FCC Test Report (WLAN)

Report No.:	RFBFBE-WTW-P21010850-1
FCC ID:	2ABLK-GS4227
Test Model:	u6x GS4227
Received Date:	Jan. 28, 2021
Test Date:	Jan. 28 to Mar. 29, 2021
Issued Date:	Apr. 29, 2021
Applicant:	Calix Inc.
Address:	1035 N. McDowell Blvd Petaluma, CA94954 U.S.A
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
RFBFBE-WTW-P21010850-1	Original release.	Apr. 29, 2021

1 Certificate of Conformity

Product:	GigaSpire BLAST
Brand:	Calix
Test Model:	u6x GS4227
Sample Status:	ENGINEERING SAMPLE
Applicant:	Calix Inc.
Test Date:	Jan. 28 to Mar. 29, 2021
Standard:	47 CFR FCC Part 15, Subpart E (Section 15.407) ANSI C63.10: 2013

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

Prepared by : Vivian Huang , **Date:** Apr. 29, 2021

Vivian Huang / Specialist

Approved by : , **Date:** Apr. 29, 2021

Clark Lin / Technical Manager

2 Summary of Test Results

47 CFR FCC Part 15, Subpart E (Section 15.407)			
FCC Clause	Test Item	Result	Remarks
15.407(b)(6)	AC Power Conducted Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -13.60 dB at 0.15018 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 -0.1dB at 17475.00MHz, 5150.00MHz
15.407(a)(1/2/3)	Max Average Transmit Power	Pass	Meet the requirement of limit.
---	Occupied Bandwidth Measurement	-	Reference only.
15.407(a)(1/2/3)	Peak Power Spectral Density	Pass	Meet the requirement of limit.
15.407(e)	6dB bandwidth	Pass	Meet the requirement of limit. (U-NII-3 Band only)
15.407(g)	Frequency Stability	Pass	Meet the requirement of limit.
15.203	Antenna Requirement	Pass	Antenna connector is i-pex(MHF) not a standard connector.

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

2.1 Measurement Uncertainty

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

Measurement	Frequency	Expanded Uncertainty (k=2) (±)
Conducted Emissions at mains ports	150kHz ~ 30MHz	1.9 dB
Conducted emissions	-	2.5 dB
Radiated Emissions up to 1 GHz	9kHz ~ 30MHz	3.1 dB
	30MHz ~ 1GHz	5.5 dB
Radiated Emissions above 1 GHz	1GHz ~ 18GHz	5.1 dB
	18GHz ~ 40GHz	5.3 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT (WLAN)

Product	GigaSpire BLAST
Brand	Calix
Test Model	u6x GS4227
Status of EUT	ENGINEERING SAMPLE
Power Supply Rating	12 Vdc from power adapter,
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
Output Power	**CDD Mode:** **2.412 ~ 2.462 GHz:** 757.798 mW **5.18 ~ 5.24 GHz:** 978.11 mW **5.745 ~ 5.825 GHz:** 922.209 mW **Beamforming Mode:** **2.412 ~ 2.462 GHz:** 678.599 mW **5.18 ~ 5.24 GHz:** 978.11 mW **5.745 ~ 5.825 GHz:** 922.209 mW
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	Adapter x1
Data Cable Supplied	NA

Note:

1. Simultaneously transmission condition.

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

2. The EUT could be supplied with power adapter as the following table:

Brand	Model No.	Spec.
AMIGO	AMS157-1203000FU	Input: 100-240V, 50/60Hz, 1A Output: 12Vdc, 3.0A DC output cable: Unshielded, 1.5m

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)
DB1	2.4G: Chain 1	HONGBO	290-11015	3.64	2.4~2.4835GHz	Dipole	i-pex(MHF)	110
	5G: Chain 3			4.55	5.15~5.85GHz			
DB2	2.4G: Chain 0	HONGBO	290-11016	3.91	2.4~2.4835GHz	Dipole	i-pex(MHF)	110
	5G: Chain 2			5.94	5.15~5.85GHz			
5G1	Chain 0	HONGBO	290-11013	4.57	5.15~5.85GHz	Dipole	i-pex(MHF)	90
5G2	Chain 1	HONGBO	290-11014	4.68	5.15~5.85GHz	Dipole	i-pex(MHF)	90

Note:

1. Antenna Gain refer to “P21010850 Multi-Antenna Systems Directional Gain measurement” files.
2. Maximum Correlated Directional Gain following KDB662911 D03 MIMO Antenna Gain Measurement.

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

Test Mode	Description
Mode A	Adapter - AMS157-1203000FU
Mode B	UPS
Mode C	**Adapter - AMS157-1203000FU + UPS**
Mode D	UPS Battery mode
Note: From the above modes, radiated emission the worst case was found in **Mode C**. Therefore only the test data of the mode was recorded in this report.	

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

Test Mode	Description
Mode A	Adapter - AMS157-1203000FU
Mode B	UPS
Mode C	**Adapter - AMS157-1203000FU + UPS**
Note: From the above modes, Conducted Emission the worst case was found in **Mode C**. 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
802.11ax (HE20)	4TX	4RX
802.11ax (HE40)	4TX	4RX
802.11ax (HE80)	4TX	4RX

Note:

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

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

Radiated Emission Test (Above 1GHz):

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

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

Radiated Emission Test (Below 1GHz):

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

CDD Mode						
Mode	FREQ. Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate Parameter
802.11ax (HE40)	5180-5240 5745-5825	38 to 46 151 to 159	46	OFDMA	BPSK	MCS0

Power Line Conducted Emission Test:

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

CDD Mode						
Mode	FREQ. Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
802.11ax (HE40)	5180-5240 5745-5825	38 to 46 151 to 159	46	OFDMA	BPSK	MCS0

Antenna Port Conducted Measurement:

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

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

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

Test Condition:

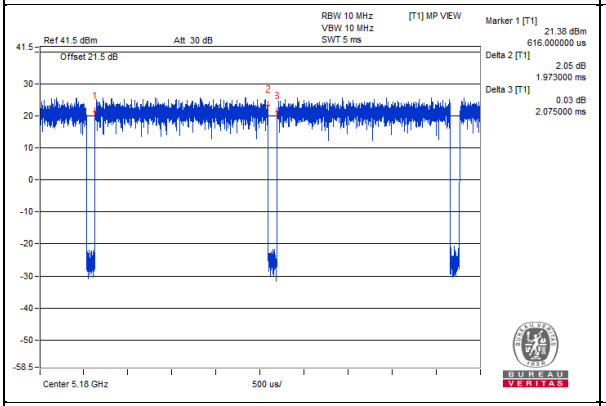
Applicable To	Environmental Conditions	Input Power	Tested By
RE≥1G	25deg. C, 66%RH	120Vac, 60Hz	Gary Cheng
RE<1G	24deg. C, 66%RH	120Vac, 60Hz	Tom Yang
PLC	24deg. C, 66%RH	120Vac, 60Hz	Tom Yang
APCM	25deg. C, 60%RH	120Vac, 60Hz	Anderson Chen

3.3 Duty Cycle of Test Signal

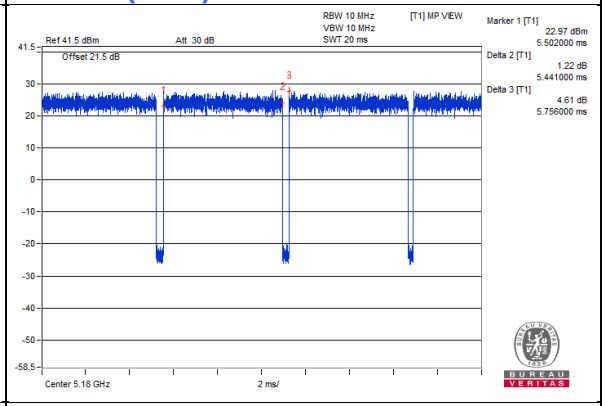
If duty cycle of test signal is < 98%, duty factor shall be considered.

802.11a: Duty cycle = 1.973 ms/2.075 ms = 0.951, Duty factor = 10 * log (1/Duty cycle) = 0.22 dB
802.11ax (HE20): Duty cycle = 5.441 ms/5.756 ms = 0.945, Duty factor = 10 * log (1/Duty cycle) = 0.24 dB
802.11ax (HE40): Duty cycle = 5.44 ms/5.74 ms = 0.948, Duty factor = 10 * log (1/Duty cycle) = 0.23 dB
802.11ax (HE80): Duty cycle = 5.44 ms/5.695 ms = 0.955, Duty factor = 10 * log (1/Duty cycle) = 0.20 dB

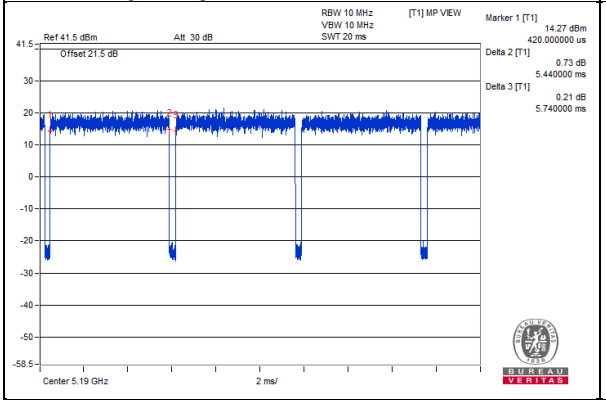
802.11a



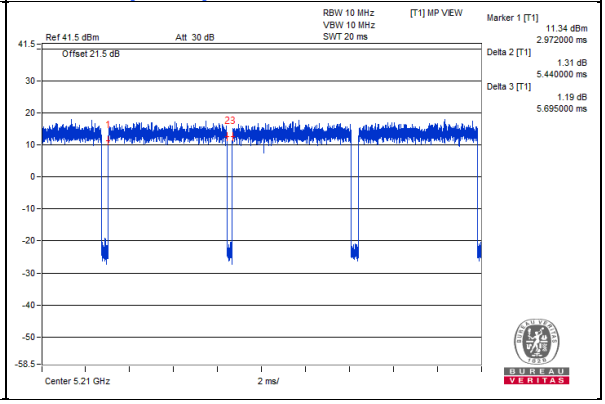
802.11ax (HE20)



802.11ax (HE40)



802.11ax (HE80)



3.4 Description of Support Units

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

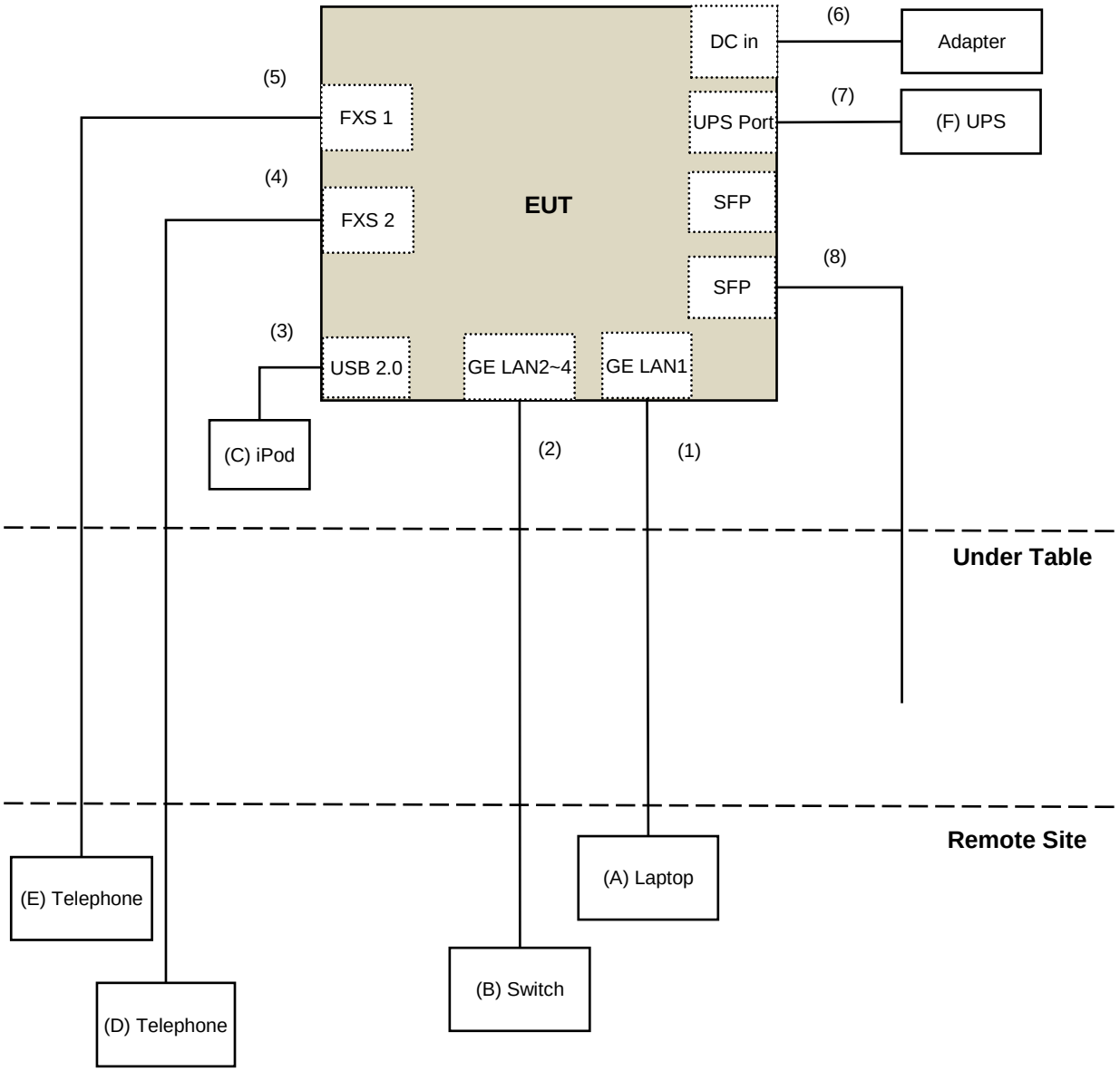
ID	Product	Brand	Model No.	Serial No	FCC ID	Remarks
A.	Laptop	DELL	E5430	HYV4VY1	DoC	Provided by Lab
B.	Switch	D-Link	DGS-1005D	DR8WC92000523	NA	Provided by Lab
C.	iPod	Apple	MC749TA/A	CC4DMFJUDFDM	NA	Provided by Lab
D.	Telephone	DAISHO	DS-03	N/A	NA	Provided by Lab
E.	Telephone	Romeo	TE-812	97280903	NA	Provided by Lab
F.	UPS	CyberPower	DTC36U12V3-G	NA	NA	Supplied by client

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	3	10	No	0	Provided by Lab
3	USB Cable	1	0.1	Yes	0	Provided by Lab
4	RJ-11 Cable	1	10	No	0	Provided by Lab
5	RJ-11 Cable	1	10	No	0	Provided by Lab
6	DC Cable	1	1.5	No	0	Supplied by client
7	UPS Cable	1	1	No	0	Supplied by client
8	Fiber Cable	1	3	No	0	Supplied by client

3.4.1 Configuration of System under Test



3.5 General Description of Applied Standards and References

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

Test Standard:
FCC Part 15, Subpart E (15.407)
ANSI C63.10-2013

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

References Test Guidance:
KDB 789033 D02 General UNII Test Procedure New Rules v02r01
KDB 662911 D01 Multiple Transmitter Output v02r01

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

4 Test Types and Results

4.1 Radiated Emission and Bandedge Measurement

4.1.1 Limits of Radiated Emission and Bandedge Measurement

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

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

NOTE:

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 Agilent	N9038A	MY51210202	Dec. 01, 2020	Nov. 30, 2021
Pre-Amplifier EMCI	EMC001340	980142	May 25, 2020	May 24, 2021
Loop Antenna Electro-Metrics	EM-6879	264	Mar. 05, 2021	Mar. 04, 2022
RF Cable	5D-FB	LOOPCAB-001	Jan. 07, 2021	Jan. 06, 2022
RF Cable	5D-FB	LOOPCAB-002	Jan. 07, 2021	Jan. 06, 2022
Pre-Amplifier EMCI	EMC330N	980701	Mar. 10, 2021	Mar. 09, 2022
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-406	Nov. 06, 2020	Nov. 05, 2021
RF Cable	8D	966-4-1	Mar. 17, 2021	Mar. 16, 2022
RF Cable	8D	966-4-2	Mar. 17, 2021	Mar. 16, 2022
RF Cable	8D	966-4-3	Mar. 17, 2021	Mar. 16, 2022
Fixed attenuator Mini-Circuits	UNAT-5+	PAD-ATT5-03	Jan. 11, 2021	Jan. 10, 2022
Horn_Antenna SCHWARZBECK	BBHA 9120D	9120D-783	Nov. 22, 2020	Nov. 21, 2021
Pre-Amplifier EMCI	EMC 12630 SE	980638	Apr. 08, 2020	Apr. 07, 2021
RF Cable	EMC104-SM-SM-1200	160922	Dec. 25, 2020	Dec. 24, 2021
RF Cable	EMC104-SM-SM-2000	180502	Apr. 29, 2020	Apr. 28, 2021
RF Cable	EMC104-SM-SM-6000	180418	Apr. 29, 2020	Apr. 28, 2021
Pre-Amplifier EMCI	EMC184045SE	980387	Jan. 11, 2021	Jan. 10, 2022
Horn_Antenna SCHWARZBECK	BBHA 9170	BBHA9170519	Nov. 22, 2020	Nov. 21, 2021
RF Cable	EMC102-KM-KM-1200	160924	Jan. 11, 2021	Jan. 10, 2022
RF Cable	EMC-KM-KM-4000	200214	Mar. 10, 2021	Mar. 09, 2022
Software	ADT_Radiated_V8.7.08	NA	NA	NA
Boresight Antenna Tower & Turn Table Max-Full	MF-7802BS	MF780208530	NA	NA

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in 966 Chamber No. 4.
3. Tested Date: Mar. 19, 2021

BandEdge & OOBE test:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver Agilent	N9038A	MY51210202	Dec. 01, 2020	Nov. 30, 2021
Pre-Amplifier EMCI	EMC001340	980142	May 25, 2020	May 24, 2021
Loop Antenna Electro-Metrics	EM-6879	264	Mar. 05, 2021	Mar. 04, 2022
RF Cable	5D-FB	LOOPCAB-001	Jan. 07, 2021	Jan. 06, 2022
RF Cable	5D-FB	LOOPCAB-002	Jan. 07, 2021	Jan. 06, 2022
Pre-Amplifier EMCI	EMC330N	980701	Mar. 11, 2020	Mar. 10, 2021
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-406	Nov. 06, 2020	Nov. 05, 2021
RF Cable	8D	966-6-1	Apr. 04, 2020	Apr. 03, 2021
RF Cable	8D	966-4-2	Mar. 18, 2020	Mar. 17, 2021
RF Cable	8D	966-4-3	Mar. 18, 2020	Mar. 17, 2021
Fixed attenuator Mini-Circuits	UNAT-5+	PAD-ATT5-03	Jan. 11, 2021	Jan. 10, 2022
Horn_Antenna SCHWARZBECK	BBHA 9120D	9120D-783	Nov. 22, 2020	Nov. 21, 2021
Pre-Amplifier EMCI	EMC 12630 SE	980638	Apr. 08, 2020	Apr. 07, 2021
RF Cable	EMC104-SM-SM-1200	160922	Dec. 25, 2020	Dec. 24, 2021
RF Cable	EMC104-SM-SM-2000	180502	Apr. 29, 2020	Apr. 28, 2021
RF Cable	EMC104-SM-SM-6000	180418	Apr. 29, 2020	Apr. 28, 2021
Pre-Amplifier EMCI	EMC184045SE	980387	Jan. 11, 2021	Jan. 10, 2022
Horn_Antenna SCHWARZBECK	BBHA 9170	BBHA9170519	Nov. 22, 2020	Nov. 21, 2021
RF Cable	EMC102-KM-KM-1200	160924	Jan. 11, 2021	Jan. 10, 2022
RF Cable	EMC-KM-KM-4000	200214	Mar. 11, 2020	Mar. 10, 2021
Software	ADT_Radiated_V8.7.08	NA	NA	NA
Boresight Antenna Tower & Turn Table Max-Full	MF-7802BS	MF780208530	NA	NA

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in 966 Chamber No. 4.
3. Tested Date: Jan. 28 to Feb. 10, 2021

For other test items:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Spectrum Analyzer R&S	FSV40	100964	May 29, 2020	May 28, 2021
Power meter Anritsu	ML2495A	1529002	July 22, 2020	July 21, 2021
Power sensor Anritsu	MA2411B	1339443	July 22, 2020	July 21, 2021
Fixed Attenuator Mini-Circuits	MDCS18N-10	MDCS18N-10-01	Apr. 14, 2020	Apr. 13, 2021
AC Power Source Extech Electronics	6905S	1991551	NA	NA
DC Power Supply Topward	6603D	795558	NA	NA
Temperature & Humidity Chamber Giant Force	GTH-150-40-SP-AR	MAA0812-008	Jan. 14, 2021	Jan. 13, 2022
True RMS Clamp Meter FLUKE	325	31130711WS	June 06, 2020	June 05, 2021
Software	ADT_RF Test Software V6.6.5.4	NA	NA	NA

NOTE: 1. The test was performed in Oven room 2.
2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
3. Tested Date: Mar. 29, 2021

4.1.3 Test Procedure

For Radiated emission below 30MHz

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

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

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

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

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

Note:

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

For Radiated emission above 30MHz

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

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

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

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

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

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

Note:

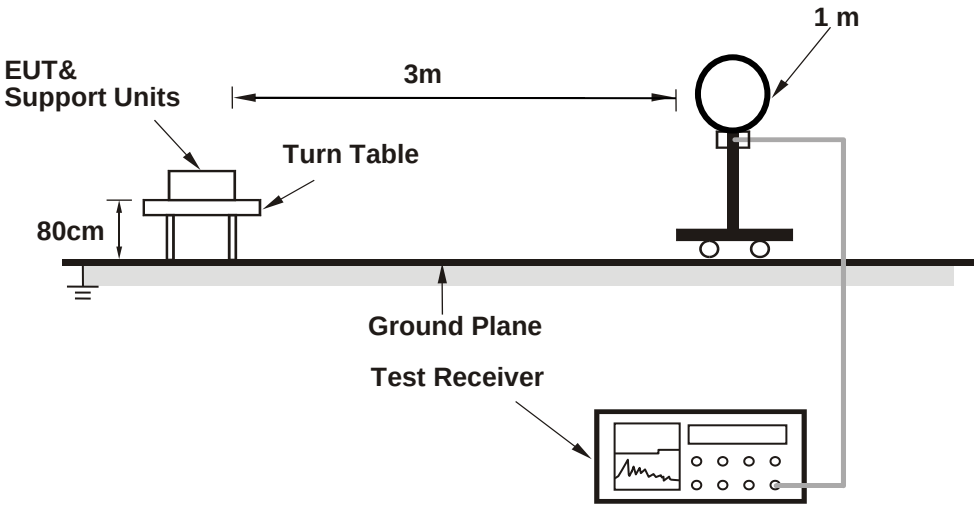
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.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

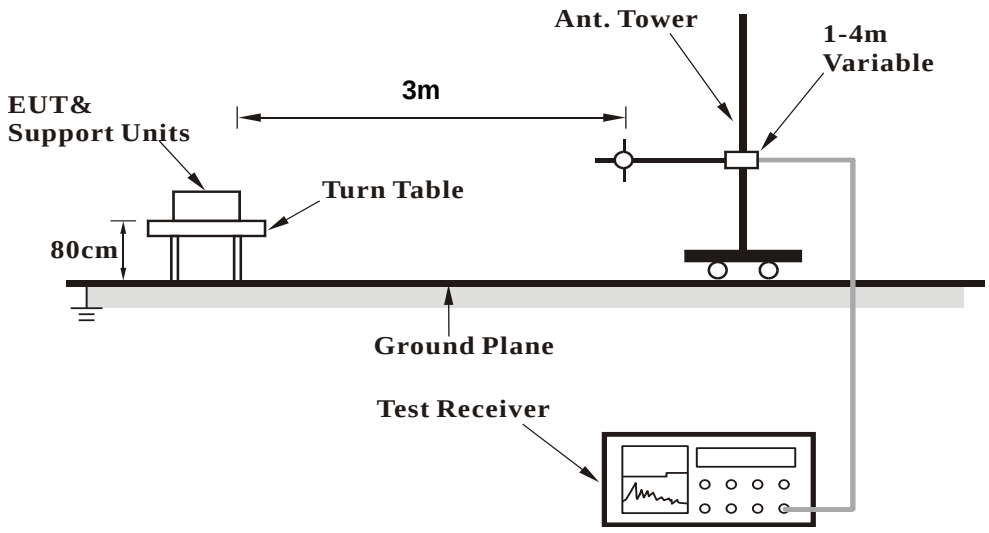
No deviation.

4.1.5 Test Setup

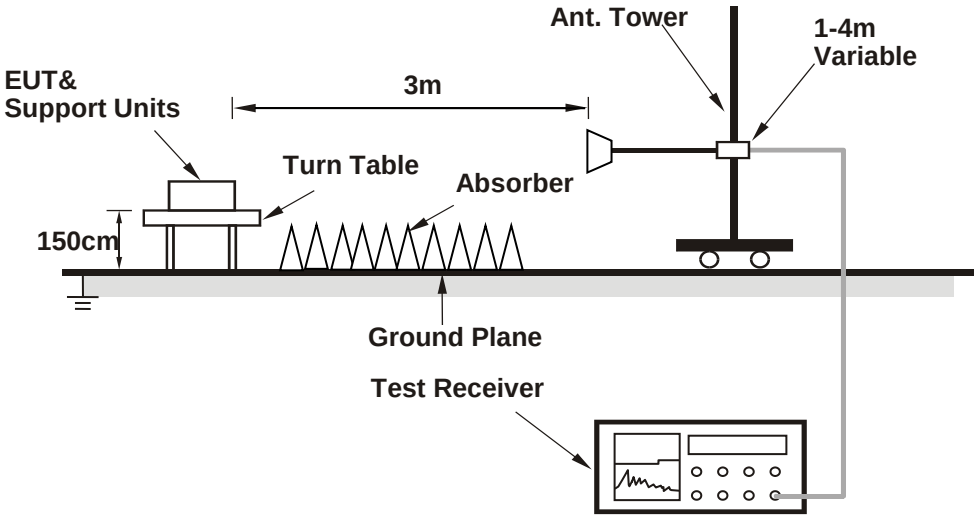
For Radiated emission below 30MHz



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 (qdart_conn.win.1.0_installer_00076.1) has been activated to set the EUT under transmission condition continuously at specific channel frequency.

4.1.7 Test Results

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	5150.00	56.5 PK	74.0	-17.5	4.00 H	135	55.4	1.1
2	5150.00	46.5 AV	54.0	-7.5	4.00 H	135	45.4	1.1
3	*5180.00	116.8 PK			4.00 H	135	115.8	1.0
4	*5180.00	108.7 AV			4.00 H	135	107.7	1.0
5	#10360.00	47.5 PK	68.2	-20.7	2.17 H	291	37.2	10.3
6	15540.00	51.4 PK	74.0	-22.6	1.56 H	232	39.4	12.0
7	15540.00	39.6 AV	54.0	-14.4	1.56 H	232	27.6	12.0
Antenna Polarity & Test Distance : Vertical at 3 m								
No	**Frequency (MHz)**	**Emission Level (dBuV/m)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Height (m)**	**Table Angle (Degree)**	**Raw Value (dBuV)**	**Correction Factor (dB/m)**
1	5150.00	67.6 PK	74.0	-6.4	1.51 V	104	66.5	1.1
2	5150.00	52.8 AV	54.0	-1.2	1.51 V	104	51.7	1.1
3	*5180.00	119.9 PK			1.51 V	104	118.9	1.0
4	*5180.00	110.7 AV			1.51 V	104	109.7	1.0
5	#10360.00	46.3 PK	68.2	-21.9	2.51 V	304	36.0	10.3
6	15540.00	57.5 PK	74.0	-16.5	1.33 V	124	45.5	12.0
7	15540.00	42.2 AV	54.0	-11.8	1.33 V	124	30.2	12.0

Remarks:

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

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

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5150.00	59.2 PK	74.0	-14.8	1.54 H	148	58.1	1.1
2	5150.00	47.2 AV	54.0	-6.8	1.54 H	148	46.1	1.1
3	*5200.00	117.2 PK			1.52 H	145	116.1	1.1
4	*5200.00	108.4 AV			1.52 H	145	107.3	1.1
5	#10400.00	60.7 PK	68.2	-7.5	2.19 H	271	50.3	10.4
6	15600.00	53.2 PK	74.0	-20.8	1.47 H	217	41.2	12.0
7	15600.00	41.9 AV	54.0	-12.1	1.47 H	217	29.9	12.0
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5150.00	65.4 PK	74.0	-8.6	1.60 V	104	64.3	1.1
2	5150.00	53.3 AV	54.0	-0.7	1.60 V	104	52.2	1.1
3	*5200.00	123.2 PK			1.60 V	104	122.1	1.1
4	*5200.00	115.7 AV			1.60 V	104	114.6	1.1
5	#10400.00	54.2 PK	68.2	-14.0	2.49 V	297	43.8	10.4
6	15600.00	59.3 PK	74.0	-14.7	1.24 V	135	47.3	12.0
7	15600.00	44.6 AV	54.0	-9.4	1.24 V	135	32.6	12.0

Remarks:

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

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

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	4531.35	47.5 PK	74.0	-26.5	1.53 H	140	48.1	-0.6
2	4531.35	41.5 AV	54.0	-12.5	1.53 H	140	42.1	-0.6
3	*5240.00	118.0 PK			1.53 H	140	117.2	0.8
4	*5240.00	109.1 AV			1.53 H	140	108.3	0.8
5	5426.33	50.8 PK	74.0	-23.2	1.53 H	140	49.8	1.0
6	5426.33	40.0 AV	54.0	-14.0	1.53 H	140	39.0	1.0
7	#10480.00	60.7 PK	68.2	-7.5	2.23 H	282	50.4	10.3
8	15720.00	53.7 PK	74.0	-20.3	1.52 H	216	42.5	11.2
9	15720.00	41.5 AV	54.0	-12.5	1.52 H	216	30.3	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	5145.07	56.9 PK	74.0	-17.1	1.61 V	163	55.8	1.1
2	5145.07	48.4 AV	54.0	-5.6	1.61 V	163	47.3	1.1
3	*5240.00	123.5 PK			1.61 V	163	122.7	0.8
4	*5240.00	116.1 AV			1.61 V	163	115.3	0.8
5	5433.29	54.8 PK	74.0	-19.2	1.61 V	163	53.8	1.0
6	5433.29	45.6 AV	54.0	-8.4	1.61 V	163	44.6	1.0
7	#10480.00	54.2 PK	68.2	-14.0	2.49 V	298	43.9	10.3
8	15720.00	59.2 PK	74.0	-14.8	1.30 V	133	48.0	11.2
9	15720.00	44.1 AV	54.0	-9.9	1.30 V	133	32.9	11.2

Remarks:

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

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

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5652.80	51.6 PK	70.3	-18.7	2.15 H	125	50.2	1.4
2	*5745.00	116.5 PK			2.15 H	125	114.8	1.7
3	*5745.00	106.1 AV			2.15 H	125	104.4	1.7
4	#5992.41	49.7 PK	68.2	-18.5	2.15 H	125	47.9	1.8
5	11490.00	63.6 PK	74.0	-10.4	1.48 H	252	51.5	12.1
6	11490.00	52.7 AV	54.0	-1.3	1.48 H	252	40.6	12.1
7	#17235.00	67.9 PK	68.2	-0.3	2.11 H	4	51.7	16.2
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5651.61	55.4 PK	69.4	-14.0	1.30 V	167	54.0	1.4
2	*5745.00	121.2 PK			1.30 V	167	119.5	1.7
3	*5745.00	110.7 AV			1.30 V	167	109.0	1.7
4	#5928.86	53.3 PK	68.2	-14.9	1.30 V	167	51.5	1.8
5	11490.00	59.8 PK	74.0	-14.2	2.51 V	298	47.7	12.1
6	11490.00	48.6 AV	54.0	-5.4	2.51 V	298	36.5	12.1
7	#17235.00	63.2 PK	68.2	-5.0	1.29 V	146	47.0	16.2

Remarks:

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

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

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5594.35	50.3 PK	68.2	-17.9	2.10 H	128	49.0	1.3
2	*5785.00	115.7 PK			2.10 H	128	113.9	1.8
3	*5785.00	105.8 AV			2.10 H	128	104.0	1.8
4	#6007.26	48.9 PK	68.2	-19.3	2.10 H	128	47.1	1.8
5	11570.00	64.0 PK	74.0	-10.0	1.46 H	249	52.0	12.0
6	11570.00	53.0 AV	54.0	-1.0	1.46 H	249	41.0	12.0
7	#17355.00	67.5 PK	68.2	-0.7	2.11 H	1	50.5	17.0
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5620.53	52.4 PK	68.2	-15.8	1.26 V	169	51.0	1.4
2	*5785.00	120.6 PK			1.26 V	169	118.8	1.8
3	*5785.00	110.7 AV			1.26 V	169	108.9	1.8
4	#5981.63	53.2 PK	68.2	-15.0	1.26 V	169	51.4	1.8
5	11570.00	60.1 PK	74.0	-13.9	2.51 V	301	48.1	12.0
6	11570.00	48.8 AV	54.0	-5.2	2.51 V	301	36.8	12.0
7	#17355.00	63.5 PK	68.2	-4.7	1.26 V	131	46.5	17.0

Remarks:

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

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

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5632.12	51.8 PK	68.2	-16.4	2.05 H	126	50.4	1.4
2	*5825.00	116.7 PK			2.05 H	126	114.9	1.8
3	*5825.00	106.3 AV			2.05 H	126	104.5	1.8
4	#5943.88	52.3 PK	68.2	-15.9	2.05 H	126	50.5	1.8
5	11650.00	63.6 PK	74.0	-10.4	1.45 H	250	51.9	11.7
6	11650.00	52.5 AV	54.0	-1.5	1.45 H	250	40.8	11.7
7	#17475.00	67.9 PK	68.2	-0.3	2.13 H	9	49.0	18.9
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5560.39	54.6 PK	68.2	-13.6	1.31 V	165	53.4	1.2
2	*5825.00	121.3 PK			1.31 V	165	119.5	1.8
3	*5825.00	111.0 AV			1.31 V	165	109.2	1.8
4	#5960.09	53.0 PK	68.2	-15.2	1.31 V	165	51.2	1.8
5	11650.00	59.1 PK	74.0	-14.9	2.54 V	308	47.4	11.7
6	11650.00	49.0 AV	54.0	-5.0	2.54 V	308	37.3	11.7
7	#17475.00	63.0 PK	68.2	-5.2	1.25 V	131	44.1	18.9

Remarks:

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

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

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5147.86	57.2 PK	74.0	-16.8	2.57 H	134	56.1	1.1
2	5147.86	44.1 AV	54.0	-9.9	2.57 H	134	43.0	1.1
3	*5180.00	118.0 PK			2.57 H	134	117.0	1.0
4	*5180.00	106.7 AV			2.57 H	134	105.7	1.0
5	#10360.00	47.0 PK	68.2	-21.2	2.16 H	283	36.7	10.3
6	15540.00	51.2 PK	74.0	-22.8	1.54 H	217	39.2	12.0
7	15540.00	39.2 AV	54.0	-14.8	1.54 H	217	27.2	12.0
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5150.00	65.4 PK	74.0	-8.6	1.51 V	275	64.3	1.1
2	5150.00	53.3 AV	54.0	-0.7	1.51 V	275	52.2	1.1
3	*5180.00	123.1 PK			1.51 V	275	122.1	1.0
4	*5180.00	111.5 AV			1.51 V	275	110.5	1.0
5	#10360.00	46.2 PK	68.2	-22.0	2.49 V	319	35.9	10.3
6	15540.00	57.8 PK	74.0	-16.2	1.29 V	129	45.8	12.0
7	15540.00	42.6 AV	54.0	-11.4	1.29 V	129	30.6	12.0

Remarks:

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

RF Mode	TX 802.11ax (HE20)	Channel	CH 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	50.1 PK	74.0	-23.9	2.52 H	120	49.0	1.1
2	5150.00	38.4 AV	54.0	-15.6	2.52 H	120	37.3	1.1
3	*5200.00	119.5 PK			2.62 H	118	118.4	1.1
4	*5200.00	108.0 AV			2.62 H	118	106.9	1.1
5	#10400.00	60.6 PK	68.2	-7.6	2.46 H	281	50.2	10.4
6	15600.00	59.0 PK	74.0	-15.0	1.90 H	302	47.0	12.0
7	15600.00	44.0 AV	54.0	-10.0	1.90 H	302	32.0	12.0
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5150.00	63.1 PK	74.0	-10.9	1.59 V	344	62.0	1.1
2	5150.00	50.1 AV	54.0	-3.9	1.59 V	344	49.0	1.1
3	*5200.00	124.4 PK			1.59 V	344	123.3	1.1
4	*5200.00	113.3 AV			1.59 V	344	112.2	1.1
5	#10400.00	53.8 PK	68.2	-14.4	2.54 V	288	43.4	10.4
6	15600.00	59.2 PK	74.0	-14.8	1.28 V	132	47.2	12.0
7	15600.00	44.4 AV	54.0	-9.6	1.28 V	132	32.4	12.0

Remarks:

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

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

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5240.00	119.8 PK			2.39 H	135	119.0	0.8
2	*5240.00	108.4 AV			2.39 H	135	107.6	0.8
3	5437.82	50.3 PK	74.0	-23.7	2.39 H	135	49.3	1.0
4	5437.82	38.6 AV	54.0	-15.4	2.39 H	135	37.6	1.0
5	#10480.00	60.1 PK	68.2	-8.1	2.51 H	279	49.8	10.3
6	15720.00	58.5 PK	74.0	-15.5	1.85 H	305	47.3	11.2
7	15720.00	44.1 AV	54.0	-9.9	1.85 H	305	32.9	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	5140.30	53.2 PK	74.0	-20.8	1.82 V	3	52.1	1.1
2	5140.30	43.6 AV	54.0	-10.4	1.82 V	3	42.5	1.1
3	*5240.00	122.7 PK			1.82 V	3	121.9	0.8
4	*5240.00	112.3 AV			1.82 V	3	111.5	0.8
5	5428.30	53.4 PK	74.0	-20.6	1.82 V	3	52.4	1.0
6	5428.30	42.7 AV	54.0	-11.3	1.82 V	3	41.7	1.0
7	#10480.00	53.7 PK	68.2	-14.5	2.54 V	315	43.4	10.3
8	15720.00	59.1 PK	74.0	-14.9	1.32 V	124	47.9	11.2
9	15720.00	44.6 AV	54.0	-9.4	1.32 V	124	33.4	11.2

Remarks:

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

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

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5643.91	51.3 PK	68.2	-16.9	1.61 H	122	49.9	1.4
2	*5745.00	117.5 PK			1.61 H	122	115.8	1.7
3	*5745.00	107.6 AV			1.61 H	122	105.9	1.7
4	#5940.25	50.2 PK	68.2	-18.0	1.61 H	122	48.4	1.8
5	11490.00	63.7 PK	74.0	-10.3	1.43 H	257	51.6	12.1
6	11490.00	52.8 AV	54.0	-1.2	1.43 H	257	40.7	12.1
7	#17235.00	67.8 PK	68.2	-0.4	2.06 H	349	51.6	16.2
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5640.67	56.4 PK	68.2	-11.8	1.31 V	167	55.0	1.4
2	*5745.00	123.1 PK			1.31 V	167	121.4	1.7
3	*5745.00	111.4 AV			1.31 V	167	109.7	1.7
4	#5932.52	52.0 PK	68.2	-16.2	1.31 V	167	50.2	1.8
5	11490.00	58.9 PK	74.0	-15.1	2.58 V	324	46.8	12.1
6	11490.00	47.6 AV	54.0	-6.4	2.58 V	324	35.5	12.1
7	#17235.00	63.5 PK	68.2	-4.7	1.23 V	133	47.3	16.2

Remarks:

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

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

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5568.20	50.6 PK	68.2	-17.6	1.65 H	127	49.3	1.3
2	*5785.00	117.3 PK			1.65 H	127	115.5	1.8
3	*5785.00	107.4 AV			1.65 H	127	105.6	1.8
4	#5930.97	50.2 PK	68.2	-18.0	1.65 H	127	48.4	1.8
5	11570.00	63.3 PK	74.0	-10.7	1.42 H	260	51.3	12.0
6	11570.00	52.3 AV	54.0	-1.7	1.42 H	260	40.3	12.0
7	#17355.00	67.4 PK	68.2	-0.8	2.03 H	355	50.4	17.0
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5632.09	52.9 PK	68.2	-15.3	1.25 V	173	51.5	1.4
2	*5785.00	123.2 PK			1.25 V	173	121.4	1.8
3	*5785.00	111.5 AV			1.25 V	173	109.7	1.8
4	#5941.85	52.1 PK	68.2	-16.1	1.25 V	173	50.3	1.8
5	11570.00	58.9 PK	74.0	-15.1	2.53 V	319	46.9	12.0
6	11570.00	47.3 AV	54.0	-6.7	2.53 V	319	35.3	12.0
7	#17355.00	63.0 PK	68.2	-5.2	1.20 V	120	46.0	17.0

Remarks:

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

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

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5636.63	49.8 PK	68.2	-18.4	1.58 H	125	48.4	1.4
2	*5825.00	117.1 PK			1.58 H	125	115.3	1.8
3	*5825.00	107.2 AV			1.58 H	125	105.4	1.8
4	#5927.51	51.6 PK	68.2	-16.6	1.58 H	125	49.8	1.8
5	11650.00	64.1 PK	74.0	-9.9	1.50 H	268	52.4	11.7
6	11650.00	52.9 AV	54.0	-1.1	1.50 H	268	41.2	11.7
7	**#17475.00**	**68.1 PK**	**68.2**	**-0.1**	**2.03 H**	**346**	**49.2**	**18.9**
Antenna Polarity & Test Distance : Vertical at 3 m								
No	**Frequency (MHz)**	**Emission Level (dBuV/m)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Height (m)**	**Table Angle (Degree)**	**Raw Value (dBuV)**	**Correction Factor (dB/m)**
1	#5638.35	53.6 PK	68.2	-14.6	1.21 V	158	52.2	1.4
2	*5825.00	123.0 PK			1.21 V	158	121.2	1.8
3	*5825.00	111.2 AV			1.21 V	158	109.4	1.8
4	#5925.11	56.3 PK	68.2	-11.9	1.21 V	158	54.5	1.8
5	11650.00	59.2 PK	74.0	-14.8	2.62 V	337	47.5	11.7
6	11650.00	48.1 AV	54.0	-5.9	2.62 V	337	36.4	11.7
7	#17475.00	62.9 PK	68.2	-5.3	1.22 V	147	44.0	18.9

Remarks:

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

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

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5150.00	63.4 PK	74.0	-10.6	1.54 H	239	62.3	1.1
2	5150.00	52.5 AV	54.0	-1.5	1.54 H	239	51.4	1.1
3	*5190.00	109.5 PK			1.54 H	239	108.5	1.0
4	*5190.00	98.6 AV			1.54 H	239	97.6	1.0
5	#10380.00	57.5 PK	68.2	-10.7	2.48 H	282	47.2	10.3
6	15570.00	55.0 PK	74.0	-19.0	2.01 H	312	42.9	12.1
7	15570.00	43.2 AV	54.0	-10.8	2.01 H	312	31.1	12.1
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5150.00	67.0 PK	74.0	-7.0	1.16 V	169	65.9	1.1
2	**5150.00**	**53.9 AV**	**54.0**	**-0.1**	**1.16 V**	**169**	**52.8**	**1.1**
3	*5190.00	115.3 PK			1.16 V	169	114.3	1.0
4	*5190.00	104.3 AV			1.16 V	169	103.3	1.0
5	#10380.00	51.6 PK	68.2	-16.6	2.51 V	315	41.3	10.3
6	15570.00	56.2 PK	74.0	-17.8	1.33 V	130	44.1	12.1
7	15570.00	41.1 AV	54.0	-12.9	1.33 V	130	29.0	12.1

Remarks:

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

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

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5141.16	59.7 PK	74.0	-14.3	1.58 H	231	58.6	1.1
2	5141.16	47.2 AV	54.0	-6.8	1.58 H	231	46.1	1.1
3	*5230.00	114.6 PK			1.58 H	231	113.7	0.9
4	*5230.00	104.6 AV			1.58 H	231	103.7	0.9
5	5361.50	51.0 PK	74.0	-23.0	1.58 H	231	50.1	0.9
6	5361.50	39.9 AV	54.0	-14.1	1.58 H	231	39.0	0.9
7	#10460.00	57.9 PK	68.2	-10.3	2.43 H	292	47.5	10.4
8	15690.00	55.6 PK	74.0	-18.4	2.06 H	312	44.3	11.3
9	15690.00	43.9 AV	54.0	-10.1	2.06 H	312	32.6	11.3
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5147.14	65.4 PK	74.0	-8.6	1.12 V	180	64.3	1.1
2	5147.14	53.8 AV	54.0	-0.2	1.12 V	180	52.7	1.1
3	*5230.00	120.5 PK			1.12 V	180	119.6	0.9
4	*5230.00	109.8 AV			1.12 V	180	108.9	0.9
5	5365.93	55.1 PK	74.0	-18.9	1.12 V	180	54.2	0.9
6	5365.93	43.8 AV	54.0	-10.2	1.12 V	180	42.9	0.9
7	#10460.00	50.8 PK	68.2	-17.4	2.43 V	338	40.4	10.4
8	15690.00	56.1 PK	74.0	-17.9	1.35 V	152	44.8	11.3
9	15690.00	41.6 AV	54.0	-12.4	1.35 V	152	30.3	11.3

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.
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	#5647.37	61.9 PK	68.2	-6.3	2.37 H	130	60.5	1.4
2	*5755.00	118.6 PK			2.37 H	130	116.9	1.7
3	*5755.00	107.5 AV			2.37 H	130	105.8	1.7
4	#5939.33	51.3 PK	68.2	-16.9	2.37 H	130	49.5	1.8
5	11510.00	58.5 PK	74.0	-15.5	1.51 H	72	46.4	12.1
6	11510.00	47.6 AV	54.0	-6.4	1.51 H	72	35.5	12.1
7	#17265.00	67.2 PK	68.2	-1.0	1.56 H	185	51.2	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	#5641.09	66.6 PK	68.2	-1.6	1.38 V	166	65.2	1.4
2	*5755.00	122.3 PK			1.38 V	166	120.6	1.7
3	*5755.00	110.4 AV			1.38 V	166	108.7	1.7
4	#5923.69	57.3 PK	69.2	-11.9	1.38 V	166	55.5	1.8
5	11510.00	55.1 PK	74.0	-18.9	2.16 V	310	43.0	12.1
6	11510.00	44.7 AV	54.0	-9.3	2.16 V	310	32.6	12.1
7	#17265.00	55.7 PK	68.2	-12.5	1.09 V	115	39.7	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	#5651.16	53.1 PK	69.1	-16.0	2.23 H	126	51.7	1.4
2	*5795.00	118.2 PK			2.23 H	126	116.3	1.9
3	*5795.00	107.3 AV			2.23 H	126	105.4	1.9
4	#5930.69	53.7 PK	68.2	-14.5	2.23 H	126	51.9	1.8
5	11590.00	58.1 PK	74.0	-15.9	1.55 H	77	46.1	12.0
6	11590.00	47.2 AV	54.0	-6.8	1.55 H	77	35.2	12.0
7	#17385.00	67.4 PK	68.2	-0.8	1.61 H	175	49.6	17.8
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5641.32	54.8 PK	68.2	-13.4	1.42 V	174	53.4	1.4
2	*5795.00	122.5 PK			1.42 V	174	120.6	1.9
3	*5795.00	110.9 AV			1.42 V	174	109.0	1.9
4	#5941.51	61.6 PK	68.2	-6.6	1.42 V	174	59.8	1.8
5	11590.00	55.1 PK	74.0	-18.9	2.15 V	304	43.1	12.0
6	11590.00	44.8 AV	54.0	-9.2	2.15 V	304	32.8	12.0
7	#17385.00	55.8 PK	68.2	-12.4	1.09 V	130	38.0	17.8

Remarks:

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

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

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5134.53	56.4 PK	74.0	-17.6	1.36 H	152	55.3	1.1
2	5134.53	46.1 AV	54.0	-7.9	1.36 H	152	45.0	1.1
3	*5210.00	107.5 PK			1.36 H	152	106.5	1.0
4	*5210.00	95.1 AV			1.36 H	152	94.1	1.0
5	5356.32	48.8 PK	74.0	-25.2	1.36 H	152	47.9	0.9
6	5356.32	36.8 AV	54.0	-17.2	1.36 H	152	35.9	0.9
7	#10420.00	55.5 PK	68.2	-12.7	2.36 H	300	45.1	10.4
8	15630.00	54.7 PK	74.0	-19.3	2.06 H	308	42.9	11.8
9	15630.00	40.6 AV	54.0	-13.4	2.06 H	308	28.8	11.8
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5139.44	64.6 PK	74.0	-9.4	1.34 V	161	63.5	1.1
2	5139.44	53.3 AV	54.0	-0.7	1.34 V	161	52.2	1.1
3	*5210.00	111.4 PK			1.34 V	161	110.4	1.0
4	*5210.00	100.1 AV			1.34 V	161	99.1	1.0
5	5358.96	51.6 PK	74.0	-22.4	1.34 V	161	50.7	0.9
6	5358.96	39.4 AV	54.0	-14.6	1.34 V	161	38.5	0.9
7	#10420.00	51.0 PK	68.2	-17.2	2.37 V	338	40.6	10.4
8	15630.00	54.2 PK	74.0	-19.8	1.36 V	109	42.4	11.8
9	15630.00	41.6 AV	54.0	-12.4	1.36 V	109	29.8	11.8

Remarks:

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

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

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5637.77	56.3 PK	68.2	-11.9	2.48 H	129	54.9	1.4
2	*5775.00	112.0 PK			2.48 H	129	110.2	1.8
3	*5775.00	101.8 AV			2.48 H	129	100.0	1.8
4	#5925.90	52.3 PK	68.2	-15.9	2.48 H	129	50.5	1.8
5	11550.00	55.6 PK	74.0	-18.4	1.54 H	69	43.5	12.1
6	11550.00	45.6 AV	54.0	-8.4	1.54 H	69	33.5	12.1
7	#17325.00	61.4 PK	68.2	-6.8	1.64 H	172	45.0	16.4
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5641.33	67.3 PK	68.2	-0.9	1.33 V	166	65.9	1.4
2	*5775.00	116.7 PK			1.33 V	166	114.9	1.8
3	*5775.00	108.5 AV			1.33 V	166	106.7	1.8
4	#5921.47	69.0 PK	70.8	-1.8	1.33 V	166	67.2	1.8
5	11550.00	53.3 PK	74.0	-20.7	2.16 V	297	41.2	12.1
6	11550.00	42.7 AV	54.0	-11.3	2.16 V	297	30.6	12.1
7	#17325.00	54.9 PK	68.2	-13.3	1.06 V	128	38.5	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.

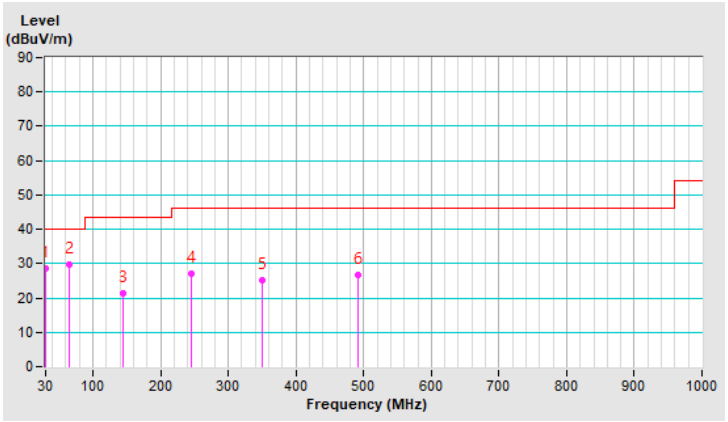
Below 1GHz Data:

RF Mode	TX 802.11ax (HE40)	Channel	CH 46：5230 MHz
Frequency Range	9kHz ~ 1GHz	Detector Function	Quasi-Peak (QP)

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	30.54	28.7 QP	40.0	-11.3	2.00 H	236	42.3	-13.6
2	64.36	29.6 QP	40.0	-10.4	2.00 H	227	43.5	-13.9
3	143.84	21.5 QP	43.5	-22.0	2.00 H	76	33.6	-12.1
4	246.28	27.0 QP	46.0	-19.0	1.00 H	114	39.8	-12.8
5	350.02	25.2 QP	46.0	-20.8	1.50 H	16	34.5	-9.3
6	492.17	26.8 QP	46.0	-19.2	1.50 H	24	31.9	-5.1

Remarks:

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

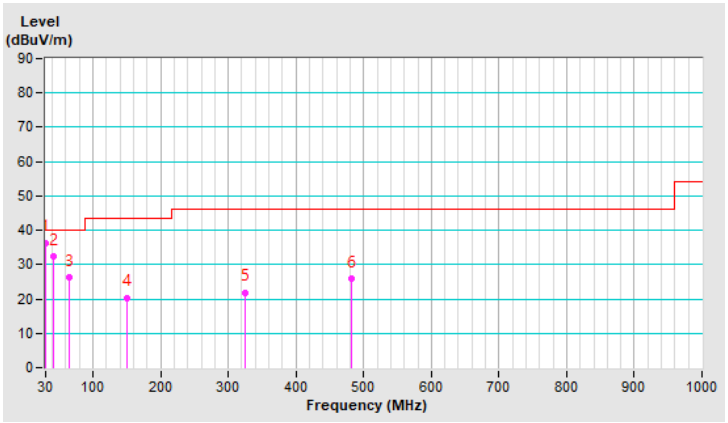


RF Mode	TX 802.11ax (HE40)	Channel	CH 46：5230 MHz
Frequency Range	9kHz ~ 1GHz	Detector Function	Quasi-Peak (QP)

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	30.23	36.4 QP	40.0	-3.6	1.00 V	232	49.9	-13.5
2	40.99	32.5 QP	40.0	-7.5	1.00 V	16	45.3	-12.8
3	65.43	26.3 QP	40.0	-13.7	1.50 V	351	40.3	-14.0
4	149.72	20.4 QP	43.5	-23.1	1.50 V	289	32.3	-11.9
5	323.93	21.9 QP	46.0	-24.1	1.50 V	341	31.9	-10.0
6	482.25	26.0 QP	46.0	-20.0	1.00 V	289	31.4	-5.4

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 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: Mar. 17, 2021

4.2.3 Test Procedure

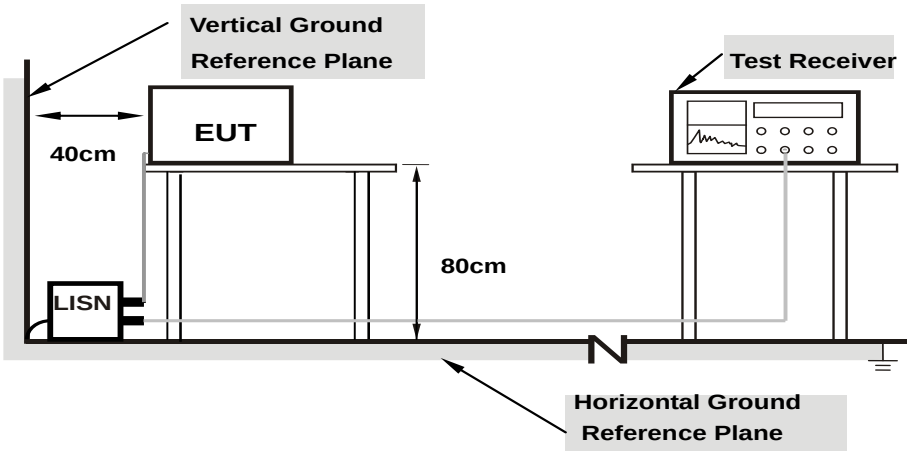
a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling 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.

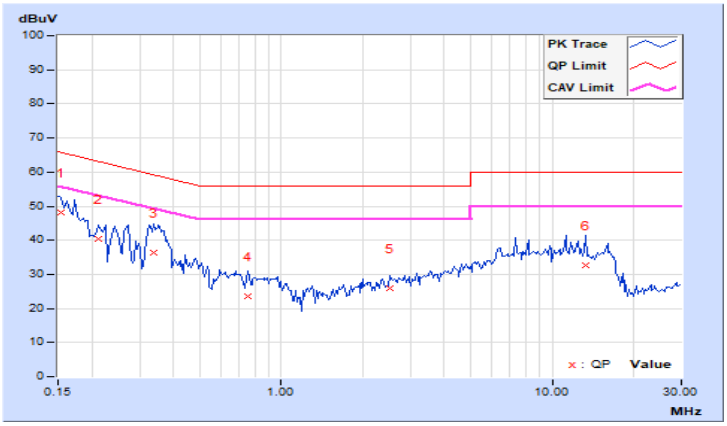
4.2.7 Test Results

RF Mode	TX 802.11ax (HE40)	Channel	CH 46：5230 MHz
Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz

Phase Of Power : Line (L)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15382	9.96	38.12	21.83	48.08	31.79	65.79	55.79	-17.71	-24.00
2	0.21235	9.99	30.49	17.26	40.48	27.25	63.11	53.11	-22.63	-25.86
3	0.33743	10.01	26.27	11.45	36.28	21.46	59.27	49.27	-22.99	-27.81
4	0.75143	10.04	13.53	1.65	23.57	11.69	56.00	46.00	-32.43	-34.31
5	2.50787	10.18	15.91	8.34	26.09	18.52	56.00	46.00	-29.91	-27.48
6	13.27727	10.97	21.75	16.74	32.72	27.71	60.00	50.00	-27.28	-22.29

Remarks:

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

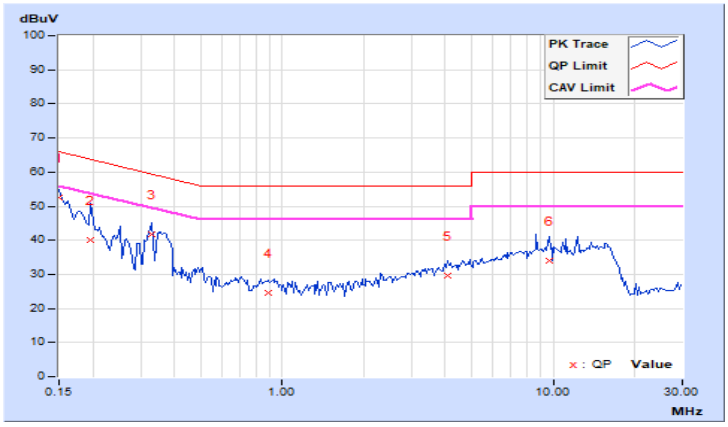


RF Mode	TX 802.11ax (HE40)	Channel	CH 46：5230 MHz
Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz

Phase Of Power : Neutral (N)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	**0.15018**	**9.94**	**42.45**	**25.98**	**52.39**	**35.92**	**65.99**	**55.99**	**-13.60**	**-20.07**
2	0.19696	9.98	30.24	10.39	40.22	20.37	63.74	53.74	-23.52	-33.37
3	0.32973	10.00	31.86	23.75	41.86	33.75	59.46	49.46	-17.60	-15.71
4	0.88445	10.06	14.57	7.49	24.63	17.55	56.00	46.00	-31.37	-28.45
5	4.07036	10.25	19.53	10.45	29.78	20.70	56.00	46.00	-26.22	-25.30
6	9.71476	10.60	23.43	17.45	34.03	28.05	60.00	50.00	-25.97	-21.95

Remarks:

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



4.3 Transmit Power Measurement

4.3.1 Limits of Transmit Power Measurement

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

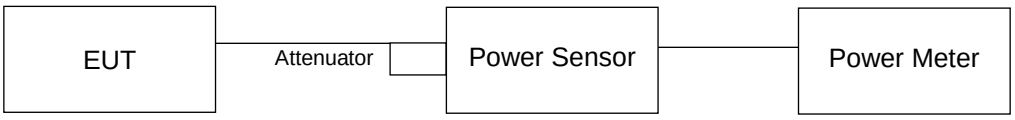
*B is the 26 dB emission bandwidth in megahertz

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

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

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

4.3.2 Test Setup



4.3.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.3.4 Test Procedure

Method PM is used to perform output power measurement, trigger and gating function of wide band power meter is enabled to measure max output power of TX on burst. Duty factor is not added to measured value.

4.3.5 Deviation from Test Standard

No deviation.

4.3.6 EUT Operating Condition

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

4.3.7 Test Results

CDD Mode

802.11a

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
36	5180	20.86	21.43	21.13	21.23	523.352	27.19	30	Pass
40	5200	23.35	23.41	23.68	23.54	894.842	29.52	30	Pass
48	5240	23.91	23.33	23.47	23.18	891.616	29.50	30	Pass
149	5745	22.97	22.71	22.23	22.53	730.96	28.64	30	Pass
157	5785	23.10	22.43	22.21	22.70	731.708	28.64	30	Pass
165	5825	23.45	23.43	23.49	23.75	902.097	29.55	30	Pass

802.11ac (VHT20)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
36	5180	21.17	21.60	22.38	22.13	611.749	27.87	30	Pass
40	5200	23.35	23.44	23.64	23.47	890.61	29.50	30	Pass
48	5240	23.79	23.41	23.38	23.48	899.227	29.54	30	Pass
149	5745	22.90	22.52	21.93	22.03	689.176	28.38	30	Pass
157	5785	22.93	22.32	22.01	22.38	698.781	28.44	30	Pass
165	5825	23.12	23.17	23.34	23.43	848.675	29.29	30	Pass

802.11ac (VHT40)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
38	5190	16.91	17.04	18.10	17.86	225.333	23.53	30	Pass
46	5230	24.23	23.25	23.72	23.33	926.982	29.67	30	Pass
151	5755	23.51	23.24	22.54	23.04	816.097	29.12	30	Pass
159	5795	23.58	23.31	23.06	23.49	867.982	29.39	30	Pass

802.11ac (VHT80)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
42	5210	16.51	16.54	15.95	16.26	171.475	22.34	30	Pass
155	5775	21.96	21.29	21.09	21.41	558.508	27.47	30	Pass

802.11ax (HE20)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
36	5180	21.38	21.84	22.64	22.39	647.195	28.11	30	Pass
40	5200	23.43	23.41	23.92	23.75	923.314	29.65	30	Pass
48	5240	24.04	23.44	23.30	23.34	903.884	29.56	30	Pass
149	5745	23.18	22.72	22.19	22.25	728.495	28.62	30	Pass
157	5785	23.13	22.59	22.25	22.64	738.675	28.68	30	Pass
165	5825	23.34	23.45	23.62	23.64	898.435	29.53	30	Pass

802.11ax (HE40)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
38	5190	17.13	17.32	18.35	18.09	238.401	23.77	30	Pass
46	5230	24.43	23.52	23.96	23.56	978.11	29.90	30	Pass
151	5755	23.75	23.49	22.82	23.26	863.756	29.36	30	Pass
159	5795	23.85	23.59	23.29	23.76	922.209	29.65	30	Pass

802.11ax (HE80)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
42	5210	16.73	16.82	16.19	16.47	181.134	22.58	30	Pass
155	5775	22.19	21.51	21.37	21.63	589.79	27.71	30	Pass

Beamforming Mode

802.11ac (VHT20)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
36	5180	21.17	21.60	22.38	22.13	611.749	27.87	30	Pass
40	5200	23.35	23.44	23.64	23.47	890.61	29.50	30	Pass
48	5240	23.79	23.41	23.38	23.48	899.227	29.54	30	Pass
149	5745	22.90	22.52	21.93	22.03	689.176	28.38	30	Pass
157	5785	22.93	22.32	22.01	22.38	698.781	28.44	30	Pass
165	5825	23.12	23.17	23.34	23.43	848.675	29.29	30	Pass

Note: 1. For U-NII-1: The directional gain = 1.78 dBi < 6dBi, so the so the power limit shall not be reduced.
2. For U-NII-3: The directional gain = 2.12 dBi < 6dBi, so the so the power limit shall not be reduced.

802.11ac (VHT40)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
38	5190	16.91	17.04	18.10	17.86	225.333	23.53	30	Pass
46	5230	24.23	23.25	23.72	23.33	926.982	29.67	30	Pass
151	5755	23.51	23.24	22.54	23.04	816.097	29.12	30	Pass
159	5795	23.58	23.31	23.06	23.49	867.982	29.39	30	Pass

Note: 1. For U-NII-1: The directional gain = 1.78 dBi < 6dBi, so the so the power limit shall not be reduced.
2. For U-NII-3: The directional gain = 2.12 dBi < 6dBi, so the so the power limit shall not be reduced.

802.11ac (VHT80)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
42	5210	16.51	16.54	15.95	16.26	171.475	22.34	30	Pass
155	5775	21.96	21.29	21.09	21.41	558.508	27.47	30	Pass

Note: 1. For U-NII-1: The directional gain = 1.78 dBi < 6dBi, so the so the power limit shall not be reduced.
2. For U-NII-3: The directional gain = 2.12 dBi < 6dBi, so the so the power limit shall not be reduced.

802.11ax (HE20)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
36	5180	21.38	21.84	22.64	22.39	647.195	28.11	30	Pass
40	5200	23.43	23.41	23.92	23.75	923.314	29.65	30	Pass
48	5240	24.04	23.44	23.30	23.34	903.884	29.56	30	Pass
149	5745	23.18	22.72	22.19	22.25	728.495	28.62	30	Pass
157	5785	23.13	22.59	22.25	22.64	738.675	28.68	30	Pass
165	5825	23.34	23.45	23.62	23.64	898.435	29.53	30	Pass

Note: 1. For U-NII-1: The directional gain = 1.78 dBi < 6dBi, so the so the power limit shall not be reduced.
2. For U-NII-3: The directional gain = 2.12 dBi < 6dBi, so the so the power limit shall not be reduced.

802.11ax (HE40)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
38	5190	17.13	17.32	18.35	18.09	238.401	23.77	30	Pass
46	5230	24.43	23.52	23.96	23.56	978.11	29.90	30	Pass
151	5755	23.75	23.49	22.82	23.26	863.756	29.36	30	Pass
159	5795	23.85	23.59	23.29	23.76	922.209	29.65	30	Pass

Note: 1. For U-NII-1: The directional gain = 1.78 dBi < 6dBi, so the so the power limit shall not be reduced.
2. For U-NII-3: The directional gain = 2.12 dBi < 6dBi, so the so the power limit shall not be reduced.

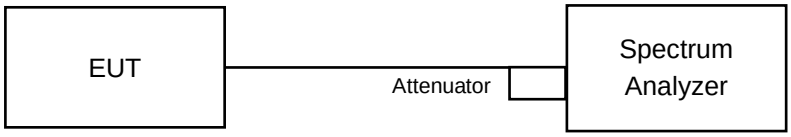
802.11ax (HE80)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
42	5210	16.73	16.82	16.19	16.47	181.134	22.58	30	Pass
155	5775	22.19	21.51	21.37	21.63	589.79	27.71	30	Pass

Note: 1. For U-NII-1: The directional gain = 1.78 dBi < 6dBi, so the so the power limit shall not be reduced.
2. For U-NII-3: The directional gain = 2.12 dBi < 6dBi, so the so the power limit shall not be reduced.

4.4 Occupied Bandwidth Measurement

4.4.1 Test Setup



4.4.2 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.4.3 Test Procedure

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

4.4.4 Test Results

802.11a

Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)			
		Chain 0	Chain 1	Chain 2	Chain 3
36	5180	16.56	16.44	16.56	16.56
40	5200	16.56	16.56	16.68	16.56
48	5240	16.56	16.56	16.56	16.56
149	5745	16.56	16.56	16.44	16.8
157	5785	16.68	16.44	16.56	16.92
165	5825	16.68	16.56	16.8	17.52

802.11ax (HE20)

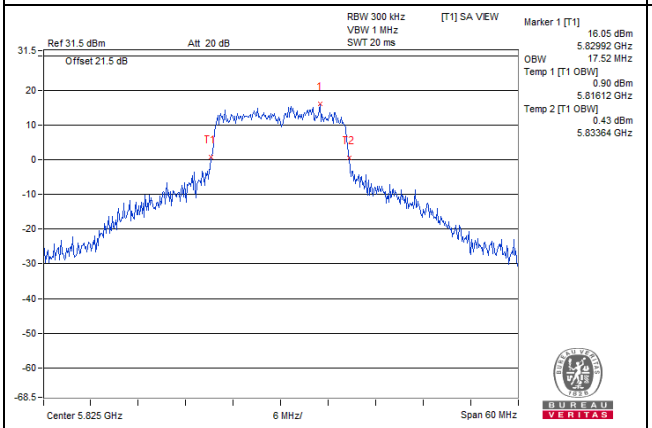
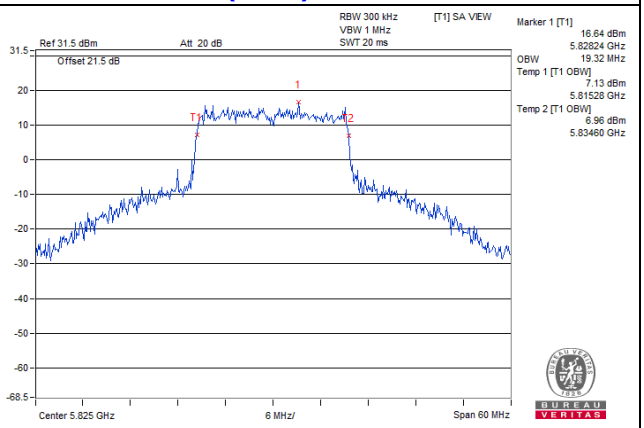
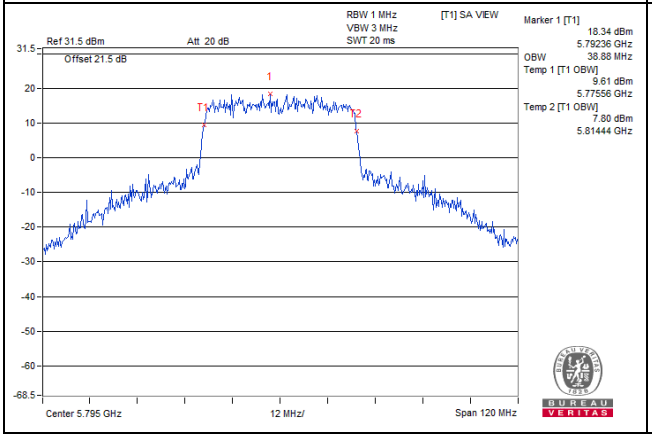
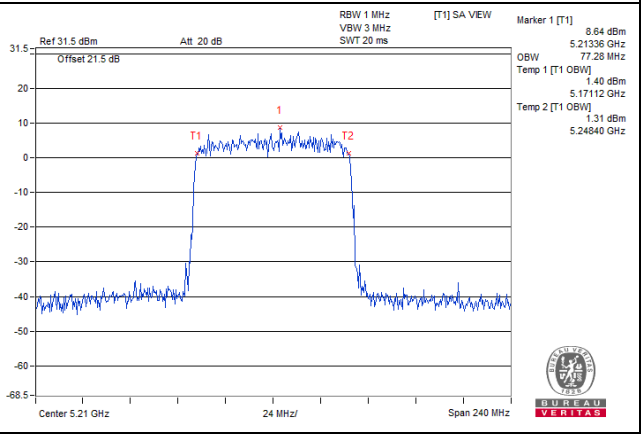
Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)			
		Chain 0	Chain 1	Chain 2	Chain 3
36	5180	18.96	19.08	19.08	19.08
40	5200	19.08	18.96	18.96	18.96
48	5240	18.96	18.96	19.2	19.2
149	5745	18.96	18.96	18.96	19.2
157	5785	19.2	18.96	19.2	19.08
165	5825	19.08	19.08	19.08	19.32

802.11ax (HE40)

Channel	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	38.64	38.16	38.16	38.16
151	5755	37.92	38.16	38.16	38.64
159	5795	38.16	38.16	38.16	38.88

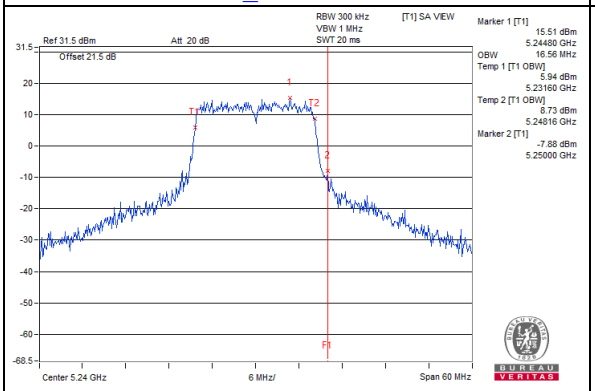
802.11ax (HE80)

Channel	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	76.8	77.28	77.28	77.28

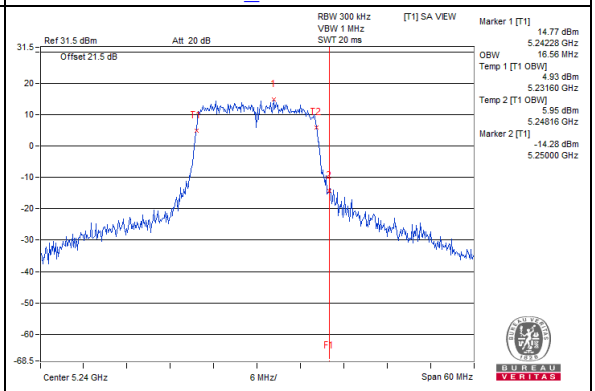
Spectrum Plot of Max. Value	
802.11a_Chain 3 / CH165	**802.11ax (HE20)_Chain 3 / CH165**
	
802.11ax (HE40)_Chain 3 / CH159	**802.11ax (HE80)_Chain 0 / CH42**
	

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

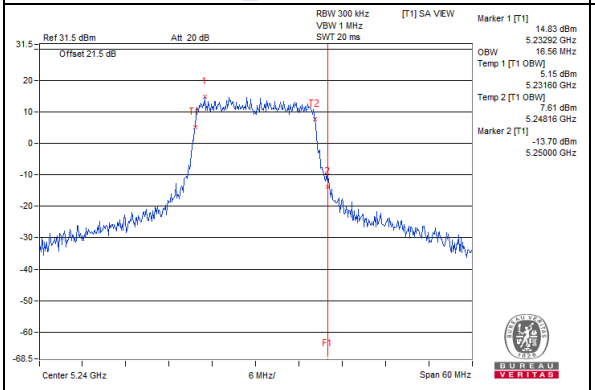
802.11a_Chain 0 / CH48



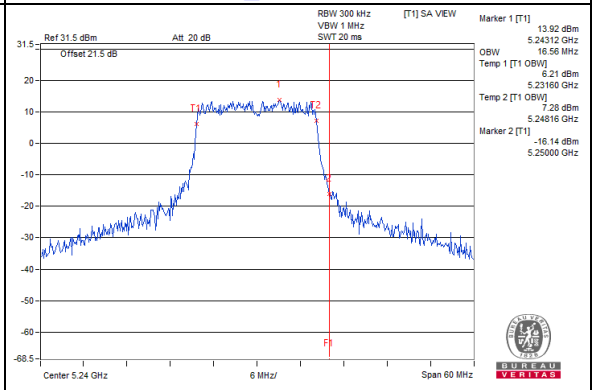
802.11a_Chain 1 / CH48



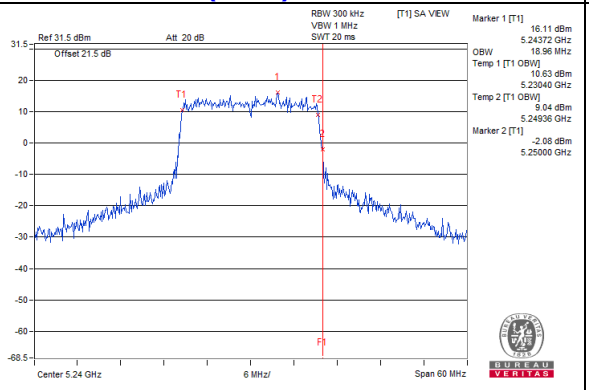
802.11a_Chain 2 / CH48



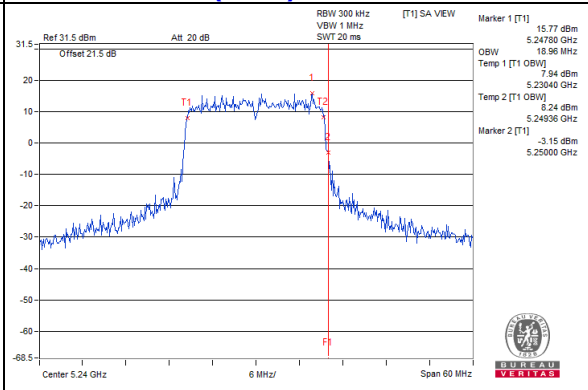
802.11a_Chain 3 / CH48



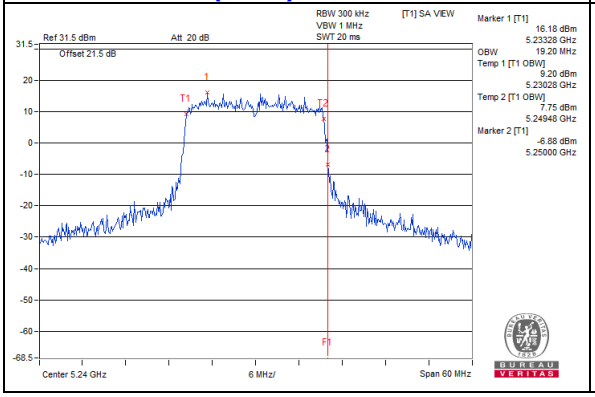
802.11ax (HE20)_Chain 0 / CH48



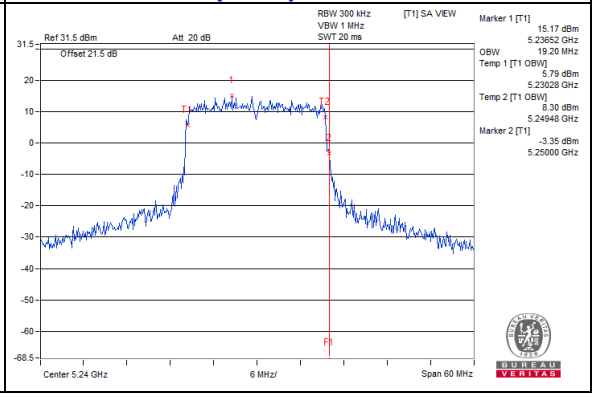
802.11ax (HE20)_Chain 1 / CH48



802.11ax (HE20)_Chain 2 / CH48

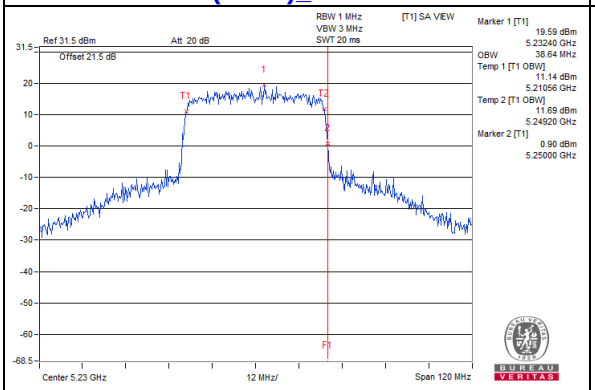


802.11ax (HE20)_Chain 3 / CH48

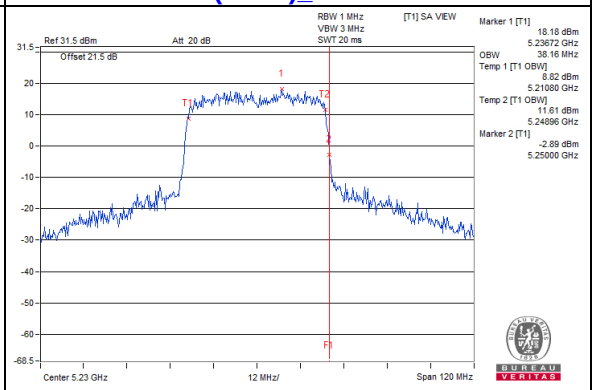


Spectrum Plot for near by DFS band
(DFS is required, if 99% OCP straddle into U-NII-2A band)

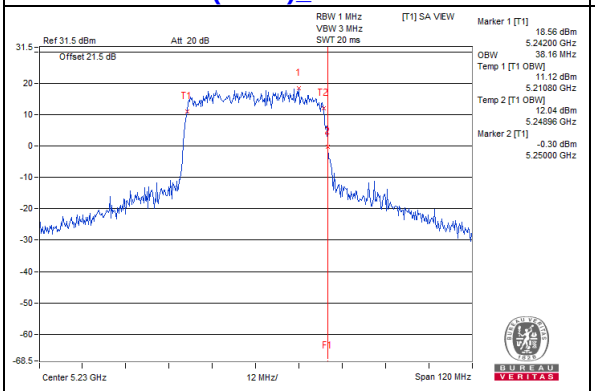
802.11ax (HE40)_Chain 0 / CH46



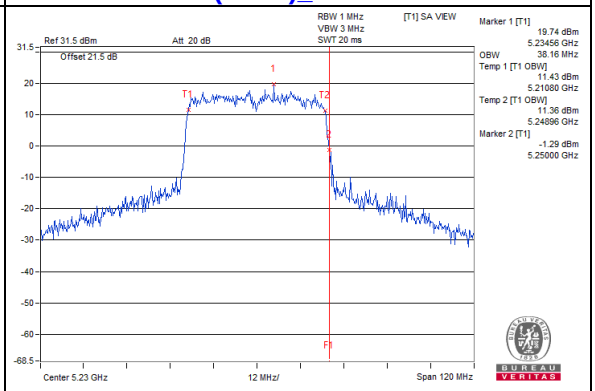
802.11ax (HE40)_Chain 1 / CH46



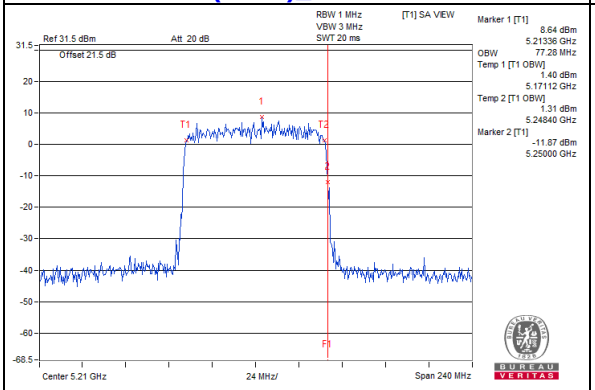
802.11ax (HE40)_Chain 2 / CH46



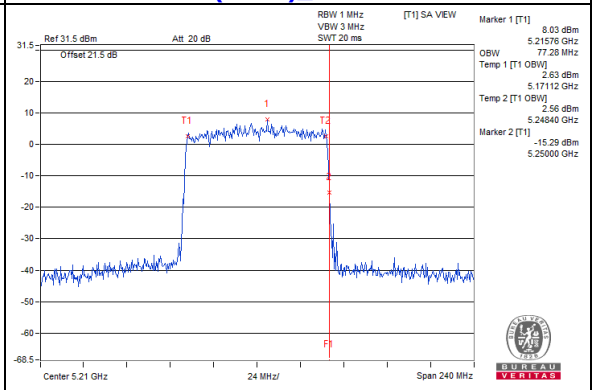
802.11ax (HE40)_Chain 3 / CH46



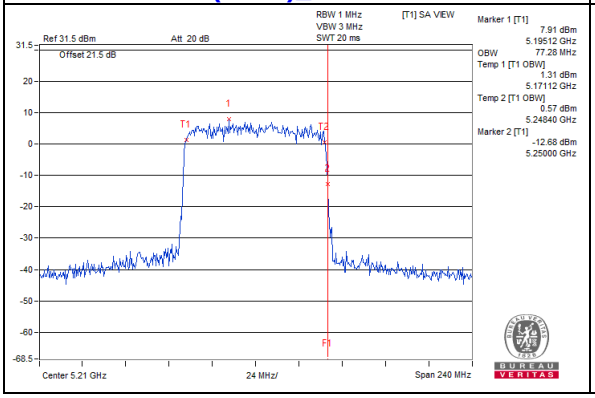
802.11ax (HE80)_Chain 0 / CH42



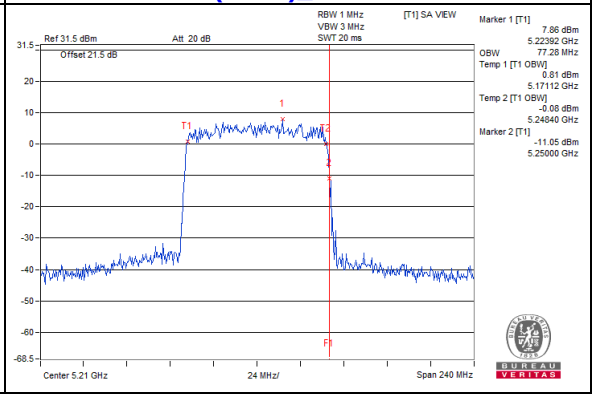
802.11ax (HE80)_Chain 1 / CH42



802.11ax (HE80)_Chain 2 / CH42

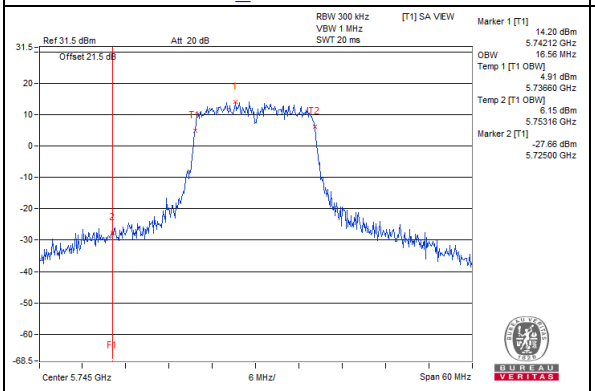


802.11ax (HE80)_Chain 3 / CH42

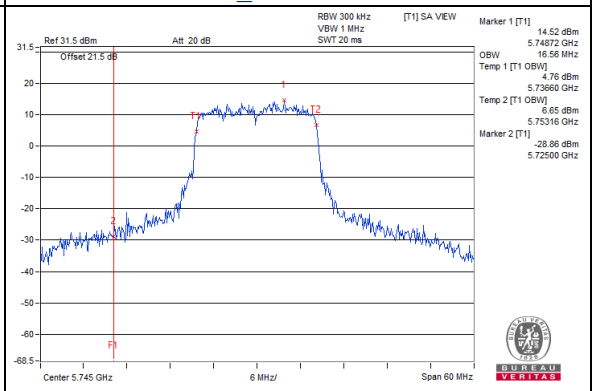


Spectrum Plot for near by DFS band
(DFS is required, if 99% OCP straddle into U-NII-2C band)

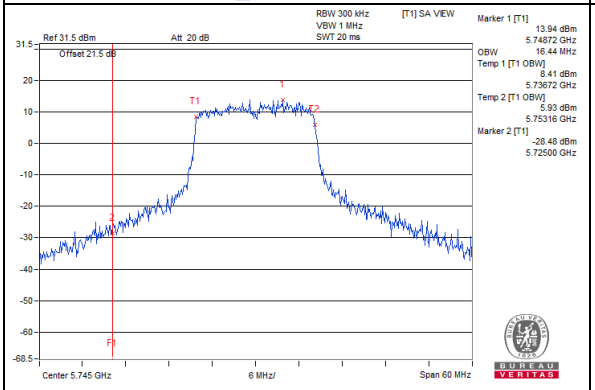
802.11a_Chain 0 / CH149



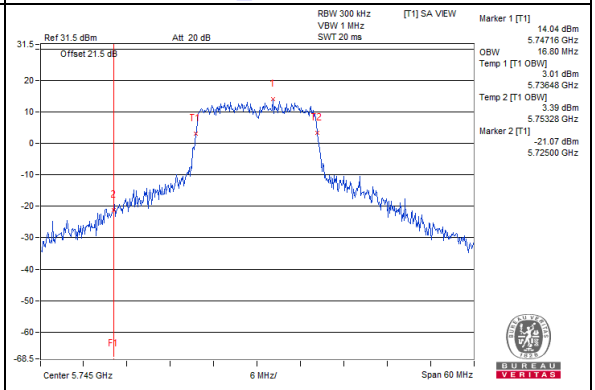
802.11a_Chain 1 / CH149



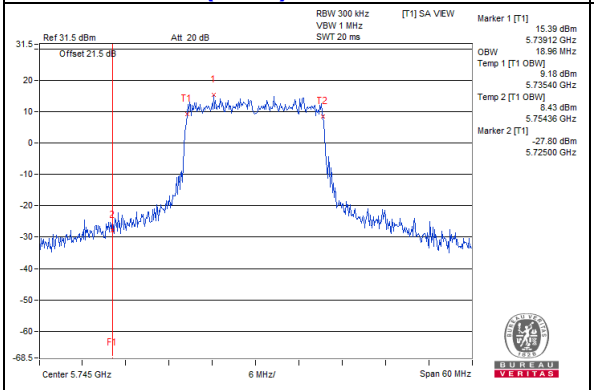
802.11a_Chain 2 / CH149



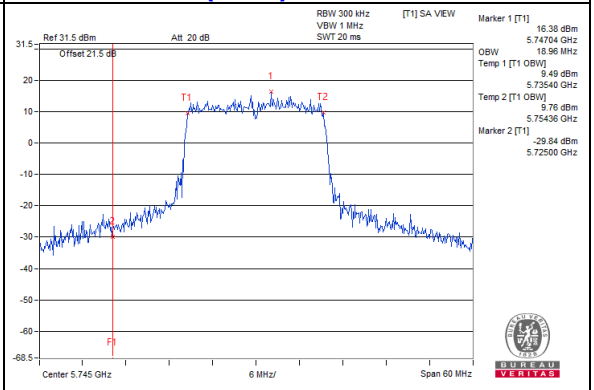
802.11a_Chain 3 / CH149



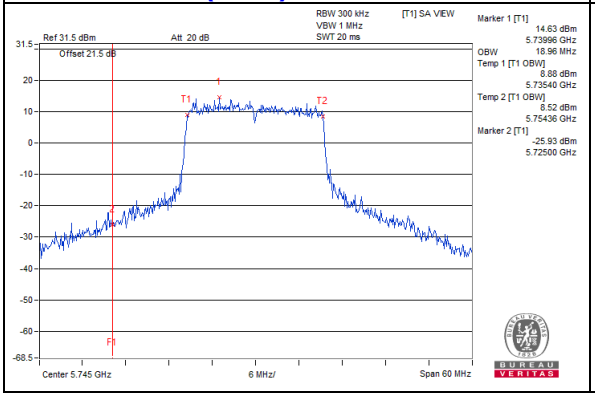
802.11ax (HE20)_Chain 0 / CH149



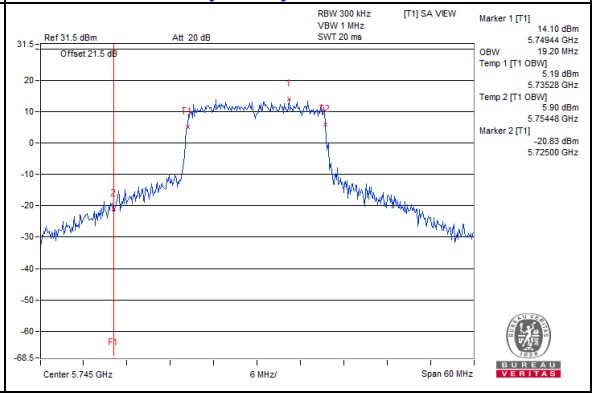
802.11ax (HE20)_Chain 1 / CH149



802.11ax (HE20)_Chain 2 / CH149

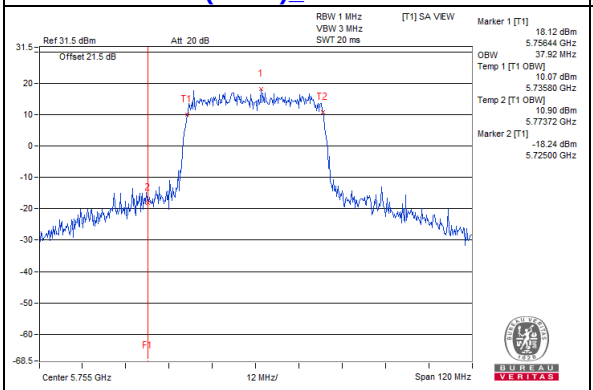


802.11ax (HE20)_Chain 3 / CH149

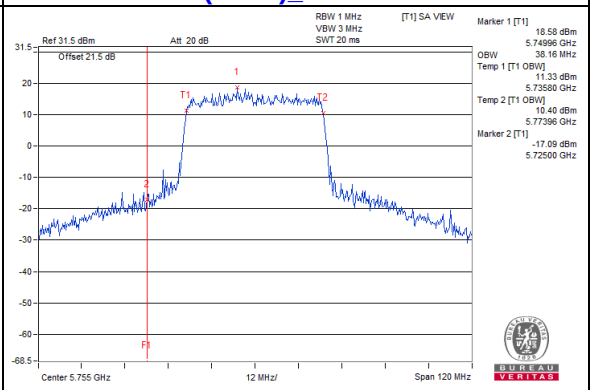


Spectrum Plot for near by DFS band
(DFS is required, if 99% OCP straddle into U-NII-2C band)

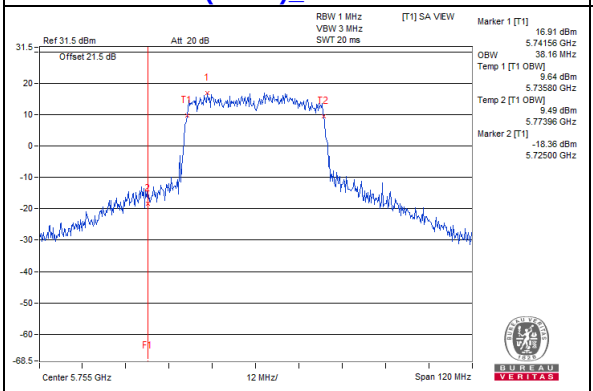
802.11ax (HE40)_Chain 0 / CH151



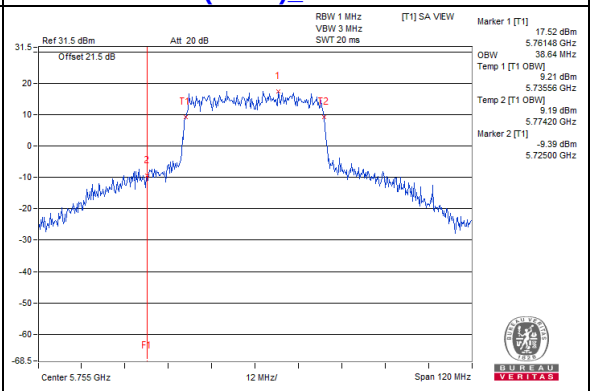
802.11ax (HE40)_Chain 1 / CH151



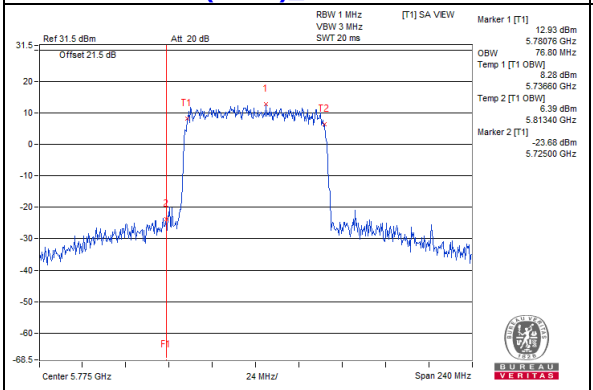
802.11ax (HE40)_Chain 2 / CH151



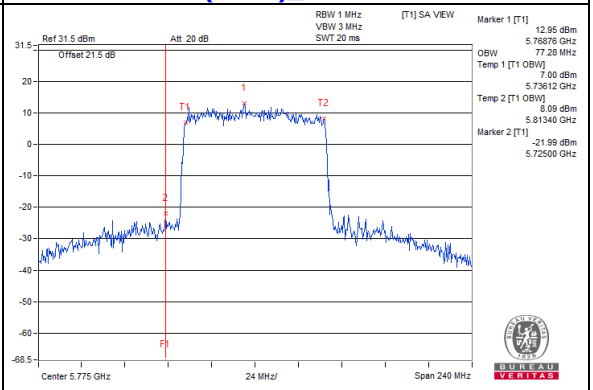
802.11ax (HE40)_Chain 3 / CH151



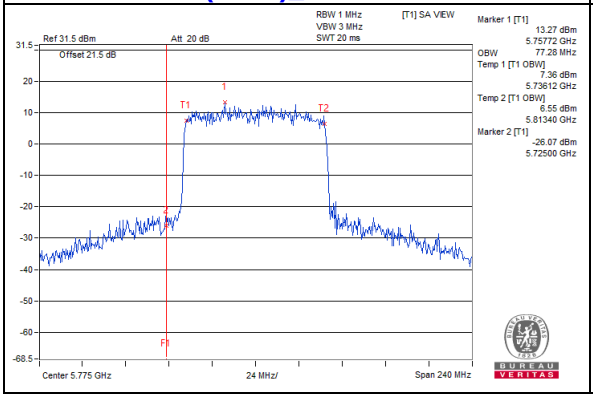
802.11ax (HE80)_Chain 0 / CH155



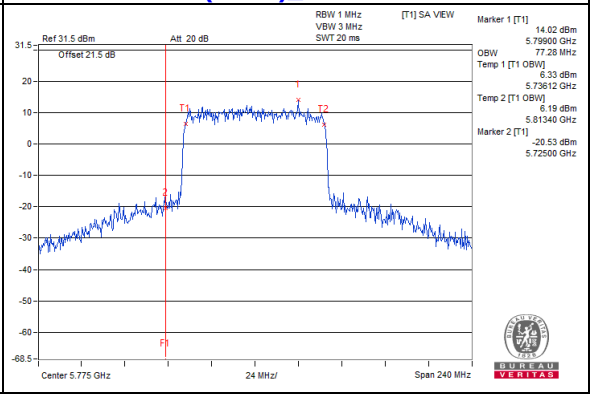
802.11ax (HE80)_Chain 1 / CH155



802.11ax (HE80)_Chain 2 / CH155



802.11ax (HE80)_Chain 3 / CH155

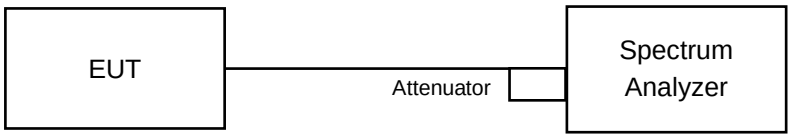


4.5 Peak Power Spectral Density Measurement

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	6.55	7.23	7.85	7.43	0.22	13.53	17.00	PASS
40	5200	9.55	10.10	10.59	9.82	0.22	16.27	17.00	PASS
48	5240	10.41	9.98	9.81	9.77	0.22	16.24	17.00	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 = 1.78 dBi < 6 dBi, so the power density limit shall not be reduced.
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	7.13	7.67	8.25	8.08	0.24	14.07	17.00	Pass
40	5200	9.21	9.53	9.83	9.60	0.24	15.81	17.00	Pass
48	5240	9.89	9.23	9.32	9.16	0.24	15.67	17.00	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 = 1.78 dBi < 6 dBi, so the power density limit shall not be reduced.
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	0.18	0.60	2.11	1.18	0.23	7.33	17.00	Pass
46	5230	7.98	7.15	7.71	7.19	0.23	13.78	17.00	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 = 1.78 dBi < 6 dBi, so the power density limit shall not be reduced.
3. Refer to section 3.3 for duty cycle spectrum plot.

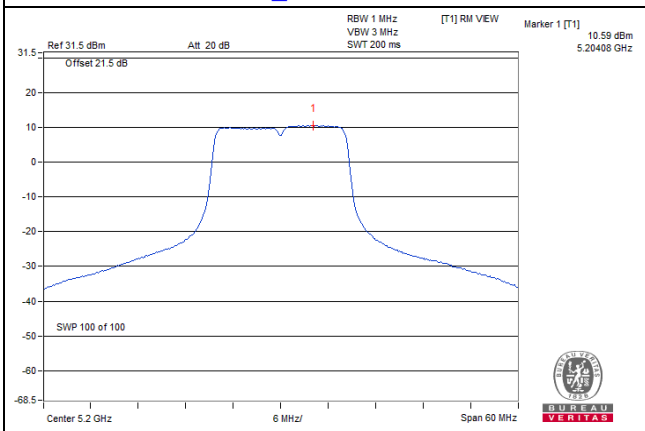
802.11ax (HE80)

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	-2.75	-3.70	-2.51	-2.66	0.20	3.34	17.00	Pass

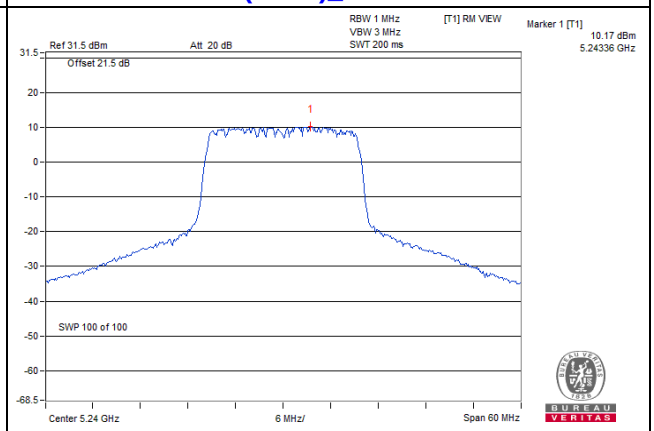
Note: 1. Method a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. The directional gain = 1.78 dBi < 6 dBi, so the power density limit shall not be reduced.
3. Refer to section 3.3 for duty cycle spectrum plot.

Spectrum Plot of Worst Value

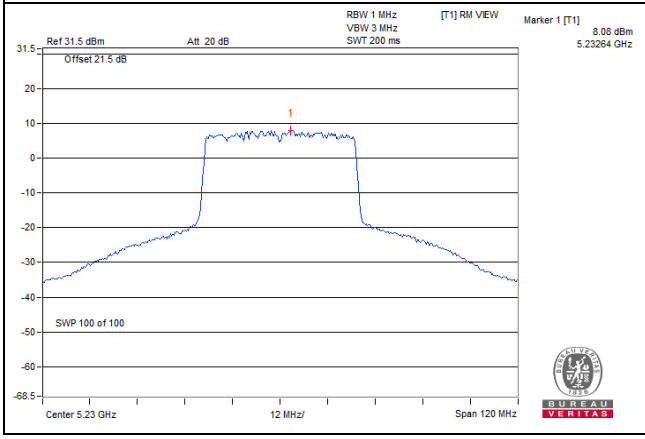
802.11a_Chain 2 / CH40



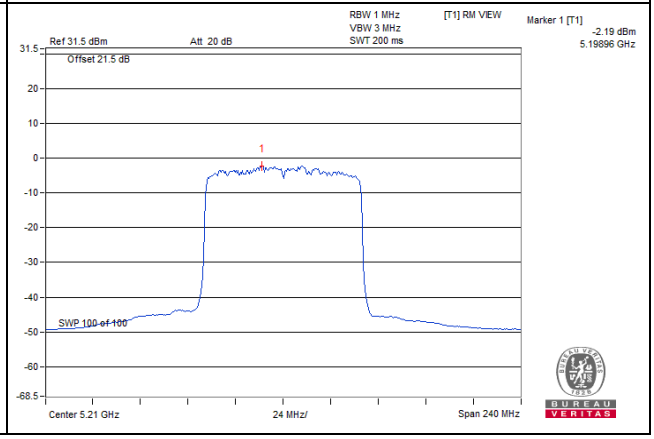
802.11ax (HE20)_Chain 0 / CH48



802.11ax (HE40)_Chain 0 / CH46 **5230**



802.11ax (HE80)_Chain 2 / CH42



For U-NII-3 Band

CDD Mode

802.11a

Chan.	Chan. Freq.	PSD w/o Duty Factor (dBm/300kHz)				Duty Factor (dB)	Total PSD (mW/300kHz)	Total PSD (dBm/300kHz)	Total PSD (dBm/500kHz)	PSD Limit (dBm/500kHz)	Pass / Fail
	(MHz)	Chain 0	Chain 1	Chain 2	Chain 3						
149	5745	1.36	1.09	0.74	1.00	0.22	5.361	7.29	9.51	30.00	PASS
157	5785	1.51	0.28	0.59	0.78	0.22	5.074	7.05	9.27	30.00	PASS
165	5825	1.69	1.57	2.56	2.84	0.22	6.98	8.44	10.66	30.00	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 = 2.12 dBi < 6 dBi, so the power density limit shall not be reduced.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ax (HE20)

Chan.	Chan. Freq.	PSD w/o Duty Factor (dBm/300kHz)				Duty Factor (dB)	Total PSD (mW/300kHz)	Total PSD (dBm/300kHz)	Total PSD (dBm/500kHz)	PSD Limit (dBm/500kHz)	Pass / Fail
	(MHz)	Chain 0	Chain 1	Chain 2	Chain 3						
149	5745	0.52	-0.50	-1.31	-0.75	0.24	3.8078	5.81	8.03	30.00	PASS
157	5785	-0.04	-0.68	-0.35	-0.48	0.24	3.8759	5.88	8.10	30.00	PASS
165	5825	0.79	0.84	0.62	0.78	0.24	5.039	7.02	9.24	30.00	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 = 2.12 dBi < 6 dBi, so the power density limit shall not be reduced.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ax (HE40)

Chan.	Chan. Freq.	PSD w/o Duty Factor (dBm/300kHz)				Duty Factor (dB)	Total PSD (mW/300kHz)	Total PSD (dBm/300kHz)	Total PSD (dBm/500kHz)	PSD Limit (dBm/500kHz)	Pass / Fail
	(MHz)	Chain 0	Chain 1	Chain 2	Chain 3						
151	5755	-2.27	-2.20	-2.51	-2.38	0.23	2.4634	3.92	6.14	30.00	PASS
159	5795	-2.00	-2.73	-1.83	-2.16	0.23	2.5625	4.09	6.31	30.00	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 = 2.12 dBi < 6 dBi, so the power density limit shall not be reduced.
3. Refer to section 3.3 for duty cycle spectrum plot.

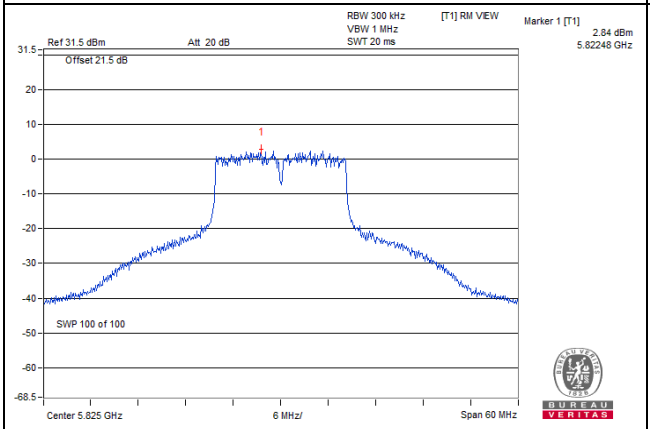
802.11ax (HE80)

Chan.	Chan. Freq.	PSD w/o Duty Factor (dBm/300kHz)				Duty Factor (dB)	Total PSD (mW/300kHz)	Total PSD (dBm/300kHz)	Total PSD (dBm/500kHz)	PSD Limit (dBm/500kHz)	Pass / Fail
	(MHz)	Chain 0	Chain 1	Chain 2	Chain 3						
155	5775	-6.73	-6.98	-6.21	-6.26	0.20	0.9304	-0.31	1.91	30.00	PASS

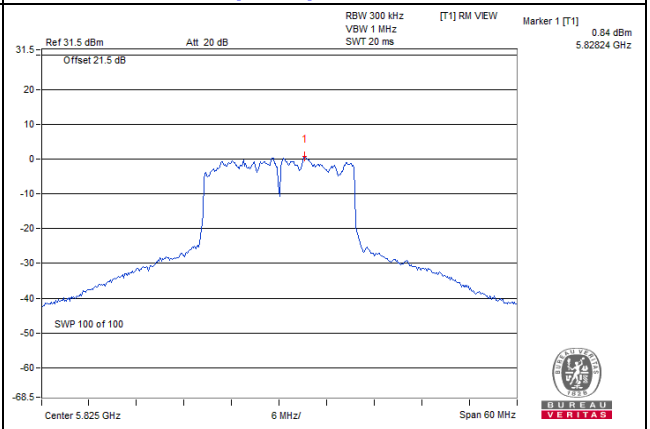
Note: 1. Method b) Measure and sum spectral maxima across the outputs of KDB 662911 is using for calculating total power density.
2. The directional gain = 2.12 dBi < 6 dBi, so the power density limit shall not be reduced.
3. Refer to section 3.3 for duty cycle spectrum plot.

Spectrum Plot of Worst Value

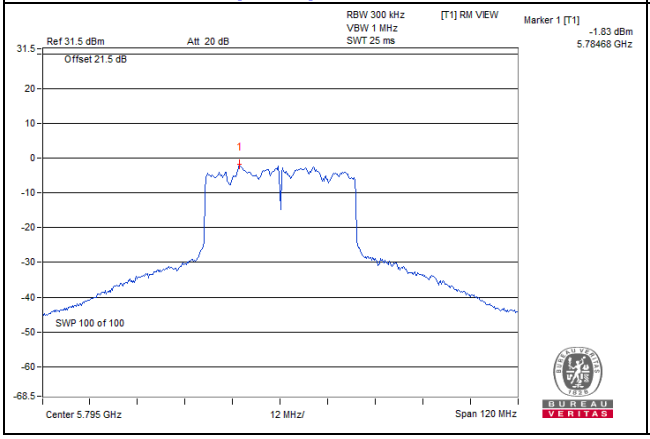
802.11a_Chain 3 / CH165



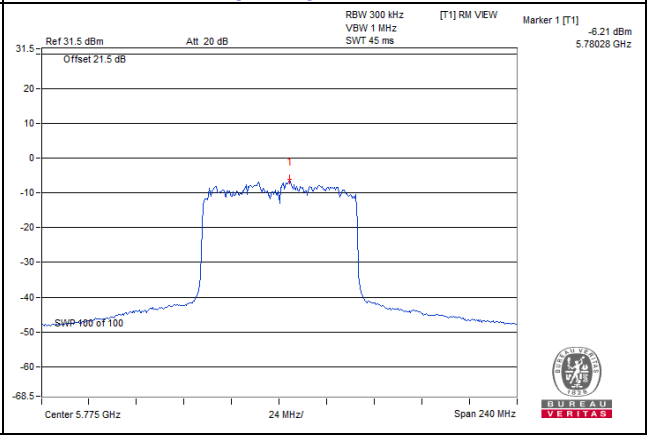
802.11ax (HE20)_Chain 1 / CH165



802.11ax (HE40)_Chain 2 / CH159



802.11ax (HE80)_Chain 2 / CH155

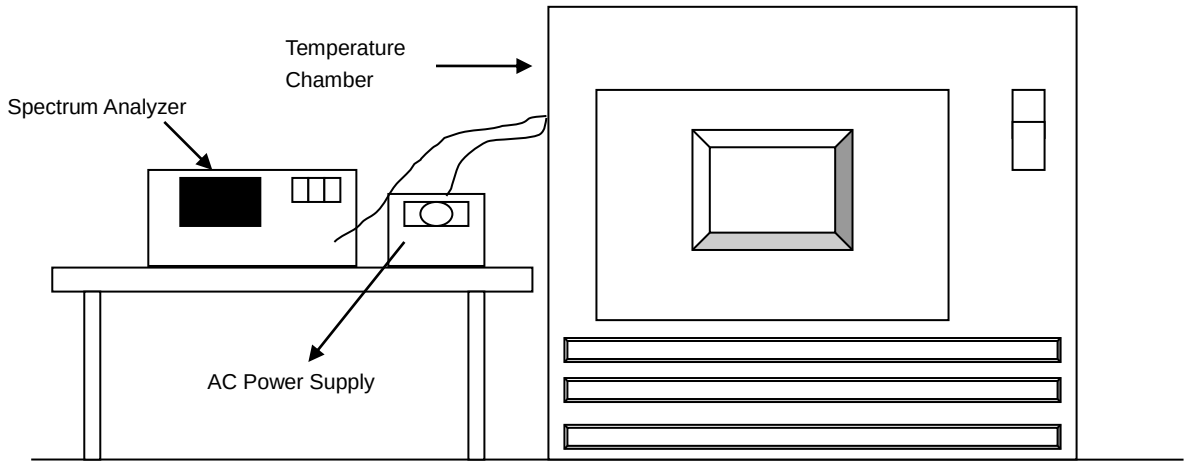


4.6 Frequency Stability Measurement

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	5180.0183	PASS	5180.0208	PASS	5180.022	PASS	5180.0219	PASS
30	120	5180.0187	PASS	5180.0182	PASS	5180.0188	PASS	5180.019	PASS
20	120	5180.0239	PASS	5180.0267	PASS	5180.0264	PASS	5180.0244	PASS
10	120	5180.0074	PASS	5180.0046	PASS	5180.0052	PASS	5180.003	PASS
0	120	5179.9864	PASS	5179.9852	PASS	5179.9848	PASS	5179.9864	PASS

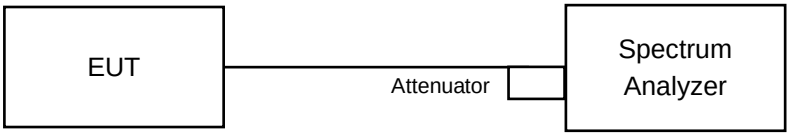
Frequency Stability Versus Voltage									
Operating Frequency: 5180 MHz									
TEMP. (℃)	Power Supply (Vac)	0 Minute		2 Minutes		5 Minutes		10 Minutes	
		Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail
20	138	5180.0239	PASS	5180.0267	PASS	5180.0271	PASS	5180.0249	PASS
	120	5180.0239	PASS	5180.0267	PASS	5180.0264	PASS	5180.0244	PASS
	102	5180.0247	PASS	5180.0275	PASS	5180.0267	PASS	5180.0251	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	16.36	16.33	16.36	16.39	0.5	Pass
157	5785	16.37	16.39	16.39	16.38	0.5	Pass
165	5825	16.37	16.33	16.36	16.36	0.5	Pass

802.11ax (HE20)

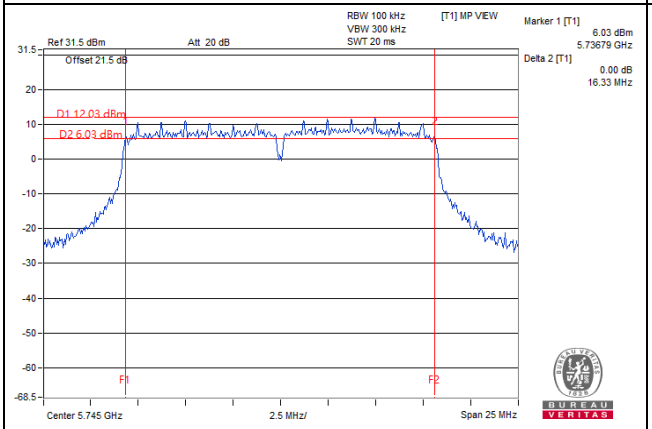
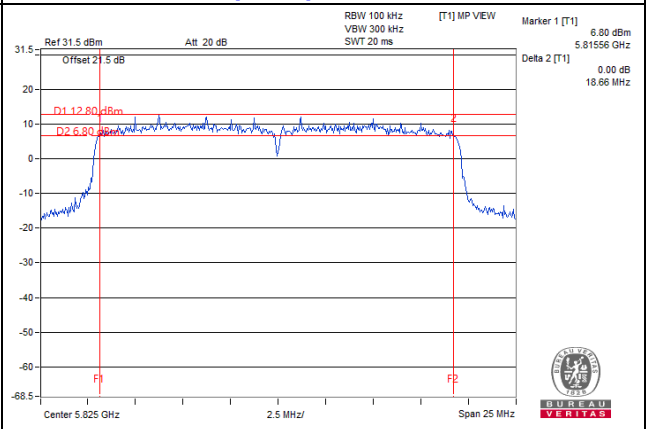
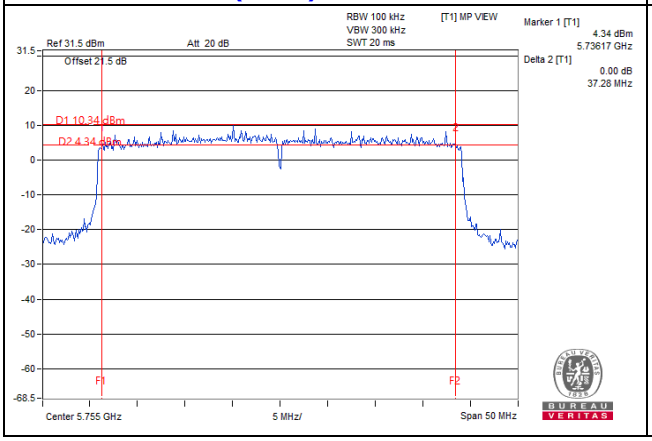
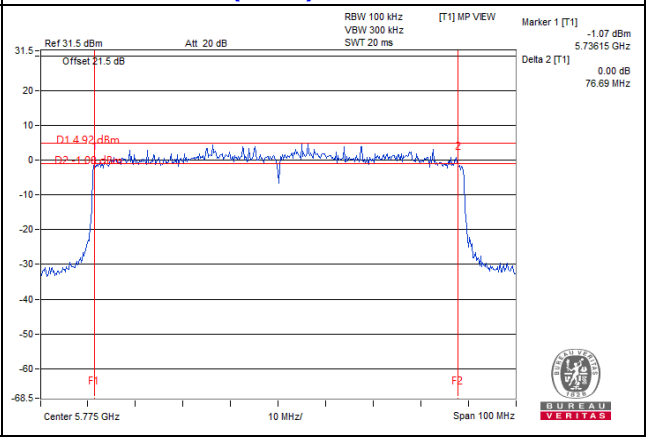
Channel	Frequency (MHz)	6dB Bandwidth (MHz)				Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3		
149	5745	18.99	18.93	18.94	18.76	0.5	Pass
157	5785	18.98	18.66	19.04	18.74	0.5	Pass
165	5825	18.66	18.83	18.95	18.9	0.5	Pass

802.11ax (HE40)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)				Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3		
151	5755	37.88	37.28	37.78	37.93	0.5	Pass
159	5795	37.39	37.76	37.98	37.71	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	77.55	77	76.69	77.25	0.5	Pass

Spectrum Plot of Worst Value	
802.11a_Chain 1 / CH149	**802.11ax (HE20)_Chain 0 / CH165**
	
802.11ax (HE40)_Chain 1 / CH151	**802.11ax (HE80)_Chain 2 / CH155**
	

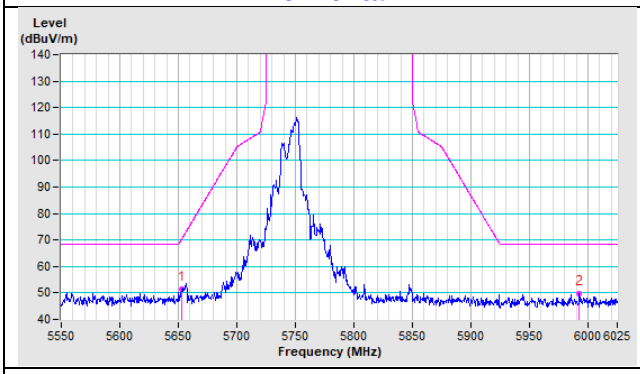
5 Pictures of Test Arrangements

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

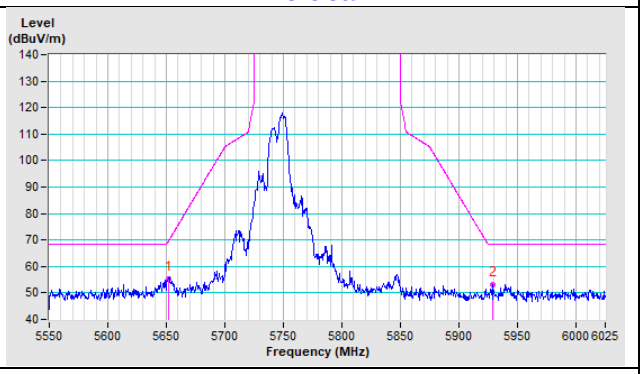
Annex A - Radiated Out of Band Emission (OOBE) Measurement (For U-NII-3 band)

802.11a CH 149：5745 MHz

Horizontal

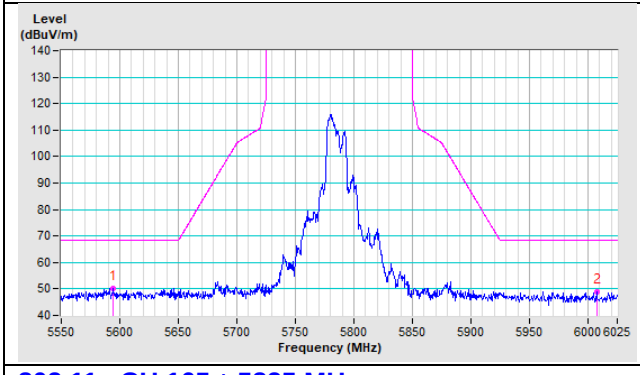


Vertical

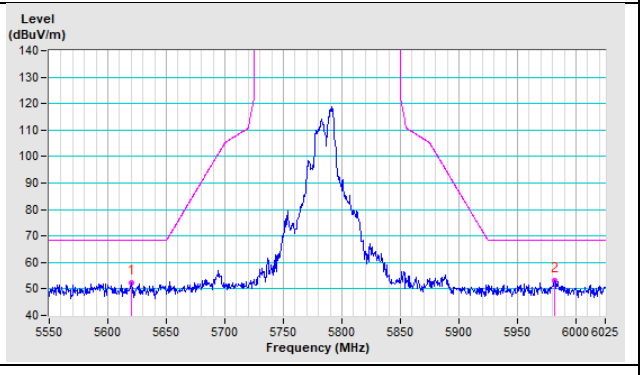


802.11a CH 157：5785 MHz

Horizontal

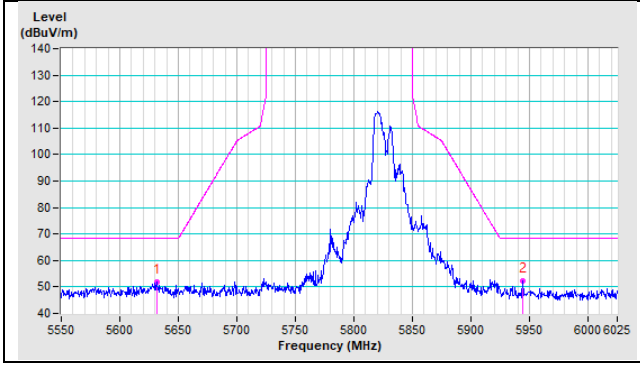


Vertical

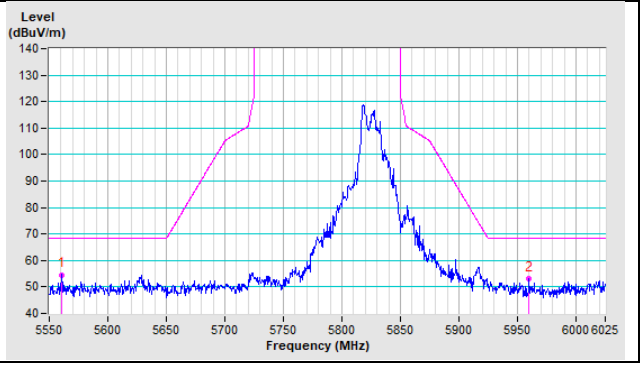


802.11a CH 165：5825 MHz

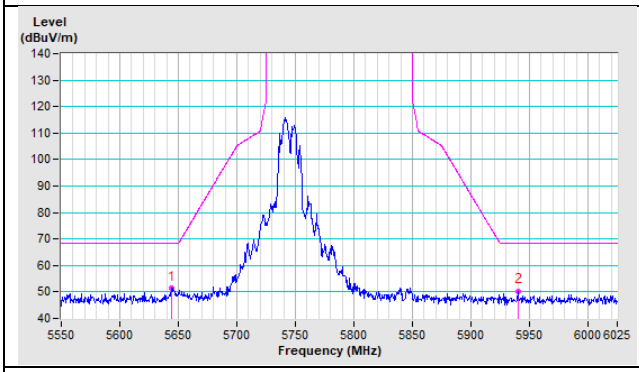
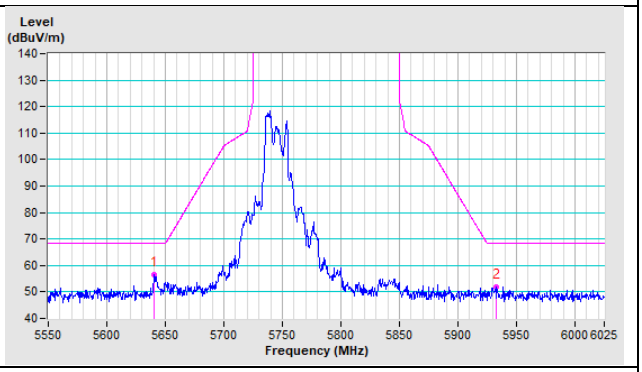
Horizontal



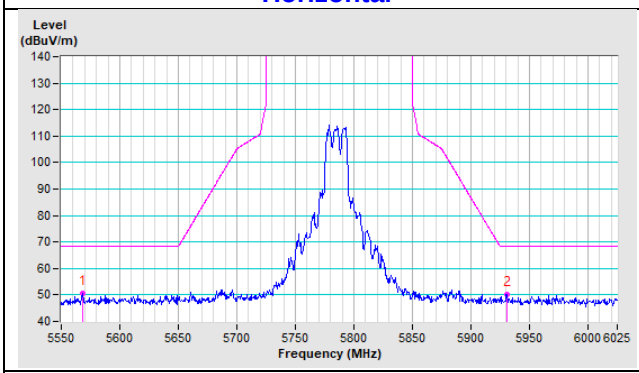
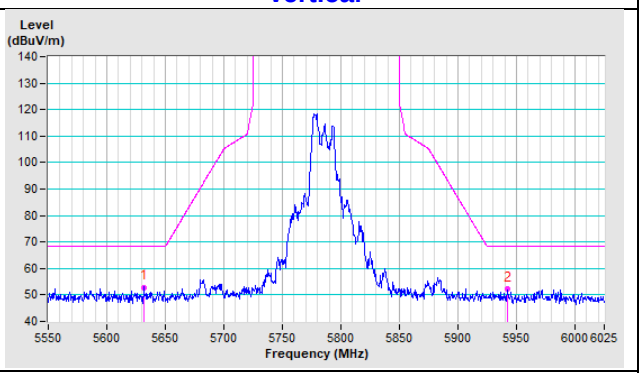
Vertical



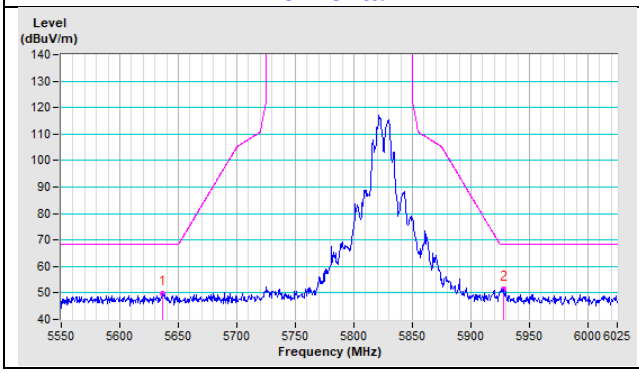
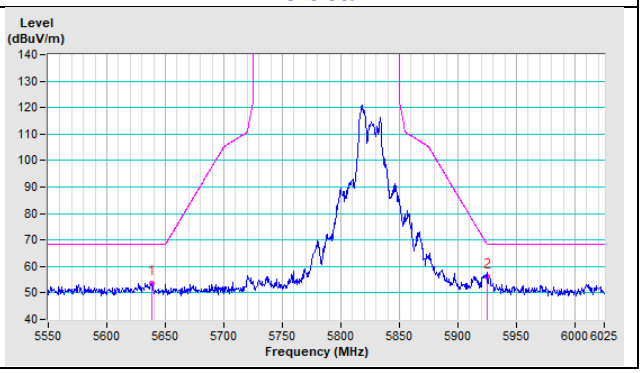
802.11ax (HE20) CH 149：5745 MHz

Horizontal	Vertical
	

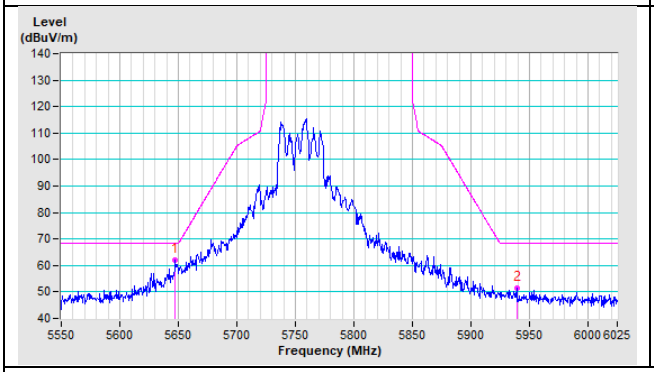
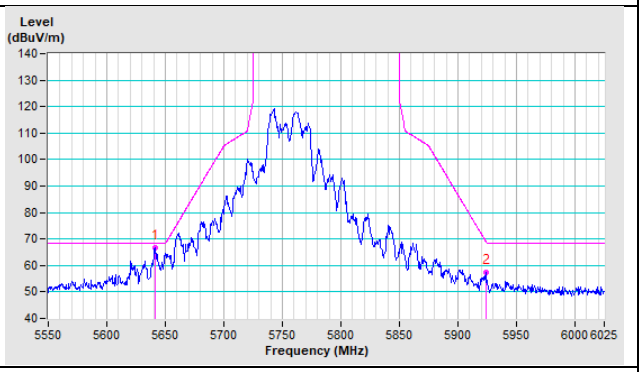
802.11ax (HE20) CH 157：5785 MHz

Horizontal	Vertical
	

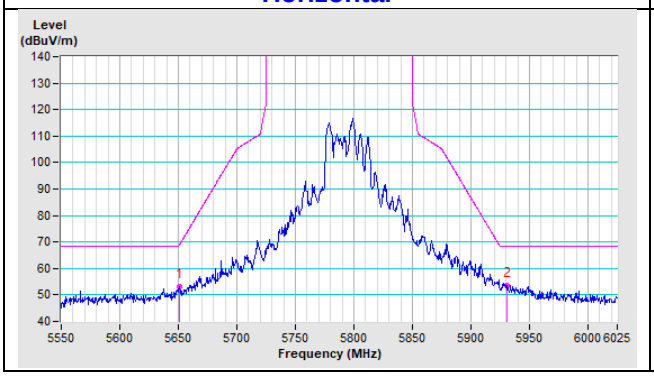
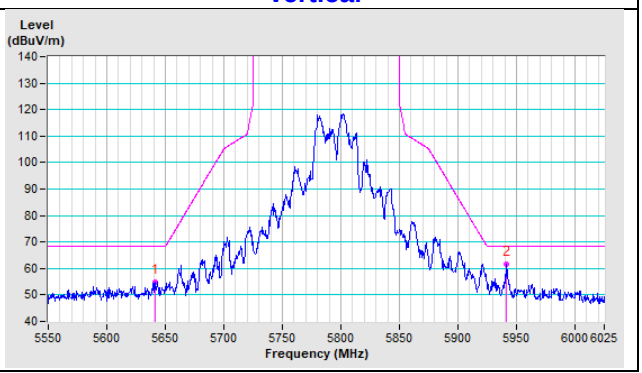
802.11ax (HE20) CH 165：5825 MHz

Horizontal	Vertical
	

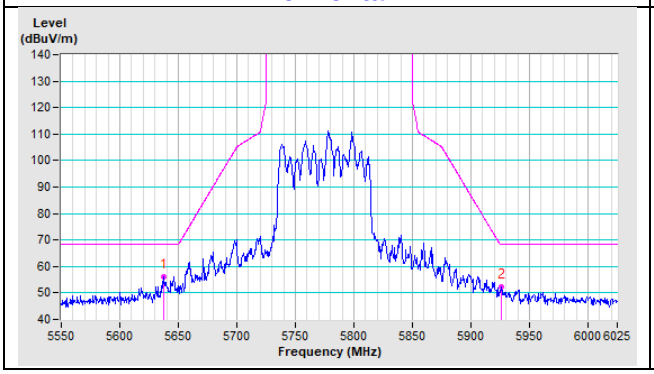
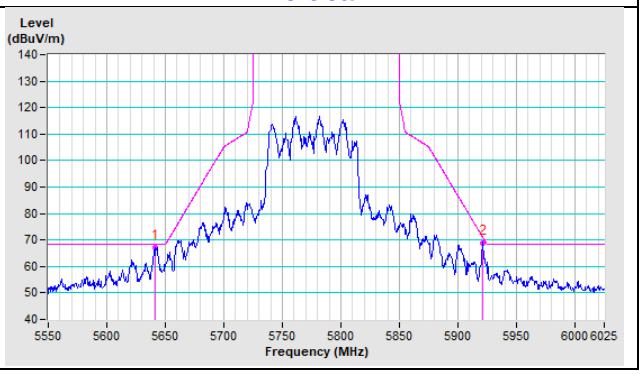
802.11ax (HE40) CH 151：5755 MHz

Horizontal	Vertical
	

802.11ax (HE40) CH 159：5795 MHz

Horizontal	Vertical
	

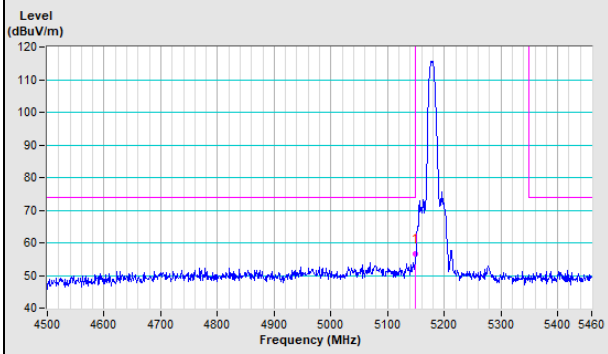
802.11ax (HE80) CH 155：5775 MHz

Horizontal	Vertical
	

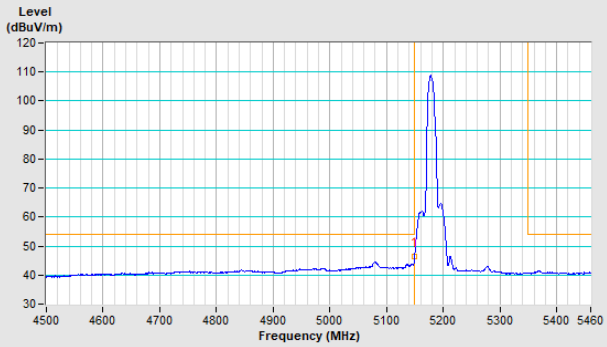
Annex B - Band-Edge Measurement (For U-NII-1 band)

802.11a Channel 36

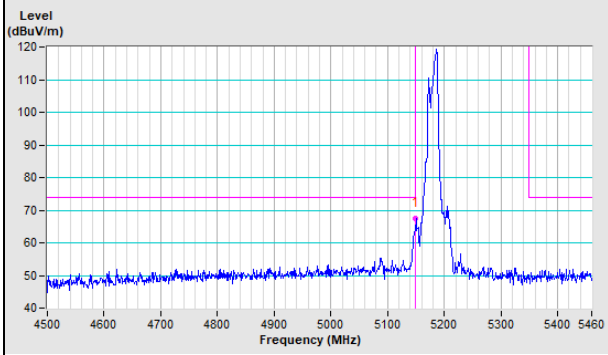
Horizontal (Peak)



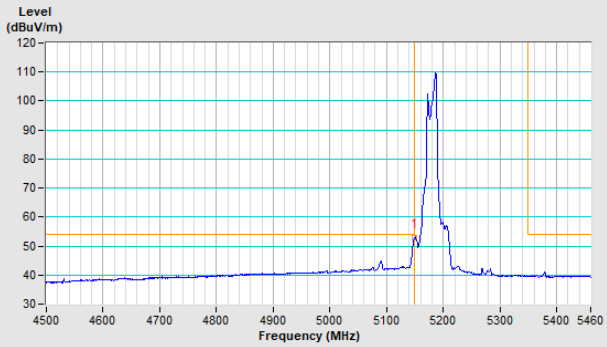
Horizontal (Average)



Vertical (Peak)

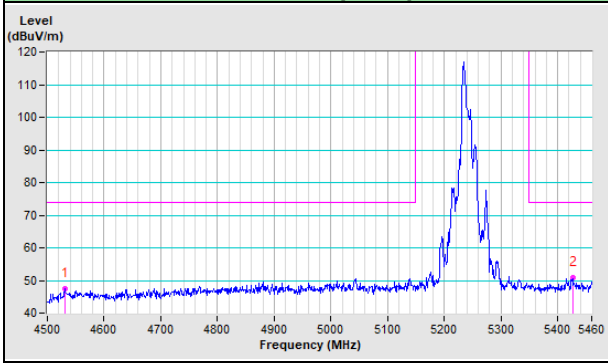


Vertical (Average)

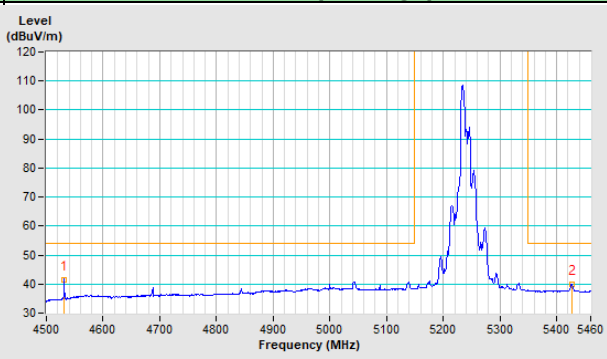


802.11a Channel 48

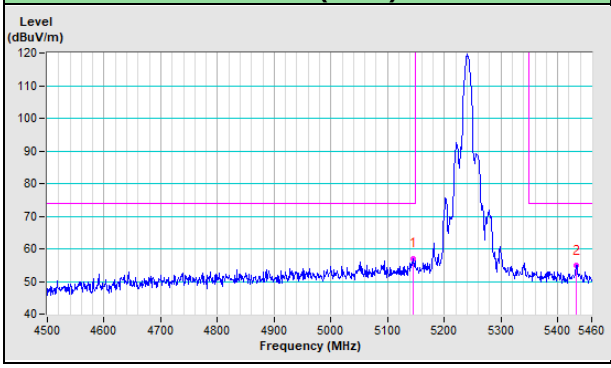
Horizontal (Peak)



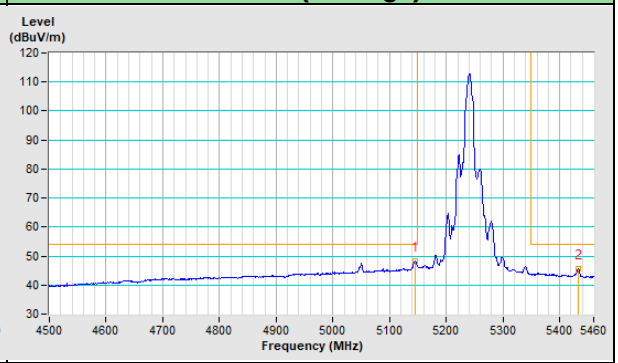
Horizontal (Average)



Vertical (Peak)

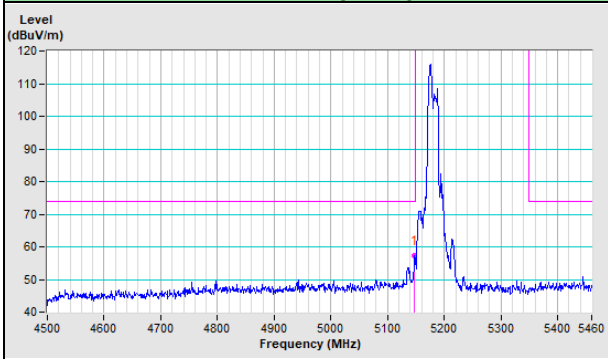


Vertical (Average)

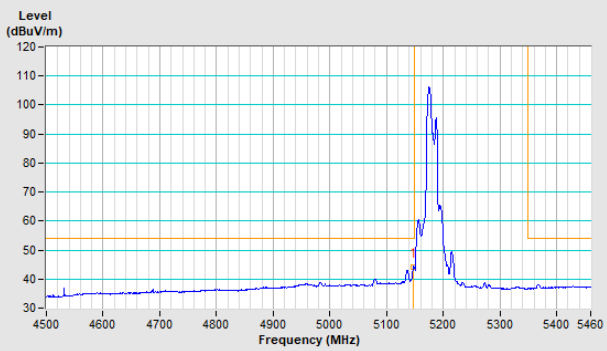


802.11ax (HE20) Channel 36

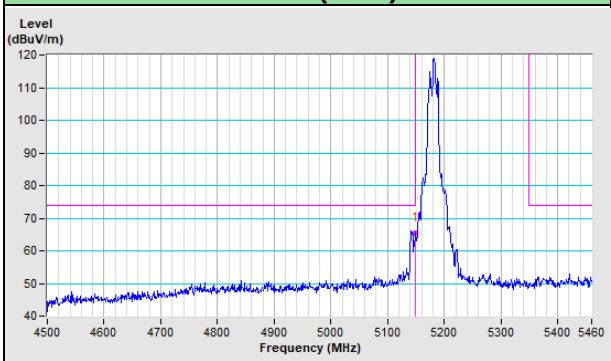
Horizontal (Peak)



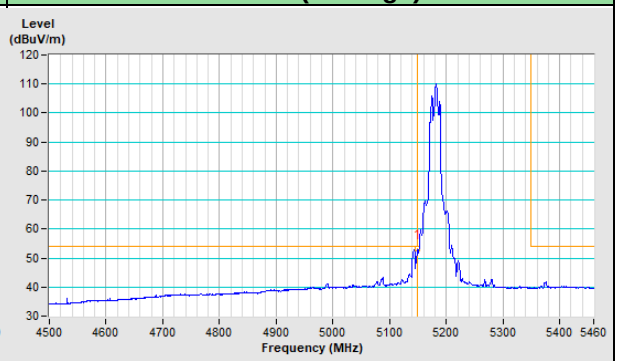
Horizontal (Average)



Vertical (Peak)

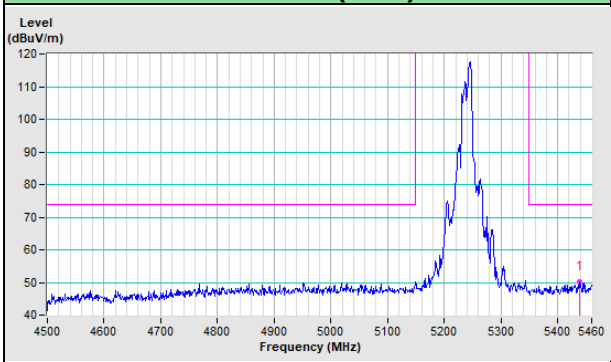


Vertical (Average)

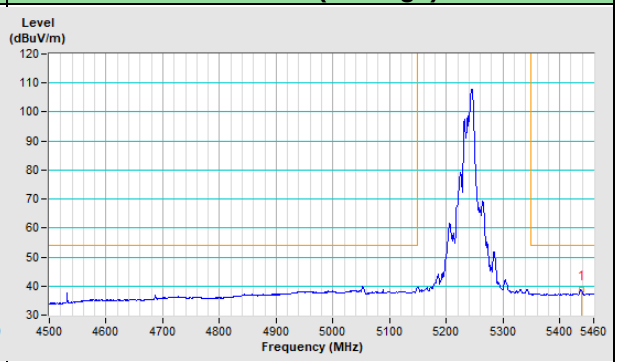


802.11ax (HE20) Channel 48

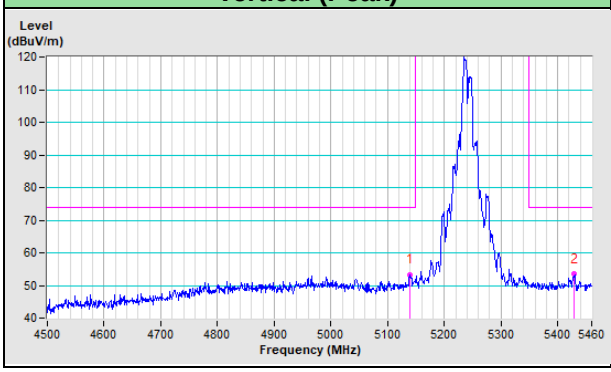
Horizontal (Peak)



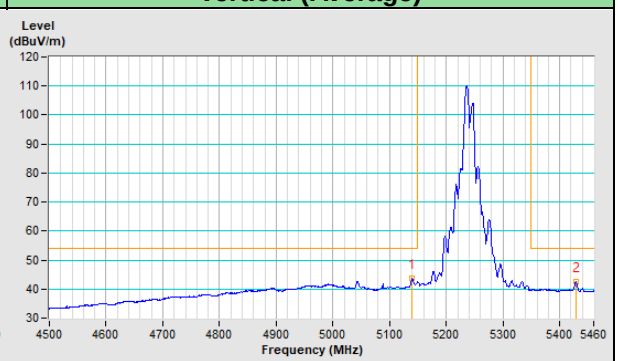
Horizontal (Average)



Vertical (Peak)

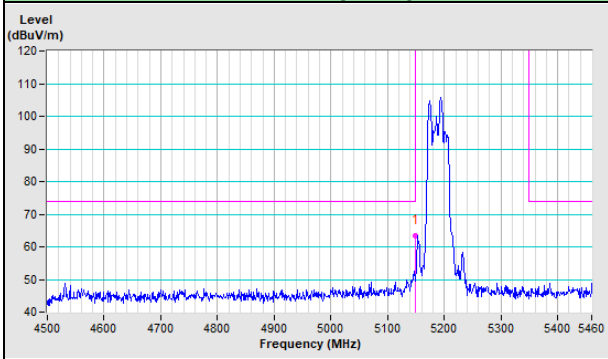


Vertical (Average)

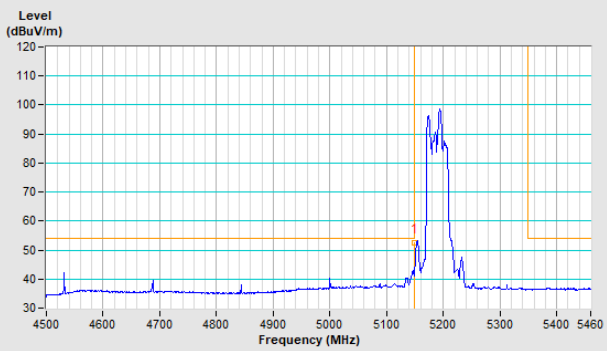


802.11ax (HE40) Channel 38

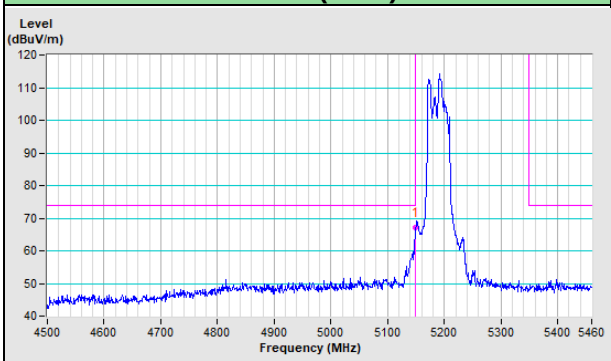
Horizontal (Peak)



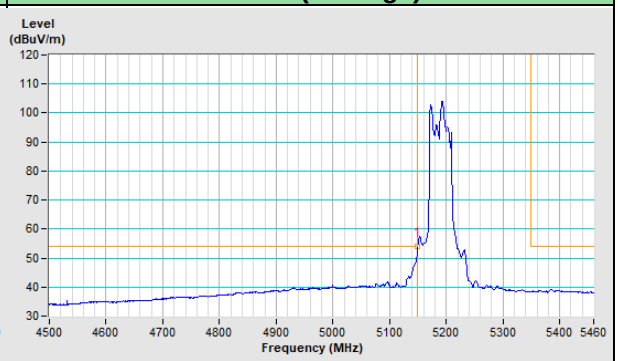
Horizontal (Average)



Vertical (Peak)

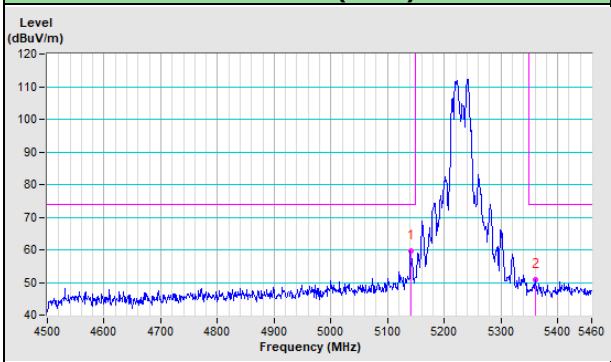


Vertical (Average)

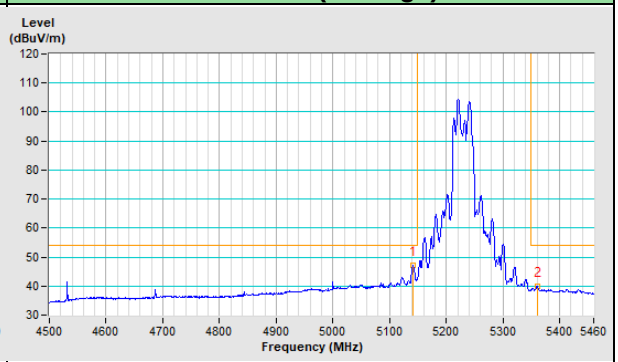


802.11ax (HE40) Channel 46

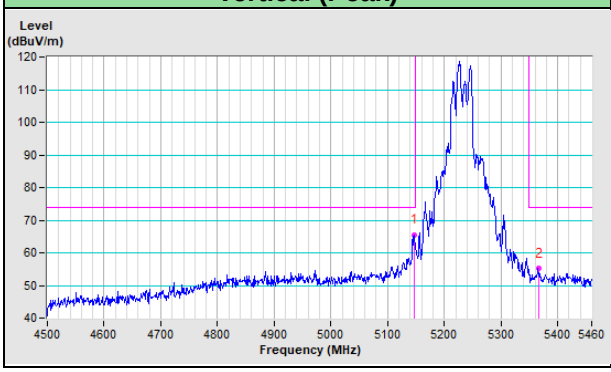
Horizontal (Peak)



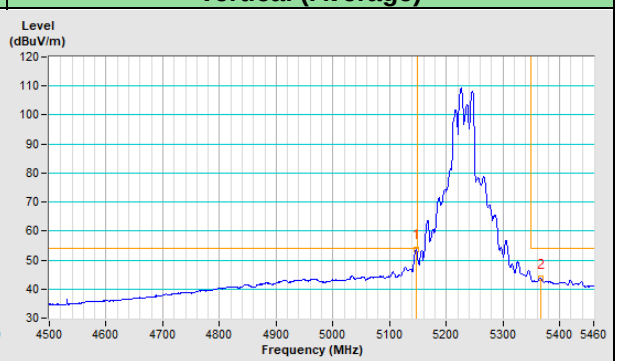
Horizontal (Average)

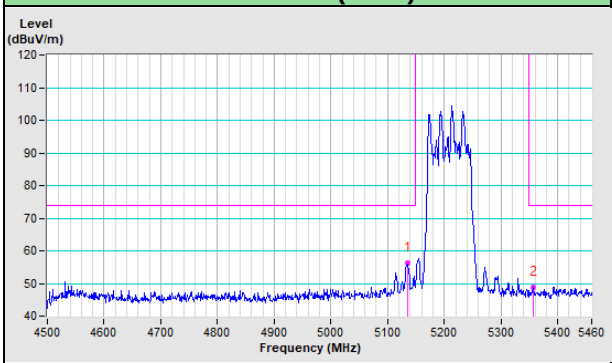
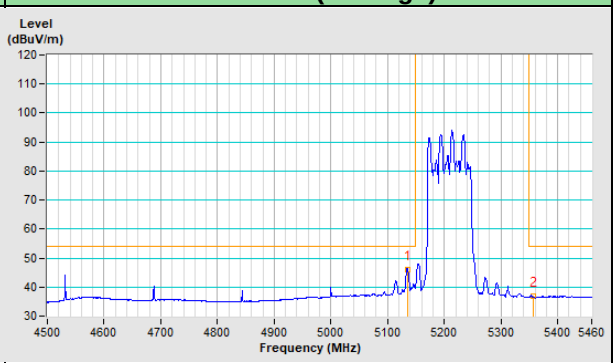
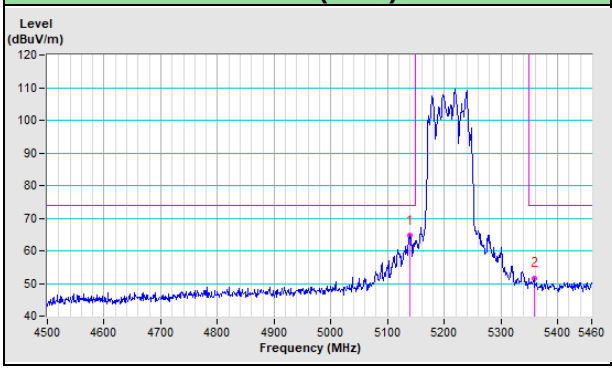
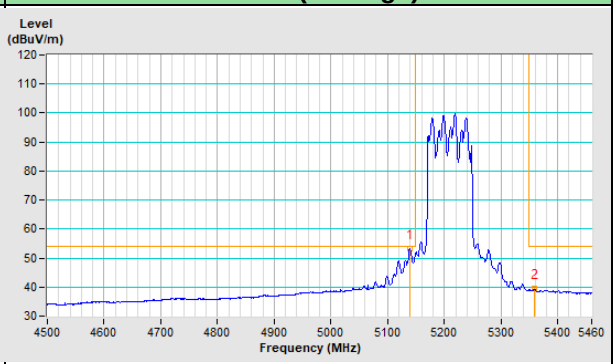


Vertical (Peak)



Vertical (Average)



802.11ax (HE80) Channel 42	
Horizontal (Peak)	Horizontal (Average)
	
Vertical (Peak)	Vertical (Average)
	

Appendix – Information of the Testing Laboratories

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

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

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

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

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