FCC Test Report (WLAN)

Report No.:	RFBEBW-WTW-P20110211-1
FCC ID:	KA2APX2850A1
Test Model:	DAP-X2850
Received Date:	Nov. 06, 2020
Test Date:	Nov. 06 to Dec. 04, 2020
Issued Date:	Dec. 24, 2020
Applicant:	D-Link Corporation
Address:	17595 Mt. Herrmann Street Fountain Valley, CA92708 USA
Issued By:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch Hsin Chu Laboratory
Lab Address:	E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300, Taiwan
Test Location:	E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300, Taiwan
FCC Registration / Designation Number:	723255 / TW2022

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Release Control Record

Issue No.	Description	Date Issued
RFBEBW-WTW-P20110211-1	Original release.	Dec. 24, 2020

1 Certificate of Conformity

Product:	Nuclias Connect AX3600 Access Point
Brand:	D-Link
Test Model:	DAP-X2850
Sample Status:	Engineering sample
Applicant:	D-Link Corporation
Test Date:	Nov. 06 to Dec. 04, 2020
Standard:	47 CFR FCC Part 15, Subpart E (Section 15.407) ANSI C63.10: 2013

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

Prepared by : _____ , **Date:** Dec. 24, 2020

Claire Kuan / Specialist

Approved by : _____ , **Date:** Dec. 24, 2020

Clark Lin / Technical Manager

2 Summary of Test Results

47 CFR FCC Part 15, Subpart E (Section 15.407)			
FCC Clause	Test Item	Result	Remarks
15.407(b)(6)	AC Power Conducted Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -12.58 dB at 0.36094 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 -0.4dB at 5649.80MHz.
15.407(a)(1/2/3)	Max Average Transmit Power	Pass	Meet the requirement of limit.
---	Occupied Bandwidth Measurement	-	Reference only.
15.407(a)(1/2/3)	Peak Power Spectral Density	Pass	Meet the requirement of limit.
15.407(e)	6dB bandwidth	Pass	Meet the requirement of limit. (U-NII-3 Band only)
15.407(g)	Frequency Stability	Pass	Meet the requirement of limit.
15.203	Antenna Requirement	Pass	Antenna connector is i-pex(MHF) not a standard connector.

Note:
1. For U-NII-3 band compliance with rule part 15.407(b)(4)(i), the OOBE test plots were recorded in Annex A.
2. For U-NII-1 band compliance with rule 15.407(b) of the band-edge items, the test plots were recorded in Annex B. Test Procedures refer to report 4.1.3.
3. Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

2.1 Measurement Uncertainty

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

Measurement	Frequency	Expanded Uncertainty (k=2) (±)
Conducted Emissions at mains ports	150kHz ~ 30MHz	1.9 dB
Radiated Emissions up to 1 GHz	9kHz ~ 30MHz	3.1 dB
	30MHz ~ 1GHz	5.1 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	Nuclias Connect AX3600 Access Point
Brand	D-Link
Test Model	DAP-X2850
Status of EUT	Engineering sample
Power Supply Rating	12 Vdc from power adapter or 12 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 600 Mbps 802.11ac: up to 1733.3 Mbps 802.11ax: up to 2401.9 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): 2 802.11ac (VHT80+80), 802.11ax (HE80+80): 1 set
Output Power	**CDD Mode:** **2.412 ~ 2.462 GHz:** 880.485 mW **5.18 ~ 5.24 GHz:** 313.331 mW **5.745 ~ 5.825 GHz:** 881.993 mW **Beamforming Mode:** **2.412 ~ 2.462 GHz:** 475.518 mW **5.18 ~ 5.24 GHz:** 274.07 mW **5.745 ~ 5.825 GHz:** 290.921 mW
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	Adapter x 1
Data Cable Supplied	NA

Note:

1. The EUT has below radios as following table:

Radio 1	Radio 2
WLAN 2.4GHz	WLAN 5GHz

2. 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.		

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

Antenna No.	RF Chain No.	Brand	Model	Antenna Net Gain(dBi)	Frequency range	Antenna Type	Connector Type	Cable Length (mm)
1	Chain0	M.gear	C037-511532-A	2.59	2.4~2.4835GHz	PIFA	i-pex(MHF)	194
2	Chain1	M.gear	C037-511532-A	2.72	2.4~2.4835GHz	PIFA	i-pex(MHF)	150
3	Chain2	M.gear	C037-511532-A	3.77	2.4~2.4835GHz	PIFA	i-pex(MHF)	75
4	Chain3	M.gear	C037-511532-A	3.57	2.4~2.4835GHz	PIFA	i-pex(MHF)	157
5	Chain0	M.gear	C037-511532-A	5.39	5.15~5.85GHz	PIFA	i-pex(MHF)	131
6	Chain1	M.gear	C037-511532-A	5.08	5.15~5.85GHz	PIFA	i-pex(MHF)	186
7	Chain2	M.gear	C037-511532-A	5.46	5.15~5.85GHz	PIFA	i-pex(MHF)	118
8	Chain3	M.gear	C037-511532-A	5.3	5.15~5.85GHz	PIFA	i-pex(MHF)	73

4. The EUT power needs to be supplied from power adapter, the information is as below table:

Brand	Model No.	Spec.
APD	WA-30P12R	Input: 100-240Vac, 0.9A, 50-60Hz Output: 12V, 2.5A DC cable: 1.2m, unshielded

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

Test Mode	Description
Mode A	With adapter mode
Mode B	With POE mode
Note: From the above modes, conducted emission the worst case was found in **Mode A** and radiated emission the worst case was found in **Mode B**. Therefore only the test data of the mode was recorded in this report.	

6. The EUT incorporates a MIMO function.

2.4GHz Band		
MODULATION MODE	**TX & RX CONFIGURATION**	
802.11b	4TX	4RX
802.11g	4TX	4RX
802.11n (HT20)	4TX	4RX
802.11n (HT40)	4TX	4RX
VHT20	4TX	4RX
VHT40	4TX	4RX
802.11ax (HE20)	4TX	4RX
802.11ax (HE40)	4TX	4RX
5GHz Band		
MODULATION MODE	**TX & RX CONFIGURATION**	
802.11a	4TX	4RX
802.11n (HT20)	4TX	4RX
802.11n (HT40)	4TX	4RX
802.11ac (VHT20)	4TX	4RX
802.11ac (VHT40)	4TX	4RX
802.11ac (VHT80)	4TX	4RX
802.11ac (VHT80+80)	2TX+2TX	2RX+2RX
802.11ax (HE20)	4TX	4RX
802.11ax (HE40)	4TX	4RX
802.11ax (HE80)	4TX	4RX
802.11ax (HE80+80)	2TX+2TX	2RX+2RX

Note:

1. All of modulation mode support beamforming function except 802.11a/b/g modulation mode.
2. The EUT support Beamforming and CDD mode, therefore both mode were investigated and the worst case scenario was identified. The worst case data were presented in test report.
3. The modulation and bandwidth are similar for 802.11n mode for 20MHz (40MHz), 802.11ac mode for 20MHz (40MHz, 80MHz, 80+80MHz) and 802.11ax mode for 20MHz (40MHz, 80MHz, 80+80MHz), therefore the manufacturer will control the power for 802.11n/ac 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)

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

3.2 Description of Test Modes

FOR 5180 ~ 5240MHz

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

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

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

Channel	Frequency	Channel	Frequency
38	5190 MHz	46	5230 MHz

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

Channel	Frequency
42	5210 MHz

FOR 5745 ~ 5825MHz:

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

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

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

Channel	Frequency	Channel	Frequency
151	5755 MHz	159	5795 MHz

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

Channel	Frequency
155	5775 MHz

For simultaneous transmission in non-adjacent channles:

1 set is provided for 802.11ac (VHT80+80), 802.11ax (HE80+80):

Channel	Frequency
42+155	5210 MHz + 5775 MHz

Note: The transmission is for noncontiguous transmission using two nonadjacent 80MHz channels.

3.2.1 Test Mode Applicability and Tested Channel Detail

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

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

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

Radiated Emission Test (Above 1GHz):

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
☒ Following channel(s) was (were) selected for the final test as listed below.

CDD Mode						
Mode	FREQ. Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate Parameter
802.11a	5180-5240	36 to 48	36, 40, 48	OFDM	BPSK	6Mb/s
802.11ax (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
802.11ax (HE80+80)	5180-5240 5745-5825	42 + 155	42 + 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	157	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 (Mbps)
802.11a	5180-5240 5745-5825	36 to 48 149 to 165	157	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
802.11ac (VHT80+80) (output power only)	5180-5240 5745-5825	42 + 155	42 + 155	OFDMA	BPSK	MCS0
802.11ax (HE80+80)	5180-5240 5745-5825	42 + 155	42 + 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
802.11ac (VHT80+80)	5180-5240 5745-5825	42 + 155	42 + 155	OFDMA	BPSK	MCS0
802.11ax (HE80+80)	5180-5240 5745-5825	42 + 155	42 + 155	OFDMA	BPSK	MCS0

Test Condition:

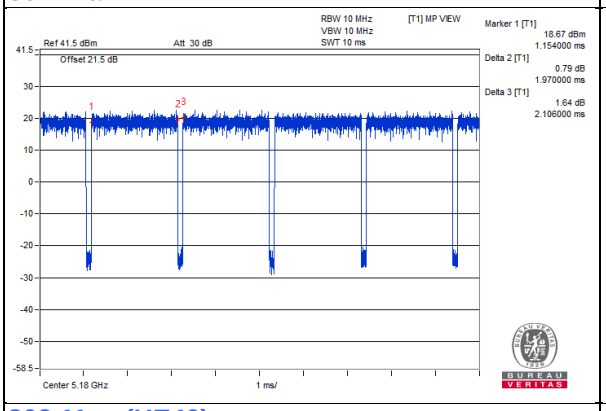
Applicable To	Environmental Conditions	Input Power	Tested By
RE≥1G	23deg. C, 69%RH	120Vac, 60Hz	Benson Chao
RE<1G	25deg. C, 65%RH	120Vac, 60Hz	Carter Lin
PLC	25deg. C, 67%RH	120Vac, 60Hz	Sampson Chen
APCM	25deg. C, 60%RH	120Vac, 60Hz	Anderson Chen

3.3 Duty Cycle of Test Signal

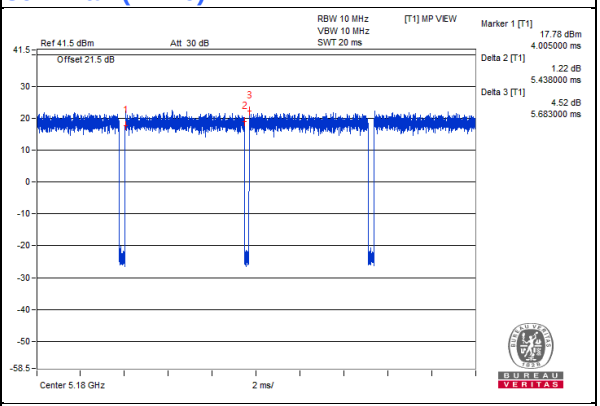
Duty cycle of test signal is < 98%, duty factor shall be considered.

802.11a: Duty cycle = 1.97 ms/2.106 ms = 0.935, Duty factor = 10 * log (1/Duty cycle) = 0.29 dB
802.11ax (HE20): Duty cycle = 5.438 ms/5.683 ms = 0.957, Duty factor = 10 * log (1/Duty cycle) = 0.19 dB
802.11ax (HE40): Duty cycle = 5.433 ms/5.673 ms = 0.958, Duty factor = 10 * log (1/Duty cycle) = 0.19 dB
802.11ax (HE80): Duty cycle = 5.436 ms/5.685 ms = 0.956, Duty factor = 10 * log (1/Duty cycle) = 0.20 dB
802.11ax (HE80+80): Duty cycle = 5.433 ms/5.706 ms = 0.952, Duty factor = 10 * log (1/Duty cycle) = 0.21 dB

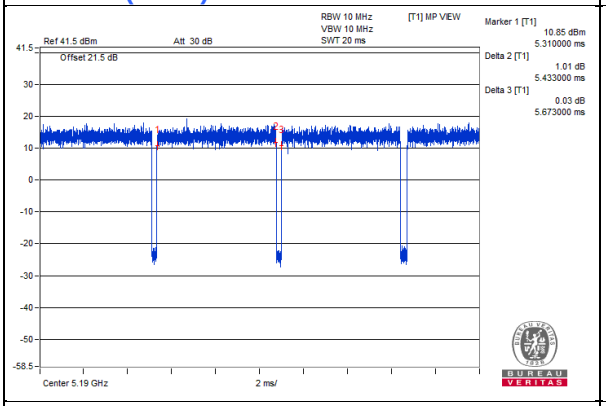
802.11a



802.11ax (HE20)



802.11ax (HE40)



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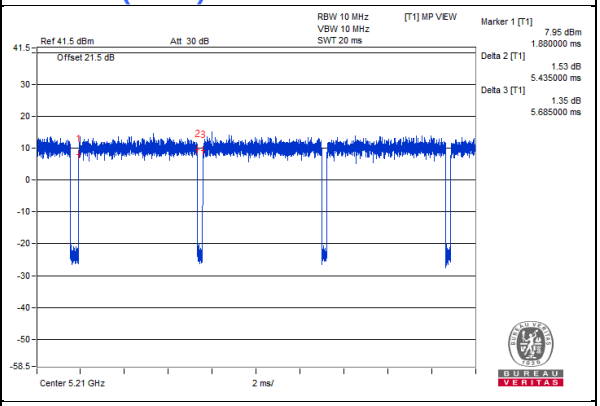
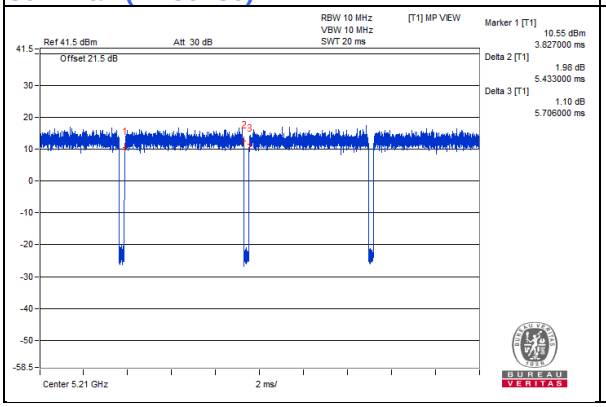


802.11ax (HE80+80)



3.4 Description of Support Units

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

ID	Product	Brand	Model No.	Serial No	FCC ID	Remarks
A.	Laptop	DELL	Inspiron 3000	DP9YQ52	NA	Provided by Lab
B.	PoE	PowerDsine	PD-3501G/AC	NA	NA	Provided by Lab
C.	Laptop	DELL	E5430	HYV4VY1	DoC	Provided by Lab

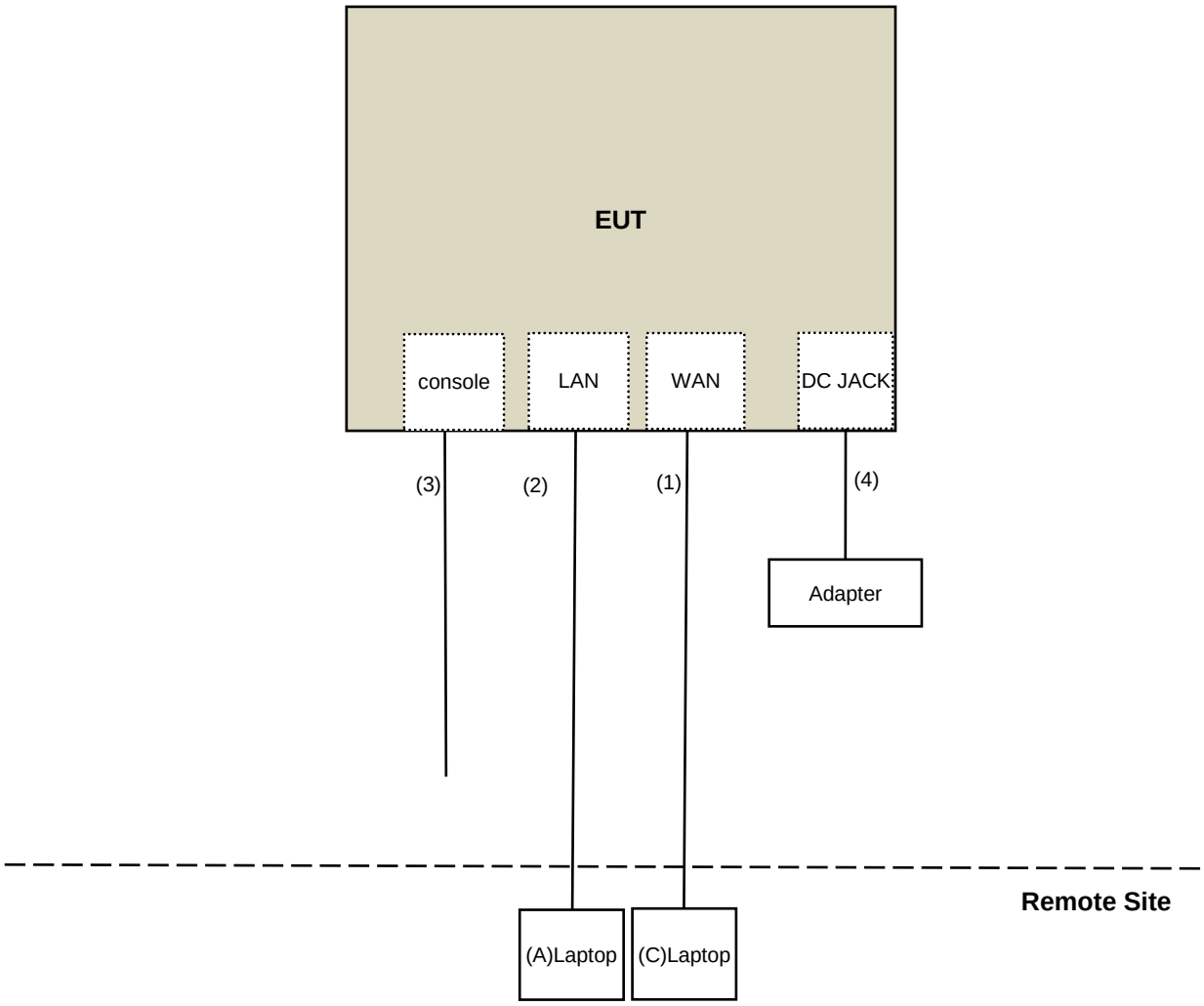
Note:

1. All power cords of the above support units are non-shielded (1.5m).

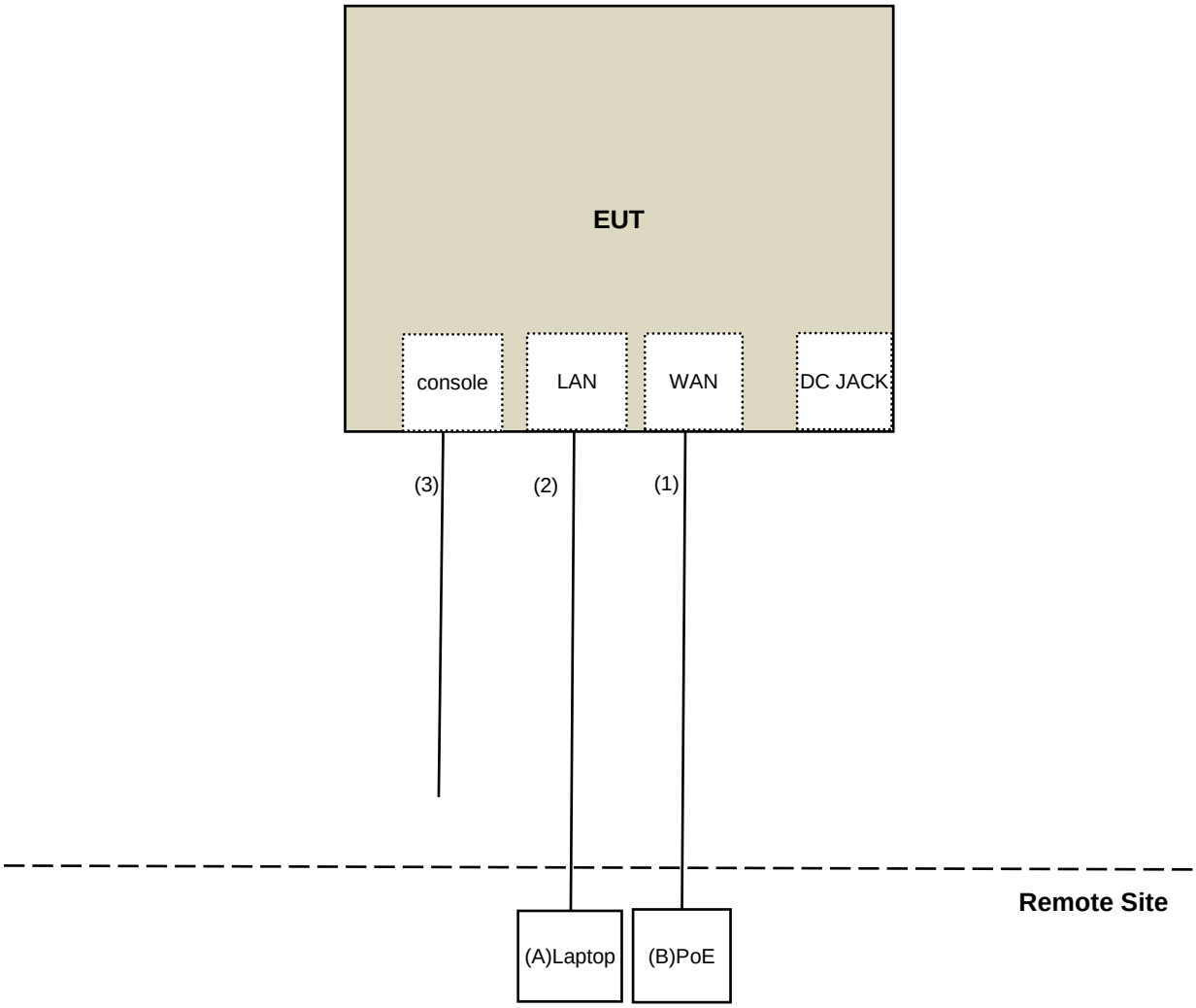
ID	Descriptions (Cables)	Qty	Length (m)	Shielding (Yes/No)	Cores (Number)	Remarks
1	RJ-45 Cable	1	10	No	0	Provided by Lab
2	RJ-45 Cable	1	10	No	0	Provided by Lab
3	Console Cable	1	1.5	No	0	Provided by Lab
4	DC Cable	1	1.2	No	0	Supplied by client

3.4.1 Configuration of System under Test

For Conducted Emission test:



For other test items:



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:

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

Limits of unwanted emission out of the restricted bands

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

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

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

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

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

Note:

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

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

4.1.2 Test Instruments

For radiated emission test:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver R&S	ESR7	102026	Apr. 22, 2020	Apr. 21, 2021
Spectrum Analyzer Keysight	N9030B	MY57141948	May 22, 2020	May 21, 2021
Pre-Amplifier EMCI	EMC001340	980142	May 25, 2020	May 24, 2021
Loop Antenna Electro-Metrics	EM-6879	264	Feb. 18, 2020	Feb. 17, 2021
RF Cable	NA	LOOPCAB-001	Jan. 08, 2020	Jan. 07, 2021
RF Cable	NA	LOOPCAB-002	Jan. 08, 2020	Jan. 07, 2021
Pre-Amplifier EMCI	EMC330N	980538	Apr. 28, 2020	Apr. 27, 2021
Trilog Broadband Antenna SCHWARZBECK	VULB9168	9168-0842	Nov. 03, 2020	Nov. 02, 2021
RF Cable	8D	966-5-1	Apr. 29, 2020	Apr. 28, 2021
RF Cable	8D	966-5-2	Apr. 29, 2020	Apr. 28, 2021
RF Cable	8D	966-5-3	Apr. 29, 2020	Apr. 28, 2021
Fixed attenuator Mini-Circuits	UNAT-5+	PAD-ATT5-02	Jan. 14, 2020	Jan. 13, 2021
Horn_Antenna SCHWARZBECK	BBHA 9120D	9120D-1819	Nov. 22, 2020	Nov. 21, 2021
Pre-Amplifier EMCI	EMC12630SE	980509	Apr. 29, 2020	Apr. 28, 2021
RF Cable EMCI	EMC104-SM-SM-1500	180503	Apr. 29, 2020	Apr. 28, 2021
RF Cable EMCI	EMC104-SM-SM-2000	180501	Apr. 29, 2020	Apr. 28, 2021
RF Cable EMCI	EMC104-SM-SM-6000	180506	Apr. 29, 2020	Apr. 28, 2021
Pre-Amplifier EMCI	EMC184045SE	980387	Jan. 15, 2020	Jan. 14, 2021
Horn_Antenna SCHWARZBECK	BBHA 9170	BBHA9170519	Nov. 22, 2020	Nov. 21, 2021
RF Cable	EMC102-KM-KM-1200	160924	Jan. 15, 2020	Jan. 14, 2021
RF Cable	EMC-KM-KM-4000	200214	Mar. 11, 2020	Mar. 10, 2021
Software	ADT_Radiated_V8.7.08	NA	NA	NA
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. 5.
3. Tested Date: Nov. 28, 2020

For BandEdge & OOBE test:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver R&S	ESR7	102026	Apr. 22, 2020	Apr. 21, 2021
Spectrum Analyzer Keysight	N9030B	MY57141948	May 22, 2020	May 21, 2021
Horn_Antenna SCHWARZBECK	BBHA 9120D	9120D-1819	Nov. 24, 2019	Nov. 23, 2020
Pre-Amplifier EMCI	EMC12630SE	980509	Apr. 29, 2020	Apr. 28, 2021
RF Cable EMCI	EMC104-SM-SM-1500	180503	Apr. 29, 2020	Apr. 28, 2021
RF Cable EMCI	EMC104-SM-SM-2000	180501	Apr. 29, 2020	Apr. 28, 2021
RF Cable EMCI	EMC104-SM-SM-6000	180506	Apr. 29, 2020	Apr. 28, 2021
Pre-Amplifier EMCI	EMC184045SE	980387	Jan. 15, 2020	Jan. 14, 2021
Horn_Antenna SCHWARZBECK	BBHA 9170	BBHA9170519	Nov. 24, 2019	Nov. 23, 2020
RF Cable	EMC102-KM-KM-1200	160924	Jan. 15, 2020	Jan. 14, 2021
RF Cable	EMC-KM-KM-4000	200214	Mar. 11, 2020	Mar. 10, 2021
Software	ADT_Radiated_V8.7.08	NA	NA	NA
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. 5.
3. Tested Date: Nov. 06 to 18, 2020

For other test:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Spectrum Analyzer R&S	FSV40	100964	May 29, 2020	May 28, 2021
Power meter Anritsu	ML2495A	1529002	July 22, 2020	July 21, 2021
Power sensor Anritsu	MA2411B	1339443	July 22, 2020	July 21, 2021
Fixed Attenuator Mini-Circuits	MDCS18N-10	MDCS18N-10-01	Apr. 14, 2020	Apr. 13, 2021
AC Power Source Extech Electronics	6205	1440452	NA	NA
Temperature & Humidity Chamber Giant Force	GTH-150-40-SP-AR	MAA0812-008	Jan. 16, 2020	Jan. 15, 2021
True RMS Clamp Meter FLUKE	325	31130711WS	June 06, 2020	June 05, 2021
Software	ADT_RF Test Software V6.6.5.4	NA	NA	NA

NOTE: 1. The test was performed in Oven room 2.
2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
3. Tested Date: Nov. 24, 2020

4.1.3 Test Procedure

For Radiated emission below 30MHz

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter chamber room. The table was rotated 360 degrees to determine the position of the highest radiation.

b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

c. Parallel, perpendicular, and ground-parallel orientations of the antenna are set to make the measurement.

d. For each suspected emission, the EUT was arranged to its worst case and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

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

Note:

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

For Radiated emission above 30MHz

a. The EUT was placed on the top of a rotating table 0.8 meters (for 30MHz ~ 1GHz) / 1.5 meters (for above 1GHz) above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.

b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

c. The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

e. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.

f. The test-receiver system was set to peak and average detects function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

Note:

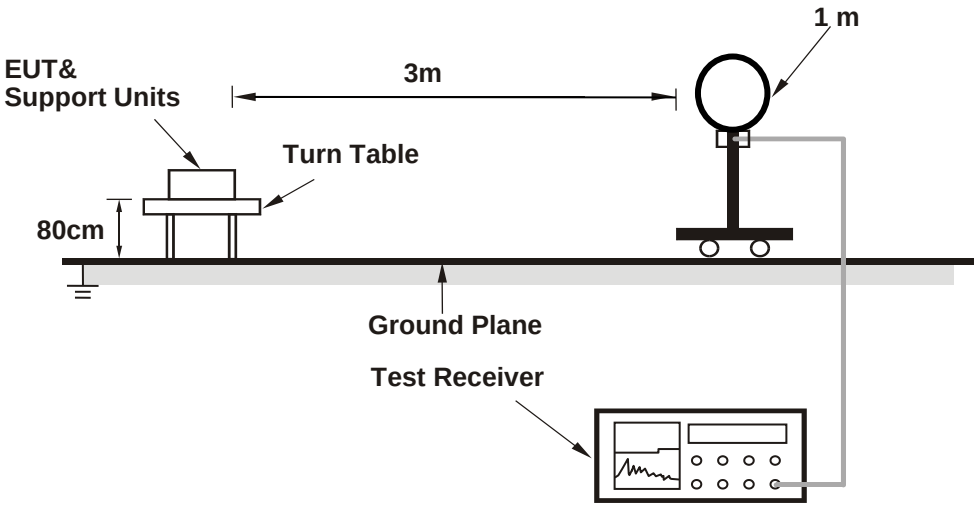
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.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

4.1.4 Deviation from Test Standard

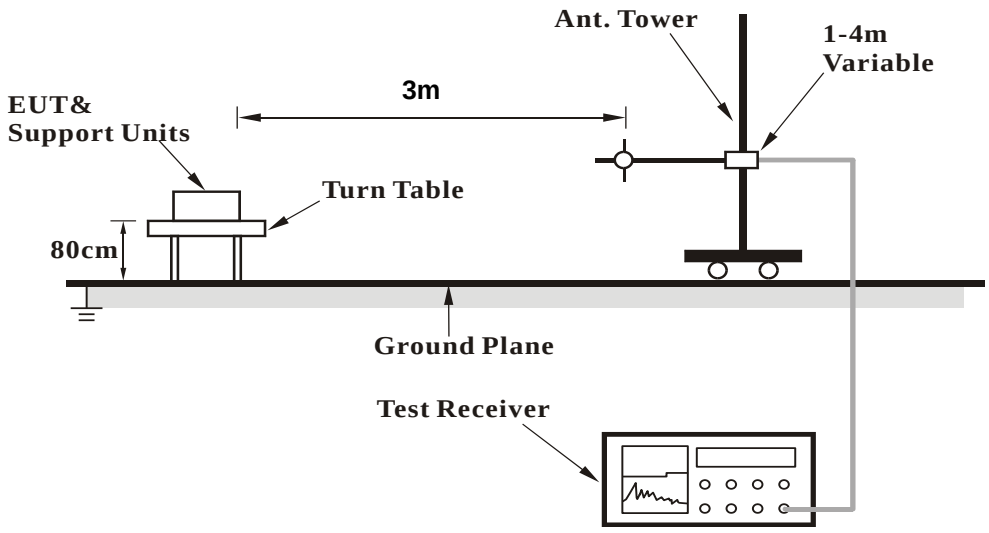
No deviation.

4.1.5 Test Setup

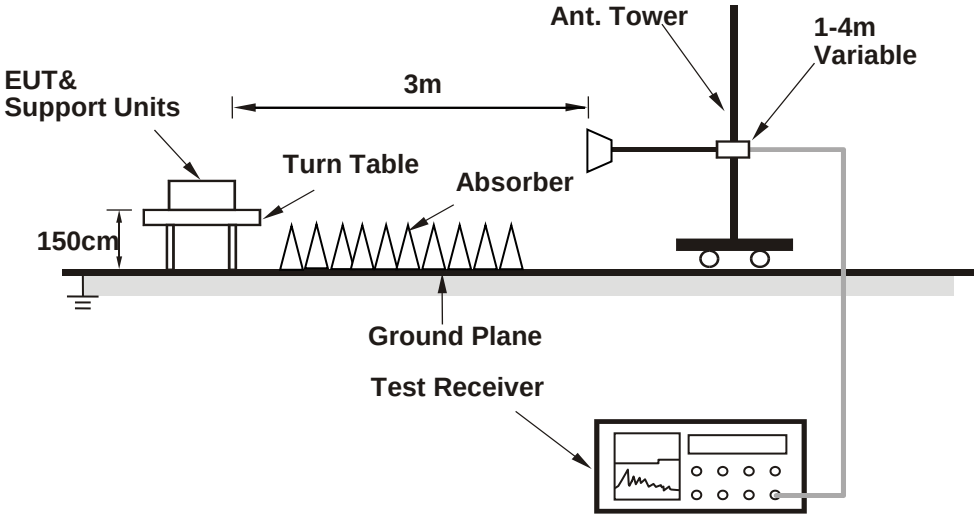
For Radiated emission below 30MHz



For Radiated emission 30MHz to 1GHz



For Radiated emission above 1GHz



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

4.1.6 EUT Operating Condition

a. Placed the EUT on the testing table.
b. Controlling software (Tx_Rx_CONTROL_V1.2.exe) has been activated to set the EUT under transmission condition continuously at specific channel frequency.

4.1.7 Test Results

CDD Mode

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	5148.94	64.0 PK	74.0	-10.0	1.61 H	296	62.3	1.7
2	5148.94	53.4 AV	54.0	-0.6	1.61 H	296	51.7	1.7
3	*5180.00	118.7 PK			1.61 H	296	117.2	1.5
4	*5180.00	108.1 AV			1.61 H	296	106.6	1.5
5	#10360.00	48.9 PK	68.2	-19.3	1.31 H	194	37.7	11.2
6	15540.00	52.7 PK	74.0	-21.3	2.95 H	309	41.0	11.7
7	15540.00	46.8 AV	54.0	-7.2	2.95 H	309	35.1	11.7
Antenna Polarity & Test Distance : Vertical at 3 m								
No	**Frequency (MHz)**	**Emission Level (dBuV/m)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Height (m)**	**Table Angle (Degree)**	**Raw Value (dBuV)**	**Correction Factor (dB/m)**
1	5148.94	67.3 PK	74.0	-6.7	3.09 V	343	65.6	1.7
2	5148.94	51.1 AV	54.0	-2.9	3.09 V	343	49.4	1.7
3	*5180.00	115.9 PK			3.09 V	343	114.4	1.5
4	*5180.00	106.2 AV			3.09 V	343	104.7	1.5
5	#10360.00	45.8 PK	68.2	-22.4	1.46 V	193	34.6	11.2
6	15540.00	50.5 PK	74.0	-23.5	1.64 V	206	38.8	11.7
7	15540.00	45.2 AV	54.0	-8.8	1.64 V	206	33.5	11.7

Remarks:

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

RF Mode	TX 802.11a	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	67.9 PK	74.0	-6.1	1.00 H	294	66.2	1.7
2	5150.00	53.1 AV	54.0	-0.9	1.00 H	294	51.4	1.7
3	*5200.00	121.8 PK			1.00 H	294	120.4	1.4
4	*5200.00	111.5 AV			1.00 H	294	110.1	1.4
5	#10400.00	48.7 PK	68.2	-19.5	1.30 H	196	37.2	11.5
6	15600.00	61.0 PK	74.0	-13.0	2.94 H	308	49.5	11.5
7	15600.00	46.1 AV	54.0	-7.9	2.94 H	308	34.6	11.5
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5150.00	58.7 PK	74.0	-15.3	3.07 V	350	57.0	1.7
2	5150.00	45.2 AV	54.0	-8.8	3.07 V	350	43.5	1.7
3	*5200.00	119.8 PK			3.07 V	350	118.4	1.4
4	*5200.00	109.7 AV			3.07 V	350	108.3	1.4
5	#10400.00	45.9 PK	68.2	-22.3	1.46 V	183	34.4	11.5
6	15600.00	51.0 PK	74.0	-23.0	1.63 V	203	39.5	11.5
7	15600.00	45.4 AV	54.0	-8.6	1.63 V	203	33.9	11.5

Remarks:

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

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	117.5 PK			1.27 H	300	116.3	1.2
2	*5240.00	108.4 AV			1.27 H	300	107.2	1.2
3	5434.42	54.3 PK	74.0	-19.7	1.27 H	300	52.7	1.6
4	5434.42	43.5 AV	54.0	-10.5	1.27 H	300	41.9	1.6
5	#10480.00	48.4 PK	68.2	-19.8	1.31 H	183	36.9	11.5
6	15720.00	57.7 PK	74.0	-16.3	2.90 H	296	46.6	11.1
7	15720.00	47.1 AV	54.0	-6.9	2.90 H	296	36.0	11.1
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	*5240.00	116.7 PK			1.51 V	344	115.5	1.2
2	*5240.00	106.9 AV			1.51 V	344	105.7	1.2
3	5426.86	51.5 PK	74.0	-22.5	1.51 V	344	49.9	1.6
4	5426.86	40.6 AV	54.0	-13.4	1.51 V	344	39.0	1.6
5	#10480.00	46.4 PK	68.2	-21.8	1.51 V	191	34.9	11.5
6	15720.00	50.6 PK	74.0	-23.4	1.64 V	204	39.5	11.1
7	15720.00	45.0 AV	54.0	-9.0	1.64 V	204	33.9	11.1

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 802.11a	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	#5647.35	65.1 PK	68.2	-3.1	1.50 H	310	63.4	1.7
2	*5745.00	119.0 PK			1.50 H	310	117.1	1.9
3	*5745.00	108.9 AV			1.50 H	310	107.0	1.9
4	#5939.61	54.5 PK	68.2	-13.7	1.50 H	310	52.1	2.4
5	11490.00	55.0 PK	74.0	-19.0	2.05 H	316	42.5	12.5
6	11490.00	43.9 AV	54.0	-10.1	2.05 H	316	31.4	12.5
7	#17235.00	67.6 PK	68.2	-0.6	1.57 H	189	51.8	15.8
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	#5647.39	58.9 PK	68.2	-9.3	1.53 V	7	57.2	1.7
2	*5745.00	116.7 PK			1.53 V	7	114.8	1.9
3	*5745.00	106.2 AV			1.53 V	7	104.3	1.9
4	#5986.99	52.9 PK	68.2	-15.3	1.53 V	7	50.4	2.5
5	11490.00	53.5 PK	74.0	-20.5	1.45 V	158	41.0	12.5
6	11490.00	42.4 AV	54.0	-11.6	1.45 V	158	29.9	12.5
7	#17235.00	59.9 PK	68.2	-8.3	1.69 V	189	44.1	15.8

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 802.11a	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	#5637.48	52.8 PK	68.2	-15.4	1.41 H	316	51.1	1.7
2	*5785.00	119.0 PK			1.41 H	316	117.0	2.0
3	*5785.00	108.9 AV			1.41 H	316	106.9	2.0
4	#5940.18	54.6 PK	68.2	-13.6	1.41 H	316	52.2	2.4
5	11570.00	55.7 PK	74.0	-18.3	2.11 H	322	42.8	12.9
6	11570.00	44.7 AV	54.0	-9.3	2.11 H	322	31.8	12.9
7	#17355.00	66.6 PK	68.2	-1.6	1.60 H	192	49.8	16.8
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	#5592.39	52.6 PK	68.2	-15.6	1.46 V	15	51.0	1.6
2	*5785.00	116.4 PK			1.46 V	15	114.4	2.0
3	*5785.00	106.4 AV			1.46 V	15	104.4	2.0
4	#5939.68	53.4 PK	68.2	-14.8	1.46 V	15	51.0	2.4
5	11570.00	53.7 PK	74.0	-20.3	1.50 V	144	40.8	12.9
6	11570.00	42.6 AV	54.0	-11.4	1.50 V	144	29.7	12.9
7	#17355.00	60.2 PK	68.2	-8.0	1.72 V	192	43.4	16.8

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 802.11a	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	#5588.44	52.3 PK	68.2	-15.9	1.73 H	291	50.6	1.7
2	*5825.00	119.5 PK			1.73 H	291	117.3	2.2
3	*5825.00	109.4 AV			1.73 H	291	107.2	2.2
4	#5926.81	59.3 PK	68.2	-8.9	1.73 H	291	56.9	2.4
5	11650.00	55.2 PK	74.0	-18.8	2.10 H	312	42.3	12.9
6	11650.00	44.3 AV	54.0	-9.7	2.10 H	312	31.4	12.9
7	#17475.00	67.4 PK	68.2	-0.8	1.63 H	204	48.7	18.7
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5579.37	51.2 PK	68.2	-17.0	1.64 V	16	49.5	1.7
2	*5825.00	116.4 PK			1.64 V	16	114.2	2.2
3	*5825.00	106.1 AV			1.64 V	16	103.9	2.2
4	#5927.86	53.4 PK	68.2	-14.8	1.64 V	16	51.0	2.4
5	11650.00	53.4 PK	74.0	-20.6	1.42 V	149	40.5	12.9
6	11650.00	42.1 AV	54.0	-11.9	1.42 V	149	29.2	12.9
7	#17475.00	60.0 PK	68.2	-8.2	1.64 V	203	41.3	18.7

Remarks:

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

RF Mode	TX 802.11ax (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	5143.44	65.3 PK	74.0	-8.7	1.35 H	304	63.6	1.7
2	5143.44	53.1 AV	54.0	-0.9	1.35 H	304	51.4	1.7
3	*5180.00	118.4 PK			1.35 H	304	116.9	1.5
4	*5180.00	108.3 AV			1.35 H	304	106.8	1.5
5	#10360.00	48.2 PK	68.2	-20.0	1.27 H	208	37.0	11.2
6	15540.00	58.6 PK	74.0	-15.4	2.86 H	308	46.9	11.7
7	15540.00	44.5 AV	54.0	-9.5	2.86 H	308	32.8	11.7
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5143.44	60.8 PK	74.0	-13.2	1.45 V	318	59.1	1.7
2	5143.44	48.1 AV	54.0	-5.9	1.45 V	318	46.4	1.7
3	*5180.00	115.9 PK			1.45 V	318	114.4	1.5
4	*5180.00	106.2 AV			1.45 V	318	104.7	1.5
5	#10360.00	44.1 PK	68.2	-24.1	1.49 V	191	32.9	11.2
6	15540.00	48.7 PK	74.0	-25.3	1.63 V	211	37.0	11.7
7	15540.00	43.1 AV	54.0	-10.9	1.63 V	211	31.4	11.7

Remarks:

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

RF Mode	TX 802.11ax (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	68.0 PK	74.0	-6.0	1.44 H	294	66.3	1.7
2	5150.00	53.5 AV	54.0	-0.5	1.44 H	294	51.8	1.7
3	*5200.00	121.7 PK			1.44 H	294	120.3	1.4
4	*5200.00	109.6 AV			1.44 H	294	108.2	1.4
5	#10400.00	52.5 PK	68.2	-15.7	1.49 H	152	41.0	11.5
6	15600.00	62.1 PK	74.0	-11.9	1.52 H	327	50.6	11.5
7	15600.00	49.9 AV	54.0	-4.1	1.52 H	327	38.4	11.5
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5150.00	66.7 PK	74.0	-7.3	1.45 V	349	65.0	1.7
2	5150.00	53.3 AV	54.0	-0.7	1.45 V	349	51.6	1.7
3	*5200.00	118.6 PK			1.45 V	349	117.2	1.4
4	*5200.00	106.4 AV			1.45 V	349	105.0	1.4
5	#10400.00	43.8 PK	68.2	-24.4	1.48 V	186	32.3	11.5
6	15600.00	48.5 PK	74.0	-25.5	1.63 V	198	37.0	11.5
7	15600.00	43.3 AV	54.0	-10.7	1.63 V	198	31.8	11.5

Remarks:

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

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	121.8 PK			3.04 H	62	120.6	1.2
2	*5240.00	109.9 AV			3.04 H	62	108.7	1.2
3	5429.18	53.7 PK	74.0	-20.3	3.04 H	62	52.1	1.6
4	5429.18	43.8 AV	54.0	-10.2	3.04 H	62	42.2	1.6
5	#10480.00	52.7 PK	68.2	-15.5	1.48 H	160	41.2	11.5
6	15720.00	60.9 PK	74.0	-13.1	2.68 H	295	49.8	11.1
7	15720.00	46.1 AV	54.0	-7.9	2.68 H	295	35.0	11.1
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	*5240.00	118.9 PK			1.48 V	292	117.7	1.2
2	*5240.00	106.7 AV			1.48 V	292	105.5	1.2
3	5427.89	50.4 PK	74.0	-23.6	1.48 V	292	48.8	1.6
4	5427.89	39.9 AV	54.0	-14.1	1.48 V	292	38.3	1.6
5	#10480.00	43.8 PK	68.2	-24.4	1.49 V	189	32.3	11.5
6	15720.00	48.5 PK	74.0	-25.5	1.62 V	203	37.4	11.1
7	15720.00	43.2 AV	54.0	-10.8	1.62 V	203	32.1	11.1

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 (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	#5645.24	62.2 PK	68.2	-6.0	1.75 H	59	60.5	1.7
2	*5745.00	123.5 PK			1.75 H	59	121.6	1.9
3	*5745.00	111.3 AV			1.75 H	59	109.4	1.9
4	#5931.98	55.1 PK	68.2	-13.1	1.75 H	59	52.7	2.4
5	11490.00	52.9 PK	74.0	-21.1	1.56 H	174	40.4	12.5
6	11490.00	40.6 AV	54.0	-13.4	1.56 H	174	28.1	12.5
7	#17235.00	58.4 PK	68.2	-9.8	2.17 H	205	42.6	15.8
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	#5644.74	64.5 PK	68.2	-3.7	1.39 V	9	62.8	1.7
2	*5745.00	120.8 PK			1.39 V	9	118.9	1.9
3	*5745.00	109.9 AV			1.39 V	9	108.0	1.9
4	#5956.85	53.4 PK	68.2	-14.8	1.39 V	9	50.9	2.5
5	11490.00	43.4 PK	74.0	-30.6	1.43 V	175	30.9	12.5
6	11490.00	35.4 AV	54.0	-18.6	1.43 V	175	22.9	12.5
7	#17235.00	48.3 PK	68.2	-19.9	1.67 V	208	32.5	15.8

Remarks:

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

RF Mode	TX 802.11ax (HE20)	Channel	CH 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	#5640.24	56.4 PK	68.2	-11.8	2.50 H	295	54.7	1.7
2	*5785.00	123.8 PK			2.50 H	295	121.8	2.0
3	*5785.00	111.5 AV			2.50 H	295	109.5	2.0
4	#5925.38	56.7 PK	68.2	-11.5	2.50 H	295	54.3	2.4
5	11570.00	52.6 PK	74.0	-21.4	1.58 H	189	39.7	12.9
6	11570.00	40.2 AV	54.0	-13.8	1.58 H	189	27.3	12.9
7	#17355.00	62.4 PK	68.2	-5.8	2.20 H	200	45.6	16.8
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	#5616.37	52.2 PK	68.2	-16.0	2.88 V	16	50.6	1.6
2	*5785.00	121.2 PK			2.88 V	16	119.2	2.0
3	*5785.00	110.4 AV			2.88 V	16	108.4	2.0
4	#5956.46	54.6 PK	68.2	-13.6	2.88 V	16	52.1	2.5
5	11570.00	43.3 PK	74.0	-30.7	1.43 V	184	30.4	12.9
6	11570.00	35.3 AV	54.0	-18.7	1.43 V	184	22.4	12.9
7	#17355.00	48.1 PK	68.2	-20.1	1.70 V	212	31.3	16.8

Remarks:

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

RF Mode	TX 802.11ax (HE20)	Channel	CH 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	#5625.70	51.7 PK	68.2	-16.5	2.07 H	293	50.0	1.7
2	*5825.00	123.2 PK			2.07 H	293	121.0	2.2
3	*5825.00	111.2 AV			2.07 H	293	109.0	2.2
4	#5938.03	66.1 PK	68.2	-2.1	2.07 H	293	63.7	2.4
5	11650.00	52.9 PK	74.0	-21.1	1.48 H	176	40.0	12.9
6	11650.00	40.6 AV	54.0	-13.4	1.48 H	176	27.7	12.9
7	#17475.00	58.6 PK	68.2	-9.6	1.52 H	203	39.9	18.7
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5601.81	51.4 PK	68.2	-16.8	1.61 V	298	49.8	1.6
2	*5825.00	120.8 PK			1.61 V	298	118.6	2.2
3	*5825.00	110.1 AV			1.61 V	298	107.9	2.2
4	#5958.11	52.3 PK	68.2	-15.9	1.61 V	298	49.8	2.5
5	11650.00	43.9 PK	74.0	-30.1	1.47 V	183	31.0	12.9
6	11650.00	35.7 AV	54.0	-18.3	1.47 V	183	22.8	12.9
7	#17475.00	48.8 PK	68.2	-19.4	1.65 V	219	30.1	18.7

Remarks:

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

RF Mode	TX 802.11ax (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	5149.30	62.3 PK	74.0	-11.7	1.72 H	293	60.6	1.7
2	5149.30	53.1 AV	54.0	-0.9	1.72 H	293	51.4	1.7
3	*5190.00	114.2 PK			1.72 H	293	112.7	1.5
4	*5190.00	103.1 AV			1.72 H	293	101.6	1.5
5	#10380.00	49.6 PK	68.2	-18.6	1.44 H	169	38.3	11.3
6	15570.00	57.8 PK	74.0	-16.2	2.68 H	302	46.2	11.6
7	15570.00	43.1 AV	54.0	-10.9	2.68 H	302	31.5	11.6
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5148.17	62.6 PK	74.0	-11.4	1.36 V	340	60.9	1.7
2	5148.17	50.4 AV	54.0	-3.6	1.36 V	340	48.7	1.7
3	*5190.00	113.6 PK			1.36 V	340	112.1	1.5
4	*5190.00	100.4 AV			1.36 V	340	98.9	1.5
5	#10380.00	43.0 PK	68.2	-25.2	1.46 V	173	31.7	11.3
6	15570.00	48.7 PK	74.0	-25.3	1.66 V	206	37.1	11.6
7	15570.00	43.2 AV	54.0	-10.8	1.66 V	206	31.6	11.6

Remarks:

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

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	5149.20	58.7 PK	74.0	-15.3	1.61 H	290	57.0	1.7
2	5149.20	46.6 AV	54.0	-7.4	1.61 H	290	44.9	1.7
3	*5230.00	117.5 PK			1.61 H	290	116.2	1.3
4	*5230.00	105.1 AV			1.61 H	290	103.8	1.3
5	5410.42	51.5 PK	74.0	-22.5	1.61 H	290	50.0	1.5
6	5410.42	40.2 AV	54.0	-13.8	1.61 H	290	38.7	1.5
7	#10460.00	50.2 PK	68.2	-18.0	1.49 H	172	38.9	11.3
8	15690.00	57.7 PK	74.0	-16.3	2.70 H	300	46.5	11.2
9	15690.00	43.3 AV	54.0	-10.7	2.70 H	300	32.1	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	5150.00	57.1 PK	74.0	-16.9	2.99 V	343	55.4	1.7
2	5150.00	45.2 AV	54.0	-8.8	2.99 V	343	43.5	1.7
3	*5230.00	117.0 PK			2.99 V	343	115.7	1.3
4	*5230.00	102.2 AV			2.99 V	343	100.9	1.3
5	5424.00	52.2 PK	74.0	-21.8	2.99 V	343	50.6	1.6
6	5424.00	40.2 AV	54.0	-13.8	2.99 V	343	38.6	1.6
7	#10460.00	48.4 PK	68.2	-19.8	1.64 V	214	37.1	11.3
8	15690.00	48.4 PK	74.0	-25.6	1.62 V	198	37.2	11.2
9	15690.00	42.7 AV	54.0	-11.3	1.62 V	198	31.5	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 (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	**#5649.80**	**67.8 PK**	**68.2**	**-0.4**	**2.22 H**	**295**	**66.1**	**1.7**
2	*5755.00	118.9 PK			2.22 H	295	117.0	1.9
3	*5755.00	107.1 AV			2.22 H	295	105.2	1.9
4	#5930.47	58.4 PK	68.2	-9.8	2.22 H	295	56.0	2.4
5	11510.00	49.7 PK	74.0	-24.3	1.38 H	168	37.2	12.5
6	11510.00	37.5 AV	54.0	-16.5	1.38 H	168	25.0	12.5
7	#17265.00	60.2 PK	68.2	-8.0	2.25 H	200	44.2	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	#5649.58	62.3 PK	68.2	-5.9	2.50 V	18	60.6	1.7
2	*5755.00	114.1 PK			2.50 V	18	112.2	1.9
3	*5755.00	103.9 AV			2.50 V	18	102.0	1.9
4	#5969.91	54.4 PK	68.2	-13.8	2.50 V	18	51.9	2.5
5	11510.00	42.9 PK	74.0	-31.1	1.43 V	168	30.4	12.5
6	11510.00	35.0 AV	54.0	-19.0	1.43 V	168	22.5	12.5
7	#17265.00	49.1 PK	68.2	-19.1	1.69 V	197	33.1	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	#5643.33	64.1 PK	68.2	-4.1	1.39 H	284	62.4	1.7
2	*5795.00	119.2 PK			1.39 H	284	117.1	2.1
3	*5795.00	107.6 AV			1.39 H	284	105.5	2.1
4	#5927.84	67.5 PK	68.2	-0.7	1.39 H	284	65.1	2.4
5	11590.00	49.8 PK	74.0	-24.2	1.43 H	174	37.0	12.8
6	11590.00	37.3 AV	54.0	-16.7	1.43 H	174	24.5	12.8
7	#17385.00	62.3 PK	68.2	-5.9	1.60 H	200	45.0	17.3
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	#5638.96	61.3 PK	68.2	-6.9	2.49 V	14	59.6	1.7
2	*5795.00	114.8 PK			2.49 V	14	112.7	2.1
3	*5795.00	104.4 AV			2.49 V	14	102.3	2.1
4	#5925.06	62.5 PK	68.2	-5.7	2.49 V	14	60.1	2.4
5	11590.00	43.2 PK	74.0	-30.8	1.41 V	165	30.4	12.8
6	11590.00	35.1 AV	54.0	-18.9	1.41 V	165	22.3	12.8
7	#17385.00	47.9 PK	68.2	-20.3	1.72 V	203	30.6	17.3

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 (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	5144.86	64.5 PK	74.0	-9.5	1.05 H	308	62.8	1.7
2	5144.86	53.1 AV	54.0	-0.9	1.05 H	308	51.4	1.7
3	*5210.00	112.7 PK			1.05 H	308	111.3	1.4
4	*5210.00	101.1 AV			1.05 H	308	99.7	1.4
5	5363.40	51.8 PK	74.0	-22.2	1.05 H	308	50.4	1.4
6	5363.40	41.6 AV	54.0	-12.4	1.05 H	308	40.2	1.4
7	#10420.00	49.0 PK	68.2	-19.2	1.72 H	193	37.6	11.4
8	15630.00	50.4 PK	74.0	-23.6	1.79 H	226	39.0	11.4
9	15630.00	42.0 AV	54.0	-12.0	1.79 H	226	30.6	11.4
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	5145.00	58.0 PK	74.0	-16.0	2.93 V	342	56.3	1.7
2	5145.00	48.6 AV	54.0	-5.4	2.93 V	342	46.9	1.7
3	*5210.00	107.2 PK			2.93 V	342	105.8	1.4
4	*5210.00	95.2 AV			2.93 V	342	93.8	1.4
5	5352.17	50.4 PK	74.0	-23.6	2.93 V	342	49.0	1.4
6	5352.17	39.9 AV	54.0	-14.1	2.93 V	342	38.5	1.4
7	#10420.00	47.9 PK	68.2	-20.3	1.86 V	217	36.5	11.4
8	15630.00	48.1 PK	74.0	-25.9	1.65 V	192	36.7	11.4
9	15630.00	40.4 AV	54.0	-13.6	1.65 V	192	29.0	11.4

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.
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	#5649.69	67.4 PK	68.2	-0.8	1.52 H	315	65.7	1.7
2	*5775.00	111.6 PK			1.52 H	315	109.6	2.0
3	*5775.00	100.1 AV			1.52 H	315	98.1	2.0
4	#5931.66	60.5 PK	68.2	-7.7	1.52 H	315	58.1	2.4
5	11550.00	47.6 PK	74.0	-26.4	2.00 H	223	34.9	12.7
6	11550.00	35.5 AV	54.0	-18.5	2.00 H	223	22.8	12.7
7	#17325.00	51.6 PK	68.2	-16.6	1.80 H	215	35.2	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	#5642.90	61.8 PK	68.2	-6.4	2.50 V	20	60.1	1.7
2	*5775.00	110.0 PK			2.50 V	20	108.0	2.0
3	*5775.00	97.8 AV			2.50 V	20	95.8	2.0
4	#5926.54	60.8 PK	68.2	-7.4	2.50 V	20	58.4	2.4
5	11550.00	49.9 PK	74.0	-24.1	1.75 V	145	37.2	12.7
6	11550.00	40.9 AV	54.0	-13.1	1.75 V	145	28.2	12.7
7	#17325.00	51.6 PK	68.2	-16.6	1.65 V	204	35.2	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.

RF Mode	TX 802.11ax (HE80+80)	Channel	CH 42+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	5147.86	64.5 PK	74.0	-9.5	1.61 H	292	62.8	1.7
2	5147.86	52.3 AV	54.0	-1.7	1.61 H	292	50.6	1.7
3	*5210.00	106.1 PK			1.61 H	292	104.7	1.4
4	*5210.00	92.4 AV			1.61 H	292	91.0	1.4
5	5352.89	51.7 PK	74.0	-22.3	1.61 H	292	50.3	1.4
6	5352.89	40.2 AV	54.0	-13.8	1.61 H	292	38.8	1.4
7	#5641.95	56.4 PK	68.2	-11.8	1.77 H	63	54.7	1.7
8	*5775.00	105.3 PK			1.77 H	63	103.3	2.0
9	*5775.00	98.6 AV			1.77 H	63	96.6	2.0
10	#5932.34	53.1 PK	68.2	-15.1	1.77 H	63	50.7	2.4
11	#10420.00	49.4 PK	68.2	-18.8	1.66 H	180	38.0	11.4
12	11550.00	50.5 PK	74.0	-23.5	1.85 H	211	37.8	12.7
13	11550.00	42.3 AV	54.0	-11.7	1.85 H	211	29.6	12.7
14	15630.00	47.8 PK	74.0	-26.2	1.98 H	219	36.4	11.4
15	15630.00	35.5 AV	54.0	-18.5	1.98 H	219	24.1	11.4
16	#17325.00	52.0 PK	68.2	-16.2	1.75 H	209	35.6	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	5147.74	66.0 PK	74.0	-8.0	1.70 V	324	64.3	1.7
2	5147.74	53.6 AV	54.0	-0.4	1.70 V	324	51.9	1.7
3	*5210.00	106.0 PK			1.70 V	324	104.6	1.4
4	*5210.00	94.0 AV			1.70 V	324	92.6	1.4
5	5350.06	51.9 PK	74.0	-22.1	1.70 V	324	50.5	1.4
6	5350.06	40.6 AV	54.0	-13.4	1.70 V	324	39.2	1.4
7	#5646.03	56.0 PK	68.2	-12.2	3.19 V	23	54.3	1.7
8	*5775.00	105.2 PK			3.19 V	23	103.2	2.0
9	*5775.00	96.6 AV			3.19 V	23	94.6	2.0
10	#5928.42	54.1 PK	68.2	-14.1	3.19 V	23	51.7	2.4
11	#10420.00	48.1 PK	68.2	-20.1	1.86 V	218	36.7	11.4
12	11550.00	48.4 PK	74.0	-25.6	1.69 V	200	35.7	12.7
13	11550.00	40.7 AV	54.0	-13.3	1.69 V	200	28.0	12.7
14	15630.00	50.2 PK	74.0	-23.8	1.77 V	142	38.8	11.4
15	15630.00	41.0 AV	54.0	-13.0	1.77 V	142	29.6	11.4
16	#17325.00	51.4 PK	68.2	-16.8	1.68 V	195	35.0	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.

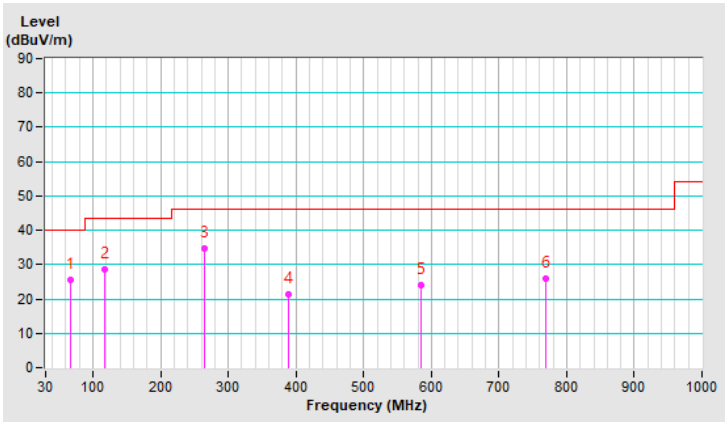
Below 1GHz Data:

RF Mode	TX 802.11a	Channel	CH 157：5785 MHz
Frequency Range	30MHz ~ 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	66.72	25.5 QP	40.0	-14.5	1.50 H	81	39.8	-14.3
2	117.11	28.4 QP	43.5	-15.1	1.50 H	72	43.6	-15.2
3	265.58	34.6 QP	46.0	-11.4	1.00 H	290	48.0	-13.4
4	389.79	21.3 QP	46.0	-24.7	1.00 H	118	31.4	-10.1
5	584.92	24.1 QP	46.0	-21.9	1.50 H	6	29.8	-5.7
6	770.05	25.9 QP	46.0	-20.1	1.50 H	360	28.2	-2.3

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 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.

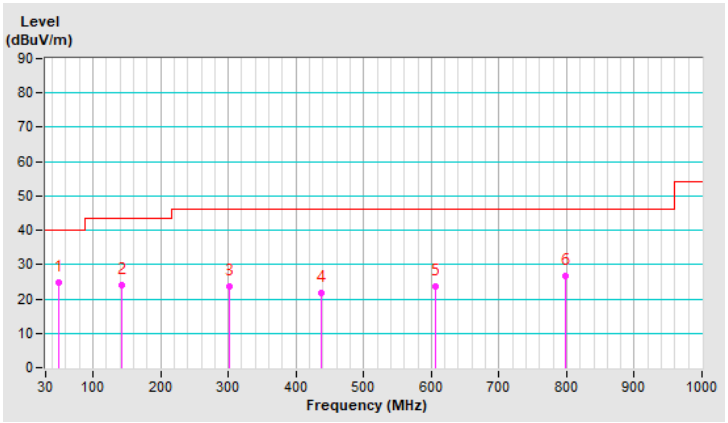


RF Mode	TX 802.11a	Channel	CH 157：5785 MHz
Frequency Range	30MHz ~ 1GHz	Detector Function	Quasi-Peak (QP)

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	49.59	24.7 QP	40.0	-15.3	1.00 V	334	37.3	-12.6
2	143.06	23.9 QP	43.5	-19.6	1.00 V	298	36.7	-12.8
3	301.61	23.7 QP	46.0	-22.3	1.50 V	360	35.8	-12.1
4	436.45	21.8 QP	46.0	-24.2	1.00 V	1	30.2	-8.4
5	606.01	23.6 QP	46.0	-22.4	1.00 V	82	28.5	-4.9
6	799.15	26.7 QP	46.0	-19.3	1.50 V	360	28.9	-2.2

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 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: Dec. 04, 2020

4.2.3 Test Procedure

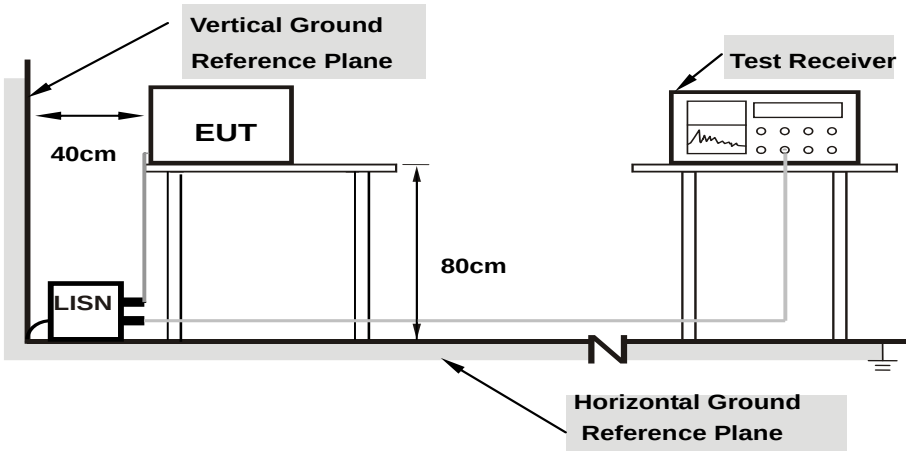
a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling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

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

4.2.4 Deviation from Test Standard

No deviation.

4.2.5 Test Setup



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

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

4.2.6 EUT Operating Condition

Same as 4.1.6.

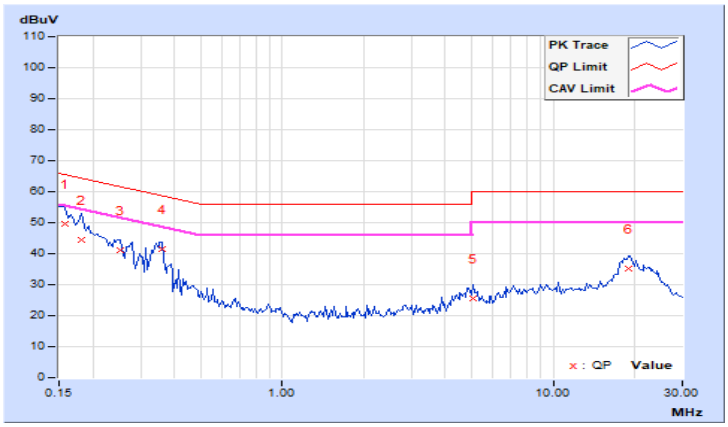
4.2.7 Test Results

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

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15781	9.96	39.53	25.42	49.49	35.38	65.58	55.58	-16.09	-20.20
2	0.18125	9.98	34.62	21.20	44.60	31.18	64.43	54.43	-19.83	-23.25
3	0.25156	10.00	31.09	22.08	41.09	32.08	61.71	51.71	-20.62	-19.63
4	**0.36094**	**10.01**	**31.46**	**26.12**	**41.47**	**36.13**	**58.71**	**48.71**	**-17.24**	**-12.58**
5	5.08203	10.36	15.16	3.23	25.52	13.59	60.00	50.00	-34.48	-36.41
6	18.97266	11.39	23.84	17.59	35.23	28.98	60.00	50.00	-24.77	-21.02

Remarks:

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

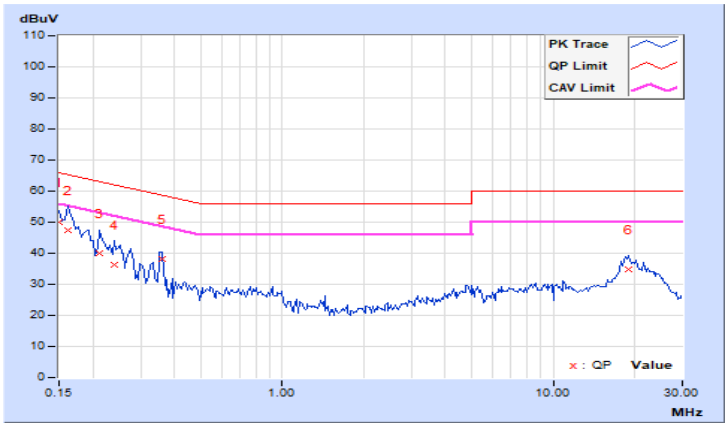


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	9.94	40.02	24.02	49.96	33.96	66.00	56.00	-16.04	-22.04
2	0.16172	9.95	37.56	25.87	47.51	35.82	65.38	55.38	-17.87	-19.56
3	0.21250	9.98	29.97	15.74	39.95	25.72	63.11	53.11	-23.16	-27.39
4	0.23984	9.99	26.46	13.57	36.45	23.56	62.10	52.10	-25.65	-28.54
5	0.36094	10.00	28.14	22.27	38.14	32.27	58.71	48.71	-20.57	-16.44
6	19.03125	11.13	23.54	16.94	34.67	28.07	60.00	50.00	-25.33	-21.93

Remarks:

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



4.3 Transmit Power Measurement

4.3.1 Limits of Transmit Power Measurement

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

*B is the 26 dB emission bandwidth in megahertz

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

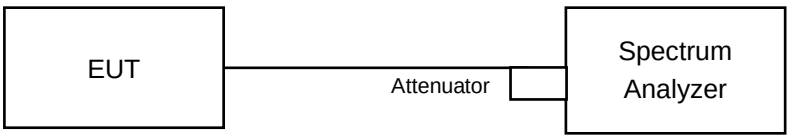
Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \leq 4$;
Array Gain = 0 dB (i.e., no array gain) for channel widths ≥ 40 MHz for any N_{ANT};
Array Gain = 5 log(N_{ANT}/N_{SS}) dB or 3 dB, whichever is less for 20-MHz channel widths with $N_{ANT} \geq 5$.

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

4.3.2 Test Setup

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	Chain 2	Chain 3				
36	5180	17.32	17.68	18.83	17.56	245.965	23.91	30.00	Pass
40	5200	17.88	18.19	19.34	18.27	280.338	24.48	30.00	Pass
48	5240	17.91	18.04	19.13	18.07	271.449	24.34	30.00	Pass
149	5745	23.67	22.81	23.01	23.48	846.624	29.28	30.00	Pass
157	5785	23.69	22.72	23.49	23.76	881.993	29.45	30.00	Pass
165	5825	23.45	22.89	23.54	23.62	871.933	29.40	30.00	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	Chain 2	Chain 3				
36	5180	16.43	16.99	17.97	17.11	208.023	23.18	30.00	Pass
40	5200	18.11	18.29	19.58	18.32	290.869	24.64	30.00	Pass
48	5240	18.02	18.05	19.51	18.24	283.225	24.52	30.00	Pass
149	5745	23.58	22.52	22.71	23.18	801.291	29.04	30.00	Pass
157	5785	23.32	22.58	23.02	23.28	809.178	29.08	30.00	Pass
165	5825	23.14	22.61	22.97	23.35	802.877	29.05	30.00	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	Chain 2	Chain 3				
38	5190	14.39	14.99	15.80	15.20	130.161	21.14	30.00	Pass
46	5230	17.39	16.43	18.62	17.43	226.895	23.56	30.00	Pass
151	5755	21.17	21.18	22.11	21.06	552.337	27.42	30.00	Pass
159	5795	22.06	21.86	23.18	22.27	690.781	28.39	30.00	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	Chain 2	Chain 3				
42	5210	13.63	13.78	14.75	14.20	103.102	20.13	30.00	Pass
155	5775	17.92	17.87	18.14	17.92	250.286	23.98	30.00	Pass

802.11ac (VHT80+80)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
42 +155	5210	16.32	15.96	-	-	82.301	19.15	30.00	Pass
	5775	-	-	17.82	16.81	108.507	20.35	30.00	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	Chain 2	Chain 3				
36	5180	16.78	17.34	18.34	17.39	224.905	23.52	30.00	Pass
40	5200	18.41	18.60	19.84	18.76	313.331	24.96	30.00	Pass
48	5240	18.38	18.32	19.82	18.55	304.34	24.83	30.00	Pass
149	5745	23.62	22.75	22.96	23.43	836.499	29.22	30.00	Pass
157	5785	23.64	22.87	23.29	23.60	867.24	29.38	30.00	Pass
165	5825	23.42	22.96	23.30	23.69	865.163	29.37	30.00	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	Chain 2	Chain 3				
38	5190	14.57	15.15	16.08	15.35	136.203	21.34	30.00	Pass
46	5230	17.60	16.66	18.87	17.67	239.458	23.79	30.00	Pass
151	5755	21.39	21.38	22.23	21.30	577.13	27.61	30.00	Pass
159	5795	22.23	22.02	23.31	22.41	714.8	28.54	30.00	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	Chain 2	Chain 3				
42	5210	13.88	14.05	15.08	14.51	110.304	20.43	30.00	Pass
155	5775	18.03	18.20	18.26	18.19	262.508	24.19	30.00	Pass

802.11ax (HE80+80)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
42 +155	5210	16.55	16.18	-	-	86.681	19.38	30.00	Pass
	5775	-	-	18.03	17.08	114.584	20.59	30.00	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	Chain 2	Chain 3				
36	5180	16.43	16.99	17.97	17.11	208.023	23.18	24.67	Pass
40	5200	17.64	17.89	18.64	18.02	256.095	24.08	24.67	Pass
48	5240	17.85	17.90	18.98	17.91	263.483	24.21	24.67	Pass
149	5745	18.02	17.89	18.57	17.82	257.384	24.11	24.67	Pass
157	5785	18.09	17.96	19.13	17.77	268.622	24.29	24.67	Pass
165	5825	17.86	18.04	19.48	17.95	275.863	24.41	24.67	Pass

Note: The directional gain = 10 log[$(10^{G0/20} + 10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2$ / 4] = 11.33 dBi > 6 dBi, so the power limit shall be reduced to 30-(11.33-6) = 24.67 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	Chain 2	Chain 3				
38	5190	14.39	14.99	15.80	15.20	130.161	21.14	24.67	Pass
46	5230	17.39	16.43	18.62	17.43	226.895	23.56	24.67	Pass
151	5755	17.98	17.84	19.28	17.62	266.152	24.25	24.67	Pass
159	5795	17.76	17.95	19.05	17.98	265.235	24.24	24.67	Pass

Note: The directional gain = 10 log[$(10^{G0/20} + 10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2$ / 4] = 11.33 dBi > 6 dBi, so the power limit shall be reduced to 30-(11.33-6) = 24.67 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	Chain 2	Chain 3				
42	5210	13.63	13.78	14.75	14.20	103.102	20.13	24.67	Pass
155	5775	17.92	17.87	18.14	17.92	250.286	23.98	24.67	Pass

Note: The directional gain = 10 log[$(10^{G0/20} + 10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2$ / 4] = 11.33 dBi > 6 dBi, so the power limit shall be reduced to 30-(11.33-6) = 24.67 dBm.

802.11ac (VHT80+80)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
42 +155	5210	16.32	15.96	-	-	82.301	19.15	27.75	Pass
	5775	-	-	17.82	16.81	108.507	20.35	27.61	Pass

Note: For U-NII-1: The directional gain = 10 log[$(10^{G0/20} + 10^{G1/20})^2$ / 2] = 8.25 dBi > 6 dBi, so the power limit shall be reduced to 30-(8.25-6) = 27.75 dBm.
For UNII-3: The directional gain = 10 log[$(10^{G0/20} + 10^{G1/20})^2$ / 2] = 8.39 dBi > 6 dBi, so the power limit shall be reduced to 30-(8.39-6) = 27.61 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	Chain 2	Chain 3				
36	5180	16.78	17.34	18.34	17.39	224.905	23.52	24.67	Pass
40	5200	17.76	18.06	18.96	18.24	269.062	24.30	24.67	Pass
48	5240	17.96	17.99	19.26	18.08	274.07	24.38	24.67	Pass
149	5745	18.22	18.02	18.88	18.09	271.446	24.34	24.67	Pass
157	5785	18.37	18.15	19.43	18.11	286.434	24.57	24.67	Pass
165	5825	18.12	18.26	19.72	18.15	290.921	24.64	24.67	Pass

Note: The directional gain = 10 log[$(10^{G0/20} + 10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2$ / 4] = 11.33 dBi > 6 dBi, so the power limit shall be reduced to 30-(11.33-6) = 24.67 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	Chain 2	Chain 3				
38	5190	14.57	15.15	16.08	15.35	136.203	21.34	24.67	Pass
46	5230	17.60	16.66	18.87	17.67	239.458	23.79	24.67	Pass
151	5755	18.16	17.96	19.40	17.78	275.056	24.39	24.67	Pass
159	5795	17.88	18.03	19.22	17.89	269.987	24.31	24.67	Pass

Note: The directional gain = 10 log[$(10^{G0/20} + 10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2$ / 4] = 11.33 dBi > 6 dBi, so the power limit shall be reduced to 30-(11.33-6) = 24.67 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	Chain 2	Chain 3				
42	5210	13.88	14.05	15.08	14.51	110.304	20.43	24.67	Pass
155	5775	18.03	18.20	18.26	18.19	262.508	24.19	24.67	Pass

Note: The directional gain = 10 log[$(10^{G0/20} + 10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2$ / 4] = 11.33 dBi > 6 dBi, so the power limit shall be reduced to 30-(11.33-6) = 24.67 dBm.

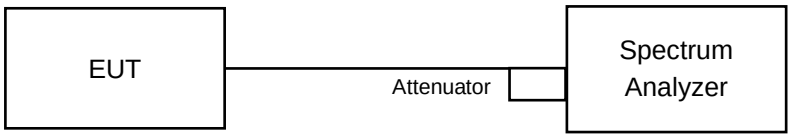
802.11ax (HE80+80)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
42 +155	5210	16.55	16.18	-	-	86.681	19.38	27.75	Pass
	5775	-	-	18.03	17.08	114.584	20.59	27.61	Pass

Note: For U-NII-1: The directional gain = 10 log[$(10^{G0/20} + 10^{G1/20})^2$ / 2] = 8.25 dBi > 6 dBi, so the power limit shall be reduced to 30-(8.25-6) = 27.75 dBm.
For UNII-3: The directional gain = 10 log[$(10^{G0/20} + 10^{G1/20})^2$ / 2] = 8.39 dBi > 6 dBi, so the power limit shall be reduced to 30-(8.39-6) = 27.61 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	Chain 2	Chain 3
36	5180	16.56	16.44	16.44	16.68
40	5200	16.56	16.68	16.68	16.68
48	5240	16.56	16.56	16.56	16.8
149	5745	30.6	30.2	33.4	30.6
157	5785	30.2	30.2	30.2	31.6
165	5825	30.2	30.4	31	32.8

802.11ax (HE20)

Channel	Frequency (MHz)	Occupied Bandwidth (MHz)			
		Chain 0	Chain 1	Chain 2	Chain 3
36	5180	19.08	18.96	19.08	19.08
40	5200	18.96	19.08	19.08	19.08
48	5240	19.08	19.08	19.08	19.2
149	5745	30.6	30.4	30.6	31.2
157	5785	30.2	30.2	30.8	30.2
165	5825	31.4	31	31.4	31.4

802.11ax (HE40)

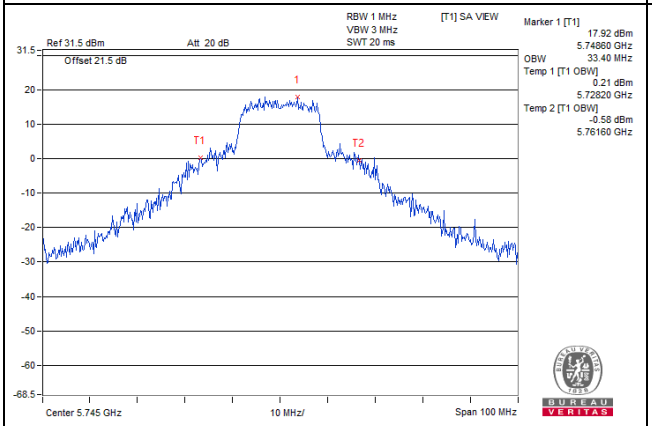
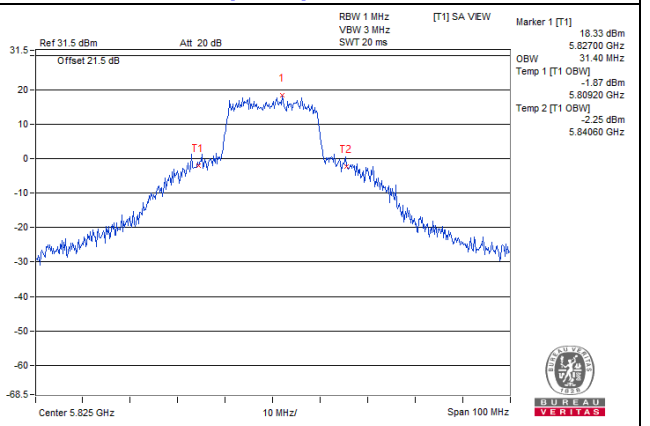
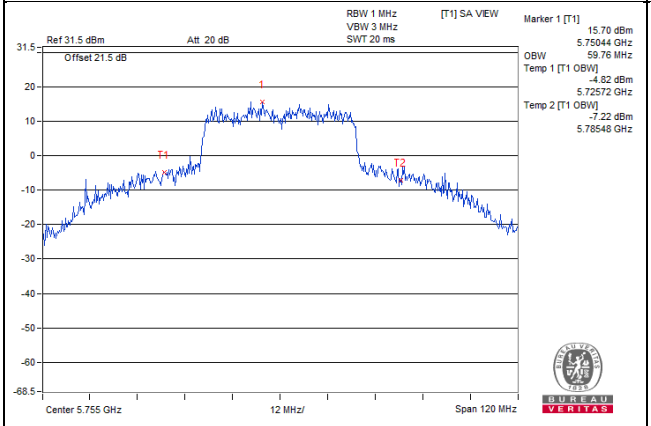
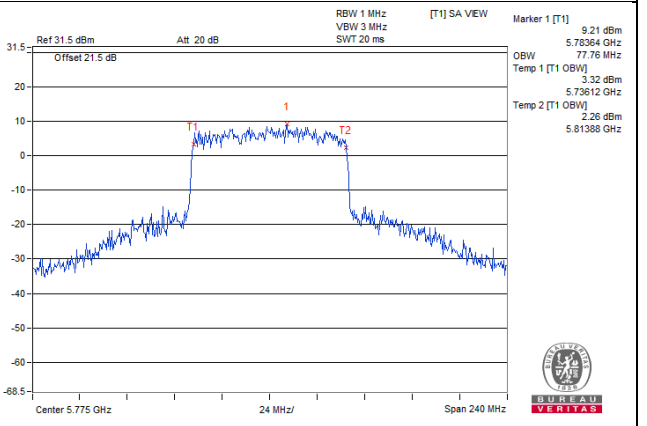
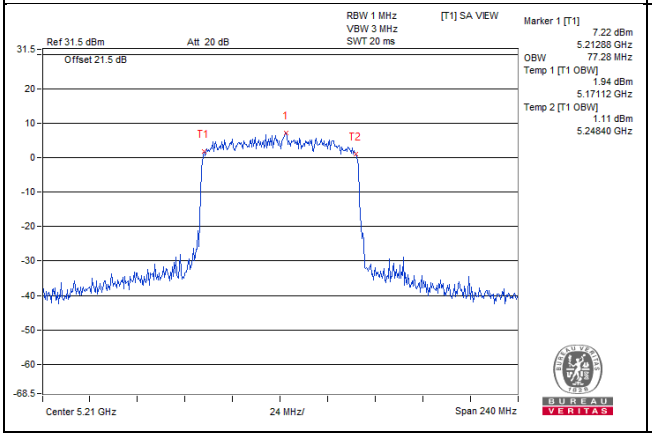
Channel	Frequency (MHz)	Occupied Bandwidth (MHz)			
		Chain 0	Chain 1	Chain 2	Chain 3
38	5190	38.16	38.16	38.16	38.16
46	5230	37.92	37.92	38.16	38.16
151	5755	49.44	42.24	59.76	43.2
159	5795	53.28	54.24	55.68	57.6

802.11ax (HE80)

Channel	Frequency (MHz)	Occupied Bandwidth (MHz)			
		Chain 0	Chain 1	Chain 2	Chain 3
42	5210	77.28	77.28	77.28	77.28
155	5775	77.28	77.28	77.76	77.76

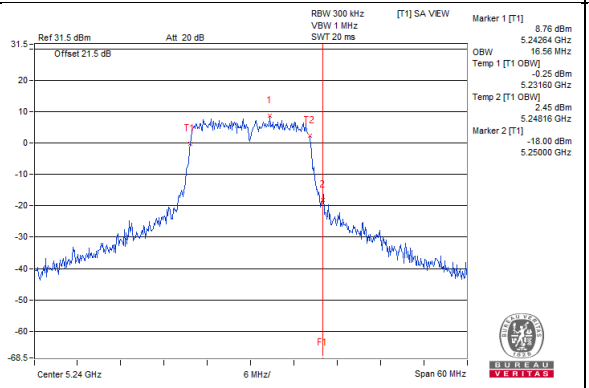
802.11ax (HE80+80)

Channel	Frequency (MHz)	Occupied Bandwidth (MHz)			
		Chain 0	Chain 1	Chain 2	Chain 3
42+155	5210	77.28	77.28	-	-
	5775	-	-	77.28	77.28

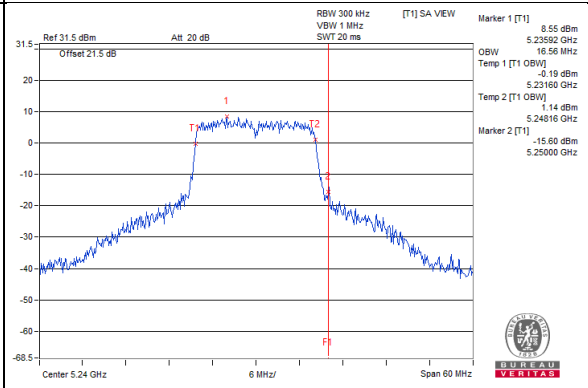
Spectrum Plot of Max. Value	
802.11a_Chain 2 / CH149	**802.11ax (HE20)_Chain 0 / CH165**
	
802.11ax (HE40)_Chain 2 / CH151	**802.11ax (HE80)_Chain 2 / CH155**
	
802.11ax (HE80+80)_Chain 0 / CH42	
	

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

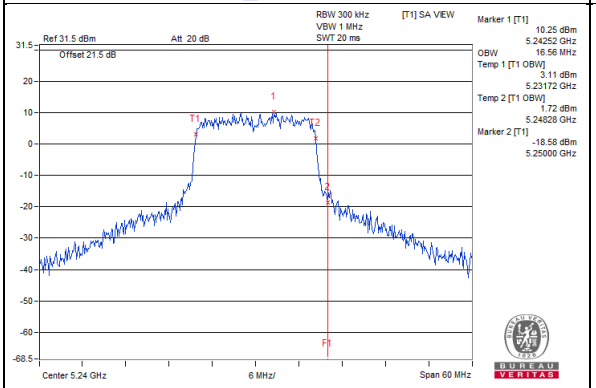
802.11a_Chain 0 / CH48



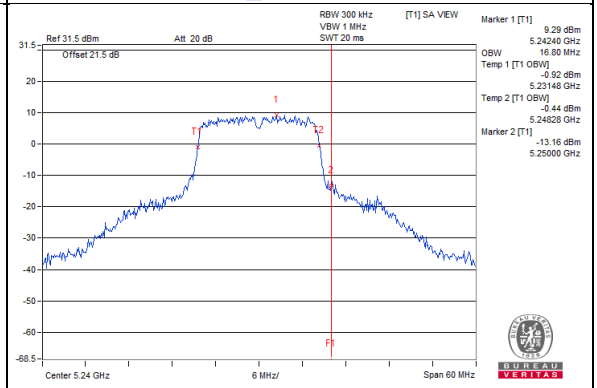
802.11a_Chain 1 / CH48



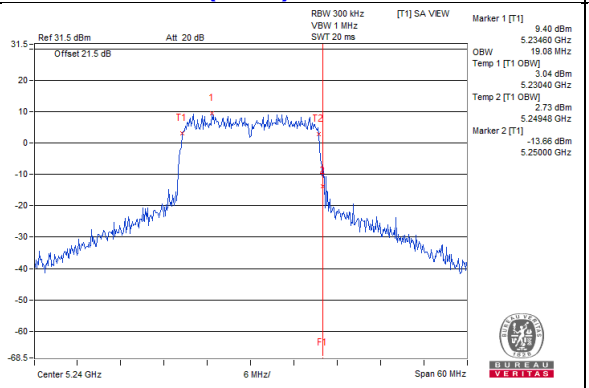
802.11a_Chain 2 / CH48



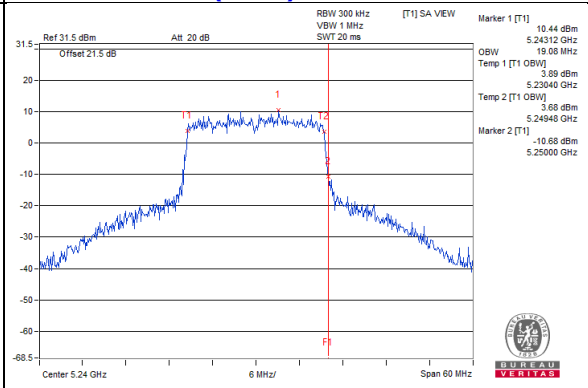
802.11a_Chain 3 / CH48



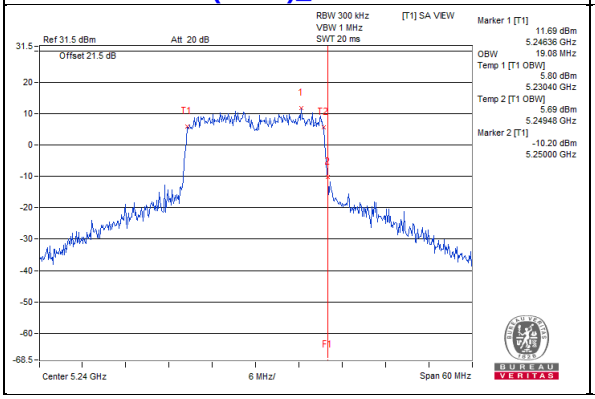
802.11ax (HE20)_Chain 0 / CH48



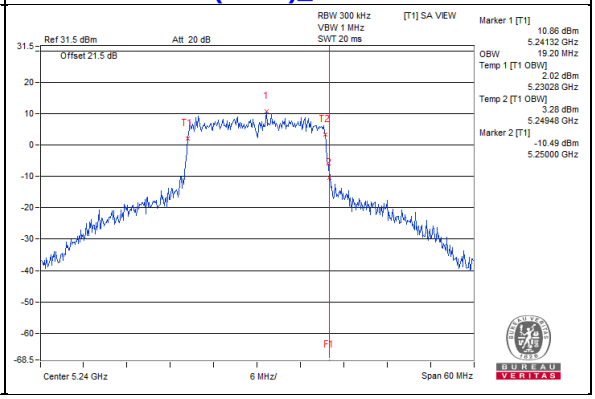
802.11ax (HE20)_Chain 1 / CH48



802.11ax (HE20)_Chain 2 / CH48

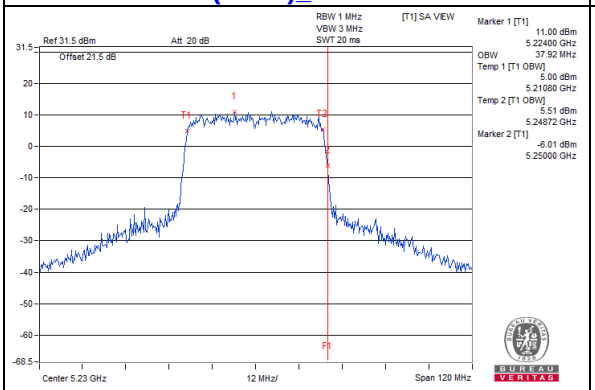


802.11ax (HE20)_Chain 3 / CH48

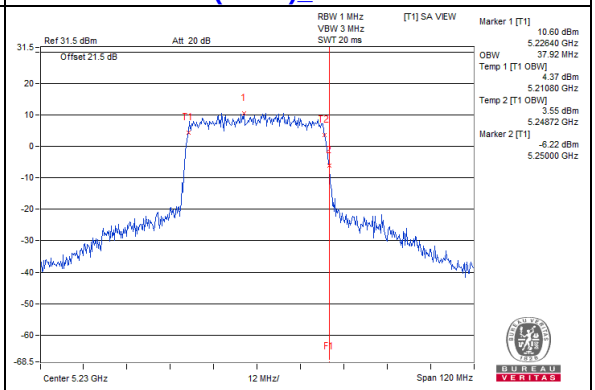


Spectrum Plot for near by DFS band
(DFS is required, if 99% OCP straddle into U-NII-2A band)

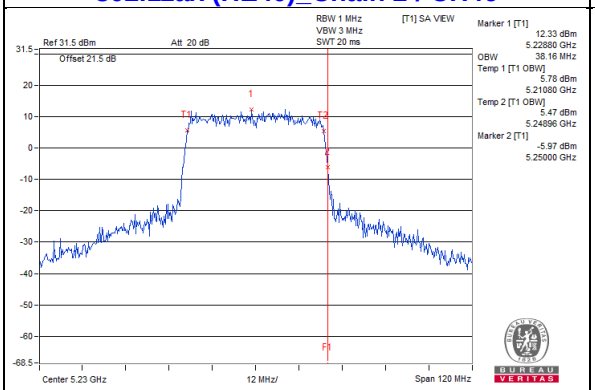
802.11ax (HE40)_Chain 0 / CH46



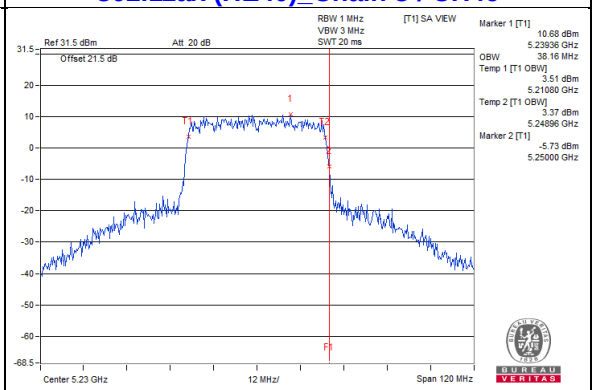
802.11ax (HE40)_Chain 1 / CH46



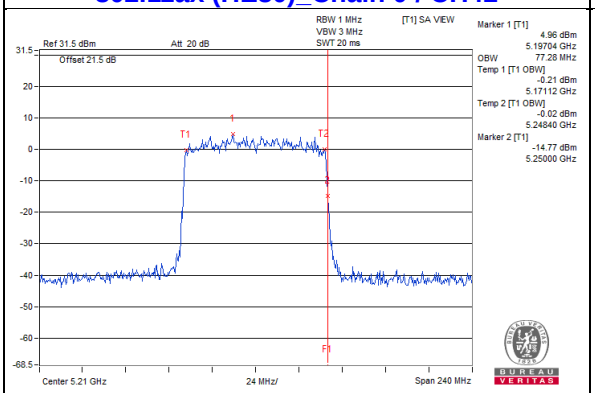
802.11ax (HE40)_Chain 2 / CH46



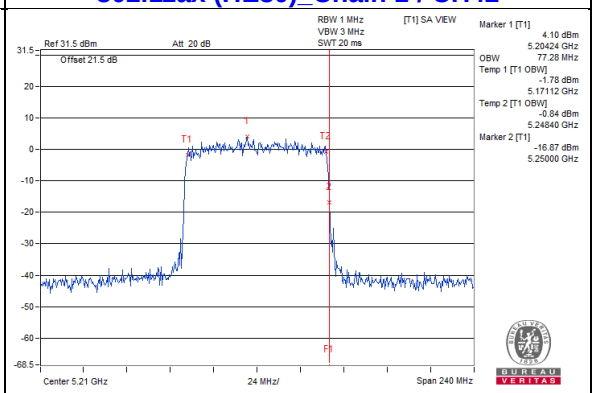
802.11ax (HE40)_Chain 3 / CH46



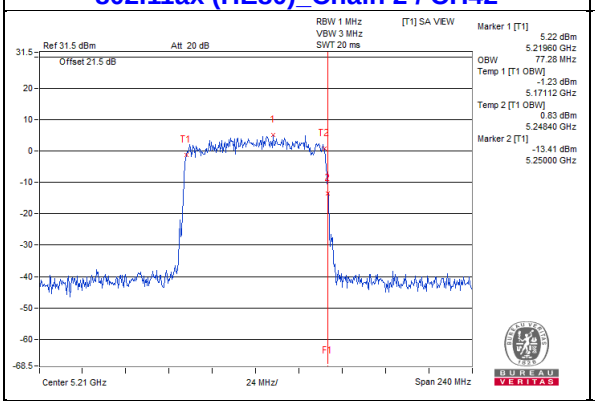
802.11ax (HE80)_Chain 0 / CH42



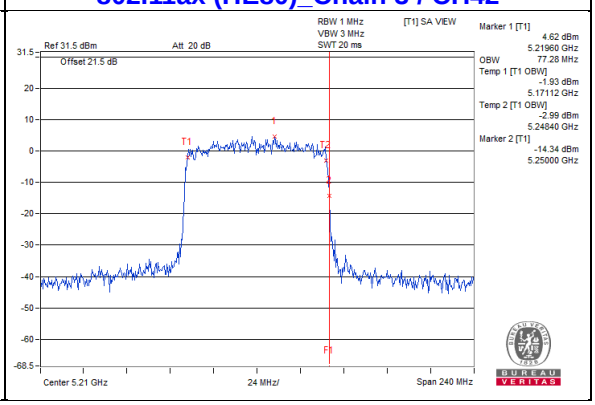
802.11ax (HE80)_Chain 1 / CH42

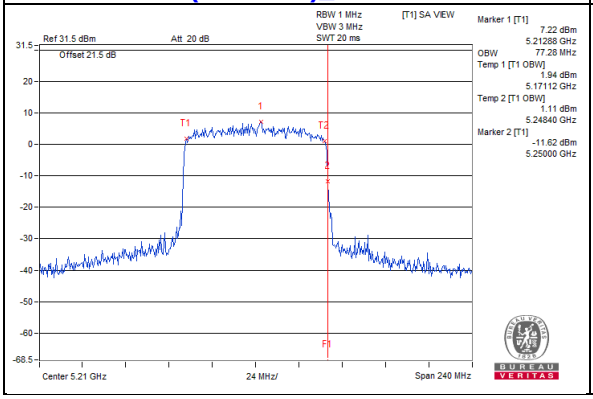
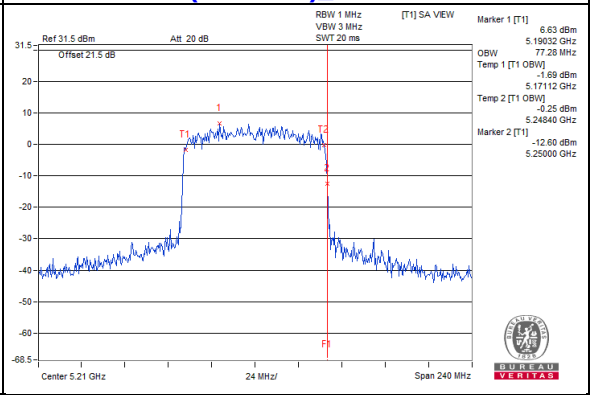


802.11ax (HE80)_Chain 2 / CH42



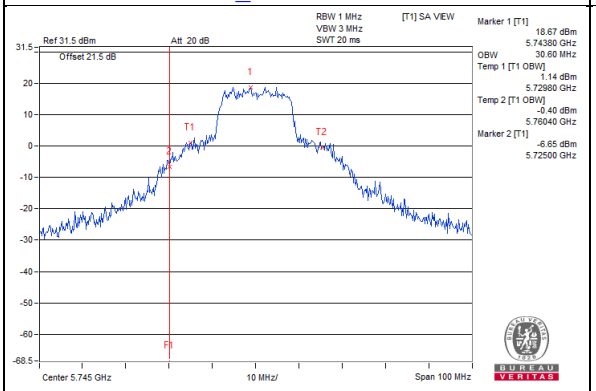
802.11ax (HE80)_Chain 3 / CH42



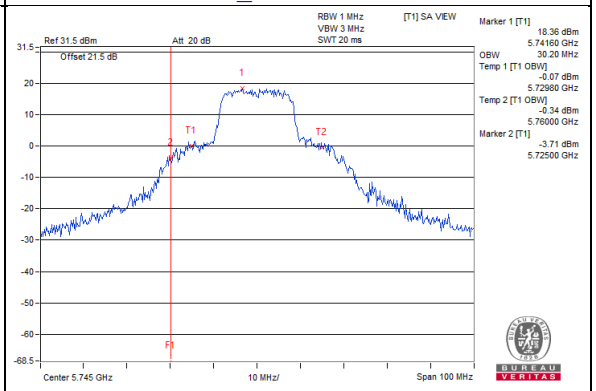
Spectrum Plot for near by DFS band (DFS is required, if 99% OCP straddle into U-NII-2A band)	
802.11ax (HE80+80)_Chain 0 / CH42	**802.11ax (HE80+80)_Chain 1 / CH42**
	

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

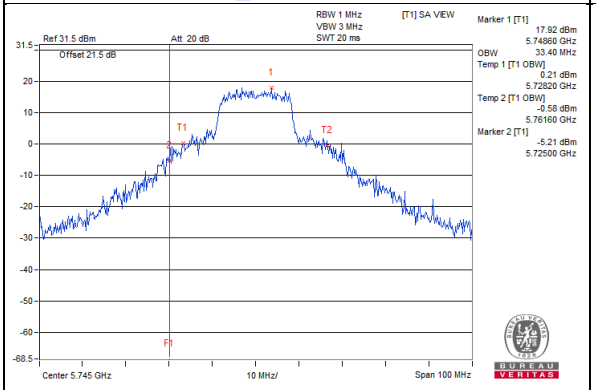
802.11a_Chain 0 / CH149



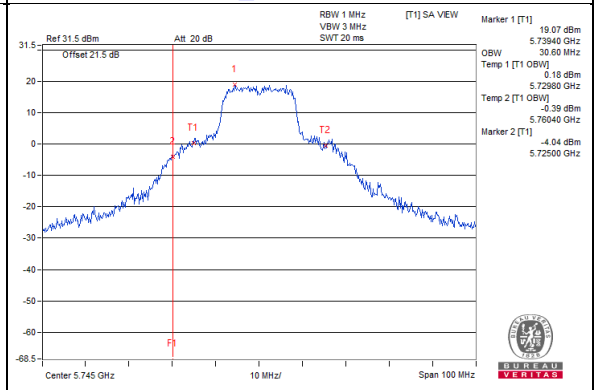
802.11a_Chain 1 / CH149



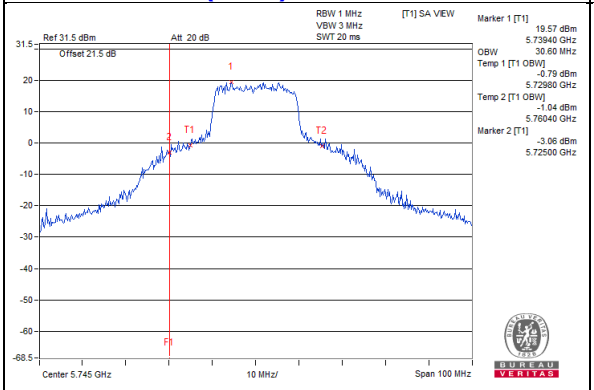
802.11a_Chain 2 / CH149



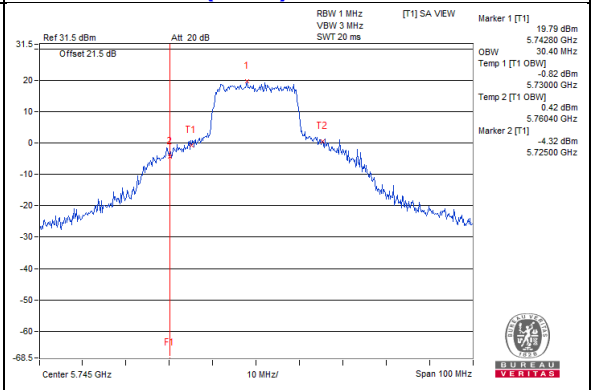
802.11a_Chain 3 / CH149



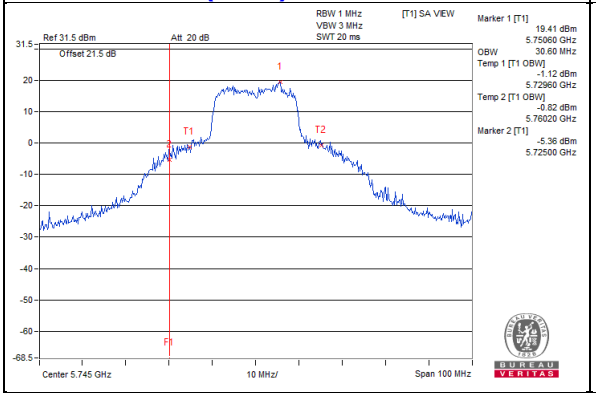
802.11ax (HE20)_Chain 0 / CH149



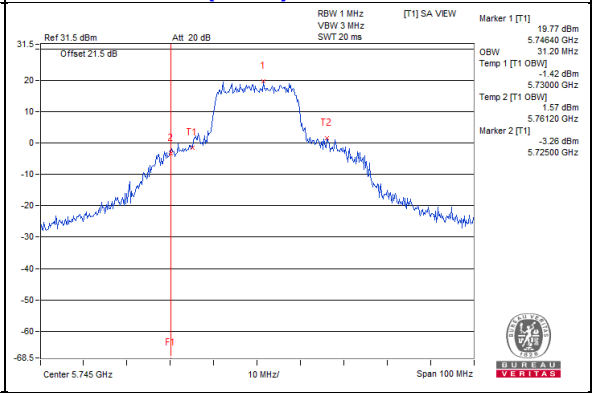
802.11ax (HE20)_Chain 1 / CH149



802.11ax (HE20)_Chain 2 / CH149

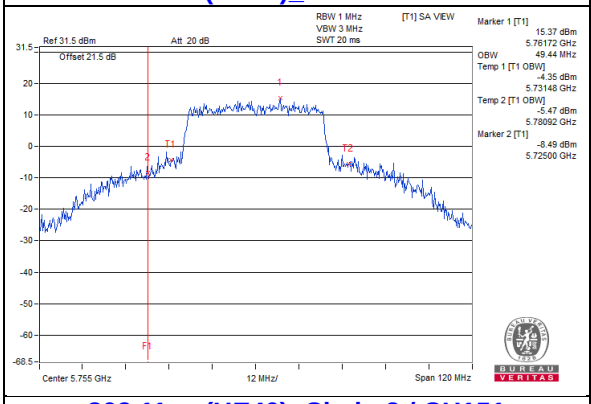


802.11ax (HE20)_Chain 3 / CH149

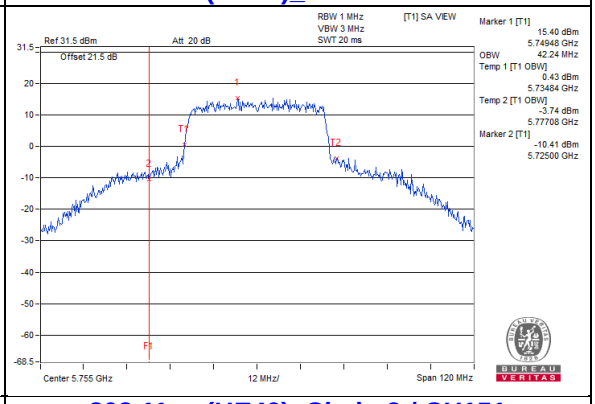


Spectrum Plot for near by DFS band
(DFS is required, if 99% OCP straddle into U-NII-2C band)

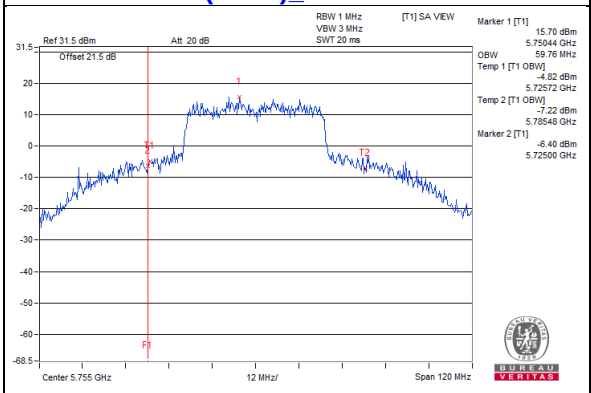
802.11ax (HE40)_Chain 0 / CH151



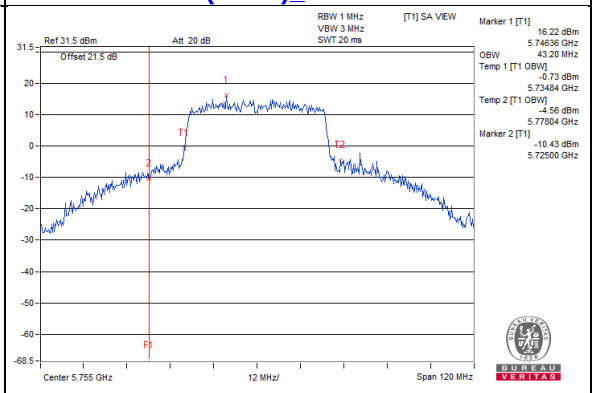
802.11ax (HE40)_Chain 1 / CH151



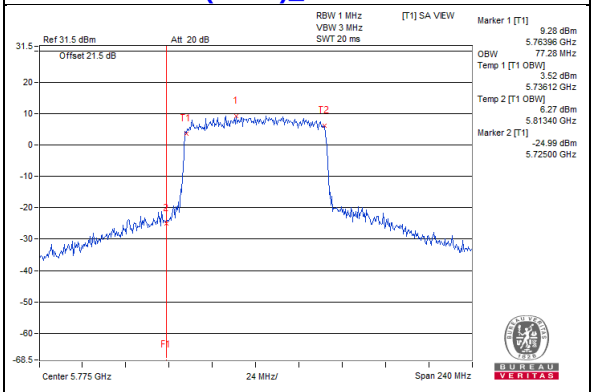
802.11ax (HE40)_Chain 2 / CH151



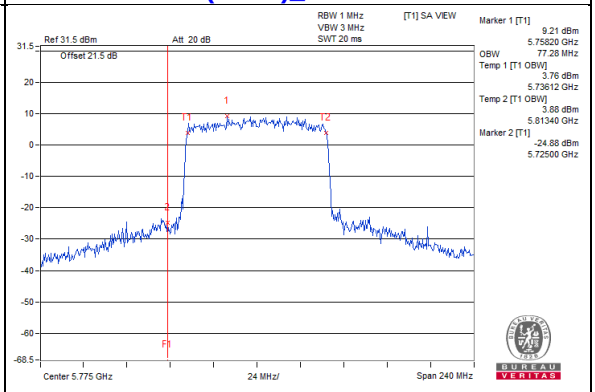
802.11ax (HE40)_Chain 3 / CH151



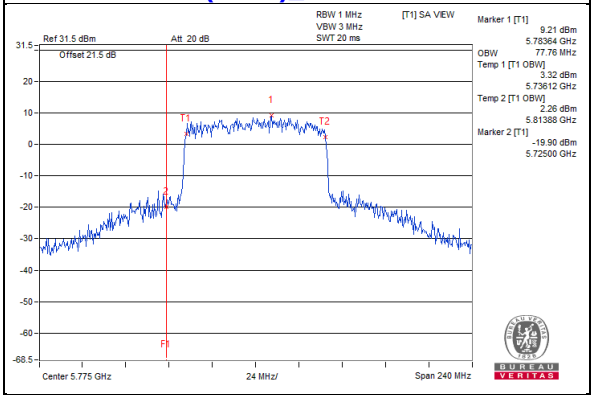
802.11ax (HE80)_Chain 0 / CH155



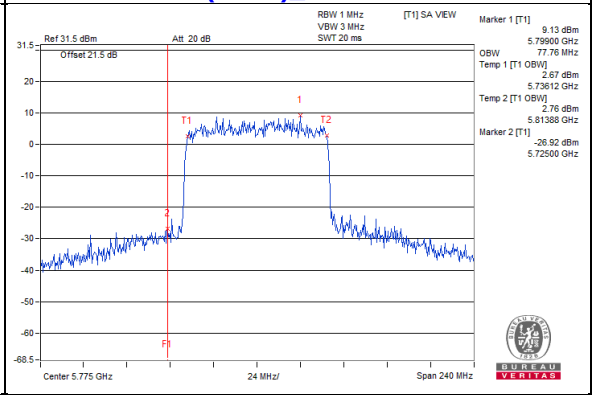
802.11ax (HE80)_Chain 1 / CH155

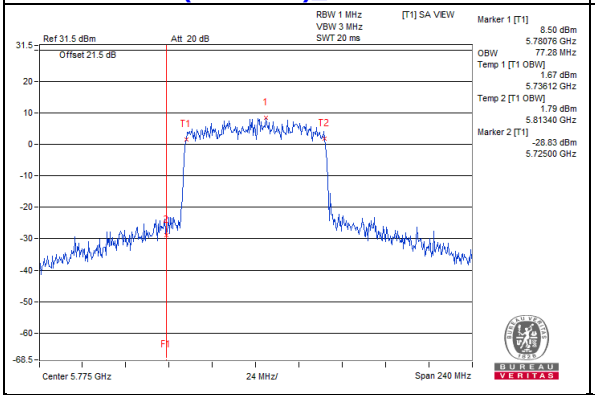
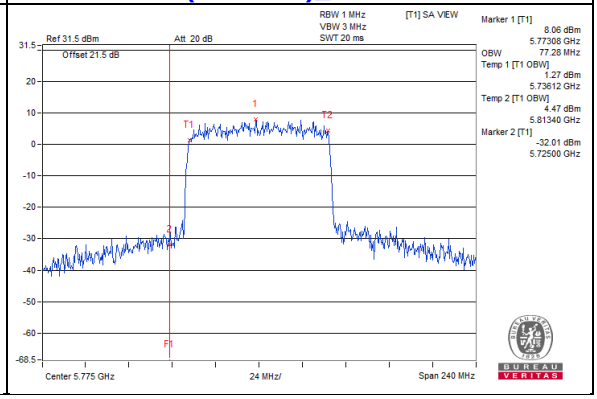


802.11ax (HE80)_Chain 2 / CH155



802.11ax (HE80)_Chain 3 / CH155



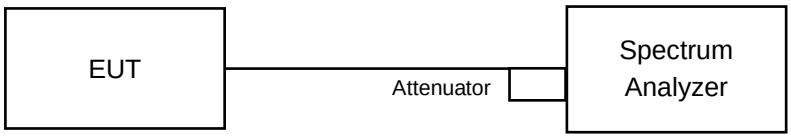
Spectrum Plot for near by DFS band (DFS is required, if 99% OCP straddle into U-NII-2C band)	
802.11ax (HE80+80)_Chain 2 / CH155	**802.11ax (HE80+80)_Chain 3 / CH155**
	

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 = 10log(500kHz/300kHz)
5. Sweep time = auto, trigger set to “free run”.
6. Trace average at least 100 traces in power averaging mode.
7. Record the max value 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	Chain 2	Chain 3				
36	5180	3.13	3.31	5.02	3.53	0.29	10.13	11.67	Pass
40	5200	3.68	3.99	5.33	3.99	0.29	10.61	11.67	Pass
48	5240	3.65	4.23	4.93	3.91	0.29	10.52	11.67	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[$(10^{G0/20} + 10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2$ / 4] = 11.33 dBi > 6 dBi, so the power density limit shall be reduced to 17-(11.33-6) = 11.67 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	Chain 2	Chain 3				
36	5180	2.00	2.30	4.02	2.42	0.19	8.97	11.67	Pass
40	5200	3.42	4.28	5.44	4.07	0.19	10.58	11.67	Pass
48	5240	3.92	3.49	5.57	3.90	0.19	10.51	11.67	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[$(10^{G0/20} + 10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2$ / 4] = 11.33 dBi > 6 dBi, so the power density limit shall be reduced to 17-(11.33-6) = 11.67 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	Chain 2	Chain 3				
38	5190	-2.85	-2.32	-1.34	-2.24	0.19	4.06	11.67	Pass
46	5230	-0.19	0.47	1.73	0.00	0.19	6.78	11.67	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[$(10^{G0/20} + 10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2$ / 4] = 11.33 dBi > 6 dBi, so the power density limit shall be reduced to 17-(11.33-6) = 11.67 dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ax (HE80)

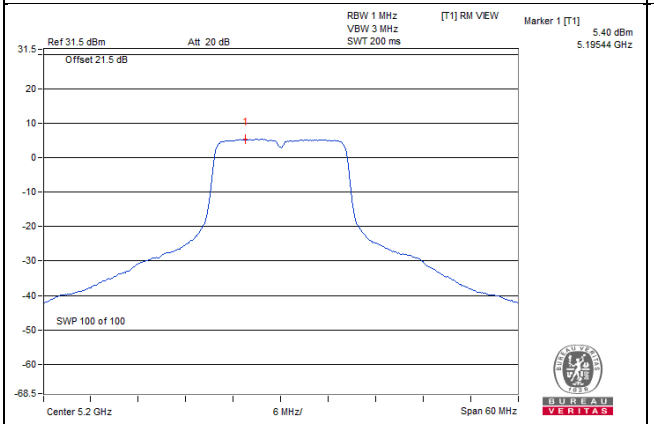
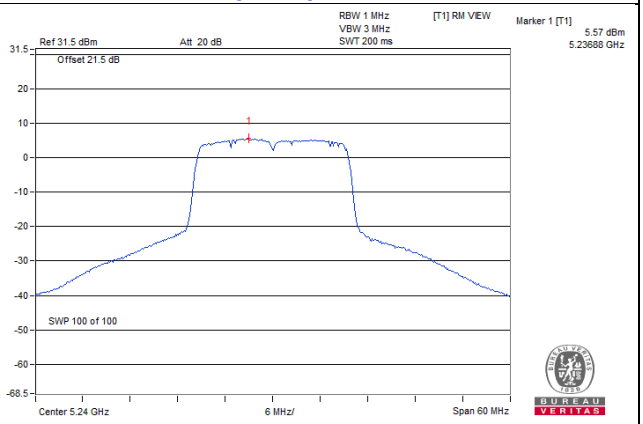
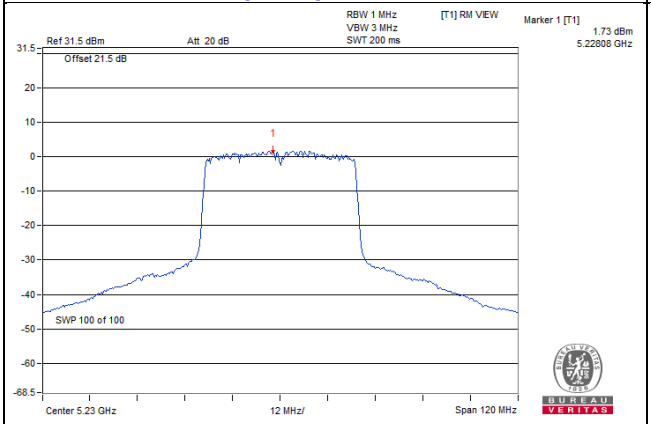
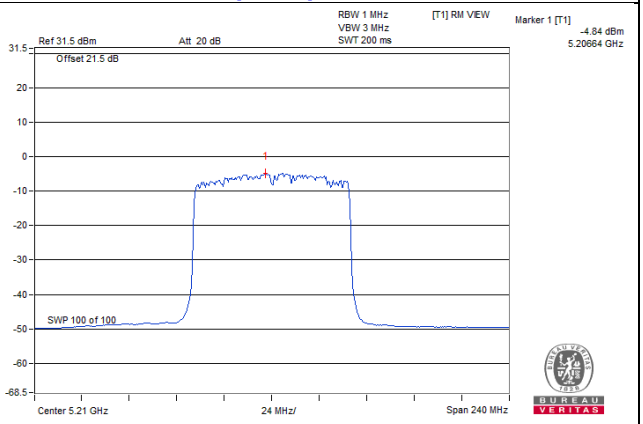
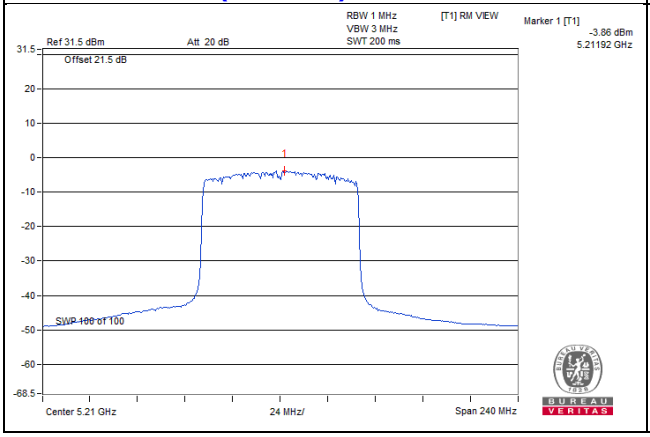
Chan.	Chan. Freq. (MHz)	PSD w/o Duty Factor (dBm/MHz)				Duty Factor (dB)	Total PSD (dBm/MHz)	Max. PSD Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
42	5210	-6.80	-6.42	-4.84	-5.83	0.20	0.31	11.67	Pass

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[$(10^{G0/20} + 10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2$ / 4] = 11.33 dBi > 6 dBi, so the power density limit shall be reduced to 17-(11.33-6) = 11.67 dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ax (HE80+80)

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	Chain 2	Chain 3				
42+155	5210	-3.86	-4.32	-	-	0.21	-0.86	14.75	Pass
	5775	Test results refer to U_NII-3 data							

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] = 8.25 dBi > 6 dBi, so the power density limit shall be reduced to 17-(8.25-6) = 14.75 dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

Spectrum Plot of Worst Value	
802.11a_Chain 2 / CH40	**802.11ax (HE20)_Chain 2 / CH48**
	
802.11ax (HE40)_Chain 2 / CH46	**802.11ax (HE80)_Chain 2 / CH42**
	
802.11ax (HE80+80)_Chain 0 / CH42	
	

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/300 kHz)	Total PSD (dBm/500 kHz)	PSD Limit (dBm/500 kHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3					
149	5745	0.93	0.68	0.95	0.87	0.29	7.17	9.39	24.67	Pass
157	5785	0.50	0.54	0.70	1.59	0.29	7.17	9.39	24.67	Pass
165	5825	0.48	1.13	0.72	1.55	0.29	7.30	9.52	24.67	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[($10^{G0/20}$ + $10^{G1/20}$+ $10^{G2/20}$+ $10^{G3/20}$)^2 / 4] = 11.33 dBi > 6 dBi, so the power density limit shall be reduced to 30-(11.33-6) = 24.67 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/300 kHz)	Total PSD (dBm/500 kHz)	PSD Limit (dBm/500 kHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3					
149	5745	-0.51	-0.56	-1.28	-0.74	0.19	5.45	7.67	24.67	Pass
157	5785	-1.07	-0.36	-0.65	-0.30	0.19	5.63	7.85	24.67	Pass
165	5825	-0.84	-0.23	-0.48	-0.06	0.19	5.82	8.04	24.67	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[($10^{G0/20}$ + $10^{G1/20}$+ $10^{G2/20}$+ $10^{G3/20}$)^2 / 4] = 11.33 dBi > 6 dBi, so the power density limit shall be reduced to 30-(11.33-6) = 24.67 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/300 kHz)	Total PSD (dBm/500 kHz)	PSD Limit (dBm/500 kHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3					
151	5755	-4.19	-4.63	-3.05	-4.19	0.19	2.23	4.45	24.67	Pass
159	5795	-3.45	-3.30	-2.97	-2.83	0.19	3.08	5.30	24.67	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[($10^{G0/20}$ + $10^{G1/20}$+ $10^{G2/20}$+ $10^{G3/20}$)^2 / 4] = 11.33 dBi > 6 dBi, so the power density limit shall be reduced to 30-(11.33-6) = 24.67 dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ax (HE80)

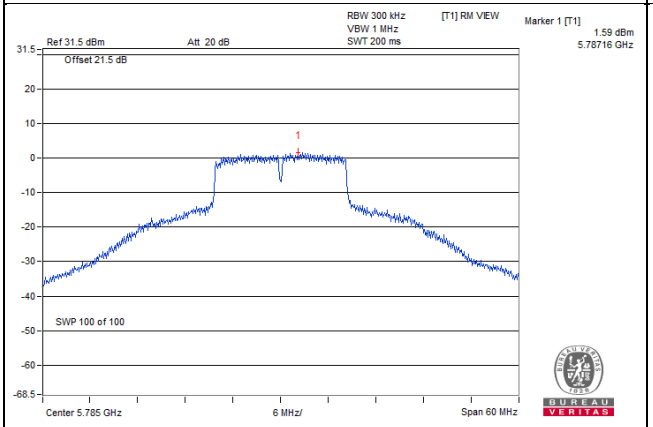
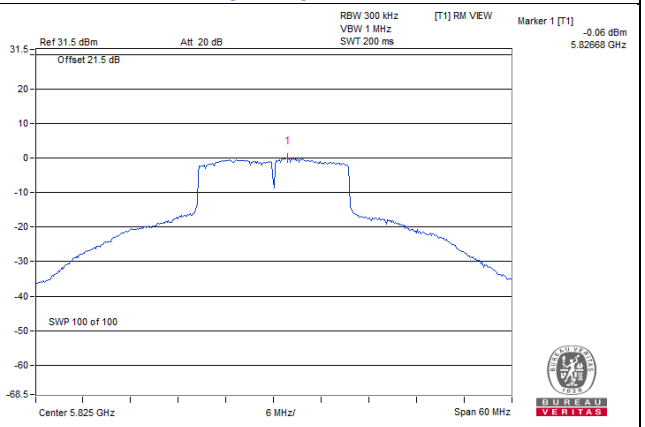
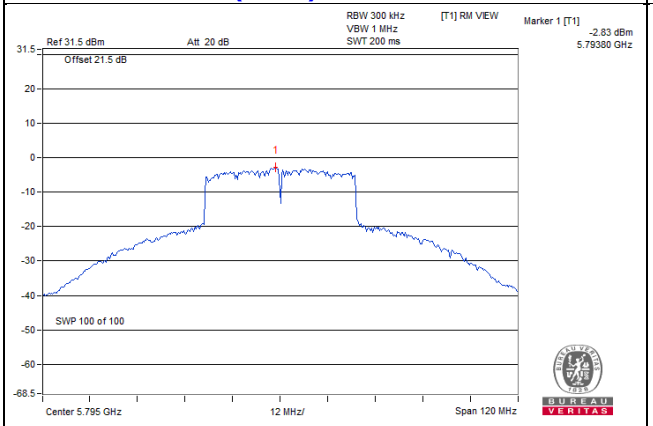
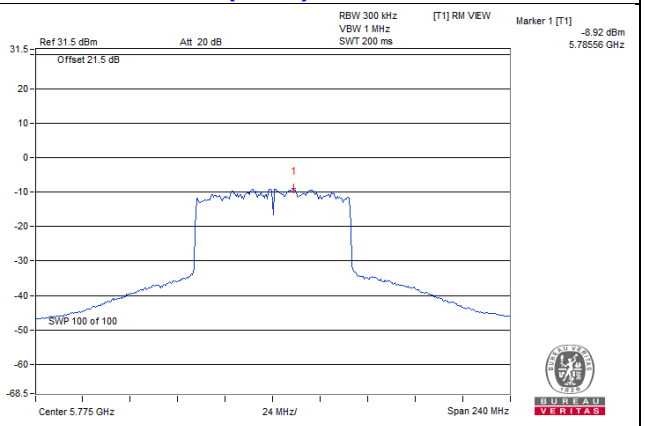
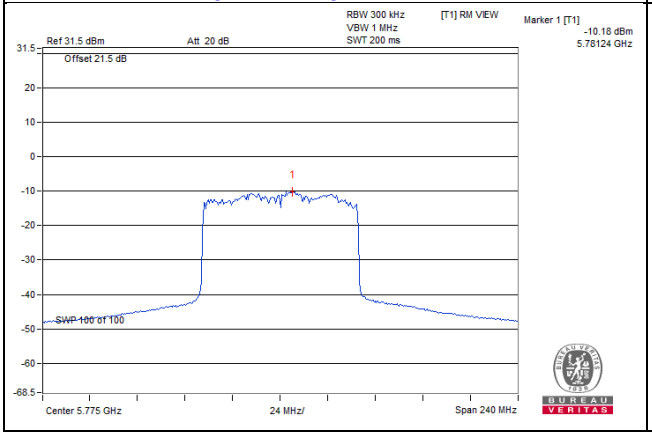
Chan.	Chan. Freq. (MHz)	PSD w/o Duty Factor (dBm/300kHz)				Duty Factor (dB)	Total PSD (dBm/300 kHz)	Total PSD (dBm/500 kHz)	PSD Limit (dBm/500 kHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3					
155	5775	-10.25	-10.46	-8.92	-10.24	0.20	-3.71	-1.49	24.67	Pass

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[$(10^{G0/20} + 10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2$ / 4] = 11.33 dBi > 6 dBi, so the power density limit shall be reduced to 30-(11.33-6) = 24.67 dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ax (HE80+80)

Chan.	Chan. Freq. (MHz)	PSD w/o Duty Factor (dBm/300kHz)				Duty Factor (dB)	Total PSD (dBm/300 kHz)	Total PSD (dBm/500 kHz)	PSD Limit (dBm/500 kHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3					
42+155	5210	Test results refer to U_NII-1 data								Pass
	5775	-	-	-10.18	-10.81	0.21	-7.26	-5.04	24.67	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[$(10^{G0/20} + 10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2$ / 4] = 11.33 dBi > 6 dBi, so the power density limit shall be reduced to 30-(11.33-6) = 24.67 dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

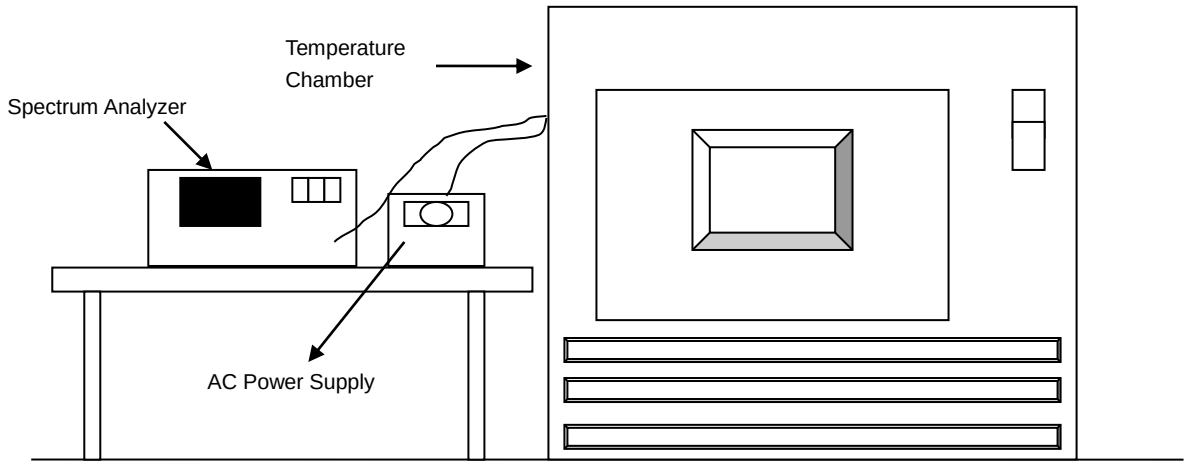
Spectrum Plot of Worst Value	
802.11a_Chain 3 / CH157	**802.11ax (HE20)_Chain 3 / CH165**
	
802.11ax (HE40)_Chain 3 / CH159	**802.11ax (HE80)_Chain 2 / CH155**
	
802.11ax (HE80+80)_Chain 2 / CH155	
	

4.6 Frequency Stability Measurement

4.6.1 Limits of Frequency Stability Measurement

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

4.6.2 Test Setup



4.6.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.6.4 Test Procedure

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

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

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

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

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

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

4.6.5 Deviation from Test Standard

No deviation.

4.6.6 EUT Operating Condition

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

4.6.7 Test Results

Frequency Stability Versus Temp.									
Operating Frequency: 5180 MHz									
TEMP. (℃)	Power Supply (Vac)	0 Minute		2 Minutes		5 Minutes		10 Minutes	
		Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail
40	120	5180.0197	Pass	5180.0167	Pass	5180.0197	Pass	5180.0165	Pass
30	120	5180.004	Pass	5180.006	Pass	5180.0067	Pass	5180.0048	Pass
20	120	5180.0041	Pass	5180.0014	Pass	5180.0056	Pass	5180.0053	Pass
10	120	5179.9916	Pass	5179.9939	Pass	5179.9892	Pass	5179.9936	Pass
0	120	5180.0142	Pass	5180.0119	Pass	5180.0105	Pass	5180.012	Pass

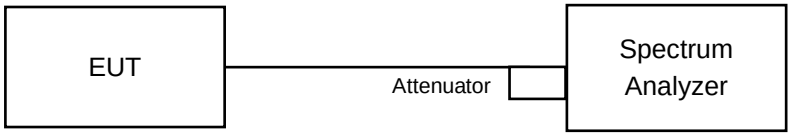
Frequency Stability Versus Voltage									
Operating Frequency: 5180 MHz									
TEMP. (℃)	Power Supply (Vac)	0 Minute		2 Minutes		5 Minutes		10 Minutes	
		Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail
20	138	5180.0032	Pass	5180.0009	Pass	5180.0049	Pass	5180.005	Pass
	120	5180.0041	Pass	5180.0014	Pass	5180.0056	Pass	5180.0053	Pass
	102	5180.0031	Pass	5180.0008	Pass	5180.0064	Pass	5180.0057	Pass

4.7 6dB Bandwidth Measurement

4.7.1 Limits of 6dB Bandwidth Measurement

The minimum of 6dB Bandwidth Measurement is 0.5MHz.

4.7.2 Test Setup



4.7.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.7.4 Test Procedure

MEASUREMENT PROCEDURE REF

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

4.7.5 Deviation from Test Standard

No deviation.

4.7.6 EUT Operating Condition

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

4.7.7 Test Results

CDD Mode

802.11a

Channel	Frequency (MHz)	6dB Bandwidth (MHz)				Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3		
149	5745	16.29	15.9	16.29	15.74	0.5	Pass
157	5785	16.06	15.74	15.77	16.32	0.5	Pass
165	5825	16.33	15.96	16.31	16.31	0.5	Pass

802.11ax (HE20)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)				Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3		
149	5745	18.79	18.96	18.53	18.85	0.5	Pass
157	5785	18.56	18.81	18.42	18.5	0.5	Pass
165	5825	18.69	18.89	17.98	18.71	0.5	Pass

802.11ax (HE40)

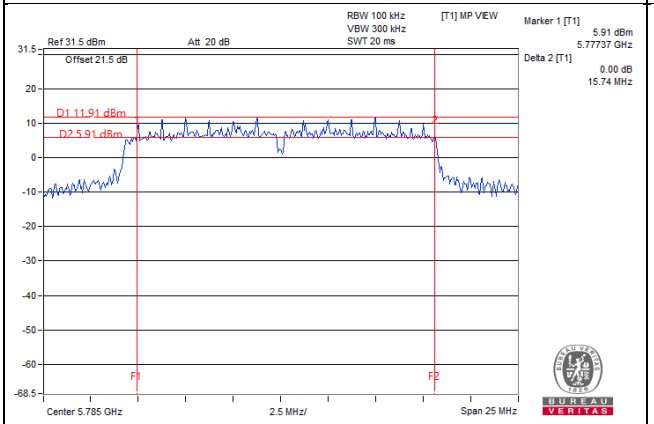
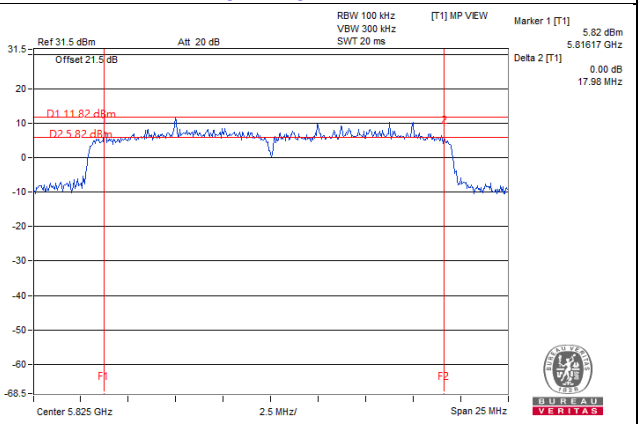
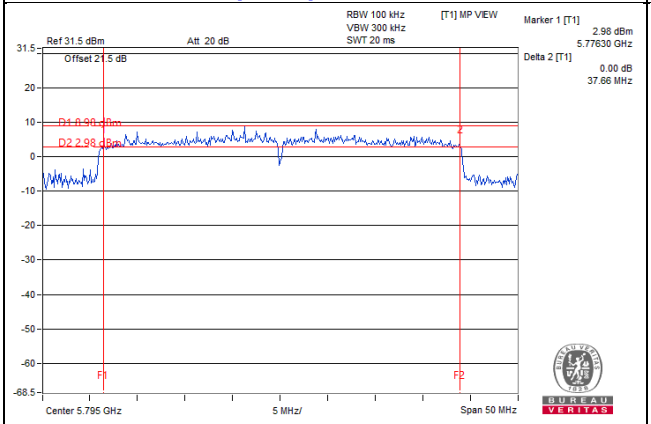
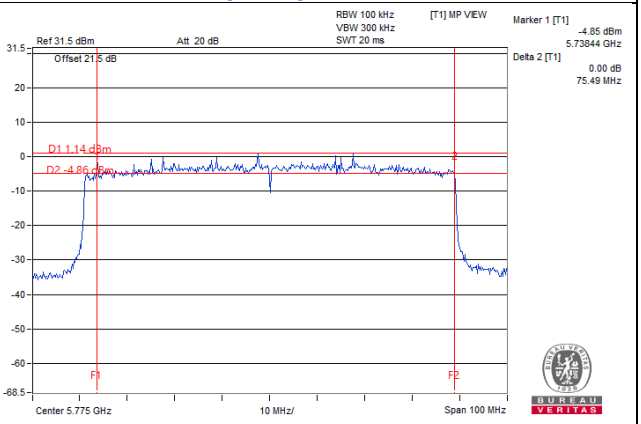
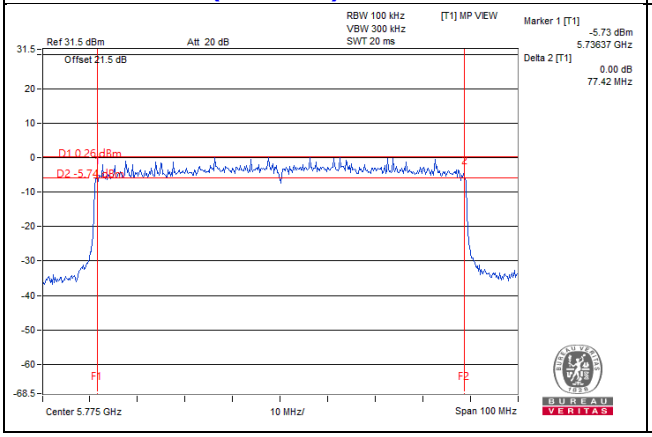
Channel	Frequency (MHz)	6dB Bandwidth (MHz)				Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3		
151	5755	38.22	38.29	38.22	37.97	0.5	Pass
159	5795	37.95	38.05	37.66	37.92	0.5	Pass

802.11ax (HE80)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)				Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3		
155	5775	77.21	76.98	77.5	75.49	0.5	Pass

802.11ax (HE80+80)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)				Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3		
42+155	5210	-					
	5775	-	-	77.89	77.42	0.5	Pass

Spectrum Plot of Worst Value	
802.11a_Chain 1 / CH157	**802.11ax (HE20)_Chain 2 / CH165**
	
802.11ax (HE40)_Chain 2 / CH159	**802.11ax (HE80)_Chain 3 / CH155**
	
802.11ax (HE80+80)_Chain 3 / CH155	
	

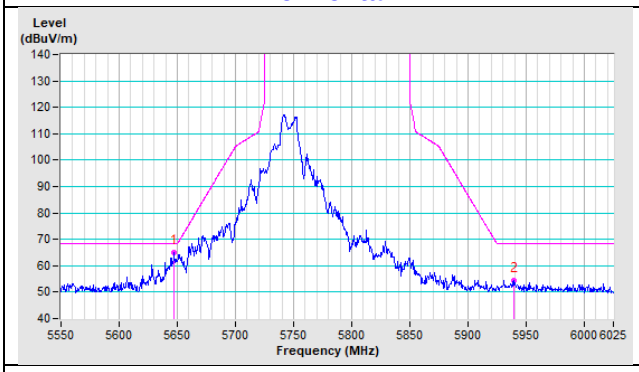
5 Pictures of Test Arrangements

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

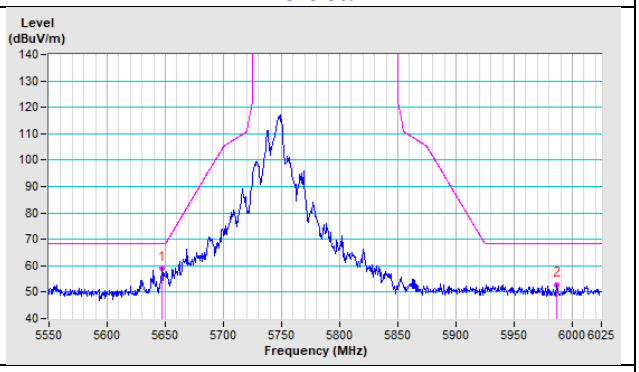
Annex A - Radiated Out of Band Emission (OOBE) Measurement (For U-NII-3 band)

802.11a CH 149：5745 MHz

Horizontal

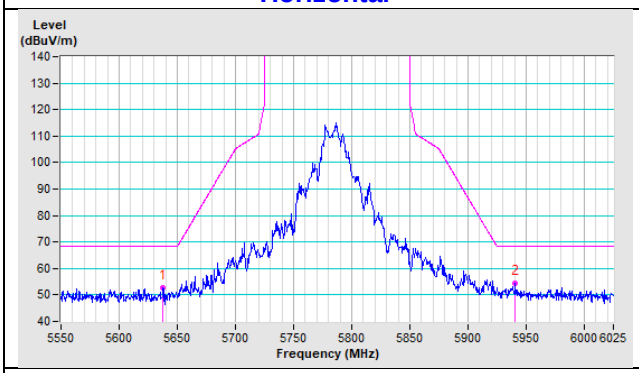


Vertical

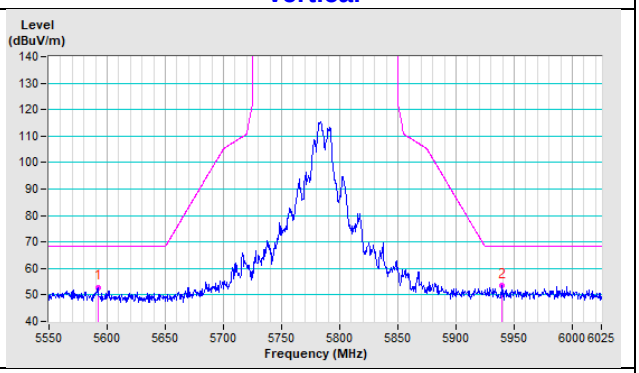


802.11a CH 157：5785 MHz

Horizontal

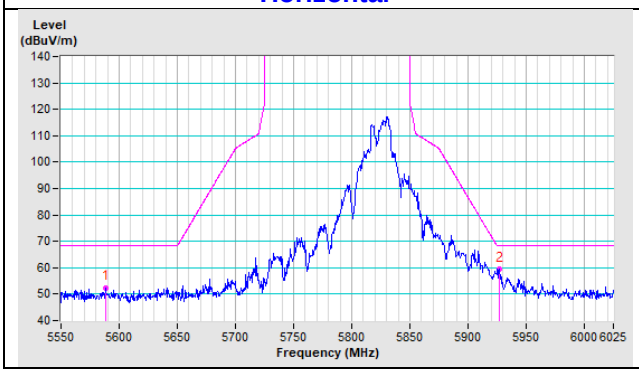


Vertical

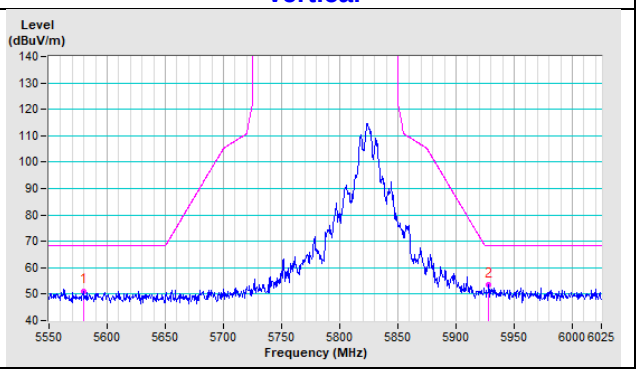


802.11a CH 165：5825 MHz

Horizontal

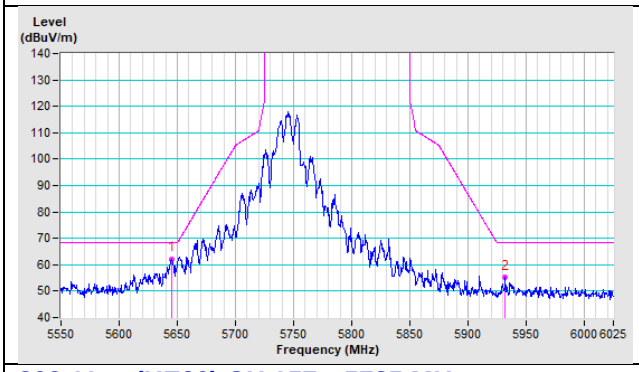


Vertical

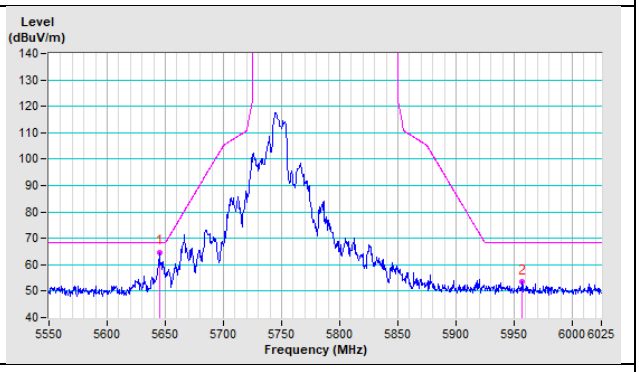


802.11ax (HE20) CH 149：5745 MHz

Horizontal

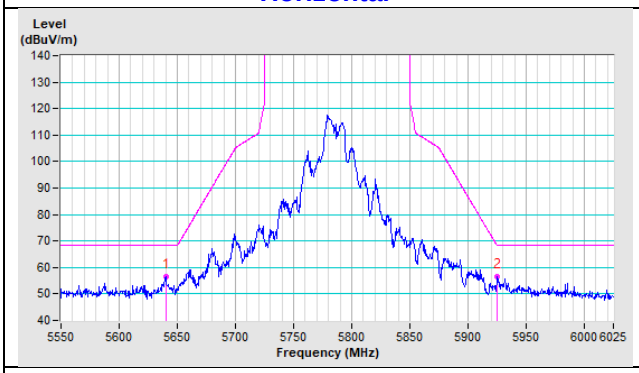


Vertical

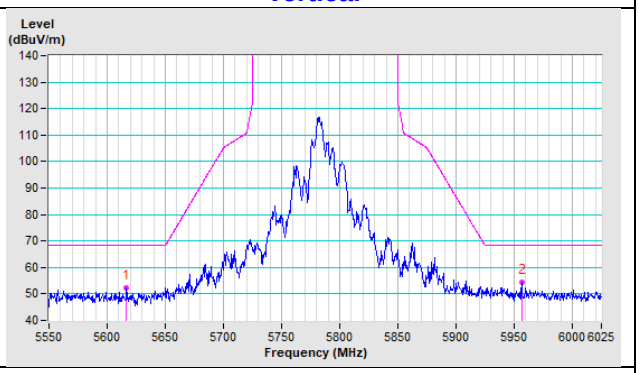


802.11ax (HE20) CH 157：5785 MHz

Horizontal

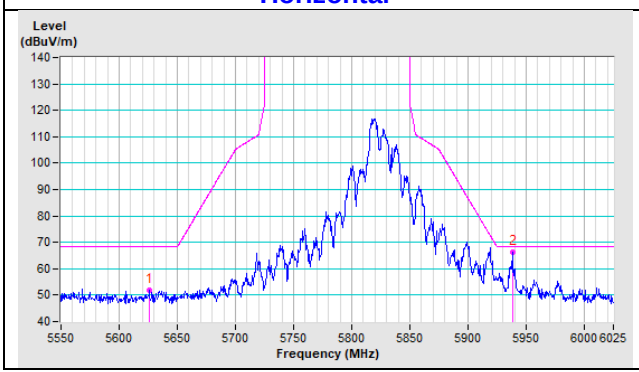


Vertical

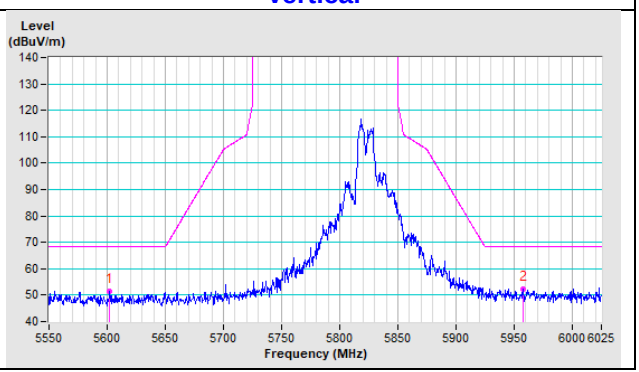


802.11ax (HE20) CH 165：5825 MHz

Horizontal

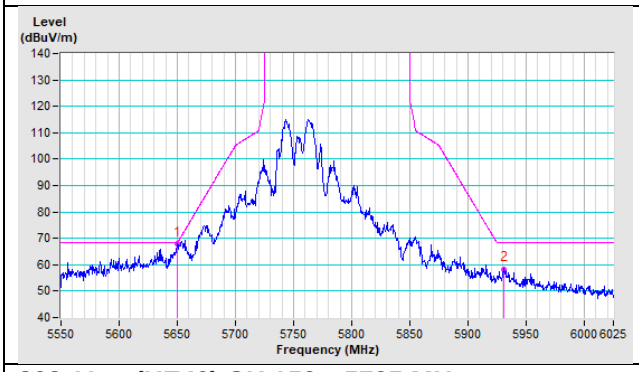


Vertical

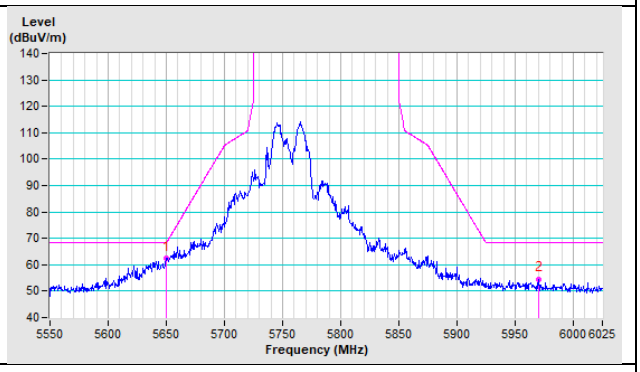


802.11ax (HE40) CH 151：5755 MHz

Horizontal

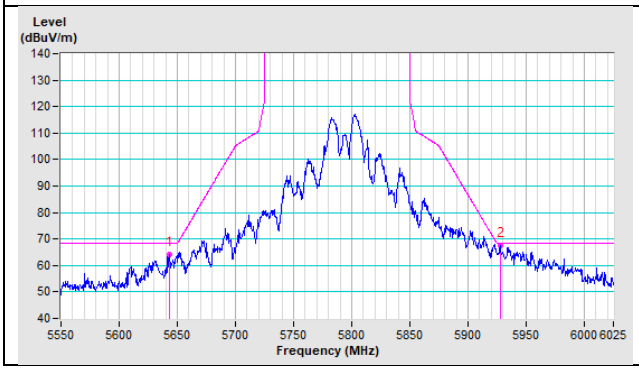


Vertical

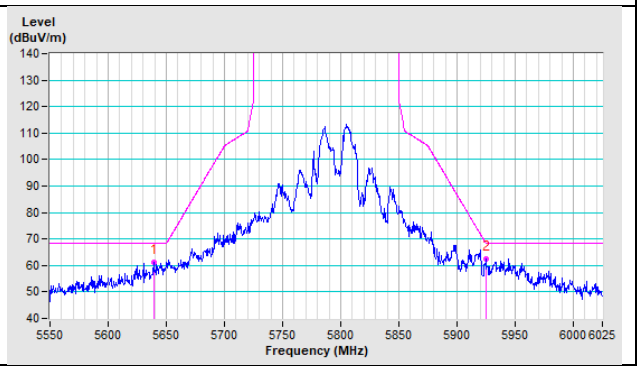


802.11ax (HE40) CH 159：5795 MHz

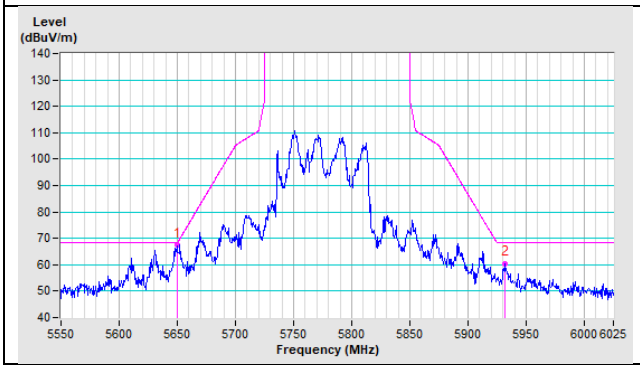
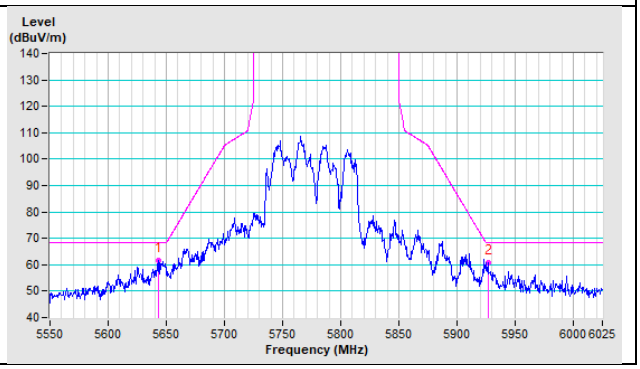
Horizontal



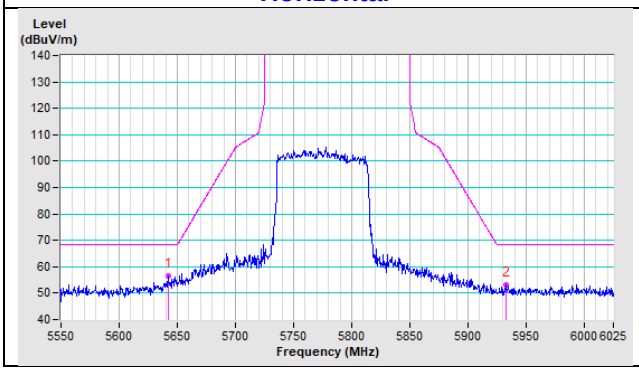
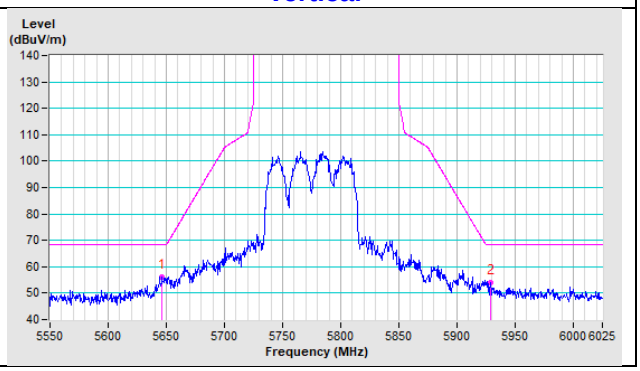
Vertical



802.11ax (HE80) CH 155：5775 MHz

Horizontal	Vertical
	

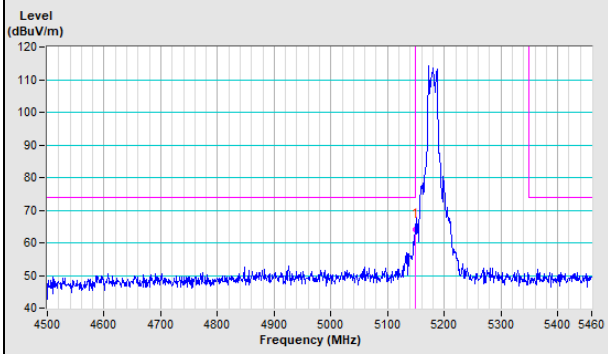
802.11ax (HE80+80) CH 42+155：5775 MHz

Horizontal	Vertical
	

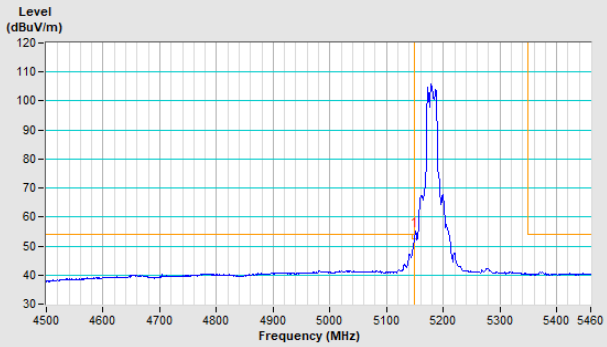
Annex B - Band-Edge Measurement (For U-NII-1 band)

802.11a Channel 36

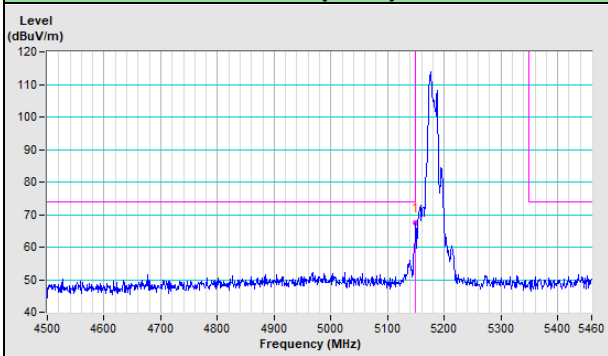
Horizontal (Peak)



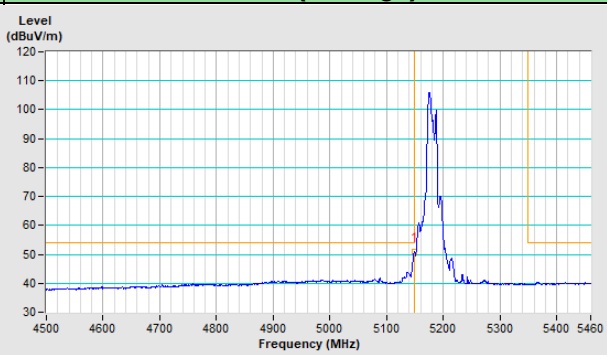
Horizontal (Average)



Vertical (Peak)

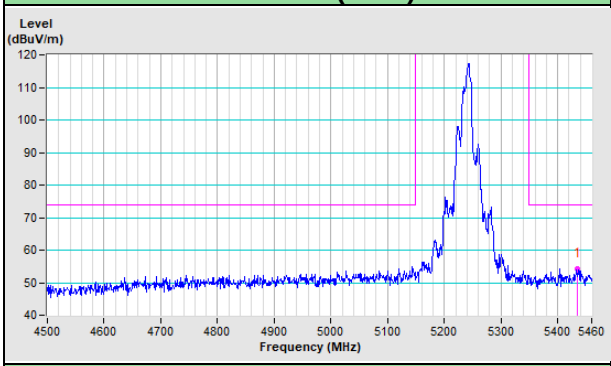


Vertical (Average)

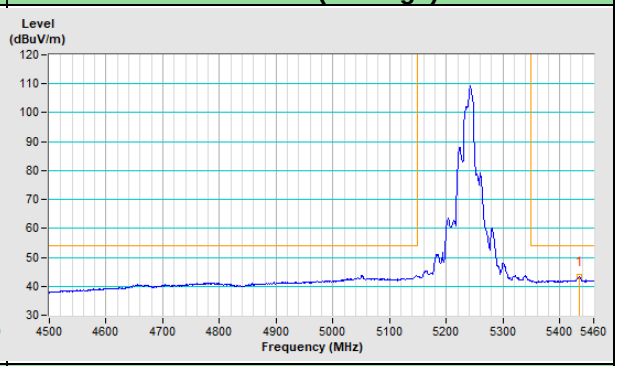


802.11a Channel 48

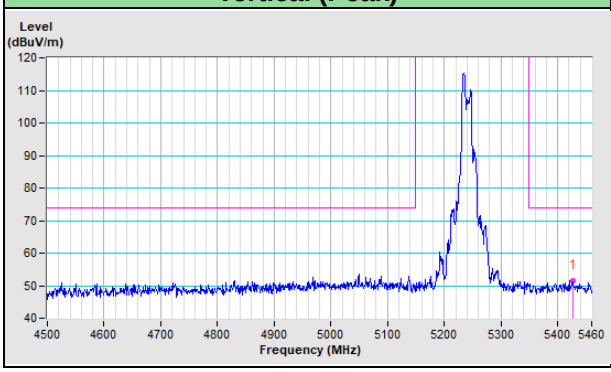
Horizontal (Peak)



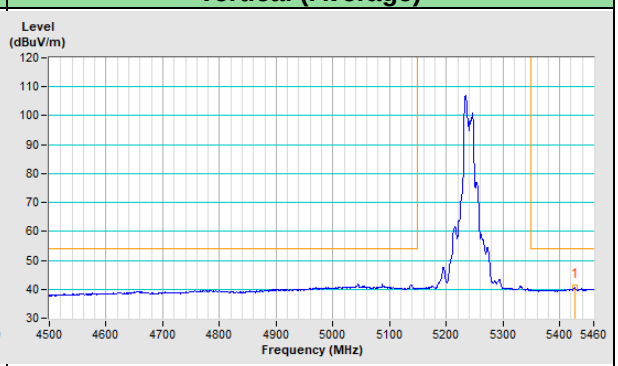
Horizontal (Average)



Vertical (Peak)

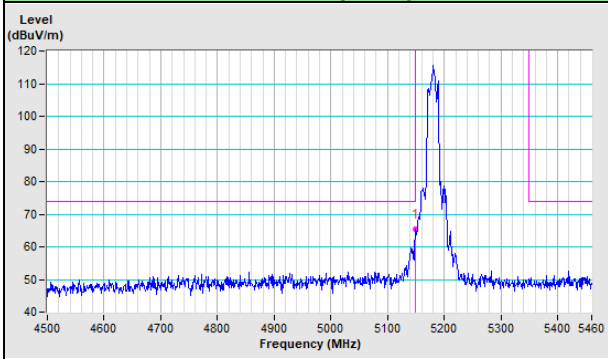


Vertical (Average)

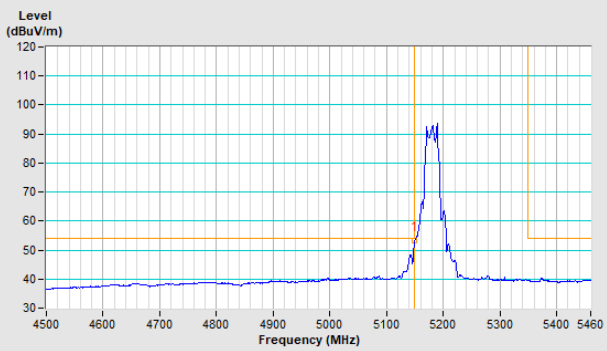


802.11ax (HE20) Channel 36

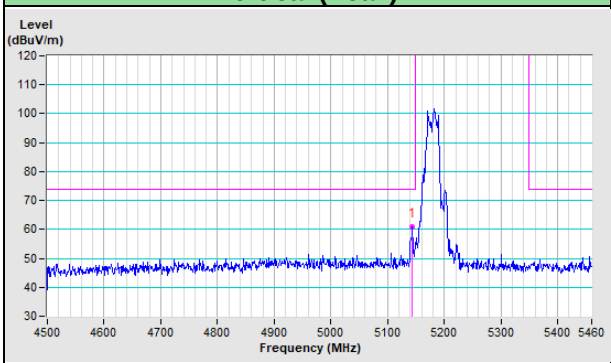
Horizontal (Peak)



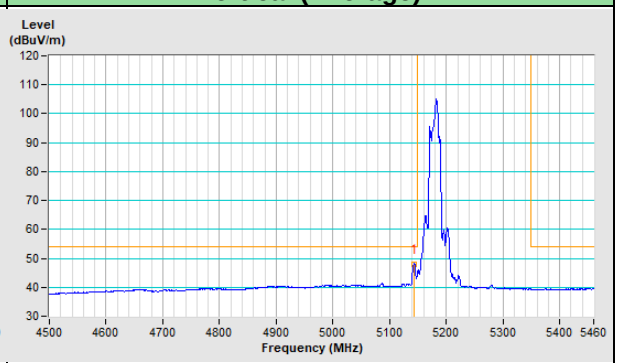
Horizontal (Average)



Vertical (Peak)

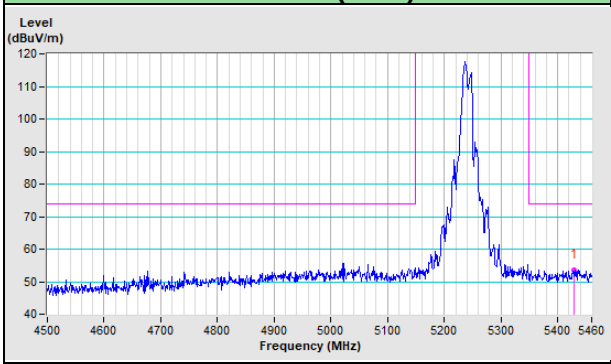


Vertical (Average)

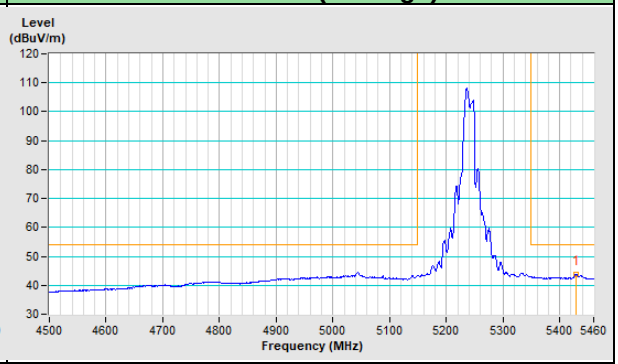


802.11ax (HE20) Channel 48

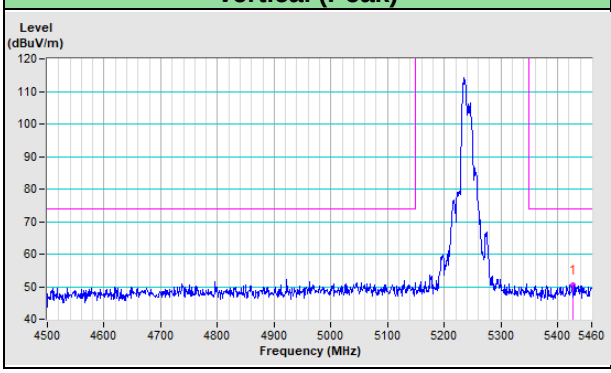
Horizontal (Peak)



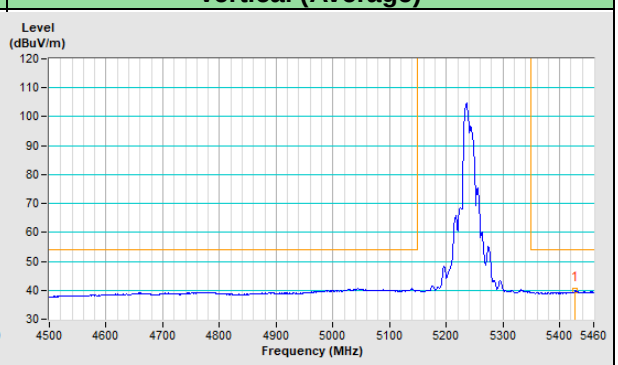
Horizontal (Average)



Vertical (Peak)

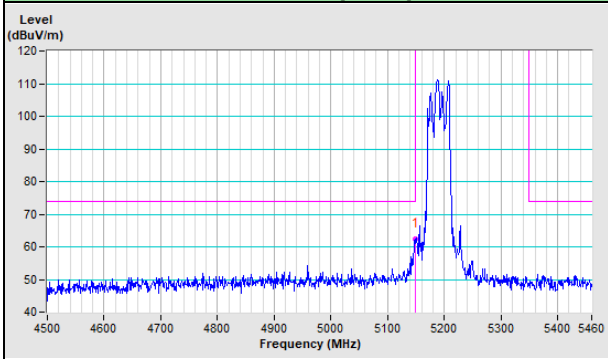


Vertical (Average)

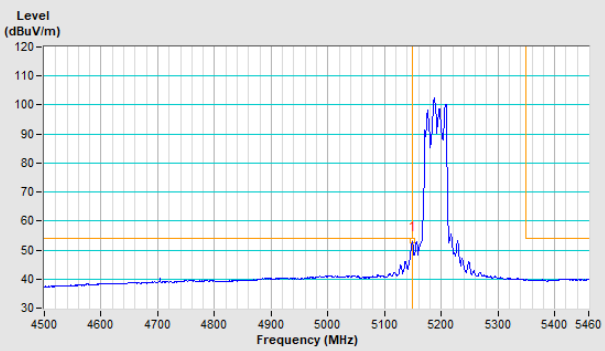


802.11ax (HE40) Channel 38

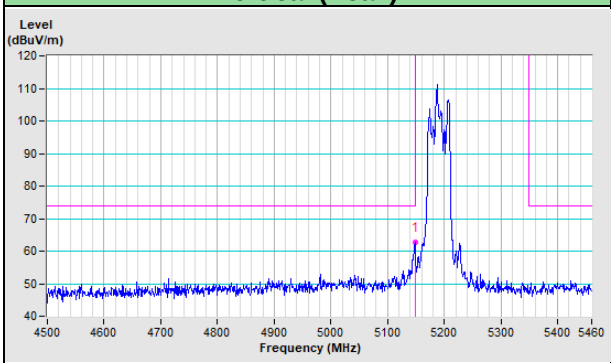
Horizontal (Peak)



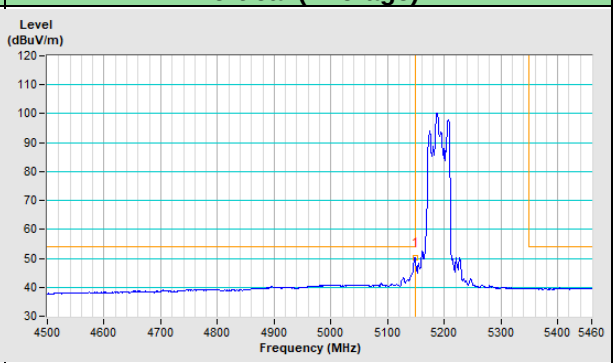
Horizontal (Average)



Vertical (Peak)

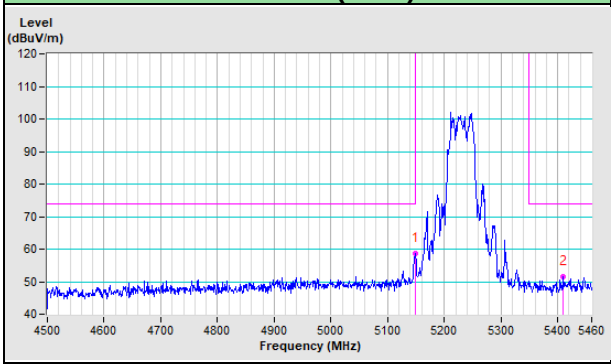


Vertical (Average)

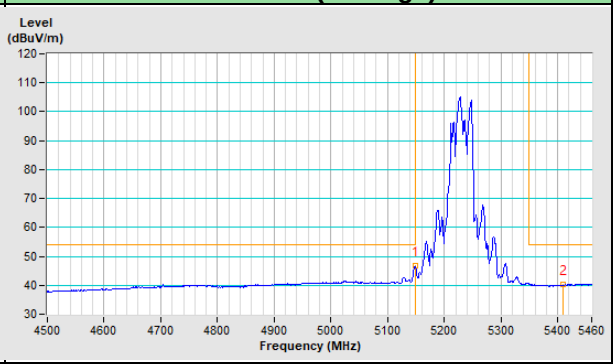


802.11ax (HE40) Channel 46

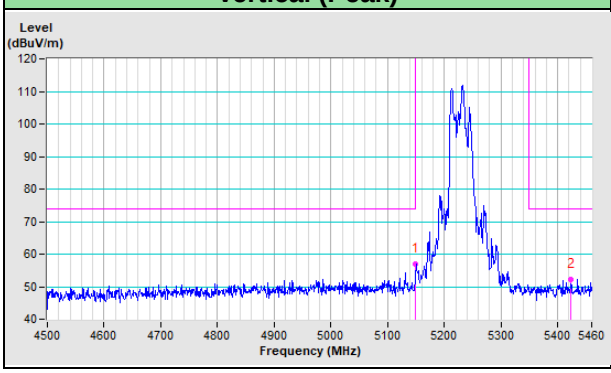
Horizontal (Peak)



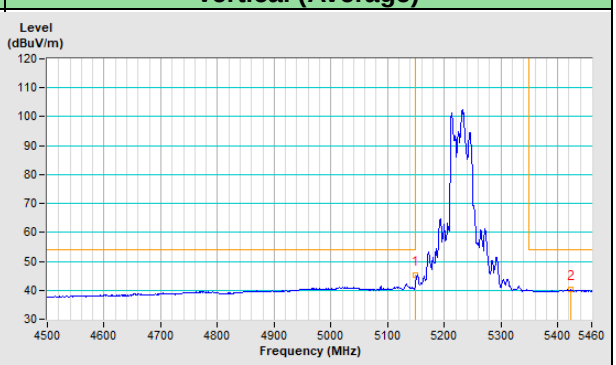
Horizontal (Average)



Vertical (Peak)

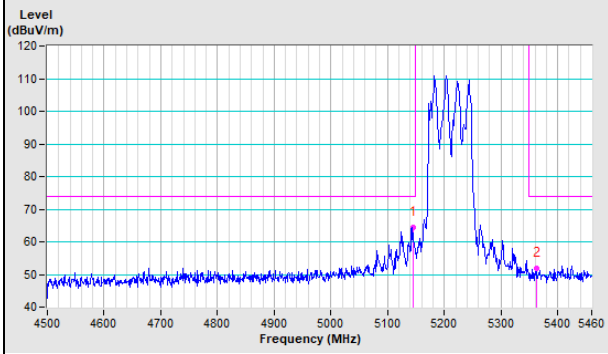


Vertical (Average)

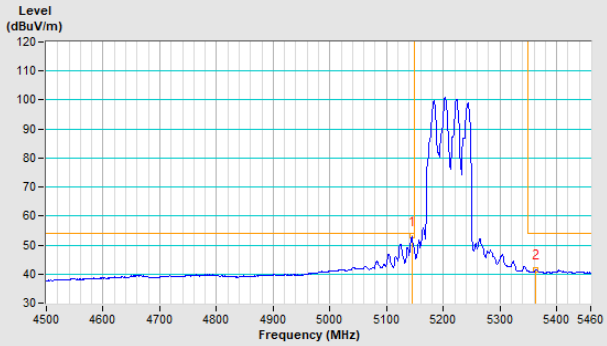


802.11ax (HE80) Channel 42

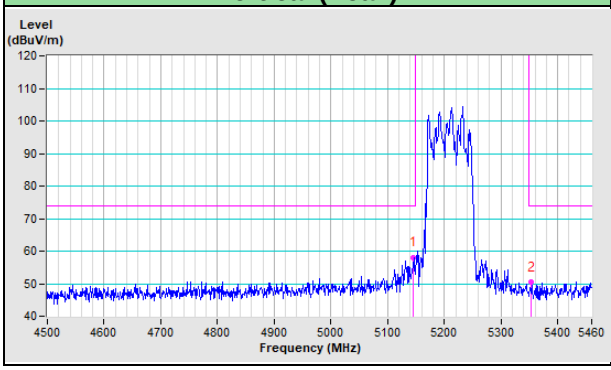
Horizontal (Peak)



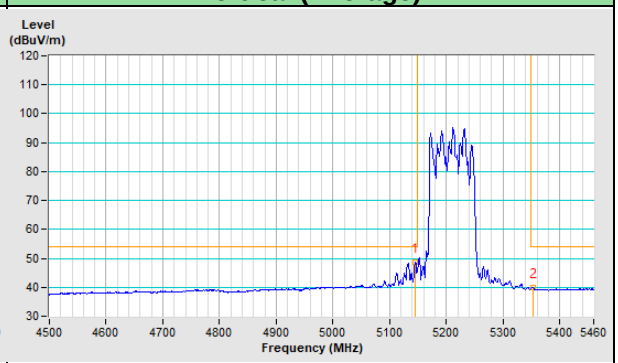
Horizontal (Average)



Vertical (Peak)

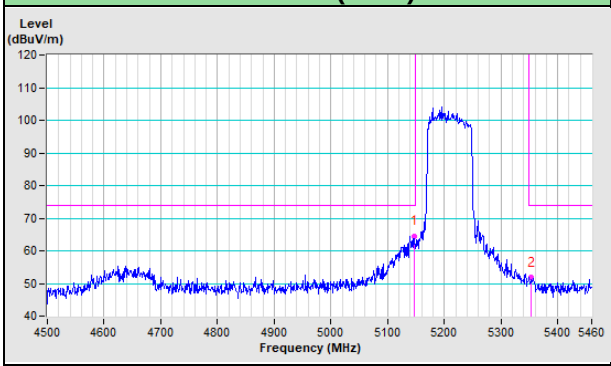


Vertical (Average)

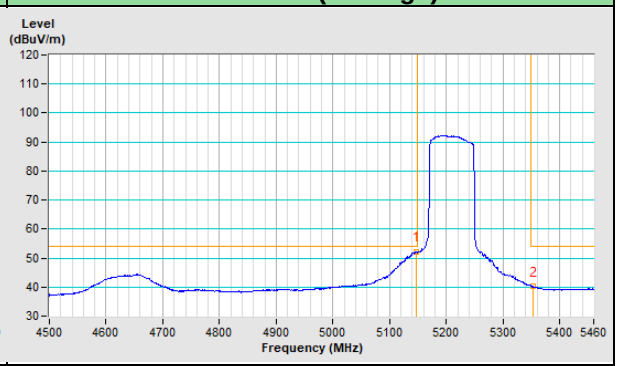


802.11ax (HE80+80) Channel 42+155

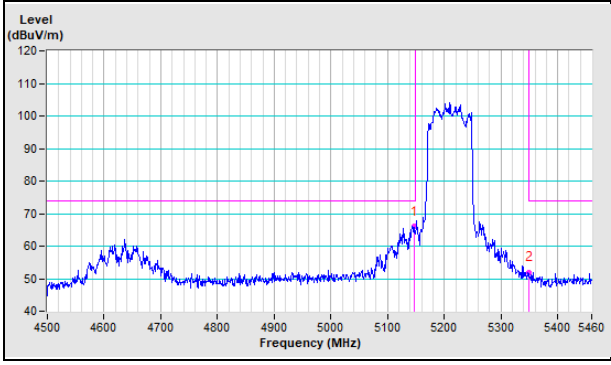
Horizontal (Peak)



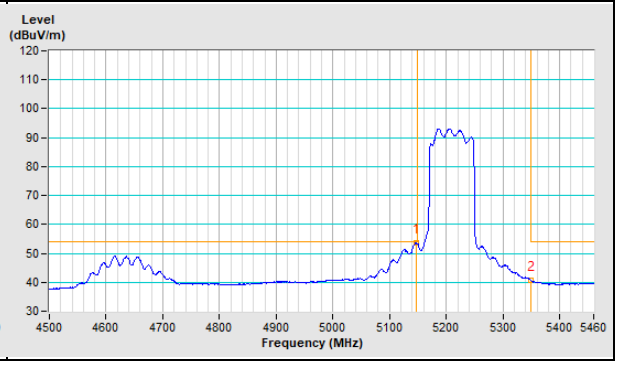
Horizontal (Average)



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

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