FCC Test Report

Report No.:	RF181001E06-1
FCC ID:	2AHKM-XM2
Test Model:	XM2
Received Date:	Oct. 01, 2018
Test Date:	Nov. 01 to 06, 2018
Issued Date:	Nov. 16, 2018
Applicant:	Hitron Technologies Inc.
Address:	No. 1-8,Li-Hsin 1st Rd.,Hsinchu Science Park, HSINCHU,30078,Taiwan
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

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Release Control Record

Issue No.	Description	Date Issued
RF181001E06-1	Original release.	Nov. 16, 2018

1 Certificate of Conformity

Product:	WIRELESS DOCSIS 3.1 METER
Brand:	Hitron
Test Model:	XM2
Sample Status:	ENGINEERING SAMPLE
Applicant:	Hitron Technologies Inc.
Test Date:	Nov. 01 to 06, 2018
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 : Mary Ko , **Date:** Nov. 16, 2018

Mary Ko / Specialist

Approved by : , **Date:** Nov. 16, 2018

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 -16.76dB at 0.17734MHz
15.407(b) (1/2/3/4(i/ii)/6)	Radiated Emissions & Band Edge Measurement*	PASS	Meet the requirement of limit. Minimum passing margin is -0.1dB at 5150.00MHz, 11490.00MHz, 11570.00MHz, 11590.00MHz, 11650.00MHz.
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.

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	1.84 dB
Radiated Emissions up to 1 GHz	30MHz ~ 1GHz	5.53 dB
Radiated Emissions above 1 GHz	1GHz ~ 6GHz	5.08 dB
	6GHz ~ 18GHz	4.98 dB
	18GHz ~ 40GHz	5.19 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	WIRELESS DOCSIS 3.1 METER
Brand	Hitron
Test Model	XM2
Status of EUT	ENGINEERING SAMPLE
Power Supply Rating	DC 10.92V from battery or DC 12 from power adapter
Modulation Type	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM 256QAM for OFDM in 11ac mode only
Modulation Technology	DSSS,OFDM
Transfer Rate	802.11b: up to 11Mbps 802.11a/g: up to 54Mbps 802.11n: up to 300Mbps 802.11ac: up to 866.7Mbps
Operating Frequency	**2.4GHz:** 2.412 ~ 2.462GHz **5GHz:** 5.18GHz ~ 5.24GHz, 5.745GHz ~ 5.825GHz
Number of Channel	**2.4GHz:** 802.11b, 802.11g, 802.11n (HT20): 11 802.11n (HT40): 7 **5GHz:** 802.11a, 802.11n (HT20), 802.11ac (VHT20): 9 802.11n (HT40), 802.11ac (VHT40): 4 802.11ac (VHT80): 2
Output Power	**2.4GHz:** 675.461mW **5.18GHz ~ 5.24GHz:** 277.341mW **5.745GHz ~ 5.825GHz:** 237.156mW
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	Battery x 1 Adapter x 1
Data Cable Supplied	Power cord x 1 (1.7m, unshielded)

Note:

1. Simultaneously transmission condition.

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

2. The EUT could be supplied with a power adapter or battery as the following table:

Adapter			
No.	Brand	Model	Specification
1	AOEM	A0605TD-120050	Input: 100-240V, 50-60Hz, 1.8A Output: 12V, 5.0A (Unshielded 1.5m with one core)
2	APD	DA-60Y12	Input: 100-240V, 50-60Hz, 1.5A Max Output: 12V, 5.0A (Unshielded 1.5m)
Battery			
Brand		Model	Rating
Getac Technology (Kunshan) Co.,Ltd.		HC33 (P/N:390100000917)	DC 10.92 V 8850mAh 96.642Wh

Note:
1. From the above conditions, the conducted emissions worse case was found in **Adapter No. 2**. Therefore only the test data of the mode was recorded in this report.
2. From the above conditions, the radiated emissions worse case was found in **Adapter No. 1**. 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:

Antenna No.	Chain No.	Brand	Model	Antenna Net Gain(dBi)	Frequency range	Antenna Type	Connecter Type	Cable Length (mm)
1	Chain 1	Anjie	AJDF2J-B0001	3.82	2.4~2.4835GHz	PCB	i-pex(MHF)	250
				5.1	5.15~5.85GHz	PCB	i-pex(MHF)	
2	Chain 0	Anjie	AJDF2J-C0001	6.36	2.4~2.4835GHz	PCB	i-pex(MHF)	90
				6.94	5.15~5.85GHz	PCB	i-pex(MHF)	

4. The EUT incorporates a MIMO function:

2.4GHz			
MODULATION MODE	**DATA RATE (MCS)**	**TX & RX CONFIGURATION**	
802.11b	1 ~ 11Mbps	2TX	2RX
802.11g	6 ~ 54Mbps	2TX	2RX
802.11n (HT20)	MCS 0~7	2TX	2RX
	MCS 8~15	2TX	2RX
802.11n (HT40)	MCS 0~7	2TX	2RX
	MCS 8~15	2TX	2RX
5GHz			
MODULATION MODE	**DATA RATE (MCS)**	**TX & RX CONFIGURATION**	
802.11a	6 ~ 54Mbps	2TX	2RX
802.11n (HT20)	MCS 0~7	2TX	2RX
	MCS 8~15	2TX	2RX
802.11n (HT40)	MCS 0~7	2TX	2RX
	MCS 8~15	2TX	2RX
802.11ac (VHT20)	MCS0~8 Nss=1	2TX	2RX
	MCS0~8 Nss=2	2TX	2RX
802.11ac (VHT40)	MCS0~9 Nss=1	2TX	2RX
	MCS0~9 Nss=2	2TX	2RX
802.11ac (VHT80)	MCS0~9 Nss=1	2TX	2RX
	MCS0~9 Nss=2	2TX	2RX

5. The above EUT information is declared by manufacturer and for more detailed features description, please refer 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):

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

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

Channel	Frequency	Channel	Frequency
38	5190MHz	46	5230MHz

1 channel is provided for 802.11ac (VHT80):

Channel	Frequency
42	5210MHz

FOR 5745 ~ 5825MHz:

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

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

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

Channel	Frequency	Channel	Frequency
151	5755MHz	159	5795MHz

1 channel is provided for 802.11ac (VHT80):

Channel	Frequency
155	5775MHz

3.2.1 Test Mode Applicability and Tested Channel Detail

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

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

NOTE:
1. The EUT had been pre-tested on the positioned of each 3 axis. The worst case was found when positioned on **Y-plane**.

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.

Mode	FREQ. Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
802.11a	5180-5240	36 to 48	36, 40, 48	OFDM	BPSK	6
802.11ac (VHT20)		36 to 48	36, 40, 48	OFDM	BPSK	6.5
802.11ac (VHT40)		38 to 46	38, 46	OFDM	BPSK	13.5
802.11ac (VHT80)		42	42	OFDM	BPSK	29.3
802.11a	5745-5825	149 to 165	149, 157, 165	OFDM	BPSK	6
802.11ac (VHT20)		149 to 165	149, 157, 165	OFDM	BPSK	6.5
802.11ac (VHT40)		151 to 159	151, 159	OFDM	BPSK	13.5
802.11ac (VHT80)		155	155	OFDM	BPSK	29.3

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.

Mode	FREQ. Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
802.11ac (VHT20)	5180-5240 5745-5825	36 to 48 149 to 165	40	OFDM	BPSK	6.5

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.

Mode	FREQ. Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
802.11ac (VHT20)	5180-5240 5745-5825	36 to 48 149 to 165	40	OFDM	BPSK	6.5

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.

Mode	FREQ. Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
802.11a	5180-5240	36 to 48	36, 40, 48	OFDM	BPSK	6
802.11ac (VHT20)		36 to 48	36, 40, 48	OFDM	BPSK	6.5
802.11ac (VHT40)		38 to 46	38, 46	OFDM	BPSK	13.5
802.11ac (VHT80)		42	42	OFDM	BPSK	29.3
802.11a	5745-5825	149 to 165	149, 157, 165	OFDM	BPSK	6
802.11ac (VHT20)		149 to 165	149, 157, 165	OFDM	BPSK	6.5
802.11ac (VHT40)		151 to 159	151, 159	OFDM	BPSK	13.5
802.11ac (VHT80)		155	155	OFDM	BPSK	29.3

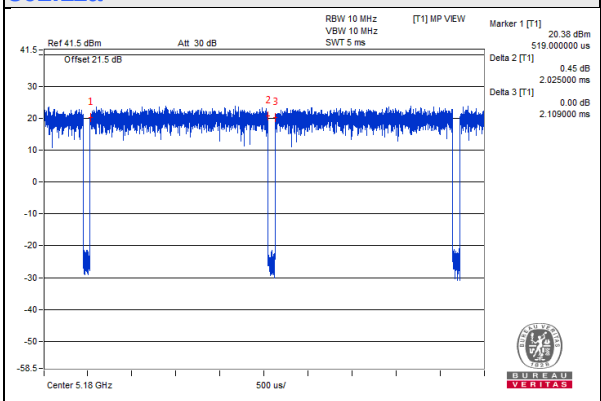
Test Condition:

Applicable To	Environmental Conditions	Input Power	Tested By
RE≥1G	23deg. C, 68%RH	120Vac, 60Hz	Frank Chuang
RE<1G	22deg. C, 67%RH	120Vac, 60Hz	Frank Chuang
PLC	24deg. C, 75%RH	120Vac, 60Hz	Andy Ho
APCM	25deg. C, 60%RH	120Vac, 60Hz	Jyunchun Lin

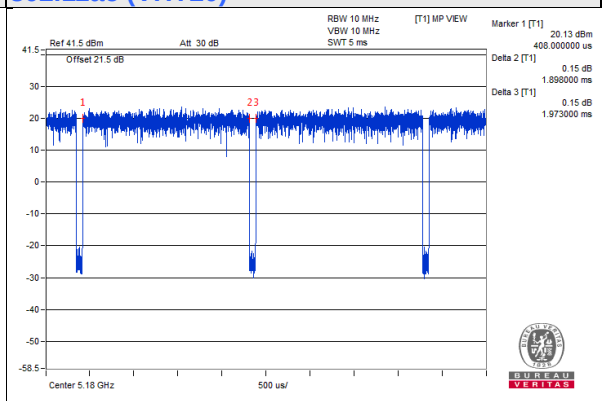
3.3 Duty Cycle of Test Signal

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.
802.11a: Duty cycle = 2.025/2.109 = 0.96, Duty factor = 10 * log(1/0.96) = 0.18
802.11ac (VHT20): Duty cycle = 1.898/1.973 = 0.962, Duty factor = 10 * log(1/0.962) = 0.17
802.11ac (VHT40): Duty cycle = 0.934/1.029 = 0.908, Duty factor = 10 * log(1/0.908) = 0.42
802.11ac (VHT80): Duty cycle = 0.455/0.525 = 0.867, Duty factor = 10 * log(1/0.867) = 0.62

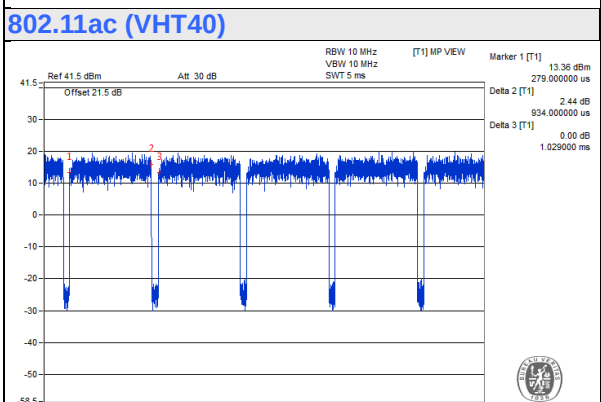
802.11a



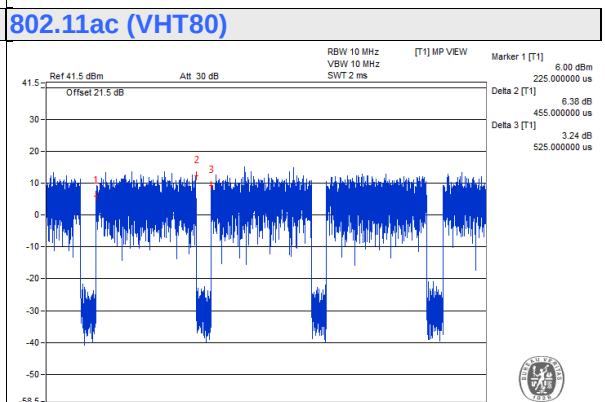
802.11ac (VHT20)



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.	USB Disk	Transcend	NA	NA	NA	Provided by Lab
B.	Laptop	DELL	E6420	B92T3R1	FCC DoC	Provided by Lab

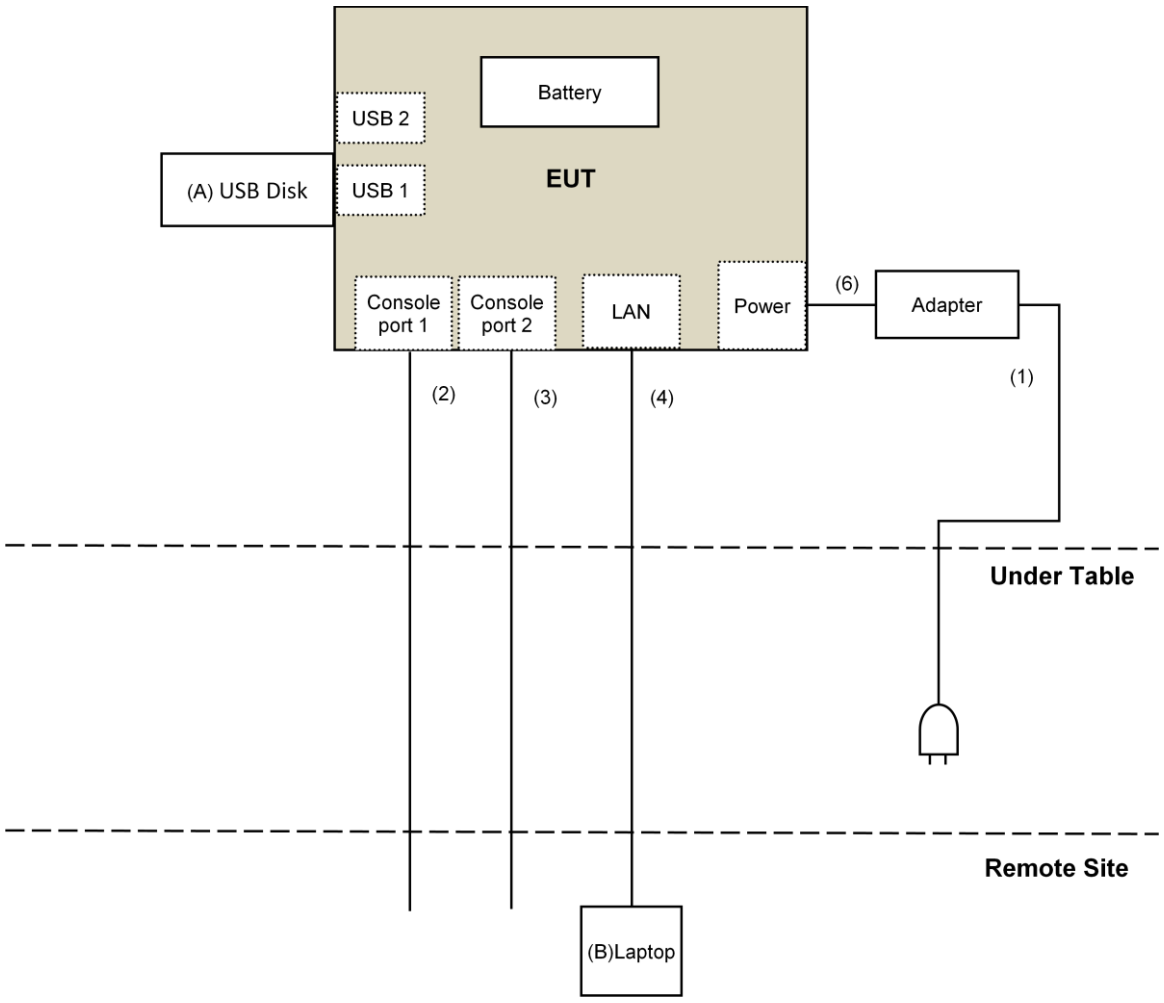
Note:

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

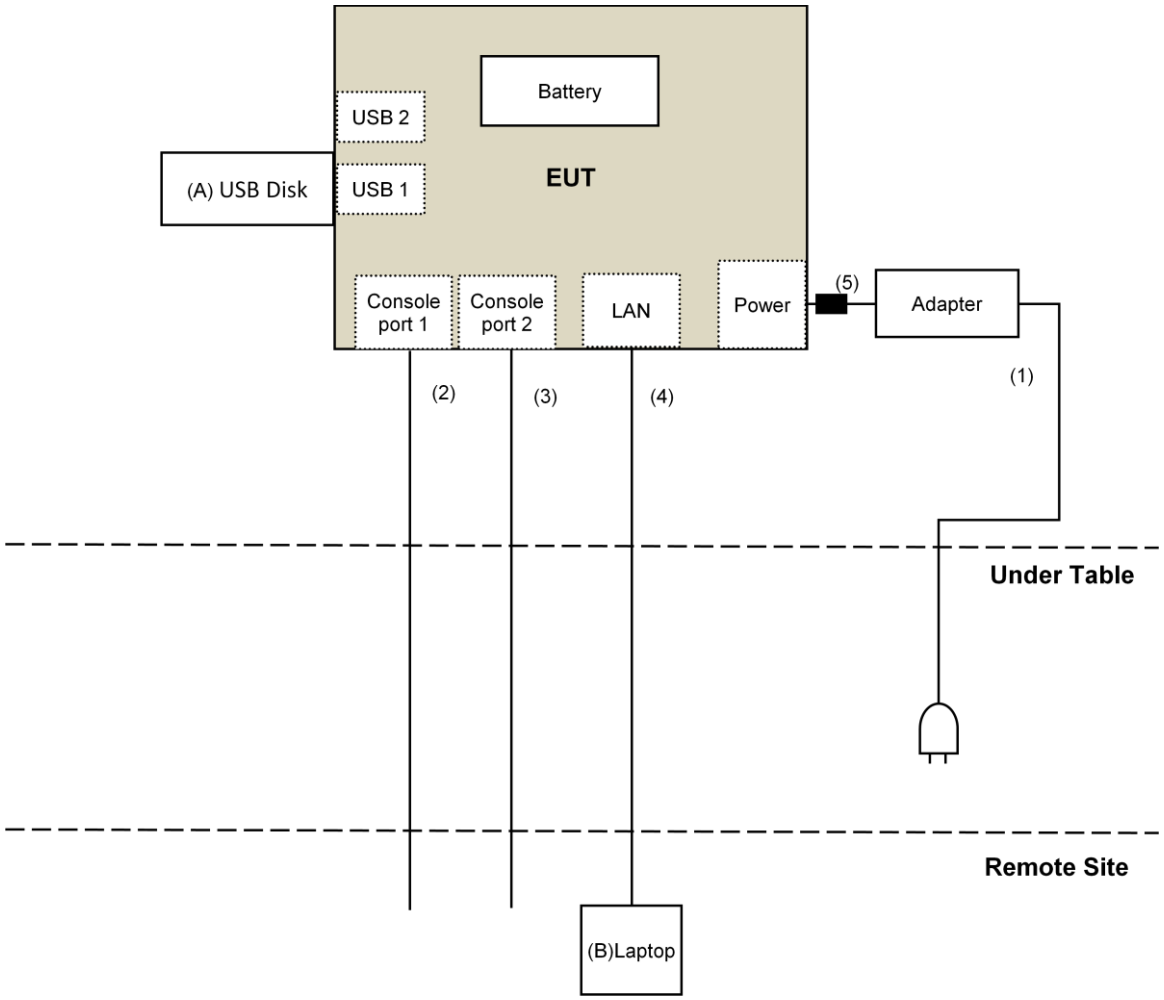
ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	AC Cable	1	1.7	No	0	Supplied by client
2.	Console Cable	1	10	No	0	Provided by Lab
3.	Console Cable	1	10	No	0	Provided by Lab
4.	RJ-45 Cable	1	10	No	0	Provided by Lab
5.	DC Cable	1	1.5	No	1	Supplied by client
6.	DC Cable	1	1.5	No	0	Supplied by client

3.4.1 Configuration of System under Test

For conducted emission test:



For radiated emission 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="4">*1 beyond 75 MHz or more above of the band edge.
*2 below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above.
*3 below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above.
*4 from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.</td></tr>
</table>

Note:

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

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

4.1.2 Test Instruments

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver Agilent	N9038A	MY50010156	July 12, 2018	July 11, 2019
Pre-Amplifier EMCI	EMC001340	980142	Feb. 09, 2018	Feb. 08, 2019
Loop Antenna(*) Electro-Metrics	EM-6879	264	Dec. 16, 2016	Dec. 15, 2018
RF Cable	NA	LOOPCAB-001	Jan. 15, 2018	Jan. 14, 2019
RF Cable	NA	LOOPCAB-002	Jan. 15, 2018	Jan. 14, 2019
Pre-Amplifier Mini-Circuits	ZFL-1000VH2B	AMP-ZFL-05	May 05, 2018	May 04, 2019
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-361	Nov. 29, 2017	Nov. 28, 2018
RF Cable	8D	966-3-1	Mar. 20, 2018	Mar. 19, 2019
RF Cable	8D	966-3-2	Mar. 20, 2018	Mar. 19, 2019
RF Cable	8D	966-3-3	Mar. 20, 2018	Mar. 19, 2019
Fixed attenuator Mini-Circuits	UNAT-5+	PAD-3m-3-01	Sep. 27, 2018	Sep. 26, 2019
Horn_Antenna SCHWARZBECK	BBHA9120-D	9120D-406	Dec. 12, 2017	Dec. 11, 2018
Pre-Amplifier EMCI	EMC12630SE	980384	Jan. 29, 2018	Jan. 28, 2019
RF Cable	EMC104-SM-SM-1200	160922	Jan. 29, 2018	Jan. 28, 2019
RF Cable	EMC104-SM-SM-2000	150317	Jan. 29, 2018	Jan. 28, 2019
RF Cable	EMC104-SM-SM-5000	150322	Jan. 29, 2018	Jan. 28, 2019
Spectrum Analyzer Keysight	N9030A	MY54490679	July 23, 2018	July 22, 2019
Pre-Amplifier EMCI	EMC184045SE	980386	Jan. 29, 2018	Jan. 28, 2019
Horn_Antenna SCHWARZBECK	BBHA 9170	BBHA9170608	Dec. 14, 2017	Dec. 13, 2018
RF Cable	EMC102-KM-KM-1200	160924	Jan. 29, 2018	Jan. 28, 2019
Software	ADT_Radiated_V8.7.08	NA	NA	NA
Antenna Tower & Turn Table Max-Full	MF-7802	MF780208406	NA	NA
Boresight Antenna Fixture	FBA-01	FBA-SIP01	NA	NA
Spectrum Analyzer R&S	FSV40	100964	June 20, 2018	June 19, 2019
Power meter Anritsu	ML2495A	1014008	May 09, 2018	May 08, 2019
Power sensor Anritsu	MA2411B	0917122	May 09, 2018	May 08, 2019
AC Power Source Extech Electronics	6205	1440452	NA	NA
Temperature & Humidity Chamber Giant Force	GTH-150-40-SP-AR	MAA0812-008	Jan. 10, 2018	Jan. 09, 2019
True RMS Clamp Meter FLUKE	325	31130711WS	May 22, 2018	May 21, 2019

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 calibration interval of the above test instruments is 24 months and the calibrations are traceable to NML/ROC and NIST/USA.
3. The test was performed in 966 Chamber No. 3.
4. The CANADA Site Registration No. is 20331-1
5. Loop antenna was used for all emissions below 30 MHz.
6. Tested Date: Nov. 01 to 06, 2018

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:

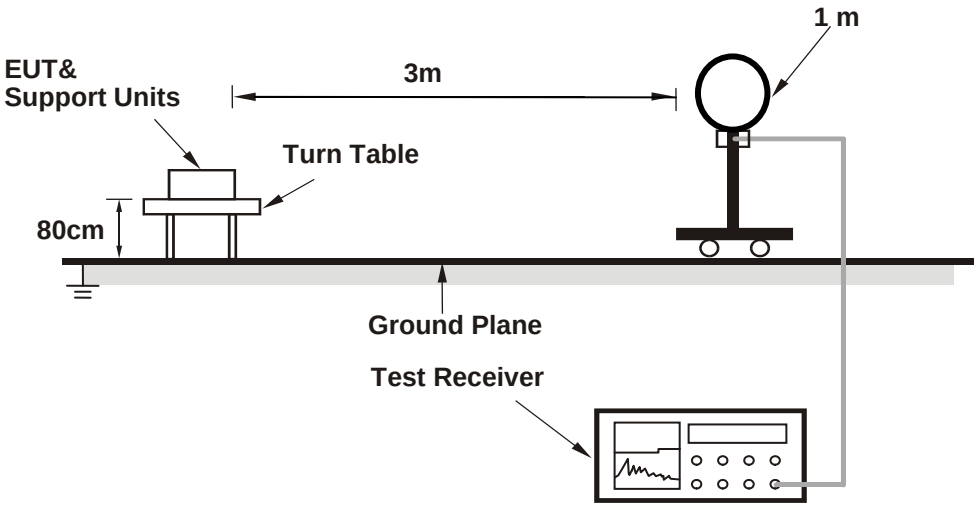
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.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

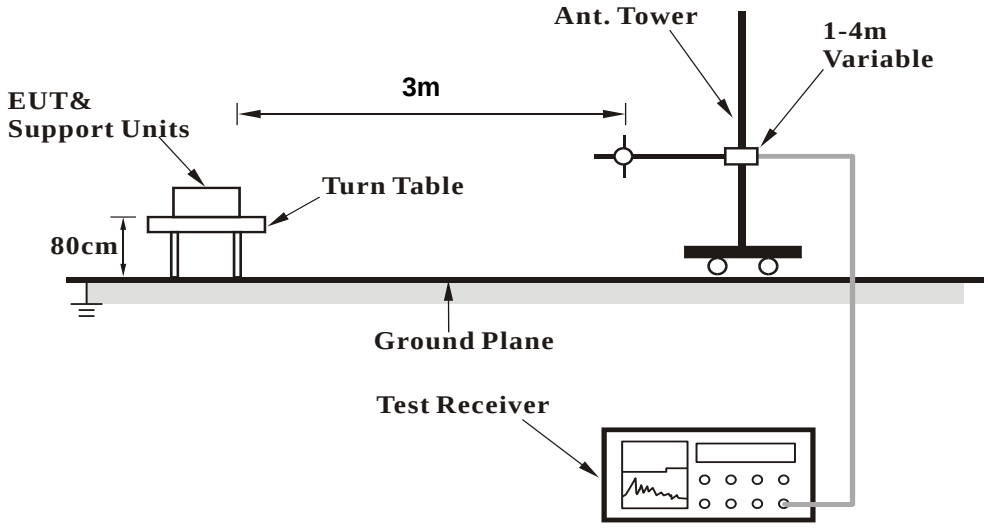
No deviation.

4.1.5 Test Setup

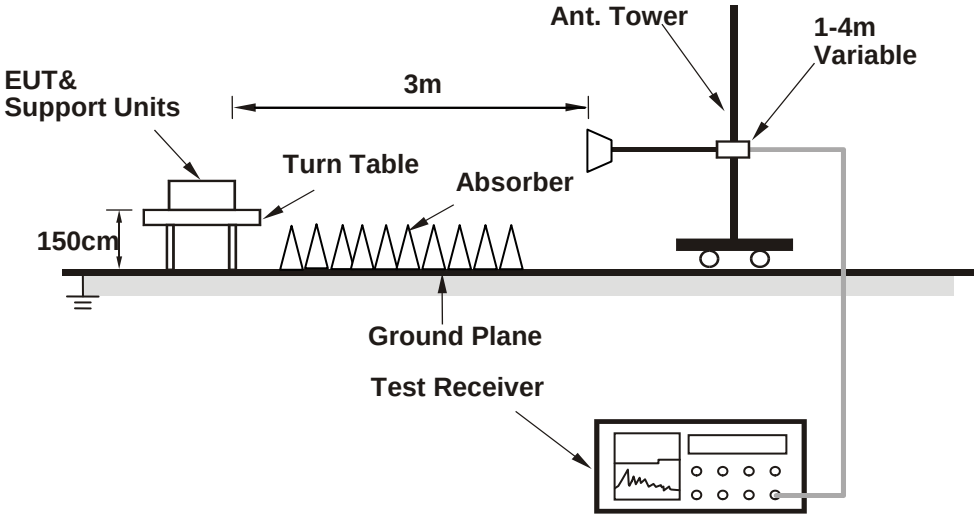
For Radiated emission below 30MHz



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 (QDART-Connectivity1000036.exe) has been activated to set the EUT on specific status.

4.1.7 Test Results

Above 1GHz Data:

802.11a

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	**FREQ. (MHz)**	**EMISSION LEVEL (dBuV/m)**	**LIMIT (dBuV/m)**	**MARGIN (dB)**	**ANTENNA HEIGHT (m)**	**TABLE ANGLE (Degree)**	**RAW VALUE (dBuV)**	**CORRECTION FACTOR (dB/m)**
1	5150.00	61.3 PK	74.0	-12.7	2.72 H	352	58.7	2.6
2	5150.00	50.7 AV	54.0	-3.3	2.72 H	352	48.1	2.6
3	*5180.00	111.6 PK			2.72 H	352	109.1	2.5
4	*5180.00	102.6 AV			2.72 H	352	100.1	2.5
5	#6930.00	53.2 PK	68.2	-15.0	2.55 H	355	46.6	6.6
6	#10360.00	57.4 PK	68.2	-10.8	1.14 H	96	45.5	11.9
7	15540.00	56.2 PK	74.0	-17.8	1.58 H	120	43.8	12.4
8	15540.00	45.5 AV	54.0	-8.5	1.58 H	120	33.1	12.4
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	**FREQ. (MHz)**	**EMISSION LEVEL (dBuV/m)**	**LIMIT (dBuV/m)**	**MARGIN (dB)**	**ANTENNA HEIGHT (m)**	**TABLE ANGLE (Degree)**	**RAW VALUE (dBuV)**	**CORRECTION FACTOR (dB/m)**
1	5150.00	64.2 PK	74.0	-9.8	2.50 V	227	61.6	2.6
2	**5150.00**	**53.9 AV**	**54.0**	**-0.1**	**2.50 V**	**227**	**51.3**	**2.6**
3	*5180.00	114.7 PK			2.50 V	227	112.2	2.5
4	*5180.00	105.9 AV			2.50 V	227	103.4	2.5
5	#6930.00	58.7 PK	68.2	-9.5	2.50 V	264	52.1	6.6
6	#10360.00	61.2 PK	68.2	-7.0	1.08 V	33	49.3	11.9
7	15540.00	56.5 PK	74.0	-17.5	1.57 V	150	44.1	12.4
8	15540.00	46.8 AV	54.0	-7.2	1.57 V	150	34.4	12.4

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	64.4 PK	74.0	-9.6	2.68 H	360	61.8	2.6
2	5150.00	50.6 AV	54.0	-3.4	2.68 H	360	48.0	2.6
3	*5200.00	117.2 PK			2.68 H	360	114.8	2.4
4	*5200.00	107.8 AV			2.68 H	360	105.4	2.4
5	5350.00	56.4 PK	74.0	-17.6	2.68 H	360	54.1	2.3
6	5350.00	46.2 AV	54.0	-7.8	2.68 H	360	43.9	2.3
7	#6930.00	53.4 PK	68.2	-14.8	2.60 H	360	46.8	6.6
8	#10400.00	61.1 PK	68.2	-7.1	1.14 H	94	48.9	12.2
9	15600.00	58.9 PK	74.0	-15.1	1.54 H	118	46.0	12.9
10	15600.00	49.0 AV	54.0	-5.0	1.54 H	118	36.1	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	68.8 PK	74.0	-5.2	2.54 V	227	66.2	2.6
2	**5150.00**	**53.9 AV**	**54.0**	**-0.1**	**2.54 V**	**227**	**51.3**	**2.6**
3	*5200.00	118.4 PK			2.54 V	227	116.0	2.4
4	*5200.00	108.9 AV			2.54 V	227	106.5	2.4
5	5350.00	60.7 PK	74.0	-13.3	2.54 V	227	58.4	2.3
6	5350.00	50.9 AV	54.0	-3.1	2.54 V	227	48.6	2.3
7	#6930.00	58.7 PK	68.2	-9.5	2.47 V	272	52.1	6.6
8	#10400.00	65.0 PK	68.2	-3.2	1.04 V	30	52.8	12.2
9	15600.00	59.8 PK	74.0	-14.2	1.53 V	167	46.9	12.9
10	15600.00	48.8 AV	54.0	-5.2	1.53 V	167	35.9	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. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5240.00	114.7 PK			2.26 H	161	112.5	2.2
2	*5240.00	106.6 AV			2.26 H	161	104.4	2.2
3	5350.00	57.5 PK	74.0	-16.5	2.26 H	161	55.2	2.3
4	5350.00	46.9 AV	54.0	-7.1	2.26 H	161	44.6	2.3
5	#6930.00	53.2 PK	68.2	-15.0	2.59 H	348	46.6	6.6
6	#10480.00	60.6 PK	68.2	-7.6	1.16 H	87	48.2	12.4
7	15720.00	58.4 PK	74.0	-15.6	1.54 H	130	46.4	12.0
8	15720.00	48.6 AV	54.0	-5.4	1.54 H	130	36.6	12.0
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	*5240.00	115.5 PK			2.36 V	228	113.3	2.2
2	*5240.00	107.1 AV			2.36 V	228	104.9	2.2
3	5350.00	60.9 PK	74.0	-13.1	2.36 V	228	58.6	2.3
4	5350.00	49.5 AV	54.0	-4.5	2.36 V	228	47.2	2.3
5	#6930.00	58.9 PK	68.2	-9.3	2.52 V	275	52.3	6.6
6	#10480.00	64.4 PK	68.2	-3.8	1.01 V	30	52.0	12.4
7	15720.00	59.5 PK	74.0	-14.5	1.59 V	174	47.5	12.0
8	15720.00	49.1 AV	54.0	-4.9	1.59 V	174	37.1	12.0

REMARKS:

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

CHANNEL	TX Channel 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	*5745.00	118.7 PK			2.21 H	162	115.8	2.9
2	*5745.00	108.4 AV			2.21 H	162	105.5	2.9
3	11490.00	61.2 PK	74.0	-12.8	1.19 H	83	48.9	12.3
4	11490.00	50.2 AV	54.0	-3.8	1.19 H	83	37.9	12.3
5	#17235.00	58.7 PK	68.2	-9.5	1.49 H	125	43.4	15.3
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	*5745.00	117.5 PK			1.53 V	360	114.6	2.9
2	*5745.00	107.8 AV			1.53 V	360	104.9	2.9
3	11490.00	65.2 PK	74.0	-8.8	1.14 V	214	52.9	12.3
4	**11490.00**	**53.9 AV**	**54.0**	**-0.1**	**1.14 V**	**214**	**41.6**	**12.3**
5	#17235.00	61.6 PK	68.2	-6.6	1.55 V	180	46.3	15.3

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5785.00	118.4 PK			2.24 H	147	115.3	3.1
2	*5785.00	108.3 AV			2.24 H	147	105.2	3.1
3	11570.00	60.9 PK	74.0	-13.1	1.23 H	70	48.5	12.4
4	11570.00	49.8 AV	54.0	-4.2	1.23 H	70	37.4	12.4
5	#17355.00	58.5 PK	68.2	-9.7	1.50 H	133	42.5	16.0
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	*5785.00	117.1 PK			1.58 V	360	114.0	3.1
2	*5785.00	107.5 AV			1.58 V	360	104.4	3.1
3	11570.00	65.1 PK	74.0	-8.9	1.11 V	222	52.7	12.4
4	11570.00	53.8 AV	54.0	-0.2	1.11 V	222	41.4	12.4
5	#17355.00	61.4 PK	68.2	-6.8	1.56 V	193	45.4	16.0

REMARKS:

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

CHANNEL	TX Channel 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	*5825.00	118.3 PK			2.24 H	157	115.1	3.2
2	*5825.00	107.9 AV			2.24 H	157	104.7	3.2
3	11650.00	61.7 PK	74.0	-12.3	1.20 H	74	49.3	12.4
4	11650.00	50.6 AV	54.0	-3.4	1.20 H	74	38.2	12.4
5	#17475.00	59.1 PK	68.2	-9.1	1.43 H	133	41.7	17.4
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5825.00	117.1 PK			1.49 V	360	113.9	3.2
2	*5825.00	107.4 AV			1.49 V	360	104.2	3.2
3	11650.00	65.0 PK	74.0	-9.0	1.16 V	229	52.6	12.4
4	**11650.00**	**53.9 AV**	**54.0**	**-0.1**	**1.16 V**	**229**	**41.5**	**12.4**
5	#17475.00	61.4 PK	68.2	-6.8	1.55 V	167	44.0	17.4

REMARKS:

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

802.11ac (VHT20)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	61.1 PK	74.0	-12.9	2.77 H	341	58.5	2.6
2	5150.00	50.3 AV	54.0	-3.7	2.77 H	341	47.7	2.6
3	*5180.00	112.2 PK			2.77 H	341	109.7	2.5
4	*5180.00	102.9 AV			2.77 H	341	100.4	2.5
5	#6930.00	53.2 PK	68.2	-15.0	2.56 H	360	46.6	6.6
6	#10360.00	57.9 PK	68.2	-10.3	1.13 H	111	46.0	11.9
7	15540.00	56.4 PK	74.0	-17.6	1.59 H	108	44.0	12.4
8	15540.00	45.5 AV	54.0	-8.5	1.59 H	108	33.1	12.4
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	64.3 PK	74.0	-9.7	2.47 V	235	61.7	2.6
2	**5150.00**	**53.9 AV**	**54.0**	**-0.1**	**2.47 V**	**235**	**51.3**	**2.6**
3	*5180.00	114.7 PK			2.47 V	235	112.2	2.5
4	*5180.00	105.7 AV			2.47 V	235	103.2	2.5
5	#6930.00	58.8 PK	68.2	-9.4	2.45 V	275	52.2	6.6
6	#10360.00	62.1 PK	68.2	-6.1	1.00 V	26	50.2	11.9
7	15540.00	56.1 PK	74.0	-17.9	1.56 V	184	43.7	12.4
8	15540.00	45.5 AV	54.0	-8.5	1.56 V	184	33.1	12.4

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	64.8 PK	74.0	-9.2	2.68 H	349	62.2	2.6
2	5150.00	50.7 AV	54.0	-3.3	2.68 H	349	48.1	2.6
3	*5200.00	116.4 PK			2.68 H	349	114.0	2.4
4	*5200.00	106.3 AV			2.68 H	349	103.9	2.4
5	5350.00	56.9 PK	74.0	-17.1	2.68 H	349	54.6	2.3
6	5350.00	46.6 AV	54.0	-7.4	2.68 H	349	44.3	2.3
7	#6930.00	53.8 PK	68.2	-14.4	2.58 H	354	47.2	6.6
8	#10400.00	60.9 PK	68.2	-7.3	1.18 H	98	48.7	12.2
9	15600.00	59.5 PK	74.0	-14.5	1.49 H	114	46.6	12.9
10	15600.00	49.3 AV	54.0	-4.7	1.49 H	114	36.4	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	69.4 PK	74.0	-4.6	2.52 V	212	66.8	2.6
2	**5150.00**	**53.9 AV**	**54.0**	**-0.1**	**2.52 V**	**212**	**51.3**	**2.6**
3	*5200.00	118.1 PK			2.52 V	212	115.7	2.4
4	*5200.00	108.5 AV			2.52 V	212	106.1	2.4
5	5350.00	61.1 PK	74.0	-12.9	2.52 V	212	58.8	2.3
6	5350.00	51.1 AV	54.0	-2.9	2.52 V	212	48.8	2.3
7	#6930.00	58.6 PK	68.2	-9.6	2.50 V	260	52.0	6.6
8	#10400.00	64.2 PK	68.2	-4.0	1.00 V	17	52.0	12.2
9	15600.00	59.5 PK	74.0	-14.5	1.58 V	161	46.6	12.9
10	15600.00	49.3 AV	54.0	-4.7	1.58 V	161	36.4	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. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5240.00	114.2 PK			2.29 H	169	112.0	2.2
2	*5240.00	104.5 AV			2.29 H	169	102.3	2.2
3	5350.00	57.4 PK	74.0	-16.6	2.29 H	169	55.1	2.3
4	5350.00	46.6 AV	54.0	-7.4	2.29 H	169	44.3	2.3
5	#6930.00	53.6 PK	68.2	-14.6	2.58 H	355	47.0	6.6
6	#10480.00	60.4 PK	68.2	-7.8	1.16 H	73	48.0	12.4
7	15720.00	58.2 PK	74.0	-15.8	1.56 H	120	46.2	12.0
8	15720.00	48.3 AV	54.0	-5.7	1.56 H	120	36.3	12.0
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	*5240.00	115.4 PK			2.32 V	224	113.2	2.2
2	*5240.00	106.8 AV			2.32 V	224	104.6	2.2
3	5350.00	60.8 PK	74.0	-13.2	2.32 V	224	58.5	2.3
4	5350.00	49.2 AV	54.0	-4.8	2.32 V	224	46.9	2.3
5	#6930.00	59.4 PK	68.2	-8.8	2.49 V	260	52.8	6.6
6	#10480.00	63.9 PK	68.2	-4.3	1.04 V	23	51.5	12.4
7	15720.00	60.0 PK	74.0	-14.0	1.58 V	181	48.0	12.0
8	15720.00	49.4 AV	54.0	-4.6	1.58 V	181	37.4	12.0

REMARKS:

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

CHANNEL	TX Channel 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	*5745.00	119.5 PK			2.33 H	158	116.6	2.9
2	*5745.00	109.9 AV			2.33 H	158	107.0	2.9
3	11490.00	61.9 PK	74.0	-12.1	1.14 H	62	49.6	12.3
4	11490.00	51.0 AV	54.0	-3.0	1.14 H	62	38.7	12.3
5	#17235.00	58.8 PK	68.2	-9.4	1.48 H	143	43.5	15.3
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	*5745.00	117.1 PK			1.46 V	8	114.2	2.9
2	*5745.00	107.5 AV			1.46 V	8	104.6	2.9
3	11490.00	64.8 PK	74.0	-9.2	1.07 V	215	52.5	12.3
4	**11490.00**	**53.9 AV**	**54.0**	**-0.1**	**1.07 V**	**215**	**41.6**	**12.3**
5	#17235.00	60.9 PK	68.2	-7.3	1.51 V	166	45.6	15.3

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5785.00	119.3 PK			2.36 H	163	116.2	3.1
2	*5785.00	109.6 AV			2.36 H	163	106.5	3.1
3	11570.00	61.2 PK	74.0	-12.8	1.24 H	81	48.8	12.4
4	11570.00	50.3 AV	54.0	-3.7	1.24 H	81	37.9	12.4
5	#17355.00	59.6 PK	68.2	-8.6	1.44 H	130	43.6	16.0
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	*5785.00	116.5 PK			1.40 V	12	113.4	3.1
2	*5785.00	107.1 AV			1.40 V	12	104.0	3.1
3	11570.00	65.6 PK	74.0	-8.4	1.13 V	212	53.2	12.4
4	**11570.00**	**53.9 AV**	**54.0**	**-0.1**	**1.13 V**	**212**	**41.5**	**12.4**
5	#17355.00	61.7 PK	68.2	-6.5	1.59 V	173	45.7	16.0

REMARKS:

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

CHANNEL	TX Channel 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	*5825.00	119.4 PK			2.35 H	160	116.2	3.2
2	*5825.00	109.8 AV			2.35 H	160	106.6	3.2
3	11650.00	61.4 PK	74.0	-12.6	1.17 H	63	49.0	12.4
4	11650.00	50.6 AV	54.0	-3.4	1.17 H	63	38.2	12.4
5	#17475.00	58.6 PK	68.2	-9.6	1.41 H	126	41.2	17.4
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5825.00	117.5 PK			1.43 V	8	114.3	3.2
2	*5825.00	108.0 AV			1.43 V	8	104.8	3.2
3	11650.00	64.9 PK	74.0	-9.1	1.14 V	214	52.5	12.4
4	11650.00	53.8 AV	54.0	-0.2	1.14 V	214	41.4	12.4
5	#17475.00	61.0 PK	68.2	-7.2	1.56 V	185	43.6	17.4

REMARKS:

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

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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	60.8 PK	74.0	-13.2	2.72 H	340	58.2	2.6
2	5150.00	50.2 AV	54.0	-3.8	2.72 H	340	47.6	2.6
3	*5190.00	109.4 PK			2.72 H	340	106.9	2.5
4	*5190.00	98.5 AV			2.72 H	340	96.0	2.5
5	5350.00	53.1 PK	74.0	-20.9	2.72 H	340	50.8	2.3
6	5350.00	41.8 AV	54.0	-12.2	2.72 H	340	39.5	2.3
7	#10380.00	56.2 PK	68.2	-12.0	1.16 H	117	44.2	12.0
8	15570.00	53.3 PK	74.0	-20.7	1.62 H	113	40.7	12.6
9	15570.00	42.1 AV	54.0	-11.9	1.62 H	113	29.5	12.6
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	63.5 PK	74.0	-10.5	2.42 V	228	60.9	2.6
2	**5150.00**	**53.9 AV**	**54.0**	**-0.1**	**2.42 V**	**228**	**51.3**	**2.6**
3	*5190.00	110.1 PK			2.42 V	228	107.6	2.5
4	*5190.00	101.6 AV			2.42 V	228	99.1	2.5
5	5350.00	53.9 PK	74.0	-20.1	2.42 V	228	51.6	2.3
6	5350.00	42.3 AV	54.0	-11.7	2.42 V	228	40.0	2.3
7	#10380.00	60.2 PK	68.2	-8.0	1.10 V	27	48.2	12.0
8	15570.00	57.5 PK	74.0	-16.5	1.61 V	171	44.9	12.6
9	15570.00	47.6 AV	54.0	-6.4	1.61 V	171	35.0	12.6

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5230.00	109.7 PK			2.72 H	344	107.5	2.2
2	*5230.00	100.2 AV			2.72 H	344	98.0	2.2
3	5350.00	60.2 PK	74.0	-13.8	2.68 H	340	57.9	2.3
4	5350.00	49.8 AV	54.0	-4.2	2.68 H	340	47.5	2.3
5	#10460.00	58.7 PK	68.2	-9.5	1.13 H	104	46.3	12.4
6	15690.00	55.7 PK	74.0	-18.3	1.57 H	110	43.5	12.2
7	15690.00	44.9 AV	54.0	-9.1	1.57 H	110	32.7	12.2
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	*5230.00	111.9 PK			2.37 V	226	109.7	2.2
2	*5230.00	102.8 AV			2.37 V	226	100.6	2.2
3	5350.00	53.6 PK	74.0	-20.4	2.37 V	226	51.3	2.3
4	5350.00	42.6 AV	54.0	-11.4	2.37 V	226	40.3	2.3
5	#10460.00	61.1 PK	68.2	-7.1	1.01 V	34	48.7	12.4
6	15690.00	58.1 PK	74.0	-15.9	1.52 V	175	45.9	12.2
7	15690.00	48.5 AV	54.0	-5.5	1.52 V	175	36.3	12.2

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. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5755.00	116.5 PK			2.32 H	165	113.5	3.0
2	*5755.00	106.4 AV			2.32 H	165	103.4	3.0
3	11510.00	61.9 PK	74.0	-12.1	1.25 H	70	49.6	12.3
4	11510.00	50.9 AV	54.0	-3.1	1.25 H	70	38.6	12.3
5	#17265.00	59.6 PK	68.2	-8.6	1.49 H	141	44.2	15.4
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5755.00	115.3 PK			1.40 V	360	112.3	3.0
2	*5755.00	106.2 AV			1.40 V	360	103.2	3.0
3	11510.00	65.9 PK	74.0	-8.1	1.15 V	32	53.6	12.3
4	11510.00	53.8 AV	54.0	-0.2	1.15 V	32	41.5	12.3
5	#17265.00	60.9 PK	68.2	-7.3	1.61 V	192	45.5	15.4

REMARKS:

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

CHANNEL	TX Channel 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	*5795.00	115.9 PK			2.28 H	162	112.9	3.0
2	*5795.00	106.3 AV			2.28 H	162	103.3	3.0
3	11590.00	61.3 PK	74.0	-12.7	1.16 H	72	48.9	12.4
4	11590.00	50.5 AV	54.0	-3.5	1.16 H	72	38.1	12.4
5	#17385.00	59.4 PK	68.2	-8.8	1.43 H	147	43.2	16.2
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	*5795.00	115.1 PK			1.39 V	359	112.1	3.0
2	*5795.00	106.0 AV			1.39 V	359	103.0	3.0
3	11590.00	65.5 PK	74.0	-8.5	1.11 V	45	53.1	12.4
4	**11590.00**	**53.9 AV**	**54.0**	**-0.1**	**1.11 V**	**45**	**41.5**	**12.4**
5	#17385.00	61.1 PK	68.2	-7.1	1.55 V	189	44.9	16.2

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. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

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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	61.4 PK	74.0	-12.6	2.68 H	337	58.8	2.6
2	5150.00	50.7 AV	54.0	-3.3	2.68 H	337	48.1	2.6
3	*5210.00	104.1 PK			2.68 H	337	101.7	2.4
4	*5210.00	94.5 AV			2.68 H	337	92.1	2.4
5	5350.00	53.3 PK	74.0	-20.7	2.68 H	337	51.0	2.3
6	5350.00	41.9 AV	54.0	-12.1	2.68 H	337	39.6	2.3
7	#10420.00	56.0 PK	68.2	-12.2	1.10 H	133	43.8	12.2
8	15630.00	53.2 PK	74.0	-20.8	1.63 H	108	40.5	12.7
9	15630.00	41.8 AV	54.0	-12.2	1.63 H	108	29.1	12.7
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	63.9 PK	74.0	-10.1	2.52 V	224	61.3	2.6
2	**5150.00**	**53.9 AV**	**54.0**	**-0.1**	**2.52 V**	**224**	**51.3**	**2.6**
3	*5210.00	105.5 PK			2.52 V	224	103.1	2.4
4	*5210.00	96.5 AV			2.52 V	224	94.1	2.4
5	5350.00	54.6 PK	74.0	-19.4	2.52 V	224	52.3	2.3
6	5350.00	43.3 AV	54.0	-10.7	2.52 V	224	41.0	2.3
7	#10420.00	61.5 PK	68.2	-6.7	1.05 V	27	49.3	12.2
8	15630.00	57.9 PK	74.0	-16.1	1.56 V	161	45.2	12.7
9	15630.00	48.5 AV	54.0	-5.5	1.56 V	161	35.8	12.7

REMARKS:

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

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	*5775.00	111.8 PK			2.24 H	159	108.8	3.0
2	*5775.00	102.3 AV			2.24 H	159	99.3	3.0
3	11550.00	59.8 PK	74.0	-14.2	1.20 H	60	47.4	12.4
4	11550.00	48.6 AV	54.0	-5.4	1.20 H	60	36.2	12.4
5	#17325.00	57.5 PK	68.2	-10.7	1.44 H	127	41.8	15.7
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5775.00	112.1 PK			1.14 V	360	109.1	3.0
2	*5775.00	102.4 AV			1.14 V	360	99.4	3.0
3	11550.00	64.6 PK	74.0	-9.4	1.02 V	32	52.2	12.4
4	11550.00	50.2 AV	54.0	-3.8	1.02 V	32	37.8	12.4
5	#17325.00	60.1 PK	68.2	-8.1	1.54 V	166	44.4	15.7

REMARKS:

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

Below 1GHz Data:

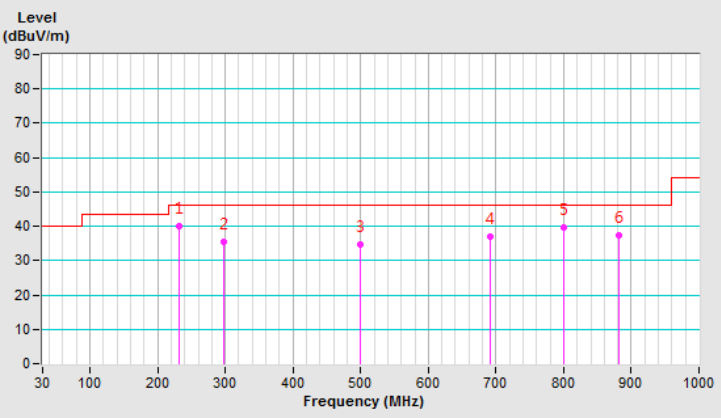
802.11ac (VHT20)

CHANNEL	TX Channel 40	**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	232.41	39.9 QP	46.0	-6.1	1.50 H	132	49.9	-10.0
2	296.75	35.6 QP	46.0	-10.4	1.00 H	45	42.6	-7.0
3	500.01	34.5 QP	46.0	-11.5	1.50 H	39	36.5	-2.0
4	690.93	36.9 QP	46.0	-9.1	1.00 H	360	35.2	1.7
5	800.01	39.5 QP	46.0	-6.5	1.00 H	200	35.8	3.7
6	881.71	37.5 QP	46.0	-8.5	1.00 H	207	32.9	4.6

REMARKS:

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

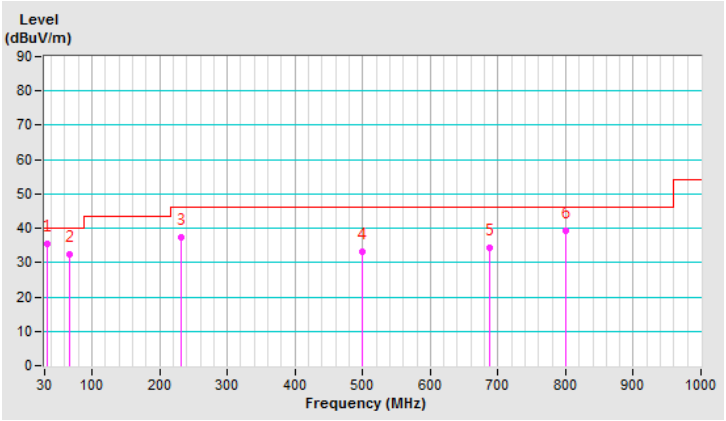


CHANNEL	TX Channel 40	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	33.83	35.4 QP	40.0	-4.6	1.00 V	359	44.3	-8.9
2	67.64	32.3 QP	40.0	-7.7	1.00 V	77	41.9	-9.6
3	232.39	37.5 QP	46.0	-8.5	1.00 V	157	47.5	-10.0
4	500.01	33.0 QP	46.0	-13.0	1.00 V	334	35.0	-2.0
5	687.61	34.2 QP	46.0	-11.8	1.50 V	90	32.5	1.7
6	799.99	39.3 QP	46.0	-6.7	1.50 V	316	35.6	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 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	Nov. 15, 2017	Nov. 14, 2018
Line-Impedance Stabilization Network (for Peripheral) R&S	ENV216	100072	June 04, 2018	June 03, 2019
50 ohms Terminator	N/A	EMC-02	Sep. 12, 2018	Sep. 11, 2019
RF Cable	5D-FB	COCCAB-001	Sep. 28, 2018	Sep. 27, 2019
Fixed attenuator EMCI	STI02-2200-10	003	Mar. 16, 2018	Mar. 15, 2019
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: Nov. 02, 2018

4.2.3 Test Procedure

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

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

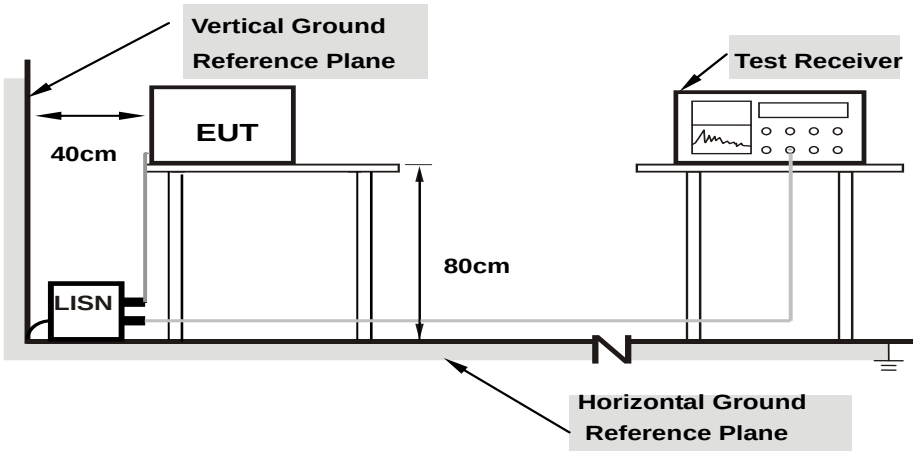
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

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

4.2.4 Deviation from Test Standard

No deviation.

4.2.5 Test Setup



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

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

4.2.6 EUT Operating Condition

Same as 4.1.6.

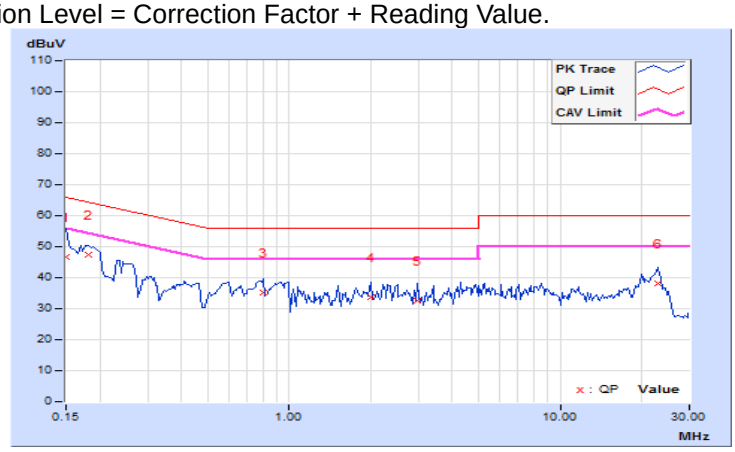
4.2.7 Test Results

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

No	Freq.	Corr. 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	10.02	36.67	17.06	46.69	27.08	66.00	56.00	-19.31	-28.92
2	0.18125	10.03	37.39	21.95	47.42	31.98	64.43	54.43	-17.01	-22.45
3	0.79844	10.10	24.91	10.98	35.01	21.08	56.00	46.00	-20.99	-24.92
4	2.00000	10.16	23.38	13.12	33.54	23.28	56.00	46.00	-22.46	-22.72
5	2.97266	10.20	22.50	12.28	32.70	22.48	56.00	46.00	-23.30	-23.52
6	22.96875	11.11	26.96	20.91	38.07	32.02	60.00	50.00	-21.93	-17.98

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.

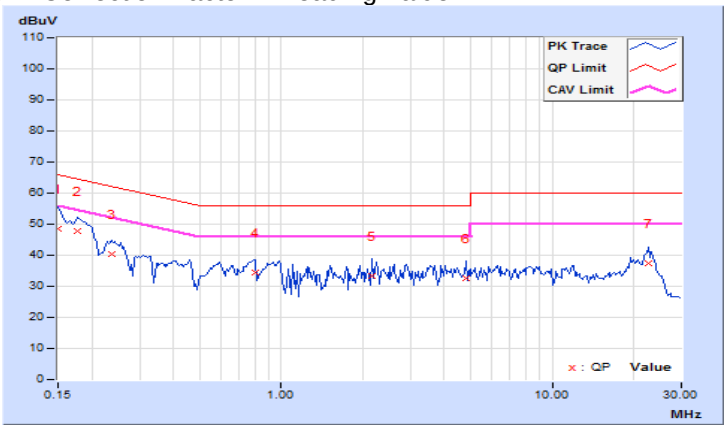


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)

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	9.93	38.73	17.30	48.66	27.23	66.00	56.00	-17.34	-28.77
2	**0.17734**	**9.94**	**37.91**	**21.01**	**47.85**	**30.95**	**64.61**	**54.61**	**-16.76**	**-23.66**
3	0.23594	9.94	30.51	17.27	40.45	27.21	62.24	52.24	-21.79	-25.03
4	0.79844	9.98	24.39	10.12	34.37	20.10	56.00	46.00	-21.63	-25.90
5	2.17578	10.05	23.14	12.29	33.19	22.34	56.00	46.00	-22.81	-23.66
6	4.80859	10.16	22.43	13.40	32.59	23.56	56.00	46.00	-23.41	-22.44
7	22.55078	10.90	26.34	20.33	37.24	31.23	60.00	50.00	-22.76	-18.77

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

802.11a

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
36	5180	18.77	18.79	151.019	21.79	29.06	Pass
40	5200	21.69	21.06	275.215	24.40	29.06	Pass
48	5240	20.30	19.33	192.856	22.85	29.06	Pass
149	5745	20.56	19.30	198.877	22.99	29.06	Pass
157	5785	20.36	19.63	200.476	23.02	29.06	Pass
165	5825	20.72	20.76	237.156	23.75	29.06	Pass

Note: 1. Max. gain = 6.94dBi > 6dBi , so the power limit shall be reduced to 30-(6.94-6) = 29.06dBm.

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				
36	5180	18.74	18.67	148.438	21.72	29.06	Pass
40	5200	21.62	21.21	277.341	24.43	29.06	Pass
48	5240	20.44	19.27	195.19	22.90	29.06	Pass
149	5745	20.12	19.18	185.596	22.69	29.06	Pass
157	5785	20.33	19.50	197.02	22.95	29.06	Pass
165	5825	20.62	19.97	214.657	23.32	29.06	Pass

Note: 1. Max. gain = 6.94dBi > 6dBi , so the power limit shall be reduced to 30-(6.94-6) = 29.06dBm.

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				
38	5190	17.01	16.58	95.733	19.81	29.06	Pass
46	5230	19.00	18.19	145.35	21.62	29.06	Pass
151	5755	20.37	19.01	188.509	22.75	29.06	Pass
159	5795	20.11	19.54	192.515	22.84	29.06	Pass

Note: 1. Max. gain = 6.94dBi > 6dBi , so the power limit shall be reduced to 30-(6.94-6) = 29.06dBm.

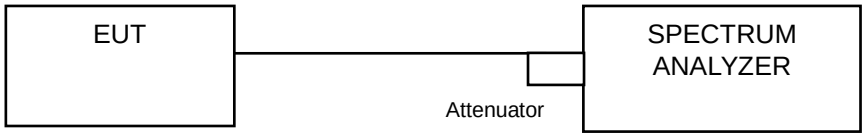
802.11ac (VHT80)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
42	5210	15.48	15.18	68.279	18.34	29.06	Pass
155	5775	19.36	18.58	158.409	22.00	29.06	Pass

Note: 1. Max. gain = 6.94dBi > 6dBi , so the power limit shall be reduced to 30-(6.94-6) = 29.06dBm.

4.4 Occupied Bandwidth Measurement

4.4.1 Test Setup



4.4.2 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.4.3 Test Procedure

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

4.4.4 Test Results

802.11a

Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
36	5180	16.92	16.92
40	5200	21.72	21.24
48	5240	18.48	17.64
149	5745	20.40	23.40
157	5785	17.76	23.52
165	5825	17.52	24.48

802.11ac (VHT20)

Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
36	5180	18.12	18.24
40	5200	22.68	23.64
48	5240	18.96	18.36
149	5745	18.84	23.52
157	5785	18.60	24.48
165	5825	18.24	23.76

802.11ac (VHT40)

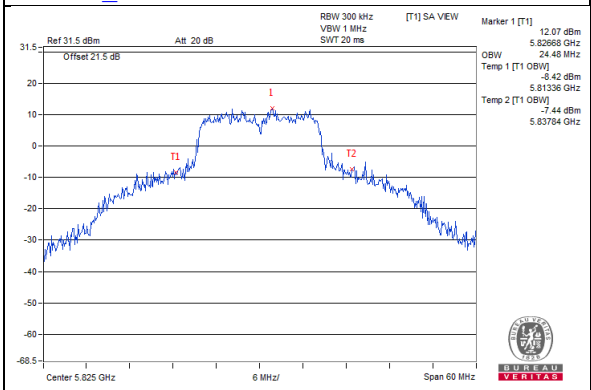
Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
38	5190	36.72	36.96
46	5230	37.20	37.20
151	5755	38.64	43.68
159	5795	37.44	42.24

802.11ac (VHT80)

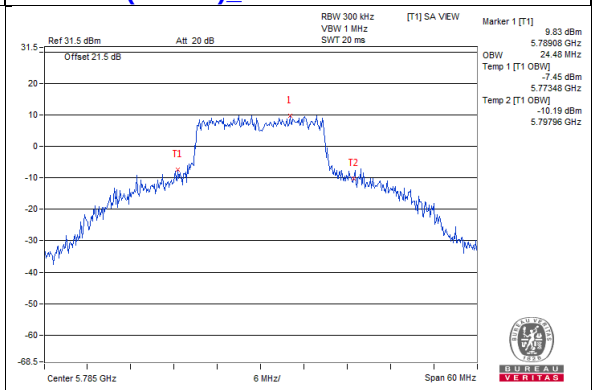
Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
42	5210	76.32	76.32
155	5775	76.32	84.96

Spectrum Plot of Worst Value

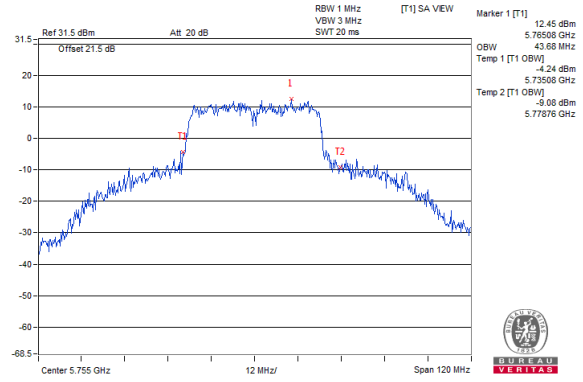
802.11a_Chain1 / CH165



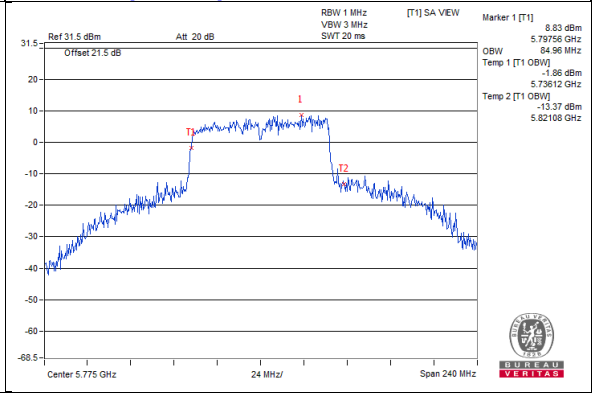
802.11ac (VHT20)_Chain1 / CH157



802.11ac (VHT40)_Chain1 / CH151

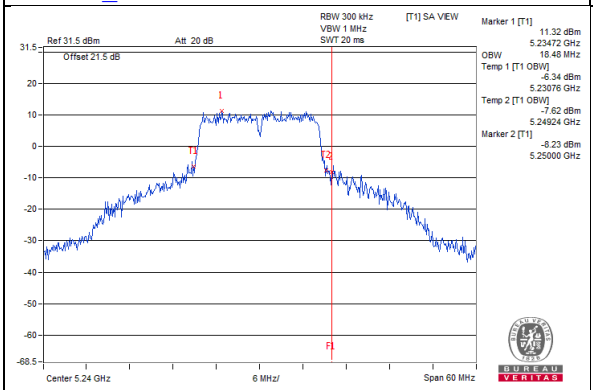


802.11ac (VHT80)_Chain1 / CH155

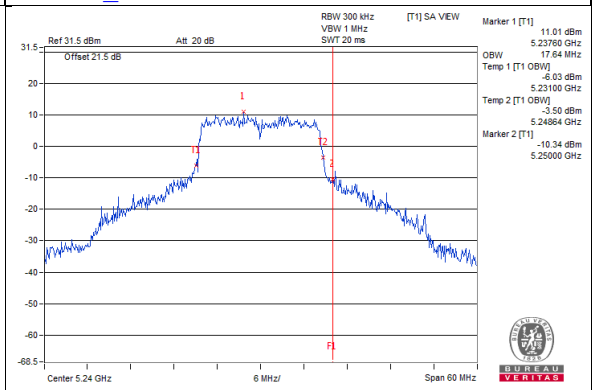


Spectrum Plot for near by DFS band
(DFS is required, if 99% OCP straddle into U-NII-2A band)

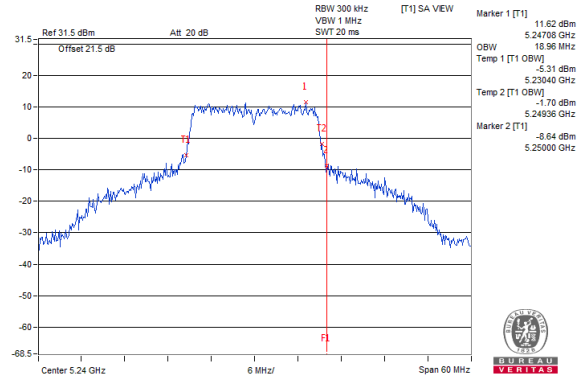
802.11a_Chain0 / CH48



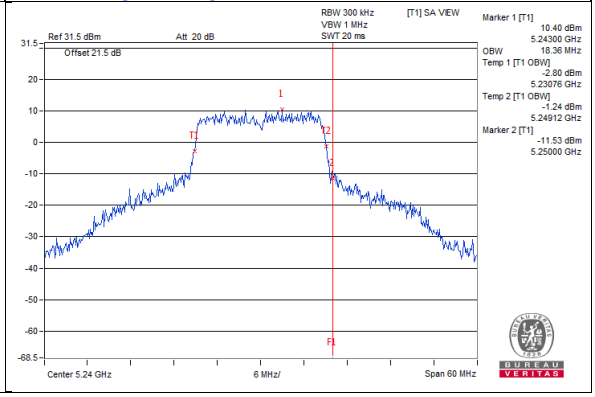
802.11a_Chain1 / CH48

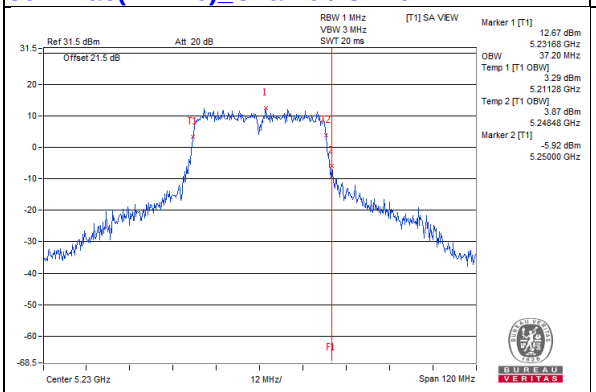
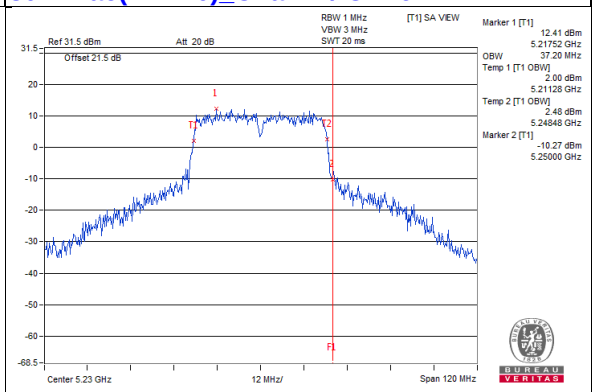
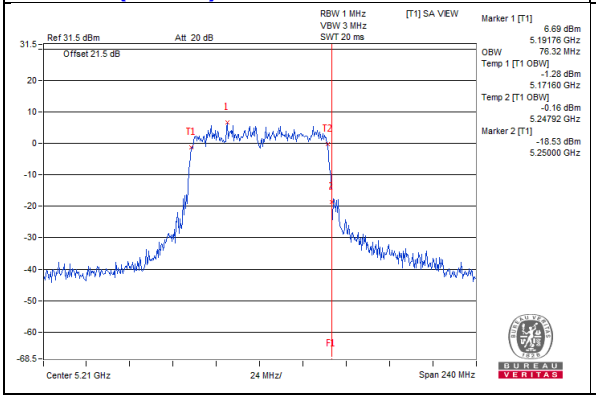
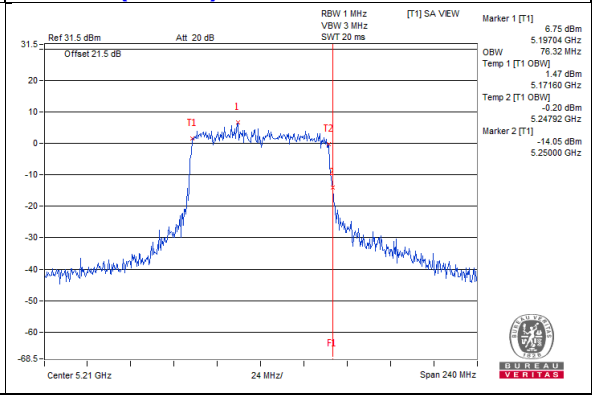


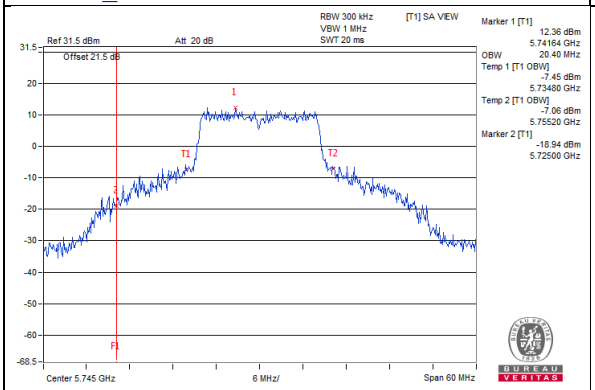
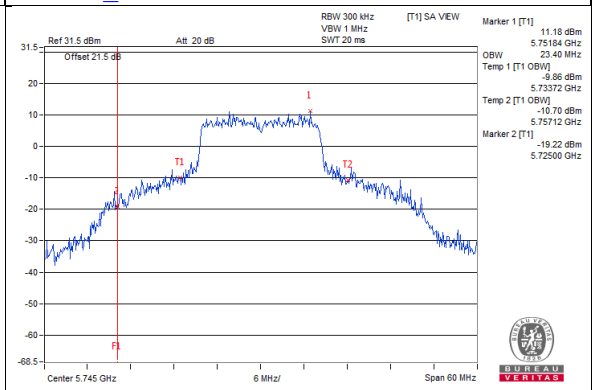
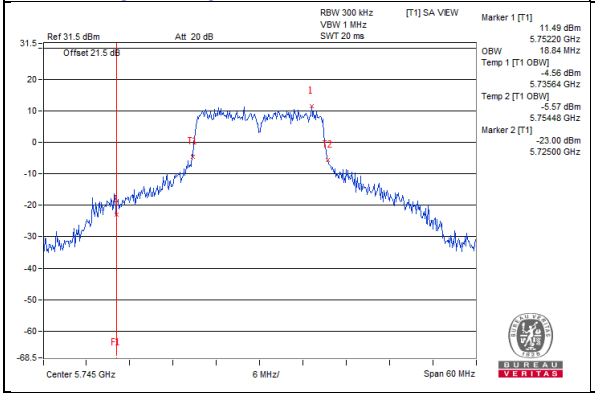
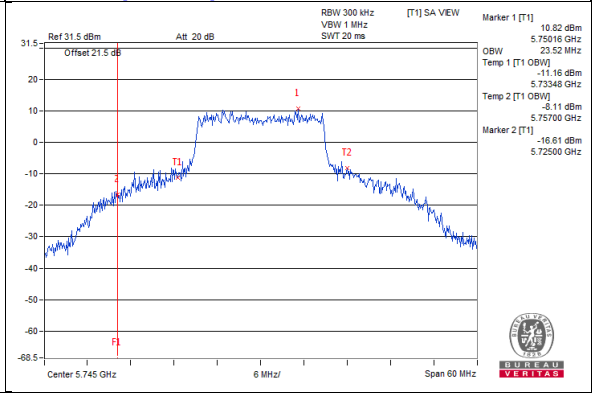
802.11ac(VHT20)_Chain0 / CH48

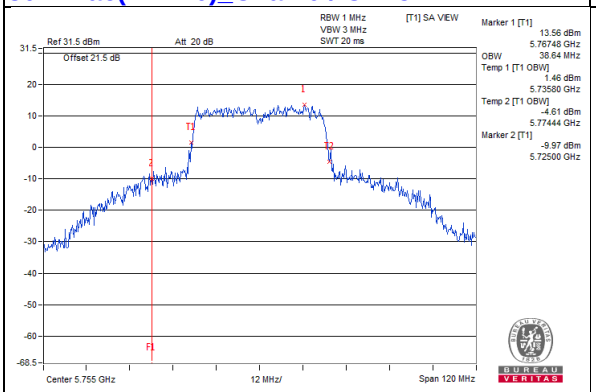
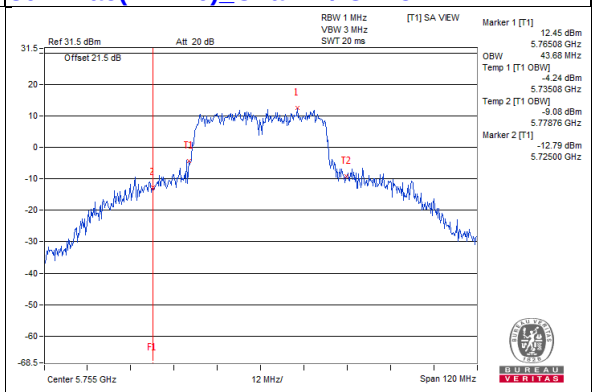
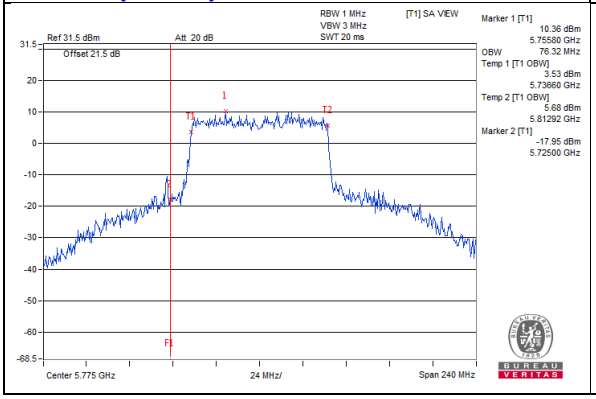
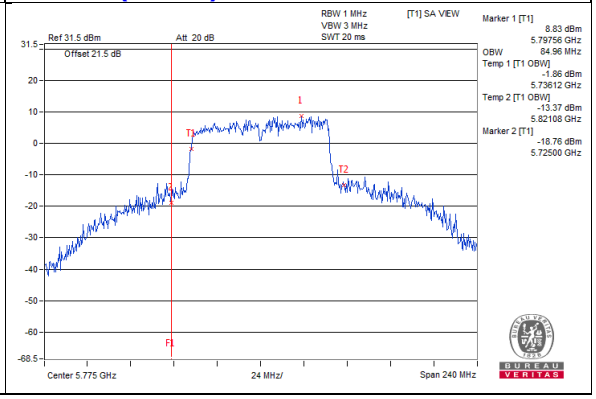


802.11ac(VHT20)_Chain1 / CH48



Spectrum Plot for near by DFS band (DFS is required, if 99% OCP straddle into U-NII-2A band)	
802.11ac(VHT40)_Chain0 / CH46	**802.11ac(VHT40)_Chain1 / CH46**
	
802.11ac(VHT80)_Chain0 / CH42	**802.11ac(VHT80)_Chain1 / CH42**
	

Spectrum Plot for near by DFS band (DFS is required, if 99% OCP straddle into U-NII-2C band)	
802.11a_Chain0 / CH149	802.11a_Chain1 / CH149
	
802.11ac(VHT20)_Chain0 / CH149	802.11ac(VHT20)_Chain1 / CH149
	

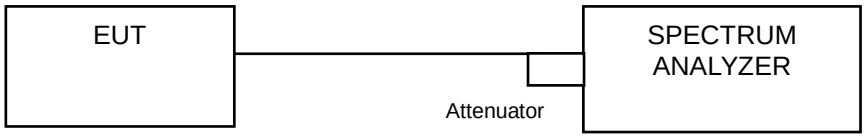
Spectrum Plot for near by DFS band (DFS is required, if 99% OCP straddle into U-NII-2C band)	
802.11ac(VHT40)_Chain0 / CH151	802.11ac(VHT40)_Chain1 / CH151
	
802.11ac(VHT80)_Chain0 / CH155	802.11ac(VHT80)_Chain1 / CH155
	

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

For U-NII-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				
36	5180	5.03	4.28	0.18	7.86	13.92	Pass
40	5200	7.69	6.95	0.18	10.53	13.92	Pass
48	5240	5.75	6.28	0.18	9.21	13.92	Pass

Note: 1. Method a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = 10 log[$(10^{G0/20} + 10^{G1/20})^2$ / 2] = 9.08dBi > 6dBi , so the power density limit shall be reduced to 17-(9.08-6) = 13.92dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ac (VHT20)

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				
36	5180	4.97	4.80	0.17	8.07	13.92	Pass
40	5200	6.08	7.11	0.17	9.81	13.92	Pass
48	5240	6.82	4.97	0.17	9.17	13.92	Pass

Note: 1. Method a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = 10 log[$(10^{G0/20} + 10^{G1/20})^2$ / 2] = 9.08dBi > 6dBi , so the power density limit shall be reduced to 17-(9.08-6) = 13.92dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ac (VHT40)

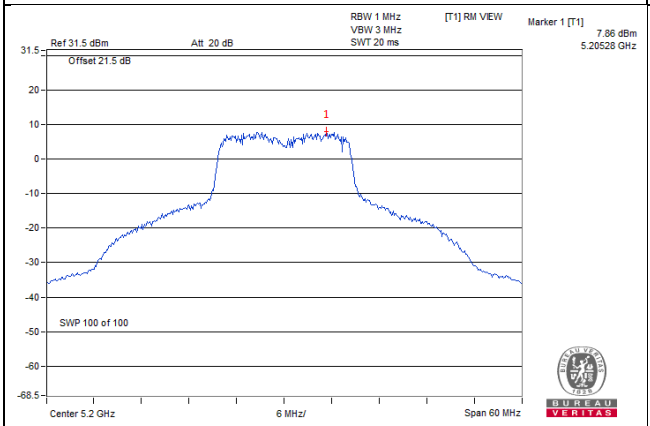
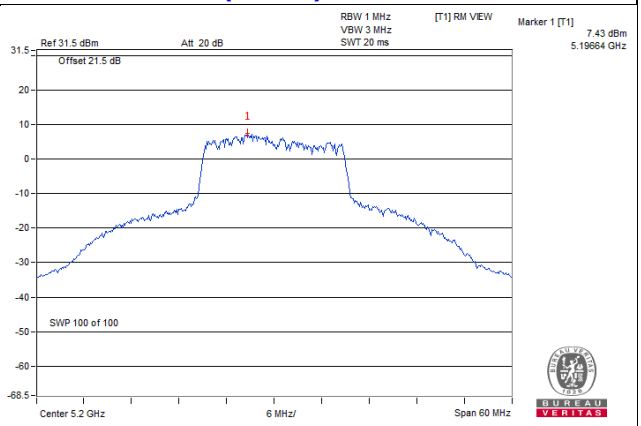
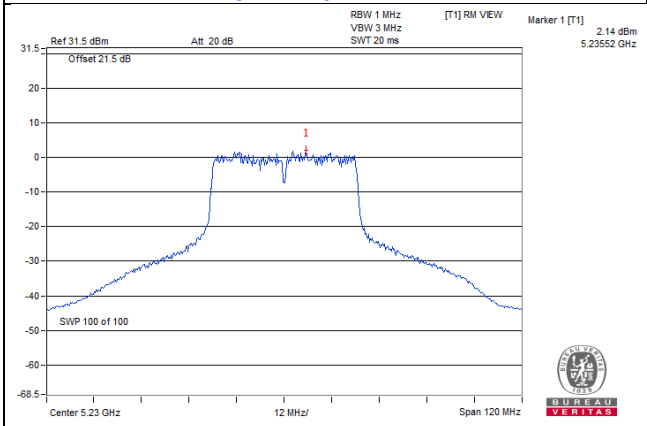
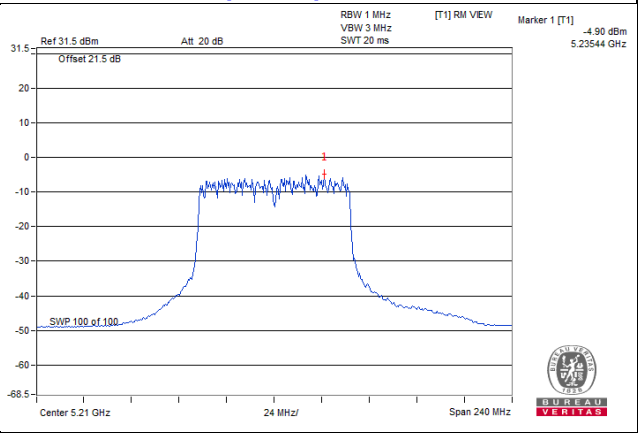
Chan.	Chan. Freq. (MHz)	PSD W/O Duty Factor (dBm/MHz)		Duty Factor (dB)	Total PSD With Duty Factor (dBm/MHz)	MAX. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1				
38	5190	-0.47	-0.66	0.42	2.87	13.92	Pass
46	5230	2.14	0.08	0.42	4.66	13.92	Pass

Note: 1. Method a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = 10 log[$(10^{G0/20} + 10^{G1/20})^2$ / 2] = 9.08dBi > 6dBi , so the power density limit shall be reduced to 17-(9.08-6) = 13.92dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ac (VHT80)

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				
42	5210	-4.90	-5.19	0.62	-1.41	13.92	Pass

Note: 1. Method a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = 10 log[$(10^{G0/20} + 10^{G1/20})^2$ / 2] = 9.08dBi > 6dBi , so the power density limit shall be reduced to 17-(9.08-6) = 13.92dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

Spectrum Plot of Worst Value	
802.11a_Chain 0 / CH40	**802.11ac (VHT20)_Chain 1 / CH40**
	
802.11ac (VHT40)_Chain 0 / CH46	**802.11ac (VHT80)_Chain 0 / CH42**
	

For U-NII-3:

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		mW/300kHz	dBm/300kHz			
149	5745	-0.92	-2.69	0.18	1.4033	1.47	3.69	26.92	Pass
157	5785	-0.65	-2.38	0.18	1.4988	1.76	3.98	26.92	Pass
165	5825	-0.13	-1.49	0.18	1.7498	2.43	4.65	26.92	Pass

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

2. Directional gain = 10 log[($10^{G0/20}$ + $10^{G1/20}$)^2 / 2] = 9.08dBi > 6dBi, so the power density limit shall be reduced to 30-(9.08-6) = 26.92dBm.

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

802.11ac (VHT20)

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		mW/300kHz	dBm/300kHz			
149	5745	-1.68	-2.69	0.17	1.2656	1.02	3.24	26.92	Pass
157	5785	-1.22	-2.14	0.17	1.42	1.52	3.74	26.92	Pass
165	5825	-1.26	-2.17	0.17	1.4084	1.49	3.71	26.92	Pass

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

2. Directional gain = 10 log[($10^{G0/20}$ + $10^{G1/20}$)^2 / 2] = 9.08dBi > 6dBi, so the power density limit shall be reduced to 30-(9.08-6) = 26.92dBm.

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

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		mW/300kHz	dBm/300kHz			
151	5755	-4.99	-6.89	0.42	0.5747	-2.41	-0.19	26.92	Pass
159	5795	-4.95	-6.41	0.42	0.6042	-2.19	0.03	26.92	Pass

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

2. Directional gain = 10 log[($10^{G0/20}$ + $10^{G1/20}$)^2 / 2] = 9.08dBi > 6dBi, so the power density limit shall be reduced to 30-(9.08-6) = 26.92dBm.

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

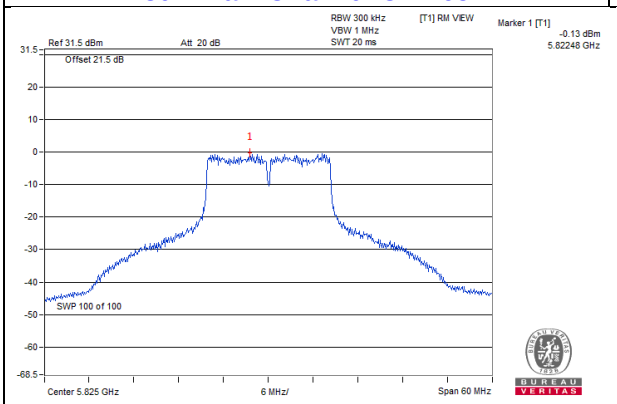
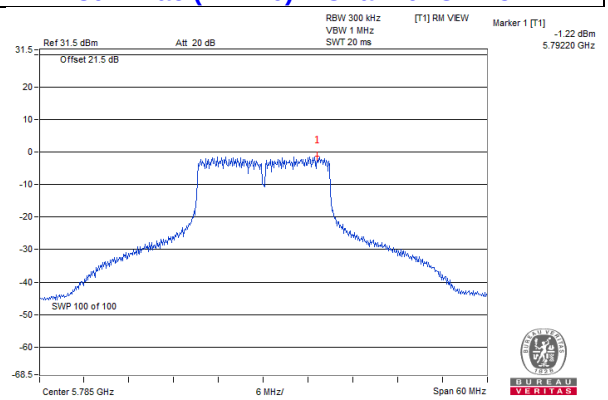
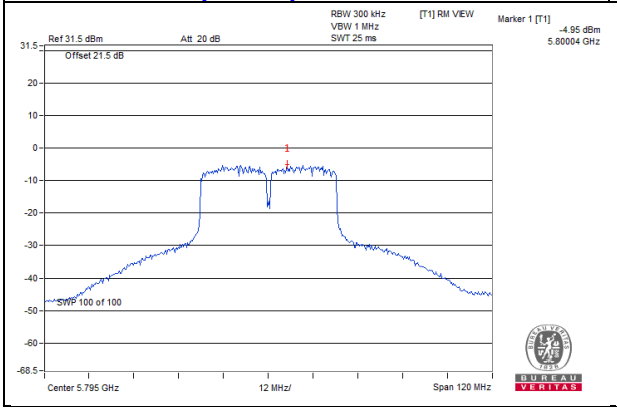
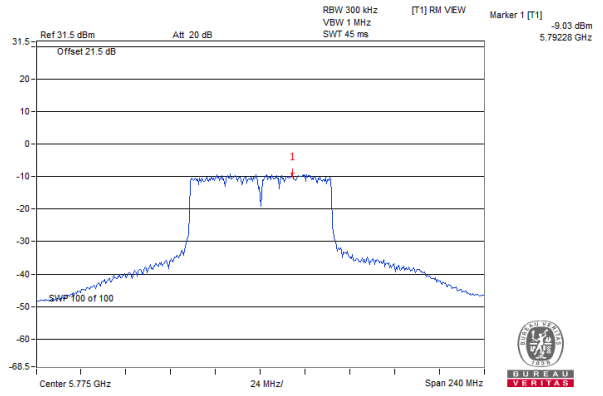
802.11ac (VHT80)

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		mW/300kHz	dBm/300kHz			
155	5775	-9.03	-10.25	0.62	0.25319	-5.97	-3.75	26.92	Pass

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

2. Directional gain = 10 log[$(10^{G0/20} + 10^{G1/20})^2$ / 2] = 9.08dBi > 6dBi, so the power density limit shall be reduced to 30-(9.08-6) = 26.92dBm.

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

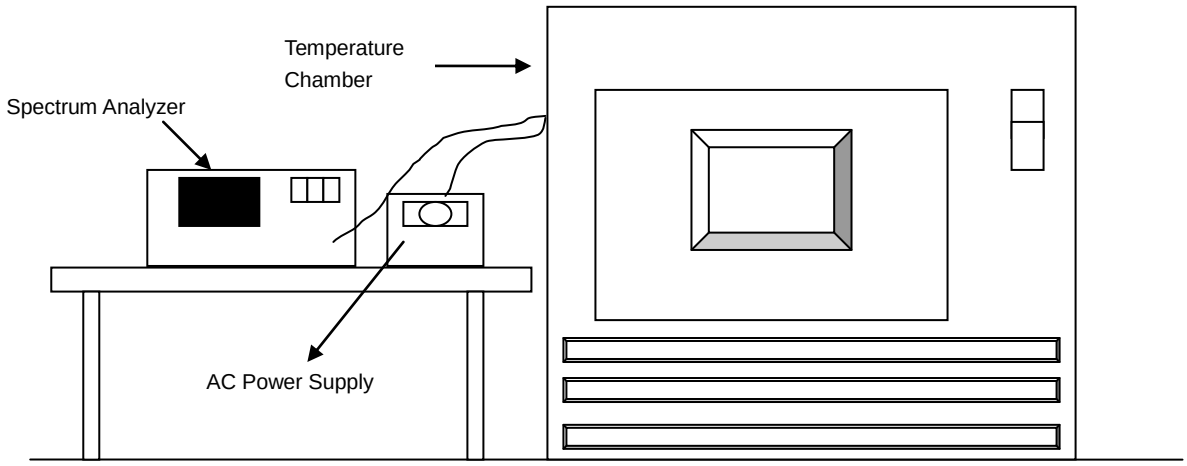
Spectrum Plot of Worst Value	
802.11a – Chain 0: CH 165	**802.11ac (VHT20) – Chain 0: CH 157**
	
802.11ac (VHT40) – Chain 0: CH 159	**802.11ac (VHT80) – Chain 0: CH 155**
	

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 2 and 3 with the temperature chamber set to the lowest temperature.
f. The test chamber was allowed to stabilize at +20 degree C for a minimum of 30 Minutes. The supply voltage was then adjusted on the EUT from 85% to 115% and the frequency record.
.

4.6.5 Deviation from Test Standard

No deviation.

4.6.6 EUT Operating Condition

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

4.6.7 Test Results

Frequency Stability Versus Temp.									
Operating Frequency: 5180 MHz									
TEMP. (℃)	Power Supply (Vac)	0 Minute		2 Minutes		5 Minutes		10 Minutes	
		Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail
50	120	5180.0161	Pass	5180.016	Pass	5180.0176	Pass	5180.0172	Pass
40	120	5179.987	Pass	5179.9891	Pass	5179.9879	Pass	5179.9864	Pass
30	120	5179.9782	Pass	5179.9746	Pass	5179.9761	Pass	5179.9795	Pass
20	120	5180.0143	Pass	5180.0131	Pass	5180.0148	Pass	5180.0126	Pass
10	120	5180.0162	Pass	5180.0151	Pass	5180.0174	Pass	5180.0166	Pass
0	120	5179.9879	Pass	5179.9891	Pass	5179.9874	Pass	5179.9863	Pass
-10	120	5180.0145	Pass	5180.0146	Pass	5180.0124	Pass	5180.0154	Pass
-20	120	5180.0004	Pass	5180.0019	Pass	5179.999	Pass	5180	Pass
-30	120	5180.0155	Pass	5180.0148	Pass	5180.016	Pass	5180.0137	Pass

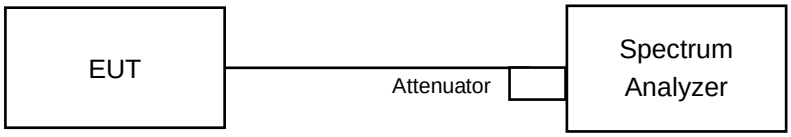
Frequency Stability Versus Voltage									
Operating Frequency: 5180 MHz									
TEMP. (℃)	Power Supply (Vac)	0 Minute		2 Minutes		5 Minutes		10 Minutes	
		Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail
20	138	5180.0149	Pass	5180.0122	Pass	5180.0158	Pass	5180.0126	Pass
	120	5180.0143	Pass	5180.0131	Pass	5180.0148	Pass	5180.0126	Pass
	102	5180.0137	Pass	5180.0135	Pass	5180.0156	Pass	5180.0127	Pass

4.7 6dB Bandwidth Measurement

4.7.1 Limits of 6dB Bandwidth Measurement

The minimum of 6dB Bandwidth Measurement is 0.5MHz.

4.7.2 Test Setup



4.7.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.7.4 Test Procedure

MEASUREMENT PROCEDURE REF

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

4.7.5 Deviation from Test Standard

No deviation.

4.7.6 EUT Operating Condition

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

4.7.7 Test Results

802.11a

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
149	5745	16.39	16.37	0.5	PASS
157	5785	16.38	16.37	0.5	PASS
165	5825	16.41	16.39	0.5	PASS

802.11ac (VHT20)

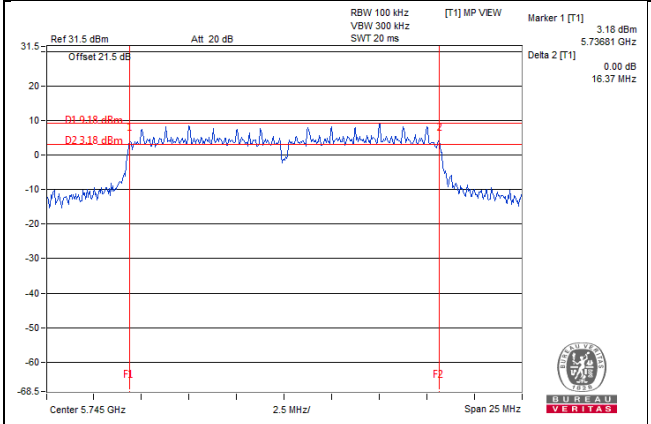
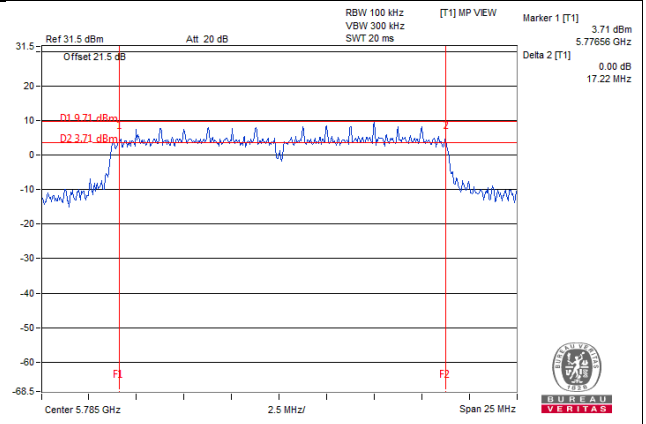
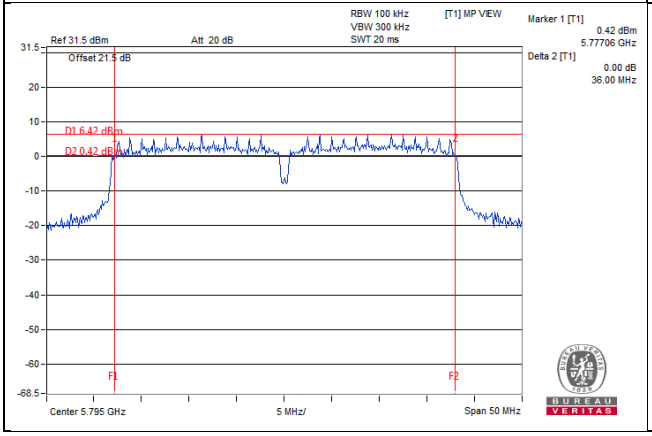
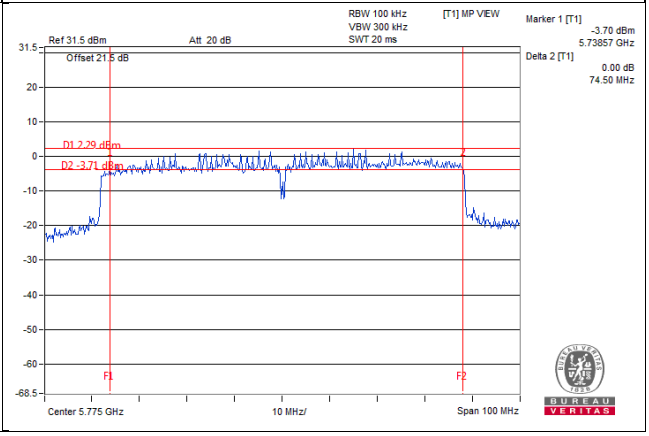
Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
149	5745	17.62	17.62	0.5	PASS
157	5785	17.65	17.22	0.5	PASS
165	5825	17.28	17.33	0.5	PASS

802.11ac (VHT40)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
151	5755	36.40	36.03	0.5	PASS
159	5795	36.00	36.06	0.5	PASS

802.11ac (VHT80)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
155	5775	76.47	74.50	0.5	PASS

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

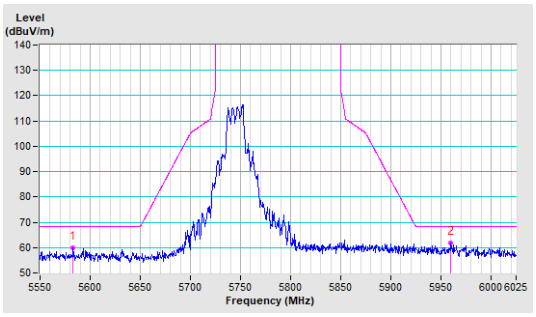
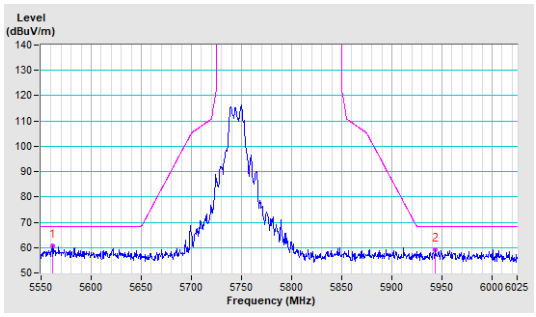
5 Pictures of Test Arrangements

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

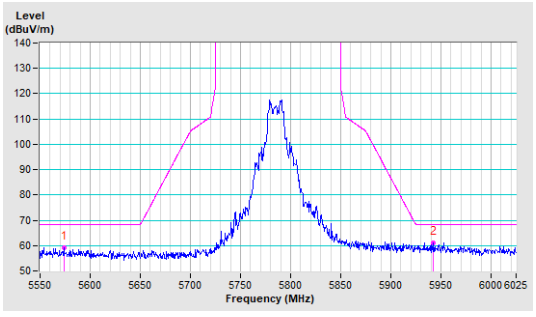
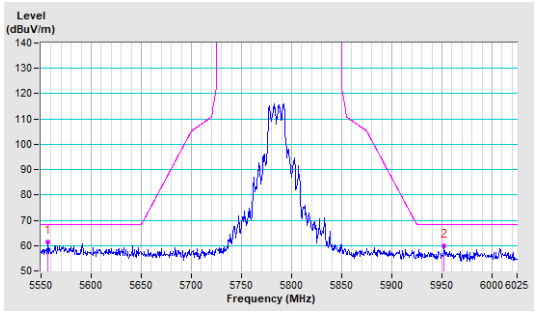
Annex A- Radiated Out of Band Emission (OOBE) Measurement (For U-NII-3 band)

802.11a

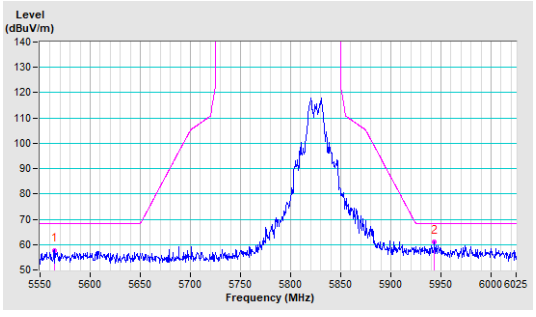
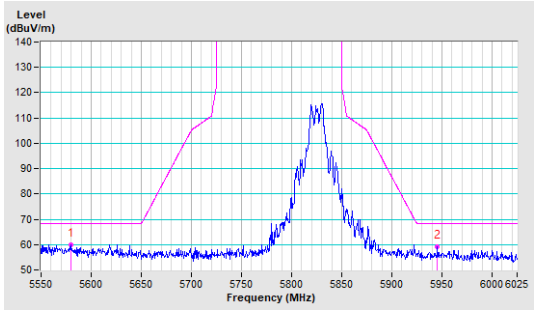
CH 149 5745 MHz

Horizontal	Vertical
	

CH 157 5785 MHz

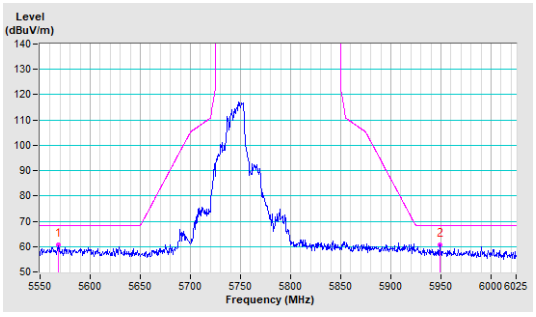
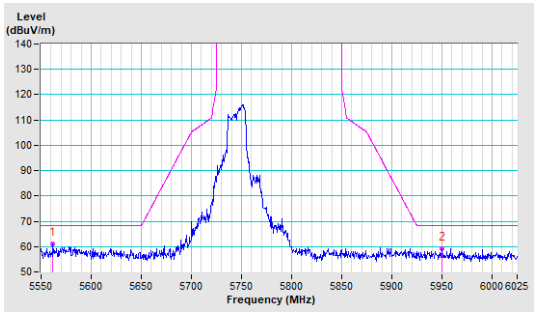
Horizontal	Vertical
	

CH 165 5825 MHz

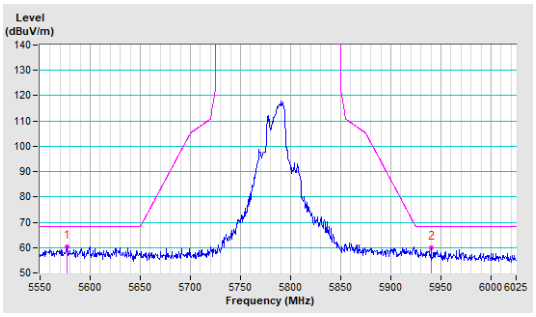
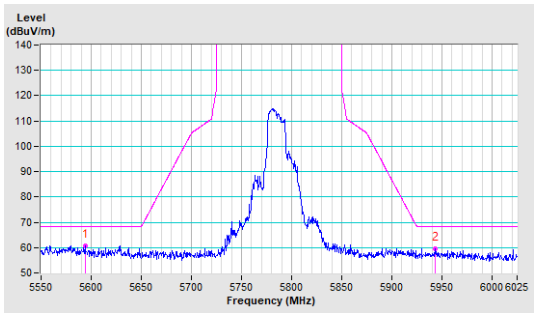
Horizontal	Vertical
	

802.11ac (VHT20)

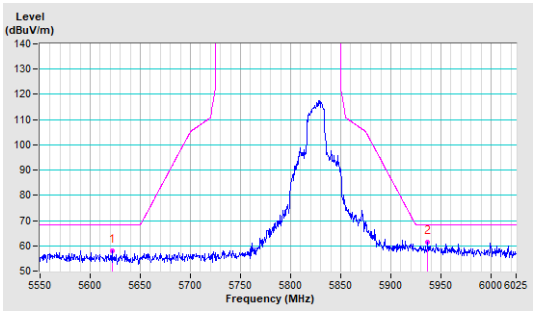
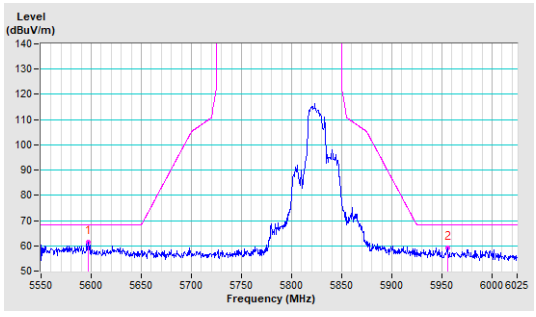
CH 149 5745 MHz

Horizontal	Vertical
	

CH 157 5785 MHz

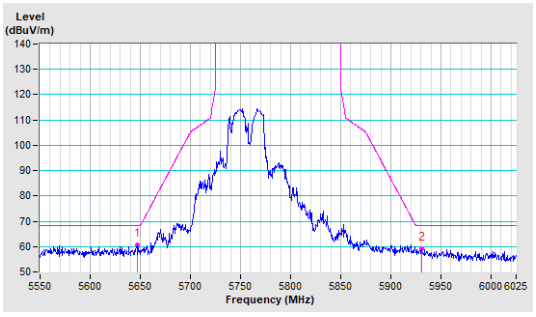
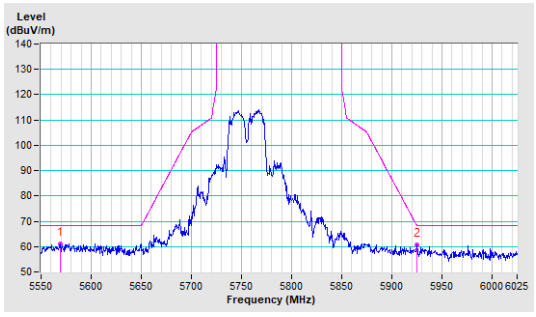
Horizontal	Vertical
	

CH 165 5825 MHz

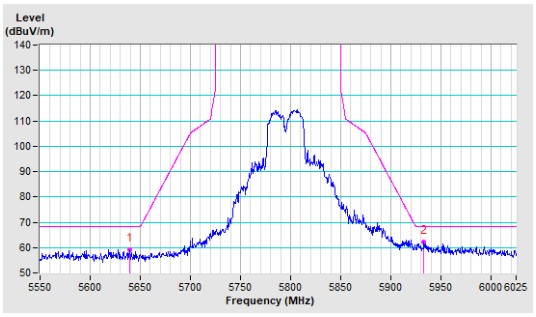
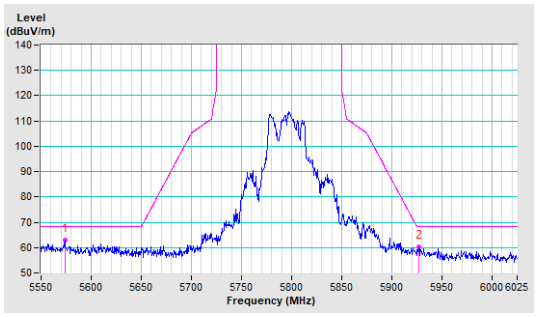
Horizontal	Vertical
	

802.11ac (VHT40)

CH 151 5755 MHz

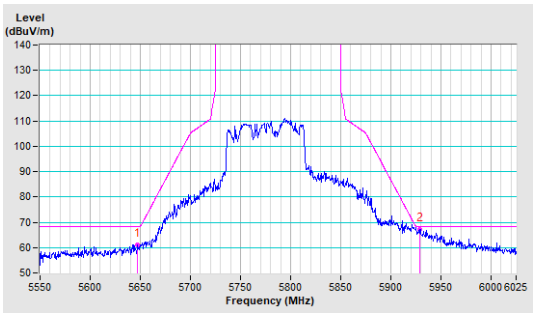
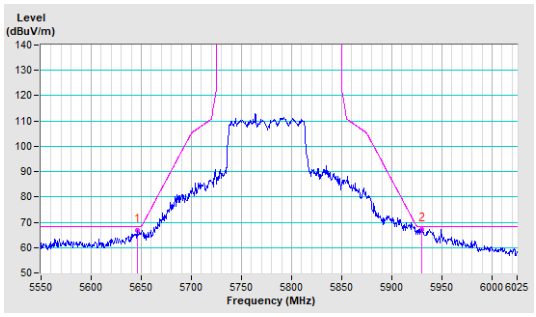
Horizontal	Vertical
	

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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