FCC Test Report

Report No.:	RF160606E02-1
FCC ID:	W59XWOBAP1
Test Model:	XWO-BAP1
Received Date:	June 06, 2016
Test Date:	June 22 to 30, 2016
Issued Date:	July 26, 2016
Applicant:	Luxul Wireless
Address:	14203 Minuteman Dr Suite 201 Draper UT 84020 USA
Issued By:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch Hsin Chu Laboratory
Lab Address:	E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300, Taiwan R.O.C.
Test Location (1):	E-2, No.1, Li Hsin 1st Road, Hsinchu Science Park, Hsinchu City 300, Taiwan R.O.C.
Test Location (2):	No. 49, Ln. 206, Wende Rd., Shangshan Tsuen, Chiung Lin Hsiang, Hsin Chu Hsien 307, Taiwan R.O.C.

Testing Laboratory
2022

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Release Control Record

Issue No.	Description	Date Issued
RF160606E02-1	Original release.	July 26, 2016

1 Certificate of Conformity

Product:	High Power AC1200 Dual-Band Outdoor Bridging AP
Brand:	Luxul
Test Model:	XWO-BAP1
Sample Status:	ENGINEERING SAMPLE
Applicant:	Luxul Wireless
Test Date:	June 22 to 30, 2016
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:** July 26, 2016

Wendy Wu / Specialist

Approved by : _____ , **Date:** July 26, 2016

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 -10.75dB at 0.37656MHz.
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 -0.3dB at 5649.75MHz.
15.407(a)(1/2/3)	Max Average Transmit Power	Pass	Meet the requirement of limit.
---	Occupied Bandwidth Measurement	Pass	Meet the requirement of limit.
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	Expended Uncertainty (k=2) (±)
Conducted Emissions at mains ports	150kHz ~ 30MHz	1.83 dB
Radiated Emissions up to 1 GHz	30MHz ~ 1GHz	5.19 dB
Radiated Emissions above 1 GHz	1GHz ~ 6GHz	3.43 dB
	6GHz ~ 18GHz	3.49 dB
	18GHz ~ 40GHz	4.11 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	High Power AC1200 Dual-Band Outdoor Bridging AP
Brand	Luxul
Test Model	XWO-BAP1
Status of EUT	ENGINEERING SAMPLE
Power Supply Rating	DC 56V from POE
Modulation Type	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM 256QAM for OFDM in 11ac mode
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 and 5.745 ~ 5.825GHz
Number of Channel	**2.4GHz:** 802.11b, 802.11g, 802.11n (HT20): 11 802.11n (HT40): 7 **5GHz:** 802.11a, 802.11n (HT20), 802.11ac (VHT20): 9 802.11n (HT40), 802.11ac (VHT40): 4 802.11ac (VHT80): 2
Output Power	**2.4GHz:** 747.622mW **5GHz:** **5.18GHz ~ 5.24GHz:** 97.338mW **5.745GHz ~ 5.825GHz:** 395.908mW
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	POE x 1
Cable Supplied	Ethernet cable x1 (unshielded, 1m) Power cable x1 (unshielded, 1.8 m) grounding cable x1 (unshielded, 1.4m)

Note:

1. Simultaneously transmission condition.

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

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

2.4GHz				
Transmitter Circuit	Antenna Gain(dBi)	Frequency range (MHz ~ MHz)	Antenna Type	Connecter Type
Chain (0)	6	2400~2483.5	Patch	i-pex(MHF)
Chain (1)	6			
5GHz				
Transmitter Circuit	Antenna Gain(dBi)	Frequency range (MHz ~ MHz)	Antenna Type	Connecter Type
Chain (0)	10	5150~5875	Patch	i-pex(MHF)
Chain (1)	10			

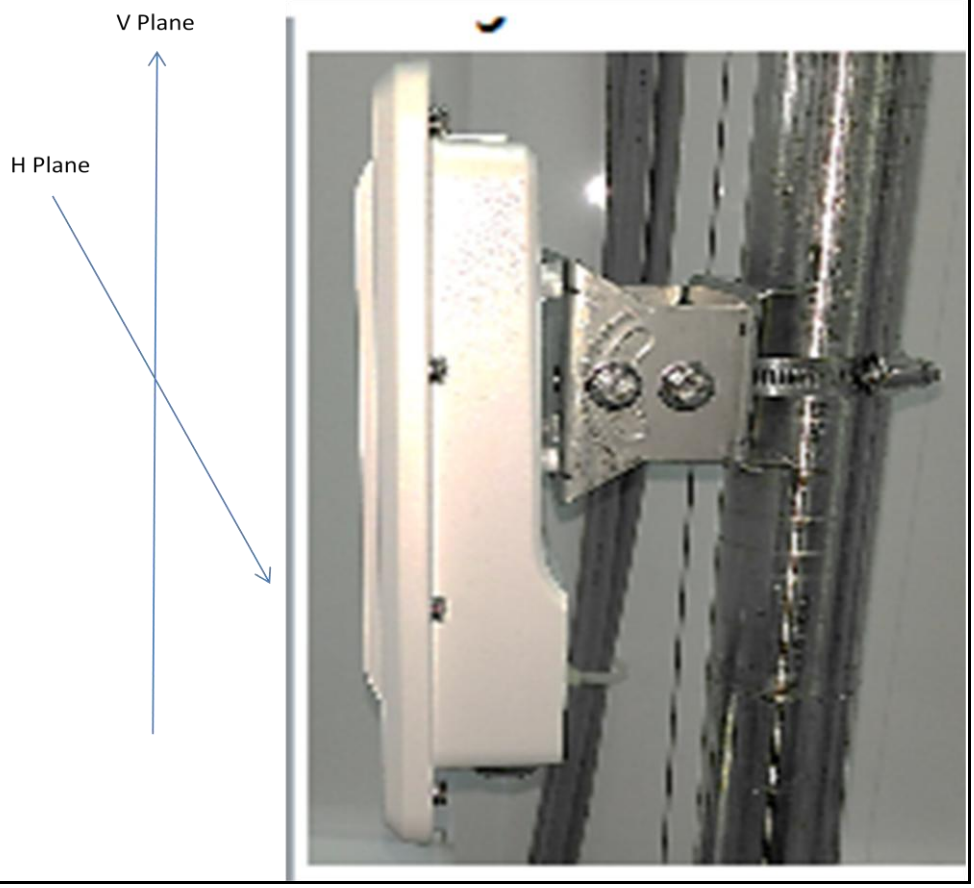
3. The EUT must be supplied with a POE as following table:

Brand	Model No.	Spec.
PHIHONG	POE29U-560	Input: 100-240V, 0.8A, 50-60Hz Output: 56V, 0.536A

4. The EUT incorporates a MIMO function.

2.4GHz			
Modulation Mode	Data Rate (MCS)	TX & RX Configuration	
802.11b	1 ~ 11Mbps	2TX	2RX
802.11g	6 ~ 54Mbps	2TX	2RX
802.11n (HT20) & 802.11n (HT40)	MCS 0~7	2TX	2RX
	MCS 8~15	2TX	2RX
5GHz			
Modulation Mode	Data Rate (MCS)	TX & RX Configuration	
802.11a	6 ~ 54Mbps	2TX	2RX
802.11n (HT20)	MCS 0~7	2TX	2RX
	MCS 8~15	2TX	2RX
802.11n (HT40)	MCS 0~7	2TX	2RX
	MCS 8~15	2TX	2RX
802.11ac (VHT20)	MCS0~8 Nss= 1	2TX	2RX
	MCS0~8 Nss= 2	2TX	2RX
802.11ac (VHT40) & 802.11ac (VHT80)	MCS0~9 Nss= 1	2TX	2RX
	MCS0~9 Nss= 2	2TX	2RX
Note: 1. 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)			

5. The EUT will install at outdoor area, the highest antenna gain from the horizon above 30 degrees as below, for more detail information please refer to antenna specification and user manual.

Antenna	Antenna gain	Antenna install degree
Patch	0.94 dBi	

6. 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

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)	5745-5825	149 to 165	157	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)	5745-5825	149 to 165	157	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

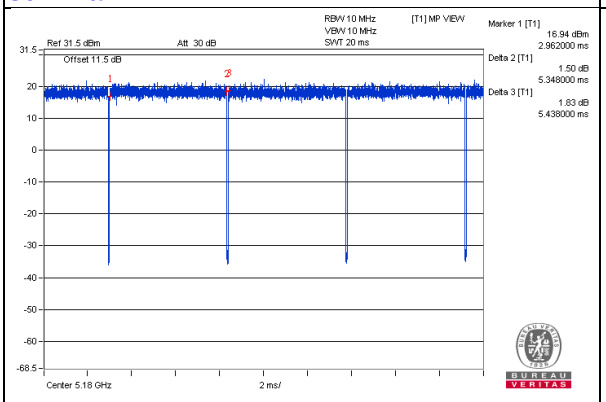
Test Condition:

Applicable To	Environmental Conditions	Input Power	Tested By
RE≥1G	25deg. C, 60%RH	120Vac, 60Hz	Russell Yeh
RE<1G	25deg. C, 60%RH	120Vac, 60Hz	Russell Yeh
PLC	24deg. C, 61%RH	120Vac, 60Hz	Jyunchun Lin
APCM	25deg. C, 60%RH	120Vac, 60Hz	Jyunchun Lin

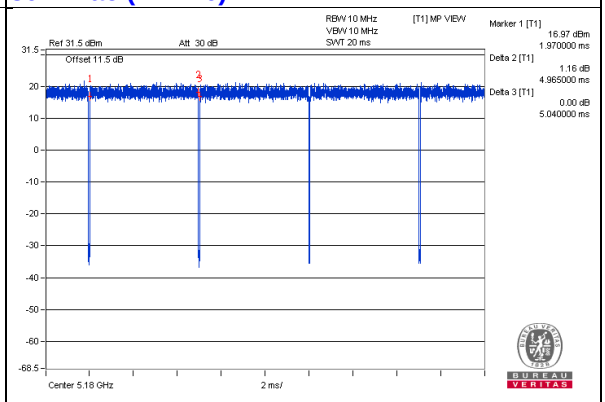
3.3 Duty Cycle of Test Signal

If duty cycle of test signal is ≥ 98 %, duty factor is not required.
If duty cycle of test signal is < 98%, duty factor shall be considered.
802.11a: Duty cycle = 5.348 ms/5.438 ms = 0.983
802.11ac (VHT20): Duty cycle = 4.965 ms/5.04 ms = 0.985
802.11ac (VHT40): Duty cycle = 2.413 ms/2.596 ms = 0.93 , Duty factor = 10 * log(1/0.93) = 0.32
802.11ac (VHT80): Duty cycle = 1.134 ms/1.208 ms = 0.939, Duty factor = 10 * log(1/0.939) = 0.27

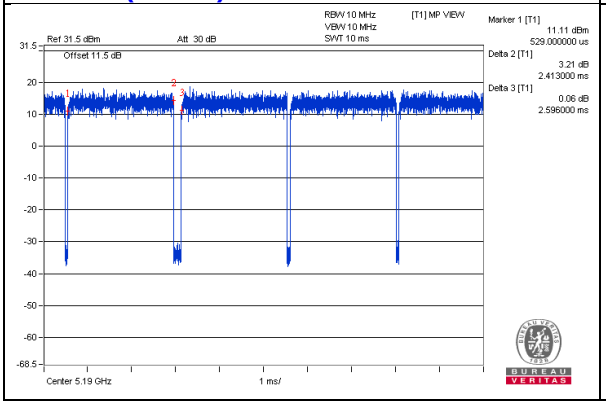
802.11a



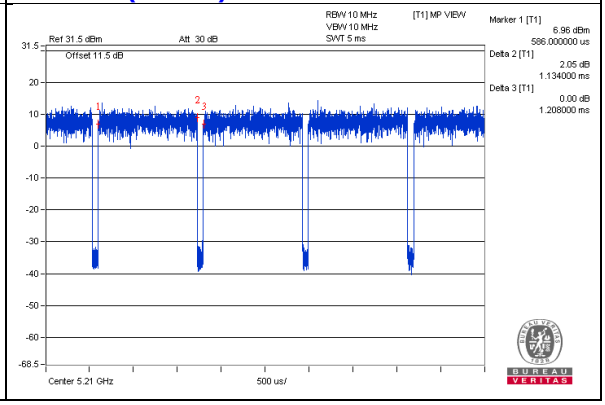
802.11ac (VHT20)



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.

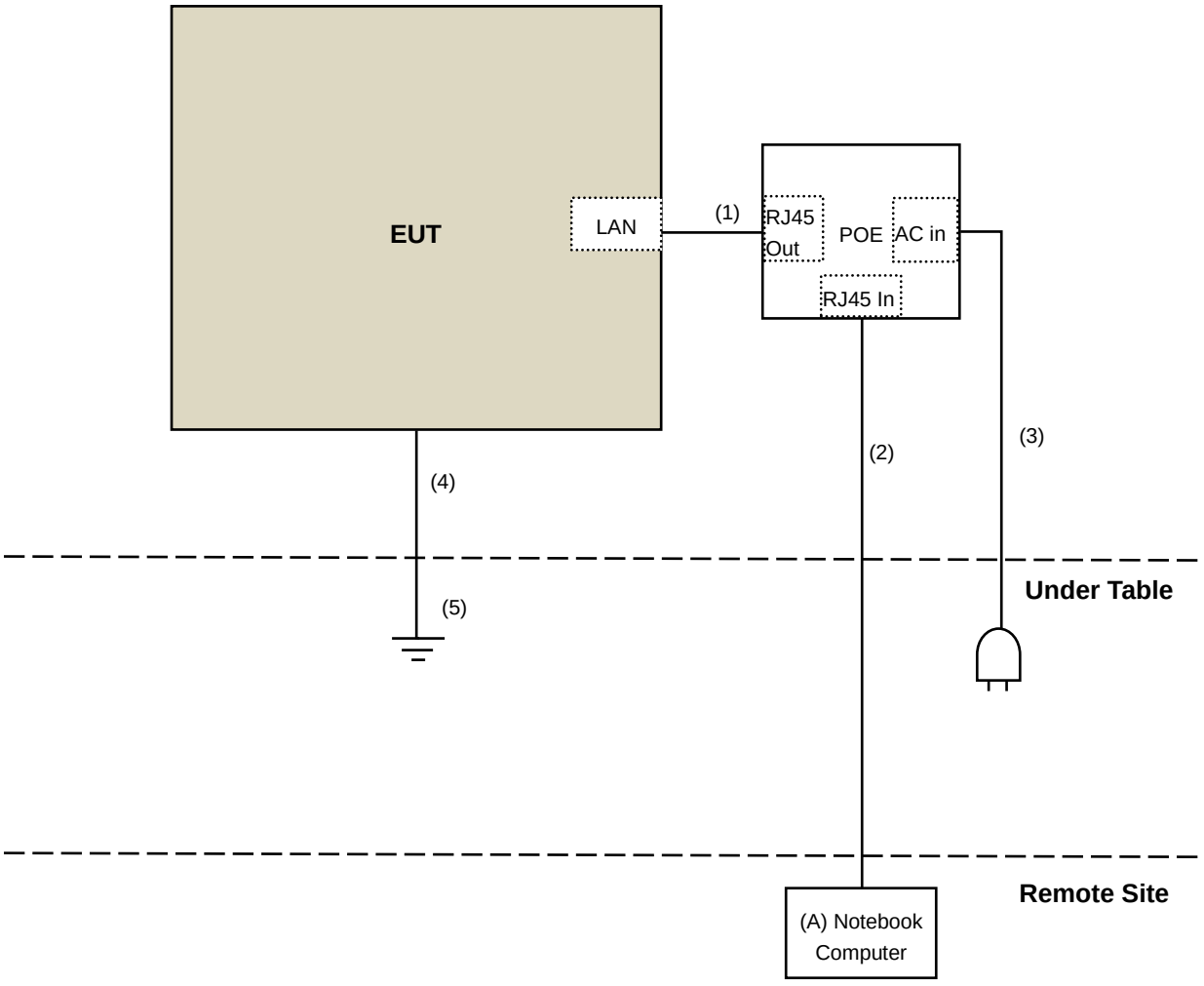
ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Notebook Computer	DELL	E5430	HYV4VY1	FCC DoC	Provided by Lab

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.	RJ-45 Cable	1	1	No	0	Supplied by client
3.	AC Cable	1	1.8	No	0	Supplied by client
4.	Ground Cable	1	1.4	No	0	Supplied by client
5.	Ground Cable	1	2	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 v01r02
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 v01r02</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	MY54450088	July 24, 2015	July 23, 2016
Pre-Amplifier(*) EMCI	EMC001340	980142	Jan. 20, 2016	Jan. 19, 2018
Loop Antenna(*) Electro-Metrics	EM-6879	264	Dec. 16, 2014	Dec. 15, 2016
RF Cable	NA	LOOPCAB-001 LOOPCAB-002	Jan. 18, 2016	Jan. 17, 2017
Pre-Amplifier Mini-Circuits	ZFL-1000VH2B	AMP-ZFL-01	Nov. 11, 2015	Nov. 10, 2016
Trilog Broadband Antenna SCHWARZBECK	VULB 9168	9168-406	Jan. 04, 2016	Jan. 03, 2017
RF Cable	8D	966-4-1 966-4-2 966-4-3	Apr. 02, 2016	Apr. 01, 2017
Horn_Antenna SCHWARZBECK	BBHA 9120D	9120D-783	Jan. 19, 2016	Jan. 18, 2017
Pre-Amplifier Agilent	8449B	3008A01922	Sep. 19, 2015	Sep. 18, 2016
RF Cable	EMC104-SM-SM-2000 EMC104-SM-SM-5000 EMC104-SM-SM-5000	150318 150323 150324	Mar. 30, 2016	Mar. 29, 2017
Pre-Amplifier EMCI	EMC184045	980143	Jan. 15, 2016	Jan. 14, 2017
Horn_Antenna SCHWARZBECK	BBHA 9170	BBHA9170608	Jan. 08, 2016	Jan. 07, 2017
RF Cable	SUCOFLEX 102	36432/2 36441/2	Jan. 16, 2016	Jan. 15, 2017
Software	ADT_Radiated_V8.7.07	NA	NA	NA
Antenna Tower & Turn Table Max-Full	MF-7802	MF780208410	NA	NA
Boresight Antenna Fixture	FBA-01	FBA-SIP02	NA	NA
Spectrum Analyzer R&S	FSP40	100060	May 11, 2016	May 10, 2017
Power meter Anritsu	ML2495A	1014008	May 5, 2016	May 4, 2017
Power sensor Anritsu	MA2411B	0917122	May 5, 2016	May 4, 2017
AC Power Source Extech Electronics	6205	1440452	NA	NA
Temperature & Humidity Chamber Giant Force	GTH-150-40-SP-AR	MAA0812-008	Jan. 15, 2016	Jan. 14, 2017
Digital Multimeter FLUKE	87III	73680266	Nov. 10, 2015	Nov. 09, 2016

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. Loop antenna was used for all emissions below 30 MHz.
4. The test was performed in 966 Chamber No. 4.
5. The FCC Site Registration No. is 292998
6. The CANADA Site Registration No. is 20331-2
7. Tested Date:June 22 to 30, 2016

4.1.3 Test Procedure

a. The EUT was placed on the top of a rotating table 0.8 meters (for below 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:

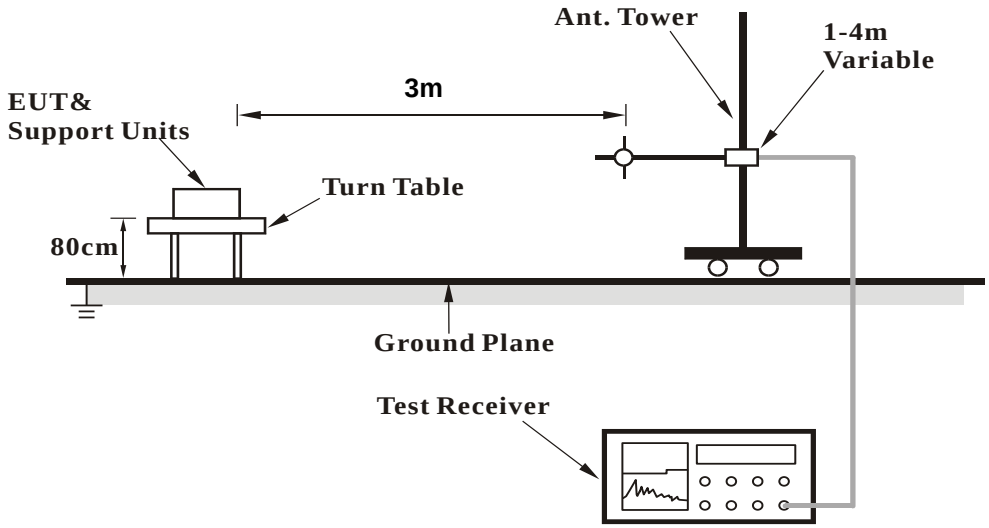
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 3MHz for RMS Average (Duty cycle < 98%) for Average detection (AV) at frequency above 1GHz, then the measurement results was added to a correction factor (10 log(1/duty cycle)).
4. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 10Hz (Duty cycle ≥ 98%) for Average detection (AV) at frequency above 1GHz.
5. All modes of operation were investigated and the worst-case emissions are reported.

4.1.4 Deviation from Test Standard

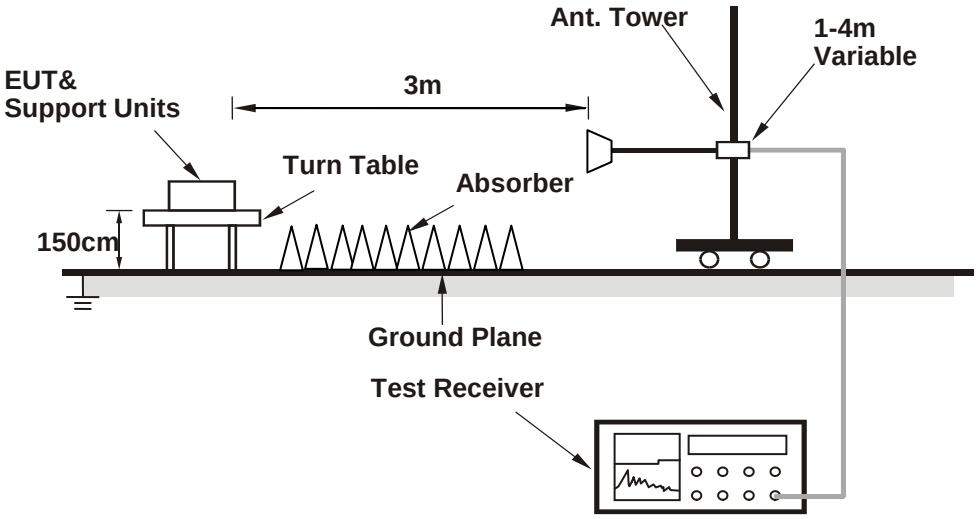
No deviation.

4.1.5 Test Setup

<Frequency Range below 1GHz>



<Frequency Range above 1GHz>



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

4.1.6 EUT Operating Condition

1. Connect the EUT with the Notebook Computer which is placed on remote site.
2. Controlling software (artgui.exe[art2 ver 4 9 802 1]) 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	66.8 PK	74.0	-7.2	1.91 H	8	65.2	1.6
2	5150.00	53.2 AV	54.0	-0.8	1.91 H	8	51.6	1.6
3	*5180.00	122.2 PK			1.91 H	8	120.5	1.7
4	*5180.00	110.1 AV			1.91 H	8	108.4	1.7
5	#10360.00	51.3 PK	74.0	-22.7	1.80 H	74	39.6	11.7
6	#10360.00	37.2 AV	54.0	-16.8	1.80 H	74	25.5	11.7
7	15540.00	52.7 PK	74.0	-21.3	2.59 H	213	39.4	13.3
8	15540.00	40.2 AV	54.0	-13.8	2.59 H	213	26.9	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	64.3 PK	74.0	-9.7	1.77 V	10	62.7	1.6
2	5150.00	49.6 AV	54.0	-4.4	1.77 V	10	48.0	1.6
3	*5180.00	120.4 PK			1.77 V	10	118.7	1.7
4	*5180.00	108.2 AV			1.77 V	10	106.5	1.7
5	#10360.00	51.8 PK	74.0	-22.2	2.70 V	162	40.1	11.7
6	#10360.00	39.3 AV	54.0	-14.7	2.70 V	162	27.6	11.7
7	15540.00	54.4 PK	74.0	-19.6	2.47 V	148	41.1	13.3
8	15540.00	41.6 AV	54.0	-12.4	2.47 V	148	28.3	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 40	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	70.0 PK	74.0	-4.0	2.16 H	3	68.4	1.6
2	5150.00	53.3 AV	54.0	-0.7	2.16 H	3	51.7	1.6
3	*5200.00	125.7 PK			2.16 H	3	123.9	1.8
4	*5200.00	113.8 AV			2.16 H	3	112.0	1.8
5	5350.00	65.3 PK	74.0	-8.7	2.16 H	3	63.2	2.1
6	5350.00	51.6 AV	54.0	-2.4	2.16 H	3	49.5	2.1
7	#10400.00	51.5 PK	74.0	-22.5	1.99 H	54	39.6	11.9
8	#10400.00	38.6 AV	54.0	-15.4	1.99 H	54	26.7	11.9
9	15600.00	52.8 PK	74.0	-21.2	2.04 H	200	39.5	13.3
10	15600.00	39.9 AV	54.0	-14.1	2.04 H	200	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	68.8 PK	74.0	-5.2	1.82 V	15	67.2	1.6
2	5150.00	49.2 AV	54.0	-4.8	1.82 V	15	47.6	1.6
3	*5200.00	122.6 PK			1.82 V	15	120.8	1.8
4	*5200.00	111.4 AV			1.82 V	15	109.6	1.8
5	5350.00	62.3 PK	74.0	-11.7	1.82 V	15	60.2	2.1
6	5350.00	47.3 AV	54.0	-6.7	1.82 V	15	45.2	2.1
7	#10400.00	52.4 PK	74.0	-21.6	2.79 V	159	40.5	11.9
8	#10400.00	39.8 AV	54.0	-14.2	2.79 V	159	27.9	11.9
9	15600.00	54.8 PK	74.0	-19.2	2.38 V	141	41.5	13.3
10	15600.00	41.9 AV	54.0	-12.1	2.38 V	141	28.6	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 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	127.1 PK			2.14 H	5	125.3	1.8
2	*5240.00	115.2 AV			2.14 H	5	113.4	1.8
3	5350.00	64.3 PK	74.0	-9.7	2.14 H	5	62.2	2.1
4	5350.00	51.5 AV	54.0	-2.5	2.14 H	5	49.4	2.1
5	#10480.00	52.8 PK	74.0	-21.2	2.06 H	66	40.6	12.2
6	#10480.00	39.2 AV	54.0	-14.8	2.06 H	66	27.0	12.2
7	15720.00	53.3 PK	74.0	-20.7	2.04 H	200	40.1	13.2
8	15720.00	41.8 AV	54.0	-12.2	2.04 H	200	28.6	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	*5240.00	124.3 PK			1.73 V	18	122.5	1.8
2	*5240.00	112.4 AV			1.73 V	18	110.6	1.8
3	5350.00	62.4 PK	74.0	-11.6	1.73 V	18	60.3	2.1
4	5350.00	48.1 AV	54.0	-5.9	1.73 V	18	46.0	2.1
5	#10480.00	52.5 PK	74.0	-21.5	2.62 V	168	40.3	12.2
6	#10480.00	38.8 AV	54.0	-15.2	2.62 V	168	26.6	12.2
7	15720.00	53.1 PK	74.0	-20.9	2.55 V	153	39.9	13.2
8	15720.00	41.5 AV	54.0	-12.5	2.55 V	153	28.3	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 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	#5629.32	63.1 PK	68.2	-5.1	2.05 H	2	60.5	2.6
2	*5745.00	124.7 PK			2.05 H	2	121.9	2.8
3	*5745.00	112.8 AV			2.05 H	2	110.0	2.8
4	#5954.23	61.4 PK	68.2	-6.8	2.05 H	2	58.2	3.2
5	11490.00	66.9 PK	74.0	-7.1	1.65 H	63	53.4	13.5
6	11490.00	53.5 AV	54.0	-0.5	1.65 H	63	40.0	13.5
7	#17235.00	60.2 PK	74.0	-13.8	2.50 H	203	41.8	18.4
8	#17235.00	46.8 AV	54.0	-7.2	2.50 H	203	28.4	18.4
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	#5641.20	62.7 PK	68.2	-5.5	2.18 V	6	60.1	2.6
2	*5745.00	123.1 PK			2.18 V	6	120.3	2.8
3	*5745.00	112.0 AV			2.18 V	6	109.2	2.8
4	#5957.55	61.0 PK	68.2	-7.2	2.18 V	6	57.8	3.2
5	11490.00	67.8 PK	74.0	-6.2	1.39 V	23	54.3	13.5
6	11490.00	52.2 AV	54.0	-1.8	1.39 V	23	38.7	13.5
7	#17235.00	57.1 PK	74.0	-16.9	2.66 V	173	38.7	18.4
8	#17235.00	44.4 AV	54.0	-9.6	2.66 V	173	26.0	18.4

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 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	#5631.70	65.9 PK	68.2	-2.3	2.14 H	1	63.3	2.6
2	*5785.00	126.0 PK			2.14 H	1	123.1	2.9
3	*5785.00	113.9 AV			2.14 H	1	111.0	2.9
4	#5965.62	66.5 PK	68.2	-1.7	2.14 H	1	63.3	3.2
5	11570.00	65.6 PK	74.0	-8.4	1.56 H	65	52.4	13.2
6	11570.00	52.6 AV	54.0	-1.4	1.56 H	65	39.4	13.2
7	#17355.00	58.8 PK	74.0	-15.2	2.55 H	208	39.7	19.1
8	#17355.00	46.2 AV	54.0	-7.8	2.55 H	208	27.1	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	#5622.68	63.9 PK	68.2	-4.3	2.14 V	7	61.3	2.6
2	*5785.00	125.1 PK			2.14 V	7	122.2	2.9
3	*5785.00	113.2 AV			2.14 V	7	110.3	2.9
4	#5939.50	61.7 PK	68.2	-6.5	2.14 V	7	58.6	3.1
5	11570.00	64.4 PK	74.0	-9.6	1.43 V	21	51.2	13.2
6	11570.00	50.0 AV	54.0	-4.0	1.43 V	21	36.8	13.2
7	#17355.00	56.7 PK	74.0	-17.3	2.55 V	170	37.6	19.1
8	#17355.00	44.2 AV	54.0	-9.8	2.55 V	170	25.1	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.

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	**#5649.75**	**67.9 PK**	**68.2**	**-0.3**	**2.10 H**	**2**	**65.3**	**2.6**
2	*5825.00	126.3 PK			2.10 H	2	123.4	2.9
3	*5825.00	114.0 AV			2.10 H	2	111.1	2.9
4	#5934.27	67.0 PK	68.2	-1.2	2.10 H	2	63.9	3.1
5	11650.00	63.3 PK	74.0	-10.7	1.58 H	65	50.1	13.2
6	11650.00	49.5 AV	54.0	-4.5	1.58 H	65	36.3	13.2
7	#17475.00	56.2 PK	74.0	-17.8	2.46 H	211	36.8	19.4
8	#17475.00	46.1 AV	54.0	-7.9	2.46 H	211	26.7	19.4
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	#5616.50	64.7 PK	68.2	-3.5	2.18 V	10	62.1	2.6
2	*5825.00	125.3 PK			2.18 V	10	122.4	2.9
3	*5825.00	113.7 AV			2.18 V	10	110.8	2.9
4	#5941.40	62.7 PK	68.2	-5.5	2.18 V	10	59.6	3.1
5	11650.00	62.4 PK	74.0	-11.6	1.55 V	22	49.2	13.2
6	11650.00	48.2 AV	54.0	-5.8	1.55 V	22	35.0	13.2
7	#17475.00	55.8 PK	74.0	-18.2	2.46 V	178	36.4	19.4
8	#17475.00	44.0 AV	54.0	-10.0	2.46 V	178	24.6	19.4

REMARKS:

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

802.11ac (VHT20)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	69.0 PK	74.0	-5.0	1.71 H	2	67.4	1.6
2	5150.00	53.4 AV	54.0	-0.6	1.71 H	2	51.8	1.6
3	*5180.00	120.9 PK			1.71 H	2	119.2	1.7
4	*5180.00	110.7 AV			1.71 H	2	109.0	1.7
5	#10360.00	51.5 PK	74.0	-22.5	1.78 H	72	39.8	11.7
6	#10360.00	37.8 AV	54.0	-16.2	1.78 H	72	26.1	11.7
7	15540.00	52.4 PK	74.0	-21.6	2.55 H	214	39.1	13.3
8	15540.00	39.6 AV	54.0	-14.4	2.55 H	214	26.3	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	63.0 PK	74.0	-11.0	1.52 V	4	61.4	1.6
2	5150.00	51.3 AV	54.0	-2.7	1.52 V	4	49.7	1.6
3	*5180.00	117.8 PK			1.69 V	4	116.1	1.7
4	*5180.00	107.7 AV			1.69 V	4	106.0	1.7
5	#10360.00	49.6 PK	74.0	-24.4	2.78 V	157	37.9	11.7
6	#10360.00	37.2 AV	54.0	-16.8	2.78 V	157	25.5	11.7
7	15540.00	52.7 PK	74.0	-21.3	2.44 V	150	39.4	13.3
8	15540.00	39.3 AV	54.0	-14.7	2.44 V	150	26.0	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 40	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	67.5 PK	74.0	-6.5	2.08 H	1	65.9	1.6
2	5150.00	53.0 AV	54.0	-1.0	2.08 H	1	51.4	1.6
3	*5200.00	124.2 PK			2.08 H	1	122.4	1.8
4	*5200.00	113.0 AV			2.08 H	1	111.2	1.8
5	#10400.00	51.2 PK	74.0	-22.8	1.96 H	62	39.3	11.9
6	#10400.00	38.8 AV	54.0	-15.2	1.96 H	62	26.9	11.9
7	15600.00	52.5 PK	74.0	-21.5	2.71 H	207	39.2	13.3
8	15600.00	39.5 AV	54.0	-14.5	2.71 H	207	26.2	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	60.2 PK	74.0	-13.8	1.70 V	3	58.6	1.6
2	5150.00	48.7 AV	54.0	-5.3	1.70 V	3	47.1	1.6
3	*5200.00	121.3 PK			1.70 V	3	119.5	1.8
4	*5200.00	109.8 AV			1.70 V	3	108.0	1.8
5	#10400.00	51.2 PK	74.0	-22.8	2.02 V	237	39.3	11.9
6	#10400.00	39.0 AV	54.0	-15.0	2.02 V	237	27.1	11.9
7	15600.00	52.5 PK	74.0	-21.5	2.05 V	191	39.2	13.3
8	15600.00	39.4 AV	54.0	-14.6	2.05 V	191	26.1	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 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	125.5 PK			1.77 H	3	123.7	1.8
2	*5240.00	115.1 AV			1.77 H	3	113.3	1.8
3	5350.00	64.6 PK	74.0	-9.4	1.77 H	3	62.5	2.1
4	5350.00	51.8 AV	54.0	-2.2	1.77 H	3	49.7	2.1
5	#10480.00	51.4 PK	74.0	-22.6	1.55 H	85	39.2	12.2
6	#10480.00	39.2 AV	54.0	-14.8	1.55 H	85	27.0	12.2
7	15720.00	53.2 PK	74.0	-20.8	2.78 H	199	40.0	13.2
8	15720.00	41.1 AV	54.0	-12.9	2.78 H	199	27.9	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	*5240.00	123.0 PK			1.61 V	2	121.2	1.8
2	*5240.00	112.3 AV			1.61 V	2	110.5	1.8
3	5350.00	61.3 PK	74.0	-12.7	1.61 V	2	59.2	2.1
4	5350.00	48.0 AV	54.0	-6.0	1.61 V	2	45.9	2.1
5	#10480.00	51.4 PK	74.0	-22.6	2.59 V	187	39.2	12.2
6	#10480.00	39.3 AV	54.0	-14.7	2.59 V	187	27.1	12.2
7	15720.00	52.8 PK	74.0	-21.2	2.80 V	205	39.6	13.2
8	15720.00	41.0 AV	54.0	-13.0	2.80 V	205	27.8	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 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	#5635.50	64.6 PK	68.2	-3.6	2.00 H	2	62.0	2.6
2	*5745.00	123.3 PK			2.00 H	2	120.5	2.8
3	*5745.00	111.2 AV			2.00 H	2	108.4	2.8
4	#5931.43	61.1 PK	68.2	-7.1	2.00 H	2	58.0	3.1
5	11490.00	69.0 PK	74.0	-5.0	1.54 H	65	55.5	13.5
6	11490.00	53.6 AV	54.0	-0.4	1.54 H	65	40.1	13.5
7	#17235.00	56.9 PK	74.0	-17.1	2.35 H	291	38.5	18.4
8	#17235.00	44.2 AV	54.0	-9.8	2.35 H	291	25.8	18.4
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	#5629.80	62.5 PK	68.2	-5.7	2.21 V	3	59.9	2.6
2	*5745.00	121.0 PK			2.21 V	3	118.2	2.8
3	*5745.00	110.2 AV			2.21 V	3	107.4	2.8
4	#5936.18	60.4 PK	68.2	-7.8	2.21 V	3	57.3	3.1
5	11490.00	63.9 PK	74.0	-10.1	1.07 V	350	50.4	13.5
6	11490.00	49.8 AV	54.0	-4.2	1.07 V	350	36.3	13.5
7	#17235.00	56.8 PK	74.0	-17.2	1.34 V	277	38.4	18.4
8	#17235.00	44.2 AV	54.0	-9.8	1.34 V	277	25.8	18.4

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 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	#5625.05	64.5 PK	68.2	-3.7	2.18 H	2	61.9	2.6
2	*5785.00	124.3 PK			2.18 H	2	121.4	2.9
3	*5785.00	113.6 AV			2.18 H	2	110.7	2.9
4	#5940.93	60.4 PK	68.2	-7.8	2.18 H	2	57.3	3.1
5	11570.00	67.6 PK	74.0	-6.4	1.69 H	69	54.4	13.2
6	11570.00	53.4 AV	54.0	-0.6	1.69 H	69	40.2	13.2
7	#17355.00	56.8 PK	74.0	-17.2	1.80 H	300	37.7	19.1
8	#17355.00	44.0 AV	54.0	-10.0	1.80 H	300	24.9	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	#5595.12	63.8 PK	68.2	-4.4	2.22 V	2	61.3	2.5
2	*5785.00	123.2 PK			2.22 V	2	120.3	2.9
3	*5785.00	112.3 AV			2.22 V	2	109.4	2.9
4	#5949.95	60.8 PK	68.2	-7.4	2.22 V	2	57.6	3.2
5	11570.00	63.4 PK	74.0	-10.6	2.46 V	338	50.2	13.2
6	11570.00	50.3 AV	54.0	-3.7	2.46 V	338	37.1	13.2
7	#17355.00	56.5 PK	74.0	-17.5	1.55 V	280	37.4	19.1
8	#17355.00	44.0 AV	54.0	-10.0	1.55 V	280	24.9	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.

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	#5640.25	64.9 PK	68.2	-3.3	2.17 H	2	62.3	2.6
2	*5825.00	125.2 PK			2.17 H	2	122.3	2.9
3	*5825.00	114.8 AV			2.17 H	2	111.9	2.9
4	#5947.10	62.3 PK	68.2	-5.9	2.17 H	2	59.2	3.1
5	11650.00	64.6 PK	74.0	-9.4	1.39 H	63	51.4	13.2
6	11650.00	51.6 AV	54.0	-2.4	1.39 H	63	38.4	13.2
7	#17475.00	61.5 PK	74.0	-12.5	2.29 H	35	42.1	19.4
8	#17475.00	47.8 AV	54.0	-6.2	2.29 H	35	28.4	19.4
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	#5626.95	63.7 PK	68.2	-4.5	2.19 V	1	61.1	2.6
2	*5825.00	123.8 PK			2.19 V	1	120.9	2.9
3	*5825.00	113.4 AV			2.19 V	1	110.5	2.9
4	#5943.30	61.1 PK	68.2	-7.1	2.19 V	1	58.0	3.1
5	11650.00	64.2 PK	74.0	-9.8	2.47 V	336	51.0	13.2
6	11650.00	50.2 AV	54.0	-3.8	2.47 V	336	37.0	13.2
7	#17475.00	56.8 PK	74.0	-17.2	1.44 V	276	37.4	19.4
8	#17475.00	44.6 AV	54.0	-9.4	1.44 V	276	25.2	19.4

REMARKS:

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

802.11ac (VHT40)

CHANNEL	TX Channel 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	68.5 PK	74.0	-5.5	1.83 H	3	66.9	1.6
2	5150.00	53.4 AV	54.0	-0.6	1.83 H	3	51.8	1.6
3	*5190.00	113.7 PK			1.83 H	3	111.9	1.8
4	*5190.00	101.3 AV			1.83 H	3	99.5	1.8
5	5350.00	57.9 PK	74.0	-16.1	1.83 H	3	55.8	2.1
6	5350.00	44.8 AV	54.0	-9.2	1.83 H	3	42.7	2.1
7	#10380.00	48.7 PK	74.0	-25.3	1.95 H	58	36.9	11.8
8	#10380.00	36.5 AV	54.0	-17.5	1.95 H	58	24.7	11.8
9	15570.00	50.3 PK	74.0	-23.7	2.74 H	202	37.0	13.3
10	15570.00	37.8 AV	54.0	-16.2	2.74 H	202	24.5	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	64.1 PK	74.0	-9.9	1.24 V	5	62.5	1.6
2	5150.00	51.3 AV	54.0	-2.7	1.24 V	5	49.7	1.6
3	*5190.00	110.7 PK			1.24 V	5	108.9	1.8
4	*5190.00	98.8 AV			1.24 V	5	97.0	1.8
5	5350.00	56.7 PK	74.0	-17.3	1.24 V	5	54.6	2.1
6	5350.00	43.2 AV	54.0	-10.8	1.24 V	5	41.1	2.1
7	#10380.00	47.5 PK	74.0	-26.5	2.88 V	145	35.7	11.8
8	#10380.00	36.1 AV	54.0	-17.9	2.88 V	145	24.3	11.8
9	15570.00	50.6 PK	74.0	-23.4	2.34 V	146	37.3	13.3
10	15570.00	37.8 AV	54.0	-16.2	2.34 V	146	24.5	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	*5230.00	122.1 PK			1.94 H	4	120.3	1.8
2	*5230.00	110.3 AV			1.94 H	4	108.5	1.8
3	5350.00	66.2 PK	74.0	-7.8	1.94 H	4	64.1	2.1
4	5350.00	52.3 AV	54.0	-1.7	1.94 H	4	50.2	2.1
5	#10460.00	49.6 PK	74.0	-24.4	1.89 H	62	37.5	12.1
6	#10460.00	37.1 AV	54.0	-16.9	1.89 H	62	25.0	12.1
7	15690.00	52.5 PK	74.0	-21.5	2.66 H	218	39.3	13.2
8	15690.00	39.5 AV	54.0	-14.5	2.66 H	218	26.3	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	*5230.00	119.8 PK			1.32 V	9	118.0	1.8
2	*5230.00	108.4 AV			1.32 V	9	106.6	1.8
3	5350.00	64.8 PK	74.0	-9.2	1.32 V	9	62.7	2.1
4	5350.00	50.1 AV	54.0	-3.9	1.32 V	9	48.0	2.1
5	#10460.00	49.4 PK	74.0	-24.6	2.60 V	167	37.3	12.1
6	#10460.00	38.2 AV	54.0	-15.8	2.60 V	167	26.1	12.1
7	15690.00	51.3 PK	74.0	-22.7	2.77 V	201	38.1	13.2
8	15690.00	39.5 AV	54.0	-14.5	2.77 V	201	26.3	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 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	#5647.37	66.8 PK	68.2	-1.4	2.18 H	3	64.2	2.6
2	*5755.00	122.2 PK			2.18 H	3	119.3	2.9
3	*5755.00	110.2 AV			2.18 H	3	107.3	2.9
4	#5990.80	66.4 PK	68.2	-1.8	2.18 H	3	63.0	3.4
5	11510.00	66.4 PK	74.0	-7.6	1.51 H	66	52.9	13.5
6	11510.00	52.5 AV	54.0	-1.5	1.51 H	66	39.0	13.5
7	#17265.00	56.7 PK	74.0	-17.3	2.34 H	118	38.2	18.5
8	#17265.00	44.3 AV	54.0	-9.7	2.34 H	118	25.8	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	#5646.90	65.6 PK	68.2	-2.6	2.09 V	2	63.0	2.6
2	*5755.00	121.1 PK			2.09 V	2	118.2	2.9
3	*5755.00	109.2 AV			2.09 V	2	106.3	2.9
4	#5933.32	61.5 PK	68.2	-6.7	2.09 V	2	58.4	3.1
5	11510.00	61.7 PK	74.0	-12.3	1.53 V	316	48.2	13.5
6	11510.00	48.3 AV	54.0	-5.7	1.53 V	316	34.8	13.5
7	#17265.00	56.8 PK	74.0	-17.2	1.78 V	284	38.3	18.5
8	#17265.00	44.2 AV	54.0	-9.8	1.78 V	284	25.7	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	#5607.48	65.7 PK	68.2	-2.5	2.11 H	0	63.1	2.6
2	*5795.00	121.8 PK			2.11 H	0	118.9	2.9
3	*5795.00	109.6 AV			2.11 H	0	106.7	2.9
4	#5967.52	65.4 PK	68.2	-2.8	2.11 H	0	62.2	3.2
5	11590.00	62.6 PK	74.0	-11.4	1.54 H	66	49.5	13.1
6	11590.00	48.8 AV	54.0	-5.2	1.54 H	66	35.7	13.1
7	#17385.00	57.2 PK	74.0	-16.8	2.20 H	121	37.9	19.3
8	#17385.00	44.7 AV	54.0	-9.3	2.20 H	121	25.4	19.3
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	#5625.52	64.5 PK	68.2	-3.7	2.05 V	4	61.9	2.6
2	*5795.00	120.5 PK			2.05 V	4	117.6	2.9
3	*5795.00	108.7 AV			2.05 V	4	105.8	2.9
4	#5962.30	61.9 PK	68.2	-6.3	2.05 V	4	58.7	3.2
5	11590.00	61.0 PK	74.0	-13.0	1.58 V	304	47.9	13.1
6	11590.00	47.5 AV	54.0	-6.5	1.58 V	304	34.4	13.1
7	#17385.00	57.2 PK	74.0	-16.8	1.71 V	290	37.9	19.3
8	#17385.00	44.4 AV	54.0	-9.6	1.71 V	290	25.1	19.3

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.

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	67.4 PK	74.0	-6.6	1.87 H	2	65.8	1.6
2	5150.00	53.5 AV	54.0	-0.5	1.87 H	2	51.9	1.6
3	*5210.00	108.4 PK			1.87 H	2	106.6	1.8
4	*5210.00	94.7 AV			1.87 H	2	92.9	1.8
5	5350.00	57.2 PK	74.0	-16.8	1.87 H	2	55.1	2.1
6	5350.00	44.5 AV	54.0	-9.5	1.87 H	2	42.4	2.1
7	#10420.00	47.4 PK	74.0	-26.6	2.02 H	66	35.4	12.0
8	#10420.00	35.3 AV	54.0	-18.7	2.02 H	66	23.3	12.0
9	15630.00	49.8 PK	74.0	-24.2	2.60 H	208	36.5	13.3
10	15630.00	36.9 AV	54.0	-17.1	2.60 H	208	23.6	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	63.7 PK	74.0	-10.3	1.89 V	9	62.1	1.6
2	5150.00	51.4 AV	54.0	-2.6	1.89 V	9	49.8	1.6
3	*5210.00	105.6 PK			1.89 V	9	103.8	1.8
4	*5210.00	93.2 AV			1.89 V	9	91.4	1.8
5	5350.00	55.8 PK	74.0	-18.2	1.89 V	9	53.7	2.1
6	5350.00	42.9 AV	54.0	-11.1	1.89 V	9	40.8	2.1
7	#10420.00	46.9 PK	74.0	-27.1	3.01 V	138	34.9	12.0
8	#10420.00	35.4 AV	54.0	-18.6	3.01 V	138	23.4	12.0
9	15630.00	50.0 PK	74.0	-24.0	2.44 V	140	36.7	13.3
10	15630.00	37.2 AV	54.0	-16.8	2.44 V	140	23.9	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 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	#5631.70	67.8 PK	68.2	-0.4	2.10 H	0	65.2	2.6
2	*5775.00	117.7 PK			2.10 H	0	114.8	2.9
3	*5775.00	103.8 AV			2.10 H	0	100.9	2.9
4	#5936.65	66.0 PK	68.2	-2.2	2.10 H	0	62.9	3.1
5	11550.00	60.7 PK	74.0	-13.3	1.59 H	65	47.4	13.3
6	11550.00	46.8 AV	54.0	-7.2	1.59 H	65	33.5	13.3
7	#17325.00	57.4 PK	74.0	-16.6	2.27 H	125	38.5	18.9
8	#17325.00	44.8 AV	54.0	-9.2	2.27 H	125	25.9	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	#5639.30	64.7 PK	68.2	-3.5	2.21 V	2	62.1	2.6
2	*5775.00	115.0 PK			2.21 V	2	112.1	2.9
3	*5775.00	101.1 AV			2.21 V	2	98.2	2.9
4	#5970.85	61.3 PK	68.2	-6.9	2.21 V	2	58.1	3.2
5	11550.00	60.3 PK	74.0	-13.7	1.66 V	295	47.0	13.3
6	11550.00	46.8 AV	54.0	-7.2	1.66 V	295	33.5	13.3
7	#17325.00	56.6 PK	74.0	-17.4	1.59 V	300	37.7	18.9
8	#17325.00	43.7 AV	54.0	-10.3	1.59 V	300	24.8	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.

Below 1GHz Data:

802.11ac (VHT20)

CHANNEL	TX Channel 157	**DETECTOR FUNCTION**	Quasi-Peak (QP)
FREQUENCY RANGE	below 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	108.75	35.6 QP	43.5	-7.9	2.50 H	102	47.1	-11.5
2	128.76	24.1 QP	43.5	-19.4	2.50 H	96	34.1	-10.0
3	256.24	21.2 QP	46.0	-24.8	2.50 H	76	30.9	-9.7
4	325.15	22.3 QP	46.0	-23.7	1.00 H	206	29.5	-7.2
5	403.54	22.1 QP	46.0	-23.9	1.00 H	54	27.4	-5.3
6	609.25	24.8 QP	46.0	-21.2	2.50 H	353	25.1	-0.3
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	73.84	33.7 QP	40.0	-6.3	1.50 V	34	45.4	-11.7
2	111.41	34.1 QP	43.5	-9.4	1.00 V	28	45.3	-11.2
3	162.45	23.1 QP	43.5	-20.4	1.00 V	233	31.8	-8.7
4	270.15	25.5 QP	46.0	-20.5	1.50 V	166	34.5	-9.0
5	350.15	23.4 QP	46.0	-22.6	1.50 V	125	30.3	-6.9
6	610.23	24.5 QP	46.0	-21.5	2.50 V	163	24.7	-0.2

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

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. 23, 2015	Oct. 22, 2016
Line-Impedance Stabilization Network (for EUT) R&S	ESH3-Z5	848773/004	Oct. 28, 2015	Oct. 27, 2016
RF Cable	5D-FB	COACAB-002	Mar. 04, 2016	Mar. 03, 2017
10 dB PAD Mini-Circuits	HAT-10+	CONATT-004	Jun. 20, 2016	Jun. 19, 2017
Software BVADT	BVADT_Cond_ V7.3.7.3	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: June 22, 2016

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.

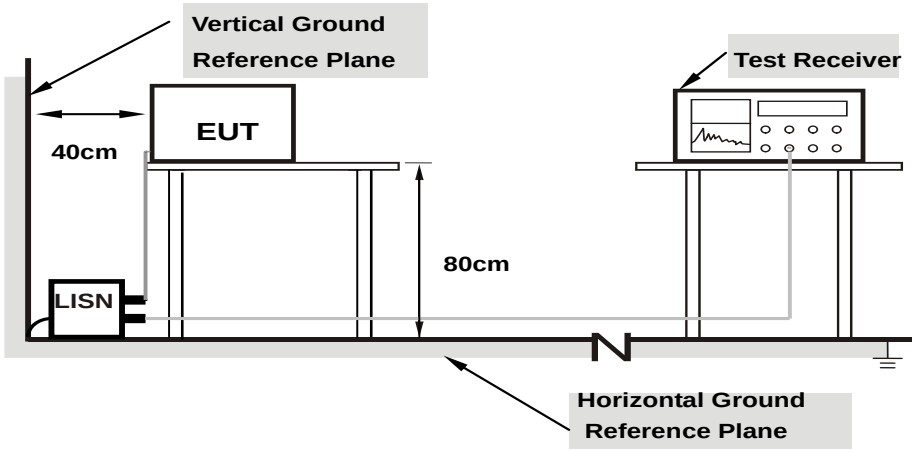
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

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.

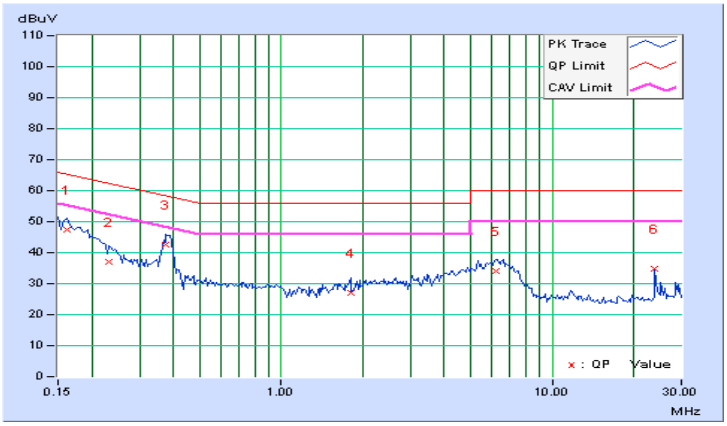
4.2.7 Test Results

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	0.16172	10.21	37.34	24.57	47.55	34.78	65.38	55.38	-17.82	-20.59
2	0.23203	10.22	26.96	15.65	37.18	25.87	62.38	52.38	-25.20	-26.51
3	**0.37656**	**10.22**	**32.27**	**27.38**	**42.49**	**37.60**	**58.35**	**48.35**	**-15.86**	**-10.75**
4	1.80469	10.30	16.91	12.45	27.21	22.75	56.00	46.00	-28.79	-23.25
5	6.20313	10.41	23.72	18.92	34.13	29.33	60.00	50.00	-25.87	-20.67
6	24.00000	11.43	23.51	22.59	34.94	34.02	60.00	50.00	-25.06	-15.98

REMARKS:

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

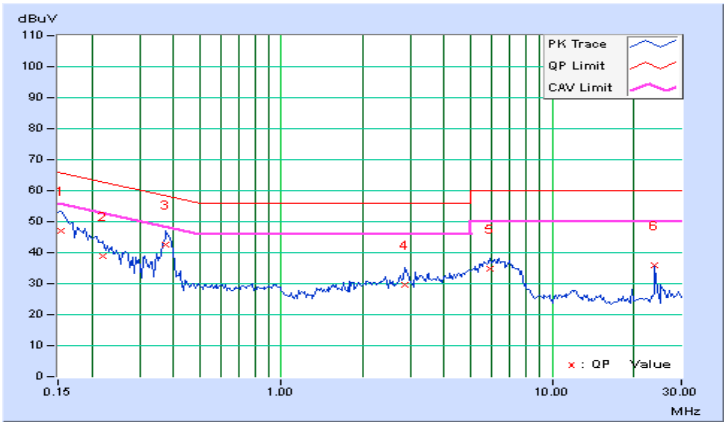


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15391	10.19	37.00	20.92	47.19	31.11	65.79	55.79	-18.59	-24.67
2	0.22031	10.21	28.77	15.56	38.98	25.77	62.81	52.81	-23.83	-27.04
3	0.37656	10.20	32.23	27.22	42.43	37.42	58.35	48.35	-15.92	-10.93
4	2.86328	10.27	19.21	13.53	29.48	23.80	56.00	46.00	-26.52	-22.20
5	5.92578	10.33	24.36	19.65	34.69	29.98	60.00	50.00	-25.31	-20.02
6	24.00000	11.13	24.85	23.95	35.98	35.08	60.00	50.00	-24.02	-14.92

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

802.11a

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
36	5180	16.03	16.71	86.968	19.39	26.00	Pass
40	5200	16.39	16.93	92.868	19.68	26.00	Pass
48	5240	16.37	16.82	91.435	19.61	26.00	Pass
149	5745	22.40	22.78	363.451	25.60	26.00	Pass
157	5785	22.54	22.88	373.562	25.72	26.00	Pass
165	5825	22.68	23.02	385.8	25.86	26.00	Pass

Note: 1. The directional gain is 10dBi > 6dBi, therefore the limit needs to reduce, so the power limit shall be reduced to 30-(10-6) = 26dBm.

EIRP POWER OUTPUT

Chan.	Chan. Freq. (MHz)	EIRP Power (mW)	EIRP Power (dBm)	Power Limit (dBm)	Pass / Fail
36	5180	107.984	20.33	21.00	Pass
40	5200	115.310	20.62	21.00	Pass
48	5240	113.530	20.55	21.00	Pass

Note: 1. EIRP = Conducted Average Power + Antenna Gain

2. Maximum Antenna Gain = 0.94 (above 30 degrees from the horizon)

802.11ac (VHT20)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
36	5180	16.18	16.76	88.919	19.49	26.00	Pass
40	5200	16.53	17.19	97.338	19.88	26.00	Pass
48	5240	16.63	17.06	96.842	19.86	26.00	Pass
149	5745	21.98	22.42	332.343	25.22	26.00	Pass
157	5785	22.89	23.04	395.908	25.98	26.00	Pass
165	5825	22.70	23.08	389.445	25.90	26.00	Pass

Note: 1. The directional gain is 10dBi > 6dBi, therefore the limit needs to reduce, so the power limit shall be reduced to 30-(10-6) = 26dBm.

EIRP POWER OUTPUT

Chan.	Chan. Freq. (MHz)	EIRP Power (mW)	EIRP Power (dBm)	Power Limit (dBm)	Pass / Fail
36	5180	110.406	20.43	21.00	Pass
40	5200	120.860	20.82	21.00	Pass
48	5240	120.244	20.80	21.00	Pass

Note: 1. EIRP = Conducted Average Power + Antenna Gain
2. Maximum Antenna Gain = 0.94 (above 30 degrees from the horizon)

802.11ac (VHT40)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
38	5190	15.86	15.89	77.363	18.89	26.00	Pass
46	5230	16.54	16.97	94.856	19.77	26.00	Pass
151	5755	22.70	23.07	388.977	25.90	26.00	Pass
159	5795	22.81	23.09	394.689	25.96	26.00	Pass

Note: 1. The directional gain is 10dBi > 6dBi, therefore the limit needs to reduce, so the power limit shall be reduced to 30-(10-6) = 26dBm.

EIRP POWER OUTPUT

Chan.	Chan. Freq. (MHz)	EIRP Power (mW)	EIRP Power (dBm)	Power Limit (dBm)	Pass / Fail
38	5190	96.058	19.83	21.00	Pass
46	5230	117.778	20.71	21.00	Pass

Note: 1. EIRP = Conducted Average Power + Antenna Gain

2. Maximum Antenna Gain = 0.94 (above 30 degrees from the horizon)

802.11ac (VHT80)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
42	5210	13.65	13.37	44.901	16.52	26.00	Pass
155	5775	20.95	20.80	244.677	23.89	26.00	Pass

Note: 1. The directional gain is 10dBi > 6dBi, therefore the limit needs to reduce, so the power limit shall be reduced to 30-(10-6) = 26dBm.

EIRP POWER OUTPUT

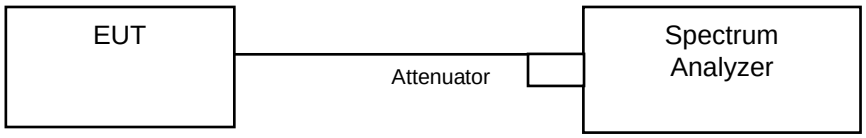
Chan.	Chan. Freq. (MHz)	EIRP Power (mW)	EIRP Power (dBm)	Power Limit (dBm)	Pass / Fail
42	5210	55.751	17.46	21.00	Pass

Note: 1. EIRP = Conducted Average Power + Antenna Gain

2. Maximum Antenna Gain = 0.94 (above 30 degrees from the horizon)

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	16.68	16.68
40	5200	16.80	16.80
48	5240	16.80	16.68
149	5745	16.80	16.68
157	5785	16.92	16.92
165	5825	16.68	17.04

802.11ac (VHT20)

Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)	
		CHAIN 0	CHAIN 1
36	5180	18.00	18.00
40	5200	17.88	17.88
48	5240	18.00	17.88
149	5745	18.00	18.00
157	5785	17.88	18.00
165	5825	17.88	18.00

802.11ac (VHT40)

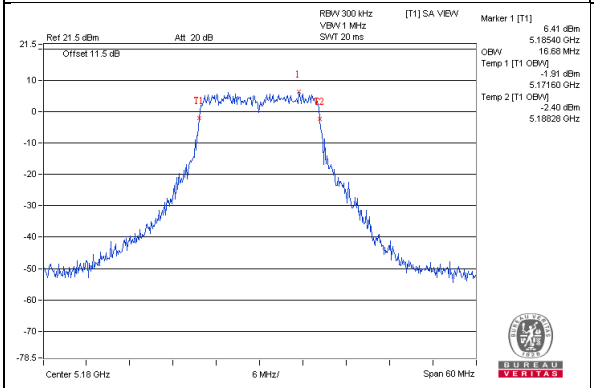
Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)	
		CHAIN 0	CHAIN 1
38	5190	36.72	36.72
46	5230	36.72	36.72
151	5755	36.96	37.44
159	5795	36.72	36.96

802.11ac (VHT80)

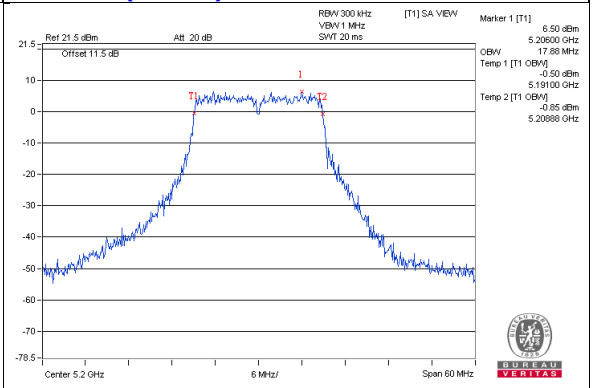
Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)	
		CHAIN 0	CHAIN 1
42	5210	75.84	75.84
155	5775	76.32	76.32

Spectrum Plot of Worst Value

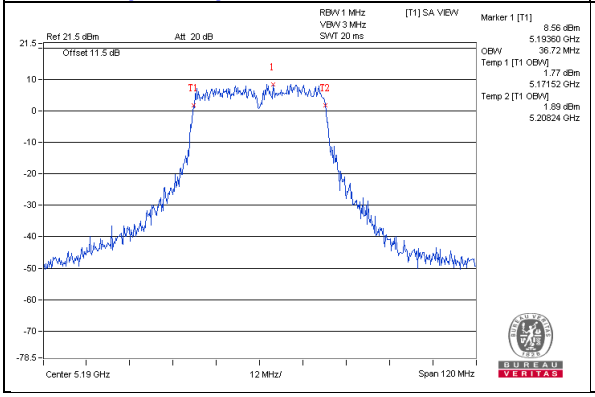
802.11a_Chain0 / CH36



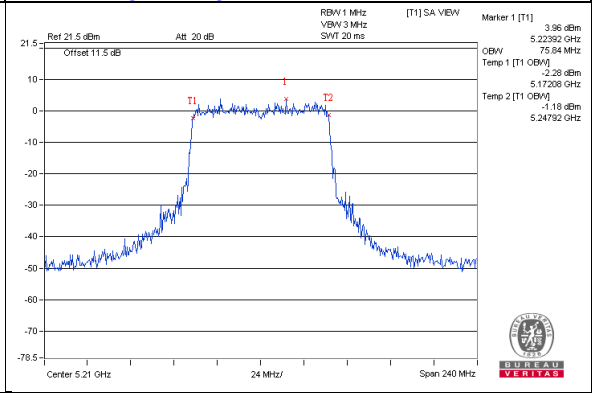
802.11ac (VHT20)_Chain0 / CH40



802.11ac (VHT40)_Chain0 / CH38

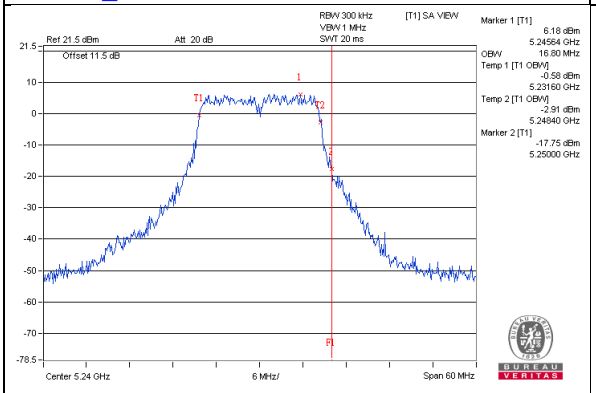


802.11ac (VHT80)_Chain0 / CH42

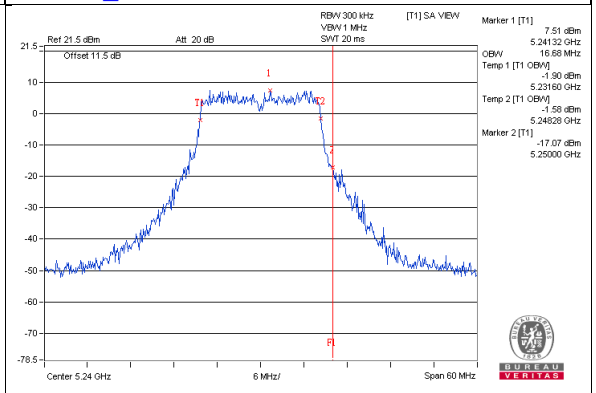


Spectrum Plot for near by DFS band
(DFS is required, if 99% OCP straddle into U-NII-2A band)

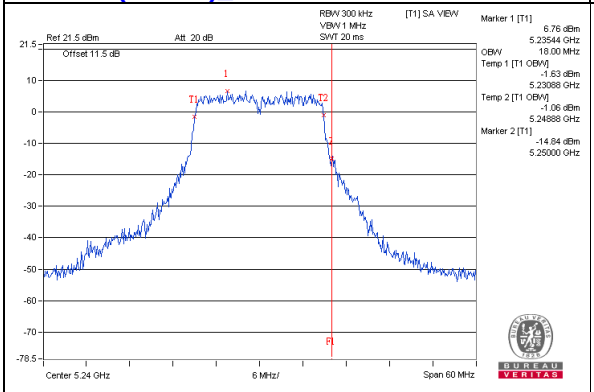
802.11a_Chain0 / CH48



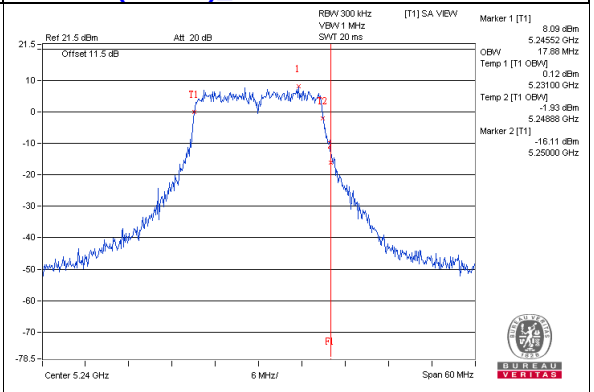
802.11a_Chain1 / CH48



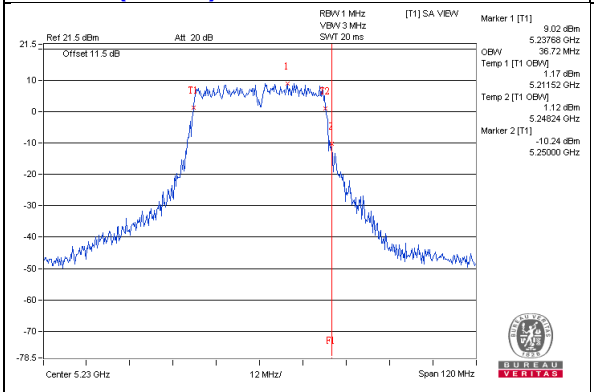
802.11ac(VHT20)_Chain0 / CH48



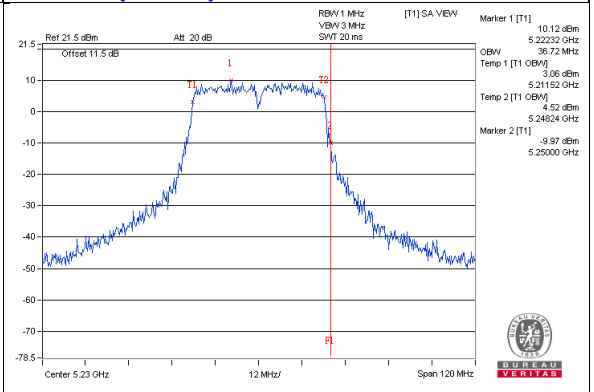
802.11ac(VHT20)_Chain1 / CH48



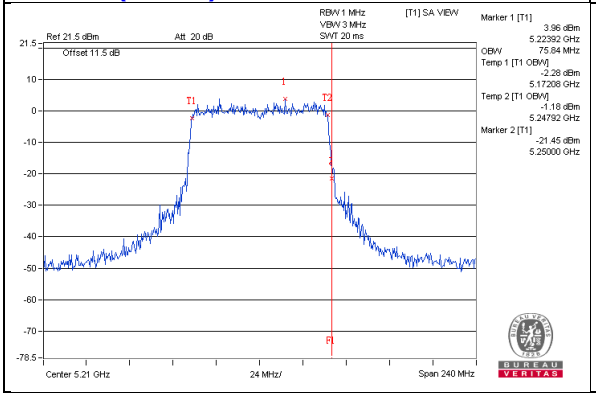
802.11ac(VHT40)_Chain0 / CH46



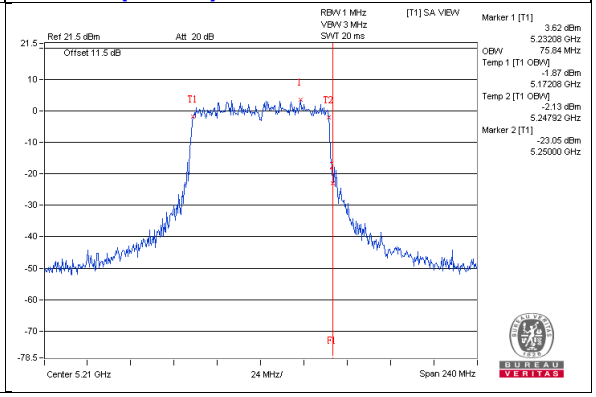
802.11ac(VHT20)_Chain1 / CH46



802.11ac(VHT80)_Chain0 / CH42



802.11ac(VHT80)_Chain1 / CH42

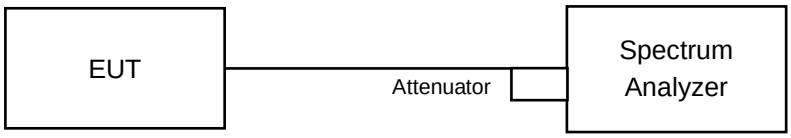


4.5 Peak Power Spectral Density Measurement

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

802.11a, 802.11ac (VHT20)

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

802.11ac (VHT40), 802.11ac (VHT80)

For U-NII-1:

Using method SA-2

1. Set span to encompass the entire emission bandwidth (EBW) of the signal.
2. Set RBW = 1 MHz, Set VBW ≥ 3 MHz, Detector = RMS
3. Sweep time = auto, trigger set to “free run”.
4. Trace average at least 100 traces in power averaging mode.
5. Record the max value and add 10 log (1/duty cycle)

For U-NII-3:

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

4.5.5 Deviation from Test Standard

No deviation.

4.5.6 EUT Operating Condition

Same as Item 4.3.6.

4.5.7 Test Results

For U-NII-1:

802.11a

Chan.	Chan. Freq. (MHz)	PSD (dBm/MHz)		Total Power Density (dBm/MHz)	MAX. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1			
36	5180	-4.82	2.86	3.54	9.99	Pass
40	5200	2.43	3.46	5.99	9.99	Pass
48	5240	2.52	3.21	5.89	9.99	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 = 10dBi + 10log(2) = 13.01dBi > 6dBi , so the power density limit shall be reduced to 17-(13.01-6) = 9.99dBm.

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	1.81	2.83	5.36	9.99	Pass
40	5200	2.03	3.25	5.69	9.99	Pass
48	5240	2.06	3.47	5.83	9.99	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 = 10dBi + 10log(2) = 13.01dBi > 6dBi , so the power density limit shall be reduced to 17-(13.01-6) = 9.99dBm.

802.11ac (VHT40)

Chan.	Chan. Freq. (MHz)	PSD W/O Duty Factor (dBm/MHz)		Duty Factor (dB)	Total PSD With Duty Factor (dBm/MHz)	MAX. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1				
38	5190	-1.32	-0.93	0.32	2.21	9.99	Pass
46	5230	-0.99	-0.06	0.32	2.83	9.99	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 = 10dBi + 10log(2) = 13.01dBi > 6dBi , so the power density limit shall be reduced to 17-(13.01-6) = 9.99dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ac (VHT80)

Chan.	Chan. Freq. (MHz)	PSD W/O Duty Factor (dBm/MHz)		Duty Factor (dB)	Total PSD With Duty Factor (dBm/MHz)	MAX. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1				
42	5210	-6.63	-6.49	0.27	-3.27	9.99	Pass

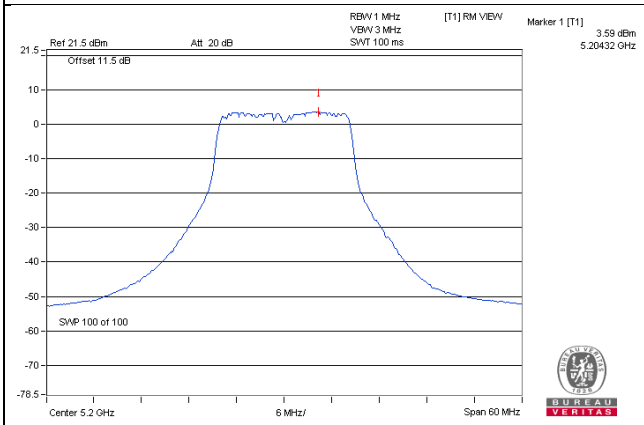
Note: 1. Method a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.

2. Directional gain = 10dBi + 10log(2) = 13.01dBi > 6dBi , so the power density limit shall be reduced to 17-(13.01-6) = 9.99dBm.

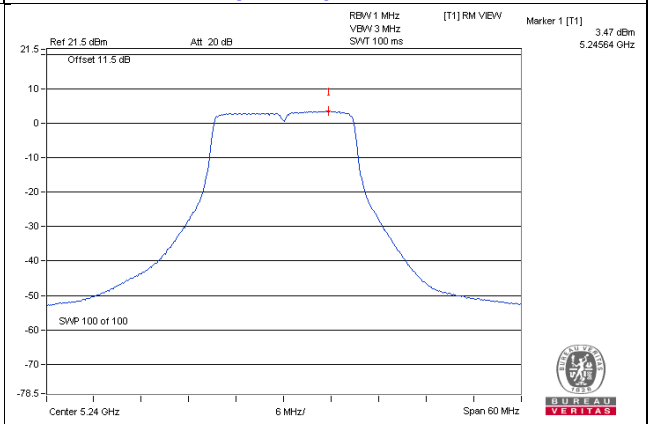
3. Refer to section 3.3 for duty cycle spectrum plot.

Spectrum Plot of Worst Value

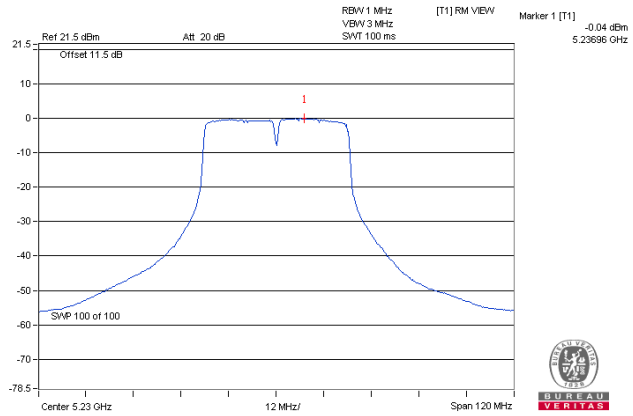
802.11a_Chain 1 / CH40



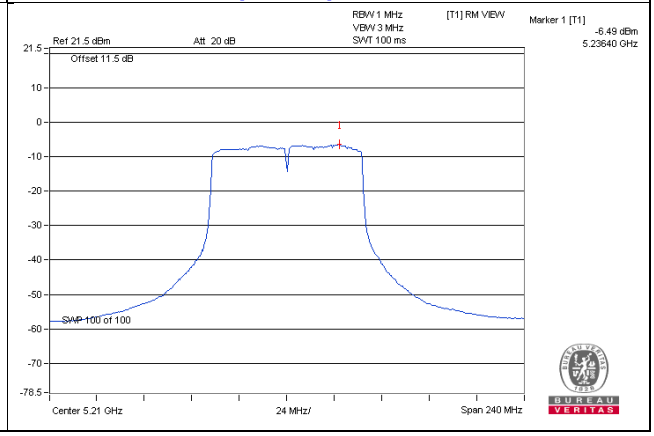
802.11ac (VHT20)_Chain 1 / CH48



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	1.43	3.65	3.01	6.66	22.99	Pass
	157	5785	1.42	3.64	3.01	6.65	22.99	Pass
	165	5825	1.75	3.97	3.01	6.98	22.99	Pass
1	149	5745	1.54	3.76	3.01	6.77	22.99	Pass
	157	5785	1.82	4.04	3.01	7.05	22.99	Pass
	165	5825	1.94	4.16	3.01	7.17	22.99	Pass

Note: 1. Directional gain = 10dBi + 10log(2) = 13.01dBi > 6dBi , so the power density limit shall be reduced to 30-(13.01-6) = 22.99dBm.

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	0.26	2.48	3.01	5.49	22.99	Pass
	157	5785	1.50	3.72	3.01	6.73	22.99	Pass
	165	5825	0.62	2.84	3.01	5.85	22.99	Pass
1	149	5745	0.50	2.72	3.01	5.73	22.99	Pass
	157	5785	1.58	3.80	3.01	6.81	22.99	Pass
	165	5825	1.36	3.58	3.01	6.59	22.99	Pass

Note: 1. Directional gain = 10dBi + 10log(2) = 13.01dBi > 6dBi , so the power density limit shall be reduced to 30-(13.01-6) = 22.99dBm.

802.11ac (VHT40)

TX chain	Chan.	Chan. Freq. (MHz)	PSD W/O Duty Factor		10 log (N=2) dB	Duty Factor (dB)	Total PSD With Duty Factor (dBm/500kHz)	Limit (dBm/500kHz)	Pass /Fail
			(dBm/300kHz)	(dBm/500kHz)					
0	151	5755	-2.42	-0.20	3.01	0.32	3.13	22.99	Pass
	159	5795	-1.96	0.26	3.01	0.32	3.59	22.99	Pass
1	151	5755	-2.06	0.16	3.01	0.32	3.49	22.99	Pass
	159	5795	-2.28	-0.06	3.01	0.32	3.27	22.99	Pass

Note: 1. Directional gain = 10dBi + 10log(2) = 13.01dBi > 6dBi , so the power density limit shall be reduced to 30-(13.01-6) = 22.99dBm.

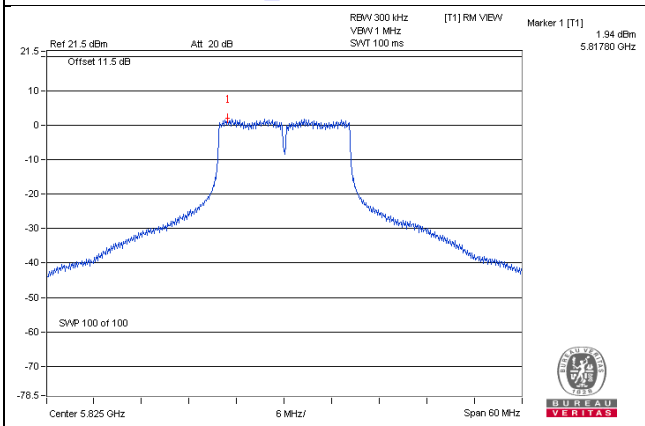
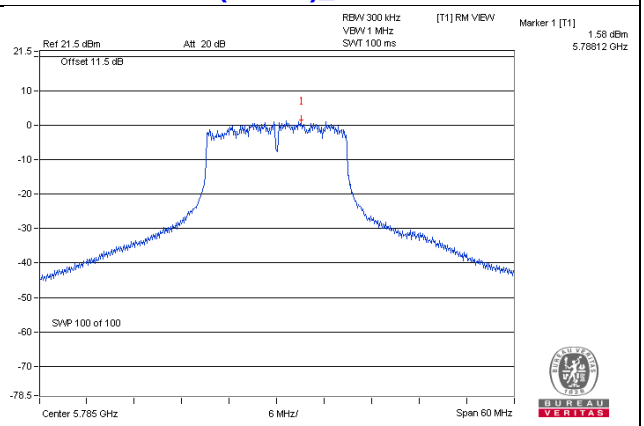
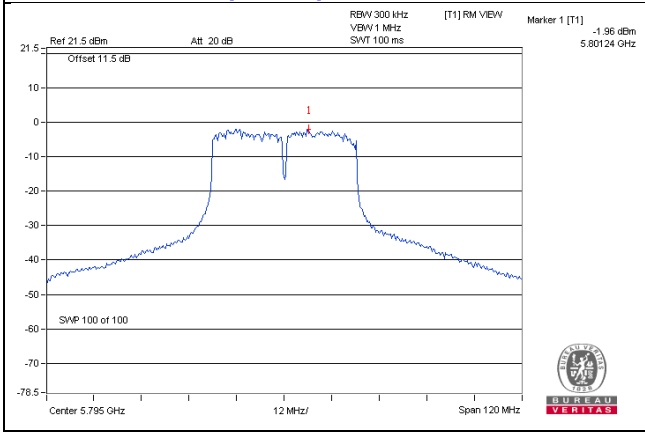
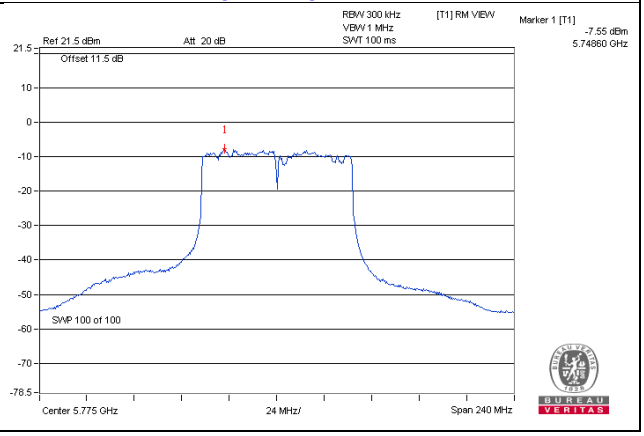
2. Refer to section 3.3 for duty cycle spectrum plot.

802.11ac (VHT80)

TX chain	Chan.	Chan. Freq. (MHz)	PSD W/O Duty Factor		10 log (N=2) dB	Duty Factor (dB)	Total PSD With Duty Factor (dBm/500kHz)	Limit (dBm/500kHz)	Pass /Fail
			(dBm/300kHz)	(dBm/500kHz)					
0	155	5775	-7.55	-5.33	3.01	0.27	-2.05	22.99	Pass
1	155	5775	-8.31	-6.09	3.01	0.27	-2.81	22.99	Pass

Note: 1. Directional gain = 10dBi + 10log(2) = 13.01dBi > 6dBi , so the power density limit shall be reduced to 30-(13.01-6) = 22.99dBm.

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

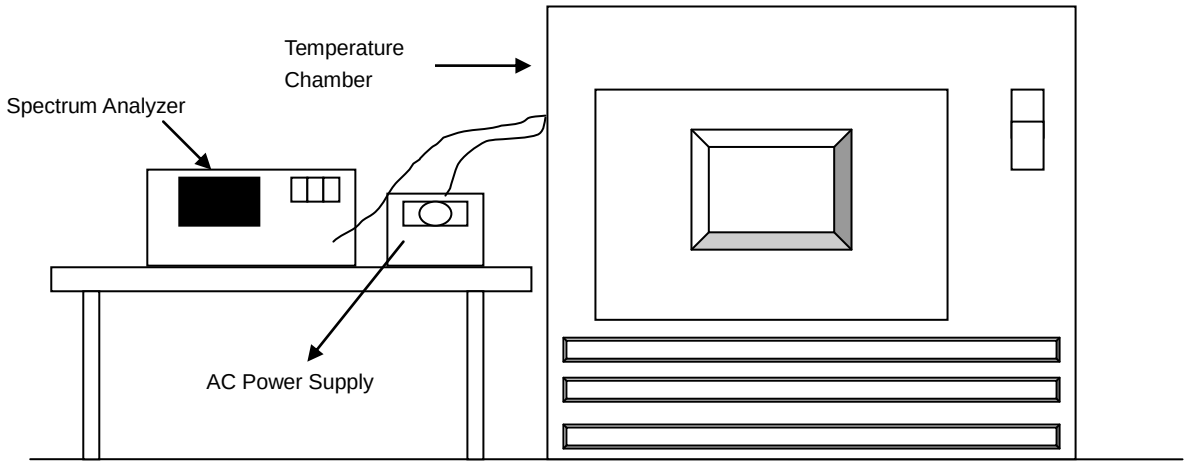
Spectrum Plot of Worst Value	
802.11a_Chain 1 / CH165	**802.11ac (VHT20)_Chain 1 / CH157**
	
802.11ac (VHT40)_Chain 0 / CH159	**802.11ac (VHT80)_Chain 0 / CH155**
	

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	5179.9951	Pass	5179.9969	Pass	5179.9945	Pass	5179.9969	Pass
40	120	5179.9854	Pass	5179.9867	Pass	5179.984	Pass	5179.9831	Pass
30	120	5179.9745	Pass	5179.9744	Pass	5179.977	Pass	5179.9735	Pass
20	120	5179.9772	Pass	5179.9751	Pass	5179.9754	Pass	5179.9787	Pass
10	120	5179.9916	Pass	5179.9911	Pass	5179.9878	Pass	5179.9895	Pass
0	120	5179.9782	Pass	5179.9786	Pass	5179.9805	Pass	5179.9802	Pass
-10	120	5180.0221	Pass	5180.0209	Pass	5180.0241	Pass	5180.0225	Pass
-20	120	5179.9907	Pass	5179.9896	Pass	5179.9906	Pass	5179.9916	Pass
-30	120	5180.0047	Pass	5180.0075	Pass	5180.0045	Pass	5180.0059	Pass

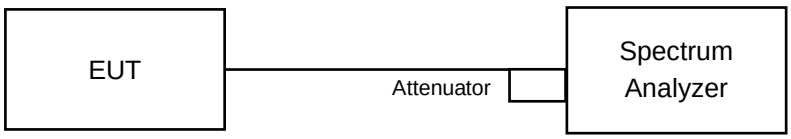
Frequency Stability Versus Voltage									
Operating Frequency: 5180 MHz									
TEMP. (℃)	Power Supply (Vac)	0 Minute		2 Minute		5 Minute		10 Minute	
		Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail	Measured Frequency (MHz)	Pass/Fail
20	138	5179.9779	Pass	5179.9751	Pass	5179.9757	Pass	5179.9784	Pass
	120	5179.9772	Pass	5179.9751	Pass	5179.9754	Pass	5179.9787	Pass
	102	5179.9766	Pass	5179.9743	Pass	5179.9745	Pass	5179.9788	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	16.40	16.38	0.5	Pass
157	5785	16.42	16.39	0.5	Pass
165	5825	16.42	16.42	0.5	Pass

802.11ac (VHT20)

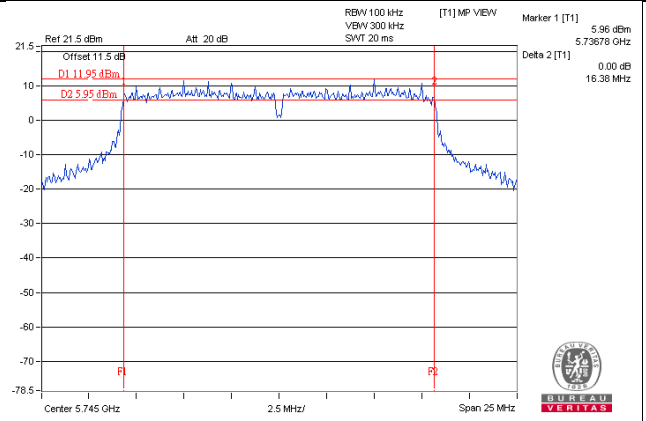
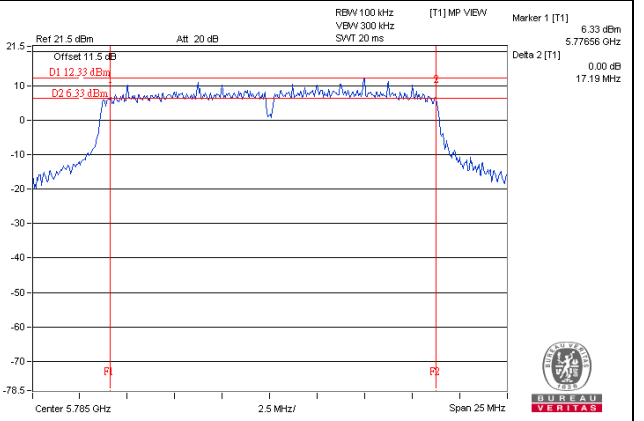
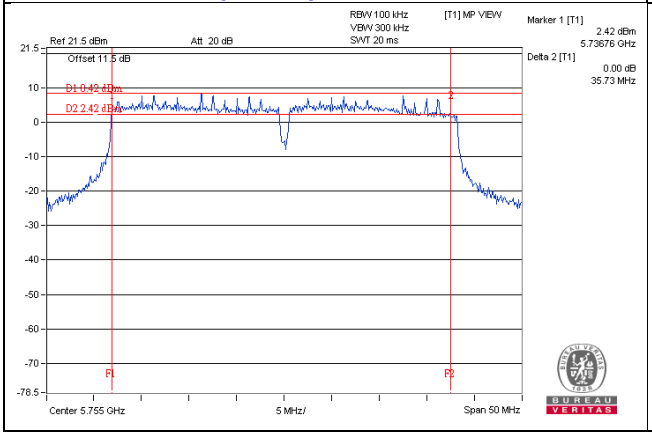
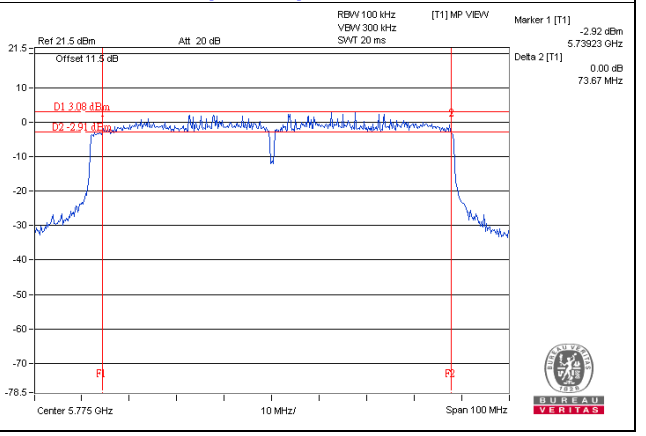
Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
149	5745	17.64	17.66	0.5	Pass
157	5785	17.61	17.19	0.5	Pass
165	5825	17.64	17.62	0.5	Pass

802.11ac (VHT40)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
151	5755	35.73	36.42	0.5	Pass
159	5795	36.04	36.42	0.5	Pass

802.11ac (VHT80)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
155	5775	76.31	73.67	0.5	Pass

Spectrum Plot of Worst Value	
802.11a / Chain 1 : CH149	**802.11ac(VHT20) / Chain 1 : CH157**
	
802.11ac(VHT40) / Chain 0 : CH151	**802.11ac(VHT80) / Chain 1 : CH155**
	

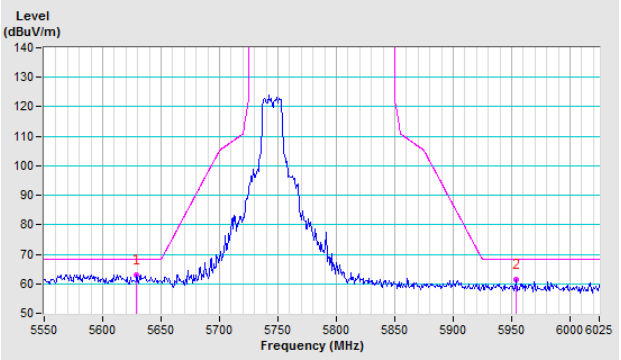
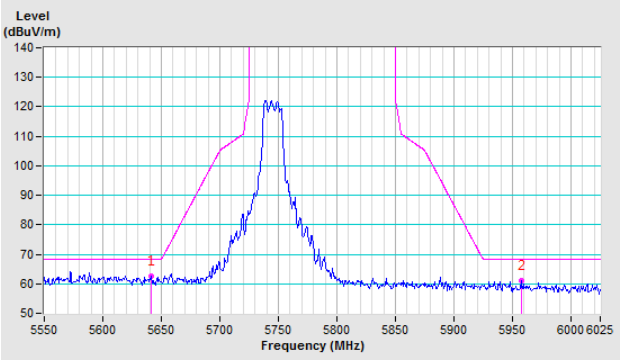
5 Pictures of Test Arrangements

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

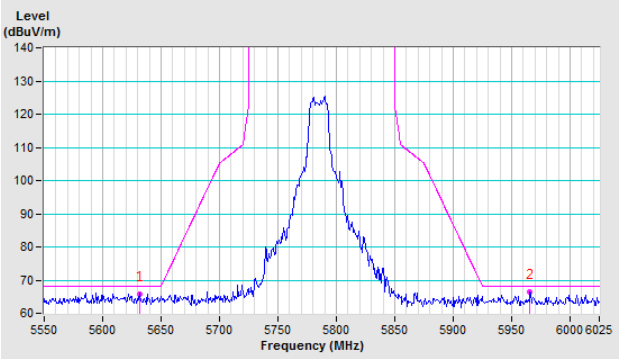
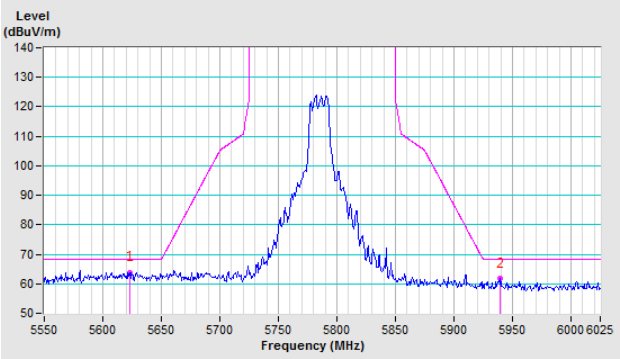
Annex A- Radiated Out of Band Emisison (OOBE) Measurement (For U-NII-3 band)

802.11a

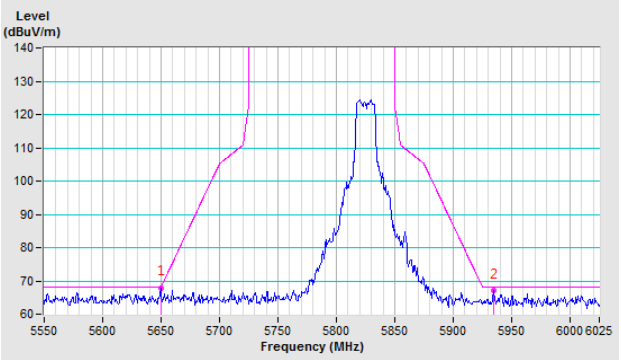
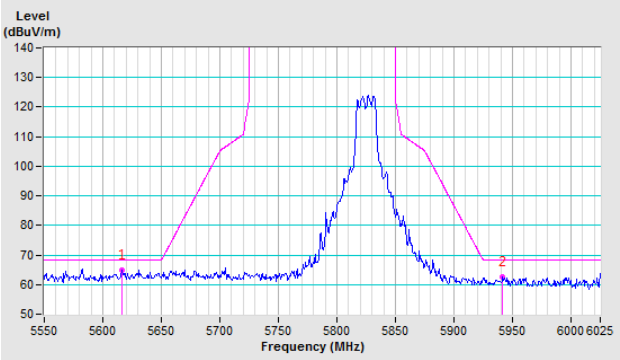
CH 149 5745 MHz

Horizontal	Vertical
	

CH 157 5785 MHz

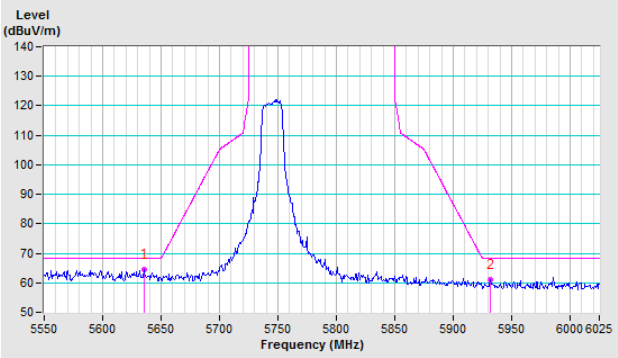
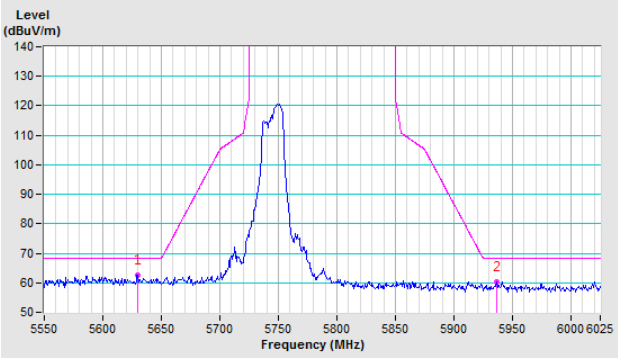
Horizontal	Vertical
	

CH 165 5825 MHz

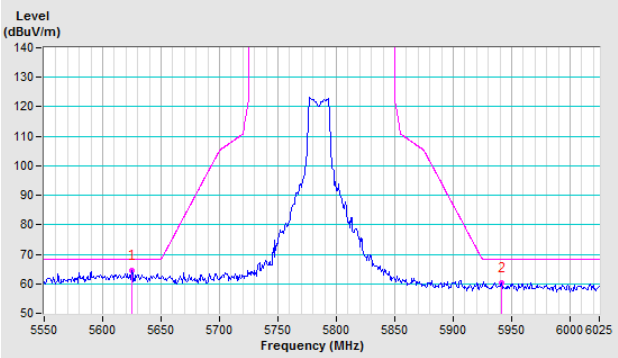
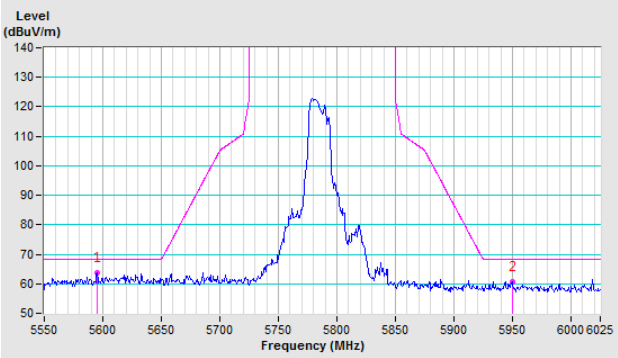
Horizontal	Vertical
	

802.11ac (VHT20)

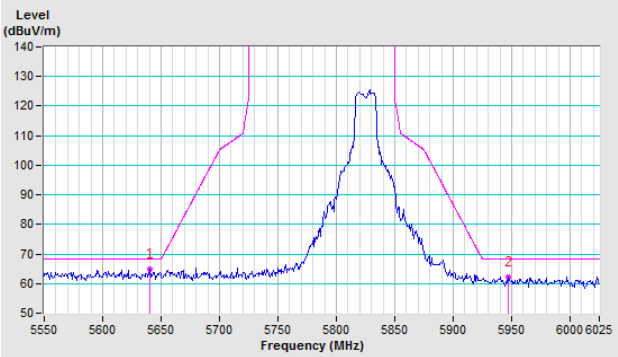
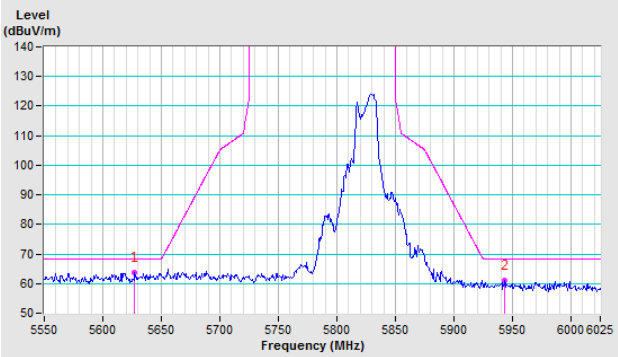
CH 149 5745 MHz

Horizontal	Vertical
	

CH 157 5785 MHz

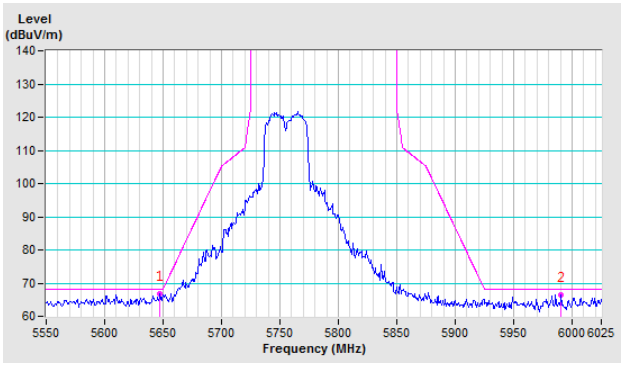
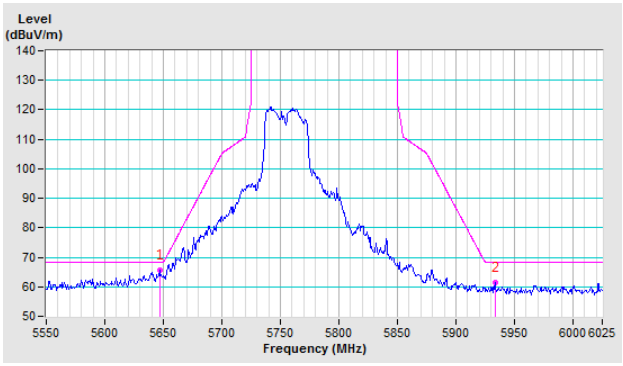
Horizontal	Vertical
	

CH 165 5825 MHz

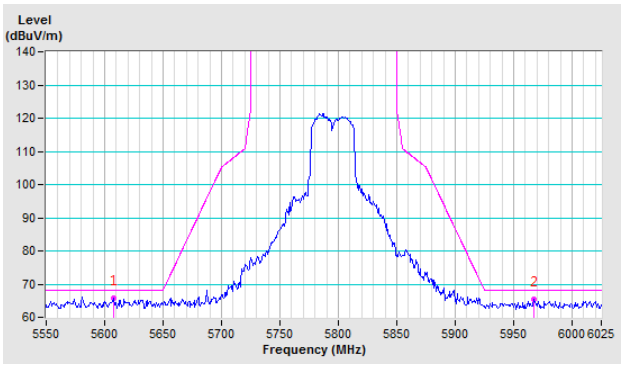
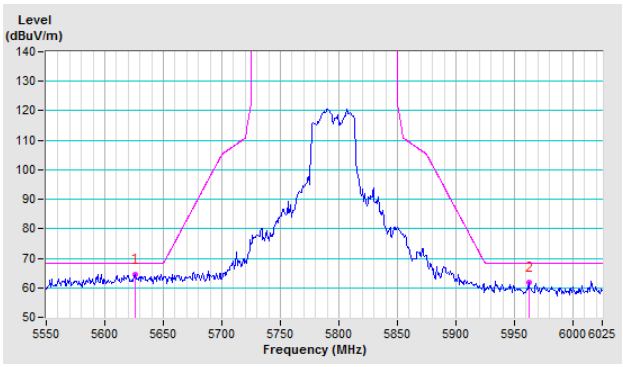
Horizontal	Vertical
	

802.11ac (VHT40)

CH 151 5755 MHz

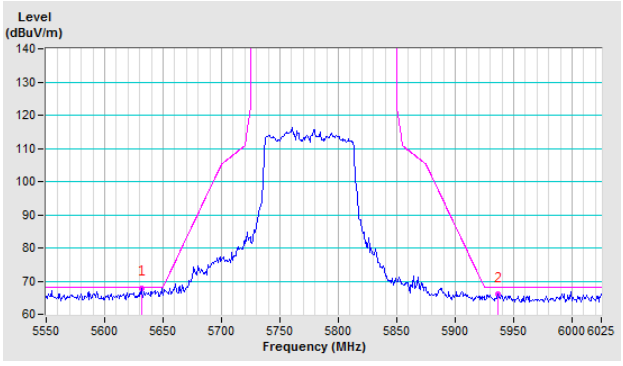
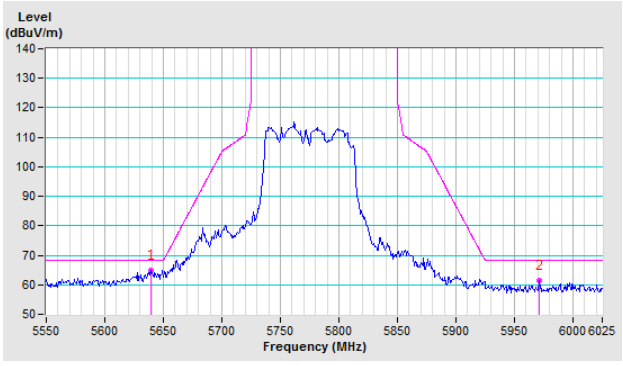
Horizontal	Vertical
	

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 accredited and approved according to ISO/IEC 17025.

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

Linko EMC/RF Lab
Tel: 886-2-26052180
Fax: 886-2-26051924

Hsin Chu EMC/RF/Telecom Lab
Tel: 886-3-6668565
Fax: 886-3-6668323

Hwa Ya EMC/RF/Safety Lab
Tel: 886-3-3183232
Fax: 886-3-3270892

Email: service.adt@tw.bureauveritas.com
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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