FCC Test Report

Report No.:	RF170106C21C
FCC ID:	QXO-4019IC
Test Model:	AP3916ic
Received Date:	Dec. 02, 2016
Test Date:	Jan. 10 ~ Feb. 02, 2017
Issued Date:	Feb. 17, 2017
Applicant:	Extreme Networks, Inc.
Address:	9 Northeastern Blvd. Salem, New Hampshire, United States, 03079
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.)

Testing Laboratory
2021

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Release Control Record

Issue No.	Description	Date Issued
RF170106C21C	Original release	Feb. 17, 2017

1 Certificate of Conformity

Product:	Wireless 802.11a/AC+b/g/n Access Point with integral Camera
Brand:	Extreme Networks
Test Model:	AP3916ic
Sample Status:	Engineering sample
Applicant:	Extreme Networks, Inc.
Test Date:	Jan. 10 ~ Feb. 02, 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:** Feb. 17, 2017

Celine Chou / Specialist

Approved by : Ken Liu , **Date:** Feb. 17, 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 -7.72dB at 0.52821MHz.
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 10600.00MHz, 11000.00MHz and 11340.00MHz.
15.407(a)(1/2/3)	Max Average Transmit Power	Pass	Meet the requirement of limit.
---	Occupied Bandwidth Measurement	-	Reference only.
15.407(a)(1/2/3)	Peak Power Spectral Density	Pass	Meet the requirement of limit.
15.407(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.

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	2.44 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 802.11a/AC+b/g/n Access Point with integral Camera
Brand	Extreme Networks
Test Model	AP3916ic
Sample Status	Engineering sample
Power Supply Rating	12Vdc from adapter 54Vdc from POE
Modulation Type	256QAM, 64QAM, 16QAM, QPSK, BPSK for OFDM
Modulation Technology	OFDM
Transfer Rate	802.11a: 54.0/ 48.0/ 36.0/ 24.0/ 18.0/ 12.0/ 9.0/ 6.0Mbps 802.11n: up to 300Mbps 802.11ac: up to 867Mbps
Operating Frequency	5260 ~ 5320MHz, 5500 ~ 5720MHz
Number of Channel	5260 ~ 5320MHz: 4 for 802.11a, 802.11n (HT20), 802.11ac (VHT20) 2 for 802.11n (HT40), 802.11ac (VHT40) 1 for 802.11ac (VHT80) 5500 ~ 5720MHz: 12 for 802.11a, 802.11n (HT20), 802.11ac (VHT20) 6 for 802.11n (HT40), 802.11ac (VHT40) 3 for 802.11ac (VHT80)
Output Power	CDD Mode: 5260 ~ 5320MHz: 204.475mW 5500 ~ 5720MHz: 192.590mW Beamforming Mode: 5260 ~ 5320MHz: 102.244mW 5500 ~ 5720MHz: 96.302mW
Antenna Type	Refer to note
Antenna Connector	Refer to note
Accessory Device	NA
Data Cable Supplied	NA

Note:

1. This report is prepared for FCC class II permissive change. The difference compared with the original report (BV ADT report no.: RF170106C21-1) 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

* For 5GHz band, CDD mode is the worst case for final tests except RF output power test after pretesting CDD mode and beamforming mode.

*The modulation and bandwidth are similar for 802.11n mode for HT20/HT40 and 802.11ac mode for VHT20/VHT40, therefore investigated worst case to representative mode in test report. (Final test mode refer section 3.2.1)

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

Adapter	
Brand	Powertron Electronics Corp.
Model	PA1024-120HUB200
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	EPA5006GAT
Input Power	100-240Vac, 50-60Hz, 0.8A
Output Power	54Vdc, 0.6A Pin 4, 5: 54Vdc Pin 7, 8: Return

4. The following antennas were provided to the EUT.

Antenna Type	PIFA	Antenna Connector	IPEX
Gain (dBi)	Frequency (MHz)		
	2400-2500	5150-5850	2400-2500
1	5.55	-	-
2	6.17	-	-
3	-	6.69	-
4	-	6.22	-
5 (BT LE / Zigbee)	-	-	3.63

5. The power setting are list as below:

CDD Mode						
	802.11a	802.11n (HT20)		802.11n (HT40)		802.11ac (VHT80)
CH 52	18.5	19	CH 54	20.5	CH 58	17.5
CH 60	18	18.5	CH 62	18.5	CH 106	18
CH 64	18	18.5	CH 102	19	CH 138 For U-NII-2C	21
CH 100	17.5	18.5	CH 110	17.5	CH 138 For U-NII-3	21
CH 116	18	18	CH 134	18.5		
CH 140	17.5	18.5	CH 142 For U-NII-2C	20.5		
CH 144 For U-NII-2C	17.5	18.5	CH 142 For U-NII-3	20.5		
CH 144 For U-NII-3	17.5	18.5				

Beamforming Mode					
	802.11n (HT20)		802.11n (HT40)		802.11ac (VHT80)
CH 52	19	CH 54	20.5	CH 58	17.5
CH 60	18.5	CH 62	18.5	CH 106	18
CH 64	18.5	CH 102	19	CH 138 For U-NII-2C	21
CH 100	18.5	CH 110	17.5	CH 138 For U-NII-3	21
CH 116	18	CH 134	18.5		
CH 140	18.5	CH 142 For U-NII-2C	20.5		
CH 144 For U-NII-2C	18.5	CH 142 For U-NII-3	20.5		
CH 144 For U-NII-3	18.5				

6. 2.4GHz & 5GHz & BT LE or 2.4GHz & 5GHz & Zigbee technology can transmit at same time. BT LE and Zigbee cannot transmit simultaneously.
7. 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

For 5260 ~ 5320MHz

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

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

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

Channel	Frequency	Channel	Frequency
54	5270 MHz	62	5310 MHz

1 channel is provided for 802.11ac (VHT80):

Channel	Frequency
58	5290 MHz

For 5500 ~ 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 **X-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	FREQ. BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
B	802.11a	5260-5320	52 to 64	52, 60, 64	OFDM	BPSK	6.0
B	802.11n (HT20)		52 to 64	52, 60, 64	OFDM	BPSK	6.5
B	802.11n (HT40)		54 to 62	54, 62	OFDM	BPSK	13.5
B	802.11ac (VHT80)		58	58	OFDM	BPSK	29.3
B	802.11a	5500-5720	100 to 144	100, 116, 140, 144	OFDM	BPSK	6.0
B	802.11n (HT20)		100 to 144	100, 116, 140, 144	OFDM	BPSK	6.5
B	802.11n (HT40)		102 to 142	102, 110, 134, 142	OFDM	BPSK	13.5
B	802.11ac (VHT80)		106, 138	106, 138	OFDM	BPSK	29.3

Radiated Emission Test (Below 1GHz):

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

EUT CONFIGURE MODE	MODE	FREQ. BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
A, B	802.11a	5260-5320	52 to 64	52	OFDM	BPSK	6.0
	802.11a	5500-5720	100 to 144		OFDM	BPSK	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	FREQ. BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
A, B	802.11a	5260-5320	52 to 64	52	OFDM	BPSK	6.0
	802.11a	5500-5720	100 to 144		OFDM	BPSK	6.0

Bandwidth, Peak Power Spectral Density 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	FREQ. BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
B	802.11a	5260-5320	52 to 64	52, 60, 64	OFDM	BPSK	6.0
B	802.11n (HT20)		52 to 64	52, 60, 64	OFDM	BPSK	6.5
B	802.11n (HT40)		54 to 62	54, 62	OFDM	BPSK	13.5
B	802.11ac (VHT80)		58	58	OFDM	BPSK	29.3
B	802.11a	5500-5720	100 to 144	100, 116, 140, 144	OFDM	BPSK	6.0
B	802.11n (HT20)		100 to 144	100, 116, 140, 144	OFDM	BPSK	6.5
B	802.11n (HT40)		102 to 142	102, 110, 134, 142	OFDM	BPSK	13.5
B	802.11ac (VHT80)		106, 138	106, 138	OFDM	BPSK	29.3

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	FREQ. BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
CDD Mode							
B	802.11a	5260-5320	52 to 64	52, 60, 64	OFDM	BPSK	6.0
B	802.11n (HT20)		52 to 64	52, 60, 64	OFDM	BPSK	6.5
B	802.11n (HT40)		54 to 62	54, 62	OFDM	BPSK	13.5
B	802.11ac (VHT80)		58	58	OFDM	BPSK	29.3
B	802.11a	5500-5720	100 to 144	100, 116, 140, 144	OFDM	BPSK	6.0
B	802.11n (HT20)		100 to 144	100, 116, 140, 144	OFDM	BPSK	6.5
B	802.11n (HT40)		102 to 142	102, 110, 134, 142	OFDM	BPSK	13.5
B	802.11ac (VHT80)		106, 138	106, 138	OFDM	BPSK	29.3
Beamforming Mode							
B	802.11n (HT20)	5260-5320	52 to 64	52, 60, 64	OFDM	BPSK	6.5
B	802.11n (HT40)		54 to 62	54, 62	OFDM	BPSK	13.5
B	802.11ac (VHT80)		58	58	OFDM	BPSK	29.3
B	802.11n (HT20)	5500-5720	100 to 144	100, 116, 140, 144	OFDM	BPSK	6.5
B	802.11n (HT40)		102 to 142	102, 110, 134, 142	OFDM	BPSK	13.5
B	802.11ac (VHT80)		106, 138	106, 138	OFDM	BPSK	29.3

Test Condition:

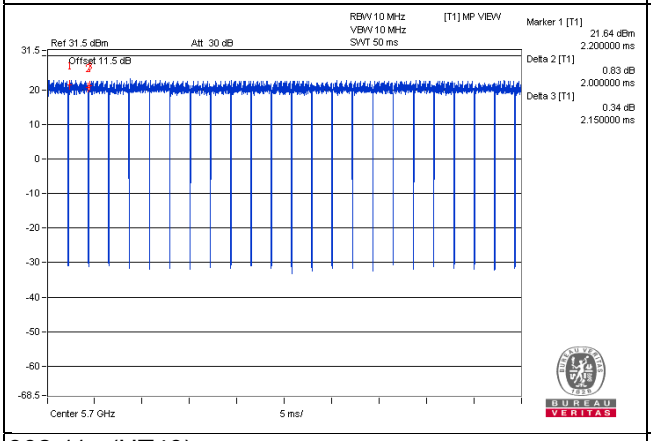
APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER (SYSTEM)	TESTED BY
RE≥1G	21deg. C, 71%RH	54Vdc	Jones Chang
RE<1G	20deg. C, 66%RH	120Vac, 60Hz 54Vdc	Jones Chang
PLC	19deg. C, 66%RH	120Vac, 60Hz 54Vdc	Jones Chang
APCM	16deg. C, 70%RH	54Vdc	Nick Hsu

3.3 Duty Cycle of Test Signal

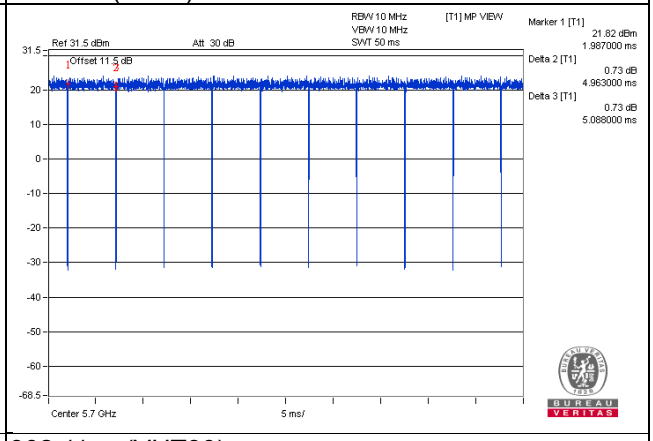
Duty cycle of test signal is < 98 %, duty factor is required.

802.11a: Duty cycle = 2.000/2.150 = 0.930, Duty factor = 10 * log(1/0.930) = 0.31
802.11n (HT20): Duty cycle = 4.963/5.088 = 0.975, Duty factor = 10 * log(1/0.975) = 0.11
802.11n (HT40): Duty cycle = 2.387/2.525 = 0.945, Duty factor = 10 * log(1/0.945) = 0.24
802.11ac (VHT80): Duty cycle = 1.075/1.237 = 0.869, Duty factor = 10 * log(1/0.869) = 0.61

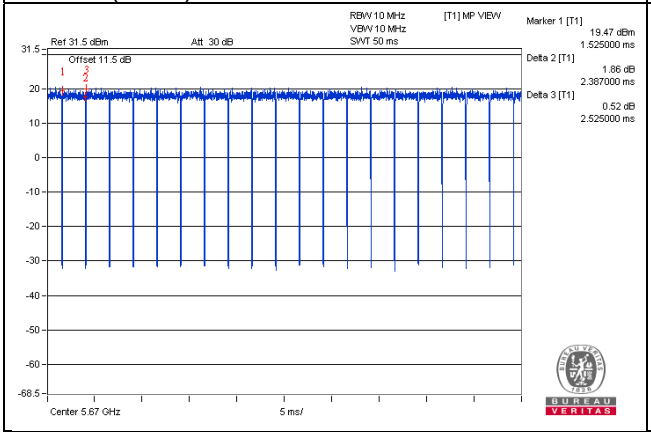
802.11a



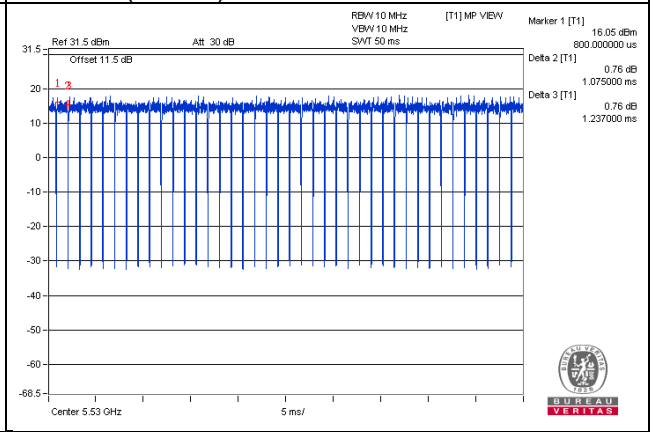
802.11n (HT20)



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.	PA1024-120HUB200	NA	NA	I/P: 100-240Vac, 50-60Hz, 0.6A. O/P: 12Vdc, 2A, 24W Max 1.5m power cable with one core attached on adapter For test mode A only Provided by manufacturer
C.	POE	EnGenius	EPA5006GAT	NA	NA	I/P: 100-240Vac, 50-60Hz 0.8A O/P: 54Vdc, 0.6A For test mode B only Provided by manufacturer

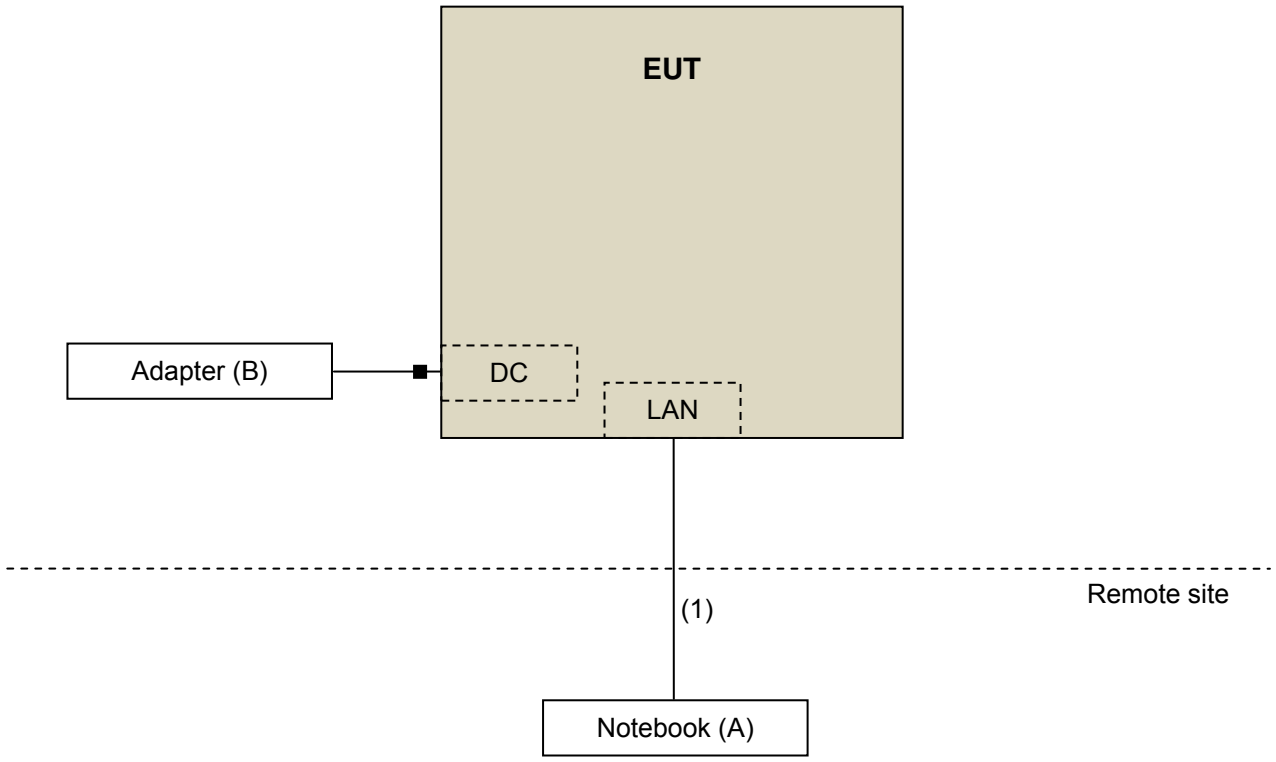
Note:

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

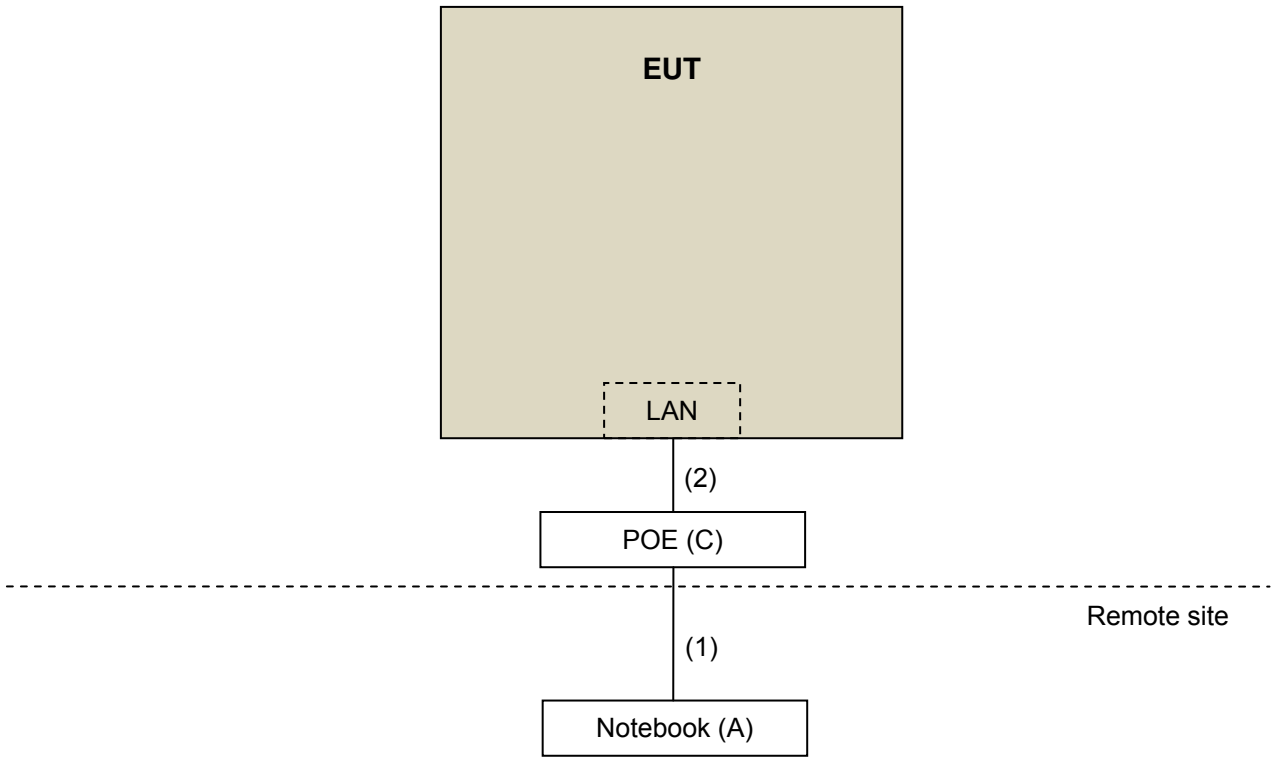
ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	RJ45 Cable	1	3	N	0	Cat5e
2.	RJ45 Cable	1	1.8	N	0	Cat5e For test mode B only

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 v01r03
KDB 662911 D01 Multiple Transmitter Output v02r01
ANSI C63.10-2013

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

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

4 Test Types and Results

4.1 Radiated Emission and Bandedge Measurement

4.1.1 Limits of Radiated Emission and Bandedge Measurement

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

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

NOTE:

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

Limits of unwanted emission out of the restricted bands

<table>
<tr><td colspan="3">Applicable To</td><td colspan="2">Limit</td></tr>
<tr><td colspan="3" rowspan="2">789033 D02 General UNII Test Procedure New Rules v01r03</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	Apr. 18, 2016	Apr. 17, 2017
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, 2016	Jun. 07, 2017

Note: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in 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 Site Registration No. is 988962.
5. The IC Site Registration No. is IC 7450F-3.

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:

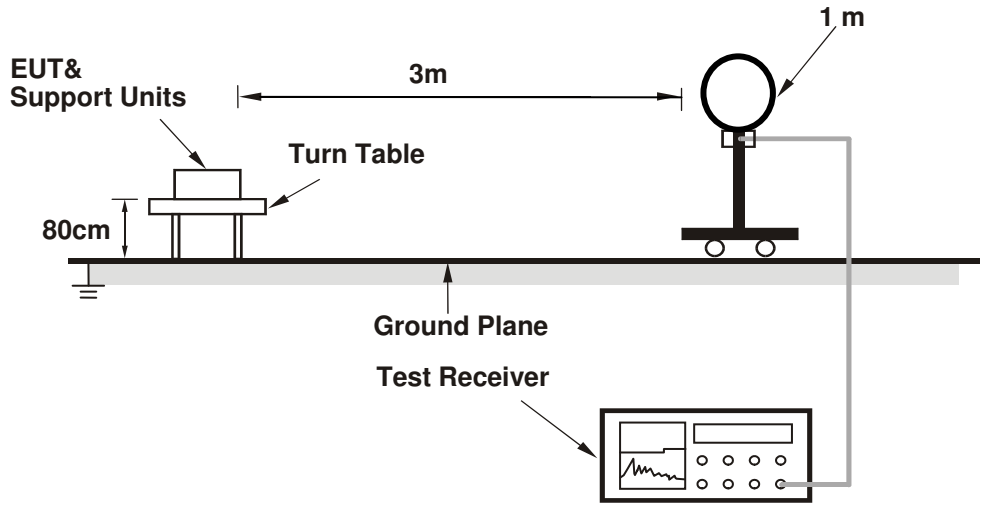
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.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

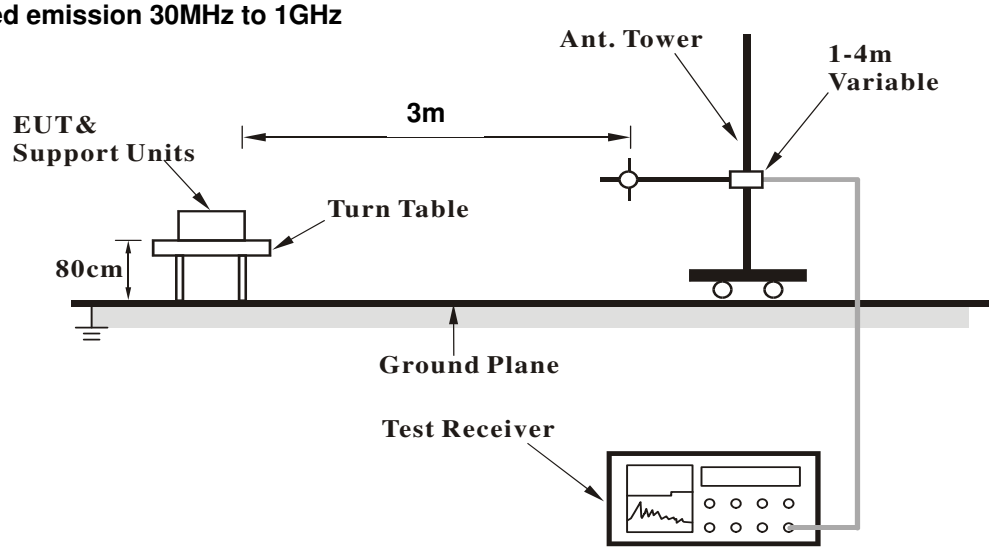
No deviation.

4.1.5 Test Set Up

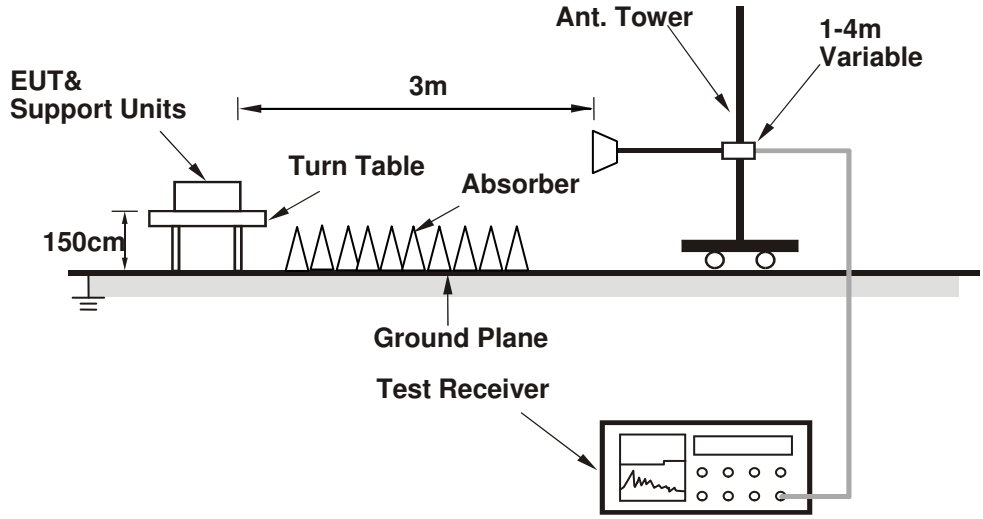
For Radiated emission below 30MHz



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.

4.1.7 Test Results

Above 1GHz data:

802.11a

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	57.8 PK	74.0	-16.2	3.40 H	292	52.9	4.9
2	5150.00	45.8 AV	54.0	-8.2	3.40 H	292	40.9	4.9
3	*5260.00	116.3 PK			3.48 H	286	77.5	38.8
4	*5260.00	106.0 AV			3.48 H	286	67.2	38.8
5	#10520.00	64.3 PK	68.2	-3.9	2.41 H	70	46.2	18.1
6	15780.00	61.8 PK	74.0	-12.2	2.22 H	359	43.5	18.3
7	15780.00	49.5 AV	54.0	-4.5	2.22 H	359	31.2	18.3
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	58.0 PK	74.0	-16.0	3.00 V	256	53.1	4.9
2	5150.00	45.6 AV	54.0	-8.4	3.00 V	256	40.7	4.9
3	*5260.00	111.8 PK			3.11 V	333	73.0	38.8
4	*5260.00	100.9 AV			3.11 V	333	62.1	38.8
5	#10520.00	66.4 PK	68.2	-1.8	2.86 V	139	48.3	18.1
6	15780.00	65.8 PK	74.0	-8.2	2.60 V	117	47.5	18.3
7	15780.00	52.1 AV	54.0	-1.9	2.60 V	117	33.8	18.3

Remark:

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	113.9 PK			3.50 H	287	75.0	38.9
2	*5300.00	103.3 AV			3.50 H	287	64.4	38.9
3	10600.00	63.3 PK	74.0	-10.7	2.45 H	70	45.2	18.1
4	10600.00	50.4 AV	54.0	-3.6	2.45 H	70	32.3	18.1
5	15900.00	60.9 PK	74.0	-13.1	2.40 H	357	42.6	18.3
6	15900.00	47.8 AV	54.0	-6.2	2.40 H	357	29.5	18.3
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5300.00	108.2 PK			2.91 V	330	69.3	38.9
2	*5300.00	97.8 AV			2.91 V	330	58.9	38.9
3	10600.00	65.4 PK	74.0	-8.6	3.01 V	151	47.3	18.1
4	**10600.00**	**53.0 AV**	**54.0**	**-1.0**	**3.01 V**	**151**	**34.9**	**18.1**
5	15900.00	63.8 PK	74.0	-10.2	2.55 V	123	45.5	18.3
6	15900.00	51.3 AV	54.0	-2.7	2.55 V	123	33.0	18.3

Remark:

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	115.4 PK			3.87 H	280	76.4	39.0
2	*5320.00	104.5 AV			3.87 H	280	65.5	39.0
3	5350.00	64.4 PK	74.0	-9.6	3.88 H	284	59.1	5.3
4	5350.00	51.5 AV	54.0	-2.5	3.88 H	284	46.2	5.3
5	10640.00	63.8 PK	74.0	-10.2	2.79 H	72	45.6	18.2
6	10640.00	50.3 AV	54.0	-3.7	2.79 H	72	32.1	18.2
7	15960.00	62.0 PK	74.0	-12.0	2.22 H	357	44.0	18.0
8	15960.00	50.0 AV	54.0	-4.0	2.22 H	357	32.0	18.0
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5320.00	108.1 PK			3.03 V	329	69.1	39.0
2	*5320.00	98.0 AV			3.03 V	329	59.0	39.0
3	5350.00	59.4 PK	74.0	-14.6	3.24 V	344	54.1	5.3
4	5350.00	47.3 AV	54.0	-6.7	3.24 V	344	42.0	5.3
5	10640.00	65.4 PK	74.0	-8.6	3.71 V	153	47.2	18.2
6	10640.00	52.4 AV	54.0	-1.6	3.71 V	153	34.2	18.2
7	15960.00	60.8 PK	74.0	-13.2	2.47 V	119	42.8	18.0
8	15960.00	48.7 AV	54.0	-5.3	2.47 V	119	30.7	18.0

Remark:

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	59.0 PK	74.0	-15.0	2.31 H	273	53.6	5.4
2	5460.00	45.2 AV	54.0	-8.8	2.31 H	273	39.8	5.4
3	#5470.00	61.1 PK	74.0	-12.9	2.42 H	282	55.7	5.4
4	#5470.00	47.2 AV	54.0	-6.8	2.42 H	282	41.8	5.4
5	*5500.00	113.6 PK			2.26 H	278	74.3	39.3
6	*5500.00	103.2 AV			2.26 H	278	63.9	39.3
7	11000.00	63.9 PK	74.0	-10.1	2.17 H	75	44.1	19.8
8	11000.00	51.0 AV	54.0	-3.0	2.17 H	75	31.2	19.8
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	57.3 PK	74.0	-16.7	2.22 V	185	51.9	5.4
2	5460.00	43.4 AV	54.0	-10.6	2.22 V	185	38.0	5.4
3	#5470.00	56.9 PK	74.0	-17.1	2.14 V	168	51.5	5.4
4	#5470.00	44.5 AV	54.0	-9.5	2.14 V	168	39.1	5.4
5	*5500.00	108.3 PK			2.25 V	169	69.0	39.3
6	*5500.00	98.2 AV			2.25 V	169	58.9	39.3
7	11000.00	66.1 PK	74.0	-7.9	2.39 V	333	46.3	19.8
8	11000.00	52.9 AV	54.0	-1.1	2.39 V	333	33.1	19.8

Remark:

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	114.5 PK			2.38 H	259	75.0	39.5
2	*5580.00	103.9 AV			2.38 H	259	64.4	39.5
3	11160.00	65.0 PK	74.0	-9.0	2.27 H	76	45.5	19.5
4	11160.00	51.5 AV	54.0	-2.5	2.27 H	76	32.0	19.5
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	*5580.00	109.8 PK			2.33 V	167	70.3	39.5
2	*5580.00	99.3 AV			2.33 V	167	59.8	39.5
3	11160.00	67.5 PK	74.0	-6.5	2.59 V	334	48.0	19.5
4	11160.00	52.8 AV	54.0	-1.2	2.59 V	334	33.3	19.5

Remark:

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	111.4 PK			2.45 H	285	71.6	39.8
2	*5700.00	101.0 AV			2.45 H	285	61.2	39.8
3	#5725.00	61.6 PK	74.0	-12.4	2.47 H	287	55.4	6.2
4	#5725.00	48.7 AV	54.0	-5.3	2.47 H	287	42.5	6.2
5	11400.00	65.5 PK	74.0	-8.5	2.43 H	77	46.3	19.2
6	11400.00	52.8 AV	54.0	-1.2	2.43 H	77	33.6	19.2
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	*5700.00	108.4 PK			2.83 V	149	68.6	39.8
2	*5700.00	98.0 AV			2.83 V	149	58.2	39.8
3	#5725.00	57.7 PK	74.0	-16.3	2.75 V	150	51.5	6.2
4	#5725.00	45.0 AV	54.0	-9.0	2.75 V	150	38.8	6.2
5	11400.00	67.3 PK	74.0	-6.7	2.97 V	330	48.1	19.2
6	11400.00	52.9 AV	54.0	-1.1	2.97 V	330	33.7	19.2

Remark:

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	55.1 PK	74.0	-18.9	2.39 H	286	53.9	1.2
2	#5470.00	42.2 AV	54.0	-11.8	2.39 H	286	41.0	1.2
3	*5720.00	114.1 PK			2.37 H	281	74.2	39.9
4	*5720.00	103.7 AV			2.37 H	281	63.8	39.9
5	#5850.00	56.6 PK	74.0	-17.4	2.47 H	285	54.3	2.3
6	#5850.00	43.9 AV	54.0	-10.1	2.47 H	285	41.6	2.3
7	11440.00	64.4 PK	74.0	-9.6	2.08 H	16	49.9	14.5
8	11440.00	51.6 AV	54.0	-2.4	2.08 H	16	37.1	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	55.8 PK	74.0	-18.2	1.88 V	86	54.6	1.2
2	#5470.00	42.0 AV	54.0	-12.0	1.88 V	86	40.8	1.2
3	*5720.00	107.4 PK			2.10 V	81	67.5	39.9
4	*5720.00	97.3 AV			2.10 V	81	57.4	39.9
5	#5850.00	56.2 PK	74.0	-17.8	2.22 V	84	53.9	2.3
6	#5850.00	43.1 AV	54.0	-10.9	2.22 V	84	40.8	2.3
7	11440.00	66.4 PK	74.0	-7.6	2.04 V	106	51.9	14.5
8	11440.00	52.8 AV	54.0	-1.2	2.04 V	106	38.3	14.5

Remark:

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	5150.00	56.0 PK	74.0	-18.0	2.22 H	293	51.1	4.9
2	5150.00	42.9 AV	54.0	-11.1	2.22 H	293	38.0	4.9
3	*5260.00	114.3 PK			2.13 H	282	75.5	38.8
4	*5260.00	103.6 AV			2.13 H	282	64.8	38.8
5	#10520.00	63.7 PK	68.2	-4.5	1.94 H	138	45.6	18.1
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	5150.00	55.2 PK	74.0	-18.8	2.85 V	342	50.3	4.9
2	5150.00	42.8 AV	54.0	-11.2	2.85 V	342	37.9	4.9
3	*5260.00	111.0 PK			2.82 V	337	72.2	38.8
4	*5260.00	100.4 AV			2.82 V	337	61.6	38.8
5	#10520.00	67.0 PK	68.2	-1.2	3.26 V	325	48.9	18.1

Remark:

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	114.7 PK			3.79 H	288	75.8	38.9
2	*5300.00	103.9 AV			3.79 H	288	65.0	38.9
3	10600.00	64.2 PK	74.0	-9.8	2.36 H	121	46.1	18.1
4	10600.00	50.2 AV	54.0	-3.8	2.36 H	121	32.1	18.1
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	*5300.00	108.8 PK			3.53 V	165	69.9	38.9
2	*5300.00	98.4 AV			3.53 V	165	59.5	38.9
3	10600.00	67.2 PK	74.0	-6.8	3.57 V	325	49.1	18.1
4	10600.00	52.7 AV	54.0	-1.3	3.57 V	325	34.6	18.1

Remark:

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	115.0 PK			3.74 H	288	76.0	39.0
2	*5320.00	104.5 AV			3.74 H	288	65.5	39.0
3	5350.00	61.6 PK	74.0	-12.4	1.04 H	281	56.3	5.3
4	5350.00	48.2 AV	54.0	-5.8	1.04 H	281	42.9	5.3
5	10640.00	63.8 PK	74.0	-10.2	3.59 H	117	45.6	18.2
6	10640.00	49.7 AV	54.0	-4.3	3.59 H	117	31.5	18.2
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	*5320.00	108.8 PK			2.50 V	127	69.8	39.0
2	*5320.00	98.3 AV			2.50 V	127	59.3	39.0
3	5350.00	58.9 PK	74.0	-15.1	2.39 V	126	53.6	5.3
4	5350.00	45.2 AV	54.0	-8.8	2.39 V	126	39.9	5.3
5	10640.00	68.2 PK	74.0	-5.8	3.64 V	325	50.0	18.2
6	10640.00	52.7 AV	54.0	-1.3	3.64 V	325	34.5	18.2

Remark:

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	2.09 H	273	54.6	5.4
2	5460.00	44.4 AV	54.0	-9.6	2.09 H	273	39.0	5.4
3	#5470.00	62.4 PK	74.0	-11.6	2.18 H	266	57.0	5.4
4	#5470.00	47.7 AV	54.0	-6.3	2.18 H	266	42.3	5.4
5	*5500.00	115.3 PK			2.19 H	279	76.0	39.3
6	*5500.00	105.1 AV			2.19 H	279	65.8	39.3
7	11000.00	65.7 PK	74.0	-8.3	2.09 H	73	45.9	19.8
8	11000.00	51.7 AV	54.0	-2.3	2.09 H	73	31.9	19.8
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	57.7 PK	74.0	-16.3	2.20 V	168	52.3	5.4
2	5460.00	43.6 AV	54.0	-10.4	2.20 V	168	38.2	5.4
3	#5470.00	58.6 PK	74.0	-15.4	2.24 V	171	53.2	5.4
4	#5470.00	45.3 AV	54.0	-8.7	2.24 V	171	39.9	5.4
5	*5500.00	109.6 PK			2.17 V	163	70.3	39.3
6	*5500.00	98.8 AV			2.17 V	163	59.5	39.3
7	11000.00	67.6 PK	74.0	-6.4	2.59 V	333	47.8	19.8
8	**11000.00**	**53.0 AV**	**54.0**	**-1.0**	**2.59 V**	**333**	**33.2**	**19.8**

Remark:

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	114.3 PK			2.39 H	279	74.8	39.5
2	*5580.00	103.8 AV			2.39 H	279	64.3	39.5
3	11160.00	63.0 PK	74.0	-11.0	2.39 H	75	43.5	19.5
4	11160.00	50.0 AV	54.0	-4.0	2.39 H	75	30.5	19.5
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	*5580.00	108.7 PK			2.85 V	165	69.2	39.5
2	*5580.00	98.3 AV			2.85 V	165	58.8	39.5
3	11160.00	68.7 PK	74.0	-5.3	2.81 V	333	49.2	19.5
4	11160.00	52.8 AV	54.0	-1.2	2.81 V	333	33.3	19.5

Remark:

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	114.1 PK			2.22 H	285	74.3	39.8
2	*5700.00	102.7 AV			2.22 H	285	62.9	39.8
3	#5725.00	63.3 PK	74.0	-10.7	2.37 H	286	57.1	6.2
4	#5725.00	48.7 AV	54.0	-5.3	2.37 H	286	42.5	6.2
5	11400.00	66.3 PK	74.0	-7.7	2.41 H	78	47.1	19.2
6	11400.00	52.5 AV	54.0	-1.5	2.41 H	78	33.3	19.2
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	*5700.00	109.3 PK			2.44 V	150	69.5	39.8
2	*5700.00	98.5 AV			2.44 V	150	58.7	39.8
3	#5725.00	50.1 PK	74.0	-23.9	2.41 V	150	43.9	6.2
4	#5725.00	46.2 AV	54.0	-7.8	2.41 V	150	40.0	6.2
5	11400.00	67.7 PK	74.0	-6.3	2.87 V	331	48.5	19.2
6	11400.00	52.9 AV	54.0	-1.1	2.87 V	331	33.7	19.2

Remark:

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	55.3 PK	74.0	-18.7	2.31 H	274	54.1	1.2
2	#5470.00	42.2 AV	54.0	-11.8	2.31 H	274	41.0	1.2
3	*5720.00	115.4 PK			2.34 H	281	75.5	39.9
4	*5720.00	104.4 AV			2.34 H	281	64.5	39.9
5	#5850.00	56.7 PK	74.0	-17.3	2.35 H	286	54.4	2.3
6	#5850.00	43.8 AV	54.0	-10.2	2.35 H	286	41.5	2.3
7	11440.00	63.8 PK	74.0	-10.2	2.21 H	61	49.3	14.5
8	11440.00	50.1 AV	54.0	-3.9	2.21 H	61	35.6	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	55.5 PK	74.0	-18.5	2.41 V	85	54.3	1.2
2	#5470.00	42.2 AV	54.0	-11.8	2.41 V	85	41.0	1.2
3	*5720.00	108.6 PK			2.20 V	81	68.7	39.9
4	*5720.00	98.0 AV			2.20 V	81	58.1	39.9
5	#5850.00	56.1 PK	74.0	-17.9	2.08 V	78	53.8	2.3
6	#5850.00	43.1 AV	54.0	-10.9	2.08 V	78	40.8	2.3
7	11440.00	67.1 PK	74.0	-6.9	2.16 V	107	52.6	14.5
8	11440.00	52.7 AV	54.0	-1.3	2.16 V	107	38.2	14.5

Remark:

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	5150.00	55.8 PK	74.0	-18.2	3.17 H	300	50.9	4.9
2	5150.00	42.4 AV	54.0	-11.6	3.17 H	300	37.5	4.9
3	*5270.00	111.2 PK			3.74 H	286	72.3	38.9
4	*5270.00	101.7 AV			3.74 H	286	62.8	38.9
5	#10540.00	62.1 PK	74.0	-11.9	1.90 H	101	44.0	18.1
6	#10540.00	49.6 AV	54.0	-4.4	1.90 H	101	31.5	18.1
7	15810.00	62.9 PK	74.0	-11.1	2.11 H	340	44.8	18.1
8	15810.00	50.3 AV	54.0	-3.7	2.11 H	340	32.2	18.1
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	5150.00	55.8 PK	74.0	-18.2	2.51 V	344	50.9	4.9
2	5150.00	42.7 AV	54.0	-11.3	2.51 V	344	37.8	4.9
3	*5270.00	107.2 PK			2.42 V	337	68.3	38.9
4	*5270.00	97.5 AV			2.42 V	337	58.6	38.9
5	#10540.00	65.4 PK	74.0	-8.6	2.59 V	324	47.3	18.1
6	#10540.00	52.6 AV	54.0	-1.4	2.59 V	324	34.5	18.1
7	15810.00	65.4 PK	74.0	-8.6	2.96 V	252	47.3	18.1
8	15810.00	52.4 AV	54.0	-1.6	2.96 V	252	34.3	18.1

Remark:

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	112.0 PK			4.00 H	293	72.9	39.1
2	*5310.00	102.8 AV			4.00 H	293	63.7	39.1
3	5350.00	67.1 PK	74.0	-6.9	4.00 H	274	61.6	5.5
4	5350.00	52.5 AV	54.0	-1.5	4.00 H	274	47.0	5.5
5	10620.00	60.0 PK	74.0	-14.0	3.62 H	281	41.5	18.5
6	10620.00	47.4 AV	54.0	-6.6	3.62 H	281	28.9	18.5
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5310.00	106.0 PK			3.66 V	48	67.1	38.9
2	*5310.00	96.3 AV			3.66 V	48	57.4	38.9
3	5350.00	64.8 PK	74.0	-9.2	3.67 V	164	59.5	5.3
4	5350.00	50.2 AV	54.0	-3.8	3.67 V	164	44.9	5.3
5	10620.00	63.3 PK	74.0	-10.7	3.44 V	322	45.2	18.1
6	10620.00	51.4 AV	54.0	-2.6	3.44 V	322	33.3	18.1

Remark:

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	65.7 PK	74.0	-8.3	3.71 H	289	60.3	5.4
2	5460.00	49.7 AV	54.0	-4.3	3.71 H	289	44.3	5.4
3	#5470.00	67.1 PK	74.0	-6.9	3.74 H	259	61.7	5.4
4	#5470.00	52.5 AV	54.0	-1.5	3.74 H	259	47.1	5.4
5	*5510.00	111.5 PK			3.87 H	283	72.2	39.3
6	*5510.00	101.8 AV			3.87 H	283	62.5	39.3
7	11020.00	62.6 PK	74.0	-11.4	3.69 H	245	42.9	19.7
8	11020.00	50.7 AV	54.0	-3.3	3.69 H	245	31.0	19.7
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5460.00	57.6 PK	74.0	-16.4	2.40 V	111	52.2	5.4
2	5460.00	46.5 AV	54.0	-7.5	2.40 V	111	41.1	5.4
3	#5470.00	60.8 PK	74.0	-13.2	2.44 V	123	55.4	5.4
4	#5470.00	50.2 AV	54.0	-3.8	2.44 V	123	44.8	5.4
5	*5510.00	106.8 PK			2.42 V	164	67.5	39.3
6	*5510.00	97.4 AV			2.42 V	164	58.1	39.3
7	11020.00	64.4 PK	74.0	-9.6	2.33 V	332	44.7	19.7
8	11020.00	52.7 AV	54.0	-1.3	2.33 V	332	33.0	19.7

Remark:

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	*5550.00	112.7 PK			2.42 H	262	73.4	39.3
2	*5550.00	102.8 AV			2.42 H	262	63.5	39.3
3	11100.00	63.1 PK	74.0	-10.9	2.16 H	78	43.8	19.3
4	11100.00	50.4 AV	54.0	-3.6	2.16 H	78	31.1	19.3
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5550.00	107.6 PK			2.37 V	167	68.3	39.3
2	*5550.00	98.3 AV			2.37 V	167	59.0	39.3
3	11100.00	65.8 PK	74.0	-8.2	2.74 V	336	46.5	19.3
4	11100.00	52.8 AV	54.0	-1.2	2.74 V	336	33.5	19.3

Remark:

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	109.5 PK			2.43 H	283	69.8	39.7
2	*5670.00	100.2 AV			2.43 H	283	60.5	39.7
3	#5725.00	64.6 PK	74.0	-9.4	2.94 H	282	58.4	6.2
4	#5725.00	51.8 AV	54.0	-2.2	2.94 H	282	45.6	6.2
5	11340.00	65.2 PK	74.0	-8.8	2.18 H	77	45.8	19.4
6	11340.00	52.7 AV	54.0	-1.3	2.18 H	77	33.3	19.4
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5670.00	105.6 PK			2.34 V	147	65.9	39.7
2	*5670.00	96.5 AV			2.34 V	147	56.8	39.7
3	#5725.00	58.1 PK	74.0	-15.9	2.55 V	78	51.9	6.2
4	#5725.00	47.0 AV	54.0	-7.0	2.55 V	78	40.8	6.2
5	11340.00	66.0 PK	74.0	-8.0	2.86 V	332	46.6	19.4
6	**11340.00**	**53.0 AV**	**54.0**	**-1.0**	**2.86 V**	**332**	**33.6**	**19.4**

Remark:

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	55.5 PK	74.0	-18.5	2.48 H	287	54.3	1.2
2	#5470.00	42.5 AV	54.0	-11.5	2.48 H	287	41.3	1.2
3	*5710.00	113.9 PK			2.44 H	283	74.0	39.9
4	*5710.00	104.1 AV			2.44 H	283	64.2	39.9
5	#5850.00	57.4 PK	74.0	-16.6	2.45 H	285	55.1	2.3
6	#5850.00	44.1 AV	54.0	-9.9	2.45 H	285	41.8	2.3
7	11420.00	62.6 PK	74.0	-11.4	2.62 H	120	48.2	14.4
8	11420.00	50.2 AV	54.0	-3.8	2.62 H	120	35.8	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	55.3 PK	74.0	-18.7	2.35 V	86	54.1	1.2
2	#5470.00	42.2 AV	54.0	-11.8	2.35 V	86	41.0	1.2
3	*5710.00	107.4 PK			2.31 V	82	67.5	39.9
4	*5710.00	97.8 AV			2.31 V	82	57.9	39.9
5	#5850.00	56.2 PK	74.0	-17.8	2.32 V	80	53.9	2.3
6	#5850.00	43.8 AV	54.0	-10.2	2.32 V	80	41.5	2.3
7	11420.00	66.0 PK	74.0	-8.0	2.08 V	107	51.6	14.4
8	11420.00	52.5 AV	54.0	-1.5	2.08 V	107	38.1	14.4

Remark:

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	*5290.00	107.6 PK			3.95 H	285	68.5	39.1
2	*5290.00	98.1 AV			3.95 H	285	59.0	39.1
3	5350.00	65.1 PK	74.0	-8.9	3.96 H	289	59.6	5.5
4	5350.00	52.5 AV	54.0	-1.5	3.96 H	289	47.0	5.5
5	#10580.00	60.2 PK	74.0	-13.8	3.47 H	78	41.6	18.6
6	#10580.00	47.2 AV	54.0	-6.8	3.47 H	78	28.6	18.6
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5290.00	101.4 PK			3.07 V	337	62.3	39.1
2	*5290.00	91.3 AV			3.07 V	337	52.2	39.1
3	5350.00	59.2 PK	74.0	-14.8	1.65 V	53	53.7	5.5
4	5350.00	46.5 AV	54.0	-7.5	1.65 V	53	41.0	5.5
5	#10580.00	63.4 PK	74.0	-10.6	3.49 V	325	44.8	18.6
6	#10580.00	50.0 AV	54.0	-4.0	3.49 V	325	31.4	18.6

Remark:

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	66.7 PK	74.0	-7.3	3.70 H	290	61.0	5.7
2	5460.00	51.5 AV	54.0	-2.5	3.70 H	290	45.8	5.7
3	#5470.00	66.5 PK	74.0	-7.5	3.63 H	315	60.8	5.7
4	#5470.00	52.6 AV	54.0	-1.4	3.63 H	315	46.9	5.7
5	*5530.00	107.1 PK			3.87 H	282	67.5	39.6
6	*5530.00	97.1 AV			3.87 H	282	57.5	39.6
7	#5725.00	61.4 PK	74.0	-12.6	2.60 H	333	55.1	6.3
8	#5725.00	49.9 AV	54.0	-4.1	2.60 H	333	43.6	6.3
9	11060.00	61.5 PK	74.0	-12.5	3.27 H	185	42.2	19.3
10	11060.00	48.1 AV	54.0	-5.9	3.27 H	185	28.8	19.3
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5460.00	56.1 PK	74.0	-17.9	2.65 V	279	50.7	5.4
2	5460.00	45.2 AV	54.0	-8.8	2.65 V	279	39.8	5.4
3	#5470.00	59.7 PK	74.0	-14.3	2.94 V	303	54.3	5.4
4	#5470.00	47.9 AV	54.0	-6.1	2.94 V	303	42.5	5.4
5	*5530.00	102.8 PK			2.31 V	165	63.5	39.3
6	*5530.00	93.0 AV			2.31 V	165	53.7	39.3
7	#5725.00	57.7 PK	74.0	-16.3	2.51 V	173	51.5	6.2
8	#5725.00	46.9 AV	54.0	-7.1	2.51 V	173	40.7	6.2
9	11060.00	62.5 PK	74.0	-11.5	2.60 V	331	43.1	19.4
10	11060.00	49.9 AV	54.0	-4.1	2.60 V	331	30.5	19.4

Remark:

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	56.8 PK	74.0	-17.2	2.55 H	286	55.6	1.2
2	#5470.00	43.3 AV	54.0	-10.7	2.55 H	286	42.1	1.2
3	*5690.00	110.3 PK			2.58 H	282	70.5	39.8
4	*5690.00	100.4 AV			2.58 H	282	60.6	39.8
5	#5850.00	63.4 PK	74.0	-10.6	2.63 H	312	61.1	2.3
6	#5850.00	47.5 AV	54.0	-6.5	2.63 H	312	45.2	2.3
7	11380.00	64.4 PK	74.0	-9.6	2.10 H	15	49.9	14.5
8	11380.00	50.7 AV	54.0	-3.3	2.10 H	15	36.2	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	55.9 PK	74.0	-18.1	2.21 V	77	54.7	1.2
2	#5470.00	43.0 AV	54.0	-11.0	2.21 V	77	41.8	1.2
3	*5690.00	104.3 PK			2.28 V	80	64.5	39.8
4	*5690.00	94.0 AV			2.28 V	80	54.2	39.8
5	#5850.00	57.4 PK	74.0	-16.6	2.29 V	82	55.1	2.3
6	#5850.00	44.5 AV	54.0	-9.5	2.29 V	82	42.2	2.3
7	11380.00	63.8 PK	74.0	-10.2	2.32 V	169	49.3	14.5
8	11380.00	52.0 AV	54.0	-2.0	2.32 V	169	37.5	14.5

Remark:

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	45.45	27.4 QP	40.0	-12.6	1.99 H	36	42.1	-14.7
2	94.06	32.7 QP	43.5	-10.8	1.99 H	241	52.1	-19.4
3	185.44	34.1 QP	43.5	-9.4	1.50 H	250	49.7	-15.6
4	274.88	39.1 QP	46.0	-6.9	1.00 H	81	51.8	-12.7
5	525.69	35.1 QP	46.0	-10.9	1.50 H	247	42.4	-7.3
6	729.84	36.2 QP	46.0	-9.8	1.99 H	312	39.0	-2.8
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	45.45	36.9 QP	40.0	-3.1	1.49 V	331	51.6	-14.7
2	179.61	31.0 QP	43.5	-12.5	1.00 V	0	45.9	-14.9
3	259.33	33.1 QP	46.0	-12.9	1.00 V	272	46.7	-13.6
4	337.10	29.5 QP	46.0	-16.5	1.00 V	15	40.7	-11.2
5	500.42	41.6 QP	46.0	-4.4	1.00 V	156	49.5	-7.9
6	519.86	37.2 QP	46.0	-8.8	1.00 V	86	44.6	-7.4

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

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	80.45	26.5 QP	40.0	-13.5	1.00 H	235	45.1	-18.6
2	158.22	28.3 QP	43.5	-15.2	1.50 H	91	41.9	-13.6
3	249.60	33.0 QP	46.0	-13.0	1.00 H	222	47.0	-14.0
4	337.10	29.9 QP	46.0	-16.1	1.00 H	104	41.1	-11.2
5	512.08	38.8 QP	46.0	-7.2	1.50 H	253	46.3	-7.5
6	582.08	38.9 QP	46.0	-7.1	1.50 H	249	44.8	-5.9
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	44.46	36.2 QP	40.0	-3.8	1.00 V	333	50.9	-14.7
2	154.33	30.2 QP	43.5	-13.3	1.00 V	239	43.9	-13.7
3	249.60	31.3 QP	46.0	-14.7	1.00 V	15	45.3	-14.0
4	500.42	41.9 QP	46.0	-4.1	1.50 V	186	49.8	-7.9
5	510.14	40.5 QP	46.0	-5.5	1.00 V	60	48.0	-7.5
6	584.02	34.9 QP	46.0	-11.1	1.00 V	162	40.7	-5.8

Remarks:

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

4.2 Conducted Emission Measurement

4.2.1 Limits of Conducted Emission Measurement

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

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

4.2.2 Test Instruments

Description & Manufacturer	Model No.	Serial No.	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	Feb. 26, 2016	Feb. 25, 2017
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.

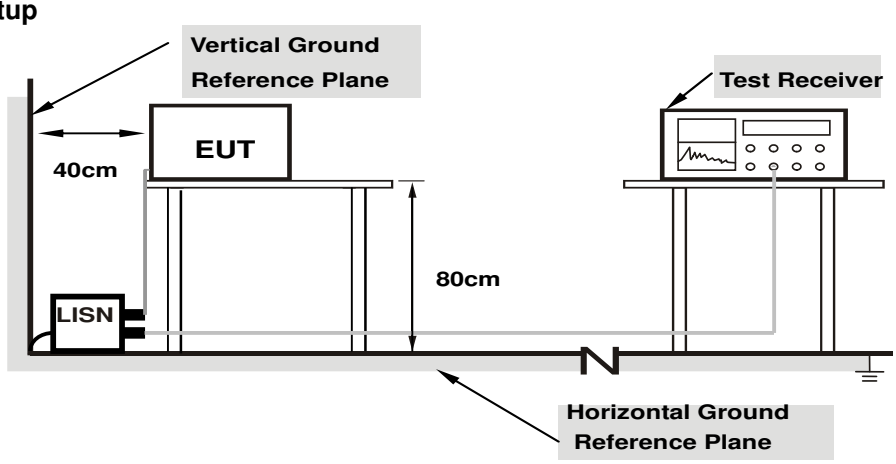
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

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

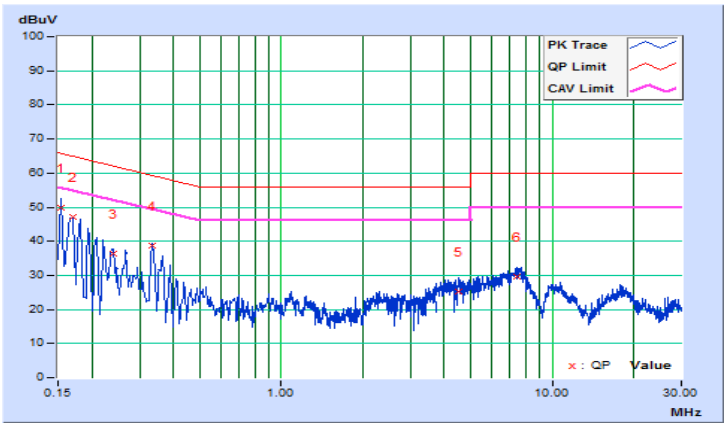
802.11a

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

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15391	10.12	39.83	25.13	49.95	35.25	65.79	55.79	-15.84	-20.54
2	0.16955	10.12	36.86	23.07	46.98	33.19	64.98	54.98	-18.00	-21.79
3	0.23993	10.15	26.38	15.09	36.53	25.24	62.10	52.10	-25.57	-26.86
4	0.33396	10.16	28.53	24.51	38.69	34.67	59.35	49.35	-20.66	-14.68
5	4.54484	10.40	14.79	6.13	25.19	16.53	56.00	46.00	-30.81	-29.47
6	7.44997	10.56	18.91	11.26	29.47	21.82	60.00	50.00	-30.53	-28.18

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.

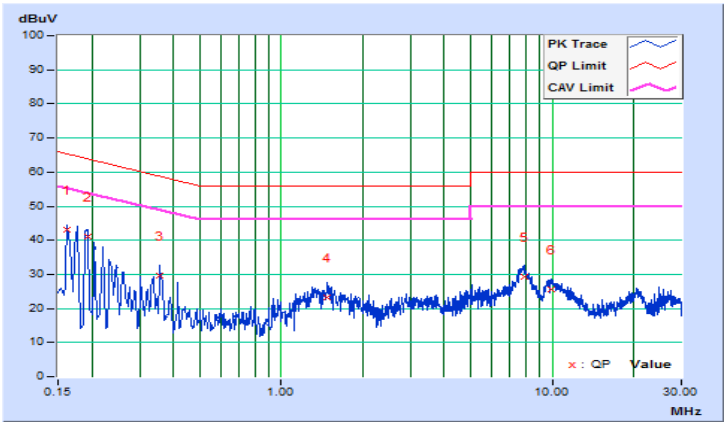


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	A		

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	0.16181	10.13	33.12	17.47	43.25	27.60	65.37	55.37	-22.12	-27.77
2	0.19255	10.15	31.01	14.60	41.16	24.75	63.93	53.93	-22.77	-29.18
3	0.35723	10.17	19.40	15.29	29.57	25.46	58.79	48.79	-29.22	-23.33
4	1.47940	10.22	13.18	5.69	23.40	15.91	56.00	46.00	-32.60	-30.09
5	7.88398	10.64	18.73	11.65	29.37	22.29	60.00	50.00	-30.63	-27.71
6	9.94846	10.77	14.97	7.82	25.74	18.59	60.00	50.00	-34.26	-31.41

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.

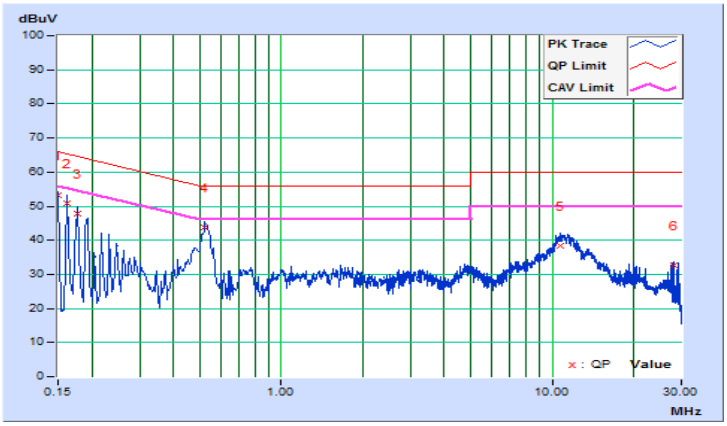


Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	B		

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	10.11	43.02	25.66	53.13	35.77	66.00	56.00	-12.87	-20.23
2	0.16173	10.12	40.76	24.23	50.88	34.35	65.37	55.37	-14.49	-21.02
3	0.17737	10.13	37.84	21.65	47.97	31.78	64.61	54.61	-16.64	-22.83
4	0.52145	10.17	33.47	27.91	43.64	38.08	56.00	46.00	-12.36	-7.92
5	10.74219	10.75	27.55	22.46	38.30	33.21	60.00	50.00	-21.70	-16.79
6	28.13387	11.89	20.69	11.83	32.58	23.72	60.00	50.00	-27.42	-26.28

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.

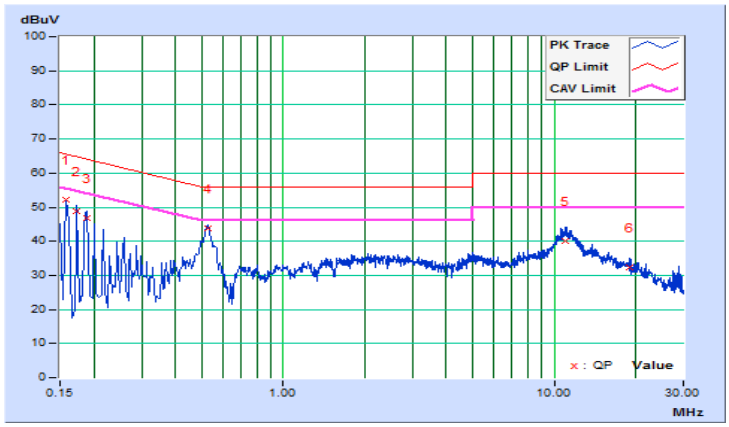


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	B		

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	0.15782	10.13	41.90	25.51	52.03	35.64	65.58	55.58	-13.55	-19.94
2	0.17346	10.14	38.77	22.53	48.91	32.67	64.79	54.79	-15.88	-22.12
3	0.18903	10.14	36.54	20.69	46.68	30.83	64.08	54.08	-17.40	-23.25
4	**0.52821**	**10.18**	**33.57**	**28.10**	**43.75**	**38.28**	**56.00**	**46.00**	**-12.25**	**-7.72**
5	11.02371	10.85	29.08	24.12	39.93	34.97	60.00	50.00	-20.07	-15.03
6	18.92973	11.48	20.93	15.22	32.41	26.70	60.00	50.00	-27.59	-23.30

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

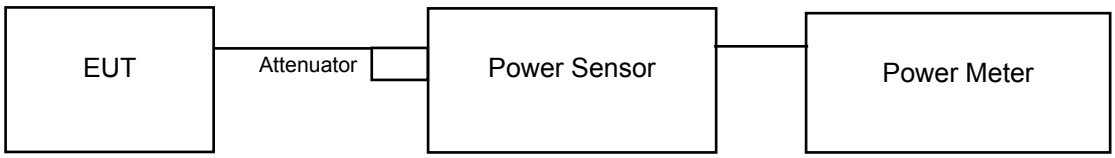
Operation Band	EUT Category		LIMIT
U-NII-1		Outdoor Access Point	1 Watt (30 dBm) (Max. e.i.r.p ≦ 125mW(21 dBm) at any elevation angle above 30 degrees as measured from the horizon)
		Fixed point-to-point Access Point	1 Watt (30 dBm)
		Indoor Access Point	1 Watt (30 dBm)
		Mobile and Portable client device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

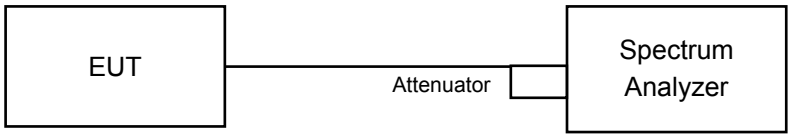
Per KDB 662911 Method of conducted output power measurement on IEEE 802.11 devices,
Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \leq 4$;
Array Gain = 0 dB (i.e., no array gain) for channel widths ≥ 40 MHz for any N_{ANT};
Array Gain = 5 log(N_{ANT}/N_{SS}) dB or 3 dB, whichever is less for 20-MHz 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

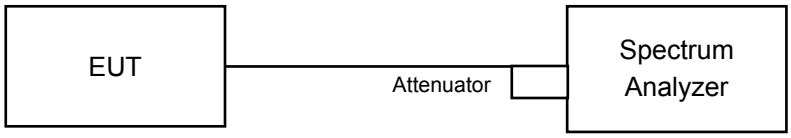
For Power Output Measurement
802.11a, 802.11n (HT20), 802.11n (HT40)



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 fromTest 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	18.17	18.09	130.032	21.14	23.16	Pass
60	5300	18.22	17.87	127.609	21.06	23.14	Pass
64	5320	18.61	18.15	137.924	21.40	23.15	Pass
100	5500	17.55	17.11	108.289	20.35	23.13	Pass
116	5580	17.61	17.45	113.267	20.54	23.14	Pass
140	5700	17.64	16.78	105.719	20.24	23.16	Pass
144	5720 For U-NII-2C	16.25	15.90	81.075	19.09	21.97	Pass
144	5720 For U-NII-3	11.14	10.83	25.108	14.00	29.31	Pass

Note:

1. U-NII-2A and U-NII-2C Band: Gain = 6.69dBi > 6dBi, so the power limit shall be reduced to “Determined Limit-(6.69-6)”.
2. U-NII-3 Band: Gain = 6.69dBi > 6dBi, so the power limit shall be reduced to 30-(6.69-6) = 29.31dBm.

* Determined Limit means compare the minimum value after 24dBm and 11 dBm+10 log(26 dB bandwidth)

Chain 0

1. 11dBm + 10log (19.38) = 23.87 < 24dBm
2. 11dBm + 10log (19.50) = 23.90 < 24dBm
3. 11dBm + 10log (19.47) = 23.89 < 24dBm
4. 11dBm + 10log (19.49) = 23.90 < 24dBm
5. 11dBm + 10log (19.46) = 23.89 < 24dBm
6. 11dBm + 10log (19.45) = 23.89 < 24dBm
7. 11dBm + 10log (5725.00 - 5710.17) = 22.71 < 24dBm

Chain 1

1. 11dBm + 10log (19.30) = 23.85 < 24dBm
2. 11dBm + 10log (19.21) = 23.83 < 24dBm
3. 11dBm + 10log (19.24) = 23.84 < 24dBm
4. 11dBm + 10log (19.16) = 23.82 < 24dBm
5. 11dBm + 10log (19.19) = 23.83 < 24dBm
6. 11dBm + 10log (19.31) = 23.85 < 24dBm
7. 11dBm + 10log (5725.00 - 5710.32) = 22.66 < 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	18.72	18.51	145.431	21.63	23.31	Pass
60	5300	18.72	18.21	140.695	21.48	23.31	Pass
64	5320	18.94	18.40	147.526	21.69	23.31	Pass
100	5500	18.19	18.02	129.304	21.12	23.31	Pass
116	5580	17.64	17.49	114.181	20.58	23.31	Pass
140	5700	18.53	17.66	129.630	21.13	23.31	Pass
144	5720 For U-NII-2C	17.14	16.76	99.185	19.96	22.15	Pass
144	5720 For U-NII-3	12.36	12.02	33.141	15.20	29.31	Pass

Note:

1. U-NII-2A and U-NII-2C Band: Gain = 6.69dBi > 6dBi, so the power limit shall be reduced to “Determined Limit-(6.69-6)”.
2. U-NII-3 Band: Gain = 6.69dBi > 6dBi, so the power limit shall be reduced to 30-(6.69-6) = 29.31dBm.

* Determined Limit means compare the minimum value after 24dBm and 11 dBm+10 log(26 dB bandwidth)

Chain 0
1. 11dBm + 10log (20.45) = 24.11 > 24dBm
2. 11dBm + 10log (20.48) = 24.11 > 24dBm
3. 11dBm + 10log (20.49) = 24.12 > 24dBm
4. 11dBm + 10log (20.48) = 24.11 > 24dBm
5. 11dBm + 10log (20.43) = 24.10 > 24dBm
6. 11dBm + 10log (20.32) = 24.08 > 24dBm
7. 11dBm + 10log (5725.00 - 5709.58) = 22.88 < 24dBm

Chain 1
1. 11dBm + 10log (20.45) = 24.11 > 24dBm
2. 11dBm + 10log (20.27) = 24.07 > 24dBm
3. 11dBm + 10log (20.33) = 24.08 > 24dBm
4. 11dBm + 10log (20.35) = 24.09 > 24dBm
5. 11dBm + 10log (20.43) = 24.10 > 24dBm
6. 11dBm + 10log (20.47) = 24.11 > 24dBm
7. 11dBm + 10log (5725.00 - 5709.69) = 22.84 < 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	20.32	19.86	**204.475**	23.11	23.31	Pass
62	5310	19.00	18.05	143.259	21.56	23.31	Pass
102	5510	19.04	18.61	152.779	21.84	23.31	Pass
110	5550	17.40	17.01	105.188	20.22	23.31	Pass
134	5670	18.48	18.04	134.149	21.28	23.31	Pass
142	5710 For U-NII-2C	19.68	19.32	178.404	22.51	23.31	Pass
142	5710 For U-NII-3	11.92	11.20	28.743	14.59	29.31	Pass

Note:

1. U-NII-2A and U-NII-2C Band: Gain = 6.69dBi > 6dBi, so the power limit shall be reduced to “Determined Limit-(6.69-6)”.
2. U-NII-3 Band: Gain = 6.69dBi > 6dBi, so the power limit shall be reduced to 30-(6.69-6) = 29.31dBm.

* Determined Limit means compare the minimum value after 24dBm and 11 dBm+10 log(26 dB bandwidth)

Chain 0

1. 11dBm + 10log (41.19) = 27.15 > 24dBm
2. 11dBm + 10log (40.91) = 27.12 > 24dBm
3. 11dBm + 10log (40.97) = 27.12 > 24dBm
4. 11dBm + 10log (40.74) = 27.10 > 24dBm
5. 11dBm + 10log (40.95) = 27.12 > 24dBm
6. 11dBm + 10log (5725.00 - 5689.17) = 26.54 > 24dBm

Chain 1

1. 11dBm + 10log (41.24) = 27.15 > 24dBm
2. 11dBm + 10log (41.16) = 27.14 > 24dBm
3. 11dBm + 10log (41.08) = 27.14 > 24dBm
4. 11dBm + 10log (40.76) = 27.10 > 24dBm
5. 11dBm + 10log (40.97) = 27.12 > 24dBm
6. 11dBm + 10log (5725.00 - 5689.20) = 26.54 > 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	17.54	17.05	107.453	20.31	23.31	Pass
106	5530	17.62	17.38	112.512	20.51	23.31	Pass
138	5690 For U-NII-2C	19.93	19.74	**192.590**	22.85	23.31	Pass
138	5690 For U-NII-3	9.61	9.59	18.240	12.61	29.31	Pass

Note:

1. U-NII-2A and U-NII-2C Band: Gain = 6.69dBi > 6dBi, so the power limit shall be reduced to “Determined Limit-(6.69-6)”.
2. U-NII-3 Band: Gain = 6.69dBi > 6dBi, so the power limit shall be reduced to 30-(6.69-6) = 29.31dBm.

* Determined Limit means compare the minimum value after 24dBm and 11 dBm+10 log(26 dB bandwidth)

Chain 0
1. 11dBm + 10log (83.96) = 30.24 > 24dBm
2. 11dBm + 10log (83.93) = 30.24 > 24dBm
3. 11dBm + 10log (5725.00 - 5648.16) = 29.86 > 24dBm

Chain 1
1. 11dBm + 10log (83.83) = 30.23 > 24dBm
2. 11dBm + 10log (83.49) = 30.22 > 24dBm
3. 11dBm + 10log (5725.00 - 5647.90) = 29.87 > 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	15.71	15.50	72.720	18.62	20.53	Pass
60	5300	15.71	15.20	70.352	18.47	20.53	Pass
64	5320	15.93	15.39	73.768	18.68	20.53	Pass
100	5500	15.18	15.01	64.657	18.11	20.53	Pass
116	5580	14.63	14.48	57.094	17.57	20.53	Pass
140	5700	15.52	14.65	64.819	18.12	20.53	Pass
144	5720 For U-NII-2C	14.13	13.75	49.596	16.95	19.37	Pass
144	5720 For U-NII-3	9.35	9.01	16.572	12.19	26.53	Pass

Note:

1. U-NII-2A and U-NII-2C Band: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + ... + 10^{GN/20})^2/2$] = 9.47dBi > 6dBi, so the power limit shall be reduced to "Determined Limit-(9.47-6)".
2. U-NII-3 Band: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + ... + 10^{GN/20})^2/2$] = 9.47dBi > 6dBi, so the power limit shall be reduced to 30-(9.47-6) = 26.53dBm.

* Determined Limit means compare the minimum value after 24dBm and 11 dBm+10 log(26 dB bandwidth)

Chain 0

1. 11dBm + 10log (20.45) = 24.11 > 24dBm
2. 11dBm + 10log (20.48) = 24.11 > 24dBm
3. 11dBm + 10log (20.49) = 24.12 > 24dBm
4. 11dBm + 10log (20.48) = 24.11 > 24dBm
5. 11dBm + 10log (20.43) = 24.10 > 24dBm
6. 11dBm + 10log (20.32) = 24.08 > 24dBm
7. 11dBm + 10log (5725.00 - 5709.58) = 22.88 < 24dBm

Chain 1

1. 11dBm + 10log (20.45) = 24.11 > 24dBm
2. 11dBm + 10log (20.27) = 24.07 > 24dBm
3. 11dBm + 10log (20.33) = 24.08 > 24dBm
4. 11dBm + 10log (20.35) = 24.09 > 24dBm
5. 11dBm + 10log (20.43) = 24.10 > 24dBm
6. 11dBm + 10log (20.47) = 24.11 > 24dBm
7. 11dBm + 10log (5725.00 - 5709.69) = 22.84 < 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	17.31	16.85	**102.244**	20.10	20.53	Pass
62	5310	15.99	15.04	71.634	18.55	20.53	Pass
102	5510	16.03	15.60	76.395	18.83	20.53	Pass
110	5550	14.39	14.00	52.598	17.21	20.53	Pass
134	5670	15.47	15.03	67.079	18.27	20.53	Pass
142	5710 For U-NII-2C	16.67	16.31	89.208	19.50	20.53	Pass
142	5710 For U-NII-3	8.91	8.19	14.372	11.58	26.53	Pass

Note:

1. U-NII-2A and U-NII-2C Band: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + ... + 10^{GN/20})^2/2$] = 9.47dBi > 6dBi, so the power limit shall be reduced to “Determined Limit-(9.47-6)”.
2. U-NII-3 Band: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + ... + 10^{GN/20})^2/2$] = 9.47dBi > 6dBi, so the power limit shall be reduced to 30-(9.47-6) = 26.53dBm.

* Determined Limit means compare the minimum value after 24dBm and 11 dBm+10 log(26 dB bandwidth)

Chain 0
1. 11dBm + 10log (41.19) = 27.15 > 24dBm
2. 11dBm + 10log (40.91) = 27.12 > 24dBm
3. 11dBm + 10log (40.97) = 27.12 > 24dBm
4. 11dBm + 10log (40.74) = 27.10 > 24dBm
5. 11dBm + 10log (40.95) = 27.12 > 24dBm
6. 11dBm + 10log (5725.00 - 5689.17) = 26.54 > 24dBm

Chain 1
1. 11dBm + 10log (41.24) = 27.15 > 24dBm
2. 11dBm + 10log (41.16) = 27.14 > 24dBm
3. 11dBm + 10log (41.08) = 27.14 > 24dBm
4. 11dBm + 10log (40.76) = 27.10 > 24dBm
5. 11dBm + 10log (40.97) = 27.12 > 24dBm
6. 11dBm + 10log (5725.00 - 5689.20) = 26.54 > 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	14.53	14.04	53.730	17.30	20.53	Pass
106	5530	14.61	14.37	56.260	17.50	20.53	Pass
138	5690 For U-NII-2C	16.92	16.73	**96.302**	19.84	20.53	Pass
138	5690 For U-NII-3	6.60	6.58	9.121	9.60	26.53	Pass

Note:

1. U-NII-2A and U-NII-2C Band: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + ... + 10^{GN/20})^2/2$] = 9.47dBi > 6dBi, so the power limit shall be reduced to “Determined Limit-(9.47-6)”.
2. U-NII-3 Band: Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + ... + 10^{GN/20})^2/2$] = 9.47dBi > 6dBi, so the power limit shall be reduced to 30-(9.47-6) = 26.53dBm.

* Determined Limit means compare the minimum value after 24dBm and 11 dBm+10 log(26 dB bandwidth)

Chain 0
1. 11dBm + 10log (83.96) = 30.24 > 24dBm
2. 11dBm + 10log (83.93) = 30.24 > 24dBm
3. 11dBm + 10log (5725.00 - 5648.16) = 29.86 > 24dBm

Chain 1
1. 11dBm + 10log (83.83) = 30.23 > 24dBm
2. 11dBm + 10log (83.49) = 30.22 > 24dBm
3. 11dBm + 10log (5725.00 - 5647.90) = 29.87 > 24dBm

26dB Bandwidth:

802.11a

Chan.	Freq. (MHz)	26dBc Bandwidth (MHz)	
		Chain 0	Chain 1
52	5260	19.38	19.30
60	5300	19.50	19.21
64	5320	19.47	19.24
100	5500	19.49	19.16
116	5580	19.46	19.19
140	5700	19.45	19.31
144	5720 For U-NII-2C	14.83	14.68
144	5720 For U-NII-3	4.57	4.57

802.11n (HT20)

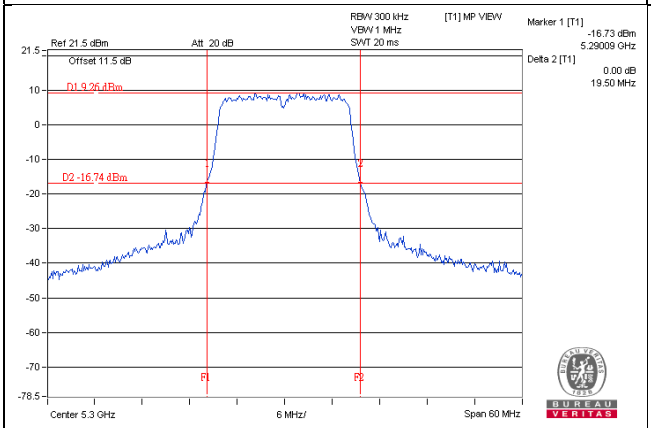
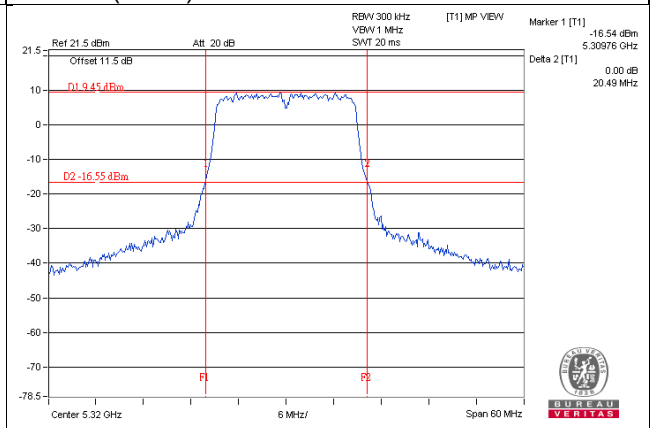
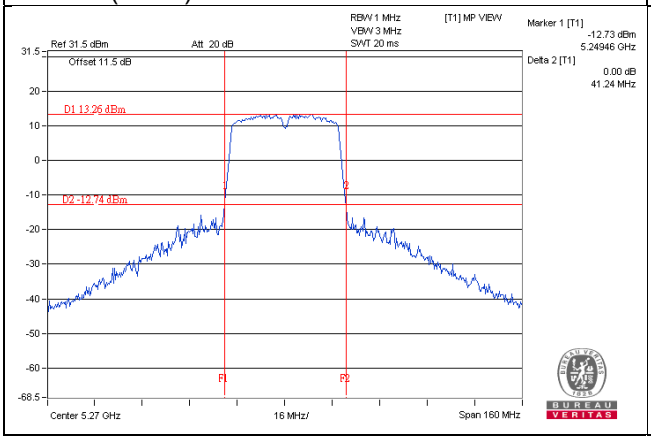
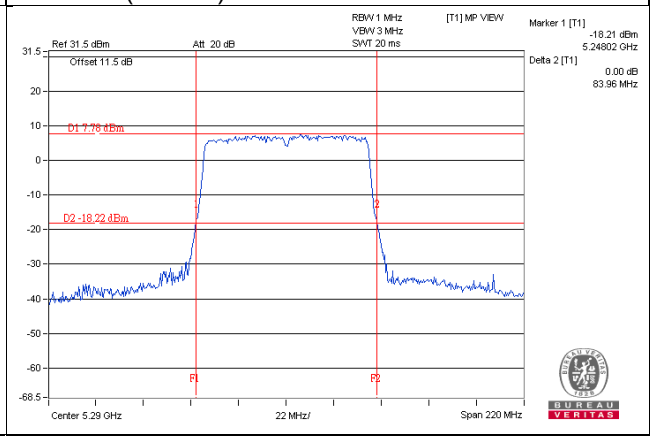
Chan.	Freq. (MHz)	26dBc Bandwidth (MHz)	
		Chain 0	Chain 1
52	5260	20.45	20.45
60	5300	20.48	20.27
64	5320	20.49	20.33
100	5500	20.48	20.35
116	5580	20.43	20.43
140	5700	20.32	20.47
144	5720 For U-NII-2C	15.42	15.31
144	5720 For U-NII-3	5.13	5.14

802.11n (HT40)

Chan.	Freq. (MHz)	26dBc Bandwidth (MHz)	
		Chain 0	Chain 1
54	5270	41.19	41.24
62	5310	40.91	41.16
102	5510	40.97	41.08
110	5550	40.74	40.76
134	5670	40.95	40.97
142	5710 For U-NII-2C	35.83	35.80
142	5710 For U-NII-3	6.01	5.53

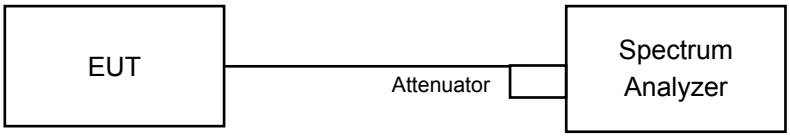
802.11ac (VHT80)

Chan.	Freq. (MHz)	26dBc Bandwidth (MHz)	
		Chain 0	Chain 1
58	5290	83.96	83.83
106	5530	83.93	83.49
138	5690 For U-NII-2C	76.84	77.10
138	5690 For U-NII-3	7.13	7.45

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

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	16.56	16.56
60	5300	16.56	16.56
64	5320	16.56	16.56
100	5500	16.56	16.56
116	5580	16.56	16.56
140	5700	16.56	16.56
144	5720 For U-NII-2C	13.40	13.28
144	5720 For U-NII-3	3.04	3.04

802.11n (HT20)

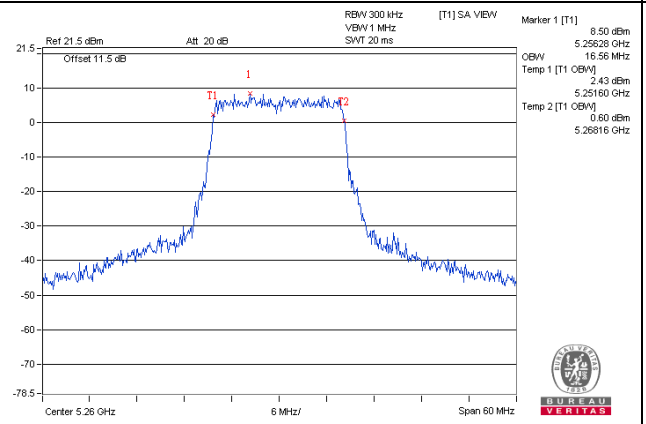
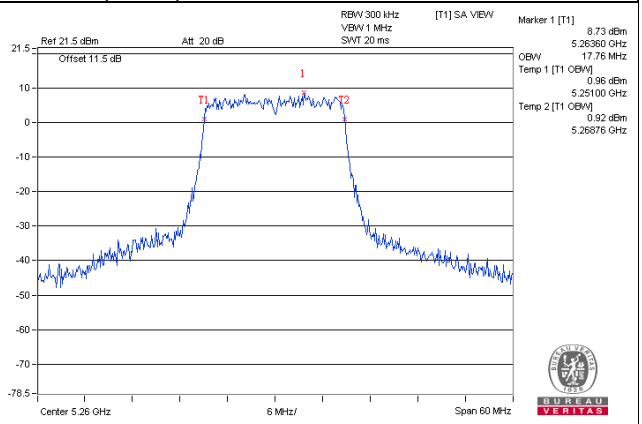
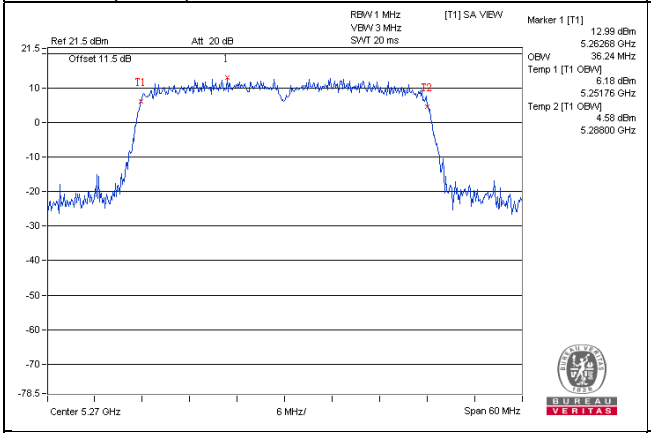
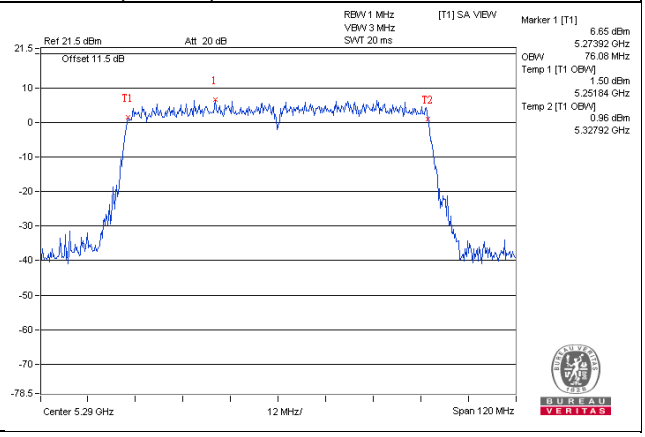
Chan.	Freq. (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
52	5260	17.76	17.76
60	5300	17.76	17.64
64	5320	17.64	17.76
100	5500	17.76	17.76
116	5580	17.76	17.76
140	5700	17.76	17.64
144	5720 For U-NII-2C	13.88	13.88
144	5720 For U-NII-3	3.64	3.64

802.11n (HT40)

Chan.	Freq. (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
54	5270	36.24	36.24
62	5310	36.24	36.24
102	5510	36.24	36.24
110	5550	36.24	36.24
134	5670	36.24	36.24
142	5710 For U-NII-2C	33.36	33.36
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	76.08	75.84
106	5530	75.60	75.84
138	5690 For U-NII-2C	73.16	73.16
138	5690 For U-NII-3	2.68	2.92

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

CDD Mode

EUT MAXIMUM CONDUCTED POWER

802.11a

Frequency Band (MHz)	Max. Power	
	Output Power (mW)	Output Power (dBm)
5250~5350	137.924	21.40
5470~5725	113.267	20.54

802.11n (HT20)

Frequency Band (MHz)	Max. Power	
	Output Power (mW)	Output Power (dBm)
5250~5350	147.526	21.69
5470~5725	129.630	21.13

802.11n (HT40)

Frequency Band (MHz)	Max. Power	
	Output Power (mW)	Output Power (dBm)
5250~5350	204.475	23.11
5470~5725	178.404	22.51

802.11ac (VHT80)

Frequency Band (MHz)	Max. Power	
	Output Power (mW)	Output Power (dBm)
5250~5350	107.453	20.31
5470~5725	192.590	22.85

Beamforming Mode

EUT MAXIMUM CONDUCTED POWER

802.11n (HT20)

Frequency Band (MHz)	Max. Power	
	Output Power (mW)	Output Power (dBm)
5250~5350	73.768	18.68
5470~5725	64.819	18.12

802.11n (HT40)

Frequency Band (MHz)	Max. Power	
	Output Power (mW)	Output Power (dBm)
5250~5350	102.244	20.10
5470~5725	89.208	19.50

802.11ac (VHT80)

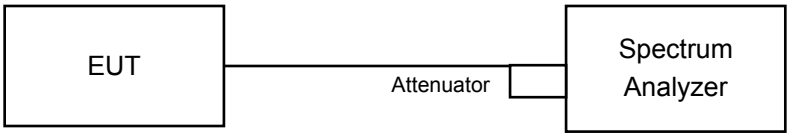
Frequency Band (MHz)	Max. Power	
	Output Power (mW)	Output Power (dBm)
5250~5350	53.730	17.30
5470~5725	96.302	19.84

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 and U-NII-2C band:
Using method SA-2

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

For U-NII-3 band:

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/300kHz)
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 Item 4.3.6.

4.5.7 Test Results

For U-NII-2A and U-NII-2C Band

802.11a

Chan.	Freq. (MHz)	PSD w/o Duty Factor (dBm)		Duty Factor (dB)	Total PSD with Duty Factor (dBm)	Max. Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
52	5260	3.76	3.62	0.31	7.02	7.53	Pass
60	5300	3.53	3.26	0.31	6.72	7.53	Pass
64	5320	3.90	3.50	0.31	7.03	7.53	Pass
100	5500	2.56	2.21	0.31	5.71	7.53	Pass
116	5580	2.97	2.83	0.31	6.23	7.53	Pass
140	5700	2.81	2.35	0.31	5.91	7.53	Pass
144	5720	3.14	2.91	0.31	6.35	7.53	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 = 10 log[$(10^{G1/20} + 10^{G2/20} + ... + 10^{GN/20})^2/2$] = 9.47dBi > 6dBi, so the power density limit shall be reduced to 11-(9.47-6) = 7.53dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11n (HT20)

Chan.	Freq. (MHz)	PSD w/o Duty Factor (dBm)		Duty Factor (dB)	Total PSD with Duty Factor (dBm)	Max. Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
52	5260	4.09	3.70	0.11	7.02	7.53	Pass
60	5300	3.95	3.51	0.11	6.86	7.53	Pass
64	5320	4.12	3.69	0.11	7.03	7.53	Pass
100	5500	3.06	3.06	0.11	6.18	7.53	Pass
116	5580	2.42	2.85	0.11	5.76	7.53	Pass
140	5700	3.81	3.15	0.11	6.61	7.53	Pass
144	5720	3.43	3.73	0.11	6.70	7.53	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 = 10 log[$(10^{G1/20} + 10^{G2/20} + ... + 10^{GN/20})^2/2$] = 9.47dBi > 6dBi, so the power density limit shall be reduced to 11-(9.47-6) = 7.53dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11n (HT40)

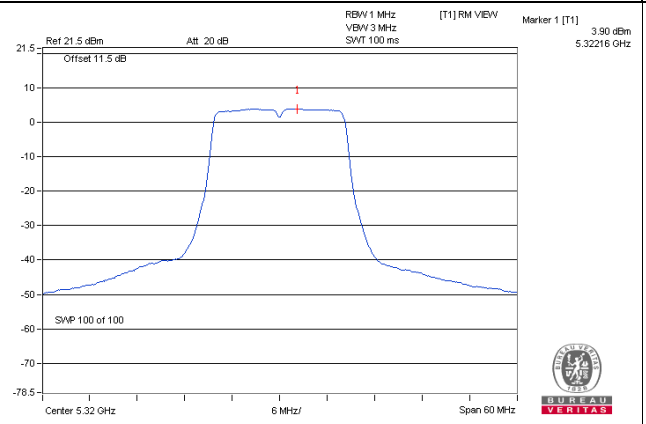
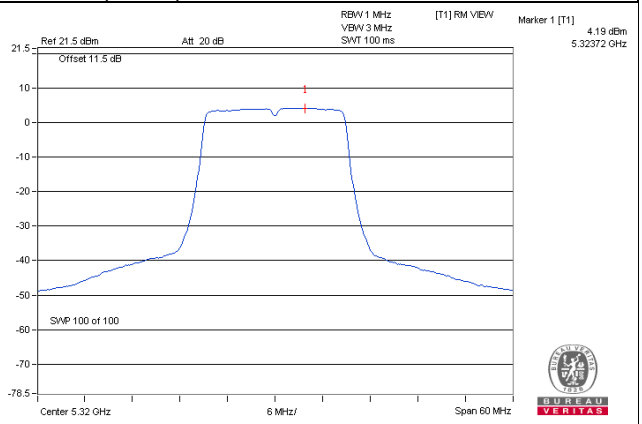
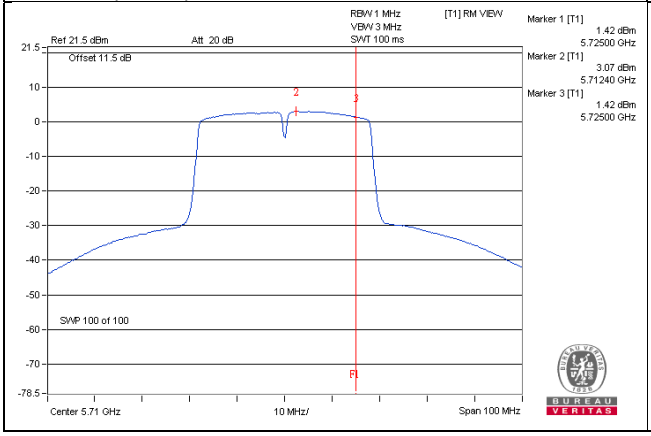
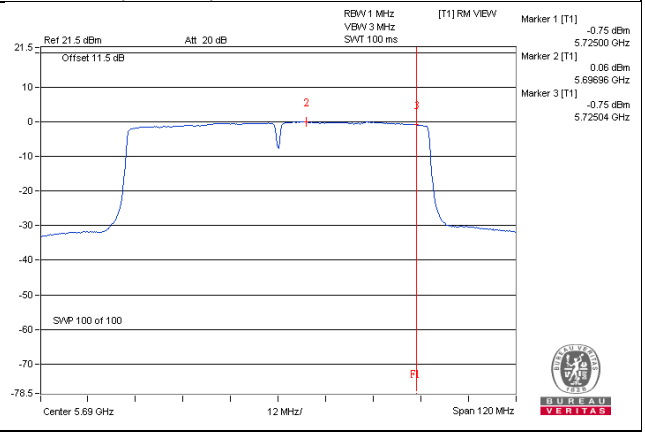
Chan.	Freq. (MHz)	PSD w/o Duty Factor (dBm)		Duty Factor (dB)	Total PSD with Duty Factor (dBm)	Max. Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
54	5270	2.86	2.34	0.24	5.86	7.53	Pass
62	5310	1.33	0.80	0.24	4.33	7.53	Pass
102	5510	1.26	0.95	0.24	4.36	7.53	Pass
110	5550	-0.35	-0.38	0.24	2.89	7.53	Pass
134	5670	0.65	0.58	0.24	3.87	7.53	Pass
142	5710	2.82	3.07	0.24	6.20	7.53	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 = 10 log[$(10^{G1/20} + 10^{G2/20} + ... + 10^{GN/20})^2/2$] = 9.47dBi > 6dBi, so the power density limit shall be reduced to 11-(9.47-6) = 7.53dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ac (VHT80)

Chan.	Freq. (MHz)	PSD w/o Duty Factor (dBm)		Duty Factor (dB)	Total PSD with Duty Factor (dBm)	Max. Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
58	5290	-3.64	-4.04	0.61	-0.21	7.53	Pass
106	5530	-3.58	-3.65	0.61	0.01	7.53	Pass
138	5690	-0.42	0.06	0.61	3.45	7.53	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 = 10 log[$(10^{G1/20} + 10^{G2/20} + ... + 10^{GN/20})^2/2$] = 9.47dBi > 6dBi, so the power density limit shall be reduced to 11-(9.47-6) = 7.53dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

Spectrum Plot of Worst Value	
802.11a / Chain 0 / CH 64	802.11n (HT20) / Chain 0 / CH 64
	
802.11n (HT40) / Chain 1 / CH 142	802.11ac (VHT80) / Chain 1 / CH 138
	

For U-NII-3 Band

802.11a

TX chain	Chan.	Freq. (MHz)	PSD w/o Duty Factor		10 log (N=2) dB	Duty Factor (dB)	Total PSD with Duty Factor (dBm/500kHz)	Limit (dBm/500 kHz)	Pass / Fail
			(dBm/300kHz)	(dBm/500kHz)					
0	144	5720	-5.23	-3.01	3.01	0.31	0.31	26.53	Pass
1	144	5720	-4.92	-2.70	3.01	0.31	0.62	26.53	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 = 10 log[$(10^{G1/20} + 10^{G2/20} + ... + 10^{GN/20})^2/2$] = 9.47dBi > 6dBi, so the power density limit shall be reduced to 30-(9.47-6) = 26.53dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11n (HT20)

TX chain	Chan.	Freq. (MHz)	PSD w/o Duty Factor		10 log (N=2) dB	Duty Factor (dB)	Total PSD with Duty Factor (dBm/500kHz)	Limit (dBm/500 kHz)	Pass / Fail
			(dBm/300kHz)	(dBm/500kHz)					
0	144	5720	-4.73	-2.51	3.01	0.11	0.61	26.53	Pass
1	144	5720	-4.33	-2.11	3.01	0.11	1.01	26.53	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 = 10 log[$(10^{G1/20} + 10^{G2/20} + ... + 10^{GN/20})^2/2$] = 9.47dBi > 6dBi, so the power density limit shall be reduced to 30-(9.47-6) = 26.53dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11n (HT40)

TX chain	Chan.	Freq. (MHz)	PSD w/o Duty Factor		10 log (N=2) dB	Duty Factor (dB)	Total PSD with Duty Factor (dBm/500kHz)	Limit (dBm/500 kHz)	Pass / Fail
			(dBm/300kHz)	(dBm/500kHz)					
0	142	5710	-7.03	-4.81	3.01	0.24	-1.56	26.53	Pass
1	142	5710	-7.03	-4.81	3.01	0.24	-1.56	26.53	Pass

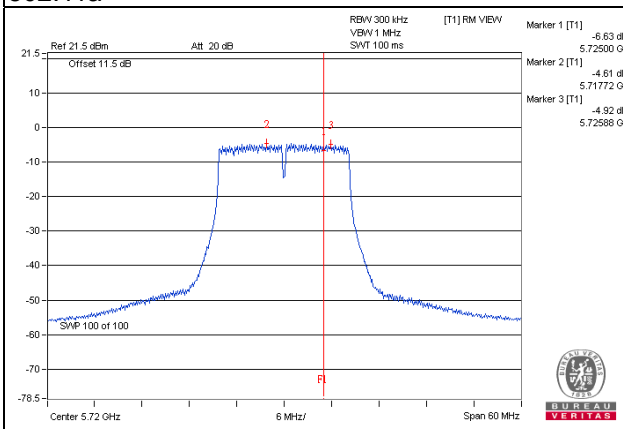
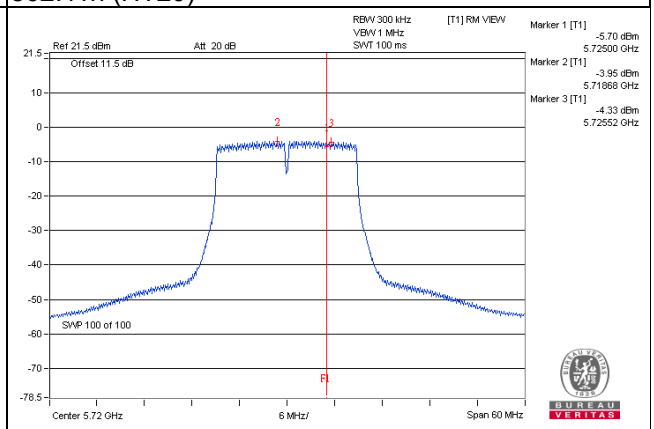
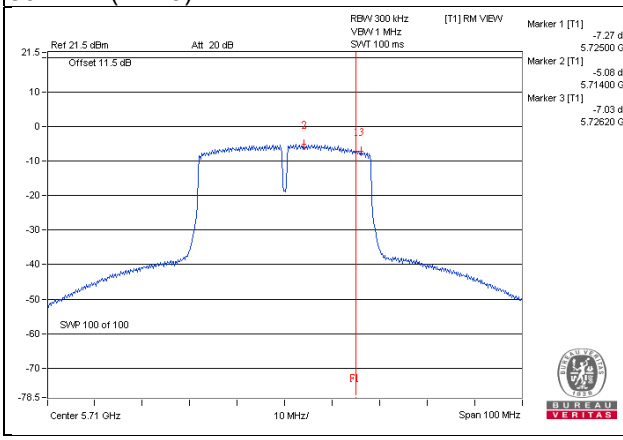
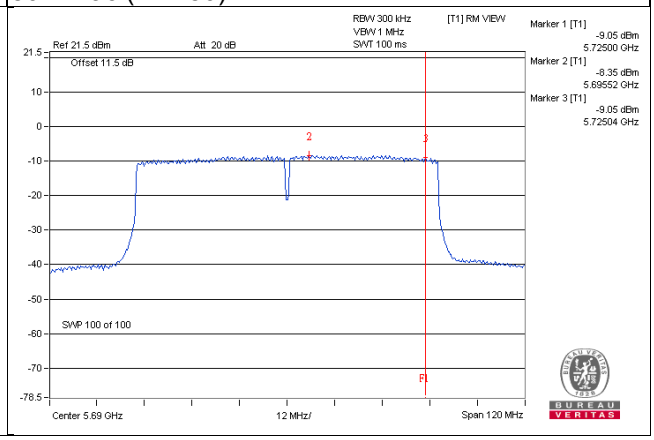
Note:
1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + ... + 10^{GN/20})^2/2$] = 9.47dBi > 6dBi, so the power density limit shall be reduced to 30-(9.47-6) = 26.53dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ac (VHT80)

TX chain	Chan.	Freq. (MHz)	PSD w/o Duty Factor		10 log (N=2) dB	Duty Factor (dB)	Total PSD with Duty Factor (dBm/500kHz)	Limit (dBm/500 kHz)	Pass / Fail
			(dBm/300kHz)	(dBm/500kHz)					
0	138	5690	-9.66	-7.44	3.01	0.61	-3.82	26.53	Pass
1	138	5690	-9.05	-6.83	3.01	0.61	-3.21	26.53	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 = 10 log[($10^{G1/20}$ + $10^{G2/20}$ + ... + $10^{GN/20}$)^2/2] = 9.47dBi > 6dBi, so the power density limit shall be reduced to 30-(9.47-6) = 26.53dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

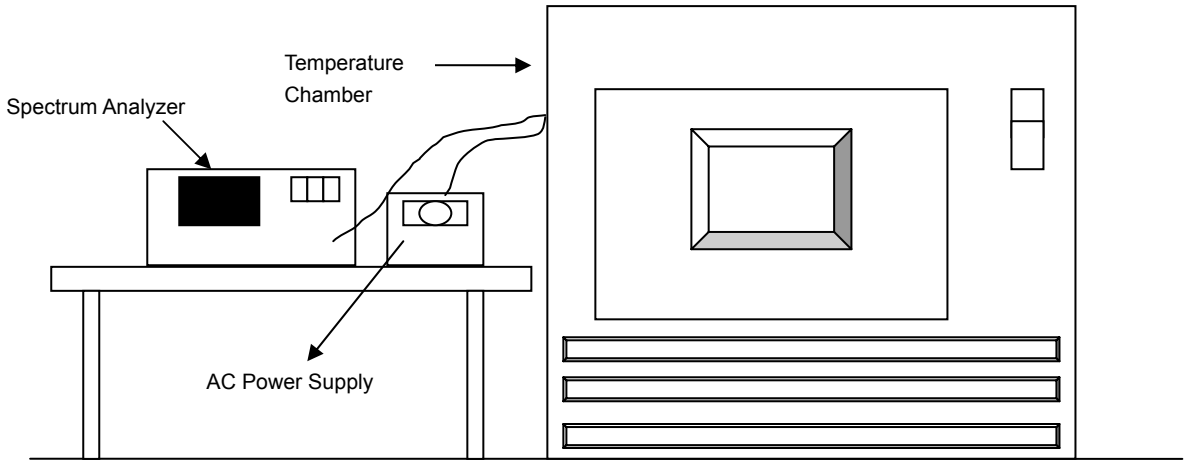
Spectrum Plot of Worst Value	
802.11a	802.11n (HT20)
	
802.11n (HT40)	802.11ac (VHT80)
	

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 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.

4.6.4 Deviation from Test Standard

No deviation.

4.6.5 EUT Operating Condition

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

4.6.6 Test Results

Frequency Stability Versus Temp.									
Operating Frequency: 5700MHz									
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	5699.9985	-0.00003	5699.9979	-0.00004	5699.9986	-0.00002	5699.9985	-0.00003
40	120	5700.0054	0.00009	5700.0007	0.00001	5700.0004	0.00001	5700.0042	0.00007
30	120	5699.9975	-0.00004	5699.9974	-0.00005	5699.9961	-0.00007	5699.9945	-0.00010
20	120	5699.9888	-0.00020	5699.9868	-0.00023	5699.9879	-0.00021	5699.9849	-0.00026
10	120	5699.9925	-0.00013	5699.9916	-0.00015	5699.9906	-0.00016	5699.9919	-0.00014
0	120	5699.9692	-0.00054	5699.9745	-0.00045	5699.9692	-0.00054	5699.9698	-0.00053
-10	120	5699.9774	-0.00040	5699.9761	-0.00042	5699.9749	-0.00044	5699.9773	-0.00040
-20	120	5700.0053	0.00009	5700.0013	0.00002	5700.001	0.00002	5700.0019	0.00003
-30	120	5699.9969	-0.00005	5699.9936	-0.00011	5699.9938	-0.00011	5699.992	-0.00014

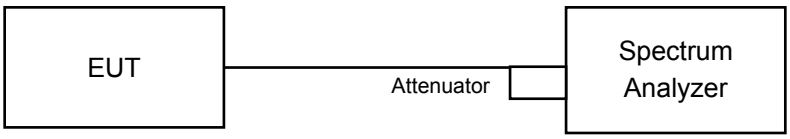
Frequency Stability Versus Voltage									
Operating Frequency: 5700MHz									
Temp. (℃)	Power Supply (Vac)	0 Minute		2 Minute		5 Minute		10 Minute	
		Measured Frequency(MHz)	Frequency Drift (%)	Measured Frequency(MHz)	Frequency Drift (%)	Measured Frequency(MHz)	Frequency Drift (%)	Measured Frequency(MHz)	Frequency Drift (%)
20	138	5699.9892	-0.00019	5699.9868	-0.00023	5699.9889	-0.00019	5699.9845	-0.00027
	120	5699.9888	-0.00020	5699.9868	-0.00023	5699.9879	-0.00021	5699.9849	-0.00026
	102	5699.9879	-0.00021	5699.9859	-0.00025	5699.9882	-0.00021	5699.9851	-0.00026

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 = average.

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	3.11	3.12	0.5	Pass

802.11n (HT20)

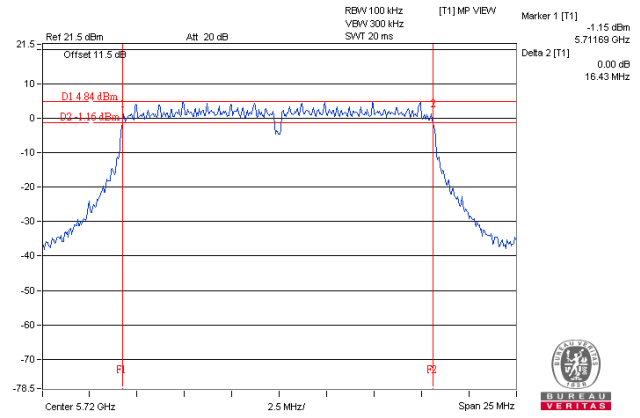
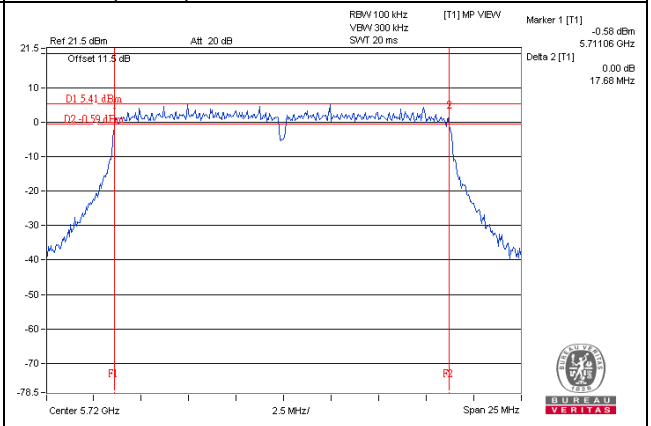
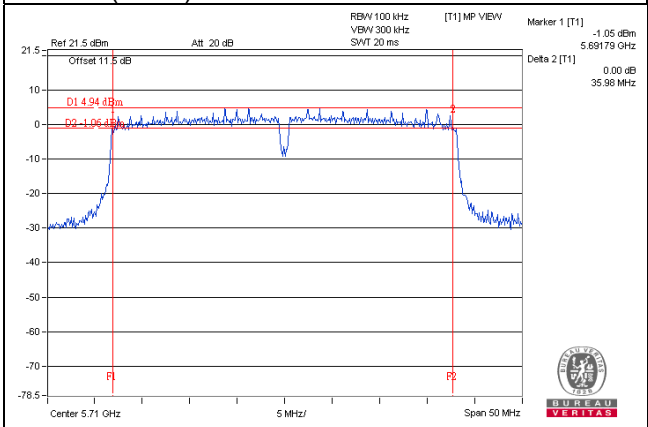
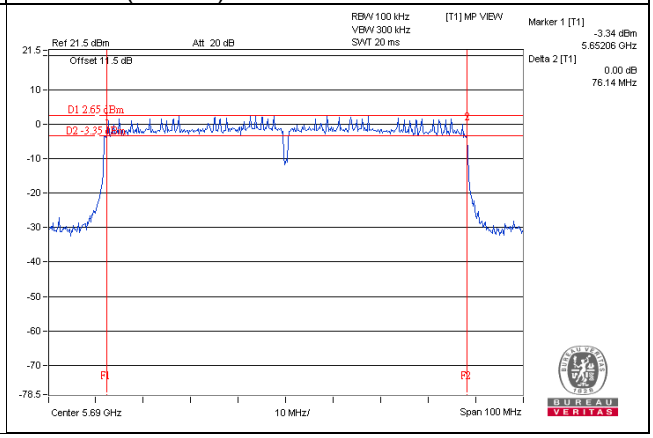
Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
144	5720	3.74	3.74	0.5	Pass

802.11n (HT40)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
142	5710	2.58	2.77	0.5	Pass

802.11ac (VHT80)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
138	5690	3.20	2.82	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 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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