FCC Test Report (DFS Band)

Report No.:	RF170810E01B-1
FCC ID:	2AKCZ-0C3
Test Model:	APL43-0C3
Received Date:	June 01, 2017
Test Date:	June 15 to Aug. 11, 2017
Issued Date:	Nov. 30, 2017
Applicant:	SonicWall Inc.
Address:	5455 Great America Parkway, Santa Clara, CA 95054 USA
Issued By:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch Hsin Chu Laboratory
Lab Address:	E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300, Taiwan R.O.C.
Test Location:	E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300, Taiwan R.O.C.

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Release Control Record

Issue No.	Description	Date Issued
RF170810E01B-1	Original release.	Nov. 30, 2017

1 Certificate of Conformity

Product:	Wireless Access Point
Brand:	SONICWALL
Test Model:	APL43-0C3
Sample Status:	ENGINEERING SAMPLE
Applicant:	SonicWall Inc.
Test Date:	June 15 to Aug. 11, 2017
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:** Nov. 30, 2017

Claire Kuan / Specialist

Approved by : _____ , **Date:** Nov. 30, 2017

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 -8.86dB at 0.34141MHz.
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 -7.9dB at 41.15MHz & 124.01MHz.
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 RSMA 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	1.84 dB
Radiated Emissions up to 1 GHz	30MHz ~ 1GHz	5.32 dB
Radiated Emissions above 1 GHz	1GHz ~ 6GHz	5.14 dB
	6GHz ~ 18GHz	5.04 dB
	18GHz ~ 40GHz	5.25 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT (DFS Band)

Product	Wireless Access Point
Brand	SONICWALL
Test Model	APL43-0C3
Status of EUT	ENGINEERING SAMPLE
Power Supply Rating	48-55Vdc (POE)
Modulation Type	256QAM, 64QAM, 16QAM, QPSK, BPSK
Modulation Technology	OFDM
Transfer Rate	802.11a: 54/ 48/ 36/ 24/ 18/ 12/ 9/ 6Mbps 802.11n: up to 600Mbps 802.11ac: up to 1733Mbps
Operating Frequency	5260 ~ 5320MHz, 5500 ~ 5700MHz
Number of Channel	5260 ~ 5320MHz: 802.11a, 802.11n (HT20), 802.11ac (VHT20): 4 802.11n (HT40), 802.11ac (VHT40): 2 802.11ac (VHT80): 1 5500 ~ 5700MHz: 802.11a, 802.11n (HT20), 802.11ac (VHT20): 11 802.11n (HT40), 802.11ac (VHT40): 5 802.11ac (VHT80): 2
Output Power	Radio 2: **5.26GHz ~ 5.32GHz:** **CDD Mode:** 71.48mW **Beamforming Mode:** 45.74mW **5.50GHz ~ 5.70GHz:** **CDD Mode:** 140.987mW **Beamforming Mode:** 45.214mW
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	NA
Data Cable Supplied	NA

Note:

1. This report is prepared for FCC class II change. The difference compared with the Report No.: RF170810E01-1 as the following infomatiion:
   - ◆ Add DFS band <5.26~ 5.32GHz, 5.50 ~ 5.7GHz >.
2. According to above condition, all test items need to be performed. And all data weres verified to meet the requirements.
3. The EUT incorporates a MIMO function.

Band	Modulation Mode	TX Function	Beamforming	Radio
5GHz	802.11a	4TX	Not Support	Radio 2
	802.11n (HT20)	4TX	Support	
	802.11n (HT40)	4TX	Support	
	802.11ac (VHT20)	4TX	Support	
	802.11ac (VHT40)	4TX	Support	
	802.11ac (VHT80)	4TX	Support	

4. The EUT uses following antennas.

Internal antenna										
Type	PIFA									
Connecter	IPEX									
Radio	1				2				3	4
Frequency	2.4GHz				5GHz				2.4GHz	BT-LE
Antenna	1	2	3	4	5	6	7	8	9	10
Gain (dBi)	3.15	3.52	3.39	4.57	4.92	5.87	5.47	5.95	2.91	3.13

5. Radio 1 & Radio 2 & Radio 3 & BLE technologies can transmit at same time.
6. Spurious emission of the simultaneous operation (2.4GHz, 5GHz and BT LE) has been evaluated and no non-compliance was found.
7. The power settings are list as below.

Modulation Mode	Frequency (MHz)	Power Setting	
		CDD Mode	Beamforming mode
802.11a	5260	7	-
	5300	6.5	-
	5320	6.5	-
	5500	5	-
	5580	5.5	-
	5700	6.5	-
802.11ac (VHT20)	5260	7	7
	5300	7	7
	5320	7	7
	5500	5.5	5.5
	5580	5.5	5.5
	5700	6.5	6.5
802.11ac (VHT40)	5270	10.5	7.5
	5310	10	7
	5510	8.5	5.5
	5550	9	6
	5670	9.5	6.5
802.11ac (VHT80)	5290	8	8
	5530	6.5	6.5
	5610	12	12

8. 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 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	
-	√	√	√	√	-

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 **X-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.

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
802.11ac (VHT20)		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
802.11a	5500-5700	100 to 140	100, 116, 140	OFDM	BPSK	6
802.11ac (VHT20)		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.

CDD Mode						
Mode	FREQ. Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
802.11ac (VHT40)	5260-5320 5500-5700	54 to 62 102 to 134	134	OFDM	BPSK	13.5

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.

CDD Mode						
Mode	FREQ. Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
802.11ac (VHT40)	5260-5320 5500-5700	54 to 62 102 to 134	134	OFDM	BPSK	13.5

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
802.11ac (VHT20)		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
802.11a	5500-5700	100 to 140	100, 116, 140	OFDM	BPSK	6
802.11ac (VHT20)		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
Beamforming Mode (Output power only)						
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:

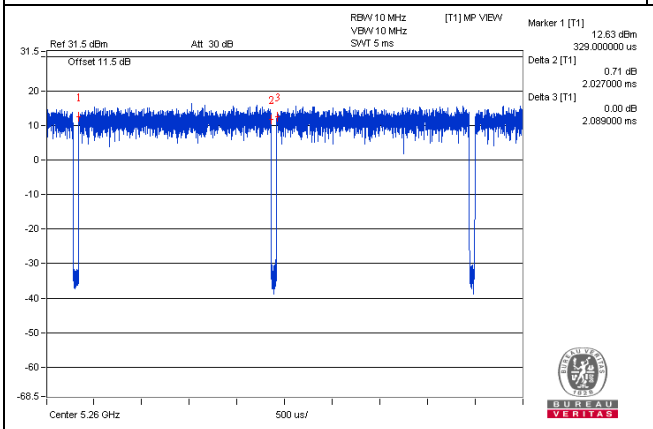
Applicable To	Environmental Conditions	Input Power	Tested By
RE≥1G	25deg. C, 70%RH	120Vac, 60Hz	Andy Ho
RE<1G	22deg. C, 67%RH	120Vac, 60Hz	Weiwei Lo
PLC	25deg. C, 75%RH	120Vac, 60Hz	Andy Ho
APCM	25deg. C, 60%RH	120Vac, 60Hz	Robert Cheng

3.3 Duty Cycle of Test Signal

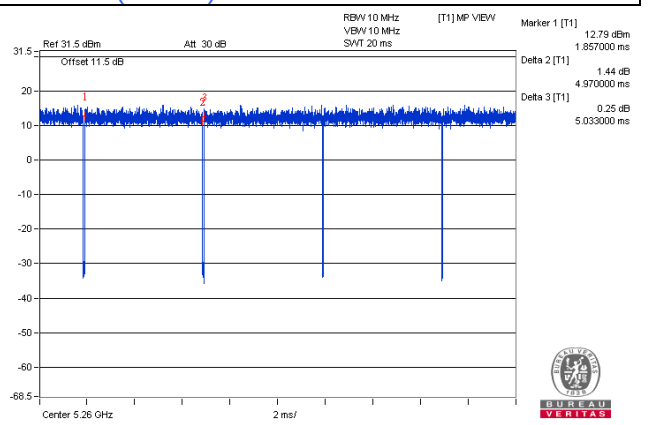
If duty cycle of test signal is ≥ 98 %, duty factor is not required.
If duty cycle of test signal is < 98 %, duty factor is required

802.11a: Duty cycle = 2.027/2.089 = 0.97, Duty factor = 10 * log(1/0.97) = 0.13
802.11ac (VHT20): Duty cycle = 4.97/5.033 = 0.987
802.11ac (VHT40): Duty cycle = 2.415/2.485 = 0.972, Duty factor = 10 * log(1/0.972) = 0.12
802.11ac (VHT80): Duty cycle = 1.135/1.205 = 0.942, Duty factor = 10 * log(1/0.942) = 0.26

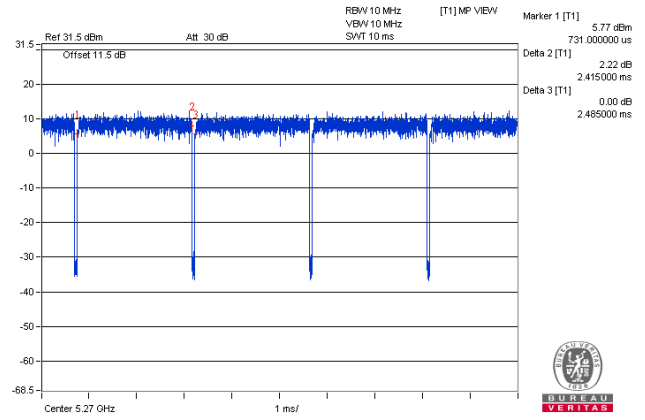
802.11a



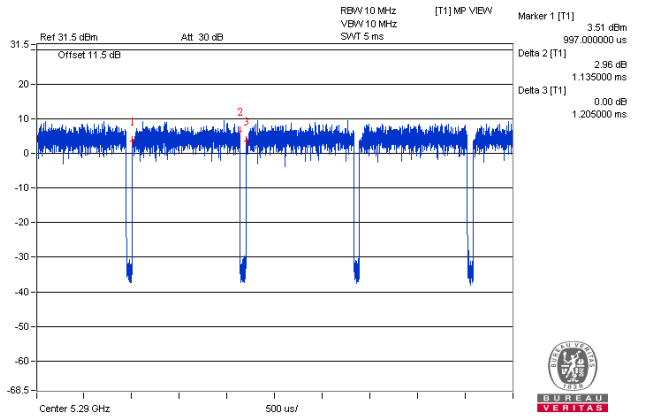
802.11ac (VHT20)



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.	PoE Adapter	Microsemi	PD-9501-10G	NA	NA	Supplied by client
B.	Laptop	DELL	E5430	HYV4VY1	FCC DoC	Provided by Lab
C.	Laptop	DELL	E5430	GM1SKV1	FCC DoC	Provided by Lab
D.	USB Disk 3.0	Transcend	16GB	NA	NA	Provided by Lab

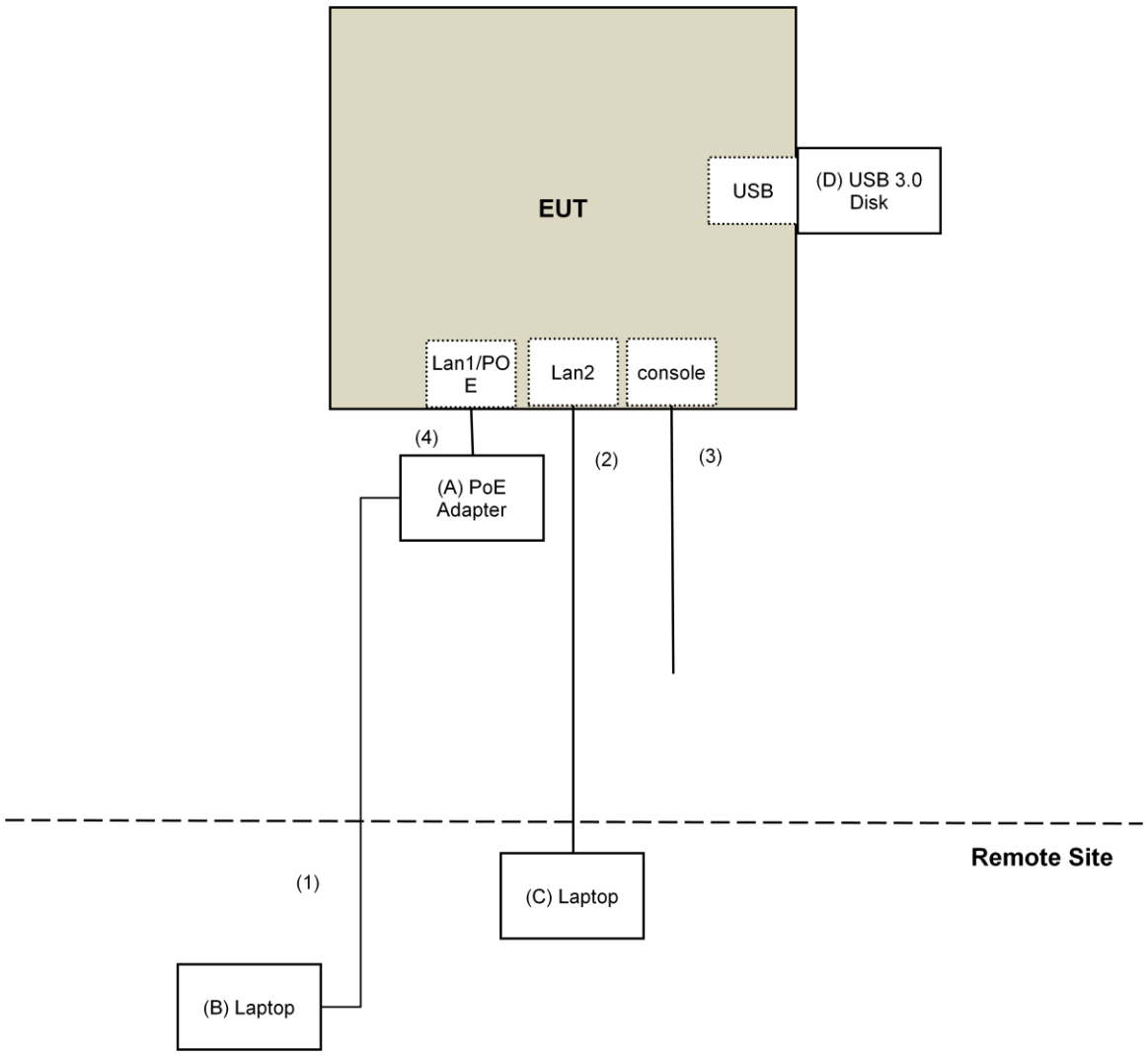
Note:

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

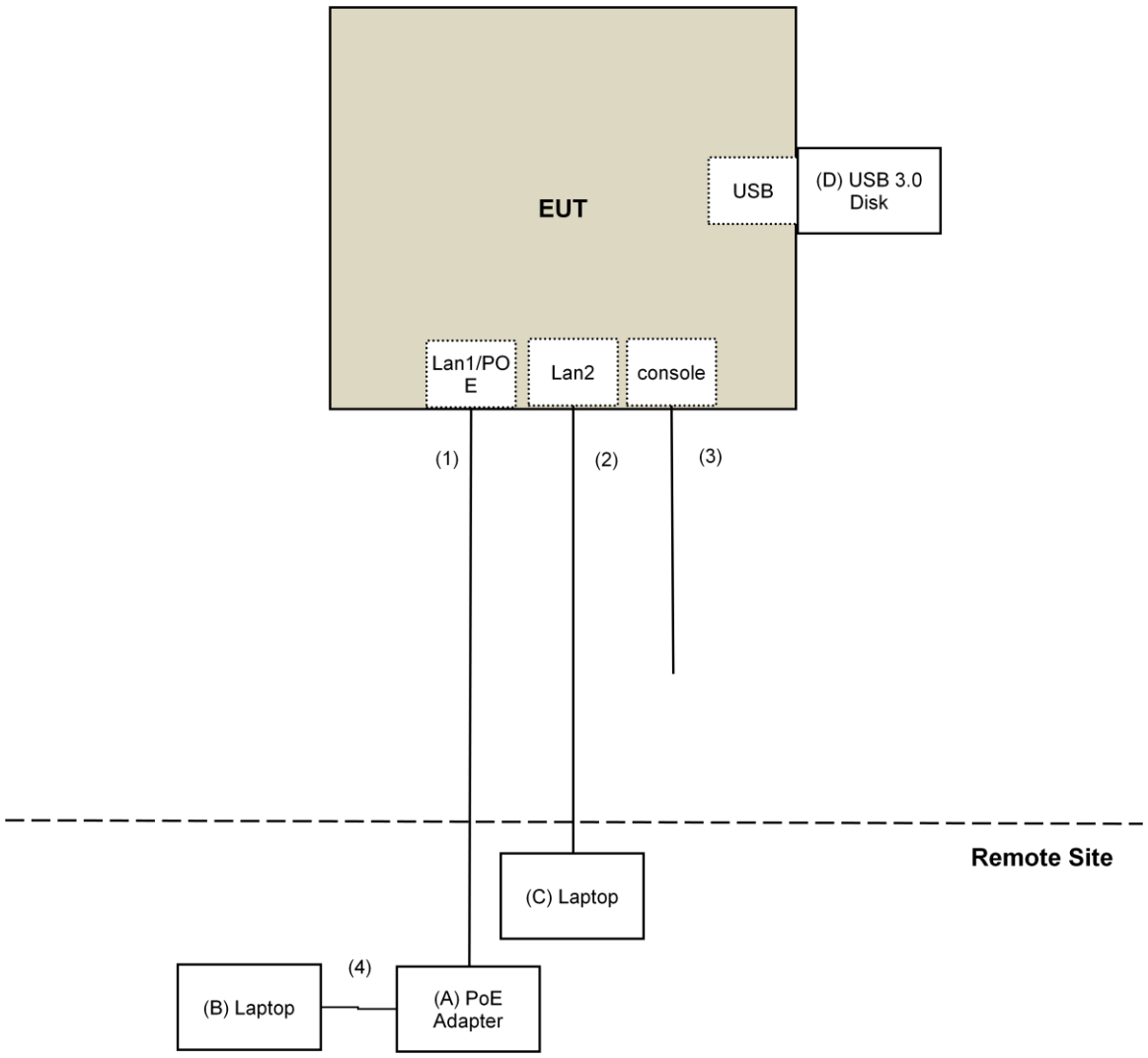
ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	RJ-45 Cable	1	10	No	0	Provided by Lab
2.	RJ-45 Cable	1	10	No	0	Provided by Lab
3.	Console Cable	1	1.6	No	0	Provided by Lab
4.	RJ-45 Cable	1	3	No	0	Provided by Lab

3.4.1 Configuration of System under Test

For conducted emission test:



For other test items:



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 v01r04
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="2">Applicable To</td><td colspan="2">Limit</td></tr>
<tr><td colspan="2" rowspan="2">789033 D02 General UNII Test Procedure New Rules v01r04</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	Aug. 18, 2016	Aug. 17, 2017
Pre-Amplifier(*) EMCI	EMC001340	980142	Jan. 20, 2016	Jan. 19, 2018
Loop Antenna(*) Electro-Metrics	EM-6879	264	Dec. 16, 2016	Dec. 15, 2018
RF Cable	NA	LOOPCAB-001 LOOPCAB-002	Jan. 17, 2017	Jan. 16, 2018
Pre-Amplifier Mini-Circuits	ZFL-1000VH2B	AMP-ZFL-05	May 06, 2017	May 05, 2018
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-361	Dec. 29, 2016	Dec. 28, 2017
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. 05, 2016	Oct. 04, 2017
Horn_Antenna SCHWARZBECK	BBHA9120-D	9120D-406	Dec. 28, 2016	Dec. 27, 2017
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	MY54490570	July 08, 2017	July 07, 2018
Pre-Amplifier EMCI	EMC184045SE	980386	Feb. 02, 2017	Feb. 01, 2018
Horn_Antenna SCHWARZBECK	BBHA 9170	BBHA9170608	Dec. 15, 2016	Dec. 14, 2017
RF Cable	SUCOFLEX 102	36432/2 36433/2	Jan. 15, 2017	Jan. 14, 2018
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 Agilent	E4446A	MY48250253	Dec. 21, 2016	Dec. 20, 2017
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. 11, 2017	Jan. 10, 2018
Digital Multimeter FLUKE	87III	73680266	Nov. 10, 2016	Nov. 09, 2017

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. The FCC Designation Number is TW2022.
5. Tested Date: July 28 to Aug. 01, 2017

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 detect function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

Note:

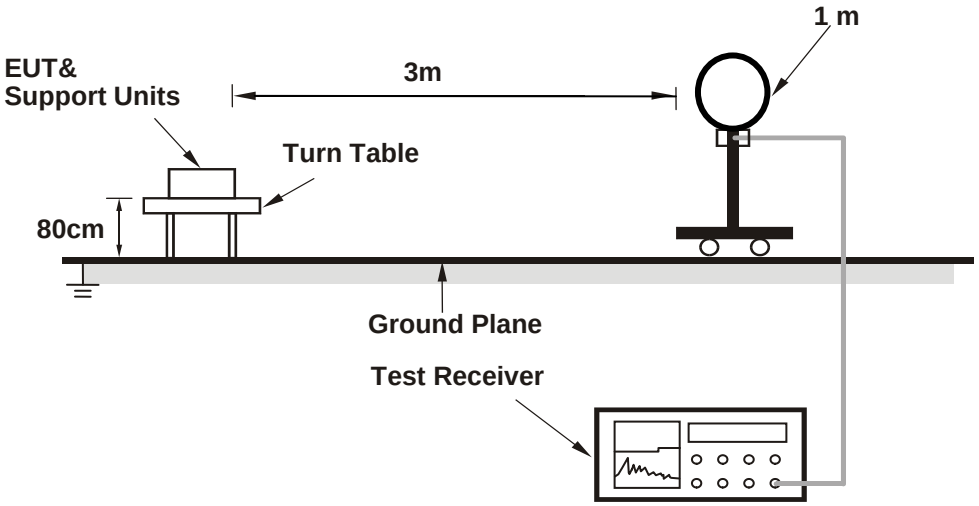
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.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

4.1.4 Deviation from Test Standard

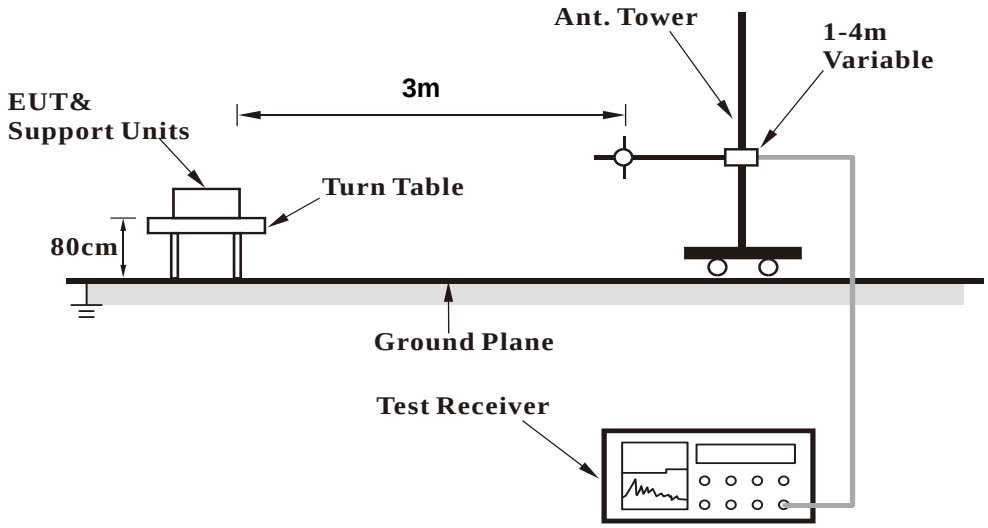
No deviation.

4.1.5 Test Setup

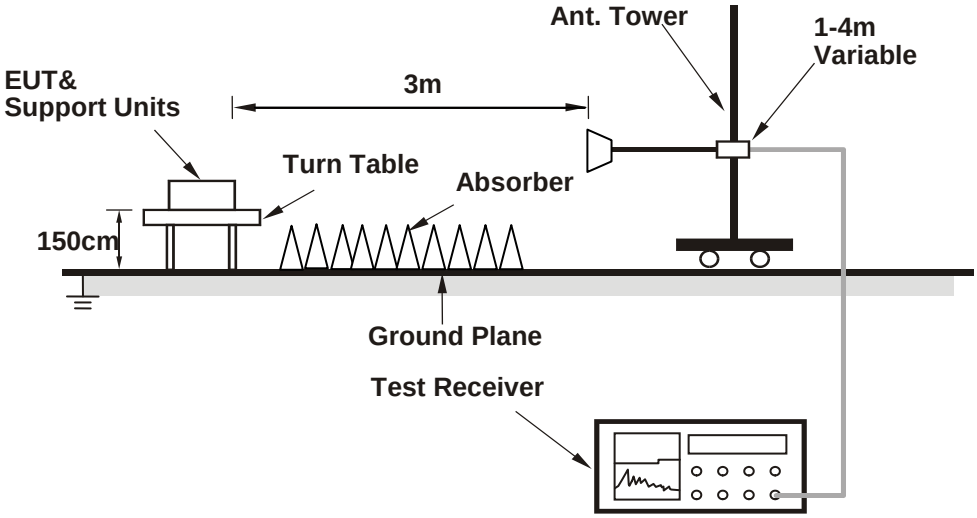
For Radiated emission below 30MHz



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. Contorlling software (QRCT Ver3.0.187.0) 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	42.9 PK	74.0	-31.1	3.40 H	228	39.2	3.7
2	5150.00	31.3 AV	54.0	-22.7	3.40 H	228	27.6	3.7
3	*5260.00	101.3 PK			3.40 H	228	97.3	4.0
4	*5260.00	91.5 AV			3.40 H	228	87.5	4.0
5	#10520.00	53.3 PK	74.0	-20.7	1.49 H	15	40.1	13.2
6	#10520.00	40.3 AV	54.0	-13.7	1.49 H	15	27.1	13.2
7	15780.00	41.1 PK	74.0	-32.9	1.59 H	336	27.5	13.6
8	15780.00	32.2 AV	54.0	-21.8	1.59 H	336	18.6	13.6
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	48.1 PK	74.0	-25.9	3.99 V	265	44.4	3.7
2	5150.00	38.2 AV	54.0	-15.8	3.99 V	265	34.5	3.7
3	*5260.00	107.7 PK			3.99 V	265	103.7	4.0
4	*5260.00	98.6 AV			3.99 V	265	94.6	4.0
5	#10520.00	56.0 PK	74.0	-18.0	2.02 V	221	42.8	13.2
6	#10520.00	42.9 AV	54.0	-11.1	2.02 V	221	29.7	13.2
7	15780.00	43.4 PK	74.0	-30.6	2.74 V	139	29.8	13.6
8	15780.00	32.7 AV	54.0	-21.3	2.74 V	139	19.1	13.6

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. 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	5150.00	41.6 PK	74.0	-32.4	3.38 H	227	37.9	3.7
2	5150.00	32.5 AV	54.0	-21.5	3.38 H	227	28.8	3.7
3	*5300.00	101.1 PK			3.38 H	227	97.0	4.1
4	*5300.00	91.0 AV			3.38 H	227	86.9	4.1
5	5350.00	42.6 PK	74.0	-31.4	3.38 H	227	38.5	4.1
6	5350.00	31.0 AV	54.0	-23.0	3.38 H	227	26.9	4.1
7	10600.00	52.9 PK	74.0	-21.1	1.53 H	16	39.4	13.5
8	10600.00	40.0 AV	54.0	-14.0	1.53 H	16	26.5	13.5
9	15900.00	41.1 PK	74.0	-32.9	1.53 H	335	28.2	12.9
10	15900.00	32.3 AV	54.0	-21.7	1.53 H	335	19.4	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	43.5 PK	74.0	-30.5	2.42 V	230	39.8	3.7
2	5150.00	35.2 AV	54.0	-18.8	2.42 V	230	31.5	3.7
3	*5300.00	107.1 PK			2.42 V	230	103.0	4.1
4	*5300.00	97.9 AV			2.42 V	230	93.8	4.1
5	5350.00	41.0 PK	74.0	-33.0	2.42 V	230	36.9	4.1
6	5350.00	33.6 AV	54.0	-20.4	2.42 V	230	29.5	4.1
7	10600.00	56.5 PK	74.0	-17.5	1.88 V	210	43.0	13.5
8	10600.00	43.3 AV	54.0	-10.7	1.88 V	210	29.8	13.5
9	15900.00	44.5 PK	74.0	-29.5	2.74 V	133	31.6	12.9
10	15900.00	33.4 AV	54.0	-20.6	2.74 V	133	20.5	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.

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	100.8 PK			3.37 H	235	96.7	4.1
2	*5320.00	90.9 AV			3.37 H	235	86.8	4.1
3	5350.00	42.0 PK	74.0	-32.0	3.37 H	235	37.9	4.1
4	5350.00	30.6 AV	54.0	-23.4	3.37 H	235	26.5	4.1
5	10640.00	53.7 PK	74.0	-20.3	1.48 H	15	40.2	13.5
6	10640.00	40.7 AV	54.0	-13.3	1.48 H	15	27.2	13.5
7	15960.00	41.7 PK	74.0	-32.3	1.51 H	323	28.8	12.9
8	15960.00	32.9 AV	54.0	-21.1	1.51 H	323	20.0	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	*5320.00	107.1 PK			3.43 V	96	103.0	4.1
2	*5320.00	98.0 AV			3.43 V	96	93.9	4.1
3	5350.00	47.6 PK	74.0	-26.4	3.43 V	96	43.5	4.1
4	5350.00	38.0 AV	54.0	-16.0	3.43 V	96	33.9	4.1
5	10640.00	55.8 PK	74.0	-18.2	2.01 V	207	42.3	13.5
6	10640.00	43.0 AV	54.0	-11.0	2.01 V	207	29.5	13.5
7	15960.00	44.6 PK	74.0	-29.4	2.71 V	140	31.7	12.9
8	15960.00	33.6 AV	54.0	-20.4	2.71 V	140	20.7	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.

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	42.6 PK	74.0	-31.4	3.37 H	247	38.4	4.2
2	#5470.00	31.1 AV	54.0	-22.9	3.37 H	247	26.9	4.2
3	*5500.00	100.6 PK			3.37 H	247	96.4	4.2
4	*5500.00	90.3 AV			3.37 H	247	86.1	4.2
5	11000.00	53.6 PK	74.0	-20.4	1.48 H	12	39.5	14.1
6	11000.00	40.5 AV	54.0	-13.5	1.48 H	12	26.4	14.1
7	#16500.00	41.5 PK	74.0	-32.5	1.59 H	319	27.0	14.5
8	#16500.00	32.5 AV	54.0	-21.5	1.59 H	319	18.0	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	42.7 PK	74.0	-31.3	2.46 V	267	38.5	4.2
2	#5470.00	32.6 AV	54.0	-21.4	2.46 V	267	28.4	4.2
3	*5500.00	107.0 PK			2.46 V	267	102.8	4.2
4	*5500.00	97.4 AV			2.46 V	267	93.2	4.2
5	11000.00	56.6 PK	74.0	-17.4	2.03 V	203	42.5	14.1
6	11000.00	43.3 AV	54.0	-10.7	2.03 V	203	29.2	14.1
7	#16500.00	44.3 PK	74.0	-29.7	2.78 V	126	29.8	14.5
8	#16500.00	33.4 AV	54.0	-20.6	2.78 V	126	18.9	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 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	#5470.00	42.3 PK	74.0	-31.7	3.33 H	223	38.1	4.2
2	#5470.00	31.1 AV	54.0	-22.9	3.33 H	223	26.9	4.2
3	*5580.00	98.6 PK			3.33 H	223	94.4	4.2
4	*5580.00	90.1 AV			3.33 H	223	85.9	4.2
5	#5725.00	41.7 PK	74.0	-32.3	3.33 H	223	37.3	4.4
6	#5725.00	30.7 AV	54.0	-23.3	3.33 H	223	26.3	4.4
7	11160.00	53.2 PK	74.0	-20.8	1.50 H	26	39.5	13.7
8	11160.00	40.5 AV	54.0	-13.5	1.50 H	26	26.8	13.7
9	#16740.00	41.2 PK	74.0	-32.8	1.56 H	346	25.5	15.7
10	#16740.00	32.5 AV	54.0	-21.5	1.56 H	346	16.8	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	#5470.00	43.8 PK	74.0	-30.2	2.44 V	91	39.6	4.2
2	#5470.00	33.3 AV	54.0	-20.7	2.44 V	91	29.1	4.2
3	*5580.00	105.5 PK			2.44 V	91	101.3	4.2
4	*5580.00	97.3 AV			2.44 V	91	93.1	4.2
5	#5725.00	40.8 PK	74.0	-33.2	2.44 V	91	36.4	4.4
6	#5725.00	30.9 AV	54.0	-23.1	2.44 V	91	26.5	4.4
7	11160.00	55.7 PK	74.0	-18.3	1.99 V	214	42.0	13.7
8	11160.00	42.5 AV	54.0	-11.5	1.99 V	214	28.8	13.7
9	#16740.00	44.1 PK	74.0	-29.9	2.74 V	144	28.4	15.7
10	#16740.00	33.4 AV	54.0	-20.6	2.74 V	144	17.7	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.

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	100.6 PK			3.34 H	239	96.1	4.5
2	*5700.00	90.2 AV			3.34 H	239	85.7	4.5
3	#5725.00	42.4 PK	74.0	-31.6	3.34 H	239	38.0	4.4
4	#5725.00	31.5 AV	54.0	-22.5	3.34 H	239	27.1	4.4
5	11400.00	53.1 PK	74.0	-20.9	1.55 H	3	39.5	13.6
6	11400.00	40.3 AV	54.0	-13.7	1.55 H	3	26.7	13.6
7	#17100.00	41.3 PK	74.0	-32.7	1.59 H	329	23.9	17.4
8	#17100.00	32.4 AV	54.0	-21.6	1.59 H	329	15.0	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	*5700.00	107.5 PK			2.20 V	275	103.0	4.5
2	*5700.00	97.6 AV			2.20 V	275	93.1	4.5
3	#5725.00	51.3 PK	74.0	-22.7	2.20 V	275	46.9	4.4
4	#5725.00	41.5 AV	54.0	-12.5	2.20 V	275	37.1	4.4
5	11400.00	56.2 PK	74.0	-17.8	2.01 V	210	42.6	13.6
6	11400.00	43.0 AV	54.0	-11.0	2.01 V	210	29.4	13.6
7	#17100.00	43.9 PK	74.0	-30.1	2.78 V	146	26.5	17.4
8	#17100.00	33.3 AV	54.0	-20.7	2.78 V	146	15.9	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 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	43.1 PK	74.0	-30.9	3.38 H	225	39.4	3.7
2	5150.00	36.4 AV	54.0	-17.6	3.38 H	225	32.7	3.7
3	*5260.00	103.7 PK			3.38 H	225	99.7	4.0
4	*5260.00	92.0 AV			3.38 H	225	88.0	4.0
5	#10520.00	53.5 PK	74.0	-20.5	1.57 H	28	40.3	13.2
6	#10520.00	40.7 AV	54.0	-13.3	1.57 H	28	27.5	13.2
7	15780.00	41.0 PK	74.0	-33.0	1.60 H	322	27.4	13.6
8	15780.00	32.0 AV	54.0	-22.0	1.60 H	322	18.4	13.6
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	44.2 PK	74.0	-29.8	3.05 V	232	40.5	3.7
2	5150.00	36.9 AV	54.0	-17.1	3.05 V	232	33.2	3.7
3	*5260.00	109.8 PK			3.05 V	232	105.8	4.0
4	*5260.00	98.8 AV			3.05 V	232	94.8	4.0
5	#10520.00	55.6 PK	74.0	-18.4	1.91 V	216	42.4	13.2
6	#10520.00	42.7 AV	54.0	-11.3	1.91 V	216	29.5	13.2
7	15780.00	44.2 PK	74.0	-29.8	2.77 V	118	30.6	13.6
8	15780.00	33.5 AV	54.0	-20.5	2.77 V	118	19.9	13.6

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. 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	103.1 PK			3.40 H	233	99.0	4.1
2	*5300.00	91.2 AV			3.40 H	233	87.1	4.1
3	5350.00	44.4 PK	74.0	-29.6	3.40 H	233	40.3	4.1
4	5350.00	36.4 AV	54.0	-17.6	3.40 H	233	32.3	4.1
5	10600.00	53.2 PK	74.0	-20.8	1.54 H	44	39.7	13.5
6	10600.00	40.4 AV	54.0	-13.6	1.54 H	44	26.9	13.5
7	15900.00	40.6 PK	74.0	-33.4	1.57 H	328	27.7	12.9
8	15900.00	31.8 AV	54.0	-22.2	1.57 H	328	18.9	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	*5300.00	109.2 PK			2.38 V	230	105.1	4.1
2	*5300.00	98.0 AV			2.38 V	230	93.9	4.1
3	5350.00	45.1 PK	74.0	-28.9	2.38 V	230	41.0	4.1
4	5350.00	37.2 AV	54.0	-16.8	2.38 V	230	33.1	4.1
5	10600.00	55.5 PK	74.0	-18.5	1.86 V	229	42.0	13.5
6	10600.00	42.5 AV	54.0	-11.5	1.86 V	229	29.0	13.5
7	15900.00	44.7 PK	74.0	-29.3	2.84 V	133	31.8	12.9
8	15900.00	33.7 AV	54.0	-20.3	2.84 V	133	20.8	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.

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	103.8 PK			3.39 H	224	99.7	4.1
2	*5320.00	92.3 AV			3.39 H	224	88.2	4.1
3	5355.00	47.9 PK	74.0	-26.1	3.39 H	224	43.8	4.1
4	5355.00	36.4 AV	54.0	-17.6	3.39 H	224	32.3	4.1
5	10640.00	53.0 PK	74.0	-21.0	1.59 H	16	39.5	13.5
6	10640.00	40.5 AV	54.0	-13.5	1.59 H	16	27.0	13.5
7	15960.00	41.5 PK	74.0	-32.5	1.62 H	306	28.6	12.9
8	15960.00	32.4 AV	54.0	-21.6	1.62 H	306	19.5	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	*5320.00	109.9 PK			3.36 V	229	105.8	4.1
2	*5320.00	99.1 AV			3.36 V	229	95.0	4.1
3	5355.00	48.6 PK	74.0	-25.4	3.36 V	229	44.5	4.1
4	5355.00	36.7 AV	54.0	-17.3	3.36 V	229	32.6	4.1
5	10640.00	55.3 PK	74.0	-18.7	1.92 V	210	41.8	13.5
6	10640.00	42.6 AV	54.0	-11.4	1.92 V	210	29.1	13.5
7	15960.00	44.0 PK	74.0	-30.0	2.80 V	115	31.1	12.9
8	15960.00	33.3 AV	54.0	-20.7	2.80 V	115	20.4	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.

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	49.1 PK	74.0	-24.9	3.44 H	240	44.9	4.2
2	#5470.00	36.6 AV	54.0	-17.4	3.44 H	240	32.4	4.2
3	*5500.00	101.5 PK			3.44 H	240	97.3	4.2
4	*5500.00	90.1 AV			3.44 H	240	85.9	4.2
5	11000.00	53.6 PK	74.0	-20.4	1.54 H	14	39.5	14.1
6	11000.00	40.6 AV	54.0	-13.4	1.54 H	14	26.5	14.1
7	#16500.00	41.3 PK	74.0	-32.7	1.65 H	317	26.8	14.5
8	#16500.00	32.2 AV	54.0	-21.8	1.65 H	317	17.7	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	49.2 PK	74.0	-24.8	2.44 V	269	45.0	4.2
2	#5470.00	37.3 AV	54.0	-16.7	2.44 V	269	33.1	4.2
3	*5500.00	107.6 PK			2.44 V	269	103.4	4.2
4	*5500.00	96.9 AV			2.44 V	269	92.7	4.2
5	11000.00	55.0 PK	74.0	-19.0	1.83 V	212	40.9	14.1
6	11000.00	42.0 AV	54.0	-12.0	1.83 V	212	27.9	14.1
7	#16500.00	44.1 PK	74.0	-29.9	2.75 V	146	29.6	14.5
8	#16500.00	33.1 AV	54.0	-20.9	2.75 V	146	18.6	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 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	#5470.00	48.9 PK	74.0	-25.1	3.44 H	232	44.7	4.2
2	#5470.00	36.5 AV	54.0	-17.5	3.44 H	232	32.3	4.2
3	*5580.00	100.8 PK			3.44 H	232	96.6	4.2
4	*5580.00	89.2 AV			3.44 H	232	85.0	4.2
5	#5725.00	49.1 PK	74.0	-24.9	3.44 H	232	44.7	4.4
6	#5725.00	36.4 AV	54.0	-17.6	3.44 H	232	32.0	4.4
7	11160.00	53.1 PK	74.0	-20.9	1.55 H	20	39.4	13.7
8	11160.00	40.3 AV	54.0	-13.7	1.55 H	20	26.6	13.7
9	#16740.00	41.6 PK	74.0	-32.4	1.65 H	335	25.9	15.7
10	#16740.00	32.4 AV	54.0	-21.6	1.65 H	335	16.7	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	#5470.00	49.5 PK	74.0	-24.5	2.31 V	280	45.3	4.2
2	#5470.00	37.5 AV	54.0	-16.5	2.31 V	280	33.3	4.2
3	*5580.00	106.9 PK			2.31 V	280	102.7	4.2
4	*5580.00	96.0 AV			2.31 V	280	91.8	4.2
5	#5725.00	50.2 PK	74.0	-23.8	2.31 V	280	45.8	4.4
6	#5725.00	36.6 AV	54.0	-17.4	2.31 V	280	32.2	4.4
7	11160.00	54.7 PK	74.0	-19.3	1.93 V	221	41.0	13.7
8	11160.00	42.1 AV	54.0	-11.9	1.93 V	221	28.4	13.7
9	#16740.00	44.4 PK	74.0	-29.6	2.80 V	127	28.7	15.7
10	#16740.00	33.5 AV	54.0	-20.5	2.80 V	127	17.8	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.

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	102.1 PK			3.44 H	237	97.6	4.5
2	*5700.00	90.4 AV			3.44 H	237	85.9	4.5
3	#5725.00	50.2 PK	74.0	-23.8	3.44 H	237	45.8	4.4
4	#5725.00	38.5 AV	54.0	-15.5	3.44 H	237	34.1	4.4
5	11400.00	53.6 PK	74.0	-20.4	1.53 H	34	40.0	13.6
6	11400.00	40.8 AV	54.0	-13.2	1.53 H	34	27.2	13.6
7	#17100.00	40.9 PK	74.0	-33.1	1.63 H	338	23.5	17.4
8	#17100.00	32.1 AV	54.0	-21.9	1.63 H	338	14.7	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	*5700.00	108.2 PK			2.51 V	278	103.7	4.5
2	*5700.00	97.2 AV			2.51 V	278	92.7	4.5
3	#5725.00	56.6 PK	74.0	-17.4	2.51 V	278	52.2	4.4
4	**#5725.00**	**45.3 AV**	**54.0**	**-8.7**	**2.51 V**	**278**	**40.9**	**4.4**
5	11400.00	55.9 PK	74.0	-18.1	1.91 V	226	42.3	13.6
6	11400.00	42.9 AV	54.0	-11.1	1.91 V	226	29.3	13.6
7	#17100.00	44.5 PK	74.0	-29.5	2.76 V	144	27.1	17.4
8	#17100.00	33.6 AV	54.0	-20.4	2.76 V	144	16.2	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 (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	46.5 PK	74.0	-27.5	2.85 H	237	42.8	3.7
2	5150.00	36.4 AV	54.0	-17.6	2.85 H	237	32.7	3.7
3	*5270.00	104.0 PK			2.85 H	237	100.0	4.0
4	*5270.00	93.8 AV			2.85 H	237	89.8	4.0
5	5350.00	46.5 PK	74.0	-27.5	2.85 H	237	42.4	4.1
6	5350.00	36.3 AV	54.0	-17.7	2.85 H	237	32.2	4.1
7	#10540.00	53.2 PK	74.0	-20.8	1.47 H	1	39.9	13.3
8	#10540.00	40.5 AV	54.0	-13.5	1.47 H	1	27.2	13.3
9	15810.00	41.8 PK	74.0	-32.2	1.56 H	353	28.4	13.4
10	15810.00	32.6 AV	54.0	-21.4	1.56 H	353	19.2	13.4
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	47.7 PK	74.0	-26.3	3.19 V	231	44.0	3.7
2	5150.00	37.6 AV	54.0	-16.4	3.19 V	231	33.9	3.7
3	*5270.00	110.1 PK			3.19 V	231	106.1	4.0
4	*5270.00	100.6 AV			3.19 V	231	96.6	4.0
5	5350.00	46.9 PK	74.0	-27.1	3.19 V	231	42.8	4.1
6	5350.00	36.4 AV	54.0	-17.6	3.19 V	231	32.3	4.1
7	#10540.00	54.4 PK	74.0	-19.6	1.85 V	221	41.1	13.3
8	#10540.00	41.8 AV	54.0	-12.2	1.85 V	221	28.5	13.3
9	15810.00	43.9 PK	74.0	-30.1	2.75 V	143	30.5	13.4
10	15810.00	32.9 AV	54.0	-21.1	2.75 V	143	19.5	13.4

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. 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	102.7 PK			2.86 H	249	98.6	4.1
2	*5310.00	92.5 AV			2.86 H	249	88.4	4.1
3	5350.00	46.6 PK	74.0	-27.4	2.86 H	249	42.5	4.1
4	5350.00	36.3 AV	54.0	-17.7	2.86 H	249	32.2	4.1
5	10620.00	53.2 PK	74.0	-20.8	1.47 H	13	39.7	13.5
6	10620.00	40.3 AV	54.0	-13.7	1.47 H	13	26.8	13.5
7	15930.00	42.1 PK	74.0	-31.9	1.61 H	335	29.3	12.8
8	15930.00	33.0 AV	54.0	-21.0	1.61 H	335	20.2	12.8
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5310.00	108.8 PK			2.44 V	230	104.7	4.1
2	*5310.00	99.3 AV			2.44 V	230	95.2	4.1
3	5350.00	49.6 PK	74.0	-24.4	2.44 V	230	45.5	4.1
4	5350.00	39.3 AV	54.0	-14.7	2.44 V	230	35.2	4.1
5	10620.00	55.6 PK	74.0	-18.4	1.80 V	233	42.1	13.5
6	10620.00	42.5 AV	54.0	-11.5	1.80 V	233	29.0	13.5
7	15930.00	43.8 PK	74.0	-30.2	2.80 V	139	31.0	12.8
8	15930.00	33.2 AV	54.0	-20.8	2.80 V	139	20.4	12.8

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. 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)
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	48.4 PK	74.0	-25.6	2.82 H	242	44.2	4.2
2	#5470.00	37.2 AV	54.0	-16.8	2.82 H	242	33.0	4.2
3	*5510.00	99.9 PK			2.82 H	242	95.7	4.2
4	*5510.00	90.3 AV			2.82 H	242	86.1	4.2
5	#5725.00	47.6 PK	74.0	-26.4	2.82 H	242	43.2	4.4
6	#5725.00	36.4 AV	54.0	-17.6	2.82 H	242	32.0	4.4
7	11020.00	54.1 PK	74.0	-19.9	1.57 H	30	40.1	14.0
8	11020.00	41.0 AV	54.0	-13.0	1.57 H	30	27.0	14.0
9	#16530.00	41.0 PK	74.0	-33.0	1.62 H	337	26.1	14.9
10	#16530.00	32.3 AV	54.0	-21.7	1.62 H	337	17.4	14.9
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	#5470.00	49.0 PK	74.0	-25.0	2.52 V	168	44.8	4.2
2	#5470.00	38.9 AV	54.0	-15.1	2.52 V	168	34.7	4.2
3	*5510.00	106.0 PK			2.52 V	168	101.8	4.2
4	*5510.00	97.1 AV			2.52 V	168	92.9	4.2
5	#5725.00	48.3 PK	74.0	-25.7	2.52 V	168	43.9	4.4
6	#5725.00	36.7 AV	54.0	-17.3	2.52 V	168	32.3	4.4
7	11020.00	55.8 PK	74.0	-18.2	1.89 V	225	41.8	14.0
8	11020.00	42.7 AV	54.0	-11.3	1.89 V	225	28.7	14.0
9	#16530.00	43.6 PK	74.0	-30.4	2.74 V	151	28.7	14.9
10	#16530.00	32.7 AV	54.0	-21.3	2.74 V	151	17.8	14.9

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 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	#5470.00	46.2 PK	74.0	-27.8	2.77 H	229	42.0	4.2
2	#5470.00	36.3 AV	54.0	-17.7	2.77 H	229	32.1	4.2
3	*5550.00	101.2 PK			2.77 H	229	97.0	4.2
4	*5550.00	91.2 AV			2.77 H	229	87.0	4.2
5	11100.00	53.6 PK	74.0	-20.4	1.51 H	29	39.8	13.8
6	11100.00	40.9 AV	54.0	-13.1	1.51 H	29	27.1	13.8
7	#16650.00	41.7 PK	74.0	-32.3	1.63 H	347	26.1	15.6
8	#16650.00	32.5 AV	54.0	-21.5	1.63 H	347	16.9	15.6
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	#5470.00	46.5 PK	74.0	-27.5	2.61 V	272	42.3	4.2
2	#5470.00	36.8 AV	54.0	-17.2	2.61 V	272	32.6	4.2
3	*5550.00	107.3 PK			2.61 V	272	103.1	4.2
4	*5550.00	98.0 AV			2.61 V	272	93.8	4.2
5	11100.00	55.7 PK	74.0	-18.3	1.86 V	229	41.9	13.8
6	11100.00	42.8 AV	54.0	-11.2	1.86 V	229	29.0	13.8
7	#16650.00	43.8 PK	74.0	-30.2	2.75 V	156	28.2	15.6
8	#16650.00	33.1 AV	54.0	-20.9	2.75 V	156	17.5	15.6

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 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	101.4 PK			2.79 H	220	97.1	4.3
2	*5670.00	91.1 AV			2.79 H	220	86.8	4.3
3	#5725.00	48.2 PK	74.0	-25.8	2.79 H	220	43.8	4.4
4	#5725.00	37.4 AV	54.0	-16.6	2.79 H	220	33.0	4.4
5	11340.00	53.4 PK	74.0	-20.6	1.50 H	31	39.8	13.6
6	11340.00	40.2 AV	54.0	-13.8	1.50 H	31	26.6	13.6
7	#17010.00	41.4 PK	74.0	-32.6	1.63 H	344	24.3	17.1
8	#17010.00	32.5 AV	54.0	-21.5	1.63 H	344	15.4	17.1
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	*5670.00	107.5 PK			2.18 V	276	103.2	4.3
2	*5670.00	97.9 AV			2.18 V	276	93.6	4.3
3	#5725.00	49.3 PK	74.0	-24.7	2.18 V	276	44.9	4.4
4	#5725.00	38.4 AV	54.0	-15.6	2.18 V	276	34.0	4.4
5	11340.00	55.5 PK	74.0	-18.5	1.87 V	234	41.9	13.6
6	11340.00	42.5 AV	54.0	-11.5	1.87 V	234	28.9	13.6
7	#17010.00	43.7 PK	74.0	-30.3	2.79 V	156	26.6	17.1
8	#17010.00	33.1 AV	54.0	-20.9	2.79 V	156	16.0	17.1

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.

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	46.8 PK	74.0	-27.2	3.18 H	232	43.1	3.7
2	5150.00	36.6 AV	54.0	-17.4	3.18 H	232	32.9	3.7
3	*5290.00	97.7 PK			3.18 H	232	93.6	4.1
4	*5290.00	88.3 AV			3.18 H	232	84.2	4.1
5	5359.30	49.4 PK	74.0	-24.6	3.18 H	232	45.3	4.1
6	5359.30	38.9 AV	54.0	-15.1	3.18 H	232	34.8	4.1
7	#10580.00	53.7 PK	74.0	-20.3	1.57 H	17	40.3	13.4
8	#10580.00	40.7 AV	54.0	-13.3	1.57 H	17	27.3	13.4
9	15870.00	41.9 PK	74.0	-32.1	1.70 H	351	28.9	13.0
10	15870.00	33.0 AV	54.0	-21.0	1.70 H	351	20.0	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	48.7 PK	74.0	-25.3	3.33 V	254	45.0	3.7
2	5150.00	38.5 AV	54.0	-15.5	3.33 V	254	34.8	3.7
3	*5290.00	103.8 PK			3.33 V	254	99.7	4.1
4	*5290.00	95.1 AV			3.33 V	254	91.0	4.1
5	5359.30	55.5 PK	74.0	-18.5	3.33 V	254	51.4	4.1
6	5359.30	45.0 AV	54.0	-9.0	3.33 V	254	40.9	4.1
7	#10580.00	55.5 PK	74.0	-18.5	1.82 V	238	42.1	13.4
8	#10580.00	43.0 AV	54.0	-11.0	1.82 V	238	29.6	13.4
9	15870.00	43.9 PK	74.0	-30.1	2.68 V	117	30.9	13.0
10	15870.00	33.1 AV	54.0	-20.9	2.68 V	117	20.1	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 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	#5463.70	47.2 PK	74.0	-26.8	3.22 H	234	43.0	4.2
2	#5463.70	36.6 AV	54.0	-17.4	3.22 H	234	32.4	4.2
3	*5530.00	95.7 PK			3.22 H	234	91.5	4.2
4	*5530.00	85.4 AV			3.22 H	234	81.2	4.2
5	#5725.00	47.6 PK	74.0	-26.4	3.22 H	234	43.2	4.4
6	#5725.00	36.4 AV	54.0	-17.6	3.22 H	234	32.0	4.4
7	11060.00	53.1 PK	74.0	-20.9	1.51 H	33	39.2	13.9
8	11060.00	40.2 AV	54.0	-13.8	1.51 H	33	26.3	13.9
9	#16590.00	42.5 PK	74.0	-31.5	1.70 H	328	26.9	15.6
10	#16590.00	33.7 AV	54.0	-20.3	1.70 H	328	18.1	15.6
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	#5463.70	53.2 PK	74.0	-20.8	2.43 V	269	49.0	4.2
2	#5463.70	42.6 AV	54.0	-11.4	2.43 V	269	38.4	4.2
3	*5530.00	101.8 PK			2.43 V	269	97.6	4.2
4	*5530.00	92.2 AV			2.43 V	269	88.0	4.2
5	#5725.00	48.9 PK	74.0	-25.1	2.43 V	269	44.5	4.4
6	#5725.00	37.8 AV	54.0	-16.2	2.43 V	269	33.4	4.4
7	11060.00	55.4 PK	74.0	-18.6	1.80 V	236	41.5	13.9
8	11060.00	42.9 AV	54.0	-11.1	1.80 V	236	29.0	13.9
9	#16590.00	43.7 PK	74.0	-30.3	2.75 V	141	28.1	15.6
10	#16590.00	32.7 AV	54.0	-21.3	2.75 V	141	17.1	15.6

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 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	100.5 PK			3.25 H	224	96.1	4.4
2	*5610.00	90.7 AV			3.25 H	224	86.3	4.4
3	#5732.90	46.2 PK	74.0	-27.8	3.25 H	224	41.8	4.4
4	#5732.90	35.7 AV	54.0	-18.3	3.25 H	224	31.3	4.4
5	11220.00	52.8 PK	74.0	-21.2	1.45 H	43	39.1	13.7
6	11220.00	40.1 AV	54.0	-13.9	1.45 H	43	26.4	13.7
7	#16830.00	42.7 PK	74.0	-31.3	1.65 H	327	26.8	15.9
8	#16830.00	34.0 AV	54.0	-20.0	1.65 H	327	18.1	15.9
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	*5610.00	106.6 PK			3.98 V	99	102.2	4.4
2	*5610.00	97.5 AV			3.98 V	99	93.1	4.4
3	#5732.90	50.8 PK	74.0	-23.2	3.98 V	99	46.4	4.4
4	#5732.90	40.3 AV	54.0	-13.7	3.98 V	99	35.9	4.4
5	11220.00	55.5 PK	74.0	-18.5	1.84 V	227	41.8	13.7
6	11220.00	43.1 AV	54.0	-10.9	1.84 V	227	29.4	13.7
7	#16830.00	43.7 PK	74.0	-30.3	2.77 V	128	27.8	15.9
8	#16830.00	32.7 AV	54.0	-21.3	2.77 V	128	16.8	15.9

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.

Below 1GHz Data:

802.11ac (VHT40)

CHANNEL	TX Channel 134	**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	109.35	35.2 QP	43.5	-8.3	1.67 H	353	46.3	-11.1
2	**124.01**	**35.6 QP**	**43.5**	**-7.9**	**3.40 H**	**140**	**45.3**	**-9.7**
3	210.00	29.0 QP	43.5	-14.5	3.86 H	143	40.5	-11.5
4	390.02	31.4 QP	46.0	-14.6	2.20 H	120	37.0	-5.6
5	675.06	34.4 QP	46.0	-11.6	1.67 H	334	34.3	0.1
6	737.01	35.4 QP	46.0	-10.6	3.83 H	220	34.2	1.2
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	**41.15**	**32.1 QP**	**40.0**	**-7.9**	**2.75 V**	**258**	**40.8**	**-8.7**
2	103.58	32.2 QP	43.5	-11.3	2.80 V	273	44.1	-11.9
3	145.58	31.3 QP	43.5	-12.2	1.71 V	329	39.5	-8.2
4	265.02	31.4 QP	46.0	-14.6	2.00 V	90	40.2	-8.8
5	393.01	31.1 QP	46.0	-14.9	1.73 V	330	36.7	-5.6
6	554.00	33.1 QP	46.0	-12.9	2.20 V	300	35.2	-2.1

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

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, 2016	Oct. 23, 2017
Line-Impedance Stabilization Network (for EUT) R&S	ESH3-Z5	848773/004	Oct. 26, 2016	Oct. 25, 2017
Line-Impedance Stabilization Network (for Peripheral) R&S	ENV216	100072	June 03, 2017	June 02, 2018
50 ohms Terminator	N/A	EMC-02	Sep. 29, 2016	Sep. 28, 2017
RF Cable	5D-FB	COCCAB-001	Sep. 30, 2016	Sep. 29, 2017
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 Shielded Room No. 1.
3. Tested Date: Aug. 11, 2017

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.

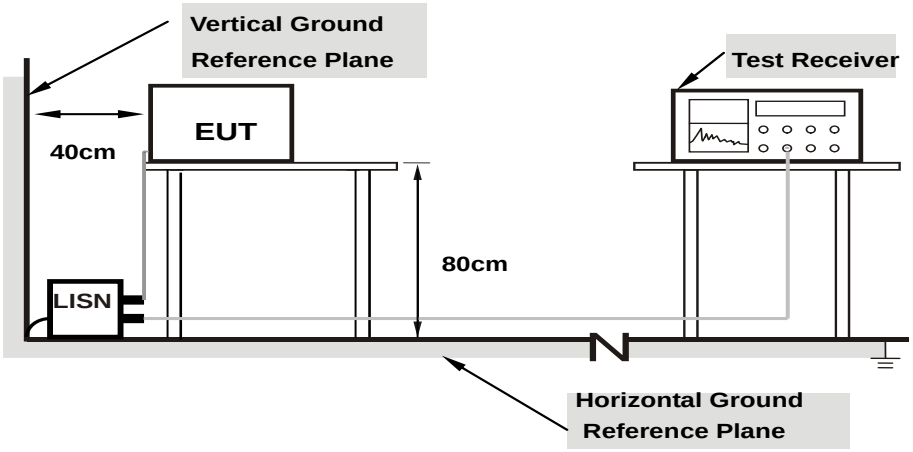
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

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.

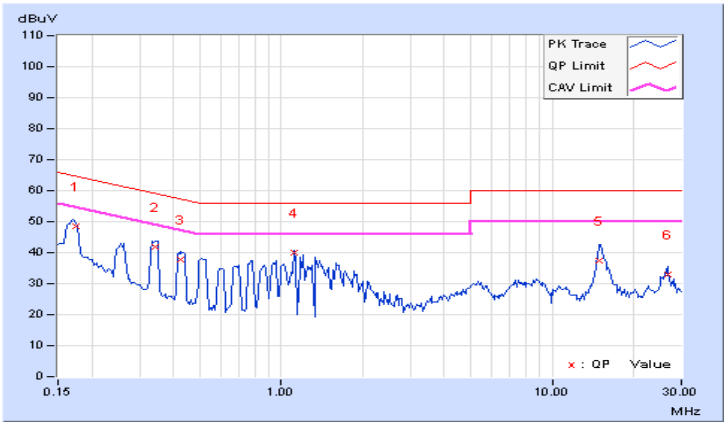
4.2.7 Test Results

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	0.17428	10.07	38.41	34.04	48.48	44.11	64.75	54.75	-16.27	-10.64
2	**0.34141**	**10.10**	**31.75**	**30.21**	**41.85**	**40.31**	**59.17**	**49.17**	**-17.32**	**-8.86**
3	0.42344	10.11	27.84	13.89	37.95	24.00	57.38	47.38	-19.43	-23.38
4	1.11719	10.14	29.99	22.20	40.13	32.34	56.00	46.00	-15.87	-13.66
5	14.96484	10.96	26.53	16.09	37.49	27.05	60.00	50.00	-22.51	-22.95
6	26.60938	11.34	21.45	15.75	32.79	27.09	60.00	50.00	-27.21	-22.91

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.

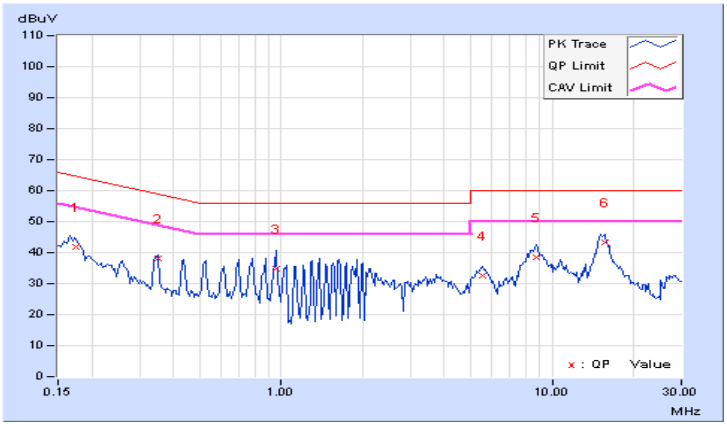


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)

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	0.17363	10.05	31.75	23.93	41.80	33.98	64.78	54.78	-22.98	-20.80
2	0.34922	10.08	27.90	26.59	37.98	36.67	58.98	48.98	-21.00	-12.31
3	0.95469	10.11	24.61	19.50	34.72	29.61	56.00	46.00	-21.28	-16.39
4	5.55078	10.31	22.28	11.49	32.59	21.80	60.00	50.00	-27.41	-28.20
5	8.76563	10.48	28.05	16.57	38.53	27.05	60.00	50.00	-21.47	-22.95
6	15.61719	10.82	32.33	22.70	43.15	33.52	60.00	50.00	-16.85	-16.48

REMARKS:

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



4.3 Transmit Power Measurment

4.3.1 Limits of Transmit Power Measurement

Operation Band	EUT Category		Limit
U-NII-1		Outdoor Wireless 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 Wireless Access Point	1 Watt (30 dBm)
		Indoor Wireless 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

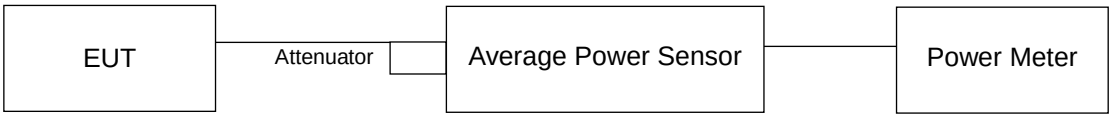
Per KDB 662911 Method of conducted output power measurement on IEEE 802.11 devices,

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(NANT/NSS) dB or 3 dB, whichever is less for 20-MHz channel widths with NANT ≥ 5.

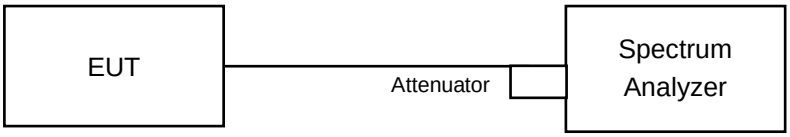
For power measurements on all other devices: Array Gain = 10 log(N_{ANT}/N_{SS}) dB.

4.3.2 Test Setup

FOR POWER OUTPUT MEASUREMENT



FOR 26dB OCCUPIED BANDWIDTH



4.3.3 Test 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 Result

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	Chain 2	Chain 3				
52	5260	8.85	8.20	9.86	10.38	34.878	15.43	23.97	Pass
60	5300	8.87	8.23	9.34	10.73	34.782	15.41	23.97	Pass
64	5320	8.79	8.41	9.06	10.90	34.859	15.42	23.99	Pass
100	5500	8.30	8.91	9.84	9.77	33.663	15.27	24.00	Pass
116	5580	9.50	8.42	9.38	10.12	34.813	15.42	23.98	Pass
140	5700	8.93	9.21	9.78	10.10	35.892	15.55	24.00	Pass

26dB BANDWIDTH:

Channel	Frequency (MHz)	26dBc Bandwidth (MHz)			
		Chain 0	Chain 1	Chain 2	Chain 3
52	5260	19.82	20.57	19.85	19.95
60	5300	19.97	20.13	20.13	19.86
64	5320	19.95	19.94	19.93	20.30
100	5500	19.98	20.05	19.98	20.09
116	5580	20.11	20.29	20.09	19.87
140	5700	20.16	20.02	20.01	19.96

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	19.82	23.97 < 24
60	5300	19.86	23.97 < 24
64	5320	19.93	23.99 < 24
100	5500	19.98	24 = 24
116	5580	19.87	23.98 < 24
140	5700	19.96	24 = 24

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	Chain 2	Chain 3				
52	5260	8.55	7.89	9.50	10.12	32.506	15.12	24.00	Pass
60	5300	8.91	8.36	9.50	10.86	35.738	15.53	24.00	Pass
64	5320	8.81	8.33	8.96	11.11	35.193	15.46	24.00	Pass
100	5500	8.76	9.07	9.80	10.15	35.489	15.50	24.00	Pass
116	5580	9.20	8.22	9.20	9.92	33.09	15.20	24.00	Pass
140	5700	8.74	8.82	9.50	9.84	33.654	15.27	24.00	Pass

26dB BANDWIDTH:

Channel	Frequency (MHz)	26dBc Bandwidth (MHz)			
		Chain 0	Chain 1	Chain 2	Chain 3
52	5260	20.82	20.66	20.80	20.74
60	5300	20.82	20.76	20.97	20.80
64	5320	20.91	20.79	20.77	20.76
100	5500	20.67	20.90	21.00	20.87
116	5580	20.71	21.15	21.07	20.81
140	5700	20.80	21.00	20.73	20.95

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	20.66	24.15 > 24
60	5300	20.76	24.17 > 24
64	5320	20.76	24.17 > 24
100	5500	20.67	24.15 > 24
116	5580	20.71	24.16 > 24
140	5700	20.73	24.16 > 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	Chain 2	Chain 3				
54	5270	11.98	11.29	12.84	13.62	71.48	18.54	24.00	Pass
62	5310	11.71	11.25	12.30	14.04	70.493	18.48	24.00	Pass
102	5510	11.57	12.21	12.51	13.18	69.61	18.43	24.00	Pass
110	5550	12.22	12.69	12.24	12.80	71.054	18.52	24.00	Pass
134	5670	12.12	12.04	12.59	13.16	71.145	18.52	24.00	Pass

26dB BANDWIDTH:

Channel	Frequency (MHz)	26dBc Bandwidth (MHz)			
		Chain 0	Chain 1	Chain 2	Chain 3
54	5270	40.94	40.97	40.86	40.83
62	5310	40.94	40.98	40.78	40.84
102	5510	41.00	41.04	40.95	40.81
110	5550	40.95	40.76	40.82	41.06
134	5670	40.93	41.44	41.01	40.91

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	40.83	27.1 > 24
62	5310	40.78	27.1 > 24
102	5510	40.81	27.1 > 24
110	5550	40.76	27.1 > 24
134	5670	40.91	27.11 > 24

802.11ac (VHT80)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
58	5290	9.87	9.46	10.74	11.86	45.74	16.60	24.00	Pass
106	5530	10.03	9.92	10.71	11.32	45.214	16.55	24.00	Pass
122	5610	15.77	14.80	15.04	16.14	140.987	21.49	24.00	Pass

26dB OCCUPIED BANDWIDTH

Channel	Frequency (MHz)	26dBc Bandwidth (MHz)			
		Chain 0	Chain 1	Chain 2	Chain 3
58	5290	84.68	84.84	84.34	85.38
106	5530	85.42	85.21	85.59	85.17
122	5610	85.55	84.38	85.16	85.22

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	84.34	30.26 > 24
106	5530	85.17	30.3 > 24
122	5610	84.38	30.26 > 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	Chain 2	Chain 3				
52	5260	8.55	7.89	9.50	10.12	32.506	15.12	18.42	Pass
60	5300	8.91	8.36	9.50	10.86	35.738	15.53	18.42	Pass
64	5320	8.81	8.33	8.96	11.11	35.193	15.46	18.42	Pass
100	5500	8.76	9.07	9.80	10.15	35.489	15.50	18.42	Pass
116	5580	9.20	8.22	9.20	9.92	33.09	15.20	18.42	Pass
140	5700	8.74	8.82	9.50	9.84	33.654	15.27	18.42	Pass

Note: 1. Directional gain = 10 log[($10^{G1/20}$ + $10^{G2/20}$ + $10^{G3/20}$ + $10^{G4/20}$)^2 / 4] = 11.58dBi > 6dBi , so the power limit shall be reduced to 24-(11.58-6) = 18.42dBm.

26dB BANDWIDTH:

Channel	Frequency (MHz)	26dBc Bandwidth (MHz)			
		Chain 0	Chain 1	Chain 2	Chain 3
52	5260	20.82	20.66	20.80	20.74
60	5300	20.82	20.76	20.97	20.80
64	5320	20.91	20.79	20.77	20.76
100	5500	20.67	20.90	21.00	20.87
116	5580	20.71	21.15	21.07	20.81
140	5700	20.80	21.00	20.73	20.95

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	20.66	24.15 > 24
60	5300	20.76	24.17 > 24
64	5320	20.76	24.17 > 24
100	5500	20.67	24.15 > 24
116	5580	20.71	24.16 > 24
140	5700	20.73	24.16 > 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	Chain 2	Chain 3				
54	5270	8.87	8.30	9.74	10.60	35.371	15.49	18.42	Pass
62	5310	8.73	8.26	9.19	10.92	34.821	15.42	18.42	Pass
102	5510	8.56	9.13	9.56	10.21	34.894	15.43	18.42	Pass
110	5550	9.23	9.57	9.19	9.81	35.303	15.48	18.42	Pass
134	5670	9.06	8.93	9.60	10.18	35.413	15.49	18.42	Pass

Note: 1. Directional gain = 10 log[($10^{G1/20}$ + $10^{G2/20}$ + $10^{G3/20}$ + $10^{G4/20}$)^2 / 4] = 11.58dBi > 6dBi , so the power limit shall be reduced to 24-(11.58-6) = 18.42dBm.

26dB BANDWIDTH:

Channel	Frequency (MHz)	26dBc Bandwidth (MHz)			
		Chain 0	Chain 1	Chain 2	Chain 3
54	5270	40.94	40.97	40.86	40.83
62	5310	40.94	40.98	40.78	40.84
102	5510	41.00	41.04	40.95	40.81
110	5550	40.95	40.76	40.82	41.06
134	5670	40.93	41.44	41.01	40.91

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	40.83	27.1 > 24
62	5310	40.78	27.1 > 24
102	5510	40.81	27.1 > 24
110	5550	40.76	27.1 > 24
134	5670	40.91	27.11 > 24

802.11ac (VHT80)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)				Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
58	5290	9.87	9.46	10.74	11.86	45.74	16.60	18.42	Pass
106	5530	10.03	9.92	10.71	11.32	45.214	16.55	18.42	Pass
122	5610	9.65	8.79	9.02	10.11	35.031	15.44	18.42	Pass

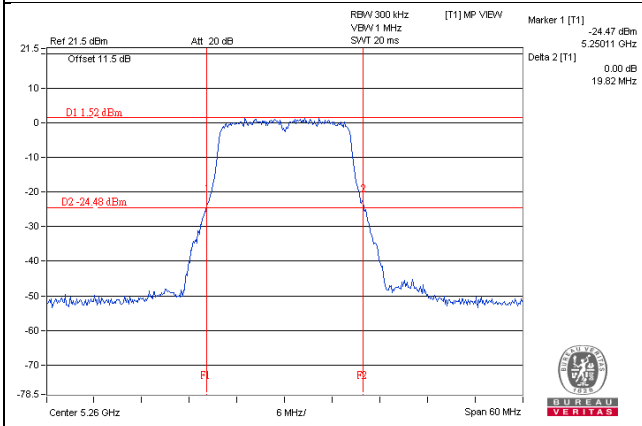
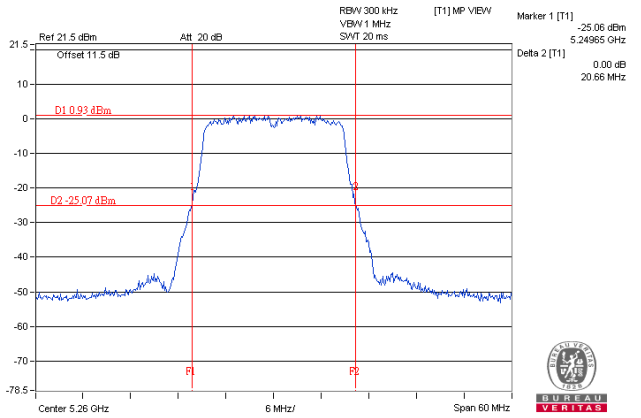
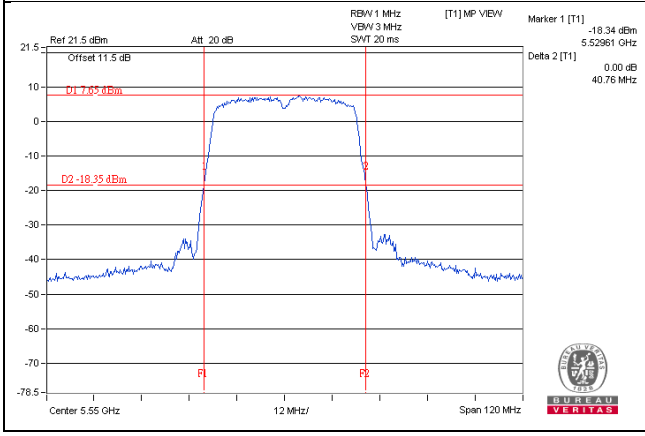
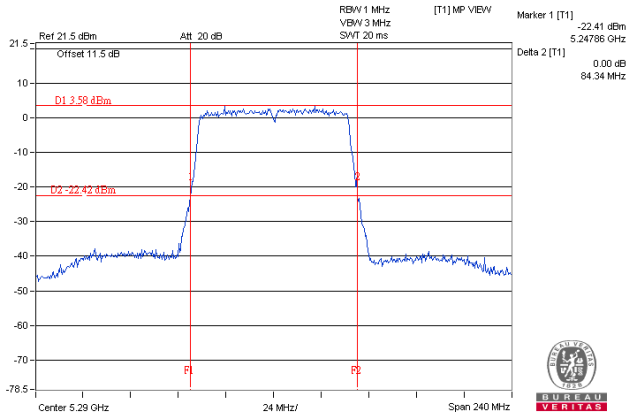
Note: 1. Directional gain = 10 log[($10^{G1/20}$ + $10^{G2/20}$ + $10^{G3/20}$ + $10^{G4/20}$)^2 / 4] = 11.58dBi > 6dBi , so the power limit shall be reduced to 24-(11.58-6) = 18.42dBm.

26dB OCCUPIED BANDWIDTH

Channel	Frequency (MHz)	26dBc Bandwidth (MHz)			
		Chain 0	Chain 1	Chain 2	Chain 3
58	5290	84.68	84.84	84.34	85.38
106	5530	85.42	85.21	85.59	85.17
122	5610	85.55	84.38	85.16	85.22

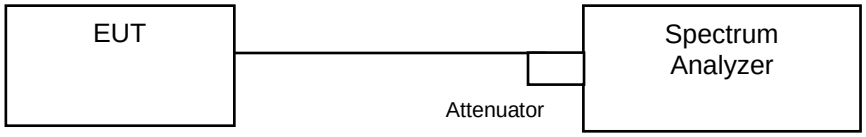
Note: For U-NII-2A, U-NII-2C Band output power limitation is determined based on 26dBc bandwidth

Power Limit = 11dBm + 10logB < U-NII-2A, U-NII-2C >			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Limit (dBm)
58	5290	84.34	30.26 > 24
106	5530	85.17	30.3 > 24
122	5610	84.38	30.26 > 24

Spectrum Plot of Worst Value	
802.11a_Chain 0 / CH52	**802.11ac (VHT20)_Chain 1 / CH52**
	
8802.11ac (VHT40) _Chain 1 / CH110	**802.11ac (VHT80) _Chain 2 / CH58**
	

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	CHAIN 2	CHAIN 3
52	5260	16.44	16.44	16.44	16.56
60	5300	16.44	16.56	16.44	16.56
64	5320	16.44	16.68	16.44	16.56
100	5500	16.56	16.56	16.56	16.56
116	5580	16.44	16.56	16.56	16.44
140	5700	16.56	16.56	16.56	16.56

802.11ac (VHT20)

Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)			
		CHAIN 0	CHAIN 1	CHAIN 2	CHAIN 3
52	5260	17.76	17.64	17.64	17.64
60	5300	17.64	17.76	17.64	17.64
64	5320	17.88	17.64	17.76	17.64
100	5500	17.64	17.76	17.76	17.64
116	5580	17.64	17.76	17.64	17.64
140	5700	17.64	17.76	17.76	17.76

802.11ac (VHT40)

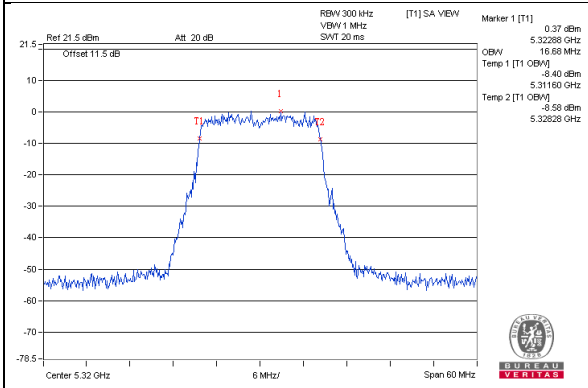
Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)			
		CHAIN 0	CHAIN 1	CHAIN 2	CHAIN 3
54	5270	36.24	36.24	36.24	36.24
62	5310	36.24	36.24	36.24	36.24
102	5510	36.24	36.24	36.24	36.24
110	5550	36.24	36.24	36.00	36.24
134	5670	36.24	36.24	36.24	36.24

802.11ac (VHT80)

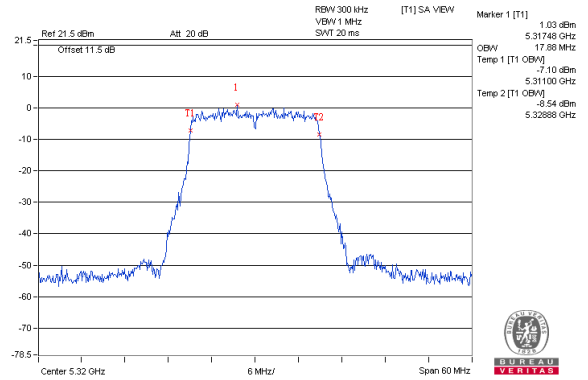
Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)			
		CHAIN 0	CHAIN 1	CHAIN 2	CHAIN 3
58	5290	75.84	76.32	75.84	75.84
106	5530	75.84	75.84	76.32	75.36
122	5610	76.32	76.32	75.84	75.84

Spectrum Plot of Worst Value

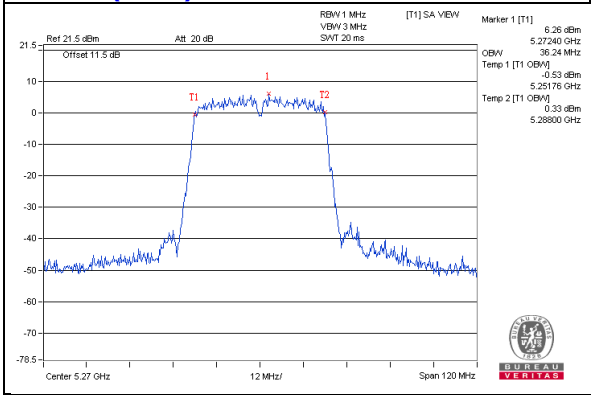
802.11a_Chain 1 / CH64



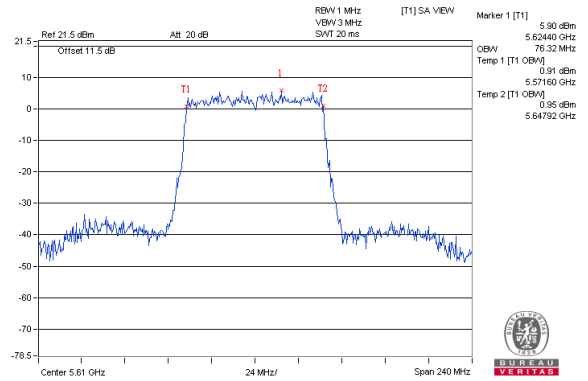
802.11n (HT20)_Chain 0 / CH64



802.11n (HT40)_Chain 0 / CH54



802.11ac (VHT80)_Chain 0 / CH122

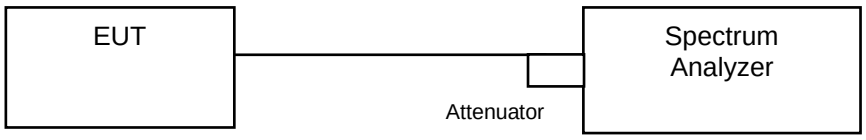


4.5 Peak Power Spectral Density Measurement

4.5.1 Limits of Peak Power Spectral Density Measurement

Operation Band	EUT Category		Limit
U-NII-1		Outdoor Wireless Access Point	17dBm/ MHz
		Fixed point-to-point Wireless Access Point	
		Indoor Wireless 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

802.11a, 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)

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

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)				Duty Factor (dB)	Total PSD With Duty Factor (dBm)	MAX. Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
52	5260	-4.37	-5.37	-3.55	-3.31	0.13	2.07	5.42	Pass
60	5300	-4.01	-4.90	-3.48	-3.01	0.13	2.36	5.42	Pass
64	5320	-4.19	-4.64	-4.37	-2.78	0.13	2.22	5.42	Pass
100	5500	-4.48	-4.01	-2.74	-3.92	0.13	2.41	5.42	Pass
120	5600	-3.70	-4.30	-3.23	-3.94	0.13	2.38	5.42	Pass
140	5700	-3.83	-3.79	-2.94	-4.75	0.13	2.37	5.42	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[$(10^{G1/20} + 10^{G2/20} + 10^{G3/20} + 10^{G4/20})^2$ / 4] = 11.58dBi > 6dBi, so the power density limit shall be reduced to11-(11.58-6) = 5.42dBm.
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	Chain 2	Chain 3			
52	5260	-4.12	-4.90	-3.59	-3.31	2.08	5.42	Pass
60	5300	-4.07	-4.76	-3.69	-3.23	2.12	5.42	Pass
64	5320	-4.22	-4.77	-4.04	-2.77	2.13	5.42	Pass
100	5500	-4.08	-4.11	-3.77	-3.08	2.28	5.42	Pass
120	5600	-3.84	-4.31	-3.73	-3.07	2.31	5.42	Pass
140	5700	-4.21	-4.20	-3.92	-2.92	2.24	5.42	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[$(10^{G1/20} + 10^{G2/20} + 10^{G3/20} + 10^{G4/20})^2$ / 4] = 11.58dBi > 6dBi, so the power density limit shall be reduced to11-(11.58-6) = 5.42dBm.

802.11ac (VHT40)

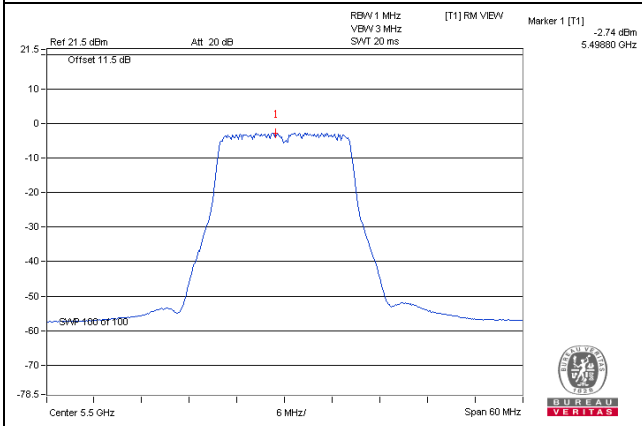
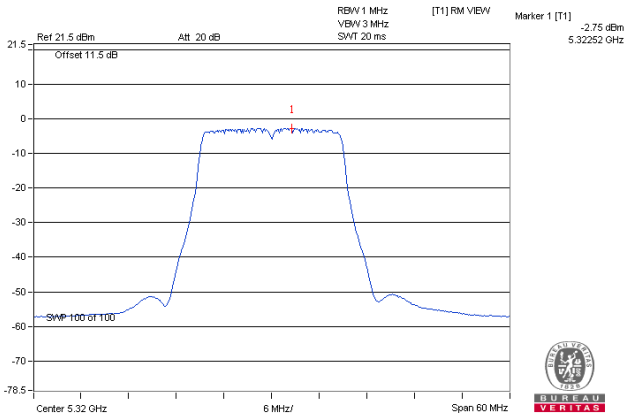
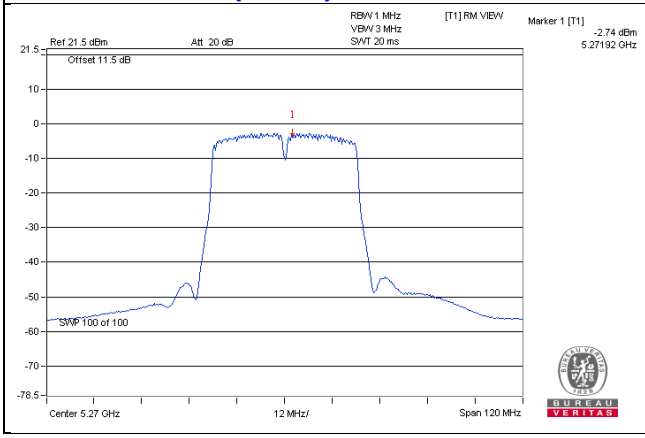
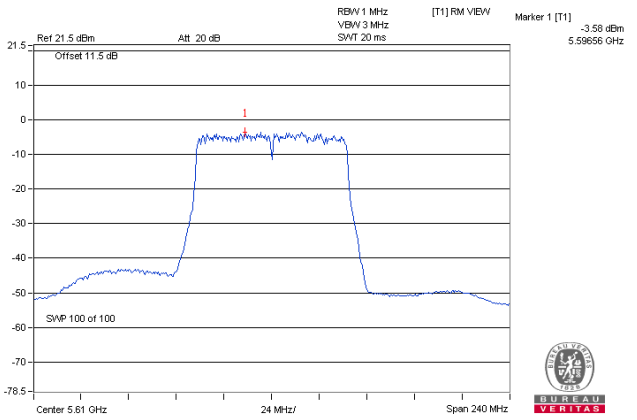
Chan.	Chan. Freq. (MHz)	PSD W/O Duty Factor (dBm)				Duty Factor (dB)	Total PSD With Duty Factor (dBm)	MAX. Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
54	5270	-4.12	-4.55	-3.54	-2.74	0.12	2.46	5.42	Pass
62	5310	-4.66	-4.77	-3.67	-2.84	0.12	2.23	5.42	Pass
102	5510	-4.59	-4.53	-3.75	-2.83	0.12	2.28	5.42	Pass
110	5550	-4.59	-4.27	-3.74	-2.80	0.12	2.35	5.42	Pass
134	5670	-4.35	-4.61	-4.34	-3.24	0.12	2.04	5.42	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[$(10^{G1/20} + 10^{G2/20} + 10^{G3/20} + 10^{G4/20})^2$ / 4] = 11.58dBi > 6dBi, so the power density limit shall be reduced to11-(11.58-6) = 5.42dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ac (VHT80)

Chan.	Chan. Freq. (MHz)	PSD W/O Duty Factor (dBm)				Duty Factor (dB)	Total PSD With Duty Factor (dBm)	MAX. Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2	Chain 3				
58	5290	-10.35	-10.80	-8.84	-8.47	0.26	-3.22	5.42	Pass
106	5530	-10.22	-10.08	-8.67	-8.53	0.26	-3.03	5.42	Pass
122	5610	-5.20	-5.07	-5.27	-3.80	0.26	1.49	5.42	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[$(10^{G1/20} + 10^{G2/20} + 10^{G3/20} + 10^{G4/20})^2$ / 4] = 11.58dBi > 6dBi, so the power density limit shall be reduced to11-(11.58-6) = 5.42dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

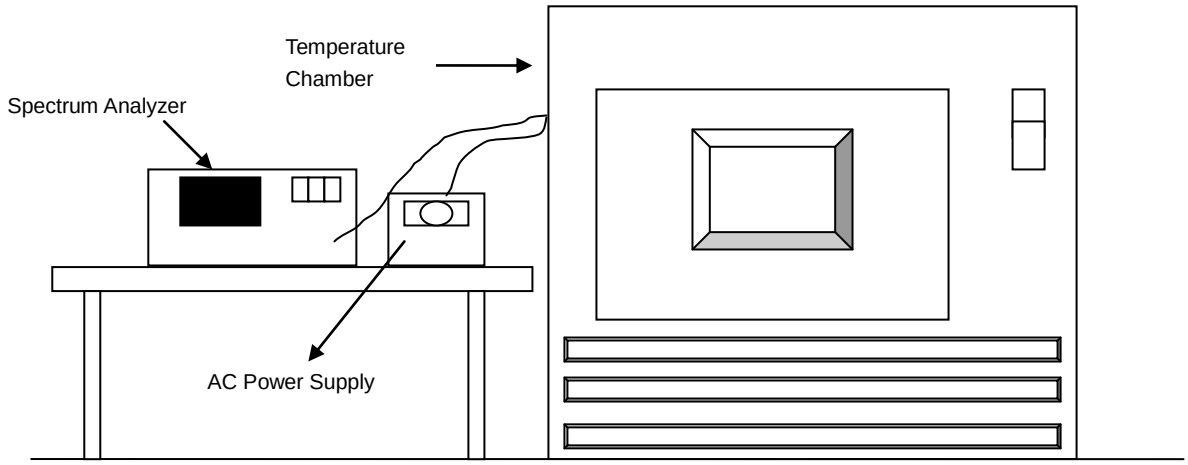
Spectrum Plot of Worst Value	
802.11a_Chain 2 / CH100	**802.11ac (VHT20)_Chain 3 / CH64**
	
802.11ac (VHT40)_Chain 3 / CH54	**802.11ac (VHT80)_Chain 3 / CH122**
	

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.
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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 Minute		5 Minute		10 Minute	
		Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail
50	120	5260.0165	PASS	5260.0183	PASS	5260.0178	PASS	5260.0191	PASS
40	120	5259.9795	PASS	5259.9824	PASS	5259.9794	PASS	5259.9814	PASS
30	120	5260.0097	PASS	5260.008	PASS	5260.0067	PASS	5260.009	PASS
20	120	5260.0048	PASS	5260.0064	PASS	5260.0057	PASS	5260.0034	PASS
10	120	5260.0197	PASS	5260.0185	PASS	5260.0192	PASS	5260.0186	PASS
0	120	5260.022	PASS	5260.0227	PASS	5260.0178	PASS	5260.019	PASS
-10	120	5260.002	PASS	5260.0003	PASS	5260.0014	PASS	5260.0004	PASS
-20	120	5260.0188	PASS	5260.0235	PASS	5260.0221	PASS	5260.0218	PASS
-30	120	5259.9784	PASS	5259.9751	PASS	5259.9767	PASS	5259.9792	PASS

Frequency Stability Versus Voltage									
Operating Frequency: 5260 MHz									
TEMP. (℃)	Power Supply (Vac)	0 Minute		2 Minute		5 Minute		10 Minute	
		Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail
20	138	5260.0044	PASS	5260.0063	PASS	5260.0055	PASS	5260.0037	Pass
	120	5260.0048	PASS	5260.0064	PASS	5260.0057	PASS	5260.0034	Pass
	102	5260.0041	PASS	5260.0072	PASS	5260.0062	PASS	5260.0041	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 accredited and approved according to ISO/IEC 17025.

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

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Web Site: www.bureauveritas-adt.com

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

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