FCC Test Report

Report No.:	RF180104E04A
FCC ID:	PY317300396
Test Model:	CBR40
Received Date:	Jan. 04, 2018
Test Date:	Jan. 10 to 19, 2018
Issued Date:	Apr. 16, 2018
Applicant:	NETGEAR, Inc.
Address:	350 East Plumeria Drive San Jose, CA 95134
Issued By:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch Hsin Chu Laboratory
Lab Address:	E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300, Taiwan R.O.C.
Test Location:	E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300, Taiwan R.O.C.
FCC Registration / Designation Number:	723255 / TW2022

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Release Control Record

Issue No.	Description	Date Issued
RF180104E04A	Original release.	Apr. 16, 2018

1 Certificate of Conformity

Product:	Orbi Cable Router
Brand:	NETGEAR
Test Model:	CBR40
Sample Status:	ENGINEERING SAMPLE
Applicant:	NETGEAR, Inc.
Test Date:	Jan. 10 to 19, 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 : _____ , **Date:** Apr. 16, 2018
Phoenix Huang / Specialist

Approved by : _____ , **Date:** Apr. 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 -4.16dB at 0.34531MHz.
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 5470MHz, 5725MHz.
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(g)	Frequency Stability	Pass	Meet the requirement of limit.
15.203	Antenna Requirement	Pass	Antenna connector is i-pex(MHF) not a standard connector.

2.1 Measurement Uncertainty

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

Measurement	Frequency	Expanded Uncertainty (k=2) (±)
Conducted Emissions at mains ports	150kHz ~ 30MHz	2.70 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 (DFS Band)

Product	Orbi Cable Router
Brand	NETGEAR
Test Model	CBR40
Status of EUT	ENGINEERING SAMPLE
Power Supply Rating	DC 12V from power adapter
Modulation Type	64QAM, 16QAM, QPSK, BPSK for OFDM 256QAM for OFDM in 11ac mode
Modulation Technology	OFDM
Transfer Rate	802.11a: up to 54Mbps 802.11n: up to 300Mbps 802.11ac: up to 866.7Mbps
Operating Frequency	5.26~ 5.32GHz, 5.50 ~ 5.70GHz
Number of Channel	802.11a, 802.11n (HT20), 802.11ac (VHT20): 15 802.11n (HT40), 802.11ac (VHT40): 7 802.11ac (VHT80): 3
Output Power	**5.26 ~ 5.32GHz:** 242.426mW **5.50 ~ 5.70GHz:** 235.847mW
Antenna Type	Dipole antenna
Antenna Connector	i-pex(MHF)
Accessory Device	Adapter x1
Data Cable Supplied	Ethernet Cable x1 (Unshielded, 2m)

Note:

1. This report is prepared for FCC class II permissive change. The difference compared with the Report No.: RF180104E04-1 as the following:
   - ◆ Add DFS band <5.26GHz ~ 5.32GHz, 5.50GHz ~ 5.70GHz>
2. According to above condition, all test items need to be performed. And all data weres verified to meet the requirements.
3. Simultaneously transmission condition.

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

4. The EUT power needs to be supplied from power adapters, the information is as below table:

No.	Brand	Model No.	P/N	Spec.
1	NETGEAR	AD2080F20	332-10883-01	Input: 100-240Vac, 1.0A, 50/60Hz Output: 12V, 3.5A DC output cable: Unshielded 1.8m
2	NETGEAR	2ABN042F NA	332-10888-01	Input: 100-240Vac, 1.5A, 50/60Hz Output: 12V, 3.5A DC output cable: Unshielded 1.8m
Note: From the above models, the worst radiated emission test was found in **Adapter 2**. Therefore only the test data of the modes were recorded in this report.				

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

Frequency Range (GHz)	Directional Antenna Gain (dBi)
2.4~2.4835	6.02
5.15~5.25	6.07
5.25~5.35	6.07
5.5~5.7	6.23
5.725~5.85	6.23

6. The EUT incorporates a MIMO function.

2.4GHz Band			
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
802.11n (VHT20)	MCS 0~8, Nss=1	2TX	2RX
	MCS 0~8, Nss=2	2TX	2RX
802.11n (VHT40)	MCS 0~9, Nss=1	2TX	2RX
	MCS 0~9, Nss=2	2TX	2RX
5GHz Band			
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)	MCS 0~8, Nss=1	2TX	2RX
	MCS 0~8, Nss=2	2TX	2RX
802.11ac (VHT40)	MCS 0~9, Nss=1	2TX	2RX
	MCS 0~9, Nss=2	2TX	2RX
802.11ac (VHT80)	MCS 0~9, Nss=1	2TX	2RX
	MCS 0~9, Nss=2	2TX	2RX
Note: All of modulation mode support beamforming function except 802.11a/b/g modulation mode.			

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

3.2 Description of Test Modes

FOR 5260 ~ 5320MHz

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

Channel	Frequency	Channel	Frequency
52	5260 MHz	60	5300 MHz
56	5280 MHz	64	5320 MHz

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

Channel	Frequency	Channel	Frequency
54	5270 MHz	62	5310 MHz

1 channel is provided for 802.11ac (VHT80):

Channel	Frequency
58	5290 MHz

FOR 5500 ~ 5700MHz

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

Channel	Frequency	Channel	Frequency
100	5500 MHz	124	5620 MHz
104	5520 MHz	128	5640 MHz
108	5540 MHz	132	5660 MHz
112	5560 MHz	136	5680 MHz
116	5580 MHz	140	5700 MHz
120	5600 MHz		

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

Channel	Frequency	Channel	Frequency
102	5510 MHz	126	5630 MHz
110	5550 MHz	134	5670 MHz
118	5590 MHz		

2 channels are provided for 802.11ac (VHT80):

Channel	Frequency	Channel	Frequency
106	5530 MHz	122	5610 MHz

3.2.1 Test Mode Applicability and Tested Channel Detail

EUT Configure Mode	Applicable To				Description
	RE≥1G	RE<1G	PLC	APCM	
1	√	√	√	√	Power from Adapter 2
2	-	-	√	-	Power from Adapter 1

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. "-" means no effect.

Radiated Emission Test (Above 1GHz):

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

CDD Mode						
Mode	FREQ. Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
802.11a	5260-5320	52 to 64	52, 60, 64	OFDM	BPSK	6
802.11a	5500-5700	100 to 140	100, 116, 140	OFDM	BPSK	6
Beamforming Mode						
Mode	FREQ. Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
802.11ac (VHT20)	5260-5320	52 to 64	52, 60, 64	OFDM	BPSK	6.5
802.11ac (VHT40)		54 to 62	54, 62	OFDM	BPSK	13.5
802.11ac (VHT80)		58	58	OFDM	BPSK	29.3
802.11ac (VHT20)	5500-5700	100 to 140	100, 116, 140	OFDM	BPSK	6.5
802.11ac (VHT40)		102 to 134	102, 110, 134	OFDM	BPSK	13.5
802.11ac (VHT80)		106 to 122	106, 122	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.

Beamforming Mode						
Mode	FREQ. Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
802.11ac (VHT20)	5260-5320, 5500-5700	52 to 64, 100 to 140	60	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.

Beamforming Mode						
Mode	**FREQ. Band (MHz)**	**Available Channel**	**Tested Channel**	**Modulation Technology**	**Modulation Type**	**Data Rate (Mbps)**
802.11ac (VHT20)	5260-5320, 5500-5700	52 to 64, 100 to 140	60	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.

CDD Mode						
Mode	**FREQ. Band (MHz)**	**Available Channel**	**Tested Channel**	**Modulation Technology**	**Modulation Type**	**Data Rate (Mbps)**
802.11a	5260-5320	52 to 64	52, 60, 64	OFDM	BPSK	6
802.11a	5500-5700	100 to 140	100, 116, 140	OFDM	BPSK	6
Beamforming Mode						
Mode	**FREQ. Band (MHz)**	**Available Channel**	**Tested Channel**	**Modulation Technology**	**Modulation Type**	**Data Rate (Mbps)**
802.11ac (VHT20)	5260-5320	52 to 64	52, 60, 64	OFDM	BPSK	6.5
802.11ac (VHT40)		54 to 62	54, 62	OFDM	BPSK	13.5
802.11ac (VHT80)		58	58	OFDM	BPSK	29.3
802.11ac (VHT20)	5500-5700	100 to 140	100, 116, 140	OFDM	BPSK	6.5
802.11ac (VHT40)		102 to 134	102, 110, 134	OFDM	BPSK	13.5
802.11ac (VHT80)		106 to 122	106, 122	OFDM	BPSK	29.3

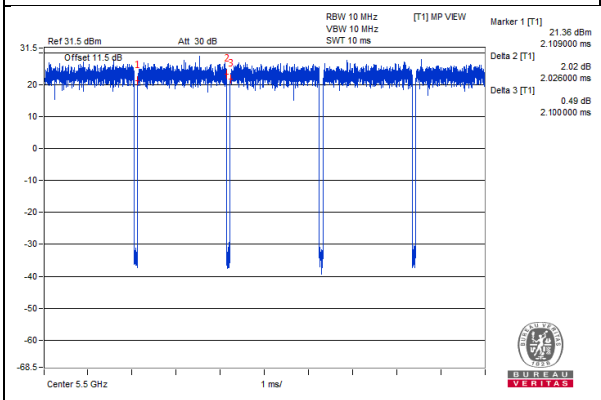
Test Condition:

Applicable To	Environmental Conditions	Input Power	Tested By
RE≥1G	24deg. C, 67%RH	120Vac, 60Hz	Weiwei Lo
RE<1G	23deg. C, 69%RH	120Vac, 60Hz	Weiwei Lo
PLC	25deg. C, 70%RH	120Vac, 60Hz	Weiwei Lo
APCM	25deg. C, 60%RH	120Vac, 60Hz	Robert Cheng

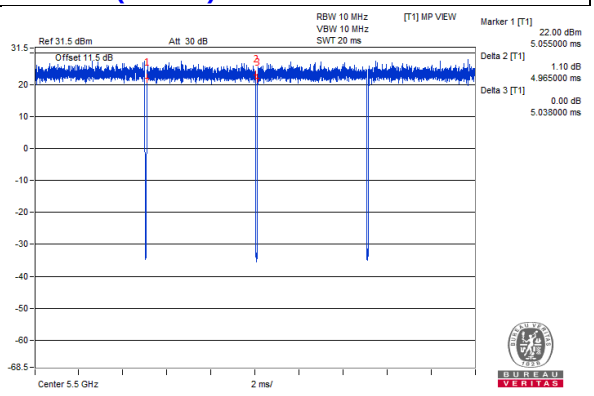
3.3 Duty Cycle of Test Signal

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 = 2.026 ms/2.1 ms = 0.965, Duty factor = 10 * log(1/0.965) = 0.16
802.11ac (VHT20): Duty cycle = 4.965 ms/5.038 ms = 0.986
802.11ac (VHT40): Duty cycle = 2.405 ms/2.489 ms = 0.966, Duty factor = 10 * log(1/0.966) = 0.15
802.11ac (VHT80): Duty cycle = 1.153 ms/1.217 ms = 0.947, Duty factor = 10 * log(1/0.947) = 0.23

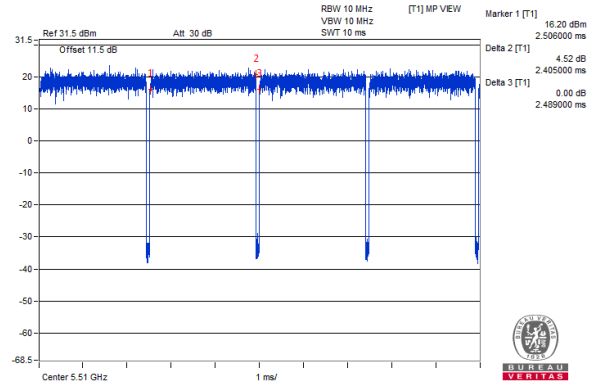
802.11a



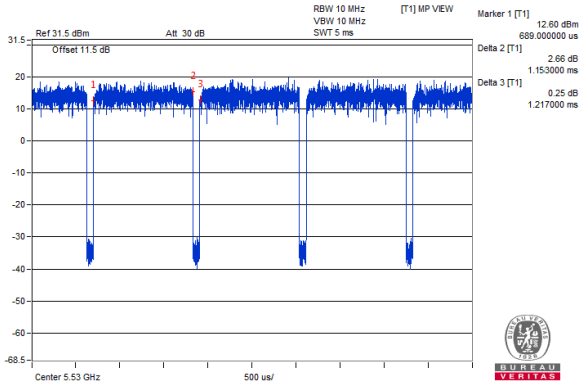
802.11ac (VHT20)



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.

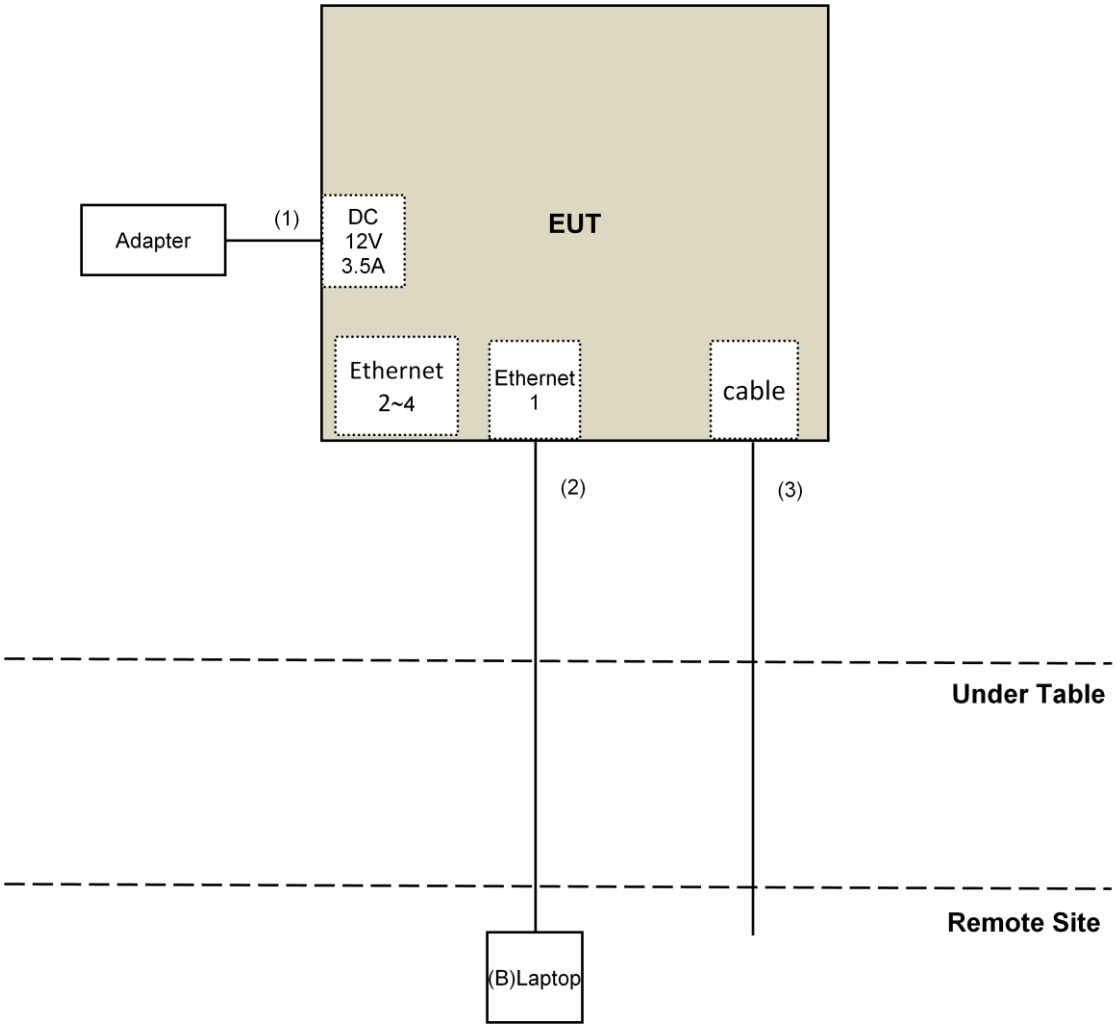
ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Laptop	DELL	Inspiron 7570	DW3CSJ2	R43004	Provided by Lab

Note:

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

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

Note: The EUT has been verified to comply with the requirements of FCC Part 15, Subpart B, Class B (DoC). The test report has been issued separately.

4 Test Types and Results

4.1 Radiated Emission and Bandedge Measurement

4.1.1 Limits of Radiated Emission and Bandedge Measurement

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

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

NOTE:

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

Limits of unwanted emission out of the restricted bands

<table>
<tr><td colspan="3">Applicable To</td><td colspan="2">Limit</td></tr>
<tr><td colspan="3" rowspan="2">789033 D02 General UNII Test Procedure New Rules v02r01</td><td colspan="2">Field Strength at 3m</td></tr>
<tr><td>PK:74 (dBµV/m)</td><td>AV:54 (dBµV/m)</td></tr>
<tr><td>Frequency Band</td><td colspan="2">Applicable To</td><td>EIRP Limit</td><td>Equivalent Field Strength at 3m</td></tr>
<tr><td>5150~5250 MHz</td><td colspan="2">15.407(b)(1)</td><td rowspan="3">PK:-27 (dBm/MHz)</td><td rowspan="3">PK:68.2(dBµV/m)</td></tr>
<tr><td>5250~5350 MHz</td><td colspan="2">15.407(b)(2)</td></tr>
<tr><td>5470~5725 MHz</td><td colspan="2">15.407(b)(3)</td></tr>
<tr><td rowspan="2">5725~5850 MHz</td><td>☐</td><td>15.407(b)(4)(i)</td><td>PK:-27 (dBm/MHz) *1
PK:10 (dBm/MHz) *2
PK:15.6 (dBm/MHz) *3
PK:27 (dBm/MHz) *4</td><td>PK: 68.2(dBµV/m) *1
PK:105.2 (dBµV/m) *2
PK: 110.8(dBµV/m) *3
PK:122.2 (dBµV/m) *4</td></tr>
<tr><td>☐</td><td>15.407(b)(4)(ii)</td><td colspan="2">Emission limits in section 15.247(d)</td></tr>
<tr><td colspan="5">*1 beyond 75 MHz or more above of the band edge.
*2 below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above.
*3 below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above.
*4 from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.</td></tr>
</table>

Note:

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

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

4.1.2 Test Instruments

For Below 1GHz:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver Agilent	N9038A	MY50010156	July 12, 2017	July 11, 2018
Loop Antenna(*) TESEQ	HLA 6121	45745	May 19, 2017	May 18, 2018
Pre-Amplifier Mini-Circuits	ZFL-1000VH2B	AMP-ZFL-05	May 06, 2017	May 05, 2018
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-361	Nov. 29, 2017	Nov. 28, 2018
RF Cable	8D	966-3-1 966-3-2 966-3-3	Apr. 01, 2017	Mar. 31, 2018
Fixed attenuator Mini-Circuits	UNAT-5+	PAD-3m-3-01	Oct. 03, 2017	Oct. 02, 2018
Software	ADT_Radiated_V8.7.08	NA	NA	NA
Antenna Tower & Turn Table Max-Full	MF-7802	MF780208406	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 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: Jan. 10, 2018

For Other Test:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver Agilent	N9038A	MY50010156	July 12, 2017	July 11, 2018
Horn_Antenna SCHWARZBECK	BBHA9120-D	9120D-406	Dec. 12, 2017	Dec. 11, 2018
Pre-Amplifier EMCI	EMC12630SE	980384	Feb. 02, 2017	Feb. 01, 2018
RF Cable	EMC104-SM-SM-1200 EMC104-SM-SM-2000 EMC104-SM-SM-5000	160922 150317 150322	Feb. 02, 2017 Mar. 29, 2017 Mar. 29, 2017	Feb. 01, 2018 Mar. 28, 2018 Mar. 28, 2018
Spectrum Analyzer Keysight	N9030A	MY54490679	July 25, 2017	July 24, 2018
Pre-Amplifier EMCI	EMC184045SE	980386	Feb. 02, 2017	Feb. 01, 2018
Horn_Antenna SCHWARZBECK	BBHA 9170	BBHA9170608	Dec. 14, 2017	Dec. 13, 2018
RF Cable	SUCOFLEX 102	36432/2 36433/2	Jan. 11, 2018	Jan. 10, 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	July 1, 2017	June 30, 2018
Power meter Anritsu	ML2495A	1014008	May 11, 2017	May 10, 2018
Power sensor Anritsu	MA2411B	0917122	May 11, 2017	May 10, 2018
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 29, 2017	May 28, 2018

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. 3.
3. The CANADA Site Registration No. is 20331-1
4. Tested Date: Jan. 19, 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. Both X and Y axes 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:

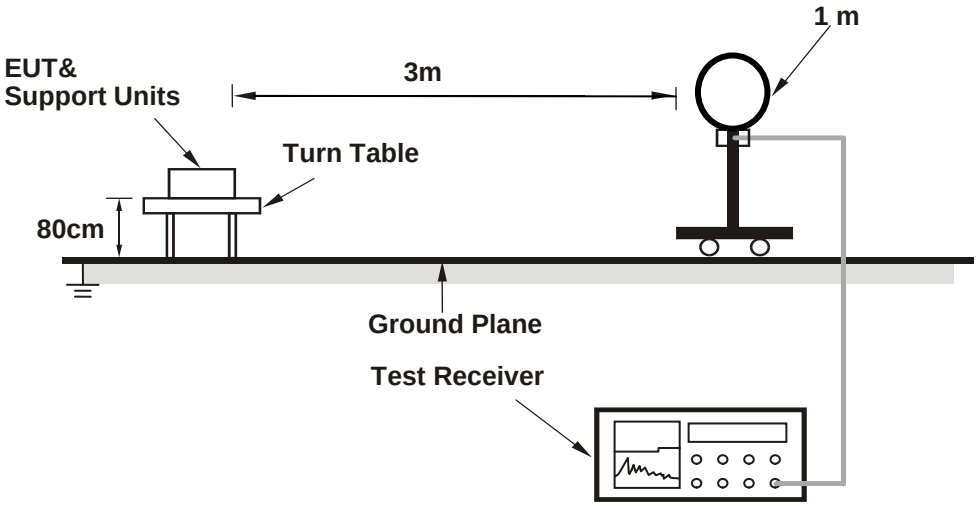
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.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

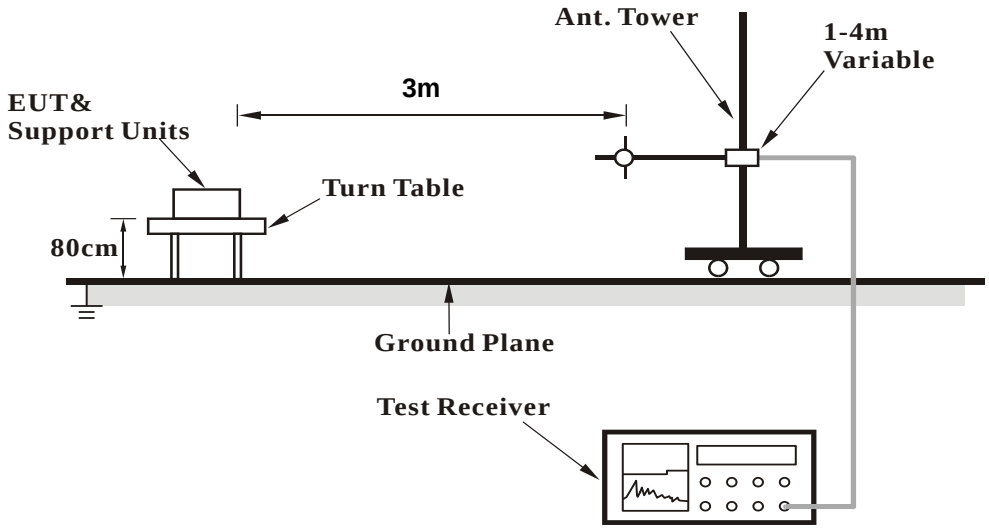
No deviation.

4.1.5 Test Setup

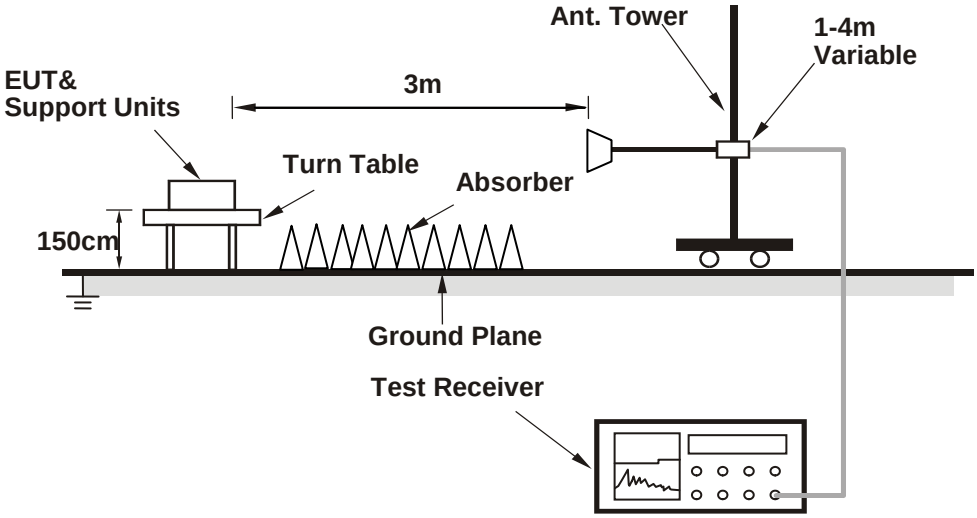
For Radiated emission below 30MHz



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 Notebook Computer which is placed on remote site.
b. Controlling software (QCA Radio Control Toolkit Version3.0.264.0) has been activated to set the EUT on specific status.

4.1.7 Test Results

Above 1GHz Data:

802.11a

CHANNEL	TX Channel 52	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	48.5 PK	74.0	-25.5	1.59 H	37	44.5	4.0
2	5150.00	36.6 AV	54.0	-17.4	1.59 H	37	32.6	4.0
3	*5260.00	108.9 PK			1.59 H	37	105.2	3.7
4	*5260.00	97.9 AV			1.59 H	37	94.2	3.7
5	#10520.00	46.6 PK	74.0	-27.4	1.44 H	128	33.2	13.4
6	#10520.00	43.2 AV	54.0	-10.8	1.44 H	128	29.8	13.4
7	15780.00	42.1 PK	74.0	-31.9	1.38 H	256	29.0	13.1
8	15780.00	32.5 AV	54.0	-21.5	1.38 H	256	19.4	13.1
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	51.0 PK	74.0	-23.0	1.21 V	3	47.0	4.0
2	5150.00	37.9 AV	54.0	-16.1	1.21 V	3	33.9	4.0
3	*5260.00	115.5 PK			1.21 V	3	111.8	3.7
4	*5260.00	105.0 AV			1.21 V	3	101.3	3.7
5	#10520.00	51.0 PK	74.0	-23.0	1.53 V	224	37.6	13.4
6	#10520.00	47.3 AV	54.0	-6.7	1.53 V	224	33.9	13.4
7	15780.00	41.5 PK	74.0	-32.5	2.48 V	161	28.4	13.1
8	15780.00	33.1 AV	54.0	-20.9	2.48 V	161	20.0	13.1

REMARKS:

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

CHANNEL	TX Channel 60	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	*5300.00	108.6 PK			1.60 H	28	104.8	3.8
2	*5300.00	97.5 AV			1.60 H	28	93.7	3.8
3	10600.00	46.1 PK	74.0	-27.9	1.42 H	121	33.0	13.1
4	10600.00	42.8 AV	54.0	-11.2	1.42 H	121	29.7	13.1
5	15900.00	41.9 PK	74.0	-32.1	1.39 H	236	29.5	12.4
6	15900.00	32.3 AV	54.0	-21.7	1.39 H	236	19.9	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	*5300.00	115.6 PK			1.23 V	22	111.8	3.8
2	*5300.00	105.3 AV			1.23 V	22	101.5	3.8
3	10600.00	51.7 PK	74.0	-22.3	1.43 V	225	38.6	13.1
4	10600.00	48.1 AV	54.0	-5.9	1.43 V	225	35.0	13.1
5	15900.00	41.8 PK	74.0	-32.2	2.53 V	157	29.4	12.4
6	15900.00	33.2 AV	54.0	-20.8	2.53 V	157	20.8	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.

CHANNEL	TX Channel 64	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	*5320.00	108.9 PK			1.57 H	34	105.0	3.9
2	*5320.00	98.1 AV			1.57 H	34	94.2	3.9
3	5350.00	48.4 PK	74.0	-25.6	1.57 H	34	44.6	3.8
4	5350.00	36.7 AV	54.0	-17.3	1.57 H	34	32.9	3.8
5	10640.00	46.7 PK	74.0	-27.3	1.38 H	140	33.5	13.2
6	10640.00	43.3 AV	54.0	-10.7	1.38 H	140	30.1	13.2
7	15960.00	41.8 PK	74.0	-32.2	1.40 H	251	29.3	12.5
8	15960.00	32.6 AV	54.0	-21.4	1.40 H	251	20.1	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	*5320.00	116.9 PK			1.16 V	33	113.0	3.9
2	*5320.00	106.0 AV			1.16 V	33	102.1	3.9
3	5350.00	58.2 PK	74.0	-15.8	1.16 V	33	54.4	3.8
4	5350.00	47.3 AV	54.0	-6.7	1.16 V	33	43.5	3.8
5	10640.00	51.0 PK	74.0	-23.0	1.53 V	230	37.8	13.2
6	10640.00	47.5 AV	54.0	-6.5	1.53 V	230	34.3	13.2
7	15960.00	41.9 PK	74.0	-32.1	2.49 V	147	29.4	12.5
8	15960.00	33.4 AV	54.0	-20.6	2.49 V	147	20.9	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. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

CHANNEL	TX Channel 100	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	#5470.00	68.4 PK	74.0	-5.6	1.63 H	51	64.4	4.0
2	#5470.00	50.4 AV	54.0	-3.6	1.63 H	51	46.4	4.0
3	*5500.00	109.1 PK			1.63 H	51	105.1	4.0
4	*5500.00	98.1 AV			1.63 H	51	94.1	4.0
5	11000.00	46.6 PK	74.0	-27.4	1.43 H	132	33.4	13.2
6	11000.00	43.1 AV	54.0	-10.9	1.43 H	132	29.9	13.2
7	#16500.00	41.9 PK	74.0	-32.1	1.44 H	234	27.7	14.2
8	#16500.00	32.7 AV	54.0	-21.3	1.44 H	234	18.5	14.2
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	#5470.00	73.2 PK	74.0	-0.8	1.00 V	82	69.2	4.0
2	**#5470.00**	**53.9 AV**	**54.0**	**-0.1**	**1.00 V**	**82**	**49.9**	**4.0**
3	*5500.00	119.2 PK			1.00 V	82	115.2	4.0
4	*5500.00	106.7 AV			1.00 V	82	102.7	4.0
5	11000.00	51.4 PK	74.0	-22.6	1.45 V	217	38.2	13.2
6	11000.00	47.7 AV	54.0	-6.3	1.45 V	217	34.5	13.2
7	#16500.00	41.8 PK	74.0	-32.2	2.55 V	153	27.6	14.2
8	#16500.00	33.2 AV	54.0	-20.8	2.55 V	153	19.0	14.2

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 116	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	*5580.00	109.2 PK			1.54 H	44	105.1	4.1
2	*5580.00	98.2 AV			1.54 H	44	94.1	4.1
3	11160.00	46.2 PK	74.0	-27.8	1.37 H	135	33.0	13.2
4	11160.00	42.8 AV	54.0	-11.2	1.37 H	135	29.6	13.2
5	#16740.00	41.5 PK	74.0	-32.5	1.38 H	250	26.1	15.4
6	#16740.00	32.2 AV	54.0	-21.8	1.38 H	250	16.8	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	*5580.00	119.3 PK			1.01 V	89	115.2	4.1
2	*5580.00	108.8 AV			1.01 V	89	104.7	4.1
3	11160.00	51.4 PK	74.0	-22.6	1.46 V	230	38.2	13.2
4	11160.00	47.7 AV	54.0	-6.3	1.46 V	230	34.5	13.2
5	#16740.00	41.1 PK	74.0	-32.9	2.54 V	146	25.7	15.4
6	#16740.00	32.9 AV	54.0	-21.1	2.54 V	146	17.5	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 140	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	*5700.00	107.6 PK			1.55 H	18	103.4	4.2
2	*5700.00	96.9 AV			1.55 H	18	92.7	4.2
3	#5725.00	68.8 PK	74.0	-5.2	1.55 H	18	64.6	4.2
4	#5725.00	50.6 AV	54.0	-3.4	1.55 H	18	46.4	4.2
5	11400.00	46.8 PK	74.0	-27.2	1.37 H	141	32.9	13.9
6	11400.00	43.1 AV	54.0	-10.9	1.37 H	141	29.2	13.9
7	#17100.00	42.0 PK	74.0	-32.0	1.41 H	248	25.4	16.6
8	#17100.00	32.3 AV	54.0	-21.7	1.41 H	248	15.7	16.6
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	*5700.00	118.0 PK			1.02 V	89	113.8	4.2
2	*5700.00	105.5 AV			1.02 V	89	101.3	4.2
3	#5725.00	70.7 PK	74.0	-3.3	1.02 V	89	66.5	4.2
4	**#5725.00**	**53.9 AV**	**54.0**	**-0.1**	**1.02 V**	**89**	**49.7**	**4.2**
5	11400.00	51.4 PK	74.0	-22.6	1.45 V	214	37.5	13.9
6	11400.00	47.7 AV	54.0	-6.3	1.45 V	214	33.8	13.9
7	#17100.00	41.1 PK	74.0	-32.9	2.52 V	165	24.5	16.6
8	#17100.00	32.8 AV	54.0	-21.2	2.52 V	165	16.2	16.6

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.

802.11ac (VHT20)

CHANNEL	TX Channel 52	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	47.8 PK	74.0	-26.2	1.43 H	48	43.8	4.0
2	5150.00	36.4 AV	54.0	-17.6	1.43 H	48	32.4	4.0
3	*5260.00	106.5 PK			1.43 H	48	102.8	3.7
4	*5260.00	97.4 AV			1.43 H	48	93.7	3.7
5	#10520.00	46.8 PK	74.0	-27.2	1.43 H	136	33.4	13.4
6	#10520.00	43.4 AV	54.0	-10.6	1.43 H	136	30.0	13.4
7	15780.00	41.7 PK	74.0	-32.3	1.36 H	239	28.6	13.1
8	15780.00	32.4 AV	54.0	-21.6	1.36 H	239	19.3	13.1
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	50.9 PK	74.0	-23.1	1.00 V	34	46.9	4.0
2	5150.00	40.1 AV	54.0	-13.9	1.00 V	34	36.1	4.0
3	*5260.00	116.3 PK			1.00 V	34	112.6	3.7
4	*5260.00	106.1 AV			1.00 V	34	102.4	3.7
5	#10520.00	51.6 PK	74.0	-22.4	1.47 V	216	38.2	13.4
6	#10520.00	48.2 AV	54.0	-5.8	1.47 V	216	34.8	13.4
7	15780.00	41.3 PK	74.0	-32.7	2.56 V	156	28.2	13.1
8	15780.00	33.0 AV	54.0	-21.0	2.56 V	156	19.9	13.1

REMARKS:

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

CHANNEL	TX Channel 60	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	*5300.00	106.4 PK			1.47 H	58	102.6	3.8
2	*5300.00	97.3 AV			1.47 H	58	93.5	3.8
3	10600.00	46.9 PK	74.0	-27.1	1.34 H	126	33.8	13.1
4	10600.00	43.6 AV	54.0	-10.4	1.34 H	126	30.5	13.1
5	15900.00	42.1 PK	74.0	-31.9	1.44 H	258	29.7	12.4
6	15900.00	32.6 AV	54.0	-21.4	1.44 H	258	20.2	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	*5300.00	116.4 PK			1.00 V	34	112.6	3.8
2	*5300.00	106.3 AV			1.00 V	34	102.5	3.8
3	10600.00	52.1 PK	74.0	-21.9	1.48 V	218	39.0	13.1
4	10600.00	48.2 AV	54.0	-5.8	1.48 V	218	35.1	13.1
5	15900.00	41.5 PK	74.0	-32.5	2.49 V	161	29.1	12.4
6	15900.00	33.1 AV	54.0	-20.9	2.49 V	161	20.7	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.

CHANNEL	TX Channel 64	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	*5320.00	109.2 PK			1.52 H	30	105.3	3.9
2	*5320.00	98.3 AV			1.52 H	30	94.4	3.9
3	5350.00	48.7 PK	74.0	-25.3	1.52 H	30	44.9	3.8
4	5350.00	37.0 AV	54.0	-17.0	1.52 H	30	33.2	3.8
5	10640.00	46.7 PK	74.0	-27.3	1.44 H	137	33.5	13.2
6	10640.00	43.4 AV	54.0	-10.6	1.44 H	137	30.2	13.2
7	15960.00	42.3 PK	74.0	-31.7	1.33 H	251	29.8	12.5
8	15960.00	32.5 AV	54.0	-21.5	1.33 H	251	20.0	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	*5320.00	116.1 PK			1.08 V	34	112.2	3.9
2	*5320.00	106.2 AV			1.08 V	34	102.3	3.9
3	5350.00	57.1 PK	74.0	-16.9	1.08 V	34	53.3	3.8
4	5350.00	46.1 AV	54.0	-7.9	1.08 V	34	42.3	3.8
5	10640.00	51.1 PK	74.0	-22.9	1.44 V	206	37.9	13.2
6	10640.00	47.3 AV	54.0	-6.7	1.44 V	206	34.1	13.2
7	15960.00	41.3 PK	74.0	-32.7	2.48 V	161	28.8	12.5
8	15960.00	33.1 AV	54.0	-20.9	2.48 V	161	20.6	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. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

CHANNEL	TX Channel 100	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	#5470.00	68.5 PK	74.0	-5.5	1.60 H	42	64.5	4.0
2	#5470.00	50.5 AV	54.0	-3.5	1.60 H	42	46.5	4.0
3	*5500.00	109.1 PK			1.60 H	42	105.1	4.0
4	*5500.00	98.0 AV			1.60 H	42	94.0	4.0
5	11000.00	46.3 PK	74.0	-27.7	1.37 H	130	33.1	13.2
6	11000.00	42.9 AV	54.0	-11.1	1.37 H	130	29.7	13.2
7	#16500.00	42.5 PK	74.0	-31.5	1.44 H	242	28.3	14.2
8	#16500.00	32.8 AV	54.0	-21.2	1.44 H	242	18.6	14.2
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	#5470.00	73.1 PK	74.0	-0.9	1.00 V	82	69.1	4.0
2	#5470.00	53.8 AV	54.0	-0.2	1.00 V	82	49.8	4.0
3	*5500.00	119.2 PK			1.06 V	80	115.2	4.0
4	*5500.00	106.5 AV			1.06 V	80	102.5	4.0
5	11000.00	51.6 PK	74.0	-22.4	1.47 V	225	38.4	13.2
6	11000.00	47.7 AV	54.0	-6.3	1.47 V	225	34.5	13.2
7	#16500.00	41.1 PK	74.0	-32.9	2.46 V	157	26.9	14.2
8	#16500.00	32.7 AV	54.0	-21.3	2.46 V	157	18.5	14.2

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 116	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	*5580.00	109.5 PK			1.57 H	42	105.4	4.1
2	*5580.00	98.5 AV			1.57 H	42	94.4	4.1
3	11160.00	47.2 PK	74.0	-26.8	1.40 H	115	34.0	13.2
4	11160.00	43.5 AV	54.0	-10.5	1.40 H	115	30.3	13.2
5	#16740.00	42.5 PK	74.0	-31.5	1.39 H	251	27.1	15.4
6	#16740.00	33.0 AV	54.0	-21.0	1.39 H	251	17.6	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	*5580.00	119.0 PK			1.01 V	89	114.9	4.1
2	*5580.00	108.7 AV			1.01 V	89	104.6	4.1
3	11160.00	51.0 PK	74.0	-23.0	1.47 V	223	37.8	13.2
4	11160.00	47.6 AV	54.0	-6.4	1.47 V	223	34.4	13.2
5	#16740.00	41.5 PK	74.0	-32.5	2.54 V	158	26.1	15.4
6	#16740.00	33.2 AV	54.0	-20.8	2.54 V	158	17.8	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 140	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	*5700.00	107.4 PK			1.59 H	27	103.2	4.2
2	*5700.00	96.4 AV			1.59 H	27	92.2	4.2
3	#5725.00	68.6 PK	74.0	-5.4	1.59 H	27	64.4	4.2
4	#5725.00	50.8 AV	54.0	-3.2	1.59 H	27	46.6	4.2
5	11400.00	46.5 PK	74.0	-27.5	1.34 H	141	32.6	13.9
6	11400.00	42.9 AV	54.0	-11.1	1.34 H	141	29.0	13.9
7	#17100.00	42.0 PK	74.0	-32.0	1.43 H	233	25.4	16.6
8	#17100.00	32.4 AV	54.0	-21.6	1.43 H	233	15.8	16.6
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	*5700.00	117.8 PK			1.02 V	89	113.6	4.2
2	*5700.00	105.3 AV			1.02 V	89	101.1	4.2
3	#5725.00	70.9 PK	74.0	-3.1	1.02 V	89	66.7	4.2
4	#5725.00	53.8 AV	54.0	-0.2	1.02 V	89	49.6	4.2
5	11400.00	51.6 PK	74.0	-22.4	1.47 V	217	37.7	13.9
6	11400.00	48.1 AV	54.0	-5.9	1.47 V	217	34.2	13.9
7	#17100.00	41.1 PK	74.0	-32.9	2.55 V	156	24.5	16.6
8	#17100.00	32.8 AV	54.0	-21.2	2.55 V	156	16.2	16.6

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.

802.11ac (VHT40)

CHANNEL	TX Channel 54	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	48.2 PK	74.0	-25.8	1.36 H	49	44.2	4.0
2	5150.00	36.6 AV	54.0	-17.4	1.36 H	49	32.6	4.0
3	*5270.00	105.6 PK			1.36 H	49	101.9	3.7
4	*5270.00	96.2 AV			1.36 H	49	92.5	3.7
5	5350.00	47.2 PK	74.0	-26.8	1.36 H	49	43.4	3.8
6	5350.00	36.2 AV	54.0	-17.8	1.36 H	49	32.4	3.8
7	#10540.00	46.9 PK	74.0	-27.1	1.38 H	118	33.6	13.3
8	#10540.00	43.1 AV	54.0	-10.9	1.38 H	118	29.8	13.3
9	15810.00	42.1 PK	74.0	-31.9	1.45 H	253	29.1	13.0
10	15810.00	32.6 AV	54.0	-21.4	1.45 H	253	19.6	13.0
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	50.1 PK	74.0	-23.9	1.42 V	360	46.1	4.0
2	5150.00	39.9 AV	54.0	-14.1	1.42 V	360	35.9	4.0
3	*5270.00	113.6 PK			1.42 V	360	109.9	3.7
4	*5270.00	104.2 AV			1.42 V	360	100.5	3.7
5	5350.00	49.1 PK	74.0	-24.9	1.42 V	360	45.3	3.8
6	5350.00	38.7 AV	54.0	-15.3	1.42 V	360	34.9	3.8
7	#10540.00	51.8 PK	74.0	-22.2	1.52 V	216	38.5	13.3
8	#10540.00	47.9 AV	54.0	-6.1	1.52 V	216	34.6	13.3
9	15810.00	41.3 PK	74.0	-32.7	2.49 V	149	28.3	13.0
10	15810.00	32.7 AV	54.0	-21.3	2.49 V	149	19.7	13.0

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 62	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	*5310.00	106.7 PK			1.64 H	40	102.9	3.8
2	*5310.00	97.4 AV			1.64 H	40	93.6	3.8
3	5350.00	67.8 PK	74.0	-6.2	1.64 H	40	64.0	3.8
4	5350.00	50.1 AV	54.0	-3.9	1.64 H	40	46.3	3.8
5	10620.00	46.5 PK	74.0	-27.5	1.41 H	130	33.4	13.1
6	10620.00	43.1 AV	54.0	-10.9	1.41 H	130	30.0	13.1
7	15930.00	41.9 PK	74.0	-32.1	1.42 H	249	29.5	12.4
8	15930.00	32.6 AV	54.0	-21.4	1.42 H	249	20.2	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	*5310.00	112.5 PK			1.44 V	360	108.7	3.8
2	*5310.00	103.9 AV			1.44 V	360	100.1	3.8
3	5350.00	61.2 PK	74.0	-12.8	1.44 V	360	57.4	3.8
4	5350.00	53.7 AV	54.0	-0.3	1.44 V	360	49.9	3.8
5	10620.00	51.5 PK	74.0	-22.5	1.53 V	234	38.4	13.1
6	10620.00	48.0 AV	54.0	-6.0	1.53 V	234	34.9	13.1
7	15930.00	41.6 PK	74.0	-32.4	2.52 V	144	29.2	12.4
8	15930.00	33.1 AV	54.0	-20.9	2.52 V	144	20.7	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.

CHANNEL	TX Channel 102	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	#5470.00	68.1 PK	74.0	-5.9	1.56 H	32	64.1	4.0
2	#5470.00	50.1 AV	54.0	-3.9	1.56 H	32	46.1	4.0
3	*5510.00	105.9 PK			1.56 H	32	101.9	4.0
4	*5510.00	95.9 AV			1.56 H	32	91.9	4.0
5	11020.00	46.4 PK	74.0	-27.6	1.37 H	138	33.1	13.3
6	11020.00	42.8 AV	54.0	-11.2	1.37 H	138	29.5	13.3
7	#16530.00	41.9 PK	74.0	-32.1	1.36 H	237	27.4	14.5
8	#16530.00	32.1 AV	54.0	-21.9	1.36 H	237	17.6	14.5
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	#5470.00	70.9 PK	74.0	-3.1	1.01 V	84	66.9	4.0
2	**#5470.00**	**53.9 AV**	**54.0**	**-0.1**	**1.01 V**	**84**	**49.9**	**4.0**
3	*5510.00	113.9 PK			1.01 V	84	109.9	4.0
4	*5510.00	103.7 AV			1.01 V	84	99.7	4.0
5	11020.00	51.2 PK	74.0	-22.8	1.48 V	221	37.9	13.3
6	11020.00	47.4 AV	54.0	-6.6	1.48 V	221	34.1	13.3
7	#16530.00	41.9 PK	74.0	-32.1	2.45 V	151	27.4	14.5
8	#16530.00	33.3 AV	54.0	-20.7	2.45 V	151	18.8	14.5

REMARKS:

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

CHANNEL	TX Channel 110	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	*5550.00	106.2 PK			1.65 H	39	102.2	4.0
2	*5550.00	97.0 AV			1.65 H	39	93.0	4.0
3	11100.00	46.1 PK	74.0	-27.9	1.41 H	134	32.7	13.4
4	11100.00	42.7 AV	54.0	-11.3	1.41 H	134	29.3	13.4
5	#16650.00	42.2 PK	74.0	-31.8	1.37 H	256	26.9	15.3
6	#16650.00	32.7 AV	54.0	-21.3	1.37 H	256	17.4	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	*5550.00	114.2 PK			1.01 V	75	110.2	4.0
2	*5550.00	105.6 AV			1.01 V	75	101.6	4.0
3	11100.00	51.8 PK	74.0	-22.2	1.46 V	210	38.4	13.4
4	11100.00	47.9 AV	54.0	-6.1	1.46 V	210	34.5	13.4
5	#16650.00	41.3 PK	74.0	-32.7	2.51 V	146	26.0	15.3
6	#16650.00	32.7 AV	54.0	-21.3	2.51 V	146	17.4	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 134	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	*5670.00	105.8 PK			1.60 H	26	101.7	4.1
2	*5670.00	96.6 AV			1.60 H	26	92.5	4.1
3	#5725.00	68.1 PK	74.0	-5.9	1.60 H	26	63.9	4.2
4	#5725.00	50.2 AV	54.0	-3.8	1.60 H	26	46.0	4.2
5	11340.00	47.0 PK	74.0	-27.0	1.42 H	144	33.4	13.6
6	11340.00	43.2 AV	54.0	-10.8	1.42 H	144	29.6	13.6
7	#17010.00	42.2 PK	74.0	-31.8	1.39 H	255	25.7	16.5
8	#17010.00	32.9 AV	54.0	-21.1	1.39 H	255	16.4	16.5
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	*5670.00	114.8 PK			1.02 V	85	110.7	4.1
2	*5670.00	104.0 AV			1.02 V	85	99.9	4.1
3	#5725.00	69.5 PK	74.0	-4.5	1.02 V	85	65.3	4.2
4	**#5725.00**	**53.9 AV**	**54.0**	**-0.1**	**1.02 V**	**85**	**49.7**	**4.2**
5	11340.00	50.9 PK	74.0	-23.1	1.55 V	227	37.3	13.6
6	11340.00	47.4 AV	54.0	-6.6	1.55 V	227	33.8	13.6
7	#17010.00	41.8 PK	74.0	-32.2	2.46 V	165	25.3	16.5
8	#17010.00	33.2 AV	54.0	-20.8	2.46 V	165	16.7	16.5

REMARKS:

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

802.11ac (VHT80)

CHANNEL	TX Channel 58	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	48.6 PK	74.0	-25.4	1.43 H	47	44.6	4.0
2	5150.00	41.6 AV	54.0	-12.4	1.43 H	47	37.6	4.0
3	*5290.00	101.5 PK			1.43 H	47	97.7	3.8
4	*5290.00	93.3 AV			1.43 H	47	89.5	3.8
5	5350.00	55.4 PK	74.0	-18.6	1.43 H	47	51.6	3.8
6	5350.00	44.7 AV	54.0	-9.3	1.43 H	47	40.9	3.8
7	#10580.00	47.3 PK	74.0	-26.7	1.45 H	122	34.2	13.1
8	#10580.00	43.5 AV	54.0	-10.5	1.45 H	122	30.4	13.1
9	15870.00	41.3 PK	74.0	-32.7	1.36 H	234	28.7	12.6
10	15870.00	32.1 AV	54.0	-21.9	1.36 H	234	19.5	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	63.3 PK	74.0	-10.7	1.10 V	22	59.3	4.0
2	5150.00	48.1 AV	54.0	-5.9	1.10 V	22	44.1	4.0
3	*5290.00	109.1 PK			1.10 V	22	105.3	3.8
4	*5290.00	99.2 AV			1.10 V	22	95.4	3.8
5	5350.00	68.6 PK	74.0	-5.4	1.10 V	22	64.8	3.8
6	5350.00	53.6 AV	54.0	-0.4	1.10 V	22	49.8	3.8
7	#10580.00	51.8 PK	74.0	-22.2	1.52 V	222	38.7	13.1
8	#10580.00	48.1 AV	54.0	-5.9	1.52 V	222	35.0	13.1
9	15870.00	40.5 PK	74.0	-33.5	2.51 V	165	27.9	12.6
10	15870.00	32.4 AV	54.0	-21.6	2.51 V	165	19.8	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 106	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	#5470.00	68.1 PK	74.0	-5.9	1.59 H	39	64.1	4.0
2	#5470.00	50.2 AV	54.0	-3.8	1.59 H	39	46.2	4.0
3	*5530.00	100.3 PK			1.59 H	39	96.3	4.0
4	*5530.00	92.3 AV			1.59 H	39	88.3	4.0
5	#5725.00	48.3 PK	74.0	-25.7	1.59 H	39	44.1	4.2
6	#5725.00	36.2 AV	54.0	-17.8	1.59 H	39	32.0	4.2
7	11060.00	47.3 PK	74.0	-26.7	1.42 H	128	34.0	13.3
8	11060.00	43.6 AV	54.0	-10.4	1.42 H	128	30.3	13.3
9	#16590.00	42.2 PK	74.0	-31.8	1.36 H	229	27.0	15.2
10	#16590.00	33.0 AV	54.0	-21.0	1.36 H	229	17.8	15.2
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	#5470.00	68.9 PK	74.0	-5.1	1.00 V	90	64.9	4.0
2	**#5470.00**	**53.9 AV**	**54.0**	**-0.1**	**1.00 V**	**90**	**49.9**	**4.0**
3	*5530.00	108.8 PK			1.00 V	90	104.8	4.0
4	*5530.00	99.1 AV			1.00 V	90	95.1	4.0
5	#5725.00	53.8 PK	74.0	-20.2	1.00 V	90	49.6	4.2
6	#5725.00	41.6 AV	54.0	-12.4	1.00 V	90	37.4	4.2
7	11060.00	51.4 PK	74.0	-22.6	1.50 V	232	38.1	13.3
8	11060.00	47.7 AV	54.0	-6.3	1.50 V	232	34.4	13.3
9	#16590.00	41.5 PK	74.0	-32.5	2.52 V	155	26.3	15.2
10	#16590.00	33.2 AV	54.0	-20.8	2.52 V	155	18.0	15.2

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 122	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	*5610.00	102.0 PK			1.39 H	42	97.8	4.2
2	*5610.00	93.8 AV			1.39 H	42	89.6	4.2
3	#5725.00	68.2 PK	74.0	-5.8	1.39 H	42	64.0	4.2
4	#5725.00	50.0 AV	54.0	-4.0	1.39 H	42	45.8	4.2
5	11220.00	46.7 PK	74.0	-27.3	1.39 H	128	33.4	13.3
6	11220.00	43.2 AV	54.0	-10.8	1.39 H	128	29.9	13.3
7	#16830.00	42.1 PK	74.0	-31.9	1.39 H	245	26.4	15.7
8	#16830.00	32.6 AV	54.0	-21.4	1.39 H	245	16.9	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	*5610.00	111.3 PK			1.00 V	88	107.1	4.2
2	*5610.00	101.9 AV			1.00 V	88	97.7	4.2
3	#5725.00	63.8 PK	74.0	-10.2	1.00 V	88	59.6	4.2
4	**#5725.00**	**53.9 AV**	**54.0**	**-0.1**	**1.00 V**	**88**	**49.7**	**4.2**
5	11220.00	51.7 PK	74.0	-22.3	1.44 V	223	38.4	13.3
6	11220.00	48.1 AV	54.0	-5.9	1.44 V	223	34.8	13.3
7	#16830.00	40.7 PK	74.0	-33.3	2.56 V	163	25.0	15.7
8	#16830.00	32.4 AV	54.0	-21.6	2.56 V	163	16.7	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 60	**DETECTOR FUNCTION**	Quasi-Peak (QP)
FREQUENCY RANGE	30MHz ~ 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	97.29	36.7 QP	43.5	-6.8	2.00 H	92	49.8	-13.1
2	144.12	35.8 QP	43.5	-7.7	2.00 H	276	43.9	-8.1
3	200.50	29.5 QP	43.5	-14.0	1.00 H	270	40.8	-11.3
4	370.49	37.6 QP	46.0	-8.4	1.00 H	116	43.3	-5.7
5	536.78	31.6 QP	46.0	-14.4	1.50 H	351	33.7	-2.1
6	871.81	33.1 QP	46.0	-12.9	1.00 H	176	30.0	3.1
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	**FREQ. (MHz)**	**EMISSION LEVEL (dBuV/m)**	**LIMIT (dBuV/m)**	**MARGIN (dB)**	**ANTENNA HEIGHT (m)**	**TABLE ANGLE (Degree)**	**RAW VALUE (dBuV)**	**CORRECTION FACTOR (dB/m)**
1	98.07	38.5 QP	43.5	-5.0	1.00 V	4	51.5	-13.0
2	125.01	35.2 QP	43.5	-8.3	1.50 V	70	44.8	-9.6
3	200.55	28.2 QP	43.5	-15.3	1.00 V	9	39.5	-11.3
4	345.88	31.3 QP	46.0	-14.7	1.50 V	250	37.5	-6.2
5	375.00	37.8 QP	46.0	-8.2	1.50 V	259	43.4	-5.6
6	516.16	33.4 QP	46.0	-12.6	1.00 V	162	35.8	-2.4

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

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	Nov. 01, 2017	Oct. 31, 2018
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 03, 2017	June 02, 2018
50 ohms Terminator	N/A	EMC-02	Sep. 22, 2017	Sep. 21, 2018
RF Cable	5D-FB	COCCAB-001	Sep. 29, 2017	Sep. 28, 2018
10 dB PAD Mini-Circuits	HAT-10+	CONATT-004	June 18, 2017	June 17, 2018
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: Jan. 10, 2018

4.2.3 Test Procedure

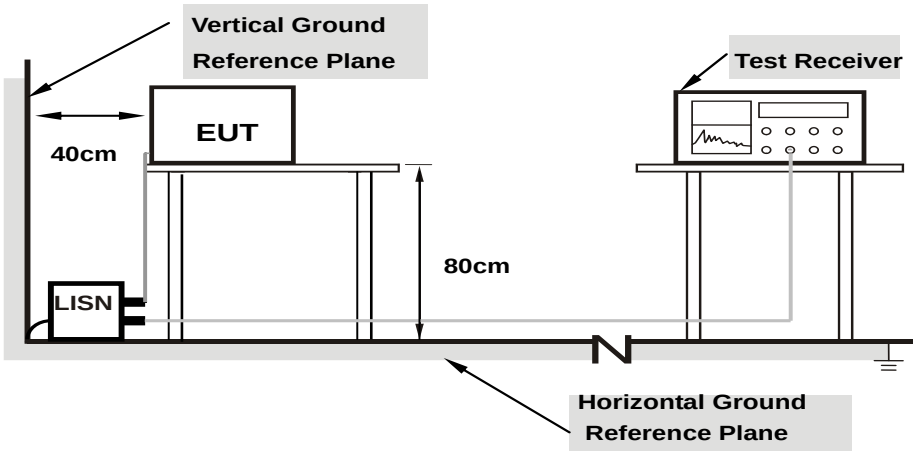
a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling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

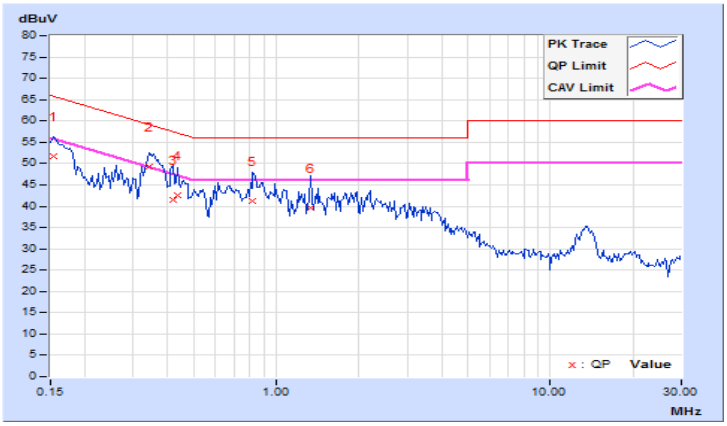
4.2.7 Test Results (Mode 1)

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	0.15391	10.14	41.55	30.44	51.69	40.58	65.79	55.79	-14.10	-15.21
2	**0.34531**	**10.19**	**39.17**	**34.72**	**49.36**	**44.91**	**59.07**	**49.07**	**-9.71**	**-4.16**
3	0.41953	10.20	31.16	23.32	41.36	33.52	57.46	47.46	-16.10	-13.94
4	0.43516	10.20	32.35	23.29	42.55	33.49	57.15	47.15	-14.60	-13.66
5	0.82188	10.24	30.98	23.60	41.22	33.84	56.00	46.00	-14.78	-12.16
6	1.32813	10.27	29.44	19.46	39.71	29.73	56.00	46.00	-16.29	-16.27

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

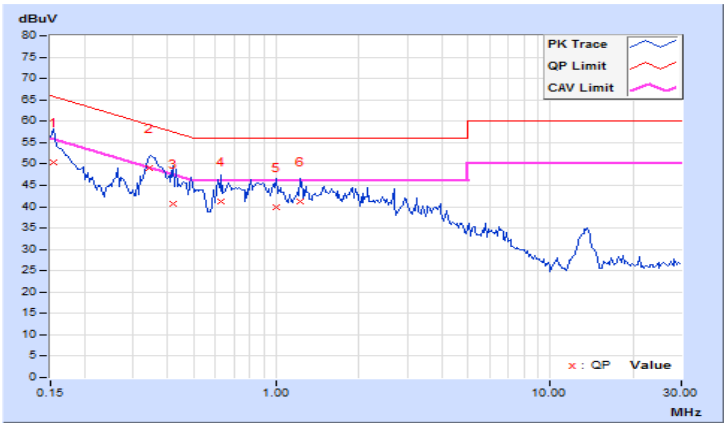


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)

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	0.15391	10.05	40.33	29.32	50.38	39.37	65.79	55.79	-15.41	-16.42
2	0.34531	10.09	38.85	34.22	48.94	44.31	59.07	49.07	-10.13	-4.76
3	0.41953	10.10	30.44	23.04	40.54	33.14	57.46	47.46	-16.92	-14.32
4	0.63047	10.11	31.23	25.05	41.34	35.16	56.00	46.00	-14.66	-10.84
5	0.99766	10.12	29.83	22.17	39.95	32.29	56.00	46.00	-16.05	-13.71
6	1.21875	10.13	31.17	23.87	41.30	34.00	56.00	46.00	-14.70	-12.00

Remarks:

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



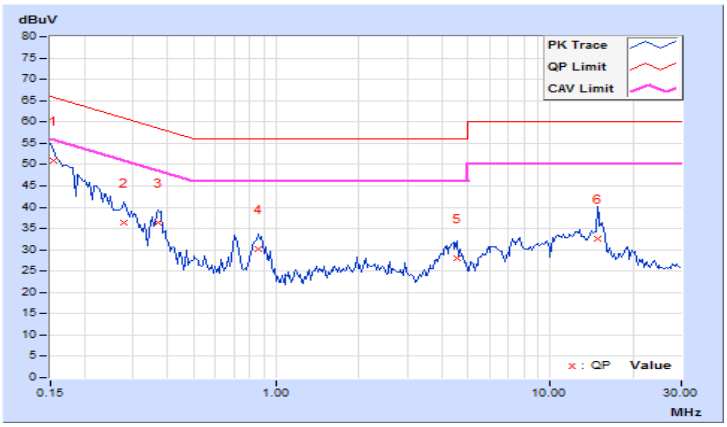
4.2.8 Test Results (Mode 2)

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	0.15391	10.14	40.67	26.50	50.81	36.64	65.79	55.79	-14.98	-19.15
2	0.27891	10.17	26.18	14.58	36.35	24.75	60.85	50.85	-24.50	-26.10
3	0.37266	10.19	26.16	21.33	36.35	31.52	58.44	48.44	-22.09	-16.92
4	0.85703	10.24	19.82	11.52	30.06	21.76	56.00	46.00	-25.94	-24.24
5	4.53906	10.47	17.59	10.99	28.06	21.46	56.00	46.00	-27.94	-24.54
6	14.78906	11.15	21.31	16.78	32.46	27.93	60.00	50.00	-27.54	-22.07

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

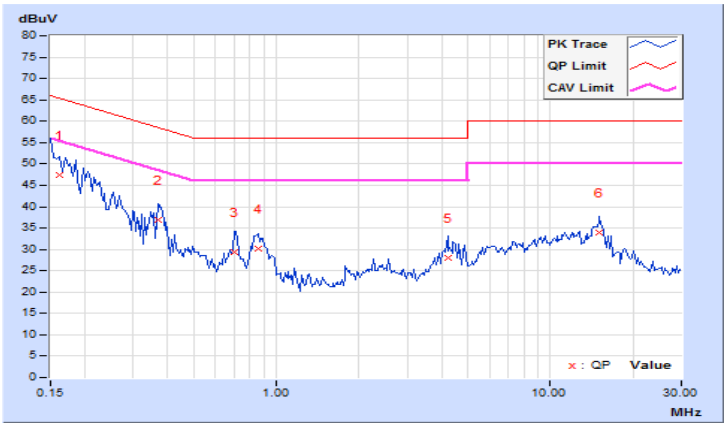


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)

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	0.16172	10.05	37.35	22.21	47.40	32.26	65.38	55.38	-17.98	-23.12
2	0.36875	10.09	26.88	21.52	36.97	31.61	58.53	48.53	-21.56	-16.92
3	0.70469	10.11	19.13	11.88	29.24	21.99	56.00	46.00	-26.76	-24.01
4	0.85703	10.12	19.98	12.82	30.10	22.94	56.00	46.00	-25.90	-23.06
5	4.21094	10.30	17.68	11.64	27.98	21.94	56.00	46.00	-28.02	-24.06
6	15.10547	10.98	23.02	18.33	34.00	29.31	60.00	50.00	-26.00	-20.69

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

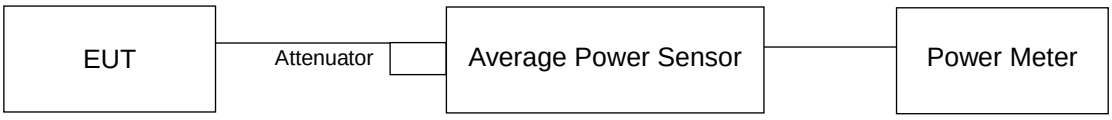
Per KDB 662911 Method of conducted output power measurement on IEEE 802.11 devices,

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 $N_{ANT} \geq 5$.

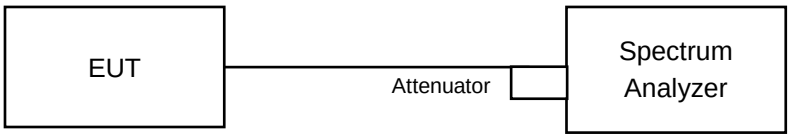
For power measurements on all other devices: Array Gain = 10 log(N_{ANT}/N_{SS}) dB.

4.3.2 Test Setup

FOR POWER OUTPUT MEASUREMENT



FOR 26dB OCCUPIED BANDWIDTH



4.3.3 est Instruments

Refer to section 4.1.2 to get information of above instrument.

4.3.4 Test Procedure

FOR AVERAGE POWER MEASUREMENT

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.

FOR 26dB OCCUPIED BANDWIDTH

1. Set RBW = approximately 1% of the emission bandwidth.
2. Set the VBW > RBW.
3. Detector = Peak.
4. Trace mode = max hold.
5. Measure the maximum width of the emission that is 26 dB down from the peak of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.

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 Results

CDD Mode

802.11a

Power Output:

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
52	5260	20.71	20.67	234.442	23.70	23.90	Pass
60	5300	20.87	20.78	241.854	23.84	24.00	Pass
64	5320	20.66	20.69	233.633	23.69	23.98	Pass
100	5500	20.36	19.30	193.757	22.87	23.88	Pass
116	5580	21.24	20.12	235.847	23.73	23.90	Pass
140	5700	20.47	19.29	196.347	22.93	23.87	Pass

26dB BANDWIDTH:

Channel	Frequency (MHz)	26dBc Bandwidth (MHz)	
		Chain 0	Chain 1
52	5260	19.98	19.54
60	5300	20.18	20.03
64	5320	19.87	19.88
100	5500	19.54	19.43
116	5580	19.75	19.51
140	5700	19.45	19.39

Note: For U_NII-2A, U_NII-2C Band output power limitation is determined based on 26dBc bandwidth.

Power Limit = 11dBm + 10logB < U_NII-2A, U_NII-2C >			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Limit (dBm)
52	5260	19.54	23.9 < 24
60	5300	20.03	24.01 > 24
64	5320	19.87	23.98 < 24
100	5500	19.43	23.88 < 24
116	5580	19.51	23.9 < 24
140	5700	19.39	23.87 < 24

Beamforming Mode

802.11ac (VHT20)

Power Output:

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
52	5260	20.81	20.70	237.994	23.77	23.93	Pass
60	5300	20.77	20.90	242.426	23.85	23.93	Pass
64	5320	20.56	20.53	226.743	23.56	23.93	Pass
100	5500	20.44	19.12	192.32	22.84	23.77	Pass
116	5580	21.22	20.10	234.763	23.71	23.77	Pass
140	5700	20.76	19.69	212.235	23.27	23.77	Pass

Note: 1. For UNII-2A: Directional gain = 6.07dBi > 6dBi, so the power limit shall be reduced to “Determined Conducted Limit-(6.07-6)”.

2. For UNII-2C: Directional gain = 6.23dBi > 6dBi, so the power limit shall be reduced to “Determined Conducted Limit-(6.23-6)”.

26dB BANDWIDTH:

Channel	Frequency (MHz)	26dBc Bandwidth (MHz)	
		Chain 0	Chain 1
52	5260	20.69	20.42
60	5300	20.66	20.75
64	5320	20.66	20.96
100	5500	20.37	20.52
116	5580	20.60	20.51
140	5700	20.50	20.37

Note: For U_NII-2A, U_NII-2C Band output power limitation is determined based on 26dBc bandwidth.

Power Limit = 11dBm + 10logB < U_NII-2A, U_NII-2C >			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Limit (dBm)
52	5260	20.42	24.1 > 24
60	5300	20.66	24.15 > 24
64	5320	20.66	24.15 > 24
100	5500	20.37	24.08 > 24
116	5580	20.51	24.11 > 24
140	5700	20.37	24.08 > 24

802.11ac (VHT40)

POWER OUTPUT:

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
54	5270	20.26	20.63	221.781	23.46	23.93	Pass
62	5310	19.95	20.27	205.269	23.12	23.93	Pass
102	5510	20.33	19.80	203.394	23.08	23.77	Pass
110	5550	20.46	20.12	213.975	23.30	23.77	Pass
134	5670	20.76	19.54	209.074	23.20	23.77	Pass

Note: 1. For UNII-2A: Directional gain = 6.07dBi > 6dBi, so the power limit shall be reduced to “Determined Conducted Limit-(6.07-6)”.

2. For UNII-2C: Directional gain = 6.23dBi > 6dBi, so the power limit shall be reduced to “Determined Conducted Limit-(6.23-6)”.

26dB BANDWIDTH:

Channel	Frequency (MHz)	26dBc Bandwidth (MHz)	
		Chain 0	Chain 1
54	5270	40.86	40.75
62	5310	40.72	40.94
102	5510	40.91	40.88
110	5550	40.82	40.85
134	5670	40.95	40.73

Note: For U_NII-2A, U_NII-2C Band output power limitation is determined based on 26dBc bandwidth.

Power Limit = 11dBm + 10logB < U_NII-2A, U_NII-2C >			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Limit (dBm)
54	5270	40.75	27.1 > 24
62	5310	40.72	27.09 > 24
102	5510	40.88	27.11 > 24
110	5550	40.82	27.1 > 24
134	5670	40.73	27.09 > 24

802.11ac (VHT80)

POWER OUTPUT:

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
58	5290	19.95	19.87	195.906	22.92	23.93	Pass
106	5530	19.99	19.76	194.394	22.89	23.77	Pass
122	5610	20.64	19.37	202.375	23.06	23.77	Pass

Note: 1. For UNII-2A: Directional gain = 6.07dBi > 6dBi, so the power limit shall be reduced to “Determined Conducted Limit-(6.07-6)”.

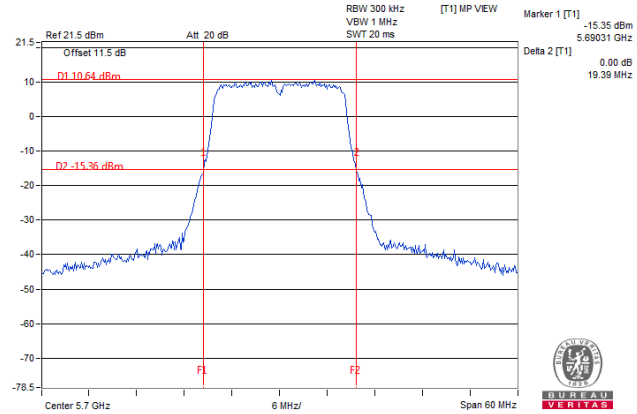
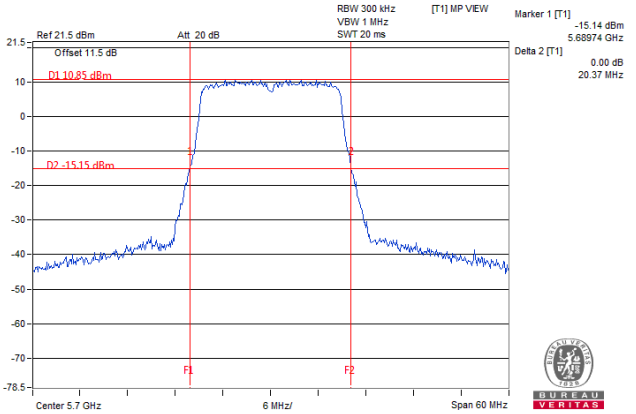
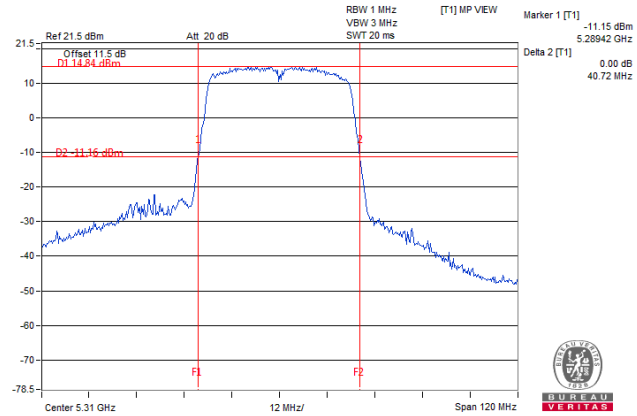
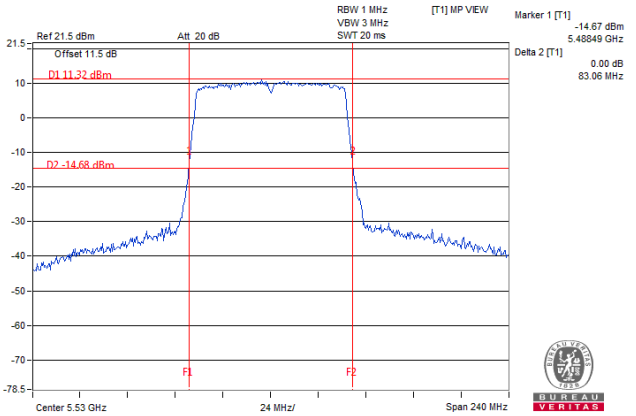
2. For UNII-2C: Directional gain = 6.23dBi > 6dBi, so the power limit shall be reduced to “Determined Conducted Limit-(6.23-6)”.

26dB BANDWIDTH:

Channel	Frequency (MHz)	26dBc Bandwidth (MHz)	
		Chain 0	Chain 1
58	5290	83.83	84.23
106	5530	83.06	83.96
122	5610	84.00	83.82

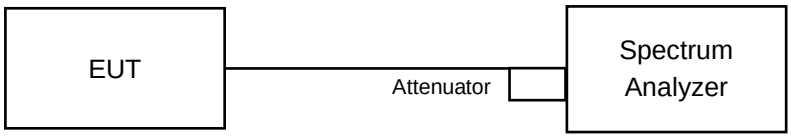
Note: For U_NII-2A, U_NII-2C Band output power limitation is determined based on 26dBc bandwidth.

Power Limit = 11dBm + 10logB < U_NII-2A, U_NII-2C >			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Limit (dBm)
58	5290	83.83	30.23 > 24
106	5530	83.06	30.19 > 24
122	5610	83.82	30.23 > 24

Spectrum Plot of Worst Value	
802.11a / Chain 1 – CH140	**802.11ac (VHT20) / Chain 1 - CH140**
	
802.11ac (VHT40) / Chain 0 – CH62	**802.11ac (VHT80) / Chain 0 - CH106**
	

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
52	5260	16.56	16.56
60	5300	16.56	16.56
64	5320	16.56	16.56
100	5500	16.56	16.44
116	5580	16.56	16.56
140	5700	16.44	16.44

802.11ac (VHT20)

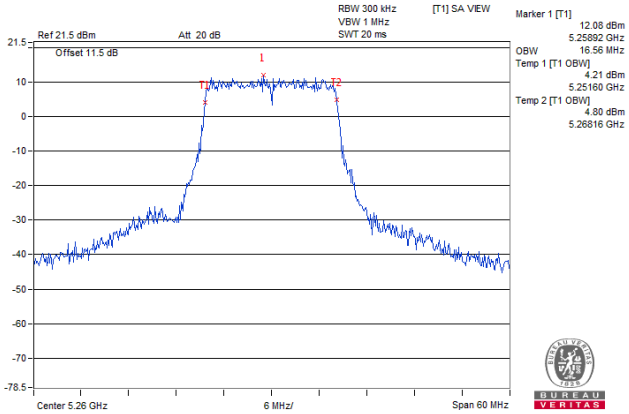
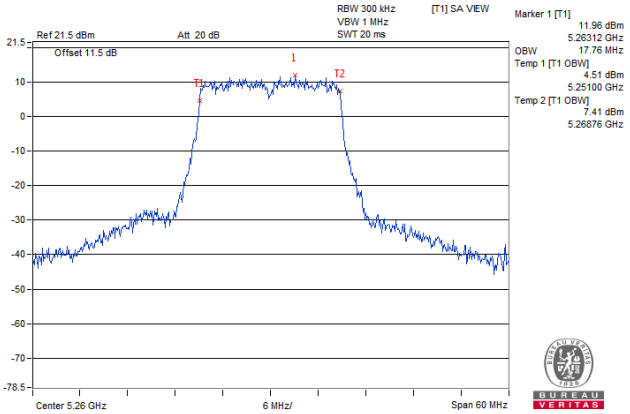
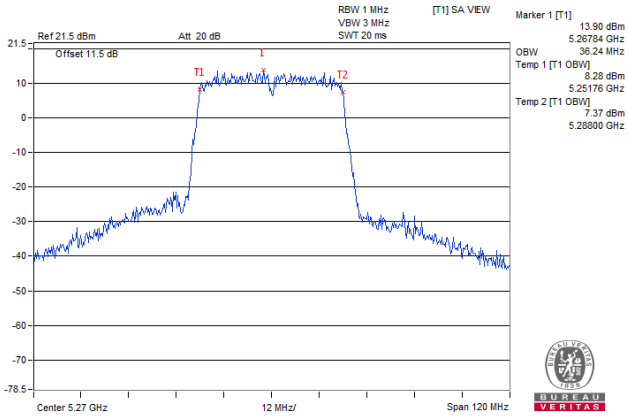
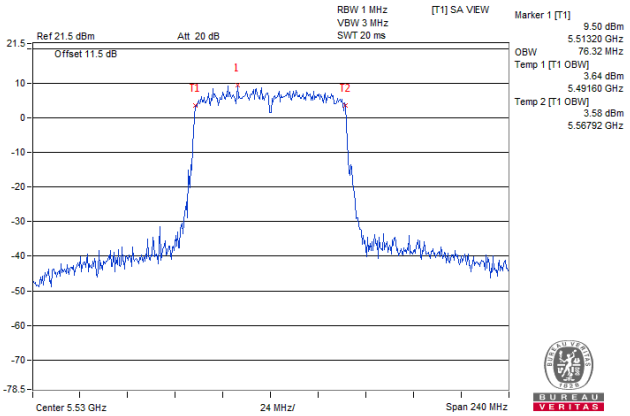
Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
52	5260	17.76	17.76
60	5300	17.76	17.76
64	5320	17.64	17.76
100	5500	17.76	17.64
116	5580	17.64	17.64
140	5700	17.64	17.64

802.11ac (VHT40)

Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
54	5270	36.24	36.24
62	5310	36.24	36.24
102	5510	36.24	36.24
110	5550	36.24	36.24
134	5670	36.24	36.24

802.11ac (VHT80)

Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
58	5290	75.84	75.84
106	5530	76.32	75.36
122	5610	76.32	75.36

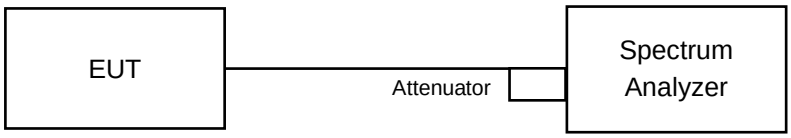
Spectrum Plot of Worst Value	
802.11a_Chain 0 / CH52	**802.11ac (VHT20)_ Chain 0 / CH52**
	
802.11ac (VHT40) _Chain 0 / CH54	**802.11ac (VHT80) _Chain 0 / CH106**
	

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

802.11ac (VHT20)

Using method SA-1

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
6.

802.11a, 802.11ac (VHT40), 802.11ac (VHT80)

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)

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

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				
52	5260	7.48	7.48	0.16	10.65	10.93	Pass
60	5300	7.29	7.27	0.16	10.45	10.93	Pass
64	5320	6.75	7.52	0.16	10.32	10.93	Pass
100	5500	7.21	6.91	0.16	10.23	10.77	Pass
116	5580	8.12	6.89	0.16	10.71	10.77	Pass
140	5700	5.82	4.93	0.16	8.56	10.77	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. For UNII-2A: Directional gain = 6.07dBi > 6dBi, so the power density limit shall be reduced to 11-(6.07-6) = 10.93dBm.
For UNII-2C: Directional gain = 6.23dBi > 6dBi, so the power density limit shall be reduced to 11-(6.23-6) = 10.77dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ac (VHT20)

Chan.	Chan. Freq. (MHz)	PSD (dBm/MHz)		Total Power Density (dBm/MHz)	MAX. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1			
52	5260	7.48	7.39	10.45	10.93	Pass
60	5300	7.32	7.38	10.36	10.93	Pass
64	5320	6.02	7.09	9.60	10.93	Pass
100	5500	7.06	5.67	9.43	10.77	Pass
116	5580	7.76	6.62	10.24	10.77	Pass
140	5700	6.60	5.34	9.03	10.77	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. For UNII-2A: Directional gain = 6.07dBi > 6dBi, so the power density limit shall be reduced to 11-(6.07-6) = 10.93dBm.
For UNII-2C: Directional gain = 6.23dBi > 6dBi, so the power density limit shall be reduced to 11-(6.23-6) = 10.77dBm.

802.11ac (VHT40)

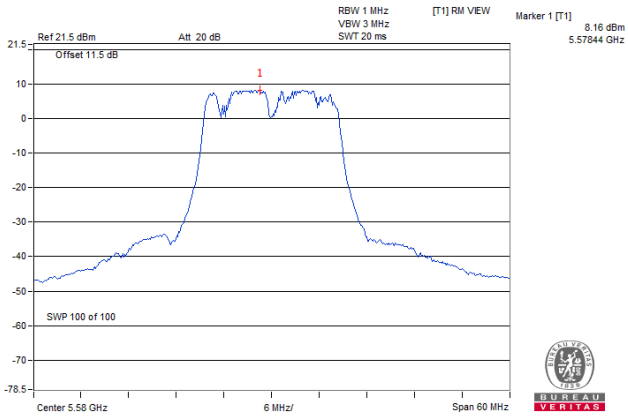
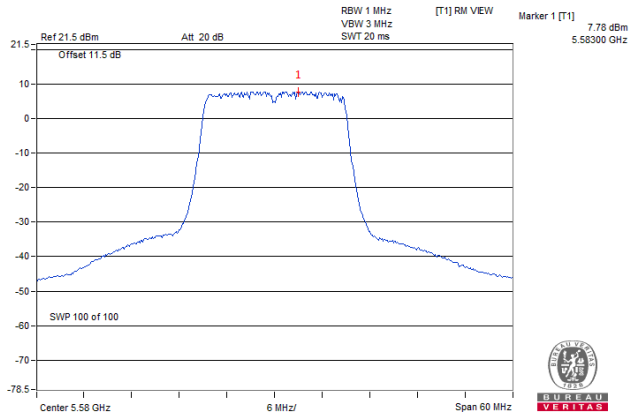
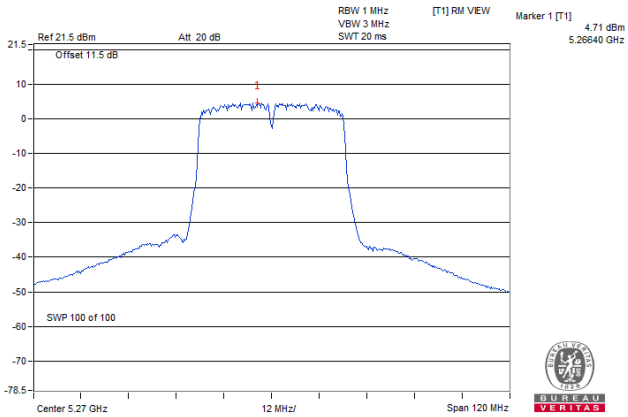
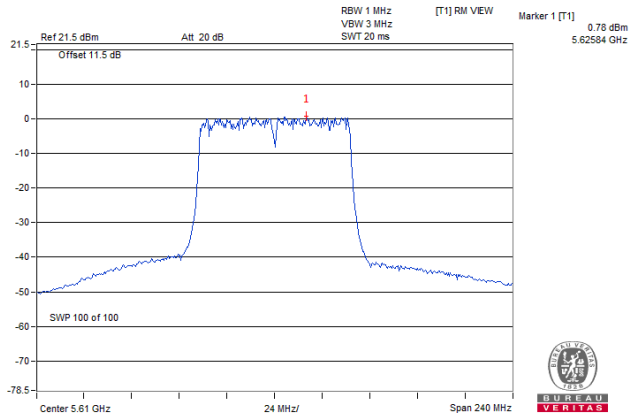
Chan.	Chan. Freq. (MHz)	PSD W/O Duty Factor (dBm/MHz)		Duty Factor (dB)	Total PSD With Duty Factor (dBm/MHz)	MAX. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1				
54	5270	3.97	4.71	0.15	7.52	10.93	Pass
62	5310	3.59	4.32	0.15	7.13	10.93	Pass
102	5510	2.79	1.77	0.15	5.47	10.77	Pass
110	5550	3.91	3.00	0.15	6.64	10.77	Pass
134	5670	3.78	2.11	0.15	6.18	10.77	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. For UNII-2A: Directional gain = 6.07dBi > 6dBi, so the power density limit shall be reduced to 11-(6.07-6) = 10.93dBm.
For UNII-2C: Directional gain = 6.23dBi > 6dBi, so the power density limit shall be reduced to 11-(6.23-6) = 10.77dBm.
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				
58	5290	-0.12	-0.10	0.23	3.13	10.93	Pass
106	5530	-1.83	-1.13	0.23	1.78	10.77	Pass
122	5610	0.78	-0.67	0.23	3.36	10.77	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. For UNII-2A: Directional gain = 6.07dBi > 6dBi, so the power density limit shall be reduced to 11-(6.07-6) = 10.93dBm.
For UNII-2C: Directional gain = 6.23dBi > 6dBi, so the power density limit shall be reduced to 11-(6.23-6) = 10.77dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

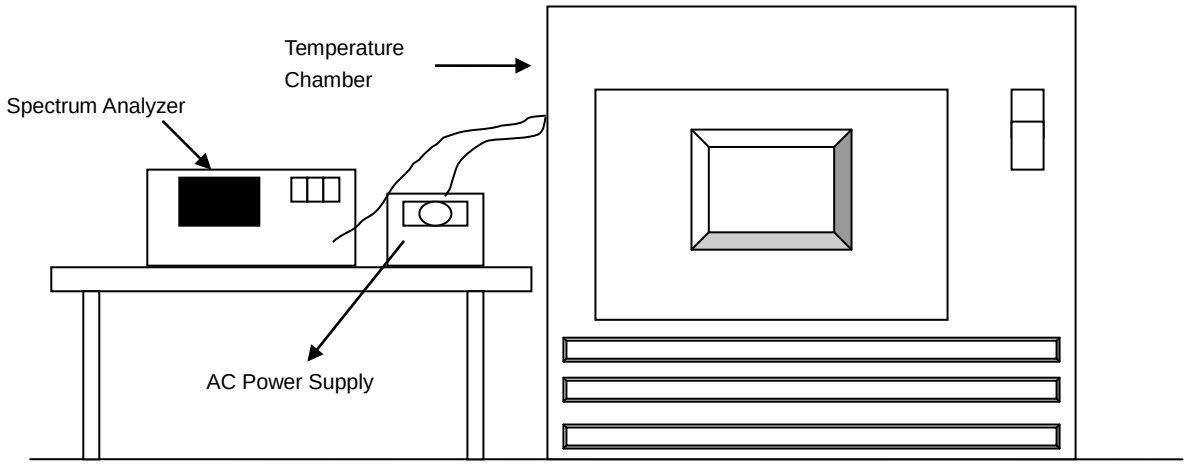
Spectrum Plot of Worst Value	
802.11a_Chain 0 / CH116	**802.11ac (VHT20)_Chain 0 / CH116**
	
802.11ac (VHT40)_Chain 1 / CH54	**802.11ac (VHT80)_Chain 0 / CH122**
	

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: 5260 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	5260	Pass	5259.9999	Pass	5259.9994	Pass	5260.0015	Pass
40	120	5260.025	Pass	5260.0257	Pass	5260.0253	Pass	5260.0214	Pass
30	120	5259.991	Pass	5259.9886	Pass	5259.9865	Pass	5259.9896	Pass
20	120	5259.9856	Pass	5259.9851	Pass	5259.9891	Pass	5259.9881	Pass
10	120	5260.0109	Pass	5260.0097	Pass	5260.0102	Pass	5260.0112	Pass
0	120	5259.9951	Pass	5259.9926	Pass	5259.9934	Pass	5259.9954	Pass
-10	120	5259.9778	Pass	5259.9794	Pass	5259.9783	Pass	5259.9769	Pass
-20	120	5260.0259	Pass	5260.0232	Pass	5260.0267	Pass	5260.0269	Pass
-30	120	5259.9879	Pass	5259.9851	Pass	5259.9851	Pass	5259.988	Pass

Frequency Stability Versus Voltage									
Operating Frequency: 5260 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	5259.9855	Pass	5259.9848	Pass	5259.9895	Pass	5259.9881	Pass
	120	5259.9856	Pass	5259.9851	Pass	5259.9891	Pass	5259.9881	Pass
	102	5259.9852	Pass	5259.9858	Pass	5259.9895	Pass	5259.9873	Pass

5 Pictures of Test Arrangements

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

Appendix – Information on the Testing Laboratories

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

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

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

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