FCC TEST REPORT

FCC ID: 2A3MU-F8L

On Behalf of

Shanghai EFIX Geomatics Co., Ltd.

Geodetic GNSS Receiver

Model No.: F8L

Prepared for	:	Shanghai EFIX Geomatics Co., Ltd.
Address	:	Room 1137, Area D, 11th Floor, Building 1, No. 158, Shuanglian Road, Qingpu District, Shanghai

Prepared By	:	Shenzhen Alpha Product Testing Co., Ltd.
Address	:	Building i, No.2, Lixin Road, Fuyong Street, Bao'an District, 518103, Shenzhen, Guangdong, China

Report Number	:	A2507136-C04-R03
Date of Receipt	:	July 9, 2025
Date of Test	:	July 9, 2025 – August 14, 2025
Date of Report	:	August 15, 2025
Version Number	:	V0
Test Result	**:**	**Pass**

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TEST REPORT DECLARATION

Applicant	:	Shanghai EFIX Geomatics Co., Ltd.
Address	:	Room 1137, Area D, 11th Floor, Building 1, No. 158, Shuanglian Road, Qingpu District, Shanghai
Manufacturer	:	Shanghai EFIX Geomatics Co., Ltd.
Address	:	Room 1137, Area D, 11th Floor, Building 1, No. 158, Shuanglian Road, Qingpu District, Shanghai
EUT Description	:	Geodetic GNSS Receiver
	(A) Model No.	: F8L
	(B) Trademark	: EFIX

Measurement Standard Used:

FCC Rules and Regulations Part 15 Subpart E, ANSI C63.10:2013

KDB 789033 D02 General U-NII Test Procedures New Rules v02r01

The device described above is tested by Shenzhen Alpha Product Testing Co., Ltd. to determine the maximum emission levels emanating from the device. The maximum emission levels are compared to the FCC Part 15 Subpart E limits both conducted and radiated emissions. The test results are contained in this test report and Shenzhen Alpha Product Testing Co., Ltd. is assumed of full responsibility for the accuracy and completeness of these tests.

After the test, our opinion is that EUT compliance with the requirement of the above standards.

This report applies to above tested sample only. This report shall not be reproduced in parts without written approval of Shenzhen Alpha Product Testing Co., Ltd.

Tested by (name + signature).....:	Yannis Wen Project Engineer	Yannis Wen
Approved by (name + signature).....:	Jack Xu Project Manager	Jack Xu
Date of issue.....:	August 15, 2025	

Revision History

Revision	Issue Date	Revisions	Revised By
V0	August 15, 2025	Initial released Issue	Yannis Wen

1 Test Summary

Test Item	Section in CFR 47	Result
Antenna requirement	Section 15.203	PASS
AC Power Line Conducted Emission	Section 15.207(a)	PASS
Maximum Conducted Output Power	Section 15.407(a) (c) (g)	PASS
Power Spectral Density	Section 15.407(a) (c) (g)	PASS
Undesirable Emission	Section 15.407(b) (c) (g)	PASS
Conducted Spurious Emission	Section 15.407(b) (c) (g)	PASS
Radiated Emission	15.205&15.209 (a)	PASS
Conducted Band Edge	Section 15.407(b) (c) (g)	PASS
Radiated Band Edge	15.205&15.209 (a)	PASS

Remark:

1. Pass: The EUT complies with the essential requirements in the standard.

2. Frequency Stability: The manufacturer stated in the user's manual.

3. The conclusion of this test report is judged by actual test data without considering measurement uncertainty.

1.1 Measurement Uncertainty

Item	Uncertainty
Uncertainty for Power point Conducted Emissions Test	1.63dB
Uncertainty for Radiation Emission test in 3m chamber (below 30MHz)	3.5dB
Uncertainty for Radiation Emission test in 3m chamber (30MHz to 1GHz)	3.74dB(Polarize: V)
	3.76dB(Polarize: H)
Uncertainty for Radiation Emission test in 3m chamber (1GHz to 25GHz)	3.77dB(Polarize: V)
	3.80dB(Polarize: H)
Uncertainty for Radiation Emission test in 3m chamber (18GHz to 40GHz)	4.31 dB(Polarize: V)
	4.30 dB(Polarize: H)
Uncertainty for radio frequency	5.06×10^{-8}GHz
Uncertainty for conducted RF Power	0.40dB
Uncertainty for temperature	0.2℃
Uncertainty for humidity	1%
Uncertainty for DC and low frequency voltages	0.06%

2 General Information

2.1 General Description of EUT

EUT Name	:	Geodetic GNSS Receiver
Model No.	:	F8L
DIFF.	:	N/A
Power supply	:	DC 7.2V from battery and DC 5V form adapter
Radio Technology	:	5G WIFI
Operation Frequency	:	802.11ac(VHT80): 5210MHz, 5775MHz
Channel separation	:	80MHz for 802.11ac(VHT80)
Modulation technology:	:	IEEE 802.11ac: OFDM (64QAM, 16QAM, 256QAM, QPSK, BPSK)
Antenna Type	:	PCB antenna, Maximum Gain is 3.89dBi (Antenna information is provided by applicant.)
Software version	:	V1.0
Hardware version	:	V1.1.0
Intend use environment	:	Residential, commercial and light industrial environment

2.2 Test mode

U-NII-1:			
Mode	data rate (Mbps)(see Note)	Channel	Frequency (MHz)
IEEE 802.11ac VHT80	433.3	CH42	5210
U-NII-3:			
Mode	data rate (Mbps)(see Note)	Channel	Frequency
IEEE 802.11ac VHT80	433.3	CH155	5775

Remark: During the test, the test voltage was tuned from 85% to 115% of the nominal rated supply voltage, and found that the worst case was under the nominal rated supply condition. So the report just shows that condition's data.

2.3 Test Facility

Shenzhen Alpha Product Testing Co., Ltd
Building i, No.2, Lixin Road, Fuyong Street, Bao'an District, 518103, Shenzhen, Guangdong, China

2.4 Description of Support Units

Accessories	:	AC Adapter
Manufacturer	:	Yisheng Electronics Co., LTD
Model	:	EA1012AVRU-050
Ratings	:	AC Input: 100-240Vac, 1.0A, 50~60Hz DC Output: 5.0V⎓2.4A 12.0W

2.5 Deviation from Standards

None.

2.6 Abnormalities from Standard Conditions

None.

2.7 Other Information Requested by the Customer

None.

2.8 Additional instructions

Software (Used for test) from client

Channel	**Power level**
5210MHz	Default
5775MHz	Default

Note: Using SecureCRT testing software to control EUT work in Continuous TX mode, and select test channel, wireless mode, the power level of the test is set to default.

3 Test Instruments list

Equipment	Manufacturer	Model No.	Firmware version	Serial No.	Last Cal.	Cal. Due day
9*6*6 anechoic chamber	CHENYU	9*6*6	/	N/A	2025.03.09	4Year
4*4*3 Shielded room	CHENYU	4*4*3	/	N/A	2025.03.09	4Year
Spectrum analyzer	ROHDE&SCHWARZ	FSV40-N	2.3	102137	2025.08.04	1Year
Spectrum analyzer	Agilent	N9020A	A.14.16	MY499100060	2025.08.04	1Year
Test Receiver	ROHDE&SCHWARZ	ESR	2.28 SP1	1316.3003K03 -102082-Wa	2025.08.04	1Year
Test Receiver	ROHDE&SCHWARZ	ESCI	4.42 SP1	101165	2025.08.04	1Year
Bilog Antenna	SCHWARZBECK	VULB 9168	/	VULB 9168#627	2023.08.28	2Year
Horn Antenna	SCHWARZBECK	BBHA 9120 D	/	2106	2023.08.19	2Year
Loop Antenna	SCHWARZBECK	FMZB 1519B	/	00128	2023.08.19	2Year
RF Cable	Resenberger	Cable 1	/	RE1	2025.08.04	1Year
RF Cable	Resenberger	Cable 2	/	RE2	2025.08.04	1Year
RF Cable	Resenberger	Cable 3	/	CE1	2025.08.04	1Year
Amplifier	HP	HP8347A	/	2834A00455	2025.08.04	1Year
Amplifier	Agilent	8449B	/	3008A02664	2025.08.04	1Year
L.I.S.N.#1	SCHWARZBECK	NSLK8126	/	8126-466	2025.08.04	1Year
L.I.S.N.#2	ROHDE&SCHWARZ	ENV216	/	101043	2025.08.04	1Year
Horn Antenna	SCHWARZBECK	BBHA 9170	/	00946	2023.08.19	2Year
Preamplifier	SKET	LNPA_1840-50	/	SK2018101801	2025.08.04	1 Year
Power Meter	Agilent	E4419B	/	GB40202122	2025.08.04	1 Year
Power Sensor	Agilent	E9300A	/	MY41496628	2025.08.04	1 Year
Power Sensor	Agilent	E9304A	/	MY41496815	2025.08.04	1 Year
Temp. & Humid. Chamber	Teelong	TL-HW408S	/	TL-20191205-01	2025.07.14	1 Year
Electronic Thermo-Hygrometer	S.H.Qixiang	HTC-1	/	N/A	2025.08.04	1 Year
Switching Mode Power Supply	JUNKE	JK12010S	/	20140927-6	2025.08.04	1 Year
Adjustable attenuator	MWRFtest	N/A	/	N/A	N/A	N/A
10dB Attenuator	Mini-Circuits	DC-6G	/	N/A	N/A	N/A

Software Information			
Test Item	Software Name	Manufacturer	Version
RE	EZ-EMC	Farad	Alpha-3A1
CE	EZ-EMC	Farad	Alpha-3A1
RF-CE	MTS 8310	MWRFtest	V2.0.0.0

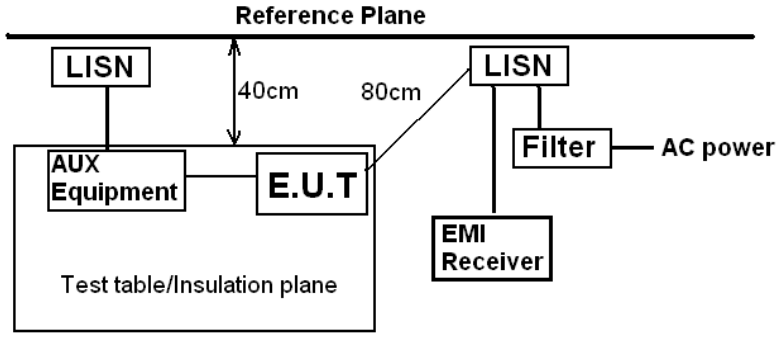
4 Test results and Measurement Data

4.1 Antenna requirement:

Standard requirement:	FCC Part15 C Section 15.203
15.203 requirement: 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, 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.	
E.U.T Antenna:	
The antenna is PCB antenna. The best case gain of the antenna is 3.89dBi for 5.15~5.25GHz, 5.725~5.85GHz	

4.2 Conducted Emissions

<table>
<tr><td>Test Requirement:</td><td>FCC Part15 C Section 15.207</td></tr>
<tr><td>Test Method:</td><td>ANSI C63.10:2013</td></tr>
<tr><td>Test Frequency Range:</td><td>150KHz to 30MHz</td></tr>
<tr><td>Class / Severity:

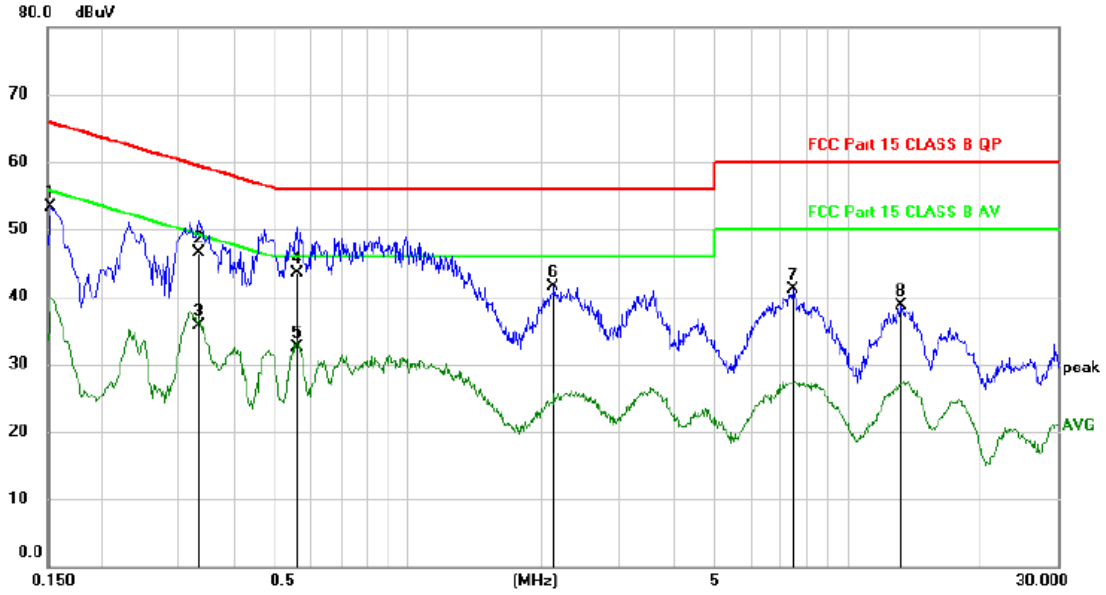
Class B</td><td>Class B</td></tr>
<tr><td>Receiver setup:</td><td>RBW=9KHz, VBW=30KHz</td></tr>
<tr><td>Limit:</td><td>
<table>
<tr><th rowspan="2">Frequency range (MHz)</th><th colspan="2">Limit (dBuV)</th></tr>
<tr><th>Quasi-peak</th><th>Average</th></tr>
<tr><td>0.15-0.5</td><td>66 to 56*</td><td>56 to 46*</td></tr>
<tr><td>0.5-5</td><td>56</td><td>46</td></tr>
<tr><td>5-30</td><td>60</td><td>50</td></tr>
</table>
* Decreases with the logarithm of the frequency.
</td></tr>
<tr><td>Test procedure</td><td>The E.U.T and simulators are connected to the main power through a line impedance stabilization network(L.I.S.N.). The provide a 50ohm/50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refers to the block diagram of the test setup and photographs). Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10:2013 on conducted measurement.</td></tr>
<tr><td>Test setup:</td><td> 

Remark:
E.U.T: Equipment Under Test
LISN: Line Impedence Stabilization Network
Test table height=0.8m</td></tr>
<tr><td>Test results:</td><td>Pass</td></tr>
</table>

Measurement Data

An initial pre-scan was performed on the line and neutral lines with peak detector. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission were detected.

Line:

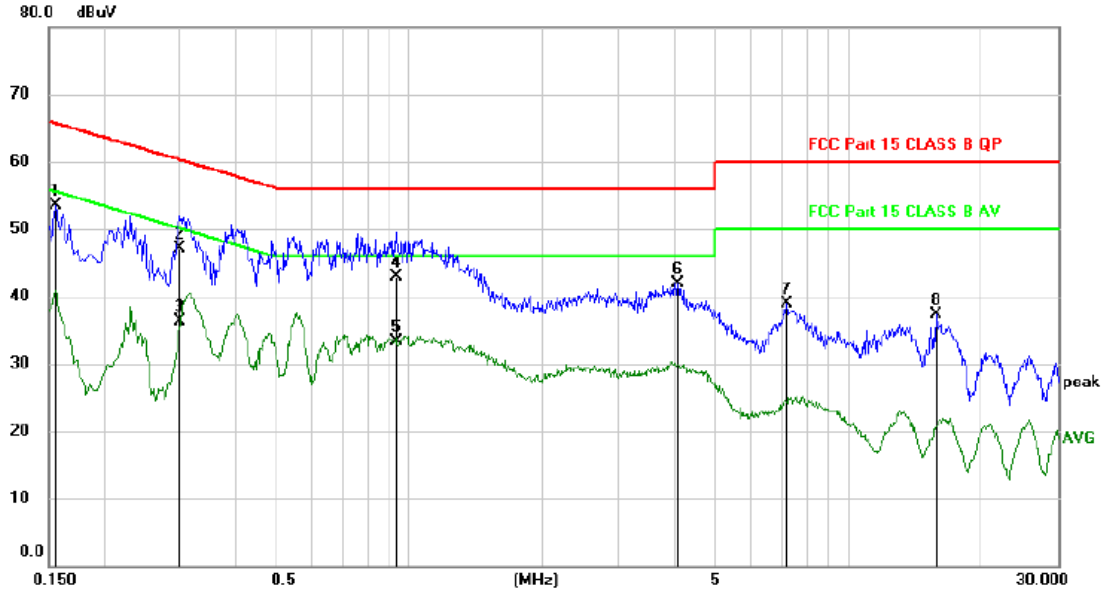


No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin	Detector	Comment
		MHz	dBuV	dB	dBuV	dBuV	dB		
1		0.1530	43.42	9.94	53.36	65.84	-12.48	peak	
2		0.3330	36.48	9.94	46.42	59.38	-12.96	QP	
3		0.3330	25.83	9.94	35.77	49.38	-13.61	AVG	
4	*	0.5580	33.64	9.94	43.58	56.00	-12.42	QP	
5		0.5580	22.61	9.94	32.55	46.00	-13.45	AVG	
6		2.1420	31.58	9.88	41.46	56.00	-14.54	peak	
7		7.5210	30.88	10.14	41.02	60.00	-18.98	peak	
8		13.2120	28.44	10.29	38.73	60.00	-21.27	peak	

*:Maximum data x:Over limit !:over margin 〈Reference Only

Note: Measurement=Reading Level+Correc Factor. Factor=(LISN or ISN or PLC or Current Probe)Factor+Cable

Neutral:



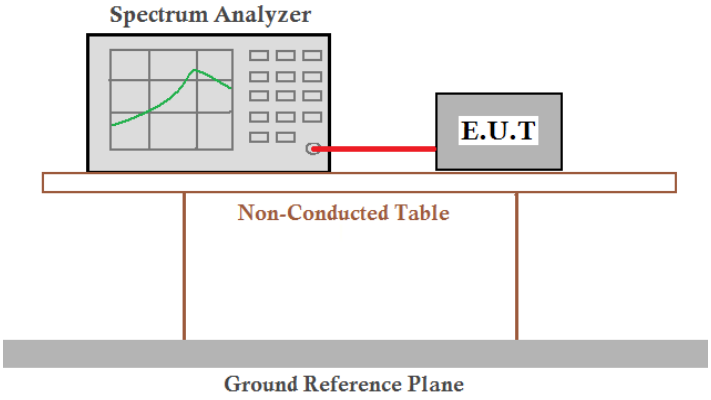
No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		
		MHz	dBuV	dB	dBuV	dBuV	dB	Detector	Comment
1	*	0.1560	43.61	9.94	53.55	65.67	-12.12	peak	
2		0.3000	37.28	9.92	47.20	60.24	-13.04	QP	
3		0.3000	26.32	9.92	36.24	50.24	-14.00	AVG	
4		0.9300	32.95	9.95	42.90	56.00	-13.10	QP	
5		0.9300	23.34	9.95	33.29	46.00	-12.71	AVG	
6		4.0710	31.98	9.97	41.95	56.00	-14.05	peak	
7		7.2150	28.72	10.13	38.85	60.00	-21.15	peak	
8		15.8790	26.87	10.35	37.22	60.00	-22.78	peak	

*:Maximum data x:Over limit !:over margin 〈Reference Only

Note: Measurement=Reading Level+Correc Factor. Factor=(LISN or ISN or PLC or Current Probe)Factor+Cable

Note: All modes and channels have been tested and only the ac 5210MHz mode with the worst data is listed.

4.3 Emission Bandwidth and 99% Occupied Bandwidth

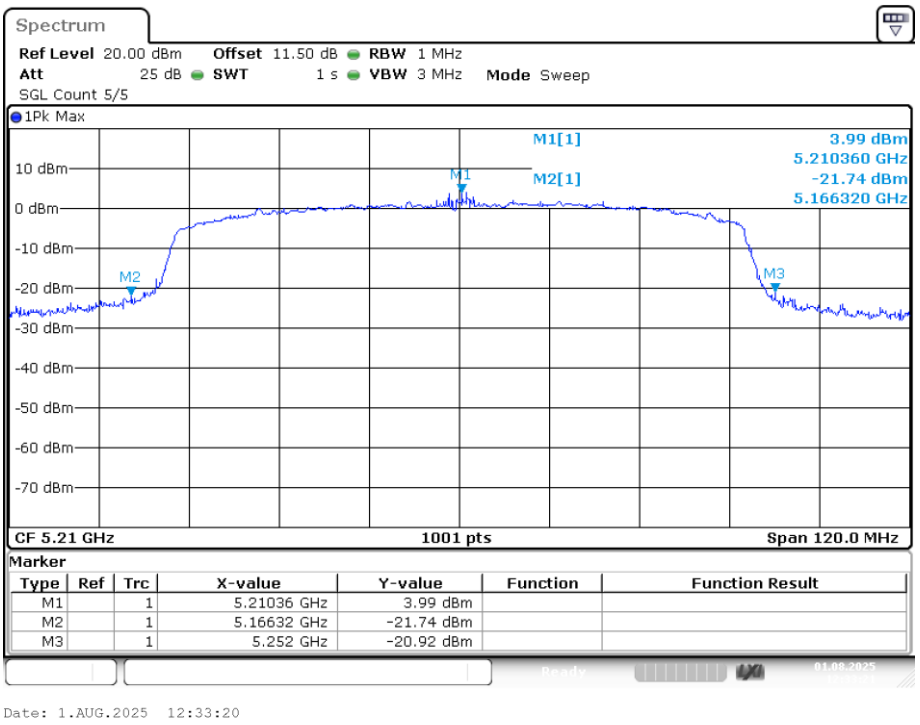
Test Requirement:	FCC Part15 E Section 15.407
Test Method:	KDB 789033 D02 General UNII Test Procedures New Rules v02r01
Limit:	N/A
Test setup:	
Test procedure:	1. Set center frequency to the nominal EUT channel center frequency. 2. Set span = 1.5 times to 5.0 times the OBW. 3. Set RBW = 1% to 5% of the OBW 4. Set VBW ≥ 3 RBW 5. Video averaging is not permitted. Where practical, a sample detection and single sweep mode shall be used. Otherwise, peak detection and max hold mode (until the trace stabilizes) shall be used. 6. Use the 99% power bandwidth function of the instrument (if available). 7. If the instrument does not have a 99% power bandwidth function, the trace data points are recovered and directly summed in power units. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5% of the total is reached; that frequency is recorded as the lower frequency. The process is repeated until 99.5% of the total is reached; that frequency is recorded as the upper frequency. The 99% occupied bandwidth is the difference between these two frequencies.
Test results:	Pass

Measurement Data:

Band 1 (5150-5250 MHz):
-26dB Bandwidth

Condition	Mode	Frequency (MHz)	Antenna	-26 dB Bandwidth (MHz)	Limit -26 dB Bandwidth (MHz)	Verdict
NVNT	ac80	5210	Ant1	85.68	N/A	Pass

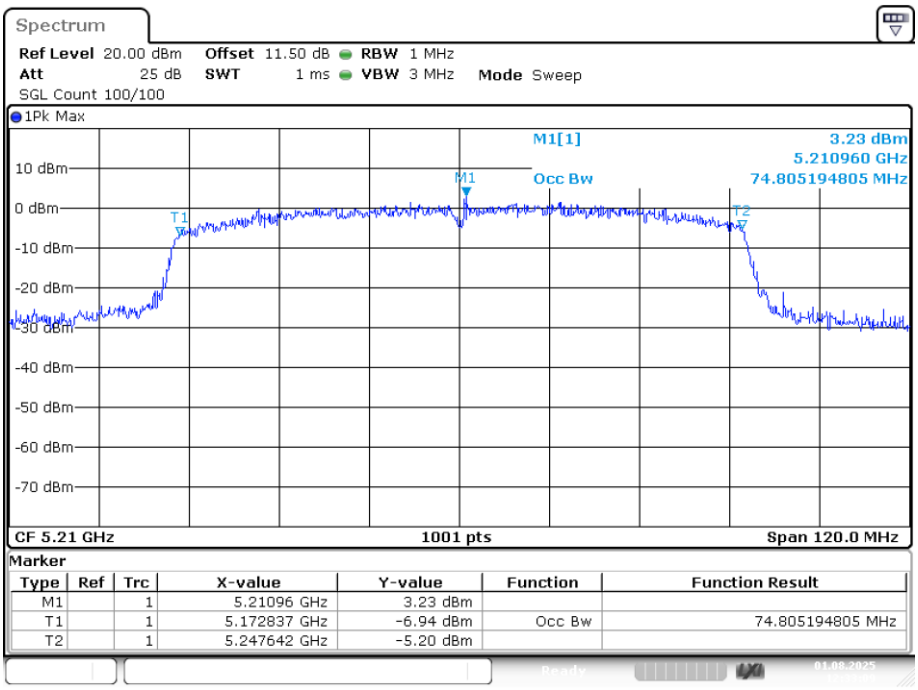
-26dB Bandwidth NVNT ac80 5210MHz Ant1



Occupied Channel Bandwidth

Condition	Mode	Frequency (MHz)	Antenna	99% OBW (MHz)
NVNT	ac80	5210	Ant1	74.805

OBW NVNT ac80 5210MHz Ant1



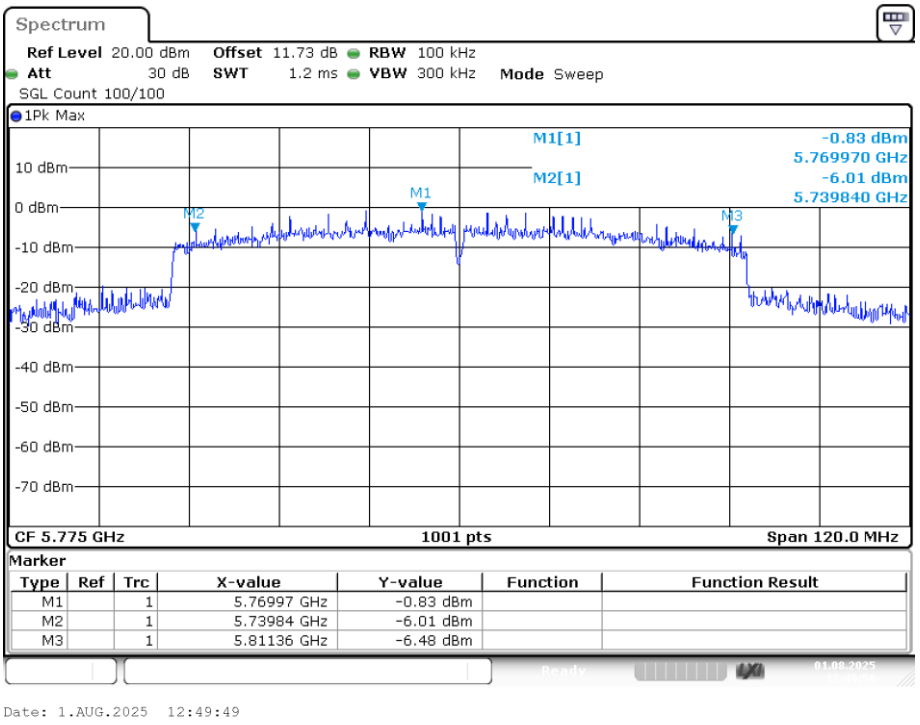
Date: 1.AUG.2025 12:33:08

Band 4 (5725-5850 MHz):

-6dB Bandwidth

Condition	Mode	Frequency (MHz)	Antenna	-6 dB Bandwidth (MHz)	Limit -6 dB Bandwidth (MHz)	Verdict
NVNT	ac80	5775	Ant1	71.52	0.5	Pass

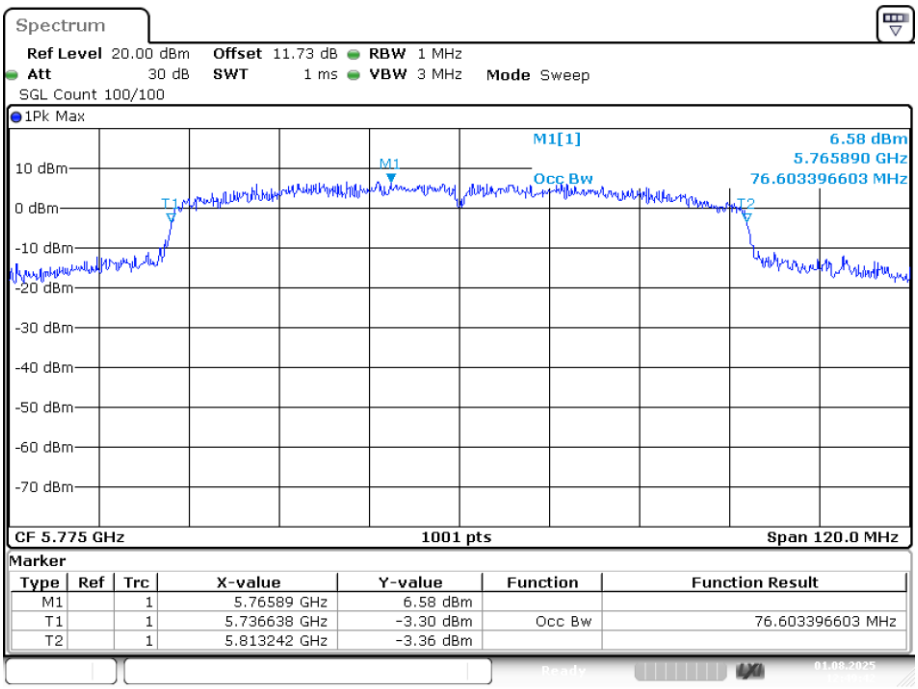
-6dB Bandwidth NVNT ac80 5775MHz Ant1



Occupied Channel Bandwidth

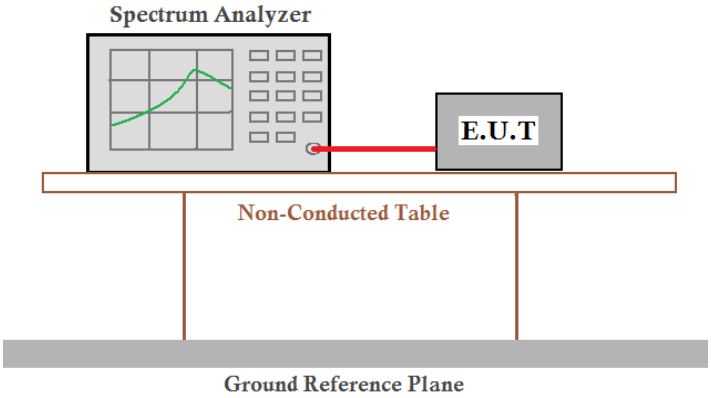
Condition	Mode	Frequency (MHz)	Antenna	99% OBW (MHz)
NVNT	ac80	5775	Ant1	76.603

OBW NVNT ac80 5775MHz Ant1



Date: 1.AUG.2025 12:49:42

4.4 Duty Cycle

Test Requirement:	FCC Part15 E Section 15.407
Test Method:	KDB 789033 D02 General UNII Test Procedures New Rules v02r01
Limit:	/
Test setup:	
Test procedure:	a) A diode detector and an oscilloscope that together have sufficiently short response time to permit accurate measurements of the on and off times of the transmitted signal. 789033 D02 General UNII Test Procedures New Rules v02r01 Page 3 b) 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
Test results:	Pass

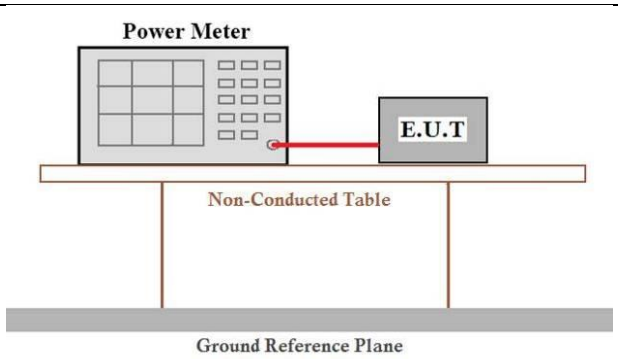
U-NII 1

Condition	Mode	Frequency (MHz)	Antenna	Duty Cycle (%)	Correction Factor (dB)
NVNT	ac80	5210	Ant1	80.45	0.94

U-NII 3

Condition	Mode	Frequency (MHz)	Antenna	Duty Cycle (%)	Correction Factor (dB)
NVNT	ac80	5775	Ant1	73.12	1.36

4.5 Maximum Conducted Output Power

Test Requirement:	FCC Part15 E Section 15.407
Test Method:	KDB 789033 D02 General UNII Test Procedures New Rules v02r01
Limit:	For the band 5.15-5.25GHz, 5.25-5.35GHz, 5.47-5.725GHz, the maximum conducted output power over the frequency bands of operation shall not exceed 250mW. For the band 5.725-5.85GHz, the maximum conducted output power over the frequency bands of operation shall not exceed 1W.
Test setup:	
Test procedure:	**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 conditions listed below 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 section 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., 10log(1/0.25) if the duty cycle is 25 percent).
Test results:	Pass

Measurement Data

Band 1 (5150-5250 MHz)

Condition	Mode	Frequency (MHz)	Antenna	Conducted Power (dBm)	Duty Cycle Factor (dB)	Total Power (dBm)	Limit (dBm)	Verdict
NVNT	ac80	5210	Ant1	7.677	0.94	8.617	24	Pass

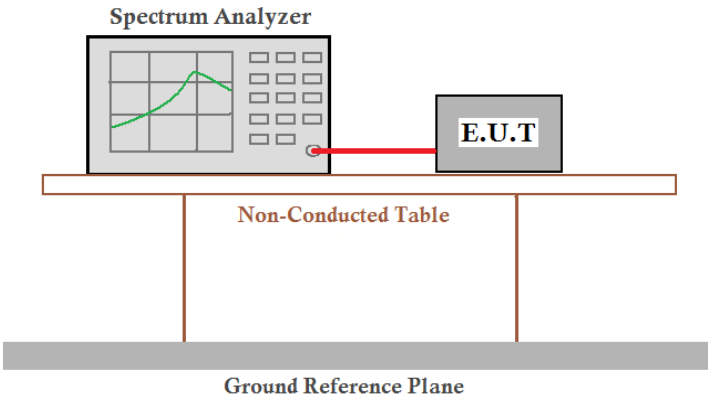
Note: Total Power= Conducted Power+ Duty Cycle Factor

Band 4 (5725 – 5850 MHz)

Condition	Mode	Frequency (MHz)	Antenna	Conducted Power (dBm)	Duty Cycle Factor (dB)	Total Power (dBm)	Limit (dBm)	Verdict
NVNT	ac80	5775	Ant1	8.097	1.36	9.457	30	Pass

Note: Total Power= Conducted Power+ Duty Cycle Factor

4.6 Power Spectral Density

Test Requirement:	47-CFR-Part-15.407
Test Method:	ANSI C63.10-2020, section 12.6
Limit:	≤11.00dBm/MHz for 5150MHz-5250MHz, 5250-5350MHz and 5470-5725 MHz ≤30.00dBm/500KHz for 5725MHz-5850MHz
Test setup:	
Test procedure:	Refer·toANSI-C63.10-2020, section.12.6-
Test results:	Pass

Measurement Data

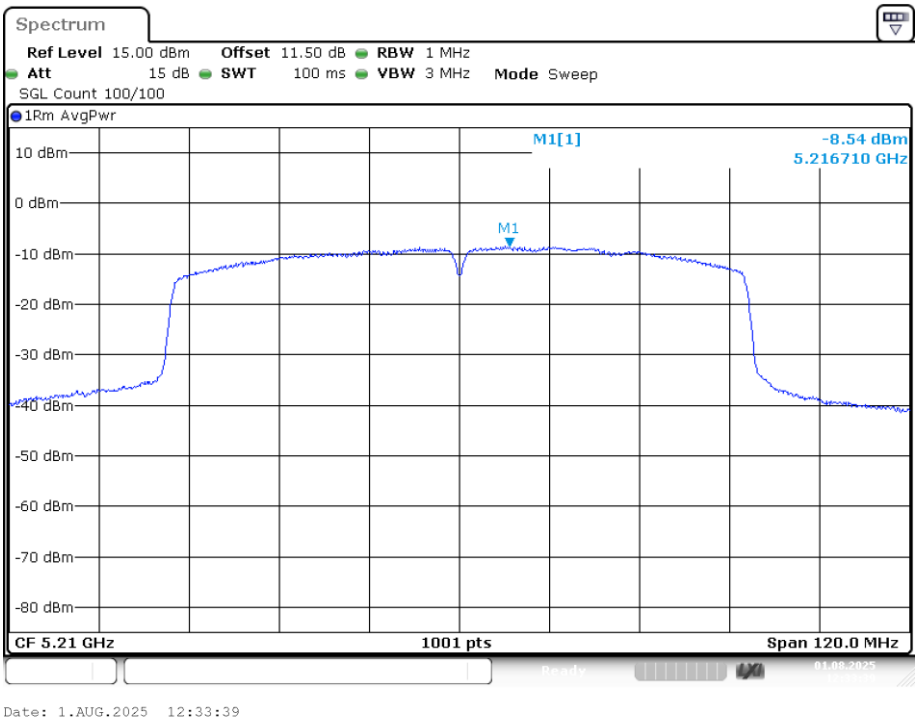
Band 1 (5150 - 5250 MHz)

Condition	Mode	Frequency (MHz)	Antenna	Conducted PSD(dBm)	Duty Cycle Factor (dB)	Total PSD (dBm)	Limit (dBm)	Verdict
NVNT	ac80	5210	Ant1	-8.545	0.94	-7.605	11	Pass

Note: 1. Total PSD= Conducted PSD+ Duty Cycle Factor,

2. Offset = Cable loss

PSD NVNT ac80 5210MHz Ant1

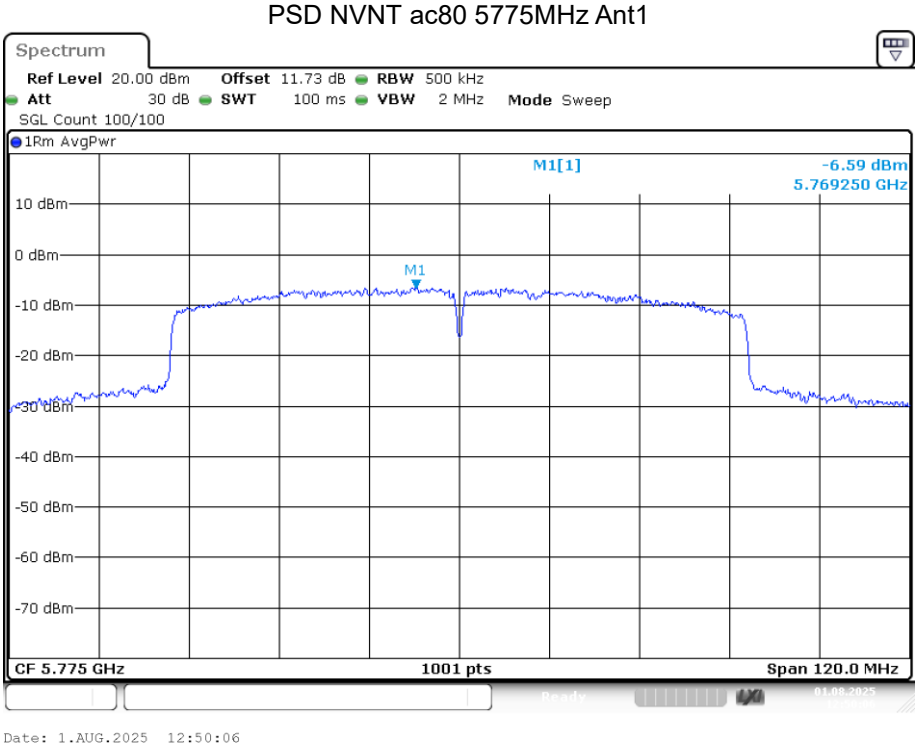


Band 4 (5725 - 5850 MHz)

Condition	Mode	Frequency (MHz)	Antenna	Conducted PSD(dBm)	Duty Cycle Factor (dB)	Total PSD (dBm)	Limit (dBm)	Verdict
NVNT	ac80	5775	Ant1	-6.589	1.36	-5.229	30	Pass

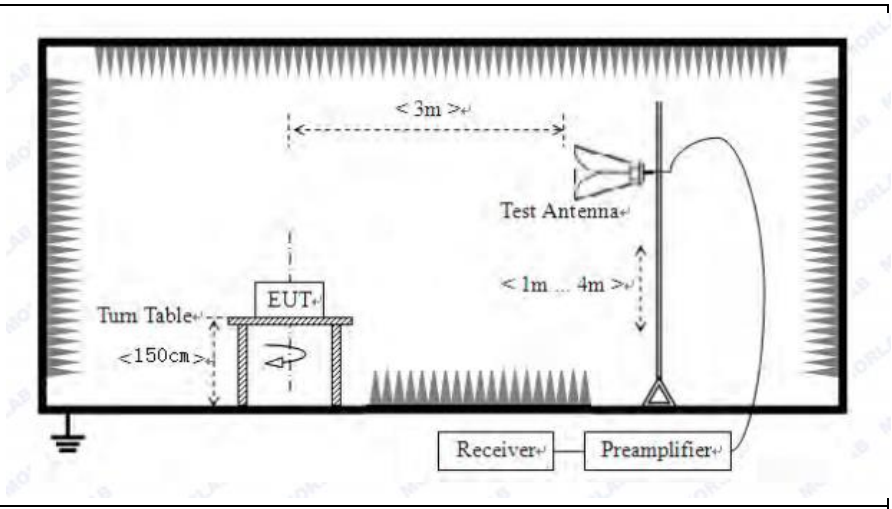
Note: 1. Total PSD= Conducted PSD+ Duty Cycle Factor,
2. Offset = Cable loss

PSD NVNT ac80 5775MHz Ant1



4.7 Radiated Band Edge

<table>
<tr><td>Test Requirement:</td><td>15.205&15.209</td></tr>
<tr><td>Test Method:</td><td>ANSI C63.10:2013</td></tr>
<tr><td>Test site:</td><td>Measurement Distance: 3m (Semi-Anechoic Chamber)</td></tr>
<tr><td>Receiver setup:</td><td>
<table>
<tr><td>Frequency</td><td>Detector</td><td>RBW</td><td>VBW</td><td>Remark</td></tr>
<tr><td>30MHz-1GHz</td><td>Quasi-peak</td><td>100KHz</td><td>300KHz</td><td>Quasi-peak Value</td></tr>
<tr><td rowspan="2">Above 1GHz</td><td>Peak</td><td>1MHz</td><td>3MHz</td><td>Peak Value</td></tr>
<tr><td>AV</td><td>1MHz</td><td>3MHz</td><td>Average Value</td></tr>
</table>
</td></tr>
<tr><td>Limit:</td><td>
<table>
<tr><td>Frequency</td><td>Limit (dBuV/m @3m)</td><td>Remark</td></tr>
<tr><td>30MHz-88MHz</td><td>40.0</td><td>Quasi-peak Value</td></tr>
<tr><td>88MHz-216MHz</td><td>43.5</td><td>Quasi-peak Value</td></tr>
<tr><td>216MHz-960MHz</td><td>46.0</td><td>Quasi-peak Value</td></tr>
<tr><td>960MHz-1GHz</td><td>54.0</td><td>Quasi-peak Value</td></tr>
<tr><td rowspan="2">Above 1GHz</td><td>54.0</td><td>Average Value</td></tr>
<tr><td>68.2</td><td>Peak Value</td></tr>
</table>
Undesirable emission limits:
(1) For transmitters operating in the 5.15-5.25 GHz band: all emissions outside of the 5.15-5.35 GHz band shall not exceed an EIRP of -27 dBm/MHz.
(2) For transmitters operating in the 5.25-5.35 GHz band: all emissions outside of the 5.15-5.35 GHz band shall not exceed an EIRP of -27 dBm/MHz. Devices operating in the 5.25-5.35 GHz band that generate emissions in the 5.15-5.25 GHz band must meet all applicable technical requirements for operation in the 5.15-5.25 GHz band (including indoor use) or alternatively meet an out-of-band emission EIRP limit of -27 dBm/MHz in the 5.15-5.25 GHz band.
(3) For transmitters operating in the 5.47-5.725 GHz band: all emissions outside of the 5.47-5.725 GHz band shall not exceed an EIRP of −27 dBm/MHz.
</td></tr>
<tr><td>Test Procedure:</td><td>
a. The EUT was placed on the top of a rotating table 1.5 m above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation.
b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
c. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotable table was turned from 0 degrees to 360 degrees to find the maximum reading.
e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.
</td></tr>
<tr><td>Test setup:</td><td>Above 1GHz</td></tr>
</table>

	
Test results:	Pass

Remark:

According to KDB 789033 D02 v02r01 section G) 1) (d), for For measurements above 1000 MHz @ 3m distance, the limit of field strength is computed as follows:

E[dBuV/m] = EIRP[dBm] + 95.2,

For example, if EIRP = -27dBm

E[dBuV/m] = -27 + 95.2 = 68.2dBuV/m.

Measurement Data:

Band1

Mode:		802.11ac		Frequency:		5210MHz	
Antenna Pol.	Frequency (MHz)	Reading Level (dBuV)	Factor (dB/m)	Measure Level (dBuV/m)	Limit (dBuV/m)	Over limit(dB)	Detector
H	5150.00	32.09	17.18	49.27	68.20	-18.93	PK
V	5150.00	35.86	17.18	53.04	68.20	-15.16	PK
Mode:		802.11ac		Frequency:		5210MHz	
Antenna Pol.	Frequency (MHz)	Reading Level (dBuV)	Factor (dB/m)	Measure Level (dBuV/m)	Limit (dBuV/m)	Over limit(dB)	Detector
H	5150.00	22.32	17.18	39.50	54.00	-14.50	AV
V	5150.00	26.50	17.18	43.68	54.00	-10.32	AV
Mode:		802.11ac		Frequency:		5210MHz	
Antenna Pol.	Frequency (MHz)	Reading Level (dBuV)	Factor (dB/m)	Measure Level (dBuV/m)	Limit (dBuV/m)	Over limit(dB)	Detector
H	5350.00	32.31	17.18	49.49	68.20	-18.71	PK
V	5350.00	35.05	17.18	52.23	68.20	-15.97	PK
Mode:		802.11ac		Frequency:		5210MHz	
Antenna Pol.	Frequency (MHz)	Reading Level (dBuV)	Factor (dB/m)	Measure Level (dBuV/m)	Limit (dBuV/m)	Over limit(dB)	Detector
H	5350.00	22.69	17.18	39.87	54.00	-14.13	AV
V	5350.00	25.02	17.18	42.20	54.00	-11.80	AV

Band 4

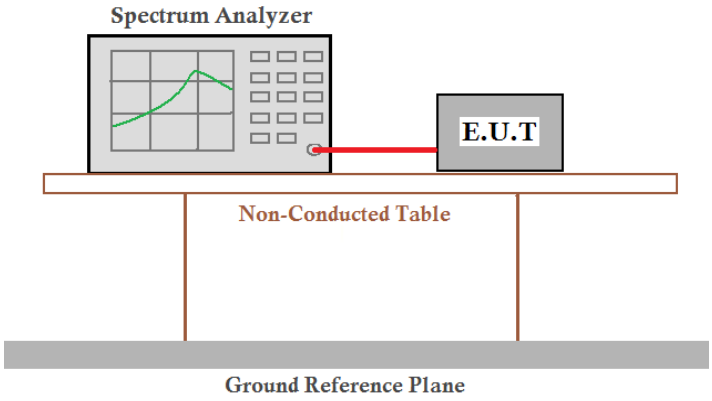
Mode:		802.11ac		Frequency:		5775MHz	
Antenna Pol.	Frequency (MHz)	Reading Level (dBuV)	Factor (dB/m)	Measure Level (dBuV/m)	Limit (dBuV/m)	Over limit(dB)	Detector
H	5725.00	34.06	17.18	51.24	68.20	-16.96	PK
V	5725.00	35.29	17.18	52.47	68.20	-15.73	PK

Mode:		802.11ac		Frequency:		5775MHz	
Antenna Pol.	Frequency (MHz)	Reading Level (dBuV)	Factor (dB/m)	Measure Level (dBuV/m)	Limit (dBuV/m)	Over limit(dB)	Detector
H	5725.00	22.04	17.18	39.22	54.00	-14.78	AV
V	5725.00	24.99	17.18	42.17	54.00	-11.83	AV

Mode:		802.11ac		Frequency:		5775MHz	
Antenna Pol.	Frequency (MHz)	Reading Level (dBuV)	Factor (dB/m)	Antenna Pol.	Frequency (MHz)	Reading Level (dBuV)	Factor (dB/m)
H	5850.00	32.00	17.18	49.18	68.20	-19.02	PK
V	5850.00	32.96	17.18	50.14	68.20	-18.06	PK

Mode:		802.11ac		Frequency:		5775MHz	
Antenna Pol.	Frequency (MHz)	Reading Level (dBuV)	Factor (dB/m)	Antenna Pol.	Frequency (MHz)	Reading Level (dBuV)	Factor (dB/m)
H	5850.00	22.25	17.18	39.43	54.00	-14.57	AV
V	5850.00	24.08	17.18	41.26	54.00	-12.74	AV

4.8 Conducted Band Edge

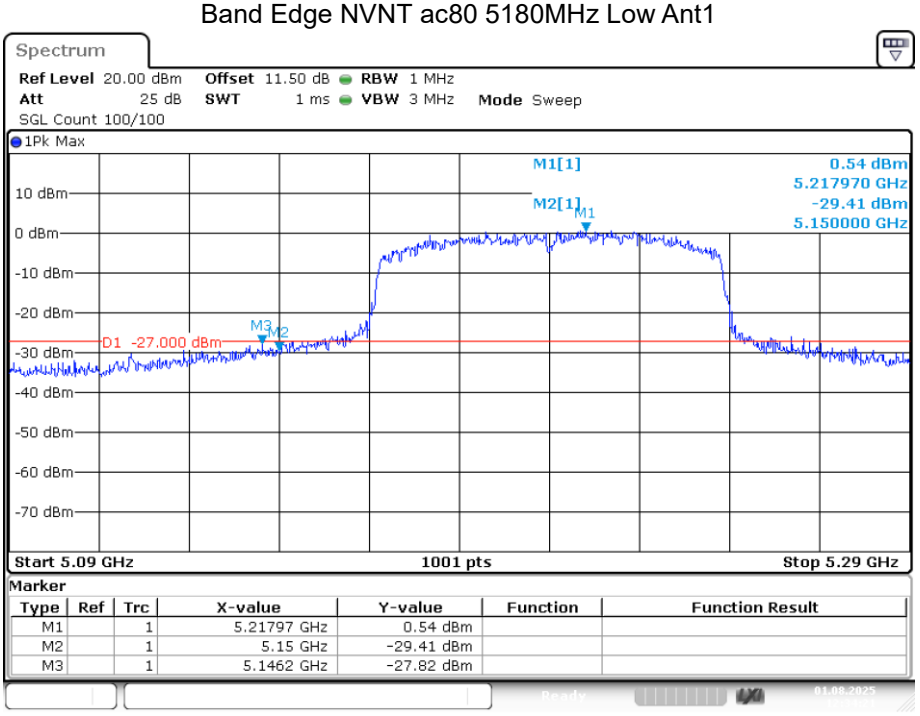
Test Requirement:	FCC Part15 E Section 15.407
Test Method:	KDB 789033 D02 General UNII Test Procedures New Rules v02r01
Limit:	1. For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz. 2. For transmitters operating solely in the 5.725-5.850 GHz band: All emissions shall be limited to a level of −27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.
Test setup:	
Test procedure:	The procedure for peak unwanted emissions measurements above 1000 MHz is as follows: a) Peak emission levels are measured by setting the instrument as follows: 1) RBW = 1 MHz. 2) VBW ≥ [3 × RBW]. 3) Detector = peak. 4) Sweep time = auto. 5) Trace mode = max hold. 6) Allow sweeps to continue until the trace stabilizes.
Test results:	Pass

Band 1

Condition	Mode	Band Edge Frequency (MHz)	Antenna	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	ac80	5180	Ant1	-27.81	-27	Pass
NVNT	ac80	5240	Ant1	-32.47	-27	Pass

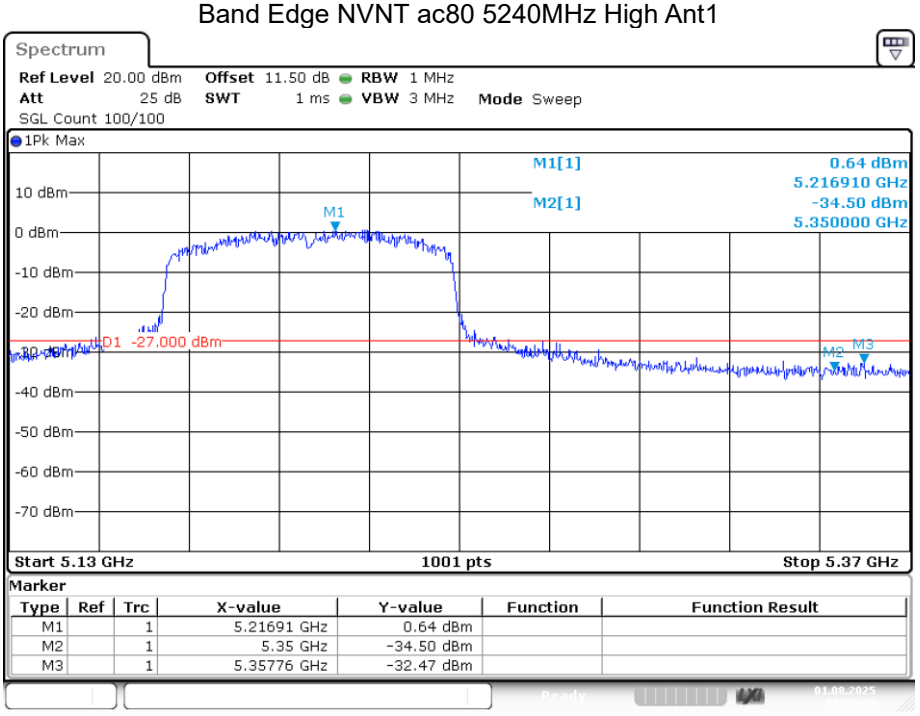
Note: The margin is at least greater than the antenna gain plus the cable loss.

Band Edge NVNT ac80 5180MHz Low Ant1



Date: 1.AUG.2025 12:34:20

Band Edge NVNT ac80 5240MHz High Ant1



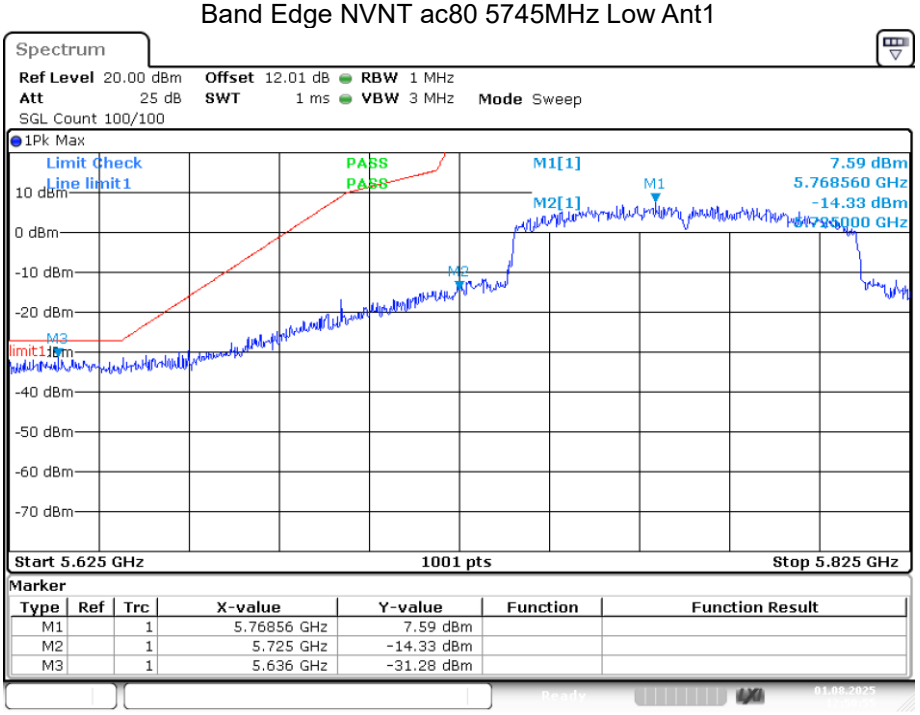
Date: 1.AUG.2025 12:35:09

Band4

Condition	Mode	Band Edge Frequency (MHz)	Antenna	Max Value (dBm)	Limit (dBm)	Verdict
NVNT	ac80	5745	Ant1	-31.27	-27	Pass
NVNT	ac80	5825	Ant1	-31.78	-27	Pass

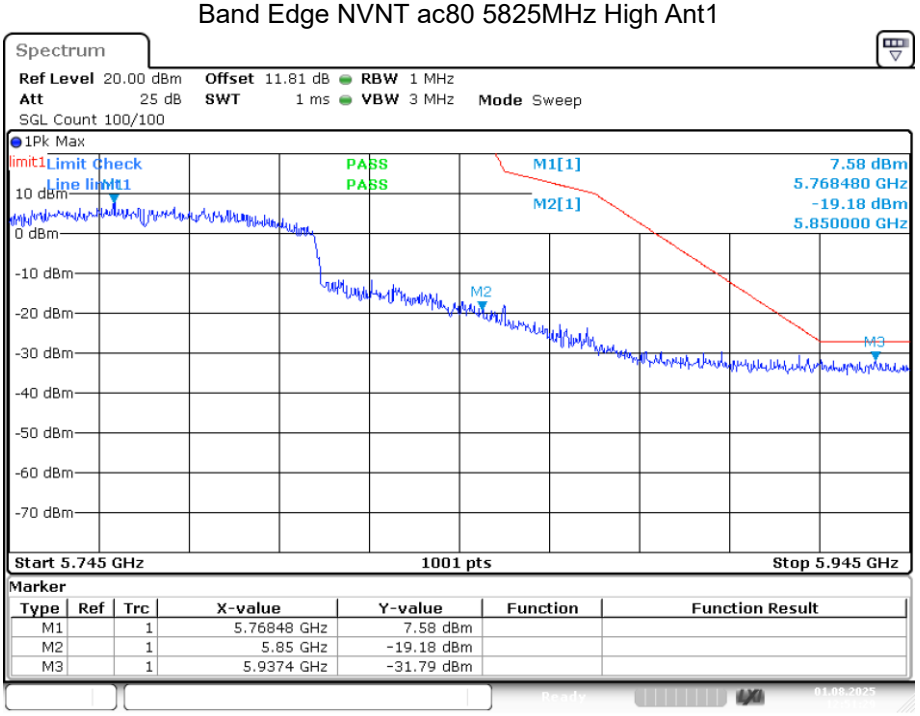
Note: The margin is at least greater than the antenna gain plus the cable loss.

Band Edge NVNT ac80 5745MHz Low Ant1



Date: 1.AUG.2025 12:50:55

Band Edge NVNT ac80 5825MHz High Ant1



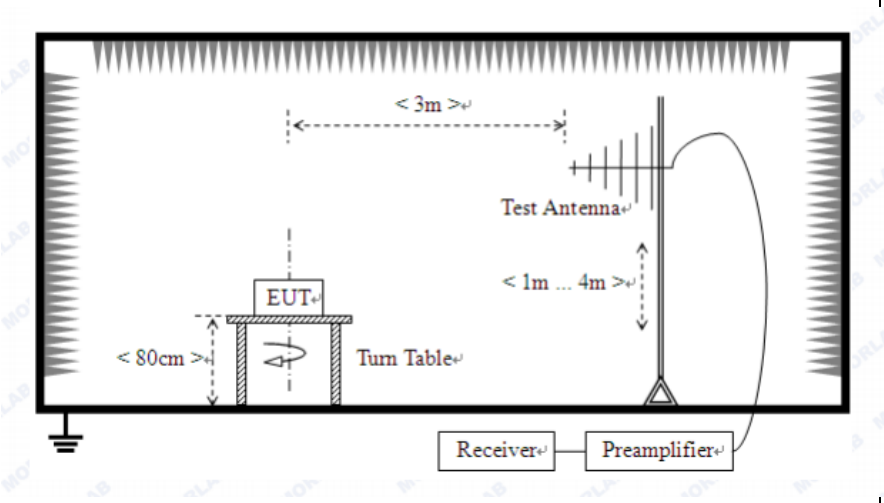
Date: 1.AUG.2025 12:51:29

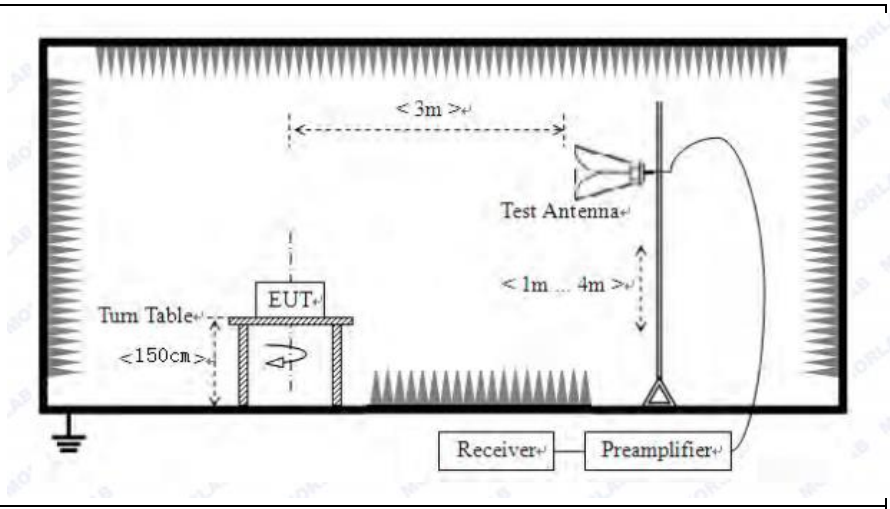
4.9 Radiated Emission

<table>
<tr><td>Test Requirement:</td><td>15.205&15.209</td></tr>
<tr><td>Test Method:</td><td>ANSI C63.10:2013</td></tr>
<tr><td>Test Frequency Range:</td><td>30MHz to 40GHz</td></tr>
<tr><td>Test site:</td><td>Measurement Distance: 3m (Semi-Anechoic Chamber)</td></tr>
<tr><td>Receiver setup:</td><td>
<table>
<tr><th>Frequency</th><th>Detector</th><th>RBW</th><th>VBW</th><th>Value</th></tr>
<tr><td>30MHz-1GHz</td><td>Quasi-peak</td><td>100KHz</td><td>300KHz</td><td>Quasi-peak Value</td></tr>
<tr><td rowspan="2">Above 1GHz</td><td>Peak</td><td>1MHz</td><td>3MHz</td><td>Peak Value</td></tr>
<tr><td>AV</td><td>1MHz</td><td>3MHz</td><td>Average Value</td></tr>
</table>
</td></tr>
<tr><td>Limit:</td><td>
<table>
<tr><th>Frequency</th><th>Limit (dBuV/m @3m)</th><th>Remark</th></tr>
<tr><td>30MHz-88MHz</td><td>40.0</td><td>Quasi-peak Value</td></tr>
<tr><td>88MHz-216MHz</td><td>43.5</td><td>Quasi-peak Value</td></tr>
<tr><td>216MHz-960MHz</td><td>46.0</td><td>Quasi-peak Value</td></tr>
<tr><td>960MHz-1GHz</td><td>54.0</td><td>Quasi-peak Value</td></tr>
<tr><td rowspan="2">Above 1GHz</td><td>74.0</td><td>Peak Value</td></tr>
<tr><td>54.0</td><td>Average Value</td></tr>
</table>
</td></tr>
<tr><td>Test Procedure:</td><td>
Substitution method was performed to determine the actual ERP emission levels of the EUT.
The following test procedure as below:

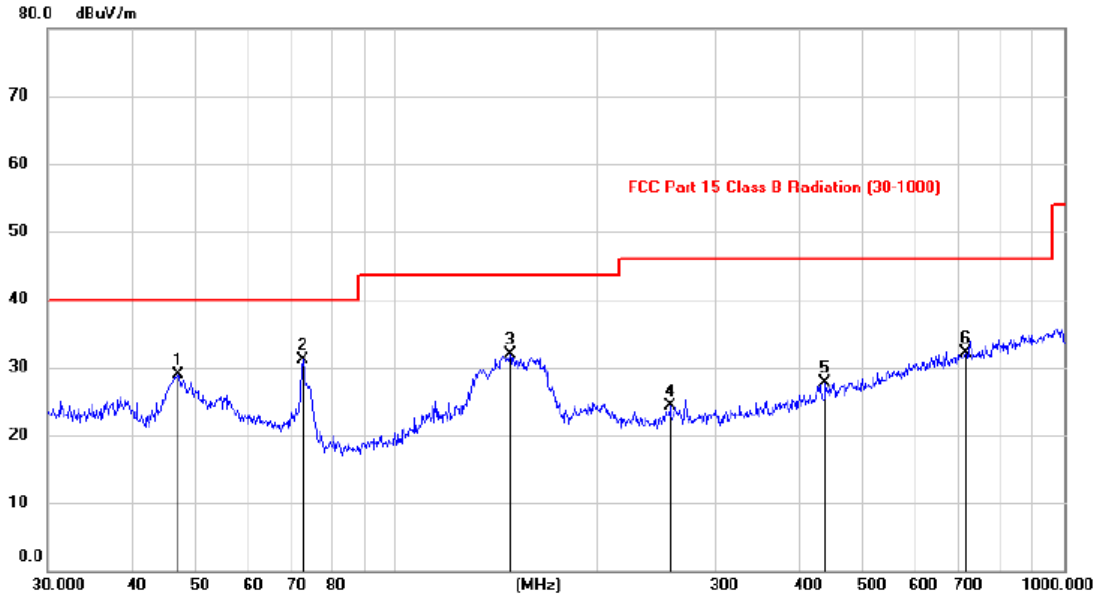
1>.Below 1GHz test procedure:
1. The EUT was placed on the top of a rotating table (0.8m for below 1GHz and 1.5 meters for above 1GHz) above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation.
2. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
3. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
4. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotable table was turned from 0 degrees to 360 degrees to find the maximum reading.
5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
6. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

2>.Above 1GHz test procedure:
1. On the test site as test setup graph above, the EUT shall be placed at the 1.5m support on the turntable and in the position closest to normal use as declared by the provider.
2. The test antenna shall be oriented initially for vertical polarization and shall be chosen to correspond to the frequency of the transmitter.The output of the test antenna shall be connected to the measuring receiver.
3. The transmitter shall be switched on, if possible, without modulation and the measuring receiver shall be tuned to the frequency of the transmitter under test.
</td></tr>
</table>

	4. The test antenna shall be raised and lowered from 1m to 4m until a maximum signal level is detected by the measuring receiver. Then the turntable should be rotated through 360° in the horizontal plane, until the maximum signal level is detected by the measuring receiver. 5. Repeat step 4 for test frequency with the test antenna polarized horizontally. 6. Remove the transmitter and replace it with a substitution antenna 7. Feed the substitution antenna at the transmitter end with a signal generator connected to the antenna by means of a nonradiating cable. With the antennas at both ends vertically polarized, and with the signal generator tuned to a particular test frequency, raise and lower the test antenna to obtain a maximum reading at the spectrum analyzer. Adjust the level of the signal generator output until the previously recorded maximum reading for this set of conditions is obtained. This should be done carefully repeating the adjustment of the test antenna and generator output. 8. Repeat step 7 with both antennas horizontally polarized for each test frequency. 9. Calculate power in dBm into a reference ideal half-wave dipole antenna by reducing the readings obtained in steps 7 and 8 by the power loss in the cable between the generator and the antenna, and further corrected for the gain of the substitution antenna used relative to an ideal half-wave dipole antenna by the following formula: EIRP(dBm) = Pg(dBm) – cable loss (dB) + antenna gain (dBi) where: Pg is the generator output power into the substitution antenna.
Test setup:	Below 1GHz  Above 1GHz

	
Test results:	Pass

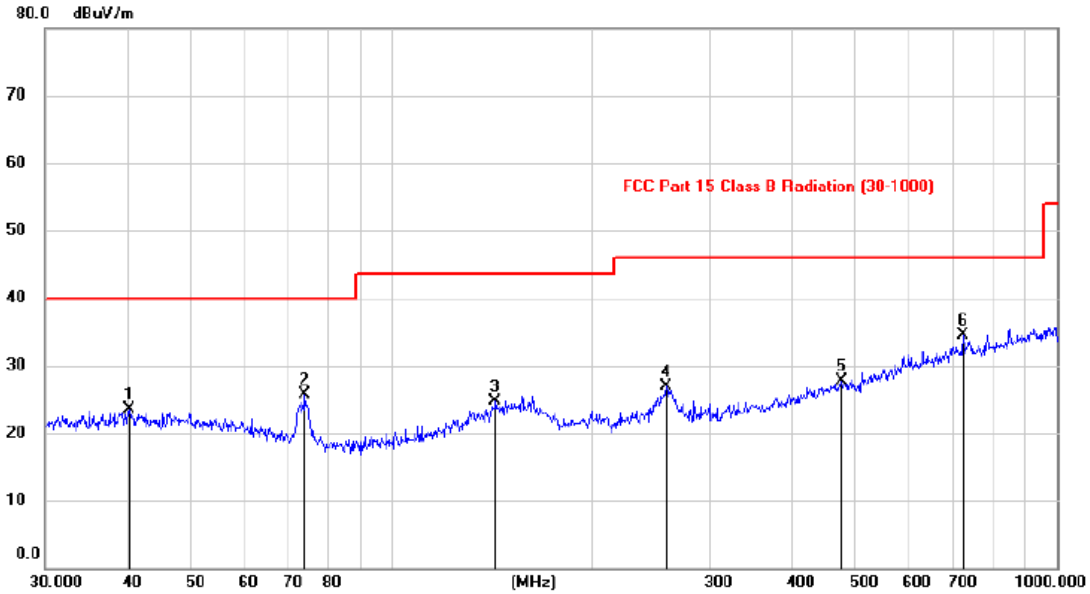
Vertical:



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		47.1930	14.87	14.07	28.94	40.00	-11.06	peak			
2	*	72.4729	20.08	10.97	31.05	40.00	-8.95	peak			
3		147.9906	16.97	14.91	31.88	43.50	-11.62	peak			
4		256.6409	11.33	12.90	24.23	46.00	-21.77	peak			
5		439.8363	10.44	17.32	27.76	46.00	-18.24	peak			
6		714.1734	10.11	21.93	32.04	46.00	-13.96	peak			

Note:1. *:Maximum data; x:Over limit; !:over margin.
2.Measurement=Reading Level+Correct Factor; Correct Factor=Antenna Factor+Cable Loss.

Horizontal:



No.	Mk.	Freq.	Reading Level	Correct Factor	Measure-ment	Limit	Margin		Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dBuV/m	dB	Detector	cm	degree	Comment
1		40.2098	9.07	14.44	23.51	40.00	-16.49	peak			
2		74.0658	14.87	10.79	25.66	40.00	-14.34	peak			
3		143.1921	10.13	14.55	24.68	43.50	-18.82	peak			
4		258.3264	13.95	12.94	26.89	46.00	-19.11	peak			
5		475.3880	9.84	17.85	27.69	46.00	-18.31	peak			
6	*	722.3166	12.46	22.05	34.51	46.00	-11.49	peak			

Note:1. *:Maximum data; x:Over limit; !:over margin.
2.Measurement=Reading Level+Correct Factor; Correct Factor=Antenna Factor+Cable Loss.

Remark: All modes have been tested, and only worst data of 802.11ac mode, Channel 5210MHz was listed in this report.

Above 1GHz (U-NII-1):

802.11ac 5210MHz

Detector：PK

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10420.14	45.06	16.29	14.62	32.65	43.32	74.00	-30.68	Vertical
15630.31	46.60	21.83	17.66	34.46	51.63	74.00	-22.37	Vertical
10420.08	50.59	8.73	14.62	32.65	41.29	74.00	-32.71	Horizontal
15630.06	52.58	11.73	17.66	34.46	47.51	74.00	-26.49	Horizontal

Detector：AV

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
10420.04	40.01	16.29	14.62	32.65	38.27	54.00	-15.73	Vertical
15630.29	42.08	21.83	17.66	34.46	47.11	54.00	-6.89	Vertical
10420.31	44.58	8.73	14.62	32.65	35.28	54.00	-18.72	Horizontal
15630.24	43.14	11.73	17.66	34.46	38.07	54.00	-15.93	Horizontal

802.11ac 5775MHz

Detector：PK

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
11550.25	46.77	16.29	14.62	32.65	45.03	74.00	-28.97	Vertical
17325.03	48.48	21.83	17.66	34.46	53.51	74.00	-20.49	Vertical
11550.31	52.57	8.73	14.62	32.65	43.27	74.00	-30.73	Horizontal
17325.16	53.08	11.73	17.66	34.46	48.01	74.00	-25.99	Horizontal

Detector：AV

Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
11550.06	38.52	16.29	14.62	32.65	36.78	54.00	-17.22	Vertical
17325.16	38.81	21.83	17.66	34.46	43.84	54.00	-10.16	Vertical
11550.00	40.92	8.73	14.62	32.65	31.62	54.00	-22.38	Horizontal
17325.14	43.74	11.73	17.66	34.46	38.67	54.00	-15.33	Horizontal

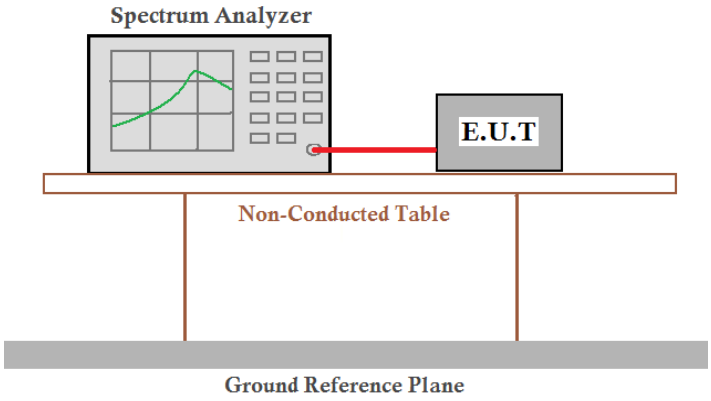
Note:

1. Level = Read Level + Antenna Factor+ Cable loss- Preamp Factor.

2. The test trace is same as the ambient noise (the test frequency range: 18GHz~40GHz), therefore no data appear in the report.

3. This limit applies for using average detector, if the test result on peak is lower than average limit, then average measurement needn't be performed.

4.10 Conducted Spurious Emission

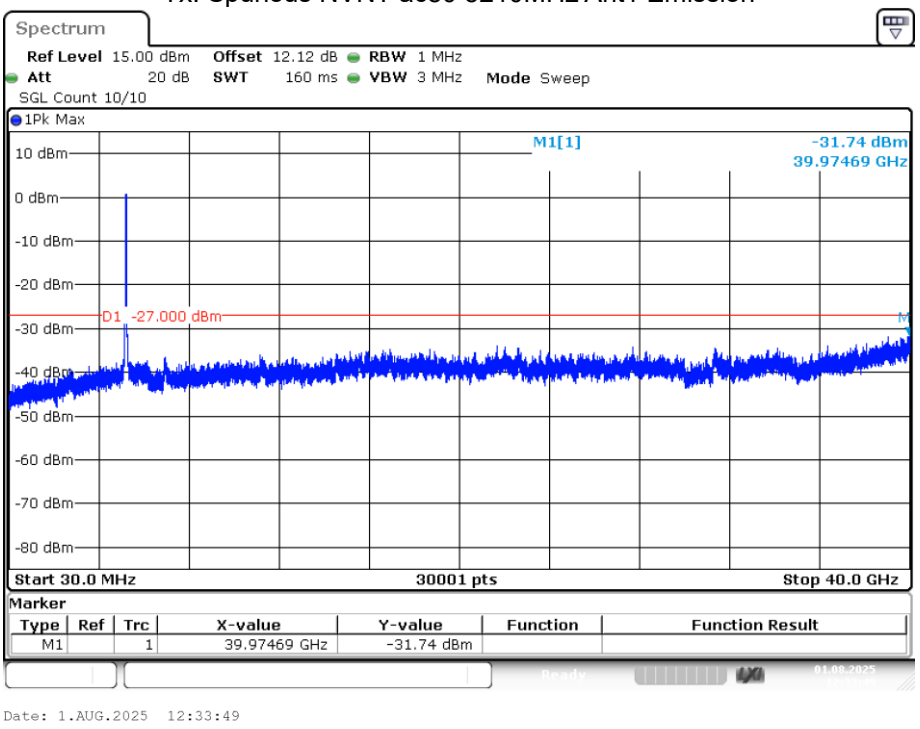
Test Requirement:	FCC Part15 E Section 15.407
Test Method:	KDB 789033 D02 General UNII Test Procedures New Rules v02r01
Limit:	1. For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz. 2. For transmitters operating solely in the 5.725-5.850 GHz band: All emissions shall be limited to a level of −27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.
Test setup:	
Test procedure:	The procedure for peak unwanted emissions measurements above 1000 MHz is as follows: a) Peak emission levels are measured by setting the instrument as follows: 1) RBW = 1 MHz. 2) VBW ≥ [3 × RBW]. 3) Detector = peak. 4) Sweep time = auto. 5) Trace mode = max hold. 6) Allow sweeps to continue until the trace stabilizes.
Test results:	Pass

U-NII 1

Condition	Mode	Frequency (MHz)	Antenna	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	ac80	5210	Ant1	-31.74	-27	Pass

Note: The margin is at least greater than the antenna gain plus the cable loss.

Tx. Spurious NVNT ac80 5210MHz Ant1 Emission

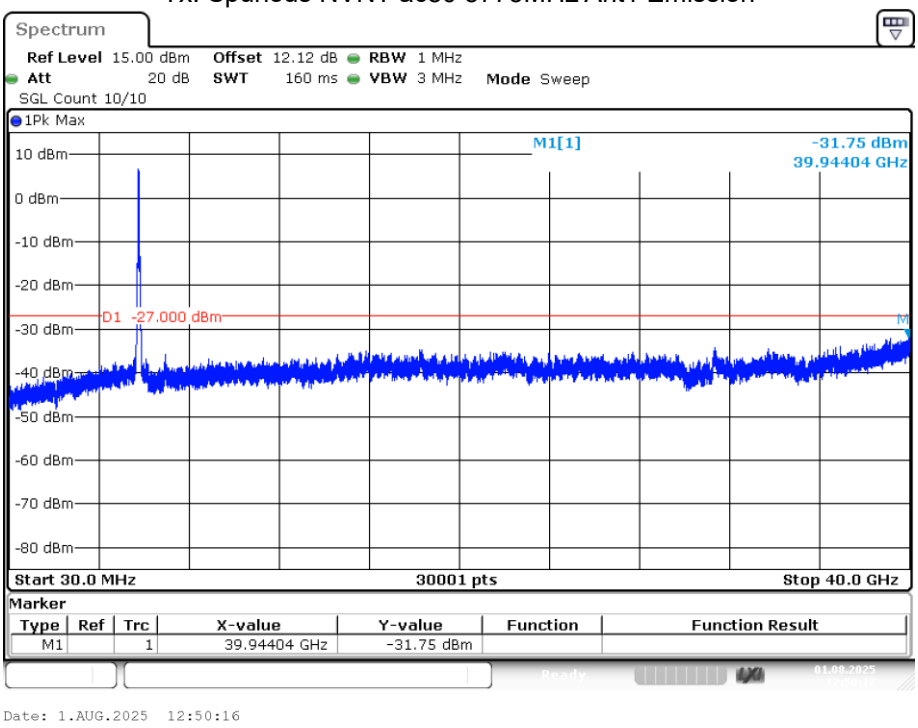


U-NII 3

Condition	Mode	Frequency (MHz)	Antenna	Max Value (dBc)	Limit (dBc)	Verdict
NVNT	ac80	5775	Ant1	-31.75	-27	Pass

Note: The margin is at least greater than the antenna gain plus the cable loss.

Tx. Spurious NVNT ac80 5775MHz Ant1 Emission



------END OF REPORT------