

TEST REPORT

CERTIFICATE OF CONFORMITY

Standard: 47 CFR FCC Part 15, Subpart E (Section 15.407)
Report No.: RFBENL-WTW-P24060724-1
FCC ID: RYK-WNFQ291BEBT
Product: WiFi 7/BT module
Brand: Sparklan
Model No.: WNFQ-291BEI(BT)
Series Model: WNFQ-291BE(BT)
Received Date: 2024/8/16
Test Date: 2024/10/25 ~ 2024/12/20
Issued Date: 2025/4/11

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Issued By: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
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FCC Registration / 723255 / TW2022
Designation Number:

Approved by: _____, **Date:** 2025/4/11
May Chen / Manager

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Prepared by : Phoenix Huang / Specialist



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Release Control Record

Issue No.	Description	Date Issued
RFBENL-WTW-P24060724-1	Original release.	2025/4/11

1 Certificate

Product: WiFi 7/BT module

Brand: Sparklan

Test Model: WNFQ-291BEI(BT)

Series Model: WNFQ-291BE(BT)

Sample Status: Engineering sample

Applicant: SparkLAN Communications, Inc.

Test Date: 2024/10/25 ~ 2024/12/20

Standard: 47 CFR FCC Part 15, Subpart E (Section 15.407)

Measurement procedure: ANSI C63.10-2013
KDB 789033 D02 General UNII Test Procedure New Rules v02r01
KDB 662911 D01 Multiple Transmitter Output v02r01

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's RF characteristics under the conditions specified in this report.

2 Summary of Test Results

47 CFR FCC Part 15, Subpart E (Section 15.407)			
Clause	Test Item	Result	Remark
15.407(a)(2)	26 dB Bandwidth	N/A	Refer to Note 1 below
15.407(a)(1) 15.407(a)(2) 15.407(a)(3)	RF Output Power	Pass	Meet the requirement of limit.
15.407(a)(1) 15.407(a)(2) 15.407(a)(3)	Power Spectral Density	N/A	Refer to Note 1 below
15.407(e)	6 dB Bandwidth	N/A	Refer to Note 1 below
---	Occupied Bandwidth	N/A	Refer to Note 1 below
15.407(b)(9)	AC Power Conducted Emissions	N/A	Refer to Note 1 below
15.407(b)(9)	Unwanted Emissions below 1 GHz	Pass	Minimum passing margin is -1.3 dB at 199.42 MHz
15.407(b) (1/10) 15.407(b) (2/10) 15.407(b) (3/10) 15.407(b) (4(i)/10)	Unwanted Emissions above 1 GHz	Pass	Minimum passing margin is -0.6 dB at 5350.00 MHz
15.203	Antenna Requirement	Pass	Antenna connector is MHF 4L, I-PEX MHF4, RP-SMA (M), MHF4L to SMA-F not a standard connector.

Notes:

- Only RF Output Power and Unwanted Emissions test items were performed for this addendum. The others testing data refer to original test report (Original FCC ID: J9C-QCNCM865).
- Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

2.1 Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

Parameter	Specification	Expanded Uncertainty (k=2) (±)
RF Output Power	-	1.1 dB
Unwanted Emissions below 1 GHz	9 kHz ~ 30 MHz	3.1 dB
	30 MHz ~ 1 GHz	5.1 dB
Unwanted Emissions above 1 GHz	1 GHz ~ 18 GHz	5.1 dB
	18 GHz ~ 40 GHz	5.3 dB

The other instruments specified are routine verified to remain within the calibrated levels, no measurement uncertainty is required to be calculated.

2.2 Supplementary Information

There is not any deviation from the test standards for the test method, and no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	WiFi 7/BT module
Brand	Sparklan
Test Model	WNFQ-291BEI(BT)
Series Model	WNFQ-291BE(BT)
Status of EUT	Engineering sample
Power Supply Rating	3.3 Vdc from host equipment
Modulation Type	64QAM, 16QAM, QPSK, BPSK for OFDM 1024QAM for OFDM in 11ac mode 4096QAM for OFDMA in 11ax mode 4096QAM for OFDMA in 11be mode
Modulation Technology	OFDM, OFDMA
Transfer Rate	802.11a: up to 54 Mbps 802.11n: up to 300 Mbps 802.11ac: up to 2166.7 Mbps 802.11ax: up to 2969.7 Mbps 802.11be: up to 2882.4 Mbps
Operating Frequency	5.18 GHz ~ 5.25 GHz 5.26 GHz ~ 5.32 GHz 5.5 GHz ~ 5.72 GHz 5.745 GHz ~ 5.825 GHz
Number of Channel	802.11a, 802.11n (HT20), 802.11ac (VHT20), 802.11ax (HE20), 802.11be (EHT20): 25 802.11n (HT40), 802.11ac (VHT40), 802.11ax (HE40), 802.11be (EHT40): 12 802.11ac (VHT80), 802.11ax (HE80), 802.11be (EHT80): 6 802.11ac (VHT160), 802.11ax (HE160), 802.11be (EHT160): 2
Resource Unit (RU)	Single RU: 26-tone, 52-tone, 106-tone, 242-tone, 484-tone, 996-tone, 2 * 996-tone Multi-RU (Small RU): 52-tone + 26-tone, 106-tone + 26-tone Multi-RU (Large RU): 484-tone + 242-tone, 996-tone + 484-tone
Channel Puncturing (Large RU)	80 MHz punctured by 20 MHz, 160 MHz punctured by 20 MHz 160 MHz punctured by 40 MHz
Output Power	5.18 GHz ~ 5.25 GHz : 86.676 mW (19.38 dBm) 5.26 GHz ~ 5.32 GHz : 89.098 mW (19.5 dBm) 5.5 GHz ~ 5.72 GHz : 86.988 mW (19.39 dBm) 5.745 GHz ~ 5.825 GHz : 81.989 mW (19.14 dBm)
EUT Category	Client device

Note:

- This report is prepared for FCC class II permissive change. The difference compared with the original design is as the following:
 - ◆ Add Dipole antenna and Chip antenna (Refer to section 3.2)
 - ◆ Change shielding case and add thermal pad.
 - ◆ Change temperature operating range to -40 °C ~ 85 °C
- According to above conditions, there are RF Output Power and Unwanted Emissions test items need to be performed. All data for meeting the requirement is verified.

3. All models are listed as below.

Brand	Model	Difference
Sparklan	WNFQ-291BEI(BT)	All models are electrically identical, different model names are for marketing purpose.
	WNFQ-291BE(BT)	

From the above models, model: WNFQ-291BEI(BT) was selected as representative model for the test and its data was recorded in this report.

4. There are Bluetooth (EDR, BLE, QHS) and WLAN (2.4 GHz & 5 GHz & 5.9 GHz & 6 GHz) technology used for the EUT.

5. Simultaneously transmission combination.

DBS			
Combination	Technology		
1	WLAN(2.4GHz)_Ant 0+1		WLAN(5GHz) _Ant 0+1
2	WLAN(2.4GHz) _Ant 0+1		WLAN(6GHz) _Ant 0+1
HBS+BT			
Combination	Technology		
3	Bluetooth_Ant 0+1		WLAN(5GHz) _Ant 0+1
4	Bluetooth_Ant 0+1		WLAN(6GHz) _Ant 0+1
5	WLAN(5GHz_U-NII-1, U-NII-2A)_Ant 0+1	WLAN(5GHz_U-NII-2C, U-NII-3, U-NII-4) _Ant 0+1	Bluetooth
6	WLAN(5GHz_U-NII-1, U-NII-2A)_Ant 0+1	WLAN(6GHz) _Ant 0+1	Bluetooth
Note: The emission of the simultaneous operation has been evaluated and no non-compliance was found.			

Note: The emission of the simultaneous operation has been evaluated and no non-compliance was found.

6. The EUT support OFDMA and Partial RU mode, therefore partial RU combination were investigated and the worst case scenario was identified.

7. The above EUT information is declared by manufacturer and for more detailed features description, please refers to the manufacturer's specifications or user's manual.

3.2 Antenna Description of EUT

1. The antenna information is listed as below.

Original									
Antenna Set	RF Chain No.	Brand	Model	Antenna Net Gain (dBi)	Frequency Range (GHz)	Cable Loss (dB)	Antenna Type	Connector Type	Cable Length (mm)
1	Chain0/1	Hong-Bo	260-25094	3.53 3.06 3.07 4.81 4.2	2.4~2.4835 5.15~5.25 5.25~5.35 5.47~5.725 5.725~5.850	0.74 1.16 1.18 1.26 1.28	PIFA	MHF 4L	300
2	Chain0/1	Hong-Bo	260-25083	5.09 5.14 5.09 5.16 5.12	5.850~5.895 5.925~6.425 6.425~6.525 6.525~6.875 6.875~7.125	1.29 1.35 1.38 1.45 1.50	PIFA	MHF 4L	300
3	Chain0/1	Hong-Bo	260-25084	3.22 3.35 3.42 4.77 4.72 4.71 4.75 4.29 4.81 4.74	2.4~2.4835 5.150~5.250 5.250~5.350 5.470~5.725 5.725~5.850 5.850~5.895 5.925~6.425 6.425~6.525 6.525~6.875 6.875~7.125	0.49 0.76 0.77 0.80 0.84 0.84 0.86 0.91 0.96 0.98	Monopole	MHF 4L	200
Newly									
Antenna Set	RF Chain No.	Brand	Model	Antenna Net Gain (dBi)	Frequency Range (GHz)	Antenna Type	Connector Type	Cable Length (mm)	
4	Chain0/1	SparkLAN	AD-513AX	3.11 4.46 4.07 4.53 4.06 4.04 3.97	2.4~2.4835 5.150~5.850 5.850~5.895 5.925~6.425 6.425~6.525 6.525~6.875 6.875~7.125	Dipole	I-PEX MHF4	150	
5	Chain0/1	SparkLAN	AD-510AX	2.27 2.88 2.6 3.23 3.34 3.52 3.52	2.4~2.4835 5.150~5.850 5.850~5.895 5.925~6.425 6.425~6.525 6.525~6.875 6.875~7.125	Dipole	RP-SMA (M)	150	
6	Chain0/1	SparkLAN	AD-512AX	2.35 3.00 2.80 2.87 3.02 3.02 2.61	2.4~2.4835 5.150~5.850 5.850~5.895 5.925~6.425 6.425~6.525 6.525~6.875 6.875~7.125	Dipole	RP-SMA (M)	150	
7	Chain0/1	SparkLAN	AD-516AX	1.65 4.3 3.98 4 4 3.91 3.78	2.4~2.4835 5.150~5.850 5.850~5.895 5.925~6.425 6.425~6.525 6.525~6.875 6.875~7.125	Dipole	I-PEX MHF4	250	
8	Chain0/1	Johanson	2450AD18A6050	2 1.5 2.7 2.7 2.7 2.7	2.4~2.4835 5.150~5.850 5.850~5.895 5.925~6.425 6.425~6.525 6.525~6.875 6.875~7.125	Chip	MHF4L to SMA-F	-	

* Detail antenna specification please refer to antenna datasheet and/or antenna measurement report.

2. The EUT incorporates a MIMO function:

5 GHz Band		
Modulation Mode	TX & RX Configuration	
802.11a	2TX	2RX
802.11n (HT20)	2TX	2RX
802.11n (HT40)	2TX	2RX
802.11ac (VHT20)	2TX	2RX
802.11ac (VHT40)	2TX	2RX
802.11ac (VHT80)	2TX	2RX
802.11ac (VHT160)	2TX	2RX
802.11ax (HE20)	2TX	2RX
802.11ax (HE40)	2TX	2RX
802.11ax (HE80)	2TX	2RX
802.11ax (HE160)	2TX	2RX
802.11be (EHT20)	2TX	2RX
802.11be (EHT40)	2TX	2RX
802.11be (EHT80)	2TX	2RX
802.11be (EHT160)	2TX	2RX
802.11ax (RU26/52/106/242/484/996/2*996)	2TX	2RX
802.11be (RU26/52/106/242/484/996/2*996 MRU52+26/106+26/ 484+242/996+484/996+484+242)	2TX	2RX

Note: The modulation and bandwidth are similar for 802.11n mode for 20 MHz (40 MHz), 802.11ac mode for 20 MHz (40 MHz, 80 MHz, 160 MHz), 802.11ax mode for 20 MHz (40 MHz, 80 MHz, 160 MHz) and 802.11be mode for 20 MHz (40 MHz, 80 MHz, 160 MHz). Therefore the investigated worst case is the representative mode in test report.

3.3 Channel List

FOR 5180 ~ 5320 MHz

8 channels are provided for 802.11a, 802.11n (HT20), 802.11ac (VHT20), 802.11ax (HE20), 802.11be (EHT20):

Channel	Frequency	Channel	Frequency
36	5180 MHz	52	5260 MHz
40	5200 MHz	56	5280 MHz
44	5220 MHz	60	5300 MHz
48	5240 MHz	64	5320 MHz

4 channels are provided for 802.11n (HT40), 802.11ac (VHT40), 802.11ax (HE40), 802.11be (EHT40):

Channel	Frequency	Channel	Frequency
38	5190 MHz	54	5270 MHz
46	5230 MHz	62	5310 MHz

2 channels are provided for 802.11ac (VHT80), 802.11ax (HE80), 802.11be (EHT80):

Channel	Frequency	Channel	Frequency
42	5210 MHz	58	5290 MHz

1 straddle channel is provided for 802.11ac (VHT160), 802.11ax (HE160), 802.11be (EHT160):

Channel	Frequency
50	5250 MHz

FOR 5500 ~ 5720 MHz

12 channels are provided for 802.11a, 802.11n (HT20), 802.11ac (VHT20), 802.11ax (HE20), 802.11be (EHT20):

Channel	Frequency	Channel	Frequency
100	5500 MHz	124	5620 MHz
104	5520 MHz	128	5640 MHz
108	5540 MHz	132	5660 MHz
112	5560 MHz	136	5680 MHz
116	5580 MHz	140	5700 MHz
120	5600 MHz	144	5720 MHz

6 channels are provided for 802.11n (HT40), 802.11ac (VHT40), 802.11ax (HE40), 802.11be (EHT40):

Channel	Frequency	Channel	Frequency
102	5510 MHz	126	5630 MHz
110	5550 MHz	134	5670 MHz
118	5590 MHz	142	5710 MHz

3 channels are provided for 802.11ac (VHT80), 802.11ax (HE80), 802.11be (EHT80):

Channel	Frequency	Channel	Frequency
106	5530 MHz	138	5690 MHz
122	5610 MHz		

1 channel is provided for 802.11ac (VHT160), 802.11ax (HE160), 802.11be (EHT160):

Channel	Frequency
114	5570 MHz

FOR 5745 ~ 5825 MHz:

5 channels are provided for 802.11a, 802.11n (HT20), 802.11ac (VHT20), 802.11ax (HE20), 802.11be (EHT20):

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

2 channels are provided for 802.11n (HT40), 802.11ac (VHT40), 802.11ax (HE40), 802.11be (EHT40):

Channel	Frequency	Channel	Frequency
151	5755 MHz	159	5795 MHz

1 channel is provided for 802.11ac (VHT80), 802.11ax (HE80), 802.11be (EHT80):

Channel	Frequency
155	5775 MHz

3.4 Test Mode Applicability and Tested Channel Detail

Pre-Scan:	1. The Dipole and Chip of antenna type in antennas can be used in the following ways: X / Y / Z axis. Pre-scan in these ways and find the worst case as a representative test condition. 2. Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates.
Worst Case:	1. Dipole antenna the worst case was found when positioned on (X / Y / Z axis): Y axis 2. Chip antenna the worst case was found when positioned on (X / Y / Z axis): Z axis

Following channel(s) was (were) selected for the final test as listed below:

Test Item	EUT Configure Mode	Mode	Signal Mode	Tested Channel	Modulation	Data Rate Parameter	RU/MRU Index
RF Output Power	A	802.11a	CDD	36, 40, 48, 52, 60, 64, 100, 116, 140, 144, 149, 157, 165	BPSK	6Mb/s	NA
		802.11be (EHT20)		36, 40, 48, 52, 60, 64, 100, 116, 140, 144, 149, 157, 165	BPSK	MCS0	NA
		802.11be (EHT40)		38, 46, 54, 62, 102, 110, 134, 142, 151, 159	BPSK	MCS0	NA
		802.11be (EHT80)		42, 58, 106, 122, 138, 155	BPSK	MCS0	NA
		802.11be (EHT160)		50, 114	BPSK	MCS0	NA
		802.11be (EHT20) 26-tone RU		36, 40, 48, 52, 60, 64, 100, 116, 140, 144, 149, 157, 165	BPSK	MCS0	0, 0, 8, 0, 0, 8, 0, 0, 8, 8, 0, 0, 8
		802.11be (EHT20) 52-tone RU		36, 40, 48, 52, 60, 64, 100, 116, 140, 144, 149, 157, 165	BPSK	MCS0	37, 37, 40, 37, 37, 40, 37, 37, 40, 40, 37, 37, 40
		802.11be (EHT20) 106-tone RU		36, 40, 48, 52, 60, 64, 100, 116, 140, 144, 149, 157, 165	BPSK	MCS0	53, 53, 54, 53, 53, 54, 53, 53, 54, 54, 53, 53, 54
		802.11be (EHT80) 484+242-tone MRU		42, 58, 138, 155	BPSK	MCS0	UL_RU484+242_Punc20_91_MCS0
		802.11be (EHT80) Punctured by 20 MHz		42, 58, 138, 155	BPSK	MCS0	EHT80_SU_Punct20_Mid2
Unwanted Emissions below 1 GHz	A, B	802.11be (EHT20)	CDD	116	BPSK	MCS0	NA
Unwanted Emissions above 1 GHz	C, D	802.11be (EHT80) 484+242-tone MRU	CDD	58	BPSK	MCS0	UL_RU484+242_Punc20_91_MCS0
		802.11be (EHT80) Punctured by 20 MHz		58	BPSK	MCS0	EHT80_SU_Punct20_Mid2
EUT Configure Mode:	A	EUT only (remove 50 ohm terminator and Connect to the appropriate equipment)					
	B	EUT with 50 ohm terminator					
	C	EUT with Dipole antenna (Model: AD-513AX)					
	D	EUT with Chip antenna (Model: 2450AD18A6050)					

Note: For unwanted emission test items, the tested channel was chosen the worst case as mode represent to report.

3.5 Duty Cycle of Test Signal

802.11a: Duty cycle = 2.083 ms / 2.113 ms x 100% = 98.6%

802.11be (EHT20): Duty cycle = 2.706 ms / 2.729 ms x 100% = 99.2%

802.11be (EHT40): Duty cycle = 1.581 ms / 1.611 ms x 100% = 98.1%

802.11be (EHT80): Duty cycle = 1.012 ms / 1.032 ms x 100% = 98.1%

802.11be (EHT160): Duty cycle = 0.755 ms / 0.768 ms x 100% = 98.3%

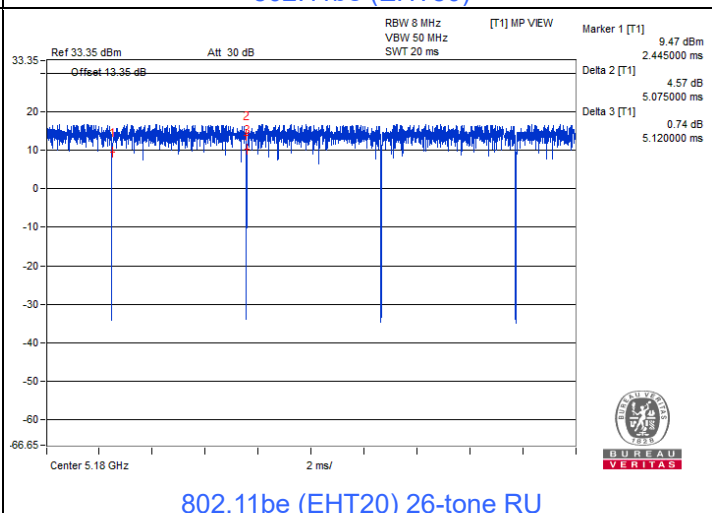
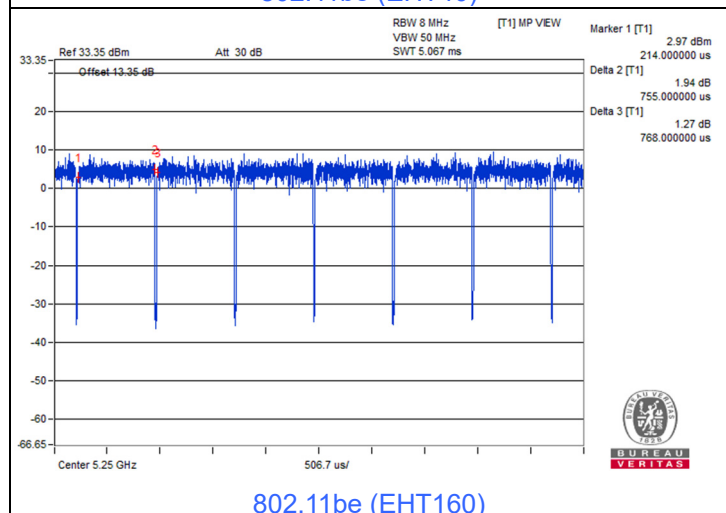
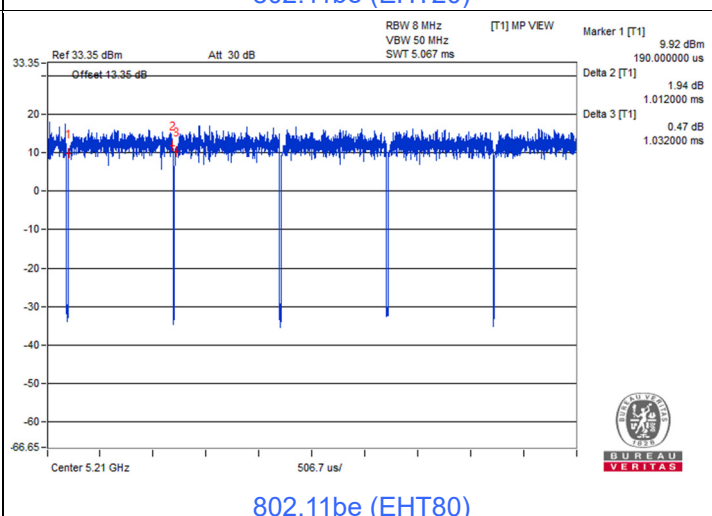
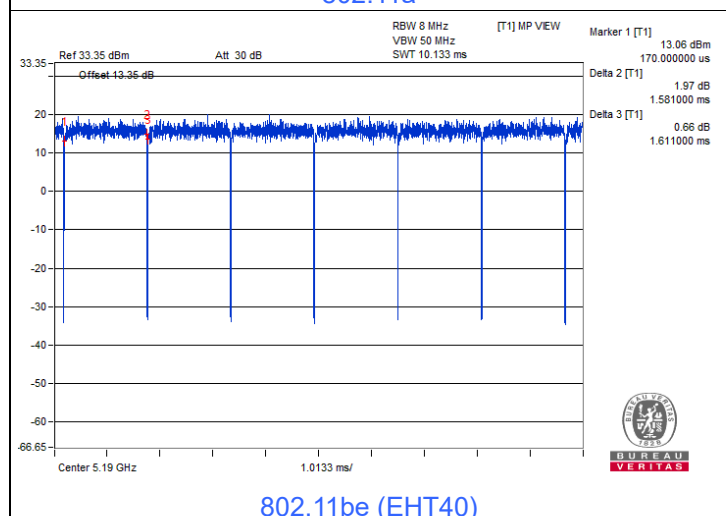
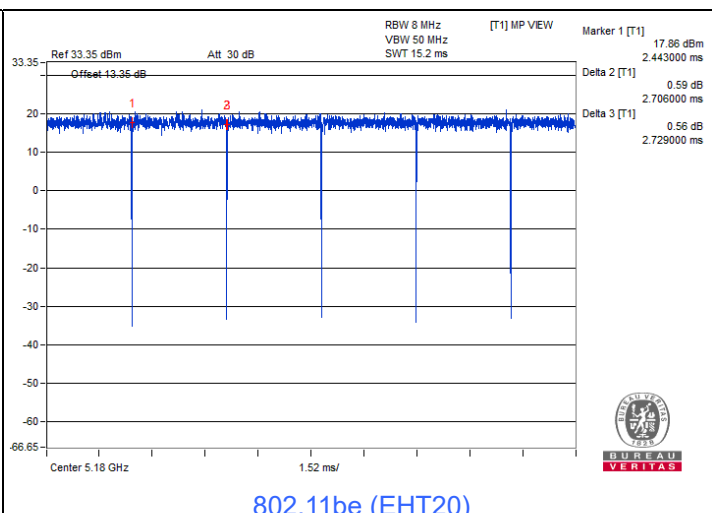
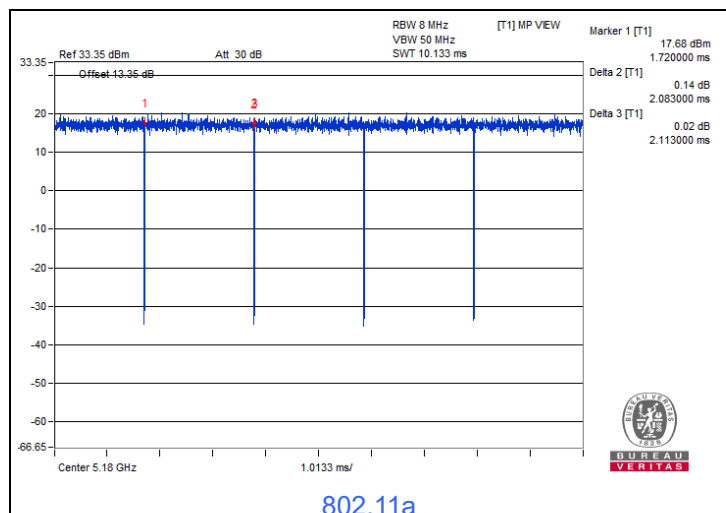
802.11be (EHT20) 26-tone RU: Duty cycle = 5.075 ms / 5.12 ms x 100% = 99.1%

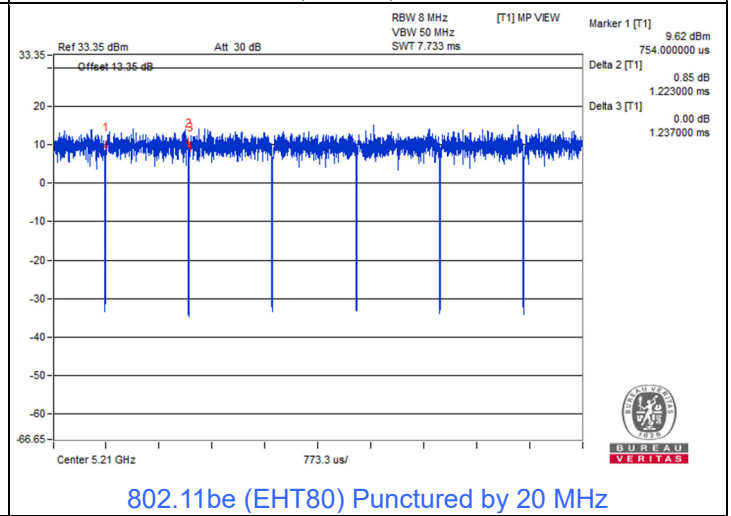
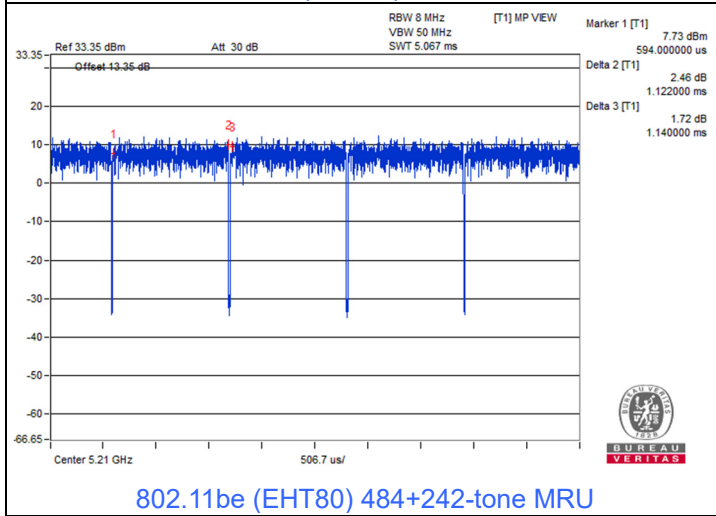
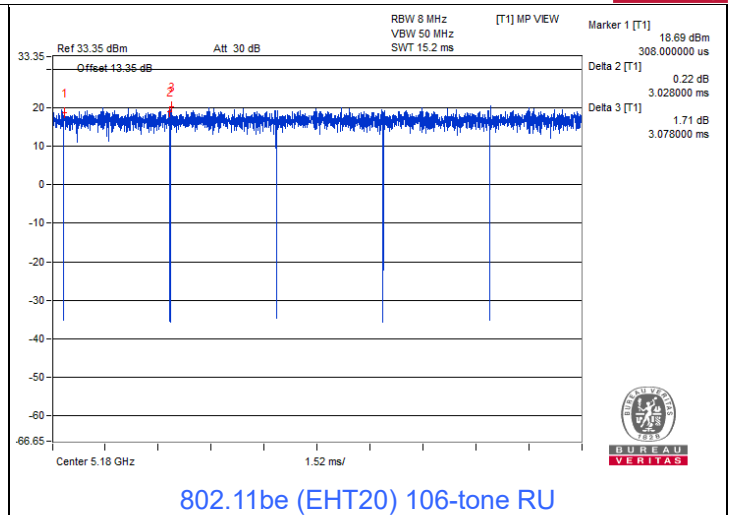
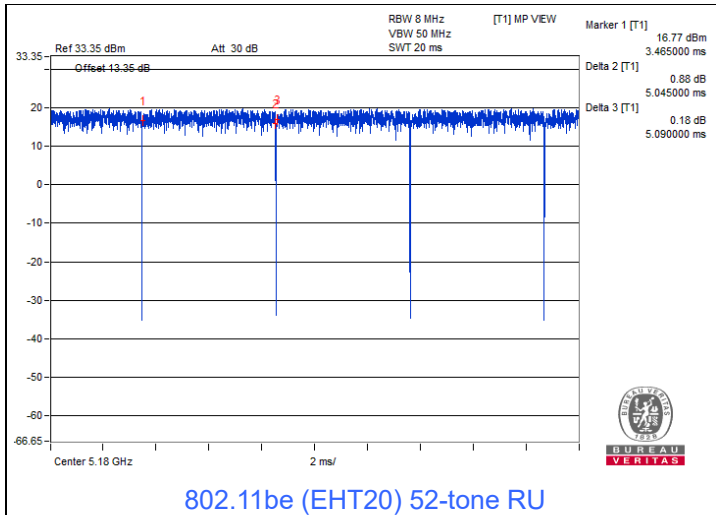
802.11be (EHT20) 52-tone RU: Duty cycle = 5.045 ms / 5.09 ms x 100% = 99.1%

802.11be (EHT20) 106-tone RU: Duty cycle = 3.028 ms / 3.078 ms x 100% = 98.4%

802.11be (EHT80) 484+242-tone MRU: Duty cycle = 1.122 ms / 1.14 ms x 100% = 98.4%

802.11be (EHT80) Punctured by 20 MHz: Duty cycle = 1.223 ms / 1.237 ms x 100% = 98.9%





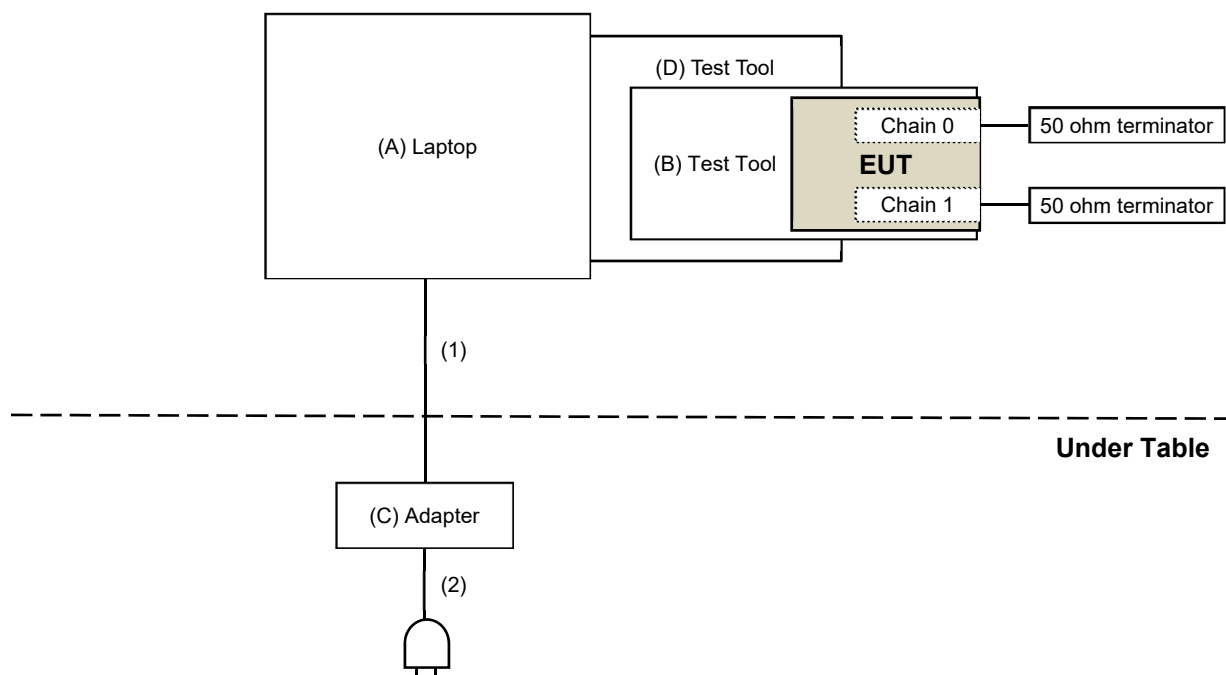
3.6 Test Program Used and Operation Descriptions

Controlling software (WLQN QRCT Module V4.0.00195.4) has been activated to set the EUT under transmission condition continuously at specific channel frequency.

3.7 Connection Diagram of EUT and Peripheral Devices

For Unwanted Emission test below 1G:

Mode B



3.8 Configuration of Peripheral Devices and Cable Connections

ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A	Laptop	Dell	E6430	N/A	N/A	Supplied by applicant
B	Test Tool	Qualcomm	N/A	N/A	N/A	Supplied by applicant
C	Adapter	Dell	LA65NM130	N/A	N/A	Supplied by applicant
D	Test Tool	Qualcomm	N/A	N/A	N/A	Supplied by applicant

ID	Cable Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1	DC Cable	1	1.8	No	0	Supplied by applicant
2	AC Cable	1	1.5	No	0	Supplied by applicant

4 Test Instruments

The calibration interval of the all test instruments are 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

4.1 RF Output Power

Description Manufacturer	Model No.	Serial No.	Calibrated Date	Calibrated Until
MXA Signal Analyzer Keysight	N9020B	MY60112408	2024/3/7	2025/3/6
Pulse Power Sensor Anritsu	MA2411B	1726434	2024/6/7	2025/6/6
RF Power Meter Anritsu	ML2495A	1529002	2024/6/7	2025/6/6
Software	ADT_RF Test Software V7.6.5.4	N/A	N/A	N/A

Notes:

1. The test was performed in Oven room 2.
2. Tested Date: 2024/10/26

4.2 Unwanted Emissions below 1 GHz

Mode A

Description Manufacturer	Model No.	Serial No.	Calibrated Date	Calibrated Until
MXA Signal Analyzer Keysight	N9020B	MY60112408	2024/3/7	2025/3/6
Software	ADT_RF Test Software V7.6.5.4	N/A	N/A	N/A

Notes:

1. The test was performed in Oven room 2.
2. Tested Date: 2024/10/25

Mode B

Description Manufacturer	Model No.	Serial No.	Calibrated Date	Calibrated Until
Bi_Log Antenna Schwarzbeck	VULB 9168	9168-0842	2024/10/8	2025/10/7
Boresight Antenna Tower & Turn Table Max-Full	MF-7802BS	MF780208530	N/A	N/A
EMI Test Receiver R&S	ESR7	102026	2024/3/25	2025/3/24
Fixed Attenuator Mini-Circuits	UNAT-5+	PAD-ATT5-02	2024/3/30	2025/3/29
Loop Antenna TESEQ	HLA 6121	63620	2024/10/17	2025/10/16
Preamplifier EMCI	EMC330N	980538	2024/3/30	2025/3/29
	EMC001340	980142	2024/2/19	2025/2/18
PXA Signal Analyzer Keysight	N9030B	MY57141948	2024/5/20	2025/5/19
RF Coaxial Cable JYEBAO	5D-FB	LOOPCAB-001	2024/2/19	2025/2/18
		LOOPCAB-002	2024/2/19	2025/2/18
RF Coaxial Cable PEWC	8D	966-5-1	2024/3/30	2025/3/29
		966-5-2	2024/3/30	2025/3/29
		966-5-3	2024/3/30	2025/3/29
Software	ADT_Radiated_V8.7.08	N/A	N/A	N/A

Notes:

1. The test was performed in 966 Chamber No. 5.
2. Tested Date: 2024/10/29

4.3 Unwanted Emissions above 1 GHz

Description Manufacturer	Model No.	Serial No.	Calibrated Date	Calibrated Until
Boresight Antenna Tower & Turn Table Max-Full	MF-7802BS	MF780208530	N/A	N/A
EMI Test Receiver R&S	ESR7	102026	2024/3/25	2025/3/24
Horn Antenna Schwarzbeck	BBHA 9120D	9120D-1819	2023/11/12 2024/11/10	2024/11/11 2025/11/9
	BBHA 9170	9170-739	2023/11/12 2024/11/10	2024/11/11 2025/11/9
Preamplifier EMCI	EMC12630SE	980509	2024/1/29	2025/1/28
	EMC184045SE	980387	2024/8/8	2025/8/7
PXA Signal Analyzer Keysight	N9030B	MY57141948	2024/5/20	2025/5/19
RF Coaxial Cable EMCI	EMC102-KM-KM-1200	160924	2024/1/29	2025/1/28
	EMC102-KM-KM-4000	200214	2024/1/29	2025/1/28
	EMC104-SM-SM-1500	180503	2024/3/16	2025/3/15
	EMC104-SM-SM-2000	180501	2024/3/16	2025/3/15
	EMC104-SM-SM-6000	180506	2024/3/16	2025/3/15
Software	ADT_Radiated_V8.7.08	N/A	N/A	N/A

Notes:

1. The test was performed in 966 Chamber No. 5.
2. Tested Date: 2024/10/30 ~ 2024/12/20

5 Limits of Test Items

5.1 RF Output Power

Operation Band	EUT Category	Limit
U-NII-1	Outdoor Access Point	1 Watt (30 dBm) (Max. e.i.r.p $\leq$ 125mW(21 dBm) at any elevation angle above 30 degrees as measured from the horizon)
	Fixed point-to-point Access Point	1 Watt (30 dBm)
	Indoor Access Point	1 Watt (30 dBm)
	Mobile and Portable client device	250mW (24 dBm)

Operation Band	Limit
U-NII-2A	250 mW (24 dBm) or 11 dBm+10 log B*
U-NII-2C	250 mW (24 dBm) or 11 dBm+10 log B*
U-NII-3	1 Watt (30 dBm)

*B is the 26 dB emission bandwidth in megahertz

Per KDB 662911 D01 Multiple Transmitter Output Method of conducted output power measurement on IEEE 802.11 devices,

Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \leq 4$;

Array Gain = 0 dB (i.e., no array gain) for channel widths ≥ 40 MHz for any N_{ANT} ;

Array Gain = $5 \log(N_{ANT}/N_{SS})$ dB or 3 dB, whichever is less, for 20-MHz channel widths with $N_{ANT} \geq 5$.

For power measurements on all other devices: Array Gain = $10 \log(N_{ANT}/N_{SS})$ dB.

5.2 Unwanted Emissions below 1 GHz

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

Frequencies (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

Notes:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).

5.3 Unwanted Emissions above 1 GHz

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

Frequencies (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
Above 960	500	3

Notes:

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 1000 MHz, 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 20 dB 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 3 m	
	PK: 74 (dBμV/m)	AV: 54 (dBμV/m)

For transmitters operating in the 5.15-5.25 GHz band:

Applicable To	EIRP Limit	Equivalent Field Strength at 3 m
15.407(b)(1)	PK: -27 (dBm/MHz)	PK: 68.2 (dBμV/m) *

* Conducted Unwanted Emission Convert Formula:

Emission Level (dBuV/m) = EIRP Level (dBm) – 20log(d) + 104.8, d = measurement distance in 3 meters.

Emission Level (dBuV/m) = -27 – 20log(3) + 104.8 = 68.26

For transmitters operating in the 5.25-5.35 GHz band:

Applicable To	EIRP Limit	Equivalent Field Strength at 3 m
15.407(b)(2)	PK: -27 (dBm/MHz)	PK: 68.2 (dBμV/m) *

* Conducted Unwanted Emission Convert Formula:

Emission Level (dBuV/m) = EIRP Level (dBm) – 20log(d) + 104.8, d = measurement distance in 3 meters.

Emission Level (dBuV/m) = -27 – 20log(3) + 104.8 = 68.26

For transmitters operating in the 5.47-5.725 GHz band:

Applicable To	EIRP Limit	Equivalent Field Strength at 3 m
15.407(b)(3)	PK: -27 (dBm/MHz)	PK: 68.2 (dBμV/m) *

* Conducted Unwanted Emission Convert Formula:

Emission Level (dBuV/m) = EIRP Level (dBm) – 20log(d) + 104.8, d = measurement distance in 3 meters.

Emission Level (dBuV/m) = -27 – 20log(3) + 104.8 = 68.26

For transmitters operating in the 5.725-5.850 GHz band:

Applicable To	EIRP Limit	Equivalent Field Strength at 3 m
15.407(b)(4)(i)	PK: -27 (dBm/MHz) ^{*1}	PK: 68.2 (dBμV/m) ^{*1}
	PK: 10 (dBm/MHz) ^{*2}	PK: 105.2 (dBμV/m) ^{*2}
	PK: 15.6 (dBm/MHz) ^{*3}	PK: 110.8 (dBμV/m) ^{*3}
	PK: 27 (dBm/MHz) ^{*4}	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.

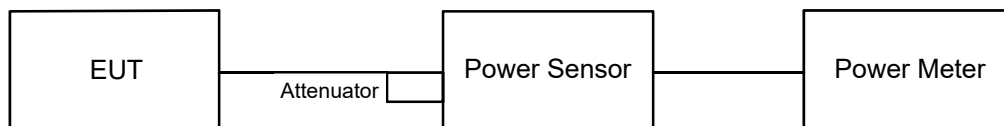
Note: The following formula is used to convert the equipment isotropic radiated power (eirp) to field strength:

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

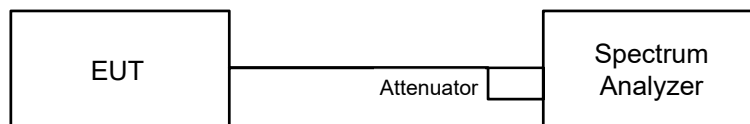
6 Test Arrangements

6.1 RF Output Power

6.1.1 Test Setup



For channel straddling:



6.1.2 Test Procedure

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.

For channel straddling:

Method SA-1

- Set span to encompass the entire emission bandwidth (EBW) of the signal.
- Set RBW = 1 MHz, Set VBW $\geq$ 3 MHz, Detector = RMS
- Sweep points $\geq [2 \times \text{span} / \text{RBW}]$. (This gives bin-to-bin spacing $\leq \text{RBW} / 2$, so that narrowband signals are not lost between frequency bins.)
- Sweep time = auto, trigger set to "free run".
- Trace average at least 100 traces in power averaging mode.
- Record the max value

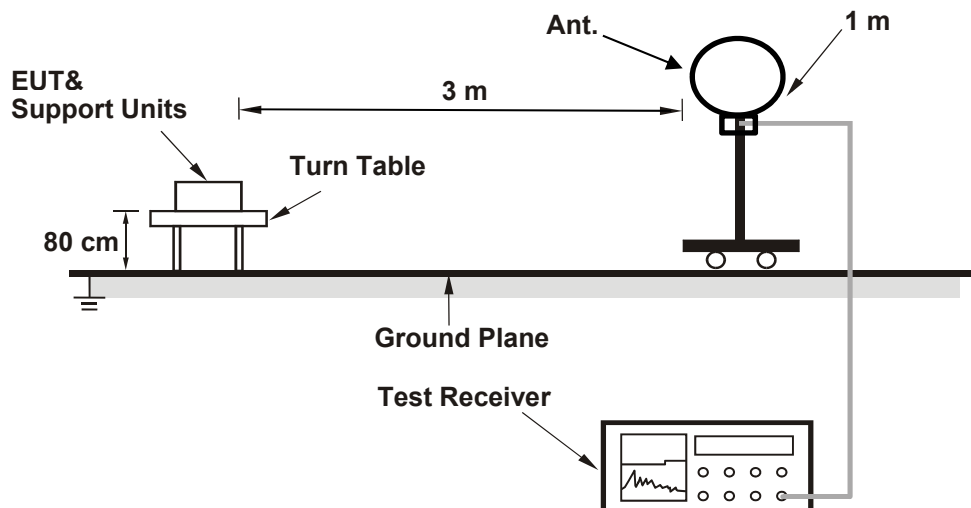
Note: When measuring straddle channel power, use compute power by integrating the spectrum across the 26 dB EBW or 99% OBW of the signal using the instrument's band power measurement function, with band limits set equal to the EBW or OBW band edges. If the instrument does not have a band power function, then sum the spectrum levels (in power units) at 1 MHz intervals extending across the 26 dB EBW or 99% OBW of the spectrum.

6.2 Unwanted Emissions below 1 GHz

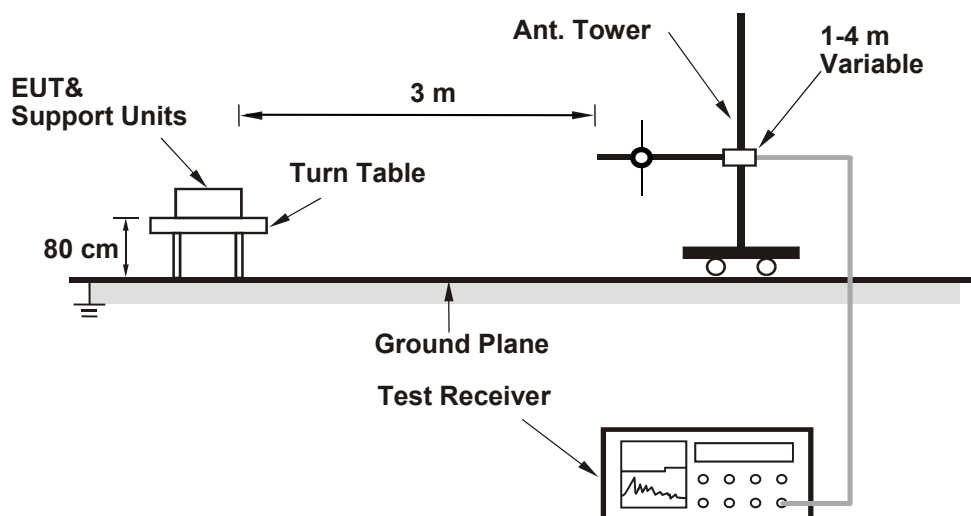
6.2.1 Test Setup

For Radiated Configuration:

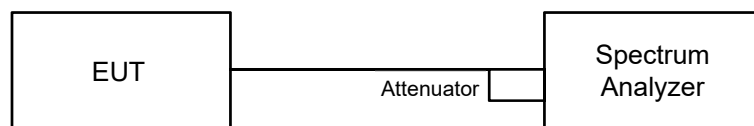
For Radiated emission below 30 MHz



For Radiated emission above 30 MHz



For Conducted Configuration:



For the actual test configuration, please refer to the attached file (Test Setup Photo).

6.2.2 Test Procedure

Radiated versus Conducted Measurement.

The unwanted emission limits in both the restricted and non-restricted bands are based on antenna-port conducted measurements in conjunction with cabinet emissions tests are permitted to demonstrate compliance.

The following steps was performed:

- a. Cabinet emissions measurements. Radiated measurement was performed to ensure that cabinet emissions are below the emission limits. For the cabinet-emission measurements the antenna was replaced by a termination matching the nominal impedance of the antenna.
- b. Conducted tests was performed using equipment that matches the nominal impedance of the antenna assembly used with the EUT.
- c. EIRP calculation. A value representative of an upper bound on out-of-band antenna gain (in dBi) shall be added to the measured antenna-port conducted emission power to compute EIRP within the specified measurement bandwidth. (For emissions in the restricted bands, additional calculations are required to convert EIRP to field strength at the specified distance.) The upper bound on antenna gain for a device with a single RF output shall be selected as the maximum in-band gain of the antenna across all operating bands or 2 dBi, whichever is greater.
- d. EIRP adjustments for multiple outputs. (Follow the procedures specified in FCC KDB Publication 662911)
- e. For all of Radiation emission test

For Radiated emission below 30 MHz

- e-1.1. The EUT was placed on the top of a rotating table 0.8 meters above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.
- e-1.2. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- e-1.3. Parallel, perpendicular, and ground-parallel orientations of the antenna are set to make the measurement.
- e-1.4. 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-1.5. The test-receiver system was set to Quasi-Peak Detect Function and Specified Bandwidth with Maximum Hold Mode, except for the frequency band (9 kHz to 90 kHz and 110 kHz to 490 kHz) set to average detect function and peak detect function.

Notes:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 200 Hz at frequency below 150 kHz.
2. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 9 kHz or 10 kHz at frequency (150 kHz to 30 MHz).
3. All modes of operation were investigated and the worst-case emissions are reported.

For Radiated emission above 30 MHz

- e-2.1. The EUT was placed on the top of a rotating table 0.8 meters above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.
- e-2.2. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- e-2.3. 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.
- e-2.4. 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 rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e-2.5. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.

Notes:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz for Quasi-peak detection (QP) at frequency below 1 GHz.
2. All modes of operation were investigated and the worst-case emissions are reported.

Radiated versus Conducted Measurement

For Radiated measurement:

The level of unwanted emissions was measured when radiated by the cabinet or structure of the equipment with the antenna connector(s) terminated by a specified load (cabinet radiation).

For Conducted measurement:

The level of unwanted emissions was measured as their power in a specified load (conducted spurious emissions).

Conducted Unwanted Emission Convert Formula

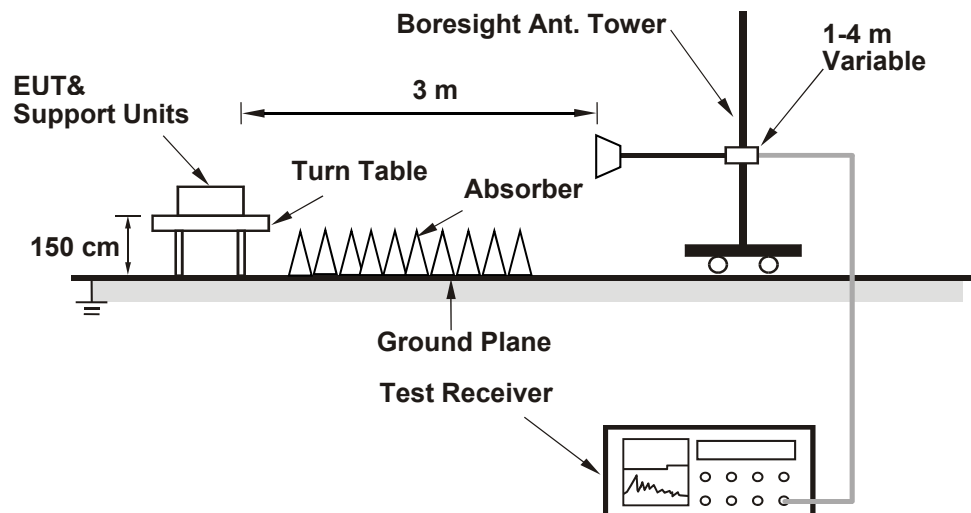
- a. $\text{Emission Level (dBuV/m)} = \text{EIRP Level (dBm)} - 20\log(d) + 104.8$
 $d = \text{measurement distance in 3 meters.}$
- b. $\text{EIRP Level (dBm)} = \text{Raw Value(dBm)} + \text{Correction Factor(dB)}$
- c. Correction Factor is directional gain, and the composite gain will be used when signal support the correlated signal.
 For the out of band spurious the gain for the specific band may have been used rather than the highest gain across all bands.
 For the band edge the gain for the specific band may have been used.

Notes:

1. In restricted bands below 1000 MHz, add upper bound on ground plane reflection:
 For frequencies between 30 MHz and 1000 MHz, add 4.7 dB.
2. The conducted emission test was considered some factor to compute test result.

6.3 Unwanted Emissions above 1 GHz

6.3.1 Test Setup



For the actual test configuration, please refer to the attached file (Test Setup Photo).

6.3.2 Test Procedure

- The EUT was placed on the top of a rotating table 1.5 meters above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.
- The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- 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.
- 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.
- 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.

Notes:

- The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) and Average detection (AV) at frequency above 1 GHz.
- For fundamental and harmonic signal measurement, the resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is $\geq 1/T$ (Duty cycle < 98%) or 10 Hz (Duty cycle $\geq 98\%$) for Average detection (AV) at frequency above 1 GHz.
- All modes of operation were investigated and the worst-case emissions are reported.

7 Test Results of Test Item

7.1 RF Output Power

Input Power:	3.3 Vdc	Environmental Conditions:	25°C, 60% RH	Tested By:	Kevin Ko
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802.11a

Chan.	Chan. Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Test Result
		Chain 0	Chain 1				
36	5180	16.10	15.04	72.653	18.61	24	Pass
40	5200	15.89	15.07	70.952	18.51	24	Pass
48	5240	15.85	15.11	70.893	18.51	24	Pass
52	5260	15.79	15.12	70.44	18.48	24	Pass
60	5300	15.81	15.17	70.992	18.51	24	Pass
64	5320	15.85	15.26	72.033	18.58	24	Pass
100	5500	15.97	15.01	71.232	18.53	24	Pass
116	5580	16.32	15.39	77.449	18.89	24	Pass
140	5700	16.17	14.89	72.232	18.59	24	Pass
*144 (U-NII-2C)	5720	15.02	14.22	58.193	17.65	23	Pass
*144 (U-NII-3)	5720	7.04	6.16	9.189	9.63	30	Pass
149	5745	16.25	14.87	72.86	18.62	30	Pass
157	5785	16.09	14.74	70.429	18.48	30	Pass
165	5825	16.13	14.68	70.397	18.48	30	Pass

Notes:

- * : Test was performed in accordance with measurement follow FCC KDB 789033 UNII test procedure Method SA-1 and use spectrum analyzer test.
- Directional gain is the maximum gain of antennas.
- For U-NII-1, the maximum gain is 4.46 dBi < 6 dBi, so the output power limit shall not be reduced.
- For U-NII-2A, the maximum gain is 4.46 dBi < 6 dBi, so the output power limit shall not be reduced.
- For U-NII-2C, the maximum gain is 4.81 dBi < 6 dBi, so the output power limit shall not be reduced.
- For U-NII-3, the maximum gain is 4.72 dBi < 6 dBi, so the output power limit shall not be reduced.

802.11be (EHT20)

Chan.	Chan. Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Test Result
		Chain 0	Chain 1				
36	5180	16.39	15.31	77.514	18.89	24	Pass
40	5200	16.89	15.71	86.104	19.35	24	Pass
48	5240	16.70	16.01	86.676	19.38	24	Pass
52	5260	16.75	16.21	89.098	19.50	24	Pass
60	5300	16.79	16.05	88.025	19.45	24	Pass
64	5320	16.51	15.94	84.036	19.24	24	Pass
100	5500	16.65	15.79	84.17	19.25	24	Pass
116	5580	16.82	15.90	86.988	19.39	24	Pass
140	5700	16.72	15.49	82.389	19.16	24	Pass
*144 (U-NII-2C)	5720	15.58	14.58	64.849	18.12	22.93	Pass
*144 (U-NII-3)	5720	8.75	7.87	13.622	11.34	30	Pass
149	5745	16.75	15.40	81.989	19.14	30	Pass
157	5785	16.61	15.37	80.249	19.04	30	Pass
165	5825	16.71	15.28	80.61	19.06	30	Pass

Notes:

- * : Test was performed in accordance with measurement follow FCC KDB 789033 UNII test procedure Method SA-1 and use spectrum analyzer test.
- Directional gain is the maximum gain of antennas.
- For U-NII-1, the maximum gain is 4.46 dBi < 6 dBi, so the output power limit shall not be reduced.
- For U-NII-2A, the maximum gain is 4.46 dBi < 6 dBi, so the output power limit shall not be reduced.
- For U-NII-2C, the maximum gain is 4.81 dBi < 6 dBi, so the output power limit shall not be reduced.
- For U-NII-3, the maximum gain is 4.72 dBi < 6 dBi, so the output power limit shall not be reduced.

802.11be (EHT40)

Chan.	Chan. Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Test Result
		Chain 0	Chain 1				
38	5190	15.89	14.44	66.612	18.24	24	Pass
46	5230	16.01	15.24	73.322	18.65	24	Pass
54	5270	16.15	15.05	73.199	18.65	24	Pass
62	5310	16.24	15.12	74.581	18.73	24	Pass
102	5510	16.14	15.38	75.629	18.79	24	Pass
110	5550	16.32	15.55	78.747	18.96	24	Pass
134	5670	16.31	15.26	76.33	18.83	24	Pass
*142 (U-NII-2C)	5710	15.50	14.82	65.82	18.18	24	Pass
*142 (U-NII-3)	5710	4.55	3.89	5.3	7.24	30	Pass
151	5755	16.27	15.23	75.707	18.79	30	Pass
159	5795	16.26	15.11	74.701	18.73	30	Pass

Notes:

- * : Test was performed in accordance with measurement follow FCC KDB 789033 UNII test procedure Method SA-1 and use spectrum analyzer test.
- Directional gain is the maximum gain of antennas.
- For U-NII-1, the maximum gain is 4.46 dBi < 6 dBi, so the output power limit shall not be reduced.
- For U-NII-2A, the maximum gain is 4.46 dBi < 6 dBi, so the output power limit shall not be reduced.
- For U-NII-2C, the maximum gain is 4.81 dBi < 6 dBi, so the output power limit shall not be reduced.
- For U-NII-3, the maximum gain is 4.72 dBi < 6 dBi, so the output power limit shall not be reduced.

802.11be (EHT80)

Chan.	Chan. Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Test Result
		Chain 0	Chain 1				
42	5210	14.28	13.42	48.77	16.88	24	Pass
58	5290	14.45	13.63	50.929	17.07	24	Pass
106	5530	14.21	13.60	49.272	16.93	24	Pass
122	5610	15.55	14.54	64.337	18.08	24	Pass
*138 (U-NII-2C)	5690	14.81	14.01	55.446	17.44	24	Pass
*138 (U-NII-3)	5690	-0.34	-1.15	1.6921	2.28	30	Pass
155	5775	15.41	14.21	61.117	17.86	30	Pass

Notes:

- * : Test was performed in accordance with measurement follow FCC KDB 789033 UNII test procedure Method SA-1 and use spectrum analyzer test.
- Directional gain is the maximum gain of antennas.
- For U-NII-1, the maximum gain is 4.46 dBi < 6 dBi, so the output power limit shall not be reduced.
- For U-NII-2A, the maximum gain is 4.46 dBi < 6 dBi, so the output power limit shall not be reduced.
- For U-NII-2C, the maximum gain is 4.81 dBi < 6 dBi, so the output power limit shall not be reduced.
- For U-NII-3, the maximum gain is 4.72 dBi < 6 dBi, so the output power limit shall not be reduced.

802.11be (EHT160)

Chan.	Chan. Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Test Result
		Chain 0	Chain 1				
*50 (U-NII-1)	5250	8.68	8.13	13.88	11.42	24	Pass
*50 (U-NII-2A)	5250	9.19	8.27	15.013	11.76	24	Pass
114	5570	11.32	10.35	24.391	13.87	24	Pass

Notes:

- * : Test was performed in accordance with measurement follow FCC KDB 789033 UNII test procedure Method SA-1 and use spectrum analyzer test.
- Directional gain is the maximum gain of antennas.
- For U-NII-1, the maximum gain is 4.46 dBi < 6 dBi, so the output power limit shall not be reduced.
- For U-NII-2A, the maximum gain is 4.46 dBi < 6 dBi, so the output power limit shall not be reduced.
- For U-NII-2C, the maximum gain is 4.81 dBi < 6 dBi, so the output power limit shall not be reduced.

802.11be (EHT20) 26-tone RU

Chan.	Chan. Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Test Result
		Chain 0	Chain 1				
36	5180	9.63	8.27	15.898	12.01	24	Pass
40	5200	9.77	8.21	16.106	12.07	24	Pass
48	5240	9.25	8.15	14.945	11.74	24	Pass
52	5260	9.40	8.35	15.549	11.92	24	Pass
60	5300	9.31	8.37	15.402	11.88	24	Pass
64	5320	9.45	8.41	15.745	11.97	24	Pass
100	5500	7.53	6.48	10.109	10.05	24	Pass
116	5580	8.15	7.08	11.636	10.66	24	Pass
140	5700	7.43	6.41	9.909	9.96	24	Pass
*144 (U-NII-2C)	5720	-13.68	-14.23	0.08061	-10.94	22.47	Pass
*144 (U-NII-3)	5720	7.08	6.40	9.47	9.76	30	Pass
149	5745	15.34	14.30	61.113	17.86	30	Pass
157	5785	15.24	14.28	60.211	17.80	30	Pass
165	5825	15.16	14.37	60.162	17.79	30	Pass

Notes:

- * : Test was performed in accordance with measurement follow FCC KDB 789033 UNII test procedure Method SA-1 and use spectrum analyzer test.
- Directional gain is the maximum gain of antennas.
- For U-NII-1, the maximum gain is 4.46 dBi < 6 dBi, so the output power limit shall not be reduced.
- For U-NII-2A, the maximum gain is 4.46 dBi < 6 dBi, so the output power limit shall not be reduced.
- For U-NII-2C, the maximum gain is 4.81 dBi < 6 dBi, so the output power limit shall not be reduced.
- For U-NII-3, the maximum gain is 4.72 dBi < 6 dBi, so the output power limit shall not be reduced.

802.11be (EHT20) 52-tone RU

Chan.	Chan. Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Test Result
		Chain 0	Chain 1				
36	5180	12.90	11.51	33.656	15.27	24	Pass
40	5200	12.92	11.48	33.649	15.27	24	Pass
48	5240	12.87	11.51	33.522	15.25	24	Pass
52	5260	12.45	11.67	32.268	15.09	24	Pass
60	5300	12.52	11.62	32.386	15.10	24	Pass
64	5320	12.41	11.54	31.674	15.01	24	Pass
100	5500	10.77	10.03	22.009	13.43	24	Pass
116	5580	11.07	10.71	24.57	13.90	24	Pass
140	5700	11.16	10.64	24.649	13.92	24	Pass
*144 (U-NII-2C)	5720	-6.37	-7.20	0.4212	-3.76	22.56	Pass
*144 (U-NII-3)	5720	10.99	10.10	22.793	13.58	30	Pass
149	5745	15.87	13.92	63.297	18.01	30	Pass
157	5785	15.91	13.95	63.826	18.05	30	Pass
165	5825	15.88	13.84	62.936	17.99	30	Pass

Notes:

- * : Test was performed in accordance with measurement follow FCC KDB 789033 UNII test procedure Method SA-1 and use spectrum analyzer test.
- Directional gain is the maximum gain of antennas.
- For U-NII-1, the maximum gain is 4.46 dBi < 6 dBi, so the output power limit shall not be reduced.
- For U-NII-2A, the maximum gain is 4.46 dBi < 6 dBi, so the output power limit shall not be reduced.
- For U-NII-2C, the maximum gain is 4.81 dBi < 6 dBi, so the output power limit shall not be reduced.
- For U-NII-3, the maximum gain is 4.72 dBi < 6 dBi, so the output power limit shall not be reduced.

802.11be (EHT20) 106-tone RU

Chan.	Chan. Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Test Result
		Chain 0	Chain 1				
36	5180	16.53	15.50	80.459	19.06	24	Pass
40	5200	16.43	15.17	76.839	18.86	24	Pass
48	5240	16.02	15.45	75.07	18.75	24	Pass
52	5260	16.14	15.58	77.256	18.88	24	Pass
60	5300	16.25	15.59	78.394	18.94	24	Pass
64	5320	16.06	15.47	75.602	18.79	24	Pass
100	5500	14.11	13.26	46.947	16.72	24	Pass
116	5580	14.56	13.69	51.964	17.16	24	Pass
140	5700	14.10	13.28	46.985	16.72	24	Pass
*144 (U-NII-2C)	5720	11.33	10.64	25.171	14.01	22.55	Pass
*144 (U-NII-3)	5720	10.56	9.67	20.645	13.15	30	Pass
149	5745	16.74	15.33	81.326	19.10	30	Pass
157	5785	16.71	15.21	80.071	19.03	30	Pass
165	5825	16.72	15.28	80.718	19.07	30	Pass

Notes:

- * : Test was performed in accordance with measurement follow FCC KDB 789033 UNII test procedure Method SA-1 and use spectrum analyzer test.
- Directional gain is the maximum gain of antennas.
- For U-NII-1, the maximum gain is 4.46 dBi < 6 dBi, so the output power limit shall not be reduced.
- For U-NII-2A, the maximum gain is 4.46 dBi < 6 dBi, so the output power limit shall not be reduced.
- For U-NII-2C, the maximum gain is 4.81 dBi < 6 dBi, so the output power limit shall not be reduced.
- For U-NII-3, the maximum gain is 4.72 dBi < 6 dBi, so the output power limit shall not be reduced.

802.11be (EHT80) 484+242-tone MRU

Chan.	Chan. Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Test Result
		Chain 0	Chain 1				
42	5210	13.32	12.30	38.461	15.85	24	Pass
58	5290	12.78	12.49	36.709	15.65	24	Pass
*138 (U-NII-2C)	5690	15.94	15.09	71.549	18.55	24	Pass
*138 (U-NII-3)	5690	2.50	1.87	3.316	5.21	30	Pass
155	5775	16.36	15.17	76.137	18.82	30	Pass

Notes:

- * : Test was performed in accordance with measurement follow FCC KDB 789033 UNII test procedure Method SA-1 and use spectrum analyzer test.
- Directional gain is the maximum gain of antennas.
- For U-NII-1, the maximum gain is 4.46 dBi < 6 dBi, so the output power limit shall not be reduced.
- For U-NII-2A, the maximum gain is 4.46 dBi < 6 dBi, so the output power limit shall not be reduced.
- For U-NII-2C, the maximum gain is 4.81 dBi < 6 dBi, so the output power limit shall not be reduced.
- For U-NII-3, the maximum gain is 4.72 dBi < 6 dBi, so the output power limit shall not be reduced.

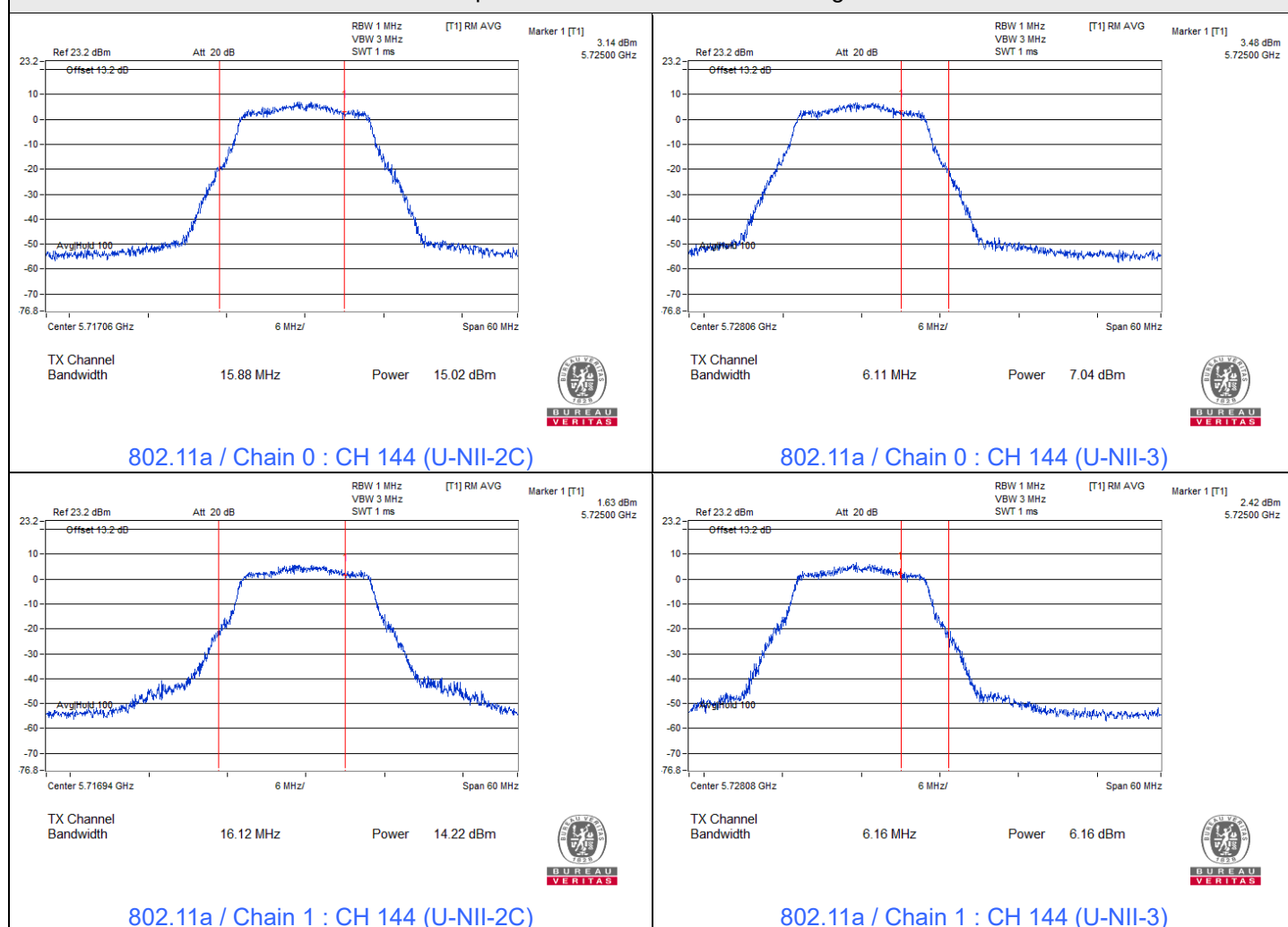
802.11be (EHT80) Punctured by 20 MHz

Chan.	Chan. Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Test Result
		Chain 0	Chain 1				
42	5210	13.43	12.61	40.268	16.05	24	Pass
58	5290	12.89	12.59	37.609	15.75	24	Pass
*138 (U-NII-2C)	5690	15.23	14.31	60.32	17.80	24	Pass
*138 (U-NII-3)	5690	1.70	1.16	2.785	4.45	30	Pass
155	5775	15.94	14.86	69.884	18.44	30	Pass

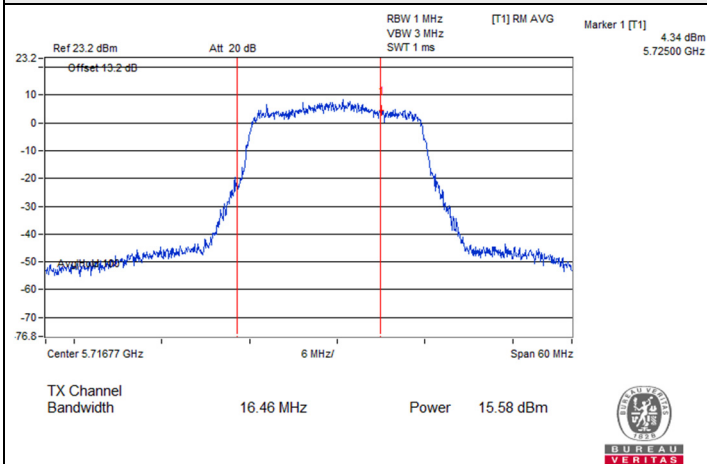
Notes:

- * : Test was performed in accordance with measurement follow FCC KDB 789033 UNII test procedure Method SA-1 and use spectrum analyzer test.
- Directional gain is the maximum gain of antennas.
- For U-NII-1, the maximum gain is 4.46 dBi < 6 dBi, so the output power limit shall not be reduced.
- For U-NII-2A, the maximum gain is 4.46 dBi < 6 dBi, so the output power limit shall not be reduced.
- For U-NII-2C, the maximum gain is 4.81 dBi < 6 dBi, so the output power limit shall not be reduced.
- For U-NII-3, the maximum gain is 4.72 dBi < 6 dBi, so the output power limit shall not be reduced.

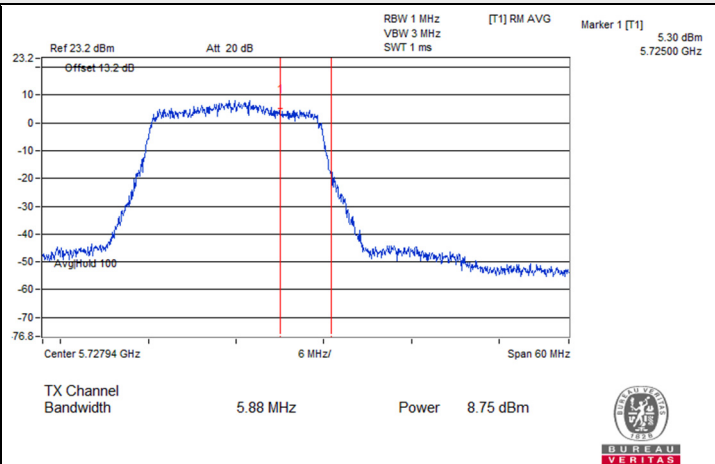
Spectrum Plot for channel straddling



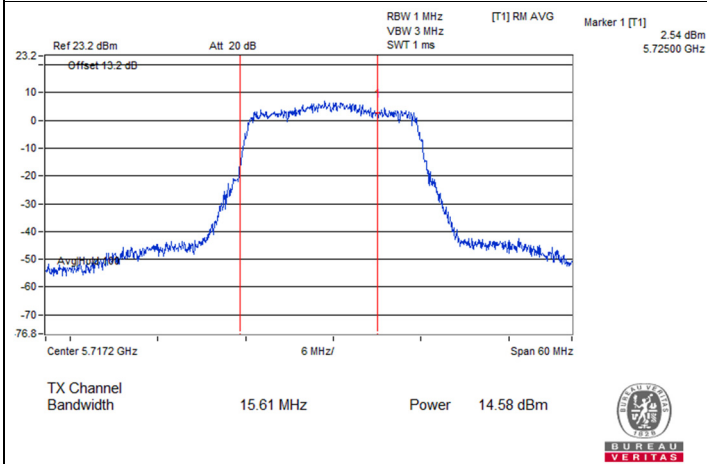
Spectrum Plot for channel straddling



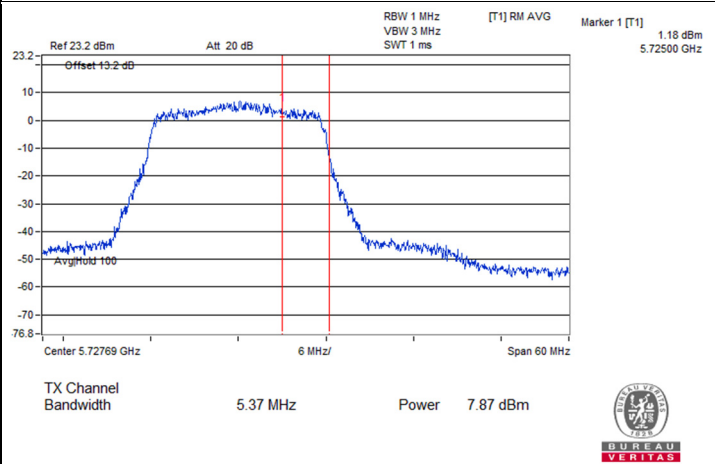
802.11be (EHT20) / Chain 0 : CH 144 (U-NII-2C)



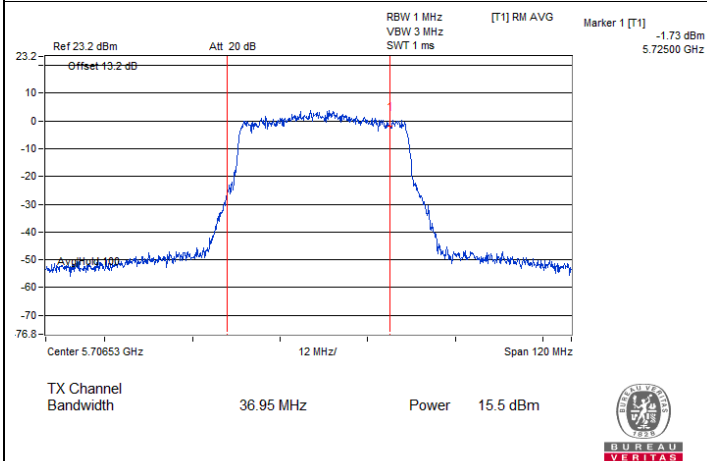
802.11be (EHT20) / Chain 0 : CH 144 (U-NII-3)



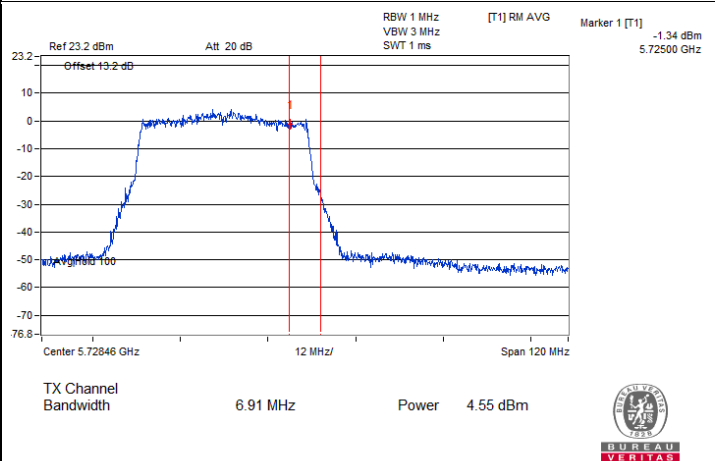
802.11be (EHT20) / Chain 1 : CH 144 (U-NII-2C)



802.11be (EHT20) / Chain 1 : CH 144 (U-NII-3)

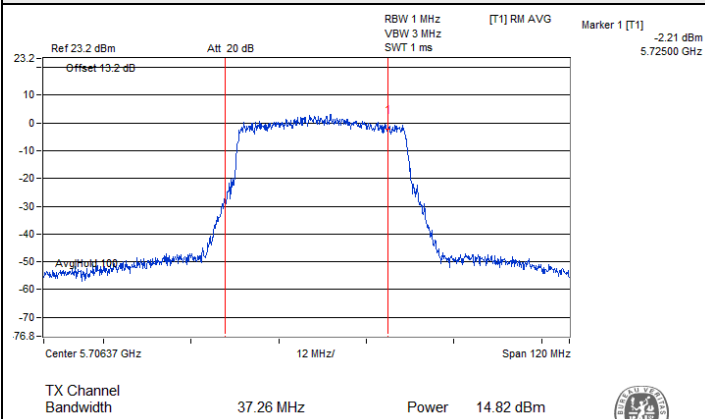


802.11be (EHT40) / Chain 0 : CH 142 (U-NII-2C)

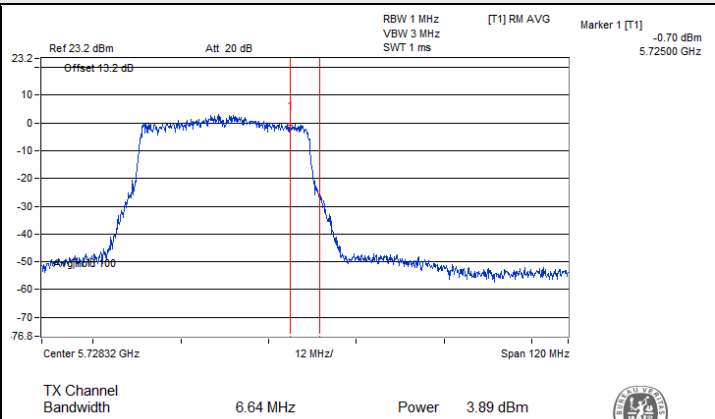


802.11be (EHT40) / Chain 0 : CH 142 (U-NII-3)

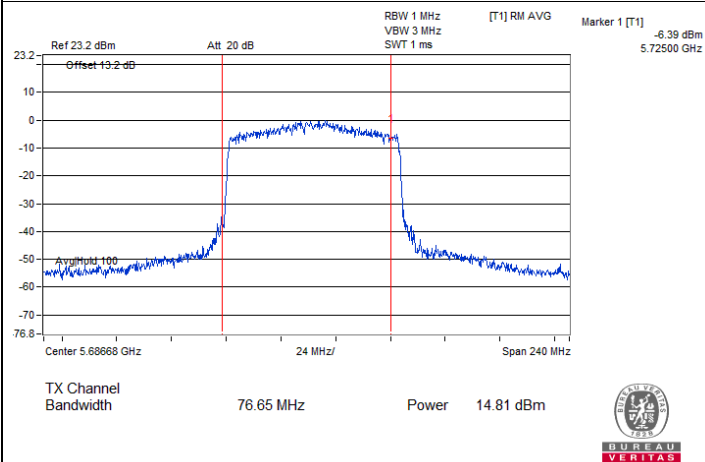
Spectrum Plot for channel straddling



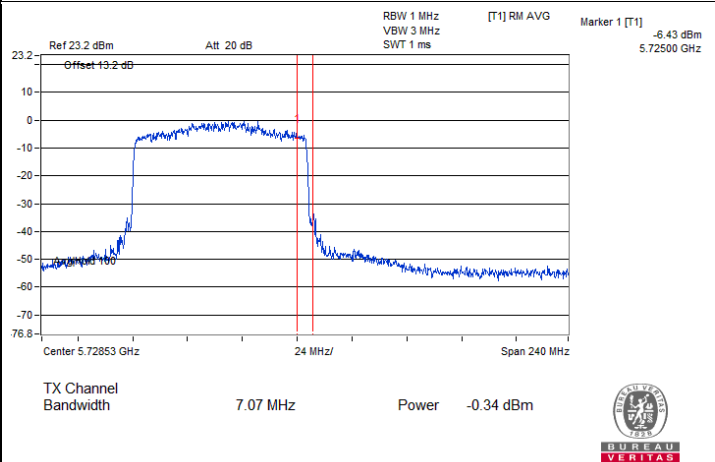
802.11be (EHT40) / Chain 1 : CH 142 (U-NII-2C)



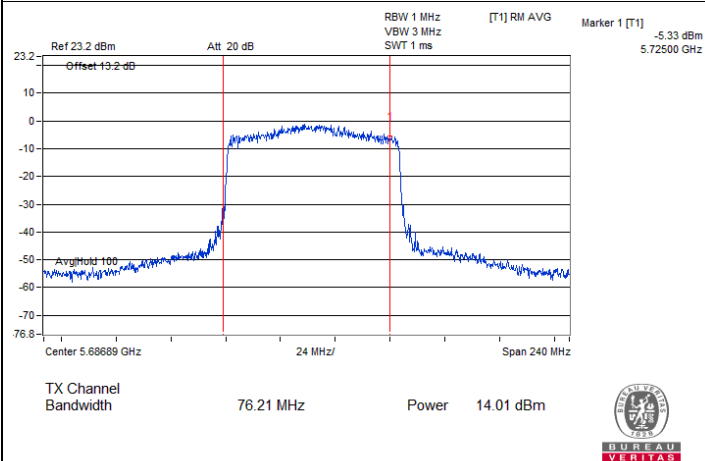
802.11be (EHT40) / Chain 1 : CH 142 (U-NII-3)



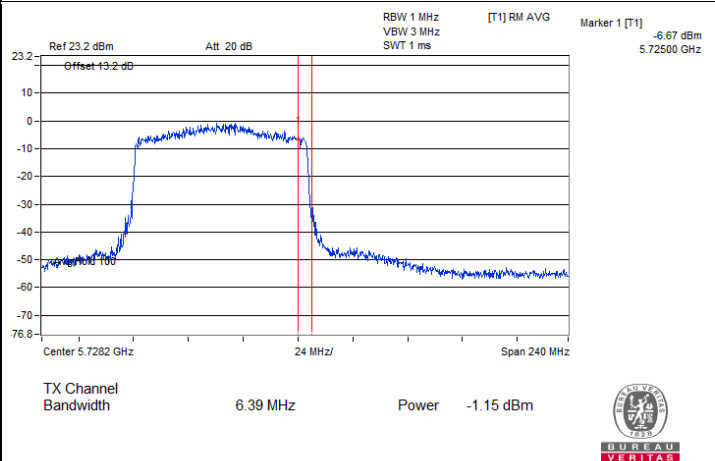
802.11be (EHT80) / Chain 0 : CH 138 (U-NII-2C)



802.11be (EHT80) / Chain 0 : CH 138 (U-NII-3)

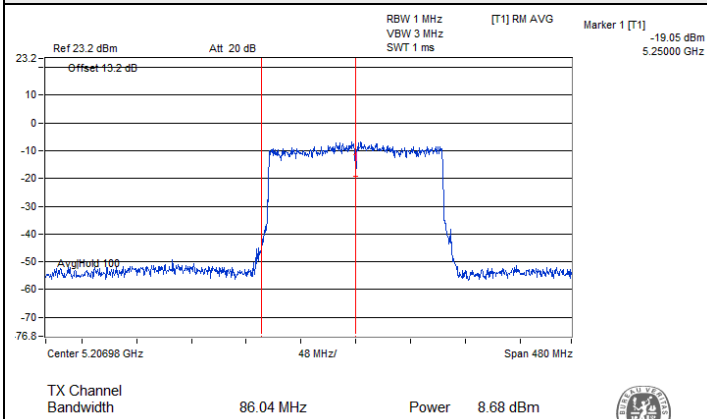


802.11be (EHT80) / Chain 1 : CH 138 (U-NII-2C)

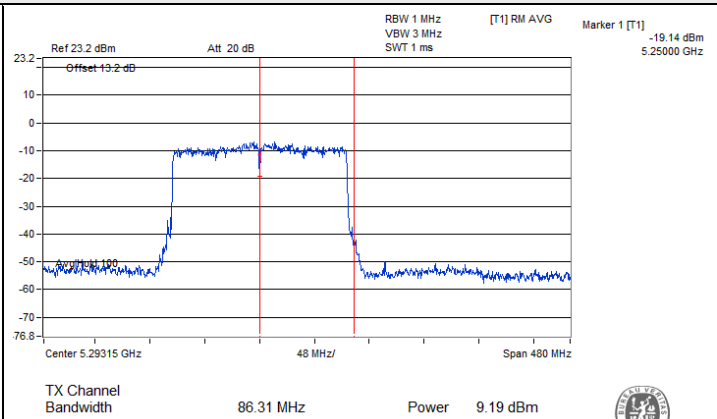


802.11be (EHT80) / Chain 1 : CH 138 (U-NII-3)

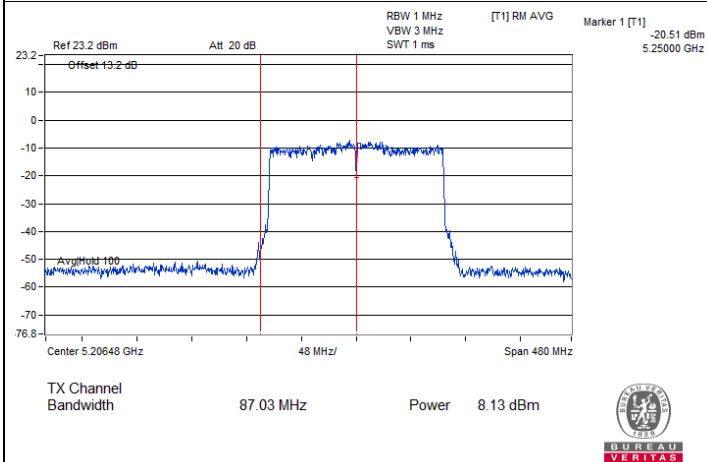
Spectrum Plot for channel straddling



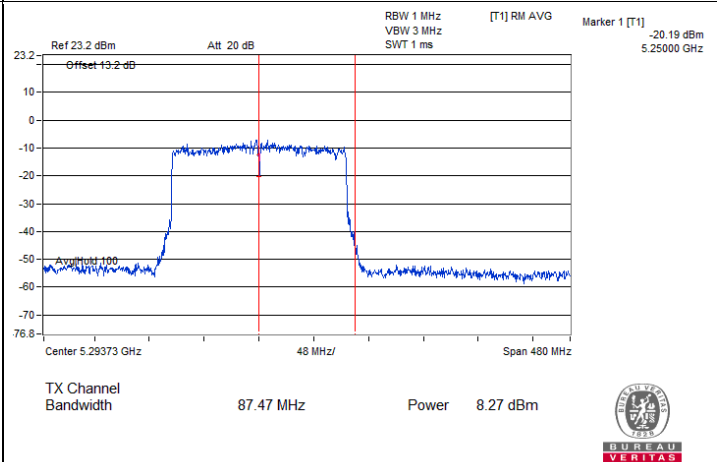
802.11be (EHT160) / Chain 0 : CH 50 (U-NII-1)



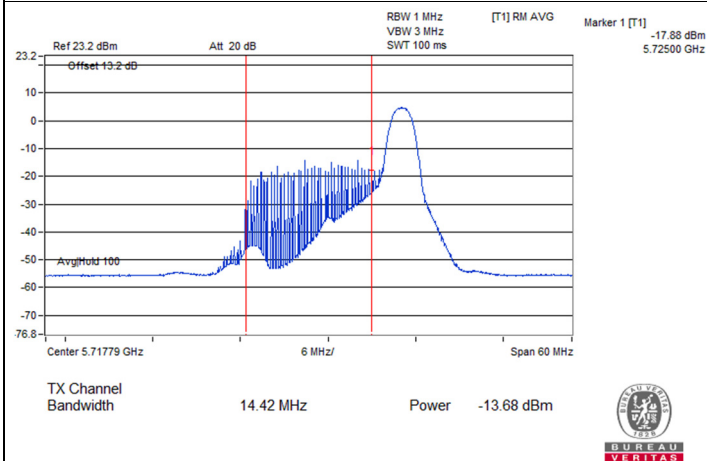
802.11be (EHT160) / Chain 0 : CH 50 (U-NII-2A)



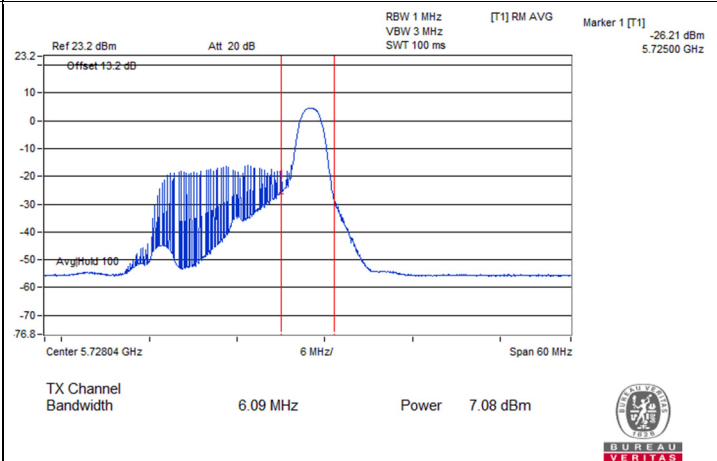
802.11be (EHT160) / Chain 1 : CH 50 (U-NII-1)



802.11be (EHT160) / Chain 1 : CH 50 (U-NII-2A)

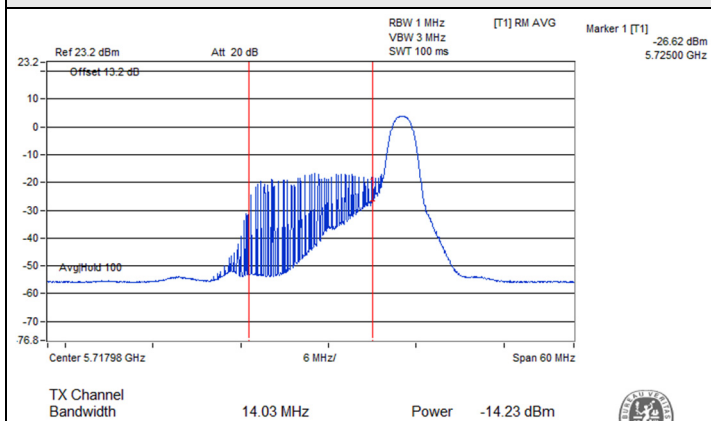


802.11be (EHT20) 26-tone RU / Chain 0 : CH 144 (U-NII-2C)

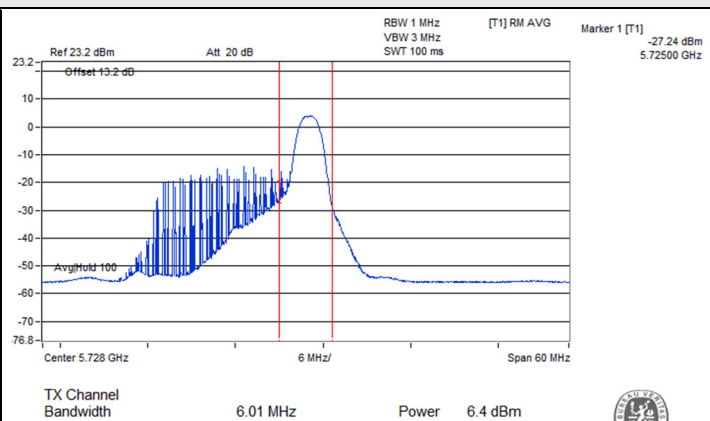


802.11be (EHT20) 26-tone RU / Chain 0 : CH 144 (U-NII-3)

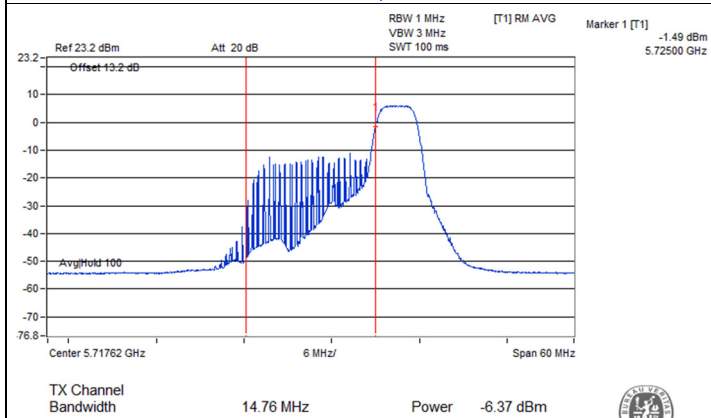
Spectrum Plot for channel straddling



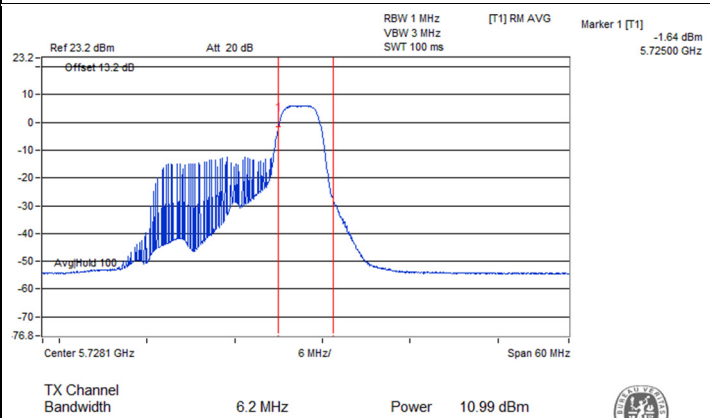
802.11be (EHT20) 26-tone RU / Chain 1 : CH 144 (U-NII-2C)



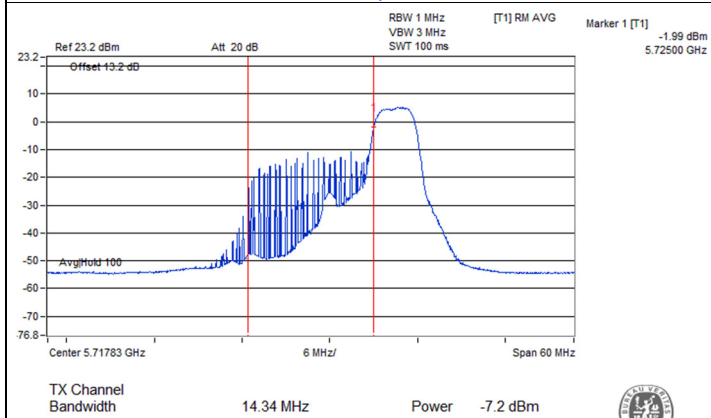
802.11be (EHT20) 26-tone RU / Chain 1 : CH 144 (U-NII-3)



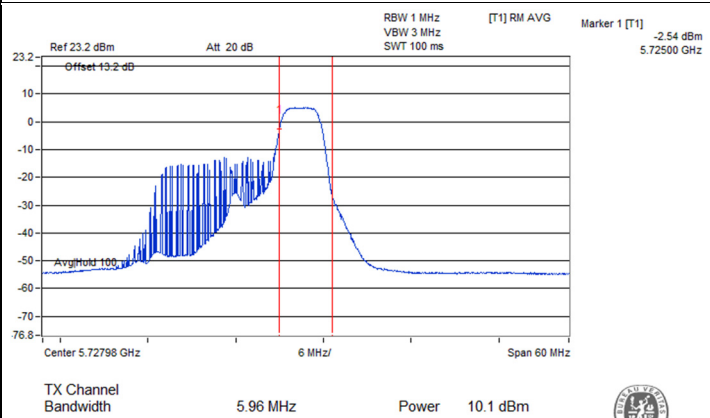
802.11be (EHT20) 52-tone RU / Chain 0 : CH 144 (U-NII-2C)



802.11be (EHT20) 52-tone RU / Chain 0 : CH 144 (U-NII-3)

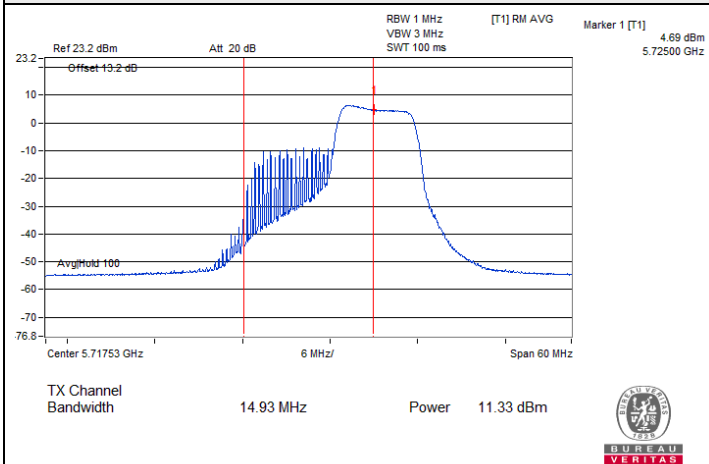


802.11be (EHT20) 52-tone RU / Chain 1 : CH 144 (U-NII-2C)

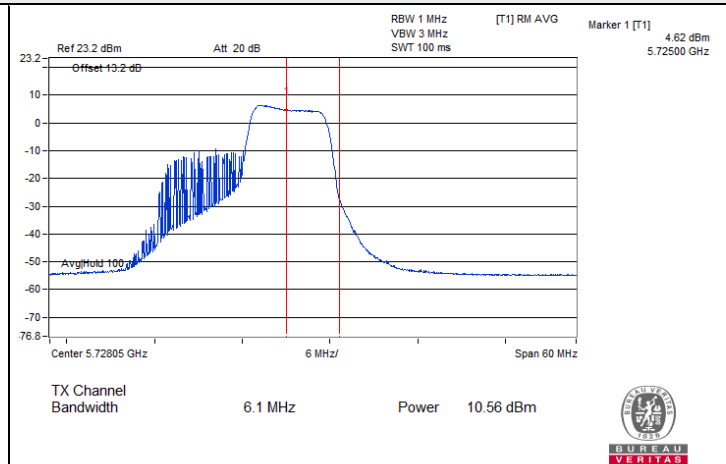


802.11be (EHT20) 52-tone RU / Chain 1 : CH 144 (U-NII-3)

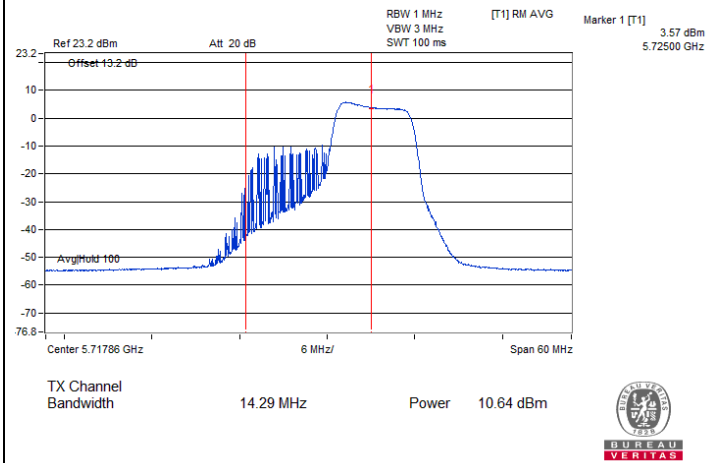
Spectrum Plot for channel straddling



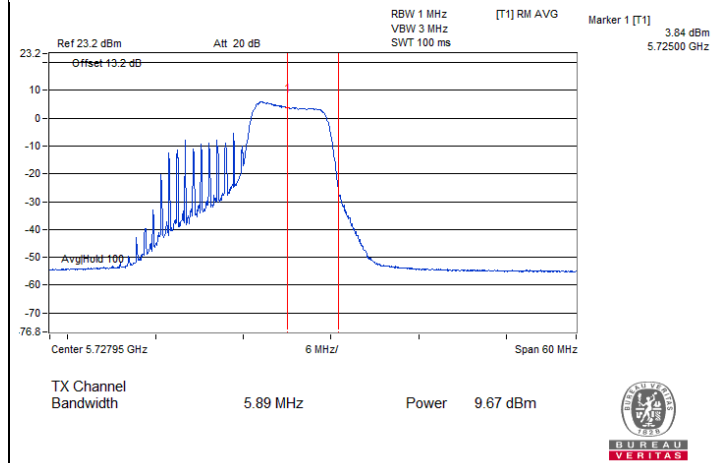
802.11be (EHT20) 106-tone RU / Chain 0 : CH 144 (U-NII-2C)



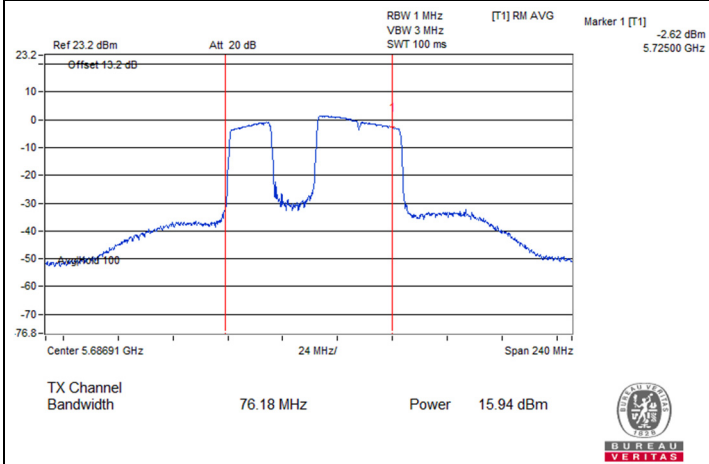
802.11be (EHT20) 106-tone RU / Chain 0 : CH 144 (U-NII-3)



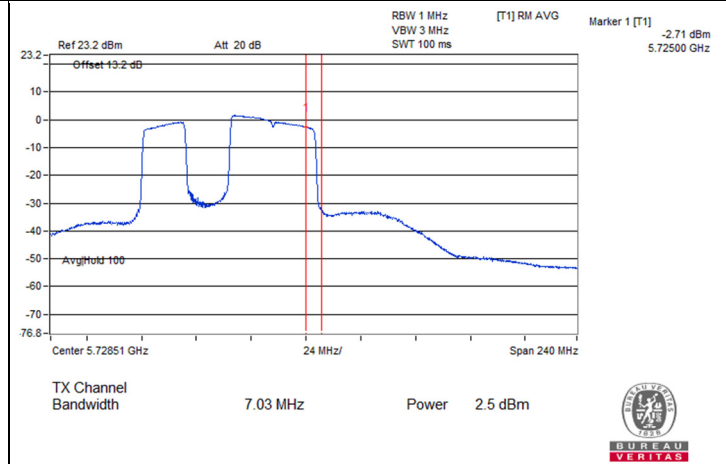
802.11be (EHT20) 106-tone RU / Chain 1 : CH 144 (U-NII-2C)



802.11be (EHT20) 106-tone RU / Chain 1 : CH 144 (U-NII-3)

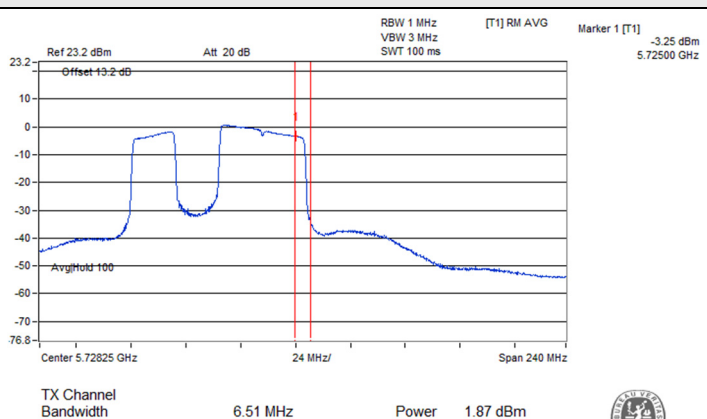
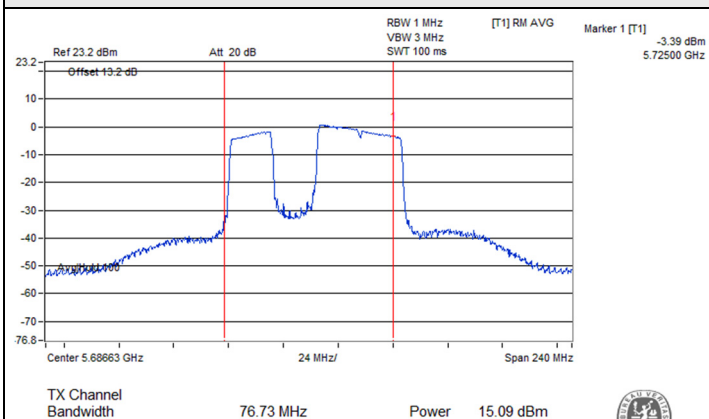


802.11be (EHT80) 484+242-tone MRU / Chain 0 : CH 138 (U-NII-2C)



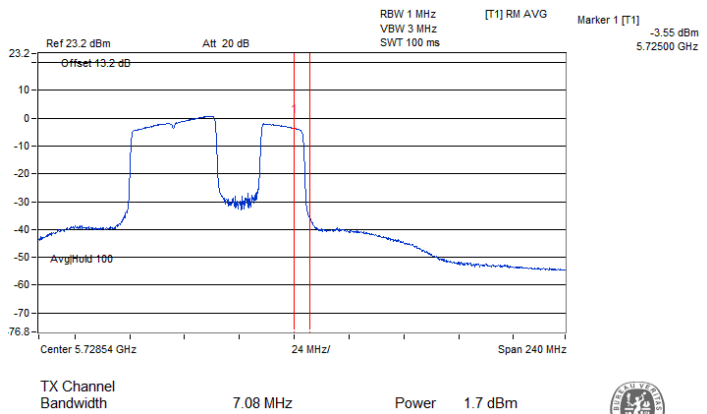
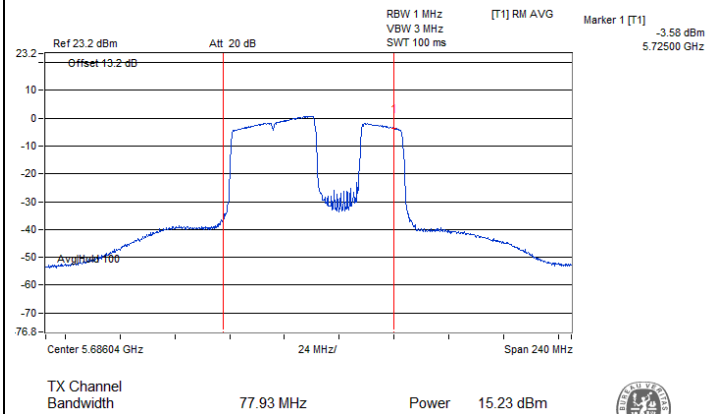
802.11be (EHT80) 484+242-tone MRU / Chain 0 : CH 138 (U-NII-3)

Spectrum Plot for channel straddling



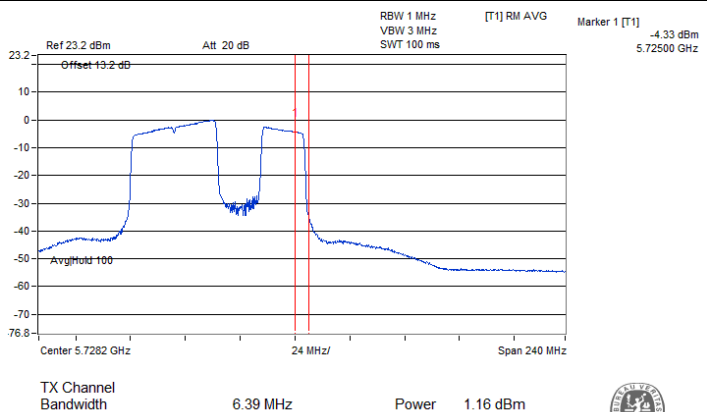
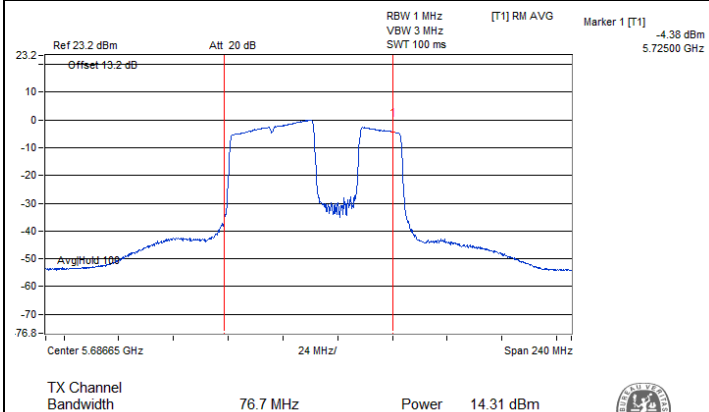
802.11be (EHT80) 484+242-tone MRU / Chain 1 : CH 138 (U-NII-2C)

802.11be (EHT80) 484+242-tone MRU / Chain 1 : CH 138 (U-NII-3)



802.11be (EHT80) Punctured by 20 MHz / Chain 0 : CH 138 (U-NII-2C)

802.11be (EHT80) Punctured by 20 MHz / Chain 0 : CH 138 (U-NII-3)



802.11be (EHT80) Punctured by 20 MHz / Chain 1 : CH 138 (U-NII-2C)

802.11be (EHT80) Punctured by 20 MHz / Chain 1 : CH 138 (U-NII-3)

7.2 Unwanted Emissions below 1 GHz

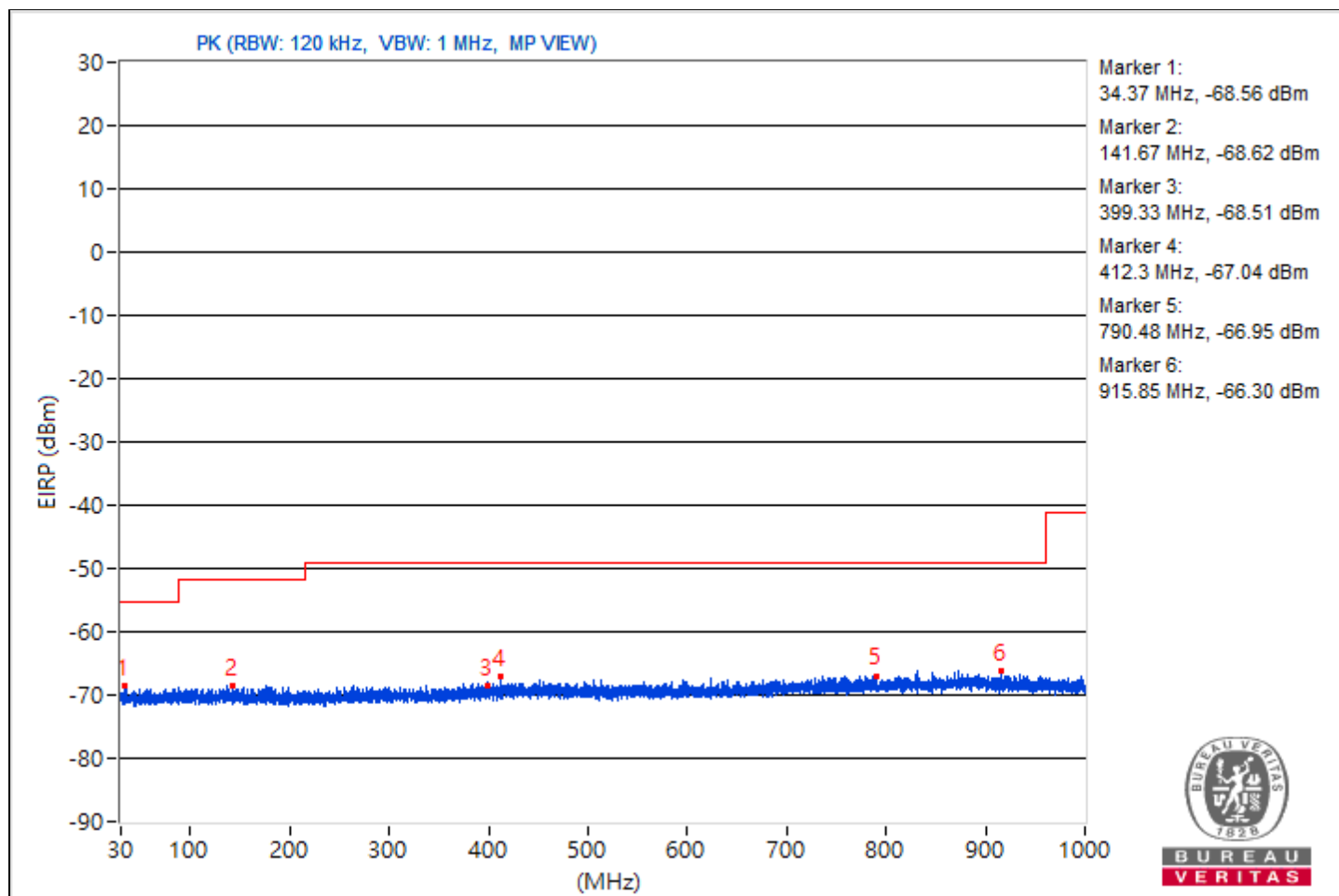
Mode A

RF Mode	802.11be (EHT20)	Channel	CH 116 : 5580 MHz
Frequency Range	30 MHz ~ 1 GHz	Environmental Conditions	22°C, 11% RH
Tested By	Kevin Ko		

Conducted Unwanted Emissions								
No.	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Raw Value Chain 0 (dBm)	Raw Value Chain 1 (dBm)	Correction Factor (dB)	EIRP Level (dBm)
1	34.37	26.7 PK	40	-13.3	-81.63	-81.23	9.86	-68.56
2	141.67	26.64 PK	43.5	-16.86	-80.13	-83.49	9.86	-68.62
3	399.33	26.75 PK	46	-19.25	-79.96	-83.52	9.86	-68.51
4	412.3	28.22 PK	46	-17.78	-78.5	-82	9.86	-67.04
5	790.48	28.31 PK	46	-17.69	-81.32	-78.71	9.86	-66.95
6	915.85	28.96 PK	46	-17.04	-80.46	-78.18	9.86	-66.3

Notes:

1. Margin value = Emission Level - Limit value
2. The frequency range 9 kHz ~ 30 MHz: all emissions are more than 20 dB below the limit, therefore do not be recorded in this report.



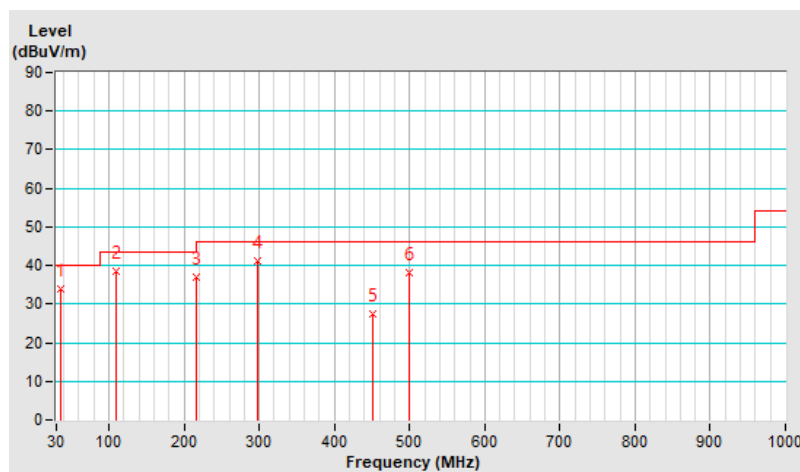
Mode B

RF Mode	802.11be (EHT20)	Channel	CH 116 : 5580 MHz
Frequency Range	30 MHz ~ 1 GHz	Detector Function & Bandwidth	QP: RB=120kHz, DET=Quasi-Peak
Input Power (System)	120 Vac, 60 Hz	Environmental Conditions	24 °C, 65 % RH
Tested By	Willy Lin		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	35.86	33.8 QP	40.0	-6.2	1.50 H	284	52.2	-18.4
2	108.62	38.6 QP	43.5	-4.9	1.50 H	335	59.3	-20.7
3	217.02	36.9 QP	46.0	-9.1	2.00 H	147	57.7	-20.8
4	297.70	41.1 QP	46.0	-4.9	1.00 H	170	58.1	-17.0
5	450.74	27.3 QP	46.0	-18.7	1.50 H	294	40.1	-12.8
6	499.05	38.2 QP	46.0	-7.8	3.00 H	200	50.2	-12.0

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit of frequency range 30 MHz ~ 1 GHz.
5. The frequency range 9 kHz ~ 30 MHz: all emissions are more than 20 dB below the limit, therefore do not be recorded in this report.

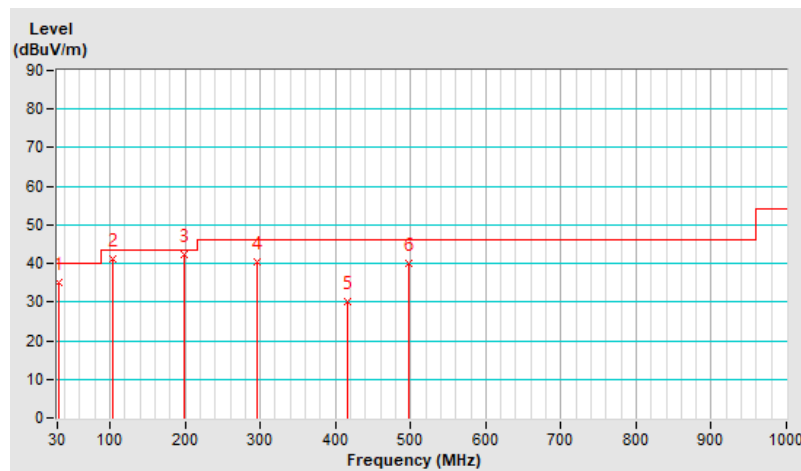


RF Mode	802.11be (EHT20)	Channel	CH 116 : 5580 MHz
Frequency Range	30 MHz ~ 1 GHz	Detector Function & Bandwidth	QP: RB=120kHz, DET=Quasi-Peak
Input Power (System)	120 Vac, 60 Hz	Environmental Conditions	24 °C, 65 % RH
Tested By	Willy Lin		

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	32.51	35.1 QP	40.0	-4.9	1.50 V	265	53.8	-18.7
2	103.51	41.0 QP	43.5	-2.5	1.50 V	292	62.5	-21.5
3	199.42	42.2 QP	43.5	-1.3	2.00 V	160	63.1	-20.9
4	296.74	40.4 QP	46.0	-5.6	3.00 V	188	57.4	-17.0
5	416.59	30.1 QP	46.0	-15.9	1.00 V	213	43.9	-13.8
6	498.00	39.9 QP	46.0	-6.1	2.00 V	336	51.9	-12.0

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit of frequency range 30 MHz ~ 1 GHz.
5. The frequency range 9 kHz ~ 30 MHz: all emissions are more than 20 dB below the limit, therefore do not be recorded in this report.



7.3 Unwanted Emissions above 1 GHz

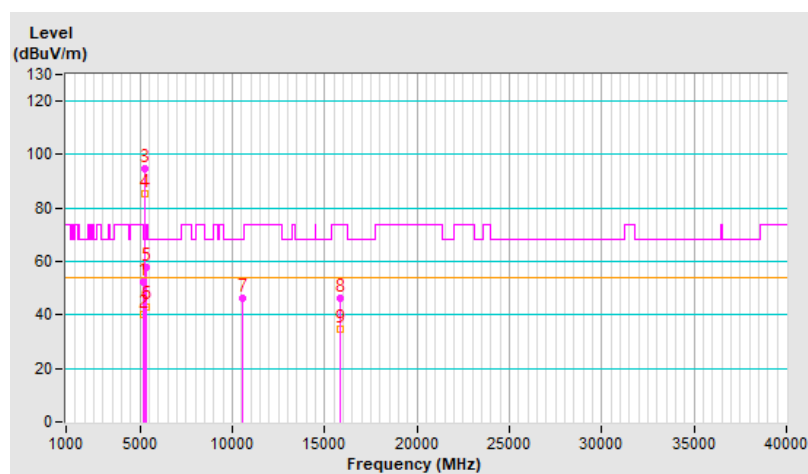
Mode C

RF Mode	802.11be (EHT80) 484+242-tone MRU	Channel	CH 58 : 5290 MHz
Frequency Range	1 GHz ~ 40 GHz	Detector Function & Bandwidth	PK: RB=1 MHz, VB=3 MHz, DET=Peak AV: RB=1 MHz, VB=10 Hz, DET=Peak
Input Power (System)	120 Vac, 60 Hz	Environmental Conditions	22 °C, 65 % RH
Tested By	Willy Lin		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5150.00	52.2 PK	74.0	-21.8	1.25 H	105	49.5	2.7
2	5150.00	40.2 AV	54.0	-13.8	1.25 H	105	37.5	2.7
3	*5290.00	94.5 PK			1.25 H	105	92.7	1.8
4	*5290.00	85.2 AV			1.25 H	105	83.4	1.8
5	5350.00	57.7 PK	74.0	-16.3	1.25 H	105	55.5	2.2
6	5350.00	43.2 AV	54.0	-10.8	1.25 H	105	41.0	2.2
7	#10580.00	46.2 PK	68.2	-22.0	1.06 H	179	34.0	12.2
8	15870.00	46.2 PK	74.0	-27.8	1.26 H	213	34.8	11.4
9	15870.00	34.9 AV	54.0	-19.1	1.26 H	213	23.5	11.4

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * " : Fundamental frequency, the limit was restricted at the RF Output Power.
6. " # " : The radiated frequency is out of the restricted band.

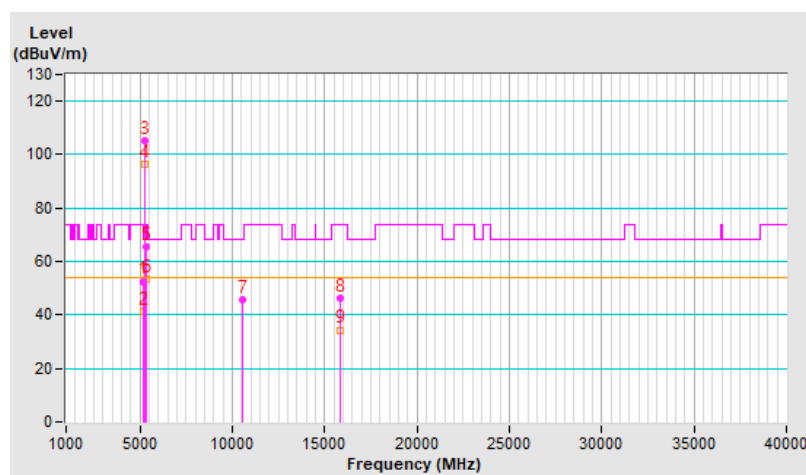


RF Mode	802.11be (EHT80) 484+242-tone MRU	Channel	CH 58 : 5290 MHz
Frequency Range	1 GHz ~ 40 GHz	Detector Function & Bandwidth	PK: RB=1 MHz, VB=3 MHz, DET=Peak AV: RB=1 MHz, VB=10 Hz, DET=Peak
Input Power (System)	120 Vac, 60 Hz	Environmental Conditions	22 °C, 65 % RH
Tested By	Willy Lin		

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5150.00	52.6 PK	74.0	-21.4	1.96 V	71	49.9	2.7
2	5150.00	41.2 AV	54.0	-12.8	1.96 V	71	38.5	2.7
3	*5290.00	105.3 PK			1.96 V	71	103.5	1.8
4	*5290.00	96.4 AV			1.96 V	71	94.6	1.8
5	5350.00	65.6 PK	74.0	-8.4	1.96 V	71	63.4	2.2
6	5350.00	53.4 AV	54.0	-0.6	1.96 V	71	51.2	2.2
7	#10580.00	45.9 PK	68.2	-22.3	1.11 V	200	33.7	12.2
8	15870.00	46.2 PK	74.0	-27.8	1.12 V	192	34.8	11.4
9	15870.00	34.4 AV	54.0	-19.6	1.12 V	192	23.0	11.4

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * " : Fundamental frequency, the limit was restricted at the RF Output Power.
6. " # " : The radiated frequency is out of the restricted band.

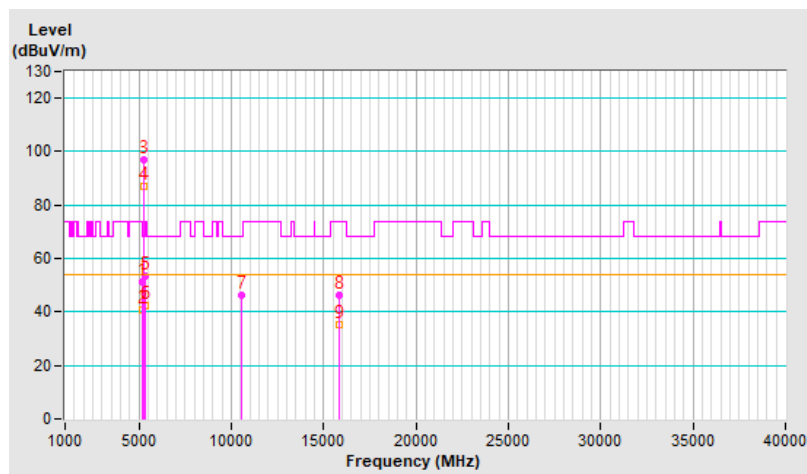


RF Mode	802.11be (EHT80) Punctured by 20 MHz	Channel	CH 58 : 5290 MHz
Frequency Range	1 GHz ~ 40 GHz	Detector Function & Bandwidth	PK: RB=1 MHz, VB=3 MHz, DET=Peak AV: RB=1 MHz, VB=10 Hz, DET=Peak
Input Power (System)	120 Vac, 60 Hz	Environmental Conditions	22 °C, 65 % RH
Tested By	Willy Lin		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5150.00	51.3 PK	74.0	-22.7	1.26 H	109	48.6	2.7
2	5150.00	40.5 AV	54.0	-13.5	1.26 H	109	37.8	2.7
3	*5290.00	96.7 PK			1.26 H	109	94.9	1.8
4	*5290.00	86.9 AV			1.26 H	109	85.1	1.8
5	5350.00	53.5 PK	74.0	-20.5	1.26 H	109	51.3	2.2
6	5350.00	42.5 AV	54.0	-11.5	1.26 H	109	40.3	2.2
7	#10580.00	46.2 PK	68.2	-22.0	1.01 H	183	34.0	12.2
8	15870.00	46.5 PK	74.0	-27.5	1.30 H	201	35.1	11.4
9	15870.00	35.3 AV	54.0	-18.7	1.30 H	201	23.9	11.4

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * " : Fundamental frequency, the limit was restricted at the RF Output Power.
6. " # " : The radiated frequency is out of the restricted band.

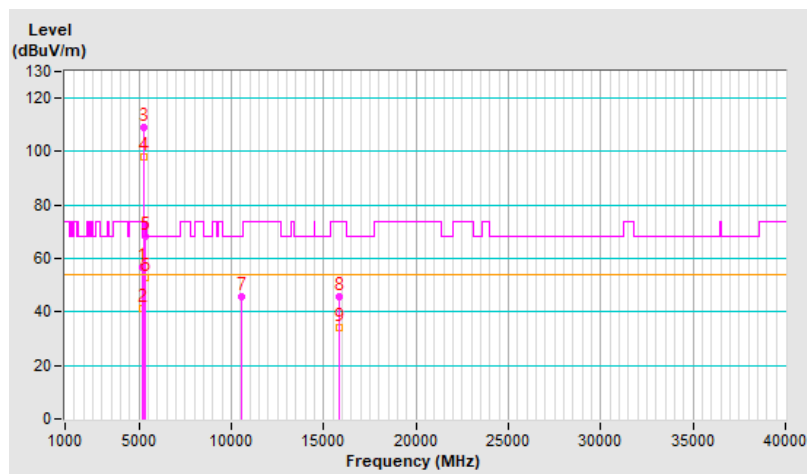


RF Mode	802.11be (EHT80) Punctured by 20 MHz	Channel	CH 58 : 5290 MHz
Frequency Range	1 GHz ~ 40 GHz	Detector Function & Bandwidth	PK: RB=1 MHz, VB=3 MHz, DET=Peak AV: RB=1 MHz, VB=10 Hz, DET=Peak
Input Power (System)	120 Vac, 60 Hz	Environmental Conditions	22 °C, 65 % RH
Tested By	Willy Lin		

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5150.00	56.6 PK	74.0	-17.4	1.95 V	75	53.9	2.7
2	5150.00	41.5 AV	54.0	-12.5	1.95 V	75	38.8	2.7
3	*5290.00	108.9 PK			1.95 V	75	107.1	1.8
4	*5290.00	97.9 AV			1.95 V	75	96.1	1.8
5	5350.00	68.5 PK	74.0	-5.5	1.95 V	75	66.3	2.2
6	5350.00	53.1 AV	54.0	-0.9	1.95 V	75	50.9	2.2
7	#10580.00	45.9 PK	68.2	-22.3	1.12 V	186	33.7	12.2
8	15870.00	45.9 PK	74.0	-28.1	1.08 V	191	34.5	11.4
9	15870.00	34.1 AV	54.0	-19.9	1.08 V	191	22.7	11.4

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * " : Fundamental frequency, the limit was restricted at the RF Output Power.
6. " # " : The radiated frequency is out of the restricted band.



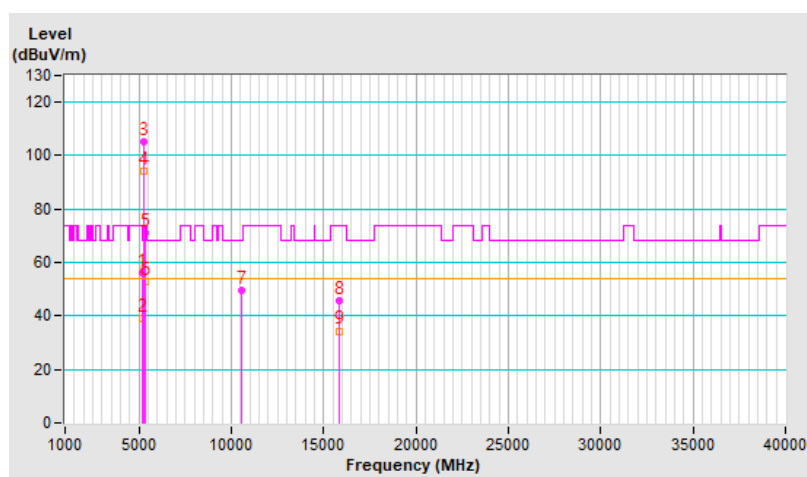
Mode D

RF Mode	802.11be (EHT80) 484+242-tone MRU	Channel	CH 58 : 5290 MHz
Frequency Range	1 GHz ~ 40 GHz	Detector Function & Bandwidth	PK: RB=1 MHz, VB=3 MHz, DET=Peak AV: RB=1 MHz, VB=10 Hz, DET=Peak
Input Power (System)	120 Vac, 60 Hz	Environmental Conditions	25 °C, 75 % RH
Tested By	Tank Wu		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5150.00	56.4 PK	74.0	-17.6	1.33 H	330	54.1	2.3
2	5150.00	39.2 AV	54.0	-14.8	1.33 H	330	36.9	2.3
3	*5290.00	105.1 PK			1.33 H	330	103.4	1.7
4	*5290.00	94.2 AV			1.33 H	330	92.5	1.7
5	5350.00	70.9 PK	74.0	-3.1	1.33 H	330	69.0	1.9
6	5350.00	52.9 AV	54.0	-1.1	1.33 H	330	51.0	1.9
7	#10580.00	49.8 PK	68.2	-18.4	3.52 H	169	38.0	11.8
8	15870.00	45.7 PK	74.0	-28.3	2.66 H	202	34.4	11.3
9	15870.00	34.4 AV	54.0	-19.6	2.66 H	202	23.1	11.3

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * " : Fundamental frequency, the limit was restricted at the RF Output Power.
6. " # " : The radiated frequency is out of the restricted band.

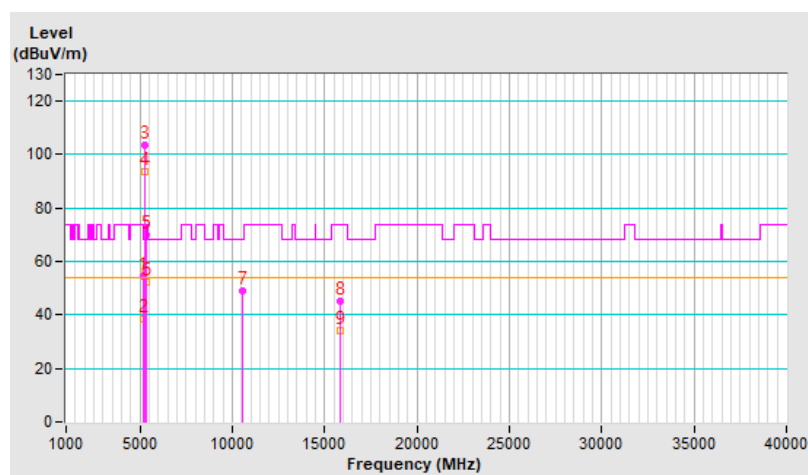


RF Mode	802.11be (EHT80) 484+242-tone MRU	Channel	CH 58 : 5290 MHz
Frequency Range	1 GHz ~ 40 GHz	Detector Function & Bandwidth	PK: RB=1 MHz, VB=3 MHz, DET=Peak AV: RB=1 MHz, VB=10 Hz, DET=Peak
Input Power (System)	120 Vac, 60 Hz	Environmental Conditions	25 °C, 75 % RH
Tested By	Tank Wu		

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5150.00	54.6 PK	74.0	-19.4	2.70 V	284	52.3	2.3
2	5150.00	38.6 AV	54.0	-15.4	2.70 V	284	36.3	2.3
3	*5290.00	103.6 PK			2.70 V	284	101.9	1.7
4	*5290.00	93.5 AV			2.70 V	284	91.8	1.7
5	5350.00	69.8 PK	74.0	-4.2	2.70 V	284	67.9	1.9
6	5350.00	52.3 AV	54.0	-1.7	2.70 V	284	50.4	1.9
7	#10580.00	49.2 PK	68.2	-19.0	2.41 V	253	37.4	11.8
8	15870.00	45.1 PK	74.0	-28.9	1.94 V	276	33.8	11.3
9	15870.00	33.9 AV	54.0	-20.1	1.94 V	276	22.6	11.3

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * " : Fundamental frequency, the limit was restricted at the RF Output Power.
6. " # " : The radiated frequency is out of the restricted band.

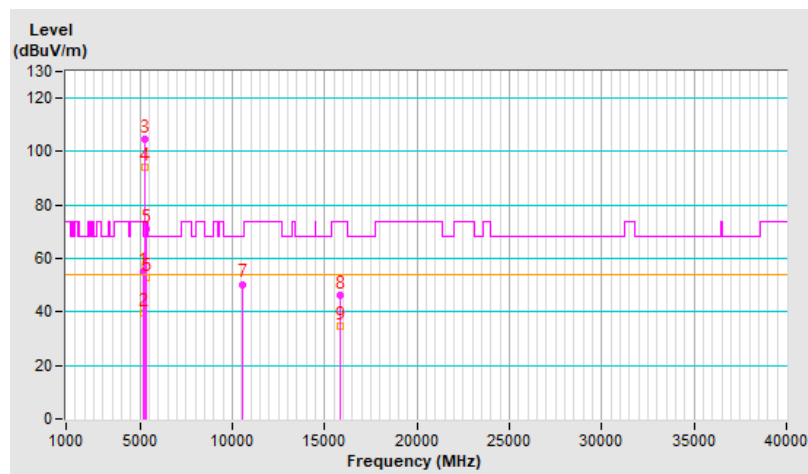


RF Mode	802.11be (EHT80) Punctured by 20 MHz	Channel	CH 58 : 5290 MHz
Frequency Range	1 GHz ~ 40 GHz	Detector Function & Bandwidth	PK: RB=1 MHz, VB=3 MHz, DET=Peak AV: RB=1 MHz, VB=10 Hz, DET=Peak
Input Power (System)	120 Vac, 60 Hz	Environmental Conditions	25 °C, 75 % RH
Tested By	Tank Wu		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5150.00	55.1 PK	74.0	-18.9	1.31 H	332	52.8	2.3
2	5150.00	39.4 AV	54.0	-14.6	1.31 H	332	37.1	2.3
3	*5290.00	104.7 PK			1.31 H	332	103.0	1.7
4	*5290.00	94.4 AV			1.31 H	332	92.7	1.7
5	5350.00	70.8 PK	74.0	-3.2	1.31 H	332	68.9	1.9
6	5350.00	53.1 AV	54.0	-0.9	1.31 H	332	51.2	1.9
7	#10580.00	50.4 PK	68.2	-17.8	3.51 H	181	38.6	11.8
8	15870.00	46.1 PK	74.0	-27.9	2.71 H	215	34.8	11.3
9	15870.00	34.6 AV	54.0	-19.4	2.71 H	215	23.3	11.3

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * " : Fundamental frequency, the limit was restricted at the RF Output Power.
6. " # " : The radiated frequency is out of the restricted band.

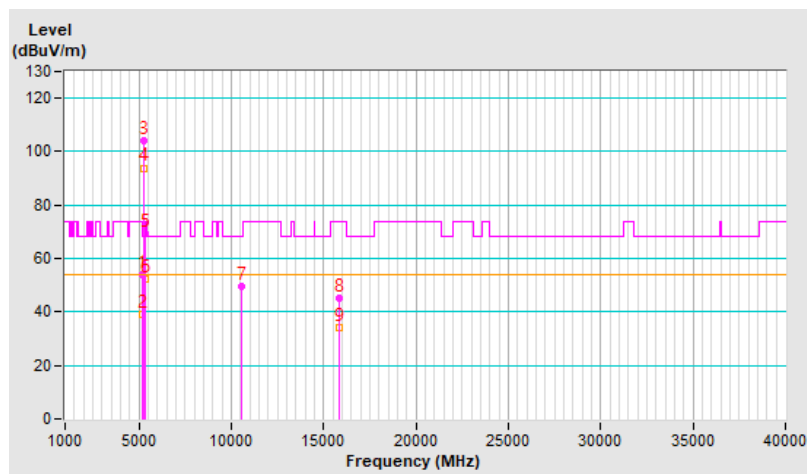


RF Mode	802.11be (EHT80) Punctured by 20 MHz	Channel	CH 58 : 5290 MHz
Frequency Range	1 GHz ~ 40 GHz	Detector Function & Bandwidth	PK: RB=1 MHz, VB=3 MHz, DET=Peak AV: RB=1 MHz, VB=10 Hz, DET=Peak
Input Power (System)	120 Vac, 60 Hz	Environmental Conditions	25 °C, 75 % RH
Tested By	Tank Wu		

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5150.00	53.9 PK	74.0	-20.1	2.56 V	276	51.6	2.3
2	5150.00	39.2 AV	54.0	-14.8	2.56 V	276	36.9	2.3
3	*5290.00	104.2 PK			2.56 V	276	102.5	1.7
4	*5290.00	93.9 AV			2.56 V	276	92.2	1.7
5	5350.00	69.5 PK	74.0	-4.5	2.56 V	276	67.6	1.9
6	5350.00	52.4 AV	54.0	-1.6	2.56 V	276	50.5	1.9
7	#10580.00	49.7 PK	68.2	-18.5	2.39 V	245	37.9	11.8
8	15870.00	45.3 PK	74.0	-28.7	1.92 V	283	34.0	11.3
9	15870.00	34.1 AV	54.0	-19.9	1.92 V	283	22.8	11.3

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * " : Fundamental frequency, the limit was restricted at the RF Output Power.
6. " # " : The radiated frequency is out of the restricted band.

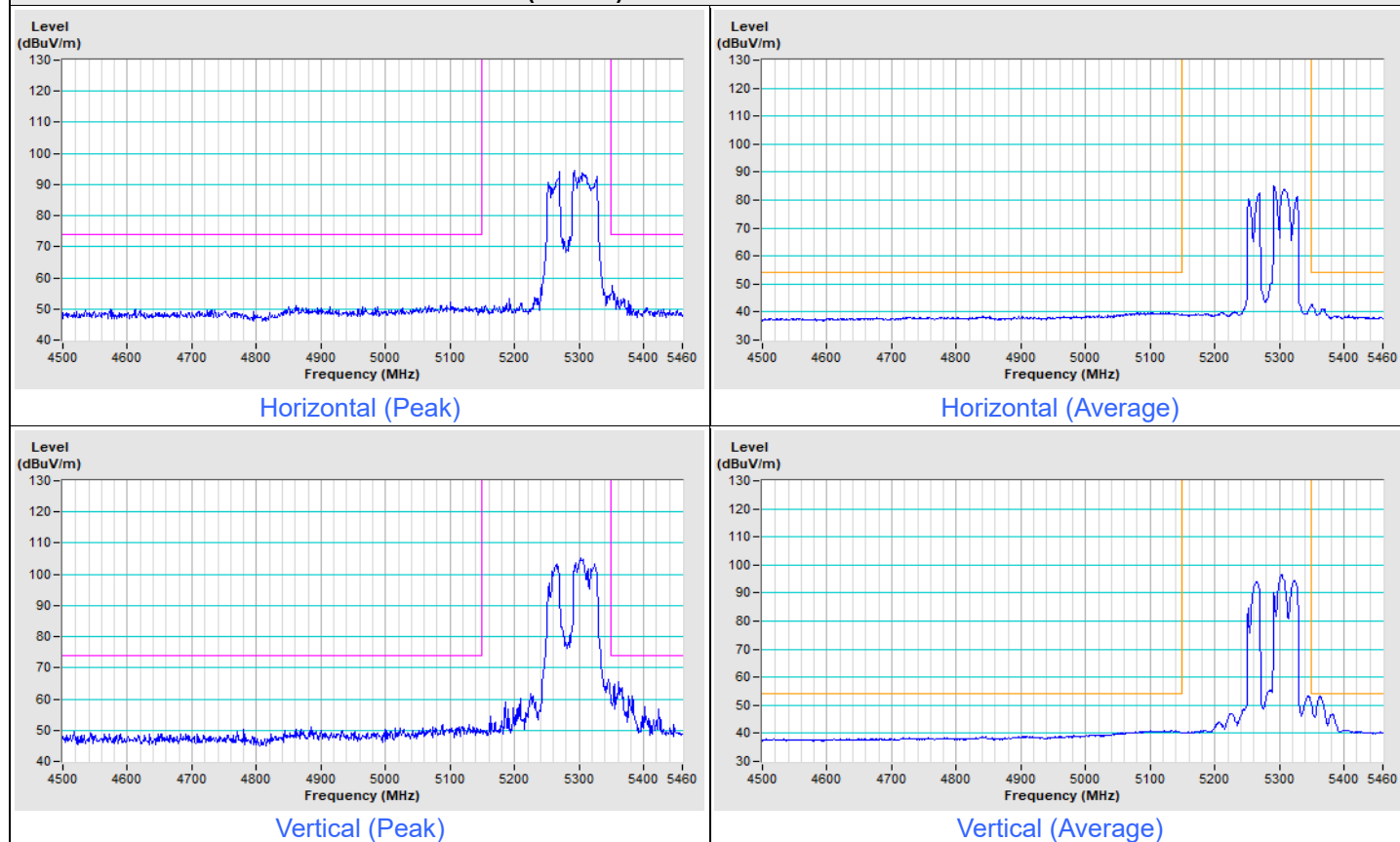


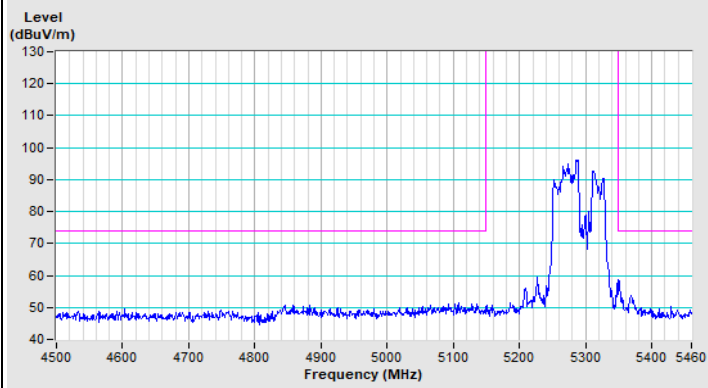
Plot of Band Edge

Mode C

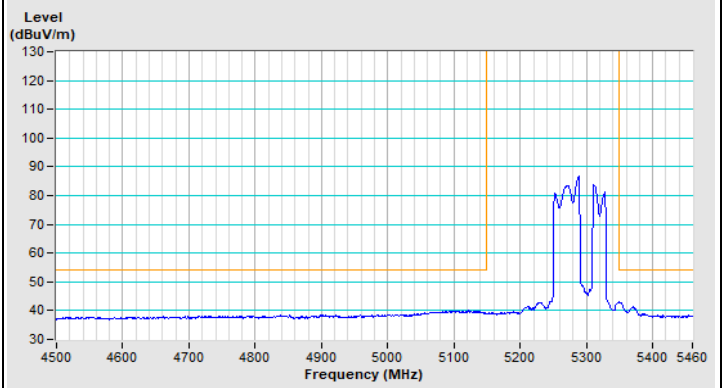
Frequency Range	4.5 GHz ~ 5.46 GHz	Detector Function & Bandwidth	PK: RB=1 MHz, VB=3 MHz, DET=Peak AV: RB=1 MHz, VB=10 Hz, DET=Peak
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802.11be (EHT80) 484+242-tone MRU Channel 58

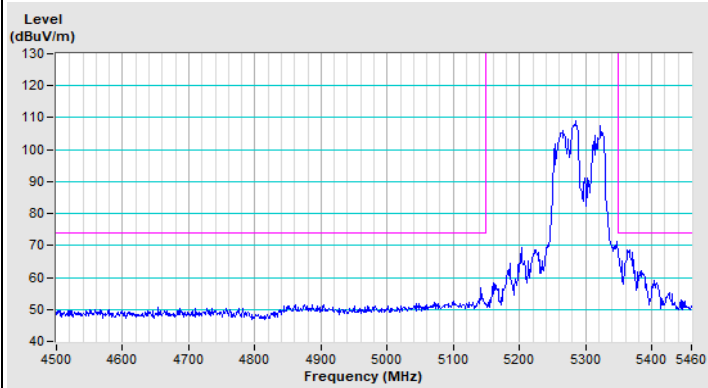


802.11be (EHT80) Punctured by 20 MHz Channel 58

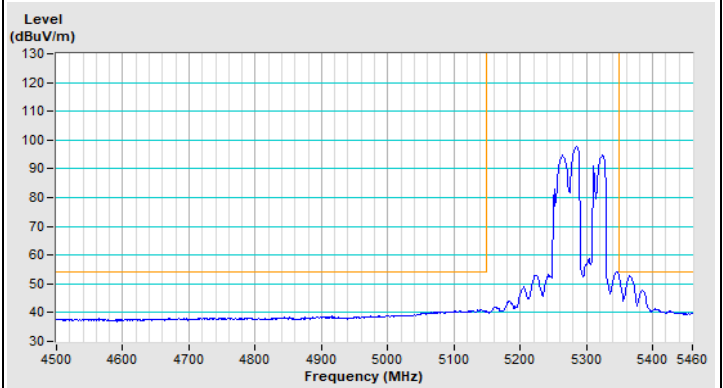
Horizontal (Peak)



Horizontal (Average)



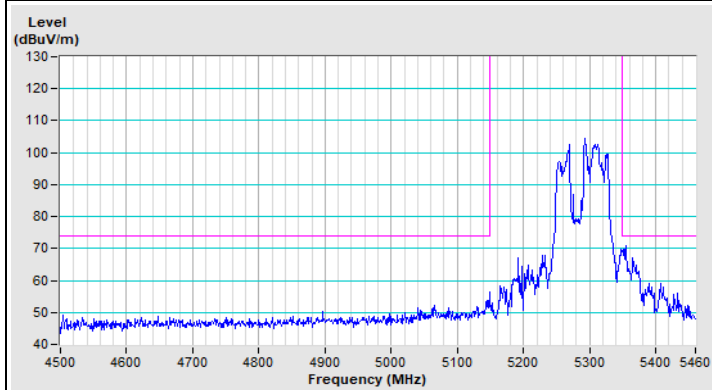
Vertical (Peak)



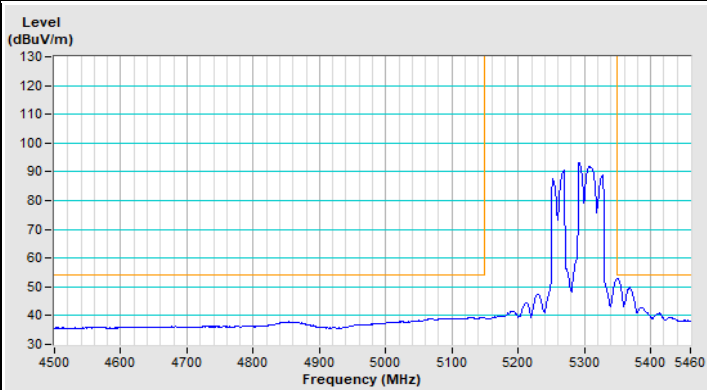
Vertical (Average)

Mode D

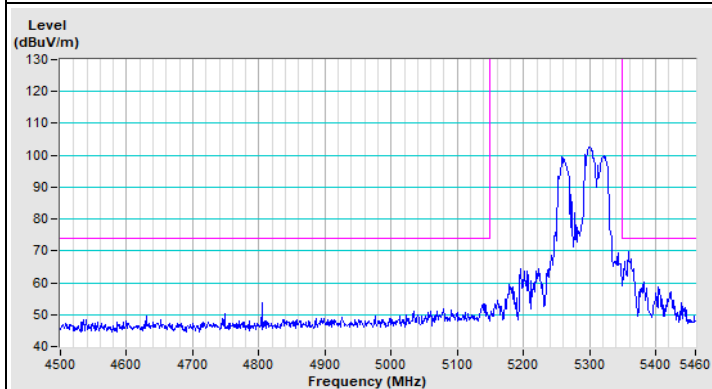
802.11be (EHT80) 484+242-tone MRU Channel 58



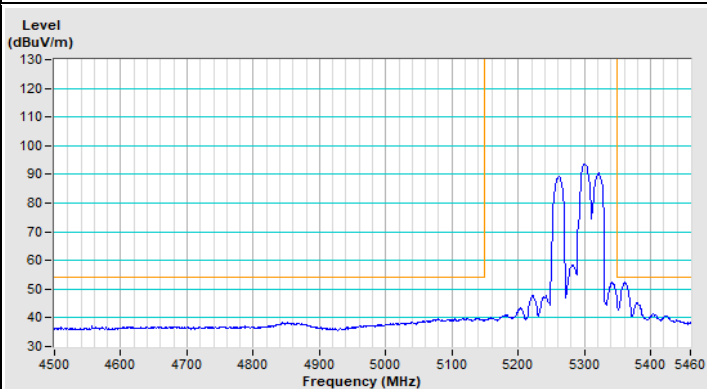
Horizontal (Peak)



Horizontal (Average)

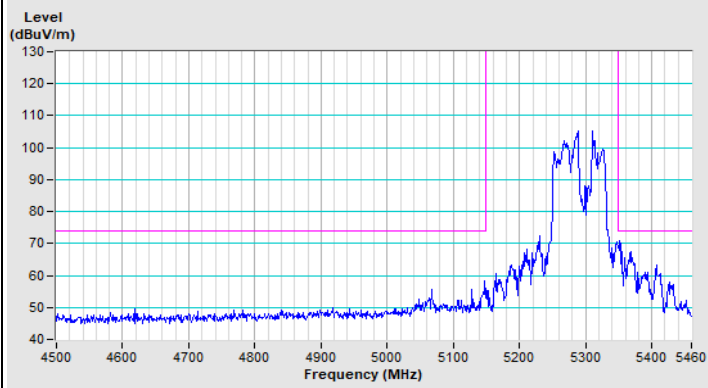


Vertical (Peak)

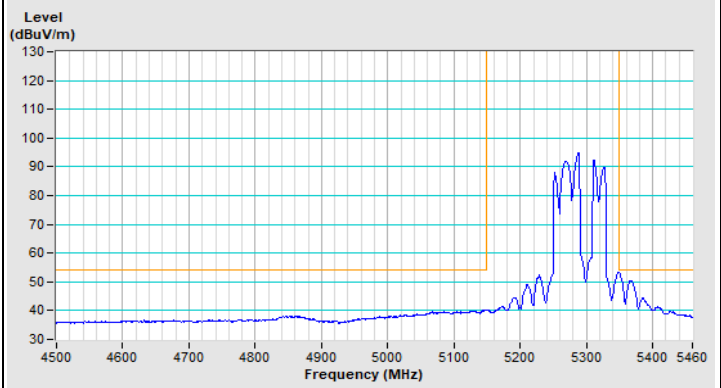


Vertical (Average)

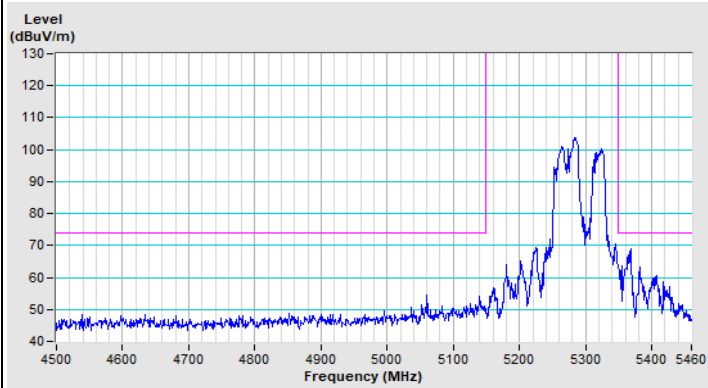
802.11be (EHT80) Punctured by 20 MHz Channel 58



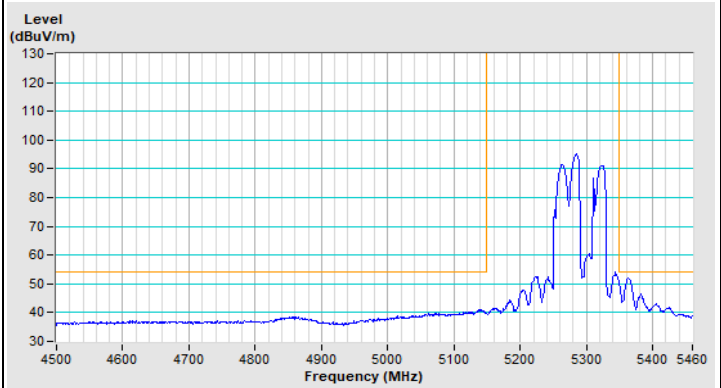
Horizontal (Peak)



Horizontal (Average)



Vertical (Peak)



Vertical (Average)

8 Pictures of Test Arrangements

Please refer to the attached file (Test Setup Photo)

9 Information of the Testing Laboratories

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are FCC recognized accredited test firms and accredited according to ISO/IEC 17025.

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Web Site: <http://ee.bureauveritas.com.tw>

The address and road map of all our labs can be found in our web site also.

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