FCC Test Report

Report No.:	RF190729C13-1
FCC ID:	PY319300461
Test Model:	CAX30
Received Date:	Jul. 29, 2019
Test Date:	Nov. 06, 2019 ~ Mar. 07, 2020
Issued Date:	Mar. 16, 2020
Applicant:	NETGEAR, Inc.
Address:	350 East Plumeria Drive San Jose, CA 95134
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

Testing Laboratory
2021

Table of Contents

Release Control Record

Issue No.	Description	Date Issued
RF190729C13-1	Original release	Mar. 16, 2020

1 Certificate of Conformity

Product:	AX2700 WiFi Cable Modem Router
Brand:	Netgear
Test Model:	CAX30
Sample Status:	Engineering sample
Applicant:	NETGEAR, Inc.
Test Date:	Nov. 06, 2019 ~ Mar. 07, 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 : Celine Chou , **Date:** Mar. 16, 2020

Celine Chou / Senior Specialist

Approved by : Bruce Chen , **Date:** Mar. 16, 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 -18.64dB at 0.15000MHz.
15.407(b) (1/2/3/4(i/ii)/6)	Radiated Emissions & Band Edge Measurement	Pass	Meet the requirement of limit. Minimum passing margin is -0.1dB at 5144.00MHz.
15.407(a)(1/2/3)	Max Average Transmit Power	Pass	Meet the requirement of limit.
---	Occupied Bandwidth Measurement	-	Reference only.
15.407(a)(1/2/3)	Peak Power Spectral Density	Pass	Meet the requirement of limit.
15.407(e)	6dB bandwidth	Pass	Meet the requirement of limit. (U-NII-3 Band only)
15.407(g)	Frequency Stability	Pass	Meet the requirement of limit.
15.203	Antenna Requirement	Pass	Antenna connector is IPEX 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	3.63 dB
	200MHz ~1000MHz	3.64 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	AX2700 WiFi Cable Modem Router
Brand	Netgear
Test Model	CAX30
Sample Status	Engineering sample
Power Supply Rating	12Vdc from adapter
Modulation Type	256QAM, 64QAM, 16QAM, QPSK, BPSK for OFDM 1024QAM for OFDMA
Modulation Technology	OFDM, OFDMA
Transfer Rate	802.11a: 54/48/36/24/18/12/9/6Mbps 802.11n: up to 450Mbps 802.11ac: up to 1300Mbps 802.11ax: up to 1800Mbps
Operating Frequency	5180 ~ 5240MHz, 5745 ~ 5825MHz
Number of Channel	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
Output Power	CDD Mode: 5180 ~ 5240MHz: 879.579mW 5745 ~ 5825MHz: 950.291mW Beamforming Mode: 5180 ~ 5240MHz: 916.836mW 5745 ~ 5825MHz: 825.699mW
Antenna Type	Refer to note
Antenna Connector	Refer to note
Accessory Device	Adapter
Cable Supplied	1.0m shielded Ethernet cable without core

Note:

1. The EUT incorporates a MIMO function. Physically, the EUT provides 3 completed transmitters and 3 receivers.

Modulation Mode	Beamforming Mode	TX Function
802.11a	Not Support	3TX
802.11n (HT20)	Support	3TX
802.11n (HT40)	Support	3TX
802.11ac (VHT20)	Support	3TX
802.11ac (VHT40)	Support	3TX
802.11ac (VHT80)	Support	3TX
802.11ax (HE20)	Support	3TX
802.11ax (HE40)	Support	3TX
802.11ax (HE80)	Support	3TX

* The bandwidth and modulation are similar for HT20/HT40 on 802.11n mode and VHT20/VHT40/VHT80 on 802.11ac mode and HE20/HE40/HE80 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 and 802.11ac, 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.

2. The EUT consumes power from the following adapters.

Adapter 1	
Brand	NETGEAR
Model	2ABN042F 1
Input Power	100-120Vac, 50/60Hz, 1.3A
Output Power	12Vdc, 3.5A
Power Line	1.8m cable without core attached on adapter

Adapter 2	
Brand	NETGEAR
Model	AD2150F10
Input Power	100-120Vac, 50/60Hz, 1.0A
Output Power	12Vdc, 3.5A
Power Line	1.8m cable without core attached on adapter

* Adapter 1 was chosen for final test and presented in the test report.

3. The following antennas were provided to the EUT.

Ant. Type	PIFA		
Connecter Type	IPEX		
Directional Antenna Gain (dBi)			
Item	2.4G	UNII-1	UNII-3
-	6.68	6.34	6.79

* For detailed antenna information, please refer to the Operational Description-Antenna Specification report.
* The above Antenna information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications, the laboratory shall not be held responsible.

3.2 Description of Test Modes

For 5180 ~ 5240MHz:

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

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

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

Channel	Frequency	Channel	Frequency
38	5190 MHz	46	5230 MHz

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

Channel	Frequency
42	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	
	√	√	√	√	-

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 **Z-plane**.
2. Radiated emission test (below 1GHz) and power line conducted emission test items chosen the worst maximum power.

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)
-	802.11a	5180-5240	36 to 48	36, 40, 48	OFDM	6.0
	802.11ax (HE20)		36 to 48	36, 40, 48	OFDMA	MCS0
	802.11ax (HE40)		38 to 46	38, 46	OFDMA	MCS0
	802.11ax (HE80)		42	42	OFDMA	MCS0
-	802.11a	5745-5825	149 to 165	149, 157, 165	OFDM	6.0
	802.11ax (HE20)		149 to 165	149, 157, 165	OFDMA	MCS0
	802.11ax (HE40)		151 to 159	151, 159	OFDMA	MCS0
	802.11ax (HE80)		155	155	OFDMA	MCS0

Radiated Emission Test (Below 1GHz):

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

EUT Configure Mode	Mode	Frequency Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Data Rate (Mbps)
-	802.11a	5180-5240	36 to 48	165	OFDM	6.0
	802.11a	5745-5825	149 to 165		OFDM	6.0

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)
-	802.11a	5180-5240	36 to 48	165	OFDM	6.0
	802.11a	5745-5825	149 to 165		OFDM	6.0

Transmit Power 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)
-	802.11a	5180-5240	36 to 48	36, 40, 48	OFDM	6.0
	802.11ac (VHT20)		36 to 48	36, 40, 48	OFDM	6.5
	802.11ac (VHT40)		38 to 46	38, 46	OFDM	13.5
	802.11ac (VHT80)		42	42	OFDM	29.3
	802.11ax (HE20)		36 to 48	36, 40, 48	OFDMA	MCS0
	802.11ax (HE40)		38 to 46	38, 46	OFDMA	MCS0
	802.11ax (HE80)		42	42	OFDMA	MCS0
-	802.11a	5745-5825	149 to 165	149, 157, 165	OFDM	6.0
	802.11ac (VHT20)		149 to 165	149, 157, 165	OFDM	6.5
	802.11ac (VHT40)		151 to 159	151, 159	OFDM	13.5
	802.11ac (VHT80)		155	155	OFDM	29.3
	802.11ax (HE20)		149 to 165	149, 157, 165	OFDMA	MCS0
	802.11ax (HE40)		151 to 159	151, 159	OFDMA	MCS0
	802.11ax (HE80)		155	155	OFDMA	MCS0

Bandwidth, Peak Power Spectral Density and Frequency Stability 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)
-	802.11a	5180-5240	36 to 48	36, 40, 48	OFDM	6.0
	802.11ax (HE20)		36 to 48	36, 40, 48	OFDMA	MCS0
	802.11ax (HE40)		38 to 46	38, 46	OFDMA	MCS0
	802.11ax (HE80)		42	42	OFDMA	MCS0
-	802.11a	5745-5825	149 to 165	149, 157, 165	OFDM	6.0
	802.11ax (HE20)		149 to 165	149, 157, 165	OFDMA	MCS0
	802.11ax (HE40)		151 to 159	151, 159	OFDMA	MCS0
	802.11ax (HE80)		155	155	OFDMA	MCS0

Test Condition:

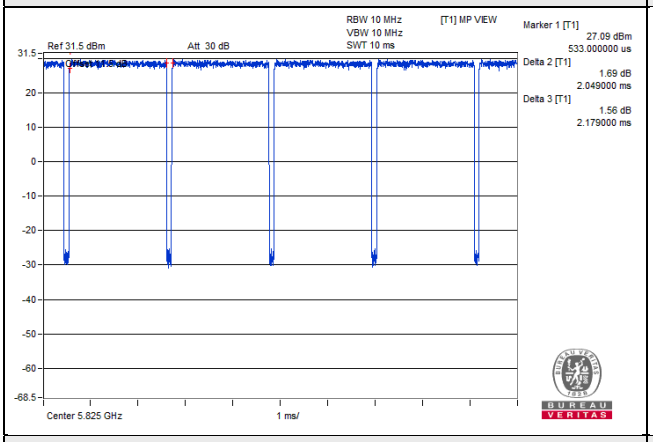
Applicable to	Environmental Conditions	Input Power	Tested by
RE≥1G	25 deg. C, 70% RH	120Vac, 60Hz	Noah Chang
RE<1G	25 deg. C, 70% RH	120Vac, 60Hz	Noah Chang
PLC	25 deg. C, 75% RH	120Vac, 60Hz	Noah Chang
APCM	25 deg. C, 60% RH	120Vac, 60Hz	Ivan Tseng

3.3 Duty Cycle of Test Signal

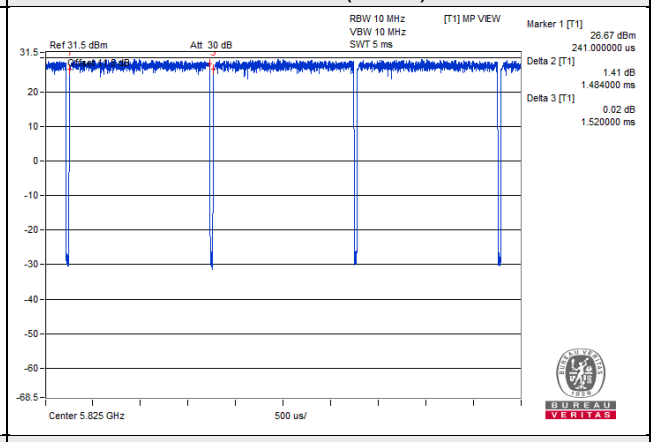
Duty cycle of test signal is < 98%, duty factor is required.

802.11a: Duty cycle = 2.049/2.179 = 0.940, Duty factor = 10 * log (1/0.940) = 0.27
802.11ax (HE20): Duty cycle = 1.484/1.520 = 0.976, Duty factor = 10 * log (1/0.976) = 0.10
802.11ax (HE40): Duty cycle = 0.773/0.803 = 0.963, Duty factor = 10 * log (1/0.963) = 0.17
802.11ax (HE80): Duty cycle = 0.400/0.433 = 0.924, Duty factor = 10 * log (1/0.924) = 0.34

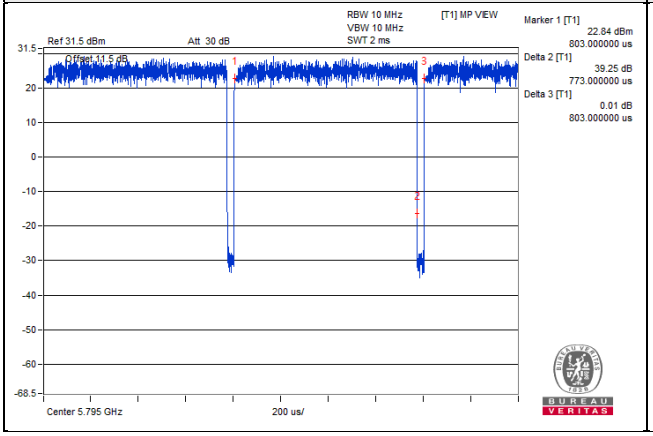
802.11a



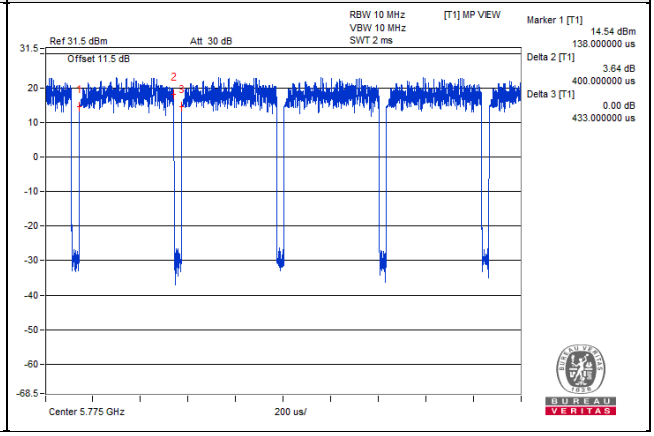
802.11ax (HE20)



802.11ax (HE40)



802.11ax (HE80)



3.4 Description of Support Units

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

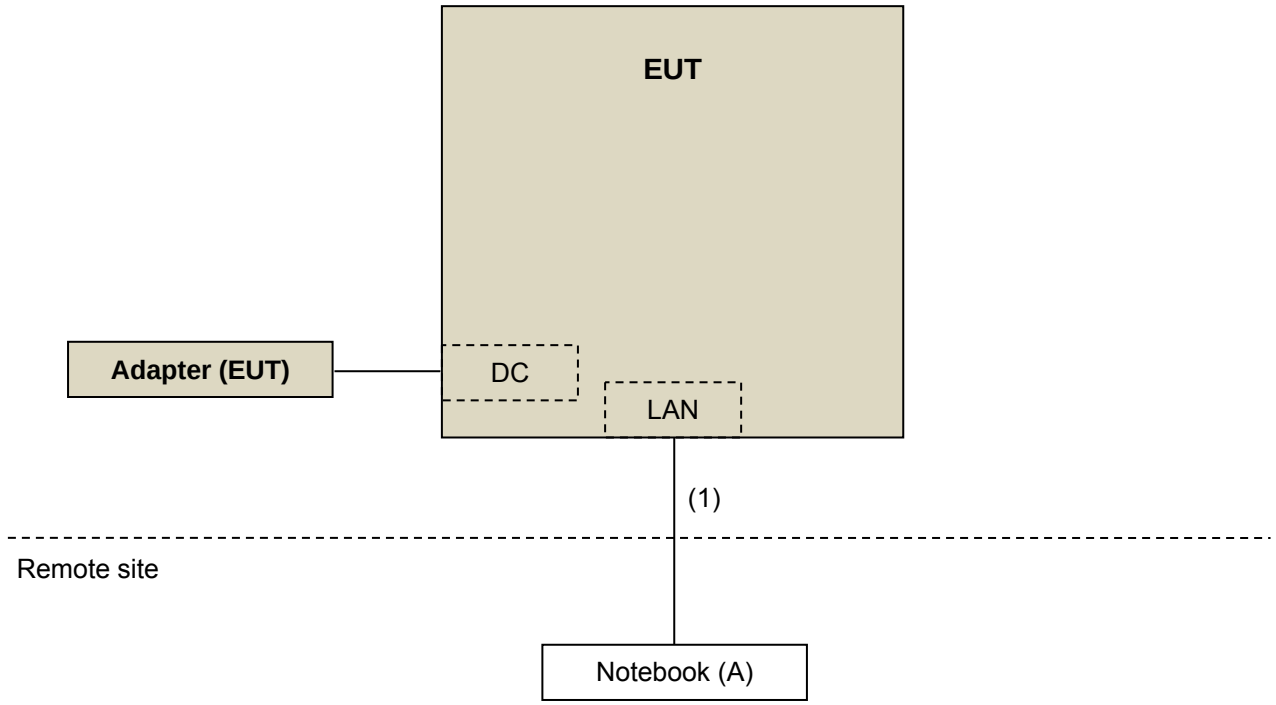
ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Notebook	Lenovo	81A4	YD02TWF5	PPD-QCNFA435	-

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	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	LAN	1	5	N	0	RJ45, Cat5e

3.4.1 Configuration of System under Test



3.5 General Description of Applied Standards and References

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

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

<table>
<tr><td colspan="3">Applicable To</td><td colspan="2">Limit</td></tr>
<tr><td colspan="3" rowspan="2">789033 D02 General UNII Test Procedure New Rules v02r01</td><td colspan="2">Field Strength at 3m</td></tr>
<tr><td>PK: 74 (dBμV/m)</td><td>AV: 54 (dBμV/m)</td></tr>
<tr><td>Frequency Band</td><td colspan="2">Applicable To</td><td>EIRP Limit</td><td>Equivalent Field Strength at 3m</td></tr>
<tr><td>5150~5250 MHz</td><td colspan="2">15.407(b)(1)</td><td rowspan="3">PK: -27 (dBm/MHz)</td><td rowspan="3">PK: 68.2(dBμV/m)</td></tr>
<tr><td>5250~5350 MHz</td><td colspan="2">15.407(b)(2)</td></tr>
<tr><td>5470~5725 MHz</td><td colspan="2">15.407(b)(3)</td></tr>
<tr><td rowspan="2">5725~5850 MHz</td><td>☒</td><td>15.407(b)(4)(i)</td><td>PK: -27 (dBm/MHz) *1
PK: 10 (dBm/MHz) *2
PK: 15.6 (dBm/MHz) *3
PK: 27 (dBm/MHz) *4</td><td>PK: 68.2(dBμV/m) *1
PK: 105.2 (dBμV/m) *2
PK: 110.8(dBμV/m) *3
PK: 122.2 (dBμV/m) *4</td></tr>
<tr><td>☐</td><td>15.407(b)(4)(ii)</td><td colspan="2">Emission limits in section 15.247(d)</td></tr>
<tr><td colspan="5">*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.</td></tr>
</table>

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

$$E = \frac{1000000\ \sqrt{30\,P}}{3}$$ 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	ESCI	100424	Jan. 03, 2019	Jan. 02, 2020
			Dec. 31, 2019	Dec. 30, 2020
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100040	Sep. 23, 2019	Sep. 22, 2020
BILOG Antenna SCHWARZBECK	VULB9168	9168-155	Dec. 12, 2018	Dec. 11, 2019
			Nov. 11, 2019	Nov. 10, 2020
HORN Antenna SCHWARZBECK	BBHA 9120D	9120D-1170	Nov. 25, 2018	Nov. 24, 2019
			Nov. 24, 2019	Nov. 23, 2020
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170241	Nov. 25, 2018	Nov. 24, 2019
			Nov. 24, 2019	Nov. 23, 2020
Loop Antenna TESEQ	HLA 6121	45745	Jul. 01, 2019	Jun. 30, 2020
Preamplifier Agilent (Below 1GHz)	8447D	2944A10631	Jul. 11, 2019	Jul. 10, 2020
Preamplifier KEYSIGHT (Above 1GHz)	83017A	MY53270295	Jun. 11, 2019	Jun. 10, 2020
RF Coaxial Cable WORKEN With 5dB PAD	8D-FB	Cable-CH4-01	Aug. 20, 2019	Aug. 19, 2020
RF Coaxial Cable EMCI	EMC102-KM-KM-3000	150929	Aug. 20, 2019	Aug. 19, 2020
RF Coaxial Cable EMCI	EMC102-KM-KM-600	150928	Aug. 20, 2019	Aug. 19, 2020
RF signal cable HUBER+SUHNER	SUCOFLEX 104	MY 13380+295012/04	Jul. 11, 2019	Jul. 10, 2020
RF signal cable HUBER+SUHNER	SUCOFLEX 104	Cable-CH4-03 (250724)	Jul. 11, 2019	Jul. 10, 2020
Software BV ADT	ADT_Radiated_V7.6.15.9.5	NA	NA	NA
Antenna Tower inn-co GmbH	MA 4000	010303	NA	NA
Antenna Tower Controller BV ADT	AT100	AT93021703	NA	NA
Turn Table BV ADT	TT100	TT93021703	NA	NA
Turn Table Controller BV ADT	SC100	SC93021703	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/MY55190004/MY55190007/MY55210005	Jul. 15, 2019	Jul. 14, 2020

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 4.

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. (802.11a: RBW = 1MHz, VBW = 1kHz; 802.11ax (HE20): RBW = 1MHz, VBW = 1kHz; 802.11ax (HE40): RBW = 1MHz, VBW = 3kHz; 802.11ax (HE80): RBW = 1MHz, VBW = 3kHz)

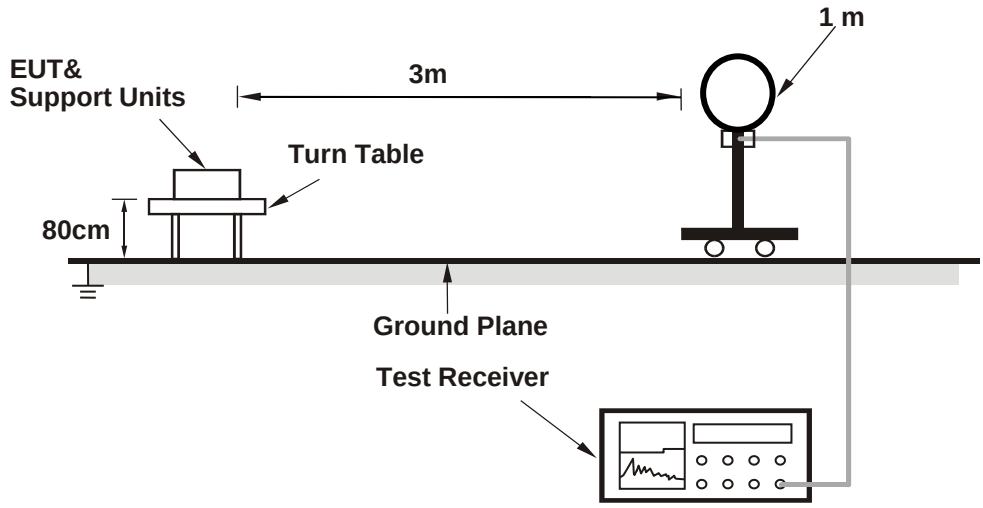
4. All modes of operation were investigated and the worst-case emissions are reported.

4.1.4 Deviation from Test Standard

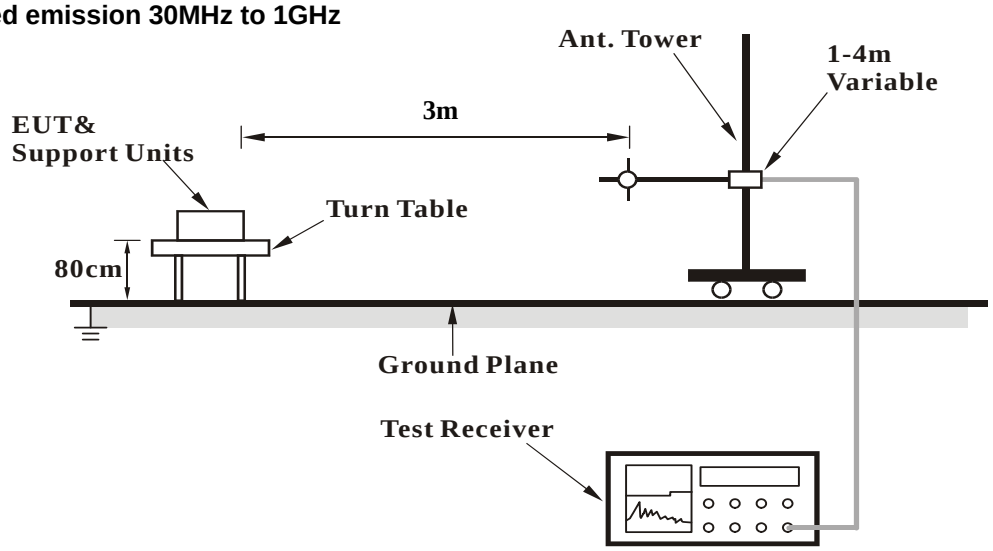
No deviation.

4.1.5 Test Setup

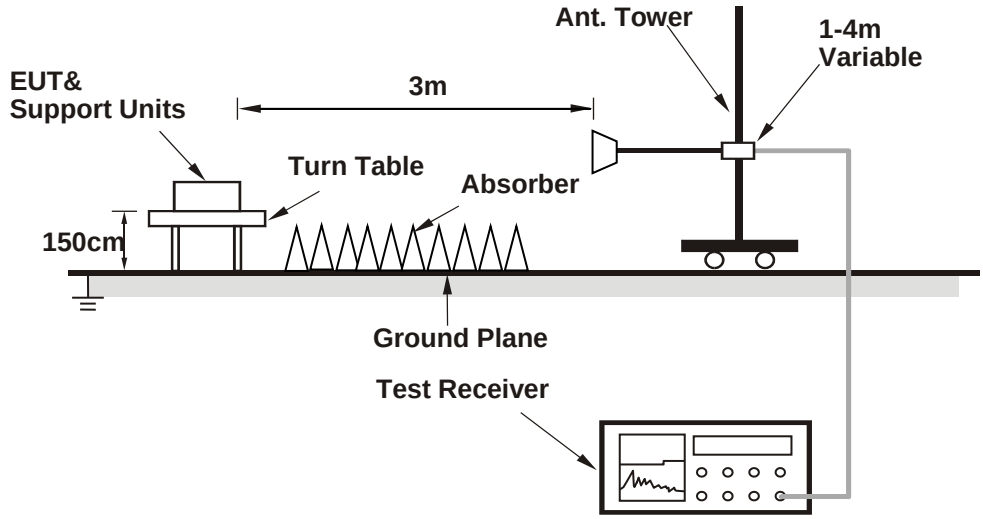
For Radiated emission below 30MHz



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:

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	5144.00	68.2 PK	74.0	-5.8	1.00 H	118	59.2	9.0
2	5144.00	48.9 AV	54.0	-5.1	1.00 H	118	39.9	9.0
3	*5180.00	114.7 PK			1.00 H	118	74.4	40.3
4	*5180.00	105.1 AV			1.00 H	118	64.8	40.3
5	#10360.00	59.9 PK	68.2	-8.3	1.99 H	222	40.0	19.9
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	5144.00	73.2 PK	74.0	-0.8	1.74 V	79	66.8	6.4
2	**5144.00**	**53.9 AV**	**54.0**	**-0.1**	**1.74 V**	**79**	**47.5**	**6.4**
3	*5180.00	119.7 PK			1.74 V	79	82.0	37.7
4	*5180.00	110.1 AV			1.74 V	79	72.4	37.7
5	#10360.00	56.9 PK	68.2	-11.3	1.59 V	200	40.2	16.7

Remarks:

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

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	5104.00	66.3 PK	74.0	-7.7	1.05 H	121	57.3	9.0
2	5104.00	48.4 AV	54.0	-5.6	1.05 H	121	39.4	9.0
3	*5200.00	120.2 PK			1.05 H	121	80.0	40.2
4	*5200.00	109.9 AV			1.05 H	121	69.7	40.2
5	#10400.00	60.5 PK	68.2	-7.7	2.66 H	233	40.4	20.1
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	5104.00	71.3 PK	74.0	-2.7	2.62 V	129	64.9	6.4
2	5104.00	53.4 AV	54.0	-0.6	2.62 V	129	47.0	6.4
3	*5200.00	125.2 PK			2.62 V	129	87.5	37.7
4	*5200.00	114.9 AV			2.62 V	129	77.2	37.7
5	#10400.00	57.5 PK	68.2	-10.7	1.05 V	222	40.5	17.0

Remarks:

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

CHANNEL	TX Channel 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	119.1 PK			1.05 H	126	79.3	39.8
2	*5240.00	109.7 AV			1.05 H	126	69.9	39.8
3	5350.00	61.4 PK	74.0	-12.6	1.05 H	126	52.6	8.8
4	5350.00	47.5 AV	54.0	-6.5	1.05 H	126	38.7	8.8
5	#10480.00	60.5 PK	68.2	-7.7	2.06 H	233	40.3	20.2
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	124.1 PK			2.35 V	124	86.6	37.5
2	*5240.00	114.7 AV			2.35 V	124	77.2	37.5
3	5350.00	61.9 PK	74.0	-12.1	2.35 V	124	55.6	6.3
4	5350.00	48.3 AV	54.0	-5.7	2.35 V	124	42.0	6.3
5	#10480.00	57.5 PK	68.2	-10.7	1.88 V	316	40.6	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. Margin value = Emission Level – Limit value.
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	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	#5639.60	59.0 PK	68.2	-9.2	1.00 H	118	49.5	9.5
2	*5745.00	113.3 PK			1.00 H	118	72.3	41.0
3	*5745.00	103.2 AV			1.00 H	118	62.2	41.0
4	#5998.80	59.0 PK	68.2	-9.2	1.00 H	118	48.6	10.4
5	11490.00	62.2 PK	74.0	-11.8	1.89 H	163	40.1	22.1
6	11490.00	48.6 AV	54.0	-5.4	1.89 H	163	26.5	22.1
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	#5641.60	63.7 PK	68.2	-4.5	1.21 V	69	57.0	6.7
2	*5745.00	123.3 PK			1.21 V	69	84.9	38.4
3	*5745.00	113.9 AV			1.21 V	69	75.5	38.4
4	#5943.20	60.6 PK	68.2	-7.6	1.21 V	69	53.2	7.4
5	11490.00	59.3 PK	74.0	-14.7	1.89 V	152	40.5	18.8
6	11490.00	45.6 AV	54.0	-8.4	1.89 V	152	26.8	18.8

Remarks:

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

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	#5634.40	58.8 PK	68.2	-9.4	1.05 H	120	49.4	9.4
2	*5785.00	118.7 PK			1.05 H	120	77.5	41.2
3	*5785.00	108.3 AV			1.05 H	120	67.1	41.2
4	#5942.80	60.0 PK	68.2	-8.2	1.05 H	120	49.8	10.2
5	11570.00	62.7 PK	74.0	-11.3	1.85 H	205	40.5	22.2
6	11570.00	49.1 AV	54.0	-4.9	1.85 H	205	26.9	22.2
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	#5620.00	59.3 PK	68.2	-8.9	1.86 V	72	52.6	6.7
2	*5785.00	125.9 PK			1.86 V	72	87.5	38.4
3	*5785.00	115.5 AV			1.86 V	72	77.1	38.4
4	#5959.20	60.7 PK	68.2	-7.5	1.86 V	72	53.3	7.4
5	11570.00	59.5 PK	74.0	-14.5	1.58 V	250	40.6	18.9
6	11570.00	45.9 AV	54.0	-8.1	1.58 V	250	27.0	18.9

Remarks:

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

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	#5620.80	59.8 PK	68.2	-8.4	1.85 H	120	50.4	9.4
2	*5825.00	118.9 PK			1.85 H	120	77.5	41.4
3	*5825.00	108.9 AV			1.85 H	120	67.5	41.4
4	#5928.40	60.2 PK	68.2	-8.0	1.85 H	120	50.0	10.2
5	11650.00	62.2 PK	74.0	-11.8	2.66 H	215	40.3	21.9
6	11650.00	49.0 AV	54.0	-5.0	2.66 H	215	27.1	21.9
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	#5620.80	59.6 PK	68.2	-8.6	2.18 V	124	52.9	6.7
2	*5825.00	125.9 PK			2.18 V	124	87.5	38.4
3	*5825.00	115.9 AV			2.18 V	124	77.5	38.4
4	#5929.60	64.6 PK	68.2	-3.6	2.18 V	124	57.2	7.4
5	11650.00	58.8 PK	74.0	-15.2	1.88 V	174	40.4	18.4
6	11650.00	45.2 AV	54.0	-8.8	1.88 V	174	26.8	18.4

Remarks:

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

802.11ax (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	68.4 PK	74.0	-5.6	1.00 H	116	59.4	9.0
2	5150.00	48.7 AV	54.0	-5.3	1.00 H	116	39.7	9.0
3	*5180.00	120.4 PK			1.00 H	116	80.1	40.3
4	*5180.00	107.8 AV			1.00 H	116	67.5	40.3
5	#10360.00	60.1 PK	68.2	-8.1	1.35 H	100	40.2	19.9
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	5148.00	73.4 PK	74.0	-0.6	2.38 V	122	67.0	6.4
2	5148.00	53.7 AV	54.0	-0.3	2.38 V	122	47.3	6.4
3	*5180.00	125.4 PK			2.38 V	122	87.7	37.7
4	*5180.00	112.8 AV			2.38 V	122	75.1	37.7
5	#10360.00	57.1 PK	68.2	-11.1	1.55 V	302	40.4	16.7

Remarks:

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

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	5150.00	65.6 PK	74.0	-8.4	2.51 H	136	56.6	9.0
2	5150.00	48.9 AV	54.0	-5.1	2.51 H	136	39.9	9.0
3	*5200.00	118.3 PK			1.00 H	118	78.1	40.2
4	*5200.00	106.5 AV			1.00 H	118	66.3	40.2
5	#10400.00	60.6 PK	68.2	-7.6	1.36 H	188	40.5	20.1
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	5150.00	70.6 PK	74.0	-3.4	2.47 V	124	64.2	6.4
2	5150.00	53.7 AV	54.0	-0.3	2.47 V	124	47.3	6.4
3	*5200.00	123.3 PK			2.47 V	124	85.6	37.7
4	*5200.00	111.5 AV			2.47 V	124	73.8	37.7
5	#10400.00	57.6 PK	68.2	-10.6	1.33 V	200	40.6	17.0

Remarks:

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

CHANNEL	TX Channel 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	120.0 PK			1.00 H	118	80.2	39.8
2	*5240.00	108.0 AV			1.00 H	118	68.2	39.8
3	5350.00	60.5 PK	74.0	-13.5	1.00 H	118	51.7	8.8
4	5350.00	47.8 AV	54.0	-6.2	1.00 H	118	39.0	8.8
5	#10480.00	60.7 PK	68.2	-7.5	1.36 H	303	40.5	20.2
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	125.0 PK			2.34 V	122	87.5	37.5
2	*5240.00	113.0 AV			2.34 V	122	75.5	37.5
3	5350.00	61.2 PK	74.0	-12.8	2.34 V	122	54.9	6.3
4	5350.00	48.0 AV	54.0	-6.0	2.34 V	122	41.7	6.3
5	#10480.00	57.7 PK	68.2	-10.5	1.98 V	200	40.8	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. Margin value = Emission Level – Limit value.
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	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	#5641.20	61.1 PK	68.2	-7.1	1.00 H	118	51.6	9.5
2	*5745.00	122.6 PK			1.00 H	118	81.6	41.0
3	*5745.00	109.0 AV			1.00 H	118	68.0	41.0
4	#5947.60	61.5 PK	68.2	-6.7	1.00 H	118	51.3	10.2
5	11490.00	62.6 PK	74.0	-11.4	2.06 H	233	40.5	22.1
6	11490.00	48.9 AV	54.0	-5.1	2.06 H	233	26.8	22.1
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	#5648.80	61.7 PK	68.2	-6.5	1.56 V	81	55.0	6.7
2	*5745.00	127.6 PK			1.56 V	81	89.2	38.4
3	*5745.00	114.0 AV			1.56 V	81	75.6	38.4
4	#5968.80	60.1 PK	68.2	-8.1	1.56 V	81	52.7	7.4
5	11490.00	59.6 PK	74.0	-14.4	1.85 V	144	40.8	18.8
6	11490.00	45.8 AV	54.0	-8.2	1.85 V	144	27.0	18.8

Remarks:

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

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	#5608.40	59.9 PK	68.2	-8.3	1.05 H	120	50.5	9.4
2	*5785.00	121.3 PK			1.05 H	120	80.1	41.2
3	*5785.00	110.0 AV			1.05 H	120	68.8	41.2
4	#5989.20	60.9 PK	68.2	-7.3	1.05 H	120	50.6	10.3
5	11570.00	62.6 PK	74.0	-11.4	2.66 H	233	40.4	22.2
6	11570.00	49.3 AV	54.0	-4.7	2.66 H	233	27.1	22.2
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	#5638.40	60.3 PK	68.2	-7.9	1.68 V	120	53.6	6.7
2	*5785.00	126.3 PK			1.68 V	120	87.9	38.4
3	*5785.00	115.0 AV			1.68 V	120	76.6	38.4
4	#5933.60	60.2 PK	68.2	-8.0	1.68 V	120	52.8	7.4
5	11570.00	59.4 PK	74.0	-14.6	1.52 V	105	40.5	18.9
6	11570.00	46.1 AV	54.0	-7.9	1.52 V	105	27.2	18.9

Remarks:

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

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	#5600.80	59.8 PK	68.2	-8.4	1.05 H	121	50.4	9.4
2	*5825.00	121.9 PK			1.05 H	121	80.5	41.4
3	*5825.00	109.8 AV			1.05 H	121	68.4	41.4
4	#5927.60	61.1 PK	68.2	-7.1	1.05 H	121	50.9	10.2
5	11650.00	62.4 PK	74.0	-11.6	2.99 H	302	40.5	21.9
6	11650.00	49.1 AV	54.0	-4.9	2.99 H	302	27.2	21.9
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	#5628.80	59.3 PK	68.2	-8.9	1.65 V	119	52.6	6.7
2	*5825.00	126.9 PK			1.65 V	119	88.5	38.4
3	*5825.00	114.8 AV			1.65 V	119	76.4	38.4
4	#5934.40	66.7 PK	68.2	-1.5	1.65 V	119	59.3	7.4
5	11650.00	59.0 PK	74.0	-15.0	1.55 V	302	40.6	18.4
6	11650.00	45.3 AV	54.0	-8.7	1.55 V	302	26.9	18.4

Remarks:

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

802.11ax (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	5149.00	66.3 PK	74.0	-7.7	1.00 H	121	57.3	9.0
2	5149.00	49.7 AV	54.0	-4.3	1.00 H	121	40.7	9.0
3	*5190.00	110.5 PK			1.00 H	121	70.2	40.3
4	*5190.00	98.6 AV			1.00 H	121	58.3	40.3
5	#10380.00	60.5 PK	68.2	-7.7	1.88 H	306	40.5	20.0
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	5149.00	71.3 PK	74.0	-2.7	2.47 V	121	64.9	6.4
2	5149.00	53.7 AV	54.0	-0.3	2.47 V	121	47.3	6.4
3	*5190.00	115.5 PK			2.47 V	121	77.8	37.7
4	*5190.00	103.6 AV			2.47 V	121	65.9	37.7
5	#10380.00	57.4 PK	68.2	-10.8	1.85 V	144	40.6	16.8

Remarks:

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

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	5148.00	65.8 PK	74.0	-8.2	1.05 H	123	56.8	9.0
2	5148.00	48.8 AV	54.0	-5.2	1.05 H	123	39.8	9.0
3	*5230.00	116.6 PK			1.05 H	123	76.7	39.9
4	*5230.00	105.8 AV			1.05 H	123	65.9	39.9
5	5350.00	65.8 PK	74.0	-8.2	1.05 H	123	57.0	8.8
6	5350.00	48.8 AV	54.0	-5.2	1.05 H	123	40.0	8.8
7	#10460.00	60.7 PK	68.2	-7.5	1.88 H	156	40.5	20.2
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	5148.00	68.8 PK	74.0	-5.2	2.33 V	124	62.4	6.4
2	5148.00	53.8 AV	54.0	-0.2	2.33 V	124	47.4	6.4
3	*5230.00	121.6 PK			2.33 V	124	84.0	37.6
4	*5230.00	110.8 AV			2.33 V	124	73.2	37.6
5	5350.00	68.2 PK	74.0	-5.8	2.33 V	124	61.9	6.3
6	5350.00	53.3 AV	54.0	-0.7	2.33 V	124	47.0	6.3
7	#10460.00	57.7 PK	68.2	-10.5	1.55 V	200	40.7	17.0

Remarks:

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

CHANNEL	TX Channel 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	#5644.00	65.0 PK	68.2	-3.2	1.00 H	115	55.5	9.5
2	*5755.00	119.2 PK			1.00 H	115	78.2	41.0
3	*5755.00	107.4 AV			1.00 H	115	66.4	41.0
4	#5946.80	62.2 PK	68.2	-6.0	1.00 H	115	52.0	10.2
5	11510.00	62.7 PK	74.0	-11.3	2.84 H	152	40.7	22.0
6	11510.00	49.1 AV	54.0	-4.9	2.84 H	152	27.1	22.0
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	#5648.80	66.3 PK	68.2	-1.9	2.00 V	120	59.6	6.7
2	*5755.00	124.2 PK			2.00 V	120	85.8	38.4
3	*5755.00	112.4 AV			2.00 V	120	74.0	38.4
4	#5932.00	61.9 PK	68.2	-6.3	2.00 V	120	54.5	7.4
5	11510.00	59.3 PK	74.0	-14.7	3.18 V	205	40.6	18.7
6	11510.00	45.9 AV	54.0	-8.1	3.18 V	205	27.2	18.7

Remarks:

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

CHANNEL	TX Channel 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	#5638.80	59.9 PK	68.2	-8.3	1.15 H	117	50.4	9.5
2	*5795.00	118.3 PK			1.15 H	117	77.0	41.3
3	*5795.00	107.3 AV			1.15 H	117	66.0	41.3
4	#5935.20	63.1 PK	68.2	-5.1	1.15 H	117	52.9	10.2
5	11590.00	62.6 PK	74.0	-11.4	2.15 H	206	40.5	22.1
6	11590.00	49.1 AV	54.0	-4.9	2.15 H	206	27.0	22.1
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	#5637.60	60.2 PK	68.2	-8.0	1.44 V	120	53.5	6.7
2	*5795.00	123.3 PK			1.44 V	120	84.9	38.4
3	*5795.00	112.3 AV			1.44 V	120	73.9	38.4
4	#5935.20	65.0 PK	68.2	-3.2	1.44 V	120	57.6	7.4
5	11590.00	59.7 PK	74.0	-14.3	1.99 V	166	40.8	18.9
6	11590.00	46.1 AV	54.0	-7.9	1.99 V	166	27.2	18.9

Remarks:

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

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	5148.00	65.9 PK	74.0	-8.1	1.00 H	130	56.9	9.0
2	5148.00	49.9 AV	54.0	-4.1	1.00 H	130	40.9	9.0
3	*5210.00	108.9 PK			1.00 H	130	68.8	40.1
4	*5210.00	96.5 AV			1.00 H	130	56.4	40.1
5	5350.00	65.3 PK	74.0	-8.7	1.00 H	130	56.5	8.8
6	5350.00	49.1 AV	54.0	-4.9	1.00 H	130	40.3	8.8
7	#10420.00	60.1 PK	68.2	-8.1	2.51 H	185	40.0	20.1
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	5148.00	70.9 PK	74.0	-3.1	2.57 V	127	64.5	6.4
2	5148.00	53.9 AV	54.0	-0.1	2.57 V	127	47.5	6.4
3	*5210.00	113.9 PK			2.58 V	127	76.3	37.6
4	*5210.00	101.5 AV			2.58 V	127	63.9	37.6
5	5350.00	66.4 PK	74.0	-7.6	2.57 V	127	60.1	6.3
6	5350.00	51.8 AV	54.0	-2.2	2.57 V	127	45.5	6.3
7	#10420.00	57.4 PK	68.2	-10.8	1.89 V	100	40.5	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. Margin value = Emission Level – Limit value.
4. The other emission levels were very low against the limit.
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	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	#5640.00	58.3 PK	68.2	-9.9	1.05 H	120	51.6	6.7
2	*5775.00	111.3 PK			1.05 H	120	72.9	38.4
3	*5775.00	100.1 AV			1.05 H	120	61.7	38.4
4	#5928.00	58.5 PK	68.2	-9.7	1.05 H	120	51.1	7.4
5	11550.00	59.4 PK	74.0	-14.6	3.05 H	200	40.5	18.9
6	11550.00	46.2 AV	54.0	-7.8	3.05 H	200	27.3	18.9
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	#5649.60	68.1 PK	68.2	-0.1	1.82 V	121	61.4	6.7
2	*5775.00	116.3 PK			1.82 V	121	77.9	38.4
3	*5775.00	105.1 AV			1.82 V	121	66.7	38.4
4	#5932.80	61.9 PK	68.2	-6.3	1.82 V	121	54.5	7.4
5	11550.00	59.3 PK	74.0	-14.7	2.05 V	305	40.4	18.9
6	11550.00	46.0 AV	54.0	-8.0	2.05 V	305	27.1	18.9

Remarks:

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

Below 1GHz Worst-Case Data:

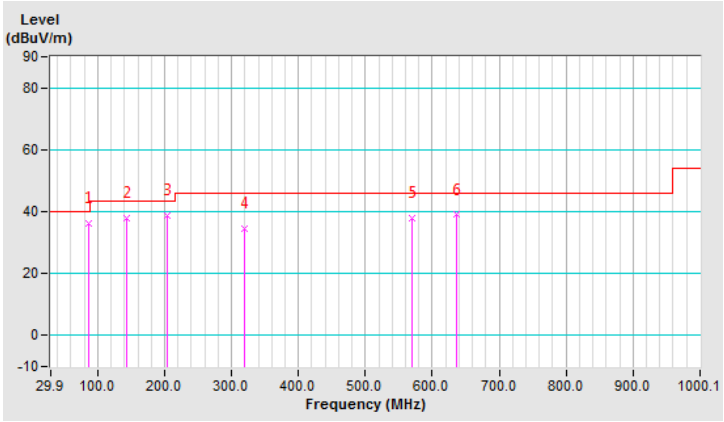
802.11ax (HE20)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	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	86.17	36.1 QP	40.0	-3.9	2.00 H	330	50.1	-14.0
2	142.44	37.7 QP	43.5	-5.8	1.50 H	343	46.7	-9.0
3	204.54	38.7 QP	43.5	-4.8	1.50 H	345	50.2	-11.5
4	319.02	34.5 QP	46.0	-11.5	1.00 H	254	41.2	-6.7
5	569.33	37.7 QP	46.0	-8.3	1.50 H	328	38.8	-1.1
6	637.25	38.9 QP	46.0	-7.1	1.00 H	310	38.0	0.9

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 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.

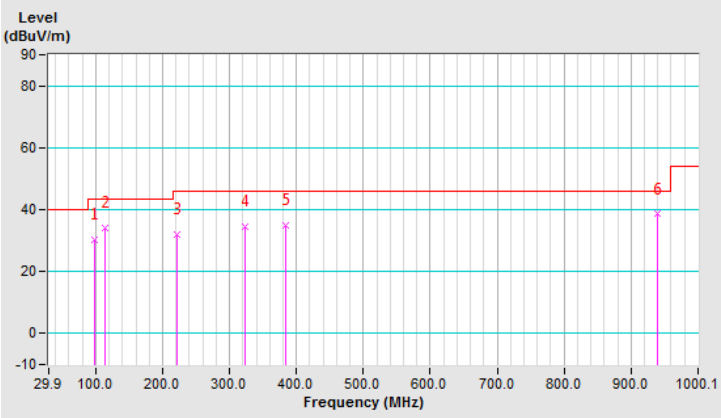


CHANNEL	TX Channel 165	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	97.81	30.4 QP	43.5	-13.1	1.00 V	161	44.0	-13.6
2	113.34	34.1 QP	43.5	-9.4	1.00 V	304	45.6	-11.5
3	222.00	31.9 QP	46.0	-14.1	1.00 V	316	43.3	-11.4
4	322.90	34.4 QP	46.0	-11.6	1.49 V	12	41.1	-6.7
5	383.05	34.8 QP	46.0	-11.2	1.00 V	308	40.0	-5.2
6	939.95	38.5 QP	46.0	-7.5	1.00 V	239	30.6	7.9

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 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

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Test Receiver ROHDE & SCHWARZ	ESCI	100613	Dec. 10, 2018	Dec. 09, 2019
			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. 21, 2019	Feb. 20, 2020
			Feb. 20, 2020	Feb. 19, 2021
LISN ROHDE & SCHWARZ (Peripheral)	ESH3-Z5	100311	Aug. 22, 2019	Aug. 21, 2020
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.
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.

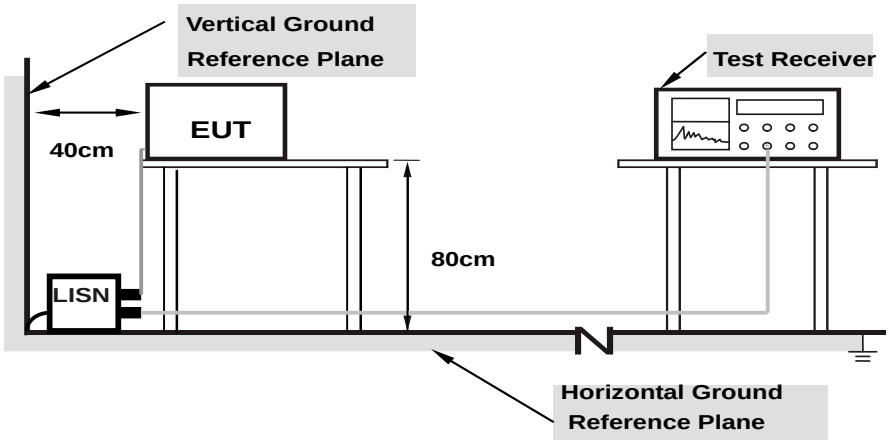
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

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

Worst-case data:

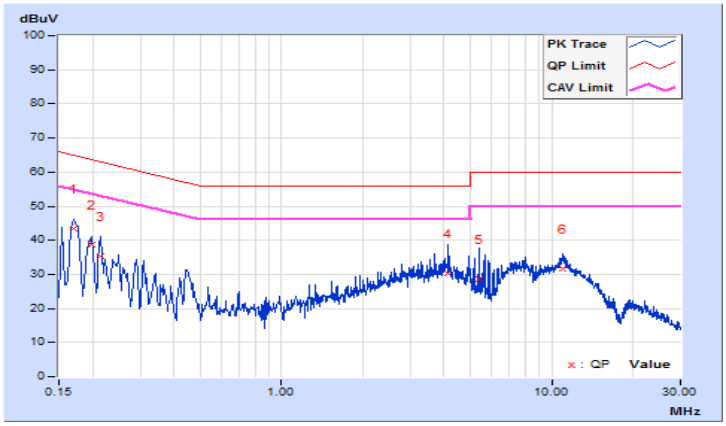
802.11ax (HE20)

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

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	0.16932	9.67	33.70	18.72	43.37	28.39	64.99	54.99	-21.62	-26.60
2	0.19800	9.66	28.93	14.74	38.59	24.40	63.69	53.69	-25.10	-29.29
3	0.21400	9.66	25.55	12.34	35.21	22.00	63.05	53.05	-27.84	-31.05
4	4.14600	9.84	20.34	12.36	30.18	22.20	56.00	46.00	-25.82	-23.80
5	5.37800	9.86	18.77	6.37	28.63	16.23	60.00	50.00	-31.37	-33.77
6	11.02600	9.94	21.64	14.62	31.58	24.56	60.00	50.00	-28.42	-25.44

Remarks:

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

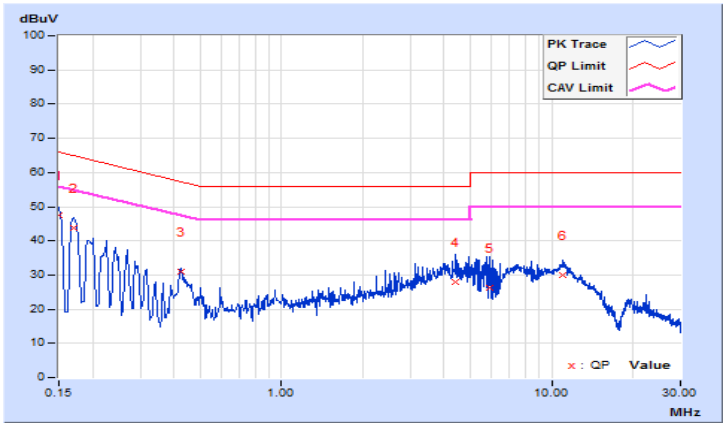


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	**0.15000**	**9.64**	**37.72**	**20.56**	**47.36**	**30.20**	**66.00**	**56.00**	**-18.64**	**-25.80**
2	0.16977	9.64	34.06	17.97	43.70	27.61	64.97	54.97	-21.27	-27.36
3	0.42577	9.66	21.32	15.99	30.98	25.65	57.33	47.33	-26.35	-21.68
4	4.40200	9.82	18.04	9.31	27.86	19.13	56.00	46.00	-28.14	-26.87
5	5.89800	9.84	16.50	5.14	26.34	14.98	60.00	50.00	-33.66	-35.02
6	11.05800	9.93	20.05	13.14	29.98	23.07	60.00	50.00	-30.02	-26.93

Remarks:

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



4.3 Transmit Power Measurement

4.3.1 Limits of Transmit Power Measurement

Operation Band	EUT Category		Limit
U-NII-1		Outdoor Access Point	1 Watt (30 dBm) (Max. e.i.r.p ≦ 125mW(21 dBm) at any elevation angle above 30 degrees as measured from the horizon)
		Fixed point-to-point Access Point	1 Watt (30 dBm)
	√	Indoor Access Point	1 Watt (30 dBm)
		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)

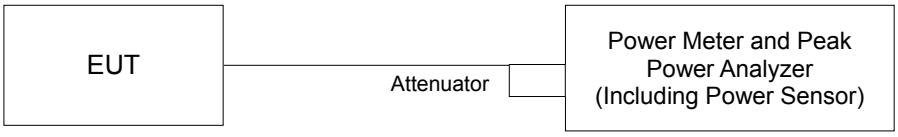
*B is the 26 dB emission bandwidth in megahertz

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:

CDD Mode

802.11a

Chan.	Freq. (MHz)	Average Power (dBm)			Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
36	5180	22.42	22.05	22.61	517.297	27.14	30.00	Pass
40	5200	24.01	23.81	24.37	765.731	28.84	30.00	Pass
48	5240	24.72	24.51	24.78	**879.579**	29.44	30.00	Pass
149	5745	25.06	24.71	25.09	939.277	29.73	30.00	Pass
157	5785	24.91	24.69	25.22	936.844	29.72	30.00	Pass
165	5825	24.81	24.65	25.16	922.529	29.65	30.00	Pass

802.11ac (VHT20)

Chan.	Freq. (MHz)	Average Power (dBm)			Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
36	5180	21.39	20.93	21.40	399.639	26.02	30.00	Pass
40	5200	24.41	23.98	24.70	821.214	29.14	30.00	Pass
48	5240	24.71	24.48	24.76	875.570	29.42	30.00	Pass
149	5745	24.97	24.77	24.99	929.467	29.68	30.00	Pass
157	5785	24.98	24.74	25.06	933.254	29.70	30.00	Pass
165	5825	24.96	24.86	25.05	939.415	29.73	30.00	Pass

802.11ac (VHT40)

Chan.	Freq. (MHz)	Average Power (dBm)			Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
38	5190	19.39	19.55	19.85	273.658	24.37	30.00	Pass
46	5230	23.48	23.05	23.85	667.342	28.24	30.00	Pass
151	5755	25.08	24.64	24.97	927.230	29.67	30.00	Pass
159	5795	25.02	24.79	24.86	925.184	29.66	30.00	Pass

802.11ac (VHT80)

Chan.	Freq. (MHz)	Average Power (dBm)			Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
42	5210	19.25	19.48	19.81	268.575	24.29	30.00	Pass
155	5775	22.64	21.97	21.88	495.222	26.95	30.00	Pass

802.11ax (HE20)

Chan.	Freq. (MHz)	Average Power (dBm)			Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
36	5180	21.46	21.02	21.46	406.392	26.09	30.00	Pass
40	5200	24.47	24.00	24.80	833.082	29.21	30.00	Pass
48	5240	24.65	24.47	24.64	862.713	29.36	30.00	Pass
149	5745	24.99	24.81	25.09	941.040	29.74	30.00	Pass
157	5785	25.04	24.76	25.07	939.746	29.73	30.00	Pass
165	5825	25.04	24.90	25.08	**950.291**	29.78	30.00	Pass

802.11ax (HE40)

Chan.	Freq. (MHz)	Average Power (dBm)			Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
38	5190	19.48	19.59	19.88	276.982	24.42	30.00	Pass
46	5230	23.56	23.08	23.87	674.003	28.29	30.00	Pass
151	5755	25.12	24.70	25.03	938.628	29.72	30.00	Pass
159	5795	25.11	24.88	24.96	945.279	29.76	30.00	Pass

802.11ax (HE80)

Chan.	Freq. (MHz)	Average Power (dBm)			Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
42	5210	19.33	19.52	19.87	272.291	24.35	30.00	Pass
155	5775	22.75	22.13	21.86	505.132	27.03	30.00	Pass

Beamforming Mode

802.11ac (VHT20)

Chan.	Freq. (MHz)	Average Power (dBm)			Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
36	5180	21.39	20.93	21.40	399.639	26.02	29.66	Pass
40	5200	24.41	23.98	24.70	821.214	29.14	29.66	Pass
48	5240	24.91	24.68	24.96	**916.836**	29.62	29.66	Pass
149	5745	24.11	24.28	24.50	807.387	29.07	29.21	Pass
157	5785	24.30	24.26	24.37	809.366	29.08	29.21	Pass
165	5825	24.25	24.41	24.46	821.385	29.15	29.21	Pass

Note:
1. 5180-5240MHz: Directional gain = 6.34dBi > 6dBi, so the power limit shall be reduced to 30 - (6.34 - 6) = 29.66dBi.
2. 5745-5825MHz: Directional gain = 6.79dBi > 6dBi, so the power limit shall be reduced to 30 - (6.79 - 6) = 29.21dBi.

802.11ac (VHT40)

Chan.	Freq. (MHz)	Average Power (dBm)			Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
38	5190	19.39	19.55	19.85	273.658	24.37	29.66	Pass
46	5230	23.48	23.05	23.85	667.342	28.24	29.66	Pass
151	5755	24.31	24.18	24.26	798.278	29.02	29.21	Pass
159	5795	24.44	24.33	24.36	821.888	29.15	29.21	Pass

Note:
1. 5180-5240MHz: Directional gain = 6.34dBi > 6dBi, so the power limit shall be reduced to 30 - (6.34 - 6) = 29.66dBi.
2. 5745-5825MHz: Directional gain = 6.79dBi > 6dBi, so the power limit shall be reduced to 30 - (6.79 - 6) = 29.21dBi.

802.11ac (VHT80)

Chan.	Freq. (MHz)	Average Power (dBm)			Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
42	5210	19.25	19.48	19.81	268.575	24.29	29.66	Pass
155	5775	21.22	20.61	21.50	388.768	25.90	29.21	Pass

Note:
1. 5180-5240MHz: Directional gain = 6.34dBi > 6dBi, so the power limit shall be reduced to 30 - (6.34 - 6) = 29.66dBi.
2. 5745-5825MHz: Directional gain = 6.79dBi > 6dBi, so the power limit shall be reduced to 30 - (6.79 - 6) = 29.21dBi.

802.11ax (HE20)

Chan.	Freq. (MHz)	Average Power (dBm)			Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
36	5180	21.46	21.02	21.46	406.392	26.09	29.66	Pass
40	5200	24.47	24.00	24.80	833.082	29.21	29.66	Pass
48	5240	24.85	24.67	24.84	903.370	29.56	29.66	Pass
149	5745	24.22	24.34	24.47	815.783	29.12	29.21	Pass
157	5785	24.26	24.30	24.42	812.533	29.10	29.21	Pass
165	5825	24.29	24.44	24.41	822.563	29.15	29.21	Pass

Note:
1. 5180-5240MHz: Directional gain = 6.34dBi > 6dBi, so the power limit shall be reduced to 30 - (6.34 - 6) = 29.66dBi.
2. 5745-5825MHz: Directional gain = 6.79dBi > 6dBi, so the power limit shall be reduced to 30 - (6.79 - 6) = 29.21dBi.

802.11ax (HE40)

Chan.	Freq. (MHz)	Average Power (dBm)			Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
38	5190	19.48	19.59	19.88	276.982	24.42	29.66	Pass
46	5230	23.56	23.08	23.87	674.003	28.29	29.66	Pass
151	5755	24.34	24.23	24.38	810.651	29.09	29.21	Pass
159	5795	24.34	24.38	24.47	**825.699**	29.17	29.21	Pass

Note:
1. 5180-5240MHz: Directional gain = 6.34dBi > 6dBi, so the power limit shall be reduced to 30 - (6.34 - 6) = 29.66dBi.
2. 5745-5825MHz: Directional gain = 6.79dBi > 6dBi, so the power limit shall be reduced to 30 - (6.79 - 6) = 29.21dBi.

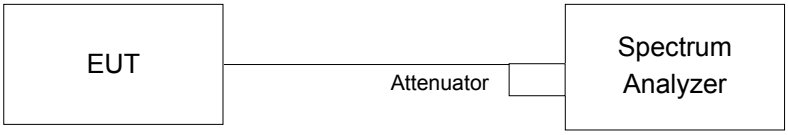
802.11ax (HE80)

Chan.	Freq. (MHz)	Average Power (dBm)			Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
42	5210	19.33	19.52	19.87	272.291	24.35	29.66	Pass
155	5775	21.29	20.68	21.54	394.097	25.96	29.21	Pass

Note:
1. 5180-5240MHz: Directional gain = 6.34dBi > 6dBi, so the power limit shall be reduced to 30 - (6.34 - 6) = 29.66dBi.
2. 5745-5825MHz: Directional gain = 6.79dBi > 6dBi, so the power limit shall be reduced to 30 - (6.79 - 6) = 29.21dBi.

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

802.11a

Chan.	Freq. (MHz)	Occupied Bandwidth (MHz)		
		Chain 0	Chain 1	Chain 2
36	5180	17.28	17.16	17.16
40	5200	18.12	18.00	18.12
48	5240	18.75	19.80	19.80
149	5745	21.30	20.16	19.80
157	5785	22.68	20.88	19.92
165	5825	23.04	21.12	19.08

802.11ax (HE20)

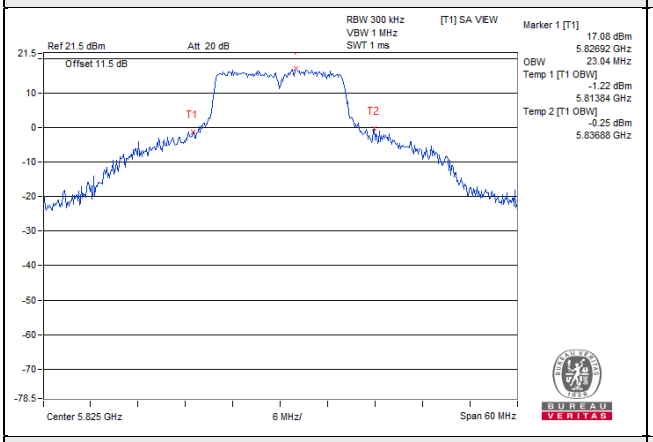
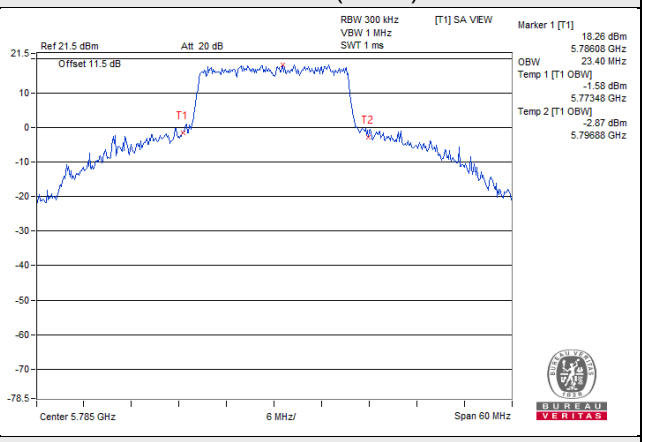
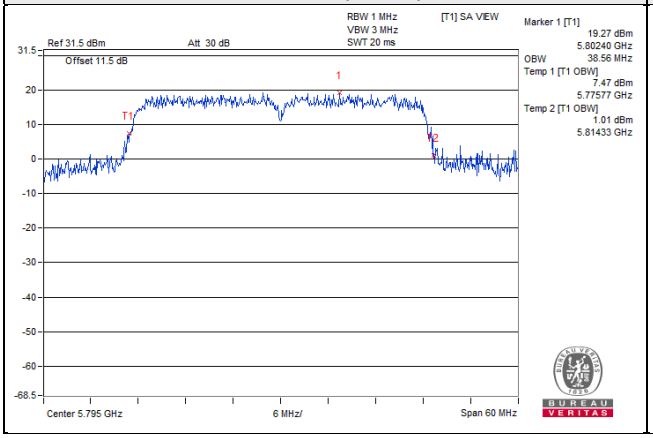
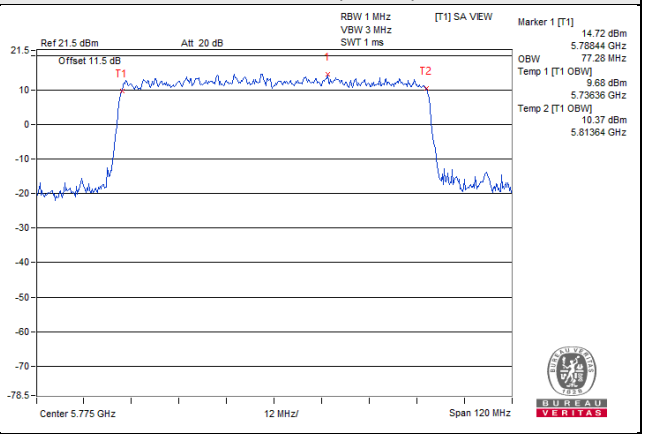
Chan.	Freq. (MHz)	Occupied Bandwidth (MHz)		
		Chain 0	Chain 1	Chain 2
36	5180	19.20	19.20	19.20
40	5200	19.80	19.56	19.56
48	5240	19.90	19.13	19.13
149	5745	23.04	22.32	20.64
157	5785	23.40	22.56	20.64
165	5825	23.16	21.96	19.68

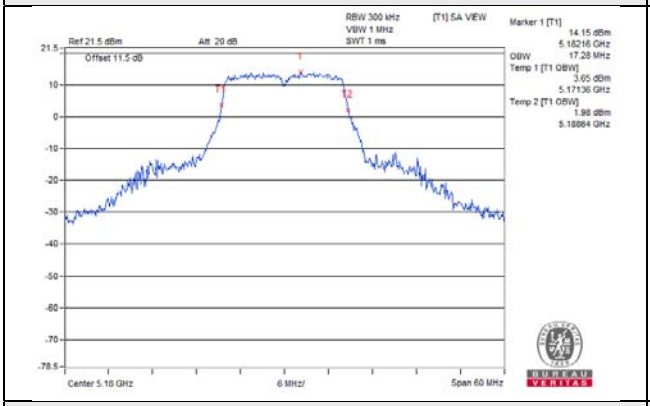
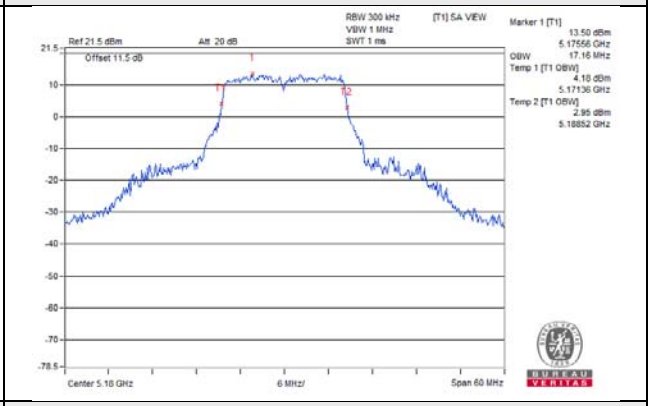
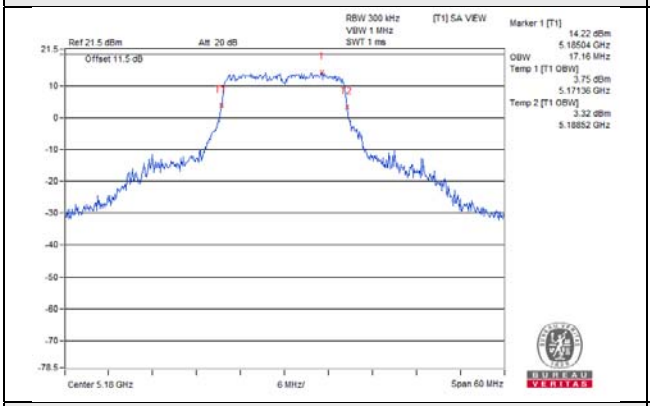
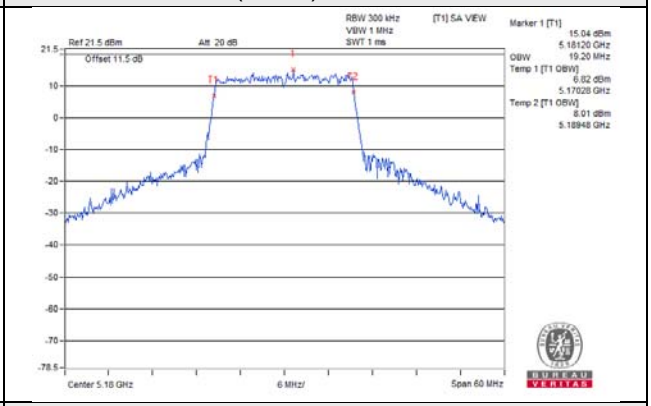
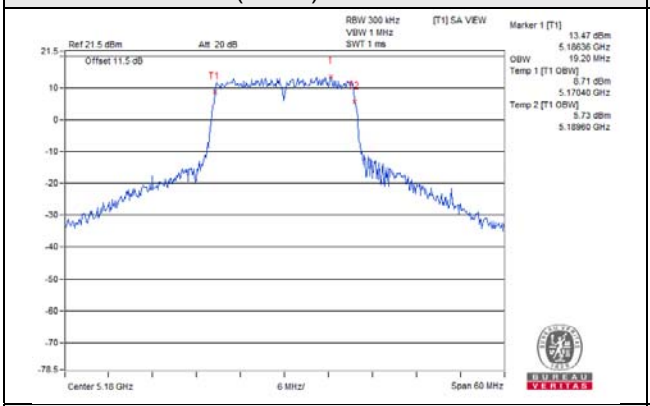
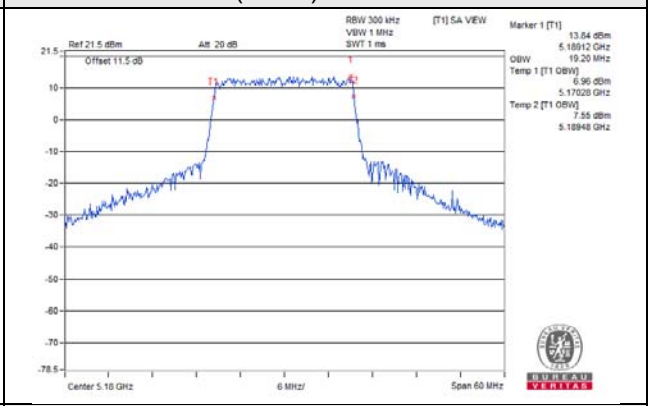
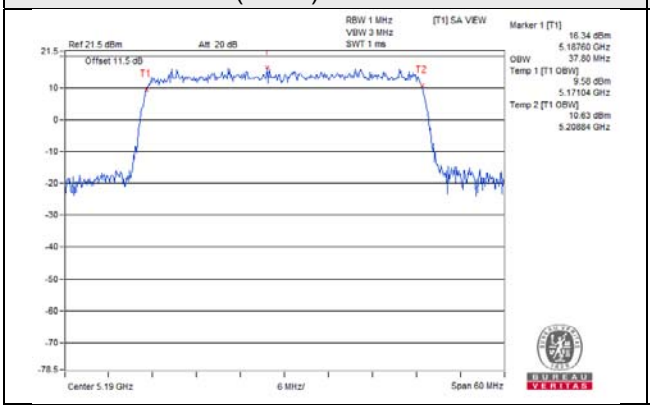
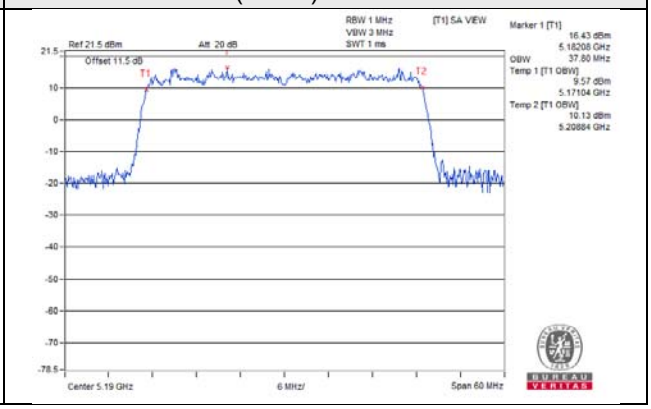
802.11ax (HE40)

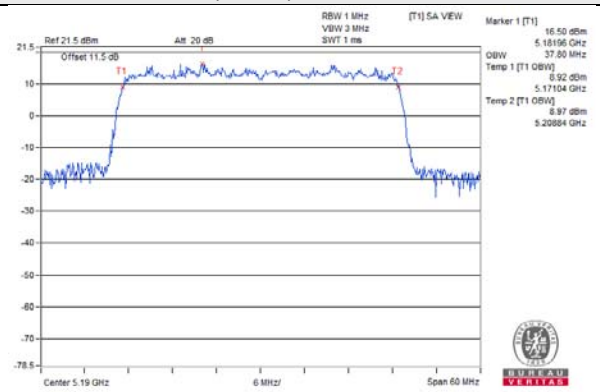
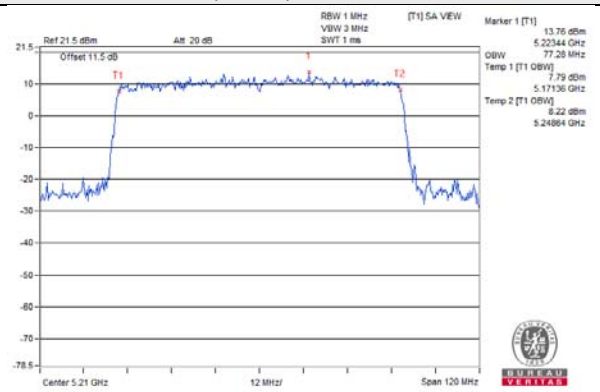
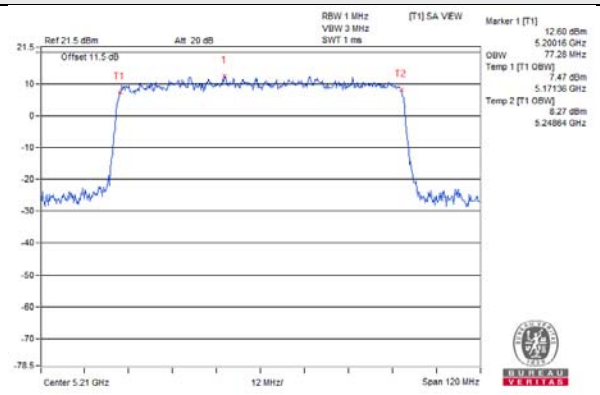
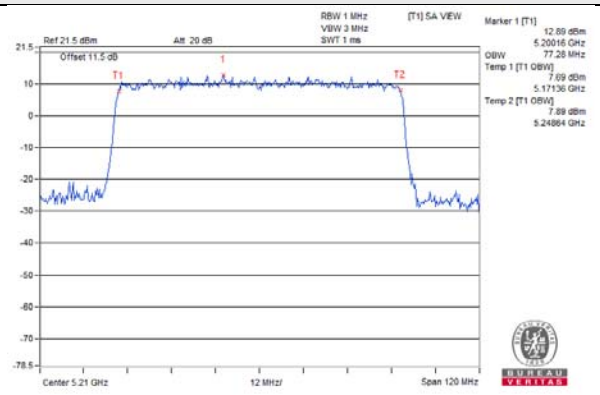
Chan.	Freq. (MHz)	Occupied Bandwidth (MHz)		
		Chain 0	Chain 1	Chain 2
38	5190	37.80	37.80	37.80
46	5230	38.04	38.04	38.04
151	5755	38.56	37.02	37.31
159	5795	38.56	37.50	37.21

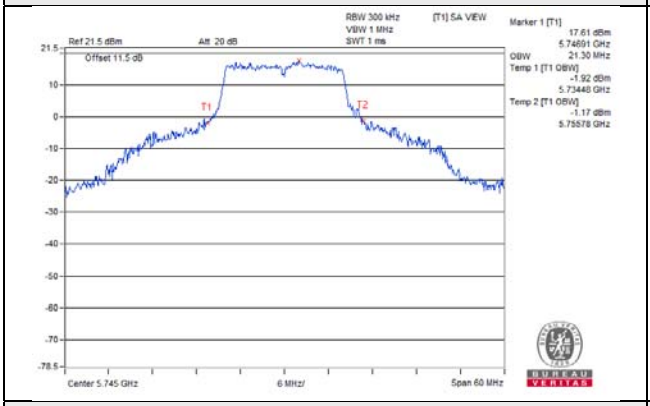
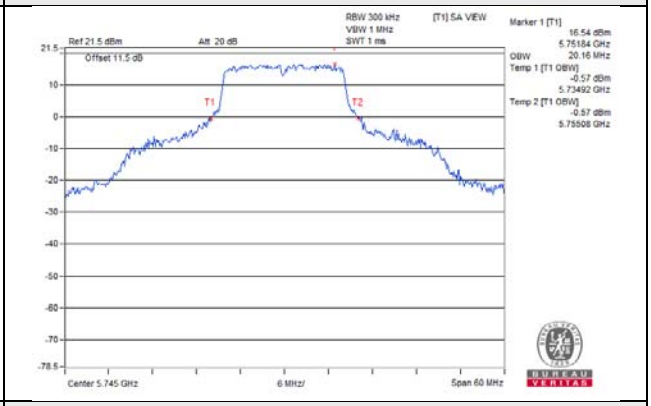
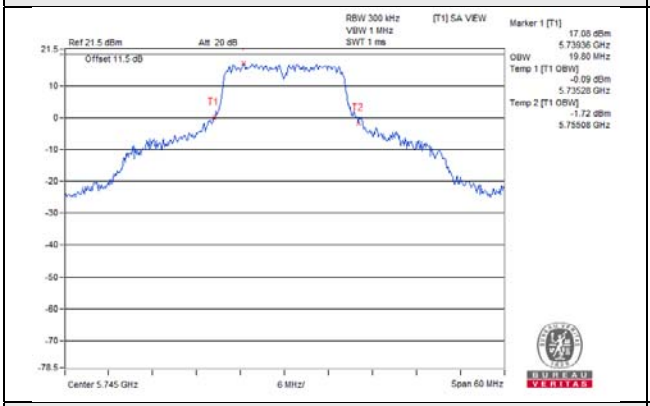
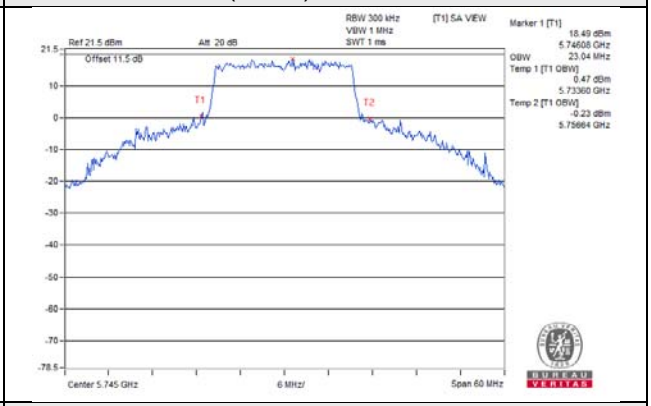
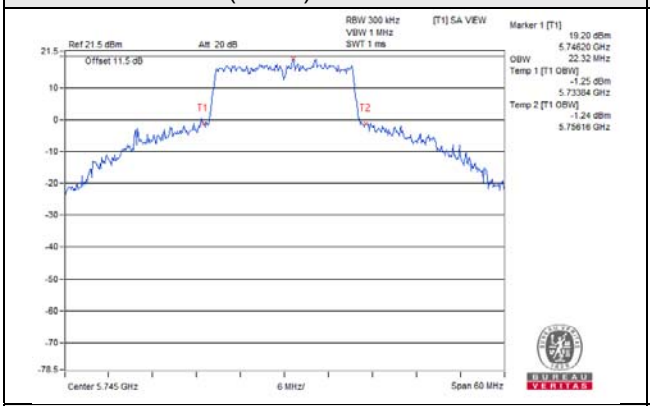
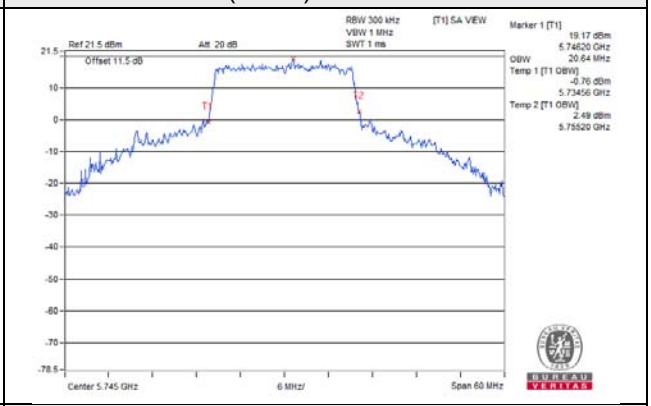
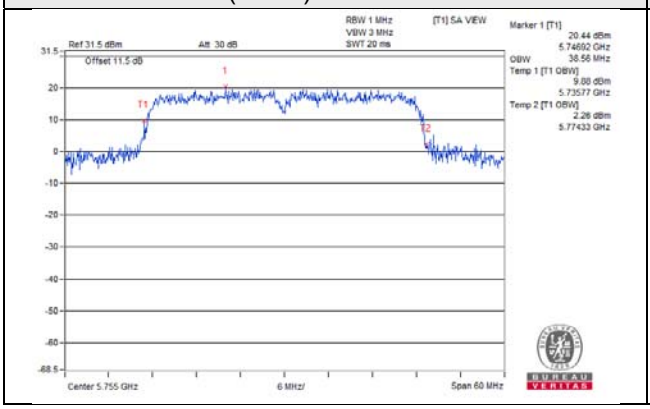
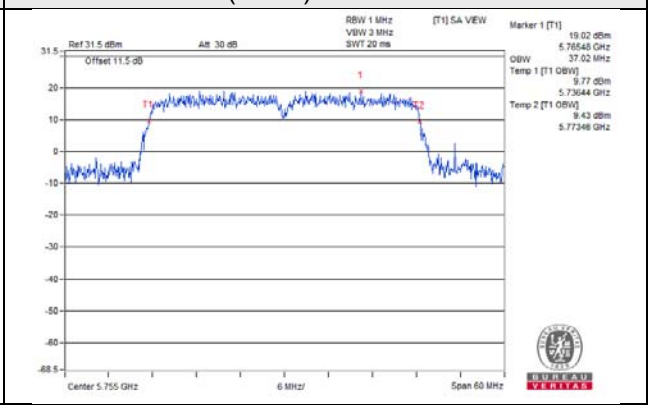
802.11ax (HE80)

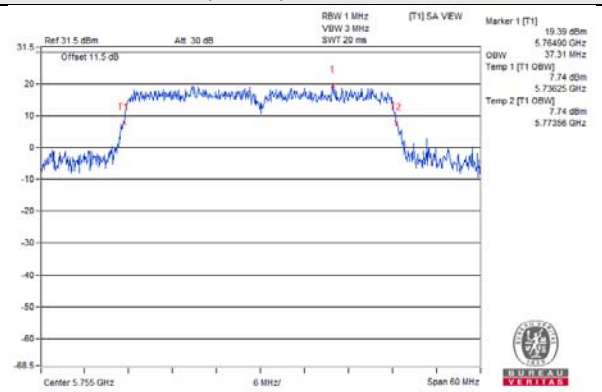
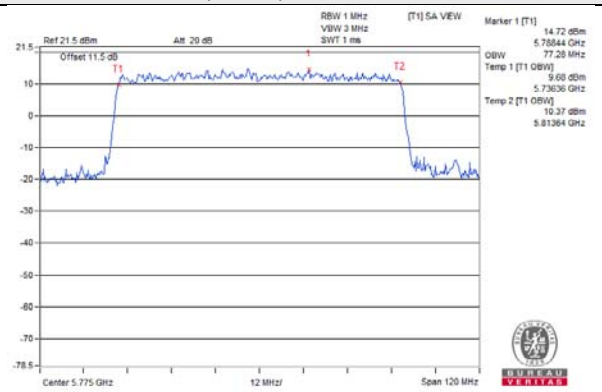
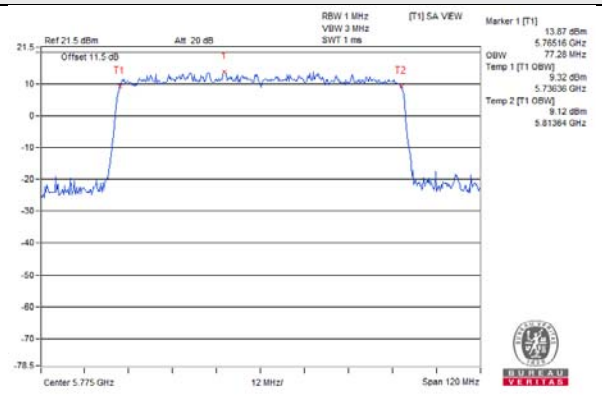
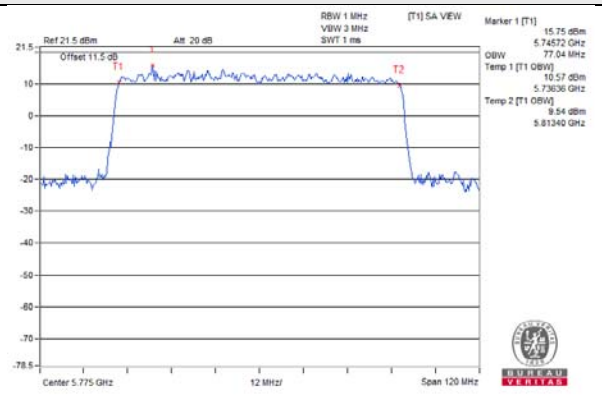
Chan.	Freq. (MHz)	Occupied Bandwidth (MHz)		
		Chain 0	Chain 1	Chain 2
42	5210	77.28	77.28	77.28
155	5775	77.28	77.28	77.04

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
	
802.11a / Chain 2 / CH 48	802.11ax (HE20) / Chain 0 / CH 48
	
802.11ax (HE20) / Chain 1 / CH 48	802.11ax (HE20) / Chain 2 / CH 48
	
802.11ax (HE40) / Chain 0 / CH 46	802.11ax (HE40) / Chain 1 / CH 46
	

Spectrum Plot for near By DFS Band	
802.11ax (HE40) / Chain 2 / CH 46	802.11ax (HE80) / Chain 0 / CH 42
	
802.11ax (HE80) / Chain 1 / CH 42	802.11ax (HE80) / Chain 2 / CH 42
	

Spectrum Plot for near By DFS Band	
802.11a / Chain 0 / CH 149	802.11a / Chain 1 / CH 149
	
802.11a / Chain 2 / CH 149	802.11ax (HE20) / Chain 0 / CH 149
	
802.11ax (HE20) / Chain 1 / CH 149	802.11ax (HE20) / Chain 2 / CH 149
	
802.11ax (HE40) / Chain 0 / CH 151	802.11ax (HE40) / Chain 1 / CH 151
	

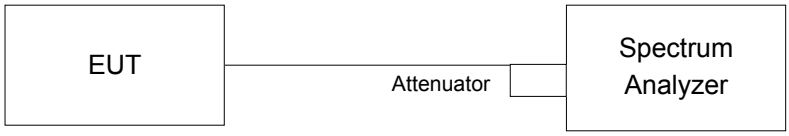
Spectrum Plot for near By DFS Band	
802.11ax (HE40) / Chain 2 / CH 151	802.11ax (HE80) / Chain 0 / CH 155
	
802.11ax (HE80) / Chain 1 / CH 155	802.11ax (HE80) / Chain 2 / CH 155
	

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:

Using method SA-2

a. Set span to encompass the entire emission bandwidth (EBW) of the signal.

b. Set RBW = 1MHz, Set VBW ≥ 3 MHz, Detector = RMS

c. Set Channel power measure = 1MHz

d. Sweep time = auto, trigger set to “free run”.

e. Trace average at least 100 traces in power averaging mode.

f. Record the max value and add 10 log (1/duty cycle)

For U-NII-3 band:

a. Set span to encompass the entire emission bandwidth (EBW) of the signal.

b. Set RBW = 300 kHz, Set VBW ≥ 1 MHz, Detector = RMS

c. Use the peak marker function to determine the maximum power level in any 300 kHz band segment within the fundamental EBW.

d. Scale the observed power level to an equivalent value in 500 kHz by adjusting (reducing) the measured power by a bandwidth correction factor (BWCF) where BWCF = 10log(500 kHz / 300 kHz)

e. Sweep time = auto, trigger set to “free run”.

f. Trace average at least 100 traces in power averaging mode.

g. 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

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	Chain 2				
36	5180	10.33	9.36	9.95	0.27	14.94	16.66	Pass
40	5200	11.34	10.20	10.72	0.27	15.82	16.66	Pass
48	5240	11.79	10.89	11.72	0.27	16.53	16.66	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 = 6.34dBi > 6dBi, so the power density limit shall be reduced to 17 - (6.34 - 6) = 16.66dBi.
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	Chain 2				
36	5180	8.97	7.79	8.55	0.10	13.33	16.66	Pass
40	5200	11.00	9.87	10.72	0.10	15.43	16.66	Pass
48	5240	11.43	11.27	11.42	0.10	16.25	16.66	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 = 6.34dBi > 6dBi, so the power density limit shall be reduced to 17 - (6.34 - 6) = 16.66dBi.
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	Chain 2				
38	5190	4.32	3.76	4.08	0.17	9.00	16.66	Pass
46	5230	8.08	7.71	8.07	0.17	12.90	16.66	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 = 6.34dBi > 6dBi, so the power density limit shall be reduced to 17 - (6.34 - 6) = 16.66dBi.
3. Refer to section 3.3 for duty cycle spectrum plot.

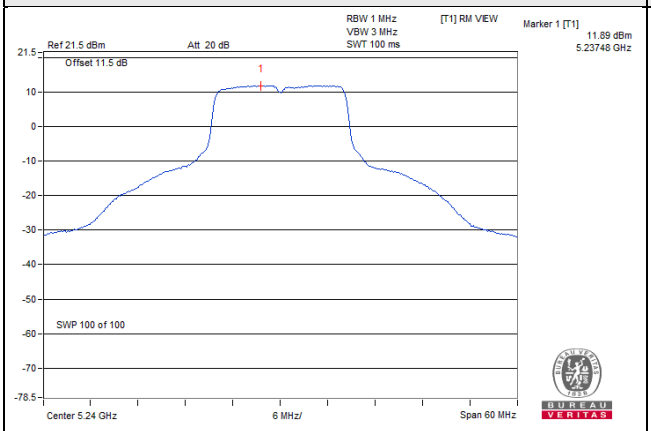
802.11ax (HE80)

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	Chain 2				
42	5210	1.43	1.13	1.13	0.34	6.34	16.66	Pass

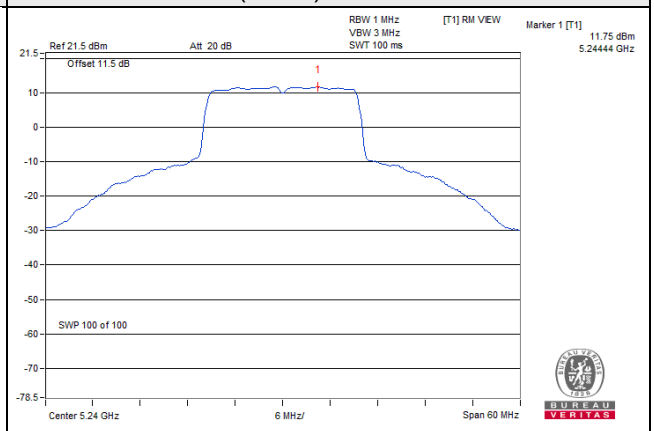
Note:
1. Method E) 2) a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = 6.34dBi > 6dBi, so the power density limit shall be reduced to 17 - (6.34 - 6) = 16.66dBi.
3. Refer to section 3.3 for duty cycle spectrum plot.

Spectrum Plot of Worst Value

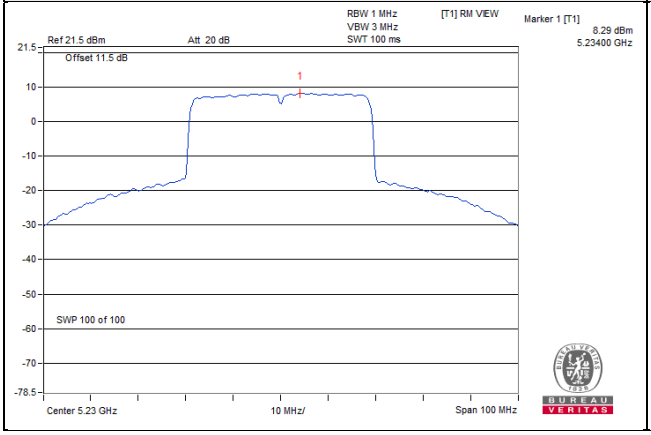
802.11a / Chain 0 / CH 148



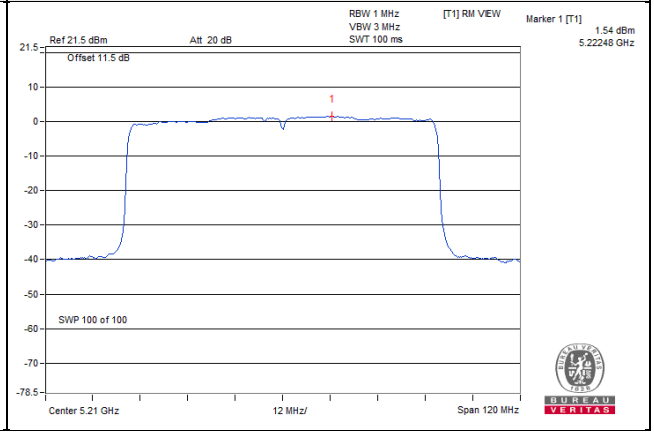
802.11ax (HE20) / Chain 0 / CH 48



802.11ax (HE40) / Chain 0 / CH 46



802.11ax (HE80) / Chain 0 / 42



For U-NII-3 band:

802.11a

TX chain	Chan.	Freq. (MHz)	PSD W/O Duty Factor		10 log (N=3) dB	Duty Factor (dB)	Total PSD With Duty Factor (dBm/500kHz)	Limit (dBm/ 500kHz)	Pass / Fail
			(dBm/300kHz)	(dBm/500kHz)					
0	149	5745	4.77	6.99	4.77	0.27	12.03	29.21	Pass
	157	5785	4.67	6.89	4.77	0.27	11.93	29.21	Pass
	165	5825	4.67	6.89	4.77	0.27	11.93	29.21	Pass
1	149	5745	4.18	6.40	4.77	0.27	11.44	29.21	Pass
	157	5785	4.21	6.43	4.77	0.27	11.47	29.21	Pass
	165	5825	4.32	6.54	4.77	0.27	11.58	29.21	Pass
2	149	5745	4.28	6.50	4.77	0.27	11.54	29.21	Pass
	157	5785	4.29	6.51	4.77	0.27	11.55	29.21	Pass
	165	5825	4.20	6.42	4.77	0.27	11.46	29.21	Pass

Note:
1. Method E) 2) c) of power density measurement of KDB 662911 is using for calculating total power density, Measure and add 10 log (N_{ANT}) dB.
2. Directional gain = 6.79dBi > 6dBi, so the power density limit shall be reduced to 30 - (6.79 - 6) = 29.21dBi.
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=3) dB	Duty Factor (dB)	Total PSD With Duty Factor (dBm/500kHz)	Limit (dBm/ 500kHz)	Pass / Fail
			(dBm/300kHz)	(dBm/500kHz)					
0	149	5745	3.55	5.77	4.77	0.10	10.64	29.21	Pass
	157	5785	3.71	5.93	4.77	0.10	10.80	29.21	Pass
	165	5825	3.84	6.06	4.77	0.10	10.93	29.21	Pass
1	149	5745	3.30	5.52	4.77	0.10	10.39	29.21	Pass
	157	5785	3.21	5.43	4.77	0.10	10.30	29.21	Pass
	165	5825	3.29	5.51	4.77	0.10	10.38	29.21	Pass
2	149	5745	3.17	5.39	4.77	0.10	10.26	29.21	Pass
	157	5785	3.10	5.32	4.77	0.10	10.19	29.21	Pass
	165	5825	3.20	5.42	4.77	0.10	10.29	29.21	Pass

Note:
1. Method E) 2) c) of power density measurement of KDB 662911 is using for calculating total power density, Measure and add 10 log (N_{ANT}) dB.
2. Directional gain = 6.79dBi > 6dBi, so the power density limit shall be reduced to 30 - (6.79 - 6) = 29.21dBi.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ax (HE40)

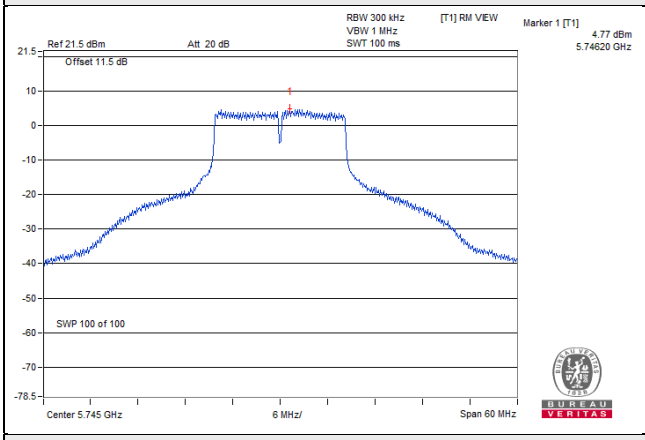
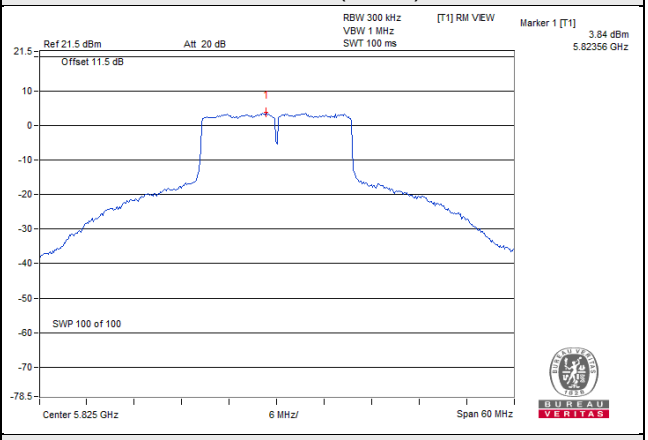
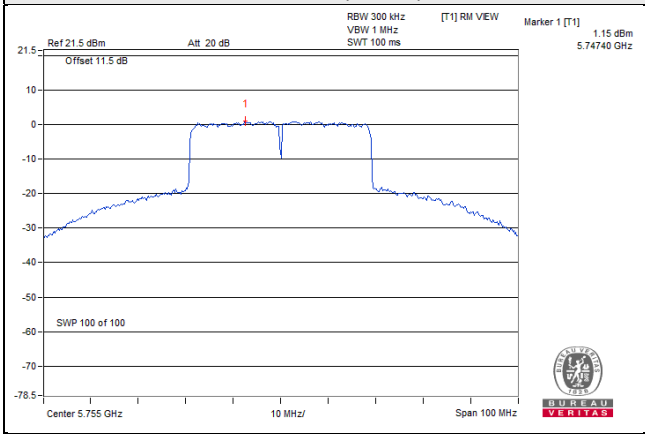
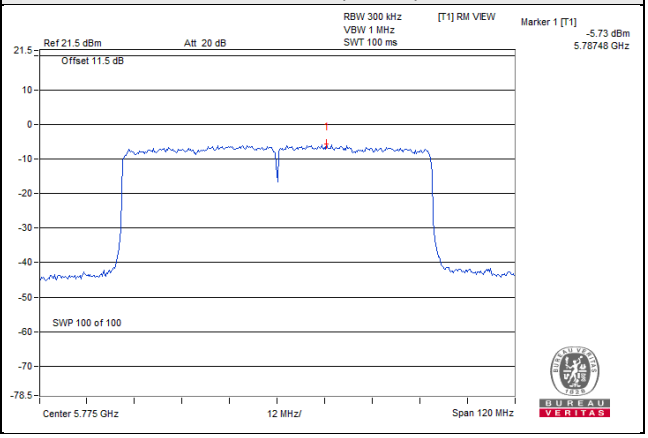
TX chain	Chan.	Freq. (MHz)	PSD W/O Duty Factor		10 log (N=3) dB	Duty Factor (dB)	Total PSD With Duty Factor (dBm/500kHz)	Limit (dBm/ 500kHz)	Pass / Fail
			(dBm/300kHz)	(dBm/500kHz)					
0	151	5755	1.15	3.37	4.77	0.17	8.31	29.21	Pass
	159	5795	0.88	3.10	4.77	0.17	8.04	29.21	Pass
1	151	5755	0.19	2.41	4.77	0.17	7.35	29.21	Pass
	159	5795	0.30	2.52	4.77	0.17	7.46	29.21	Pass
2	151	5755	0.56	2.78	4.77	0.17	7.72	29.21	Pass
	159	5795	0.45	2.67	4.77	0.17	7.61	29.21	Pass

Note:
1. Method E) 2) c) of power density measurement of KDB 662911 is using for calculating total power density, Measure and add 10 log (N_{ANT}) dB.
2. Directional gain = 6.79dBi > 6dBi, so the power density limit shall be reduced to 30 - (6.79 - 6) = 29.21dBi.
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=3) dB	Duty Factor (dB)	Total PSD With Duty Factor (dBm/500kHz)	Limit (dBm/ 500kHz)	Pass / Fail
			(dBm/300kHz)	(dBm/500kHz)					
0	155	5775	-5.73	-3.51	4.77	0.34	1.60	29.21	Pass
1	155	5775	-6.58	-4.36	4.77	0.34	0.75	29.21	Pass
2	155	5775	-6.26	-4.04	4.77	0.34	1.07	29.21	Pass

Note:
1. Method E) 2) c) of power density measurement of KDB 662911 is using for calculating total power density, Measure and add 10 log (N_{ANT}) dB.
2. Directional gain = 6.79dBi > 6dBi, so the power density limit shall be reduced to 30 - (6.79 - 6) = 29.21dBi.
3. Refer to section 3.3 for duty cycle spectrum plot.

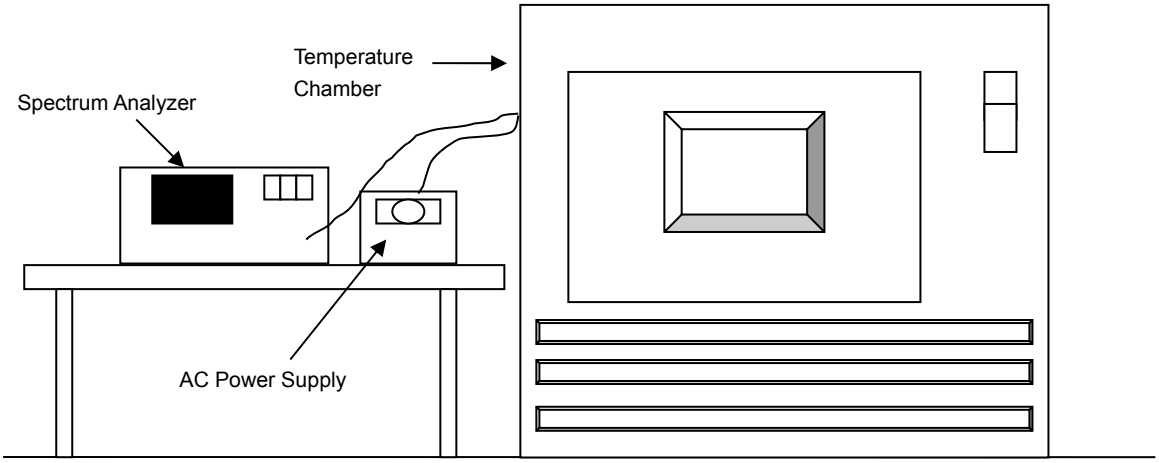
Spectrum Plot of Worst Value	
802.11a	802.11ax (HE20)
	
802.11ax (HE40)	802.11ax (HE80)
	

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

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100040	Sep. 23, 2019	Sep. 22, 2020
WIT Standard Temperature And Humidity Chamber	TH-4S-C	W981030	Jun. 03, 2019	Jun. 02, 2020
Digital Multimeter Fluke	87-III	70360742	Jun. 28, 2019	Jun. 27, 2020
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 c and d with every 10 degrees reduction until the lowest temperature achieved.

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

4.6.5 Deviation from Test Standard

No deviation.

4.6.6 EUT Operating Condition

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

4.6.7 Test Results

Frequency Stability Versus Temp.									
Operating Frequency: 5180MHz									
Temp. (℃)	Power Supply (Vac)	0 Minute		2 Minute		5 Minute		10 Minute	
		Measured Frequency (MHz)	Result	Measured Frequency (MHz)	Result	Measured Frequency (MHz)	Result	Measured Frequency (MHz)	Result
40	120	5180.0058	Pass	5180.0041	Pass	5180.006	Pass	5180.0087	Pass
30	120	5179.9935	Pass	5179.9953	Pass	5179.9941	Pass	5179.9953	Pass
20	120	5180.0001	Pass	5179.9962	Pass	5180.0014	Pass	5180.0008	Pass
10	120	5179.9779	Pass	5179.9746	Pass	5179.979	Pass	5179.9793	Pass
0	120	5180.0145	Pass	5180.0133	Pass	5180.0112	Pass	5180.0123	Pass

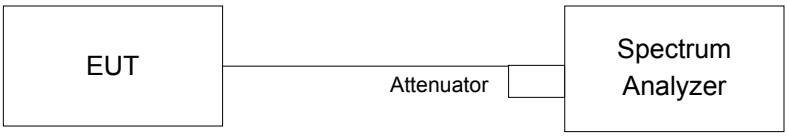
Frequency Stability Versus Voltage									
Operating Frequency: 5180MHz									
Temp. (℃)	Power Supply (Vac)	0 Minute		2 Minute		5 Minute		10 Minute	
		Measured Frequency (MHz)	Result	Measured Frequency (MHz)	Result	Measured Frequency (MHz)	Result	Measured Frequency (MHz)	Result
20	138	5180.0003	Pass	5179.9966	Pass	5180.0004	Pass	5180.0013	Pass
	120	5180.0001	Pass	5179.9962	Pass	5180.0014	Pass	5180.0008	Pass
	102	5180.0007	Pass	5179.9956	Pass	5180.0019	Pass	5180.0016	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

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

4.7.5 Deviation from Test Standard

No deviation.

4.7.6 EUT Operating Condition

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

4.7.7 Test Results

802.11a

Channel	Frequency (MHz)	6dB Bandwidth (MHz)			Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2		
149	5745	16.37	16.42	16.41	0.5	Pass
157	5785	16.40	16.42	16.41	0.5	Pass
165	5825	16.40	16.42	16.41	0.5	Pass

802.11ax (HE20)

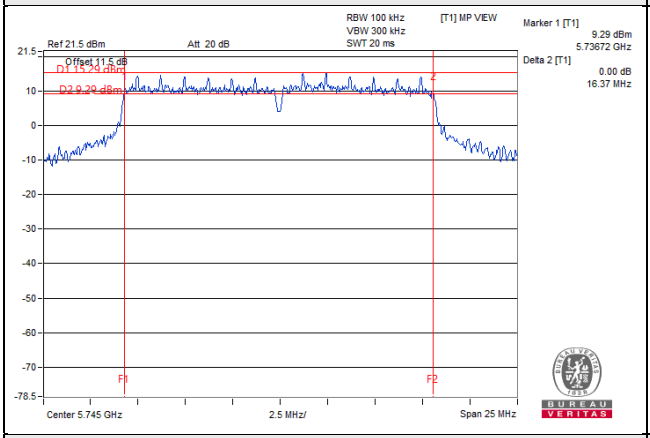
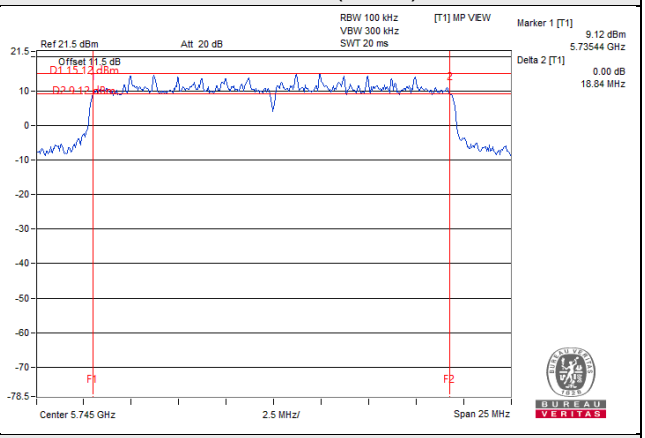
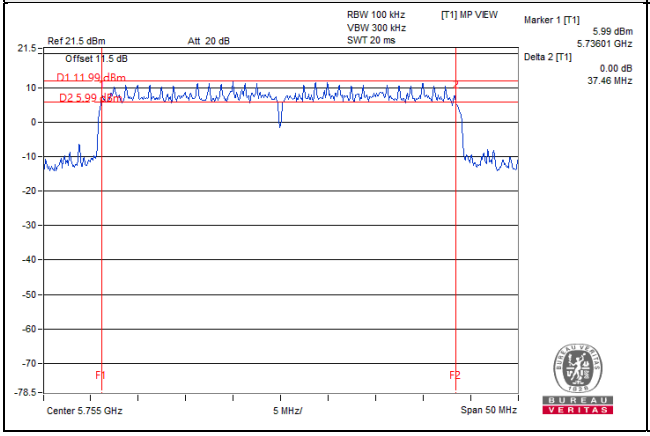
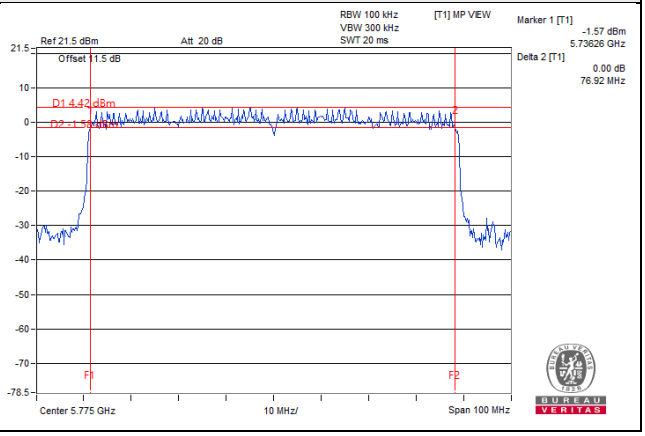
Channel	Frequency (MHz)	6dB Bandwidth (MHz)			Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2		
149	5745	18.84	19.07	18.96	0.5	Pass
157	5785	18.99	19.03	18.95	0.5	Pass
165	5825	18.94	18.98	18.94	0.5	Pass

802.11ax (HE40)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)			Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2		
151	5755	37.69	37.52	37.46	0.5	Pass
159	5795	37.70	37.76	37.46	0.5	Pass

802.11ax (HE80)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)			Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2		
155	5775	77.35	77.89	76.92	0.5	Pass

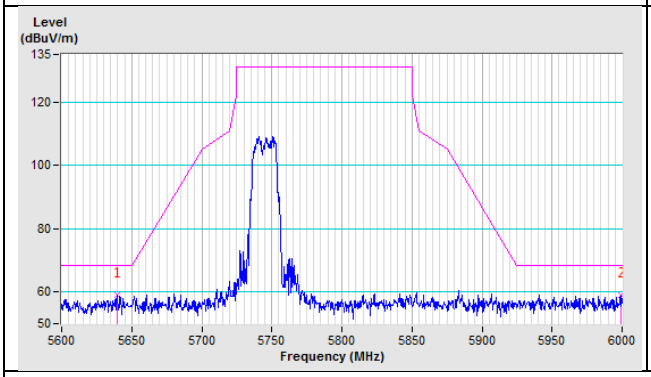
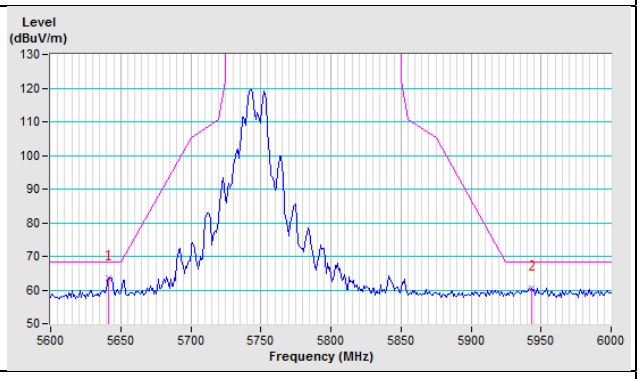
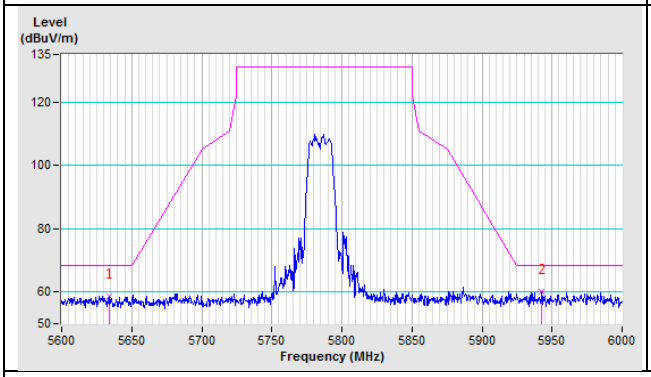
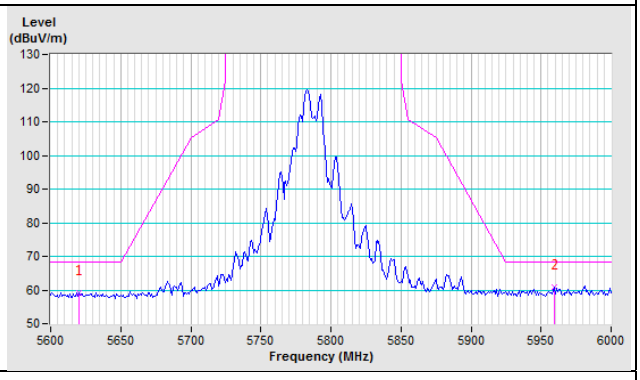
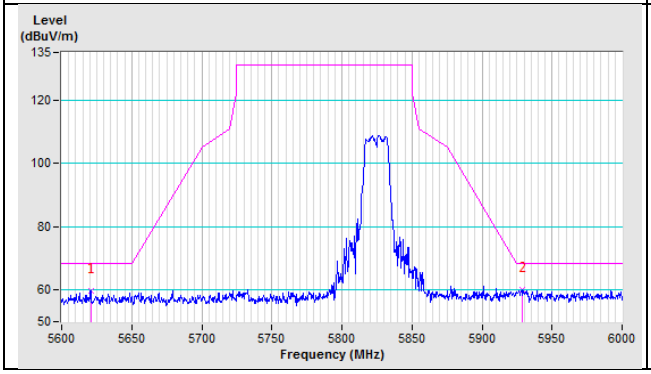
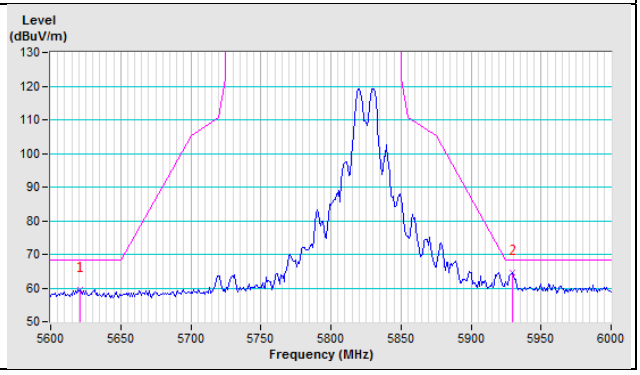
Spectrum Plot of Worst Value	
802.11a	802.11ax (HE20)
	
802.11ax (HE40)	802.11ax (HE80)
	

5 Pictures of Test Arrangements

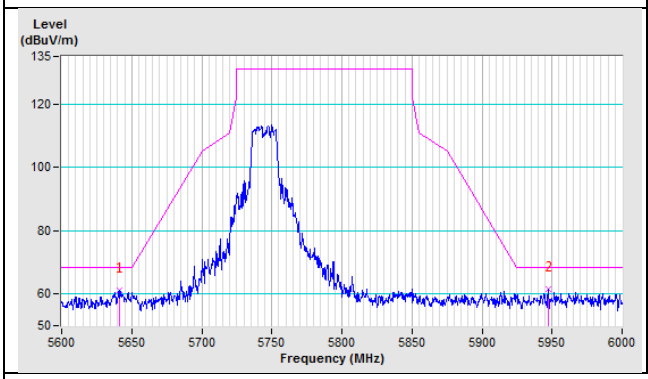
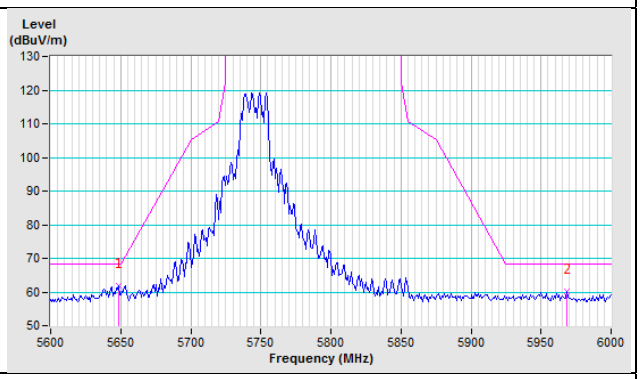
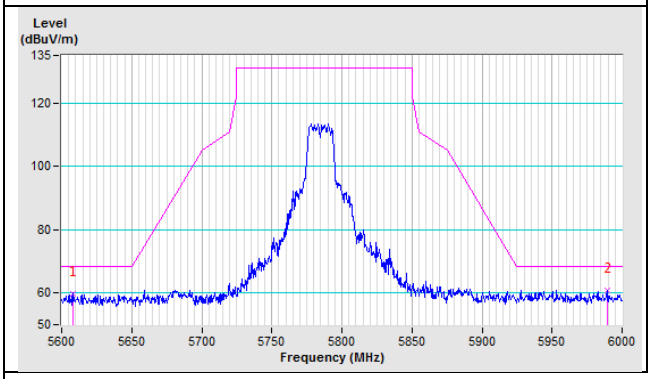
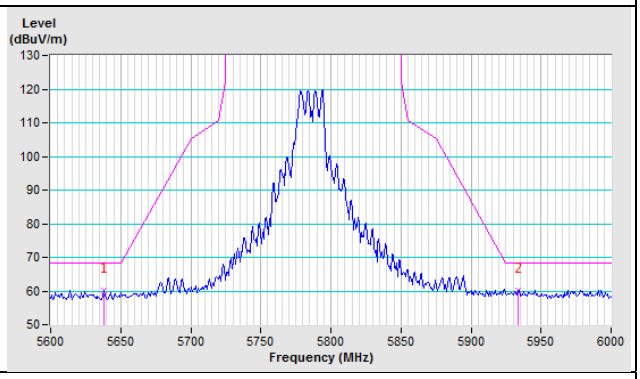
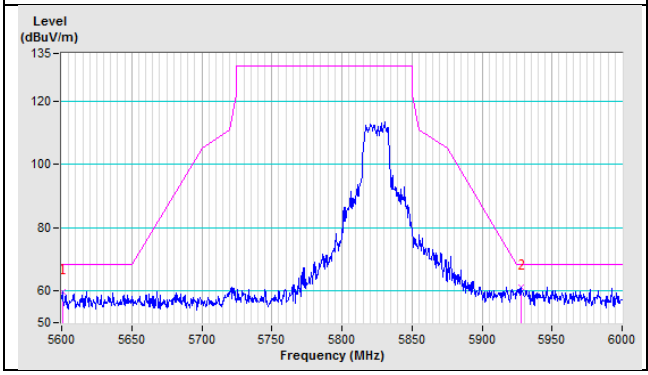
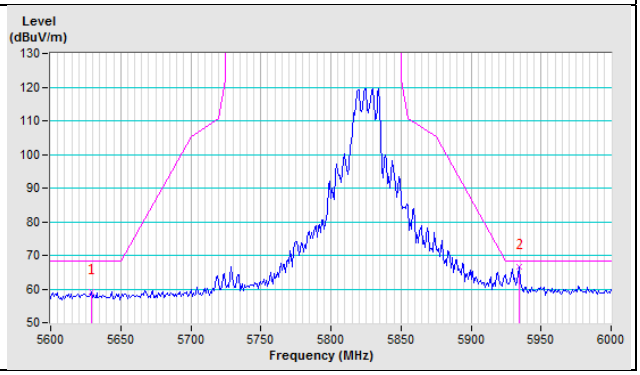
Please refer to the attached file (Test Setup Photo).

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

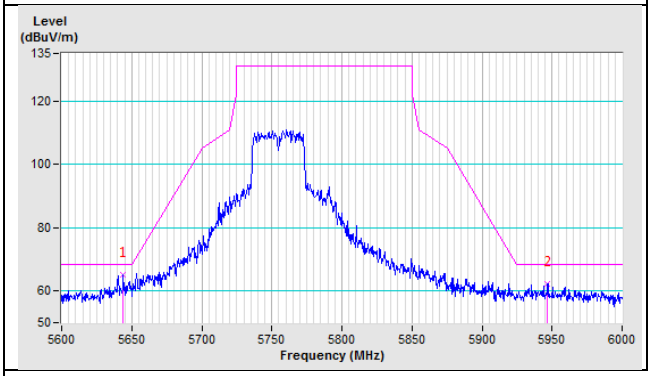
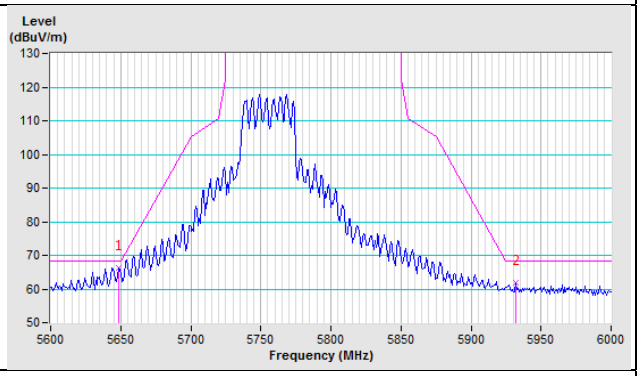
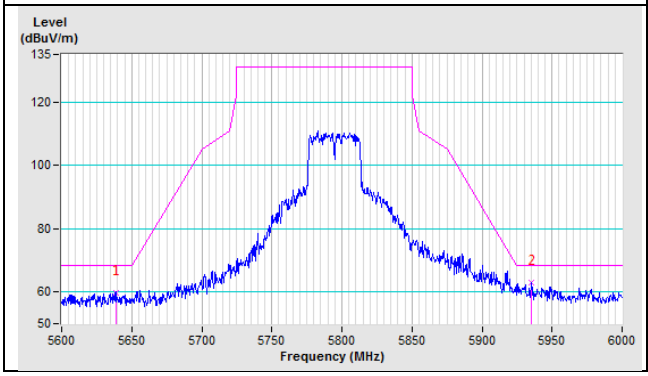
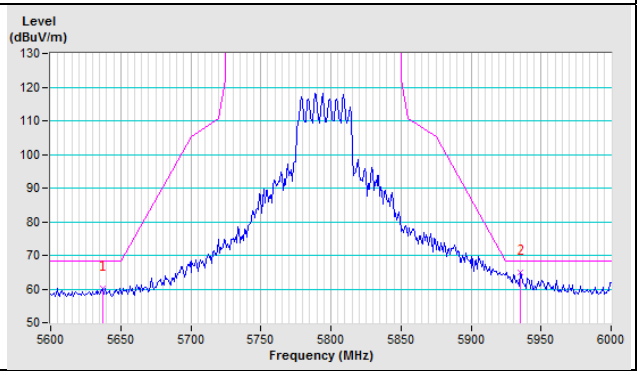
802.11a

CH 149 5745 MHz	
Horizontal	Vertical
	
CH 157 5785 MHz	
Horizontal	Vertical
	
CH 165 5825 MHz	
Horizontal	Vertical
	

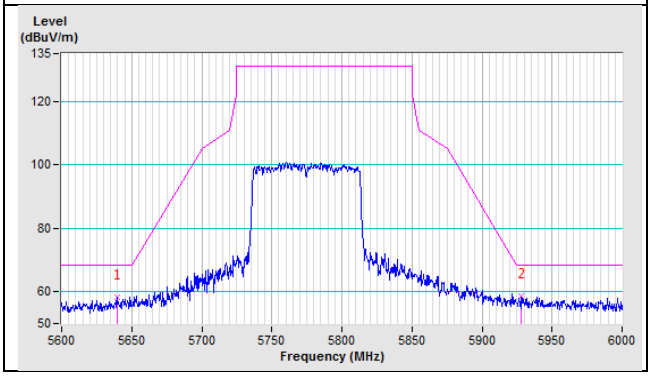
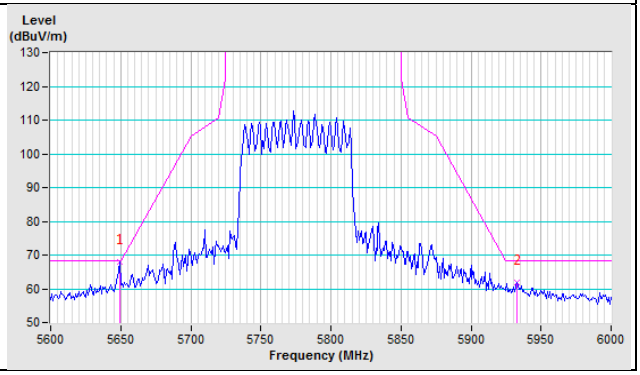
802.11ax (HE20)

CH 149 5745 MHz	
Horizontal	Vertical
	
CH 157 5785 MHz	
Horizontal	Vertical
	
CH 165 5825 MHz	
Horizontal	Vertical
	

802.11ax (HE40)

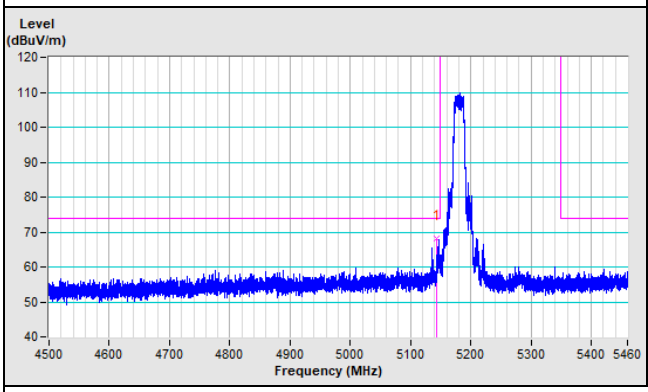
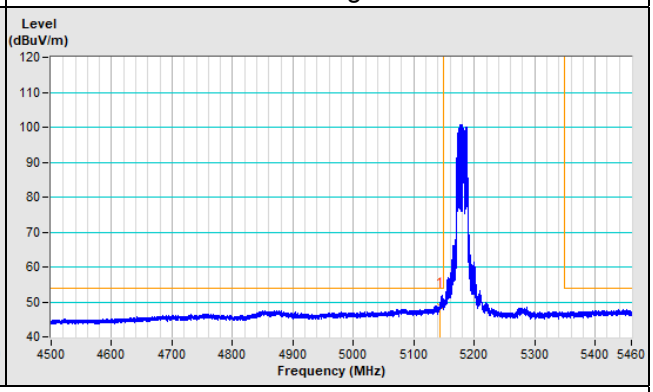
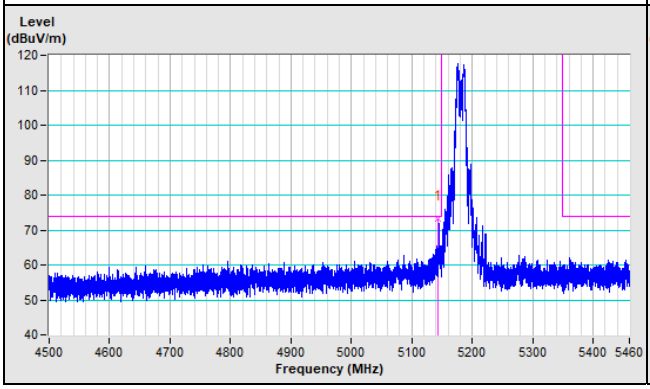
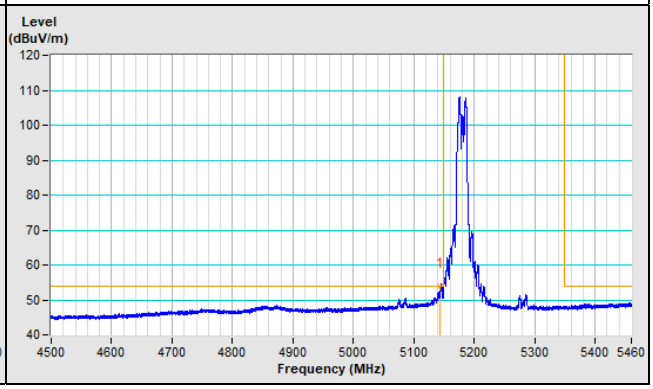
CH 151 5755 MHz	
Horizontal	Vertical
	
CH 159 5795 MHz	
Horizontal	Vertical
	

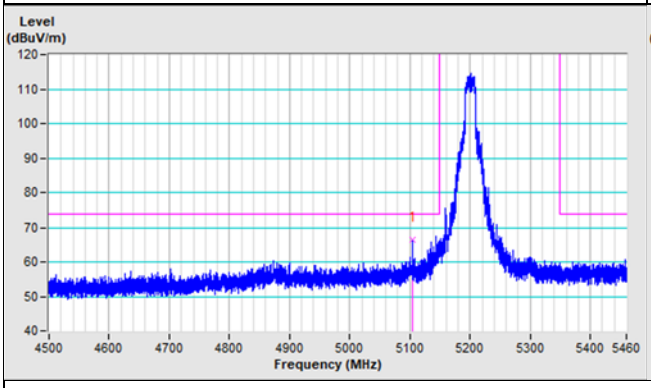
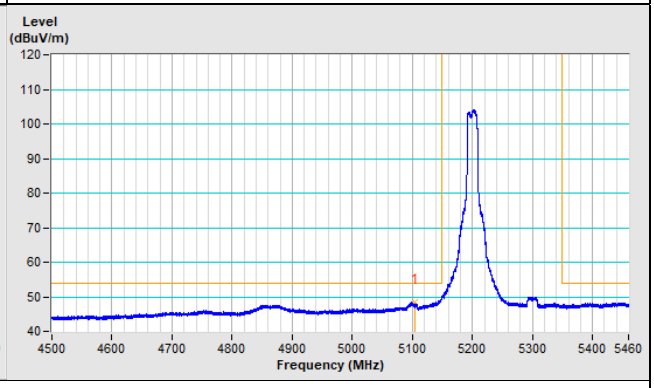
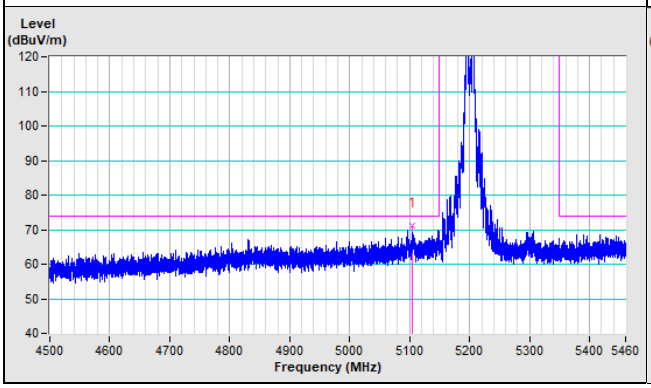
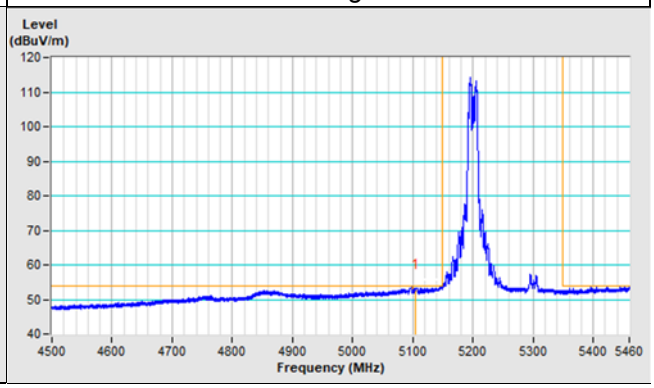
802.11ax (HE80)

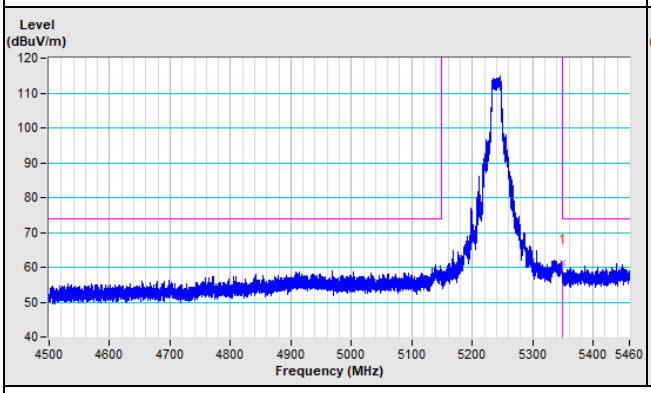
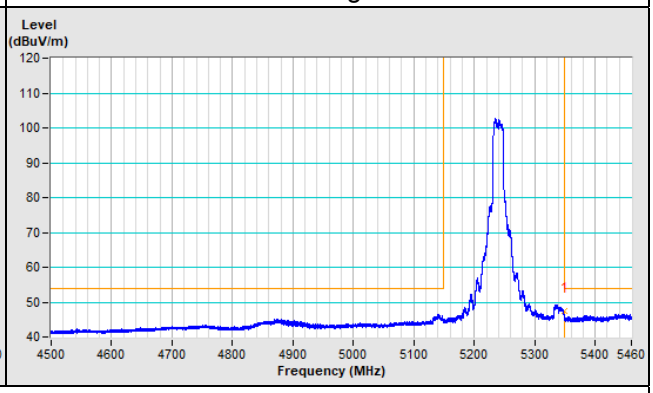
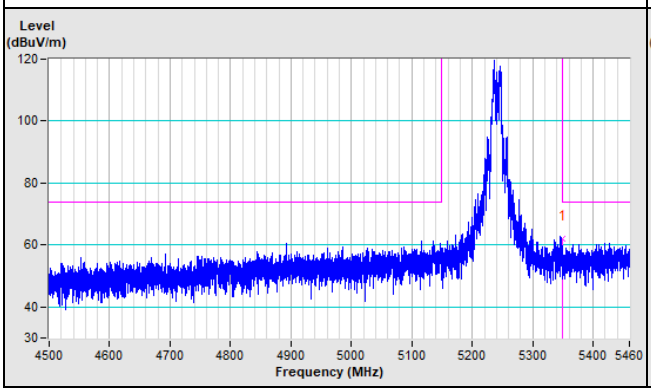
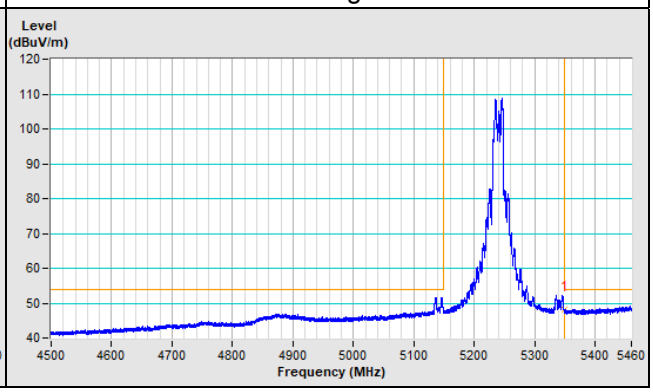
CH 155 5775 MHz	
Horizontal	Vertical
	

Annex B- Band Edge Measurement

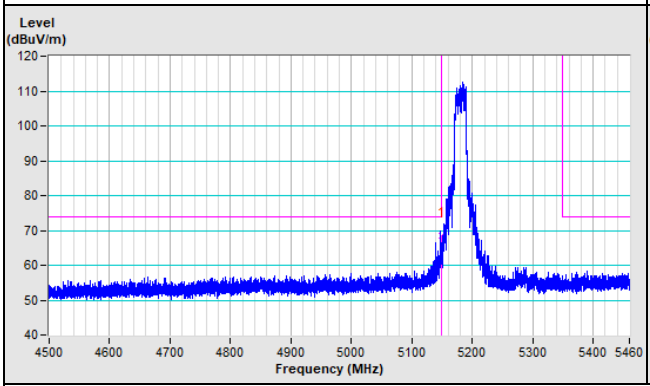
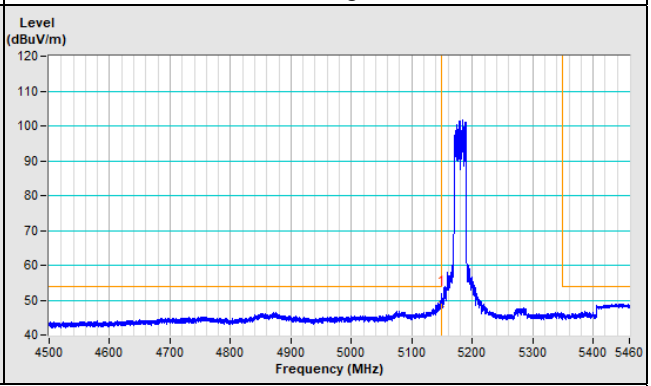
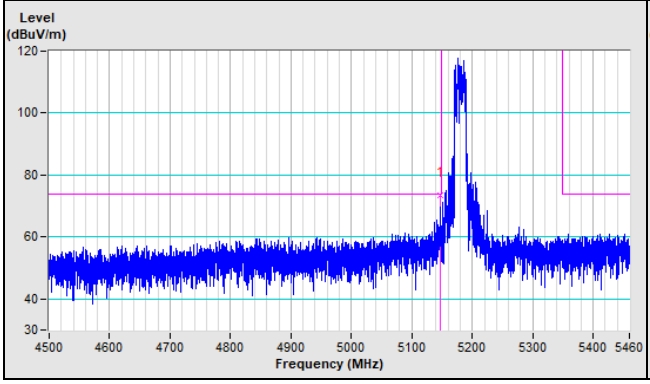
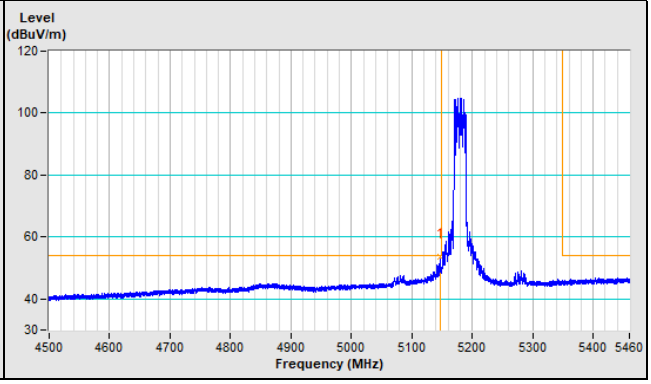
802.11a

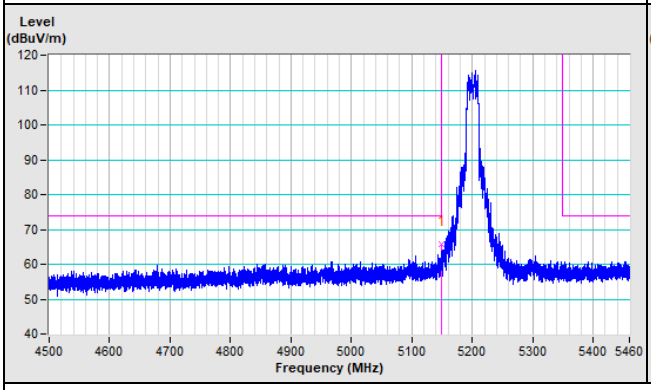
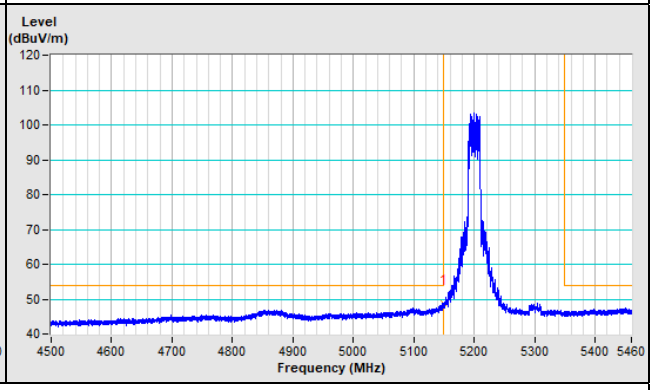
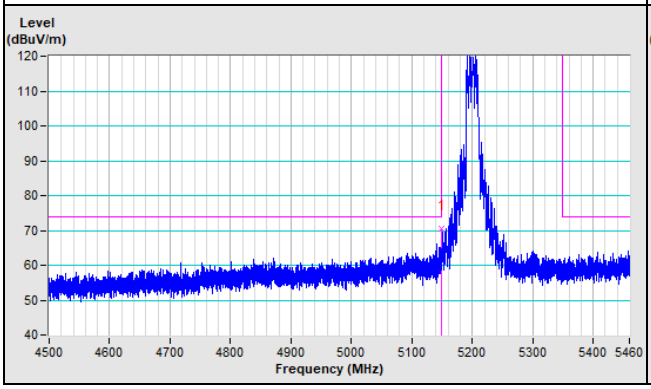
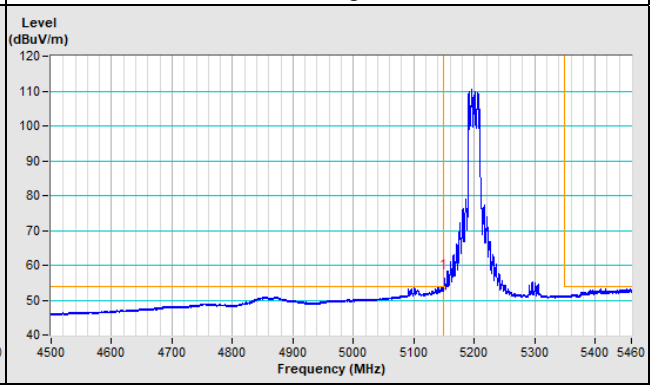
CH 36	
Horizontal	
Peak	Average
	
Vertical	
Peak	Average
	

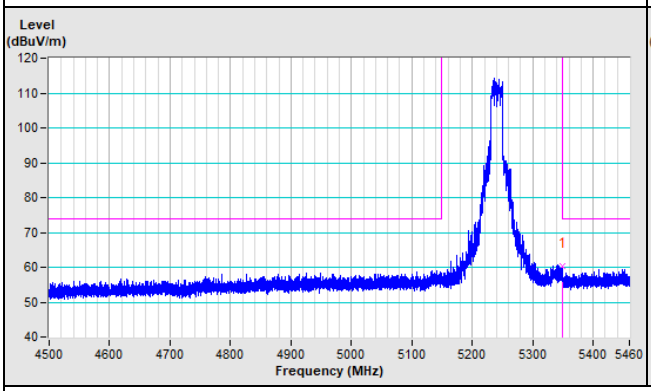
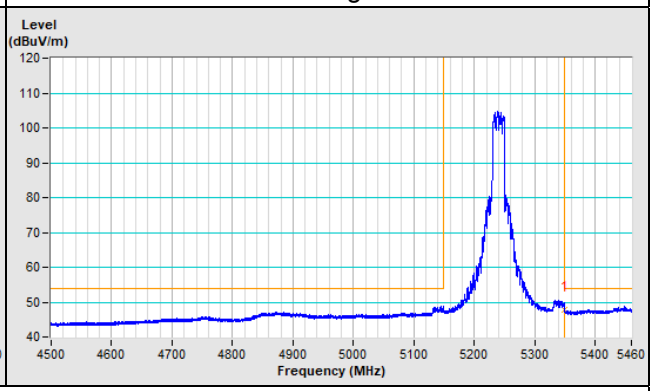
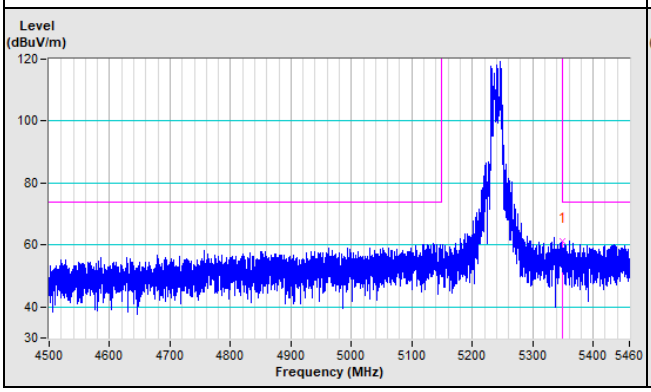
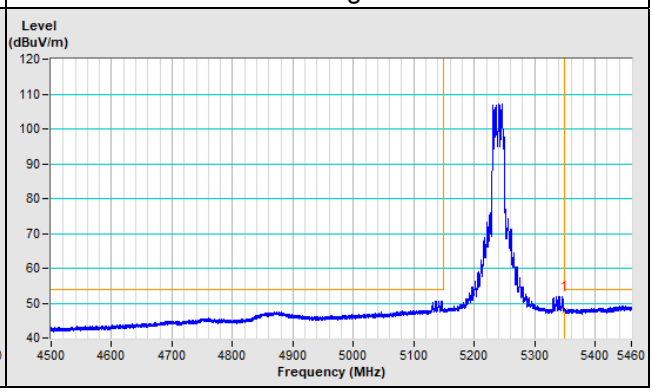
CH 40	
Horizontal	
Peak	Average
	
Vertical	
Peak	Average
	

CH 48	
Horizontal	
Peak	Average
	
Vertical	
Peak	Average
	

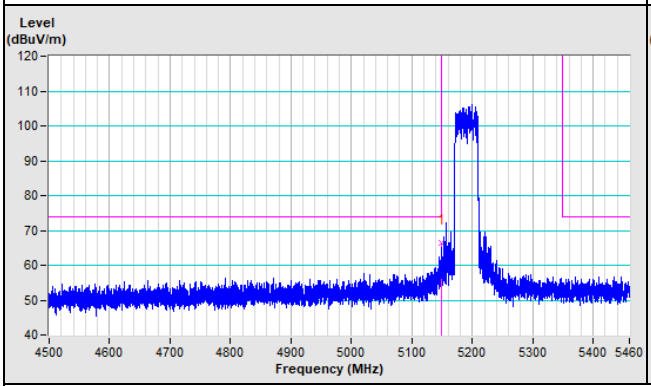
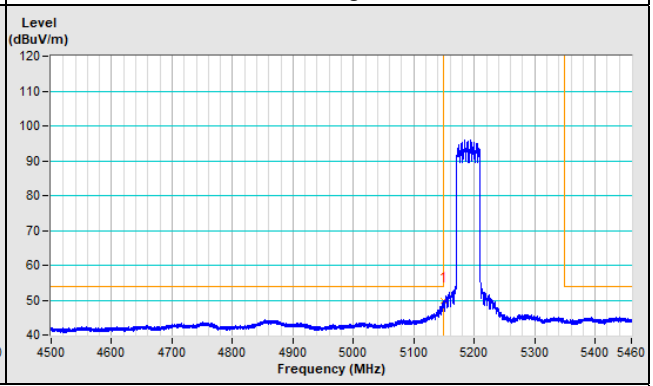
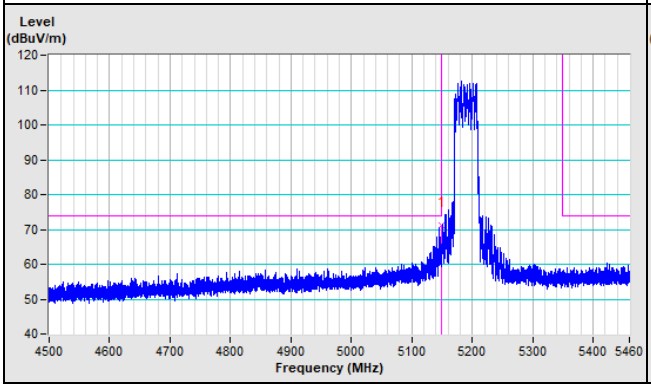
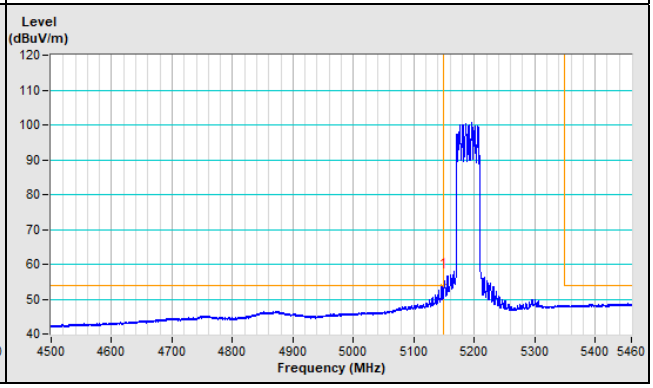
802.11ax (HE20)

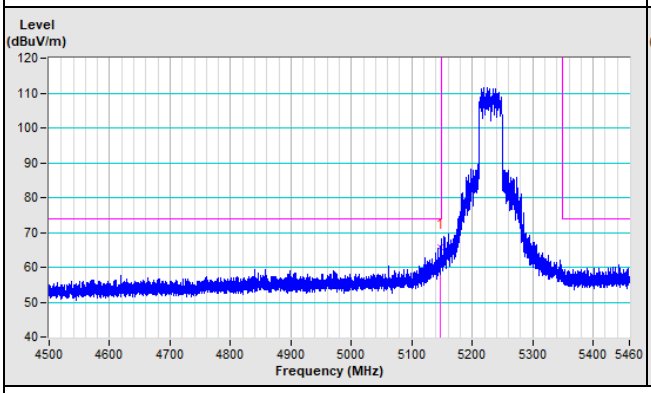
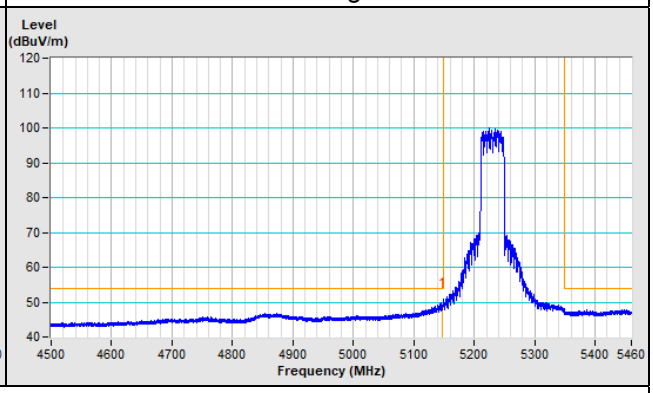
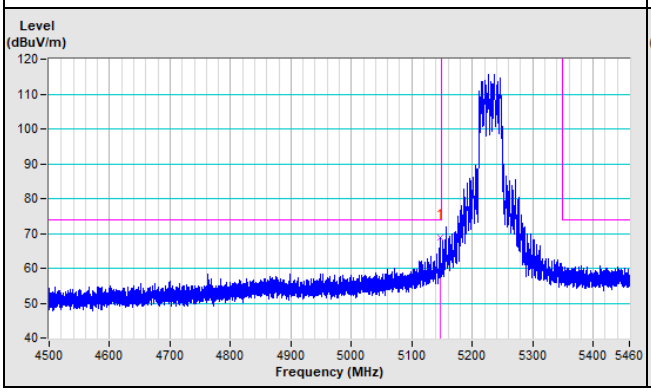
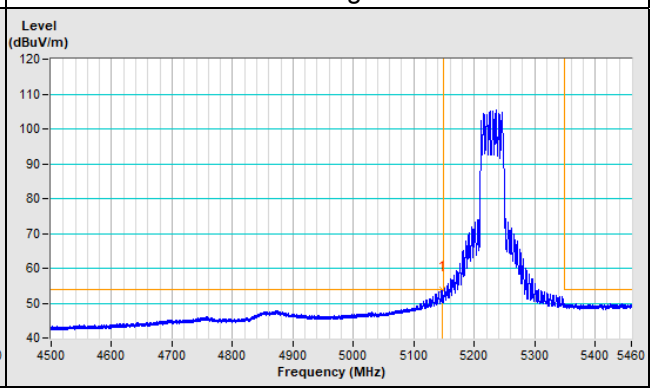
CH 36	
Horizontal	
Peak	Average
	
Vertical	
Peak	Average
	

CH 40	
Horizontal	
Peak	Average
	
Vertical	
Peak	Average
	

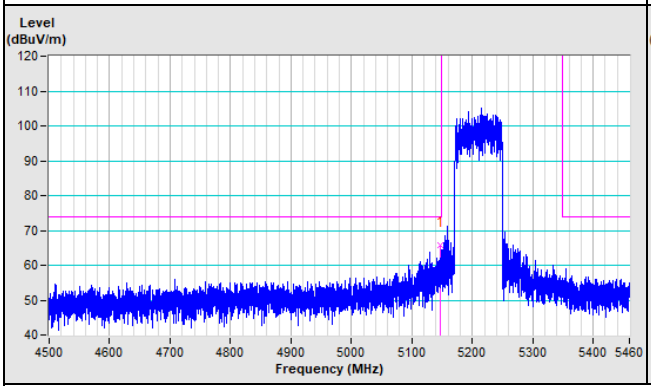
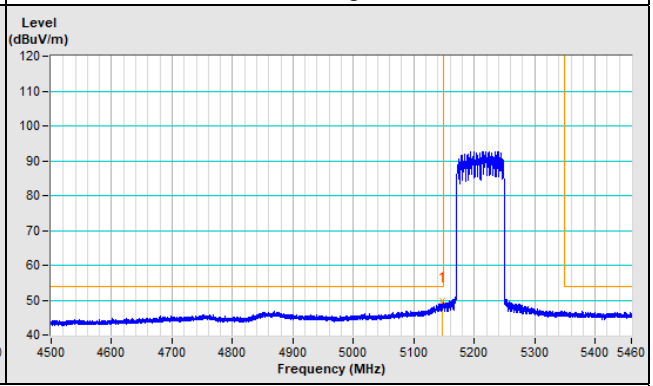
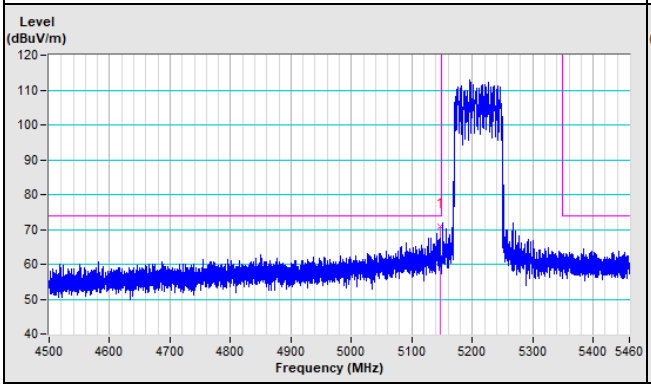
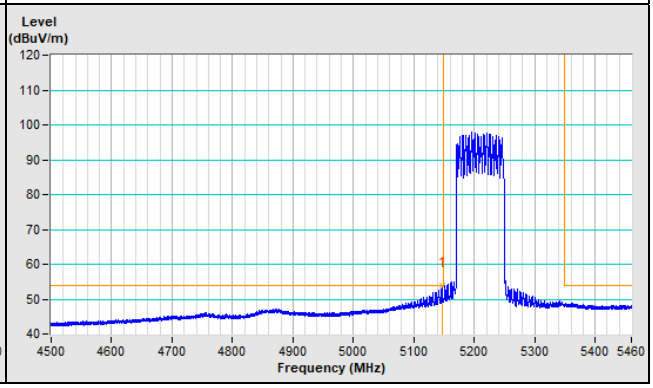
CH 48	
Horizontal	
Peak	Average
	
Vertical	
Peak	Average
	

802.11ax (HE40)

CH 38	
Horizontal	
Peak	Average
	
Vertical	
Peak	Average
	

CH 46	
Horizontal	
Peak	Average
	
Vertical	
Peak	Average
	

802.11ax (HE80)

CH 42	
Horizontal	
Peak	Average
	
Vertical	
Peak	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:

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

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

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

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

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

--- END ---