FCC Test Report

Report No.:	RFBDYS-WTW-P20080137-1
FCC ID:	TVE-3417T0696
Test Model:	FAP-231F
Series Model:	FortiAP 231Fxxxxxx, FAP-231Fxxxxxx, FORTIAP-231Fxxxxxx (where "x" can be used as "A-Z", or "0-9", or "-", or blank for software changes or marketing purposes only) (Refer to item 3.1 for more details)
Received Date:	Aug. 07, 2020
Test Date:	Aug. 18 ~ Aug. 27, 2020
Issued Date:	Aug. 31, 2020
Applicant:	Fortinet Inc.
Address:	899 Kifer Road Sunnyvale, CA 94086 USA
Issued By:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch Lin Kou Laboratories
Lab Address:	No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan
Test Location:	No. 19, Hwa Ya 2nd Rd., Wen Hwa Vil., Kwei Shan Dist., Taoyuan City 33383, TAIWAN
FCC Registration / Designation Number:	788550 / TW0003

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

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Release Control Record

Issue No.	Description	Date Issued
RFBDYS-WTW-P20080137-1	Original release.	Aug. 31, 2020

1 Certificate of Conformity

Product: Secured Wireless Access Point

Brand: Fortinet

Test Model: FAP-231F

Series Model: FortiAP 231Fxxxxxx, FAP-231Fxxxxxx, FORTIAP-231Fxxxxxx (where "x" can be used as "A-Z", or "0-9", or "-", or blank for software changes or marketing purposes only) (Refer to item 3.1 for more details)

Sample Status: Engineering sample

Applicant: Fortinet Inc.

Test Date: Aug. 18 ~ Aug. 27, 2020

Standards: 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 RF characteristics under the conditions specified in this report.

Prepared by : Polly Chien , **Date:** Aug. 31, 2020
Polly Chien / Specialist

Approved by : Bruce Chen , **Date:** Aug. 31, 2020
Bruce Chen / Senior Project Engineer

2 Summary of Test Results

47 CFR FCC Part 15, Subpart E (Section 15.407)			
FCC Clause	Test Item	Result	Remarks
15.407(b)(6)	AC Power Conducted Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -8.43dB at 0.46200MHz.
15.407(b) (1/2/3/4(i/ii)/6)	Radiated Emissions & Band Edge Measurement	Pass	Meet the requirement of limit. Minimum passing margin is -1.0dB at 11650.00MHz.
15.407(a)(1/2/3)	Max Average Transmit Power	Pass	Meet the requirement of limit.
---	Occupied Bandwidth Measurement	Pass	Meet the requirement of limit.
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	2.79 dB
Radiated Emissions up to 1 GHz	9kHz ~ 30MHz	3.04 dB
	30MHz ~ 200MHz	3.86 dB
	200MHz ~1000MHz	3.87 dB
Radiated Emissions above 1 GHz	1GHz ~ 18GHz	2.29 dB
	18GHz ~ 40GHz	2.29 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	Secured Wireless Access Point
Brand	Fortinet
Test Model	FAP-231F
Series Model	FortiAP 231Fxxxxxx, FAP-231Fxxxxxx, FORTIAP-231Fxxxxxx (where "x" can be used as "A-Z", or "0-9", or "-", or blank for software changes or marketing purposes only)
Model Difference	Refer to note
Sample Status	Engineering sample
Power Supply rating	12Vdc from Adapter 54Vdc from PoE
Modulation Type	802.11a: BPSK, QPSK, 16QAM, 64QAM 802.11ac: BPSK, QPSK, 16QAM, 64QAM, 256QAM 802.11ax: BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024QAM
Modulation Technology	OFDM, OFDMA
Transfer Rate	802.11a: 54/48/36/24/18/12/9/6Mbps 802.11n (HT20/40): up to MCS31 802.11ac (VHT20/40): up to MCS9 802.11ax: up to MCS11
Operating Frequency	5180~5240MHz, 5745~5825MHz
Number of Channel	<u>5GHz traffic radio:</u> 5180 ~ 5240MHz: 802.11a, 802.11n (HT20), 802.11ac (VHT20), 802.11ax (HE20): 4 802.11n (HT40), 802.11ac (VHT40), 802.11ax (HE40): 2 802.11ac (VHT80), 802.11ax (HE80): 1 5745 ~ 5825MHz: 802.11a, 802.11n (HT20), 802.11ac (VHT20), 802.11ax (HE20): 5 802.11n (HT40), 802.11ac (VHT40), 802.11ax (HE40): 2 802.11ac (VHT80), 802.11ax (HE80): 1 <u>Scanning radio:</u> 5180 ~ 5240MHz: 802.11a, 802.11n (HT20), 802.11ac (VHT20): 4 802.11n (HT40), 802.11ac (VHT40): 2 802.11ac (VHT80): 1 5745 ~ 5825MHz: 802.11a, 802.11n (HT20), 802.11ac (VHT20): 5 802.11n (HT40), 802.11ac (VHT40): 2 802.11ac (VHT80): 1

Output Power	5180 ~ 5240MHz: 5G traffic radio: CDD Mode: 381.588mW 5G traffic radio: Beamforming Mode: 185.877mW Scanning radio: CDD Mode: 146.218mW 5745 ~ 5825MHz: 5G traffic radio: CDD Mode: 281.146mW 5G traffic radio: Beamforming Mode: 140.583mW Scanning radio: CDD Mode: 144.212mW
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	Adapter
Cable Supplied	NA

Note:

1. The following models are provided to this EUT. The model FAP-231F was chosen for final test.

Brand	Test Model	Series Model	Difference
Fortinet	FAP-231F	FortiAP 231Fxxxxxx, FAP-231Fxxxxxx, FORTIAP-231Fxxxxxx	Where "x" can be used as "A-Z", or "0-9", or "-", or blank for software changes or marketing purposes only.

2. The EUT incorporates a MIMO function. Physically, the EUT provides 2 completed transmitters and 2 receivers.

Modulation Mode	CDD Mode	Beamforming Mode	TX Function	Radio
802.11a	Support	Not Support	2TX	5G traffic radio (Radio 2)
802.11n (HT20)	Support	Support	2TX	
802.11n (HT40)	Support	Support	2TX	
802.11ac (VHT20)	Support	Support	2TX	
802.11ac (VHT40)	Support	Support	2TX	
802.11ac (VHT80)	Support	Support	2TX	
802.11ax (HE20)	Support	Support	2TX	
802.11ax (HE40)	Support	Support	2TX	
802.11ax (HE80)	Support	Support	2TX	
802.11a	Support	Not Support	1TX	Scanning radio (Radio 3)
802.11n (HT20)	Support	Not Support	1TX	
802.11n (HT40)	Support	Not Support	1TX	
802.11ac (VHT20)	Support	Not Support	1TX	
802.11ac (VHT40)	Support	Not Support	1TX	
802.11ac (VHT80)	Support	Not Support	1TX	

* The bandwidth and modulation are similar for HT20/HT40 on 802.11n mode and VHT20/VHT40 on 802.11n mode and HE20/HE40 on 802.11ax mode. Therefore the investigated worst case is the representative mode in test report. (Final test mode refer section 3.2.1)

* For 802.11n/ax, CDD mode and Beamforming mode are presented in power output test item. For other test items, CDD mode is the worst case for final tests after pretesting.

3. The EUT consumes power from the following power supply. (Support unit only)

Adapter	
Brand	Asian Power Devices Inc.
Model	WA-30J12R
Input Power	100-240Vac, 50-60Hz, 0.9A MAX
Output Power	12Vdc, 2.5A
Power Line	1.5m cable without core attached on adapter

POE	
Brand	EnGenius
Model	EPA5006GPR
Input Power	100-240Vac, 50-60Hz, 0.8A
Output Power	54V, 0.6A

4. The following antennas were provided to the EUT.

Antenna Type		PIFA	
Antenna Connector		i-pex(MHF)	
Antenna No.		Gain (dBi)	
		2.4~2.4835GHz	5.180~5.825GHz
1	Chain0	4.9	5.2
2	Chain1	3.8	5.5
3	Scan	4.0	5.1
4	BLE & Zigbee	3.6	-

*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.

5. The simultaneous operation mode was determined by client.

No	Mode
1	2G traffic radio (Radio 1) + 5GHz traffic radio (Radio 2) + 5G Scanning radio (Radio 3) +BLE
2	2G traffic radio (Radio 1) + 5GHz traffic radio (Radio 2) + 5G Scanning radio (Radio 3) +Zigbee
3	5GHz traffic radio (Radio 2)+ 2G Scanning radio (Radio 3) + BLE
4	5GHz traffic radio (Radio 2)+ 2G Scanning radio (Radio 3) + Zigbee

*5GHz traffic radio (Radio 2) and 5G Scanning radio (Radio 3) cannot transmit in the same band at same time.

2G traffic radio (Radio 1) and 2G Scanning radio (Radio 3) cannot transmit at same time.

2G traffic radio (Radio 1) and Zigbee and BT technologies cannot transmit at same time.

6. Spurious emission of the simultaneous operation (WLAN, BLE and Zigbee) has been evaluated and no non-compliance was found.

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	5210MHz

For 5745 ~ 5825MHz:

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

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

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

Channel	Frequency	Channel	Frequency
151	5755MHz	159	5795MHz

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

Channel	Frequency
155	5775MHz

3.2.1 Test Mode Applicability and Tested Channel Detail

EUT Configure Mode	Applicable to				Description
	RE≥1G	RE<1G	PLC	APCM	
A	-	√	√	-	Power from adapter
B	√	√	√	√	Power from PoE

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

Note:
1. The EUT had been pre-tested on the positioned of each 3 axis. The worst case was found when positioned on **Y-plane**.
2. "-"means no effect.

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.

EUT Configure Mode	Mode	Frequency Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Data Rate (Mbps)	Remark
B	802.11a	5180-5240	36 to 48	36, 40, 48	OFDM	6.0	5G traffic radio
B	802.11ax (HE20)		36 to 48	36, 40, 48	OFDMA	MCS0	
B	802.11ax (HE40)		38 to 46	38, 46	OFDMA	MCS0	
B	802.11ax (HE80)		42	42	OFDMA	MCS0	
B	802.11a		36 to 48	36, 40, 48	OFDM	6.0	Scanning radio
B	802.11n (HT20)		36 to 48	36, 40, 48	OFDM	6.5	
B	802.11n (HT40)		38 to 46	38, 46	OFDM	13.5	
B	802.11ac (VHT80)		42	42	OFDM	65.0	
B	802.11a	5745-5825	149 to 165	149, 157, 165	OFDM	6.0	5G traffic radio
B	802.11ax (HE20)		149 to 165	149, 157, 165	OFDMA	MCS0	
B	802.11ax (HE40)		151 to 159	151, 159	OFDMA	MCS0	
B	802.11ax (HE80)		155	155	OFDMA	MCS0	
B	802.11a		149 to 165	149, 157, 165	OFDM	6.0	Scanning radio
B	802.11n (HT20)		149 to 165	149, 157, 165	OFDM	6.5	
B	802.11n (HT40)		151 to 159	151, 159	OFDM	13.5	
B	802.11ac (VHT80)		155	155	OFDM	65.0	

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.

EUT Configure Mode	Mode	Frequency Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Data Rate (Mbps)	Remark
A, B	802.11ax (HE20)	5180-5240	36 to 48	149	OFDMA	MCS0	5G traffic radio
		5745-5825	149 to 165				
A, B	802.11a	5180-5240	36 to 48	40	OFDM	6.0	Scanning radio
		5745-5825	149 to 165				

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.

EUT Configure Mode	Mode	Frequency Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Data Rate (Mbps)	Remark
A, B	802.11ax (HE20)	5180-5240	36 to 48	149	OFDMA	MCS0	5G traffic radio
		5745-5825	149 to 165				
A, B	802.11a	5180-5240	36 to 48	40	OFDM	6.0	Scanning radio
		5745-5825	149 to 165				

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.

EUT Configure Mode	Mode	Frequency Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Data Rate (Mbps)	Remark
CDD Mode							
B	802.11a	5180-5240	36 to 48	36, 40, 48	OFDM	6.0	5G traffic radio
B	802.11n (HT20)		36 to 48	36, 40, 48	OFDM	6.5	
B	802.11n (HT40)		38 to 46	38, 46	OFDM	13.5	
B	802.11ac (VHT20)		36 to 48	36, 40, 48	OFDM	6.5	
B	802.11ac (VHT40)		38 to 46	38, 46	OFDM	13.5	
B	802.11ac (VHT80)		42	42	OFDM	65.0	
B	802.11ax (HE20)		36 to 48	36, 40, 48	OFDMA	MCS0	
B	802.11ax (HE40)		38 to 46	38, 46	OFDMA	MCS0	
B	802.11ax (HE80)		42	42	OFDMA	MCS0	
B	802.11a		36 to 48	36, 40, 48	OFDM	6.0	Scanning radio
B	802.11n (HT20)		36 to 48	36, 40, 48	OFDM	6.5	
B	802.11n (HT40)		38 to 46	38, 46	OFDM	13.5	
B	802.11ac (VHT80)		42	42	OFDM	65.0	
B	802.11a	5745-5825	149 to 165	149, 157, 165	OFDM	6.0	5G traffic radio
B	802.11n (HT20)		149 to 165	149, 157, 165	OFDM	6.5	
B	802.11n (HT40)		151 to 159	151, 159	OFDM	13.5	
B	802.11ac (VHT20)		149 to 165	149, 157, 165	OFDM	6.5	
B	802.11ac (VHT40)		151 to 159	151, 159	OFDM	13.5	
B	802.11ac (VHT80)		155	155	OFDM	65.0	
B	802.11ax (HE20)		149 to 165	149, 157, 165	OFDMA	MCS0	
B	802.11ax (HE40)		151 to 159	151, 159	OFDMA	MCS0	
B	802.11ax (HE80)		155	155	OFDMA	MCS0	
B	802.11a		149 to 165	149, 157, 165	OFDM	6.0	Scanning radio
B	802.11n (HT20)		149 to 165	149, 157, 165	OFDM	6.5	
B	802.11n (HT40)		151 to 159	151, 159	OFDM	13.5	
B	802.11ac (VHT80)		155	155	OFDM	65.0	
Beamforming Mode							
B	802.11ac (VHT20)	5180-5240	36 to 48	36, 40, 48	OFDM	6.5	5G traffic radio
B	802.11ac (VHT40)		38 to 46	38, 46	OFDM	13.5	
B	802.11ac (VHT80)		42	42	OFDM	65.0	
B	802.11ax (HE20)		36 to 48	36, 40, 48	OFDMA	MCS0	
B	802.11ax (HE40)		38 to 46	38, 46	OFDMA	MCS0	
B	802.11ax (HE80)		42	42	OFDMA	MCS0	
B	802.11ac (VHT20)	5745-5825	149 to 165	149, 157, 165	OFDM	6.5	5G traffic radio
B	802.11ac (VHT40)		151 to 159	151, 159	OFDM	13.5	
B	802.11ac (VHT80)		155	155	OFDM	65.0	
B	802.11ax (HE20)		149 to 165	149, 157, 165	OFDMA	MCS0	
B	802.11ax (HE40)		151 to 159	151, 159	OFDMA	MCS0	
B	802.11ax (HE80)		155	155	OFDMA	MCS0	

*802.11n (HT20), 802.11n (HT40), 802.11ac (VHT20), 802.11ac (VHT40), 802.11ac (VHT80) are for Conducted Output Power Measurement only.

Test Condition:

Applicable to	Environmental Conditions	Input Power	Tested by
RE≥1G	23 deg. C, 66% RH	120Vac, 60Hz	Titan Hsu
RE<1G	23 deg. C, 66% RH	120Vac, 60Hz 54Vdc	Titan Hsu
PLC	25 deg. C, 75% RH	120Vac, 60Hz 54Vdc	Greg Lin
APCM	25 deg. C, 60% RH	120Vac, 60Hz	Jisyong Wang

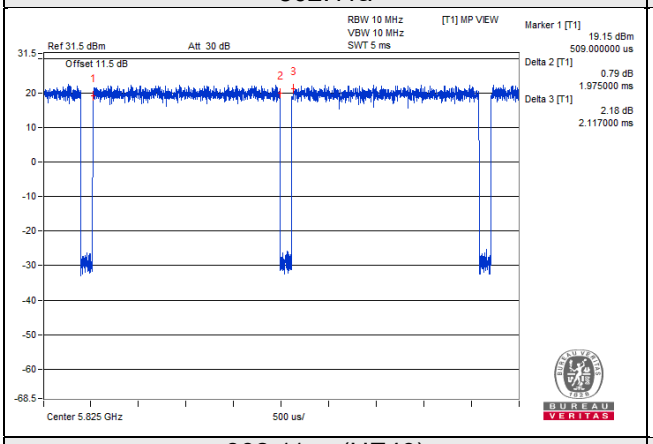
3.3 Duty Cycle of Test Signal

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

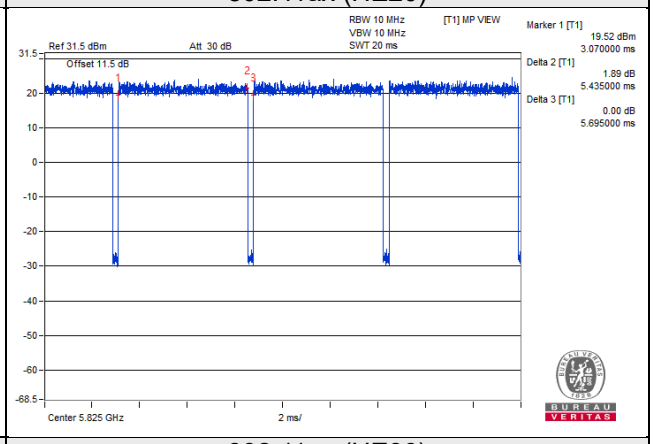
5G traffic radio: CDD Mode

802.11a: Duty cycle = 1.975/2.117 = 0.933, Duty factor = 10 * log (1/0.933) = 0.30
802.11ax (HE20): Duty cycle = 5.435/5.695 = 0.954, Duty factor = 10 * log (1/0.954) = 0.20
802.11ax (HE40): Duty cycle = 5.435/5.765 = 0.943, Duty factor = 10 * log (1/0.943) = 0.26
802.11ax (HE80): Duty cycle = 5.405/5.675 = 0.952, Duty factor = 10 * log (1/0.952) = 0.21

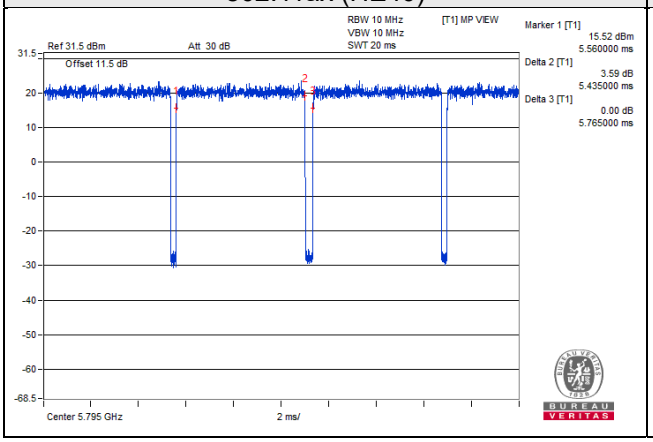
802.11a



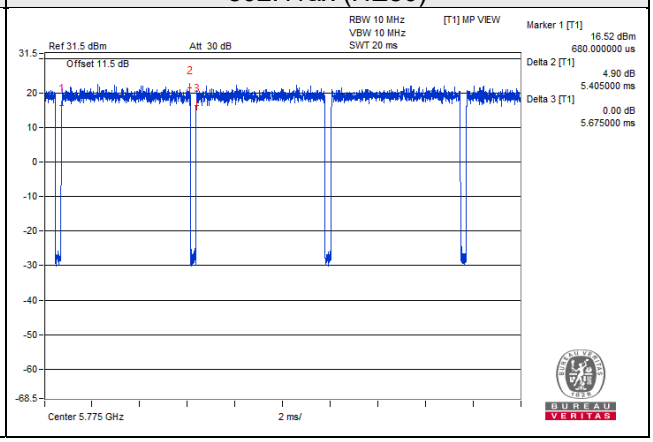
802.11ax (HE20)



802.11ax (HE40)



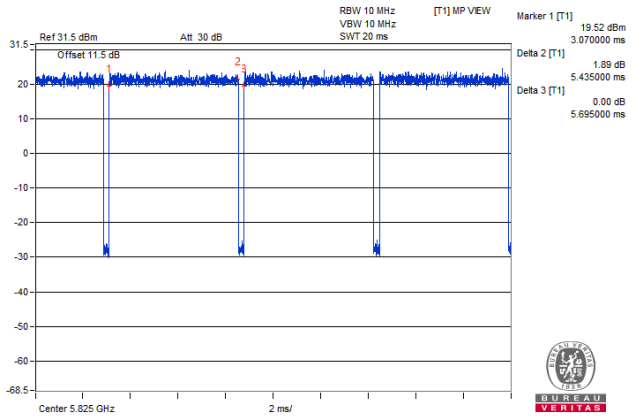
802.11ax (HE80)



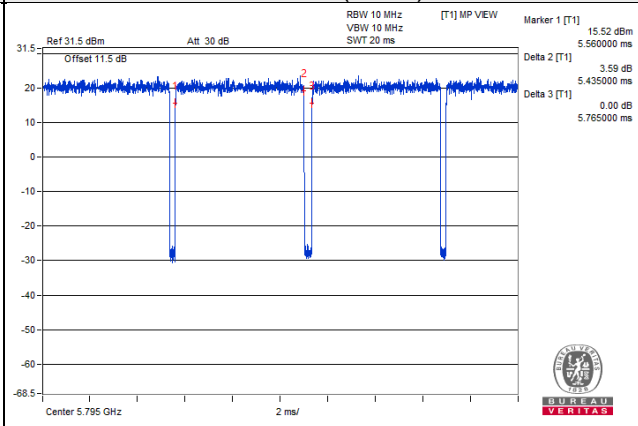
5G traffic radio: Beamforming Mode

802.11ax (HE20): Duty cycle = 5.435/5.695 = 0.954, Duty factor = 10 * log (1/0.954) = 0.20
802.11ax (HE40): Duty cycle = 5.435/5.765 = 0.943, Duty factor = 10 * log (1/0.943) = 0.26
802.11ax (HE80): Duty cycle = 5.405/5.675 = 0.952, Duty factor = 10 * log (1/0.952) = 0.21

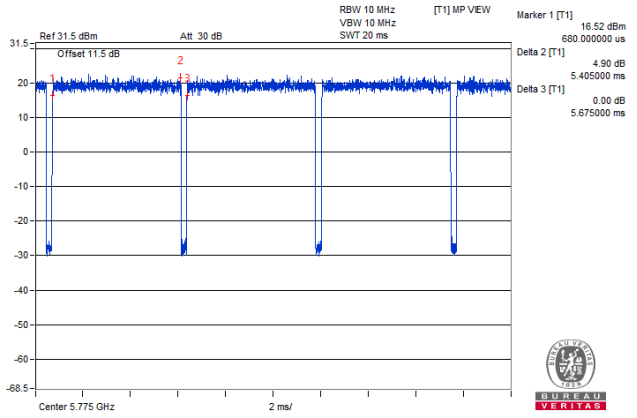
802.11ax (HE20)



802.11ax (HE40)



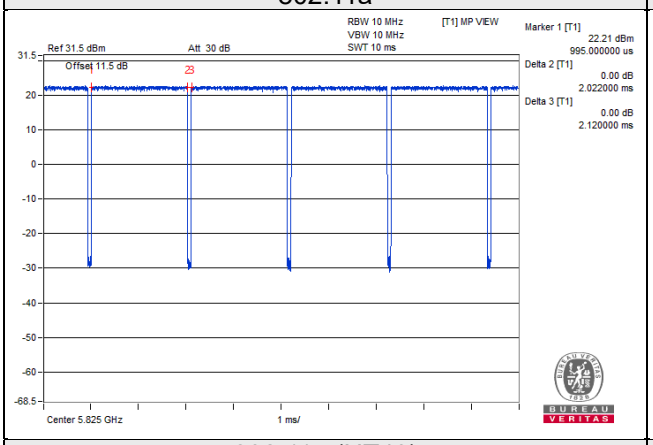
802.11ax (HE80)



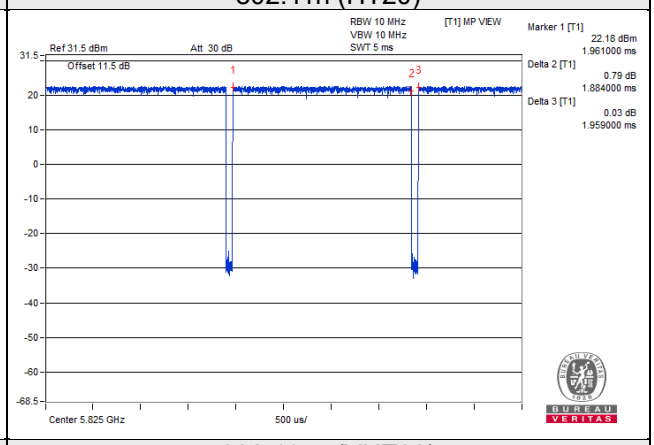
Scanning radio: CDD Mode

802.11a: Duty cycle = 2.022/2.120 = 0.954, Duty factor = 10 * log (1/0.954) = 0.21
802.11n (HT20): Duty cycle = 1.884/1.959 = 0.962, Duty factor = 10 * log (1/0.962) = 0.17
802.11n (HT40): Duty cycle = 0.922/0.995 = 0.927, Duty factor = 10 * log (1/0.927) = 0.33
802.11ac (VHT80): Duty cycle = 0.455/0.541 = 0.841, Duty factor = 10 * log (1/0.841) = 0.75

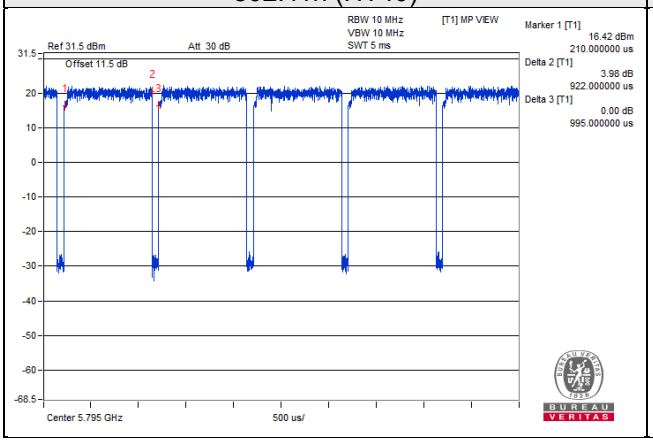
802.11a



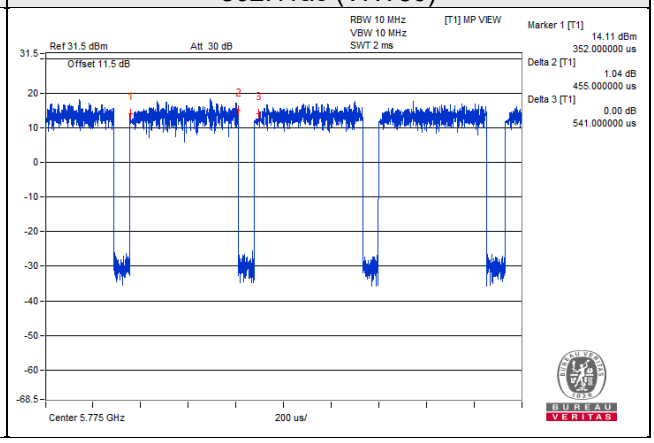
802.11n (HT20)



802.11n (HT40)



802.11ac (VHT80)



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.	Notebook	DELL	E5410	1HC2XM1	FCC DoC Approved	-
B.	Load	NA	NA	NA	NA	-
C.	Adapter	Asian Power Devices Inc.	WA-30J12R	NA	NA	Provided by client
D.	USB Flash	HP	v250W	03	NA	-
E.	POE	EnGenius	EPA5006GPR	NA	NA	Provided by client

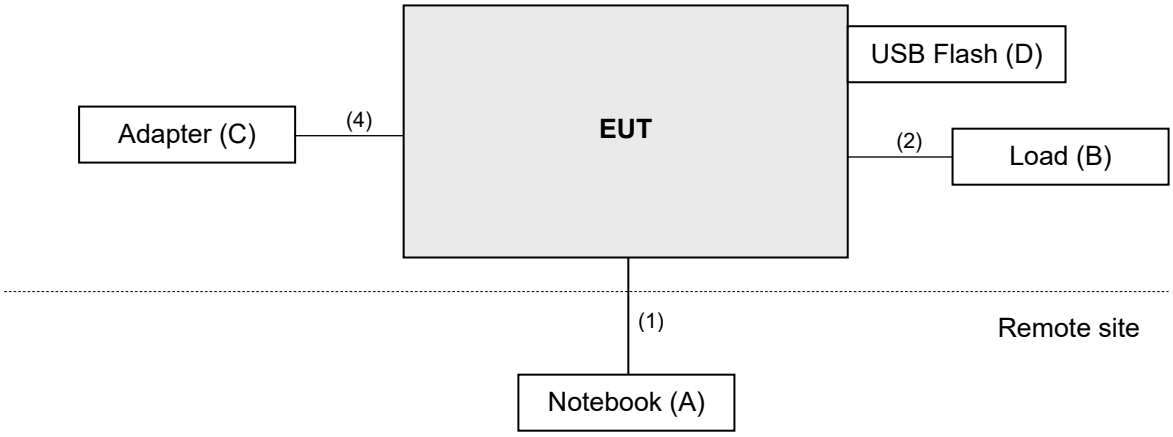
Note:

1. All power cords of the above support units are non-shielded (1.8m).
2. Item A acted as a communication partner to transfer data.

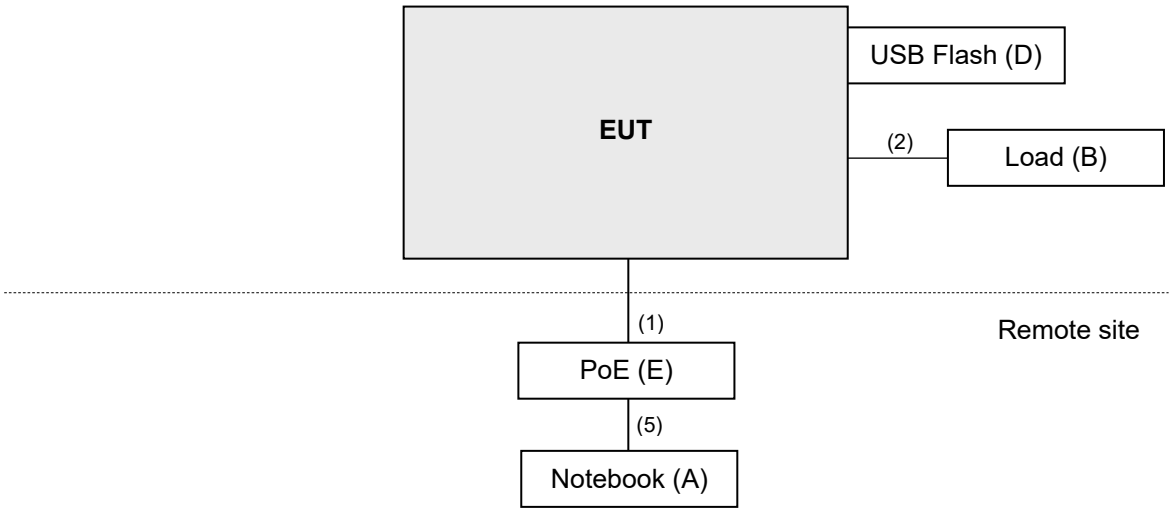
ID	Cable Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	LAN	1	7.0	N	0	RJ45, Cat5e
2.	LAN	2	1.5	N	0	RJ45, Cat5e
3.	Power cable	1	1.5	-	0	Provided by client
4.	LAN	1	1.5	N	0	RJ45, Cat5e

3.4.1 Configuration of System under Test

Mode A



Mode B



3.5 General Description of Applied Standards and References

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

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

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

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

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

4 Test Types and Results

4.1 Radiated Emission and Bandedge Measurement

4.1.1 Limits of Radiated Emission and Bandedge Measurement

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

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

NOTE:

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

Limits of unwanted emission out of the restricted bands

Applicable To			Limit	
789033 D02 General UNII Test Procedure New Rules v02r01			Field Strength at 3m	
			PK: 74 (dBμV/m)	AV: 54 (dBμV/m)
Frequency Band	Applicable To		EIRP Limit	Equivalent Field Strength at 3m
5150~5250 MHz	15.407(b)(1)		PK: -27 (dBm/MHz)	PK: 68.2(dBμV/m)
5250~5350 MHz	15.407(b)(2)			
5470~5725 MHz	15.407(b)(3)			
5725~5850 MHz	☒	15.407(b)(4)(i)	PK: -27 (dBm/MHz) *1 PK: 10 (dBm/MHz) *2 PK: 15.6 (dBm/MHz) *3 PK: 27 (dBm/MHz) *4	PK: 68.2 (dBμV/m) *1 PK: 105.2 (dBμV/m) *2 PK: 110.8 (dBμV/m) *3 PK: 122.2 (dBμV/m) *4
	☐	15.407(b)(4)(ii)	Emission limits in section 15.247(d)	

*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

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Test Receiver ROHDE & SCHWARZ	ESR3	102579	Jul. 07, 2020	Jul. 06, 2021
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100269	Jun. 09, 2020	Jun. 08, 2021
BILOG Antenna SCHWARZBECK	VULB9168	9168-171	Nov. 11, 2019	Nov. 10, 2020
HORN Antenna SCHWARZBECK	9120D	209	Nov. 24, 2019	Nov. 23, 2020
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170241	Nov. 24, 2019	Nov. 23, 2020
Loop Antenna TESEQ	HLA 6121	45745	Jul. 06, 2020	Jul. 05, 2021
Preamplifier Agilent (Below 1GHz)	8447D	2944A10738	Aug. 16, 2020	Aug. 15, 2021
Preamplifier Agilent (Above 1GHz)	8449B	3008A02465	Mar. 23, 2020	Mar. 22, 2021
RF Coaxial Cable WOKEN With 5dB PAD	8D-FB	Cable-CH3-01	Aug. 16, 2020	Aug. 15, 2021
RF signal cable HUBER+SUHNER	SUCOFLEX 104	Cable-CH3-03 (223653/4)	Aug. 16, 2020	Aug. 15, 2021
RF signal cable HUBER+SUHNER& EMCI	SUCOFLEX 104&EMC104-SM-S M-8000	Cable-CH3-03 (309224+170907)	Aug. 16, 2020	Aug. 15, 2021
Software BV ADT	ADT_Radiated_ V7.6.15.9.5	NA	NA	NA
Antenna Tower inn-co GmbH	MA 4000	013303	NA	NA
Antenna Tower Controller BV ADT	AT100	AT93021702	NA	NA
Turn Table BV ADT	TT100	TT93021702	NA	NA
Turn Table Controller BV ADT	SC100	SC93021702	NA	NA
Boresight Antenna Fixture	FBA-01	FBA-SIP01	NA	NA
Pre-amplifier (18GHz-40GHz) EMC	EMC184045B	980175	Sep. 05, 2019	Sep. 04, 2020
USB Wideband Power Sensor KEYSIGHT	U2021XA	MY55050005/MY5519 0004/MY55190007/MY 55210005	Jul. 13, 2020	Jul. 12, 2021

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 HwaYa Chamber 3.

4.1.3 Test Procedures

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 detect 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. (5G traffic radio: 802.11a: RBW = 1MHz, VBW = 1kHz; 802.11ax (HE20): RBW = 1MHz, VBW = 1kHz; 802.11ax (HE40): RBW = 1MHz, VBW = 1kHz; 802.11ax (HE80): RBW = 1MHz, VBW = 1kHz; Scanning radio: 802.11a: RBW = 1MHz, VBW = 1kHz; 802.11n (HT20): RBW = 1MHz, VBW = 1kHz; 802.11n (HT40): RBW = 1MHz, VBW = 3kHz; 802.11ac (VHT80): RBW = 1MHz, VBW = 3kHz)

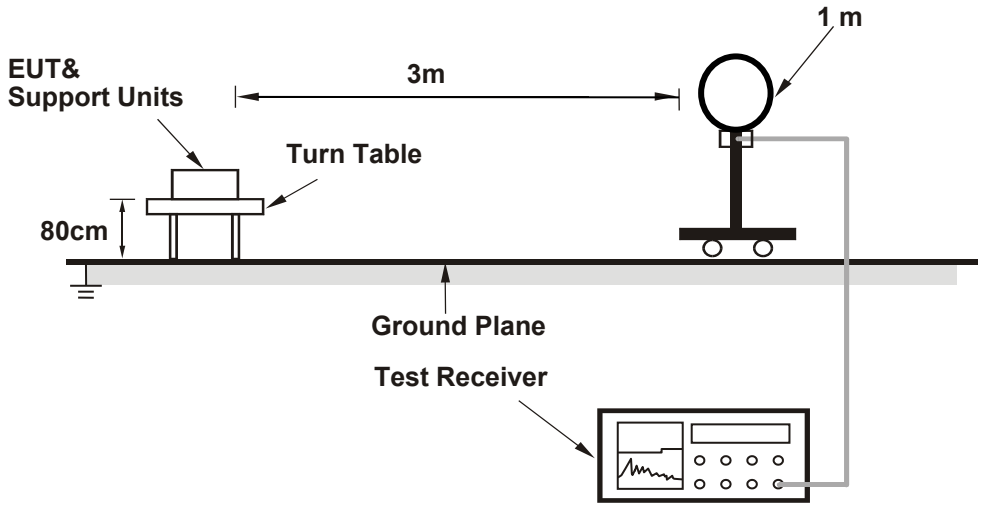
4. All modes of operation were investigated and the worst-case emissions are reported.

4.1.4 Deviation from Test Standard

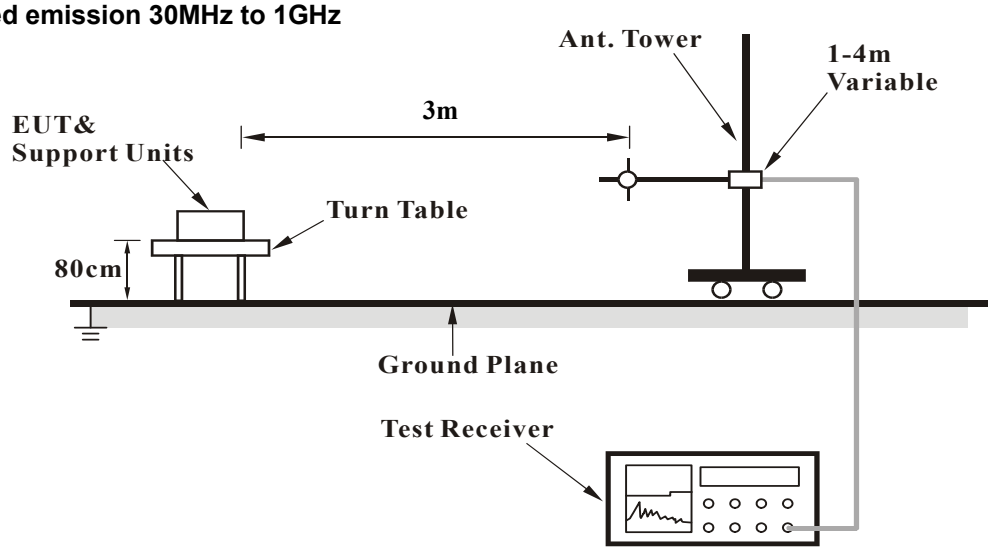
No deviation.

4.1.5 Test Setup

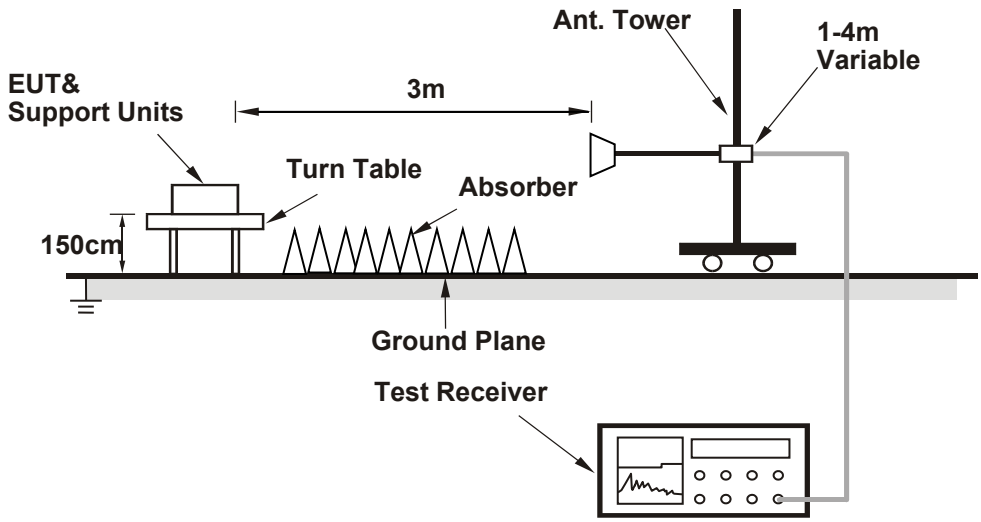
For Radiated emission below 30MHz



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 Conditions

a. Placed the EUT on the testing table.
b. Prepared a notebook to act as a communication partner and placed it outside of testing area.
c. The communication partner connected with EUT via a RJ45 cable and ran a test program (provided by manufacturer) to enable EUT under transmission condition continuously at specific channel frequency.
d. The communication partner sent data to EUT by command "PING".

4.1.7 Test Results

Above 1GHz data:

5G traffic radio:

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.	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	5150.00	63.5 PK	74.0	-10.5	1.33 H	9	60.0	3.5
2	5150.00	52.3 AV	54.0	-1.7	1.33 H	9	48.8	3.5
3	*5180.00	119.5 PK			1.30 H	13	80.2	39.3
4	*5180.00	109.4 AV			1.30 H	13	70.1	39.3
5	#10360.00	59.9 PK	68.2	-8.3	2.22 H	320	43.0	16.9
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	5150.00	58.2 PK	74.0	-15.8	3.86 V	39	54.7	3.5
2	5150.00	44.9 AV	54.0	-9.1	3.86 V	39	41.4	3.5
3	*5180.00	115.2 PK			3.83 V	34	75.9	39.3
4	*5180.00	104.1 AV			3.83 V	34	64.8	39.3
5	#10360.00	59.2 PK	68.2	-9.0	1.63 V	329	42.3	16.9

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
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.	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	*5200.00	120.2 PK			1.26 H	13	80.9	39.3
2	*5200.00	109.6 AV			1.26 H	13	70.3	39.3
3	#10400.00	59.9 PK	68.2	-8.3	2.26 H	323	42.8	17.1
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	*5200.00	116.0 PK			3.99 V	41	76.7	39.3
2	*5200.00	105.4 AV			3.99 V	41	66.1	39.3
3	#10400.00	59.4 PK	68.2	-8.8	1.73 V	339	42.3	17.1

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. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
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.	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	*5240.00	119.4 PK			1.05 H	15	80.3	39.1
2	*5240.00	109.3 AV			1.05 H	15	70.2	39.1
3	5350.00	55.6 PK	74.0	-18.4	1.08 H	18	52.0	3.6
4	5350.00	43.6 AV	54.0	-10.4	1.08 H	18	40.0	3.6
5	#10480.00	60.4 PK	68.2	-7.8	2.26 H	331	42.8	17.6
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	*5240.00	115.0 PK			3.81 V	20	75.9	39.1
2	*5240.00	104.3 AV			3.81 V	20	65.2	39.1
3	5350.00	55.1 PK	74.0	-18.9	3.78 V	22	51.5	3.6
4	5350.00	42.8 AV	54.0	-11.2	3.78 V	22	39.2	3.6
5	#10480.00	60.0 PK	68.2	-8.2	1.68 V	332	42.4	17.6

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
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.	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	#5643.59	57.6 PK	68.2	-10.6	2.22 H	291	51.4	6.2
2	*5745.00	122.1 PK			2.22 H	291	80.1	42.0
3	*5745.00	111.1 AV			2.22 H	291	69.1	42.0
4	#5940.38	59.7 PK	68.2	-8.5	2.22 H	291	52.7	7.0
5	11490.00	65.8 PK	74.0	-8.2	1.48 H	8	47.8	18.0
6	11490.00	52.0 AV	54.0	-2.0	1.48 H	8	34.0	18.0
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	#5605.13	57.7 PK	68.2	-10.5	3.80 V	28	51.6	6.1
2	*5745.00	118.2 PK			3.80 V	28	76.2	42.0
3	*5745.00	107.5 AV			3.80 V	28	65.5	42.0
4	#5953.85	58.4 PK	68.2	-9.8	3.80 V	28	51.4	7.0
5	11490.00	66.0 PK	74.0	-8.0	3.72 V	348	48.0	18.0
6	11490.00	52.3 AV	54.0	-1.7	3.72 V	348	34.3	18.0

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. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
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.	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	#5639.74	57.5 PK	68.2	-10.7	2.19 H	289	51.3	6.2
2	*5785.00	121.6 PK			2.19 H	289	79.7	41.9
3	*5785.00	110.5 AV			2.19 H	289	68.6	41.9
4	#5932.05	58.4 PK	68.2	-9.8	2.19 H	289	51.4	7.0
5	11570.00	66.6 PK	74.0	-7.4	1.29 H	11	49.0	17.6
6	11570.00	52.6 AV	54.0	-1.4	1.29 H	11	35.0	17.6
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	#5644.87	56.1 PK	68.2	-12.1	3.90 V	33	49.9	6.2
2	*5785.00	117.4 PK			3.90 V	33	75.5	41.9
3	*5785.00	106.9 AV			3.90 V	33	65.0	41.9
4	#5971.15	58.4 PK	68.2	-9.8	3.90 V	33	51.5	6.9
5	11570.00	66.1 PK	74.0	-7.9	3.58 V	353	48.5	17.6
6	11570.00	52.9 AV	54.0	-1.1	3.58 V	353	35.3	17.6

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
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.	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	#5632.05	58.5 PK	68.2	-9.7	2.20 H	294	52.3	6.2
2	*5825.00	120.5 PK			2.20 H	294	78.3	42.2
3	*5825.00	110.2 AV			2.20 H	294	68.0	42.2
4	#6000.00	58.8 PK	68.2	-9.4	2.20 H	294	51.9	6.9
5	11650.00	65.7 PK	74.0	-8.3	1.31 H	7	48.0	17.7
6	11650.00	52.7 AV	54.0	-1.3	1.31 H	7	35.0	17.7
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	#5621.15	56.6 PK	68.2	-11.6	3.81 V	32	50.5	6.1
2	*5825.00	117.5 PK			3.81 V	32	75.3	42.2
3	*5825.00	106.7 AV			3.81 V	32	64.5	42.2
4	#5952.56	57.8 PK	68.2	-10.4	3.81 V	32	50.8	7.0
5	11650.00	67.1 PK	74.0	-6.9	3.44 V	348	49.4	17.7
6	**11650.00**	**53.0 AV**	**54.0**	**-1.0**	**3.44 V**	**348**	**35.3**	**17.7**

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. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
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.	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	5150.00	65.3 PK	74.0	-8.7	1.45 H	13	61.8	3.5
2	5150.00	52.2 AV	54.0	-1.8	1.45 H	13	48.7	3.5
3	*5180.00	121.6 PK			1.43 H	6	82.3	39.3
4	*5180.00	108.2 AV			1.43 H	6	68.9	39.3
5	#10360.00	59.7 PK	68.2	-8.5	2.29 H	328	42.8	16.9
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	5150.00	58.5 PK	74.0	-15.5	3.85 V	23	55.0	3.5
2	5150.00	45.1 AV	54.0	-8.9	3.85 V	23	41.6	3.5
3	*5180.00	116.1 PK			3.86 V	25	76.8	39.3
4	*5180.00	103.1 AV			3.86 V	25	63.8	39.3
5	#10360.00	59.4 PK	68.2	-8.8	1.63 V	342	42.5	16.9

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
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.	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	*5200.00	122.3 PK			1.13 H	18	83.0	39.3
2	*5200.00	108.9 AV			1.13 H	18	69.6	39.3
3	#10400.00	59.7 PK	68.2	-8.5	2.29 H	318	42.6	17.1
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	*5200.00	116.2 PK			3.80 V	29	76.9	39.3
2	*5200.00	103.4 AV			3.80 V	29	64.1	39.3
3	#10400.00	59.5 PK	68.2	-8.7	1.73 V	335	42.4	17.1

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. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
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.	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	*5240.00	121.9 PK			1.21 H	9	82.8	39.1
2	*5240.00	108.3 AV			1.21 H	9	69.2	39.1
3	5350.00	55.4 PK	74.0	-18.6	1.26 H	13	51.8	3.6
4	5350.00	43.4 AV	54.0	-10.6	1.26 H	13	39.8	3.6
5	#10480.00	60.5 PK	68.2	-7.7	2.32 H	328	42.9	17.6
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	*5240.00	117.5 PK			3.94 V	32	78.4	39.1
2	*5240.00	104.1 AV			3.94 V	32	65.0	39.1
3	5350.00	55.1 PK	74.0	-18.9	3.88 V	35	51.5	3.6
4	5350.00	42.2 AV	54.0	-11.8	3.88 V	35	38.6	3.6
5	#10480.00	60.2 PK	68.2	-8.0	1.73 V	340	42.6	17.6

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
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.	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	#5601.92	57.5 PK	68.2	-10.7	1.94 H	294	51.4	6.1
2	*5745.00	124.6 PK			1.94 H	294	82.6	42.0
3	*5745.00	110.9 AV			1.94 H	294	68.9	42.0
4	#5989.10	58.9 PK	68.2	-9.3	1.94 H	294	52.0	6.9
5	11490.00	65.8 PK	74.0	-8.2	1.32 H	9	47.8	18.0
6	11490.00	52.5 AV	54.0	-1.5	1.32 H	9	34.5	18.0
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	#5630.13	57.4 PK	68.2	-10.8	3.87 V	23	51.3	6.1
2	*5745.00	121.3 PK			3.87 V	23	79.3	42.0
3	*5745.00	107.3 AV			3.87 V	23	65.3	42.0
4	#5976.92	58.1 PK	68.2	-10.1	3.87 V	23	51.2	6.9
5	11490.00	67.2 PK	74.0	-6.8	3.36 V	355	49.2	18.0
6	11490.00	52.7 AV	54.0	-1.3	3.36 V	355	34.7	18.0

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. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
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.	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	#5634.62	58.2 PK	68.2	-10.0	2.19 H	296	52.0	6.2
2	*5785.00	123.8 PK			2.19 H	296	81.9	41.9
3	*5785.00	110.1 AV			2.19 H	296	68.2	41.9
4	#5995.51	58.7 PK	68.2	-9.5	2.19 H	296	51.8	6.9
5	11570.00	65.3 PK	74.0	-8.7	1.33 H	9	47.7	17.6
6	11570.00	52.3 AV	54.0	-1.7	1.33 H	9	34.7	17.6
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	#5604.49	56.8 PK	68.2	-11.4	3.60 V	26	50.7	6.1
2	*5785.00	120.4 PK			3.60 V	26	78.5	41.9
3	*5785.00	107.1 AV			3.60 V	26	65.2	41.9
4	#5999.36	57.7 PK	68.2	-10.5	3.60 V	26	50.8	6.9
5	11570.00	66.7 PK	74.0	-7.3	3.33 V	353	49.1	17.6
6	11570.00	52.7 AV	54.0	-1.3	3.33 V	353	35.1	17.6

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
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.	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	#5639.74	59.4 PK	68.2	-8.8	1.98 H	292	53.2	6.2
2	*5825.00	123.3 PK			1.98 H	292	81.1	42.2
3	*5825.00	109.7 AV			1.98 H	292	67.5	42.2
4	#5928.85	59.6 PK	68.2	-8.6	1.98 H	292	52.6	7.0
5	11650.00	66.7 PK	74.0	-7.3	1.32 H	8	49.0	17.7
6	11650.00	52.4 AV	54.0	-1.6	1.32 H	8	34.7	17.7
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	#5631.41	57.3 PK	68.2	-10.9	3.76 V	26	51.1	6.2
2	*5825.00	119.7 PK			3.80 V	30	77.5	42.2
3	*5825.00	105.9 AV			3.80 V	30	63.7	42.2
4	#5967.95	58.4 PK	68.2	-9.8	3.76 V	26	51.5	6.9
5	11650.00	68.8 PK	74.0	-5.2	3.45 V	350	51.1	17.7
6	11650.00	53.0 AV	54.0	-1.0	3.45 V	350	35.3	17.7

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. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
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.	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	5150.00	68.5 PK	74.0	-5.5	1.48 H	8	65.0	3.5
2	5150.00	52.8 AV	54.0	-1.2	1.48 H	8	49.3	3.5
3	*5190.00	118.6 PK			1.13 H	14	79.3	39.3
4	*5190.00	105.7 AV			1.13 H	14	66.4	39.3
5	#10380.00	59.6 PK	68.2	-8.6	2.29 H	318	42.6	17.0
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	5150.00	66.0 PK	74.0	-8.0	3.89 V	30	62.5	3.5
2	5150.00	47.1 AV	54.0	-6.9	3.89 V	30	43.6	3.5
3	*5190.00	113.6 PK			3.87 V	28	74.3	39.3
4	*5190.00	100.4 AV			3.87 V	28	61.1	39.3
5	#10380.00	59.4 PK	68.2	-8.8	1.72 V	333	42.4	17.0

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
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.	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	5150.00	63.5 PK	74.0	-10.5	1.33 H	12	60.0	3.5
2	5150.00	45.3 AV	54.0	-8.7	1.33 H	12	41.8	3.5
3	*5230.00	119.3 PK			1.30 H	6	80.2	39.1
4	*5230.00	106.4 AV			1.30 H	6	67.3	39.1
5	5350.00	56.3 PK	74.0	-17.7	1.36 H	15	52.7	3.6
6	5350.00	43.5 AV	54.0	-10.5	1.36 H	15	39.9	3.6
7	#10460.00	60.2 PK	68.2	-8.0	2.30 H	331	42.8	17.4
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	5150.00	55.0 PK	74.0	-19.0	3.88 V	13	51.5	3.5
2	5150.00	42.1 AV	54.0	-11.9	3.88 V	13	38.6	3.5
3	*5230.00	114.1 PK			3.85 V	11	75.0	39.1
4	*5230.00	101.4 AV			3.85 V	11	62.3	39.1
5	5350.00	54.9 PK	74.0	-19.1	3.86 V	14	51.3	3.6
6	5350.00	42.0 AV	54.0	-12.0	3.86 V	14	38.4	3.6
7	#10460.00	59.8 PK	68.2	-8.4	1.72 V	334	42.4	17.4

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
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.	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	#5609.62	58.3 PK	68.2	-9.9	2.11 H	290	52.2	6.1
2	#5650.00	60.9 PK	68.2	-7.3	2.27 H	291	54.8	6.1
3	*5755.00	122.8 PK			2.11 H	290	80.8	42.0
4	*5755.00	109.8 AV			2.11 H	290	67.8	42.0
5	#5983.97	59.1 PK	68.2	-9.1	2.11 H	290	52.2	6.9
6	11510.00	64.5 PK	74.0	-9.5	1.30 H	10	46.6	17.9
7	11510.00	52.3 AV	54.0	-1.7	1.30 H	10	34.4	17.9
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	#5647.44	58.1 PK	68.2	-10.1	3.64 V	27	51.9	6.2
2	#5650.00	60.7 PK	68.2	-7.5	3.66 V	31	54.6	6.1
3	*5755.00	120.2 PK			3.64 V	27	78.2	42.0
4	*5755.00	106.6 AV			3.64 V	27	64.6	42.0
5	#5933.97	58.7 PK	68.2	-9.5	3.64 V	27	51.7	7.0
6	11510.00	65.2 PK	74.0	-8.8	3.54 V	349	47.3	17.9
7	11510.00	52.5 AV	54.0	-1.5	3.54 V	349	34.6	17.9

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
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.	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	#5616.03	59.8 PK	68.2	-8.4	2.11 H	295	53.7	6.1
2	*5795.00	122.5 PK			2.11 H	295	80.5	42.0
3	*5795.00	109.1 AV			2.11 H	295	67.1	42.0
4	#5923.72	59.6 PK	69.1	-9.5	2.11 H	295	52.6	7.0
5	#5925.00	61.5 PK	68.2	-6.7	2.15 H	298	54.5	7.0
6	11590.00	65.7 PK	74.0	-8.3	1.50 H	8	48.2	17.5
7	11590.00	52.3 AV	54.0	-1.7	1.50 H	8	34.8	17.5
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	#5634.62	58.1 PK	68.2	-10.1	3.58 V	28	51.9	6.2
2	*5795.00	119.0 PK			3.58 V	28	77.0	42.0
3	*5795.00	105.2 AV			3.58 V	28	63.2	42.0
4	#5925.00	59.5 PK	68.2	-8.7	3.62 V	33	52.5	7.0
5	#5936.54	58.8 PK	68.2	-9.4	3.58 V	28	51.8	7.0
6	11590.00	65.1 PK	74.0	-8.9	3.48 V	350	47.6	17.5
7	11590.00	52.5 AV	54.0	-1.5	3.48 V	350	35.0	17.5

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
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.	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	5150.00	66.7 PK	74.0	-7.3	1.32 H	11	63.2	3.5
2	5150.00	52.2 AV	54.0	-1.8	1.32 H	11	48.7	3.5
3	*5210.00	114.0 PK			1.22 H	9	74.8	39.2
4	*5210.00	101.6 AV			1.22 H	9	62.4	39.2
5	5350.00	56.0 PK	74.0	-18.0	1.36 H	16	52.4	3.6
6	5350.00	43.1 AV	54.0	-10.9	1.36 H	16	39.5	3.6
7	#10420.00	59.8 PK	68.2	-8.4	2.36 H	332	42.5	17.3
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	5150.00	59.0 PK	74.0	-15.0	3.82 V	20	55.5	3.5
2	5150.00	44.5 AV	54.0	-9.5	3.82 V	20	41.0	3.5
3	*5210.00	109.0 PK			3.84 V	16	69.8	39.2
4	*5210.00	96.0 AV			3.84 V	16	56.8	39.2
5	5350.00	55.1 PK	74.0	-18.9	3.80 V	22	51.5	3.6
6	5350.00	41.9 AV	54.0	-12.1	3.80 V	22	38.3	3.6
7	#10420.00	59.8 PK	68.2	-8.4	1.69 V	336	42.5	17.3

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
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.	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	#5645.51	61.1 PK	68.2	-7.1	2.11 H	295	54.9	6.2
2	#5650.00	66.6 PK	68.2	-1.6	2.31 H	288	60.5	6.1
3	*5775.00	118.4 PK			2.11 H	295	76.4	42.0
4	*5775.00	104.8 AV			2.11 H	295	62.8	42.0
5	#5925.00	66.7 PK	68.2	-1.5	2.35 H	290	59.7	7.0
6	#5945.51	61.6 PK	68.2	-6.6	2.11 H	295	54.6	7.0
7	11550.00	64.3 PK	74.0	-9.7	2.42 H	332	46.5	17.8
8	11550.00	50.3 AV	54.0	-3.7	2.42 H	332	32.5	17.8
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	#5636.54	59.9 PK	68.2	-8.3	3.90 V	35	53.7	6.2
2	#5650.00	61.8 PK	68.2	-6.4	3.88 V	37	55.7	6.1
3	*5775.00	114.3 PK			3.90 V	35	72.3	42.0
4	*5775.00	101.5 AV			3.90 V	35	59.5	42.0
5	#5925.00	61.3 PK	68.2	-6.9	3.83 V	40	54.3	7.0
6	#5983.33	59.0 PK	68.2	-9.2	3.90 V	35	52.1	6.9
7	11550.00	65.2 PK	74.0	-8.8	3.05 V	355	47.4	17.8
8	11550.00	52.1 AV	54.0	-1.9	3.05 V	355	34.3	17.8

Remarks:

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

Scanning radio:

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.	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	5150.00	61.5 PK	74.0	-12.5	1.36 H	33	58.0	3.5
2	5150.00	46.9 AV	54.0	-7.1	1.36 H	33	43.4	3.5
3	*5180.00	110.0 PK			1.33 H	32	70.7	39.3
4	*5180.00	99.9 AV			1.33 H	32	60.6	39.3
5	#10360.00	59.1 PK	68.2	-9.1	3.25 H	228	42.2	16.9
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	5150.00	68.9 PK	74.0	-5.1	1.65 V	329	65.4	3.5
2	5150.00	52.9 AV	54.0	-1.1	1.65 V	329	49.4	3.5
3	*5180.00	115.1 PK			1.70 V	330	75.8	39.3
4	*5180.00	105.1 AV			1.70 V	330	65.8	39.3
5	#10360.00	59.7 PK	68.2	-8.5	3.05 V	143	42.8	16.9

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
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.	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	*5200.00	110.9 PK			1.46 H	34	71.6	39.3
2	*5200.00	100.4 AV			1.46 H	34	61.1	39.3
3	#10400.00	59.4 PK	68.2	-8.8	3.32 H	208	42.3	17.1
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	*5200.00	117.7 PK			1.60 V	328	78.4	39.3
2	*5200.00	107.1 AV			1.60 V	328	67.8	39.3
3	#10400.00	60.1 PK	68.2	-8.1	3.11 V	152	43.0	17.1

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. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
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.	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	*5240.00	111.7 PK			1.46 H	26	72.6	39.1
2	*5240.00	101.4 AV			1.46 H	26	62.3	39.1
3	5350.00	57.0 PK	74.0	-17.0	1.52 H	30	53.4	3.6
4	5350.00	44.6 AV	54.0	-9.4	1.52 H	30	41.0	3.6
5	#10480.00	60.0 PK	68.2	-8.2	3.32 H	232	42.4	17.6
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	*5240.00	117.1 PK			1.42 V	329	78.0	39.1
2	*5240.00	106.9 AV			1.42 V	329	67.8	39.1
3	5350.00	61.6 PK	74.0	-12.4	1.76 V	337	58.0	3.6
4	5350.00	49.8 AV	54.0	-4.2	1.76 V	337	46.2	3.6
5	#10480.00	60.5 PK	68.2	-7.7	3.26 V	152	42.9	17.6

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
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.	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	#5621.15	57.5 PK	68.2	-10.7	1.19 H	41	53.6	3.9
2	*5745.00	114.6 PK			1.19 H	41	74.6	40.0
3	*5745.00	103.6 AV			1.19 H	41	63.6	40.0
4	#5959.62	56.2 PK	68.2	-12.0	1.19 H	41	51.4	4.8
5	11490.00	60.3 PK	74.0	-13.7	3.39 H	209	42.0	18.3
6	11490.00	47.2 AV	54.0	-6.8	3.39 H	209	28.9	18.3
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	#5619.23	58.9 PK	68.2	-9.3	1.13 V	336	55.0	3.9
2	*5745.00	115.8 PK			1.13 V	336	75.8	40.0
3	*5745.00	104.7 AV			1.13 V	336	64.7	40.0
4	#5960.26	57.0 PK	68.2	-11.2	1.13 V	336	52.2	4.8
5	11490.00	60.4 PK	74.0	-13.6	3.36 V	131	42.1	18.3
6	11490.00	46.8 AV	54.0	-7.2	3.36 V	131	28.5	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. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
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.	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	#5617.95	56.1 PK	68.2	-12.1	1.21 H	39	52.2	3.9
2	*5785.00	114.4 PK			1.21 H	39	74.2	40.2
3	*5785.00	103.4 AV			1.21 H	39	63.2	40.2
4	#5974.36	55.5 PK	68.2	-12.7	1.21 H	39	50.7	4.8
5	11570.00	60.0 PK	74.0	-14.0	3.19 H	221	42.1	17.9
6	11570.00	46.9 AV	54.0	-7.1	3.19 H	221	29.0	17.9
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	#5630.77	58.0 PK	68.2	-10.2	1.02 V	334	54.1	3.9
2	*5785.00	115.3 PK			1.02 V	334	75.1	40.2
3	*5785.00	104.3 AV			1.02 V	334	64.1	40.2
4	#5980.77	56.9 PK	68.2	-11.3	1.02 V	334	52.0	4.9
5	11570.00	60.1 PK	74.0	-13.9	3.39 V	136	42.2	17.9
6	11570.00	46.6 AV	54.0	-7.4	3.39 V	136	28.7	17.9

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
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.	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	#5637.82	56.8 PK	68.2	-11.4	1.25 H	38	52.9	3.9
2	*5825.00	114.8 PK			1.25 H	38	74.4	40.4
3	*5825.00	103.9 AV			1.25 H	38	63.5	40.4
4	#5955.77	56.4 PK	68.2	-11.8	1.25 H	38	51.6	4.8
5	11650.00	60.1 PK	74.0	-13.9	3.25 H	233	42.2	17.9
6	11650.00	47.0 AV	54.0	-7.0	3.25 H	233	29.1	17.9
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	#5646.79	58.3 PK	68.2	-9.9	1.00 V	332	54.4	3.9
2	*5825.00	115.4 PK			1.00 V	332	75.0	40.4
3	*5825.00	104.6 AV			1.00 V	332	64.2	40.4
4	#5966.03	57.4 PK	68.2	-10.8	1.00 V	332	52.6	4.8
5	11650.00	60.1 PK	74.0	-13.9	3.29 V	135	42.2	17.9
6	11650.00	46.7 AV	54.0	-7.3	3.29 V	135	28.8	17.9

Remarks:

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

802.11n (HT20)

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

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	5150.00	59.9 PK	74.0	-14.1	1.49 H	35	56.4	3.5
2	5150.00	46.1 AV	54.0	-7.9	1.49 H	35	42.6	3.5
3	*5180.00	108.6 PK			1.47 H	31	69.3	39.3
4	*5180.00	98.4 AV			1.47 H	31	59.1	39.3
5	#10360.00	59.1 PK	68.2	-9.1	3.29 H	215	42.2	16.9
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	5150.00	65.4 PK	74.0	-8.6	1.74 V	333	61.9	3.5
2	5150.00	52.2 AV	54.0	-1.8	1.74 V	333	48.7	3.5
3	*5180.00	114.7 PK			1.54 V	334	75.4	39.3
4	*5180.00	104.3 AV			1.54 V	334	65.0	39.3
5	#10360.00	59.7 PK	68.2	-8.5	3.22 V	152	42.8	16.9

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
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.	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	*5200.00	110.9 PK			1.27 H	35	71.6	39.3
2	*5200.00	100.4 AV			1.27 H	35	61.1	39.3
3	#10400.00	59.5 PK	68.2	-8.7	3.29 H	225	42.4	17.1
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	*5200.00	117.3 PK			1.53 V	336	78.0	39.3
2	*5200.00	106.7 AV			1.53 V	336	67.4	39.3
3	#10400.00	59.6 PK	68.2	-8.6	3.28 V	153	42.5	17.1

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. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
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.	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	*5240.00	111.7 PK			1.17 H	32	72.6	39.1
2	*5240.00	100.7 AV			1.17 H	32	61.6	39.1
3	5350.00	57.1 PK	74.0	-16.9	1.22 H	35	53.5	3.6
4	5350.00	44.3 AV	54.0	-9.7	1.22 H	35	40.7	3.6
5	#10480.00	59.9 PK	68.2	-8.3	3.19 H	221	42.3	17.6
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	*5240.00	116.5 PK			1.47 V	326	77.4	39.1
2	*5240.00	105.9 AV			1.47 V	326	66.8	39.1
3	5350.00	62.3 PK	74.0	-11.7	1.62 V	336	58.7	3.6
4	5350.00	50.1 AV	54.0	-3.9	1.62 V	336	46.5	3.6
5	#10480.00	60.2 PK	68.2	-8.0	3.24 V	150	42.6	17.6

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
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.	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	#5630.13	57.0 PK	68.2	-11.2	1.19 H	43	53.1	3.9
2	*5745.00	114.3 PK			1.19 H	43	74.3	40.0
3	*5745.00	103.4 AV			1.19 H	43	63.4	40.0
4	#5969.87	56.3 PK	68.2	-11.9	1.19 H	43	51.5	4.8
5	11490.00	60.6 PK	74.0	-13.4	3.26 H	228	42.3	18.3
6	11490.00	47.3 AV	54.0	-6.7	3.26 H	228	29.0	18.3
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	#5633.33	58.4 PK	68.2	-9.8	1.12 V	333	54.5	3.9
2	*5745.00	115.7 PK			1.12 V	333	75.7	40.0
3	*5745.00	104.5 AV			1.12 V	333	64.5	40.0
4	#5952.56	56.8 PK	68.2	-11.4	1.12 V	333	52.0	4.8
5	11490.00	60.5 PK	74.0	-13.5	3.25 V	141	42.2	18.3
6	11490.00	47.1 AV	54.0	-6.9	3.25 V	141	28.8	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. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
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.	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	#5630.13	56.7 PK	68.2	-11.5	1.21 H	40	52.8	3.9
2	*5785.00	114.2 PK			1.21 H	40	74.0	40.2
3	*5785.00	103.2 AV			1.21 H	40	63.0	40.2
4	#5944.87	57.8 PK	68.2	-10.4	1.21 H	40	53.0	4.8
5	11570.00	60.1 PK	74.0	-13.9	3.26 H	227	42.2	17.9
6	11570.00	47.0 AV	54.0	-7.0	3.26 H	227	29.1	17.9
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	#5628.85	58.7 PK	68.2	-9.5	1.10 V	336	54.8	3.9
2	*5785.00	115.5 PK			1.10 V	336	75.3	40.2
3	*5785.00	104.1 AV			1.10 V	336	63.9	40.2
4	#5936.54	57.3 PK	68.2	-10.9	1.10 V	336	52.5	4.8
5	11570.00	60.1 PK	74.0	-13.9	3.32 V	135	42.2	17.9
6	11570.00	46.6 AV	54.0	-7.4	3.32 V	135	28.7	17.9

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
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.	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	#5630.77	58.4 PK	68.2	-9.8	1.15 H	39	54.5	3.9
2	*5825.00	114.7 PK			1.15 H	39	74.3	40.4
3	*5825.00	103.8 AV			1.15 H	39	63.4	40.4
4	#5938.46	56.8 PK	68.2	-11.4	1.15 H	39	52.0	4.8
5	11650.00	60.1 PK	74.0	-13.9	3.19 H	233	42.2	17.9
6	11650.00	47.1 AV	54.0	-6.9	3.19 H	233	29.2	17.9
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	#5638.46	59.1 PK	68.2	-9.1	1.17 V	337	55.2	3.9
2	*5825.00	115.2 PK			1.17 V	337	74.8	40.4
3	*5825.00	104.3 AV			1.17 V	337	63.9	40.4
4	#5928.85	57.0 PK	68.2	-11.2	1.17 V	337	52.2	4.8
5	11650.00	60.2 PK	74.0	-13.8	3.39 V	144	42.3	17.9
6	11650.00	46.8 AV	54.0	-7.2	3.39 V	144	28.9	17.9

Remarks:

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

802.11n (HT40)

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

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	5150.00	59.4 PK	74.0	-14.6	1.43 H	32	55.9	3.5
2	5150.00	47.1 AV	54.0	-6.9	1.43 H	32	43.6	3.5
3	*5190.00	105.5 PK			1.40 H	29	66.2	39.3
4	*5190.00	95.4 AV			1.40 H	29	56.1	39.3
5	#10380.00	59.4 PK	68.2	-8.8	3.21 H	218	42.4	17.0
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	5150.00	65.1 PK	74.0	-8.9	1.42 V	330	61.6	3.5
2	5150.00	52.6 AV	54.0	-1.4	1.42 V	330	49.1	3.5
3	*5190.00	111.5 PK			1.55 V	320	72.2	39.3
4	*5190.00	101.2 AV			1.55 V	320	61.9	39.3
5	#10380.00	59.5 PK	68.2	-8.7	3.35 V	163	42.5	17.0

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
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.	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	*5230.00	108.4 PK			1.48 H	24	69.3	39.1
2	*5230.00	97.7 AV			1.48 H	24	58.6	39.1
3	5350.00	58.3 PK	74.0	-15.7	1.52 H	28	54.7	3.6
4	5350.00	43.9 AV	54.0	-10.1	1.52 H	28	40.3	3.6
5	#10460.00	59.7 PK	68.2	-8.5	3.22 H	225	42.3	17.4
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	*5230.00	114.1 PK			1.56 V	333	75.0	39.1
2	*5230.00	103.2 AV			1.56 V	333	64.1	39.1
3	5350.00	62.7 PK	74.0	-11.3	1.53 V	333	59.1	3.6
4	5350.00	50.1 AV	54.0	-3.9	1.53 V	333	46.5	3.6
5	#10460.00	60.0 PK	68.2	-8.2	3.29 V	154	42.6	17.4

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
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.	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	#5649.36	63.0 PK	68.2	-5.2	1.13 H	40	59.1	3.9
2	#5650.00	64.0 PK	68.2	-4.2	1.19 H	44	60.2	3.8
3	*5755.00	110.8 PK			1.13 H	40	70.8	40.0
4	*5755.00	100.2 AV			1.13 H	40	60.2	40.0
5	#5947.44	57.0 PK	68.2	-11.2	1.13 H	40	52.2	4.8
6	11510.00	60.5 PK	74.0	-13.5	3.29 H	228	42.2	18.3
7	11510.00	47.4 AV	54.0	-6.6	3.29 H	228	29.1	18.3
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	#5650.00	66.8 PK	68.2	-1.4	1.40 V	337	63.0	3.8
2	#5650.00	65.8 PK	68.2	-2.4	1.11 V	336	62.0	3.8
3	*5755.00	112.9 PK			1.11 V	336	72.9	40.0
4	*5755.00	101.2 AV			1.11 V	336	61.2	40.0
5	#5939.74	56.8 PK	68.2	-11.4	1.11 V	336	52.0	4.8
6	11510.00	60.5 PK	74.0	-13.5	3.31 V	152	42.2	18.3
7	11510.00	47.2 AV	54.0	-6.8	3.31 V	152	28.9	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. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
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.	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	#5637.18	58.7 PK	68.2	-9.5	1.22 H	40	54.8	3.9
2	*5795.00	111.3 PK			1.22 H	40	71.0	40.3
3	*5795.00	100.6 AV			1.22 H	40	60.3	40.3
4	#5926.92	56.4 PK	68.2	-11.8	1.22 H	40	51.6	4.8
5	11590.00	60.0 PK	74.0	-14.0	3.25 H	228	42.2	17.8
6	11590.00	46.8 AV	54.0	-7.2	3.25 H	228	29.0	17.8
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	#5607.05	59.4 PK	68.2	-8.8	1.11 V	337	55.5	3.9
2	*5795.00	112.4 PK			1.11 V	337	72.1	40.3
3	*5795.00	101.4 AV			1.11 V	337	61.1	40.3
4	#5934.62	58.4 PK	68.2	-9.8	1.11 V	337	53.6	4.8
5	11590.00	59.9 PK	74.0	-14.1	3.25 V	149	42.1	17.8
6	11590.00	46.7 AV	54.0	-7.3	3.25 V	149	28.9	17.8

Remarks:

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

802.11ac (VHT80)

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

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	5150.00	58.8 PK	74.0	-15.2	1.69 H	30	55.3	3.5
2	5150.00	46.6 AV	54.0	-7.4	1.69 H	30	43.1	3.5
3	*5210.00	98.5 PK			1.74 H	27	59.3	39.2
4	*5210.00	89.0 AV			1.74 H	27	49.8	39.2
5	5350.00	54.9 PK	74.0	-19.1	1.70 H	29	51.3	3.6
6	5350.00	43.0 AV	54.0	-11.0	1.70 H	29	39.4	3.6
7	#10420.00	59.7 PK	68.2	-8.5	3.22 H	205	42.4	17.3
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	5150.00	67.0 PK	74.0	-7.0	1.47 V	323	63.5	3.5
2	5150.00	52.7 AV	54.0	-1.3	1.47 V	323	49.2	3.5
3	*5210.00	104.2 PK			1.47 V	325	65.0	39.2
4	*5210.00	94.1 AV			1.47 V	325	54.9	39.2
5	5350.00	57.6 PK	74.0	-16.4	1.52 V	333	54.0	3.6
6	5350.00	45.7 AV	54.0	-8.3	1.52 V	333	42.1	3.6
7	#10420.00	59.8 PK	68.2	-8.4	3.32 V	158	42.5	17.3

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
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.	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	#5647.44	60.4 PK	68.2	-7.8	1.08 H	40	56.5	3.9
2	#5650.00	63.6 PK	68.2	-4.6	1.15 H	42	59.8	3.8
3	*5775.00	106.9 PK			1.08 H	40	66.8	40.1
4	*5775.00	96.1 AV			1.08 H	40	56.0	40.1
5	#5925.00	60.8 PK	68.2	-7.4	1.18 H	44	56.0	4.8
6	#5926.92	58.7 PK	68.2	-9.5	1.08 H	40	53.9	4.8
7	11550.00	60.3 PK	74.0	-13.7	3.29 H	205	42.2	18.1
8	11550.00	47.3 AV	54.0	-6.7	3.29 H	205	29.2	18.1
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	#5646.79	62.7 PK	68.2	-5.5	1.25 V	337	58.8	3.9
2	#5650.00	66.6 PK	68.2	-1.6	1.30 V	338	62.8	3.8
3	*5775.00	107.6 PK			1.25 V	337	67.5	40.1
4	*5775.00	96.7 AV			1.25 V	337	56.6	40.1
5	#5923.72	60.6 PK	69.1	-8.5	1.25 V	337	55.8	4.8
6	#5925.00	62.8 PK	68.2	-5.4	1.19 V	330	58.0	4.8
7	11550.00	60.4 PK	74.0	-13.6	3.28 V	147	42.3	18.1
8	11550.00	47.1 AV	54.0	-6.9	3.28 V	147	29.0	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. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

Below 1GHz Worst-Case:

5G traffic radio:

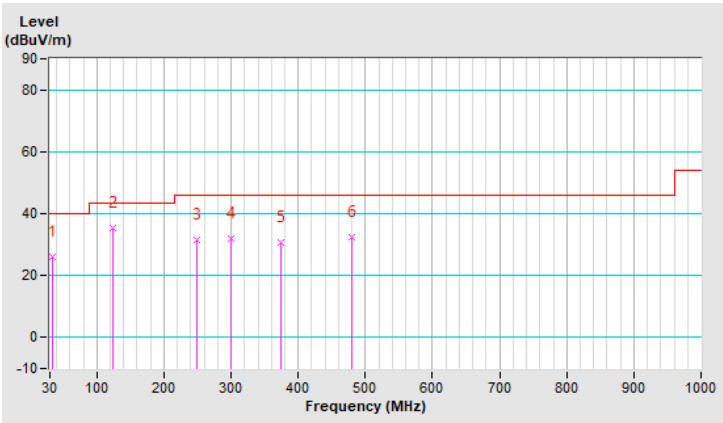
802.11ax (HE20)

CHANNEL	TX Channel 149	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz	TEST MODE	A

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	34.22	26.2 QP	40.0	-13.8	1.50 H	314	36.7	-10.5
2	124.19	35.4 QP	43.5	-8.1	1.00 H	94	45.9	-10.5
3	249.30	31.5 QP	46.0	-14.5	1.00 H	154	40.3	-8.8
4	299.91	32.1 QP	46.0	-13.9	2.00 H	145	38.8	-6.7
5	374.42	30.7 QP	46.0	-15.3	1.50 H	132	35.7	-5.0
6	479.86	32.3 QP	46.0	-13.7	1.00 H	320	34.9	-2.6

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m).
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB).
3. The other emission levels were very low against the limit of frequency range 30MHz ~ 1000MHz.
4. Margin value = Emission Level – Limit value.
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.

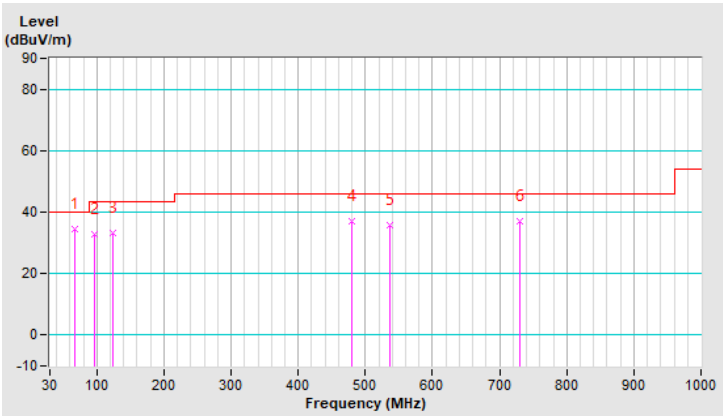


CHANNEL	TX Channel 149	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz	TEST MODE	A

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	66.55	34.7 QP	40.0	-5.3	1.50 V	5	44.9	-10.2
2	96.07	33.0 QP	43.5	-10.5	1.00 V	251	46.7	-13.7
3	124.19	33.2 QP	43.5	-10.3	1.50 V	5	43.7	-10.5
4	479.86	37.1 QP	46.0	-8.9	1.00 V	149	39.7	-2.6
5	536.09	35.8 QP	46.0	-10.2	1.50 V	80	37.4	-1.6
6	730.09	37.0 QP	46.0	-9.0	1.00 V	26	34.4	2.6

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m).
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB).
3. The other emission levels were very low against the limit of frequency range 30MHz ~ 1000MHz.
4. Margin value = Emission Level – Limit value.
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.

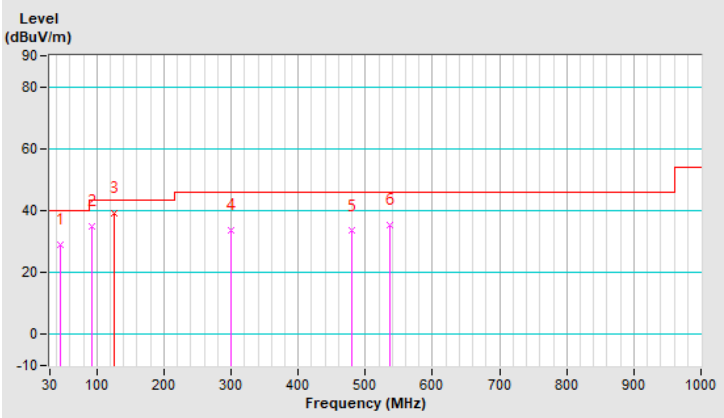


CHANNEL	TX Channel 149	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz	TEST MODE	B

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	45.46	28.9 QP	40.0	-11.1	2.00 H	93	38.0	-9.1
2	93.26	35.1 QP	43.5	-8.4	2.00 H	273	49.2	-14.1
3	125.00	39.1 QP	43.5	-4.4	1.49 H	99	49.5	-10.4
4	299.91	33.6 QP	46.0	-12.4	1.00 H	143	40.3	-6.7
5	479.86	33.4 QP	46.0	-12.6	1.49 H	156	36.0	-2.6
6	536.09	35.2 QP	46.0	-10.8	1.49 H	199	36.8	-1.6

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m).
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB).
3. The other emission levels were very low against the limit of frequency range 30MHz ~ 1000MHz.
4. Margin value = Emission Level – Limit value.
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.

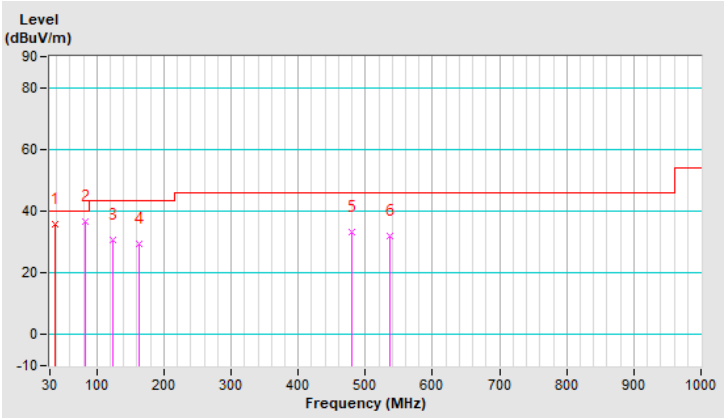


CHANNEL	TX Channel 149	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz	TEST MODE	B

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	37.17	35.9 QP	40.0	-4.1	1.00 V	284	45.8	-9.9
2	83.42	36.5 QP	40.0	-3.5	1.49 V	152	50.5	-14.0
3	124.19	30.5 QP	43.5	-13.0	1.99 V	200	41.0	-10.5
4	162.14	29.6 QP	43.5	-13.9	1.00 V	82	38.0	-8.4
5	479.86	33.2 QP	46.0	-12.8	1.00 V	194	35.8	-2.6
6	536.09	31.9 QP	46.0	-14.1	1.00 V	259	33.5	-1.6

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m).
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB).
3. The other emission levels were very low against the limit of frequency range 30MHz ~ 1000MHz.
4. Margin value = Emission Level – Limit value.
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.



Scanning radio:

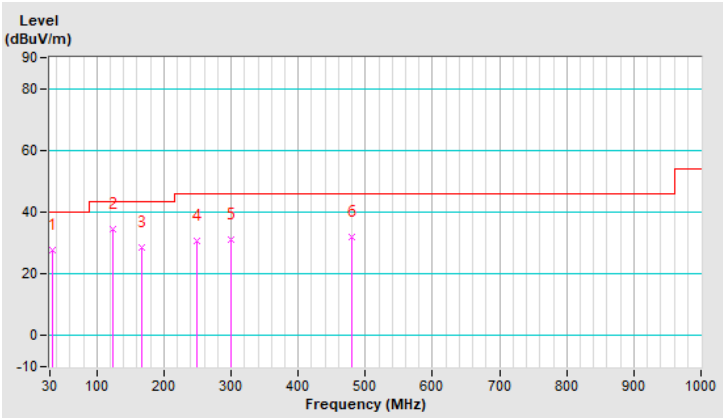
802.11a

CHANNEL	TX Channel 40	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz	TEST MODE	A

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	34.22	27.8 QP	40.0	-12.2	2.00 H	74	38.3	-10.5
2	124.19	34.6 QP	43.5	-8.9	1.00 H	92	45.1	-10.5
3	167.77	28.7 QP	43.5	-14.8	1.50 H	113	37.3	-8.6
4	249.30	30.8 QP	46.0	-15.2	1.00 H	167	39.6	-8.8
5	299.91	31.0 QP	46.0	-15.0	1.50 H	168	37.7	-6.7
6	479.86	32.0 QP	46.0	-14.0	1.00 H	295	34.6	-2.6

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m).
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB).
3. The other emission levels were very low against the limit of frequency range 30MHz ~ 1000MHz.
4. Margin value = Emission Level – Limit value.
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.

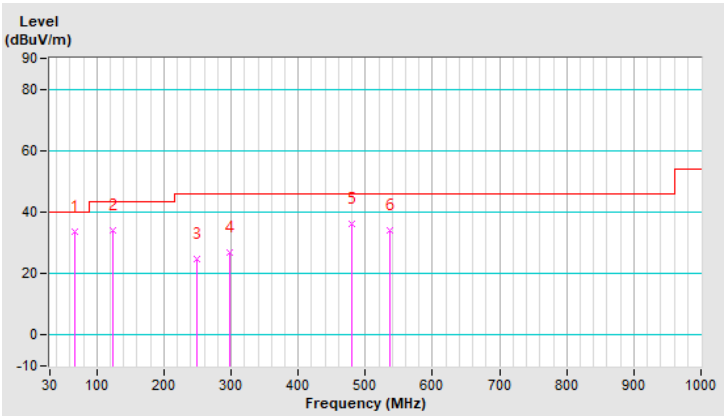


CHANNEL	TX Channel 40	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz	TEST MODE	A

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	66.55	33.7 QP	40.0	-6.3	1.50 V	313	43.9	-10.2
2	124.19	34.2 QP	43.5	-9.3	1.00 V	41	44.7	-10.5
3	249.30	24.9 QP	46.0	-21.1	1.00 V	314	33.7	-8.8
4	298.51	26.8 QP	46.0	-19.2	1.00 V	224	33.6	-6.8
5	479.86	36.3 QP	46.0	-9.7	1.50 V	140	38.9	-2.6
6	536.09	34.1 QP	46.0	-11.9	1.00 V	68	35.7	-1.6

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m).
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB).
3. The other emission levels were very low against the limit of frequency range 30MHz ~ 1000MHz.
4. Margin value = Emission Level – Limit value.
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.

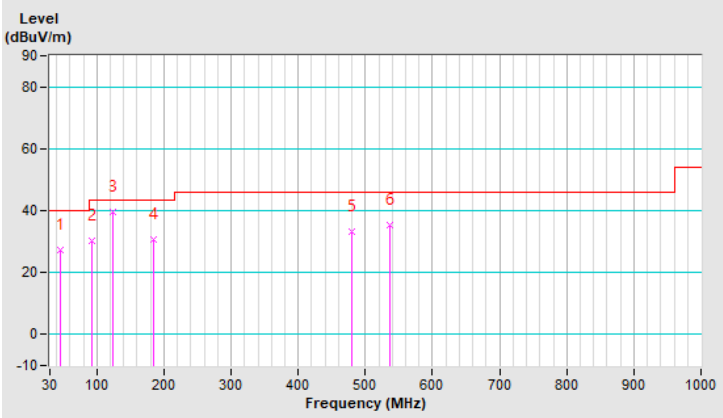


CHANNEL	TX Channel 40	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz	TEST MODE	B

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	45.46	27.4 QP	40.0	-12.6	1.00 H	110	36.5	-9.1
2	93.26	30.1 QP	43.5	-13.4	1.50 H	142	44.2	-14.1
3	124.19	39.7 QP	43.5	-3.8	1.50 H	101	50.2	-10.5
4	184.64	30.6 QP	43.5	-12.9	1.50 H	117	40.9	-10.3
5	479.86	33.1 QP	46.0	-12.9	1.50 H	162	35.7	-2.6
6	536.09	35.5 QP	46.0	-10.5	1.00 H	165	37.1	-1.6

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m).
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB).
3. The other emission levels were very low against the limit of frequency range 30MHz ~ 1000MHz.
4. Margin value = Emission Level – Limit value.
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.

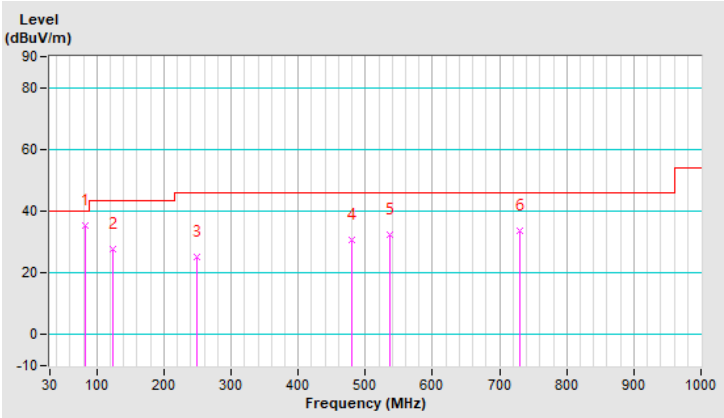


CHANNEL	TX Channel 40	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz	TEST MODE	B

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	83.42	35.3 QP	40.0	-4.7	1.00 V	205	49.3	-14.0
2	124.19	27.7 QP	43.5	-15.8	1.50 V	77	38.2	-10.5
3	249.30	25.3 QP	46.0	-20.7	1.50 V	167	34.1	-8.8
4	479.86	30.5 QP	46.0	-15.5	1.50 V	309	33.1	-2.6
5	536.09	32.3 QP	46.0	-13.7	1.50 V	268	33.9	-1.6
6	730.09	33.7 QP	46.0	-12.3	1.00 V	6	31.1	2.6

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m).
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB).
3. The other emission levels were very low against the limit of frequency range 30MHz ~ 1000MHz.
4. Margin value = Emission Level – Limit value.
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

Tested date: Aug. 25, 2020

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Test Receiver ROHDE & SCHWARZ	ESCI	100613	Dec. 11, 2019	Dec. 10, 2020
RF signal cable Woken	5D-FB	Cable-cond1-01	Sep. 05, 2019	Sep. 04, 2020
LISN ROHDE & SCHWARZ (EUT)	ENV216	101826	Feb. 20, 2020	Feb. 19, 2021
V-LISN ROHDE & SCHWARZ (Peripheral)	NNBL 8226-2	8226-142	Jul. 31, 2020	Jul. 30, 2021
Software ADT	BV ADT_Cond_ V7.3.7.4	NA	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 HwaYa Shielded Room 1 (Conduction 1).
3. The VCCI Site Registration No. is C-12040.

4.2.3 Test Procedures

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.

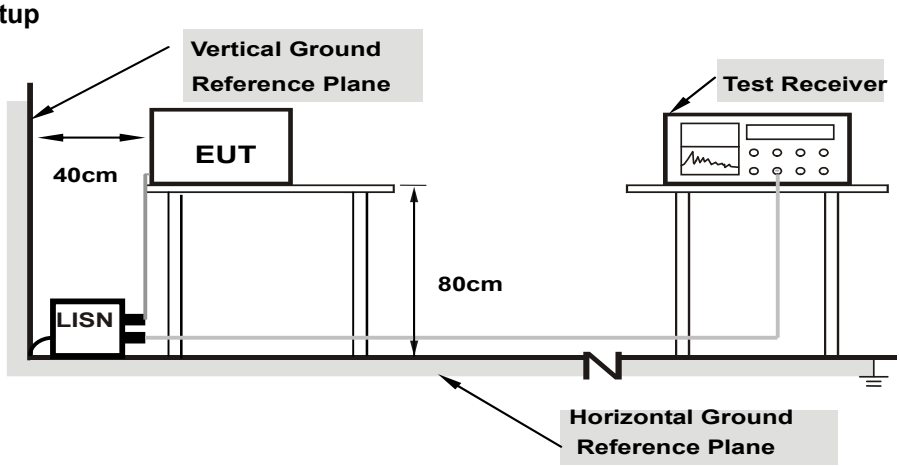
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

NOTE: The resolution bandwidth and video bandwidth of test receiver is 9kHz for quasi-peak detection (QP) and average detection (AV) at frequency 0.15MHz-30MHz.

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 Conditions

Same as 4.1.6.

4.2.7 Test Results

5G traffic radio:

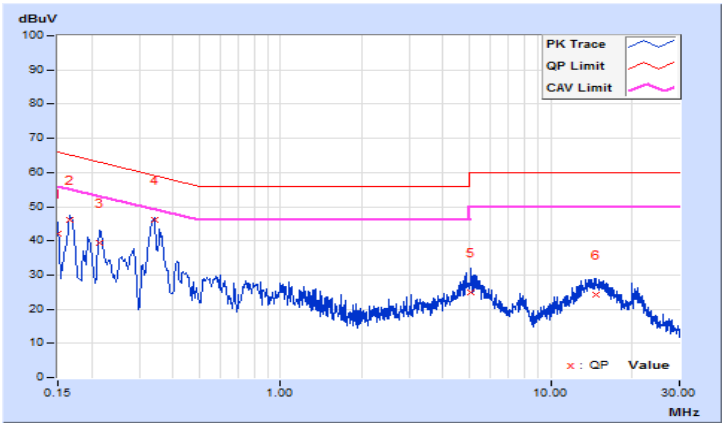
Worst-case data: 802.11ax (HE20)

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

No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	9.63	32.58	19.08	42.21	28.71	66.00	56.00	-23.79	-27.29
2	0.16535	9.63	36.57	25.44	46.20	35.07	65.19	55.19	-18.99	-20.12
3	0.21400	9.62	29.92	17.81	39.54	27.43	63.05	53.05	-23.51	-25.62
4	0.34200	9.64	36.37	28.20	46.01	37.84	59.15	49.15	-13.14	-11.31
5	5.08600	9.80	15.26	7.45	25.06	17.25	60.00	50.00	-34.94	-32.75
6	14.65800	9.90	14.22	7.73	24.12	17.63	60.00	50.00	-35.88	-32.37

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.

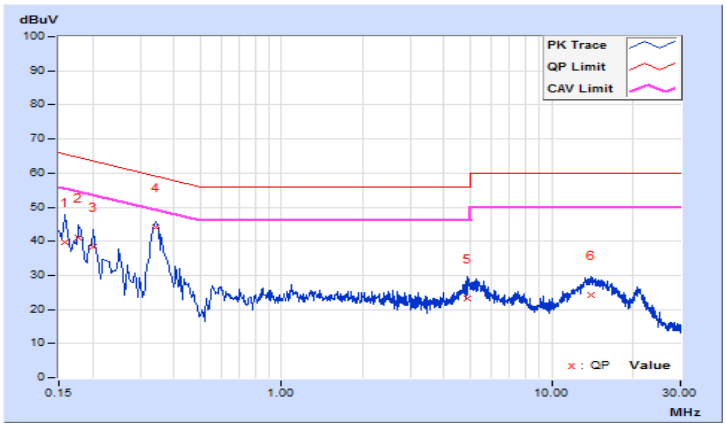


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	A		

No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15800	9.66	30.18	24.64	39.84	34.30	65.57	55.57	-25.73	-21.27
2	0.17800	9.65	31.54	18.96	41.19	28.61	64.58	54.58	-23.39	-25.97
3	0.20200	9.64	28.74	18.13	38.38	27.77	63.53	53.53	-25.15	-25.76
4	0.34200	9.66	34.32	26.33	43.98	35.99	59.15	49.15	-15.17	-13.16
5	4.90200	9.83	13.57	6.50	23.40	16.33	56.00	46.00	-32.60	-29.67
6	14.03800	9.97	14.28	8.16	24.25	18.13	60.00	50.00	-35.75	-31.87

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.

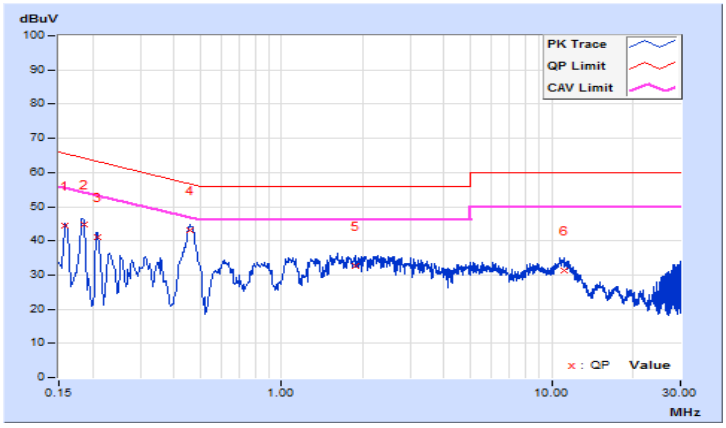


Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	B		

No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15800	9.56	35.04	25.59	44.60	35.15	65.57	55.57	-20.97	-20.42
2	0.18600	9.55	35.08	20.83	44.63	30.38	64.21	54.21	-19.58	-23.83
3	0.20740	9.55	31.52	18.32	41.07	27.87	63.31	53.31	-22.24	-25.44
4	0.45800	9.57	33.65	28.48	43.22	38.05	56.73	46.73	-13.51	-8.68
5	1.87400	9.65	22.93	18.28	32.58	27.93	56.00	46.00	-23.42	-18.07
6	11.16200	9.80	21.42	16.31	31.22	26.11	60.00	50.00	-28.78	-23.89

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.

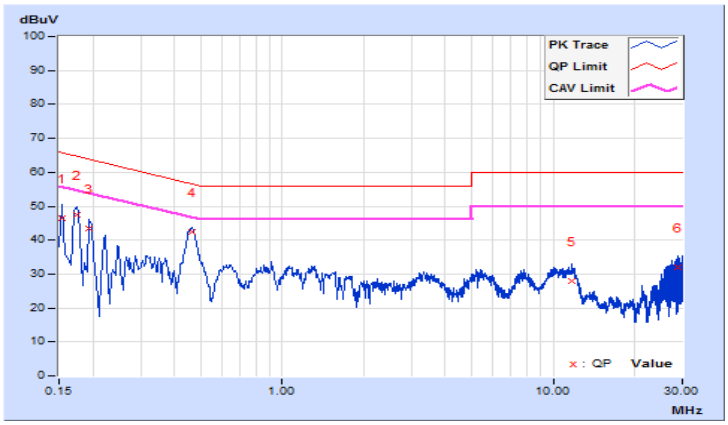


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	B		

No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15400	9.54	37.03	27.82	46.57	37.36	65.78	55.78	-19.21	-18.42
2	0.17384	9.54	38.01	23.90	47.55	33.44	64.77	54.77	-17.22	-21.33
3	0.19400	9.53	34.02	19.65	43.55	29.18	63.86	53.86	-20.31	-24.68
4	**0.46200**	**9.55**	**33.00**	**28.68**	**42.55**	**38.23**	**56.66**	**46.66**	**-14.11**	**-8.43**
5	11.79000	9.81	18.10	13.11	27.91	22.92	60.00	50.00	-32.09	-27.08
6	28.85800	9.91	22.14	18.45	32.05	28.36	60.00	50.00	-27.95	-21.64

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.



Scanning radio:

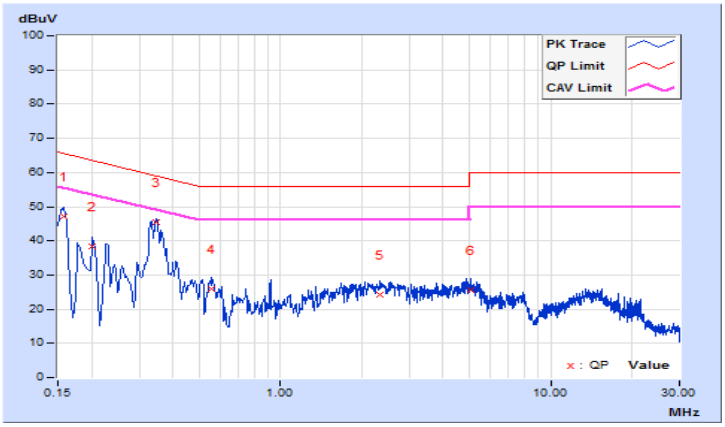
Worst-case data: 802.11a

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

No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15800	9.63	37.37	22.57	47.00	32.20	65.57	55.57	-18.57	-23.37
2	0.20200	9.62	28.71	13.63	38.33	23.25	63.53	53.53	-25.20	-30.28
3	0.34577	9.64	35.74	27.98	45.38	37.62	59.06	49.06	-13.68	-11.44
4	0.55800	9.66	16.32	8.76	25.98	18.42	56.00	46.00	-30.02	-27.58
5	2.34600	9.74	14.54	8.81	24.28	18.55	56.00	46.00	-31.72	-27.45
6	5.07800	9.80	15.73	8.33	25.53	18.13	60.00	50.00	-34.47	-31.87

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.

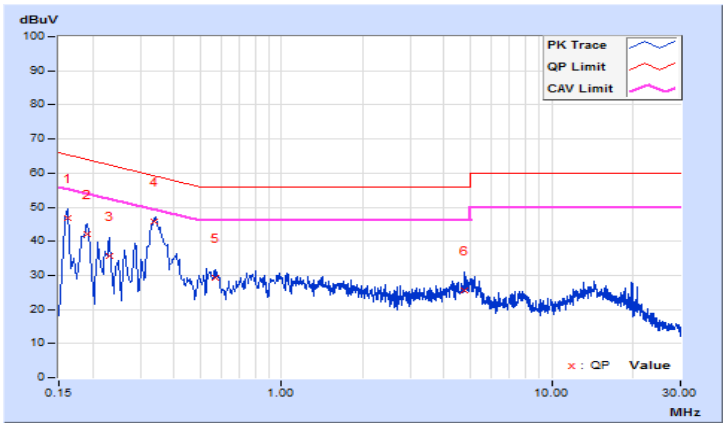


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	A		

No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.16190	9.66	37.11	23.78	46.77	33.44	65.37	55.37	-18.60	-21.93
2	0.19000	9.64	32.43	20.44	42.07	30.08	64.04	54.04	-21.97	-23.96
3	0.23000	9.64	26.11	14.98	35.75	24.62	62.45	52.45	-26.70	-27.83
4	0.33678	9.66	36.06	29.59	45.72	39.25	59.28	49.28	-13.56	-10.03
5	0.56591	9.68	19.74	14.09	29.42	23.77	56.00	46.00	-26.58	-22.23
6	4.77400	9.83	15.86	8.93	25.69	18.76	56.00	46.00	-30.31	-27.24

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.

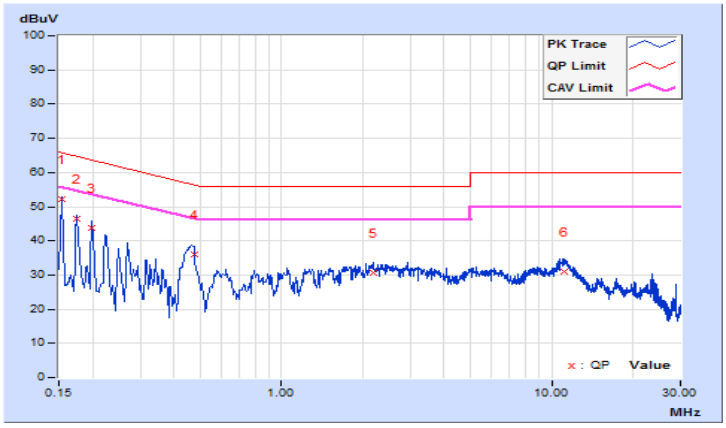


Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	B		

No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15400	9.56	42.60	28.09	52.16	37.65	65.78	55.78	-13.62	-18.13
2	0.17400	9.56	36.85	24.13	46.41	33.69	64.77	54.77	-18.36	-21.08
3	0.19800	9.55	34.07	19.21	43.62	28.76	63.69	53.69	-20.07	-24.93
4	0.47400	9.57	26.34	19.98	35.91	29.55	56.44	46.44	-20.53	-16.89
5	2.17800	9.67	21.05	16.52	30.72	26.19	56.00	46.00	-25.28	-19.81
6	11.15000	9.80	21.10	16.02	30.90	25.82	60.00	50.00	-29.10	-24.18

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.

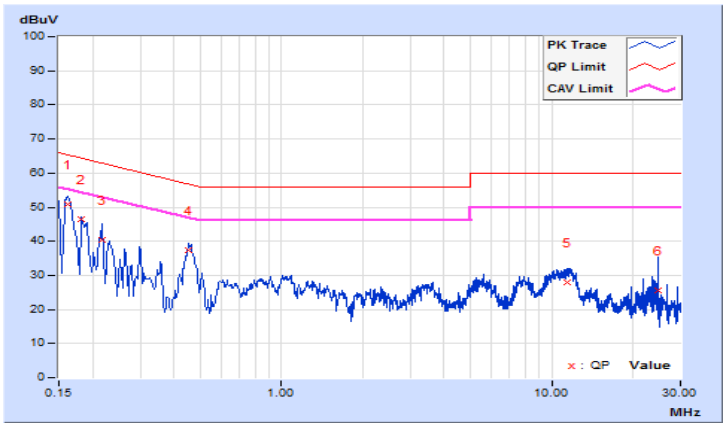


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	B		

No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.16148	9.54	41.35	25.50	50.89	35.04	65.39	55.39	-14.50	-20.35
2	0.18200	9.53	36.82	21.93	46.35	31.46	64.39	54.39	-18.04	-22.93
3	0.21800	9.53	30.92	15.71	40.45	25.24	62.89	52.89	-22.44	-27.65
4	0.45356	9.55	27.87	21.70	37.42	31.25	56.81	46.81	-19.39	-15.56
5	11.47400	9.81	18.08	13.02	27.89	22.83	60.00	50.00	-32.11	-27.17
6	24.67800	9.91	15.76	11.09	25.67	21.00	60.00	50.00	-34.33	-29.00

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)
	-	Mobile and Portable 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)

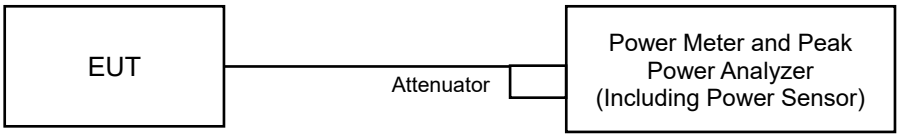
*B is the 26 dB emission bandwidth in megahertz

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 and set the detector to average. Duty factor is not added to measured value.

4.3.5 Deviation from Test Standard

No deviation.

4.3.6 EUT Operating Conditions

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 Result

Power Output:

5G traffic radio: CDD Mode

802.11a

Chan.	Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
36	5180	22.23	21.83	319.514	25.04	30.00	Pass
40	5200	22.81	22.59	372.537	25.71	30.00	Pass
48	5240	22.88	22.73	**381.588**	25.82	30.00	Pass
149	5745	20.75	20.49	230.794	23.63	30.00	Pass
157	5785	20.43	20.12	213.209	23.29	30.00	Pass
165	5825	19.95	19.63	190.689	22.80	30.00	Pass

802.11n (HT20)

Chan.	Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
36	5180	21.68	21.33	283.063	24.52	30.00	Pass
40	5200	22.21	21.89	320.867	25.06	30.00	Pass
48	5240	22.11	22.03	322.143	25.08	30.00	Pass
149	5745	21.15	20.66	246.729	23.92	30.00	Pass
157	5785	20.66	20.35	224.805	23.52	30.00	Pass
165	5825	20.24	19.93	204.083	23.10	30.00	Pass

802.11n (HT40)

Chan.	Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
38	5190	21.61	21.27	278.845	24.45	30.00	Pass
46	5230	22.71	22.47	363.242	25.60	30.00	Pass
151	5755	21.71	21.15	278.568	24.45	30.00	Pass
159	5795	21.68	21.14	277.248	24.43	30.00	Pass

802.11ac (VHT20)

Chan.	Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
36	5180	21.72	21.39	286.315	24.57	30.00	Pass
40	5200	22.30	21.93	325.780	25.13	30.00	Pass
48	5240	22.17	22.07	325.881	25.13	30.00	Pass
149	5745	21.17	20.68	247.868	23.94	30.00	Pass
157	5785	20.68	20.37	225.843	23.54	30.00	Pass
165	5825	20.27	19.95	205.270	23.12	30.00	Pass

802.11ac (VHT40)

Chan.	Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
38	5190	21.67	21.31	282.100	24.50	30.00	Pass
46	5230	22.75	22.51	366.603	25.64	30.00	Pass
151	5755	21.73	21.17	279.854	24.47	30.00	Pass
159	5795	21.71	21.16	278.869	24.45	30.00	Pass

802.11ac (VHT80)

Chan.	Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
42	5210	19.91	19.67	190.632	22.80	30.00	Pass
155	5775	20.61	20.31	222.479	23.47	30.00	Pass

802.11ax (HE20)

Chan.	Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
36	5180	21.79	21.43	290.003	24.62	30.00	Pass
40	5200	22.35	21.99	329.916	25.18	30.00	Pass
48	5240	22.21	22.13	329.646	25.18	30.00	Pass
149	5745	21.20	20.71	249.586	23.97	30.00	Pass
157	5785	20.71	20.39	227.156	23.56	30.00	Pass
165	5825	20.30	19.98	206.692	23.15	30.00	Pass

802.11ax (HE40)

Chan.	Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
38	5190	21.72	21.39	286.315	24.57	30.00	Pass
46	5230	22.82	22.56	371.727	25.70	30.00	Pass
151	5755	21.75	21.19	**281.146**	24.49	30.00	Pass
159	5795	21.73	21.18	280.156	24.47	30.00	Pass

802.11ax (HE80)

Chan.	Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
42	5210	19.99	19.72	193.526	22.87	30.00	Pass
155	5775	20.70	20.42	227.644	23.57	30.00	Pass

5G traffic radio: Beamforming Mode

802.11n (HT20)

Chan.	Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
36	5180	18.67	18.32	141.541	21.51	27.49	Pass
40	5200	19.20	18.88	160.444	22.05	27.49	Pass
48	5240	19.10	19.02	161.083	22.07	27.49	Pass
149	5745	18.14	17.65	123.373	20.91	27.49	Pass
157	5785	17.65	17.34	112.410	20.51	27.49	Pass
165	5825	17.23	16.92	102.048	20.09	27.49	Pass

Note: Beamforming Directional gain = 5.50dBi + 10log(2) = 8.51dBi > 6dBi, so the limit shall be reduced to 30-(8.51-6) = 27.49dBm.

802.11n (HT40)

Chan.	Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
38	5190	18.60	18.26	139.432	21.44	27.49	Pass
46	5230	19.70	19.46	181.633	22.59	27.49	Pass
151	5755	18.70	18.14	139.294	21.44	27.49	Pass
159	5795	18.67	18.13	138.634	21.42	27.49	Pass

Note: Beamforming Directional gain = 5.50dBi + 10log(2) = 8.51dBi > 6dBi, so the limit shall be reduced to 30-(8.51-6) = 27.49dBm.

802.11ac (VHT20)

Chan.	Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
36	5180	18.71	18.38	143.167	21.56	27.49	Pass
40	5200	19.29	18.92	162.901	22.12	27.49	Pass
48	5240	19.16	19.06	162.952	22.12	27.49	Pass
149	5745	18.16	17.67	123.943	20.93	27.49	Pass
157	5785	17.67	17.36	112.929	20.53	27.49	Pass
165	5825	17.26	16.94	102.642	20.11	27.49	Pass

Note: Beamforming Directional gain = 5.50dBi + 10log(2) = 8.51dBi > 6dBi, so the limit shall be reduced to 30-(8.51-6) = 27.49dBm.

802.11ac (VHT40)

Chan.	Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
38	5190	18.66	18.30	141.060	21.49	27.49	Pass
46	5230	19.74	19.50	183.314	22.63	27.49	Pass
151	5755	18.72	18.16	139.937	21.46	27.49	Pass
159	5795	18.70	18.15	139.444	21.44	27.49	Pass

Note: Beamforming Directional gain = 5.50dBi + 10log(2) = 8.51dBi > 6dBi, so the limit shall be reduced to 30-(8.51-6) = 27.49dBm.

802.11ac (VHT80)

Chan.	Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
42	5210	16.90	16.66	95.323	19.79	27.49	Pass
155	5775	17.60	17.30	111.247	20.46	27.49	Pass

Note: Beamforming Directional gain = 5.50dBi + 10log(2) = 8.51dBi > 6dBi, so the limit shall be reduced to 30-(8.51-6) = 27.49dBm.

802.11ax (HE20)

Chan.	Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
36	5180	18.78	18.42	145.012	21.61	27.49	Pass
40	5200	19.34	18.98	164.969	22.17	27.49	Pass
48	5240	19.20	19.12	164.835	22.17	27.49	Pass
149	5745	18.19	17.70	124.802	20.96	27.49	Pass
157	5785	17.70	17.38	113.586	20.55	27.49	Pass
165	5825	17.29	16.97	103.353	20.14	27.49	Pass

Note: Beamforming Directional gain = 5.50dBi + 10log(2) = 8.51dBi > 6dBi, so the limit shall be reduced to 30-(8.51-6) = 27.49dBm.

802.11ax (HE40)

Chan.	Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
38	5190	18.71	18.38	143.167	21.56	27.49	Pass
46	5230	19.81	19.55	**185.877**	22.69	27.49	Pass
151	5755	18.74	18.18	**140.583**	21.48	27.49	Pass
159	5795	18.72	18.17	140.088	21.46	27.49	Pass

Note: Beamforming Directional gain = 5.50dBi + 10log(2) = 8.51dBi > 6dBi, so the limit shall be reduced to 30-(8.51-6) = 27.49dBm.

802.11ax (HE80)

Chan.	Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
42	5210	16.98	16.71	96.770	19.86	27.49	Pass
155	5775	17.69	17.41	113.83	20.56	27.49	Pass

Note: Beamforming Directional gain = 5.50dBi + 10log(2) = 8.51dBi > 6dBi, so the limit shall be reduced to 30-(8.51-6) = 27.49dBm.

Scanning radio:

802.11a

Chan.	Freq. (MHz)	Maximum Conducted Power (mW)	Maximum Conducted Power (dBm)	Power Limit (dBm)	Pass / Fail
36	5180	93.111	19.69	30.00	Pass
40	5200	139.316	21.44	30.00	Pass
48	5240	**146.218**	21.65	30.00	Pass
149	5745	143.219	21.56	30.00	Pass
157	5785	**144.212**	21.59	30.00	Pass
165	5825	143.880	21.58	30.00	Pass

802.11n (HT20)

Chan.	Freq. (MHz)	Maximum Conducted Power (mW)	Maximum Conducted Power (dBm)	Power Limit (dBm)	Pass / Fail
36	5180	80.538	19.06	30.00	Pass
40	5200	136.458	21.35	30.00	Pass
48	5240	138.676	21.42	30.00	Pass
149	5745	141.906	21.52	30.00	Pass
157	5785	141.254	21.50	30.00	Pass
165	5825	143.880	21.58	30.00	Pass

802.11n (HT40)

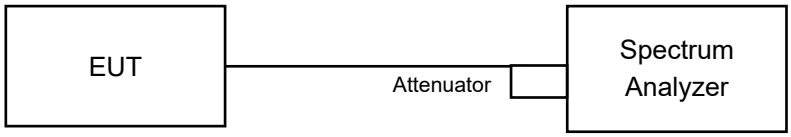
Chan.	Freq. (MHz)	Maximum Conducted Power (mW)	Maximum Conducted Power (dBm)	Power Limit (dBm)	Pass / Fail
38	5190	71.450	18.54	30.00	Pass
46	5230	129.420	21.12	30.00	Pass
151	5755	132.739	21.23	30.00	Pass
159	5795	135.519	21.32	30.00	Pass

802.11ac (VHT80)

Chan.	Freq. (MHz)	Maximum Conducted Power (mW)	Maximum Conducted Power (dBm)	Power Limit (dBm)	Pass / Fail
42	5210	26.607	14.25	30.00	Pass
155	5775	60.954	17.85	30.00	Pass

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 sampling. 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 Result

5G traffic radio:

802.11a

Channel	Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
36	5180	16.44	16.56
40	5200	16.44	16.44
48	5240	16.44	16.44
149	5745	16.43	16.43
157	5785	16.44	16.56
165	5825	16.44	16.44

802.11ax (HE20)

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

802.11ax (HE40)

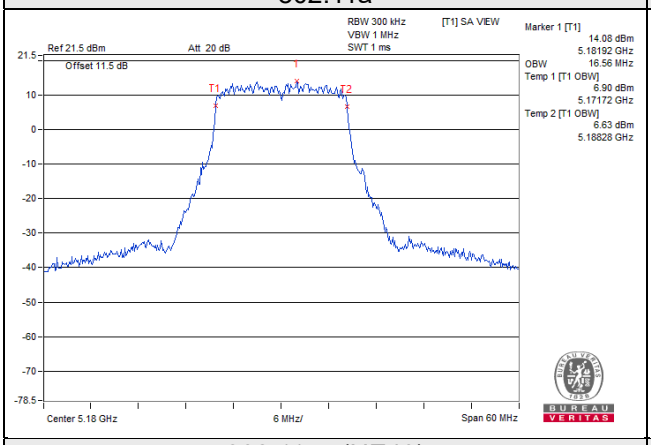
Channel	Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
38	5190	38.04	37.92
46	5230	38.04	37.92
151	5755	38.04	37.92
159	5795	37.92	38.04

802.11ax (HE80)

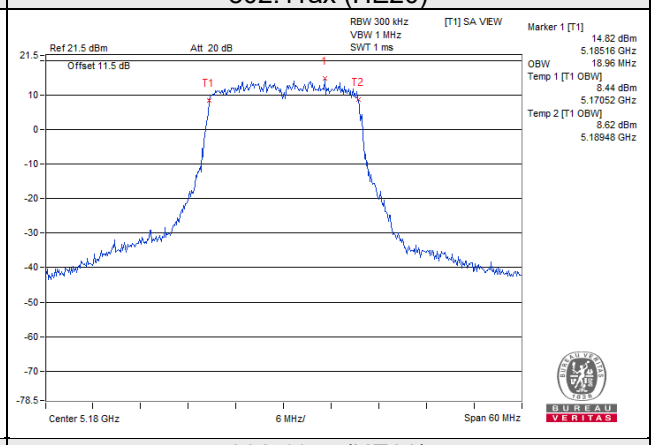
Channel	Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
42	5210	77.28	77.76
155	5775	77.28	77.52

Spectrum Plot of Worst Value

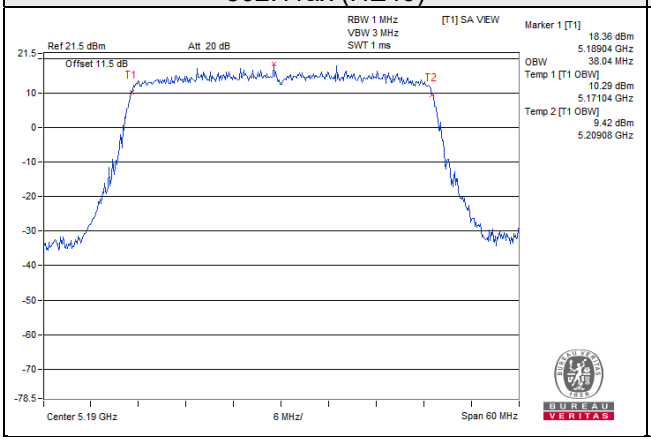
802.11a



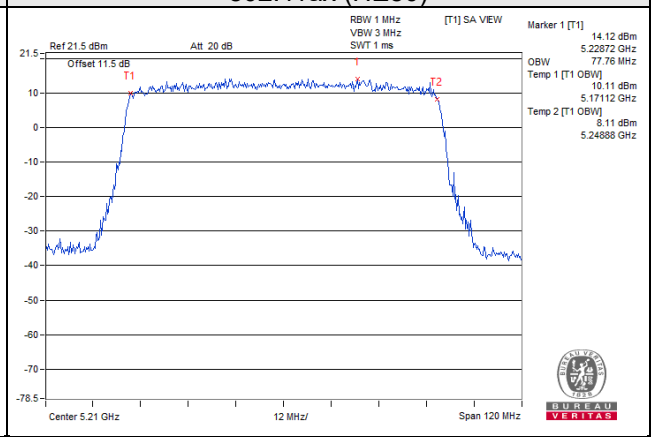
802.11ax (HE20)

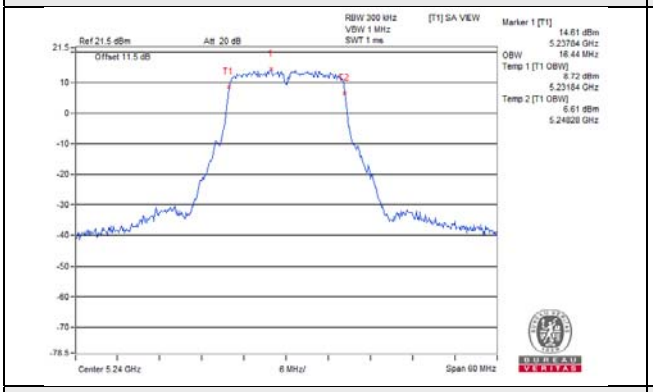
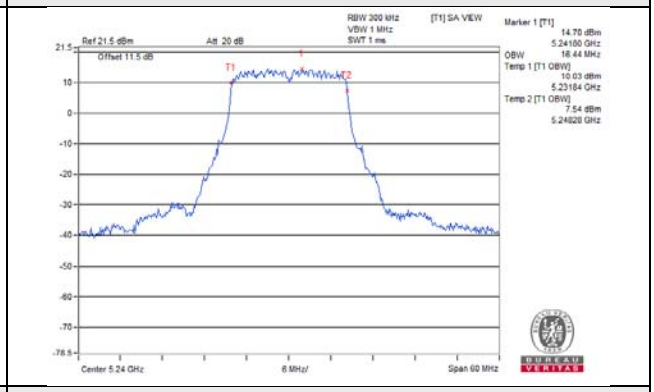
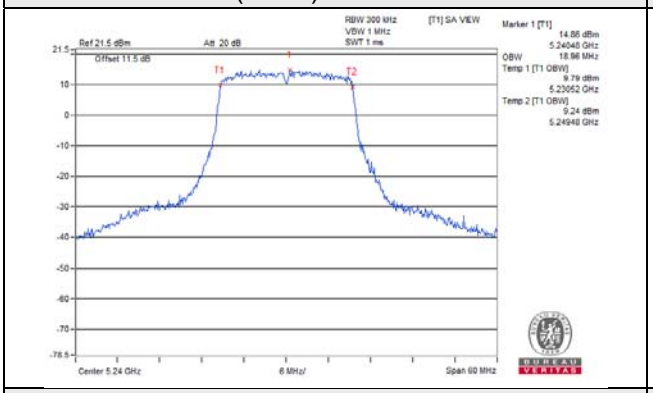
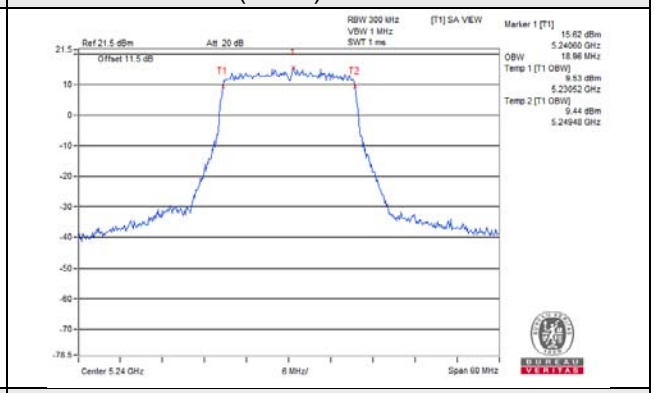
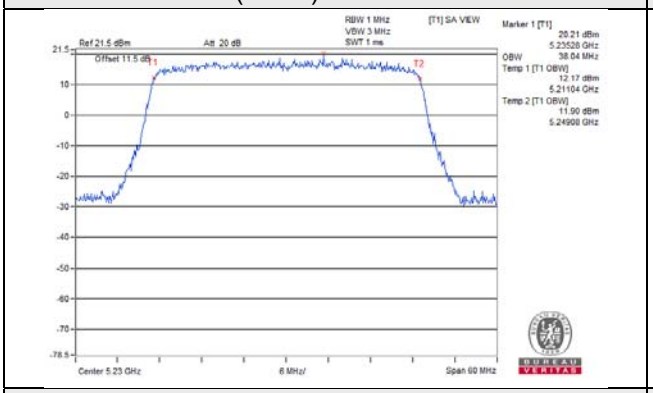
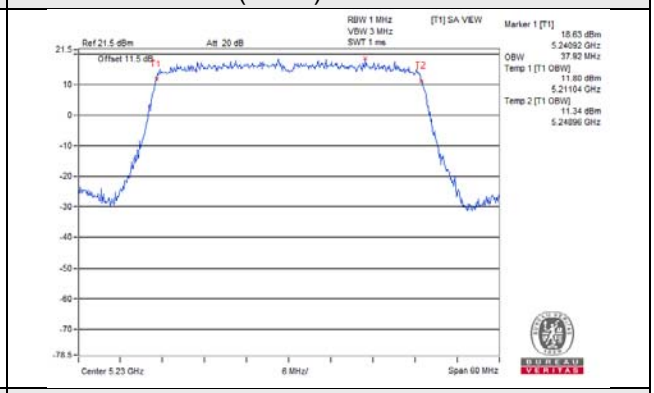
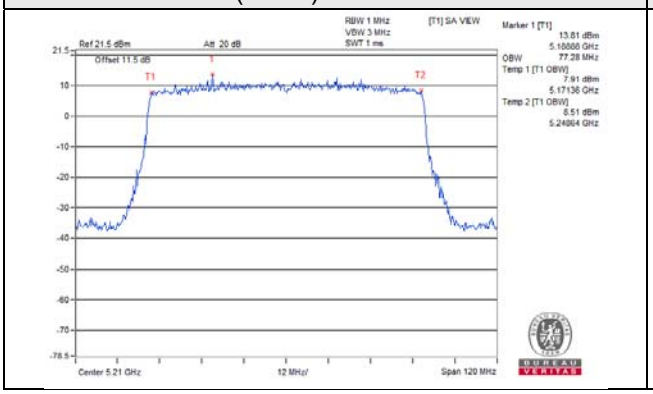
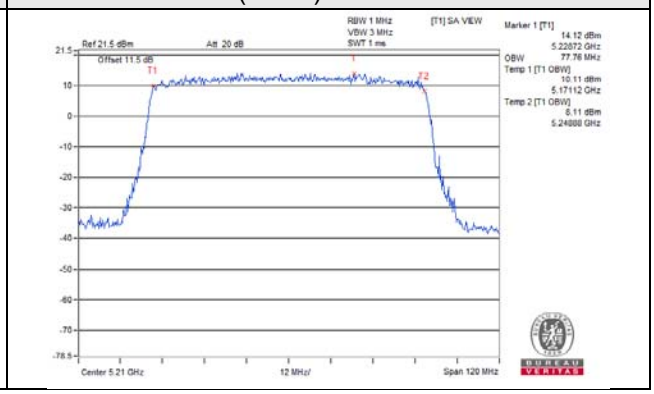


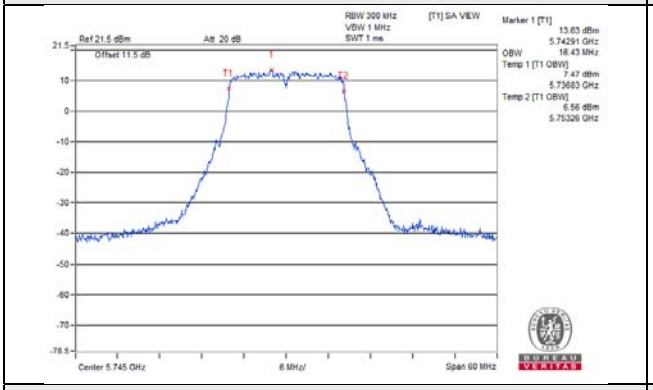
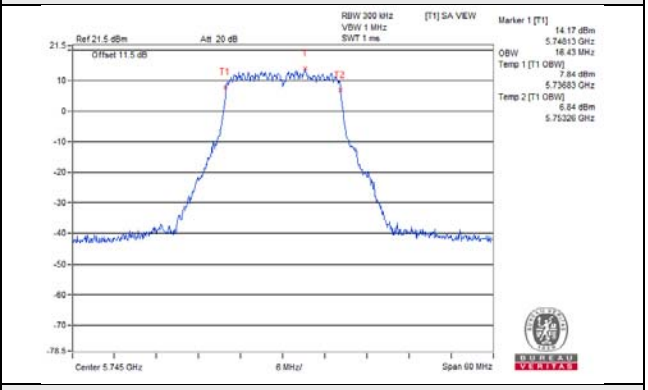
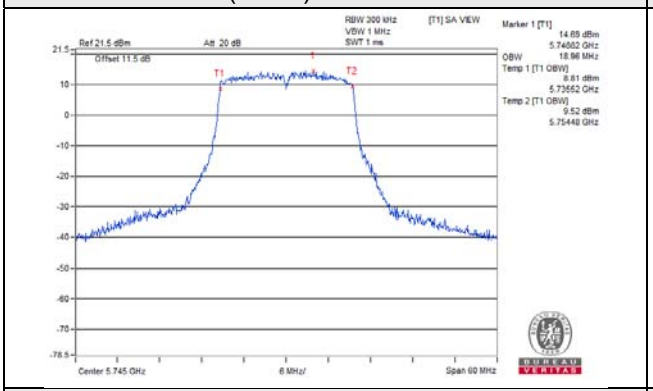
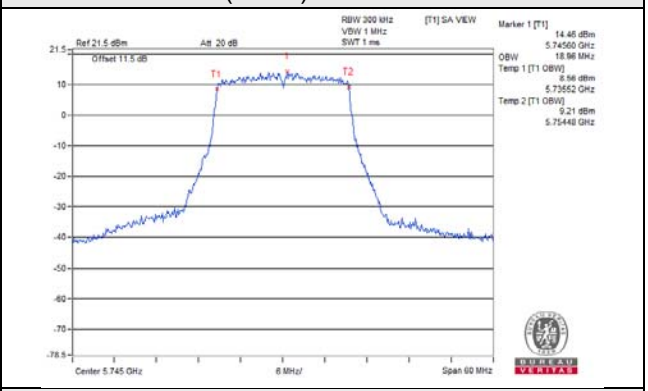
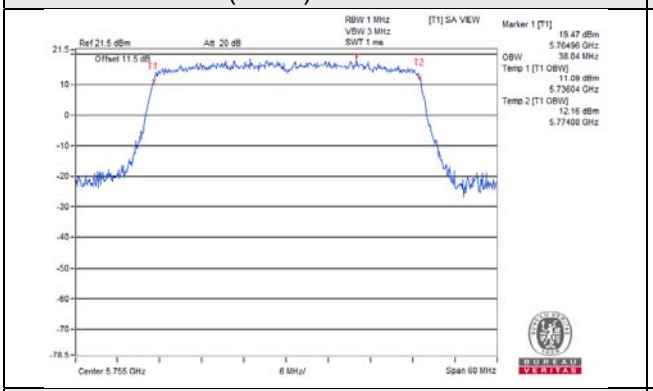
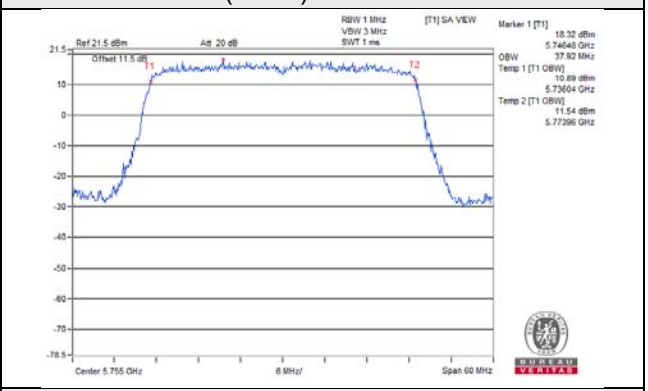
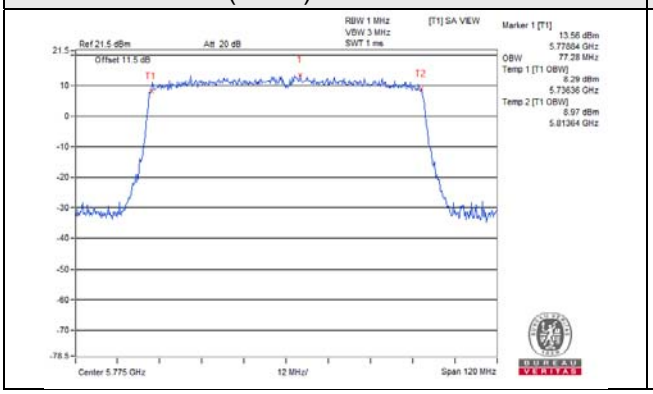
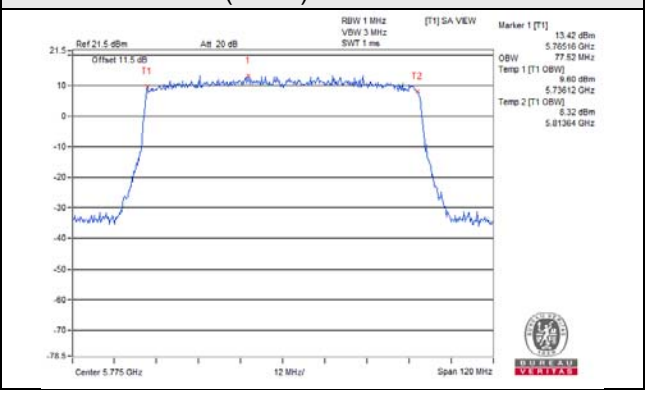
802.11ax (HE40)



802.11ax (HE80)



Spectrum Plot for near By DFS Band	
802.11a / Chain 0 / CH 48	802.11a / Chain 1 / CH 48
	
802.11ax (HE20) / Chain 0 / CH 48	802.11ax (HE20) / Chain 1 / CH 48
	
802.11ax (HE40) / Chain 0 / CH 46	802.11ax (HE40) / Chain 1 / CH 46
	
802.11ax (HE80) / Chain 0 / CH 42	802.11ax (HE80) / Chain 1 / CH 42
	

Spectrum Plot for near By DFS Band	
802.11a / Chain 0 / CH 149	802.11a / Chain 1 / CH 149
	
802.11ax (HE20) / Chain 0 / CH 149	802.11ax (HE20) / Chain 1 / CH 149
	
802.11ax (HE40) / Chain 0 / CH 151	802.11ax (HE40) / Chain 1 / CH 151
	
802.11ax (HE80) / Chain 0 / CH 155	802.11ax (HE80) / Chain 1 / CH 155
	

Scanning radio:

802.11a

Channel	Frequency (MHz)	Occupied Bandwidth (MHz)
36	5180	17.16
40	5200	18.48
48	5240	18.60
149	5745	31.68
157	5785	30.72
165	5825	30.12

802.11n (HT20)

Channel	Frequency (MHz)	Occupied Bandwidth (MHz)
36	5180	18.36
40	5200	18.96
48	5240	19.32
149	5745	32.70
157	5785	31.32
165	5825	31.56

802.11n (HT40)

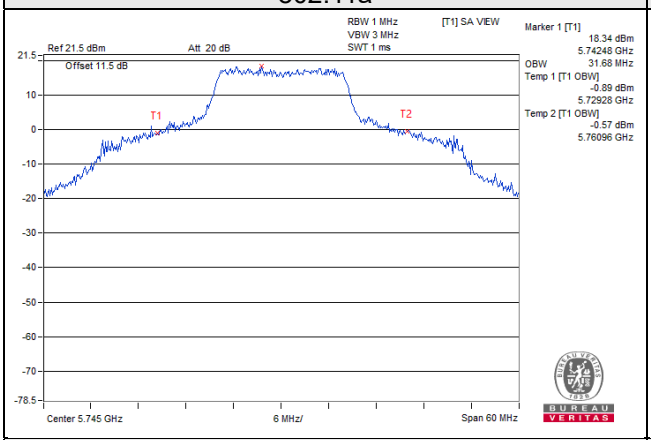
Channel	Frequency (MHz)	Occupied Bandwidth (MHz)
38	5190	37.20
46	5230	37.68
151	5755	44.64
159	5795	44.52

802.11ac (VHT80)

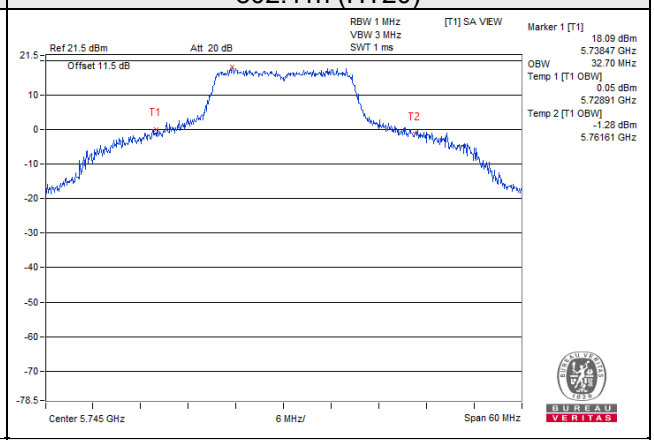
Channel	Frequency (MHz)	Occupied Bandwidth (MHz)
42	5210	76.32
155	5775	77.04

Spectrum Plot of Worst Value

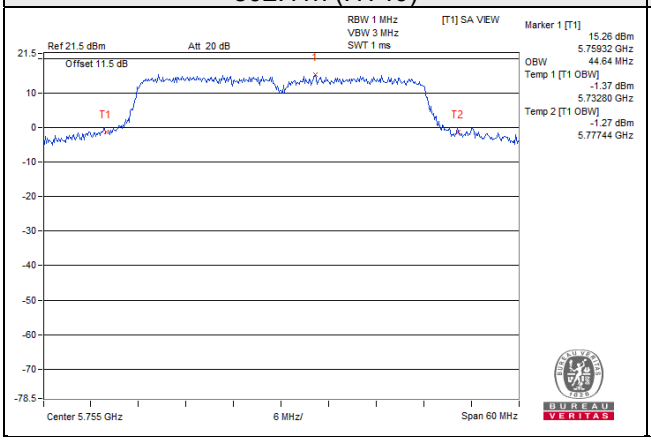
802.11a



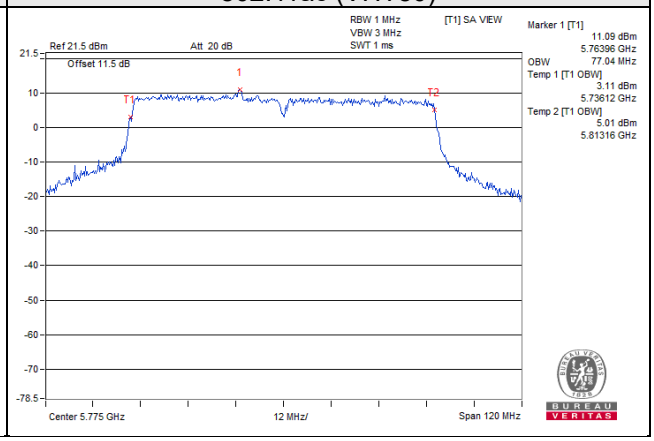
802.11n (HT20)



802.11n (HT40)

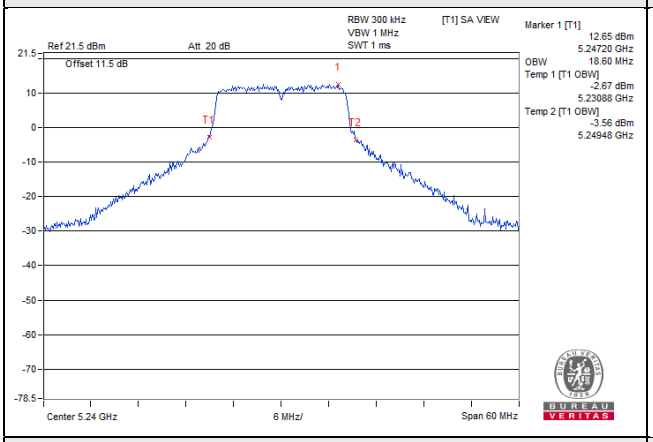


802.11ac (VHT80)

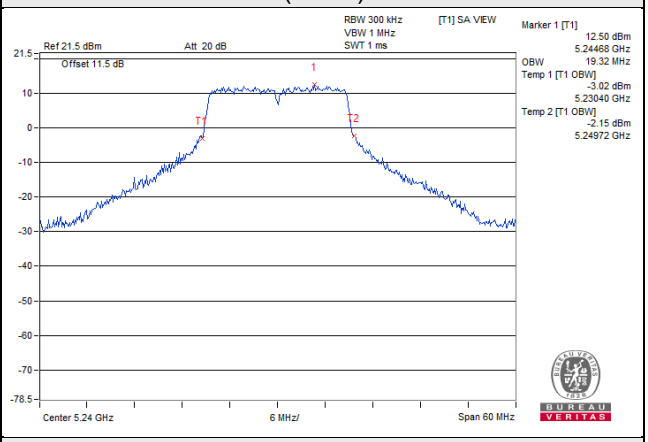


Spectrum Plot for near By DFS Band

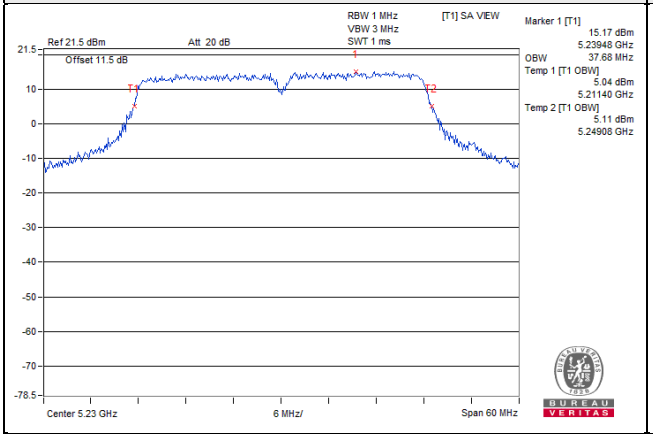
802.11a / CH 48



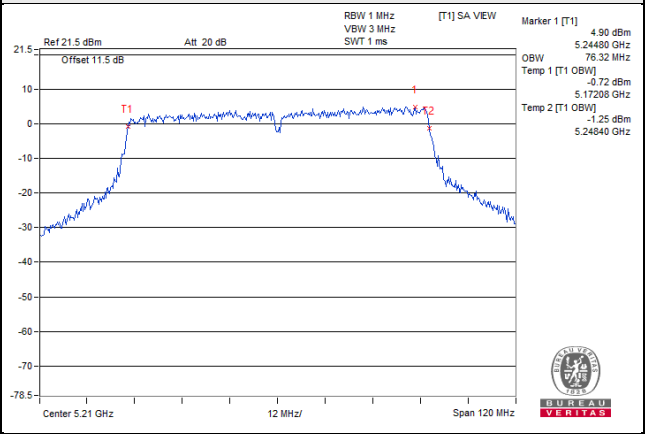
802.11n (HT20) / CH 48



802.11n (HT40) / CH 46

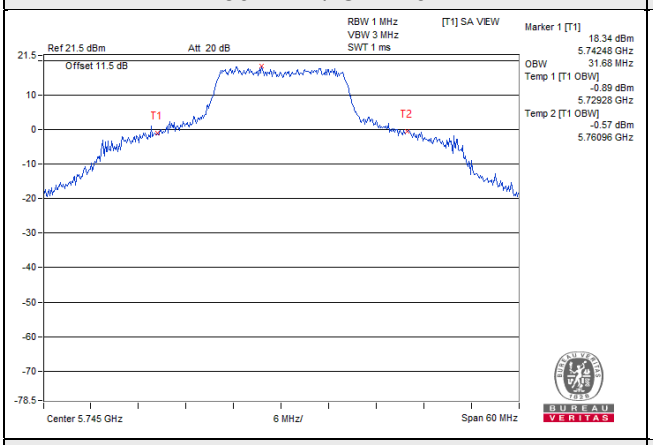


802.11ac (VHT80) / CH 42

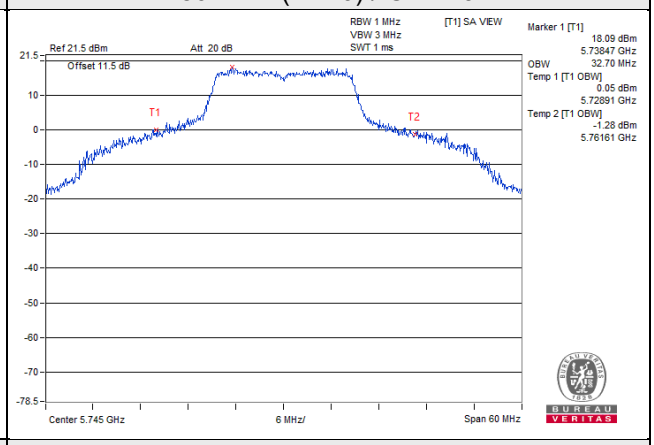


Spectrum Plot for near By DFS Band

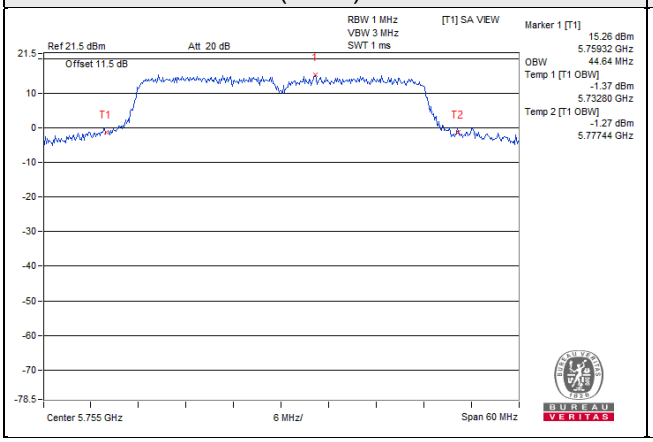
802.11a / CH 149



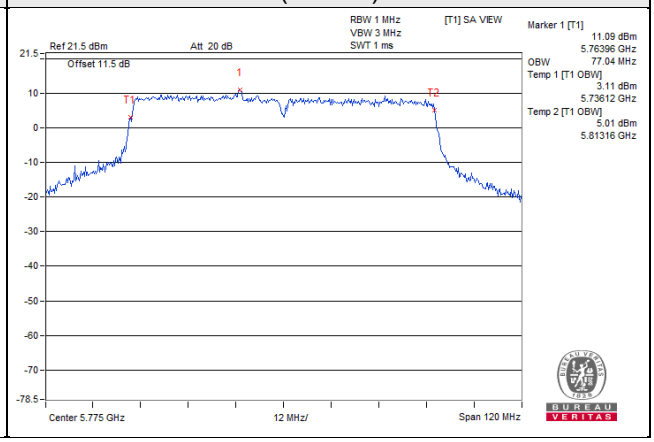
802.11n (HT20) / CH 149



802.11n (HT40) / CH 151



802.11ac (VHT80) / CH 155

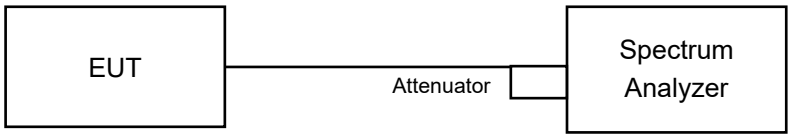


4.5 Peak Power Spectral Density Measurement

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	
		Mobile and Portable 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 Procedures

For U-NII-1 band:
Duty cycle of test signal is < 98%
Using method SA-2
1) Set span to encompass the entire emission bandwidth (EBW) of the signal.
2) Set RBW = 1MHz, Set VBW ≥ 3 MHz, Detector = RMS.
3) Set Channel power measure = 1MHz.
4) Sweep time = auto, trigger set to “free run”.
5) Trace average at least 100 traces in power averaging mode.
6) Record the max value and add 10 log (1/duty cycle).

For U-NII-3 band:
Duty cycle of test signal is < 98%
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 / 300 kHz).
5) Sweep time = auto, trigger set to “free run”.
6) Trace average at least 100 traces in power averaging mode.
7) Record the max value and add 10 log (1/duty cycle).

4.5.5 Deviation from Test Standard

No deviation.

4.5.6 EUT Operating Conditions

Same as 4.3.6.

4.5.7 Test Results

5G traffic radio:

For U-NII-1 band:

802.11a

Chan.	Freq. (MHz)	PSD W/O Duty Factor (dBm/MHz)		Duty Factor (dB)	Total PSD With Duty Factor (dBm/MHz)	Max. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1				
36	5180	8.97	8.87	0.30	12.23	14.49	Pass
40	5200	9.45	9.63	0.30	12.85	14.49	Pass
48	5240	9.71	9.94	0.30	13.14	14.49	Pass

Note:
1. Method E) 2) 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. Directional Gain = 5.50dBi + 10log(2) = 8.51dBi > 6dBi, so the limit shall be reduced to 17-(8.51-6) = 14.49dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ax (HE20)

Chan.	Freq. (MHz)	PSD W/O Duty Factor (dBm/MHz)		Duty Factor (dB)	Total PSD With Duty Factor (dBm/MHz)	Max. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1				
36	5180	7.79	7.90	0.20	11.06	14.49	Pass
40	5200	8.61	8.18	0.20	11.61	14.49	Pass
48	5240	8.46	8.72	0.20	11.80	14.49	Pass

Note:
1. Method E) 2) 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. Directional Gain = 5.50dBi + 10log(2) = 8.51dBi > 6dBi, so the limit shall be reduced to 17-(8.51-6) = 14.49dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ax (HE40)

Chan.	Freq. (MHz)	PSD W/O Duty Factor (dBm/MHz)		Duty Factor (dB)	Total PSD With Duty Factor (dBm/MHz)	Max. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1				
38	5190	4.30	4.46	0.26	7.65	14.49	Pass
46	5230	5.70	5.96	0.26	9.10	14.49	Pass

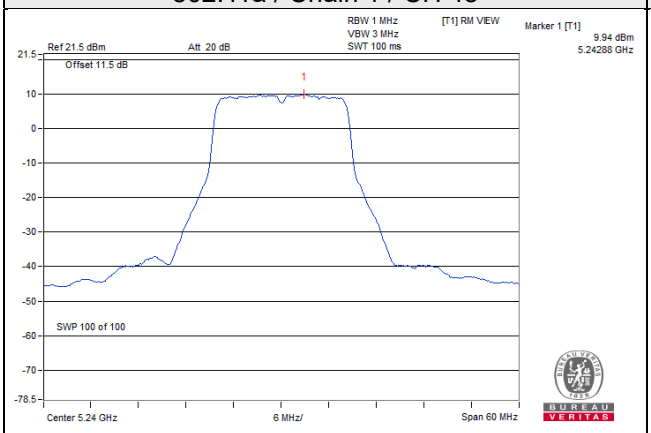
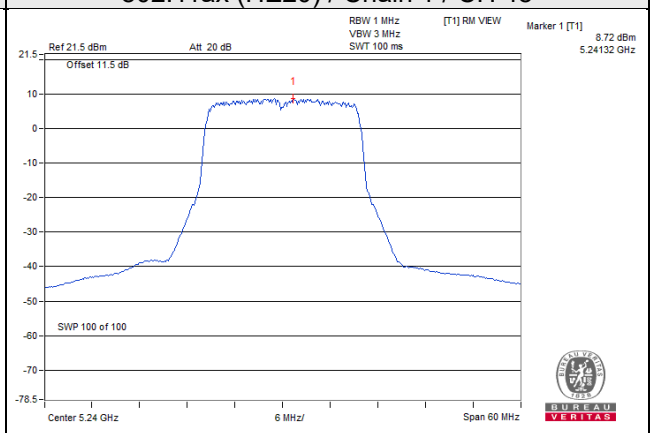
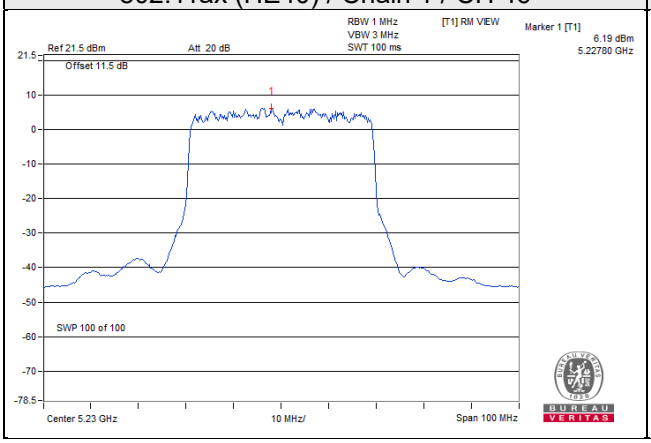
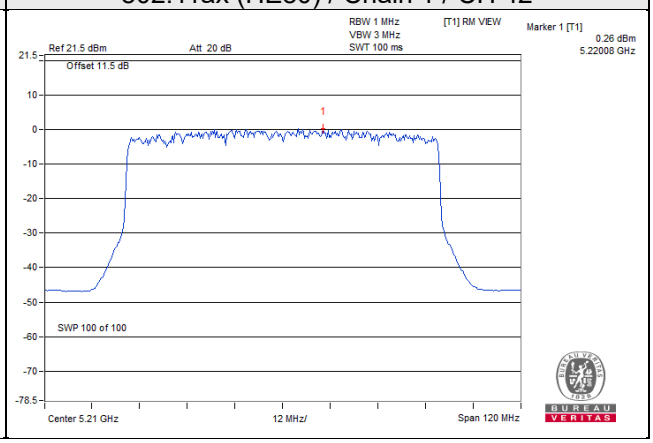
Note:
1. Method E) 2) a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional Gain = 5.50dBi + 10log(2) = 8.51dBi > 6dBi, so the limit shall be reduced to 17-(8.51-6) = 14.49dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ax (HE80)

Chan.	Freq. (MHz)	PSD W/O Duty Factor (dBm/MHz)		Duty Factor (dB)	Total PSD With Duty Factor (dBm/MHz)	Max. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1				
42	5210	0.10	0.17	0.21	3.36	14.49	Pass

Note:

1. Method E) 2) 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. Directional Gain = 5.50dBi + 10log(2) = 8.51dBi > 6dBi, so the limit shall be reduced to 17-(8.51-6) = 14.49dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

Spectrum Plot of Worst Value	
802.11a / Chain 1 / CH 48	802.11ax (HE20) / Chain 1 / CH 48
	
802.11ax (HE40) / Chain 1 / CH 46	802.11ax (HE80) / Chain 1 / CH 42
	

For U-NII-3 band:

802.11a

TX chain	Chan.	Freq. (MHz)	PSD W/O Duty Factor		10 log (N=2) dB	Duty Factor (dB)	Total PSD With Duty Factor (dBm/500kHz)	Limit (dBm/ 500kHz)	Pass / Fail
			(dBm/300kHz)	(dBm/500kHz)					
0	149	5745	0.25	2.47	3.01	0.30	5.78	27.49	Pass
	157	5785	0.00	2.22	3.01	0.30	5.53	27.49	Pass
	165	5825	-0.37	1.85	3.01	0.30	5.16	27.49	Pass
1	149	5745	-0.02	2.20	3.01	0.30	5.51	27.49	Pass
	157	5785	-0.58	1.64	3.01	0.30	4.95	27.49	Pass
	165	5825	-0.81	1.41	3.01	0.30	4.72	27.49	Pass

Note:
1. Method E) 2) c) of power density measurement of KDB 662911 is using for calculating total power density.
2. Directional Gain = 5.50dBi + 10log(2) = 8.51dBi > 6dBi, so the limit shall be reduced to 30-(8.51-6) = 27.49dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ax (HE20)

TX chain	Chan.	Freq. (MHz)	PSD W/O Duty Factor		10 log (N=2) dB	Duty Factor (dB)	Total PSD With Duty Factor (dBm/500kHz)	Limit (dBm/ 500kHz)	Pass / Fail
			(dBm/300kHz)	(dBm/500kHz)					
0	149	5745	-1.09	1.13	3.01	0.20	4.34	27.49	Pass
	157	5785	-1.31	0.91	3.01	0.20	4.12	27.49	Pass
	165	5825	-2.15	0.07	3.01	0.20	3.28	27.49	Pass
1	149	5745	-1.47	0.75	3.01	0.20	3.96	27.49	Pass
	157	5785	-1.92	0.30	3.01	0.20	3.51	27.49	Pass
	165	5825	-2.39	-0.17	3.01	0.20	3.04	27.49	Pass

Note:
1. Method E) 2) c) of power density measurement of KDB 662911 is using for calculating total power density.
2. Directional Gain = 5.50dBi + 10log(2) = 8.51dBi > 6dBi, so the limit shall be reduced to 30-(8.51-6) = 27.49dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ax (HE40)

TX chain	Chan.	Freq. (MHz)	PSD W/O Duty Factor		10 log (N=2) dB	Duty Factor (dB)	Total PSD With Duty Factor (dBm/500kHz)	Limit (dBm/ 500kHz)	Pass / Fail
			(dBm/300kHz)	(dBm/500kHz)					
0	151	5755	-3.20	-0.98	3.01	0.26	2.29	27.49	Pass
	159	5795	-3.48	-1.26	3.01	0.26	2.01	27.49	Pass
1	151	5755	-3.62	-1.40	3.01	0.26	1.87	27.49	Pass
	159	5795	-3.34	-1.12	3.01	0.26	2.15	27.49	Pass

Note:
1. Method E) 2) c) of power density measurement of KDB 662911 is using for calculating total power density.
2. Directional Gain = 5.50dBi + 10log(2) = 8.51dBi > 6dBi, so the limit shall be reduced to 30-(8.51-6) = 27.49dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

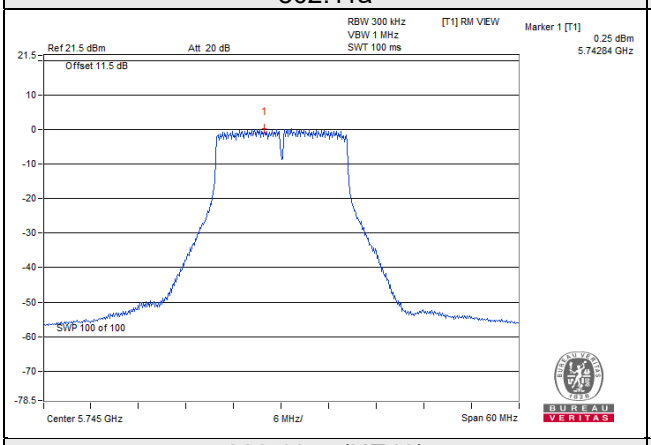
802.11ax (HE80)

TX chain	Chan.	Freq. (MHz)	PSD W/O Duty Factor		10 log (N=2) dB	Duty Factor (dB)	Total PSD With Duty Factor (dBm/500kHz)	Limit (dBm/ 500kHz)	Pass / Fail
			(dBm/300kHz)	(dBm/500kHz)					
0	155	5775	-8.13	-5.91	3.01	0.21	-2.69	27.49	Pass
1	155	5775	-8.11	-5.89	3.01	0.21	-2.67	27.49	Pass

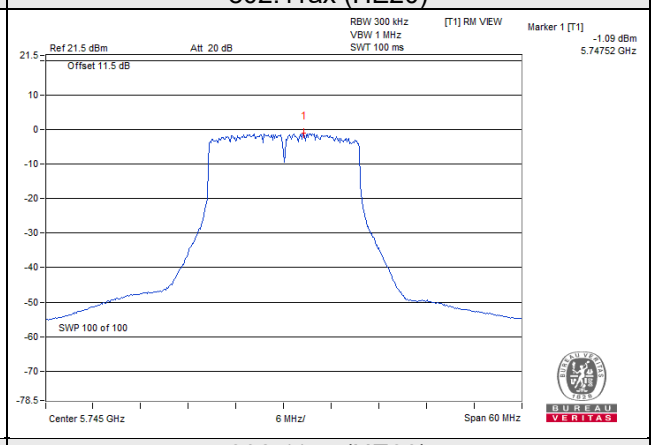
Note:
1. Method E) 2) c) of power density measurement of KDB 662911 is using for calculating total power density.
2. Directional Gain = 5.50dBi + 10log(2) = 8.51dBi > 6dBi, so the limit shall be reduced to 30-(8.51-6) = 27.49dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

Spectrum Plot of Worst Value

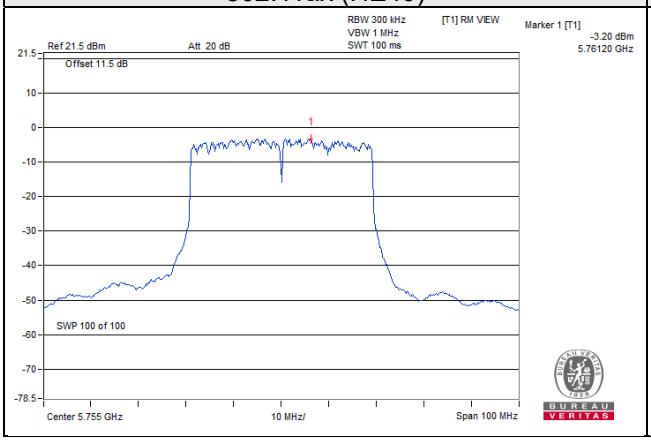
802.11a



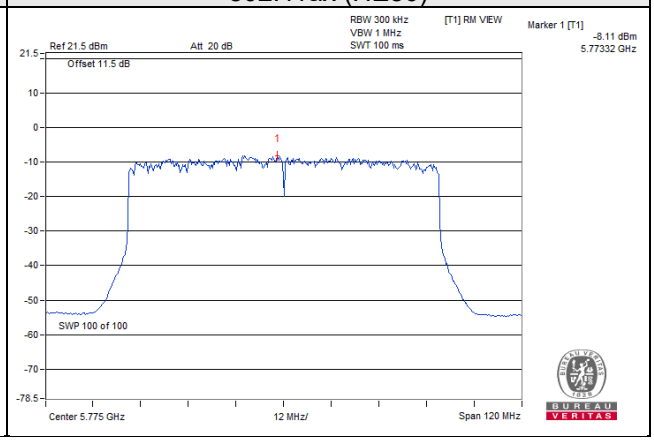
802.11ax (HE20)



802.11ax (HE40)



802.11ax (HE80)



Scanning radio: CDD Mode

For U-NII-1 band:

802.11a

Chan.	Freq. (MHz)	PSD w/o duty factor (dBm)	Duty factor (dB)	PSD with duty factor (dBm)	Max. Limit (dBm)	Pass / Fail
36	5180	6.50	0.21	6.71	17.00	Pass
40	5200	8.18	0.21	8.39	17.00	Pass
48	5240	8.30	0.21	8.51	17.00	Pass

802.11n (HT20)

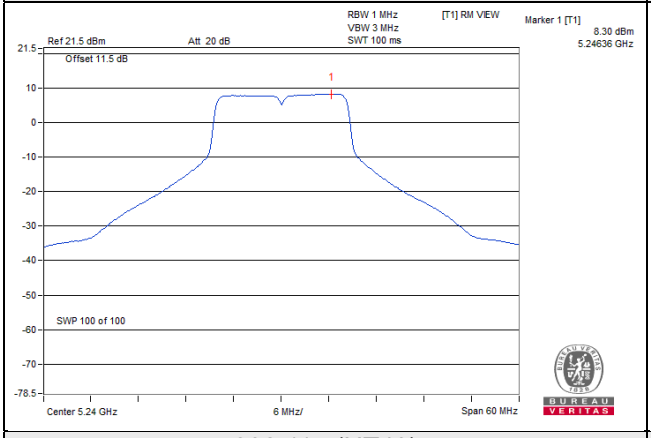
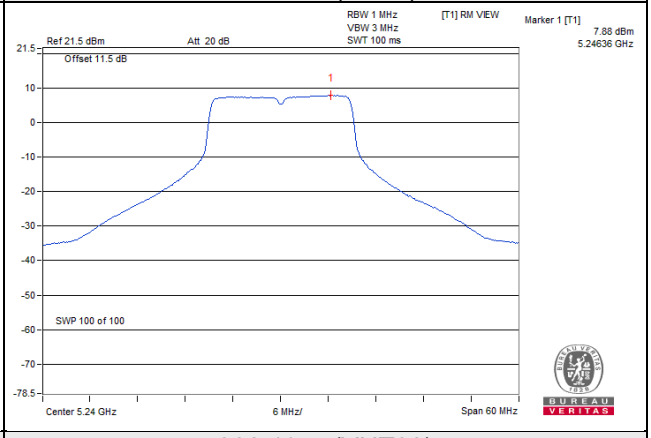
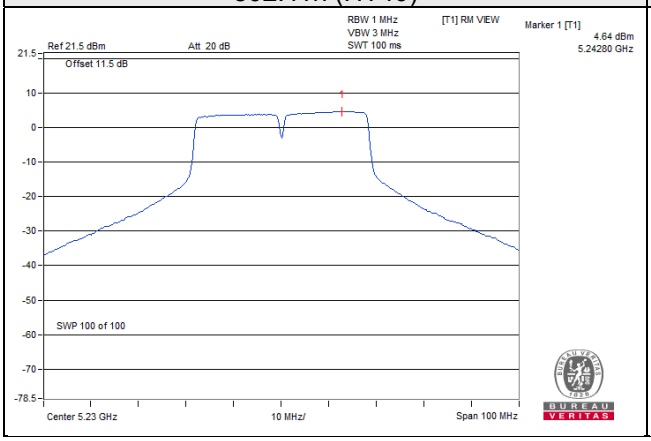
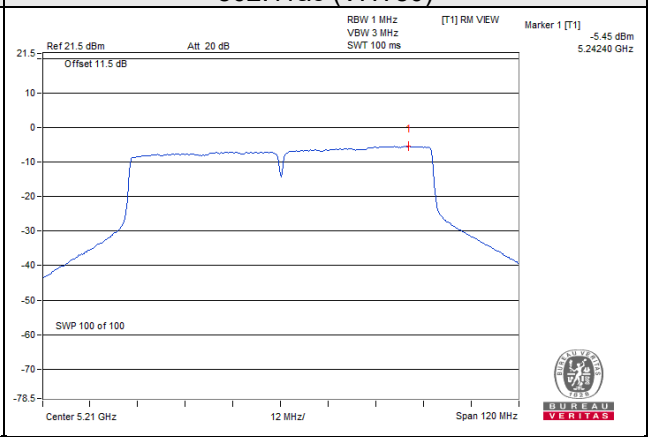
Chan.	Freq. (MHz)	PSD w/o duty factor (dBm)	Duty factor (dB)	PSD with duty factor (dBm)	Max. Limit (dBm)	Pass / Fail
36	5180	5.70	0.17	5.87	17.00	Pass
40	5200	7.76	0.17	7.93	17.00	Pass
48	5240	7.88	0.17	8.05	17.00	Pass

802.11n (HT40)

Chan.	Freq. (MHz)	PSD w/o duty factor (dBm)	Duty factor (dB)	PSD with duty factor (dBm)	Max. Limit (dBm)	Pass / Fail
38	5190	2.02	0.33	2.35	17.00	Pass
46	5230	4.64	0.33	4.97	17.00	Pass

802.11ac (VHT80)

Chan.	Freq. (MHz)	PSD w/o duty factor (dBm)	Duty factor (dB)	PSD with duty factor (dBm)	Max. Limit (dBm)	Pass / Fail
42	5210	-5.45	0.75	-4.70	17.00	Pass

Spectrum Plot of Worst Value	
802.11a	802.11n (HT20)
	
802.11n (HT40)	802.11ac (VHT80)
	

For U-NII-3 band:

802.11a

Chan.	Freq. (MHz)	PSD (dBm/300k Hz)	PSD (dBm/500k Hz)	Duty factor (dB)	Total PSD (dBm/500k Hz)	Limit (dBm/500k Hz)	Pass / Fail
149	5745	-0.37	1.85	0.21	2.06	30.00	Pass
157	5785	-0.35	1.87	0.21	2.08	30.00	Pass
165	5825	-0.18	2.04	0.21	2.25	30.00	Pass

802.11n (HT20)

Chan.	Freq. (MHz)	PSD (dBm/300k Hz)	PSD (dBm/500k Hz)	Duty factor (dB)	Total PSD (dBm/500k Hz)	Limit (dBm/500k Hz)	Pass / Fail
149	5745	-0.62	1.60	0.17	1.77	30.00	Pass
157	5785	-0.69	1.53	0.17	1.70	30.00	Pass
165	5825	-0.52	1.70	0.17	1.87	30.00	Pass

802.11n (HT40)

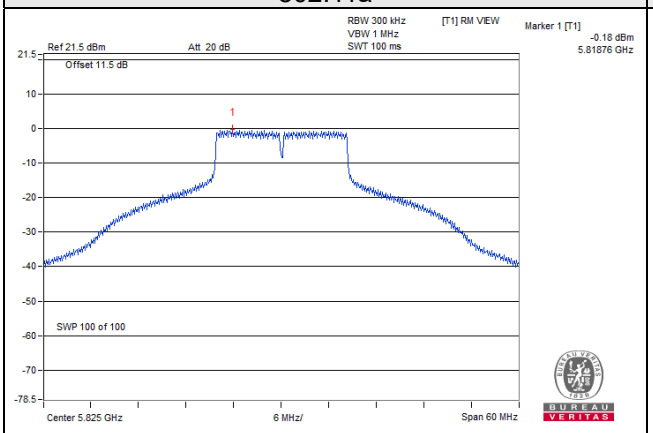
Chan.	Freq. (MHz)	PSD (dBm/300k Hz)	PSD (dBm/500k Hz)	Duty factor (dB)	Total PSD (dBm/500k Hz)	Limit (dBm/500k Hz)	Pass / Fail
151	5755	-4.22	-2.00	0.33	-1.67	30.00	Pass
159	5795	-4.16	-1.94	0.33	-1.61	30.00	Pass

802.11ac (VHT80)

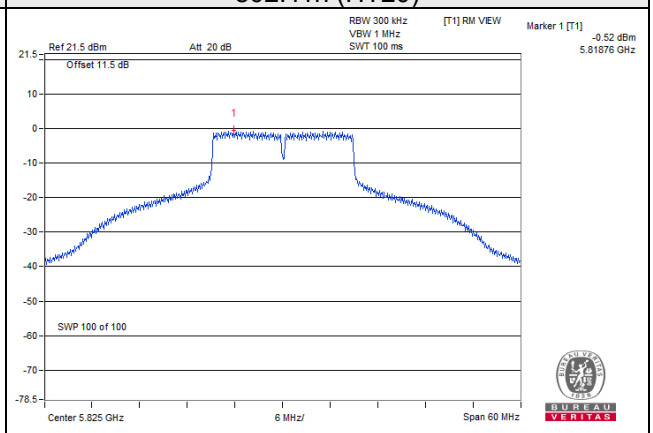
Chan.	Freq. (MHz)	PSD (dBm/300k Hz)	PSD (dBm/500k Hz)	Duty factor (dB)	Total PSD (dBm/500k Hz)	Limit (dBm/500k Hz)	Pass / Fail
155	5775	-9.78	-7.56	0.75	-6.81	30.00	Pass

Spectrum Plot of Worst Value

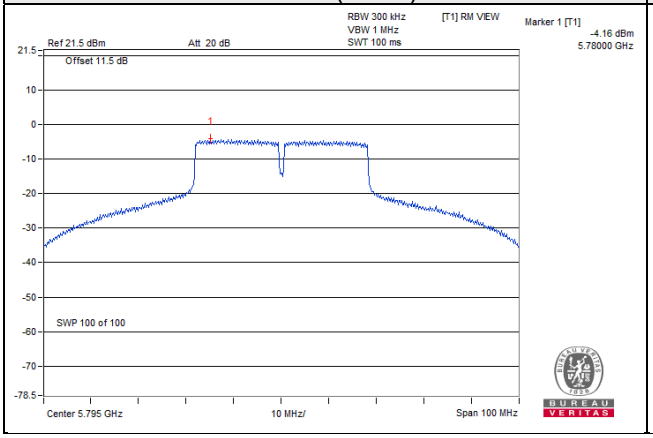
802.11a



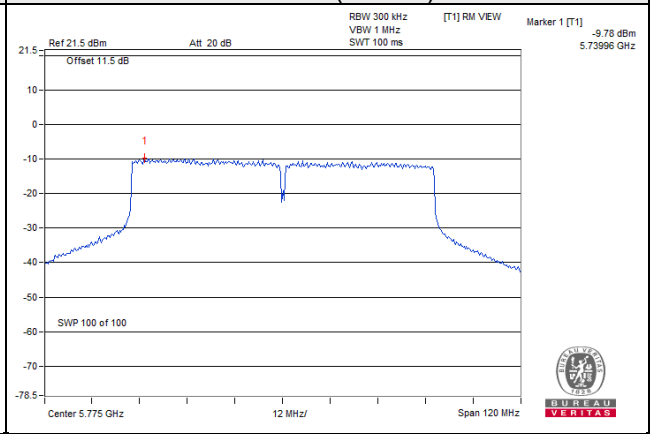
802.11n (HT20)



802.11n (HT40)



802.11ac (VHT80)

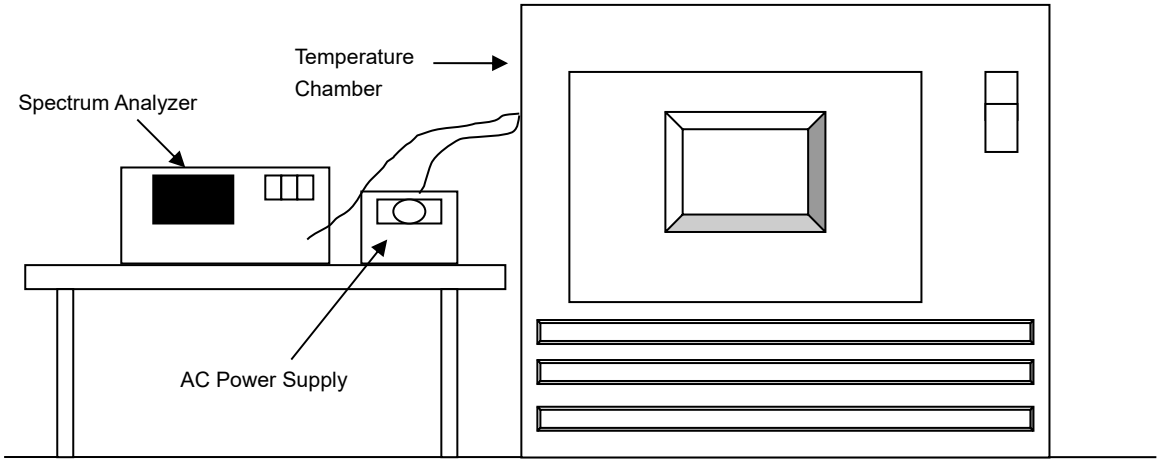


4.6 Frequency Stability

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

Tested date: Aug. 27, 2020

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100039	Jun. 12, 2020	Jun. 11, 2021
Standard Temperature And Humidity Chamber	MHU-225AU	920842	May 28, 2020	May 27, 2021
Digital Multimeter Fluke	87-III	70360742	Jun. 23, 2020	Jun. 22, 2021
AC Power Supply Extech	CFW-105	E000603	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.

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

5G traffic radio:

Frequency Stability Versus Temp.									
Operating Frequency: 5180MHz									
Temp. (℃)	Power Supply (Vac)	0 Minute		2 Minute		5 Minute		10 Minute	
		Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail
50	120	5179.9761	Pass	5179.976	Pass	5179.9754	Pass	5179.9778	Pass
40	120	5179.9747	Pass	5179.9744	Pass	5179.9769	Pass	5179.9748	Pass
30	120	5179.9976	Pass	5180.0022	Pass	5180.0002	Pass	5179.9977	Pass
20	120	5180.0167	Pass	5180.0161	Pass	5180.0204	Pass	5180.0183	Pass
10	120	5179.977	Pass	5179.9781	Pass	5179.9819	Pass	5179.9783	Pass
0	120	5180.0141	Pass	5180.0152	Pass	5180.0155	Pass	5180.0139	Pass
-10	120	5180.0028	Pass	5180.0039	Pass	5179.9991	Pass	5180.0036	Pass
-20	120	5179.9919	Pass	5179.9918	Pass	5179.9928	Pass	5179.9953	Pass
-30	120	5180.0226	Pass	5180.0206	Pass	5180.0233	Pass	5180.0233	Pass

Frequency Stability Versus Voltage									
Operating Frequency: 5180MHz									
Temp. (℃)	Power Supply (Vac)	0 Minute		2 Minute		5 Minute		10 Minute	
		Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail
20	138	5180.0175	Pass	5180.0165	Pass	5180.0195	Pass	5180.0183	Pass
	120	5180.0167	Pass	5180.0161	Pass	5180.0204	Pass	5180.0183	Pass
	102	5180.0173	Pass	5180.0163	Pass	5180.0199	Pass	5180.0191	Pass

Scanning radio:

Frequency Stability Versus Temp.									
Operating Frequency: 5180MHz									
Temp. (℃)	Power Supply (Vac)	0 Minute		2 Minute		5 Minute		10 Minute	
		Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail
50	120	5180.0057	Pass	5180.0026	Pass	5180.0069	Pass	5180.0075	Pass
40	120	5180.0188	Pass	5180.0177	Pass	5180.0196	Pass	5180.0177	Pass
30	120	5180.0106	Pass	5180.0056	Pass	5180.0099	Pass	5180.0088	Pass
20	120	5180.0158	Pass	5180.0152	Pass	5180.0189	Pass	5180.0145	Pass
10	120	5180.0042	Pass	5180.0025	Pass	5180.0057	Pass	5180.0008	Pass
0	120	5180.0253	Pass	5180.0225	Pass	5180.0212	Pass	5180.0226	Pass
-10	120	5179.9805	Pass	5179.9788	Pass	5179.9807	Pass	5179.9805	Pass
-20	120	5179.9754	Pass	5179.9719	Pass	5179.9721	Pass	5179.9730	Pass
-30	120	5180.0070	Pass	5180.0063	Pass	5180.0063	Pass	5180.0064	Pass

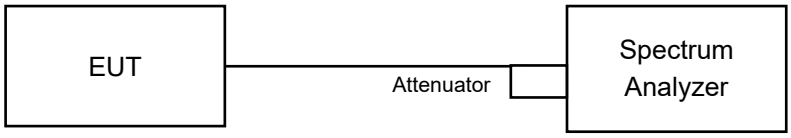
Frequency Stability Versus Voltage									
Operating Frequency: 5180MHz									
Temp. (℃)	Power Supply (Vac)	0 Minute		2 Minute		5 Minute		10 Minute	
		Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail
20	138	5180.0157	Pass	5180.0149	Pass	5180.0188	Pass	5180.0155	Pass
	120	5180.0158	Pass	5180.0152	Pass	5180.0189	Pass	5180.0145	Pass
	102	5180.0157	Pass	5180.0157	Pass	5180.0194	Pass	5180.0151	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

5G traffic radio:

802.11a

Chan.	Freq. (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
149	5745	15.81	16.08	0.5	Pass
157	5785	15.97	16.12	0.5	Pass
165	5825	15.60	16.01	0.5	Pass

802.11ax (HE20)

Chan.	Freq. (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
149	5745	18.43	18.53	0.5	Pass
157	5785	18.30	18.41	0.5	Pass
165	5825	18.12	18.53	0.5	Pass

802.11ax (HE40)

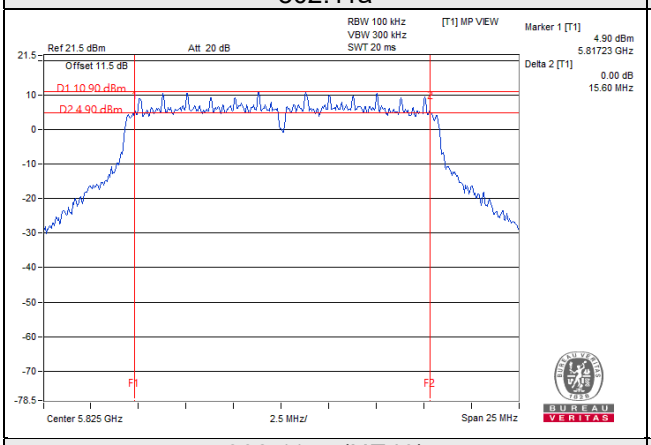
Chan.	Freq. (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
151	5755	37.85	37.53	0.5	Pass
159	5795	37.67	37.73	0.5	Pass

802.11ax (HE80)

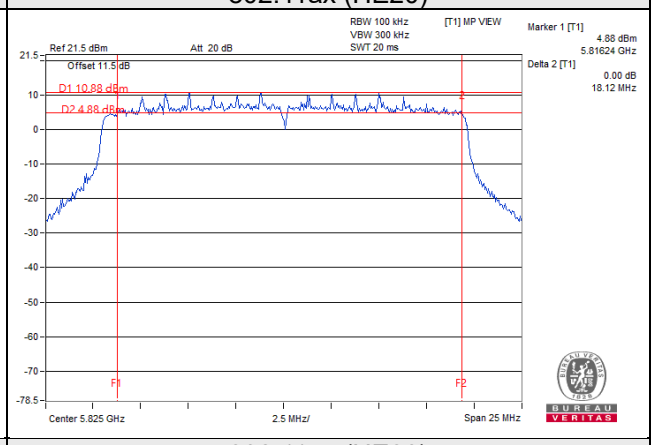
Chan.	Freq. (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
155	5775	76.44	75.40	0.5	Pass

Spectrum Plot of Worst Value

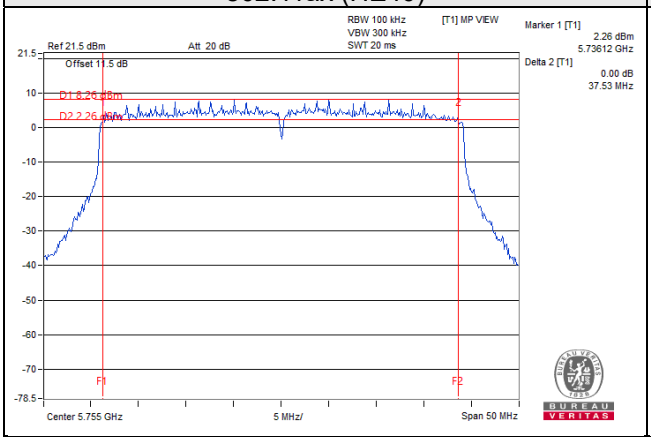
802.11a



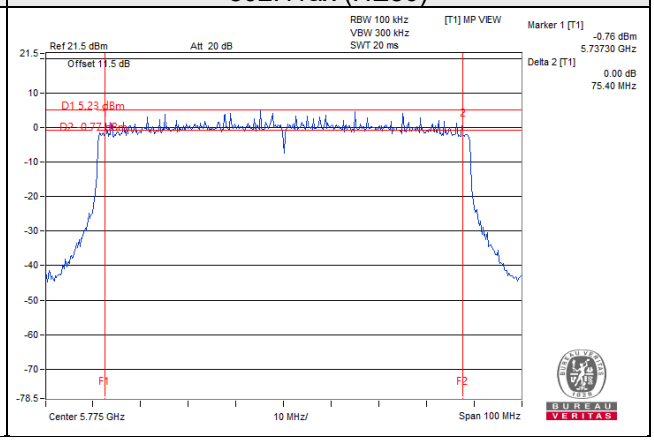
802.11ax (HE20)



802.11ax (HE40)



802.11ax (HE80)



Scanning radio:

802.11a

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
149	5745	16.40	0.5	Pass
157	5785	16.40	0.5	Pass
165	5825	16.40	0.5	Pass

802.11n (HT20)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
149	5745	17.60	0.5	Pass
157	5785	17.63	0.5	Pass
165	5825	17.64	0.5	Pass

802.11n (HT40)

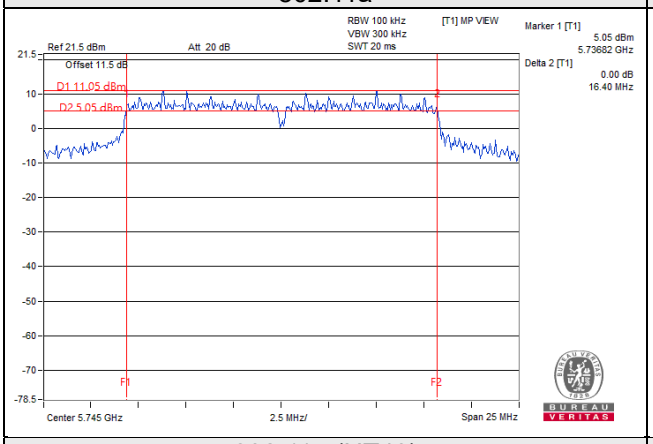
Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
151	5755	36.47	0.5	Pass
159	5795	36.50	0.5	Pass

802.11ac (VHT80)

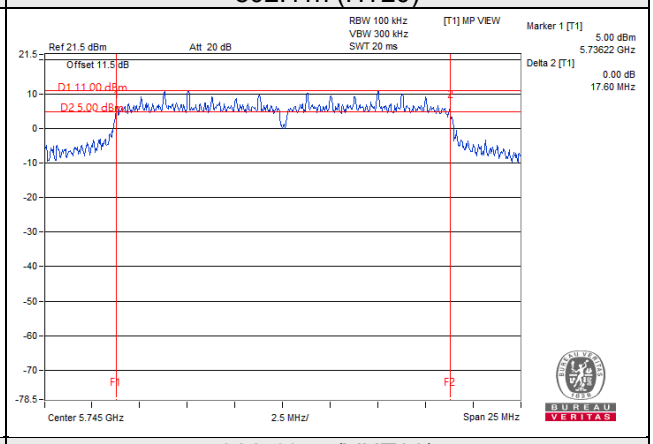
Channel	Frequency (MHz)	6dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
155	5775	75.95	0.5	Pass

Spectrum Plot of Worst Value

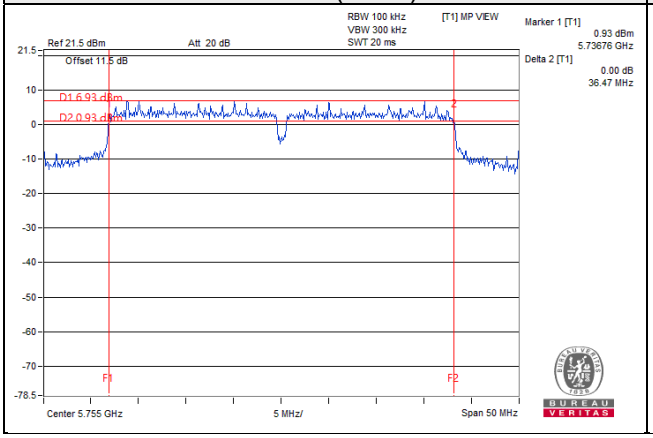
802.11a



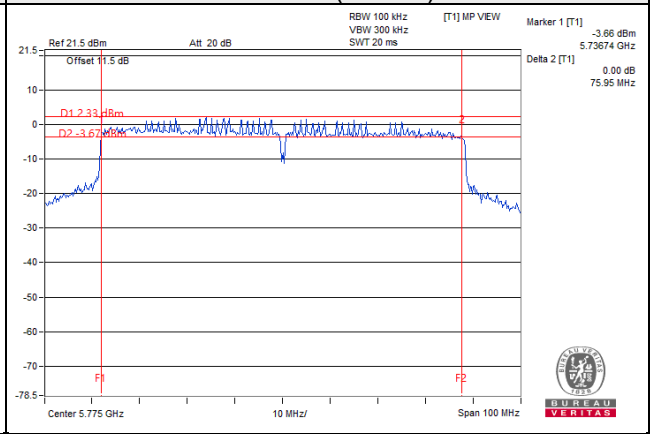
802.11n (HT20)



802.11n (HT40)



802.11ac (VHT80)



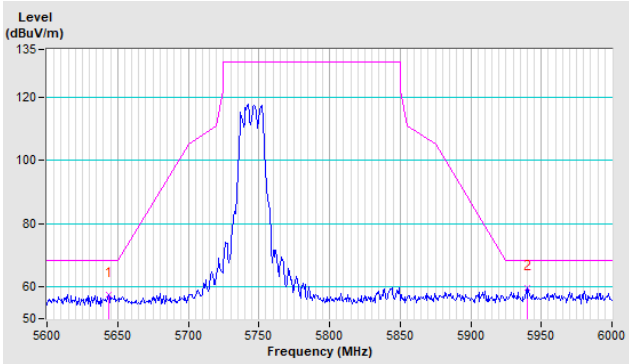
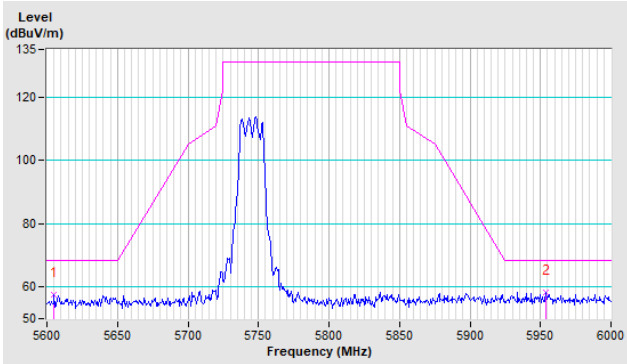
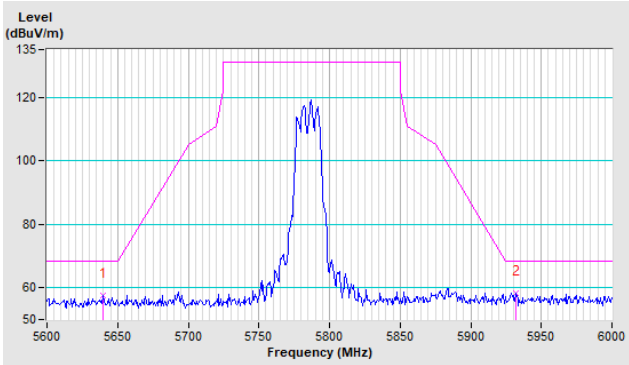
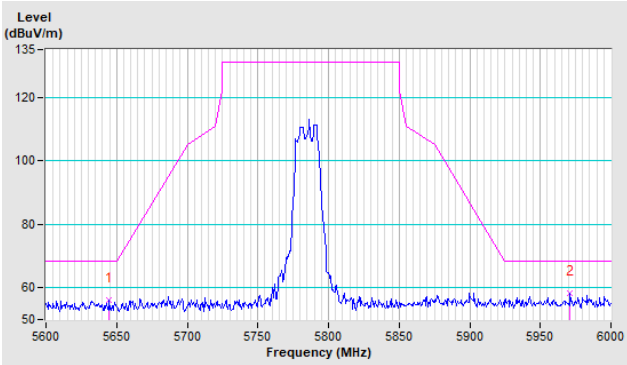
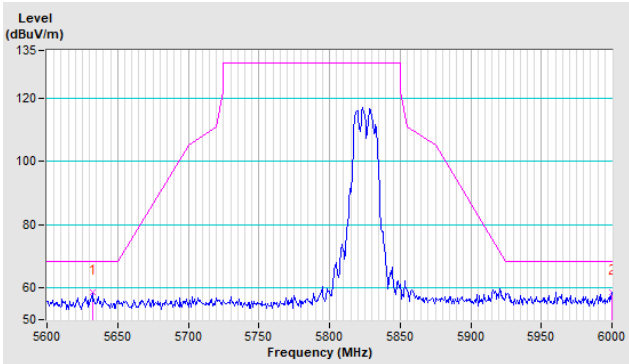
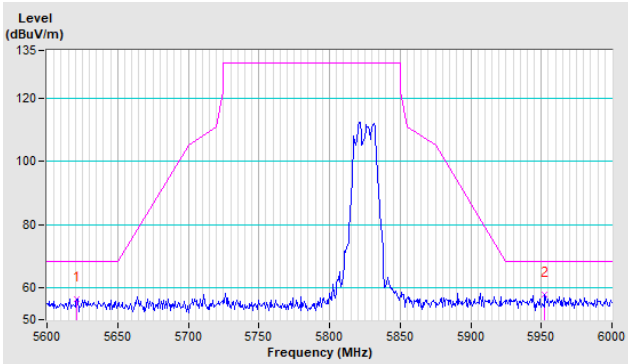
5 Pictures of Test Arrangements

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

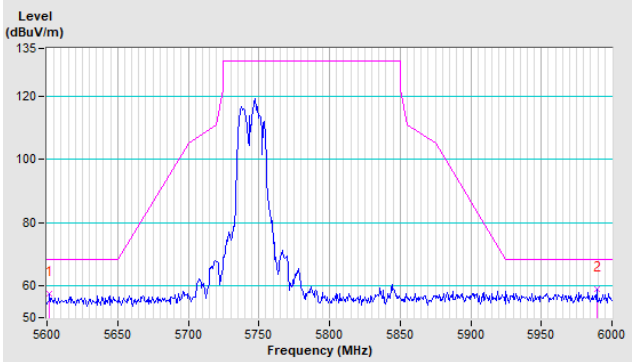
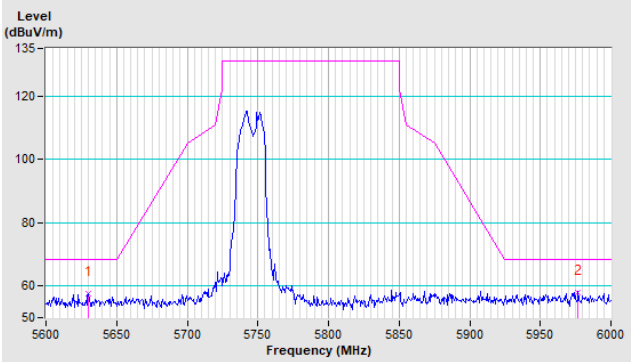
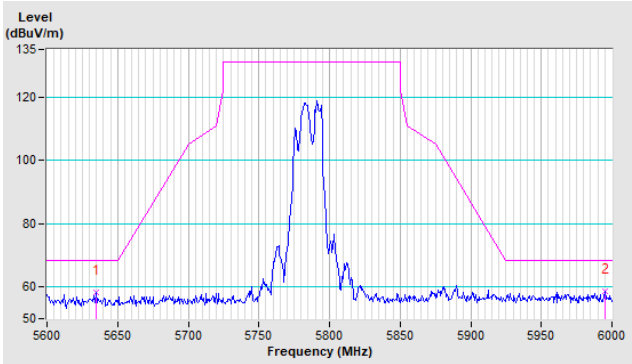
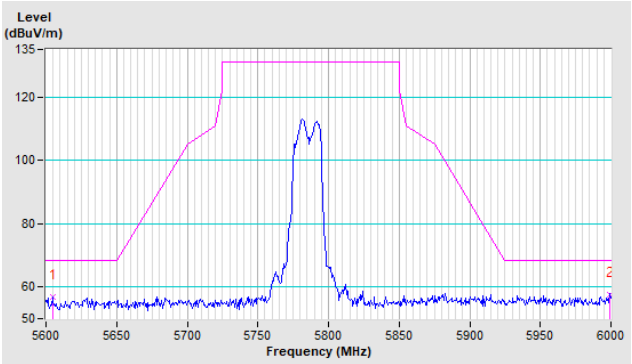
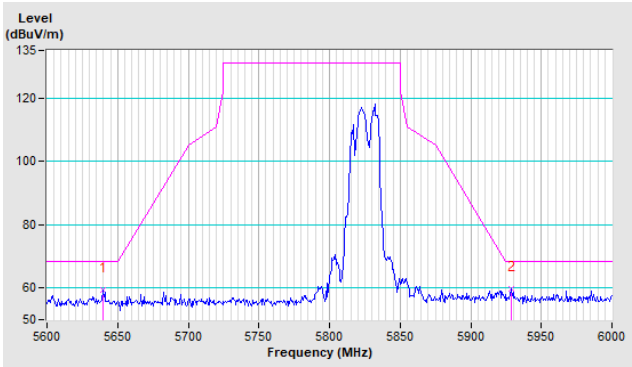
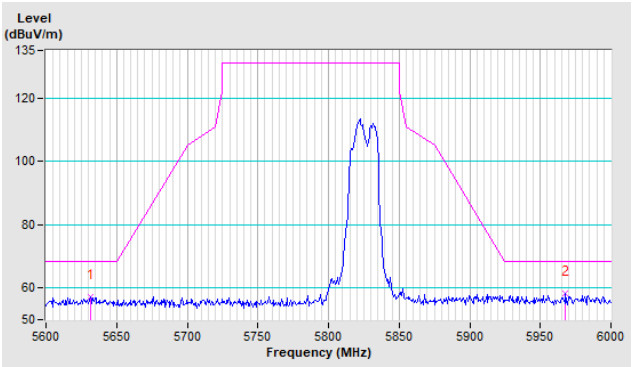
Annex A- Radiated Out of Band Emission (OOBE) Measurement (For U-NII-3 band)

5G traffic radio:

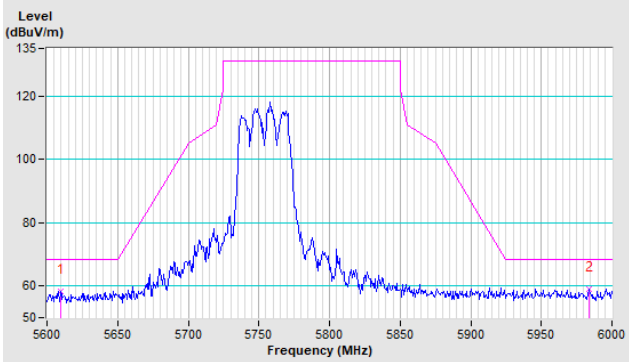
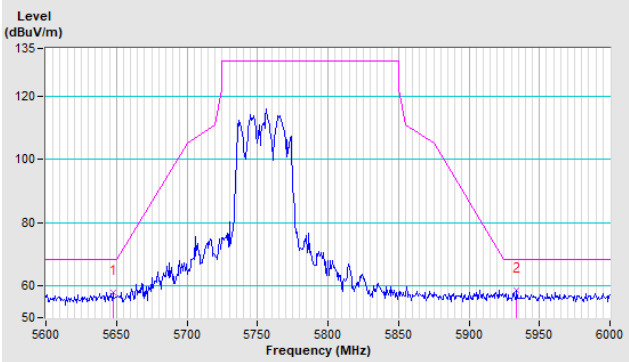
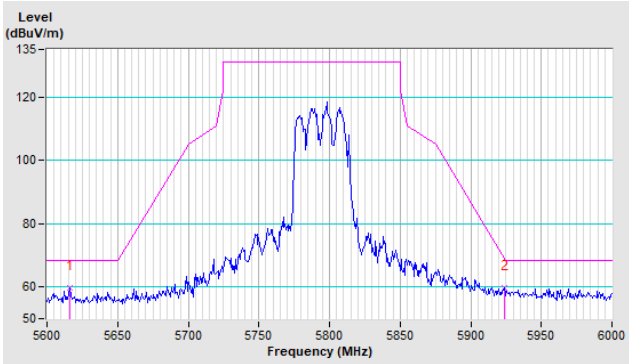
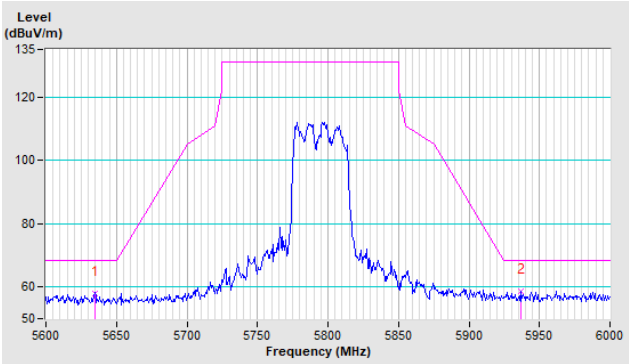
802.11a

CH149	
Horizontal	Vertical
	
CH157	
Horizontal	Vertical
	
CH165	
Horizontal	Vertical
	

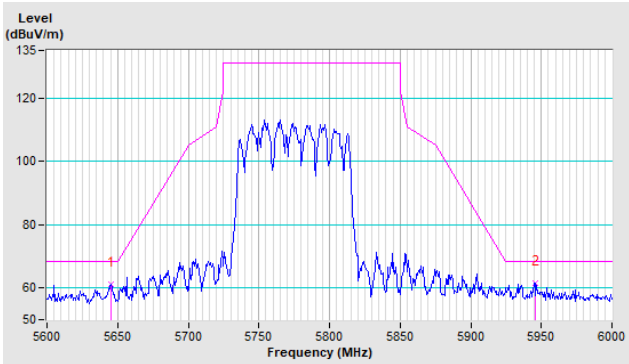
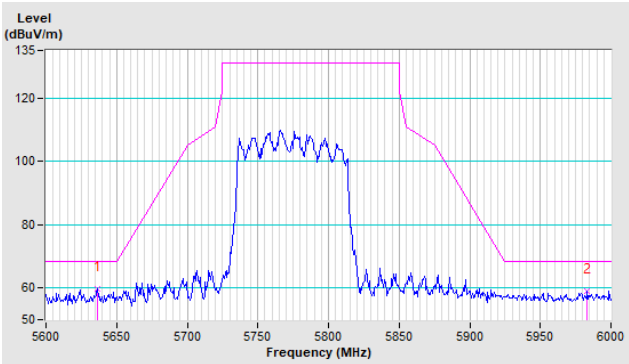
802.11ax (HE20)

CH149	
Horizontal	Vertical
	
CH157	
Horizontal	Vertical
	
CH165	
Horizontal	Vertical
	

802.11ax (HE40)

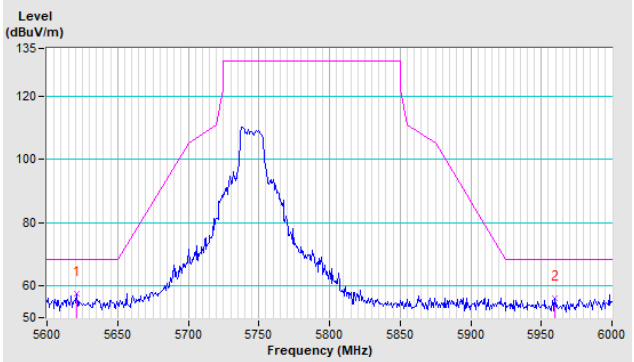
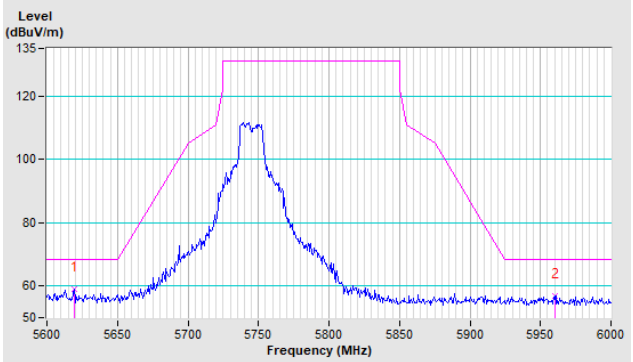
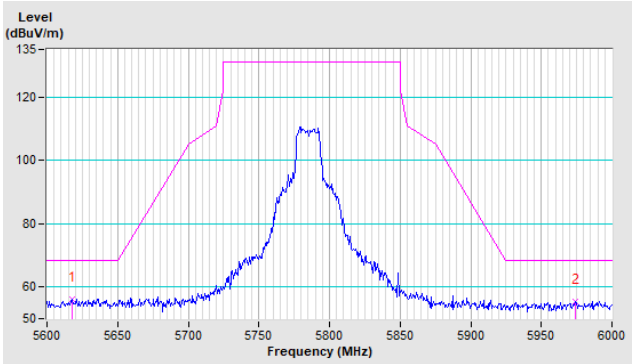
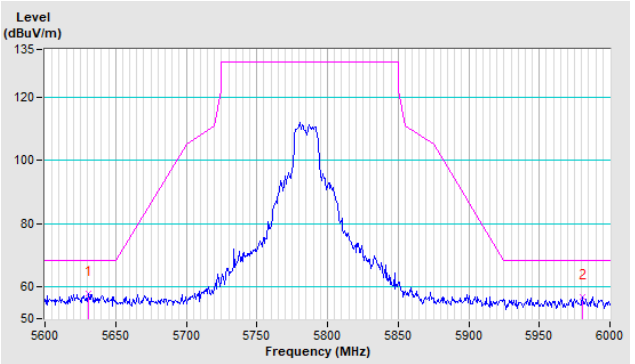
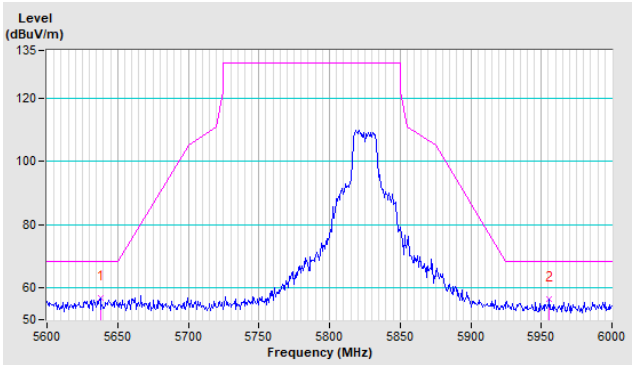
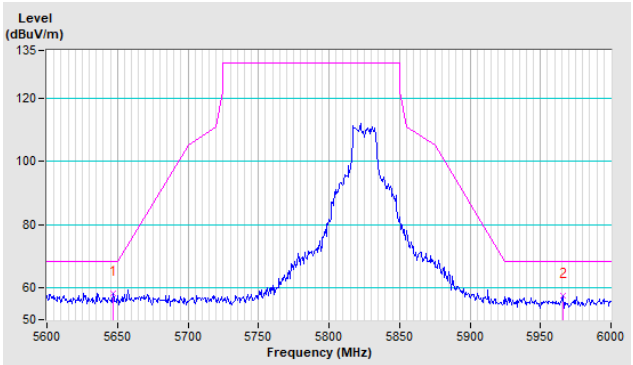
CH151	
Horizontal	Vertical
	
CH159	
Horizontal	Vertical
	

802.11ax (HE80)

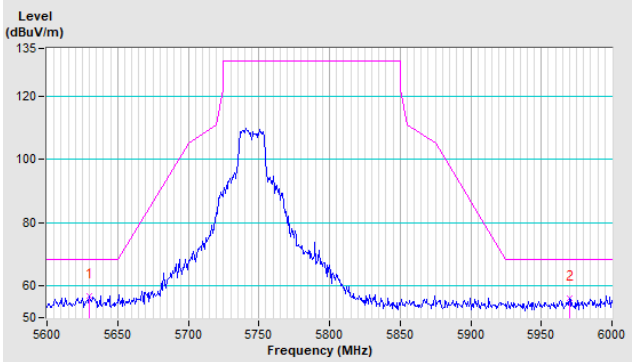
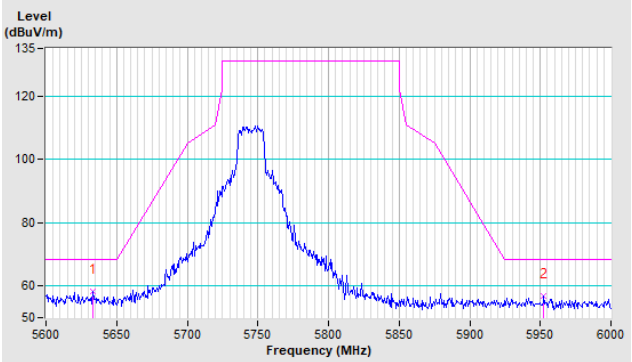
CH155	
Horizontal	Vertical
	

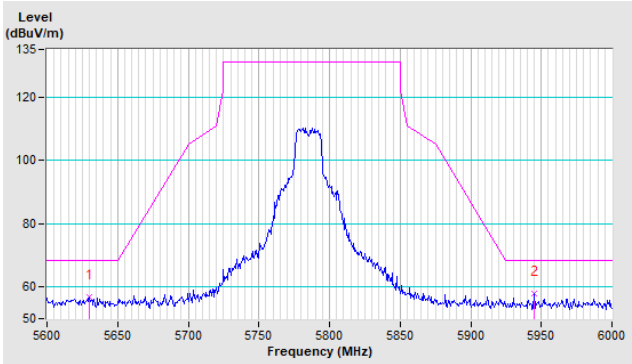
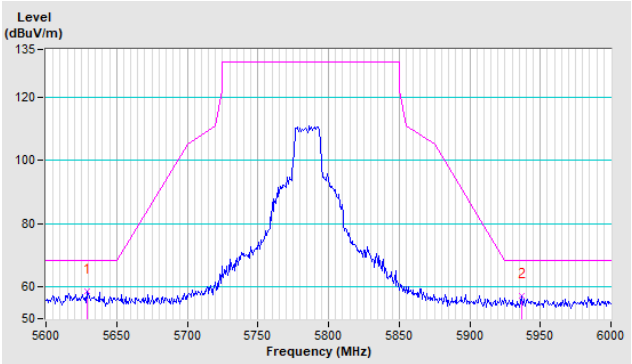
Scanning radio:

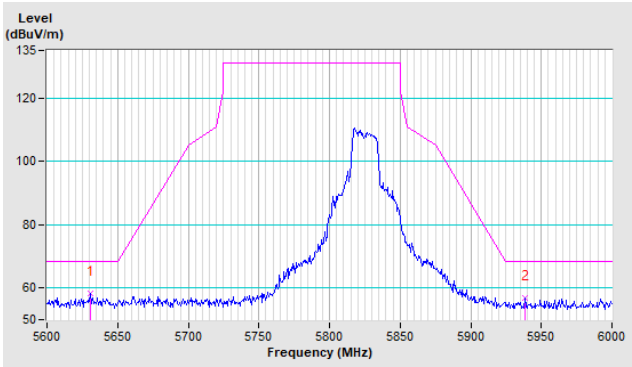
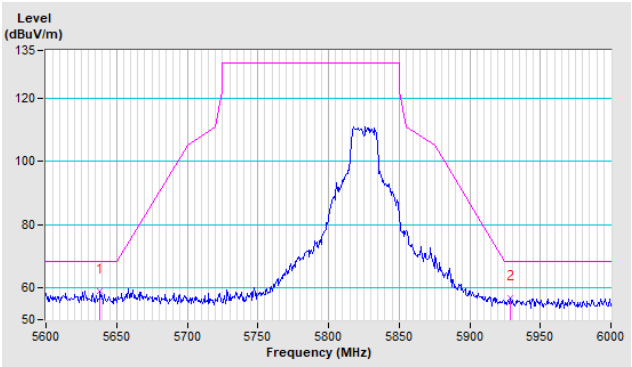
802.11a

CH149	
Horizontal	Vertical
	
CH157	
Horizontal	Vertical
	
CH165	
Horizontal	Vertical
	

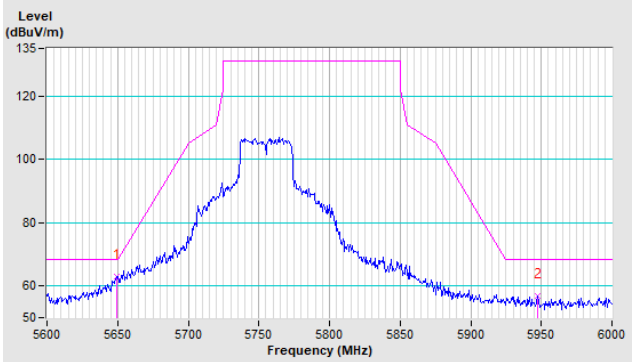
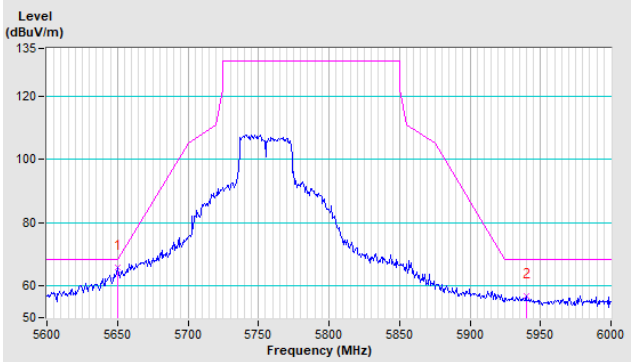
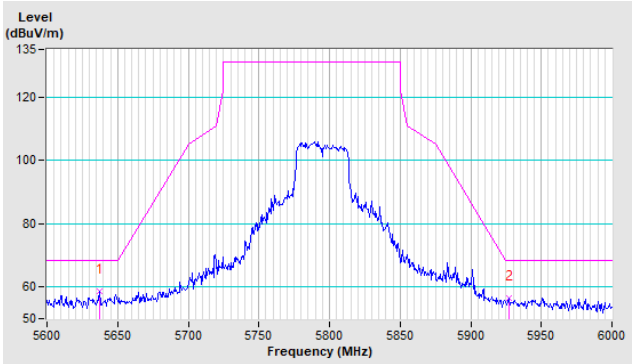
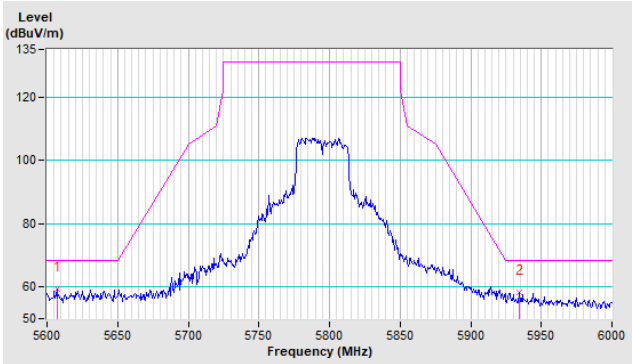
802.11n (HT20)

CH149	
Horizontal	Vertical
	

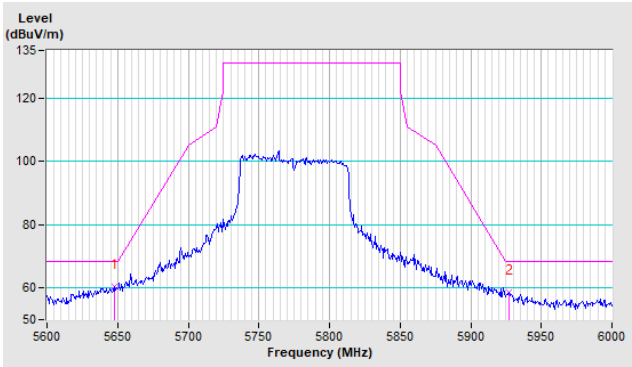
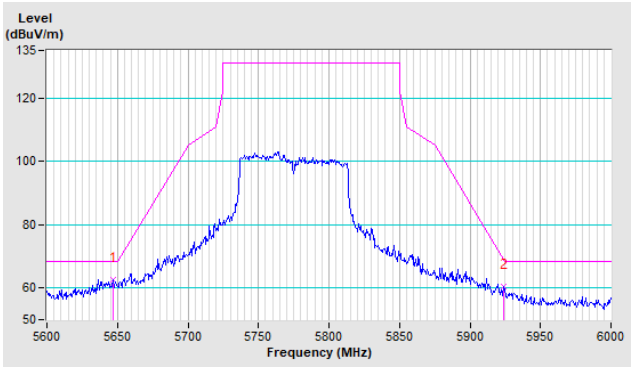
CH157	
Horizontal	Vertical
	

CH165	
Horizontal	Vertical
	

802.11n (HT40)

CH151	
Horizontal	Vertical
	
CH159	
Horizontal	Vertical
	

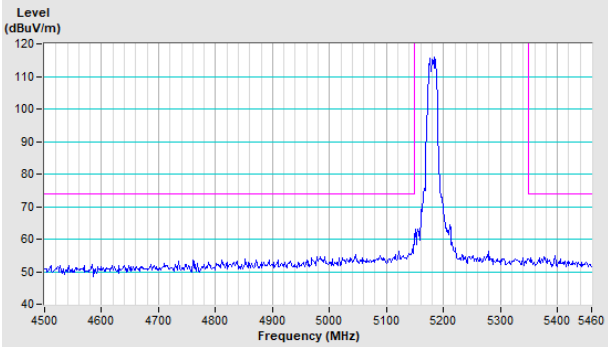
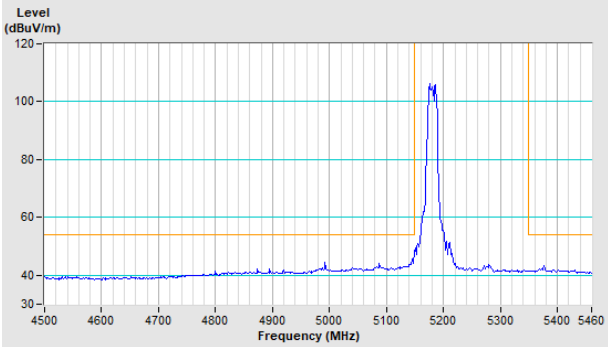
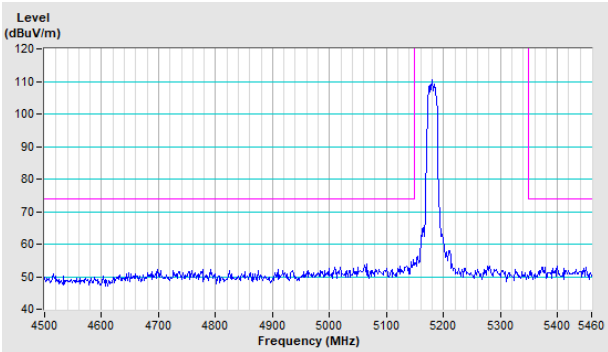
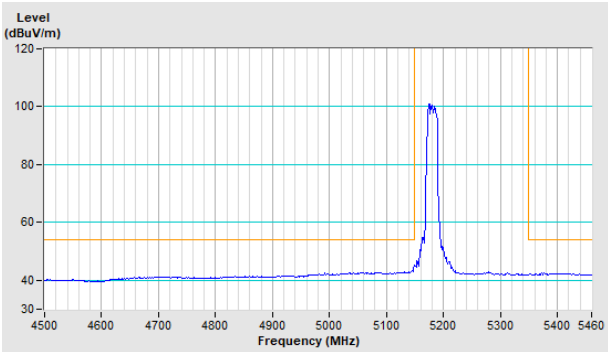
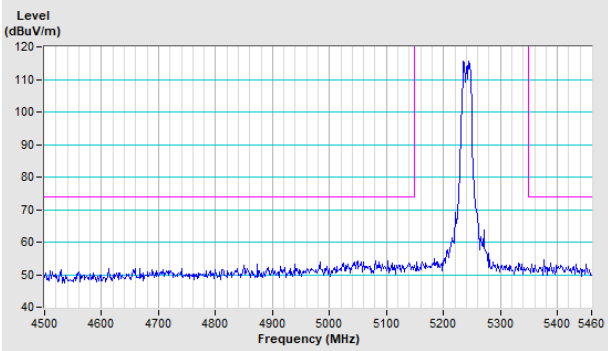
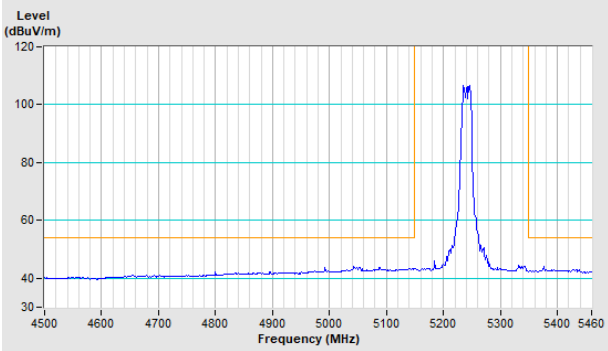
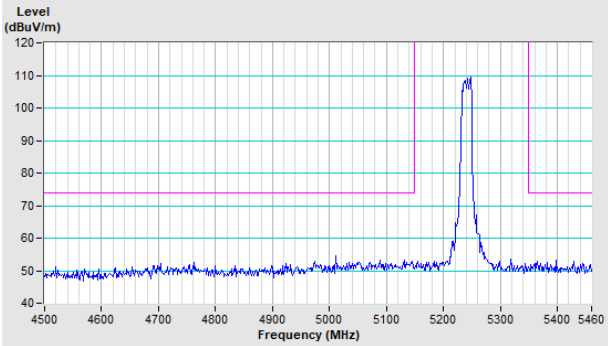
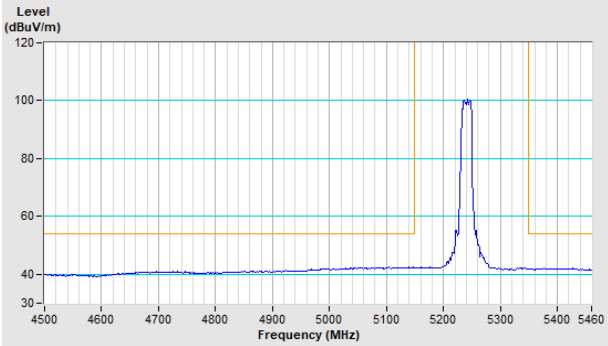
802.11ac (VHT80)

CH155	
Horizontal	Vertical
	

Annex B- Band Edge Measurement

5G traffic radio:

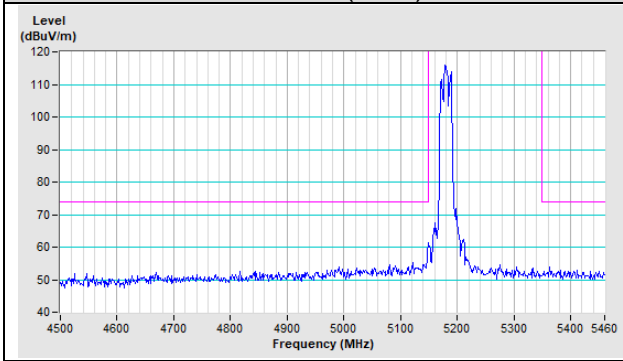
802.11a

Channel 36	
Horizontal (Peak)	Horizontal (Average)
	
Vertical (Peak)	Vertical (Average)
	
Channel 48	
Horizontal (Peak)	Horizontal (Average)
	
Vertical (Peak)	Vertical (Average)
	

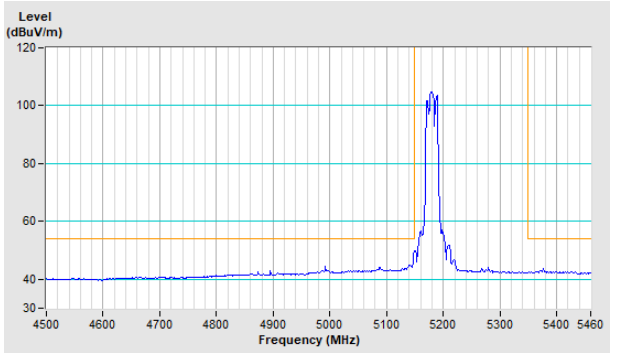
802.11ax (HE20)

Channel 36

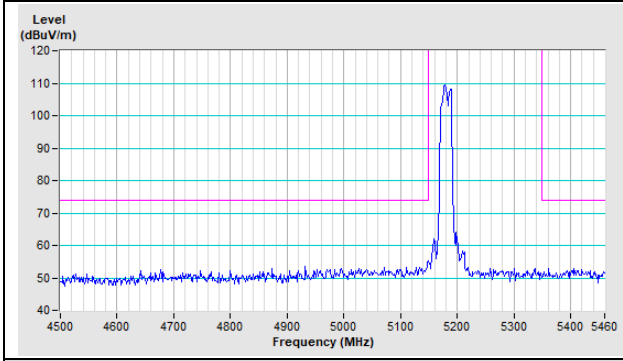
Horizontal (Peak)



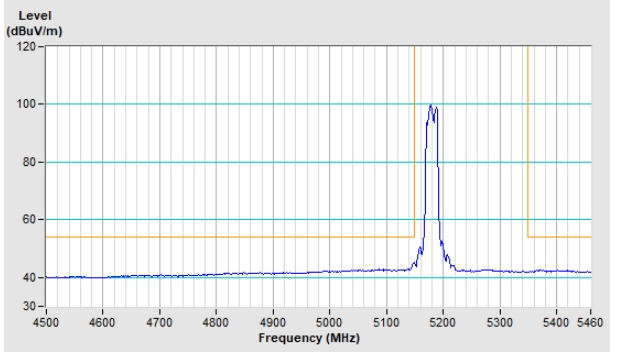
Horizontal (Average)



Vertical (Peak)

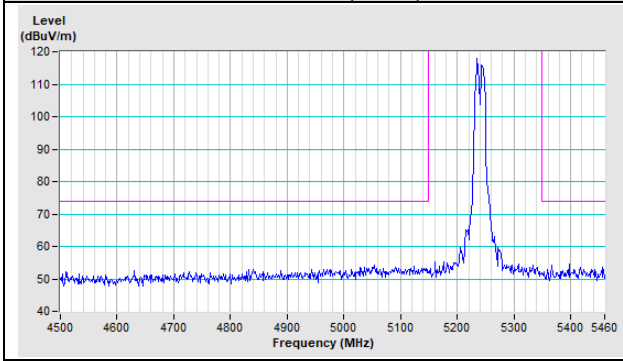


Vertical (Average)

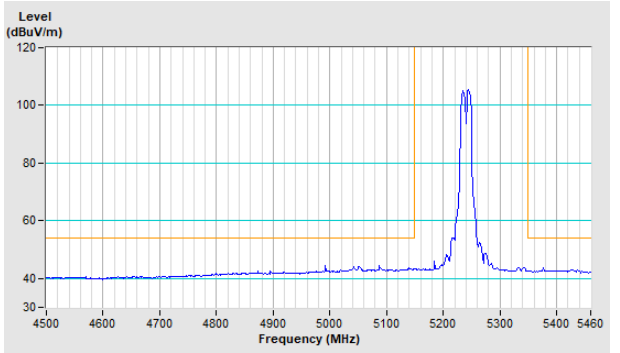


Channel 48

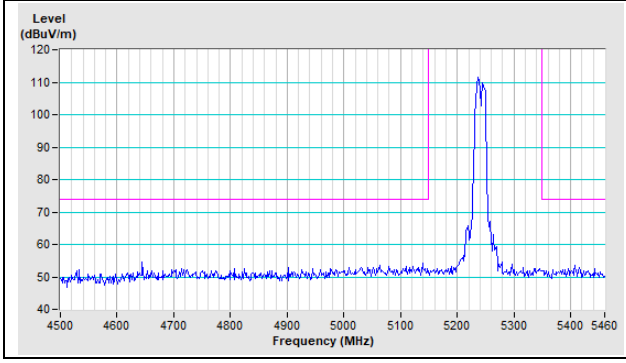
Horizontal (Peak)



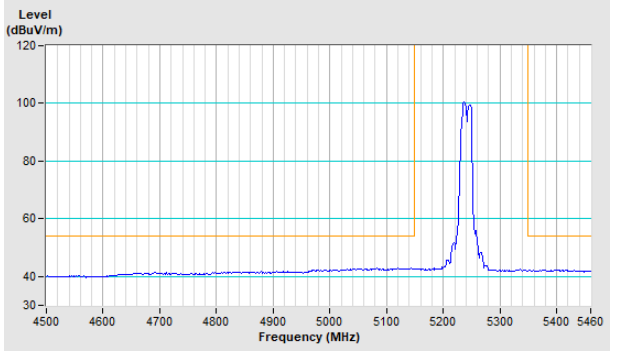
Horizontal (Average)



Vertical (Peak)



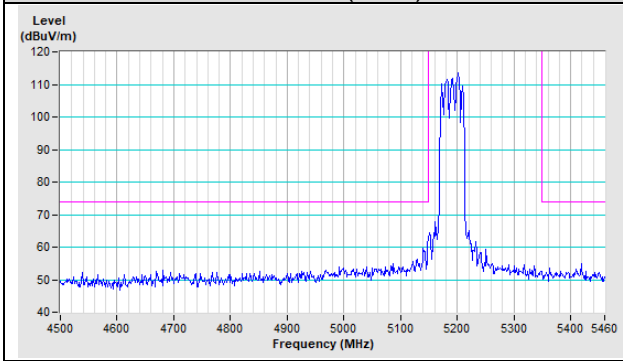
Vertical (Average)



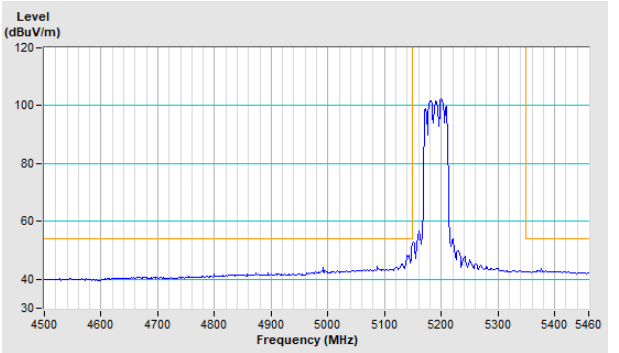
802.11ax (HE40)

Channel 38

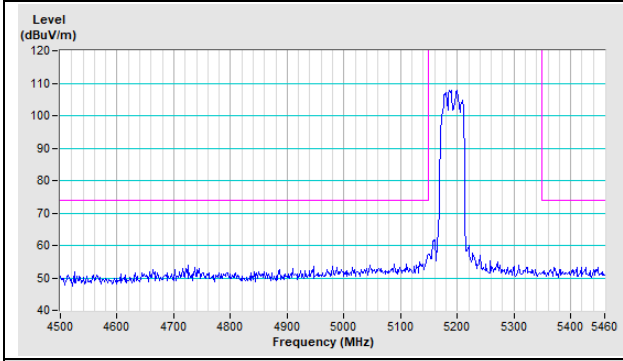
Horizontal (Peak)



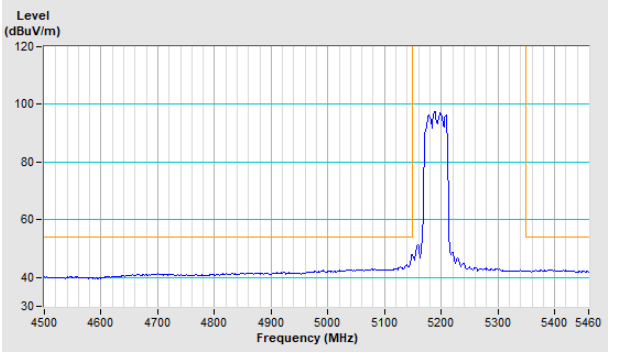
Horizontal (Average)



Vertical (Peak)

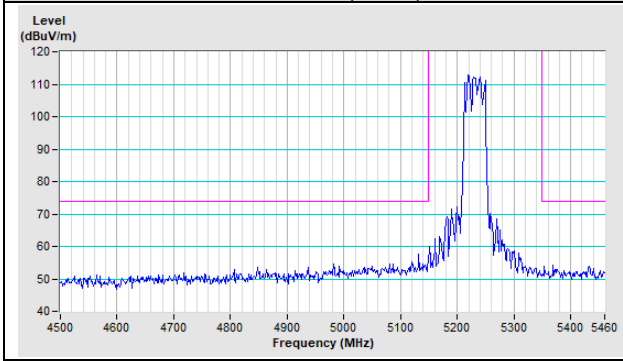


Vertical (Average)

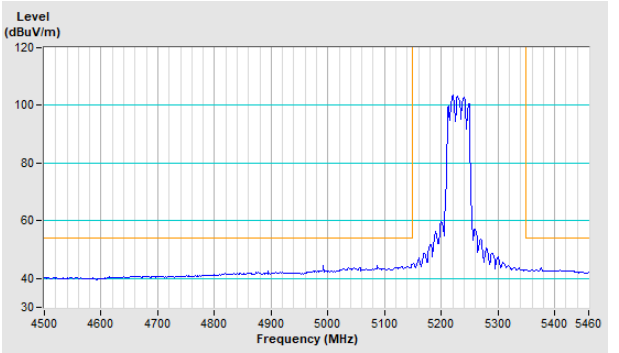


Channel 46

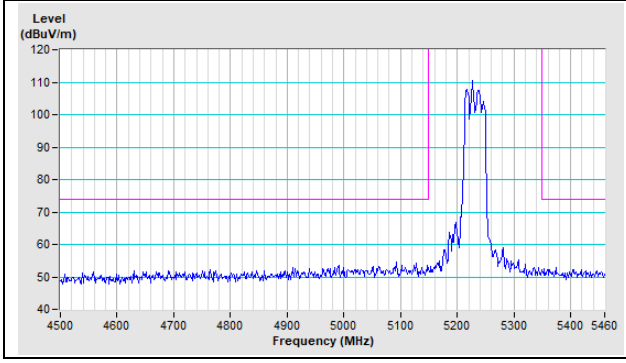
Horizontal (Peak)



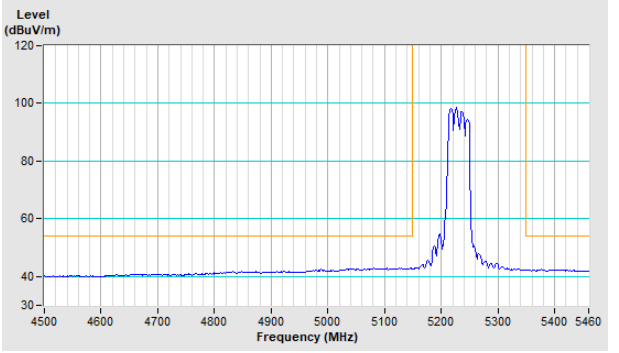
Horizontal (Average)



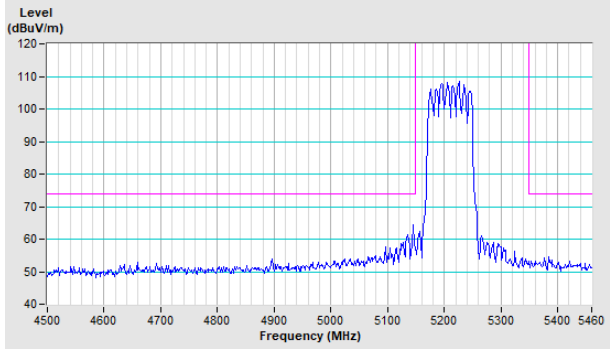
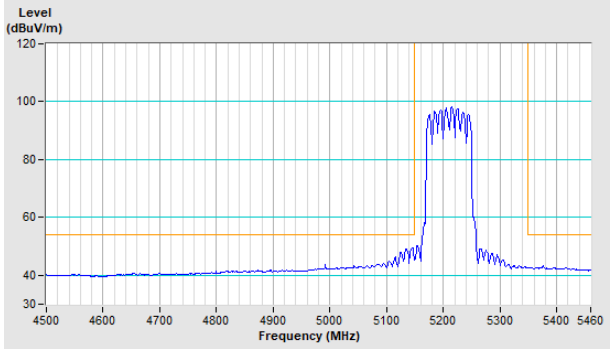
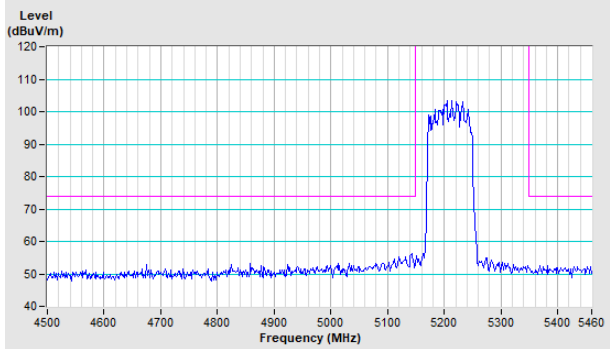
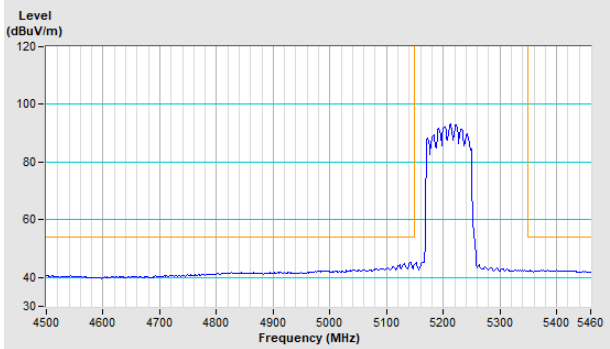
Vertical (Peak)



Vertical (Average)

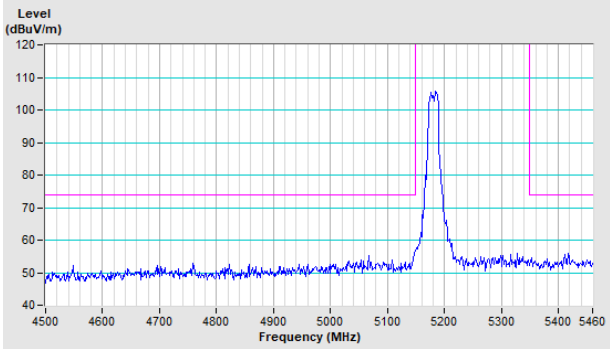
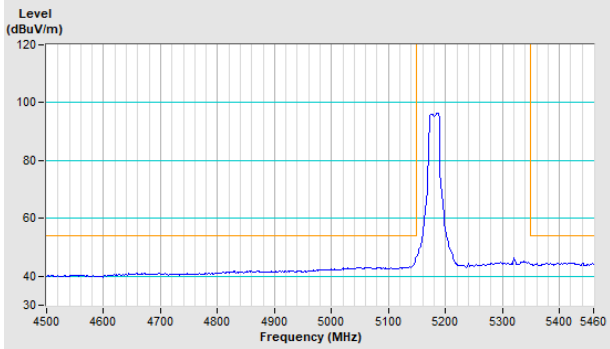
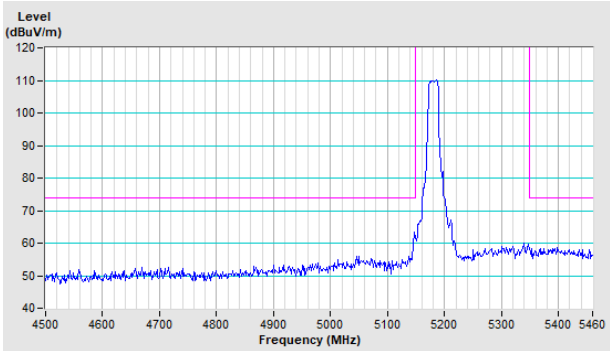
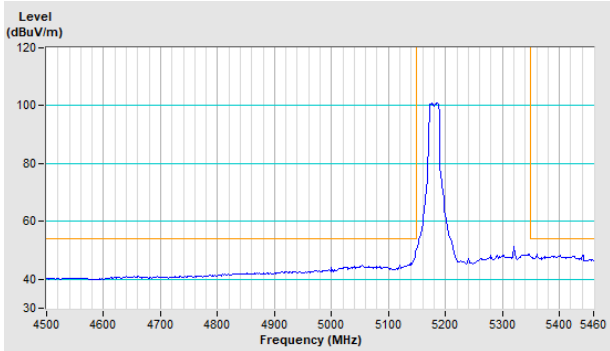


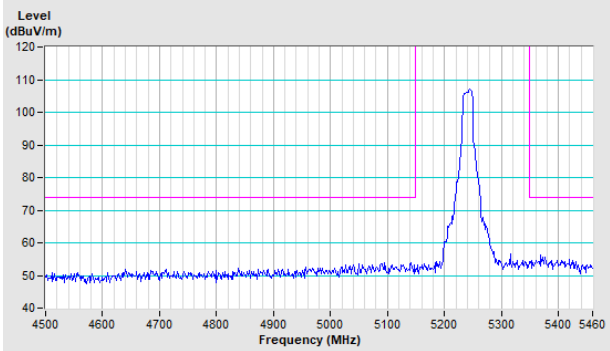
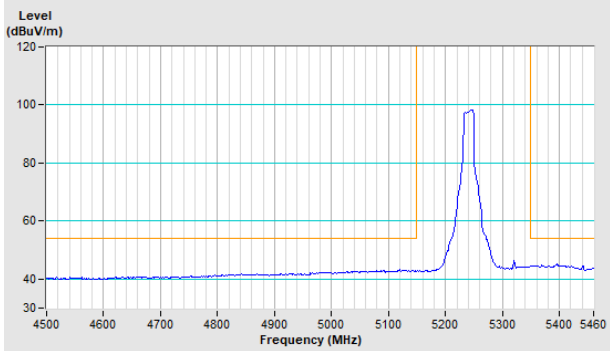
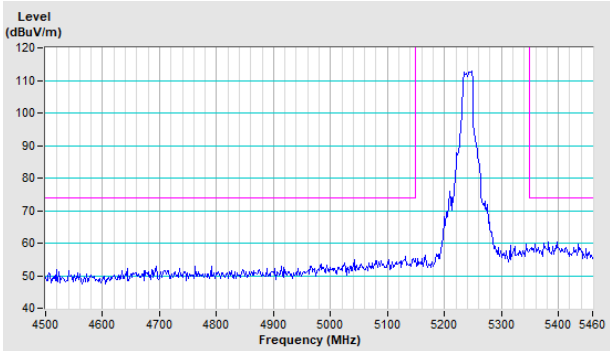
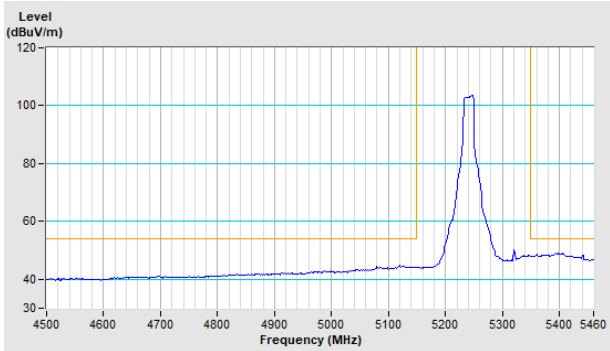
802.11ax (HE80)

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

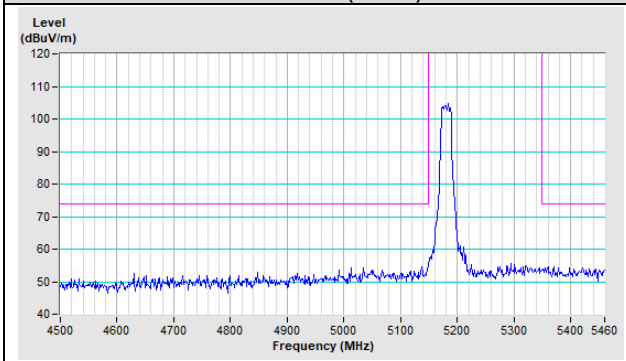
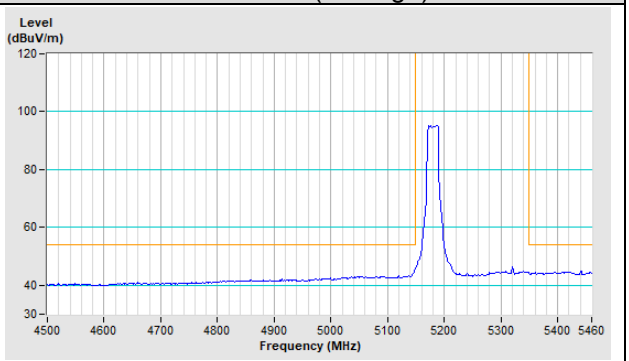
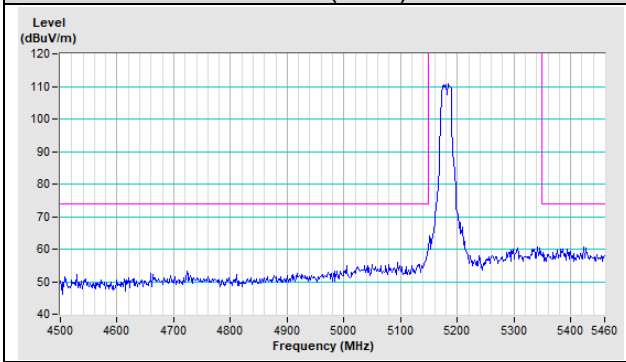
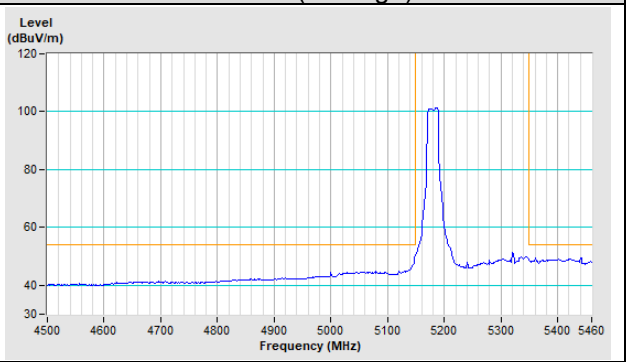
Scanning radio:

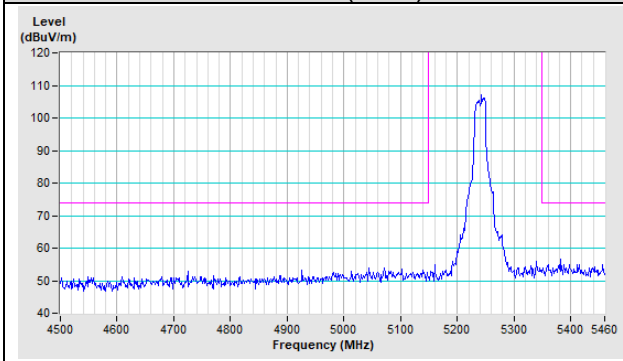
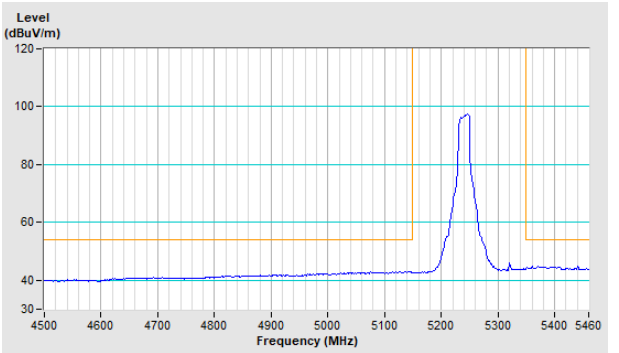
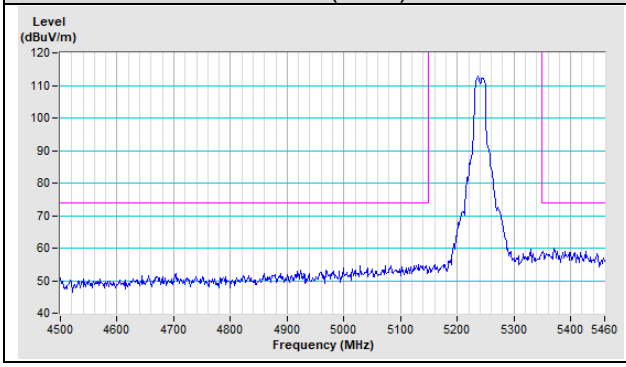
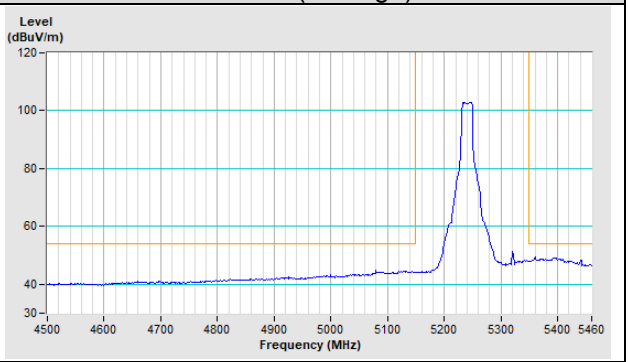
802.11a

Channel 36	
Horizontal (Peak)	Horizontal (Average)
	
Vertical (Peak)	Vertical (Average)
	

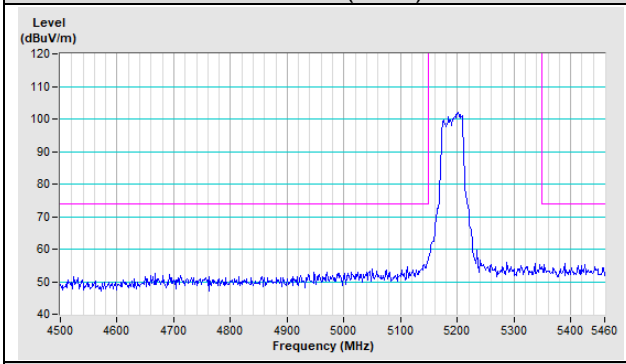
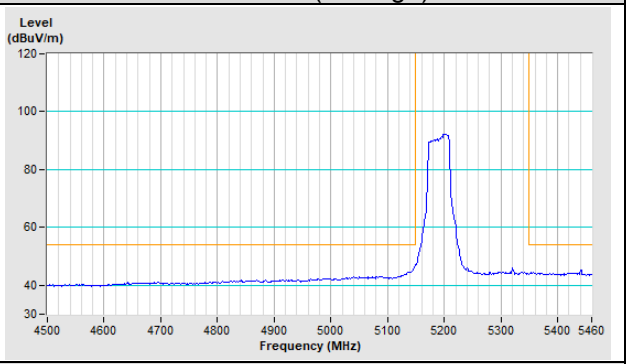
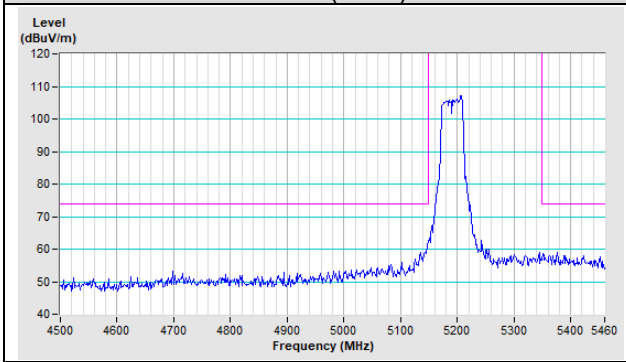
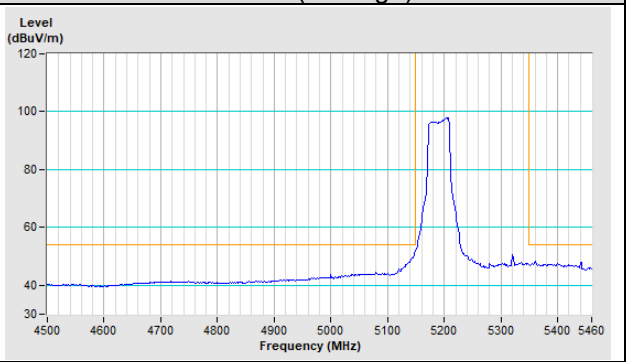
Channel 48	
Horizontal (Peak)	Horizontal (Average)
	
Vertical (Peak)	Vertical (Average)
	

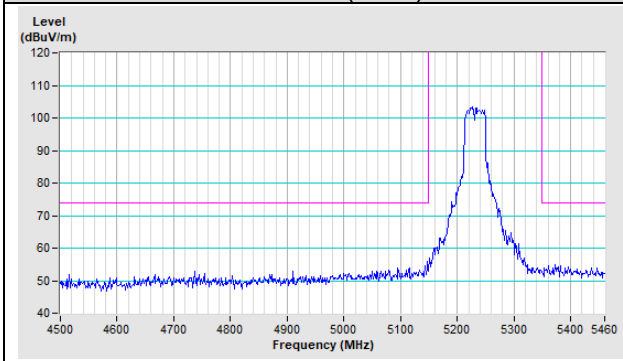
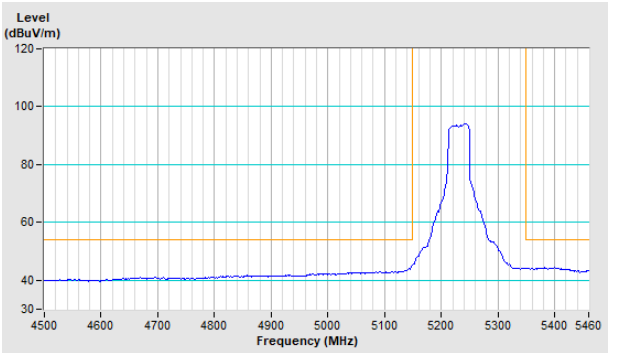
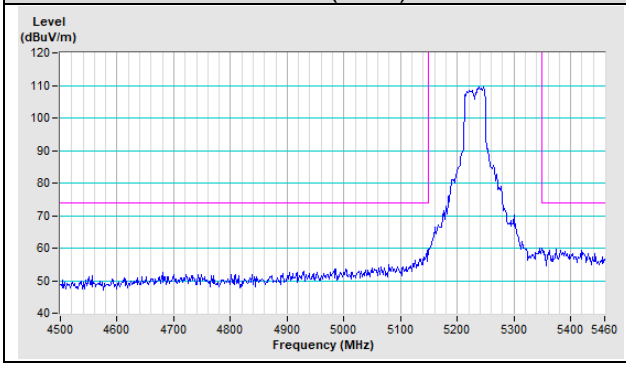
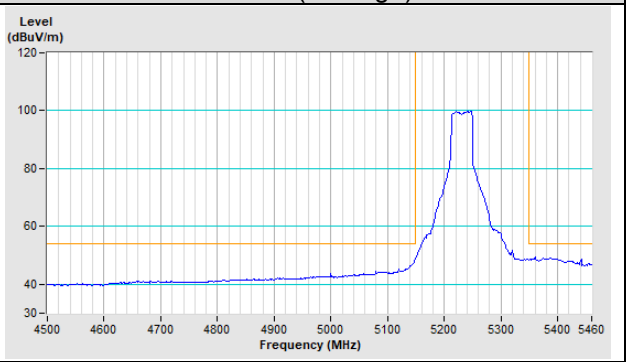
802.11n (HT20)

Channel 36	
Horizontal (Peak)	Horizontal (Average)
	
Vertical (Peak)	Vertical (Average)
	

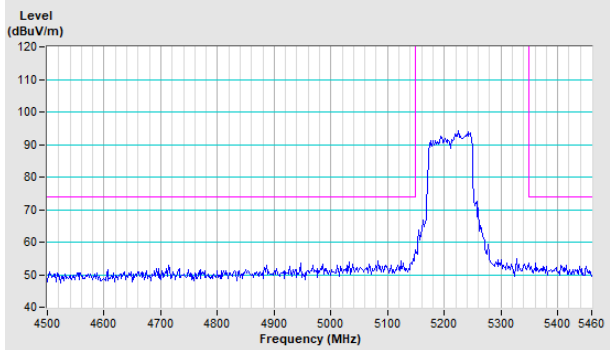
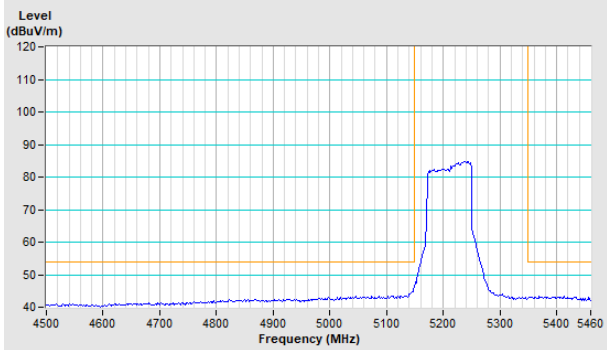
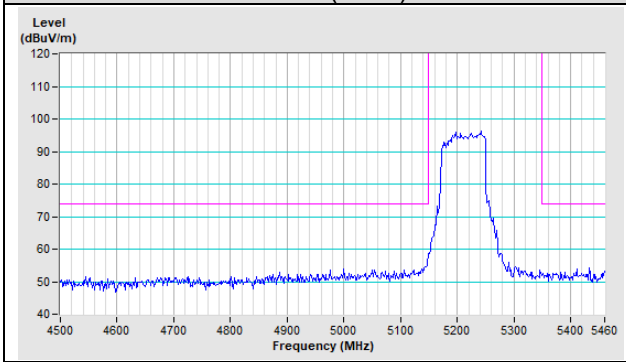
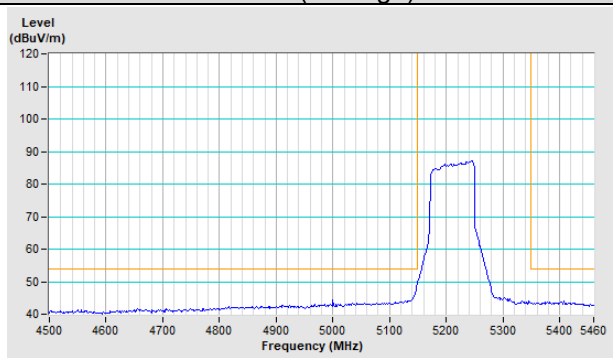
Channel 48	
Horizontal (Peak)	Horizontal (Average)
	
Vertical (Peak)	Vertical (Average)
	

802.11n (HT40)

Channel 38	
Horizontal (Peak)	Horizontal (Average)
	
Vertical (Peak)	Vertical (Average)
	

Channel 46	
Horizontal (Peak)	Horizontal (Average)
	
Vertical (Peak)	Vertical (Average)
	

802.11ac (VHT80)

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 and approved according to ISO/IEC 17025.

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

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

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

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