FCC Test Report (DFS Band)

Report No.:	RF180123E04C-1
FCC ID:	KA2COVR2200A1
Test Model:	COVR-2200
Received Date:	Feb. 09, 2018
Test Date:	June 15, 2018
Issued Date:	July 02, 2018
Applicant:	D-LINK Corporation
Address:	17595 Mt. Herrmann, Fountain Valley, California, United States 92708
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
RF180123E04C-1	Original release.	July 02, 2018

1 Certificate of Conformity

Product:	Tri Band Whole Home Wi-Fi Extender
Brand:	D-Link
Test Model:	COVR-2200
Sample Status:	ENGINEERING SAMPLE
Applicant:	D-LINK Corporation
Test Date:	June 15, 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 : Phoenix Huang , **Date:** July 02, 2018

Phoenix Huang / Specialist

Approved by : , **Date:** July 02, 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 -14.20dB at 0.44297MHz.
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 5350.00 MHz & 5470.00MHz.
15.407(a)(1/2/3)	Max Average Transmit Power	Pass	Meet the requirement of limit.
---	Occupied Bandwidth Measurement	-	Reference only.
15.407(a)(1/2/3)	Peak Power Spectral Density	Pass	Meet the requirement of limit.
15.407(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	1.84 dB
Radiated Emissions up to 1 GHz	30MHz ~ 1GHz	5.33 dB
Radiated Emissions above 1 GHz	1GHz ~ 6GHz	5.10 dB
	6GHz ~ 18GHz	4.85 dB
	18GHz ~ 40GHz	5.24 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT (DFS Band)

Product	Tri Band Whole Home Wi-Fi Extender
Brand	D-Link
Test Model	COVR-2200
Status of EUT	ENGINEERING SAMPLE
Power Supply Rating	12Vdc from power adapter
Modulation Type	64QAM, 16QAM, QPSK, BPSK for OFDM 256QAM for OFDM in 11ac mode only
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	**CDD Mode:** **5.26 ~ 5.32GHz:** 249.765mW **5.5 ~ 5.7GHz:** 247.429mW **Beamforming Mode:** **5.26 ~ 5.32GHz:** 181.32mW **5.5 ~ 5.7GHz:** 174.294mW
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	Adapter x1
Data Cable Supplied	NA

Note:

1. This report is prepared for FCC class II change. The difference compared with the Report No.: RF180123E04-1 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. The EUT has below radios as following table:

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

4. Simultaneously transmission condition.

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

5. The EUT must be supplied with a power adapter as following table:

Brand	Model No.	Spec.
Shenzhen Gongjin Electronics Co., Ltd	S24B72-120A200-C4	Input: 100-240Vac, 0.8A, 50/60Hz Output: 12Vdc, 2A DC output cable (Unshielded, 1.2m)

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

Ant No.	Model	Antenna Gain (dBi)	Frequency rang (GHz)	Antenna type	Connector type
Dual-Ant 0	290-60110	5.23	2.4~2.4835	PCB	i-pex(MHF)
		3.76	5.15~5.25		
		3.04	5.25~5.35		
Dual-Ant 1	290-60111	4.76	2.4~2.4835	PCB	i-pex(MHF)
		5.45	5.15~5.25		
		5.31	5.25~5.35		
5g_Ant 1	290-60107	5.24	5.47~5.725	PCB	i-pex(MHF)
		5.23	5.725~5.85		
5g_Ant 1_B	290-60105	5.12	5.47~5.725	Dipole	i-pex(MHF)
		5.09	5.725~5.85		
5g_Ant 0	290-60108	3.84	5.47~5.725	PCB	i-pex(MHF)
		5.15	5.725~5.85		
5g_Ant 0_B	290-60106	3.45	5.47~5.725	Dipole	i-pex(MHF)
		3.48	5.725~5.85		

7. For Antenna configuration mode of 5GHz (high band), please refer to the following table:

Condition	**Antenna No.**	
1	5g_Ant 1	5g_Ant 0
2	5g_Ant 1_B	5g_Ant 0_B
3	5g_Ant 1_B	5g_Ant 0
4	5g_Ant 1	5g_Ant 0_B

Note:
1. From the above antennas, the radiated emissions worst case was found in **Condition 3**.
2. For other test, **Condition 1** was selected for final test.

8. 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
VHT20	MCS0~8 Nss=1	2TX	2RX
	MCS0~8 Nss=2	2TX	2RX
VHT40	MCS0~9 Nss=1	2TX	2RX
	MCS0~9 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)	MCS0~8 Nss=1	2TX	2RX
	MCS0~8 Nss=2	2TX	2RX
802.11ac (VHT40)	MCS0~9 Nss=1	2TX	2RX
	MCS0~9 Nss=2	2TX	2RX
802.11ac (VHT80)	MCS0~9 Nss=1	2TX	2RX
	MCS0~9 Nss=2	2TX	2RX

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

9. 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	
-	√	√	√	√	-

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

Radiated Emission Test (Above 1GHz):

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

Radio 1 / 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
Radio 2 / CDD Mode						
Mode	**FREQ. Band (MHz)**	**Available Channel**	**Tested Channel**	**Modulation Technology**	**Modulation Type**	**Data Rate (Mbps)**
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, 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.

Radio 1 / CDD Mode						
Mode	**FREQ. Band (MHz)**	**Available Channel**	**Tested Channel**	**Modulation Technology**	**Modulation Type**	**Data Rate (Mbps)**
802.11ac (VHT40)	5260-5320	54 to 62	62	OFDM	BPSK	13.5
Radio 2 / CDD Mode						
Mode	**FREQ. Band (MHz)**	**Available Channel**	**Tested Channel**	**Modulation Technology**	**Modulation Type**	**Data Rate (Mbps)**
802.11ac (VHT40)	5500-5700	102 to 134	110	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.

Radio 1 / CDD Mode						
Mode	**FREQ. Band (MHz)**	**Available Channel**	**Tested Channel**	**Modulation Technology**	**Modulation Type**	**Data Rate (Mbps)**
802.11ac (VHT40)	5260-5320	54 to 62	62	OFDM	BPSK	13.5
Radio 2 / CDD Mode						
Mode	**FREQ. Band (MHz)**	**Available Channel**	**Tested Channel**	**Modulation Technology**	**Modulation Type**	**Data Rate (Mbps)**
802.11ac (VHT40)	5500-5700	102 to 134	110	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.

Radio 1 / 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
Radio 1 / 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
Radio 2 / CDD Mode						
Mode	**FREQ. Band (MHz)**	**Available Channel**	**Tested Channel**	**Modulation Technology**	**Modulation Type**	**Data Rate (Mbps)**
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, 122	106, 122	OFDM	BPSK	29.3
Radio 2 / Beamforming Mode (output power only)						
Mode	**FREQ. Band (MHz)**	**Available Channel**	**Tested Channel**	**Modulation Technology**	**Modulation Type**	**Data Rate (Mbps)**
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, 122	106, 122	OFDM	BPSK	29.3

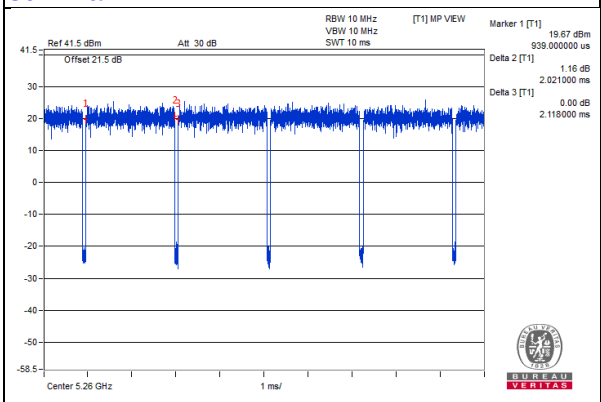
Test Condition:

Applicable To	Environmental Conditions	Input Power	Tested By
RE≥1G	23deg. C, 70%RH	120Vac, 60Hz	Andy Ho
RE<1G	24deg. C, 67%RH	120Vac, 60Hz	Andy Ho
PLC	25deg. C, 75%RH	120Vac, 60Hz	Andy Ho
APCM	25deg. C, 60%RH	120Vac, 60Hz	Anderson Chen

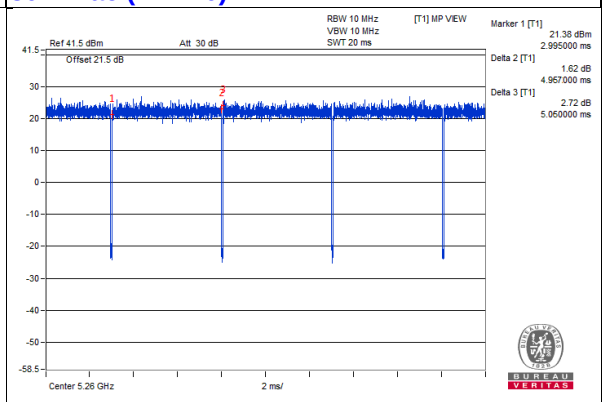
3.3 Duty Cycle of Test Signal

If duty cycle of test signal is ≥ 98 %, duty factor is not required.
If duty cycle of test signal is < 98%, duty factor shall be considered.
802.11a: Duty cycle = 2.021 ms/2.118 ms = 0.954, Duty factor = 10 * log(1/ Duty cycle) = 0.20
802.11ac (VHT20): Duty cycle = 4.957 ms/5.05 ms = 0.982
802.11ac (VHT40): Duty cycle = 2.409 ms/2.504 ms = 0.962, Duty factor = 10 * log(1/ Duty cycle) = 0.17
802.11ac (VHT80): Duty cycle = 1.133 ms/1.219 ms = 0.929, Duty factor = 10 * log(1/ Duty cycle) = 0.32

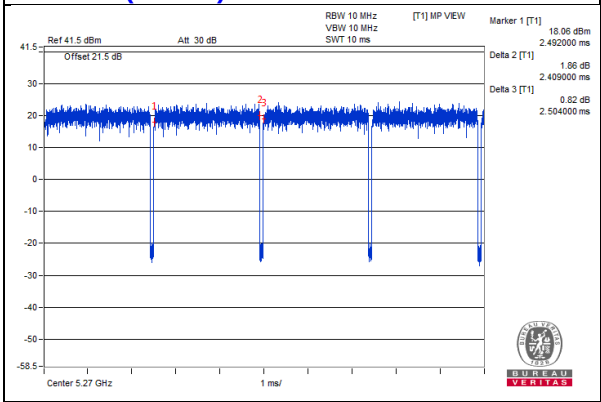
802.11a



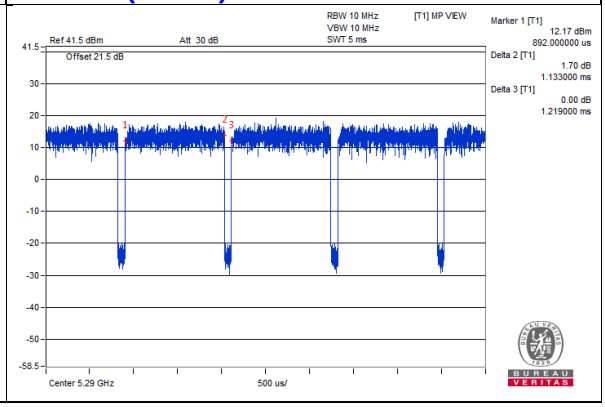
802.11ac (VHT20)



802.11ac (VHT40)



802.11ac (VHT80)



3.4 Description of Support Units

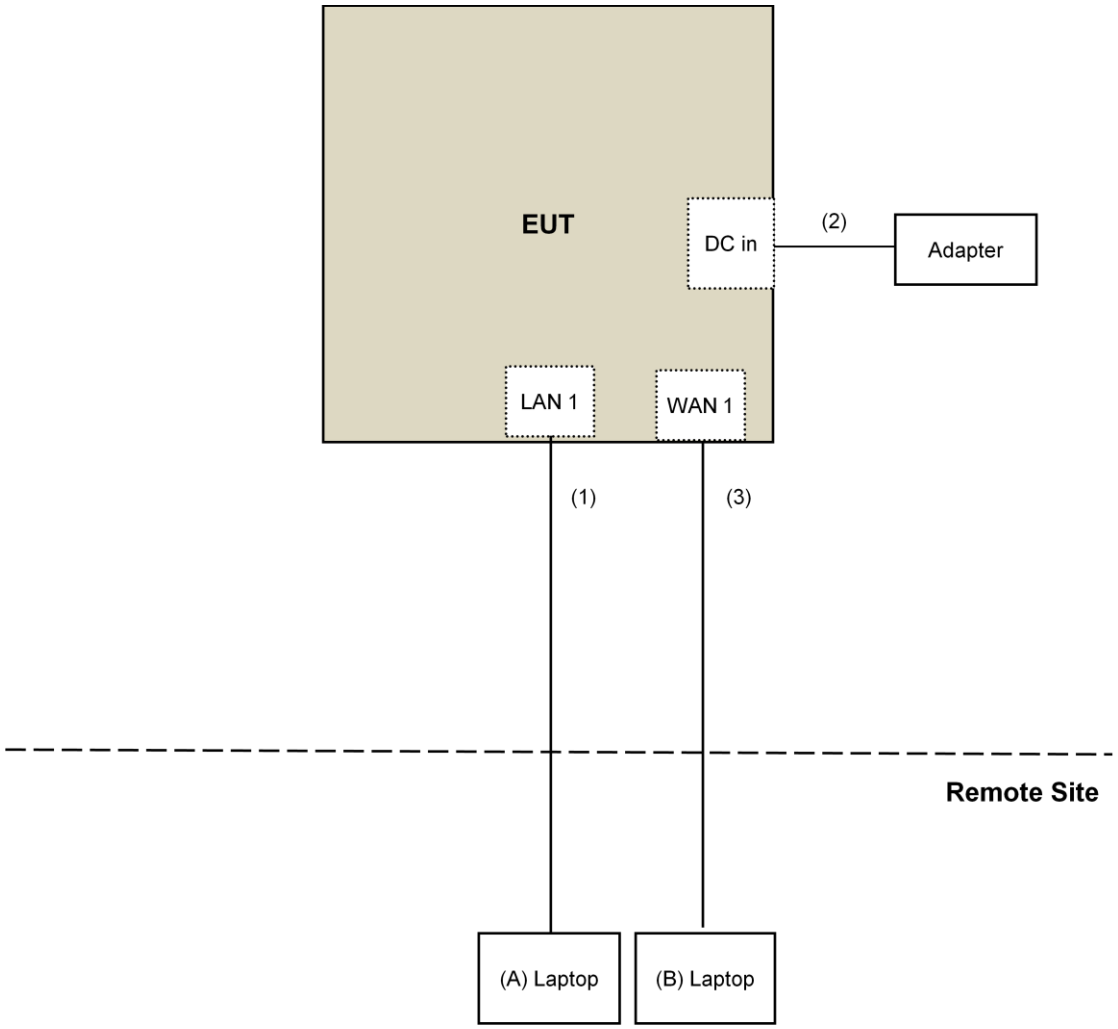
The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Laptop	DELL	E6420	B92T3R1	FCC DoC	Provided by Lab
B.	Laptop	DELL	E6420	482T3R1	FCC DoC	Provided by Lab

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

ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	RJ-45 Cable	1	10	No	0	Provided by Lab
2.	DC Cable	1	1.2	No	0	Supplied by client
3.	RJ-45 Cable	1	10	No	0	Provided by Lab

3.4.1 Configuration of System under Test



3.5 General Description of Applied Standard

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

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

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

4 Test Types and Results

4.1 Radiated Emission and Bandedge Measurement

4.1.1 Limits of Radiated Emission and Bandedge Measurement

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

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

NOTE:

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

Limits of unwanted emission out of the restricted bands

<table>
<tr><td colspan="3">Applicable To</td><td colspan="2">Limit</td></tr>
<tr><td colspan="3" rowspan="2">789033 D02 General UNII Test Procedure New Rules v02r01</td><td colspan="2">Field Strength at 3m</td></tr>
<tr><td>PK:74 (dBμV/m)</td><td>AV:54 (dBμV/m)</td></tr>
<tr><td>Frequency Band</td><td colspan="2">Applicable To</td><td>EIRP Limit</td><td>Equivalent Field Strength at 3m</td></tr>
<tr><td>5150~5250 MHz</td><td colspan="2">15.407(b)(1)</td><td rowspan="3">PK:-27 (dBm/MHz)</td><td rowspan="3">PK:68.2(dBμV/m)</td></tr>
<tr><td>5250~5350 MHz</td><td colspan="2">15.407(b)(2)</td></tr>
<tr><td>5470~5725 MHz</td><td colspan="2">15.407(b)(3)</td></tr>
<tr><td rowspan="2">5725~5850 MHz</td><td>☐</td><td>15.407(b)(4)(i)</td><td>PK:-27 (dBm/MHz) *1
PK:10 (dBm/MHz) *2
PK:15.6 (dBm/MHz) *3
PK:27 (dBm/MHz) *4</td><td>PK: 68.2(dBμV/m) *1
PK:105.2 (dBμV/m) *2
PK: 110.8(dBμV/m) *3
PK:122.2 (dBμV/m) *4</td></tr>
<tr><td>☐</td><td>15.407(b)(4)(ii)</td><td colspan="2">Emission limits in section 15.247(d)</td></tr>
<tr><td colspan="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

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver Keysight	N9038A	MY54450088	July 08, 2017	July 07, 2018
Pre-Amplifier EMCI	EMC001340	980142	Feb. 09, 2018	Feb. 08, 2019
Loop Antenna(*) Electro-Metrics	EM-6879	264	Dec. 16, 2016	Dec. 15, 2018
RF Cable	NA	LOOPCAB-001 LOOPCAB-002	Jan. 15, 2018	Jan. 14, 2019
Pre-Amplifier Mini-Circuits	ZFL-1000VH2B	AMP-ZFL-01	Nov. 09, 2017	Nov. 08, 2018
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-406	Nov. 29, 2017	Nov. 28, 2018
RF Cable	8D	966-4-1 966-4-2 966-4-3	Mar. 21, 2018	Mar. 20, 2019
Fixed attenuator Mini-Circuits	UNAT-5+	PAD-3m-4-01	Oct. 03, 2017	Oct. 02, 2018
Horn_Antenna SCHWARZBECK	BBHA 9120D	9120D-783	Dec. 12, 2017	Dec. 11, 2018
Pre-Amplifier EMCI	EMC12630SE	980385	Jan. 29, 2018	Jan. 28, 2019
RF Cable	EMC104-SM-SM-1200 EMC104-SM-SM-2000 EMC104-SM-SM-5000	160923 150318 150321	Jan. 29, 2018	Jan. 28, 2019
Pre-Amplifier EMCI	EMC184045SE	980387	Jan. 29, 2018	Jan. 28, 2019
Horn_Antenna SCHWARZBECK	BBHA 9170	BBHA9170608	Dec. 14, 2017	Dec. 13, 2018
RF Cable	EMC102-KM-KM-1200	160925	Jan. 29, 2018	Jan. 28, 2019
Software	ADT_Radiated_V8.7.08	NA	NA	NA
Boresight Antenna Tower & Turn Table Max-Full	MF-7802BS	MF780208530	NA	NA
Spectrum Analyzer R&S	FSv40	100964	July 01, 2017	June 30, 2018
Power meter Anritsu	ML2495A	1014008	May 09, 2018	May 08, 2019
Power sensor Anritsu	MA2411B	0917122	May 09, 2018	May 08, 2019
AC Power Source Extech Electronics	6205	1440452	NA	NA
Temperature & Humidity Chamber Giant Force	GTH-150-40-SP-AR	MAA0812-008	Jan. 10, 2018	Jan. 09, 2019
DC Power Supply Topward	6603D	795558	NA	NA
True RMS Clamp Meter FLUKE	325	31130711WS	May 22, 2018	May 21, 2019

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. *The calibration interval of the above test instruments is 24 months and the calibrations are traceable to NML/ROC and NIST/USA.
3. The test was performed in 966 Chamber No. 4.
4. The CANADA Site Registration No. is 20331-2
5. Loop antenna was used for all emissions below 30 MHz.
6. Tested Date: June 15, 2018

4.1.3 Test Procedure

For Radiated emission below 30MHz

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

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

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

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

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

Note:

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

For Radiated emission above 30MHz

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

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

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

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

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

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

Note:

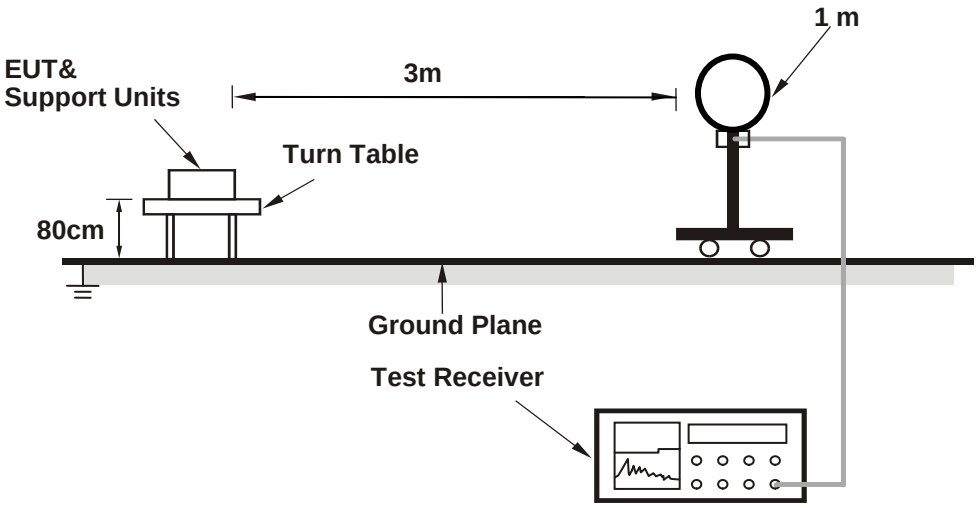
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.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

4.1.4 Deviation from Test Standard

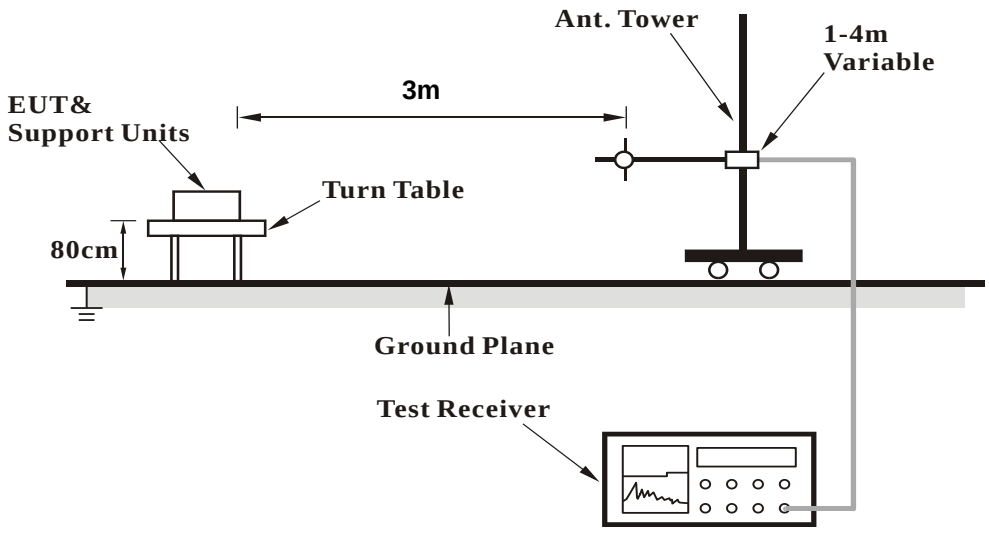
No deviation.

4.1.5 Test Setup

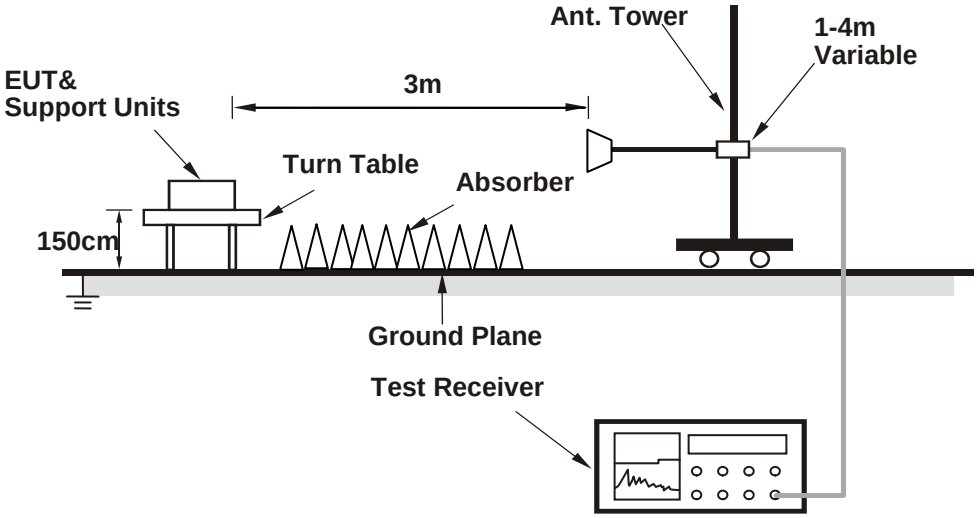
For Radiated emission below 30MHz



For Radiated emission 30MHz to 1GHz



For Radiated emission above 1GHz



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

4.1.6 EUT Operating Condition

a. Connected the EUT with the Laptop which is placed on remote site.
b. Controlling software (QRCT.exe[Ver 10.0.0.38]) has been activated to set the EUT on specific status.

4.1.7 Test Results

For Radio 1

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	48.4 PK	74.0	-25.6	1.85 H	20	45.4	3.0
2	5150.00	37.2 AV	54.0	-16.8	1.85 H	20	34.2	3.0
3	*5260.00	110.8 PK			1.85 H	20	108.4	2.4
4	*5260.00	100.3 AV			1.85 H	20	97.9	2.4
5	#10520.00	51.1 PK	74.0	-22.9	2.18 H	252	38.2	12.9
6	#10520.00	39.4 AV	54.0	-14.6	2.18 H	252	26.5	12.9
7	15780.00	60.4 PK	74.0	-13.6	2.51 H	42	47.9	12.5
8	15780.00	49.6 AV	54.0	-4.4	2.51 H	42	37.1	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	5150.00	49.6 PK	74.0	-24.4	1.50 V	158	46.6	3.0
2	5150.00	38.7 AV	54.0	-15.3	1.50 V	158	35.7	3.0
3	*5260.00	114.8 PK			1.50 V	158	112.4	2.4
4	*5260.00	104.8 AV			1.50 V	158	102.4	2.4
5	#10520.00	47.0 PK	74.0	-27.0	1.52 V	166	34.1	12.9
6	#10520.00	35.8 AV	54.0	-18.2	1.52 V	166	22.9	12.9
7	15780.00	57.0 PK	74.0	-17.0	3.84 V	23	44.5	12.5
8	15780.00	45.5 AV	54.0	-8.5	3.84 V	23	33.0	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.
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	109.4 PK			1.91 H	37	106.9	2.5
2	*5300.00	99.7 AV			1.91 H	37	97.2	2.5
3	5350.00	58.7 PK	74.0	-15.3	1.91 H	37	56.1	2.6
4	5350.00	42.3 AV	54.0	-11.7	1.91 H	37	39.7	2.6
5	10600.00	51.5 PK	74.0	-22.5	2.14 H	263	39.1	12.4
6	10600.00	39.9 AV	54.0	-14.1	2.14 H	263	27.5	12.4
7	15900.00	60.6 PK	74.0	-13.4	2.53 H	39	48.3	12.3
8	15900.00	49.5 AV	54.0	-4.5	2.53 H	39	37.2	12.3
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5300.00	113.4 PK			1.50 V	158	110.9	2.5
2	*5300.00	104.2 AV			1.50 V	158	101.7	2.5
3	5350.00	62.3 PK	74.0	-11.7	1.50 V	158	59.7	2.6
4	5350.00	45.8 AV	54.0	-8.2	1.50 V	158	43.2	2.6
5	10600.00	47.0 PK	74.0	-27.0	1.55 V	170	34.6	12.4
6	10600.00	35.9 AV	54.0	-18.1	1.55 V	170	23.5	12.4
7	15900.00	57.0 PK	74.0	-17.0	3.84 V	26	44.7	12.3
8	15900.00	45.3 AV	54.0	-8.7	3.84 V	26	33.0	12.3

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. 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	111.3 PK			1.86 H	31	108.8	2.5
2	*5320.00	101.1 AV			1.86 H	31	98.6	2.5
3	5350.00	53.8 PK	74.0	-20.2	1.86 H	31	51.2	2.6
4	5350.00	41.0 AV	54.0	-13.0	1.86 H	31	38.4	2.6
5	5352.40	66.2 PK	74.0	-7.8	1.86 H	31	63.6	2.6
6	5352.40	46.4 AV	54.0	-7.6	1.86 H	31	43.8	2.6
7	10640.00	51.5 PK	74.0	-22.5	2.16 H	261	38.9	12.6
8	10640.00	40.0 AV	54.0	-14.0	2.16 H	261	27.4	12.6
9	15960.00	60.6 PK	74.0	-13.4	2.48 H	27	48.1	12.5
10	15960.00	49.4 AV	54.0	-4.6	2.48 H	27	36.9	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	115.3 PK			1.50 V	160	112.8	2.5
2	*5320.00	105.6 AV			1.50 V	160	103.1	2.5
3	5350.00	71.6 PK	74.0	-2.4	1.50 V	160	69.0	2.6
4	5350.00	51.9 AV	54.0	-2.1	1.50 V	160	49.3	2.6
5	10640.00	47.6 PK	74.0	-26.4	1.53 V	165	35.0	12.6
6	10640.00	36.4 AV	54.0	-17.6	1.53 V	165	23.8	12.6
7	15960.00	57.6 PK	74.0	-16.4	3.85 V	24	45.1	12.5
8	15960.00	45.6 AV	54.0	-8.4	3.85 V	24	33.1	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.

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	47.9 PK	74.0	-26.1	1.81 H	21	44.9	3.0
2	5150.00	37.3 AV	54.0	-16.7	1.81 H	21	34.3	3.0
3	*5260.00	110.4 PK			1.81 H	21	108.0	2.4
4	*5260.00	99.9 AV			1.81 H	21	97.5	2.4
5	#10520.00	48.9 PK	74.0	-25.1	2.09 H	233	36.0	12.9
6	#10520.00	39.1 AV	54.0	-14.9	2.09 H	233	26.2	12.9
7	15780.00	59.0 PK	74.0	-15.0	2.58 H	36	46.5	12.5
8	15780.00	48.5 AV	54.0	-5.5	2.58 H	36	36.0	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	5150.00	48.4 PK	74.0	-25.6	1.85 V	162	45.4	3.0
2	5150.00	37.5 AV	54.0	-16.5	1.85 V	162	34.5	3.0
3	*5260.00	114.4 PK			1.85 V	162	112.0	2.4
4	*5260.00	104.4 AV			1.85 V	162	102.0	2.4
5	#10520.00	45.8 PK	74.0	-28.2	1.58 V	130	32.9	12.9
6	#10520.00	35.4 AV	54.0	-18.6	1.58 V	130	22.5	12.9
7	15780.00	56.6 PK	74.0	-17.4	3.79 V	14	44.1	12.5
8	15780.00	44.7 AV	54.0	-9.3	3.79 V	14	32.2	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.
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	109.9 PK			1.82 H	36	107.4	2.5
2	*5300.00	98.6 AV			1.82 H	36	96.1	2.5
3	5350.00	51.0 PK	74.0	-23.0	1.82 H	36	48.4	2.6
4	5350.00	37.5 AV	54.0	-16.5	1.82 H	36	34.9	2.6
5	10600.00	48.7 PK	74.0	-25.3	2.11 H	223	36.3	12.4
6	10600.00	38.9 AV	54.0	-15.1	2.11 H	223	26.5	12.4
7	15900.00	58.2 PK	74.0	-15.8	2.56 H	31	45.9	12.3
8	15900.00	48.2 AV	54.0	-5.8	2.56 H	31	35.9	12.3
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5300.00	113.9 PK			1.50 V	162	111.4	2.5
2	*5300.00	103.1 AV			1.50 V	162	100.6	2.5
3	5350.00	55.2 PK	74.0	-18.8	1.50 V	162	52.6	2.6
4	5350.00	40.7 AV	54.0	-13.3	1.50 V	162	38.1	2.6
5	10600.00	46.4 PK	74.0	-27.6	1.55 V	134	34.0	12.4
6	10600.00	36.0 AV	54.0	-18.0	1.55 V	134	23.6	12.4
7	15900.00	57.1 PK	74.0	-16.9	3.81 V	22	44.8	12.3
8	15900.00	45.1 AV	54.0	-8.9	3.81 V	22	32.8	12.3

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. 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	110.9 PK			1.85 H	27	108.4	2.5
2	*5320.00	99.9 AV			1.85 H	27	97.4	2.5
3	5350.00	60.6 PK	74.0	-13.4	1.85 H	27	58.0	2.6
4	5350.00	45.1 AV	54.0	-8.9	1.85 H	27	42.5	2.6
5	10640.00	48.6 PK	74.0	-25.4	2.05 H	225	36.0	12.6
6	10640.00	38.9 AV	54.0	-15.1	2.05 H	225	26.3	12.6
7	15960.00	58.9 PK	74.0	-15.1	2.47 H	36	46.4	12.5
8	15960.00	48.6 AV	54.0	-5.4	2.47 H	36	36.1	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	114.9 PK			2.62 V	167	112.4	2.5
2	*5320.00	104.4 AV			2.62 V	167	101.9	2.5
3	5350.00	64.6 PK	74.0	-9.4	2.62 V	167	62.0	2.6
4	5350.00	49.6 AV	54.0	-4.4	2.62 V	167	47.0	2.6
5	10640.00	46.3 PK	74.0	-27.7	1.52 V	132	33.7	12.6
6	10640.00	35.9 AV	54.0	-18.1	1.52 V	132	23.3	12.6
7	15960.00	56.8 PK	74.0	-17.2	3.79 V	7	44.3	12.5
8	15960.00	45.0 AV	54.0	-9.0	3.79 V	7	32.5	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.

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	50.7 PK	74.0	-23.3	1.76 H	17	47.7	3.0
2	5150.00	37.4 AV	54.0	-16.6	1.76 H	17	34.4	3.0
3	*5270.00	106.2 PK			1.76 H	17	103.8	2.4
4	*5270.00	94.2 AV			1.76 H	17	91.8	2.4
5	5350.00	52.4 PK	74.0	-21.6	1.76 H	17	49.8	2.6
6	5350.00	37.5 AV	54.0	-16.5	1.76 H	17	34.9	2.6
7	5352.30	57.1 PK	74.0	-16.9	1.76 H	17	54.5	2.6
8	5352.30	41.7 AV	54.0	-12.3	1.76 H	17	39.1	2.6
9	#10540.00	51.3 PK	74.0	-22.7	2.12 H	233	38.5	12.8
10	#10540.00	40.6 AV	54.0	-13.4	2.12 H	233	27.8	12.8
11	15810.00	60.4 PK	74.0	-13.6	2.50 H	36	48.0	12.4
12	15810.00	48.8 AV	54.0	-5.2	2.50 H	36	36.4	12.4
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	54.7 PK	74.0	-19.3	1.54 V	167	51.7	3.0
2	5150.00	41.9 AV	54.0	-12.1	1.54 V	167	38.9	3.0
3	*5270.00	110.2 PK			1.54 V	167	107.8	2.4
4	*5270.00	98.7 AV			1.54 V	167	96.3	2.4
5	5350.00	56.4 PK	74.0	-17.6	1.54 V	167	53.8	2.6
6	5350.00	41.4 AV	54.0	-12.6	1.54 V	167	38.8	2.6
7	5352.30	61.1 PK	74.0	-12.9	1.54 V	167	58.5	2.6
8	5352.30	46.2 AV	54.0	-7.8	1.54 V	167	43.6	2.6
9	#10540.00	46.5 PK	74.0	-27.5	1.52 V	155	33.7	12.8
10	#10540.00	35.2 AV	54.0	-18.8	1.52 V	155	22.4	12.8
11	15810.00	57.7 PK	74.0	-16.3	3.73 V	17	45.3	12.4
12	15810.00	45.8 AV	54.0	-8.2	3.73 V	17	33.4	12.4

REMARKS:

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

CHANNEL	TX Channel 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	105.1 PK			1.77 H	21	102.7	2.4
2	*5310.00	94.5 AV			1.77 H	21	92.1	2.4
3	5350.00	68.2 PK	74.0	-5.8	1.77 H	21	65.6	2.6
4	5350.00	48.4 AV	54.0	-5.6	1.77 H	21	45.8	2.6
5	10620.00	51.0 PK	74.0	-23.0	2.12 H	234	38.5	12.5
6	10620.00	40.4 AV	54.0	-13.6	2.12 H	234	27.9	12.5
7	15930.00	60.3 PK	74.0	-13.7	2.50 H	42	47.9	12.4
8	15930.00	48.9 AV	54.0	-5.1	2.50 H	42	36.5	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	109.1 PK			1.50 V	167	106.7	2.4
2	*5310.00	99.0 AV			1.50 V	167	96.6	2.4
3	5350.00	72.2 PK	74.0	-1.8	1.50 V	167	69.6	2.6
4	5350.00	52.9 AV	54.0	-1.1	1.50 V	167	50.3	2.6
5	10620.00	46.3 PK	74.0	-27.7	1.54 V	150	33.8	12.5
6	10620.00	35.4 AV	54.0	-18.6	1.54 V	150	22.9	12.5
7	15930.00	58.3 PK	74.0	-15.7	3.83 V	23	45.9	12.4
8	15930.00	46.0 AV	54.0	-8.0	3.83 V	23	33.6	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.

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	53.5 PK	74.0	-20.5	1.73 H	52	50.5	3.0
2	5150.00	39.5 AV	54.0	-14.5	1.73 H	52	36.5	3.0
3	*5290.00	106.1 PK			1.73 H	52	103.7	2.4
4	*5290.00	96.0 AV			1.73 H	52	93.6	2.4
5	5350.00	63.2 PK	74.0	-10.8	1.73 H	52	60.6	2.6
6	5350.00	49.4 AV	54.0	-4.6	1.73 H	52	46.8	2.6
7	#10580.00	49.5 PK	74.0	-24.5	2.13 H	230	36.9	12.6
8	#10580.00	38.3 AV	54.0	-15.7	2.13 H	230	25.7	12.6
9	15870.00	59.1 PK	74.0	-14.9	2.37 H	38	46.7	12.4
10	15870.00	47.7 AV	54.0	-6.3	2.37 H	38	35.3	12.4
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	57.5 PK	74.0	-16.5	1.50 V	167	54.5	3.0
2	5150.00	44.0 AV	54.0	-10.0	1.50 V	167	41.0	3.0
3	*5290.00	110.1 PK			1.50 V	167	107.7	2.4
4	*5290.00	100.5 AV			1.50 V	167	98.1	2.4
5	5350.00	67.2 PK	74.0	-6.8	1.50 V	167	64.6	2.6
6	**5350.00**	**53.9 AV**	**54.0**	**-0.1**	**1.50 V**	**167**	**51.3**	**2.6**
7	#10580.00	45.4 PK	74.0	-28.6	1.54 V	157	32.8	12.6
8	#10580.00	34.4 AV	54.0	-19.6	1.54 V	157	21.8	12.6
9	15870.00	57.0 PK	74.0	-17.0	3.82 V	31	44.6	12.4
10	15870.00	45.0 AV	54.0	-9.0	3.82 V	31	32.6	12.4

REMARKS:

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

Below 1GHz Data:

802.11ac (VHT40)

CHANNEL	TX Channel 62	**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	125.01	37.1 QP	43.5	-6.4	1.65 H	318	46.5	-9.4
2	140.60	34.2 QP	43.5	-9.3	1.82 H	297	42.3	-8.1
3	165.82	31.1 QP	43.5	-12.4	1.82 H	241	39.1	-8.0
4	270.56	31.6 QP	46.0	-14.4	1.59 H	178	39.8	-8.2
5	526.50	29.9 QP	46.0	-16.1	1.53 H	199	31.7	-1.8
6	730.50	38.9 QP	46.0	-7.1	1.43 H	305	37.1	1.8
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	37.75	33.1 QP	40.0	-6.9	1.10 V	241	41.6	-8.5
2	53.30	35.2 QP	40.0	-4.8	1.00 V	265	43.1	-7.9
3	157.07	35.1 QP	43.5	-8.4	1.09 V	278	42.6	-7.5
4	395.70	29.6 QP	46.0	-16.4	1.00 V	31	34.3	-4.7
5	683.81	32.4 QP	46.0	-13.6	1.46 V	171	31.2	1.2
6	910.75	36.3 QP	46.0	-9.7	1.84 V	203	31.6	4.7

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

For Radio 2

Above 1GHz Data:

802.11a

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	60.8 PK	74.0	-13.2	1.84 H	22	57.9	2.9
2	#5470.00	47.2 AV	54.0	-6.8	1.84 H	22	44.3	2.9
3	*5500.00	110.4 PK			1.84 H	22	107.5	2.9
4	*5500.00	99.7 AV			1.84 H	22	96.8	2.9
5	11000.00	51.3 PK	74.0	-22.7	2.15 H	247	38.1	13.2
6	11000.00	40.0 AV	54.0	-14.0	2.15 H	247	26.8	13.2
7	#16500.00	60.3 PK	74.0	-13.7	2.48 H	22	45.3	15.0
8	#16500.00	49.2 AV	54.0	-4.8	2.48 H	22	34.2	15.0
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	#5470.00	64.8 PK	74.0	-9.2	1.89 V	40	61.9	2.9
2	#5470.00	51.7 AV	54.0	-2.3	1.89 V	40	48.8	2.9
3	*5500.00	114.4 PK			1.89 V	40	111.5	2.9
4	*5500.00	104.2 AV			1.89 V	40	101.3	2.9
5	11000.00	47.4 PK	74.0	-26.6	1.48 V	160	34.2	13.2
6	11000.00	36.0 AV	54.0	-18.0	1.48 V	160	22.8	13.2
7	#16500.00	57.8 PK	74.0	-16.2	3.84 V	27	42.8	15.0
8	#16500.00	45.9 AV	54.0	-8.1	3.84 V	27	30.9	15.0

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 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	48.2 PK	74.0	-25.8	1.89 H	11	45.3	2.9
2	#5470.00	37.4 AV	54.0	-16.6	1.89 H	11	34.5	2.9
3	*5580.00	109.6 PK			1.89 H	11	106.4	3.2
4	*5580.00	98.5 AV			1.89 H	11	95.3	3.2
5	11160.00	54.8 PK	74.0	-19.2	1.42 H	35	41.7	13.1
6	11160.00	42.9 AV	54.0	-11.1	1.42 H	35	29.8	13.1
7	#16740.00	57.6 PK	74.0	-16.4	1.67 H	339	41.2	16.4
8	#16740.00	45.8 AV	54.0	-8.2	1.67 H	339	29.4	16.4
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	#5470.00	49.5 PK	74.0	-24.5	1.50 V	40	46.6	2.9
2	#5470.00	38.8 AV	54.0	-15.2	1.50 V	40	35.9	2.9
3	*5580.00	113.6 PK			1.50 V	40	110.4	3.2
4	*5580.00	103.0 AV			1.50 V	40	99.8	3.2
5	11160.00	52.2 PK	74.0	-21.8	1.66 V	234	39.1	13.1
6	11160.00	40.5 AV	54.0	-13.5	1.66 V	234	27.4	13.1
7	#16740.00	54.3 PK	74.0	-19.7	1.85 V	256	37.9	16.4
8	#16740.00	42.6 AV	54.0	-11.4	1.85 V	256	26.2	16.4

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	110.2 PK			1.84 H	7	106.8	3.4
2	*5700.00	100.5 AV			1.84 H	7	97.1	3.4
3	#5725.00	65.2 PK	74.0	-8.8	1.84 H	7	61.9	3.3
4	#5725.00	48.4 AV	54.0	-5.6	1.84 H	7	45.1	3.3
5	11400.00	54.8 PK	74.0	-19.2	1.46 H	28	41.3	13.5
6	11400.00	42.8 AV	54.0	-11.2	1.46 H	28	29.3	13.5
7	#17100.00	57.3 PK	74.0	-16.7	1.70 H	344	41.2	16.1
8	#17100.00	45.3 AV	54.0	-8.7	1.70 H	344	29.2	16.1
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	*5700.00	114.2 PK			1.67 V	53	110.8	3.4
2	*5700.00	105.0 AV			1.67 V	53	101.6	3.4
3	#5725.00	69.3 PK	74.0	-4.7	1.59 V	27	66.0	3.3
4	#5725.00	52.6 AV	54.0	-1.4	1.59 V	27	49.3	3.3
5	11400.00	52.4 PK	74.0	-21.6	1.63 V	224	38.9	13.5
6	11400.00	40.8 AV	54.0	-13.2	1.63 V	224	27.3	13.5
7	#17100.00	54.4 PK	74.0	-19.6	1.89 V	262	38.3	16.1
8	#17100.00	42.5 AV	54.0	-11.5	1.89 V	262	26.4	16.1

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 (VHT20)

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	62.7 PK	74.0	-11.3	1.85 H	30	59.8	2.9
2	#5470.00	46.6 AV	54.0	-7.4	1.85 H	30	43.7	2.9
3	*5500.00	110.4 PK			1.85 H	30	107.5	2.9
4	*5500.00	98.1 AV			1.85 H	30	95.2	2.9
5	11000.00	54.9 PK	74.0	-19.1	1.33 H	59	41.7	13.2
6	11000.00	43.1 AV	54.0	-10.9	1.33 H	59	29.9	13.2
7	#16500.00	58.6 PK	74.0	-15.4	1.62 H	360	43.6	15.0
8	#16500.00	47.4 AV	54.0	-6.6	1.62 H	360	32.4	15.0
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	#5470.00	66.7 PK	74.0	-7.3	1.99 V	31	63.8	2.9
2	#5470.00	51.1 AV	54.0	-2.9	1.99 V	31	48.2	2.9
3	*5500.00	114.4 PK			1.99 V	31	111.5	2.9
4	*5500.00	102.6 AV			1.99 V	31	99.7	2.9
5	11000.00	51.8 PK	74.0	-22.2	1.74 V	217	38.6	13.2
6	11000.00	41.1 AV	54.0	-12.9	1.74 V	217	27.9	13.2
7	#16500.00	53.6 PK	74.0	-20.4	1.82 V	216	38.6	15.0
8	#16500.00	42.5 AV	54.0	-11.5	1.82 V	216	27.5	15.0

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 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	47.4 PK	74.0	-26.6	1.81 H	18	44.5	2.9
2	#5470.00	37.3 AV	54.0	-16.7	1.81 H	18	34.4	2.9
3	*5580.00	110.6 PK			1.81 H	18	107.4	3.2
4	*5580.00	98.7 AV			1.81 H	18	95.5	3.2
5	11160.00	54.6 PK	74.0	-19.4	1.31 H	47	41.5	13.1
6	11160.00	42.9 AV	54.0	-11.1	1.31 H	47	29.8	13.1
7	#16740.00	58.6 PK	74.0	-15.4	1.63 H	360	42.2	16.4
8	#16740.00	47.1 AV	54.0	-6.9	1.63 H	360	30.7	16.4
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	#5470.00	48.4 PK	74.0	-25.6	1.84 V	42	45.5	2.9
2	#5470.00	37.5 AV	54.0	-16.5	1.84 V	42	34.6	2.9
3	*5580.00	114.6 PK			1.84 V	42	111.4	3.2
4	*5580.00	103.2 AV			1.84 V	42	100.0	3.2
5	11160.00	51.3 PK	74.0	-22.7	1.73 V	216	38.2	13.1
6	11160.00	40.6 AV	54.0	-13.4	1.73 V	216	27.5	13.1
7	#16740.00	53.6 PK	74.0	-20.4	1.74 V	234	37.2	16.4
8	#16740.00	42.6 AV	54.0	-11.4	1.74 V	234	26.2	16.4

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	109.8 PK			1.82 H	16	106.4	3.4
2	*5700.00	97.7 AV			1.82 H	16	94.3	3.4
3	#5725.00	61.6 PK	74.0	-12.4	1.82 H	16	58.3	3.3
4	#5725.00	46.1 AV	54.0	-7.9	1.82 H	16	42.8	3.3
5	11400.00	55.3 PK	74.0	-18.7	1.40 H	33	41.8	13.5
6	11400.00	43.6 AV	54.0	-10.4	1.40 H	33	30.1	13.5
7	#17100.00	58.1 PK	74.0	-15.9	1.66 H	358	42.0	16.1
8	#17100.00	47.0 AV	54.0	-7.0	1.66 H	358	30.9	16.1
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	*5700.00	113.8 PK			1.87 V	71	110.4	3.4
2	*5700.00	102.2 AV			1.87 V	71	98.8	3.4
3	#5725.00	65.6 PK	74.0	-8.4	1.87 V	71	62.3	3.3
4	#5725.00	50.6 AV	54.0	-3.4	1.87 V	71	47.3	3.3
5	11400.00	52.1 PK	74.0	-21.9	1.83 V	235	38.6	13.5
6	11400.00	41.0 AV	54.0	-13.0	1.83 V	235	27.5	13.5
7	#17100.00	53.5 PK	74.0	-20.5	1.81 V	235	37.4	16.1
8	#17100.00	42.4 AV	54.0	-11.6	1.81 V	235	26.3	16.1

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 (VHT40)

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	63.8 PK	74.0	-10.2	1.72 H	31	60.9	2.9
2	#5470.00	49.2 AV	54.0	-4.8	1.72 H	31	46.3	2.9
3	*5510.00	107.7 PK			1.72 H	31	104.8	2.9
4	*5510.00	97.2 AV			1.72 H	31	94.3	2.9
5	11020.00	51.4 PK	74.0	-22.6	1.45 H	23	38.2	13.2
6	11020.00	41.5 AV	54.0	-12.5	1.45 H	23	28.3	13.2
7	#16530.00	54.4 PK	74.0	-19.6	1.56 H	351	39.5	14.9
8	#16530.00	46.4 AV	54.0	-7.6	1.56 H	351	31.5	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	67.8 PK	74.0	-6.2	1.97 V	38	64.9	2.9
2	#5470.00	53.7 AV	54.0	-0.3	1.97 V	38	50.8	2.9
3	*5510.00	111.7 PK			1.97 V	38	108.8	2.9
4	*5510.00	101.7 AV			1.97 V	38	98.8	2.9
5	11020.00	49.0 PK	74.0	-25.0	1.78 V	222	35.8	13.2
6	11020.00	38.1 AV	54.0	-15.9	1.78 V	222	24.9	13.2
7	#16530.00	52.6 PK	74.0	-21.4	1.69 V	234	37.7	14.9
8	#16530.00	41.5 AV	54.0	-12.5	1.69 V	234	26.6	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	54.2 PK	74.0	-19.8	1.72 H	32	51.3	2.9
2	#5470.00	40.1 AV	54.0	-13.9	1.72 H	32	37.2	2.9
3	*5550.00	105.0 PK			1.72 H	32	102.0	3.0
4	*5550.00	94.0 AV			1.72 H	32	91.0	3.0
5	#5856.20	47.2 PK	74.0	-26.8	1.72 H	32	43.6	3.6
6	#5856.20	37.3 AV	54.0	-16.7	1.72 H	32	33.7	3.6
7	11100.00	51.1 PK	74.0	-22.9	1.44 H	41	38.1	13.0
8	11100.00	41.1 AV	54.0	-12.9	1.44 H	41	28.1	13.0
9	#16650.00	54.9 PK	74.0	-19.1	1.60 H	358	39.3	15.6
10	#16650.00	46.6 AV	54.0	-7.4	1.60 H	358	31.0	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	58.2 PK	74.0	-15.8	1.69 V	36	55.3	2.9
2	#5470.00	44.6 AV	54.0	-9.4	1.69 V	36	41.7	2.9
3	*5550.00	109.0 PK			1.69 V	36	106.0	3.0
4	*5550.00	98.5 AV			1.69 V	36	95.5	3.0
5	#5856.20	48.6 PK	74.0	-25.4	1.69 V	36	45.0	3.6
6	#5856.20	37.4 AV	54.0	-16.6	1.69 V	36	33.8	3.6
7	11100.00	49.5 PK	74.0	-24.5	1.76 V	222	36.5	13.0
8	11100.00	38.3 AV	54.0	-15.7	1.76 V	222	25.3	13.0
9	#16650.00	52.8 PK	74.0	-21.2	1.71 V	244	37.2	15.6
10	#16650.00	41.4 AV	54.0	-12.6	1.71 V	244	25.8	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	108.0 PK			1.75 H	41	104.7	3.3
2	*5670.00	96.6 AV			1.75 H	41	93.3	3.3
3	#5725.00	62.9 PK	74.0	-11.1	1.75 H	41	59.6	3.3
4	#5725.00	47.7 AV	54.0	-6.3	1.75 H	41	44.4	3.3
5	11340.00	51.0 PK	74.0	-23.0	1.48 H	39	37.5	13.5
6	11340.00	41.1 AV	54.0	-12.9	1.48 H	39	27.6	13.5
7	#17010.00	54.7 PK	74.0	-19.3	1.61 H	356	38.2	16.5
8	#17010.00	46.6 AV	54.0	-7.4	1.61 H	356	30.1	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	112.0 PK			2.67 V	38	108.7	3.3
2	*5670.00	101.1 AV			2.67 V	38	97.8	3.3
3	#5725.00	66.9 PK	74.0	-7.1	2.67 V	38	63.6	3.3
4	#5725.00	52.2 AV	54.0	-1.8	2.67 V	38	48.9	3.3
5	11340.00	48.6 PK	74.0	-25.4	1.83 V	225	35.1	13.5
6	11340.00	37.7 AV	54.0	-16.3	1.83 V	225	24.2	13.5
7	#17010.00	52.3 PK	74.0	-21.7	1.76 V	225	35.8	16.5
8	#17010.00	41.2 AV	54.0	-12.8	1.76 V	225	24.7	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 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	64.9 PK	74.0	-9.1	1.78 H	38	62.0	2.9
2	#5470.00	49.4 AV	54.0	-4.6	1.78 H	38	46.5	2.9
3	*5530.00	100.0 PK			1.78 H	38	97.0	3.0
4	*5530.00	91.3 AV			1.78 H	38	88.3	3.0
5	11060.00	50.1 PK	74.0	-23.9	2.14 H	236	36.9	13.2
6	11060.00	38.6 AV	54.0	-15.4	2.14 H	236	25.4	13.2
7	#16590.00	59.4 PK	74.0	-14.6	2.35 H	56	44.3	15.1
8	#16590.00	48.1 AV	54.0	-5.9	2.35 H	56	33.0	15.1
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	#5470.00	68.9 PK	74.0	-5.1	1.85 V	38	66.0	2.9
2	**#5470.00**	**53.9 AV**	**54.0**	**-0.1**	**1.85 V**	**38**	**51.0**	**2.9**
3	*5530.00	104.0 PK			1.85 V	38	101.0	3.0
4	*5530.00	95.8 AV			1.85 V	38	92.8	3.0
5	11060.00	48.8 PK	74.0	-25.2	1.80 V	242	35.6	13.2
6	11060.00	37.7 AV	54.0	-16.3	1.80 V	242	24.5	13.2
7	#16590.00	52.4 PK	74.0	-21.6	1.73 V	249	37.3	15.1
8	#16590.00	40.8 AV	54.0	-13.2	1.73 V	249	25.7	15.1

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 122	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	1.75 H	42	45.5	2.9
2	#5470.00	37.9 AV	54.0	-16.1	1.75 H	42	35.0	2.9
3	*5610.00	105.7 PK			1.75 H	42	102.4	3.3
4	*5610.00	95.5 AV			1.75 H	42	92.2	3.3
5	#5725.00	61.6 PK	74.0	-12.4	1.75 H	42	58.3	3.3
6	#5725.00	47.9 AV	54.0	-6.1	1.75 H	42	44.6	3.3
7	11220.00	50.1 PK	74.0	-23.9	2.10 H	230	36.9	13.2
8	11220.00	38.7 AV	54.0	-15.3	2.10 H	230	25.5	13.2
9	#16830.00	58.4 PK	74.0	-15.6	2.35 H	32	41.8	16.6
10	#16830.00	47.3 AV	54.0	-6.7	2.35 H	32	30.7	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	#5470.00	52.4 PK	74.0	-21.6	1.79 V	35	49.5	2.9
2	#5470.00	42.4 AV	54.0	-11.6	1.79 V	35	39.5	2.9
3	*5610.00	109.7 PK			1.79 V	35	106.4	3.3
4	*5610.00	100.0 AV			1.79 V	35	96.7	3.3
5	#5725.00	65.6 PK	74.0	-8.4	1.79 V	35	62.3	3.3
6	#5725.00	52.4 AV	54.0	-1.6	1.79 V	35	49.1	3.3
7	11220.00	49.2 PK	74.0	-24.8	1.78 V	232	36.0	13.2
8	11220.00	38.2 AV	54.0	-15.8	1.78 V	232	25.0	13.2
9	#16830.00	51.9 PK	74.0	-22.1	1.75 V	226	35.3	16.6
10	#16830.00	40.6 AV	54.0	-13.4	1.75 V	226	24.0	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.

Below 1GHz Data:

802.11ac (VHT40)

CHANNEL	TX Channel 110	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	125.01	35.9 QP	43.5	-7.6	1.73 H	254	45.3	-9.4
2	140.59	33.6 QP	43.5	-9.9	1.65 H	318	41.7	-8.1
3	165.82	34.3 QP	43.5	-9.2	1.69 H	214	42.3	-8.0
4	270.55	32.3 QP	46.0	-13.7	1.65 H	331	40.5	-8.2
5	526.65	31.4 QP	46.0	-14.6	1.49 H	172	33.2	-1.8
6	730.35	38.4 QP	46.0	-7.6	1.00 H	263	36.6	1.8
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	37.75	34.2 QP	40.0	-5.8	1.05 V	336	42.7	-8.5
2	53.29	34.1 QP	40.0	-5.9	1.00 V	141	42.0	-7.9
3	157.06	35.4 QP	43.5	-8.1	1.51 V	279	42.9	-7.5
4	395.70	29.4 QP	46.0	-16.6	1.13 V	87	34.1	-4.7
5	683.78	30.9 QP	46.0	-15.1	1.55 V	302	29.7	1.2
6	910.76	36.6 QP	46.0	-9.4	1.63 V	210	31.9	4.7

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

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 04, 2018	June 03, 2019
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
Fixed attenuator EMCI	STI02-2200-10	003	Mar. 16, 2018	Mar. 15, 2019
Software BVADT	BVADT_Cond_ V7.3.7.4	NA	NA	NA

Note:
1. The calibration interval of the above test instruments are 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in Conduction 1.
3 Tested Date: June 15, 2018

4.2.3 Test Procedure

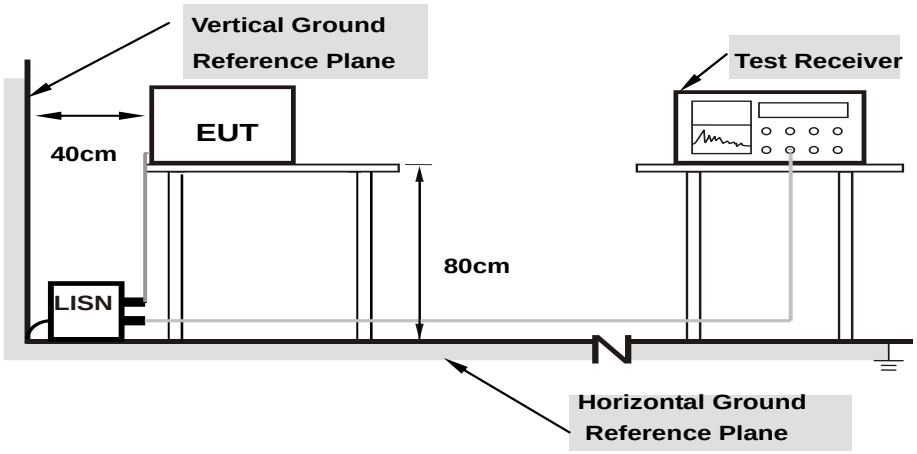
a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling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

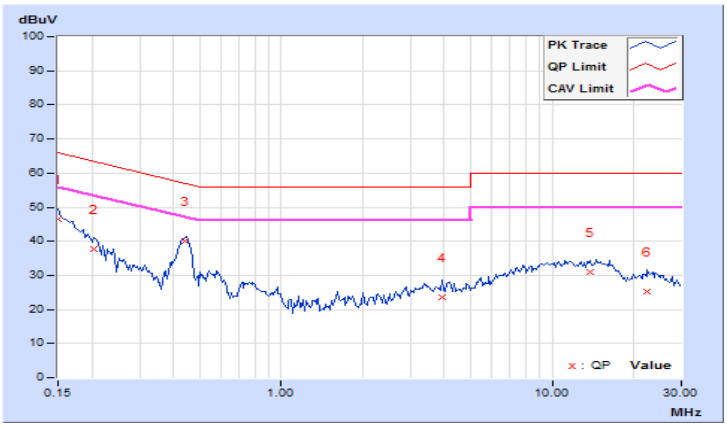
For Radio 1

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

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	10.05	36.49	19.56	46.54	29.61	66.00	56.00	-19.46	-26.39
2	0.20469	10.07	27.68	13.14	37.75	23.21	63.42	53.42	-25.67	-30.21
3	0.44297	10.12	29.91	22.56	40.03	32.68	57.01	47.01	-16.98	-14.33
4	3.92188	10.34	13.31	7.63	23.65	17.97	56.00	46.00	-32.35	-28.03
5	13.73828	10.97	20.12	14.61	31.09	25.58	60.00	50.00	-28.91	-24.42
6	22.53906	11.43	13.82	9.05	25.25	20.48	60.00	50.00	-34.75	-29.52

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

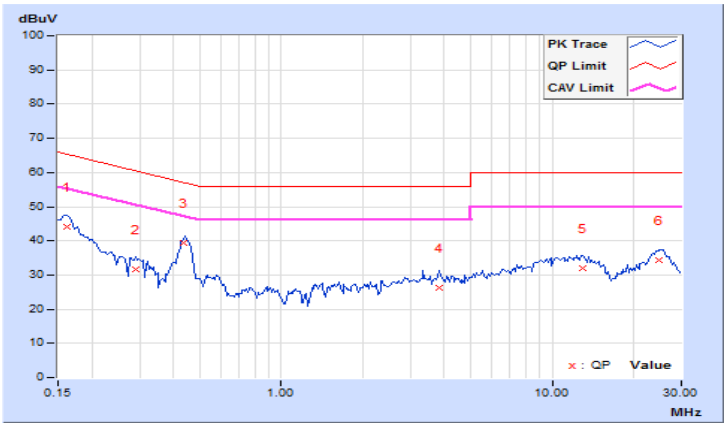


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)

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	9.96	34.23	17.02	44.19	26.98	65.38	55.38	-21.19	-28.40
2	0.29063	9.99	21.66	11.53	31.65	21.52	60.51	50.51	-28.86	-28.99
3	0.43516	10.02	29.21	21.64	39.23	31.66	57.15	47.15	-17.92	-15.49
4	3.81250	10.18	16.04	10.21	26.22	20.39	56.00	46.00	-29.78	-25.61
5	13.01172	10.74	21.31	15.02	32.05	25.76	60.00	50.00	-27.95	-24.24
6	24.91797	11.22	23.11	17.68	34.33	28.90	60.00	50.00	-25.67	-21.10

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



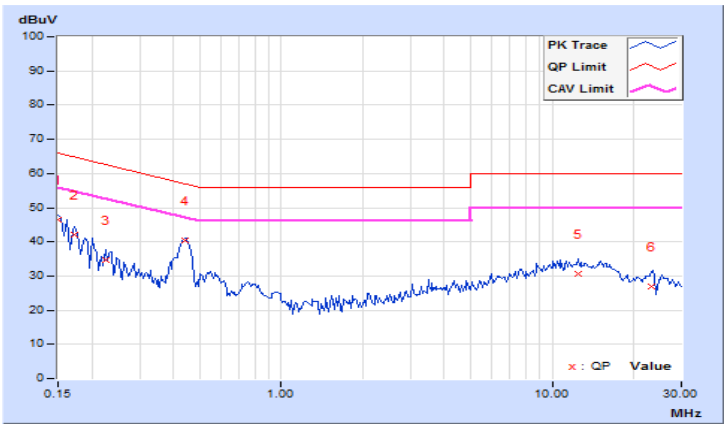
For Radio 2

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

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	10.05	36.42	18.56	46.47	28.61	66.00	56.00	-19.53	-27.39
2	0.17344	10.06	32.13	16.02	42.19	26.08	64.79	54.79	-22.60	-28.71
3	0.22422	10.08	24.64	10.12	34.72	20.20	62.66	52.66	-27.94	-32.46
4	**0.44297**	**10.12**	**30.23**	**22.69**	**40.35**	**32.81**	**57.01**	**47.01**	**-16.66**	**-14.20**
5	12.46875	10.88	19.83	13.50	30.71	24.38	60.00	50.00	-29.29	-25.62
6	23.12500	11.44	15.43	10.92	26.87	22.36	60.00	50.00	-33.13	-27.64

Remarks:

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

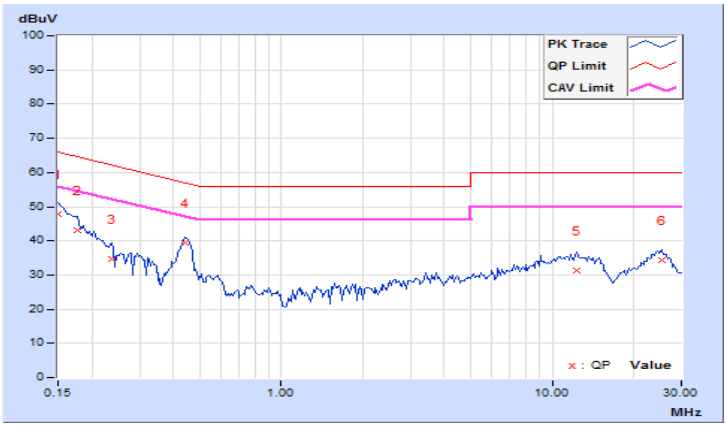


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	9.95	37.78	21.46	47.73	31.41	66.00	56.00	-18.27	-24.59
2	0.17734	9.96	33.24	16.63	43.20	26.59	64.61	54.61	-21.41	-28.02
3	0.23594	9.98	24.56	10.12	34.54	20.10	62.24	52.24	-27.70	-32.14
4	0.44297	10.02	29.49	22.23	39.51	32.25	57.01	47.01	-17.50	-14.76
5	12.38672	10.70	20.67	15.22	31.37	25.92	60.00	50.00	-28.63	-24.08
6	25.49219	11.23	23.11	17.76	34.34	28.99	60.00	50.00	-25.66	-21.01

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,

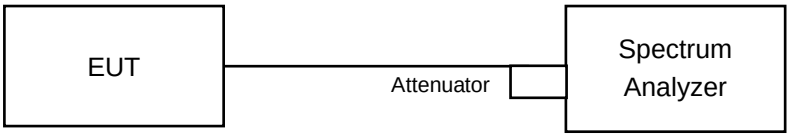
Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \leq 4$;
Array Gain = 0 dB (i.e., no array gain) for channel widths ≥ 40 MHz for any N_{ANT};
Array Gain = 5 log(N_{ANT}/N_{SS}) dB or 3 dB, whichever is less for 20-MHz channel widths with $N_{ANT} \geq 5$.

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 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.3.4 Test Procedure

FOR POWER OUTPUT 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

For Radio 1:

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	19.87	19.32	182.558	22.61	23.85	Pass
60	5300	19.37	19.62	178.119	22.51	23.80	Pass
64	5320	19.64	19.50	181.17	22.58	23.81	Pass

26dB OCCUPIED BANDWIDTH

Channel	Frequency (MHz)	26dBc Bandwidth (MHz)	
		Chain 0	Chain 1
52	5260	19.52	19.29
60	5300	19.42	19.09
64	5320	19.54	19.13

Note: For U-NII-2A 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	19.29	23.85 < 24
60	5300	19.09	23.8 < 24
64	5320	19.13	23.81 < 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				
52	5260	19.76	19.38	181.32	22.58	24.00	Pass
60	5300	19.10	19.64	173.328	22.39	24.00	Pass
64	5320	19.45	19.41	175.402	22.44	24.00	Pass

26dB OCCUPIED BANDWIDTH

Channel	Frequency (MHz)	26dBc Bandwidth (MHz)	
		Chain 0	Chain 1
52	5260	20.49	20.59
60	5300	20.61	20.44
64	5320	20.51	20.39

Note: For U-NII-2A 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	20.49	24.11 > 24
60	5300	20.44	24.1 > 24
64	5320	20.39	24.09 > 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	21.04	20.81	247.561	23.94	24.00	Pass
62	5310	20.95	20.98	249.765	23.98	24.00	Pass

26dB OCCUPIED BANDWIDTH

Channel	Frequency (MHz)	26dBc Bandwidth (MHz)	
		Chain 0	Chain 1
54	5270	40.72	40.81
62	5310	41.05	40.85

Note: For U-NII-2A 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	40.72	27.09 > 24
62	5310	40.85	27.11 > 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	19.36	19.30	171.412	22.34	24.00	Pass

26dB OCCUPIED BANDWIDTH

Channel	Frequency (MHz)	26dBc Bandwidth (MHz)	
		Chain 0	Chain 1
58	5290	86.61	84.21

Note: For U-NII-2A 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	84.21	30.25 > 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	19.76	19.38	181.32	22.58	22.74	Pass
60	5300	19.10	19.64	173.328	22.39	22.74	Pass
64	5320	19.45	19.41	175.402	22.44	22.74	Pass

Note: 1. The directional gain = 10 log[($10^{Chain0/20}$ + $10^{Chain1/20}$)^2 / 2] = 7.26dBi > 6dBi, therefore the limit needs to reduce, so the power limit shall be reduced to “Determined Conducted Limit-(7.26-6)”.

26dB OCCUPIED BANDWIDTH

Channel	Frequency (MHz)	26dBc Bandwidth (MHz)	
		Chain 0	Chain 1
52	5260	20.49	20.59
60	5300	20.61	20.44
64	5320	20.51	20.39

Note: For U-NII-2A 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	20.49	24.11 > 24
60	5300	20.44	24.1 > 24
64	5320	20.39	24.09 > 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	19.58	19.32	176.289	22.46	22.74	Pass
62	5310	19.41	19.63	179.13	22.53	22.74	Pass

Note: 1. The directional gain = 10 log[($10^{Chain0/20}$ + $10^{Chain1/20}$)^2 / 2] = 7.26dBi > 6dBi, therefore the limit needs to reduce, so the power limit shall be reduced to “Determined Conducted Limit-(7.26-6)”.

26dB OCCUPIED BANDWIDTH

Channel	Frequency (MHz)	26dBc Bandwidth (MHz)	
		Chain 0	Chain 1
54	5270	40.72	40.81
62	5310	41.05	40.85

Note: For U-NII-2A 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	40.72	27.09 > 24
62	5310	40.85	27.11 > 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	19.36	19.30	171.412	22.34	22.74	Pass

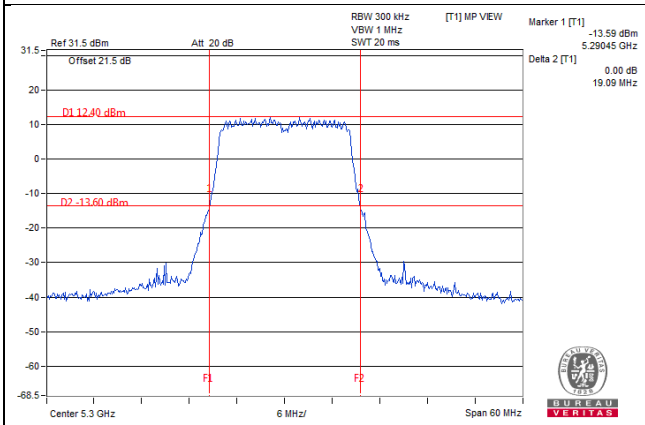
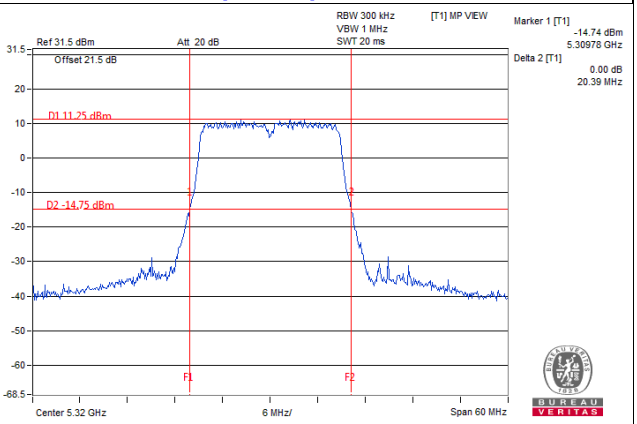
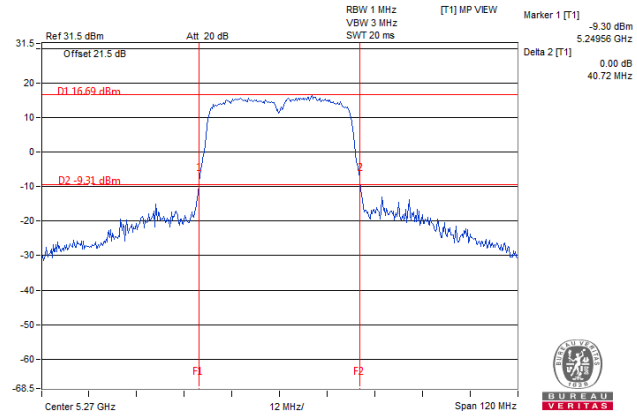
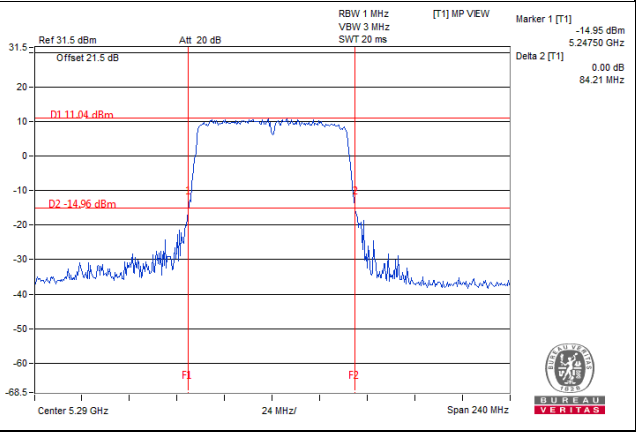
Note: 1. The directional gain = 10 log[($10^{Chain0/20}$ + $10^{Chain1/20}$)^2 / 2] = 7.26dBi > 6dBi, therefore the limit needs to reduce, so the power limit shall be reduced to “Determined Conducted Limit-(7.26-6)”.

26dB OCCUPIED BANDWIDTH

Channel	Frequency (MHz)	26dBc Bandwidth (MHz)	
		Chain 0	Chain 1
58	5290	86.61	84.21

Note: For U-NII-2A 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	84.21	30.25 > 24

Spectrum Plot of Worst Value	
802.11a_Chain 1 / CH60	**802.11ac (VHT20)_Chain 1 / CH64**
	
8802.11ac (VHT40) _Chain 0 / CH54	**802.11ac (VHT80) _Chain 1 / CH58**
	

For Radio 2:

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				
100	5500	18.82	19.54	166.158	22.21	23.90	Pass
116	5580	18.65	19.98	172.823	22.38	24.00	Pass
140	5700	18.87	19.78	172.15	22.36	24.00	Pass

26dB OCCUPIED BANDWIDTH

Channel	Frequency (MHz)	26dBc Bandwidth (MHz)	
		Chain 0	Chain 1
100	5500	19.89	19.54
116	5580	19.97	19.97
140	5700	20.12	19.97

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

Power Limit = 11dBm + 10logB < U-NII-2C >			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Limit (dBm)
100	5500	19.54	23.9 < 24
116	5580	19.97	24 > 24
140	5700	19.97	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				
100	5500	18.80	19.58	166.64	22.22	24.00	Pass
116	5580	18.66	19.97	172.763	22.37	24.00	Pass
140	5700	18.62	19.46	161.086	22.07	24.00	Pass

26dB OCCUPIED BANDWIDTH

Channel	Frequency (MHz)	26dBc Bandwidth (MHz)	
		Chain 0	Chain 1
100	5500	20.85	20.74
116	5580	20.91	20.70
140	5700	20.87	20.74

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

Power Limit = 11dBm + 10logB < U-NII-2C >			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Limit (dBm)
100	5500	20.74	24.16 > 24
116	5580	20.70	24.15 > 24
140	5700	20.74	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				
102	5510	19.62	20.32	199.269	22.99	24.00	Pass
110	5550	20.36	21.37	245.731	23.90	24.00	Pass
134	5670	20.43	21.22	242.842	23.85	24.00	Pass

26dB OCCUPIED BANDWIDTH

Channel	Frequency (MHz)	26dBc Bandwidth (MHz)	
		Chain 0	Chain 1
102	5510	41.10	41.09
110	5550	41.29	40.97
134	5670	41.27	40.93

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

Power Limit = 11dBm + 10logB < U-NII-2C >			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Limit (dBm)
102	5510	41.09	27.13 > 24
110	5550	40.97	27.12 > 24
134	5670	40.93	27.12 > 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				
106	5530	15.56	16.54	81.057	19.09	24.00	Pass
122	5610	20.22	21.53	247.429	23.93	24.00	Pass

26dB OCCUPIED BANDWIDTH

Channel	Frequency (MHz)	26dBc Bandwidth (MHz)	
		Chain 0	Chain 1
106	5530	83.95	83.66
122	5610	84.64	83.91

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

Power Limit = 11dBm + 10logB < U-NII-2C >			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Limit (dBm)
106	5530	83.66	30.22 > 24
122	5610	83.91	30.23 > 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				
100	5500	18.80	19.58	166.64	22.22	22.42	Pass
116	5580	18.66	19.97	172.763	22.37	22.42	Pass
140	5700	18.62	19.46	161.086	22.07	22.42	Pass

Note: 1. The directional gain = 10 log[($10^{Chain0/20}$ + $10^{Chain1/20}$)^2 / 2] = 7.58dBi > 6dBi, therefore the limit needs to reduce, so the power limit shall be reduced to “Determined Conducted Limit-(7.58-6)”.

26dB OCCUPIED BANDWIDTH

Channel	Frequency (MHz)	26dBc Bandwidth (MHz)	
		Chain 0	Chain 1
100	5500	20.85	20.74
116	5580	20.91	20.70
140	5700	20.87	20.74

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

Power Limit = 11dBm + 10logB < U-NII-2C >			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Limit (dBm)
100	5500	20.74	24.16 > 24
116	5580	20.70	24.15 > 24
140	5700	20.74	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				
102	5510	19.06	19.72	174.294	22.41	22.42	Pass
110	5550	18.86	19.84	173.296	22.39	22.42	Pass
134	5670	18.94	19.71	171.884	22.35	22.42	Pass

Note: 1. The directional gain = 10 log[($10^{Chain0/20}$ + $10^{Chain1/20}$)^2 / 2] = 7.58dBi > 6dBi, therefore the limit needs to reduce, so the power limit shall be reduced to “Determined Conducted Limit-(7.58-6)”.

26dB OCCUPIED BANDWIDTH

Channel	Frequency (MHz)	26dBc Bandwidth (MHz)	
		Chain 0	Chain 1
102	5510	41.10	41.09
110	5550	41.29	40.97
134	5670	41.27	40.93

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

Power Limit = 11dBm + 10logB < U-NII-2C >			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Limit (dBm)
102	5510	41.09	27.13 > 24
110	5550	40.97	27.12 > 24
134	5670	40.93	27.12 > 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				
106	5530	15.56	16.54	81.057	19.09	22.42	Pass
122	5610	18.84	19.90	174.284	22.41	22.42	Pass

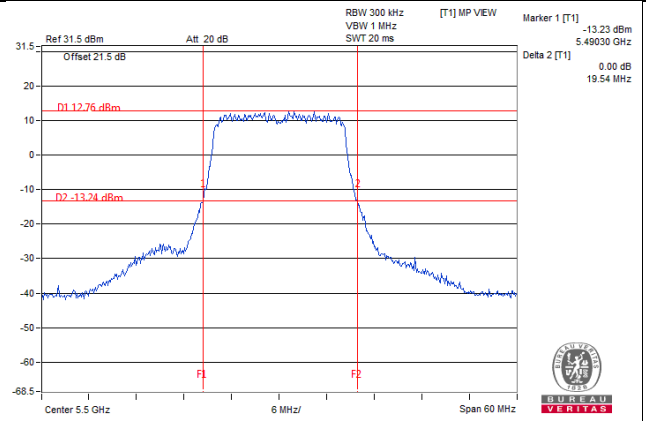
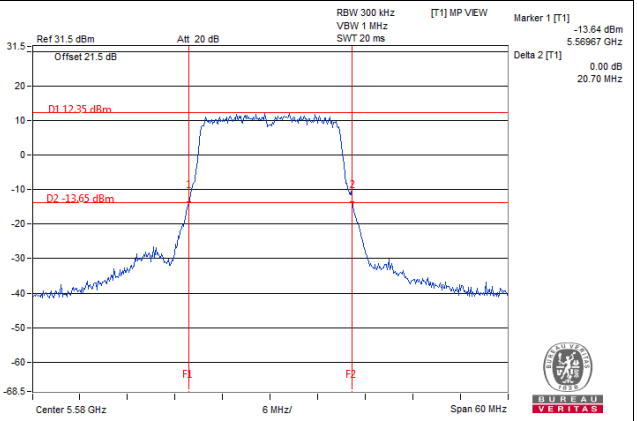
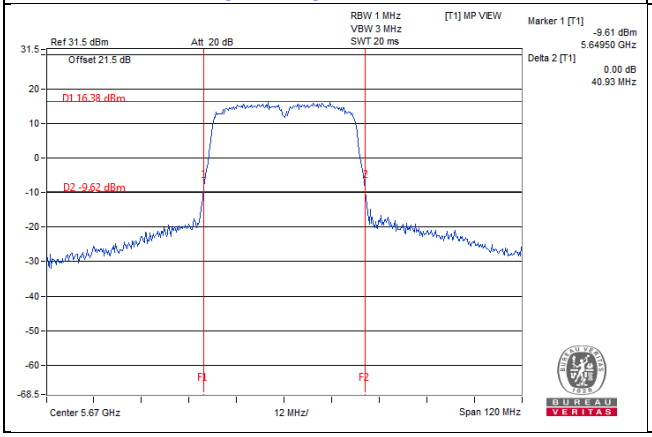
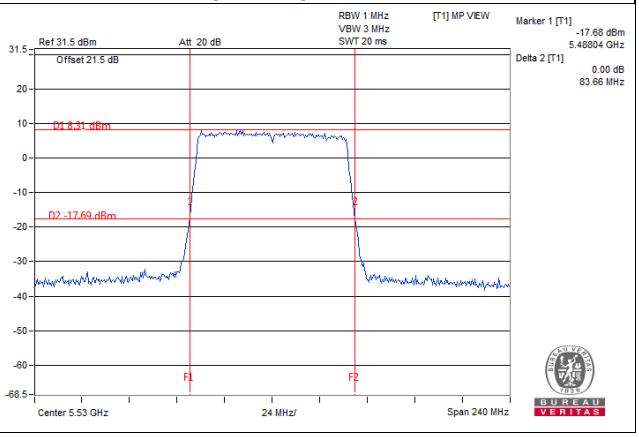
Note: 1. The directional gain = 10 log[($10^{Chain0/20}$ + $10^{Chain1/20}$)^2 / 2] = 7.58dBi > 6dBi, therefore the limit needs to reduce, so the power limit shall be reduced to “Determined Conducted Limit-(7.58-6)”.

26dB OCCUPIED BANDWIDTH

Channel	Frequency (MHz)	26dBc Bandwidth (MHz)	
		Chain 0	Chain 1
106	5530	83.95	83.66
122	5610	84.64	83.91

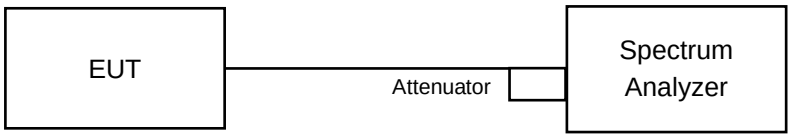
Note: For U-NII-2C Band output power limitation is determined based on 26dBc bandwidth.

Power Limit = 11dBm + 10logB < U-NII-2C >			
Channel Number	Freq.(MHz)	Min. B(MHz)	Determined Conducted Limit (dBm)
106	5530	83.66	30.22 > 24
122	5610	83.91	30.23 > 24

Spectrum Plot of Worst Value	
802.11a_Chain 1 / CH100	**802.11ac (VHT20) _Chain 1 / CH116**
	
802.11ac (VHT40) _Chain 1 / CH134	**802.11ac (VHT80) _Chain 1 / 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

For Radio 1:

CDD Mode

802.11a

Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
52	5260	16.56	16.56
60	5300	16.56	16.44
64	5320	16.56	16.44

802.11ac (VHT20)

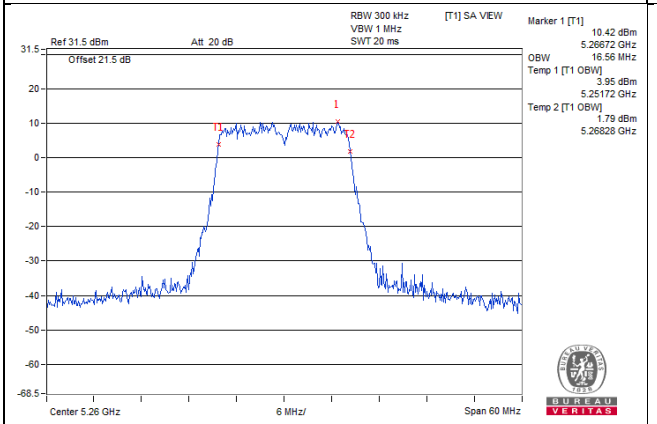
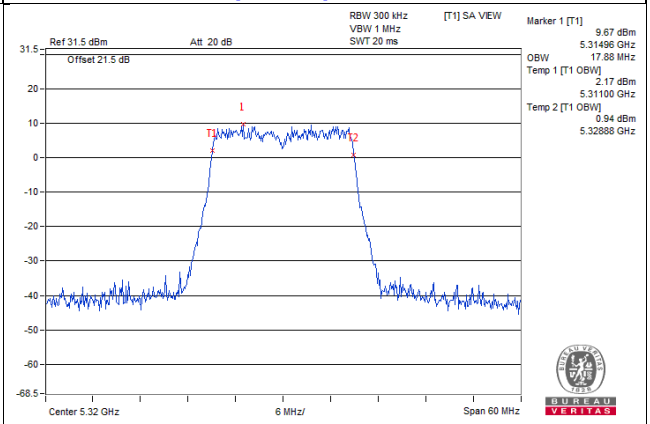
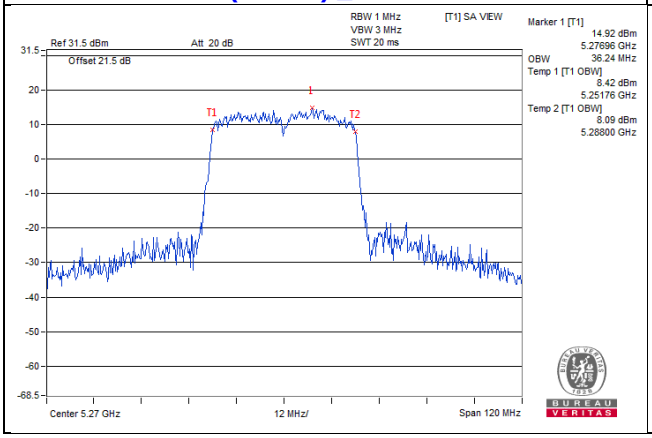
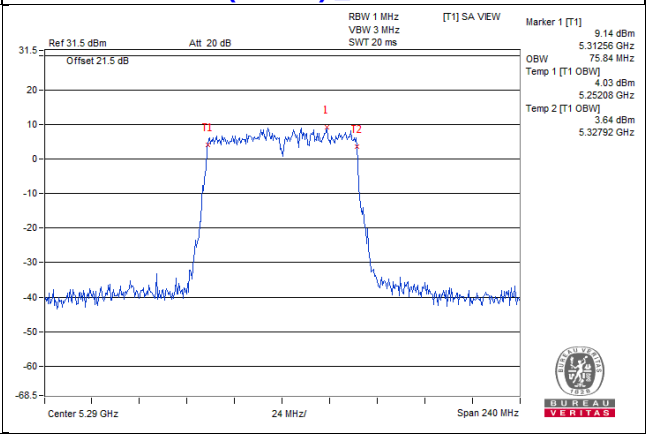
Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
52	5260	17.64	17.64
60	5300	17.76	17.64
64	5320	17.88	17.64

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

802.11ac (VHT80)

Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
58	5290	75.84	75.84

Spectrum Plot of Max Value	
802.11a_Chain 0 / CH52	**802.11ac (VHT20)_Chain 0 / CH64**
	
802.11ac (VHT40) _Chain 0 / CH54	**802.11ac (VHT80) _Chain 0 / CH58**
	

For Radio 2:

CDD Mode

802.11a

Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
100	5500	16.56	16.44
116	5580	16.44	16.44
140	5700	16.56	16.56

802.11ac (VHT20)

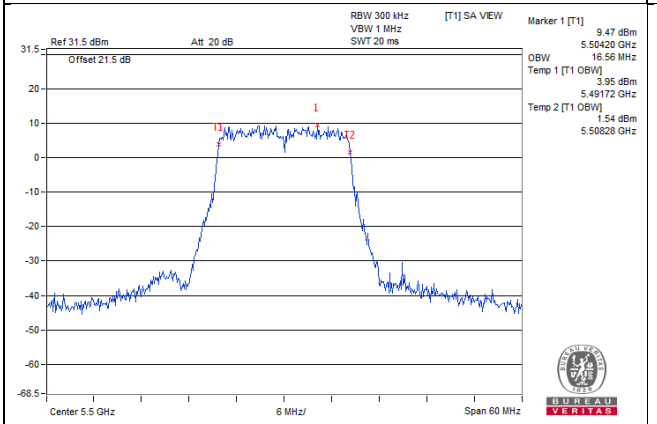
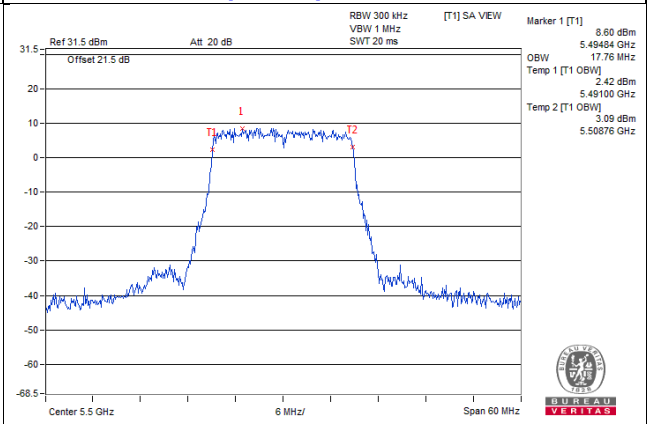
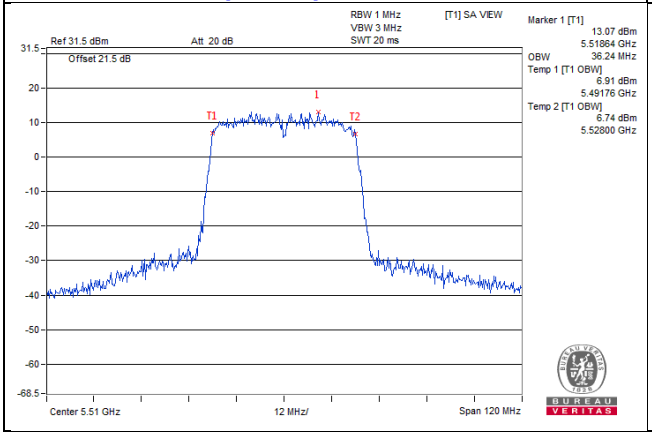
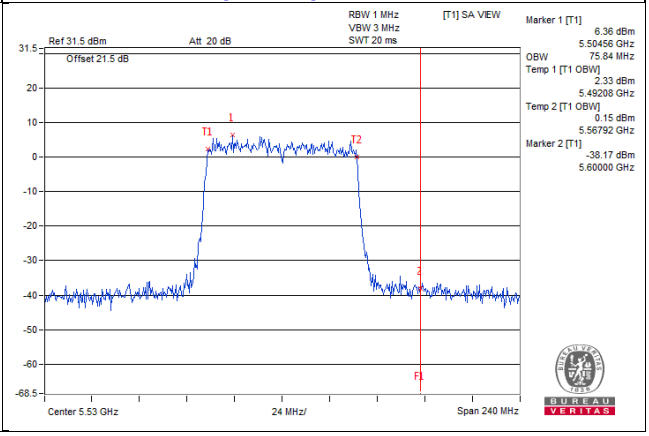
Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
100	5500	17.76	17.64
116	5580	17.76	17.64
140	5700	17.64	17.64

802.11ac (VHT40)

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

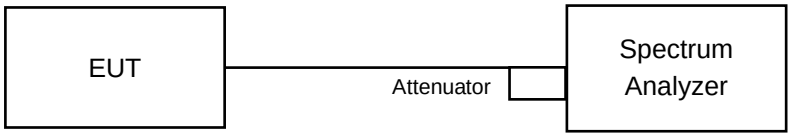
Spectrum Plot of Max Value	
802.11a_Chain 0 / CH100	**802.11ac (VHT20)_Chain 0 / CH100**
	
802.11ac (VHT40) _Chain 0 / CH102	**802.11ac (VHT80) _Chain 0 / CH106**
	

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

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

For Radio 1:

CDD Mode

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	6.84	5.08	0.2	9.26	9.74	Pass
60	5300	6.06	6.04	0.2	9.26	9.74	Pass
64	5320	6.06	5.77	0.2	9.13	9.74	Pass

Note: 1. Method a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. The directional gain = 10 log[($10^{Chain0/20}$ + $10^{Chain1/20}$)^2 / 2] = 7.26dBi > 6dBi , so the power density limit shall be reduced to 11-(7.26-6) = 9.74dBm.
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	6.31	5.19	8.80	9.74	Pass
60	5300	5.08	5.30	8.20	9.74	Pass
64	5320	5.06	5.09	8.09	9.74	Pass

Note: 1. Method a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. The directional gain = 10 log[($10^{Chain0/20}$ + $10^{Chain1/20}$)^2 / 2] = 7.26dBi > 6dBi , so the power density limit shall be reduced to 11-(7.26-6) = 9.74dBm.

802.11ac (VHT40)

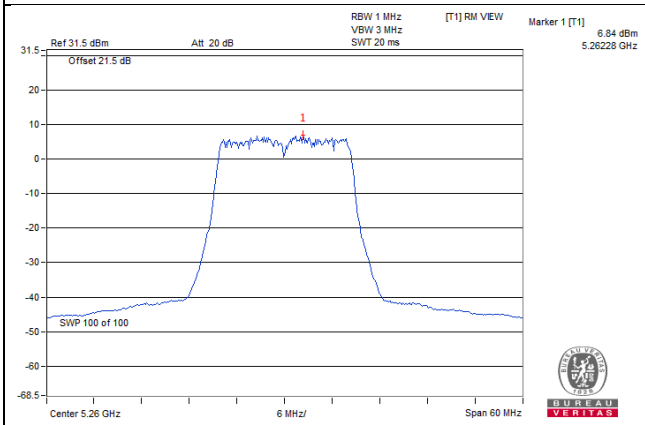
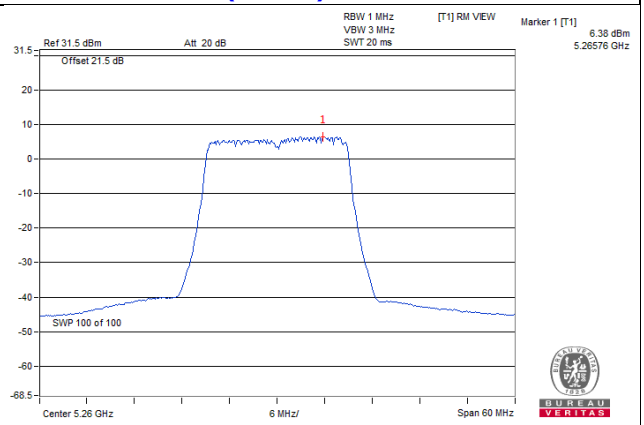
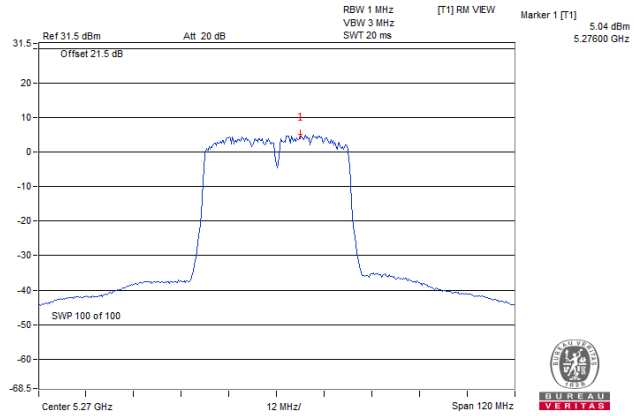
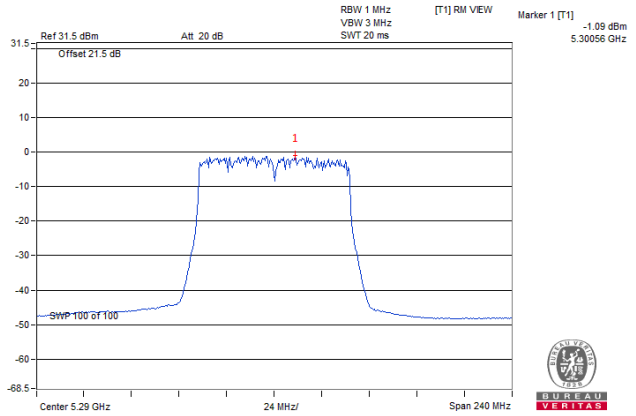
Chan.	Chan. Freq. (MHz)	PSD W/O Duty Factor (dBm/MHz)		Duty Factor (dB)	Total PSD With Duty Factor (dBm/MHz)	MAX. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1				
54	5270	5.04	4.17	0.17	7.81	9.74	Pass
62	5310	4.24	4.35	0.17	7.47	9.74	Pass

Note: 1. Method a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. The directional gain = 10 log[$(10^{Chain0/20} + 10^{Chain1/20})^2$ / 2] = 7.26dBi > 6dBi , so the power density limit shall be reduced to 11-(7.26-6) = 9.74dBm.
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	-1.35	-1.22	0.32	2.04	9.74	Pass

Note: 1. Method a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. The directional gain = 10 log[$(10^{Chain0/20} + 10^{Chain1/20})^2$ / 2] = 7.26dBi > 6dBi , so the power density limit shall be reduced to 11-(7.26-6) = 9.74dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

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 1 / CH58**
	

For Radio 2:

CDD Mode

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				
100	5500	4.64	6.33	0.2	8.78	9.42	Pass
116	5580	4.71	6.57	0.2	8.95	9.42	Pass
140	5700	4.87	6.18	0.2	8.79	9.42	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. The directional gain = 10 log[$(10^{Chain0/20} + 10^{Chain1/20})^2$ / 2] = 7.58dBi > 6dBi , so the power density limit shall be reduced to 11-(7.58-6) = 9.42dBm.
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			
100	5500	4.87	5.59	8.26	9.42	Pass
116	5580	4.96	5.92	8.48	9.42	Pass
140	5700	4.76	5.76	8.30	9.42	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. The directional gain = 10 log[$(10^{Chain0/20} + 10^{Chain1/20})^2$ / 2] = 7.58dBi > 6dBi , so the power density limit shall be reduced to 11-(7.58-6) = 9.42dBm.

802.11ac (VHT40)

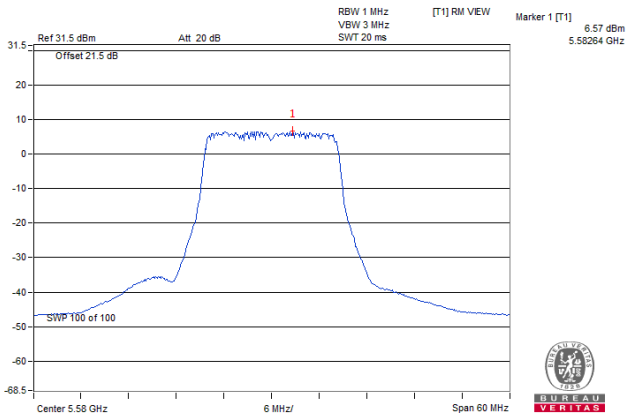
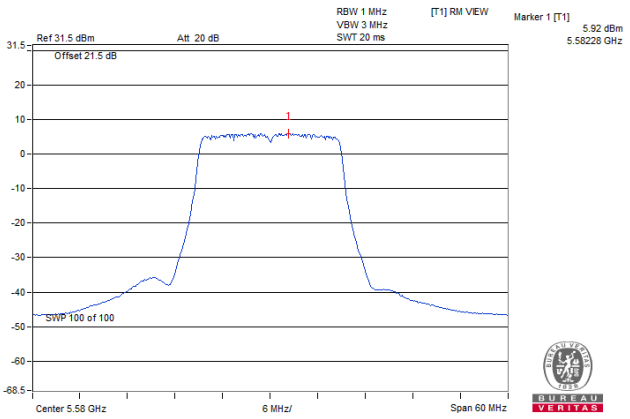
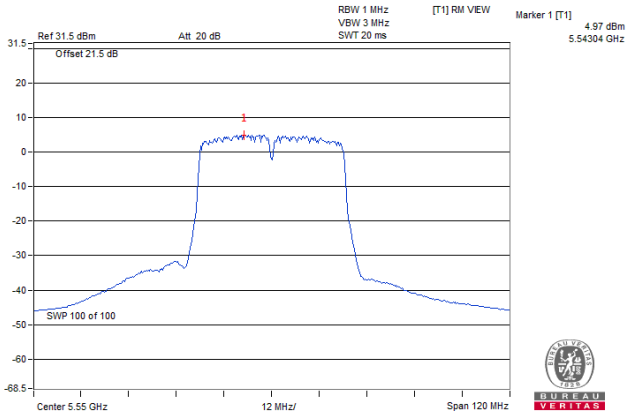
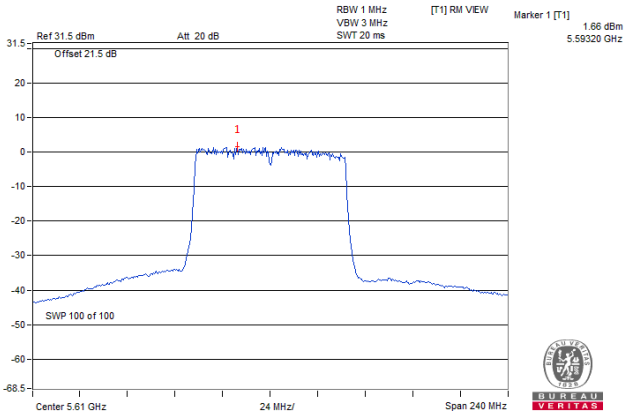
Chan.	Chan. Freq. (MHz)	PSD W/O Duty Factor (dBm/MHz)		Duty Factor (dB)	Total PSD With Duty Factor (dBm/MHz)	MAX. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1				
102	5510	3.19	3.63	0.17	6.59	9.42	Pass
110	5550	3.55	4.97	0.17	7.50	9.42	Pass
134	5670	3.95	4.23	0.17	7.27	9.42	Pass

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. The directional gain = 10 log[($10^{Chain0/20}$ + $10^{Chain1/20}$)^2 / 2] = 7.58dBi > 6dBi , so the power density limit shall be reduced to 11-(7.58-6) = 9.42dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ac (VHT80)

Chan.	Chan. Freq. (MHz)	PSD W/O Duty Factor (dBm/MHz)		Duty Factor (dB)	Total PSD With Duty Factor (dBm/MHz)	MAX. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1				
106	5530	-4.67	-3.66	0.32	-0.81	9.42	Pass
122	5610	0.22	1.14	0.32	4.03	9.42	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. The directional gain = 10 log[($10^{Chain0/20}$ + $10^{Chain1/20}$)^2 / 2] = 7.58dBi > 6dBi , so the power density limit shall be reduced to 11-(7.58-6) = 9.42dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

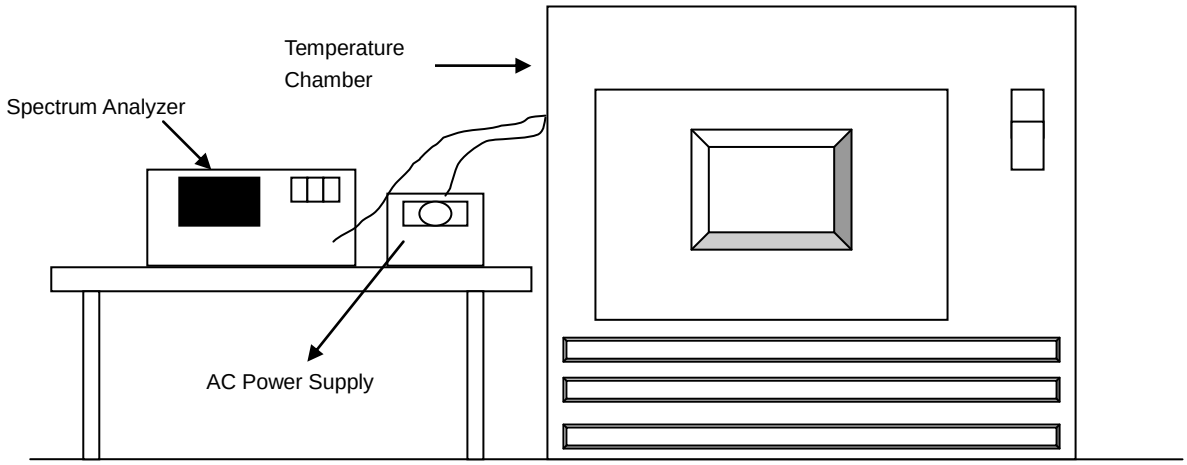
Spectrum Plot of Worst Value	
802.11a_Chain 1 / CH116	**802.11ac (VHT20)_Chain 1 / CH116**
	
802.11ac (VHT40) _Chain 1 / CH110	**802.11ac (VHT80) _Chain 1 / CH122**
	

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	5260.0054	Pass	5260.0092	Pass	5260.0065	Pass	5260.0079	Pass
40	120	5260.0128	Pass	5260.0152	Pass	5260.0125	Pass	5260.0119	Pass
30	120	5260.0079	Pass	5260.0069	Pass	5260.0079	Pass	5260.007	Pass
20	120	5260.0217	Pass	5260.0265	Pass	5260.0254	Pass	5260.0228	Pass
10	120	5260.0102	Pass	5260.0086	Pass	5260.0094	Pass	5260.0127	Pass
0	120	5260.0145	Pass	5260.0139	Pass	5260.017	Pass	5260.0139	Pass
-10	120	5259.9976	Pass	5259.9971	Pass	5259.9987	Pass	5259.995	Pass
-20	120	5259.9756	Pass	5259.976	Pass	5259.9757	Pass	5259.9759	Pass
-30	120	5259.9734	Pass	5259.9774	Pass	5259.9769	Pass	5259.9739	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	5260.0219	Pass	5260.0265	Pass	5260.0252	Pass	5260.0225	Pass
	120	5260.0217	Pass	5260.0265	Pass	5260.0254	Pass	5260.0228	Pass
	102	5260.0215	Pass	5260.0261	Pass	5260.0259	Pass	5260.0224	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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