FCC Test Report

Report No.:	RFDLK-WTW-P20070355-1
FCC ID:	KA2APX1860A1
Test Model:	DAP-X1860
Received Date:	July 16, 2020
Test Date:	Aug. 04 to Sep. 01, 2020
Issued Date:	Oct. 30, 2020
Applicant:	D-Link Corporation
Address:	No. 289, Sinhu 3rd Rd.,Neihu District, Taipei City, 114, Taiwan
Issued By:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch Hsin Chu Laboratory
Lab Address:	E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300, Taiwa.
Test Location:	E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300, Taiwan.
FCC Registration / Designation Number:	723255 / TW2022

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Release Control Record

Issue No.	Description	Date Issued
RFDLK-WTW-P20070355-1	Original release.	Oct. 30, 2020

1 Certificate of Conformity

Product:	AX1800 Mesh Wi-Fi 6 Range Extender
Brand:	D-Link
Test Model:	DAP-X1860
Sample Status:	ENGINEERING SAMPLE
Applicant:	D-Link Corporation
Test Date:	Aug. 04 to Sep. 01, 2020
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 : Cherry Chuo , **Date:** Oct. 30, 2020

Cherry Chuo / Specialist

Approved by : , **Date:** Oct. 30, 2020

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)(6)	AC Power Conducted Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -11.07dB at 0.49375MHz.
15.407(b) (1/2/3/4(i/ii)/6)	Radiated Emissions & Band Edge Measurement*	Pass	Meet the requirement of limit. Minimum passing margin is -0.4dB at 5150.00MHz.
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	Pass	Meet the requirement of limit.
15.203	Antenna Requirement	Pass	Antenna connector is i-pex(MHF) not a standard connector.

Note:
1. For U-NII-3 band compliance with rule part 15.407(b)(4)(i), the OOBE test plots were recorded in Annex A.
2. For U-NII-1 band compliance with rule 15.407(b) of the band-edge items, the test plots were recorded in Annex B. Test Procedures refer to report 4.1.3.
3. 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	5.5 dB
Radiated Emissions above 1 GHz	1GHz ~ 18GHz	5.1 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	AX1800 Mesh Wi-Fi 6 Range Extender
Brand	D-Link
Test Model	DAP-X1860
Status of EUT	ENGINEERING SAMPLE
Power Supply Rating	100-240 Vac
Modulation Type	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM 256QAM for OFDM in 11ac mode and VHT20/40 in 2.4GHz 1024QAM for OFDMA in 11ax HE mode
Modulation Technology	DSSS, OFDM, OFDMA
Transfer Rate	802.11b: up to 11 Mbps 802.11a/g: up to 54 Mbps 802.11n: up to 300 Mbps 802.11ac: up to 866.7 Mbps 802.11ax: up to 1201 Mbps
Operating Frequency	**2.4GHz:** 2.412 ~ 2.462GHz **5GHz:** 5.18 ~ 5.24GHz, 5.745 ~ 5.825GHz
Number of Channel	**2.4GHz:** 802.11b, 802.11g, 802.11n (HT20), VHT20, 80211ax (HE20): 11 802.11n (HT40), VHT40, 80211ax (HE40): 7 **5GHz:** 802.11a, 802.11n (HT20), 802.11ac (VHT20), 80211ax (HE20): 9 802.11n (HT40), 802.11ac (VHT40), 80211ax (HE40): 4 802.11ac (VHT80), 80211ax (HE80): 2
Output Power	**CDD Mode:** **2.412 ~ 2.462 GHz:** 667.709 mW **5.18 ~ 5.24 GHz:** 277.825 mW **5.745 ~ 5.825 GHz:** 526.791 mW **Beamforming Mode:** **2.412 ~ 2.462 GHz:** 583.148 mW **5.18 ~ 5.24 GHz:** 277.825 mW **5.745 ~ 5.825 GHz:** 526.791 mW
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	NA
Data Cable Supplied	NA

Note:

1. Simultaneously transmission condition.

Condition	Technology	
1	WLAN (2.4GHz)	WLAN (5GHz)
Note: The emission of the simultaneous operation has been evaluated and no non-compliance was found.		

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

Antenna No.	RF Chain No.	Brand	Antenna Net Gain (dBi)	Frequency Range (GHz)	Antenna Type	Connector Type
1	Chain0	Lynwave	3	2.4~2.4835	Dipole	i-pex(MHF)
			4.6	5.15~5.25		
			4.6	5.25~5.35		
			4.9	5.47~5.725		
			4.9	5.725~5.85		
2	Chain1	Lynwave	3.9	2.4~2.4835	Dipole	i-pex(MHF)
			4.9	5.15~5.25		
			4.9	5.25~5.35		
			5	5.47~5.725		
			4.8	5.725~5.85		

3. 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:

1. All of modulation mode support beamforming function except 802.11a/b/g modulation mode.
2. The EUT support Beamforming and CDD mode, therefore both mode were investigated and the worst case scenario was identified. The worst case data were presented in test report.
3. 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)

4. 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.
5. 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

FOR 5180 ~ 5240MHz

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

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

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

Channel	Frequency	Channel	Frequency
38	5190 MHz	46	5230 MHz

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

Channel	Frequency
42	5210 MHz

FOR 5745 ~ 5825MHz:

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

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):

Channel	Frequency	Channel	Frequency
151	5755 MHz	159	5795 MHz

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

Channel	Frequency
155	5775 MHz

3.2.1 Test Mode Applicability and Tested Channel Detail

EUT Configure Mode	Applicable To				Description
	RE≥1G	RE<1G	PLC	APCM	
-	√	√	√	√	-

Where **RE≥1G:** Radiated Emission above 1GHz **RE<1G:** Radiated Emission below 1GHz
PLC: Power Line Conducted Emission **APCM:** Antenna Port Conducted Measurement

NOTE: The EUT had been pre-tested on the positioned of each 3 axis. The worst case was found when positioned of 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.

CDD Mode						
Mode	FREQ. Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate Parameter
802.11a	5180-5240	36 to 48	36, 40, 48	OFDM	BPSK	6Mb/s
802.11a	5745-5825	149 to 165	149, 157, 165	OFDM	BPSK	6Mb/s
802.11ax (HE20)	5180-5240	36 to 48	36, 40, 48	OFDMA	BPSK	MCS0
802.11ax (HE40)		38 to 46	38, 46	OFDMA	BPSK	MCS0
802.11ax (HE80)		42	42	OFDMA	BPSK	MCS0
802.11ax (HE20)	5745-5825	149 to 165	149, 157, 165	OFDMA	BPSK	MCS0
802.11ax (HE40)		151 to 159	151, 159	OFDMA	BPSK	MCS0
802.11ax (HE80)		155	155	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.

CDD Mode						
Mode	FREQ. Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate Parameter
802.11ax (HE20)	5180-5240 5745-5825	36 to 48 149 to 165	157	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.

CDD Mode						
Mode	**FREQ. Band (MHz)**	**Available Channel**	**Tested Channel**	**Modulation Technology**	**Modulation Type**	**Data Rate Parameter**
802.11ax (HE20)	5180-5240 5745-5825	36 to 48 149 to 165	157	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.

CDD Mode						
Mode	**FREQ. Band (MHz)**	**Available Channel**	**Tested Channel**	**Modulation Technology**	**Modulation Type**	**Data Rate Parameter**
802.11a	5180-5240	36 to 48	36, 40, 48	OFDM	BPSK	6Mb/s
802.11ac (VHT20) (output power only)		36 to 48	36, 40, 48	OFDM	BPSK	MCS0
802.11ac (VHT40) (output power only)		38 to 46	38, 46	OFDM	BPSK	MCS0
802.11ac (VHT80) (output power only)		42	42	OFDM	BPSK	MCS0
802.11ax (HE20)		36 to 48	36, 40, 48	OFDMA	BPSK	MCS0
802.11ax (HE40)		38 to 46	38, 46	OFDMA	BPSK	MCS0
802.11ax (HE80)		42	42	OFDMA	BPSK	MCS0
802.11a	5745-5825	149 to 165	149, 157, 165	OFDM	BPSK	6Mb/s
802.11ac (VHT20) (output power only)		149 to 165	149, 157, 165	OFDM	BPSK	MCS0
802.11ac (VHT40) (output power only)		151 to 159	151, 159	OFDM	BPSK	MCS0
802.11ac (VHT80) (output power only)		155	155	OFDM	BPSK	MCS0
802.11ax (HE20)		149 to 165	149, 157, 165	OFDMA	BPSK	MCS0
802.11ax (HE40)		151 to 159	151, 159	OFDMA	BPSK	MCS0
802.11ax (HE80)		155	155	OFDMA	BPSK	MCS0

Beamforming Mode (output power only)						
Mode	**FREQ. Band (MHz)**	**Available Channel**	**Tested Channel**	**Modulation Technology**	**Modulation Type**	**Data Rate Parameter**
802.11ac (VHT20)	5180-5240	36 to 48	36, 40, 48	OFDM	BPSK	MCS0
802.11ac (VHT40)		38 to 46	38, 46	OFDM	BPSK	MCS0
802.11ac (VHT80)		42	42	OFDM	BPSK	MCS0
802.11ax (HE20)		36 to 48	36, 40, 48	OFDMA	BPSK	MCS0
802.11ax (HE40)		38 to 46	38, 46	OFDMA	BPSK	MCS0
802.11ax (HE80)		42	42	OFDMA	BPSK	MCS0
802.11ac (VHT20)	5745-5825	149 to 165	149, 157, 165	OFDM	BPSK	MCS0
802.11ac (VHT40)		151 to 159	151, 159	OFDM	BPSK	MCS0
802.11ac (VHT80)		155	155	OFDM	BPSK	MCS0
802.11ax (HE20)		149 to 165	149, 157, 165	OFDMA	BPSK	MCS0
802.11ax (HE40)		151 to 159	151, 159	OFDMA	BPSK	MCS0
802.11ax (HE80)		155	155	OFDMA	BPSK	MCS0

Test Condition:

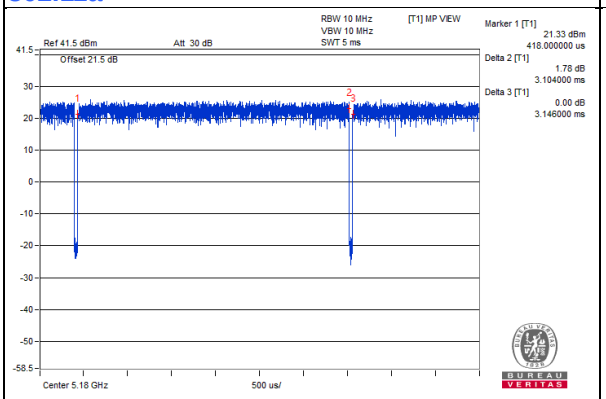
Applicable To	Environmental Conditions	Input Power	Tested By
RE≥1G	25deg. C, 75%RH	120Vac, 60Hz	Ryan Du
RE<1G	25deg. C, 64%RH	120Vac, 60Hz	Kevin Ko
PLC	25deg. C, 75%RH	120Vac, 60Hz	Kevin Ko
APCM	25deg. C, 60%RH	120Vac, 60Hz	Jyunchun Lin

3.3 Duty Cycle of Test Signal

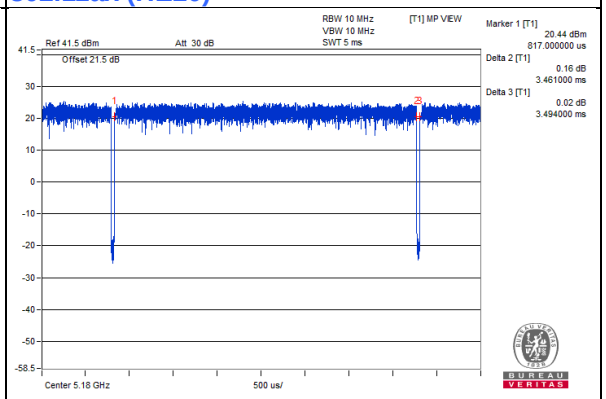
If duty cycle of test signal is ≥ 98 %, duty factor is not required.

802.11a: Duty cycle = 3.104 ms/3.146 ms = 0.987
802.11ax (HE20): Duty cycle = 3.461 ms/3.494 ms = 0.991
802.11ax (HE40): Duty cycle = 3.454 ms/3.485 ms = 0.991
802.11ax (HE80): Duty cycle = 3.455 ms/3.511 ms = 0.984

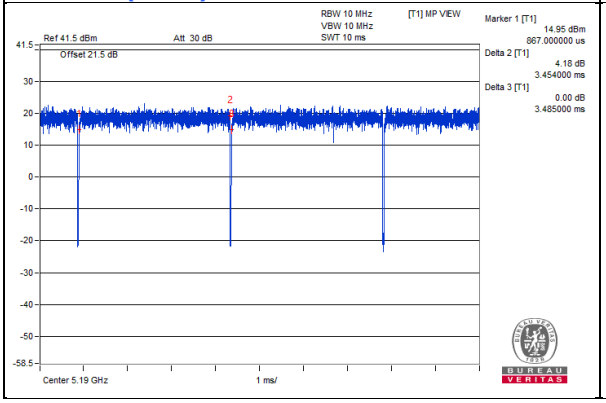
802.11a



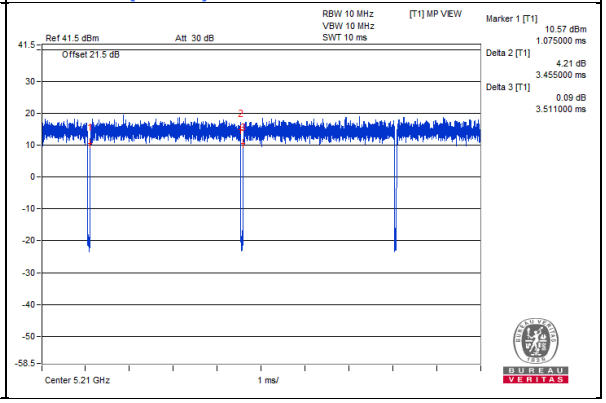
802.11ax (HE20)



802.11ax (HE40)



802.11ax (HE80)



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.

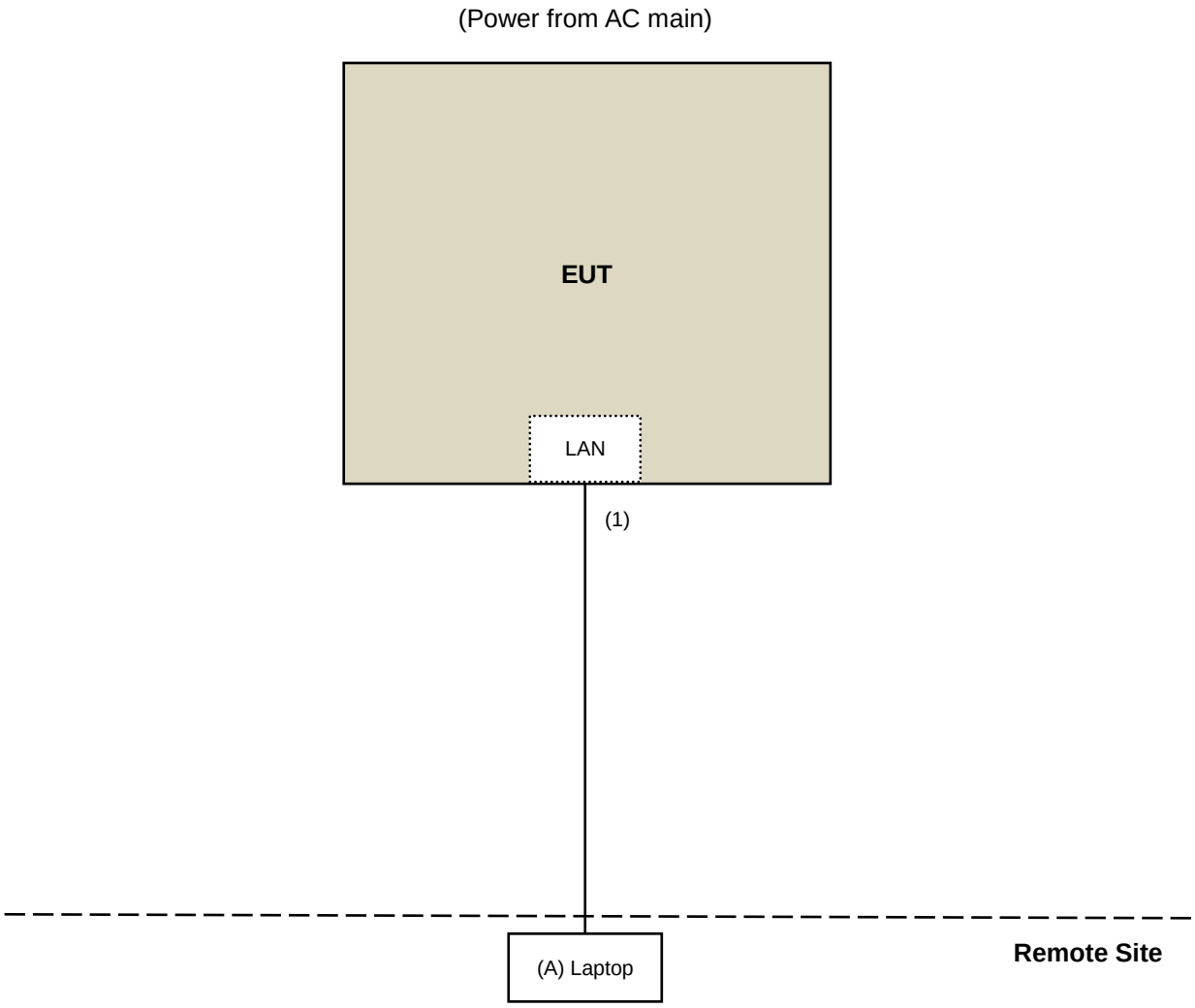
ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Laptop	DELL	E5430	HYV4VY1	FCC DoC	Provided by Lab

Note:

1. All power cords of the above support units are non-shielded (1.8m).

ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	RJ45 Cable	1	10	No	0	Provided by Lab

3.4.1 Configuration of System under Test



3.5 General Description of Applied Standard 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:

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

Limits of unwanted emission out of the restricted bands

Applicable To		Limit	
789033 D02 General UNII Test Procedure New Rules v02r01		Field Strength at 3m	
		PK:74 (dBµV/m)	AV:54 (dBµV/m)
Frequency Band	Applicable To	EIRP Limit	Equivalent Field Strength at 3m
5150~5250 MHz	15.407(b)(1)	PK:-27 (dBm/MHz)	PK:68.2(dBµV/m)
5250~5350 MHz	15.407(b)(2)		
5470~5725 MHz	15.407(b)(3)		
5725~5850 MHz	15.407(b)(4)(i)	PK:-27 (dBm/MHz) *1 PK:10 (dBm/MHz) *2 PK:15.6 (dBm/MHz) *3 PK:27 (dBm/MHz) *4	PK: 68.2(dBµV/m) *1 PK:105.2 (dBµV/m) *2 PK: 110.8(dBµV/m) *3 PK:122.2 (dBµV/m) *4

*1 beyond 75 MHz or more above of the band edge.

*2 below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above.

*3 below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above.

*4 from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

Note:

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

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

4.1.2 Test Instruments

For Radiated Emission & Bandedge 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 25, 2020	May 24, 2021
Loop Antenna Electro-Metrics	EM-6879	264	Feb. 18, 2020	Feb. 17, 2021
RF Cable	NA	LOOPCAB-001	Jan. 08, 2020	Jan. 07, 2021
RF Cable	NA	LOOPCAB-002	Jan. 08, 2020	Jan. 07, 2021
Pre-Amplifier Mini-Circuits	ZFL-1000VH2B	AMP-ZFL-05	Apr. 28, 2020	Apr. 27, 2021
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-361	Nov. 11, 2019	Nov. 10, 2020
RF Cable	8D	966-3-1	Mar. 17, 2020	Mar. 16, 2021
RF Cable	8D	966-3-2	Mar. 17, 2020	Mar. 16, 2021
RF Cable	8D	966-3-3	Mar. 17, 2020	Mar. 16, 2021
Fixed attenuator Mini-Circuits	UNAT-5+	PAD-3m-3-01	Sep. 26, 2019	Sep. 25, 2020
Horn_Antenna SCHWARZBECK	BBHA9120-D	9120D-406	Nov. 24, 2019	Nov. 23, 2020
Pre-Amplifier EMCI	EMC12630SE	980384	Jan. 15, 2020	Jan. 14, 2021
RF Cable	EMC104-SM-SM-1200	160922	Jan. 15, 2020	Jan. 14, 2021
RF Cable	EMC104-SM-SM-2000	180601	June 09, 2020	June 08, 2021
RF Cable	EMC104-SM-SM-6000	180602	June 09, 2020	June 08, 2021
Spectrum Analyzer Keysight	N9030A	MY54490679	July 13, 2020	July 12, 2021
Pre-Amplifier EMCI	EMC184045SE	980387	Jan. 15, 2020	Jan. 14, 2021
Horn_Antenna SCHWARZBECK	BBHA 9170	BBHA9170519	Nov. 24, 2019	Nov. 23, 2020
RF Cable	EMC102-KM-KM-1200	160924	Jan. 15, 2020	Jan. 14, 2021
RF Cable	EMC-KM-KM-4000	200214	Mar. 11, 2020	Mar. 10, 2021
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: Aug. 04 to 28, 2020

For other test:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Spectrum Analyzer R&S	FSV40	100964	May 29, 2020	May 28, 2021
Power meter Anritsu	ML2495A	1529002	July 22, 2020	July 21, 2021
Power sensor Anritsu	MA2411B	1339443	July 22, 2020	July 21, 2021
Fixed Attenuator Mini-Circuits	MDCS18N-10	MDCS18N-10-01	Apr. 14, 2020	Apr. 13, 2021
AC Power Source Extech Electronics	6205	1440452	NA	NA
Temperature & Humidity Chamber Giant Force	GTH-150-40-SP-AR	MAA0812-008	Jan. 16, 2020	Jan. 15, 2021
True RMS Clamp Meter FLUKE	325	31130711WS	June 06, 2020	June 05, 2021
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: Sep. 01, 2020

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:

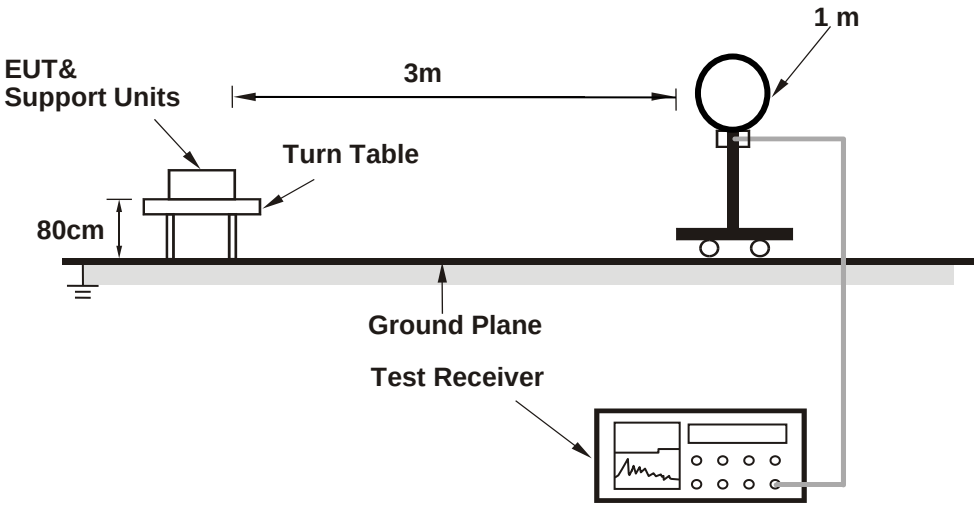
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.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

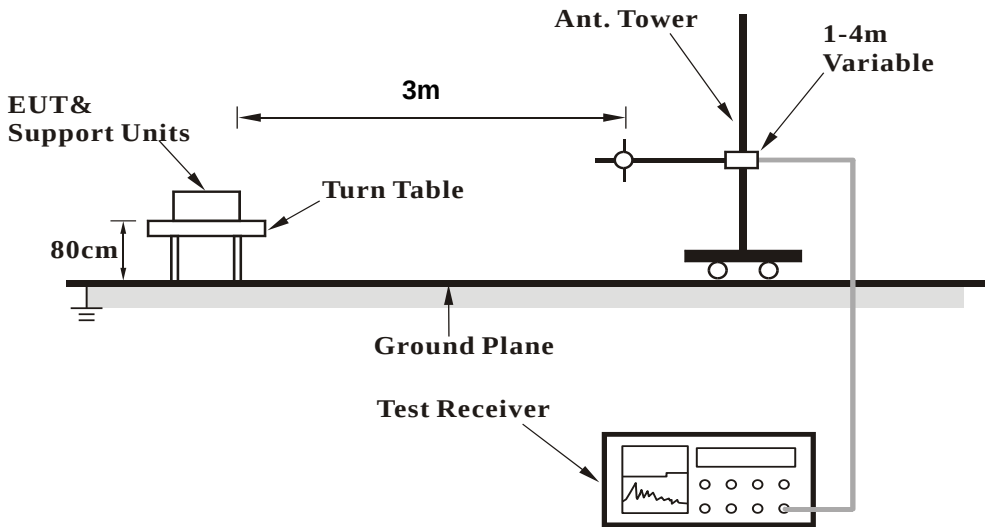
No deviation.

4.1.5 Test Setup

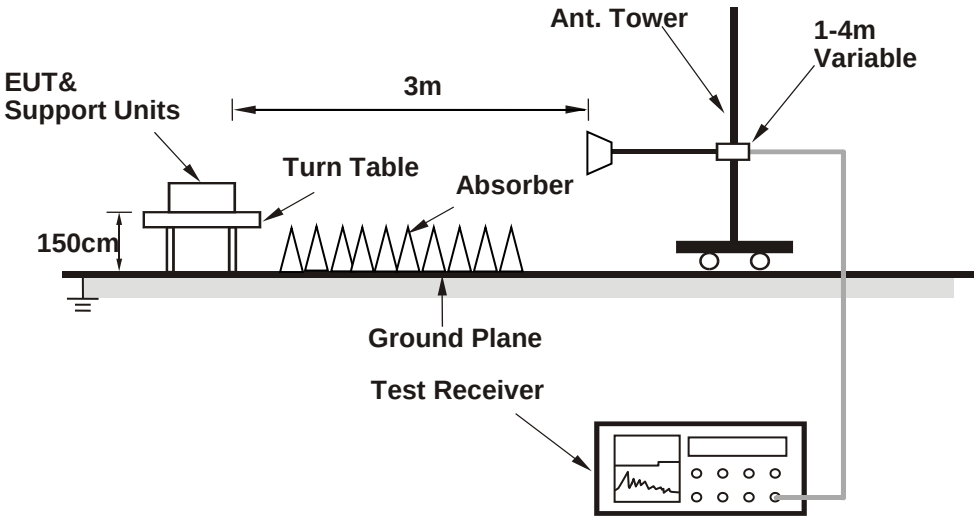
For Radiated emission below 30MHz



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

a. Connected the EUT with the Laptop Computer which is placed on remote site.
b. Controlling software (MT7915 QA 0.0.2.15) has been activated to set the EUT under transmission condition continuously at specific channel frequency.

4.1.7 Test Results

Above 1GHz Data:

802.11a

Channel	TX Channel 36	**Detector Function**	Peak (PK) Average (AV)
Frequency Range	1GHz ~ 40GHz		

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	68.5 PK	74.0	-5.5	1.88 H	280	64.8	3.7
2	5150.00	51.9 AV	54.0	-2.1	1.88 H	280	48.2	3.7
3	*5180.00	113.6 PK			1.88 H	280	110.0	3.6
4	*5180.00	103.7 AV			1.88 H	280	100.1	3.6
5	#10360.00	52.8 PK	68.2	-15.4	2.03 H	24	40.1	12.7
6	15540.00	46.7 PK	74.0	-27.3	1.53 H	360	33.5	13.2
7	15540.00	33.5 AV	54.0	-20.5	1.53 H	360	20.3	13.2
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	68.8 PK	74.0	-5.2	1.54 V	20	65.1	3.7
2	5150.00	52.1 AV	54.0	-1.9	1.54 V	20	48.4	3.7
3	*5180.00	115.4 PK			1.54 V	20	111.8	3.6
4	*5180.00	106.3 AV			1.54 V	20	102.7	3.6
5	#10360.00	59.0 PK	68.2	-9.2	1.03 V	350	46.3	12.7
6	15540.00	46.3 PK	74.0	-27.7	1.13 V	357	33.1	13.2
7	15540.00	34.0 AV	54.0	-20.0	1.13 V	357	20.8	13.2

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.

Channel	TX Channel 40	Detector Function	Peak (PK) Average (AV)
Frequency Range	1GHz ~ 40GHz		

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	68.3 PK	74.0	-5.7	1.74 H	300	64.6	3.7
2	5150.00	51.9 AV	54.0	-2.1	1.74 H	300	48.2	3.7
3	*5200.00	114.3 PK			1.74 H	300	110.8	3.5
4	*5200.00	104.9 AV			1.74 H	300	101.4	3.5
5	#10400.00	65.1 PK	68.2	-3.1	1.47 H	32	52.3	12.8
6	15600.00	50.8 PK	74.0	-23.2	1.81 H	132	37.3	13.5
7	15600.00	39.5 AV	54.0	-14.5	1.81 H	132	26.0	13.5
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	70.5 PK	74.0	-3.5	1.57 V	26	66.8	3.7
2	5150.00	53.0 AV	54.0	-1.0	1.57 V	26	49.3	3.7
3	*5200.00	117.6 PK			1.57 V	26	114.1	3.5
4	*5200.00	108.7 AV			1.57 V	26	105.2	3.5
5	#10400.00	59.2 PK	68.2	-9.0	3.50 V	144	46.4	12.8
6	15600.00	49.7 PK	74.0	-24.3	1.98 V	200	36.2	13.5
7	15600.00	37.3 AV	54.0	-16.7	1.98 V	200	23.8	13.5

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.

Channel	TX Channel 48	Detector Function	Peak (PK) Average (AV)
Frequency Range	1GHz ~ 40GHz		

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	5147.50	55.6 PK	74.0	-18.4	1.12 H	298	51.9	3.7
2	5147.50	42.4 AV	54.0	-11.6	1.12 H	298	38.7	3.7
3	*5240.00	113.4 PK			1.12 H	298	109.9	3.5
4	*5240.00	104.4 AV			1.12 H	298	100.9	3.5
5	#10480.00	58.6 PK	68.2	-9.6	1.08 H	84	45.5	13.1
6	15720.00	46.7 PK	74.0	-27.3	1.64 H	360	32.9	13.8
7	15720.00	33.2 AV	54.0	-20.8	1.64 H	360	19.4	13.8
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	5148.26	55.2 PK	74.0	-18.8	1.65 V	30	51.5	3.7
2	5148.26	42.8 AV	54.0	-11.2	1.65 V	30	39.1	3.7
3	*5240.00	116.6 PK			1.65 V	30	113.1	3.5
4	*5240.00	107.5 AV			1.65 V	30	104.0	3.5
5	#10480.00	60.4 PK	68.2	-7.8	1.06 V	347	47.3	13.1
6	15720.00	46.5 PK	74.0	-27.5	1.34 V	352	32.7	13.8
7	15720.00	34.4 AV	54.0	-19.6	1.34 V	352	20.6	13.8

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.

Channel	TX Channel 149	Detector Function	Peak (PK) Average (AV)
Frequency Range	1GHz ~ 40GHz		

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	#5648.39	60.1 PK	68.2	-8.1	1.71 H	314	55.7	4.4
2	*5745.00	115.5 PK			1.71 H	314	111.5	4.0
3	*5745.00	104.8 AV			1.71 H	314	100.8	4.0
4	#5951.34	52.0 PK	68.2	-16.2	1.71 H	314	47.1	4.9
5	11490.00	51.2 PK	74.0	-22.8	1.64 H	86	37.9	13.3
6	11490.00	37.9 AV	54.0	-16.1	1.64 H	86	24.6	13.3
7	#17235.00	57.1 PK	68.2	-11.1	1.53 H	360	39.5	17.6
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	#5645.80	65.1 PK	68.2	-3.1	1.57 V	39	60.8	4.3
2	*5745.00	119.1 PK			1.57 V	39	115.1	4.0
3	*5745.00	109.0 AV			1.57 V	39	105.0	4.0
4	#6017.68	51.7 PK	68.2	-16.5	1.57 V	39	46.6	5.1
5	11490.00	50.3 PK	74.0	-23.7	1.51 V	360	37.0	13.3
6	11490.00	37.4 AV	54.0	-16.6	1.51 V	360	24.1	13.3
7	#17235.00	56.6 PK	68.2	-11.6	1.50 V	360	39.0	17.6

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.

Channel	TX Channel 157	Detector Function	Peak (PK) Average (AV)
Frequency Range	1GHz ~ 40GHz		

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	#5623.15	52.0 PK	68.2	-16.2	1.62 H	316	47.7	4.3
2	*5785.00	115.8 PK			1.62 H	316	111.7	4.1
3	*5785.00	104.8 AV			1.62 H	316	100.7	4.1
4	#5938.30	53.7 PK	68.2	-14.5	1.62 H	316	48.7	5.0
5	11570.00	54.2 PK	74.0	-19.8	1.49 H	358	41.0	13.2
6	11570.00	42.8 AV	54.0	-11.2	1.49 H	358	29.6	13.2
7	#17355.00	66.6 PK	68.2	-1.6	2.93 H	120	49.0	17.6
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	#5635.92	60.9 PK	68.2	-7.3	1.68 V	40	56.6	4.3
2	*5785.00	119.2 PK			1.68 V	40	115.1	4.1
3	*5785.00	108.8 AV			1.68 V	40	104.7	4.1
4	#5926.86	56.3 PK	68.2	-11.9	1.68 V	40	51.4	4.9
5	11570.00	49.9 PK	74.0	-24.1	1.46 V	170	36.7	13.2
6	11570.00	37.8 AV	54.0	-16.2	1.46 V	170	24.6	13.2
7	#17355.00	58.4 PK	68.2	-9.8	1.69 V	234	40.8	17.6

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.

Channel	TX Channel 165	Detector Function	Peak (PK) Average (AV)
Frequency Range	1GHz ~ 40GHz		

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	#5622.30	50.4 PK	68.2	-17.8	1.49 H	314	46.1	4.3
2	*5825.00	114.9 PK			1.49 H	314	110.6	4.3
3	*5825.00	104.4 AV			1.49 H	314	100.1	4.3
4	#5929.14	51.5 PK	68.2	-16.7	1.49 H	314	46.6	4.9
5	11650.00	55.8 PK	74.0	-18.2	1.66 H	324	42.5	13.3
6	11650.00	42.9 AV	54.0	-11.1	1.66 H	324	29.6	13.3
7	#17475.00	57.0 PK	68.2	-11.2	1.54 H	150	39.1	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	#5630.22	51.2 PK	68.2	-17.0	1.66 V	34	46.9	4.3
2	*5825.00	118.1 PK			1.66 V	34	113.8	4.3
3	*5825.00	108.2 AV			1.66 V	34	103.9	4.3
4	#5925.51	58.8 PK	68.2	-9.4	1.66 V	34	53.9	4.9
5	11650.00	54.3 PK	74.0	-19.7	1.15 V	360	41.0	13.3
6	11650.00	40.4 AV	54.0	-13.6	1.15 V	360	27.1	13.3
7	#17475.00	55.6 PK	68.2	-12.6	1.23 V	360	37.7	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.

802.11ax (HE20)

Channel	TX Channel 36	Detector Function	Peak (PK) Average (AV)
Frequency Range	1GHz ~ 40GHz		

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	71.5 PK	74.0	-2.5	1.69 H	265	67.8	3.7
2	5150.00	51.1 AV	54.0	-2.9	1.69 H	265	47.4	3.7
3	*5180.00	114.4 PK			1.69 H	265	110.8	3.6
4	*5180.00	102.7 AV			1.69 H	265	99.1	3.6
5	#10360.00	55.3 PK	68.2	-12.9	1.51 H	148	42.6	12.7
6	15540.00	48.7 PK	74.0	-25.3	1.48 H	24	35.5	13.2
7	15540.00	33.9 AV	54.0	-20.1	1.48 H	24	20.7	13.2
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	71.6 PK	74.0	-2.4	1.54 V	20	67.9	3.7
2	5150.00	53.3 AV	54.0	-0.7	1.54 V	20	49.6	3.7
3	*5180.00	117.5 PK			1.54 V	20	113.9	3.6
4	*5180.00	107.6 AV			1.54 V	20	104.0	3.6
5	#10360.00	54.0 PK	68.2	-14.2	1.03 V	195	41.3	12.7
6	15540.00	45.7 PK	74.0	-28.3	1.04 V	196	32.5	13.2
7	15540.00	33.4 AV	54.0	-20.6	1.04 V	196	20.2	13.2

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.

Channel	TX Channel 40	Detector Function	Peak (PK) Average (AV)
Frequency Range	1GHz ~ 40GHz		

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	67.4 PK	74.0	-6.6	1.00 H	294	63.7	3.7
2	5150.00	50.4 AV	54.0	-3.6	1.01 H	294	46.7	3.7
3	*5200.00	114.5 PK			1.00 H	294	111.0	3.5
4	*5200.00	104.0 AV			1.00 H	294	100.5	3.5
5	#10400.00	56.9 PK	68.2	-11.3	1.08 H	86	44.1	12.8
6	15600.00	46.4 PK	74.0	-27.6	1.48 H	91	32.9	13.5
7	15600.00	34.0 AV	54.0	-20.0	1.48 H	91	20.5	13.5
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	68.4 PK	74.0	-5.6	1.49 V	28	64.7	3.7
2	5150.00	52.8 AV	54.0	-1.2	1.49 V	28	49.1	3.7
3	*5200.00	118.6 PK			1.49 V	28	115.1	3.5
4	*5200.00	107.5 AV			1.49 V	28	104.0	3.5
5	#10400.00	56.6 PK	68.2	-11.6	1.03 V	193	43.8	12.8
6	15600.00	45.5 PK	74.0	-28.5	1.09 V	200	32.0	13.5
7	15600.00	33.2 AV	54.0	-20.8	1.09 V	200	19.7	13.5

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.

Channel	TX Channel 48	Detector Function	Peak (PK) Average (AV)
Frequency Range	1GHz ~ 40GHz		

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	5146.06	55.6 PK	74.0	-18.4	1.12 H	258	51.9	3.7
2	5146.06	43.1 AV	54.0	-10.9	1.12 H	258	39.4	3.7
3	*5240.00	115.1 PK			1.12 H	258	111.6	3.5
4	*5240.00	104.0 AV			1.12 H	258	100.5	3.5
5	5350.00	53.7 PK	74.0	-20.3	1.12 H	258	50.3	3.4
6	5350.00	41.6 AV	54.0	-12.4	1.12 H	258	38.2	3.4
7	#10480.00	56.9 PK	68.2	-11.3	1.10 H	83	43.8	13.1
8	15720.00	47.1 PK	74.0	-26.9	1.51 H	26	33.3	13.8
9	15720.00	34.5 AV	54.0	-19.5	1.51 H	26	20.7	13.8
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	5148.40	58.5 PK	74.0	-15.5	1.56 V	11	54.8	3.7
2	5148.40	45.6 AV	54.0	-8.4	1.56 V	11	41.9	3.7
3	*5240.00	118.5 PK			1.56 V	11	115.0	3.5
4	*5240.00	108.2 AV			1.56 V	11	104.7	3.5
5	5350.00	55.8 PK	74.0	-18.2	1.56 V	11	52.4	3.4
6	5350.00	43.9 AV	54.0	-10.1	1.56 V	11	40.5	3.4
7	#10480.00	56.5 PK	68.2	-11.7	1.04 V	195	43.4	13.1
8	15720.00	46.0 PK	74.0	-28.0	1.03 V	196	32.2	13.8
9	15720.00	33.4 AV	54.0	-20.6	1.03 V	196	19.6	13.8

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.

Channel	TX Channel 149	Detector Function	Peak (PK) Average (AV)
Frequency Range	1GHz ~ 40GHz		

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	#5644.68	65.9 PK	68.2	-2.3	1.64 H	294	61.6	4.3
2	*5745.00	116.3 PK			1.64 H	294	112.3	4.0
3	*5745.00	105.6 AV			1.64 H	294	101.6	4.0
4	#6001.68	54.3 PK	68.2	-13.9	1.64 H	294	49.2	5.1
5	11490.00	54.2 PK	74.0	-19.8	1.14 H	82	40.9	13.3
6	11490.00	40.0 AV	54.0	-14.0	1.14 H	82	26.7	13.3
7	#17235.00	60.3 PK	68.2	-7.9	1.18 H	71	42.7	17.6
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	#5624.28	66.5 PK	68.2	-1.7	1.51 V	6	62.2	4.3
2	*5745.00	120.3 PK			1.51 V	6	116.3	4.0
3	*5745.00	108.9 AV			1.51 V	6	104.9	4.0
4	#5954.62	54.6 PK	68.2	-13.6	1.51 V	6	49.7	4.9
5	11490.00	53.5 PK	74.0	-20.5	1.01 V	3	40.2	13.3
6	11490.00	39.7 AV	54.0	-14.3	1.01 V	3	26.4	13.3
7	#17235.00	59.5 PK	68.2	-8.7	1.01 V	60	41.9	17.6

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.

Channel	TX Channel 157	Detector Function	Peak (PK) Average (AV)
Frequency Range	1GHz ~ 40GHz		

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	#5649.16	59.5 PK	68.2	-8.7	1.67 H	285	55.1	4.4
2	*5785.00	117.7 PK			1.66 H	284	113.6	4.1
3	*5785.00	106.8 AV			1.66 H	284	102.7	4.1
4	#5932.82	59.7 PK	68.2	-8.5	1.67 H	285	54.8	4.9
5	11570.00	54.0 PK	74.0	-20.0	3.86 H	103	40.8	13.2
6	11570.00	41.7 AV	54.0	-12.3	3.86 H	103	28.5	13.2
7	#17355.00	62.8 PK	68.2	-5.4	3.85 H	86	45.2	17.6
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	#5644.21	61.6 PK	68.2	-6.6	1.50 V	1	57.3	4.3
2	*5785.00	121.2 PK			1.50 V	1	117.1	4.1
3	*5785.00	109.5 AV			1.50 V	1	105.4	4.1
4	#5925.88	56.7 PK	68.2	-11.5	1.50 V	1	51.8	4.9
5	11570.00	52.6 PK	74.0	-21.4	1.17 V	360	39.4	13.2
6	11570.00	40.5 AV	54.0	-13.5	1.17 V	360	27.3	13.2
7	#17355.00	59.0 PK	68.2	-9.2	1.17 V	351	41.4	17.6

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.

Channel	TX Channel 165	Detector Function	Peak (PK) Average (AV)
Frequency Range	1GHz ~ 40GHz		

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	#5643.11	54.4 PK	68.2	-13.8	1.67 H	294	50.1	4.3
2	*5825.00	116.8 PK			1.67 H	294	112.5	4.3
3	*5825.00	105.9 AV			1.67 H	294	101.6	4.3
4	#5935.08	58.6 PK	68.2	-9.6	1.67 H	294	53.7	4.9
5	11650.00	53.8 PK	74.0	-20.2	1.09 H	88	40.5	13.3
6	11650.00	41.5 AV	54.0	-12.5	1.09 H	88	28.2	13.3
7	#17475.00	60.2 PK	68.2	-8.0	1.86 H	194	42.3	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	#5628.70	55.5 PK	68.2	-12.7	1.50 V	3	51.2	4.3
2	*5825.00	120.1 PK			1.50 V	3	115.8	4.3
3	*5825.00	108.5 AV			1.50 V	3	104.2	4.3
4	#5928.53	60.8 PK	68.2	-7.4	1.50 V	3	55.9	4.9
5	11650.00	52.6 PK	74.0	-21.4	1.11 V	360	39.3	13.3
6	11650.00	40.1 AV	54.0	-13.9	1.11 V	360	26.8	13.3
7	#17475.00	56.9 PK	68.2	-11.3	1.11 V	352	39.0	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.

802.11ax (HE40)

Channel	TX Channel 38	Detector Function	Peak (PK) Average (AV)
Frequency Range	1GHz ~ 40GHz		

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	69.8 PK	74.0	-4.2	1.72 H	268	66.1	3.7
2	5150.00	48.8 AV	54.0	-5.2	1.72 H	268	45.1	3.7
3	*5190.00	107.8 PK			1.72 H	268	104.2	3.6
4	*5190.00	97.8 AV			1.72 H	268	94.2	3.6
5	#10380.00	51.2 PK	68.2	-17.0	1.50 H	360	38.5	12.7
6	15570.00	50.9 PK	74.0	-23.1	1.22 H	36	37.5	13.4
7	15570.00	37.8 AV	54.0	-16.2	1.22 H	36	24.4	13.4
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	72.5 PK	74.0	-1.5	1.46 V	28	68.8	3.7
2	5150.00	52.8 AV	54.0	-1.2	1.46 V	28	49.1	3.7
3	*5190.00	112.3 PK			1.46 V	28	108.7	3.6
4	*5190.00	101.6 AV			1.46 V	28	98.0	3.6
5	#10380.00	48.5 PK	68.2	-19.7	1.32 V	289	35.8	12.7
6	15570.00	46.9 PK	74.0	-27.1	1.32 V	250	33.5	13.4
7	15570.00	34.6 AV	54.0	-19.4	1.32 V	250	21.2	13.4

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

Channel	TX Channel 46	Detector Function	Peak (PK) Average (AV)
Frequency Range	1GHz ~ 40GHz		

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	69.5 PK	74.0	-4.5	1.78 H	280	65.8	3.7
2	5150.00	48.9 AV	54.0	-5.1	1.78 H	280	45.2	3.7
3	*5230.00	111.8 PK			1.78 H	280	108.3	3.5
4	*5230.00	101.5 AV			1.78 H	280	98.0	3.5
5	5350.00	57.1 PK	74.0	-16.9	1.78 H	280	53.7	3.4
6	5350.00	42.9 AV	54.0	-11.1	1.78 H	280	39.5	3.4
7	#10460.00	53.2 PK	68.2	-15.0	1.61 H	258	40.2	13.0
8	15690.00	49.6 PK	74.0	-24.4	1.61 H	293	35.7	13.9
9	15690.00	37.9 AV	54.0	-16.1	1.61 H	293	24.0	13.9
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	5150.00	70.5 PK	74.0	-3.5	1.56 V	21	66.8	3.7
2	5150.00	53.3 AV	54.0	-0.7	1.56 V	21	49.6	3.7
3	*5230.00	115.9 PK			1.56 V	21	112.4	3.5
4	*5230.00	105.3 AV			1.56 V	21	101.8	3.5
5	5350.00	61.2 PK	74.0	-12.8	1.56 V	21	57.8	3.4
6	5350.00	46.1 AV	54.0	-7.9	1.56 V	21	42.7	3.4
7	#10460.00	49.7 PK	68.2	-18.5	1.24 V	354	36.7	13.0
8	15690.00	47.1 PK	74.0	-26.9	1.24 V	330	33.2	13.9
9	15690.00	34.8 AV	54.0	-19.2	1.24 V	330	20.9	13.9

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.

Channel	TX Channel 151	Detector Function	Peak (PK) Average (AV)
Frequency Range	1GHz ~ 40GHz		

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	#5651.68	65.3 PK	69.4	-4.1	1.69 H	282	60.9	4.4
2	*5755.00	112.5 PK			1.69 H	282	108.5	4.0
3	*5755.00	102.3 AV			1.69 H	282	98.3	4.0
4	#5938.39	53.5 PK	68.2	-14.7	1.69 H	282	48.5	5.0
5	11510.00	48.8 PK	74.0	-25.2	1.43 H	360	35.5	13.3
6	11510.00	36.4 AV	54.0	-17.6	1.43 H	360	23.1	13.3
7	#17265.00	52.6 PK	68.2	-15.6	1.46 H	20	35.1	17.5
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	#5644.56	67.6 PK	68.2	-0.6	1.48 V	33	63.3	4.3
2	*5755.00	114.7 PK			1.48 V	33	110.7	4.0
3	*5755.00	104.5 AV			1.48 V	33	100.5	4.0
4	#5943.73	55.1 PK	68.2	-13.1	1.48 V	33	50.2	4.9
5	11510.00	49.0 PK	74.0	-25.0	1.43 V	360	35.7	13.3
6	11510.00	36.4 AV	54.0	-17.6	1.43 V	360	23.1	13.3
7	#17265.00	53.1 PK	68.2	-15.1	1.46 V	20	35.6	17.5

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.

Channel	TX Channel 159	Detector Function	Peak (PK) Average (AV)
Frequency Range	1GHz ~ 40GHz		

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	#5652.48	66.1 PK	70.0	-3.9	1.76 H	296	61.7	4.4
2	*5795.00	115.0 PK			1.76 H	296	110.8	4.2
3	*5795.00	104.1 AV			1.76 H	296	99.9	4.2
4	#5929.44	65.5 PK	68.2	-2.7	1.76 H	296	60.6	4.9
5	11590.00	51.3 PK	74.0	-22.7	1.54 H	360	38.0	13.3
6	11590.00	38.1 AV	54.0	-15.9	1.54 H	360	24.8	13.3
7	#17385.00	56.8 PK	68.2	-11.4	1.39 H	354	39.1	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	#5651.85	69.0 PK	69.6	-0.6	1.60 V	32	64.6	4.4
2	*5795.00	116.5 PK			1.60 V	32	112.3	4.2
3	*5795.00	106.2 AV			1.60 V	32	102.0	4.2
4	#5943.63	64.4 PK	68.2	-3.8	1.60 V	32	59.5	4.9
5	11590.00	49.1 PK	74.0	-24.9	1.22 V	360	35.8	13.3
6	11590.00	36.4 AV	54.0	-17.6	1.22 V	360	23.1	13.3
7	#17385.00	54.6 PK	68.2	-13.6	1.22 V	358	36.9	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.

802.11ax (HE80)

Channel	TX Channel 42	Detector Function	Peak (PK) Average (AV)
Frequency Range	1GHz ~ 40GHz		

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	59.3 PK	74.0	-14.7	1.81 H	288	55.6	3.7
2	5150.00	49.3 AV	54.0	-4.7	1.81 H	288	45.6	3.7
3	*5210.00	104.1 PK			1.81 H	288	100.5	3.6
4	*5210.00	93.2 AV			1.81 H	288	89.6	3.6
5	5350.00	52.5 PK	74.0	-21.5	1.81 H	288	49.1	3.4
6	5350.00	40.1 AV	54.0	-13.9	1.81 H	288	36.7	3.4
7	#10420.00	46.7 PK	68.2	-21.5	1.50 H	360	33.9	12.8
8	15630.00	46.4 PK	74.0	-27.6	1.49 H	353	32.7	13.7
9	15630.00	34.7 AV	54.0	-19.3	1.49 H	353	21.0	13.7
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	5150.00	65.3 PK	74.0	-8.7	1.61 V	15	61.6	3.7
2	**5150.00**	**53.6 AV**	**54.0**	**-0.4**	**1.61 V**	**15**	**49.9**	**3.7**
3	*5210.00	107.5 PK			1.61 V	15	103.9	3.6
4	*5210.00	97.6 AV			1.61 V	15	94.0	3.6
5	5350.00	53.5 PK	74.0	-20.5	1.61 V	15	50.1	3.4
6	5350.00	42.2 AV	54.0	-11.8	1.61 V	15	38.8	3.4
7	#10420.00	46.3 PK	68.2	-21.9	1.48 V	360	33.5	12.8
8	15630.00	46.1 PK	74.0	-27.9	1.50 V	255	32.4	13.7
9	15630.00	34.7 AV	54.0	-19.3	1.50 V	255	21.0	13.7

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.

Channel	TX Channel 155	Detector Function	Peak (PK) Average (AV)
Frequency Range	1GHz ~ 40GHz		

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	#5646.28	63.8 PK	68.2	-4.4	1.67 H	306	59.5	4.3
2	*5775.00	108.9 PK			1.67 H	306	104.8	4.1
3	*5775.00	98.1 AV			1.67 H	306	94.0	4.1
4	#5935.90	63.5 PK	68.2	-4.7	1.67 H	306	58.5	5.0
5	11550.00	47.9 PK	74.0	-26.1	1.53 H	360	34.7	13.2
6	11550.00	35.4 AV	54.0	-18.6	1.53 H	360	22.2	13.2
7	#17325.00	50.1 PK	68.2	-18.1	1.52 H	360	32.5	17.6
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	#5643.24	67.4 PK	68.2	-0.8	1.56 V	17	63.1	4.3
2	*5775.00	110.5 PK			1.56 V	17	106.4	4.1
3	*5775.00	100.3 AV			1.56 V	17	96.2	4.1
4	#5927.90	61.5 PK	68.2	-6.7	1.56 V	17	56.6	4.9
5	11550.00	47.6 PK	74.0	-26.4	1.51 V	355	34.4	13.2
6	11550.00	35.2 AV	54.0	-18.8	1.51 V	355	22.0	13.2
7	#17325.00	49.8 PK	68.2	-18.4	1.48 V	360	32.2	17.6

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:

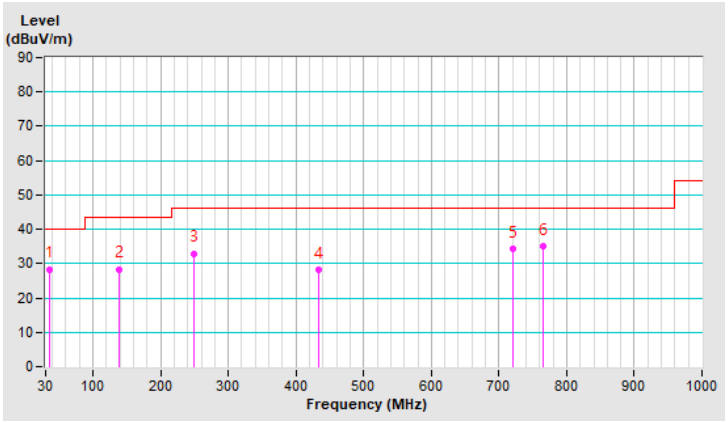
802.11ax (HE20)

CHANNEL	TX Channel 157	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz		

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	34.97	28.4 QP	40.0	-11.6	1.50 H	176	37.0	-8.6
2	137.67	28.4 QP	43.5	-15.1	2.00 H	277	35.9	-7.5
3	250.02	33.0 QP	46.0	-13.0	1.00 H	30	41.0	-8.0
4	433.33	28.2 QP	46.0	-17.8	1.00 H	259	30.0	-1.8
5	720.25	34.3 QP	46.0	-11.7	1.50 H	205	30.1	4.2
6	765.89	34.9 QP	46.0	-11.1	1.00 H	193	29.2	5.7

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.

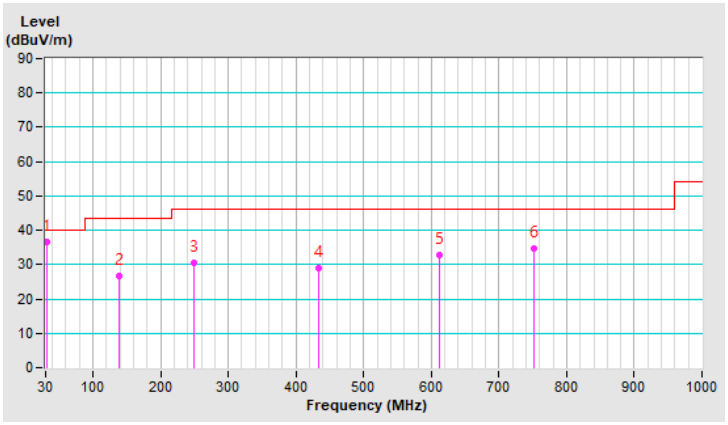


CHANNEL	TX Channel 157	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz		

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	31.45	36.7 QP	40.0	-3.3	1.50 V	360	45.6	-8.9
2	137.72	26.8 QP	43.5	-16.7	1.00 V	360	34.3	-7.5
3	250.00	30.3 QP	46.0	-15.7	2.00 V	325	38.3	-8.0
4	433.40	29.1 QP	46.0	-16.9	1.00 V	278	30.9	-1.8
5	612.92	32.8 QP	46.0	-13.2	1.50 V	317	30.3	2.5
6	752.53	34.8 QP	46.0	-11.2	2.00 V	118	29.3	5.5

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. 23, 2019	Oct. 22, 2020
Line-Impedance Stabilization Network (for EUT) R&S	ESH3-Z5	848773/004	Oct. 23, 2019	Oct. 22, 2020
Line-Impedance Stabilization Network (for Peripheral) R&S	ESH3-Z5	835239/001	Mar. 19, 2020	Mar. 18, 2021
50 ohms Terminator	50	3	Oct. 23, 2019	Oct. 22, 2020
RF Cable	5D-FB	COCCAB-001	Sep. 27, 2019	Sep. 26, 2020
Fixed attenuator EMCI	STI02-2200-10	005	Aug. 30, 2019	Aug. 29, 2020
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: Aug. 11 2020

4.2.3 Test Procedure

a. 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.

b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.

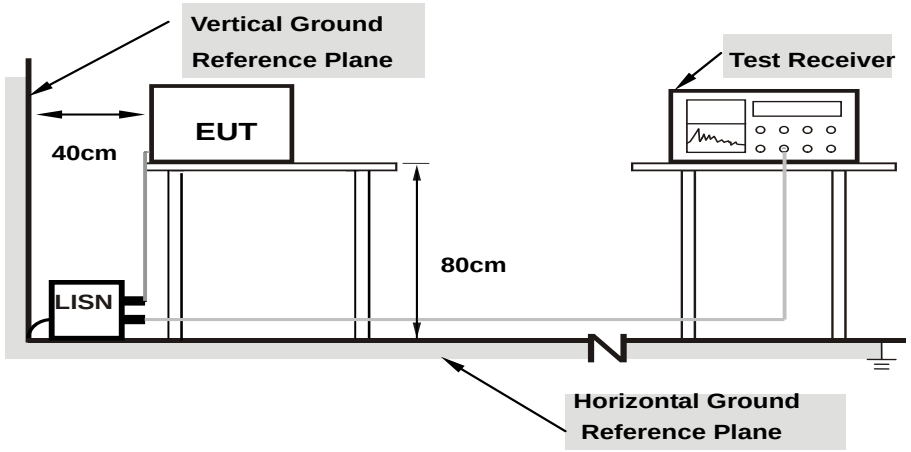
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

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.

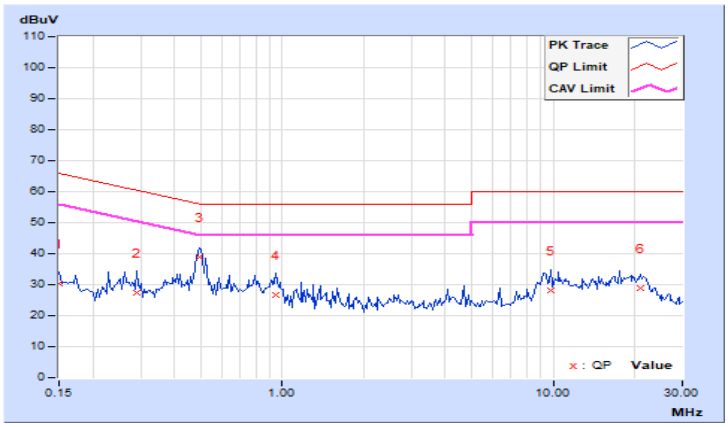
4.2.7 Test Results

Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	9.98	20.42	8.77	30.40	18.75	66.00	56.00	-35.60	-37.25
2	0.29063	10.00	17.49	8.66	27.49	18.66	60.51	50.51	-33.02	-31.85
3	**0.49375**	**10.02**	**29.02**	**25.01**	**39.04**	**35.03**	**56.10**	**46.10**	**-17.06**	**-11.07**
4	0.94688	10.05	16.77	10.34	26.82	20.39	56.00	46.00	-29.18	-25.61
5	9.80859	10.66	17.62	10.57	28.28	21.23	60.00	50.00	-31.72	-28.77
6	21.02734	11.43	17.60	10.51	29.03	21.94	60.00	50.00	-30.97	-28.06

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

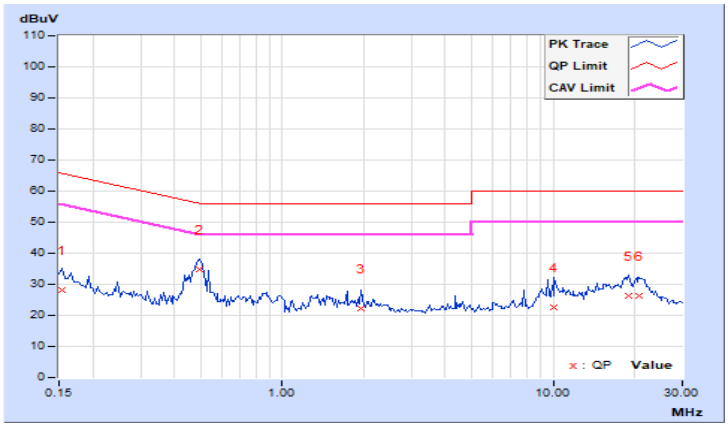


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15391	9.99	18.20	3.65	28.19	13.64	65.79	55.79	-37.60	-42.15
2	0.49375	10.04	24.67	20.26	34.71	30.30	56.10	46.10	-21.39	-15.80
3	1.96484	10.16	12.02	3.02	22.18	13.18	56.00	46.00	-33.82	-32.82
4	10.01953	10.60	12.09	3.99	22.69	14.59	60.00	50.00	-37.31	-35.41
5	18.97656	11.08	15.25	6.01	26.33	17.09	60.00	50.00	-33.67	-32.91
6	20.72266	11.15	15.10	6.30	26.25	17.45	60.00	50.00	-33.75	-32.55

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 ≦ 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

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. Duty factor is not added to measured value.

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 lowest, middle and highest channel frequencies individually.

4.3.7 Test Results

CDD Mode

802.11a

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
36	5180	19.96	19.80	194.582	22.89	30.00	Pass
40	5200	21.00	20.91	249.203	23.97	30.00	Pass
48	5240	21.56	21.16	273.836	24.37	30.00	Pass
149	5745	23.20	23.40	427.706	26.31	30.00	Pass
157	5785	23.40	23.89	463.682	26.66	30.00	Pass
165	5825	22.85	22.83	384.619	25.85	30.00	Pass

802.11ac (VHT20)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
36	5180	19.39	19.20	170.072	22.31	30.00	Pass
40	5200	21.06	20.76	246.768	23.92	30.00	Pass
48	5240	21.29	21.04	261.643	24.18	30.00	Pass
149	5745	22.96	23.21	407.108	26.10	30.00	Pass
157	5785	23.71	24.22	499.204	26.98	30.00	Pass
165	5825	23.17	22.90	402.476	26.05	30.00	Pass

802.11ac (VHT40)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
38	5190	17.13	16.84	99.948	20.00	30.00	Pass
46	5230	21.05	20.78	247.024	23.93	30.00	Pass
151	5755	20.51	21.02	238.934	23.78	30.00	Pass
159	5795	22.46	23.11	380.842	25.81	30.00	Pass

802.11ac (VHT80)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
42	5210	15.82	15.63	74.754	18.74	30.00	Pass
155	5775	19.23	20.09	185.847	22.69	30.00	Pass

802.11ax (HE20)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
36	5180	19.63	19.43	179.533	22.54	30.00	Pass
40	5200	21.34	21.00	262.037	24.18	30.00	Pass
48	5240	21.57	21.28	277.825	24.44	30.00	Pass
149	5745	23.24	23.43	431.155	26.35	30.00	Pass
157	5785	23.97	24.43	526.791	27.22	30.00	Pass
165	5825	23.41	23.12	424.397	26.28	30.00	Pass

802.11ax (HE40)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
38	5190	17.35	17.07	105.258	20.22	30	Pass
46	5230	21.25	20.99	258.955	24.13	30	Pass
151	5755	20.76	21.28	253.401	24.04	30	Pass
159	5795	22.75	23.37	405.635	26.08	30	Pass

802.11ax (HE80)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
42	5210	16.07	15.85	78.917	18.97	30.00	Pass
155	5775	19.51	20.34	197.474	22.96	30.00	Pass

Beamforming Mode

802.11ac (VHT20)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
36	5180	19.39	19.20	170.072	22.31	28.24	Pass
40	5200	21.06	20.76	246.768	23.92	28.24	Pass
48	5240	21.29	21.04	261.643	24.18	28.24	Pass
149	5745	22.96	23.21	407.108	26.10	28.14	Pass
157	5785	23.71	24.22	499.204	26.98	28.14	Pass
165	5825	23.17	22.90	402.476	26.05	28.14	Pass

Note: 1. For U-NII-1: The directional gain = 10 log[($10^{G0/20}$ + $10^{G1/20}$)^2 / 2] = 7.76 dBi > 6 dBi, so the power limit shall be reduced to 30-(7.76-6) = 28.24dBm.
2. For U-NII-3: The directional gain = 10 log[($10^{G0/20}$ + $10^{G1/20}$)^2 / 2] = 7.86 > 6 dBi, so the power limit shall be reduced to 30-(7.86-6) = 28.14dBm.

802.11ac (VHT40)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
38	5190	17.13	16.84	99.948	20.00	28.24	Pass
46	5230	21.05	20.78	247.024	23.93	28.24	Pass
151	5755	20.51	21.02	238.934	23.78	28.14	Pass
159	5795	22.46	23.11	380.842	25.81	28.14	Pass

Note: 1. For U-NII-1: The directional gain = 10 log[($10^{G0/20}$ + $10^{G1/20}$)^2 / 2] = 7.76 dBi > 6 dBi, so the power limit shall be reduced to 30-(7.76-6) = 28.24dBm.
2. For U-NII-3: The directional gain = 10 log[($10^{G0/20}$ + $10^{G1/20}$)^2 / 2] = 7.86 > 6 dBi, so the power limit shall be reduced to 30-(7.86-6) = 28.14dBm.

802.11ac (VHT80)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
42	5210	15.82	15.63	74.754	18.74	28.24	Pass
155	5775	19.23	20.09	185.847	22.69	28.14	Pass

Note: 1. For U-NII-1: The directional gain = 10 log[($10^{G0/20}$ + $10^{G1/20}$)^2 / 2] = 7.76 dBi > 6 dBi, so the power limit shall be reduced to 30-(7.76-6) = 28.24dBm.
2. For U-NII-3: The directional gain = 10 log[($10^{G0/20}$ + $10^{G1/20}$)^2 / 2] = 7.86 > 6 dBi, so the power limit shall be reduced to 30-(7.86-6) = 28.14dBm.

802.11ax (HE20)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
36	5180	19.63	19.43	179.533	22.54	28.24	Pass
40	5200	21.34	21.00	262.037	24.18	28.24	Pass
48	5240	21.57	21.28	277.825	24.44	28.24	Pass
149	5745	23.24	23.43	431.155	26.35	28.14	Pass
157	5785	23.97	24.43	526.791	27.22	28.14	Pass
165	5825	23.41	23.12	424.397	26.28	28.14	Pass

Note: 1. For U-NII-1: The directional gain = 10 log[($10^{G0/20}$ + $10^{G1/20}$)^2 / 2] = 7.76 dBi > 6 dBi, so the power limit shall be reduced to 30-(7.76-6) = 28.24dBm.
2. For U-NII-3: The directional gain = 10 log[($10^{G0/20}$ + $10^{G1/20}$)^2 / 2] = 7.86 > 6 dBi, so the power limit shall be reduced to 30-(7.86-6) = 28.14dBm.

802.11ax (HE40)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
38	5190	17.35	17.07	105.258	20.22	28.24	Pass
46	5230	21.25	20.99	258.955	24.13	28.24	Pass
151	5755	20.76	21.28	253.401	24.04	28.14	Pass
159	5795	22.75	23.37	405.635	26.08	28.14	Pass

Note: 1. For U-NII-1: The directional gain = 10 log[($10^{G0/20}$ + $10^{G1/20}$)^2 / 2] = 7.76 dBi > 6 dBi, so the power limit shall be reduced to 30-(7.76-6) = 28.24dBm.
2. For U-NII-3: The directional gain = 10 log[($10^{G0/20}$ + $10^{G1/20}$)^2 / 2] = 7.86 > 6 dBi, so the power limit shall be reduced to 30-(7.86-6) = 28.14dBm.

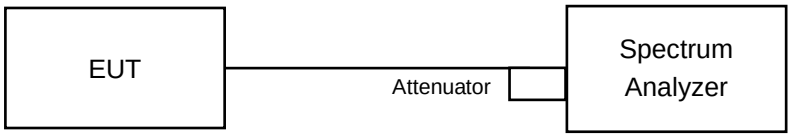
802.11ax (HE80)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
42	5210	16.07	15.85	78.917	18.97	28.24	Pass
155	5775	19.51	20.34	197.474	22.96	28.14	Pass

Note: 1. For U-NII-1: The directional gain = 10 log[($10^{G0/20}$ + $10^{G1/20}$)^2 / 2] = 7.76 dBi > 6 dBi, so the power limit shall be reduced to 30-(7.76-6) = 28.24dBm.
2. For U-NII-3: The directional gain = 10 log[($10^{G0/20}$ + $10^{G1/20}$)^2 / 2] = 7.86 > 6 dBi, so the power limit shall be reduced to 30-(7.86-6) = 28.14dBm.

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

CDD Mode

802.11a

Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
36	5180	17.04	16.92
40	5200	17.82	17.4
48	5240	18.36	17.76
149	5745	27.21	32
157	5785	31.54	35.95
165	5825	27.13	23.74

802.11ax (HE20)

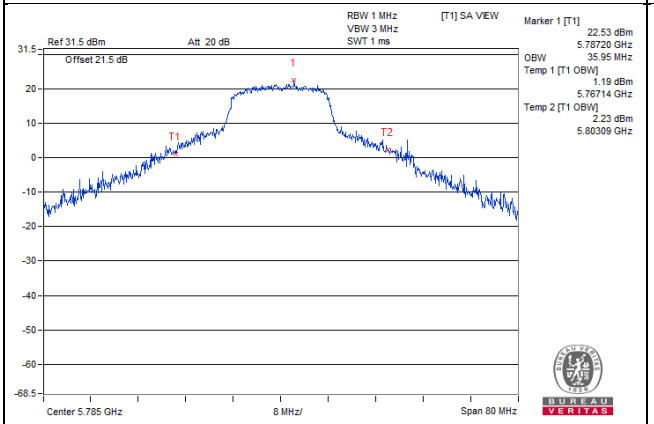
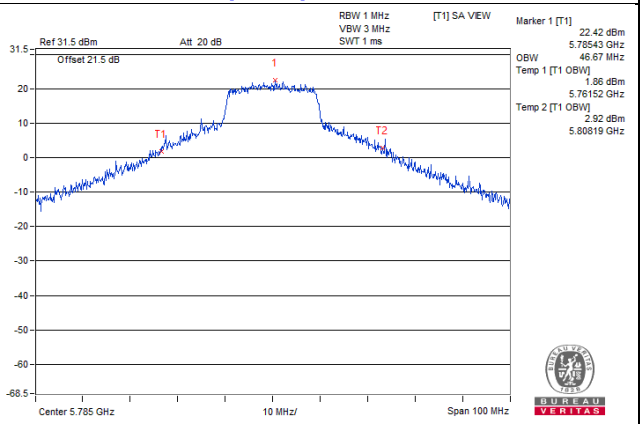
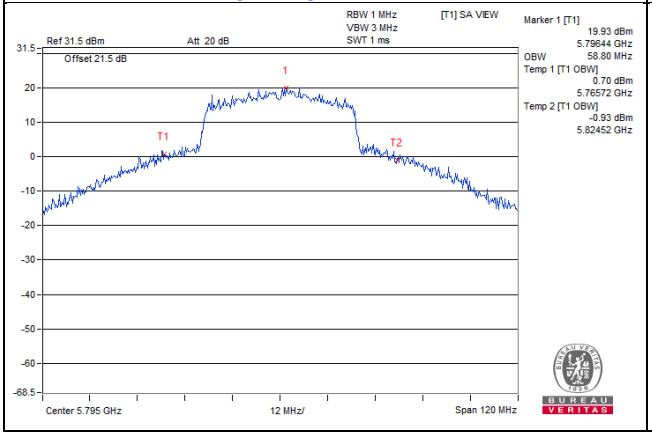
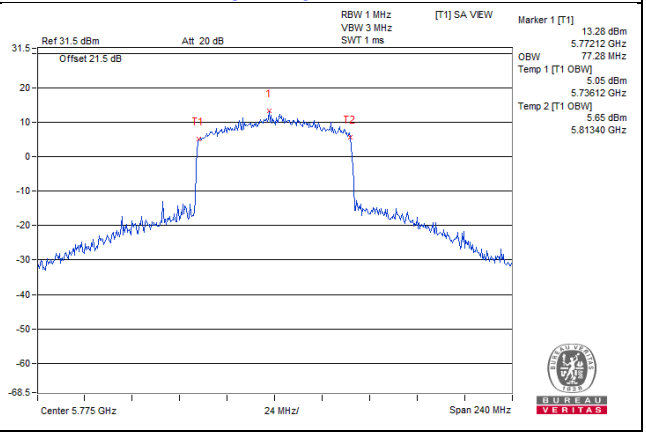
Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
36	5180	19.2	19.08
40	5200	19.2	18.96
48	5240	19.08	19.08
149	5745	34.21	35.52
157	5785	46.66	46.67
165	5825	37.8	32.4

802.11ax (HE40)

Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
38	5190	37.68	37.68
46	5230	38.16	38.16
151	5755	38.64	38.64
159	5795	56.4	58.8

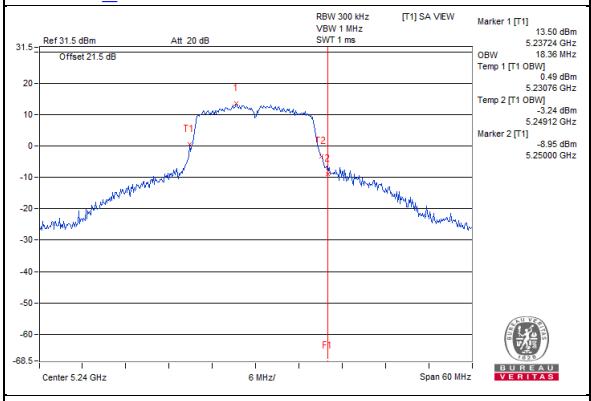
802.11ax (HE80)

Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
42	5210	76.8	76.32
155	5775	77.28	77.28

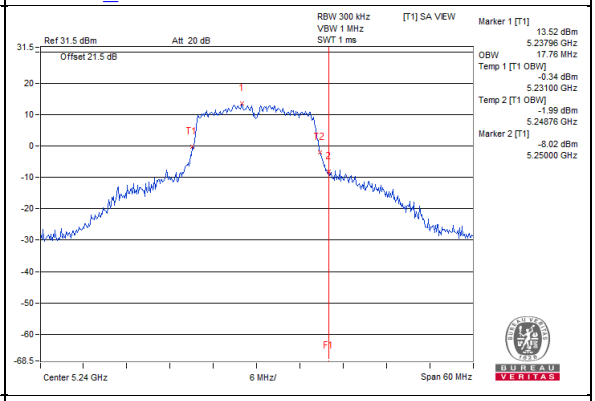
Spectrum Plot of Max. Value	
802.11a_Chain 1 / CH157	**802.11ax (HE20)_Chain 1 / CH157**
	
802.11ax (HE40)_Chain 1 / CH159	**802.11ax (HE80)_Chain 0 / CH155**
	

Spectrum Plot for near by DFS band
(DFS is required, if 99% OCP straddle into U-NII-2A band)

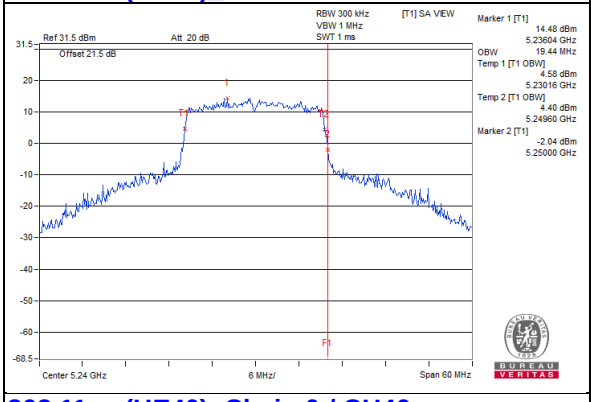
802.11a_Chain 0 / CH48



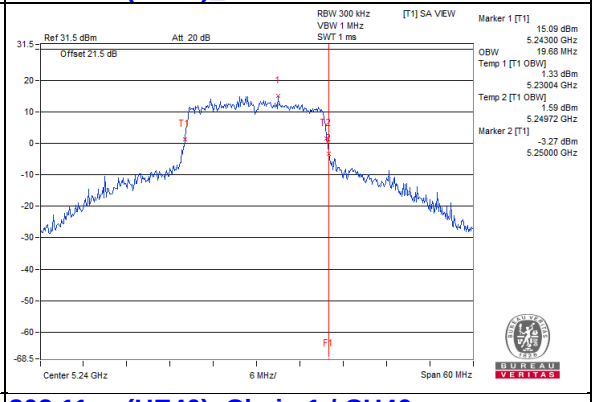
802.11a_Chain 1 / CH48



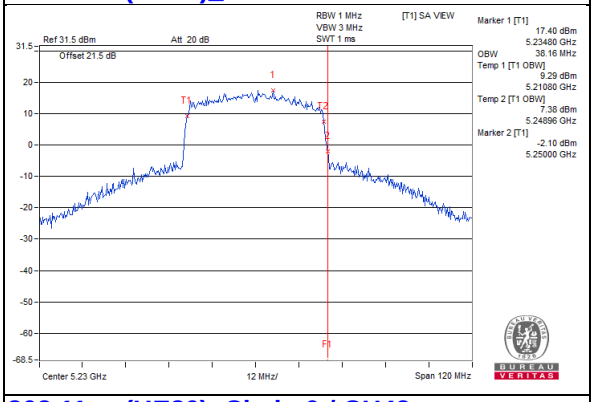
802.11ax (HE20)_Chain 0 / CH48



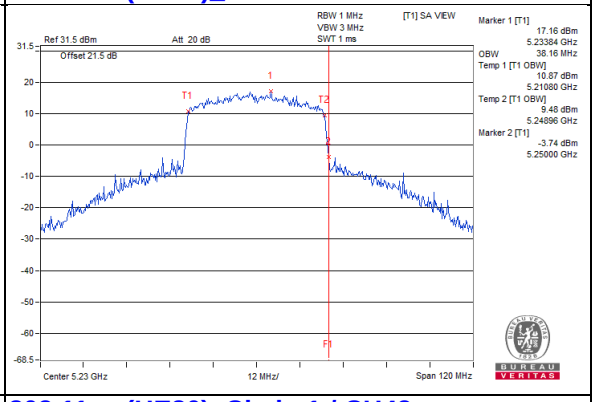
802.11ax (HE20)_Chain 1 / CH48



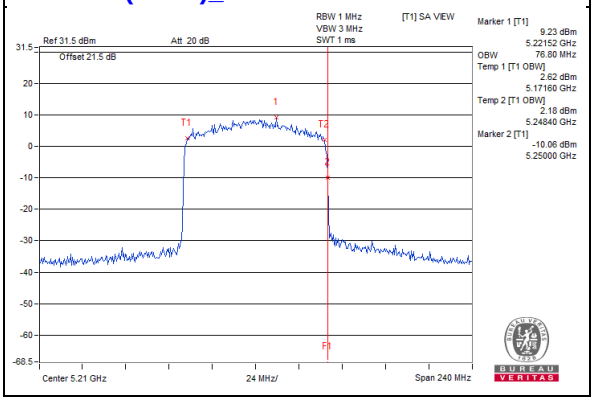
802.11ax (HE40)_Chain 0 / CH46



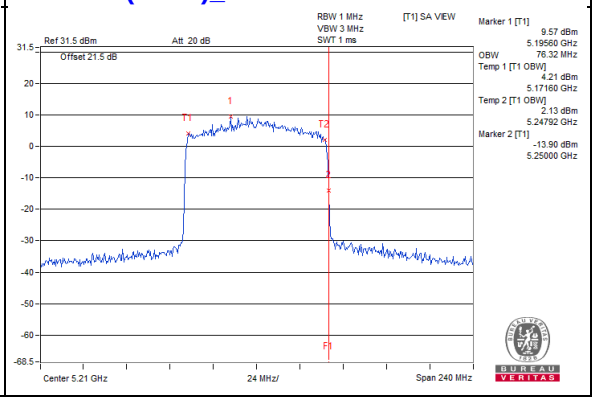
802.11ax (HE40)_Chain 1 / CH46



802.11ax (HE80)_Chain 0 / CH42

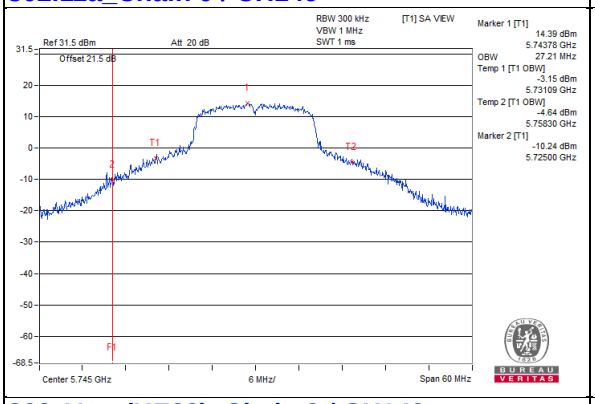


802.11ax (HE80)_Chain 1 / CH42

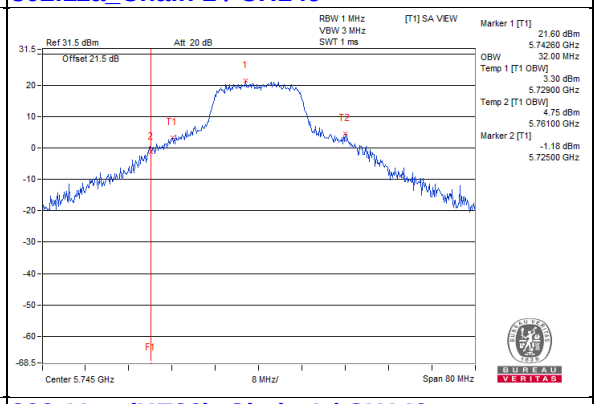


Spectrum Plot for near by DFS band
(DFS is required, if 99% OCP straddle into U-NII-2C band)

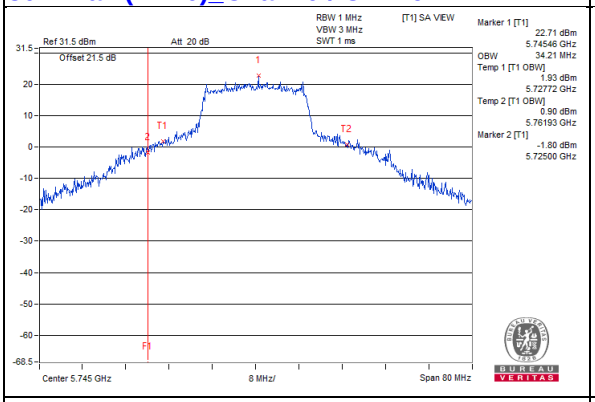
802.11a_Chain 0 / CH149



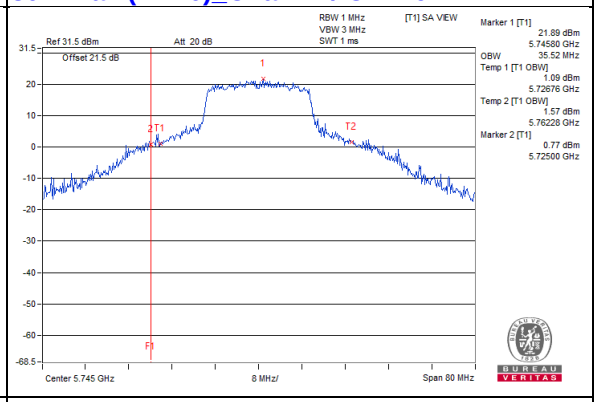
802.11a_Chain 1 / CH149



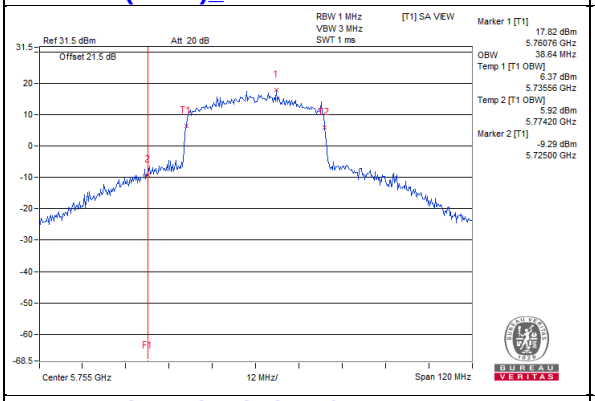
802.11ax (HE20)_Chain 0 / CH149



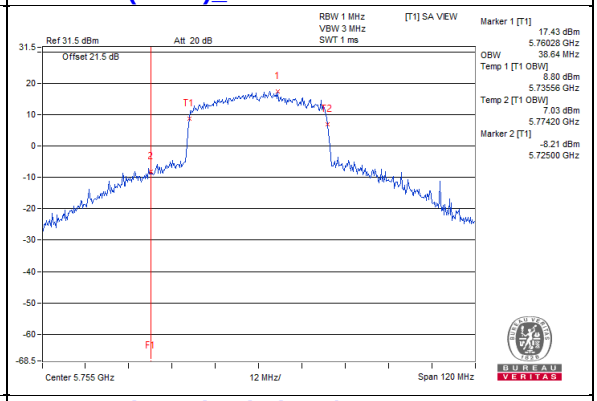
802.11ax (HE20)_Chain 1 / CH149



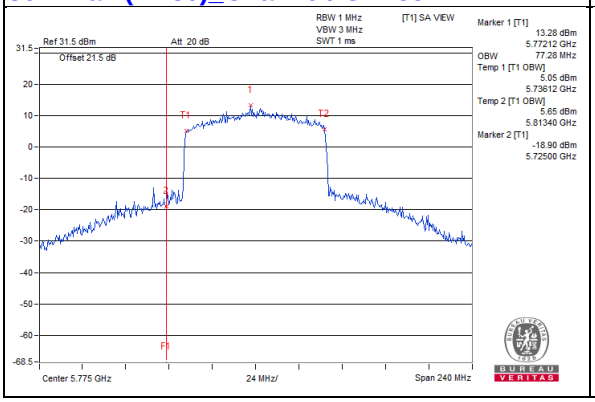
802.11ax (HE40)_Chain 0 / CH151



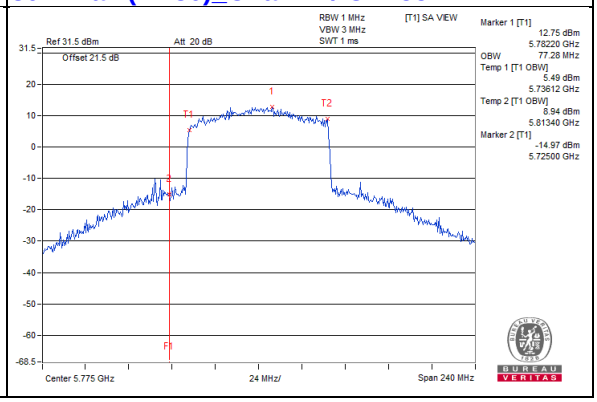
802.11ax (HE40)_Chain 1 / CH151



802.11ax (HE80)_Chain 0 / CH155



802.11ax (HE80)_Chain 1 / CH155

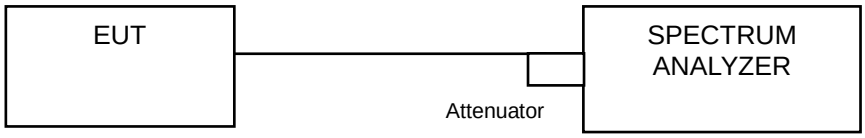


4.5 Peak Power Spectral Density Measurement

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-1 band:

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 U-NII-3:

1. Set span to encompass the entire emission bandwidth (EBW) of the signal.
2. Set RBW = 300 kHz, Set VBW ≥ 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 = 10log(500 kHz/300kHz)
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

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-1:

CDD Mode

802.11a

Chan.	Chan. Freq. (MHz)	PSD w/o Duty Factor (dBm/MHz)		Total PSD (dBm/MHz)	Max. PSD Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1			
36	5180	7.84	7.88	10.87	15.24	PASS
40	5200	8.98	8.55	11.78	15.24	PASS
48	5240	9.41	9.01	12.22	15.24	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 = 10 log[$(10^{G0/20} + 10^{G1/20})^2$ / 2] =7.76 dBi > 6 dBi, so the power density limit shall be reduced to 17-(7.76-6) = 15.24dBm.

802.11ax (HE20)

Chan.	Chan. Freq. (MHz)	PSD w/o Duty Factor (dBm/MHz)		Total PSD (dBm/MHz)	Max. PSD Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1			
36	5180	6.95	6.42	9.70	15.24	PASS
40	5200	7.99	7.81	10.91	15.24	PASS
48	5240	8.46	8.49	11.49	15.24	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 = 10 log[$(10^{G0/20} + 10^{G1/20})^2$ / 2] =7.76 dBi > 6 dBi, so the power density limit shall be reduced to 17-(7.76-6) = 15.24dBm.

802.11ax (HE40)

Chan.	Chan. Freq. (MHz)	PSD w/o Duty Factor (dBm/MHz)		Total PSD (dBm/MHz)	Max. PSD Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1			
38	5190	2.14	2.23	5.20	15.24	PASS
46	5230	6.12	6.20	9.17	15.24	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 = 10 log[$(10^{G0/20} + 10^{G1/20})^2$ / 2] =7.76 dBi > 6 dBi, so the power density limit shall be reduced to 17-(7.76-6) = 15.24dBm.

802.11ax (HE80)

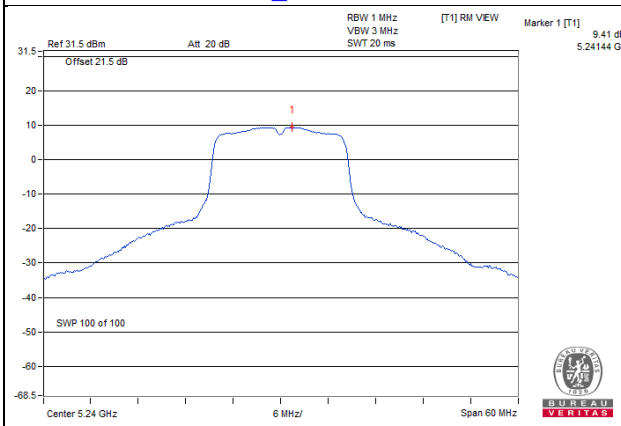
Chan.	Chan. Freq. (MHz)	PSD w/o Duty Factor (dBm/MHz)		Total PSD (dBm/MHz)	Max. PSD Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1			
42	5210	-1.94	-1.98	1.05	15.24	PASS

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.

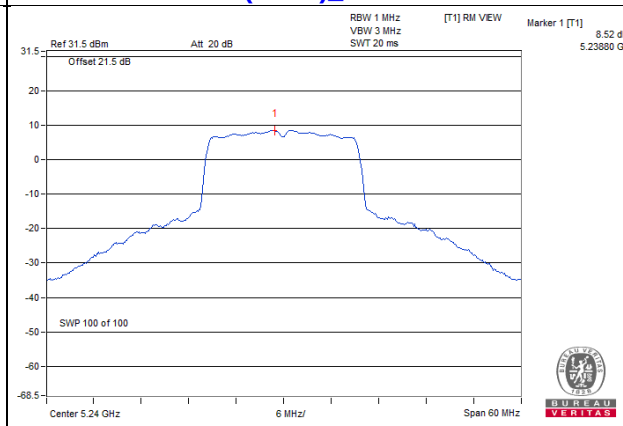
2. The directional gain = 10 log[($10^{G0/20}$ + $10^{G1/20}$)^2 / 2] =7.76 dBi > 6 dBi, so the power density limit shall be reduced to 17-(7.76-6) = 15.24dBm.

Spectrum Plot of Worst Value

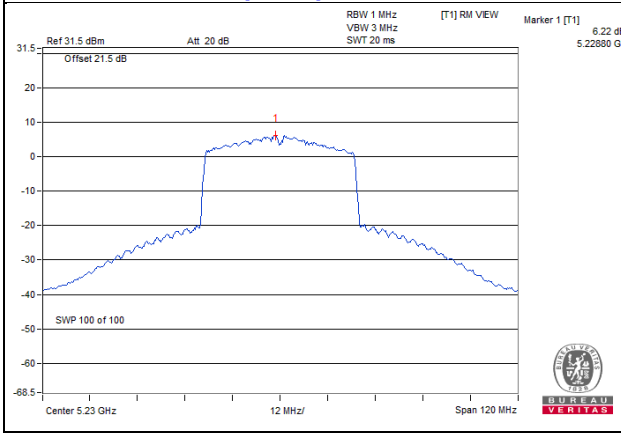
802.11a_Chain 0 / CH48



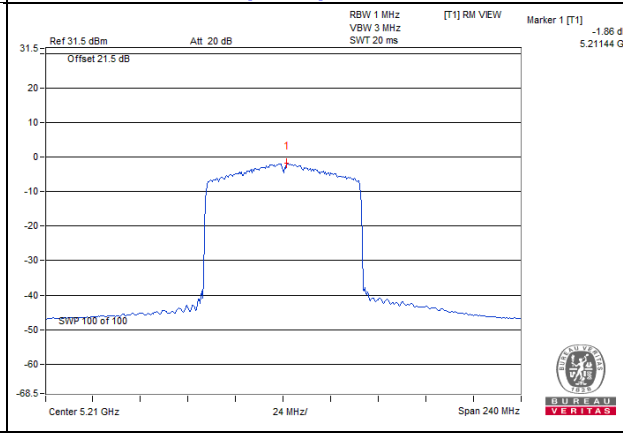
802.11ax (HE20)_Chain 1 / CH48



802.11ax (HE40)_Chain 1 / CH46



802.11ax (HE80)_Chain 0 / CH42



For U-NII-3:

CDD Mode

802.11a

Chan.	Chan. Freq. (MHz)	PSD w/o Duty Factor (dBm/300kHz)		Total PSD (mW/300kHz)	Total PSD (dBm/300kHz)	Total PSD (dBm/500kHz)	PSD Limit (dBm/500kHz)	Pass / Fail
		Chain 0	Chain 1					
149	5745	1.91	2.76	3.443	5.37	7.59	28.14	PASS
157	5785	2.18	2.91	3.606	5.57	7.79	28.14	PASS
165	5825	2.07	1.94	3.177	5.02	7.24	28.14	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 = 10 log[($10^{G0/20}$ + $10^{G1/20}$)^2 / 2] =7.86 dBi > 6 dBi, so the power density limit shall be reduced to 30-(7.86-6) = 28.14dBm.

802.11ax (HE20)

Chan.	Chan. Freq. (MHz)	PSD w/o Duty Factor (dBm/300kHz)		Total PSD (mW/300kHz)	Total PSD (dBm/300kHz)	Total PSD (dBm/500kHz)	PSD Limit (dBm/500kHz)	Pass / Fail
		Chain 0	Chain 1					
149	5745	0.59	1.03	2.415	3.83	6.05	28.14	PASS
157	5785	1.46	1.83	2.924	4.66	6.88	28.14	PASS
165	5825	1.26	0.88	2.559	4.08	6.30	28.14	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 = 10 log[($10^{G0/20}$ + $10^{G1/20}$)^2 / 2] =7.86 dBi > 6 dBi, so the power density limit shall be reduced to 30-(7.86-6) = 28.14dBm.

802.11ax (HE40)

Chan.	Chan. Freq. (MHz)	PSD w/o Duty Factor (dBm/300kHz)		Total PSD (mW/300kHz)	Total PSD (dBm/300kHz)	Total PSD (dBm/500kHz)	PSD Limit (dBm/500kHz)	Pass / Fail
		Chain 0	Chain 1					
151	5755	-3.21	-2.82	1	0.00	2.22	28.14	PASS
159	5795	-1.26	-0.83	1.574	1.97	4.19	28.14	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 = 10 log[($10^{G0/20}$ + $10^{G1/20}$)^2 / 2] =7.86 dBi > 6 dBi, so the power density limit shall be reduced to 30-(7.86-6) = 28.14dBm.

802.11ax (HE80)

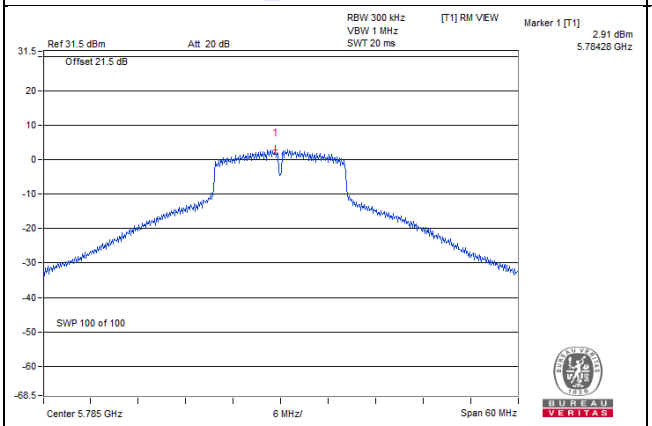
Chan.	Chan. Freq. (MHz)	PSD w/o Duty Factor (dBm/300kHz)		Total PSD (mW/300kHz)	Total PSD (dBm/300kHz)	Total PSD (dBm/500kHz)	PSD Limit (dBm/500kHz)	Pass / Fail
		Chain 0	Chain 1					
155	5775	-7.50	-6.80	0.3864	-4.13	-1.91	28.14	PASS

Note: 1. Method b) Measure and sum spectral maxima across the outputs of KDB 662911 is using for calculating total power density.

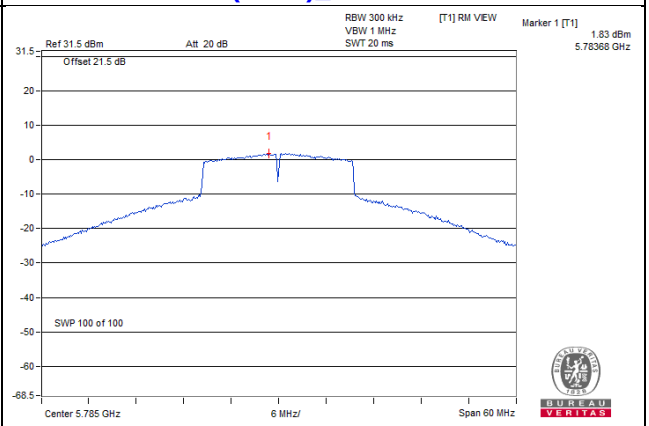
2. The directional gain = 10 log[($10^{G0/20}$ + $10^{G1/20}$)^2 / 2] =7.86 dBi > 6 dBi, so the power density limit shall be reduced to 30-(7.86-6) = 28.14dBm.

Spectrum Plot of Worst Value

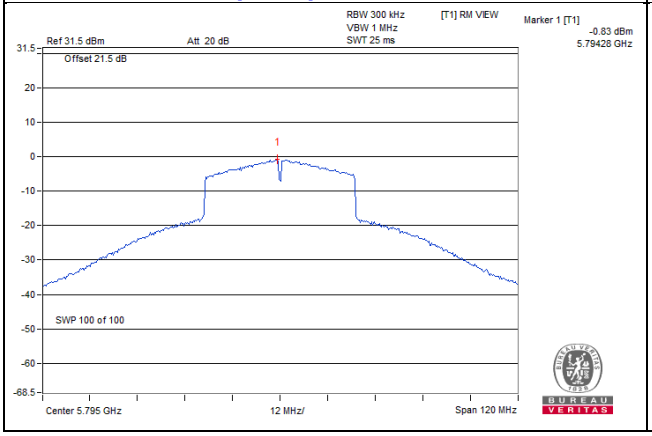
802.11a_Chain 1 / CH157



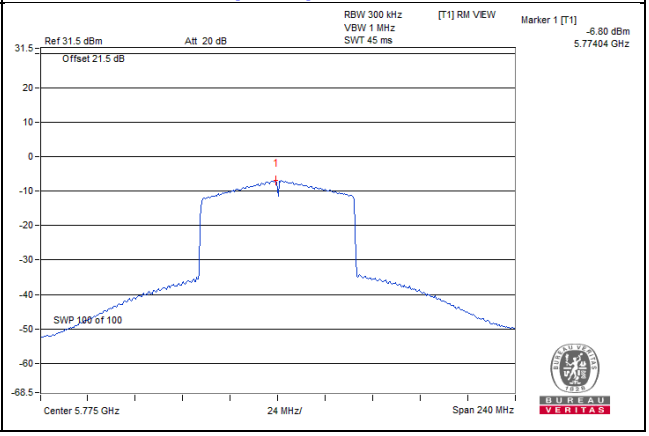
802.11ax (HE20)_Chain 1 / CH157



802.11ax (HE40)_Chain 1 / CH159



802.11ax (HE80)_Chain 1 / CH155

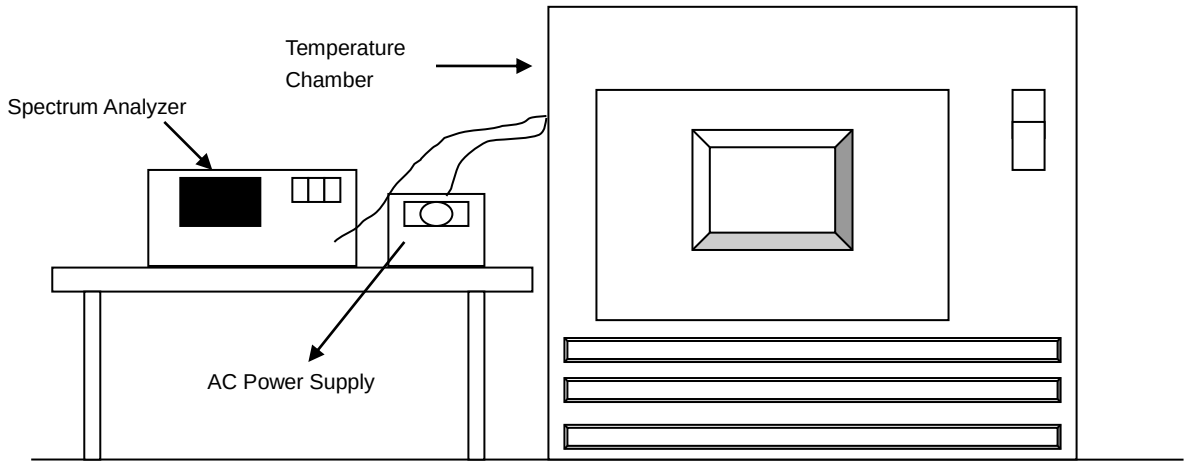


4.6 Frequency Stability Measurement

4.6.1 Limits of Frequency Stability Measurement

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

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

a. The EUT was placed inside the environmental test chamber and powered by nominal AC voltage.

b. Turn the EUT on and couple its output to a spectrum analyzer.

c. Turn the EUT off and set the chamber to the highest temperature specified.

d. Allow sufficient time (approximately 30 min) for the temperature of the chamber to stabilize, turn the EUT on and measure the operating frequency after 2, 5, and 10 Minutes.

e. Repeat step (d) with the temperature chamber set to the next desired temperature until measurements down to the lowest specified temperature have been completed.

f. The test chamber was allowed to stabilize at +20 degree C for a minimum of 30 Minutes. The supply voltage was then adjusted on the EUT from 85% to 115% and the frequency record.

4.6.5 Deviation from Test Standard

No deviation.

4.6.6 EUT Operating Condition

Set the EUT transmit at un-modulation mode to test frequency stability.

4.6.7 Test Results

Frequency Stability Versus Temp.									
Operating Frequency: 5180 MHz									
TEMP. (℃)	Power Supply (Vac)	0 Minute		2 Minutes		5 Minutes		10 Minutes	
		Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail
40	120	5180.0182	PASS	5180.0164	PASS	5180.0207	PASS	5180.0198	PASS
30	120	5179.9872	PASS	5179.9821	PASS	5179.9841	PASS	5179.9859	PASS
20	120	5179.9979	PASS	5179.9982	PASS	5179.9959	PASS	5179.9978	PASS
10	120	5180.0159	PASS	5180.0188	PASS	5180.0159	PASS	5180.0195	PASS
0	120	5179.9929	PASS	5179.9914	PASS	5179.9923	PASS	5179.9881	PASS

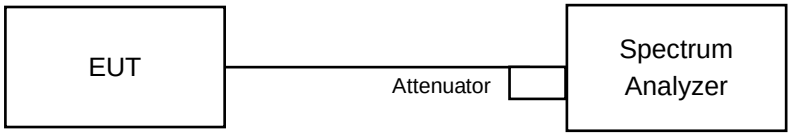
Frequency Stability Versus Voltage									
Operating Frequency: 5180 MHz									
TEMP. (℃)	Power Supply (Vac)	0 Minute		2 Minutes		5 Minutes		10 Minutes	
		Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail
20	138	5180.0154	PASS	5180.0195	PASS	5180.0167	PASS	5180.02	PASS
	120	5180.0159	PASS	5180.0188	PASS	5180.0159	PASS	5180.0195	PASS
	102	5180.0155	PASS	5180.018	PASS	5180.0166	PASS	5180.0192	PASS

4.7 6dB Bandwidth Measurement

4.7.1 Limits of 6dB Bandwidth Measurement

The minimum of 6dB Bandwidth Measurement is 0.5MHz.

4.7.2 Test Setup



4.7.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.7.4 Test Procedure

MEASUREMENT PROCEDURE REF

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

4.7.5 Deviation from Test Standard

No deviation.

4.7.6 EUT Operating Condition

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

4.7.7 Test Results

CDD Mode

802.11a

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
149	5745	15.72	16.36	0.5	Pass
157	5785	16.34	16.35	0.5	Pass
165	5825	15.74	15.94	0.5	Pass

802.11ax (HE20)

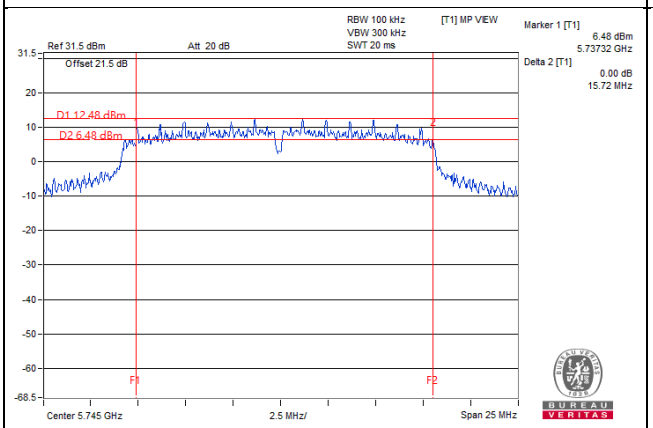
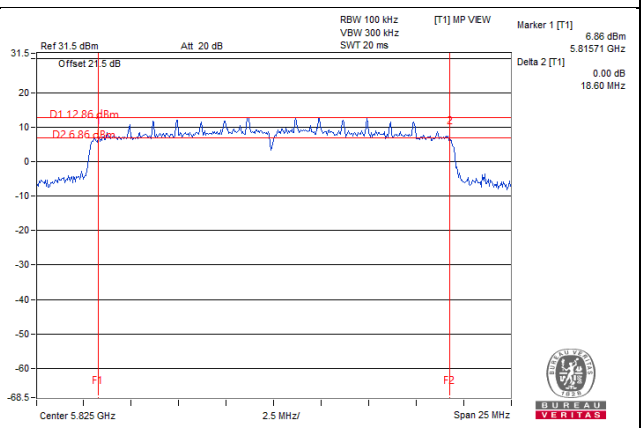
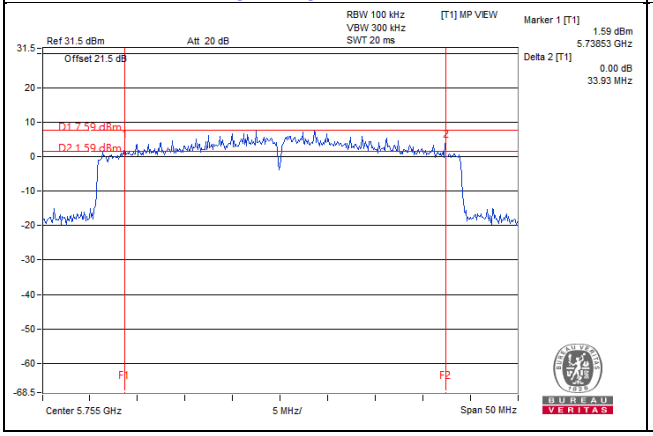
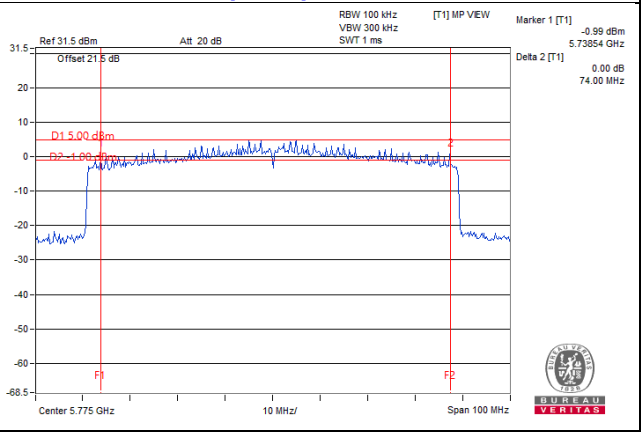
Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
149	5745	18.67	18.81	0.5	Pass
157	5785	18.72	18.84	0.5	Pass
165	5825	18.71	18.6	0.5	Pass

802.11ax (HE40)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
151	5755	33.93	35.11	0.5	Pass
159	5795	34.29	34.34	0.5	Pass

802.11ax (HE80)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
155	5775	74.05	74	0.5	Pass

Spectrum Plot of Worst Value	
802.11a_Chain 0 / CH149	**802.11ax (HE20)_Chain 1 / CH165**
	
802.11ax (HE40)_Chain 0 / CH151	**802.11ax (HE80)_Chain 1 / CH155**
	

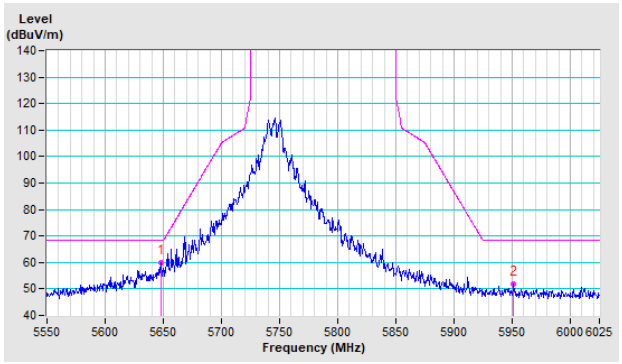
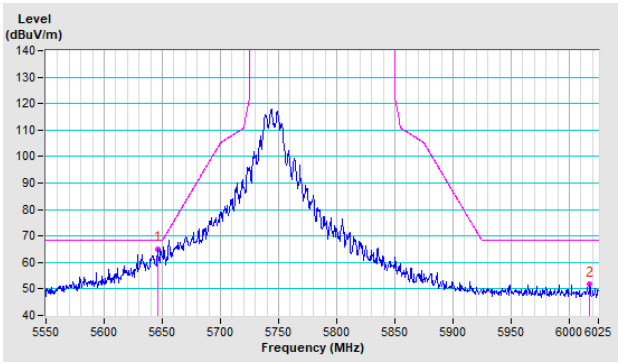
5 Pictures of Test Arrangements

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

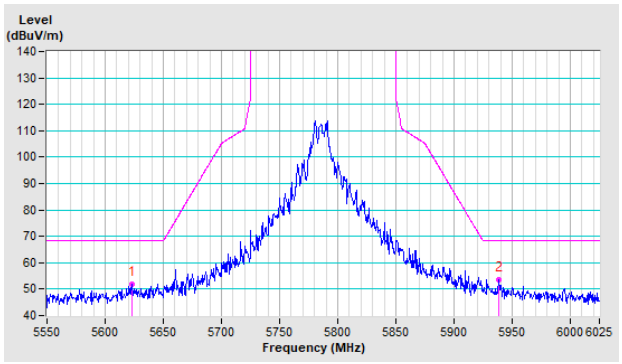
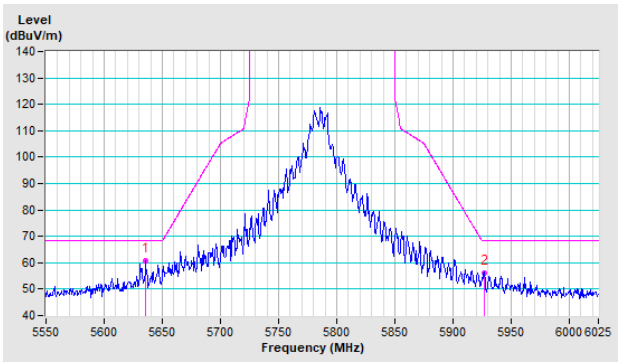
Annex A- Radiated Out of Band Emission (OOBE) Measurement (For U-NII-3 band)

802.11a

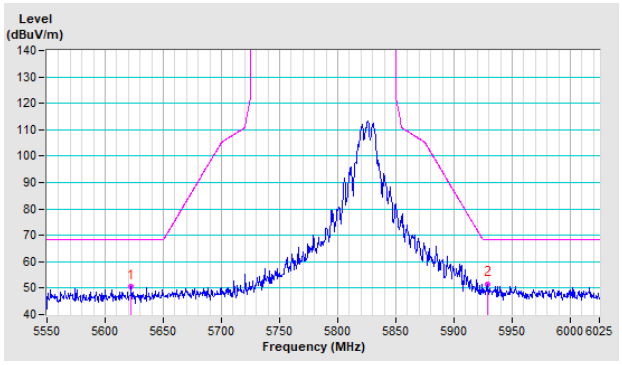
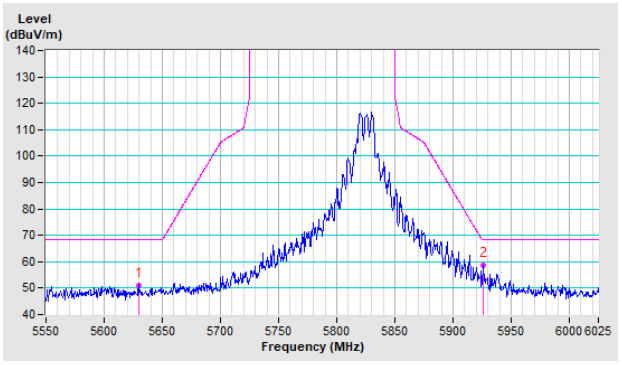
CH 149 5745 MHz

Horizontal	Vertical
	

CH 157 5785 MHz

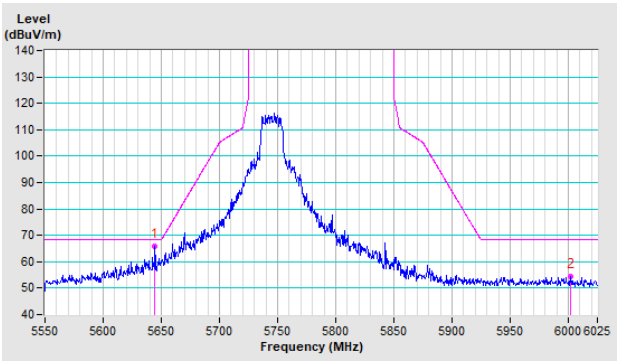
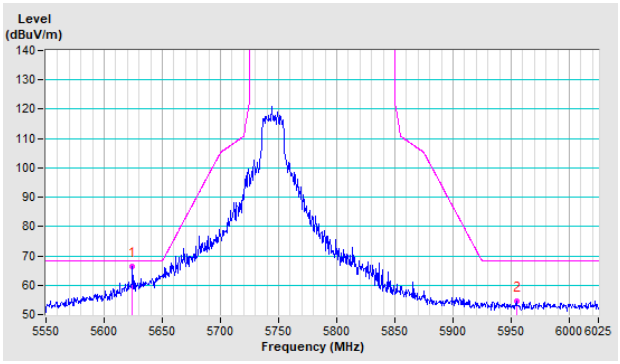
Horizontal	Vertical
	

CH 165 5825 MHz

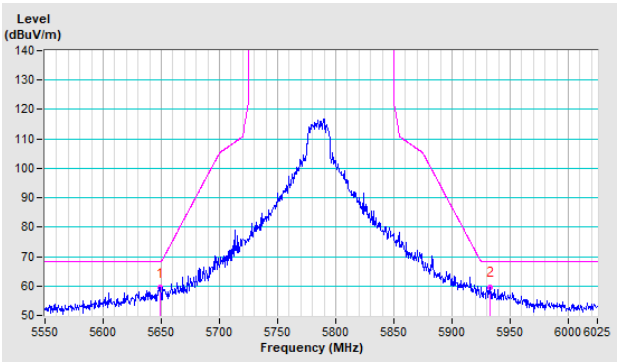
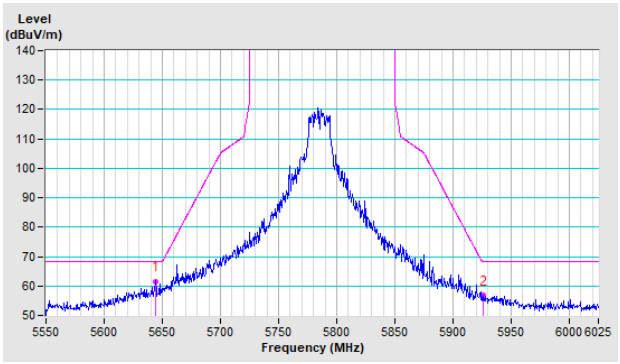
Horizontal	Vertical
	

802.11ax (HE20)

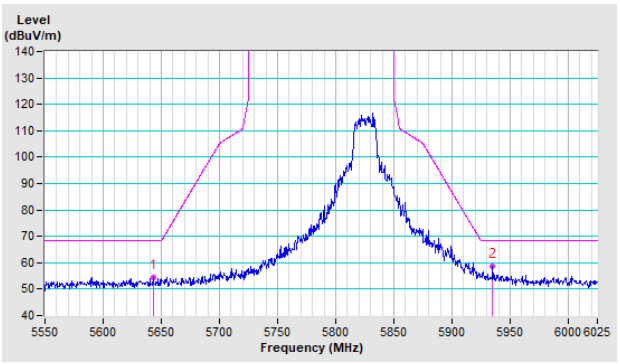
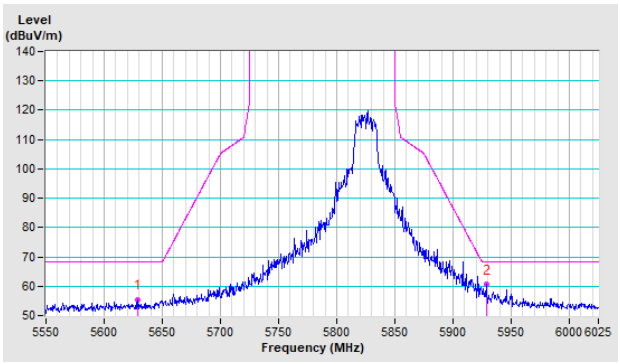
CH 149 5745 MHz

Horizontal	Vertical
	

CH 157 5785 MHz

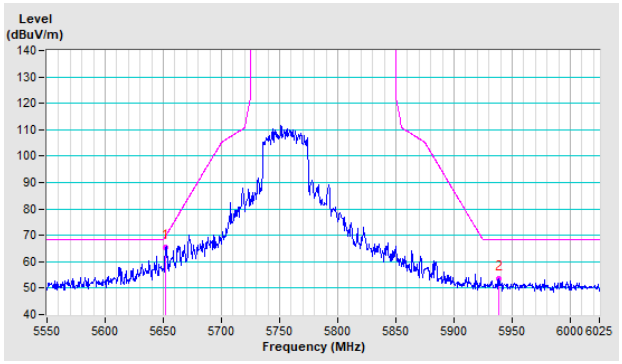
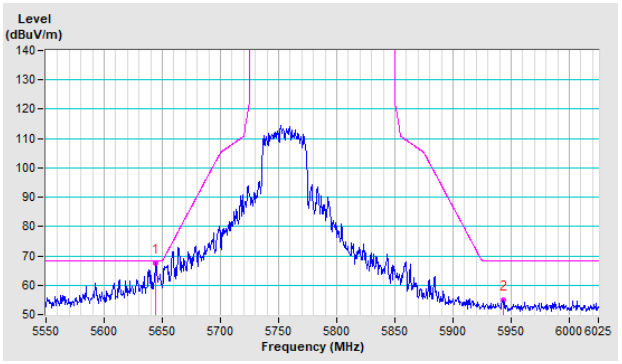
Horizontal	Vertical
	

CH 165 5825 MHz

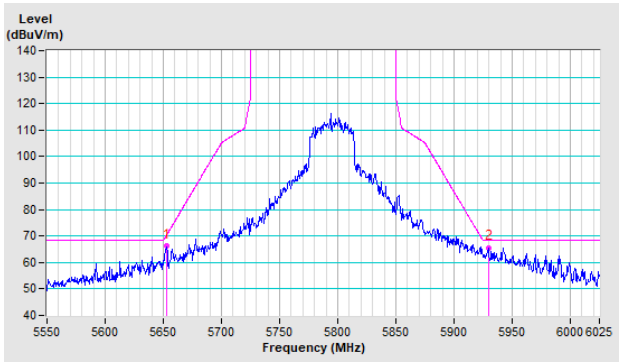
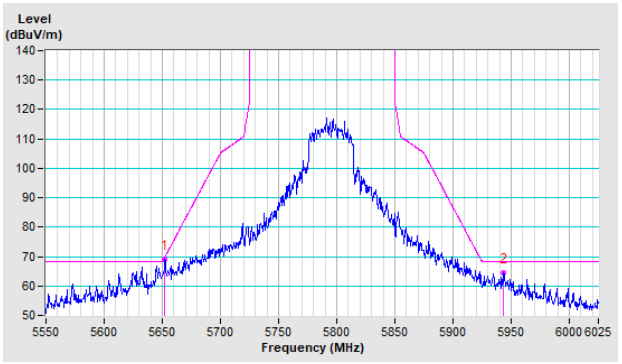
Horizontal	Vertical
	

802.11ax (HE40)

CH 151 5755 MHz

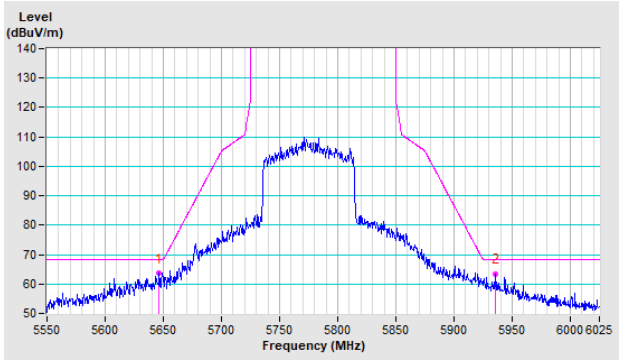
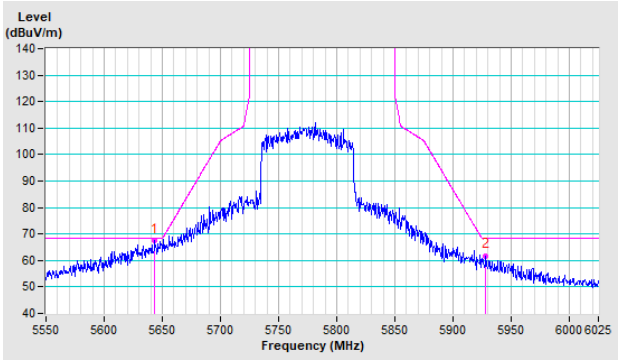
Horizontal	Vertical
	

CH 159 5795 MHz

Horizontal	Vertical
	

802.11ax (HE80)

CH 155 5775 MHz

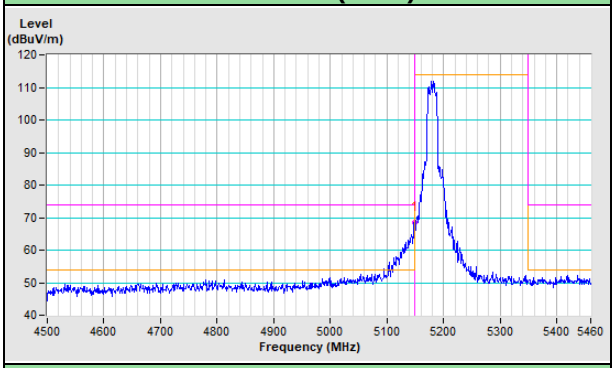
Horizontal	Vertical
	

Annex B- Band-edge measurement (For U-NII-1 band)

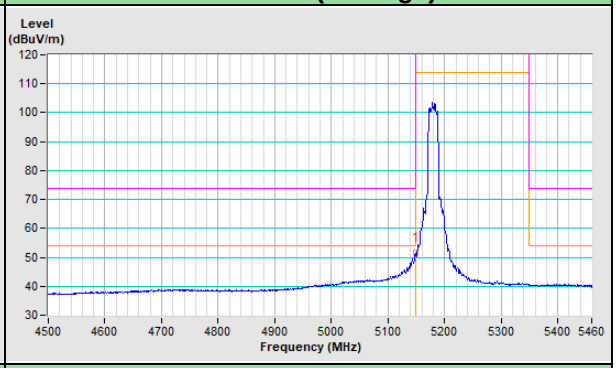
802.11a

Channel 36

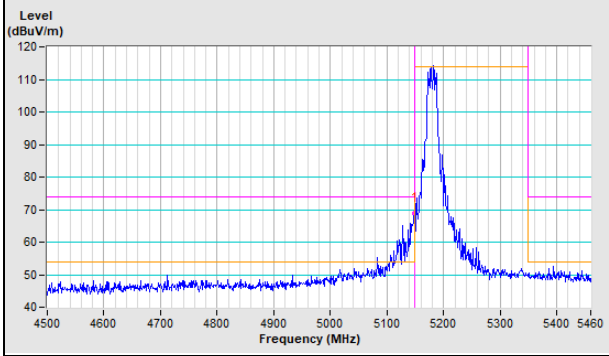
Horizontal (Peak)



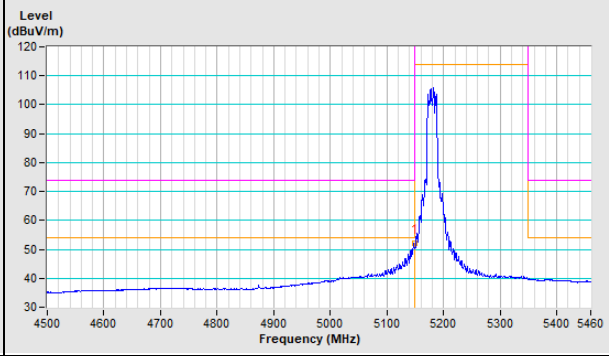
Horizontal (Average)



Vertical (Peak)

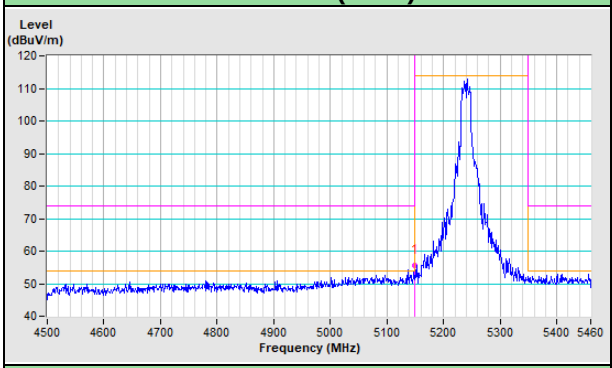


Vertical (Average)

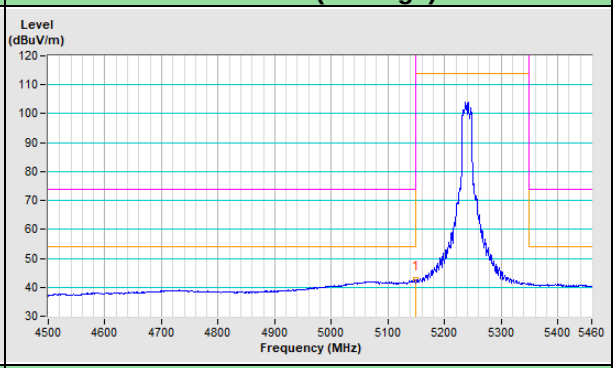


Channel 48

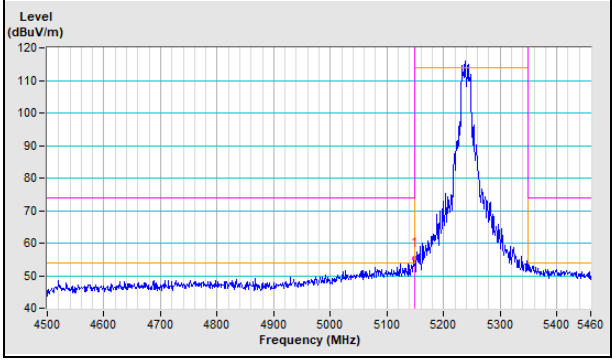
Horizontal (Peak)



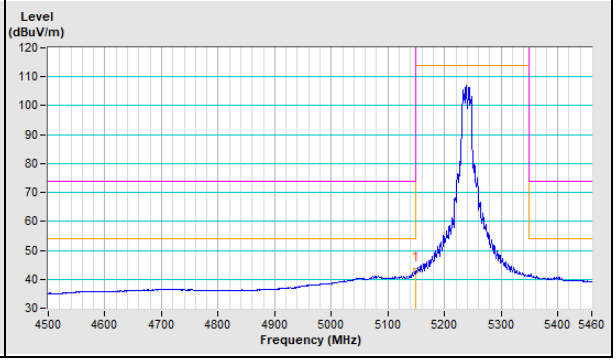
Horizontal (Average)



Vertical (Peak)



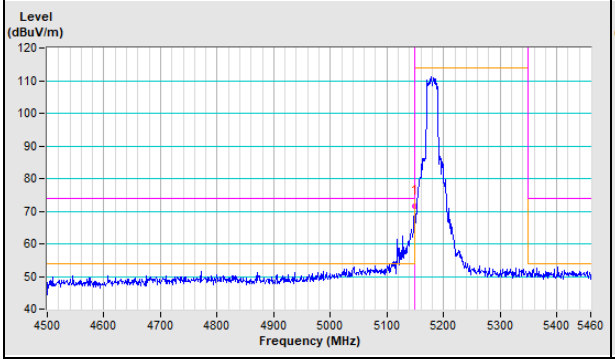
Vertical (Average)



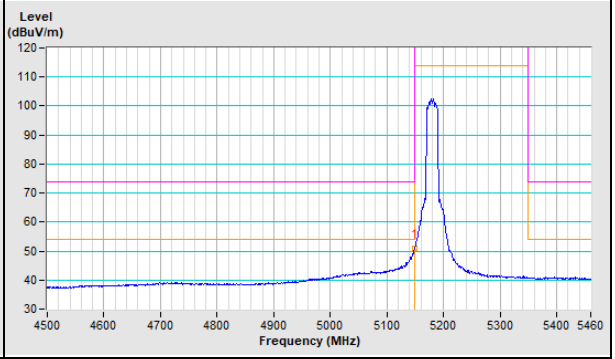
802.11ax (HE20)

Channel 36

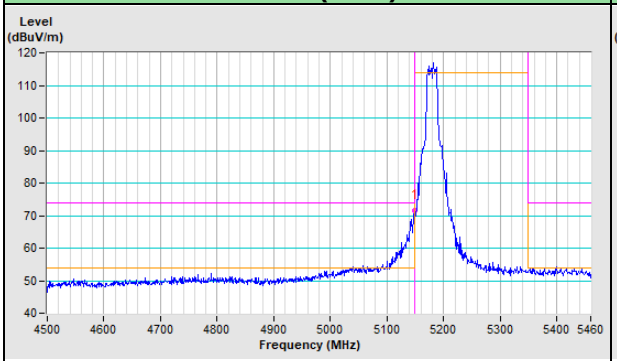
Horizontal (Peak)



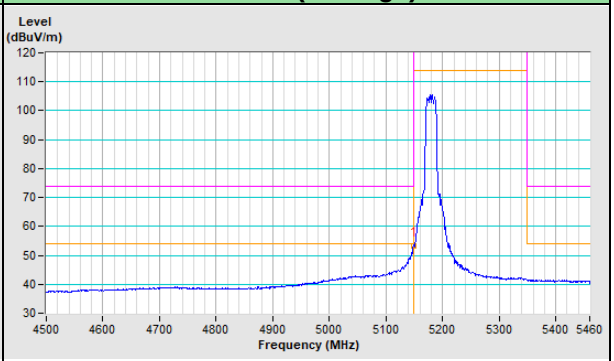
Horizontal (Average)



Vertical (Peak)

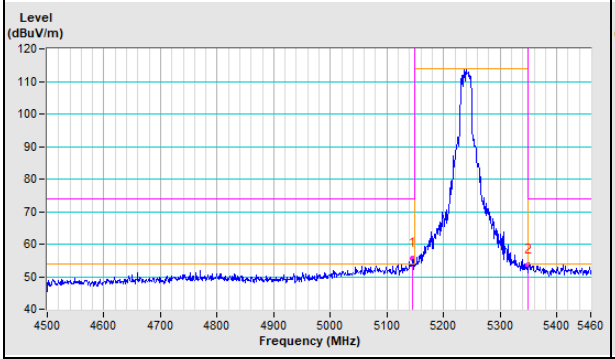


Vertical (Average)

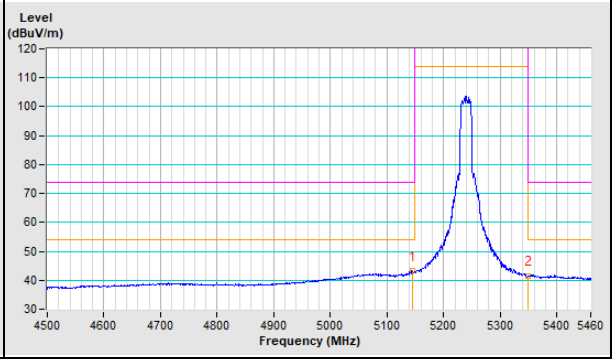


Channel 48

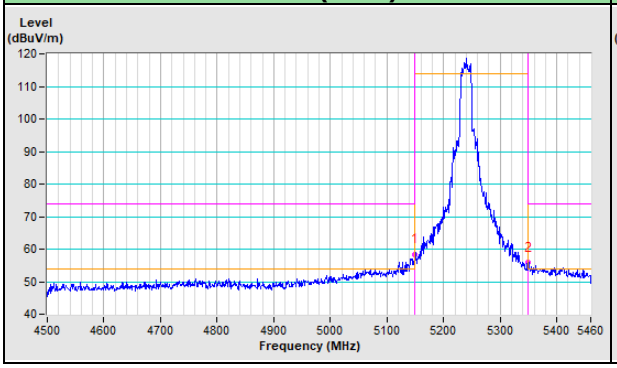
Horizontal (Peak)



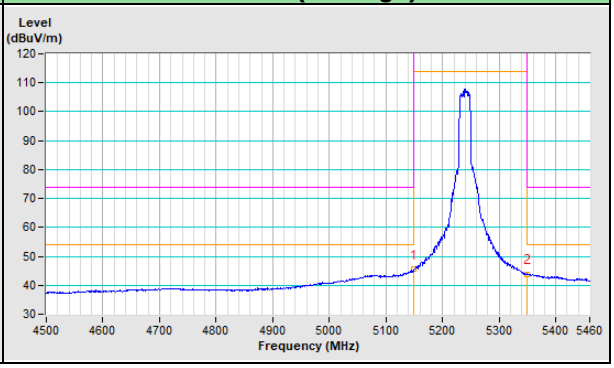
Horizontal (Average)



Vertical (Peak)



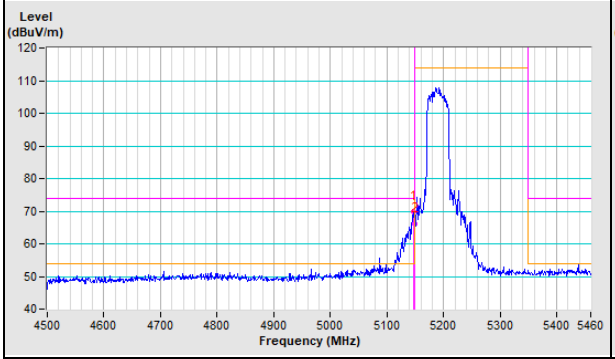
Vertical (Average)



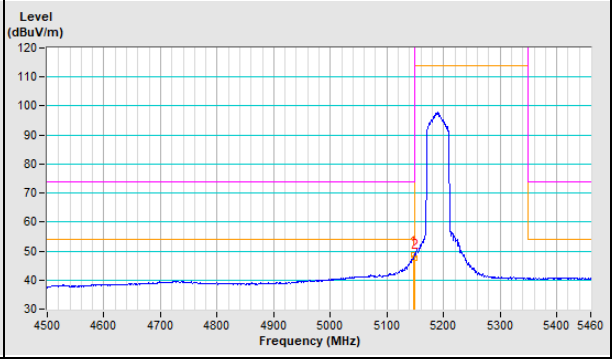
802.11ax (HE40)

Channel 38

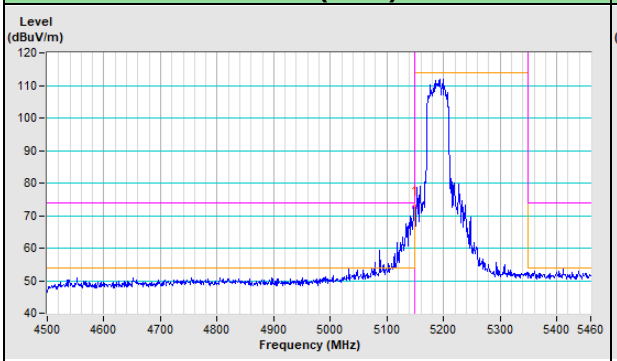
Horizontal (Peak)



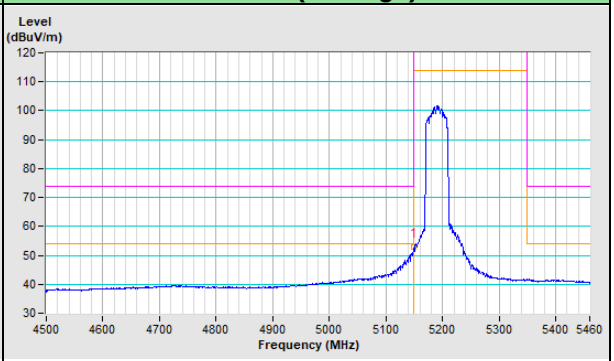
Horizontal (Average)



Vertical (Peak)

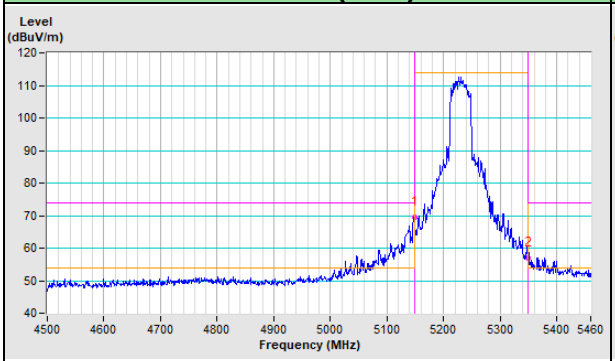


Vertical (Average)

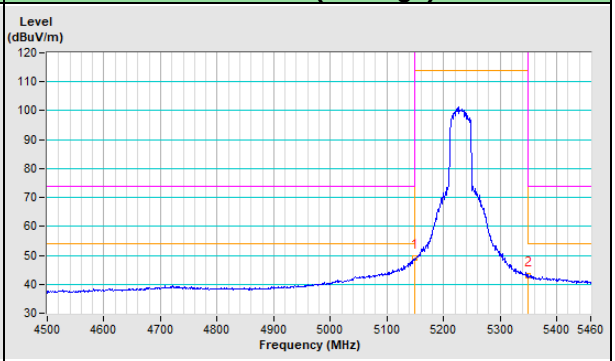


Channel 46

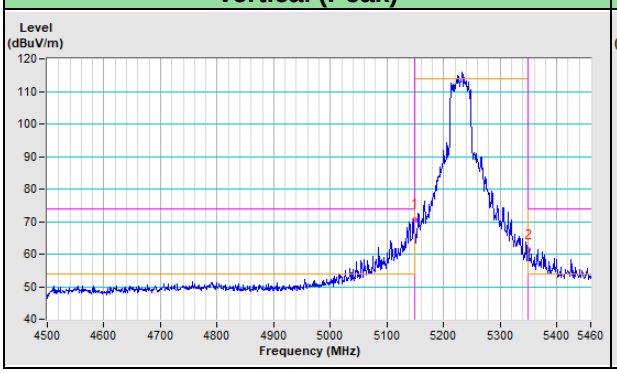
Horizontal (Peak)



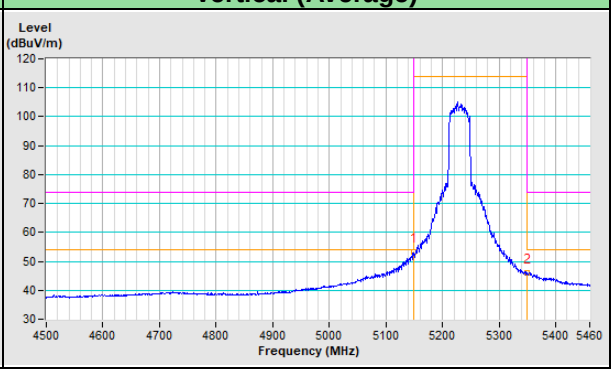
Horizontal (Average)



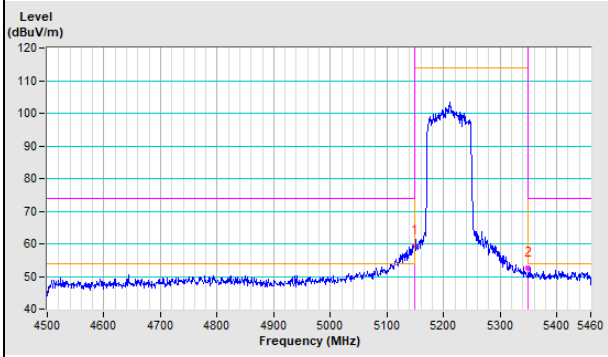
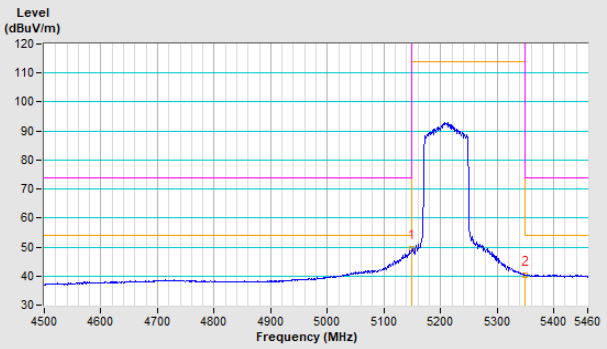
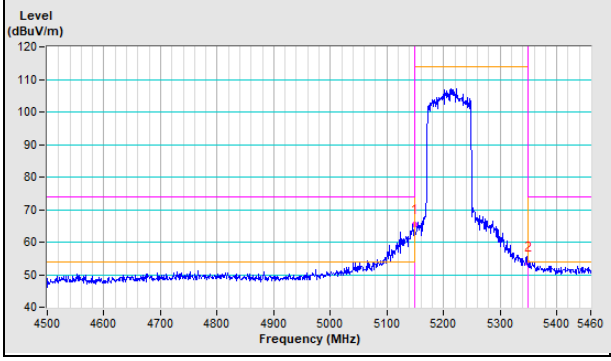
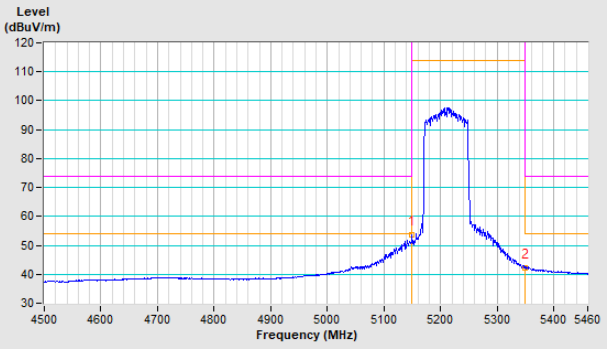
Vertical (Peak)



Vertical (Average)



802.11ax (HE80)

Channel 42	
Horizontal (Peak)	Horizontal (Average)
	
Vertical (Peak)	Vertical (Average)
	

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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Tel: 886-2-26052180
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Tel: 886-3-6668565
Fax: 886-3-6668323

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Fax: 886-3-3270892

Email: service.adt@tw.bureauveritas.com
Web Site: www.bureauveritas-adt.com

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

--- END ---