FCC Test Report

Report No.:	RF200514E05-1
FCC ID:	K7S-03535
Test Model:	E7350
Received Date:	May 12, 2020
Test Date:	May 12 to June 08, 2020
Issued Date:	June 18, 2020
Applicant:	Belkin International, Inc.
Address:	12045 East Waterfront Dr. Playa Vista California United States 90094
Issued By:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch Hsin Chu Laboratory
Lab Address:	E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300, Taiwa.
Test Location:	E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300, Taiwan.
FCC Registration / Designation Number:	723255 / TW2022

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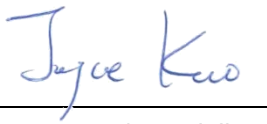
Release Control Record

Issue No.	Description	Date Issued
RF200514E05-1	Original release.	June 18, 2020

1 Certificate of Conformity

Product:	AX1800 Dual-Band WiFi 6 Router
Brand:	Linksys
Test Model:	E7350
Sample Status:	ENGINEERING SAMPLE
Applicant:	Belkin International, Inc.
Test Date:	May 12 to June 08, 2020
Standard:	47 CFR FCC Part 15, Subpart E (Section 15.407) ANSI C63.10: 2013

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

Prepared by :  , **Date:** June 18, 2020

Joyce Kuo / Specialist

Approved by :  , **Date:** June 18, 2020

Clark Lin / Technical Manager

2 Summary of Test Results

47 CFR FCC Part 15, Subpart E (Section 15.407)			
FCC Clause	Test Item	Result	Remarks
15.407(b)(6)	AC Power Conducted Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -8.23dB at 16.22656MHz.
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 -1.1dB at 5150.00MHz.
15.407(a)(1/2/3)	Max Average Transmit Power	Pass	Meet the requirement of limit.
---	Occupied Bandwidth Measurement	-	Reference only.
15.407(a)(1/2/3)	Peak Power Spectral Density	Pass	Meet the requirement of limit.
15.407(e)	6dB bandwidth	Pass	Meet the requirement of limit. (U-NII-3 Band only)
15.407(g)	Frequency Stability	Pass	Meet the requirement of limit.
15.203	Antenna Requirement	Pass	Antenna connector is i-pex(MHF) not a standard connector.

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

2.1 Measurement Uncertainty

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

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

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	AX1800 Dual-Band WiFi 6 Router
Brand	Linksys
Test Model	E7350
Status of EUT	ENGINEERING SAMPLE
Driver version (FVIN)	7.1.0.2
Test Software Version	MT7915 QA 0.0.2.15
Power Supply Rating	12Vdc 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 300 Mbps 802.11ac: up to 866.7 Mbps 802.11ax: up to 1201.0 Mbps
Operating Frequency	**2.4GHz:** 2.412GHz ~ 2.462GHz **5GHz:** 5.18 ~ 5.24GHz, 5.745 ~ 5.825GHz
Number of Channel	**2.4GHz:** 802.11b, 802.11g, 802.11n (HT20), VHT20, 80211ax (HE20): 11 802.11n (HT40), VHT40, 80211ax (HE40): 7 **5GHz:** 802.11a, 802.11n (HT20), 802.11ac (VHT20), 80211ax (HE20): 9 802.11n (HT40), 802.11ac (VHT40), 80211ax (HE40): 4 802.11ac (VHT80), 80211ax (HE80): 2
Output Power	**CDD Mode:** **2.412 ~ 2.462 GHz:** 583.096 mW **5.18 ~ 5.24 GHz:** 880.096 mW **5.745 ~ 5.825 GHz:** 882.45 mW **Beamforming Mode:** **2.412 ~ 2.462 GHz:** 366.17 mW **5.18 ~ 5.24 GHz:** 743.141 mW **5.745 ~ 5.825 GHz:** 979.63 mW
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	Adapter x 1
Data Cable Supplied	RJ-45 Cable x 1 (Unshielded, 1 m)

Note:

1. There are WLAN and Bluetooth technology used for the EUT. The EUT has two radios as following table:

Radio 1	Radio 2
WLAN 2.4GHz + 5GHz	Bluetooth

2. Simultaneously transmission condition.

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

3. The EUT must be supplied power adapter and following different models could be chosen as following table:

No.	Brand	Model No.	Spec.	Plug
1	APD	WB-24J12FU	AC Input: 100-240Vac, 0.7A Max, 50-60Hz DC Output: 12V, 2A DC Output Cable: 1.5m, Unshielded	FCC/IC
2	Ktec	KSA-24W-120200HU	AC Input: 100-240Vac, 0.6A, 50/60Hz DC Output: 12V, 2A DC Output Cable: 1.5m, Unshielded	FCC/IC
3	APD	WB-24J12R	AC Input: 100-240Vac, 0.7A Max, 50-60Hz DC Output: 12V, 2A DC Output Cable: 1.5m, Unshielded	interchangeable plug
4	Ktec	KSA-24W-120200D5	AC Input: 100-240Vac, 0.6A, 50/60Hz DC Output: 12V, 2A DC Output Cable: 1.5m, Unshielded	interchangeable plug

Note:
1. The adapter 1 is as same as adapter 3; except for plug shape is different.
2. The adapter 2 is as same as adapter 4; except for plug shape is different.
3. From the above adapters, the worst conducted emission was found in **Adapter 1** and radiated emission test was found in **Adapter 2.** Therefore only the test data of the modes were recorded in this report.

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

Antenna NO.	Model	Antenna Net Gain(dBi)	Frequency range	Antenna Type	Connector Type	Cable Length (mm)
DB1	Galtronics	3.4	2.4~2.4835GHz	PCB	i-pex(MHF)	58
		3.99	5.15~5.25GHz			
		4.17	5.25~5.35GHz			
		4.74	5.47~5.725GHz			
		5.24	5.725~5.85GHz			
DB2	Galtronics	3.45	2.4~2.4835GHz	PCB	i-pex(MHF)	68
		3.52	5.15~5.25GHz			
		3.00	5.25~5.35GHz			
		3.08	5.47~5.725GHz			
		3.11	5.725~5.85GHz			
DFS AnT (RX only)	Galtronics	2.14	5.15~5.25GHz	metal	none	N/A
		2.86	5.25~5.35GHz			
		3.17	5.47~5.725GHz			
		3.38	5.725~5.85GHz			
BT Ant	Galtronics	4.28	2.4~2.4835GHz	metal	none	N/A

5. The EUT incorporates a MIMO function:

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

Note:
1. All of modulation mode support beamforming function except 802.11a/b/g modulation mode.
2. The EUT support Beamforming and CDD mode, therefore both mode were investigated and the worst case scenario was identified. The worst case data were presented in test report.
3. The modulation and bandwidth are similar for 802.11n mode for 20MHz (40MHz), 802.11ac mode for 20MHz (40MHz, 80MHz) and 802.11ax mode for 20MHz (40MHz, 80MHz), therefore the manufacturer will control the power for 802.11n/ac mode is the same as the 802.11ax or more lower than it and investigated worst case to representative mode in test report. (Final test mode refer to section 3.2.1)

6. The power setting are list as below:

802.11a		802.11ac (VHT20)		802.11ac (VHT40)		802.11ac (VHT80)		802.11ax (HE20)		802.11ax (HE40)		802.11ax (HE80)	
Freq. (MHz)	Power Setting	Freq. (MHz)	Power Setting	Freq. (MHz)	Power Setting	Freq. (MHz)	Power Setting	Freq. (MHz)	Power Setting	Freq. (MHz)	Power Setting	Freq. (MHz)	Power Setting
5180	18.5	5180	33	5190	30	5210	25	5180	33	5190	30	5210	25
5200	24	5200	44	5230	41	5775	37	5200	44	5230	41	5775	37
5240	20.5	5240	41	5755	44			5240	41	5755	44		
5745	22	5745	44	5795	44			5745	44	5795	44		
5785	22	5785	44					5785	44				
5825	22	5825	44					5825	44				

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.

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

Radiated Emission Test (Below 1GHz):

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

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

Beamforming Mode						
Mode	**FREQ. Band (MHz)**	**Available Channel**	**Tested Channel**	**Modulation Technology**	**Modulation Type**	**Data Rate Parameter**
802.11ax (HE20)	5180-5240 5745-5825	36 to 48 149 to 165	165	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
802.11a	5745-5825	149 to 165	149, 157, 165	OFDM	BPSK	6Mb/s
Beamforming Mode						
Mode	**FREQ. Band (MHz)**	**Available Channel**	**Tested Channel**	**Modulation Technology**	**Modulation Type**	**Data Rate Parameter**
802.11ac (VHT20) (output power only)	5180-5240	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
802.11ac (VHT20) (output power only)	5745-5825	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

Test Condition:

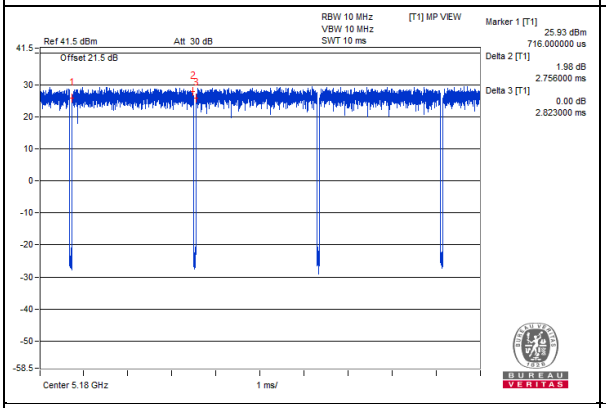
Applicable To	Environmental Conditions	Input Power	Tested By
RE≥1G	23deg. C, 73%RH	120Vac, 60Hz	Sampson Chen
RE<1G	18deg. C, 61%RH	120Vac, 60Hz	Sampson Chen
PLC	25deg. C, 75%RH	120Vac, 60Hz	Nick Lo
APCM	25deg. C, 60%RH	120Vac, 60Hz	Anderson Chen

3.3 Duty Cycle of Test Signal

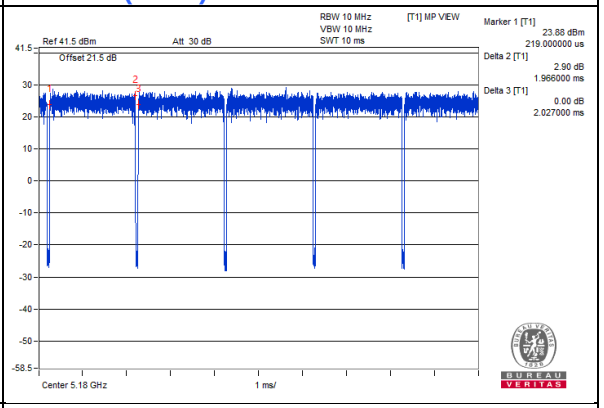
Duty cycle of test signal is < 98%, duty factor shall be considered.

802.11a: Duty cycle = 2.756 ms/2.823 ms = 0.976, Duty factor = 10 * log (1/Duty cycle) =0.10 dB
802.11ax (HE20): Duty cycle = 1.966 ms/2.027 ms = 0.97, Duty factor = 10 * log (1/Duty cycle) = 0.13 dB
802.11ax (HE40): Duty cycle = 1.012 ms/1.072 ms = 0.944, Duty factor = 10 * log (1/Duty cycle) = 0.25 dB
802.11ax (HE80): Duty cycle = 0.514 ms/0.572 ms = 0.899, Duty factor = 10 * log (1/Duty cycle) = 0.46 dB

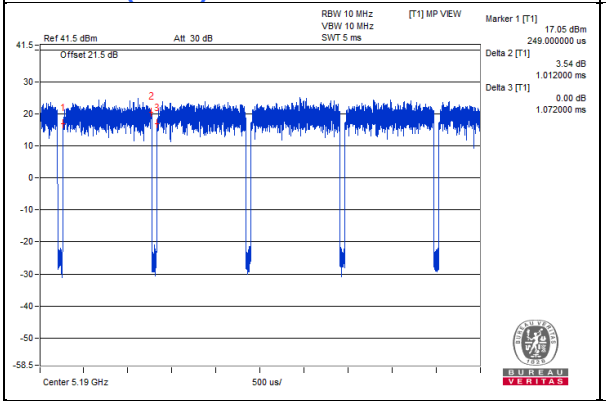
802.11a



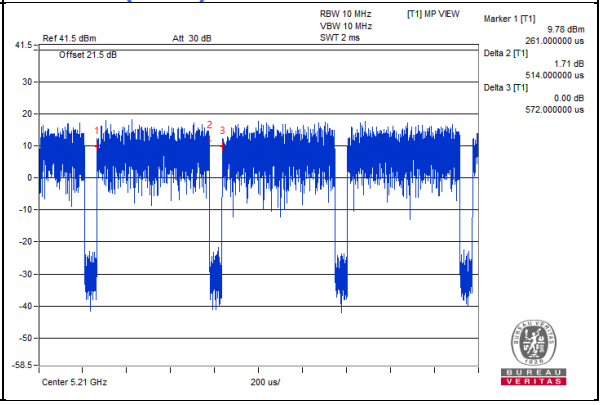
802.11ax (HE20)



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.

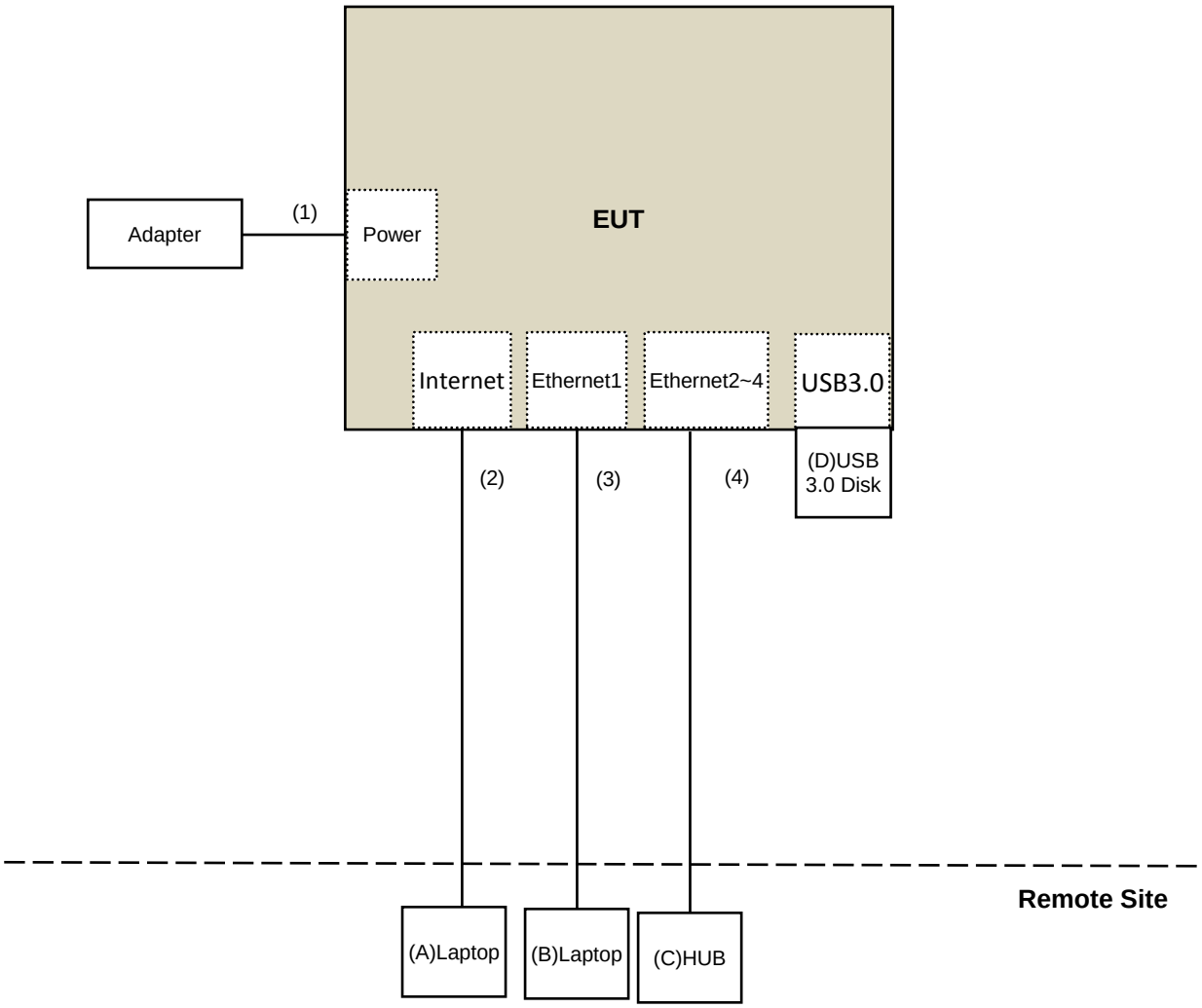
ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Laptop	Lenovo	81A4	YD02YN76	NA	Provided by Lab
B.	Laptop	DELL	E5430	HYV4VY1	FCC DoC	Provided by Lab
C.	HUB	ZyXEL	GS1100-16	S150H44000046	FCC DoC	Provided by Lab
D.	USB 3.0 Disk	SanDisk	Ultra Flalr USB 3.0	NA	NA	Provided by Lab

Note:

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

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

3.4.1 Configuration of System under Test



3.5 General Description of Applied Standard and references

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

Test Standard:

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

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

References Test Guidance:

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

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

4 Test Types and Results

4.1 Radiated Emission and Bandedge Measurement

4.1.1 Limits of Radiated Emission and Bandedge Measurement

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

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

NOTE:

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

Limits of unwanted emission out of the restricted bands

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

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

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

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

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

Note:

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

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

4.1.2 Test Instruments

For Radiated Emission (Below 1GHz) test:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver Agilent	N9038A	MY51210202	Dec. 13, 2019	Dec. 12, 2020
Pre-Amplifier EMCI	EMC001340	980142	May 25, 2020	May 24, 2021
Loop Antenna Electro-Metrics	EM-6879	264	Feb. 18, 2020	Feb. 17, 2021
RF Cable	NA	LOOPCAB-001	Jan. 08, 2020	Jan. 07, 2021
RF Cable	NA	LOOPCAB-002	Jan. 08, 2020	Jan. 07, 2021
Pre-Amplifier Mini-Circuits	ZFL-1000VH2B	AMP-ZFL-01	Oct. 23, 2019	Oct. 22, 2020
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-406	Nov. 11, 2019	Nov. 10, 2020
RF Cable	8D	966-4-1	Mar. 18, 2020	Mar. 17, 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-3m-4-01	Sep. 26, 2019	Sep. 25, 2020
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: June 04, 2020

For Radiated Emission (Above 1GHz) test:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver Agilent	N9038A	MY51210202	Dec. 13, 2019	Dec. 12, 2020
Horn_Antenna SCHWARZBECK	BBHA 9120D	9120D-783	Nov. 24, 2019	Nov. 23, 2020
Pre-Amplifier EMCI	EMC12630SE	980385	Aug. 15, 2019	Aug. 14, 2020
RF Cable	EMC104-SM-SM-1200	160923	Jan. 15, 2020	Jan. 14, 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. 15, 2020	Jan. 14, 2021
Horn_Antenna SCHWARZBECK	BBHA 9170	BBHA9170519	Nov. 24, 2019	Nov. 23, 2020
RF Cable	EMC102-KM-KM-1200	160924	Jan. 15, 2020	Jan. 14, 2021
RF Cable	EMC-KM-KM-4000	200214	Mar. 11, 2020	Mar. 10, 2021
Software	ADT_Radiated_V8.7.08	NA	NA	NA
Boresight Antenna Tower & Turn Table Max-Full	MF-7802BS	MF780208530	NA	NA

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in 966 Chamber No. 4.
3. Tested Date: May 12 to June 04, 2020

For other test

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Spectrum Analyzer R&S	FSV40	100964	May 29, 2020	May 28, 2021
Power meter Anritsu	ML2495A	1529002	July 26, 2019	July 25, 2020
Power sensor Anritsu	MA2411B	1339443	July 26, 2019	July 25, 2020
Fixed Attenuator Mini-Circuits	MDCS18N-10	MDCS18N-10-01	Apr. 14, 2020	Apr. 13, 2021
AC Power Source Extech Electronics	6205	1440452	NA	NA
Temperature & Humidity Chamber Giant Force	GTH-150-40-SP-AR	MAA0812-008	Jan. 16, 2020	Jan. 15, 2021
Voltage Meter FLUKE	179	89610322	Sep. 25, 2019	Sep. 24, 2020
Software	ADT_RF Test Software V6.6.5.4	NA	NA	NA

Note:

1. The test was performed in Oven room 2.
2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
3. Tested Date: June 06 to 08, 2020

4.1.3 Test Procedure

For Radiated emission below 30MHz

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

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

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

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

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

Note:

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

For Radiated emission above 30MHz

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

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

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

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

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

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

Note:

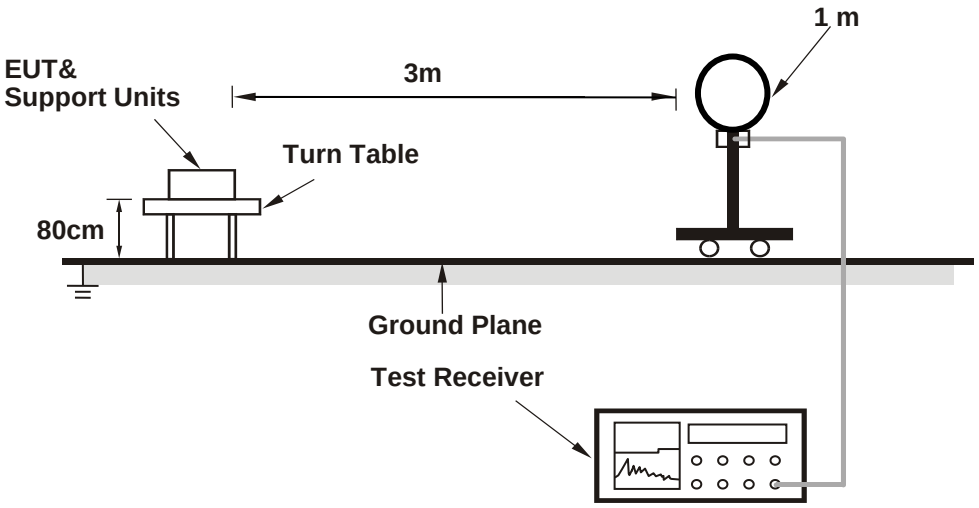
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.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

4.1.4 Deviation from Test Standard

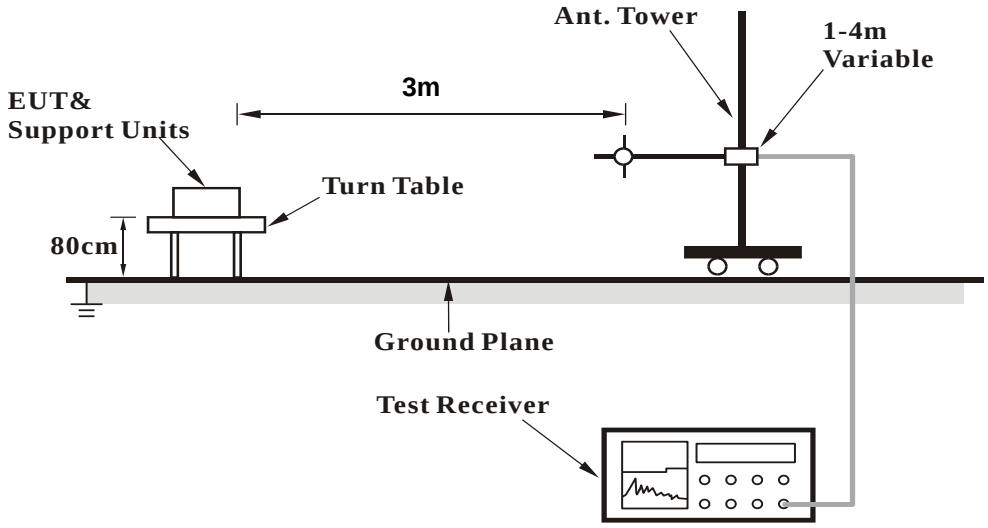
No deviation.

4.1.5 Test Setup

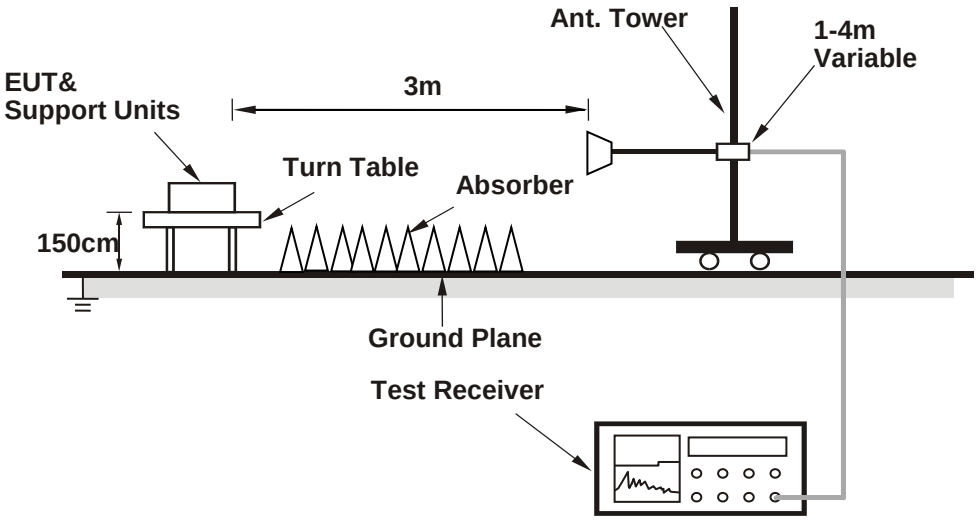
For Radiated emission below 30MHz



For Radiated emission 30MHz to 1GHz



For Radiated emission above 1GHz



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

4.1.6 EUT Operating Condition

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

4.1.7 Test Results

Above 1GHz Data:

802.11a

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

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	**Frequency (MHz)**	**Emission Level (dBuV/m)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Height (m)**	**Table Angle (Degree)**	**Raw Value (dBuV)**	**Correction Factor (dB/m)**
1	5150.00	63.8 PK	74.0	-10.2	2.34 H	265	60.8	3.0
2	5150.00	46.2 AV	54.0	-7.8	2.34 H	265	43.2	3.0
3	*5180.00	106.1 PK			2.34 H	265	103.1	3.0
4	*5180.00	102.3 AV			2.34 H	265	99.3	3.0
5	#10360.00	47.7 PK	68.2	-20.5	1.83 H	324	34.5	13.2
6	15540.00	58.0 PK	74.0	-16.0	1.50 H	122	44.4	13.6
7	15540.00	44.9 AV	54.0	-9.1	1.50 H	122	31.3	13.6
Antenna Polarity & Test Distance : Vertical at 3 m								
No	**Frequency (MHz)**	**Emission Level (dBuV/m)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Height (m)**	**Table Angle (Degree)**	**Raw Value (dBuV)**	**Correction Factor (dB/m)**
1	5150.00	71.2 PK	74.0	-2.8	1.41 V	180	68.2	3.0
2	5150.00	52.7 AV	54.0	-1.3	1.41 V	180	49.7	3.0
3	*5180.00	118.3 PK			1.41 V	180	115.3	3.0
4	*5180.00	109.0 AV			1.41 V	180	106.0	3.0
5	#10360.00	47.6 PK	68.2	-20.6	2.12 V	346	34.4	13.2
6	15540.00	55.0 PK	74.0	-19.0	1.69 V	238	41.4	13.6
7	15540.00	42.9 AV	54.0	-11.1	1.69 V	238	29.3	13.6

Remarks:

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

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

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5150.00	61.2 PK	74.0	-12.8	2.35 H	265	58.2	3.0
2	5150.00	46.5 AV	54.0	-7.5	2.35 H	265	43.5	3.0
3	*5200.00	111.5 PK			2.35 H	265	108.6	2.9
4	*5200.00	107.1 AV			2.35 H	265	104.2	2.9
5	#10400.00	47.7 PK	68.2	-20.5	1.88 H	331	34.4	13.3
6	15600.00	58.4 PK	74.0	-15.6	1.51 H	127	44.5	13.9
7	15600.00	45.2 AV	54.0	-8.8	1.51 H	127	31.3	13.9
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5150.00	68.9 PK	74.0	-5.1	1.51 V	177	65.9	3.0
2	5150.00	52.2 AV	54.0	-1.8	1.51 V	177	49.2	3.0
3	*5200.00	122.1 PK			1.51 V	177	119.2	2.9
4	*5200.00	113.0 AV			1.51 V	177	110.1	2.9
5	#10400.00	48.2 PK	68.2	-20.0	2.14 V	332	34.9	13.3
6	15600.00	55.3 PK	74.0	-18.7	1.72 V	250	41.4	13.9
7	15600.00	43.1 AV	54.0	-10.9	1.72 V	250	29.2	13.9

Remarks:

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

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

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5150.00	51.7 PK	74.0	-22.3	2.33 H	264	48.7	3.0
2	5150.00	39.9 AV	54.0	-14.1	2.33 H	264	36.9	3.0
3	*5240.00	108.2 PK			2.33 H	264	105.3	2.9
4	*5240.00	105.4 AV			2.33 H	264	102.5	2.9
5	5350.00	50.6 PK	74.0	-23.4	2.33 H	264	47.6	3.0
6	5350.00	39.0 AV	54.0	-15.0	2.33 H	264	36.0	3.0
7	#10480.00	47.3 PK	68.2	-20.9	1.88 H	336	33.8	13.5
8	15720.00	58.9 PK	74.0	-15.1	1.57 H	112	45.5	13.4
9	15720.00	45.5 AV	54.0	-8.5	1.57 H	112	32.1	13.4
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5150.00	56.5 PK	74.0	-17.5	1.60 V	177	53.5	3.0
2	5150.00	45.1 AV	54.0	-8.9	1.60 V	177	42.1	3.0
3	*5240.00	120.8 PK			1.60 V	177	117.9	2.9
4	*5240.00	111.7 AV			1.60 V	177	108.8	2.9
5	5352.10	55.5 PK	74.0	-18.5	1.60 V	177	52.5	3.0
6	5352.10	44.1 AV	54.0	-9.9	1.60 V	177	41.1	3.0
7	#10480.00	48.9 PK	68.2	-19.3	2.13 V	344	35.4	13.5
8	15720.00	54.9 PK	74.0	-19.1	1.70 V	242	41.5	13.4
9	15720.00	42.7 AV	54.0	-11.3	1.70 V	242	29.3	13.4

Remarks:

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

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

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5637.61	51.9 PK	68.2	-16.3	1.50 H	309	48.5	3.4
2	*5745.00	113.6 PK			1.50 H	309	109.8	3.8
3	*5745.00	103.5 AV			1.50 H	309	99.7	3.8
4	#5926.27	52.9 PK	68.2	-15.3	1.50 H	309	49.0	3.9
5	11490.00	47.7 PK	74.0	-26.3	1.85 H	317	33.7	14.0
6	11490.00	35.3 AV	54.0	-18.7	1.85 H	317	21.3	14.0
7	#17235.00	63.5 PK	68.2	-4.7	2.02 H	306	47.0	16.5
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5604.22	58.4 PK	68.2	-9.8	1.57 V	190	55.0	3.4
2	*5745.00	123.6 PK			1.57 V	190	119.8	3.8
3	*5745.00	114.3 AV			1.57 V	190	110.5	3.8
4	#5945.53	54.5 PK	68.2	-13.7	1.57 V	190	50.5	4.0
5	11490.00	47.8 PK	74.0	-26.2	2.10 V	329	33.8	14.0
6	11490.00	35.1 AV	54.0	-18.9	2.10 V	329	21.1	14.0
7	#17235.00	55.8 PK	68.2	-12.4	1.72 V	258	39.3	16.5

Remarks:

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

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

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5562.30	53.3 PK	68.2	-14.9	1.49 H	307	50.0	3.3
2	*5785.00	113.9 PK			1.49 H	307	110.0	3.9
3	*5785.00	113.9 AV			1.49 H	307	110.0	3.9
4	#6015.73	52.4 PK	68.2	-15.8	1.49 H	307	48.3	4.1
5	11570.00	47.2 PK	74.0	-26.8	1.74 H	319	33.6	13.6
6	11570.00	35.0 AV	54.0	-19.0	1.74 H	319	21.4	13.6
7	#17355.00	62.8 PK	68.2	-5.4	1.95 H	293	45.8	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	#5622.83	58.0 PK	68.2	-10.2	1.60 V	188	54.6	3.4
2	*5785.00	123.2 PK			1.60 V	188	119.3	3.9
3	*5785.00	113.8 AV			1.60 V	188	109.9	3.9
4	#5927.74	55.4 PK	68.2	-12.8	1.60 V	188	51.5	3.9
5	11570.00	48.1 PK	74.0	-25.9	2.10 V	318	34.5	13.6
6	11570.00	35.4 AV	54.0	-18.6	2.10 V	318	21.8	13.6
7	#17355.00	54.8 PK	68.2	-13.4	1.71 V	259	37.8	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.

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

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5593.69	52.4 PK	68.2	-15.8	1.49 H	307	49.0	3.4
2	*5825.00	113.8 PK			1.49 H	307	109.7	4.1
3	*5825.00	103.7 AV			1.49 H	307	99.6	4.1
4	#5973.50	52.7 PK	68.2	-15.5	1.49 H	307	48.6	4.1
5	11650.00	47.6 PK	74.0	-26.4	1.79 H	311	34.1	13.5
6	11650.00	35.4 AV	54.0	-18.6	1.79 H	311	21.9	13.5
7	#17475.00	62.4 PK	68.2	-5.8	1.97 H	302	43.8	18.6
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5621.94	57.7 PK	68.2	-10.5	1.59 V	185	54.3	3.4
2	*5825.00	123.8 PK			1.59 V	185	119.7	4.1
3	*5825.00	114.3 AV			1.59 V	185	110.2	4.1
4	#5948.92	57.9 PK	68.2	-10.3	1.59 V	185	53.9	4.0
5	11650.00	48.0 PK	74.0	-26.0	2.09 V	285	34.5	13.5
6	11650.00	36.1 AV	54.0	-17.9	2.09 V	285	22.6	13.5
7	#17475.00	61.9 PK	68.2	-6.3	1.52 V	288	43.3	18.6

Remarks:

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

802.11ax (HE20)

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

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5150.00	55.5 PK	74.0	-18.5	1.67 H	281	52.5	3.0
2	5150.00	40.1 AV	54.0	-13.9	1.67 H	281	37.1	3.0
3	*5180.00	111.8 PK			1.67 H	281	108.8	3.0
4	*5180.00	99.5 AV			1.67 H	281	96.5	3.0
5	#10360.00	47.4 PK	68.2	-20.8	1.94 H	327	34.2	13.2
6	15540.00	57.7 PK	74.0	-16.3	1.55 H	116	44.1	13.6
7	15540.00	44.8 AV	54.0	-9.2	1.55 H	116	31.2	13.6
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5150.00	66.4 PK	74.0	-7.6	1.51 V	186	63.4	3.0
2	**5150.00**	**52.9 AV**	**54.0**	**-1.1**	**1.51 V**	**186**	**49.9**	**3.0**
3	*5180.00	120.4 PK			1.51 V	186	117.4	3.0
4	*5180.00	108.3 AV			1.51 V	186	105.3	3.0
5	#10360.00	47.6 PK	68.2	-20.6	2.14 V	325	34.4	13.2
6	15540.00	55.2 PK	74.0	-18.8	1.70 V	255	41.6	13.6
7	15540.00	43.2 AV	54.0	-10.8	1.70 V	255	29.6	13.6

Remarks:

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

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

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5150.00	61.8 PK	74.0	-12.2	1.56 H	202	58.8	3.0
2	5150.00	45.9 AV	54.0	-8.1	1.56 H	202	42.9	3.0
3	*5200.00	120.4 PK			1.56 H	202	117.5	2.9
4	*5200.00	100.1 AV			1.56 H	202	97.2	2.9
5	#10400.00	47.4 PK	68.2	-20.8	1.82 H	328	34.1	13.3
6	15600.00	58.7 PK	74.0	-15.3	1.53 H	126	44.8	13.9
7	15600.00	45.6 AV	54.0	-8.4	1.53 H	126	31.7	13.9
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5150.00	71.7 PK	74.0	-2.3	1.47 V	194	68.7	3.0
2	5150.00	52.4 AV	54.0	-1.6	1.47 V	194	49.4	3.0
3	*5200.00	122.6 PK			1.47 V	194	119.7	2.9
4	*5200.00	111.6 AV			1.47 V	194	108.7	2.9
5	#10400.00	48.5 PK	68.2	-19.7	2.11 V	339	35.2	13.3
6	15600.00	55.3 PK	74.0	-18.7	1.73 V	242	41.4	13.9
7	15600.00	43.2 AV	54.0	-10.8	1.73 V	242	29.3	13.9

Remarks:

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

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

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5150.00	51.5 PK	74.0	-22.5	1.67 H	360	48.5	3.0
2	5150.00	39.7 AV	54.0	-14.3	1.67 H	360	36.7	3.0
3	*5240.00	111.6 PK			1.67 H	360	108.7	2.9
4	*5240.00	101.4 AV			1.67 H	360	98.5	2.9
5	5350.00	51.1 PK	74.0	-22.9	1.67 H	360	48.1	3.0
6	5350.00	39.0 AV	54.0	-15.0	1.67 H	360	36.0	3.0
7	#10480.00	47.5 PK	68.2	-20.7	1.87 H	319	34.0	13.5
8	15720.00	58.4 PK	74.0	-15.6	1.53 H	139	45.0	13.4
9	15720.00	44.9 AV	54.0	-9.1	1.53 H	139	31.5	13.4
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5150.00	56.8 PK	74.0	-17.2	1.52 V	186	53.8	3.0
2	5150.00	46.3 AV	54.0	-7.7	1.52 V	186	43.3	3.0
3	*5240.00	122.6 PK			1.52 V	186	119.7	2.9
4	*5240.00	111.1 AV			1.52 V	186	108.2	2.9
5	5360.70	55.5 PK	74.0	-18.5	1.52 V	186	52.4	3.1
6	5360.70	44.5 AV	54.0	-9.5	1.52 V	186	41.4	3.1
7	#10480.00	48.1 PK	68.2	-20.1	2.10 V	318	34.6	13.5
8	15720.00	54.7 PK	74.0	-19.3	1.69 V	258	41.3	13.4
9	15720.00	42.7 AV	54.0	-11.3	1.69 V	258	29.3	13.4

Remarks:

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

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

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5591.02	50.5 PK	68.2	-17.7	1.50 H	282	47.1	3.4
2	*5745.00	110.4 PK			1.50 H	282	106.6	3.8
3	*5745.00	100.2 AV			1.50 H	282	96.4	3.8
4	#5985.12	51.4 PK	68.2	-16.8	1.50 H	282	47.3	4.1
5	11490.00	47.4 PK	74.0	-26.6	1.83 H	311	33.4	14.0
6	11490.00	35.1 AV	54.0	-18.9	1.83 H	311	21.1	14.0
7	#17235.00	64.5 PK	68.2	-3.7	1.94 H	288	48.0	16.5
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5640.81	58.3 PK	68.2	-9.9	1.35 V	191	54.9	3.4
2	*5745.00	124.1 PK			1.35 V	191	120.3	3.8
3	*5745.00	112.4 AV			1.35 V	191	108.6	3.8
4	#5937.08	54.5 PK	68.2	-13.7	1.35 V	191	50.5	4.0
5	11490.00	48.7 PK	74.0	-25.3	2.16 V	341	34.7	14.0
6	11490.00	35.9 AV	54.0	-18.1	2.16 V	341	21.9	14.0
7	#17235.00	54.8 PK	68.2	-13.4	1.69 V	254	38.3	16.5

Remarks:

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

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

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5643.87	51.0 PK	68.2	-17.2	1.48 H	280	47.5	3.5
2	*5785.00	111.2 PK			1.48 H	280	107.3	3.9
3	*5785.00	100.1 AV			1.48 H	280	96.2	3.9
4	#5945.52	52.2 PK	68.2	-16.0	1.48 H	280	48.2	4.0
5	11570.00	48.2 PK	74.0	-25.8	1.75 H	319	34.6	13.6
6	11570.00	35.8 AV	54.0	-18.2	1.75 H	319	22.2	13.6
7	#17355.00	64.8 PK	68.2	-3.4	2.00 H	304	47.8	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	#5629.53	56.2 PK	68.2	-12.0	1.69 V	193	52.8	3.4
2	*5785.00	123.2 PK			1.69 V	193	119.3	3.9
3	*5785.00	111.7 AV			1.69 V	193	107.8	3.9
4	#5934.26	56.3 PK	68.2	-11.9	1.69 V	193	52.3	4.0
5	11570.00	48.3 PK	74.0	-25.7	2.16 V	324	34.7	13.6
6	11570.00	35.4 AV	54.0	-18.6	2.16 V	324	21.8	13.6
7	#17355.00	55.5 PK	68.2	-12.7	1.75 V	251	38.5	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.

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

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5646.15	51.3 PK	68.2	-16.9	1.47 H	283	47.8	3.5
2	*5825.00	109.5 PK			1.47 H	283	105.4	4.1
3	*5825.00	99.5 AV			1.47 H	283	95.4	4.1
4	#5956.74	51.9 PK	68.2	-16.3	1.47 H	283	47.8	4.1
5	11650.00	47.0 PK	74.0	-27.0	1.84 H	309	33.5	13.5
6	11650.00	35.0 AV	54.0	-19.0	1.84 H	309	21.5	13.5
7	#17475.00	63.1 PK	68.2	-5.1	2.01 H	301	44.5	18.6
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5627.21	57.4 PK	68.2	-10.8	1.51 V	193	54.0	3.4
2	*5825.00	124.5 PK			1.51 V	193	120.4	4.1
3	*5825.00	112.2 AV			1.51 V	193	108.1	4.1
4	#5939.71	55.4 PK	68.2	-12.8	1.51 V	193	51.4	4.0
5	11650.00	48.2 PK	74.0	-25.8	2.09 V	330	34.7	13.5
6	11650.00	35.7 AV	54.0	-18.3	2.09 V	330	22.2	13.5
7	#17475.00	54.6 PK	68.2	-13.6	1.72 V	263	36.0	18.6

Remarks:

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

802.11ax (HE40)

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

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5150.00	58.1 PK	74.0	-15.9	1.50 H	279	55.1	3.0
2	5150.00	45.5 AV	54.0	-8.5	1.50 H	279	42.5	3.0
3	*5190.00	106.0 PK			1.50 H	279	103.0	3.0
4	*5190.00	98.6 AV			1.50 H	279	95.6	3.0
5	#10380.00	47.2 PK	68.2	-21.0	1.82 H	322	34.0	13.2
6	15570.00	58.4 PK	74.0	-15.6	1.46 H	132	44.6	13.8
7	15570.00	45.0 AV	54.0	-9.0	1.46 H	132	31.2	13.8
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5150.00	66.5 PK	74.0	-7.5	1.16 V	194	63.5	3.0
2	5150.00	52.8 AV	54.0	-1.2	1.16 V	194	49.8	3.0
3	*5190.00	113.3 PK			1.16 V	194	110.3	3.0
4	*5190.00	102.9 AV			1.16 V	194	99.9	3.0
5	#10380.00	48.2 PK	68.2	-20.0	2.17 V	329	35.0	13.2
6	15570.00	55.6 PK	74.0	-18.4	1.77 V	234	41.8	13.8
7	15570.00	43.4 AV	54.0	-10.6	1.77 V	234	29.6	13.8

Remarks:

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

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

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5150.00	55.4 PK	74.0	-18.6	1.49 H	279	52.4	3.0
2	5150.00	41.8 AV	54.0	-12.2	1.49 H	279	38.8	3.0
3	*5230.00	109.0 PK			1.49 H	279	106.1	2.9
4	*5230.00	99.7 AV			1.49 H	279	96.8	2.9
5	#10460.00	47.9 PK	68.2	-20.3	1.86 H	323	34.4	13.5
6	15690.00	57.7 PK	74.0	-16.3	1.50 H	131	44.2	13.5
7	15690.00	44.7 AV	54.0	-9.3	1.50 H	131	31.2	13.5
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5150.00	64.9 PK	74.0	-9.1	1.47 V	174	61.9	3.0
2	5150.00	52.6 AV	54.0	-1.4	1.47 V	174	49.6	3.0
3	*5230.00	119.3 PK			1.47 V	174	116.4	2.9
4	*5230.00	108.2 AV			1.47 V	174	105.3	2.9
5	#10460.00	48.4 PK	68.2	-19.8	2.15 V	344	34.9	13.5
6	15690.00	55.2 PK	74.0	-18.8	1.75 V	245	41.7	13.5
7	15690.00	42.8 AV	54.0	-11.2	1.75 V	245	29.3	13.5

Remarks:

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

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

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5650.00	56.3 PK	68.2	-11.9	1.47 H	281	52.8	3.5
2	*5755.00	110.4 PK			1.47 H	281	106.6	3.8
3	*5755.00	99.4 AV			1.47 H	281	95.6	3.8
4	#5945.86	52.2 PK	68.2	-16.0	1.47 H	281	48.2	4.0
5	11510.00	47.6 PK	74.0	-26.4	1.81 H	318	33.8	13.8
6	11510.00	35.7 AV	54.0	-18.3	1.81 H	318	21.9	13.8
7	#17265.00	64.6 PK	68.2	-3.6	1.95 H	301	48.0	16.6
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5647.30	65.2 PK	68.2	-3.0	1.37 V	3	61.7	3.5
2	*5755.00	120.5 PK			1.37 V	2	116.7	3.8
3	*5755.00	108.8 AV			1.37 V	2	105.0	3.8
4	#5927.45	58.1 PK	68.2	-10.1	1.37 V	3	54.2	3.9
5	11510.00	48.5 PK	74.0	-25.5	2.10 V	336	34.7	13.8
6	11510.00	36.0 AV	54.0	-18.0	2.10 V	336	22.2	13.8
7	#17265.00	55.6 PK	68.2	-12.6	1.75 V	255	39.0	16.6

Remarks:

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

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

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5642.58	52.3 PK	68.2	-15.9	1.50 H	278	48.8	3.5
2	*5795.00	110.3 PK			1.50 H	278	106.4	3.9
3	*5795.00	99.6 AV			1.50 H	278	95.7	3.9
4	#5924.38	53.4 PK	68.7	-15.3	1.50 H	278	49.5	3.9
5	11590.00	47.5 PK	74.0	-26.5	1.82 H	301	33.9	13.6
6	11590.00	35.3 AV	54.0	-18.7	1.82 H	301	21.7	13.6
7	#17385.00	65.0 PK	68.2	-3.2	2.02 H	309	47.6	17.4
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	#5616.29	58.4 PK	68.2	-9.8	1.51 V	2	55.0	3.4
2	*5795.00	120.7 PK			1.51 V	2	116.8	3.9
3	*5795.00	109.5 AV			1.51 V	2	105.6	3.9
4	#5947.73	60.5 PK	68.2	-7.7	1.51 V	2	56.5	4.0
5	11590.00	47.9 PK	74.0	-26.1	2.15 V	327	34.3	13.6
6	11590.00	35.4 AV	54.0	-18.6	2.15 V	327	21.8	13.6
7	#17385.00	55.3 PK	68.2	-12.9	1.72 V	256	37.9	17.4

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.

802.11ax (HE80)

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

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5150.00	54.1 PK	74.0	-19.9	1.79 H	132	51.1	3.0
2	5150.00	44.8 AV	54.0	-9.2	1.79 H	132	41.8	3.0
3	*5210.00	99.2 PK			1.79 H	132	96.2	3.0
4	*5210.00	88.6 AV			1.79 H	132	85.6	3.0
5	5350.00	50.0 PK	74.0	-24.0	1.79 H	132	47.0	3.0
6	5350.00	38.9 AV	54.0	-15.1	1.79 H	132	35.9	3.0
7	#10420.00	47.7 PK	68.2	-20.5	1.93 H	342	34.4	13.3
8	15630.00	58.5 PK	74.0	-15.5	1.50 H	140	44.8	13.7
9	15630.00	45.4 AV	54.0	-8.6	1.50 H	140	31.7	13.7
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5150.00	60.9 PK	74.0	-13.1	1.77 V	186	57.9	3.0
2	5150.00	52.8 AV	54.0	-1.2	1.77 V	186	49.8	3.0
3	*5210.00	108.3 PK			1.77 V	186	105.3	3.0
4	*5210.00	98.4 AV			1.77 V	186	95.4	3.0
5	5350.00	51.1 PK	74.0	-22.9	1.77 V	186	48.1	3.0
6	5350.00	40.6 AV	54.0	-13.4	1.77 V	186	37.6	3.0
7	#10420.00	48.4 PK	68.2	-19.8	2.16 V	321	35.1	13.3
8	15630.00	55.0 PK	74.0	-19.0	1.76 V	263	41.3	13.7
9	15630.00	42.7 AV	54.0	-11.3	1.76 V	263	29.0	13.7

Remarks:

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

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

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5647.15	55.0 PK	68.2	-13.2	1.51 H	301	51.5	3.5
2	*5775.00	101.8 PK			1.51 H	301	97.9	3.9
3	*5775.00	91.4 AV			1.51 H	301	87.5	3.9
4	#5930.95	53.0 PK	68.2	-15.2	1.51 H	301	49.0	4.0
5	11550.00	47.0 PK	74.0	-27.0	1.82 H	292	33.3	13.7
6	11550.00	35.1 AV	54.0	-18.9	1.82 H	292	21.4	13.7
7	#17325.00	64.9 PK	68.2	-3.3	2.06 H	295	48.1	16.8
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5649.00	66.0 PK	68.2	-2.2	1.42 V	188	62.5	3.5
2	*5775.00	114.4 PK			1.42 V	188	110.5	3.9
3	*5775.00	101.8 AV			1.42 V	188	97.9	3.9
4	#5944.65	61.9 PK	68.2	-6.3	1.42 V	188	57.9	4.0
5	11550.00	48.6 PK	74.0	-25.4	2.15 V	346	34.9	13.7
6	11550.00	35.8 AV	54.0	-18.2	2.15 V	346	22.1	13.7
7	#17325.00	55.5 PK	68.2	-12.7	1.69 V	235	38.7	16.8

Remarks:

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

Below 1GHz Data:

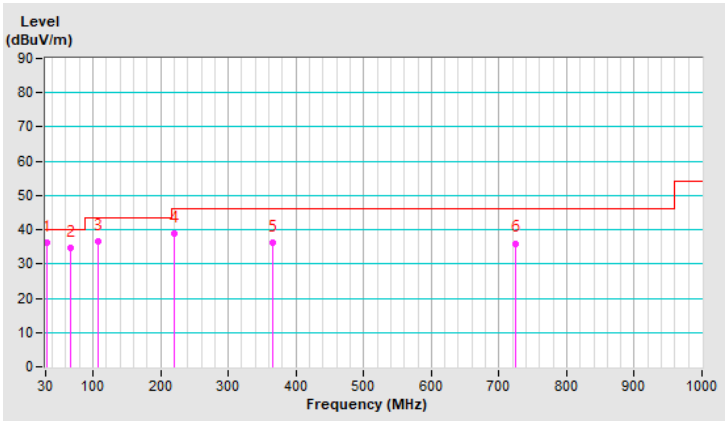
802.11ax (HE20)

CHANNEL	TX Channel 165	**DETECTOR FUNCTION**	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	**Frequency (MHz)**	**Emission Level (dBuV/m)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Height (m)**	**Table Angle (Degree)**	**Raw Value (dBuV)**	**Correction Factor (dB/m)**
1	31.05	36.2 QP	40.0	-3.8	1.24 H	17	45.5	-9.3
2	66.72	34.8 QP	40.0	-5.2	1.67 H	350	44.0	-9.2
3	107.97	36.6 QP	43.5	-6.9	2.16 H	271	47.2	-10.6
4	219.23	38.8 QP	46.0	-7.2	1.23 H	265	49.5	-10.7
5	365.30	36.1 QP	46.0	-9.9	1.13 H	45	40.9	-4.8
6	725.42	36.0 QP	46.0	-10.0	1.33 H	127	32.8	3.2

Remarks:

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

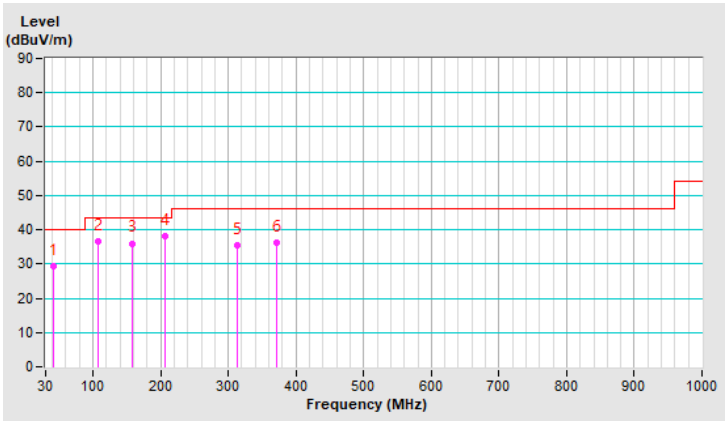


CHANNEL	TX Channel 165	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz		

Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	41.12	29.4 QP	40.0	-10.6	3.12 V	236	37.7	-8.3
2	106.73	36.7 QP	43.5	-6.8	3.25 V	267	47.6	-10.9
3	157.82	36.0 QP	43.5	-7.5	2.23 V	104	43.3	-7.3
4	206.13	38.2 QP	43.5	-5.3	1.15 V	118	48.9	-10.7
5	312.94	35.6 QP	46.0	-10.4	1.36 V	321	41.7	-6.1
6	370.65	36.3 QP	46.0	-9.7	1.43 V	47	40.8	-4.5

Remarks:

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



4.2 Conducted Emission Measurement

4.2.1 Limits of Conducted Emission Measurement

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

Note: 1. The lower limit shall apply at the transition frequencies.
2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

4.2.2 Test Instruments

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver R&S	ESCS 30	847124/029	Oct. 23, 2019	Oct. 22, 2020
Line-Impedance Stabilization Network (for EUT) R&S	ESH3-Z5	848773/004	Oct. 23, 2019	Oct. 22, 2020
Line-Impedance Stabilization Network (for Peripheral) R&S	ESH3-Z5	835239/001	Mar. 19, 2020	Mar. 18, 2021
50 ohms Terminator	50	3	Oct. 23, 2019	Oct. 22, 2020
RF Cable	5D-FB	COCCAB-001	Sep. 27, 2019	Sep. 26, 2020
Fixed attenuator EMCI	STI02-2200-10	005	Aug. 30, 2019	Aug. 29, 2020
Software BVADT	BVADT_Cond_ V7.3.7.4	NA	NA	NA

Note:
1. The calibration interval of the above test instruments are 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in Conduction 1.
3 Tested Date: June 01, 2020

4.2.3 Test Procedure

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

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

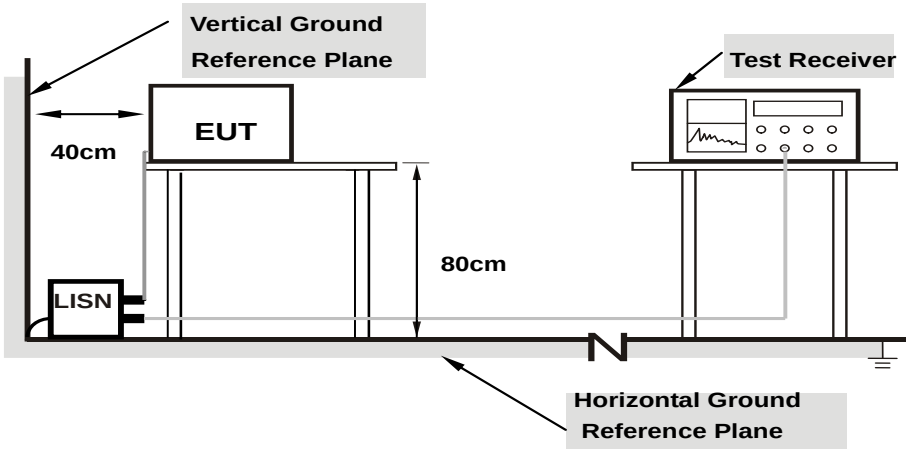
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

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

4.2.4 Deviation from Test Standard

No deviation.

4.2.5 Test Setup



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

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

4.2.6 EUT Operating Condition

Same as 4.1.6.

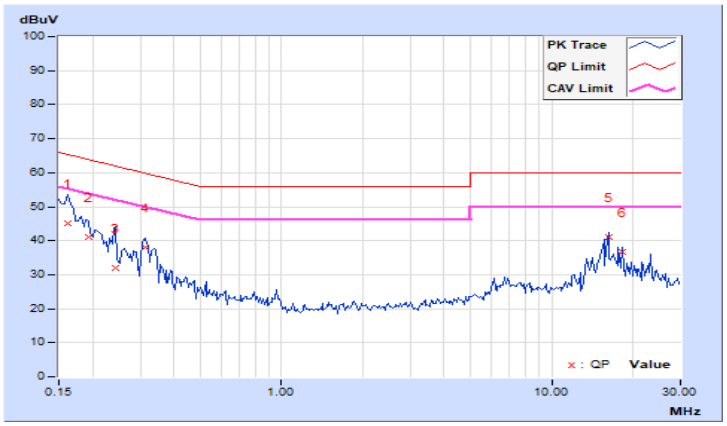
4.2.7 Test Results

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

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.16172	10.03	35.02	22.56	45.05	32.59	65.38	55.38	-20.33	-22.79
2	0.19297	10.04	31.14	16.40	41.18	26.44	63.91	53.91	-22.73	-27.47
3	0.24375	10.04	22.01	7.66	32.05	17.70	61.97	51.97	-29.92	-34.27
4	0.31406	10.05	28.12	21.44	38.17	31.49	59.86	49.86	-21.69	-18.37
5	16.23047	11.20	29.79	27.77	40.99	38.97	60.00	50.00	-19.01	-11.03
6	18.24219	11.34	25.36	24.16	36.70	35.50	60.00	50.00	-23.30	-14.50

Remarks:

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

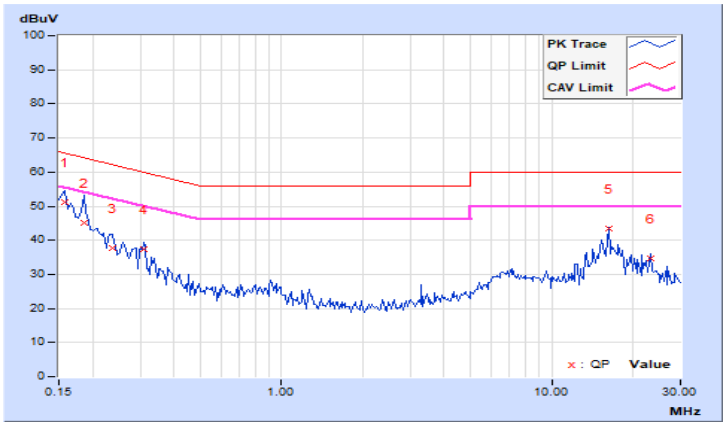


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15781	10.02	41.16	26.96	51.18	36.98	65.58	55.58	-14.40	-18.60
2	0.18516	10.03	35.00	22.68	45.03	32.71	64.25	54.25	-19.22	-21.54
3	0.23594	10.03	27.73	17.63	37.76	27.66	62.24	52.24	-24.48	-24.58
4	0.31016	10.04	27.40	20.27	37.44	30.31	59.97	49.97	-22.53	-19.66
5	**16.22656**	**11.00**	**32.51**	**30.77**	**43.51**	**41.77**	**60.00**	**50.00**	**-16.49**	**-8.23**
6	23.12500	11.29	23.39	21.89	34.68	33.18	60.00	50.00	-25.32	-16.82

Remarks:

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



4.3 Transmit Power Measurement

4.3.1 Limits of Transmit Power Measurement

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

*B is the 26 dB emission bandwidth in megahertz

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

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

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

4.3.2 Test Setup

4.3.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.3.4 Test Procedure

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

4.3.5 Deviation from Test Standard

No deviation.

4.3.6 EUT Operating Condition

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

4.3.7 Test Results

CDD Mode

802.11a

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
36	5180	23.51	23.88	468.731	26.71	30.00	Pass
40	5200	26.43	26.44	880.096	29.45	30.00	Pass
48	5240	25.03	24.96	631.748	28.01	30.00	Pass
149	5745	26.28	26.41	862.142	29.36	30.00	Pass
157	5785	26.14	26.27	834.793	29.22	30.00	Pass
165	5825	26.05	26.81	882.45	29.46	30.00	Pass

Beamforming Mode

802.11ac (VHT20)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
36	5180	21.68	22.19	312.808	24.95	30.00	Pass
40	5200	25.51	25.62	720.385	28.58	30.00	Pass
48	5240	24.69	24.98	609.217	27.85	30.00	Pass
149	5745	26.71	26.58	923.801	29.66	30.00	Pass
157	5785	26.96	26.42	935.123	29.71	30.00	Pass
165	5825	27.10	26.38	947.372	29.77	30.00	Pass

Note: 1. For U-NII-1: The directional gain = 10 log[$(10^{G0/20} + 10^{G1/20})^2$ / 2] = 4.91 dBi < 6 dBi, so the power limit shall not be reduced.
2. For U-NII-3: The directional gain = 10 log[$(10^{G0/20} + 10^{G1/20})^2$ / 2] = 5.44 dBi < 6 dBi, 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				
38	5190	19.89	19.92	195.674	22.92	30.00	Pass
46	5230	24.68	24.53	577.557	27.62	30.00	Pass
151	5755	26.72	26.39	905.406	29.57	30.00	Pass
159	5795	26.51	26.44	888.268	29.49	30.00	Pass

Note: 1. For U-NII-1: The directional gain = 10 log[($10^{G0/20}$ + $10^{G1/20}$)^2 / 2] = 4.91 dBi < 6 dBi, so the power limit shall not be reduced.
2. For U-NII-3: The directional gain = 10 log[($10^{G0/20}$ + $10^{G1/20}$)^2 / 2] = 5.44 dBi < 6 dBi, 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				
42	5210	17.63	17.75	117.509	20.70	30.00	Pass
155	5775	24.16	23.82	501.606	27.00	30.00	Pass

Note: 1. For U-NII-1: The directional gain = 10 log[($10^{G0/20}$ + $10^{G1/20}$)^2 / 2] = 4.91 dBi < 6 dBi, so the power limit shall not be reduced.
2. For U-NII-3: The directional gain = 10 log[($10^{G0/20}$ + $10^{G1/20}$)^2 / 2] = 5.44 dBi < 6 dBi, 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				
36	5180	21.84	22.33	323.758	25.10	30.00	Pass
40	5200	25.64	25.76	743.141	28.71	30.00	Pass
48	5240	24.82	25.09	626.239	27.97	30.00	Pass
149	5745	26.84	26.72	952.953	29.79	30.00	Pass
157	5785	27.08	26.56	963.403	29.84	30.00	Pass
165	5825	27.25	26.52	979.63	29.91	30.00	Pass

Note: 1. For U-NII-1: The directional gain = 10 log[($10^{G0/20}$ + $10^{G1/20}$)^2 / 2] = 4.91 dBi < 6 dBi, so the power limit shall not be reduced.
2. For U-NII-3: The directional gain = 10 log[($10^{G0/20}$ + $10^{G1/20}$)^2 / 2] = 5.44 dBi < 6 dBi, 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				
38	5190	20.04	20.11	203.49	23.09	30	Pass
46	5230	24.83	24.68	597.853	27.77	30	Pass
151	5755	26.88	26.54	938.345	29.72	30	Pass
159	5795	26.67	26.56	917.413	29.63	30	Pass

Note: 1. For U-NII-1: The directional gain = 10 log[($10^{G0/20}$ + $10^{G1/20}$)^2 / 2] = 4.91 dBi < 6 dBi, so the power limit shall not be reduced.
2. For U-NII-3: The directional gain = 10 log[($10^{G0/20}$ + $10^{G1/20}$)^2 / 2] = 5.44 dBi < 6 dBi, so the power limit shall not be reduced.

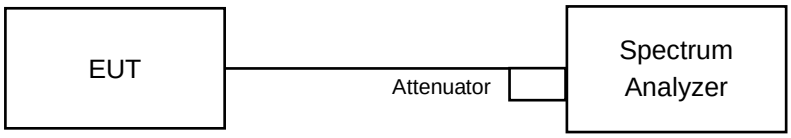
802.11ax (HE80)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
42	5210	17.85	17.93	123.041	20.90	30.00	Pass
155	5775	24.28	24.08	523.775	27.19	30.00	Pass

Note: 1. For U-NII-1: The directional gain = 10 log[($10^{G0/20}$ + $10^{G1/20}$)^2 / 2] = 4.91 dBi < 6 dBi, so the power limit shall not be reduced.
2. For U-NII-3: The directional gain = 10 log[($10^{G0/20}$ + $10^{G1/20}$)^2 / 2] = 5.44 dBi < 6 dBi, 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

CDD Mode

802.11a

Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
36	5180	16.68	16.56
40	5200	17.4	21.24
48	5240	17.16	16.92
149	5745	20.16	20.16
157	5785	18.84	20.4
165	5825	18.12	22.92

Beamforming Mode

802.11ax (HE20)

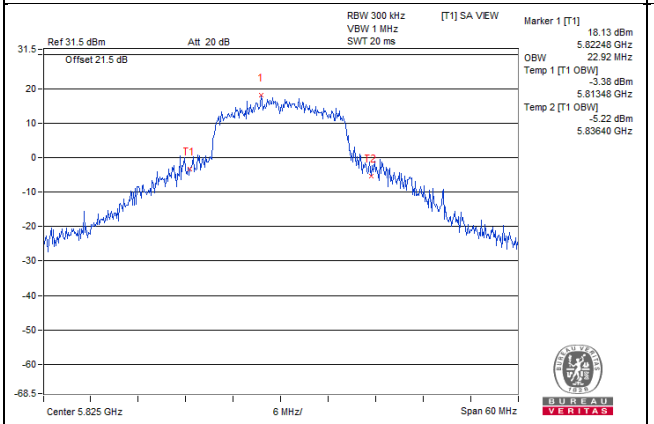
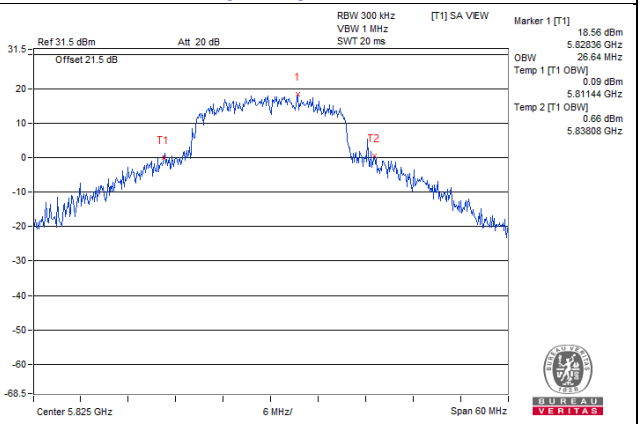
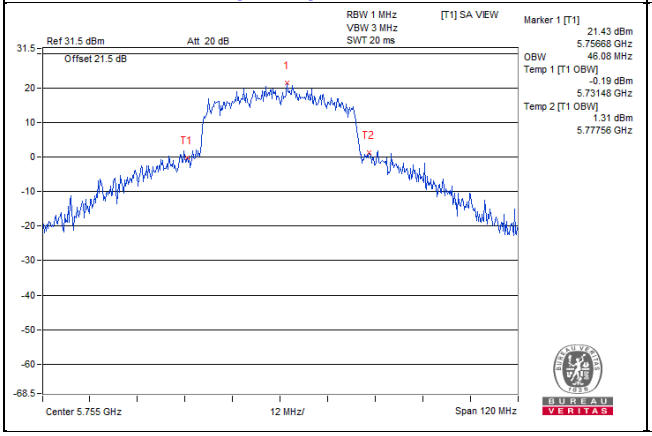
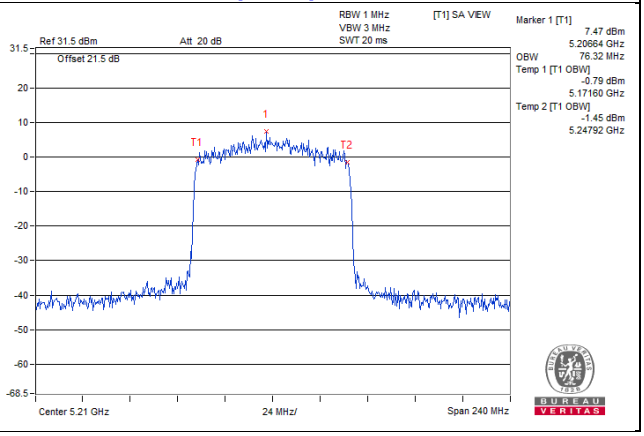
Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
36	5180	18.84	18.96
40	5200	19.08	19.32
48	5240	19.2	19.08
149	5745	21.12	21.12
157	5785	25.08	25.2
165	5825	26.64	26.28

802.11ax (HE40)

Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
38	5190	37.68	37.68
46	5230	38.16	38.16
151	5755	42.72	46.08
159	5795	40.8	44.88

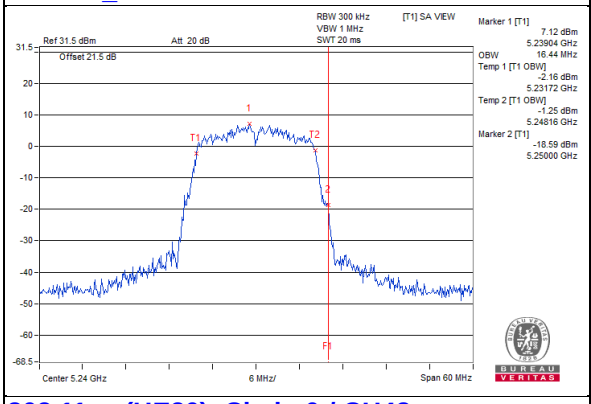
802.11ax (HE80)

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

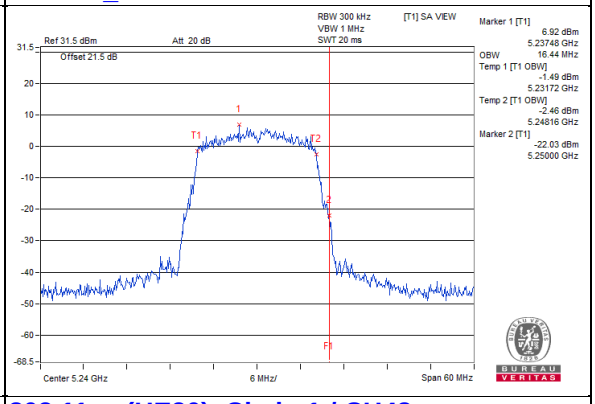
Spectrum Plot of Max. Value	
802.11a_Chain 1 / CH165	**802.11ax (HE20)_Chain 0 / CH165**
	
802.11ax (HE40)_Chain 1 / CH151	**802.11ax (HE80)_Chain 0 / CH42**
	

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

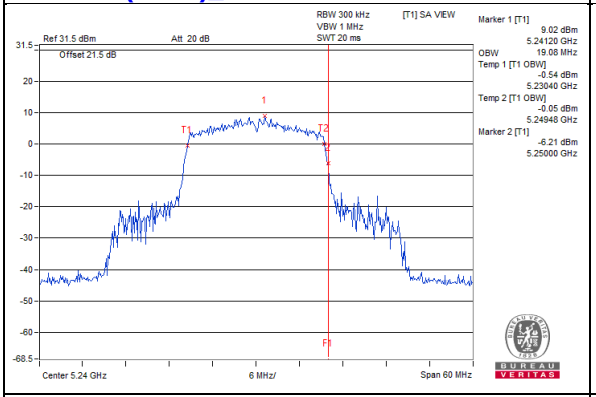
802.11a_Chain 0 / CH48



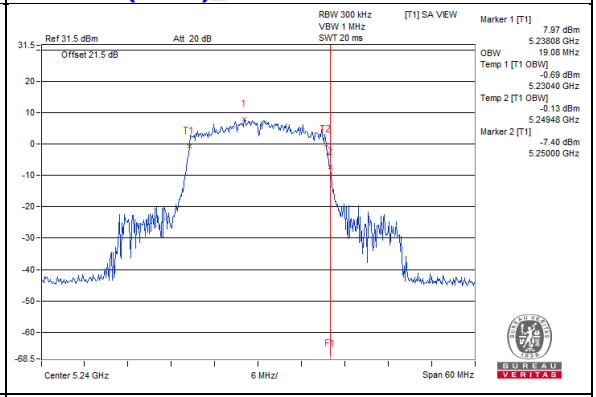
802.11a_Chain 1 / CH48



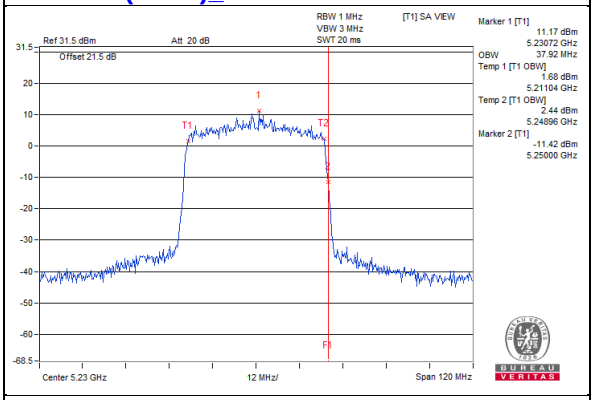
802.11ax (HE20)_Chain 0 / CH48



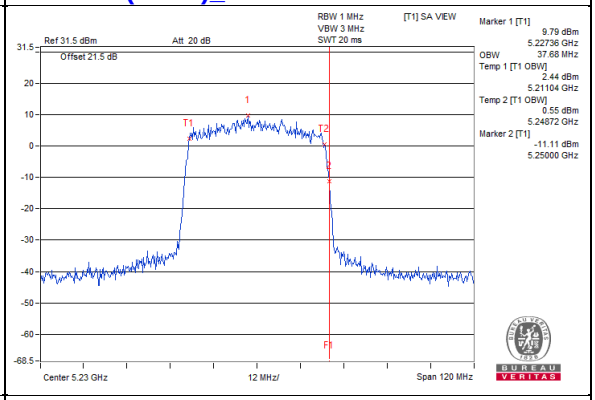
802.11ax (HE20)_Chain 1 / CH48



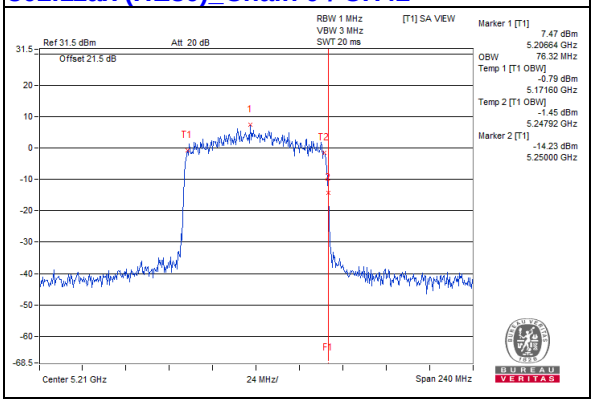
802.11ax (HE40)_Chain 0 / CH46



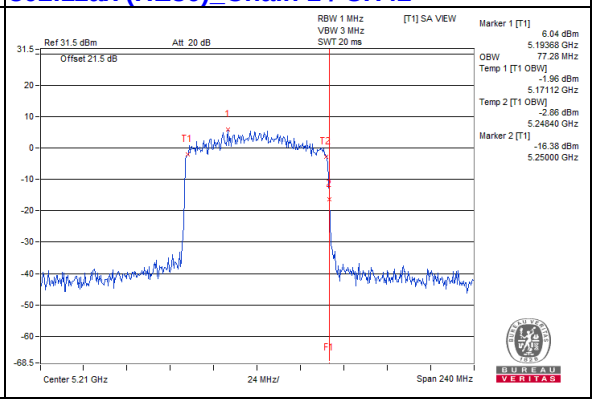
802.11ax (HE40)_Chain 1 / CH46



802.11ax (HE80)_Chain 0 / CH42

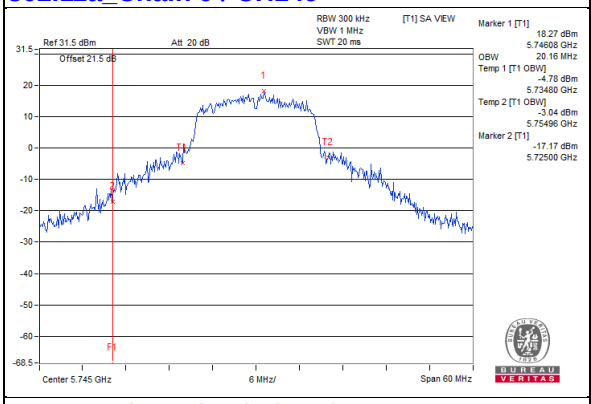


802.11ax (HE80)_Chain 1 / CH42

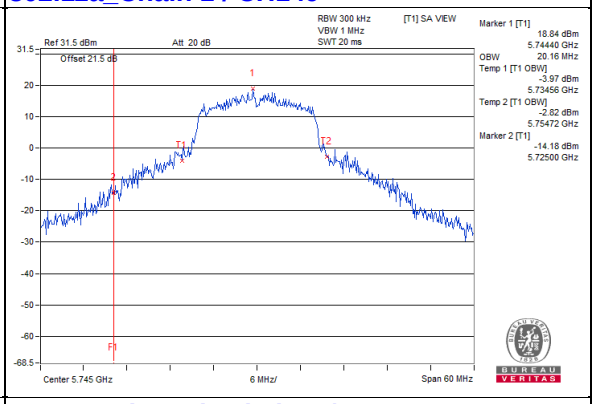


Spectrum Plot for near by DFS band
(DFS is required, if 99% OCP straddle into U-NII-2C band)

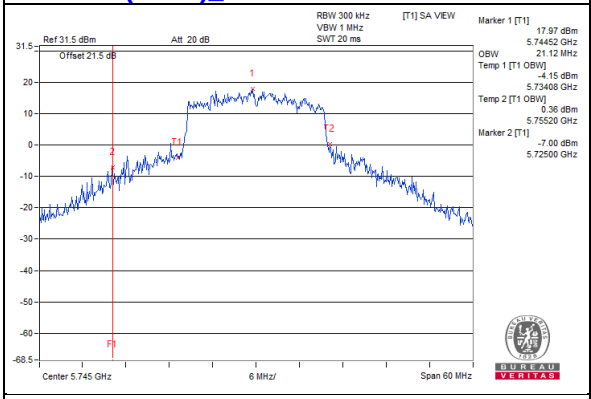
802.11a_Chain 0 / CH149



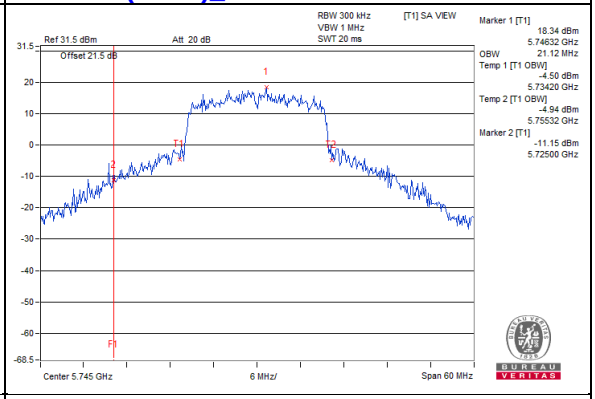
802.11a_Chain 1 / CH149



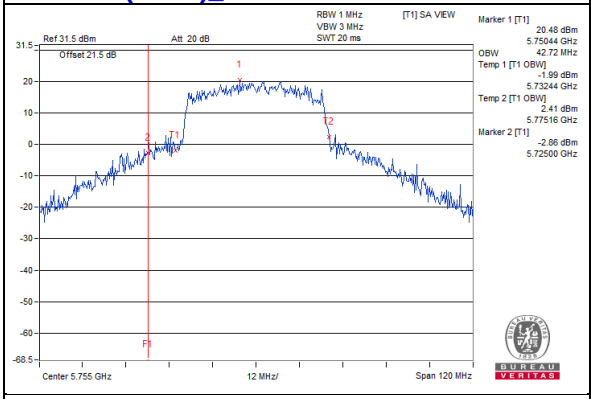
802.11ax (HE20)_Chain 0 / CH149



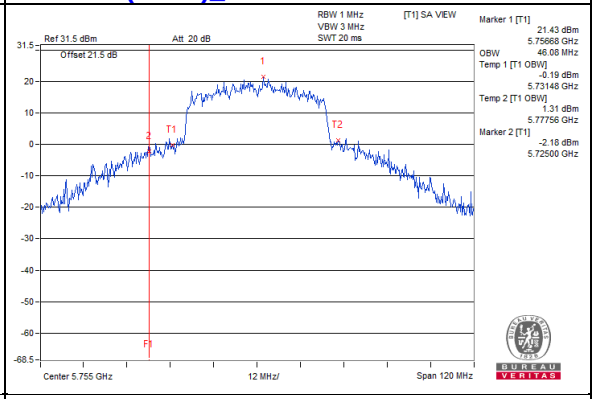
802.11ax (HE20)_Chain 1 / CH149



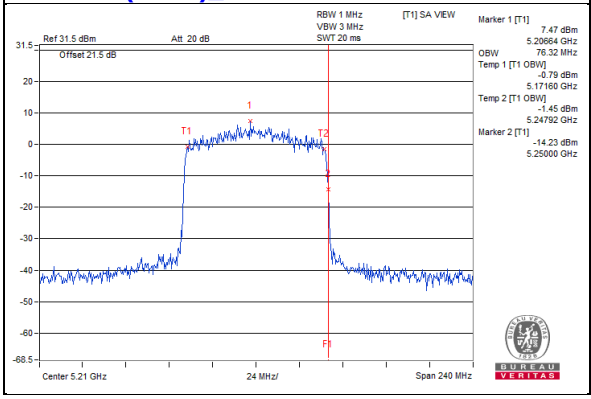
802.11ax (HE40)_Chain 0 / CH151



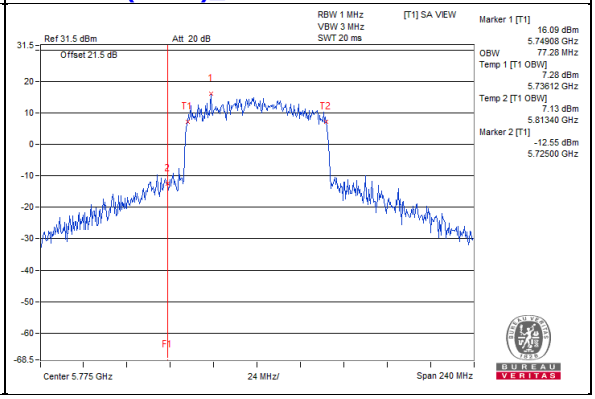
802.11ax (HE40)_Chain 1 / CH151



802.11ax (HE80)_Chain 0 / CH155



802.11ax (HE80)_Chain 1 / CH155

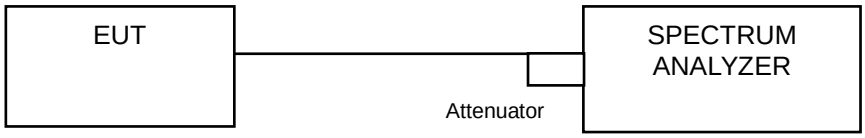


4.5 Peak Power Spectral Density Measurement

4.5.1 Limits of Peak Power Spectral Density Measurement

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

4.5.2 Test Setup



4.5.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.5.4 Test Procedure

For U-NII-1 band:

Using method SA-2

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

For U-NII-3:

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 (reducing) 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:

CDD Mode

802.11a

Chan.	Chan. Freq. (MHz)	PSD w/o Duty Factor (dBm/MHz)		Duty Factor (dB)	Total PSD (dBm/MHz)	Max. PSD Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1				
36	5180	11.95	11.25	0.10	14.72	17.00	PASS
40	5200	13.81	13.53	0.10	16.78	17.00	PASS
48	5240	13.24	12.15	0.10	15.84	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 = 10 log[$(10^{G0/20} + 10^{G1/20})^2$ / 2] =4.91dBi < 6 dBi, so the power density limit shall not be reduced.
3. Refer to section 3.3 for duty cycle spectrum plot.

Beamforming Mode

802.11ax (HE20)

Chan.	Chan. Freq. (MHz)	PSD w/o Duty Factor (dBm/MHz)		Duty Factor (dB)	Total PSD (dBm/MHz)	Max. PSD Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1				
36	5180	9.42	9.49	0.13	12.60	17.00	PASS
40	5200	12.53	12.32	0.13	15.57	17.00	PASS
48	5240	11.53	12.20	0.13	15.02	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 = 10 log[$(10^{G0/20} + 10^{G1/20})^2$ / 2] =4.91dBi < 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				
38	5190	4.04	3.97	0.25	7.27	17.00	PASS
46	5230	8.88	8.01	0.25	11.73	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 = 10 log[$(10^{G0/20} + 10^{G1/20})^2$ / 2] =4.91dBi < 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				
42	5210	-1.53	-1.17	0.46	2.12	17.00	PASS

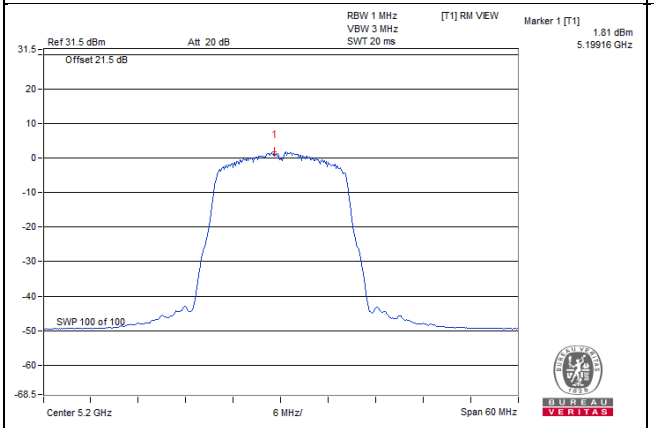
Note: 1. Method a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.

2. The directional gain = 10 log[$(10^{G0/20} + 10^{G1/20})^2$ / 2] =4.91dBi < 6 dBi, so the power density limit shall not be reduced.

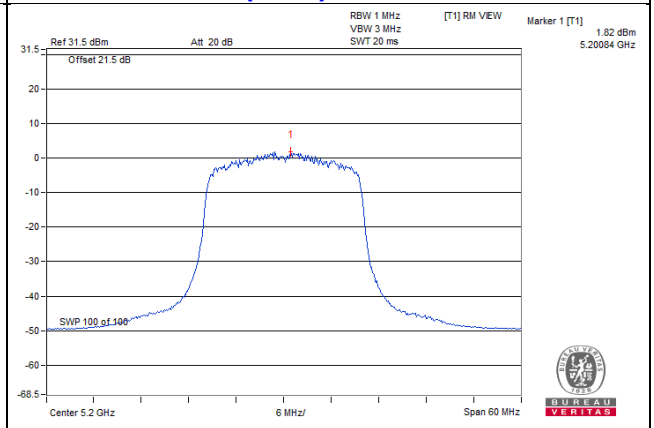
3. Refer to section 3.3 for duty cycle spectrum plot.

Spectrum Plot of Worst Value

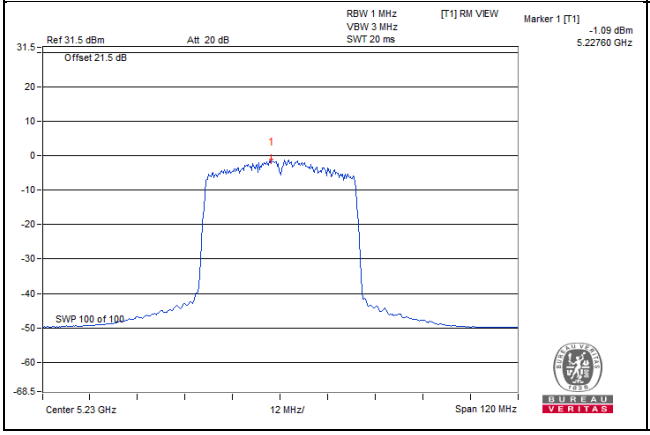
802.11a_Chain 0 / CH40



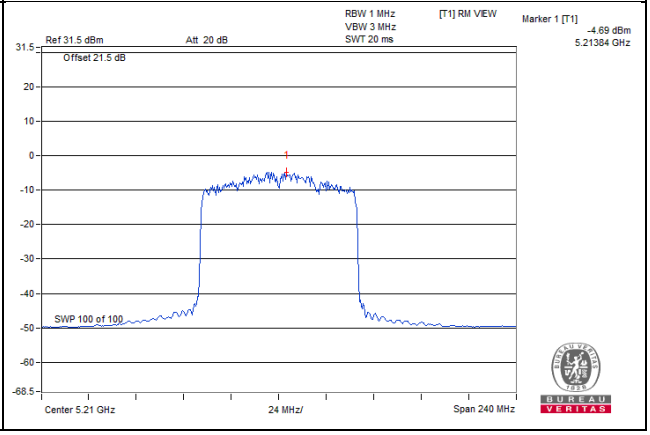
802.11ax (HE20)_Chain 0 / CH40



802.11ax (HE40)_Chain 0 / CH46



802.11ax (HE80)_Chain 1 / CH42



For U-NII-3:

CDD Mode

802.11a

Chan.	Chan. Freq. (MHz)	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
		Chain 0	Chain 1						
149	5745	6.30	5.73	0.10	8.185	9.13	11.35	30.00	PASS
157	5785	5.97	5.36	0.10	7.568	8.79	11.01	30.00	PASS
165	5825	5.74	6.54	0.10	8.453	9.27	11.49	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 = 10 log[($10^{G0/20}$ + $10^{G1/20}$)^2 / 2] = 5.44dBi < 6 dBi, so the power density limit shall not be reduced.
3. Refer to section 3.3 for duty cycle spectrum plot.

Beamforming Mode

802.11ax (HE20)

Chan.	Chan. Freq. (MHz)	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
		Chain 0	Chain 1						
149	5745	4.65	4.75	0.13	6.081	7.84	10.06	30.00	PASS
157	5785	5.77	5.02	0.13	7.161	8.55	10.77	30.00	PASS
165	5825	5.76	5.10	0.13	7.211	8.58	10.80	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 = 10 log[($10^{G0/20}$ + $10^{G1/20}$)^2 / 2] = 5.44dBi < 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/300kHz)		Duty Factor (dB)	Total PSD (mW/300kHz)	Total PSD (dBm/300kHz)	Total PSD (dBm/500kHz)	PSD Limit (dBm/500kHz)	Pass / Fail
		Chain 0	Chain 1						
151	5755	2.20	1.65	0.25	3.304	5.19	7.41	30.00	PASS
159	5795	1.71	1.54	0.25	3.083	4.89	7.11	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 = 10 log[($10^{G0/20}$ + $10^{G1/20}$)^2 / 2] = 5.44dBi < 6 dBi, so the power density limit shall not be reduced.
3. Refer to section 3.3 for duty cycle spectrum plot.

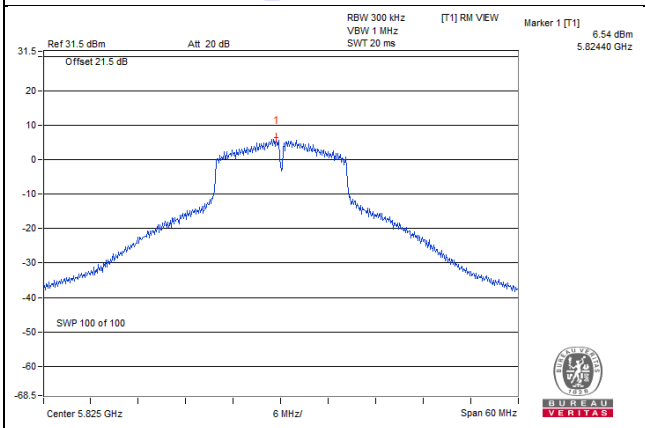
802.11ax (HE80)

Chan.	Chan. Freq. (MHz)	PSD w/o Duty Factor (dBm/300kHz)		Duty Factor (dB)	Total PSD (mW/300kHz)	Total PSD (dBm/300kHz)	Total PSD (dBm/500kHz)	PSD Limit (dBm/500kHz)	Pass / Fail
		Chain 0	Chain 1						
155	5775	-3.01	-3.40	0.46	1.0641	0.27	2.49	30.00	PASS

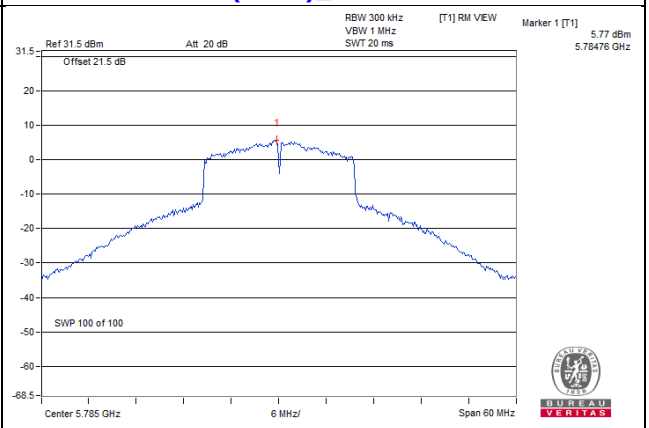
Note: 1. Method b) Measure and sum spectral maxima across the outputs of KDB 662911 is using for calculating total power density.
2. The directional gain = 10 log[($10^{G0/20}$ + $10^{G1/20}$)^2 / 2] = 5.44dBi < 6 dBi, so the power density limit shall not be reduced.
3. Refer to section 3.3 for duty cycle spectrum plot.

Spectrum Plot of Worst Value

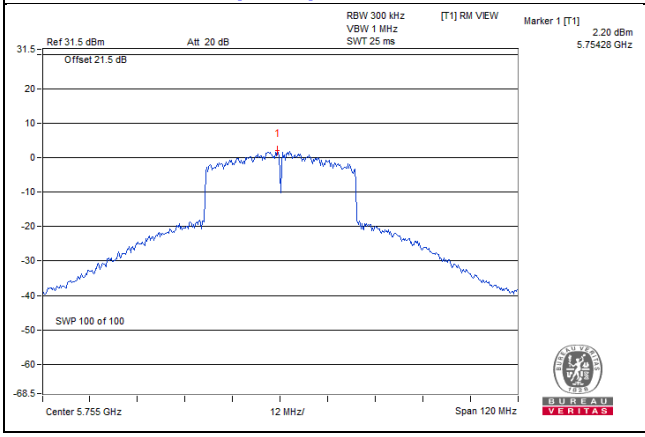
802.11a_Chain 1 / CH165



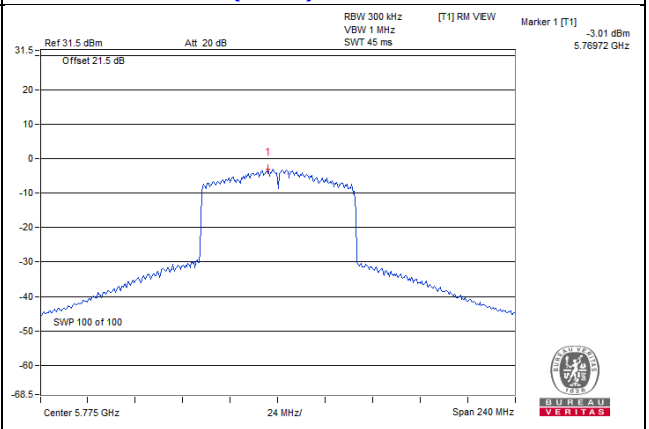
802.11ax (HE20)_Chain 0 / CH157



802.11ax (HE40)_Chain 0 / CH151



802.11ax (HE80)_Chain 0 / CH155

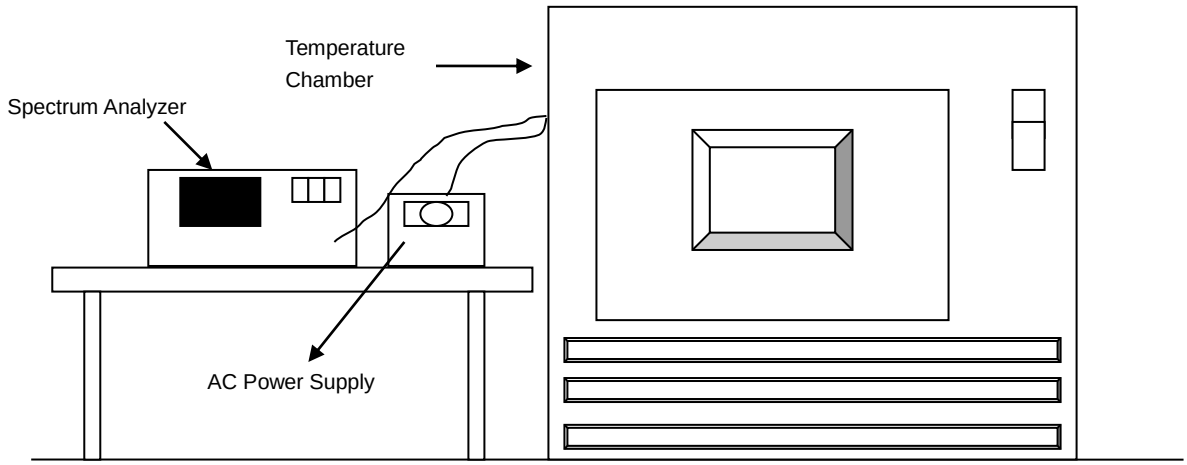


4.6 Frequency Stability Measurement

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	5179.9774	PASS	5179.9731	PASS	5179.9776	PASS	5179.9727	PASS
30	120	5180.0194	PASS	5180.0176	PASS	5180.0167	PASS	5180.0169	PASS
20	120	5180.0021	PASS	5180.0025	PASS	5180.0052	PASS	5180.0017	PASS
10	120	5179.9758	PASS	5179.975	PASS	5179.9771	PASS	5179.9737	PASS
0	120	5179.9764	PASS	5179.9749	PASS	5179.9735	PASS	5179.9777	PASS

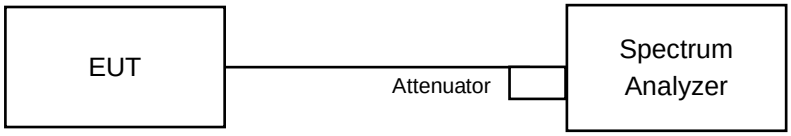
Frequency Stability Versus Voltage									
Operating Frequency: 5180 MHz									
TEMP. (℃)	Power Supply (Vac)	0 Minute		2 Minutes		5 Minutes		10 Minutes	
		Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail
20	138	5180.0019	PASS	5180.0021	PASS	5180.0059	PASS	5180.0019	PASS
	120	5180.0021	PASS	5180.0025	PASS	5180.0052	PASS	5180.0017	PASS
	102	5180.0015	PASS	5180.0019	PASS	5180.0042	PASS	5180.0009	PASS

4.7 6dB Bandwidth Measurement

4.7.1 Limits of 6dB Bandwidth Measurement

The minimum of 6dB Bandwidth Measurement is 0.5MHz.

4.7.2 Test Setup



4.7.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.7.4 Test Procedure

MEASUREMENT PROCEDURE REF

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

4.7.5 Deviation from Test Standard

No deviation.

4.7.6 EUT Operating Condition

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

4.7.7 Test Results

CDD Mode

802.11a

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
149	5745	15.15	15.13	0.5	Pass
157	5785	15.1	15.08	0.5	Pass
165	5825	15.17	15.17	0.5	Pass

Beamforming Mode

802.11ax (HE20)

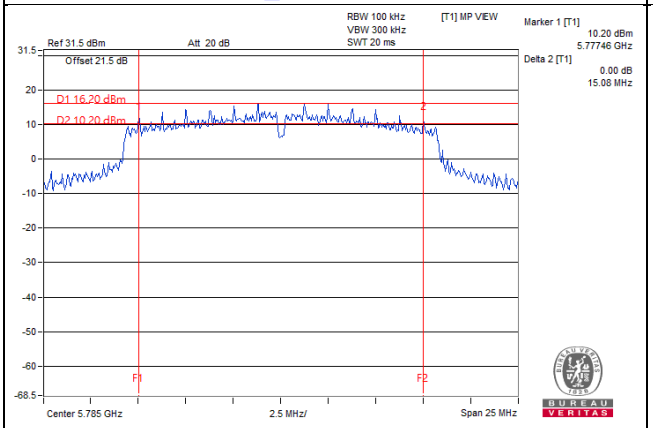
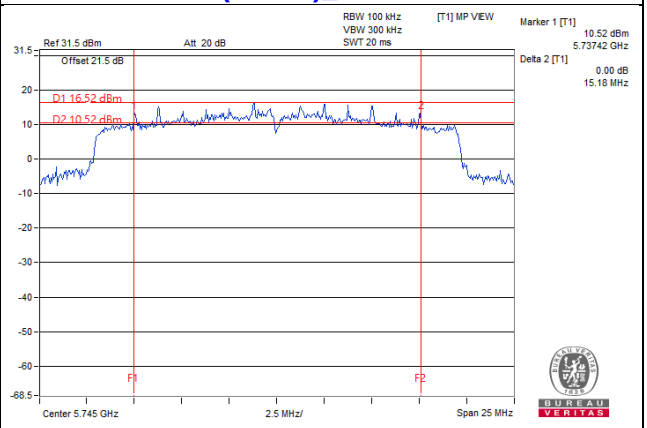
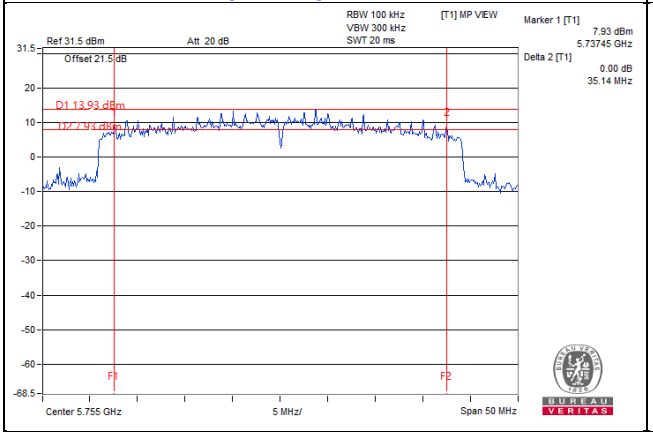
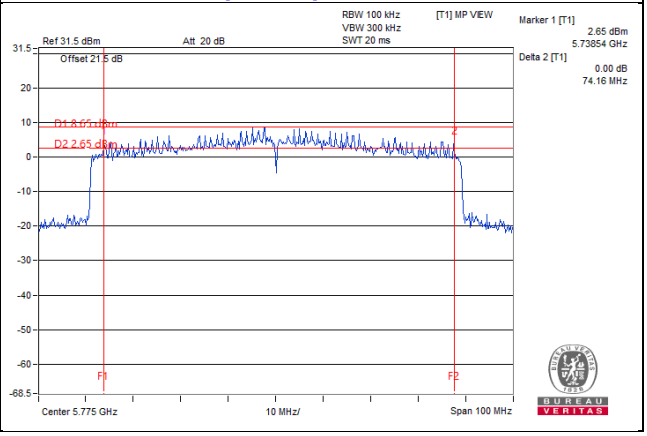
Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
149	5745	15.18	15.79	0.5	Pass
157	5785	15.48	16.26	0.5	Pass
165	5825	16.56	16.45	0.5	Pass

802.11ax (HE40)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
151	5755	35.14	35.16	0.5	Pass
159	5795	35.97	35.15	0.5	Pass

802.11ax (HE80)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
155	5775	75.32	74.16	0.5	Pass

Spectrum Plot of Worst Value	
802.11a_Chain 1 / CH157	**802.11ac (VHT20)_Chain 0 / CH149**
	
802.11ac (VHT40)_Chain 0 / CH151	**802.11ac (VHT80)_Chain 1 / CH155**
	

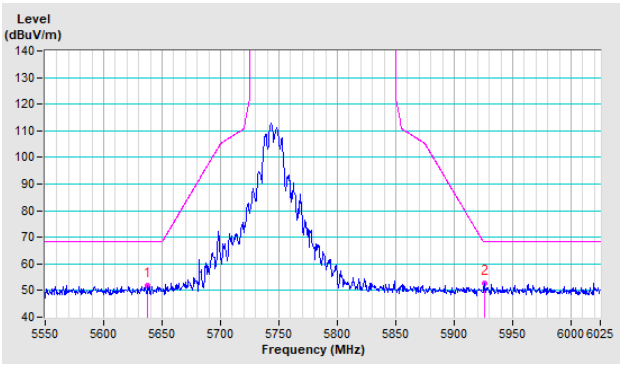
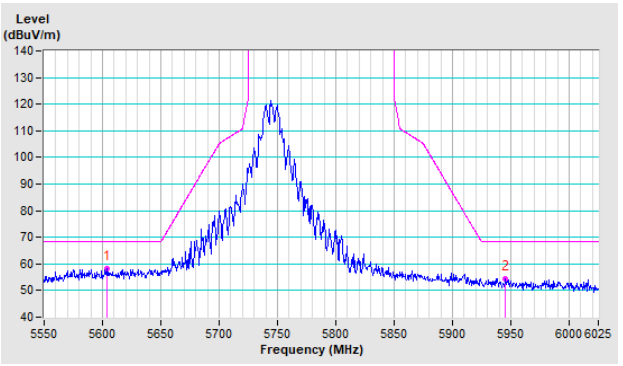
5 Pictures of Test Arrangements

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

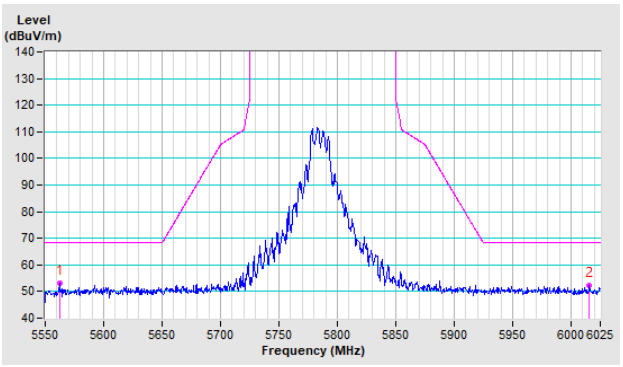
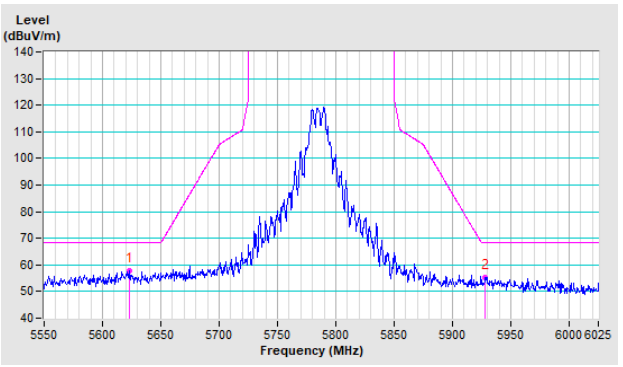
Annex A- Radiated Out of Band Emission (OOBE) Measurement (For U-NII-3 band)

802.11a

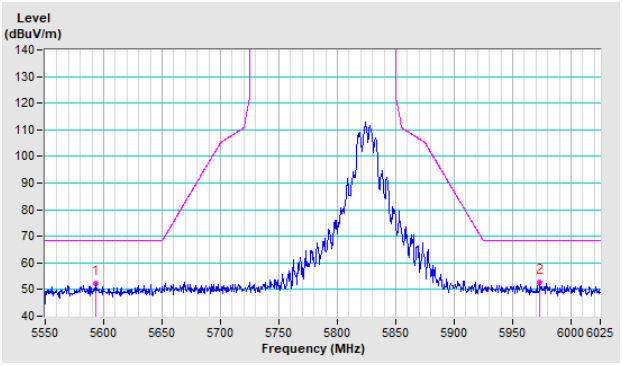
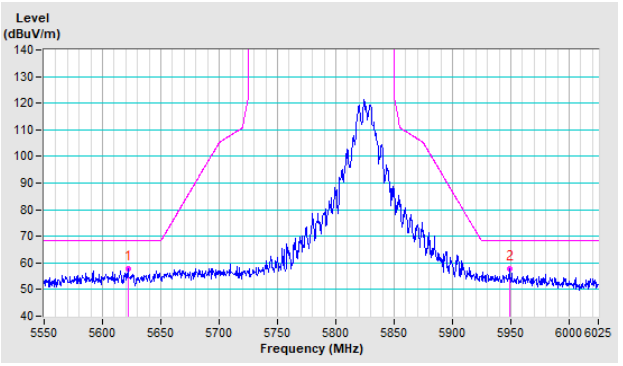
CH 149 5745 MHz

Horizontal	Vertical
	

CH 157 5785 MHz

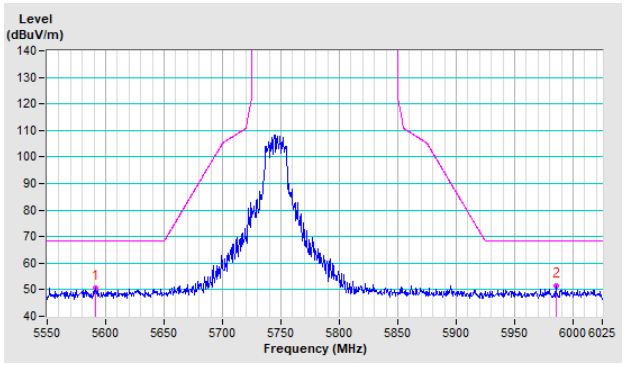
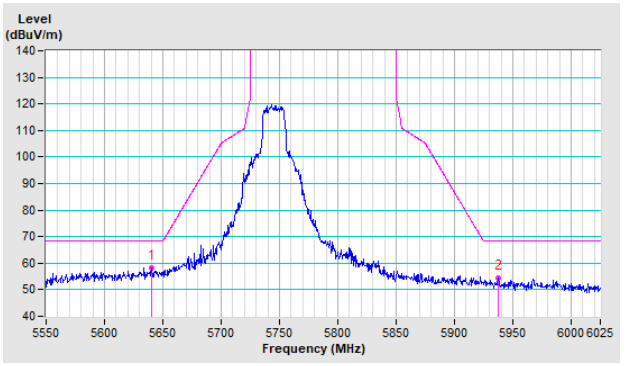
Horizontal	Vertical
	

CH 165 5825 MHz

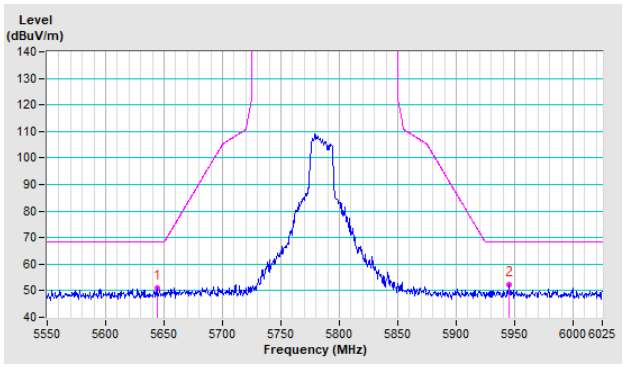
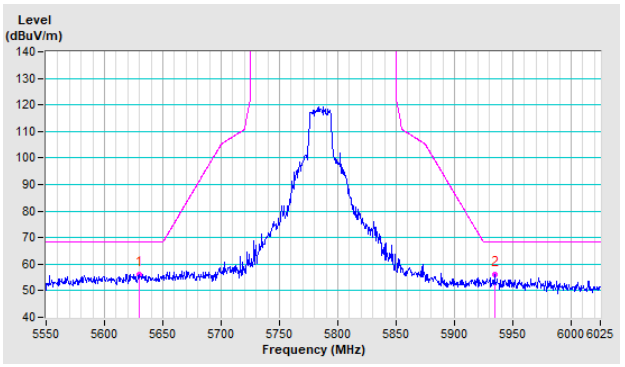
Horizontal	Vertical
	

802.11ax (HE20)

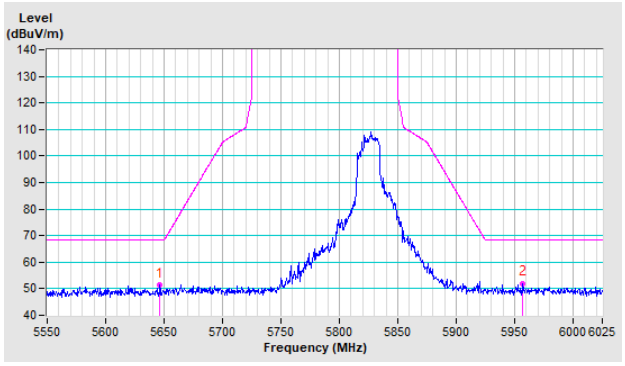
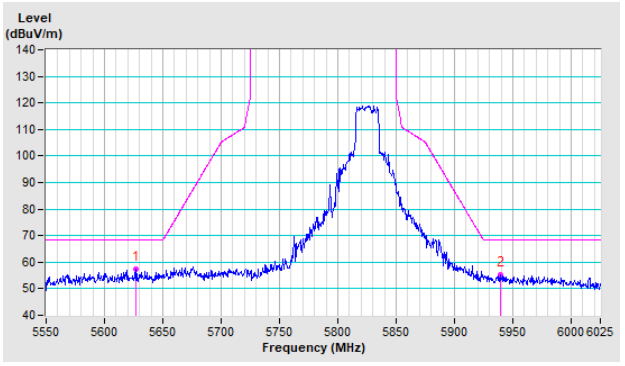
CH 149 5745 MHz

Horizontal	Vertical
	

CH 157 5785 MHz

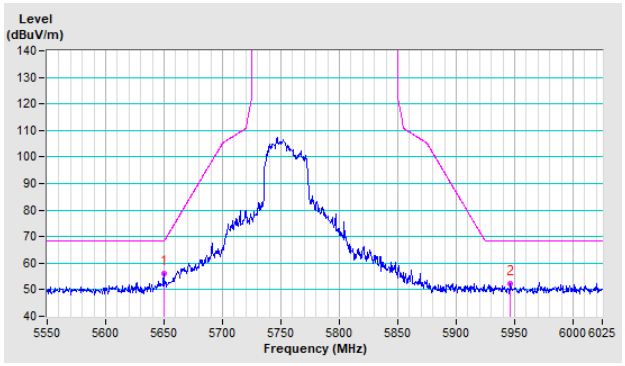
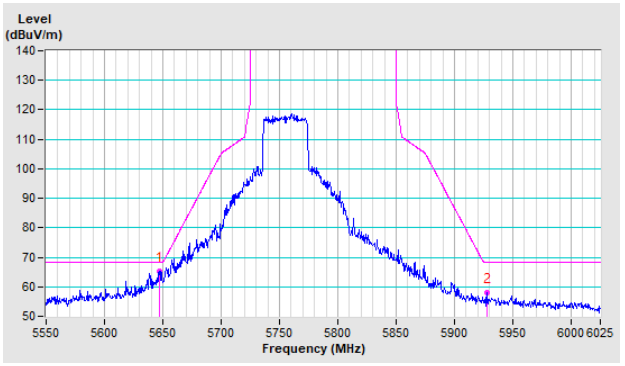
Horizontal	Vertical
	

CH 165 5825 MHz

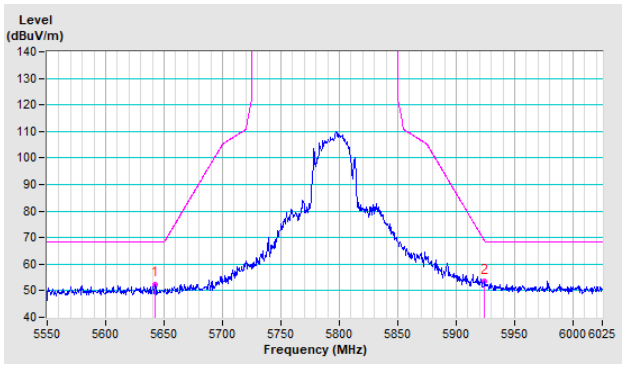
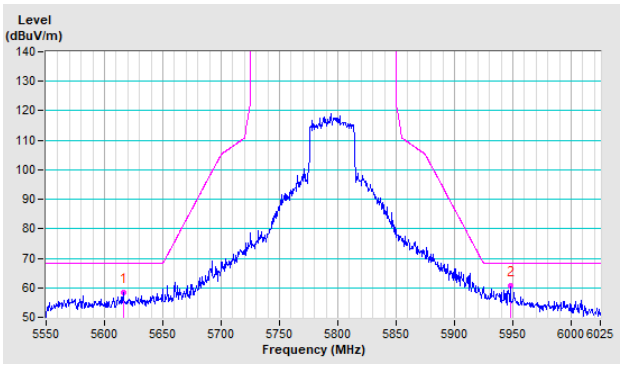
Horizontal	Vertical
	

802.11ax (HE40)

CH 151 5755 MHz

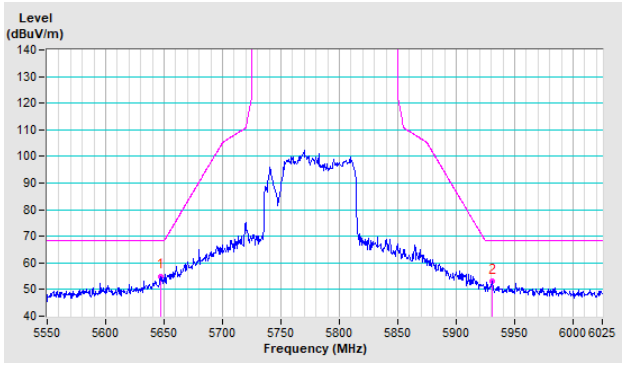
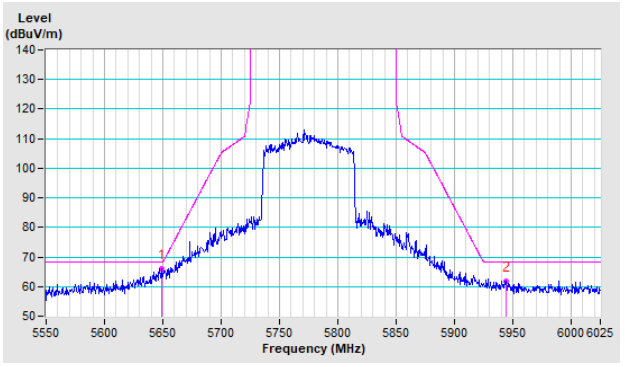
Horizontal	Vertical
	

CH 159 5795 MHz

Horizontal	Vertical
	

802.11ax (HE80)

CH 155 5775 MHz

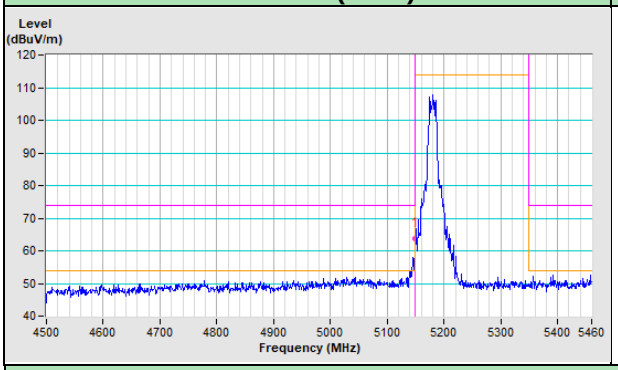
Horizontal	Vertical
	

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

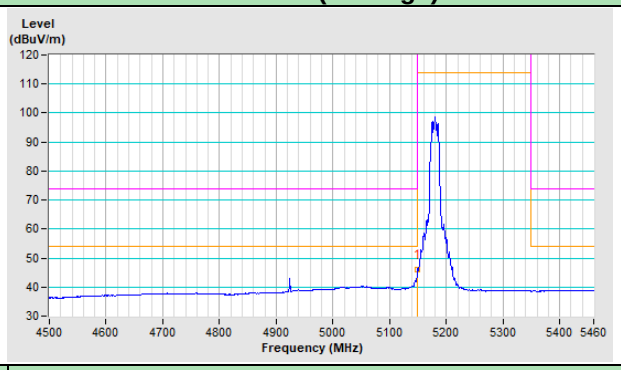
802.11a

Channel 36

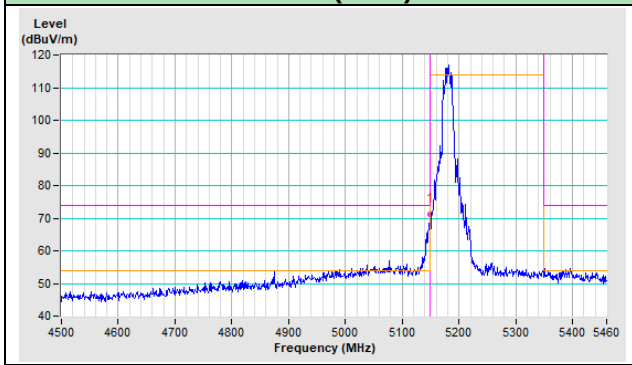
Horizontal (Peak)



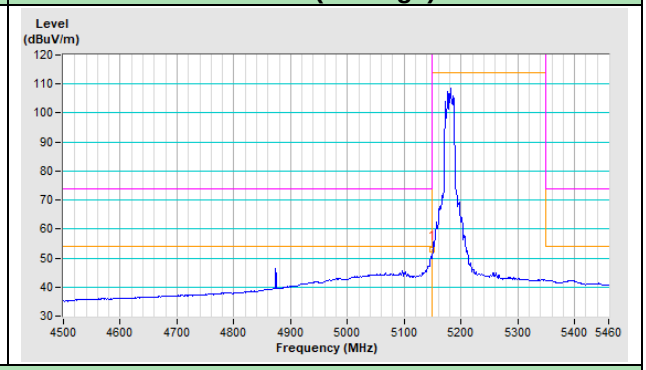
Horizontal (Average)



Vertical (Peak)

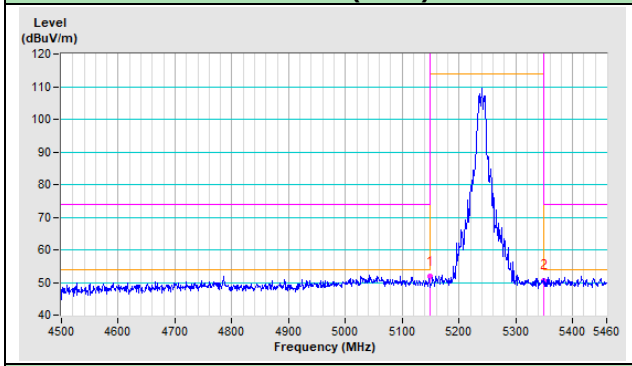


Vertical (Average)

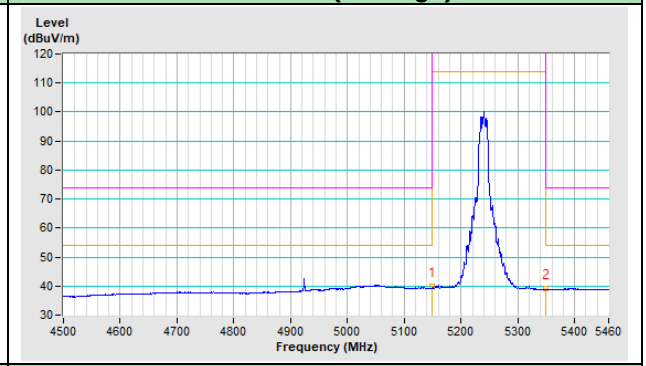


Channel 48

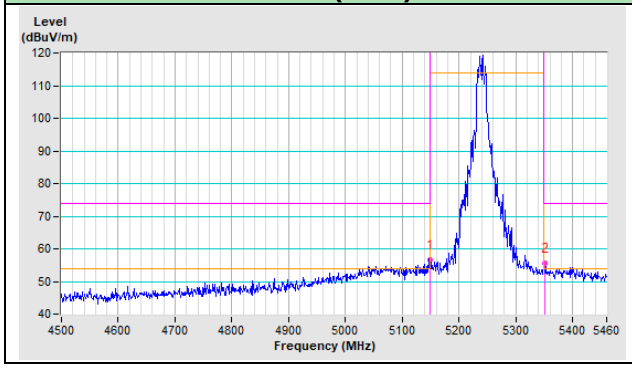
Horizontal (Peak)



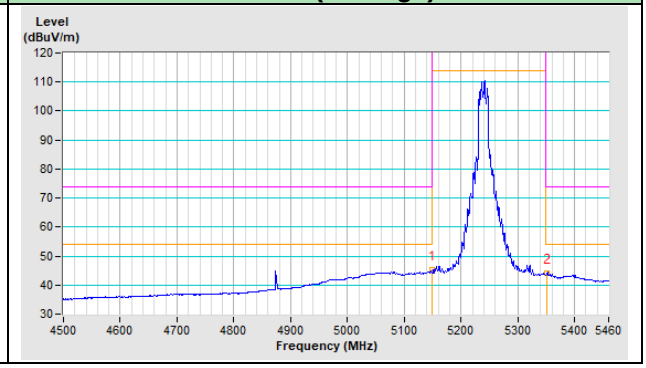
Horizontal (Average)



Vertical (Peak)



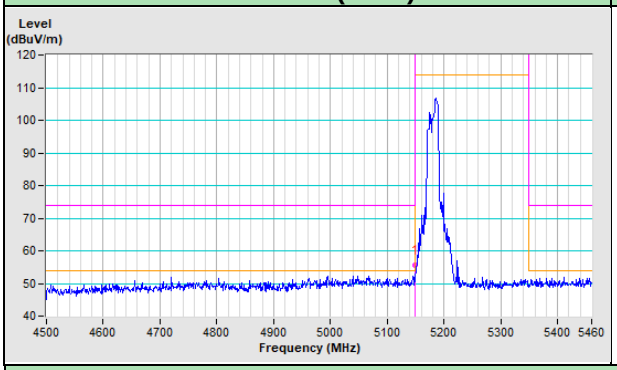
Vertical (Average)



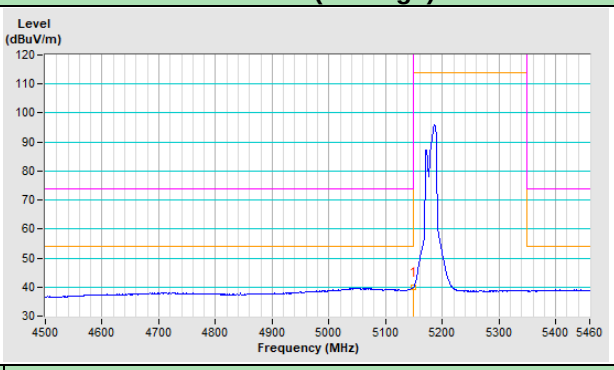
802.11ax (HE20)

Channel 36

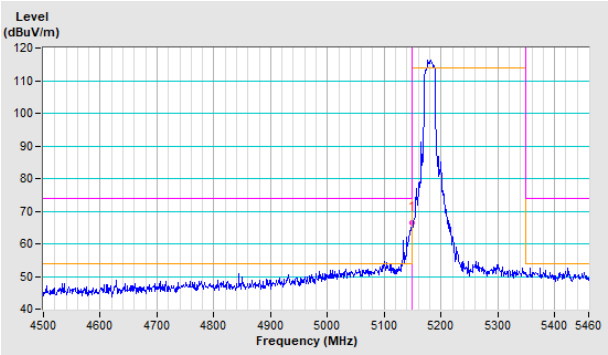
Horizontal (Peak)



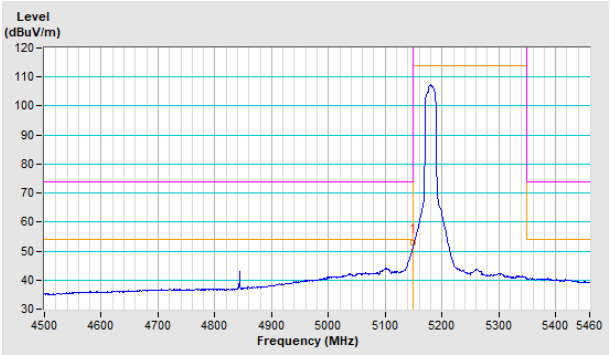
Horizontal (Average)



Vertical (Peak)

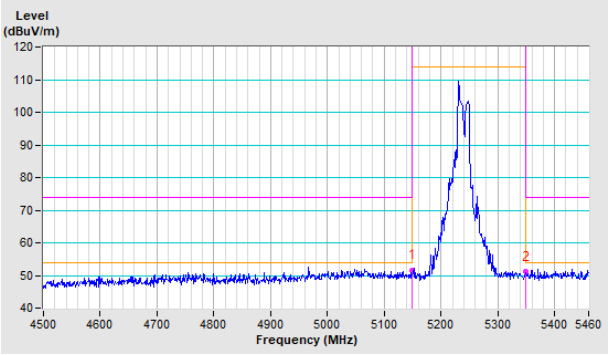


Vertical (Average)

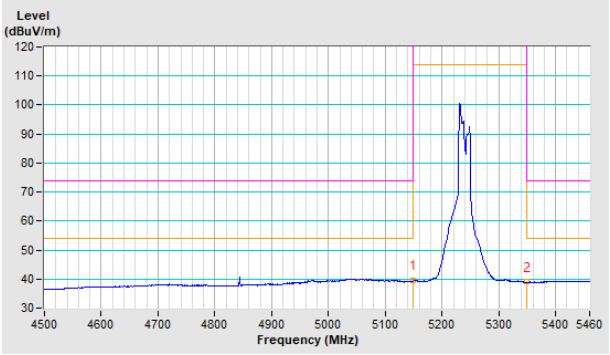


Channel 48

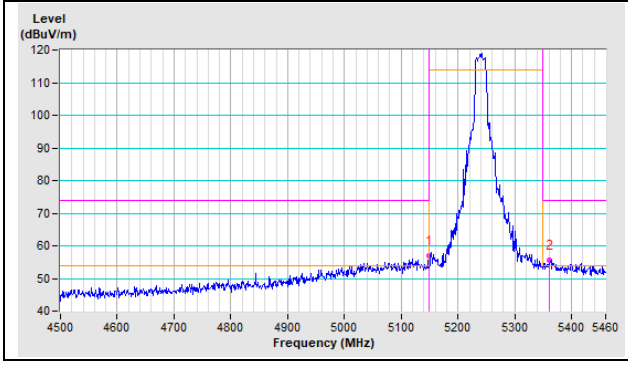
Horizontal (Peak)



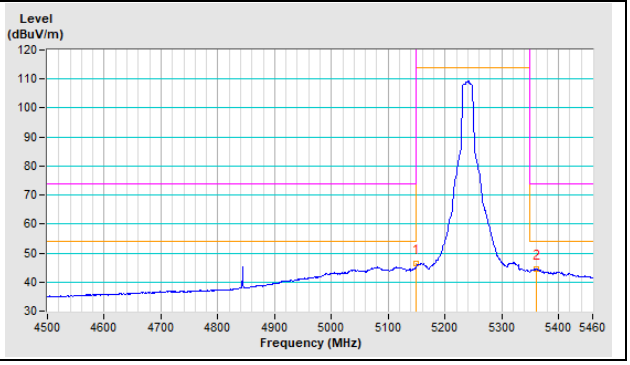
Horizontal (Average)



Vertical (Peak)



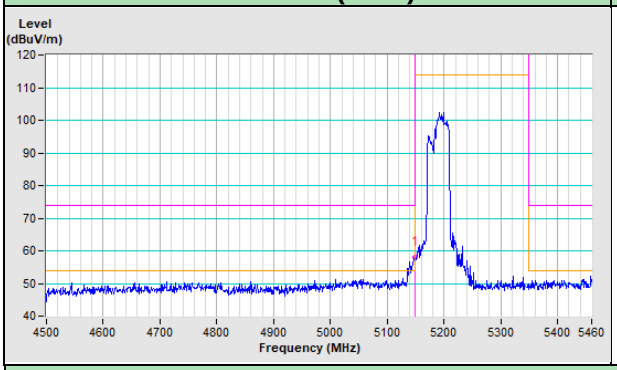
Vertical (Average)



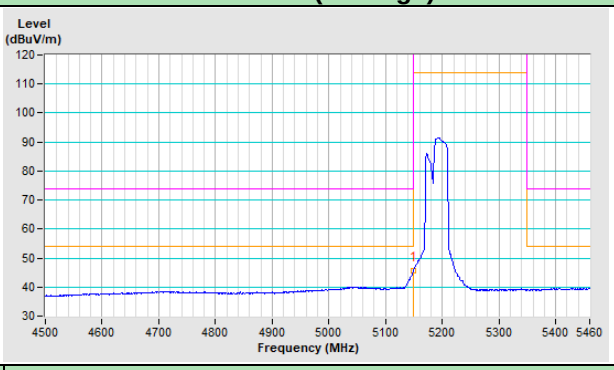
802.11ax (HE40)

Channel 38

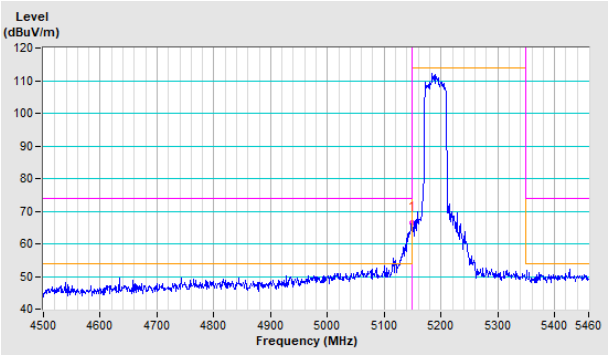
Horizontal (Peak)



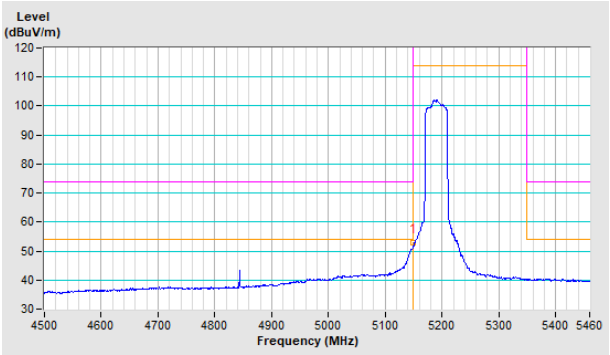
Horizontal (Average)



Vertical (Peak)

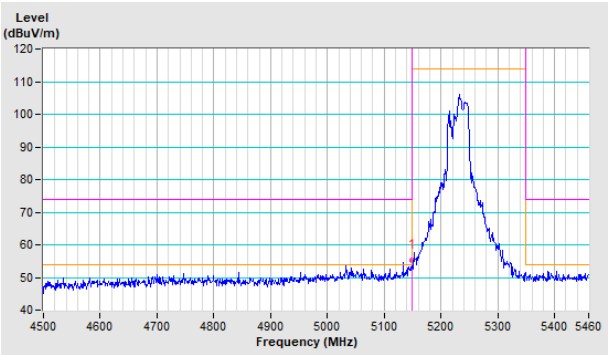


Vertical (Average)

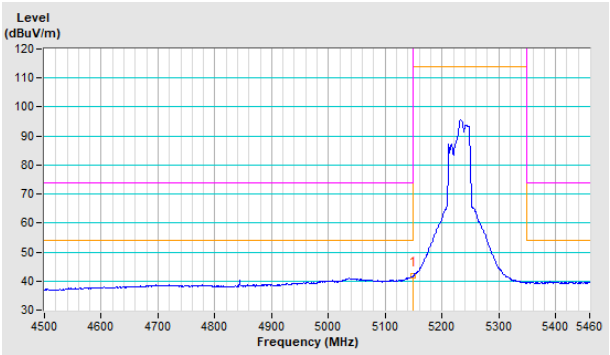


Channel 46

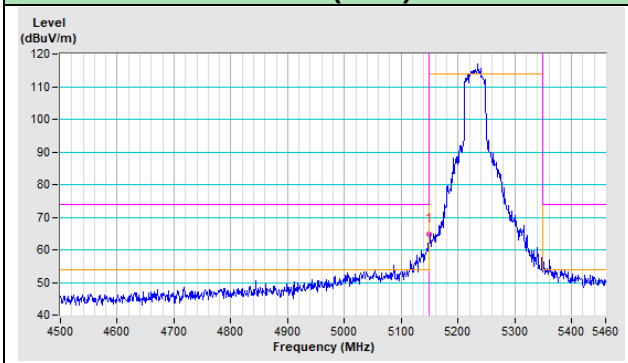
Horizontal (Peak)



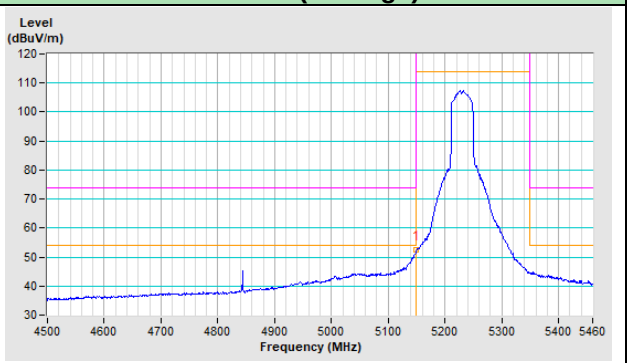
Horizontal (Average)



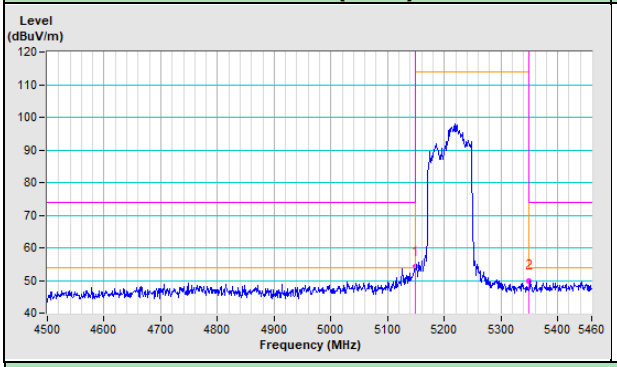
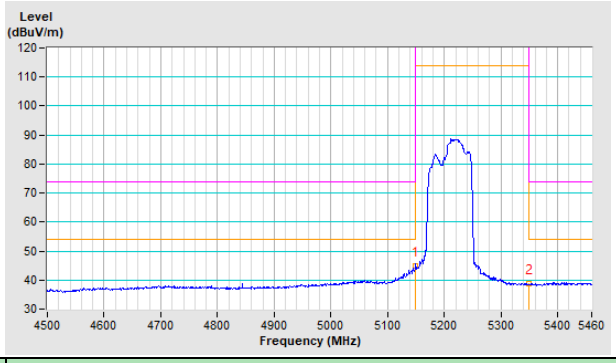
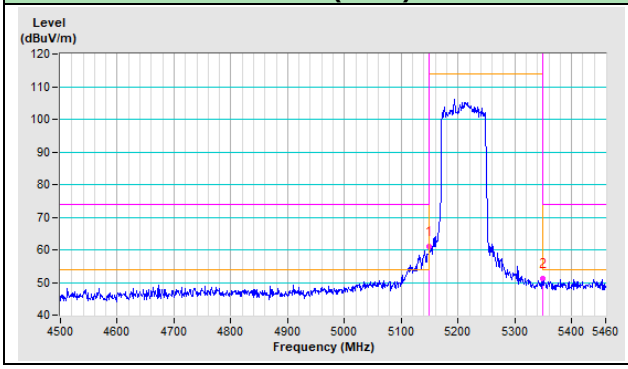
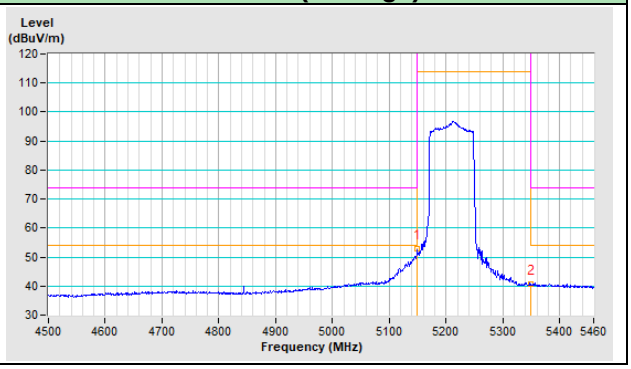
Vertical (Peak)



Vertical (Average)



802.11ax (HE80)

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

Appendix – Information of the Testing Laboratories

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

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

Lin Kou EMC/RF Lab
Tel: 886-2-26052180
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Tel: 886-3-6668565
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Tel: 886-3-3183232
Fax: 886-3-3270892

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

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

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