FCC Test Report

Report No.:	RF170801C10B
FCC ID:	KA2WL7620APA1
Test Model:	DWL-7620AP
Received Date:	Aug. 01, 2017
Test Date:	Aug. 07 ~ Aug. 31, 2017
Issued Date:	Aug. 09, 2018
Applicant:	D-Link Corporation
Address:	17595 Mt. Herrmann, Fountain Valley, California, United States, 92708
Issued By:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
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.)
FCC Registration / Designation Number:	788550 / TW0003

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Release Control Record

Issue No.	Description	Date Issued
RF170801C10B	Original release.	Aug. 09, 2018

1 Certificate of Conformity

Product: Unified AC Tri-band PoE Access Point

Brand: D-Link Corporation

Test Model: DWL-7620AP

Sample Status: Identical Prototype

Applicant: D-Link Corporation

Test Date: Aug. 07 ~ Aug. 31, 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 RF characteristics under the conditions specified in this report.

Prepared by : Pettie Chen , **Date:** Aug. 09, 2018

Pettie Chen / Senior Specialist

Approved by : Bruce Chen , **Date:** Aug. 09, 2018

Bruce Chen / Project Engineer

2 Summary of Test Results

47 CFR FCC Part 15, Subpart E (Section 15.407)			
FCC Clause	Test Item	Result	Remarks
15.407(b)(6)	AC Power Conducted Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -6.61dB at 17.51431MHz.
15.407(b) (1/2/3/4(i/ii)/6)	Radiated Emissions & Band Edge Measurement	Pass	Meet the requirement of limit. Minimum passing margin is -0.7dB at 5725.00MHz.
15.407(a)(1/2/3)	Max Average Transmit Power	Pass	Meet the requirement of limit.
---	Occupied Bandwidth Measurement	-	Reference only.
15.407(a)(1/2/3)	Peak Power Spectral Density	Pass	Meet the requirement of limit.
15.407(g)	Frequency Stability	Pass	Meet the requirement of limit.
15.203	Antenna Requirement	Pass	Antenna connector is I-PEX 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	2.94 dB
Radiated Emissions up to 1 GHz	30MHz ~ 200MHz	3.59 dB
	200MHz ~1000MHz	3.60 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	Unified AC Tri-band PoE Access Point
Brand	D-Link Corporation
Test Model	DWL-7620AP
Sample Status	Identical Prototype
Power Supply Rating	12Vdc (From adapter) 53Vdc (From POE)
Modulation Type	256QAM, 64QAM, 16QAM, QPSK, BPSK
Modulation Technology	OFDM
Transfer Rate	802.11a: 54/48/36/24/18/12/9/6Mbps 802.11n: up to 300Mbps 802.11ac: up to 867Mbps
Operating Frequency	5260 ~ 5320MHz, 5500 ~ 5720MHz
Number of Channel	5260 ~ 5320MHz: 802.11a, 802.11n (HT20), 802.11ac (VHT20): 4 802.11n (HT40), 802.11ac (VHT40): 2 802.11ac (VHT80): 1 5500 ~ 5720MHz: 802.11a, 802.11n (HT20), 802.11ac (VHT20): 12 802.11n (HT40), 802.11ac (VHT40): 6 802.11ac (VHT80): 3
Output Power	CDD Mode: 5260 ~ 5320MHz: 250.671mW 5500 ~ 5720MHz: 244.840mW Beamforming Mode: 5260 ~ 5320MHz: 125.344mW 5500 ~ 5720MHz: 122.429mW
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	Adapter
Cable Supplied	NA

Note:

1. This report is prepared for FCC class II permissive change. The difference compared with the original report (BV CPS report no.: RF170801C10-1) 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.

Band	Modulation Mode	Beamforming Mode	TX Function	Remark
5GHz	802.11a	Not Support	2TX	Radio 1 (Band 1, 2), Radio 2 (Band 3, 4)
	802.11n (HT20)	Support	2TX	
	802.11n (HT40)	Support	2TX	
	802.11ac (VHT20)	Support	2TX	
	802.11ac (VHT40)	Support	2TX	
	802.11ac (VHT80)	Support	2TX	

* The modulation and bandwidth are similar for 802.11n mode for 20MHz/40MHz and 802.11ac mode for 20MHz/40MHz, therefore investigated worst case to representative mode in test report. (Final test mode refer section 3.2.1)
* For 802.11n and 802.11ac, CDD mode and Beamforming mode are presented in power output test item. For other test items, CDD mode is the worst case for final tests after pretesting.

3. The EUT uses following antennas.

Type	Connector	Gain (dBi)
		5GHz
PIFA	I-PEX	4.3

4. The EUT consumes power from the following Adapter and PoE.

Adapter 1	
Brand	Channel Well Technology
Model	2ABL030F US
Input Power	100-240Vac~1.0A
Output Power	12Vdc / 2.5A
Power Cord	1.2m non-shielded power cord without core

Adapter 2	
Brand	Asian Power Devices Inc.
Model	WA-30J12R
Input Power	100-240Vac~0.9A, 50-60Hz
Output Power	12Vdc / 2.5A
Power Cord	0.5m non-shielded power cord without core

PoE (Support unit only)	
Brand	D-Link
Model	DGS-1210-10P
Input Power	100-240Vac
Output Power	53Vdc

5. 2.4GHz & 5GHz technology can transmit at same time.
6. The above EUT information is declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or user's manual.

3.2 Description of Test Modes

5260~5320MHz:

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

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

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

Channel	Frequency	Channel	Frequency
54	5270 MHz	62	5310 MHz

1 channel is provided for 802.11ac (VHT80):

Channel	Frequency
58	5290MHz

5500~5720MHz:

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

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

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

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

3 channels are provided for 802.11ac (VHT80):

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

3.2.1 Test Mode Applicability and Tested Channel Detail

EUT Configure Mode	Applicable to				Description
	RE≥1G	RE<1G	PLC	APCM	
A	√	√	√	√	Power from adapter 1
B	-	√	√	-	Power from adapter 2
C	-	√	√	-	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 **Z-plane**.
2. "-" means no effect.

Radiated Emission Test (Above 1GHz):

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

EUT Configure Mode	Mode	Frequency Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Data Rate (Mbps)
A	802.11a	5260-5320	52 to 64	52, 60, 64	OFDM	6.0
	802.11n (HT20)		52 to 64	52, 60, 64	OFDM	6.5
	802.11n (HT40)		54 to 62	54, 62	OFDM	13.5
	802.11ac (VHT80)		58	58	OFDM	58.5
A	802.11a	5500-5720	100 to 144	100, 116, 140, 144	OFDM	6.0
	802.11n (HT20)		100 to 144	100, 116, 140, 144	OFDM	6.5
	802.11n (HT40)		102 to 142	102, 110, 134, 142	OFDM	13.5
	802.11ac (VHT80)		106 to 138	106, 122, 138	OFDM	58.5

Radiated Emission Test (Below 1GHz):

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

EUT Configure Mode	Mode	Frequency Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Data Rate (Mbps)
A, B, C	802.11a	5260-5320	52 to 64	116	OFDM	6.0
	802.11a	5500-5720	100 to 144		OFDM	6.0

Power Line Conducted Emission Test:

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

EUT Configure Mode	Mode	Frequency Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Data Rate (Mbps)
A, B, C	802.11a	5260-5320	52 to 64	116	OFDM	6.0
	802.11a	5500-5720	100 to 144		OFDM	6.0

Transmit Power Measurement:

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

EUT Configure Mode	Mode	Frequency Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Data Rate (Mbps)
CDD Mode						
A	802.11a	5260-5320	52 to 64	52, 60, 64	OFDM	6.0
	802.11n (HT20)		52 to 64	52, 60, 64	OFDM	6.5
	802.11n (HT40)		54 to 62	54, 62	OFDM	13.5
	802.11ac (VHT80)		58	58	OFDM	58.5
A	802.11a	5500-5720	100 to 144	100, 116, 140, 144	OFDM	6.0
	802.11n (HT20)		100 to 144	100, 116, 140, 144	OFDM	6.5
	802.11n (HT40)		102 to 142	102, 110, 134, 142	OFDM	13.5
	802.11ac (VHT80)		106 to 138	106, 122, 138	OFDM	58.5
Beamforming Mode						
A	802.11n (HT20)	5260-5320	52 to 64	52, 60, 64	OFDM	6.5
	802.11n (HT40)		54 to 62	54, 62	OFDM	13.5
	802.11ac (VHT80)		58	58	OFDM	58.5
A	802.11n (HT20)	5500-5720	100 to 144	100, 116, 140, 144	OFDM	6.5
	802.11n (HT40)		102 to 142	102, 110, 134, 142	OFDM	13.5
	802.11ac (VHT80)		106 to 138	106, 122, 138	OFDM	58.5

Peak Power Spectral Density, Bandwidth and Frequency Stability Measurement:

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

EUT Configure Mode	Mode	Frequency Band (MHz)	Available Channel	Tested Channel	Modulation Technology	Data Rate (Mbps)
A	802.11a	5260-5320	52 to 64	52, 60, 64	OFDM	6.0
	802.11n (HT20)		52 to 64	52, 60, 64	OFDM	6.5
	802.11n (HT40)		54 to 62	54, 62	OFDM	13.5
	802.11ac (VHT80)		58	58	OFDM	58.5
A	802.11a	5500-5720	100 to 144	100, 116, 140, 144	OFDM	6.0
	802.11n (HT20)		100 to 144	100, 116, 140, 144	OFDM	6.5
	802.11n (HT40)		102 to 142	102, 110, 134, 142	OFDM	13.5
	802.11ac (VHT80)		106 to 138	106, 122, 138	OFDM	58.5

Test Condition:

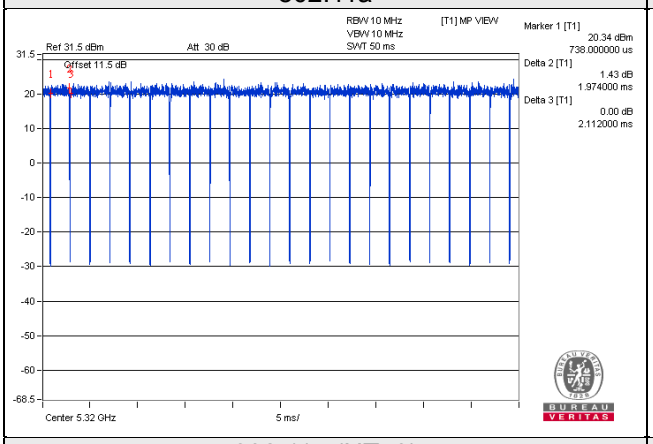
Applicable to	Environmental Conditions	Input Power	Tested by
RE≥1G	25 deg. C, 66% RH	120Vac, 60Hz	James Yang
RE<1G	25 deg. C, 65% RH	120Vac, 60Hz 53Vdc	James Yang
PLC	23 deg. C, 64% RH	120Vac, 60Hz 53Vdc	Willy Cheng
APCM	25 deg. C, 60% RH	120Vac, 60Hz	Frank Liu Ted Chang

3.3 Duty Cycle of Test Signal

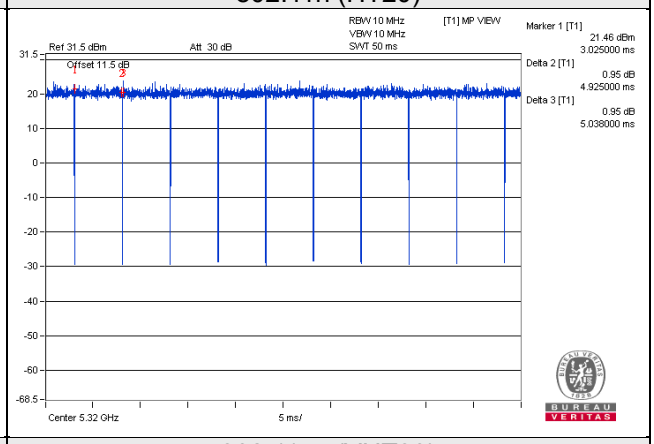
Duty cycle of test signal is > 98%, duty factor is not required
Duty cycle of test signal is < 98 %, duty factor is required

802.11a: Duty cycle = 1.974/2.112 = 0.935, Duty factor = 10 * log(1/0.935) = 0.29
802.11n (HT20): Duty cycle = 4.925/5.038 = 0.978, Duty factor = 10 * log(1/0.978) = 0.10
802.11n (HT40): Duty cycle = 2.337/2.487 = 0.940, Duty factor = 10 * log(1/0.94) = 0.27
802.11ac (VHT80): Duty cycle = 1.115/1.22 = 0.914, Duty factor = 10 * log(1/0.914) = 0.39

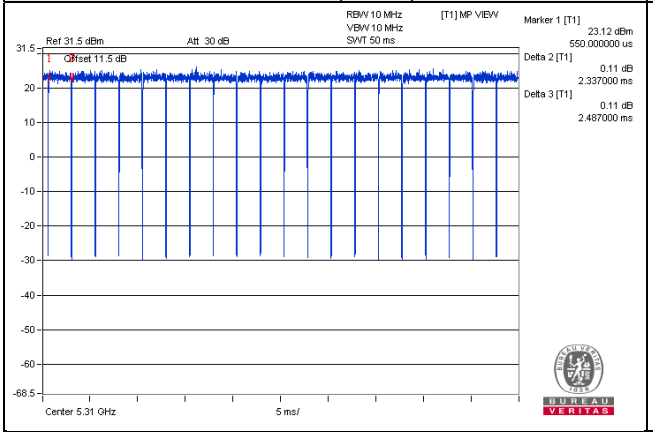
802.11a



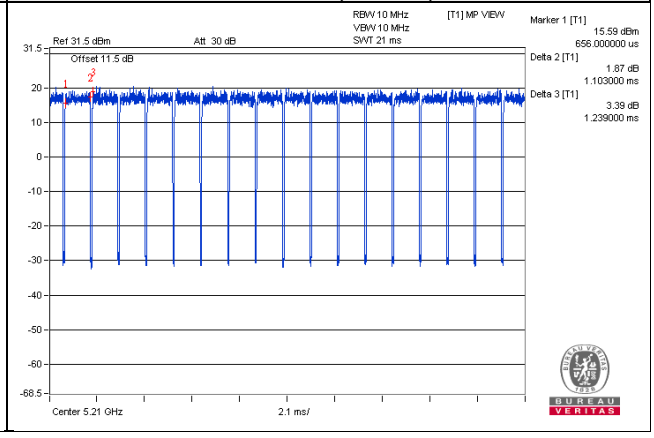
802.11n (HT20)



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	Lenovo	X201i	NA	FCC DoC Approved	Provided by manufacturer
B.	Load	NA	NA	NA	NA	-
C.	PoE	D-Link	DGS-1210-10P	NA	NA	Provided by manufacturer

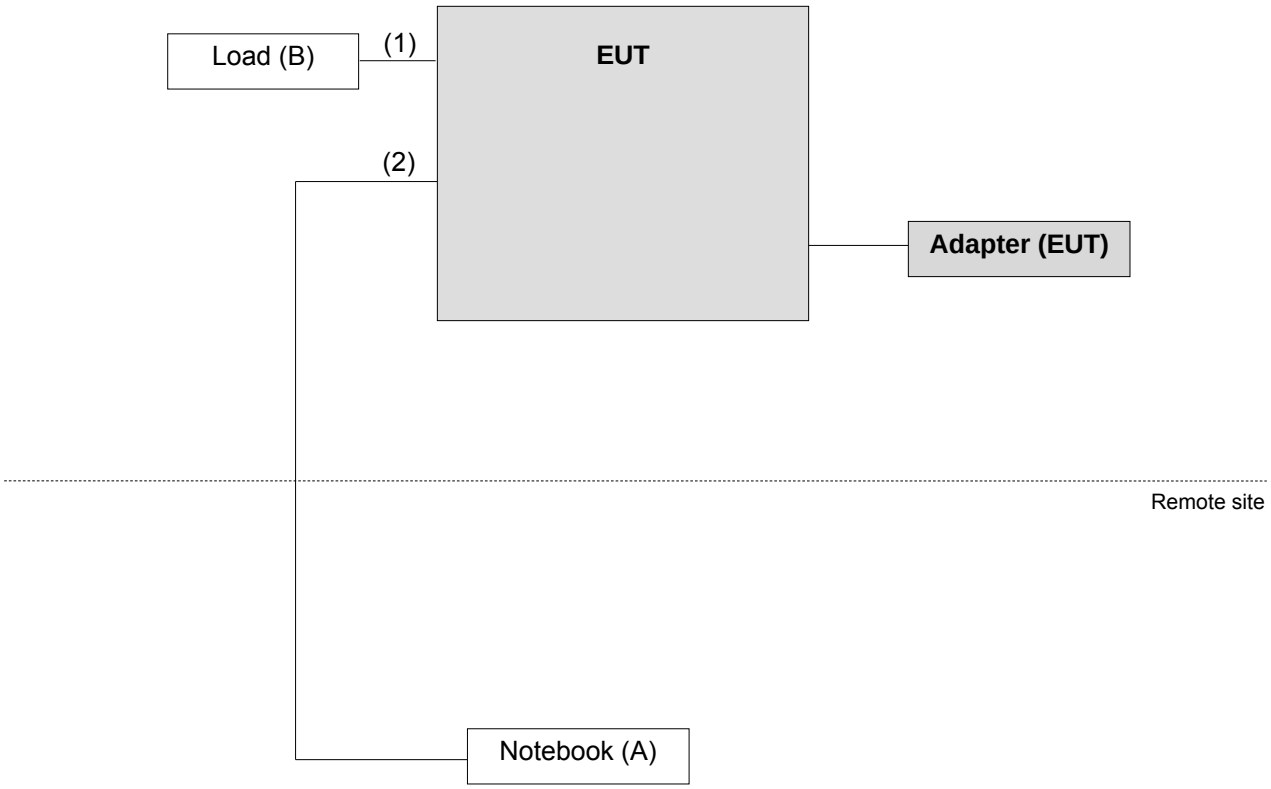
Note:

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

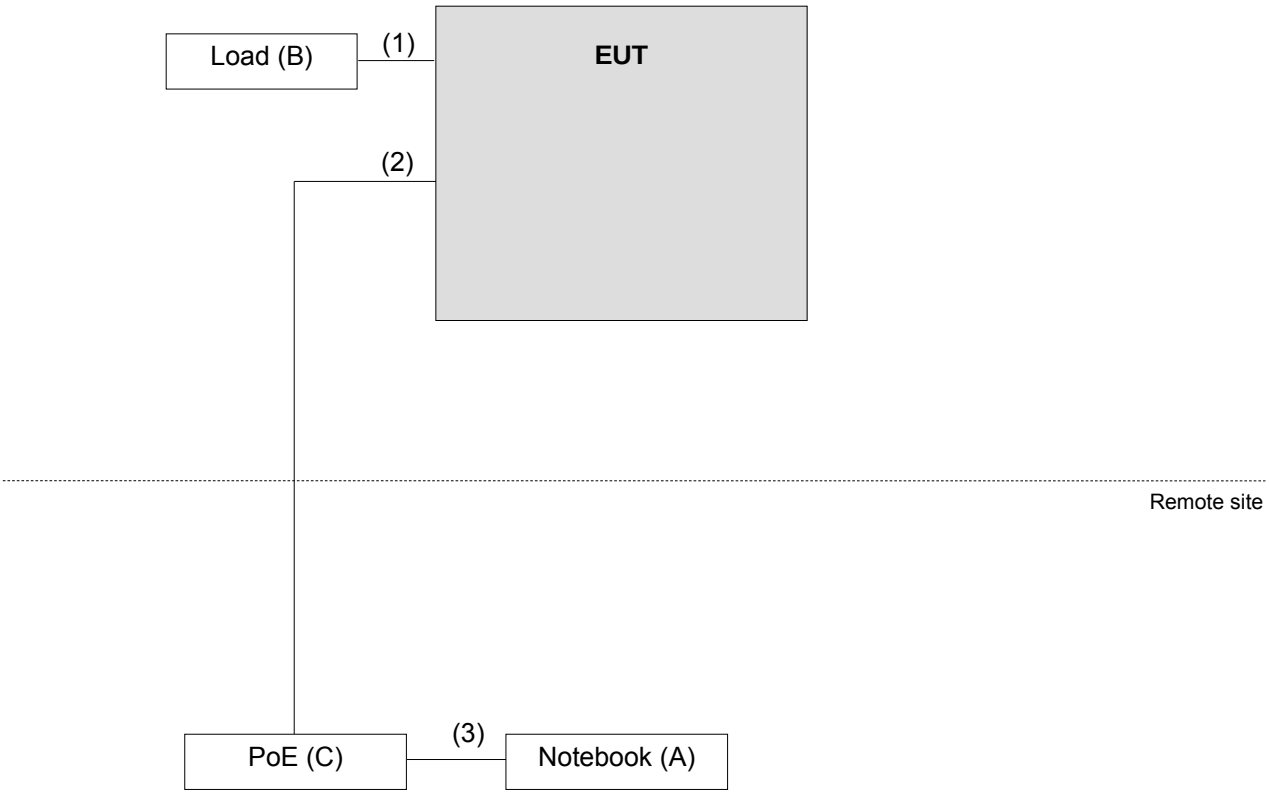
ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	RJ45, Cat5e	2	1.6	N	0	-
2.	RJ45, Cat5e	1	10	N	0	-
3.	RJ45, Cat5e	1	1.8	N	0	-

3.4.1 Configuration of System under Test

Test Mode A, B



Test Mode C



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

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

4 Test Types and Results

4.1 Radiated Emission and Bandedge Measurement

4.1.1 Limits of Radiated Emission and Bandedge Measurement

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

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

Note:

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

Limits of unwanted emission out of the restricted bands

<table>
<tr><td colspan="3">Applicable To</td><td colspan="2">Limit</td></tr>
<tr><td colspan="3" rowspan="2">789033 D02 General UNII Test Procedure New Rules v02r01</td><td colspan="2">Field Strength at 3m</td></tr>
<tr><td>PK: 74 (dBμV/m)</td><td>AV: 54 (dBμV/m)</td></tr>
<tr><td>Frequency Band</td><td colspan="2">Applicable To</td><td>EIRP Limit</td><td>Equivalent Field Strength at 3m</td></tr>
<tr><td>5150~5250 MHz</td><td colspan="2">15.407(b)(1)</td><td rowspan="3">PK: -27 (dBm/MHz)</td><td rowspan="3">PK: 68.2(dBμV/m)</td></tr>
<tr><td>5250~5350 MHz</td><td colspan="2">15.407(b)(2)</td></tr>
<tr><td>5470~5725 MHz</td><td colspan="2">15.407(b)(3)</td></tr>
<tr><td rowspan="2">5725~5850 MHz</td><td>☒</td><td>15.407(b)(4)(i)</td><td>PK: -27 (dBm/MHz) *1
PK: 10 (dBm/MHz) *2
PK: 15.6 (dBm/MHz) *3
PK: 27 (dBm/MHz) *4</td><td>PK: 68.2(dBμV/m) *1
PK: 105.2 (dBμV/m) *2
PK: 110.8(dBμV/m) *3
PK: 122.2 (dBμV/m) *4</td></tr>
<tr><td>☐</td><td>15.407(b)(4)(ii)</td><td colspan="2">Emission limits in section 15.247(d)</td></tr>
<tr><td colspan="5">*1 beyond 75 MHz or more above of the band edge.
*2 below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above.
*3 below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above.
*4 from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.</td></tr>
</table>

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

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

4.1.2 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Test Receiver KEYSIGHT	N9038A	MY55420137	Mar. 27, 2017	Mar. 26, 2018
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100269	May. 11, 2017	May. 10, 2018
BILOG Antenna SCHWARZBECK	VULB9168	9168-148	Dec. 28, 2016	Dec. 27, 2017
HORN Antenna SCHWARZBECK	BBHA 9120 D	9120D-1169	Dec. 27, 2016	Dec. 26, 2017
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170241	Dec. 14, 2016	Dec. 13, 2017
Loop Antenna TESEQ	HLA 6121	45745	May 19, 2017	May 18, 2018
Preamplifier Agilent	8449B	3008A01638	Feb. 22, 2017	Feb. 21, 2018
Preamplifier Agilent	8447D	2944A10638	Aug. 08, 2016	Aug. 07, 2017
			Aug. 08, 2017	Aug. 07, 2018
RF signal cable HUBER+SUHNER	SUCOFLEX 104	CABLE-CH9-02 (248780+MY13377)	Aug. 09, 2016	Aug. 08, 2017
			Aug. 08, 2017	Aug. 07, 2018
RF signal cable HUBER+SUHNER	SUCOFLEX 104	CABLE-CH9-(250795 /4)	Aug. 09, 2016	Aug. 08, 2017
			Aug. 08, 2017	Aug. 07, 2018
RF signal cable Woken	8D-FB	Cable-CH9-01	Aug. 01, 2017	Jul. 31, 2018
Software BV ADT	ADT_Radiated_ V7.6.15.9.4	NA	NA	NA
Antenna Tower EMCO	2070/2080	512.835.4684	NA	NA
Turn Table EMCO	2087-2.03	NA	NA	NA
Antenna Tower &Turn BV ADT	AT100	AT93021705	NA	NA
Turn Table BV ADT	TT100	TT93021705	NA	NA
Turn Table Controller BV ADT	SC100	SC93021705	NA	NA
High Speed Peak Power Meter	ML2495A	1145013	Mar. 07, 2017	Mar. 06, 2018
Power Sensor	MA2411B	1126085	Mar. 07, 2017	Mar. 06, 2018
26GHz ~ 40GHz Amplifier	EM26400	815221	Oct. 17, 2016	Oct. 16, 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 9.
3. The horn antenna and preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
4. The FCC Designation Number is TW0003. The number will be varied with the Lab location and scope as attached.
5. The IC Site Registration No. is IC 7450F-9.

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

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

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

Note:

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

For Radiated emission above 30MHz

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

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

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

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

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

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

Note:

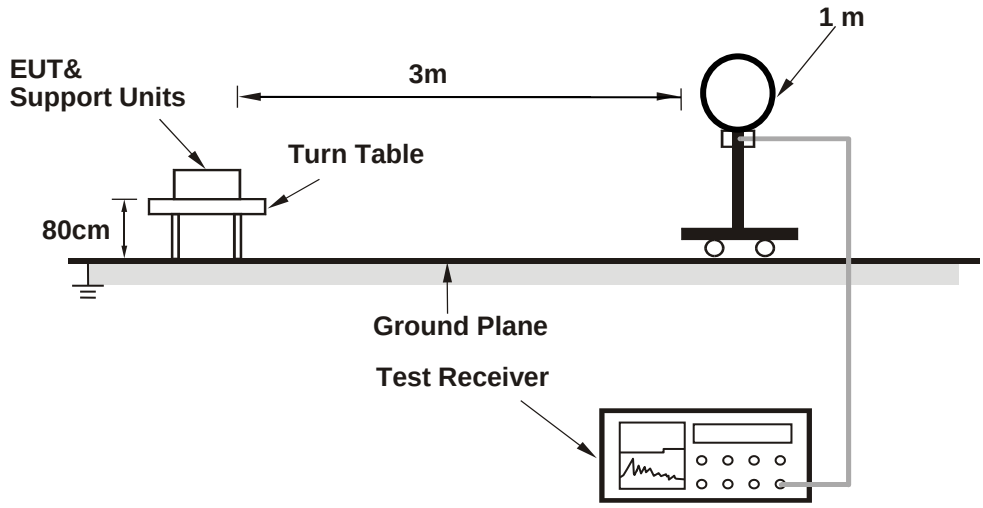
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.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

4.1.4 Deviation from Test Standard

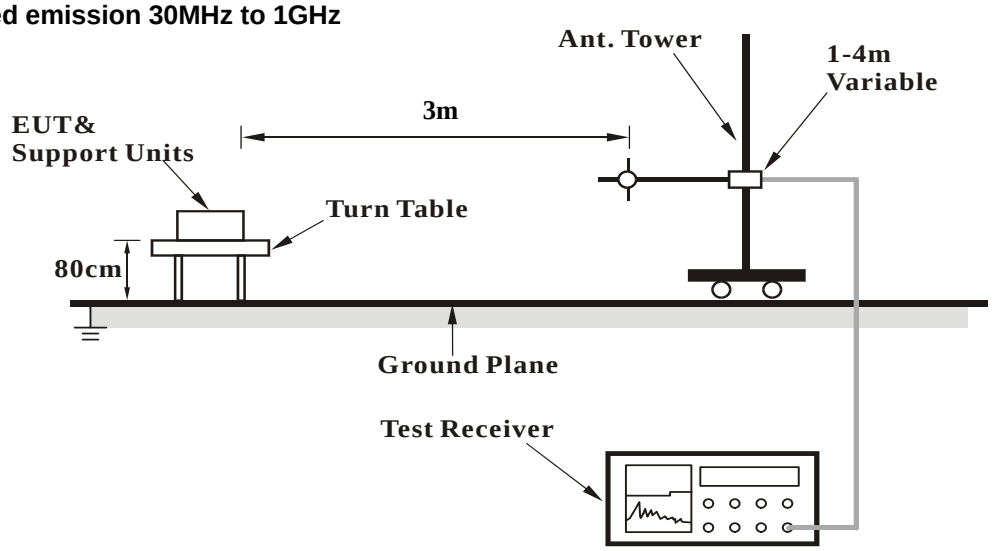
No deviation.

4.1.5 Test Setup

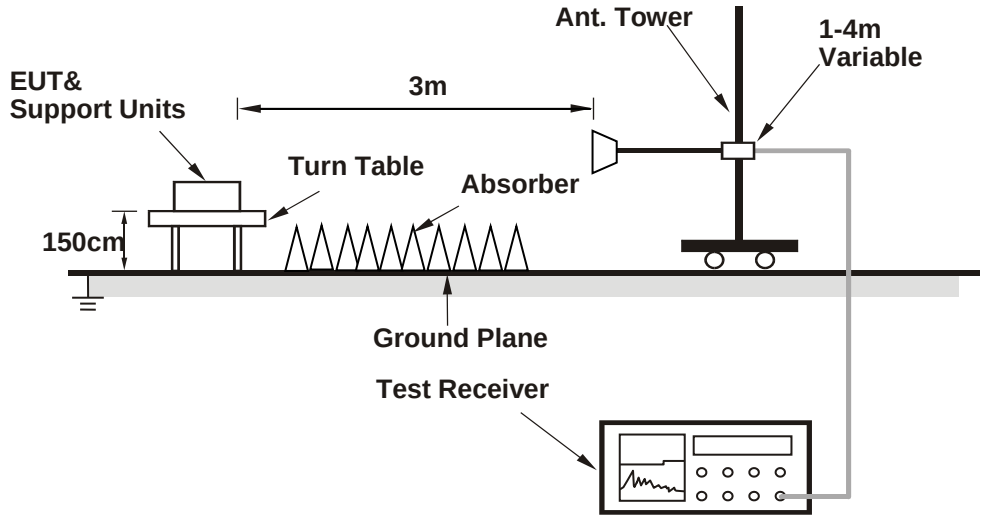
For Radiated emission below 30MHz



For Radiated emission 30MHz to 1GHz



For Radiated emission above 1GHz



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

4.1.6 EUT Operating Conditions

a. Placed the EUT on the testing table.
b. Prepared a notebook to act as a communication partner and placed it outside of testing area.
c. The communication partner connected with EUT via a RJ45 cable and ran a test program (QRCT) to enable EUT under transmission condition continuously at specific channel frequency.
d. The necessary accessories enable the system in full functions.

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	58.1 PK	74.0	-15.9	2.97 H	82	54.2	3.9
2	5150.00	43.9 AV	54.0	-10.1	2.97 H	82	40.0	3.9
3	*5260.00	119.1 PK			3.61 H	54	78.2	40.9
4	*5260.00	108.9 AV			3.61 H	54	68.0	40.9
5	#10520.00	56.4 PK	74.0	-17.6	1.24 H	206	42.2	14.2
6	#10520.00	43.4 AV	54.0	-10.6	1.24 H	206	29.2	14.2
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	56.9 PK	74.0	-17.1	1.24 V	345	53.0	3.9
2	5150.00	43.8 AV	54.0	-10.2	1.24 V	345	39.9	3.9
3	*5260.00	113.2 PK			1.13 V	325	72.3	40.9
4	*5260.00	103.5 AV			1.13 V	325	62.6	40.9
5	#10520.00	56.0 PK	74.0	-18.0	2.77 V	263	41.8	14.2
6	#10520.00	42.5 AV	54.0	-11.5	2.77 V	263	28.3	14.2

Remarks:

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

CHANNEL	TX Channel 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	117.1 PK			3.45 H	40	76.1	41.0
2	*5300.00	106.7 AV			3.45 H	40	65.7	41.0
3	10600.00	57.3 PK	74.0	-16.7	1.63 H	146	42.6	14.7
4	10600.00	44.6 AV	54.0	-9.4	1.63 H	146	29.9	14.7
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5300.00	111.3 PK			1.33 V	331	70.3	41.0
2	*5300.00	101.8 AV			1.33 V	331	60.8	41.0
3	10600.00	56.9 PK	74.0	-17.1	2.43 V	48	42.2	14.7
4	10600.00	43.3 AV	54.0	-10.7	2.43 V	48	28.6	14.7

Remarks:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5320.00	117.1 PK			3.34 H	59	76.1	41.0
2	*5320.00	107.0 AV			3.34 H	59	66.0	41.0
3	5350.00	62.8 PK	74.0	-11.2	3.28 H	25	58.4	4.4
4	5350.00	47.9 AV	54.0	-6.1	3.28 H	25	43.5	4.4
5	10640.00	57.1 PK	74.0	-16.9	2.31 H	283	42.4	14.7
6	10640.00	44.3 AV	54.0	-9.7	2.31 H	283	29.6	14.7
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5320.00	111.7 PK			1.38 V	331	70.7	41.0
2	*5320.00	101.8 AV			1.38 V	331	60.8	41.0
3	5350.00	60.3 PK	74.0	-13.7	1.43 V	34	55.9	4.4
4	5350.00	46.0 AV	54.0	-8.0	1.43 V	34	41.6	4.4
5	10640.00	57.7 PK	74.0	-16.3	2.45 V	304	43.0	14.7
6	10640.00	45.0 AV	54.0	-9.0	2.45 V	304	30.3	14.7

Remarks:

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

CHANNEL	TX Channel 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	59.1 PK	74.0	-14.9	2.83 H	340	54.7	4.4
2	5460.00	46.1 AV	54.0	-7.9	2.83 H	340	41.7	4.4
3	#5470.00	60.1 PK	74.0	-13.9	2.86 H	335	55.6	4.5
4	#5470.00	47.3 AV	54.0	-6.7	2.86 H	335	42.8	4.5
5	*5500.00	113.1 PK			2.97 H	336	71.8	41.3
6	*5500.00	102.3 AV			2.97 H	336	61.0	41.3
7	11000.00	58.0 PK	74.0	-16.0	1.43 H	256	42.0	16.0
8	11000.00	44.7 AV	54.0	-9.3	1.43 H	256	28.7	16.0
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	5460.00	61.4 PK	74.0	-12.6	2.72 V	146	57.0	4.4
2	5460.00	48.7 AV	54.0	-5.3	2.72 V	146	44.3	4.4
3	#5470.00	63.4 PK	74.0	-10.6	3.18 V	166	58.9	4.5
4	#5470.00	50.1 AV	54.0	-3.9	3.18 V	166	45.6	4.5
5	*5500.00	117.4 PK			3.16 V	164	76.1	41.3
6	*5500.00	107.4 AV			3.16 V	164	66.1	41.3
7	11000.00	61.9 PK	74.0	-12.1	1.16 V	88	45.9	16.0
8	11000.00	48.8 AV	54.0	-5.2	1.16 V	88	32.8	16.0

Remarks:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5580.00	112.0 PK			2.10 H	336	70.5	41.5
2	*5580.00	101.7 AV			2.10 H	336	60.2	41.5
3	11160.00	59.5 PK	74.0	-14.5	2.12 H	185	44.0	15.5
4	11160.00	45.1 AV	54.0	-8.9	2.12 H	185	29.6	15.5
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	119.0 PK			2.81 V	149	77.5	41.5
2	*5580.00	108.4 AV			2.81 V	149	66.9	41.5
3	11160.00	62.4 PK	74.0	-11.6	1.22 V	92	46.9	15.5
4	11160.00	49.3 AV	54.0	-4.7	1.22 V	92	33.8	15.5

Remarks:

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

CHANNEL	TX Channel 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	111.2 PK			2.53 H	316	69.6	41.6
2	*5700.00	100.8 AV			2.53 H	316	59.2	41.6
3	#5725.00	62.9 PK	74.0	-11.1	2.43 H	315	58.1	4.8
4	#5725.00	49.0 AV	54.0	-5.0	2.43 H	315	44.2	4.8
5	11400.00	57.2 PK	74.0	-16.8	3.81 H	6	42.2	15.0
6	11400.00	44.6 AV	54.0	-9.4	3.81 H	6	29.6	15.0
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5700.00	117.7 PK			2.65 V	158	76.1	41.6
2	*5700.00	106.5 AV			2.65 V	158	64.9	41.6
3	#5725.00	67.7 PK	74.0	-6.3	3.05 V	145	62.9	4.8
4	**#5725.00**	**53.3 AV**	**54.0**	**-0.7**	**3.05 V**	**145**	**48.5**	**4.8**
5	11400.00	60.8 PK	74.0	-13.2	1.32 V	99	45.8	15.0
6	11400.00	47.3 AV	54.0	-6.7	1.32 V	99	32.3	15.0

Remarks:

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

CHANNEL	TX Channel 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	57.8 PK	74.0	-16.2	2.63 H	289	53.3	4.5
2	#5470.00	44.4 AV	54.0	-9.6	2.63 H	289	39.9	4.5
3	*5720.00	112.4 PK			2.65 H	314	70.8	41.6
4	*5720.00	101.9 AV			2.65 H	314	60.3	41.6
5	#5825.00	57.9 PK	74.0	-16.1	2.73 H	308	53.2	4.7
6	#5825.00	44.6 AV	54.0	-9.4	2.73 H	308	39.9	4.7
7	11440.00	60.0 PK	74.0	-14.0	1.26 H	36	44.9	15.1
8	11440.00	46.4 AV	54.0	-7.6	1.26 H	36	31.3	15.1
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5470.00	59.6 PK	74.0	-14.4	2.57 V	144	55.1	4.5
2	#5470.00	46.4 AV	54.0	-7.6	2.57 V	144	41.9	4.5
3	*5720.00	119.4 PK			2.62 V	158	77.8	41.6
4	*5720.00	108.2 AV			2.62 V	158	66.6	41.6
5	#5825.00	58.0 PK	74.0	-16.0	2.70 V	164	53.3	4.7
6	#5825.00	45.2 AV	54.0	-8.8	2.70 V	164	40.5	4.7
7	11440.00	61.0 PK	74.0	-13.0	1.42 V	102	45.9	15.1
8	11440.00	47.7 AV	54.0	-6.3	1.42 V	102	32.6	15.1

Remarks:

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

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	47.3 PK	74.0	-26.7	3.33 H	68	43.4	3.9
2	5150.00	43.8 AV	54.0	-10.2	3.33 H	68	39.9	3.9
3	*5260.00	117.1 PK			3.75 H	47	76.2	40.9
4	*5260.00	106.7 AV			3.75 H	47	65.8	40.9
5	#10520.00	57.2 PK	74.0	-16.8	1.65 H	226	42.0	15.2
6	#10520.00	45.1 AV	54.0	-8.9	1.65 H	226	29.9	15.2
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	56.7 PK	74.0	-17.3	1.11 V	345	52.8	3.9
2	5150.00	43.7 AV	54.0	-10.3	1.11 V	345	39.8	3.9
3	*5260.00	114.1 PK			1.00 V	324	73.2	40.9
4	*5260.00	104.7 AV			1.00 V	324	63.8	40.9
5	#10520.00	58.2 PK	74.0	-15.8	2.13 V	258	43.0	15.2
6	#10520.00	45.0 AV	54.0	-9.0	2.13 V	258	29.8	15.2

Remarks:

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

CHANNEL	TX Channel 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	118.6 PK			3.25 H	40	77.6	41.0
2	*5300.00	108.2 AV			3.25 H	40	67.2	41.0
3	10600.00	59.1 PK	74.0	-14.9	1.53 H	187	43.0	16.1
4	10600.00	45.5 AV	54.0	-8.5	1.53 H	187	29.4	16.1
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5300.00	114.0 PK			1.30 V	329	73.0	41.0
2	*5300.00	103.6 AV			1.30 V	329	62.6	41.0
3	10600.00	59.3 PK	74.0	-14.7	2.38 V	326	43.2	16.1
4	10600.00	46.6 AV	54.0	-7.4	2.38 V	326	30.5	16.1

Remarks:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5320.00	117.7 PK			3.35 H	45	76.7	41.0
2	*5320.00	107.3 AV			3.35 H	45	66.3	41.0
3	5350.00	67.0 PK	74.0	-7.0	3.29 H	56	62.6	4.4
4	5350.00	49.8 AV	54.0	-4.2	3.29 H	56	45.4	4.4
5	10640.00	57.5 PK	74.0	-16.5	2.14 H	106	41.5	16.0
6	10640.00	44.6 AV	54.0	-9.4	2.14 H	106	28.6	16.0
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	113.6 PK			1.24 V	331	72.6	41.0
2	*5320.00	102.6 AV			1.24 V	331	61.6	41.0
3	5350.00	57.7 PK	74.0	-16.3	1.25 V	323	53.3	4.4
4	5350.00	45.2 AV	54.0	-8.8	1.25 V	323	40.8	4.4
5	10640.00	59.3 PK	74.0	-14.7	2.13 V	74	43.3	16.0
6	10640.00	45.8 AV	54.0	-8.2	2.13 V	74	29.8	16.0

Remarks:

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

CHANNEL	TX Channel 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	59.3 PK	74.0	-14.7	2.50 H	334	54.9	4.4
2	5460.00	45.7 AV	54.0	-8.3	2.50 H	334	41.3	4.4
3	#5470.00	60.2 PK	74.0	-13.8	2.51 H	338	55.7	4.5
4	#5470.00	46.5 AV	54.0	-7.5	2.51 H	338	42.0	4.5
5	*5500.00	113.1 PK			2.58 H	333	71.8	41.3
6	*5500.00	102.2 AV			2.58 H	333	60.9	41.3
7	11000.00	59.8 PK	74.0	-14.2	1.16 H	153	42.3	17.5
8	11000.00	46.7 AV	54.0	-7.3	1.16 H	153	29.2	17.5
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	5460.00	61.2 PK	74.0	-12.8	3.18 V	168	56.8	4.4
2	5460.00	48.9 AV	54.0	-5.1	3.18 V	168	44.5	4.4
3	#5470.00	64.8 PK	74.0	-9.2	2.84 V	159	60.3	4.5
4	#5470.00	51.1 AV	54.0	-2.9	2.84 V	159	46.6	4.5
5	*5500.00	117.6 PK			2.88 V	161	76.3	41.3
6	*5500.00	106.6 AV			2.88 V	161	65.3	41.3
7	11000.00	63.0 PK	74.0	-11.0	1.34 V	157	45.5	17.5
8	11000.00	49.6 AV	54.0	-4.4	1.34 V	157	32.1	17.5

Remarks:

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

CHANNEL	TX Channel 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	112.8 PK			2.17 H	337	71.3	41.5
2	*5580.00	101.8 AV			2.17 H	337	60.3	41.5
3	11160.00	59.1 PK	74.0	-14.9	1.53 H	175	42.7	16.4
4	11160.00	45.8 AV	54.0	-8.2	1.53 H	175	29.4	16.4
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5580.00	118.0 PK			3.05 V	139	76.5	41.5
2	*5580.00	107.2 AV			3.05 V	139	65.7	41.5
3	11160.00	59.5 PK	74.0	-14.5	2.13 V	228	43.1	16.4
4	11160.00	46.4 AV	54.0	-7.6	2.13 V	228	30.0	16.4

Remarks:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5700.00	109.5 PK			2.20 H	309	67.9	41.6
2	*5700.00	98.4 AV			2.20 H	309	56.8	41.6
3	#5725.00	62.0 PK	74.0	-12.0	2.21 H	325	57.2	4.8
4	#5725.00	48.7 AV	54.0	-5.3	2.21 H	325	43.9	4.8
5	11400.00	58.4 PK	74.0	-15.6	1.28 H	143	42.2	16.2
6	11400.00	45.6 AV	54.0	-8.4	1.28 H	143	29.4	16.2
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	116.1 PK			2.90 V	154	74.5	41.6
2	*5700.00	105.4 AV			2.90 V	154	63.8	41.6
3	#5725.00	65.8 PK	74.0	-8.2	3.07 V	154	61.0	4.8
4	#5725.00	53.1 AV	54.0	-0.9	3.07 V	154	48.3	4.8
5	11400.00	61.0 PK	74.0	-13.0	3.21 V	191	44.8	16.2
6	11400.00	47.1 AV	54.0	-6.9	3.21 V	191	30.9	16.2

Remarks:

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

CHANNEL	TX Channel 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	57.8 PK	74.0	-16.2	2.34 H	317	53.3	4.5
2	#5470.00	44.3 AV	54.0	-9.7	2.34 H	317	39.8	4.5
3	*5720.00	111.8 PK			2.40 H	320	70.2	41.6
4	*5720.00	101.1 AV			2.40 H	320	59.5	41.6
5	#5825.00	58.1 PK	74.0	-15.9	2.42 H	331	53.4	4.7
6	#5825.00	44.3 AV	54.0	-9.7	2.42 H	331	39.6	4.7
7	11440.00	58.5 PK	74.0	-15.5	1.67 H	75	42.4	16.1
8	11440.00	45.9 AV	54.0	-8.1	1.67 H	75	29.8	16.1
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5470.00	59.7 PK	74.0	-14.3	3.11 V	164	55.2	4.5
2	#5470.00	45.6 AV	54.0	-8.4	3.11 V	164	41.1	4.5
3	*5720.00	118.3 PK			3.15 V	152	76.7	41.6
4	*5720.00	107.4 AV			3.15 V	152	65.8	41.6
5	#5825.00	57.9 PK	74.0	-16.1	3.07 V	155	53.2	4.7
6	#5825.00	44.7 AV	54.0	-9.3	3.07 V	155	40.0	4.7
7	11440.00	63.3 PK	74.0	-10.7	3.23 V	105	47.2	16.1
8	11440.00	48.9 AV	54.0	-5.1	3.23 V	105	32.8	16.1

Remarks:

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

802.11n (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	57.2 PK	74.0	-16.8	3.47 H	45	53.3	3.9
2	5150.00	43.9 AV	54.0	-10.1	3.47 H	45	40.0	3.9
3	*5270.00	116.0 PK			3.39 H	59	75.0	41.0
4	*5270.00	106.2 AV			3.39 H	59	65.2	41.0
5	#10540.00	58.5 PK	74.0	-15.5	2.37 H	219	43.1	15.4
6	#10540.00	45.3 AV	54.0	-8.7	2.37 H	219	29.9	15.4
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	56.9 PK	74.0	-17.1	2.10 V	199	53.0	3.9
2	5150.00	43.8 AV	54.0	-10.2	2.10 V	199	39.9	3.9
3	*5270.00	110.6 PK			1.20 V	327	69.6	41.0
4	*5270.00	101.3 AV			1.20 V	327	60.3	41.0
5	#10540.00	59.0 PK	74.0	-15.0	2.62 V	129	43.6	15.4
6	#10540.00	45.7 AV	54.0	-8.3	2.62 V	129	30.3	15.4

Remarks:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5310.00	115.5 PK			2.94 H	49	74.5	41.0
2	*5310.00	106.2 AV			2.94 H	49	65.2	41.0
3	5350.00	68.7 PK	74.0	-5.3	3.30 H	29	64.3	4.4
4	5350.00	52.4 AV	54.0	-1.6	3.30 H	29	48.0	4.4
5	10620.00	56.9 PK	74.0	-17.1	1.38 H	301	40.9	16.0
6	10620.00	44.5 AV	54.0	-9.5	1.38 H	301	28.5	16.0
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	*5310.00	109.7 PK			1.41 V	332	68.7	41.0
2	*5310.00	100.3 AV			1.41 V	332	59.3	41.0
3	5350.00	66.9 PK	74.0	-7.1	1.17 V	333	62.5	4.4
4	5350.00	50.6 AV	54.0	-3.4	1.17 V	333	46.2	4.4
5	10620.00	59.3 PK	74.0	-14.7	2.77 V	169	43.3	16.0
6	10620.00	46.2 AV	54.0	-7.8	2.77 V	169	30.2	16.0

Remarks:

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

CHANNEL	TX Channel 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	57.8 PK	74.0	-16.2	2.63 H	318	53.4	4.4
2	5460.00	44.3 AV	54.0	-9.7	2.63 H	318	39.9	4.4
3	#5470.00	60.3 PK	74.0	-13.7	2.69 H	322	55.8	4.5
4	#5470.00	47.4 AV	54.0	-6.6	2.69 H	322	42.9	4.5
5	*5510.00	107.1 PK			2.71 H	334	65.8	41.3
6	*5510.00	96.9 AV			2.71 H	334	55.6	41.3
7	11020.00	60.5 PK	74.0	-13.5	2.03 H	136	43.3	17.2
8	11020.00	47.2 AV	54.0	-6.8	2.03 H	136	30.0	17.2
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5460.00	62.1 PK	74.0	-11.9	3.04 V	162	57.7	4.4
2	5460.00	49.4 AV	54.0	-4.6	3.04 V	162	45.0	4.4
3	#5470.00	63.0 PK	74.0	-11.0	3.18 V	165	58.5	4.5
4	#5470.00	53.2 AV	54.0	-0.8	3.18 V	165	48.7	4.5
5	*5510.00	112.6 PK			3.15 V	163	71.3	41.3
6	*5510.00	101.9 AV			3.15 V	163	60.6	41.3
7	11020.00	61.2 PK	74.0	-12.8	1.92 V	76	44.0	17.2
8	11020.00	47.0 AV	54.0	-7.0	1.92 V	76	29.8	17.2

Remarks:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5550.00	108.8 PK			3.11 H	56	67.3	41.5
2	*5550.00	99.2 AV			3.11 H	56	57.7	41.5
3	11100.00	59.6 PK	74.0	-14.4	2.40 H	165	43.2	16.4
4	11100.00	46.3 AV	54.0	-7.7	2.40 H	165	29.9	16.4
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5550.00	115.0 PK			3.06 V	152	73.5	41.5
2	*5550.00	104.9 AV			3.06 V	152	63.4	41.5
3	11100.00	59.1 PK	74.0	-14.9	1.43 V	212	42.7	16.4
4	11100.00	46.6 AV	54.0	-7.4	1.43 V	212	30.2	16.4

Remarks:

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

CHANNEL	TX Channel 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	109.0 PK			2.87 H	53	67.5	41.5
2	*5670.00	98.3 AV			2.87 H	53	56.8	41.5
3	#5725.00	60.4 PK	74.0	-13.6	2.74 H	147	55.6	4.8
4	#5725.00	47.8 AV	54.0	-6.2	2.74 H	147	43.0	4.8
5	11340.00	60.6 PK	74.0	-13.4	1.53 H	43	44.0	16.6
6	11340.00	46.2 AV	54.0	-7.8	1.53 H	43	29.6	16.6
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5670.00	116.0 PK			2.86 V	154	74.5	41.5
2	*5670.00	105.8 AV			2.86 V	154	64.3	41.5
3	#5725.00	65.4 PK	74.0	-8.6	3.06 V	142	60.6	4.8
4	#5725.00	51.4 AV	54.0	-2.6	3.06 V	142	46.6	4.8
5	11340.00	61.4 PK	74.0	-12.6	3.15 V	111	44.8	16.6
6	11340.00	48.7 AV	54.0	-5.3	3.15 V	111	32.1	16.6

Remarks:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5470.00	57.5 PK	74.0	-16.5	2.68 H	142	53.0	4.5
2	#5470.00	44.3 AV	54.0	-9.7	2.68 H	142	39.8	4.5
3	*5710.00	108.9 PK			2.77 H	149	67.3	41.6
4	*5710.00	98.9 AV			2.77 H	149	57.3	41.6
5	#5825.00	57.2 PK	74.0	-16.8	2.61 H	160	52.5	4.7
6	#5825.00	44.4 AV	54.0	-9.6	2.61 H	160	39.7	4.7
7	11420.00	59.4 PK	74.0	-14.6	2.68 H	223	43.3	16.1
8	11420.00	46.1 AV	54.0	-7.9	2.68 H	223	30.0	16.1
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5470.00	59.4 PK	74.0	-14.6	1.42 V	138	54.9	4.5
2	#5470.00	46.1 AV	54.0	-7.9	1.42 V	138	41.6	4.5
3	*5710.00	116.0 PK			2.97 V	153	74.4	41.6
4	*5710.00	105.8 AV			2.97 V	153	64.2	41.6
5	#5825.00	59.3 PK	74.0	-14.7	2.65 V	166	54.6	4.7
6	#5825.00	45.5 AV	54.0	-8.5	2.65 V	166	40.8	4.7
7	11420.00	60.5 PK	74.0	-13.5	1.42 V	237	44.4	16.1
8	11420.00	46.9 AV	54.0	-7.1	1.42 V	237	30.8	16.1

Remarks:

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

802.11ac (VHT80)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	61.2 PK	74.0	-12.8	2.91 H	46	57.3	3.9
2	5150.00	48.5 AV	54.0	-5.5	2.91 H	46	44.6	3.9
3	*5290.00	111.5 PK			2.86 H	39	70.5	41.0
4	*5290.00	101.6 AV			2.86 H	39	60.6	41.0
5	5350.00	67.3 PK	74.0	-6.7	2.88 H	25	62.9	4.4
6	5350.00	53.1 AV	54.0	-0.9	2.88 H	25	48.7	4.4
7	#10580.00	58.9 PK	74.0	-15.1	2.30 H	151	43.0	15.9
8	#10580.00	45.9 AV	54.0	-8.1	2.30 H	151	30.0	15.9
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	5150.00	59.5 PK	74.0	-14.5	1.44 V	334	55.6	3.9
2	5150.00	46.4 AV	54.0	-7.6	1.44 V	334	42.5	3.9
3	*5290.00	106.9 PK			1.21 V	332	65.9	41.0
4	*5290.00	97.2 AV			1.21 V	332	56.2	41.0
5	5350.00	59.2 PK	74.0	-14.8	1.30 V	331	54.8	4.4
6	5350.00	46.0 AV	54.0	-8.0	1.30 V	331	41.6	4.4
7	#10580.00	59.8 PK	74.0	-14.2	1.65 V	243	43.9	15.9
8	#10580.00	46.2 AV	54.0	-7.8	1.65 V	243	30.3	15.9

Remarks:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5460.00	61.9 PK	74.0	-12.1	2.74 H	336	57.5	4.4
2	5460.00	48.7 AV	54.0	-5.3	2.74 H	336	44.3	4.4
3	#5470.00	63.4 PK	74.0	-10.6	2.84 H	333	58.9	4.5
4	#5470.00	49.1 AV	54.0	-4.9	2.84 H	333	44.6	4.5
5	*5530.00	102.7 PK			3.03 H	337	61.4	41.3
6	*5530.00	92.6 AV			3.03 H	337	51.3	41.3
7	#5725.00	58.6 PK	74.0	-15.4	2.17 H	260	53.8	4.8
8	#5725.00	44.6 AV	54.0	-9.4	2.17 H	260	39.8	4.8
9	11060.00	59.3 PK	74.0	-14.7	1.35 H	118	42.4	16.9
10	11060.00	46.5 AV	54.0	-7.5	1.35 H	118	29.6	16.9
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	5460.00	63.6 PK	74.0	-10.4	2.69 V	66	59.2	4.4
2	5460.00	50.2 AV	54.0	-3.8	2.69 V	66	45.8	4.4
3	#5470.00	66.8 PK	74.0	-7.2	2.53 V	58	62.3	4.5
4	#5470.00	53.2 AV	54.0	-0.8	2.53 V	58	48.7	4.5
5	*5530.00	107.9 PK			3.15 V	160	66.6	41.3
6	*5530.00	97.7 AV			3.15 V	160	56.4	41.3
7	#5725.00	58.0 PK	74.0	-16.0	2.71 V	74	53.2	4.8
8	#5725.00	44.7 AV	54.0	-9.3	2.71 V	74	39.9	4.8
9	11060.00	59.9 PK	74.0	-14.1	2.91 V	106	43.0	16.9
10	11060.00	46.4 AV	54.0	-7.6	2.91 V	106	29.5	16.9

Remarks:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5460.00	61.4 PK	74.0	-12.6	2.79 H	339	57.0	4.4
2	5460.00	45.4 AV	54.0	-8.6	2.79 H	339	41.0	4.4
3	#5470.00	62.9 PK	74.0	-11.1	2.80 H	336	58.4	4.5
4	#5470.00	45.6 AV	54.0	-8.4	2.80 H	336	41.1	4.5
5	*5610.00	102.6 PK			3.00 H	330	61.0	41.6
6	*5610.00	92.6 AV			3.00 H	330	51.0	41.6
7	#5725.00	61.0 PK	74.0	-13.0	2.10 H	259	56.2	4.8
8	#5725.00	47.2 AV	54.0	-6.8	2.10 H	259	42.4	4.8
9	11220.00	58.7 PK	74.0	-15.3	1.39 H	100	42.2	16.5
10	11220.00	45.8 AV	54.0	-8.2	1.39 H	100	29.3	16.5
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5460.00	62.6 PK	74.0	-11.4	2.59 V	56	58.2	4.4
2	5460.00	49.6 AV	54.0	-4.4	2.59 V	56	45.2	4.4
3	#5470.00	63.8 PK	74.0	-10.2	2.50 V	45	59.3	4.5
4	#5470.00	50.2 AV	54.0	-3.8	2.50 V	45	45.7	4.5
5	*5610.00	107.6 PK			3.10 V	150	66.0	41.6
6	*5610.00	97.6 AV			3.10 V	150	56.0	41.6
7	#5725.00	66.0 PK	74.0	-8.0	2.77 V	77	61.2	4.8
8	#5725.00	53.1 AV	54.0	-0.9	2.77 V	77	48.3	4.8
9	11220.00	58.5 PK	74.0	-15.5	2.96 V	100	42.0	16.5
10	11220.00	45.5 AV	54.0	-8.5	2.96 V	100	29.0	16.5

Remarks:

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

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	57.4 PK	74.0	-16.6	2.67 H	306	52.9	4.5
2	#5470.00	44.4 AV	54.0	-9.6	2.67 H	306	39.9	4.5
3	*5690.00	105.3 PK			2.58 H	318	63.7	41.6
4	*5690.00	95.2 AV			2.58 H	318	53.6	41.6
5	#5825.00	58.6 PK	74.0	-15.4	2.74 H	301	53.9	4.7
6	#5825.00	45.4 AV	54.0	-8.6	2.74 H	301	40.7	4.7
7	11380.00	59.1 PK	74.0	-14.9	2.88 H	145	42.8	16.3
8	11380.00	45.9 AV	54.0	-8.1	2.88 H	145	29.6	16.3
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	#5470.00	59.4 PK	74.0	-14.6	3.45 V	155	54.9	4.5
2	#5470.00	46.5 AV	54.0	-7.5	3.45 V	155	42.0	4.5
3	*5690.00	110.7 PK			3.51 V	156	69.1	41.6
4	*5690.00	101.0 AV			3.51 V	156	59.4	41.6
5	#5825.00	61.3 PK	74.0	-12.7	2.76 V	156	56.6	4.7
6	#5825.00	48.1 AV	54.0	-5.9	2.76 V	156	43.4	4.7
7	11380.00	60.9 PK	74.0	-13.1	1.17 V	97	44.6	16.3
8	11380.00	48.7 AV	54.0	-5.3	1.17 V	97	32.4	16.3

Remarks:

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

Below 1GHz Worst-Case Data: 802.11a

CHANNEL	TX Channel 116	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	198.78	40.5 QP	43.5	-3.0	1.00 H	122	56.6	-16.1
2	284.14	43.5 QP	46.0	-2.5	1.00 H	280	56.1	-12.6
3	370.90	42.7 QP	46.0	-3.3	1.00 H	234	54.1	-11.4
4	518.88	40.2 QP	46.0	-5.8	1.49 H	174	49.3	-9.1
5	625.58	33.3 QP	46.0	-12.7	1.49 H	10	40.3	-7.0
6	914.64	34.6 QP	46.0	-11.4	1.49 H	290	37.2	-2.6
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	31.94	32.7 QP	40.0	-7.3	1.00 V	358	48.1	-15.4
2	74.62	37.8 QP	40.0	-2.2	1.00 V	250	54.2	-16.4
3	196.84	36.7 QP	43.5	-6.8	1.00 V	167	52.8	-16.1
4	284.14	37.5 QP	46.0	-8.5	1.49 V	331	50.1	-12.6
5	370.10	43.5 QP	46.0	-2.5	1.00 V	177	54.9	-11.4
6	501.42	32.9 QP	46.0	-13.1	1.00 V	113	42.3	-9.4

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 116	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	183.26	42.2 QP	43.5	-1.3	1.49 H	120	57.3	-15.1
2	213.74	40.9 QP	43.5	-2.6	1.00 H	105	57.1	-16.2
3	286.08	40.9 QP	46.0	-5.1	1.00 H	300	53.5	-12.6
4	366.66	44.8 QP	46.0	-1.2	1.00 H	75	56.3	-11.5
5	526.64	39.2 QP	46.0	-6.8	1.49 H	179	48.2	-9.0
6	621.70	33.4 QP	46.0	-12.6	1.49 H	342	40.5	-7.1
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	30.26	32.4 QP	40.0	-7.6	1.00 V	318	47.9	-15.5
2	53.26	37.7 QP	40.0	-2.3	1.00 V	12	51.3	-13.6
3	125.06	33.2 QP	43.5	-10.3	1.00 V	190	48.6	-15.4
4	173.56	35.3 QP	43.5	-8.2	1.00 V	236	49.5	-14.2
5	336.52	44.1 QP	46.0	-1.9	1.49 V	344	55.8	-11.7
6	385.02	43.3 QP	46.0	-2.7	1.00 V	90	54.4	-11.1

Remarks:

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

CHANNEL	TX Channel 116	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz		
TEST MODE	C		

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	30.14	33.0 QP	40.0	-7.0	1.50 H	12	48.5	-15.5
2	84.32	32.5 QP	40.0	-7.5	1.50 H	285	51.1	-18.6
3	191.02	38.3 QP	43.5	-5.2	1.00 H	264	54.2	-15.9
4	284.14	42.7 QP	46.0	-3.3	1.00 H	126	55.3	-12.6
5	366.57	43.5 QP	46.0	-2.5	1.00 H	303	55.0	-11.5
6	522.76	40.8 QP	46.0	-5.2	1.50 H	23	49.8	-9.0
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	31.76	35.3 QP	40.0	-4.7	1.00 V	196	50.7	-15.4
2	54.83	38.3 QP	40.0	-1.7	1.00 V	204	51.9	-13.6
3	76.56	36.9 QP	40.0	-3.1	1.00 V	265	53.9	-17.0
4	125.06	34.3 QP	43.5	-9.2	1.00 V	214	49.7	-15.4
5	367.07	40.3 QP	46.0	-5.7	1.00 V	201	51.8	-11.5
6	385.18	40.0 QP	46.0	-6.0	1.50 V	78	51.1	-11.1

Remarks:

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

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

Test Date: Aug. 07, 2017

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Test Receiver ROHDE & SCHWARZ	ESCI	100613	Nov. 21, 2016	Nov. 20, 2017
RF signal cable (with 10dB PAD) Woken	5D-FB	Cable-cond1-01	Dec. 22, 2016	Dec. 21, 2017
LISN ROHDE & SCHWARZ (EUT)	ESH3-Z5	835239/001	Mar. 10, 2017	Mar. 09, 2018
LISN ROHDE & SCHWARZ (Peripheral)	ESH3-Z5	100220	Nov. 08, 2016	Nov. 07, 2017
Software ADT	BV ADT_Cond_ V7.3.7.4	NA	NA	NA

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

4.2.3 Test Procedures

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

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

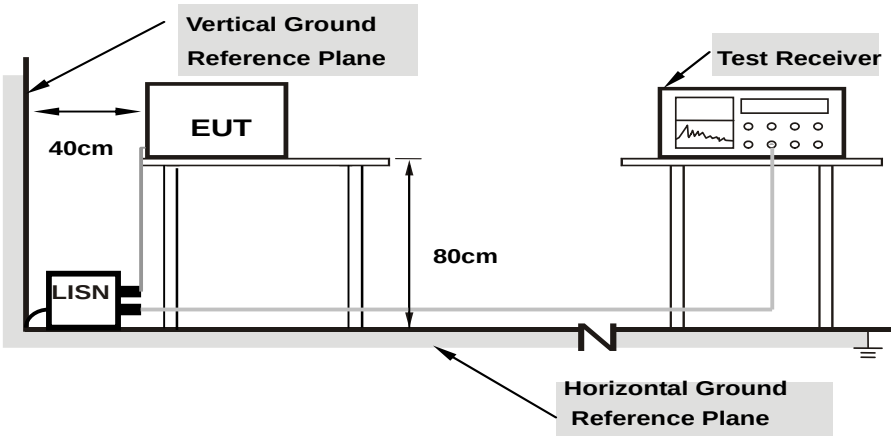
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

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

4.2.4 Deviation from Test Standard

No deviation.

4.2.5 Test Setup



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

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

4.2.6 EUT Operating Conditions

Same as 4.1.6.

4.2.7 Test Results

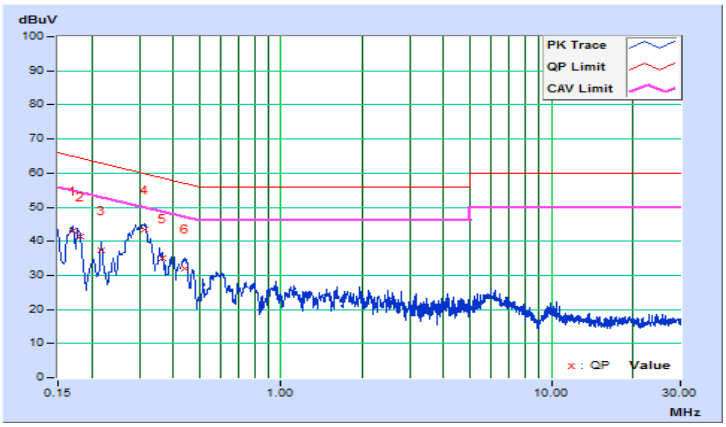
Worst-case data: 802.11a

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

No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.16967	10.41	32.52	18.25	42.93	28.66	64.98	54.98	-22.05	-26.32
2	0.18128	10.42	31.11	17.58	41.53	28.00	64.43	54.43	-22.90	-26.43
3	0.21565	10.44	26.80	14.09	37.24	24.53	62.98	52.98	-25.74	-28.45
4	0.31185	10.47	32.89	26.84	43.36	37.31	59.92	49.92	-16.56	-12.61
5	0.36334	10.50	24.35	16.94	34.85	27.44	58.65	48.65	-23.80	-21.21
6	0.43924	10.51	21.43	14.41	31.94	24.92	57.08	47.08	-25.14	-22.16

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.

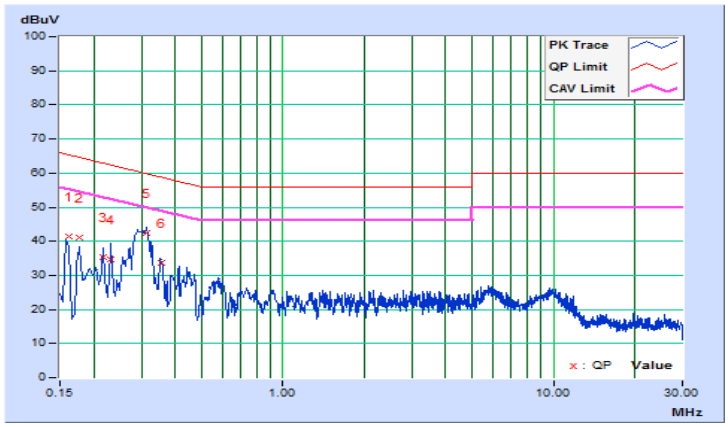


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	A		

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	0.16173	10.17	31.17	15.85	41.34	26.02	65.37	55.37	-24.03	-29.35
2	0.17605	10.18	30.80	16.85	40.98	27.03	64.67	54.67	-23.69	-27.64
3	0.21565	10.20	25.26	12.91	35.46	23.11	62.98	52.98	-27.52	-29.87
4	0.22972	10.20	24.40	12.25	34.60	22.45	62.46	52.46	-27.86	-30.01
5	0.31185	10.22	32.11	25.99	42.33	36.21	59.92	49.92	-17.59	-13.71
6	0.35389	10.22	23.36	15.19	33.58	25.41	58.87	48.87	-25.29	-23.46

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.

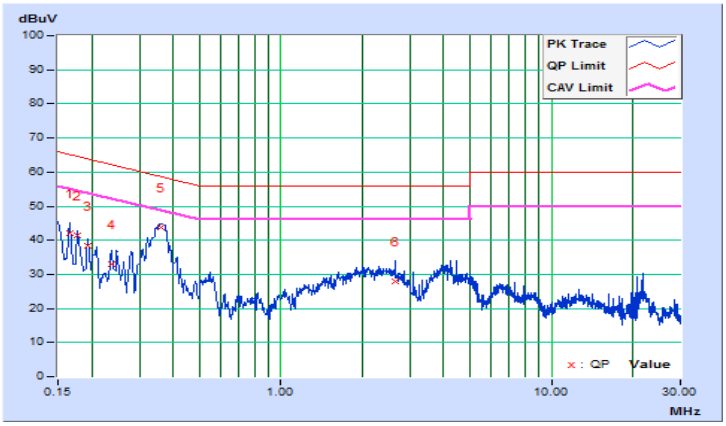


Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	B		

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	0.16526	10.41	31.78	18.09	42.19	28.50	65.20	55.20	-23.01	-26.70
2	0.17605	10.42	30.89	18.20	41.31	28.62	64.67	54.67	-23.36	-26.05
3	0.19255	10.43	28.09	15.56	38.52	25.99	63.93	53.93	-25.41	-27.94
4	0.23586	10.44	22.42	11.81	32.86	22.25	62.24	52.24	-29.38	-29.99
5	0.35859	10.49	33.23	26.73	43.72	37.22	58.76	48.76	-15.04	-11.54
6	2.63538	10.56	17.49	12.70	28.05	23.26	56.00	46.00	-27.95	-22.74

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.

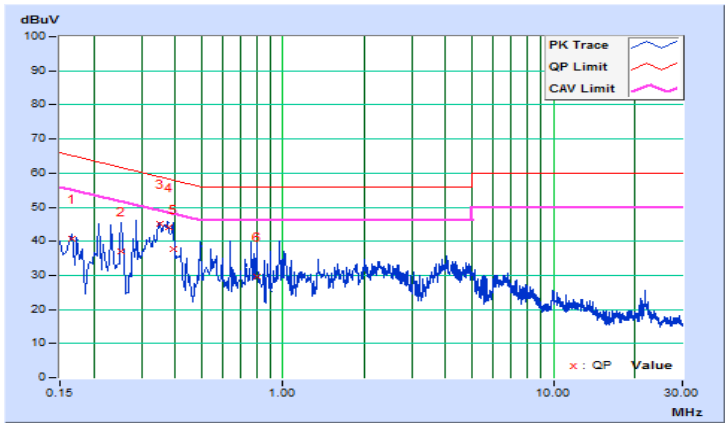


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	B		

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	0.16526	10.17	30.64	18.56	40.81	28.73	65.20	55.20	-24.39	-26.47
2	0.25125	10.21	26.83	15.59	37.04	25.80	61.72	51.72	-24.68	-25.92
3	0.34926	10.22	34.94	28.54	45.16	38.76	58.98	48.98	-13.82	-10.22
4	0.37700	10.23	33.89	27.07	44.12	37.30	58.35	48.35	-14.23	-11.05
5	0.39219	10.23	27.32	20.24	37.55	30.47	58.02	48.02	-20.47	-17.55
6	0.79885	10.24	19.54	13.37	29.78	23.61	56.00	46.00	-26.22	-22.39

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.

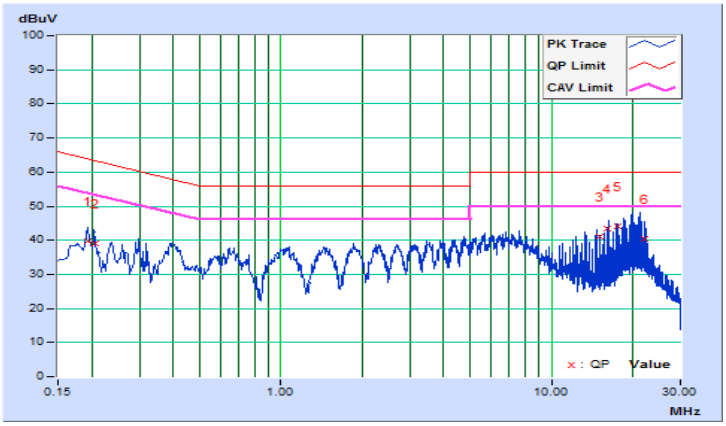


Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	C		

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	0.19255	10.43	29.40	19.68	39.83	30.11	63.93	53.93	-24.10	-23.82
2	0.20511	10.43	28.63	18.46	39.06	28.89	63.40	53.40	-24.34	-24.51
3	15.01191	11.16	30.07	29.34	41.23	40.50	60.00	50.00	-18.77	-9.50
4	16.01287	11.21	32.22	31.97	43.43	43.18	60.00	50.00	-16.57	-6.82
5	**17.51431**	**11.29**	**32.69**	**32.10**	**43.98**	**43.39**	**60.00**	**50.00**	**-16.02**	**-6.61**
6	22.01081	11.49	28.91	17.84	40.40	29.33	60.00	50.00	-19.60	-20.67

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.

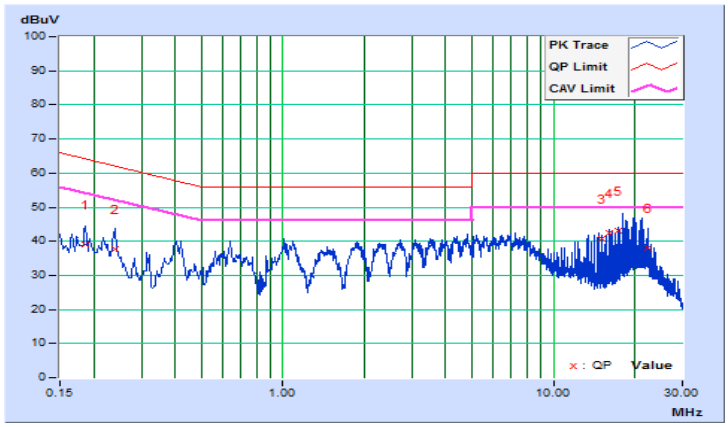


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test Mode	C		

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	0.18508	10.19	28.87	19.01	39.06	29.20	64.25	54.25	-25.19	-25.05
2	0.23898	10.21	27.35	22.38	37.56	32.59	62.13	52.13	-24.57	-19.54
3	15.01191	10.84	29.99	27.46	40.83	38.30	60.00	50.00	-19.17	-11.70
4	16.01287	10.88	31.70	31.03	42.58	41.91	60.00	50.00	-17.42	-8.09
5	17.26407	10.94	32.16	31.58	43.10	42.52	60.00	50.00	-16.90	-7.48
6	22.26496	11.10	26.96	22.94	38.06	34.04	60.00	50.00	-21.94	-15.96

Remarks:

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



4.3 Transmit Power Measurement

4.3.1 Limits of Transmit Power Measurement

Operation Band	EUT Category		Limit
U-NII-1		Outdoor Access Point	1 Watt (30 dBm) (Max. e.i.r.p ≦ 125mW(21 dBm) at any elevation angle above 30 degrees as measured from the horizon)
		Fixed point-to-point Access Point	1 Watt (30 dBm)
		Indoor Access Point	1 Watt (30 dBm)
		Mobile and Portable client device	250mW (24 dBm)
U-NII-2A	√		250mW (24 dBm) or 11 dBm+10 log B*
U-NII-2C	√		250mW (24 dBm) or 11 dBm+10 log B*
U-NII-3	√		1 Watt (30 dBm)

*B is the 26 dB emission bandwidth in megahertz

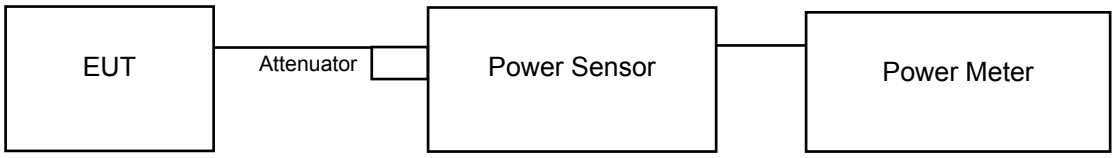
Per KDB 662911 Method of conducted output power measurement on IEEE 802.11 devices,

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

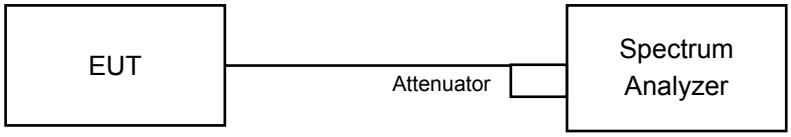
For power measurements on all other devices: Array Gain = 10 log(N_{ANT}/N_{SS}) dB.

4.3.2 Test Setup

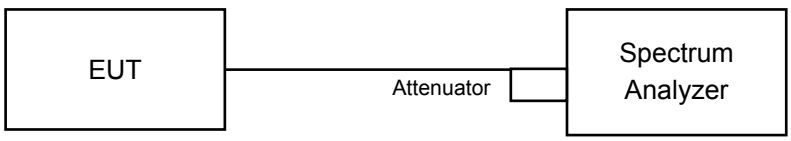
For Power Output
802.11a, 802.11n (HT20), 802.11n (HT40)



802.11ac (VHT80)



For 26dB Bandwidth



4.3.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.3.4 Test Procedure

For Average Power Measurement

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

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

For 802.11ac (VHT80)

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

b. Set sweep trigger to “free run”.

c. Set RBW = 1 MHz.

d. Set VBW ≥ 3 MHz.

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

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

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

h. Detector = RMS.

i. Trace mode = max hold.

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

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

For 26dB Bandwidth

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

b. Set the VBW > RBW.

c. Detector = Peak.

d. Trace mode = max hold.

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

4.3.5 Deviation from Test Standard

No deviation.

4.3.6 EUT Operating Conditions

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

4.3.7 Test Result

Power Output:

CDD Mode

802.11a

Chan.	Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
52	5260	18.34	18.43	137.897	21.40	23.86	Pass
60	5300	18.12	18.33	132.940	21.24	23.94	Pass
64	5320	18.23	18.27	133.670	21.26	23.97	Pass
100	5500	18.27	18.33	135.220	21.31	23.96	Pass
116	5580	18.35	18.26	135.379	21.32	24.00	Pass
140	5700	18.30	18.79	143.291	21.56	23.97	Pass
144	5720 For U-NII-2C	16.94	16.96	105.979	20.25	22.73	Pass
144	5720 For U-NII-3	11.28	12.73	34.415	15.37	30.00	Pass

Note:
For U-NII-2A, U-NII-2C Band:
Chain 0
1. 11dBm + 10log(19.33) = 23.86 dBm < 24dBm
2. 11dBm + 10log(19.68) = 23.94 dBm < 24dBm
3. 11dBm + 10log(19.86) = 23.97 dBm < 24dBm
4. 11dBm + 10log(20.27) = 24.07 dBm > 24dBm
5. 11dBm + 10log(20.14) = 24.04 dBm > 24dBm
6. 11dBm + 10log(19.83) = 23.97 dBm < 24dBm
7. 11dBm + 10log(5725.00 - 5710.09) = 22.73 dBm < 24dBm.

Chain 1
1. 11dBm + 10log(20.05) = 24.02 dBm > 24dBm
2. 11dBm + 10log(19.82) = 23.97 dBm < 24dBm
3. 11dBm + 10log(19.97) = 24.00 dBm = 24dBm
4. 11dBm + 10log(19.81) = 23.96 dBm < 24dBm
5. 11dBm + 10log(20.07) = 24.03 dBm > 24dBm
6. 11dBm + 10log(20.18) = 24.05 dBm > 24dBm
7. 11dBm + 10log(5725.00 - 5709.89) = 22.79 dBm < 24dBm.

802.11n (HT20)

Chan.	Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
52	5260	18.13	18.26	132.001	21.21	24.00	Pass
60	5300	18.22	18.29	133.827	21.27	24.00	Pass
64	5320	18.21	18.34	134.456	21.29	24.00	Pass
100	5500	18.31	18.43	137.427	21.38	24.00	Pass
116	5580	18.27	18.37	135.850	21.33	24.00	Pass
140	5700	17.73	18.42	128.795	21.10	24.00	Pass
144	5720 For U-NII-2C	18.08	17.89	128.617	21.09	22.85	Pass
144	5720 For U-NII-3	12.68	11.96	35.009	15.44	30.00	Pass

Note:
For U-NII-2A, U-NII-2C Band:
Chain 0
1. 11dBm + 10log(20.45) = 24.11 dBm > 24dBm
2. 11dBm + 10log(20.58) = 24.13 dBm > 24dBm
3. 11dBm + 10log(20.51) = 24.12 dBm > 24dBm
4. 11dBm + 10log(20.94) = 24.21 dBm > 24dBm
5. 11dBm + 10log(21.28) = 24.28 dBm > 24dBm
6. 11dBm + 10log(21.09) = 24.24 dBm > 24dBm
7. 11dBm + 10log(5725.00 - 5709.31) = 22.96 dBm < 24dBm.
Chain 1
1. 11dBm + 10log(20.68) = 24.16 dBm > 24dBm
2. 11dBm + 10log(20.55) = 24.13 dBm > 24dBm
3. 11dBm + 10log(20.65) = 24.15 dBm > 24dBm
4. 11dBm + 10log(20.53) = 24.12 dBm > 24dBm
5. 11dBm + 10log(20.79) = 24.18 dBm > 24dBm
6. 11dBm + 10log(20.55) = 24.13 dBm > 24dBm
7. 11dBm + 10log(5725.00 - 5709.68) = 22.85 dBm < 24dBm.

802.11n (HT40)

Chan.	Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
54	5270	20.90	21.06	**250.671**	23.99	24.00	Pass
62	5310	20.97	20.71	242.787	23.85	24.00	Pass
102	5510	17.73	18.13	124.306	20.94	24.00	Pass
110	5550	20.70	21.05	**244.840**	23.89	24.00	Pass
134	5670	20.41	20.69	227.121	23.56	24.00	Pass
142	5710 For U-NII-2C	18.33	17.74	135.645	21.32	24.00	Pass
142	5710 For U-NII-3	8.56	5.94	11.813	10.72	30.00	Pass

Note:
For U-NII-2A, U-NII-2C Band:
Chain 0
1. 11dBm + 10log(40.53) = 27.08 dBm > 24dBm
2. 11dBm + 10log(40.70) = 27.10 dBm > 24dBm
3. 11dBm + 10log(40.69) = 27.09 dBm > 24dBm
4. 11dBm + 10log(40.75) = 27.10 dBm > 24dBm
5. 11dBm + 10log(40.76) = 27.10 dBm > 24dBm
6. 11dBm + 10log(5725.00 - 5689.71) = 26.48 dBm > 24dBm.

Chain 1
1. 11dBm + 10log(40.78) = 27.10 dBm > 24dBm
2. 11dBm + 10log(40.65) = 27.09 dBm > 24dBm
3. 11dBm + 10log(40.65) = 27.09 dBm > 24dBm
4. 11dBm + 10log(40.66) = 27.09 dBm > 24dBm
5. 11dBm + 10log(40.78) = 27.10 dBm > 24dBm
6. 11dBm + 10log(5725.00 - 5689.50) = 26.50 dBm > 24dBm.

802.11ac (VHT80)

Chan.	Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
58	5290	20.00	19.84	196.383	22.93	24.00	Pass
106	5530	16.57	17.19	97.754	19.90	24.00	Pass
122	5610	16.49	17.21	97.168	19.88	24.00	Pass
138	5690 For U-NII-2C	15.20	17.02	91.316	19.61	24.00	Pass
138	5690 For U-NII-3	1.24	1.80	3.112	4.93	30.00	Pass

Note:
For U-NII-2A, U-NII-2C Band:
Chain 0
1. 11dBm + 10log(83.87) = 30.24 dBm > 24dBm
2. 11dBm + 10log(83.73) = 30.23 dBm > 24dBm
3. 11dBm + 10log(84.15) = 30.25 dBm > 24dBm
4. 11dBm + 10log(5725.00 - 5647.30) = 29.90 dBm > 24dBm.
Chain 1
1. 11dBm + 10log(83.43) = 30.21 dBm > 24dBm
2. 11dBm + 10log(83.72) = 30.23 dBm > 24dBm
3. 11dBm + 10log(83.72) = 30.23 dBm > 24dBm
4. 11dBm + 10log(5725.00 - 5647.07) = 29.92 dBm > 24dBm.

Beamforming Mode

802.11n (HT20)

Chan.	Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
52	5260	15.12	15.25	66.006	18.20	22.69	Pass
60	5300	15.21	15.28	66.918	18.26	22.69	Pass
64	5320	15.20	15.33	67.232	18.28	22.69	Pass
100	5500	15.30	15.42	68.718	18.37	22.69	Pass
116	5580	15.26	15.36	67.930	18.32	22.69	Pass
140	5700	14.72	15.41	64.402	18.09	22.69	Pass
144	5720 For U-NII-2C	15.24	14.74	64.624	18.10	21.54	Pass
144	5720 For U-NII-3	8.41	8.72	14.704	11.67	28.69	Pass

Note:

1. 5260~5320MHz directional gain = 4.3dBi + 10log(2) = 7.31dBi > 6dBi, so the power limit shall be reduced to 24-(7.31-6) = 22.69dBm.
2. 5500~5700MHz directional gain = 4.3dBi + 10log(2) = 7.31dBi > 6dBi, so the power limit shall be reduced to 24-(7.31-6) = 22.69dBm.
3. 5720MHz directional gain = 4.3dBi + 10log(2) = 7.31dBi > 6dBi, so the power limit shall be reduced to 22.85-(7.31-6) = 21.54dBm.
4. 5745~5825MHz directional gain = 4.3dBi + 10log(2) = 7.31dBi > 6dBi, so the power limit shall be reduced to 30-(7.31-6) = 28.69dBm.

Note:
For U-NII-2A, U-NII-2C Band:
Chain 0
1. 11dBm + 10log(20.45) = 24.11 dBm > 24dBm
2. 11dBm + 10log(20.58) = 24.13 dBm > 24dBm
3. 11dBm + 10log(20.51) = 24.12 dBm > 24dBm
4. 11dBm + 10log(20.94) = 24.21 dBm > 24dBm
5. 11dBm + 10log(21.28) = 24.28 dBm > 24dBm
6. 11dBm + 10log(21.09) = 24.24 dBm > 24dBm
7. 11dBm + 10log(5725.00 - 5709.31) = 22.96 dBm < 24dBm.

Chain 1
1. 11dBm + 10log(20.68) = 24.16 dBm > 24dBm
2. 11dBm + 10log(20.55) = 24.13 dBm > 24dBm
3. 11dBm + 10log(20.65) = 24.15 dBm > 24dBm
4. 11dBm + 10log(20.53) = 24.12 dBm > 24dBm
5. 11dBm + 10log(20.79) = 24.18 dBm > 24dBm
6. 11dBm + 10log(20.55) = 24.13 dBm > 24dBm
7. 11dBm + 10log(5725.00 - 5709.68) = 22.85 dBm < 24dBm.

802.11n (HT40)

Chan.	Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
54	5270	17.89	18.05	**125.344**	20.98	22.69	Pass
62	5310	17.96	17.70	121.401	20.84	22.69	Pass
102	5510	14.72	15.12	62.157	17.93	22.69	Pass
110	5550	17.69	18.04	**122.429**	20.88	22.69	Pass
134	5670	17.40	17.68	113.568	20.55	22.69	Pass
142	5710 For U-NII-2C	15.78	14.62	71.082	18.52	22.69	Pass
142	5710 For U-NII-3	2.88	3.15	4.262	6.30	28.69	Pass

Note:
1. 5260~5320MHz directional gain = 4.3dBi + 10log(2) = 7.31dBi > 6dBi, so the power limit shall be reduced to 24-(7.31-6) = 22.69dBm.
2. 5500~5720MHz directional gain = 4.3dBi + 10log(2) = 7.31dBi > 6dBi, so the power limit shall be reduced to 24-(7.31-6) = 22.69dBm.
3. 5745~5825MHz directional gain = 4.3dBi + 10log(2) = 7.31dBi > 6dBi, so the power limit shall be reduced to 30-(7.31-6) = 28.69dBm.

For U-NII-2A, U-NII-2C Band:
Chain 0
1. 11dBm + 10log(40.53) = 27.08 dBm > 24dBm
2. 11dBm + 10log(40.70) = 27.10 dBm > 24dBm
3. 11dBm + 10log(40.69) = 27.09 dBm > 24dBm
4. 11dBm + 10log(40.75) = 27.10 dBm > 24dBm
5. 11dBm + 10log(40.76) = 27.10 dBm > 24dBm
6. 11dBm + 10log(5725.00 - 5689.71) = 26.48 dBm > 24dBm.

Chain 1
1. 11dBm + 10log(40.78) = 27.10 dBm > 24dBm
2. 11dBm + 10log(40.65) = 27.09 dBm > 24dBm
3. 11dBm + 10log(40.65) = 27.09 dBm > 24dBm
4. 11dBm + 10log(40.66) = 27.09 dBm > 24dBm
5. 11dBm + 10log(40.78) = 27.10 dBm > 24dBm
6. 11dBm + 10log(5725.00 - 5689.50) = 26.50 dBm > 24dBm.

802.11ac (VHT80)

Chan.	Freq. (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
58	5290	16.99	16.83	98.198	19.92	22.69	Pass
106	5530	13.56	14.18	48.881	16.89	22.69	Pass
122	5610	13.48	14.20	48.587	16.87	22.69	Pass
138	5690 For U-NII-2C	12.34	13.88	45.486	16.58	22.69	Pass
138	5690 For U-NII-3	-2.04	-1.25	1.505	1.77	28.69	Pass

Note:
1. 5260~5320MHz directional gain = 4.3dBi + 10log(2) = 7.31dBi > 6dBi, so the power limit shall be reduced to 24-(7.31-6) = 22.69dBm.
2. 5500~5720MHz directional gain = 4.3dBi + 10log(2) = 7.31dBi > 6dBi, so the power limit shall be reduced to 24-(7.31-6) = 22.69dBm.
3. 5745~5825MHz directional gain = 4.3dBi + 10log(2) = 7.31dBi > 6dBi, so the power limit shall be reduced to 30-(7.31-6) = 28.69dBm.

Note:
For U-NII-2A, U-NII-2C Band:
Chain 0
1. 11dBm + 10log(83.87) = 30.24 dBm > 24dBm
2. 11dBm + 10log(83.73) = 30.23 dBm > 24dBm
3. 11dBm + 10log(84.15) = 30.25 dBm > 24dBm
4. 11dBm + 10log(5725.00 - 5647.30) = 29.90 dBm > 24dBm.

Chain 1
1. 11dBm + 10log(83.43) = 30.21 dBm > 24dBm
2. 11dBm + 10log(83.72) = 30.23 dBm > 24dBm
3. 11dBm + 10log(83.72) = 30.23 dBm > 24dBm
4. 11dBm + 10log(5725.00 - 5647.07) = 29.92 dBm > 24dBm.

26dB Bandwidth:

802.11a

Chan.	Freq. (MHz)	26dBc Bandwidth (MHz)	
		Chain 0	Chain 1
52	5260	19.33	20.05
60	5300	19.68	19.82
64	5320	19.86	19.97
100	5500	20.27	19.81
116	5580	20.14	20.07
140	5700	19.83	20.18
144	5720 For U-NII-2C	14.91	15.11
144	5720 For U-NII-3	5.01	5.11

802.11n (HT20)

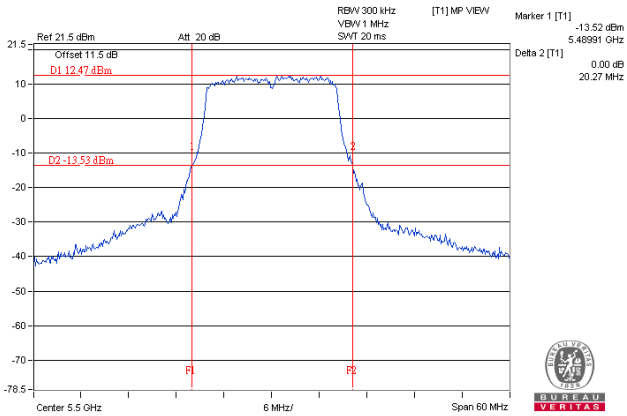
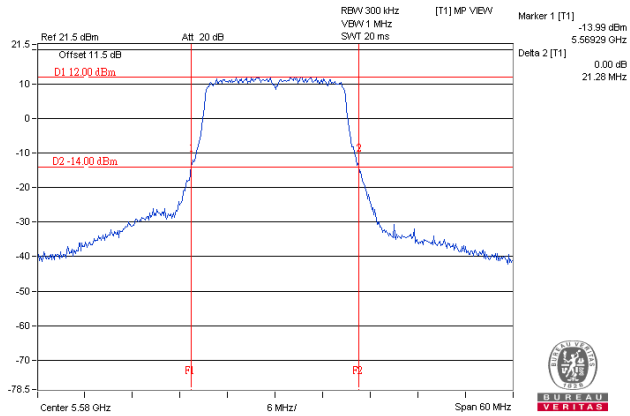
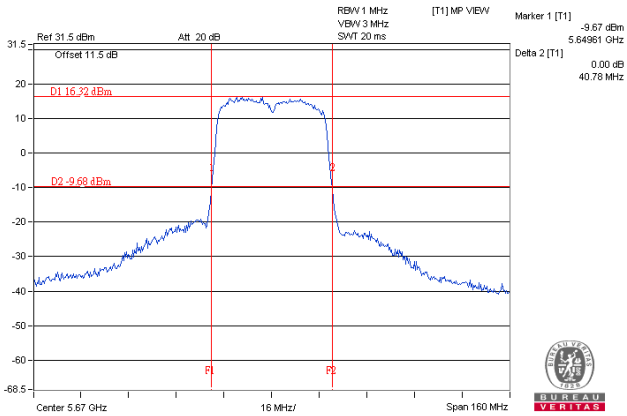
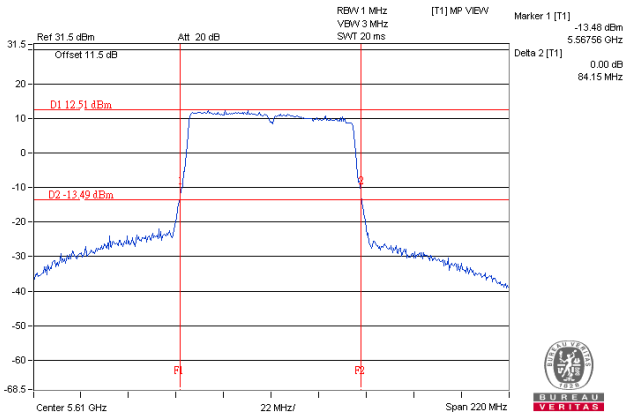
Chan.	Freq. (MHz)	26dBc Bandwidth (MHz)	
		Chain 0	Chain 1
52	5260	20.45	20.68
60	5300	20.58	20.55
64	5320	20.51	20.65
100	5500	20.94	20.53
116	5580	21.28	20.79
140	5700	21.09	20.55
144	5720 For U-NII-2C	15.69	15.32
144	5720 For U-NII-3	5.46	5.54

802.11n (HT40)

Chan.	Freq. (MHz)	26dBc Bandwidth (MHz)	
		Chain 0	Chain 1
54	5270	40.53	40.78
62	5310	40.70	40.65
102	5510	40.69	40.65
110	5550	40.75	40.66
134	5670	40.76	40.78
142	5710 For U-NII-2C	35.29	35.50
142	5710 For U-NII-3	5.18	5.34

802.11ac (VHT80)

Chan.	Freq. (MHz)	26dBc Bandwidth (MHz)	
		Chain 0	Chain 1
58	5290	83.87	83.43
106	5530	83.73	83.72
122	5610	84.15	83.72
138	5690 For U-NII-2C	77.70	77.93
138	5690 For U-NII-3	6.79	7.29

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

EUT Maximum Conducted Power

CDD Mode

802.11a

Frequency Band (MHz)	Max. Power	
	Output Power (mW)	Output Power (dBm)
5250~5350	137.897	21.40
5470~5725	143.291	21.56

802.11n (HT20)

Frequency Band (MHz)	Max. Power	
	Output Power (mW)	Output Power (dBm)
5250~5350	134.456	21.29
5470~5725	137.427	21.38

802.11n (HT40)

Frequency Band (MHz)	Max. Power	
	Output Power (mW)	Output Power (dBm)
5250~5350	250.671	23.99
5470~5725	244.840	23.89

802.11ac (VHT80)

Frequency Band (MHz)	Max. Power	
	Output Power (mW)	Output Power (dBm)
5250~5350	196.383	22.93
5470~5725	97.754	19.90

Beamforming Mode

802.11n (HT20)

Frequency Band (MHz)	Max. Power	
	Output Power (mW)	Output Power (dBm)
5250~5350	67.232	18.28
5470~5725	68.718	18.37

802.11n (HT40)

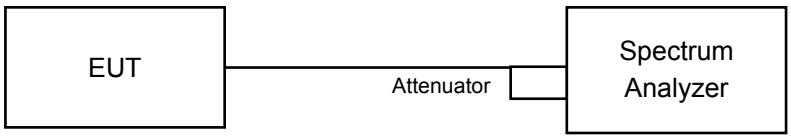
Frequency Band (MHz)	Max. Power	
	Output Power (mW)	Output Power (dBm)
5250~5350	125.344	20.98
5470~5725	122.429	20.88

802.11ac (VHT80)

Frequency Band (MHz)	Max. Power	
	Output Power (mW)	Output Power (dBm)
5250~5350	98.198	19.92
5470~5725	48.881	16.89

4.4 Occupied Bandwidth Measurement

4.4.1 Test Setup



4.4.2 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.4.3 Test Procedure

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

4.4.4 Test Result

802.11a

Chan.	Freq. (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
52	5260	16.44	16.44
60	5300	16.44	16.44
64	5320	16.44	16.44
100	5500	16.44	16.44
116	5580	16.44	16.44
140	5700	16.44	16.44
144	5720 For U-NII-2C	13.28	13.16
144	5720 For U-NII-3	3.16	3.16

802.11n (HT20)

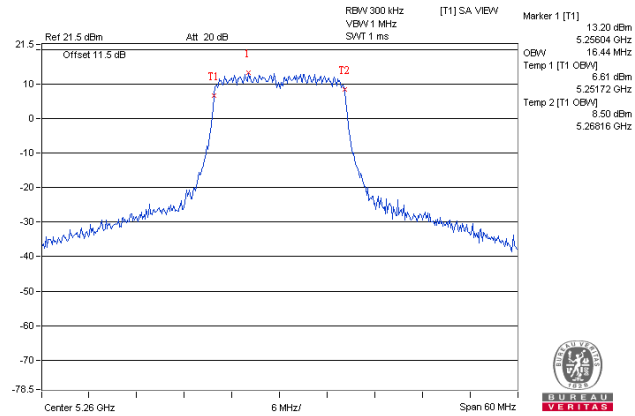
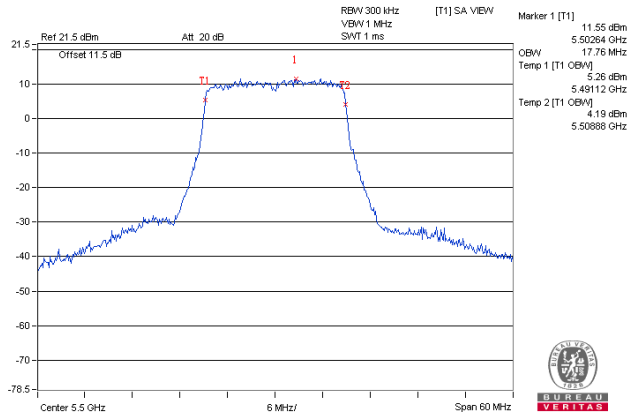
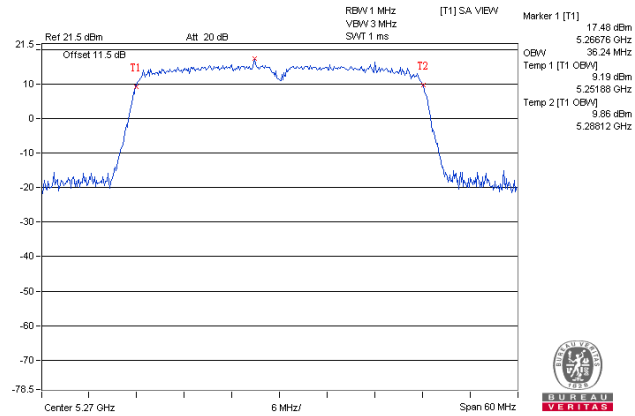
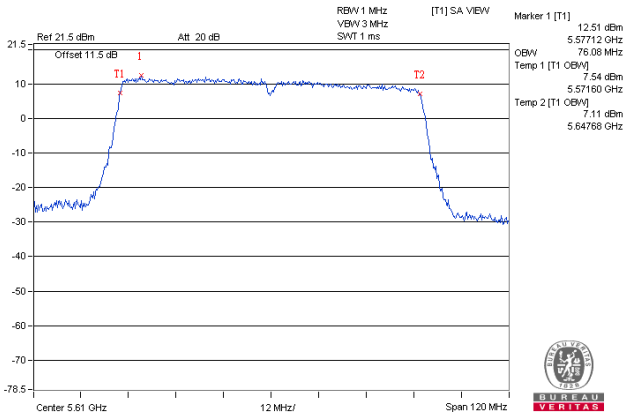
Chan.	Freq. (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
52	5260	17.64	17.64
60	5300	17.64	17.76
64	5320	17.64	17.64
100	5500	17.76	17.64
116	5580	17.64	17.64
140	5700	17.64	17.64
144	5720 For U-NII-2C	13.88	13.76
144	5720 For U-NII-3	3.76	3.76

802.11n (HT40)

Chan.	Freq. (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
54	5270	36.24	36.24
62	5310	36.12	36.00
102	5510	36.00	36.12
110	5550	36.12	36.12
134	5670	36.24	36.00
142	5710 For U-NII-2C	33.24	33.12
142	5710 For U-NII-3	3.00	3.00

802.11ac (VHT80)

Chan.	Freq. (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
58	5290	75.60	75.84
106	5530	75.84	75.84
122	5610	76.08	75.60
138	5690 For U-NII-2C	73.16	73.16
138	5690 For U-NII-3	2.92	2.92

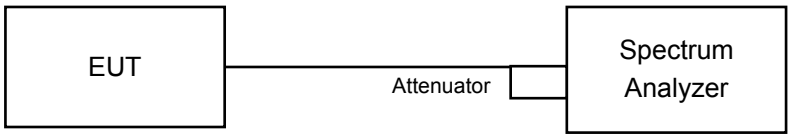
Spectrum Plot of Worst Value	
802.11a	802.11n (HT20)
	
802.11n (HT40)	802.11ac (VHT80)
	

4.5 Peak Power Spectral Density Measurement

4.5.1 Limits of Peak Power Spectral Density Measurement

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

4.5.2 Test Setup



4.5.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.5.4 Test Procedures

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

Duty cycle of test signal is > 98%

Using method SA-1

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

Duty cycle of test signal is < 98%

Using method SA-2

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

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

c. Set Channel power measure = 1MHz

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

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

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

For U-NII-3 band:

Duty cycle of test signal is > 98%

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

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

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

d. Scale the observed power level to an equivalent value in 500 kHz by adjusting (reducing) the measured power by a bandwidth correction factor (BWCF) where BWCF = 10log(500 kHz/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

Duty cycle of test signal is < 98%

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

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

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

d. Scale the observed power level to an equivalent value in 500 kHz by adjusting (reducing) the measured power by a bandwidth correction factor (BWCF) where BWCF = 10log(500 kHz / 300 kHz)

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

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

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

4.5.5 Deviation from Test Standard

No deviation.

4.5.6 EUT Operating Conditions

Same as 4.3.6.

4.5.7 Test Results

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

802.11a

Chan.	Freq. (MHz)	PSD w/o Duty Factor (dBm/MHz)		Duty Factor (dB)	Total PSD with Duty Factor (dBm/MHz)	Max. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1				
52	5260	6.23	6.35	0.29	9.59	9.69	Pass
60	5300	6.40	6.42	0.29	9.64	9.69	Pass
64	5320	6.01	6.17	0.29	9.39	9.69	Pass
100	5500	6.55	6.02	0.29	9.60	9.69	Pass
116	5580	6.15	6.09	0.29	9.42	9.69	Pass
140	5700	6.22	6.25	0.29	9.54	9.69	Pass
144	5720	6.58	6.00	0.29	9.60	9.69	Pass

Note:

1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = 4.3dBi + 10log(2) =7.31dBi > 6dBi, so the power density limit shall be reduced to 11-(7.31-6) = 9.69dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11n (HT20)

Chan.	Freq. (MHz)	PSD w/o Duty Factor (dBm/MHz)		Duty Factor (dB)	Total PSD with Duty Factor (dBm/MHz)	Max. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1				
52	5260	6.50	6.49	0.10	9.60	9.69	Pass
60	5300	6.36	6.05	0.10	9.31	9.69	Pass
64	5320	6.46	6.09	0.10	9.39	9.69	Pass
100	5500	6.41	5.91	0.10	9.27	9.69	Pass
116	5580	6.16	6.15	0.10	9.26	9.69	Pass
140	5700	6.09	6.22	0.10	9.26	9.69	Pass
144	5720	6.61	6.52	0.10	9.67	9.69	Pass

Note:

1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = 4.3dBi + 10log(2) =7.31dBi > 6dBi, so the power density limit shall be reduced to 11-(7.31-6) = 9.69dBm.

802.11n (HT40)

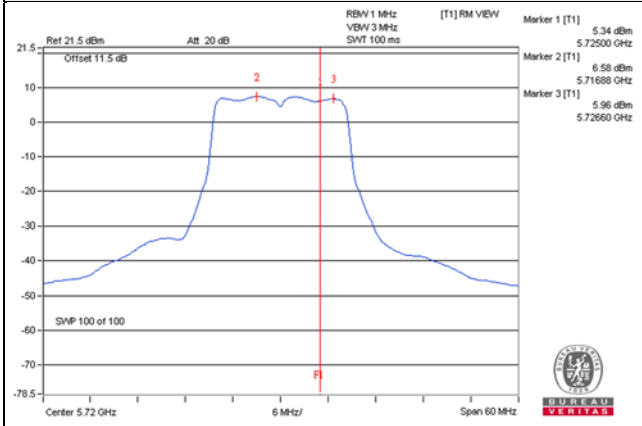
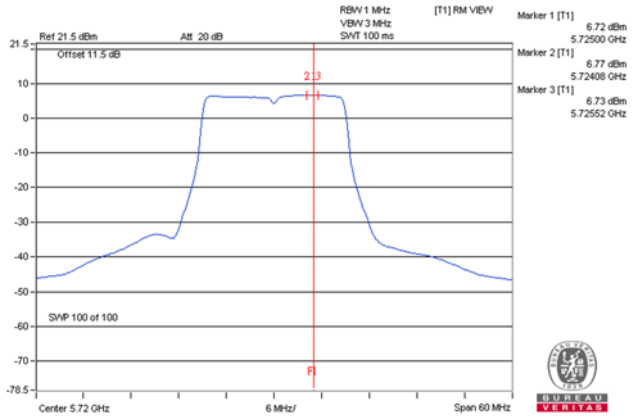
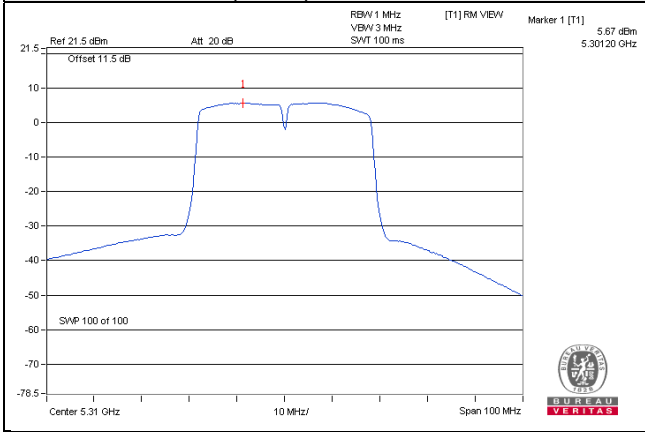
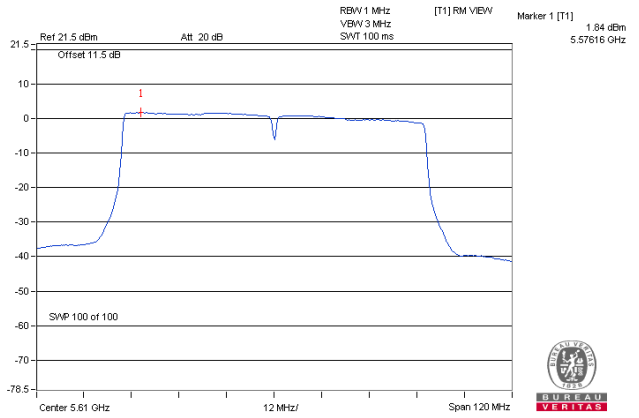
Chan.	Freq. (MHz)	PSD w/o Duty Factor (dBm/MHz)		Duty Factor (dB)	Total PSD with Duty Factor (dBm/MHz)	Max. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1				
54	5270	5.28	5.59	0.27	8.72	9.69	Pass
62	5310	5.36	5.65	0.27	8.79	9.69	Pass
102	5510	2.38	2.40	0.27	5.67	9.69	Pass
110	5550	5.31	5.45	0.27	8.66	9.69	Pass
134	5670	4.45	5.28	0.27	8.16	9.69	Pass
142	5710	5.17	3.94	0.27	7.88	9.69	Pass

Note:
1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = 4.3dBi + 10log(2) =7.31dBi > 6dBi, so the power density limit shall be reduced to 11-(7.31-6) = 9.69dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ac (VHT80)

Chan.	Freq. (MHz)	PSD w/o Duty Factor (dBm/MHz)		Duty Factor (dB)	Total PSD with Duty Factor (dBm/MHz)	Max. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1				
58	5290	0.43	1.15	0.39	4.21	9.69	Pass
106	5530	-1.19	-3.21	0.39	1.32	9.69	Pass
122	5610	1.84	-3.23	0.39	3.41	9.69	Pass
138	5690	-0.95	0.54	0.39	3.26	9.69	Pass

Note:
1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = 4.3dBi + 10log(2) =7.31dBi > 6dBi, so the power density limit shall be reduced to 11-(7.31-6) = 9.69dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

Spectrum Plot of Worst Value	
802.11a / Chain 0 / CH 144	802.11n (HT20) / Chain 0 / CH 144
	
802.11n (HT40) / Chain 1 / CH 62	802.11ac (VHT80) / Chain 0 / CH 122
	

For U-NII-3 band:

802.11a

Ch.	Freq. (MHz)	PSD (dBm/300kHz)		PSD (dBm/500kHz)		Duty factor	Total PSD (dBm /500 kHz)	Limit (dBm /500 kHz)	Pass / Fail
		Chain 0	Chain 1	Chain 0	Chain 1				
144	5720	-1.01	-1.49	1.21	0.73	0.15	4.14	28.69	Pass

Note:
1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = 4.3dBi + 10log(2) =7.31dBi > 6dBi, so the power density limit shall be reduced to 30-(7.31-6) = 28.69dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11n (HT20)

Ch.	Freq. (MHz)	PSD (dBm/300kHz)		PSD (dBm/500kHz)		Total PSD (dBm /500 kHz)	Limit (dBm /500 kHz)	Pass / Fail
		Chain 0	Chain 1	Chain 0	Chain 1			
144	5720	-1.57	-2.23	0.65	-0.01	3.34	28.69	Pass

Note:
1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = 4.3dBi + 10log(2) =7.31dBi > 6dBi, so the power density limit shall be reduced to 30-(7.31-6) = 28.69dBm.

802.11n (HT40)

Ch.	Freq. (MHz)	PSD (dBm/300kHz)		PSD (dBm/500kHz)		Duty factor	Total PSD (dBm /500 kHz)	Limit (dBm /500 kHz)	Pass / Fail
		Chain 0	Chain 1	Chain 0	Chain 1				
142	5710	-5.16	-6.66	-2.94	-4.44	0.27	-0.35	28.69	Pass

Note:
1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = 4.3dBi + 10log(2) =7.31dBi > 6dBi, so the power density limit shall be reduced to 30-(7.31-6) = 28.69dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

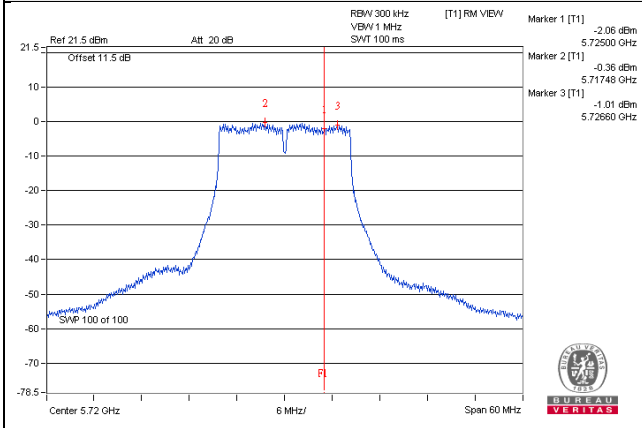
802.11ac (VHT80)

Ch.	Freq. (MHz)	PSD (dBm/300kHz)		PSD (dBm/500kHz)		Duty factor	Total PSD (dBm /500 kHz)	Limit (dBm /500 kHz)	Pass / Fail
		Chain 0	Chain 1	Chain 0	Chain 1				
138	5690	-11.56	-11.62	-9.34	-9.40	0.39	-5.97	28.69	Pass

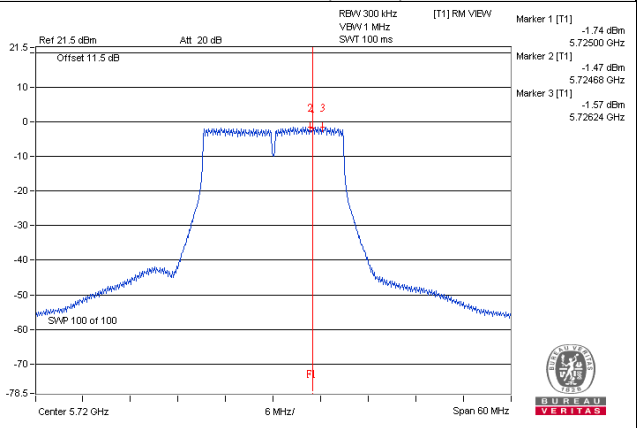
Note:
1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = 4.3dBi + 10log(2) =7.31dBi > 6dBi, so the power density limit shall be reduced to 30-(7.31-6) = 28.69dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

Spectrum Plot of Worst Value

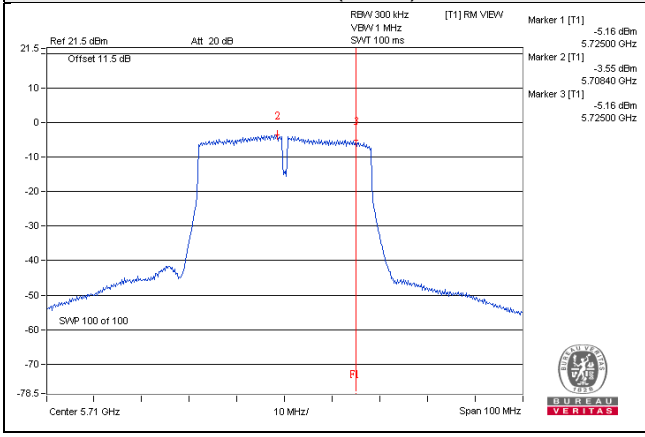
802.11a



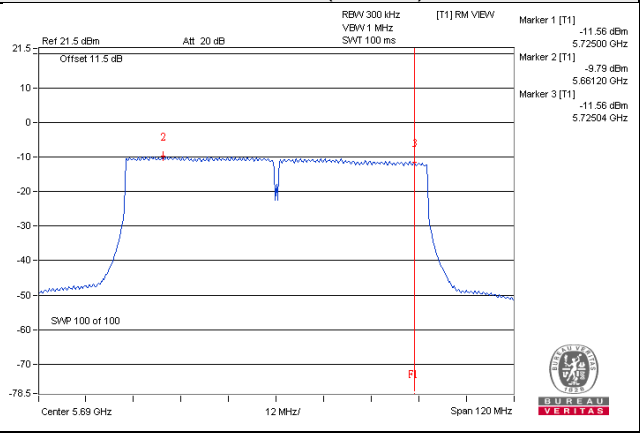
802.11n (HT20)



802.11n (HT40)



802.11ac (VHT80)

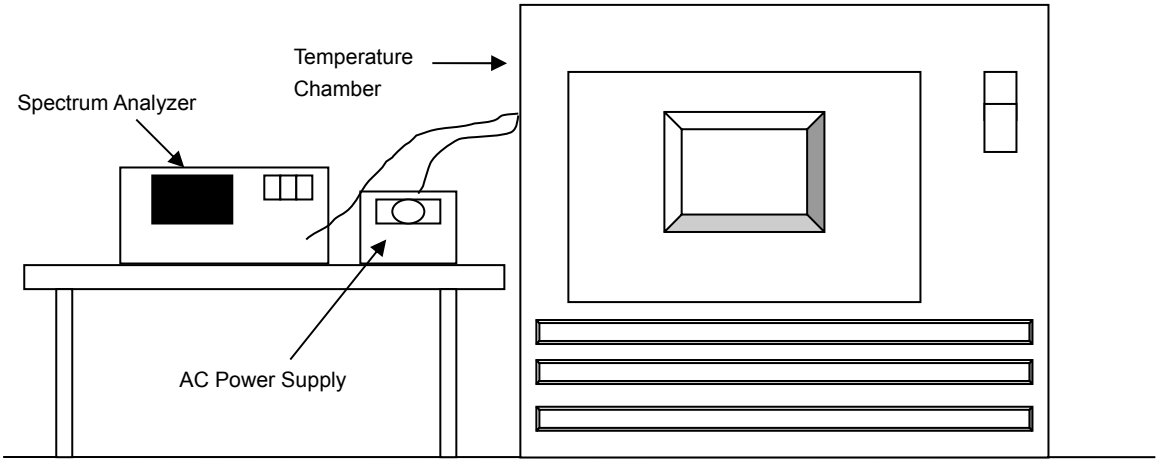


4.6 Frequency Stability

4.6.1 Limits of Frequency Stability Measurement

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

4.6.2 Test Setup



4.6.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.6.4 Test Procedure

a. The EUT was placed inside the environmental test chamber and powered by nominal AC voltage.

b. Turn the EUT on and couple its output to a spectrum analyzer.

c. Turn the EUT off and set the chamber to the highest temperature specified.

d. Allow sufficient time (approximately 30 min) for the temperature of the chamber to stabilize, turn the EUT on and measure the operating frequency after 2, 5, and 10 minutes.

e. Repeat step 2 and 3 with the temperature chamber set to the lowest temperature.

f. The test chamber was allowed to stabilize at +20 degree C for a minimum of 30 minutes. The supply voltage was then adjusted on the EUT from 85% to 115% and the frequency record.

4.6.5 Deviation from Test Standard

No deviation.

4.6.6 EUT Operating Condition

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

4.6.7 Test Results

Frequency Stability Versus Temp.									
Operating Frequency: 5260MHz									
Temp. (℃)	Power Supply (Vac)	0 Minute		2 Minute		5 Minute		10 Minute	
		Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)
50	120	5259.9850	-0.00029	5259.9843	-0.00030	5259.9873	-0.00024	5259.9847	-0.00029
40	120	5259.9776	-0.00043	5259.9730	-0.00051	5259.9780	-0.00042	5259.9729	-0.00052
30	120	5260.0024	0.00005	5260.0027	0.00005	5260.0022	0.00004	5260.0034	0.00006
20	120	5260.0205	0.00039	5260.0219	0.00042	5260.0178	0.00034	5260.0218	0.00041
10	120	5259.9781	-0.00042	5259.9821	-0.00034	5259.9793	-0.00039	5259.9799	-0.00038
0	120	5259.9935	-0.00012	5259.9906	-0.00018	5259.9926	-0.00014	5259.9901	-0.00019
-10	120	5260.0255	0.00048	5260.0236	0.00045	5260.0213	0.00040	5260.0213	0.00040
-20	120	5260.0070	0.00013	5260.0051	0.00010	5260.0040	0.00008	5260.0041	0.00008
-30	120	5260.0153	0.00029	5260.0119	0.00023	5260.0152	0.00029	5260.0139	0.00026

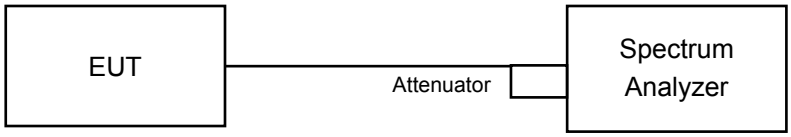
Frequency Stability Versus Voltage									
Operating Frequency: 5260MHz									
Temp. (℃)	Power Supply (Vac)	0 Minute		2 Minute		5 Minute		10 Minute	
		Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)
20	138	5260.0204	0.00039	5260.0228	0.00043	5260.0183	0.00035	5260.0213	0.00040
	120	5260.0205	0.00039	5260.0219	0.00042	5260.0178	0.00034	5260.0218	0.00041
	102	5260.0199	0.00038	5260.0219	0.00042	5260.0169	0.00032	5260.0208	0.00040

4.7 6dB Bandwidth Measurement

4.7.1 Limits of 6dB Bandwidth Measurement

The minimum of 6dB Bandwidth Measurement is 0.5MHz.

4.7.2 Test Setup



4.7.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.7.4 Test Procedure

Measurement Procedure REF

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

4.7.5 Deviation from Test Standard

No deviation.

4.7.6 EUT Operating Condition

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

4.7.7 Test Results

802.11a

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
144	5720 For U-NII-3	3.18	3.16	0.5	Pass

802.11n (HT20)

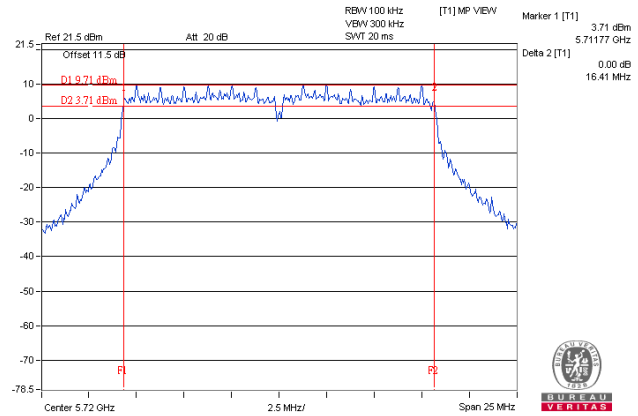
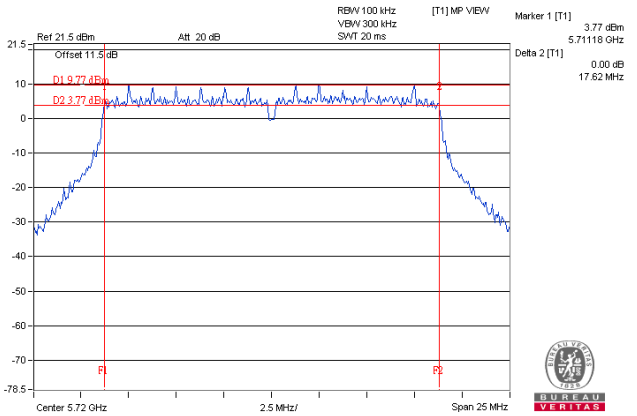
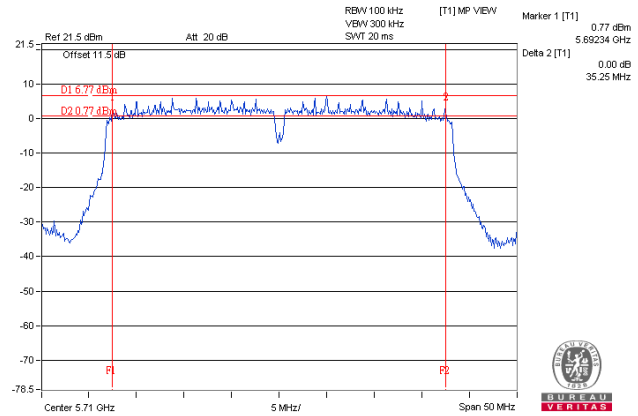
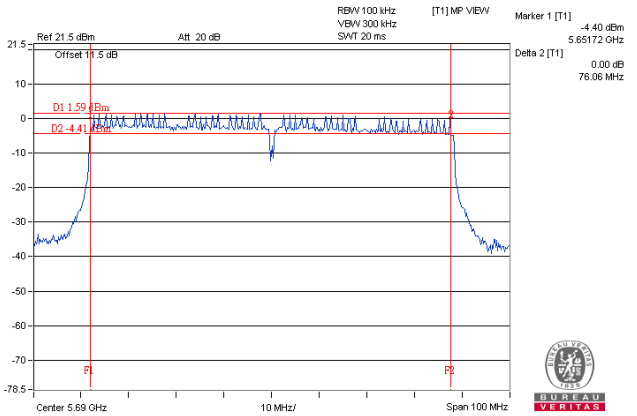
Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
144	5720 For U-NII-3	3.80	3.80	0.5	Pass

802.11n (HT40)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
142	5710 For U-NII-3	2.57	2.59	0.5	Pass

802.11ac (VHT80)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
138	5690 For U-NII-3	2.78	2.78	0.5	Pass

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

Note:

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

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

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

5 Pictures of Test Arrangements

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

Appendix – Information on the Testing Laboratories

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

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

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

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

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

Email: service.adt@tw.bureauveritas.com
Web Site: www.bureauveritas-adt.com

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

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