FCC Test Report

Report No.:	RFBDHL-WTW-P20080206-1
FCC ID:	GZ5NVG578HLX
Test Model:	NVG578HLX
Series Model:	NVG568HLX
Received Date:	Aug. 12, 2020
Test Date:	Aug. 14 to Oct. 26, 2020
Issued Date:	Nov. 26, 2020
Applicant:	ARRIS
Address:	2500 Walsh Ave., Santa Clara, CA 95051 United States
Issued By:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch Hsin Chu Laboratory
Lab Address:	E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300, Taiwa.
Test Location (1):	E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300, Taiwan
Test Location (2):	No. 49, Ln. 206, Wende Rd., Shangshan Tsuen, Chiung Lin Hsiang, Hsin Chu Hsien 307, Taiwan
FCC Registration / Designation Number:	723255 / TW2022 for Test Location (1) / 736135 / TW0004 for Test Location (2)

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.

Table of Contents

Release Control Record 4

1 Certificate of Conformity 5

2 Summary of Test Results 6

2.1 Measurement Uncertainty 6
2.2 Modification Record 6

3 General Information 7

3.1 General Description of EUT 7
3.2 Description of Test Modes 11
3.2.1 Test Mode Applicability and Tested Channel Detail 12
3.3 Duty Cycle of Test Signal 15
3.4 Description of Support Units 16
3.4.1 Configuration of System under Test 17
3.5 General Description of Applied Standard and references 18

4 Test Types and Results 19

4.1 Radiated Emission and Bandedge Measurement 19
4.1.1 Limits of Radiated Emission and Bandedge Measurement 19
4.1.2 Test Instruments 20
4.1.3 Test Procedure 23
4.1.4 Deviation from Test Standard 24
4.1.5 Test Setup 24
4.1.6 EUT Operating Condition 25
4.1.7 Test Results 26
4.2 Conducted Emission Measurement 46
4.2.1 Limits of Conducted Emission Measurement 46
4.2.2 Test Instruments 46
4.2.3 Test Procedure 47
4.2.4 Deviation from Test Standard 47
4.2.5 Test Setup 47
4.2.6 EUT Operating Condition 47
4.2.7 Test Results 48
4.3 Transmit Power Measurement 50
4.3.1 Limits of Transmit Power Measurement 50
4.3.2 Test Setup 50
4.3.3 Test Instruments 50
4.3.4 Test Procedure 50
4.3.5 Deviation from Test Standard 50
4.3.6 EUT Operating Condition 50
4.3.7 Test Results 51
4.4 Occupied Bandwidth Measurement 55
4.4.1 Test Setup 55
4.4.2 Test Instruments 55
4.4.3 Test Procedure 55
4.4.4 Test Results 56
4.5 Peak Power Spectral Density Measurement 62
4.5.1 Limits of Peak Power Spectral Density Measurement 62
4.5.2 Test Setup 62
4.5.3 Test Instruments 62
4.5.4 Test Procedure 62
4.5.5 Deviation from Test Standard 63
4.5.6 EUT Operating Condition 63
4.5.7 Test Results 64
4.6 Frequency Stability Measurement 68
4.6.1 Limits of Frequency Stability Measurement 68

4.6.2 Test Setup 68
4.6.3 Test Instruments 68
4.6.4 Test Procedure 68
4.6.5 Deviation from Test Standard 68
4.6.6 EUT Operating Condition 68
4.6.7 Test Results 69
4.7 6dB Bandwidth Measurement 70
4.7.1 Limits of 6dB Bandwidth Measurement 70
4.7.2 Test Setup 70
4.7.3 Test Instruments 70
4.7.4 Test Procedure 70
4.7.5 Deviation from Test Standard 70
4.7.6 EUT Operating Condition 70
4.7.7 Test Results 71

5 Pictures of Test Arrangements 73

Annex A- Radiated Out of Band Emission (OOBE) Measurement (For U-NII-3 band) 74

Annex B- Band-edge measurement (For U-NII-1 band) 77

Appendix – Information of the Testing Laboratories 81

Release Control Record

Issue No.	Description	Date Issued
RFBDHL-WTW-P20080206-1	Original release.	Nov. 26, 2020

1 Certificate of Conformity

Product: 2.5G PON GATEWAY

Brand: ARRIS

Test Model: NVG578HLX

Series Model: NVG568HLX

Sample Status: ENGINEERING SAMPLE

Applicant: ARRIS

Test Date: Aug. 14 to Oct. 26, 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:** Nov. 26, 2020
Vivian Hunag / Specialist

Approved by : , **Date:** Nov. 26, 2020
Clark Lin / Technical Manager

2 Summary of Test Results

47 CFR FCC Part 15, Subpart E (Section 15.407)			
FCC Clause	Test Item	Result	Remarks
15.407(b)(6)	AC Power Conducted Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -14.25dB at 0.15391MHz.
15.407(b) (1/2/3/4(i/ii)/6)	Radiated Emissions & Band Edge Measurement*	Pass	Meet the requirement of limit. Minimum passing margin is -0.1dB at 5150.00MHz.
15.407(a)(1/2/3)	Max Average Transmit Power	Pass	Meet the requirement of limit.
---	Occupied Bandwidth Measurement	-	Reference only.
15.407(a)(1/2/3)	Peak Power Spectral Density	Pass	Meet the requirement of limit.
15.407(e)	6dB bandwidth	Pass	Meet the requirement of limit. (U-NII-3 Band only)
15.407(g)	Frequency Stability	Pass	Meet the requirement of limit.
15.203	Antenna Requirement	Pass	Antenna connector is i-pex(MHF) not a standard connector.

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

2.1 Measurement Uncertainty

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

Measurement	Frequency	Expanded Uncertainty (k=2) (±)
Conducted Emissions at mains ports	150kHz ~ 30MHz	1.9 dB
Radiated Emissions up to 1 GHz	9kHz ~ 30MHz	3.1 dB
	30MHz ~ 1GHz	5.4 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

Product	2.5G PON GATEWAY
Brand	ARRIS
Test Model	NVG578HLX
Series Model	NVG568HLX
Status of EUT	ENGINEERING SAMPLE
Power Supply Rating	12Vdc from power adapter
Modulation Type	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM 256QAM for OFDM in 11ac mode and VHT20/40 in 2.4GHz 1024QAM for OFDMA in 11ax HE mode
Modulation Technology	DSSS,OFDM, OFDMA
Transfer Rate	802.11b: up to 11 Mbps 802.11a/g: up to 54 Mbps 802.11n: up to 600 Mbps 802.11ac: up to 1733.3 Mbps 802.11ax: up to 2401.9 Mbps
Operating Frequency	**2.4GHz:** 2.412GHz ~ 2.462GHz **5GHz:** 5.18 ~ 5.25GHz, 5.745 ~ 5.825GHz
Number of Channel	**2.4GHz:** 802.11b, 802.11g, 802.11n (HT20), VHT20, 802.11ax (HE20): 11 802.11n (HT40), VHT40, 802.11ax (HE40): 7 **5GHz:** 802.11a, 802.11n (HT20), 802.11ac (VHT20), 802.11ax (HE20): 9 802.11n (HT40), 802.11ac (VHT40), 802.11ax (HE40): 4 802.11ac (VHT80), 802.11ax (HE80): 2
Output Power	**CDD Mode:** **2.412 ~ 2.462 GHz:** 349.696 mW **5.18 ~ 5.25 GHz:** 913.035 mW **5.745 ~ 5.825 GHz:** 993.722 mW **Beamforming Mode:** **2.412 ~ 2.462 GHz:** 311.479 mW **5.18 ~ 5.25 GHz:** 487.26 mW **5.745 ~ 5.825 GHz:** 417.227 mW
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	Adapter x1

Note:

1. The EUT has two radios as following table:

Radio 1	Radio 2
WLAN 2.4GHz	WLAN 5GHz

2. Simultaneously transmission condition.

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

3. The EUT has below model names, which are identical to each other in all aspects except for the following information:

Different	Model No. NVG578HLX	Model No. NVG568HLX
Feature	5G High power	5G High power
Target Market	NA	NA
Key IC	Main IC: BCM68360 LD: BCM68901 WIFI 2.4G: BCM6710 WIFI 5G：BCM43684	Main IC: BCM68360 WIFI 2.4G: BCM6710 WIFI 5G：BCM43684
2.5 G Phy	BCM54991EL	BCM54991EL
Slic	Microsemi Le9642	Microsemi Le9642
Flash	256MB	256MB
DDR	512MB	512MB
802.11ax 2.4G	3 x 3	3 x 3
802.11ax 5G	4 x 4	4 x 4
B+ BOSA with STIA SC/APC	yes	no
5G FEM	SKY85743-21	SKY85743-21
USB 3.0	1	1
VOIP port	2	2
LAN port	RJ45 with 1 LED 2.5G LAN x1 1G LAN x3	RJ45 with 1 LED 2.5G LAN x1 1G LAN x3
Power on/off button	yes	yes
WPS button	yes	yes
Reset button	yes	yes
LEDs	Power, Broadband, WAN, WiFi, Voice	Power, Broadband, WAN, WiFi, Voice

From the above models, model: **NVG578HLX** was selected as representative model for the test and its data was recorded in this report.

4. The EUT must be supplied with a power adapter as following table:

Brand	Model No.	Spec.
NetBit	NBS36J120300VU	Input: 100-120Vac, 1A, 50-60Hz Output: 12Vdc, 3A

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

Ant. Set	RF Chain No.	Ant. Net Gain (dBi)	Freq. Range (GHz)	Ant. Type	Connector Type	Cable Length (mm)
0	5G Chain0	3.93	5.15~5.25	PIFA	RF switch	on-board no cable
		3.45	5.25~5.35			
		4.15	5.47~5.725			
		4.33	5.725~5.85			
1	5G Chain1 / 2.4G Chain 2	4.69	2.4~2.4835	PIFA	RF switch	on-board no cable
		2.77	5.15~5.25			
		3.33	5.25~5.35			
		4.33	5.47~5.725			
		4.54	5.725~5.85			
2	5G Chain2 / 2.4G Chain 1	2.27	2.4~2.4835	Dipole	i-pex(MHF)	200
		2.65	5.15~5.25			
		2.86	5.25~5.35			
		3.12	5.47~5.725			
		3.12	5.725~5.85			
3	5G Chain3 / 2.4G Chain 0	3.36	2.4~2.4835	Dipole	i-pex(MHF)	200
		2.83	5.15~5.25			
		2.77	5.25~5.35			
		2.65	5.47~5.725			
		2.83	5.725~5.85			

6. The EUT incorporates a MIMO function:

2.4GHz Band		
MODULATION MODE	**TX & RX CONFIGURATION**	
802.11b	3TX	3RX
802.11g	3TX	3RX
802.11n (HT20)	3TX	3RX
802.11n (HT40)	3TX	3RX
VHT20	3TX	3RX
VHT40	3TX	3RX
802.11ax (HE20)	3TX	3RX
802.11ax (HE40)	3TX	3RX
5GHz Band		
MODULATION MODE	**TX & RX CONFIGURATION**	
802.11a	4TX	4RX
802.11n (HT20)	4TX	4RX
802.11n (HT40)	4TX	4RX
802.11ac (VHT20)	4TX	4RX
802.11ac (VHT40)	4TX	4RX
802.11ac (VHT80)	4TX	4RX
802.11ax (HE20)	4TX	4RX
802.11ax (HE40)	4TX	4RX
802.11ax (HE80)	4TX	4RX

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

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

3.2 Description of Test Modes

FOR 5180 ~ 5240MHz

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

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

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

Channel	Frequency	Channel	Frequency
38	5190 MHz	46	5230 MHz

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

Channel	Frequency
42	5210 MHz

FOR 5745 ~ 5825MHz:

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

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

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

Channel	Frequency	Channel	Frequency
151	5755 MHz	159	5795 MHz

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

Channel	Frequency
155	5775 MHz

3.2.1 Test Mode Applicability and Tested Channel Detail

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

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

Radiated Emission Test (Above 1GHz):

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

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

Radiated Emission Test (Below 1GHz):

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

CDD Mode						
Mode	FREQ. Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate Parameter
802.11a	5180-5240 5745-5825	36 to 48 149 to 165	157	OFDM	BPSK	6Mb/s

Power Line Conducted Emission Test:

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

CDD Mode						
Mode	FREQ. Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate Parameter
802.11a	5180-5240 5745-5825	36 to 48 149 to 165	157	OFDM	BPSK	6Mb/s

Antenna Port Conducted Measurement:

☒ This item includes all test value of each mode, but only includes spectrum plot of worst value of each mode.

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

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

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

Test Condition:

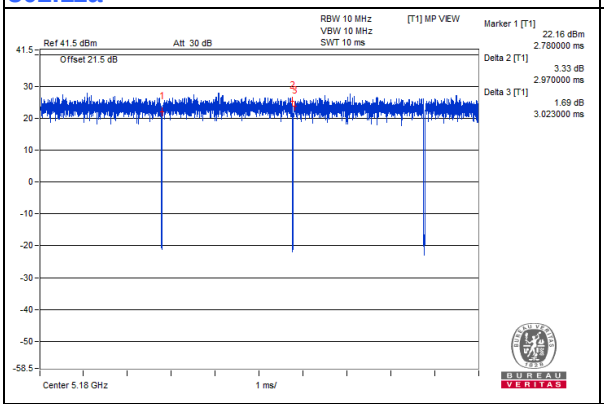
Applicable To	Environmental Conditions	Input Power	Tested By
RE≥1G	25deg. C, 68%RH	120Vac, 60Hz	Nelson Teng
RE<1G	23deg. C, 71%RH	120Vac, 60Hz	Ryan Du
PLC	25deg. C, 68%RH	120Vac, 60Hz	Eagle Chen
APCM	25deg. C, 60%RH	120Vac, 60Hz	Kevin Ko

3.3 Duty Cycle of Test Signal

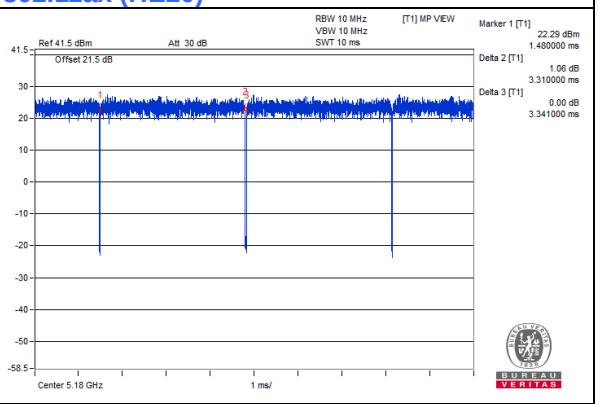
Duty cycle of test signal is ≥ 98 %, duty factor is not required.

802.11a: Duty cycle = 2.97 ms /3.023 ms=0.982
802.11ax (HE20): Duty cycle = 3.31 ms /3.341 ms=0.991
802.11ax (HE40): Duty cycle = 2.498 ms /2.548 ms=0.98
802.11ax (HE80): Duty cycle = 2.464 ms /2.502 ms=0.985

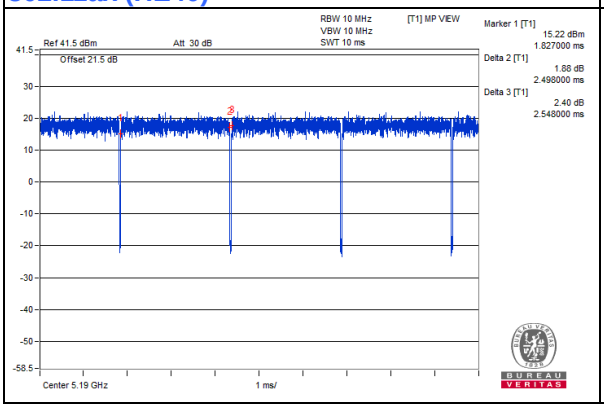
802.11a



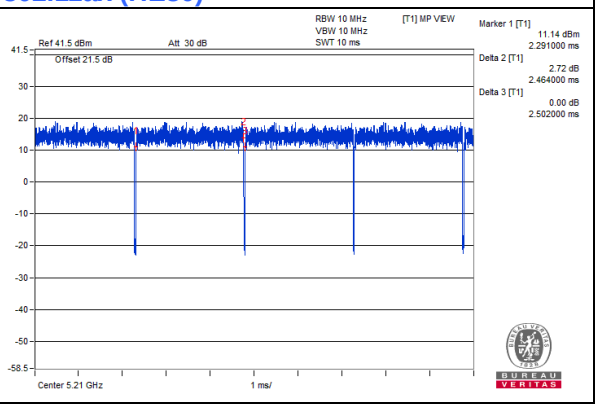
802.11ax (HE20)



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.

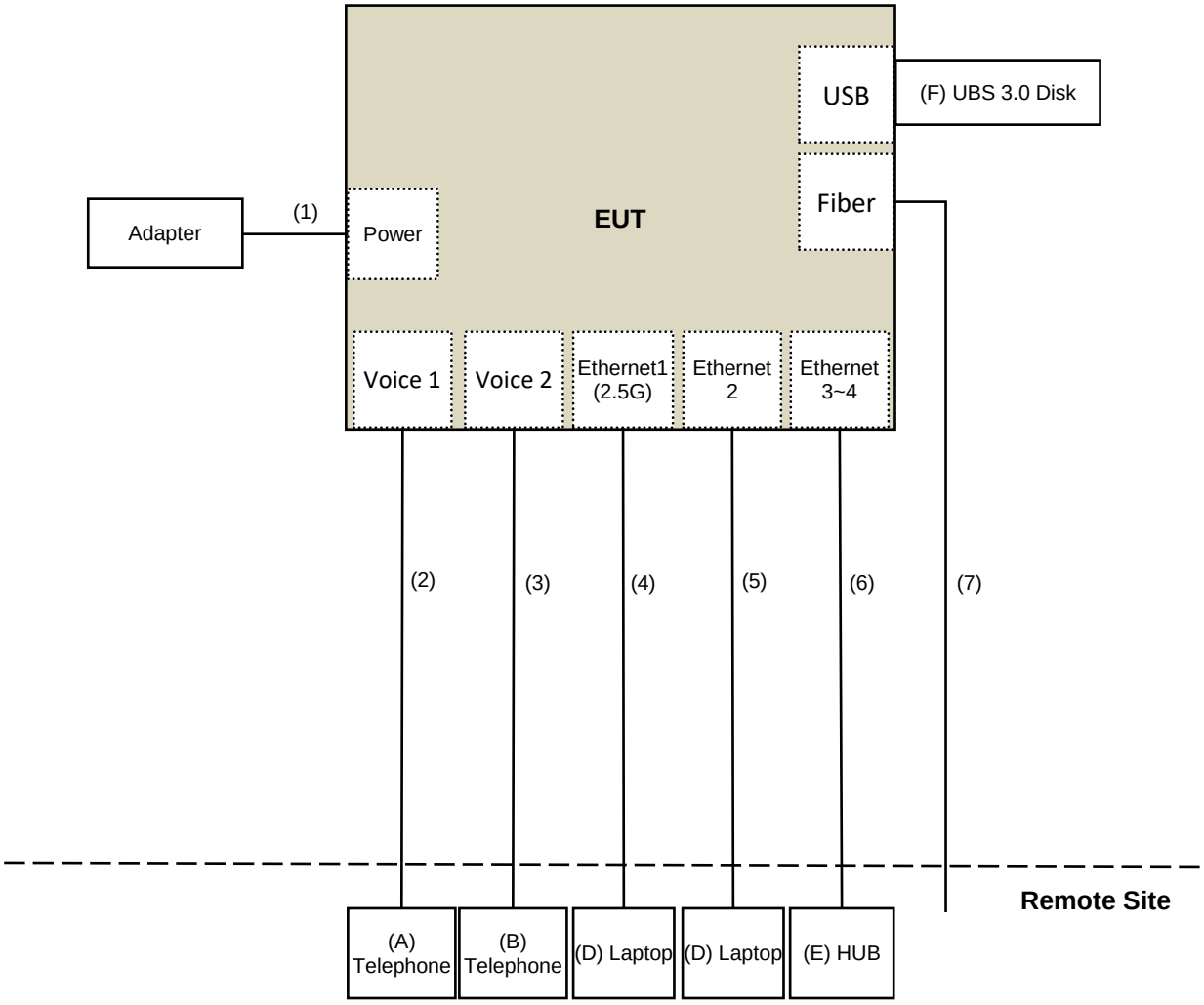
ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Telephone	Romeo	TE-812	97285638	NA	Provided by Lab
B.	Telephone	Romeo	TE-812	97280903	NA	Provided by Lab
C.	Laptop	DELL	PP36S	25733582128	NA	Provided by Lab
D.	Laptop	DELL	E5430	HYV4VY1	FCC DoC	Provided by Lab
E.	HUB	ZyXEL	GS1100-16	S150H44000046	FCC DoC	Provided by Lab
F.	UBS 3.0 Disk	Transcend	16GB JetFlash 700	F80093 0291	NA	Provided by Lab

Note:

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

ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	DC Cable	1	2	No	0	Supplied by client
2.	RJ-11 Cable	1	10	No	0	Provided by Lab
3.	RJ-11 Cable	1	10	No	0	Provided by Lab
4.	RJ-45 Cable	1	10	No	0	Provided by Lab
5.	RJ-45 Cable	1	10	No	0	Provided by Lab
6.	RJ-45 Cable	2	10	No	0	Provided by Lab
7.	Fiber Cable	1	10	No	0	Provided by Lab

3.4.1 Configuration of System under Test



3.5 General Description of Applied Standard and references

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

Test Standard:

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

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

References Test Guidance:

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

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

4 Test Types and Results

4.1 Radiated Emission and Bandedge Measurement

4.1.1 Limits of Radiated Emission and Bandedge Measurement

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

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

NOTE:

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

Limits of unwanted emission out of the restricted bands

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

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

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

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

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

Note:

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

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

4.1.2 Test Instruments

For Radiated emission & BandEdge 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. 13 to 16, 2020

For OOBE test

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver Keysight	N9038A	MY54450088	July 06, 2020	July 05, 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-1200	160922	Jan. 15, 2020	Jan. 14, 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: Aug. 18, 2020

For other test

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Spectrum Analyzer R&S	FSV40	100964	May 29, 2020	May 28, 2021
Power meter Anritsu	ML2495A	1529002	July 22, 2020	July 21, 2021
Power sensor Anritsu	MA2411B	1339443	July 22, 2020	July 21, 2021
Fixed Attenuator Mini-Circuits	MDCS18N-10	MDCS18N-10-01	Apr. 14, 2020	Apr. 13, 2021
Software	ADT_RF Test Software V6.6.5.4	NA	NA	NA

Note:

1. 1. The test was performed in Oven room 2.
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. 3. Tested Date: Oct. 26, 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:

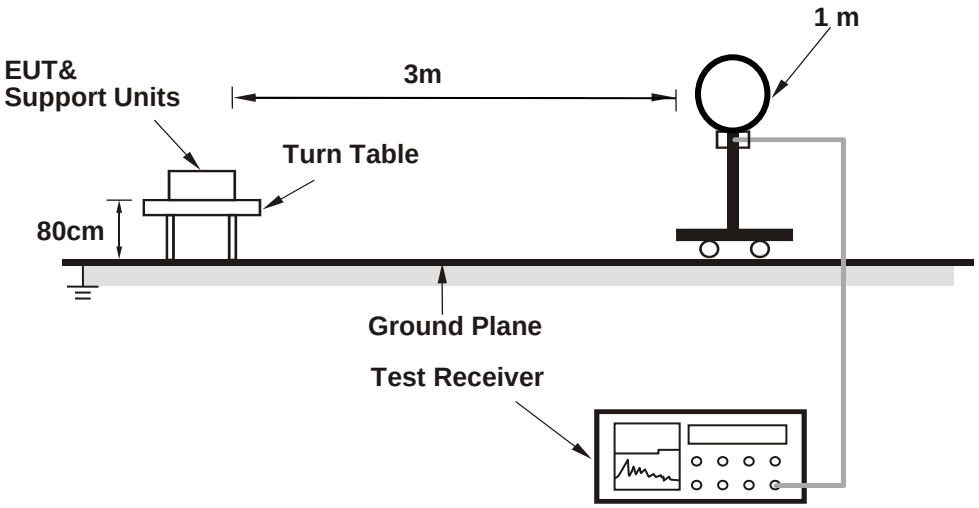
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.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

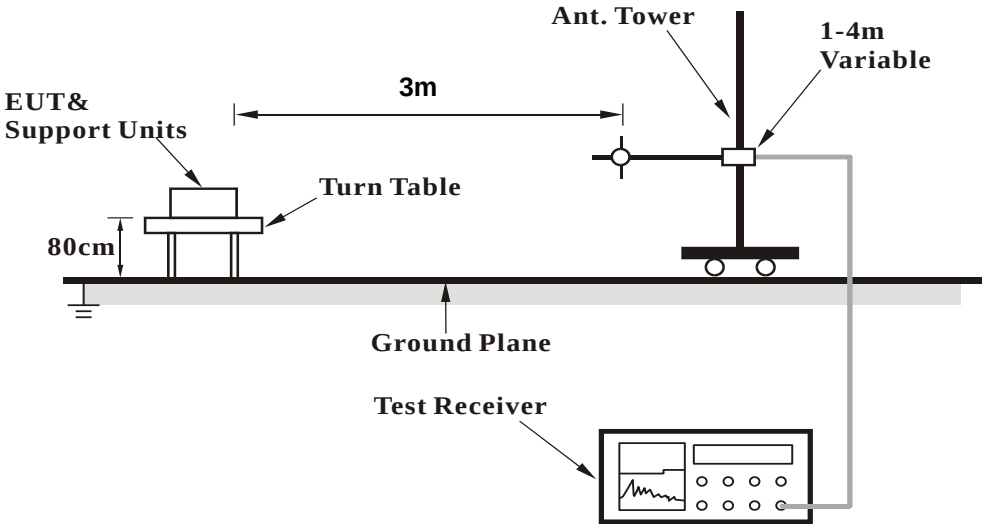
No deviation.

4.1.5 Test Setup

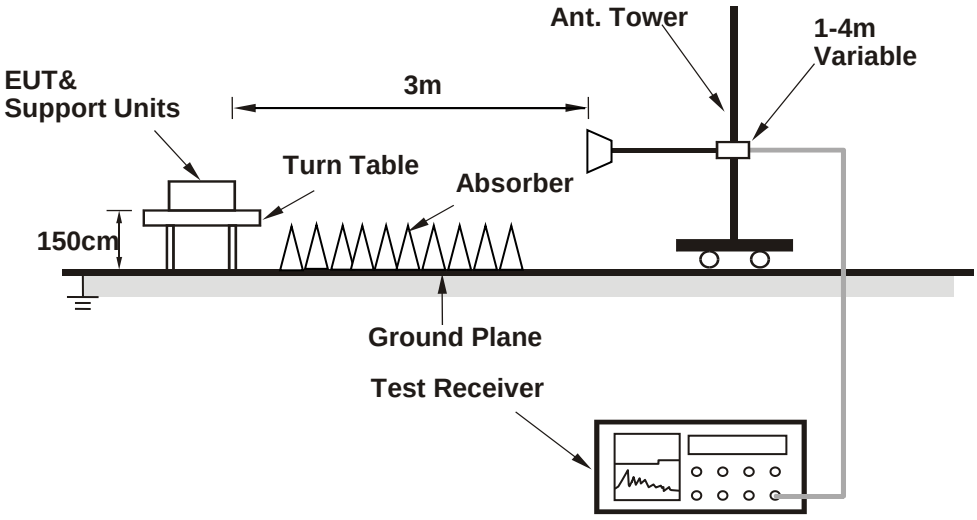
For Radiated emission below 30MHz



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 (accessMTool_REL_3_2_0_0) has been activated to set the EUT under transmission condition continuously at specific channel frequency.

4.1.7 Test Results

Above 1GHz Data:

802.11a

CHANNEL	TX Channel 36	**DETECTOR FUNCTION**	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	**Frequency (MHz)**	**Emission Level (dBuV/m)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Height (m)**	**Table Angle (Degree)**	**Raw Value (dBuV)**	**Correction Factor (dB/m)**
1	5148.02	73.0 PK	74.0	-1.0	1.31 H	39	68.8	4.2
2	5148.02	53.4 AV	54.0	-0.6	1.31 H	39	49.2	4.2
3	*5180.00	117.2 PK			1.31 H	39	113.1	4.1
4	*5180.00	108.7 AV			1.31 H	39	104.6	4.1
5	#10360.00	50.3 PK	68.2	-17.9	1.77 H	195	37.1	13.2
6	15540.00	51.5 PK	74.0	-22.5	1.53 H	159	37.8	13.7
7	15540.00	38.3 AV	54.0	-15.7	1.53 H	159	24.6	13.7
Antenna Polarity & Test Distance : Vertical at 3 m								
No	**Frequency (MHz)**	**Emission Level (dBuV/m)**	**Limit (dBuV/m)**	**Margin (dB)**	**Antenna Height (m)**	**Table Angle (Degree)**	**Raw Value (dBuV)**	**Correction Factor (dB/m)**
1	5150.00	71.6 PK	74.0	-2.4	1.29 V	188	67.4	4.2
2	5150.00	53.6 AV	54.0	-0.4	1.29 V	188	49.4	4.2
3	*5180.00	118.0 PK			1.29 V	188	113.9	4.1
4	*5180.00	109.3 AV			1.29 V	188	105.2	4.1
5	#10360.00	49.7 PK	68.2	-18.5	1.81 V	245	36.5	13.2
6	15540.00	49.8 PK	74.0	-24.2	1.94 V	246	36.1	13.7
7	15540.00	37.8 AV	54.0	-16.2	1.94 V	246	24.1	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 40	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5150.00	58.6 PK	74.0	-15.4	1.28 H	37	54.4	4.2
2	5150.00	43.7 AV	54.0	-10.3	1.28 H	37	39.5	4.2
3	*5200.00	118.0 PK			1.28 H	37	114.1	3.9
4	*5200.00	109.2 AV			1.28 H	37	105.3	3.9
5	#10400.00	50.6 PK	68.2	-17.6	1.71 H	180	37.4	13.2
6	15600.00	52.2 PK	74.0	-21.8	1.57 H	155	38.2	14.0
7	15600.00	38.8 AV	54.0	-15.2	1.57 H	155	24.8	14.0
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5150.00	62.4 PK	74.0	-11.6	1.44 V	275	58.2	4.2
2	5150.00	46.5 AV	54.0	-7.5	1.44 V	275	42.3	4.2
3	*5200.00	118.8 PK			1.44 V	275	114.9	3.9
4	*5200.00	110.0 AV			1.44 V	275	106.1	3.9
5	#10400.00	49.5 PK	68.2	-18.7	1.76 V	255	36.3	13.2
6	15600.00	49.7 PK	74.0	-24.3	1.90 V	241	35.7	14.0
7	15600.00	37.5 AV	54.0	-16.5	1.90 V	241	23.5	14.0

REMARKS:

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

CHANNEL	TX Channel 48	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5240.00	119.6 PK			1.39 H	17	115.7	3.9
2	*5240.00	110.3 AV			1.39 H	17	106.4	3.9
3	5350.00	55.3 PK	74.0	-18.7	1.39 H	17	51.6	3.7
4	5350.00	41.3 AV	54.0	-12.7	1.39 H	17	37.6	3.7
5	#10480.00	50.1 PK	68.2	-18.1	1.70 H	176	36.6	13.5
6	15720.00	51.9 PK	74.0	-22.1	1.53 H	170	37.4	14.5
7	15720.00	38.5 AV	54.0	-15.5	1.53 H	170	24.0	14.5
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	*5240.00	120.5 PK			1.44 V	276	116.6	3.9
2	*5240.00	111.1 AV			1.44 V	276	107.2	3.9
3	5350.00	54.6 PK	74.0	-19.4	1.44 V	276	50.9	3.7
4	5350.00	44.3 AV	54.0	-9.7	1.44 V	276	40.6	3.7
5	#10480.00	49.4 PK	68.2	-18.8	1.82 V	250	35.9	13.5
6	15720.00	50.1 PK	74.0	-23.9	1.87 V	254	35.6	14.5
7	15720.00	37.9 AV	54.0	-16.1	1.87 V	254	23.4	14.5

REMARKS:

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

CHANNEL	TX Channel 149	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5608.77	56.3 PK	68.2	-11.9	1.72 H	87	52.1	4.2
2	*5745.00	118.2 PK			1.72 H	87	113.8	4.4
3	*5745.00	108.8 AV			1.72 H	87	104.4	4.4
4	#5959.94	54.4 PK	68.2	-13.8	1.72 H	87	49.4	5.0
5	11490.00	49.6 PK	74.0	-24.4	1.87 H	158	35.7	13.9
6	11490.00	40.5 AV	54.0	-13.5	1.87 H	158	26.6	13.9
7	#17235.00	49.4 PK	68.2	-18.8	1.52 H	187	31.1	18.3
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	#5617.04	57.0 PK	68.2	-11.2	1.69 V	238	52.7	4.3
2	*5745.00	120.1 PK			1.69 V	238	115.7	4.4
3	*5745.00	110.8 AV			1.69 V	238	106.4	4.4
4	#5946.01	56.0 PK	68.2	-12.2	1.69 V	238	51.1	4.9
5	11490.00	46.9 PK	74.0	-27.1	1.94 V	240	33.0	13.9
6	11490.00	35.6 AV	54.0	-18.4	1.94 V	240	21.7	13.9
7	#17235.00	49.0 PK	68.2	-19.2	1.71 V	275	30.7	18.3

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 157	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5646.58	54.1 PK	68.2	-14.1	1.68 H	90	49.8	4.3
2	*5785.00	118.7 PK			1.68 H	90	114.2	4.5
3	*5785.00	109.0 AV			1.68 H	90	104.5	4.5
4	#5958.11	53.8 PK	68.2	-14.4	1.68 H	90	48.8	5.0
5	11570.00	50.0 PK	74.0	-24.0	1.87 H	166	36.1	13.9
6	11570.00	40.9 AV	54.0	-13.1	1.87 H	166	27.0	13.9
7	#17355.00	49.7 PK	68.2	-18.5	1.53 H	185	31.5	18.2
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	#5635.31	54.6 PK	68.2	-13.6	1.62 V	241	50.3	4.3
2	*5785.00	120.4 PK			1.62 V	241	115.9	4.5
3	*5785.00	110.9 AV			1.62 V	241	106.4	4.5
4	#5961.42	54.3 PK	68.2	-13.9	1.62 V	241	49.3	5.0
5	11570.00	47.2 PK	74.0	-26.8	1.93 V	236	33.3	13.9
6	11570.00	35.9 AV	54.0	-18.1	1.93 V	236	22.0	13.9
7	#17355.00	49.2 PK	68.2	-19.0	1.66 V	291	31.0	18.2

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 165	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5647.54	53.9 PK	68.2	-14.3	1.62 H	90	49.5	4.4
2	*5825.00	118.9 PK			1.62 H	90	114.2	4.7
3	*5825.00	109.4 AV			1.62 H	90	104.7	4.7
4	#5928.05	55.3 PK	68.2	-12.9	1.62 H	90	50.4	4.9
5	11650.00	50.1 PK	74.0	-23.9	1.82 H	176	36.1	14.0
6	11650.00	41.0 AV	54.0	-13.0	1.82 H	176	27.0	14.0
7	#17475.00	49.4 PK	68.2	-18.8	1.52 H	190	30.6	18.8
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	#5604.48	53.8 PK	68.2	-14.4	1.73 V	268	49.6	4.2
2	*5825.00	120.5 PK			1.73 V	268	115.8	4.7
3	*5825.00	111.0 AV			1.73 V	268	106.3	4.7
4	#5927.03	54.9 PK	68.2	-13.3	1.73 V	268	50.0	4.9
5	11650.00	47.5 PK	74.0	-26.5	1.96 V	235	33.5	14.0
6	11650.00	36.4 AV	54.0	-17.6	1.96 V	235	22.4	14.0
7	#17475.00	48.5 PK	68.2	-19.7	1.70 V	287	29.7	18.8

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 36	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5150.00	68.6 PK	74.0	-5.4	1.59 H	73	64.4	4.2
2	5150.00	53.1 AV	54.0	-0.9	1.59 H	73	48.9	4.2
3	*5180.00	119.4 PK			1.59 H	73	115.3	4.1
4	*5180.00	108.6 AV			1.59 H	73	104.5	4.1
5	#10360.00	51.0 PK	68.2	-17.2	1.68 H	156	37.8	13.2
6	15540.00	52.1 PK	74.0	-21.9	1.61 H	150	38.4	13.7
7	15540.00	38.6 AV	54.0	-15.4	1.61 H	150	24.9	13.7
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5150.00	68.7 PK	74.0	-5.3	1.58 V	274	64.5	4.2
2	5150.00	53.5 AV	54.0	-0.5	1.58 V	274	49.3	4.2
3	*5180.00	121.2 PK			1.58 V	274	117.1	4.1
4	*5180.00	110.1 AV			1.58 V	274	106.0	4.1
5	#10360.00	46.9 PK	68.2	-21.3	1.93 V	222	33.7	13.2
6	15540.00	49.3 PK	74.0	-24.7	1.66 V	288	35.6	13.7
7	15540.00	37.6 AV	54.0	-16.4	1.66 V	288	23.9	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 40	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5150.00	66.0 PK	74.0	-8.0	1.65 H	74	61.8	4.2
2	5150.00	50.2 AV	54.0	-3.8	1.65 H	74	46.0	4.2
3	*5200.00	118.5 PK			1.65 H	74	114.6	3.9
4	*5200.00	109.6 AV			1.65 H	74	105.7	3.9
5	#10400.00	50.7 PK	68.2	-17.5	1.69 H	157	37.5	13.2
6	15600.00	51.7 PK	74.0	-22.3	1.67 H	160	37.7	14.0
7	15600.00	38.3 AV	54.0	-15.7	1.67 H	160	24.3	14.0
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5149.05	66.4 PK	74.0	-7.6	1.48 V	276	62.2	4.2
2	5149.05	50.4 AV	54.0	-3.6	1.48 V	276	46.2	4.2
3	*5200.00	122.9 PK			1.48 V	276	119.0	3.9
4	*5200.00	111.8 AV			1.48 V	276	107.9	3.9
5	#10400.00	46.6 PK	68.2	-21.6	1.95 V	241	33.4	13.2
6	15600.00	49.1 PK	74.0	-24.9	1.71 V	284	35.1	14.0
7	15600.00	37.5 AV	54.0	-16.5	1.71 V	284	23.5	14.0

REMARKS:

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

CHANNEL	TX Channel 48	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*5240.00	122.2 PK			1.65 H	63	118.3	3.9
2	*5240.00	111.2 AV			1.65 H	63	107.3	3.9
3	5350.00	56.3 PK	74.0	-17.7	1.65 H	63	52.6	3.7
4	5350.00	45.2 AV	54.0	-8.8	1.65 H	63	41.5	3.7
5	#10480.00	51.2 PK	68.2	-17.0	1.69 H	175	37.7	13.5
6	15720.00	51.9 PK	74.0	-22.1	1.57 H	162	37.4	14.5
7	15720.00	38.6 AV	54.0	-15.4	1.57 H	162	24.1	14.5
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	*5240.00	122.9 PK			1.48 V	277	119.0	3.9
2	*5240.00	112.2 AV			1.48 V	277	108.3	3.9
3	5350.00	55.4 PK	74.0	-18.6	1.48 V	277	51.7	3.7
4	5350.00	44.2 AV	54.0	-9.8	1.48 V	277	40.5	3.7
5	#10480.00	47.0 PK	68.2	-21.2	1.98 V	241	33.5	13.5
6	15720.00	49.3 PK	74.0	-24.7	1.69 V	297	34.8	14.5
7	15720.00	37.5 AV	54.0	-16.5	1.69 V	297	23.0	14.5

REMARKS:

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

CHANNEL	TX Channel 149	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5620.09	55.5 PK	68.2	-12.7	1.74 H	92	51.2	4.3
2	*5745.00	119.7 PK			1.74 H	92	115.3	4.4
3	*5745.00	108.2 AV			1.74 H	92	103.8	4.4
4	#5942.61	53.1 PK	68.2	-15.1	1.74 H	92	48.1	5.0
5	11490.00	51.1 PK	74.0	-22.9	1.66 H	174	37.2	13.9
6	11490.00	38.5 AV	54.0	-15.5	1.66 H	174	24.6	13.9
7	#17235.00	52.7 PK	68.2	-15.5	1.57 H	172	34.4	18.3
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	#5628.67	55.5 PK	68.2	-12.7	1.68 V	241	51.2	4.3
2	*5745.00	121.8 PK			1.68 V	241	117.4	4.4
3	*5745.00	110.6 AV			1.68 V	241	106.2	4.4
4	#5928.80	53.5 PK	68.2	-14.7	1.68 V	241	48.6	4.9
5	11490.00	47.2 PK	74.0	-26.8	1.91 V	231	33.3	13.9
6	11490.00	35.7 AV	54.0	-18.3	1.91 V	231	21.8	13.9
7	#17235.00	48.9 PK	68.2	-19.3	1.70 V	297	30.6	18.3

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 157	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5619.22	53.0 PK	68.2	-15.2	1.64 H	95	48.7	4.3
2	*5785.00	120.0 PK			1.64 H	95	115.5	4.5
3	*5785.00	108.0 AV			1.64 H	95	103.5	4.5
4	#5946.04	55.1 PK	68.2	-13.1	1.64 H	95	50.2	4.9
5	11570.00	51.0 PK	74.0	-23.0	1.64 H	158	37.1	13.9
6	11570.00	38.1 AV	54.0	-15.9	1.64 H	158	24.2	13.9
7	#17355.00	52.3 PK	68.2	-15.9	1.60 H	141	34.1	18.2
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	#5649.42	55.9 PK	68.2	-12.3	1.63 V	287	51.5	4.4
2	*5785.00	123.1 PK			1.63 V	287	118.6	4.5
3	*5785.00	110.9 AV			1.63 V	287	106.4	4.5
4	#5932.23	54.7 PK	68.2	-13.5	1.63 V	287	49.8	4.9
5	11570.00	47.9 PK	74.0	-26.1	1.97 V	245	34.0	13.9
6	11570.00	36.4 AV	54.0	-17.6	1.97 V	245	22.5	13.9
7	#17355.00	49.6 PK	68.2	-18.6	1.67 V	305	31.4	18.2

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 165	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5573.41	52.9 PK	68.2	-15.3	1.59 H	92	48.6	4.3
2	*5825.00	120.0 PK			1.59 H	92	115.3	4.7
3	*5825.00	108.2 AV			1.59 H	92	103.5	4.7
4	#5951.05	55.1 PK	68.2	-13.1	1.59 H	92	50.2	4.9
5	11650.00	50.6 PK	74.0	-23.4	1.76 H	160	36.6	14.0
6	11650.00	37.9 AV	54.0	-16.1	1.76 H	160	23.9	14.0
7	#17475.00	52.7 PK	68.2	-15.5	1.66 H	143	33.9	18.8
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	#5612.08	54.4 PK	68.2	-13.8	1.63 V	255	50.2	4.2
2	*5825.00	122.2 PK			1.63 V	255	117.5	4.7
3	*5825.00	110.6 AV			1.63 V	255	105.9	4.7
4	#5986.70	55.9 PK	68.2	-12.3	1.63 V	255	50.8	5.1
5	11650.00	46.8 PK	74.0	-27.2	1.97 V	241	32.8	14.0
6	11650.00	35.5 AV	54.0	-18.5	1.97 V	241	21.5	14.0
7	#17475.00	49.9 PK	68.2	-18.3	1.66 V	299	31.1	18.8

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 38	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5148.65	56.6 PK	74.0	-17.4	1.63 H	63	52.4	4.2
2	5148.65	46.9 AV	54.0	-7.1	1.63 H	63	42.7	4.2
3	*5190.00	113.3 PK			1.63 H	63	109.2	4.1
4	*5190.00	101.4 AV			1.63 H	63	97.3	4.1
5	#10380.00	51.1 PK	68.2	-17.1	1.65 H	164	37.9	13.2
6	15570.00	52.6 PK	74.0	-21.4	1.59 H	156	38.8	13.8
7	15570.00	38.8 AV	54.0	-15.2	1.59 H	156	25.0	13.8
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5150.00	66.3 PK	74.0	-7.7	1.61 V	279	62.1	4.2
2	**5150.00**	**53.9 AV**	**54.0**	**-0.1**	**1.61 V**	**279**	**49.7**	**4.2**
3	*5190.00	113.7 PK			1.61 V	279	109.6	4.1
4	*5190.00	102.2 AV			1.61 V	279	98.1	4.1
5	#10380.00	46.7 PK	68.2	-21.5	1.99 V	225	33.5	13.2
6	15570.00	49.8 PK	74.0	-24.2	1.70 V	296	36.0	13.8
7	15570.00	37.9 AV	54.0	-16.1	1.70 V	296	24.1	13.8

Remarks:

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

CHANNEL	TX Channel 46	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5150.00	65.6 PK	74.0	-8.4	1.73 H	66	61.4	4.2
2	5150.00	52.5 AV	54.0	-1.5	1.73 H	66	48.3	4.2
3	*5230.00	119.4 PK			1.73 H	66	115.5	3.9
4	*5230.00	107.8 AV			1.73 H	66	103.9	3.9
5	#10460.00	51.4 PK	68.2	-16.8	1.71 H	162	38.1	13.3
6	15690.00	52.0 PK	74.0	-22.0	1.61 H	156	37.5	14.5
7	15690.00	38.5 AV	54.0	-15.5	1.61 H	156	24.0	14.5
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	5149.13	69.2 PK	74.0	-4.8	1.65 V	281	65.0	4.2
2	5149.13	53.2 AV	54.0	-0.8	1.65 V	281	49.0	4.2
3	*5230.00	121.6 PK			1.65 V	281	117.7	3.9
4	*5230.00	108.9 AV			1.65 V	281	105.0	3.9
5	#10460.00	46.8 PK	68.2	-21.4	1.98 V	241	33.5	13.3
6	15690.00	49.3 PK	74.0	-24.7	1.64 V	286	34.8	14.5
7	15690.00	37.6 AV	54.0	-16.4	1.64 V	286	23.1	14.5

Remarks:

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

CHANNEL	TX Channel 151	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5642.76	62.0 PK	68.2	-6.2	1.66 H	90	57.7	4.3
2	*5755.00	119.1 PK			1.66 H	90	114.7	4.4
3	*5755.00	106.3 AV			1.66 H	90	101.9	4.4
4	#5926.08	55.1 PK	68.2	-13.1	1.66 H	90	50.2	4.9
5	11510.00	51.2 PK	74.0	-22.8	1.69 H	154	37.2	14.0
6	11510.00	38.6 AV	54.0	-15.4	1.69 H	154	24.6	14.0
7	#17265.00	52.8 PK	68.2	-15.4	1.67 H	151	34.7	18.1
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	#5648.18	65.0 PK	68.2	-3.2	1.74 V	288	60.6	4.4
2	*5755.00	120.4 PK			1.74 V	288	116.0	4.4
3	*5755.00	108.6 AV			1.74 V	288	104.2	4.4
4	#5936.37	54.7 PK	68.2	-13.5	1.74 V	288	49.7	5.0
5	11510.00	47.6 PK	74.0	-26.4	1.92 V	229	33.6	14.0
6	11510.00	36.4 AV	54.0	-17.6	1.92 V	229	22.4	14.0
7	#17265.00	49.6 PK	68.2	-18.6	1.63 V	286	31.5	18.1

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 159	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5644.74	57.7 PK	68.2	-10.5	1.65 H	91	53.4	4.3
2	*5795.00	119.0 PK			1.65 H	91	114.4	4.6
3	*5795.00	106.4 AV			1.65 H	91	101.8	4.6
4	#5925.77	59.7 PK	68.2	-8.5	1.65 H	91	54.8	4.9
5	11590.00	51.2 PK	74.0	-22.8	1.71 H	163	37.3	13.9
6	11590.00	38.3 AV	54.0	-15.7	1.71 H	163	24.4	13.9
7	#17385.00	52.3 PK	68.2	-15.9	1.63 H	168	33.9	18.4
Antenna Polarity & Test Distance : Vertical at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5644.85	58.5 PK	68.2	-9.7	1.77 V	287	54.2	4.3
2	*5795.00	120.2 PK			1.77 V	287	115.6	4.6
3	*5795.00	108.5 AV			1.77 V	287	103.9	4.6
4	#5927.10	61.6 PK	68.2	-6.6	1.77 V	287	56.7	4.9
5	11590.00	46.8 PK	74.0	-27.2	1.88 V	245	32.9	13.9
6	11590.00	35.6 AV	54.0	-18.4	1.88 V	245	21.7	13.9
7	#17385.00	48.8 PK	68.2	-19.4	1.70 V	299	30.4	18.4

Remarks:

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

802.11ax (HE80)

CHANNEL	TX Channel 42	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	5145.89	55.1 PK	74.0	-18.9	1.70 H	64	50.9	4.2
2	5145.89	45.3 AV	54.0	-8.7	1.70 H	64	41.1	4.2
3	*5210.00	109.4 PK			1.70 H	64	105.5	3.9
4	*5210.00	97.5 AV			1.70 H	64	93.6	3.9
5	5350.00	53.9 PK	74.0	-20.1	1.70 H	64	50.2	3.7
6	5350.00	40.9 AV	54.0	-13.1	1.70 H	64	37.2	3.7
7	#10420.00	51.2 PK	68.2	-17.0	1.70 H	163	38.0	13.2
8	15630.00	52.3 PK	74.0	-21.7	1.59 H	157	38.0	14.3
9	15630.00	39.1 AV	54.0	-14.9	1.59 H	157	24.8	14.3
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	5145.89	64.7 PK	74.0	-9.3	1.60 V	280	60.5	4.2
2	5145.89	53.2 AV	54.0	-0.8	1.60 V	280	49.0	4.2
3	*5210.00	110.1 PK			1.60 V	280	106.2	3.9
4	*5210.00	98.2 AV			1.60 V	280	94.3	3.9
5	5350.00	54.3 PK	74.0	-19.7	1.60 V	280	50.6	3.7
6	5350.00	41.6 AV	54.0	-12.4	1.60 V	280	37.9	3.7
7	#10420.00	46.6 PK	68.2	-21.6	1.94 V	236	33.4	13.2
8	15630.00	49.9 PK	74.0	-24.1	1.66 V	276	35.6	14.3
9	15630.00	37.9 AV	54.0	-16.1	1.66 V	276	23.6	14.3

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 155	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

Antenna Polarity & Test Distance : Horizontal at 3 m								
No	Frequency (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#5645.38	64.0 PK	68.2	-4.2	1.64 H	95	59.7	4.3
2	*5775.00	112.3 PK			1.64 H	95	107.8	4.5
3	*5775.00	100.4 AV			1.64 H	95	95.9	4.5
4	#5943.12	60.3 PK	68.2	-7.9	1.64 H	95	55.4	4.9
5	11550.00	51.4 PK	74.0	-22.6	1.71 H	158	37.5	13.9
6	11550.00	38.7 AV	54.0	-15.3	1.71 H	158	24.8	13.9
7	#17325.00	52.1 PK	68.2	-16.1	1.65 H	155	33.9	18.2
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	#5646.52	67.7 PK	68.2	-0.5	1.68 V	286	63.4	4.3
2	*5775.00	115.4 PK			1.68 V	286	110.9	4.5
3	*5775.00	103.9 AV			1.68 V	286	99.4	4.5
4	#5925.68	63.1 PK	68.2	-5.1	1.68 V	286	58.2	4.9
5	11550.00	47.2 PK	74.0	-26.8	1.97 V	234	33.3	13.9
6	11550.00	35.9 AV	54.0	-18.1	1.97 V	234	22.0	13.9
7	#17325.00	49.6 PK	68.2	-18.6	1.68 V	303	31.4	18.2

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.

Below 1GHz Data:

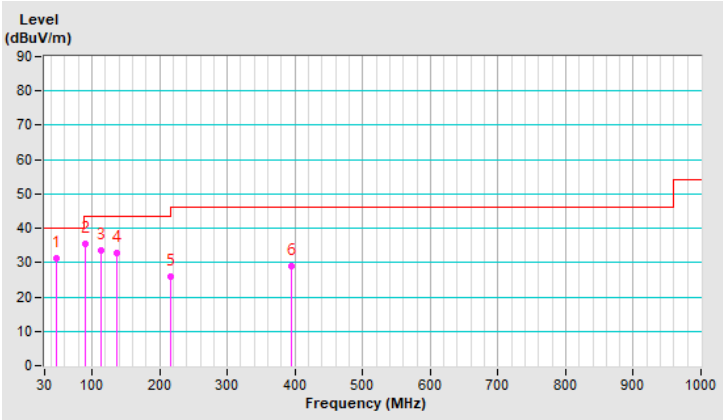
802.11a

CHANNEL	TX Channel 157	**DETECTOR FUNCTION**	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	**FREQ. (MHz)**	**EMISSION LEVEL (dBuV/m)**	**LIMIT (dBuV/m)**	**MARGIN (dB)**	**ANTENNA HEIGHT (m)**	**TABLE ANGLE (Degree)**	**RAW VALUE (dBuV)**	**CORRECTION FACTOR (dB/m)**
1	48.35	31.4 QP	40.0	-8.6	2.00 H	2	39.0	-7.6
2	90.22	35.3 QP	43.5	-8.2	2.00 H	120	48.5	-13.2
3	112.65	33.7 QP	43.5	-9.8	1.50 H	250	43.5	-9.8
4	135.88	32.9 QP	43.5	-10.6	1.50 H	110	40.5	-7.6
5	215.43	25.9 QP	43.5	-17.6	2.00 H	95	35.9	-10.0
6	395.42	28.9 QP	46.0	-17.1	3.00 H	235	32.0	-3.1

REMARKS:

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

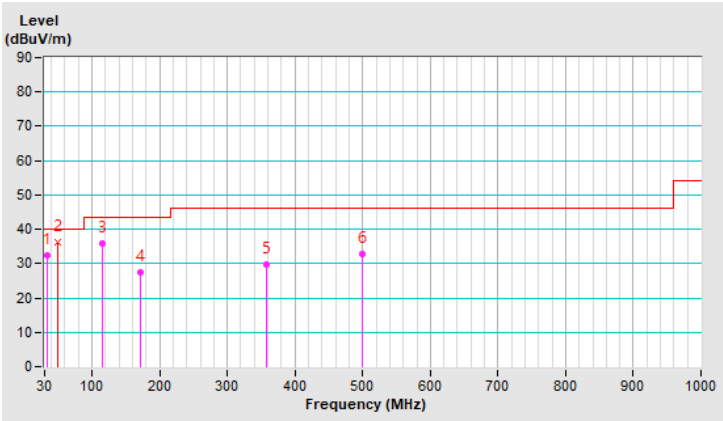


CHANNEL	TX Channel 157	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	33.54	32.5 QP	40.0	-7.5	1.00 V	245	41.3	-8.8
2	49.88	36.3 QP	40.0	-3.7	1.00 V	2	43.8	-7.5
3	115.90	35.7 QP	43.5	-7.8	1.00 V	265	45.2	-9.5
4	171.54	27.3 QP	43.5	-16.2	1.50 V	230	34.8	-7.5
5	357.35	29.6 QP	46.0	-16.4	1.50 V	300	33.7	-4.1
6	500.19	32.8 QP	46.0	-13.2	1.00 V	100	33.2	-0.4

REMARKS:

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



4.2 Conducted Emission Measurement

4.2.1 Limits of Conducted Emission Measurement

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

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

4.2.2 Test Instruments

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver R&S	ESCS 30	100287	Apr. 16, 2020	Apr. 15, 2021
Line-Impedance Stabilization Network (for Peripheral) R&S	ENV 216	100072	June 13, 2020	June 12, 2021
Line-Impedance Stabilization Network (for EUT) SCHWARZBECK	NSLK-8127	8127-522	Sep. 08, 2020	Sep. 07, 2021
RF Cable	5D-FB	COACAB-001	Mar. 13, 2020	Mar. 12, 2021
10 dB PAD EMEC	STI02-2200-10	006	Aug. 28, 2020	Aug. 27, 2021
50 ohms Terminator	N/A	EMC-02	Sep. 16, 2020	Sep. 15, 2021
50 ohms Terminator	N/A	EMC-03	Sep. 30, 2020	Sep. 29, 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 Conducted Room C
3. The VCCI Con C Registration No. is C-13611.
4. Tested Date: Oct. 19, 2020

4.2.3 Test Procedure

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

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

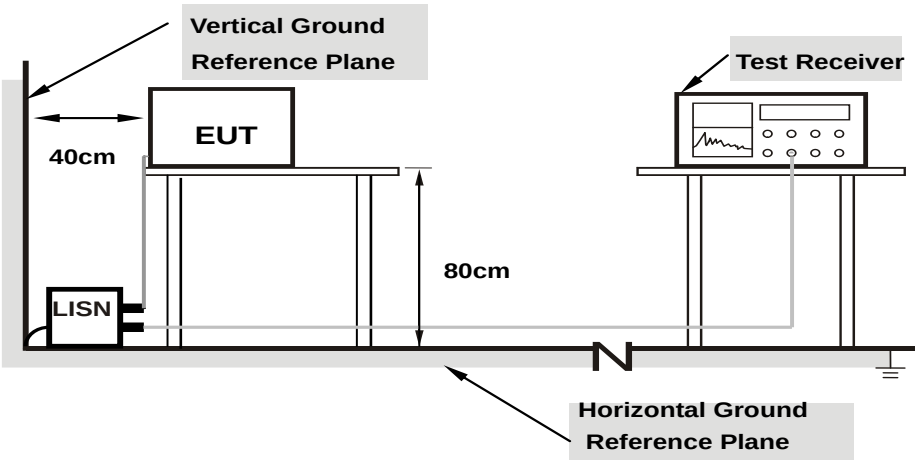
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

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

4.2.4 Deviation from Test Standard

No deviation.

4.2.5 Test Setup



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

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

4.2.6 EUT Operating Condition

Same as 4.1.6.

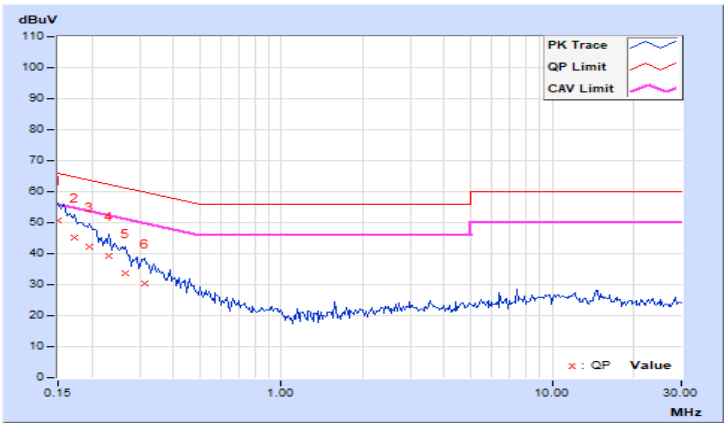
4.2.7 Test Results

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

No	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15033	9.94	40.80	23.19	50.74	33.13	65.98	55.98	-15.24	-22.85
2	0.17344	9.94	35.38	19.19	45.32	29.13	64.79	54.79	-19.47	-25.66
3	0.19687	9.95	32.35	15.39	42.30	25.34	63.74	53.74	-21.44	-28.40
4	0.23203	9.95	29.26	12.78	39.21	22.73	62.38	52.38	-23.17	-29.65
5	0.26719	9.96	23.89	8.83	33.85	18.79	61.20	51.20	-27.35	-32.41
6	0.31406	9.96	20.33	6.06	30.29	16.02	59.86	49.86	-29.57	-33.84

Remarks:

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

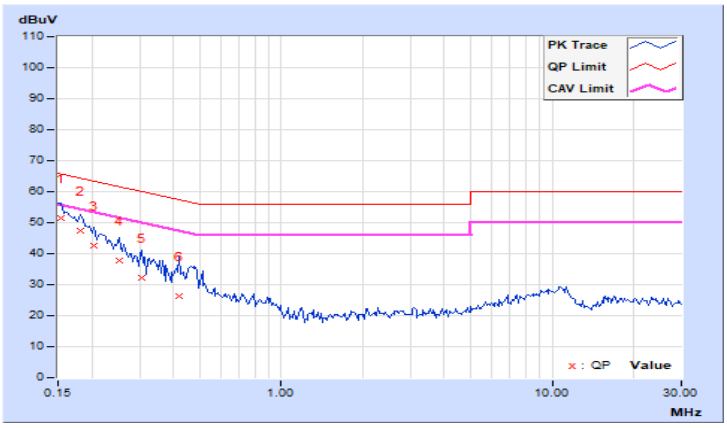


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	**0.15391**	**9.95**	**41.59**	**24.39**	**51.54**	**34.34**	**65.79**	**55.79**	**-14.25**	**-21.45**
2	0.18125	9.96	37.29	21.19	47.25	31.15	64.43	54.43	-17.18	-23.28
3	0.20469	9.96	32.52	16.89	42.48	26.85	63.42	53.42	-20.94	-26.57
4	0.25156	9.97	27.63	12.04	37.60	22.01	61.71	51.71	-24.11	-29.70
5	0.30625	9.97	22.42	7.34	32.39	17.31	60.07	50.07	-27.68	-32.76
6	0.41953	9.98	16.34	-5.45	26.32	4.53	57.46	47.46	-31.14	-42.93

Remarks:

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



4.3 Transmit Power Measurement

4.3.1 Limits of Transmit Power Measurement

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

*B is the 26 dB emission bandwidth in megahertz

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

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

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

4.3.2 Test Setup

4.3.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.3.4 Test Procedure

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

4.3.5 Deviation from Test Standard

No deviation.

4.3.6 EUT Operating Condition

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

4.3.7 Test Results

CDD Mode

802.11a

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
36	5180	20.48	20.91	20.79	20.96	479.685	26.81	30	Pass
40	5200	20.26	20.90	20.87	20.93	475.256	26.77	30	Pass
48	5240	20.53	21.16	20.63	20.93	483.088	26.84	30	Pass
149	5745	24.13	24.02	23.70	23.86	988.813	29.95	30	Pass
157	5785	24.10	24.02	23.74	23.94	993.722	29.97	30	Pass
165	5825	24.05	24.01	23.42	23.96	974.537	29.89	30	Pass

802.11ac (VHT20)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
36	5180	20.48	20.74	20.49	20.55	455.708	26.59	30	Pass
40	5200	20.11	20.93	20.24	20.45	443.044	26.46	30	Pass
48	5240	20.34	20.86	20.13	20.59	447.632	26.51	30	Pass
149	5745	23.51	23.63	23.87	24.09	955.292	29.80	30	Pass
157	5785	23.44	23.41	23.67	23.98	922.925	29.65	30	Pass
165	5825	23.46	23.39	23.52	24.02	917.346	29.63	30	Pass

802.11ac (VHT40)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
38	5190	17.27	17.72	17.27	16.05	206.095	23.14	30	Pass
46	5230	23.77	23.83	23.52	22.73	892.183	29.50	30	Pass
151	5755	23.81	23.79	23.48	23.09	906.316	29.57	30	Pass
159	5795	23.69	23.75	23.22	23.11	885.56	29.47	30	Pass

802.11ac (VHT80)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
42	5210	16.33	16.61	16.48	16.65	179.469	22.54	30	Pass
155	5775	22.13	22.45	22.61	22.58	702.621	28.47	30	Pass

802.11ax (HE20)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
36	5180	20.74	21.01	20.75	20.88	486.071	26.87	30	Pass
40	5200	20.38	21.21	20.49	20.73	471.522	26.74	30	Pass
48	5240	20.61	21.18	20.37	20.83	476.253	26.78	30	Pass
149	5745	23.68	23.77	23.96	24.23	985.313	29.94	30	Pass
157	5785	23.53	23.48	23.75	24.10	942.444	29.74	30	Pass
165	5825	23.59	23.49	23.61	24.16	942.147	29.74	30	Pass

802.11ax (HE40)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
38	5190	17.40	17.81	17.38	16.16	211.355	23.25	30	Pass
46	5230	23.85	23.94	23.64	22.82	913.035	29.60	30	Pass
151	5755	23.93	23.94	23.62	23.23	935.437	29.71	30	Pass
159	5795	23.81	23.88	23.41	23.25	915.409	29.62	30	Pass

802.11ax (HE80)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
42	5210	16.47	16.73	16.61	16.79	185.026	22.67	30	Pass
155	5775	22.26	22.58	22.72	22.70	722.678	28.59	30	Pass

Beamforming Mode

802.11ac (VHT20)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
36	5180	20.48	20.74	20.49	20.55	455.708	26.59	26.92	Pass
40	5200	20.11	20.93	20.24	20.45	443.044	26.46	26.92	Pass
48	5240	20.34	20.86	20.13	20.59	447.632	26.51	26.92	Pass
149	5745	19.67	19.88	20.06	20.27	397.763	26.00	26.24	Pass
157	5785	19.76	19.71	19.97	20.18	391.708	25.93	26.24	Pass
165	5825	19.89	19.74	19.83	20.14	391.125	25.92	26.24	Pass

Note: 1. For U-NII-1: The directional gain= 10 log[$(10^{G0/20} + 10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2$ / 4] = 9.08 dBi > 6 dBi, so the power limit shall be reduced to 30-(9.08-6) = 26.92 dBm.
2. For U-NII-3: The directional gain= 10 log[$(10^{G0/20} + 10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2$ / 4] = 9.76 dBi > 6 dBi, so the power limit shall be reduced to 30-(9.76-6) = 26.24 dBm.

802.11ac (VHT40)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
38	5190	17.27	17.72	17.27	16.05	206.095	23.14	26.92	Pass
46	5230	20.92	21.01	20.74	19.96	467.438	26.70	26.92	Pass
151	5755	20.01	19.99	19.85	19.97	395.917	25.98	26.24	Pass
159	5795	19.96	20.07	19.76	20.02	395.793	25.97	26.24	Pass

Note: 1. For U-NII-1: The directional gain= 10 log[$(10^{G0/20} + 10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2$ / 4] = 9.08 dBi > 6 dBi, so the power limit shall be reduced to 30-(9.08-6) = 26.92 dBm.
2. For U-NII-3: The directional gain= 10 log[$(10^{G0/20} + 10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2$ / 4] = 9.76 dBi > 6 dBi, so the power limit shall be reduced to 30-(9.76-6) = 26.24 dBm.

802.11ac (VHT80)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
42	5210	16.33	16.61	16.48	16.65	179.469	22.54	26.92	Pass
155	5775	19.67	20.03	20.06	20.14	398.043	26.00	26.24	Pass

Note: 1. For U-NII-1: The directional gain= 10 log[$(10^{G0/20} + 10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2$ / 4] = 9.08 dBi > 6 dBi, so the power limit shall be reduced to 30-(9.08-6) = 26.92 dBm.
2. For U-NII-3: The directional gain= 10 log[$(10^{G0/20} + 10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2$ / 4] = 9.76 dBi > 6 dBi, so the power limit shall be reduced to 30-(9.76-6) = 26.24 dBm.

802.11ax (HE20)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
36	5180	20.74	21.01	20.75	20.88	486.071	26.87	26.92	Pass
40	5200	20.38	21.21	20.49	20.73	471.522	26.74	26.92	Pass
48	5240	20.61	21.18	20.37	20.83	476.253	26.78	26.92	Pass
149	5745	19.91	19.96	20.33	20.48	416.613	26.20	26.24	Pass
157	5785	20.01	19.92	20.19	20.53	415.857	26.19	26.24	Pass
165	5825	20.02	19.95	20.16	20.53	416.049	26.19	26.24	Pass

Note: 1. For U-NII-1: The directional gain= 10 log[$(10^{G0/20} + 10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2$ / 4] = 9.08 dBi > 6 dBi, so the power limit shall be reduced to 30-(9.08-6) = 26.92 dBm.
2. For U-NII-3: The directional gain= 10 log[$(10^{G0/20} + 10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2$ / 4] = 9.76 dBi > 6 dBi, so the power limit shall be reduced to 30-(9.76-6) = 26.24 dBm.

802.11ax (HE40)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
38	5190	17.40	17.81	17.38	16.16	211.355	23.25	26.92	Pass
46	5230	21.13	21.19	20.89	20.14	487.26	26.88	26.92	Pass
151	5755	20.25	20.23	20.06	20.19	417.227	26.20	26.24	Pass
159	5795	20.18	20.24	19.93	20.19	412.787	26.16	26.24	Pass

Note: 1. For U-NII-1: The directional gain= 10 log[$(10^{G0/20} + 10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2$ / 4] = 9.08 dBi > 6 dBi, so the power limit shall be reduced to 30-(9.08-6) = 26.92 dBm.
2. For U-NII-3: The directional gain= 10 log[$(10^{G0/20} + 10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2$ / 4] = 9.76 dBi > 6 dBi, so the power limit shall be reduced to 30-(9.76-6) = 26.24 dBm.

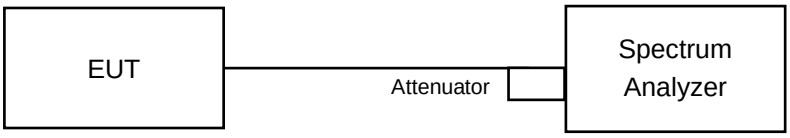
802.11ax (HE80)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
42	5210	16.47	16.73	16.61	16.79	185.026	22.67	26.92	Pass
155	5775	19.83	20.16	20.19	20.26	410.556	26.13	26.24	Pass

Note: 1. For U-NII-1: The directional gain= 10 log[$(10^{G0/20} + 10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2$ / 4] = 9.08 dBi > 6 dBi, so the power limit shall be reduced to 30-(9.08-6) = 26.92 dBm.
2. For U-NII-3: The directional gain= 10 log[$(10^{G0/20} + 10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2$ / 4] = 9.76 dBi > 6 dBi, so the power limit shall be reduced to 30-(9.76-6) = 26.24 dBm.

4.4 Occupied Bandwidth Measurement

4.4.1 Test Setup



4.4.2 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.4.3 Test Procedure

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

4.4.4 Test Results

802.11a

Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)			
		Chain 0	Chain 1	Chain 2	Chain 3
36	5180	17.04	17.04	17.04	17.04
40	5200	16.92	17.04	17.04	16.92
48	5240	16.8	17.04	17.04	16.92
149	5745	17.88	17.64	18.72	18.24
157	5785	18.48	18.12	18.48	18.36
165	5825	18.12	17.76	18.36	18

802.11ax (HE20)

Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)			
		Chain 0	Chain 1	Chain 2	Chain 3
36	5180	19.08	19.08	19.2	19.2
40	5200	19.08	19.2	19.2	19.2
48	5240	19.08	19.32	19.08	19.2
149	5745	19.32	19.32	19.92	19.56
157	5785	19.32	19.32	19.68	19.44
165	5825	19.32	19.32	19.8	19.32

802.11ax (HE40)

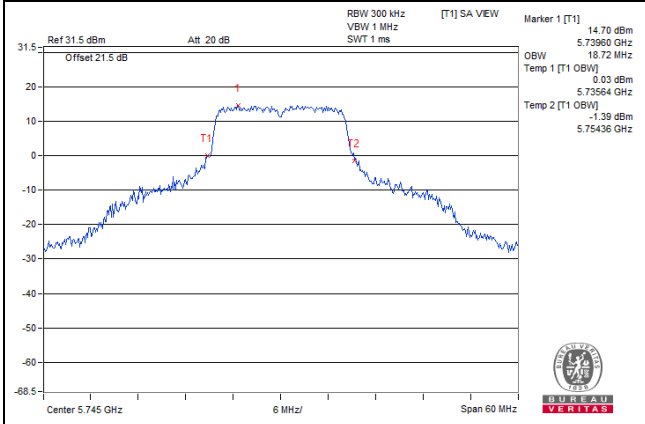
Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)			
		Chain 0	Chain 1	Chain 2	Chain 3
38	5190	37.68	37.68	37.92	37.68
46	5230	38.16	38.16	37.92	37.68
151	5755	38.4	38.16	38.88	38.16
159	5795	38.64	38.16	38.64	37.92

802.11ax (HE80)

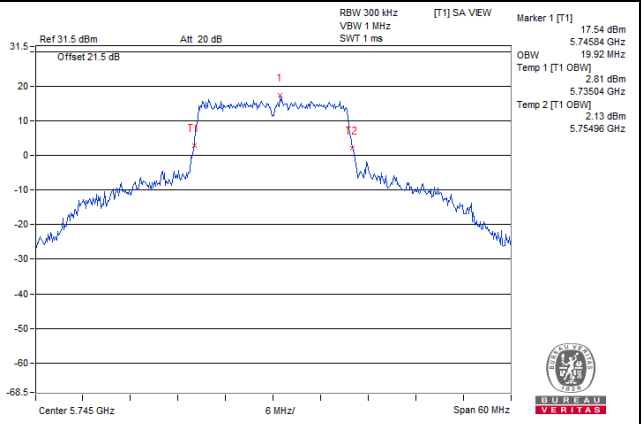
Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)			
		Chain 0	Chain 1	Chain 2	Chain 3
42	5210	77.28	77.28	77.28	76.8
155	5775	79.68	77.28	77.76	77.76

Spectrum Plot of Max. Value

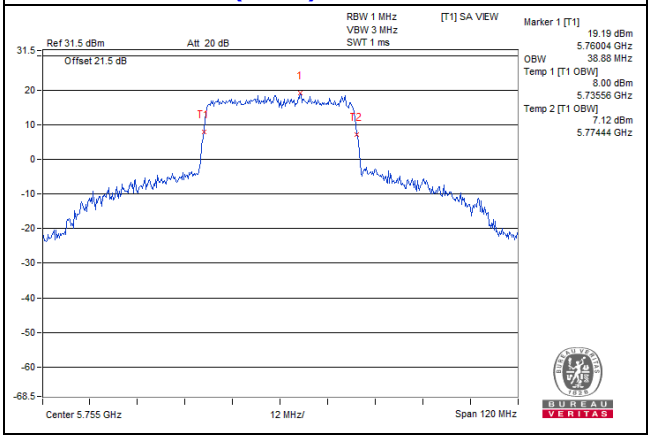
802.11a_Chain 2 / CH149



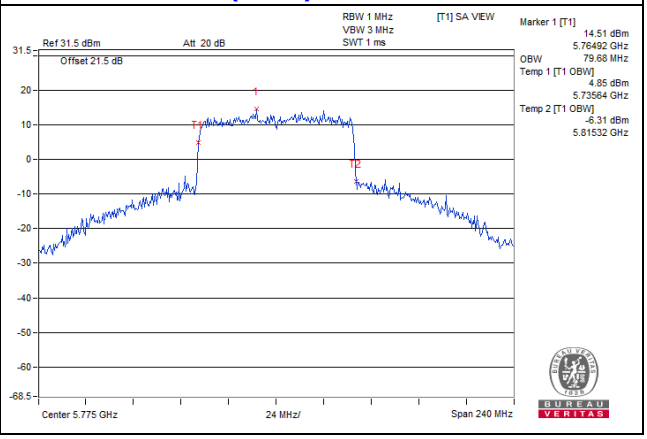
802.11ax (HE20)_Chain 2 / CH149



802.11ax (HE40)_Chain 2 / CH151

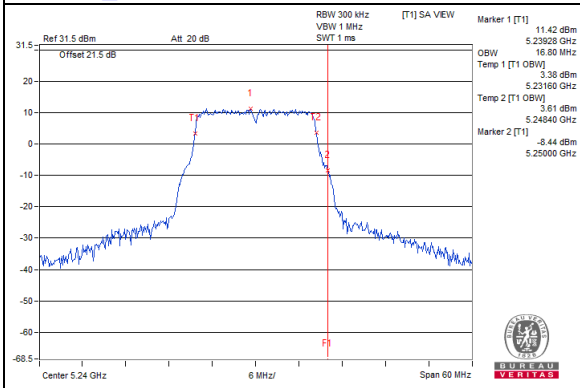


802.11ax (HE80)_Chain 0 / CH155

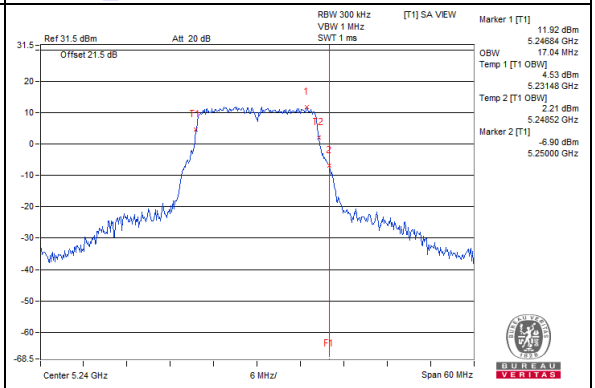


Spectrum Plot for near by DFS band
(DFS is required, if 99% OCP straddle into U-NII-2A band)

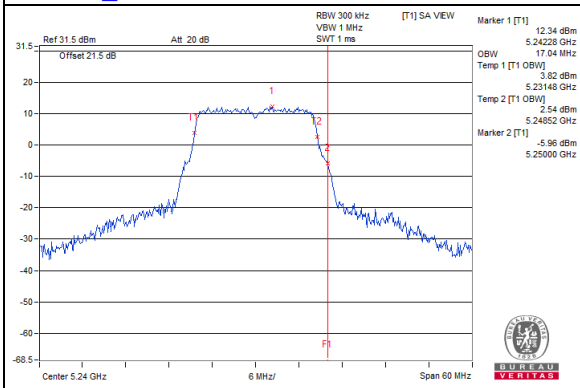
802.11a_Chain 0 / CH48



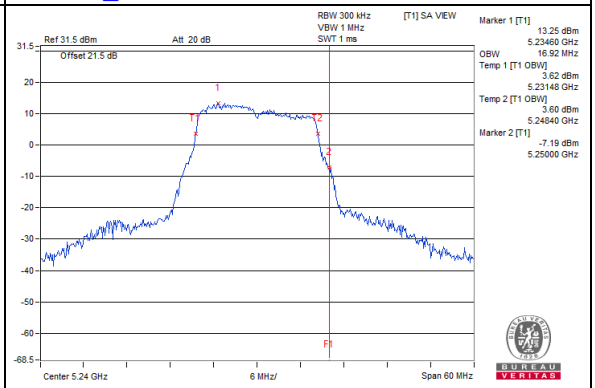
802.11a_Chain 1 / CH48



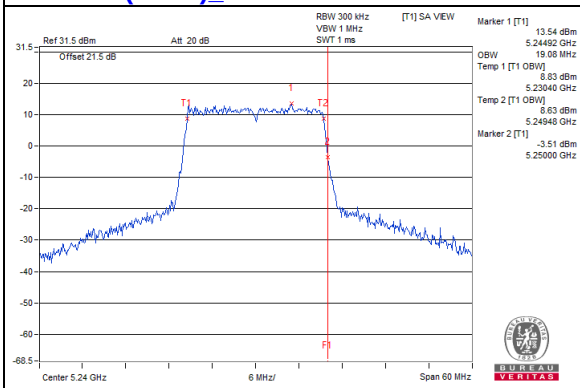
802.11a_Chain 2 / CH48



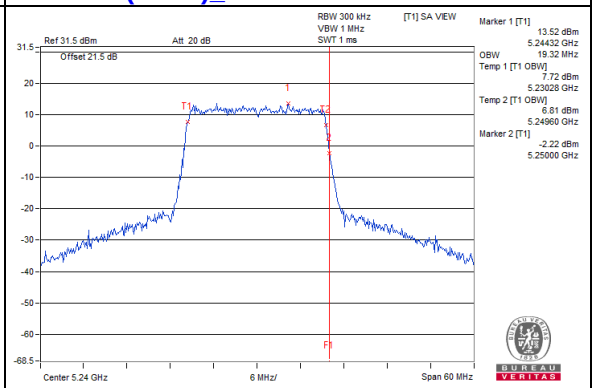
802.11a_Chain 3 / CH48



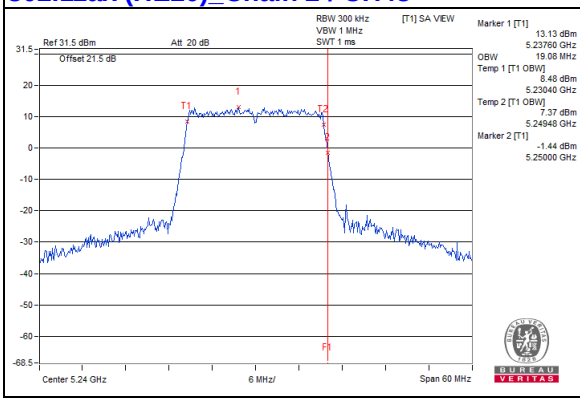
802.11ax (HE20)_Chain 0 / CH48



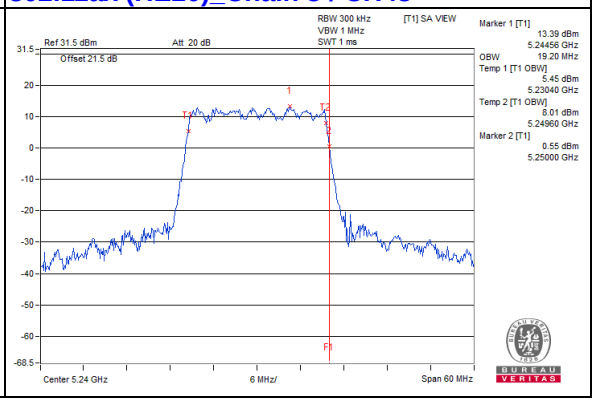
802.11ax (HE20)_Chain 1 / CH48



802.11ax (HE20)_Chain 2 / CH48

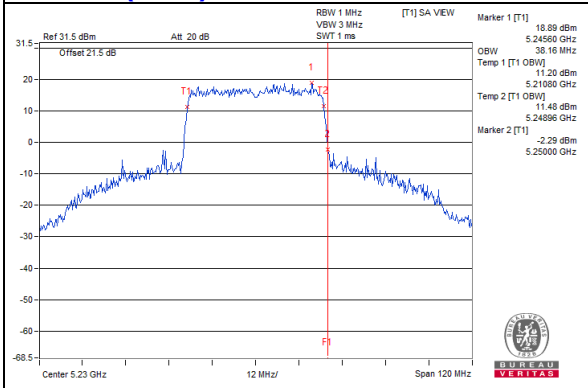


802.11ax (HE20)_Chain 3 / CH48

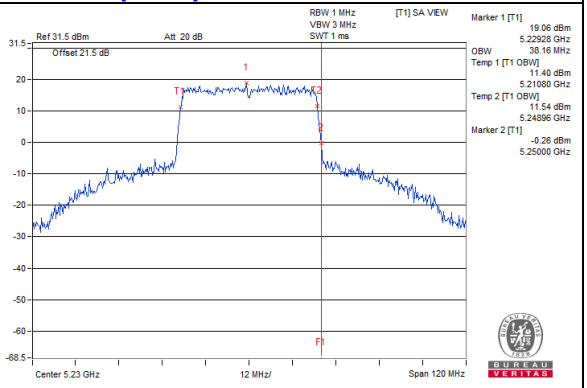


Spectrum Plot for near by DFS band
(DFS is required, if 99% OCP straddle into U-NII-2A band)

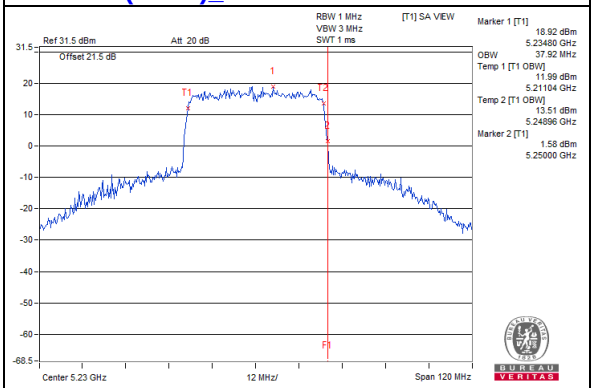
802.11ax (HE40)_Chain 0 / CH46



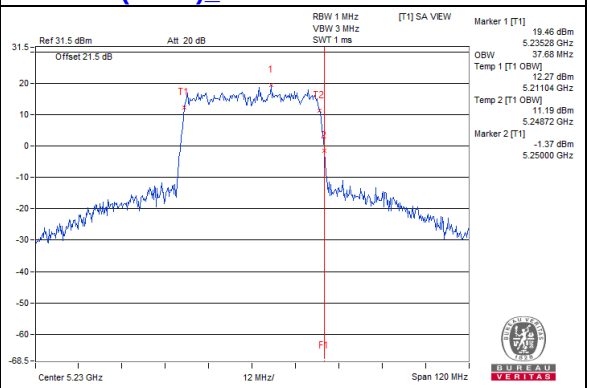
802.11ax (HE40)_Chain 1 / CH46



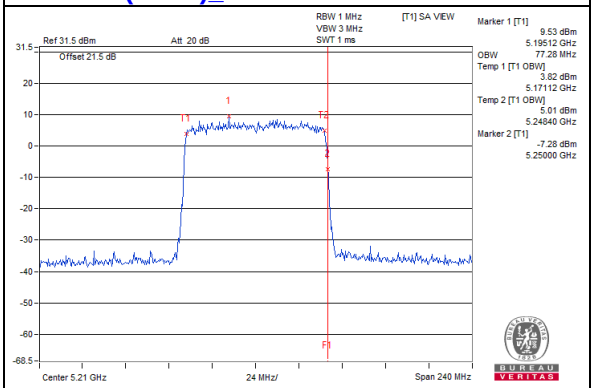
802.11ax (HE40)_Chain 2 / CH46



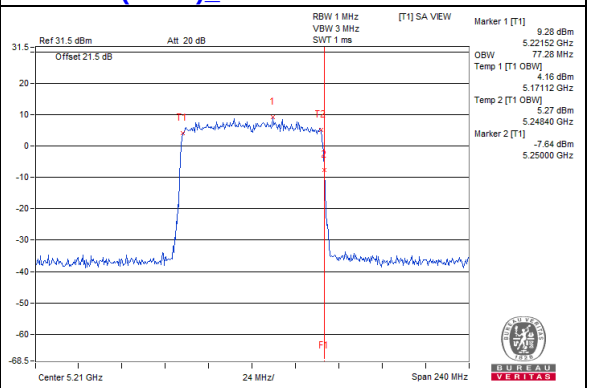
802.11ax (HE40)_Chain 3 / CH46



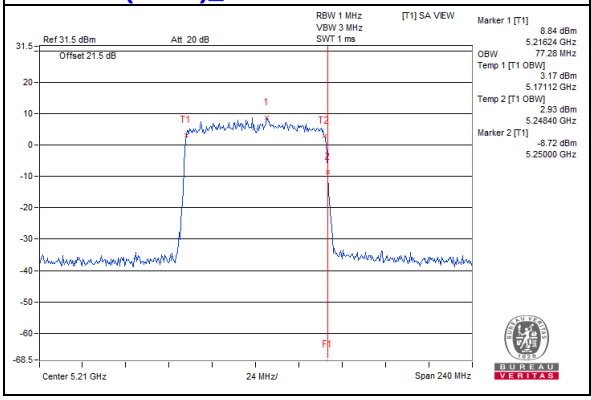
802.11ax (HE80)_Chain 0 / CH42



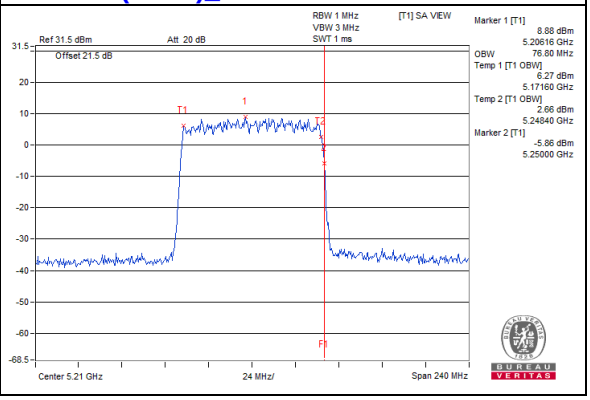
802.11ax (HE80)_Chain 1 / CH42



802.11ax (HE80)_Chain 2 / CH42

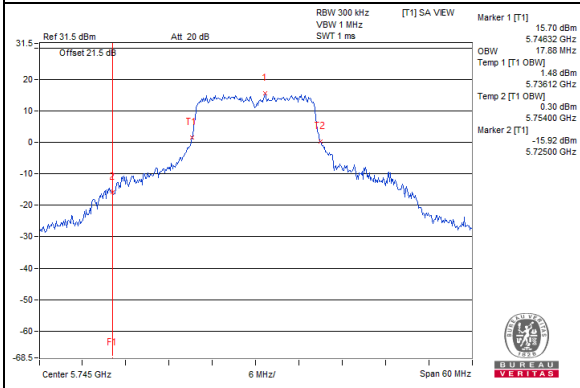


802.11ax (HE80)_Chain 3 / CH42

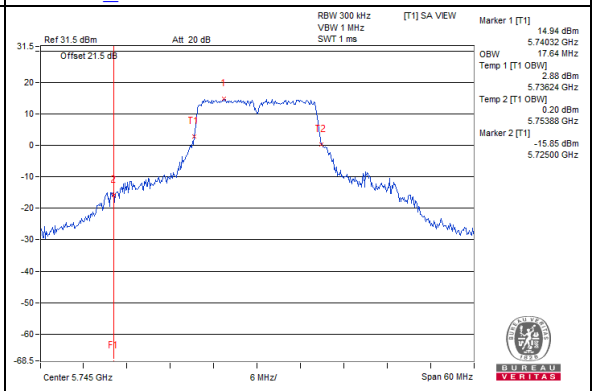


Spectrum Plot for near by DFS band
(DFS is required, if 99% OCP straddle into U-NII-2C band)

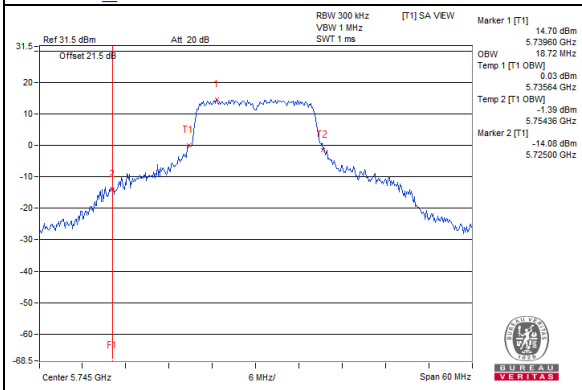
802.11a_Chain 0 / CH149



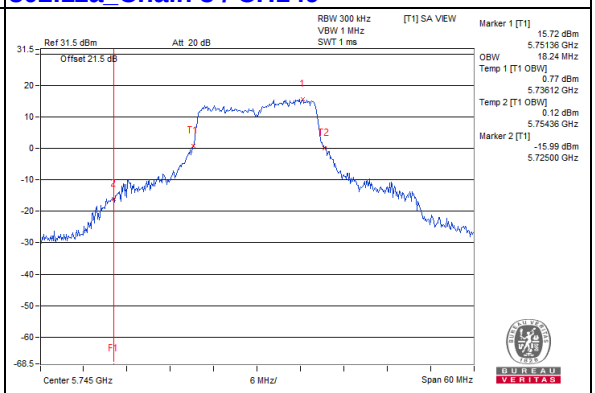
802.11a_Chain 1 / CH149



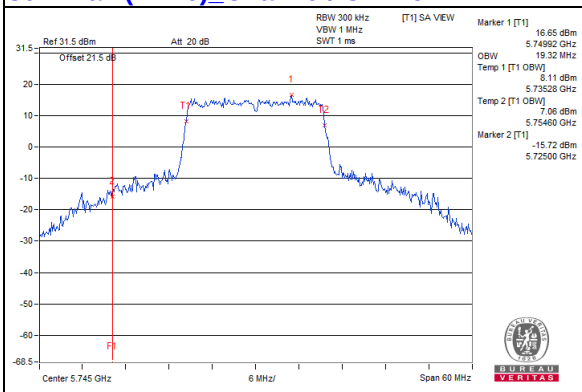
802.11a_Chain 2 / CH149



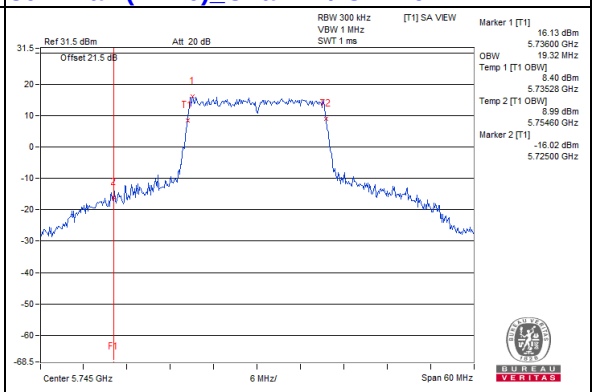
802.11a_Chain 3 / CH149



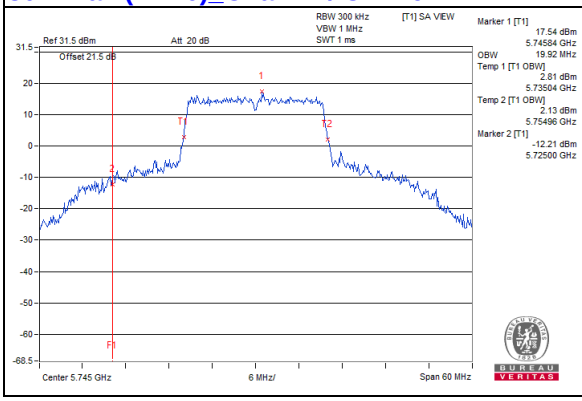
802.11ax (HE20)_Chain 0 / CH149



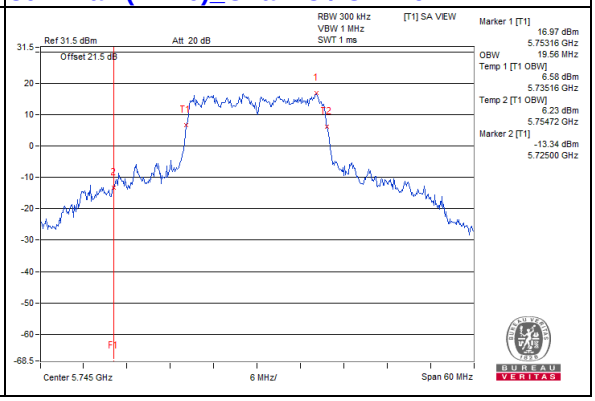
802.11ax (HE20)_Chain 1 / CH149



802.11ax (HE20)_Chain 2 / CH149

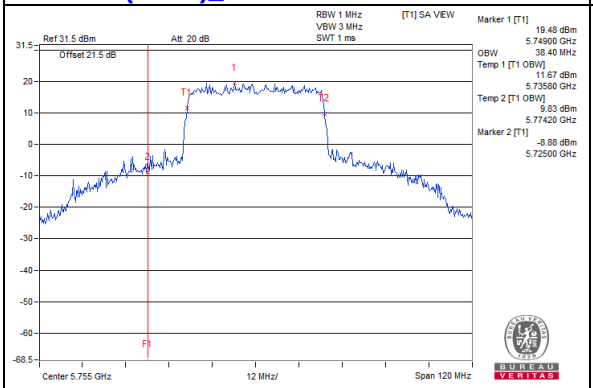


802.11ax (HE20)_Chain 3 / CH149

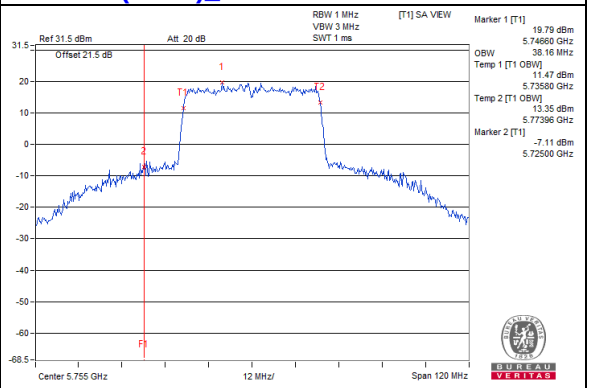


Spectrum Plot for near by DFS band
(DFS is required, if 99% OCP straddle into U-NII-2C band)

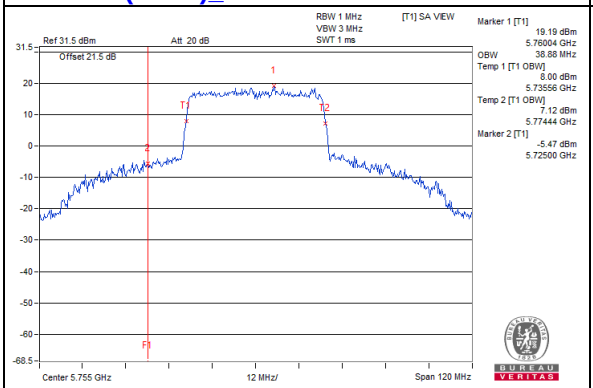
802.11ax (HE40)_Chain 0 / CH151



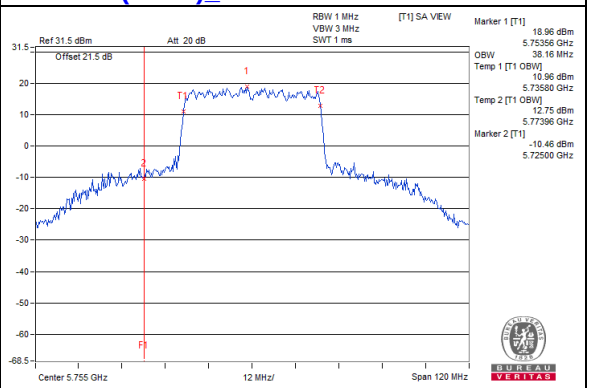
802.11ax (HE40)_Chain 1 / CH151



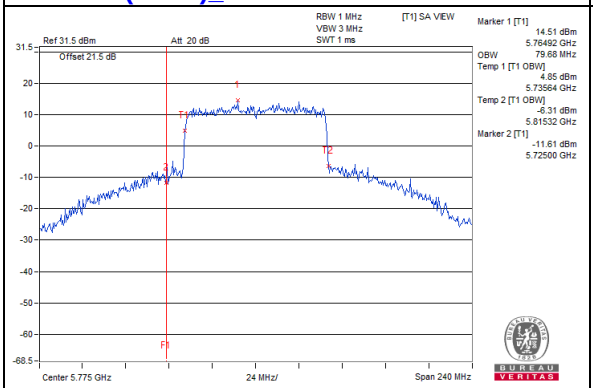
802.11ax (HE40)_Chain 2 / CH151



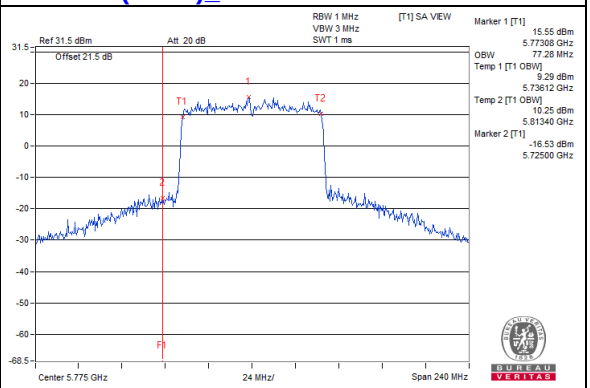
802.11ax (HE40)_Chain 3 / CH151



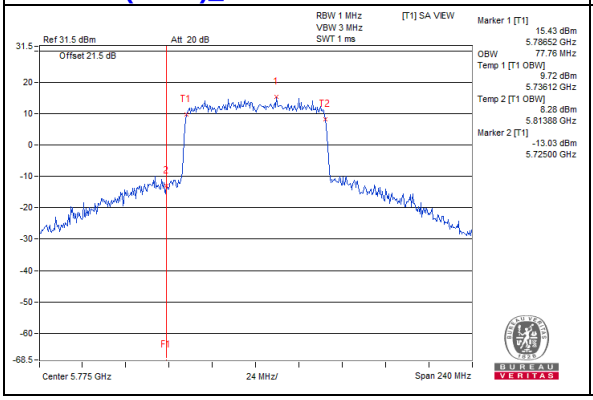
802.11ax (HE80)_Chain 0 / CH155



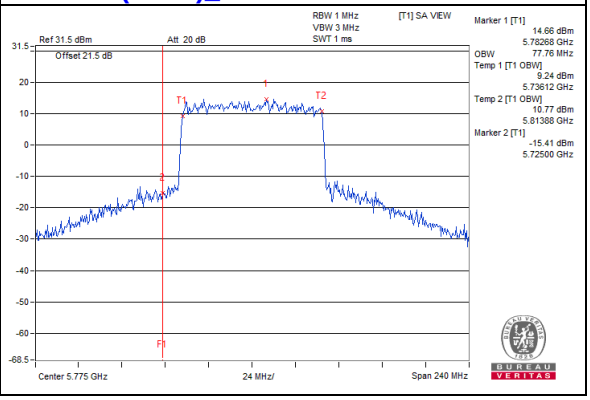
802.11ax (HE80)_Chain 1 / CH155



802.11ax (HE80)_Chain 2 / CH155



802.11ax (HE80)_Chain 3 / CH155

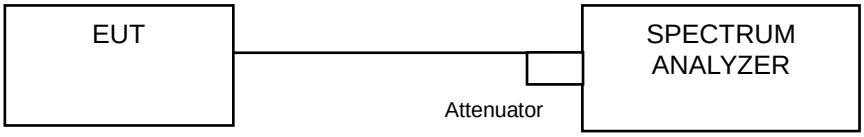


4.5 Peak Power Spectral Density Measurement

4.5.1 Limits of Peak Power Spectral Density Measurement

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

4.5.2 Test Setup



4.5.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.5.4 Test Procedure

For U-NII-1:

Using method SA-1

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

For U-NII-3:

1. Set span to encompass the entire emission bandwidth (EBW) of the signal.
2. Set RBW = 300 kHz, Set VBW ≥ 1 MHz, Detector = RMS
3. Use the peak marker function to determine the maximum power level in any 300 kHz band segment within the fundamental EBW.
4. Scale the observed power level to an equivalent value in 500 kHz by adjusting (increasing) the measured power by a bandwidth correction factor (BWCF) where BWCF = 10log(500 kHz/300kHz)
5. Sweep time = auto, trigger set to “free run”.
6. Trace average at least 100 traces in power averaging mode.
7. Record the max value

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

For U-NII-1:

802.11a

Chan.	Chan. Freq. (MHz)	PSD (dBm/MHz)				Total Power Density (dBm/MHz)	MAX. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3			
36	5180	7.26	8.67	7.56	7.83	13.88	13.92	Pass
40	5200	7.22	8.00	7.45	7.63	13.60	13.92	Pass
48	5240	7.12	8.04	7.91	7.81	13.75	13.92	Pass

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

2. The directional gain= 10 log[$(10^{G0/20} + 10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2$ / 4] = 9.08 dBi > 6 dBi, so the power density limit shall be reduced to 17-(9.08-6) = 13.92 dBm.

802.11ax (HE20)

Chan.	Chan. Freq. (MHz)	PSD (dBm/MHz)				Total Power Density (dBm/MHz)	MAX. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3			
36	5180	7.20	7.48	7.06	8.24	13.54	13.92	Pass
40	5200	7.23	7.40	7.09	8.24	13.53	13.92	Pass
48	5240	7.21	7.24	7.24	7.71	13.38	13.92	Pass

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

2. The directional gain= 10 log[$(10^{G0/20} + 10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2$ / 4] = 9.08 dBi > 6 dBi, so the power density limit shall be reduced to 17-(9.08-6) = 13.92 dBm.

802.11ax (HE40)

Chan.	Chan. Freq. (MHz)	PSD (dBm/MHz)				Total Power Density (dBm/MHz)	MAX. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3			
38	5190	0.90	0.97	0.61	1.01	6.90	13.92	Pass
46	5230	7.21	7.64	7.31	7.20	13.36	13.92	Pass

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

2. The directional gain= 10 log[$(10^{G0/20} + 10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2$ / 4] = 9.08 dBi > 6 dBi, so the power density limit shall be reduced to 17-(9.08-6) = 13.92 dBm.

802.11ax (HE80)

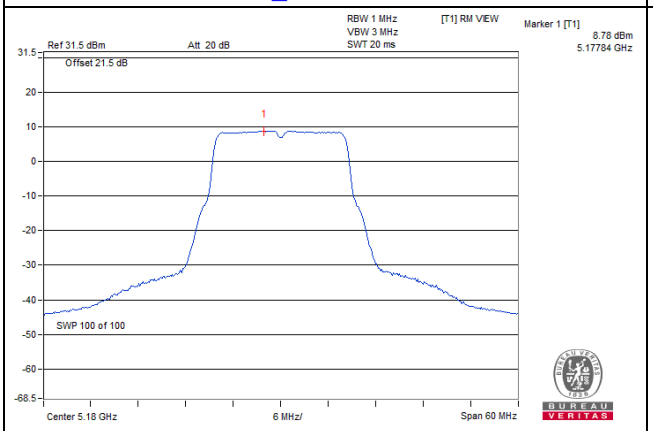
Chan.	Chan. Freq. (MHz)	PSD (dBm/MHz)				Total Power Density (dBm/MHz)	MAX. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3			
42	5210	-2.78	-2.69	-2.99	-1.61	3.54	13.92	Pass

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

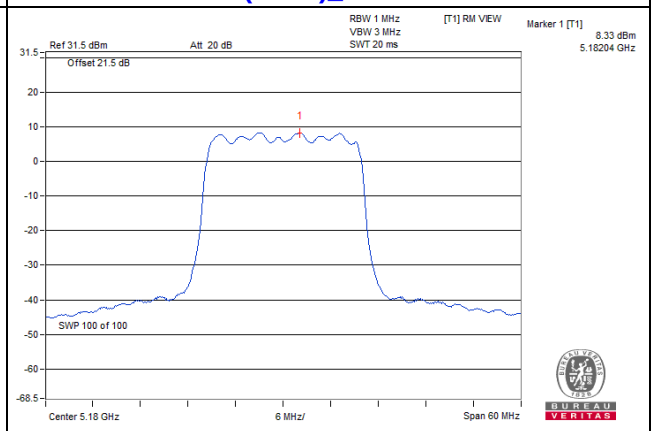
2. The directional gain= 10 log[$(10^{G0/20} + 10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2$ / 4] = 9.08 dBi > 6 dBi, so the power density limit shall be reduced to 17-(9.08-6) = 13.92 dBm.

Spectrum Plot of Worst Value

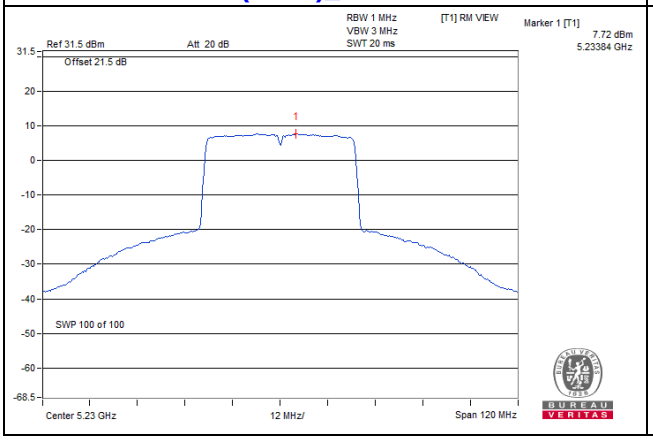
802.11a_Chain 1 / CH36



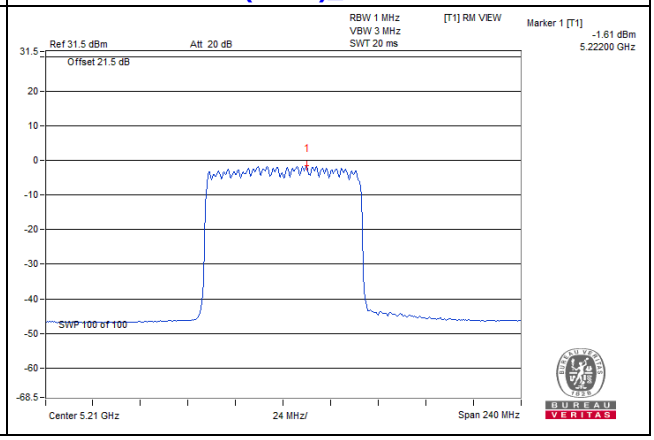
802.11ax (HE20)_Chain 3 / CH36



802.11ax (HE40)_Chain 1 / CH46



802.11ax (HE80)_Chain 3 / CH42



For U-NII-3:

802.11a

Chan.	Chan. Freq. (MHz)	PSD (dBm/300kHz)				Total PSD (mW/300kHz)	Total PSD (dBm/300kHz)	Total PSD (dBm/500kHz)	PSD Limit (dBm/500kHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3					
149	5745	2.36	2.54	2.15	3.41	7.35	8.66	10.88	26.24	PASS
157	5785	2.40	2.48	2.41	3.17	7.325	8.65	10.87	26.24	PASS
165	5825	2.07	2.25	1.85	2.52	6.607	8.20	10.42	26.24	PASS

Note: 1. Method b) Measure and sum spectral maxima across the outputs of KDB 662911 is using for calculating total power density.
2. The directional gain= 10 log[$(10^{G0/20} + 10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2$ / 4] = 9.76 dBi > 6 dBi, so the power limit shall be reduced to 30-(9.76-6) = 26.24 dBm.

802.11ax (HE20)

Chan.	Chan. Freq. (MHz)	PSD (dBm/300kHz)				Total PSD (mW/300kHz)	Total PSD (dBm/300kHz)	Total PSD (dBm/500kHz)	PSD Limit (dBm/500kHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3					
149	5745	0.78	0.83	1.07	2.43	5.437	7.35	9.57	26.24	PASS
157	5785	0.72	0.84	1.01	2.19	5.311	7.25	9.47	26.24	PASS
165	5825	0.46	0.90	0.83	1.67	5.022	7.01	9.23	26.24	PASS

Note: 1. Method b) Measure and sum spectral maxima across the outputs of KDB 662911 is using for calculating total power density.
2. The directional gain= 10 log[$(10^{G0/20} + 10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2$ / 4] = 9.76 dBi > 6 dBi, so the power density limit shall be reduced to 30-(9.76-6) = 26.24 dBm.

802.11ax (HE40)

Chan.	Chan. Freq. (MHz)	PSD (dBm/300kHz)				Total PSD (mW/300kHz)	Total PSD (dBm/300kHz)	Total PSD (dBm/500kHz)	PSD Limit (dBm/500kHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3					
151	5755	-1.89	-1.64	-2.10	-1.19	2.7096	4.33	6.55	26.24	PASS
159	5795	-1.96	-1.49	-2.10	-1.49	2.6725	4.27	6.49	26.24	PASS

Note: 1. Method b) Measure and sum spectral maxima across the outputs of KDB 662911 is using for calculating total power density.
2. The directional gain= 10 log[$(10^{G0/20} + 10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2$ / 4] = 9.76 dBi > 6 dBi, so the power density limit shall be reduced to 30-(9.76-6) = 26.24 dBm.

802.11ax (HE80)

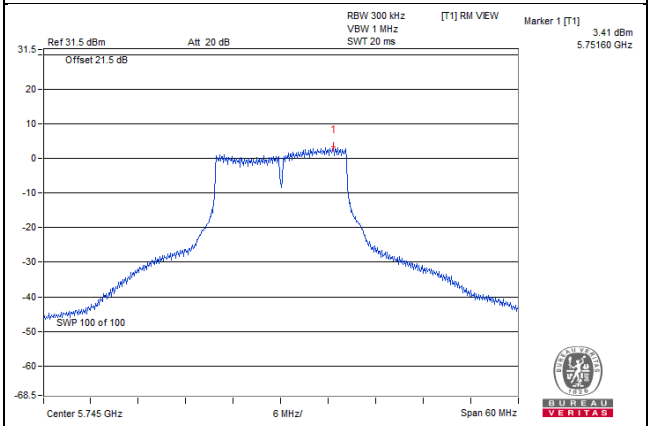
Chan.	Chan. Freq. (MHz)	PSD (dBm/300kHz)				Total PSD (mW/300kHz)	Total PSD (dBm/300kHz)	Total PSD (dBm/500kHz)	PSD Limit (dBm/500kHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3					
155	5775	-6.78	-5.92	-6.10	-4.86	1.0378	0.16	2.38	26.24	PASS

Note: 1. Method b) Measure and sum spectral maxima across the outputs of KDB 662911 is using for calculating total power density.

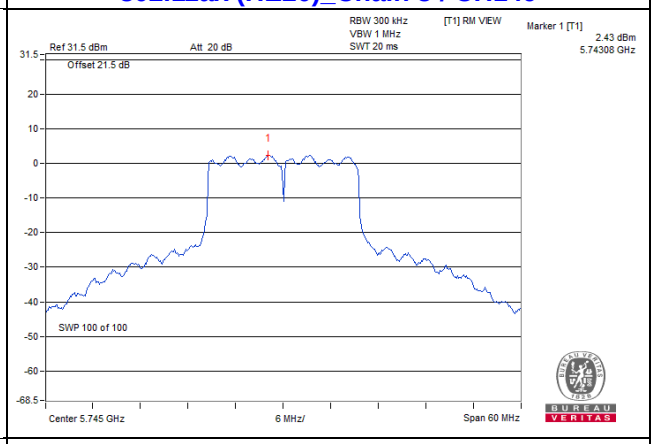
2. The directional gain= 10 log[$(10^{G0/20} + 10^{G1/20} + 10^{G2/20} + 10^{G3/20})^2$ / 4] = 9.76 dBi > 6 dBi, so the power density limit shall be reduced to 30-(9.76-6) = 26.24 dBm.

Spectrum Plot of Worst Value

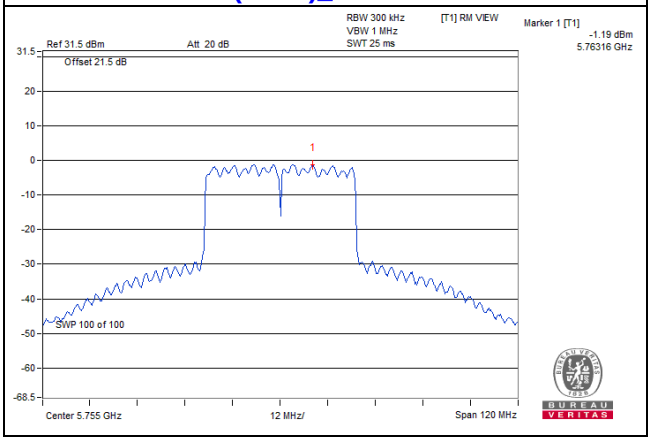
802.11a_Chain 3 / CH149



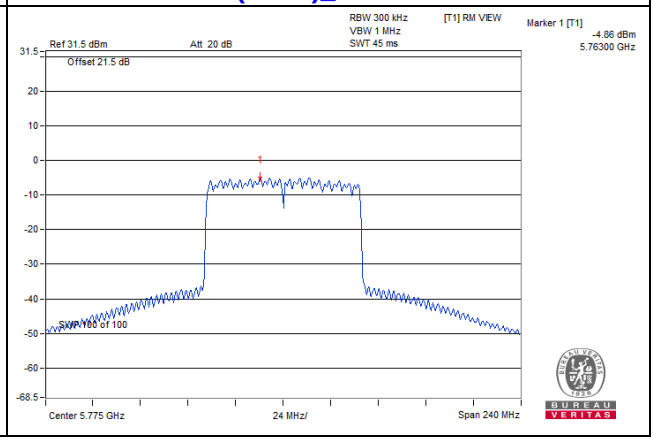
802.11ax (HE20)_Chain 3 / CH149



802.11ax (HE40)_Chain 3 / CH151



802.11ax (HE80)_Chain 3 / CH155

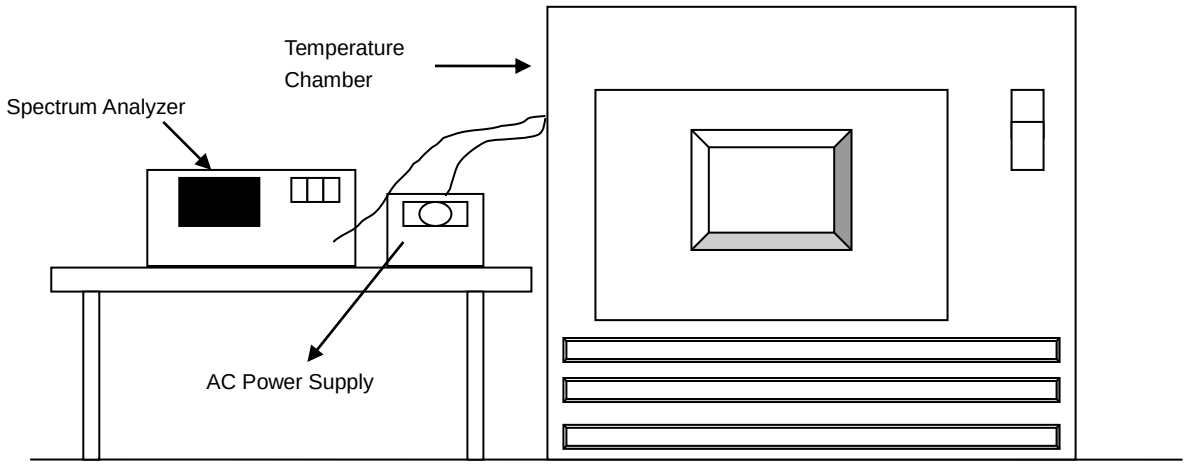


4.6 Frequency Stability Measurement

4.6.1 Limits of Frequency Stability Measurement

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

4.6.2 Test Setup



4.6.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.6.4 Test Procedure

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

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

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

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

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

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

4.6.5 Deviation from Test Standard

No deviation.

4.6.6 EUT Operating Condition

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

4.6.7 Test Results

Frequency Stability Versus Temp.									
Operating Frequency: 5180 MHz									
TEMP. (℃)	Power Supply (Vac)	0 Minute		2 Minutes		5 Minutes		10 Minutes	
		Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail
40	120	5180.005	Pass	5180.0076	Pass	5180.0043	Pass	5180.0047	Pass
30	120	5179.9997	Pass	5180.0002	Pass	5180	Pass	5180.001	Pass
20	120	5179.9779	Pass	5179.9763	Pass	5179.9773	Pass	5179.9763	Pass
10	120	5180.0036	Pass	5180.0032	Pass	5180.0017	Pass	5180.0014	Pass
0	120	5180.0125	Pass	5180.0136	Pass	5180.0125	Pass	5180.0133	Pass

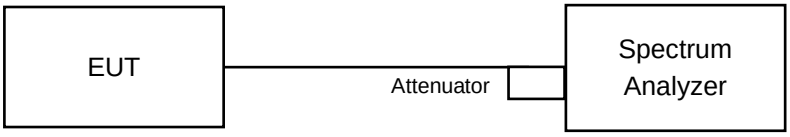
Frequency Stability Versus Voltage									
Operating Frequency: 5180 MHz									
TEMP. (℃)	Power Supply (Vac)	0 Minute		2 Minutes		5 Minutes		10 Minutes	
		Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail
20	138	5179.9785	Pass	5179.9755	Pass	5179.9773	Pass	5179.977	Pass
	120	5179.9779	Pass	5179.9763	Pass	5179.9773	Pass	5179.9763	Pass
	102	5179.9782	Pass	5179.976	Pass	5179.9776	Pass	5179.9754	Pass

4.7 6dB Bandwidth Measurement

4.7.1 Limits of 6dB Bandwidth Measurement

The minimum of 6dB Bandwidth Measurement is 0.5MHz.

4.7.2 Test Setup



4.7.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.7.4 Test Procedure

MEASUREMENT PROCEDURE REF

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

4.7.5 Deviation from Test Standard

No deviation.

4.7.6 EUT Operating Condition

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

4.7.7 Test Results

802.11a

Channel	Frequency (MHz)	6dB Bandwidth (MHz)				Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3		
149	5745	16.4	16.4	16.38	16	0.5	Pass
157	5785	16.39	16.41	16.38	16.36	0.5	Pass
165	5825	16.39	16.4	16.38	16.38	0.5	Pass

802.11ax (HE20)

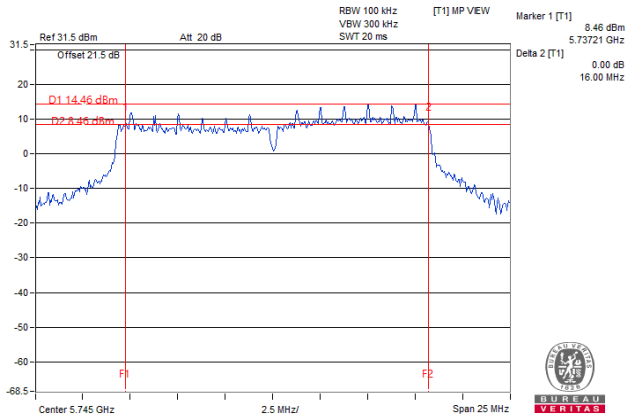
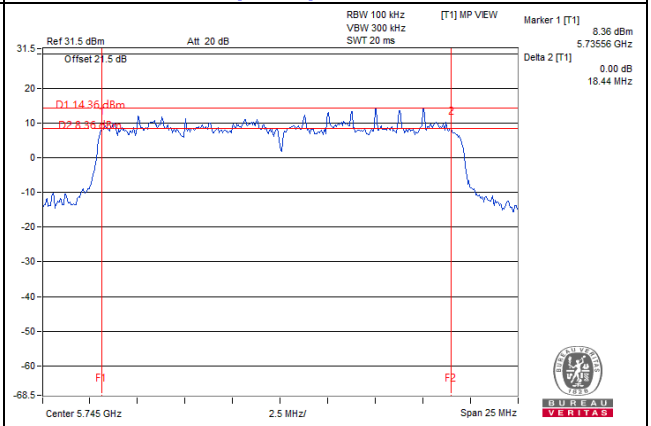
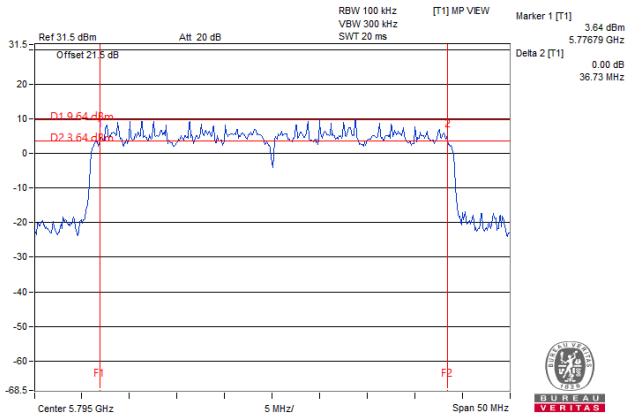
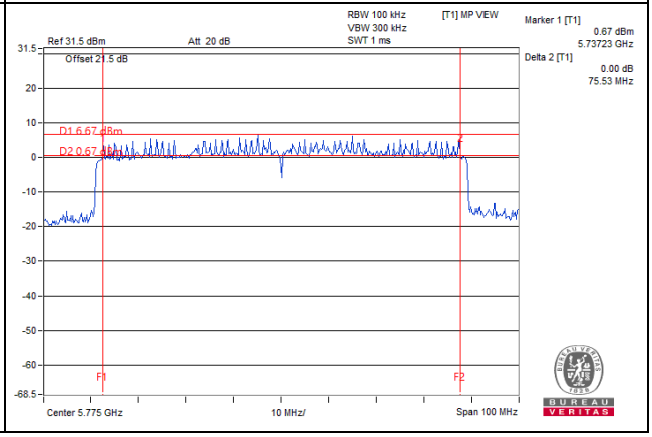
Channel	Frequency (MHz)	6dB Bandwidth (MHz)				Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3		
149	5745	19	19.03	18.89	18.44	0.5	Pass
157	5785	18.99	18.96	18.86	18.48	0.5	Pass
165	5825	18.95	18.78	18.97	18.57	0.5	Pass

802.11ax (HE40)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)				Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3		
151	5755	37.64	37.57	37.46	36.89	0.5	Pass
159	5795	37.17	37.32	37.52	36.73	0.5	Pass

802.11ax (HE80)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)				Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3		
155	5775	75.53	76.68	76.99	76.41	0.5	Pass

Spectrum Plot of Worst Value	
802.11a_Chain 3 / CH149	**802.11ax (HE20)_Chain 3 / CH149**
	
802.11ax (HE40)_Chain 3 / CH159	**802.11ax (HE80)_Chain 0 / CH155**
	

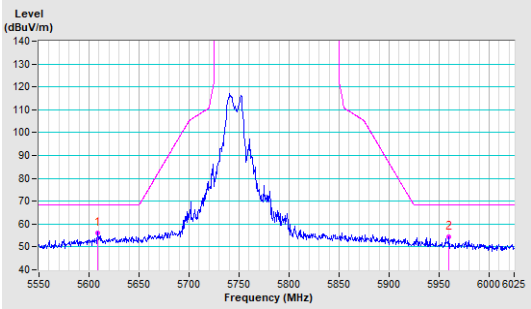
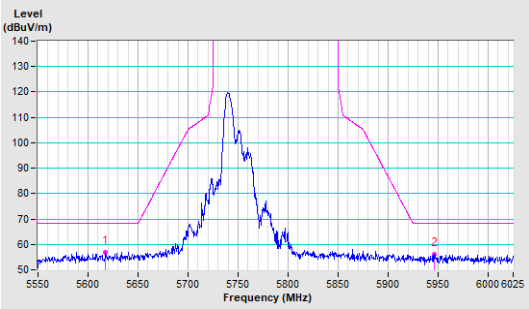
5 Pictures of Test Arrangements

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

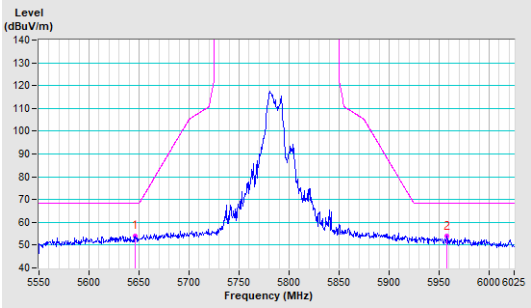
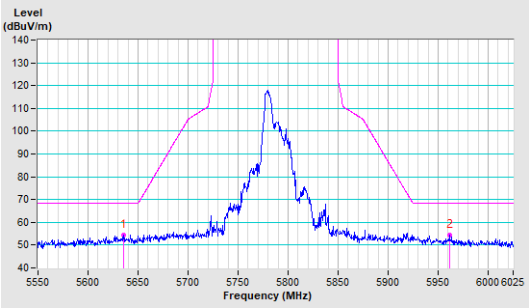
Annex A- Radiated Out of Band Emission (OOBE) Measurement (For U-NII-3 band)

802.11a

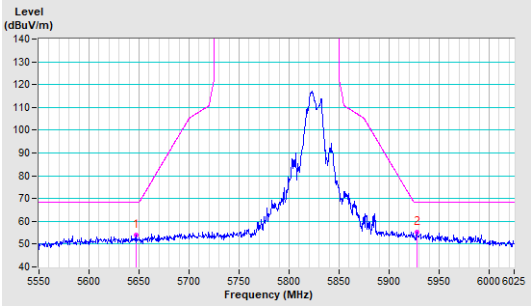
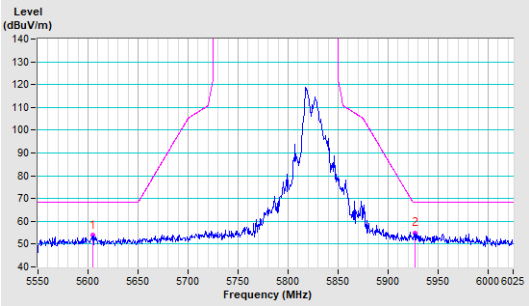
CH 149 5745 MHz

Horizontal	Vertical
	

CH 157 5785 MHz

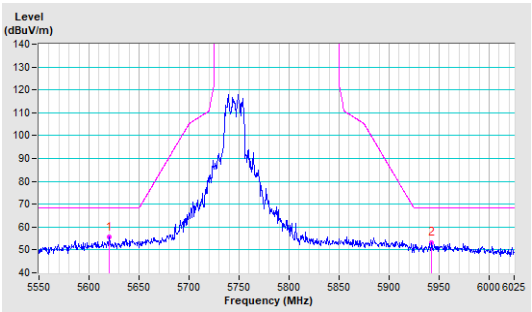
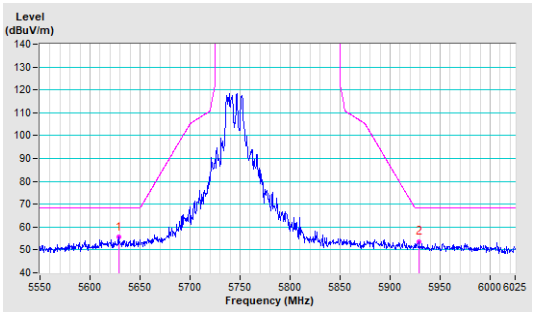
Horizontal	Vertical
	

CH 165 5825 MHz

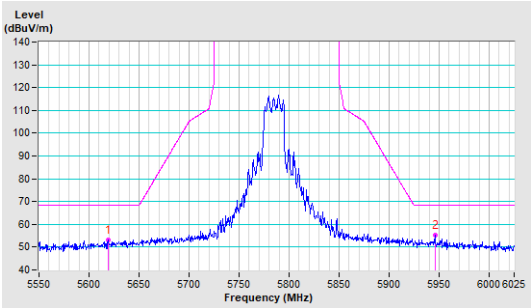
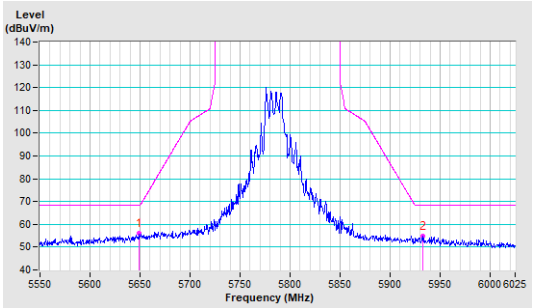
Horizontal	Vertical
	

802.11ax (HE20)

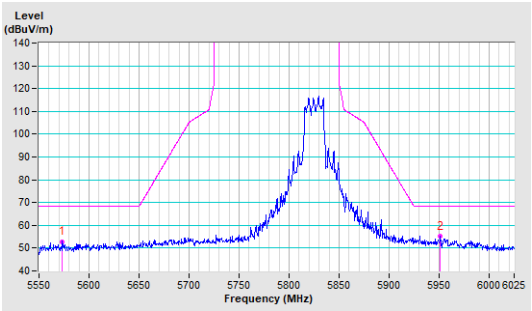
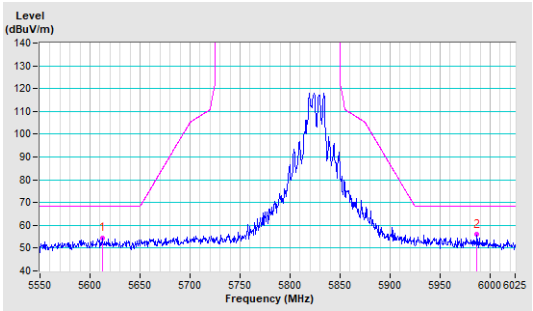
CH 149 5745 MHz

Horizontal	Vertical
	

CH 157 5785 MHz

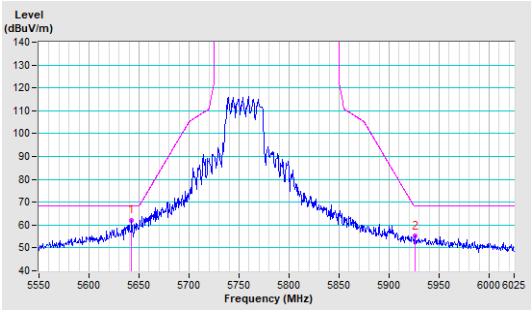
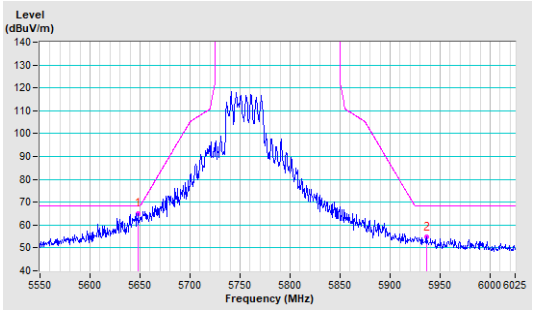
Horizontal	Vertical
	

CH 165 5825 MHz

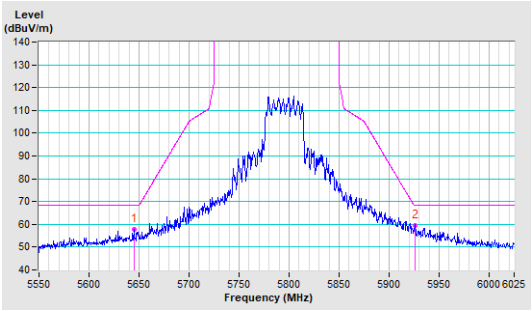
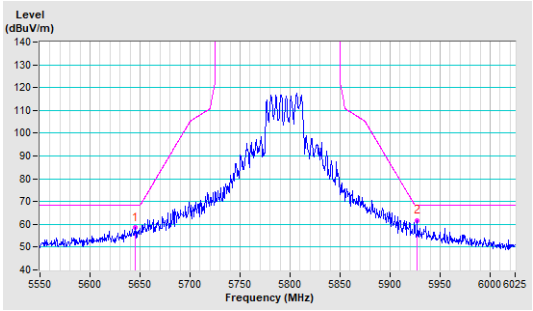
Horizontal	Vertical
	

802.11ax (HE40)

CH 151 5755 MHz

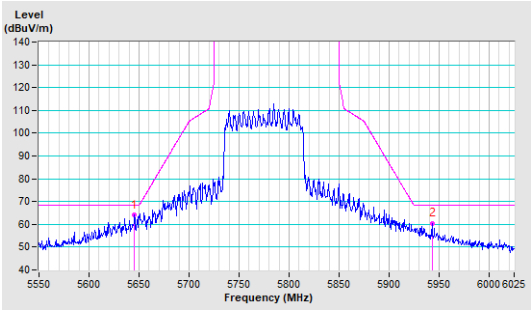
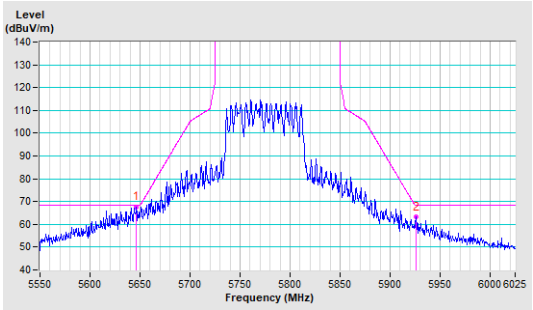
Horizontal	Vertical
	

CH 159 5795 MHz

Horizontal	Vertical
	

802.11ax (HE80)

CH 155 5775 MHz

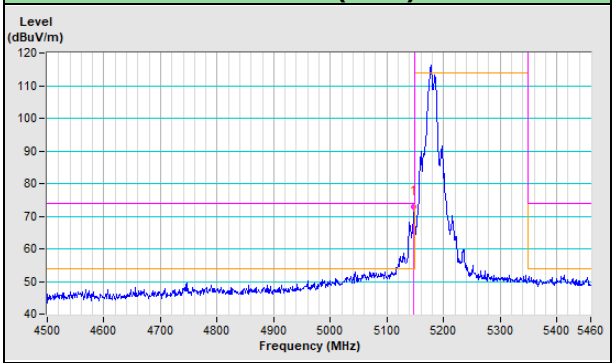
Horizontal	Vertical
	

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

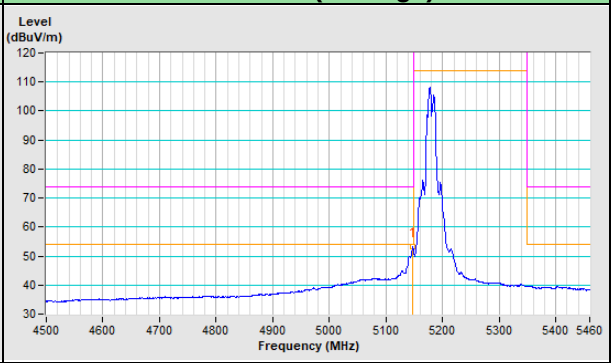
802.11a

Channel 36

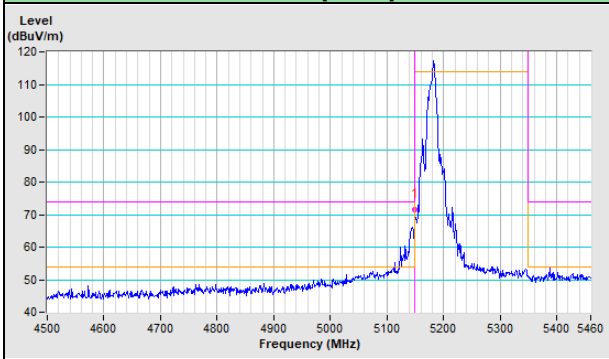
Horizontal (Peak)



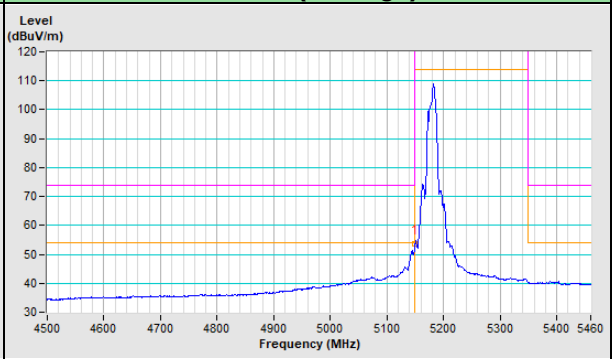
Horizontal (Average)



Vertical (Peak)

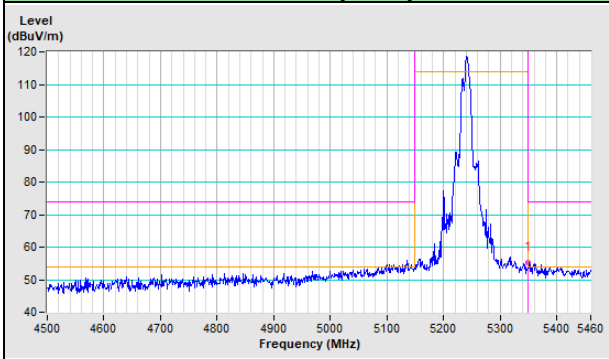


Vertical (Average)

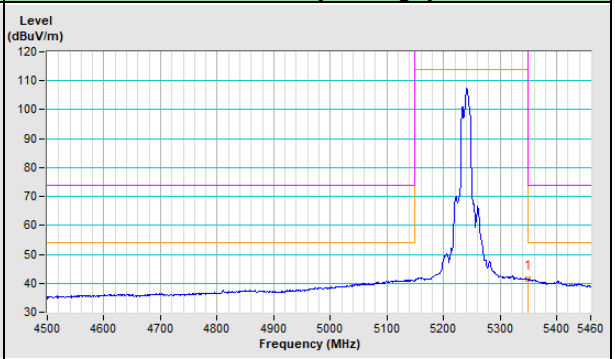


Channel 48

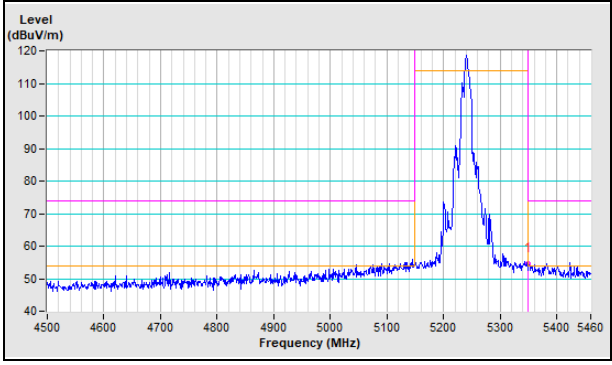
Horizontal (Peak)



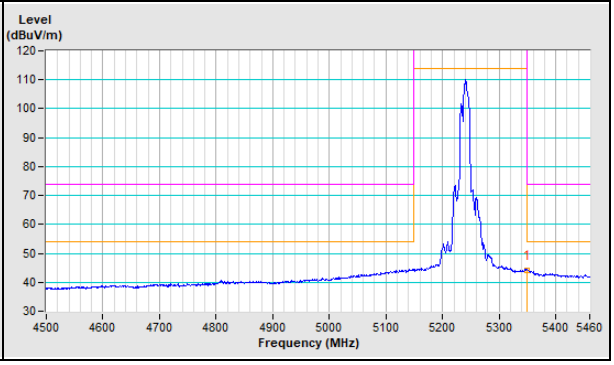
Horizontal (Average)



Vertical (Peak)



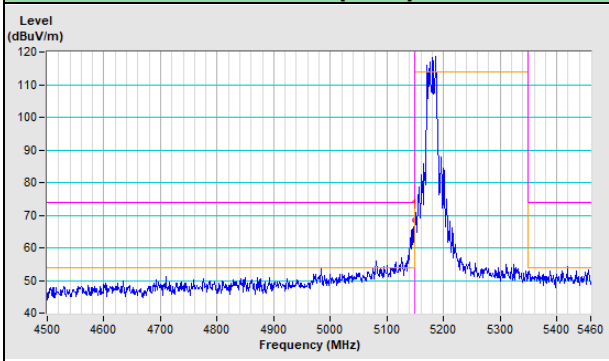
Vertical (Average)



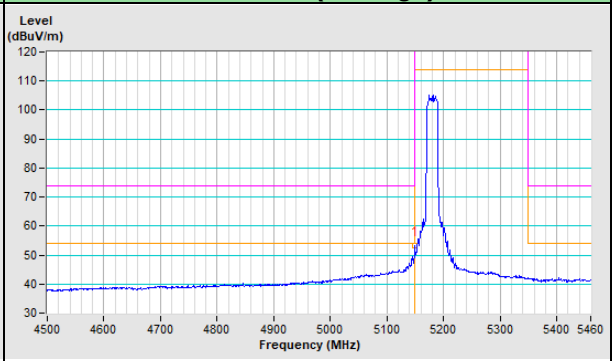
802.11ax (HE20)

Channel 36

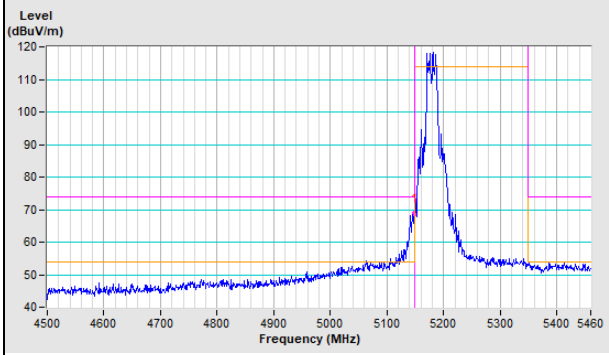
Horizontal (Peak)



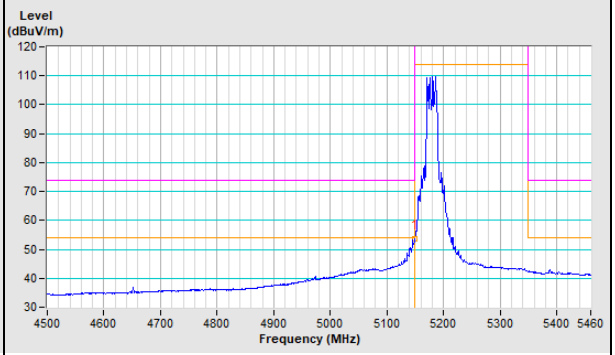
Horizontal (Average)



Vertical (Peak)

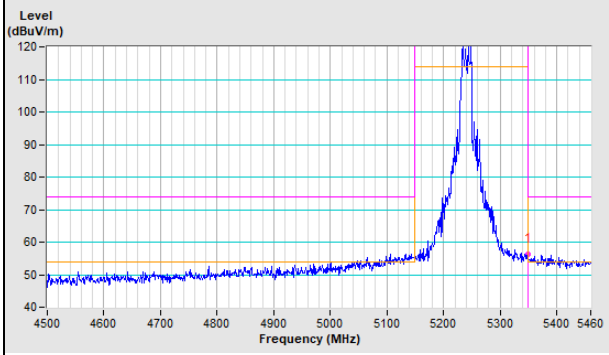


Vertical (Average)

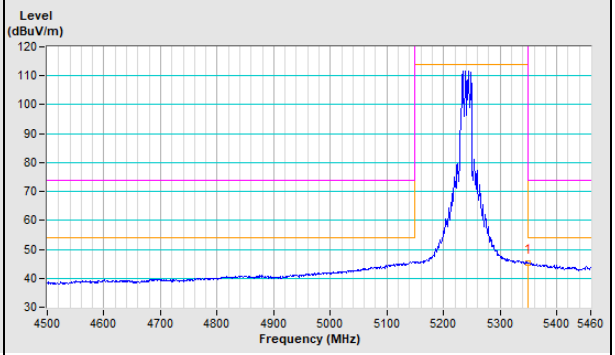


Channel 48

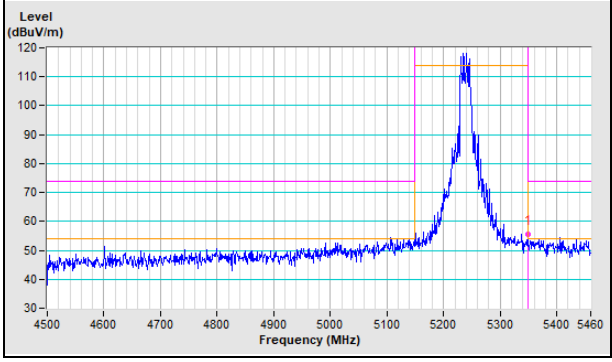
Horizontal (Peak)



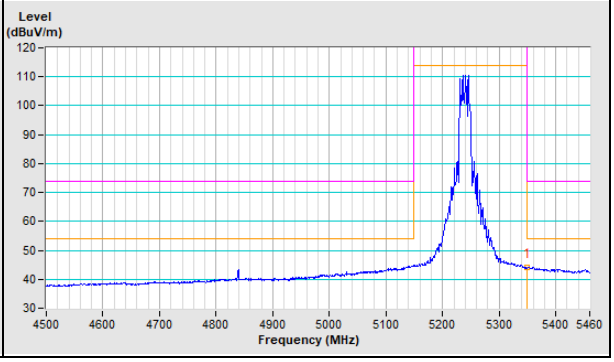
Horizontal (Average)



Vertical (Peak)



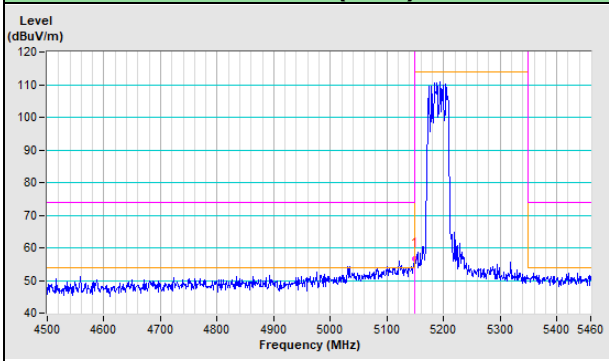
Vertical (Average)



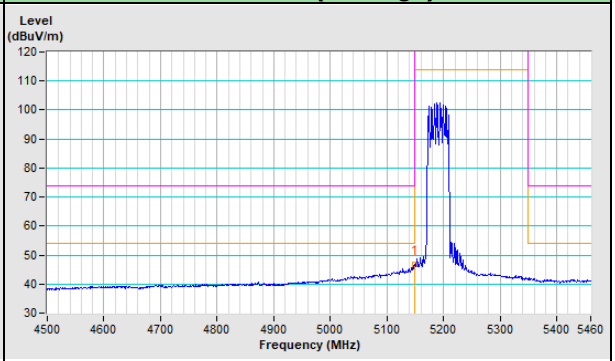
802.11ax (HE40)

Channel 38

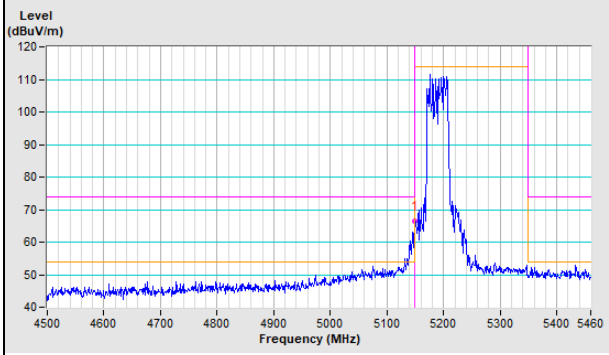
Horizontal (Peak)



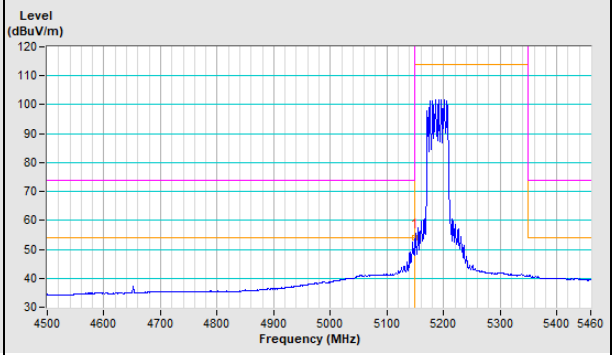
Horizontal (Average)



Vertical (Peak)

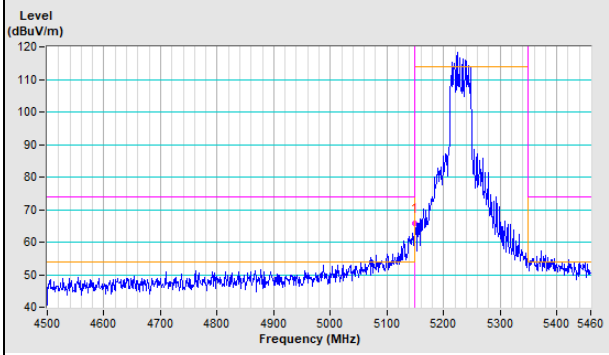


Vertical (Average)

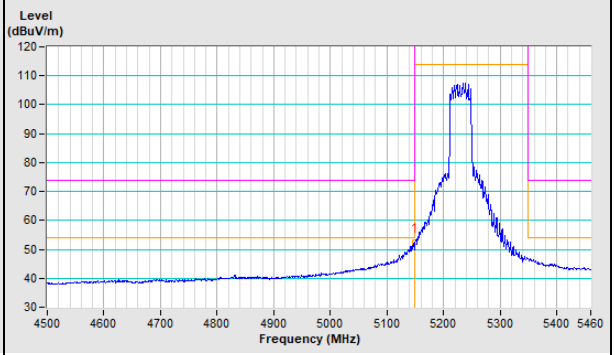


Channel 46

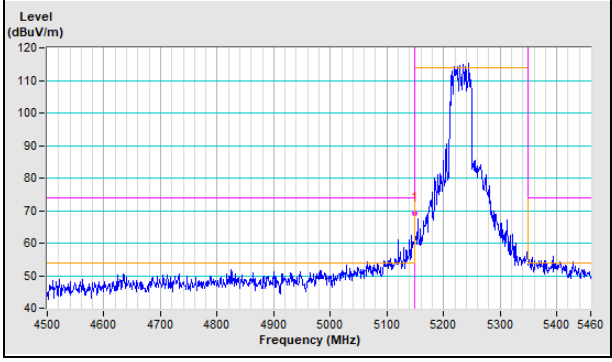
Horizontal (Peak)



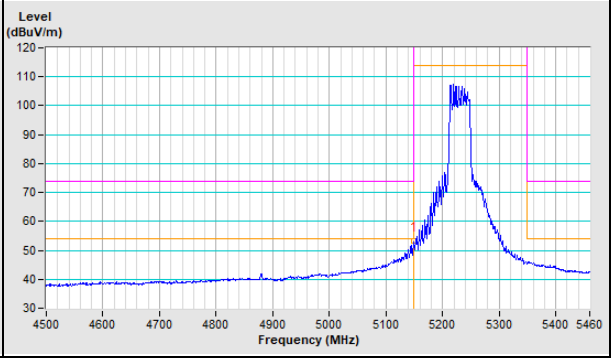
Horizontal (Average)



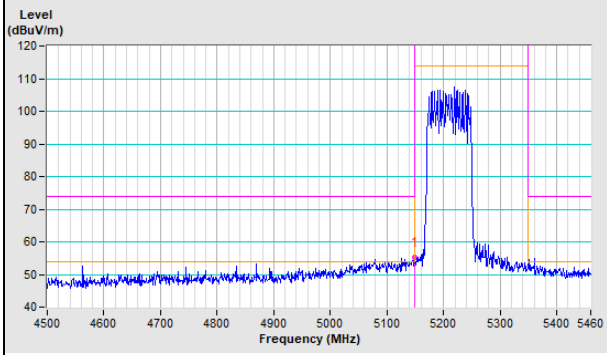
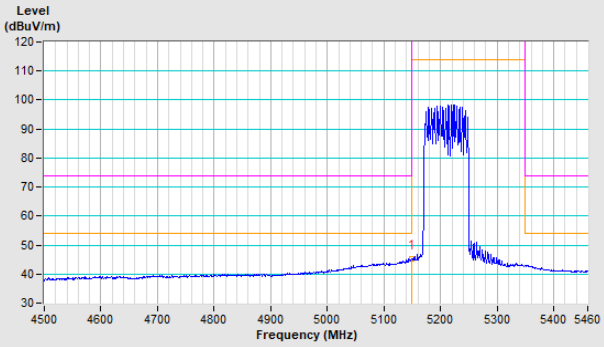
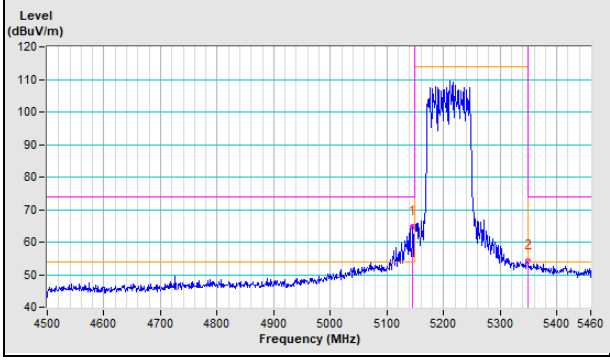
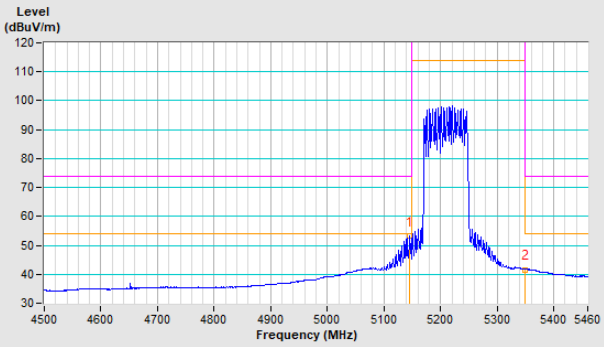
Vertical (Peak)



Vertical (Average)



802.11ax (HE80)

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

Appendix – Information of the Testing Laboratories

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

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

Lin Kou EMC/RF Lab
Tel: 886-2-26052180
Fax: 886-2-26051924

Hsin Chu EMC/RF/Telecom Lab
Tel: 886-3-6668565
Fax: 886-3-6668323

Hwa Ya EMC/RF/Safety Lab
Tel: 886-3-3183232
Fax: 886-3-3270892

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

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

--- END ---