

FCC Test Report (Straddle Channel)

Report No.: RFBARR-WTW-P20100689E-1

FCC ID: RAS-MT7921

Test Model: MT7921

Received Date: June 17, 2021

Test Date: June 18 to 19, 2021

Issued Date: June 24, 2021

Applicant: MediaTek Inc.

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Issued By: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
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Test Location: E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300,
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**FCC Registration /
Designation Number:** 723255 / TW2022



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Release Control Record

Issue No.	Description	Date Issued
RFBARR-WTW-P20100689E-1	Original release.	June 24, 2021

1 Certificate of Conformity

Product: 2TX 11ax (WiFi6) + BLE Combo Card

Brand: MediaTek

Test Model: MT7921

Sample Status: Engineering sample

Applicant: MediaTek Inc.

Test Date: June 18 to 19, 2021

Standard: 47 CFR FCC Part 15, Subpart E (Section 15.407)
ANSI C63.10: 2013

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 EMC characteristics under the conditions specified in this report.

Prepared by : Phoenix Huang, **Date:** June 24, 2021
Phoenix Huang / Specialist

Approved by : Clark Lin, **Date:** June 24, 2021
Clark Lin / Technical Manager

2 Summary of Test Results

47 CFR FCC Part 15, Subpart E (Section 15.407)			
FCC Clause	Test Item	Result	Remarks
15.407(b)(8)	AC Power Conducted Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -7.21 dB at 21.16782 MHz.
15.407(b) (1/2/3/4(i/ii)/8)	Radiated Emissions & Band Edge Measurement*	Pass	Meet the requirement of limit. Minimum passing margin is -3.4 dB at 199.32 MHz.
15.407(a)(1/2/3)	Max Average Transmit Power	Pass	Meet the requirement of limit.
---	Occupied Bandwidth Measurement	-	Reference only.
15.407(a)(1/2/3)	Peak Power Spectral Density	Pass	Meet the requirement of limit.
15.407(e)	6dB bandwidth	Pass	Meet the requirement of limit. (U-NII-3 Band only)
15.407(g)	Frequency Stability	NA	Refer to Note 1 below
15.203	Antenna Requirement	Pass	Antenna connector is R-SMA or i-pex(MHF) not a standard connector.

Note:

1. All of test items need to be performed for straddle channels (except for Frequency Stability test item) were performed for this addendum. The others testing data refer to original test report.
2. 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:

Measurement	Frequency	Expanded Uncertainty (k=2) (±)
Conducted Emissions at mains ports	150kHz ~ 30MHz	1.9 dB
Radiated Emissions up to 1 GHz	9kHz ~ 30MHz	3.1 dB
	30MHz ~ 1GHz	5.4 dB
Radiated Emissions above 1 GHz	1GHz ~ 18GHz	5.0 dB
	18GHz ~ 40GHz	5.3 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	2TX 11ax (WiFi6) + BLE Combo Card
Brand	MediaTek
Test Model	MT7921
Status of EUT	Engineering sample
Power Supply Rating	3.3Vdc from host equipment
Modulation Type	64QAM, 16QAM, QPSK, BPSK for OFDM 256QAM for OFDM in 11ac mode only 1024QAM for OFDMA in 11ax HE mode
Modulation Technology	OFDM, OFDMA
Transfer Rate	802.11a: up to 54 Mbps 802.11n: up to 300 Mbps 802.11ac: up to 866.7 Mbps 802.11ax: up to 1201.0 Mbps
Operating Frequency	5.18~5.32GHz, 5.50~5.72GHz, 5.745 ~ 5.825GHz
Number of Channel	802.11a, 802.11n (HT20), 802.11ac (VHT20), 802.11ax (HE20): 25 802.11n (HT40), 802.11ac (VHT40), 802.11ax (HE40): 12 802.11ac (VHT80), 802.11ax (HE80): 6
Output Power	Straddle Channels (U-NII-2C): 123.949 mW Straddle Channels (U-NII-3): 32.885 mW
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	NA
Data Cable Supplied	NA

Note:

- This report is prepared for FCC class II change. The difference compared with the Report No.: RF200317E01-1 as the following:
 - ◆ Updated straddle channels power (CH144, CH142 & CH138).
- According to above condition, all of test items need to be performed for straddle channels (except for Frequency Stability test item). And all data were verified to meet the requirements.
- Simultaneously transmission condition.

Condition	Technology	
1	WLAN (2.4GHz)	Bluetooth
2	WLAN (5GHz)	Bluetooth

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

4. The antennas provided to the EUT, please refer to the following table:

Ant. Set	RF Chain No.	Brand	Model	Ant. Net Gain (dBi)	Freq. Range (GHz)	Ant. Type	Connector Type	Cable Length (mm)	Cable Loss (dB)	Excluding cable loss Ant. Gain (dBi)
1	Chain0	Cortec	AN2450-490 2BRS	2.42 3.87	2.4~2.4835 5.15~5.85	Dipole	R-SMA	150	2.4~2.4835GHz : 0.5 5.15~5.85GHz : 0.8	2.92 4.67
	Chain1	Cortec	AN2450-490 2BRS	2.42 3.87	2.4~2.4835 5.15~5.85	Dipole	R-SMA	150	2.4~2.4835GHz : 0.5 5.15~5.85GHz : 0.8	2.92 4.67
2	Chain0	PSA	RFMTA3407 18EMLB302	3.18 4.92	2.4~2.4835 5.15~5.85	PIFA	i-pex(MHF)	200	included Cable loss	-
	Chain1	PSA	RFMTA3407 18EMLB302	3.18 4.92	2.4~2.4835 5.15~5.85	PIFA	i-pex(MHF)	200	included Cable loss	-

5. The EUT incorporates a MIMO function:

2.4GHz Band		
MODULATION MODE	TX & RX CONFIGURATION	
802.11b	2TX	2RX
802.11g	2TX	2RX
802.11n (HT20)	2TX	2RX
802.11n (HT40)	2TX	2RX
VHT20	2TX	2RX
VHT40	2TX	2RX
802.11ax (HE20)	2TX	2RX
802.11ax (HE40)	2TX	2RX
5GHz 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
802.11ax (HE20)	2TX	2RX
802.11ax (HE40)	2TX	2RX
802.11ax (HE80)	2TX	2RX

Note: The modulation and bandwidth are similar for 802.11n mode for 20MHz (40MHz), 802.11ac mode for 20MHz (40MHz, 80MHz) and 802.11ax mode for 20MHz (40MHz, 80MHz), therefore the manufacturer will control the power for 802.11n/ac mode is the same as the 802.11ax or more lower than it and investigated worst case to representative mode in test report. (Final test mode refer to section 3.2.1)

6. 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.

7. The above Antenna information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications, the laboratory shall not be held responsible.

3.2 Description of Test Modes

Straddle Channel

802.11a, 802.11n (HT20), 802.11ac (VHT20), 802.11ax (HE20):

Channel	Frequency
144	5720 MHz

802.11n (HT40), 802.11ac (VHT40), 802.11ax (HE40):

Channel	Frequency
142	5710 MHz

802.11ac (VHT80), 802.11ax (HE80):

Channel	Frequency
138	5690 MHz

3.2.1 Test Mode Applicability and Tested Channel Detail

EUT Configure Mode	Applicable To				Description
	RE $\geq$ 1G	RE<1G	PLC	APCM	
1	√	√	√	√	With PIFA antenna
2	√	√	-	√	With Dipole antenna

Where **RE $\geq$ 1G**: Radiated Emission above 1GHz

RE<1G: Radiated Emission below 1GHz

PLC: Power Line Conducted Emission

APCM: Antenna Port Conducted Measurement

Note: In original report, the EUT's antenna (PIFA) had been pre-tested on the positioned of each 3 axis. The worst case was found when positioned on Z-plane

Radiated Emission Test (Above 1GHz):

- ☒ 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).
- ☒ Following channel(s) was (were) selected for the final test as listed below.

Mode	Tested Channel	Modulation Technology	Modulation Type	Data Rate Parameter
802.11a	144	OFDM	BPSK	6Mb/s
802.11ax (HE20)	144	OFDMA	BPSK	MCS0
802.11ax (HE40)	142	OFDMA	BPSK	MCS0
802.11ax (HE80)	138	OFDMA	BPSK	MCS0

Radiated Emission Test (Below 1GHz):

- ☒ 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).
- ☒ Following channel(s) was (were) selected for the final test as listed below.

Mode	Tested Channel	Modulation Technology	Modulation Type	Data Rate Parameter
802.11ax (HE20)	144	OFDMA	BPSK	MCS0

Power Line Conducted Emission Test:

- ☒ 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).
- ☒ Following channel(s) was (were) selected for the final test as listed below.

Mode	Tested Channel	Modulation Technology	Modulation Type	Data Rate Parameter
802.11ax (HE20)	144	OFDMA	BPSK	MCS0

Antenna Port Conducted Measurement:

- ☒ This item includes all test value of each mode, but only includes spectrum plot of worst value of each mode.
- ☒ 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).
- ☒ Following channel(s) was (were) selected for the final test as listed below.

Mode	Tested Channel	Modulation Technology	Modulation Type	Data Rate Parameter
802.11a	144	OFDM	BPSK	6Mb/s
802.11ac (VHT20) (for output power)	144	OFDM	BPSK	MCS0
802.11ac (VHT40) (for output power)	142	OFDM	BPSK	MCS0
802.11ac (VHT80) (for output power)	138	OFDM	BPSK	MCS0
802.11ax (HE20)	144	OFDMA	BPSK	MCS0
802.11ax (HE40)	142	OFDMA	BPSK	MCS0
802.11ax (HE80)	138	OFDMA	BPSK	MCS0

Test Condition:

Applicable To	Environmental Conditions	Input Power (System)	Tested By
RE $\geq$ 1G	25deg. C, 70%RH	120Vac, 60Hz	Ryan Du
RE<1G	25deg. C, 70%RH	120Vac, 60Hz	Ryan Du
PLC	25deg. C, 75%RH	120Vac, 60Hz	Ryan Du
APCM	25deg. C, 60%RH	120Vac, 60Hz	Anderson Chen

3.3 Duty Cycle of Test Signal

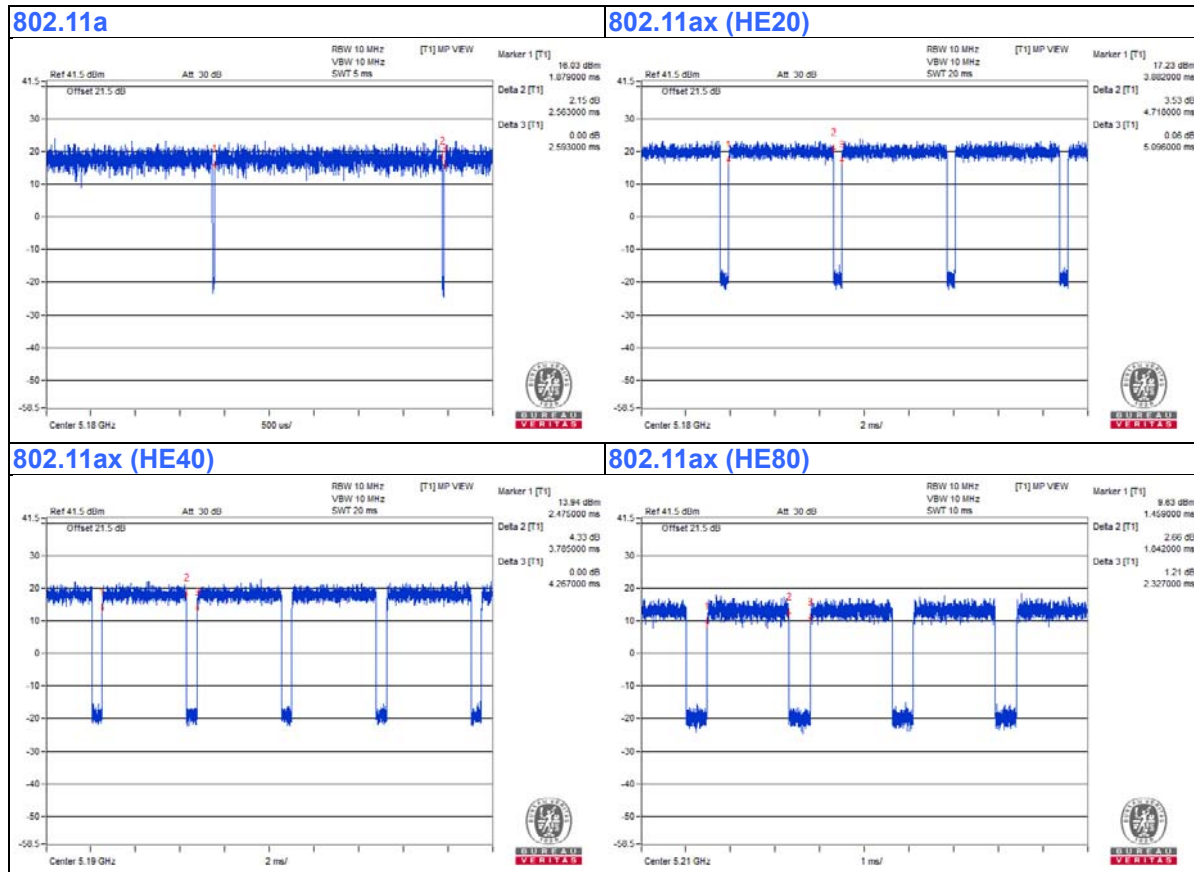
If duty cycle of test signal is $\geq 98\%$, duty factor is not required.
If duty cycle of test signal is $< 98\%$, duty factor shall be considered.

802.11a: Duty cycle = 2.563 ms / 2.593 ms = 0.988

802.11ax (HE20): Duty cycle = 4.718 ms / 5.096 ms = 0.926, Duty factor = $10 \cdot \log(1/\text{Duty cycle}) = 0.33 \text{ dB}$

802.11ax (HE40): Duty cycle = 3.785 ms / 4.267 ms = 0.887, Duty factor = $10 \cdot \log(1/\text{Duty cycle}) = 0.52 \text{ dB}$

802.11ax (HE80): Duty cycle = 1.842 ms / 2.327 ms = 0.792, Duty factor = $10 \cdot \log(1/\text{Duty cycle}) = 1.02 \text{ dB}$



3.4 Description of Support Units

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

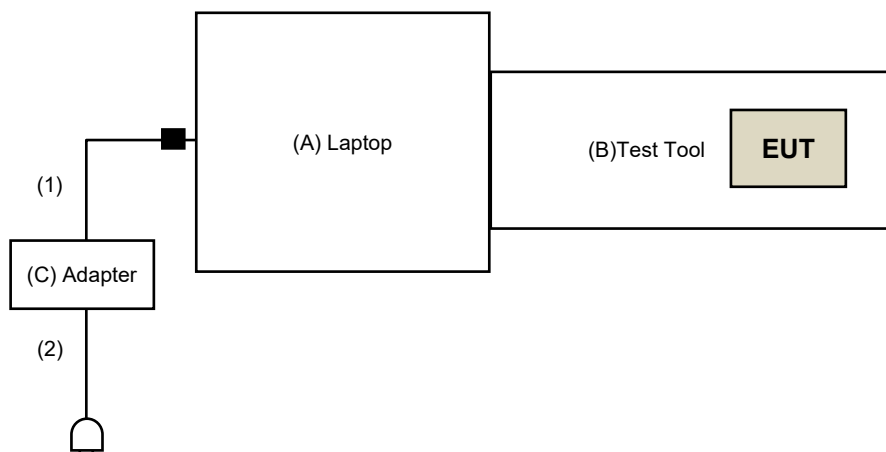
ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Laptop	DELL	E6440	H7LYQ32	DoC	Provided by Lab
B.	Test Tool	MTK	NA	NA	NA	Supplied by client
C.	Adapter	Dell	FA65NE0-00	NA	NA	Provided by Lab

ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	DC Cable	1	1.6	No	1	Provided by Lab
2.	AC Cable	1	1	No	0	Provided by Lab

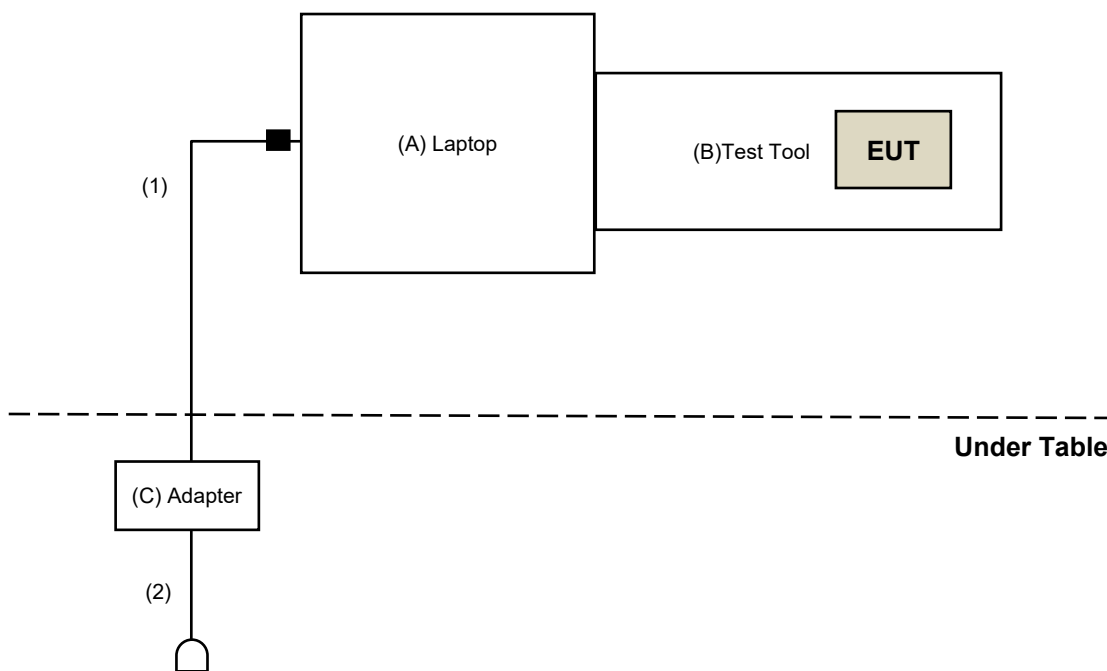
Note: The core(s) is(are) originally attached to the cable(s).

3.4.1 Configuration of System under Test

For AC Power Conducted Emissions test:



For Radiated Emissions test:



3.5 General Description of Applied Standards and References

The EUT is a RF Product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards and references:

Test Standard:

FCC Part 15, Subpart E (15.407)

ANSI C63.10-2013

All test items have been performed and recorded as per the above standards.

References Test Guidance:

KDB 789033 D02 General UNII Test Procedure New Rules v02r01

KDB 662911 D01 Multiple Transmitter Output v02r01

All test items have been performed as a reference to the above KDB test guidance.

4 Test Types and Results

4.1 Radiated Emission and Bandedge Measurement

4.1.1 Limits of Radiated Emission and Bandedge Measurement

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

NOTE:

- The lower limit shall apply at the transition frequencies.
- Emission level (dBuV/m) = 20 log Emission level (uV/m).
- 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 (dBuV/m)	AV:54 (dBuV/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(dBuV/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(dBuV/m) ^{*1} PK: 105.2 (dBuV/m) ^{*2} PK: 110.8(dBuV/m) ^{*3} PK: 122.2 (dBuV/m) ^{*4}
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(dBuV/m) ^{*1} PK:105.2 (dBuV/m) ^{*2} PK: 110.8(dBuV/m) ^{*3} PK:122.2 (dBuV/m) ^{*4}
^{*1} beyond 75 MHz or more above of the band edge. ^{*3} below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above.		^{*2} below the band edge increasing linearly to 10 dBm/MHz at 25 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:

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

4.1.2 Test Instruments

For Radiated Emission test:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver Keysight	N9038A	MY54450088	July 06, 2020	July 05, 2021
Pre-Amplifier EMCI	EMC001340	980142	May 24, 2021	May 23, 2022
Loop Antenna Electro-Metrics	EM-6879	264	Mar. 05, 2021	Mar. 04, 2022
RF Cable	5D-FB	LOOPCAB-001	Jan. 07, 2021	Jan. 06, 2022
RF Cable	5D-FB	LOOPCAB-002	Jan. 07, 2021	Jan. 06, 2022
Pre-Amplifier Mini-Circuits	ZFL-1000VH2	QA0838008	Oct. 20, 2020	Oct. 19, 2021
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-361	Nov. 05, 2020	Nov. 04, 2021
RF Cable	8D	966-3-1	Mar. 16, 2021	Mar. 15, 2022
RF Cable	8D	966-3-2	Mar. 16, 2021	Mar. 15, 2022
RF Cable	8D	966-3-3	Mar. 16, 2021	Mar. 15, 2022
Fixed attenuator Mini-Circuits	UNAT-5+	PAD-3m-3-01	Sep. 24, 2020	Sep. 23, 2021
Horn_Antenna SCHWARZBECK	BBHA9120-D	9120D-406	Nov. 22, 2020	Nov. 21, 2021
Pre-Amplifier EMCI	EMC12630SE	980384	Jan. 11, 2021	Jan. 10, 2022
RF Cable	EMC104-SM-SM-1500	180504	Apr. 26, 2021	Apr. 25, 2022
RF Cable	EMC104-SM-SM-2000	180601	June 08, 2021	June 07, 2022
RF Cable	EMC104-SM-SM-6000	210201	May 13, 2021	May 12, 2022
Spectrum Analyzer Keysight	N9030A	MY54490679	July 13, 2020	July 12, 2021
Pre-Amplifier EMCI	EMC184045SE	980387	Jan. 11, 2021	Jan. 10, 2022
Horn_Antenna SCHWARZBECK	BBHA 9170	BBHA9170519	Nov. 22, 2020	Nov. 21, 2021
RF Cable	EMC102-KM-KM-1200	160924	Jan. 11, 2021	Jan. 10, 2022
RF Cable	EMC-KM-KM-4000	200214	Mar. 10, 2021	Mar. 09, 2022
Software	ADT_Radiated_V8.7.08	NA	NA	NA
Antenna Tower & Turn Table Max-Full	MF-7802	MF780208406	NA	NA
Boresight Antenna Fixture	FBA-01	FBA-SIP01	NA	NA

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in 966 Chamber No. 3.
3. Tested Date: June 18, 2021

For other test items:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Spectrum Analyzer R&S	FSV40	101516	Mar. 08, 2021	Mar. 07, 2022
10dB Attenuator Woken	MDCS18N-10	MDCS18N-10-01	Apr. 13, 2021	Apr. 12, 2022
DC Power Supply Topward	6603D	795558	NA	NA
Temperature & Humidity Chamber Giant Force	GTH-150-40-SP-AR	MAA0812-008	Jan. 14, 2021	Jan. 13, 2022
True RMS Clamp Meter FLUKE	325	31130711WS	June 02, 2021	June 01, 2022
Software	ADT_RF Test Software V6.6.5.4	NA	NA	NA

- NOTE:**
1. The test was performed in Oven room 2.
 2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
 3. Tested Date: June 19, 2021

4.1.3 Test Procedure

For Radiated emission below 30MHz

- 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. The test-receiver system was set to Quasi-Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

Note:

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

For Radiated emission above 30MHz

- 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. 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.
- 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:

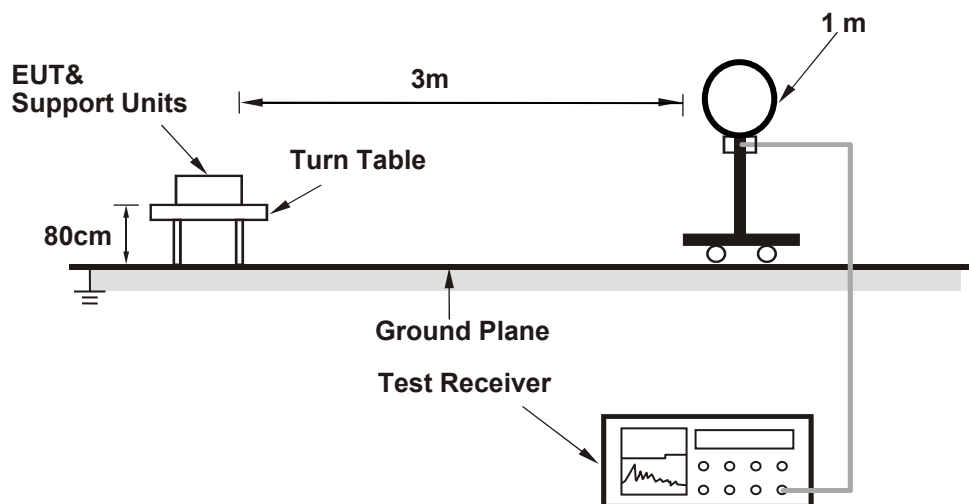
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is $\geq 1/T$ (Duty cycle $< 98\%$) or 10Hz (Duty cycle $\geq 98\%$) for Average detection (AV) at frequency above 1GHz.
4. All modes of operation were investigated and the worst-case emissions are reported.

4.1.4 Deviation from Test Standard

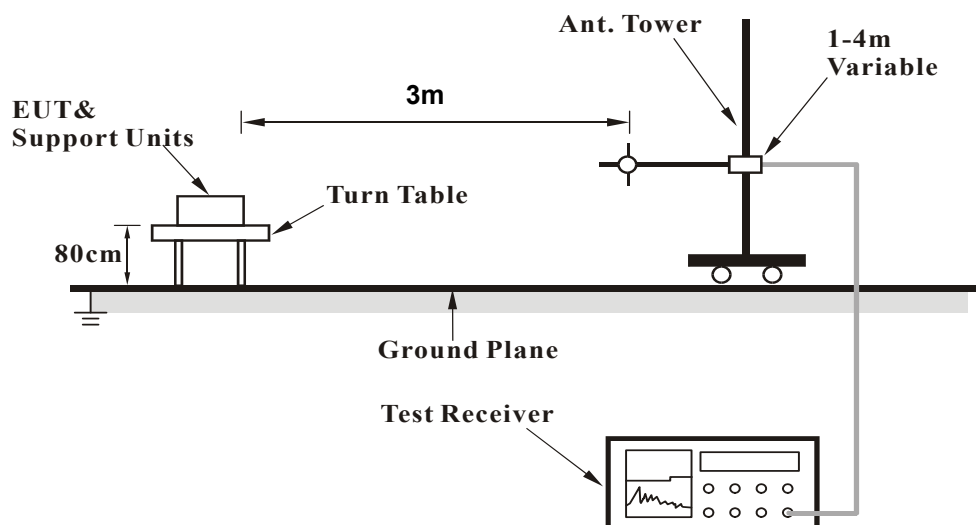
No deviation.

4.1.5 Test Setup

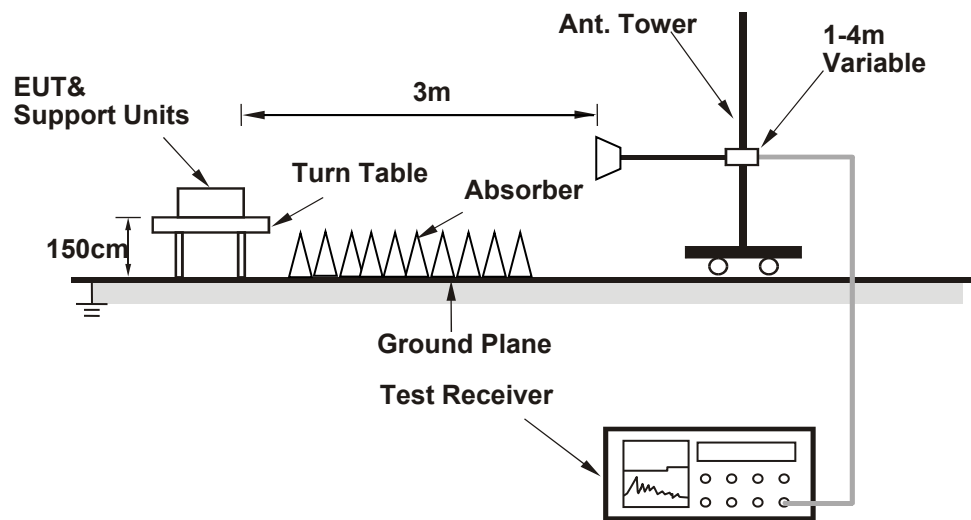
For Radiated emission below 30MHz



For Radiated emission 30MHz to 1GHz



For Radiated emission above 1GHz



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

4.1.6 EUT Operating Condition

- Placed the EUT on the testing table.
- Controlling software (MT7961 QA 0.0.2.28) has been activated to set the EUT under transmission condition continuously at specific channel frequency.

4.1.7 Test Results (Mode 1)

Above 1GHz Data:

RF Mode	TX 802.11a	Channel	CH 144 : 5720 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) Average (AV)

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	5460.00	52.7 PK	74.0	-21.3	1.55 H	18	48.3	4.4
2	5460.00	42.4 AV	54.0	-11.6	1.55 H	18	38.0	4.4
3	#5470.00	54.0 PK	68.2	-14.2	1.55 H	18	49.5	4.5
4	*5720.00	116.3 PK			1.55 H	18	111.6	4.7
5	*5720.00	109.4 AV			1.55 H	18	104.7	4.7
6	#5850.00	63.5 PK	68.2	-4.7	1.55 H	18	58.5	5.0
7	11440.00	58.8 PK	74.0	-15.2	1.73 H	95	44.2	14.6
8	11440.00	47.8 AV	54.0	-6.2	1.73 H	95	33.2	14.6
9	#17160.00	51.1 PK	68.2	-17.1	1.77 H	134	33.3	17.8
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	5460.00	47.2 PK	74.0	-26.8	1.12 V	37	42.8	4.4
2	5460.00	38.3 AV	54.0	-15.7	1.12 V	37	33.9	4.4
3	#5470.00	50.0 PK	68.2	-18.2	1.12 V	37	45.5	4.5
4	*5720.00	114.9 PK			1.12 V	37	110.2	4.7
5	*5720.00	105.7 AV			1.12 V	37	101.0	4.7
6	#5850.00	55.0 PK	68.2	-13.2	1.12 V	37	50.0	5.0
7	11440.00	55.5 PK	74.0	-18.5	1.48 V	140	40.9	14.6
8	11440.00	46.1 AV	54.0	-7.9	1.48 V	140	31.5	14.6
9	#17160.00	55.4 PK	68.2	-12.8	2.56 V	76	37.6	17.8

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.
6. " # ": The radiated frequency is out of the restricted band.

RF Mode	TX 802.11ax (HE20)	Channel	CH 144 : 5720 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) Average (AV)

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	5460.00	50.8 PK	74.0	-23.2	1.80 H	343	46.4	4.4
2	5460.00	41.0 AV	54.0	-13.0	1.80 H	343	36.6	4.4
3	#5470.00	51.2 PK	68.2	-17.0	1.80 H	343	46.7	4.5
4	*5720.00	116.7 PK			1.80 H	343	112.0	4.7
5	*5720.00	105.7 AV			1.80 H	343	101.0	4.7
6	#5850.00	60.6 PK	68.2	-7.6	1.80 H	343	55.6	5.0
7	11440.00	58.4 PK	74.0	-15.6	1.71 H	92	43.8	14.6
8	11440.00	46.7 AV	54.0	-7.3	1.71 H	92	32.1	14.6
9	#17160.00	51.7 PK	68.2	-16.5	1.72 H	121	33.9	17.8
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	5460.00	47.2 PK	74.0	-26.8	1.16 V	34	42.8	4.4
2	5460.00	38.8 AV	54.0	-15.2	1.16 V	34	34.4	4.4
3	#5470.00	50.8 PK	68.2	-17.4	1.16 V	34	46.3	4.5
4	*5720.00	111.5 PK			1.16 V	34	106.8	4.7
5	*5720.00	102.9 AV			1.16 V	34	98.2	4.7
6	#5850.00	55.0 PK	68.2	-13.2	1.16 V	34	50.0	5.0
7	11440.00	57.7 PK	74.0	-16.3	1.70 V	128	43.1	14.6
8	11440.00	47.6 AV	54.0	-6.4	1.70 V	128	33.0	14.6
9	#17160.00	56.1 PK	68.2	-12.1	2.52 V	101	38.3	17.8

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.
6. " # ": The radiated frequency is out of the restricted band.

RF Mode	TX 802.11ax (HE40)	Channel	CH 142 : 5710 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) Average (AV)

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	5460.00	52.0 PK	74.0	-22.0	1.79 H	357	47.6	4.4
2	5460.00	41.6 AV	54.0	-12.4	1.79 H	357	37.2	4.4
3	#5470.00	54.8 PK	68.2	-13.4	1.79 H	357	50.3	4.5
4	*5710.00	115.1 PK			1.79 H	357	110.4	4.7
5	*5710.00	101.8 AV			1.79 H	357	97.1	4.7
6	#5850.00	55.6 PK	68.2	-12.6	1.79 H	357	50.6	5.0
7	11420.00	55.3 PK	74.0	-18.7	1.72 H	89	40.8	14.5
8	11420.00	43.3 AV	54.0	-10.7	1.72 H	89	28.8	14.5
9	#17130.00	51.1 PK	68.2	-17.1	1.77 H	126	33.4	17.7
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	5460.00	47.2 PK	74.0	-26.8	1.06 V	34	42.8	4.4
2	5460.00	39.0 AV	54.0	-15.0	1.06 V	34	34.6	4.4
3	#5470.00	50.5 PK	68.2	-17.7	1.06 V	34	46.0	4.5
4	*5710.00	108.2 PK			1.06 V	34	103.5	4.7
5	*5710.00	99.0 AV			1.06 V	34	94.3	4.7
6	#5850.00	54.9 PK	68.2	-13.3	1.06 V	34	49.9	5.0
7	#17130.00	52.4 PK	68.2	-15.8	2.58 V	90	34.7	17.7

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.
6. " # ": The radiated frequency is out of the restricted band.

RF Mode	TX 802.11ax (HE80)	Channel	CH 138 : 5690 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) Average (AV)

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	5460.00	49.0 PK	74.0	-25.0	2.73 H	13	44.6	4.4
2	5460.00	39.8 AV	54.0	-14.2	2.73 H	13	35.4	4.4
3	#5470.00	50.2 PK	68.2	-18.0	2.73 H	13	45.7	4.5
4	*5690.00	106.1 PK			2.73 H	13	101.6	4.5
5	*5690.00	96.6 AV			2.73 H	13	92.1	4.5
6	#5850.00	53.0 PK	68.2	-15.2	2.73 H	13	48.0	5.0
7	11380.00	54.0 PK	74.0	-20.0	1.72 H	103	39.5	14.5
8	11380.00	41.7 AV	54.0	-12.3	1.72 H	103	27.2	14.5
9	#17070.00	50.7 PK	68.2	-17.5	1.78 H	89	32.8	17.9
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	5460.00	46.1 PK	74.0	-27.9	1.16 V	24	41.7	4.4
2	5460.00	38.1 AV	54.0	-15.9	1.16 V	24	33.7	4.4
3	#5470.00	50.3 PK	68.2	-17.9	1.16 V	24	45.8	4.5
4	*5690.00	104.4 PK			1.16 V	24	99.9	4.5
5	*5690.00	94.6 AV			1.16 V	24	90.1	4.5
6	#5850.00	55.3 PK	68.2	-12.9	1.16 V	24	50.3	5.0
7	11380.00	51.8 PK	74.0	-22.2	1.49 V	151	37.3	14.5
8	11380.00	41.3 AV	54.0	-12.7	1.49 V	151	26.8	14.5
9	#17070.00	50.8 PK	68.2	-17.4	2.48 V	60	32.9	17.9

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.
6. " # ": The radiated frequency is out of the restricted band.

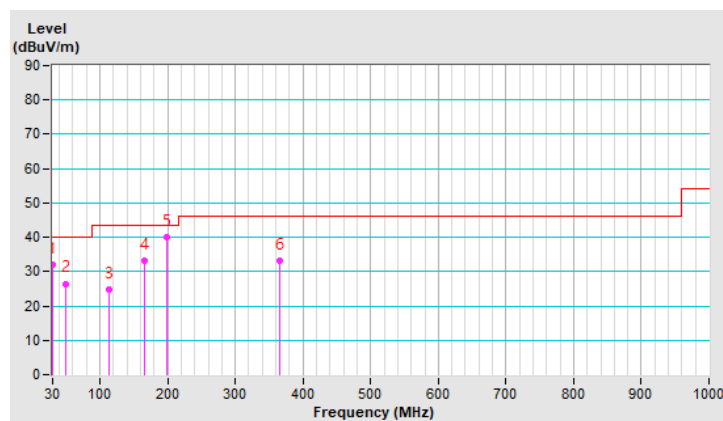
Below 1GHz Data:

RF Mode	TX 802.11ax (HE20)	Channel	CH 144 : 5720 MHz
Frequency Range	9kHz ~ 1GHz	Detector Function	Quasi-Peak (QP)

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	30.33	32.0 QP	40.0	-8.0	2.50 H	128	41.4	-9.4
2	49.04	26.5 QP	40.0	-13.5	1.00 H	294	34.6	-8.1
3	113.18	24.8 QP	43.5	-18.7	1.50 H	137	35.2	-10.4
4	165.66	33.0 QP	43.5	-10.5	1.50 H	128	41.0	-8.0
5	199.19	40.0 QP	43.5	-3.5	1.50 H	189	50.6	-10.6
6	364.66	33.1 QP	46.0	-12.9	2.00 H	157	37.8	-4.7

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 30MHz~1000MHz.
5. The emission levels were very low against the limit of frequency range 9kHz~30MHz: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value to be report.

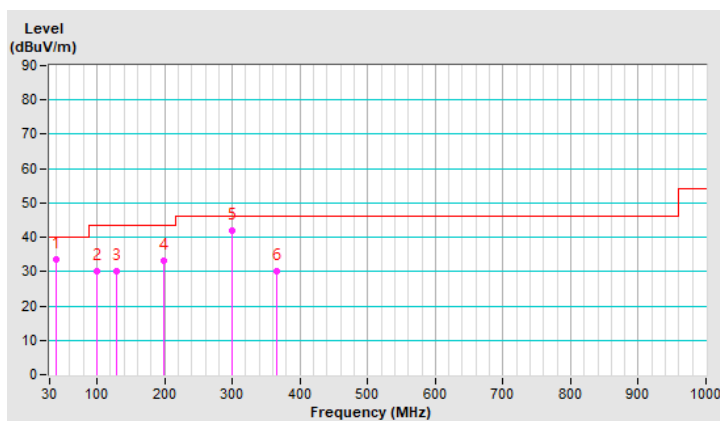


RF Mode	TX 802.11ax (HE20)	Channel	CH 144 : 5720 MHz
Frequency Range	9kHz ~ 1GHz	Detector Function	Quasi-Peak (QP)

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	39.69	33.5 QP	40.0	-6.5	1.00 V	129	42.1	-8.6
2	99.60	30.2 QP	43.5	-13.3	1.50 V	146	42.6	-12.4
3	129.21	30.1 QP	43.5	-13.4	1.50 V	162	39.0	-8.9
4	199.07	33.1 QP	43.5	-10.4	2.00 V	159	43.7	-10.6
5	299.01	42.0 QP	46.0	-4.0	1.00 V	243	48.6	-6.6
6	365.06	30.0 QP	46.0	-16.0	2.00 V	142	34.7	-4.7

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 30MHz~1000MHz.
5. The emission levels were very low against the limit of frequency range 9kHz~30MHz: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value to be report.



4.1.8 Test Results (Mode 2)

Above 1GHz Data:

RF Mode	TX 802.11a	Channel	CH 144 : 5720 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) Average (AV)

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	5460.00	52.1 PK	74.0	-21.9	1.33 H	144	47.7	4.4
2	5460.00	39.5 AV	54.0	-14.5	1.33 H	144	35.1	4.4
3	#5470.00	53.2 PK	68.2	-15.0	1.33 H	144	48.7	4.5
4	*5720.00	104.4 PK			1.33 H	144	99.7	4.7
5	*5720.00	97.2 AV			1.33 H	144	92.5	4.7
6	#5850.00	57.3 PK	68.2	-10.9	1.33 H	144	52.3	5.0
7	11440.00	56.6 PK	74.0	-17.4	2.52 H	126	42.0	14.6
8	11440.00	45.5 AV	54.0	-8.5	2.52 H	126	30.9	14.6
9	#17160.00	52.1 PK	68.2	-16.1	2.32 H	95	34.3	17.8
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	5460.00	51.7 PK	74.0	-22.3	1.05 V	168	47.3	4.4
2	5460.00	41.0 AV	54.0	-13.0	1.05 V	168	36.6	4.4
3	#5470.00	52.4 PK	68.2	-15.8	1.05 V	168	47.9	4.5
4	*5720.00	114.5 PK			1.05 V	168	109.8	4.7
5	*5720.00	108.1 AV			1.05 V	168	103.4	4.7
6	#5850.00	59.5 PK	68.2	-8.7	1.05 V	168	54.5	5.0
7	11440.00	56.7 PK	74.0	-17.3	3.24 V	65	42.1	14.6
8	11440.00	45.9 AV	54.0	-8.1	3.24 V	65	31.3	14.6
9	#17160.00	56.3 PK	68.2	-11.9	3.19 V	238	38.5	17.8

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.
6. " # ": The radiated frequency is out of the restricted band.

RF Mode	TX 802.11ax (HE20)	Channel	CH 144 : 5720 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) Average (AV)

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	5460.00	50.0 PK	74.0	-24.0	1.02 H	130	45.6	4.4
2	5460.00	39.6 AV	54.0	-14.4	1.02 H	130	35.2	4.4
3	#5470.00	50.2 PK	68.2	-18.0	1.02 H	130	45.7	4.5
4	*5720.00	106.7 PK			1.02 H	130	102.0	4.7
5	*5720.00	97.7 AV			1.02 H	130	93.0	4.7
6	#5850.00	57.8 PK	68.2	-10.4	1.02 H	130	52.8	5.0
7	11440.00	53.3 PK	74.0	-20.7	2.48 H	125	38.7	14.6
8	11440.00	42.7 AV	54.0	-11.3	2.48 H	125	28.1	14.6
9	#17160.00	50.5 PK	68.2	-17.7	2.25 H	103	32.7	17.8
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	5460.00	50.8 PK	74.0	-23.2	1.02 V	178	46.4	4.4
2	5460.00	41.1 AV	54.0	-12.9	1.02 V	178	36.7	4.4
3	#5470.00	52.1 PK	68.2	-16.1	1.02 V	178	47.6	4.5
4	*5720.00	116.5 PK			1.02 V	178	111.8	4.7
5	*5720.00	106.4 AV			1.02 V	178	101.7	4.7
6	#5850.00	60.3 PK	68.2	-7.9	1.02 V	178	55.3	5.0
7	11440.00	54.6 PK	74.0	-19.4	3.38 V	29	40.0	14.6
8	11440.00	43.5 AV	54.0	-10.5	3.38 V	29	28.9	14.6
9	#17160.00	54.4 PK	68.2	-13.8	3.25 V	207	36.6	17.8

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.
6. " # ": The radiated frequency is out of the restricted band.

RF Mode	TX 802.11ax (HE40)	Channel	CH 142 : 5710 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) Average (AV)

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	5460.00	49.8 PK	74.0	-24.2	1.17 H	148	45.4	4.4
2	5460.00	38.1 AV	54.0	-15.9	1.17 H	148	33.7	4.4
3	#5470.00	49.6 PK	68.2	-18.6	1.17 H	148	45.1	4.5
4	*5710.00	101.6 PK			1.17 H	148	96.9	4.7
5	*5710.00	91.4 AV			1.17 H	148	86.7	4.7
6	#5850.00	56.6 PK	68.2	-11.6	1.17 H	148	51.6	5.0
7	11420.00	54.3 PK	74.0	-19.7	2.36 H	145	39.8	14.5
8	11420.00	43.7 AV	54.0	-10.3	2.36 H	145	29.2	14.5
9	#17130.00	50.8 PK	68.2	-17.4	2.26 H	94	33.1	17.7
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	5460.00	53.0 PK	74.0	-21.0	1.03 V	123	48.6	4.4
2	5460.00	42.6 AV	54.0	-11.4	1.03 V	123	38.2	4.4
3	#5470.00	54.3 PK	68.2	-13.9	1.03 V	123	49.8	4.5
4	*5710.00	109.6 PK			1.03 V	123	104.9	4.7
5	*5710.00	101.3 AV			1.03 V	123	96.6	4.7
6	#5850.00	61.5 PK	68.2	-6.7	1.03 V	123	56.5	5.0
7	11420.00	53.5 PK	74.0	-20.5	3.35 V	65	39.0	14.5
8	11420.00	40.7 AV	54.0	-13.3	3.35 V	65	26.2	14.5
9	#17130.00	51.3 PK	68.2	-16.9	3.27 V	186	33.6	17.7

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.
6. " # ": The radiated frequency is out of the restricted band.

RF Mode	TX 802.11ax (HE80)	Channel	CH 138 : 5690 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) Average (AV)

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	5460.00	50.6 PK	74.0	-23.4	1.08 H	155	46.2	4.4
2	5460.00	38.7 AV	54.0	-15.3	1.08 H	155	34.3	4.4
3	#5470.00	50.4 PK	68.2	-17.8	1.08 H	155	45.9	4.5
4	*5690.00	95.4 PK			1.08 H	155	90.9	4.5
5	*5690.00	86.1 AV			1.08 H	155	81.6	4.5
6	#5850.00	56.9 PK	68.2	-11.3	1.08 H	155	51.9	5.0
7	11380.00	54.5 PK	74.0	-19.5	2.31 H	166	40.0	14.5
8	11380.00	42.9 AV	54.0	-11.1	2.31 H	166	28.4	14.5
9	#17070.00	52.4 PK	68.2	-15.8	2.18 H	76	34.5	17.9
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	5460.00	47.7 PK	74.0	-26.3	1.15 V	154	43.3	4.4
2	5460.00	38.2 AV	54.0	-15.8	1.15 V	154	33.8	4.4
3	#5470.00	47.8 PK	68.2	-20.4	1.15 V	154	43.3	4.5
4	*5690.00	104.4 PK			1.15 V	154	99.9	4.5
5	*5690.00	96.1 AV			1.15 V	154	91.6	4.5
6	#5850.00	50.9 PK	68.2	-17.3	1.15 V	154	45.9	5.0
7	11380.00	53.7 PK	74.0	-20.3	3.38 V	68	39.2	14.5
8	11380.00	41.0 AV	54.0	-13.0	3.38 V	68	26.5	14.5
9	#17070.00	50.8 PK	68.2	-17.4	3.19 V	172	32.9	17.9

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.
6. " # ": The radiated frequency is out of the restricted band.

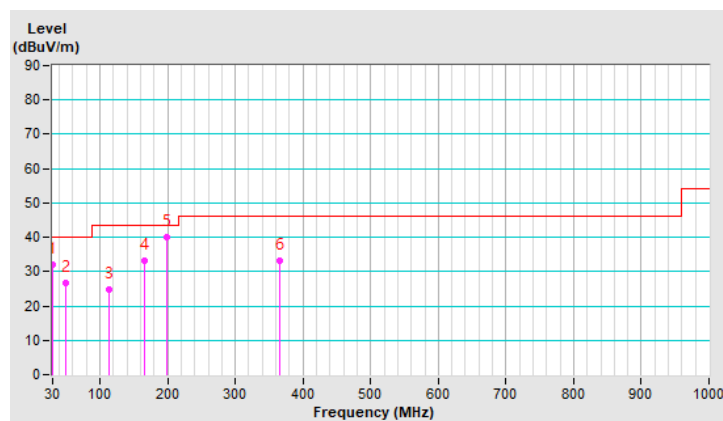
Below 1GHz Data:

RF Mode	TX 802.11ax (HE20)	Channel	CH 144 : 5720 MHz
Frequency Range	9kHz ~ 1GHz	Detector Function	Quasi-Peak (QP)

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	30.41	32.1 QP	40.0	-7.9	2.50 H	154	41.5	-9.4
2	49.15	26.6 QP	40.0	-13.4	1.00 H	278	34.7	-8.1
3	113.28	24.9 QP	43.5	-18.6	1.50 H	113	35.3	-10.4
4	165.77	33.2 QP	43.5	-10.3	1.50 H	137	41.2	-8.0
5	199.32	40.1 QP	43.5	-3.4	1.50 H	213	50.7	-10.6
6	364.76	33.3 QP	46.0	-12.7	2.00 H	142	38.0	-4.7

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 30MHz~1000MHz.
5. The emission levels were very low against the limit of frequency range 9kHz~30MHz: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value to be report.

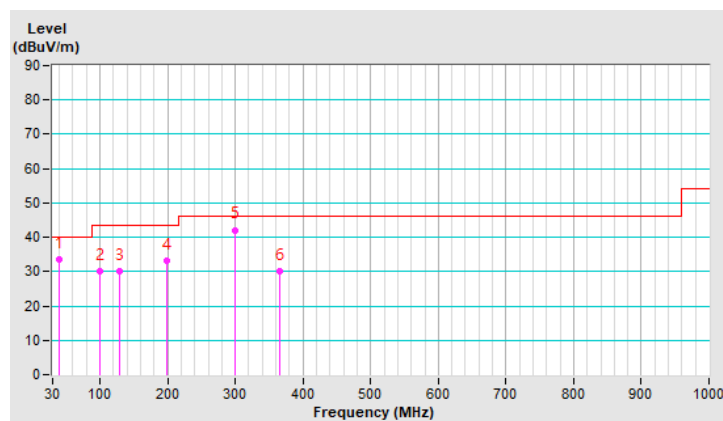


RF Mode	TX 802.11ax (HE20)	Channel	CH 144 : 5720 MHz
Frequency Range	9kHz ~ 1GHz	Detector Function	Quasi-Peak (QP)

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	39.79	33.6 QP	40.0	-6.4	1.00 V	142	42.3	-8.7
2	99.71	30.1 QP	43.5	-13.4	1.50 V	129	42.4	-12.3
3	129.32	30.2 QP	43.5	-13.3	1.50 V	171	39.1	-8.9
4	199.18	33.0 QP	43.5	-10.5	2.00 V	186	43.6	-10.6
5	299.11	42.1 QP	46.0	-3.9	1.00 V	257	48.7	-6.6
6	365.16	30.1 QP	46.0	-15.9	2.00 V	135	34.8	-4.7

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 30MHz~1000MHz.
5. The emission levels were very low against the limit of frequency range 9kHz~30MHz: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value to be report.



4.2 Conducted Emission Measurement

4.2.1 Limits of Conducted Emission Measurement

Frequency (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15 - 0.5	66 - 56	56 - 46
0.50 - 5.0	56	46
5.0 - 30.0	60	50

Note: 1. The lower limit shall apply at the transition frequencies.

2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

4.2.2 Test Instruments

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver R&S	ESCS 30	847124/029	Oct. 20, 2020	Oct. 19, 2021
Line-Impedance Stabilization Network (for EUT) R&S	ESH3-Z5	848773/004	Oct. 27, 2020	Oct. 26, 2021
Line-Impedance Stabilization Network (for Peripheral) R&S	ESH3-Z5	835239/001	Mar. 26, 2021	Mar. 25, 2022
50 ohms Terminator	50	3	Oct. 26, 2020	Oct. 25, 2021
RF Cable	5D-FB	COCCAB-001	Sep. 26, 2020	Sep. 25, 2021
Fixed attenuator EMCI	STI02-2200-10	005	Aug. 29, 2020	Aug. 28, 2021
Software BVADT	BVADT_Cond_ V7.3.7.4	NA	NA	NA

Note:

1. The calibration interval of the above test instruments are 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in Conduction 1.
- 3 Tested Date: June 18, 2021

4.2.3 Test Procedure

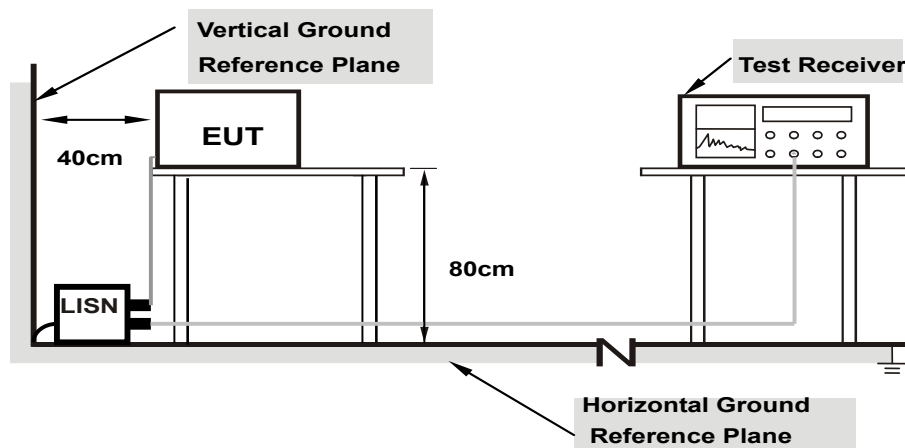
- The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.
- Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
- The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

Note: All modes of operation were investigated and the worst-case emissions are reported.

4.2.4 Deviation from Test Standard

No deviation.

4.2.5 Test Setup



Note: 1.Support units were connected to second LISN.

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

4.2.6 EUT Operating Condition

Same as 4.1.6.

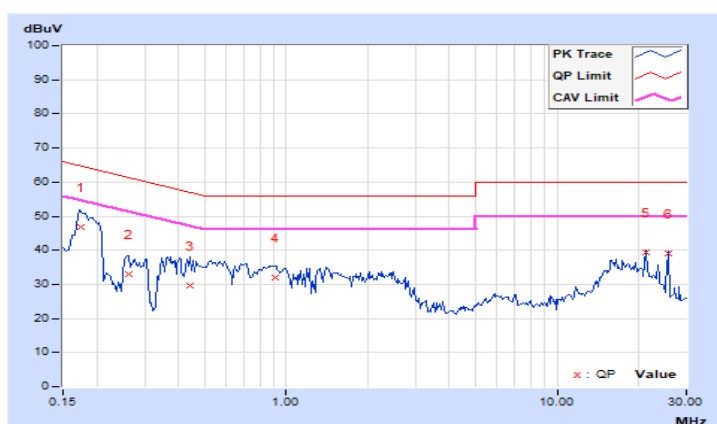
4.2.7 Test Results

RF Mode	TX 802.11ax (HE20)	Channel	CH 144 : 5720 MHz
Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz

Phase Of Power : Line (L)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.17522	9.96	36.76	13.08	46.72	23.04	64.71	54.71	-17.99	-31.67
2	0.26282	9.98	22.99	2.25	32.97	12.23	61.34	51.34	-28.37	-39.11
3	0.44291	9.99	19.79	0.86	29.78	10.85	57.01	47.01	-27.23	-36.16
4	0.91253	10.02	22.03	7.63	32.05	17.65	56.00	46.00	-23.95	-28.35
5	21.16783	11.15	28.21	27.34	39.36	38.49	60.00	50.00	-20.64	-11.51
6	25.87118	11.24	27.93	27.76	39.17	39.00	60.00	50.00	-20.83	-11.00

Remarks:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level – Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value

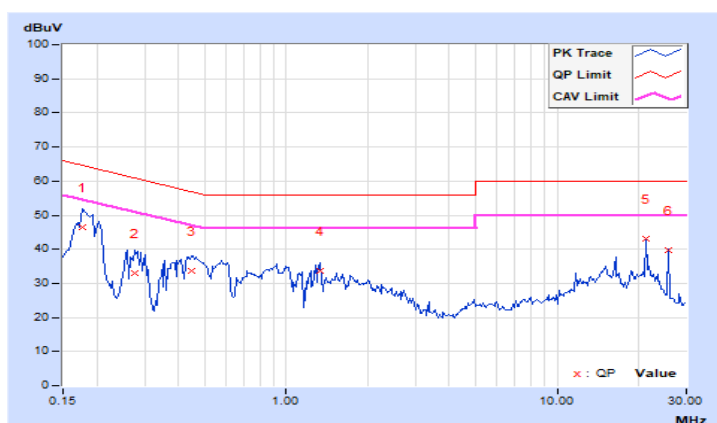


RF Mode	TX 802.11ax (HE20)	Channel	CH 144 : 5720 MHz
Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz

Phase Of Power : Neutral (N)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.17726	9.94	36.68	12.36	46.62	22.30	64.61	54.61	-17.99	-32.31
2	0.27523	9.95	22.88	1.33	32.83	11.28	60.96	50.96	-28.13	-39.68
3	0.44686	9.96	23.83	5.75	33.79	15.71	56.93	46.93	-23.14	-31.22
4	1.33247	10.01	23.54	9.24	33.55	19.25	56.00	46.00	-22.45	-26.75
5	21.16782	10.86	32.19	31.93	43.05	42.79	60.00	50.00	-16.95	-7.21
6	25.87141	10.91	28.71	28.66	39.62	39.57	60.00	50.00	-20.38	-10.43

Remarks:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level – Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value



4.3 Transmit Power Measurement

4.3.1 Limits of Transmit Power Measurement

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)
		Client device	250mW (24 dBm)
U-NII-2A			250mW (24 dBm) or 11 dBm+10 log B*
U-NII-2C	√		250mW (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 Method of conducted output power measurement on IEEE 802.11 devices,

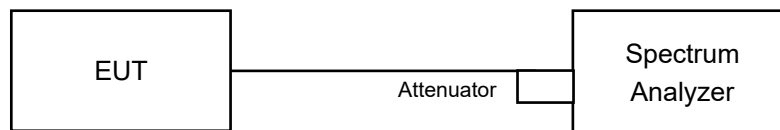
Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \leq 4$;

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.

4.3.2 Test Setup



4.3.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.3.4 Test Procedure

FOR POWER OUTPUT MEASUREMENT

For 802.11a

Follow FCC KDB 789033 UNII test procedure:

Method SA-1

1. Set span to encompass the entire emission bandwidth (EBW) of the signal.
2. Set RBW = 1MHz.
3. Set the VBW $\geq 3 \times$ RBW.
4. Number of points in sweep ≥ 2 Span / RBW.
5. Sweep time = auto.
6. Set trigger to free run (duty cycle ≥ 98 percent)
7. Detector = RMS.
8. Trace average at least 100 traces in power averaging mode
9. Compute power by integrating the spectrum across the 26 dB EBW of the signal.

For other modulation

Follow FCC KDB 789033 UNII test procedure:

Method SA-2

1. Set span to encompass the emission bandwidth (EBW) of the signal.
2. Set RBW = 1MHz.
3. Set the VBW $\geq 3 \times$ RBW.
4. Number of points in sweep ≥ 2 Span / RBW.
5. Sweep time = auto.
6. Detector = RMS.
7. Trace average at least 100 traces in power averaging mode
8. Compute power by integrating the spectrum across the 26 dB EBW of the signal.
9. Duty factor need added to measured value (duty cycle < 98 percent).

FOR 26dB OCCUPIED BANDWIDTH

1. Set RBW = approximately 1% of the emission bandwidth.
2. Set the VBW $>$ RBW.
3. Detector = Peak.
4. Trace mode = max hold.
5. 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%.

4.3.5 Deviation from Test Standard

No deviation.

4.3.6 EUT Operating Condition

The software provided by client to enable the EUT under transmission condition continuously at specific channel frequencies individually.

4.3.7 Test Results

Power Output:

802.11a

Chan.	Chan. Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
*144 (U-NII-2C Band)	5720	17.50	17.24	109.2	20.38	24	Pass
*144 (U-NII-3 Band)	5720	10.58	10.76	23.341	13.68	30	Pass

Note: * Test was performed in accordance with measurement follow FCC KDB 789033 UNII test procedure Method SA-1 and use spectrum analyzer test.

Determined Power Limit			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Power Limit (dBm)
144 (U-NII-2C Band)	5720	20.83	24.18 > 24

Note: For U-NII-2C Band output power limitation is determined based on 26dBc bandwidth.

802.11ac (VHT20)

Chan.	Chan. Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
*144 (U-NII-2C Band)	5720	17.52	17.24	118.23	20.73	23.51	Pass
*144 (U-NII-3 Band)	5720	11.14	11.30	28.614	14.57	30	Pass

Note: * Test was performed in accordance with measurement follow FCC KDB 789033 UNII test procedure Method SA-2 and use spectrum analyzer test. The duty factor was included in the total power.

Determined Power Limit			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Power Limit (dBm)
144 (U-NII-2C Band)	5720	17.84	23.51 < 24

Note: For U-NII-2C Band output power limitation is determined based on 26dBc bandwidth.

802.11ac (VHT40)

Chan.	Chan. Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
*142 (U-NII-2C Band)	5710	16.55	16.39	100.037	20.00	24	Pass
*142 (U-NII-3 Band)	5710	3.51	4.07	5.407	7.33	30	Pass

Note: * Test was performed in accordance with measurement follow FCC KDB 789033 UNII test procedure Method SA-2 and use spectrum analyzer test. The duty factor was included in the total power.

Determined Power Limit			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Power Limit (dBm)
142 (U-NII-2C Band)	5710	37.92	26.78 > 24

Note: For U-NII-2C Band output power limitation is determined based on 26dBc bandwidth.

802.11ac (VHT80)

Chan.	Chan. Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
*138 (U-NII-2C Band)	5690	16.41	15.95	104.989	20.21	24	Pass
*138 (U-NII-3 Band)	5690	0.37	1.38	3.111	4.93	30	Pass

Note: * Test was performed in accordance with measurement follow FCC KDB 789033 UNII test procedure Method SA-2 and use spectrum analyzer test. The duty factor was included in the total power.

Determined Power Limit			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Power Limit (dBm)
138 (U-NII-2C Band)	5690	76.28	29.82 > 24

Note: For U-NII-2C Band output power limitation is determined based on 26dBc bandwidth.

802.11ax (HE20)

Chan.	Chan. Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
*144 (U-NII-2C Band)	5720	17.73	17.44	123.949	20.93	23.51	Pass
*144 (U-NII-3 Band)	5720	11.82	11.83	32.885	15.17	30	Pass

Note: * Test was performed in accordance with measurement follow FCC KDB 789033 UNII test procedure Method SA-2 and use spectrum analyzer test. The duty factor was included in the total power.

Determined Power Limit			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Power Limit (dBm)
144 (U-NII-2C Band)	5720	17.84	23.51 < 24

Note: For U-NII-2C Band output power limitation is determined based on 26dBc bandwidth.

802.11ax (HE40)

Chan.	Chan. Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
*142 (U-NII-2C Band)	5710	16.96	16.66	108.23	20.34	24	Pass
*142 (U-NII-3 Band)	5710	5.52	5.94	8.445	9.27	30	Pass

Note: * Test was performed in accordance with measurement follow FCC KDB 789033 UNII test procedure Method SA-2 and use spectrum analyzer test. The duty factor was included in the total power.

Determined Power Limit			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Power Limit (dBm)
142 (U-NII-2C Band)	5710	37.92	26.78 > 24

Note: For U-NII-2C Band output power limitation is determined based on 26dBc bandwidth.

802.11ax (HE80)

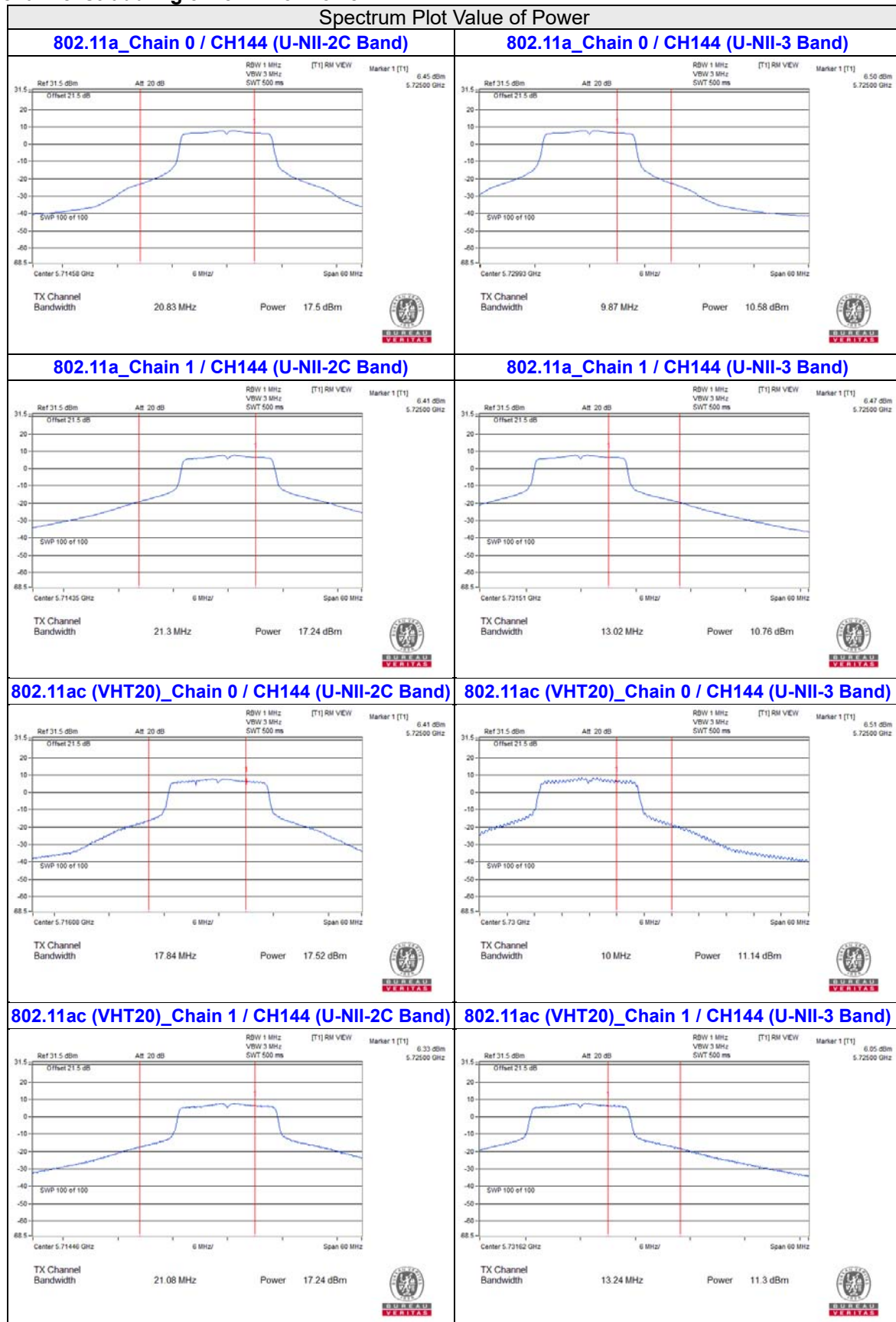
Chan.	Chan. Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
*138 (U-NII-2C Band)	5690	16.55	16.29	110.849	20.45	24	Pass
*138 (U-NII-3 Band)	5690	0.98	2.59	3.877	5.88	30	Pass

Note: * Test was performed in accordance with measurement follow FCC KDB 789033 UNII test procedure Method SA-2 and use spectrum analyzer test. The duty factor was included in the total power.

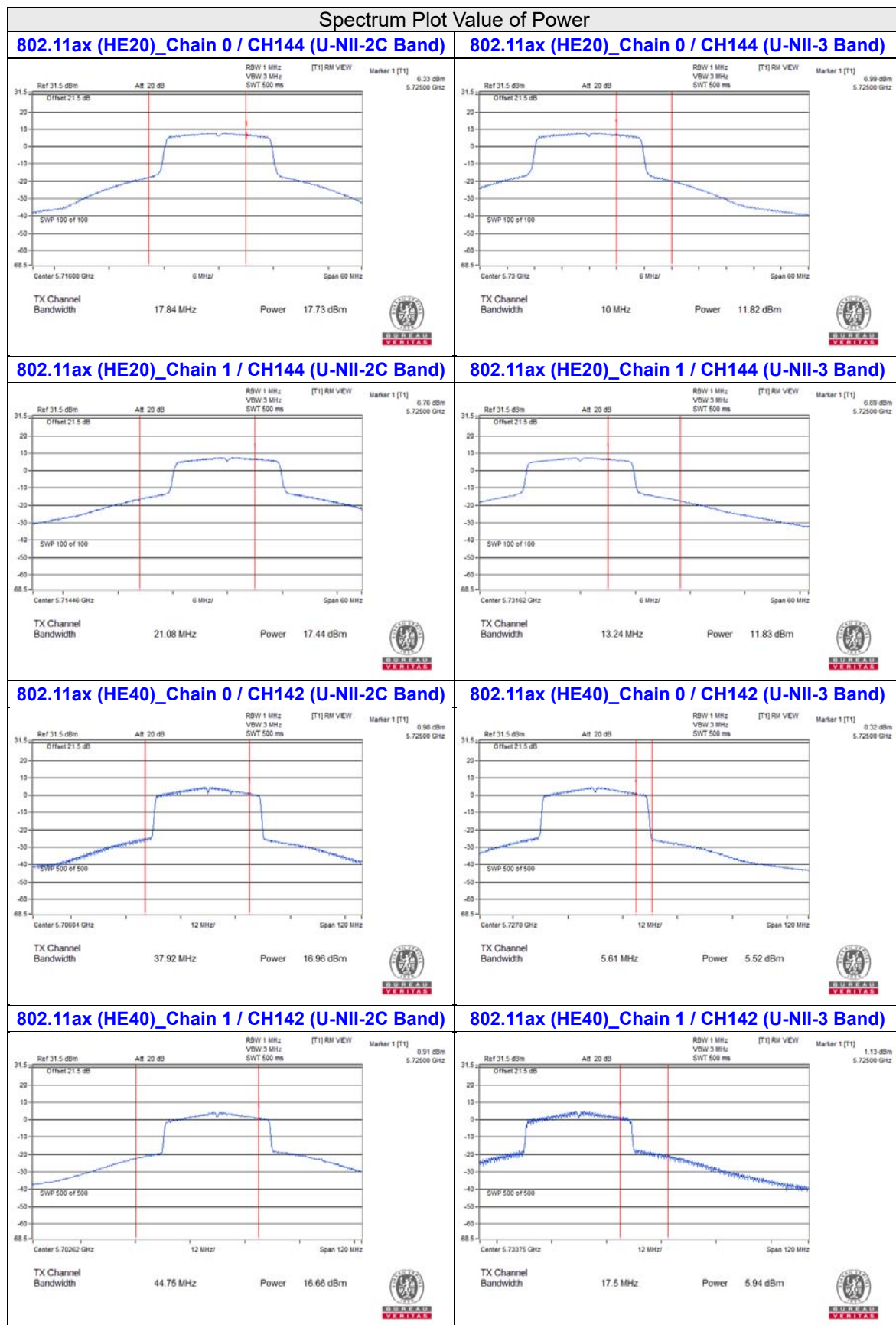
Determined Power Limit			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Power Limit (dBm)
138 (U-NII-2C Band)	5690	76.28	29.82 > 24

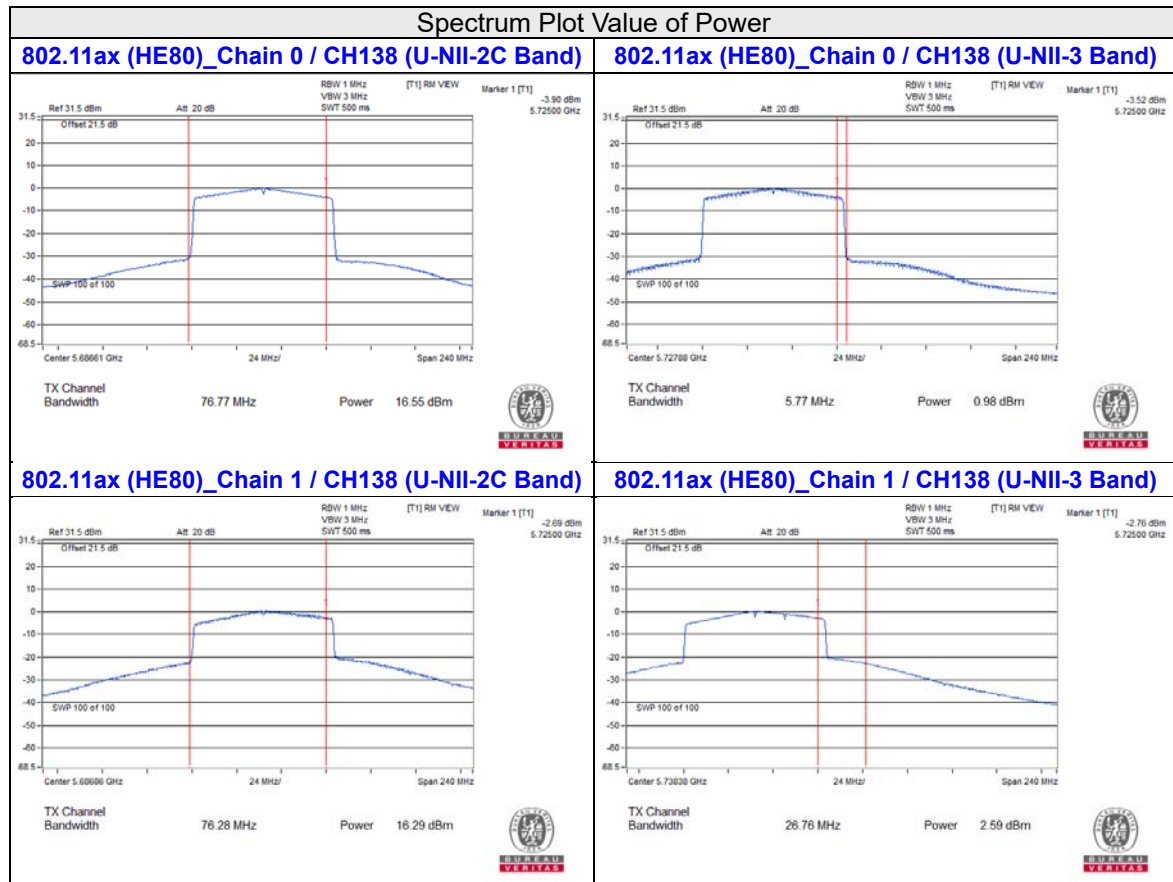
Note: For U-NII-2C Band output power limitation is determined based on 26dBc bandwidth.

For channel straddling 5725MHz of Power









26dB Bandwidth:

802.11a

Channel	Frequency (MHz)	26dB Bandwidth (MHz)	
		Chain 0	Chain 1
144 (U-NII-2C Band)	5720	20.83	21.3
144 (U-NII-3 Band)	5720	9.87	13.02

802.11ax (HE20)

Channel	Frequency (MHz)	26dB Bandwidth (MHz)	
		Chain 0	Chain 1
144 (U-NII-2C Band)	5720	17.84	21.08
144 (U-NII-3 Band)	5720	10	13.24

802.11ax (HE40)

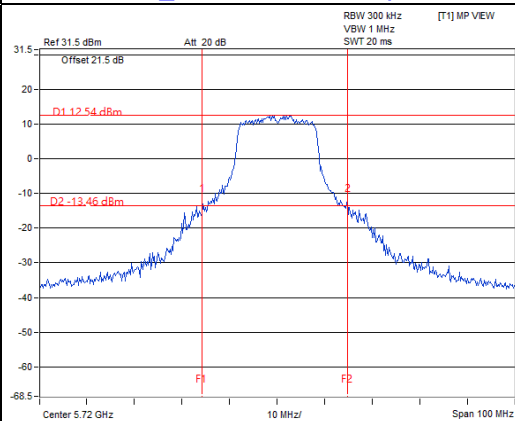
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	
		Chain 0	Chain 1
142 (U-NII-2C Band)	5710	37.92	44.75
142 (U-NII-3 Band)	5710	5.61	17.5

802.11ax (HE80)

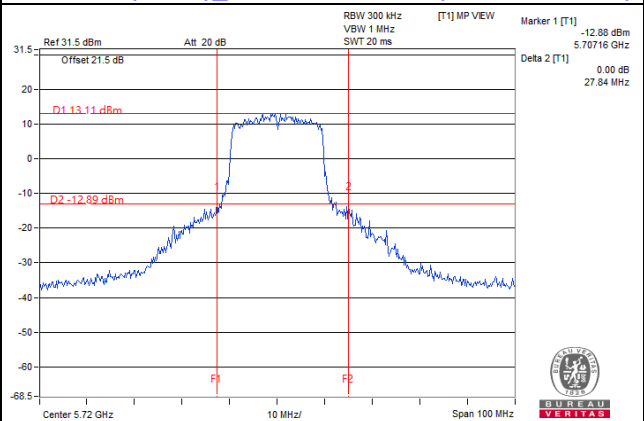
Channel	Frequency (MHz)	26dB Bandwidth (MHz)	
		Chain 0	Chain 1
138 (U-NII-2C Band)	5690	76.77	76.28
138 (U-NII-3 Band)	5690	5.77	26.76

Spectrum Plot of Min. Value

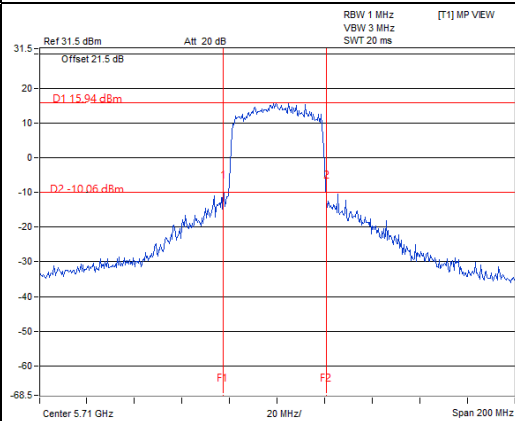
802.11a_Chain 0 / CH144 (U-NII-2C Band)



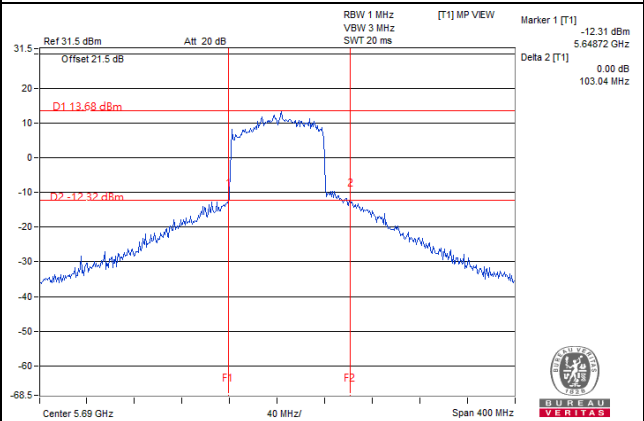
802.11ax (HE20)_Chain 0 / CH144 (U-NII-2C Band)



802.11ax (HE40)_Chain 0 / CH142 (U-NII-2C Band)



802.11ax (HE80)_Chain 1 / CH138 (U-NII-2C Band)

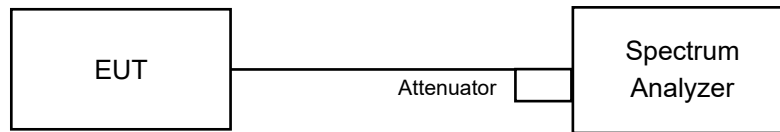


Note:

- For CH144 (U-NII-2C) = 5725MHz - Marker 1
- For CH142 (U-NII-2C) = 5725MHz - Marker 1
- For CH138 (U-NII-2C) = 5725MHz - Marker 1
- For CH144 (U-NII-3) = Marker 1 + Delta 2 - 5725MHz
- For CH142 (U-NII-3) = Marker 1 + Delta 2 - 5725MHz
- For CH138 (U-NII-3) = Marker 1 + Delta 2 - 5725MHz

4.4 Occupied Bandwidth Measurement

4.4.1 Test Setup



4.4.2 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.4.3 Test Procedure

The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with resolution bandwidth in the range of 1% to 5% of the anticipated emission bandwidth, and a video bandwidth at least 3x the resolution bandwidth and set the detector to SAMPLE. The width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage 0.5% of the total mean power of a given emission.

4.4.4 Test Results

802.11a

Channel	Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
144 (U-NII-2C Band)	5720	13.88	14.24
144 (U-NII-3 Band)	5720	3.52	4.48

802.11ax (HE20)

Channel	Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
144 (U-NII-2C Band)	5720	14.72	14.72
144 (U-NII-3 Band)	5720	4.48	4.6

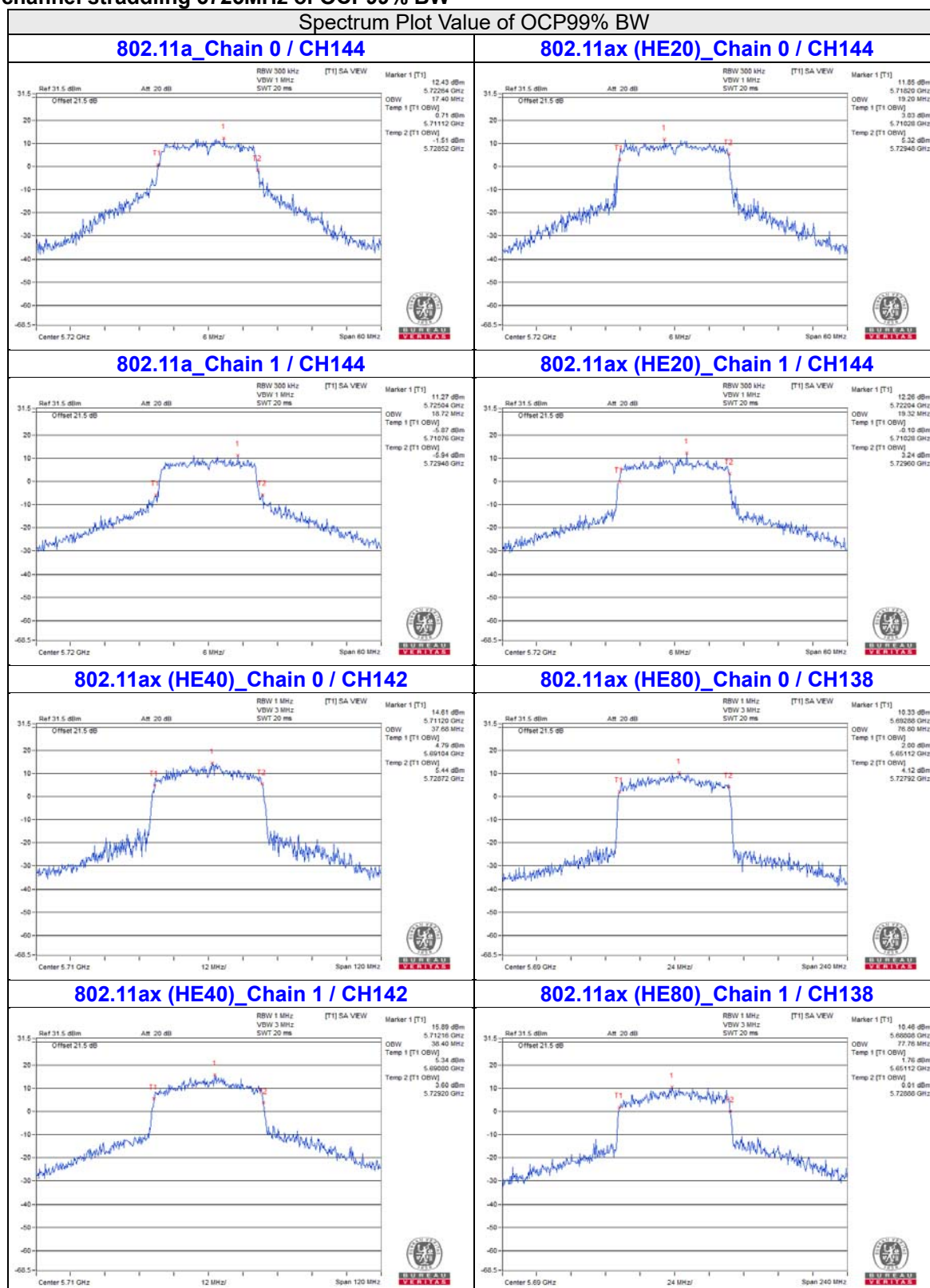
802.11ax (HE40)

Channel	Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
142 (U-NII-2C Band)	5710	33.96	34.2
142 (U-NII-3 Band)	5710	3.72	4.2

802.11ax (HE80)

Channel	Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
138 (U-NII-2C Band)	5690	73.88	73.88
138 (U-NII-3 Band)	5690	2.92	3.88

For channel straddling 5725MHz of OCP99% BW



Note:

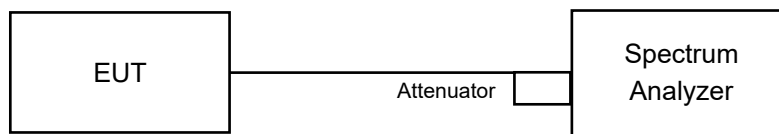
- For CH144 (U-NII-2C) = 5725MHz - Temp 1
- For CH142 (U-NII-2C) = 5725MHz - Temp 1
- For CH138 (U-NII-2C) = 5725MHz - Temp 1
- For CH144 (U-NII-3) = Temp 2 - 5725MHz
- For CH142 (U-NII-3) = Temp 2 - 5725MHz
- For CH138 (U-NII-3) = Temp 2 - 5725MHz

4.5 Peak Power Spectral Density Measurement

4.5.1 Limits of Peak Power Spectral Density Measurement

Operation Band	EUT Category		Limit
U-NII-1		Outdoor Access Point	17dBm/ MHz
		Fixed point-to-point Access Point	
		Indoor Access Point	
		Client device	11dBm/ MHz
U-NII-2A			11dBm/ MHz
U-NII-2C	√		11dBm/ MHz
U-NII-3	√		30dBm/ 500kHz

4.5.2 Test Setup



4.5.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.5.4 Test Procedure

For U-NII-2C band:

For 802.11a

Using method SA-1

1. Set span to encompass the entire emission bandwidth (EBW) of the signal.
2. Set RBW = 1 MHz, Set VBW ≥ 3 MHz, Detector = RMS
3. Sweep time = auto, trigger set to “free run”.
4. Trace average at least 100 traces in power averaging mode.
5. Record the max value

For other modulation

Using method SA-2

1. Set span to encompass the entire emission bandwidth (EBW) of the signal.
2. Set RBW = 1 MHz, Set VBW ≥ 3 MHz, Detector = RMS
3. Sweep time = auto, trigger set to “free run”.
4. Trace average at least 100 traces in power averaging mode.
5. Record the max value and add 10 log (1/duty cycle)

For U-NII-3 band:

For 802.11a

1. Set span to encompass the entire emission bandwidth (EBW) of the signal.
2. Set RBW = 300 kHz, Set VBW $\geq$ 1 MHz, Detector = RMS
3. Use the peak marker function to determine the maximum power level in any 300 kHz band segment within the fundamental EBW.
4. Scale the observed power level to an equivalent value in 500 kHz by adjusting (increasing) the measured power by a bandwidth correction factor (BWCF) where $BWCF = 10\log(500\text{kHz}/300\text{kHz})$
5. Sweep time = auto, trigger set to "free run".
6. Trace average at least 100 traces in power averaging mode.
7. Record the max value

For other modulation

1. Set span to encompass the entire emission bandwidth (EBW) of the signal.
2. Set RBW = 300 kHz, Set VBW $\geq$ 1 MHz, Detector = RMS
3. Use the peak marker function to determine the maximum power level in any 300 kHz band segment within the fundamental EBW.
4. Scale the observed power level to an equivalent value in 500 kHz by adjusting (increasing) the measured power by a bandwidth correction factor (BWCF) where $BWCF = 10\log(500\text{kHz}/300\text{kHz})$
5. Sweep time = auto, trigger set to "free run".
6. Trace average at least 100 traces in power averaging mode.
7. Record the max value and add $10 \log (1/\text{duty cycle})$

4.5.5 Deviation from Test Standard

No deviation.

4.5.6 EUT Operating Condition

Same as Item 4.3.6.

4.5.7 Test Results

For U-NII-2C band:

802.11a

Chan.	Chan. Freq. (MHz)	PSD (dBm/MHz)		Total PSD (dBm/MHz)	Max. PSD Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1			
144 (U-NII-2C Band)	5720	5.71	6.04	8.89	9.07	Pass

Note: 1. Method a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.

2. The directional gain = $4.92\text{dBi} + 10\log(2) = 7.93\text{dBi} > 6\text{dBi}$, so the power density limit shall be reduced to $11-(7.93-6)=9.07\text{dBm}$.

802.11ax (HE20)

Chan.	Chan. Freq. (MHz)	PSD w/o Duty Factor (dBm/MHz)		Duty Factor (dB)	Total PSD (dBm/MHz)	Max. PSD Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1				
144 (U-NII-2C Band)	5720	6.06	5.30	0.33	9.04	9.07	Pass

Note: 1. Method a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.

2. The directional gain = $4.92\text{dBi} + 10\log(2) = 7.93\text{dBi} > 6\text{dBi}$, so the power density limit shall be reduced to $11-(7.93-6)=9.07\text{dBm}$.

3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ax (HE40)

Chan.	Chan. Freq. (MHz)	PSD w/o Duty Factor (dBm/MHz)		Duty Factor (dB)	Total PSD (dBm/MHz)	Max. PSD Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1				
142 (U-NII-2C Band)	5710	2.79	2.65	0.52	6.25	9.07	Pass

Note: 1. Method a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.

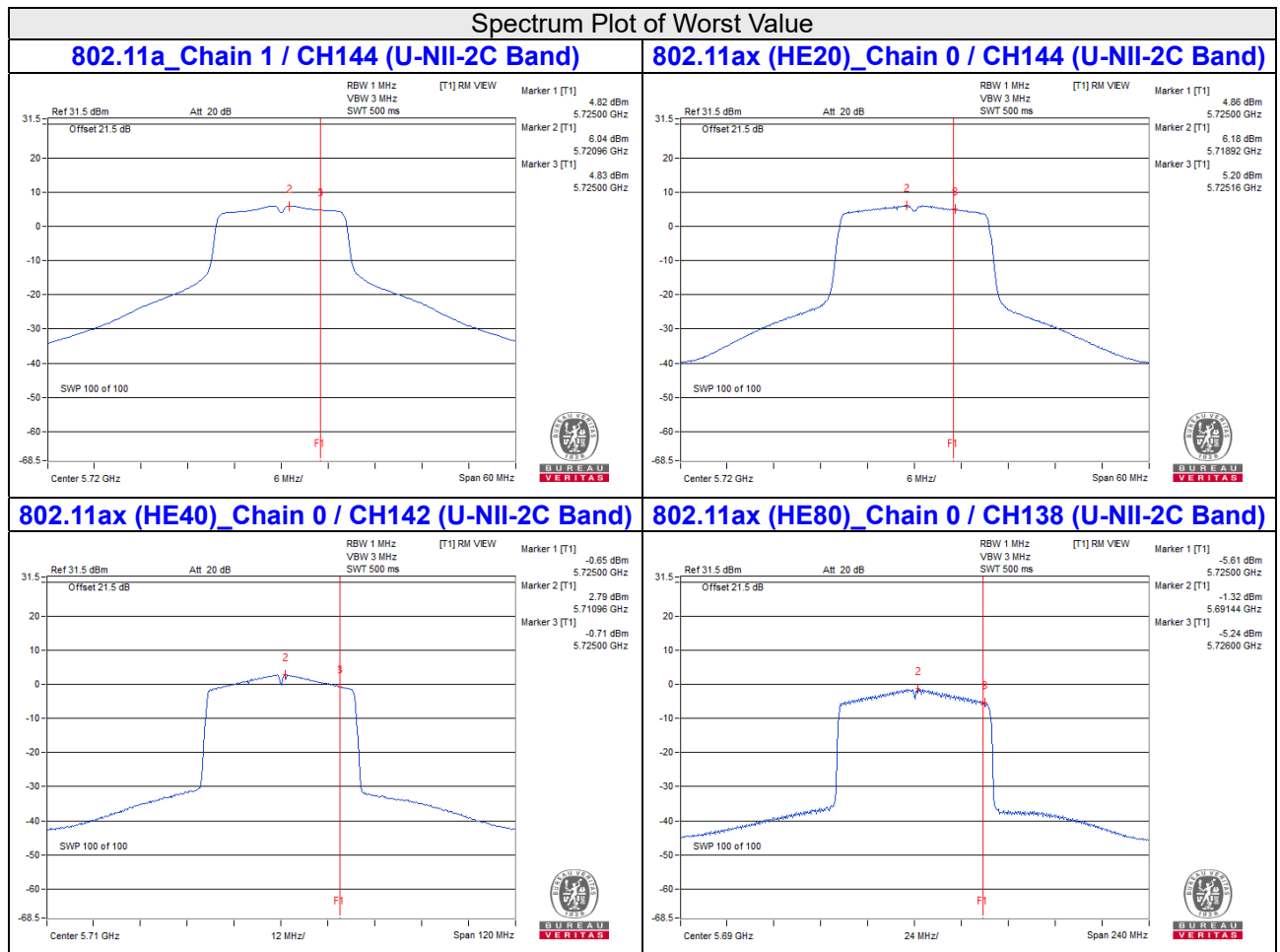
2. The directional gain = $4.92\text{dBi} + 10\log(2) = 7.93\text{dBi} > 6\text{dBi}$, so the power density limit shall be reduced to $11-(7.93-6)=9.07\text{dBm}$.

3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ax (HE80)

Chan.	Chan. Freq. (MHz)	PSD w/o Duty Factor (dBm/MHz)		Duty Factor (dB)	Total PSD (dBm/MHz)	Max. PSD Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1				
138 (U-NII-2C Band)	5690	-1.32	-1.95	1.02	2.40	9.07	Pass

- Note: 1. Method a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. The directional gain = $4.92\text{dBi} + 10\log(2) = 7.93\text{dBi} > 6\text{dBi}$, so the power density limit shall be reduced to $11-(7.93-6)=9.07\text{dBm}$.
3. Refer to section 3.3 for duty cycle spectrum plot.



For U-NII-3 band:

802.11a

Chan.	Chan. Freq. (MHz)	PSD (dBm/300kHz)		Total PSD (dBm/300kHz)	Total PSD (dBm/500kHz)	PSD Limit (dBm/500kHz)	Pass / Fail
		Chain 0	Chain 1				
144 (U-NII-3 Band)	5720	-3.76	-3.23	-0.48	1.74	28.07	Pass

Note: 1. Method b) Measure and sum spectral maxima across the outputs of KDB 662911 is using for calculating total power density.
 2. The directional gain = $4.92\text{dBi} + 10\log(2) = 7.93\text{dBi} > 6\text{dBi}$, so the power density limit shall be reduced to $30-(7.93-6)=28.07\text{dBm}$.

802.11ax (HE20)

Chan.	Chan. Freq. (MHz)	PSD w/o Duty Factor (dBm/300kHz)		Duty Factor (dB)	Total PSD (dBm/300kHz)	Total PSD (dBm/500kHz)	PSD Limit (dBm/500kHz)	Pass / Fail
		Chain 0	Chain 1					
144 (U-NII-3 Band)	5720	-3.71	-4.23	0.33	-0.62	1.60	28.07	Pass

Note: 1. Method b) Measure and sum spectral maxima across the outputs of KDB 662911 is using for calculating total power density.
 2. The directional gain = $4.92\text{dBi} + 10\log(2) = 7.93\text{dBi} > 6\text{dBi}$, so the power density limit shall be reduced to $30-(7.93-6)=28.07\text{dBm}$.
 3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ax (HE40)

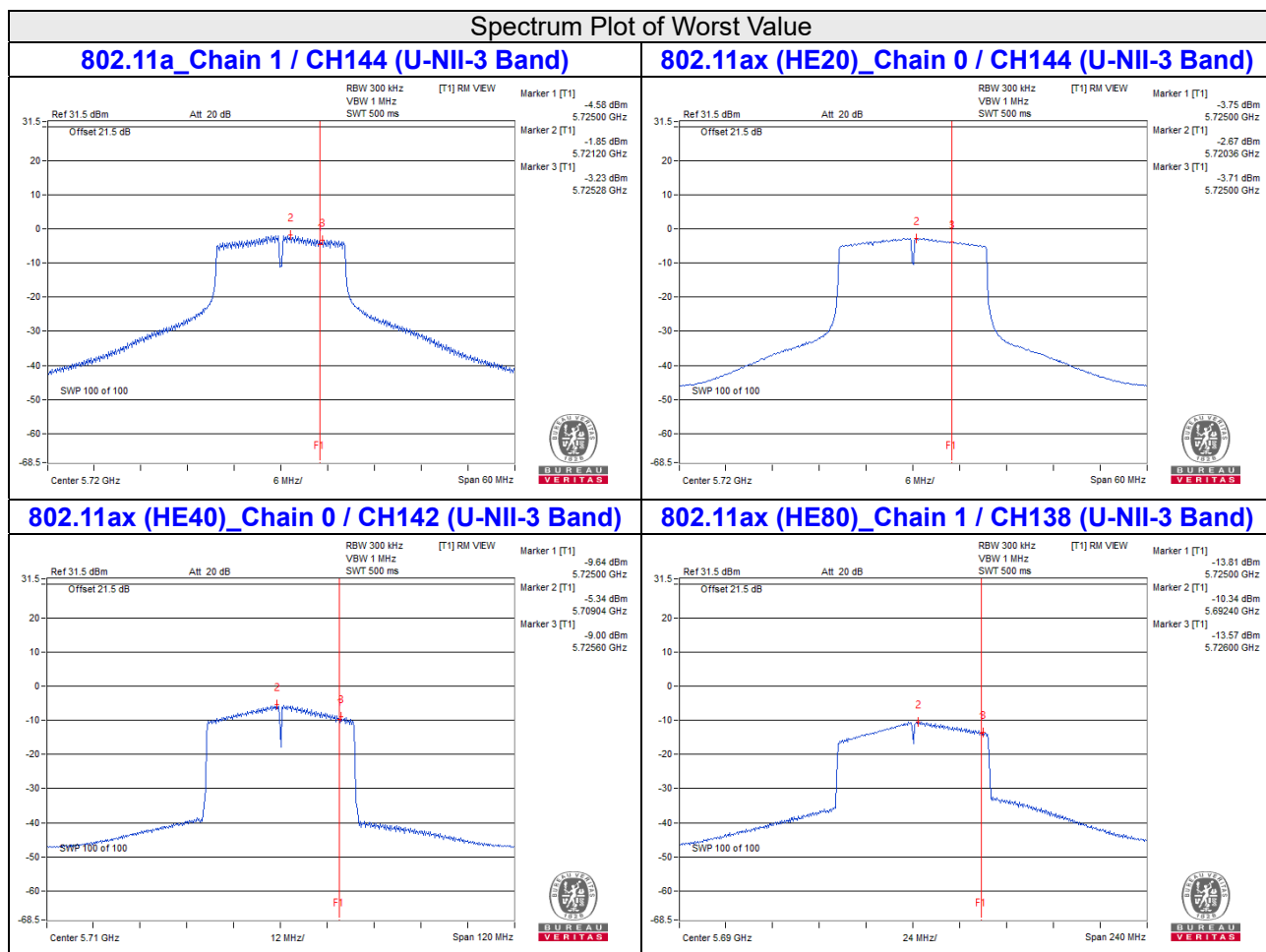
Chan.	Chan. Freq. (MHz)	PSD w/o Duty Factor (dBm/300kHz)		Duty Factor (dB)	Total PSD (dBm/300kHz)	Total PSD (dBm/500kHz)	PSD Limit (dBm/500kHz)	Pass / Fail
		Chain 0	Chain 1					
142 (U-NII-3 Band)	5710	-9.00	-9.03	0.52	-5.48	-3.26	28.07	Pass

Note: 1. Method b) Measure and sum spectral maxima across the outputs of KDB 662911 is using for calculating total power density.
 2. The directional gain = $4.92\text{dBi} + 10\log(2) = 7.93\text{dBi} > 6\text{dBi}$, so the power density limit shall be reduced to $30-(7.93-6)=28.07\text{dBm}$.
 3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ax (HE80)

Chan.	Chan. Freq. (MHz)	PSD w/o Duty Factor (dBm/300kHz)		Duty Factor (dB)	Total PSD (dBm/300kHz)	Total PSD (dBm/500kHz)	PSD Limit (dBm/500kHz)	Pass / Fail
		Chain 0	Chain 1					
138 (U-NII-3 Band)	5690	-14.42	-13.57	1.02	-9.95	-7.73	28.07	Pass

- Note: 1. Method b) Measure and sum spectral maxima across the outputs of KDB 662911 is using for calculating total power density.
2. The directional gain = $4.92\text{dBi} + 10\log(2) = 7.93\text{dBi} > 6\text{dBi}$, so the power density limit shall be reduced to $30 - (7.93 - 6) = 28.07\text{dBm}$.
3. Refer to section 3.3 for duty cycle spectrum plot.

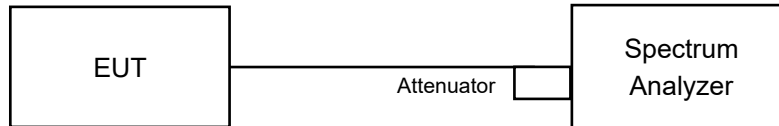


4.6 6dB Bandwidth Measurement

4.6.1 Limits of 6dB Bandwidth Measurement

The minimum of 6dB Bandwidth Measurement is 0.5MHz.

4.6.2 Test Setup



4.6.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.6.4 Test Procedure

MEASUREMENT PROCEDURE REF

- Set resolution bandwidth (RBW) = 100kHz
- Set the video bandwidth (VBW) $\geq 3 \times$ RBW, Detector = Peak.
- Trace mode = max hold.
- Sweep = auto couple.
- 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

4.6.5 Deviation from Test Standard

No deviation.

4.6.6 EUT Operating Condition

Same as Item 4.3.6.

4.6.7 Test Results

802.11a

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
144 (U-NII-3 Band)	5720	3.1	3.12	0.5	Pass

802.11ax (HE20)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
144 (U-NII-3 Band)	5720	4.32	4.36	0.5	Pass

802.11ax (HE40)

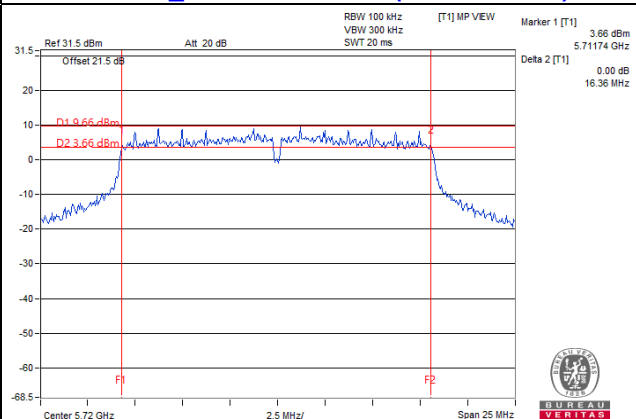
Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
142 (U-NII-3 Band)	5710	2.56	2.53	0.5	Pass

802.11ax (HE80)

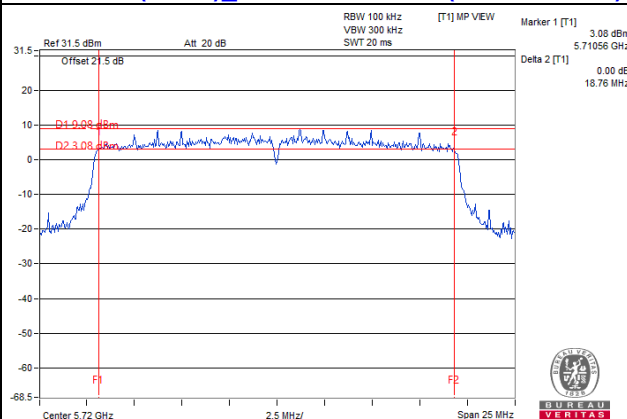
Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
138 (U-NII-3 Band)	5690	1.47	2.73	0.5	Pass

Spectrum Plot of Worst Value

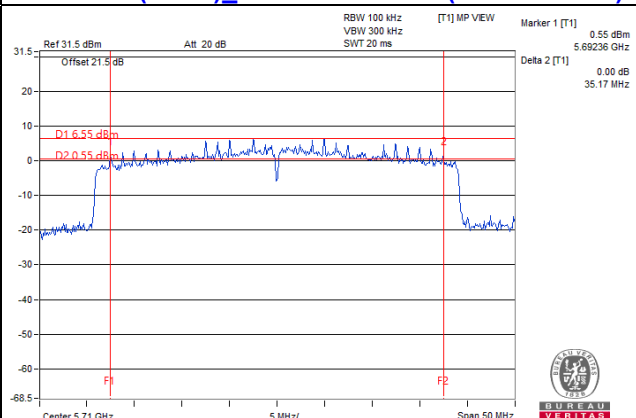
802.11a_Chain 0 / CH144 (U-NII-3 Band)



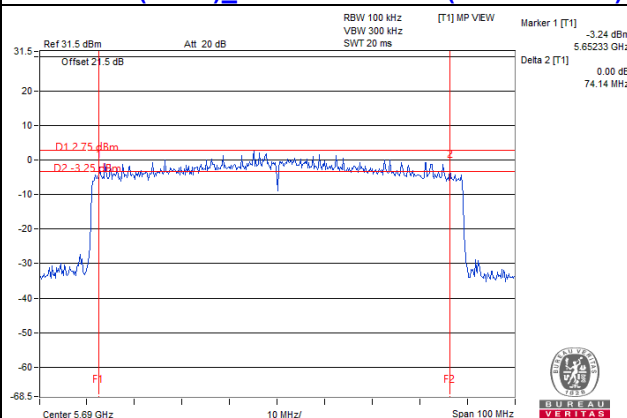
802.11ax (HE20)_Chain 0 / CH144 (U-NII-3 Band)



802.11ax (HE40)_Chain 1 / CH142 (U-NII-3 Band)



802.11ax (HE80)_Chain 0 / CH138 (U-NII-3 Band)



Note: The 6dB bandwidth above 5725MHz = Marker 1 + Delta 2 - 5725MHz

5 Pictures of Test Arrangements

Please refer to the attached file (Test Setup Photo).

Appendix – 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.

If you have any comments, please feel free to contact us at the following:

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

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