Report No.:	RFBAOZ-WTW-P20090121A-1
FCC ID:	2AHKM-ARIA2210
Test Model:	ARIA2210
Series Model:	OS2210
Received Date:	Sep. 04, 2020
Test Date:	Oct. 06 to 12, 2020
Issued Date:	July 20, 2021
Applicant:	Hitron Technologies Inc.
Address:	No. 1-8, Li-Hsin 1st Rd., Hsinchu Science Park, Hsinchu 30078, Taiwan, R.O.C.
Issued By:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch Hsin Chu Laboratory
Lab Address:	E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300, Taiwan
Test Location:	E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300, Taiwan
FCC Registration / Designation Number:	723255 / TW2022

This report is for your exclusive use. Any copying or replication of this report to or for any other person or entity, or use of our name or trademark, is permitted only with our prior written permission. This report sets forth our findings solely with respect to the test samples identified herein. The results set forth in this report are not indicative or representative of the quality or characteristics of the lot from which a test sample was taken or any similar or identical product unless specifically and expressly noted. Our report includes all of the tests requested by you and the results thereof based upon the information that you provided to us. You have 60 days from date of issuance of this report to notify us of any material error or omission caused by our negligence, provided, however, that such notice shall be in writing and shall specifically address the issue you wish to raise. A failure to raise such issue within the prescribed time shall constitute your unqualified acceptance of the completeness of this report, the tests conducted and the correctness of the report contents. Unless specific mention, the uncertainty of measurement has been explicitly taken into account to declare the compliance or non-compliance to the specification.

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Release Control Record

Issue No.	Description	Date Issued
RFBAOZ-WTW-P20090121A-1	Original release.	July 20, 2021

1 Certificate of Conformity

Product: WiFi Extender

Brand: hitron

Test Model: ARIA2210

Series Model: OS2210

Sample Status: ENGINEERING SAMPLE

Applicant: Hitron Technologies Inc.

Test Date: Oct. 06 to 12, 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 : Vivian Huang , **Date:** July 20, 2021
Vivian Huang / Specialist

Approved by : , **Date:** July 20, 2021
Clark Lin / Technical Manager

2 Summary of Test Results

47 CFR FCC Part 15, Subpart E (Section 15.407)			
FCC Clause	Test Item	Result	Remarks
15.407(b)(6)	AC Power Conducted Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -4.14 dB at 0.34141 MHz.
15.407(b) (1/2/3/4(i/ii)/6)	Radiated Emissions & Band Edge Measurement*	Pass	Meet the requirement of limit. Minimum passing margin is -0.1 dB at 5725.00MHz and 5350.00 MHz.
15.407(a)(1/2/3)	Max Average Transmit Power	Pass	Meet the requirement of limit.
---	Occupied Bandwidth Measurement	-	Reference only.
15.407(a)(1/2/3)	Peak Power Spectral Density	Pass	Meet the requirement of limit.
15.407(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-2A and U-NII-2C band compliance with rule 15.407(b) of the band-edge items, the test plots were recorded in Annex A. Test Procedures refer to report 4.1.3.
2. 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	5.4 dB
Radiated Emissions above 1 GHz	1GHz ~ 18GHz	5.0 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 (DFS Band)

Product	WiFi Extender
Brand	hitron
Test Model	ARIA2210
Series Model	OS2210
Status of EUT	ENGINEERING SAMPLE
Power Supply Rating	12Vdc from power adapter
Modulation Type	64QAM, 16QAM, QPSK, BPSK for OFDM 256QAM for OFDM in 11ac mode 1024QAM for OFDMA in 11ax HE mode
Modulation Technology	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	5.26 ~ 5.32GHz, 5.50 ~ 5.70GHz
Number of Channel	802.11a, 802.11n (HT20), 802.11ac (VHT20), 802.11ax (HE20): 15 802.11n (HT40), 802.11ac (VHT40), 802.11ax (HE40): 7 802.11ac (VHT80), 802.11ax (HE80): 3
Output Power	**CDD Mode:** **5.26 ~ 5.32 GHz:** 247.699 mW **5.5 ~ 5.7 GHz:** 245.948 mW **Beamforming Mode:** **5.26 ~ 5.32 GHz:** 197.715 mW **5.5 ~ 5.7 GHz:** 208.24 mW
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	Adapter x1
Data Cable Supplied	NA

Note:

1. This report is prepared for FCC class II change. The difference compared with the Report No.: RFBAOZ-WTW-P20090121-1 as the following:
   - Add DFS band <5250~5350 MHz & 5470~5725 MHz> by software.
   - Added new adapter (Model: AMS200-1201500FU).
2. According to above conditions, for DFS band all of test items need to be performed and all data was verified to meet the requirements.
3. The EUT has below model names, which are identical to each other in all aspects except for the following table:

Brand	Model No.	Description
hitron	ARIA2210	with black housing
	OS2210	with white housing

From the above models, model: **ARIA2210** was selected as representative model for the test and its data was recorded in this report.

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

Radio 1	Radio 2	Radio 3
WLAN 2.4GHz	WLAN 5GHz	Bluetooth

5. Simultaneously transmission condition.

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

6. The EUT must be supplied with a power adapter and following different models could be chosen:

Original			
No.	Brand	Model No.	Spec.
1	UNIVERSAL MICROELECTRONICS CO., LTD.	UP0181M-12PA	Input: 100-240Vac, 0.4A, 50/60Hz Output: 12Vdc, 1.5A 18W DC Output cable: Unshielded, 1.2m
Newly			
No.	Brand	Model No.	Spec.
2	AMIGO	AMS200-1201500FU	Input: 100-240Vac, 0.8A, 50/60Hz Output: 12Vdc, 1.5A DC Output cable: Unshielded, 1.5m
From the above adapters, the worst was found in Adapter 1. Therefore only the test data of the mode was recorded in this report.			

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

Antenna NO.	Chain No.	Brand	Model	Antenna Net Gain(dBi)	Frequency range	Antenna Type	Connector Type	Cable Length (mm)
WiFi 2.4G	1	ALPHA	RFPCA252007IMAB301	3.5	2.4~2.4835GHz	PIFA	i-pex(MHF)	7
	2		RFPCA252023IMAB301	2.7	2.4~2.4835GHz			23.5
WiFi 5G	1		RFPCA251812IM5B302	4	5.15~5.85GHz			12
	2		RFPCA251817IM5B301	3.5	5.15~5.85GHz			18
BT	-		RFPCA252019IMAB302	2.8	2.4~2.4835GHz			19

8. 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)

9. 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.
10. The above Antenna information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications, the laboratory shall not be held responsible.

3.2 Description of Test Modes

FOR 5260 ~ 5320MHz

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

Channel	Frequency	Channel	Frequency
52	5260 MHz	60	5300 MHz
56	5280 MHz	64	5320 MHz

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

Channel	Frequency	Channel	Frequency
54	5270 MHz	62	5310 MHz

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

Channel	Frequency
58	5290 MHz

FOR 5500 ~ 5700MHz

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

Channel	Frequency	Channel	Frequency
100	5500 MHz	124	5620 MHz
104	5520 MHz	128	5640 MHz
108	5540 MHz	132	5660 MHz
112	5560 MHz	136	5680 MHz
116	5580 MHz	140	5700 MHz
120	5600 MHz		

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

Channel	Frequency	Channel	Frequency
102	5510 MHz	126	5630 MHz
110	5550 MHz	134	5670 MHz
118	5590 MHz		

2 channels are provided for 802.11ac (VHT80), 802.11ax (HE80):

Channel	Frequency	Channel	Frequency
106	5530 MHz	122	5610 MHz

3.2.1 Test Mode Applicability and Tested Channel Detail

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

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

Note: The EUT had been pre-tested on the positioned of laying-flat and wall-mount. The worst case was found when positioned of on laying-flat.

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	5260-5320	52 to 64	52, 60, 64	OFDM	BPSK	6Mb/s
802.11ax (HE20)		52 to 64	52, 60, 64	OFDMA	BPSK	MCS0
802.11ax (HE40)		54 to 62	54, 62	OFDMA	BPSK	MCS0
802.11ax (HE80)		58	58	OFDMA	BPSK	MCS0
802.11a	5500-5700	100 to 140	100, 116, 140	OFDM	BPSK	6Mb/s
802.11ax (HE20)		100 to 140	100, 116, 140	OFDMA	BPSK	MCS0
802.11ax (HE40)		102 to 134	102, 110, 134	OFDMA	BPSK	MCS0
802.11ax (HE80)		106 to 122	106, 122	OFDMA	BPSK	MCS0

Radiated Emission Test (Below 1GHz):

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

CDD Mode						
Mode	FREQ. Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate Parameter
802.11ax (HE40)	5260-5320 5500-5700	54 to 62 102 to 134	62	OFDMA	BPSK	MCS0

Power Line Conducted Emission Test:

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

CDD Mode						
Mode	FREQ. Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate Parameter
802.11ax (HE40)	5260-5320 5500-5700	54 to 62 102 to 134	62	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	5260-5320	52 to 64	52, 60, 64	OFDM	BPSK	6Mb/s
802.11ac (VHT20) (output power only)		52 to 64	52, 60, 64	OFDM	BPSK	MCS0
802.11ac (VHT40) (output power only)		54 to 62	54, 62	OFDM	BPSK	MCS0
802.11ac (VHT80) (output power only)		58	58	OFDM	BPSK	MCS0
802.11ax (HE20)		52 to 64	52, 60, 64	OFDMA	BPSK	MCS0
802.11ax (HE40)		54 to 62	54, 62	OFDMA	BPSK	MCS0
802.11ax (HE80)		58	58	OFDMA	BPSK	MCS0
802.11a	5500-5700	100 to 140	100, 116, 140	OFDM	BPSK	6Mb/s
802.11ac (VHT20) (output power only)		100 to 140	100, 116, 140	OFDM	BPSK	MCS0
802.11ac (VHT40) (output power only)		102 to 134	102, 110, 134	OFDM	BPSK	MCS0
802.11ac (VHT80) (output power only)		106 to 122	106, 122	OFDM	BPSK	MCS0
802.11ax (HE20)		100 to 140	100, 116, 140	OFDMA	BPSK	MCS0
802.11ax (HE40)		102 to 134	102, 110, 134	OFDMA	BPSK	MCS0
802.11ax (HE80)		106 to 122	106, 122	OFDMA	BPSK	MCS0
Beamforming Mode (output power only)						
Mode	**FREQ. Band (MHz)**	**Available Channel**	**Tested Channel**	**Modulation Technology**	**Modulation Type**	**Data Rate Parameter**
802.11ac (VHT20)	5260-5320	52 to 64	52, 60, 64	OFDM	BPSK	MCS0
802.11ac (VHT40)		54 to 62	54, 62	OFDM	BPSK	MCS0
802.11ac (VHT80)		58	58	OFDM	BPSK	MCS0
802.11ax (HE20)		52 to 64	52, 60, 64	OFDMA	BPSK	MCS0
802.11ax (HE40)		54 to 62	54, 62	OFDMA	BPSK	MCS0
802.11ax (HE80)		58	58	OFDMA	BPSK	MCS0
802.11ac (VHT20)	5500-5700	100 to 140	100, 116, 140	OFDM	BPSK	MCS0
802.11ac (VHT40)		102 to 134	102, 110, 134	OFDM	BPSK	MCS0
802.11ac (VHT80)		106 to 122	106, 122	OFDM	BPSK	MCS0
802.11ax (HE20)		100 to 140	100, 116, 140	OFDMA	BPSK	MCS0
802.11ax (HE40)		102 to 134	102, 110, 134	OFDMA	BPSK	MCS0
802.11ax (HE80)		106 to 122	106, 122	OFDMA	BPSK	MCS0

Test Condition:

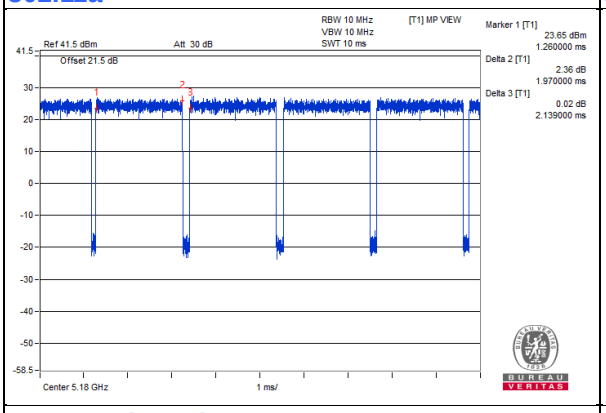
Applicable To	Environmental Conditions	Input Power	Tested By
RE≥1G	25deg. C, 68%RH	120Vac, 60Hz	Ryan Du
RE<1G	25deg. C, 67%RH	120Vac, 60Hz	Tom Yang
PLC	25deg. C, 64%RH	120Vac, 60Hz	Sampson Chen
APCM	25deg. C, 60%RH	120Vac, 60Hz	Anderson Chen

3.3 Duty Cycle of Test Signal

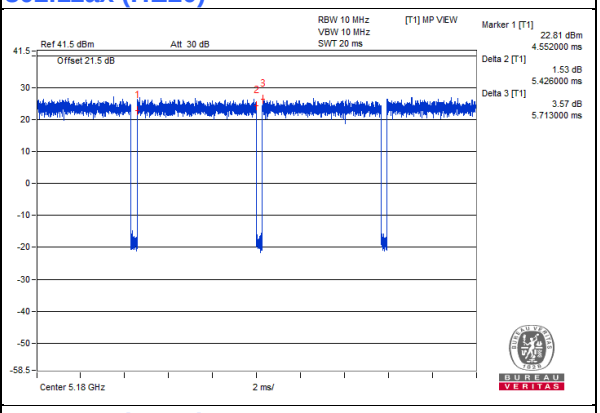
Duty cycle of test signal is < 98 %, duty factor shall be considered.

802.11a: Duty cycle = 1.97 ms/2.139 ms =0.921, Duty factor = 10 * log (1/Duty cycle) =0.36 dB
802.11ax (HE20): Duty cycle = 5.426 ms/5.713 ms = 0.95, Duty factor = 10 * log (1/Duty cycle) = 0.22 dB
802.11ax (HE40): Duty cycle = 5.438 ms/5.733 ms = 0.949, Duty factor = 10 * log (1/Duty cycle) = 0.23 dB
802.11ax (HE80): Duty cycle = 5.432 ms/5.717 ms = 0.95, Duty factor = 10 * log (1/Duty cycle) = 0.22 dB

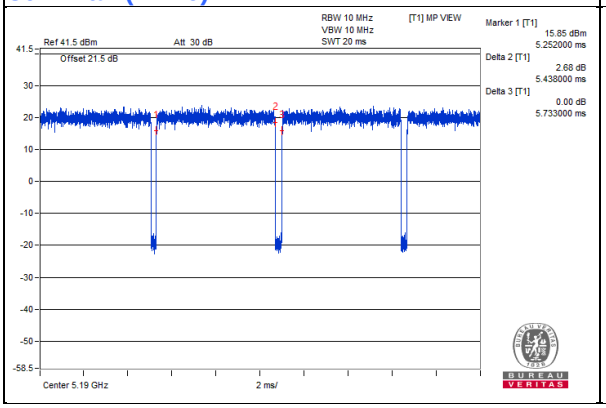
802.11a



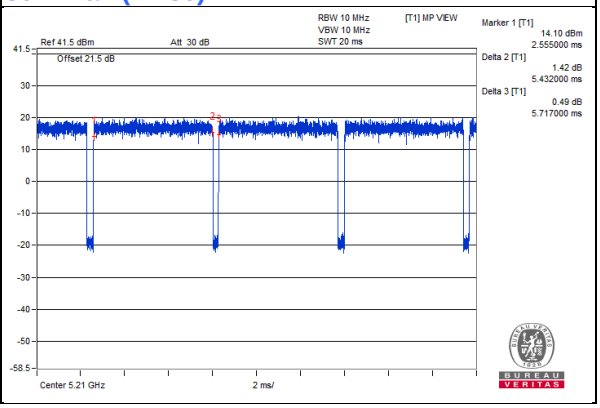
802.11ax (HE20)



802.11ax (HE40)



802.11ax (HE80)



3.4 Description of Support Units

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

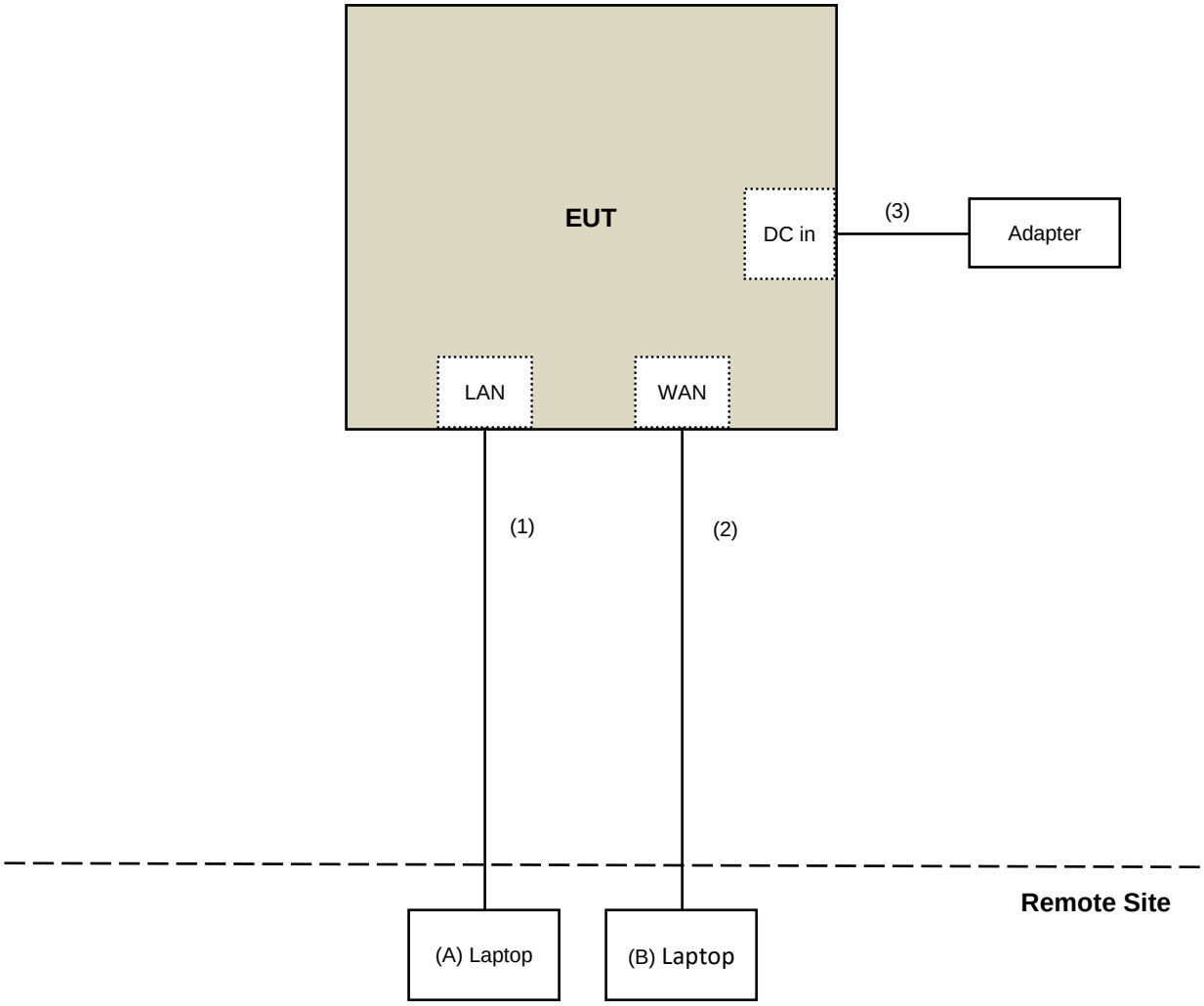
ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Laptop	Dell	E5430	HYV4VY1	FCC DoC	Provided by Lab
B.	Laptop	Dell	E6420	B92T3R1	FCC DoC	Provided by Lab

Note:

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

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

3.4.1 Configuration of System under Test



3.5 General Description of Applied Standards and References

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

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

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

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

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

4 Test Types and Results

4.1 Radiated Emission and Bandedge Measurement

4.1.1 Limits of Radiated Emission and Bandedge Measurement

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

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

NOTE:

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

Limits of unwanted emission out of the restricted bands

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

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver Keysight	N9038A	MY54450088	July 06, 2020	July 05, 2021
Pre-Amplifier EMCI	EMC001340	980142	May 25, 2020	May 24, 2021
Loop Antenna Electro-Metrics	EM-6879	264	Feb. 18, 2020	Feb. 17, 2021
RF Cable	NA	LOOPCAB-001	Jan. 08, 2020	Jan. 07, 2021
RF Cable	NA	LOOPCAB-002	Jan. 08, 2020	Jan. 07, 2021
Pre-Amplifier Mini-Circuits	ZFL-1000VH2B	AMP-ZFL-05	Apr. 28, 2020	Apr. 27, 2021
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-361	Nov. 11, 2019	Nov. 10, 2020
RF Cable	8D	966-3-1	Mar. 17, 2020	Mar. 16, 2021
RF Cable	8D	966-3-2	Mar. 17, 2020	Mar. 16, 2021
RF Cable	8D	966-3-3	Mar. 17, 2020	Mar. 16, 2021
Fixed attenuator Mini-Circuits	UNAT-5+	PAD-3m-3-01	Sep. 24, 2020	Sep. 23, 2021
Horn_Antenna SCHWARZBECK	BBHA9120-D	9120D-406	Nov. 24, 2019	Nov. 23, 2020
Pre-Amplifier EMCI	EMC12630SE	980384	Jan. 15, 2020	Jan. 14, 2021
RF Cable	EMC104-SM-SM-1500	180504	Apr. 29, 2020	Apr. 28, 2021
RF Cable	EMC104-SM-SM-2000	180601	June 09, 2020	June 08, 2021
RF Cable	EMC104-SM-SM-6000	180602	June 09, 2020	June 08, 2021
Spectrum Analyzer Keysight	N9030A	MY54490679	July 13, 2020	July 12, 2021
Pre-Amplifier EMCI	EMC184045SE	980387	Jan. 15, 2020	Jan. 14, 2021
Horn_Antenna SCHWARZBECK	BBHA 9170	BBHA9170519	Nov. 24, 2019	Nov. 23, 2020
RF Cable	EMC102-KM-KM-1200	160924	Jan. 15, 2020	Jan. 14, 2021
RF Cable	EMC-KM-KM-4000	200214	Mar. 11, 2020	Mar. 10, 2021
Software	ADT_Radiated_V8.7.08	NA	NA	NA
Antenna Tower & Turn Table Max-Full	MF-7802	MF780208406	NA	NA
Boresight Antenna Fixture	FBA-01	FBA-SIP01	NA	NA

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in 966 Chamber No. 3.
3. Tested Date: Oct. 06 to 07, 2020

For other test items:

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

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

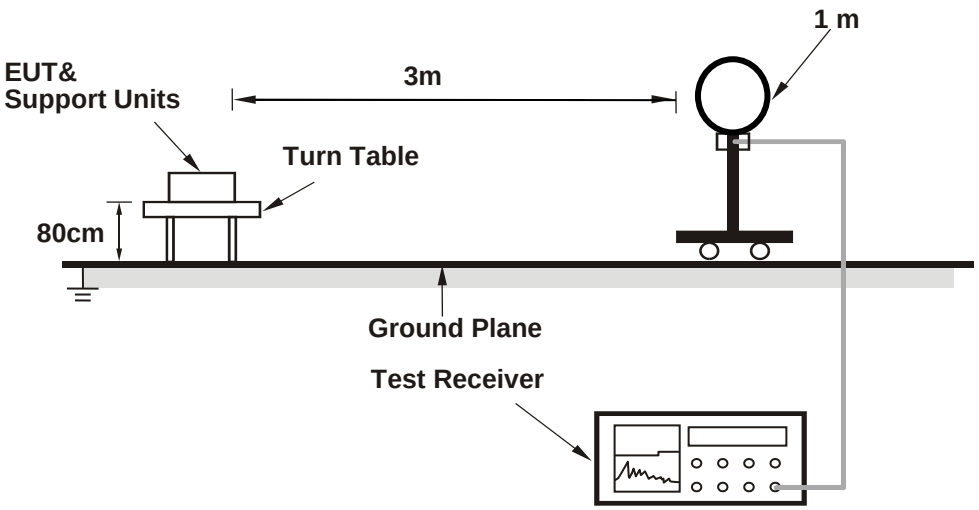
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.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

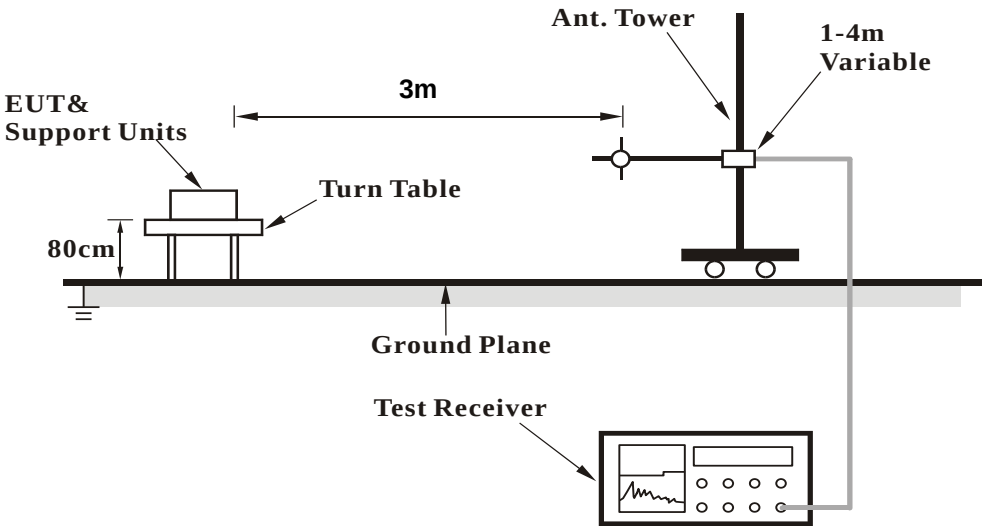
No deviation.

4.1.5 Test Setup

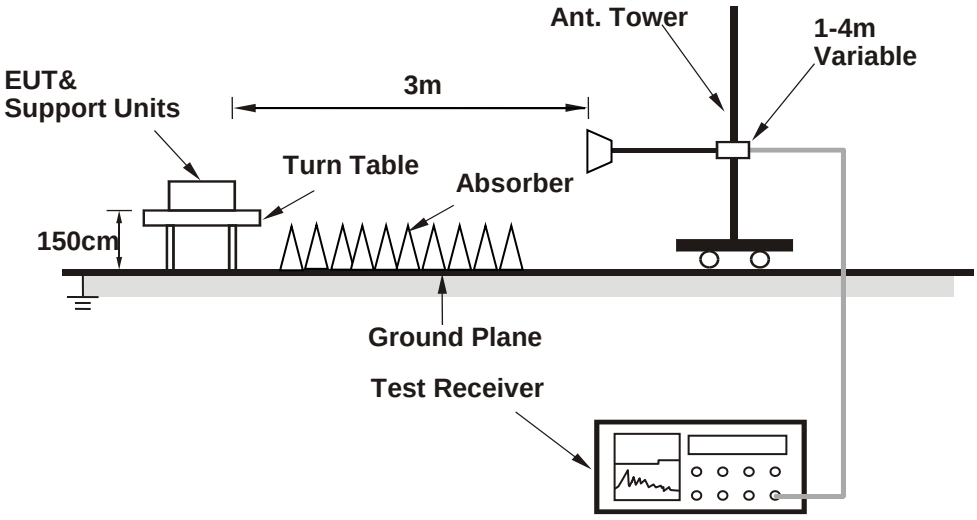
For Radiated emission below 30MHz



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 (AX14_Tx_Rx_CONTROL_V1.2.exe) has been activated to set the EUT under transmission condition continuously at specific channel frequency.

4.1.7 Test Results

Above 1GHz Data

802.11a

Channel	TX Channel 52	**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	51.0 PK	74.0	-23.0	3.76 H	273	46.8	4.2
2	5150.00	42.2 AV	54.0	-11.8	3.76 H	273	38.0	4.2
3	*5260.00	114.3 PK			3.76 H	273	110.5	3.8
4	*5260.00	106.3 AV			3.76 H	273	102.5	3.8
5	#10520.00	47.4 PK	68.2	-20.8	1.69 H	261	34.0	13.4
6	15780.00	46.6 PK	74.0	-27.4	2.36 H	177	32.4	14.2
7	15780.00	34.3 AV	54.0	-19.7	2.36 H	177	20.1	14.2
Antenna Polarity & Test Distance : Vertical at 3 m								
No	**Frequency (MHz)**	**Emission Level (dBuV/m)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Height (m)**	**Table Angle (Degree)**	**Raw Value (dBuV)**	**Correction Factor (dB/m)**
1	5087.58	53.0 PK	74.0	-21.0	1.02 V	70	48.7	4.3
2	5087.58	44.5 AV	54.0	-9.5	1.02 V	70	40.2	4.3
3	5147.21	54.5 PK	74.0	-19.5	1.02 V	70	50.3	4.2
4	5147.21	43.4 AV	54.0	-10.6	1.02 V	70	39.2	4.2
5	*5260.00	119.6 PK			1.02 V	70	115.8	3.8
6	*5260.00	110.3 AV			1.02 V	70	106.5	3.8
7	#10520.00	45.8 PK	68.2	-22.4	1.66 V	285	32.4	13.4
8	15780.00	47.4 PK	74.0	-26.6	1.42 V	57	33.2	14.2
9	15780.00	36.4 AV	54.0	-17.6	1.42 V	57	22.2	14.2

Remarks:

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

Channel	TX Channel 60	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	*5300.00	114.3 PK			3.73 H	280	110.6	3.7
2	*5300.00	106.5 AV			3.73 H	280	102.8	3.7
3	10600.00	47.5 PK	74.0	-26.5	1.63 H	253	34.1	13.4
4	10600.00	36.4 AV	54.0	-17.6	1.63 H	253	23.0	13.4
5	15900.00	46.6 PK	74.0	-27.4	2.38 H	170	33.1	13.5
6	15900.00	34.5 AV	54.0	-19.5	2.38 H	170	21.0	13.5
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5300.00	119.9 PK			1.03 V	72	116.2	3.7
2	*5300.00	110.3 AV			1.03 V	72	106.6	3.7
3	10600.00	46.0 PK	74.0	-28.0	1.63 V	296	32.6	13.4
4	10600.00	35.5 AV	54.0	-18.5	1.63 V	296	22.1	13.4
5	15900.00	46.8 PK	74.0	-27.2	1.42 V	59	33.3	13.5
6	15900.00	36.1 AV	54.0	-17.9	1.42 V	59	22.6	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.

Channel	TX Channel 64	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	*5320.00	112.8 PK			3.79 H	282	109.0	3.8
2	*5320.00	103.5 AV			3.79 H	282	99.7	3.8
3	5353.00	61.4 PK	74.0	-12.6	3.79 H	282	57.7	3.7
4	5353.00	48.6 AV	54.0	-5.4	3.79 H	282	44.9	3.7
5	10640.00	48.0 PK	74.0	-26.0	1.65 H	257	34.5	13.5
6	10640.00	37.0 AV	54.0	-17.0	1.65 H	257	23.5	13.5
7	15960.00	46.4 PK	74.0	-27.6	2.34 H	179	32.9	13.5
8	15960.00	34.0 AV	54.0	-20.0	2.34 H	179	20.5	13.5
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5320.00	117.9 PK			1.00 V	66	114.1	3.8
2	*5320.00	108.3 AV			1.00 V	66	104.5	3.8
3	5350.00	65.1 PK	74.0	-8.9	1.00 V	66	61.4	3.7
4	5350.00	53.6 AV	54.0	-0.4	1.00 V	66	49.9	3.7
5	10640.00	46.2 PK	74.0	-27.8	1.59 V	310	32.7	13.5
6	10640.00	35.8 AV	54.0	-18.2	1.59 V	310	22.3	13.5
7	15960.00	47.2 PK	74.0	-26.8	1.38 V	44	33.7	13.5
8	15960.00	36.5 AV	54.0	-17.5	1.38 V	44	23.0	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.

Channel	TX Channel 100	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	5460.00	60.2 PK	74.0	-13.8	3.82 H	280	56.1	4.1
2	5460.00	47.6 AV	54.0	-6.4	3.82 H	280	43.5	4.1
3	#5466.59	60.3 PK	68.2	-7.9	3.82 H	280	56.1	4.2
4	*5500.00	111.1 PK			3.82 H	280	106.9	4.2
5	*5500.00	102.8 AV			3.82 H	280	98.6	4.2
6	11000.00	47.4 PK	74.0	-26.6	1.59 H	258	33.9	13.5
7	11000.00	36.3 AV	54.0	-17.7	1.59 H	258	22.8	13.5
8	#16500.00	46.3 PK	68.2	-21.9	2.37 H	163	31.2	15.1
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5458.43	65.3 PK	74.0	-8.7	1.02 V	88	61.2	4.1
2	5458.43	50.0 AV	54.0	-4.0	1.02 V	88	45.9	4.1
3	#5467.86	67.6 PK	68.2	-0.6	1.02 V	88	63.4	4.2
4	*5500.00	118.7 PK			1.02 V	88	114.5	4.2
5	*5500.00	108.4 AV			1.02 V	88	104.2	4.2
6	11000.00	46.1 PK	74.0	-27.9	1.61 V	293	32.6	13.5
7	11000.00	35.5 AV	54.0	-18.5	1.61 V	293	22.0	13.5
8	#16500.00	46.5 PK	68.2	-21.7	1.38 V	44	31.4	15.1

Remarks:

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

Channel	TX Channel 116	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	*5580.00	114.4 PK			3.82 H	296	110.1	4.3
2	*5580.00	106.2 AV			3.82 H	296	101.9	4.3
3	11160.00	47.9 PK	74.0	-26.1	1.69 H	249	34.3	13.6
4	11160.00	36.9 AV	54.0	-17.1	1.69 H	249	23.3	13.6
5	#16740.00	46.0 PK	68.2	-22.2	2.37 H	188	29.4	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	*5580.00	119.9 PK			1.06 V	98	115.6	4.3
2	*5580.00	110.1 AV			1.06 V	98	105.8	4.3
3	11160.00	45.8 PK	74.0	-28.2	1.58 V	288	32.2	13.6
4	11160.00	35.6 AV	54.0	-18.4	1.58 V	288	22.0	13.6
5	#16740.00	46.8 PK	68.2	-21.4	1.40 V	56	30.2	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 140	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	*5700.00	109.8 PK			2.67 H	290	105.5	4.3
2	*5700.00	101.7 AV			2.67 H	290	97.4	4.3
3	#5725.00	59.8 PK	68.2	-8.4	2.67 H	290	55.4	4.4
4	11400.00	47.0 PK	74.0	-27.0	1.56 H	248	33.4	13.6
5	11400.00	36.1 AV	54.0	-17.9	1.56 H	248	22.5	13.6
6	#17100.00	45.9 PK	68.2	-22.3	2.35 H	159	28.1	17.8
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5700.00	116.4 PK			1.21 V	126	112.1	4.3
2	*5700.00	106.8 AV			1.21 V	126	102.5	4.3
3	**#5725.00**	**68.1 PK**	**68.2**	**-0.1**	**1.21 V**	**126**	**63.7**	**4.4**
4	11400.00	46.5 PK	74.0	-27.5	1.63 V	309	32.9	13.6
5	11400.00	35.8 AV	54.0	-18.2	1.63 V	309	22.2	13.6
6	#17100.00	46.6 PK	68.2	-21.6	1.39 V	66	28.8	17.8

Remarks:

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

802.11ax (HE20)

Channel	TX Channel 52	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	51.9 PK	74.0	-22.1	3.78 H	273	47.7	4.2
2	5150.00	42.0 AV	54.0	-12.0	3.78 H	273	37.8	4.2
3	*5260.00	115.5 PK			3.78 H	273	111.7	3.8
4	*5260.00	104.8 AV			3.78 H	273	101.0	3.8
5	#10520.00	47.3 PK	68.2	-20.9	1.60 H	252	33.9	13.4
6	15780.00	46.2 PK	74.0	-27.8	2.30 H	147	32.0	14.2
7	15780.00	33.8 AV	54.0	-20.2	2.30 H	147	19.6	14.2
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5071.06	54.5 PK	74.0	-19.5	1.00 V	68	50.4	4.1
2	5071.06	43.1 AV	54.0	-10.9	1.00 V	68	39.0	4.1
3	5088.00	52.4 PK	74.0	-21.6	1.00 V	68	48.1	4.3
4	5088.00	44.5 AV	54.0	-9.5	1.00 V	68	40.2	4.3
5	*5260.00	121.4 PK			1.00 V	68	117.6	3.8
6	*5260.00	108.9 AV			1.00 V	68	105.1	3.8
7	#10520.00	45.8 PK	68.2	-22.4	1.58 V	306	32.4	13.4
8	15780.00	46.0 PK	74.0	-28.0	1.41 V	50	31.8	14.2
9	15780.00	35.4 AV	54.0	-18.6	1.41 V	50	21.2	14.2

Remarks:

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

Channel	TX Channel 60	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	*5300.00	114.9 PK			3.69 H	291	111.2	3.7
2	*5300.00	104.4 AV			3.69 H	291	100.7	3.7
3	10600.00	47.6 PK	74.0	-26.4	1.58 H	243	34.2	13.4
4	10600.00	36.3 AV	54.0	-17.7	1.58 H	243	22.9	13.4
5	15900.00	46.8 PK	74.0	-27.2	2.32 H	166	33.3	13.5
6	15900.00	34.9 AV	54.0	-19.1	2.32 H	166	21.4	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	*5300.00	121.2 PK			1.01 V	65	117.5	3.7
2	*5300.00	108.7 AV			1.01 V	65	105.0	3.7
3	10600.00	45.3 PK	74.0	-28.7	1.63 V	281	31.9	13.4
4	10600.00	35.2 AV	54.0	-18.8	1.63 V	281	21.8	13.4
5	15900.00	47.0 PK	74.0	-27.0	1.43 V	42	33.5	13.5
6	15900.00	36.1 AV	54.0	-17.9	1.43 V	42	22.6	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.

Channel	TX Channel 64	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	*5320.00	113.2 PK			3.97 H	275	109.4	3.8
2	*5320.00	102.2 AV			3.97 H	275	98.4	3.8
3	5350.00	53.9 PK	74.0	-20.1	3.97 H	275	50.2	3.7
4	5350.00	46.5 AV	54.0	-7.5	3.97 H	275	42.8	3.7
5	10640.00	47.0 PK	74.0	-27.0	1.57 H	255	33.5	13.5
6	10640.00	36.4 AV	54.0	-17.6	1.57 H	255	22.9	13.5
7	15960.00	46.3 PK	74.0	-27.7	2.36 H	168	32.8	13.5
8	15960.00	33.9 AV	54.0	-20.1	2.36 H	168	20.4	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	*5320.00	120.2 PK			1.02 V	68	116.4	3.8
2	*5320.00	107.3 AV			1.02 V	68	103.5	3.8
3	5354.50	64.3 PK	74.0	-9.7	1.02 V	68	60.6	3.7
4	5354.50	53.8 AV	54.0	-0.2	1.02 V	68	50.1	3.7
5	10640.00	46.1 PK	74.0	-27.9	1.60 V	299	32.6	13.5
6	10640.00	35.5 AV	54.0	-18.5	1.60 V	299	22.0	13.5
7	15960.00	46.8 PK	74.0	-27.2	1.38 V	57	33.3	13.5
8	15960.00	36.1 AV	54.0	-17.9	1.38 V	57	22.6	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.

Channel	TX Channel 100	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	5456.90	54.4 PK	74.0	-19.6	3.63 H	281	50.3	4.1
2	5456.90	43.0 AV	54.0	-11.0	3.63 H	281	38.9	4.1
3	#5465.07	57.4 PK	68.2	-10.8	3.63 H	281	53.2	4.2
4	*5500.00	111.4 PK			3.63 H	281	107.2	4.2
5	*5500.00	100.7 AV			3.63 H	281	96.5	4.2
6	11000.00	47.3 PK	74.0	-26.7	1.54 H	242	33.8	13.5
7	11000.00	36.1 AV	54.0	-17.9	1.54 H	242	22.6	13.5
8	#16500.00	46.3 PK	68.2	-21.9	2.37 H	166	31.2	15.1
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5456.74	62.8 PK	74.0	-11.2	1.01 V	121	58.7	4.1
2	5456.74	49.9 AV	54.0	-4.1	1.01 V	121	45.8	4.1
3	#5468.02	67.5 PK	68.2	-0.7	1.01 V	121	63.3	4.2
4	*5500.00	116.6 PK			1.01 V	121	112.4	4.2
5	*5500.00	106.5 AV			1.01 V	121	102.3	4.2
6	11000.00	46.9 PK	74.0	-27.1	1.59 V	309	33.4	13.5
7	11000.00	36.2 AV	54.0	-17.8	1.59 V	309	22.7	13.5
8	#16500.00	46.6 PK	68.2	-21.6	1.45 V	70	31.5	15.1

Remarks:

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

Channel	TX Channel 116	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	*5580.00	115.1 PK			3.73 H	301	110.8	4.3
2	*5580.00	104.4 AV			3.73 H	301	100.1	4.3
3	11160.00	47.8 PK	74.0	-26.2	1.53 H	236	34.2	13.6
4	11160.00	36.3 AV	54.0	-17.7	1.53 H	236	22.7	13.6
5	#16740.00	46.7 PK	68.2	-21.5	2.42 H	153	30.1	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	*5580.00	121.2 PK			1.04 V	82	116.9	4.3
2	*5580.00	108.8 AV			1.04 V	82	104.5	4.3
3	11160.00	45.5 PK	74.0	-28.5	1.67 V	274	31.9	13.6
4	11160.00	35.4 AV	54.0	-18.6	1.67 V	274	21.8	13.6
5	#16740.00	47.4 PK	68.2	-20.8	1.39 V	32	30.8	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 140	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	*5700.00	109.3 PK			3.57 H	286	105.0	4.3
2	*5700.00	100.4 AV			3.57 H	286	96.1	4.3
3	#5725.00	60.2 PK	68.2	-8.0	3.57 H	286	55.8	4.4
4	11400.00	47.4 PK	74.0	-26.6	1.57 H	254	33.8	13.6
5	11400.00	36.6 AV	54.0	-17.4	1.57 H	254	23.0	13.6
6	#17100.00	45.9 PK	68.2	-22.3	2.32 H	166	28.1	17.8
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5700.00	119.2 PK			1.01 V	125	114.9	4.3
2	*5700.00	105.6 AV			1.01 V	125	101.3	4.3
3	#5725.00	67.9 PK	68.2	-0.3	1.01 V	125	63.5	4.4
4	11400.00	45.1 PK	74.0	-28.9	1.61 V	288	31.5	13.6
5	11400.00	35.3 AV	54.0	-18.7	1.61 V	288	21.7	13.6
6	#17100.00	46.9 PK	68.2	-21.3	1.47 V	28	29.1	17.8

Remarks:

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

802.11ax (HE40)

Channel	TX Channel 54	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	54.3 PK	74.0	-19.7	3.74 H	274	50.1	4.2
2	5150.00	45.0 AV	54.0	-9.0	3.74 H	274	40.8	4.2
3	*5270.00	114.8 PK			3.74 H	274	111.0	3.8
4	*5270.00	102.7 AV			3.74 H	274	98.9	3.8
5	5352.00	56.5 PK	74.0	-17.5	3.74 H	274	52.8	3.7
6	5352.00	46.9 AV	54.0	-7.1	3.74 H	274	43.2	3.7
7	#10540.00	47.4 PK	68.2	-20.8	1.47 H	231	34.0	13.4
8	15810.00	46.6 PK	74.0	-27.4	2.46 H	154	32.7	13.9
9	15810.00	34.0 AV	54.0	-20.0	2.46 H	154	20.1	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	55.5 PK	74.0	-18.5	1.01 V	69	51.3	4.2
2	5150.00	46.3 AV	54.0	-7.7	1.01 V	69	42.1	4.2
3	*5270.00	116.7 PK			1.01 V	69	112.9	3.8
4	*5270.00	106.1 AV			1.01 V	69	102.3	3.8
5	5350.00	65.8 PK	74.0	-8.2	1.01 V	69	62.1	3.7
6	**5350.00**	**53.9 AV**	**54.0**	**-0.1**	**1.01 V**	**69**	**50.2**	**3.7**
7	#10540.00	45.7 PK	68.2	-22.5	1.58 V	273	32.3	13.4
8	15810.00	47.3 PK	74.0	-26.7	1.42 V	35	33.4	13.9
9	15810.00	36.2 AV	54.0	-17.8	1.42 V	35	22.3	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 62	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	*5310.00	107.7 PK			3.65 H	290	104.0	3.7
2	*5310.00	96.5 AV			3.65 H	290	92.8	3.7
3	5356.10	57.1 PK	74.0	-16.9	3.65 H	290	53.4	3.7
4	5356.10	47.8 AV	54.0	-6.2	3.65 H	290	44.1	3.7
5	10620.00	47.9 PK	74.0	-26.1	1.61 H	245	34.5	13.4
6	10620.00	36.8 AV	54.0	-17.2	1.61 H	245	23.4	13.4
7	15930.00	45.8 PK	74.0	-28.2	2.40 H	169	32.3	13.5
8	15930.00	34.0 AV	54.0	-20.0	2.40 H	169	20.5	13.5
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5310.00	113.1 PK			1.05 V	62	109.4	3.7
2	*5310.00	101.0 AV			1.05 V	62	97.3	3.7
3	5350.00	63.1 PK	74.0	-10.9	1.05 V	62	59.4	3.7
4	5350.00	53.8 AV	54.0	-0.2	1.05 V	62	50.1	3.7
5	10620.00	45.5 PK	74.0	-28.5	1.64 V	299	32.1	13.4
6	10620.00	35.0 AV	54.0	-19.0	1.64 V	299	21.6	13.4
7	15930.00	46.0 PK	74.0	-28.0	1.46 V	65	32.5	13.5
8	15930.00	35.3 AV	54.0	-18.7	1.46 V	65	21.8	13.5

Remarks:

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

Channel	TX Channel 102	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	5460.00	53.8 PK	74.0	-20.2	3.81 H	270	49.7	4.1
2	5460.00	45.3 AV	54.0	-8.7	3.81 H	270	41.2	4.1
3	#5463.26	57.1 PK	68.2	-11.1	3.81 H	270	53.0	4.1
4	*5510.00	106.2 PK			3.81 H	270	102.0	4.2
5	*5510.00	95.6 AV			3.81 H	270	91.4	4.2
6	11020.00	47.2 PK	74.0	-26.8	1.54 H	241	33.7	13.5
7	11020.00	36.5 AV	54.0	-17.5	1.54 H	241	23.0	13.5
8	#16530.00	46.1 PK	68.2	-22.1	2.35 H	180	30.8	15.3
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5460.00	63.2 PK	74.0	-10.8	1.02 V	120	59.1	4.1
2	5460.00	51.6 AV	54.0	-2.4	1.02 V	120	47.5	4.1
3	#5470.00	67.6 PK	68.2	-0.6	1.02 V	120	63.4	4.2
4	*5510.00	113.0 PK			1.02 V	120	108.8	4.2
5	*5510.00	101.3 AV			1.02 V	120	97.1	4.2
6	11020.00	45.0 PK	74.0	-29.0	1.65 V	288	31.5	13.5
7	11020.00	35.2 AV	54.0	-18.8	1.65 V	288	21.7	13.5
8	#16530.00	46.9 PK	68.2	-21.3	1.43 V	39	31.6	15.3

Remarks:

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

Channel	TX Channel 110	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	5460.00	55.8 PK	74.0	-18.2	3.82 H	260	51.7	4.1
2	5460.00	45.2 AV	54.0	-8.8	3.82 H	260	41.1	4.1
3	#5470.00	58.6 PK	68.2	-9.6	3.82 H	260	54.4	4.2
4	*5550.00	115.5 PK			3.82 H	260	111.3	4.2
5	*5550.00	102.4 AV			3.82 H	260	98.2	4.2
6	11100.00	47.4 PK	74.0	-26.6	1.65 H	233	34.0	13.4
7	11100.00	36.4 AV	54.0	-17.6	1.65 H	233	23.0	13.4
8	#16650.00	46.0 PK	68.2	-22.2	2.43 H	176	29.8	16.2
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5460.00	64.2 PK	74.0	-9.8	1.04 V	122	60.1	4.1
2	5460.00	52.1 AV	54.0	-1.9	1.04 V	122	48.0	4.1
3	#5470.00	67.9 PK	68.2	-0.3	1.04 V	122	63.7	4.2
4	*5550.00	116.5 PK			1.04 V	122	112.3	4.2
5	*5550.00	106.0 AV			1.04 V	122	101.8	4.2
6	11100.00	45.6 PK	74.0	-28.4	1.66 V	269	32.2	13.4
7	11100.00	35.6 AV	54.0	-18.4	1.66 V	269	22.2	13.4
8	#16650.00	47.6 PK	68.2	-20.6	1.35 V	21	31.4	16.2

Remarks:

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

Channel	TX Channel 134	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	*5670.00	113.3 PK			3.65 H	287	108.9	4.4
2	*5670.00	101.0 AV			3.65 H	287	96.6	4.4
3	#5725.00	59.7 PK	68.2	-8.5	3.65 H	287	55.3	4.4
4	11340.00	47.1 PK	74.0	-26.9	1.50 H	242	33.2	13.9
5	11340.00	36.5 AV	54.0	-17.5	1.50 H	242	22.6	13.9
6	#17010.00	46.2 PK	68.2	-22.0	2.29 H	175	28.7	17.5
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5670.00	115.2 PK			1.08 V	126	110.8	4.4
2	*5670.00	104.3 AV			1.08 V	126	99.9	4.4
3	#5725.00	67.5 PK	68.2	-0.7	1.08 V	126	63.1	4.4
4	11340.00	45.4 PK	74.0	-28.6	1.62 V	293	31.5	13.9
5	11340.00	34.6 AV	54.0	-19.4	1.62 V	293	20.7	13.9
6	#17010.00	45.3 PK	68.2	-22.9	1.44 V	57	27.8	17.5

Remarks:

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

802.11ax (HE80)

Channel	TX Channel 58	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	51.2 PK	74.0	-22.8	3.89 H	295	47.0	4.2
2	5150.00	43.3 AV	54.0	-10.7	3.89 H	295	39.1	4.2
3	*5290.00	104.9 PK			3.89 H	295	101.2	3.7
4	*5290.00	94.8 AV			3.89 H	295	91.1	3.7
5	5356.08	53.7 PK	74.0	-20.3	3.89 H	295	50.0	3.7
6	5356.08	47.3 AV	54.0	-6.7	3.89 H	295	43.6	3.7
7	#10580.00	47.8 PK	68.2	-20.4	1.59 H	249	34.4	13.4
8	15870.00	46.0 PK	74.0	-28.0	2.46 H	181	32.3	13.7
9	15870.00	34.5 AV	54.0	-19.5	2.46 H	181	20.8	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	5146.85	56.4 PK	74.0	-17.6	1.01 V	65	52.2	4.2
2	5146.85	45.0 AV	54.0	-9.0	1.01 V	65	40.8	4.2
3	*5290.00	111.1 PK			1.01 V	65	107.4	3.7
4	*5290.00	100.1 AV			1.01 V	65	96.4	3.7
5	5354.20	65.6 PK	74.0	-8.4	1.01 V	65	61.9	3.7
6	5354.20	53.6 AV	54.0	-0.4	1.01 V	65	49.9	3.7
7	#10580.00	45.8 PK	68.2	-22.4	1.62 V	292	32.4	13.4
8	15870.00	46.3 PK	74.0	-27.7	1.47 V	63	32.6	13.7
9	15870.00	35.3 AV	54.0	-18.7	1.47 V	63	21.6	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 106	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	5456.02	56.6 PK	74.0	-17.4	3.59 H	292	52.5	4.1
2	5456.02	47.8 AV	54.0	-6.2	3.59 H	292	43.7	4.1
3	#5463.90	57.2 PK	68.2	-11.0	3.59 H	292	53.1	4.1
4	*5530.00	102.3 PK			3.59 H	292	98.1	4.2
5	*5530.00	92.9 AV			3.59 H	292	88.7	4.2
6	#5809.56	50.7 PK	68.2	-17.5	3.59 H	292	46.1	4.6
7	11060.00	46.7 PK	74.0	-27.3	1.44 H	239	33.3	13.4
8	11060.00	36.3 AV	54.0	-17.7	1.44 H	239	22.9	13.4
9	#16590.00	46.3 PK	68.2	-21.9	2.29 H	189	30.6	15.7
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	5457.05	65.2 PK	74.0	-8.8	1.03 V	118	61.1	4.1
2	5457.05	53.6 AV	54.0	-0.4	1.03 V	118	49.5	4.1
3	#5467.05	67.5 PK	68.2	-0.7	1.03 V	118	63.3	4.2
4	*5530.00	110.9 PK			1.03 V	118	106.7	4.2
5	*5530.00	99.1 AV			1.03 V	118	94.9	4.2
6	#5725.66	54.1 PK	68.2	-14.1	1.03 V	118	49.7	4.4
7	11060.00	45.4 PK	74.0	-28.6	1.64 V	279	32.0	13.4
8	11060.00	35.5 AV	54.0	-18.5	1.64 V	279	22.1	13.4
9	#16590.00	47.0 PK	68.2	-21.2	1.48 V	32	31.3	15.7

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 122	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	5460.00	57.4 PK	74.0	-16.6	3.63 H	277	53.3	4.1
2	5460.00	48.0 AV	54.0	-6.0	3.63 H	277	43.9	4.1
3	#5470.00	59.9 PK	68.2	-8.3	3.63 H	277	55.7	4.2
4	*5610.00	109.0 PK			3.63 H	277	104.8	4.2
5	*5610.00	98.5 AV			3.63 H	277	94.3	4.2
6	#5725.00	60.7 PK	68.2	-7.5	3.63 H	277	56.3	4.4
7	11220.00	47.7 PK	74.0	-26.3	1.68 H	246	33.9	13.8
8	11220.00	36.4 AV	54.0	-17.6	1.68 H	246	22.6	13.8
9	#16830.00	45.8 PK	68.2	-22.4	2.45 H	192	29.1	16.7
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	5460.00	63.9 PK	74.0	-10.1	1.01 V	123	59.8	4.1
2	5460.00	53.0 AV	54.0	-1.0	1.01 V	123	48.9	4.1
3	#5470.00	66.8 PK	68.2	-1.4	1.01 V	123	62.6	4.2
4	*5610.00	112.8 PK			1.01 V	123	108.6	4.2
5	*5610.00	102.8 AV			1.01 V	123	98.6	4.2
6	#5725.00	67.8 PK	68.2	-0.4	1.01 V	123	63.4	4.4
7	11220.00	45.4 PK	74.0	-28.6	1.65 V	282	31.6	13.8
8	11220.00	35.5 AV	54.0	-18.5	1.65 V	282	21.7	13.8
9	#16830.00	47.1 PK	68.2	-21.1	1.34 V	16	30.4	16.7

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.

Below 1GHz Data:

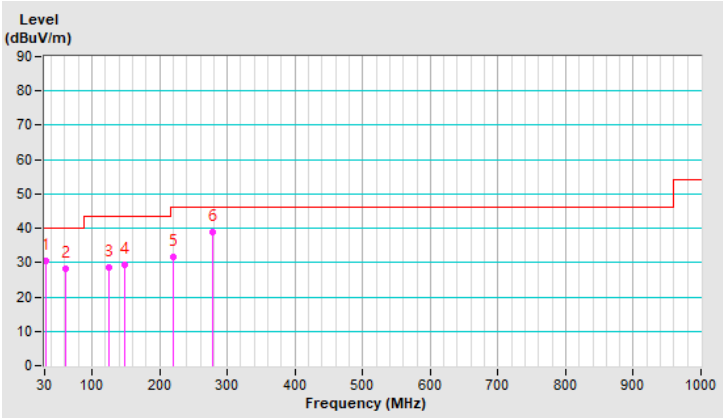
802.11ax (HE40)

Channel	TX Channel 62	**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	32.47	30.6 QP	40.0	-9.4	1.00 H	0	39.4	-8.8
2	61.45	28.1 QP	40.0	-11.9	2.00 H	356	36.5	-8.4
3	125.06	28.5 QP	43.5	-15.0	3.00 H	98	37.1	-8.6
4	148.46	29.3 QP	43.5	-14.2	2.00 H	256	36.2	-6.9
5	220.73	31.5 QP	46.0	-14.5	1.00 H	218	41.3	-9.8
6	278.13	38.8 QP	46.0	-7.2	1.00 H	101	45.4	-6.6

Remarks:

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

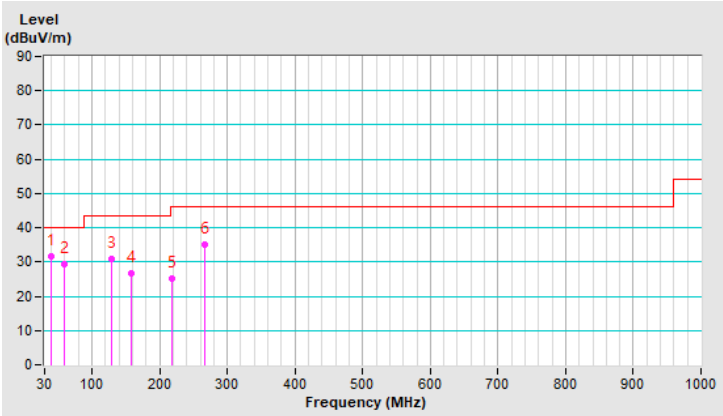


Channel	TX Channel 62	Detector Function	Quasi-Peak (QP)
Frequency Range	9kHz ~ 1GHz		

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	40.62	31.6 QP	40.0	-8.4	1.50 V	63	39.6	-8.0
2	59.22	29.4 QP	40.0	-10.6	1.00 V	357	37.5	-8.1
3	129.35	30.9 QP	43.5	-12.6	1.00 V	0	39.1	-8.2
4	158.91	26.5 QP	43.5	-17.0	1.00 V	179	33.4	-6.9
5	218.47	25.0 QP	46.0	-21.0	1.50 V	360	34.9	-9.9
6	267.60	35.2 QP	46.0	-10.8	2.00 V	250	42.4	-7.2

Remarks:

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



4.2 Conducted Emission Measurement

4.2.1 Limits of Conducted Emission Measurement

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

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

4.2.2 Test Instruments

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver R&S	ESCS 30	847124/029	Oct. 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. 26, 2020	Sep. 25, 2021
Fixed attenuator EMCI	STI02-2200-10	005	Aug. 29, 2020	Aug. 28, 2021
Software BVADT	BVADT_Cond_ V7.3.7.4	NA	NA	NA

Note:

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

4.2.3 Test Procedure

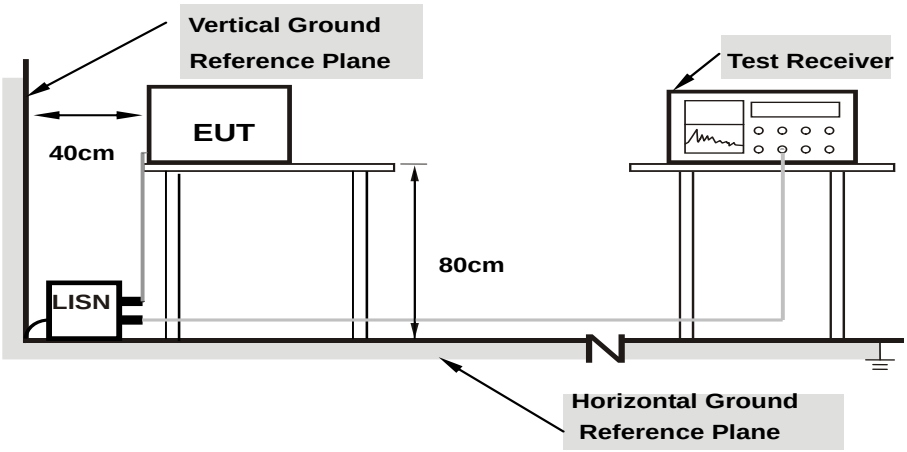
a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling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

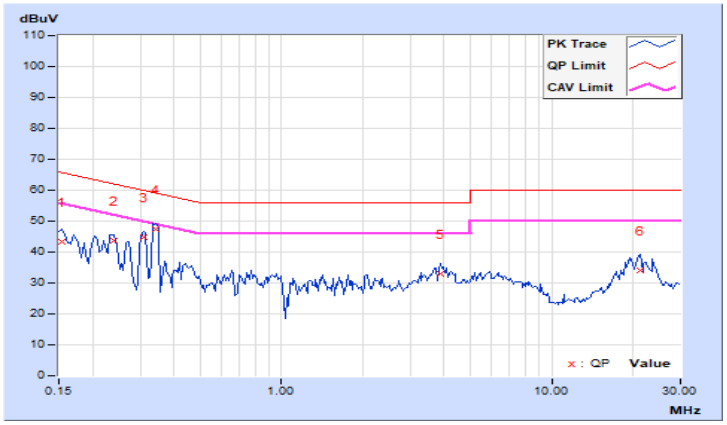
4.2.7 Test Results

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

Phase Of Power : Line (L)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15391	9.92	33.43	17.96	43.35	27.88	65.79	55.79	-22.44	-27.91
2	0.23984	9.96	33.91	30.31	43.87	40.27	62.10	52.10	-18.23	-11.83
3	0.31016	9.97	34.96	31.13	44.93	41.10	59.97	49.97	-15.04	-8.87
4	**0.34141**	**9.97**	**37.53**	**35.06**	**47.50**	**45.03**	**59.17**	**49.17**	**-11.67**	**-4.14**
5	3.85547	10.22	22.76	15.58	32.98	25.80	56.00	46.00	-23.02	-20.20
6	21.30469	11.40	22.76	14.07	34.16	25.47	60.00	50.00	-25.84	-24.53

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

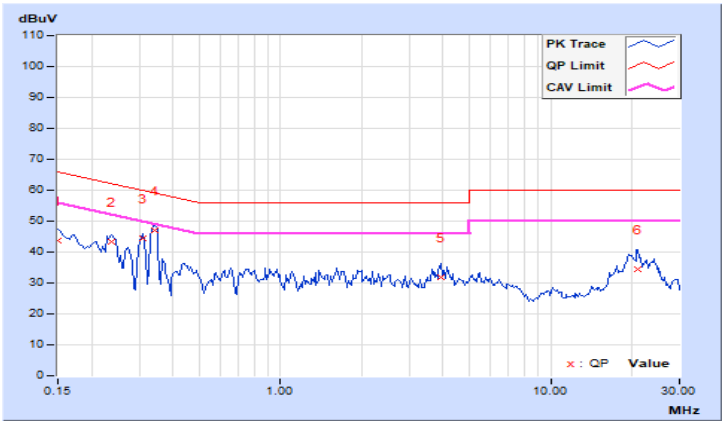


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)

Phase Of Power : Neutral (N)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	9.93	33.88	20.62	43.81	30.55	66.00	56.00	-22.19	-25.45
2	0.23594	9.97	33.28	29.54	43.25	39.51	62.24	52.24	-18.99	-12.73
3	0.31016	9.98	34.35	30.40	44.33	40.38	59.97	49.97	-15.64	-9.59
4	0.34141	9.99	37.23	34.65	47.22	44.64	59.17	49.17	-11.95	-4.53
5	3.92578	10.23	21.54	13.26	31.77	23.49	56.00	46.00	-24.23	-22.51
6	21.06250	11.12	23.48	14.57	34.60	25.69	60.00	50.00	-25.40	-24.31

Remarks:

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



4.3 Transmit Power Measurement

4.3.1 Limits of Transmit Power Measurement

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

*B is the 26 dB emission bandwidth in megahertz

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

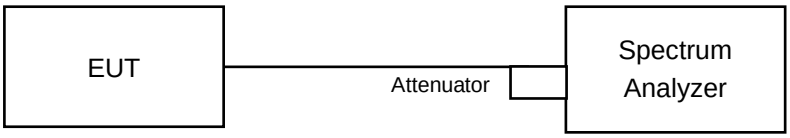
Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \leq 4$;
Array Gain = 0 dB (i.e., no array gain) for channel widths ≥ 40 MHz for any N_{ANT};
Array Gain = 5 log(N_{ANT}/N_{SS}) dB or 3 dB, whichever is less for 20-MHz channel widths with $N_{ANT} \geq 5$.

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

4.3.2 Test Setup

FOR POWER OUTPUT MEASUREMENT

FOR 26dB OCCUPIED BANDWIDTH



4.3.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.3.4 Test Procedure

FOR POWER OUTPUT MEASUREMENT

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

FOR 26dB OCCUPIED BANDWIDTH

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

4.3.5 Deviation from Test Standard

No deviation.

4.3.6 EUT Operating Condition

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

4.3.7 Test Results

CDD Mode

802.11a

Power Output:

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
52	5260	20.17	19.71	197.533	22.96	24.00	Pass
60	5300	20.22	19.75	199.602	23.00	24.00	Pass
64	5320	20.31	19.81	203.118	23.08	24.00	Pass
100	5500	19.71	20.19	198.013	22.97	24.00	Pass
116	5580	20.22	20.10	207.525	23.17	24.00	Pass
140	5700	20.83	19.27	205.588	23.13	24.00	Pass

26dB OCCUPIED BANDWIDTH

Channel	Frequency (MHz)	26dBc Bandwidth (MHz)	
		Chain 0	Chain 1
52	5260	20.62	20.43
60	5300	20.62	20.72
64	5320	20.62	20.82
100	5500	20.78	20.76
116	5580	20.92	20.68
140	5700	21.65	20.82

Note: For U-NII-2A, U-NII-2C Band output power limitation is determined based on 26dBc bandwidth

Power Limit = 11dBm + 10logB < U-NII-2A, U-NII-2C >			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Limit (dBm)
52	5260	20.43	24.1 > 24
60	5300	20.62	24.14 > 24
64	5320	20.62	24.14 > 24
100	5500	20.76	24.17 > 24
116	5580	20.68	24.15 > 24
140	5700	20.82	24.18 > 24

802.11ac (VHT20)

Power Output:

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
52	5260	20.24	19.93	204.083	23.10	24.00	Pass
60	5300	20.44	19.93	209.063	23.20	24.00	Pass
64	5320	20.47	19.91	209.378	23.21	24.00	Pass
100	5500	20.14	20.11	205.841	23.14	24.00	Pass
116	5580	19.95	19.90	196.579	22.94	24.00	Pass
140	5700	20.39	19.29	194.314	22.89	24.00	Pass

26dB OCCUPIED BANDWIDTH

Channel	Frequency (MHz)	26dBc Bandwidth (MHz)	
		Chain 0	Chain 1
52	5260	21.75	21.83
60	5300	21.71	21.83
64	5320	21.88	21.98
100	5500	21.44	21.35
116	5580	21.61	21.81
140	5700	22.11	21.43

Note: For U-NII-2A, U-NII-2C Band output power limitation is determined based on 26dBc bandwidth

Power Limit = 11dBm + 10logB < U-NII-2A, U-NII-2C >			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Limit (dBm)
52	5260	21.75	24.37 > 24
60	5300	21.71	24.36 > 24
64	5320	21.88	24.4 > 24
100	5500	21.35	24.29 > 24
116	5580	21.61	24.34 > 24
140	5700	21.43	24.31 > 24

802.11ac (VHT40)

Power Output:

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
54	5270	20.79	20.51	232.41	23.66	24.00	Pass
62	5310	20.84	20.47	232.768	23.67	24.00	Pass
102	5510	20.29	20.47	218.335	23.39	24.00	Pass
110	5550	20.32	20.67	224.327	23.51	24.00	Pass
134	5670	20.98	19.79	220.594	23.44	24.00	Pass

26dB OCCUPIED BANDWIDTH

Channel	Frequency (MHz)	26dBc Bandwidth (MHz)	
		Chain 0	Chain 1
54	5270	42.95	42.74
62	5310	42.57	42.56
102	5510	42.45	42.43
110	5550	42.8	42.46
134	5670	42.46	42.52

Note: For U-NII-2A, U-NII-2C Band output power limitation is determined based on 26dBc bandwidth

Power Limit = 11dBm + 10logB < U-NII-2A, U-NII-2C >			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Limit (dBm)
54	5270	42.74	27.3 > 24
62	5310	42.56	27.29 > 24
102	5510	42.43	27.27 > 24
110	5550	42.46	27.27 > 24
134	5670	42.46	27.27 > 24

802.11ac (VHT80)

Power Output:

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
58	5290	20.84	20.42	231.493	23.65	24.00	Pass
106	5530	20.01	20.38	209.375	23.21	24.00	Pass
122	5610	20.83	20.45	231.977	23.65	24.00	Pass

26dB OCCUPIED BANDWIDTH

Channel	Frequency (MHz)	26dBc Bandwidth (MHz)	
		Chain 0	Chain 1
58	5290	83.46	83.3
106	5530	83.55	83.15
122	5610	83.63	83.49

Note: For U-NII-2A, U-NII-2C Band output power limitation is determined based on 26dBc bandwidth

Power Limit = 11dBm + 10logB < U-NII-2A, U-NII-2C >			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Limit (dBm)
58	5290	83.3	30.2 > 24
106	5530	83.15	30.19 > 24
122	5610	83.49	30.21 > 24

802.11ax (HE20)

Power Output:

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
52	5260	20.44	20.20	215.375	23.33	24.00	Pass
60	5300	20.76	20.19	223.596	23.49	24.00	Pass
64	5320	20.83	20.16	224.813	23.52	24.00	Pass
100	5500	20.37	20.36	217.536	23.38	24.00	Pass
116	5580	20.23	20.12	208.24	23.19	24.00	Pass
140	5700	20.64	19.54	205.827	23.14	24.00	Pass

26dB OCCUPIED BANDWIDTH

Channel	Frequency (MHz)	26dBc Bandwidth (MHz)	
		Chain 0	Chain 1
52	5260	21.75	21.83
60	5300	21.71	21.83
64	5320	21.88	21.98
100	5500	21.44	21.35
116	5580	21.61	21.81
140	5700	22.11	21.43

Note: For U-NII-2A, U-NII-2C Band output power limitation is determined based on 26dBc bandwidth

Power Limit = 11dBm + 10logB < U-NII-2A, U-NII-2C >			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Limit (dBm)
52	5260	21.75	24.37 > 24
60	5300	21.71	24.36 > 24
64	5320	21.88	24.4 > 24
100	5500	21.35	24.29 > 24
116	5580	21.61	24.34 > 24
140	5700	21.43	24.31 > 24

802.11ax (HE40)

Power Output:

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
54	5270	21.03	20.76	245.889	23.91	24.00	Pass
62	5310	21.11	20.74	247.699	23.94	24.00	Pass
102	5510	20.54	20.75	232.09	23.66	24.00	Pass
110	5550	20.56	20.93	237.642	23.76	24.00	Pass
134	5670	21.21	20.07	233.754	23.69	24.00	Pass

26dB OCCUPIED BANDWIDTH

Channel	Frequency (MHz)	26dBc Bandwidth (MHz)	
		Chain 0	Chain 1
54	5270	42.95	42.74
62	5310	42.57	42.56
102	5510	42.45	42.43
110	5550	42.8	42.46
134	5670	42.46	42.52

Note: For U-NII-2A, U-NII-2C Band output power limitation is determined based on 26dBc bandwidth

Power Limit = 11dBm + 10logB < U-NII-2A, U-NII-2C >			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Limit (dBm)
54	5270	42.74	27.3 > 24
62	5310	42.56	27.29 > 24
102	5510	42.43	27.27 > 24
110	5550	42.46	27.27 > 24
134	5670	42.46	27.27 > 24

802.11ax (HE80)

Power Output:

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
58	5290	21.06	20.63	243.255	23.86	24.00	Pass
106	5530	20.23	20.65	221.584	23.46	24.00	Pass
122	5610	21.06	20.73	245.948	23.91	24.00	Pass

26dB OCCUPIED BANDWIDTH

Channel	Frequency (MHz)	26dBc Bandwidth (MHz)	
		Chain 0	Chain 1
58	5290	83.46	83.3
106	5530	83.55	83.15
122	5610	83.63	83.49

Note: For U-NII-2A, U-NII-2C Band output power limitation is determined based on 26dBc bandwidth

Power Limit = 11dBm + 10logB < U-NII-2A, U-NII-2C >			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Limit (dBm)
58	5290	83.3	30.2 > 24
106	5530	83.15	30.19 > 24
122	5610	83.49	30.21 > 24

Beamforming Mode

802.11ac (VHT20)

Power Output:

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
52	5260	19.72	19.40	180.853	22.57	23.24	Pass
60	5300	19.96	19.43	186.783	22.71	23.24	Pass
64	5320	19.99	19.42	187.268	22.72	23.24	Pass
100	5500	19.51	19.71	182.871	22.62	23.24	Pass
116	5580	19.95	19.90	196.579	22.94	23.24	Pass
140	5700	20.39	19.29	194.314	22.89	23.24	Pass

Note: 1. The directional gain $= 10 \log[(10^{G1/20} + 10^{G2/20})^2 / 2] = 6.76\text{dBi} > 6\text{dBi}$, so the power limit shall be reduced to 24-(6.76-6) = 23.24dBm

26dB OCCUPIED BANDWIDTH

Channel	Frequency (MHz)	26dBc Bandwidth (MHz)	
		Chain 0	Chain 1
52	5260	21.75	21.83
60	5300	21.71	21.83
64	5320	21.88	21.98
100	5500	21.44	21.35
116	5580	21.61	21.81
140	5700	22.11	21.43

Note: For U-NII-2A, U-NII-2C Band output power limitation is determined based on 26dBc bandwidth

Power Limit = 11dBm + 10logB < U-NII-2A, U-NII-2C >			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Limit (dBm)
52	5260	21.75	24.37 > 24
60	5300	21.71	24.36 > 24
64	5320	21.88	24.4 > 24
100	5500	21.35	24.29 > 24
116	5580	21.61	24.34 > 24
140	5700	21.43	24.31 > 24

802.11ac (VHT40)

Power Output:

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
54	5270	19.80	19.67	188.182	22.75	23.24	Pass
62	5310	19.78	19.64	187.105	22.72	23.24	Pass
102	5510	19.68	19.90	190.62	22.80	23.24	Pass
110	5550	19.79	19.98	194.82	22.90	23.24	Pass
134	5670	20.38	19.47	197.656	22.96	23.24	Pass

Note: 1. The directional gain $= 10 \log[(10^{G1/20} + 10^{G2/20})^2 / 2] = 6.76\text{dBi} > 6\text{dBi}$, so the power limit shall be reduced to 24-(6.76-6) = 23.24dBm

26dB OCCUPIED BANDWIDTH

Channel	Frequency (MHz)	26dBc Bandwidth (MHz)	
		Chain 0	Chain 1
54	5270	42.95	42.74
62	5310	42.57	42.56
102	5510	42.45	42.43
110	5550	42.8	42.46
134	5670	42.46	42.52

Note: For U-NII-2A, U-NII-2C Band output power limitation is determined based on 26dBc bandwidth

Power Limit = 11dBm + 10logB < U-NII-2A, U-NII-2C >			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Limit (dBm)
54	5270	42.74	27.3 > 24
62	5310	42.56	27.29 > 24
102	5510	42.43	27.27 > 24
110	5550	42.46	27.27 > 24
134	5670	42.46	27.27 > 24

802.11ac (VHT80)

Power Output:

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
58	5290	19.65	19.51	181.588	22.59	23.24	Pass
106	5530	19.55	19.66	182.627	22.62	23.24	Pass
122	5610	19.78	19.42	182.559	22.61	23.24	Pass

Note: 1. The directional gain = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2] = 6.76dBi > 6dBi, so the power limit shall be reduced to 24-(6.76-6) = 23.24dBm

26dB OCCUPIED BANDWIDTH

Channel	Frequency (MHz)	26dBc Bandwidth (MHz)	
		Chain 0	Chain 1
58	5290	83.46	83.3
106	5530	83.55	83.15
122	5610	83.63	83.49

Note: For U-NII-2A, U-NII-2C Band output power limitation is determined based on 26dBc bandwidth

Power Limit = 11dBm + 10logB < U-NII-2A, U-NII-2C >			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Limit (dBm)
58	5290	83.3	30.2 > 24
106	5530	83.15	30.19 > 24
122	5610	83.49	30.21 > 24

802.11ax (HE20)

Power Output:

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
52	5260	19.98	19.64	191.585	22.82	23.24	Pass
60	5300	20.19	19.65	196.729	22.94	23.24	Pass
64	5320	20.22	19.63	197.029	22.95	23.24	Pass
100	5500	19.74	19.95	193.044	22.86	23.24	Pass
116	5580	20.23	20.12	208.24	23.19	23.24	Pass
140	5700	20.64	19.54	205.827	23.14	23.24	Pass

Note: 1. The directional gain = $10 \log[(10^{G1/20} + 10^{G2/20})^2 / 2]$ = 6.76dBi > 6dBi, so the power limit shall be reduced to 24-(6.76-6) = 23.24dBm

26dB OCCUPIED BANDWIDTH

Channel	Frequency (MHz)	26dBc Bandwidth (MHz)	
		Chain 0	Chain 1
52	5260	21.75	21.83
60	5300	21.71	21.83
64	5320	21.88	21.98
100	5500	21.44	21.35
116	5580	21.61	21.81
140	5700	22.11	21.43

Note: For U-NII-2A, U-NII-2C Band output power limitation is determined based on 26dBc bandwidth

Power Limit = 11dBm + 10logB < U-NII-2A, U-NII-2C >			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Limit (dBm)
52	5260	21.75	24.37 > 24
60	5300	21.71	24.36 > 24
64	5320	21.88	24.4 > 24
100	5500	21.35	24.29 > 24
116	5580	21.61	24.34 > 24
140	5700	21.43	24.31 > 24

802.11ax (HE40)

Power Output:

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
54	5270	20.00	19.88	197.275	22.95	23.24	Pass
62	5310	19.98	19.92	197.715	22.96	23.24	Pass
102	5510	19.95	20.18	203.087	23.08	23.24	Pass
110	5550	20.06	20.21	206.345	23.15	23.24	Pass
134	5670	20.61	19.68	207.977	23.18	23.24	Pass

Note: 1. The directional gain = $10 \log[(10^{G1/20} + 10^{G2/20})^2 / 2]$ = 6.76dBi > 6dBi, so the power limit shall be reduced to 24-(6.76-6) = 23.24dBm

26dB OCCUPIED BANDWIDTH

Channel	Frequency (MHz)	26dBc Bandwidth (MHz)	
		Chain 0	Chain 1
54	5270	42.95	42.74
62	5310	42.57	42.56
102	5510	42.45	42.43
110	5550	42.8	42.46
134	5670	42.46	42.52

Note: For U-NII-2A, U-NII-2C Band output power limitation is determined based on 26dBc bandwidth

Power Limit = 11dBm + 10logB < U-NII-2A, U-NII-2C >			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Limit (dBm)
54	5270	42.74	27.3 > 24
62	5310	42.56	27.29 > 24
102	5510	42.43	27.27 > 24
110	5550	42.46	27.27 > 24
134	5670	42.46	27.27 > 24

802.11ax (HE80)

Power Output:

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
58	5290	19.92	19.71	191.715	22.83	23.24	Pass
106	5530	19.81	19.93	194.121	22.88	23.24	Pass
122	5610	20.05	19.62	192.78	22.85	23.24	Pass

Note: 1. The directional gain = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2] = 6.76dBi > 6dBi, so the power limit shall be reduced to 24-(6.76-6) = 23.24dBm

26dB OCCUPIED BANDWIDTH

Channel	Frequency (MHz)	26dBc Bandwidth (MHz)	
		Chain 0	Chain 1
58	5290	83.46	83.3
106	5530	83.55	83.15
122	5610	83.63	83.49

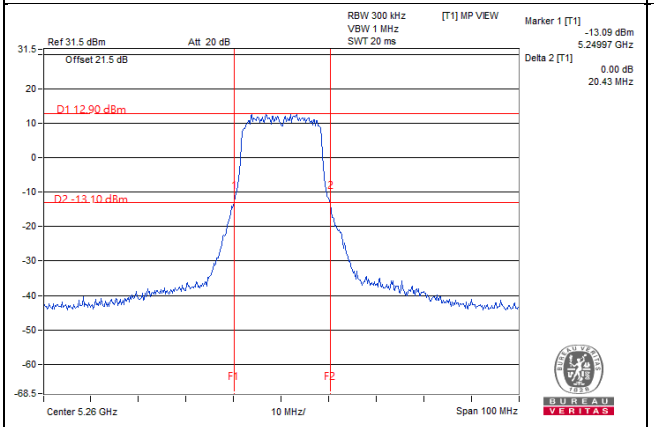
Note: For U-NII-2A, U-NII-2C Band output power limitation is determined based on 26dBc bandwidth

Power Limit = 11dBm + 10logB < U-NII-2A, U-NII-2C >			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Limit (dBm)
58	5290	83.3	30.2 > 24
106	5530	83.15	30.19 > 24
122	5610	83.49	30.21 > 24

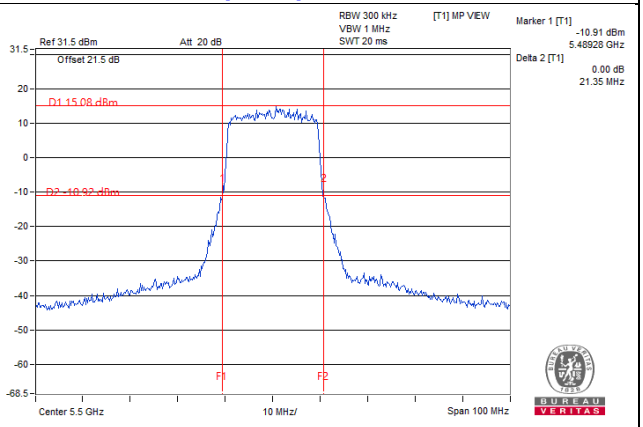
26dB OCCUPIED BANDWIDTH

Spectrum Plot of Worst Value

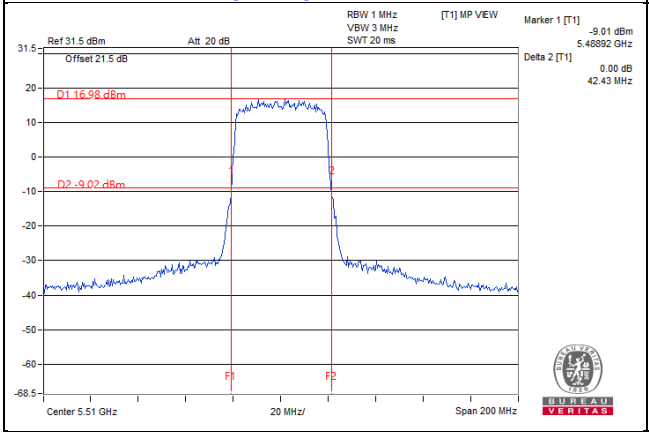
802.11a / Chain 1 : CH52



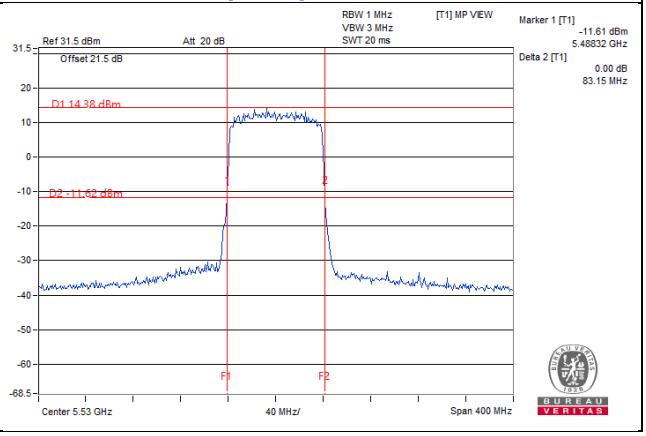
802.11ax (HE20) / Chain 1 : CH100



802.11ax (HE40) / Chain 1 : CH102

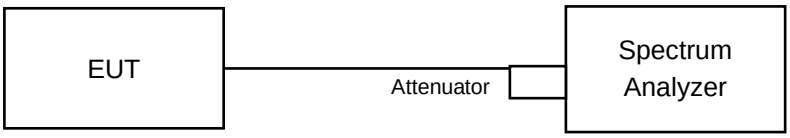


802.11ax (HE80) / Chain 1 : CH106



4.4 Occupied Bandwidth Measurement

4.4.1 Test Setup



4.4.2 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.4.3 Test Procedure

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

4.4.4 Test Results

802.11a

Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
52	5260	16.44	16.44
60	5300	16.44	16.44
64	5320	16.44	16.44
100	5500	16.44	16.44
116	5580	16.56	16.56
140	5700	16.44	16.44

802.11ax (HE20)

Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
52	5260	19.08	18.96
60	5300	18.96	18.96
64	5320	19.08	18.96
100	5500	19.08	19.08
116	5580	19.08	19.08
140	5700	18.96	19.08

802.11ax (HE40)

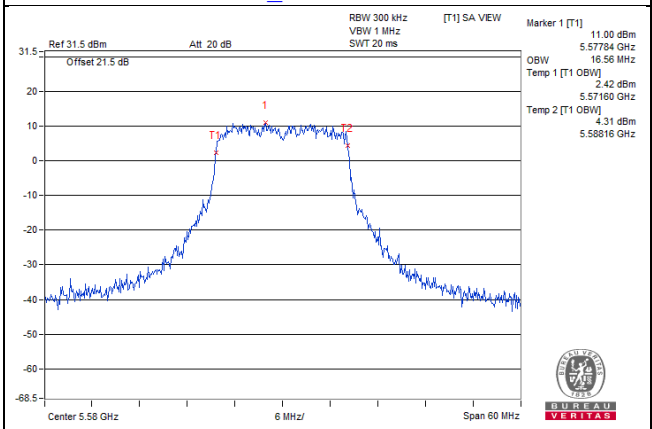
Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
54	5270	38.16	37.92
62	5310	38.16	37.92
102	5510	37.92	38.16
110	5550	38.16	38.16
134	5670	38.16	38.16

802.11ax (HE80)

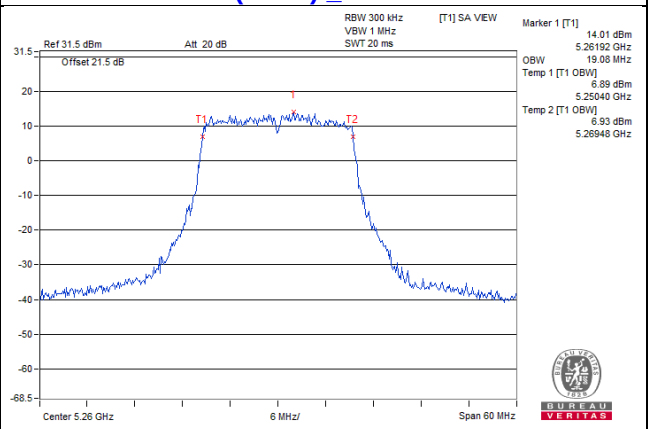
Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
58	5290	77.28	77.28
106	5530	77.28	77.28
122	5610	77.76	77.28

Spectrum Plot of Max. Value

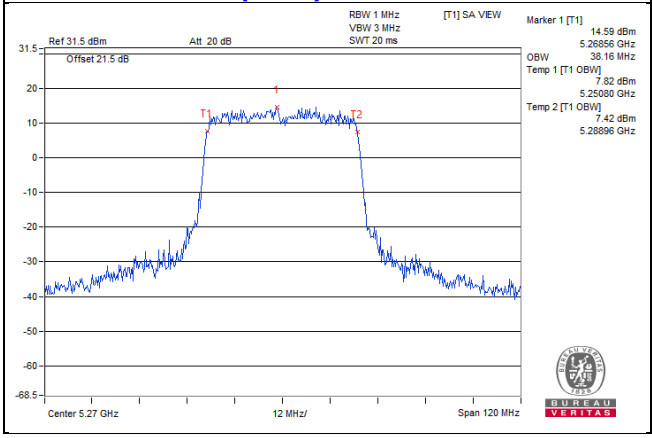
802.11a_Chain 0 / CH116



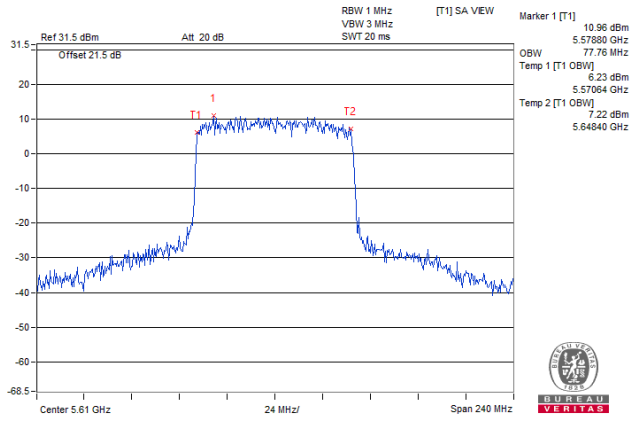
802.11ax (HE20) _Chain 0 / CH52



802.11ax (HE40) _Chain 0 / CH54



802.11ax (HE80) _Chain 0 / CH122

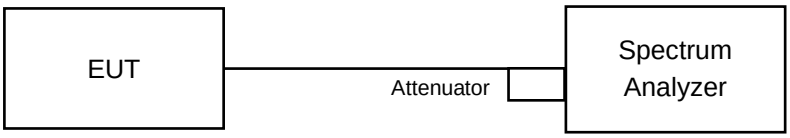


4.5 Peak Power Spectral Density Measurement

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-2A, U-NII-2C 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)

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

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				
52	5260	6.72	6.43	0.36	9.95	10.24	PASS
60	5300	7.16	6.44	0.36	10.18	10.24	PASS
64	5320	6.73	6.29	0.36	9.88	10.24	PASS
100	5500	5.91	6.63	0.36	9.65	10.24	PASS
116	5580	7.01	6.39	0.36	10.08	10.24	PASS
140	5700	6.78	5.99	0.36	9.77	10.24	PASS

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

2. The directional gain = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2] = 6.76dBi > 6dBi, so the power density limit shall be reduced to 11-(6.76-6) = 10.24dBm

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

802.11ax (HE20)

Chan.	Chan. Freq. (MHz)	PSD w/o Duty Factor (dBm/MHz)		Duty Factor (dB)	Total PSD (dBm/MHz)	Max. PSD Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1				
52	5260	6.51	6.16	0.22	9.57	10.24	PASS
60	5300	6.29	6.58	0.22	9.67	10.24	PASS
64	5320	6.84	5.81	0.22	9.59	10.24	PASS
100	5500	6.75	6.39	0.22	9.81	10.24	PASS
116	5580	6.35	6.02	0.22	9.42	10.24	PASS
140	5700	6.40	5.12	0.22	9.04	10.24	PASS

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

2. The directional gain = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2] = 6.76dBi > 6dBi, so the power density limit shall be reduced to 11-(6.76-6) = 10.24dBm

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				
54	5270	4.28	3.77	0.23	7.27	10.24	PASS
62	5310	4.28	3.36	0.23	7.08	10.24	PASS
102	5510	3.57	3.50	0.23	6.78	10.24	PASS
110	5550	3.94	3.36	0.23	6.90	10.24	PASS
134	5670	4.66	3.20	0.23	7.23	10.24	PASS

Note:
1. Method a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. The directional gain = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2] = 6.76dBi > 6dBi, so the power density limit shall be reduced to 11-(6.76-6) = 10.24dBm
3. Refer to section 3.3 for duty cycle spectrum plot.

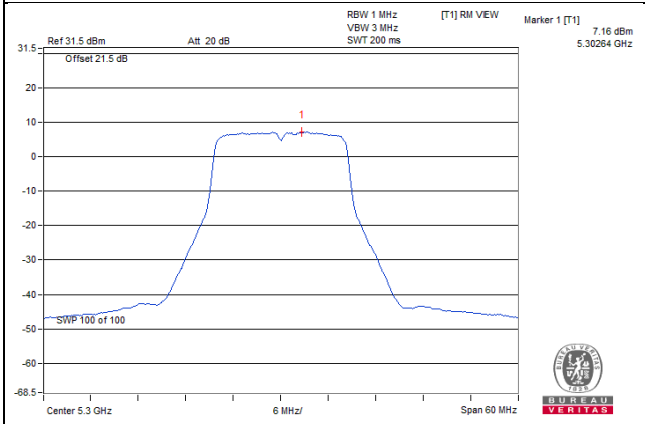
802.11ax (HE80)

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				
58	5290	1.47	0.67	0.22	4.32	10.24	PASS
106	5530	0.67	0.64	0.22	3.89	10.24	PASS
122	5610	1.05	0.85	0.22	4.18	10.24	PASS

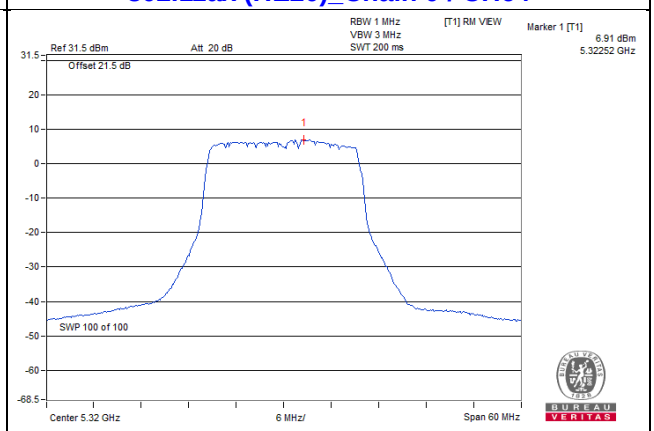
Note:
1. Method a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. The directional gain = 10 log[$(10^{G1/20} + 10^{G2/20})^2$ / 2] = 6.76dBi > 6dBi, so the power density limit shall be reduced to 11-(6.76-6) = 10.24dBm
3. Refer to section 3.3 for duty cycle spectrum plot.

Spectrum Plot of Worst Value

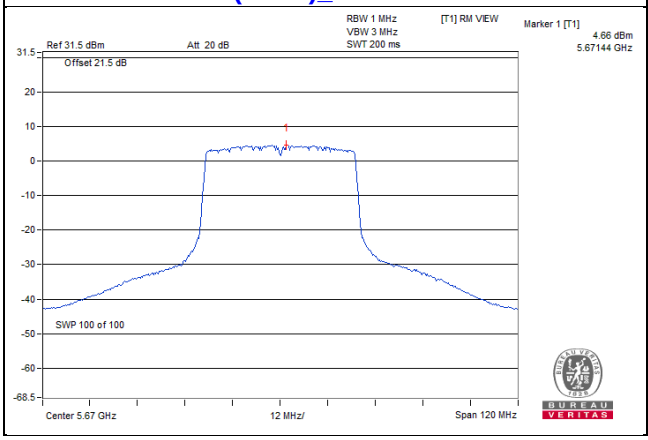
802.11a_Chain 0 / CH60



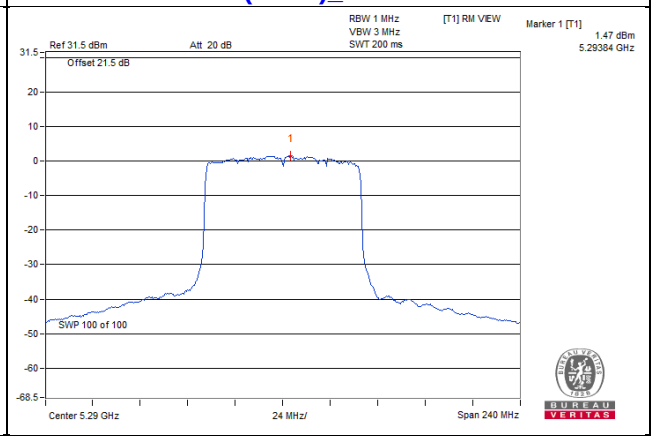
802.11ax (HE20)_Chain 0 / CH64



802.11ax (HE40)_Chain 0 / CH134



802.11ax (HE80)_Chain 0 / CH58

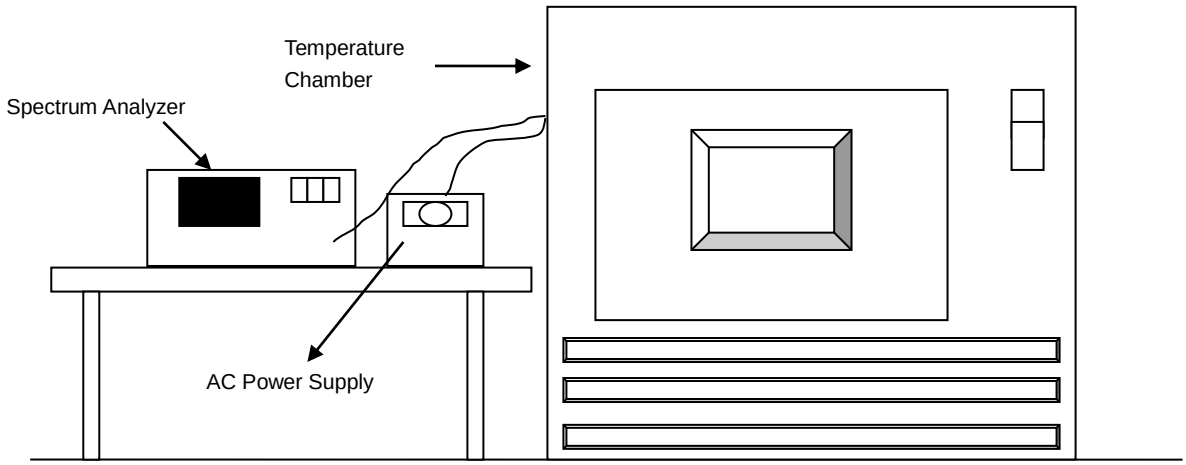


4.6 Frequency Stability Measurement

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: 5260 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	5260.0019	PASS	5259.9991	PASS	5260.003	PASS	5260.0028	PASS
30	120	5259.9907	PASS	5259.992	PASS	5259.99	PASS	5259.99	PASS
20	120	5260.0081	PASS	5260.0066	PASS	5260.0062	PASS	5260.007	PASS
10	120	5260.0061	PASS	5260.0065	PASS	5260.0052	PASS	5260.0059	PASS
0	120	5260.0165	PASS	5260.0199	PASS	5260.0187	PASS	5260.0199	PASS

Frequency Stability Versus Voltage									
Operating Frequency: 5260 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	5260.0079	PASS	5260.0065	PASS	5260.0055	PASS	5260.0061	PASS
	120	5260.0081	PASS	5260.0066	PASS	5260.0062	PASS	5260.007	PASS
	102	5260.0071	PASS	5260.0075	PASS	5260.0065	PASS	5260.0072	PASS

5 Pictures of Test Arrangements

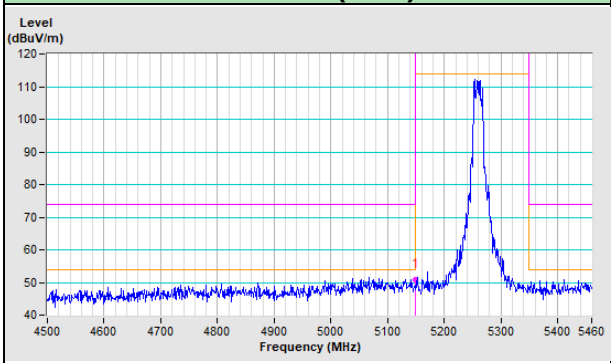
Please refer to the attached file (Test Setup Photo).

Annex A - Band-Edge Measurement (For U-NII-2A, U-NII-2C band)

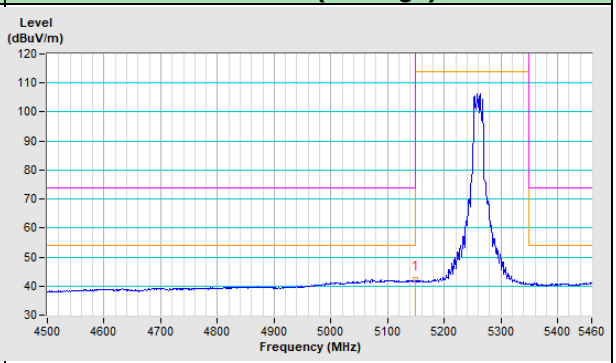
802.11a

Channel 52

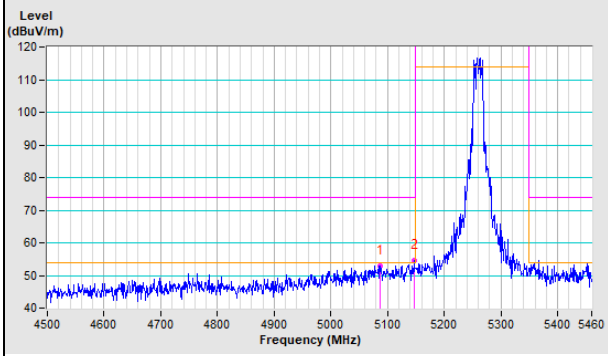
Horizontal (Peak)



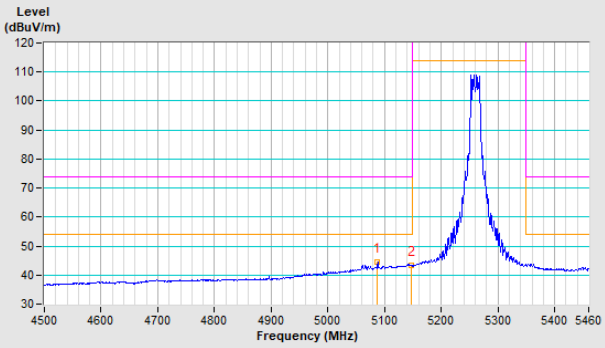
Horizontal (Average)



Vertical (Peak)

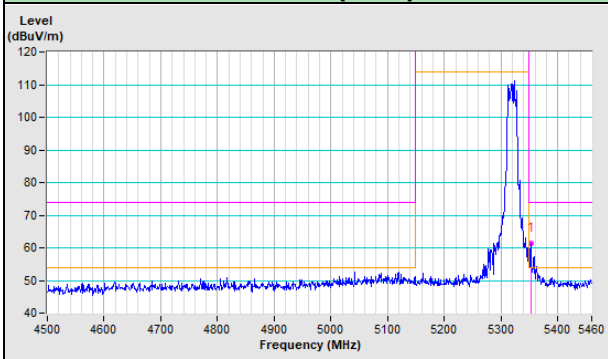


Vertical (Average)

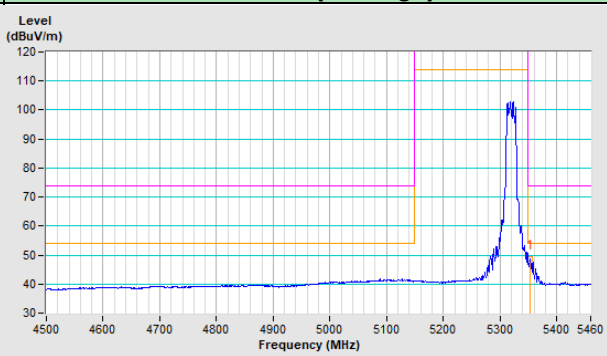


Channel 64

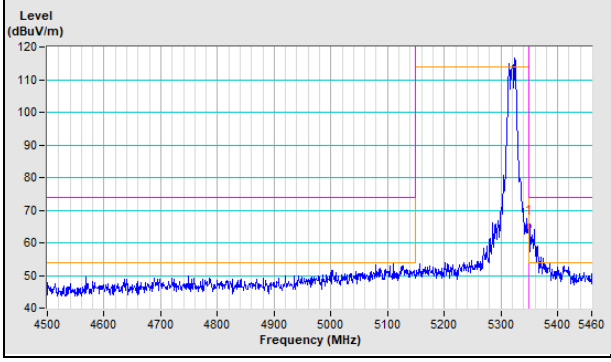
Horizontal (Peak)



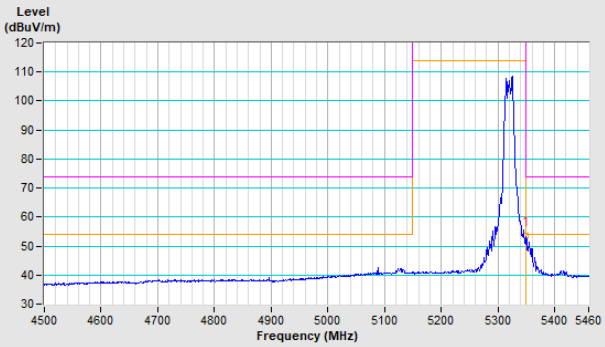
Horizontal (Average)

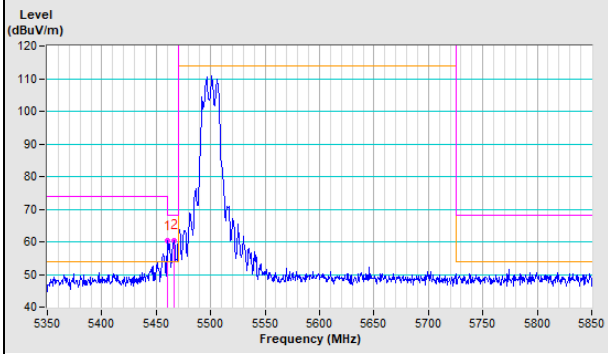
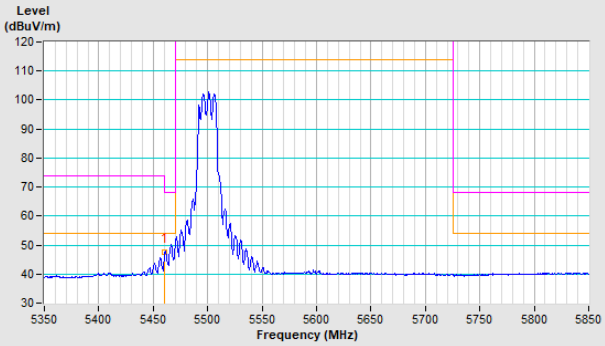
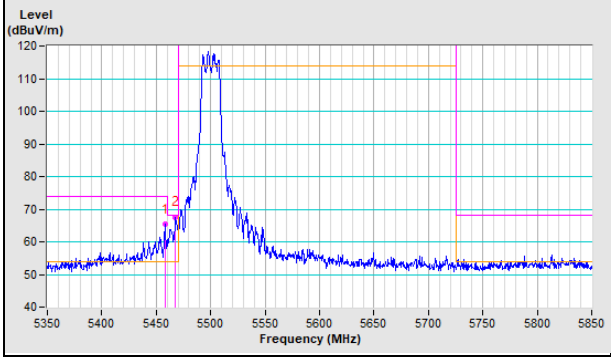
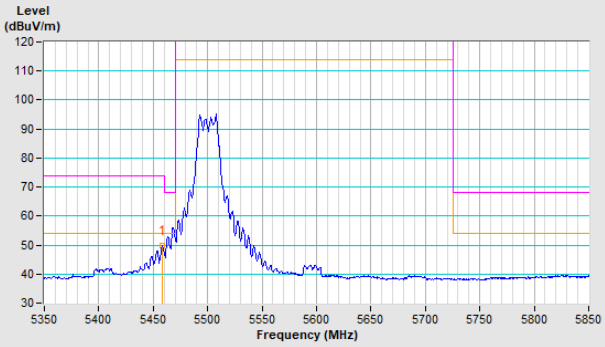


Vertical (Peak)



Vertical (Average)

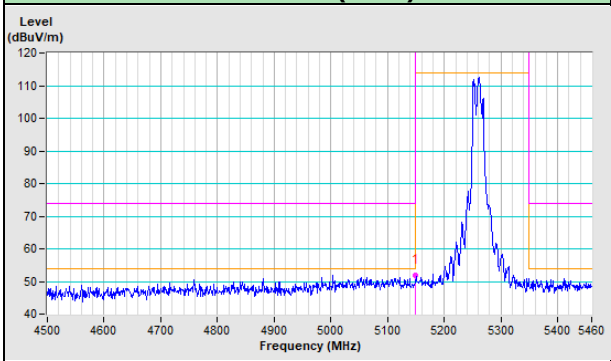


Channel 100	
Horizontal (Peak)	**Horizontal (Average)**
	
Vertical (Peak)	**Vertical (Average)**
	

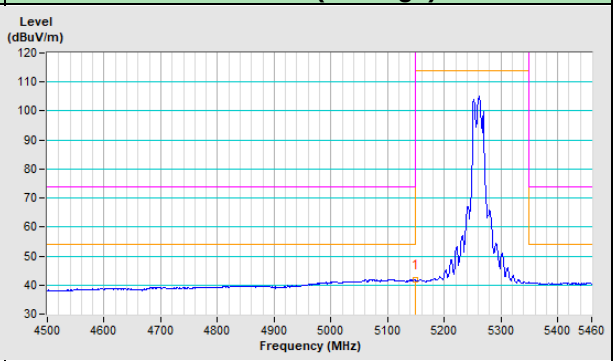
802.11ax (HE20)

Channel 52

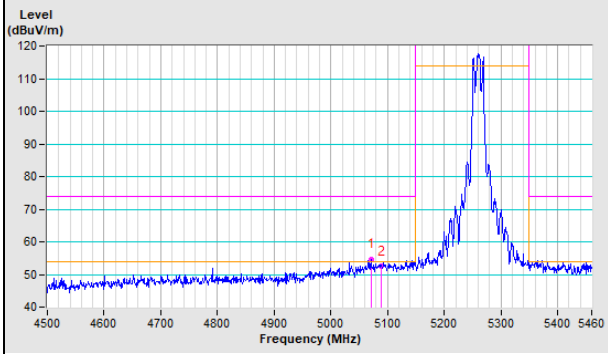
Horizontal (Peak)



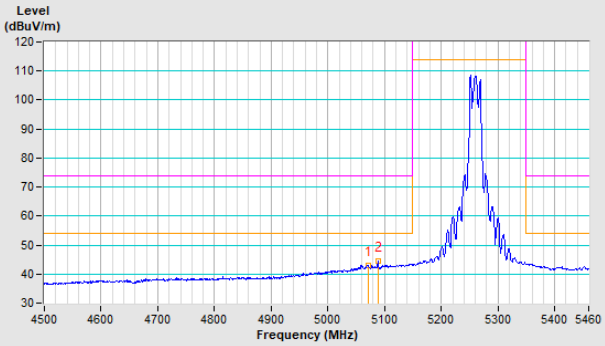
Horizontal (Average)



Vertical (Peak)

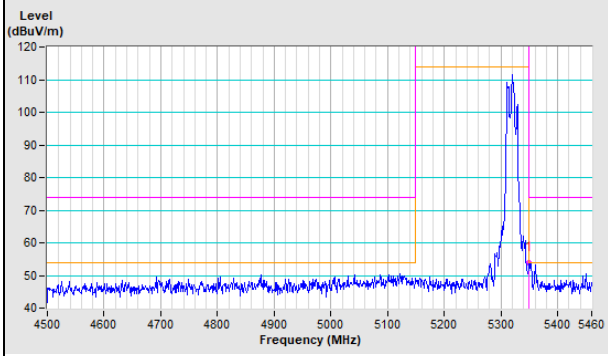


Vertical (Average)

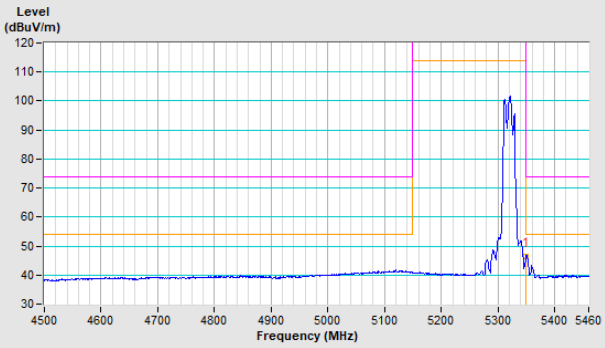


Channel 64

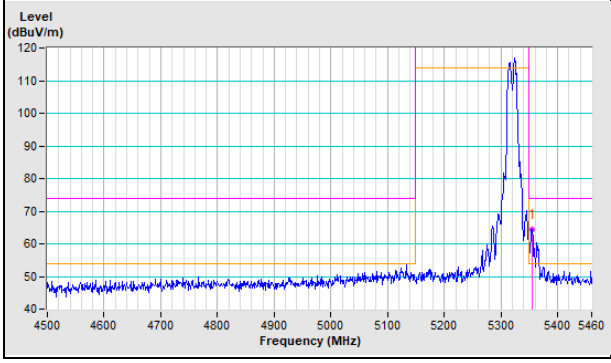
Horizontal (Peak)



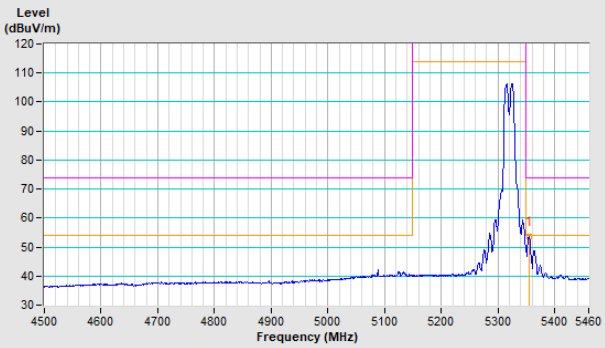
Horizontal (Average)

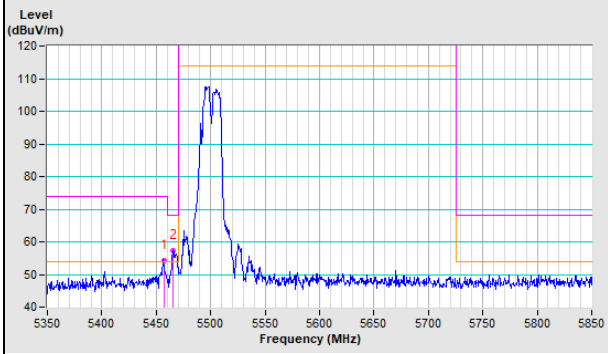
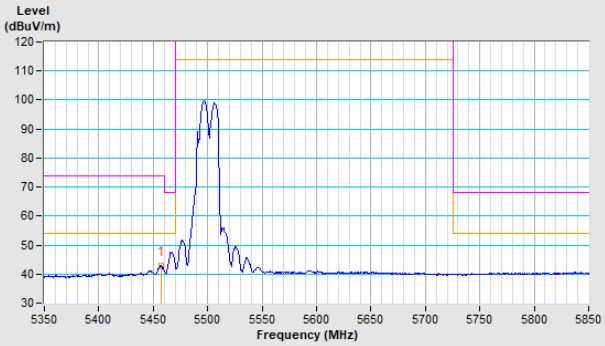
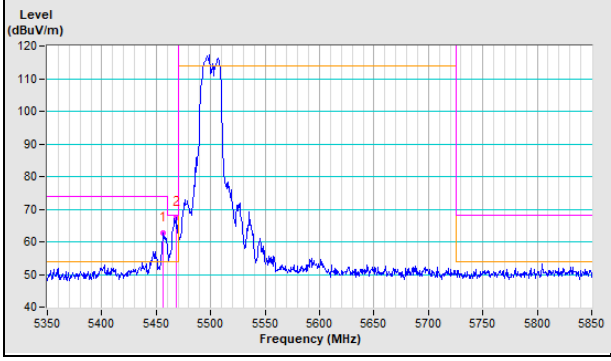
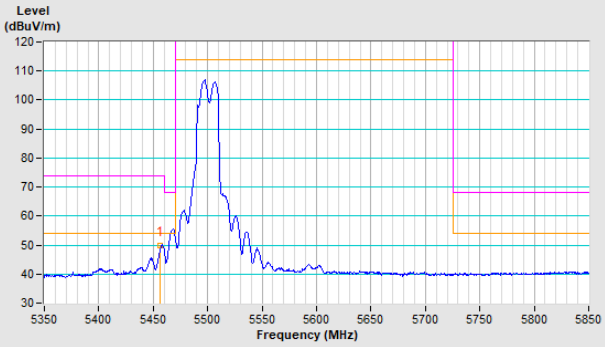


Vertical (Peak)



Vertical (Average)

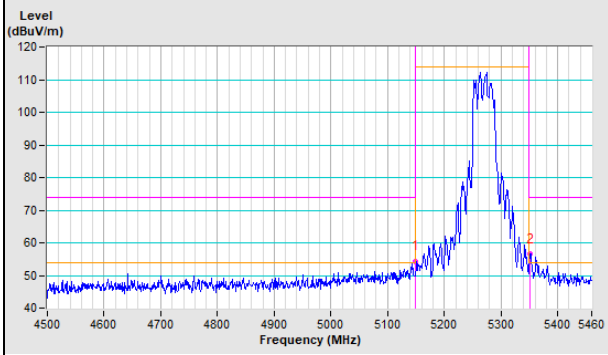


Channel 100	
Horizontal (Peak)	**Horizontal (Average)**
	
Vertical (Peak)	**Vertical (Average)**
	

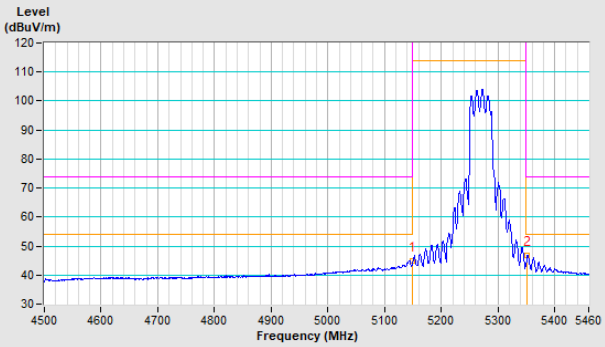
802.11ax (HE40)

Channel 54

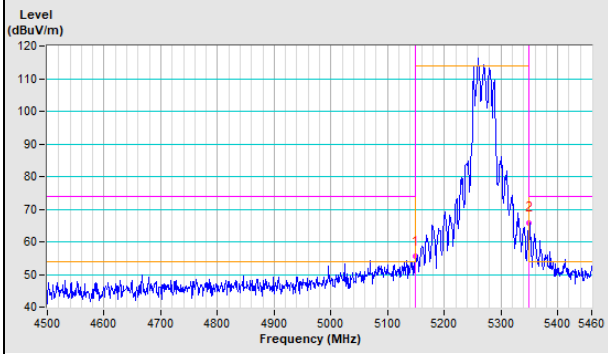
Horizontal (Peak)



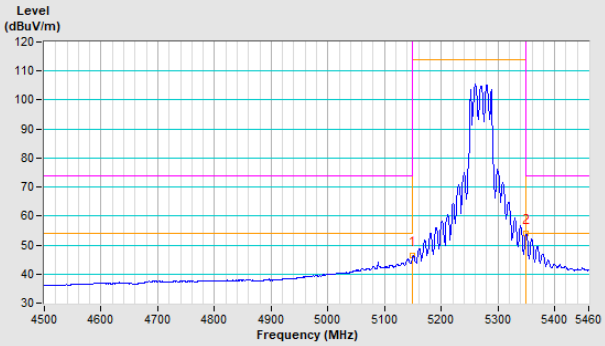
Horizontal (Average)



Vertical (Peak)

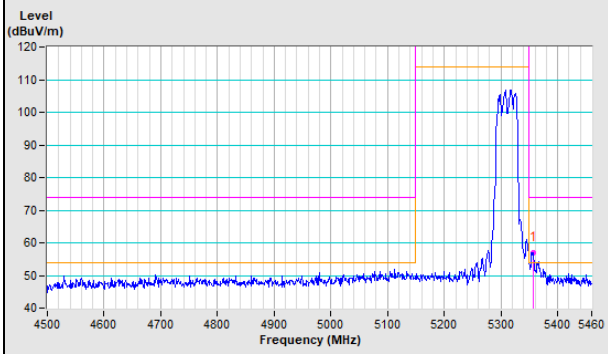


Vertical (Average)

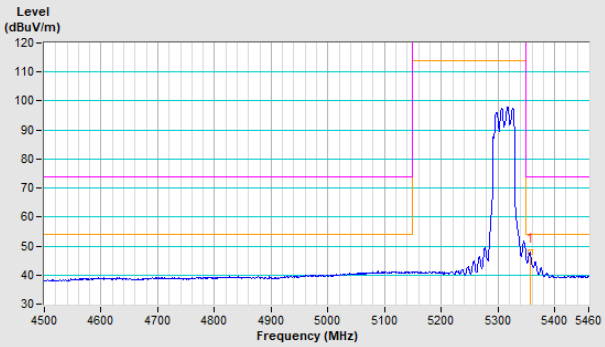


Channel 62

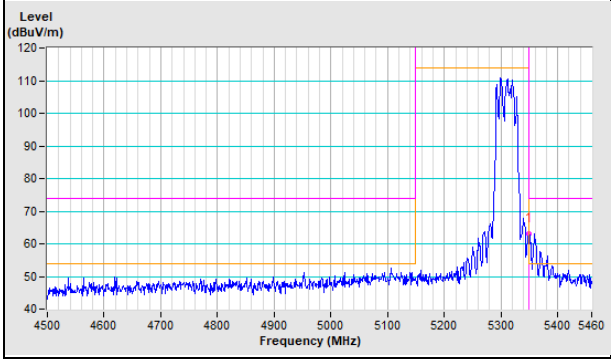
Horizontal (Peak)



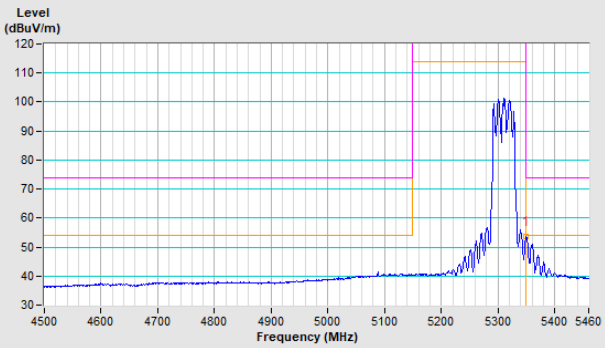
Horizontal (Average)

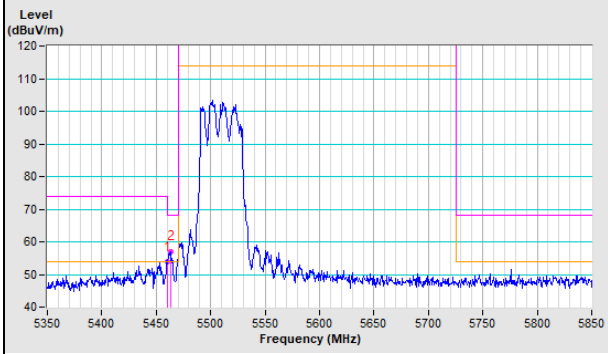
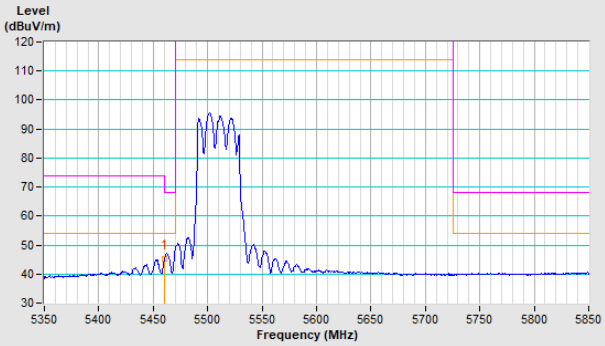
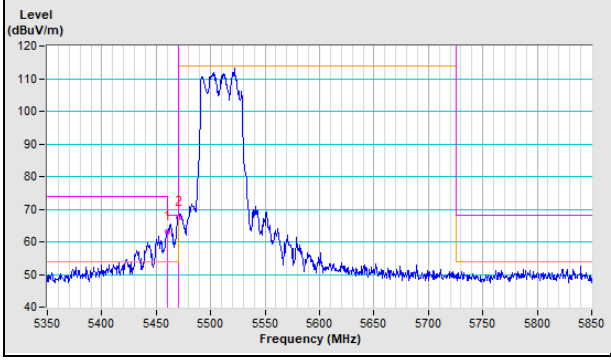
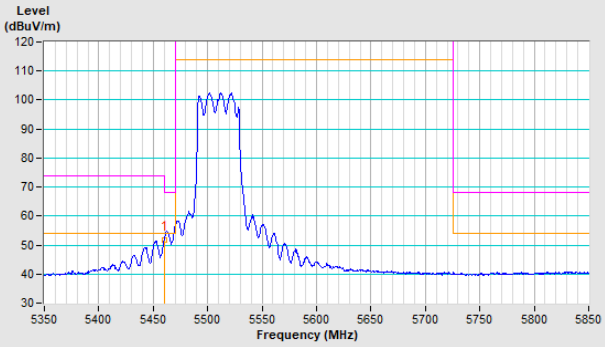


Vertical (Peak)



Vertical (Average)

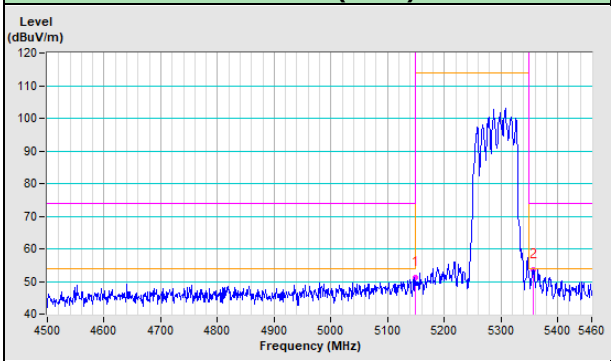


Channel 102	
Horizontal (Peak)	**Horizontal (Average)**
	
Vertical (Peak)	**Vertical (Average)**
	

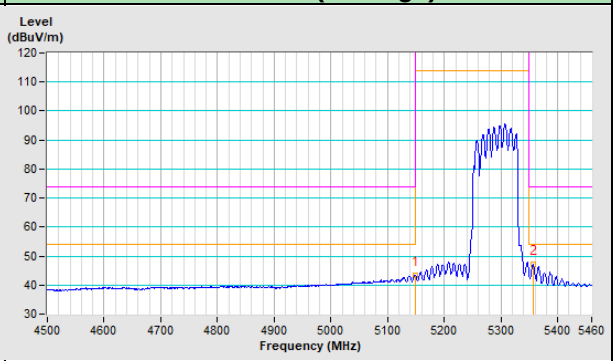
802.11ax (HE80)

Channel 58

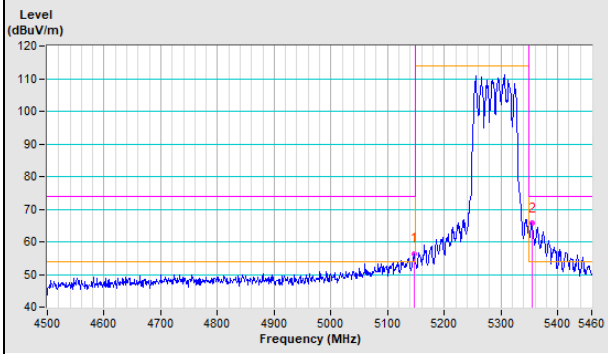
Horizontal (Peak)



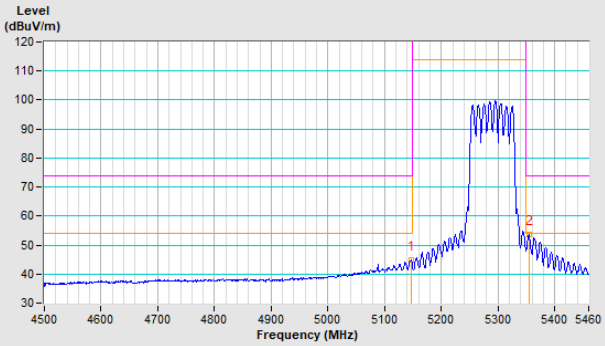
Horizontal (Average)



Vertical (Peak)

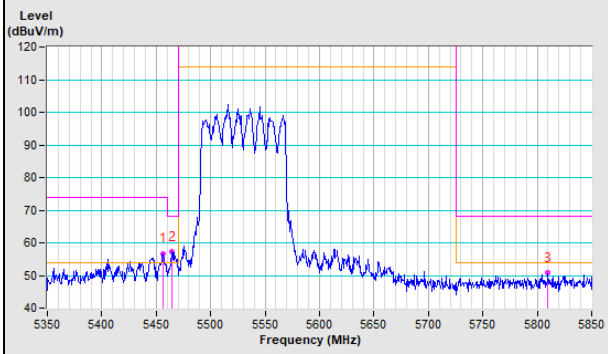


Vertical (Average)

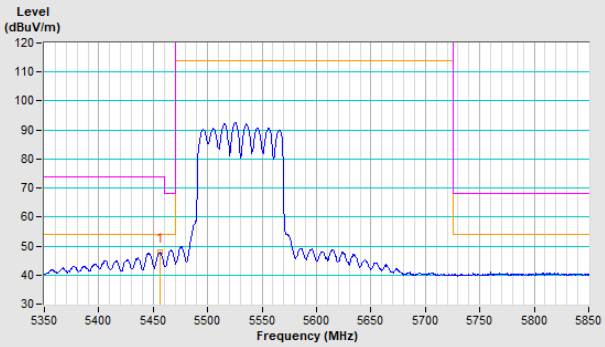


Channel 106

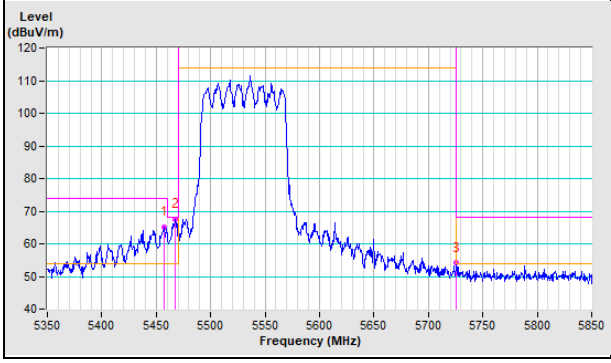
Horizontal (Peak)



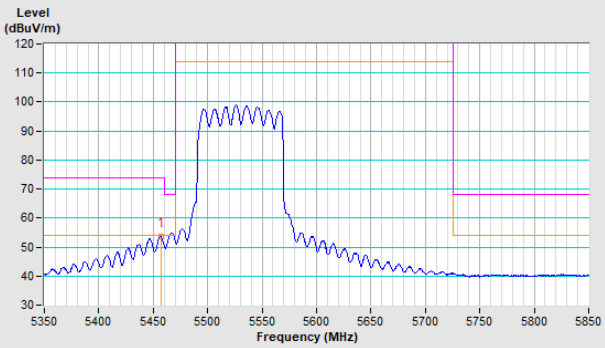
Horizontal (Average)



Vertical (Peak)



Vertical (Average)



Appendix – Information of the Testing Laboratories

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

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

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

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