FCC Test Report

Report No.: RF190716E02-1

FCC ID: PY319200453

Test Model: RBR850

Series Model: RBS850

Received Date: July 17, 2019

Test Date: Aug. 21 to 23, 2019

Issued Date: Sep. 02, 2019

Applicant: NETGEAR, Inc.

Address: 350 East Plumeria Drive San Jose, CA 95134

Issued By: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch Hsin Chu Laboratory

Lab Address: E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300, Taiwan R.O.C.

Test Location: E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300, Taiwan R.O.C.

FCC Registration / Designation Number: 723255 / TW2022

Testing Laboratory
2022

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Release Control Record

Issue No.	Description	Date Issued
RF190716E02-1	Original release.	Sep. 02, 2019

1 Certificate of Conformity

Product: Orbi Router, Orbi Satellite

Brand: NETGEAR

Test Model: RBR850

Series Model: RBS850

Sample Status: ENGINEERING SAMPLE

Applicant: NETGEAR, Inc.

Test Date: Aug. 21 to 23, 2019

Standard: 47 CFR FCC Part 15, Subpart E (Section 15.407)
ANSI C63.10: 2013

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

Prepared by : ______________________ , **Date:** Sep. 02, 2019

Claire Kuan / Specialist

Approved by : ______________________ , **Date:** Sep. 02, 2019

May Chen / Manager

2 Summary of Test Results

47 CFR FCC Part 15, Subpart E (Section 15.407)			
FCC Clause	Test Item	Result	Remarks
15.407(b)(6)	AC Power Conducted Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -13.43dB at 0.34140MHz.
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 -0.2dB at 5150.00MHz.
15.407(a)(1/2/3)	Max Average Transmit Power	Pass	Meet the requirement of limit.
---	Occupied Bandwidth Measurement	-	Reference only.
15.407(a)(1/2/3)	Peak Power Spectral Density	Pass	Meet the requirement of limit.
15.407(e)	6dB bandwidth	Pass	Meet the requirement of limit. (U-NII-3 Band only)
15.407(g)	Frequency Stability	Pass	Meet the requirement of limit.
15.203	Antenna Requirement	Pass	Antenna connector is i-pex(MHF) not a standard connector.

*For U-NII-3 band compliance with rule part 15.407(b)(4)(i), the OOBE test plots were recorded in Annex A.

Note:

Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

2.1 Measurement Uncertainty

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

Measurement	Frequency	Expanded Uncertainty (k=2) (±)
Conducted Emissions at mains ports	150kHz ~ 30MHz	1.8 dB
Radiated Emissions up to 1 GHz	9kHz ~ 30MHz	3.0 dB
	30MHz ~ 1GHz	4.9 dB
Radiated Emissions above 1 GHz	1GHz ~ 6GHz	5.1 dB
	6GHz ~ 18GHz	4.9 dB
	18GHz ~ 40GHz	5.2 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	Orbi Router, Orbi Satellite
Brand	NETGEAR
Test Model	RBR850
Series Model	RBS850
Status of EUT	ENGINEERING SAMPLE
Power Supply Rating	12Vdc from power adapter
Modulation Type	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM 256QAM for OFDM in 11ac mode and VHT20/40 in 2.4GHz 1024QAM for OFDMA in 11ax HE mode
Modulation Technology	DSSS, OFDM, OFDMA
Transfer Rate	802.11b: up to 11Mbps 802.11a/g: up to 54Mbps 802.11n: up to 600Mbps 802.11ac: up to 1733.3Mbps 802.11ax: up to 2401.9Mbps
Operating Frequency	**2.4GHz:** 2.412 ~ 2.462GHz **5GHz:** 5.18~ 5.24GHz, 5.745 ~ 5.825GHz
Number of Channel	**2.4GHz:** 802.11b, 802.11g, 802.11n (HT20), VHT20, 802.11ax (HE20): 11 802.11n (HT40), VHT40, 802.11ax (HE40): 7 **5GHz (U-NII-1):** 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 **5GHz (U-NII-3):** 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	**Non-Beamforming Mode:** **2.412 ~ 2.462 GHz:** 992.435 mW **5.18 ~ 5.24GHz:** 924.661mW **5.745 ~ 5.825GHz:** 993.367mW **Beamforming Mode:** **2.412 ~ 2.462 GHz:** 986.685 mW **5.18 ~ 5.24GHz:** 896.804mW **5.745 ~ 5.825GHz:** 885.339mW
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	Adapter x 1
Data Cable Supplied	RJ45 cable x 1 (Unshielded, 1.8m)

Note:

1. All models are listed as below.

Product	Model	Difference
Orbi Router	RBR850	Function:Master With Internet port x 1
Orbi Satellite	RBS850	Function:Master+Client Without Internet port

From the above models, model: **RBR850** was the worst case and it was selected as representative model for the test and its data was recorded in this report.

2. The EUT has below radios as following table:

Radio 1	Radio 2	Radio 3
WLAN(2.4GHz)	WLAN 5GHz (low band)	WLAN 5GHz (high band)

3. Simultaneously transmission condition.

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

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

No.	Brand	Model No.	P/N	Spec.
1	NETGEAR	2ABN042F	332-11507-01	Input: 100-240Vac, 1.3A, 50/60Hz Output: 12V, 3.5A DC Output cable: Unshielded, 1.8m
2	NETGEAR	AD2150F10	332-11093-01	Input: 100-120Vac, 1.0A, 50/60Hz Output: 12V, 3.5A DC Output cable: Unshielded, 1.8m

For conducted and radiated emissions test, the EUT was pre-tested with adapter 1 & 2, the conducted emission worst case was found in adapter 1 and the radiated emission worst case was found in adapter 2. Therefore the test and its data was recorded in this report.

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

Frequency Range (GHz)	Directional Antenna Gain (dBi)	Antenna Type	Antenna Connector
2.4~2.4835	6.01	Dipole	i-pex(MHF)
5.15~5.25	6.22		
5.25~5.35	6.37		
5.47~5.725	6.29		
5.725~5.85	6.52		
Note: More detailed information, please refer to opearating description.			

6. The EUT incorporates a MIMO function:

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

Note:
1. All of modulation mode support beamforming function except 802.11a/b/g modulation mode.
2. The EUT support Beamforming and non-beamforming mode, therefore both mode were investigated and the worst case scenario was identified. The worst case data were presented in test report.
3. The modulation and bandwidth are similar for 802.11n mode for 20MHz (40MHz), 802.11ac mode for 20MHz (40MHz, 80MHz) and 802.11ax mode for 20MHz (40MHz, 80MHz), therefore investigated worst case to representative mode in test report. (Final test mode refer section 3.2.1)

7. The above EUT information is declared by manufacturer and for more detailed features description, please refers to the manufacturer's specifications or user's manual.

3.2 Description of Test Modes

FOR 5180 ~ 5240MHz

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

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

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

Channel	Frequency	Channel	Frequency
38	5190 MHz	46	5230 MHz

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

Channel	Frequency
42	5210 MHz

FOR 5745 ~ 5825MHz:

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

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

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

Channel	Frequency	Channel	Frequency
151	5755 MHz	159	5795 MHz

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

Channel	Frequency
155	5775 MHz

3.2.1 Test Mode Applicability and Tested Channel Detail

EUT Configure Mode	Applicable To				Description
	RE≥1G	RE<1G	PLC	APCM	
1	√	√	√	√	WALN 5GHz Low band
2	√	√	√	√	WALN 5GHz High band

Where **RE≥1G:** Radiated Emission above 1GHz **RE<1G:** Radiated Emission below 1GHz

PLC: Power Line Conducted Emission **APCM:** Antenna Port Conducted Measurement

Radiated Emission Test (Above 1GHz):

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

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

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

Radiated Emission Test (Below 1GHz):

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

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

Non-Beamforming Mode (low band)						
Mode	FREQ. Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate Parameter
802.11a	5180-5240	36 to 48	48	OFDM	BPSK	6Mb/s
Non-Beamforming Mode (high band)						
Mode	FREQ. Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate Parameter
802.11ax (HE40)	5745-5825	151 to 159	159	OFDM	BPSK	MCS0

Power Line Conducted Emission Test:

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

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

Non-Beamforming Mode (low band)						
Mode	FREQ. Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate Parameter
802.11a	5180-5240	36 to 48	48	OFDM	BPSK	6Mb/s
Non-Beamforming Mode (high band)						
Mode	FREQ. Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate Parameter
802.11ax (HE40)	5745-5825	151 to 159	159	OFDM	BPSK	MCS0

Antenna Port Conducted Measurement:

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

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

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

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

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

Test Condition:

Applicable To	Environmental Conditions	Input Power	Tested By
RE≥1G	23deg. C, 71%RH	120Vac, 60Hz	Robert Cheng
RE<1G	22deg. C, 69%RH	120Vac, 60Hz	Ryan Du
PLC	24deg. C, 76%RH	120Vac, 60Hz	Andy Ho
APCM	25deg. C, 60%RH	120Vac, 60Hz	Anderson Chen

3.3 Duty Cycle of Test Signal

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

For low band:

802.11a: Duty cycle = 1.972 ms/2.099 ms = 0.939, Duty factor = 10 * log (1/Duty cycle) = 0.27

802.11ac (VHT20): Duty cycle = 5.419 ms/5.692 ms = 0.952, Duty factor = 10 * log (1/Duty cycle) = 0.21

802.11ac (VHT40): Duty cycle = 5.41 ms/5.693 ms = 0.95, Duty factor = 10 * log (1/Duty cycle) = 0.22

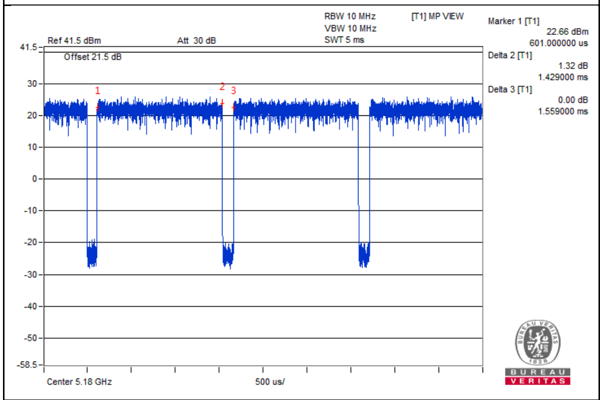
802.11ac (VHT80): Duty cycle = 5.422 ms/5.668 ms = 0.957, Duty factor = 10 * log (1/Duty cycle) = 0.19

802.11ax (HE20): Duty cycle = 5.443 ms/5.7 ms = 0.955, Duty factor = 10 * log (1/Duty cycle) = 0.20

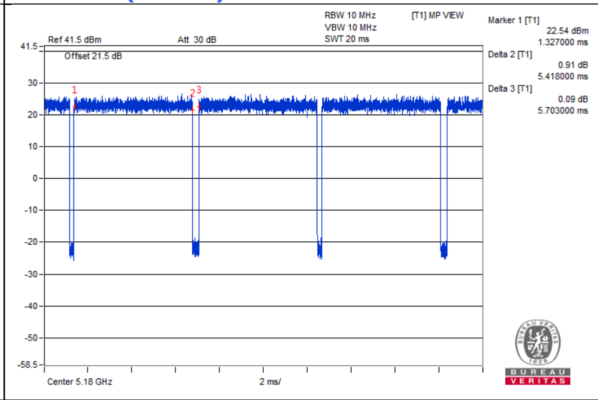
802.11ax (HE40): Duty cycle = 5.442 ms/5.734 ms = 0.949, Duty factor = 10 * log (1/Duty cycle) = 0.23

802.11ax (HE80): Duty cycle = 5.443 ms/5.764 ms = 0.944, Duty factor = 10 * log (1/Duty cycle) = 0.25

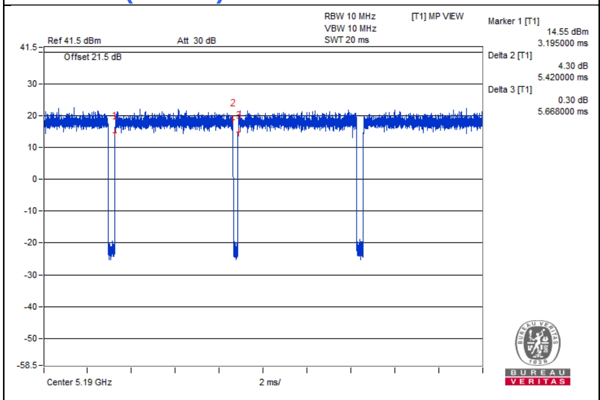
802.11a



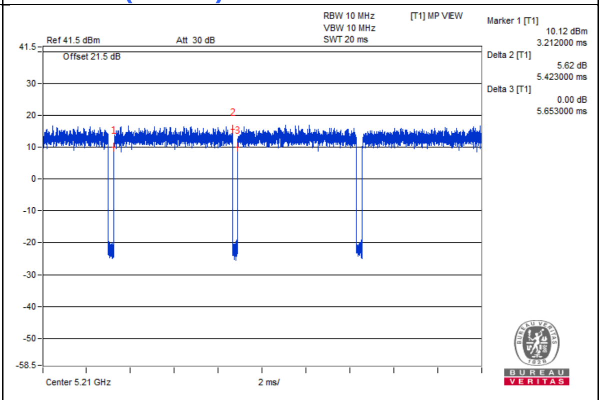
802.11ac (VHT20)



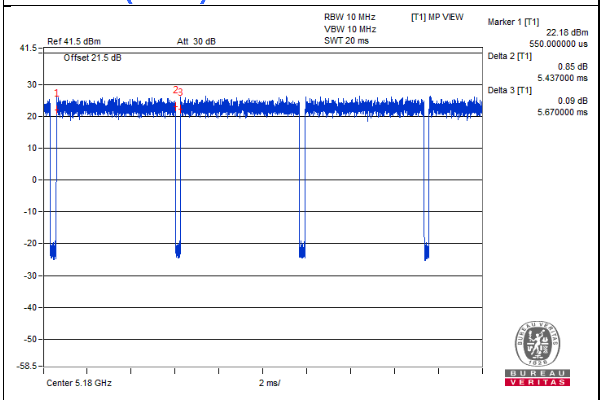
802.11ac (VHT40)



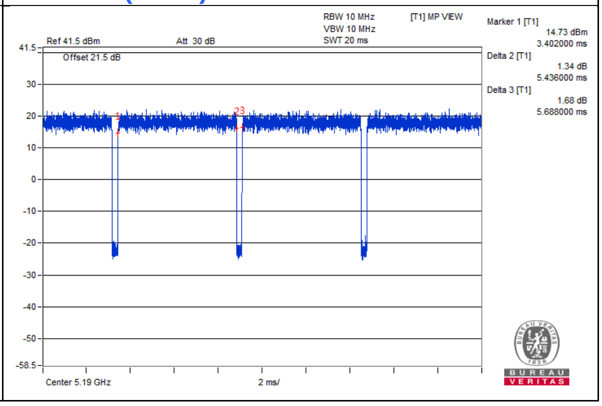
802.11ac (VHT80)



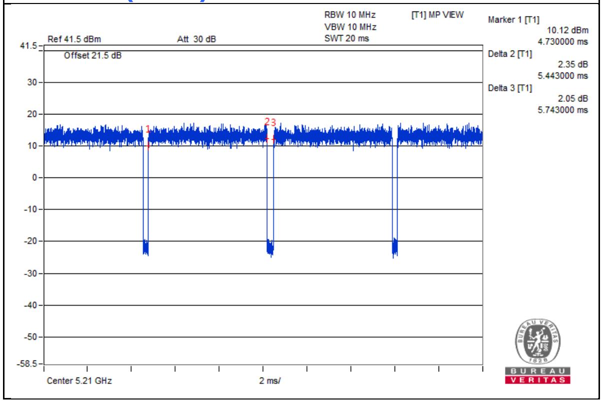
802.11ax (HE20)



802.11ax (HE40)



802.11ax (HE80)



For high band:

802.11a: Duty cycle = 1.971 ms/2.099 ms = 0.939, Duty factor = 10 * log (1/Duty cycle) = 0.27

802.11ac (VHT20): Duty cycle = 5.42 ms/5.683 ms = 0.954, Duty factor = 10 * log (1/Duty cycle) = 0.21

802.11ac (VHT40): Duty cycle = 5.423 ms/5.66 ms = 0.958, Duty factor = 10 * log (1/Duty cycle) = 0.19

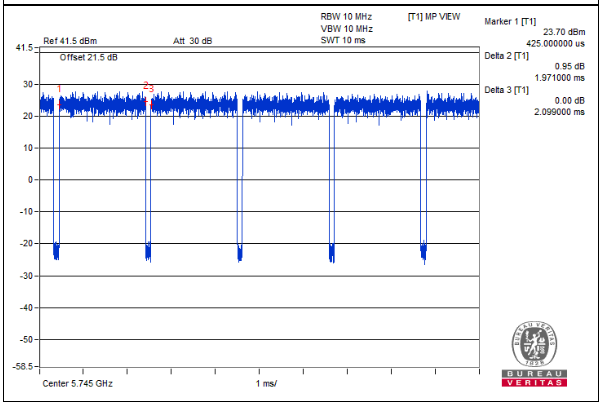
802.11ac (VHT80): Duty cycle = 5.419 ms/5.668 ms = 0.956, Duty factor = 10 * log (1/Duty cycle) = 0.19

802.11ax (HE20): Duty cycle = 5.443 ms/5.705 ms = 0.954, Duty factor = 10 * log (1/Duty cycle) = 0.20

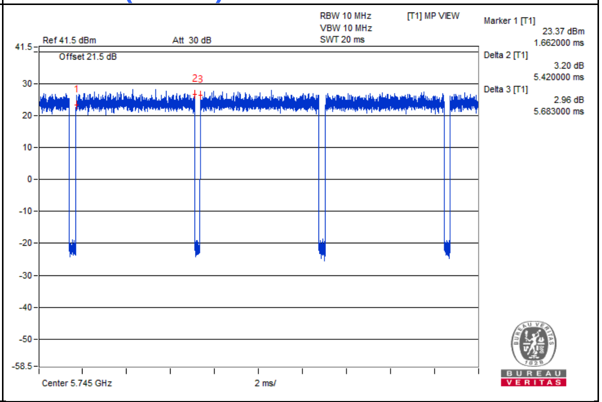
802.11ax (HE40): Duty cycle = 5.44 ms/5.668 ms = 0.96, Duty factor = 10 * log (1/Duty cycle) = 0.18

802.11ax (HE80): Duty cycle = 5.447 ms/5.7 ms = 0.956, Duty factor = 10 * log (1/Duty cycle) = 0.20

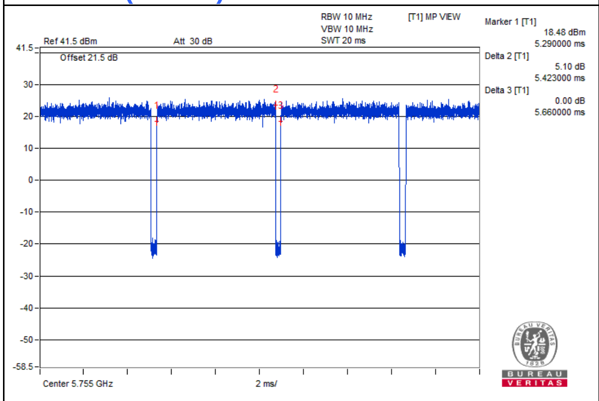
802.11a



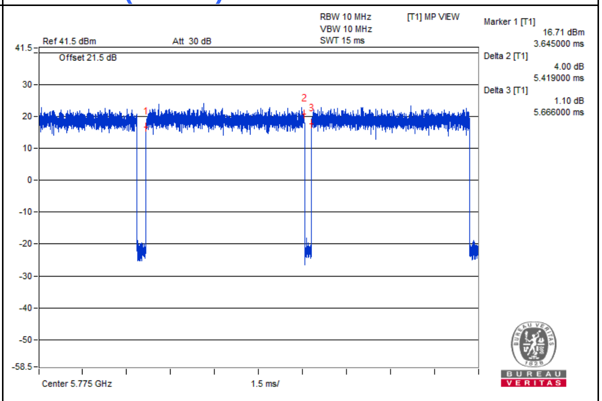
802.11ac (VHT20)



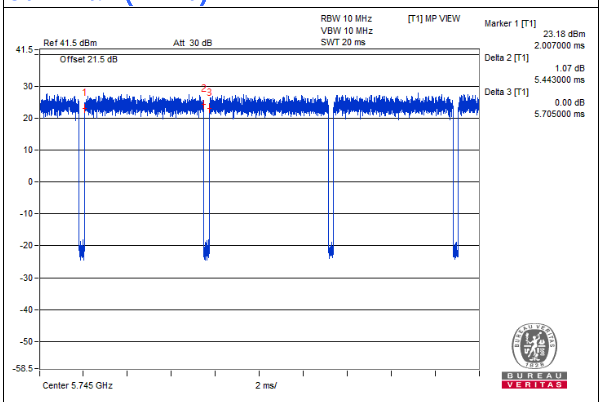
802.11ac (VHT40)



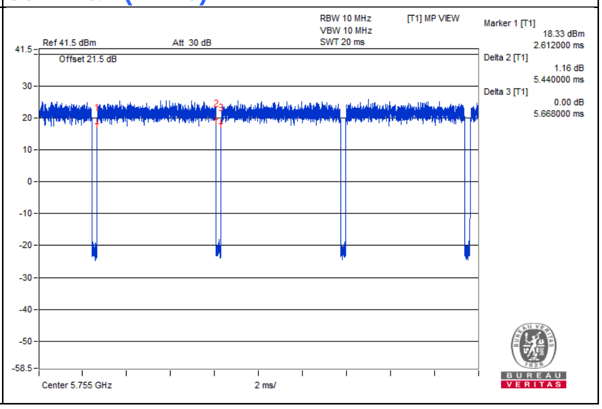
802.11ac (VHT80)



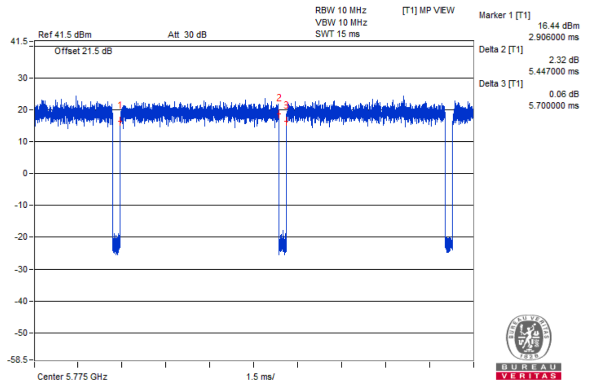
802.11ax (HE20)



802.11ax (HE40)



802.11ax (HE80)



3.4 Description of Support Units

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

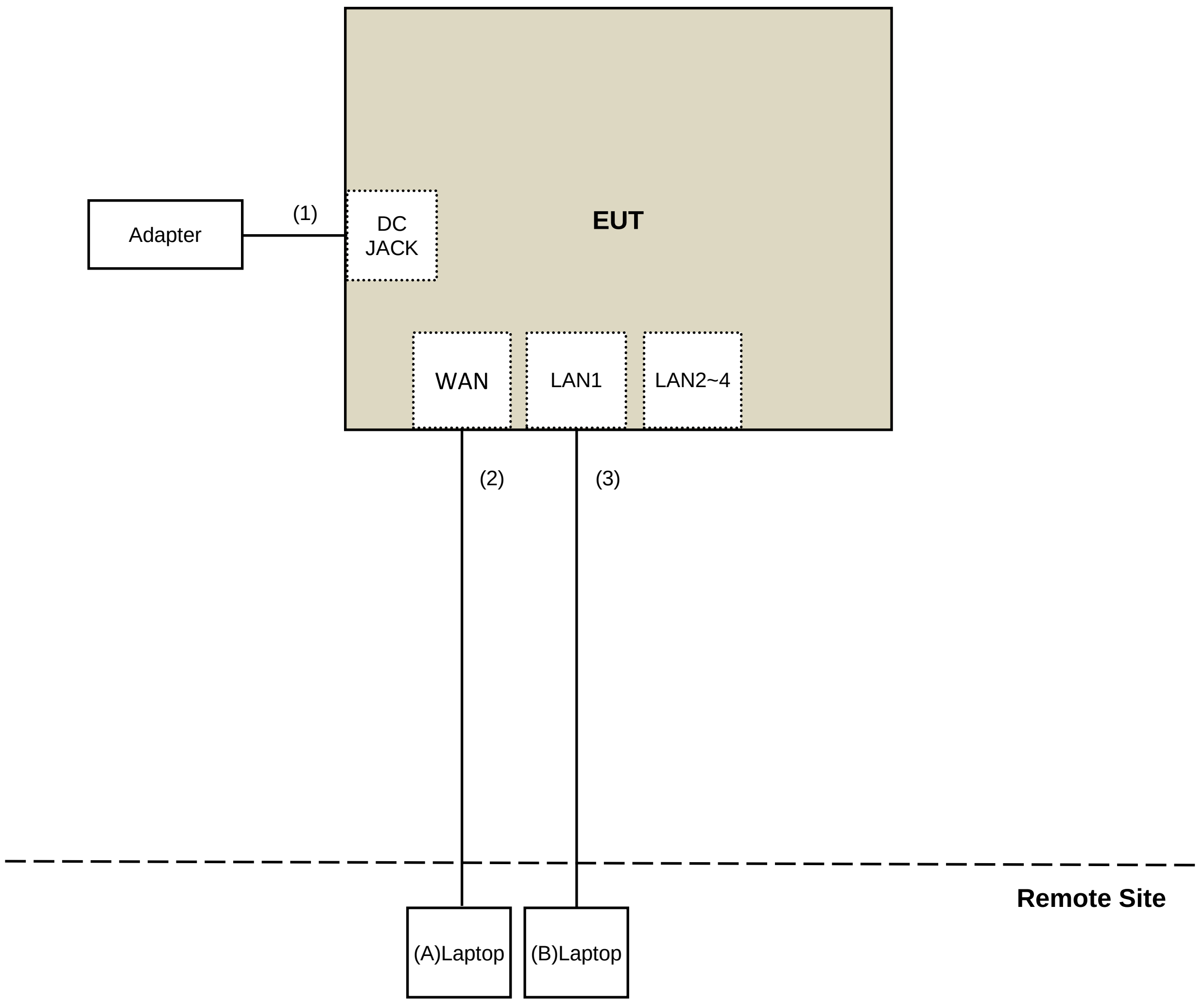
ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Laptop	DELL	Inspiron 7570	DW3CSJ2	NA	Provided by Lab
B.	Laptop	DELL	E6420	482T3R1	FCC DoC	Provided by Lab

Note:

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

ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	DC Cable	1	1.8	No	0	Supplied by client
2.	RJ-45 Cable	1	10	No	0	Provided by Lab
3.	RJ-45 Cable	1	10	No	0	Provided by Lab

3.4.1 Configuration of System under Test



3.5 General Description of Applied Standard

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

FCC Part 15, Subpart E (15.407)
KDB 789033 D02 General UNII Test Procedure New Rules v02r01
KDB 662911 D01 Multiple Transmitter Output v02r01
ANSI C63.10-2013

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

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="3">*1 beyond 75 MHz or more above of the band edge.
*3 below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above.</td><td colspan="2">*2 below the band edge increasing linearly to 10 dBm/MHz at 25 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:

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

4.1.2 Test Instruments

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver Keysight	N9038A	MY54450088	July 03, 2019	July 02, 2020
Pre-Amplifier EMCI	EMC001340	980142	May 30, 2019	May 29, 2020
Loop Antenna Electro-Metrics	EM-6879	264	Jan. 22, 2019	Jan. 21, 2020
RF Cable	NA	LOOPCAB-001	Jan. 14, 2019	Jan. 13, 2020
RF Cable	NA	LOOPCAB-002	Jan. 14, 2019	Jan. 13, 2020
Pre-Amplifier Mini-Circuits	ZFL-1000VH2B	AMP-ZFL-01	Oct. 30, 2018	Oct. 29, 2019
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-406	Nov. 22, 2018	Nov. 21, 2019
RF Cable	8D	966-4-1	Mar. 19, 2019	Mar. 18, 2020
RF Cable	8D	966-4-2	Mar. 19, 2019	Mar. 18, 2020
RF Cable	8D	966-4-3	Mar. 19, 2019	Mar. 18, 2020
Fixed attenuator Mini-Circuits	UNAT-5+	PAD-3m-4-01	Sep. 27, 2018	Sep. 26, 2019
Horn_Antenna SCHWARZBECK	BBHA 9120D	9120D-783	Nov. 25, 2018	Nov. 24, 2019
Pre-Amplifier EMCI	EMC12630SE	980385	Aug. 15, 2019	Aug. 14, 2020
RF Cable	EMC104-SM-SM-1200	160923	Jan. 28, 2019	Jan. 27, 2020
RF Cable	104 RF cable	131215	Jan. 10, 2019	Jan. 09, 2020
RF Cable	EMC104-SM-SM-6000	180418	May 03, 2019	May 02, 2020
Pre-Amplifier EMCI	EMC184045SE	980387	Jan. 28, 2019	Jan. 27, 2020
Horn_Antenna SCHWARZBECK	BBHA 9170	BBHA9170519	Nov. 25, 2018	Nov. 24, 2019
RF Cable	EMC102-KM-KM-1200	160924	Jan. 28, 2019	Jan. 27, 2020
RF Cable	EMC102-KM-KM-1200	160925	Jan. 28, 2019	Jan. 27, 2020
Software	ADT_Radiated_V8.7.08	NA	NA	NA
Boresight Antenna Tower & Turn Table Max-Full	MF-7802BS	MF780208530	NA	NA

Note:
1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in 966 Chamber No. 4.
3. Loop antenna was used for all emissions below 30 MHz.
4. Tested Date: Aug.22 to 23, 2019

4.1.3 Test Procedure

For Radiated emission below 30MHz

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

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

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

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

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

NOTE:

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

For Radiated emission above 30MHz

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

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

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

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

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

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

Note:

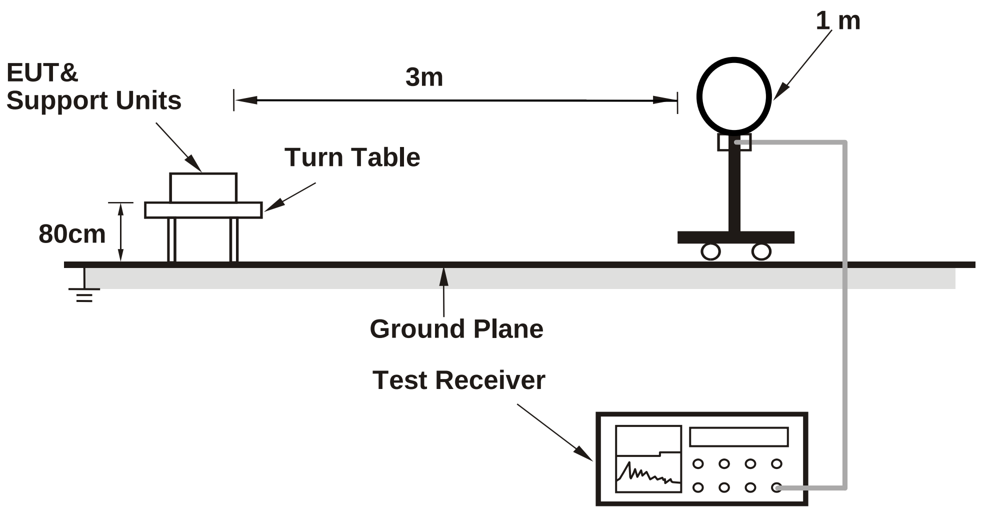
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.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

4.1.4 Deviation from Test Standard

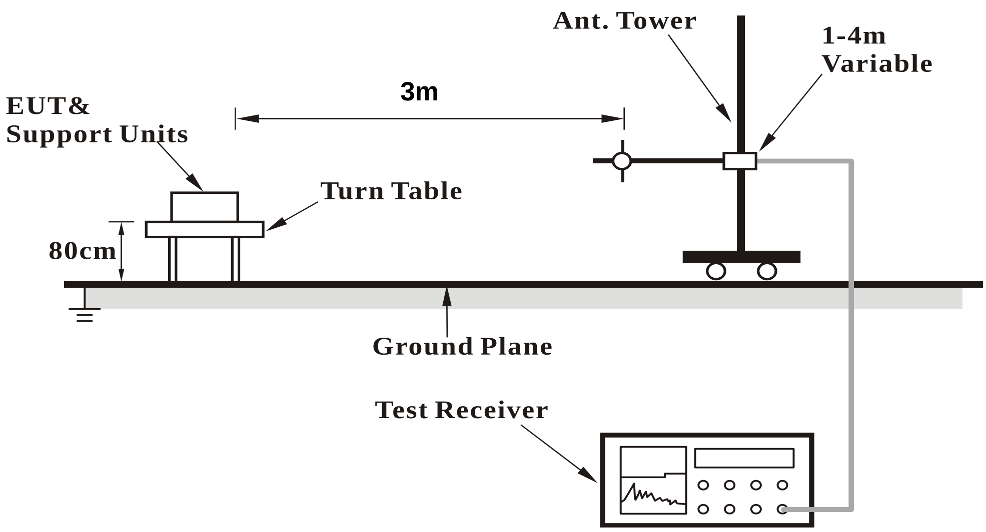
No deviation.

4.1.5 Test Setup

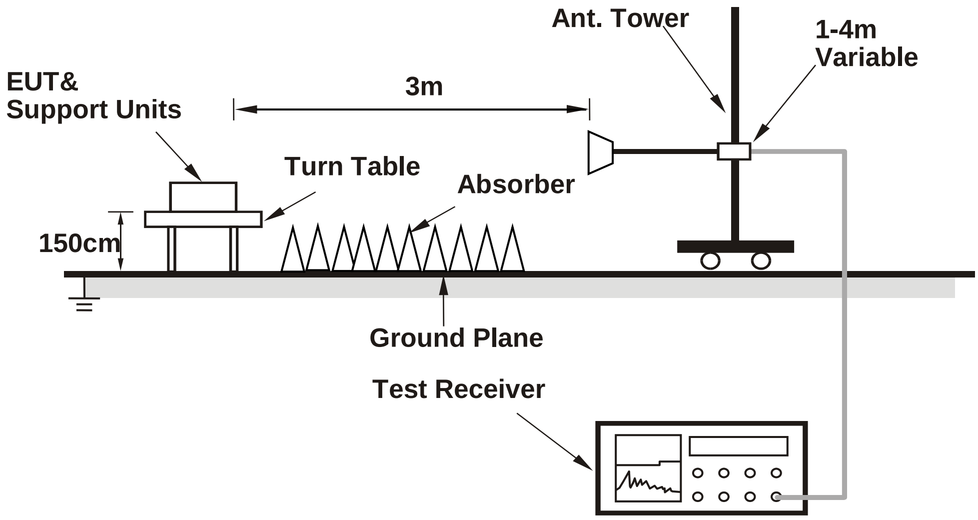
For Radiated emission below 30MHz



For Radiated emission 30MHz to 1GHz



For Radiated emission above 1GHz



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

4.1.6 EUT Operating Condition

a. Connected the EUT with the Laptop which is placed on remote site.
b. Controlling software (QSPR (5.0-00140)) has been activated to set the EUT under transmission condition continuously at specific channel frequency.

4.1.7 Test Results (Mode 1)

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	5150.00	54.7 PK	74.0	-19.3	1.39 H	228	51.2	3.5
2	5150.00	43.7 AV	54.0	-10.3	1.39 H	228	40.2	3.5
3	*5180.00	113.3 PK			1.39 H	228	109.9	3.4
4	*5180.00	104.1 AV			1.39 H	228	100.7	3.4
5	#10360.00	49.3 PK	68.2	-18.9	1.40 H	228	36.2	13.1
6	15540.00	51.0 PK	74.0	-23.0	2.35 H	320	37.4	13.6
7	15540.00	42.2 AV	54.0	-11.8	2.35 H	320	28.6	13.6
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	62.8 PK	74.0	-11.2	2.70 V	161	59.3	3.5
2	5150.00	53.7 AV	54.0	-0.3	2.70 V	161	50.2	3.5
3	*5180.00	120.9 PK			2.70 V	161	117.5	3.4
4	*5180.00	111.9 AV			2.70 V	161	108.5	3.4
5	#10360.00	51.8 PK	68.2	-16.4	2.06 V	186	38.7	13.1
6	15540.00	52.3 PK	74.0	-21.7	1.62 V	227	38.7	13.6
7	15540.00	42.2 AV	54.0	-11.8	1.62 V	227	28.6	13.6

REMARKS:

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

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

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	54.9 PK	74.0	-19.1	1.41 H	214	51.4	3.5
2	5150.00	44.1 AV	54.0	-9.9	1.41 H	214	40.6	3.5
3	*5200.00	118.7 PK			1.41 H	214	115.3	3.4
4	*5200.00	109.7 AV			1.41 H	214	106.3	3.4
5	#10400.00	49.7 PK	68.2	-18.5	1.45 H	216	36.3	13.4
6	15600.00	51.2 PK	74.0	-22.8	2.39 H	326	37.8	13.4
7	15600.00	42.5 AV	54.0	-11.5	2.39 H	326	29.1	13.4
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	64.1 PK	74.0	-9.9	1.50 V	9	60.6	3.5
2	5150.00	51.6 AV	54.0	-2.4	1.50 V	9	48.1	3.5
3	*5200.00	126.4 PK			1.50 V	9	123.0	3.4
4	*5200.00	117.3 AV			1.50 V	9	113.9	3.4
5	#10400.00	52.0 PK	68.2	-16.2	2.06 V	199	38.6	13.4
6	15600.00	52.6 PK	74.0	-21.4	1.56 V	219	39.2	13.4
7	15600.00	42.4 AV	54.0	-11.6	1.56 V	219	29.0	13.4

REMARKS:

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

CHANNEL	TX Channel 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	5150.00	54.2 PK	74.0	-19.8	1.43 H	211	50.7	3.5
2	5150.00	43.2 AV	54.0	-10.8	1.43 H	211	39.7	3.5
3	*5240.00	118.9 PK			1.43 H	211	115.9	3.0
4	*5240.00	110.1 AV			1.43 H	211	107.1	3.0
5	5350.00	54.8 PK	74.0	-19.2	1.43 H	211	51.5	3.3
6	5350.00	43.9 AV	54.0	-10.1	1.43 H	211	40.6	3.3
7	#10480.00	49.0 PK	68.2	-19.2	1.44 H	202	35.5	13.5
8	15720.00	50.5 PK	74.0	-23.5	2.36 H	333	37.7	12.8
9	15720.00	42.0 AV	54.0	-12.0	2.36 H	333	29.2	12.8

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	55.1 PK	74.0	-18.9	1.65 V	4	51.6	3.5
2	5150.00	45.6 AV	54.0	-8.4	1.65 V	4	42.1	3.5
3	*5240.00	126.1 PK			1.65 V	4	123.1	3.0
4	*5240.00	118.2 AV			1.65 V	4	115.2	3.0
5	5350.00	54.8 PK	74.0	-19.2	1.65 V	4	51.5	3.3
6	5350.00	44.8 AV	54.0	-9.2	1.65 V	4	41.5	3.3
7	#10480.00	52.6 PK	68.2	-15.6	2.08 V	193	39.1	13.5
8	15720.00	52.4 PK	74.0	-21.6	1.62 V	219	39.6	12.8
9	15720.00	42.5 AV	54.0	-11.5	1.62 V	219	29.7	12.8

REMARKS:

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

802.11ax (HE20)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	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	5138.00	54.8 PK	74.0	-19.2	1.41 H	239	51.3	3.5
2	5138.00	44.1 AV	54.0	-9.9	1.41 H	239	40.6	3.5
3	*5180.00	113.1 PK			1.41 H	239	109.7	3.4
4	*5180.00	103.8 AV			1.41 H	239	100.4	3.4
5	#10360.00	49.1 PK	68.2	-19.1	1.44 H	229	36.0	13.1
6	15540.00	50.8 PK	74.0	-23.2	2.42 H	334	37.2	13.6
7	15540.00	42.2 AV	54.0	-11.8	2.42 H	334	28.6	13.6
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5138.00	65.2 PK	74.0	-8.8	1.61 V	186	61.7	3.5
2	5138.00	53.4 AV	54.0	-0.6	1.61 V	186	49.9	3.5
3	*5180.00	124.2 PK			1.61 V	186	120.8	3.4
4	*5180.00	114.6 AV			1.61 V	186	111.2	3.4
5	#10360.00	52.2 PK	68.2	-16.0	2.11 V	198	39.1	13.1
6	15540.00	52.1 PK	74.0	-21.9	1.54 V	208	38.5	13.6
7	15540.00	41.8 AV	54.0	-12.2	1.54 V	208	28.2	13.6

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	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	5140.30	54.9 PK	74.0	-19.1	1.45 H	204	51.4	3.5
2	5140.30	44.1 AV	54.0	-9.9	1.45 H	204	40.6	3.5
3	5150.00	54.1 PK	74.0	-19.9	1.45 H	204	50.6	3.5
4	5150.00	43.7 AV	54.0	-10.3	1.45 H	204	40.2	3.5
5	*5200.00	118.4 PK			1.45 H	204	115.0	3.4
6	*5200.00	109.5 AV			1.45 H	204	106.1	3.4
7	5350.00	54.7 PK	74.0	-19.3	1.45 H	204	51.4	3.3
8	5350.00	43.7 AV	54.0	-10.3	1.45 H	204	40.4	3.3
9	#10400.00	48.9 PK	68.2	-19.3	1.44 H	200	35.5	13.4
10	15600.00	51.1 PK	74.0	-22.9	2.39 H	309	37.7	13.4
11	15600.00	42.7 AV	54.0	-11.3	2.39 H	309	29.3	13.4
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5140.30	67.8 PK	74.0	-6.2	1.39 V	179	64.3	3.5
2	5140.30	53.5 AV	54.0	-0.5	1.39 V	179	50.0	3.5
3	5150.00	50.3 PK	74.0	-23.7	1.34 V	226	46.8	3.5
4	5150.00	40.2 AV	54.0	-13.8	1.34 V	226	36.7	3.5
5	*5200.00	127.4 PK			1.39 V	179	124.0	3.4
6	*5200.00	116.7 AV			1.39 V	179	113.3	3.4
7	5350.00	52.3 PK	74.0	-21.7	1.46 V	223	49.0	3.3
8	5350.00	41.6 AV	54.0	-12.4	1.46 V	223	38.3	3.3
9	#10400.00	52.2 PK	68.2	-16.0	2.16 V	190	38.8	13.4
10	15600.00	52.5 PK	74.0	-21.5	1.61 V	198	39.1	13.4
11	15600.00	42.4 AV	54.0	-11.6	1.61 V	198	29.0	13.4

REMARKS:

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

CHANNEL	TX Channel 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	5150.00	54.5 PK	74.0	-19.5	1.36 H	204	51.0	3.5
2	5150.00	44.0 AV	54.0	-10.0	1.36 H	204	40.5	3.5
3	*5240.00	119.0 PK			1.36 H	204	116.0	3.0
4	*5240.00	109.7 AV			1.36 H	204	106.7	3.0
5	5350.00	55.0 PK	74.0	-19.0	1.36 H	204	51.7	3.3
6	5350.00	44.0 AV	54.0	-10.0	1.36 H	204	40.7	3.3
7	#10480.00	49.0 PK	68.2	-19.2	1.41 H	200	35.5	13.5
8	15720.00	51.2 PK	74.0	-22.8	2.39 H	323	38.4	12.8
9	15720.00	42.7 AV	54.0	-11.3	2.39 H	323	29.9	12.8
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	56.8 PK	74.0	-17.2	2.42 V	192	53.3	3.5
2	5150.00	44.8 AV	54.0	-9.2	2.42 V	192	41.3	3.5
3	*5240.00	127.1 PK			2.42 V	192	124.1	3.0
4	*5240.00	116.8 AV			2.42 V	192	113.8	3.0
5	5350.00	57.4 PK	74.0	-16.6	2.42 V	192	54.1	3.3
6	5350.00	44.1 AV	54.0	-9.9	2.42 V	192	40.8	3.3
7	#10480.00	52.7 PK	68.2	-15.5	2.07 V	182	39.2	13.5
8	15720.00	52.1 PK	74.0	-21.9	1.63 V	218	39.3	12.8
9	15720.00	42.1 AV	54.0	-11.9	1.63 V	218	29.3	12.8

REMARKS:

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

802.11ax (HE40)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	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	53.7 PK	74.0	-20.3	1.39 H	224	50.2	3.5
2	5150.00	43.5 AV	54.0	-10.5	1.39 H	224	40.0	3.5
3	*5190.00	110.3 PK			1.39 H	224	106.9	3.4
4	*5190.00	100.2 AV			1.39 H	224	96.8	3.4
5	#10380.00	50.0 PK	68.2	-18.2	1.39 H	205	36.7	13.3
6	15570.00	50.5 PK	74.0	-23.5	2.36 H	308	37.1	13.4
7	15570.00	41.8 AV	54.0	-12.2	2.36 H	308	28.4	13.4
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	67.3 PK	74.0	-6.7	1.78 V	191	63.8	3.5
2	5150.00	53.4 AV	54.0	-0.6	1.78 V	191	49.9	3.5
3	*5190.00	117.5 PK			1.78 V	191	114.1	3.4
4	*5190.00	107.1 AV			1.78 V	191	103.7	3.4
5	#10380.00	52.7 PK	68.2	-15.5	2.04 V	185	39.4	13.3
6	15570.00	51.9 PK	74.0	-22.1	1.58 V	216	38.5	13.4
7	15570.00	41.8 AV	54.0	-12.2	1.58 V	216	28.4	13.4

REMARKS:

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

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

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	54.1 PK	74.0	-19.9	1.40 H	240	50.6	3.5
2	5150.00	43.6 AV	54.0	-10.4	1.40 H	240	40.1	3.5
3	*5230.00	113.3 PK			1.40 H	240	110.2	3.1
4	*5230.00	103.5 AV			1.40 H	240	100.4	3.1
5	5350.00	53.9 PK	74.0	-20.1	1.40 H	240	50.6	3.3
6	5350.00	43.5 AV	54.0	-10.5	1.40 H	240	40.2	3.3
7	#10460.00	50.0 PK	68.2	-18.2	1.36 H	198	36.5	13.5
8	15690.00	51.4 PK	74.0	-22.6	2.30 H	328	38.5	12.9
9	15690.00	42.6 AV	54.0	-11.4	2.30 H	328	29.7	12.9
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	64.6 PK	74.0	-9.4	1.38 V	168	61.1	3.5
2	**5150.00**	**53.8 AV**	**54.0**	**-0.2**	**1.38 V**	**168**	**50.3**	**3.5**
3	*5230.00	121.7 PK			1.38 V	168	118.6	3.1
4	*5230.00	112.1 AV			1.38 V	168	109.0	3.1
5	5350.00	58.9 PK	74.0	-15.1	1.38 V	168	55.6	3.3
6	5350.00	46.5 AV	54.0	-7.5	1.38 V	168	43.2	3.3
7	#10460.00	52.2 PK	68.2	-16.0	2.15 V	209	38.7	13.5
8	15690.00	52.2 PK	74.0	-21.8	1.59 V	202	39.3	12.9
9	15690.00	42.2 AV	54.0	-11.8	1.59 V	202	29.3	12.9

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	5150.00	53.6 PK	74.0	-20.4	1.43 H	235	50.1	3.5
2	5150.00	43.2 AV	54.0	-10.8	1.43 H	235	39.7	3.5
3	*5210.00	108.3 PK			1.43 H	235	105.0	3.3
4	*5210.00	97.6 AV			1.43 H	235	94.3	3.3
5	5350.00	54.0 PK	74.0	-20.0	1.43 H	235	50.7	3.3
6	5350.00	43.8 AV	54.0	-10.2	1.43 H	235	40.5	3.3
7	#10420.00	49.6 PK	68.2	-18.6	1.23 H	199	36.1	13.5
8	15630.00	50.6 PK	74.0	-23.4	2.14 H	321	37.4	13.2
9	15630.00	0.5 AV	54.0	-53.5	2.14 H	321	-12.7	13.2
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	5150.00	63.6 PK	74.0	-10.4	1.44 V	167	60.1	3.5
2	5150.00	53.5 AV	54.0	-0.5	1.44 V	167	50.0	3.5
3	*5210.00	113.9 PK			1.44 V	167	110.6	3.3
4	*5210.00	103.0 AV			1.44 V	167	99.7	3.3
5	5350.00	54.1 PK	74.0	-19.9	1.44 V	167	50.8	3.3
6	5350.00	43.4 AV	54.0	-10.6	1.44 V	167	40.1	3.3
7	#10420.00	52.5 PK	68.2	-15.7	2.04 V	195	39.0	13.5
8	15630.00	52.8 PK	74.0	-21.2	1.56 V	223	39.6	13.2
9	15630.00	42.5 AV	54.0	-11.5	1.56 V	223	29.3	13.2

REMARKS:

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

Below 1GHz Data:

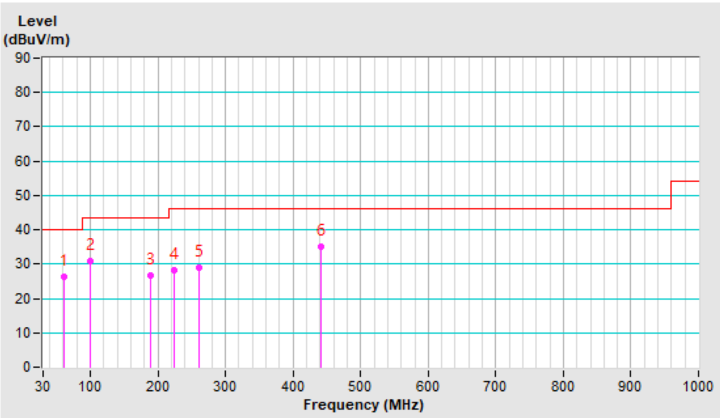
802.11a

CHANNEL	TX Channel 48	**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	61.86	26.4 QP	40.0	-13.6	1.00 H	271	35.5	-9.1
2	100.80	30.9 QP	43.5	-12.6	1.50 H	233	42.7	-11.8
3	189.19	26.7 QP	43.5	-16.8	1.50 H	105	36.8	-10.1
4	223.76	28.3 QP	46.0	-17.7	1.50 H	281	38.5	-10.2
5	260.09	29.0 QP	46.0	-17.0	2.00 H	57	37.4	-8.4
6	441.91	35.0 QP	46.0	-11.0	1.50 H	208	37.7	-2.7

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 of frequency range 30MHz~1000MHz.
5. The emission levels were very low against the limit of frequency range 9kHz~30MHz: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value to be report.

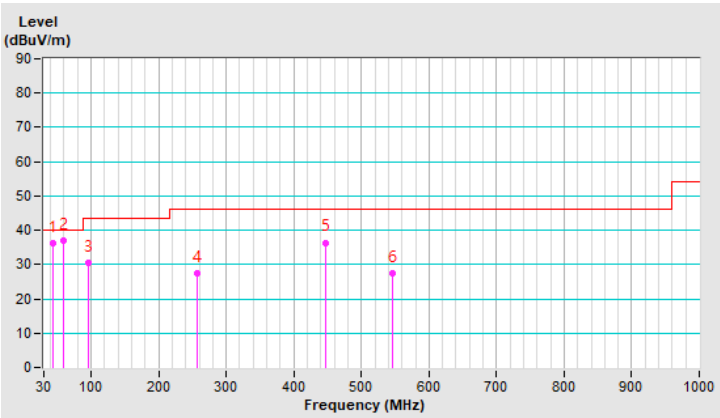


CHANNEL	TX Channel 48	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz		

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	42.81	36.1 QP	40.0	-3.9	1.00 V	296	44.5	-8.4
2	60.03	36.9 QP	40.0	-3.1	1.00 V	338	45.5	-8.6
3	96.77	30.4 QP	43.5	-13.1	1.00 V	227	42.9	-12.5
4	256.16	27.4 QP	46.0	-18.6	1.50 V	209	36.0	-8.6
5	447.96	36.4 QP	46.0	-9.6	1.50 V	144	39.0	-2.6
6	545.99	27.3 QP	46.0	-18.7	1.00 V	321	28.2	-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. Margin value = Emission Level – Limit value
4. The other emission levels were very low against the limit of frequency range 30MHz~1000MHz.
5. The emission levels were very low against the limit of frequency range 9kHz~30MHz: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value to be report.



4.1.8 Test Results (Mode 2)

Above 1GHz Data:

802.11a

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	#5644.50	52.7 PK	68.2	-15.5	2.35 H	349	49.1	3.6
2	*5745.00	120.2 PK			2.35 H	349	116.3	3.9
3	*5745.00	111.8 AV			2.35 H	349	107.9	3.9
4	#5943.34	51.9 PK	68.2	-16.3	2.35 H	349	47.5	4.4
5	11490.00	49.8 PK	74.0	-24.2	2.30 H	322	35.6	14.2
6	11490.00	41.5 AV	54.0	-12.5	2.30 H	322	27.3	14.2
7	#17235.00	54.6 PK	68.2	-13.6	2.85 H	269	37.3	17.3
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	**FREQ. (MHz)**	**EMISSION LEVEL (dBuV/m)**	**LIMIT (dBuV/m)**	**MARGIN (dB)**	**ANTENNA HEIGHT (m)**	**TABLE ANGLE (Degree)**	**RAW VALUE (dBuV)**	**CORRECTION FACTOR (dB/m)**
1	#5651.67	57.9 PK	69.4	-11.5	2.58 V	16	54.3	3.6
2	*5745.00	123.1 PK			2.58 V	16	119.2	3.9
3	*5745.00	116.2 AV			2.58 V	16	112.3	3.9
4	#5939.44	54.6 PK	68.2	-13.6	2.58 V	16	50.3	4.3
5	11490.00	52.2 PK	74.0	-21.8	2.14 V	177	38.0	14.2
6	11490.00	40.8 AV	54.0	-13.2	2.14 V	177	26.6	14.2
7	#17235.00	53.1 PK	68.2	-15.1	1.62 V	212	35.8	17.3

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. 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	#5551.28	54.8 PK	68.2	-13.4	1.50 H	140	51.1	3.7
2	*5785.00	121.0 PK			1.50 H	140	117.0	4.0
3	*5785.00	110.4 AV			1.50 H	140	106.4	4.0
4	#5929.26	52.1 PK	68.2	-16.1	1.50 H	140	47.9	4.2
5	11570.00	49.4 PK	74.0	-24.6	2.35 H	315	35.2	14.2
6	11570.00	41.2 AV	54.0	-12.8	2.35 H	315	27.0	14.2
7	#17355.00	55.3 PK	68.2	-12.9	2.81 H	260	37.6	17.7
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5589.61	57.1 PK	68.2	-11.1	2.57 V	349	53.4	3.7
2	*5785.00	122.4 PK			2.57 V	349	118.4	4.0
3	*5785.00	116.1 AV			2.57 V	349	112.1	4.0
4	#5986.18	55.2 PK	68.2	-13.0	2.57 V	349	50.8	4.4
5	11570.00	52.2 PK	74.0	-21.8	2.15 V	173	38.0	14.2
6	11570.00	40.6 AV	54.0	-13.4	2.15 V	173	26.4	14.2
7	#17355.00	53.4 PK	68.2	-14.8	1.60 V	212	35.7	17.7

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. 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	#5627.77	53.4 PK	68.2	-14.8	2.43 H	198	49.8	3.6
2	*5825.00	122.2 PK			2.43 H	198	118.0	4.2
3	*5825.00	112.0 AV			2.43 H	198	107.8	4.2
4	#5935.39	53.9 PK	68.2	-14.3	2.43 H	198	49.6	4.3
5	11650.00	50.1 PK	74.0	-23.9	2.33 H	321	36.2	13.9
6	11650.00	41.6 AV	54.0	-12.4	2.33 H	321	27.7	13.9
7	#17475.00	54.6 PK	68.2	-13.6	2.80 H	268	35.8	18.8
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5593.50	56.6 PK	68.2	-11.6	2.43 V	355	52.9	3.7
2	*5825.00	122.8 PK			2.43 V	355	118.6	4.2
3	*5825.00	116.7 AV			2.43 V	355	112.5	4.2
4	#5946.46	55.9 PK	68.2	-12.3	2.43 V	355	51.5	4.4
5	11650.00	52.0 PK	74.0	-22.0	2.17 V	189	38.1	13.9
6	11650.00	40.6 AV	54.0	-13.4	2.17 V	189	26.7	13.9
7	#17475.00	53.2 PK	68.2	-15.0	1.60 V	205	34.4	18.8

REMARKS:

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

802.11ax (HE20)

CHANNEL	TX Channel 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	#5644.32	53.7 PK	68.2	-14.5	1.58 H	171	50.1	3.6
2	*5745.00	121.3 PK			1.58 H	171	117.4	3.9
3	*5745.00	110.3 AV			1.58 H	171	106.4	3.9
4	#5927.22	52.7 PK	68.2	-15.5	1.58 H	171	48.5	4.2
5	11490.00	49.5 PK	74.0	-24.5	2.25 H	331	35.3	14.2
6	11490.00	41.1 AV	54.0	-12.9	2.25 H	331	26.9	14.2
7	#17235.00	54.8 PK	68.2	-13.4	2.86 H	282	37.5	17.3
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5647.17	57.2 PK	68.2	-11.0	2.45 V	18	53.6	3.6
2	*5745.00	122.5 PK			2.45 V	18	118.6	3.9
3	*5745.00	113.6 AV			2.45 V	18	109.7	3.9
4	#5996.93	54.9 PK	68.2	-13.3	2.45 V	18	50.5	4.4
5	11490.00	51.5 PK	74.0	-22.5	2.15 V	181	37.3	14.2
6	11490.00	40.2 AV	54.0	-13.8	2.15 V	181	26.0	14.2
7	#17235.00	53.1 PK	68.2	-15.1	1.62 V	197	35.8	17.3

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. 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	#5587.86	53.4 PK	68.2	-14.8	1.48 H	140	49.7	3.7
2	*5785.00	121.7 PK			1.48 H	140	117.7	4.0
3	*5785.00	112.5 AV			1.48 H	140	108.5	4.0
4	#5956.31	51.6 PK	68.2	-16.6	1.48 H	140	47.2	4.4
5	11570.00	49.7 PK	74.0	-24.3	2.30 H	325	35.5	14.2
6	11570.00	41.4 AV	54.0	-12.6	2.30 H	325	27.2	14.2
7	#17355.00	54.6 PK	68.2	-13.6	2.86 H	272	36.9	17.7
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5597.38	56.4 PK	68.2	-11.8	2.46 V	5	52.7	3.7
2	*5785.00	122.3 PK			2.46 V	5	118.3	4.0
3	*5785.00	114.8 AV			2.46 V	5	110.8	4.0
4	#5981.47	54.9 PK	68.2	-13.3	2.46 V	5	50.5	4.4
5	11570.00	52.1 PK	74.0	-21.9	2.20 V	169	37.9	14.2
6	11570.00	40.4 AV	54.0	-13.6	2.20 V	169	26.2	14.2
7	#17355.00	53.3 PK	68.2	-14.9	1.60 V	196	35.6	17.7

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. 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	#5557.37	51.9 PK	68.2	-16.3	2.48 H	198	48.2	3.7
2	*5825.00	122.5 PK			2.48 H	198	118.3	4.2
3	*5825.00	113.6 AV			2.48 H	198	109.4	4.2
4	#5941.70	52.2 PK	68.2	-16.0	2.48 H	198	47.9	4.3
5	11650.00	49.8 PK	74.0	-24.2	2.29 H	332	35.9	13.9
6	11650.00	41.7 AV	54.0	-12.3	2.29 H	332	27.8	13.9
7	#17475.00	54.8 PK	68.2	-13.4	2.89 H	273	36.0	18.8
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5565.71	55.4 PK	68.2	-12.8	2.47 V	14	51.7	3.7
2	*5825.00	123.1 PK			2.47 V	14	118.9	4.2
3	*5825.00	115.2 AV			2.47 V	14	111.0	4.2
4	#5928.68	58.2 PK	68.2	-10.0	2.47 V	14	54.0	4.2
5	11650.00	52.0 PK	74.0	-22.0	2.09 V	168	38.1	13.9
6	11650.00	40.2 AV	54.0	-13.8	2.09 V	168	26.3	13.9
7	#17475.00	53.6 PK	68.2	-14.6	1.55 V	209	34.8	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.

802.11ax (HE40)

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	#5640.97	55.9 PK	68.2	-12.3	1.49 H	144	52.3	3.6
2	*5755.00	120.2 PK			1.49 H	144	116.3	3.9
3	*5755.00	109.8 AV			1.49 H	144	105.9	3.9
4	#5957.66	51.5 PK	68.2	-16.7	1.49 H	144	47.1	4.4
5	11510.00	49.7 PK	74.0	-24.3	2.27 H	336	35.5	14.2
6	11510.00	41.4 AV	54.0	-12.6	2.27 H	336	27.2	14.2
7	#17265.00	54.9 PK	68.2	-13.3	2.88 H	259	37.7	17.2
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	#5565.90	58.7 PK	68.2	-9.5	2.38 V	355	55.0	3.7
2	*5755.00	121.3 PK			2.38 V	355	117.4	3.9
3	*5755.00	112.9 AV			2.38 V	355	109.0	3.9
4	#5965.41	55.3 PK	68.2	-12.9	2.38 V	355	50.9	4.4
5	11510.00	52.4 PK	74.0	-21.6	2.18 V	181	38.2	14.2
6	11510.00	40.8 AV	54.0	-13.2	2.18 V	181	26.6	14.2
7	#17265.00	53.6 PK	68.2	-14.6	1.60 V	223	36.4	17.2

REMARKS:

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

CHANNEL	TX Channel 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	#5575.34	51.4 PK	68.2	-16.8	2.92 H	143	47.7	3.7
2	*5795.00	120.7 PK			2.92 H	143	116.7	4.0
3	*5795.00	110.5 AV			2.92 H	143	106.5	4.0
4	#5931.07	53.7 PK	68.2	-14.5	2.92 H	143	49.4	4.3
5	11590.00	49.5 PK	74.0	-24.5	2.26 H	324	35.3	14.2
6	11590.00	41.4 AV	54.0	-12.6	2.26 H	324	27.2	14.2
7	#17385.00	54.4 PK	68.2	-13.8	2.88 H	258	36.6	17.8
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5556.47	57.5 PK	68.2	-10.7	2.35 V	356	53.8	3.7
2	*5795.00	122.0 PK			2.35 V	356	118.0	4.0
3	*5795.00	113.6 AV			2.35 V	356	109.6	4.0
4	#5942.17	56.1 PK	68.2	-12.1	2.35 V	356	51.8	4.3
5	11590.00	52.6 PK	74.0	-21.4	2.16 V	175	38.4	14.2
6	11590.00	40.8 AV	54.0	-13.2	2.16 V	175	26.6	14.2
7	#17385.00	53.3 PK	68.2	-14.9	1.59 V	217	35.5	17.8

REMARKS:

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

802.11ax (HE80)

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	#5636.75	59.3 PK	68.2	-8.9	3.33 H	140	55.7	3.6
2	*5775.00	115.6 PK			3.33 H	140	111.7	3.9
3	*5775.00	105.3 AV			3.33 H	140	101.4	3.9
4	#5939.89	54.3 PK	68.2	-13.9	3.33 H	140	50.0	4.3
5	11550.00	49.3 PK	74.0	-24.7	2.35 H	328	35.1	14.2
6	11550.00	41.3 AV	54.0	-12.7	2.35 H	328	27.1	14.2
7	#17325.00	54.5 PK	68.2	-13.7	2.81 H	262	37.1	17.4
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5638.17	66.8 PK	68.2	-1.4	2.48 V	357	63.2	3.6
2	*5775.00	119.0 PK			2.48 V	357	115.1	3.9
3	*5775.00	108.6 AV			2.48 V	357	104.7	3.9
4	#5929.76	60.1 PK	68.2	-8.1	2.48 V	357	55.9	4.2
5	11550.00	52.6 PK	74.0	-21.4	2.17 V	162	38.4	14.2
6	11550.00	40.8 AV	54.0	-13.2	2.17 V	162	26.6	14.2
7	#17325.00	53.2 PK	68.2	-15.0	1.57 V	221	35.8	17.4

REMARKS:

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

Below 1GHz Data:

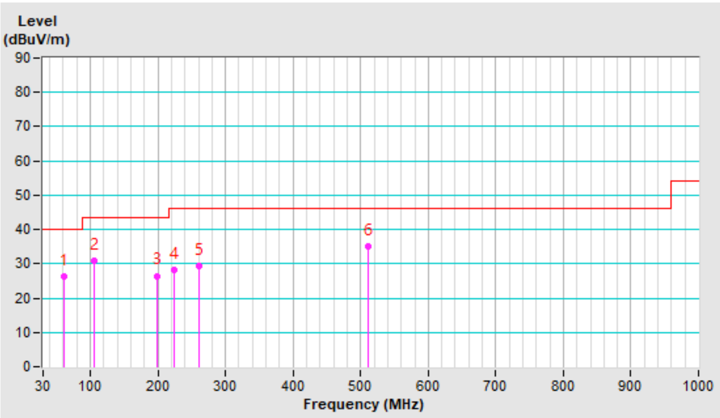
802.11ax (HE40)

CHANNEL	TX Channel 159	**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	61.76	26.2 QP	40.0	-13.8	1.70 H	311	35.3	-9.1
2	104.80	30.9 QP	43.5	-12.6	1.80 H	273	42.2	-11.3
3	199.19	26.5 QP	43.5	-17.0	1.45 H	145	36.9	-10.4
4	223.66	28.3 QP	46.0	-17.7	1.56 H	311	38.5	-10.2
5	260.29	29.3 QP	46.0	-16.7	2.06 H	87	37.7	-8.4
6	511.91	35.0 QP	46.0	-11.0	1.70 H	248	36.4	-1.4

REMARKS:

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

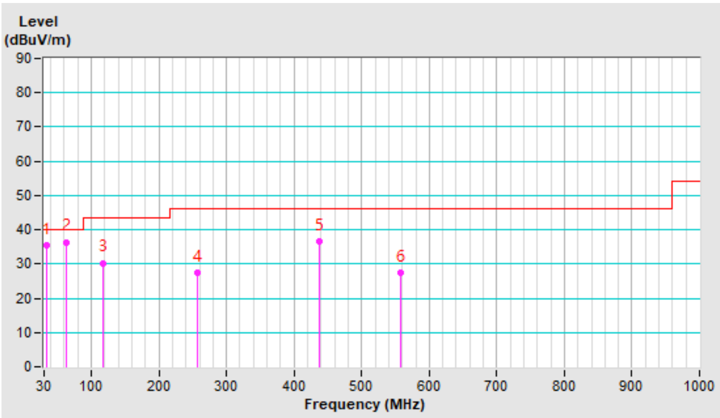


CHANNEL	TX Channel 159	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz		

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	32.91	35.6 QP	40.0	-4.4	1.18 V	286	45.3	-9.7
2	62.23	36.4 QP	40.0	-3.6	1.40 V	358	45.5	-9.1
3	116.77	30.3 QP	43.5	-13.2	1.60 V	237	40.5	-10.2
4	256.16	27.4 QP	46.0	-18.6	1.50 V	259	36.0	-8.6
5	437.86	36.6 QP	46.0	-9.4	2.02 V	184	39.5	-2.9
6	556.99	27.3 QP	46.0	-18.7	2.00 V	301	28.0	-0.7

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 of frequency range 30MHz~1000MHz.
5. The emission levels were very low against the limit of frequency range 9kHz~30MHz: the amplitude of spurious emissions attenuated more than 20 dB below the permissible value to be report.



4.2 Conducted Emission Measurement

4.2.1 Limits of Conducted Emission Measurement

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

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

4.2.2 Test Instruments

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver R&S	ESCS 30	847124/029	Oct. 24, 2018	Oct. 23, 2019
Line-Impedance Stabilization Network (for EUT) R&S	ESH3-Z5	848773/004	Oct. 22, 2018	Oct. 21, 2019
Line-Impedance Stabilization Network (for Peripheral) R&S	ESH3-Z5	835239/001	Mar. 17, 2019	Mar. 16, 2020
50 ohms Terminator	N/A	3	Oct. 22, 2018	Oct. 21, 2019
RF Cable	5D-FB	COCCAB-001	Sep. 28, 2018	Sep. 27, 2019
Fixed attenuator EMCI	STI02-2200-10	003	Mar. 14, 2019	Mar. 13, 2020
Software BVADT	BVADT_Cond_ V7.3.7.4	NA	NA	NA

Note:

1. The calibration interval of the above test instruments are 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in Conduction 1.
3. Tested Date: Aug. 21, 2019

4.2.3 Test Procedure

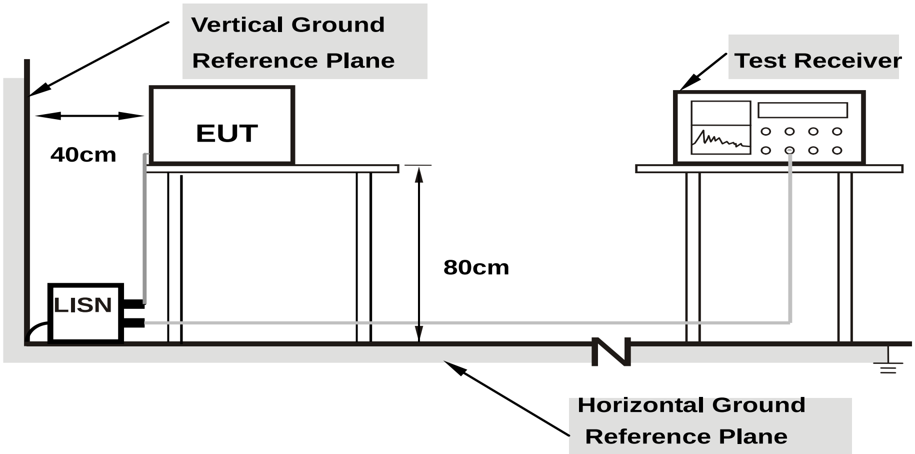
a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.
b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

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

4.2.4 Deviation from Test Standard

No deviation.

4.2.5 Test Setup



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

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

4.2.6 EUT Operating Condition

Same as 4.1.6.

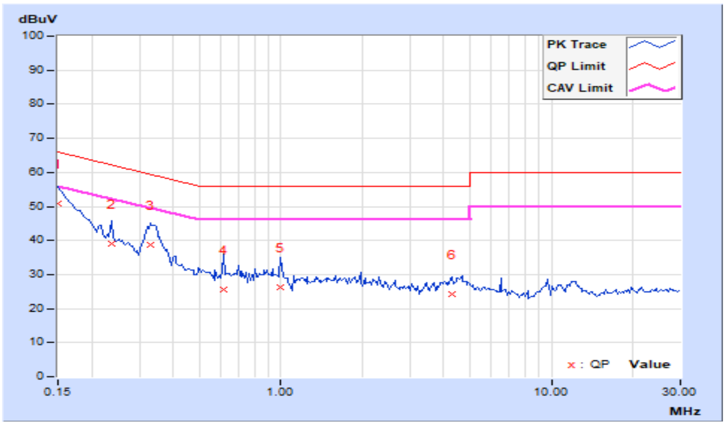
4.2.7 Test Results (Mode 1)

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

No	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	9.96	40.88	23.63	50.84	33.59	66.00	56.00	-15.16	-22.41
2	0.23594	9.97	28.94	17.56	38.91	27.53	62.24	52.24	-23.33	-24.71
3	0.32969	9.98	28.87	20.08	38.85	30.06	59.46	49.46	-20.61	-19.40
4	0.61484	10.00	15.57	8.74	25.57	18.74	56.00	46.00	-30.43	-27.26
5	0.99766	10.03	16.22	10.13	26.25	20.16	56.00	46.00	-29.75	-25.84
6	4.29297	10.28	14.01	7.99	24.29	18.27	56.00	46.00	-31.71	-27.73

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.

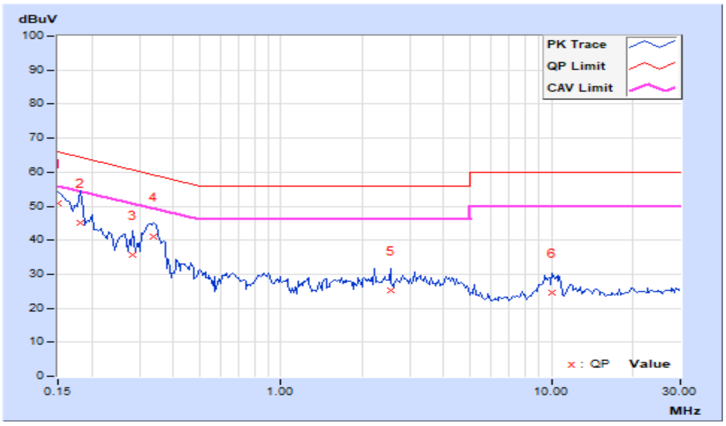


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)

No	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	9.94	40.85	22.81	50.79	32.75	66.00	56.00	-15.21	-23.25
2	0.18125	9.95	35.32	19.39	45.27	29.34	64.43	54.43	-19.16	-25.09
3	0.28281	9.96	25.72	16.41	35.68	26.37	60.73	50.73	-25.05	-24.36
4	0.33750	9.96	30.99	25.44	40.95	35.40	59.26	49.26	-18.31	-13.86
5	2.53906	10.12	15.15	9.96	25.27	20.08	56.00	46.00	-30.73	-25.92
6	10.00000	10.55	13.93	9.24	24.48	19.79	60.00	50.00	-35.52	-30.21

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.



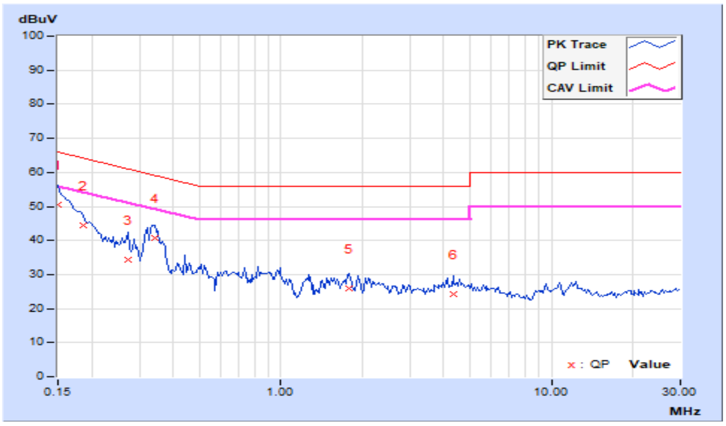
4.2.8 Test Results (Mode 2)

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

No	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	9.96	40.39	23.28	50.35	33.24	66.00	56.00	-15.65	-22.76
2	0.18515	9.97	34.55	18.75	44.52	28.72	64.25	54.25	-19.73	-25.53
3	0.27108	9.97	24.31	13.61	34.28	23.58	61.08	51.08	-26.80	-27.50
4	**0.34140**	**9.98**	**30.72**	**25.76**	**40.70**	**35.74**	**59.17**	**49.17**	**-18.47**	**-13.43**
5	1.79687	10.09	15.69	10.28	25.78	20.37	56.00	46.00	-30.22	-25.63
6	4.32812	10.28	14.12	8.01	24.40	18.29	56.00	46.00	-31.60	-27.71

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.

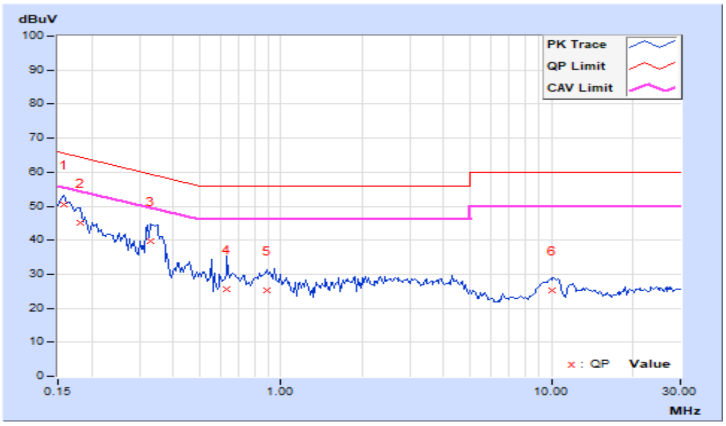


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)

No	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15780	9.95	40.46	25.13	50.41	35.08	65.58	55.58	-15.17	-20.50
2	0.18125	9.95	35.31	19.48	45.26	29.43	64.43	54.43	-19.17	-25.00
3	0.32968	9.96	29.72	20.13	39.68	30.09	59.46	49.46	-19.78	-19.37
4	0.63437	9.99	15.76	10.10	25.75	20.09	56.00	46.00	-30.25	-25.91
5	0.89218	10.00	15.40	7.48	25.40	17.48	56.00	46.00	-30.60	-28.52
6	10.11327	10.56	14.55	9.28	25.11	19.84	60.00	50.00	-34.89	-30.16

REMARKS:

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



4.3 Transmit Power Measurement

4.3.1 Limits of Transmit Power Measurement

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

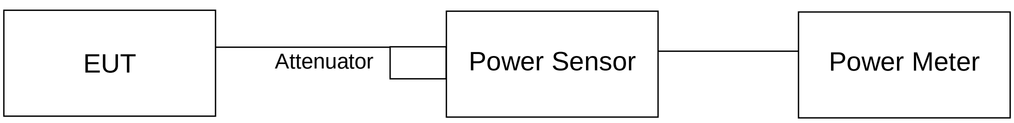
*B is the 26 dB emission bandwidth in megahertz

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

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

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

4.3.2 Test Setup



4.3.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.3.4 Test Procedure

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

4.3.5 Deviation from Test Standard

No deviation.

4.3.6 EUT Operating Condition

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

4.3.7 Test Result (Mode 1)

Non-Beamforming Mode

802.11a

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
36	5180	23.15	23.04	23.70	22.74	830.265	29.19	30.00	Pass
40	5200	23.48	23.31	24.35	23.05	911.24	29.60	30.00	Pass
48	5240	23.49	23.37	24.44	23.14	924.661	29.66	30.00	Pass

802.11ac (VHT20)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
36	5180	23.05	23.01	23.65	22.68	818.915	29.13	30.00	Pass
40	5200	23.44	23.21	24.25	22.98	894.893	29.52	30.00	Pass
48	5240	23.35	23.34	24.31	22.90	896.804	29.53	30.00	Pass

802.11ac (VHT40)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
38	5190	18.46	18.48	18.51	18.92	289.556	24.62	30.00	Pass
46	5230	23.36	23.04	23.99	23.48	891.597	29.50	30.00	Pass

802.11ac (VHT80)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
42	5210	17.48	17.02	17.41	17.76	221.111	23.45	30.00	Pass

802.11ax (HE20)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
36	5180	23.05	23.01	23.65	22.68	818.915	29.13	30.00	Pass
40	5200	23.44	23.21	24.25	22.98	894.893	29.52	30.00	Pass
48	5240	23.35	23.34	24.31	22.90	896.804	29.53	30.00	Pass

802.11ax (HE40)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
38	5190	18.46	18.48	18.51	18.92	289.556	24.62	30.00	Pass
46	5230	23.36	23.04	23.99	23.48	891.597	29.50	30.00	Pass

802.11ax (HE80)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
42	5210	17.48	17.02	17.41	17.76	221.111	23.45	30.00	Pass

Beamforming Mode

802.11ac (VHT20)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
36	5180	23.05	23.01	23.65	22.68	818.915	29.13	29.78	Pass
40	5200	23.44	23.21	24.25	22.98	894.893	29.52	29.78	Pass
48	5240	23.35	23.34	24.31	22.90	896.804	29.53	29.78	Pass

Note: 1. Directional gain = 6.22dBi > 6dBi , so the power limit shall be reduced to 30-(6.22-6) = 29.78dBm.

802.11ac (VHT40)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
38	5190	18.46	18.48	18.51	18.92	289.556	24.62	29.78	Pass
46	5230	23.36	23.04	23.99	23.48	891.597	29.50	29.78	Pass

Note: 1. Directional gain = 6.22dBi > 6dBi , so the power limit shall be reduced to 30-(6.22-6) = 29.78dBm.

802.11ac (VHT80)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
42	5210	17.48	17.02	17.41	17.76	221.111	23.45	29.78	Pass

Note: 1. Directional gain = 6.22dBi > 6dBi , so the power limit shall be reduced to 30-(6.22-6) = 29.78dBm.

802.11ax (HE20)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
36	5180	23.05	23.01	23.65	22.68	818.915	29.13	29.78	Pass
40	5200	23.44	23.21	24.25	22.98	894.893	29.52	29.78	Pass
48	5240	23.35	23.34	24.31	22.90	896.804	29.53	29.78	Pass

Note: 1. Directional gain = 6.22dBi > 6dBi , so the power limit shall be reduced to 30-(6.22-6) = 29.78dBm.

802.11ax (HE40)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
38	5190	18.46	18.48	18.51	18.92	289.556	24.62	29.78	Pass
46	5230	23.36	23.04	23.99	23.48	891.597	29.50	29.78	Pass

Note: 1. Directional gain = 6.22dBi > 6dBi , so the power limit shall be reduced to 30-(6.22-6) = 29.78dBm.

802.11ax (HE80)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
42	5210	17.48	17.02	17.41	17.76	221.111	23.45	29.78	Pass

Note: 1. Directional gain = 6.22dBi > 6dBi , so the power limit shall be reduced to 30-(6.22-6) = 29.78dBm.

4.3.8 Test Result (Mode 2)

Non-Beamforming Mode

802.11a

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
149	5745	24.06	24.09	22.88	24.24	970.681	29.87	30.00	Pass
157	5785	23.65	23.59	23.75	23.36	914.206	29.61	30.00	Pass
165	5825	23.64	23.93	23.11	23.85	925.683	29.66	30.00	Pass

802.11ac (VHT20)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
149	5745	23.85	24.03	23.01	23.68	928.923	29.68	30.00	Pass
157	5785	23.86	24.01	23.31	23.81	949.713	29.78	30.00	Pass
165	5825	23.59	24.20	23.38	23.82	950.349	29.78	30.00	Pass

802.11ac (VHT40)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
151	5755	23.74	23.89	23.61	23.55	937.577	29.72	30.00	Pass
159	5795	23.88	24.20	23.95	23.76	993.367	29.97	30.00	Pass

802.11ac (VHT80)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
155	5775	22.59	22.60	22.50	22.08	702.786	28.47	30.00	Pass

802.11ax (HE20)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
149	5745	23.85	24.03	23.01	23.68	928.923	29.68	30.00	Pass
157	5785	23.86	24.01	23.31	23.81	949.713	29.78	30.00	Pass
165	5825	23.59	24.20	23.38	23.82	950.349	29.78	30.00	Pass

802.11ax (HE40)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
151	5755	23.74	23.89	23.61	23.55	937.577	29.72	30.00	Pass
159	5795	23.88	24.20	23.95	23.76	993.367	29.97	30.00	Pass

802.11ax (HE80)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
155	5775	22.59	22.60	22.50	22.08	702.786	28.47	30.00	Pass

Beamforming Mode

802.11ac (VHT20)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
149	5745	23.35	23.53	22.51	23.18	827.904	29.18	29.48	Pass
157	5785	23.36	23.51	22.81	23.31	846.432	29.28	29.48	Pass
165	5825	23.09	23.70	22.88	23.32	846.999	29.28	29.48	Pass

Note: 1. Directional gain = 6.52dBi > 6dBi , so the power limit shall be reduced to 30-(6.52-6) = 29.48dBm.

802.11ac (VHT40)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
151	5755	23.24	23.39	23.11	23.05	835.617	29.22	29.48	Pass
159	5795	23.38	23.70	23.45	23.26	885.339	29.47	29.48	Pass

Note: 1. Directional gain = 6.52dBi > 6dBi , so the power limit shall be reduced to 30-(6.52-6) = 29.48dBm.

802.11ac (VHT80)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
155	5775	22.59	22.60	22.50	22.08	702.786	28.47	29.48	Pass

Note: 1. Directional gain = 6.52dBi > 6dBi , so the power limit shall be reduced to 30-(6.52-6) = 29.48dBm.

802.11ax (HE20)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
149	5745	23.35	23.53	22.51	23.18	827.904	29.18	29.48	Pass
157	5785	23.36	23.51	22.81	23.31	846.432	29.28	29.48	Pass
165	5825	23.09	23.70	22.88	23.32	846.999	29.28	29.48	Pass

Note: 1. Directional gain = 6.52dBi > 6dBi , so the power limit shall be reduced to 30-(6.52-6) = 29.48dBm.

802.11ax (HE40)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
151	5755	23.24	23.39	23.11	23.05	835.617	29.22	29.48	Pass
159	5795	23.38	23.70	23.45	23.26	885.339	29.47	29.48	Pass

Note: 1. Directional gain = 6.52dBi > 6dBi , so the power limit shall be reduced to 30-(6.52-6) = 29.48dBm.

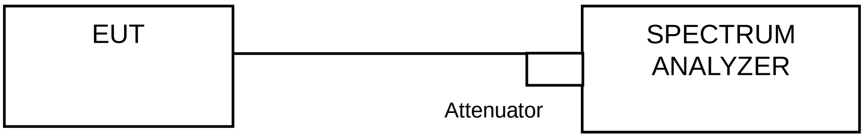
802.11ax (HE80)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
155	5775	22.59	22.60	22.50	22.08	702.786	28.47	29.48	Pass

Note: 1. Directional gain = 6.52dBi > 6dBi , so the power limit shall be reduced to 30-(6.52-6) = 29.48dBm.

4.4 Occupied Bandwidth Measurement

4.4.1 Test Setup



4.4.2 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.4.3 Test Procedure

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

4.4.4 Test Results (Mode 1)

802.11a

Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)			
		Chain 0	Chain 1	Chain 2	Chain 3
36	5180	16.44	16.44	16.68	16.68
40	5200	16.56	16.44	16.56	16.44
48	5240	16.44	16.56	16.44	16.44

802.11ax (HE20)

Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)			
		Chain 0	Chain 1	Chain 2	Chain 3
36	5180	19.08	18.96	19.08	19.20
40	5200	19.08	18.96	19.08	19.08
48	5240	18.96	19.08	18.96	18.96

802.11ax (HE40)

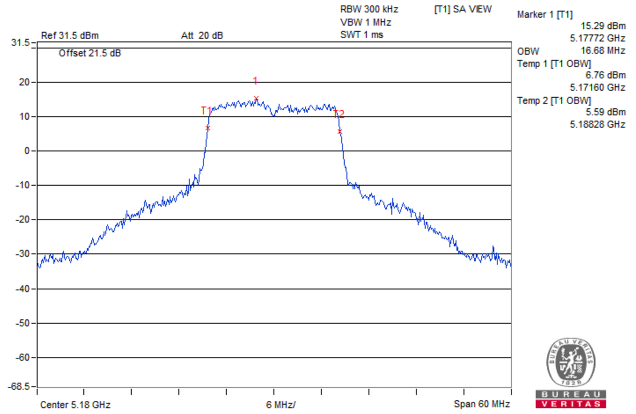
Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)			
		Chain 0	Chain 1	Chain 2	Chain 3
38	5190	38.16	37.92	38.16	37.92
46	5230	38.64	37.92	38.40	38.16

802.11ax (HE80)

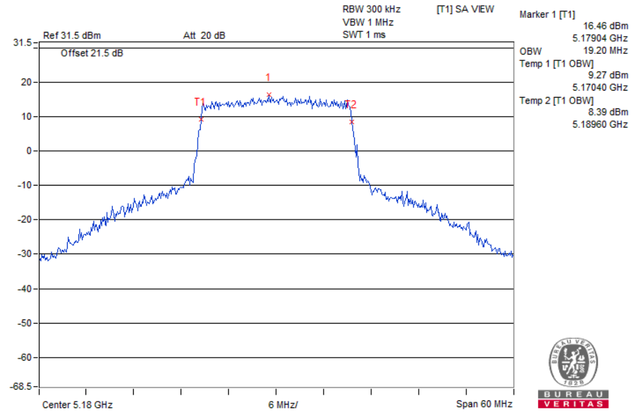
Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)			
		Chain 0	Chain 1	Chain 2	Chain 3
42	5210	77.76	76.80	77.76	77.28

Spectrum Plot of Max. Value

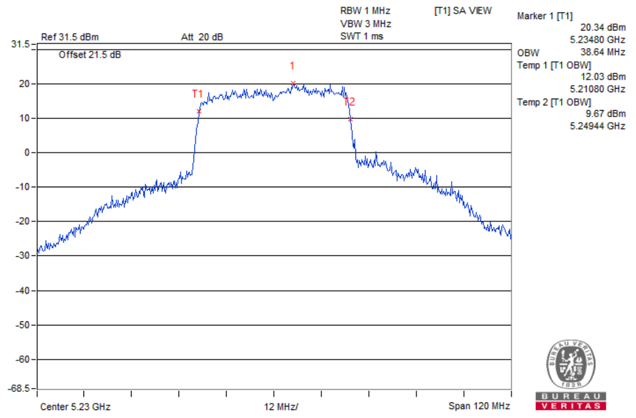
802.11a_Chain 2 / CH36



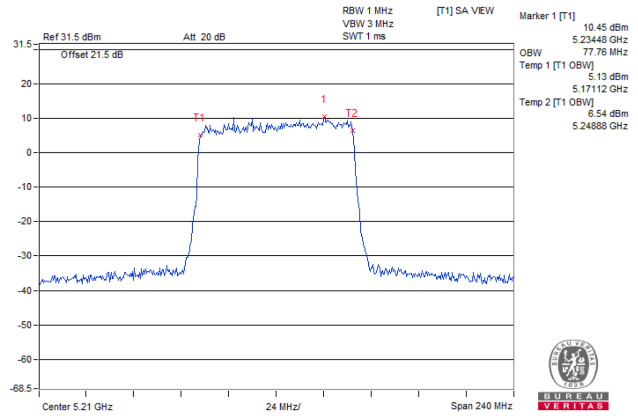
802.11ax (HE20)_Chain 3 / CH36



802.11ax (HE40)_Chain 0 / CH46



802.11ax (HE80)_Chain 0 / CH42



4.4.5 Test Results (Mode 2)

802.11a

Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)			
		Chain 0	Chain 1	Chain 2	Chain 3
149	5745	16.52	16.61	16.52	16.43
157	5785	16.56	16.56	16.44	16.44
165	5825	16.44	16.44	16.32	16.44

802.11ax (HE20)

Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)			
		Chain 0	Chain 1	Chain 2	Chain 3
149	5745	18.96	18.96	19.05	18.96
157	5785	18.96	18.96	19.08	18.96
165	5825	19.08	19.08	19.08	19.08

802.11ax (HE40)

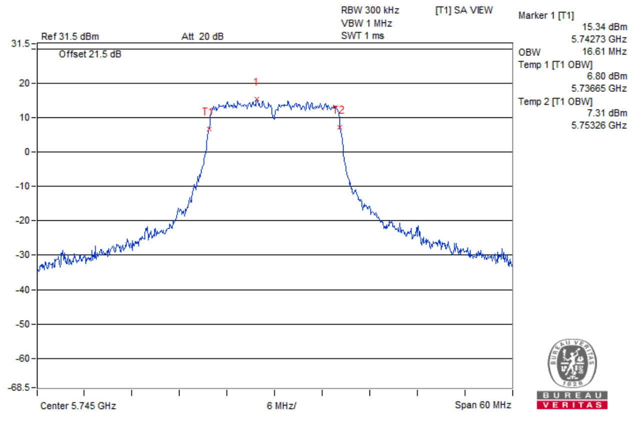
Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)			
		Chain 0	Chain 1	Chain 2	Chain 3
151	5755	38.16	38.16	37.92	37.92
159	5795	38.16	37.92	38.16	38.16

802.11ax (HE80)

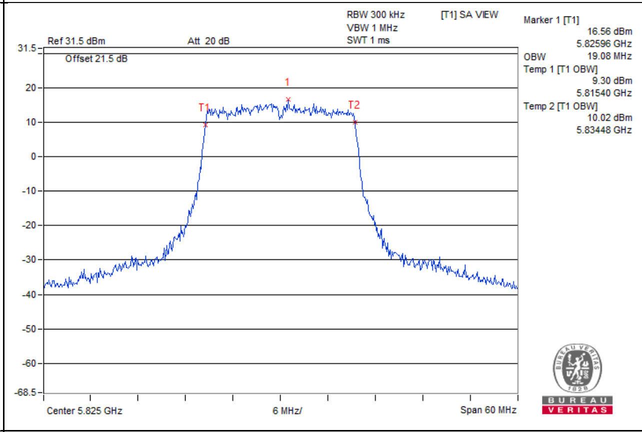
Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)			
		Chain 0	Chain 1	Chain 2	Chain 3
155	5775	77.22	76.80	77.28	76.80

Spectrum Plot of Max. Value

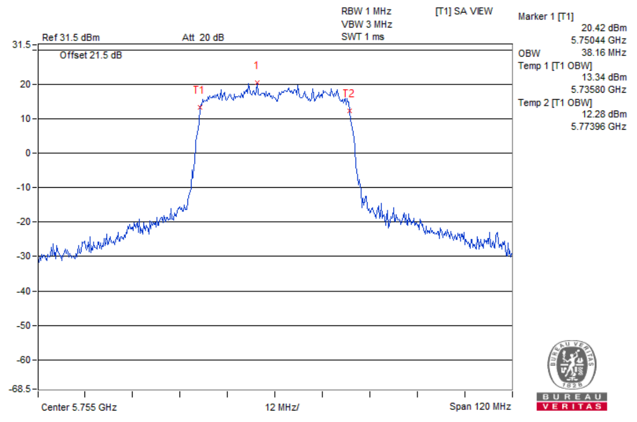
802.11a_Chain 149



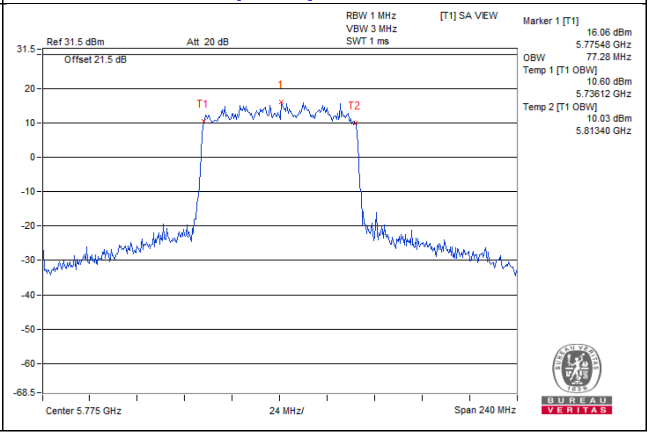
802.11ax (HE20)_Chain 0 / CH165

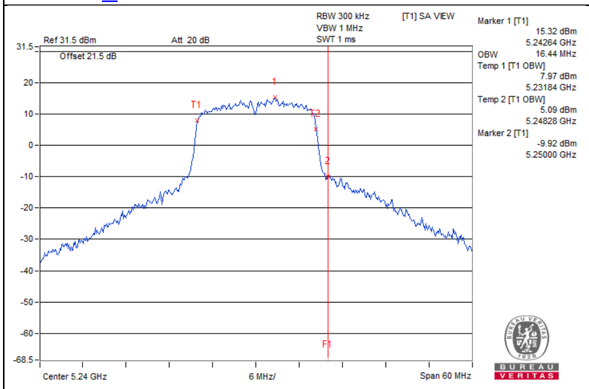
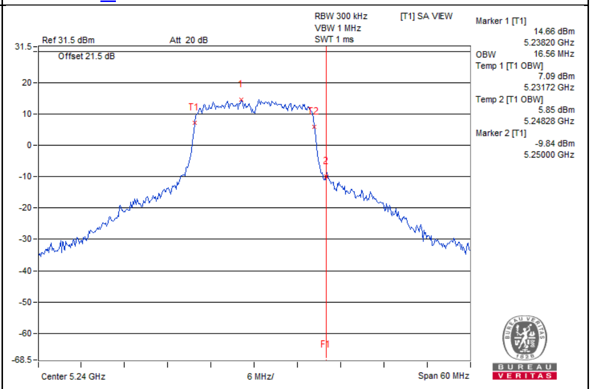
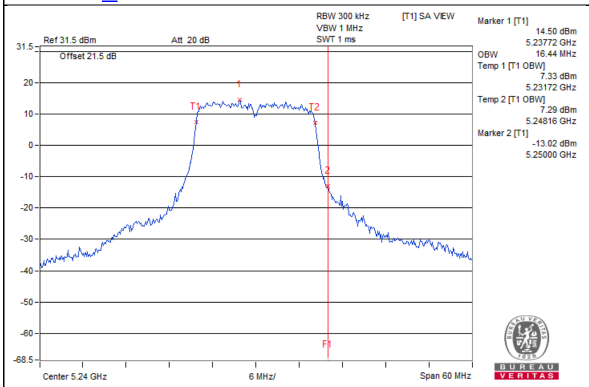
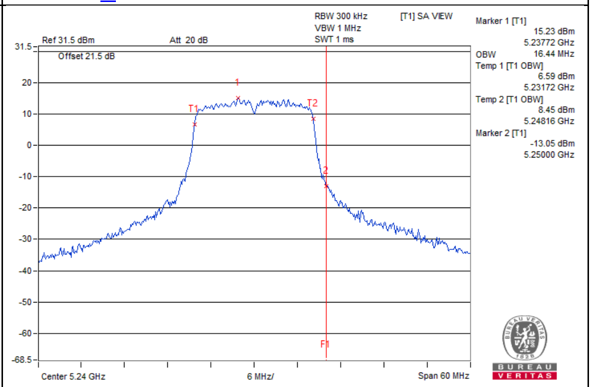
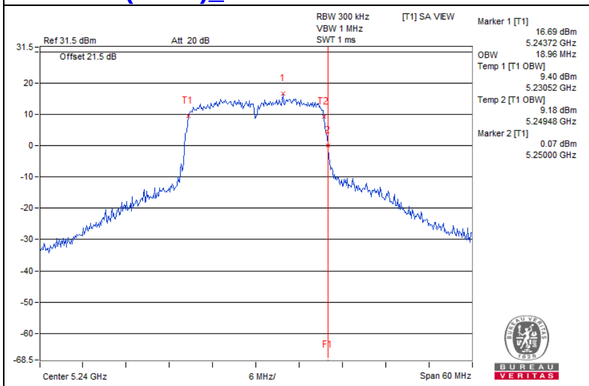
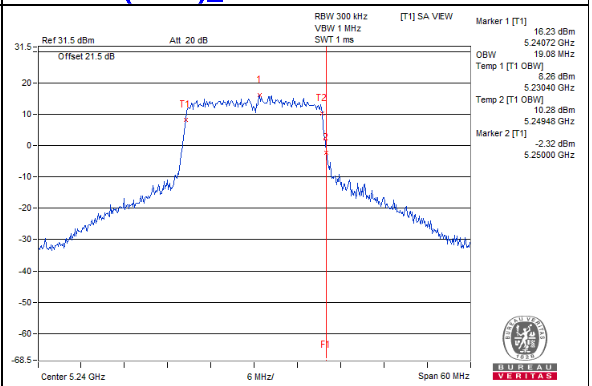
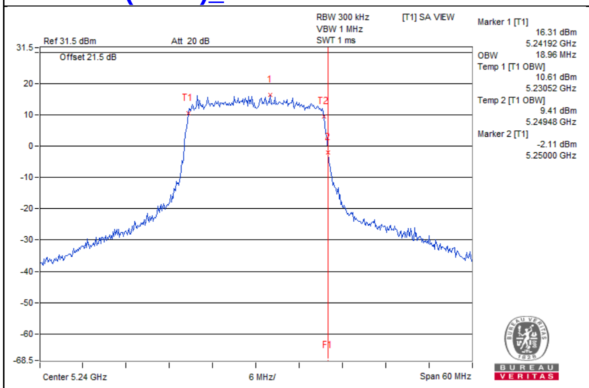
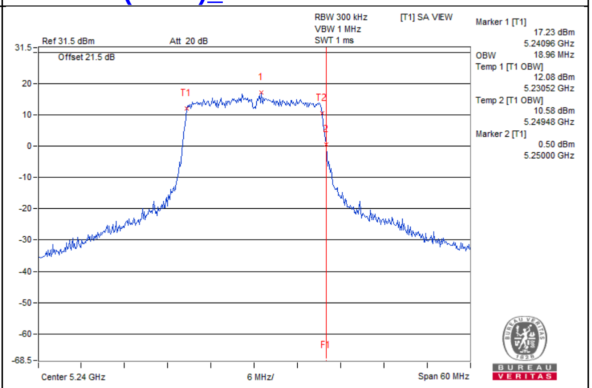


802.11ax (HE40)_Chain 0 / CH151



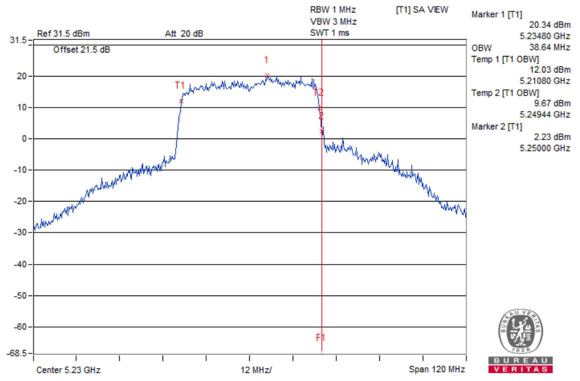
802.11ax (HE80)_Chain 2 / CH155



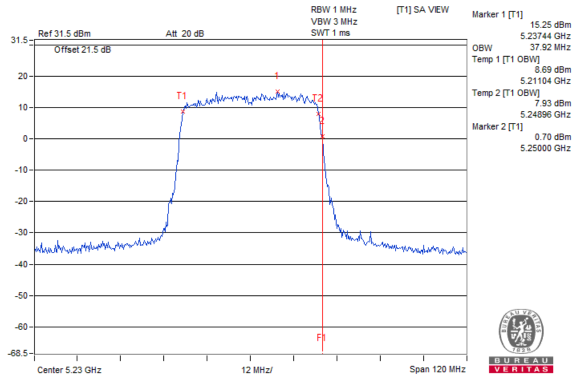
Spectrum Plot for near by DFS band (DFS is required, if 99% OCP straddle into U-NII-2A band)	
802.11a_Chain 0 / CH48	**802.11a_Chain 1 / CH48**
	
802.11a_Chain 2 / CH48	**802.11a_Chain 3 / CH48**
	
802.11ax (HE20)_Chain 0 / CH48	**802.11ax (HE20)_Chain 1 / CH48**
	
802.11ax (HE20)_Chain 2 / CH48	**802.11ax (HE20)_Chain 3 / CH48**
	

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

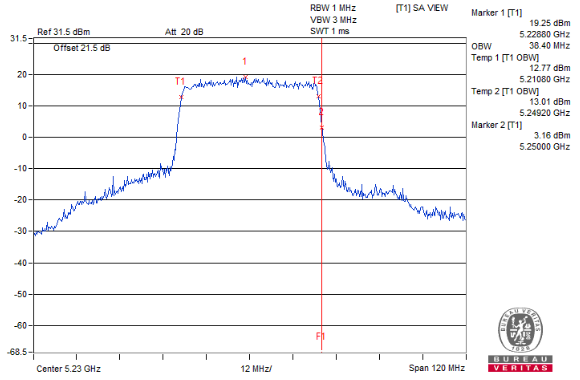
802.11ax (HE40)_Chain 0 / CH46



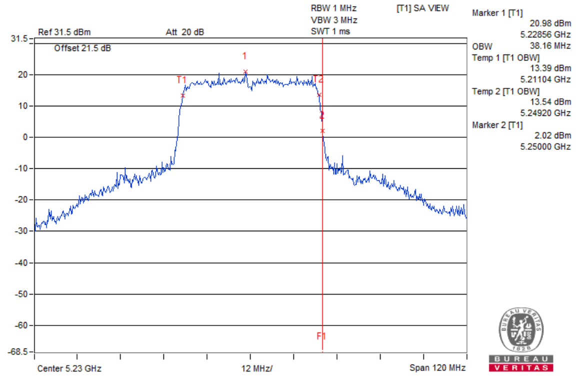
802.11ax (HE40)_Chain 1 / CH46



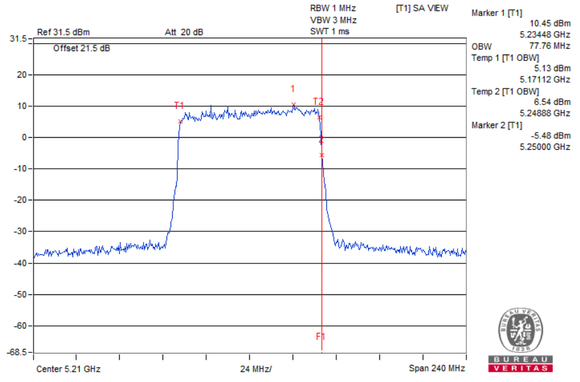
802.11ax (HE40)_Chain 2 / CH46



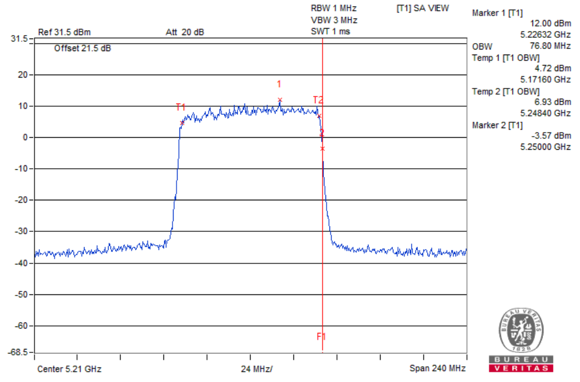
802.11ax (HE40)_Chain 3 / CH46



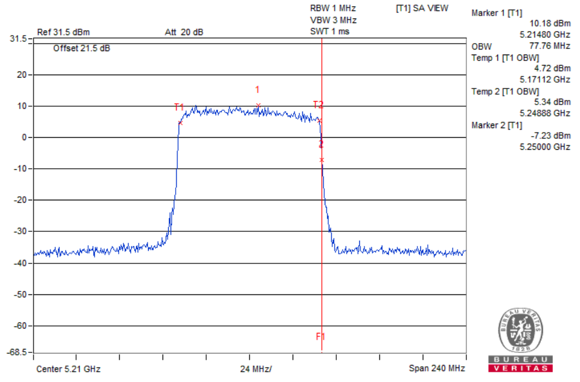
802.11ax (HE80)_Chain 0 / CH42



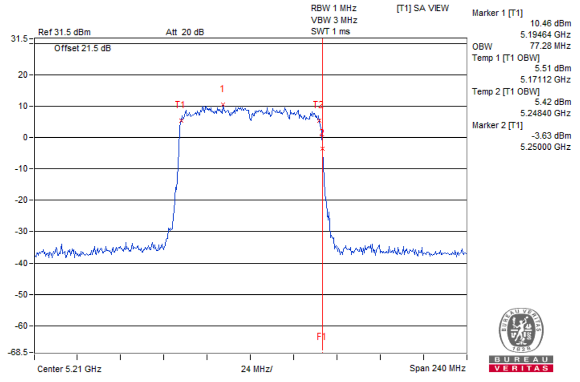
802.11ax (HE80)_Chain 1 / CH42



802.11ax (HE80)_Chain 2 / CH42

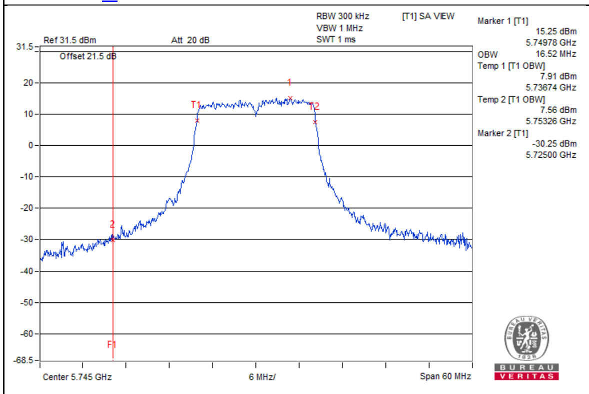


802.11ax (HE80)_Chain 3 / CH42

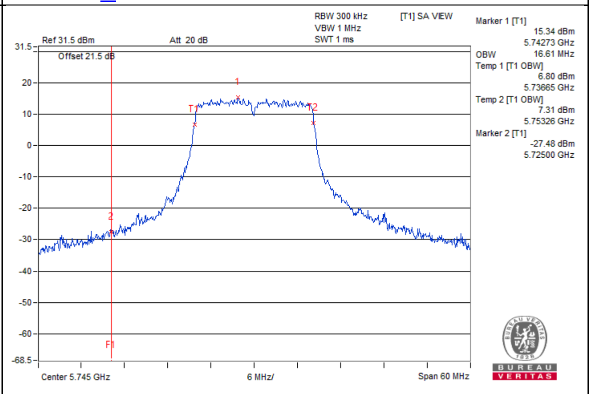


Spectrum Plot for near by DFS band (DFS is required, if 99% OCP straddle into U-NII-2C band)	
802.11a_Chain 0 / CH149	**802.11a_Chain 1 / CH149**

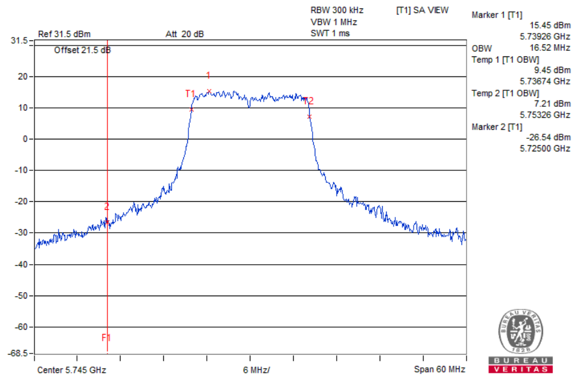
802.11a_Chain 0 / CH149



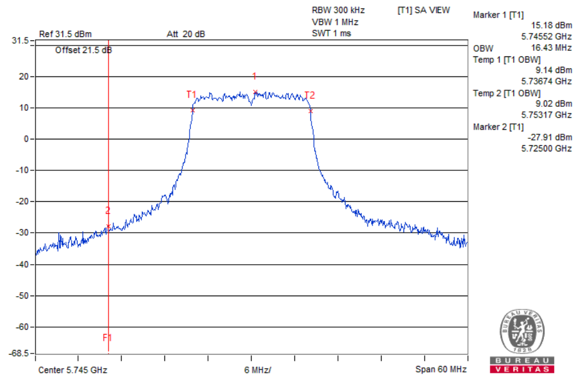
802.11a_Chain 1 / CH149



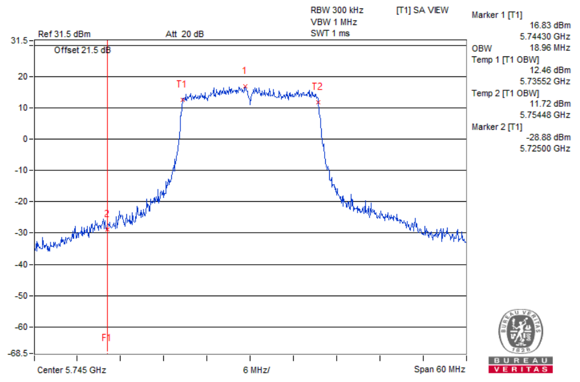
802.11a_Chain 2 / CH149



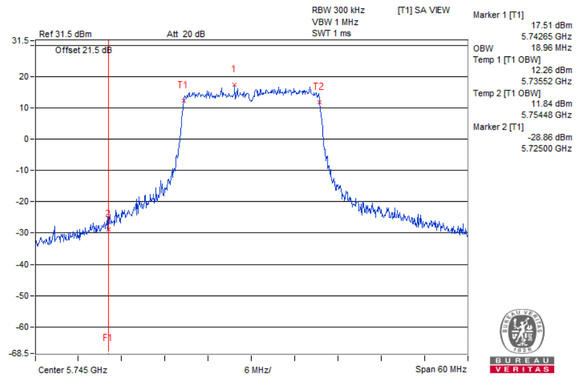
802.11a_Chain 3 / CH149



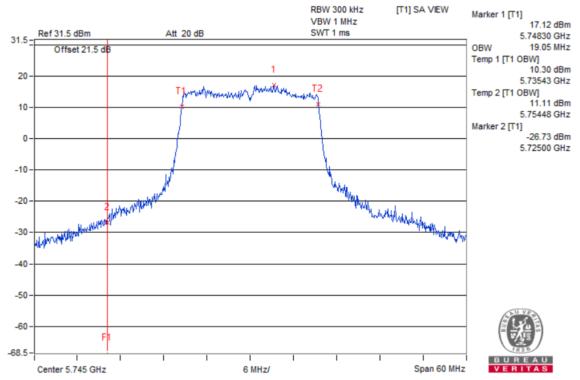
802.11ax (HE20)_Chain 0 / CH149



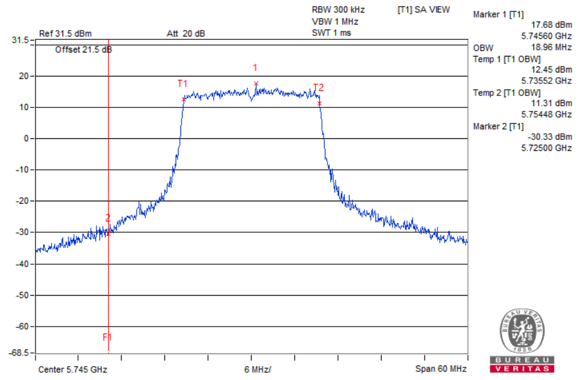
802.11ax (HE20)_Chain 1 / CH149



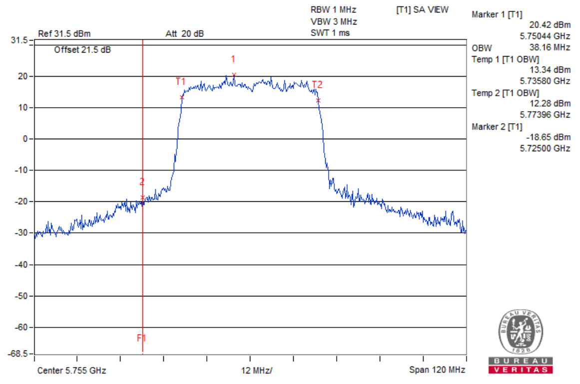
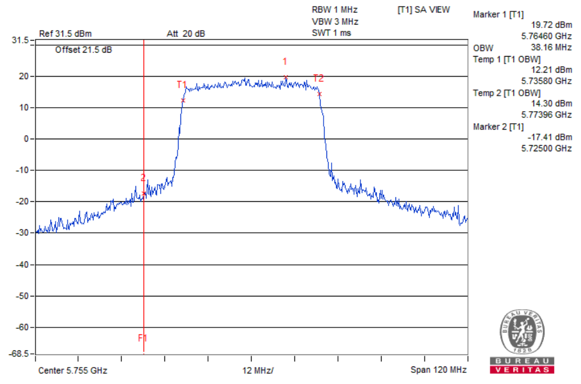
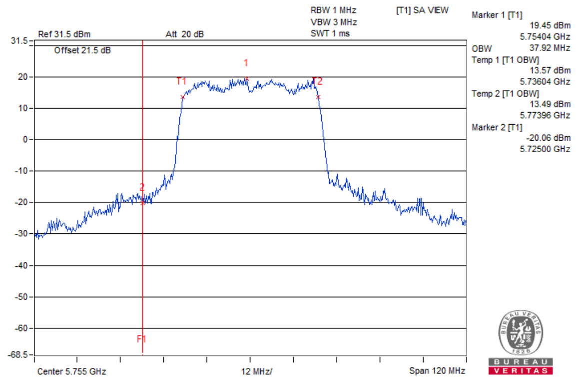
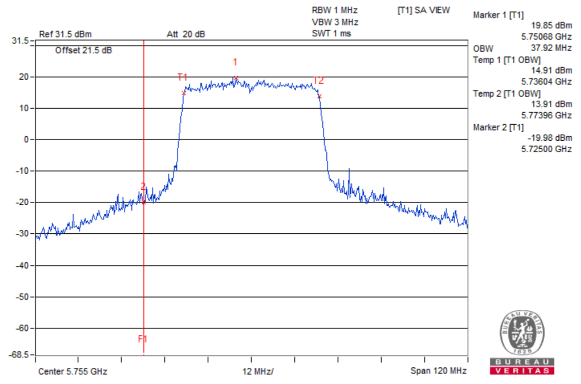
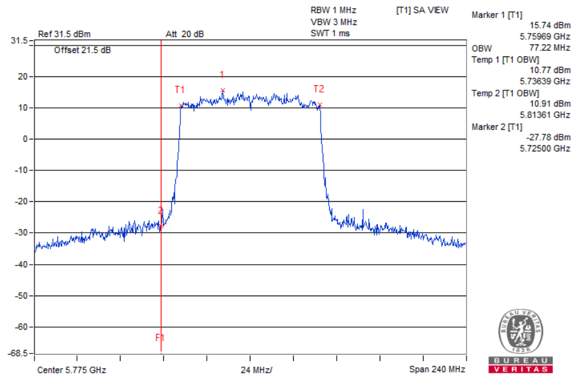
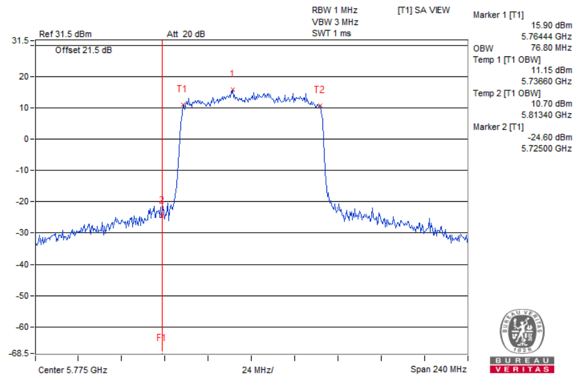
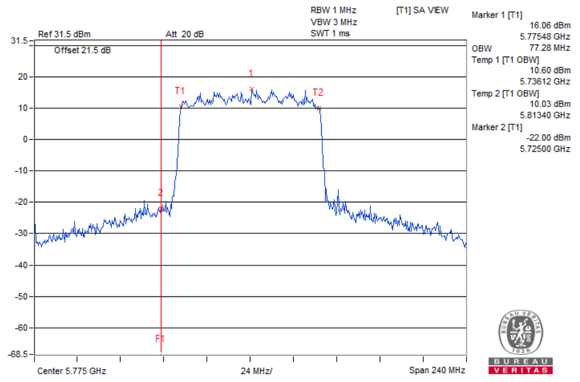
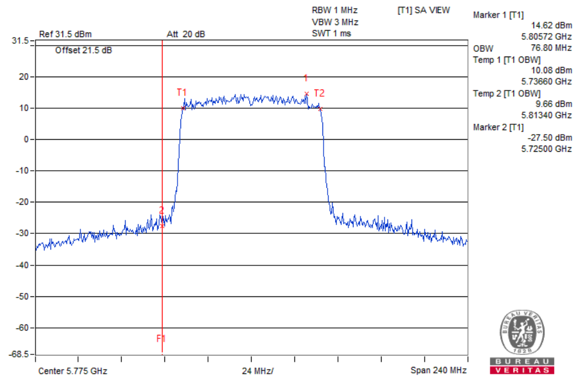
802.11ax (HE20)_Chain 2 / CH149



802.11ax (HE20)_Chain 3 / CH149



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

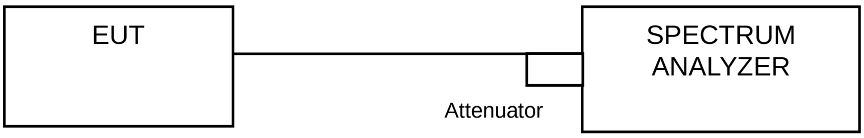
802.11ax (HE40)_Chain 0 / CH151	802.11ax (HE40)_Chain 1 / CH151
	
802.11ax (HE40)_Chain 2 / CH151	802.11ax (HE40)_Chain 3 / CH151
	
802.11ax (HE80)_Chain 0 / CH155	802.11ax (HE80)_Chain 1 / CH155
	
802.11ax (HE80)_Chain 2 / CH155	802.11ax (HE80)_Chain 3 / CH155
	

4.5 Peak Power Spectral Density Measurement

4.5.1 Limits of Peak Power Spectral Density Measurement

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

4.5.2 Test Setup



4.5.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.5.4 Test Procedure

For U-NII-1:

Using method SA-2

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

For U-NII-3:

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

4.5.5 Deviation from Test Standard

No deviation.

4.5.6 EUT Operating Condition

Same as Item 4.3.6.

4.5.7 Test Results (Mode 1)

802.11a

Chan.	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	Chain 3				
36	5180	10.22	7.60	9.06	9.91	0.27	15.60	16.78	Pass
40	5200	8.52	9.34	8.03	9.70	0.27	15.24	16.78	Pass
48	5240	9.73	8.59	8.40	8.92	0.27	15.23	16.78	Pass

Note: 1. Method a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = 6.22dBi > 6dBi , so the power density limit shall be reduced to 17-(6.22-6) = 16.78dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ax (HE20)

Chan.	Chan. Freq. (MHz)	PSD W/O Duty Factor (dBm/MHz)				Duty Factor (dB)	Total PSD With Duty Factor (dBm/MHz)	Max. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
36	5180	8.57	8.54	9.47	8.07	0.20	14.91	16.78	Pass
40	5200	8.67	7.36	9.54	7.44	0.20	14.57	16.78	Pass
48	5240	8.44	7.95	8.34	8.27	0.20	14.47	16.78	Pass

Note: 1. Method a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = 6.22dBi > 6dBi , so the power density limit shall be reduced to 17-(6.22-6) = 16.78dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ax (HE40)

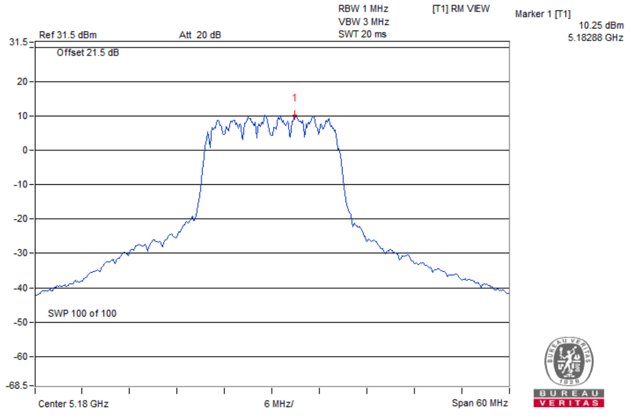
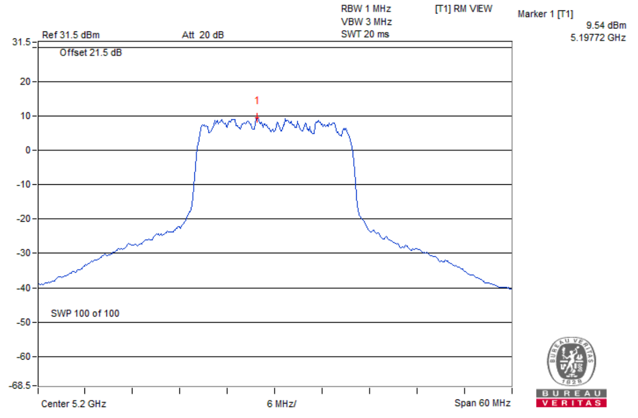
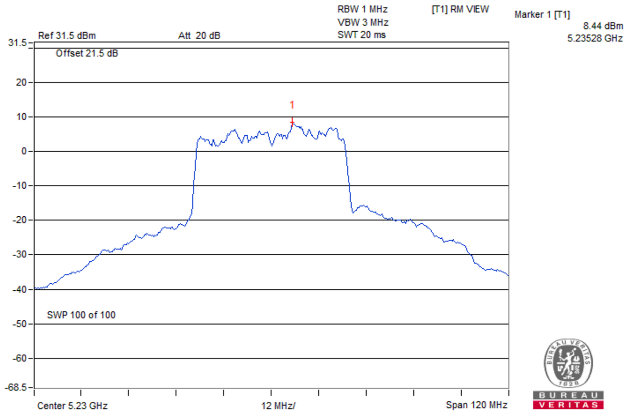
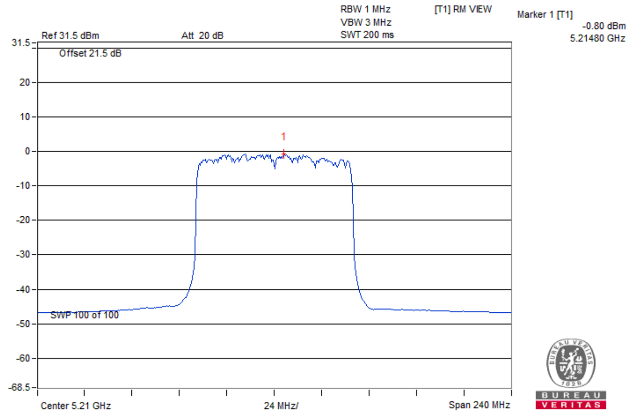
Chan.	Chan. Freq. (MHz)	PSD W/O Duty Factor (dBm/MHz)				Duty Factor (dB)	Total PSD With Duty Factor (dBm/MHz)	Max. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
38	5190	1.26	0.93	1.41	1.41	0.23	7.51	16.78	Pass
46	5230	8.44	1.34	5.91	6.69	0.23	12.51	16.78	Pass

Note: 1. Method a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = 6.22dBi > 6dBi , so the power density limit shall be reduced to 17-(6.22-6) = 16.78dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ax (HE80)

Chan.	Chan. Freq. (MHz)	PSD W/O Duty Factor (dBm/MHz)				Duty Factor (dB)	Total PSD With Duty Factor (dBm/MHz)	Max. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
42	5210	-2.00	-1.18	-1.56	-1.01	0.25	4.85	16.78	Pass

Note: 1. Method a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = 6.22dBi > 6dBi , so the power density limit shall be reduced to 17-(6.22-6) = 16.78dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

Spectrum Plot of Worst Value	
802.11a_Chain 0 / CH36	**802.11ax (HE20)_Chain 2 / CH40**
	
802.11ax (HE40)_Chain 0 / CH46	**802.11ax (HE80)_Chain 3 / CH42**
	

4.5.8 Test Results (Mode 2)

802.11a

Chan.	Freq. (MHz)	PSD W/O Duty Factor (dBm/300kHz)				Duty Factor (dB)	Total PSD With Duty Factor		Total PSD With Duty Factor (dBm/500kHz)	Limit (dBm/500kHz)	Pass /Fail
		Chain 0	Chain 1	Chain 2	Chain 3		mW/300 kHz	dBm/300kHz			
149	5745	1.48	1.09	1.45	2.09	0.27	6.0763	7.84	10.06	29.48	Pass
157	5785	1.55	2.31	3.21	2.33	0.27	7.3856	8.68	10.90	29.48	Pass
165	5825	1.01	1.36	1.74	1.50	0.27	5.8943	7.70	9.92	29.48	Pass

Note: 1. Method b) Measure and sum spectral maxima across the outputs of KDB 662911 is using for calculating total power density.
2. Directional gain = 6.52dBi > 6dBi , so the power density limit shall be reduced to 30-(6.52-6) = 29.48dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ax (HE20)

Chan.	Freq. (MHz)	PSD W/O Duty Factor (dBm/300kHz)				Duty Factor (dB)	Total PSD With Duty Factor		Total PSD With Duty Factor (dBm/500kHz)	Limit (dBm/500kHz)	Pass /Fail
		Chain 0	Chain 1	Chain 2	Chain 3		mW/300 kHz	dBm/300kHz			
149	5745	0.84	0.02	1.13	0.45	0.20	4.847	6.85	9.07	29.48	Pass
157	5785	1.06	0.93	1.82	1.82	0.20	5.8238	7.65	9.87	29.48	Pass
165	5825	0.05	-0.10	0.51	0.57	0.20	4.4584	6.49	8.71	29.48	Pass

Note: 1. Method b) Measure and sum spectral maxima across the outputs of KDB 662911 is using for calculating total power density.
2. Directional gain = 6.52dBi > 6dBi , so the power density limit shall be reduced to 30-(6.52-6) = 29.48dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ax (HE40)

Chan.	Freq. (MHz)	PSD W/O Duty Factor (dBm/300kHz)				Duty Factor (dB)	Total PSD With Duty Factor		Total PSD With Duty Factor (dBm/500kHz)	Limit (dBm/500kHz)	Pass /Fail
		Chain 0	Chain 1	Chain 2	Chain 3		mW/300 kHz	dBm/300kHz			
151	5755	-1.68	-1.94	-1.11	-1.78	0.18	2.8727	4.58	6.80	29.48	Pass
159	5795	-1.98	-1.01	-1.04	-1.26	0.18	3.0857	4.89	7.11	29.48	Pass

Note: 1. Method b) Measure and sum spectral maxima across the outputs of KDB 662911 is using for calculating total power density.
2. Directional gain = 6.52dBi > 6dBi , so the power density limit shall be reduced to 30-(6.52-6) = 29.48dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

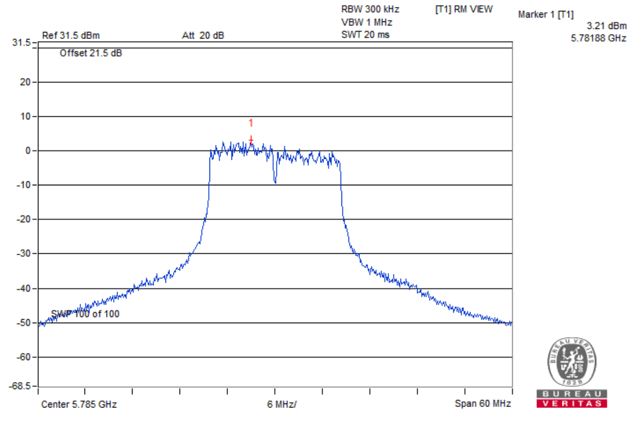
802.11ax (HE80)

Chan.	Freq. (MHz)	PSD W/O Duty Factor (dBm/300kHz)				Duty Factor (dB)	Total PSD With Duty Factor		Total PSD With Duty Factor (dBm/500kHz)	Limit (dBm/500kHz)	Pass /Fail
		Chain 0	Chain 1	Chain 2	Chain 3		mW/300 kHz	dBm/300kHz			
155	5775	-5.27	-5.62	-4.77	-6.20	0.20	1.1978	0.78	3.00	29.48	Pass

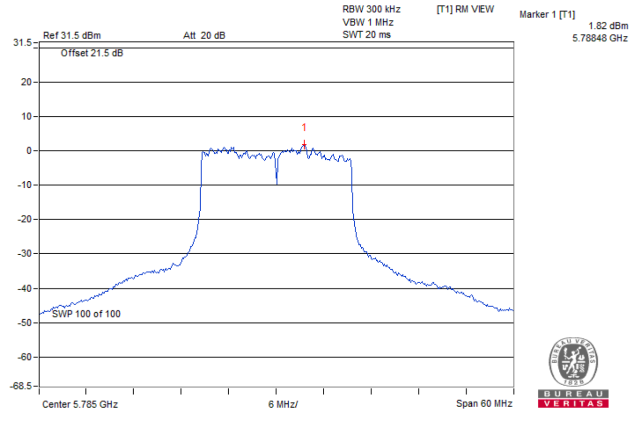
Note: 1. Method b) Measure and sum spectral maxima across the outputs of KDB 662911 is using for calculating total power density.
2. Directional gain = 6.52dBi > 6dBi , so the power density limit shall be reduced to 30-(6.52-6) = 29.48dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

Spectrum Plot of Worst Value

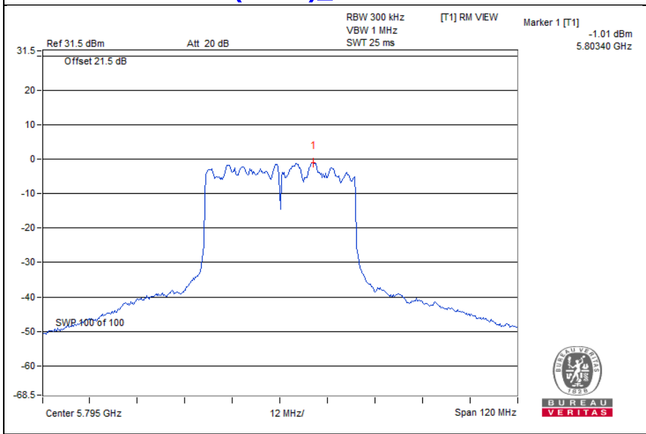
802.11a_Chain 2 / CH157



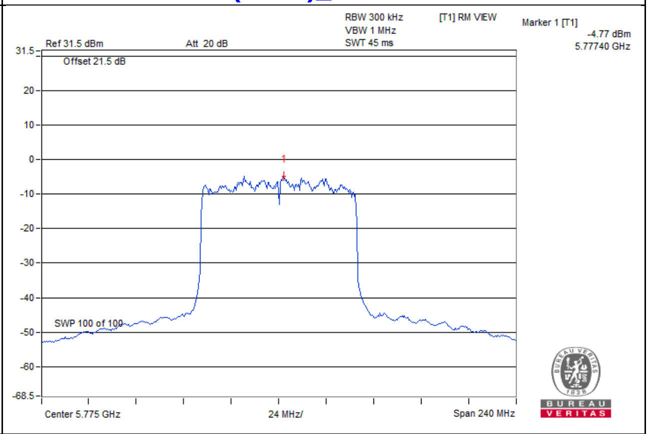
802.11ax (HE20)_Chain 2 / CH157



802.11ax (HE40)_Chain 1 / CH159



802.11ax (HE80)_Chain 2 / CH155

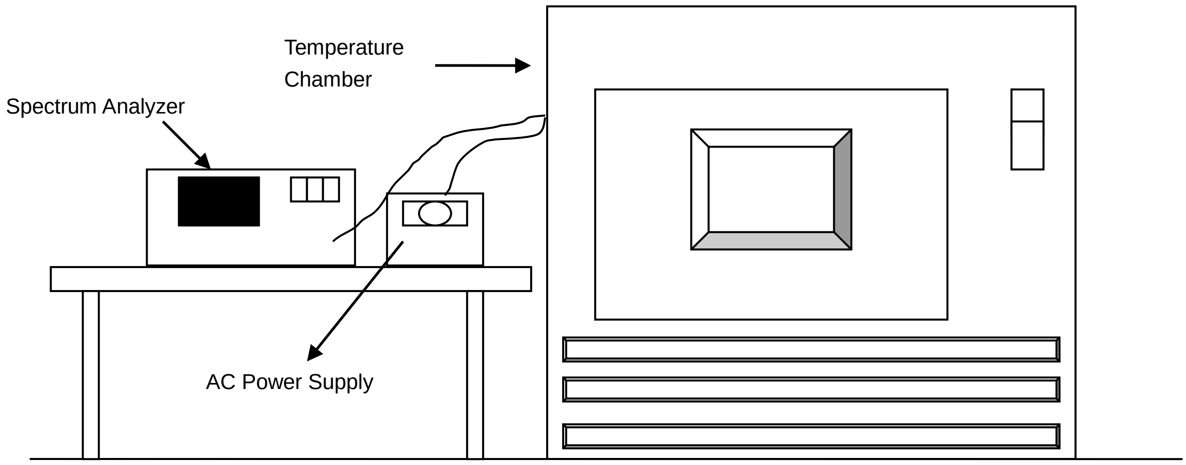


4.6 Frequency Stability Measurement

4.6.1 Limits of Frequency Stability Measurement

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

4.6.2 Test Setup



4.6.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.6.4 Test Procedure

a. The EUT was placed inside the environmental test chamber and powered by nominal AC voltage.
b. Turn the EUT on and couple its output to a spectrum analyzer.
c. Turn the EUT off and set the chamber to the highest temperature specified.
d. Allow sufficient time (approximately 30 min) for the temperature of the chamber to stabilize, turn the EUT on and measure the operating frequency after 2, 5, and 10 Minutes.
e. Repeat step (d) with the temperature chamber set to the next desired temperature until measurements down to the lowest specified temperature have been completed.
f. The test chamber was allowed to stabilize at +20 degree C for a minimum of 30 Minutes. The supply voltage was then adjusted on the EUT from 85% to 115% and the frequency record.
.

4.6.5 Deviation from Test Standard

No deviation.

4.6.6 EUT Operating Condition

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

4.6.7 Test Results (Mode 1)

Frequency Stability Versus Temp.									
Operating Frequency: 5180 MHz									
TEMP. (℃)	Power Supply (Vac)	0 Minute		2 Minutes		5 Minutes		10 Minutes	
		Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail
40	120	5180.0226	PASS	5180.0201	PASS	5180.0205	PASS	5180.0231	PASS
30	120	5179.9777	PASS	5179.9785	PASS	5179.9754	PASS	5179.9762	PASS
20	120	5179.9779	PASS	5179.9785	PASS	5179.9796	PASS	5179.9784	PASS
10	120	5179.9971	PASS	5179.994	PASS	5179.9955	PASS	5179.9957	PASS
0	120	5180.0018	PASS	5180.0042	PASS	5180.0031	PASS	5180.0017	PASS

Frequency Stability Versus Voltage									
Operating Frequency: 5180 MHz									
TEMP. (℃)	Power Supply (Vac)	0 Minute		2 Minutes		5 Minutes		10 Minutes	
		Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail
20	138	5179.9782	PASS	5179.9779	PASS	5179.9789	PASS	5179.9783	PASS
	120	5179.9779	PASS	5179.9785	PASS	5179.9796	PASS	5179.9784	PASS
	102	5179.9785	PASS	5179.9781	PASS	5179.979	PASS	5179.9775	PASS

4.6.8 Test Results (Mode 2)

Frequency Stability Versus Temp.									
Operating Frequency: 5745 MHz									
TEMP. (℃)	Power Supply (Vac)	0 Minute		2 Minutes		5 Minutes		10 Minutes	
		Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail
40	120	5744.9938	PASS	5744.9921	PASS	5744.992	PASS	5744.9945	PASS
30	120	5744.9906	PASS	5744.9906	PASS	5744.9881	PASS	5744.9859	PASS
20	120	5744.9998	PASS	5744.9975	PASS	5744.9959	PASS	5744.9985	PASS
10	120	5745.0183	PASS	5745.0204	PASS	5745.0183	PASS	5745.0209	PASS
0	120	5745.0231	PASS	5745.0229	PASS	5745.0217	PASS	5745.0179	PASS

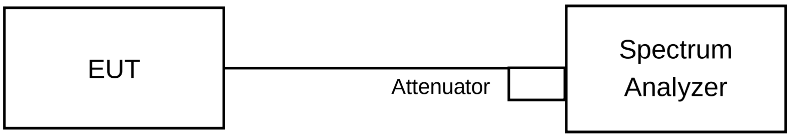
Frequency Stability Versus Voltage									
Operating Frequency: 5745 MHz									
TEMP. (℃)	Power Supply (Vac)	0 Minute		2 Minutes		5 Minutes		10 Minutes	
		Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail
20	138	5745.0004	PASS	5744.9965	PASS	5744.9952	PASS	5744.9987	PASS
	120	5744.9998	PASS	5744.9975	PASS	5744.9959	PASS	5744.9985	PASS
	102	5745.0003	PASS	5744.9964	PASS	5744.9958	PASS	5744.9978	PASS

4.7 6dB Bandwidth Measurement

4.7.1 Limits of 6dB Bandwidth Measurement

The minimum of 6dB Bandwidth Measurement is 0.5MHz.

4.7.2 Test Setup



4.7.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.7.4 Test Procedure

MEASUREMENT PROCEDURE REF

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

4.7.5 Deviation from Test Standard

No deviation.

4.7.6 EUT Operating Condition

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

4.7.7 Test Results

802.11a

Channel	Frequency (MHz)	6dB Bandwidth (MHz)				Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3		
149	5745	15.99	16.35	16.35	16.36	0.5	Pass
157	5785	16.35	15.98	15.76	15.98	0.5	Pass
165	5825	15.96	15.93	15.73	16.37	0.5	Pass

802.11ax (HE20)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)				Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3		
149	5745	18.89	18.92	19.01	18.92	0.5	Pass
157	5785	18.35	18.50	18.81	18.79	0.5	Pass
165	5825	18.92	19.02	18.93	18.93	0.5	Pass

802.11ax (HE40)

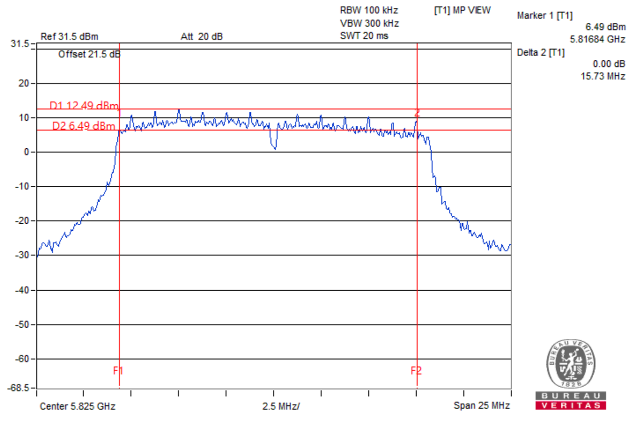
Channel	Frequency (MHz)	6dB Bandwidth (MHz)				Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3		
151	5755	37.91	38.11	37.87	37.75	0.5	Pass
159	5795	37.44	37.97	36.67	37.70	0.5	Pass

802.11ax (HE80)

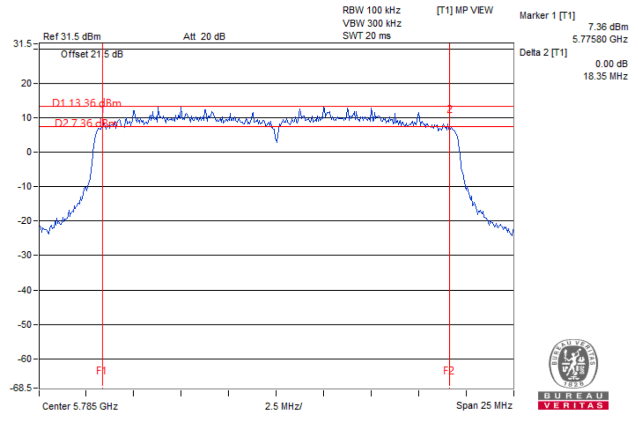
Channel	Frequency (MHz)	6dB Bandwidth (MHz)				Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3		
155	5775	76.44	77.51	76.75	77.65	0.5	Pass

Spectrum Plot of Worst Value

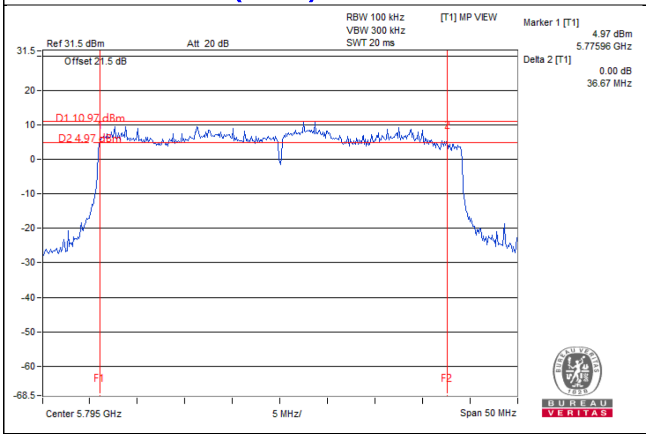
802.11a_Chain 2 / CH165



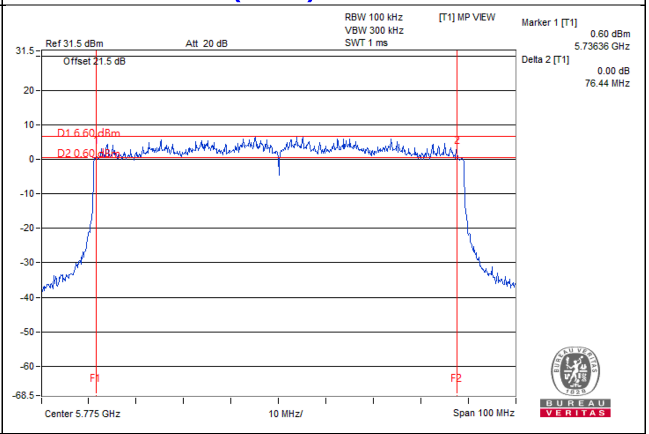
802.11ax (HE20)_Chain 0 / CH157



802.11ax (HE40)_Chain 2 / CH159



802.11ax (HE80)_Chain 0 / CH155



5 Pictures of Test Arrangements

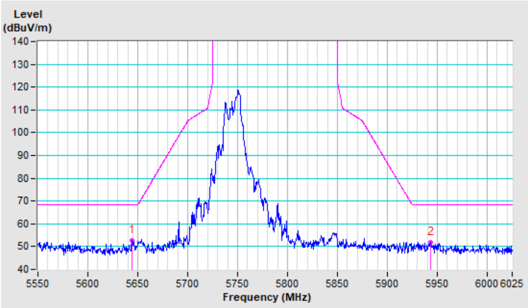
Please refer to the attached file (Test Setup Photo).

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

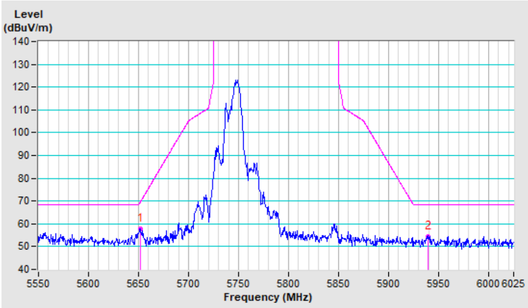
802.11a

CH 149 5745 MHz

Horizontal

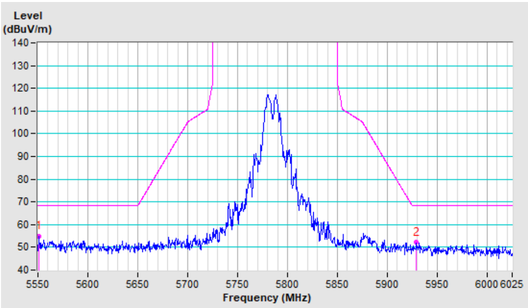


Vertical

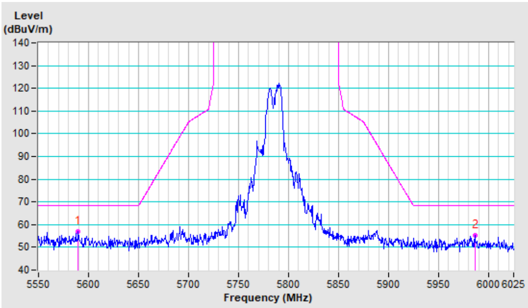


CH 157 5785 MHz

Horizontal

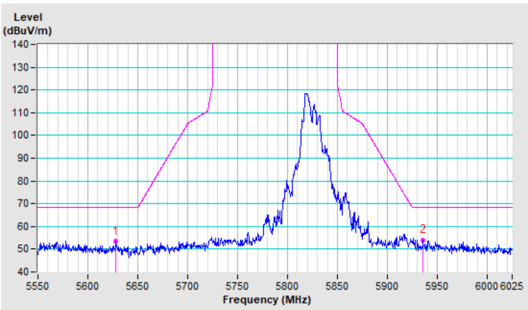


Vertical

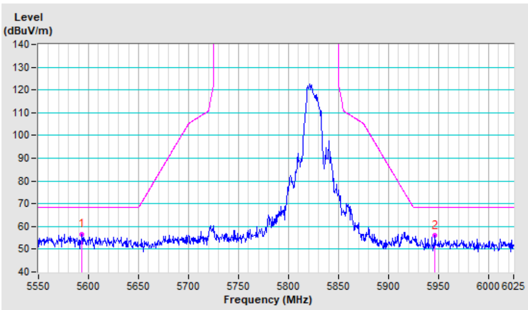


CH 165 5825 MHz

Horizontal



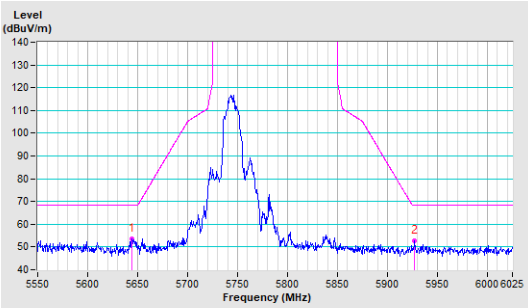
Vertical



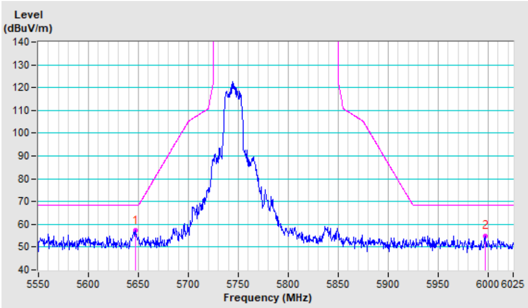
802.11ax (HE20)

CH 149 5745 MHz

Horizontal

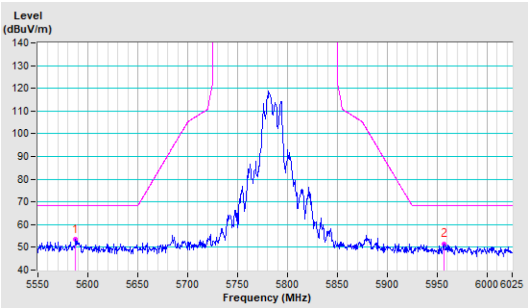


Vertical

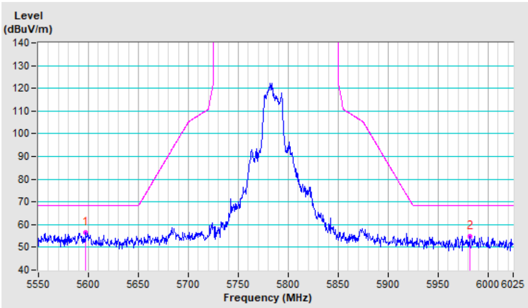


CH 157 5785 MHz

Horizontal

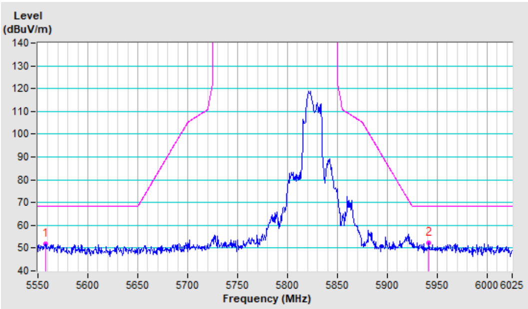


Vertical

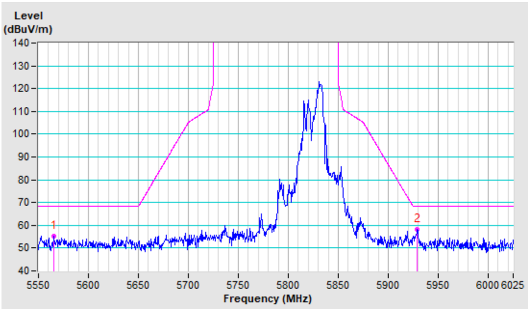


CH 165 5825 MHz

Horizontal

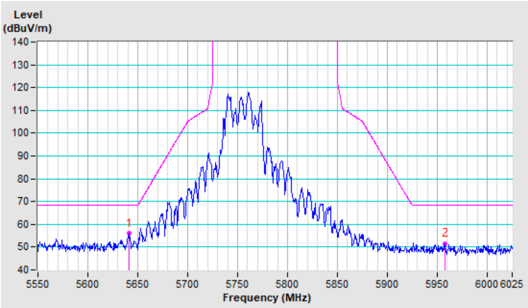
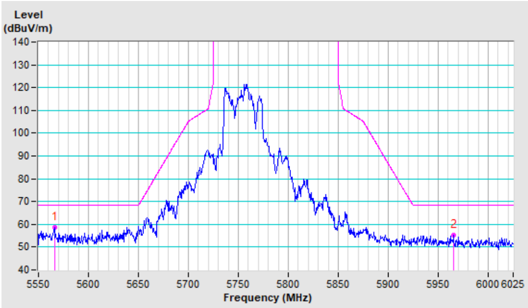


Vertical

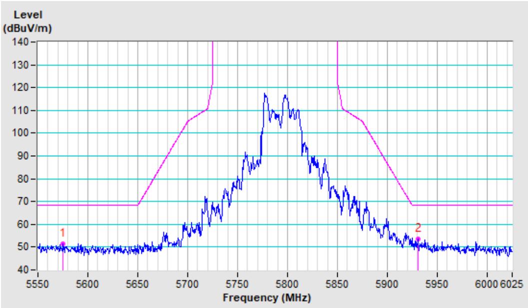
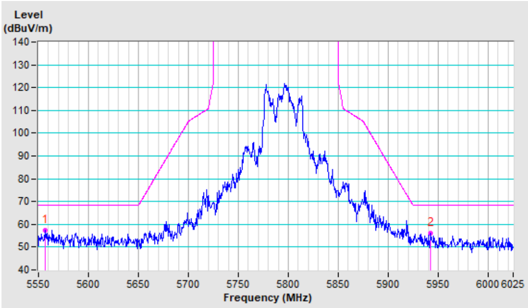


802.11ax (HE40)

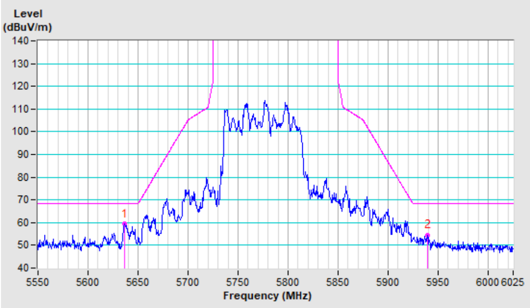
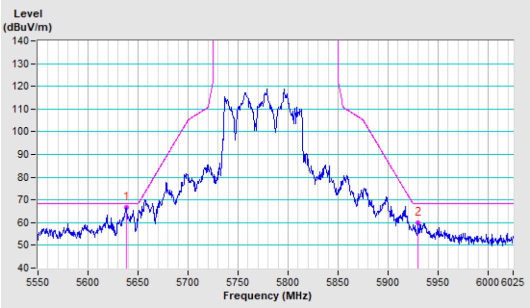
CH 151 5755 MHz

Horizontal	Vertical
	

CH 159 5795 MHz

Horizontal	Vertical
	

802.11ax (HE80)

CH 155 5775 MHz	
Horizontal	**Vertical**
	

Appendix – Information of the Testing Laboratories

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

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

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

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