FCC Test Report

Report No.:	RF170609C18A
FCC ID:	QXO-AP3915I
Test Model:	AP3915i
Series Model:	AP7632i (refer to item 3.1 for more details)
Received Date:	Jun. 09, 2017
Test Date:	Jul. 03 ~ Jul. 17, 2017
Issued Date:	Aug. 07, 2017
Applicant:	Extreme Networks, Inc.
Address:	6480 VIA DEL ORO SAN JOSE CA 95119 USA
Issued By:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
Lab Address:	No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan (R.O.C.)
Test Location:	No. 19, Hwa Ya 2nd Rd., Wen Hwa Vil., Kwei Shan Dist., Taoyuan City 33383, TAIWAN (R.O.C.)

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Release Control Record

Issue No.	Description	Date Issued
RF170609C18A	Original release.	Aug. 07, 2017

1 Certificate of Conformity

Product:	Wireless 802.11 a/ac+b/g/n Indoor Access Point
Brand:	Extreme Networks
Test Model:	AP3915i
Series Model:	AP7632i (refer to item 3.1 for more details)
Sample Status:	Engineering sample
Applicant:	Extreme Networks, Inc.
Test Date:	Jul. 03 ~ Jul. 17, 2017
Standards:	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 : Celine Chou , **Date:** Aug. 07, 2017

Celine Chou / Specialist

Approved by : Ken Liu , **Date:** Aug. 07, 2017

Ken Liu / Senior 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 -6.48dB at 0.48317MHz.
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 -1.0dB at 37.89MHz.
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 IPEX 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	2.94 dB
Radiated Emissions up to 1 GHz	30MHz ~ 200MHz	3.86 dB
	200MHz ~1000MHz	3.87 dB
Radiated Emissions above 1 GHz	1GHz ~ 18GHz	2.29 dB
	18GHz ~ 40GHz	2.29 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	Wireless 802.11 a/ac+b/g/n Indoor Access Point
Brand	Extreme Networks
Test Model	AP3915i
Series Model	AP7632i
Model Difference	Refer to note for more details
Sample Status	Engineering sample
Power Supply Rating	12Vdc from adapter 54Vdc from POE
Modulation Type	256QAM, 64QAM, 16QAM, QPSK, BPSK
Modulation Technology	OFDM
Transfer Rate	802.11a: 54/48/36/24/18/12/9/6Mbps 802.11n: up to 300Mbps 802.11ac: up to 867Mbps
Operating Frequency	5260~5320MHz, 5500~5720MHz
Number of Channel	5260~5320MHz: 802.11a, 802.11n (HT20), 802.11ac (VHT20): 4 802.11n (HT40), 802.11ac (VHT40): 2 802.11ac (VHT80): 1 5500~5720MHz: 802.11a, 802.11n (HT20), 802.11ac (VHT20): 12 802.11n (HT40), 802.11ac (VHT40): 6 802.11ac (VHT80): 3
Output Power	CDD Mode: 5260~5320MHz: 234.640mW 5500~5720MHz: 246.054mW Beamforming Mode: 5260~5320MHz: 117.328mW 5500~5720MHz: 123.036mW
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	NA
Cable Supplied	NA

Note:

1. This report is prepared for FCC class II permissive change. The difference compared with the original report (BV ADT report no.: RF170609C18-1) is adding 5.26GHz to 5.32GHz and 5.50GHz to 5.70GHz by software.

2. The EUT incorporates a MIMO function. Physically, the EUT provides 2 completed transmitters and 2 receivers.

Modulation Mode	TX Function	Beamforming
802.11a	2TX	Not Support
802.11n (HT20)	2TX	Support
802.11n (HT40)	2TX	Support
802.11ac (VHT20)	2TX	Support
802.11ac (VHT40)	2TX	Support
802.11ac (VHT80)	2TX	Support

* 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)

* For 802.11n and 802.11ac, CDD mode and Beamforming mode are presented in power output test item. For other test items, CDD mode is the worst case for final tests after pretesting.

3. All models are listed as below. Model: AP3915i was chosen for final test.

Brand	Model	Difference
Extreme Networks	AP3915i	All models are electrically identical, only the cover printing is different.
	AP7632i	

4. The EUT consumes power from the following adapter and POE. (Support unit only)

Adapter	
Brand	Powertron Electronics Corp.
Model	PA1024-120IB200
Input Power	100-240Vac, 50-60Hz, 0.6A.
Output Power	12Vdc, 2A, 24W Max
Power Line	1.5m power cable with one core attached on adapter

POE	
Brand	EnGenius
Model	EPA5006GP
Input Power	100-240Vac, 50-60Hz, 0.8A
Output Power	54Vdc, 0.6A Pin 4, 5: 54Vdc Pin 7, 8: Return

5. The EUT uses following antennas.

Antenna Type	PIFA	Antenna Connector	IPEX
Gain (dBi)	Frequency (MHz)		
	2400-2500		5150-5850
1	4.1		-
2	4.3		-
3 (BT LE / Zigbee)	4.1		-
4	-		5.3
5	-		5.3

6. Power Setting as below.

CDD Mode						
	802.11a	802.11n (HT20)		802.11n (HT40)		802.11ac (VHT80)
CH 52	18.5	19	CH 54	20	CH 58	16.5
CH 60	18.5	19	CH 62	17	CH 106	17.5
CH 64	19	19	CH 102	18	CH 122	21
CH 100	19	19	CH 110	20.5	CH 138 For 5500~5720MHz	21
CH 116	19	19	CH 134	20	CH 138 For 5745~5825MHz	21
CH 140	19.5	19.5	CH 142 For 5500~5720MHz	21		
CH 144 For 5500~5720MHz	19	20	CH 142 For 5745~5825MHz	21		
CH 144 For 5745~5825MHz	19	20				

Beamforming Mode					
	802.11n (HT20)		802.11n (HT40)		802.11ac (VHT80)
CH 52	19	CH 54	20	CH 58	16.5
CH 60	19	CH 62	17	CH 106	17.5
CH 64	19	CH 102	18	CH 122	21
CH 100	19	CH 110	20.5	CH 138 For 5500~5720MHz	21
CH 116	19	CH 134	20	CH 138 For 5745~5825MHz	21
CH 140	19.5	CH 142 For 5500~5720MHz	21		
CH 144 For 5500~5720MHz	20	CH 142 For 5745~5825MHz	21		
CH 144 For 5745~5825MHz	20				

7. 2.4GHz & 5GHz & BT LE or 2.4GHz & 5GHz & Zigbee technology can transmit at same time. BT LE and Zigbee cannot transmit simultaneously.
8. Spurious emission of the simultaneous operation (2.4GHz & 5GHz & BT LE or 2.4GHz & 5GHz & Zigbee) has been evaluated and no non-compliance was found.

3.2 Description of Test Modes

5260~5320MHz:

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

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

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

Channel	Frequency	Channel	Frequency
54	5270 MHz	62	5310 MHz

1 channel is provided for 802.11ac (VHT80):

Channel	Frequency
58	5290MHz

5500~5720MHz:

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

Channel	Frequency	Channel	Frequency
100	5500 MHz	124	5620 MHz
104	5520 MHz	128	5640 MHz
108	5540 MHz	132	5660 MHz
112	5560 MHz	136	5680 MHz
116	5580 MHz	140	5700 MHz
120	5600 MHz	144	5720 MHz

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

Channel	Frequency	Channel	Frequency
102	5510 MHz	126	5630 MHz
110	5550 MHz	134	5670 MHz
118	5590 MHz	142	5710 MHz

3 channels are provided for 802.11ac (VHT80):

Channel	Frequency	Channel	Frequency
106	5530 MHz	122	5610 MHz
138	5690 MHz		

3.2.1 Test Mode Applicability and Tested Channel Detail

EUT Configure Mode	Applicable to				Description
	RE≥1G	RE<1G	PLC	APCM	
A	√	√	√	√	Power from adapter
B	-	√	√	-	Power from POE

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

Note:
1. The EUT had been pre-tested on the positioned of each 3 axis. The worst case was found when positioned on **Y-plane**.
2. "-" means no effect.

Radiated Emission Test (Above 1GHz):

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

EUT Configure Mode	Mode	Frequency Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Data Rate (Mbps)
A	802.11a	5260-5320	52 to 64	52, 60, 64	OFDM	6.0
	802.11n (HT20)		52 to 64	52, 60, 64	OFDM	6.5
	802.11n (HT40)		54 to 62	54, 62	OFDM	13.5
	802.11ac (VHT80)		58	58	OFDM	29.3
A	802.11a	5500-5720	100 to 144	100, 116, 140, 144	OFDM	6.0
	802.11n (HT20)		100 to 144	100, 116, 140, 144	OFDM	6.5
	802.11n (HT40)		102 to 142	102, 110, 134, 142	OFDM	13.5
	802.11ac (VHT80)		106 to 138	106, 122, 138	OFDM	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.

EUT Configure Mode	Mode	Frequency Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Data Rate (Mbps)
A, B	802.11a	5260-5320	52 to 64	52	OFDM	6.0
	802.11a	5500-5720	100 to 144		OFDM	6.0

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.

EUT Configure Mode	Mode	Frequency Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Data Rate (Mbps)
A, B	802.11a	5260-5320	52 to 64	52	OFDM	6.0
	802.11a	5500-5720	100 to 144		OFDM	6.0

Transmit Power 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.

EUT Configure Mode	Mode	Frequency Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Data Rate (Mbps)
CDD Mode						
A	802.11a	5260-5320	52 to 64	52, 60, 64	OFDM	6.0
	802.11n (HT20)		52 to 64	52, 60, 64	OFDM	6.5
	802.11n (HT40)		54 to 62	54, 62	OFDM	13.5
	802.11ac (VHT80)		58	58	OFDM	29.3
A	802.11a	5500-5720	100 to 144	100, 116, 140, 144	OFDM	6.0
	802.11n (HT20)		100 to 144	100, 116, 140, 144	OFDM	6.5
	802.11n (HT40)		102 to 142	102, 110, 134, 142	OFDM	13.5
	802.11ac (VHT80)		106 to 138	106, 122, 138	OFDM	29.3
Beamforming Mode						
A	802.11n (HT20)	5260-5320	52 to 64	52, 60, 64	OFDM	6.5
	802.11n (HT40)		54 to 62	54, 62	OFDM	13.5
	802.11ac (VHT80)		58	58	OFDM	29.3
A	802.11n (HT20)	5500-5720	100 to 144	100, 116, 140, 144	OFDM	6.5
	802.11n (HT40)		102 to 142	102, 110, 134, 142	OFDM	13.5
	802.11ac (VHT80)		106 to 138	106, 122, 138	OFDM	29.3

Peak Power Spectral Density, Bandwidth and Frequency Stability 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.

EUT Configure Mode	Mode	Frequency Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Data Rate (Mbps)
A	802.11a	5260-5320	52 to 64	52, 60, 64	OFDM	6.0
	802.11n (HT20)		52 to 64	52, 60, 64	OFDM	6.5
	802.11n (HT40)		54 to 62	54, 62	OFDM	13.5
	802.11ac (VHT80)		58	58	OFDM	29.3
A	802.11a	5500-5720	100 to 144	100, 116, 140, 144	OFDM	6.0
	802.11n (HT20)		100 to 144	100, 116, 140, 144	OFDM	6.5
	802.11n (HT40)		102 to 142	102, 110, 134, 142	OFDM	13.5
	802.11ac (VHT80)		106 to 138	106, 122, 138	OFDM	29.3

Test Condition:

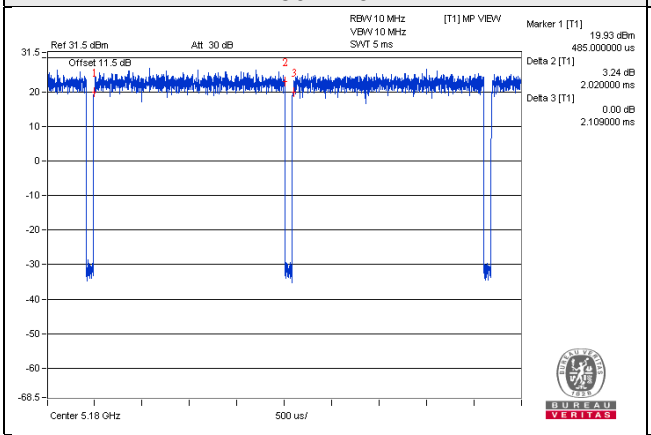
Applicable to	Environmental Conditions	Input Power (System)	Tested by
RE≥1G	25 deg. C, 66% RH	120Vac, 60Hz	Jones Chang
RE<1G	25 deg. C, 66% RH	120Vac, 60Hz	Jones Chang
PLC	25 deg. C, 75% RH	120Vac, 60Hz 54Vdc	Jones Chang
APCM	25 deg. C, 60% RH	120Vac, 60Hz	Edward Lin

3.3 Duty Cycle of Test Signal

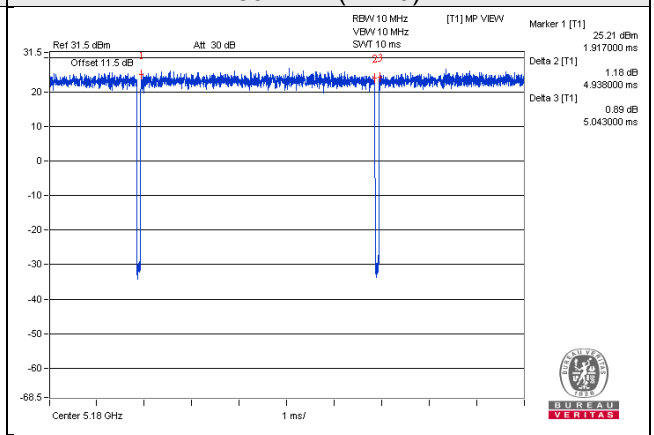
Duty cycle of test signal is < 98%, duty factor is required.

802.11a: Duty cycle = 2.020/2.109 = 0.958, Duty factor = 10 * log(1/0.958) = 0.19
802.11n (HT20): Duty cycle = 4.938/5.043 = 0.979, Duty factor = 10 * log(1/0.979) = 0.09
802.11n (HT40): Duty cycle = 2.390/2.497 = 0.957, Duty factor = 10 * log(1/0.957) = 0.19
802.11ac (VHT80): Duty cycle = 1.129/1.216 = 0.928, Duty factor = 10 * log(1/0.928) = 0.32

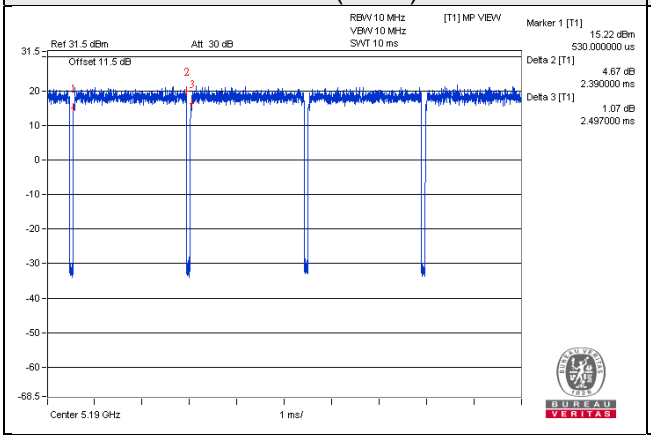
802.11a



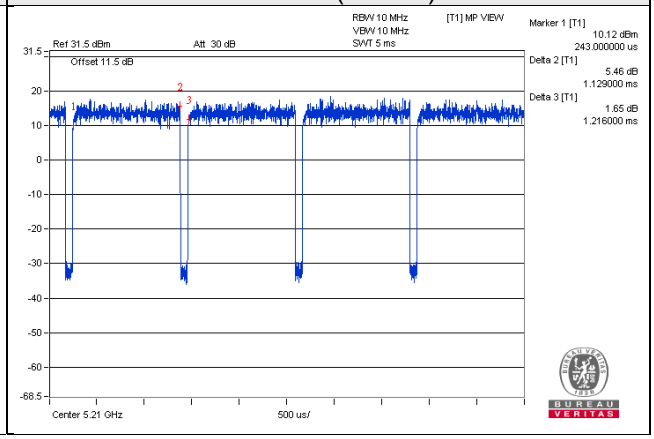
802.11n (HT20)



802.11n (HT40)



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	DELL	E5410	1HC2XM1	FCC DoC Approved	-
B.	Adapter	Powertron Electronics Corp.	PA1024-120IB200	NA	NA	Provided by manufacturer
C.	POE	EnGenius	EPA5006GP	NA	NA	Provided by manufacturer

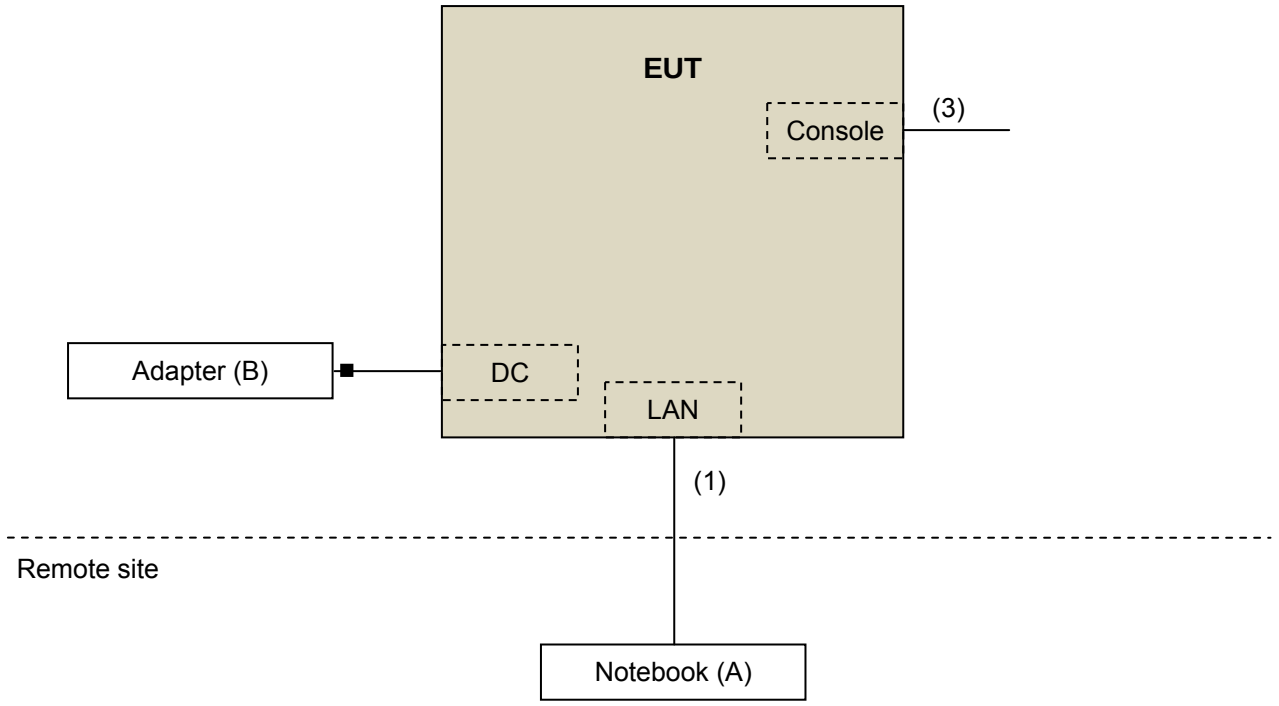
Note:

1. All power cords of the above support units are non-shielded (1.8m).
2. Item A acted as a communication partner to transfer data.

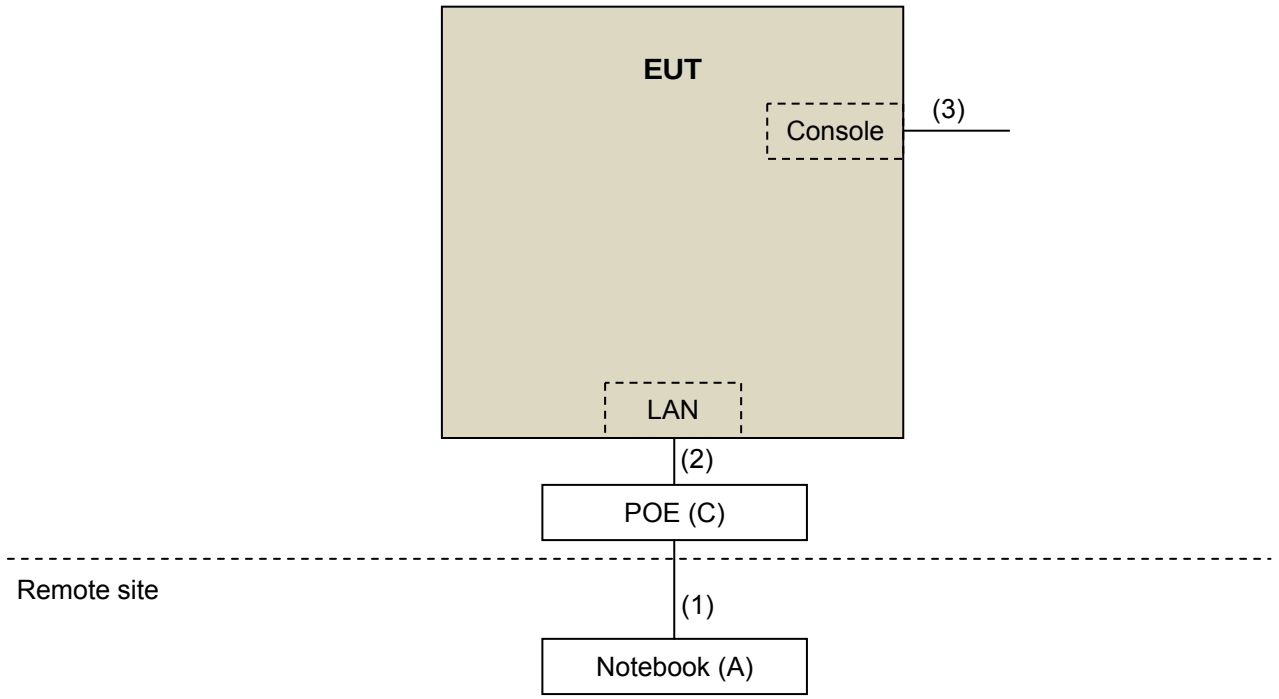
ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	RJ45, Cat5e	1	3	N	0	-
2.	RJ45, Cat5e	1	1.8	N	0	-
3.	Console cable	1	1	N	0	Provided by manufacturer

3.4.1 Configuration of System under Test

Test Mode A



Test Mode B



3.5 General Description of Applied Standards

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
662911 D01 Multiple Transmitter Output v02r01
ANSI C63.10:2013

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

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

4 Test Types and Results

4.1 Radiated Emission and Bandedge Measurement

4.1.1 Limits of Radiated Emission and Bandedge Measurement

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

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

NOTE:

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

Limits of unwanted emission out of the restricted bands

<table>
<tr><td colspan="3">Applicable To</td><td colspan="2">Limit</td></tr>
<tr><td colspan="3" rowspan="2">789033 D02 General UNII Test Procedure New Rules 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="5">*1 beyond 75 MHz or more above of the band edge.
*2 below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above.
*3 below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above.
*4 from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.</td></tr>
</table>

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

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

4.1.2 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Test Receiver ROHDE & SCHWARZ	ESIB7	100187	May 02, 2017	May 01, 2018
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100041	Nov. 16, 2016	Nov. 15, 2017
BILOG Antenna SCHWARZBECK	VULB9168	9168-171	Dec. 28, 2016	Dec. 27, 2017
HORN Antenna SCHWARZBECK	9120D	209	Dec. 27, 2016	Dec. 26, 2017
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170241	Dec. 14, 2016	Dec. 13, 2017
Loop Antenna	EM-6879	269	Aug. 11, 2016	Aug. 10, 2017
Preamplifier Agilent	8447D	2944A10738	Aug. 22, 2016	Aug. 21, 2017
Preamplifier Agilent	8449B	3008A01922	Sep. 18, 2016	Sep. 17, 2017
RF signal cable HUBER+SUHNER	SUCOFLEX 104	Cable-CH3-03 (214378)	Aug. 22, 2016	Aug. 21, 2017
RF signal cable HUBER+SUHNER	SUCOFLEX 106	Cable-CH3-03 (309224+12738)	Aug. 22, 2016	Aug. 21, 2017
Software BV ADT	ADT_Radiated_ V7.6.15.9.4	NA	NA	NA
Antenna Tower inn-co GmbH	MA 4000	013303	NA	NA
Antenna Tower Controller BV ADT	AT100	AT93021702	NA	NA
Turn Table BV ADT	TT100	TT93021702	NA	NA
Turn Table Controller BV ADT	SC100	SC93021702	NA	NA
26GHz ~ 40GHz Amplifier	EM26400	815221	Oct. 17, 2016	Oct. 16, 2017
High Speed Peak Power Meter	ML2495A	0824012	Aug. 11, 2016	Aug. 10, 2017
Power Sensor	MA2411B	0738171	Aug. 11, 2016	Aug. 10, 2017
WIT Standard Temperature And Humidity Chamber	TH-4S-C	W981030	Jun. 08, 2017	Jun. 07, 2018

Note:
1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in HwaYa Chamber 3.
3. The horn antenna and preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
4. The FCC Designation Number is TW0003. The number will be varied with the Lab location and scope as attached.
5. The IC Site Registration No. is IC7450F-4.

4.1.3 Test Procedures

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:

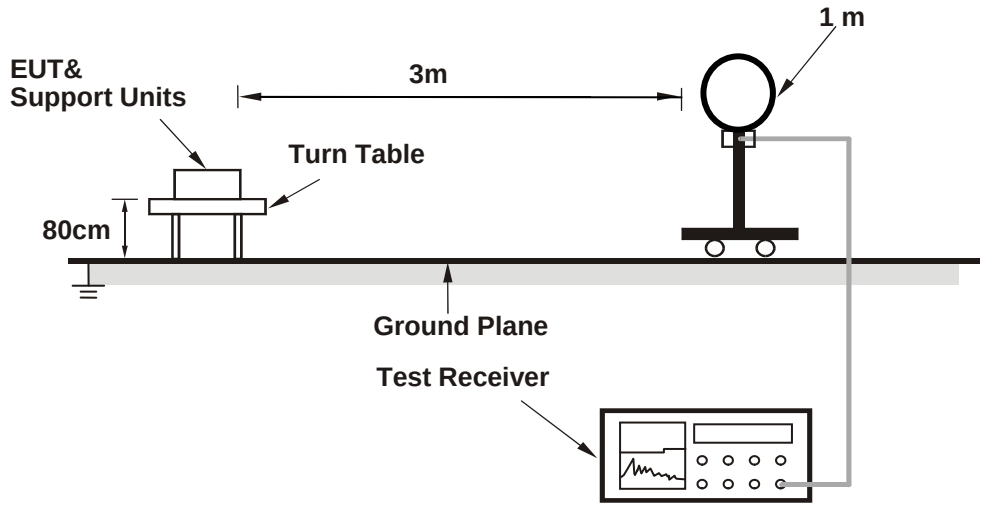
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.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

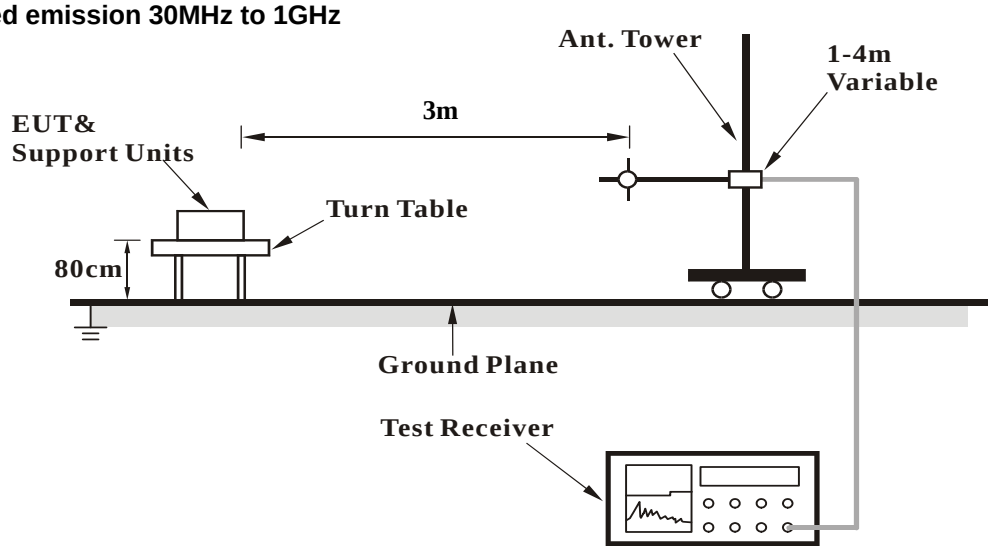
No deviation.

4.1.5 Test Setup

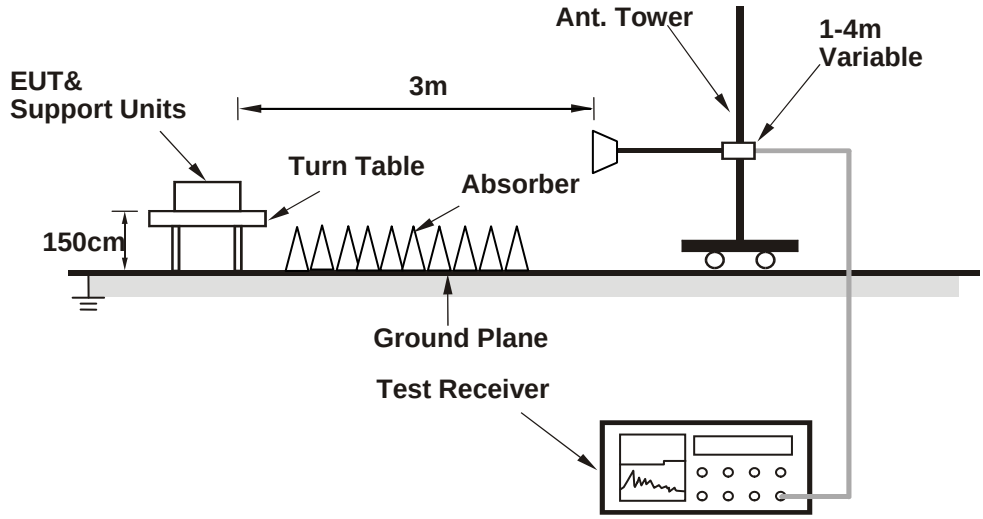
For Radiated emission below 30MHz



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 Conditions

a. Placed the EUT on the testing table.
b. Prepared a notebook to act as a communication partner and placed it outside of testing area.
c. The communication partner connected with EUT via a RJ45 cable and ran a test program (provided by manufacturer) to enable EUT under transmission condition continuously at specific channel frequency.
d. The communication partner sent data to EUT by command "PING".

4.1.7 Test Results

Above 1GHz data:

802.11a

CHANNEL	TX Channel 52	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5260.00	118.7 PK			2.70 H	291	79.9	38.8
2	*5260.00	107.7 AV			2.70 H	291	68.9	38.8
3	5420.00	59.9 PK	74.0	-14.1	1.84 H	22	58.6	1.3
4	5420.00	49.2 AV	54.0	-4.8	1.84 H	22	47.9	1.3
5	#10520.00	59.1 PK	74.0	-14.9	1.94 H	152	45.4	13.7
6	#10520.00	46.3 AV	54.0	-7.7	1.94 H	152	32.6	13.7
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	*5260.00	114.0 PK			3.25 V	330	75.2	38.8
2	*5260.00	103.2 AV			3.25 V	330	64.4	38.8
3	5420.00	55.8 PK	74.0	-18.2	2.87 V	311	54.5	1.3
4	5420.00	44.8 AV	54.0	-9.2	2.87 V	311	43.5	1.3
5	#10520.00	58.3 PK	74.0	-15.7	1.85 V	243	44.6	13.7
6	#10520.00	45.7 AV	54.0	-8.3	1.85 V	243	32.0	13.7

Remarks:

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

CHANNEL	TX Channel 60	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5300.00	119.3 PK			2.63 H	292	80.4	38.9
2	*5300.00	108.4 AV			2.63 H	292	69.5	38.9
3	10600.00	60.2 PK	74.0	-13.8	2.00 H	151	46.4	13.8
4	10600.00	47.1 AV	54.0	-6.9	2.00 H	151	33.3	13.8
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5300.00	114.9 PK			3.22 V	342	76.0	38.9
2	*5300.00	104.6 AV			3.22 V	342	65.7	38.9
3	10600.00	59.0 PK	74.0	-15.0	1.90 V	222	45.2	13.8
4	10600.00	45.6 AV	54.0	-8.4	1.90 V	222	31.8	13.8

Remarks:

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

CHANNEL	TX Channel 64	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5320.00	117.1 PK			2.63 H	286	78.1	39.0
2	*5320.00	106.2 AV			2.63 H	286	67.2	39.0
3	5350.00	60.8 PK	74.0	-13.2	2.53 H	288	59.7	1.1
4	5350.00	52.7 AV	54.0	-1.3	2.53 H	288	51.6	1.1
5	10640.00	58.3 PK	74.0	-15.7	1.97 H	133	44.4	13.9
6	10640.00	45.1 AV	54.0	-8.9	1.97 H	133	31.2	13.9
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5320.00	112.7 PK			3.13 V	332	73.7	39.0
2	*5320.00	102.2 AV			3.13 V	332	63.2	39.0
3	5350.00	60.2 PK	74.0	-13.8	2.98 V	321	59.1	1.1
4	5350.00	49.1 AV	54.0	-4.9	2.98 V	321	48.0	1.1
5	10640.00	57.9 PK	74.0	-16.1	1.90 V	211	44.0	13.9
6	10640.00	45.0 AV	54.0	-9.0	1.90 V	211	31.1	13.9

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5460.00	61.5 PK	74.0	-12.5	2.69 H	290	60.3	1.2
2	5460.00	47.5 AV	54.0	-6.5	2.69 H	290	46.3	1.2
3	#5470.00	65.4 PK	74.0	-8.6	2.48 H	294	64.2	1.2
4	#5470.00	52.3 AV	54.0	-1.7	2.48 H	294	51.1	1.2
5	*5500.00	115.6 PK			2.64 H	291	76.3	39.3
6	*5500.00	105.1 AV			2.64 H	291	65.8	39.3
7	11000.00	60.6 PK	74.0	-13.4	2.15 H	137	45.3	15.3
8	11000.00	48.1 AV	54.0	-5.9	2.15 H	137	32.8	15.3
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5460.00	60.9 PK	74.0	-13.1	3.10 V	330	59.7	1.2
2	5460.00	46.3 AV	54.0	-7.7	3.10 V	330	45.1	1.2
3	#5470.00	65.9 PK	74.0	-8.1	3.18 V	338	64.7	1.2
4	#5470.00	50.3 AV	54.0	-3.7	3.18 V	338	49.1	1.2
5	*5500.00	113.8 PK			3.15 V	338	74.5	39.3
6	*5500.00	103.4 AV			3.15 V	338	64.1	39.3
7	11000.00	60.1 PK	74.0	-13.9	2.00 V	190	44.8	15.3
8	11000.00	47.8 AV	54.0	-6.2	2.00 V	190	32.5	15.3

Remarks:

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

CHANNEL	TX Channel 116	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5580.00	116.6 PK			2.57 H	294	77.1	39.5
2	*5580.00	106.6 AV			2.57 H	294	67.1	39.5
3	11160.00	63.4 PK	74.0	-10.6	1.78 H	135	48.5	14.9
4	11160.00	49.0 AV	54.0	-5.0	1.78 H	135	34.1	14.9
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5580.00	114.8 PK			3.04 V	332	75.3	39.5
2	*5580.00	104.5 AV			3.04 V	332	65.0	39.5
3	11160.00	60.2 PK	74.0	-13.8	1.92 V	186	45.3	14.9
4	11160.00	48.2 AV	54.0	-5.8	1.92 V	186	33.3	14.9

Remarks:

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

CHANNEL	TX Channel 140	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5700.00	114.9 PK			2.62 H	306	75.1	39.8
2	*5700.00	104.7 AV			2.62 H	306	64.9	39.8
3	#5725.00	68.6 PK	74.0	-5.4	2.89 H	300	66.6	2.0
4	#5725.00	52.3 AV	54.0	-1.7	2.89 H	300	50.3	2.0
5	11400.00	59.1 PK	74.0	-14.9	1.90 H	156	44.6	14.5
6	11400.00	45.9 AV	54.0	-8.1	1.90 H	156	31.4	14.5
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5700.00	112.2 PK			2.95 V	348	72.4	39.8
2	*5700.00	102.2 AV			2.95 V	348	62.4	39.8
3	#5725.00	65.0 PK	74.0	-9.0	3.11 V	352	63.0	2.0
4	#5725.00	50.6 AV	54.0	-3.4	3.11 V	352	48.6	2.0
5	11400.00	59.0 PK	74.0	-15.0	1.95 V	148	44.5	14.5
6	11400.00	46.6 AV	54.0	-7.4	1.95 V	148	32.1	14.5

Remarks:

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

CHANNEL	TX Channel 144	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5470.00	56.7 PK	74.0	-17.3	2.50 H	300	55.5	1.2
2	#5470.00	44.3 AV	54.0	-9.7	2.50 H	300	43.1	1.2
3	*5720.00	118.3 PK			2.45 H	314	78.4	39.9
4	*5720.00	108.0 AV			2.45 H	314	68.1	39.9
5	#5825.00	57.9 PK	74.0	-16.1	2.40 H	333	55.7	2.2
6	#5825.00	47.0 AV	54.0	-7.0	2.40 H	333	44.8	2.2
7	11440.00	60.1 PK	74.0	-13.9	1.80 H	53	45.6	14.5
8	11440.00	47.3 AV	54.0	-6.7	1.80 H	53	32.8	14.5
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5470.00	56.2 PK	74.0	-17.8	2.96 V	111	55.0	1.2
2	#5470.00	45.5 AV	54.0	-8.5	2.96 V	111	44.3	1.2
3	*5720.00	114.3 PK			3.20 V	350	74.4	39.9
4	*5720.00	104.5 AV			3.20 V	350	64.6	39.9
5	#5825.00	57.7 PK	74.0	-16.3	3.21 V	309	55.5	2.2
6	#5825.00	47.3 AV	54.0	-6.7	3.21 V	309	45.1	2.2
7	11440.00	58.3 PK	74.0	-15.7	1.70 V	124	43.8	14.5
8	11440.00	46.2 AV	54.0	-7.8	1.70 V	124	31.7	14.5

Remarks:

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

802.11n (HT20)

CHANNEL	TX Channel 52	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5260.00	118.5 PK			2.64 H	289	79.7	38.8
2	*5260.00	107.3 AV			2.64 H	289	68.5	38.8
3	5370.00	57.9 PK	74.0	-16.1	2.00 H	14	56.7	1.2
4	5370.00	47.6 AV	54.0	-6.4	2.00 H	14	46.4	1.2
5	#10520.00	59.5 PK	74.0	-14.5	1.94 H	144	45.8	13.7
6	#10520.00	46.6 AV	54.0	-7.4	1.94 H	144	32.9	13.7
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	*5260.00	113.0 PK			3.07 V	340	74.2	38.8
2	*5260.00	102.6 AV			3.07 V	340	63.8	38.8
3	5370.00	56.9 PK	74.0	-17.1	2.64 V	23	55.7	1.2
4	5370.00	45.6 AV	54.0	-8.4	2.64 V	23	44.4	1.2
5	#10520.00	58.4 PK	74.0	-15.6	1.78 V	189	44.7	13.7
6	#10520.00	45.2 AV	54.0	-8.8	1.78 V	189	31.5	13.7

Remarks:

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

CHANNEL	TX Channel 60	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5300.00	119.1 PK			2.75 H	293	80.2	38.9
2	*5300.00	108.4 AV			2.75 H	293	69.5	38.9
3	10600.00	59.8 PK	74.0	-14.2	1.98 H	152	46.0	13.8
4	10600.00	46.6 AV	54.0	-7.4	1.98 H	152	32.8	13.8
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5300.00	113.3 PK			3.04 V	347	74.4	38.9
2	*5300.00	102.7 AV			3.04 V	347	63.8	38.9
3	10600.00	58.6 PK	74.0	-15.4	1.80 V	206	44.8	13.8
4	10600.00	45.3 AV	54.0	-8.7	1.80 V	206	31.5	13.8

Remarks:

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

CHANNEL	TX Channel 64	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5320.00	118.2 PK			2.77 H	288	79.2	39.0
2	*5320.00	107.4 AV			2.77 H	288	68.4	39.0
3	5350.00	67.9 PK	74.0	-6.1	2.53 H	277	66.8	1.1
4	5350.00	52.5 AV	54.0	-1.5	2.53 H	277	51.4	1.1
5	10640.00	57.5 PK	74.0	-16.5	1.94 H	104	43.6	13.9
6	10640.00	44.8 AV	54.0	-9.2	1.94 H	104	30.9	13.9
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5320.00	112.5 PK			3.08 V	333	73.5	39.0
2	*5320.00	101.3 AV			3.08 V	333	62.3	39.0
3	5350.00	60.4 PK	74.0	-13.6	3.00 V	319	59.3	1.1
4	5350.00	48.7 AV	54.0	-5.3	3.00 V	319	47.6	1.1
5	10640.00	58.1 PK	74.0	-15.9	1.76 V	211	44.2	13.9
6	10640.00	45.2 AV	54.0	-8.8	1.76 V	211	31.3	13.9

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5460.00	60.0 PK	74.0	-14.0	2.70 H	313	58.8	1.2
2	5460.00	48.8 AV	54.0	-5.2	2.70 H	313	47.6	1.2
3	#5470.00	68.3 PK	74.0	-5.7	2.77 H	314	67.1	1.2
4	#5470.00	52.3 AV	54.0	-1.7	2.77 H	314	51.1	1.2
5	*5500.00	117.1 PK			3.04 H	287	77.8	39.3
6	*5500.00	106.4 AV			3.04 H	287	67.1	39.3
7	11000.00	60.9 PK	74.0	-13.1	2.04 H	150	45.6	15.3
8	11000.00	47.7 AV	54.0	-6.3	2.04 H	150	32.4	15.3
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5460.00	60.4 PK	74.0	-13.6	2.90 V	344	59.2	1.2
2	5460.00	49.3 AV	54.0	-4.7	2.90 V	344	48.1	1.2
3	#5470.00	62.3 PK	74.0	-11.7	2.94 V	350	61.1	1.2
4	#5470.00	47.5 AV	54.0	-6.5	2.94 V	350	46.3	1.2
5	*5500.00	114.6 PK			3.14 V	335	75.3	39.3
6	*5500.00	103.4 AV			3.14 V	335	64.1	39.3
7	11000.00	60.8 PK	74.0	-13.2	1.80 V	145	45.5	15.3
8	11000.00	47.5 AV	54.0	-6.5	1.80 V	145	32.2	15.3

Remarks:

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

CHANNEL	TX Channel 116	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5580.00	118.4 PK			2.76 H	297	78.9	39.5
2	*5580.00	107.3 AV			2.76 H	297	67.8	39.5
3	11160.00	61.4 PK	74.0	-12.6	1.77 H	169	46.5	14.9
4	11160.00	48.8 AV	54.0	-5.2	1.77 H	169	33.9	14.9
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5580.00	115.7 PK			3.05 V	336	76.2	39.5
2	*5580.00	104.5 AV			3.05 V	336	65.0	39.5
3	11160.00	61.5 PK	74.0	-12.5	1.85 V	136	46.6	14.9
4	11160.00	48.7 AV	54.0	-5.3	1.85 V	136	33.8	14.9

Remarks:

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

CHANNEL	TX Channel 140	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5700.00	114.7 PK			2.82 H	303	74.9	39.8
2	*5700.00	104.1 AV			2.82 H	303	64.3	39.8
3	#5725.00	67.8 PK	74.0	-6.2	2.82 H	291	65.8	2.0
4	#5725.00	52.6 AV	54.0	-1.4	2.82 H	291	50.6	2.0
5	11400.00	59.3 PK	74.0	-14.7	2.02 H	173	44.8	14.5
6	11400.00	46.4 AV	54.0	-7.6	2.02 H	173	31.9	14.5
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5700.00	110.7 PK			3.16 V	342	70.9	39.8
2	*5700.00	100.5 AV			3.16 V	342	60.7	39.8
3	#5725.00	63.2 PK	74.0	-10.8	2.94 V	330	61.2	2.0
4	#5725.00	50.2 AV	54.0	-3.8	2.94 V	330	48.2	2.0
5	11400.00	58.6 PK	74.0	-15.4	1.94 V	130	44.1	14.5
6	11400.00	45.8 AV	54.0	-8.2	1.94 V	130	31.3	14.5

Remarks:

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

CHANNEL	TX Channel 144	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5470.00	58.4 PK	74.0	-15.6	2.50 H	310	57.2	1.2
2	#5470.00	47.4 AV	54.0	-6.6	2.50 H	310	46.2	1.2
3	*5720.00	117.5 PK			2.46 H	313	77.6	39.9
4	*5720.00	107.3 AV			2.46 H	313	67.4	39.9
5	#5825.00	58.2 PK	74.0	-15.8	2.33 H	321	56.0	2.2
6	#5825.00	46.6 AV	54.0	-7.4	2.33 H	321	44.4	2.2
7	11440.00	60.7 PK	74.0	-13.3	1.75 H	31	46.2	14.5
8	11440.00	47.5 AV	54.0	-6.5	1.75 H	31	33.0	14.5
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5470.00	56.3 PK	74.0	-17.7	3.11 V	322	55.1	1.2
2	#5470.00	46.0 AV	54.0	-8.0	3.11 V	322	44.8	1.2
3	*5720.00	115.1 PK			3.34 V	349	75.2	39.9
4	*5720.00	104.7 AV			3.34 V	349	64.8	39.9
5	#5825.00	56.8 PK	74.0	-17.2	2.98 V	355	54.6	2.2
6	#5825.00	46.1 AV	54.0	-7.9	2.98 V	355	43.9	2.2
7	11440.00	59.7 PK	74.0	-14.3	1.94 V	149	45.2	14.5
8	11440.00	46.3 AV	54.0	-7.7	1.94 V	149	31.8	14.5

Remarks:

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

802.11n (HT40)

CHANNEL	TX Channel 54	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5270.00	115.4 PK			2.68 H	285	76.5	38.9
2	*5270.00	106.0 AV			2.68 H	285	67.1	38.9
3	5350.00	62.6 PK	74.0	-11.4	2.68 H	291	61.5	1.1
4	5350.00	49.7 AV	54.0	-4.3	2.68 H	291	48.6	1.1
5	#10540.00	58.3 PK	74.0	-15.7	1.89 H	172	44.6	13.7
6	#10540.00	45.3 AV	54.0	-8.7	1.89 H	172	31.6	13.7
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	*5270.00	109.6 PK			3.23 V	348	70.7	38.9
2	*5270.00	100.1 AV			3.23 V	348	61.2	38.9
3	5350.00	58.4 PK	74.0	-15.6	2.89 V	337	57.3	1.1
4	5350.00	45.7 AV	54.0	-8.3	2.89 V	337	44.6	1.1
5	#10580.00	59.5 PK	74.0	-14.5	2.04 V	210	45.7	13.8
6	#10580.00	46.4 AV	54.0	-7.6	2.04 V	210	32.6	13.8

Remarks:

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

CHANNEL	TX Channel 62	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5310.00	111.4 PK			2.55 H	304	72.5	38.9
2	*5310.00	101.5 AV			2.55 H	304	62.6	38.9
3	5350.00	65.2 PK	74.0	-8.8	2.72 H	290	64.1	1.1
4	5350.00	52.4 AV	54.0	-1.6	2.72 H	290	51.3	1.1
5	10620.00	57.8 PK	74.0	-16.2	1.85 H	201	44.0	13.8
6	10620.00	44.5 AV	54.0	-9.5	1.85 H	201	30.7	13.8
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5310.00	106.7 PK			3.35 V	328	67.8	38.9
2	*5310.00	97.3 AV			3.35 V	328	58.4	38.9
3	5350.00	61.2 PK	74.0	-12.8	3.01 V	337	60.1	1.1
4	5350.00	49.4 AV	54.0	-4.6	3.01 V	337	48.3	1.1
5	10620.00	57.7 PK	74.0	-16.3	2.12 V	201	43.9	13.8
6	10620.00	44.9 AV	54.0	-9.1	2.12 V	201	31.1	13.8

Remarks:

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

CHANNEL	TX Channel 102	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5460.00	60.1 PK	74.0	-13.9	2.65 H	287	58.9	1.2
2	5460.00	48.7 AV	54.0	-5.3	2.65 H	287	47.5	1.2
3	#5470.00	64.5 PK	74.0	-9.5	2.49 H	306	63.3	1.2
4	#5470.00	52.5 AV	54.0	-1.5	2.49 H	306	51.3	1.2
5	*5510.00	111.2 PK			2.85 H	290	71.9	39.3
6	*5510.00	101.5 AV			2.85 H	290	62.2	39.3
7	11020.00	59.7 PK	74.0	-14.3	1.99 H	245	44.5	15.2
8	11020.00	47.1 AV	54.0	-6.9	1.99 H	245	31.9	15.2
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5460.00	59.1 PK	74.0	-14.9	3.66 V	24	57.9	1.2
2	5460.00	47.6 AV	54.0	-6.4	3.66 V	24	46.4	1.2
3	#5470.00	61.5 PK	74.0	-12.5	3.75 V	19	60.3	1.2
4	#5470.00	49.1 AV	54.0	-4.9	3.75 V	19	47.9	1.2
5	*5510.00	107.1 PK			2.55 V	20	67.8	39.3
6	*5510.00	97.9 AV			2.55 V	20	58.6	39.3
7	11020.00	60.2 PK	74.0	-13.8	1.55 V	179	45.0	15.2
8	11020.00	47.5 AV	54.0	-6.5	1.55 V	179	32.3	15.2

Remarks:

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

CHANNEL	TX Channel 110	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5460.00	55.8 PK	74.0	-18.2	2.70 H	300	54.6	1.2
2	5460.00	44.7 AV	54.0	-9.3	2.70 H	300	43.5	1.2
3	#5470.00	61.8 PK	74.0	-12.2	2.93 H	303	60.6	1.2
4	#5470.00	49.1 AV	54.0	-4.9	2.93 H	303	47.9	1.2
5	*5550.00	112.5 PK			2.68 H	303	73.2	39.3
6	*5550.00	103.3 AV			2.68 H	303	64.0	39.3
7	11100.00	60.9 PK	74.0	-13.1	1.78 H	359	46.1	14.8
8	11100.00	48.1 AV	54.0	-5.9	1.78 H	359	33.3	14.8
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5460.00	55.3 PK	74.0	-18.7	2.90 V	336	54.1	1.2
2	5460.00	43.7 AV	54.0	-10.3	2.90 V	336	42.5	1.2
3	#5470.00	58.7 PK	74.0	-15.3	2.81 V	336	57.5	1.2
4	#5470.00	45.1 AV	54.0	-8.9	2.81 V	336	43.9	1.2
5	*5550.00	110.6 PK			3.62 V	0	71.3	39.3
6	*5550.00	101.6 AV			3.62 V	0	62.3	39.3
7	11020.00	62.5 PK	74.0	-11.5	1.90 V	150	47.3	15.2
8	11020.00	49.3 AV	54.0	-4.7	1.90 V	150	34.1	15.2

Remarks:

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

CHANNEL	TX Channel 134	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5670.00	111.7 PK			2.66 H	301	72.0	39.7
2	*5670.00	103.2 AV			2.66 H	301	63.5	39.7
3	#5725.00	69.5 PK	74.0	-4.5	2.76 H	311	67.5	2.0
4	#5725.00	52.2 AV	54.0	-1.8	2.76 H	311	50.2	2.0
5	11340.00	60.6 PK	74.0	-13.4	1.69 H	19	45.9	14.7
6	11340.00	47.7 AV	54.0	-6.3	1.69 H	19	33.0	14.7
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	*5670.00	109.8 PK			3.73 V	329	70.1	39.7
2	*5670.00	100.6 AV			3.73 V	329	60.9	39.7
3	#5725.00	65.3 PK	74.0	-8.7	3.10 V	358	63.3	2.0
4	#5725.00	49.7 AV	54.0	-4.3	3.10 V	358	47.7	2.0
5	11340.00	61.0 PK	74.0	-13.0	2.10 V	134	46.3	14.7
6	11340.00	48.3 AV	54.0	-5.7	2.10 V	134	33.6	14.7

Remarks:

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

CHANNEL	TX Channel 142	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5470.00	57.3 PK	74.0	-16.7	2.44 H	322	56.1	1.2
2	#5470.00	46.3 AV	54.0	-7.7	2.44 H	322	45.1	1.2
3	*5710.00	114.1 PK			2.51 H	316	74.2	39.9
4	*5710.00	104.2 AV			2.51 H	316	64.3	39.9
5	#5825.00	58.6 PK	74.0	-15.4	2.60 H	359	56.4	2.2
6	#5825.00	47.7 AV	54.0	-6.3	2.60 H	359	45.5	2.2
7	11420.00	58.4 PK	74.0	-15.6	1.68 H	61	44.0	14.4
8	11420.00	45.7 AV	54.0	-8.3	1.68 H	61	31.3	14.4
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5470.00	56.3 PK	74.0	-17.7	3.10 V	322	55.1	1.2
2	#5470.00	45.1 AV	54.0	-8.9	3.10 V	322	43.9	1.2
3	*5710.00	111.2 PK			3.35 V	354	71.3	39.9
4	*5710.00	101.5 AV			3.35 V	354	61.6	39.9
5	#5825.00	57.7 PK	74.0	-16.3	2.98 V	333	55.5	2.2
6	#5825.00	46.3 AV	54.0	-7.7	2.98 V	333	44.1	2.2
7	11420.00	58.9 PK	74.0	-15.1	1.78 V	54	44.5	14.4
8	11420.00	45.4 AV	54.0	-8.6	1.78 V	54	31.0	14.4

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 (VHT80)

CHANNEL	TX Channel 58	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5120.00	57.2 PK	74.0	-16.8	2.45 H	285	56.5	0.7
2	5120.00	46.5 AV	54.0	-7.5	2.45 H	285	45.8	0.7
3	*5290.00	107.0 PK			2.51 H	285	68.1	38.9
4	*5290.00	97.3 AV			2.51 H	285	58.4	38.9
5	5350.00	65.1 PK	74.0	-8.9	2.89 H	289	64.0	1.1
6	5350.00	52.3 AV	54.0	-1.7	2.89 H	289	51.2	1.1
7	#10580.00	57.4 PK	74.0	-16.6	1.92 H	158	43.6	13.8
8	#10580.00	45.1 AV	54.0	-8.9	1.92 H	158	31.3	13.8
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	54.3 PK	74.0	-19.7	3.05 V	230	53.5	0.8
2	5150.00	42.9 AV	54.0	-11.1	3.05 V	230	42.1	0.8
3	*5290.00	103.0 PK			3.24 V	346	64.1	38.9
4	*5290.00	93.9 AV			3.24 V	346	55.0	38.9
5	5350.00	60.2 PK	74.0	-13.8	3.16 V	339	59.1	1.1
6	5350.00	48.1 AV	54.0	-5.9	3.16 V	339	47.0	1.1
7	#10580.00	58.1 PK	74.0	-15.9	2.17 V	180	44.3	13.8
8	#10580.00	45.4 AV	54.0	-8.6	2.17 V	180	31.6	13.8

Remarks:

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

CHANNEL	TX Channel 106	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5460.00	61.5 PK	74.0	-12.5	3.35 H	291	60.3	1.2
2	5460.00	48.9 AV	54.0	-5.1	3.35 H	291	47.7	1.2
3	#5470.00	64.0 PK	74.0	-10.0	2.80 H	301	62.8	1.2
4	#5470.00	52.3 AV	54.0	-1.7	2.80 H	301	51.1	1.2
5	*5530.00	107.2 PK			2.50 H	296	67.9	39.3
6	*5530.00	97.2 AV			2.50 H	296	57.9	39.3
7	#5725.00	57.5 PK	74.0	-16.5	2.62 H	294	55.5	2.0
8	#5725.00	44.5 AV	54.0	-9.5	2.62 H	294	42.5	2.0
9	10600.00	57.7 PK	74.0	-16.3	1.80 H	212	43.9	13.8
10	10600.00	44.9 AV	54.0	-9.1	1.80 H	212	31.1	13.8
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5460.00	57.5 PK	74.0	-16.5	3.01 V	20	56.3	1.2
2	5460.00	46.4 AV	54.0	-7.6	3.01 V	20	45.2	1.2
3	#5470.00	59.3 PK	74.0	-14.7	3.05 V	18	58.1	1.2
4	#5470.00	48.3 AV	54.0	-5.7	3.05 V	18	47.1	1.2
5	*5530.00	104.0 PK			2.53 V	22	64.7	39.3
6	*5530.00	94.0 AV			2.53 V	22	54.7	39.3
7	#5725.00	56.6 PK	74.0	-17.4	2.78 V	138	54.6	2.0
8	#5725.00	45.3 AV	54.0	-8.7	2.78 V	138	43.3	2.0
9	10600.00	58.6 PK	74.0	-15.4	1.79 V	233	44.8	13.8
10	10600.00	45.9 AV	54.0	-8.1	1.79 V	233	32.1	13.8

Remarks:

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

CHANNEL	TX Channel 122	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5470.00	62.9 PK	74.0	-11.1	3.47 H	302	61.7	1.2
2	#5470.00	49.4 AV	54.0	-4.6	3.47 H	302	48.2	1.2
3	*5610.00	111.1 PK			3.25 H	303	71.5	39.6
4	*5610.00	101.0 AV			3.25 H	303	61.4	39.6
5	#5725.00	68.3 PK	74.0	-5.7	3.84 H	44	66.3	2.0
6	#5725.00	52.9 AV	54.0	-1.1	3.84 H	44	50.9	2.0
7	11220.00	60.8 PK	74.0	-13.2	2.36 H	209	45.7	15.1
8	11220.00	47.1 AV	54.0	-6.9	2.36 H	209	32.0	15.1
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5470.00	61.2 PK	74.0	-12.8	3.87 V	348	60.0	1.2
2	#5470.00	47.8 AV	54.0	-6.2	3.87 V	348	46.6	1.2
3	*5610.00	109.8 PK			3.83 V	341	70.2	39.6
4	*5610.00	99.7 AV			3.83 V	341	60.1	39.6
5	#5725.00	65.2 PK	74.0	-8.8	3.68 V	1	63.2	2.0
6	#5725.00	51.8 AV	54.0	-2.2	3.68 V	1	49.8	2.0
7	11220.00	59.6 PK	74.0	-14.4	2.91 V	231	44.5	15.1
8	11220.00	46.4 AV	54.0	-7.6	2.91 V	231	31.3	15.1

Remarks:

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

CHANNEL	TX Channel 138	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5470.00	48.5 PK	74.0	-25.5	2.50 H	311	47.3	1.2
2	#5470.00	47.5 AV	54.0	-6.5	2.50 H	311	46.3	1.2
3	*5690.00	109.8 PK			2.74 H	306	70.0	39.8
4	*5690.00	100.4 AV			2.74 H	306	60.6	39.8
5	#5825.00	64.8 PK	74.0	-9.2	2.45 H	307	62.6	2.2
6	#5825.00	50.7 AV	54.0	-3.3	2.45 H	307	48.5	2.2
7	11380.00	58.4 PK	74.0	-15.6	1.96 H	107	43.9	14.5
8	11380.00	45.8 AV	54.0	-8.2	1.96 H	107	31.3	14.5
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5470.00	56.1 PK	74.0	-17.9	3.13 V	340	54.9	1.2
2	#5470.00	44.7 AV	54.0	-9.3	3.13 V	340	43.5	1.2
3	*5690.00	107.5 PK			3.26 V	348	67.7	39.8
4	*5690.00	98.1 AV			3.26 V	348	58.3	39.8
5	#5825.00	64.5 PK	74.0	-9.5	3.26 V	348	62.3	2.2
6	#5825.00	50.0 AV	54.0	-4.0	3.26 V	348	47.8	2.2
7	11380.00	58.3 PK	74.0	-15.7	1.56 V	135	43.8	14.5
8	11380.00	45.3 AV	54.0	-8.7	1.56 V	135	30.8	14.5

Remarks:

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

Below 1GHz Worst-Case Data: 802.11a

CHANNEL	TX Channel 52	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz		
TEST MODE	A		

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	57.12	30.4 QP	40.0	-9.6	1.00 H	355	45.0	-14.6
2	115.45	35.9 QP	43.5	-7.6	1.49 H	95	52.6	-16.7
3	166.00	33.9 QP	43.5	-9.6	1.49 H	101	47.8	-13.9
4	280.71	34.9 QP	46.0	-11.1	1.49 H	358	47.3	-12.4
5	379.87	34.1 QP	46.0	-11.9	1.49 H	358	44.5	-10.4
6	554.86	33.8 QP	46.0	-12.2	2.00 H	111	40.7	-6.9
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	45.45	37.6 QP	40.0	-2.4	1.00 V	14	52.3	-14.7
2	115.45	35.3 QP	43.5	-8.2	1.00 V	14	52.0	-16.7
3	154.33	34.7 QP	43.5	-8.8	1.00 V	86	48.4	-13.7
4	282.66	32.2 QP	46.0	-13.8	1.49 V	127	44.6	-12.4
5	391.54	36.1 QP	46.0	-9.9	1.00 V	154	46.3	-10.2
6	556.80	34.1 QP	46.0	-11.9	1.00 V	234	40.9	-6.8

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

CHANNEL	TX Channel 52	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz		
TEST MODE	B		

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	37.68	29.5 QP	40.0	-10.5	1.49 H	88	44.9	-15.4
2	84.34	30.2 QP	40.0	-9.8	1.49 H	238	49.6	-19.4
3	125.17	30.7 QP	43.5	-12.8	1.49 H	226	46.5	-15.8
4	327.38	31.6 QP	46.0	-14.4	1.01 H	37	42.9	-11.3
5	665.68	31.9 QP	46.0	-14.1	1.01 H	211	36.3	-4.4
6	731.79	37.0 QP	46.0	-9.0	1.49 H	195	39.7	-2.7
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	**37.89**	**39.0 QP**	**40.0**	**-1.0**	**1.49 V**	**345**	**54.3**	**-15.3**
2	47.40	37.9 QP	40.0	-2.1	1.00 V	190	52.4	-14.5
3	64.90	37.4 QP	40.0	-2.6	1.00 V	318	52.9	-15.5
4	164.06	25.9 QP	43.5	-17.6	1.00 V	307	39.6	-13.7
5	729.84	33.0 QP	46.0	-13.0	1.00 V	22	35.8	-2.8
6	902.89	35.4 QP	46.0	-10.6	1.49 V	16	35.2	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.	Cal. Date	Cal. Due
Test Receiver ROHDE & SCHWARZ	ESCI	100613	Nov. 21, 2016	Nov. 20, 2017
RF signal cable (with 10dB PAD) Woken	5D-FB	Cable-cond1-01	Dec. 22, 2016	Dec. 21, 2017
LISN ROHDE & SCHWARZ (EUT)	ESH3-Z5	835239/001	Mar. 10, 2017	Mar. 09, 2018
LISN ROHDE & SCHWARZ (Peripheral)	ESH3-Z5	100311	Jul. 28, 2016	Jul. 27, 2017
Software ADT	BV ADT_Cond_ V7.3.7.3	NA	NA	NA

Note: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in HwaYa Shielded Room 1.
3. The VCCI Site Registration No. is C-2040.

4.2.3 Test Procedures

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.

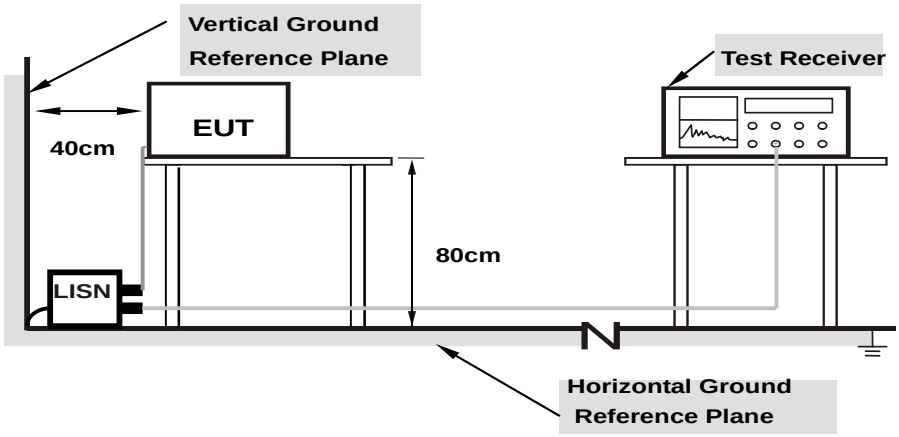
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

NOTE: The resolution bandwidth and video bandwidth of test receiver is 9kHz for quasi-peak detection (QP) and average detection (AV) at frequency 0.15MHz-30MHz.

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 Conditions

Same as 4.1.6.

4.2.7 Test Results

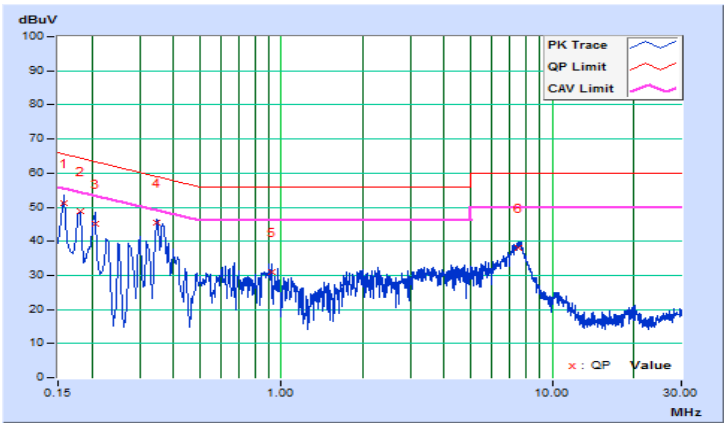
Worst-case data: 802.11a

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

No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15800	10.41	40.72	27.79	51.13	38.20	65.57	55.57	-14.44	-17.37
2	0.18037	10.42	38.39	26.39	48.81	36.81	64.47	54.47	-15.66	-17.66
3	0.20577	10.43	34.78	21.92	45.21	32.35	63.37	53.37	-18.16	-21.02
4	0.34668	10.49	34.90	31.27	45.39	41.76	59.04	49.04	-13.65	-7.28
5	0.91800	10.47	20.65	16.02	31.12	26.49	56.00	46.00	-24.88	-19.51
6	7.50200	10.80	27.36	21.09	38.16	31.89	60.00	50.00	-21.84	-18.11

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.

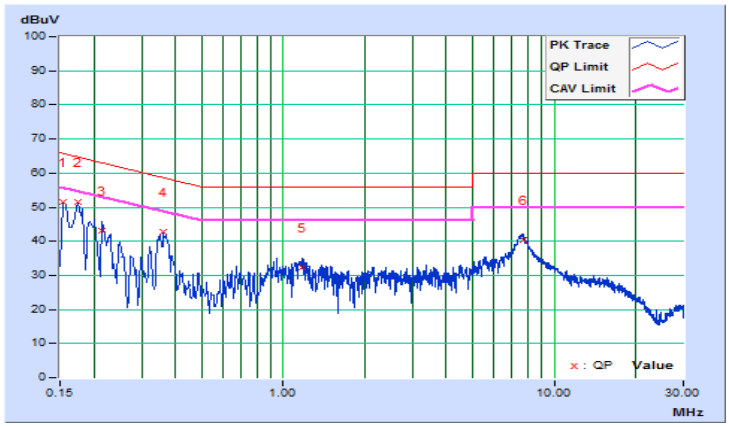


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	A		

No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15400	10.16	41.37	26.39	51.53	36.55	65.78	55.78	-14.25	-19.23
2	0.17400	10.18	41.26	25.67	51.44	35.85	64.77	54.77	-13.33	-18.92
3	0.21406	10.20	33.03	16.62	43.23	26.82	63.05	53.05	-19.82	-26.23
4	0.36200	10.22	32.63	24.68	42.85	34.90	58.68	48.68	-15.83	-13.78
5	1.17800	10.25	22.18	15.06	32.43	25.31	56.00	46.00	-23.57	-20.69
6	7.67400	10.55	29.81	22.90	40.36	33.45	60.00	50.00	-19.64	-16.55

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.

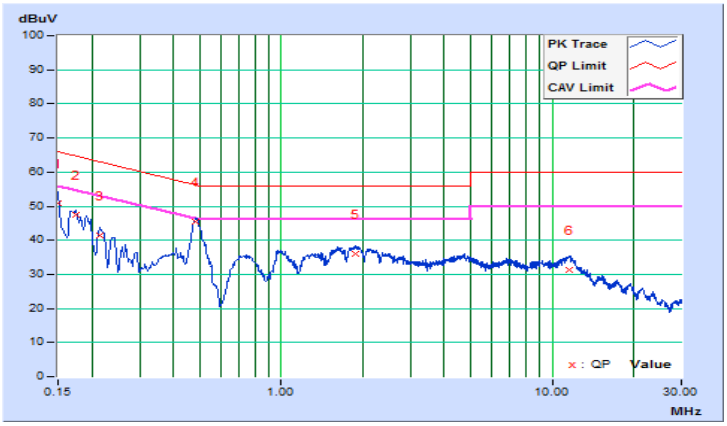


Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	B		

No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	10.40	40.47	24.84	50.87	35.24	66.00	56.00	-15.13	-20.76
2	0.17384	10.42	36.89	23.23	47.31	33.65	64.77	54.77	-17.46	-21.12
3	0.21406	10.44	31.00	18.14	41.44	28.58	63.05	53.05	-21.61	-24.47
4	**0.48317**	**10.50**	**34.86**	**29.30**	**45.36**	**39.80**	**56.28**	**46.28**	**-10.92**	**-6.48**
5	1.88146	10.51	25.50	21.59	36.01	32.10	56.00	46.00	-19.99	-13.90
6	11.56200	10.98	20.38	15.13	31.36	26.11	60.00	50.00	-28.64	-23.89

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.

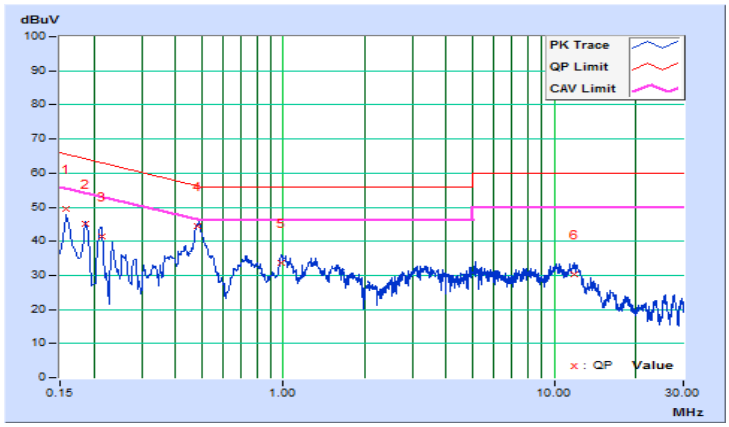


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	B		

No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15811	10.16	39.38	26.02	49.54	36.18	65.56	55.56	-16.02	-19.38
2	0.18617	10.19	34.83	21.61	45.02	31.80	64.21	54.21	-19.19	-22.41
3	0.21294	10.20	31.09	18.41	41.29	28.61	63.09	53.09	-21.80	-24.48
4	0.48190	10.23	34.14	28.64	44.37	38.87	56.31	46.31	-11.94	-7.44
5	0.98667	10.24	23.32	20.31	33.56	30.55	56.00	46.00	-22.44	-15.45
6	11.86537	10.71	19.51	14.20	30.22	24.91	60.00	50.00	-29.78	-25.09

Remarks:

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



4.3 Transmit Power Measurement

4.3.1 Limits of Transmit Power Measurement

Operation Band	EUT Category		Limit
U-NII-1		Outdoor Access Point	1 Watt (30 dBm) (Max. e.i.r.p ≦ 125mW(21 dBm) at any elevation angle above 30 degrees as measured from the horizon)
		Fixed point-to-point Access Point	1 Watt (30 dBm)
		Indoor Access Point	1 Watt (30 dBm)
		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

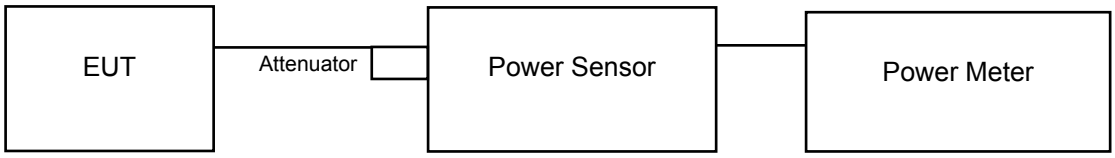
Per KDB 662911 Method of conducted output power measurement on IEEE 802.11 devices,

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 $N_{ANT} \geq 5$.

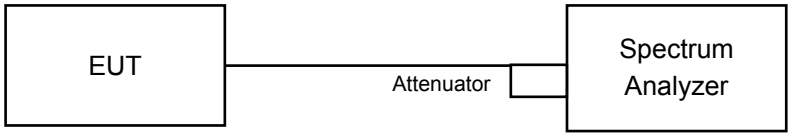
For power measurements on all other devices: Array Gain = 10 log(N_{ANT}/N_{SS}) dB.

4.3.2 Test Setup

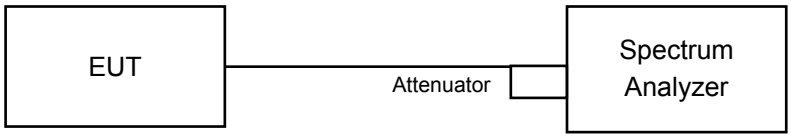
For Power Output
802.11a, 802.11n (HT20), 802.11n (HT40)



802.11ac (VHT80)



For 26dB Bandwidth



4.3.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.3.4 Test Procedure

For Average Power Measurement

For 802.11a, 802.11n (HT20), 802.11n (HT40)

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

For 802.11ac (VHT80)

a. Set span to encompass the entire 26 dB EBW (or, alternatively, the entire 99% occupied bandwidth) of the signal.

b. Set sweep trigger to “free run”.

c. Set RBW = 1 MHz.

d. Set VBW ≥ 3 MHz.

e. Number of points in sweep ≥ 2 Span / RBW.

f. Sweep time ≤ (number of points in sweep) * T

g. Using emission bandwidth to determine the frequency span for integration the channel bandwidth.

h. Detector = RMS.

i. Trace mode = max hold.

j. Allow max hold to run for at least 60 seconds, or longer as needed to allow the trace to stabilize.

k. Compute power by integrating the spectrum across the EBW (or, alternatively, the entire 99% occupied bandwidth) of the signal using the instrument’s band power measurement function with band limits set equal to the EBW (or occupied bandwidth) band edges. If the instrument does not have a band power function, sum the spectrum levels (in power units) at 1 MHz intervals extending across the EBW (or, alternatively, the entire 99% occupied bandwidth) of the spectrum.

For 26dB Bandwidth

a. Set RBW = approximately 1% of the emission bandwidth.

b. Set the VBW > RBW.

c. Detector = Peak.

d. Trace mode = max hold.

e. Measure the maximum width of the emission that is 26 dB down from the peak of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.

4.3.5 Deviation from Test Standard

No deviation.

4.3.6 EUT Operating Conditions

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:

CDD Mode

802.11a

Chan.	Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
52	5260	18.53	18.72	145.758	21.64	23.85	Pass
60	5300	18.57	18.68	145.735	21.64	23.85	Pass
64	5320	19.15	19.33	167.928	22.25	23.87	Pass
100	5500	19.11	19.23	165.223	22.18	23.83	Pass
116	5580	19.15	19.29	167.142	22.23	23.83	Pass
140	5700	18.83	19.72	170.140	22.31	23.83	Pass
144	5720 For U-NII-2C	17.69	18.01	127.338	21.05	22.67	Pass
144	5720 For U-NII-3	12.72	13.05	40.596	16.08	30.00	Pass

Note:

Chain 0

1. 11dBm + 10log (19.54) = 23.91 dBm < 24dBm
2. 11dBm + 10log (19.61) = 23.92 dBm < 24dBm
3. 11dBm + 10log (19.57) = 23.92 dBm < 24dBm
4. 11dBm + 10log (19.56) = 23.91 dBm < 24dBm
5. 11dBm + 10log (19.65) = 23.93 dBm < 24dBm
6. 11dBm + 10log (19.55) = 23.91 dBm < 24dBm
7. 11dBm + 10log (5725.00 - 5710.21) = 22.70 dBm < 24dBm

Chain 1

1. 11dBm + 10log (19.29) = 23.85 dBm < 24dBm
2. 11dBm + 10log (19.26) = 23.85 dBm < 24dBm
3. 11dBm + 10log (19.35) = 23.87 dBm < 24dBm
4. 11dBm + 10log (19.17) = 23.83 dBm < 24dBm
5. 11dBm + 10log (19.18) = 23.83 dBm < 24dBm
6. 11dBm + 10log (19.20) = 23.83 dBm < 24dBm
7. 11dBm + 10log (5725.00 - 5710.32) = 22.67 dBm < 24dBm

802.11n (HT20)

Chan.	Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
52	5260	19.22	19.42	171.058	22.33	24.00	Pass
60	5300	19.18	19.37	169.291	22.29	24.00	Pass
64	5320	19.35	19.53	175.842	22.45	24.00	Pass
100	5500	19.21	19.33	169.072	22.28	24.00	Pass
116	5580	19.24	19.43	171.646	22.35	24.00	Pass
140	5700	19.61	19.77	186.253	22.70	24.00	Pass
144	5720 For U-NII-2C	18.08	18.90	144.938	21.61	22.82	Pass
144	5720 For U-NII-3	13.35	14.18	48.835	16.89	30.00	Pass

Note:
Chain 0
1. 11dBm + 10log (20.50) = 24.12 dBm > 24dBm
2. 11dBm + 10log (20.43) = 24.10 dBm > 24dBm
3. 11dBm + 10log (20.53) = 24.12 dBm > 24dBm
4. 11dBm + 10log (20.54) = 24.13 dBm > 24dBm
5. 11dBm + 10log (20.45) = 24.11 dBm > 24dBm
6. 11dBm + 10log (20.54) = 24.13 dBm > 24dBm
7. 11dBm + 10log (5725.00 - 5709.61) = 22.87 dBm < 24dBm

Chain 1
1. 11dBm + 10log (20.51) = 24.12 dBm > 24dBm
2. 11dBm + 10log (20.39) = 24.09 dBm > 24dBm
3. 11dBm + 10log (20.25) = 24.06 dBm > 24dBm
4. 11dBm + 10log (20.34) = 24.08 dBm > 24dBm
5. 11dBm + 10log (20.49) = 24.12 dBm > 24dBm
6. 11dBm + 10log (20.27) = 24.07 dBm > 24dBm
7. 11dBm + 10log (5725.00 - 5709.80) = 22.82 dBm < 24dBm

802.11n (HT40)

Chan.	Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
54	5270	20.51	20.87	**234.640**	23.70	24.00	Pass
62	5310	17.68	17.87	119.849	20.79	24.00	Pass
102	5510	18.45	18.16	135.448	21.32	24.00	Pass
110	5550	20.89	20.91	**246.054**	23.91	24.00	Pass
134	5670	19.73	20.50	206.174	23.14	24.00	Pass
142	5710 For U-NII-2C	19.39	20.81	216.719	23.36	24.00	Pass
142	5710 For U-NII-3	11.25	12.46	32.346	15.10	30.00	Pass

Note:
Chain 0
1. 11dBm + 10log (41.01) = 27.13 dBm > 24dBm
2. 11dBm + 10log (40.71) = 27.10 dBm > 24dBm
3. 11dBm + 10log (40.87) = 27.11 dBm > 24dBm
4. 11dBm + 10log (40.91) = 27.12 dBm > 24dBm
5. 11dBm + 10log (40.75) = 27.10 dBm > 24dBm
6. 11dBm + 10log (5725.00 - 5689.79) = 26.47 dBm > 24dBm

Chain 1
1. 11dBm + 10log (40.47) = 27.07 dBm > 24dBm
2. 11dBm + 10log (40.46) = 27.07 dBm > 24dBm
3. 11dBm + 10log (40.34) = 27.06 dBm > 24dBm
4. 11dBm + 10log (40.37) = 27.06 dBm > 24dBm
5. 11dBm + 10log (40.49) = 27.07 dBm > 24dBm
6. 11dBm + 10log (5725.00 - 5689.75) = 26.47 dBm > 24dBm

802.11ac (VHT80)

Chan.	Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
58	5290	17.02	17.13	101.992	20.09	24.00	Pass
106	5530	17.78	17.67	118.458	20.74	24.00	Pass
122	5610	20.31	20.77	226.798	23.56	24.00	Pass
138	5690 For U-NII-2C	19.78	20.74	230.212	23.62	24.00	Pass
138	5690 For U-NII-3	9.49	10.31	21.155	13.25	30.00	Pass

Note:
Chain 0
1. 11dBm + 10log (84.05) = 30.25 dBm > 24dBm
2. 11dBm + 10log (83.90) = 30.24 dBm > 24dBm
3. 11dBm + 10log (83.90) = 30.24 dBm > 24dBm
4. 11dBm + 10log (5725.00 - 5648.36) = 29.84 dBm > 24dBm

Chain 1
1. 11dBm + 10log (83.59) = 30.22 dBm > 24dBm
2. 11dBm + 10log (84.35) = 30.26 dBm > 24dBm
3. 11dBm + 10log (83.90) = 30.24 dBm > 24dBm
4. 11dBm + 10log (5725.00 - 5648.29) = 29.85 dBm > 24dBm

Beamforming Mode

802.11n (HT20)

Chan.	Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
52	5260	16.21	16.41	85.535	19.32	21.69	Pass
60	5300	16.17	16.36	84.651	19.28	21.69	Pass
64	5320	16.34	16.52	87.928	19.44	21.69	Pass
100	5500	16.20	16.32	84.542	19.27	21.69	Pass
116	5580	16.23	16.42	85.829	19.34	21.69	Pass
140	5700	16.60	16.76	93.133	19.69	21.69	Pass
144	5720 For U-NII-2C	15.07	15.89	72.474	18.60	20.51	Pass
144	5720 For U-NII-3	10.34	11.17	24.419	13.88	27.69	Pass

Note:

1. 5260~5320MHz directional gain = 5.3dBi + 10log(2) = 8.31dBi > 6dBi, so the power limit shall be reduced to 24-(8.31-6) = 21.69dBm.
2. 5500~5700MHz directional gain = 5.3dBi + 10log(2) = 8.31dBi > 6dBi, so the power limit shall be reduced to 24-(8.31-6) = 21.69dBm.
3. 5720MHz directional gain = 5.3dBi + 10log(2) = 8.31dBi > 6dBi, so the power limit shall be reduced to 22.82-(8.31-6) = 20.51dBm.
4. 5745~5825MHz directional gain = 5.3dBi + 10log(2) = 8.31dBi > 6dBi, so the power limit shall be reduced to 30-(8.31-6) = 27.69dBm.

Chain 0

1. 11dBm + 10log (20.50) = 24.12 dBm > 24dBm
2. 11dBm + 10log (20.43) = 24.10 dBm > 24dBm
3. 11dBm + 10log (20.53) = 24.12 dBm > 24dBm
4. 11dBm + 10log (20.54) = 24.13 dBm > 24dBm
5. 11dBm + 10log (20.45) = 24.11 dBm > 24dBm
6. 11dBm + 10log (20.54) = 24.13 dBm > 24dBm
7. 11dBm + 10log (5725.00 - 5709.61) = 22.87 dBm < 24dBm

Chain 1

1. 11dBm + 10log (20.51) = 24.12 dBm > 24dBm
2. 11dBm + 10log (20.39) = 24.09 dBm > 24dBm
3. 11dBm + 10log (20.25) = 24.06 dBm > 24dBm
4. 11dBm + 10log (20.34) = 24.08 dBm > 24dBm
5. 11dBm + 10log (20.49) = 24.12 dBm > 24dBm
6. 11dBm + 10log (20.27) = 24.07 dBm > 24dBm
7. 11dBm + 10log (5725.00 - 5709.80) = 22.82 dBm < 24dBm

802.11n (HT40)

Chan.	Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
54	5270	17.50	17.86	**117.328**	20.69	21.69	Pass
62	5310	14.67	14.86	59.929	17.78	21.69	Pass
102	5510	15.44	15.15	67.729	18.31	21.69	Pass
110	5550	17.88	17.90	**123.036**	20.90	21.69	Pass
134	5670	16.72	17.49	103.094	20.13	21.69	Pass
142	5710 For U-NII-2C	16.38	17.80	108.367	20.35	21.69	Pass
142	5710 For U-NII-3	8.24	9.45	16.173	12.09	27.69	Pass

Note:
1. 5260~5320MHz directional gain = 5.3dBi + 10log(2) = 8.31dBi > 6dBi, so the power limit shall be reduced to 24-(8.31-6) = 21.69dBm.
2. 5500~5720MHz directional gain = 5.3dBi + 10log(2) = 8.31dBi > 6dBi, so the power limit shall be reduced to 24-(8.31-6) = 21.69dBm.
3. 5745~5825MHz directional gain = 5.3dBi + 10log(2) = 8.31dBi > 6dBi, so the power limit shall be reduced to 30-(8.31-6) = 27.69dBm.

Chain 0
1. 11dBm + 10log (41.01) = 27.13 dBm > 24dBm
2. 11dBm + 10log (40.71) = 27.10 dBm > 24dBm
3. 11dBm + 10log (40.87) = 27.11 dBm > 24dBm
4. 11dBm + 10log (40.91) = 27.12 dBm > 24dBm
5. 11dBm + 10log (40.75) = 27.10 dBm > 24dBm
6. 11dBm + 10log (5725.00 - 5689.79) = 26.47 dBm > 24dBm

Chain 1
1. 11dBm + 10log (40.47) = 27.07 dBm > 24dBm
2. 11dBm + 10log (40.46) = 27.07 dBm > 24dBm
3. 11dBm + 10log (40.34) = 27.06 dBm > 24dBm
4. 11dBm + 10log (40.37) = 27.06 dBm > 24dBm
5. 11dBm + 10log (40.49) = 27.07 dBm > 24dBm
6. 11dBm + 10log (5725.00 - 5689.75) = 26.47 dBm > 24dBm

802.11ac (VHT80)

Chan.	Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
58	5290	14.01	14.12	51.000	17.08	21.69	Pass
106	5530	14.77	14.66	59.234	17.73	21.69	Pass
122	5610	17.30	17.76	113.407	20.55	21.69	Pass
138	5690 For U-NII-2C	16.77	17.73	115.115	20.61	21.69	Pass
138	5690 For U-NII-3	6.48	7.30	10.578	10.24	27.69	Pass

Note:
1. 5260~5320MHz directional gain = 5.3dBi + 10log(2) = 8.31dBi > 6dBi, so the power limit shall be reduced to 24-(8.31-6) = 21.69dBm.
2. 5500~5720MHz directional gain = 5.3dBi + 10log(2) = 8.31dBi > 6dBi, so the power limit shall be reduced to 24-(8.31-6) = 21.69dBm.
3. 5745~5825MHz directional gain = 5.3dBi + 10log(2) = 8.31dBi > 6dBi, so the power limit shall be reduced to 30-(8.31-6) = 27.69dBm.

Chain 0
1. 11dBm + 10log (84.05) = 30.25 dBm > 24dBm
2. 11dBm + 10log (83.90) = 30.24 dBm > 24dBm
3. 11dBm + 10log (83.90) = 30.24 dBm > 24dBm
4. 11dBm + 10log (5725.00 - 5648.36) = 29.84 dBm > 24dBm

Chain 1
1. 11dBm + 10log (83.59) = 30.22 dBm > 24dBm
2. 11dBm + 10log (84.35) = 30.26 dBm > 24dBm
3. 11dBm + 10log (83.90) = 30.24 dBm > 24dBm
4. 11dBm + 10log (5725.00 - 5648.29) = 29.85 dBm > 24dBm

26dB Bandwidth:

802.11a

Chan.	Freq. (MHz)	26dBc Bandwidth (MHz)	
		Chain 0	Chain 1
52	5260	19.54	19.29
60	5300	19.61	19.26
64	5320	19.57	19.35
100	5500	19.56	19.17
116	5580	19.65	19.18
140	5700	19.55	19.20
144	5720 For U-NII-2C	14.79	14.68
144	5720 For U-NII-3	4.71	4.69

802.11n (HT20)

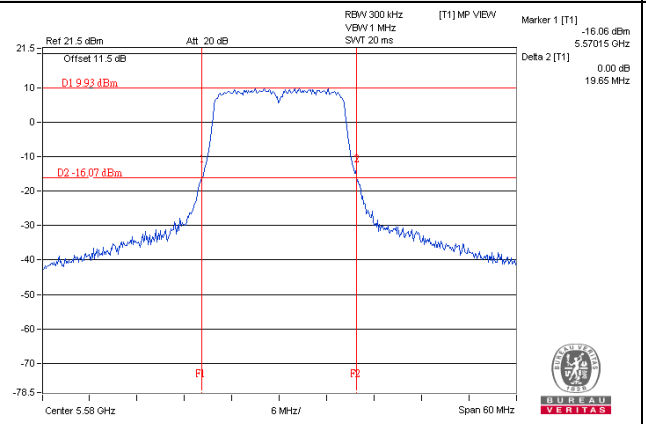
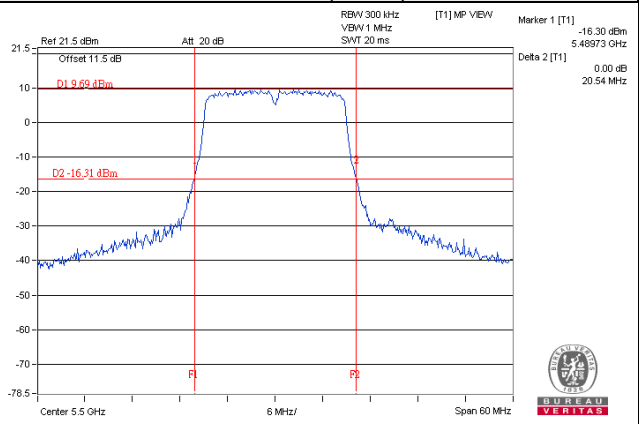
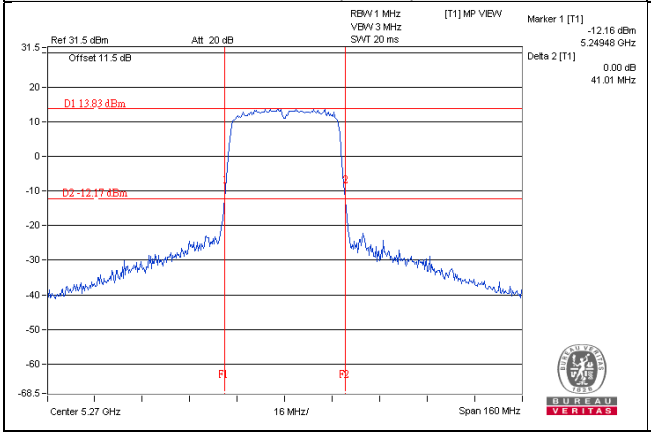
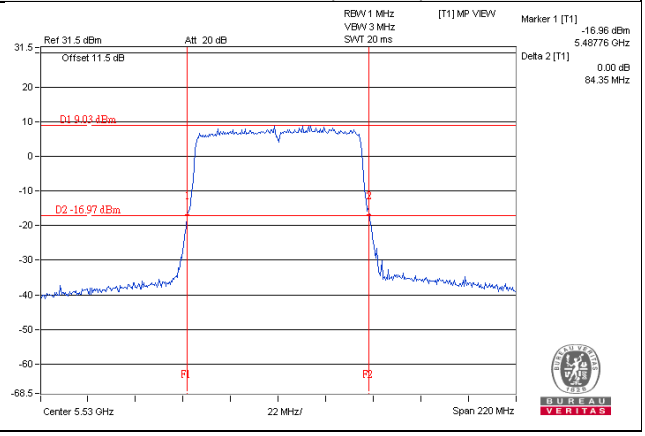
Chan.	Freq. (MHz)	26dBc Bandwidth (MHz)	
		Chain 0	Chain 1
52	5260	20.50	20.51
60	5300	20.43	20.39
64	5320	20.53	20.25
100	5500	20.54	20.34
116	5580	20.45	20.49
140	5700	20.54	20.27
144	5720 For U-NII-2C	15.39	15.20
144	5720 For U-NII-3	5.18	5.13

802.11n (HT40)

Chan.	Freq. (MHz)	26dBc Bandwidth (MHz)	
		Chain 0	Chain 1
54	5270	41.01	40.47
62	5310	40.71	40.46
102	5510	40.87	40.34
110	5550	40.91	40.37
134	5670	40.75	40.49
142	5710 For U-NII-2C	35.21	35.25
142	5710 For U-NII-3	5.40	5.16

802.11ac (VHT80)

Chan.	Freq. (MHz)	26dBc Bandwidth (MHz)	
		Chain 0	Chain 1
58	5290	84.05	83.59
106	5530	83.90	84.35
122	5610	83.90	83.90
138	5690 For U-NII-2C	76.64	76.71
138	5690 For U-NII-3	7.17	6.95

Spectrum Plot of Worst Value	
802.11a	802.11n (HT20)
	
802.11n (HT40)	802.11ac (VHT80)
	

EUT Maximum Conducted Power

CDD Mode

802.11a

Frequency Band (MHz)	Max. Power	
	Output Power (mW)	Output Power (dBm)
5250~5350	167.928	22.25
5470~5725	170.140	22.31

802.11n (HT20)

Frequency Band (MHz)	Max. Power	
	Output Power (mW)	Output Power (dBm)
5250~5350	175.842	22.45
5470~5725	186.253	22.70

802.11n (HT40)

Frequency Band (MHz)	Max. Power	
	Output Power (mW)	Output Power (dBm)
5250~5350	234.640	23.70
5470~5725	246.054	23.91

802.11ac (VHT80)

Frequency Band (MHz)	Max. Power	
	Output Power (mW)	Output Power (dBm)
5250~5350	101.992	20.09
5470~5725	230.212	23.62

Beamforming Mode

802.11n (HT20)

Frequency Band (MHz)	Max. Power	
	Output Power (mW)	Output Power (dBm)
5250~5350	87.928	19.44
5470~5725	93.133	19.69

802.11n (HT40)

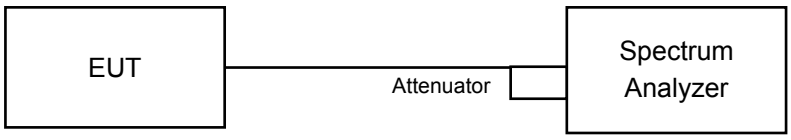
Frequency Band (MHz)	Max. Power	
	Output Power (mW)	Output Power (dBm)
5250~5350	117.328	20.69
5470~5725	123.036	20.90

802.11ac (VHT80)

Frequency Band (MHz)	Max. Power	
	Output Power (mW)	Output Power (dBm)
5250~5350	51.000	17.08
5470~5725	115.115	20.61

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 sampling. 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 Result

802.11a

Chan.	Freq. (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
52	5260	16.44	16.44
60	5300	16.44	16.44
64	5320	16.44	16.44
100	5500	16.44	16.44
116	5580	16.44	16.44
140	5700	16.44	16.44
144	5720 For U-NII-2C	13.28	13.28
144	5720 For U-NII-3	3.04	3.04

802.11n (HT20)

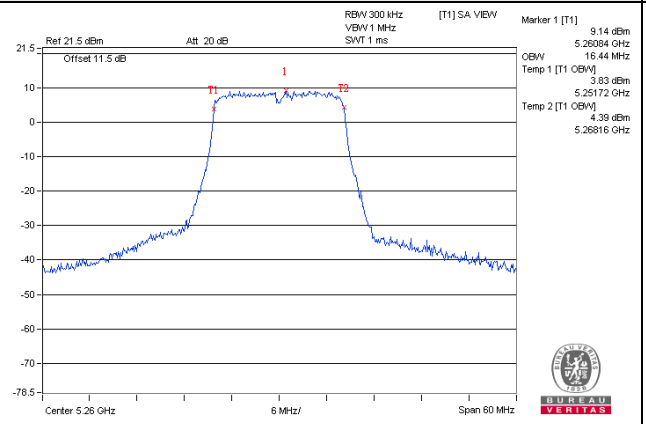
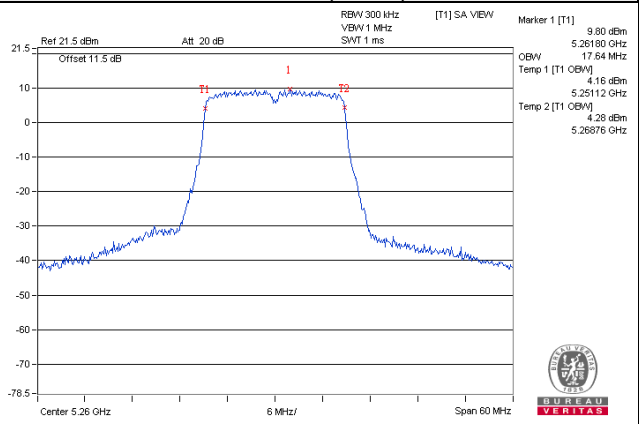
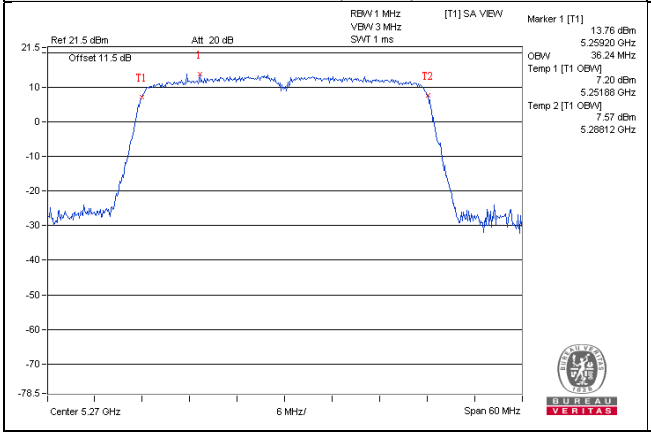
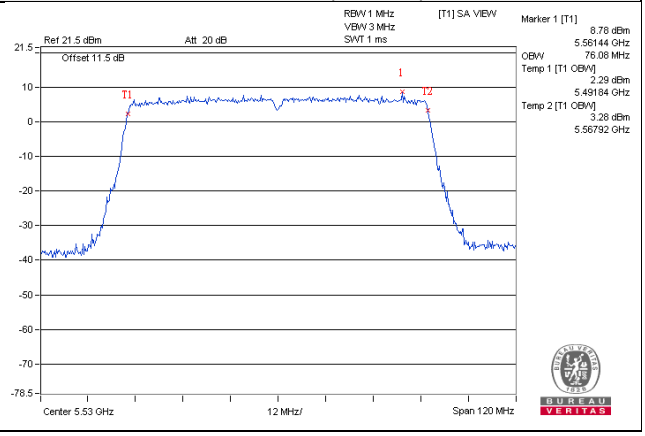
Chan.	Freq. (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
52	5260	17.64	17.64
60	5300	17.64	17.64
64	5320	17.64	17.64
100	5500	17.64	17.64
116	5580	17.64	17.64
140	5700	17.64	17.64
144	5720 For U-NII-2C	13.88	13.88
144	5720 For U-NII-3	3.64	3.64

802.11n (HT40)

Chan.	Freq. (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
54	5270	36.24	36.12
62	5310	36.12	36.12
102	5510	36.12	36.12
110	5550	36.12	36.12
134	5670	36.12	36.12
142	5710 For U-NII-2C	33.12	33.12
142	5710 For U-NII-3	3.00	3.00

802.11ac (VHT80)

Chan.	Freq. (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
58	5290	75.84	75.84
106	5530	75.84	76.08
122	5610	75.84	75.84
138	5690 For U-NII-2C	72.92	72.92
138	5690 For U-NII-3	3.16	2.92

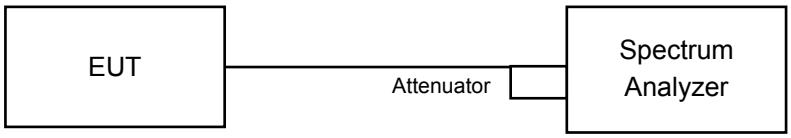
Spectrum Plot of Worst Value	
802.11a	802.11n (HT20)
	
802.11n (HT40)	802.11ac (VHT80)
	

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 Procedures

For U-NII-2A, U-NII-2C band:

Using method SA-2

a. Set span to encompass the entire emission bandwidth (EBW) of the signal.

b. Set RBW = 1MHz, Set VBW ≥ 3 MHz, Detector = RMS

c. Set Channel power measure = 1MHz

d. Sweep time = auto, trigger set to “free run”.

e. Trace average at least 100 traces in power averaging mode.

f. Record the max value and add 10 log (1/duty cycle)

For U-NII-3 band:

Duty cycle of test signal is < 98%

a. Set span to encompass the entire emission bandwidth (EBW) of the signal.

b. Set RBW = 300 kHz, Set VBW ≥ 1 MHz, Detector = RMS

c. Use the peak marker function to determine the maximum power level in any 300 kHz band segment within the fundamental EBW.

d. 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 / 300 kHz)

e. Sweep time = auto, trigger set to “free run”.

f. Trace average at least 100 traces in power averaging mode.

g. 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 Conditions

Same as 4.3.6.

4.5.7 Test Results

For U-NII-2A, U-NII-2C band:

802.11a

Chan.	Freq. (MHz)	PSD w/o Duty Factor (dBm/MHz)		Duty Factor (dB)	Total PSD with Duty Factor (dBm/MHz)	Max. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1				
52	5260	4.75	5.40	0.19	8.28	8.69	Pass
60	5300	4.88	5.04	0.19	8.16	8.69	Pass
64	5320	5.50	5.33	0.19	8.61	8.69	Pass
100	5500	5.17	5.32	0.19	8.44	8.69	Pass
116	5580	5.27	5.45	0.19	8.56	8.69	Pass
140	5700	5.12	5.75	0.19	8.64	8.69	Pass
144	5720 For U-NII-2C	4.97	5.28	0.19	8.32	8.69	Pass

Note:
1. Method 1 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 = 5.3dBi + 10log(2) = 8.31dBi > 6dBi, so the power density limit shall be reduced to 11-(8.31-6) = 8.69dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11n (HT20)

Chan.	Freq. (MHz)	PSD w/o Duty Factor (dBm/MHz)		Duty Factor (dB)	Total PSD with Duty Factor (dBm/MHz)	Max. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1				
52	5260	5.27	5.50	0.09	8.49	8.69	Pass
60	5300	5.34	5.45	0.09	8.50	8.69	Pass
64	5320	5.46	5.44	0.09	8.55	8.69	Pass
100	5500	4.93	5.17	0.09	8.15	8.69	Pass
116	5580	4.97	5.31	0.09	8.25	8.69	Pass
140	5700	4.36	5.40	0.09	8.01	8.69	Pass
144	5720 For U-NII-2C	5.30	5.78	0.09	8.65	8.69	Pass

Note:
1. Method 1 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 = 5.3dBi + 10log(2) = 8.31dBi > 6dBi, so the power density limit shall be reduced to 11-(8.31-6) = 8.69dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11n (HT40)

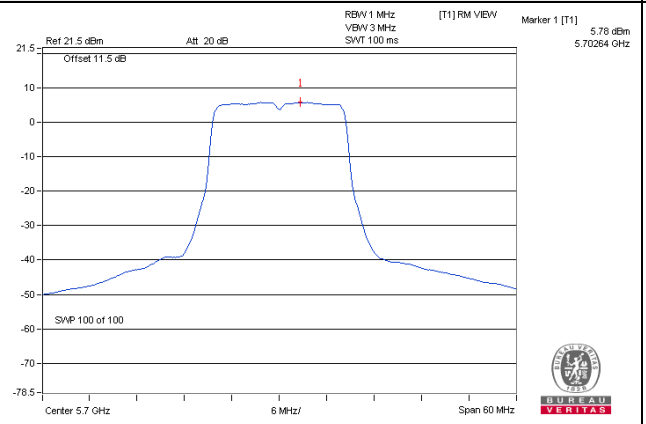
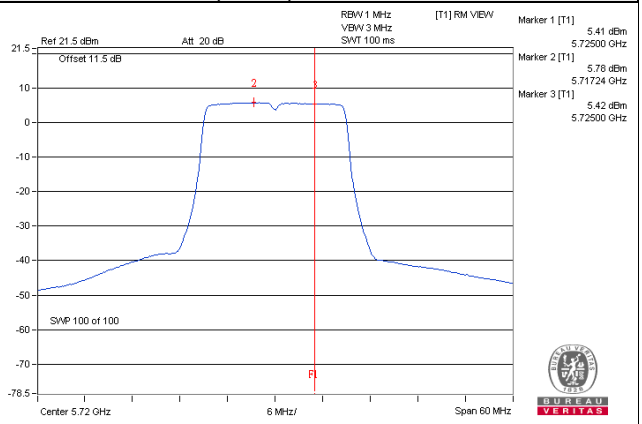
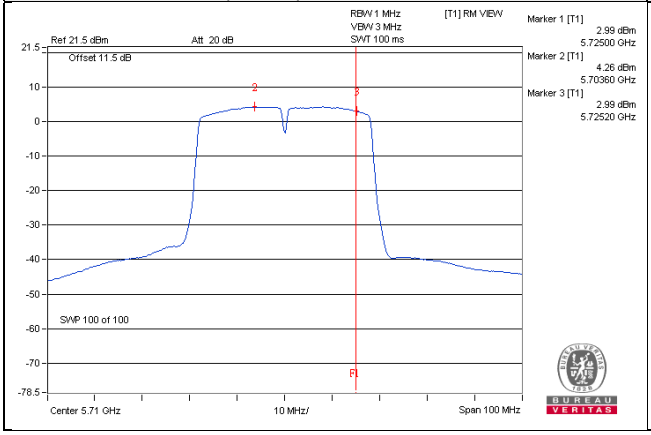
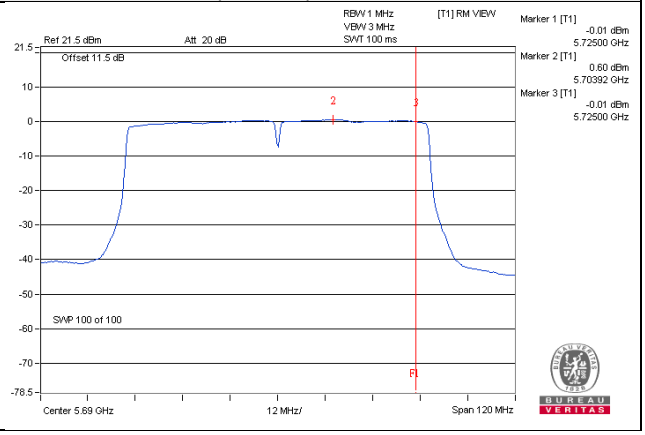
Chan.	Freq. (MHz)	PSD w/o Duty Factor (dBm/MHz)		Duty Factor (dB)	Total PSD with Duty Factor (dBm/MHz)	Max. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1				
54	5270	3.41	3.71	0.19	6.76	8.69	Pass
62	5310	0.49	0.52	0.19	3.71	8.69	Pass
102	5510	1.36	1.09	0.19	4.43	8.69	Pass
110	5550	3.61	3.96	0.19	6.99	8.69	Pass
134	5670	2.85	3.39	0.19	6.33	8.69	Pass
142	5710 For U-NII-2C	3.75	4.22	0.19	7.19	8.69	Pass

Note:
1. Method 1 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 = 5.3dBi + 10log(2) = 8.31dBi > 6dBi, so the power density limit shall be reduced to 11-(8.31-6) = 8.69dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ac (VHT80)

Chan.	Freq. (MHz)	PSD w/o Duty Factor (dBm/MHz)		Duty Factor (dB)	Total PSD with Duty Factor (dBm/MHz)	Max. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1				
58	5290	-3.95	-3.81	0.32	-0.54	8.69	Pass
106	5530	-2.99	-3.10	0.32	0.29	8.69	Pass
122	5610	-3.04	-3.04	0.32	0.30	8.69	Pass
138	5690 For U-NII-2C	0.46	0.58	0.32	3.86	8.69	Pass

Note:
1. Method 1 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 = 5.3dBi + 10log(2) = 8.31dBi > 6dBi, so the power density limit shall be reduced to 11-(8.31-6) = 8.69dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

Spectrum Plot of Worst Value	
802.11a / Chain 1 / CH 140	802.11n (HT20) / Chain 1 / CH 144
	
802.11n (HT40) / Chain 1 / CH 142	802.11ac (VHT80) / Chain 1 / CH 138
	

For U-NII-3 band:

802.11a

Ch.	Freq. (MHz)	PSD (dBm/300kHz)		PSD (dBm/500kHz)		Duty factor (dB)	Total PSD (dBm/500kHz)	Limit (dBm/500kHz)	Pass / Fail
		Chain 0	Chain 1	Chain 0	Chain 1				
144	5720 For U-NII-3	-3.91	-3.39	-1.69	-1.17	0.19	1.77	27.69	Pass

Note:
1. Method 1 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 = 5.3dBi + 10log(2) = 8.31dBi > 6dBi, so the power density limit shall be reduced to 30-(8.31-6) = 27.69dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11n (HT20)

Ch.	Freq. (MHz)	PSD (dBm/300kHz)		PSD (dBm/500kHz)		Duty factor (dB)	Total PSD (dBm/500kHz)	Limit (dBm/500kHz)	Pass / Fail
		Chain 0	Chain 1	Chain 0	Chain 1				
144	5720 For U-NII-3	-3.35	-3.03	-1.13	-0.81	0.09	2.13	27.69	Pass

Note:
1. Method 1 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 = 5.3dBi + 10log(2) = 8.31dBi > 6dBi, so the power density limit shall be reduced to 30-(8.31-6) = 27.69dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11n (HT40)

Ch.	Freq. (MHz)	PSD (dBm/300kHz)		PSD (dBm/500kHz)		Duty factor (dB)	Total PSD (dBm/500kHz)	Limit (dBm/500kHz)	Pass / Fail
		Chain 0	Chain 1	Chain 0	Chain 1				
142	5710 For U-NII-3	-6.05	-5.79	-3.83	-3.57	0.19	-0.50	27.69	Pass

Note:
1. Method 1 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 = 5.3dBi + 10log(2) = 8.31dBi > 6dBi, so the power density limit shall be reduced to 30-(8.31-6) = 27.69dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

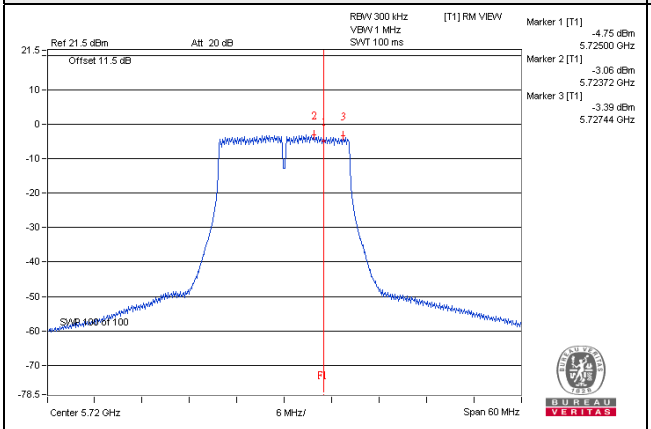
802.11ac (VHT80)

Ch.	Freq. (MHz)	PSD (dBm/300kHz)		PSD (dBm/500kHz)		Duty factor (dB)	Total PSD (dBm/500kHz)	Limit (dBm/500kHz)	Pass / Fail
		Chain 0	Chain 1	Chain 0	Chain 1				
138	5690 For U-NII-3	-8.71	-8.87	-6.49	-6.65	0.32	-3.24	27.69	Pass

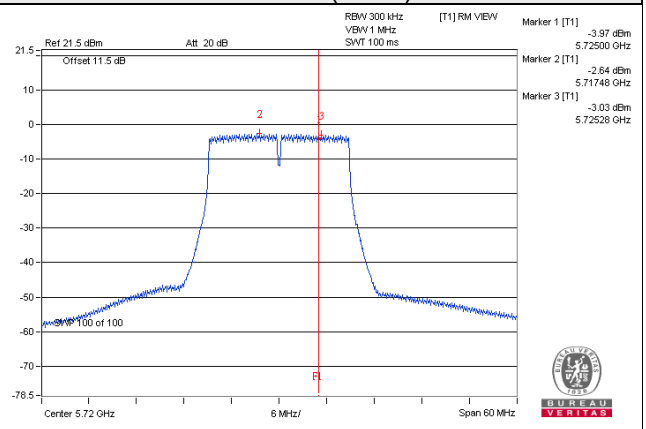
Note:
1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = 5.3dBi + 10log(2) = 8.31dBi > 6dBi, so the power density limit shall be reduced to 30-(8.31-6) = 27.69dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

Spectrum Plot of Worst Value

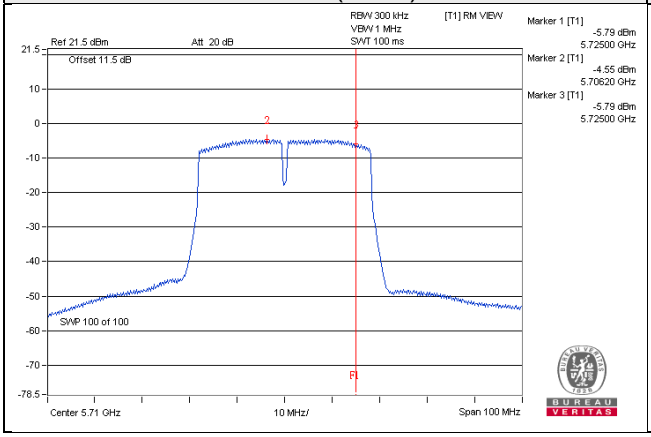
802.11a



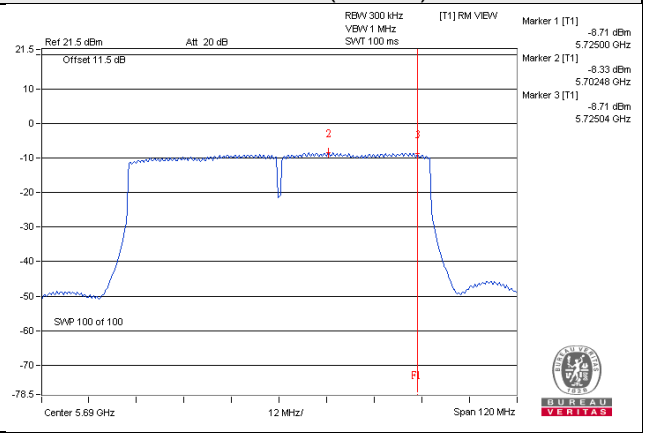
802.11n (HT20)



802.11n (HT40)



802.11ac (VHT80)

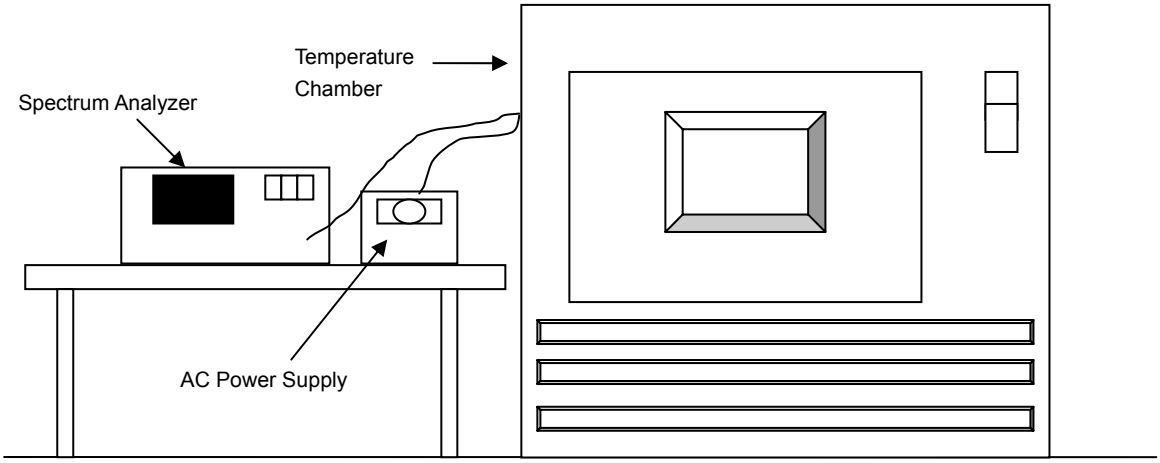


4.6 Frequency Stability

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: 5260MHz									
Temp. (℃)	Power Supply (Vac)	0 Minute		2 Minute		5 Minute		10 Minute	
		Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)
50	120	5260.0228	0.00043	5260.0212	0.00040	5260.0214	0.00041	5260.0236	0.00045
40	120	5259.9764	-0.00045	5259.9761	-0.00045	5259.9785	-0.00041	5259.9782	-0.00041
30	120	5260.0014	0.00003	5260.0037	0.00007	5260.0005	0.00001	5260.0013	0.00002
20	120	5260.016	0.00030	5260.0116	0.00022	5260.0129	0.00025	5260.0119	0.00023
10	120	5260.019	0.00036	5260.02	0.00038	5260.0201	0.00038	5260.0205	0.00039
0	120	5259.9803	-0.00037	5259.9819	-0.00034	5259.9799	-0.00038	5259.9786	-0.00041
-10	120	5259.9999	0.00000	5259.9994	-0.00001	5260.0004	0.00001	5260.0007	0.00001
-20	120	5259.9948	-0.00010	5259.9928	-0.00014	5259.9935	-0.00012	5259.9899	-0.00019
-30	120	5260.0165	0.00031	5260.0172	0.00033	5260.018	0.00034	5260.0172	0.00033

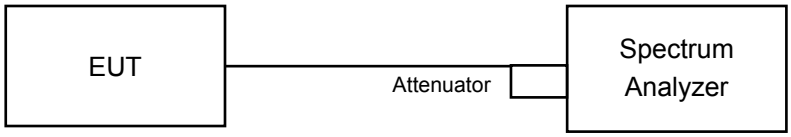
Frequency Stability Versus Voltage									
Operating Frequency: 5260MHz									
Temp. (℃)	Power Supply (Vac)	0 Minute		2 Minute		5 Minute		10 Minute	
		Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)
20	138	5260.0159	0.00030	5260.0121	0.00023	5260.0129	0.00025	5260.0114	0.00022
	120	5260.016	0.00030	5260.0116	0.00022	5260.0129	0.00025	5260.0119	0.00023
	102	5260.0166	0.00032	5260.0124	0.00024	5260.0139	0.00026	5260.011	0.00021

4.7 6dB Bandwidth Measurement

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		
144	5720 For U-NII-3	3.17	3.17	0.5	Pass

802.11n (HT20)

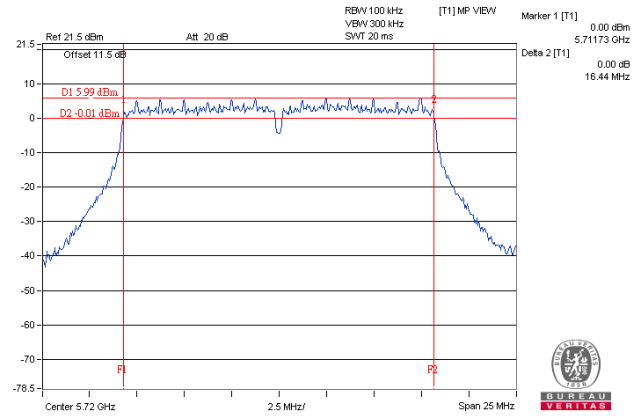
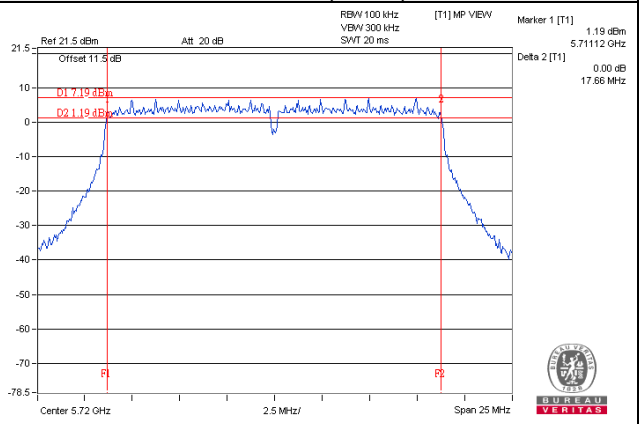
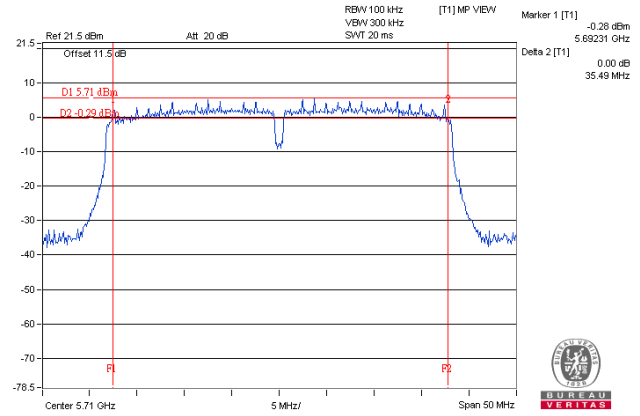
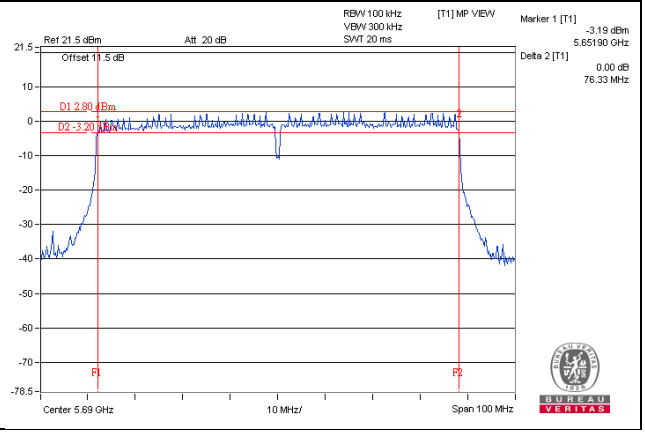
Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
144	5720 For U-NII-3	3.77	3.78	0.5	Pass

802.11n (HT40)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
142	5710 For U-NII-3	2.80	2.73	0.5	Pass

802.11ac (VHT80)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
138	5690 For U-NII-3	3.22	3.23	0.5	Pass

Spectrum Plot of Worst Value	
802.11a	802.11n (HT20)
	
802.11n (HT40)	802.11ac (VHT80)
	

Note:

For CH144 (UNII-3 Band): The 6dB bandwidth above 5725MHz = Marker 1 + Delta 2 - 5725MHz

For CH142 (UNII-3 Band): The 6dB bandwidth above 5725MHz = Marker 1 + Delta 2 - 5725MHz

For CH138 (UNII-3 Band): The 6dB bandwidth above 5725MHz = Marker 1 + Delta 2 - 5725MHz

5 Pictures of Test Arrangements

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

Appendix – Information on the Testing Laboratories

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

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

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Web Site: www.bureauveritas-adt.com

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

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