FCC Test Report

Report No.:	RF170623E04-1
FCC ID:	KA2IR815D1
Test Model:	DIR-815
Received Date:	June 23, 2017
Test Date:	July 18 to Aug. 07, 2017
Issued Date:	Aug. 30, 2017
Applicant:	D-Link Corporation
Address:	17595 Mt. Herrmann, Fountain Valley,California, United States
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.

Testing Laboratory
2022

Table of Contents

Release Control Record

Issue No.	Description	Date Issued
RF170623E04-1	Original release.	Aug. 30, 2017

1 Certificate of Conformity

Product:	Wireless AC1200 Dual Band Router
Brand:	D-Link
Test Model:	DIR-815
Sample Status:	ENGINEERING SAMPLE
Applicant:	D-Link Corporation
Test Date:	July 18 to Aug. 07, 2017
Standard:	47 CFR FCC Part 15, Subpart E (Section 15.407) ANSI C63.10: 2013

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

Prepared by : _____ , **Date:** Aug. 30, 2017

Wendy Wu / Specialist

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

May Chen / Manager

2 Summary of Test Results

47 CFR FCC Part 15, Subpart E (Section 15.407)			
FCC Clause	Test Item	Result	Remarks
15.407(b)(6)	AC Power Conducted Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -13.35dB at 0.15MHz.
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 5649.92MHz 11570MHz, 11650MHz, 11510MHz, 11590MHz.
15.407(a)(1/2/3)	Max Average Transmit Power	Pass	Meet the requirement of limit.
---	Occupied Bandwidth Measurement	-	Reference only.
15.407(a)(1/2/3)	Peak Power Spectral Density	Pass	Meet the requirement of limit.
15.407(e)	6dB bandwidth	Pass	Meet the requirement of limit. (U-NII-3 Band only)
15.407(g)	Frequency Stability	Pass	Meet the requirement of limit.
15.203	Antenna Requirement	Pass	Antenna connector is i-pex(MHF) not a standard connector.

*For U-NII-3 band compliance with rule part 15.407(b)(4)(i), the OOBE test plots were recorded in Annex A.

2.1 Measurement Uncertainty

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

Measurement	Frequency	Expanded Uncertainty (k=2) (±)
Conducted Emissions at mains ports	150kHz ~ 30MHz	1.84 dB
Radiated Emissions up to 1 GHz	30MHz ~ 1GHz	5.30 dB
Radiated Emissions above 1 GHz	1GHz ~ 6GHz	5.16 dB
	6GHz ~ 18GHz	4.91 dB
	18GHz ~ 40GHz	5.30 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	Wireless AC1200 Dual Band Router
Brand	D-Link
Test Model	DIR-815
Status of EUT	ENGINEERING SAMPLE
Power Supply Rating	DC 12V from power adapter
Modulation Type	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM 256QAM for OFDM in 11ac mode and VHT20/40 mode in 2.4GHz band
Modulation Technology	DSSS,OFDM
Transfer Rate	802.11b: up to 11Mbps 802.11a/g: up to 54Mbps 802.11n: up to 300Mbps 802.11ac: up to 866.7Mbps
Operating Frequency	**2.4GHz:** 2.412 ~ 2.462GHz **5GHz:** 5.18 ~ 5.24GHz, 5.745 ~ 5.825GHz
Number of Channel	**2.4GHz:** 802.11b/g, 802.11n (HT20), VHT20 : 11 802.11n (HT40), VHT40: 7 **5GHz:** 802.11a, 802.11n (HT20), 802.11ac (VHT20): 9 802.11n (HT40), 802.11ac (VHT40): 4 802.11ac (VHT80): 2
Output Power	**2.4GHz:** 836.97mW **5.18 ~ 5.24GHz:** 346.853mW **5.745 ~ 5.825GHz:** 182.643mW
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	Adapter x 1
Data Cable Supplied	RJ45 cable (Unshielded, 0.9m) x 1

Note:

1. The EUT could be supplied with a power adapter as following table:

Brand	Model No.	Spec.
Gongjin	S12B22-120A100-C4	AC Input: 100-240V, 0.5A, 50/60Hz DC Output:12V, 1A DC cable: 1.1m, Unshielded

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

Antenna No.	Chain No.	Antenna Net Gain (dBi)	Frequency range (GHz)	Antenna Type	Connecter Type
2.4GHz_0	Chain 0	5	2.4~2.4835GHz	Dipole	i-pex(MHF)
2.4GHz_1	Chain 1	5	2.4~2.4835GHz	Dipole	i-pex(MHF)
5GHz_0	Chain 0	5	5.15~5.85GHz	Dipole	i-pex(MHF)
5GHz_1	Chain 1	5	5.15~5.85GHz	Dipole	i-pex(MHF)

3. Simultaneously transmission condition.

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

4. The EUT incorporates a MIMO function.

2.4GHz Band			
MODULATION MODE	**DATA RATE (MCS)**	**TX & RX CONFIGURATION**	
802.11b	1 ~ 11Mbps	1TX Fixed Chain 0	1RX Fixed chain 0
802.11g	6 ~ 54Mbps	1TX Fixed Chain 0	1RX Fixed chain 0
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: 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.			

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

3.2 Description of Test Modes

FOR 5180 ~ 5240MHz

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

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

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

Channel	Frequency	Channel	Frequency
38	5190 MHz	46	5230 MHz

1 channel is provided for 802.11ac (VHT80):

Channel	Frequency
42	5210MHz

FOR 5745 ~ 5825MHz:

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

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

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

Channel	Frequency	Channel	Frequency
151	5755MHz	159	5795MHz

1 channel is provided for 802.11ac (VHT80):

Channel	Frequency
155	5775MHz

3.2.1 Test Mode Applicability and Tested Channel Detail

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

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

NOTE: The EUT had been pre-tested on the positioned of each 2 axis. The worst case was found when positioned on **Y-plane.**

Radiated Emission Test (Above 1GHz):

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

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

Radiated Emission Test (Below 1GHz):

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

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

Power Line Conducted Emission Test:

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

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

Antenna Port Conducted Measurement:

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

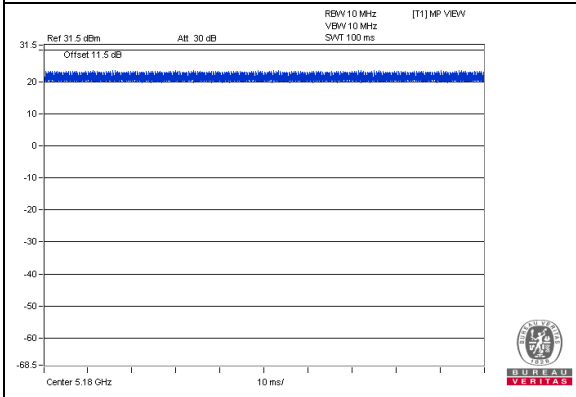
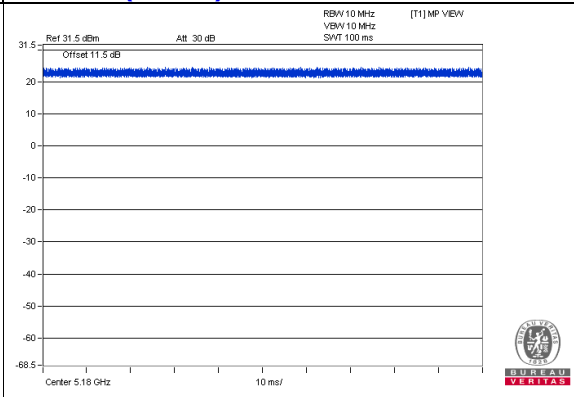
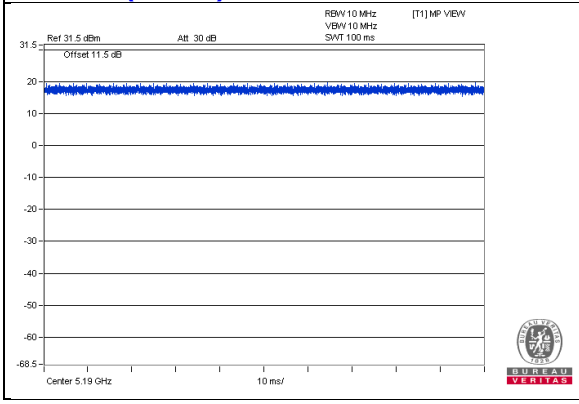
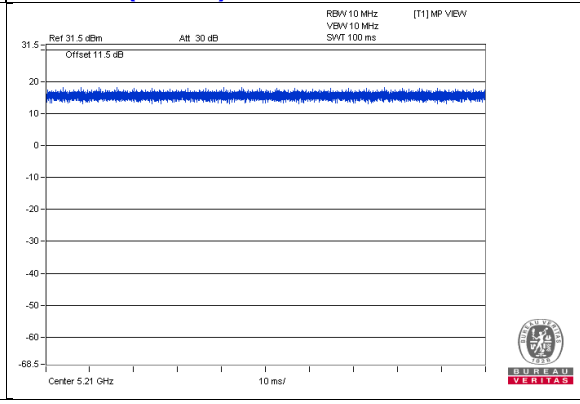
Mode	FREQ. Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
802.11a	5180-5240	36 to 48	36, 40, 48	OFDM	BPSK	6
802.11ac (VHT20)		36 to 48	36, 40, 48	OFDM	BPSK	6.5
802.11ac (VHT40)		38 to 46	38, 46	OFDM	BPSK	13.5
802.11ac (VHT80)		42	42	OFDM	BPSK	29.3
802.11a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

Test Condition:

Applicable To	Environmental Conditions	Input Power	Tested By
RE≥1G	26deg. C, 69%RH	120Vac, 60Hz	Andy Ho
RE<1G	24deg. C, 65%RH	120Vac, 60Hz	Jyunchun Lin
PLC	24deg. C, 75%RH	120Vac, 60Hz	Andy Ho
APCM	25deg. C, 60%RH	120Vac, 60Hz	Robert Cheng

3.3 Duty Cycle of Test Signal

Duty cycle of test signal is 100 %, duty factor is not required.

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.

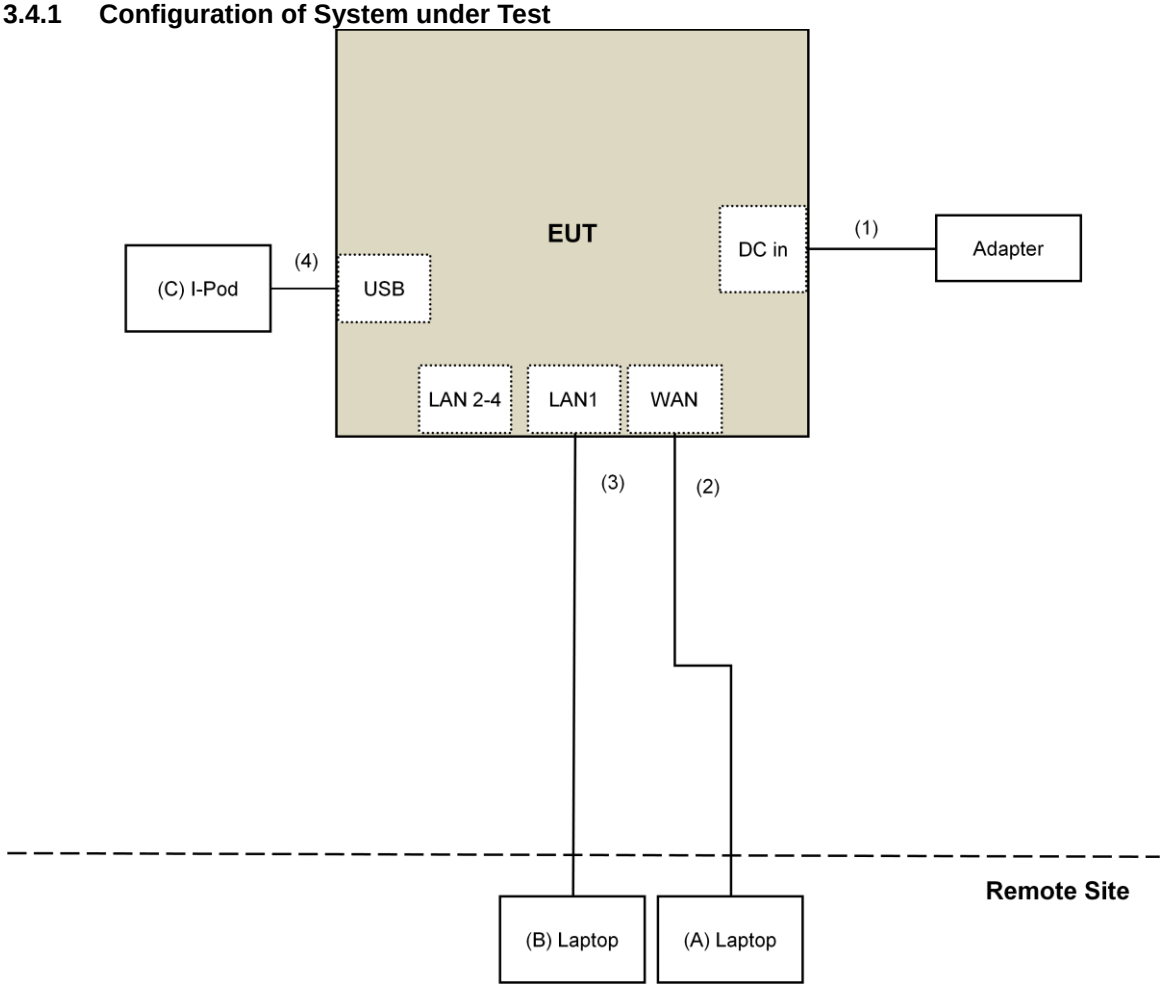
ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Laptop	DELL	E6420	B92T3R1	FCC DoC	Provided by Lab
B.	Laptop	DELL	E5430	HYV4VY1	FCC DoC	Provided by Lab
C.	iPod	Apple	MD778TA/A	CC4JL03FF4T1	NA	Provided by Lab

Note:

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

ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	DC Cable	1	1.1	No	0	Supplied by client
2.	RJ-45 Cable	1	10	No	0	Provided by Lab
3.	RJ-45 Cable	1	10	No	0	Provided by Lab
4.	USB Cable	1	0.1	Yes	0	Provided by Lab

3.4.1 Configuration of System under Test



3.5 General Description of Applied Standard

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

FCC Part 15, Subpart E (15.407)
KDB 789033 D02 General UNII Test Procedure New Rules v01r04
KDB 662911 D01 Multiple Transmitter Output v02r01
ANSI C63.10-2013

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

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

4 Test Types and Results

4.1 Radiated Emission and Bandedge Measurement

4.1.1 Limits of Radiated Emission and Bandedge Measurement

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

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

NOTE:

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

Limits of unwanted emission out of the restricted bands

<table>
<tr><td colspan="2">Applicable To</td><td colspan="2">Limit</td></tr>
<tr><td colspan="2" rowspan="2">789033 D02 General UNII Test Procedure New Rules v01r04</td><td colspan="2">Field Strength at 3m</td></tr>
<tr><td>PK:74 (dBμV/m)</td><td>AV:54 (dBμV/m)</td></tr>
<tr><td>Frequency Band</td><td colspan="2">Applicable To</td><td>EIRP Limit</td><td>Equivalent Field Strength at 3m</td></tr>
<tr><td>5150~5250 MHz</td><td colspan="2">15.407(b)(1)</td><td rowspan="3">PK:-27 (dBm/MHz)</td><td rowspan="3">PK:68.2(dBμV/m)</td></tr>
<tr><td>5250~5350 MHz</td><td colspan="2">15.407(b)(2)</td></tr>
<tr><td>5470~5725 MHz</td><td colspan="2">15.407(b)(3)</td></tr>
<tr><td rowspan="2">5725~5850 MHz</td><td>☒</td><td>15.407(b)(4)(i)</td><td>PK:-27 (dBm/MHz) *1
PK:10 (dBm/MHz) *2
PK:15.6 (dBm/MHz) *3
PK:27 (dBm/MHz) *4</td><td>PK: 68.2(dBμV/m) *1
PK:105.2 (dBμV/m) *2
PK: 110.8(dBμV/m) *3
PK:122.2 (dBμV/m) *4</td></tr>
<tr><td>☐</td><td>15.407(b)(4)(ii)</td><td colspan="2">Emission limits in section 15.247(d)</td></tr>
<tr><td colspan="4">*1 beyond 75 MHz or more above of the band edge.
*2 below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above.
*3 below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above.
*4 from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.</td></tr>
</table>

Note:

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

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

4.1.2 Test Instruments

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver Agilent	N9038A	MY50010156	July 12, 2017	July 11, 2018
Pre-Amplifier(*) EMCI	EMC001340	980142	Jan. 20, 2016	Jan. 19, 2018
Loop Antenna(*) Electro-Metrics	EM-6879	264	Dec. 16, 2016	Dec. 15, 2018
RF Cable	NA	LOOPCAB-001 LOOPCAB-002	Jan. 17, 2017	Jan. 16, 2018
Pre-Amplifier Mini-Circuits	ZFL-1000VH2B	AMP-ZFL-05	May 06, 2017	May 05, 2018
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-361	Dec. 29, 2016	Dec. 28, 2017
RF Cable	8D	966-3-1 966-3-2 966-3-3	Apr. 01, 2017	Mar. 31, 2018
Fixed attenuator Mini-Circuits	UNAT-5+	PAD-3m-3-01	Oct. 05, 2016	Oct. 04, 2017
Horn_Antenna SCHWARZBECK	BBHA9120-D	9120D-406	Dec. 28, 2016	Dec. 27, 2017
Pre-Amplifier EMCI	EMC12630SE	980384	Feb. 02, 2017	Feb. 01, 2018
RF Cable	EMC104-SM-SM-1200 EMC104-SM-SM-2000 EMC104-SM-SM-5000	160922 150317 150322	Feb. 02, 2017 Mar. 29, 2017 Mar. 29, 2017	Feb. 01, 2018 Mar. 28, 2018 Mar. 28, 2018
Spectrum Analyzer Keysight	N9030A	MY54490520	July 25, 2017	July 24, 2018
Pre-Amplifier EMCI	EMC184045SE	980386	Feb. 02, 2017	Feb. 01, 2018
Horn_Antenna SCHWARZBECK	BBHA 9170	BBHA9170608	Dec. 15, 2016	Dec. 14, 2017
RF Cable	SUCOFLEX 102	36432/2 36433/2	Jan. 15, 2017	Jan. 14, 2018
Software	ADT_Radiated_V8.7.08	NA	NA	NA
Antenna Tower & Turn Table Max-Full	MF-7802	MF780208406	NA	NA
Boresight Antenna Fixture	FBA-01	FBA-SIP01	NA	NA
Spectrum Analyzer R&S	FSV40	100964	July 1, 2017	June 30, 2018
Power meter Anritsu	ML2495A	1014008	May 11, 2017	May 10, 2018
Power sensor Anritsu	MA2411B	0917122	May 11, 2017	May 10, 2018
AC Power Source Extech Electronics	6205	1440452	NA	NA
Temperature & Humidity Chamber Giant Force	GTH-150-40-SP-AR	MAA0812-008	Jan. 11, 2017	Jan. 10, 2018
Digital Multimeter FLUKE	87III	73680266	Nov. 10, 2016	Nov. 09, 2017

NOTE:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. *The calibration interval of the above test instruments is 24 months and the calibrations are traceable to NML/ROC and NIST/USA.
3. The test was performed in 966 Chamber No. 3.
4. The CANADA Site Registration No. is 20331-1.
5. Loop antenna was used for all emissions below 30 MHz.
6. Tested Date: Aug. 04 to 07, 2017.

4.1.3 Test Procedure

For Radiated emission below 30MHz

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

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

c. Both X and Y axes of the antenna are set to make the measurement.

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

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

NOTE:

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

For Radiated emission above 30MHz

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

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

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

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

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

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

Note:

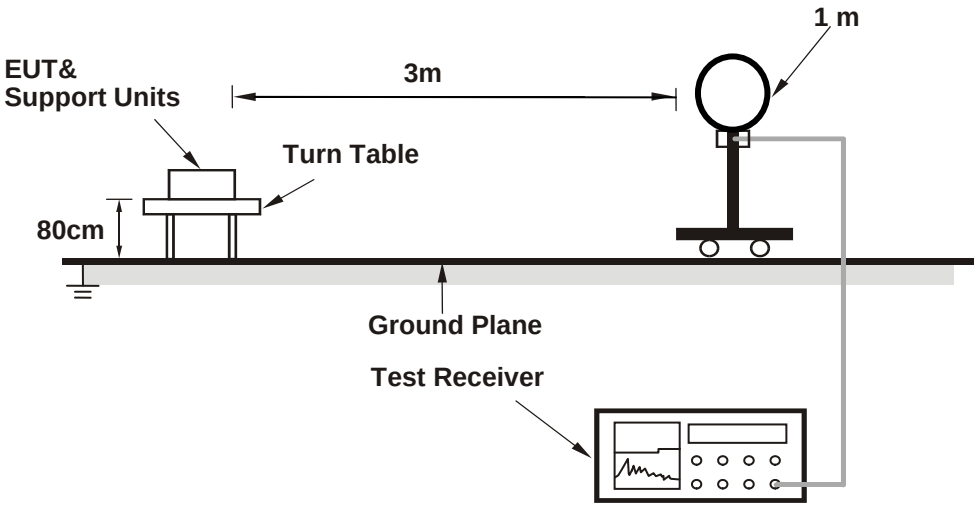
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.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

4.1.4 Deviation from Test Standard

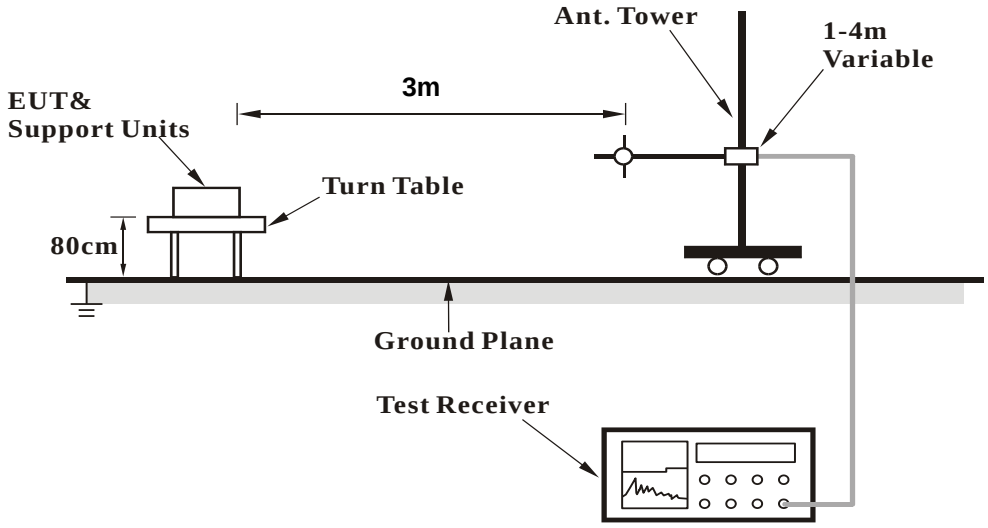
No deviation.

4.1.5 Test Setup

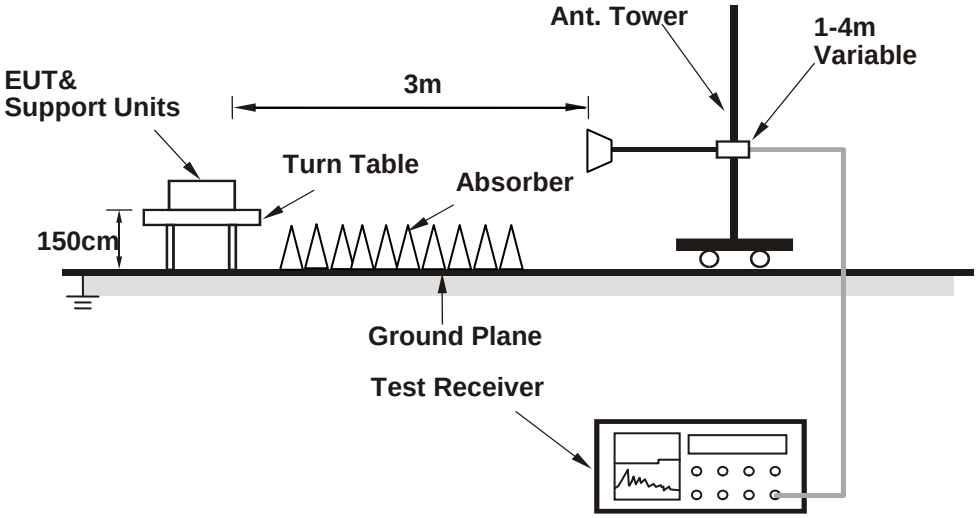
For Radiated emission below 30MHz



For Radiated emission 30MHz to 1GHz



For Radiated emission above 1GHz



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

4.1.6 EUT Operating Condition

a. Connected the EUT with the Laptop which is placed on remote site.
b. Contorlling software (telnet (command)) has been activated to set the EUT on specific status.

4.1.7 Test Results

Above 1GHz Data:

802.11a

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	**FREQ. (MHz)**	**EMISSION LEVEL (dBuV/m)**	**LIMIT (dBuV/m)**	**MARGIN (dB)**	**ANTENNA HEIGHT (m)**	**TABLE ANGLE (Degree)**	**RAW VALUE (dBuV)**	**CORRECTION FACTOR (dB/m)**
1	5150.00	52.9 PK	74.0	-21.1	1.50 H	178	48.9	4.0
2	5150.00	41.8 AV	54.0	-12.2	1.50 H	178	37.8	4.0
3	*5180.00	104.0 PK			1.50 H	178	100.0	4.0
4	*5180.00	95.2 AV			1.50 H	178	91.2	4.0
5	#10360.00	63.1 PK	74.0	-10.9	2.11 H	298	49.5	13.6
6	#10360.00	48.5 AV	54.0	-5.5	2.11 H	298	34.9	13.6
7	15540.00	58.2 PK	74.0	-15.8	3.06 H	353	45.0	13.2
8	15540.00	44.2 AV	54.0	-9.8	3.06 H	353	31.0	13.2
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	**FREQ. (MHz)**	**EMISSION LEVEL (dBuV/m)**	**LIMIT (dBuV/m)**	**MARGIN (dB)**	**ANTENNA HEIGHT (m)**	**TABLE ANGLE (Degree)**	**RAW VALUE (dBuV)**	**CORRECTION FACTOR (dB/m)**
1	5150.00	69.7 PK	74.0	-4.3	1.50 V	8	65.7	4.0
2	5150.00	53.4 AV	54.0	-0.6	1.50 V	8	49.4	4.0
3	*5180.00	116.2 PK			1.50 V	8	112.2	4.0
4	*5180.00	107.5 AV			1.50 V	8	103.5	4.0
5	#10360.00	60.2 PK	74.0	-13.8	3.41 V	12	46.6	13.6
6	#10360.00	45.5 AV	54.0	-8.5	3.41 V	12	31.9	13.6
7	15540.00	58.9 PK	74.0	-15.1	3.41 V	346	45.7	13.2
8	15540.00	45.2 AV	54.0	-8.8	3.41 V	346	32.0	13.2

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5120.00	56.5 PK	74.0	-17.5	1.63 H	62	52.6	3.9
2	5120.00	41.2 AV	54.0	-12.8	1.63 H	62	37.3	3.9
3	*5200.00	108.3 PK			1.63 H	62	104.3	4.0
4	*5200.00	99.5 AV			1.63 H	62	95.5	4.0
5	5360.00	50.6 PK	74.0	-23.4	1.63 H	62	46.2	4.4
6	5360.00	42.2 AV	54.0	-11.8	1.63 H	62	37.8	4.4
7	#10400.00	65.4 PK	74.0	-8.6	2.01 H	106	51.8	13.6
8	#10400.00	50.7 AV	54.0	-3.3	2.01 H	106	37.1	13.6
9	15600.00	60.6 PK	74.0	-13.4	3.34 H	216	47.2	13.4
10	15600.00	46.1 AV	54.0	-7.9	3.34 H	216	32.7	13.4
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5120.00	60.5 PK	74.0	-13.5	1.50 V	358	56.6	3.9
2	5120.00	48.3 AV	54.0	-5.7	1.50 V	358	44.4	3.9
3	*5200.00	118.6 PK			1.50 V	358	114.6	4.0
4	*5200.00	109.8 AV			1.50 V	358	105.8	4.0
5	5360.00	59.7 PK	74.0	-14.3	1.50 V	0	55.3	4.4
6	5360.00	52.0 AV	54.0	-2.0	1.50 V	0	47.6	4.4
7	#10400.00	62.1 PK	74.0	-11.9	2.06 V	180	48.5	13.6
8	#10400.00	47.6 AV	54.0	-6.4	2.06 V	180	34.0	13.6
9	15600.00	61.1 PK	74.0	-12.9	2.63 V	212	47.7	13.4
10	15600.00	47.4 AV	54.0	-6.6	2.63 V	212	34.0	13.4

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5240.00	108.9 PK			1.63 H	79	104.7	4.2
2	*5240.00	99.9 AV			1.63 H	79	95.7	4.2
3	5400.00	54.7 PK	74.0	-19.3	1.47 H	79	50.3	4.4
4	5400.00	46.4 AV	54.0	-7.6	1.47 H	79	42.0	4.4
5	#10480.00	64.2 PK	74.0	-9.8	2.06 H	312	50.5	13.7
6	#10480.00	49.4 AV	54.0	-4.6	2.06 H	312	35.7	13.7
7	15720.00	59.1 PK	74.0	-14.9	3.05 H	360	45.1	14.0
8	15720.00	45.3 AV	54.0	-8.7	3.05 H	360	31.3	14.0
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5240.00	118.7 PK			1.50 V	349	114.5	4.2
2	*5240.00	109.9 AV			1.50 V	349	105.7	4.2
3	5400.00	59.2 PK	74.0	-14.8	1.50 V	360	54.8	4.4
4	5400.00	49.9 AV	54.0	-4.1	1.50 V	360	45.5	4.4
5	#10480.00	61.1 PK	74.0	-12.9	3.39 V	6	47.4	13.7
6	#10480.00	46.2 AV	54.0	-7.8	3.39 V	6	32.5	13.7
7	15720.00	59.9 PK	74.0	-14.1	3.41 V	332	45.9	14.0
8	15720.00	46.4 AV	54.0	-7.6	3.41 V	332	32.4	14.0

REMARKS:

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

CHANNEL	TX Channel 149	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5622.01	52.5 PK	68.2	-15.7	2.11 H	133	48.7	3.8
2	*5745.00	102.3 PK			2.09 H	130	97.3	5.0
3	*5745.00	93.5 AV			2.09 H	130	88.5	5.0
4	#5954.14	52.5 PK	68.2	-15.7	2.11 H	133	47.8	4.7
5	11490.00	69.1 PK	74.0	-4.9	2.03 H	170	55.0	14.1
6	11490.00	53.5 AV	54.0	-0.5	2.03 H	170	39.4	14.1
7	#17235.00	59.5 PK	74.0	-14.5	1.81 H	335	41.2	18.3
8	#17235.00	46.3 AV	54.0	-7.7	1.81 H	335	28.0	18.3
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	#5609.53	55.1 PK	68.2	-13.1	1.50 V	224	50.4	4.7
2	*5745.00	114.5 PK			1.50 V	224	109.5	5.0
3	*5745.00	105.7 AV			1.50 V	224	100.7	5.0
4	#5951.24	53.7 PK	68.2	-14.5	1.50 V	224	48.3	5.4
5	11490.00	68.4 PK	74.0	-5.6	2.13 V	172	54.3	14.1
6	11490.00	53.2 AV	54.0	-0.8	2.13 V	172	39.1	14.1
7	#17235.00	53.1 PK	74.0	-20.9	3.61 V	346	34.8	18.3
8	#17235.00	42.8 AV	54.0	-11.2	3.61 V	346	24.5	18.3

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5631.51	52.2 PK	68.2	-16.0	2.10 H	133	48.4	3.8
2	*5785.00	103.1 PK			2.10 H	133	98.1	5.0
3	*5785.00	93.3 AV			2.10 H	133	88.3	5.0
4	#5976.98	52.2 PK	68.2	-16.0	2.10 H	133	47.2	5.0
5	11570.00	67.8 PK	74.0	-6.2	2.13 H	166	53.8	14.0
6	11570.00	52.9 AV	54.0	-1.1	2.13 H	166	38.9	14.0
7	#17355.00	59.7 PK	74.0	-14.3	1.78 H	348	40.8	18.9
8	#17355.00	46.5 AV	54.0	-7.5	1.78 H	348	27.6	18.9
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	#5625.01	56.0 PK	68.2	-12.2	1.86 V	203	51.3	4.7
2	*5785.00	115.4 PK			1.86 V	203	110.4	5.0
3	*5785.00	105.6 AV			1.86 V	203	100.6	5.0
4	#5946.28	55.1 PK	68.2	-13.1	1.86 V	203	49.7	5.4
5	11570.00	68.4 PK	74.0	-5.6	2.06 V	183	54.4	14.0
6	11570.00	53.6 AV	54.0	-0.4	2.06 V	183	39.6	14.0
7	#17355.00	53.5 PK	74.0	-20.5	3.65 V	359	34.6	18.9
8	#17355.00	43.2 AV	54.0	-10.8	3.65 V	359	24.3	18.9

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5613.54	51.8 PK	68.2	-16.4	2.09 H	130	48.0	3.8
2	*5825.00	101.8 PK			2.11 H	133	96.6	5.2
3	*5825.00	93.0 AV			2.11 H	133	87.8	5.2
4	#5947.75	53.9 PK	68.2	-14.3	2.09 H	130	49.3	4.6
5	11650.00	69.1 PK	74.0	-4.9	2.09 H	158	55.0	14.1
6	11650.00	53.6 AV	54.0	-0.4	2.09 H	158	39.5	14.1
7	#17475.00	60.2 PK	74.0	-13.8	1.79 H	337	40.5	19.7
8	#17475.00	46.8 AV	54.0	-7.2	1.79 H	337	27.1	19.7
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5619.33	54.4 PK	68.2	-13.8	1.86 V	222	49.7	4.7
2	*5825.00	114.1 PK			1.86 V	222	108.9	5.2
3	*5825.00	105.3 AV			1.86 V	222	100.1	5.2
4	#5973.30	54.4 PK	68.2	-13.8	1.86 V	222	48.9	5.5
5	11650.00	67.4 PK	74.0	-6.6	2.09 V	182	53.3	14.1
6	11650.00	53.2 AV	54.0	-0.8	2.09 V	182	39.1	14.1
7	#17475.00	53.0 PK	74.0	-21.0	3.64 V	351	33.3	19.7
8	#17475.00	42.9 AV	54.0	-11.1	3.64 V	351	23.2	19.7

REMARKS:

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

802.11ac (VHT20)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	64.2 PK	74.0	-9.8	1.42 H	60	60.2	4.0
2	5150.00	47.8 AV	54.0	-6.2	1.42 H	60	43.8	4.0
3	*5180.00	106.9 PK			1.42 H	60	102.9	4.0
4	*5180.00	96.7 AV			1.42 H	60	92.7	4.0
5	#10360.00	62.9 PK	74.0	-11.1	2.11 H	313	49.3	13.6
6	#10360.00	48.5 AV	54.0	-5.5	2.11 H	313	34.9	13.6
7	15540.00	58.2 PK	74.0	-15.8	3.00 H	360	45.0	13.2
8	15540.00	43.9 AV	54.0	-10.1	3.00 H	360	30.7	13.2
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	71.2 PK	74.0	-2.8	1.50 V	181	67.2	4.0
2	5150.00	53.7 AV	54.0	-0.3	1.50 V	181	49.7	4.0
3	*5180.00	114.7 PK			1.50 V	181	110.7	4.0
4	*5180.00	105.5 AV			1.50 V	181	101.5	4.0
5	#10360.00	60.5 PK	74.0	-13.5	3.40 V	10	46.9	13.6
6	#10360.00	45.6 AV	54.0	-8.4	3.40 V	10	32.0	13.6
7	15540.00	60.3 PK	74.0	-13.7	3.39 V	360	47.1	13.2
8	15540.00	45.5 AV	54.0	-8.5	3.39 V	360	32.3	13.2

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5120.00	58.2 PK	74.0	-15.8	1.42 H	61	54.3	3.9
2	5120.00	41.9 AV	54.0	-12.1	1.42 H	61	38.0	3.9
3	*5200.00	108.0 PK			1.42 H	61	104.0	4.0
4	*5200.00	98.0 AV			1.42 H	61	94.0	4.0
5	5359.00	51.6 PK	74.0	-22.4	1.42 H	61	47.2	4.4
6	5359.00	43.7 AV	54.0	-10.3	1.42 H	61	39.3	4.4
7	#10400.00	59.7 PK	74.0	-14.3	2.63 H	48	46.1	13.6
8	#10400.00	46.0 AV	54.0	-8.0	2.63 H	48	32.4	13.6
9	15600.00	60.1 PK	74.0	-13.9	1.93 H	57	46.7	13.4
10	15600.00	47.2 AV	54.0	-6.8	1.93 H	57	33.8	13.4
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5120.00	60.2 PK	74.0	-13.8	1.50 V	181	56.3	3.9
2	5120.00	47.1 AV	54.0	-6.9	1.50 V	181	43.2	3.9
3	*5200.00	117.3 PK			1.50 V	188	113.3	4.0
4	*5200.00	108.1 AV			1.50 V	188	104.1	4.0
5	5359.00	57.4 PK	74.0	-16.6	1.84 V	197	53.0	4.4
6	5359.00	51.7 AV	54.0	-2.3	1.84 V	197	47.3	4.4
7	#10400.00	60.8 PK	74.0	-13.2	2.22 V	360	47.2	13.6
8	#10400.00	47.1 AV	54.0	-6.9	2.22 V	360	33.5	13.6
9	15600.00	62.4 PK	74.0	-11.6	1.92 V	26	49.0	13.4
10	15600.00	48.7 AV	54.0	-5.3	1.92 V	26	35.3	13.4

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5000.00	49.5 PK	74.0	-24.5	1.42 H	51	45.7	3.8
2	5000.00	38.9 AV	54.0	-15.1	1.42 H	51	35.1	3.8
3	*5240.00	107.1 PK			1.42 H	51	102.9	4.2
4	*5240.00	97.5 AV			1.42 H	51	93.3	4.2
5	5400.00	51.4 PK	74.0	-22.6	1.42 H	51	47.0	4.4
6	5400.00	41.3 AV	54.0	-12.7	1.42 H	51	36.9	4.4
7	#10480.00	63.8 PK	74.0	-10.2	2.08 H	298	50.1	13.7
8	#10480.00	49.0 AV	54.0	-5.0	2.08 H	298	35.3	13.7
9	15720.00	58.4 PK	74.0	-15.6	3.01 H	360	44.4	14.0
10	15720.00	44.8 AV	54.0	-9.2	3.01 H	360	30.8	14.0
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	5000.00	52.4 PK	74.0	-21.6	1.50 V	188	48.6	3.8
2	5000.00	45.2 AV	54.0	-8.8	1.50 V	188	41.4	3.8
3	*5240.00	116.2 PK			1.50 V	188	112.0	4.2
4	*5240.00	106.8 AV			1.50 V	188	102.6	4.2
5	5400.00	57.5 PK	74.0	-16.5	1.50 V	188	53.1	4.4
6	5400.00	51.7 AV	54.0	-2.3	1.50 V	188	47.3	4.4
7	#10480.00	60.5 PK	74.0	-13.5	3.38 V	13	46.8	13.7
8	#10480.00	45.7 AV	54.0	-8.3	3.38 V	13	32.0	13.7
9	15720.00	60.9 PK	74.0	-13.1	3.35 V	339	46.9	14.0
10	15720.00	46.3 AV	54.0	-7.7	3.35 V	339	32.3	14.0

REMARKS:

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

CHANNEL	TX Channel 149	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5626.11	50.7 PK	68.2	-17.5	1.46 H	347	46.9	3.8
2	*5745.00	102.8 PK			1.46 H	347	97.8	5.0
3	*5745.00	93.2 AV			1.46 H	347	88.2	5.0
4	#5951.33	52.7 PK	68.2	-15.5	1.46 H	347	48.1	4.6
5	11490.00	62.0 PK	74.0	-12.0	1.00 H	42	47.9	14.1
6	11490.00	50.0 AV	54.0	-4.0	1.00 H	42	35.9	14.1
7	#17235.00	59.7 PK	74.0	-14.3	1.85 H	332	41.4	18.3
8	#17235.00	46.7 AV	54.0	-7.3	1.85 H	332	28.4	18.3
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	#5607.05	51.8 PK	68.2	-16.4	1.45 V	354	48.0	3.8
2	*5745.00	114.6 PK			1.45 V	354	109.6	5.0
3	*5745.00	105.5 AV			1.45 V	354	100.5	5.0
4	#5952.99	52.9 PK	68.2	-15.3	1.45 V	354	48.3	4.6
5	11490.00	67.6 PK	74.0	-6.4	2.03 V	351	53.5	14.1
6	11490.00	53.7 AV	54.0	-0.3	2.03 V	351	39.6	14.1
7	#17235.00	53.6 PK	74.0	-20.4	3.59 V	355	35.3	18.3
8	#17235.00	43.2 AV	54.0	-10.8	3.59 V	355	24.9	18.3

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5581.88	51.9 PK	68.2	-16.3	1.46 H	336	48.2	3.7
2	*5785.00	102.3 PK			1.46 H	336	97.3	5.0
3	*5785.00	92.6 AV			1.46 H	336	87.6	5.0
4	#5981.83	53.2 PK	68.2	-15.0	1.46 H	336	48.1	5.1
5	11570.00	58.8 PK	74.0	-15.2	1.07 H	40	44.8	14.0
6	11570.00	49.4 AV	54.0	-4.6	1.07 H	40	35.4	14.0
7	#17355.00	59.9 PK	74.0	-14.1	1.80 H	344	41.0	18.9
8	#17355.00	46.6 AV	54.0	-7.4	1.80 H	344	27.7	18.9
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	#5606.22	54.2 PK	68.2	-14.0	1.51 V	358	50.4	3.8
2	*5785.00	113.8 PK			1.51 V	358	108.8	5.0
3	*5785.00	104.6 AV			1.51 V	358	99.6	5.0
4	#5969.05	52.6 PK	68.2	-15.6	1.51 V	358	47.7	4.9
5	11570.00	66.8 PK	74.0	-7.2	2.06 V	348	52.8	14.0
6	**11570.00**	**53.9 AV**	**54.0**	**-0.1**	**2.06 V**	**348**	**39.9**	**14.0**
7	#17355.00	53.0 PK	74.0	-21.0	3.59 V	338	34.1	18.9
8	#17355.00	42.5 AV	54.0	-11.5	3.59 V	338	23.6	18.9

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5633.66	51.2 PK	68.2	-17.0	1.40 H	334	47.4	3.8
2	*5825.00	101.1 PK			1.40 H	334	95.9	5.2
3	*5825.00	91.2 AV			1.40 H	334	86.0	5.2
4	#5960.40	52.7 PK	68.2	-15.5	1.40 H	334	47.9	4.8
5	11650.00	58.5 PK	74.0	-15.5	1.11 H	55	44.4	14.1
6	11650.00	49.0 AV	54.0	-5.0	1.11 H	55	34.9	14.1
7	#17475.00	59.8 PK	74.0	-14.2	1.81 H	355	40.1	19.7
8	#17475.00	46.6 AV	54.0	-7.4	1.81 H	355	26.9	19.7
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5566.40	51.1 PK	68.2	-17.1	1.50 V	360	47.4	3.7
2	*5825.00	112.8 PK			1.50 V	360	107.6	5.2
3	*5825.00	103.8 AV			1.50 V	360	98.6	5.2
4	#5980.81	53.6 PK	68.2	-14.6	1.50 V	360	48.5	5.1
5	11650.00	67.2 PK	74.0	-6.8	2.12 V	360	53.1	14.1
6	**11650.00**	**53.9 AV**	**54.0**	**-0.1**	**2.12 V**	**360**	**39.8**	**14.1**
7	#17475.00	52.8 PK	74.0	-21.2	3.57 V	341	33.1	19.7
8	#17475.00	42.4 AV	54.0	-11.6	3.57 V	341	22.7	19.7

REMARKS:

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

802.11ac (VHT40)

CHANNEL	TX Channel 38	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	60.9 PK	74.0	-13.1	1.61 H	356	56.9	4.0
2	5150.00	47.1 AV	54.0	-6.9	1.61 H	356	43.1	4.0
3	*5190.00	102.2 PK			1.61 H	356	98.2	4.0
4	*5190.00	91.9 AV			1.61 H	356	87.9	4.0
5	5350.00	51.2 PK	74.0	-22.8	1.61 H	356	46.8	4.4
6	5350.00	42.3 AV	54.0	-11.7	1.61 H	356	37.9	4.4
7	#10380.00	58.9 PK	74.0	-15.1	2.04 H	295	45.3	13.6
8	#10380.00	43.9 AV	54.0	-10.1	2.04 H	295	30.3	13.6
9	15570.00	53.8 PK	74.0	-20.2	2.96 H	352	40.5	13.3
10	15570.00	39.9 AV	54.0	-14.1	2.96 H	352	26.6	13.3
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	69.4 PK	74.0	-4.6	1.50 V	205	65.4	4.0
2	5150.00	53.7 AV	54.0	-0.3	1.50 V	205	49.7	4.0
3	*5190.00	110.7 PK			1.50 V	205	106.7	4.0
4	*5190.00	101.3 AV			1.50 V	205	97.3	4.0
5	5350.00	55.2 PK	74.0	-18.8	1.50 V	205	50.8	4.4
6	5350.00	50.5 AV	54.0	-3.5	1.50 V	205	46.1	4.4
7	#10380.00	55.8 PK	74.0	-18.2	3.34 V	12	42.2	13.6
8	#10380.00	40.5 AV	54.0	-13.5	3.34 V	12	26.9	13.6
9	15570.00	56.1 PK	74.0	-17.9	3.37 V	334	42.8	13.3
10	15570.00	41.7 AV	54.0	-12.3	3.37 V	334	28.4	13.3

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	57.5 PK	74.0	-16.5	1.51 H	52	53.5	4.0
2	5150.00	44.4 AV	54.0	-9.6	1.51 H	52	40.4	4.0
3	*5230.00	105.5 PK			1.51 H	52	101.3	4.2
4	*5230.00	96.9 AV			1.51 H	52	92.7	4.2
5	5389.00	51.2 PK	74.0	-22.8	1.51 H	52	46.8	4.4
6	5389.00	40.1 AV	54.0	-13.9	1.51 H	52	35.7	4.4
7	#10460.00	62.7 PK	74.0	-11.3	2.08 H	292	49.0	13.7
8	#10460.00	47.5 AV	54.0	-6.5	2.08 H	292	33.8	13.7
9	15690.00	57.6 PK	74.0	-16.4	3.00 H	358	43.6	14.0
10	15690.00	43.6 AV	54.0	-10.4	3.00 H	358	29.6	14.0
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	68.7 PK	74.0	-5.3	1.50 V	205	64.7	4.0
2	5150.00	53.2 AV	54.0	-0.8	1.50 V	205	49.2	4.0
3	*5230.00	114.7 PK			1.50 V	205	110.5	4.2
4	*5230.00	105.7 AV			1.50 V	205	101.5	4.2
5	5389.00	57.3 PK	74.0	-16.7	1.50 V	205	52.9	4.4
6	5389.00	48.7 AV	54.0	-5.3	1.50 V	205	44.3	4.4
7	#10460.00	59.8 PK	74.0	-14.2	3.33 V	10	46.1	13.7
8	#10460.00	44.8 AV	54.0	-9.2	3.33 V	10	31.1	13.7
9	15690.00	60.3 PK	74.0	-13.7	3.33 V	333	46.3	14.0
10	15690.00	45.9 AV	54.0	-8.1	3.33 V	333	31.9	14.0

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5570.43	50.9 PK	68.2	-17.3	1.50 H	347	47.2	3.7
2	*5755.00	100.1 PK			1.50 H	347	95.1	5.0
3	*5755.00	91.3 AV			1.50 H	347	86.3	5.0
4	#5968.06	52.4 PK	68.2	-15.8	1.50 H	347	47.5	4.9
5	11510.00	58.3 PK	74.0	-15.7	1.09 H	58	44.3	14.0
6	11510.00	48.9 AV	54.0	-5.1	1.09 H	58	34.9	14.0
7	#17265.00	60.1 PK	74.0	-13.9	1.86 H	347	41.6	18.5
8	#17265.00	47.0 AV	54.0	-7.0	1.86 H	347	28.5	18.5
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	#5643.23	63.3 PK	68.2	-4.9	1.50 V	11	59.4	3.9
2	*5755.00	112.4 PK			1.50 V	10	107.4	5.0
3	*5755.00	103.3 AV			1.50 V	10	98.3	5.0
4	#6013.62	54.9 PK	68.2	-13.3	1.50 V	11	49.7	5.2
5	11510.00	68.1 PK	74.0	-5.9	2.03 V	360	54.1	14.0
6	**11510.00**	**53.9 AV**	**54.0**	**-0.1**	**2.03 V**	**360**	**39.9**	**14.0**
7	#17265.00	52.4 PK	74.0	-21.6	3.54 V	345	33.9	18.5
8	#17265.00	42.2 AV	54.0	-11.8	3.54 V	345	23.7	18.5

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5610.47	51.9 PK	68.2	-16.3	1.47 H	352	48.1	3.8
2	*5795.00	99.6 PK			1.47 H	352	94.5	5.1
3	*5795.00	90.7 AV			1.47 H	352	85.6	5.1
4	#5953.52	52.1 PK	68.2	-16.1	1.47 H	352	47.5	4.6
5	11590.00	58.7 PK	74.0	-15.3	1.14 H	46	44.7	14.0
6	11590.00	49.0 AV	54.0	-5.0	1.14 H	46	35.0	14.0
7	#17385.00	59.7 PK	74.0	-14.3	1.86 H	360	40.6	19.1
8	#17385.00	46.3 AV	54.0	-7.7	1.86 H	360	27.2	19.1
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	#5566.38	52.8 PK	68.2	-15.4	1.50 V	10	49.1	3.7
2	*5795.00	111.4 PK			1.50 V	11	106.3	5.1
3	*5795.00	102.6 AV			1.50 V	11	97.5	5.1
4	#5927.99	60.1 PK	68.2	-8.1	1.50 V	10	55.6	4.5
5	11590.00	68.5 PK	74.0	-5.5	2.07 V	352	54.5	14.0
6	**11590.00**	**53.9 AV**	**54.0**	**-0.1**	**2.07 V**	**352**	**39.9**	**14.0**
7	#17385.00	52.4 PK	74.0	-21.6	3.60 V	327	33.3	19.1
8	#17385.00	42.0 AV	54.0	-12.0	3.60 V	327	22.9	19.1

REMARKS:

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

802.11ac (VHT80)

CHANNEL	TX Channel 42	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	50.3 PK	74.0	-23.7	1.34 H	352	46.3	4.0
2	5150.00	47.5 AV	54.0	-6.5	1.34 H	352	43.5	4.0
3	*5210.00	99.7 PK			1.34 H	352	95.6	4.1
4	*5210.00	90.8 AV			1.34 H	352	86.7	4.1
5	5350.00	55.1 PK	74.0	-18.9	1.34 H	352	50.7	4.4
6	5350.00	43.7 AV	54.0	-10.3	1.34 H	352	39.3	4.4
7	#10420.00	59.2 PK	74.0	-14.8	2.04 H	305	45.6	13.6
8	#10420.00	44.1 AV	54.0	-9.9	2.04 H	305	30.5	13.6
9	15630.00	54.0 PK	74.0	-20.0	3.00 H	360	40.4	13.6
10	15630.00	40.0 AV	54.0	-14.0	3.00 H	360	26.4	13.6
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	66.1 PK	74.0	-7.9	1.50 V	172	62.1	4.0
2	5150.00	53.6 AV	54.0	-0.4	1.50 V	172	49.6	4.0
3	*5210.00	108.2 PK			1.50 V	172	104.1	4.1
4	*5210.00	99.1 AV			1.50 V	172	95.0	4.1
5	5350.00	54.1 PK	74.0	-19.9	1.50 V	172	49.7	4.4
6	5350.00	44.0 AV	54.0	-10.0	1.50 V	172	39.6	4.4
7	#10420.00	55.8 PK	74.0	-18.2	3.33 V	0	42.2	13.6
8	#10420.00	40.8 AV	54.0	-13.2	3.33 V	0	27.2	13.6
9	15630.00	56.0 PK	74.0	-18.0	3.36 V	324	42.4	13.6
10	15630.00	41.7 AV	54.0	-12.3	3.36 V	324	28.1	13.6

REMARKS:

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

CHANNEL	TX Channel 155	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5640.81	58.7 PK	68.2	-9.5	2.00 H	244	54.8	3.9
2	*5775.00	97.6 PK			2.00 H	244	92.6	5.0
3	*5775.00	88.8 AV			2.00 H	244	83.8	5.0
4	#5918.33	54.2 PK	73.1	-18.9	2.00 H	244	49.8	4.4
5	11550.00	57.5 PK	74.0	-16.5	1.11 H	62	43.5	14.0
6	11550.00	44.1 AV	54.0	-9.9	1.11 H	62	30.1	14.0
7	#17325.00	55.6 PK	74.0	-18.4	1.83 H	356	37.0	18.6
8	#17325.00	44.3 AV	54.0	-9.7	1.83 H	356	25.7	18.6
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	**#5649.92**	**68.1 PK**	**68.2**	**-0.1**	**1.40 V**	**360**	**64.2**	**3.9**
2	*5775.00	109.2 PK			1.40 V	360	104.2	5.0
3	*5775.00	100.4 AV			1.40 V	360	95.4	5.0
4	#5945.75	59.9 PK	68.2	-8.3	1.40 V	360	55.3	4.6
5	11550.00	61.6 PK	74.0	-12.4	2.08 V	356	47.6	14.0
6	11550.00	48.9 AV	54.0	-5.1	2.08 V	356	34.9	14.0
7	#17325.00	53.1 PK	74.0	-20.9	3.59 V	324	34.5	18.6
8	#17325.00	42.6 AV	54.0	-11.4	3.59 V	324	24.0	18.6

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 (VHT20)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	**FREQ. (MHz)**	**EMISSION LEVEL (dBuV/m)**	**LIMIT (dBuV/m)**	**MARGIN (dB)**	**ANTENNA HEIGHT (m)**	**TABLE ANGLE (Degree)**	**RAW VALUE (dBuV)**	**CORRECTION FACTOR (dB/m)**
1	125.01	30.6 QP	43.5	-12.9	2.00 H	102	40.2	-9.6
2	181.25	35.3 QP	43.5	-8.2	1.50 H	54	45.1	-9.8
3	250.00	42.6 QP	46.0	-3.4	1.50 H	360	52.1	-9.5
4	499.99	41.4 QP	46.0	-4.6	1.50 H	219	44.2	-2.8
5	817.64	29.5 QP	46.0	-16.5	2.50 H	97	26.8	2.7
6	906.27	35.3 QP	46.0	-10.7	1.00 H	360	31.2	4.1
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	64.77	34.5 QP	40.0	-5.5	1.00 V	244	43.4	-8.9
2	106.70	32.8 QP	43.5	-10.7	1.00 V	252	44.3	-11.5
3	181.27	34.1 QP	43.5	-9.4	2.00 V	12	43.9	-9.8
4	250.00	38.4 QP	46.0	-7.6	2.00 V	155	47.9	-9.5
5	500.00	42.6 QP	46.0	-3.4	1.00 V	127	45.4	-2.8
6	894.39	32.3 QP	46.0	-13.7	1.50 V	0	28.5	3.8

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value

4.2 Conducted Emission Measurement

4.2.1 Limits of Conducted Emission Measurement

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

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

4.2.2 Test Instruments

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver R&S	ESCS 30	847124/029	Oct. 24, 2016	Oct. 23, 2017
Line-Impedance Stabilization Network (for EUT) R&S	ESH3-Z5	848773/004	Oct. 26, 2016	Oct. 25, 2017
Line-Impedance Stabilization Network (for Peripheral) R&S	ENV216	100072	June 03, 2017	June 02, 2018
50 ohms Terminator	N/A	EMC-02	Sep. 29, 2016	Sep. 28, 2017
RF Cable	5D-FB	COCCAB-001	Sep. 30, 2016	Sep. 29, 2017
10 dB PAD Mini-Circuits	HAT-10+	CONATT-004	June 18, 2017	June 17, 2018
Software BVADT	BVADT_Cond_ V7.3.7.4	NA	NA	NA

Note:
1. The calibration interval of the above test instruments are 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in Shielded Room No. 1.
3. Tested Date: July 18, 2017.

4.2.3 Test Procedure

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

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

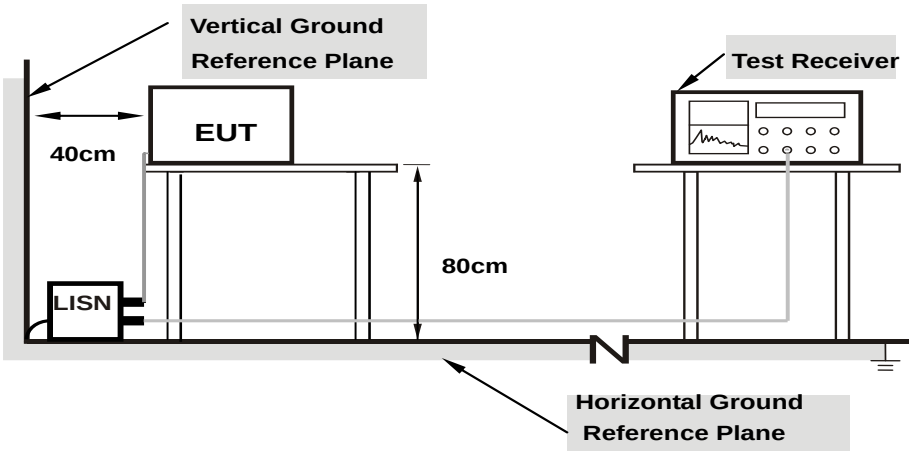
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

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

4.2.4 Deviation from Test Standard

No deviation.

4.2.5 Test Setup



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

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

4.2.6 EUT Operating Condition

Same as 4.1.6.

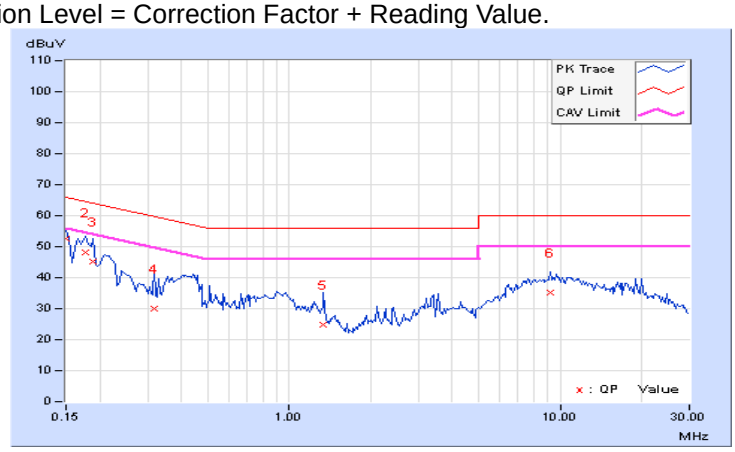
4.2.7 Test Results

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

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	10.08	42.42	30.20	52.50	40.28	66.00	56.00	-13.50	-15.72
2	0.17734	10.07	38.21	28.88	48.28	38.95	64.61	54.61	-16.33	-15.66
3	0.18906	10.07	35.21	21.95	45.28	32.02	64.08	54.08	-18.80	-22.06
4	0.31797	10.10	20.02	10.00	30.12	20.10	59.76	49.76	-29.64	-29.66
5	1.33594	10.16	14.53	9.10	24.69	19.26	56.00	46.00	-31.31	-26.74
6	9.17188	10.72	24.48	19.91	35.20	30.63	60.00	50.00	-24.80	-19.37

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.

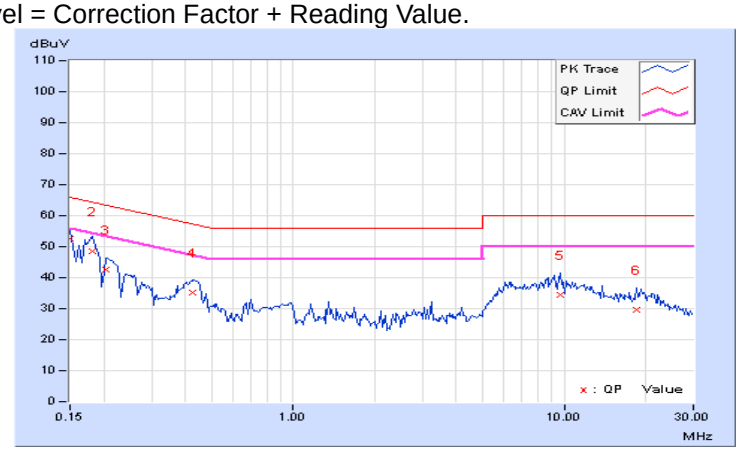


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)

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**	**10.07**	**42.58**	**29.22**	**52.65**	**39.29**	**66.00**	**56.00**	**-13.35**	**-16.71**
2	0.18125	10.05	38.59	28.03	48.64	38.08	64.43	54.43	-15.79	-16.35
3	0.20469	10.04	32.45	16.40	42.49	26.44	63.42	53.42	-20.93	-26.98
4	0.42734	10.12	25.11	19.73	35.23	29.85	57.30	47.30	-22.07	-17.45
5	9.70703	10.68	23.79	18.85	34.47	29.53	60.00	50.00	-25.53	-20.47
6	18.57422	11.20	18.60	13.57	29.80	24.77	60.00	50.00	-30.20	-25.23

REMARKS:

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



4.3 Transmit Power Measurment

4.3.1 Limits of Transmit Power Measurement

Operation Band	EUT Category		Limit
U-NII-1		Outdoor 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)
		Mobile and Portable client device	250mW (24 dBm)
U-NII-2A			250mW (24 dBm) or 11 dBm+10 log B*
U-NII-2C			250mW (24 dBm) or 11 dBm+10 log B*
U-NII-3	√		1 Watt (30 dBm)

*B is the 26 dB emission bandwidth in megahertz

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

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

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

4.3.2 Test Setup

4.3.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.3.4 Test Procedure

Method PM is used to perform output power measurement, trigger and gating function of wide band power meter is enabled to measure max output power of TX on burst. Duty factor is not added to measured value.

4.3.5 Deviation from Test Standard

No deviation.

4.3.6 EUT Operating Condition

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

4.3.7 Test Result

Power Output:

802.11a

Chan.	Chan. Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
36	5180	19.68	19.92	191.072	22.81	30.00	Pass
40	5200	22.19	22.38	338.559	25.30	30.00	Pass
48	5240	21.84	22.12	315.687	24.99	30.00	Pass
149	5745	18.59	17.98	135.083	21.31	30.00	Pass
157	5785	18.38	17.45	124.455	20.95	30.00	Pass
165	5825	18.36	17.26	121.76	20.86	30.00	Pass

802.11ac (VHT20)

Chan.	Chan. Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
36	5180	20.39	20.51	221.856	23.46	30.00	Pass
40	5200	22.29	22.49	346.853	25.40	30.00	Pass
48	5240	21.24	21.53	275.278	24.40	30.00	Pass
149	5745	19.49	18.87	166.01	22.20	30.00	Pass
157	5785	18.95	18.22	144.898	21.61	30.00	Pass
165	5825	18.62	17.87	134.013	21.27	30.00	Pass

802.11ac (VHT40)

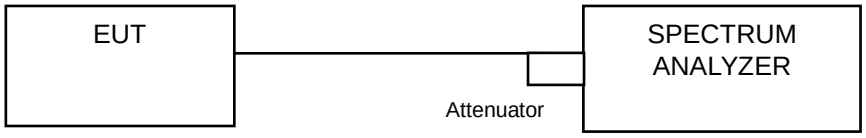
Chan.	Chan. Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
38	5190	17.89	18.18	127.284	21.05	30.00	Pass
46	5230	22.25	22.37	340.464	25.32	30.00	Pass
151	5755	19.96	19.22	182.643	22.62	30.00	Pass
159	5795	19.84	18.84	172.943	22.38	30.00	Pass

802.11ac (VHT80)

Chan.	Chan. Freq. (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
42	5210	18.04	18.45	133.664	21.26	30.00	Pass
155	5775	19.45	18.85	164.841	22.17	30.00	Pass

4.4 Occupied Bandwidth Measurement

4.4.1 Test Setup



4.4.2 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.4.3 Test Procedure

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

4.4.4 Test Results

802.11a

Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)	
		CHAIN 0	CHAIN 1
36	5180	16.92	17.16
40	5200	26.52	26.76
48	5240	18.36	18.00
149	5745	20.52	18.72
157	5785	18.12	17.76
165	5825	17.28	18.36

802.11ac (VHT20)

Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)	
		CHAIN 0	CHAIN 1
36	5180	19.32	18.36
40	5200	27.72	25.68
48	5240	18.72	18.36
149	5745	25.32	26.28
157	5785	20.40	25.32
165	5825	18.24	21.48

802.11ac (VHT40)

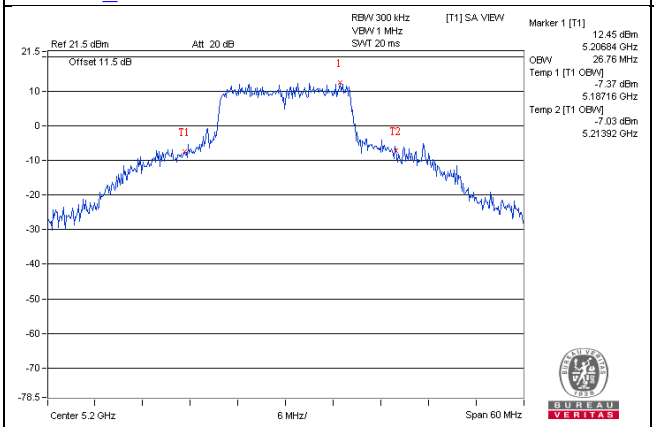
Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)	
		CHAIN 0	CHAIN 1
38	5190	36.96	36.96
46	5230	37.92	37.68
151	5755	53.04	55.68
159	5795	50.64	54.24

802.11ac (VHT80)

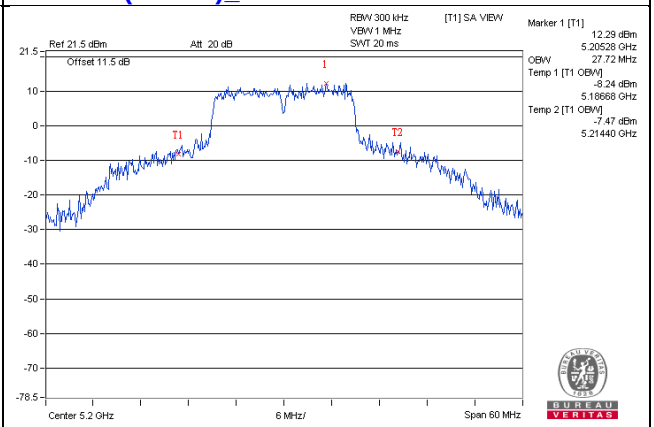
Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)	
		CHAIN 0	CHAIN 1
42	5210	75.84	75.36
155	5775	81.60	81.60

Spectrum Plot of Worst Value

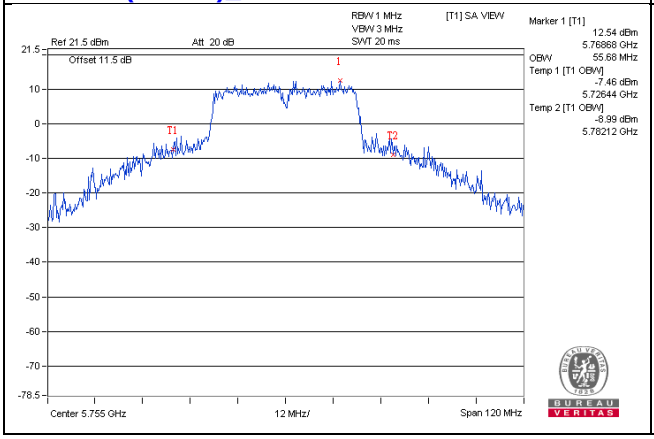
802.11a_Chain1 / CH40



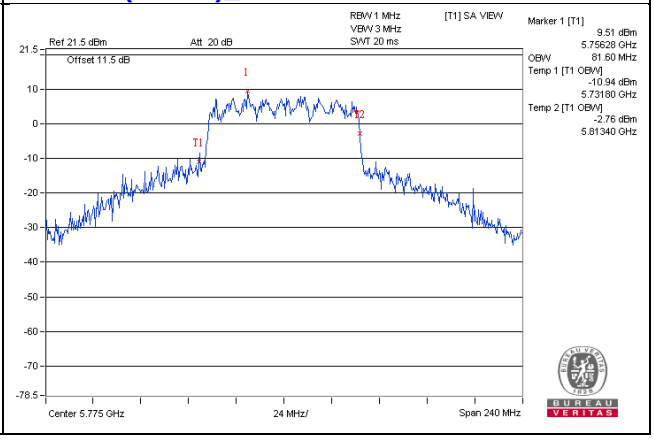
802.11ac (VHT20)_Chain0 / CH40



802.11ac (VHT40)_Chain1 / CH151

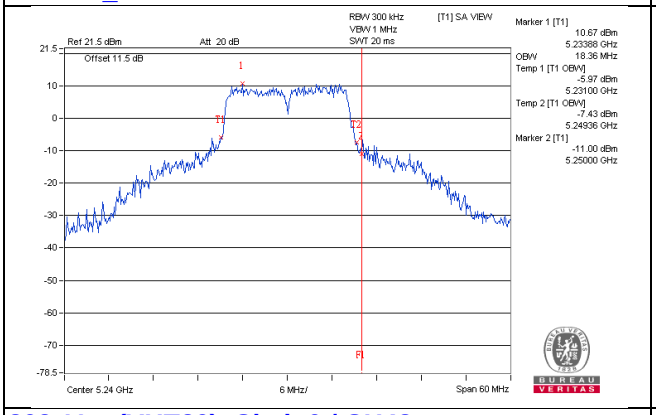


802.11ac (VHT80)_Chain0 / CH155

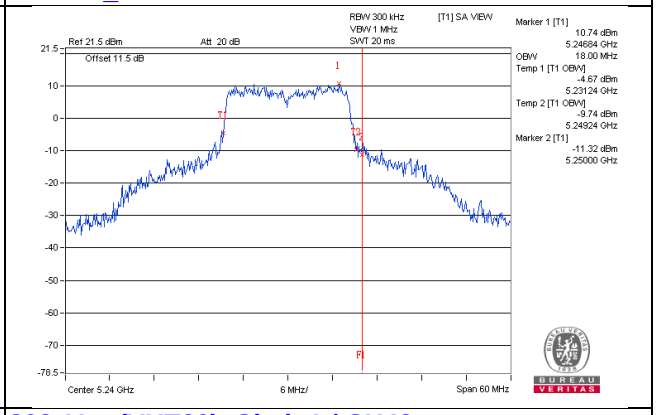


Spectrum Plot for near by DFS band
(DFS is required, if 99% OCP straddle into U-NII-2A band)

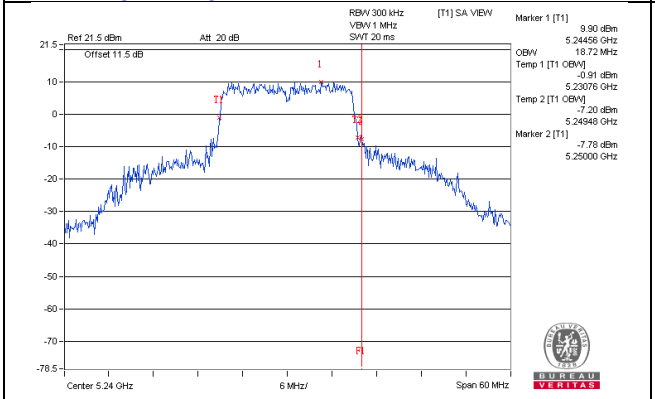
802.11a_Chain0 / CH48



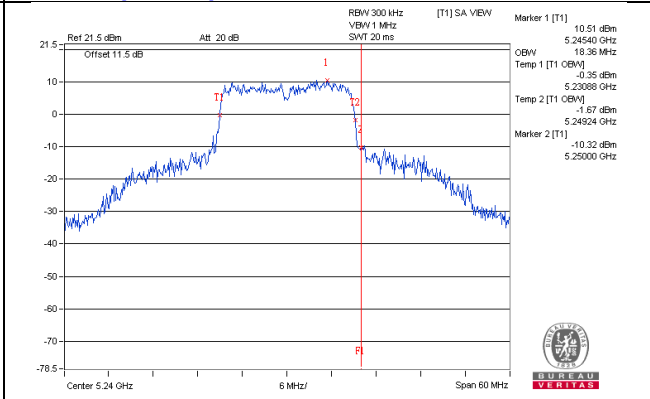
802.11a_Chain1 / CH48



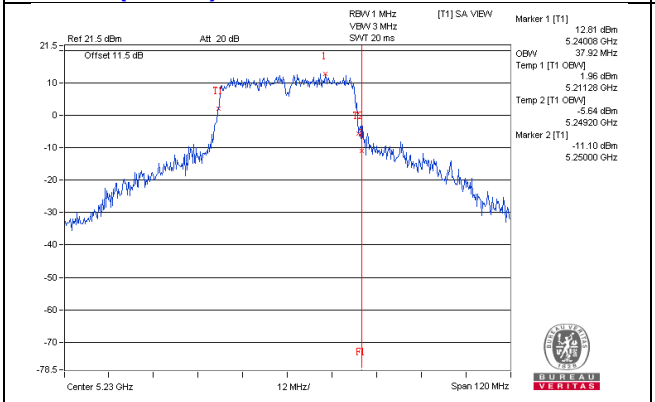
802.11ac(VHT20)_Chain0 / CH48



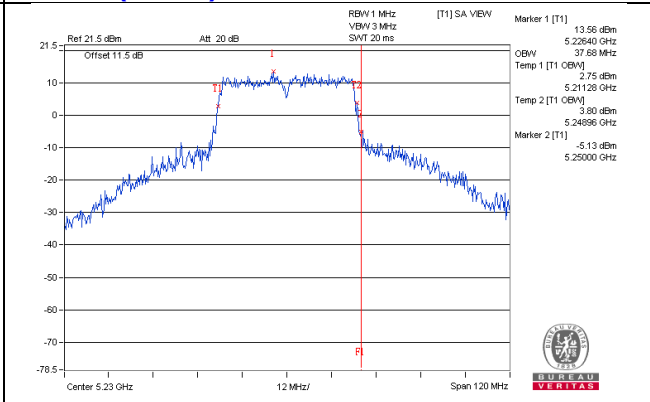
802.11ac(VHT20)_Chain1 / CH48



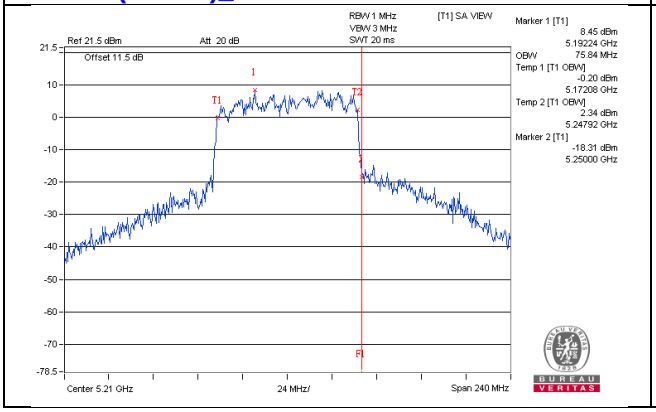
802.11ac(VHT40)_Chain0 / CH46



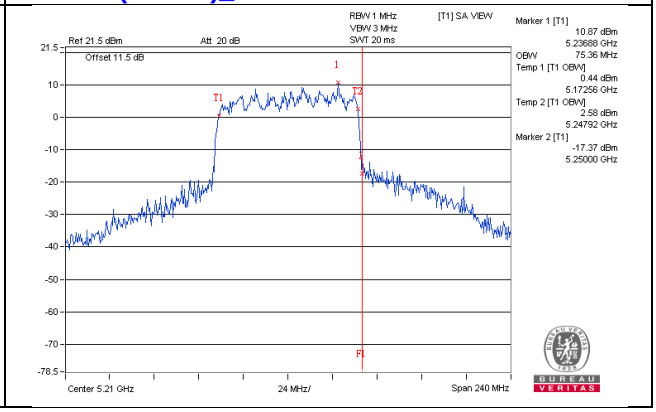
802.11ac(VHT40)_Chain1 / CH46



802.11ac(VHT80)_Chain0 / CH42

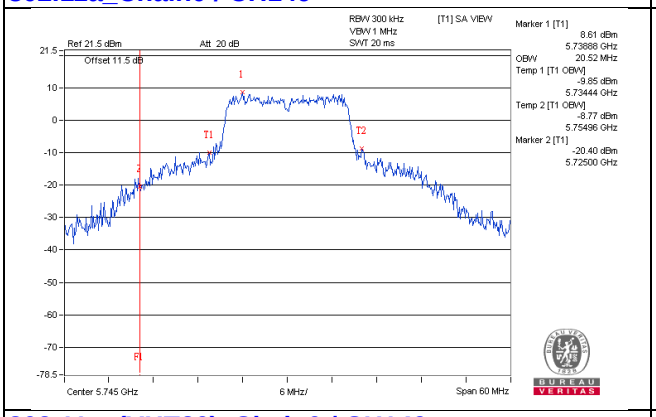


802.11ac(VHT80)_Chain1 / CH42

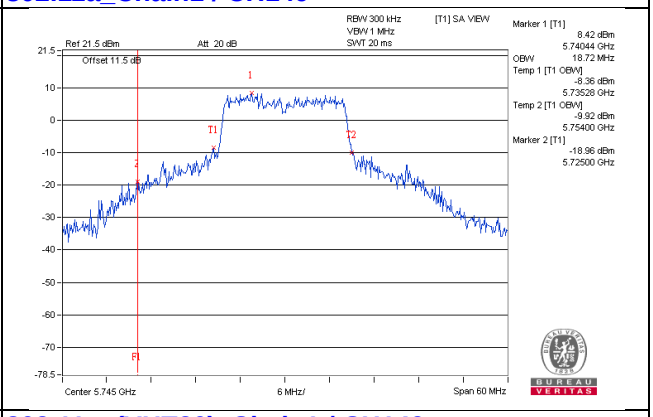


Spectrum Plot for near by DFS band
(DFS is required, if 99% OCP straddle into U-NII-2C band)

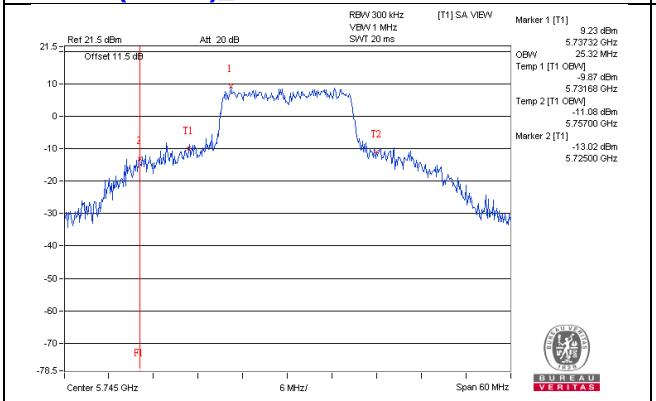
802.11a_Chain0 / CH149



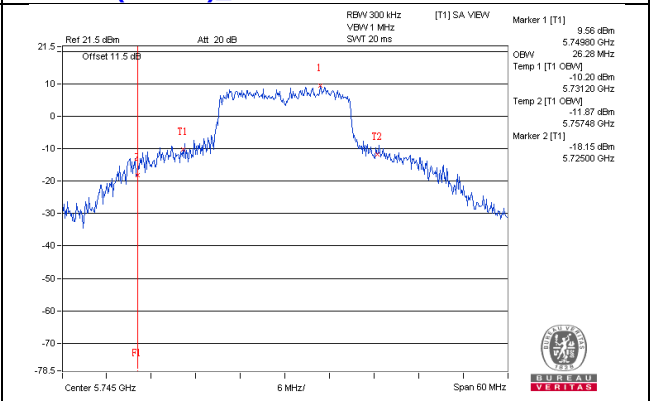
802.11a_Chain1 / CH149



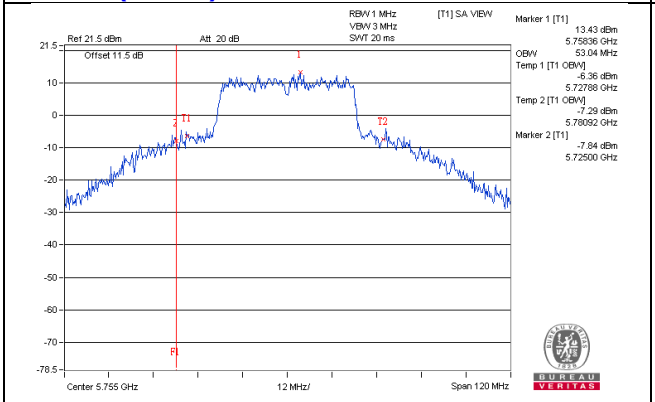
802.11ac(VHT20)_Chain0 / CH149



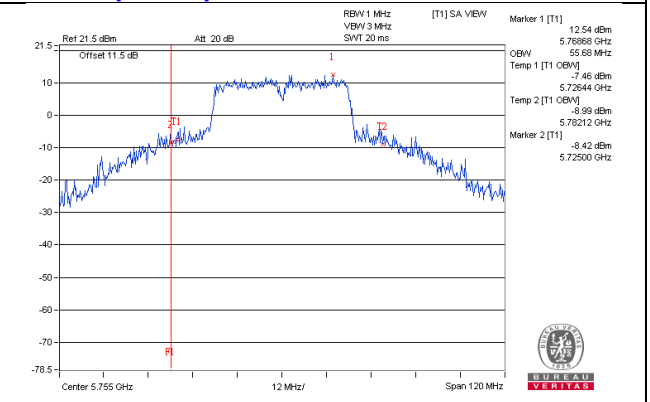
802.11ac(VHT20)_Chain1 / CH149



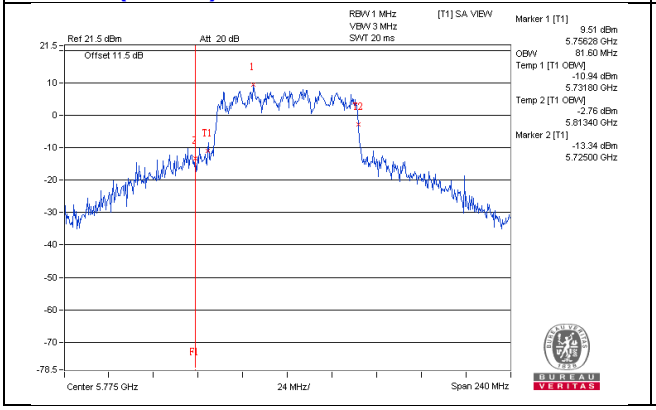
802.11ac(VHT40)_Chain0 / CH151



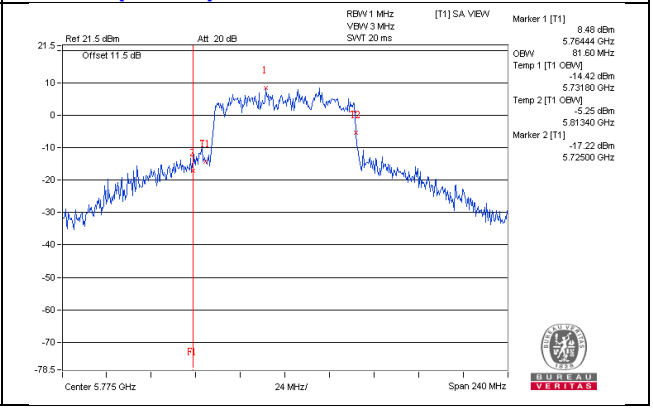
802.11ac(VHT40)_Chain1 / CH151



802.11ac(VHT80)_Chain0 / CH155



802.11ac(VHT80)_Chain1 / CH155

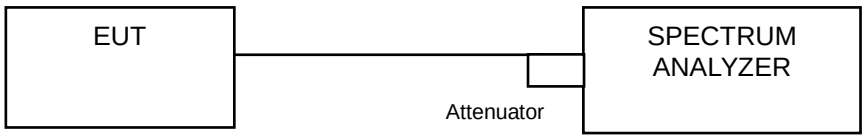


4.5 Peak Power Spectral Density Measurement

4.5.1 Limits of Peak Power Spectral Density Measurement

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

4.5.2 Test Setup



4.5.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.5.4 Test Procedure

For U-NII-1

Using method SA-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

For U-NII-3:

1. Set span to encompass the entire emission bandwidth (EBW) of the signal.
2. Set RBW = 300 kHz, Set VBW ≥ 1 MHz, Detector = RMS
3. Use the peak marker function to determine the maximum power level in any 300 kHz band segment within the fundamental EBW.
4. Scale the observed power level to an equivalent value in 500 kHz by adjusting (reducing) the measured power by a bandwidth correction factor (BWCF) where BWCF = 10log(500 kHz/300kHz)
5. Sweep time = auto, trigger set to “free run”.
6. Trace average at least 100 traces in power averaging mode.
7. Record the max value

4.5.5 Deviation from Test Standard

No deviation.

4.5.6 EUT Operating Condition

Same as Item 4.3.6.

4.5.7 Test Results

For U-NII-1:

802.11a

Chan.	Chan. Freq. (MHz)	PSD (dBm/MHz)		Total Power Density (dBm/MHz)	MAX. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1			
36	5180	5.40	5.92	8.68	14.99	Pass
40	5200	8.44	8.73	11.60	14.99	Pass
48	5240	7.09	6.96	10.04	14.99	Pass

Note: 1. Method a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = 5.0dBi + 10log(2) = 8.01dBi > 6dBi , so the power density limit shall be reduced to 17-(8.01-6) = 14.99dBm.

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			
36	5180	6.81	5.89	9.38	14.99	Pass
40	5200	8.37	7.91	11.16	14.99	Pass
48	5240	6.48	6.55	9.53	14.99	Pass

Note: 1. Method a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = 5.0dBi + 10log(2) = 8.01dBi > 6dBi , so the power density limit shall be reduced to 17-(8.01-6) = 14.99dBm.

802.11ac (VHT40)

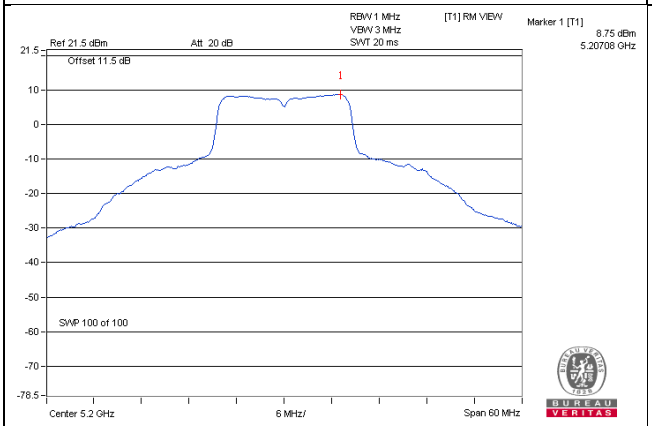
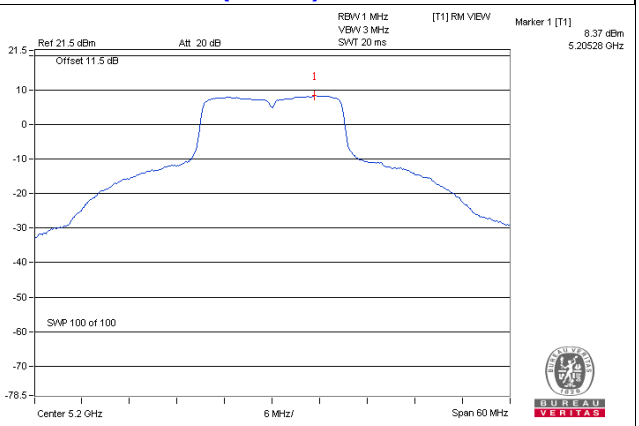
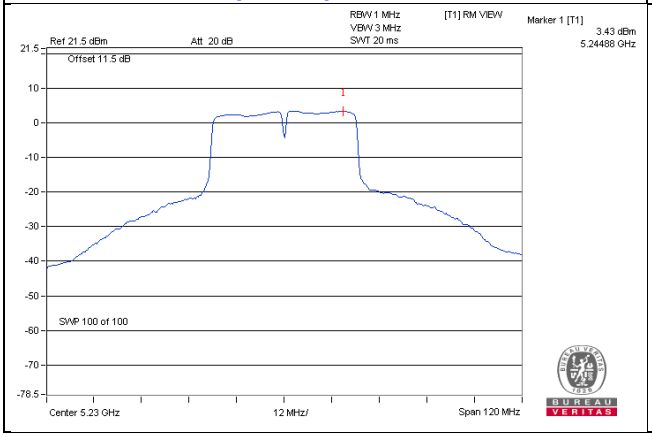
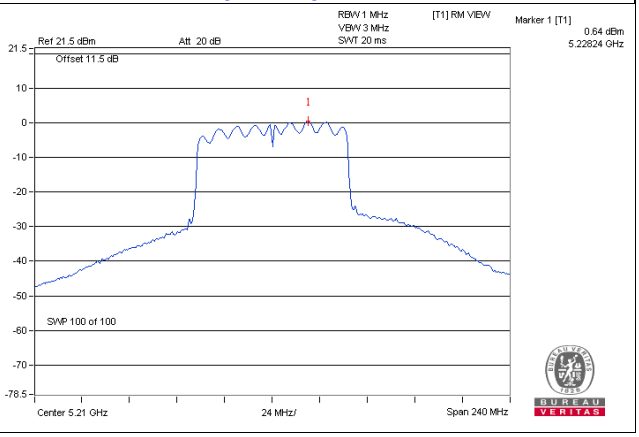
Chan.	Chan. Freq. (MHz)	PSD (dBm/MHz)		Total Power Density (dBm/MHz)	MAX. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1			
38	5190	0.76	0.89	3.84	14.99	Pass
46	5230	3.39	3.42	6.42	14.99	Pass

Note: 1. Method a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = 5.0dBi + 10log(2) = 8.01dBi > 6dBi , so the power density limit shall be reduced to 17-(8.01-6) = 14.99dBm.

802.11ac (VHT80)

Chan.	Chan. Freq. (MHz)	PSD (dBm/MHz)		Total Power Density (dBm/MHz)	MAX. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1			
42	5210	-0.27	0.64	3.22	14.99	Pass

Note: 1. Method a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = 5.0dBi + 10log(2) = 8.01dBi > 6dBi , so the power density limit shall be reduced to 17-(8.01-6) = 14.99dBm.

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

For U-NII-3:

802.11a

TX chain	Channel	Freq. (MHz)	PSD (dBm/300kHz)	PSD (dBm/500kHz)	10 log (N=2) dB	Total PSD (dBm/500kHz)	Limit (dBm/500kHz)	Pass /Fail
0	149	5745	-3.24	-1.02	3.01	1.99	27.99	Pass
	157	5785	-3.88	-1.66	3.01	1.35	27.99	Pass
	165	5825	-4.71	-2.49	3.01	0.52	27.99	Pass
1	149	5745	-3.27	-1.05	3.01	1.96	27.99	Pass
	157	5785	-4.42	-2.20	3.01	0.81	27.99	Pass
	165	5825	-4.68	-2.46	3.01	0.55	27.99	Pass

Note: 1. Directional gain = 5dBi + 10log(2) = 8.01dBi > 6dBi , so the power density limit shall be reduced to 30-(8.01-6) = 27.99dBm.

802.11ac (VHT20)

TX chain	Channel	Freq. (MHz)	PSD (dBm/300kHz)	PSD (dBm/500kHz)	10 log (N=2) dB	Total PSD (dBm/500kHz)	Limit (dBm/500kHz)	Pass /Fail
0	149	5745	-2.64	-0.42	3.01	2.59	27.99	Pass
	157	5785	-3.48	-1.26	3.01	1.75	27.99	Pass
	165	5825	-4.34	-2.12	3.01	0.89	27.99	Pass
1	149	5745	-2.81	-0.59	3.01	2.42	27.99	Pass
	157	5785	-3.61	-1.39	3.01	1.62	27.99	Pass
	165	5825	-4.31	-2.09	3.01	0.92	27.99	Pass

Note: 1. Directional gain = 5dBi + 10log(2) = 8.01dBi > 6dBi , so the power density limit shall be reduced to 30-(8.01-6) = 27.99dBm.

802.11ac (VHT40)

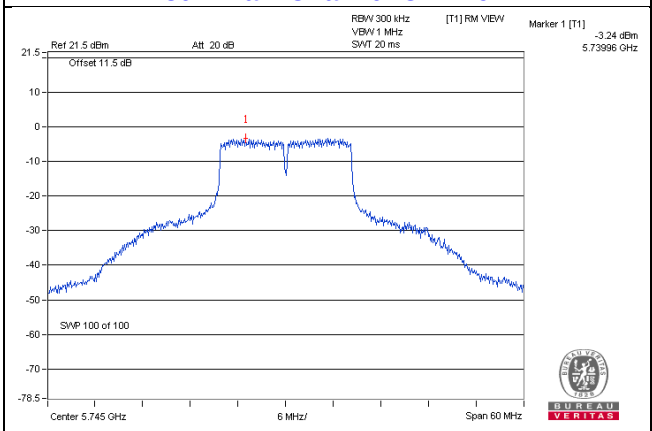
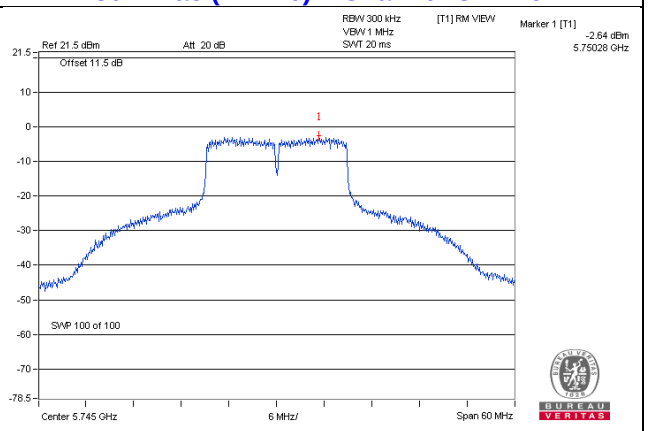
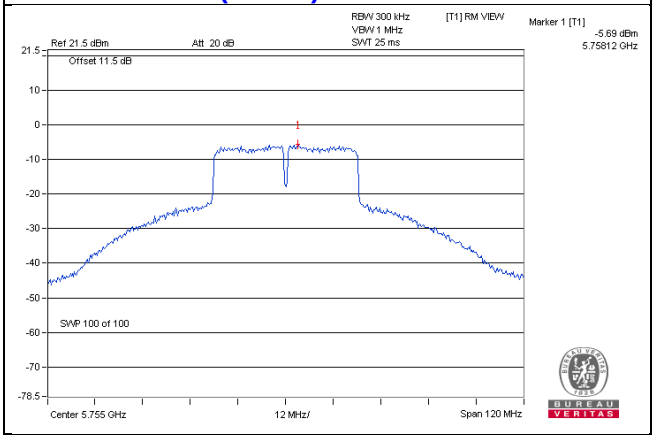
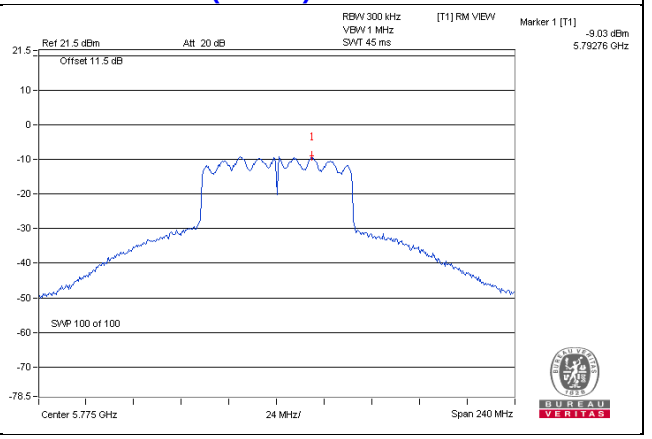
TX chain	Channel	Freq. (MHz)	PSD (dBm/300kHz)	PSD (dBm/500kHz)	10 log (N=2) dB	Total PSD (dBm/500kHz)	Limit (dBm/500kHz)	Pass /Fail
0	151	5755	-5.69	-3.47	3.01	-0.46	27.99	Pass
	159	5795	-6.48	-4.26	3.01	-1.25	27.99	Pass
1	151	5755	-5.79	-3.57	3.01	-0.56	27.99	Pass
	159	5795	-7.01	-4.79	3.01	-1.78	27.99	Pass

Note: 1. Directional gain = 5dBi + 10log(2) = 8.01dBi > 6dBi , so the power density limit shall be reduced to 30-(8.01-6) = 27.99dBm.

802.11ac (VHT80)

TX chain	Channel	Freq. (MHz)	PSD (dBm/300kHz)	PSD (dBm/500kHz)	10 log (N=2) dB	Total PSD (dBm/500kHz)	Limit (dBm/500kHz)	Pass /Fail
0	155	5775	-9.03	-6.81	3.01	-3.80	27.99	Pass
1	155	5775	-9.76	-7.54	3.01	-4.53	27.99	Pass

Note: 1. Directional gain = 5dBi + 10log(2) = 8.01dBi > 6dBi , so the power density limit shall be reduced to 30-(8.01-6) = 27.99dBm.

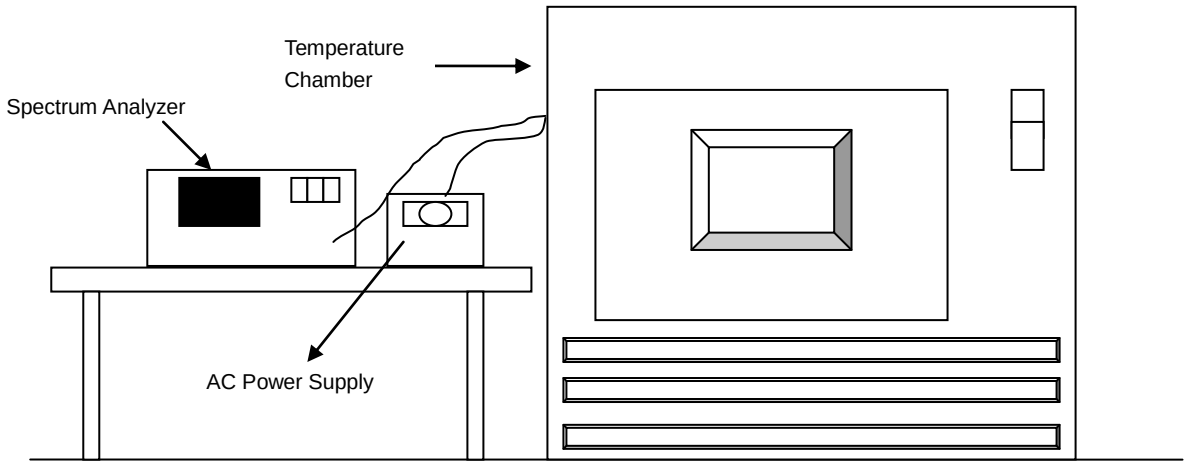
Spectrum Plot of Worst Value	
802.11a – Chain 0: CH 149	**802.11ac (VHT20) – Chain 0: CH 149**
	
802.11ac (VHT40) – Chain 0: CH 151	**802.11ac (VHT80) – Chain 0: CH 155**
	

4.6 Frequency Stability Measurement

4.6.1 Limits of Frequency Stability Measurement

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

4.6.2 Test Setup



4.6.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.6.4 Test Procedure

a. The EUT was placed inside the environmental test chamber and powered by nominal AC voltage.
b. Turn the EUT on and couple its output to a spectrum analyzer.
c. Turn the EUT off and set the chamber to the highest temperature specified.
d. Allow sufficient time (approximately 30 min) for the temperature of the chamber to stabilize, turn the EUT on and measure the operating frequency after 2, 5, and 10 Minutes.
e. Repeat step 2 and 3 with the temperature chamber set to the lowest temperature.
f. The test chamber was allowed to stabilize at +20 degree C for a minimum of 30 Minutes. The supply voltage was then adjusted on the EUT from 85% to 115% and the frequency record.
.

4.6.5 Deviation from Test Standard

No deviation.

4.6.6 EUT Operating Condition

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

4.6.7 Test Results

Frequency Stability Versus Temp.									
Operating Frequency: 5180 MHz									
TEMP. (℃)	Power Supply (Vac)	0 Minute		2 Minute		5 Minute		10 Minute	
		Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail
50	120	5179.9991	Pass	5179.9953	Pass	5179.9975	Pass	5179.9963	Pass
40	120	5180.0196	Pass	5180.0166	Pass	5180.0212	Pass	5180.02	Pass
30	120	5179.9905	Pass	5179.9928	Pass	5179.9892	Pass	5179.9911	Pass
20	120	5179.9784	Pass	5179.9798	Pass	5179.9774	Pass	5179.9765	Pass
10	120	5179.9843	Pass	5179.9825	Pass	5179.9815	Pass	5179.9812	Pass
0	120	5179.9869	Pass	5179.9874	Pass	5179.9886	Pass	5179.9914	Pass
-10	120	5180.0142	Pass	5180.0169	Pass	5180.0143	Pass	5180.0169	Pass
-20	120	5180.0053	Pass	5180.0089	Pass	5180.0086	Pass	5180.0067	Pass
-30	120	5180.0138	Pass	5180.0127	Pass	5180.0147	Pass	5180.011	Pass

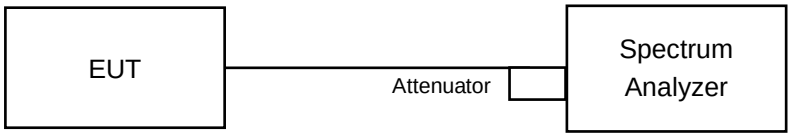
Frequency Stability Versus Voltage									
Operating Frequency: 5180 MHz									
TEMP. (℃)	Power Supply (Vac)	0 Minute		2 Minute		5 Minute		10 Minute	
		Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail
20	138	5179.9789	Pass	5179.9788	Pass	5179.9767	PASS	5179.9772	PASS
	120	5179.9784	Pass	5179.9798	Pass	5179.9774	PASS	5179.9765	PASS
	102	5179.9776	Pass	5179.9803	Pass	5179.9772	PASS	5179.9767	PASS

4.7 6dB Bandwidth Measurment

4.7.1 Limits of 6dB Bandwidth Measurement

The minimum of 6dB Bandwidth Measurement is 0.5MHz.

4.7.2 Test Setup



4.7.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.7.4 Test Procedure

MEASUREMENT PROCEDURE REF

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

4.7.5 Deviation from Test Standard

No deviation.

4.7.6 EUT Operating Condition

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

4.7.7 Test Results

802.11a

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
149	5745	16.54	16.55	0.5	PASS
157	5785	16.55	16.50	0.5	PASS
165	5825	16.55	16.54	0.5	PASS

802.11ac (VHT20)

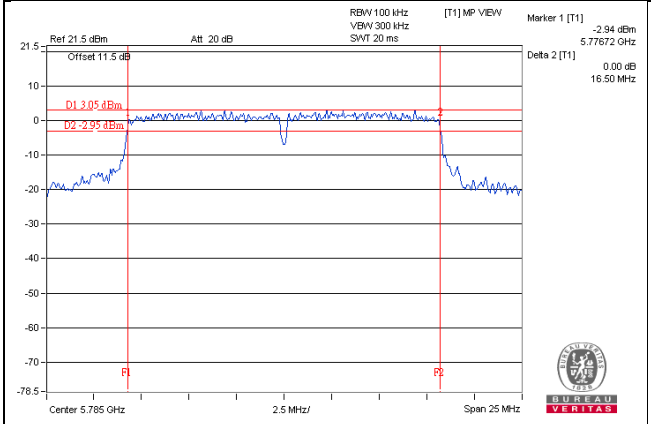
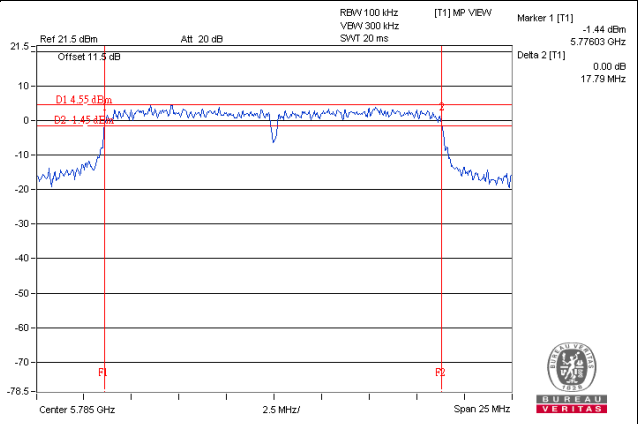
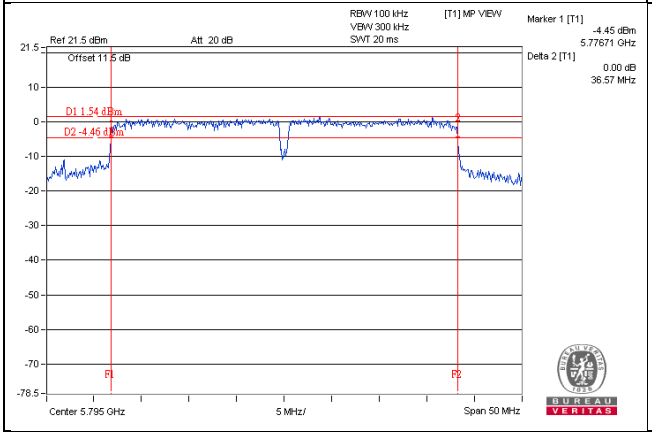
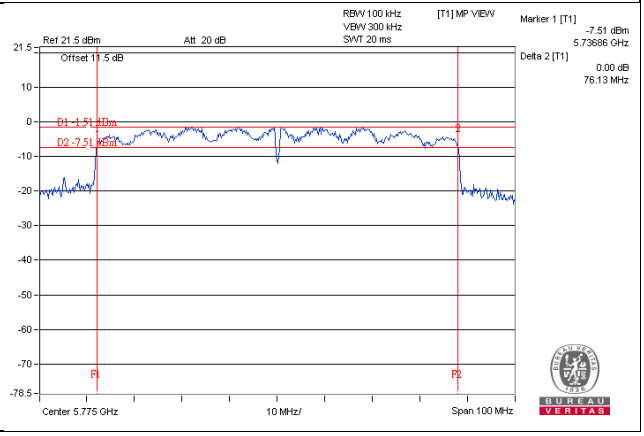
Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
149	5745	17.81	17.86	0.5	PASS
157	5785	17.79	17.82	0.5	PASS
165	5825	17.79	17.80	0.5	PASS

802.11ac (VHT40)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
151	5755	36.58	36.57	0.5	PASS
159	5795	36.60	36.57	0.5	PASS

802.11ac (VHT80)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
155	5775	76.13	76.29	0.5	PASS

Spectrum Plot of Worst Value	
802.11a_Chain 1 / CH157	**802.11ac (VHT20)_Chain 0 / CH157**
	
802.11ac (VHT40)_Chain 1 / CH151	**802.11ac (VHT80)_Chain 0 / CH155**
	

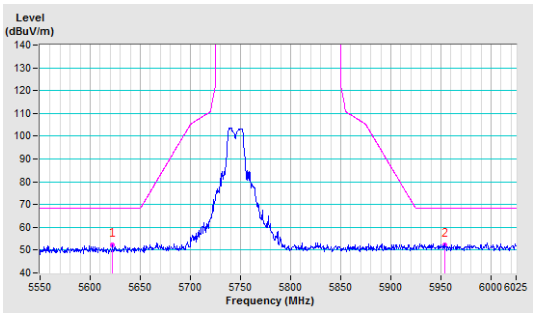
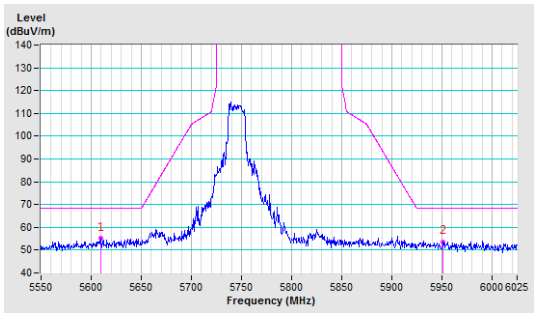
5 Pictures of Test Arrangements

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

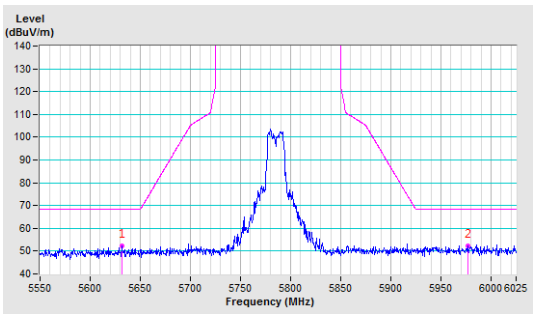
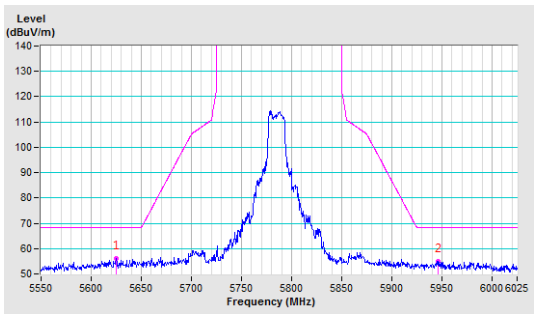
Annex A- Radiated Out of Band Emission (OOBE) Measurement (For U-NII-3 band)

802.11a

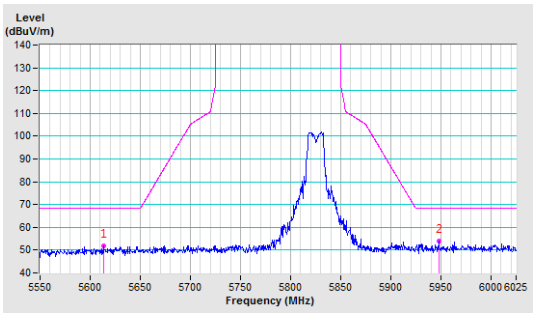
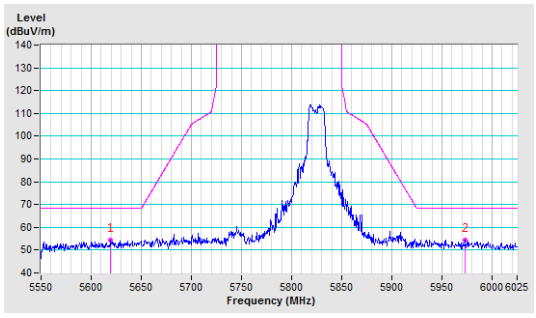
CH 149 5745 MHz

Horizontal	Vertical
	

CH 157 5785 MHz

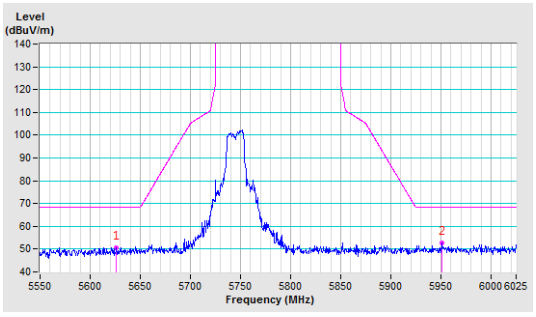
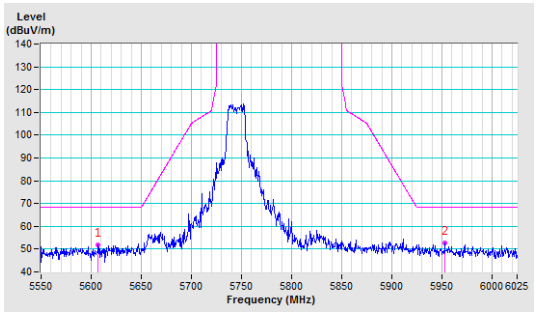
Horizontal	Vertical
	

CH 165 5825 MHz

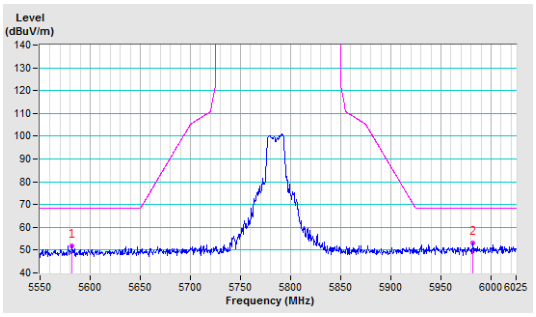
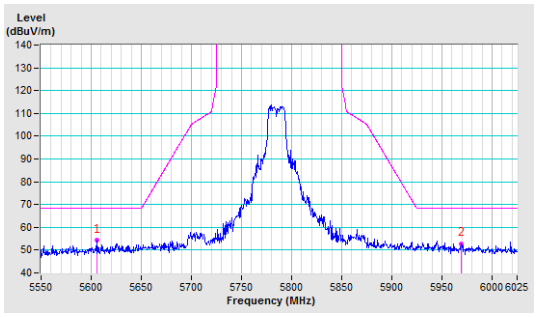
Horizontal	Vertical
	

802.11ac (VHT20)

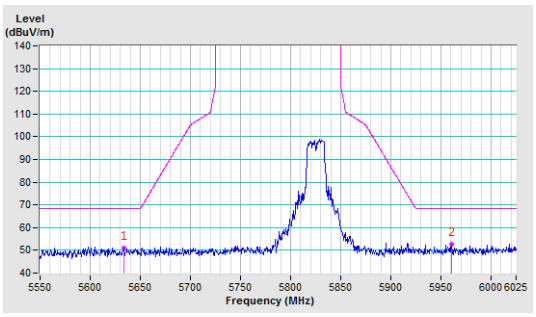
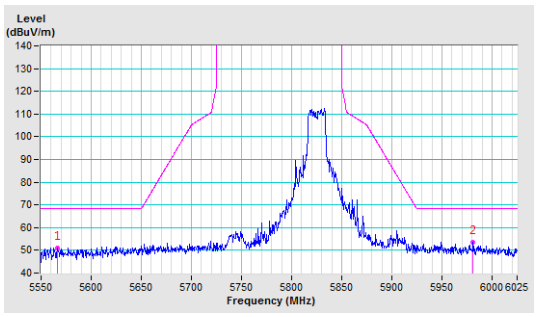
CH 149 5745 MHz

Horizontal	Vertical
	

CH 157 5785 MHz

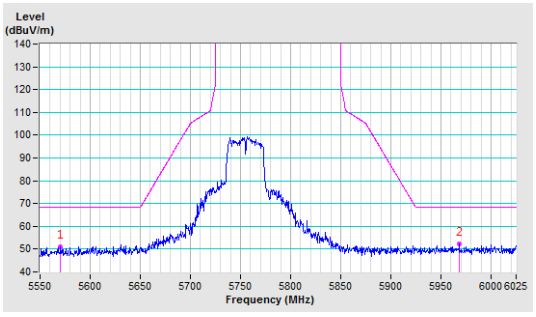
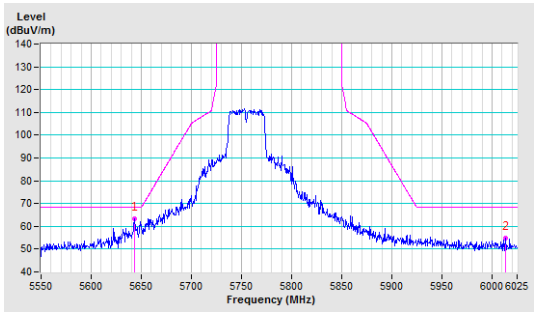
Horizontal	Vertical
	

CH 165 5825 MHz

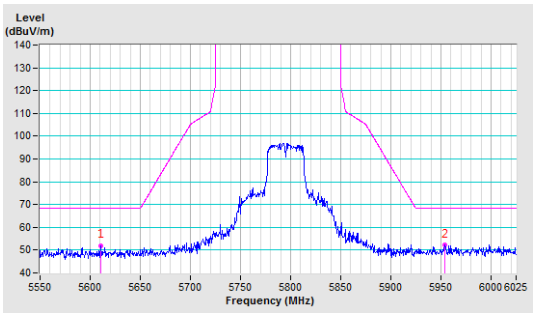
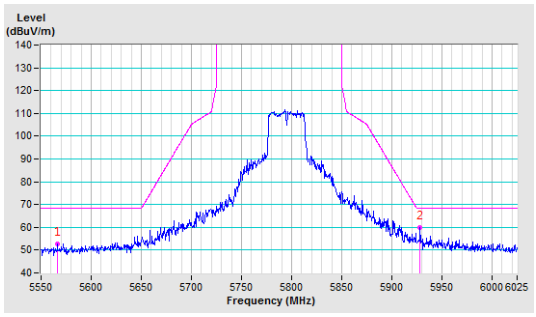
Horizontal	Vertical
	

802.11ac (VHT40)

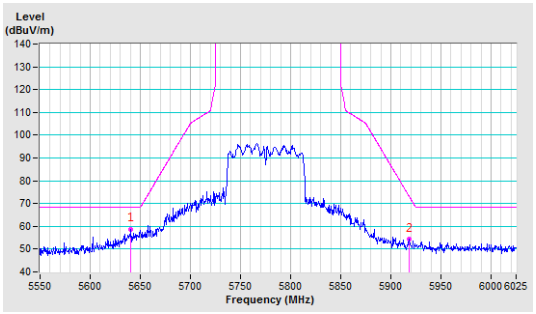
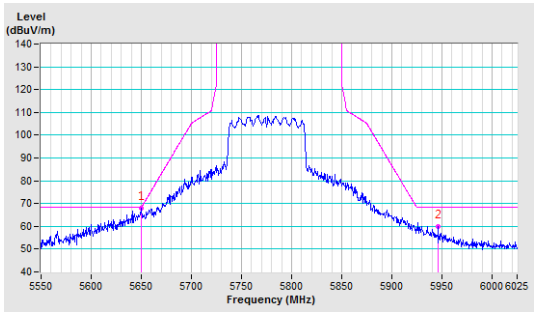
CH 151 5755 MHz

Horizontal	Vertical
	

CH 159 5795 MHz

Horizontal	Vertical
	

802.11ac (VHT80)

CH 155 5775 MHz	
Horizontal	**Vertical**
	

Appendix – Information 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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Web Site: www.bureauveritas-adt.com

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

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