RADIO TEST REPORT

Product	:	HD Wireless Sender & Receiver
Model Name	:	WTR-5500
FCC ID	:	BY4WTR5500
Test Regulation	:	FCC 47 CFR Part 15 Subpart E (Section 15.407)
Received Date	:	2023/7/13
Test Date	:	2023/7/24 ~ 2023/8/1
Issued Date	:	2023/10/24
Applicant	:	Trans Electric Co., Ltd 771 Sec.2 Chungsan Rd, Huatang, Changhua, Taiwan
Issued By	:	Underwriters Laboratories Taiwan Co., Ltd. Building A, B and E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan

Testing Laboratory
3398

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REVISION HISTORY

Original Test Report No.: 4791012519-US-R1-V0

Revision	Test report No.	Date	Page revised	Contents
Original	4791012519-US-R1-V0	2023/10/24	-	Initial issue

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1. Attestation of Test Results

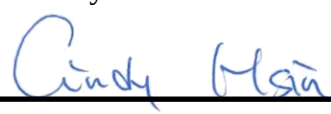
APPLICANT:	Trans Electric Co., Ltd 771 Sec.2 Chungsan Rd, Huatang, Changhua, Taiwan
MANUFACTURER:	Trans Electric Co., Ltd 771 Sec.2 Chungsan Rd, Huatang, Changhua, Taiwan
EUT DESCRIPTION:	HD Wireless Sender & Receiver
BRAND:	PX
MODEL:	WTR-5500
SAMPLE STAGE:	Engineering Verification Test sample
DATE of TESTED:	2023/7/24 ~ 2023/8/1

APPLICABLE STANDARDS	
STANDARD	**Test Results**
FCC 47 CFR PART 15 Subpart E (Section 15.407)	PASS

Underwriters Laboratories Taiwan Co., Ltd. tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by Underwriters Laboratories Taiwan Co., Ltd. based on interpretations and/or observations of test results. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by Underwriters Laboratories Taiwan Co., Ltd. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by Underwriters Laboratories Taiwan Co., Ltd. will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, any agency of the Federal Government, or any agency of any government.

Prepared By:



Cindy Hsin Date : 2023/10/24
Project Handler

Approved and Authorized By:

Eric Lee Date : 2023/10/24
Senior Laboratory Engineer

2. Summary of Test Results

Summary of Test Results		
FCC Clause	**Test Items**	**Result**
15.407(e)	6dB Bandwidth	PASS
15.403(i)	26dB Bandwidth	PASS
2.1049	Occupied Bandwidth	See Note 1
15.407(a)(1/2/3)	Conducted Output Power	PASS
15.407(a)(1/2/3)	Power Spectral Density	PASS
15.407(g)	Frequency Stability	PASS
15.407(b) (1/2/3/4(i/ii)/9)	Radiated Emissions and Band Edge Measurement	PASS
15.407(b)(9)	AC Power Conducted Emission	PASS
15.203	Antenna Requirement	PASS
15.407(h)	Dynamic Frequency Selection & Transmit power control	N/A

Note:
1. The Occupied Bandwidth was reference only.

3. Test Methodology and Reference Procedures

The tests documented in this report were performed in accordance with 47 CFR FCC Part 2, KDB 789033 D02 General UNII Test Procedure New Rules v02r01, KDB414788 D01 Radiated Test Site v01r01, ANSI C63.10-2013.

4. Facilities and Accreditation

Test Location	Underwriters Laboratories Taiwan Co., Ltd.
Address	Building A, B and E, No. 372-7, Sec. 4, Zhongxing Rd., Zhudong Township, Hsinchu County, Taiwan
Accreditation Certificate	Underwriters Laboratories Taiwan Co., Ltd. is accredited by TAF, Laboratory Code 3398.

5. Measurement Uncertainty

For statement of conformity, simple acceptance (Section 4.3.4 of ISO Guide 115) was applied as decision rule for measurement in this test report.

The following uncertainties have been calculated to provide a confidence level of 95 % using a coverage factor k=2.

Determining compliance based on the results of the compliance measurement, not considering measurement instrumentation uncertainty.

Measurement	Frequency	Uncertainty
Conducted disturbance at mains terminals ports	150kHz ~ 30MHz	3.1 dB
RF Conducted	9 kHz - 40GHz	2.3 dB
Radiated disturbance below 30MHz	9 kHz - 30 MHz	3.2 dB
Radiated disturbance below 1 GHz	30MHz ~ 1GHz	6.1 dB
Radiated disturbance above 1 GHz	1GHz ~ 40GHz	5.1 dB

6. Equipment under Test

6.1. Description of EUT

Product	HD Wireless Sender & Receiver	
Brand Name	PX	
Model Name	WTR-5500	
Operating Frequency	5180 ~ 5240 MHz 5745 ~ 5825 MHz	
Modulation	256QAM, 64QAM, 16QAM, QPSK, BPSK	
Transfer Rate	802.11a: up to 54 Mbps 802.11n: up to MCS7 802.11ac: up to MCS9	
Number of Channel	5180 ~ 5240 MHz	4 for 802.11a, 802.11n (HT20), 802.11ac (VHT20)
		2 for 802.11n (HT40), 802.11ac (VHT40)
		1 for 802.11ac (VHT80)
	5745 ~ 5825 MHz	5 for 802.11a, 802.11n (HT20), 802.11ac (VHT20)
		2 for 802.11n (HT40), 802.11ac (VHT40)
		1 for 802.11ac (VHT80)
Maximum Output Power	5180 ~ 5240 MHz: 12.87 dBm 5745 ~ 5825 MHz: 9.32 dBm	
Normal Voltage	5Vdc from adapter 5Vdc from host	
Sample ID	Conducted Test: 6261654 Radiated Test: 6261652	

Note:

1. The EUT incorporates a SISO function. Physically, the EUT provides one completed transmitters and one receivers.

Modulation Mode	Tx,Rx Function
802.11a	1TX,1RX
802.11n (HT20)	1TX,1RX
802.11n (HT40)	1TX,1RX
802.11ac (VHT20)	1TX,1RX
802.11ac (VHT40)	1TX,1RX
802.11ac (VHT80)	1TX,1RX

* The modulation and bandwidth are similar for 802.11n mode for HT20 / HT40 and 802.11ac mode for VHT20 / VHT40, therefore investigated worst case to representative mode in test report.

2. The EUT contains following accessory devices.

Product	Brand	Model	Description
USB cable	PX	F1546-02G	Length: 1 m
Adaptor	AMIGO	AMS195-0502000FU	Input: 100-240Vac ~ 50/60Hz 0.5A Output: 5Vdc 2.0A
USB C to HDMI dongle	PX	B1183G	-

3. The above EUT information is declared by manufacturer and for more detailed features description, please refer the manufacturer's or user's manual, the laboratory shall not be held responsible.

6.2. Channel List

FOR 5180 ~ 5240MHz

4 channels are provided for 802.11a, 802.11n (HT20), 802.11ac (VHT20):

Channel	Frequency	Channel	Frequency
36	5180 MHz	44	5220 MHz
40	5200 MHz	48	5240 MHz

2 channels are provided for 802.11n (HT40), 802.11ac (VHT40):

Channel	Frequency	Channel	Frequency
38	5190 MHz	46	5230 MHz

1 channel is provided for 802.11ac (VHT80):

Channel	Frequency
42	5210MHz

FOR 5745 ~ 5825MHz:

5 channels are provided for 802.11a, 802.11n (HT20), 802.11ac (VHT20):

Channel	Frequency	Channel	Frequency
149	5745MHz	161	5805MHz
153	5765MHz	165	5825MHz
157	5785MHz	-	-

2 channels are provided for 802.11n (HT40), 802.11ac (VHT40):

Channel	Frequency	Channel	Frequency
151	5755MHz	159	5795MHz

1 channel is provided for 802.11ac (VHT80):

Channel	Frequency
155	5775MHz

6.3. Test Condition

Test Item	Test Site No.	Environmental Condition	Input Power	Test Date	Tested by
Antenna Port Conducted Measurement	SR4	22~24℃/ 60~66%RH	5Vdc	2023/07/26~ 2023/07/31	WaterNil Guan
Radiated Spurious Emission	966-2	22~24℃/ 59~68%RH	5Vdc	2023/07/24~ 2023/08/01	WaterNil Guan
AC power Line Conducted Emission	SR1	24~24℃/ 67~67%RH	110Vac/ 60Hz	2023/08/01~ 2023/08/01	WaterNil Guan

FCC Test Firm Registration Number: 498077

Sample Calculation:

Antenna Port Conducted Measurement:

- Where relevant, the follow sample calculation is provided:
  Result Value (dBm) = Reading Value (dBm) +Attenuator Factor (dB) + Cable Loss (dB).
  Example: Result Value (10dBm) = Reading Value (-2dBm) +Attenuator Factor (10dB) + Cable Loss(2dB).
  *Test plot only shown the “Result Value”.

Radiated Spurious Emission:

- Where relevant, the follow sample calculation is provided:
  Result Value (dBuV/m) = Reading Value (dBuV) + Correction Factor (dB/m).
  Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Loss (dB) - Preamp Factor (dB).
  Example: Result Value (34.5dBuV/m) = Reading Value (40.1dBuV) + Antenna Factor (18.7dB/m) + Cable Loss (4.2dB) - Preamp Factor (28.5dB).

AC power Line Conducted Emission:

- Where relevant, the follow sample calculation is provided:
  Result Value (dBuV) = Reading Value (dBuV) + Correction Factor (dB).
  Correction Factor (dB) = Insertion loss(dB) + Cable loss(dB).
  Example: Result Value (53.7dBuV) = Reading Value (35.1dBuV) + Insertion loss(18.1dB) + Cable loss(0.5dB).

6.4. Description of Available Antennas

Ant. No.	Transmitter Circuit	Brand Name	Model Name	Ant. Type	Maximum Gain (dBi)
1	Chain (0)	Redbirdtek	RBT-ANT-524-03-A002	Metal type antenna	5150-5350 GHz :1.27 5710-5850 GHz : 0.67

Note: The above antenna information was provided from customer and for more detailed features description, please refer the manufacturer's specification or user's manual, the laboratory shall not be held responsible.

6.5. Test Mode Applicability and Tested Channel Detail

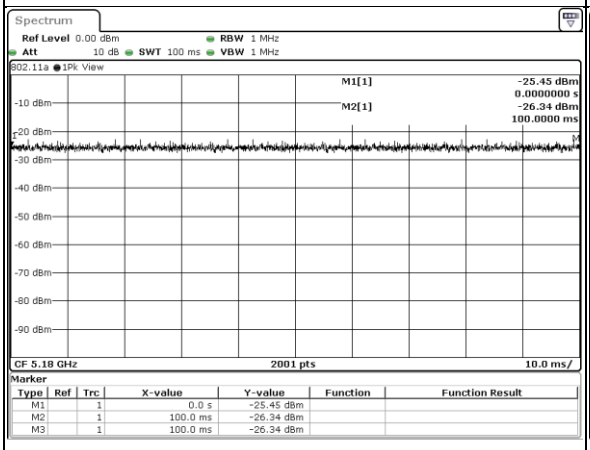
- The fundamental of the EUT was investigated in three orthogonal axes X-Y/Y-Z/X-Z, it was determined that Y-Z plane was worst-case. Therefore, all final radiated testing was performed with the EUT in Y-Z plane.
- For Antenna Port Conducted Measurement, this item includes all test value of each mode, but only includes spectrum plot of worst value of each mode.
- For below 30MHz testing, investigation was done on three antenna orientations (parallel, perpendicular, and ground-parallel), parallel and perpendicular are the worst orientations, therefore testing was performed on these two orientations only.
- For below 1 GHz radiated emission and AC power line conducted emission have performed all modes of operation were investigated and the worst-case emissions are reported.
- Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

Test Item	Mode	Modulation Technology	Modulation Type	Available Channel	Test Channel	Data Rate
Radiated Emissions (Above 1GHz)	802.11a	5180-5240	OFDM	36 to 48	36, 44, 48	6Mbps
	802.11ac20			36 to 48	36, 44, 48	MCS0 Nss1
	802.11ac40			38 to 46	38, 46	MCS0 Nss1
	802.11ac80			42	42	MCS0 Nss1
	802.11a	5745-5825	OFDM	149 to 165	149, 157, 165	6Mbps
	802.11ac20			149 to 165	149, 157, 165	MCS0 Nss1
	802.11ac40			151 to 159	151, 159	MCS0 Nss1
	802.11ac80			155	155	MCS0 Nss1
Radiated Emissions (Below 1GHz)	802.11a	5180-5240	OFDM	36 to 48	48	6Mbps
AC Power Line Conducted Emission	802.11a	5180-5240	OFDM	36 to 48	48	6Mbps
Antenna Port Conducted Measurement	802.11a	5180-5240	OFDM	36 to 48	36, 44, 48	6Mbps
	802.11ac20			36 to 48	36, 44, 48	MCS0 Nss1
	802.11ac40			38 to 46	38, 46	MCS0 Nss1
	802.11ac80			42	42	MCS0 Nss1
	802.11a	5745-5825	OFDM	149 to 165	149, 157, 165	6Mbps
	802.11ac20			149 to 165	149, 157, 165	MCS0 Nss1
	802.11ac40			151 to 159	151, 159	MCS0 Nss1
	802.11ac80			155	155	MCS0 Nss1

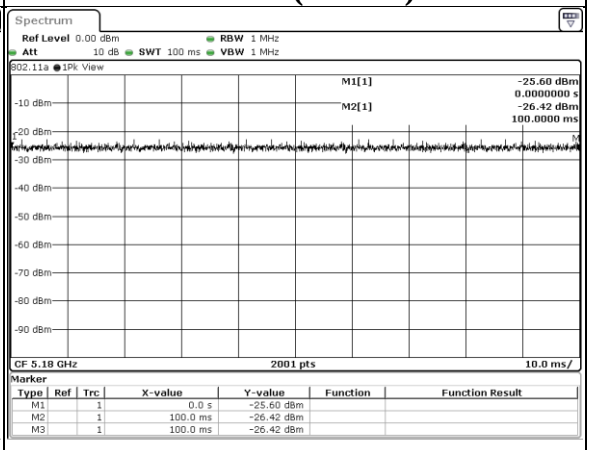
6.6. Duty cycle

Mode	On Time (ms)	On+Off Time (ms)	Duty Cycle	Duty Factor (dB)	VBW Set (above 1GHz)
802.11a	100.000	100.000	1.0000	N/A	10Hz
802.11ac(VHT20)	100.000	100.000	1.0000	N/A	10Hz
802.11ac(VHT40)	100.000	100.000	1.0000	N/A	10Hz
802.11ac(VHT80)	100.000	100.000	1.0000	N/A	10Hz

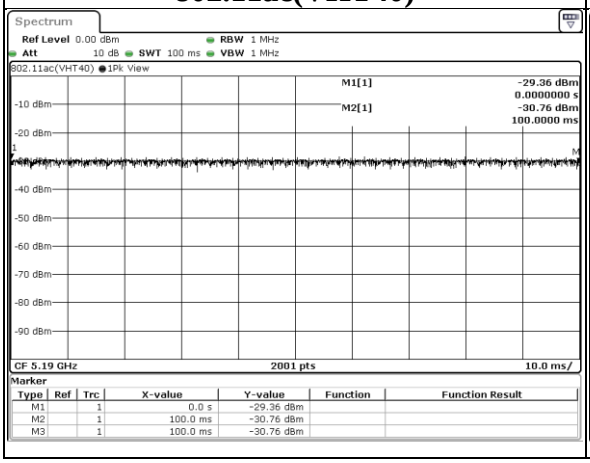
802.11a



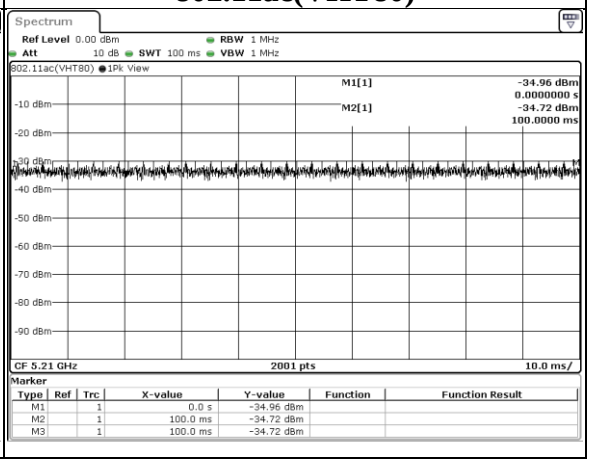
802.11ac(VHT20)



802.11ac(VHT40)



802.11ac(VHT80)



7. Test Equipment

Test Equipment List					
Equipment	**Manufacturer**	**Model No.**	**Serial No.**	**Cal. Date**	**Expired date**
Radiated Spurious Emission					
Spectrum Analyzer	Keysight	N9010A	MY56070827	2023/4/7	2024/4/6
EMI Test Receiver	Rohde & Schwarz	ESR7	101754	2022/12/13	2023/12/12
Loop Antenna	ETS lindgren	6502	00213440	2023/1/4	2024/1/3
Trilog-Broadband Antenna with 5dB Attenuator	Schwarzbeck & EMCI	VULB 9168 & N-6-05	774 & AT-N0538	2023/2/13	2024/2/12
Horn Antenna (1-18 GHz)	Schwarzbeck	BBHA 9120 D	01690	2022/12/21	2023/12/20
Horn Antenna (18-40 GHz)	Schwarzbeck	BBHA 9170	781	2022/12/30	2023/12/29
Preamplifier (30-1000 MHz)	EMCI	EMC330E	980405	2023/6/7	2024/6/6
Preamplifier (1-18 GHz)	EMCI	EMC051835BE	980406	2023/2/17	2024/2/16
Preamplifier (18-40GHz)	EMCI	EMC184040SEE	980426	2023/5/9	2024/5/8
Cables	Hanyitek	K1K50-UP0264-K1K50-2500	170214-4 & 170425-2	2022/12/1	2023/11/30
Cables	Hanyitek	K1K50-UP0264-K1K50-2500	170214-1 & 170214-2	2022/12/1	2023/11/30

Test Equipment List					
Equipment	**Manufacturer**	**Model No.**	**Serial No.**	**Cal. Date**	**Expired date**
Antenna Port Conducted Measurement					
Spectrum Analyzer	Keysight	N9010A	MY56070834	2022/10/24	2023/10/23
Attenuator	EMCI	EMC-40ATK2W10	17002	2022/12/9	2023/12/8
USB Power Sensor	Anritsu	MA24408A	12031	2023/7/12	2024/7/11
Temperature &Humidity Test Chamber	GIANT FORCE	GTH-150-40-CP-AR	MAA1701-010	2023/3/8	2024/3/7
AC power Line Conducted Emission					
EMI Test Receiver	Rohde & Schwarz	ESR7	101753	2022/11/10	2023/11/9
Two-Line V-Network	Rohde & Schwarz	ENV216	102136	2023/5/24	2024/5/23
Impuls-Begrenzer Pulse Limiter	Rohde & Schwarz	ESH3-Z2	102219-Qt	2022/8/30	2023/8/29
Cables	TITAN	CFD200	T0732ACFD200 20A300-2	2023/5/23	2024/5/22

UL Software		
Description	**Name**	**Version**
Radiated measurement	e3	6.191211 (V6)
Conducted measurement	RF-Conducted-FCC 15407	ver 1.1
AC power Line Conducted Emission	EZ_EMC	UL-3A1.2

8. Description of Test Setup

Support Equipment

ID	Equipment	Brand Name	Model Name	S/N	Remark
A	Adapter	AMIGO	AMS195-0502000FU	N/A	Provided by Client
B	Laptop	DELL	Latitude E6430	2MMN3X1	Provided by LAB
C	female HDMI to female HDMI adapter	Benevo	BHDMICPLR	N/A	Provided by LAB

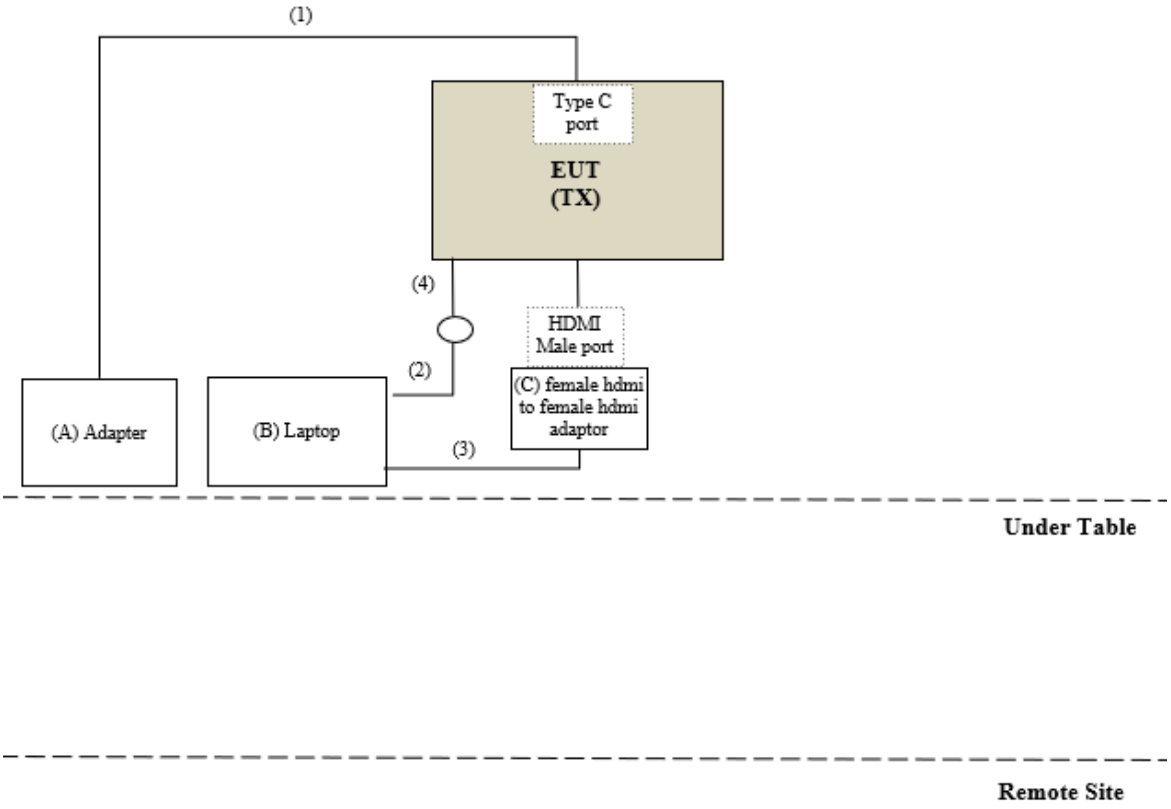
I/O Cables

ID	Equipment	Brand Name	Model Name	Length (m)	Remark
1	USB cable	PX	F1546-02G	1	Provided by Client
2	USB Standard Type A Male to Female Cable	I - wiz	US-44	1	Provided by LAB
3	HDMI Cable	PX	HM2-AA120	2	Provided by Client
4	USB RF Console Cable	PX	USB A to B 4 core	0.08	Provided by Client

Test Setup

Controlled using a bespoke application (Realtek 11ac 8821C USB WLAN MP Diagnostic Program 0.0003.07.20190211) on a test Notebook. The application was used to enable a continuous transmission mode and to select the test channels, data rates, modulation schemes and power setting as required.

Setup Diagram for Test



9. Test Results

9.1. 6dB Bandwidth

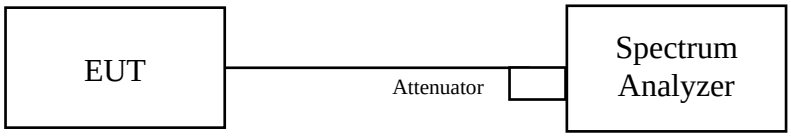
Requirements

The minimum 6 dB bandwidth shall be at least 500 kHz.

Test procedure

a. Set resolution bandwidth (RBW) = 100kHz
b. Set the video bandwidth (VBW) ≥ 3 x RBW, Detector = Peak.
c. Trace mode = max hold.
d. Sweep = auto couple.
e. Measure the maximum width of the emission that is constrained by the frequencies associated with the two amplitude points (upper and lower) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission
f. In the plot of the test result, only the worst channel is shown as a representative.

Test Setup

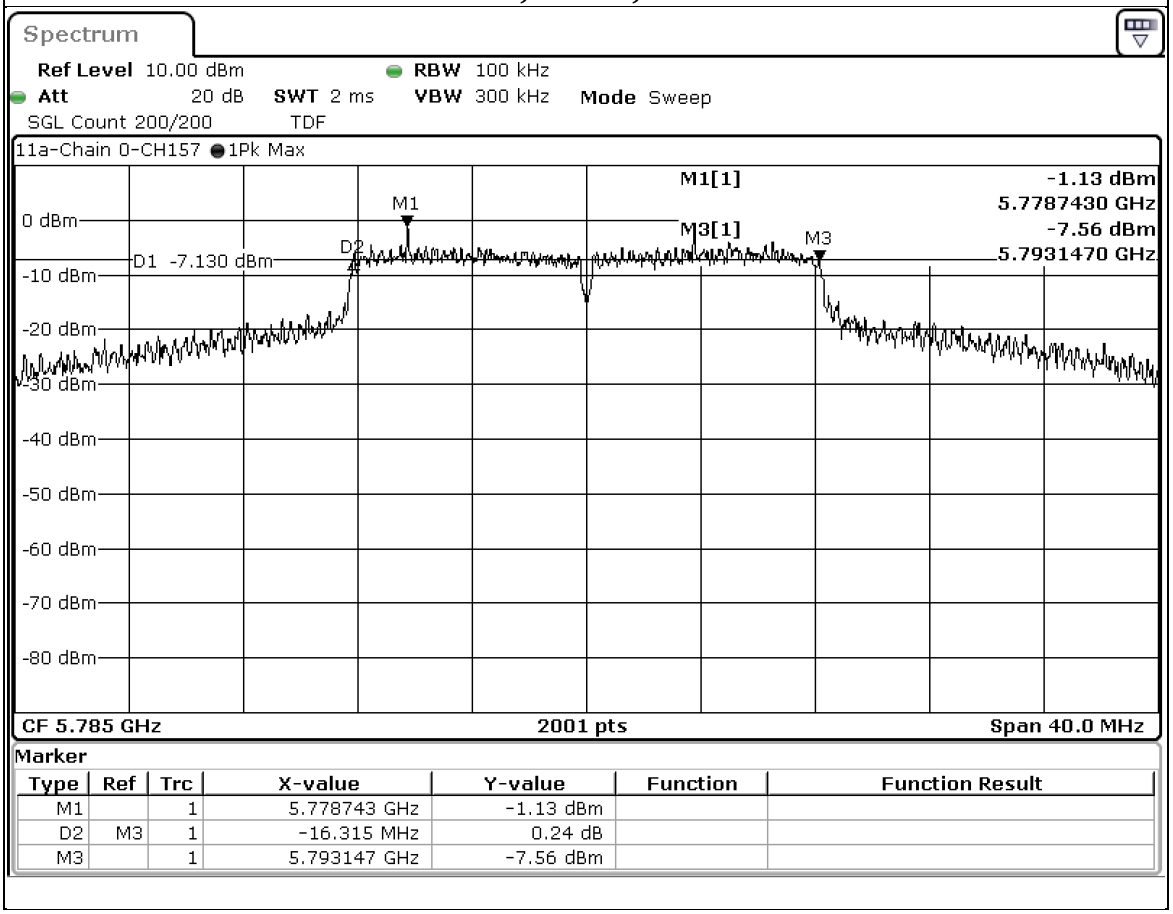


The loss between RF output port of the EUT and the input port of the Spectrum Analyzer has been taken into consideration.

Test Data

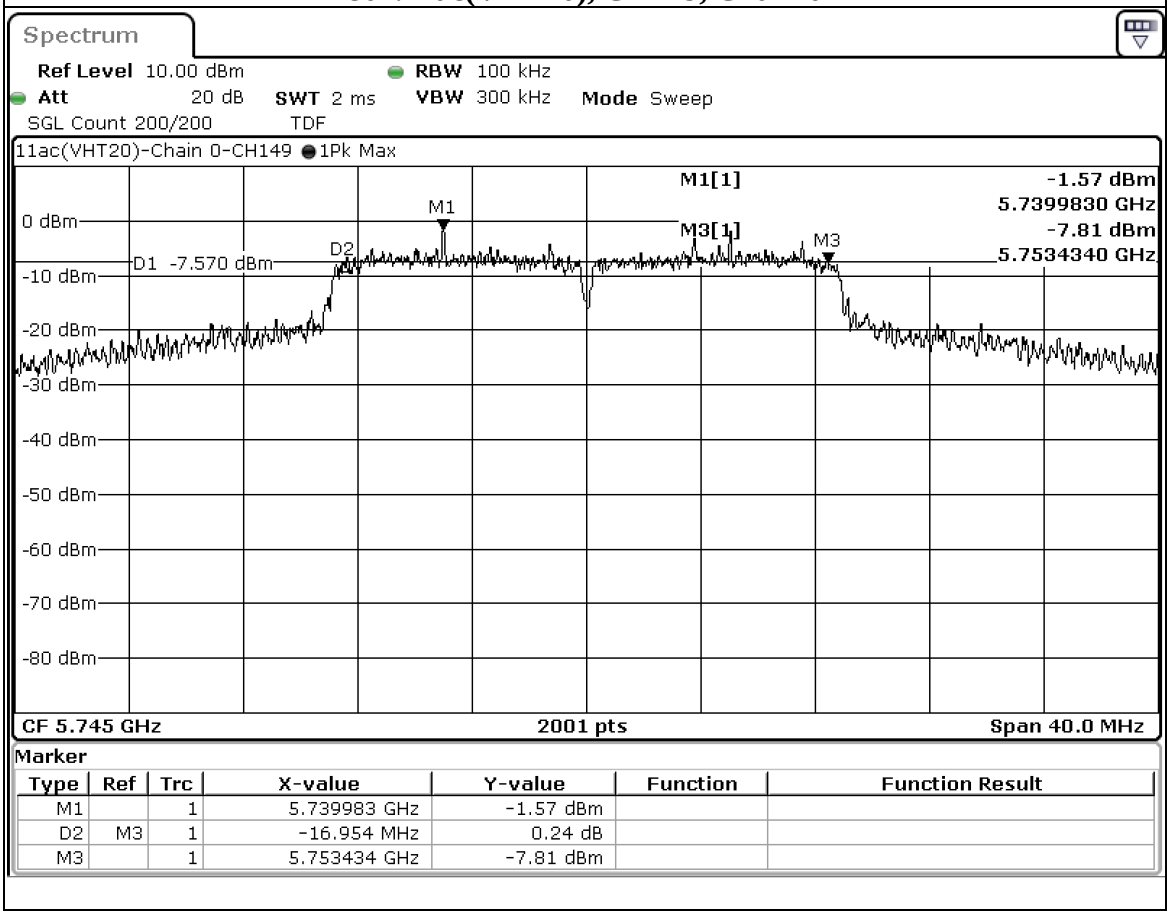
Mode	CH	Freq (MHz)	6dB BW (MHz) Chain 0	Limit (MHz)	Result
802.11a	149	5745	16.331	0.5	PASS
	157	5785	16.315	0.5	PASS
	165	5825	16.326	0.5	PASS

802.11a, CH157, Chain 0



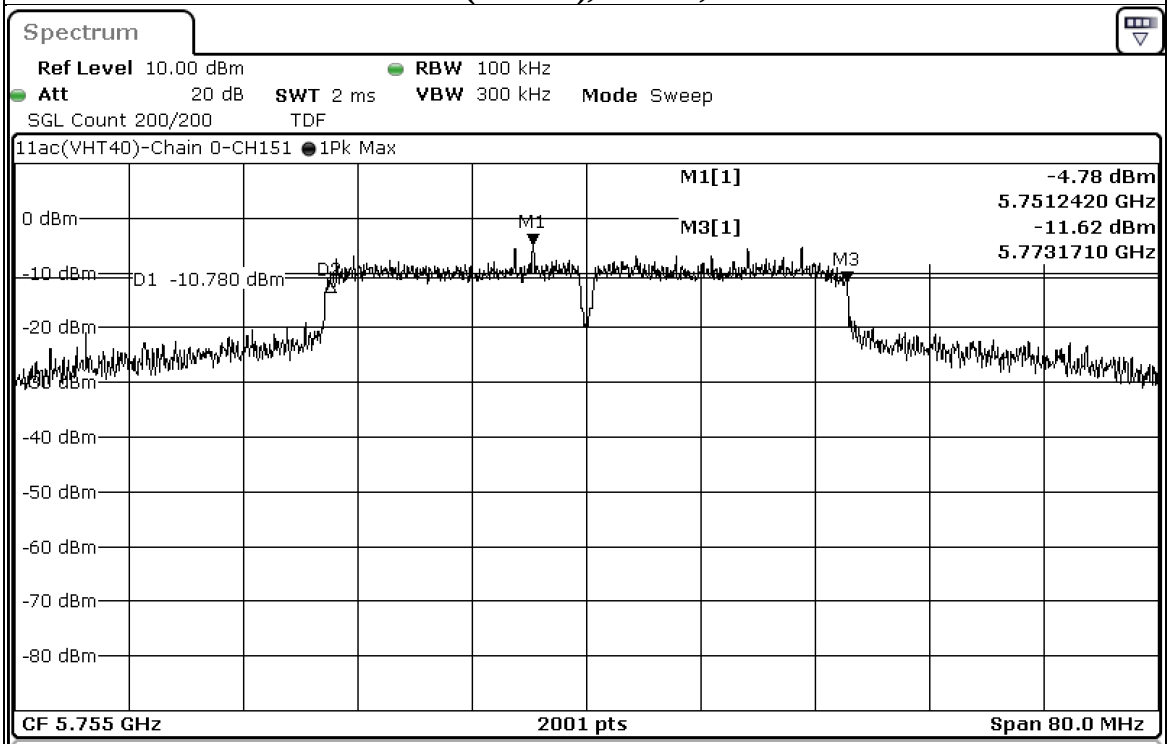
Mode	CH	Freq (MHz)	6dB BW (MHz)	Limit (MHz)	Result
			Chain 0		
802.11ac(VHT20)	149	5745	16.954	0.5	PASS
	157	5785	17.584	0.5	PASS
	165	5825	17.438	0.5	PASS

802.11ac(VHT20), CH149, Chain 0



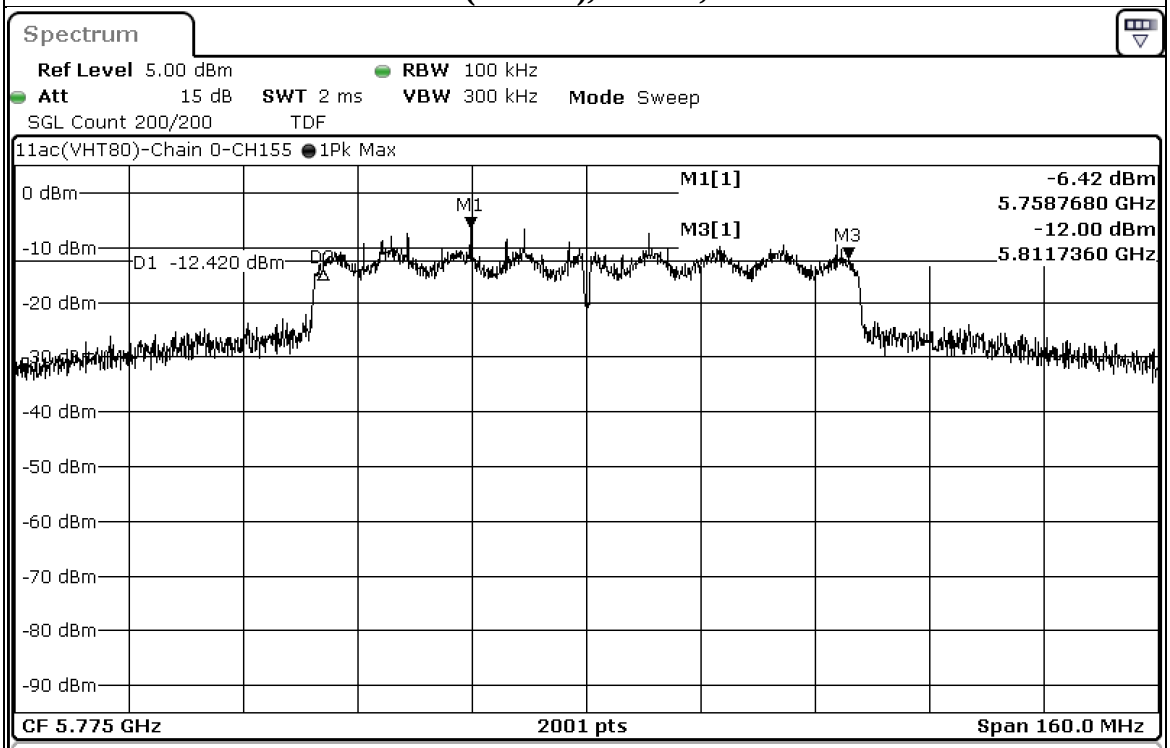
Mode	CH	Freq (MHz)	6dB BW (MHz) Chain 0	Limit (MHz)	Result
802.11ac(VHT40)	151	5755	36.107	0.5	PASS
	159	5795	36.355	0.5	PASS

802.11ac(VHT40), CH151, Chain 0



Mode	CH	Freq (MHz)	6dB BW (MHz) Chain 0	Limit (MHz)	Result
802.11ac(VHT80)	155	5775	73.654	0.5	PASS

802.11ac(VHT80), CH155, Chain 0

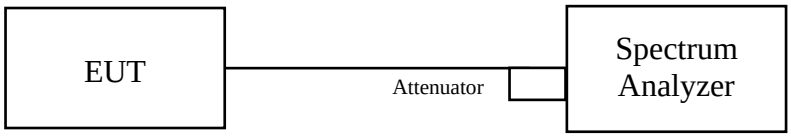


9.2. 26dB Bandwidth

Test procedure

a. Set RBW = approximately 1% of the emission bandwidth.
b. Set the VBW > RBW.
c. Detector = Peak.
d. Trace mode = max hold.
e. Measure the maximum width of the emission that is 26 dB down from the peak of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.
f. In the plot of the test result, only the worst channel is shown as a representative.

Test Setup

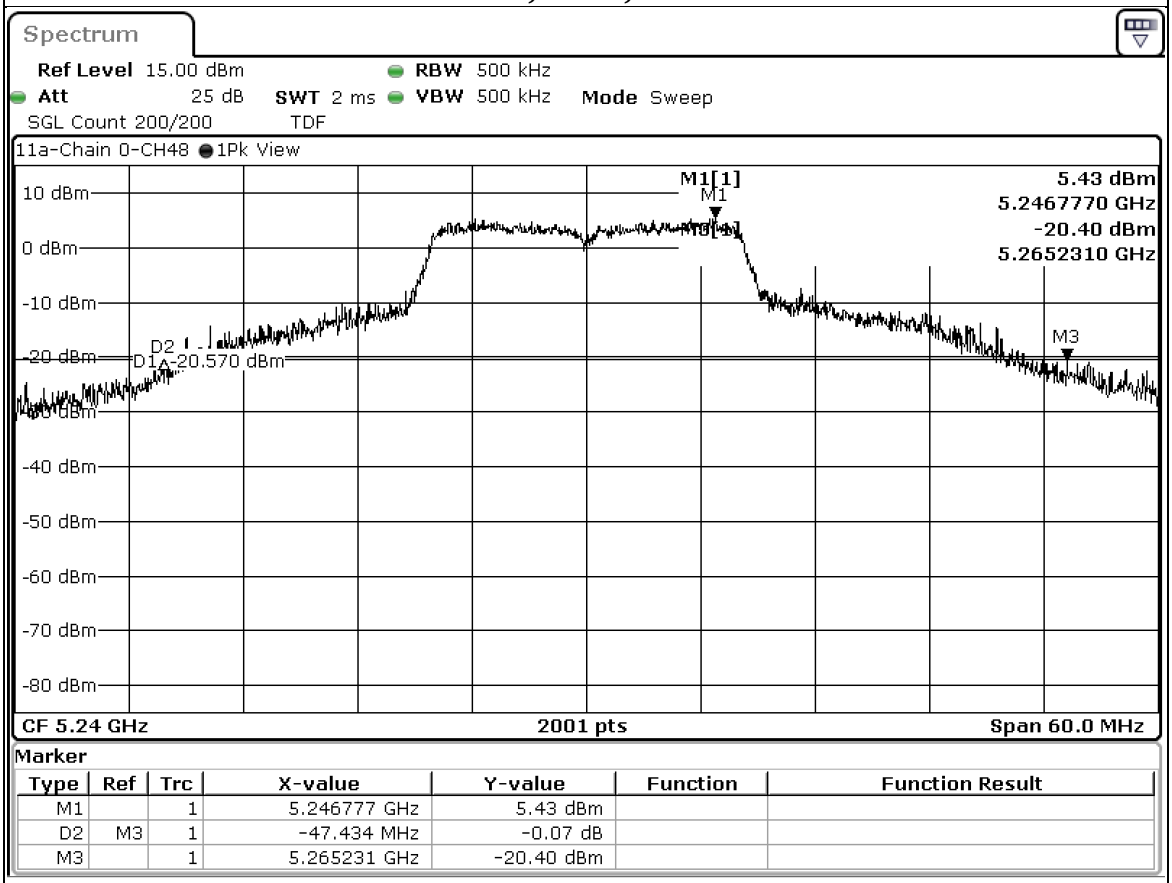


The loss between RF output port of the EUT and the input port of the Spectrum Analyzer has been taken into consideration.

Test Data

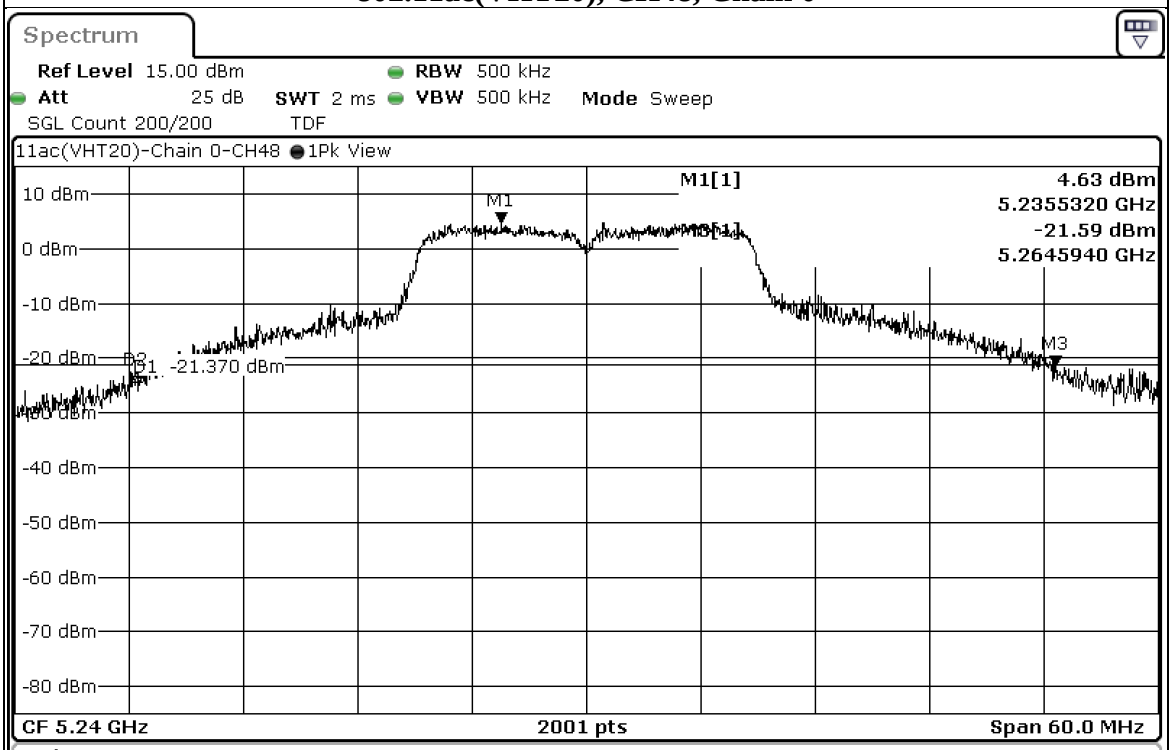
Mode	CH	Freq (MHz)	26dB BW (MHz) Chain 0	Limit (MHz)	Result
802.11a	36	5180	20.524	N/A	PASS
	44	5220	45.005	N/A	PASS
	48	5240	47.434	N/A	PASS

802.11a, CH48, Chain 0



Mode	CH	Freq (MHz)	26dB BW (MHz)	Limit (MHz)	Result
			Chain 0		
802.11ac(VHT20)	36	5180	21.031	N/A	PASS
	44	5220	47.614	N/A	PASS
	48	5240	48.212	N/A	PASS

802.11ac(VHT20), CH48, Chain 0

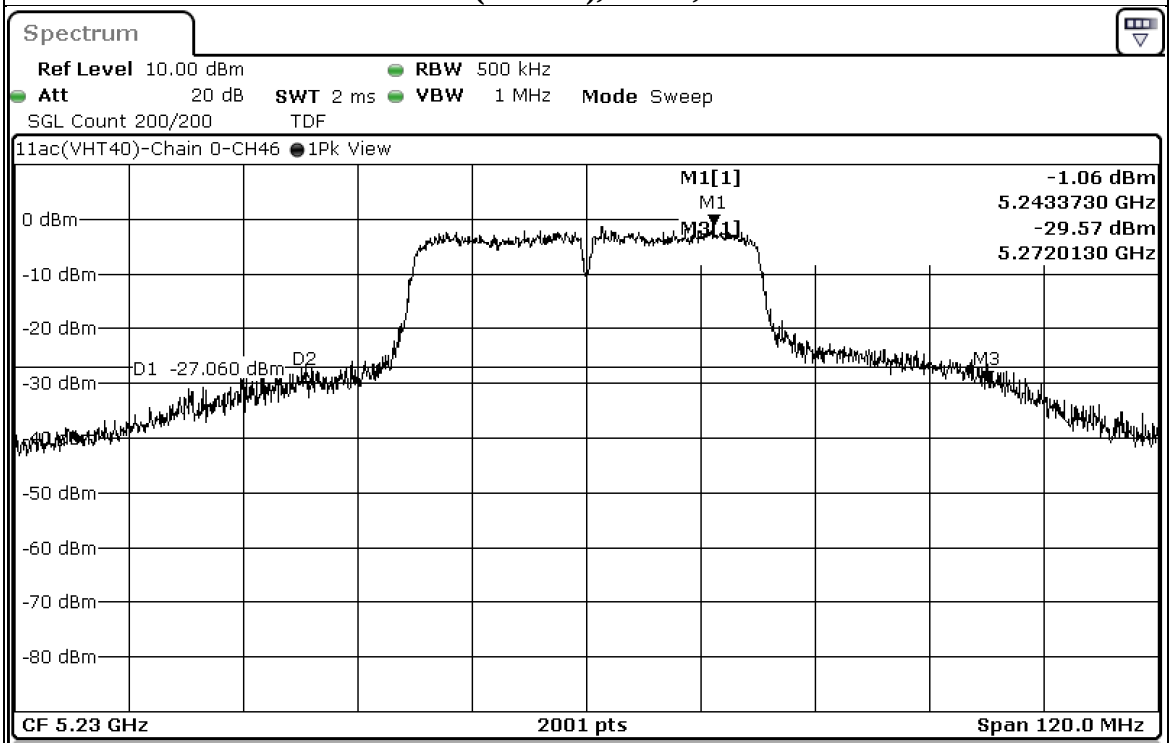


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.235532 GHz	4.63 dBm		
D2	M3	1	-48.212 MHz	-0.85 dB		
M3		1	5.264594 GHz	-21.59 dBm		

Mode	CH	Freq (MHz)	26dB BW (MHz) Chain 0	Limit (MHz)	Result
802.11ac(VHT40)	38	5190	42.146	N/A	PASS
	46	5230	71.493	N/A	PASS

802.11ac(VHT40), CH46, Chain 0

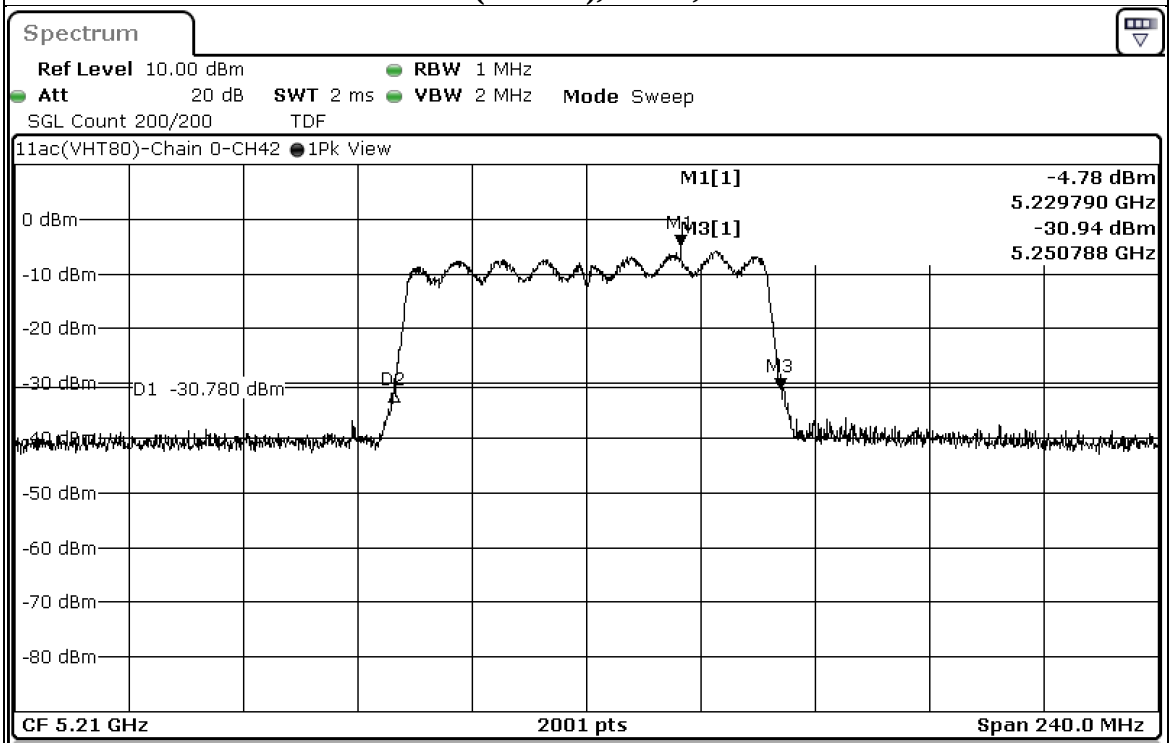


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.243373 GHz	-1.06 dBm		
D2	M3	1	-71.493 MHz	1.64 dB		
M3		1	5.272013 GHz	-29.57 dBm		

Mode	CH	Freq (MHz)	26dB BW (MHz) Chain 0	Limit (MHz)	Result
802.11ac(VHT80)	42	5210	81.188	N/A	PASS

802.11ac(VHT80), CH42, Chain 0



Marker

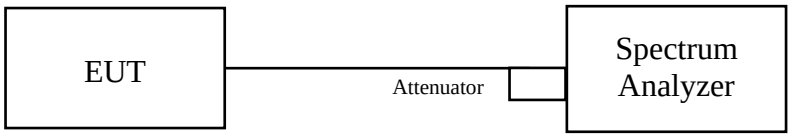
Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.22979 GHz	-4.78 dBm		
D2	M3	1	-81.188 MHz	-0.67 dB		
M3		1	5.250788 GHz	-30.94 dBm		

9.3. Occupied Bandwidth

Test procedure

a. Set center frequency to the nominal EUT channel center frequency.
b. Set span = 1.5 times to 5.0 times the OBW.
c. Set RBW = 1% to 5% of the OBW
d. Set VBW ≥ 3 x RBW
e. 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.
f. Use the 99% power bandwidth function of the instrument (if available).
g. 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.
h. In the plot of the test result, only the worst channel is shown as a representative.

Test Setup

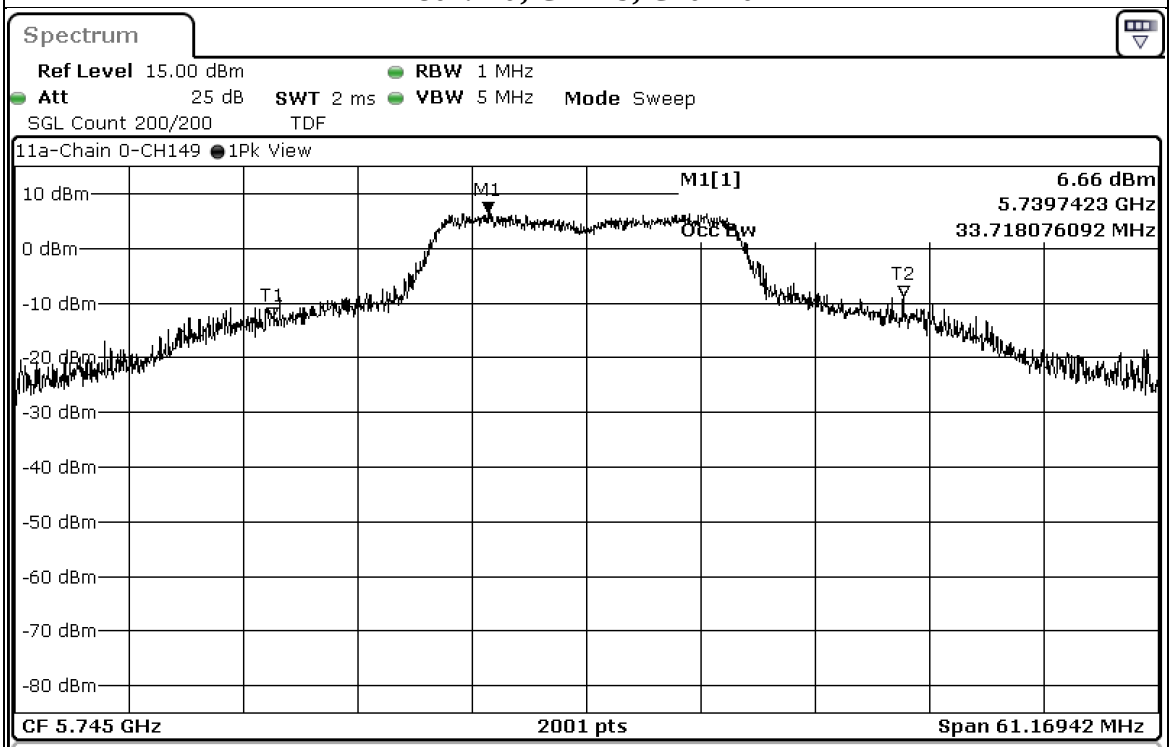


The loss between RF output port of the EUT and the input port of the Spectrum Analyzer has been taken into consideration.

Test Data

Mode	CH	Freq (MHz)	OBW (MHz) Chain 0	Limit (MHz)	Result
802.11a	36	5180	17.309	N/A	PASS
	44	5220	30.694	N/A	PASS
	48	5240	31.335	N/A	PASS
	149	5745	33.718	N/A	PASS
	157	5785	31.969	N/A	PASS
	165	5825	30.13	N/A	PASS

802.11a, CH149, Chain 0

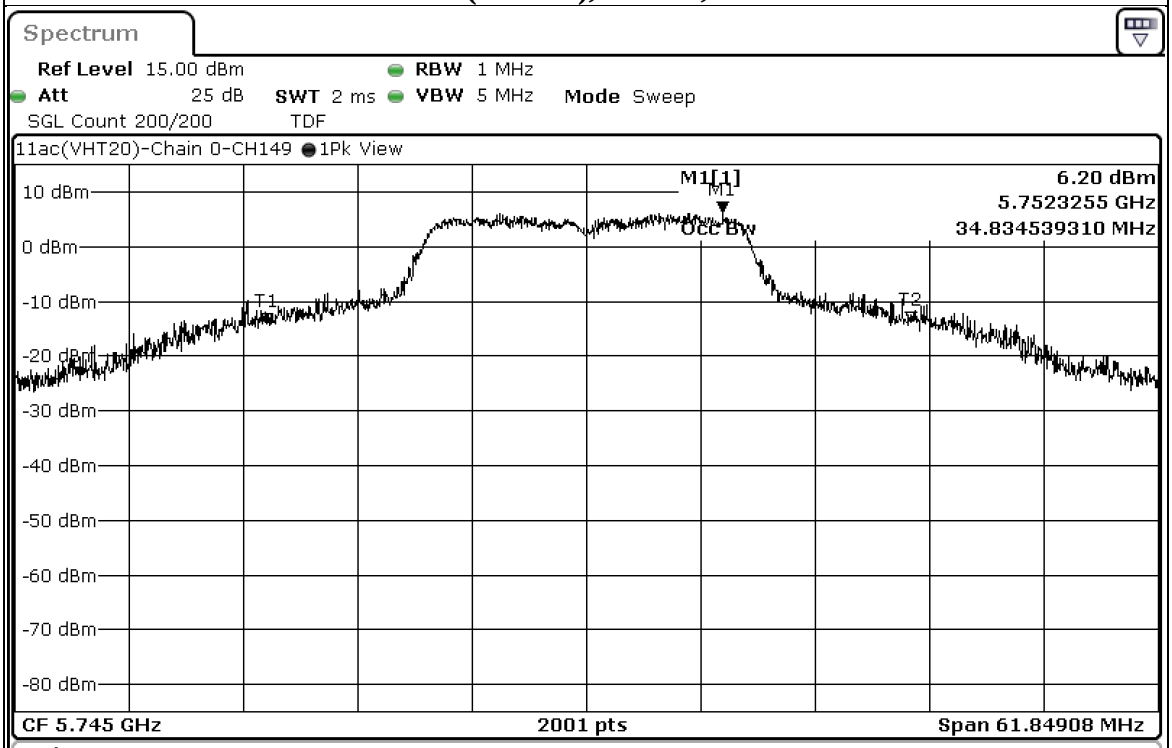


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.7397423 GHz	6.66 dBm		
T1		1	5.7282174 GHz	-12.65 dBm	Occ Bw	33.718076092 MHz
T2		1	5.7619355 GHz	-8.83 dBm		

Mode	CH	Freq (MHz)	OBW (MHz) Chain 0	Limit (MHz)	Result
802.11ac(VHT20)	36	5180	18.182	N/A	PASS
	44	5220	30.664	N/A	PASS
	48	5240	31.474	N/A	PASS
	149	5745	34.835	N/A	PASS
	157	5785	32.885	N/A	PASS
	165	5825	30.968	N/A	PASS

802.11ac(VHT20), CH149, Chain 0

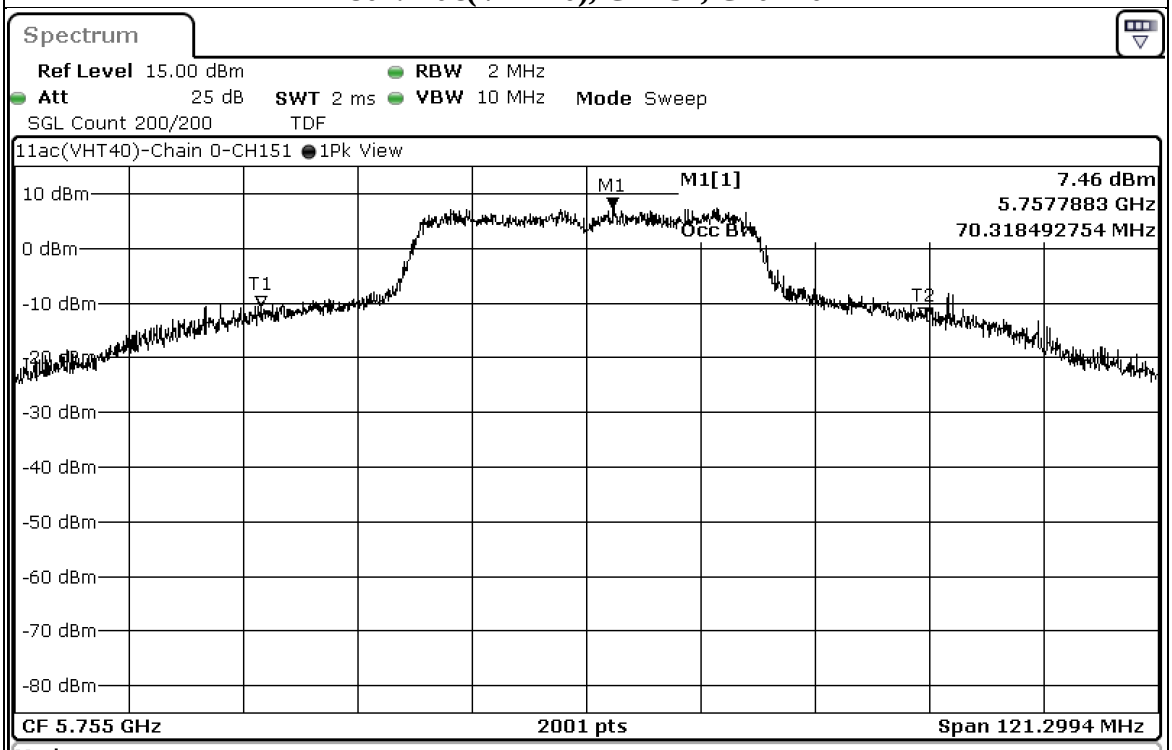


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.7523255 GHz	6.20 dBm		
T1		1	5.7276909 GHz	-14.05 dBm	Occ Bw	34.83453931 MHz
T2		1	5.7625255 GHz	-13.73 dBm		

Mode	CH	Freq (MHz)	OBW (MHz) Chain 0	Limit (MHz)	Result
802.11ac(VHT40)	38	5190	36.673	N/A	PASS
	46	5230	38.115	N/A	PASS
	151	5755	70.318	N/A	PASS
	159	5795	67.356	N/A	PASS

802.11ac(VHT40), CH151, Chain 0

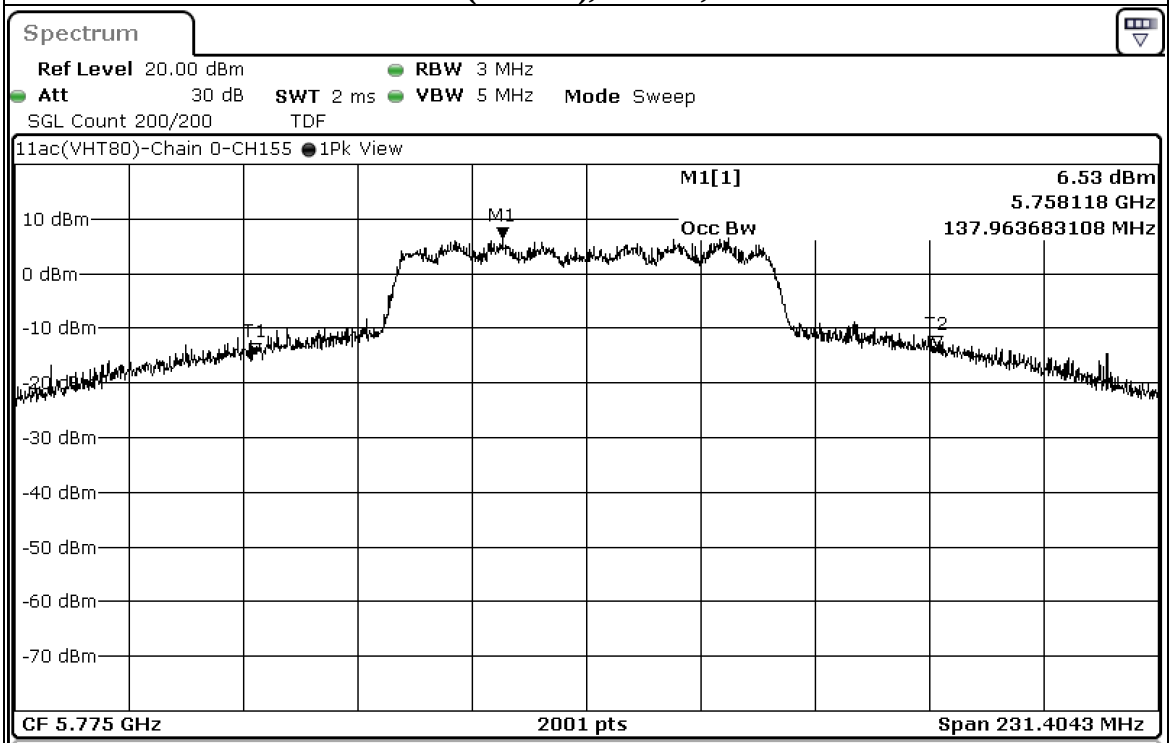


Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.7577883 GHz	7.46 dBm		
T1		1	5.7204469 GHz	-10.63 dBm	Occ Bw	70.318492754 MHz
T2		1	5.7907654 GHz	-12.67 dBm		

Mode	CH	Freq (MHz)	OBW (MHz) Chain 0	Limit (MHz)	Result
802.11ac(VHT80)	42	5210	76.842	N/A	PASS
	155	5775	137.964	N/A	PASS

802.11ac(VHT80), CH155, Chain 0



Marker

Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1		1	5.758118 GHz	6.53 dBm		
T1		1	5.707811 GHz	-14.55 dBm	Occ Bw	137.963683108 MHz
T2		1	5.845774 GHz	-13.36 dBm		

9.4. Conducted output power

Requirements

Operation Band	EUT Category		Limit
U-NII-1		Outdoor Access Point	1 Watt (30 dBm) Max. e.i.r.p ≦ 125mW(21 dBm) at any elevation angle above 30 degrees as measured from the horizon If G_{TX} > 6 dBi, then P_{Out} = 30 – (G_{TX} – 6)
		Fixed point-to-point Access Point	1 Watt (30 dBm) If G_{TX} > 23 dBi, then P_{Out} = 30 – (G_{TX} – 23)
		Indoor Access Point	1 Watt (30 dBm) If G_{TX} > 6 dBi, then P_{Out} = 30 – (G_{TX} – 6)
	√	Client device	250mW (24 dBm) If G_{TX} > 6 dBi, then P_{Out} = 23.98 – (G_{TX} – 6)
U-NII-2A	---		250mW (24 dBm) or 11 dBm+10 log B* If G_{TX} > 6 dBi, then P_{Out} = 23.98 – (G_{TX} – 6)
U-NII-2C	---		250mW (24 dBm) or 11 dBm+10 log B* If G_{TX} > 6 dBi, then P_{Out} = 23.98 – (G_{TX} – 6)
U-NII-3	√		For Point-to-multipoint systems (P2M): 1 Watt (30 dBm). If G_{TX} > 6 dBi, then P_{Out} = 30 – (G_{TX} – 6) For Point-to-point systems (P2P): 1 Watt (30 dBm)

Note:
1. P_{Out} = maximum conducted output power in dBm, G_{TX} = the maximum transmitting antenna directional gain in dBi, B is the 26 dB emission bandwidth in megahertz

Test Procedure

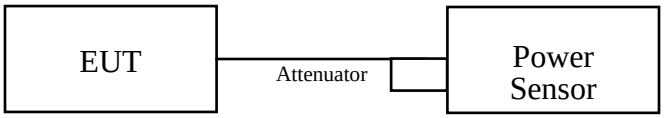
For Average Power Measurement

Test method PM

Method PM is used to perform output power measurement, trigger and gating function of wide band power meter is enabled to measure max output power of TX on burst and set the detector to AVERAGE. Duty factor is not added to measured value.

Test Setup

For Average Power Measurement



The loss between RF output port of the EUT and the input port of the Power Meter has been taken into consideration.

Test Data

802.11a

Channel	Channel Frequency (MHz)	Maximum Conducted Power (mW)	Maximum Conducted Power (dBm)	Power Limit (dBm)	Pass/Fail
36	5180	3.177	5.02	24	PASS
44	5220	18.578	12.69	24	PASS
48	5240	19.364	12.87	24	PASS
149	5745	8.279	9.18	30	PASS
157	5785	8.551	9.32	30	PASS
165	5825	8.472	9.28	30	PASS

802.11ac (VHT20)

Channel	Channel Frequency (MHz)	Maximum Conducted Power (mW)	Maximum Conducted Power (dBm)	Power Limit (dBm)	Pass/Fail
36	5180	2.825	4.51	24	PASS
44	5220	18.967	12.78	24	PASS
48	5240	18.836	12.75	24	PASS
149	5745	7.998	9.03	30	PASS
157	5785	8.166	9.12	30	PASS
165	5825	8.375	9.23	30	PASS

802.11ac (VHT40)

Channel	Channel Frequency (MHz)	Maximum Conducted Power (mW)	Maximum Conducted Power (dBm)	Power Limit (dBm)	Pass/Fail
38	5190	2.158	3.34	24	PASS
46	5230	7.261	8.61	24	PASS
151	5755	8.375	9.23	30	PASS
159	5795	8.204	9.14	30	PASS

802.11ac (VHT80)

Channel	Channel Frequency (MHz)	Maximum Conducted Power (mW)	Maximum Conducted Power (dBm)	Power Limit (dBm)	Pass/Fail
42	5210	1.702	2.31	24	PASS
155	5775	7.727	8.88	30	PASS

9.5. Power Spectral Density

Requirements

Operation Band	EUT Category		Limit
U-NII-1		Outdoor Access Point	17dBm/ MHz If G_{TX} > 6 dBi, then PSD = 17 – (G_{TX} – 6)
		Fixed point-to-point Access Point	17dBm/ MHz If G_{TX} > 23 dBi, then PSD = 17 – (G_{TX} – 23)
		Indoor Access Point	17dBm/ MHz If G_{TX} > 6 dBi, then PSD = 17 – (G_{TX} – 6)
	√	Client device	11dBm/ MHz If G_{TX} > 6 dBi, then PSD = 11 – (G_{TX} – 6)
U-NII-2A	---		11dBm/ MHz If G_{TX} > 6 dBi, then PSD = 11 – (G_{TX} – 6)
U-NII-2C	---		11dBm/ MHz If G_{TX} > 6 dBi, then PSD = 11 – (G_{TX} – 6)
U-NII-3	√		For Point-to-multipoint systems (P2M): 30dBm/ 500kHz. If G_{TX} > 6 dBi, then PSD = 30 – (G_{TX} – 6) For Point-to-point systems (P2P): 30dBm/ 500kHz

Note:
1. PSD = power spectral density that he same method as used to determine the conducted output power shall be used to determine the power spectral density. And power spectral density in dBm/MHz
2. G_{TX} = the maximum transmitting antenna directional gain in dBi.
3. Refer to section 6.6 for duty cycle spectrum plot. (If duty cycle<98%)

Test procedure

For U-NII-1 band:

Using method as below:

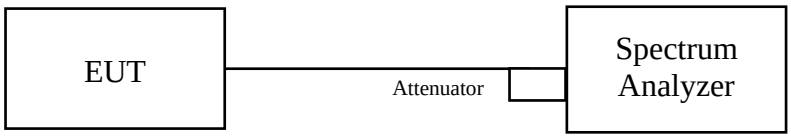
a. Set span to encompass the entire emission bandwidth (EBW) of the signal.
b. Set RBW = 1 MHz, Set VBW ≥ 3 RBW, Detector = RMS
c. Sweep time = auto, trigger set to "free run".
d. Trace average at least 100 traces in power averaging mode.
e. Record the max value. (if Duty cycle <98 %, add 10 log (1/duty cycle))

For U-NII-3 band:

Using method as below:

a. Set span to encompass the entire emission bandwidth (EBW) of the signal.
b. Set RBW = 300 kHz, Set VBW ≥ 1 MHz, Detector = RMS
c. Use the peak marker function to determine the maximum power level in any 300 kHz band segment within the fundamental EBW.
d. Scale the observed power level to an equivalent value in 500 kHz by adjusting (reducing) the measured power by a bandwidth correction factor (BWCF) where BWCF = 10 log (500 kHz/300kHz)
e. Sweep time = auto, trigger set to "free run".
f. Trace average at least 100 traces in power averaging mode.
g. Record the max value. (if Duty cycle <98 %, add 10 log (1/duty cycle))

Test Setup



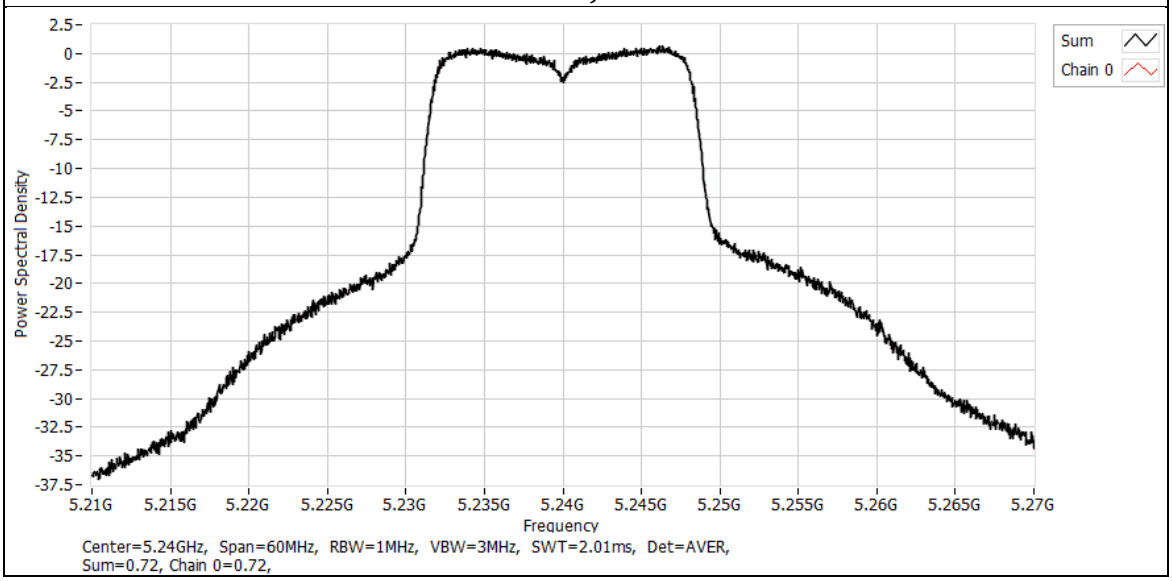
The loss between RF output port of the EUT and the input port of the Spectrum Analyzer has been taken into consideration.

Test Data

Mode (U-NII-1)	CH	Freq (MHz)	Directional Gain (dBi)	Total PSD (dBm/MHz)	Limit (dBm/MHz)	Result
802.11a	36	5180	1.27	-6.84	11	PASS
	44	5220	1.27	0.55	11	PASS
	48	5240	1.27	0.72	11	PASS

Mode (U-NII-1)	CH	Freq (MHz)	PSD per Chain (dBm/MHz)
			Chain 0
802.11a	36	5180	-6.836
	44	5220	0.547
	48	5240	0.715

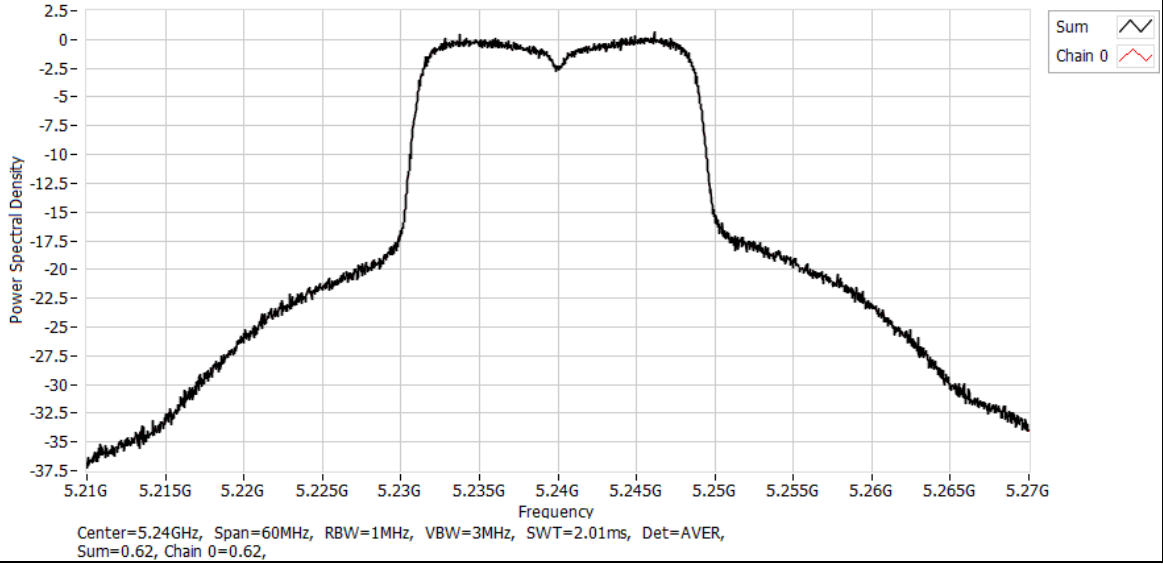
802.11a, CH48



Mode (U-NII-1)	CH	Freq (MHz)	Directional Gain (dBi)	Total PSD (dBm/MHz)	Limit (dBm/MHz)	Result
802.11ac(VHT20)	36	5180	1.27	-7.28	11	PASS
	44	5220	1.27	0.32	11	PASS
	48	5240	1.27	0.62	11	PASS

Mode (U-NII-1)	CH	Freq (MHz)	PSD per Chain (dBm/MHz)
			Chain 0
802.11ac(VHT20)	36	5180	-7.283
	44	5220	0.315
	48	5240	0.624

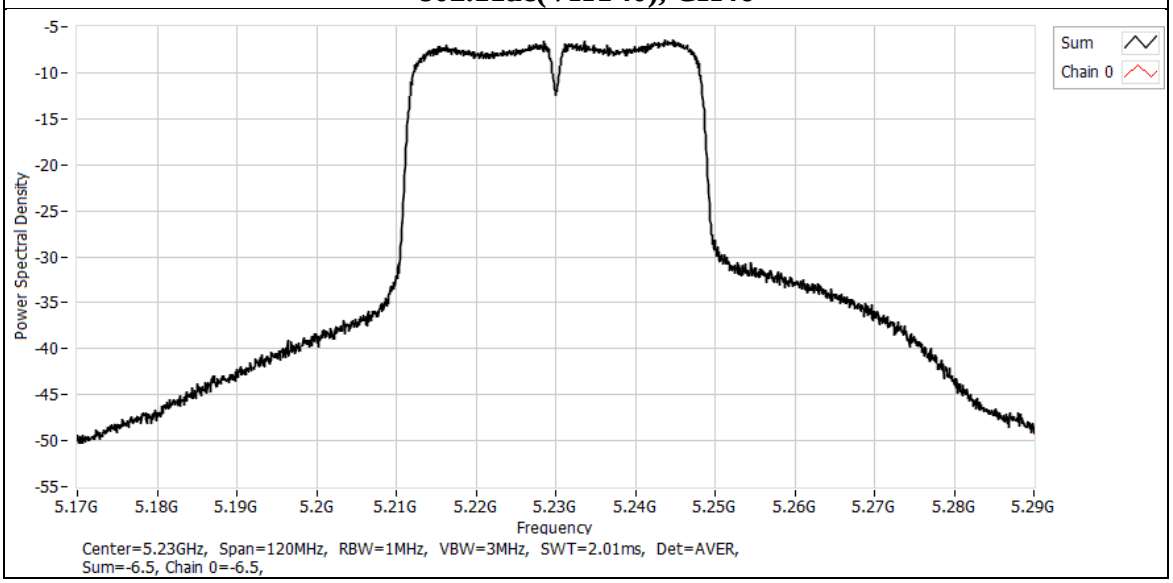
802.11ac(VHT20), CH48



Mode (U-NII-1)	CH	Freq (MHz)	Directional Gain (dBi)	Total PSD (dBm/MHz)	Limit (dBm/MHz)	Result
802.11ac(VHT40)	38	5190	1.27	-12.99	11	PASS
	46	5230	1.27	-6.5	11	PASS

Mode (U-NII-1)	CH	Freq (MHz)	PSD per Chain (dBm/MHz)
			Chain 0
802.11ac(VHT40)	38	5190	-12.991
	46	5230	-6.496

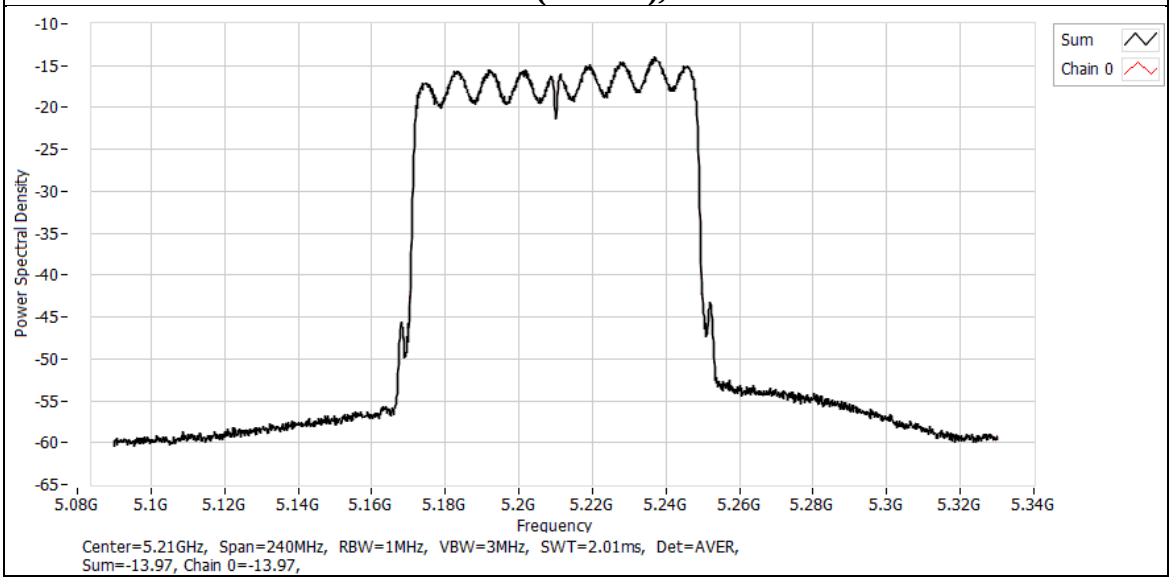
802.11ac(VHT40), CH46



Mode (U-NII-1)	CH	Freq (MHz)	Directional Gain (dBi)	Total PSD (dBm/MHz)	Limit (dBm/MHz)	Result
802.11ac(VHT80)	42	5210	1.27	-13.97	11	PASS

Mode (U-NII-1)	CH	Freq (MHz)	PSD per Chain (dBm/MHz)
			Chain 0
802.11ac(VHT80)	42	5210	-13.974

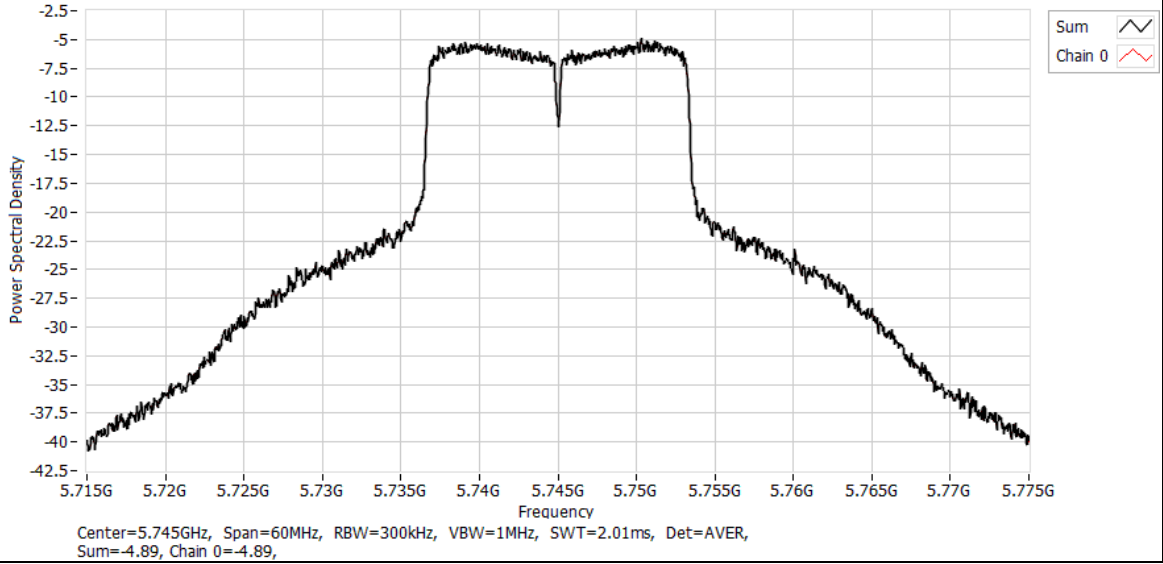
802.11ac(VHT80), CH42



Mode (U-NII-3)	CH	Freq (MHz)	BWCF	Directional Gain (dBi)	Total PSD (dBm/500kHz)	Limit (dBm/500kHz)	Result
802.11a	149	5745	2.22	1.27	-2.67	30	PASS
	157	5785	2.22	1.27	-2.81	30	PASS
	165	5825	2.22	1.27	-2.84	30	PASS

Mode (U-NII-3)	CH	Freq (MHz)	PSD per Chain (dBm/500kHz)
			Chain 0
802.11a	149	5745	-4.892
	157	5785	-5.031
	165	5825	-5.062

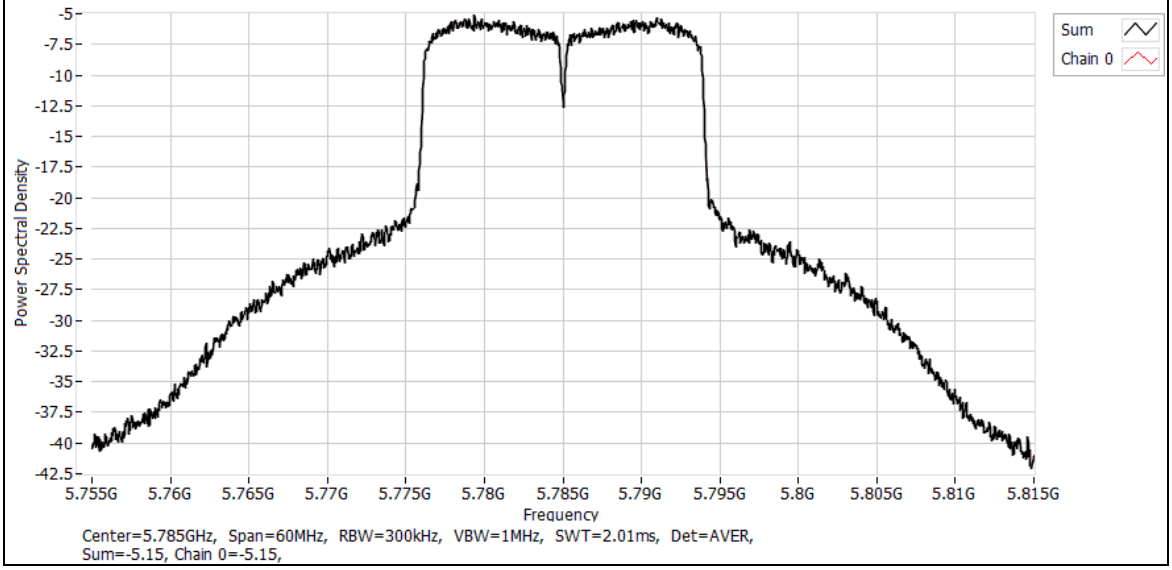
802.11a, CH149



Mode (U-NII-3)	CH	Freq (MHz)	BWCF	Directional Gain (dBi)	Total PSD (dBm/500kHz)	Limit (dBm/500kHz)	Result
802.11ac(VHT20)	149	5745	2.22	1.27	-3.2	30	PASS
	157	5785	2.22	1.27	-2.93	30	PASS
	165	5825	2.22	1.27	-3.22	30	PASS

Mode (U-NII-3)	CH	Freq (MHz)	PSD per Chain (dBm/500kHz)
			Chain 0
802.11ac(VHT20)	149	5745	-5.422
	157	5785	-5.153
	165	5825	-5.443

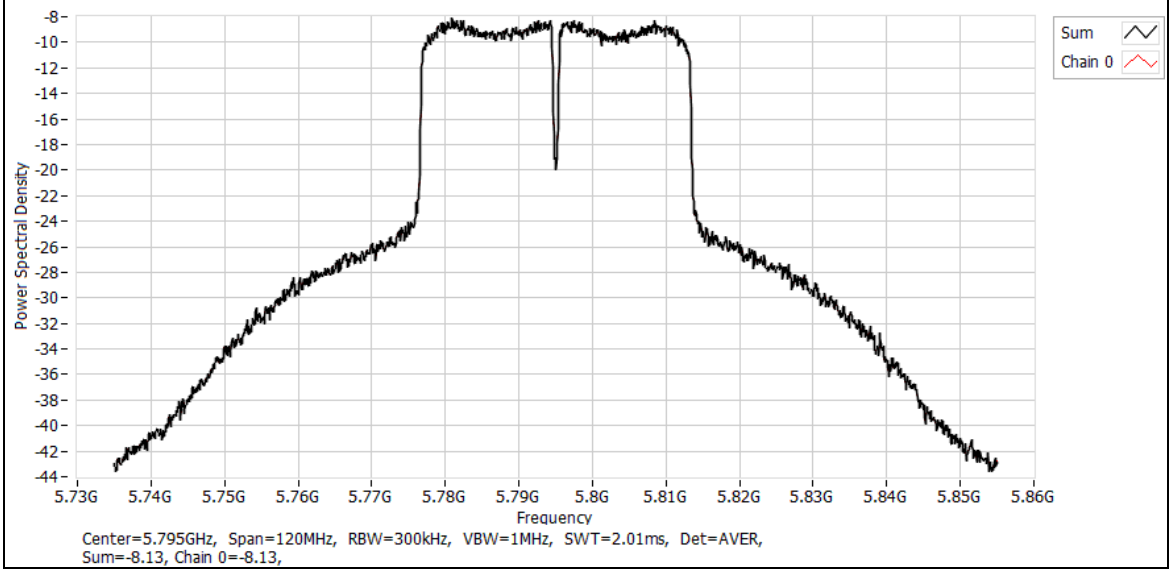
802.11ac(VHT20), CH157



Mode (U-NII-3)	CH	Freq (MHz)	BWCF	Directional Gain (dBi)	Total PSD (dBm/500kHz)	Limit (dBm/500kHz)	Result
802.11ac(VHT40)	151	5755	2.22	1.27	-6	30	PASS
	159	5795	2.22	1.27	-5.91	30	PASS

Mode (U-NII-3)	CH	Freq (MHz)	PSD per Chain (dBm/500kHz)
			Chain 0
802.11ac(VHT40)	151	5755	-8.217
	159	5795	-8.131

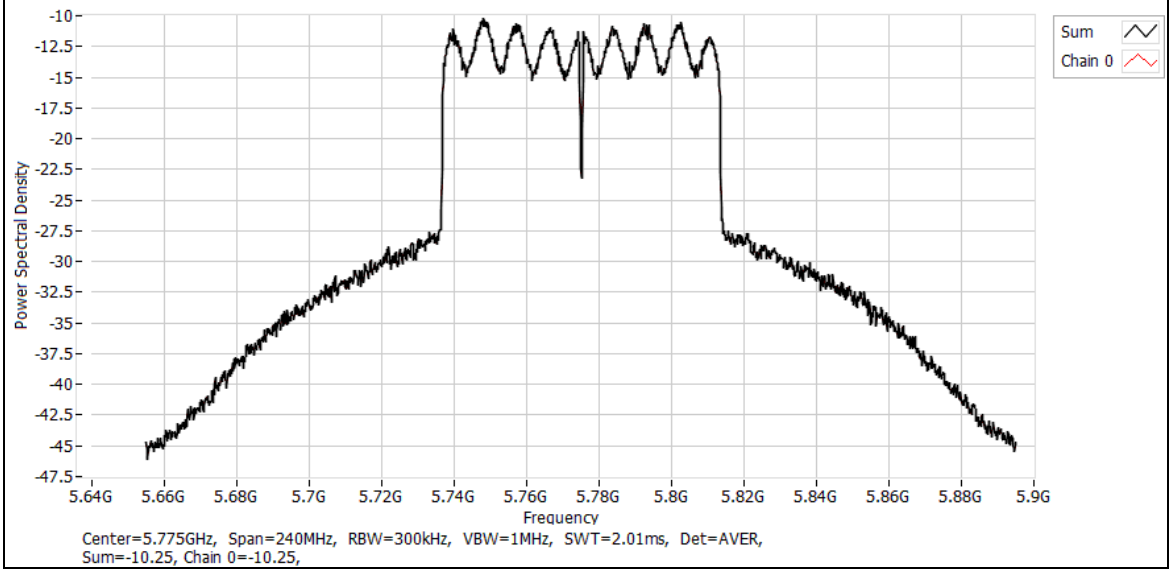
802.11ac(VHT40), CH159



Mode (U-NII-3)	CH	Freq (MHz)	BWCF	Directional Gain (dBi)	Total PSD (dBm/500kHz)	Limit (dBm/500kHz)	Result
802.11ac(VHT80)	155	5775	2.22	1.27	-8.03	30	PASS

Mode (U-NII-3)	CH	Freq (MHz)	PSD per Chain (dBm/500kHz)
			Chain 0
802.11ac(VHT80)	155	5775	-10.248

802.11ac(VHT80), CH155



9.6. Frequency Stability

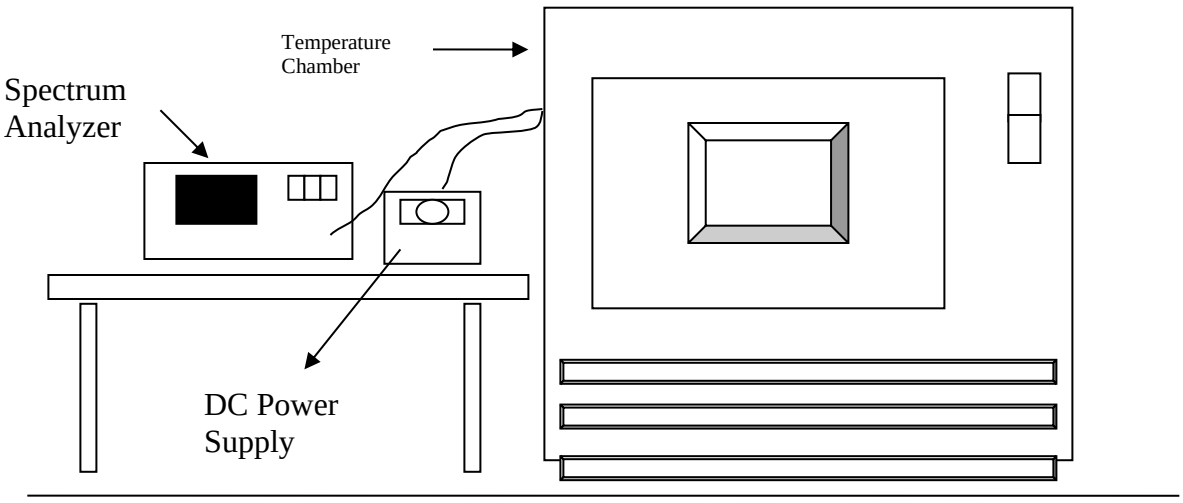
Requirements

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

Test procedure

a. The EUT was placed inside the environmental test chamber and powered by nominal DC voltage.
b. Turn the EUT on and couple its output to a spectrum analyzer.
c. Turn the EUT off and set the chamber to the highest temperature specified.
d. Allow sufficient time (approximately 30 min) for the temperature of the chamber to stabilize, turn the EUT on and measure the operating frequency after 2, 5, and 10 Minutes.
e. Repeat step 2 and 3 with the temperature chamber set to the lowest temperature.
f. The test chamber was allowed to stabilize at +20 degree C for a minimum of 30 Minutes. The supply voltage was then adjusted on the EUT from 85% to 115% and the frequency record.

Test Setup



Test Data

Frequency Stability Versus Temp.									
Operating Frequency: 5180 MHz									
TEMP. (°C)	Power Supply (Vdc)	0 Minute		2 Minute		5 Minute		10 Minute	
		Measured Frequency (MHz)	Freq. Drift (ppm)	Measured Frequency (MHz)	Freq. Drift (ppm)	Measured Frequency (MHz)	Freq. Drift (ppm)	Measured Frequency (MHz)	Freq. Drift (ppm)
75	5	5180.0147	2.84	5180.0162	3.13	5180.0123	2.37	5180.0126	2.43
70	5	5179.9772	-4.40	5179.9789	-4.07	5179.9764	-4.56	5179.9783	-4.19
60	5	5179.9944	-1.08	5179.9964	-0.69	5179.9918	-1.58	5179.994	-1.16
50	5	5180.0193	3.73	5180.0168	3.24	5180.0171	3.30	5180.0173	3.34
40	5	5180.01	1.93	5180.0125	2.41	5180.011	2.12	5180.0088	1.70
30	5	5180.01	1.93	5180.0119	2.30	5180.013	2.51	5180.0123	2.37
20	5	5179.9979	-0.41	5179.9977	-0.44	5179.998	-0.39	5179.9967	-0.64
10	5	5179.9923	-1.49	5179.9945	-1.06	5179.9962	-0.73	5179.9923	-1.49
0	5	5180.0226	4.36	5180.0209	4.03	5180.0182	3.51	5180.0194	3.75
-10	5	5179.9764	-4.56	5179.9782	-4.21	5179.9778	-4.29	5179.9765	-4.54
-20	5	5179.977	-4.44	5179.9777	-4.31	5179.979	-4.05	5179.9785	-4.15
-30	5	5180.0084	1.62	5180.0098	1.89	5180.0098	1.89	5180.0123	2.37
-40	5	5179.9841	-3.07	5179.9821	-3.46	5179.9823	-3.42	5179.9844	-3.01
TEMP. (°C)	Power Supply (Vdc)	0 Minute		2 Minute		5 Minute		10 Minute	
		Measured Frequency (MHz)	Freq. Drift (ppm)	Measured Frequency (MHz)	Freq. Drift (ppm)	Measured Frequency (MHz)	Freq. Drift (ppm)	Measured Frequency (MHz)	Freq. Drift (ppm)
20	5.75	5179.9973	-0.52	5179.9975	-0.48	5179.9983	-0.33	5179.9961	-0.75
20	5	5179.9979	-0.41	5179.9977	-0.44	5179.998	-0.39	5179.9967	-0.64
20	4.25	5179.997	-0.58	5179.998	-0.39	5179.9972	-0.54	5179.997	-0.58

9.7. Radiated Spurious Emission

Requirements

Radiated emissions which fall in the restricted bands must comply with the radiated emission limits specified as below table.

Frequency(MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

NOTE:
1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. For frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.

Limits of unwanted emission out of the restricted bands

Applicable To		Limit	
789033 D02 General UNII Test Procedure New Rules v02r01		Field Strength at 3m	
		PK:74 (dBµV/m)	AV:54 (dBµV/m)
Frequency Band	**Applicable To**	**EIRP Limit**	**Equivalent Field Strength at 3m**
5150~5250 MHz	15.407(b)(1)	PK:-27 (dBm/MHz)	PK:68.2(dBµV/m)
5250~5350 MHz	15.407(b)(2)		
5470~5725 MHz	15.407(b)(3)		
5725~5850 MHz	15.407(b)(4)(i)	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
*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.			

Note:
The following formula is used to convert the effective isotropic radiated power (eirp) to field strength:

$$E = \frac{1000000\sqrt{30P}}{3}$$ µV/m, where P is the eirp (Watts).

Test Procedures

[For 9 kHz ~ 30 MHz]

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter chamber room. 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. Parallel, perpendicular, and ground-parallel orientations of the antenna are set to make the measurement.
d. For each suspected emission, the EUT was arranged to its worst case and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
e. For measurement below 30MHz, 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 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.

NOTE:
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 9kHz at frequency below 30MHz.

[For above 30 MHz]

a. The EUT was placed on the top of a rotating table 0.8 meters (for 30MHz ~ 1GHz) / 1.5 meters (for above 1GHz) above the ground at 3 meter chamber room for test. 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 height of antenna 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 rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
e. For measurement below 1GHz, the initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured. If the emission level of the EUT measured by the peak detector is 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.
f. The test-receiver system was set to peak and average detects function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

Note:

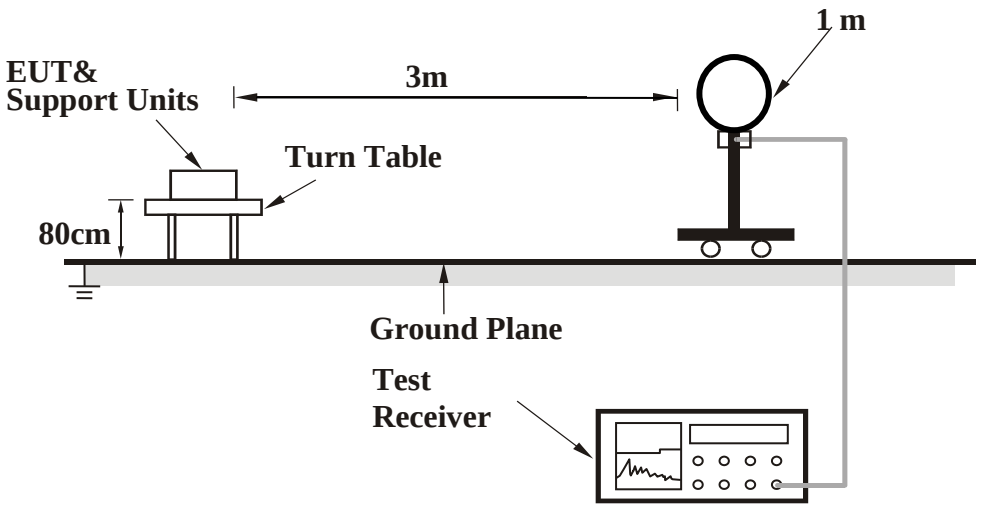
a. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
b. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
c. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is ≥ 1/T (Duty cycle < 98%) or 10Hz (Duty cycle ≥ 98%) for Average detection (AV) at frequency above 1GHz.

Configuration	Average	
	RBW	VBW
802.11a	1MHz	Refer to section 6.6 for duty cycle.
802.11ac (VHT20)		
802.11ac (VHT40)		
802.11ac (VHT80)		

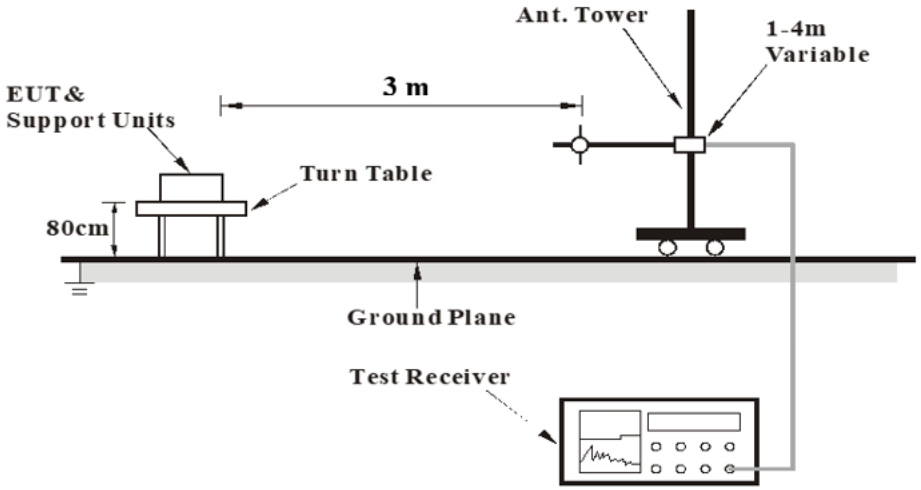
d. All modes of operation were investigated (includes all external accessories) and the worst-case emissions are reported, the other emission levels were low against the limit.
e. Test data of Result value (dBuV/m) = Reading value (dBuV/m) + Correction Factor (dB/m).
f. Test data of Margin(dB) = Result value (dBuV/m) - Limit value (dBuV/m).
g. Test data of Correction Factor (dB/m) = Antenna Factor (dBuV/m) + Cable Loss (dB) - Preamp Factor (dB).
h. Test data of Notation "@" = Fundamental Frequency
i. Test data of Notation " * " = Only required peak limit or the peak result under 20 dB above and complies with AVG limit, AVG result is deemed to comply with AVG limit.

Test Setup

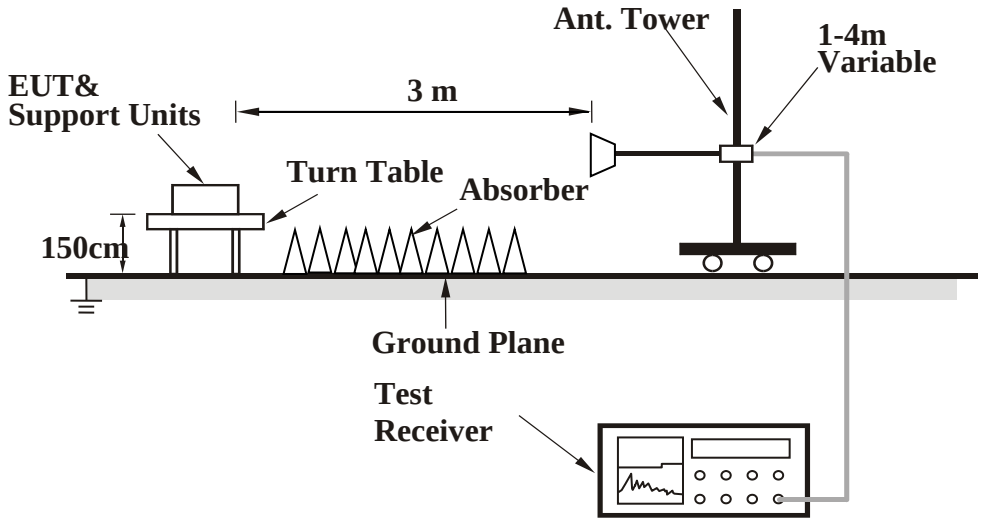
<Frequency Range 9 kHz ~ 30 MHz>



<Frequency Range 30 MHz ~ 1 GHz >



<Frequency Range above 1 GHz>



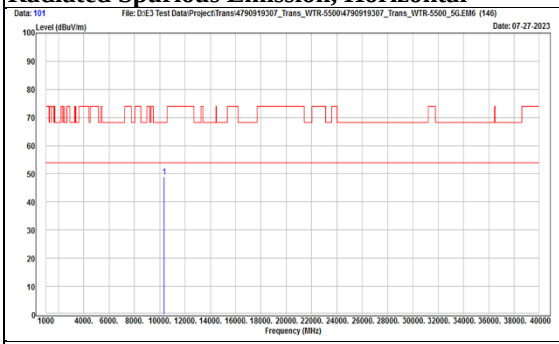
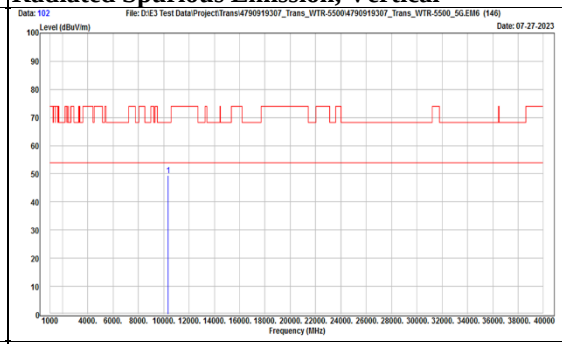
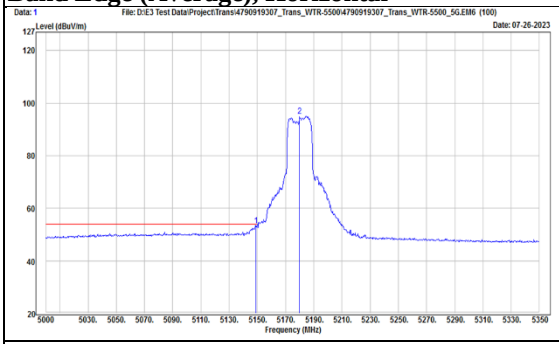
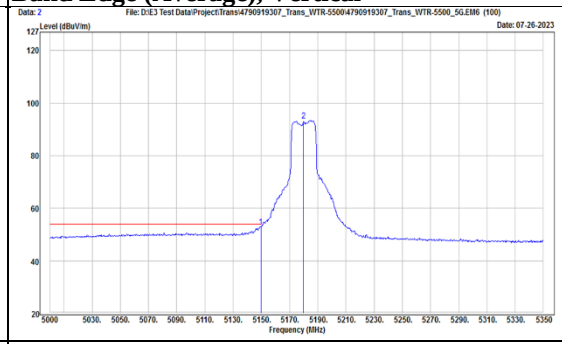
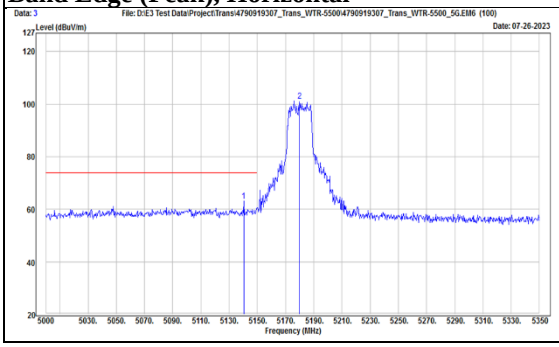
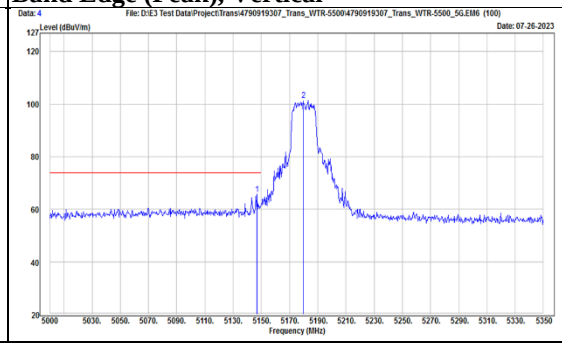
For the actual test configuration, please refer to the Setup Configurations.

Test Data

Above 1 GHz

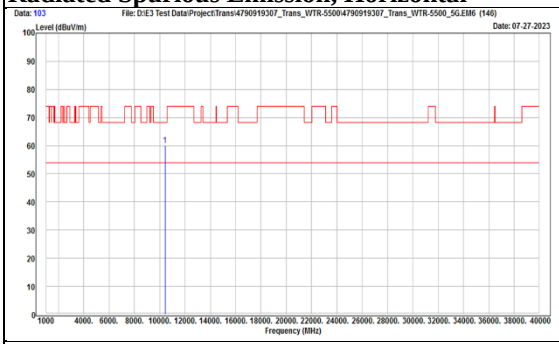
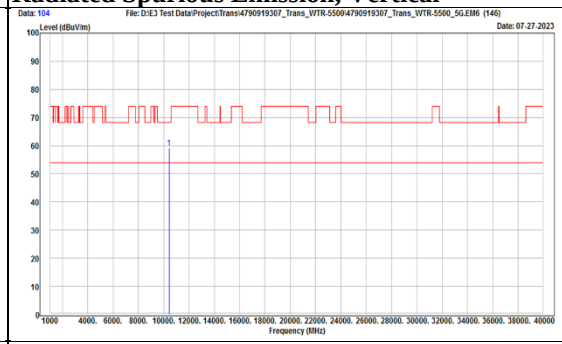
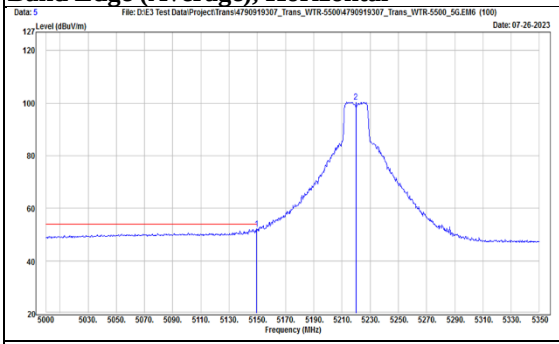
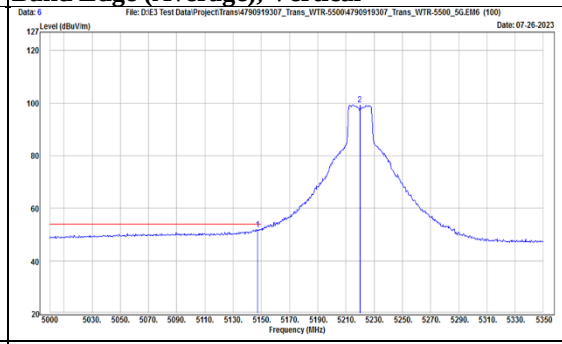
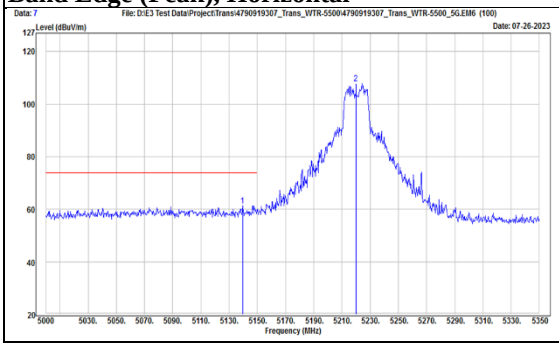
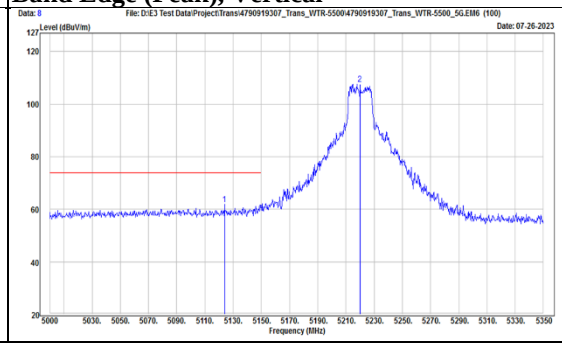
Mode	802.11a	Channel	36

Polarization	Notation	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
Horizontal		5140.35	43.89	19.23	63.12	74	-10.88	PK
		5149.1	34.27	19.22	53.49	54	-0.51	AVG
	@	5180	82.07	19.14	101.21	N/A	N/A	PK
	@	5180	75.83	19.14	94.97	N/A	N/A	AVG
	*	10360	32	17.03	49.03	68.2	-19.17	PK
Vertical		5147	46.52	19.23	65.75	74	-8.25	PK
		5149.8	33.82	19.22	53.04	54	-0.96	AVG
	@	5180	82.43	19.14	101.57	N/A	N/A	PK
	@	5180	74.2	19.14	93.34	N/A	N/A	AVG
	*	10360	32.28	17.03	49.31	68.2	-18.89	PK

TX, 802.11a (Ch 36) **Radiated Spurious Emission, Horizontal**	**TX, 802.11a (Ch 36)** **Radiated Spurious Emission, Vertical**
	
TX, 802.11a (Ch 36) **Band Edge (Average), Horizontal**	**TX, 802.11a (Ch 36)** **Band Edge (Average), Vertical**
	
TX, 802.11a (Ch 36) **Band Edge (Peak), Horizontal**	**TX, 802.11a (Ch 36)** **Band Edge (Peak), Vertical**
	

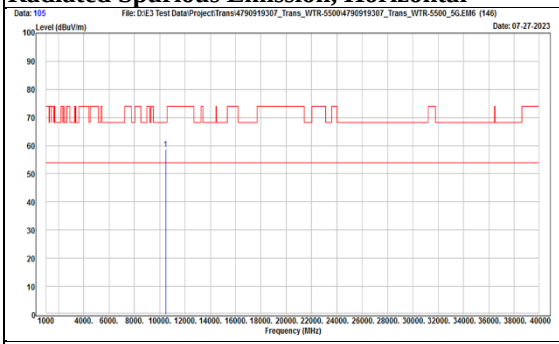
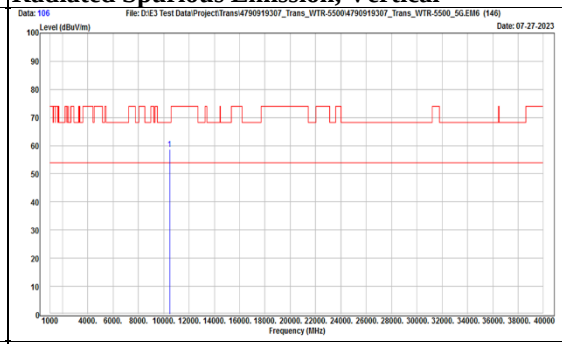
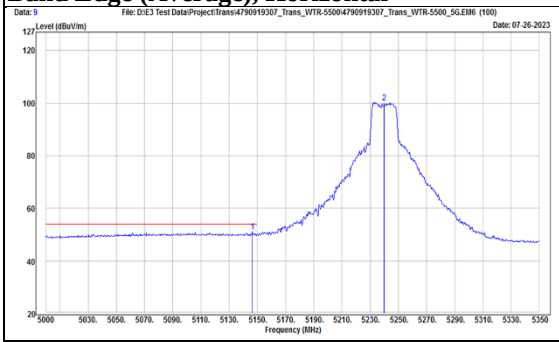
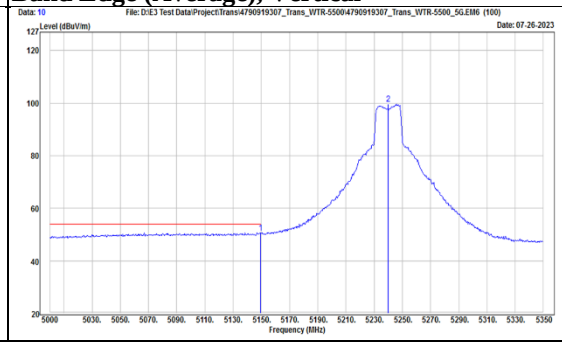
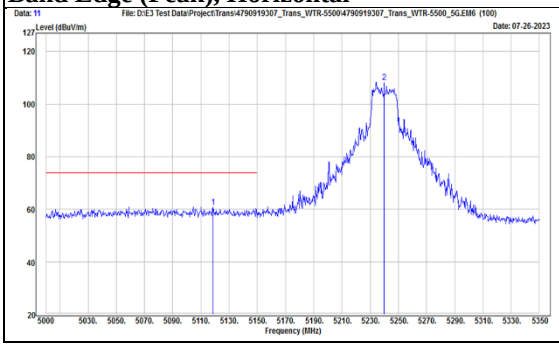
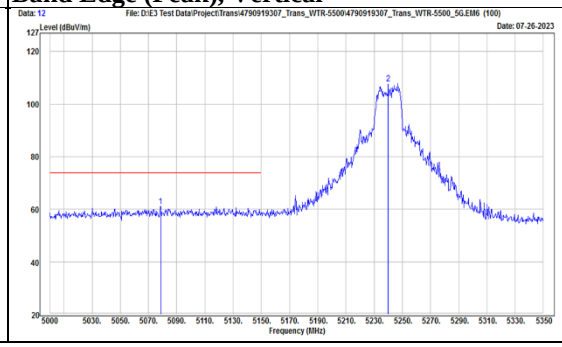
Mode	802.11a	Channel	44

Polarization	Notation	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
Horizontal		5139.65	42.08	19.22	61.3	74	-12.7	PK
		5149.45	32.93	19.22	52.15	54	-1.85	AVG
	@	5220	88.71	19.04	107.75	N/A	N/A	PK
	@	5220	81.4	19.04	100.44	N/A	N/A	AVG
	*	10440	42.81	17.45	60.26	68.2	-7.94	PK
Vertical		5123.9	42.64	19.24	61.88	74	-12.12	PK
		5147.35	32.78	19.23	52.01	54	-1.99	AVG
	@	5220	88.55	19.04	107.59	N/A	N/A	PK
	@	5220	80.46	19.04	99.5	N/A	N/A	AVG
	*	10440	41.78	17.45	59.23	68.2	-8.97	PK

TX, 802.11a (Ch 44) **Radiated Spurious Emission, Horizontal**	**TX, 802.11a (Ch 44)** **Radiated Spurious Emission, Vertical**
	
TX, 802.11a (Ch 44) **Band Edge (Average), Horizontal**	**TX, 802.11a (Ch 44)** **Band Edge (Average), Vertical**
	
TX, 802.11a (Ch 44) **Band Edge (Peak), Horizontal**	**TX, 802.11a (Ch 44)** **Band Edge (Peak), Vertical**
	

Mode	802.11a	Channel	48

Polarization	Notation	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
Horizontal		5118.65	41.59	19.24	60.83	74	-13.17	PK
		5146.65	31.85	19.23	51.08	54	-2.92	AVG
	@	5240	89.25	18.99	108.24	N/A	N/A	PK
	@	5240	81.23	18.99	100.22	N/A	N/A	AVG
	*	10480	41.11	17.55	58.66	68.2	-9.54	PK
Vertical		5078.75	42.02	19.13	61.15	74	-12.85	PK
		5149.45	31.49	19.22	50.71	54	-3.29	AVG
	@	5240	88.85	18.99	107.84	N/A	N/A	PK
	@	5240	80.66	18.99	99.65	N/A	N/A	AVG
	*	10480	41.24	17.55	58.79	68.2	-9.41	PK

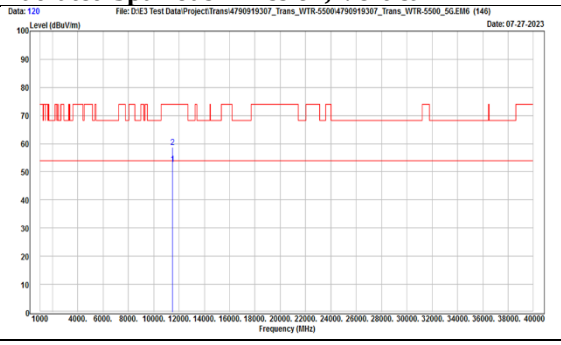
TX, 802.11a (Ch 48) **Radiated Spurious Emission, Horizontal**	**TX, 802.11a (Ch 48)** **Radiated Spurious Emission, Vertical**
	
TX, 802.11a (Ch 48) **Band Edge (Average), Horizontal**	**TX, 802.11a (Ch 48)** **Band Edge (Average), Vertical**
	
TX, 802.11a (Ch 48) **Band Edge (Peak), Horizontal**	**TX, 802.11a (Ch 48)** **Band Edge (Peak), Vertical**
	

Mode	802.11a	Channel	149

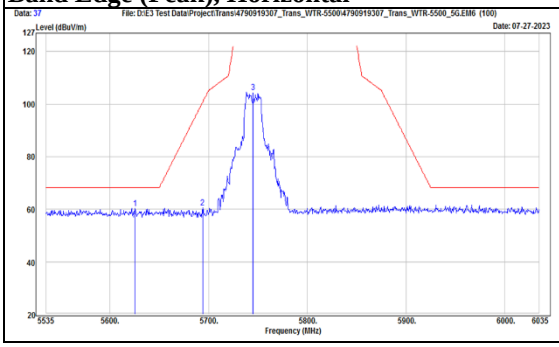
Polarization	Notation	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
Horizontal		5625.5	40.83	19.62	60.45	68.2	-7.75	PK
		5694	40.9	19.6	60.5	100.78	-40.28	PK
	@	5745	84.63	20.01	104.64	N/A	N/A	PK
		11490	42.29	18.86	61.15	74	-12.85	PK
		11490	34.39	18.86	53.25	54	-0.75	AVG
Vertical		5630	41.08	19.63	60.71	68.2	-7.49	PK
		5661	40.82	19.64	60.46	76.37	-15.91	PK
	@	5745	84.11	20.01	104.12	N/A	N/A	PK
		11490	39.88	18.86	58.74	74	-15.26	PK
		11490	33.78	18.86	52.64	54	-1.36	AVG

TX, 802.11a (Ch 149)
Radiated Spurious Emission, Horizontal

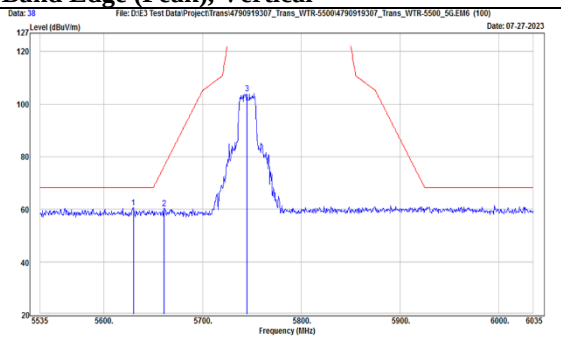
TX, 802.11a (Ch 149)
Radiated Spurious Emission, Vertical



TX, 802.11a (Ch 149)
Band Edge (Peak), Horizontal



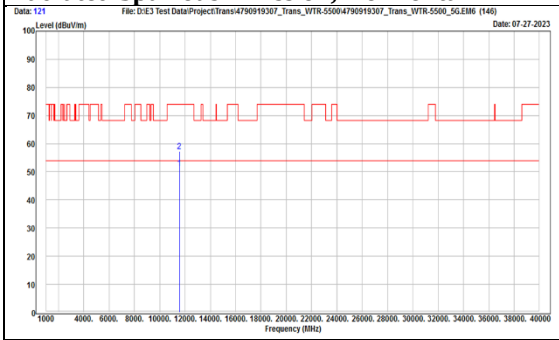
TX, 802.11a (Ch 149)
Band Edge (Peak), Vertical



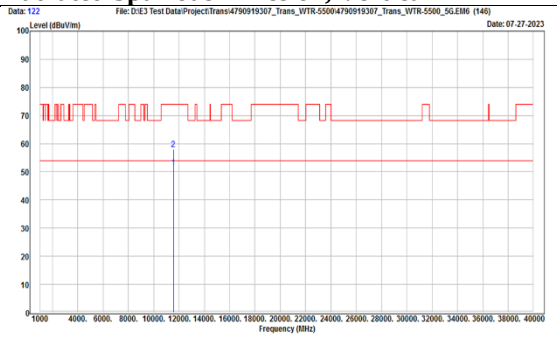
Mode	802.11a	Channel	157

Polarization	Notation	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
Horizontal		5648.5	40.32	19.65	59.97	68.2	-8.23	PK
		5654	40.73	19.64	60.37	71.17	-10.8	PK
	@	5785	84.85	20.37	105.22	N/A	N/A	PK
		5887	41.39	20.69	62.08	96.29	-34.21	PK
		6017	39.65	20.86	60.51	68.2	-7.69	PK
		11570	38.74	18.65	57.39	74	-16.61	PK
		11570	32.76	18.65	51.41	54	-2.59	AVG
Vertical		5603	40.99	19.6	60.59	68.2	-7.61	PK
		5658	39.72	19.64	59.36	74.14	-14.78	PK
	@	5785	86.53	20.37	106.9	N/A	N/A	PK
		5882	40.95	20.69	61.64	100	-38.36	PK
		6025	40.04	20.89	60.93	68.2	-7.27	PK
		11570	39.43	18.65	58.08	74	-15.92	PK
		11570	32.84	18.65	51.49	54	-2.51	AVG

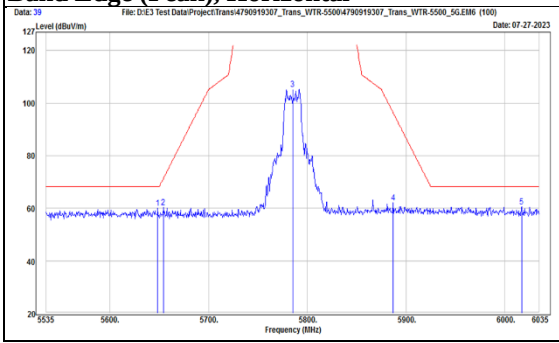
TX, 802.11a (Ch 157)
Radiated Spurious Emission, Horizontal



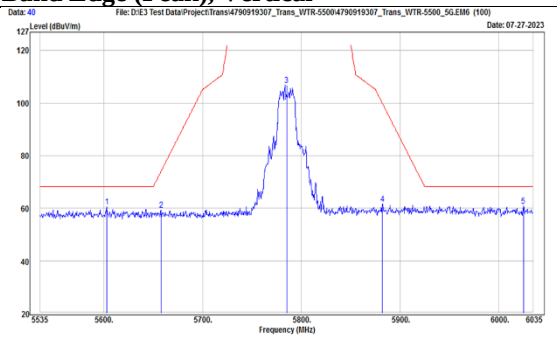
TX, 802.11a (Ch 157)
Radiated Spurious Emission, Vertical



TX, 802.11a (Ch 157)
Band Edge (Peak), Horizontal



TX, 802.11a (Ch 157)
Band Edge (Peak), Vertical

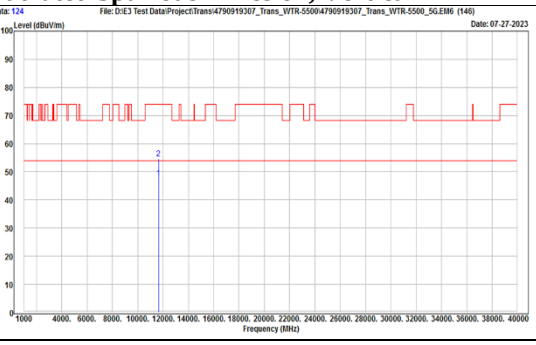


Mode	802.11a	Channel	165

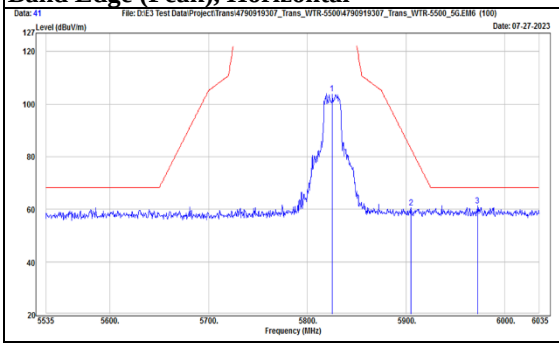
Polarization	Notation	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
Horizontal	@	5825	83.4	20.57	103.97	N/A	N/A	PK
		5905	39.85	20.7	60.55	82.96	-22.41	PK
		5972.5	40.68	20.77	61.45	68.2	-6.75	PK
		11650	37.94	18.38	56.32	74	-17.68	PK
		11650	30.42	18.38	48.8	54	-5.2	AVG
Vertical	@	5825	85.59	20.57	106.16	N/A	N/A	PK
		5918.5	40.62	20.72	61.34	72.99	-11.65	PK
		5925.5	40.57	20.73	61.3	68.2	-6.9	PK
		11650	36.19	18.38	54.57	74	-19.43	PK
		11650	29.3	18.38	47.68	54	-6.32	AVG

TX, 802.11a (Ch 165)
Radiated Spurious Emission, Horizontal

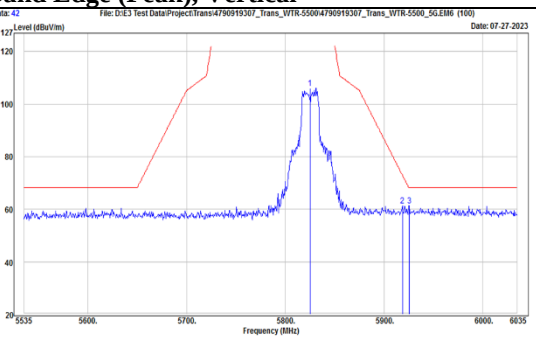
TX, 802.11a (Ch 165)
Radiated Spurious Emission, Vertical



TX, 802.11a (Ch 165)
Band Edge (Peak), Horizontal

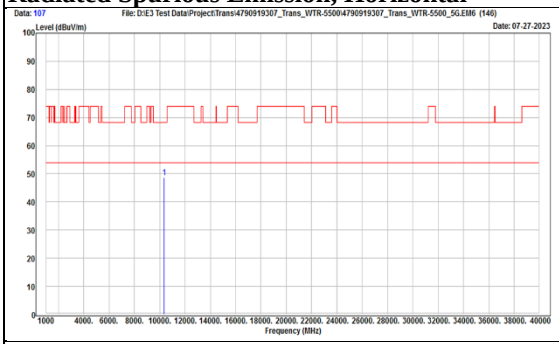
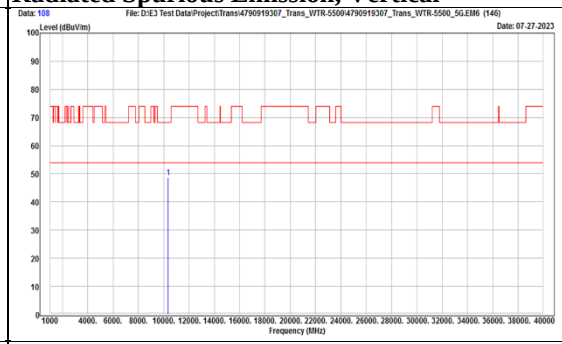
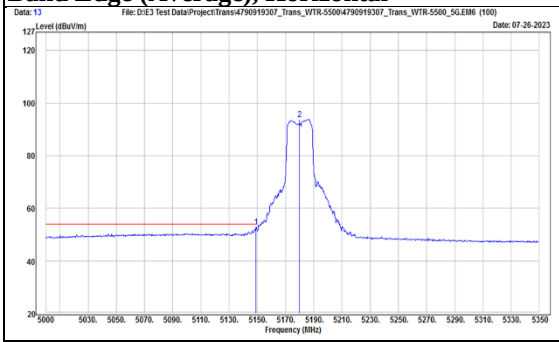
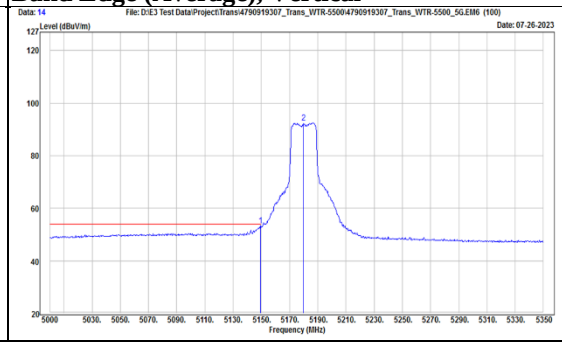
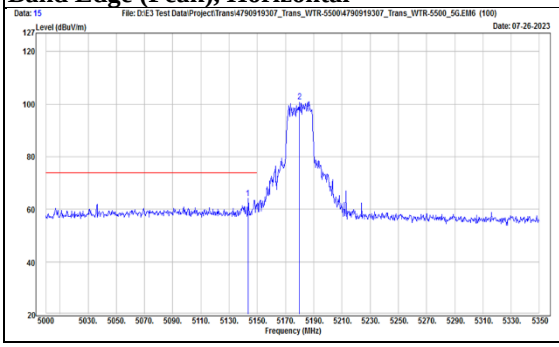
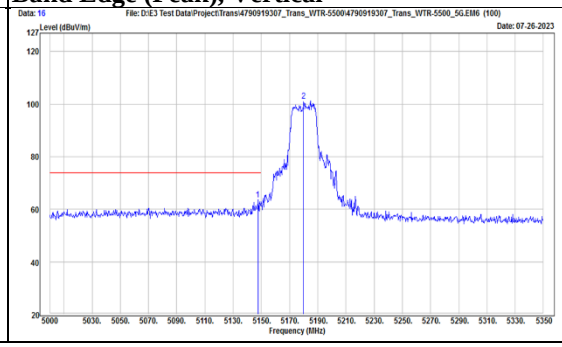


TX, 802.11a (Ch 165)
Band Edge (Peak), Vertical



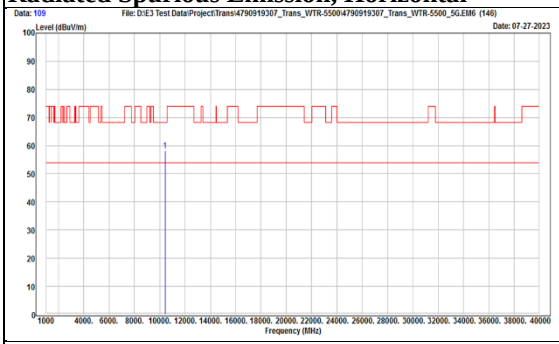
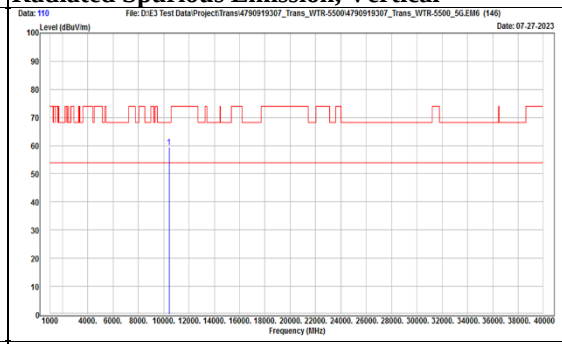
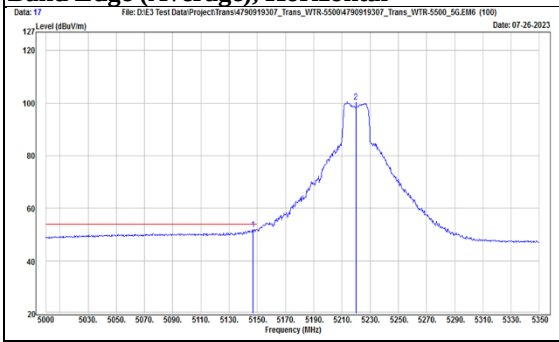
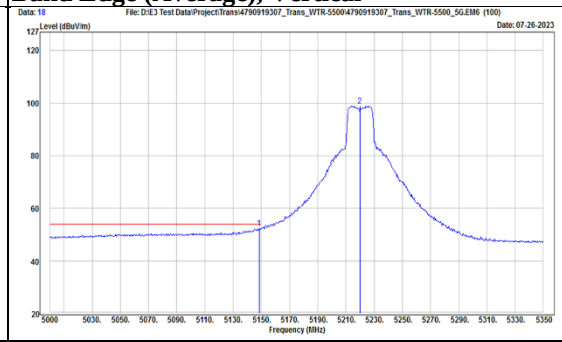
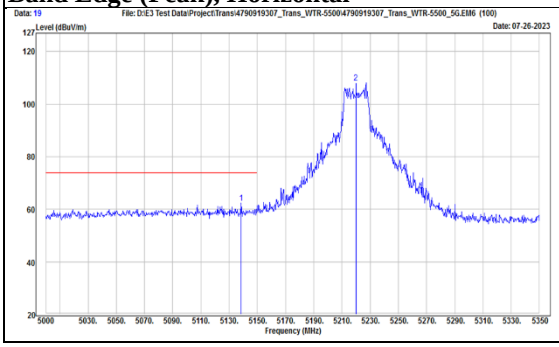
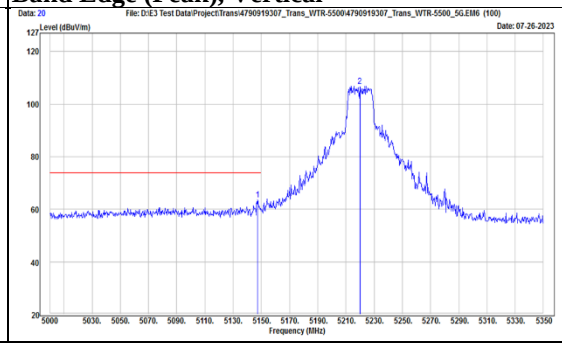
Mode	802.11ac(VHT20)	Channel	36

Polarization	Notation	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
Horizontal		5143.5	45.07	19.22	64.29	74	-9.71	PK
		5149.1	33.61	19.22	52.83	54	-1.17	AVG
	@	5180	81.7	19.14	100.84	N/A	N/A	PK
	@	5180	74.78	19.14	93.92	N/A	N/A	AVG
	*	10360	31.56	17.03	48.59	68.2	-19.61	PK
Vertical		5147.7	44.43	19.22	63.65	74	-10.35	PK
		5149.45	34.27	19.22	53.49	54	-0.51	AVG
	@	5180	81.99	19.14	101.13	N/A	N/A	PK
	@	5180	73.34	19.14	92.48	N/A	N/A	AVG
	*	10360	31.6	17.03	48.63	68.2	-19.57	PK

TX, 802.11ac(VHT20) (Ch 36) **Radiated Spurious Emission, Horizontal**	**TX, 802.11ac(VHT20) (Ch 36)** **Radiated Spurious Emission, Vertical**
	
TX, 802.11ac(VHT20) (Ch 36) **Band Edge (Average), Horizontal**	**TX, 802.11ac(VHT20) (Ch 36)** **Band Edge (Average), Vertical**
	
TX, 802.11ac(VHT20) (Ch 36) **Band Edge (Peak), Horizontal**	**TX, 802.11ac(VHT20) (Ch 36)** **Band Edge (Peak), Vertical**
	

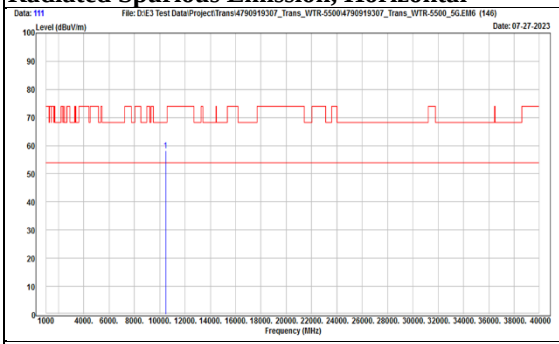
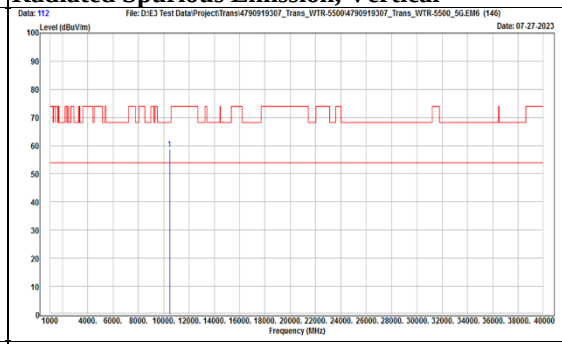
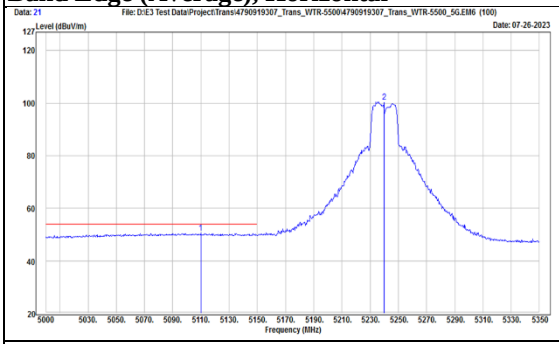
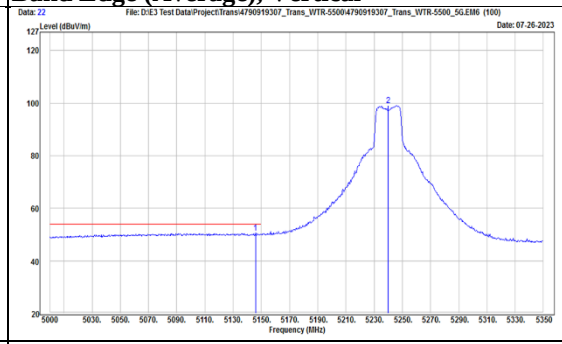
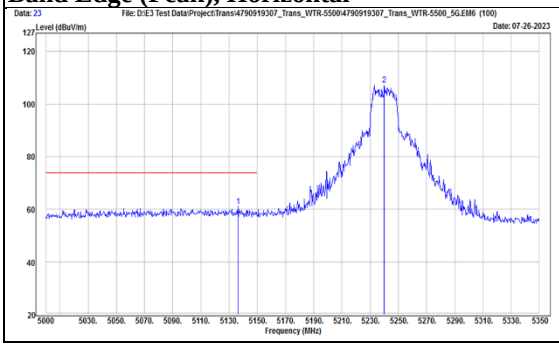
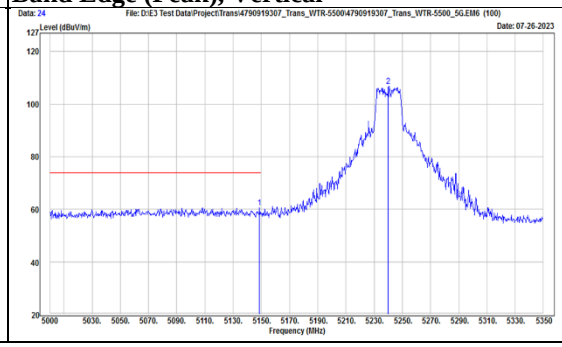
Mode	802.11ac(VHT20)	Channel	44

Polarization	Notation	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
Horizontal		5138.6	43.06	19.22	62.28	74	-11.72	PK
		5147	32.8	19.23	52.03	54	-1.97	AVG
	@	5220	89	19.04	108.04	N/A	N/A	PK
	@	5220	81.35	19.04	100.39	N/A	N/A	AVG
	*	10440	40.78	17.45	58.23	68.2	-9.97	PK
Vertical		5147.35	44.5	19.23	63.73	74	-10.27	PK
		5148.4	33.12	19.22	52.34	54	-1.66	AVG
	@	5220	87.77	19.04	106.81	N/A	N/A	PK
	@	5220	79.83	19.04	98.87	N/A	N/A	AVG
	*	10440	41.87	17.45	59.32	68.2	-8.88	PK

TX, 802.11ac(VHT20) (Ch 44) **Radiated Spurious Emission, Horizontal**	**TX, 802.11ac(VHT20) (Ch 44)** **Radiated Spurious Emission, Vertical**
	
TX, 802.11ac(VHT20) (Ch 44) **Band Edge (Average), Horizontal**	**TX, 802.11ac(VHT20) (Ch 44)** **Band Edge (Average), Vertical**
	
TX, 802.11ac(VHT20) (Ch 44) **Band Edge (Peak), Horizontal**	**TX, 802.11ac(VHT20) (Ch 44)** **Band Edge (Peak), Vertical**
	

Mode	802.11ac(VHT20)	Channel	48

Polarization	Notation	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
Horizontal		5109.9	31.34	19.24	50.58	54	-3.42	AVG
		5136.5	41.98	19.23	61.21	74	-12.79	PK
	@	5240	88.3	18.99	107.29	N/A	N/A	PK
	@	5240	81.43	18.99	100.42	N/A	N/A	AVG
	*	10480	40.63	17.55	58.18	68.2	-10.02	PK
Vertical		5145.95	31.32	19.22	50.54	54	-3.46	AVG
		5148.75	41.45	19.22	60.67	74	-13.33	PK
	@	5240	87.81	18.99	106.8	N/A	N/A	PK
	@	5240	80.07	18.99	99.06	N/A	N/A	AVG
	*	10480	41.19	17.55	58.74	68.2	-9.46	PK

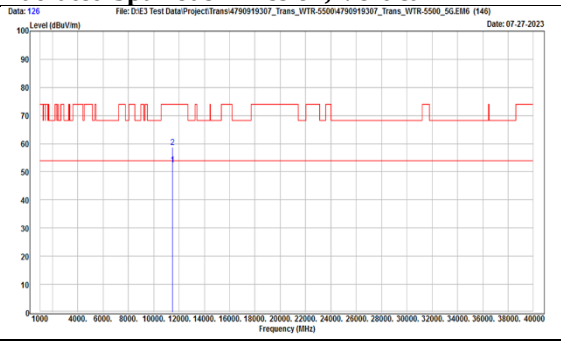
TX, 802.11ac(VHT20) (Ch 48) **Radiated Spurious Emission, Horizontal**	**TX, 802.11ac(VHT20) (Ch 48)** **Radiated Spurious Emission, Vertical**
	
TX, 802.11ac(VHT20) (Ch 48) **Band Edge (Average), Horizontal**	**TX, 802.11ac(VHT20) (Ch 48)** **Band Edge (Average), Vertical**
	
TX, 802.11ac(VHT20) (Ch 48) **Band Edge (Peak), Horizontal**	**TX, 802.11ac(VHT20) (Ch 48)** **Band Edge (Peak), Vertical**
	

Mode	802.11ac(VHT20)	Channel	149

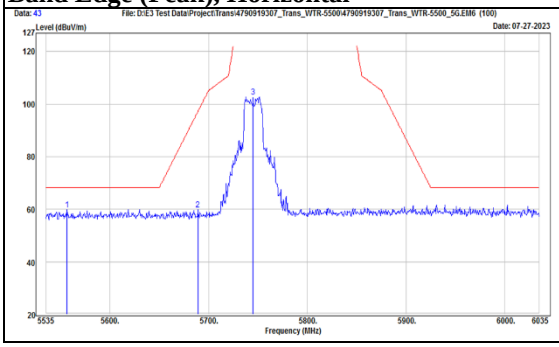
Polarization	Notation	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
Horizontal		5556.5	40.41	19.55	59.96	68.2	-8.24	PK
		5689	40.34	19.61	59.95	97.09	-37.14	PK
	@	5745	82.73	20.01	102.74	N/A	N/A	PK
		11490	41.92	18.86	60.78	74	-13.22	PK
		11490	34.32	18.86	53.18	54	-0.82	AVG
Vertical		5623.5	40.6	19.62	60.22	68.2	-7.98	PK
		5675.5	40.09	19.63	59.72	87.11	-27.39	PK
	@	5745	85.17	20.01	105.18	N/A	N/A	PK
		11490	39.75	18.86	58.61	74	-15.39	PK
		11490	33.71	18.86	52.57	54	-1.43	AVG

TX, 802.11ac(VHT20) (Ch 149)
Radiated Spurious Emission, Horizontal

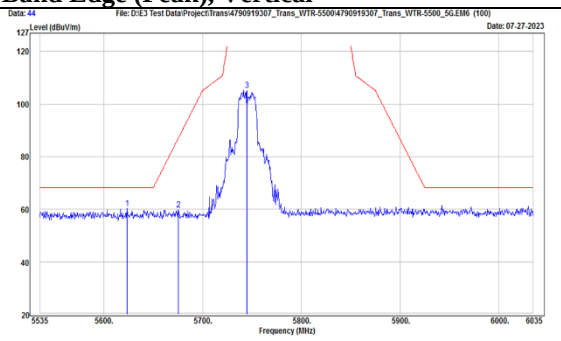
TX, 802.11ac(VHT20) (Ch 149)
Radiated Spurious Emission, Vertical



TX, 802.11ac(VHT20) (Ch 149)
Band Edge (Peak), Horizontal



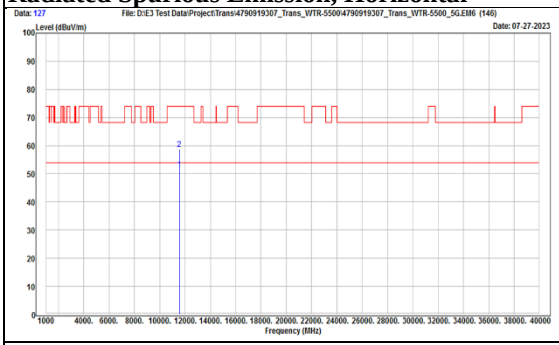
TX, 802.11ac(VHT20) (Ch 149)
Band Edge (Peak), Vertical



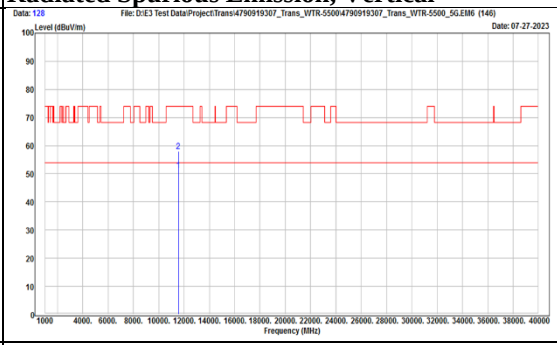
Mode	802.11ac(VHT20)	Channel	157

Polarization	Notation	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
Horizontal		5571.5	40.5	19.57	60.07	68.2	-8.13	PK
		5670.5	39.77	19.63	59.4	83.41	-24.01	PK
	@	5785	82.45	20.37	102.82	N/A	N/A	PK
		5924.5	40.01	20.73	60.74	68.57	-7.83	PK
		5972	40.21	20.77	60.98	68.2	-7.22	PK
		11570	40	18.65	58.65	74	-15.35	PK
		11570	32.79	18.65	51.44	54	-2.56	AVG
Vertical		5548.5	40.69	19.55	60.24	68.2	-7.96	PK
		5666	39.81	19.64	59.45	80.08	-20.63	PK
	@	5785	85.1	20.37	105.47	N/A	N/A	PK
		5922.5	39.87	20.72	60.59	70.04	-9.45	PK
		5969.5	40.92	20.77	61.69	68.2	-6.51	PK
		11570	39.3	18.65	57.95	74	-16.05	PK
		11570	32.62	18.65	51.27	54	-2.73	AVG

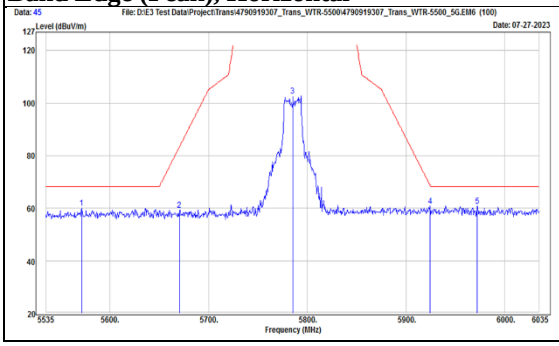
TX, 802.11ac(VHT20) (Ch 157)
Radiated Spurious Emission, Horizontal



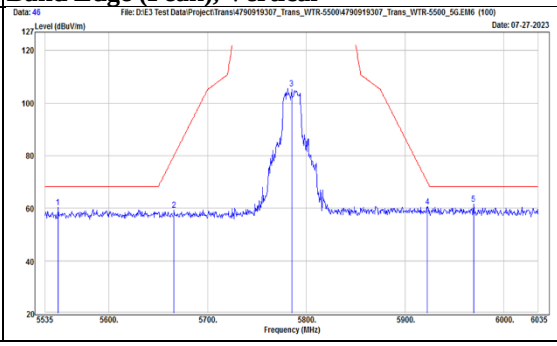
TX, 802.11ac(VHT20) (Ch 157)
Radiated Spurious Emission, Vertical



TX, 802.11ac(VHT20) (Ch 157)
Band Edge (Peak), Horizontal



TX, 802.11ac(VHT20) (Ch 157)
Band Edge (Peak), Vertical

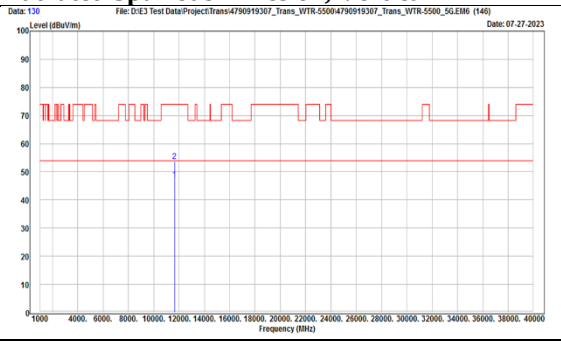


Mode	802.11ac(VHT20)	Channel	165

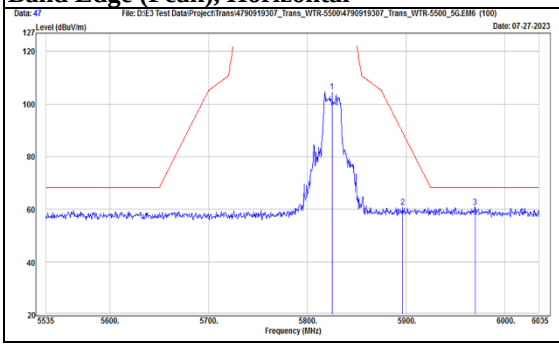
Polarization	Notation	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
Horizontal	@	5825	84.26	20.57	104.83	N/A	N/A	PK
		5896.5	40.19	20.69	60.88	89.25	-28.37	PK
		5970	40.16	20.77	60.93	68.2	-7.27	PK
		11650	38.6	18.38	56.98	74	-17.02	PK
		11650	29.99	18.38	48.37	54	-5.63	AVG
Vertical	@	5825	85.37	20.57	105.94	N/A	N/A	PK
		5883.5	40.23	20.69	60.92	98.89	-37.97	PK
		5995	39.99	20.79	60.78	68.2	-7.42	PK
		11650	35.38	18.38	53.76	74	-20.24	PK
		11650	28.78	18.38	47.16	54	-6.84	AVG

TX, 802.11ac(VHT20) (Ch 165)
Radiated Spurious Emission, Horizontal

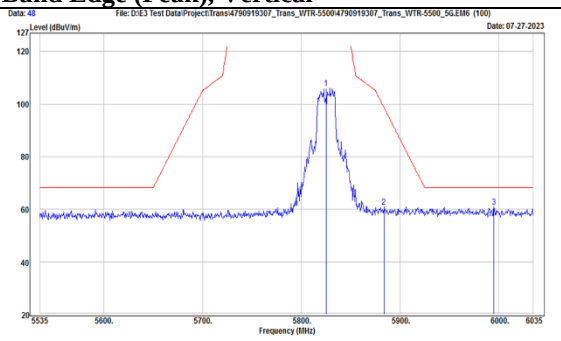
TX, 802.11ac(VHT20) (Ch 165)
Radiated Spurious Emission, Vertical



TX, 802.11ac(VHT20) (Ch 165)
Band Edge (Peak), Horizontal

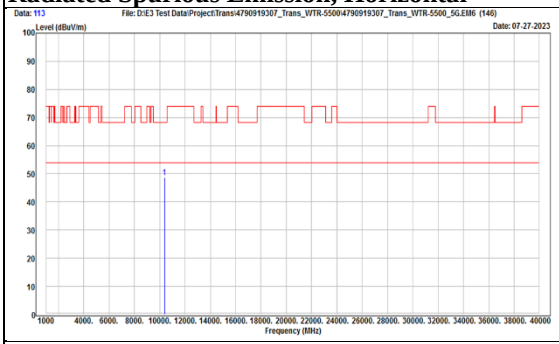
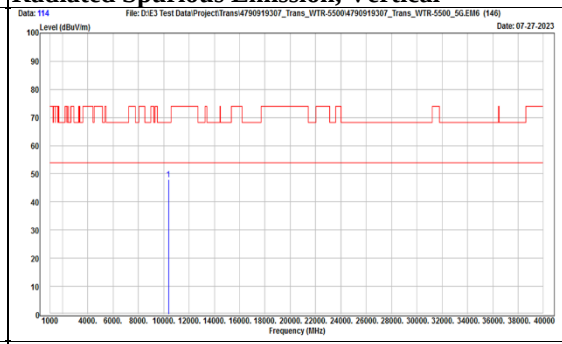
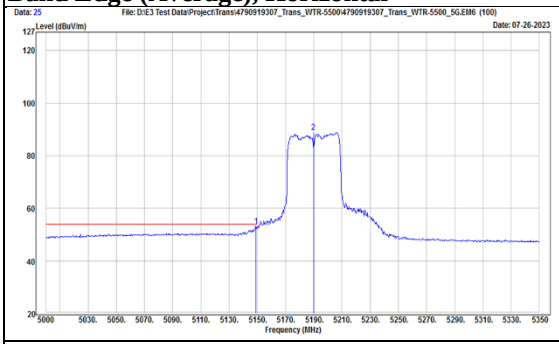
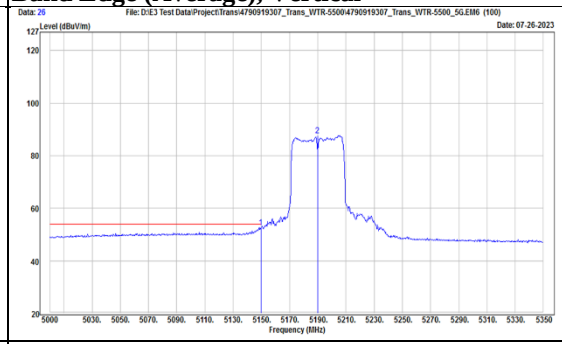
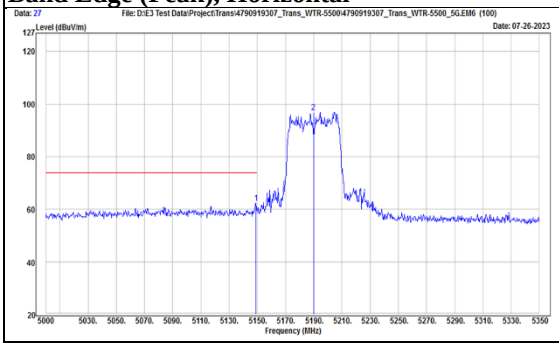
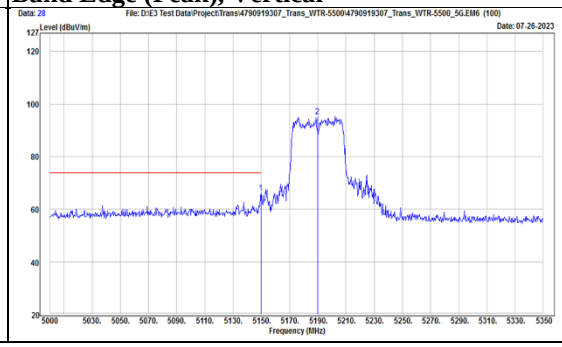


TX, 802.11ac(VHT20) (Ch 165)
Band Edge (Peak), Vertical



Mode	802.11ac(VHT40)	Channel	38

Polarization	Notation	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
Horizontal		5149.1	43.25	19.22	62.47	74	-11.53	PK
		5149.1	33.97	19.22	53.19	54	-0.81	AVG
	@	5190	77.79	19.12	96.91	N/A	N/A	PK
	@	5190	69.77	19.12	88.89	N/A	N/A	AVG
	*	10380	31.53	17.19	48.72	68.2	-19.48	PK
Vertical		5149.8	46.9	19.22	66.12	74	-7.88	PK
		5149.8	33.57	19.22	52.79	54	-1.21	AVG
	@	5190	76.25	19.12	95.37	N/A	N/A	PK
	@	5190	68.57	19.12	87.69	N/A	N/A	AVG
	*	10380	30.86	17.19	48.05	68.2	-20.15	PK

TX, 802.11ac(VHT40) (Ch 38) **Radiated Spurious Emission, Horizontal**	**TX, 802.11ac(VHT40) (Ch 38)** **Radiated Spurious Emission, Vertical**
	
TX, 802.11ac(VHT40) (Ch 38) **Band Edge (Average), Horizontal**	**TX, 802.11ac(VHT40) (Ch 38)** **Band Edge (Average), Vertical**
	
TX, 802.11ac(VHT40) (Ch 38) **Band Edge (Peak), Horizontal**	**TX, 802.11ac(VHT40) (Ch 38)** **Band Edge (Peak), Vertical**
	

Mode	802.11ac(VHT40)	Channel	46

Polarization	Notation	Frequency (MHz)	Reading (dBuV)	Correct (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Remark
Horizontal		5117.6	42.39	19.24	61.63	74	-12.37	PK
		5149.8	33.91	19.22	53.13	54	-0.87	AVG
	@	5230	84.22	19.01	103.23	N/A	N/A	PK
	@	5230	75.86	19.01	94.87	N/A	N/A	AVG
	*	10460	33.58	17.5	51.08	68.2	-17.12	PK
Vertical		5126.35	42.46	19.24	61.7	74	-12.3	PK
		5149.8	33.65	19.22	52.87	54	-1.13	AVG
	@	5230	81.71	19.01	100.72	N/A	N/A	PK
	@	5230	74.03	19.01	93.04	N/A	N/A	AVG
	*	10460	33.04	17.5	50.54	68.2	-17.66	PK