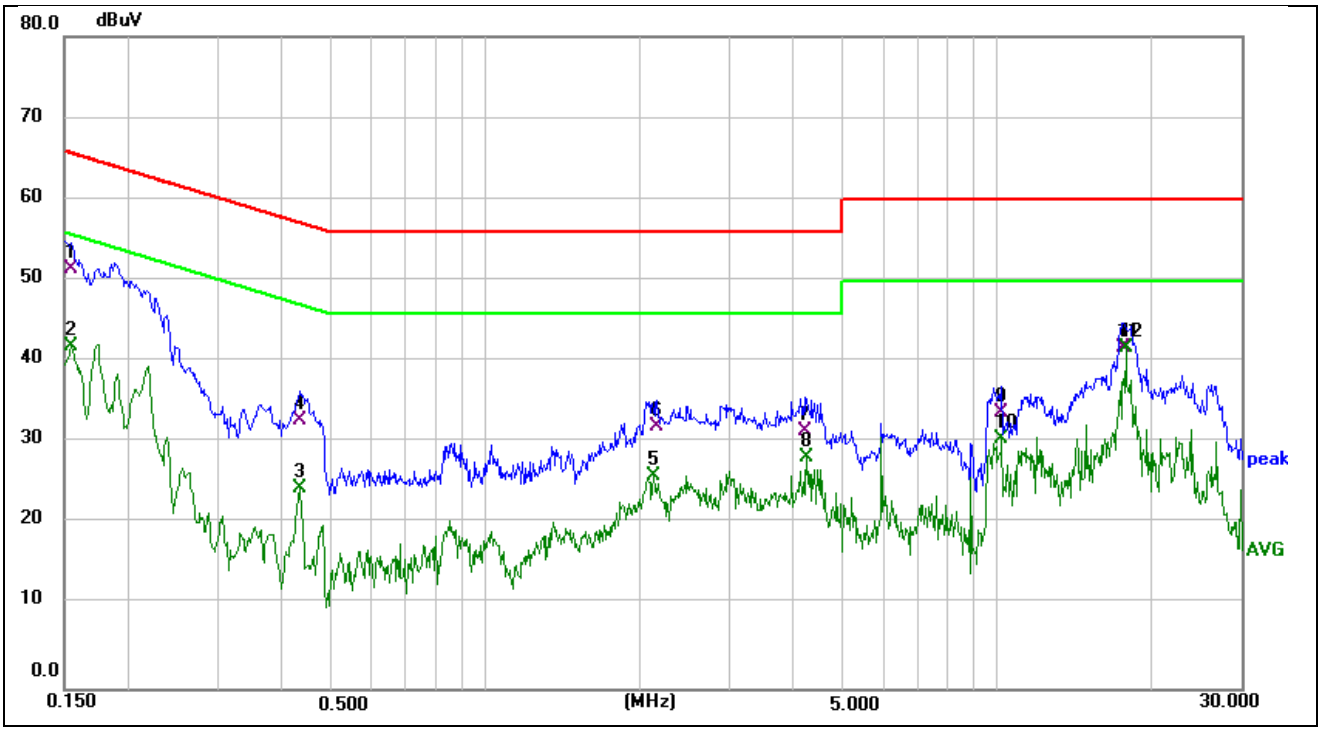
The EUT is put on a table of non-conducting material that is 80 cm high. The vertical conducting wall of shielding is located 40 cm to the rear of the EUT. The power line of the EUT is connected to the AC mains through a Artificial Mains Network (A.M.N.). A EMI Measurement Receiver (R&S Test Receiver ESR3) is used to test the emissions from both sides of AC line. According to the requirements in Section 6.2 of ANSI C63.10-2013.Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30 MHz using CISPR Quasi-Peak and average detector mode. The bandwidth of EMI test receiver is set at 9 kHz.

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

TEST ENVIRONMENT

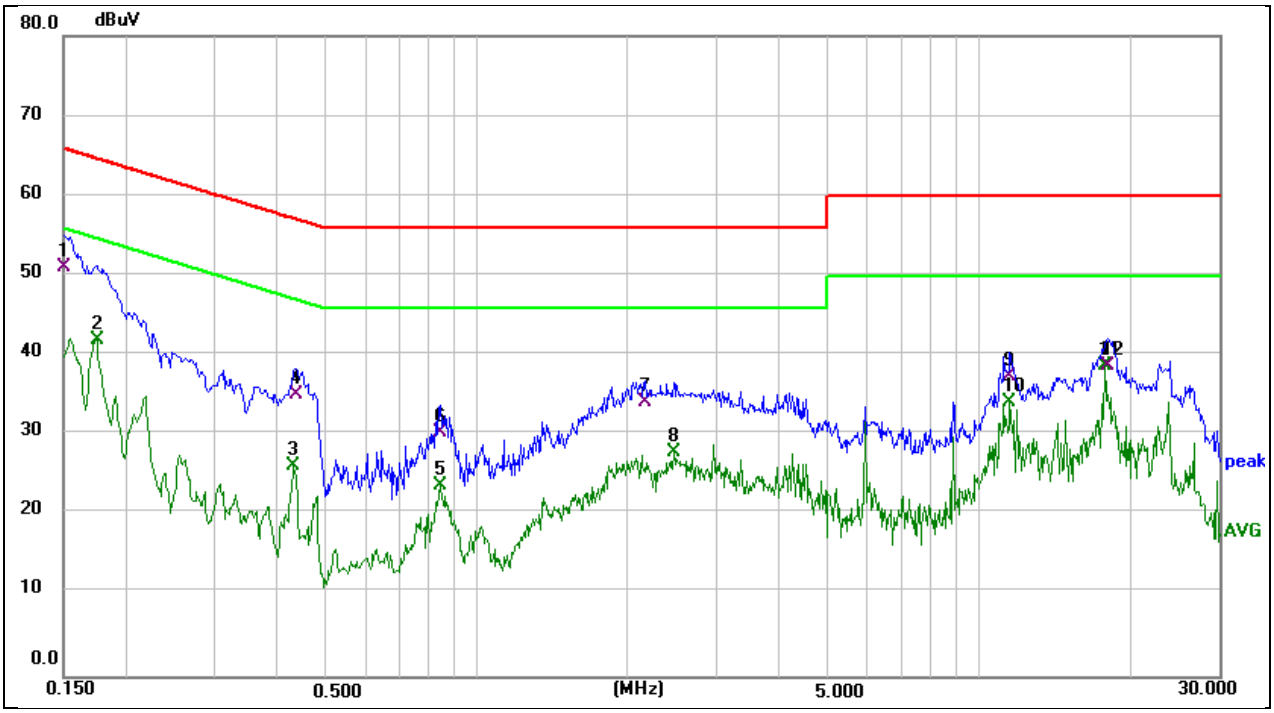
Temperature	25℃	Relative Humidity	55%
Atmosphere Pressure	101kPa		

TEST RESULTS



Site:		**Phase:L1**	**Temperature(C):23.5(C)**
Limit:	**FCC Part 15 C Conduction(QP)**		**Humidity(%):52.6%**
EUT:	**802.11a/b/g/n/ac 867Mbps WiFi USB Module**	**Test Time:**	**2023-04-25**
M/N.:	**BL-M8812CU2**	**Power Rating:**	**DC 5V**
Mode:	**802.11 a 5260MHz**	**Test Engineer:**	**Sunshine**
Note:			

No.	Frequency (MHz)	Reading Level(dBuV)	Factor (dB)	Measure-ment(dBuV)	Limit (dBuV)	Margin (dB)	Detector	Comment
1	0.1547	41.75	9.85	51.60	65.74	-14.14	QP	
2	0.1547	32.20	9.85	42.05	55.74	-13.69	AVG	
3	0.4318	14.18	10.43	24.61	47.22	-22.61	QP	
4	0.4340	22.57	10.43	33.00	57.18	-24.18	AVG	
5	2.1270	16.65	9.63	26.28	46.00	-19.72	QP	
6	2.1610	22.67	9.63	32.30	56.00	-23.70	AVG	
7	4.1993	21.92	9.68	31.60	56.00	-24.40	QP	
8	4.2441	18.71	9.68	28.39	46.00	-17.61	AVG	
9	10.2001	24.07	9.93	34.00	60.00	-26.00	QP	
10	10.2001	20.79	9.93	30.72	50.00	-19.28	AVG	
11	17.6330	31.76	10.14	41.90	60.00	-18.10	QP	
12 *	17.8213	31.75	10.15	41.90	50.00	-8.10	AVG	



Site:		**Phase:N**	**Temperature(C):23.5(C)**
Limit:	**FCC Part 15 C Conduction(QP)**		**Humidity(%):52.6%**
EUT:	**802.11a/b/g/n/ac 867Mbps WiFi USB Module**	**Test Time:**	**2023-04-25**
M/N.:	**BL-M8812CU2**	**Power Rating:**	**DC 5V**
Mode:	**WIFI mode**	**Test Engineer:**	**Sunshine**
Note:	**802.11 a 5260MHz**		

No.	Frequency (MHz)	Reading Level(dBuV)	Factor (dB)	Measure-ment(dBuV)	Limit (dBuV)	Margin (dB)	Detector	Comment
1	0.1500	41.36	9.84	51.20	66.00	-14.80	QP	
2	0.1750	32.19	9.89	42.08	54.72	-12.64	AVG	
3	0.4314	16.04	10.43	26.47	47.23	-20.76	QP	
4	0.4360	24.85	10.45	35.30	57.14	-21.84	AVG	
5	0.8422	14.31	9.59	23.90	46.00	-22.10	QP	
6	0.8467	20.91	9.59	30.50	56.00	-25.50	AVG	
7	2.1552	24.67	9.63	34.30	56.00	-21.70	QP	
8	2.4612	18.46	9.64	28.10	46.00	-17.90	AVG	
9	11.4762	27.63	9.97	37.60	60.00	-22.40	QP	
10	11.4762	24.31	9.97	34.28	50.00	-15.72	AVG	
11 *	17.7362	28.75	10.15	38.90	50.00	-11.10	QP	
12	18.0210	28.74	10.16	38.90	60.00	-21.10	AVG	

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

Note: All the modes have been tested, only the worst data was recorded in the report.

10. ANTENNA REQUIREMENT

REQUIREMENT

Standard	Requirement
FCC CRF Part 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 Sunshine or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of §15.211, §15.213, §15.217, §15.219, or §15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with §15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this part are not exceeded.

For intentional device, according to FCC 47 CFR Section 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. And according to FCC 47 CFR Section 15.407 (a), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

DESCRIPTION

Pass

11. TEST DATA

Please refer to Appendix B

APPENDIX: PHOTOGRAPHS OF TEST CONFIGURATION

Please refer to test report: **E01A23040583F00102**

END OF REPORT