

FCC Test Report

Report No.: RFBDQY-WTW-P21010024-1

FCC ID: 2ASXXPAX1800

Test Model: PAX1800

Received Date: Jan. 05, 2021

Test Date: Jan. 23 to Feb. 02, 2021

Issued Date: Mar. 24, 2021

Applicant: Plasma Cloud Limited

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**FCC Registration /
Designation Number:** 723255 / TW2022



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Release Control Record

Issue No.	Description	Date Issued
RFBDQY-WTW-P21010024-1	Original release.	Mar. 24, 2021

1 Certificate of Conformity

Product: WiFi 6 AP

Brand: Plasma Cloud Limited

Test Model: PAX1800

Sample Status: Mass Market

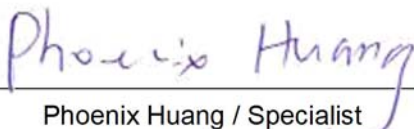
Applicant: Plasma Cloud Limited

Test Date: Jan. 23 to Feb. 02, 2021

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

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

Prepared by :


Phoenix Huang / Specialist

Date:

Mar. 24, 2021

Approved by :



Clark Lin / Technical Manager

Date:

Mar. 24, 2021

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 -5.88 dB at 25.15625 MHz.
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 -0.2 dB at 5150.00 MHz.
15.407(a)(1/2/3)	Max Average Transmit Power	Pass	Meet the requirement of limit.
---	Occupied Bandwidth Measurement	-	Reference only.
15.407(a)(1/2/3)	Peak Power Spectral Density	Pass	Meet the requirement of limit.
15.407(e)	6dB bandwidth	Pass	Meet the requirement of limit. (U-NII-3 Band only)
15.407(g)	Frequency Stability	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 OOB 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 (WLAN)

Product	WiFi 6 AP
Brand	Plasma Cloud Limited
Test Model	PAX1800
Status of EUT	Mass Market
Power Supply Rating	12Vdc from power adapter or 48~54 Vdc from POE
Modulation Type	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM 256QAM for OFDM in 11ac mode and VHT (20/40) mode 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 1201.0 Mbps
Operating Frequency	2.4GHz: 2.412 ~ 2.462 GHz 5GHz: 5.18 ~ 5.24 GHz, 5.745 ~ 5.825 GHz
Number of Channel	2.4GHz: 802.11b, 802.11g, 802.11n (HT20), VHT20, 802.11ax (HE20): 11 802.11n (HT40), VHT40, 802.11ax (HE40): 7 5GHz: 802.11a, 802.11n (HT20), 802.11ac (VHT20), 802.11ax (HE20): 9 802.11n (HT40), 802.11ac (VHT40), 802.11ax (HE40): 4 802.11ac (VHT80), 802.11ax (HE80): 2
Output Power	2.4GHz: CDD Mode: 767.304 mW Beamforming Mode: 767.304 mW 5GHz: CDD Mode: 5.18 ~ 5.24GHz: 380.504 mW 5.745 ~ 5.825GHz: 426.857 mW Beamforming Mode: 5.18 ~ 5.24GHz: 351.415 mW 5.745 ~ 5.825GHz: 424.785 mW
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	Wall shelf x 1
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 EUT has below radios as following table:

Radio 1	Radio 2
WLAN (2.4GHz)	WLAN (5GHz)

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

Antenna No.	Chain No.	Antenna Net Gain (dBi)	Frequency Range (GHz)	Antenna Type	Connector Type
1	2.4GHz Chain1	3.9	2.4~2.5	PIFA	i-pex(MHF)
2	2.4GHz Chain0	3	2.4~2.5	PIFA	i-pex(MHF)
3	5GHz Chain1	4.7	5.15~5.85	PIFA	i-pex(MHF)
4	5GHz Chain0	5.6	5.15~5.85	PIFA	i-pex(MHF)

4. The EUT was pre-tested under the following modes:

Test Mode	Description
Mode A	Power from adapter
Mode B	Power from POE

Note: From the above modes, the Radiated Emission and AC Power Conducted Emission test worst case was found in **Mode B**. Therefore only the test data of the mode was recorded in this report.

5. The EUT incorporates a MIMO function:

2.4GHz Band		
MODULATION MODE	TX & RX CONFIGURATION	
802.11b	2TX	2RX
802.11g	2TX	2RX
802.11n (HT20)	2TX	2RX
802.11n (HT40)	2TX	2RX
VHT20	2TX	2RX
VHT40	2TX	2RX
802.11ax (HE20)	2TX	2RX
802.11ax (HE40)	2TX	2RX
5GHz Band		
MODULATION MODE	TX & RX CONFIGURATION	
802.11a	2TX	2RX
802.11n (HT20)	2TX	2RX
802.11n (HT40)	2TX	2RX
802.11ac (VHT20)	2TX	2RX
802.11ac (VHT40)	2TX	2RX
802.11ac (VHT80)	2TX	2RX
802.11ax (HE20)	2TX	2RX
802.11ax (HE40)	2TX	2RX
802.11ax (HE80)	2TX	2RX

Note:

- All of modulation mode support beamforming function except 802.11a/b/g modulation mode.
- 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.
- 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/ VHT mode is the same as the 802.11ax mode or more lower than it and investigated worst case to representative mode in test report. (Final test mode refer to section 3.2.1)

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

3.2 Description of Test Modes

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	5210MHz

FOR 5745 ~ 5825MHz:

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

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

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

Channel	Frequency	Channel	Frequency
151	5755MHz	159	5795MHz

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

Channel	Frequency
155	5775MHz

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
PLC: Power Line Conducted Emission

RE<1G: Radiated Emission below 1GHz
APCM: Antenna Port Conducted Measurement

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
802.11ax (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
802.11ax (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

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
802.11a	5180-5240 5745-5825	36 to 48 149 to 165	165	OFDM	BPSK	6Mb/s

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
802.11a	5180-5240 5745-5825	36 to 48 149 to 165	165	OFDM	BPSK	6Mb/s

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

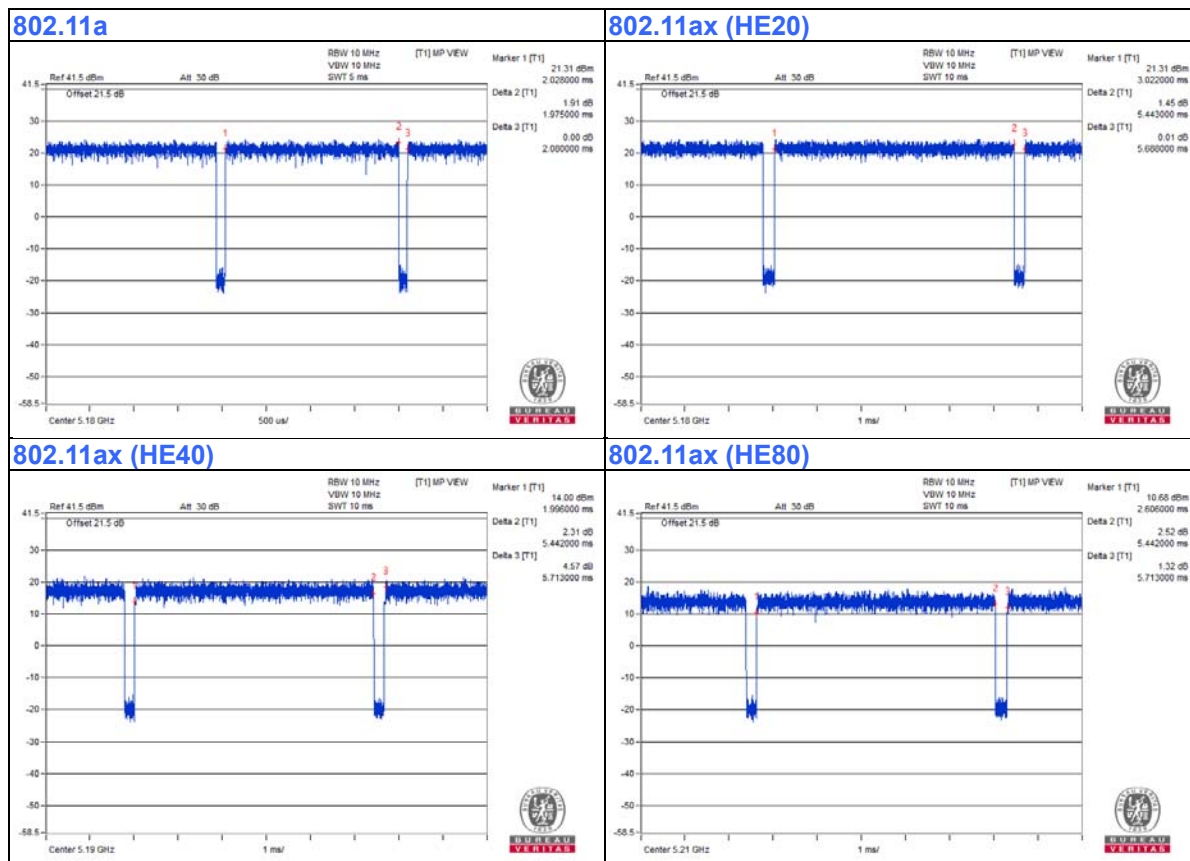
Test Condition:

Applicable To	Environmental Conditions	Input Power (System)	Tested By
RE $\geq$ 1G	25deg. C, 75%RH	120Vac, 60Hz	Carter Lin
RE<1G	26deg. C, 66%RH	120Vac, 60Hz	Sampson Chen
PLC	25deg. C, 71%RH	120Vac, 60Hz	Sampson Chen
APCM	25deg. C, 60%RH	120Vac, 60Hz	Kevin Ko

3.3 Duty Cycle of Test Signal

Duty cycle of test signal is < 98%, duty factor shall be considered.

802.11a: Duty cycle = 1.975 ms/2.08 ms = 0.95, Duty factor = $10 \cdot \log(1/\text{Duty cycle}) = 0.22 \text{ dB}$
 802.11ax (HE20): Duty cycle = 5.443 ms/5.688 ms = 0.957, Duty factor = $10 \cdot \log(1/\text{Duty cycle}) = 0.19 \text{ dB}$
 802.11ax (HE40): Duty cycle = 5.442 ms/5.713 ms = 0.953, Duty factor = $10 \cdot \log(1/\text{Duty cycle}) = 0.21 \text{ dB}$
 802.11ax (HE80): Duty cycle = 5.442 ms/5.713 ms = 0.953, Duty factor = $10 \cdot \log(1/\text{Duty cycle}) = 0.21 \text{ dB}$



3.4 Description of Support Units

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

ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Laptop	Lenovo	20U5S01X00 L14	PF-1ANPYA	NA	Provided by Lab
B.	POE Adapter	BulletPoE	BPI100-GH	NA	NA	Supplied by client
C.	Laptop	Lenovo	20U5S01X00 L14	PF-28LKK7	NA	Provided by Lab

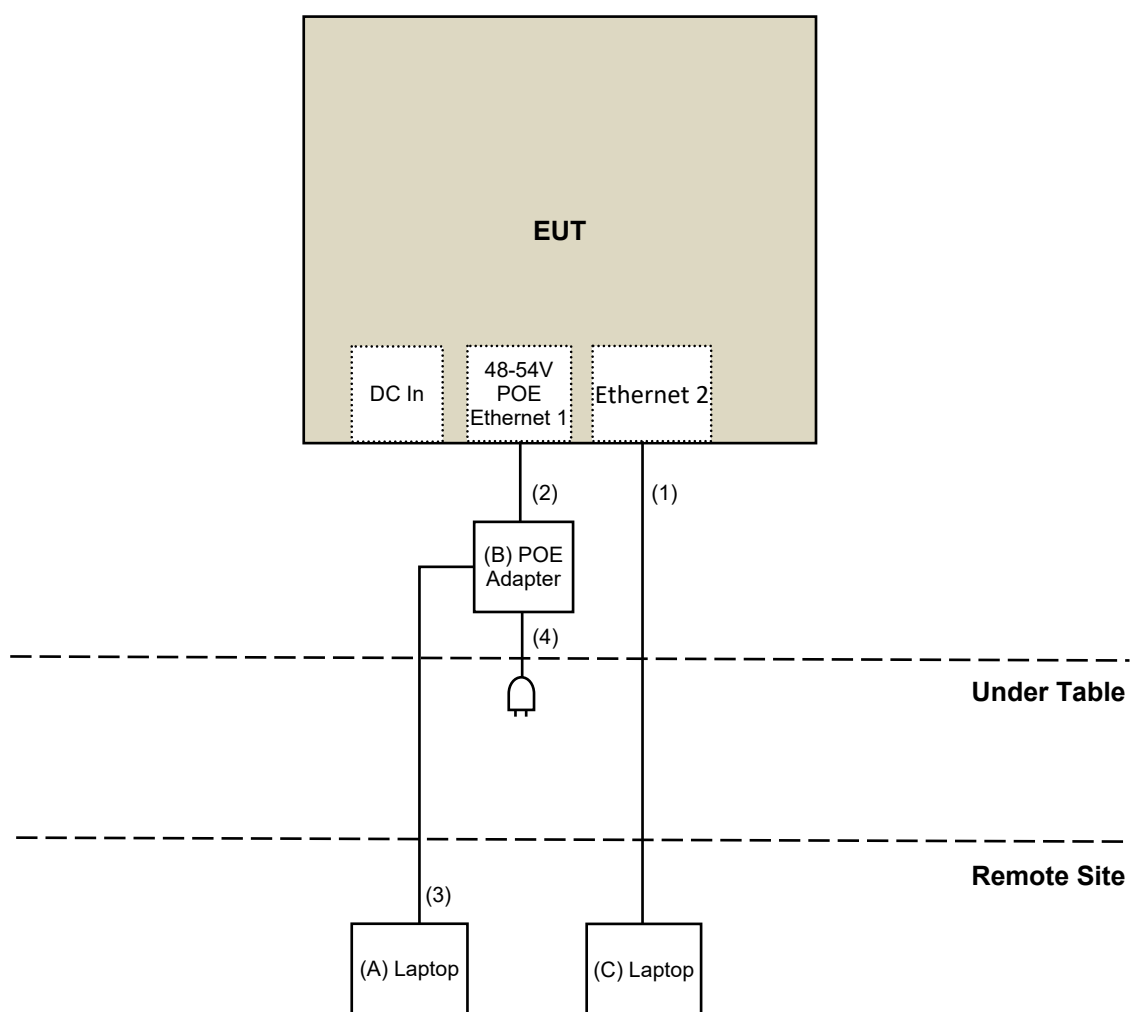
Note:

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

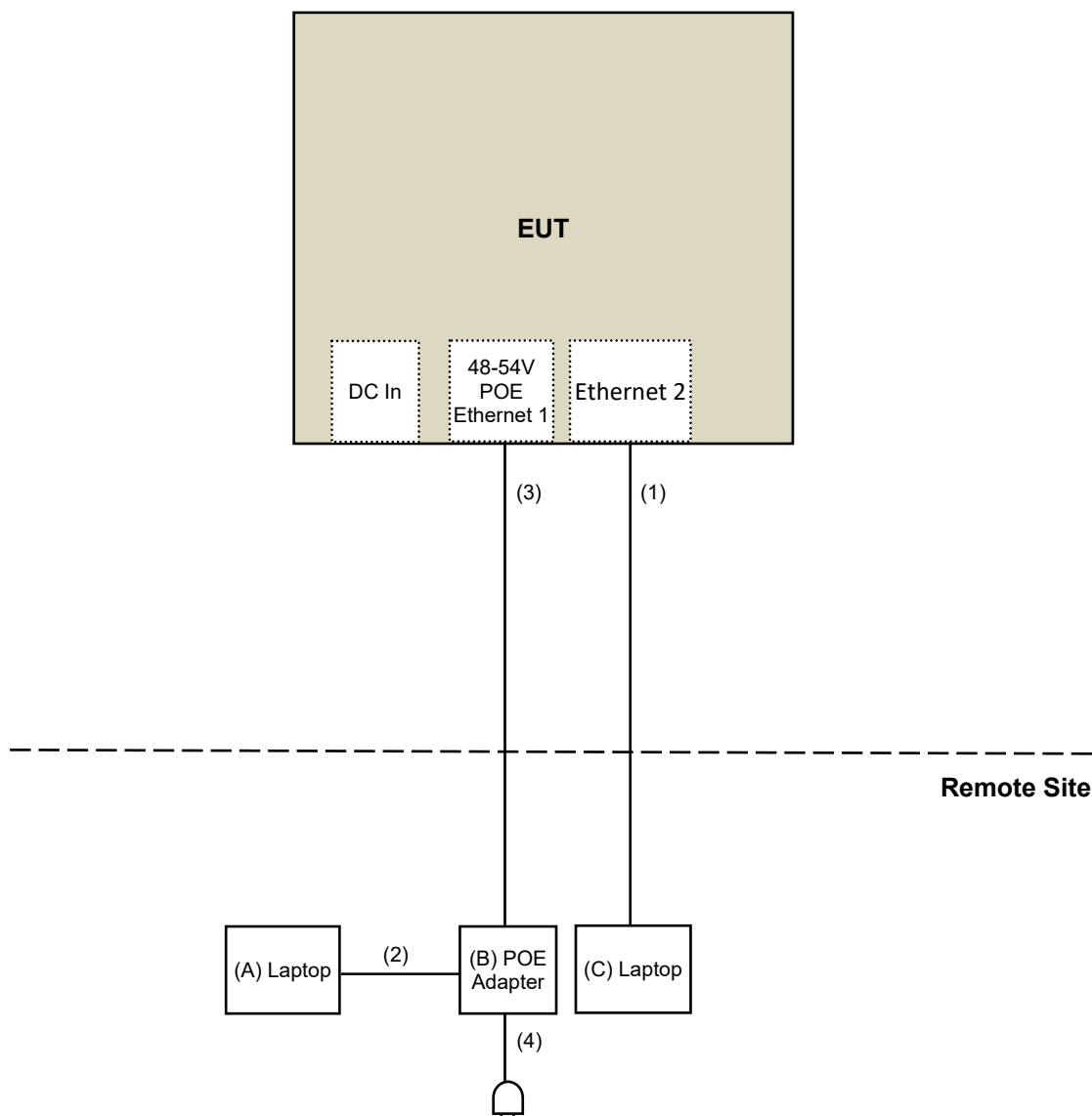
ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	RJ-45 Cable	1	10	No	0	Provided by Lab
2.	RJ-45 Cable	1	1.8	No	0	Provided by Lab
3.	RJ-45 Cable	1	10	No	0	Provided by Lab
4.	AC Cable	1	1.5	No	0	Supplied by client

3.4.1 Configuration of System under Test

For AC Power Conducted Emission test



For Radiated Emission test:



3.5 General Description of Applied Standards and References

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

Test Standard:

FCC Part 15, Subpart E (15.407)

ANSI C63.10-2013

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

References Test Guidance:

KDB 789033 D02 General UNII Test Procedure New Rules v02r01

KDB 662911 D01 Multiple Transmitter Output v02r01

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

4 Test Types and Results

4.1 Radiated Emission and Bandedge Measurement

4.1.1 Limits of Radiated Emission and Bandedge Measurement

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

Frequencies (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009 ~ 0.490	2400/F(kHz)	300
0.490 ~ 1.705	24000/F(kHz)	30
1.705 ~ 30.0	30	30
30 ~ 88	100	3
88 ~ 216	150	3
216 ~ 960	200	3
Above 960	500	3

NOTE:

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

Limits of unwanted emission out of the restricted bands

Applicable To		Limit	
789033 D02 General UNII Test Procedure New Rules v02r01		Field Strength at 3m	
		PK:74 (dBuV/m)	AV:54 (dBuV/m)
Frequency Band	Applicable To	EIRP Limit	Equivalent Field Strength at 3m
5150~5250 MHz	15.407(b)(1)	PK:-27 (dBm/MHz)	PK:68.2(dBuV/m)
5250~5350 MHz	15.407(b)(2)		
5470~5725 MHz	15.407(b)(3)		
5725~5850 MHz	15.407(b)(4)(i)	PK: -27 (dBm/MHz) ^{*1} PK: 10 (dBm/MHz) ^{*2} PK: 15.6 (dBm/MHz) ^{*3} PK: 27 (dBm/MHz) ^{*4}	PK: 68.2(dBuV/m) ^{*1} PK: 105.2 (dBuV/m) ^{*2} PK: 110.8(dBuV/m) ^{*3} PK: 122.2 (dBuV/m) ^{*4}
5725~5850 MHz	15.407(b)(4)(i)	PK:-27 (dBm/MHz) ^{*1} PK:10 (dBm/MHz) ^{*2} PK:15.6 (dBm/MHz) ^{*3} PK:27 (dBm/MHz) ^{*4}	PK: 68.2(dBuV/m) ^{*1} PK:105.2 (dBuV/m) ^{*2} PK: 110.8(dBuV/m) ^{*3} PK:122.2 (dBuV/m) ^{*4}
^{*1} beyond 75 MHz or more above of the band edge. ^{*2} below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above. ^{*3} below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above. ^{*4} from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.			

Note:

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

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

4.1.2 Test Instruments

For Radiated Emission test

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver Agilent	N9038A	MY51210202	Dec. 01, 2020	Nov. 30, 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	5D-FB	LOOPCAB-001	Jan. 07, 2021	Jan. 06, 2022
RF Cable	5D-FB	LOOPCAB-002	Jan. 07, 2021	Jan. 06, 2022
Pre-Amplifier Mini-Circuits	ZFL-1000VH2B	AMP-ZFL-02	Oct. 21, 2020	Oct. 20, 2021
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-406	Nov. 06, 2020	Nov. 05, 2021
RF Cable	8D	966-6-1	Apr. 04, 2020	Apr. 03, 2021
RF Cable	8D	966-4-2	Mar. 18, 2020	Mar. 17, 2021
RF Cable	8D	966-4-3	Mar. 18, 2020	Mar. 17, 2021
Fixed attenuator Mini-Circuits	UNAT-5+	PAD-ATT5-03	Jan. 11, 2021	Jan. 10, 2022
Horn_Antenna SCHWARZBECK	BBHA 9120D	9120D-783	Nov. 22, 2020	Nov. 21, 2021
Pre-Amplifier EMCI	EMC 12630 SE	980638	Apr. 08, 2020	Apr. 07, 2021
RF Cable	EMC104-SM-SM-1200	160922	Dec. 25, 2020	Dec. 24, 2021
RF Cable	EMC104-SM-SM-2000	180502	Apr. 29, 2020	Apr. 28, 2021
RF Cable	EMC104-SM-SM-6000	180418	Apr. 29, 2020	Apr. 28, 2021
Pre-Amplifier EMCI	EMC184045SE	980387	Jan. 11, 2021	Jan. 10, 2022
Horn_Antenna SCHWARZBECK	BBHA 9170	BBHA9170519	Nov. 22, 2020	Nov. 21, 2021
RF Cable	EMC102-KM-KM-1200	160924	Jan. 11, 2021	Jan. 10, 2022
RF Cable	EMC-KM-KM-4000	200214	Mar. 11, 2020	Mar. 10, 2021
Software	ADT_Radiated_V8.7.08	NA	NA	NA
Boresight Antenna Tower & Turn Table Max-Full	MF-7802BS	MF780208530	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. 4.
3. Tested Date: Jan. 23 to 31, 2021

For other test items:

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
DC Power Supply Topward	6603D	795558	NA	NA
Temperature & Humidity Chamber Giant Force	GTH-150-40-SP-AR	MAA0812-008	Jan. 14, 2021	Jan. 13, 2022
True RMS Clamp Meter FLUKE	325	31130711WS	June 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: Feb. 02, 2021

4.1.3 Test Procedure

For Radiated emission below 30MHz

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter chamber room. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. Parallel, perpendicular, and ground-parallel orientations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Quasi-Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

Note:

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

For Radiated emission above 30MHz

- a. The EUT was placed on the top of a rotating table 0.8 meters (for 30MHz ~ 1GHz) / 1.5 meters (for above 1GHz) above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.
- f. The test-receiver system was set to peak and average detects function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

Note:

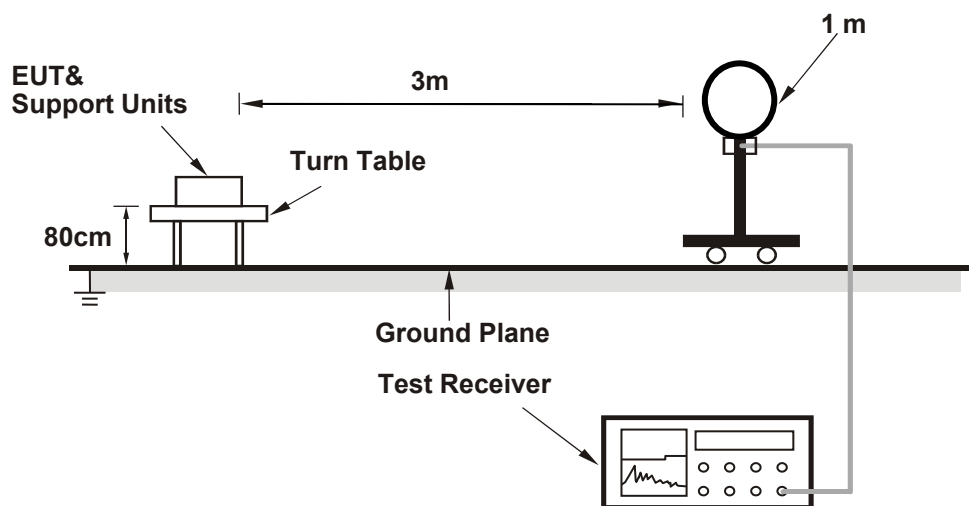
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.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

4.1.4 Deviation from Test Standard

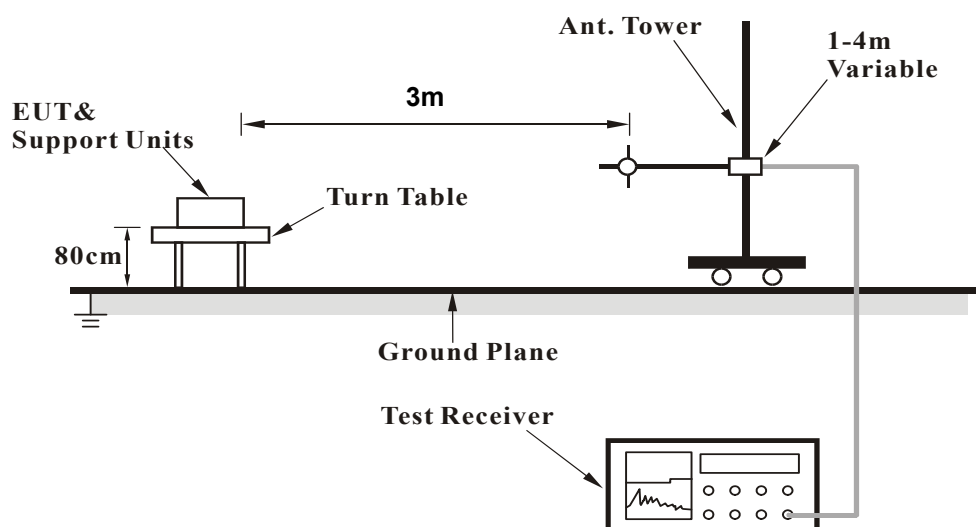
No deviation.

4.1.5 Test Setup

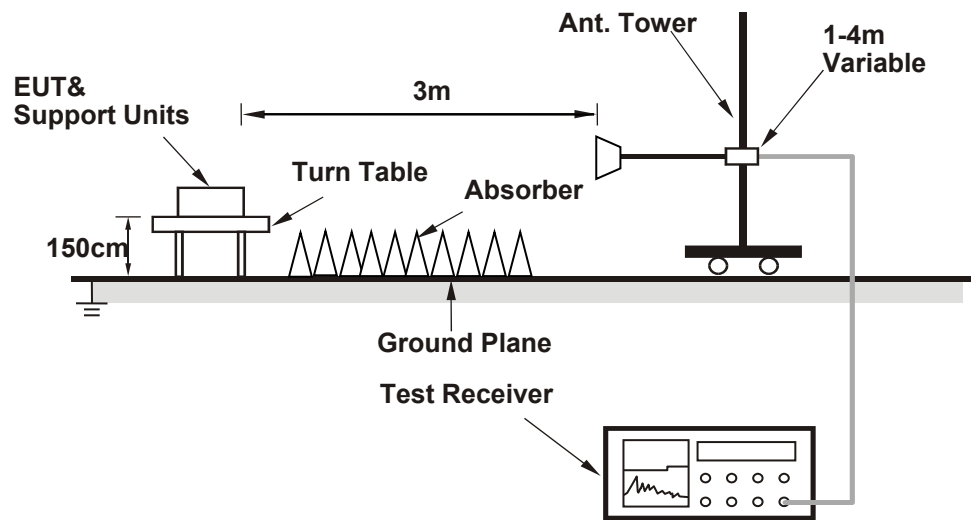
For Radiated emission below 30MHz



For Radiated emission 30MHz to 1GHz



For Radiated emission above 1GHz



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

4.1.6 EUT Operating Condition

- Placed the EUT on the testing table.
- Controlling software (qdart_conn.win.1.0_installer_00076.1) has been activated to set the EUT under transmission condition continuously at specific channel frequency.

4.1.7 Test Results

Above 1GHz Data:

RF Mode	TX 802.11a	Channel	CH 36 : 5180 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5150.00	62.9 PK	74.0	-11.1	2.20 H	72	61.8	1.1
2	5150.00	53.3 AV	54.0	-0.7	2.20 H	72	52.2	1.1
3	*5180.00	118.1 PK			2.20 H	72	117.1	1.0
4	*5180.00	109.1 AV			2.20 H	72	108.1	1.0
5	#10360.00	47.2 PK	68.2	-21.0	1.07 H	126	36.9	10.3
6	15540.00	56.6 PK	74.0	-17.4	1.56 H	130	44.6	12.0
7	15540.00	44.4 AV	54.0	-9.6	1.56 H	130	32.4	12.0
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	51.5 PK	74.0	-22.5	3.62 V	4	50.4	1.1
2	5150.00	42.6 AV	54.0	-11.4	3.62 V	4	41.5	1.1
3	*5180.00	112.4 PK			3.62 V	4	111.4	1.0
4	*5180.00	103.2 AV			3.62 V	4	102.2	1.0
5	#10360.00	45.3 PK	68.2	-22.9	2.43 V	17	35.0	10.3
6	15540.00	50.0 PK	74.0	-24.0	3.51 V	124	38.0	12.0
7	15540.00	37.2 AV	54.0	-16.8	3.51 V	124	25.2	12.0

Remarks:

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

RF Mode	TX 802.11a	Channel	CH 40 : 5200 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5150.00	62.3 PK	74.0	-11.7	2.15 H	68	61.2	1.1
2	5150.00	53.1 AV	54.0	-0.9	2.15 H	68	52.0	1.1
3	*5200.00	119.5 PK			2.15 H	68	118.4	1.1
4	*5200.00	110.5 AV			2.15 H	68	109.4	1.1
5	5350.00	54.3 PK	74.0	-19.7	2.15 H	68	53.5	0.8
6	5350.00	45.4 AV	54.0	-8.6	2.15 H	68	44.6	0.8
7	#10400.00	46.8 PK	68.2	-21.4	1.02 H	112	36.4	10.4
8	15600.00	56.9 PK	74.0	-17.1	1.52 H	138	44.9	12.0
9	15600.00	44.5 AV	54.0	-9.5	1.52 H	138	32.5	12.0

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	55.3 PK	74.0	-18.7	3.65 V	3	54.2	1.1
2	5150.00	45.3 AV	54.0	-8.7	3.65 V	3	44.2	1.1
3	*5200.00	114.6 PK			3.65 V	3	113.5	1.1
4	*5200.00	106.6 AV			3.65 V	3	105.5	1.1
5	5350.00	54.1 PK	74.0	-19.9	3.65 V	3	53.3	0.8
6	5350.00	44.7 AV	54.0	-9.3	3.65 V	3	43.9	0.8
7	#10400.00	45.5 PK	68.2	-22.7	2.38 V	23	35.1	10.4
8	15600.00	50.1 PK	74.0	-23.9	3.52 V	138	38.1	12.0
9	15600.00	37.6 AV	54.0	-16.4	3.52 V	138	25.6	12.0

Remarks:

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

RF Mode	TX 802.11a	Channel	CH 48 : 5240 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5240.00	119.1 PK			2.26 H	64	118.3	0.8
2	*5240.00	109.9 AV			2.26 H	64	109.1	0.8
3	5376.06	54.0 PK	74.0	-20.0	2.26 H	64	53.1	0.9
4	5376.06	44.9 AV	54.0	-9.1	2.26 H	64	44.0	0.9
5	#10480.00	46.4 PK	68.2	-21.8	1.01 H	117	36.1	10.3
6	15720.00	56.7 PK	74.0	-17.3	1.55 H	151	45.5	11.2
7	15720.00	44.4 AV	54.0	-9.6	1.55 H	151	33.2	11.2
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	*5240.00	114.1 PK			3.62 V	11	113.3	0.8
2	*5240.00	105.7 AV			3.62 V	11	104.9	0.8
3	5434.68	49.6 PK	74.0	-24.4	3.62 V	11	48.6	1.0
4	5434.68	39.2 AV	54.0	-14.8	3.62 V	11	38.2	1.0
5	#10480.00	45.0 PK	68.2	-23.2	2.36 V	35	34.7	10.3
6	15720.00	49.7 PK	74.0	-24.3	3.57 V	126	38.5	11.2
7	15720.00	37.4 AV	54.0	-16.6	3.57 V	126	26.2	11.2

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.

RF Mode	TX 802.11a	Channel	CH 149 : 5745 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5554.99	52.7 PK	68.2	-15.5	2.03 H	65	51.5	1.2
2	*5745.00	120.5 PK			2.03 H	65	118.8	1.7
3	*5745.00	111.1 AV			2.03 H	65	109.4	1.7
4	#5941.17	51.1 PK	68.2	-17.1	2.03 H	65	49.3	1.8
5	11490.00	51.4 PK	74.0	-22.6	1.02 H	104	39.3	12.1
6	11490.00	39.1 AV	54.0	-14.9	1.02 H	104	27.0	12.1
7	#17235.00	57.7 PK	68.2	-10.5	1.56 H	118	41.5	16.2
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	#5643.92	55.0 PK	68.2	-13.2	3.59 V	0	53.6	1.4
2	*5745.00	116.6 PK			3.59 V	0	114.9	1.7
3	*5745.00	106.6 AV			3.59 V	0	104.9	1.7
4	#5938.44	52.1 PK	68.2	-16.1	3.59 V	0	50.3	1.8
5	11490.00	50.3 PK	74.0	-23.7	2.40 V	21	38.2	12.1
6	11490.00	38.4 AV	54.0	-15.6	2.40 V	21	26.3	12.1
7	#17235.00	56.0 PK	68.2	-12.2	1.47 V	314	39.8	16.2

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.

RF Mode	TX 802.11a	Channel	CH 157 : 5785 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5588.32	53.1 PK	68.2	-15.1	2.05 H	54	51.8	1.3
2	*5785.00	120.8 PK			2.05 H	54	119.0	1.8
3	*5785.00	111.2 AV			2.05 H	54	109.4	1.8
4	#5979.25	51.2 PK	68.2	-17.0	2.05 H	54	49.4	1.8
5	11570.00	51.8 PK	74.0	-22.2	1.00 H	111	39.8	12.0
6	11570.00	39.4 AV	54.0	-14.6	1.00 H	111	27.4	12.0
7	#17355.00	57.5 PK	68.2	-10.7	1.55 H	124	40.5	17.0
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	#5651.47	53.4 PK	69.3	-15.9	3.53 V	19	52.0	1.4
2	*5785.00	116.6 PK			3.53 V	19	114.8	1.8
3	*5785.00	106.5 AV			3.53 V	19	104.7	1.8
4	#5979.67	49.7 PK	68.2	-18.5	3.53 V	19	47.9	1.8
5	11570.00	50.4 PK	74.0	-23.6	2.34 V	16	38.4	12.0
6	11570.00	38.8 AV	54.0	-15.2	2.34 V	16	26.8	12.0
7	#17355.00	55.4 PK	68.2	-12.8	1.48 V	327	38.4	17.0

Remarks:

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

RF Mode	TX 802.11a	Channel	CH 165 : 5825 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5628.34	54.6 PK	68.2	-13.6	2.09 H	66	53.2	1.4
2	*5825.00	121.5 PK			2.09 H	66	119.7	1.8
3	*5825.00	111.7 AV			2.09 H	66	109.9	1.8
4	#5926.22	52.1 PK	68.2	-16.1	2.09 H	66	50.3	1.8
5	11650.00	51.1 PK	74.0	-22.9	1.06 H	117	39.4	11.7
6	11650.00	39.0 AV	54.0	-15.0	1.06 H	117	27.3	11.7
7	#17475.00	56.9 PK	68.2	-11.3	1.57 H	137	38.0	18.9
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	#5625.89	51.2 PK	68.2	-17.0	3.56 V	18	49.8	1.4
2	*5825.00	116.6 PK			3.56 V	18	114.8	1.8
3	*5825.00	106.4 AV			3.56 V	18	104.6	1.8
4	#5928.75	54.0 PK	68.2	-14.2	3.56 V	18	52.2	1.8
5	11650.00	50.0 PK	74.0	-24.0	2.35 V	14	38.3	11.7
6	11650.00	38.6 AV	54.0	-15.4	2.35 V	14	26.9	11.7
7	#17475.00	55.8 PK	68.2	-12.4	1.53 V	315	36.9	18.9

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.

RF Mode	TX 802.11ax (HE20)	Channel	CH 36 : 5180 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5150.00	64.5 PK	74.0	-9.5	2.04 H	73	63.4	1.1
2	5150.00	53.7 AV	54.0	-0.3	2.04 H	73	52.6	1.1
3	*5180.00	121.8 PK			2.04 H	73	120.8	1.0
4	*5180.00	110.9 AV			2.04 H	73	109.9	1.0
5	#10360.00	44.9 PK	68.2	-23.3	1.04 H	124	34.6	10.3
6	15540.00	53.8 PK	74.0	-20.2	1.53 H	139	41.8	12.0
7	15540.00	42.5 AV	54.0	-11.5	1.53 H	139	30.5	12.0
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	61.7 PK	74.0	-12.3	3.61 V	2	60.6	1.1
2	5150.00	47.3 AV	54.0	-6.7	3.61 V	2	46.2	1.1
3	*5180.00	115.3 PK			3.61 V	2	114.3	1.0
4	*5180.00	103.9 AV			3.61 V	2	102.9	1.0
5	#10360.00	45.9 PK	68.2	-22.3	2.37 V	2	35.6	10.3
6	15540.00	50.3 PK	74.0	-23.7	3.53 V	123	38.3	12.0
7	15540.00	37.4 AV	54.0	-16.6	3.53 V	123	25.4	12.0

Remarks:

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

RF Mode	TX 802.11ax (HE20)	Channel	CH 40 : 5200 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5150.00	63.2 PK	74.0	-10.8	2.16 H	63	62.1	1.1
2	5150.00	53.8 AV	54.0	-0.2	2.16 H	63	52.7	1.1
3	*5200.00	122.3 PK			2.16 H	63	121.2	1.1
4	*5200.00	111.3 AV			2.16 H	63	110.2	1.1
5	5350.00	54.4 PK	74.0	-19.6	2.16 H	63	53.6	0.8
6	5350.00	44.6 AV	54.0	-9.4	2.16 H	63	43.8	0.8
7	#10400.00	44.6 PK	68.2	-23.6	1.02 H	113	34.2	10.4
8	15600.00	54.4 PK	74.0	-19.6	1.54 H	146	42.4	12.0
9	15600.00	42.9 AV	54.0	-11.1	1.54 H	146	30.9	12.0

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	62.5 PK	74.0	-11.5	3.59 V	11	61.4	1.1
2	5150.00	48.1 AV	54.0	-5.9	3.59 V	11	47.0	1.1
3	*5200.00	118.1 PK			3.59 V	11	117.0	1.1
4	*5200.00	106.5 AV			3.59 V	11	105.4	1.1
5	5350.00	54.0 PK	74.0	-20.0	3.59 V	11	53.2	0.8
6	5350.00	44.4 AV	54.0	-9.6	3.59 V	11	43.6	0.8
7	#10400.00	45.9 PK	68.2	-22.3	2.33 V	10	35.5	10.4
8	15600.00	50.6 PK	74.0	-23.4	3.48 V	123	38.6	12.0
9	15600.00	37.6 AV	54.0	-16.4	3.48 V	123	25.6	12.0

Remarks:

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

RF Mode	TX 802.11ax (HE20)	Channel	CH 48 : 5240 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5240.00	120.6 PK			2.06 H	62	119.8	0.8
2	*5240.00	109.0 AV			2.06 H	62	108.2	0.8
3	5375.95	51.7 PK	74.0	-22.3	2.06 H	62	50.8	0.9
4	5375.95	45.4 AV	54.0	-8.6	2.06 H	62	44.5	0.9
5	#10480.00	45.0 PK	68.2	-23.2	1.02 H	121	34.7	10.3
6	15720.00	54.8 PK	74.0	-19.2	1.60 H	160	43.6	11.2
7	15720.00	43.4 AV	54.0	-10.6	1.60 H	160	32.2	11.2
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	*5240.00	117.3 PK			3.60 V	12	116.5	0.8
2	*5240.00	105.5 AV			3.60 V	12	104.7	0.8
3	5428.78	50.2 PK	74.0	-23.8	3.60 V	12	49.2	1.0
4	5428.78	38.7 AV	54.0	-15.3	3.60 V	12	37.7	1.0
5	#10480.00	45.7 PK	68.2	-22.5	2.36 V	22	35.4	10.3
6	15720.00	50.3 PK	74.0	-23.7	3.43 V	125	39.1	11.2
7	15720.00	37.2 AV	54.0	-16.8	3.43 V	125	26.0	11.2

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.

RF Mode	TX 802.11ax (HE20)	Channel	CH 149 : 5745 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5557.91	53.2 PK	68.2	-15.0	2.02 H	66	52.0	1.2
2	*5745.00	122.2 PK			2.02 H	66	120.5	1.7
3	*5745.00	109.7 AV			2.02 H	66	108.0	1.7
4	#5932.93	50.5 PK	68.2	-17.7	2.02 H	66	48.7	1.8
5	11490.00	48.9 PK	74.0	-25.1	1.10 H	111	36.8	12.1
6	11490.00	38.4 AV	54.0	-15.6	1.10 H	111	26.3	12.1
7	#17235.00	54.0 PK	68.2	-14.2	1.53 H	133	37.8	16.2
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	#5644.01	58.6 PK	68.2	-9.6	3.53 V	20	57.2	1.4
2	*5745.00	117.0 PK			3.53 V	20	115.3	1.7
3	*5745.00	105.1 AV			3.53 V	20	103.4	1.7
4	#5935.00	49.1 PK	68.2	-19.1	3.53 V	20	47.3	1.8
5	11490.00	48.9 PK	74.0	-25.1	2.34 V	13	36.8	12.1
6	11490.00	37.3 AV	54.0	-16.7	2.34 V	13	25.2	12.1
7	#17235.00	53.3 PK	68.2	-14.9	1.52 V	329	37.1	16.2

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.

RF Mode	TX 802.11ax (HE20)	Channel	CH 157 : 5785 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5591.59	52.8 PK	68.2	-15.4	2.04 H	55	51.5	1.3
2	*5785.00	122.6 PK			2.04 H	55	120.8	1.8
3	*5785.00	110.4 AV			2.04 H	55	108.6	1.8
4	#5935.53	50.4 PK	68.2	-17.8	2.04 H	55	48.6	1.8
5	11570.00	49.5 PK	74.0	-24.5	1.04 H	126	37.5	12.0
6	11570.00	38.9 AV	54.0	-15.1	1.04 H	126	26.9	12.0
7	#17355.00	54.1 PK	68.2	-14.1	1.53 H	138	37.1	17.0
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	#5590.45	50.9 PK	68.2	-17.3	3.62 V	25	49.6	1.3
2	*5785.00	116.9 PK			3.62 V	25	115.1	1.8
3	*5785.00	105.0 AV			3.62 V	25	103.2	1.8
4	#5974.14	50.8 PK	68.2	-17.4	3.62 V	25	49.0	1.8
5	11570.00	48.9 PK	74.0	-25.1	2.40 V	26	36.9	12.0
6	11570.00	37.3 AV	54.0	-16.7	2.40 V	26	25.3	12.0
7	#17355.00	52.6 PK	68.2	-15.6	1.52 V	336	35.6	17.0

Remarks:

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

RF Mode	TX 802.11ax (HE20)	Channel	CH 165 : 5825 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5634.11	53.0 PK	68.2	-15.2	2.06 H	42	51.6	1.4
2	*5825.00	122.5 PK			2.06 H	42	120.7	1.8
3	*5825.00	110.1 AV			2.06 H	42	108.3	1.8
4	#6019.89	51.7 PK	68.2	-16.5	2.06 H	42	49.8	1.9
5	11650.00	49.4 PK	74.0	-24.6	1.07 H	122	37.7	11.7
6	11650.00	38.8 AV	54.0	-15.2	1.07 H	122	27.1	11.7
7	#17475.00	53.8 PK	68.2	-14.4	1.50 H	152	34.9	18.9
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	#5626.27	51.2 PK	68.2	-17.0	3.54 V	14	49.8	1.4
2	*5825.00	116.3 PK			3.54 V	14	114.5	1.8
3	*5825.00	104.7 AV			3.54 V	14	102.9	1.8
4	#5924.20	56.4 PK	68.8	-12.4	3.54 V	14	54.6	1.8
5	11650.00	49.0 PK	74.0	-25.0	2.44 V	35	37.3	11.7
6	11650.00	37.2 AV	54.0	-16.8	2.44 V	35	25.5	11.7
7	#17475.00	52.9 PK	68.2	-15.3	1.51 V	341	34.0	18.9

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.

RF Mode	TX 802.11ax (HE40)	Channel	CH 38 : 5190 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5150.00	63.5 PK	74.0	-10.5	2.17 H	65	62.4	1.1
2	5150.00	53.5 AV	54.0	-0.5	2.17 H	65	52.4	1.1
3	*5190.00	115.2 PK			2.17 H	65	114.2	1.0
4	*5190.00	103.0 AV			2.17 H	65	102.0	1.0
5	#10380.00	45.1 PK	68.2	-23.1	1.08 H	114	34.8	10.3
6	15570.00	54.8 PK	74.0	-19.2	1.52 H	153	42.7	12.1
7	15570.00	43.4 AV	54.0	-10.6	1.52 H	153	31.3	12.1
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	5148.02	54.0 PK	74.0	-20.0	3.58 V	16	52.9	1.1
2	5148.02	43.3 AV	54.0	-10.7	3.58 V	16	42.2	1.1
3	*5190.00	110.6 PK			3.58 V	16	109.6	1.0
4	*5190.00	98.3 AV			3.58 V	16	97.3	1.0
5	#10380.00	46.2 PK	68.2	-22.0	2.32 V	3	35.9	10.3
6	15570.00	51.0 PK	74.0	-23.0	3.50 V	117	38.9	12.1
7	15570.00	37.8 AV	54.0	-16.2	3.50 V	117	25.7	12.1

Remarks:

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

RF Mode	TX 802.11ax (HE40)	Channel	CH 46 : 5230 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5150.00	68.4 PK	74.0	-5.6	2.21 H	61	67.3	1.1
2	5150.00	53.6 AV	54.0	-0.4	2.21 H	61	52.5	1.1
3	*5230.00	117.4 PK			2.21 H	61	116.5	0.9
4	*5230.00	106.6 AV			2.21 H	61	105.7	0.9
5	5353.49	58.0 PK	74.0	-16.0	2.21 H	61	57.2	0.8
6	5353.49	44.8 AV	54.0	-9.2	2.21 H	61	44.0	0.8
7	#10460.00	45.1 PK	68.2	-23.1	1.08 H	103	34.7	10.4
8	15690.00	54.6 PK	74.0	-19.4	1.49 H	160	43.3	11.3
9	15690.00	43.1 AV	54.0	-10.9	1.49 H	160	31.8	11.3
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	*5230.00	113.1 PK			3.63 V	4	112.2	0.9
2	*5230.00	101.6 AV			3.63 V	4	100.7	0.9
3	5352.92	53.5 PK	74.0	-20.5	3.63 V	4	52.7	0.8
4	5352.92	41.5 AV	54.0	-12.5	3.63 V	4	40.7	0.8
5	#10460.00	45.6 PK	68.2	-22.6	2.34 V	26	35.2	10.4
6	15690.00	50.3 PK	74.0	-23.7	3.45 V	133	39.0	11.3
7	15690.00	37.2 AV	54.0	-16.8	3.45 V	133	25.9	11.3

Remarks:

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

RF Mode	TX 802.11ax (HE40)	Channel	CH 151 : 5755 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5649.98	64.1 PK	68.2	-4.1	2.05 H	67	62.7	1.4
2	*5755.00	118.8 PK			2.05 H	67	117.1	1.7
3	*5755.00	107.4 AV			2.05 H	67	105.7	1.7
4	#5935.39	52.0 PK	68.2	-16.2	2.05 H	67	50.2	1.8
5	11510.00	48.7 PK	74.0	-25.3	1.05 H	133	36.6	12.1
6	11510.00	38.3 AV	54.0	-15.7	1.05 H	133	26.2	12.1
7	#17265.00	53.8 PK	68.2	-14.4	1.47 H	165	37.8	16.0
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	#5650.05	54.7 PK	68.2	-13.5	3.64 V	4	53.3	1.4
2	*5755.00	113.1 PK			3.64 V	4	111.4	1.7
3	*5755.00	102.3 AV			3.64 V	4	100.6	1.7
4	#5987.31	52.2 PK	68.2	-16.0	3.64 V	4	50.4	1.8
5	11510.00	49.0 PK	74.0	-25.0	2.42 V	20	36.9	12.1
6	11510.00	37.2 AV	54.0	-16.8	2.42 V	20	25.1	12.1
7	#17265.00	52.3 PK	68.2	-15.9	1.53 V	338	36.3	16.0

Remarks:

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

RF Mode	TX 802.11ax (HE40)	Channel	CH 159 : 5795 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5608.99	53.1 PK	68.2	-15.1	2.09 H	74	51.7	1.4
2	*5795.00	119.7 PK			2.09 H	74	117.8	1.9
3	*5795.00	107.5 AV			2.09 H	74	105.6	1.9
4	#5932.74	54.2 PK	68.2	-14.0	2.09 H	74	52.4	1.8
5	11590.00	49.5 PK	74.0	-24.5	1.01 H	134	37.5	12.0
6	11590.00	38.7 AV	54.0	-15.3	1.01 H	134	26.7	12.0
7	#17385.00	54.4 PK	68.2	-13.8	1.55 H	155	36.6	17.8
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5647.28	53.2 PK	68.2	-15.0	3.55 V	1	51.8	1.4
2	*5795.00	112.8 PK			3.55 V	1	110.9	1.9
3	*5795.00	102.1 AV			3.55 V	1	100.2	1.9
4	#5930.50	52.8 PK	68.2	-15.4	3.55 V	1	51.0	1.8
5	11590.00	49.4 PK	74.0	-24.6	2.44 V	40	37.4	12.0
6	11590.00	37.3 AV	54.0	-16.7	2.44 V	40	25.3	12.0
7	#17385.00	52.7 PK	68.2	-15.5	1.52 V	355	34.9	17.8

Remarks:

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

RF Mode	TX 802.11ax (HE80)	Channel	CH 42 : 5210 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5150.00	65.3 PK	74.0	-8.7	2.14 H	62	64.2	1.1
2	5150.00	53.4 AV	54.0	-0.6	2.14 H	62	52.3	1.1
3	*5210.00	111.3 PK			2.14 H	62	110.3	1.0
4	*5210.00	99.4 AV			2.14 H	62	98.4	1.0
5	5375.86	51.9 PK	74.0	-22.1	2.14 H	62	51.0	0.9
6	5375.86	41.9 AV	54.0	-12.1	2.14 H	62	41.0	0.9
7	#10420.00	45.1 PK	68.2	-23.1	1.02 H	127	34.7	10.4
8	15630.00	53.8 PK	74.0	-20.2	1.53 H	161	42.0	11.8
9	15630.00	42.6 AV	54.0	-11.4	1.53 H	161	30.8	11.8

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	5147.07	58.0 PK	74.0	-16.0	3.55 V	3	56.9	1.1
2	5147.07	43.7 AV	54.0	-10.3	3.55 V	3	42.6	1.1
3	*5210.00	106.2 PK			3.55 V	3	105.2	1.0
4	*5210.00	94.9 AV			3.55 V	3	93.9	1.0
5	5445.74	49.4 PK	74.0	-24.6	3.55 V	3	48.4	1.0
6	5445.74	37.7 AV	54.0	-16.3	3.55 V	3	36.7	1.0
7	#10420.00	46.2 PK	68.2	-22.0	2.27 V	1	35.8	10.4
8	15630.00	50.0 PK	74.0	-24.0	3.44 V	118	38.2	11.8
9	15630.00	37.2 AV	54.0	-16.8	3.44 V	118	25.4	11.8

Remarks:

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

RF Mode	TX 802.11ax (HE80)	Channel	CH 155 : 5775 MHz
Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) Average (AV)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5635.32	67.3 PK	68.2	-0.9	2.01 H	66	65.9	1.4
2	*5775.00	115.7 PK			2.01 H	66	113.9	1.8
3	*5775.00	103.4 AV			2.01 H	66	101.6	1.8
4	#5927.79	61.7 PK	68.2	-6.5	2.01 H	66	59.9	1.8
5	11550.00	50.0 PK	74.0	-24.0	1.10 H	128	37.9	12.1
6	11550.00	39.2 AV	54.0	-14.8	1.10 H	128	27.1	12.1
7	#17325.00	53.4 PK	68.2	-14.8	1.51 H	145	37.0	16.4
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	#5652.71	65.0 PK	70.2	-5.2	3.64 V	12	63.6	1.4
2	*5775.00	110.3 PK			3.64 V	12	108.5	1.8
3	*5775.00	99.2 AV			3.64 V	12	97.4	1.8
4	#5933.24	60.2 PK	68.2	-8.0	3.64 V	12	58.4	1.8
5	11550.00	49.1 PK	74.0	-24.9	2.47 V	33	37.0	12.1
6	11550.00	37.1 AV	54.0	-16.9	2.47 V	33	25.0	12.1
7	#17325.00	53.1 PK	68.2	-15.1	1.52 V	329	36.7	16.4

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.

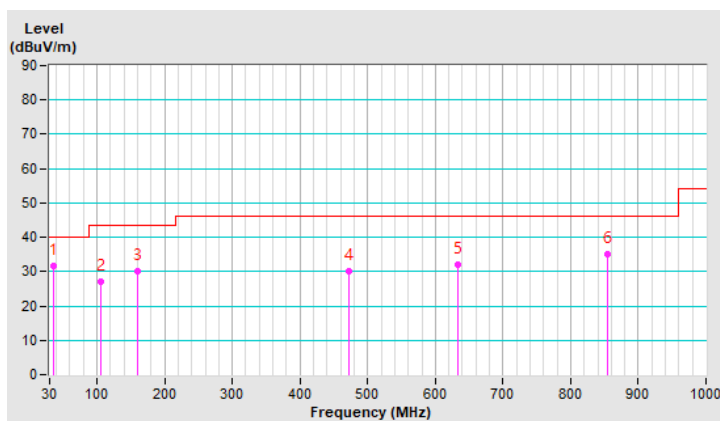
Below 1GHz Data:

RF Mode	TX 802.11a	Channel	CH 165 : 5825 MHz
Frequency Range	9kHz ~ 1GHz	Detector Function	Quasi-Peak (QP)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	35.71	31.5 QP	40.0	-8.5	2.00 H	358	41.2	-9.7
2	105.41	27.2 QP	43.5	-16.3	1.50 H	5	39.2	-12.0
3	159.12	30.0 QP	43.5	-13.5	1.00 H	358	38.4	-8.4
4	471.64	30.1 QP	46.0	-15.9	1.50 H	311	33.9	-3.8
5	634.31	32.1 QP	46.0	-13.9	1.50 H	298	32.5	-0.4
6	855.37	35.1 QP	46.0	-10.9	1.50 H	15	32.0	3.1

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit of frequency range 30MHz~1000MHz.
5. The emission levels were very low against the limit of frequency range 9kHz~30MHz: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value to be report.

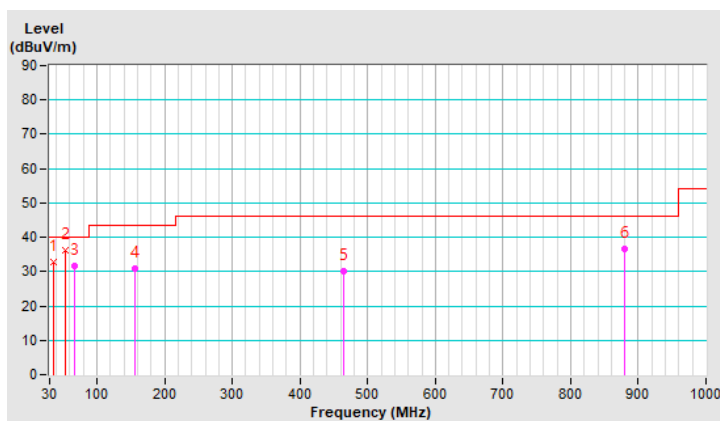


RF Mode	TX 802.11a	Channel	CH 165 : 5825 MHz
Frequency Range	9kHz ~ 1GHz	Detector Function	Quasi-Peak (QP)

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	36.41	32.9 QP	40.0	-7.1	1.00 V	5	42.5	-9.6
2	52.41	36.2 QP	40.0	-3.8	1.50 V	350	45.1	-8.9
3	67.60	31.7 QP	40.0	-8.3	1.00 V	155	42.2	-10.5
4	155.31	31.0 QP	43.5	-12.5	2.00 V	110	39.5	-8.5
5	464.30	30.2 QP	46.0	-15.8	1.50 V	188	34.2	-4.0
6	880.61	36.5 QP	46.0	-9.5	2.00 V	106	32.9	3.6

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



4.2 Conducted Emission Measurement

4.2.1 Limits of Conducted Emission Measurement

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

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

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

4.2.2 Test Instruments

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver R&S	ESCS 30	847124/029	Oct. 20, 2020	Oct. 19, 2021
Line-Impedance Stabilization Network (for EUT) R&S	ESH3-Z5	848773/004	Oct. 27, 2020	Oct. 26, 2021
Line-Impedance Stabilization Network (for Peripheral) R&S	ESH3-Z5	835239/001	Mar. 19, 2020	Mar. 18, 2021
50 ohms Terminator	50	3	Oct. 26, 2020	Oct. 25, 2021
RF Cable	5D-FB	COCCAB-001	Sep. 26, 2020	Sep. 25, 2021
Fixed attenuator EMCI	STI02-2200-10	005	Aug. 29, 2020	Aug. 28, 2021
Software BVADT	BVADT_Cond_V7.3.7.4	NA	NA	NA

Note:

1. The calibration interval of the above test instruments are 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in Conduction 1.
- 3 Tested Date: Jan. 30, 2021

4.2.3 Test Procedure

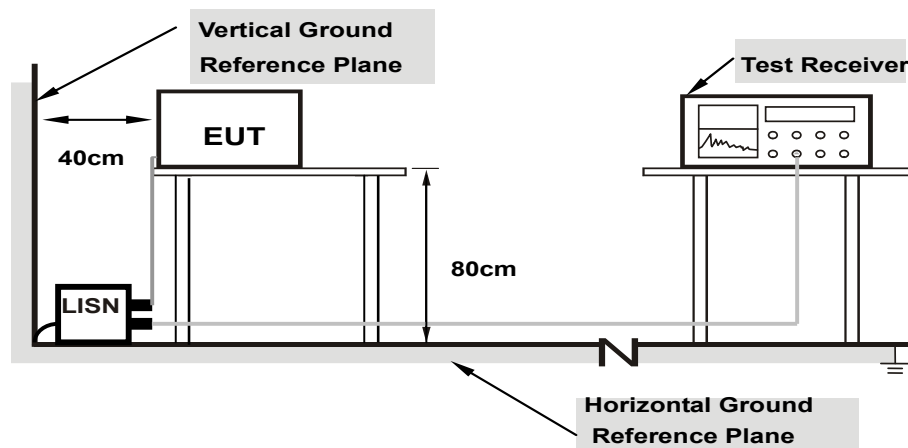
- The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance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

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

4.2.4 Deviation from Test Standard

No deviation.

4.2.5 Test Setup



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

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

4.2.6 EUT Operating Condition

Same as 4.1.6.

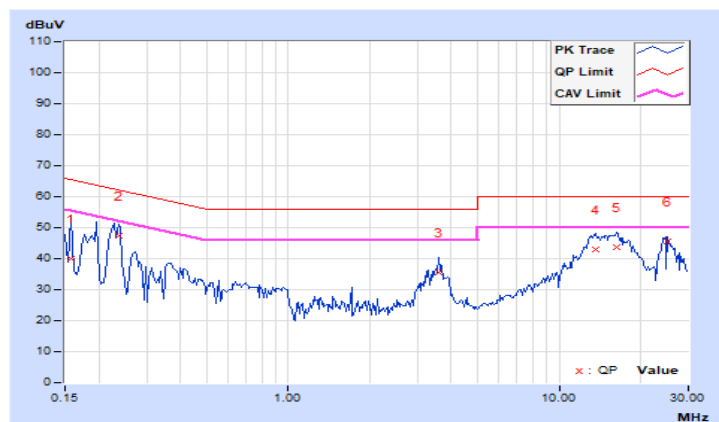
4.2.7 Test Results

RF Mode	TX 802.11a	Channel	CH 165 : 5825 MHz
Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz

Phase Of Power : Line (L)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15781	9.95	29.89	5.97	39.84	15.92	65.58	55.58	-25.74	-39.66
2	0.23594	9.97	37.50	27.78	47.47	37.75	62.24	52.24	-14.77	-14.49
3	3.58203	10.15	25.45	13.72	35.60	23.87	56.00	46.00	-20.40	-22.13
4	13.57813	10.74	32.34	26.28	43.08	37.02	60.00	50.00	-16.92	-12.98
5	16.27344	10.90	32.79	27.26	43.69	38.16	60.00	50.00	-16.31	-11.84
6	25.15625	11.23	34.41	32.89	45.64	44.12	60.00	50.00	-14.36	-5.88

Remarks:

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

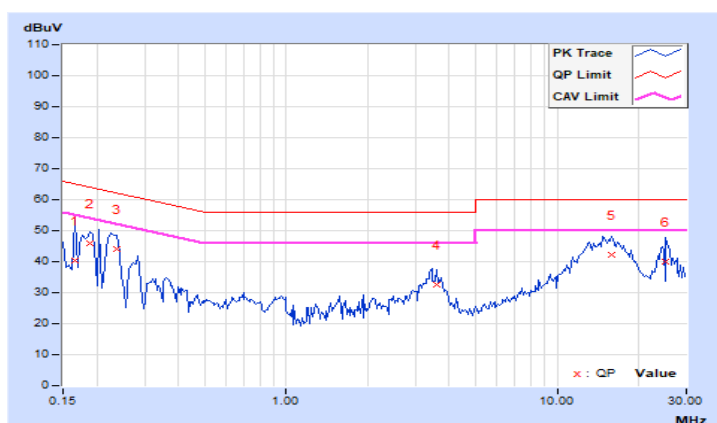


RF Mode	TX 802.11a	Channel	CH 165 : 5825 MHz
Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz

Phase Of Power : Neutral (N)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.16562	9.93	30.58	6.62	40.51	16.55	65.18	55.18	-24.67	-38.63
2	0.18906	9.94	35.97	21.93	45.91	31.87	64.08	54.08	-18.17	-22.21
3	0.23594	9.95	34.21	21.74	44.16	31.69	62.24	52.24	-18.08	-20.55
4	3.59766	10.10	22.47	13.09	32.57	23.19	56.00	46.00	-23.43	-22.81
5	15.89844	10.67	31.68	26.65	42.35	37.32	60.00	50.00	-17.65	-12.68
6	25.14844	10.91	29.10	18.42	40.01	29.33	60.00	50.00	-19.99	-20.67

Remarks:

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



4.3 Transmit Power Measurement

4.3.1 Limits of Transmit Power Measurement

Operation Band	EUT Category		Limit
U-NII-1		Outdoor Access Point	1 Watt (30 dBm) (Max. e.i.r.p $\leq$ 125mW(21 dBm) at any elevation angle above 30 degrees as measured from the horizon)
		Fixed point-to-point Access Point	1 Watt (30 dBm)
	√	Indoor Access Point	1 Watt (30 dBm)
		Client device	250mW (24 dBm)
U-NII-2A			250mW (24 dBm) or 11 dBm+10 log B*
U-NII-2C			250mW (24 dBm) or 11 dBm+10 log B*
U-NII-3		√	1 Watt (30 dBm)

*B is the 26 dB emission bandwidth in megahertz

Per KDB 662911 Method of conducted output power measurement on IEEE 802.11 devices,

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

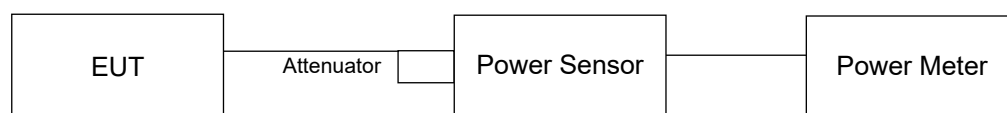
Array Gain = 0 dB (i.e., no array gain) for channel widths ≥ 40 MHz for any N_{ANT} ;

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

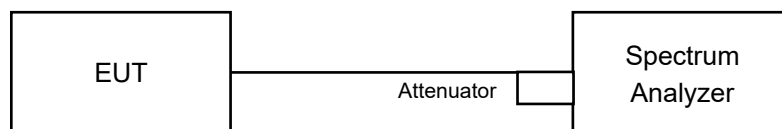
For power measurements on all other devices: Array Gain = $10 \log(N_{ANT}/N_{SS})$ dB.

4.3.2 Test Setup

FOR POWER OUTPUT MEASUREMENT



FOR 26dB OCCUPIED BANDWIDTH



4.3.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.3.4 Test Procedure

FOR POWER OUTPUT MEASUREMENT

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.

FOR 26dB OCCUPIED BANDWIDTH

1. Set RBW = approximately 1% of the emission bandwidth.
2. Set the VBW > RBW.
3. Detector = Peak.
4. Trace mode = max hold.
5. Measure the maximum width of the emission that is 26 dB down from the peak of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.

4.3.5 Deviation from Test Standard

No deviation.

4.3.6 EUT Operating Condition

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

4.3.7 Test Results

CDD Mode

802.11a

Chan.	Chan. Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
36	5180	20.37	20.88	231.355	23.64	30	Pass
40	5200	22.44	23.12	380.504	25.80	30	Pass
48	5240	21.71	22.39	321.632	25.07	30	Pass
149	5745	22.38	22.31	343.197	25.36	30	Pass
157	5785	22.73	22.84	379.809	25.80	30	Pass
165	5825	23.61	22.95	426.857	26.30	30	Pass

802.11ac (VHT20)

Chan.	Chan. Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
36	5180	19.68	20.25	198.822	22.98	30	Pass
40	5200	21.90	22.51	333.12	25.23	30	Pass
48	5240	21.11	21.62	274.333	24.38	30	Pass
149	5745	21.76	21.70	297.879	24.74	30	Pass
157	5785	22.21	22.26	334.609	25.25	30	Pass
165	5825	23.11	22.80	395.191	25.97	30	Pass

802.11ac (VHT40)

Chan.	Chan. Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
38	5190	17.76	17.97	122.365	20.88	30	Pass
46	5230	21.08	21.55	271.122	24.33	30	Pass
151	5755	22.48	22.58	358.145	25.54	30	Pass
159	5795	23.12	22.91	400.55	26.03	30	Pass

802.11ac (VHT80)

Chan.	Chan. Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
42	5210	16.81	17.46	103.692	20.16	30	Pass
155	5775	20.26	20.41	216.07	23.35	30	Pass

802.11ax (HE20)

Chan.	Chan. Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
36	5180	19.91	20.51	210.409	23.23	30	Pass
40	5200	22.10	22.77	351.415	25.46	30	Pass
48	5240	21.32	21.88	289.689	24.62	30	Pass
149	5745	22.01	21.98	316.616	25.01	30	Pass
157	5785	22.44	22.51	353.626	25.49	30	Pass
165	5825	23.36	23.01	416.757	26.20	30	Pass

802.11ax (HE40)

Chan.	Chan. Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
38	5190	17.98	18.22	129.18	21.11	30	Pass
46	5230	21.33	21.78	286.492	24.57	30	Pass
151	5755	22.72	22.79	377.176	25.77	30	Pass
159	5795	23.38	23.16	424.785	26.28	30	Pass

802.11ax (HE80)

Chan.	Chan. Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
42	5210	17.04	17.66	108.927	20.37	30	Pass
155	5775	20.52	20.61	227.8	23.58	30	Pass

Beamforming Mode

802.11ac (VHT20)

Chan.	Chan. Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
36	5180	19.68	20.25	198.822	22.98	27.83	Pass
40	5200	21.90	22.51	333.12	25.23	27.83	Pass
48	5240	21.11	21.62	274.333	24.38	27.83	Pass
149	5745	21.76	21.70	297.879	24.74	27.83	Pass
157	5785	22.21	22.26	334.609	25.25	27.83	Pass
165	5825	23.11	22.80	395.191	25.97	27.83	Pass

Note: The directional gain = $10 \log[(10^{G_{0/20}} + 10^{G_{1/20}})^2 / 2]$ = 8.17 dBi > 6 dBi , so the power limit shall be reduced to $30-(8.17-6) = 27.83$ dBm.

802.11ac (VHT40)

Chan.	Chan. Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
38	5190	17.76	17.97	122.365	20.88	27.83	Pass
46	5230	21.08	21.55	271.122	24.33	27.83	Pass
151	5755	22.48	22.58	358.145	25.54	27.83	Pass
159	5795	23.12	22.91	400.55	26.03	27.83	Pass

Note: The directional gain = $10 \log[(10^{G_{0/20}} + 10^{G_{1/20}})^2 / 2]$ = 8.17 dBi > 6 dBi , so the power limit shall be reduced to $30-(8.17-6) = 27.83$ dBm.

802.11ac (VHT80)

Chan.	Chan. Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
42	5210	16.81	17.46	103.692	20.16	27.83	Pass
155	5775	20.26	20.41	216.07	23.35	27.83	Pass

Note: The directional gain = $10 \log[(10^{G_{0/20}} + 10^{G_{1/20}})^2 / 2]$ = 8.17 dBi > 6 dBi , so the power limit shall be reduced to $30-(8.17-6) = 27.83$ dBm.

802.11ax (HE20)

Chan.	Chan. Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
36	5180	19.91	20.51	210.409	23.23	27.83	Pass
40	5200	22.10	22.77	351.415	25.46	27.83	Pass
48	5240	21.32	21.88	289.689	24.62	27.83	Pass
149	5745	22.01	21.98	316.616	25.01	27.83	Pass
157	5785	22.44	22.51	353.626	25.49	27.83	Pass
165	5825	23.36	23.01	416.757	26.20	27.83	Pass

Note: The directional gain = $10 \log[(10^{G_{0/20}} + 10^{G_{1/20}})^2 / 2]$ = 8.17 dBi > 6 dBi , so the power limit shall be reduced to $30-(8.17-6) = 27.83$ dBm.

802.11ax (HE40)

Chan.	Chan. Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
38	5190	17.98	18.22	129.18	21.11	27.83	Pass
46	5230	21.33	21.78	286.492	24.57	27.83	Pass
151	5755	22.72	22.79	377.176	25.77	27.83	Pass
159	5795	23.38	23.16	424.785	26.28	27.83	Pass

Note: The directional gain = $10 \log[(10^{G0/20} + 10^{G1/20})^2 / 2] = 8.17 \text{ dBi} > 6 \text{ dBi}$, so the power limit shall be reduced to $30-(8.17-6) = 27.83 \text{ dBm}$.

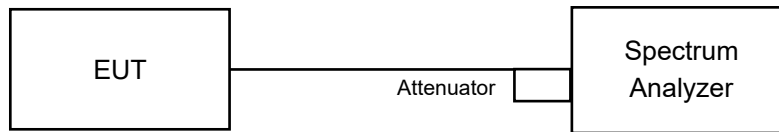
802.11ax (HE80)

Chan.	Chan. Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
42	5210	17.04	17.66	108.927	20.37	27.83	Pass
155	5775	20.52	20.61	227.8	23.58	27.83	Pass

Note: The directional gain = $10 \log[(10^{G0/20} + 10^{G1/20})^2 / 2] = 8.17 \text{ dBi} > 6 \text{ dBi}$, so the power limit shall be reduced to $30-(8.17-6) = 27.83 \text{ dBm}$.

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	Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
36	5180	16.44	17.04
40	5200	18.36	17.83
48	5240	17.16	18.12
149	5745	28.08	18.60
157	5785	29.72	25.74
165	5825	41.01	32.40

802.11ax (HE20)

Channel	Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
36	5180	19.32	19.32
40	5200	19.56	19.80
48	5240	19.68	19.32
149	5745	22.52	19.56
157	5785	24.12	23.16
165	5825	47.82	29.96

802.11ax (HE40)

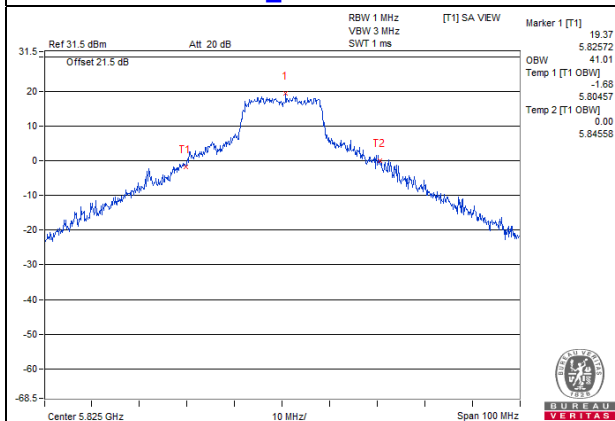
Channel	Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
38	5190	38.16	37.92
46	5230	38.40	38.16
151	5755	46.08	52.80
159	5795	50.40	63.70

802.11ax (HE80)

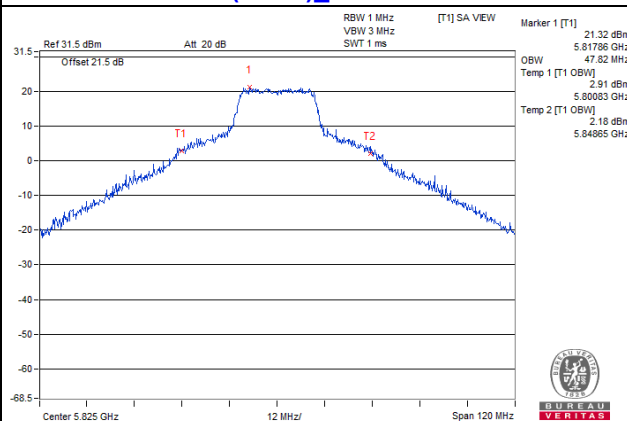
Channel	Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
42	5210	77.28	77.28
155	5775	81.12	98.40

Spectrum Plot of Max. Value

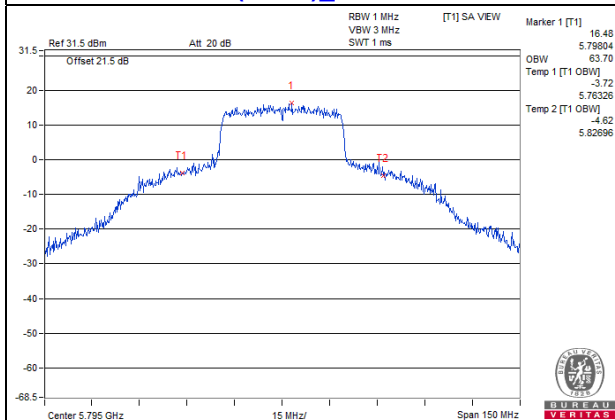
802.11a_Chain 0 / CH165



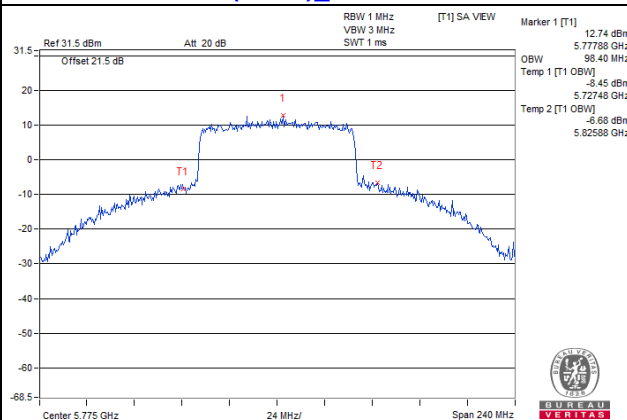
802.11ax (HE20)_Chain 0 / CH165



802.11ax (HE40)_Chain 1 / CH159

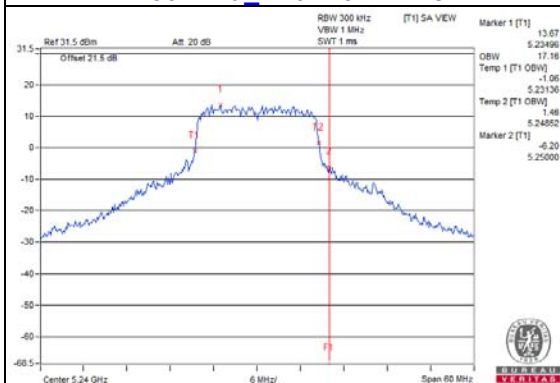


802.11ax (HE80)_Chain 1 / CH155

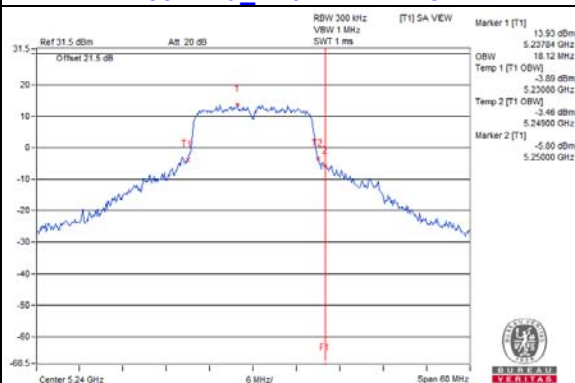


**Spectrum Plot for near by DFS band
(DFS is required, if 99% OCP straddle into U-NII-2A band)**

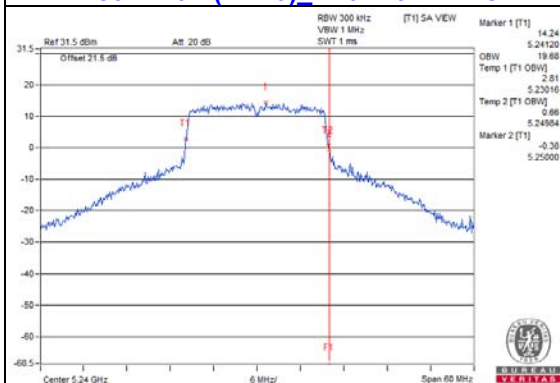
802.11a_Chain 0 / CH48



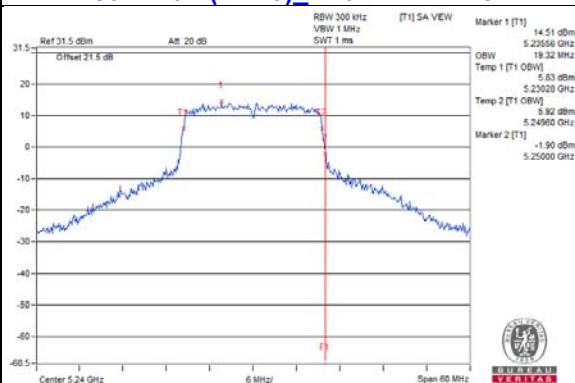
802.11a_Chain 1 / CH48



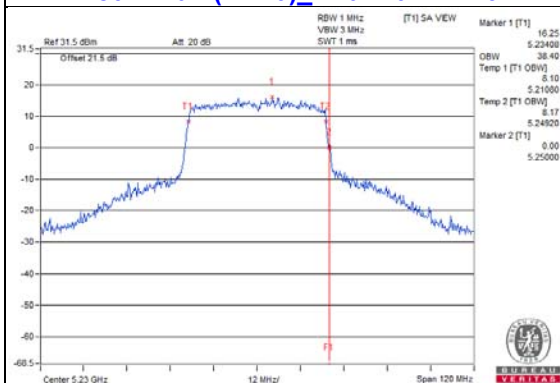
802.11ax (HE20)_Chain 0 / CH48



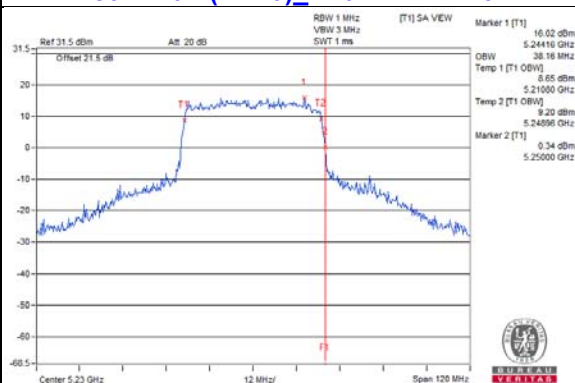
802.11ax (HE20)_Chain 1 / CH48



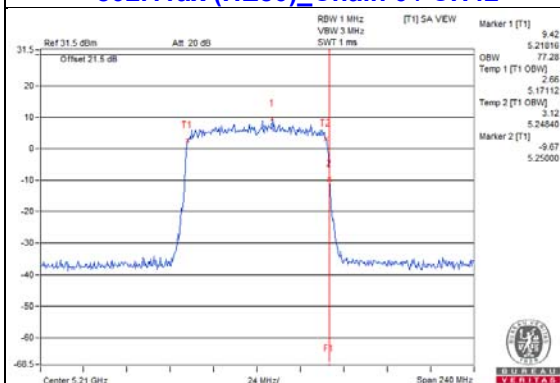
802.11ax (HE40)_Chain 0 / CH46



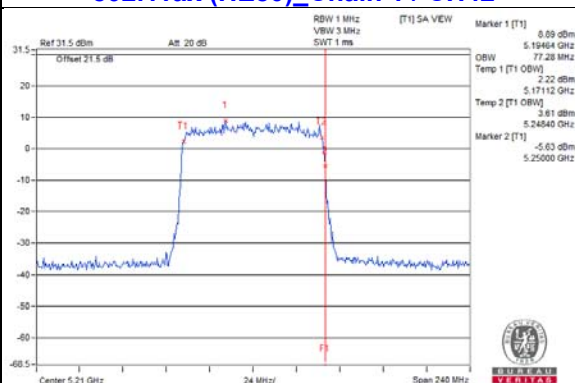
802.11ax (HE40)_Chain 1 / CH46



802.11ax (HE80)_Chain 0 / CH42

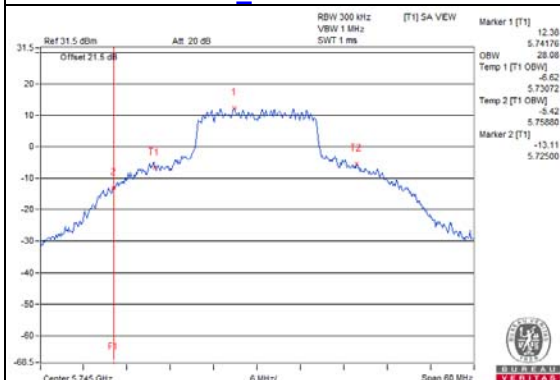


802.11ax (HE80)_Chain 1 / CH42

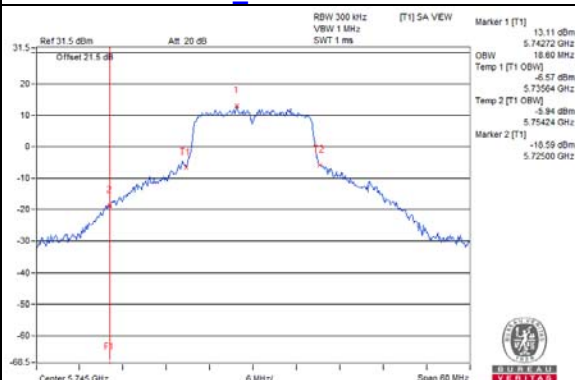


**Spectrum Plot for near by DFS band
(DFS is required, if 99% OCP straddle into U-NII-2C band)**

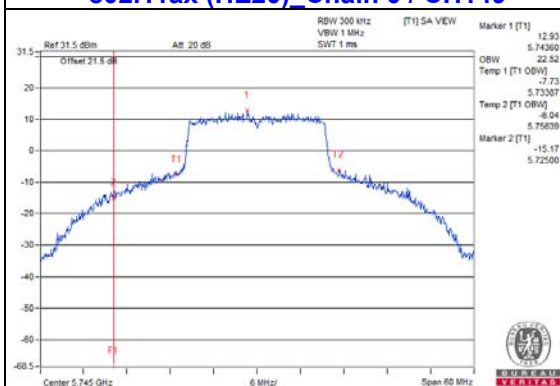
802.11a_Chain 0 / CH149



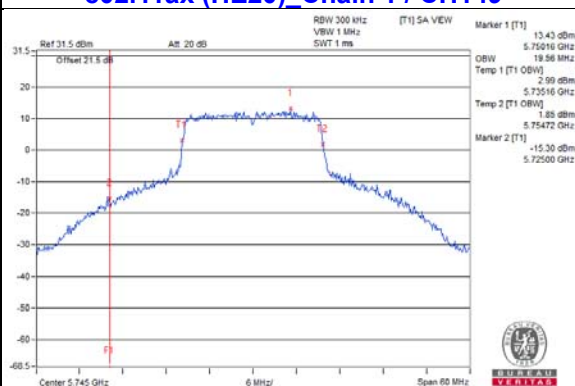
802.11a_Chain 1 / CH149



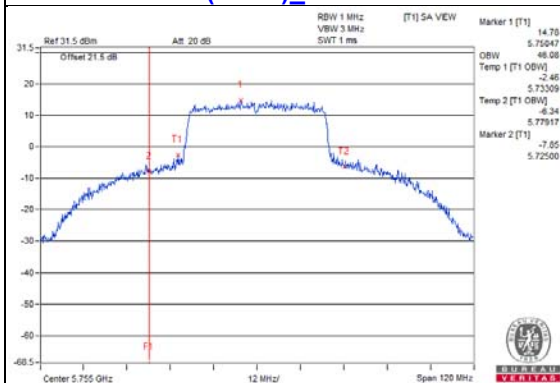
802.11ax (HE20)_Chain 0 / CH149



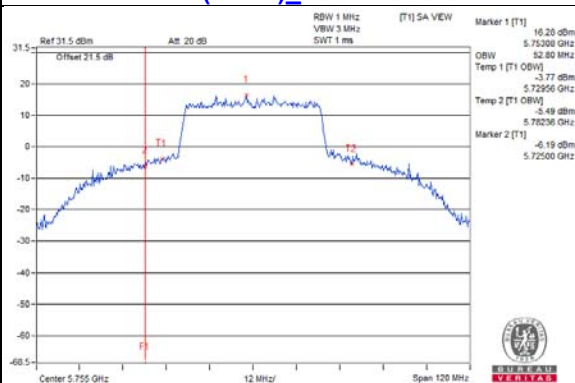
802.11ax (HE20)_Chain 1 / CH149



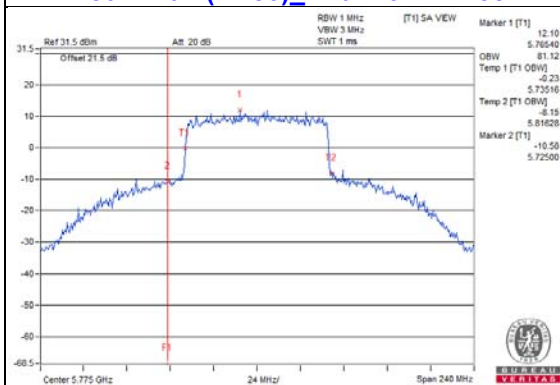
802.11ax (HE40)_Chain 0 / CH151



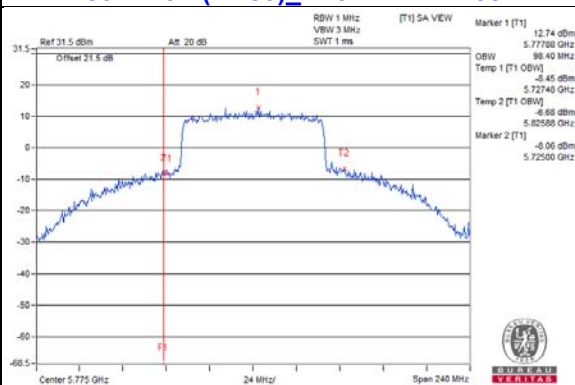
802.11ax (HE40)_Chain 1 / CH151



802.11ax (HE80)_Chain 0 / CH155



802.11ax (HE80)_Chain 1 / CH155

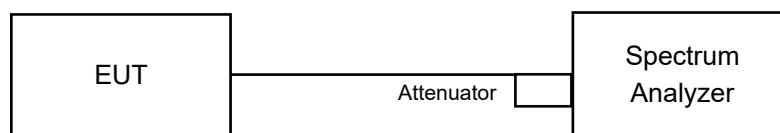


4.5 Peak Power Spectral Density Measurement

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-2

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

For U-NII-3 band:

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 $BWCF = 10\log(500\text{kHz}/300\text{kHz})$
5. Sweep time = auto, trigger set to “free run”.
6. Trace average at least 100 traces in power averaging mode.
7. Record the max value and add 10 log (1/duty cycle)

4.5.5 Deviation from Test Standard

No deviation.

4.5.6 EUT Operating Condition

Same as Item 4.3.6.

4.5.7 Test Results

For U-NII-1 band:

CDD Mode

802.11a

Chan.	Chan. Freq. (MHz)	PSD w/o Duty Factor (dBm/MHz)		Duty Factor (dB)	Total PSD (dBm/MHz)	Max. PSD Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1				
36	5180	5.87	5.88	0.22	9.11	14.83	Pass
40	5200	8.91	7.89	0.22	11.67	14.83	Pass
48	5240	7.88	8.59	0.22	11.48	14.83	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 = $10 \log[(10^{G0/20} + 10^{G1/20})^2 / 2] = 8.17 \text{ dBi} > 6 \text{ dBi}$, so the power density limit shall be reduced to $17 - (8.17 - 6) = 14.83 \text{ dBm}$.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ax (HE20)

Chan.	Chan. Freq. (MHz)	PSD w/o Duty Factor (dBm/MHz)		Duty Factor (dB)	Total PSD (dBm/MHz)	Max. PSD Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1				
36	5180	5.59	5.20	0.19	8.60	14.83	Pass
40	5200	6.20	6.27	0.19	9.44	14.83	Pass
48	5240	6.56	7.42	0.19	10.21	14.83	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 = $10 \log[(10^{G0/20} + 10^{G1/20})^2 / 2] = 8.17 \text{ dBi} > 6 \text{ dBi}$, so the power density limit shall be reduced to $17 - (8.17 - 6) = 14.83 \text{ dBm}$.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ax (HE40)

Chan.	Chan. Freq. (MHz)	PSD w/o Duty Factor (dBm/MHz)		Duty Factor (dB)	Total PSD (dBm/MHz)	Max. PSD Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1				
38	5190	-0.13	0.33	0.21	3.33	14.83	Pass
46	5230	4.04	3.86	0.21	7.17	14.83	Pass

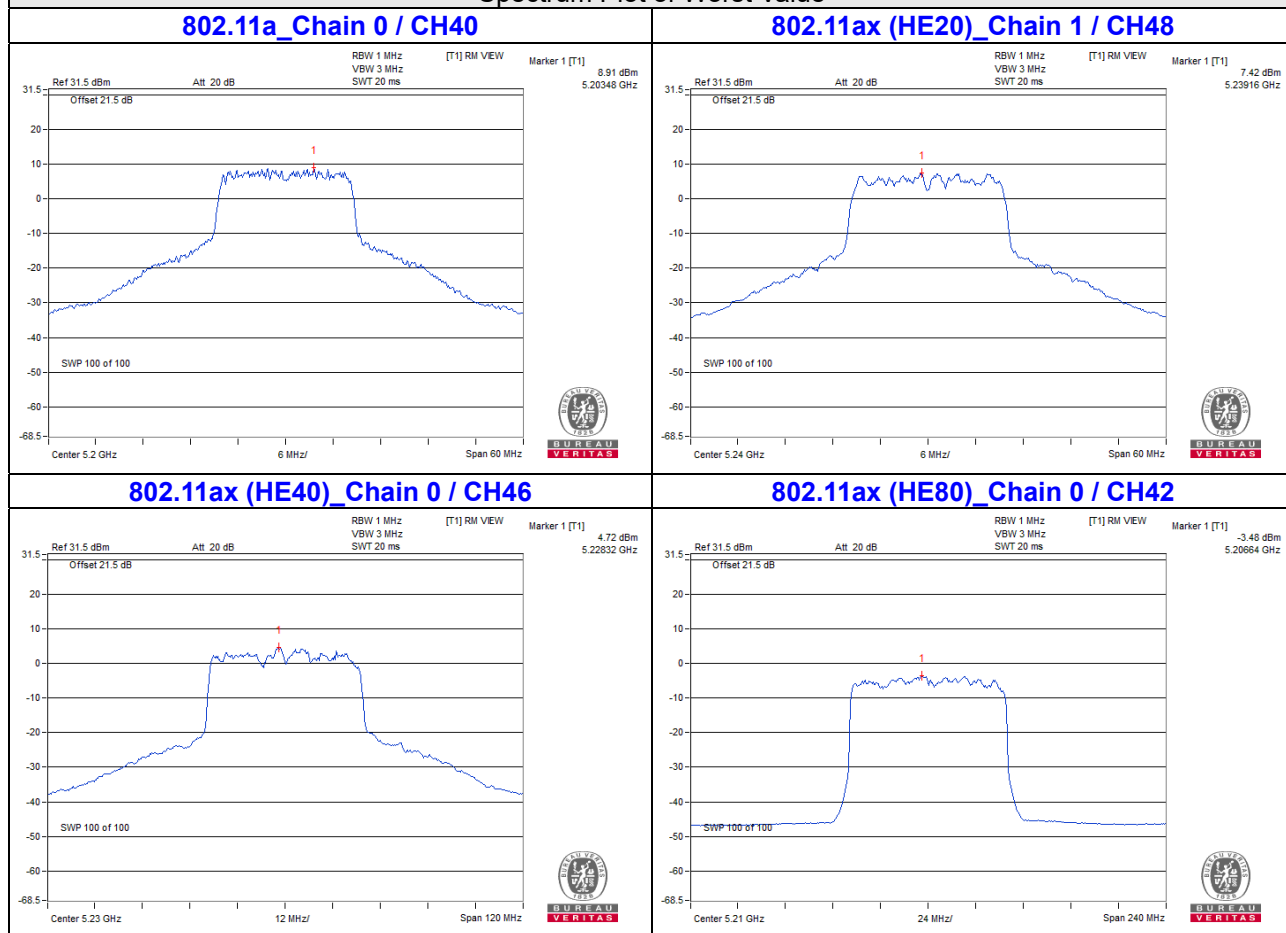
- Note: 1. Method a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. The directional gain = $10 \log[(10^{G0/20} + 10^{G1/20})^2 / 2] = 8.17 \text{ dBi} > 6 \text{ dBi}$, so the power density limit shall be reduced to $17 - (8.17 - 6) = 14.83 \text{ dBm}$.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ax (HE80)

Chan.	Chan. Freq. (MHz)	PSD w/o Duty Factor (dBm/MHz)		Duty Factor (dB)	Total PSD (dBm/MHz)	Max. PSD Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1				
42	5210	-3.48	-3.91	0.21	-0.47	14.83	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 = $10 \log[(10^{G0/20} + 10^{G1/20})^2 / 2] = 8.17 \text{ dBi} > 6 \text{ dBi}$, so the power density limit shall be reduced to $17 - (8.17 - 6) = 14.83 \text{ dBm}$.
3. Refer to section 3.3 for duty cycle spectrum plot.

Spectrum Plot of Worst Value



For U-NII-3 band:

CDD Mode

802.11a

Chan.	Chan. Freq. (MHz)	PSD w/o Duty Factor (dBm/300kHz)		Duty Factor (dB)	Total PSD (dBm/300kHz)	Total PSD (dBm/500kHz)	PSD Limit (dBm/500kHz)	Pass / Fail
		Chain 0	Chain 1					
149	5745	-2.32	-1.00	0.22	1.63	3.85	27.83	Pass
157	5785	-1.20	-0.34	0.22	2.49	4.71	27.83	Pass
165	5825	-0.52	-0.22	0.22	2.87	5.09	27.83	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 = $10 \log[(10^{G0/20} + 10^{G1/20})^2 / 2] = 8.17 \text{ dBi} > 6 \text{ dBi}$, so the power density limit shall be reduced to $30 - (8.17 - 6) = 27.83 \text{ dBm}$.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ax (HE20)

Chan.	Chan. Freq. (MHz)	PSD w/o Duty Factor (dBm/300kHz)		Duty Factor (dB)	Total PSD (dBm/300kHz)	Total PSD (dBm/500kHz)	PSD Limit (dBm/500kHz)	Pass / Fail
		Chain 0	Chain 1					
149	5745	-4.59	-3.02	0.19	-0.53	1.69	27.83	Pass
157	5785	-3.23	-3.02	0.19	0.08	2.30	27.83	Pass
165	5825	-2.52	-2.40	0.19	0.74	2.96	27.83	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 = $10 \log[(10^{G0/20} + 10^{G1/20})^2 / 2] = 8.17 \text{ dBi} > 6 \text{ dBi}$, so the power density limit shall be reduced to $30 - (8.17 - 6) = 27.83 \text{ dBm}$.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ax (HE40)

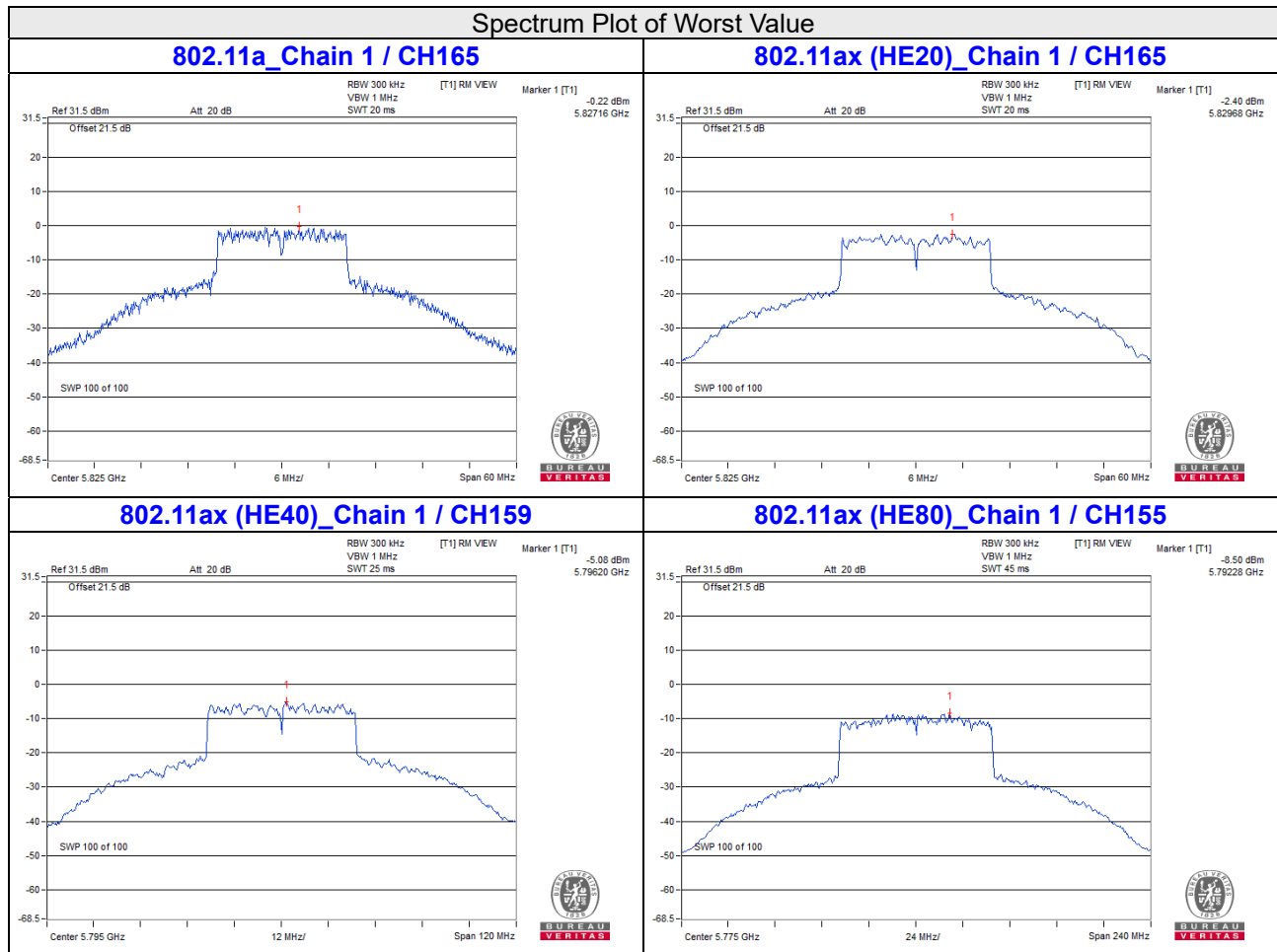
Chan.	Chan. Freq. (MHz)	PSD w/o Duty Factor (dBm/300kHz)		Duty Factor (dB)	Total PSD (dBm/300kHz)	Total PSD (dBm/500kHz)	PSD Limit (dBm/500kHz)	Pass / Fail
		Chain 0	Chain 1					
151	5755	-7.03	-5.47	0.21	-2.96	-0.74	27.83	Pass
159	5795	-5.95	-5.08	0.21	-2.27	-0.05	27.83	Pass

- 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 = $10 \log[(10^{G0/20} + 10^{G1/20})^2 / 2] = 8.17 \text{ dBi} > 6 \text{ dBi}$, so the power density limit shall be reduced to $30 - (8.17 - 6) = 27.83 \text{ dBm}$.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ax (HE80)

Chan.	Chan. Freq. (MHz)	PSD w/o Duty Factor (dBm/300kHz)		Duty Factor (dB)	Total PSD (dBm/300kHz)	Total PSD (dBm/500kHz)	PSD Limit (dBm/500kHz)	Pass / Fail
		Chain 0	Chain 1					
155	5775	-9.48	-8.50	0.21	-5.74	-3.52	27.83	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 = $10 \log[(10^{G0/20} + 10^{G1/20})^2 / 2] = 8.17 \text{ dBi} > 6 \text{ dBi}$, so the power density limit shall be reduced to $30 - (8.17 - 6) = 27.83 \text{ dBm}$.
3. Refer to section 3.3 for duty cycle spectrum plot.

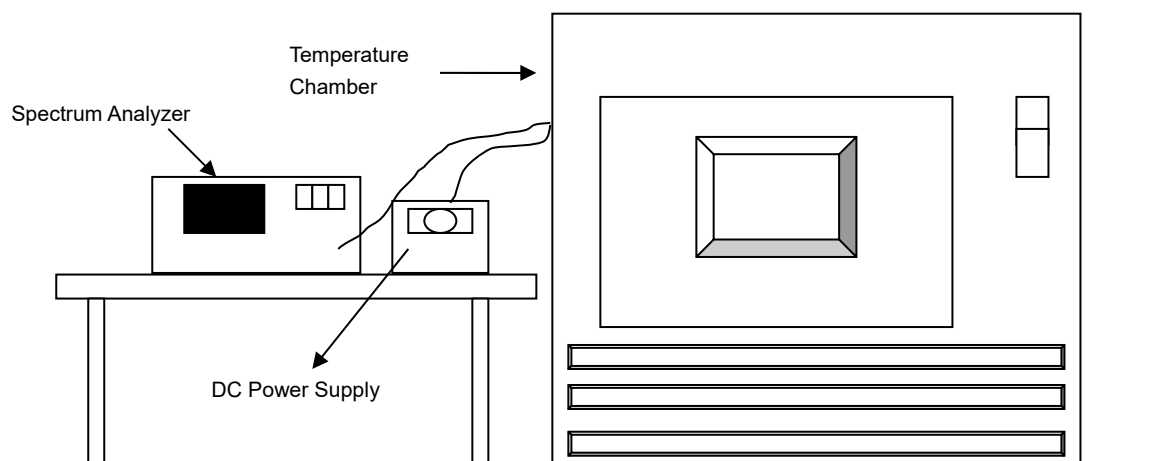


4.6 Frequency Stability Measurement

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

- The EUT was placed inside the environmental test chamber and powered by nominal DC voltage.
- Turn the EUT on and couple its output to a spectrum analyzer.
- Turn the EUT off and set the chamber to the highest temperature specified.
- 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.
- Repeat step (d) with the temperature chamber set to the next desired temperature until measurements down to the lowest specified temperature have been completed.
- 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. (°C)	Power Supply (Vdc)	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	54	5179.9781	Pass	5179.9789	Pass	5179.9806	Pass	5179.9825	Pass
30	54	5180.0178	Pass	5180.0184	Pass	5180.0192	Pass	5180.0193	Pass
20	54	5180.0035	Pass	5180.0011	Pass	5180.0016	Pass	5180.0004	Pass
10	54	5179.9881	Pass	5179.9903	Pass	5179.9894	Pass	5179.9871	Pass
0	54	5179.9741	Pass	5179.9771	Pass	5179.9751	Pass	5179.9742	Pass

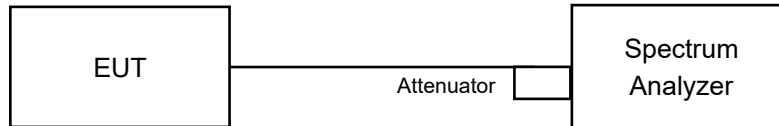
Frequency Stability Versus Voltage									
Operating Frequency: 5180 MHz									
TEMP. (°C)	Power Supply (Vdc)	0 Minute		2 Minutes		5 Minutes		10 Minutes	
		Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail
20	62.1	5180.0041	Pass	5180.0002	Pass	5180.0014	Pass	5179.9998	Pass
	54	5180.0035	Pass	5180.0011	Pass	5180.0016	Pass	5180.0004	Pass
	45.9	5180.0027	Pass	5180.0002	Pass	5180.0021	Pass	5180.001	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

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

4.7.5 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	16.38	16.34	0.5	Pass
157	5785	15.79	15.79	0.5	Pass
165	5825	16.06	15.84	0.5	Pass

802.11ax (HE20)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
149	5745	18.31	18.48	0.5	Pass
157	5785	17.29	18.44	0.5	Pass
165	5825	18.18	18.6	0.5	Pass

802.11ax (HE40)

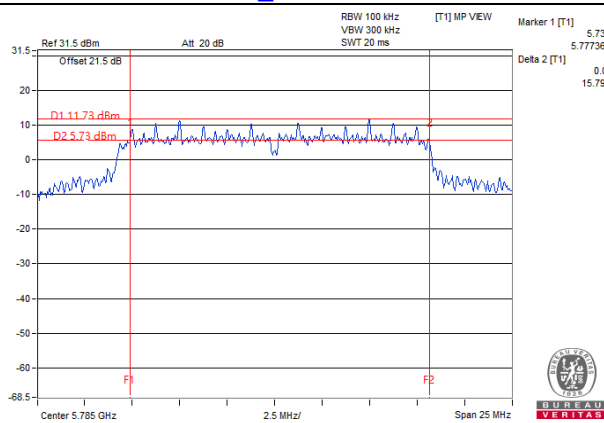
Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
151	5755	37.75	37.96	0.5	Pass
159	5795	37.94	37.16	0.5	Pass

802.11ax (HE80)

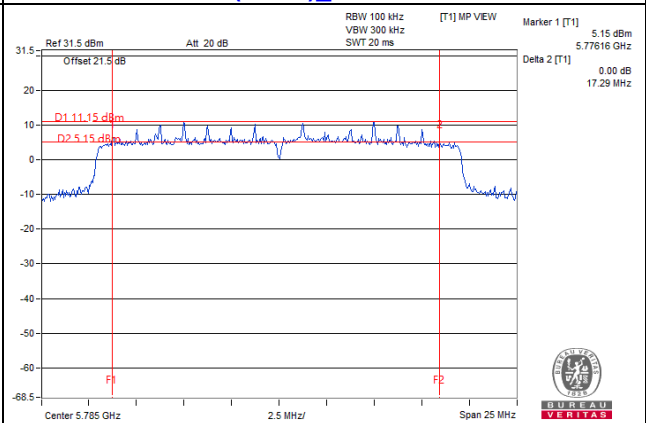
Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
155	5775	75.35	75.43	0.5	Pass

Spectrum Plot of Worst Value

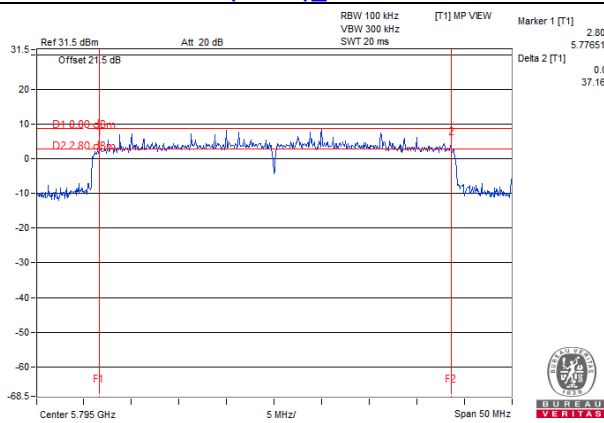
802.11a_Chain 0 / CH157



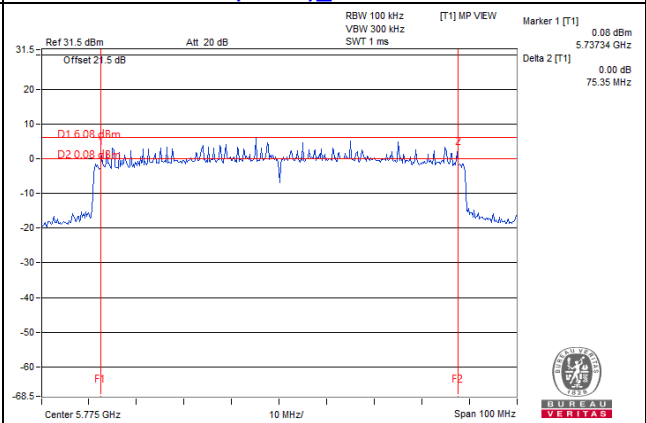
802.11ax (HE20)_Chain 0 / CH157



802.11ax (HE40)_Chain 1 / CH159



802.11ax (HE80)_Chain 0 / CH155



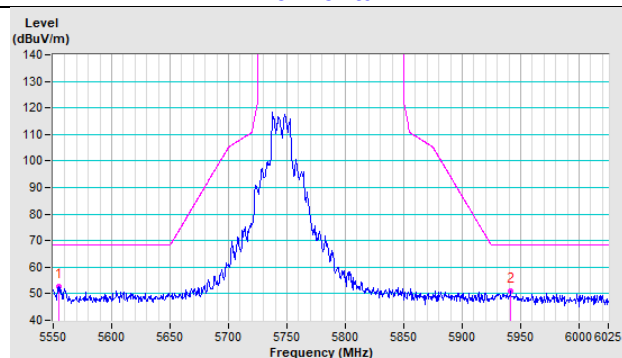
5 Pictures of Test Arrangements

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

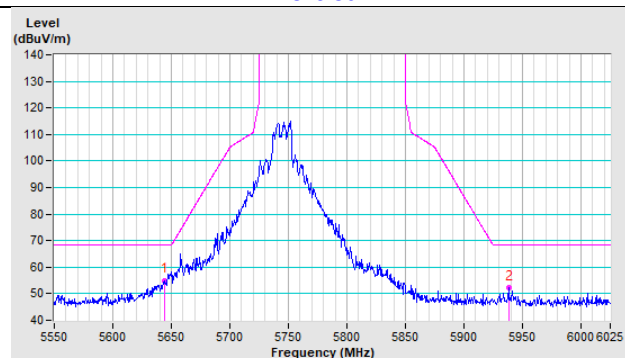
Annex A - Radiated Out of Band Emission (OOBE) Measurement (For U-NII-3 band)

802.11a CH 149 : 5745 MHz

Horizontal

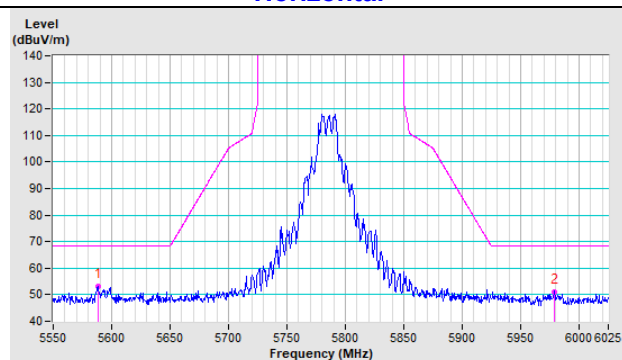


Vertical

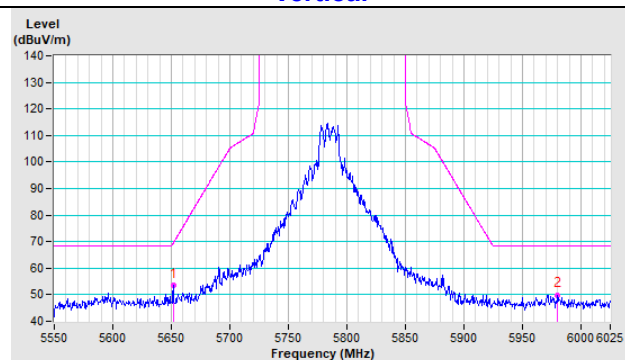


802.11a CH 157 : 5785 MHz

Horizontal

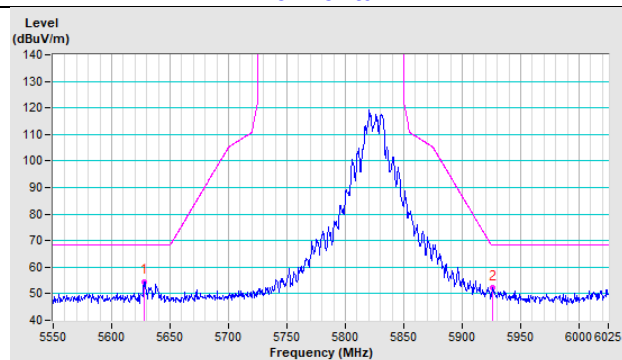


Vertical

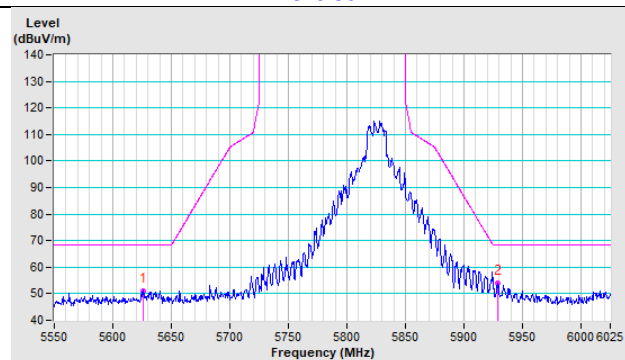


802.11a CH 165 : 5825 MHz

Horizontal

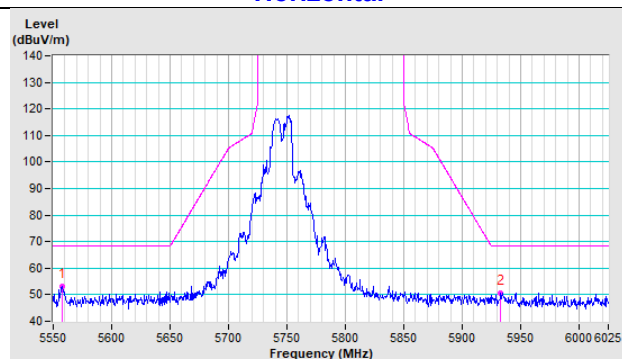


Vertical

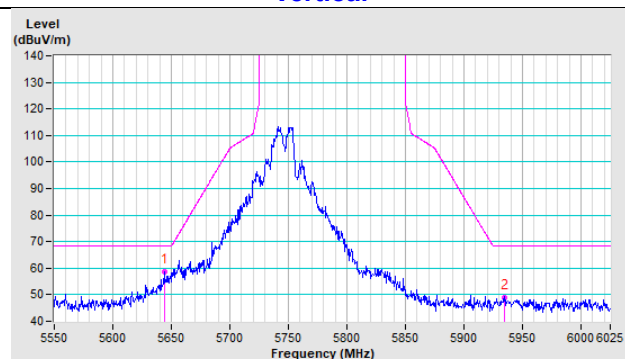


802.11ax (HE20) CH 149 : 5745 MHz

Horizontal

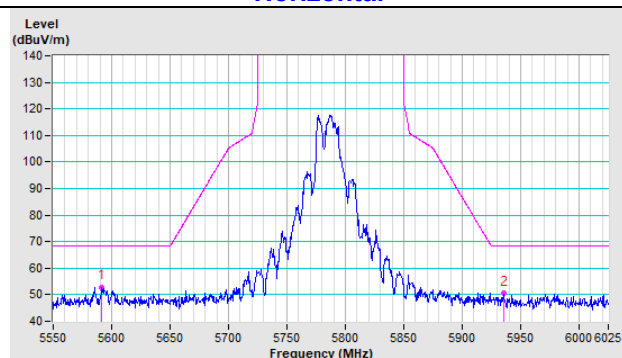


Vertical

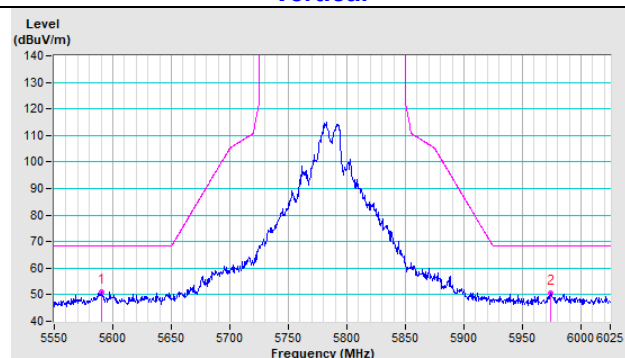


802.11ax (HE20) CH 157 : 5785 MHz

Horizontal

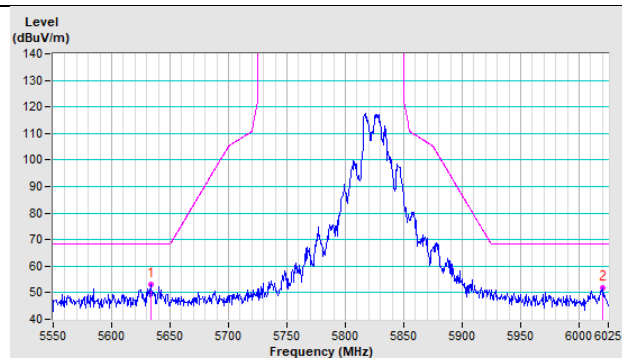


Vertical

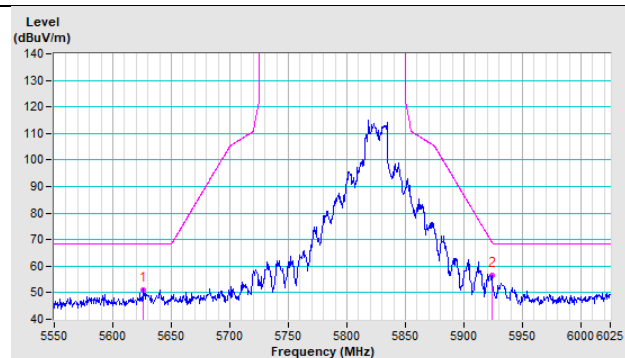


802.11ax (HE20) CH 165 : 5825 MHz

Horizontal

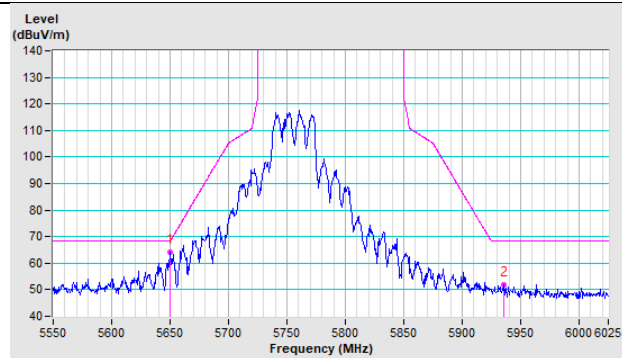


Vertical

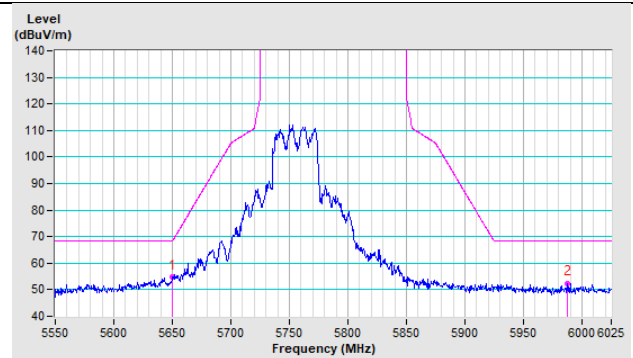


802.11ax (HE40) CH 151 : 5755 MHz

Horizontal

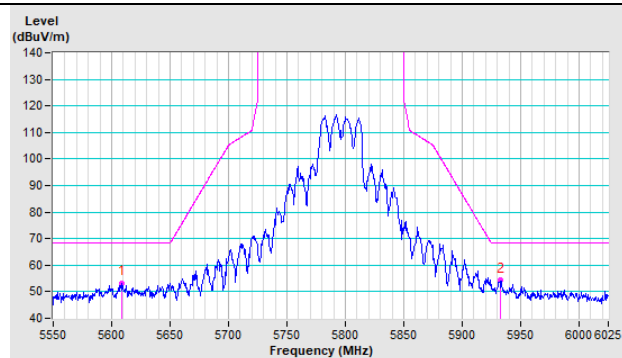


Vertical

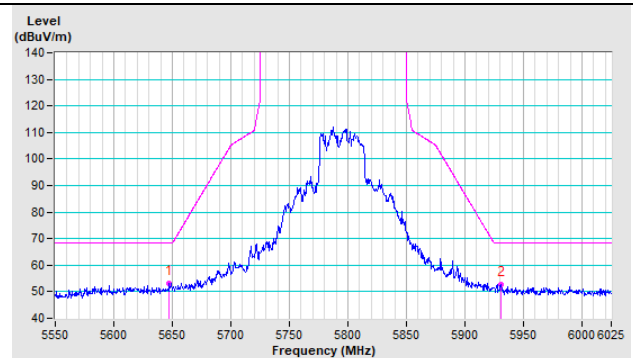


802.11ax (HE40) CH 159 : 5795 MHz

Horizontal

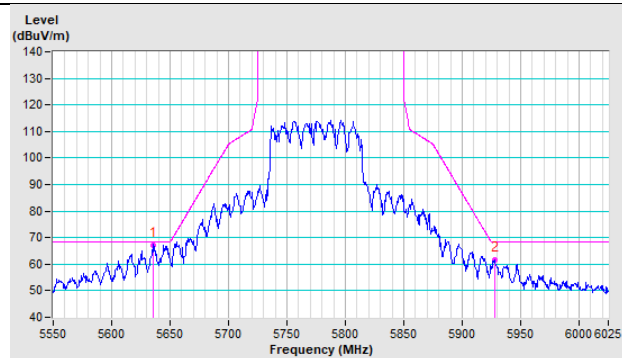


Vertical

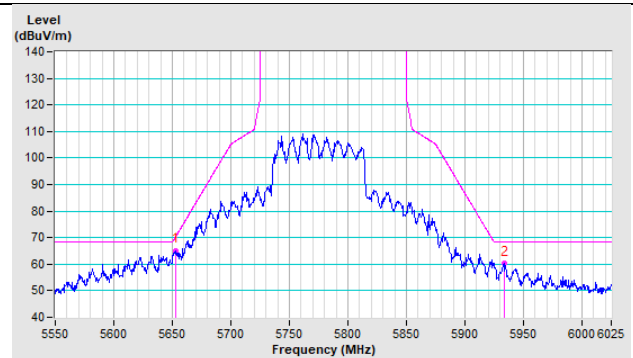


802.11ax (HE80) CH 155 : 5775 MHz

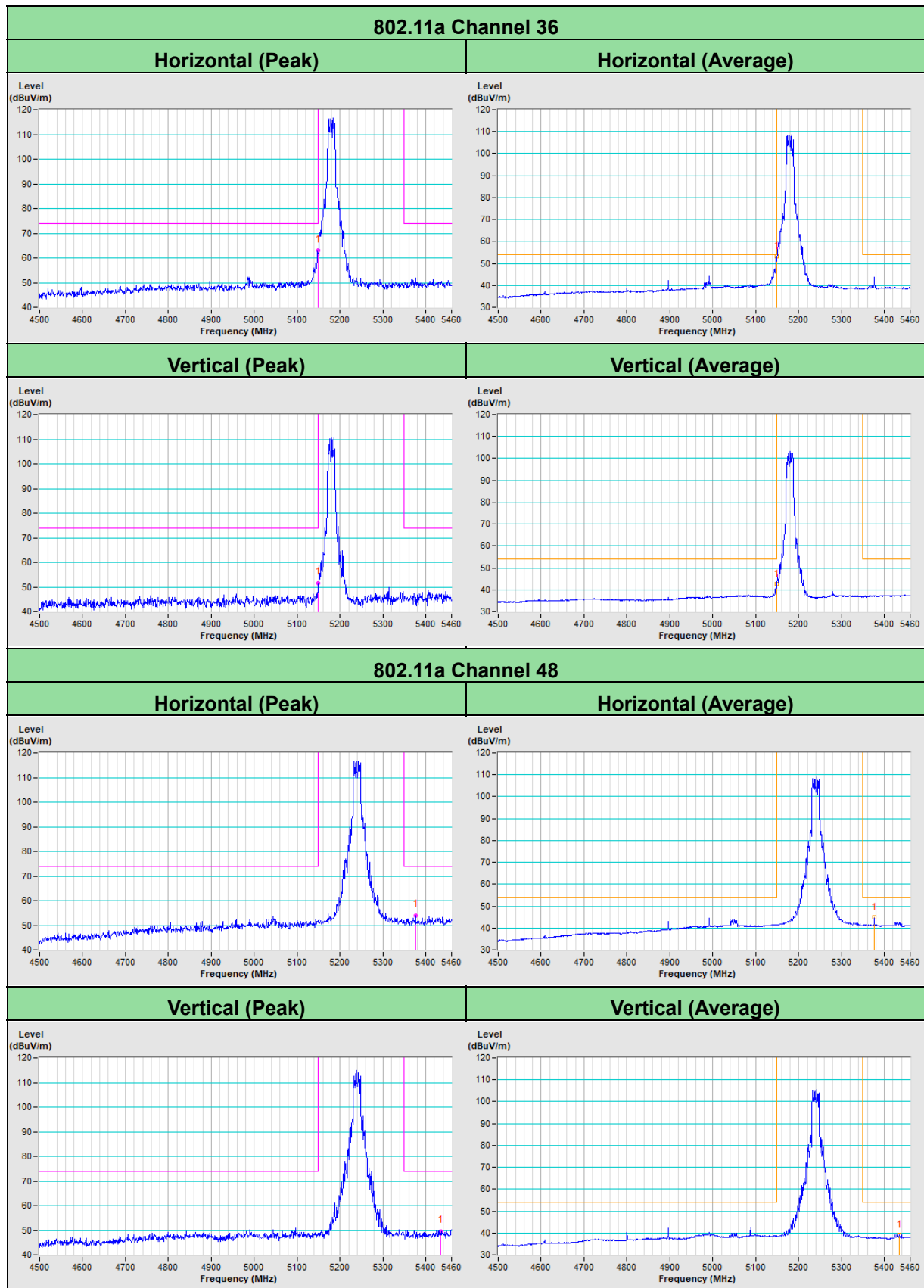
Horizontal



Vertical

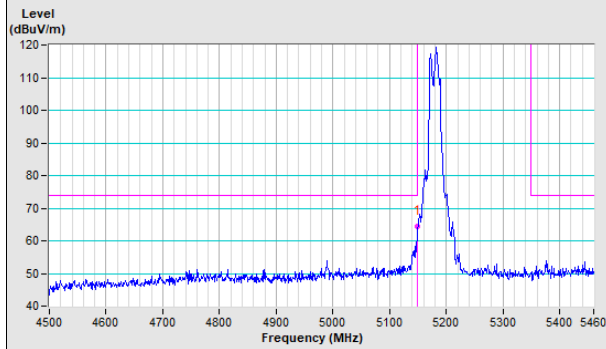


Annex B - Band-Edge Measurement (For U-NII-1 band)

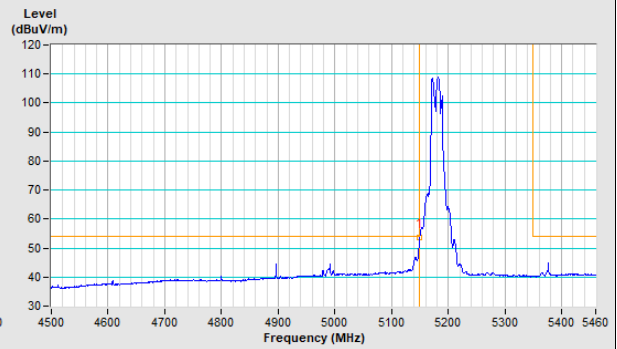


802.11ax (HE20) Channel 36

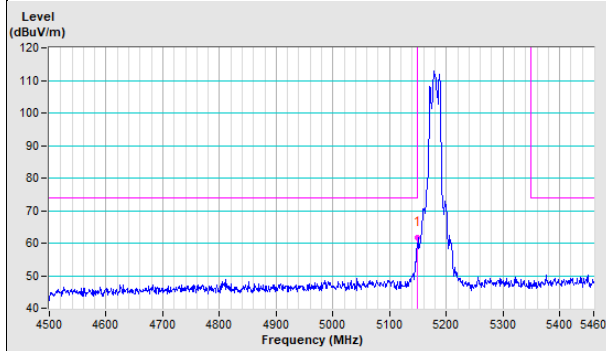
Horizontal (Peak)



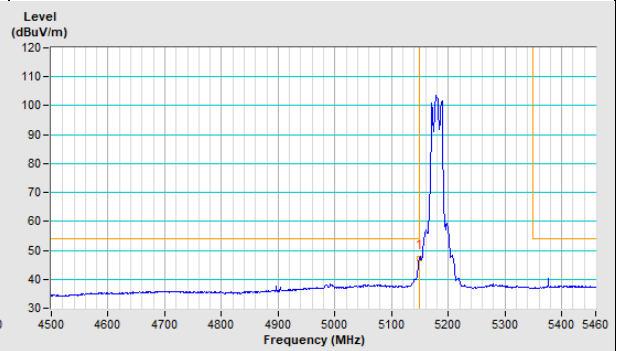
Horizontal (Average)



Vertical (Peak)

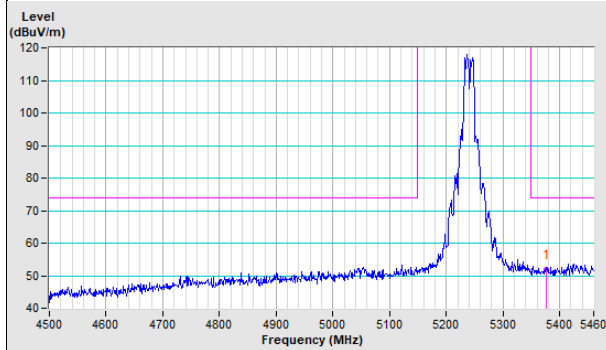


Vertical (Average)

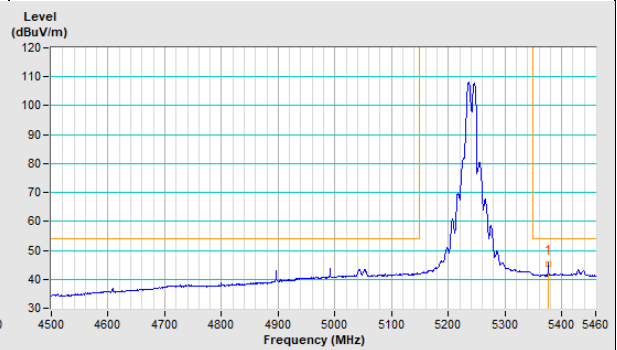


802.11ax (HE20) Channel 48

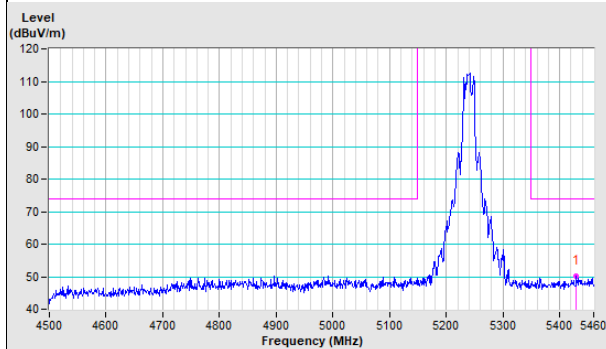
Horizontal (Peak)



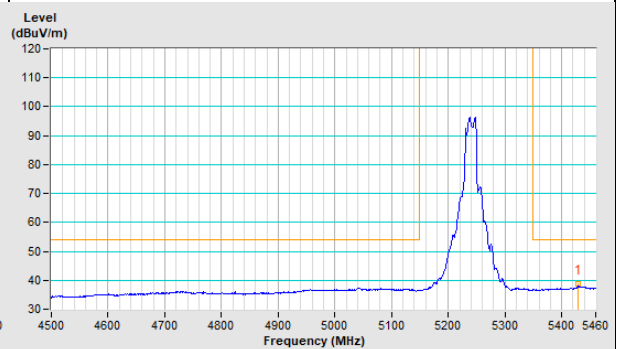
Horizontal (Average)



Vertical (Peak)

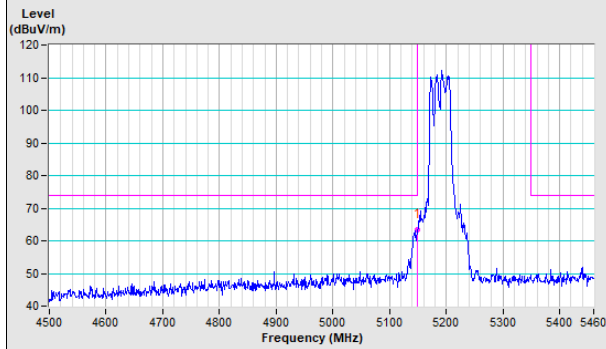


Vertical (Average)

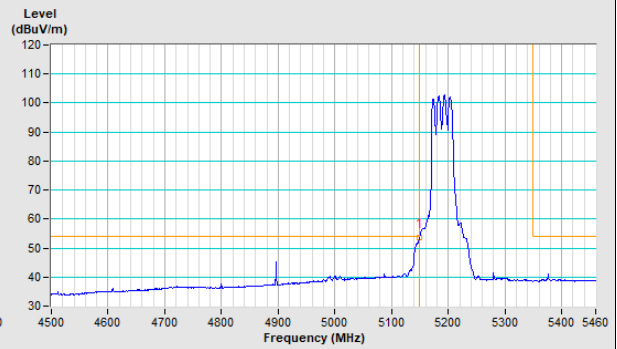


802.11ax (HE40) Channel 38

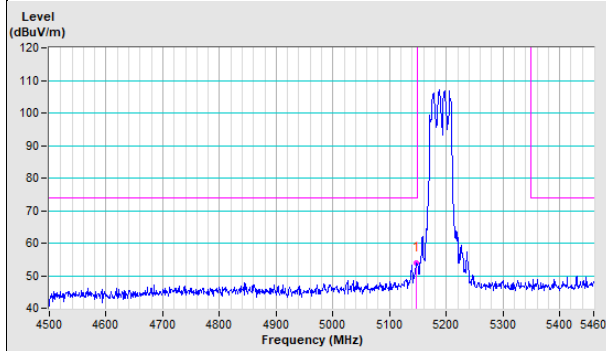
Horizontal (Peak)



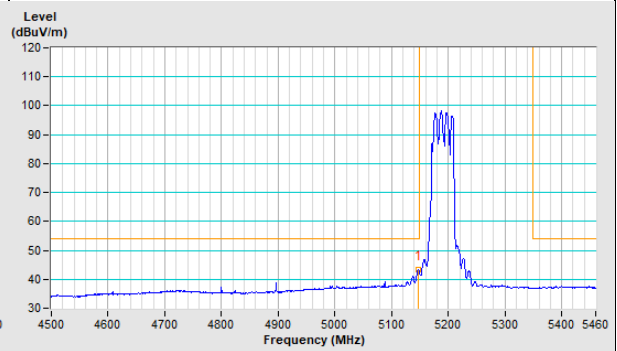
Horizontal (Average)



Vertical (Peak)

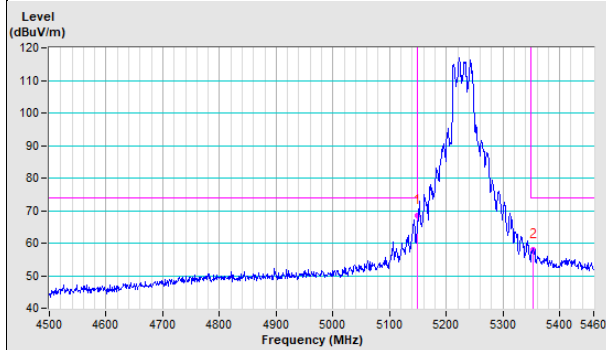


Vertical (Average)

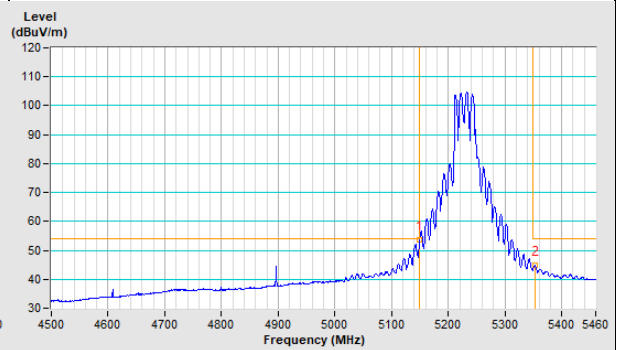


802.11ax (HE40) Channel 46

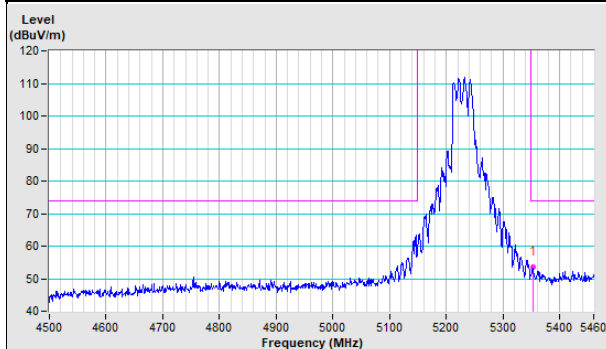
Horizontal (Peak)



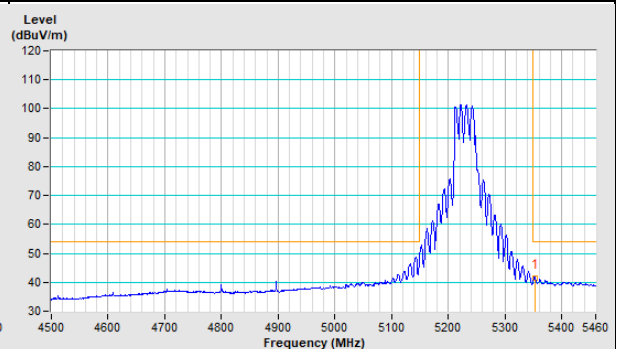
Horizontal (Average)

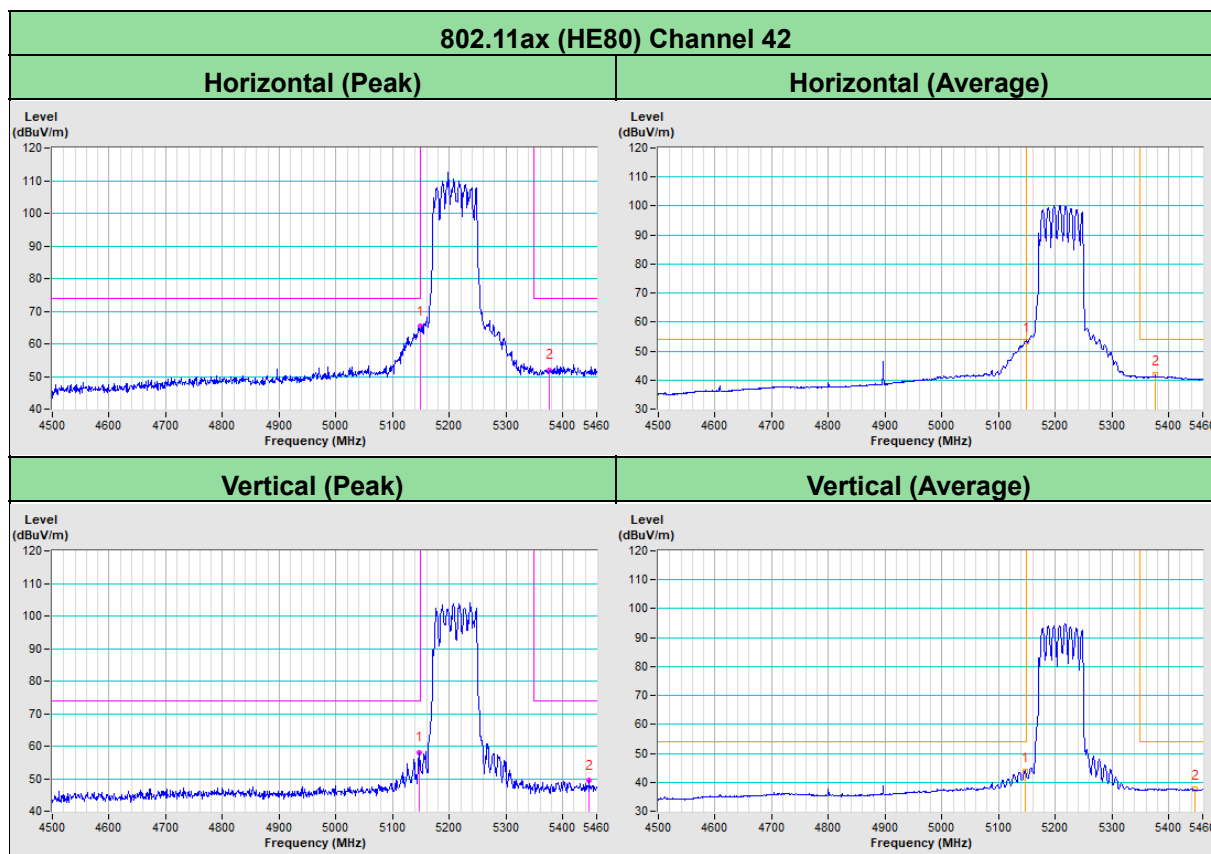


Vertical (Peak)



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.

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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.

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