FCC Test Report

Report No.:	RF190515E04-1
FCC ID:	Q87-03448
Test Model:	MX5300
Received Date:	May 15, 2019
Test Date:	May 16 to July 03, 2019
Issued Date:	July 19, 2019
Applicant:	Linksys LLC
Address:	121 Theory Drive, Irvine, CA 92617, USA
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
RF190515E04-1	Original release.	July 19, 2019

1 Certificate of Conformity

Product:	Velop
Brand:	Linksys
Test Model:	MX5300
Sample Status:	ENGINEERING SAMPLE
Applicant:	Linksys LLC
Test Date:	May 16 to July 03, 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:** **July 19, 2019**

Wendy Wu / Specialist

Approved by : _____ , **Date:** **July 19, 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 -7.03dB at 0.15000MHz.
15.407(b) (1/2/3/4(i/ii)/6)	Radiated Emissions & Band Edge Measurement*	Pass	Meet the requirement of limit. Minimum passing margin is -0.1dB at 17355.00MHz, 17235.00MHz.
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	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	Velop
Brand	Linksys
Test Model	MX5300
Status of EUT	ENGINEERING SAMPLE
Driver Version	0.2.2
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): 5 802.11n (HT40), 802.11ac (VHT40): 2 802.11ac (VHT80): 1
Output Power	**Non-Beamforming Mode:** **2.4GHz:** 986.923mW **5.18 ~ 5.24GHz:** 922.721mW **5.745 ~ 5.825GHz:** 671.308mW **Beamforming Mode:** **2.4GHz:** 986.923mW **5.18 ~ 5.24GHz:** 914.12mW **5.745 ~ 5.825GHz:** 671.308mW
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	Adapter x 1
Data Cable Supplied	NA

Note:

1. Simultaneously transmission condition.

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

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

No.	Brand	Model No.	Spec.
1	Ktec	KSAS0501200400HU	Input: 100-240Vac, 1.2A, 50/60Hz Output: 12V, 4.0A DC Output cable: Unshielded, 1.6m
2	Frecom	F48L-120400SPAU	Input: 100-240Vac, 1.4A, 50/60Hz Output: 12V, 4.0A DC Output cable: Unshielded, 1.5m
3	APD	WA-48B12FU	Input: 100-240Vac, 1.5A, 50/60Hz Output: 12V, 4.0A DC Output cable: Unshielded, 1.5m
4	APD	DA-48T12	Input: 100-240Vac, 1.4A, 50/60Hz AC Input cable: Unshielded, 1m Output: 12V, 4.0A DC Output cable: Unshielded, 1.5m
Note: From the above adapters, the worst Radiated Emissions was found in **Adapter 2 ;** the worst Conducted Emission was found in **Adapter 3.** Therefore only the test data of the mode was recorded in this report.			

3. 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 (Bluetooth+Zigbee)	1.97	Dipole	i-pex(mhf)
2.4~2.4835 (WLAN)	3.98		
5.15~5.25	5.18		
5.25~5.35	5.98		
5.47~5.725	4.72		
5.725~5.85	5.73		
Note: More detailed information, please refer to operating description.			

4. 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)

5. 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):

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):

Channel	Frequency	Channel	Frequency
151	5755 MHz	159	5795 MHz

1 channel is provided for 802.11ac (VHT80):

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
802.11ac (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

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
802.11ac (VHT40)	5745-5825	151 to 159	151	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**
802.11ac (VHT40)	5745-5825	151 to 159	151	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) (Output power only)		36 to 48	36, 40, 48	OFDM	BPSK	MCS0
802.11ac (VHT40) (Output power only)		38 to 46	38, 46	OFDM	BPSK	MCS0
802.11ac (VHT80) (Output power only)		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
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

Test Condition:

Applicable To	Environmental Conditions	Input Power	Tested By
RE≥1G	21deg. C, 67%RH	120Vac, 60Hz	Robert Cheng
RE<1G	23deg. C, 68%RH	120Vac, 60Hz	Robert Cheng
PLC	25deg. C, 75%RH	120Vac, 60Hz	Andy Ho
APCM	25deg. C, 60%RH	120Vac, 60Hz	Jyunchun Lin

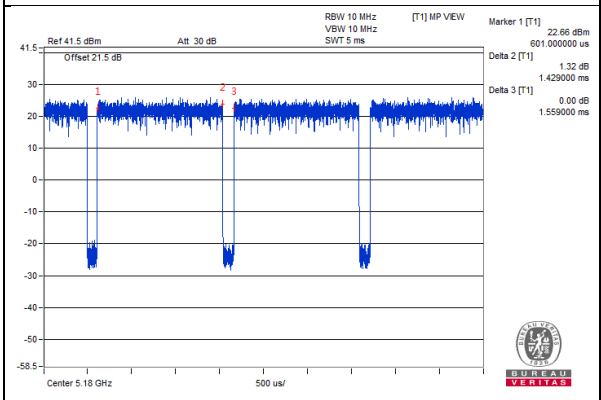
3.3 Duty Cycle of Test Signal

If duty cycle of test signal is ≥ 98 %, duty factor is not required.
If duty cycle of test signal is < 98%, duty factor shall be considered.

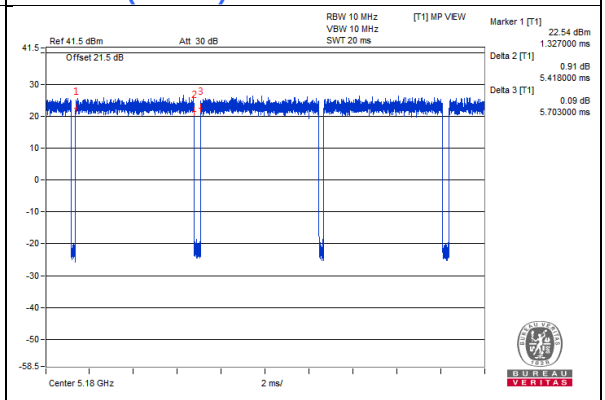
For low band:

802.11a: Duty cycle = 1.429 ms/1.559 ms = 0.917, Duty factor = 10 * log (1/Duty cycle) = 0.38
802.11ac (VHT20): Duty cycle = 5.418 ms/5.703 ms = 0.95, Duty factor = 10 * log (1/Duty cycle) = 0.22
802.11ac (VHT40): Duty cycle = 5.42 ms/5.668 ms = 0.956, Duty factor = 10 * log (1/Duty cycle) = 0.19
802.11ac (VHT80): Duty cycle = 5.423 ms/5.653 ms = 0.959, Duty factor = 10 * log (1/Duty cycle) = 0.18
802.11ax (HE20): Duty cycle = 5.437 ms/5.67 ms = 0.959, Duty factor = 10 * log (1/Duty cycle) = 0.18
802.11ax (HE40): Duty cycle = 5.436 ms/5.688 ms = 0.956, Duty factor = 10 * log (1/Duty cycle) = 0.20
802.11ax (HE80): Duty cycle = 5.443 ms/5.743 ms = 0.948, Duty factor = 10 * log (1/Duty cycle) = 0.23

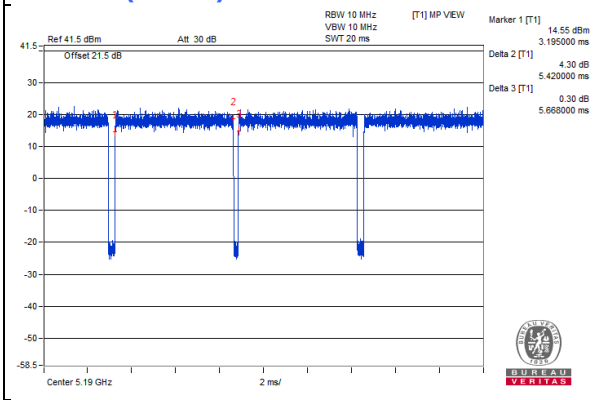
802.11a



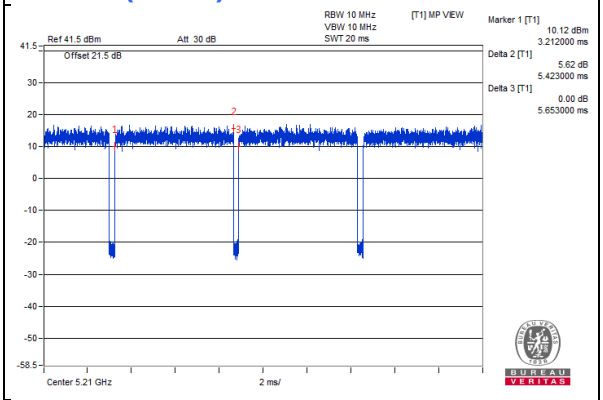
802.11ac (VHT20)



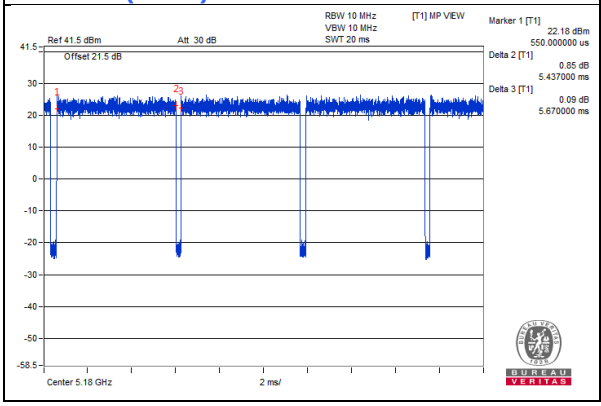
802.11ac (VHT40)



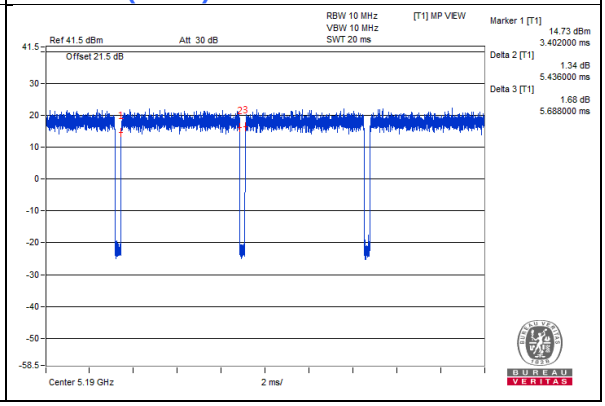
802.11ac (VHT80)



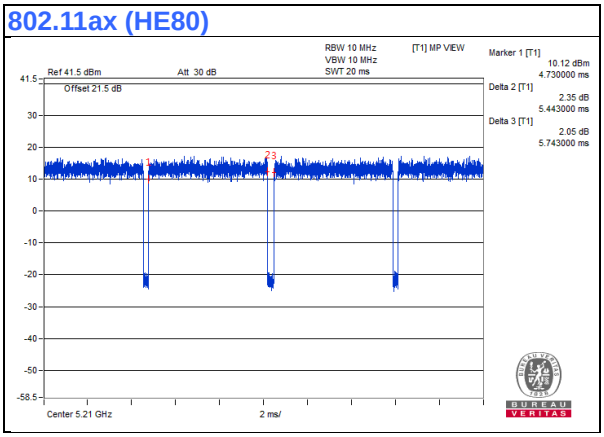
802.11ax (HE20)



802.11ax (HE40)



802.11ax (HE80)



For high band:

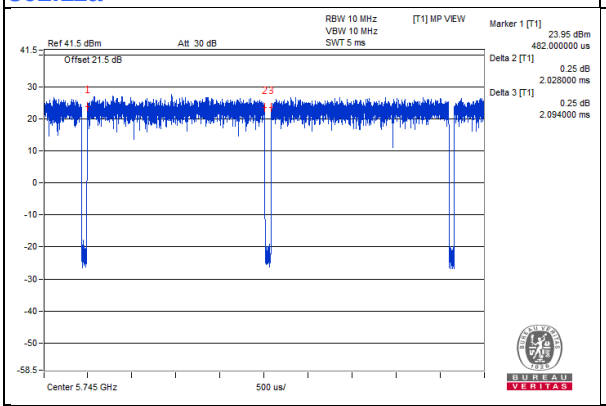
802.11a: Duty cycle = 2.028 ms/2.094 ms = 0.968, Duty factor = 10 * log (1/Duty cycle) = 0.14

802.11ac (VHT20): Duty cycle = 4.965 ms/5.055 ms = 0.982

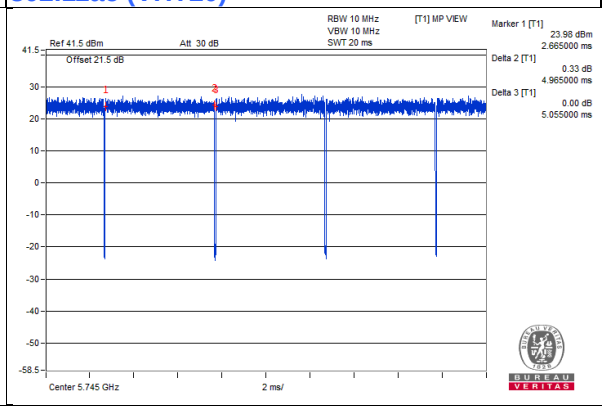
802.11ac (VHT40): Duty cycle = 2.415 ms/2.481 ms = 0.973, Duty factor = 10 * log (1/Duty cycle) = 0.12

802.11ac (VHT80): Duty cycle = 1.134 ms/1.202 ms = 0.943, Duty factor = 10 * log (1/Duty cycle) = 0.25

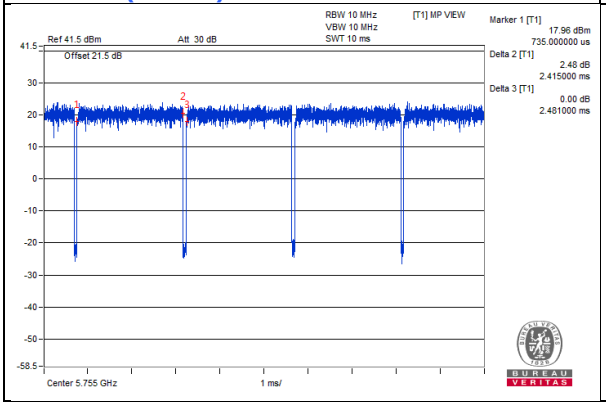
802.11a



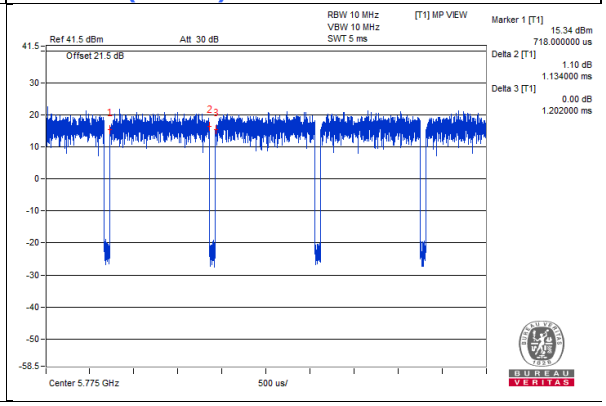
802.11ac (VHT20)



802.11ac (VHT40)



802.11ac (VHT80)



3.4 Description of Support Units

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

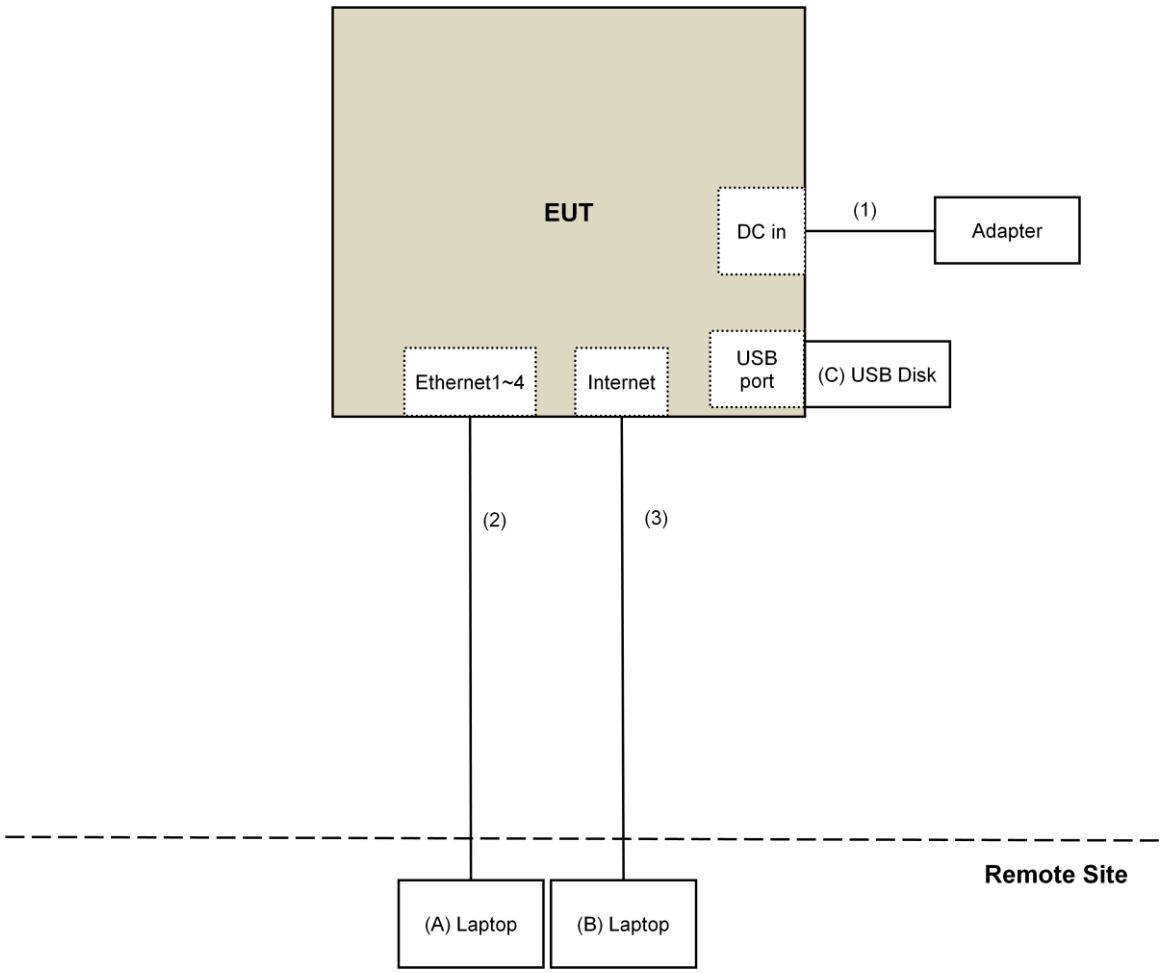
ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Laptop	DELL	E5430	4YV4VY1	FCC DoC	Provided by Lab
B.	Laptop	Lenovo	81A4	YD02YN2A	PD93165NGU	Provided by Lab
C.	USB Disk	SanDisk	Ultra Flair USB 3.0(32GB)	NA	NA	Provided by Lab

Note:

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

ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	DC Cable	1.5	10	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="2">Applicable To</td><td colspan="2">Limit</td></tr>
<tr><td colspan="2" rowspan="2">789033 D02 General UNII Test Procedure New Rules v02r01</td><td colspan="2">Field Strength at 3m</td></tr>
<tr><td>PK:74 (dBμV/m)</td><td>AV:54 (dBμV/m)</td></tr>
<tr><td>Frequency Band</td><td colspan="2">Applicable To</td><td>EIRP Limit</td><td>Equivalent Field Strength at 3m</td></tr>
<tr><td>5150~5250 MHz</td><td colspan="2">15.407(b)(1)</td><td rowspan="3">PK:-27 (dBm/MHz)</td><td rowspan="3">PK:68.2(dBμV/m)</td></tr>
<tr><td>5250~5350 MHz</td><td colspan="2">15.407(b)(2)</td></tr>
<tr><td>5470~5725 MHz</td><td colspan="2">15.407(b)(3)</td></tr>
<tr><td rowspan="2">5725~5850 MHz</td><td>☒</td><td>15.407(b)(4)(i)</td><td>PK:-27 (dBm/MHz) *1
PK:10 (dBm/MHz) *2
PK:15.6 (dBm/MHz) *3
PK:27 (dBm/MHz) *4</td><td>PK: 68.2(dBμV/m) *1
PK:105.2 (dBμV/m) *2
PK: 110.8(dBμV/m) *3
PK:122.2 (dBμV/m) *4</td></tr>
<tr><td>☐</td><td>15.407(b)(4)(ii)</td><td colspan="2">Emission limits in section 15.247(d)</td></tr>
<tr><td colspan="5">*1 beyond 75 MHz or more above of the band edge.
*2 below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above.
*3 below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above.
*4 from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.</td></tr>
</table>

Note:

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

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

4.1.2 Test Instruments

For OOBE test:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver Keysight	N9038A	MY54450088	July 05, 2018	July 04, 2019
Horn_Antenna SCHWARZBECK	BBHA 9120D	9120D-783	Nov. 25, 2018	Nov. 24, 2019
Pre-Amplifier EMCI	EMC12630SE	980385	Aug. 16, 2018	Aug. 15, 2019
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: May 16, 2019

For other test:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver Keysight	N9038A	MY54450088	July 05, 2018	July 04, 2019
Pre-Amplifier EMCI	EMC001340	980142	Jan. 25, 2019	Jan. 24, 2020
Loop Antenna Electro-Metrics	EM-6879	269	Sep. 07, 2018	Sep. 06, 2019
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. 16, 2018	Aug. 15, 2019
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
Spectrum Analyzer R&S	FSV40	100964	June 04, 2019	June 03, 2020
Power meter Anritsu	ML2495A	1014008	May 13, 2019	May 12, 2020
Power sensor Anritsu	MA2411B	0917122	May 13, 2019	May 12, 2020
AC Power Source Extech Electronics	6205	1440452	NA	NA
Temperature & Humidity Chamber Giant Force	GTH-150-40-SP-AR	MAA0812-008	Jan. 09, 2019	Jan. 08, 2020
True RMS Clamp Meter FLUKE	325	31130711WS	May 21, 2019	May 20, 2020

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in 966 Chamber No. 4.
3. Loop antenna was used for all emissions below 30 MHz.
4. Tested Date: June 27 to July 03, 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:

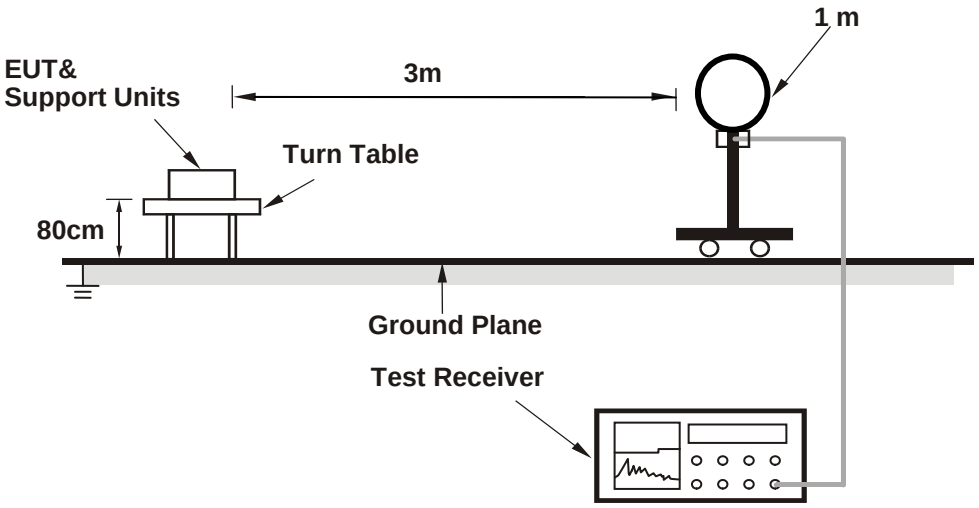
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.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

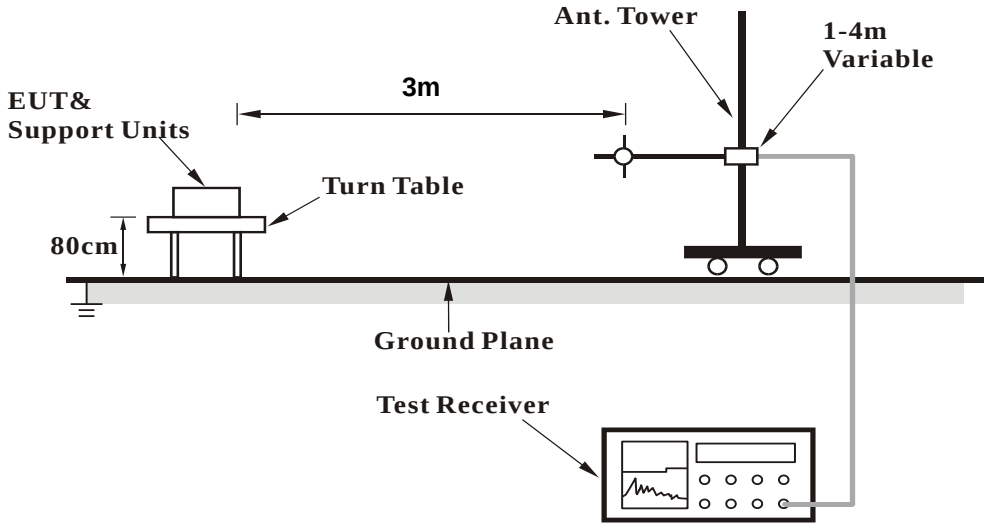
No deviation.

4.1.5 Test Setup

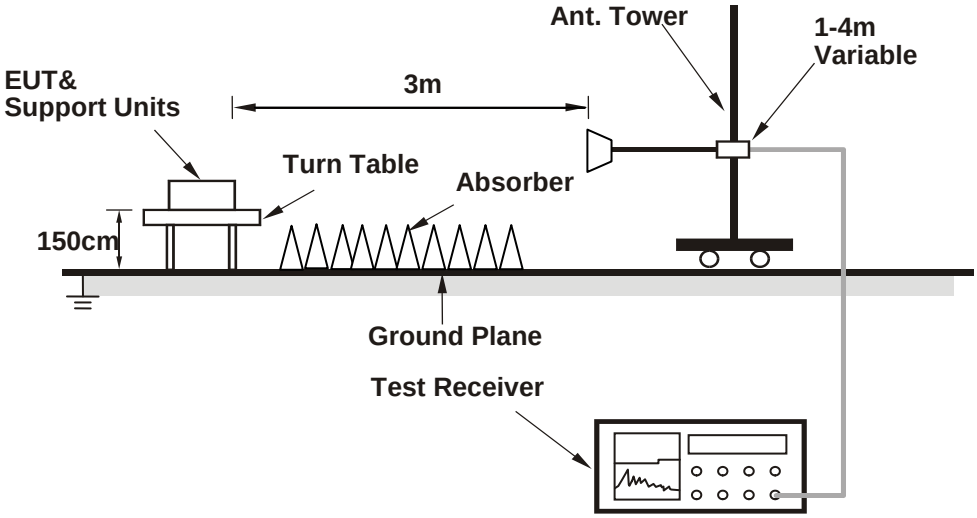
For Radiated emission below 30MHz



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 (5.0-00160) 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	70.0 PK	74.0	-4.0	2.17 H	314	66.7	3.3
2	5150.00	53.4 AV	54.0	-0.6	2.17 H	314	50.1	3.3
3	*5180.00	119.8 PK			2.17 H	314	116.5	3.3
4	*5180.00	110.6 AV			2.17 H	314	107.3	3.3
5	#10360.00	54.6 PK	68.2	-13.6	1.80 H	257	42.4	12.2
6	15540.00	46.7 PK	74.0	-27.3	1.54 H	330	33.5	13.2
7	15540.00	33.9 AV	54.0	-20.1	1.54 H	330	20.7	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	67.0 PK	74.0	-7.0	1.38 V	307	63.7	3.3
2	5150.00	51.2 AV	54.0	-2.8	1.38 V	307	47.9	3.3
3	*5180.00	120.2 PK			1.38 V	307	116.9	3.3
4	*5180.00	111.5 AV			1.38 V	307	108.2	3.3
5	#10360.00	50.7 PK	68.2	-17.5	3.26 V	53	38.5	12.2
6	15540.00	46.1 PK	74.0	-27.9	1.69 V	151	32.9	13.2
7	15540.00	33.8 AV	54.0	-20.2	1.69 V	151	20.6	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.

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5200.00	122.1 PK			2.57 H	305	119.0	3.1
2	*5200.00	112.7 AV			2.57 H	305	109.6	3.1
3	#10400.00	54.8 PK	68.2	-13.4	1.83 H	262	42.4	12.4
4	15600.00	46.1 PK	74.0	-27.9	1.56 H	321	32.9	13.2
5	15600.00	33.5 AV	54.0	-20.5	1.56 H	321	20.3	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	*5200.00	122.6 PK			1.44 V	311	119.5	3.1
2	*5200.00	113.1 AV			1.44 V	311	110.0	3.1
3	#10400.00	50.3 PK	68.2	-17.9	3.31 V	59	37.9	12.4
4	15600.00	45.8 PK	74.0	-28.2	1.65 V	155	32.6	13.2
5	15600.00	33.4 AV	54.0	-20.6	1.65 V	155	20.2	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.

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5240.00	121.6 PK			2.08 H	317	118.8	2.8
2	*5240.00	112.8 AV			2.08 H	317	110.0	2.8
3	5350.00	50.7 PK	74.0	-23.3	2.08 H	317	47.7	3.0
4	5350.00	39.1 AV	54.0	-14.9	2.08 H	317	36.1	3.0
5	#10480.00	55.0 PK	68.2	-13.2	1.88 H	250	42.5	12.5
6	15720.00	46.3 PK	74.0	-27.7	1.50 H	322	34.0	12.3
7	15720.00	33.7 AV	54.0	-20.3	1.50 H	322	21.4	12.3
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	*5240.00	122.7 PK			1.34 V	307	119.9	2.8
2	*5240.00	113.2 AV			1.34 V	307	110.4	2.8
3	5350.00	50.6 PK	74.0	-23.4	1.34 V	307	47.6	3.0
4	5350.00	39.0 AV	54.0	-15.0	1.34 V	307	36.0	3.0
5	#10480.00	50.9 PK	68.2	-17.3	3.31 V	65	38.4	12.5
6	15720.00	45.6 PK	74.0	-28.4	1.62 V	155	33.3	12.3
7	15720.00	33.3 AV	54.0	-20.7	1.62 V	155	21.0	12.3

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.

802.11ax (HE20)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	66.8 PK	74.0	-7.2	2.16 H	313	63.5	3.3
2	5150.00	53.5 AV	54.0	-0.5	2.16 H	313	50.2	3.3
3	*5180.00	121.1 PK			2.16 H	313	117.8	3.3
4	*5180.00	109.3 AV			2.16 H	313	106.0	3.3
5	#10360.00	55.1 PK	68.2	-13.1	1.93 H	246	42.9	12.2
6	15540.00	46.8 PK	74.0	-27.2	1.49 H	310	33.6	13.2
7	15540.00	34.0 AV	54.0	-20.0	1.49 H	310	20.8	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	66.8 PK	74.0	-7.2	1.49 V	308	63.5	3.3
2	5150.00	50.5 AV	54.0	-3.5	1.49 V	308	47.2	3.3
3	*5180.00	121.1 PK			1.49 V	308	117.8	3.3
4	*5180.00	110.3 AV			1.49 V	308	107.0	3.3
5	#10360.00	50.9 PK	68.2	-17.3	3.26 V	58	38.7	12.2
6	15540.00	46.2 PK	74.0	-27.8	1.73 V	165	33.0	13.2
7	15540.00	33.9 AV	54.0	-20.1	1.73 V	165	20.7	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.

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5200.00	123.6 PK			2.58 H	320	120.5	3.1
2	*5200.00	111.8 AV			2.58 H	320	108.7	3.1
3	#10400.00	55.3 PK	68.2	-12.9	1.88 H	234	42.9	12.4
4	15600.00	46.9 PK	74.0	-27.1	1.49 H	306	33.7	13.2
5	15600.00	34.0 AV	54.0	-20.0	1.49 H	306	20.8	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	*5200.00	124.3 PK			1.50 V	317	121.2	3.1
2	*5200.00	112.3 AV			1.50 V	317	109.2	3.1
3	#10400.00	50.0 PK	68.2	-18.2	3.22 V	57	37.6	12.4
4	15600.00	46.1 PK	74.0	-27.9	1.70 V	139	32.9	13.2
5	15600.00	33.8 AV	54.0	-20.2	1.70 V	139	20.6	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.

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5240.00	123.4 PK			2.17 H	306	120.6	2.8
2	*5240.00	111.8 AV			2.17 H	306	109.0	2.8
3	5350.00	51.7 PK	74.0	-22.3	2.17 H	306	48.7	3.0
4	5350.00	39.6 AV	54.0	-14.4	2.17 H	306	36.6	3.0
5	#10480.00	55.5 PK	68.2	-12.7	1.84 H	242	43.0	12.5
6	15720.00	45.7 PK	74.0	-28.3	1.52 H	307	33.4	12.3
7	15720.00	33.3 AV	54.0	-20.7	1.52 H	307	21.0	12.3
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	*5240.00	124.3 PK			1.53 V	323	121.5	2.8
2	*5240.00	112.6 AV			1.53 V	323	109.8	2.8
3	5350.00	51.9 PK	74.0	-22.1	1.53 V	323	48.9	3.0
4	5350.00	40.0 AV	54.0	-14.0	1.53 V	323	37.0	3.0
5	#10480.00	50.1 PK	68.2	-18.1	3.25 V	55	37.6	12.5
6	15720.00	46.6 PK	74.0	-27.4	1.74 V	163	34.3	12.3
7	15720.00	34.2 AV	54.0	-19.8	1.74 V	163	21.9	12.3

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.

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	67.5 PK	74.0	-6.5	2.81 H	320	64.2	3.3
2	5150.00	53.7 AV	54.0	-0.3	2.81 H	320	50.4	3.3
3	*5190.00	115.4 PK			2.81 H	320	112.2	3.2
4	*5190.00	103.7 AV			2.81 H	320	100.5	3.2
5	#10380.00	45.3 PK	68.2	-22.9	1.99 H	271	32.9	12.4
6	15570.00	47.3 PK	74.0	-26.7	1.83 H	341	34.0	13.3
7	15570.00	35.1 AV	54.0	-18.9	1.83 H	341	21.8	13.3
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	59.4 PK	74.0	-14.6	1.46 V	321	56.1	3.3
2	5150.00	50.2 AV	54.0	-3.8	1.46 V	321	46.9	3.3
3	*5190.00	116.2 PK			1.46 V	321	113.0	3.2
4	*5190.00	104.1 AV			1.46 V	321	100.9	3.2
5	#10380.00	45.6 PK	68.2	-22.6	3.23 V	47	33.2	12.4
6	15570.00	46.3 PK	74.0	-27.7	1.67 V	160	33.0	13.3
7	15570.00	34.2 AV	54.0	-19.8	1.67 V	160	20.9	13.3

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	66.3 PK	74.0	-7.7	2.19 H	318	63.0	3.3
2	5150.00	53.5 AV	54.0	-0.5	2.19 H	318	50.2	3.3
3	*5230.00	119.3 PK			2.19 H	318	116.4	2.9
4	*5230.00	107.4 AV			2.19 H	318	104.5	2.9
5	5350.00	57.6 PK	74.0	-16.4	2.19 H	318	54.6	3.0
6	5350.00	39.6 AV	54.0	-14.4	2.19 H	318	36.6	3.0
7	#10460.00	45.2 PK	68.2	-23.0	1.95 H	266	32.7	12.5
8	15690.00	47.1 PK	74.0	-26.9	1.79 H	353	34.6	12.5
9	15690.00	34.8 AV	54.0	-19.2	1.79 H	353	22.3	12.5
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	63.1 PK	74.0	-10.9	1.45 V	295	59.8	3.3
2	5150.00	50.4 AV	54.0	-3.6	1.45 V	295	47.1	3.3
3	*5230.00	120.0 PK			1.45 V	295	117.1	2.9
4	*5230.00	107.8 AV			1.45 V	295	104.9	2.9
5	5350.00	57.6 PK	74.0	-16.4	1.45 V	295	54.6	3.0
6	5350.00	39.8 AV	54.0	-14.2	1.45 V	295	36.8	3.0
7	#10460.00	45.0 PK	68.2	-23.2	3.29 V	47	32.5	12.5
8	15690.00	46.1 PK	74.0	-27.9	1.64 V	148	33.6	12.5
9	15690.00	34.3 AV	54.0	-19.7	1.64 V	148	21.8	12.5

REMARKS:

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

802.11ax (HE80)

CHANNEL	TX Channel 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	65.2 PK	74.0	-8.8	2.63 H	319	61.9	3.3
2	5150.00	53.7 AV	54.0	-0.3	2.63 H	319	50.4	3.3
3	*5210.00	111.3 PK			2.63 H	319	108.3	3.0
4	*5210.00	99.7 AV			2.63 H	319	96.7	3.0
5	5350.00	57.7 PK	74.0	-16.3	2.63 H	319	54.7	3.0
6	5350.00	39.6 AV	54.0	-14.4	2.63 H	319	36.6	3.0
7	#10420.00	45.0 PK	68.2	-23.2	1.91 H	269	32.5	12.5
8	15630.00	45.1 PK	74.0	-28.9	1.67 H	320	32.2	12.9
9	15630.00	33.1 AV	54.0	-20.9	1.67 H	320	20.2	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	63.5 PK	74.0	-10.5	1.48 V	305	60.2	3.3
2	5150.00	50.7 AV	54.0	-3.3	1.48 V	305	47.4	3.3
3	*5210.00	111.8 PK			1.48 V	305	108.8	3.0
4	*5210.00	100.1 AV			1.48 V	305	97.1	3.0
5	5350.00	57.5 PK	74.0	-16.5	1.48 V	305	54.5	3.0
6	5350.00	39.8 AV	54.0	-14.2	1.48 V	305	36.8	3.0
7	#10420.00	45.3 PK	68.2	-22.9	3.23 V	41	32.8	12.5
8	15630.00	46.5 PK	74.0	-27.5	1.73 V	146	33.6	12.9
9	15630.00	34.3 AV	54.0	-19.7	1.73 V	146	21.4	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.

Below 1GHz Data:

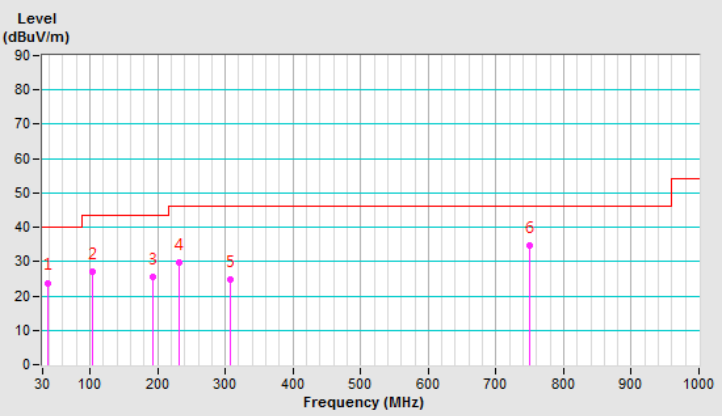
802.11a

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	38.68	23.8 QP	40.0	-16.2	1.35 H	356	32.4	-8.6
2	104.54	27.0 QP	43.5	-16.5	1.44 H	88	38.3	-11.3
3	192.04	25.5 QP	43.5	-18.0	1.66 H	278	35.7	-10.2
4	231.18	29.7 QP	46.0	-16.3	1.79 H	65	39.2	-9.5
5	306.69	24.7 QP	46.0	-21.3	1.89 H	40	31.5	-6.8
6	750.01	34.6 QP	46.0	-11.4	3.02 H	28	30.9	3.7

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.

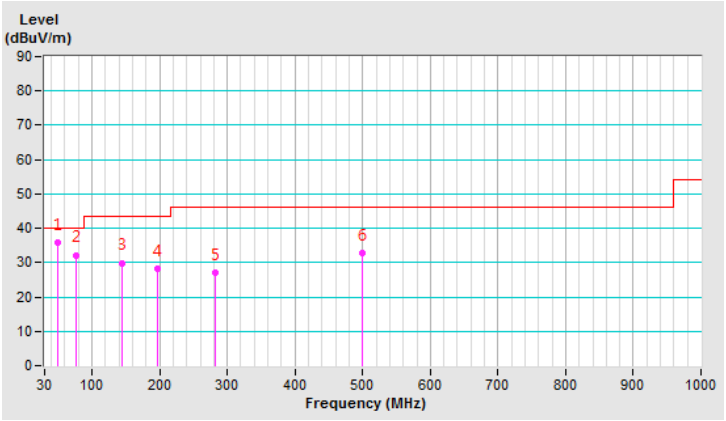


CHANNEL	TX Channel 48	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz		

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	49.35	35.8 QP	40.0	-4.2	1.34 V	197	43.9	-8.1
2	76.05	32.2 QP	40.0	-7.8	1.42 V	90	44.1	-11.9
3	144.94	29.9 QP	43.5	-13.6	1.55 V	360	37.8	-7.9
4	196.57	28.3 QP	43.5	-15.2	1.67 V	252	38.7	-10.4
5	282.61	26.9 QP	46.0	-19.1	1.88 V	252	34.3	-7.4
6	500.01	32.9 QP	46.0	-13.1	1.00 V	360	34.7	-1.8

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 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	#5633.22	54.3 PK	68.2	-13.9	3.20 H	133	51.0	3.3
2	*5745.00	119.6 PK			3.20 H	133	116.0	3.6
3	*5745.00	112.1 AV			3.20 H	133	108.5	3.6
4	#5945.48	55.5 PK	68.2	-12.7	3.20 H	133	51.3	4.2
5	11490.00	64.1 PK	74.0	-9.9	2.51 H	224	51.0	13.1
6	11490.00	53.4 AV	54.0	-0.6	2.51 H	224	40.3	13.1
7	#17235.00	67.9 PK	68.2	-0.3	1.47 H	358	50.9	17.0
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	**FREQ. (MHz)**	**EMISSION LEVEL (dBuV/m)**	**LIMIT (dBuV/m)**	**MARGIN (dB)**	**ANTENNA HEIGHT (m)**	**TABLE ANGLE (Degree)**	**RAW VALUE (dBuV)**	**CORRECTION FACTOR (dB/m)**
1	#5643.91	56.3 PK	68.2	-11.9	1.42 V	52	53.0	3.3
2	*5745.00	120.5 PK			1.42 V	52	116.9	3.6
3	*5745.00	112.6 AV			1.42 V	52	109.0	3.6
4	#5942.59	54.9 PK	68.2	-13.3	1.42 V	52	50.7	4.2
5	11490.00	54.1 PK	74.0	-19.9	3.33 V	360	41.0	13.1
6	11490.00	43.0 AV	54.0	-11.0	3.33 V	360	29.9	13.1
7	#17235.00	66.3 PK	68.2	-1.9	1.52 V	354	49.3	17.0

REMARKS:

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

CHANNEL	TX Channel 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	#5586.59	54.1 PK	68.2	-14.1	3.00 H	137	50.8	3.3
2	*5785.00	119.4 PK			3.00 H	137	115.6	3.8
3	*5785.00	111.2 AV			3.00 H	137	107.4	3.8
4	#5925.15	55.6 PK	68.2	-12.6	3.00 H	137	51.5	4.1
5	11570.00	64.3 PK	74.0	-9.7	2.45 H	210	51.6	12.7
6	11570.00	53.5 AV	54.0	-0.5	2.45 H	210	40.8	12.7
7	**#17355.00**	**68.1 PK**	**68.2**	**-0.1**	**1.49 H**	**358**	**51.2**	**16.9**
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5588.24	53.8 PK	68.2	-14.4	1.40 V	53	50.5	3.3
2	*5785.00	119.5 PK			1.40 V	53	115.7	3.8
3	*5785.00	112.2 AV			1.40 V	53	108.4	3.8
4	#5930.17	54.8 PK	68.2	-13.4	1.40 V	53	50.7	4.1
5	11570.00	54.4 PK	74.0	-19.6	3.35 V	360	41.7	12.7
6	11570.00	43.2 AV	54.0	-10.8	3.35 V	360	30.5	12.7
7	#17355.00	66.0 PK	68.2	-2.2	1.49 V	343	49.1	16.9

REMARKS:

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

CHANNEL	TX Channel 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	#5581.55	53.7 PK	68.2	-14.5	3.02 H	135	50.4	3.3
2	*5825.00	118.7 PK			3.02 H	135	114.8	3.9
3	*5825.00	111.0 AV			3.02 H	135	107.1	3.9
4	#5985.14	54.6 PK	68.2	-13.6	3.02 H	135	50.5	4.1
5	11650.00	63.5 PK	74.0	-10.5	2.53 H	220	50.7	12.8
6	11650.00	53.0 AV	54.0	-1.0	2.53 H	220	40.2	12.8
7	#17475.00	68.0 PK	68.2	-0.2	1.32 H	356	50.5	17.5
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5605.87	53.6 PK	68.2	-14.6	1.40 V	50	50.3	3.3
2	*5825.00	119.9 PK			1.40 V	50	116.0	3.9
3	*5825.00	112.1 AV			1.40 V	50	108.2	3.9
4	#5934.07	55.6 PK	68.2	-12.6	1.40 V	50	51.4	4.2
5	11650.00	53.9 PK	74.0	-20.1	3.30 V	360	41.1	12.8
6	11650.00	42.8 AV	54.0	-11.2	3.30 V	360	30.0	12.8
7	#17475.00	66.3 PK	68.2	-1.9	1.49 V	345	48.8	17.5

REMARKS:

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

802.11ac (VHT20)

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	#5616.88	53.7 PK	68.2	-14.5	3.22 H	135	50.4	3.3
2	*5745.00	119.0 PK			3.22 H	135	115.4	3.6
3	*5745.00	111.2 AV			3.22 H	135	107.6	3.6
4	#5934.99	54.0 PK	68.2	-14.2	3.22 H	135	49.8	4.2
5	11490.00	64.4 PK	74.0	-9.6	2.41 H	201	51.3	13.1
6	11490.00	53.4 AV	54.0	-0.6	2.41 H	201	40.3	13.1
7	**#17235.00**	**68.1 PK**	**68.2**	**-0.1**	**2.07 H**	**349**	**51.1**	**17.0**
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5635.18	54.7 PK	68.2	-13.5	1.40 V	52	51.4	3.3
2	*5745.00	119.6 PK			1.40 V	52	116.0	3.6
3	*5745.00	112.0 AV			1.40 V	52	108.4	3.6
4	#5927.23	54.6 PK	68.2	-13.6	1.40 V	52	50.5	4.1
5	11490.00	54.5 PK	74.0	-19.5	3.28 V	360	41.4	13.1
6	11490.00	43.2 AV	54.0	-10.8	3.28 V	360	30.1	13.1
7	#17235.00	66.9 PK	68.2	-1.3	1.55 V	360	49.9	17.0

REMARKS:

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

CHANNEL	TX Channel 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	#5576.78	54.2 PK	68.2	-14.0	3.01 H	133	50.9	3.3
2	*5785.00	119.5 PK			3.01 H	133	115.7	3.8
3	*5785.00	110.4 AV			3.01 H	133	106.6	3.8
4	#5941.38	56.8 PK	68.2	-11.4	3.01 H	133	52.6	4.2
5	11570.00	63.9 PK	74.0	-10.1	2.44 H	226	51.2	12.7
6	11570.00	53.4 AV	54.0	-0.6	2.44 H	226	40.7	12.7
7	#17355.00	67.9 PK	68.2	-0.3	2.06 H	348	51.0	16.9
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5619.44	55.1 PK	68.2	-13.1	1.37 V	49	51.8	3.3
2	*5785.00	118.9 PK			1.37 V	49	115.1	3.8
3	*5785.00	111.5 AV			1.37 V	49	107.7	3.8
4	#5931.69	55.8 PK	68.2	-12.4	1.37 V	49	51.7	4.1
5	11570.00	54.5 PK	74.0	-19.5	3.33 V	356	41.8	12.7
6	11570.00	43.5 AV	54.0	-10.5	3.33 V	356	30.8	12.7
7	#17355.00	66.0 PK	68.2	-2.2	1.50 V	360	49.1	16.9

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5600.73	53.3 PK	68.2	-14.9	3.00 H	134	50.0	3.3
2	*5825.00	118.8 PK			3.00 H	134	114.9	3.9
3	*5825.00	110.7 AV			3.00 H	134	106.8	3.9
4	#5940.30	57.0 PK	68.2	-11.2	3.00 H	134	52.8	4.2
5	11650.00	63.7 PK	74.0	-10.3	2.39 H	225	50.9	12.8
6	11650.00	53.5 AV	54.0	-0.5	2.39 H	225	40.7	12.8
7	#17475.00	67.8 PK	68.2	-0.4	2.14 H	348	50.3	17.5
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5604.47	53.6 PK	68.2	-14.6	1.37 V	52	50.3	3.3
2	*5825.00	119.0 PK			1.37 V	52	115.1	3.9
3	*5825.00	111.4 AV			1.37 V	52	107.5	3.9
4	#5938.35	54.7 PK	68.2	-13.5	1.37 V	52	50.5	4.2
5	11650.00	54.3 PK	74.0	-19.7	3.33 V	360	41.5	12.8
6	11650.00	43.2 AV	54.0	-10.8	3.33 V	360	30.4	12.8
7	#17475.00	66.6 PK	68.2	-1.6	1.49 V	354	49.1	17.5

REMARKS:

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

802.11ac (VHT40)

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	#5639.56	55.7 PK	68.2	-12.5	3.08 H	138	52.4	3.3
2	*5755.00	116.2 PK			3.08 H	138	112.5	3.7
3	*5755.00	108.7 AV			3.08 H	138	105.0	3.7
4	#5944.31	56.8 PK	68.2	-11.4	3.08 H	138	52.6	4.2
5	11510.00	60.2 PK	74.0	-13.8	2.50 H	209	47.2	13.0
6	11510.00	50.1 AV	54.0	-3.9	2.50 H	209	37.1	13.0
7	#17265.00	67.8 PK	68.2	-0.4	2.10 H	349	50.9	16.9
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5650.26	60.2 PK	68.4	-8.2	1.32 V	52	56.9	3.3
2	*5755.00	116.9 PK			1.32 V	52	113.2	3.7
3	*5755.00	107.4 AV			1.32 V	52	103.7	3.7
4	#5948.54	55.9 PK	68.2	-12.3	1.32 V	52	51.7	4.2
5	11510.00	51.5 PK	74.0	-22.5	3.34 V	360	38.5	13.0
6	11510.00	40.8 AV	54.0	-13.2	3.34 V	360	27.8	13.0
7	#17265.00	65.4 PK	68.2	-2.8	1.48 V	360	48.5	16.9

REMARKS:

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

CHANNEL	TX Channel 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	#5625.01	53.6 PK	68.2	-14.6	3.28 H	139	50.3	3.3
2	*5795.00	116.1 PK			3.28 H	139	112.3	3.8
3	*5795.00	108.5 AV			3.28 H	139	104.7	3.8
4	#5929.68	57.5 PK	68.2	-10.7	3.28 H	139	53.4	4.1
5	11590.00	60.6 PK	74.0	-13.4	2.52 H	214	47.8	12.8
6	11590.00	50.3 AV	54.0	-3.7	2.52 H	214	37.5	12.8
7	#17385.00	68.0 PK	68.2	-0.2	2.10 H	349	51.2	16.8
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	#5640.89	55.1 PK	68.2	-13.1	1.31 V	50	51.8	3.3
2	*5795.00	117.7 PK			1.31 V	50	113.9	3.8
3	*5795.00	109.2 AV			1.31 V	50	105.4	3.8
4	#5932.76	55.1 PK	68.2	-13.1	1.31 V	50	51.0	4.1
5	11590.00	51.2 PK	74.0	-22.8	3.37 V	360	38.4	12.8
6	11590.00	40.6 AV	54.0	-13.4	3.37 V	360	27.8	12.8
7	#17385.00	64.9 PK	68.2	-3.3	1.46 V	360	48.1	16.8

REMARKS:

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

802.11ac (VHT80)

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	#5636.24	63.2 PK	68.2	-5.0	3.28 H	137	59.9	3.3
2	*5775.00	111.5 PK			3.28 H	137	107.8	3.7
3	*5775.00	103.3 AV			3.28 H	137	99.6	3.7
4	#5919.85	69.3 PK	72.0	-2.7	3.28 H	137	65.2	4.1
5	11550.00	54.1 PK	74.0	-19.9	2.51 H	219	41.2	12.9
6	11550.00	44.2 AV	54.0	-9.8	2.51 H	219	31.3	12.9
7	#17325.00	60.3 PK	68.2	-7.9	2.08 H	335	43.3	17.0
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5649.58	67.0 PK	68.2	-1.2	1.42 V	51	63.7	3.3
2	*5775.00	112.6 PK			1.42 V	51	108.9	3.7
3	*5775.00	104.5 AV			1.42 V	51	100.8	3.7
4	#5932.17	64.0 PK	68.2	-4.2	1.42 V	51	59.9	4.1
5	11550.00	50.2 PK	74.0	-23.8	3.28 V	360	37.3	12.9
6	11550.00	39.1 AV	54.0	-14.9	3.28 V	360	26.2	12.9
7	#17325.00	54.6 PK	68.2	-13.6	1.52 V	360	37.6	17.0

REMARKS:

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

Below 1GHz Data:

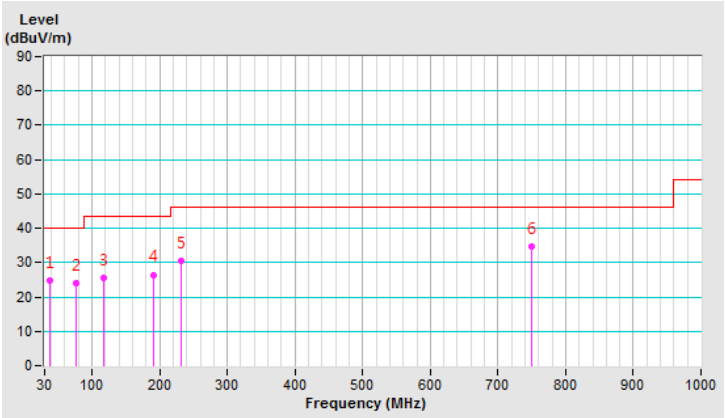
802.11ac (VHT40)

CHANNEL	TX Channel 151	**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	38.27	24.8 QP	40.0	-15.2	1.33 H	315	33.5	-8.7
2	76.22	23.9 QP	40.0	-16.1	1.42 H	98	35.9	-12.0
3	118.10	25.4 QP	43.5	-18.1	1.75 H	283	35.4	-10.0
4	191.72	26.5 QP	43.5	-17.0	1.34 H	267	36.7	-10.2
5	230.94	30.4 QP	46.0	-15.6	1.00 H	74	40.0	-9.6
6	750.03	34.5 QP	46.0	-11.5	1.00 H	27	30.8	3.7

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.

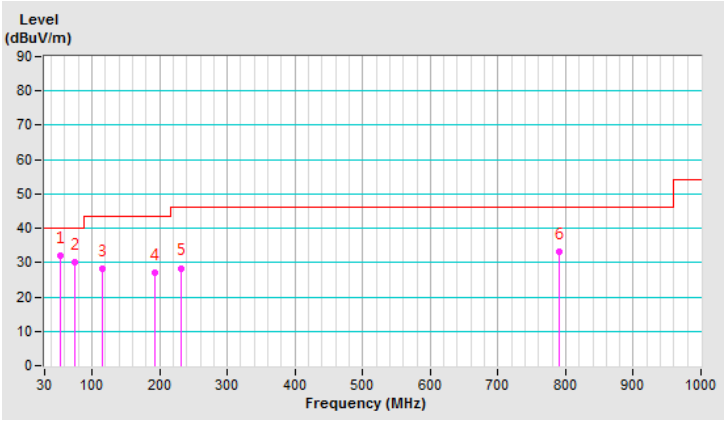


CHANNEL	TX Channel 151	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz		

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	54.23	32.1 QP	40.0	-7.9	1.89 V	65	40.4	-8.3
2	74.84	30.0 QP	40.0	-10.0	2.03 V	278	41.5	-11.5
3	114.78	28.3 QP	43.5	-15.2	1.55 V	301	38.6	-10.3
4	192.26	27.1 QP	43.5	-16.4	1.02 V	286	37.3	-10.2
5	230.91	28.4 QP	46.0	-17.6	2.33 V	113	38.0	-9.6
6	790.02	33.1 QP	46.0	-12.9	1.65 V	141	28.9	4.2

REMARKS:

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



4.2 Conducted Emission Measurement

4.2.1 Limits of Conducted Emission Measurement

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

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

4.2.2 Test Instruments

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver R&S	ESCS 30	847124/029	Oct. 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: July 02, 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.

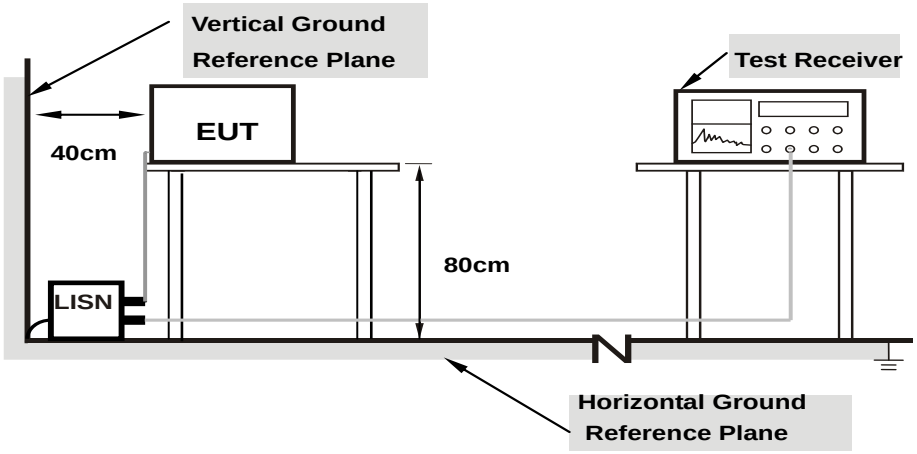
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

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.

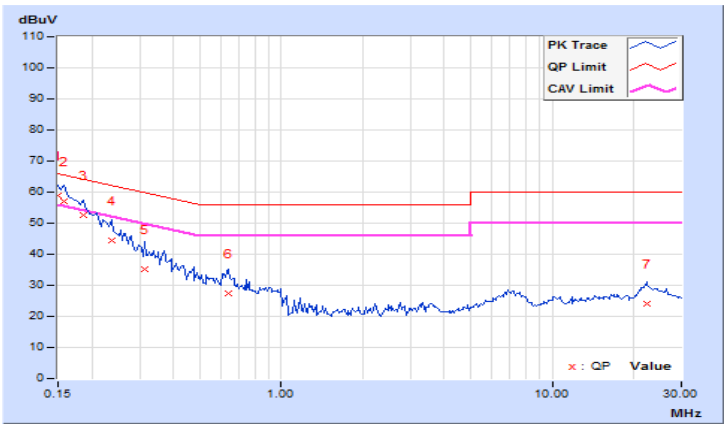
4.2.7 Test Results (Mode 1)

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

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	10.03	48.81	30.84	58.84	40.87	66.00	56.00	-7.16	-15.13
2	0.15781	10.03	47.17	26.35	57.20	36.38	65.58	55.58	-8.38	-19.20
3	0.18516	10.04	42.67	23.84	52.71	33.88	64.25	54.25	-11.54	-20.37
4	0.23594	10.06	34.42	15.87	44.48	25.93	62.24	52.24	-17.76	-26.31
5	0.31406	10.07	25.15	10.02	35.22	20.09	59.86	49.86	-24.64	-29.77
6	0.64219	10.10	17.33	12.01	27.43	22.11	56.00	46.00	-28.57	-23.89
7	22.27734	11.41	12.48	7.11	23.89	18.52	60.00	50.00	-36.11	-31.48

REMARKS:

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

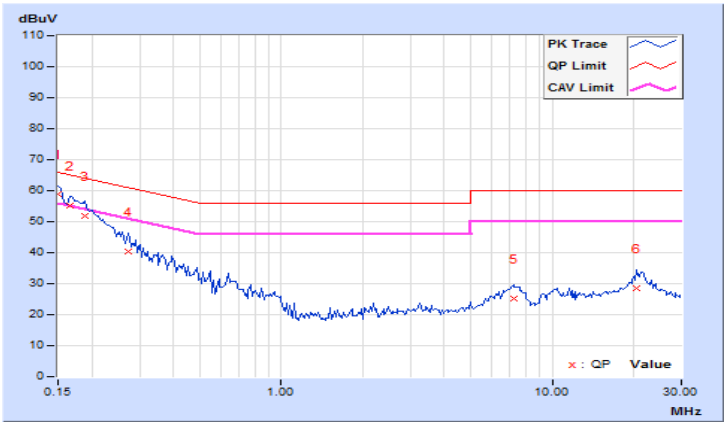


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	**0.15000**	**9.94**	**49.03**	**31.73**	**58.97**	**41.67**	**66.00**	**56.00**	**-7.03**	**-14.33**
2	0.16562	9.94	45.10	25.68	55.04	35.62	65.18	55.18	-10.14	-19.56
3	0.18906	9.95	41.89	23.19	51.84	33.14	64.08	54.08	-12.24	-20.94
4	0.27109	9.96	30.55	13.79	40.51	23.75	61.08	51.08	-20.57	-27.33
5	7.19141	10.36	14.78	8.81	25.14	19.17	60.00	50.00	-34.86	-30.83
6	20.52344	11.15	17.37	12.40	28.52	23.55	60.00	50.00	-31.48	-26.45

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.



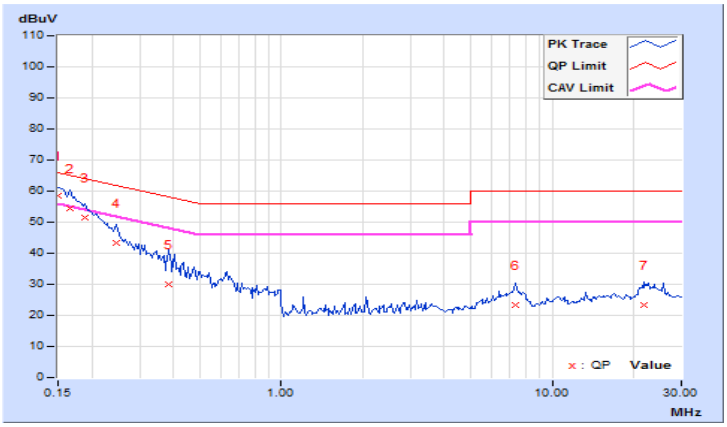
4.2.8 Test Results (Mode 2)

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

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	10.03	48.63	30.96	58.66	40.99	66.00	56.00	-7.34	-15.01
2	0.16562	10.04	44.54	24.02	54.58	34.06	65.18	55.18	-10.60	-21.12
3	0.18906	10.05	41.52	21.81	51.57	31.86	64.08	54.08	-12.51	-22.22
4	0.24766	10.06	33.39	16.13	43.45	26.19	61.84	51.84	-18.39	-25.65
5	0.38438	10.08	19.92	6.01	30.00	16.09	58.18	48.18	-28.18	-32.09
6	7.31641	10.53	12.72	6.64	23.25	17.17	60.00	50.00	-36.75	-32.83
7	21.76172	11.40	11.96	6.09	23.36	17.49	60.00	50.00	-36.64	-32.51

REMARKS:

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

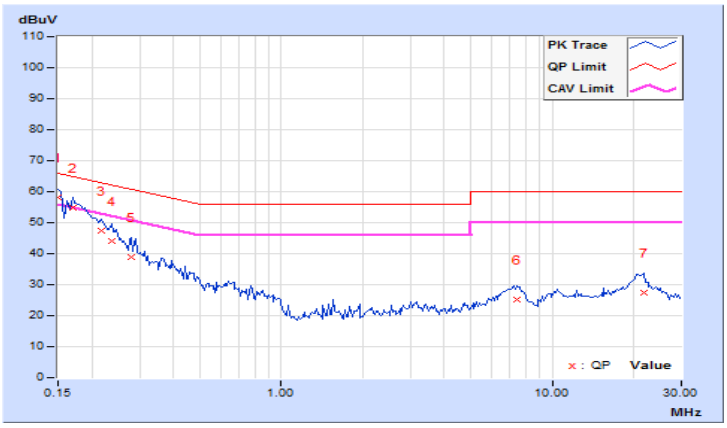


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	9.94	48.37	31.24	58.31	41.18	66.00	56.00	-7.69	-14.82
2	0.16953	9.94	44.79	26.56	54.73	36.50	64.98	54.98	-10.25	-18.48
3	0.21641	9.95	37.57	20.65	47.52	30.60	62.96	52.96	-15.44	-22.36
4	0.23594	9.96	34.18	17.36	44.14	27.32	62.24	52.24	-18.10	-24.92
5	0.27891	9.96	29.01	14.24	38.97	24.20	60.85	50.85	-21.88	-26.65
6	7.41406	10.37	14.98	9.16	25.35	19.53	60.00	50.00	-34.65	-30.47
7	21.82031	11.17	16.42	11.42	27.59	22.59	60.00	50.00	-32.41	-27.41

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	20.65	20.71	20.83	21.40	493.004	26.93	30.00	Pass
40	5200	23.42	23.51	23.55	23.93	917.81	29.63	30.00	Pass
48	5240	23.44	23.66	23.56	23.85	922.721	29.65	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	20.12	20.37	20.58	20.90	449.01	26.52	30.00	Pass
40	5200	23.40	23.51	23.54	23.71	904.071	29.56	30.00	Pass
48	5240	23.30	23.42	23.51	23.64	889.176	29.49	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	18.72	18.73	19.06	19.41	316.953	25.01	30.00	Pass
46	5230	23.01	22.49	22.26	22.99	744.739	28.72	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	16.72	16.98	16.92	17.41	201.162	23.04	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	20.16	20.41	20.62	20.98	454.313	26.57	30.00	Pass
40	5200	23.41	23.55	23.62	23.77	914.12	29.61	30.00	Pass
48	5240	23.31	23.45	23.60	23.70	899.108	29.54	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	18.81	18.77	19.12	19.46	321.335	25.07	30.00	Pass
46	5230	23.06	22.55	22.33	23.06	755.493	28.78	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	16.79	17.03	16.97	17.48	203.969	23.10	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	20.12	20.37	20.58	20.90	449.01	26.52	30.00	Pass
40	5200	23.40	23.51	23.54	23.71	904.071	29.56	30.00	Pass
48	5240	23.30	23.42	23.51	23.64	889.176	29.49	30.00	Pass

Note: 1. The directional gain = 5.18dBi < 6dBi, so the power limit shall not be reduced.

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	18.72	18.73	19.06	19.41	316.953	25.01	30.00	Pass
46	5230	23.01	22.49	22.26	22.99	744.739	28.72	30.00	Pass

Note: 1. The directional gain = 5.18dBi < 6dBi, so the power limit shall not be reduced.

802.11ac (VHT80)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
42	5210	16.72	16.98	16.92	17.41	201.162	23.04	30.00	Pass

Note: 1. The directional gain = 5.18dBi < 6dBi, so the power limit shall not be reduced.

802.11ax (HE20)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
36	5180	20.16	20.41	20.62	20.98	454.313	26.57	30.00	Pass
40	5200	23.41	23.55	23.62	23.77	914.12	29.61	30.00	Pass
48	5240	23.31	23.45	23.60	23.70	899.108	29.54	30.00	Pass

Note: 1. The directional gain = 5.18dBi < 6dBi, so the power limit shall not be reduced.

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	18.81	18.77	19.12	19.46	321.335	25.07	30.00	Pass
46	5230	23.06	22.55	22.33	23.06	755.493	28.78	30.00	Pass

Note: 1. The directional gain = 5.18dBi < 6dBi, so the power limit shall not be reduced.

802.11ax (HE80)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
42	5210	16.79	17.03	16.97	17.48	203.969	23.10	30.00	Pass

Note: 1. The directional gain = 5.18dBi < 6dBi, so the power limit shall not be reduced.

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	22.09	21.43	22.24	22.46	644.495	28.09	30.00	Pass
157	5785	21.34	20.93	21.33	21.75	545.479	27.37	30.00	Pass
165	5825	21.54	21.32	21.15	21.57	551.946	27.42	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	21.76	21.10	21.86	22.04	592.211	27.72	30.00	Pass
157	5785	21.02	20.62	21.03	21.48	509.189	27.07	30.00	Pass
165	5825	21.15	20.91	20.84	21.26	508.626	27.06	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	22.23	21.57	22.49	22.63	671.308	28.27	30.00	Pass
159	5795	22.22	21.83	22.12	22.59	663.612	28.22	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	19.77	19.34	20.01	20.38	390.118	25.91	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	21.76	21.10	21.86	22.04	592.211	27.72	30.00	Pass
157	5785	21.02	20.62	21.03	21.48	509.189	27.07	30.00	Pass
165	5825	21.15	20.91	20.84	21.26	508.626	27.06	30.00	Pass

Note: 1. The directional gain = 5.73dBi < 6dBi, so the power limit shall not be reduced.

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	22.23	21.57	22.49	22.63	671.308	28.27	30.00	Pass
159	5795	22.22	21.83	22.12	22.59	663.612	28.22	30.00	Pass

Note: 1. The directional gain = 5.73dBi < 6dBi, so the power limit shall not be reduced.

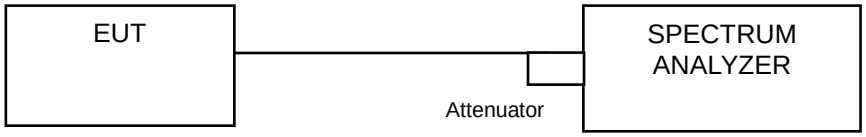
802.11ac (VHT80)

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	19.77	19.34	20.01	20.38	390.118	25.91	30.00	Pass

Note: 1. The directional gain = 5.73dBi < 6dBi, so the power limit shall not be reduced.

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	16.68	16.56	16.68	16.68
40	5200	17.28	17.28	17.64	20.04
48	5240	19.44	17.04	17.88	17.16

802.11ax (HE20)

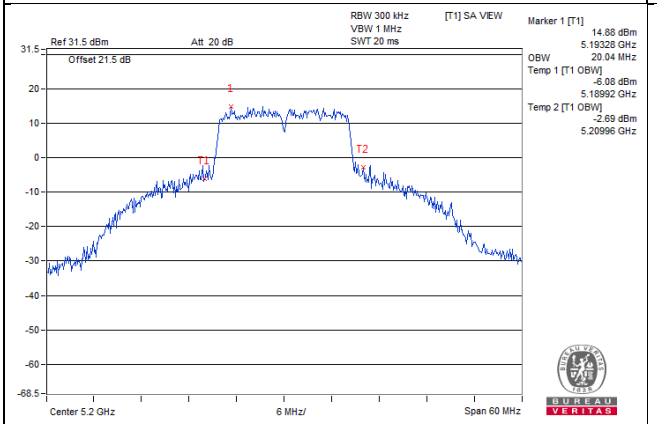
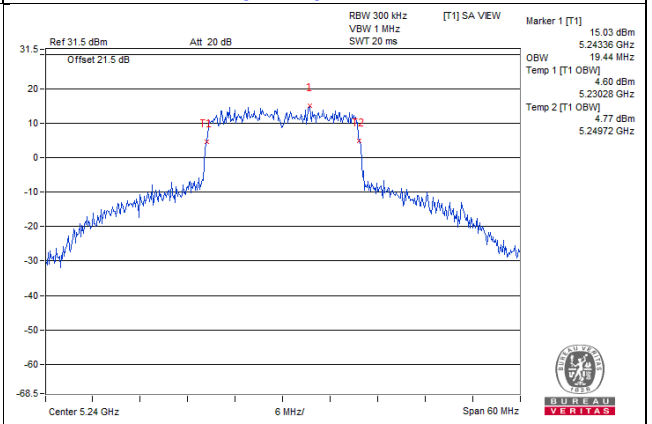
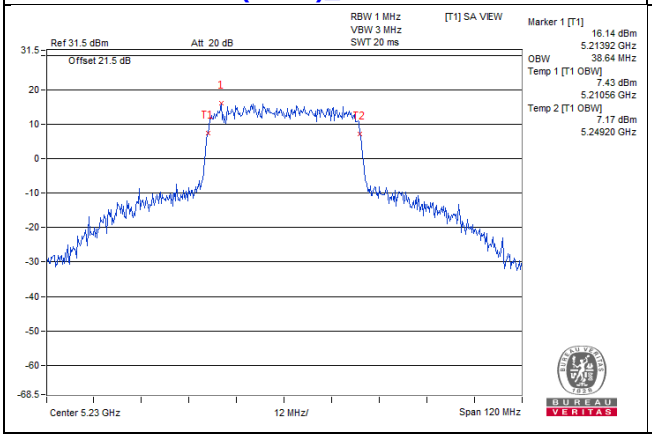
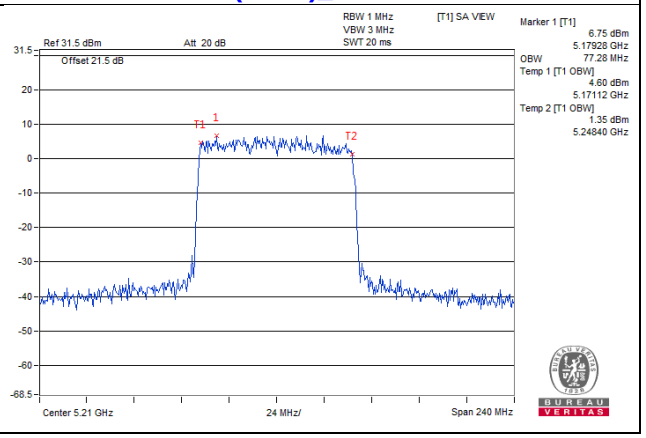
Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)			
		Chain 0	Chain 1	Chain 2	Chain 3
36	5180	19.08	19.08	19.08	19.08
40	5200	19.32	19.20	19.20	19.32
48	5240	19.44	19.32	19.44	19.32

802.11ax (HE40)

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

802.11ax (HE80)

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

Spectrum Plot of Max. Value	
802.11a_Chain 3 / CH40	**802.11ax (HE20)_Chain 0 / CH48**
	
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	16.44	16.56	16.44	16.44
157	5785	16.56	16.56	16.44	16.56
165	5825	16.44	16.56	16.44	16.56

802.11ac (VHT20)

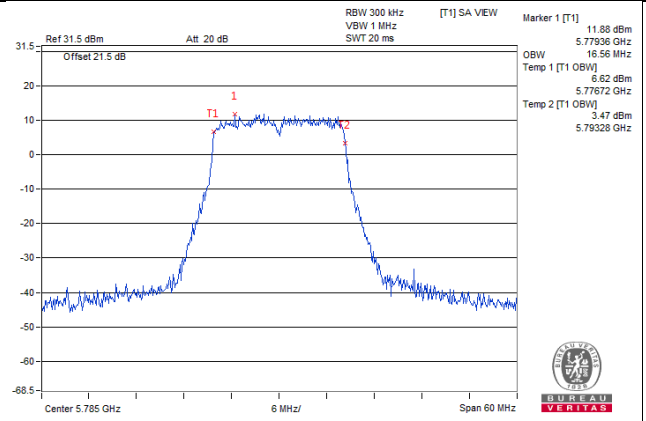
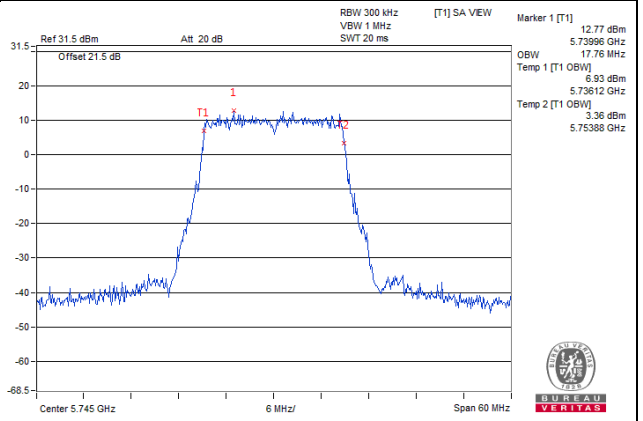
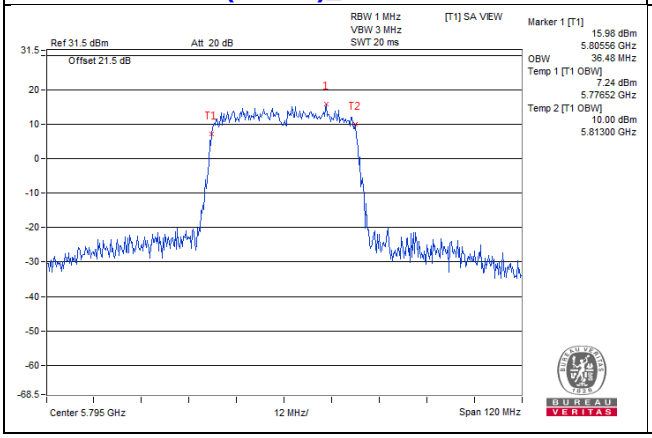
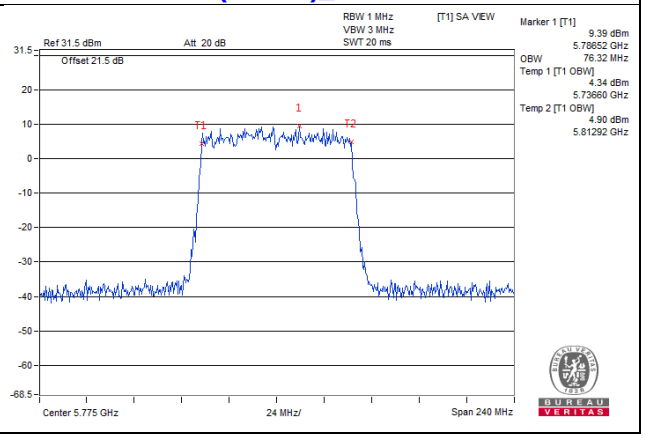
Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)			
		Chain 0	Chain 1	Chain 2	Chain 3
149	5745	17.76	17.64	17.76	17.76
157	5785	17.76	17.64	17.76	17.64
165	5825	17.76	17.76	17.76	17.76

802.11ac (VHT40)

Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)			
		Chain 0	Chain 1	Chain 2	Chain 3
151	5755	36.24	36.24	36.24	36.24
159	5795	36.48	36.24	36.48	36.48

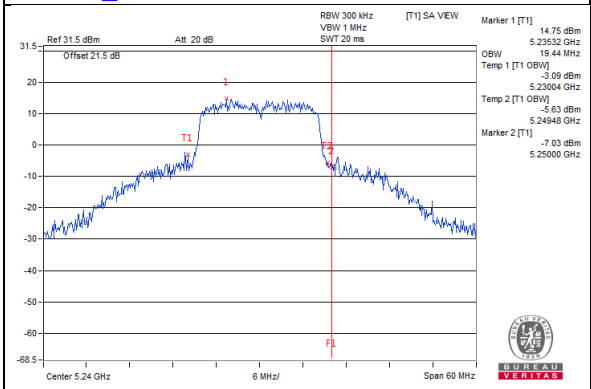
802.11ac (VHT80)

Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)			
		Chain 0	Chain 1	Chain 2	Chain 3
155	5775	75.84	76.32	75.84	75.84

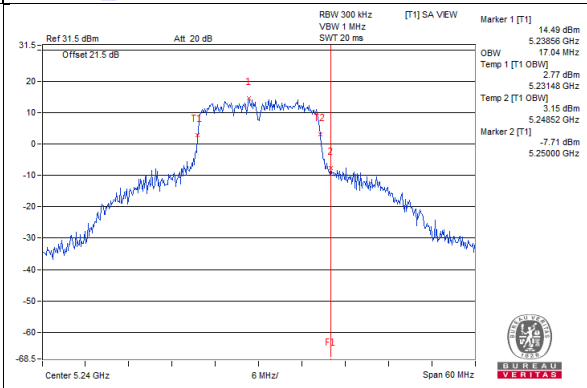
Spectrum Plot of Max. Value	
802.11a_Chain 0 / CH157	**802.11ac (VHT20)_Chain 0 / CH149**
	
802.11ac (VHT40)_Chain 0 / CH159	**802.11ac (VHT80)_Chain 1 / CH155**
	

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

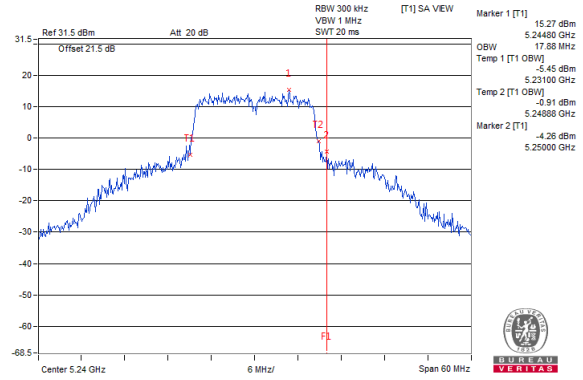
802.11a_Chain 0 / CH48



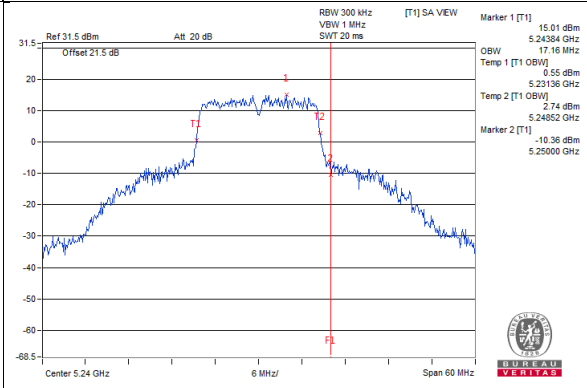
802.11a_Chain 1 / CH48



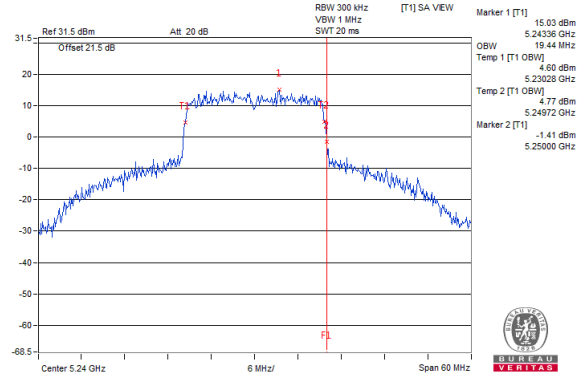
802.11a_Chain 2 / CH48



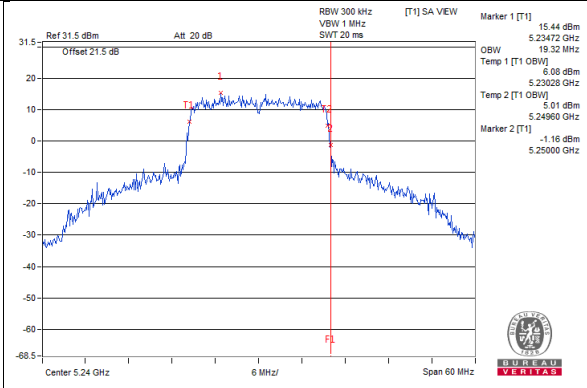
802.11a_Chain 3 / CH48



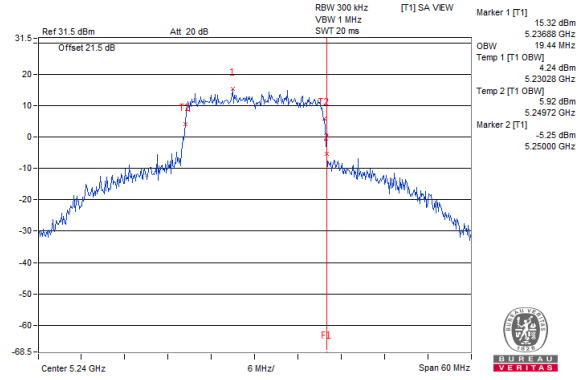
802.11ax (HE20)_Chain 0 / CH48



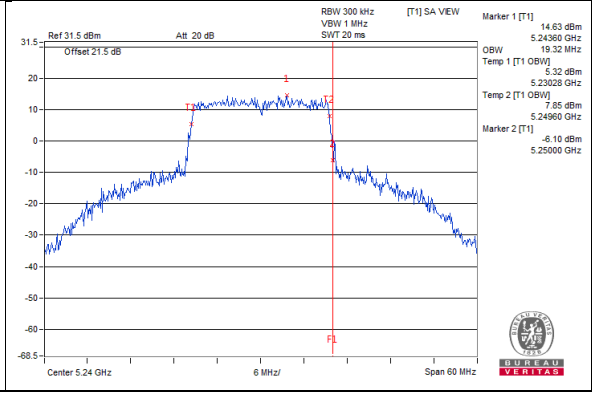
802.11ax (HE20)_Chain 1 / CH48



802.11ax (HE20)_Chain 2 / CH48

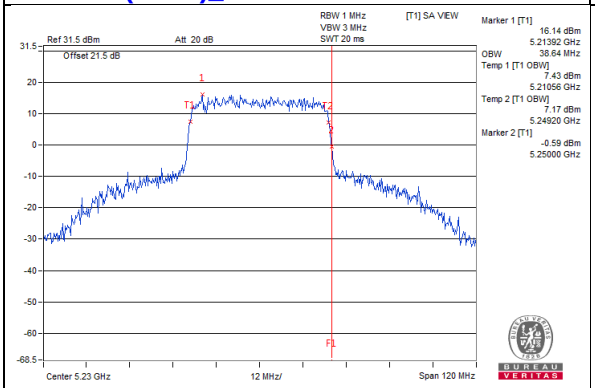


802.11ax (HE20)_Chain 3 / CH48

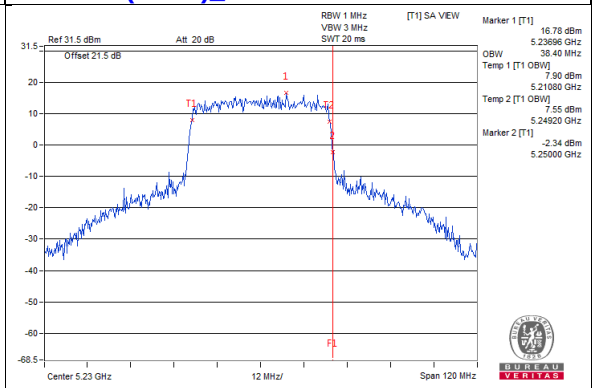


Spectrum Plot for near by DFS band
(DFS is required, if 99% OCP straddle into U-NII-2A band)

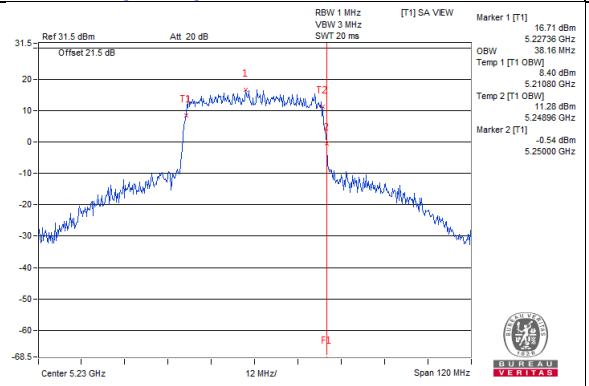
802.11ax (HE40)_Chain 0 / CH46



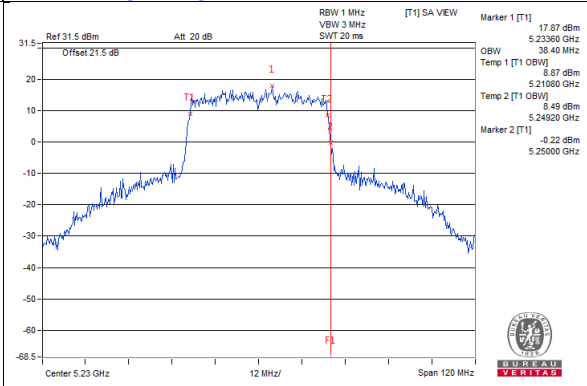
802.11ax (HE40)_Chain 1 / CH46



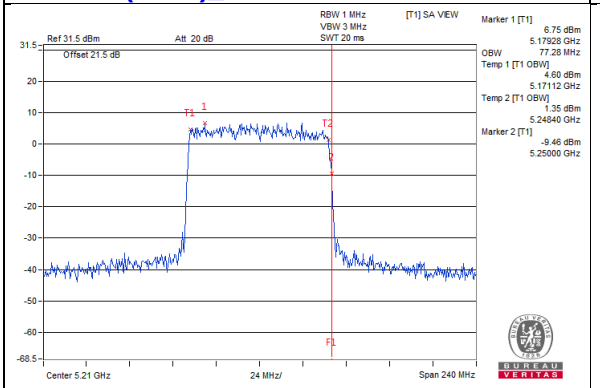
802.11ax (HE40)_Chain 2 / CH46



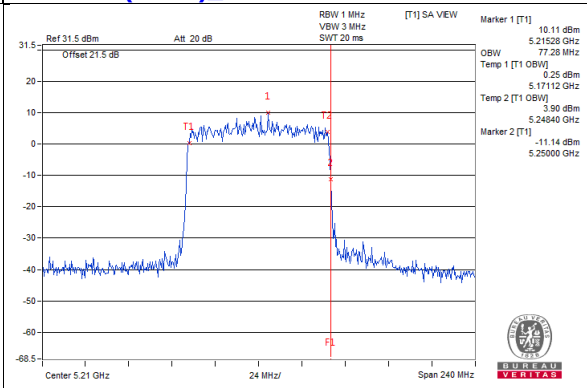
802.11ax (HE40)_Chain 3 / CH46



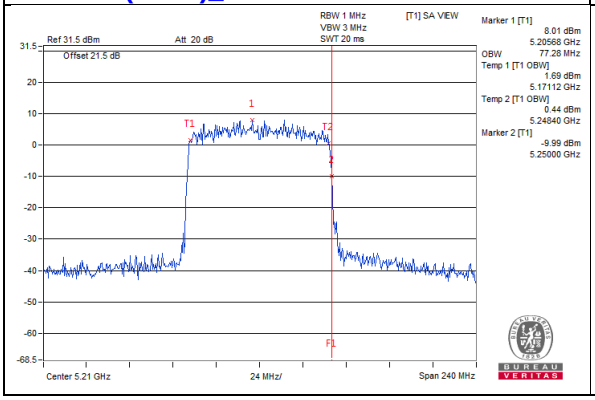
802.11ax (HE80)_Chain 0 / CH42



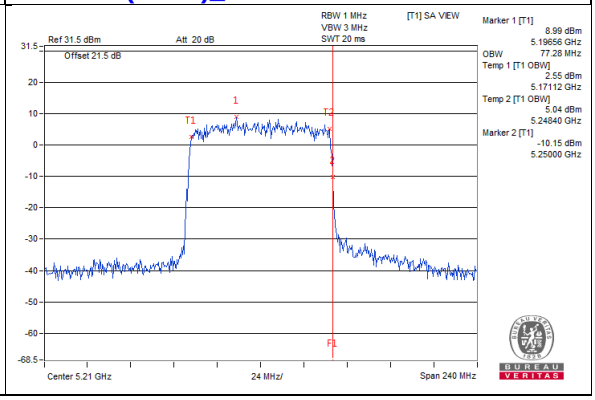
802.11ax (HE80)_Chain 1 / CH42



802.11ax (HE80)_Chain 2 / CH42

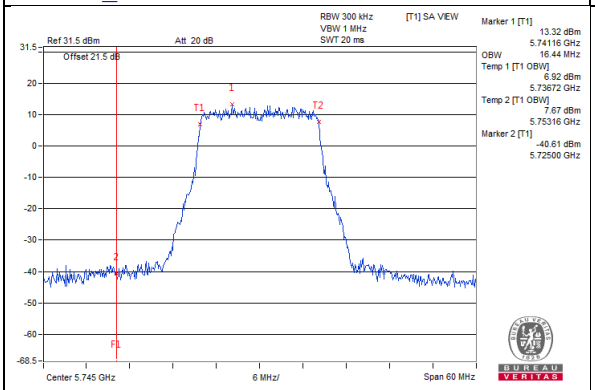


802.11ax (HE80)_Chain 3 / CH42

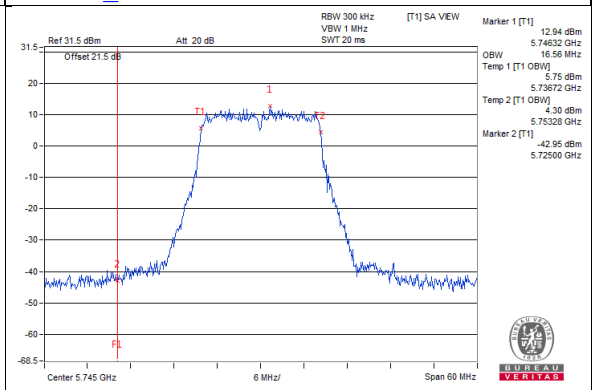


Spectrum Plot for near by DFS band
(DFS is required, if 99% OCP straddle into U-NII-2C band)

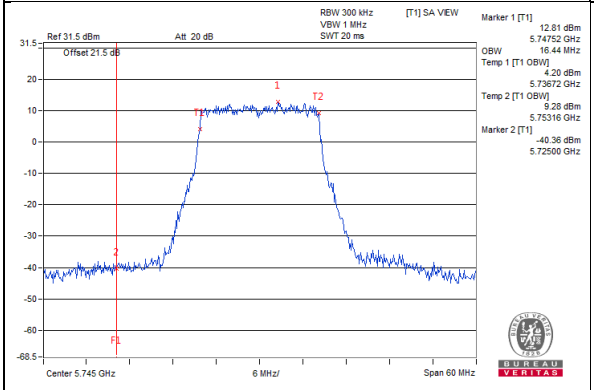
802.11a_Chain 0 / CH149



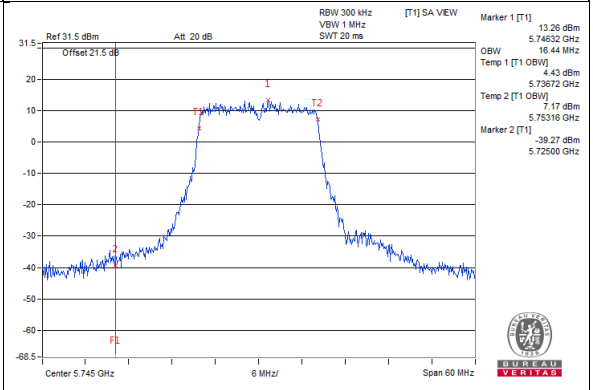
802.11a_Chain 1 / CH149



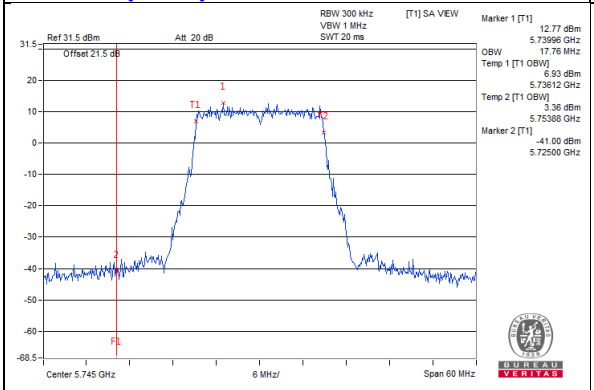
802.11a_Chain 2 / CH149



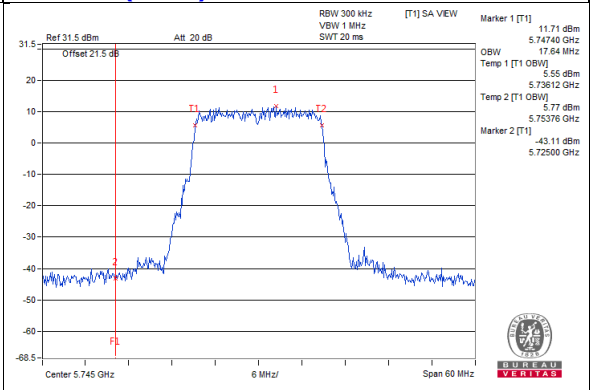
802.11a_Chain 3 / CH149



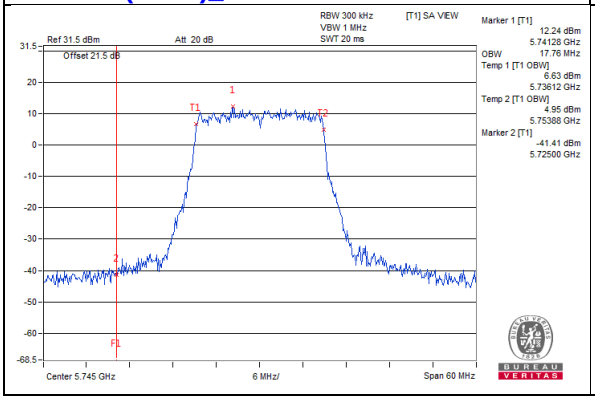
802.11ax (HE20)_Chain 0 / CH149



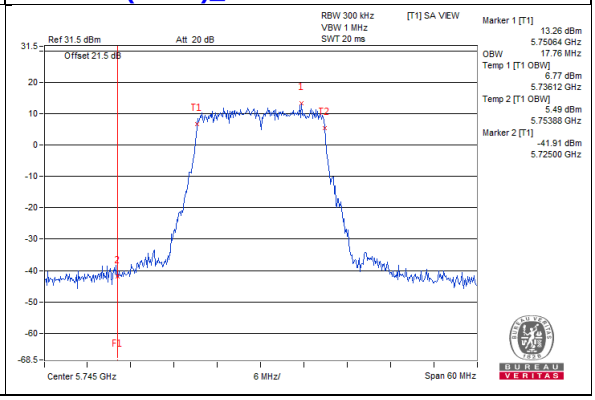
802.11ax (HE20)_Chain 1 / CH149



802.11ax (HE20)_Chain 2 / CH149

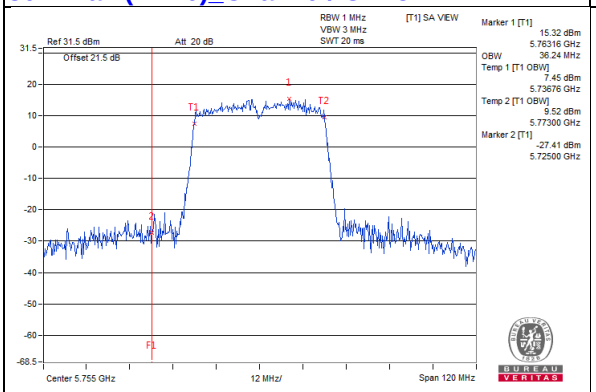


802.11ax (HE20)_Chain 3 / CH149

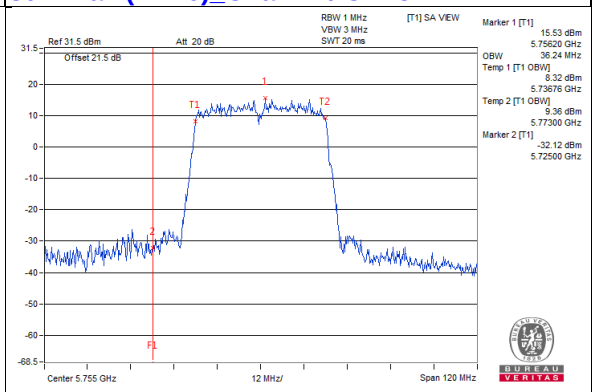


Spectrum Plot for near by DFS band
(DFS is required, if 99% OCP straddle into U-NII-2C band)

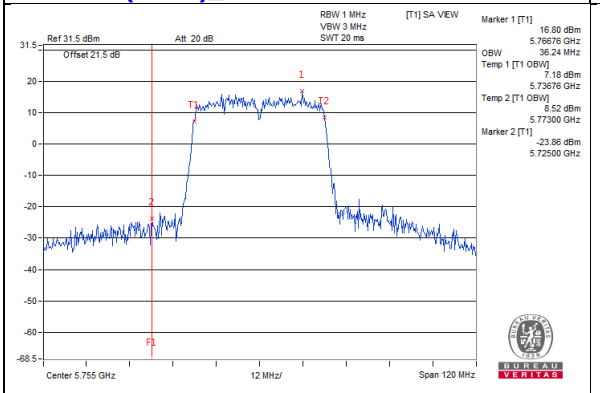
802.11ax (HE40)_Chain 0 / CH151



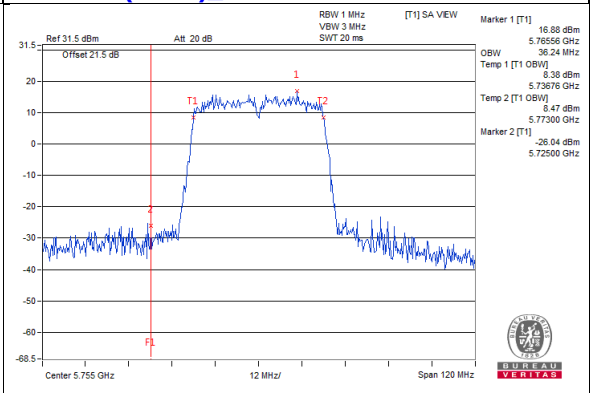
802.11ax (HE40)_Chain 1 / CH151



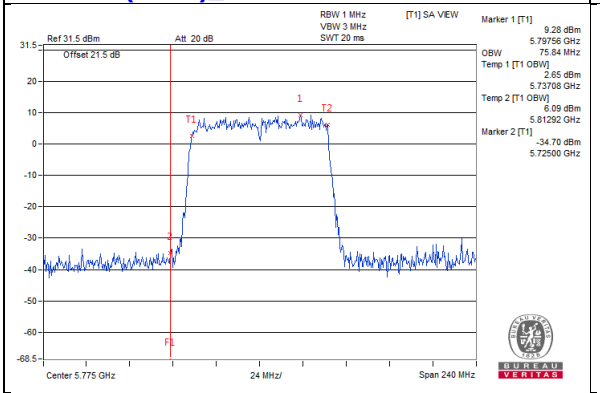
802.11ax (HE40)_Chain 2 / CH151



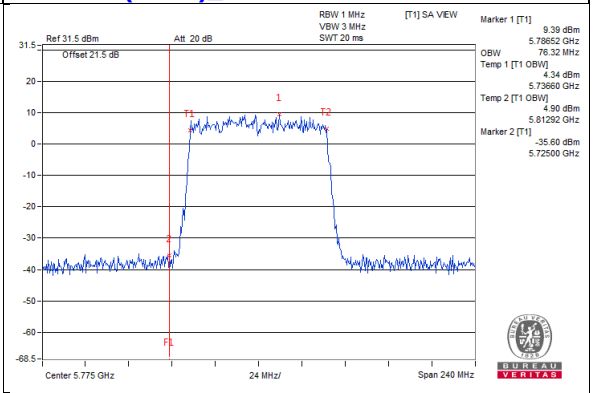
802.11ax (HE40)_Chain 3 / CH151



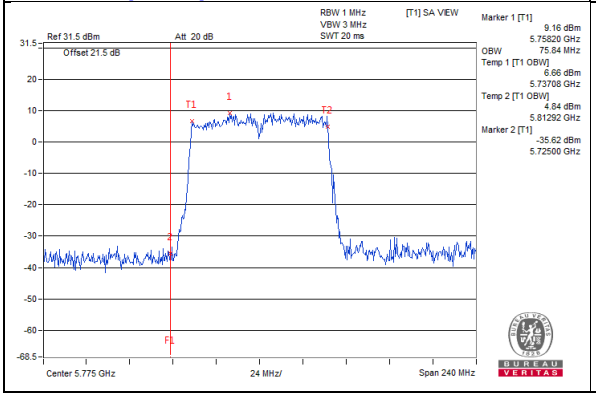
802.11ax (HE80)_Chain 0 / CH155



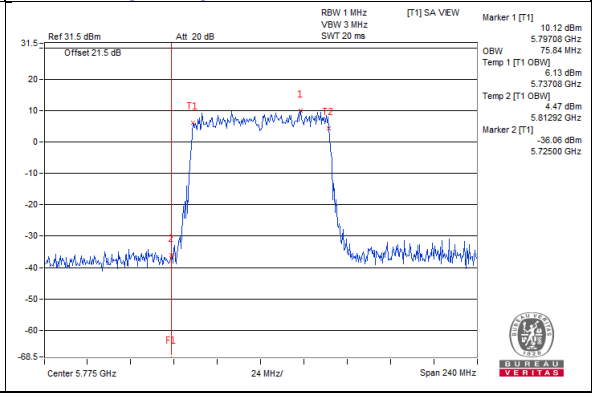
802.11ax (HE80)_Chain 1 / CH155



802.11ax (HE80)_Chain 2 / CH155



802.11ax (HE80)_Chain 3 / CH155

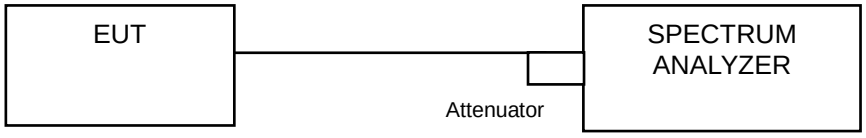


4.5 Peak Power Spectral Density Measurement

4.5.1 Limits of Peak Power Spectral Density Measurement

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

4.5.2 Test Setup



4.5.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.5.4 Test Procedure

For U-NII-1:

Using method SA-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	5.91	5.80	5.72	6.47	0.38	12.39	17.00	Pass
40	5200	7.31	8.82	8.13	8.75	0.38	14.69	17.00	Pass
48	5240	8.70	8.91	9.87	10.17	0.38	15.86	17.00	Pass

Note: 1. Method a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. The directional gain = 5.18dBi < 6dBi, so the power density limit shall not be reduced.
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	5.41	5.32	5.70	6.21	0.18	11.87	17.00	Pass
40	5200	7.02	7.08	8.65	9.19	0.18	14.29	17.00	Pass
48	5240	9.03	9.24	9.02	9.32	0.18	15.36	17.00	Pass

Note: 1. Method a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. The directional gain = 5.18dBi < 6dBi, so the power density limit shall not be reduced.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ax (HE40)

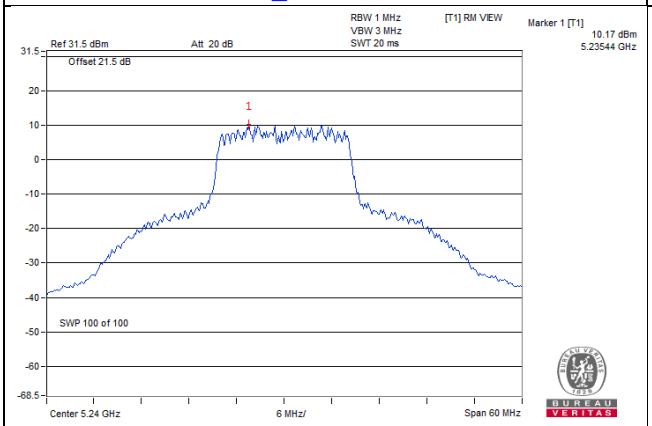
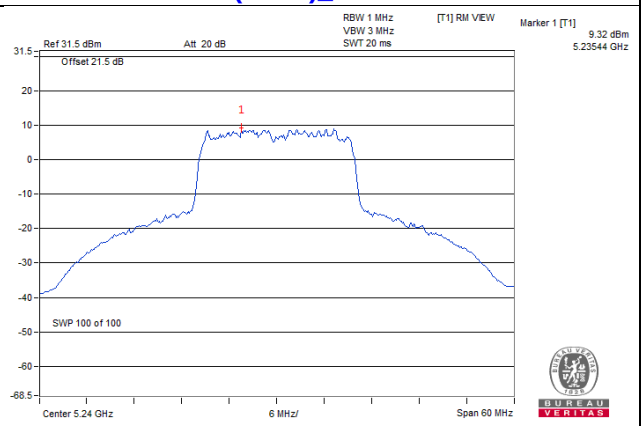
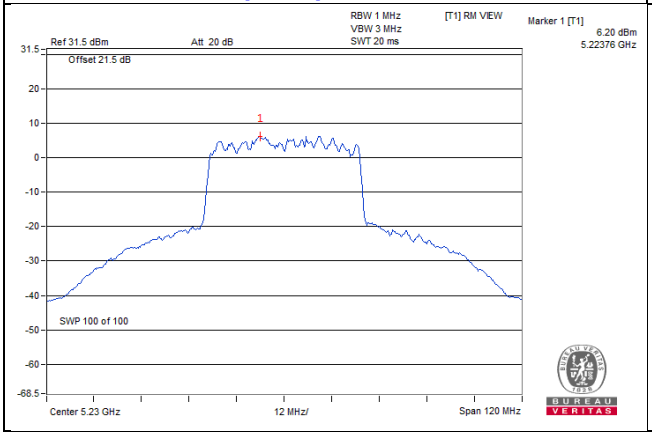
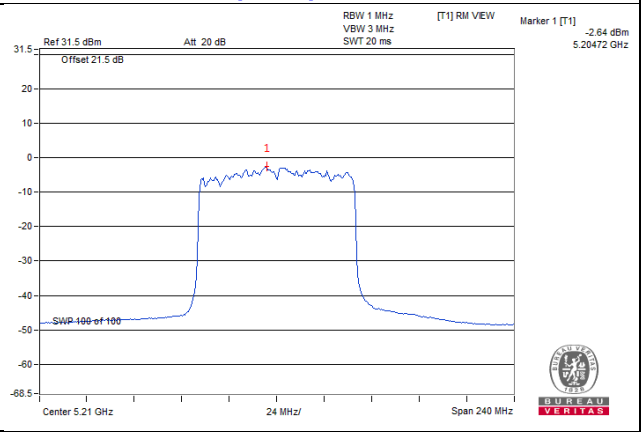
Chan.	Chan. Freq. (MHz)	PSD W/O Duty Factor (dBm/MHz)				Duty Factor (dB)	Total PSD With Duty Factor (dBm/MHz)	Max. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
38	5190	0.58	1.01	0.96	2.55	0.20	7.56	17.00	Pass
46	5230	4.91	4.83	4.86	6.05	0.20	11.41	17.00	Pass

Note: 1. Method a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. The directional gain = 5.18dBi < 6dBi, so the power density limit shall not be reduced.
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	-4.82	-2.65	-3.74	-2.91	0.23	2.80	17.00	Pass

Note: 1. Method a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. The directional gain = 5.18dBi < 6dBi, so the power density limit shall not be reduced.
3. Refer to section 3.3 for duty cycle spectrum plot.

Spectrum Plot of Worst Value	
802.11a_Chain 3 / CH48	**802.11ax (HE20)_Chain 3 / CH48**
	
802.11ax (HE40)_Chain 3 / CH46	**802.11ax (HE80)_Chain 1 / 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	0.58	-0.62	0.30	0.86	0.14	4.4403	6.47	8.69	30.00	Pass
157	5785	-0.41	-1.00	-0.27	-0.23	0.14	3.7093	5.69	7.91	30.00	Pass
165	5825	-0.36	-0.57	-0.32	-0.62	0.14	3.7103	5.69	7.91	30.00	Pass

Note: 1. Method b) Measure and sum spectral maxima across the outputs of KDB 662911 is using for calculating total power density.
2. The directional gain = 5.73dBi < 6dBi, so the power density limit shall not be reduced.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ac (VHT20)

Chan.	Freq. (MHz)	PSD (dBm/300kHz)				Total PSD		Total PSD (dBm/500kHz)	Limit (dBm/ 500kHz)	Pass /Fail
		Chain 0	Chain 1	Chain 2	Chain 3	mW/ 300kHz	dBm/ 300kHz			
149	5745	-0.27	-1.14	-0.67	-0.14	3.5342	5.48	7.70	30.00	Pass
157	5785	-0.90	-1.46	-1.04	-0.59	3.1873	5.03	7.25	30.00	Pass
165	5825	-0.98	-1.22	-1.19	-0.83	3.1395	4.97	7.19	30.00	Pass

Note: 1. Method b) Measure and sum spectral maxima across the outputs of KDB 662911 is using for calculating total power density.
2. The directional gain = 5.73dBi < 6dBi, so the power density limit shall not be reduced.

802.11ac (VHT40)

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	-3.29	-3.48	-2.73	-2.67	0.12	2.0461	3.11	5.33	30.00	Pass
159	5795	-3.35	-3.74	-3.23	-2.69	0.12	1.9505	2.90	5.12	30.00	Pass

Note: 1. Method b) Measure and sum spectral maxima across the outputs of KDB 662911 is using for calculating total power density.
2. The directional gain = 5.73dBi < 6dBi, so the power density limit shall not be reduced.
3. Refer to section 3.3 for duty cycle spectrum plot.

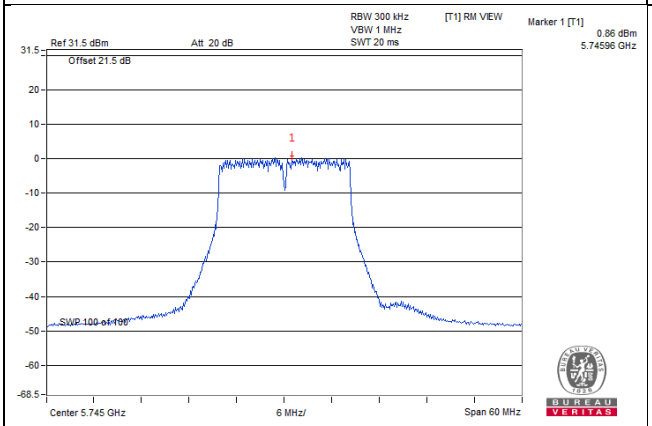
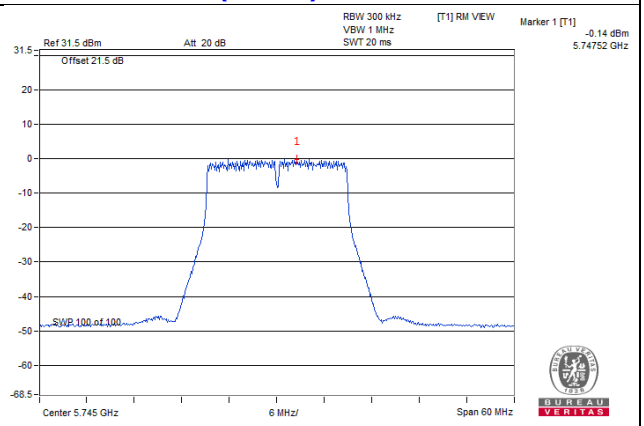
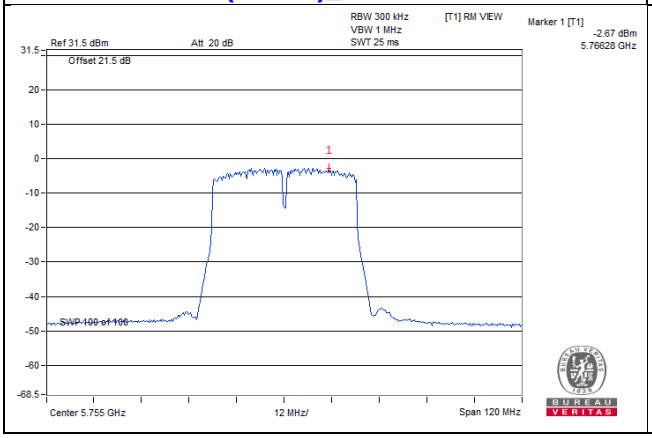
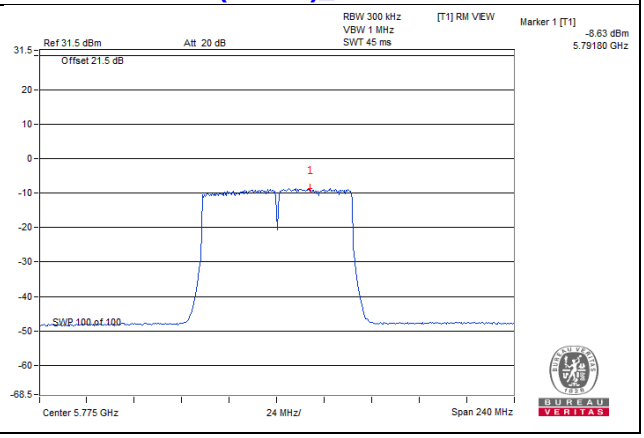
802.11ac (VHT80)

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	-9.25	-9.61	-9.12	-8.63	0.25	0.517	-2.87	-0.65	30.00	Pass

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

2. The directional gain = 5.73dBi < 6dBi, so the power density limit shall not be reduced.

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

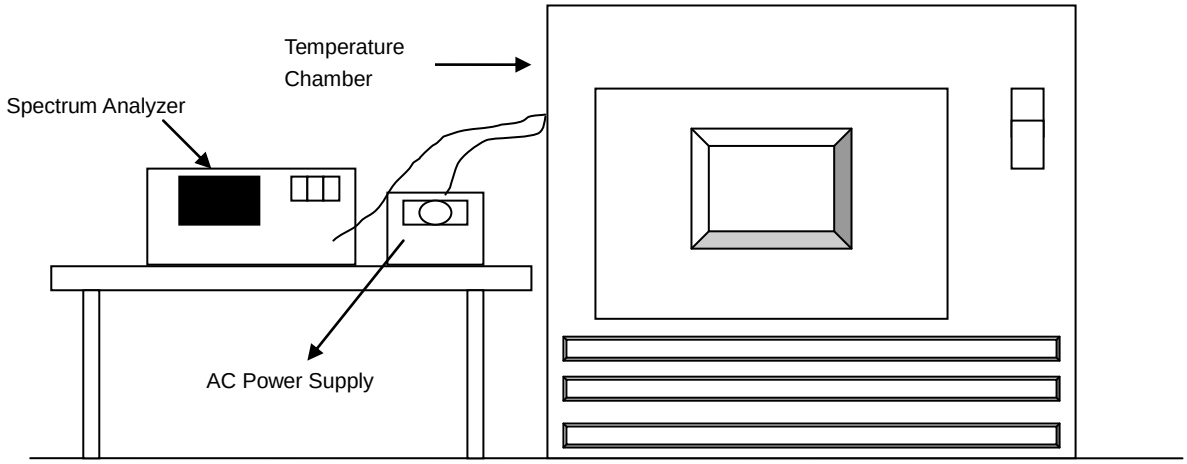
Spectrum Plot of Worst Value	
802.11a_Chain 3 / CH149	**802.11ac (VHT20)_Chain 3 / CH149**
	
802.11ac (VHT40)_Chain 3 / CH151	**802.11ac (VHT80)_Chain 3 / CH155**
	

4.6 Frequency Stability Measurement

4.6.1 Limits of Frequency Stability Measurement

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

4.6.2 Test Setup



4.6.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.6.4 Test Procedure

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

4.6.5 Deviation from Test Standard

No deviation.

4.6.6 EUT Operating Condition

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

4.6.7 Test Results (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
50	120	5180.0141	PASS	5180.0132	PASS	5180.011	PASS	5180.0154	PASS
40	120	5180.0002	PASS	5180.0038	PASS	5180.002	PASS	5180.0009	PASS
30	120	5180.0216	PASS	5180.0182	PASS	5180.0178	PASS	5180.0206	PASS
20	120	5180.0011	PASS	5179.9979	PASS	5179.9992	PASS	5179.9967	PASS
10	120	5179.9935	PASS	5179.9908	PASS	5179.9916	PASS	5179.994	PASS
0	120	5180.0075	PASS	5180.0108	PASS	5180.0067	PASS	5180.0116	PASS
-10	120	5180.0078	PASS	5180.0059	PASS	5180.0084	PASS	5180.0064	PASS
-20	120	5180.0059	PASS	5180.0077	PASS	5180.0077	PASS	5180.0093	PASS
-30	120	5180.0193	PASS	5180.0172	PASS	5180.0214	PASS	5180.0192	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	5180.0013	PASS	5179.9978	PASS	5179.999	PASS	5179.9964	PASS
	120	5180.0011	PASS	5179.9979	PASS	5179.9992	PASS	5179.9967	PASS
	102	5180.0013	PASS	5179.9988	PASS	5179.9991	PASS	5179.9962	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
50	120	5745.0083	PASS	5745.0074	PASS	5745.0098	PASS	5745.0079	PASS
40	120	5744.9884	PASS	5744.9909	PASS	5744.9897	PASS	5744.9911	PASS
30	120	5744.9796	PASS	5744.977	PASS	5744.9782	PASS	5744.9786	PASS
20	120	5745.0149	PASS	5745.014	PASS	5745.0153	PASS	5745.0123	PASS
10	120	5745.028	PASS	5745.0243	PASS	5745.0265	PASS	5745.0273	PASS
0	120	5744.9973	PASS	5744.9986	PASS	5744.9975	PASS	5744.9977	PASS
-10	120	5745.0057	PASS	5745.0021	PASS	5745.0028	PASS	5745.0031	PASS
-20	120	5745.0009	PASS	5744.9976	PASS	5744.9987	PASS	5745.0019	PASS
-30	120	5745.004	PASS	5745.0014	PASS	5745.0001	PASS	5745.0005	PASS

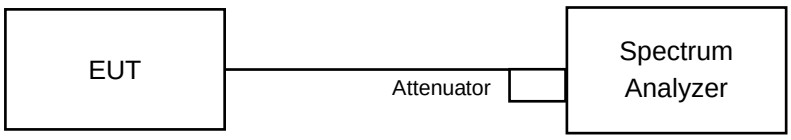
Frequency Stability Versus Voltage									
Operating Frequency: 5745 MHz									
TEMP. (℃)	Power Supply (Vac)	0 Minute		2 Minutes		5 Minutes		10 Minutes	
		Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail
20	138	5745.0157	PASS	5745.0133	PASS	5745.0164	PASS	5745.0112	PASS
	120	5745.0149	PASS	5745.014	PASS	5745.0153	PASS	5745.0123	PASS
	102	5745.0139	PASS	5745.0133	PASS	5745.0151	PASS	5745.0117	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 (Mode 2)

802.11a

Channel	Frequency (MHz)	6dB Bandwidth (MHz)				Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3		
149	5745	16.40	16.36	16.37	16.37	0.5	Pass
157	5785	16.38	16.38	16.38	16.39	0.5	Pass
165	5825	16.36	16.40	16.40	16.36	0.5	Pass

802.11ac (VHT20)

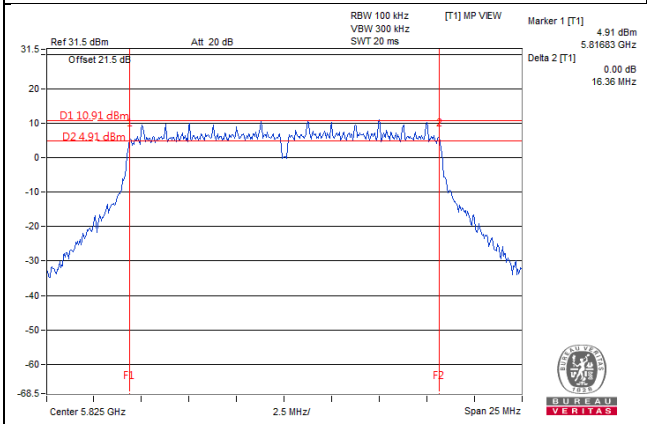
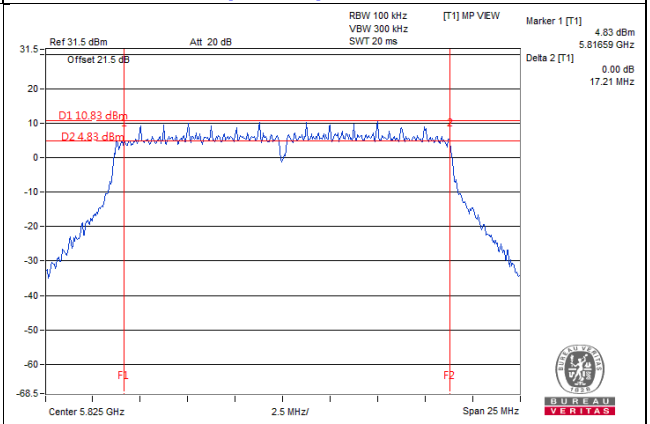
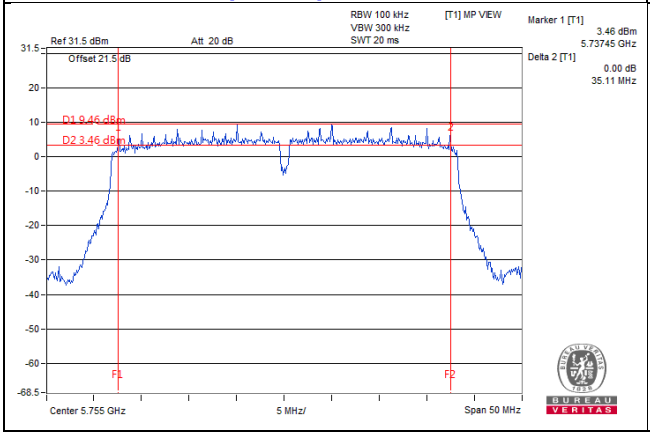
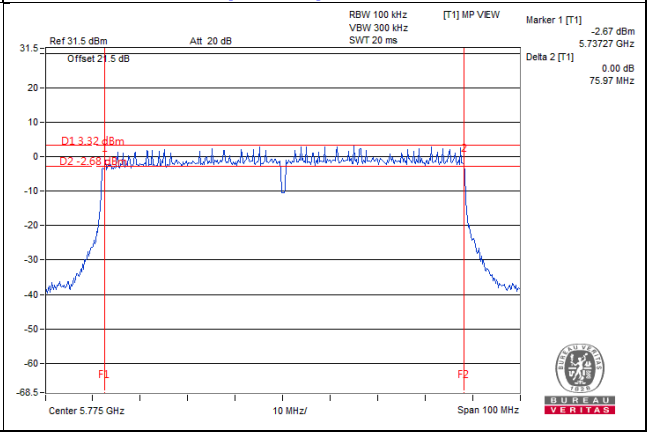
Channel	Frequency (MHz)	6dB Bandwidth (MHz)				Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3		
149	5745	17.62	17.60	17.23	17.61	0.5	Pass
157	5785	17.58	17.62	17.61	17.61	0.5	Pass
165	5825	17.21	17.58	17.38	17.63	0.5	Pass

802.11ac (VHT40)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)				Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3		
151	5755	35.14	35.18	35.16	35.11	0.5	Pass
159	5795	35.24	35.18	35.18	35.28	0.5	Pass

802.11ac (VHT80)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)				Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3		
155	5775	76.06	75.99	76.03	75.97	0.5	Pass

Spectrum Plot of Worst Value	
802.11a_Chain 0 / CH165	**802.11ac (VHT20)_Chain 0 / CH165**
	
802.11ac (VHT40)_Chain 3 / CH151	**802.11ac (VHT80)_Chain 3 / CH155**
	

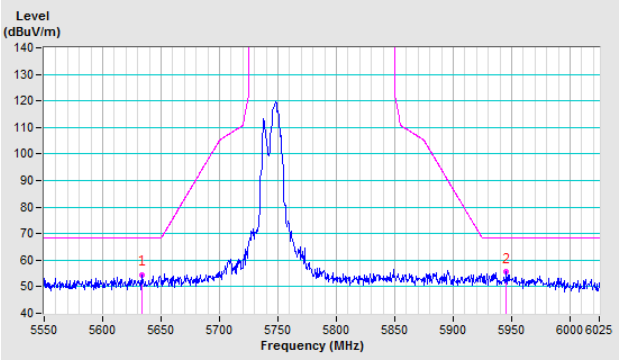
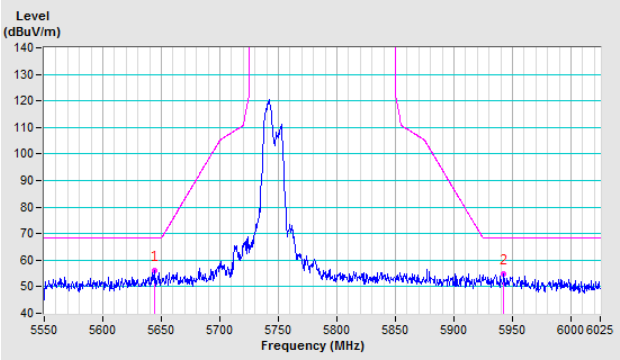
5 Pictures of Test Arrangements

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

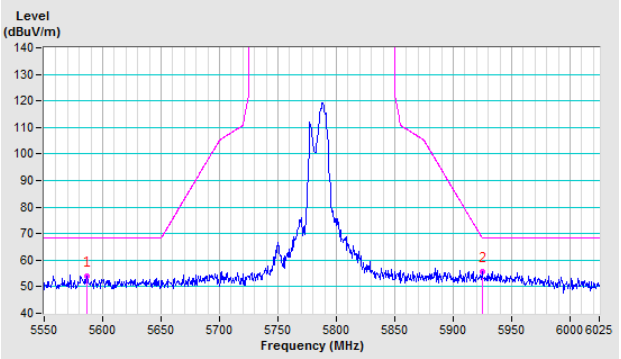
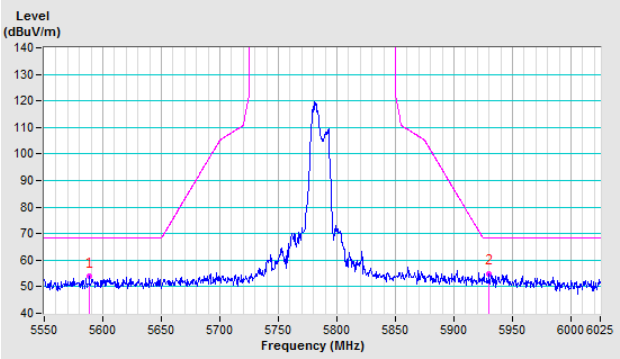
Annex A- Radiated Out of Band Emission (OOBE) Measurement (For U-NII-3 band)

802.11a

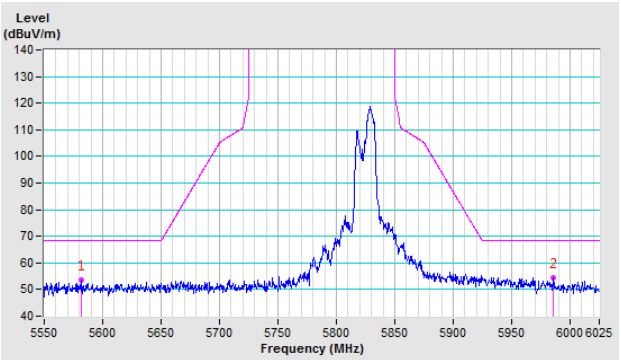
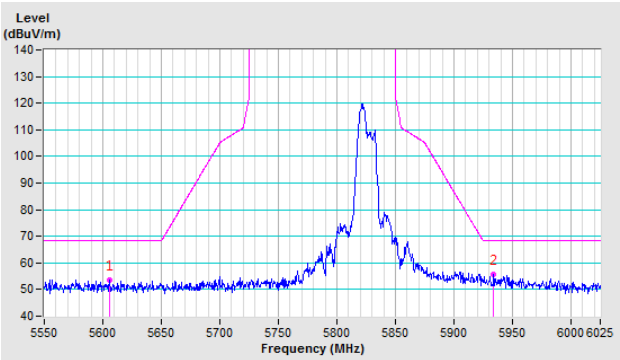
CH 149 5745 MHz

Horizontal	Vertical
	

CH 157 5785 MHz

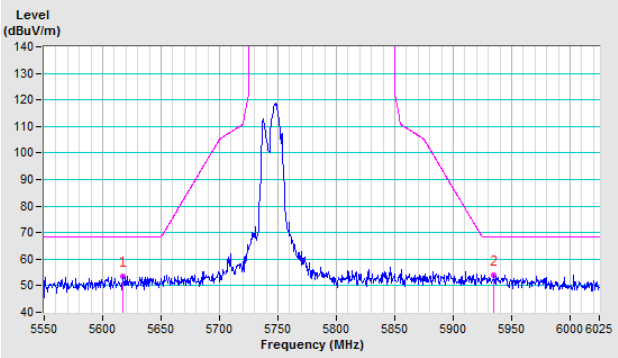
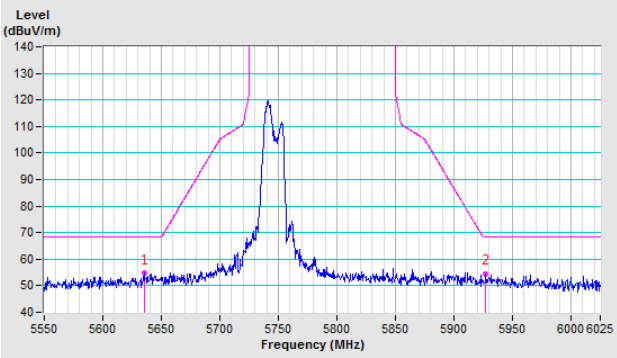
Horizontal	Vertical
	

CH 165 5825 MHz

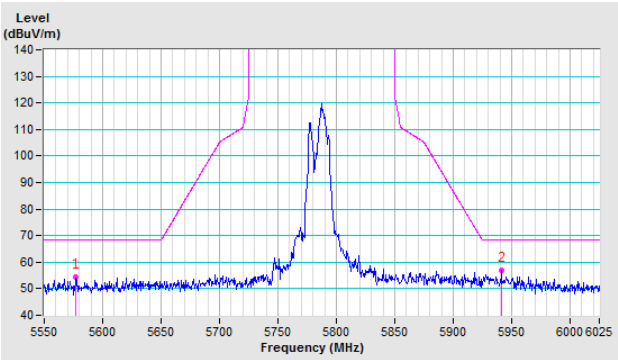
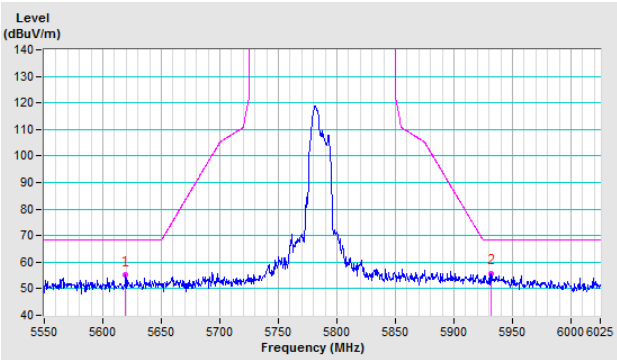
Horizontal	Vertical
	

802.11ac (VHT20)

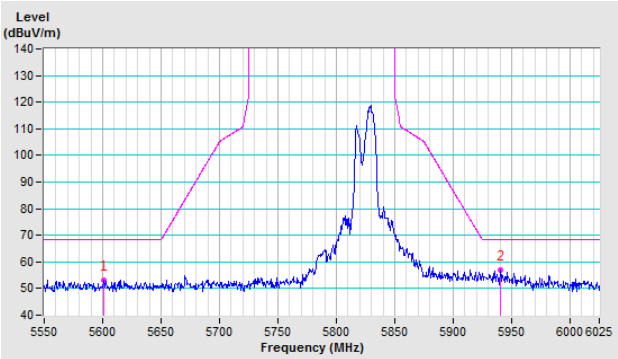
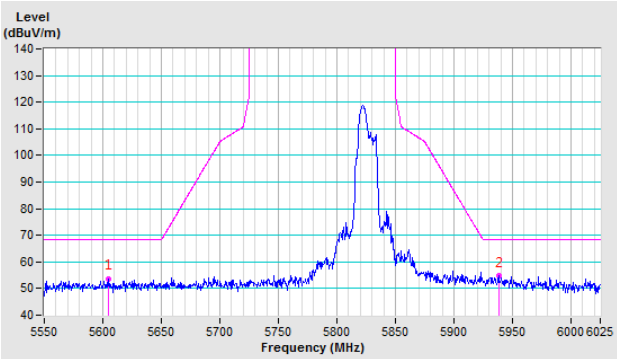
CH 149 5745 MHz

Horizontal	Vertical
	

CH 157 5785 MHz

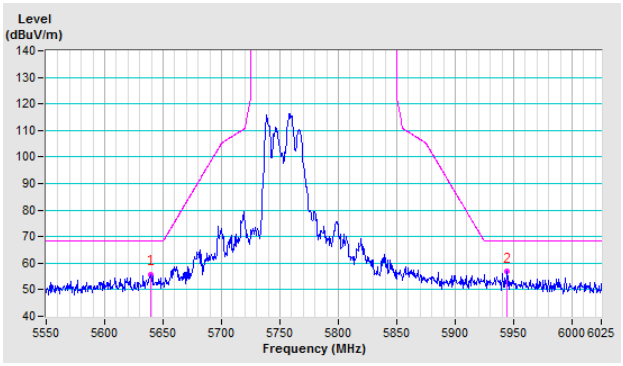
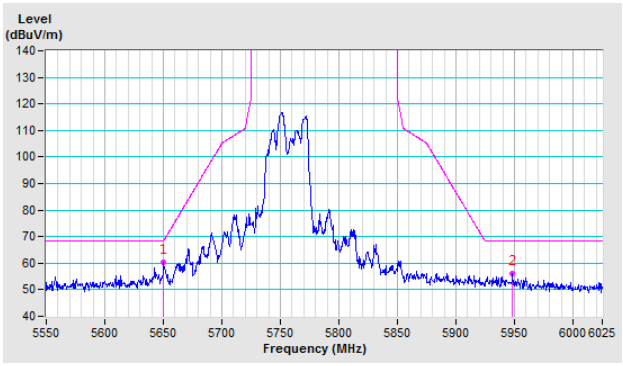
Horizontal	Vertical
	

CH 165 5825 MHz

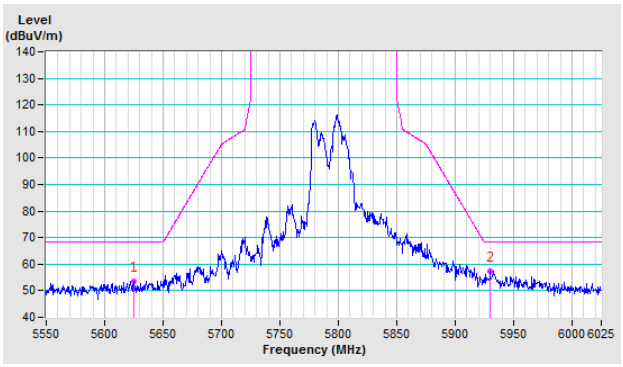
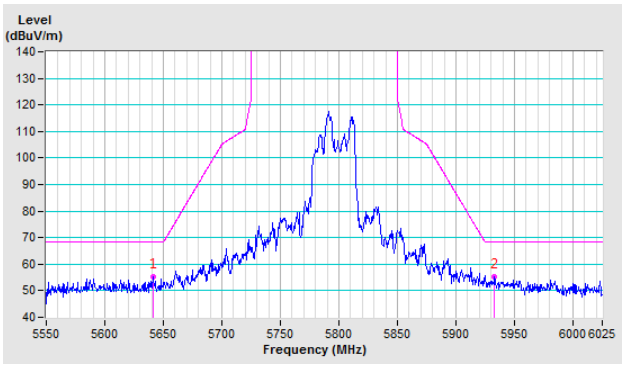
Horizontal	Vertical
	

802.11ac (VHT40)

CH 151 5755 MHz

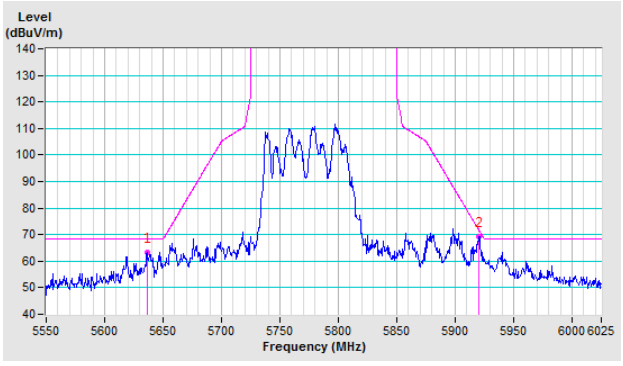
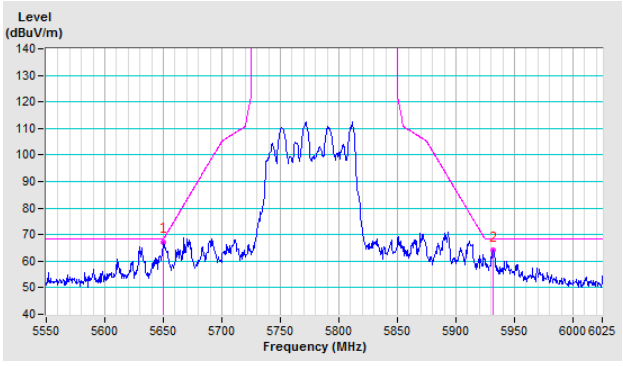
Horizontal	Vertical
	

CH 159 5795 MHz

Horizontal	Vertical
	

802.11ac (VHT80)

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.

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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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