

FCC Test Report

Report No.: RF140224C17G

FCC ID: A8J-EAP1750H

Test Model: EAP1750H

Series Model: EWS360AP

Received Date: Feb. 24, 2014

Test Date: Mar. 13 ~ Mar. 20, 2014 (Conducted emission test)

Jul. 14 ~ Jul. 22, 2015 (All tests except conducted emission)

Issued Date: Aug. 12, 2015

Applicant: EnGenius Technologies

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Issued By: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch

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Release Control Record

Issue No.	Description	Date Issued
RF140224C17G	Original release.	Aug. 12, 2015

1 Certificate of Conformity

Product: Dual Band AC1750 Access Point

Brand: EnGenius

Test Model: EAP1750H

Series Model: EWS360AP

Sample Status: Engineering sample

Applicant: EnGenius Technologies

Test Date: Mar. 13 ~ Mar. 20, 2014 (Conducted emission test)

Jul. 14 ~ Jul. 22, 2015 (All tests except conducted emission)

Standard: 47 CFR FCC Part 15, Subpart E (Section 15.407)

ANSI C63.10:2013

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

Prepared by : Ivy Lin , **Date:** Aug. 12, 2015
Ivy Lin / Specialist

Approved by : Ken Liu , **Date:** Aug. 12, 2015
Ken Liu / Senior Manager

2 Summary of Test Results

47 CFR FCC Part 15, Subpart E (Section 15.407)			
FCC Clause	Test Item	Result	Remarks
15.407(b)(6)	AC Power Conducted Emissions	PASS	Meet the requirement of limit. Minimum passing margin is -2.11dB at 0.47422MHz.
15.407(b)(1/2/3/4/6)	Radiated Emissions & Band Edge Measurement	PASS	Meet the requirement of limit. Minimum passing margin is -1.0dB at 5714.90MHz.
15.407(a)(1/2/3)	Max Average Transmit Power	PASS	Meet the requirement of limit.
15.407(a)(1/2/3)	Peak Power Spectral Density	PASS	Meet the requirement of limit.
15.407(e)	6dB bandwidth	PASS	Meet the requirement of limit. (U-NII-3 Band only)
15.407(g)	Frequency Stability	PASS	Meet the requirement of limit.
15.203	Antenna Requirement	PASS	Antenna connector is IPEX not a standard connector.

2.1 Measurement Uncertainty

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

Measurement	Frequency	Expanded Uncertainty (k=2) (±)
Conducted Emissions at mains ports	150kHz ~ 30MHz	2.44 dB
Radiated Emissions up to 1 GHz	30MHz ~ 200MHz	3.86 dB
	200MHz ~1000MHz	3.87 dB
Radiated Emissions above 1 GHz	1GHz ~ 18GHz	2.29 dB
	18GHz ~ 40GHz	2.29 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	Dual Band AC1750 Access Point
Brand	EnGenius
Test Model	EAP1750H
Series Model	EWS360AP
Model Difference	marketing purpose
Status of EUT	Engineering sample
Power Supply Rating	12Vdc from adapter 48Vdc from PoE
Modulation Type	256QAM, 64QAM, 16QAM, QPSK, BPSK
Modulation Technology	OFDM
Transfer Rate	802.11a: 54.0/ 48.0/ 36.0/ 24.0/ 18.0/ 12.0/ 9.0/ 6.0Mbps 802.11n: up to 450.0Mbps 802.11ac: up to 1299.9Mbps
Operating Frequency	5180 ~ 5240MHz & 5745 ~ 5825MHz
Number of Channel	5180 ~ 5240MHz: 4 for 802.11a, 802.11n (HT20), 802.11ac (VHT20) 2 for 802.11n (HT40), 802.11ac (VHT40) 1 for 802.11ac (VHT80) 5745 ~ 5825MHz: 5 for 802.11a, 802.11n (HT20), 802.11ac (VHT20) 2 for 802.11n (HT40), 802.11ac (VHT40) 1 for 802.11ac (VHT80)
Output Power	5180 ~ 5240MHz: 585.896mW 5745 ~ 5825MHz: 419.235mW
Antenna Type	PIFA antenna with 5.0dBi gain
Antenna Connector	IPEX
Accessory Device	Adapter
Data Cable Supplied	NA

Note:

1. This report is issued as a supplementary report of BV ADT report no.: RF140224C17-1. This report is prepared for FCC class II permissive change. The difference compared with original report is updating FCC KDB to new rule. All test items of U-NII-1 and U-NII-3 band are retested in this report.
2. All models are listed as below. Model: EAP1750H was chosen for final test.

Brand	Model	Difference
EnGenius	EAP1750H	All models are electrically identical, different model names are for appearance.
	EWS360AP	

3. The EUT incorporates a MIMO function. Physically, the EUT provides 3 completed transmitters and 3 receivers.

Modulation Mode	TX Function
802.11a	3TX
802.11n (HT20) MCS 0-7	3TX
802.11n (HT20) MCS 8-15	3TX
802.11n (HT20) MCS 16-23	3TX
802.11n (HT40) MCS 0-7	3TX
802.11n (HT40) MCS 8-15	3TX
802.11n (HT40) MCS 16-23	3TX
802.11ac (VHT20)	3TX
802.11ac (VHT40)	3TX
802.11ac (VHT80)	3TX

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

4. The EUT consumes power from the following adapter & PoE.

Adapter	
Brand	Powertron Electronics Corp.
Model	PA1024-2HUB PA1024-2HU PA1024-120HUB200
Input Power	100-240Vac, 50-60Hz, 0.6A
Output Power	12Vdc, 2.0A, 24W Max
Power Line	1.50m non-shielded cable with one core

PoE (Support unit only)	
Brand	EnGenius
Model	NPE-5818
Rating	48Vdc, 0.5A

Adapter of PoE (Support unit only)	
Brand	Powertron Electronics Corp.
Model	PA1024-480DUB050
Input Power	100-240V~50-60Hz 0.6A
Output Power	48Vdc, 0.5A, 24W Max
Power Line	1.55m non-shielded cable without core

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

3.2 Description of Test Modes

FOR 5180 ~ 5240MHz

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

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

2 channels are provided for 802.11n (HT40), 802.11ac (40MHz):

Channel	Frequency	Channel	Frequency
38	5190 MHz	46	5230 MHz

1 channel is provided for 802.11ac (VHT80):

Channel	Frequency
42	5210MHz

FOR 5745 ~ 5825MHz:

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

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

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

Channel	Frequency	Channel	Frequency
151	5755MHz	159	5795MHz

1 channel is provided for 802.11ac (VHT80):

Channel	Frequency
155	5775MHz

3.2.1 Test Mode Applicability and Tested Channel Detail

EUT CONFIGURE MODE	APPLICABLE TO				DESCRIPTION
	RE≥1G	RE<1G	PLC	APCM	
A	√	√	√	√	Power from adapter
B	-	√	√	-	Power from PoE

Where **RE≥1G**: Radiated Emission above 1GHz **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	FREQ. BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
A	802.11a	5180-5240	36 to 48	36, 40, 48	OFDM	BPSK	6.0
A	802.11n (HT20)		36 to 48	36, 40, 48	OFDM	BPSK	6.5
A	802.11n (HT40)		38 to 46	38, 46	OFDM	BPSK	15.0
A	802.11ac (VHT80)		42	42	OFDM	BPSK	97.5
A	802.11a	5745-5825	149 to 165	149, 157, 165	OFDM	BPSK	6.0
A	802.11n (HT20)		149 to 165	149, 157, 165	OFDM	BPSK	6.5
A	802.11n (HT40)		151 to 159	151, 159	OFDM	BPSK	15.0
A	802.11ac (VHT80)		155	155	OFDM	BPSK	97.5

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	FREQ. BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
A, B	802.11a	5180-5320 5745-5825	36 to 64 149 to 165	40	OFDM	BPSK	6.0

Power Line Conducted Emission Test:

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

EUT CONFIGURE MODE	MODE	FREQ. BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
A, B	802.11a	5180-5320 5745-5825	36 to 64 149 to 165	40	OFDM	BPSK	6.0

Antenna Port Conducted Measurement:

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

EUT CONFIGURE MODE	MODE	FREQ. BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
A	802.11a	5180-5240	36 to 48	36, 40, 48	OFDM	BPSK	6.0
A	802.11n (HT20)		36 to 48	36, 40, 48	OFDM	BPSK	6.5
A	802.11n (HT40)		38 to 46	38, 46	OFDM	BPSK	15.0
A	802.11ac (VHT80)		42	42	OFDM	BPSK	97.5
A	802.11a	5745-5825	149 to 165	149, 157, 165	OFDM	BPSK	6.0
A	802.11n (HT20)		149 to 165	149, 157, 165	OFDM	BPSK	6.5
A	802.11n (HT40)		151 to 159	151, 159	OFDM	BPSK	15.0
A	802.11ac (VHT80)		155	155	OFDM	BPSK	97.5

Test Condition:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RE $\geq$ 1G	18deg. C, 70%RH, 21deg. C, 66%RH,	120Vac, 60Hz	Nick Hsu, Jones Chang
RE<1G	18deg. C, 70%RH	120Vac, 60Hz, 48Vdc (PoE)	Nick Hsu
PLC	25deg. C, 65%RH	120Vac, 60Hz, 48Vdc (PoE)	Ted Chang
APCM	24deg. C, 64%RH	120Vac, 60Hz	Match Tsui

3.3 Duty Cycle of Test Signal

Duty cycle of test signal is < 98%, duty factor shall be considered.

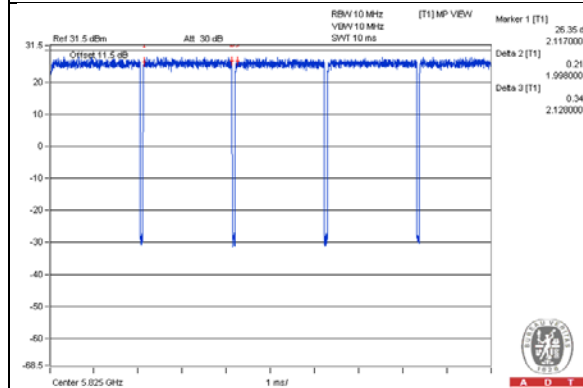
802.11a: Duty cycle = $1.998/2.128 = 0.939$, Duty factor = $10 * \log(1/0.939) = 0.27$

802.11n (HT20): Duty cycle = $1.870/2.067 = 0.905$, Duty factor = $10 * \log(1/0.905) = 0.43$

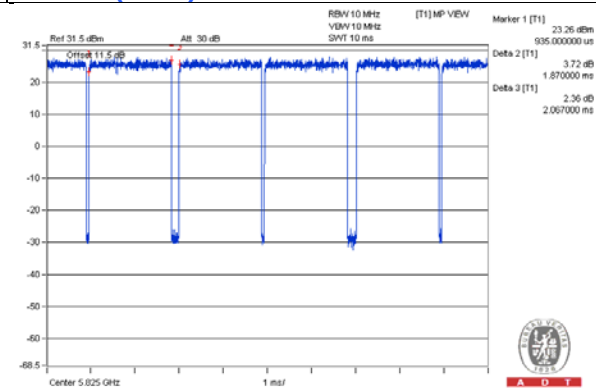
802.11n (HT40): Duty cycle = $0.917/1.005 = 0.912$, Duty factor = $10 * \log(1/0.912) = 0.40$

802.11ac (VHT80): Duty cycle = $0.442/0.522 = 0.847$, Duty factor = $10 * \log(1/0.847) = 0.72$

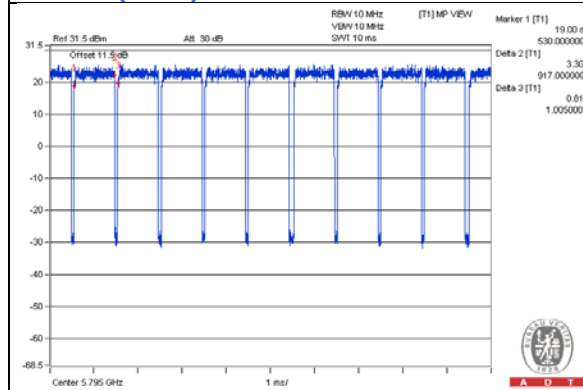
802.11a



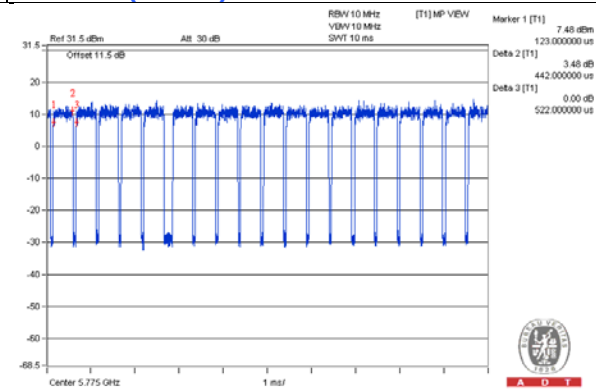
802.11n (HT20)



802.11n (HT40)



802.11ac (VHT80)



3.4 Description of Support Units

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Notebook	DELL	E5410	1HC2XM1	FCC DoC Approved	-
B.	POE	EnGenius	NPE-5818	NA	NA	Supplied by the manufacturer
C.	ADAPTER	Powertron Electronics Corp.	PA1024-480DUB050	NA	NA	Supplied by the manufacturer

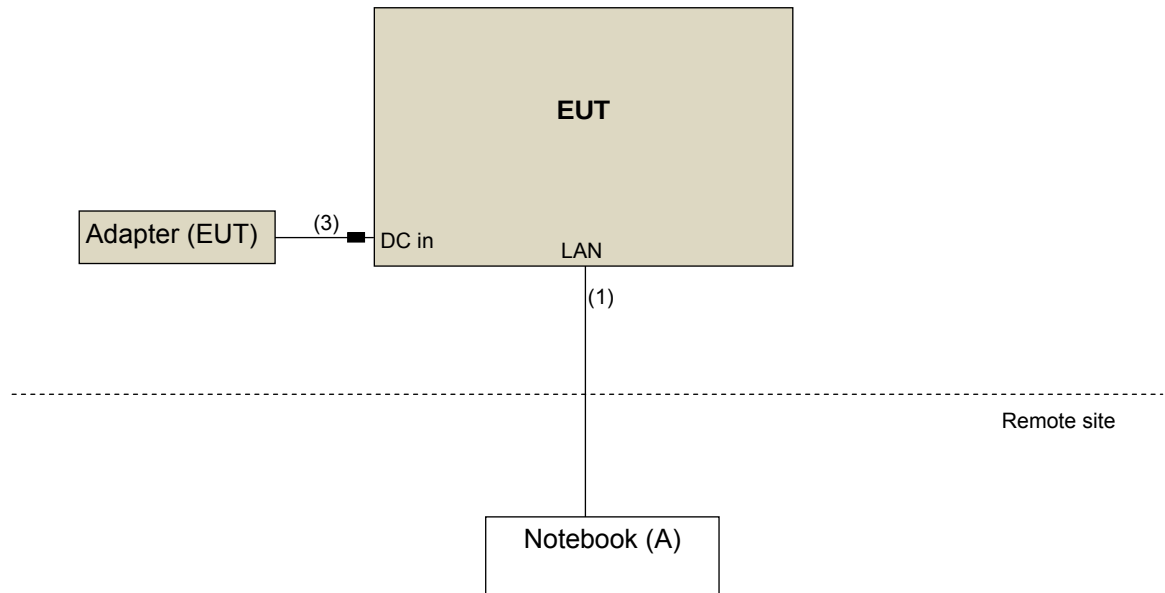
Note:

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.

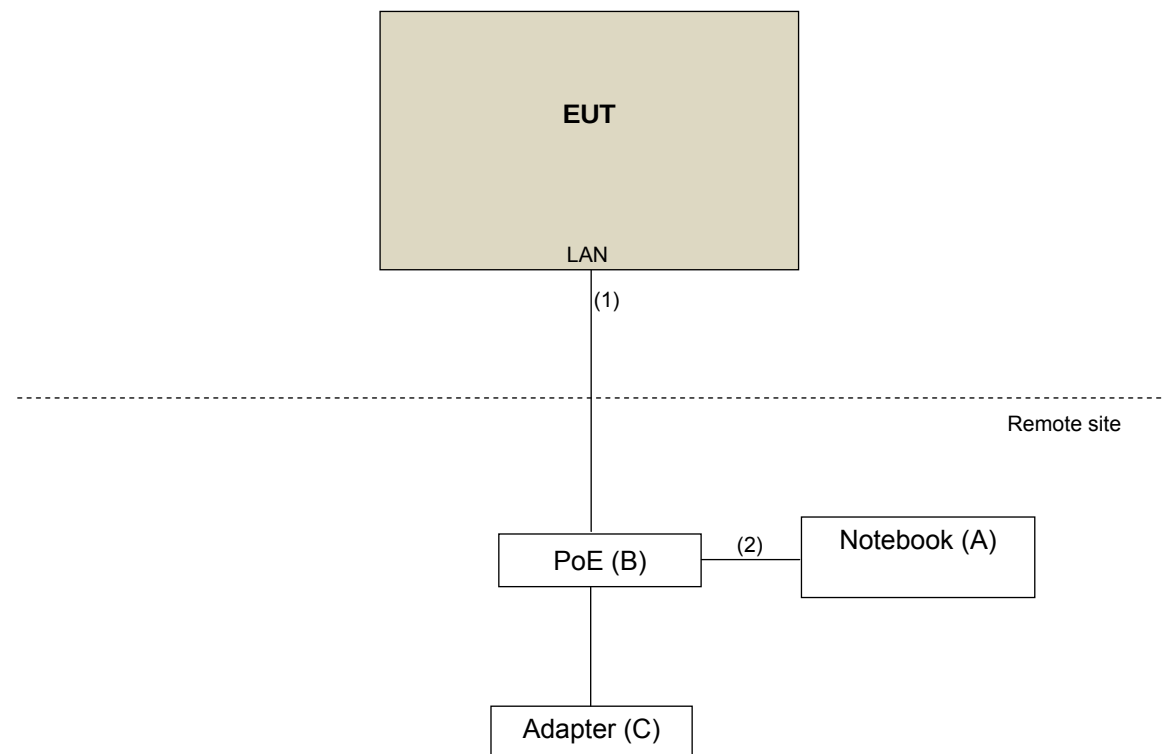
ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	LAN cable	1	10	N	0	Cat5e
2.	LAN cable	1	1.8	N	0	Cat5e

3.4.1 Configuration of System under Test

<Adapter Mode>



<PoE Mode>



3.5 General Description of Applied Standard

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

FCC Part 15, Subpart E (15.407)

789033 D02 General UNII Test Procedure New Rules v01

662911 D01 Multiple Transmitter Output v02r01

ANSI C63.10-2013

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

NOTE: The EUT is also considered as a kind of computer peripheral, because the connection to computer is necessary for typical use. It has been verified to comply with the requirements of FCC Part 15, Subpart B, Class B (DoC). The test report has been issued separately.

4 Test Types and Results

4.1 Radiated Emission and Bandedge Measurement

4.1.1 Limits of Radiated Emission and Bandedge Measurement

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

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

NOTE:

- The lower limit shall apply at the transition frequencies.
- Emission level (dBuV/m) = 20 log Emission level (uV/m).
- 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

APPLICABLE TO	LIMIT	
789033 D02 General UNII Test Procedure New Rules v01	FIELD STRENGTH AT 3m	
	PK:74 (dBuV/m)	AV:54 (dBuV/m)
APPLICABLE TO	EIRP LIMIT	EQUIVALENT FIELD STRENGTH AT 3m
15.407(b)(1)	PK:-27 (dBm/MHz)	PK:68.2(dBuV/m)
15.407(b)(2)		
15.407(b)(3)		
15.407(b)(4)	PK:-27 (dBm/MHz) ^{*1} PK:-17 (dBm/MHz) ^{*2}	PK: 68.2(dBuV/m) ^{*1} PK:78.2 (dBuV/m) ^{*2}

NOTE: ^{*1} beyond 10MHz of the band edge ^{*2} within 10 MHz of band edge

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

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



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4.1.2 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Test Receiver ROHDE & SCHWARZ	ESIB7	100187	Apr. 10, 2015	Apr. 09, 2016
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100041	Aug. 29, 2014	Aug. 28, 2015
BILOG Antenna SCHWARZBECK	VULB9168	9168-160	Feb. 05, 2015	Feb. 04, 2016
HORN Antenna SCHWARZBECK	9120D	209	Feb. 09, 2015	Feb. 08, 2016
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170241	Feb. 09, 2015	Feb. 08, 2016
Preamplifier Agilent	8447D	2944A10738	Oct. 18, 2014	Oct. 17, 2015
Preamplifier Agilent	8449B	3008A01964	Aug. 22, 2014	Aug. 21, 2015
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	214378/4	Aug. 22, 2014	Aug. 21, 2015
RF signal cable HUBER+SUHNNER	SUCOFLEX 106	12738/6 +309224/4	Aug. 22, 2014	Aug. 21, 2015
Software BV ADT	ADT_Radiated_ V7.6.15.9.4	NA	NA	NA
Antenna Tower inn-co GmbH	MA 4000	013303	NA	NA
Antenna Tower Controller BV ADT	AT100	AT93021702	NA	NA
Turn Table BV ADT	TT100	TT93021702	NA	NA
Turn Table Controller BV ADT	SC100	SC93021702	NA	NA
26GHz ~ 40GHz Amplifier	EM26400	815221	Oct. 18, 2014	Oct. 17, 2015
High Speed Peak Power Meter	ML2495A	0824011	Jul. 26, 2014	Jul. 25, 2015
Power Sensor	MA2411B	0738171	Jul. 26, 2014	Jul. 25, 2015
WIT Standard Temperature And Humidity Chamber	TH-4S-C	W981030	Jun. 08, 2015	Jun. 07, 2016

- Note: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in HwaYa Chamber 3.
3. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
4. The FCC Site Registration No. is 988962.
5. The IC Site Registration No. is IC 7450F-3.

4.1.3 Test Procedure

- a. The EUT was placed on the top of a rotating table 0.8 meters (for below 1GHz) / 1.5 meters (for above 1GHz) above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.
- f. The test-receiver system was set to peak and average detect function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

Note:

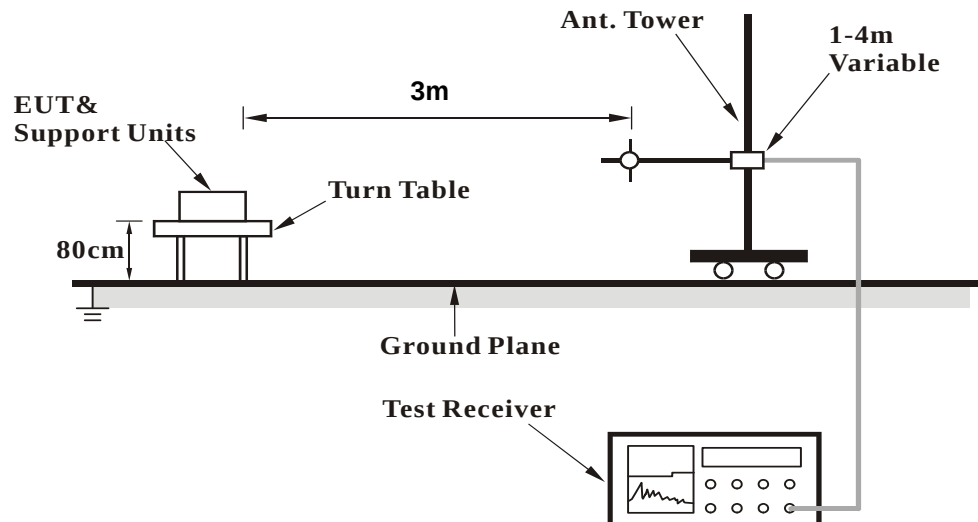
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.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

4.1.4 Deviation from Test Standard

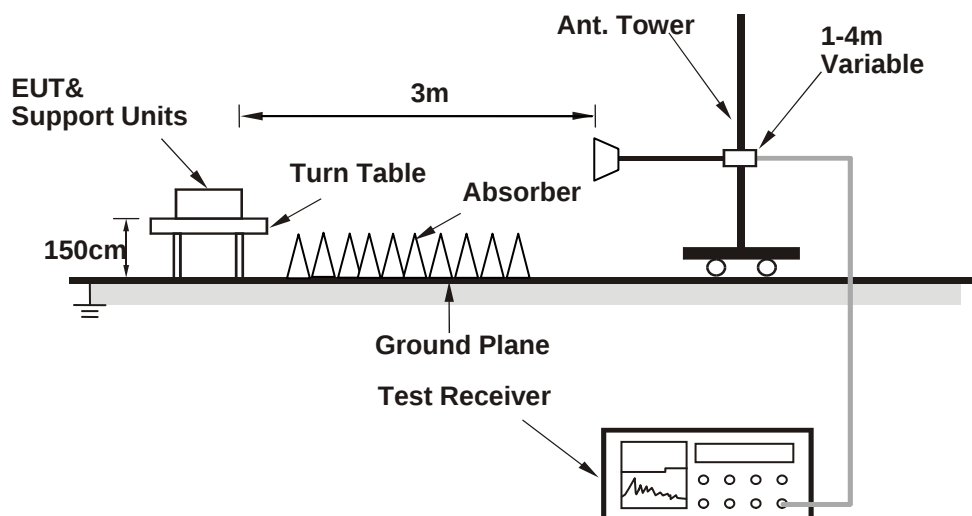
No deviation.

4.1.5 Test Setup

<Frequency Range below 1GHz>



<Frequency Range above 1GHz>



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

4.1.6 EUT Operating Conditions

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

4.1.7 Test Results

ABOVE 1GHz DATA :

802.11a

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	68.4 PK	74.0	-5.6	1.81 H	52	62.40	6.00
2	5150.00	52.4 AV	54.0	-1.6	1.81 H	52	46.40	6.00
3	*5180.00	118.0 PK			1.45 H	288	78.50	39.50
4	*5180.00	107.5 AV			1.45 H	288	68.00	39.50
5	#10360.00	60.3 PK	74.0	-13.7	1.27 H	7	41.90	18.40
6	#10360.00	48.0 AV	54.0	-6.0	1.27 H	7	29.60	18.40
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	61.5 PK	74.0	-12.5	1.89 V	33	55.50	6.00
2	5150.00	47.4 AV	54.0	-6.6	1.89 V	33	41.40	6.00
3	*5180.00	115.2 PK			1.66 V	346	75.70	39.50
4	*5180.00	104.9 AV			1.66 V	346	65.40	39.50
5	#10360.00	61.1 PK	74.0	-12.9	1.13 V	278	42.70	18.40
6	#10360.00	47.3 AV	54.0	-6.7	1.13 V	278	28.90	18.40

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)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	66.3 PK	74.0	-7.7	1.15 H	288	60.30	6.00
2	5150.00	52.0 AV	54.0	-2.0	1.15 H	288	46.00	6.00
3	*5200.00	121.9 PK			1.17 H	276	82.30	39.60
4	*5200.00	112.2 AV			1.17 H	276	72.60	39.60
5	#10400.00	61.2 PK	74.0	-12.8	1.14 H	128	42.70	18.50
6	#10400.00	49.4 AV	54.0	-4.6	1.14 H	128	30.90	18.50
7	15600.00	63.0 PK	74.0	-11.0	1.18 H	187	44.20	18.80
8	15600.00	52.1 AV	54.0	-1.9	1.18 H	187	33.30	18.80
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	64.0 PK	74.0	-10.0	1.72 V	20	58.00	6.00
2	5150.00	48.4 AV	54.0	-5.6	1.72 V	20	42.40	6.00
3	*5200.00	118.8 PK			1.03 V	0	79.20	39.60
4	*5200.00	108.4 AV			1.03 V	0	68.80	39.60
5	#10400.00	60.6 PK	74.0	-13.4	1.54 V	295	42.10	18.50
6	#10400.00	47.6 AV	54.0	-6.4	1.54 V	295	29.10	18.50
7	15600.00	64.1 PK	74.0	-9.9	1.65 V	163	45.30	18.80
8	15600.00	50.2 AV	54.0	-3.8	1.65 V	163	31.40	18.80

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)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5240.00	124.3 PK			2.00 H	46	84.70	39.60
2	*5240.00	113.7 AV			2.00 H	46	74.10	39.60
3	5400.00	60.7 PK	74.0	-13.3	1.71 H	44	54.40	6.30
4	5400.00	49.8 AV	54.0	-4.2	1.71 H	44	43.50	6.30
5	#10480.00	62.3 PK	74.0	-11.7	1.54 H	142	43.30	19.00
6	#10480.00	49.0 AV	54.0	-5.0	1.54 H	142	30.00	19.00
7	15720.00	68.4 PK	74.0	-5.6	1.59 H	157	49.90	18.50
8	15720.00	52.4 AV	54.0	-1.6	1.59 H	157	33.90	18.50
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5240.00	120.7 PK			1.10 V	352	81.10	39.60
2	*5240.00	109.9 AV			1.10 V	352	70.30	39.60
3	5400.00	57.9 PK	74.0	-16.1	1.77 V	311	51.60	6.30
4	5400.00	46.6 AV	54.0	-7.4	1.77 V	311	40.30	6.30
5	#10480.00	62.5 PK	74.0	-11.5	2.09 V	187	43.50	19.00
6	#10480.00	49.7 AV	54.0	-4.3	2.09 V	187	30.70	19.00
7	15720.00	65.9 PK	74.0	-8.1	1.67 V	158	47.40	18.50
8	15720.00	51.1 AV	54.0	-2.9	1.67 V	158	32.60	18.50

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	68.4 PK	74.0	-5.6	1.82 H	34	62.40	6.00
2	5150.00	52.1 AV	54.0	-1.9	1.82 H	34	46.10	6.00
3	*5180.00	117.7 PK			1.71 H	31	78.20	39.50
4	*5180.00	108.0 AV			1.71 H	31	68.50	39.50
5	#10360.00	60.4 PK	74.0	-13.6	1.31 H	359	42.00	18.40
6	#10360.00	47.4 AV	54.0	-6.6	1.31 H	359	29.00	18.40
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	60.6 PK	74.0	-13.4	1.65 V	320	54.60	6.00
2	5150.00	47.1 AV	54.0	-6.9	1.65 V	320	41.10	6.00
3	*5180.00	115.3 PK			2.04 V	324	75.80	39.50
4	*5180.00	105.1 AV			2.04 V	324	65.60	39.50
5	#10360.00	60.2 PK	74.0	-13.8	1.99 V	174	41.80	18.40
6	#10360.00	47.0 AV	54.0	-7.0	1.99 V	174	28.60	18.40

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)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	70.9 PK	74.0	-3.1	1.66 H	35	64.90	6.00
2	5150.00	52.2 AV	54.0	-1.8	1.66 H	35	46.20	6.00
3	*5200.00	122.9 PK			1.71 H	39	83.30	39.60
4	*5200.00	112.9 AV			1.71 H	39	73.30	39.60
5	#10400.00	61.0 PK	74.0	-13.0	1.41 H	115	42.50	18.50
6	#10400.00	48.4 AV	54.0	-5.6	1.41 H	115	29.90	18.50
7	15600.00	66.4 PK	74.0	-7.6	1.76 H	187	47.60	18.80
8	15600.00	51.8 AV	54.0	-2.2	1.76 H	187	33.00	18.80
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	57.5 PK	74.0	-16.5	1.80 V	311	51.50	6.00
2	5150.00	46.3 AV	54.0	-7.7	1.80 V	311	40.30	6.00
3	*5200.00	119.8 PK			1.95 V	324	80.20	39.60
4	*5200.00	109.4 AV			1.95 V	324	69.80	39.60
5	#10400.00	61.1 PK	74.0	-12.9	1.48 V	311	42.60	18.50
6	#10400.00	47.9 AV	54.0	-6.1	1.48 V	311	29.40	18.50
7	15600.00	62.8 PK	74.0	-11.2	1.65 V	158	44.00	18.80
8	15600.00	49.6 AV	54.0	-4.4	1.65 V	158	30.80	18.80

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)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5240.00	125.4 PK			1.66 H	50	85.80	39.60
2	*5240.00	114.9 AV			1.66 H	50	75.30	39.60
3	5400.00	61.3 PK	74.0	-12.7	1.99 H	31	55.00	6.30
4	5400.00	49.3 AV	54.0	-4.7	1.99 H	31	43.00	6.30
5	#10480.00	61.4 PK	74.0	-12.6	1.55 H	140	42.40	19.00
6	#10480.00	48.3 AV	54.0	-5.7	1.55 H	140	29.30	19.00
7	15720.00	66.1 PK	74.0	-7.9	1.63 H	154	47.60	18.50
8	15720.00	52.1 AV	54.0	-1.9	1.63 H	154	33.60	18.50
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5240.00	116.1 PK			1.09 V	348	76.50	39.60
2	*5240.00	105.8 AV			1.09 V	348	66.20	39.60
3	5400.00	48.9 PK	74.0	-25.1	1.71 V	311	42.60	6.30
4	5400.00	35.7 AV	54.0	-18.3	1.71 V	311	29.40	6.30
5	#10480.00	60.8 PK	74.0	-13.2	2.07 V	190	41.80	19.00
6	#10480.00	47.7 AV	54.0	-6.3	2.07 V	190	28.70	19.00
7	15720.00	62.2 PK	74.0	-11.8	1.63 V	155	43.70	18.50
8	15720.00	50.2 AV	54.0	-3.8	1.63 V	155	31.70	18.50

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	68.2 PK	74.0	-5.8	1.73 H	37	62.20	6.00
2	5150.00	52.6 AV	54.0	-1.4	1.73 H	37	46.60	6.00
3	*5190.00	112.7 PK			1.95 H	38	73.20	39.50
4	*5190.00	102.8 AV			1.95 H	38	63.30	39.50
5	#10380.00	60.2 PK	74.0	-13.8	1.36 H	0	41.70	18.50
6	#10380.00	47.0 AV	54.0	-7.0	1.36 H	0	28.50	18.50
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	59.4 PK	74.0	-14.6	1.66 V	314	53.40	6.00
2	5150.00	47.8 AV	54.0	-6.2	1.66 V	314	41.80	6.00
3	*5190.00	107.0 PK			2.06 V	324	67.50	39.50
4	*5190.00	97.2 AV			2.06 V	324	57.70	39.50
5	#10380.00	59.9 PK	74.0	-14.1	2.00 V	180	41.40	18.50
6	#10380.00	46.8 AV	54.0	-7.2	2.00 V	180	28.30	18.50

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)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	68.5 PK	74.0	-5.5	1.74 H	41	62.50	6.00
2	5150.00	52.1 AV	54.0	-1.9	1.74 H	41	46.10	6.00
3	*5230.00	120.5 PK			1.81 H	35	80.90	39.60
4	*5230.00	110.2 AV			1.81 H	35	70.60	39.60
5	#10460.00	60.2 PK	74.0	-13.8	1.40 H	309	41.30	18.90
6	#10460.00	46.9 AV	54.0	-7.1	1.40 H	309	28.00	18.90
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	62.0 PK	74.0	-12.0	1.96 V	323	56.00	6.00
2	5150.00	50.0 AV	54.0	-4.0	1.96 V	323	44.00	6.00
3	*5230.00	115.2 PK			2.22 V	327	75.60	39.60
4	*5230.00	105.8 AV			2.22 V	327	66.20	39.60
5	#10460.00	60.3 PK	74.0	-13.7	2.08 V	199	41.40	18.90
6	#10460.00	47.1 AV	54.0	-6.9	2.08 V	199	28.20	18.90

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)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

802.11ac (VHT80)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	66.1 PK	74.0	-7.9	1.78 H	40	60.10	6.00
2	5150.00	52.3 AV	54.0	-1.7	1.78 H	40	46.30	6.00
3	*5210.00	105.7 PK			1.78 H	34	66.10	39.60
4	*5210.00	96.3 AV			1.78 H	34	56.70	39.60
5	#10420.00	59.6 PK	74.0	-14.4	1.45 H	55	41.00	18.60
6	#10420.00	46.5 AV	54.0	-7.5	1.45 H	55	27.90	18.60
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	63.3 PK	74.0	-10.7	1.96 V	325	57.30	6.00
2	5150.00	50.4 AV	54.0	-3.6	1.96 V	325	44.40	6.00
3	*5210.00	103.4 PK			1.86 V	324	63.80	39.60
4	*5210.00	92.3 AV			1.86 V	324	52.70	39.60
5	#10420.00	60.1 PK	74.0	-13.9	2.00 V	193	41.50	18.60
6	#10420.00	47.0 AV	54.0	-7.0	2.00 V	193	28.40	18.60

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)
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.

802.11a

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5714.00	64.4 PK	74.0	-9.6	1.56 H	288	57.60	6.80
2	#5714.00	50.5 AV	54.0	-3.5	1.56 H	288	43.70	6.80
3	#5722.00	71.1 PK	78.2	-7.1	1.38 H	285	64.30	6.80
4	#5725.00	60.3 PK	78.2	-17.9	1.38 H	285	53.50	6.80
5	*5745.00	118.8 PK			2.07 H	286	78.40	40.40
6	*5745.00	108.6 AV			2.07 H	286	68.20	40.40
7	11490.00	63.5 PK	74.0	-10.5	1.52 H	357	45.10	18.40
8	11490.00	50.9 AV	54.0	-3.1	1.52 H	357	32.50	18.40
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	#5714.00	63.6 PK	74.0	-10.4	1.64 V	342	56.80	6.80
2	#5714.00	48.5 AV	54.0	-5.5	1.64 V	342	41.70	6.80
3	#5722.00	72.5 PK	78.2	-5.7	2.03 V	349	65.70	6.80
4	#5725.00	60.3 PK	78.2	-17.9	2.03 V	349	53.50	6.80
5	*5745.00	113.9 PK			1.54 V	354	73.50	40.40
6	*5745.00	104.0 AV			1.54 V	354	63.60	40.40
7	11490.00	66.1 PK	74.0	-7.9	1.28 V	354	47.70	18.40
8	11490.00	52.2 AV	54.0	-1.8	1.28 V	354	33.80	18.40

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)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5785.00	120.2 PK			1.89 H	284	79.70	40.50
2	*5785.00	110.6 AV			1.89 H	284	70.10	40.50
3	11570.00	66.6 PK	74.0	-7.4	1.20 H	294	48.20	18.40
4	11570.00	50.8 AV	54.0	-3.2	1.20 H	294	32.40	18.40
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	*5785.00	119.0 PK			2.05 V	308	78.50	40.50
2	*5785.00	108.5 AV			2.05 V	308	68.00	40.50
3	11570.00	68.6 PK	74.0	-5.4	2.09 V	5	50.20	18.40
4	11570.00	52.4 AV	54.0	-1.6	2.09 V	5	34.00	18.40

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)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5825.00	118.8 PK			2.30 H	309	78.30	40.50
2	*5825.00	109.3 AV			2.30 H	309	68.80	40.50
3	#5850.00	61.8 PK	78.2	-16.4	2.02 H	298	54.90	6.90
4	#5853.00	72.5 PK	78.2	-5.7	2.02 H	298	65.50	7.00
5	#5861.00	66.1 PK	74.0	-7.9	2.30 H	299	59.10	7.00
6	#5861.00	51.6 AV	54.0	-2.4	2.30 H	299	44.60	7.00
7	11650.00	64.5 PK	74.0	-9.5	1.19 H	292	45.60	18.90
8	11650.00	51.6 AV	54.0	-2.4	1.19 H	292	32.70	18.90
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	*5825.00	117.9 PK			1.86 V	311	77.40	40.50
2	*5825.00	107.6 AV			1.86 V	311	67.10	40.50
3	#5850.00	57.4 PK	78.2	-20.8	1.82 V	343	50.50	6.90
4	#5853.00	69.2 PK	78.2	-9.0	1.82 V	343	62.20	7.00
5	#5861.00	62.5 PK	74.0	-11.5	1.98 V	321	55.50	7.00
6	#5861.00	48.6 AV	54.0	-5.4	1.98 V	321	41.60	7.00
7	11650.00	67.6 PK	74.0	-6.4	1.50 V	318	48.70	18.90
8	11650.00	52.9 AV	54.0	-1.1	1.50 V	318	34.00	18.90

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5714.00	65.4 PK	74.0	-8.6	1.36 H	290	58.60	6.80
2	#5714.00	51.6 AV	54.0	-2.4	1.36 H	290	44.80	6.80
3	#5722.00	73.1 PK	78.2	-5.1	1.86 H	278	66.30	6.80
4	#5725.00	62.6 PK	78.2	-15.6	1.86 H	178	55.80	6.80
5	*5745.00	119.4 PK			2.20 H	294	79.00	40.40
6	*5745.00	109.2 AV			2.20 H	294	68.80	40.40
7	11490.00	64.3 PK	74.0	-9.7	1.50 H	55	45.90	18.40
8	11490.00	52.0 AV	54.0	-2.0	1.50 H	55	33.60	18.40
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	#5714.00	65.3 PK	74.0	-8.7	1.64 V	350	58.50	6.80
2	#5714.00	49.2 AV	54.0	-4.8	1.64 V	350	42.40	6.80
3	#5722.00	71.3 PK	78.2	-6.9	1.46 V	316	64.50	6.80
4	#5725.00	61.2 PK	78.2	-17.0	1.46 V	316	54.40	6.80
5	*5745.00	116.5 PK			1.98 V	307	76.10	40.40
6	*5745.00	106.1 AV			1.98 V	307	65.70	40.40
7	11490.00	66.6 PK	74.0	-7.4	1.36 V	324	48.20	18.40
8	11490.00	52.3 AV	54.0	-1.7	1.36 V	324	33.90	18.40

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)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5785.00	118.3 PK			2.18 H	297	77.80	40.50
2	*5785.00	108.6 AV			2.18 H	297	68.10	40.50
3	11570.00	66.6 PK	74.0	-7.4	1.46 H	54	48.20	18.40
4	11570.00	51.5 AV	54.0	-2.5	1.46 H	54	33.10	18.40
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	*5785.00	116.8 PK			1.72 V	318	76.30	40.50
2	*5785.00	106.6 AV			1.72 V	318	66.10	40.50
3	11570.00	67.0 PK	74.0	-7.0	1.38 V	325	48.60	18.40
4	11570.00	52.4 AV	54.0	-1.6	1.38 V	325	34.00	18.40

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)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5825.00	117.4 PK			2.22 H	297	76.90	40.50
2	*5825.00	108.5 AV			2.22 H	297	68.00	40.50
3	#5850.00	58.8 PK	78.2	-19.4	1.85 H	293	51.90	6.90
4	#5853.00	71.2 PK	78.2	-7.0	1.85 H	293	64.20	7.00
5	#5861.00	64.3 PK	74.0	-9.7	1.25 H	282	57.30	7.00
6	#5861.00	49.9 AV	54.0	-4.1	1.25 H	282	42.90	7.00
7	11650.00	62.9 PK	74.0	-11.1	1.21 H	292	44.00	18.90
8	11650.00	50.7 AV	54.0	-3.3	1.21 H	292	31.80	18.90
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	*5825.00	116.4 PK			2.02 V	309	75.90	40.50
2	*5825.00	106.8 AV			2.02 V	309	66.30	40.50
3	#5850.00	59.1 PK	78.2	-19.1	1.92 V	347	52.20	6.90
4	#5853.00	69.8 PK	78.2	-8.4	1.92 V	347	62.80	7.00
5	#5861.00	64.5 PK	74.0	-9.5	1.83 V	351	57.50	7.00
6	#5861.00	39.4 AV	54.0	-14.6	1.83 V	351	32.40	7.00
7	11650.00	67.1 PK	74.0	-6.9	1.18 V	323	48.20	18.90
8	11650.00	52.7 AV	54.0	-1.3	1.18 V	323	33.80	18.90

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5714.90	67.2 PK	74.0	-6.8	2.24 H	295	60.40	6.80
2	#5714.90	53.0 AV	54.0	-1.0	2.24 H	295	46.20	6.80
3	#5722.00	74.3 PK	78.2	-3.9	2.02 H	295	67.50	6.80
4	#5725.00	63.2 PK	78.2	-15.0	2.02 H	295	56.40	6.80
5	*5755.00	112.1 PK			1.97 H	295	71.60	40.50
6	*5755.00	102.5 AV			1.97 H	295	62.00	40.50
7	11510.00	59.8 PK	74.0	-14.2	1.53 H	53	41.50	18.30
8	11510.00	46.6 AV	54.0	-7.4	1.53 H	53	28.30	18.30
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	#5714.90	63.5 PK	74.0	-10.5	2.02 V	303	56.70	6.80
2	#5714.90	49.7 AV	54.0	-4.3	2.02 V	303	42.90	6.80
3	#5722.00	72.0 PK	78.2	-6.2	1.89 V	321	65.20	6.80
4	#5725.00	59.4 PK	78.2	-18.8	1.89 V	321	52.60	6.80
5	*5755.00	110.4 PK			1.97 V	314	69.90	40.50
6	*5755.00	100.4 AV			1.97 V	314	59.90	40.50
7	11510.00	60.3 PK	74.0	-13.7	1.42 V	321	42.00	18.30
8	11510.00	47.2 AV	54.0	-6.8	1.42 V	321	28.90	18.30

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)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5795.00	115.2 PK			2.03 H	300	74.70	40.50
2	*5795.00	105.4 AV			2.03 H	300	64.90	40.50
3	#5850.00	58.5 PK	78.2	-19.7	2.02 H	305	51.60	6.90
4	#5853.00	67.8 PK	78.2	-10.4	2.02 H	305	60.80	7.00
5	#5860.10	65.6 PK	74.0	-8.4	2.32 H	294	58.60	7.00
6	#5860.10	52.1 AV	54.0	-1.9	2.32 H	294	45.10	7.00
7	11590.00	63.1 PK	74.0	-10.9	1.48 H	55	44.60	18.50
8	11590.00	49.7 AV	54.0	-4.3	1.48 H	55	31.20	18.50
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	*5795.00	112.3 PK			1.84 V	342	71.80	40.50
2	*5795.00	102.6 AV			1.84 V	342	62.10	40.50
3	#5850.00	56.9 PK	78.2	-21.3	1.83 V	337	50.00	6.90
4	#5853.00	66.9 PK	78.2	-11.3	1.83 V	337	59.90	7.00
5	#5860.10	62.3 PK	74.0	-11.7	2.16 V	345	55.30	7.00
6	#5860.10	48.9 AV	54.0	-5.1	2.16 V	345	41.90	7.00
7	11590.00	62.9 PK	74.0	-11.1	1.52 V	321	44.40	18.50
8	11590.00	51.0 AV	54.0	-3.0	1.52 V	321	32.50	18.50

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5714.90	69.6 PK	74.0	-4.4	1.66 H	40	62.80	6.80
2	#5714.90	52.8 AV	54.0	-1.2	1.66 H	40	46.00	6.80
3	#5722.00	73.7 PK	78.2	-4.5	1.53 H	277	66.90	6.80
4	#5725.00	63.3 PK	78.2	-14.9	1.53 H	277	56.50	6.80
5	*5775.00	105.5 PK			2.15 H	284	65.00	40.50
6	*5775.00	96.0 AV			2.15 H	284	55.50	40.50
7	11550.00	60.6 PK	74.0	-13.4	1.67 H	301	42.20	18.40
8	11550.00	47.5 AV	54.0	-6.5	1.67 H	301	29.10	18.40
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	#5714.00	63.2 PK	74.0	-10.8	1.80 V	316	56.40	6.80
2	#5714.00	49.7 AV	54.0	-4.3	1.80 V	316	42.90	6.80
3	#5722.00	69.9 PK	78.2	-8.3	2.03 V	296	63.10	6.80
4	#5725.00	59.3 PK	78.2	-18.9	2.03 V	296	52.50	6.80
5	*5775.00	103.2 PK			2.05 V	303	62.70	40.50
6	*5775.00	93.9 AV			2.05 V	303	53.40	40.50
7	11550.00	61.2 PK	74.0	-12.8	1.25 V	66	42.80	18.40
8	11550.00	48.1 AV	54.0	-5.9	1.25 V	66	29.70	18.40

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)
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

Test Mode A

CHANNEL	TX Channel 40	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	30MHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	138.78	35.4 QP	43.5	-8.1	1.99 H	241	50.10	-14.70
2	337.10	39.3 QP	46.0	-6.7	1.00 H	123	51.00	-11.70
3	389.59	38.1 QP	46.0	-7.9	1.00 H	267	48.70	-10.60
4	703.38	42.1 QP	46.0	-3.9	1.09 H	210	46.40	-4.30
5	755.12	42.6 QP	46.0	-3.4	1.00 H	263	45.60	-3.00
6	786.23	40.0 QP	46.0	-6.0	1.00 H	257	42.40	-2.40
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	47.60	30.7 QP	40.0	-9.3	1.09 V	233	45.30	-14.60
2	86.28	32.1 QP	40.0	-7.9	1.50 V	181	51.80	-19.70
3	136.84	33.2 QP	43.5	-10.3	1.50 V	16	48.20	-15.00
4	191.28	33.6 QP	43.5	-9.9	1.00 V	203	49.80	-16.20
5	401.26	37.0 QP	46.0	-9.0	1.50 V	278	47.50	-10.50
6	702.62	41.5 QP	46.0	-4.5	1.50 V	179	45.80	-4.30

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)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value

Test Mode B

CHANNEL	TX Channel 40	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	30MHz ~ 1GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	57.12	30.5 QP	40.0	-9.5	2.00 H	150	45.30	-14.80
2	101.84	29.3 QP	43.5	-14.2	2.00 H	237	48.20	-18.90
3	140.72	34.2 QP	43.5	-9.3	2.00 H	276	48.80	-14.60
4	267.10	24.5 QP	46.0	-21.5	1.00 H	209	38.10	-13.60
5	710.40	32.4 QP	46.0	-13.6	1.00 H	187	36.60	-4.20
6	751.23	38.1 QP	46.0	-7.9	1.00 H	187	41.20	-3.10
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	37.18	32.3 QP	40.0	-7.7	1.11 V	130	47.80	-15.50
2	45.85	35.9 QP	40.0	-4.1	1.00 V	23	50.70	-14.80
3	173.78	27.7 QP	43.5	-15.8	1.00 V	70	42.30	-14.60
4	500.42	30.8 QP	46.0	-15.2	1.00 V	117	39.10	-8.30
5	714.29	41.7 QP	46.0	-4.3	1.49 V	111	45.80	-4.10
6	842.61	33.9 QP	46.0	-12.1	1.00 V	67	35.50	-1.60

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)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value

4.2 Conducted Emission Measurement

4.2.1 Limits of Conducted Emission Measurement

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

Note: 1. The lower limit shall apply at the transition frequencies.

2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

4.2.2 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Date Of Calibration	Due Date Of Calibration
Test Receiver ROHDE & SCHWARZ	ESCS30	100288	Nov. 17, 2013	Nov. 16, 2014
RF signal cable Woken	5D-FB	Cable-HYCO2-01	Dec. 27, 2013	Dec. 26, 2014
LISN ROHDE & SCHWARZ (EUT)	ESH2-Z5	100100	Dec. 23, 2013	Dec. 22, 2014
LISN ROHDE & SCHWARZ (Peripheral)	ESH3-Z5	100312	Jul. 08, 2013	Jul. 07, 2014
Software ADT	BV ADT_Cond_ V7.3.7.3	NA	NA	NA

Notes: 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 2.

3. The VCCI Site Registration No. is C-2047.

4.2.3 Test Procedure

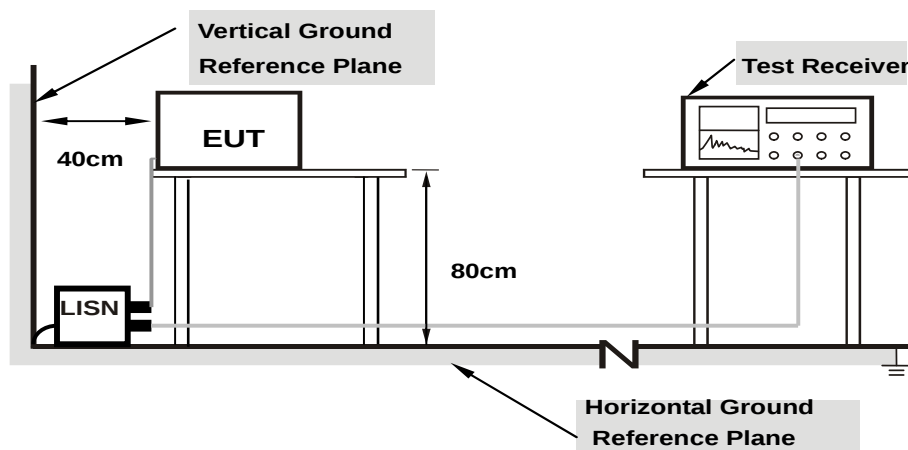
- The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance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

2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

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

4.2.6 EUT Operating Conditions

Same as 4.1.6.

4.2.7 Test Results

802.11a

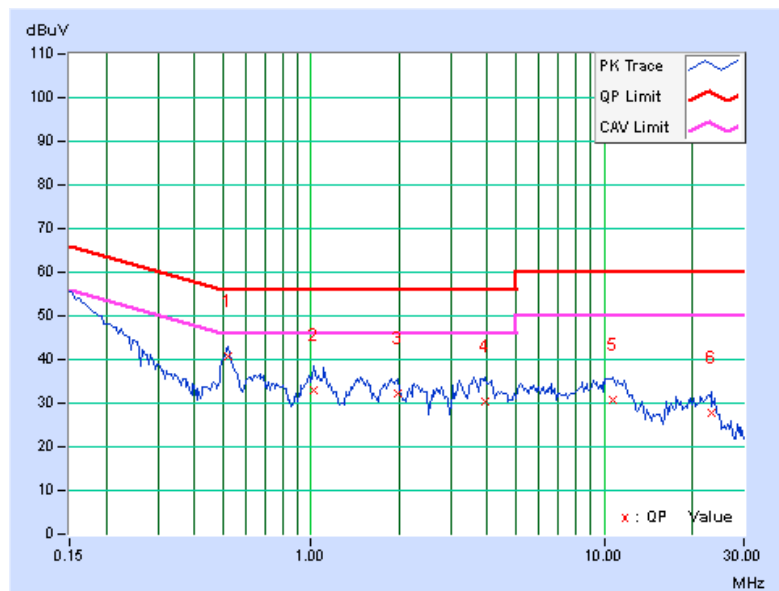
Test Mode A

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

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.52109	0.24	40.53	33.72	40.77	33.96	56.00	46.00	-15.23	-12.04
2	1.02734	0.30	32.61	26.95	32.91	27.25	56.00	46.00	-23.09	-18.75
3	1.98047	0.37	31.90	25.01	32.27	25.38	56.00	46.00	-23.73	-20.62
4	3.92969	0.44	29.97	22.45	30.41	22.89	56.00	46.00	-25.59	-23.11
5	10.65234	0.52	30.27	24.27	30.79	24.79	60.00	50.00	-29.21	-25.21
6	23.12500	0.66	27.01	22.33	27.67	22.99	60.00	50.00	-32.33	-27.01

REMARKS:

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

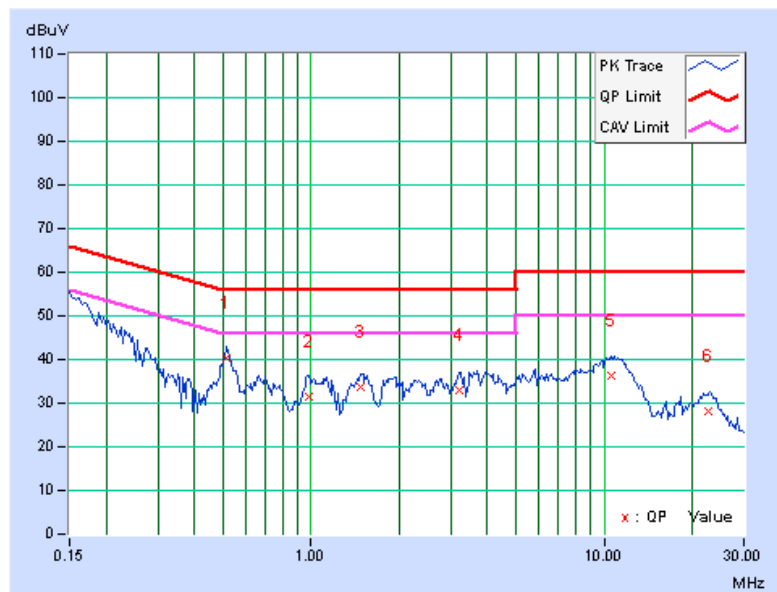


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
-------	-------------	-------------------	--------------------------------

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.51328	0.30	40.13	34.86	40.43	35.16	56.00	46.00	-15.57	-10.84
2	0.97813	0.29	31.03	25.08	31.32	25.37	56.00	46.00	-24.68	-20.63
3	1.48438	0.34	33.45	27.50	33.79	27.84	56.00	46.00	-22.21	-18.16
4	3.20703	0.45	32.36	27.09	32.81	27.54	56.00	46.00	-23.19	-18.46
5	10.55078	0.59	35.76	31.11	36.35	31.70	60.00	50.00	-23.65	-18.30
6	22.58203	0.76	27.52	22.20	28.28	22.96	60.00	50.00	-31.72	-27.04

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.



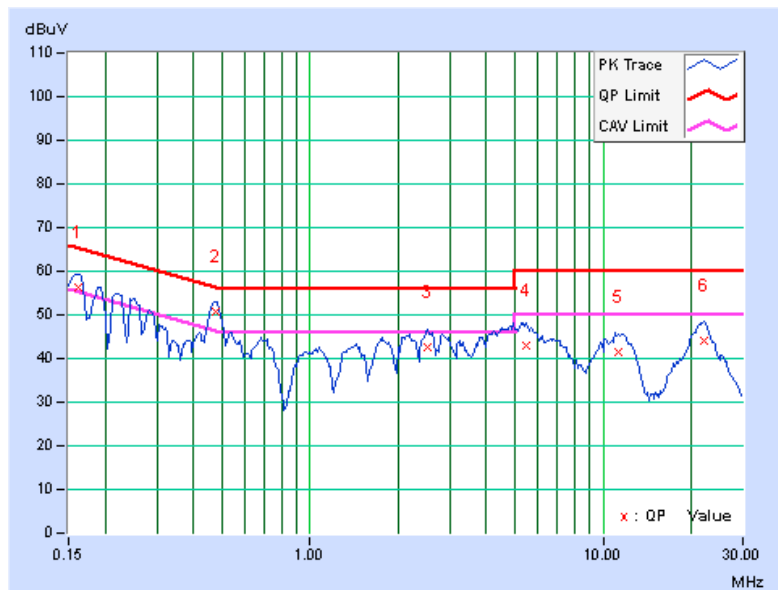
Test Mode B

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

No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
	[MHz]	(dB)	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.16172	0.22	56.21	47.13	56.43	47.35	65.38	55.38	-8.94	-8.02
2	0.47422	0.23	50.63	44.10	50.86	44.33	56.44	46.44	-5.58	-2.11
3	2.51953	0.39	42.27	38.23	42.66	38.62	56.00	46.00	-13.34	-7.38
4	5.44922	0.46	42.66	36.85	43.12	37.31	60.00	50.00	-16.88	-12.69
5	11.32813	0.53	40.89	36.45	41.42	36.98	60.00	50.00	-18.58	-13.02
6	22.19922	0.67	43.33	38.79	44.00	39.46	60.00	50.00	-16.00	-10.54

REMARKS:

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

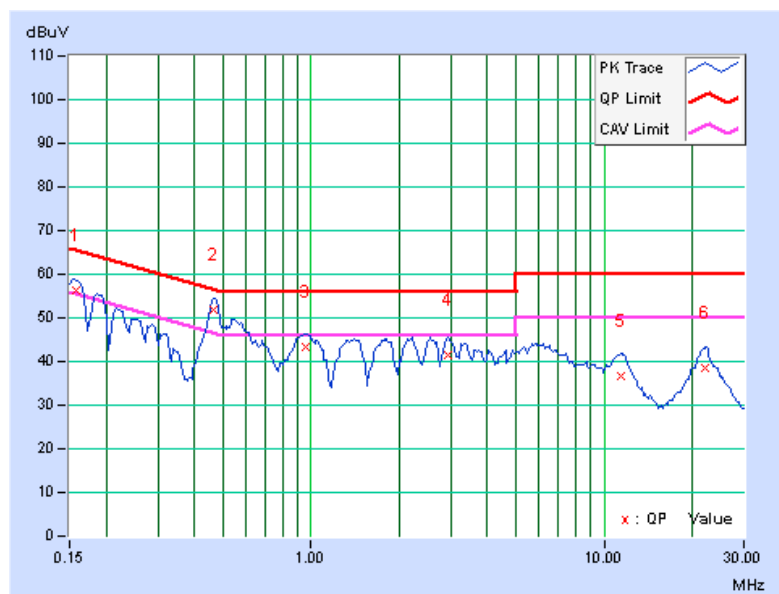


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
-------	-------------	-------------------	--------------------------------

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15781	0.23	56.15	49.94	56.38	50.17	65.58	55.58	-9.20	-5.41
2	0.46641	0.30	51.43	44.10	51.73	44.40	56.58	46.58	-4.85	-2.18
3	0.95859	0.29	42.96	38.03	43.25	38.32	56.00	46.00	-12.75	-7.68
4	2.92188	0.44	41.15	37.12	41.59	37.56	56.00	46.00	-14.41	-8.44
5	11.38281	0.60	36.10	30.89	36.70	31.49	60.00	50.00	-23.30	-18.51
6	22.10547	0.77	37.80	33.18	38.57	33.95	60.00	50.00	-21.43	-16.05

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 $\leq$ 125mW(21 dBm) at any elevation angle above 30 degrees as measured from the horizon)
		Fixed point-to-point Access Point	1 Watt (30 dBm)
	√	Indoor Access Point	1 Watt (30 dBm)
		Mobile and Portable client device	250mW (24 dBm)
U-NII-2A	---		250mW (24 dBm) or 11 dBm+10 log B*
U-NII-2C	---		250mW (24 dBm) or 11 dBm+10 log B*
U-NII-3	√		1 Watt (30 dBm)

*B is the 26 dB emission bandwidth in megahertz

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

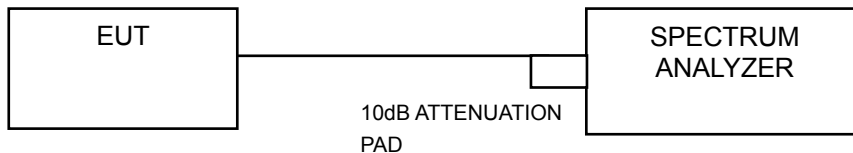
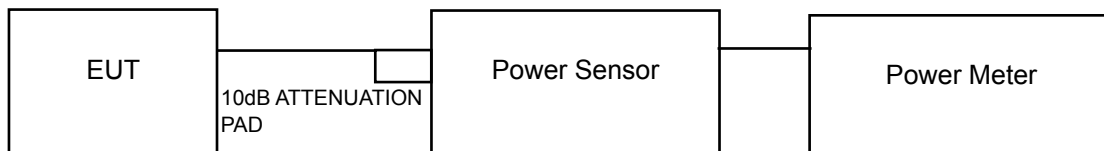
Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \leq 4$;

Array Gain = 0 dB (i.e., no array gain) for channel widths ≥ 40 MHz for any N_{ANT} ;

Array Gain = $5 \log(N_{ANT}/N_{SS})$ dB or 3 dB, whichever is less for 20-MHz channel widths with $N_{ANT} \geq 5$.

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

4.3.2 Test Setup



4.3.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.3.4 Test Procedure

FOR AVERAGE POWER MEASUREMENT

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

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

For 802.11ac (VHT80)

- 1) Set span to encompass the entire 26 dB EBW (or, alternatively, the entire 99% occupied bandwidth) of the signal.
- 2) Set sweep trigger to "free run".
- 3) Set RBW = 1 MHz.
- 4) Set VBW $\geq$ 3 MHz
- 5) Number of points in sweep $\geq$ 2 Span / RBW.
- 6) Sweep time $\leq$ (number of points in sweep) * T
- 7) Using emission bandwidth to determine the frequency span for integration the channel bandwidth.
- 8) Detector = RMS.
- 9) Trace mode = max hold.
- 10) Allow max hold to run for at least 60 seconds, or longer as needed to allow the trace to stabilize.

FOR OCCUPIED BANDWIDTH

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. 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.

4.3.5 Deviation fromTest Standard

No deviation.

4.3.6 EUT Operating Conditions

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

4.3.7 Test Result

POWER OUTPUT:

802.11a

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)			Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
36	5180	19.56	20.41	20.06	301.657	24.80	30.00	Pass
40	5200	20.75	20.66	20.24	340.945	25.33	30.00	Pass
48	5240	20.27	20.48	20.11	320.665	25.06	30.00	Pass
149	5745	20.68	18.64	18.89	267.51	24.27	30.00	Pass
157	5785	22.23	20.35	20.17	379.494	25.79	30.00	Pass
165	5825	22.02	19.36	19.42	333.017	25.22	30.00	Pass

802.11n (HT20)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)			Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
36	5180	17.80	19.48	18.93	227.135	23.56	30.00	Pass
40	5200	20.81	20.68	20.42	347.608	25.41	30.00	Pass
48	5240	20.60	20.53	20.19	332.267	25.21	30.00	Pass
149	5745	21.79	19.35	19.88	334.382	25.24	30.00	Pass
157	5785	22.15	20.34	20.07	373.827	25.73	30.00	Pass
165	5825	21.72	19.24	19.20	315.716	24.99	30.00	Pass

802.11n (HT40)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)			Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
38	5190	15.86	17.03	16.81	136.987	21.37	30.00	Pass
46	5230	23.04	23.02	22.65	585.896	27.68	30.00	Pass
151	5755	18.97	17.12	17.55	187.294	22.73	30.00	Pass
159	5795	22.68	20.96	20.38	419.235	26.22	30.00	Pass

802.11ac (VHT80)

Chan.	Chan. Freq. (MHz)	Maximum Conducted Power (dBm)			Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
42	5210	11.37	12.32	11.93	46.366	16.66	30.00	Pass
155	5775	12.96	11.05	11.49	46.598	16.68	30.00	Pass

26dB BANDWIDTH:

802.11a

Channel	Channel Frequency (MHz)	26dBc Bandwidth (MHz)			Pass / Fail
		Chain 0	Chain 1	Chain 2	
36	5180	21.81	21.61	21.94	PASS
40	5200	24.30	31.48	27.02	PASS
48	5240	25.01	26.87	24.45	PASS

802.11n (HT20)

Channel	Channel Frequency (MHz)	26dBc Bandwidth (MHz)			Pass / Fail
		Chain 0	Chain 1	Chain 2	
36	5180	22.81	22.83	24.10	PASS
40	5200	22.97	24.90	24.57	PASS
48	5240	29.72	33.52	28.55	PASS

802.11n (HT40)

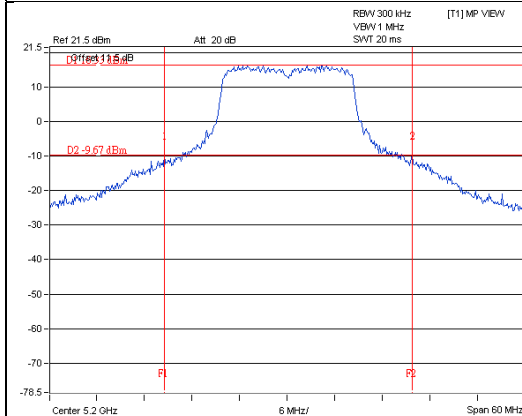
Channel	Channel Frequency (MHz)	26dBc Bandwidth (MHz)			Pass / Fail
		Chain 0	Chain 1	Chain 2	
38	5190	46.94	46.18	45.41	PASS
46	5230	47.59	48.28	45.87	PASS

802.11ac (VHT80)

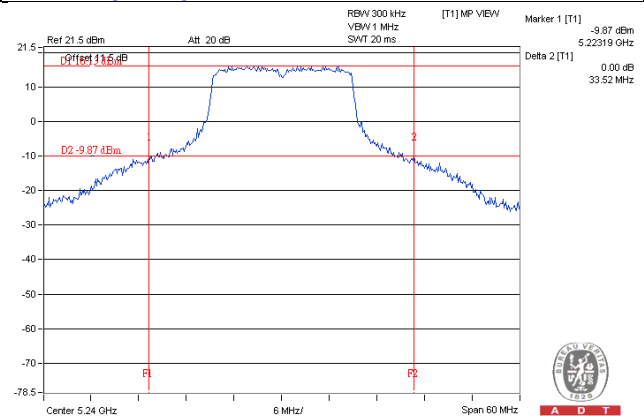
Channel	Channel Frequency (MHz)	26dBc Bandwidth (MHz)			Pass / Fail
		Chain 0	Chain 1	Chain 2	
42	5210	89.85	87.43	87.77	PASS

SPECTRUM PLOT OF WORST VALUE

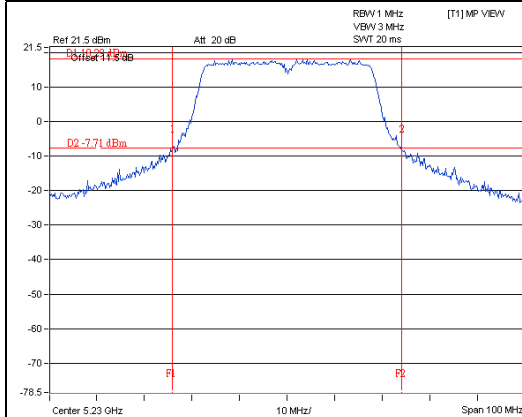
802.11a



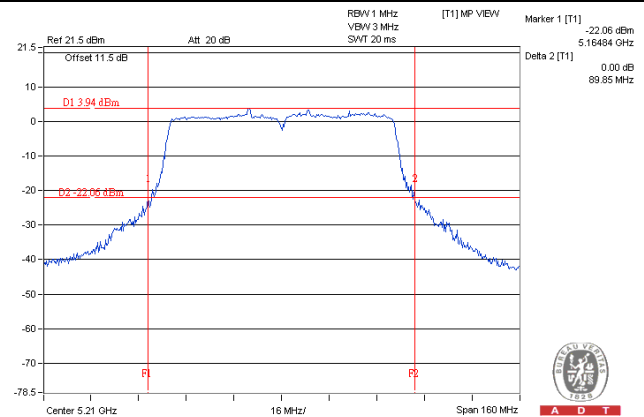
802.11n (HT20)



802.11n (HT40)



802.11ac (VHT80)



OCCUPIED BANDWIDTH:

802.11a

Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)			Pass / Fail
		Chain 0	Chain 1	Chain 2	
36	5180	16.80	16.68	16.68	PASS
40	5200	16.92	17.04	16.92	PASS
48	5240	16.92	17.04	16.92	PASS
149	5745	16.78	16.78	16.70	PASS
157	5785	16.80	16.68	16.56	PASS
165	5825	16.80	16.68	16.68	PASS

802.11n (HT20)

Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)			Pass / Fail
		Chain 0	Chain 1	Chain 2	
36	5180	17.88	17.88	17.88	PASS
40	5200	17.88	18.12	18.00	PASS
48	5240	18.12	18.36	18.24	PASS
149	5745	17.88	17.76	17.88	PASS
157	5785	17.88	17.88	17.76	PASS
165	5825	17.88	17.76	17.88	PASS

802.11n (HT40)

Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)			Pass / Fail
		Chain 0	Chain 1	Chain 2	
38	5190	37.08	36.84	36.84	PASS
46	5230	36.84	37.08	36.84	PASS
151	5755	36.96	36.96	36.84	PASS
159	5795	37.08	36.84	36.96	PASS

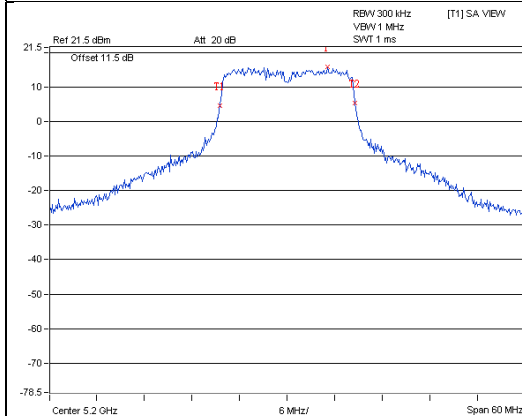
802.11ac (VHT80)

Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)			Pass / Fail
		Chain 0	Chain 1	Chain 2	
42	5210	75.84	76.08	76.08	PASS
155	5775	76.08	76.08	76.08	PASS

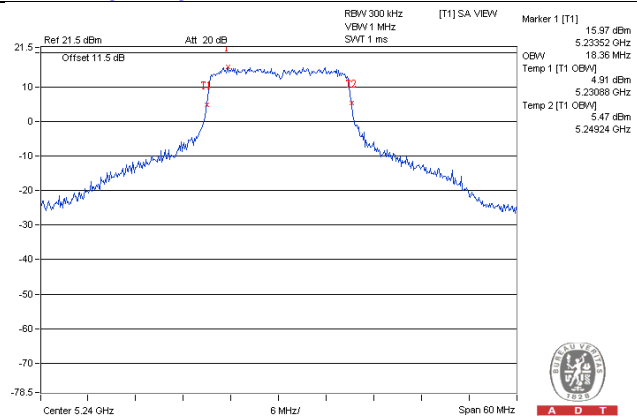
SPECTRUM PLOT OF WORST VALUE

802.11a

802.11n (HT20)



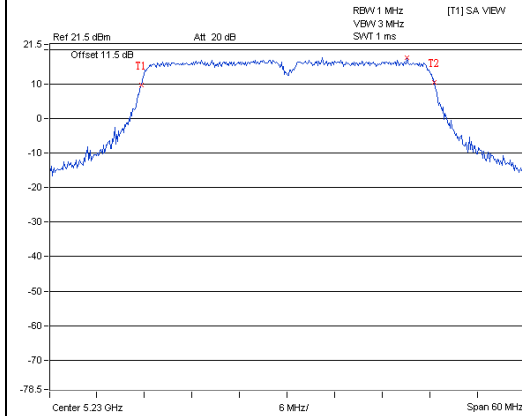
A D T



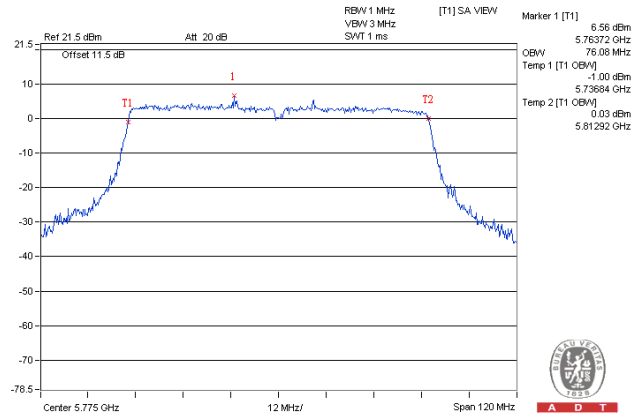
A D T

802.11n (HT40)

802.11ac (VHT80)



A D T



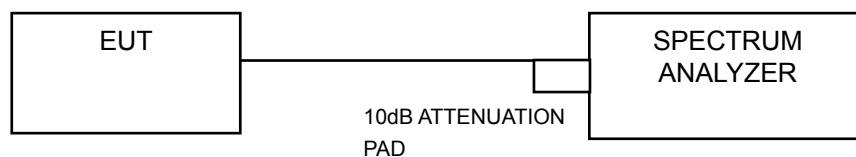
A D T

4.4 Peak Power Spectral Density Measurement

4.4.1 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

4.4.2 Test Setup



4.4.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.4.4 Test Procedure

For U-NII-1 band:

Using method SA-2

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

For U-NII-3 band:

- 1) Set span to encompass the entire emission bandwidth (EBW) of the signal.
- 2) Set RBW = 500 kHz, Set VBW $\geq$ 3 RBW, Detector = RMS
- 3) Sweep time = auto, trigger set to "free run".
- 4) Trace average at least 100 traces in power averaging mode.
- 5) Record the max value and add 10 log (1/duty cycle)
- 6) 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 $BWCF = 10\log(500\text{kHz}/300\text{kHz})$

4.4.5 Deviation from Test Standard

No deviation.

4.4.6 EUT Operating Condition

Same as Item 4.3.6.

4.4.7 Test Results

For U-NII-1 Band

802.11a

Chan.	Freq. (MHz)	PSD (dBm)			Total PSD w/o Duty Factor (dBm)	Duty Factor	Total PSD with Duty Factor (dBm)	Max. Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2					
36	5180	6.58	7.90	7.12	12.01	0.27	12.28	13.23	Pass
40	5200	7.28	7.87	7.25	12.25	0.27	12.52	13.23	Pass
48	5240	7.72	8.01	7.64	12.57	0.27	12.84	13.23	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. For U-NII-1 Band:

Directional gain = 5dBi + 10log(3) = 9.77dBi > 6dBi, so the power density limit shall be reduced to 17-(9.77 -6) = 13.23dBm.

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

802.11n (HT20)

Chan.	Freq. (MHz)	PSD (dBm)			Total PSD w/o Duty Factor (dBm)	Duty Factor	Total PSD with Duty Factor (dBm)	Max. Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2					
36	5180	5.22	6.47	5.49	10.54	0.43	10.97	13.23	Pass
40	5200	7.35	8.22	7.23	12.40	0.43	12.83	13.23	Pass
48	5240	7.74	7.87	7.09	12.35	0.43	12.78	13.23	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. For U-NII-1 Band:

Directional gain = 5dBi + 10log(3) = 9.77dBi > 6dBi, so the power density limit shall be reduced to 17-(9.77 -6) = 13.23dBm.

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

802.11n (HT40)

Chan.	Freq. (MHz)	PSD (dBm)			Total PSD w/o Duty Factor (dBm)	Duty Factor	Total PSD with Duty Factor (dBm)	Max. Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2					
38	5190	-1.31	0.22	-0.37	4.33	0.40	4.73	13.23	Pass
46	5230	6.68	6.90	6.06	11.33	0.40	11.73	13.23	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. For U-NII-1 Band:

Directional gain = 5dBi + 10log(3) = 9.77dBi > 6dBi, so the power density limit shall be reduced to 17-(9.77 -6) = 13.23dBm.

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

802.11n (VHT80)

Chan.	Freq. (MHz)	PSD (dBm)			Total PSD w/o Duty Factor (dBm)	Duty Factor	Total PSD with Duty Factor (dBm)	Max. Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2					
42	5210	-8.05	-7.54	-7.91	-3.06	0.72	-2.34	13.23	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.

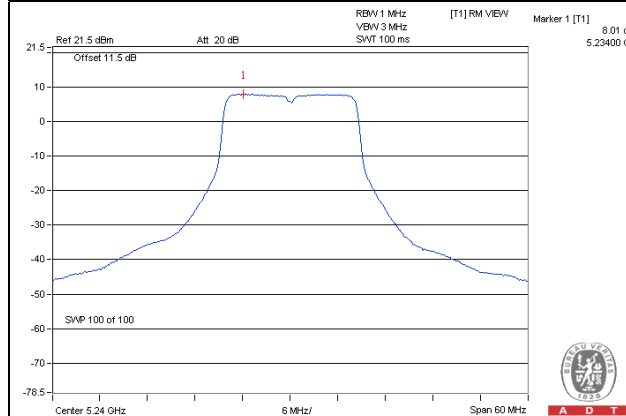
2. For U-NII-1 Band:

Directional gain = 5dBi + 10log(3) = 9.77dBi > 6dBi, so the power density limit shall be reduced to 17-(9.77 -6) = 13.23dBm.

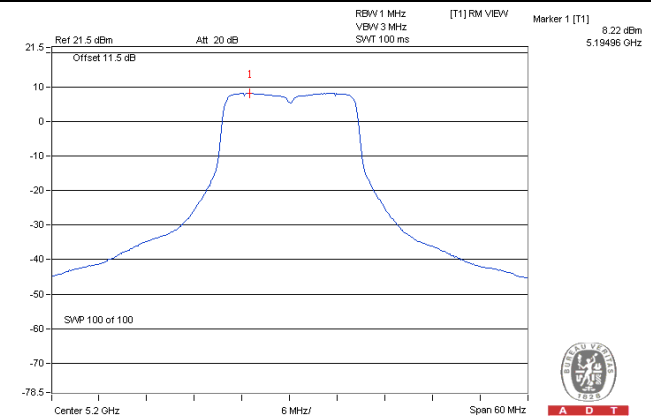
3. Refer to section 3.3 for duty cycle spectrum plot.

SPECTRUM PLOT OF WORST VALUE

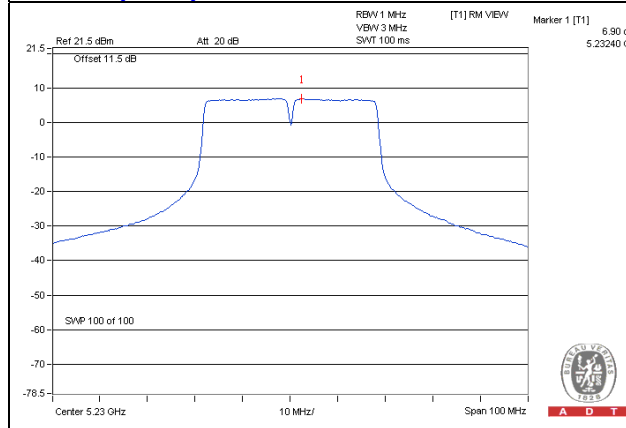
802.11a



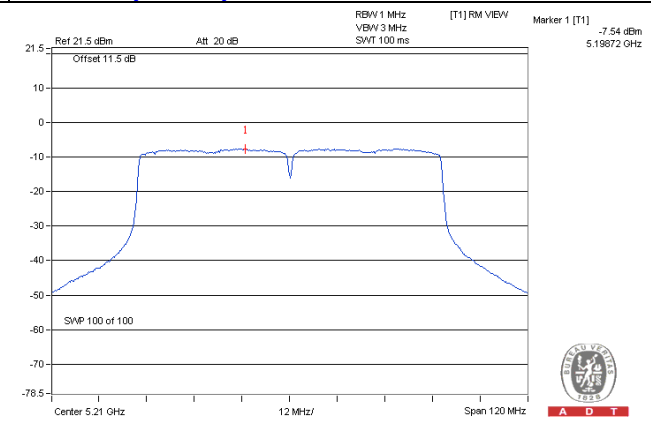
802.11n (HT20)



802.11n (HT40)



802.11ac (VHT80)



For U-NII-3 Band

802.11a

TX chain	Chan.	Freq. (MHz)	PSD (dBm /300kHz)	PSD (dBm /500kHz)	10 log (N=3) dB	Duty Factor	Total PSD (dBm /500kHz)	Limit (dBm /500kHz)	Pass /Fail
0	149	5745	0.02	2.24	4.77	0.27	7.28	26.23	Pass
	157	5785	1.39	3.61	4.77	0.27	8.65	26.23	Pass
	165	5825	0.96	3.18	4.77	0.27	8.22	26.23	Pass
1	149	5745	-2.14	0.08	4.77	0.27	5.12	26.23	Pass
	157	5785	0.18	2.40	4.77	0.27	7.44	26.23	Pass
	165	5825	-1.10	1.12	4.77	0.27	6.16	26.23	Pass
2	149	5745	-2.15	0.07	4.77	0.27	5.11	26.23	Pass
	157	5785	-0.79	1.43	4.77	0.27	6.47	26.23	Pass
	165	5825	-1.07	1.15	4.77	0.27	6.19	26.23	Pass

NOTE: 1. Directional gain = 5dBi + 10log(3) = 9.77dBi > 6dBi , so the power density limit shall be reduced to 30-(9.77-6) = 26.23dBm.

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

802.11n (HT20)

TX chain	Chan.	Freq. (MHz)	PSD (dBm /300kHz)	PSD (dBm /500kHz)	10 log (N=3) dB	Duty Factor	Total PSD (dBm /500kHz)	Limit (dBm /500kHz)	Pass /Fail
0	149	5745	0.58	2.80	4.77	0.43	8.00	26.23	Pass
	157	5785	1.09	3.31	4.77	0.43	8.51	26.23	Pass
	165	5825	0.76	2.98	4.77	0.43	8.18	26.23	Pass
1	149	5745	-1.04	1.18	4.77	0.43	6.38	26.23	Pass
	157	5785	-0.61	1.61	4.77	0.43	6.81	26.23	Pass
	165	5825	-1.67	0.55	4.77	0.43	5.75	26.23	Pass
2	149	5745	-1.34	0.88	4.77	0.43	6.08	26.23	Pass
	157	5785	-1.29	0.93	4.77	0.43	6.13	26.23	Pass
	165	5825	-2.59	-0.37	4.77	0.43	4.83	26.23	Pass

NOTE: 1. Directional gain = 5dBi + 10log(3) = 9.77dBi > 6dBi , so the power density limit shall be reduced to 30-(9.77-6) = 26.23dBm.

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

802.11n (HT40)

TX chain	Chan.	Freq. (MHz)	PSD (dBm /300kHz)	PSD (dBm /500kHz)	10 log (N=3) dB	Duty Factor	Total PSD (dBm /500kHz)	Limit (dBm /500kHz)	Pass /Fail
0	151	5755	-6.52	-4.30	4.77	0.40	0.87	26.23	Pass
	159	5795	-2.85	-0.63	4.77	0.40	4.54	26.23	Pass
1	151	5755	-7.31	-5.09	4.77	0.40	0.08	26.23	Pass
	159	5795	-3.88	-1.66	4.77	0.40	3.51	26.23	Pass
2	151	5755	-8.28	-6.06	4.77	0.40	-0.89	26.23	Pass
	159	5795	-5.06	-2.84	4.77	0.40	2.33	26.23	Pass

NOTE: 1. Directional gain = 5dBi + 10log(3) = 9.77dBi > 6dBi , so the power density limit shall be reduced to 30-(9.77-6) = 26.23dBm.

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

802.11ac (VHT80)

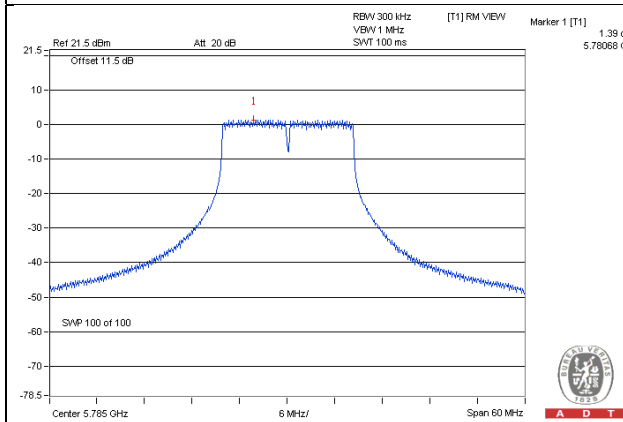
TX chain	Chan.	Freq. (MHz)	PSD (dBm /300kHz)	PSD (dBm /500kHz)	10 log (N=3) dB	Duty Factor	Total PSD (dBm /500kHz)	Limit (dBm /500kHz)	Pass /Fail
0	155	5775	-15.08	-12.86	4.77	0.72	-7.37	26.23	Pass
1	155	5775	-16.80	-14.58	4.77	0.72	-9.09	26.23	Pass
2	155	5775	-16.88	-14.66	4.77	0.72	-9.17	26.23	Pass

NOTE: 1. Directional gain = 5dBi + 10log(3) = 9.77dBi > 6dBi , so the power density limit shall be reduced to 30-(9.77-6) = 26.23dBm.

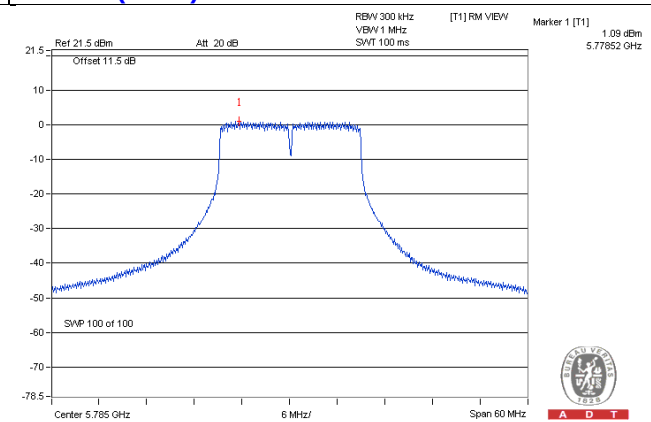
2. Refer to section 3.3 for duty cycle spectrum plot.

SPECTRUM PLOT OF WORST VALUE

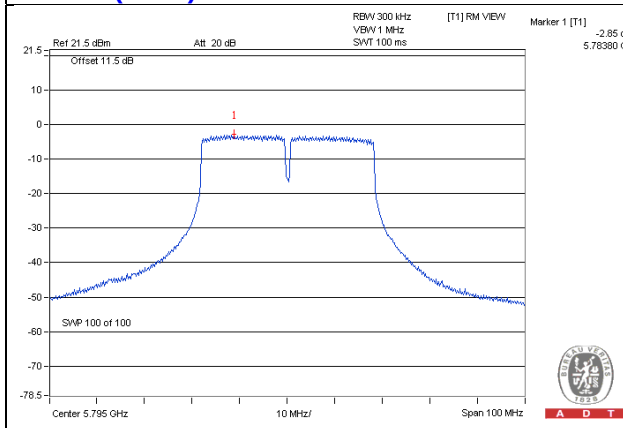
802.11a



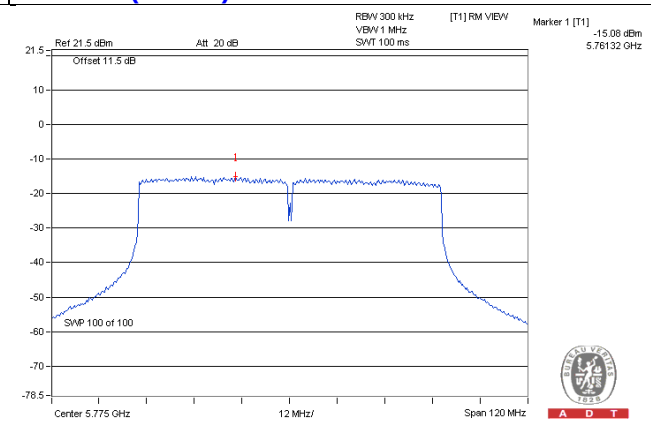
802.11n (HT20)



802.11n (HT40)



802.11ac (VHT80)

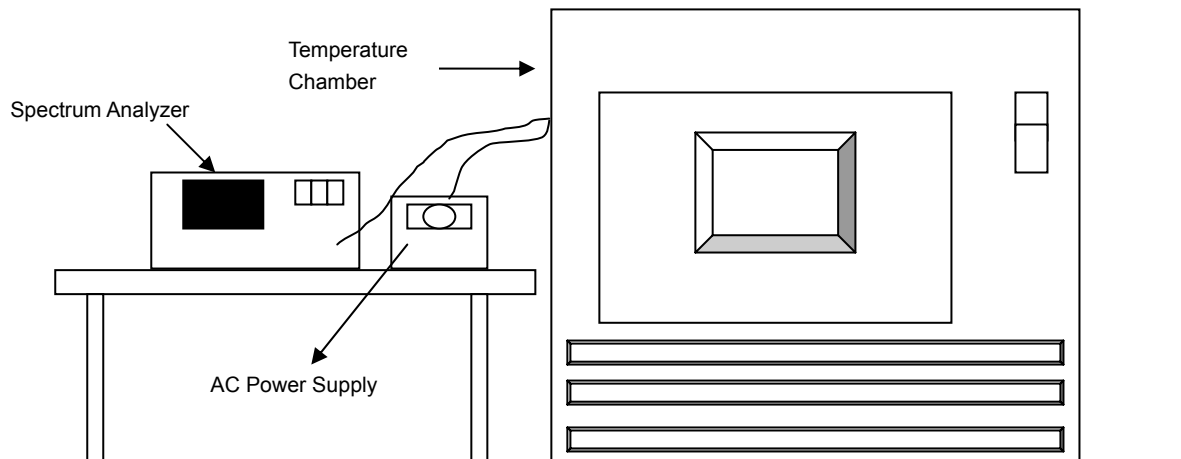


4.5 Frequency Stability

4.5.1 Limits of Frequency Stability Measurement

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

4.5.2 Test Setup



4.5.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.5.4 Test Procedure

- The EUT was placed inside the environmental test chamber and powered by nominal AC voltage.
- Turn the EUT on and couple its output to a spectrum analyzer.
- Turn the EUT off and set the chamber to the highest temperature specified.
- 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.
- Repeat step 2 and 3 with the temperature chamber set to the lowest temperature.
- 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.

4.5.5 Deviation from Test Standard

No deviation.

4.5.6 EUT Operating Condition

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

4.5.7 Test Results

FREQUENCY STABILITY VERSUS TEMP.									
OPERATING FREQUENCY: 5240MHz									
TEMP. (°C)	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	5239.9945	-0.00010	5239.9923	-0.00015	5239.9936	-0.00012	5239.9938	-0.00012
40	120	5240.0252	0.00048	5240.0225	0.00043	5240.0249	0.00048	5240.0238	0.00045
30	120	5240.0082	0.00016	5240.0083	0.00016	5240.0101	0.00019	5240.0101	0.00019
20	120	5239.9823	-0.00034	5239.9835	-0.00031	5239.9853	-0.00028	5239.9864	-0.00026
10	120	5239.9934	-0.00013	5239.9923	-0.00015	5239.9932	-0.00013	5239.9913	-0.00017
0	120	5239.9852	-0.00028	5239.9846	-0.00029	5239.9829	-0.00033	5239.9828	-0.00033
-10	120	5239.9951	-0.00009	5239.9972	-0.00005	5239.9953	-0.00009	5239.9942	-0.00011
-20	120	5239.9792	-0.00040	5239.9765	-0.00045	5239.9781	-0.00042	5239.9796	-0.00039
-30	120	5240.0187	0.00036	5240.0157	0.00030	5240.0168	0.00032	5240.0146	0.00028

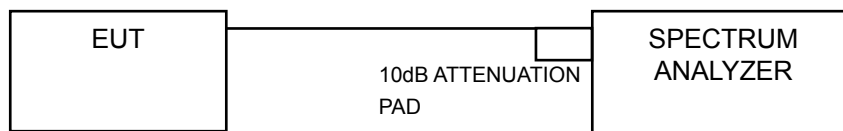
FREQUENCY STABILITY VERSUS TEMP.									
OPERATING FREQUENCY: 5240MHz									
TEMP. (°C)	POWER SUPPLY (Vac)	0 MINUTE		2 MINUTE		5 MINUTE		10 MINUTE	
		Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)
20	138	5239.9829	-0.00033	5239.9837	-0.00031	5239.9854	-0.00028	5239.9863	-0.00026
	120	5239.9823	-0.00034	5239.9835	-0.00031	5239.9853	-0.00028	5239.9864	-0.00026
	102	5239.9818	-0.00035	5239.9842	-0.00030	5239.9854	-0.00028	5239.9865	-0.00026

4.6 6dB Bandwidth Measurement

4.6.1 Limits of 6dB Bandwidth Measurement

The minimum of 6dB Bandwidth Measurement is 0.5MHz.

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

MEASUREMENT PROCEDURE REF

- Set resolution bandwidth (RBW) = 100kHz
- Set the video bandwidth (VBW) $\geq 3 \times$ RBW, Detector = Peak.
- Trace mode = max hold.
- Sweep = auto couple.
- 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

4.6.5 Deviation from Test Standard

No deviation.

4.6.6 EUT Operating Condition

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

4.6.7 Test Results

802.11a

Channel	Frequency (MHz)	6dB Bandwidth (MHz)			Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2		
149	5745	16.41	16.45	16.45	0.5	PASS
157	5785	16.42	16.40	16.42	0.5	PASS
165	5825	16.42	16.43	16.52	0.5	PASS

802.11n (HT20)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)			Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2		
149	5745	17.65	17.64	17.67	0.5	PASS
157	5785	17.66	17.64	17.67	0.5	PASS
165	5825	17.64	17.65	17.70	0.5	PASS

802.11n (HT40)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)			Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2		
151	5755	36.47	36.15	36.48	0.5	PASS
159	5795	36.44	35.94	36.46	0.5	PASS

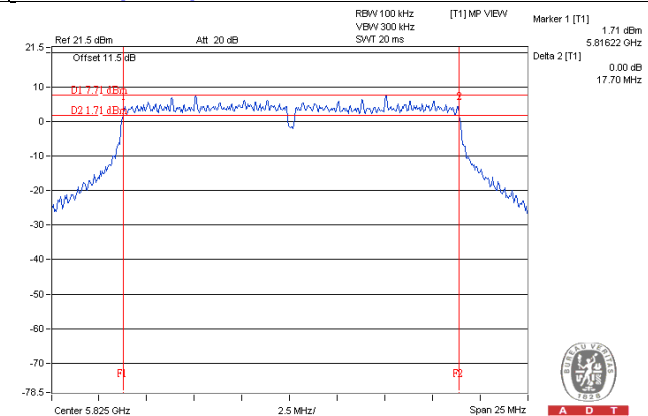
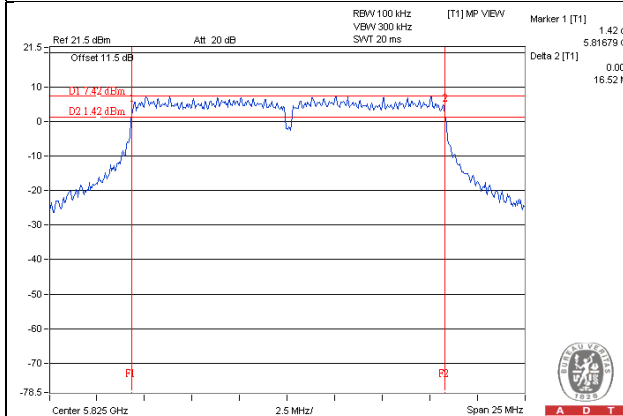
802.11ac (VHT80)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)			Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1	Chain 2		
155	5775	76.37	76.65	76.66	0.5	PASS

SPECTRUM PLOT OF WORST VALUE

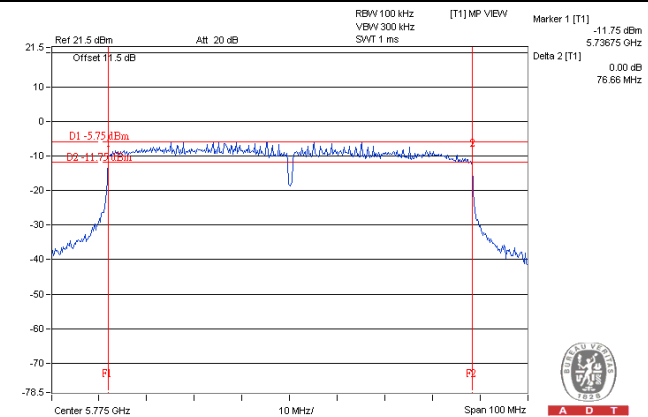
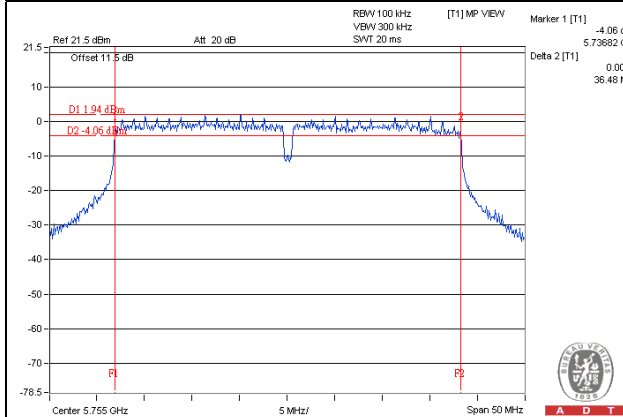
802.11a

802.11n (HT20)



802.11n (HT40)

802.11ac (VHT80)



5 Pictures of Test Arrangements

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

Appendix – Information on the Testing Laboratories

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

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

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Fax: 886-2-26051924

Hsin Chu EMC/RF/Telecom Lab

Tel: 886-3-5935343

Fax: 886-3-5935342

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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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