FCC Test Report

Report No.:	RF150721C05C
FCC ID:	UL9502AC
Test Model:	WBS-502AC
Received Date:	Jul. 21, 2015
Test Date:	Jul. 22 ~ Aug. 11, 2015 (For all tests, except OOBE test) Aug. 24, 2017 (For OOBE test)
Issued Date:	Aug. 30, 2017
Applicant:	PLANET Technology Corporation
Address:	10F., No.96, Minquan Rd., Xindian Dist., New Taipei City 231, Taiwan, R.O.C.
Issued By:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
Test Location:	No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan, R.O.C.
Lab Address:	No.19, Hwa Ya 2nd Rd., Wen Hwa Vil., Kwei Shan Dist., Taoyuan City 33383, TAIWAN (R.O.C.)

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Release Control Record

Issue No.	Description	Date Issued
RF150721C05C	Original release	Aug. 30, 2017

1 Certificate of Conformity

Product:	900Mbps 802.11ac Outdoor Wireless CPE
Brand:	PLANET
Test Model:	WBS-502AC
Sample Status:	Engineering sample
Applicant:	PLANET Technology Corporation
Test Date:	Jul. 22 ~ Aug. 11, 2015 (For all tests, except OOBE test) Aug. 24, 2017 (For OOBE test)
Standards:	47 CFR FCC Part 15, Subpart E (Section 15.407) ANSI C63.10:2013

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

Prepared by : _____ , **Date:** Aug. 30, 2017
Polly Chien / Specialist

Approved by : _____ , **Date:** Aug. 30, 2017
Ken Liu / Senior Manager

2 Summary of Test Results

47 CFR FCC Part 15, Subpart E (Section 15.407)			
FCC Clause	Test Item	Result	Remarks
15.207 15.407(b)(6)	AC Power Conducted Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -7.32dB at 0.52544MHz.
15.407(b) (1/2/3/4/6)	Radiated Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -1.0dB at 900.00MHz and 5640.00MHz
15.407(b) (1/2/3/4/6)	Band Edge Measurement	Pass	Meet the requirement of limit. Minimum passing margin is -1.0dB at 5150MHz.
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.

*For U-NII-3 band compliance with rule part 15.407(b)(4)(i), the OOBE test plots were recorded in Annex A.

2.1 Measurement Uncertainty

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

Measurement	Frequency	Expended Uncertainty (k=2) (±)
Conducted Emissions at mains ports0	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	900Mbps 802.11ac Outdoor Wireless CPE
Brand	PLANET
Test Model	WBS-502AC
Status of EUT	Engineering sample
Power Supply Rating	54Vdc (PoE)
Modulation Type	256QAM, 64QAM, 16QAM, QPSK, BPSK for OFDM
Modulation Technology	OFDM
Transfer Rate	802.11a: 54.0/ 48.0/ 36.0/ 24.0/ 18.0/ 12.0/ 9.0/ 6.0Mbps 802.11n: up to 300Mbps 802.11ac: up to 866.7Mbps
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: 119.452mW 5745 ~ 5825MHz: 80.873mW
Antenna Type	Refer to Note
Antenna Connector	IPEX
Accessory Device	POE
Data Cable Supplied	NA

Note:

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

Modulation Mode	TX Function
802.11a	2TX
802.11n (HT20)	2TX
802.11n (HT40)	2TX
802.11ac (VHT20)	2TX
802.11ac (VHT40)	2TX
802.11ac (VHT80)	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)

2. The EUT uses following POE.

Brand	NA
Model	EPA5006GP
Input	100-240Vac, 0.8A, 50-60Hz
Output	54Vdc, 0.6A

3. The following antennas were provided to the EUT.

Type	Gain(dBi)		Connector
	Ant. 1	Ant. 2	
PATCH	15.5	15.5	IPEX

3.2 Description of Test Modes

For 5180 ~ 5240MHz

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

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

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

Channel	Frequency	Channel	Frequency
38	5190 MHz	46	5230 MHz

1 channel is provided for 802.11ac (VHT80):

Channel	Frequency
42	5210MHz

For 5745 ~ 5825MHz:

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

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

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

Channel	Frequency	Channel	Frequency
151	5755MHz	159	5795MHz

1 channel is provided for 802.11ac (VHT80):

Channel	Frequency
155	5775MHz

3.2.1 Test Mode Applicability and Tested Channel Detail

EUT CONFIGURE MODE	APPLICABLE TO				DESCRIPTION
	RE≥1G	RE<1G	PLC	APCM	
-	√	√	√	√	-

Where **RE≥1G:** Radiated Emission above 1GHz & Bandedge Measurement **RE<1G:** Radiated Emission below 1GHz

PLC: Power Line Conducted Emission **APCM:** Antenna Port Conducted Measurement

Note: The EUT had been pre-tested on the positioned of each 3 axis. The worst case was found when positioned on **Z-plane.**

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)
-	802.11a	5180-5240	36 to 48	36, 40, 48	OFDM	BPSK	6.0
-	802.11n (HT20)		36 to 48	36, 40, 48	OFDM	BPSK	7.2
-	802.11n (HT40)		38 to 46	38, 46	OFDM	BPSK	15.0
-	802.11ac (VHT80)		42	42	OFDM	BPSK	65.0
-	802.11a	5745-5825	149 to 165	149, 157, 165	OFDM	BPSK	6.0
-	802.11n (HT20)		149 to 165	149, 157, 165	OFDM	BPSK	7.2
-	802.11n (HT40)		151 to 159	151, 159	OFDM	BPSK	15.0
-	802.11ac (VHT80)		155	155	OFDM	BPSK	65.0

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)
-	802.11a	5180-5240	36 to 48	36	OFDM	BPSK	6.0
	802.11a	5745-5825	149 to 165		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)
-	802.11a	5180-5240	36 to 48	36	OFDM	BPSK	6.0
	802.11a	5745-5825	149 to 165		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)
-	802.11a	5180-5240	36 to 48	36, 40, 48	OFDM	BPSK	6.0
-	802.11n (HT20)		36 to 48	36, 40, 48	OFDM	BPSK	7.2
-	802.11n (HT40)		38 to 46	38, 46	OFDM	BPSK	15.0
-	802.11ac (VHT80)		42	42	OFDM	BPSK	65.0
-	802.11a	5745-5825	149 to 165	149, 157, 165	OFDM	BPSK	6.0
-	802.11n (HT20)		149 to 165	149, 157, 165	OFDM	BPSK	7.2
-	802.11n (HT40)		151 to 159	151, 159	OFDM	BPSK	15.0
-	802.11ac (VHT80)		155	155	OFDM	BPSK	65.0

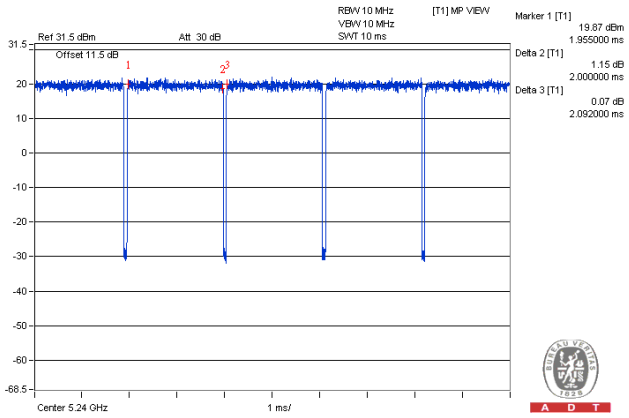
Test Condition:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER (POE)	TESTED BY
RE≥1G	18deg. C, 70%RH	54Vdc	Nick Hsu
RE<1G	18deg. C, 70%RH	54Vdc	Nick Hsu
PLC	18deg. C, 70%RH	54Vdc	Nick Hsu
APCM	25deg. C, 60%RH	54Vdc	Leo Tsai

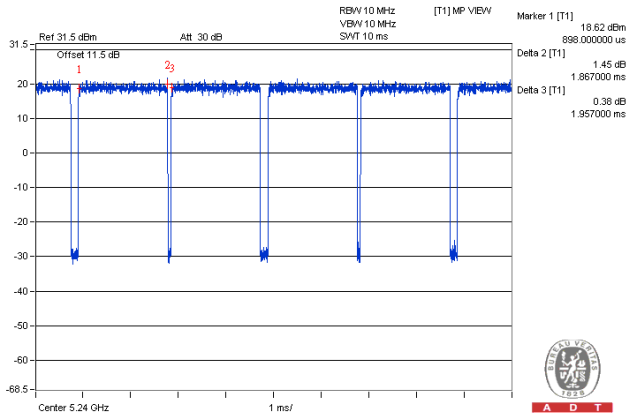
3.3 Duty Cycle of Test Signal

Duty cycle of test signal is < 98 %, duty factor is required
802.11a: Duty cycle = 2.000/2.092 = 0.956, Duty factor = 10 * log(1/0.956) = 0.20
802.11n (HT20): Duty cycle = 1.868/1.957 = 0.954, Duty factor = 10 * log(1/0.954) = 0.20
802.11n (HT40): Duty cycle = 0.907/1.037 = 0.875, Duty factor = 10 * log(1/0.875) = 0.58
802.11ac (VHT80): Duty cycle = 0.455/0.542 = 0.839, Duty factor = 10 * log(1/0.839) = 0.76

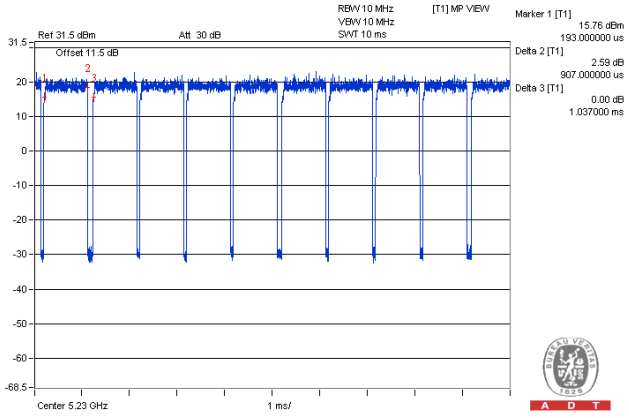
802.11a



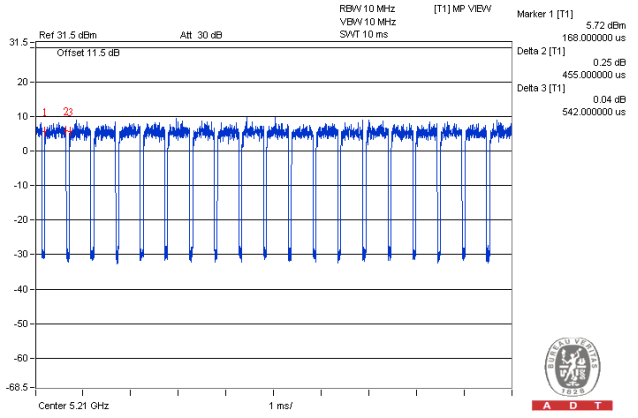
802.11n (HT20)



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.

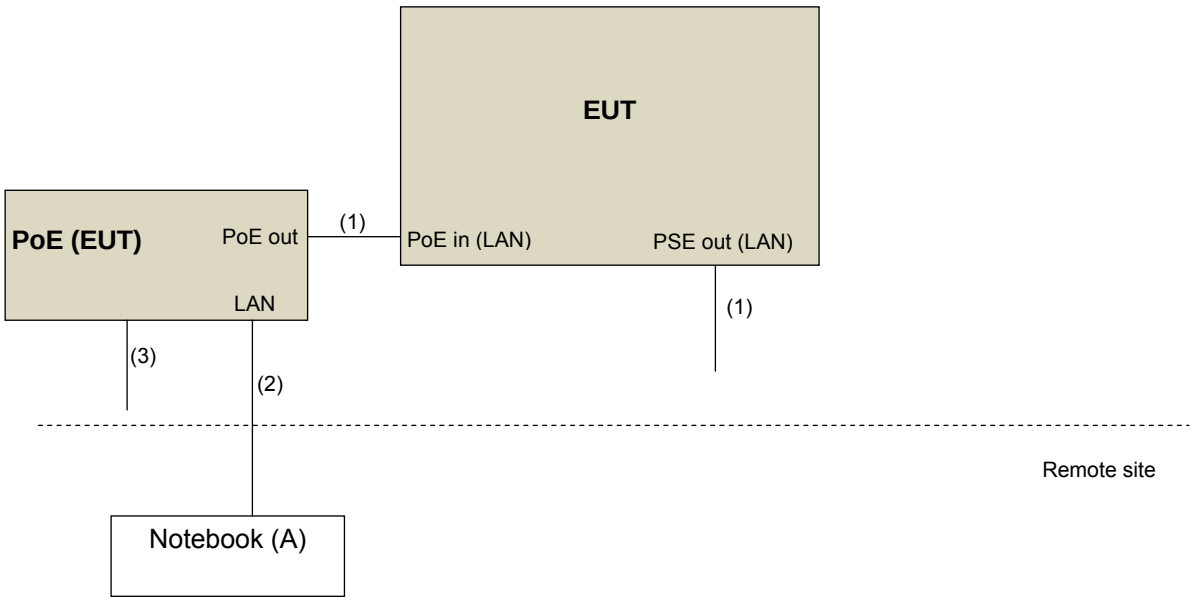
ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Notebook	DELL	E5410	1HC2XM1	FCC DoC Approved	-

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.

No.	Cable	Qty.	Length (m)	Shielded (Yes/ No)	Cores (Number)	Remark
1.	RJ45, Cat5e	2	1.8	N	0	-
2.	RJ45, Cat5e	1	10	N	0	-
3.	AC cable	1	1.8	N	0	-

3.4.1 Configuration of System under Test



3.5 General Description of Applied Standards

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

FCC Part 15, Subpart E (15.407)
KDB 789033 D02 General UNII Test Procedure New Rules v01r04
662911 D01 Multiple Transmitter Output v02r01
ANSI C63.10-2013

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

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

4 Test Types and Results

4.1 Radiated Emission and Bandedge Measurement

4.1.1 Limits of Radiated Emission and Bandedge Measurement

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

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

NOTE:

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

Limits of unwanted emission out of the restricted bands

<table>
<tr><td colspan="3">Applicable To</td><td colspan="2">Limit</td></tr>
<tr><td colspan="3" rowspan="2">789033 D02 General UNII Test Procedure New Rules v01r04</td><td colspan="2">Field Strength at 3m</td></tr>
<tr><td>PK: 74 (dBµV/m)</td><td>AV: 54 (dBµV/m)</td></tr>
<tr><td>Frequency Band</td><td colspan="2">Applicable To</td><td>EIRP Limit</td><td>Equivalent Field Strength at 3m</td></tr>
<tr><td>5150~5250 MHz</td><td colspan="2">15.407(b)(1)</td><td rowspan="3">PK: -27 (dBm/MHz)</td><td rowspan="3">PK: 68.2(dBµV/m)</td></tr>
<tr><td>5250~5350 MHz</td><td colspan="2">15.407(b)(2)</td></tr>
<tr><td>5470~5725 MHz</td><td colspan="2">15.407(b)(3)</td></tr>
<tr><td rowspan="2">5725~5850 MHz</td><td>☒</td><td>15.407(b)(4)(i)</td><td>PK: -27 (dBm/MHz) *1
PK: 10 (dBm/MHz) *2
PK: 15.6 (dBm/MHz) *3
PK: 27 (dBm/MHz) *4</td><td>PK: 68.2(dBµV/m) *1
PK: 105.2 (dBµV/m) *2
PK: 110.8(dBµV/m) *3
PK: 122.2 (dBµV/m) *4</td></tr>
<tr><td>☐</td><td>15.407(b)(4)(ii)</td><td colspan="2">Emission limits in section 15.247(d)</td></tr>
<tr><td colspan="5">*1 beyond 75 MHz or more above of the band edge.
*2 below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above.
*3 below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above.
*4 from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.</td></tr>
</table>

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

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

4.1.2 Test Instruments

Tested date: Jul. 22 ~ Aug. 11, 2015

Description & Manufacturer	Model No.	Serial No.	Date of Calibration	Due Date of Calibration
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
Loop Antenna R&S	HFH2-Z2	100070	Mar. 06, 2014	Mar. 05, 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 Power Meter	ML2495A	0824011	Jul. 09, 2015	Jul. 08, 2016
Power Sensor	MA2411B	0738171	Jul. 09, 2015	Jul. 08, 2016
WIT Standard Temperature And Humidity Chamber	TH-4S-C	W981030	Jun. 09, 2015	Jun. 08, 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 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-3.

Tested date: Aug. 24, 2017

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Test Receiver ROHDE & SCHWARZ	ESIB7	100187	May 02, 2017	May 01, 2018
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100041	Nov. 16, 2016	Nov. 15, 2017
BILOG Antenna SCHWARZBECK	VULB9168	9168-171	Dec. 28, 2016	Dec. 27, 2017
HORN Antenna SCHWARZBECK	9120D	209	Dec. 27, 2016	Dec. 26, 2017
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170241	Dec. 14, 2016	Dec. 13, 2017
Loop Antenna	EM-6879	269	Aug. 11, 2016	Aug. 10, 2017
Preamplifier Agilent	8447D	2944A10738	Aug. 21, 2017	Aug. 20, 2018
Preamplifier Agilent	8449B	3008A01922	Sep. 18, 2016	Sep. 17, 2017
RF signal cable HUBER+SUHNER	SUCOFLEX 104	Cable-CH3-03 (214378)	Aug. 21, 2017	Aug. 20, 2018
RF signal cable HUBER+SUHNER	SUCOFLEX 106	Cable-CH3-03 (309224+12738)	Aug. 21, 2017	Aug. 20, 2018
Software BV ADT	ADT_Radiated_ V7.6.15.9.4	NA	NA	NA
Antenna Tower inn-co GmbH	MA 4000	013303	NA	NA
Antenna Tower Controller BV ADT	AT100	AT93021702	NA	NA
Turn Table BV ADT	TT100	TT93021702	NA	NA
Turn Table Controller BV ADT	SC100	SC93021702	NA	NA
26GHz ~ 40GHz Amplifier	EM26400	815221	Oct. 17, 2016	Oct. 16, 2017
High Speed Peak Power Meter	ML2495A	0824012	Aug. 18, 2017	Aug. 17, 2018
Power Sensor	MA2411B	0738171	Aug. 18, 2017	Aug. 17, 2018

Note:
1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in HwaYa Chamber 3.
3. The horn antenna and preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
4. The FCC Designation Number is TW0003. The number will be varied with the Lab location and scope as attached.
5. The IC Site Registration No. is IC 7450F-3.

4.1.3 Test Procedures

For Radiated emission below 30MHz

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter chamber room. The table was rotated 360 degrees to determine the position of the highest radiation.

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

c. Both X and Y axes of the antenna are set to make the measurement.

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

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

Note:

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

For Radiated emission above 30MHz

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

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

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

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

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

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

Note:

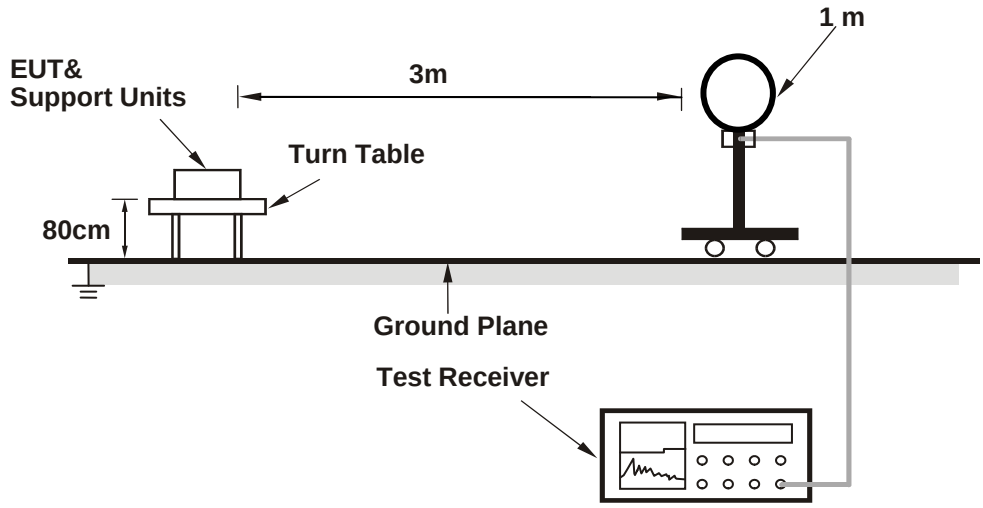
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.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

4.1.4 Deviation from Test Standard

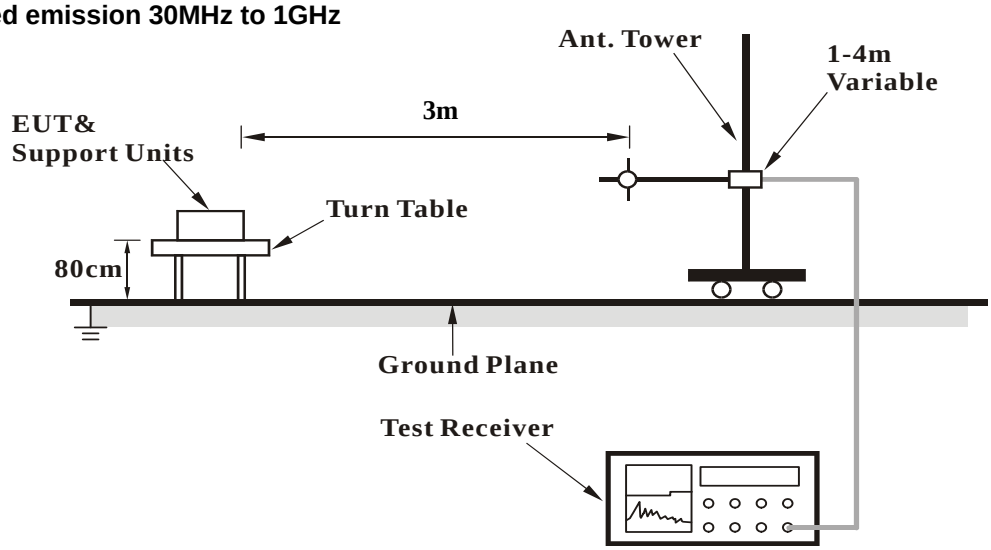
No deviation.

4.1.5 Test Set Up

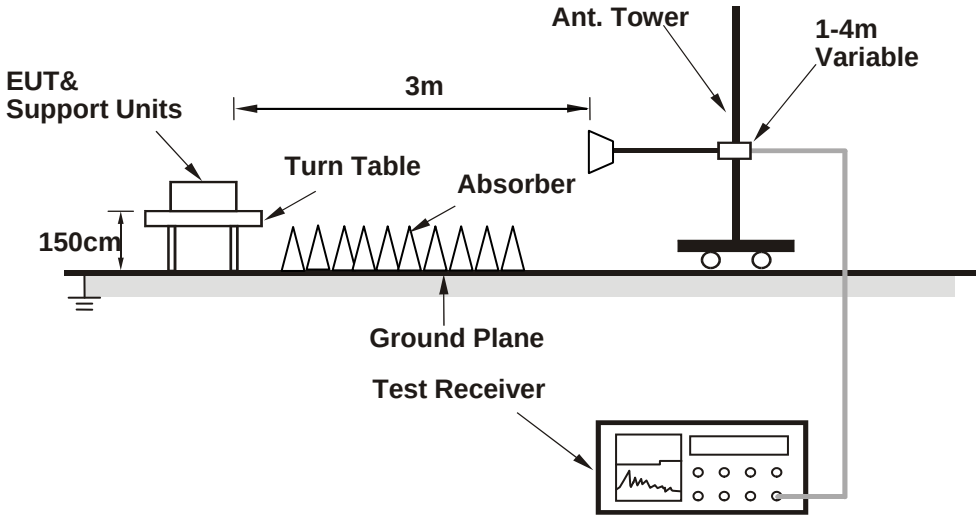
For Radiated emission below 30MHz



For Radiated emission 30MHz to 1GHz



For Radiated emission above 1GHz



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

4.1.6 EUT Operating Conditions

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

4.1.7 Test Results

Above 1GHz Data:

802.11a

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	62.1 PK	74.0	-11.9	1.41 H	2	56.10	6.00
2	5150.00	48.4 AV	54.0	-5.6	1.41 H	2	42.40	6.00
3	*5180.00	117.0 PK			1.46 H	1	77.50	39.50
4	*5180.00	107.0 AV			1.46 H	1	67.50	39.50
5	5400.00	60.3 PK	74.0	-13.7	1.69 H	357	54.00	6.30
6	5400.00	48.2 AV	54.0	-5.8	1.69 H	357	41.90	6.30
7	#10360.00	59.4 PK	74.0	-14.6	1.47 H	5	41.00	18.40
8	#10360.00	47.0 AV	54.0	-7.0	1.47 H	5	28.60	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	62.3 PK	74.0	-11.7	2.02 V	353	56.30	6.00
2	5150.00	49.2 AV	54.0	-4.8	2.02 V	353	43.20	6.00
3	*5180.00	119.0 PK			2.00 V	351	79.50	39.50
4	*5180.00	108.3 AV			2.00 V	351	68.80	39.50
5	5400.00	63.0 PK	74.0	-11.0	1.99 V	349	56.70	6.30
6	5400.00	52.3 AV	54.0	-1.7	1.99 V	349	46.00	6.30
7	#10360.00	59.9 PK	74.0	-14.1	2.10 V	6	41.50	18.40
8	#10360.00	46.9 AV	54.0	-7.1	2.10 V	6	28.50	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) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5200.00	119.8 PK			1.63 H	1	80.20	39.60
2	*5200.00	110.2 AV			1.63 H	1	70.60	39.60
3	5400.00	61.2 PK	74.0	-12.8	1.47 H	358	54.90	6.30
4	5400.00	48.8 AV	54.0	-5.2	1.47 H	358	42.50	6.30
5	#10400.00	59.7 PK	74.0	-14.3	1.67 H	347	41.20	18.50
6	#10400.00	46.9 AV	54.0	-7.1	1.67 H	347	28.40	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	*5200.00	119.3 PK			2.01 V	351	79.70	39.60
2	*5200.00	107.9 AV			2.01 V	351	68.30	39.60
3	5400.00	62.5 PK	74.0	-11.5	1.92 V	348	56.20	6.30
4	5400.00	52.2 AV	54.0	-1.8	1.92 V	348	45.90	6.30
5	#10400.00	60.3 PK	74.0	-13.7	1.83 V	340	41.80	18.50
6	#10400.00	47.2 AV	54.0	-6.8	1.83 V	340	28.70	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) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5240.00	118.0 PK			1.51 H	0	78.40	39.60
2	*5240.00	106.9 AV			1.51 H	0	67.30	39.60
3	5423.00	63.5 PK	74.0	-10.5	1.63 H	0	57.20	6.30
4	5423.00	50.8 AV	54.0	-3.2	1.63 H	0	44.50	6.30
5	#10480.00	59.3 PK	74.0	-14.7	1.73 H	1	40.30	19.00
6	#10480.00	46.9 AV	54.0	-7.1	1.73 H	1	27.90	19.00
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	120.6 PK			2.06 V	353	81.00	39.60
2	*5240.00	109.6 AV			2.06 V	353	70.00	39.60
3	5420.00	62.9 PK	74.0	-11.1	1.96 V	349	56.60	6.30
4	5420.00	52.3 AV	54.0	-1.7	1.96 V	349	46.00	6.30
5	#10480.00	59.5 PK	74.0	-14.5	1.90 V	329	40.50	19.00
6	#10480.00	46.9 AV	54.0	-7.1	1.90 V	329	27.90	19.00

Remarks:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5420.00	62.2 PK	74.0	-11.8	1.49 H	359	55.90	6.30
2	5420.00	50.5 AV	54.0	-3.5	1.49 H	359	44.20	6.30
3	#5608.80	62.6 PK	68.2	-5.6	1.49 H	355	60.10	2.50
4	#5714.90	65.6 PK	109.4	-43.8	1.55 H	354	58.80	6.80
5	#5722.90	69.0 PK	117.4	-48.4	1.62 H	354	62.20	6.80
6	#5725.00	55.8 PK	122.2	-66.4	1.59 H	355	49.00	6.80
7	*5745.00	116.5 PK			1.49 H	355	76.10	40.40
8	*5745.00	106.7 AV			1.49 H	355	66.30	40.40
9	#5975.20	58.5 PK	68.2	-9.7	1.49 H	355	55.10	3.40
10	11490.00	59.6 PK	74.0	-14.4	1.38 H	342	41.20	18.40
11	11490.00	45.8 AV	54.0	-8.2	1.38 H	342	27.40	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	5420.00	64.2 PK	74.0	-9.8	2.05 V	349	57.90	6.30
2	5420.00	52.2 AV	54.0	-1.8	2.05 V	349	45.90	6.30
3	#5628.80	61.5 PK	68.2	-6.7	2.05 V	349	59.00	2.50
4	#5714.90	67.0 PK	109.4	-42.4	1.80 V	352	60.20	6.80
5	#5722.90	58.2 PK	117.4	-59.2	1.72 V	350	51.40	6.80
6	#5725.00	55.6 PK	122.2	-66.6	1.72 V	349	48.80	6.80
7	*5745.00	116.8 PK			1.77 V	351	76.40	40.40
8	*5745.00	108.3 AV			1.77 V	351	67.90	40.40
9	#5984.80	57.9 PK	68.2	-10.3	2.05 V	349	54.50	3.40
10	11490.00	58.6 PK	74.0	-15.4	1.65 V	4	40.20	18.40
11	11490.00	46.0 AV	54.0	-8.0	1.65 V	4	27.60	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) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5460.00	64.8 PK	74.0	-9.2	1.61 H	358	58.40	6.40
2	5460.00	52.6 AV	54.0	-1.4	1.61 H	358	46.20	6.40
3	#5626.40	65.7 PK	68.2	-2.5	1.58 H	354	63.20	2.50
4	*5785.00	118.6 PK			1.58 H	354	78.10	40.50
5	*5785.00	109.1 AV			1.58 H	354	68.60	40.50
6	#5972.00	59.5 PK	68.2	-8.7	1.58 H	354	56.20	3.30
7	11570.00	60.9 PK	74.0	-13.1	1.26 H	8	42.50	18.40
8	11570.00	48.3 AV	54.0	-5.7	1.26 H	8	29.90	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	5460.00	68.0 PK	74.0	-6.0	1.99 V	349	61.60	6.40
2	5460.00	52.9 AV	54.0	-1.1	1.99 V	349	46.50	6.40
3	#5632.80	62.7 PK	68.2	-5.5	1.75 V	349	60.20	2.50
4	*5785.00	121.4 PK			1.75 V	349	80.90	40.50
5	*5785.00	110.0 AV			1.75 V	349	69.50	40.50
6	#5940.80	57.9 PK	68.2	-10.3	1.75 V	349	54.70	3.20
7	11570.00	59.2 PK	74.0	-14.8	1.74 V	359	40.80	18.40
8	11570.00	46.8 AV	54.0	-7.2	1.74 V	359	28.40	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) – 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.

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5400.00	63.9 PK	74.0	-10.1	1.62 H	358	57.60	6.30
2	5400.00	51.7 AV	54.0	-2.3	1.62 H	358	45.40	6.30
3	#5627.20	64.3 PK	68.2	-3.9	1.40 H	354	61.80	2.50
4	#5640.00	66.2 PK	68.2	-2.0	1.56 H	356	59.40	6.80
5	*5825.00	118.4 PK			1.40 H	354	77.90	40.50
6	*5825.00	108.5 AV			1.40 H	354	68.00	40.50
7	#5850.00	54.9 PK	122.2	-67.3	1.44 H	354	48.00	6.90
8	#5852.10	74.2 PK	117.4	-43.2	1.48 H	351	67.20	7.00
9	#5860.10	68.9 PK	109.4	-40.5	1.62 H	354	61.90	7.00
10	#5944.00	59.4 PK	68.2	-8.8	1.40 H	354	56.20	3.20
11	11650.00	59.9 PK	74.0	-14.1	1.40 H	14	41.00	18.90
12	11650.00	48.1 AV	54.0	-5.9	1.40 H	14	29.20	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	5400.00	64.8 PK	74.0	-9.2	1.91 V	352	58.50	6.30
2	5400.00	52.5 AV	54.0	-1.5	1.91 V	352	46.20	6.30
3	#5637.60	64.2 PK	68.2	-4.0	1.60 V	349	61.70	2.50
4	**#5640.00**	**67.2 PK**	**68.2**	**-1.0**	**1.83 V**	**348**	**60.40**	**6.80**
5	*5825.00	120.9 PK			1.60 V	349	80.40	40.50
6	*5825.00	109.9 AV			1.60 V	349	69.40	40.50
7	#5850.00	51.7 PK	122.2	-70.5	1.82 V	350	44.80	6.90
8	#5852.10	69.4 PK	117.4	-48.0	1.75 V	351	62.40	7.00
9	#5860.10	63.2 PK	109.4	-46.2	1.54 V	348	56.20	7.00
10	#5860.10	50.0 AV	54.0	-4.0	1.54 V	348	43.00	7.00
11	#5957.60	58.7 PK	68.2	-9.5	1.60 V	349	55.50	3.20
12	11650.00	59.2 PK	74.0	-14.8	1.45 V	7	40.30	18.90
13	11650.00	47.0 AV	54.0	-7.0	1.45 V	7	28.10	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) – 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 36	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	62.1 PK	74.0	-11.9	1.47 H	2	56.10	6.00
2	5150.00	49.6 AV	54.0	-4.4	1.47 H	2	43.60	6.00
3	*5180.00	117.0 PK			1.42 H	1	77.50	39.50
4	*5180.00	106.8 AV			1.42 H	1	67.30	39.50
5	5415.00	61.6 PK	74.0	-12.4	1.66 H	358	55.30	6.30
6	5415.00	48.7 AV	54.0	-5.3	1.66 H	358	42.40	6.30
7	#10360.00	59.9 PK	74.0	-14.1	1.77 H	355	41.50	18.40
8	#10360.00	47.1 AV	54.0	-6.9	1.77 H	355	28.70	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	62.6 PK	74.0	-11.4	2.05 V	350	56.60	6.00
2	5150.00	50.0 AV	54.0	-4.0	2.05 V	350	44.00	6.00
3	*5180.00	118.5 PK			2.01 V	349	79.00	39.50
4	*5180.00	107.9 AV			2.01 V	349	68.40	39.50
5	5400.00	62.8 PK	74.0	-11.2	1.90 V	353	56.50	6.30
6	5400.00	52.3 AV	54.0	-1.7	1.90 V	353	46.00	6.30
7	#10360.00	60.0 PK	74.0	-14.0	1.76 V	332	41.60	18.40
8	#10360.00	47.2 AV	54.0	-6.8	1.76 V	332	28.80	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) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5200.00	117.1 PK			1.46 H	3	77.50	39.60
2	*5200.00	106.8 AV			1.46 H	3	67.20	39.60
3	5400.00	60.1 PK	74.0	-13.9	1.48 H	357	53.80	6.30
4	5400.00	48.7 AV	54.0	-5.3	1.48 H	357	42.40	6.30
5	#10400.00	59.2 PK	74.0	-14.8	2.03 H	334	40.70	18.50
6	#10400.00	47.2 AV	54.0	-6.8	2.03 H	334	28.70	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	*5200.00	118.9 PK			2.00 V	351	79.30	39.60
2	*5200.00	108.7 AV			2.00 V	351	69.10	39.60
3	5400.00	62.5 PK	74.0	-11.5	2.10 V	347	56.20	6.30
4	5400.00	52.3 AV	54.0	-1.7	2.10 V	347	46.00	6.30
5	#10400.00	59.3 PK	74.0	-14.7	1.84 V	348	40.80	18.50
6	#10400.00	47.0 AV	54.0	-7.0	1.84 V	348	28.50	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) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5240.00	116.9 PK			1.51 H	0	77.30	39.60
2	*5240.00	106.7 AV			1.51 H	0	67.10	39.60
3	5400.00	60.8 PK	74.0	-13.2	1.56 H	357	54.50	6.30
4	5400.00	48.4 AV	54.0	-5.6	1.56 H	357	42.10	6.30
5	#10480.00	58.9 PK	74.0	-15.1	1.73 H	295	39.90	19.00
6	#10480.00	46.5 AV	54.0	-7.5	1.73 H	295	27.50	19.00
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	118.9 PK			2.06 V	352	79.30	39.60
2	*5240.00	108.5 AV			2.06 V	352	68.90	39.60
3	5400.00	63.5 PK	74.0	-10.5	1.99 V	348	57.20	6.30
4	5400.00	52.4 AV	54.0	-1.6	1.99 V	348	46.10	6.30
5	#10480.00	59.3 PK	74.0	-14.7	1.86 V	332	40.30	19.00
6	#10480.00	46.7 AV	54.0	-7.3	1.86 V	332	27.70	19.00

Remarks:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5420.00	63.2 PK	74.0	-10.8	1.70 H	357	56.90	6.30
2	5420.00	50.9 AV	54.0	-3.1	1.70 H	357	44.60	6.30
3	#5625.60	62.9 PK	68.2	-5.3	1.44 H	355	60.40	2.50
4	#5714.90	64.1 PK	109.4	-45.3	1.58 H	353	57.30	6.80
5	#5722.90	68.1 PK	117.4	-49.3	1.58 H	354	61.30	6.80
6	#5725.00	56.9 PK	122.2	-65.3	1.56 H	353	50.10	6.80
7	*5745.00	116.4 PK			1.44 H	355	76.00	40.40
8	*5745.00	106.3 AV			1.44 H	355	65.90	40.40
9	#5970.40	58.8 PK	68.2	-9.4	1.44 H	355	55.50	3.30
10	11490.00	58.6 PK	74.0	-15.4	1.43 H	347	40.20	18.40
11	11490.00	46.7 AV	54.0	-7.3	1.43 H	347	28.30	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	5420.00	65.4 PK	74.0	-8.6	1.96 V	351	59.10	6.30
2	5420.00	51.8 AV	54.0	-2.2	1.96 V	351	45.50	6.30
3	#5609.60	63.7 PK	68.2	-4.5	1.70 V	349	61.20	2.50
4	#5714.90	65.6 PK	109.4	-43.8	1.72 V	349	58.80	6.80
5	#5722.90	68.7 PK	117.4	-48.7	1.71 V	350	61.90	6.80
6	#5725.00	54.8 PK	122.2	-67.4	1.77 V	349	48.00	6.80
7	*5745.00	118.7 PK			1.70 V	349	78.30	40.40
8	*5745.00	108.4 AV			1.70 V	349	68.00	40.40
9	#5924.80	58.6 PK	68.3	-9.7	1.70 V	349	55.50	3.10
10	11490.00	58.3 PK	74.0	-15.7	1.55 V	3	39.90	18.40
11	11490.00	46.2 AV	54.0	-7.8	1.55 V	3	27.80	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) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5460.00	65.8 PK	74.0	-8.2	1.50 H	358	59.40	6.40
2	5460.00	52.9 AV	54.0	-1.1	1.50 H	358	46.50	6.40
3	#5628.00	65.1 PK	68.2	-3.1	1.47 H	352	62.60	2.50
4	*5785.00	118.3 PK			1.47 H	352	77.80	40.50
5	*5785.00	108.5 AV			1.47 H	352	68.00	40.50
6	#5932.00	60.3 PK	68.2	-7.9	1.47 H	352	57.10	3.20
7	11570.00	60.1 PK	74.0	-13.9	1.37 H	5	41.70	18.40
8	11570.00	47.8 AV	54.0	-6.2	1.37 H	5	29.40	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	5460.00	63.8 PK	74.0	-10.2	1.86 V	350	57.40	6.40
2	5460.00	51.3 AV	54.0	-2.7	1.86 V	350	44.90	6.40
3	#5612.00	63.3 PK	68.2	-4.9	1.68 V	352	60.80	2.50
4	*5785.00	120.8 PK			1.68 V	352	80.30	40.50
5	*5785.00	109.9 AV			1.68 V	352	69.40	40.50
6	#5953.60	59.2 PK	68.2	-9.0	1.68 V	352	56.00	3.20
7	11570.00	59.9 PK	74.0	-14.1	1.34 V	353	41.50	18.40
8	11570.00	46.7 AV	54.0	-7.3	1.34 V	353	28.30	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) – 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.

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5420.00	64.2 PK	74.0	-9.8	1.65 H	357	57.90	6.30
2	5420.00	51.3 AV	54.0	-2.7	1.65 H	357	45.00	6.30
3	#5600.00	64.8 PK	68.2	-3.4	1.52 H	356	58.10	6.70
4	#5608.00	63.3 PK	68.2	-4.9	1.40 H	353	60.80	2.50
5	*5825.00	118.2 PK			1.40 H	353	77.70	40.50
6	*5825.00	108.0 AV			1.40 H	353	67.50	40.50
7	#5850.00	55.3 PK	122.2	-66.9	1.45 H	352	48.40	6.90
8	#5852.10	74.8 PK	117.4	-42.6	1.46 H	351	67.80	7.00
9	#5860.10	68.4 PK	109.4	-41.0	1.66 H	352	61.40	7.00
10	#5952.80	60.0 PK	68.2	-8.2	1.40 H	353	56.80	3.20
11	11650.00	60.5 PK	74.0	-13.5	1.42 H	9	41.60	18.90
12	11650.00	47.2 AV	54.0	-6.8	1.42 H	9	28.30	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	5420.00	65.5 PK	74.0	-8.5	1.85 V	349	59.20	6.30
2	5420.00	52.6 AV	54.0	-1.4	1.85 V	349	46.30	6.30
3	#5600.00	67.1 PK	68.2	-1.1	1.75 V	352	60.40	6.70
4	#5618.40	63.9 PK	68.2	-4.3	1.75 V	352	61.40	2.50
5	*5825.00	120.3 PK			1.75 V	352	79.80	40.50
6	*5825.00	110.0 AV			1.75 V	352	69.50	40.50
7	#5850.00	53.2 PK	122.2	-69.0	1.75 V	349	46.30	6.90
8	#5852.10	69.5 PK	117.4	-47.9	1.73 V	350	62.50	7.00
9	#5860.10	63.1 PK	109.4	-46.3	1.75 V	348	56.10	7.00
10	#5930.40	59.4 PK	68.2	-8.8	1.75 V	352	56.20	3.20
11	11650.00	60.1 PK	74.0	-13.9	1.53 V	351	41.20	18.90
12	11650.00	46.6 AV	54.0	-7.4	1.53 V	351	27.70	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) – 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 38	DETECTOR FUNCTION	Peak (PK) Average (AV)
FREQUENCY RANGE	1GHz ~ 40GHz		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	64.7 PK	74.0	-9.3	1.40 H	1	58.70	6.00
2	5150.00	52.0 AV	54.0	-2.0	1.40 H	1	46.00	6.00
3	*5190.00	110.5 PK			1.41 H	1	71.00	39.50
4	*5190.00	101.5 AV			1.41 H	1	62.00	39.50
5	#10380.00	60.9 PK	74.0	-13.1	1.86 H	6	42.40	18.50
6	#10380.00	48.0 AV	54.0	-6.0	1.86 H	6	29.50	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	65.7 PK	74.0	-8.3	2.05 V	350	59.70	6.00
2	**5150.00**	**53.0 AV**	**54.0**	**-1.0**	**2.05 V**	**350**	**47.00**	**6.00**
3	*5190.00	112.4 PK			2.09 V	352	72.90	39.50
4	*5190.00	102.5 AV			2.09 V	352	63.00	39.50
5	#10380.00	59.9 PK	74.0	-14.1	1.86 V	335	41.40	18.50
6	#10380.00	48.0 AV	54.0	-6.0	1.86 V	335	29.50	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) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5230.00	117.5 PK			1.45 H	2	77.90	39.60
2	*5230.00	107.9 AV			1.45 H	2	68.30	39.60
3	5420.00	61.6 PK	74.0	-12.4	1.49 H	359	55.30	6.30
4	5420.00	49.9 AV	54.0	-4.1	1.49 H	359	43.60	6.30
5	#10460.00	59.3 PK	74.0	-14.7	1.61 H	354	40.40	18.90
6	#10460.00	47.8 AV	54.0	-6.2	1.61 H	354	28.90	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	*5230.00	119.3 PK			2.08 V	350	79.70	39.60
2	*5230.00	109.4 AV			2.08 V	350	69.80	39.60
3	5420.00	61.7 PK	74.0	-12.3	1.88 V	349	55.40	6.30
4	5420.00	50.9 AV	54.0	-3.1	1.88 V	349	44.60	6.30
5	#10460.00	59.8 PK	74.0	-14.2	1.92 V	3	40.90	18.90
6	#10460.00	47.6 AV	54.0	-6.4	1.92 V	3	28.70	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) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5633.60	59.7 PK	68.2	-8.5	1.42 H	354	57.20	2.50
2	#5714.90	65.5 PK	109.4	-43.9	1.54 H	354	58.70	6.80
3	#5722.90	71.9 PK	117.4	-45.5	1.47 H	355	65.10	6.80
4	#5725.00	58.9 PK	122.2	-63.3	1.60 H	352	52.10	6.80
5	*5755.00	112.5 PK			1.42 H	354	72.00	40.50
6	*5755.00	102.4 AV			1.42 H	354	61.90	40.50
7	#5968.80	57.9 PK	68.2	-10.3	1.42 H	354	54.60	3.30
8	11510.00	58.8 PK	74.0	-15.2	1.31 H	6	40.50	18.30
9	11510.00	47.1 AV	54.0	-6.9	1.31 H	6	28.80	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	#5636.00	59.5 PK	68.2	-8.7	1.77 V	349	57.00	2.50
2	#5714.90	67.4 PK	109.4	-42.0	1.86 V	353	60.60	6.80
3	#5722.90	73.3 PK	117.4	-44.1	1.85 V	351	66.50	6.80
4	#5725.00	60.4 PK	122.2	-61.8	1.76 V	350	53.60	6.80
5	*5755.00	114.0 PK			1.77 V	349	73.50	40.50
6	*5755.00	103.8 AV			1.77 V	349	63.30	40.50
7	#5942.40	57.4 PK	68.2	-10.8	1.77 V	349	54.20	3.20
8	11510.00	58.4 PK	74.0	-15.6	1.63 V	0	40.10	18.30
9	11510.00	46.7 AV	54.0	-7.3	1.63 V	0	28.40	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) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5420.00	64.4 PK	74.0	-9.6	1.52 H	355	58.10	6.30
2	5420.00	52.2 AV	54.0	-1.8	1.52 H	355	45.90	6.30
3	#5647.20	64.1 PK	68.2	-4.1	1.47 H	353	61.60	2.50
4	*5795.00	116.5 PK			1.47 H	353	76.00	40.50
5	*5795.00	106.5 AV			1.47 H	353	66.00	40.50
6	#5850.00	51.7 PK	122.2	-70.5	1.46 H	350	44.80	6.90
7	#5852.10	65.1 PK	117.4	-52.3	4.00 H	350	58.10	7.00
8	#5860.10	63.1 PK	109.4	-46.3	1.38 H	350	56.10	7.00
9	#5966.40	59.2 PK	68.2	-9.0	1.47 H	353	55.90	3.30
10	11590.00	59.5 PK	74.0	-14.5	1.57 H	350	41.00	18.50
11	11590.00	48.2 AV	54.0	-5.8	1.57 H	350	29.70	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	5420.00	62.5 PK	74.0	-11.5	1.97 V	351	56.20	6.30
2	5420.00	50.2 AV	54.0	-3.8	1.97 V	351	43.90	6.30
3	#5633.60	60.6 PK	68.2	-7.6	1.69 V	352	58.10	2.50
4	*5795.00	117.8 PK			1.69 V	352	77.30	40.50
5	*5795.00	108.1 AV			1.69 V	352	67.60	40.50
6	#5850.00	50.8 PK	122.2	-71.4	1.75 V	349	43.90	6.90
7	#5852.10	65.9 PK	117.4	-51.5	1.65 V	349	58.90	7.00
8	#5860.10	63.4 PK	109.4	-46.0	1.73 V	347	56.40	7.00
9	#5950.40	57.8 PK	68.2	-10.4	1.69 V	352	54.60	3.20
10	11590.00	60.0 PK	74.0	-14.0	1.66 V	7	41.50	18.50
11	11590.00	47.3 AV	54.0	-6.7	1.66 V	7	28.80	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) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

802.11ac (VHT80)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	65.4 PK	74.0	-8.6	1.60 H	1	59.40	6.00
2	5150.00	51.0 AV	54.0	-3.0	1.60 H	1	45.00	6.00
3	*5210.00	105.4 PK			1.63 H	0	65.80	39.60
4	*5210.00	93.8 AV			1.63 H	0	54.20	39.60
5	#10420.00	59.4 PK	74.0	-14.6	1.73 H	342	40.80	18.60
6	#10420.00	48.1 AV	54.0	-5.9	1.73 H	342	29.50	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	67.7 PK	74.0	-6.3	2.02 V	355	61.70	6.00
2	5150.00	52.6 AV	54.0	-1.4	2.02 V	355	46.60	6.00
3	*5210.00	106.9 PK			2.09 V	349	67.30	39.60
4	*5210.00	95.5 AV			2.09 V	349	55.90	39.60
5	#10420.00	59.4 PK	74.0	-14.6	1.90 V	352	40.80	18.60
6	#10420.00	47.9 AV	54.0	-6.1	1.90 V	352	29.30	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) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5616.00	59.0 PK	68.2	-9.2	1.52 H	356	56.50	2.50
2	#5714.90	65.2 PK	109.4	-44.2	1.51 H	354	58.40	6.80
3	#5722.90	70.2 PK	117.4	-47.2	1.57 H	354	63.40	6.80
4	#5725.00	56.1 PK	122.2	-66.1	1.59 H	357	49.30	6.80
5	*5775.00	103.1 PK			1.52 H	356	62.60	40.50
6	*5775.00	92.3 AV			1.52 H	356	51.80	40.50
7	#5958.40	58.1 PK	68.2	-10.1	1.52 H	356	54.90	3.20
8	11550.00	58.9 PK	74.0	-15.1	1.52 H	339	40.50	18.40
9	11550.00	47.4 AV	54.0	-6.6	1.52 H	339	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	#5628.80	58.0 PK	68.2	-10.2	1.77 V	350	55.50	2.50
2	#5714.90	68.4 PK	109.4	-41.0	1.86 V	350	61.60	6.80
3	#5722.90	72.6 PK	117.4	-44.8	1.77 V	349	65.80	6.80
4	#5725.00	58.2 PK	122.2	-64.0	1.77 V	350	51.40	6.80
5	*5775.00	106.5 PK			1.77 V	350	66.00	40.50
6	*5775.00	94.5 AV			1.77 V	350	54.00	40.50
7	#5952.00	57.6 PK	68.2	-10.6	1.77 V	350	54.40	3.20
8	11550.00	58.7 PK	74.0	-15.3	1.65 V	356	40.30	18.40
9	11550.00	47.3 AV	54.0	-6.7	1.65 V	356	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) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

Below 1GHz Data: 802.11a

CHANNEL	TX Channel 36	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 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	79.25	36.0 QP	40.0	-4.0	1.72 H	30	54.70	-18.70
2	125.17	34.8 QP	43.5	-8.7	1.99 H	228	50.70	-15.90
3	284.60	36.8 QP	46.0	-9.2	1.00 H	163	49.60	-12.80
4	327.38	35.5 QP	46.0	-10.5	1.00 H	212	47.20	-11.70
5	624.85	32.9 QP	46.0	-13.1	1.99 H	211	38.30	-5.40
6	900.94	35.3 QP	46.0	-10.7	1.99 H	95	35.90	-0.60
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	39.76	33.7 QP	40.0	-6.3	1.00 V	44	48.90	-15.20
2	49.74	37.4 QP	40.0	-2.6	1.06 V	307	52.00	-14.60
3	72.42	34.1 QP	40.0	-5.9	1.14 V	4	51.20	-17.10
4	344.87	35.4 QP	46.0	-10.6	1.49 V	121	47.10	-11.70
5	624.85	35.9 QP	46.0	-10.1	1.00 V	190	41.30	-5.40
6	**900.00**	**45.0 QP**	**46.0**	**-1.0**	**1.00 V**	**197**	**45.60**	**-0.60**

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) – 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

Tested date: Aug. 06, 2015

Description & Manufacturer	Model No.	Serial No.	Date of Calibration	Due Date of Calibration
Test Receiver ROHDE & SCHWARZ	ESCI	100613	Nov. 11, 2014	Nov. 10, 2015
RF signal cable Woken	5D-FB	Cable-HYC01-01	Dec. 26, 2014	Dec. 25, 2015
LISN ROHDE & SCHWARZ (EUT)	ESH3-Z5	835239/001	Feb. 26, 2015	Feb. 25, 2016
LISN ROHDE & SCHWARZ (Peripheral)	ESH3-Z5	100311	Jul. 21, 2014	Jul. 20, 2015
			Jul. 24, 2015	Jul. 23, 2016
Software ADT	BV ADT_Cond_ V7.3.7.3	NA	NA	NA

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

4.2.3 Test Procedures

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

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

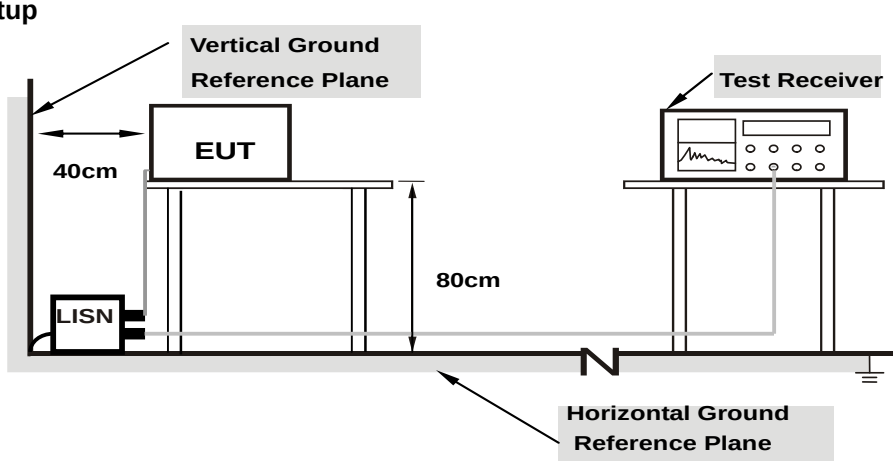
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

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

4.2.4 Deviation from Test Standard

No deviation.

4.2.5 Test Setup



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

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

4.2.6 EUT Operating Conditions

Same as 4.1.6.

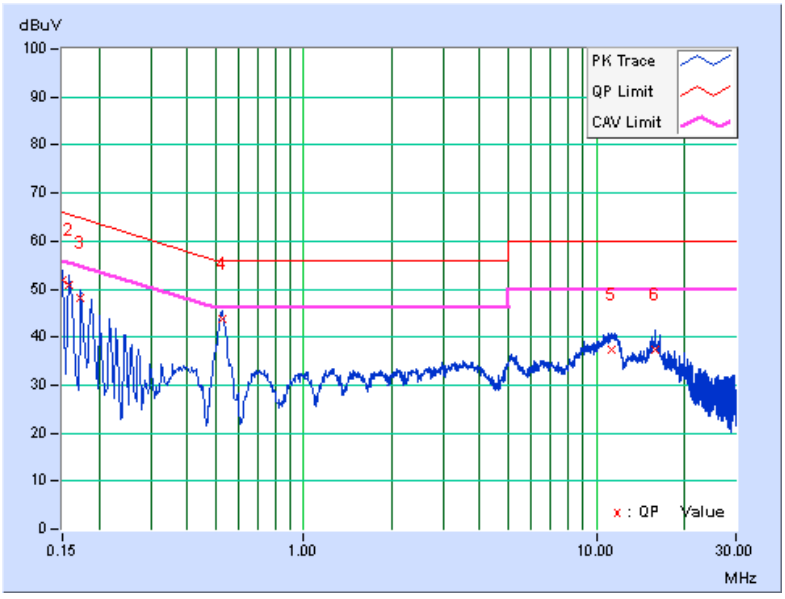
4.2.7 Test Results

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

No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	0.05	51.88	36.23	51.93	36.28	66.00	56.00	-14.07	-19.72
2	0.15782	0.05	50.96	35.04	51.01	35.09	65.58	55.58	-14.57	-20.49
3	0.17346	0.05	48.07	32.33	48.12	32.38	64.79	54.79	-16.67	-22.41
4	**0.52544**	**0.06**	**43.55**	**38.62**	**43.61**	**38.68**	**56.00**	**46.00**	**-12.39**	**-7.32**
5	11.32869	0.51	36.81	31.93	37.32	32.44	60.00	50.00	-22.68	-17.56
6	15.87602	0.71	36.56	32.33	37.27	33.04	60.00	50.00	-22.73	-16.96

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.

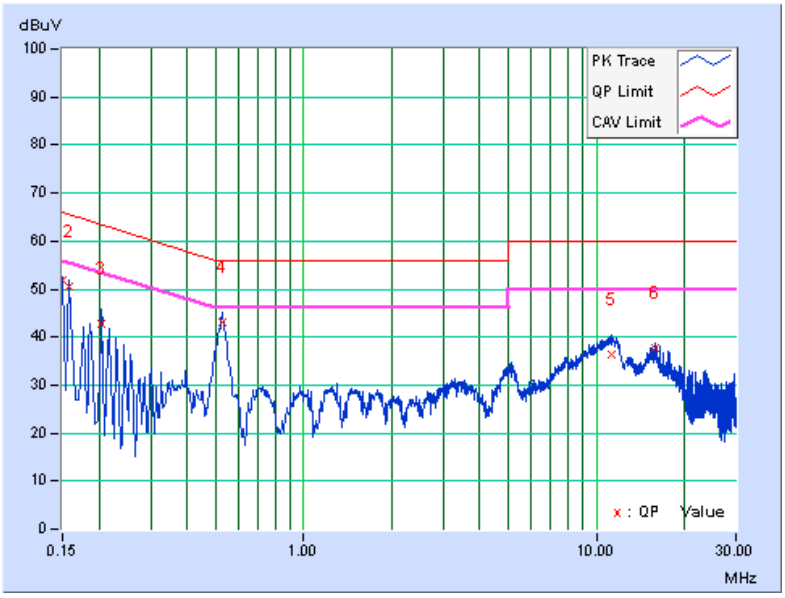


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	0.05	51.71	35.64	51.76	35.69	66.00	56.00	-14.24	-20.31
2	0.15782	0.05	50.47	34.06	50.52	34.11	65.58	55.58	-15.06	-21.47
3	0.20474	0.05	42.65	25.99	42.70	26.04	63.42	53.42	-20.72	-27.38
4	0.52544	0.06	42.94	37.99	43.00	38.05	56.00	46.00	-13.00	-7.95
5	11.21921	0.46	35.94	31.05	36.40	31.51	60.00	50.00	-23.60	-18.49
6	15.87211	0.60	37.17	33.61	37.77	34.21	60.00	50.00	-22.23	-15.79

Remarks:

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



4.3 Transmit Power Measurment

4.3.1 Limits of Transmit Power Measurement

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

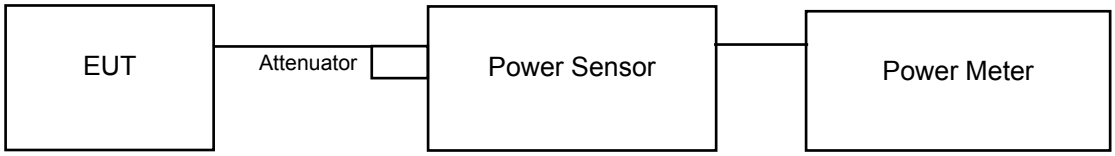
*B is the 26 dB emission bandwidth in megahertz

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

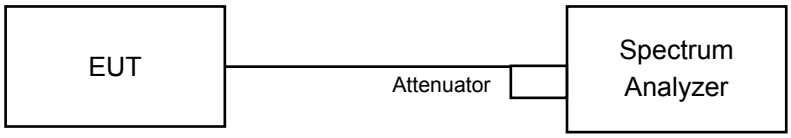
For power measurements on all other devices: Array Gain = 10 log(N_{ANT}/N_{SS}) dB.

4.3.2 Test Setup

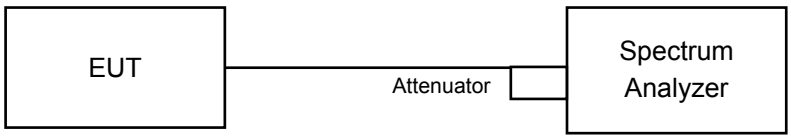
For 802.11a, 802.11n (HT20), 802.11n (HT40), 802.11ac (VHT20), 802.11ac (VHT40)



For 802.11ac (VHT80)



For 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), 802.11ac (VHT20), 802.11ac (VHT40)
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 ≥ 3 MHz
5) Number of points in sweep ≥ 2 Span / RBW.
6) Sweep time ≤ (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 26dB Bandwidth
1) Set RBW = approximately 1% of the emission bandwidth.
2) Set the VBW > RBW.
3) Detector = Peak.
4) Trace mode = max hold.
5) Measure the maximum width of the emission that is 26 dB down from the peak of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.

4.3.5 Deviation fromTest Standard

No deviation.

4.3.6 EUT Operating Conditions

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

4.3.7 Test Result

Power Output:

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				
36	5180	14.53	15.20	61.492	17.89	30	Pass
40	5200	14.72	15.13	62.232	17.94	30	Pass
48	5240	14.20	14.86	56.923	17.55	30	Pass
149	5745	14.36	14.65	56.464	17.52	30	Pass
157	5785	15.91	16.22	**80.873**	19.08	30	Pass
165	5825	15.65	16.16	78.033	18.92	30	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				
36	5180	14.55	15.18	61.471	17.89	30	Pass
40	5200	14.63	15.14	61.699	17.90	30	Pass
48	5240	14.08	14.78	55.647	17.45	30	Pass
149	5745	14.32	14.49	55.159	17.42	30	Pass
157	5785	15.77	16.10	78.495	18.95	30	Pass
165	5825	15.54	15.91	74.804	18.74	30	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				
38	5190	11.54	11.90	29.744	14.73	30	Pass
46	5230	17.64	17.88	**119.452**	20.77	30	Pass
151	5755	11.85	12.04	31.307	14.96	30	Pass
159	5795	15.71	16.30	79.897	19.03	30	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				
42	5210	7.44	7.66	11.38	10.56	30	Pass
155	5775	4.51	4.83	5.866	7.68	30	Pass

26dB Bandwidth:

802.11a

Channel	Channel Frequency (MHz)	26dBc Bandwidth (MHz)		Pass / Fail
		Chain 0	Chain 1	
36	5180	22.47	22.30	Pass
40	5200	22.27	22.28	Pass
48	5240	22.01	21.92	Pass

802.11n (HT20)

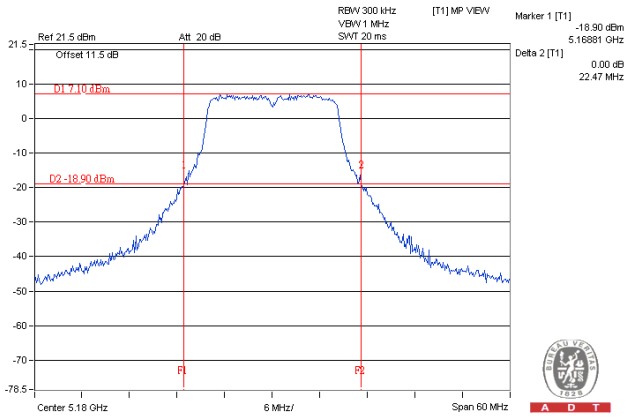
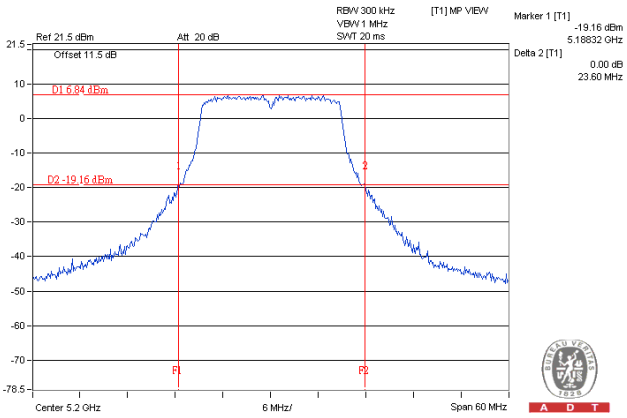
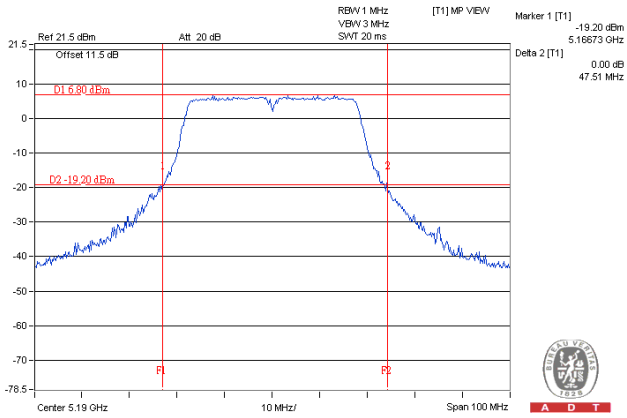
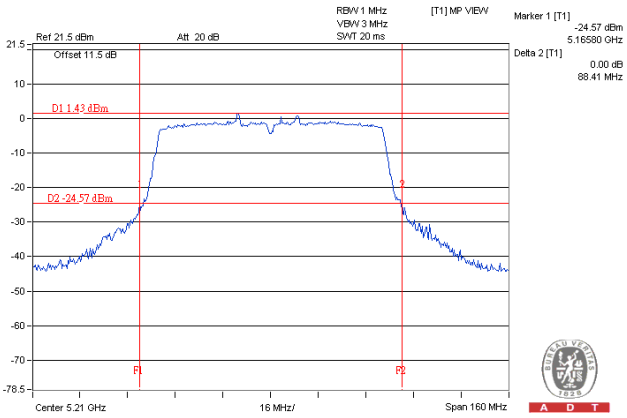
Channel	Channel Frequency (MHz)	26dBc Bandwidth (MHz)		Pass / Fail
		Chain 0	Chain 1	
36	5180	23.08	23.58	Pass
40	5200	23.60	23.07	Pass
48	5240	23.20	23.15	Pass

802.11n (HT40)

Channel	Channel Frequency (MHz)	26dBc Bandwidth (MHz)		Pass / Fail
		Chain 0	Chain 1	
38	5190	47.51	45.59	Pass
46	5230	47.42	45.67	Pass

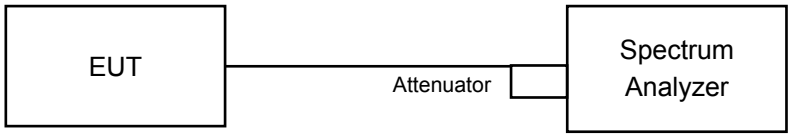
802.11ac (VHT80)

Channel	Channel Frequency (MHz)	26dBc Bandwidth (MHz)		Pass / Fail
		Chain 0	Chain 1	
42	5210	88.41	87.53	Pass

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

4.4 Occupied Bandwidth Measurement

4.4.1 Test Setup



4.4.2 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.4.3 Test Procedure

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

4.4.4 Test Result

802.11a

Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
36	5180	16.80	16.80
40	5200	16.80	16.68
48	5240	16.80	16.68
149	5745	16.87	16.70
157	5785	16.80	16.80
165	5825	16.80	16.80

802.11n (HT20)

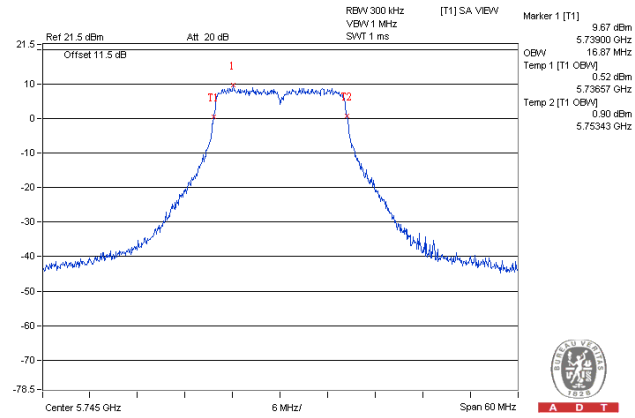
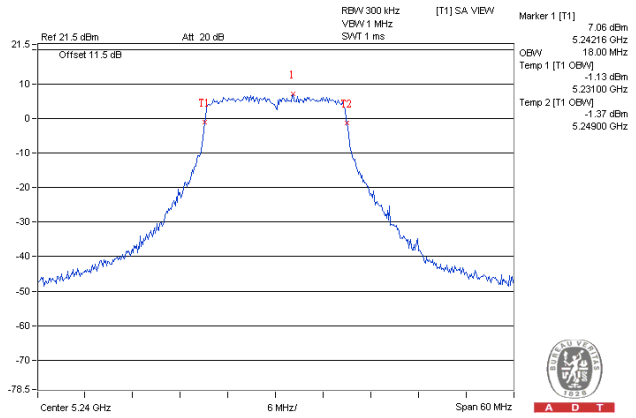
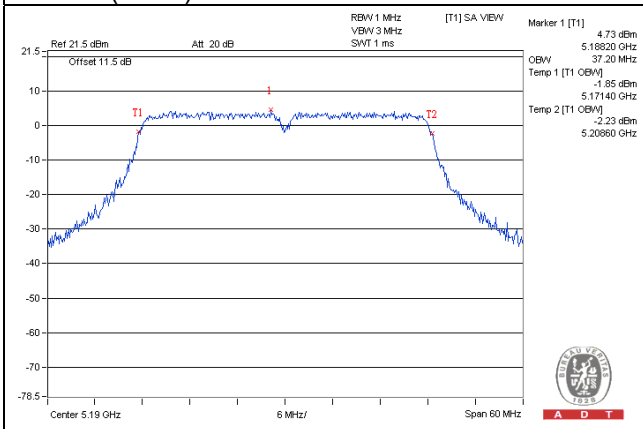
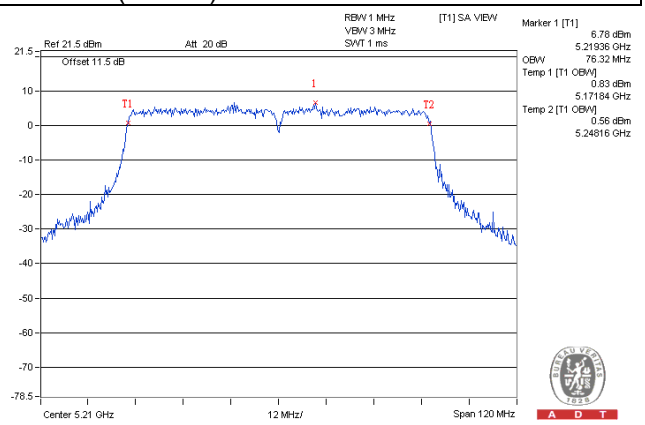
Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
36	5180	17.88	18.00
40	5200	17.88	18.00
48	5240	18.00	17.88
149	5745	18.00	17.88
157	5785	17.88	17.88
165	5825	18.00	17.88

802.11n (HT40)

Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
38	5190	37.08	37.20
46	5230	36.96	37.08
151	5755	37.08	36.96
159	5795	37.08	36.96

802.11ac (VHT80)

Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
42	5210	75.84	76.32
155	5775	76.08	76.32

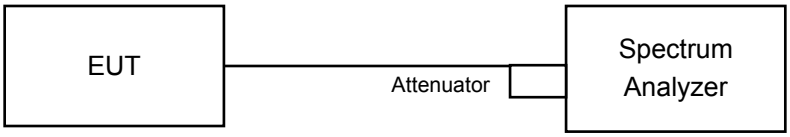
Spectrum Plot of Worst Value	
802.11a	802.11n (HT20)
	
802.11n (HT40)	802.11ac (VHT80)
	

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-1 band:

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

4.5.5 Deviation from Test Standard

No deviation.

4.5.6 EUT Operating Conditions

Same as Item 4.3.6.

4.5.7 Test Results

For U-NII-1 Band

802.11a

Chan.	Freq. (MHz)	PSD (dBm/MHz)		Total PSD w/o duty factor (dBm)	Duty factor (dB)	Total PSD with duty factor (dBm/MHz)	Max. Limit (dBm/ MHz)	Pass / Fail
		Chain 0	Chain 1					
36	5180	2.71	0.55	5.17	0.20	4.97	17	Pass
40	5200	2.82	0.64	5.27	0.20	5.07	17	Pass
48	5240	3.43	0.01	5.45	0.20	5.25	17	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 = 15.5dBi + 10log(2) = 18.51dBi < 23dBi , so the power density limit no need to reduced.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11n (HT20)

Chan.	Freq. (MHz)	PSD (dBm/MHz)		Total PSD w/o duty factor (dBm)	Duty factor (dB)	Total PSD with duty factor (dBm/MHz)	Max. Limit (dBm/ MHz)	Pass / Fail
		Chain 0	Chain 1					
36	5180	2.06	0.37	4.71	0.20	4.51	17	Pass
40	5200	2.28	0.16	4.76	0.20	4.56	17	Pass
48	5240	2.15	-0.24	4.53	0.20	4.33	17	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 = 15.5dBi + 10log(2) = 18.51dBi < 23dBi , so the power density limit no need to reduced.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11n (HT40)

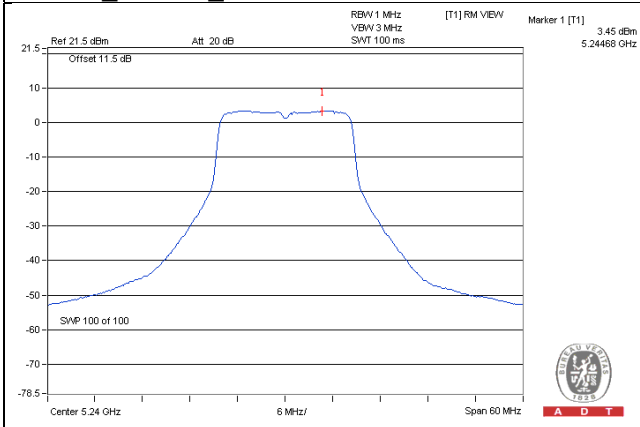
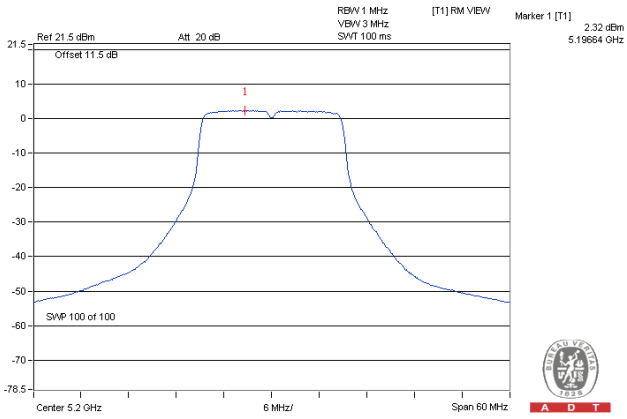
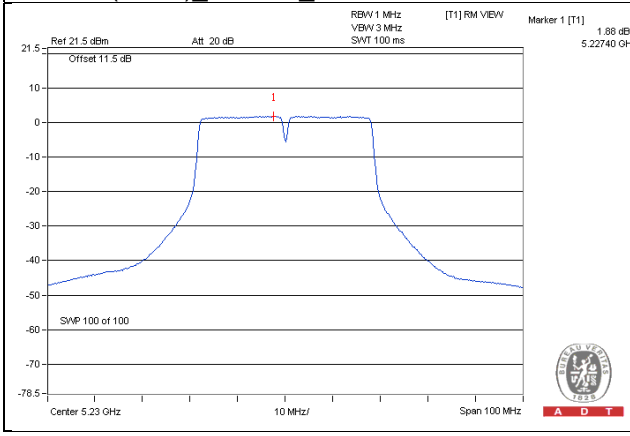
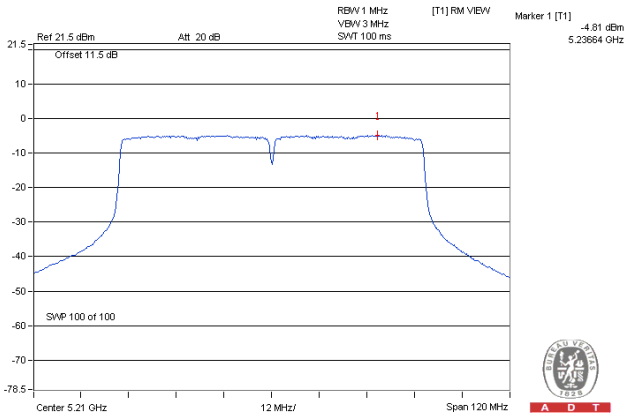
Chan.	Freq. (MHz)	PSD (dBm/MHz)		Total PSD w/o duty factor (dBm)	Duty factor (dB)	Total PSD with duty factor (dBm/MHz)	Max. Limit (dBm/ MHz)	Pass / Fail
		Chain 0	Chain 1					
38	5190	-4.14	-6.14	-0.86	0.58	-1.44	17	Pass
46	5230	1.88	-0.65	4.97	0.58	4.39	17	Pass

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 = 15.5dBi + 10log(2) = 18.51dBi < 23dBi , so the power density limit no need to reduced.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ac (VHT80)

Chan.	Freq. (MHz)	PSD (dBm/MHz)		Total PSD w/o duty factor (dBm)	Duty factor (dB)	Total PSD with duty factor (dBm/MHz)	Max. Limit (dBm/ MHz)	Pass / Fail
		Chain 0	Chain 1					
42	5210	-12.04	-4.81	-2.53	0.76	-3.29	17	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 = 15.5dBi + 10log(2) = 18.51dBi < 23dBi , so the power density limit no need to reduced.3. Refer to section 3.3 for duty cycle spectrum plot.

Spectrum Plot of Worst Value	
802.11a_Chain 0_Ch48	802.11n (HT20)_Chain 0_Ch40
	
802.11n (HT40)_Chain 0_Ch46	802.11ac (VHT80)_Chain 1_Ch42
	

For U-NII-3 Band

802.11a

TX chain	Channel	Freq. (MHz)	PSD (dBm/ 300kHz)	PSD (dBm/ 500kHz)	10 log (N=2) dB	Duty factor (dB)	Total PSD (dBm/ 500kHz)	Limit (dBm/ 500kHz)	Pass / Fail
0	149	5745	-3.47	-1.25	3.01	0.20	1.96	17.49	Pass
	157	5785	-2.19	0.03	3.01	0.20	3.24	17.49	Pass
	165	5825	-2.64	-0.42	3.01	0.20	2.79	17.49	Pass
1	149	5745	-7.03	-4.81	3.01	0.20	-1.60	17.49	Pass
	157	5785	-5.86	-3.64	3.01	0.20	-0.43	17.49	Pass
	165	5825	-7.30	-5.08	3.01	0.20	-1.87	17.49	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 = 15.5dBi + 10log(2) = 18.51 > 6dBi, so the power density limit shall be reduced to 30-(18.51-6) = 17.49dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11n (HT20)

TX chain	Channel	Freq. (MHz)	PSD (dBm/ 300kHz)	PSD (dBm/ 500kHz)	10 log (N=2) dB	Duty factor (dB)	Total PSD (dBm/ 500kHz)	Limit (dBm/ 500kHz)	Pass / Fail
0	149	5745	-3.99	-1.77	3.01	0.20	1.44	17.49	Pass
	157	5785	-2.70	-0.48	3.01	0.20	2.73	17.49	Pass
	165	5825	-2.85	-0.63	3.01	0.20	2.58	17.49	Pass
1	149	5745	-7.27	-5.05	3.01	0.20	-1.84	17.49	Pass
	157	5785	-6.65	-4.43	3.01	0.20	-1.22	17.49	Pass
	165	5825	-7.70	-5.48	3.01	0.20	-2.27	17.49	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 = 15.5dBi + 10log(2) = 18.51 > 6dBi, so the power density limit shall be reduced to 30-(18.51-6) = 17.49dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11n (HT40)

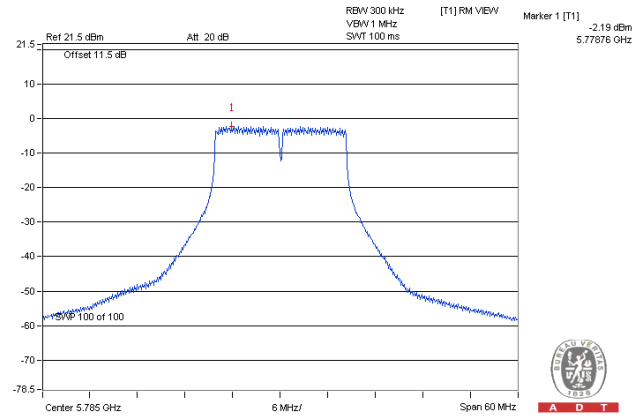
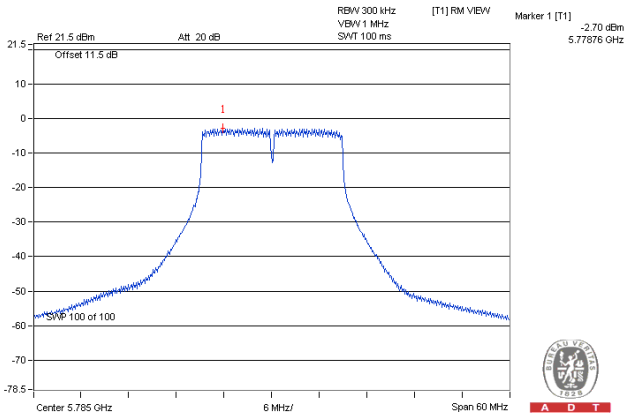
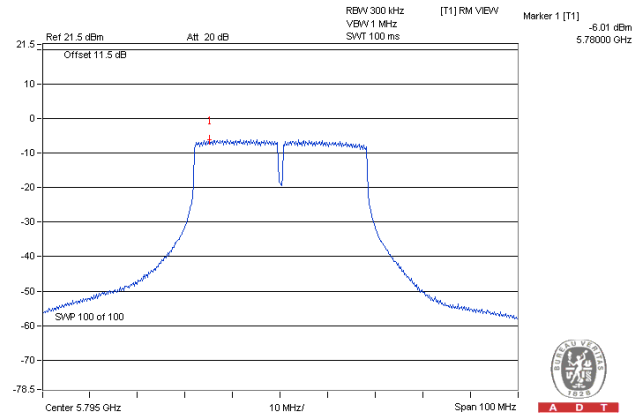
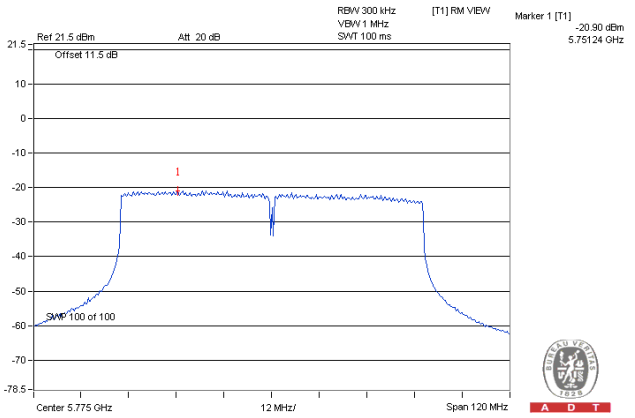
TX chain	Channel	Freq. (MHz)	PSD (dBm/ 300kHz)	PSD (dBm/ 500kHz)	10 log (N=2) dB	Duty factor (dB)	Total PSD (dBm/ 500kHz)	Limit (dBm/ 500kHz)	Pass / Fail
0	151	5755	-9.83	-7.61	3.01	0.58	-4.02	17.49	Pass
	159	5795	-6.01	-3.79	3.01	0.58	-0.20	17.49	Pass
1	151	5755	-13.36	-11.14	3.01	0.58	-7.55	17.49	Pass
	159	5795	-9.90	-7.68	3.01	0.58	-4.09	17.49	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 = 15.5dBi + 10log(2) = 18.51 > 6dBi, so the power density limit shall be reduced to 30-(18.51-6) = 17.49dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ac (VHT80)

TX chain	Channel	Freq. (MHz)	PSD (dBm/ 300kHz)	PSD (dBm/ 500kHz)	10 log (N=2) dB	Duty factor (dB)	Total PSD (dBm/ 500kHz)	Limit (dBm/ 500kHz)	Pass / Fail
0	155	5775	-20.90	-18.68	3.01	0.76	-14.91	17.49	Pass
1	155	5775	-23.66	-21.44	3.01	0.76	-17.67	17.49	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 = 15.5dBi + 10log(2) = 18.51 > 6dBi, so the power density limit shall be reduced to 30-(18.51-6) = 17.49dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

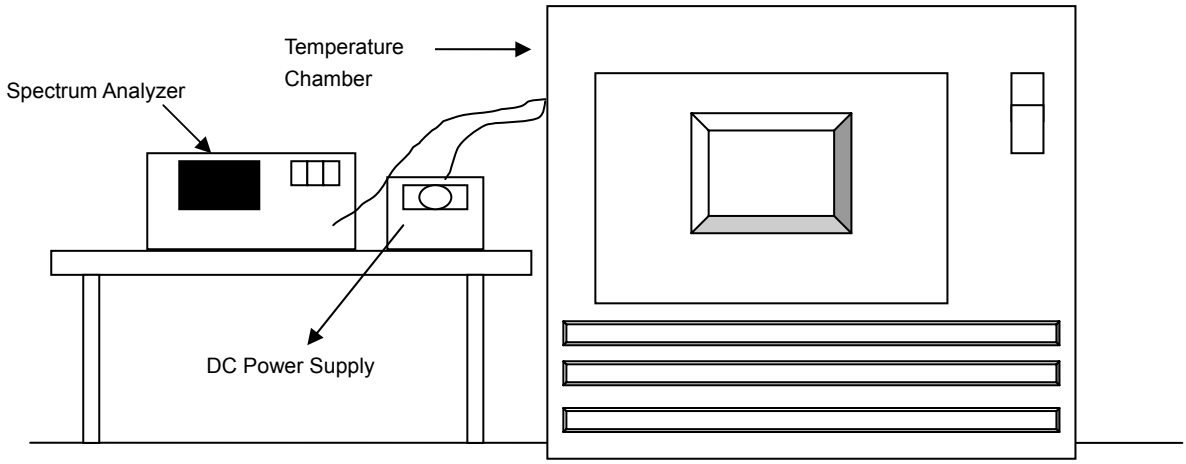
Spectrum Plot of Worst Value	
802.11a	802.11n (HT20)
	
802.11n (HT40)	802.11ac (VHT80)
	

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 DC 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

Frequemcy Stability Versus Temp.									
Operating Frequency: 5180MHz									
Temp. (℃)	Power Supply (Vdc)	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	54	5180.0174	0.00034	5180.0166	0.00032	5180.0167	0.00032	5180.0167	0.00032
40	54	5179.9771	-0.00044	5179.9773	-0.00044	5179.9779	-0.00043	5179.9775	-0.00043
30	54	5180.0222	0.00043	5180.0196	0.00038	5180.0196	0.00038	5180.0185	0.00036
20	54	5180.0173	0.00033	5180.0188	0.00036	5180.0188	0.00036	5180.0178	0.00034
10	54	5179.9987	-0.00003	5179.9991	-0.00002	5179.9983	-0.00003	5179.9977	-0.00004
0	54	5179.9945	-0.00011	5179.9925	-0.00014	5179.9915	-0.00016	5179.9948	-0.00010
-10	54	5180.0228	0.00044	5180.0217	0.00042	5180.0191	0.00037	5180.0195	0.00038
-20	54	5180.014	0.00027	5180.0118	0.00023	5180.016	0.00031	5180.0126	0.00024

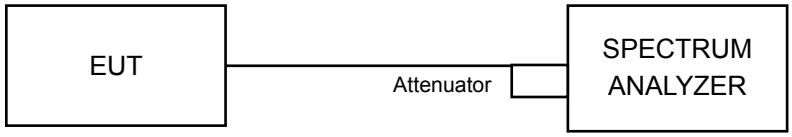
Frequemcy Stability Versus Temp.									
Operating Frequency: 5180MHz									
Temp. (℃)	Power Supply (Vdc)	0 Minute		2 Minute		5 Minute		10 Minute	
		Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)
20	62.1	5180.0169	0.00033	5180.0184	0.00036	5180.0188	0.00036	5180.018	0.00035
	54	5180.0173	0.00033	5180.0188	0.00036	5180.0188	0.00036	5180.0178	0.00034
	45.9	5180.0163	0.00031	5180.0197	0.00038	5180.0193	0.00037	5180.017	0.00033

4.7 6dB Bandwidth Measurment

4.7.1 Limits of 6dB Bandwidth Measurement

The minimum of 6dB Bandwidth Measurement is 0.5MHz.

4.7.2 Test Setup



4.7.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.7.4 Test Procedure

Measurement Procedure REF

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

4.7.5 Deviation from Test Standard

No deviation.

4.7.6 EUT Operating Condition

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

4.7.7 Test Results

802.11a

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
149	5745	16.41	16.42	0.5	Pass
157	5785	16.43	16.45	0.5	Pass
165	5825	16.43	16.44	0.5	Pass

802.11n (HT20)

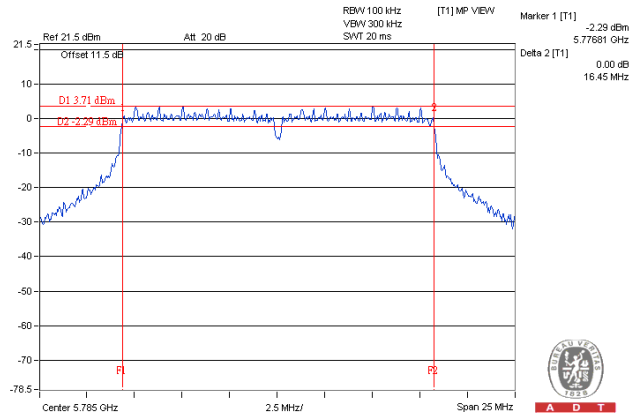
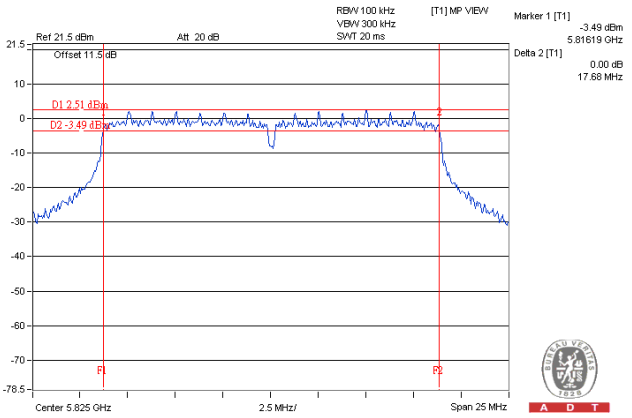
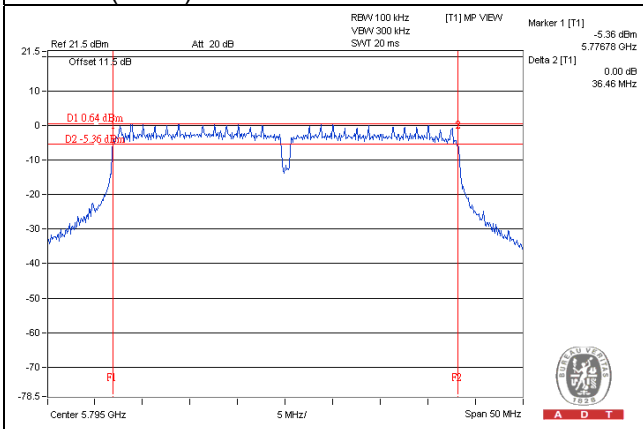
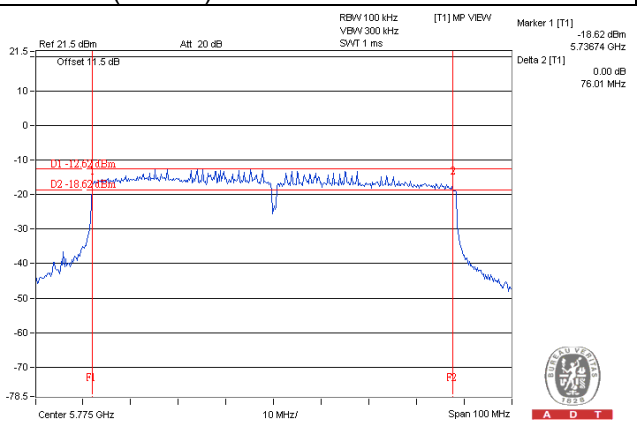
Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
149	5745	17.65	17.65	0.5	Pass
157	5785	17.66	17.66	0.5	Pass
165	5825	17.66	17.68	0.5	Pass

802.11n (HT40)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
151	5755	36.45	36.45	0.5	Pass
159	5795	36.44	36.46	0.5	Pass

802.11ac (VHT80)

Channel	Frequency (MHz)	6dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
155	5775	75.89	76.01	0.5	Pass

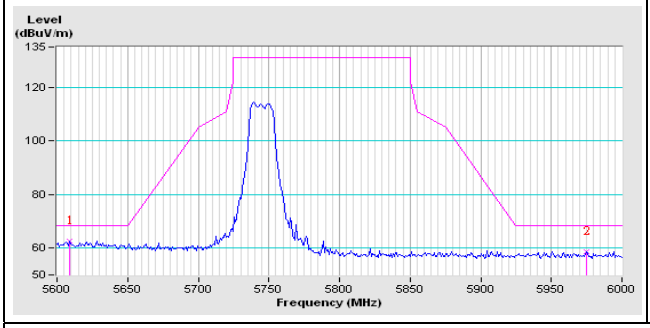
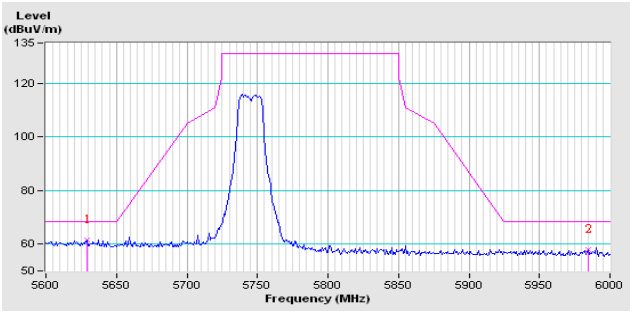
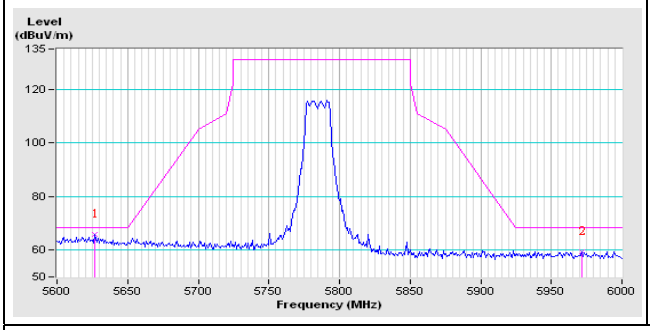
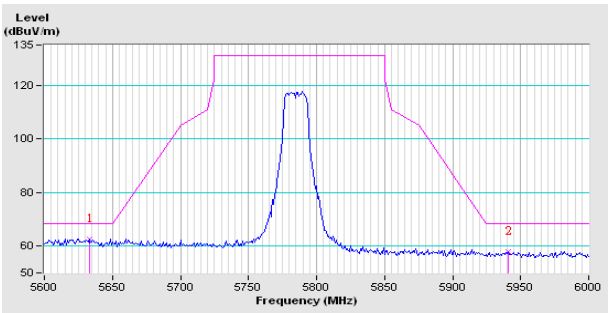
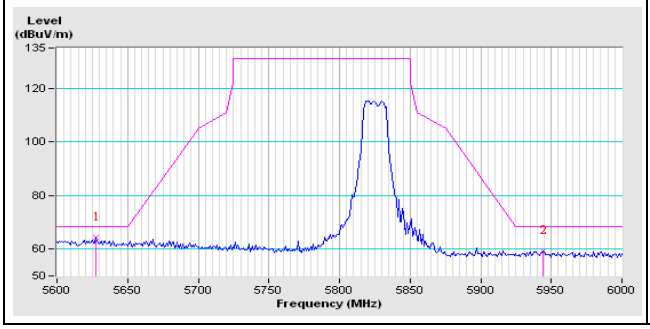
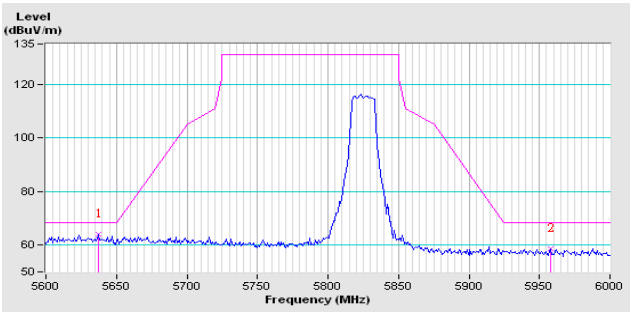
Spectrum Plot of Worst Value	
802.11a	802.11n (HT20)
	
802.11n (HT40)	802.11ac (VHT80)
	

5 Pictures of Test Arrangements

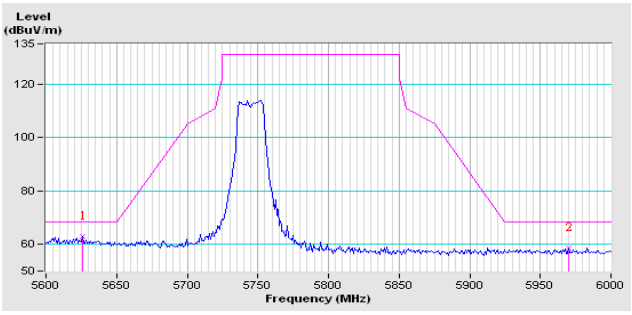
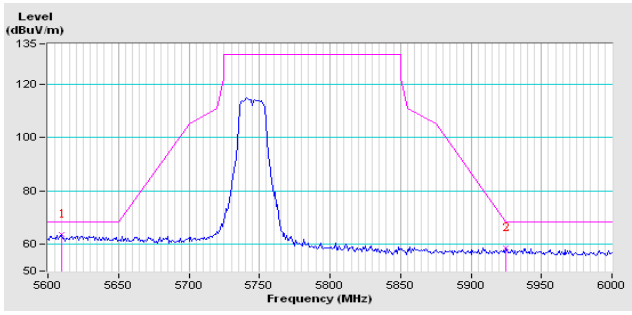
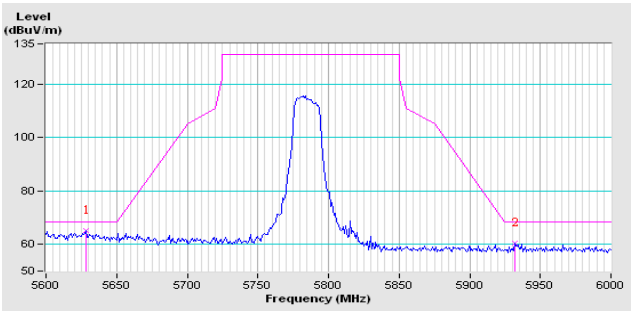
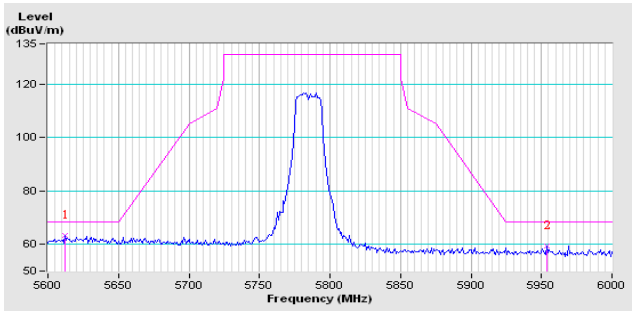
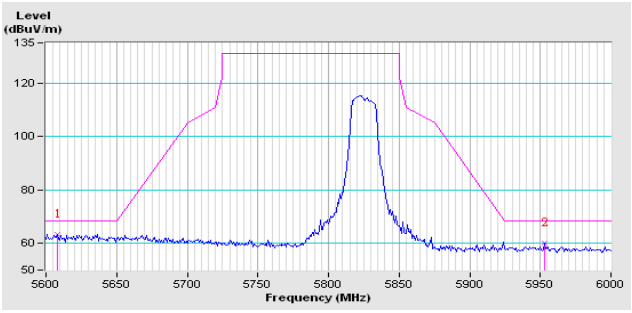
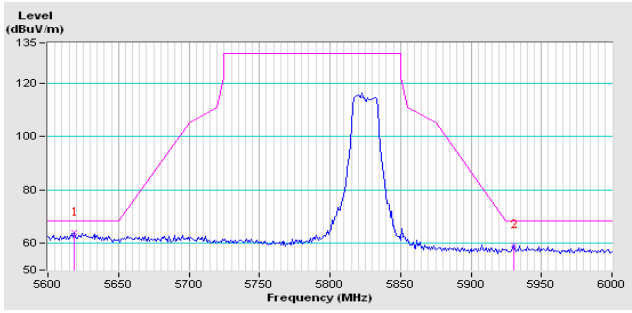
Please refer to the attached file (Test Setup Photo).

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

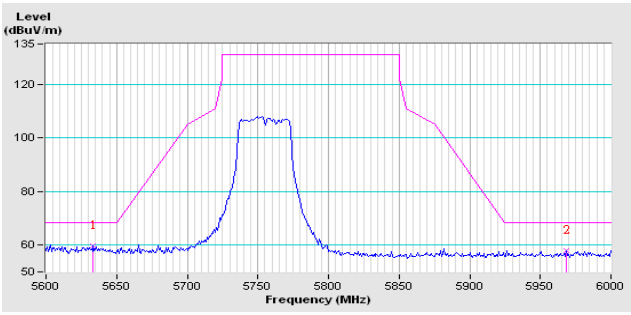
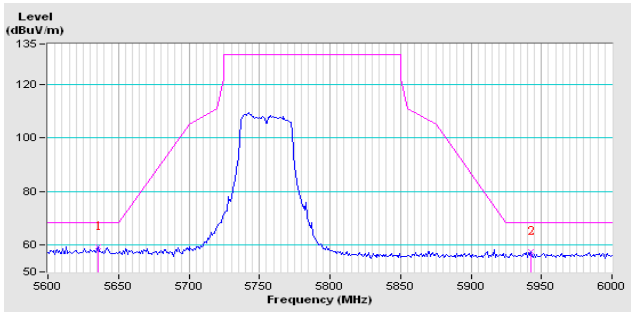
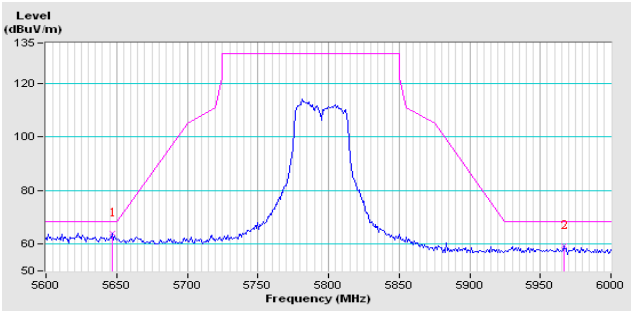
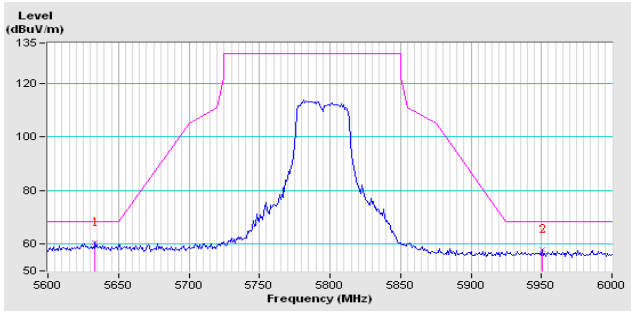
802.11a

CH149	
Horizontal	Vertical
	
CH157	
Horizontal	Vertical
	
CH165	
Horizontal	Vertical
	

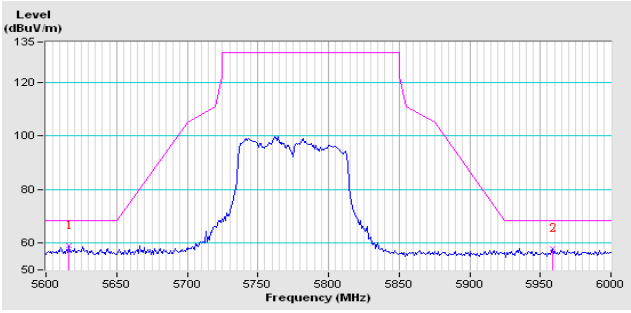
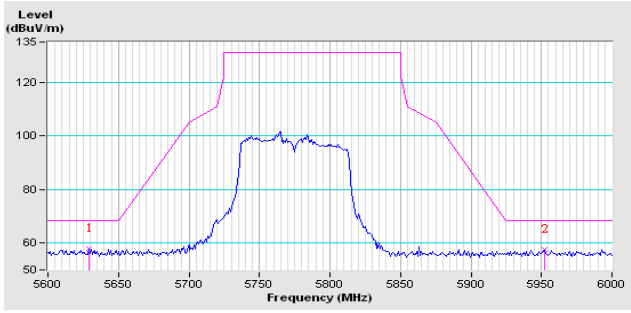
802.11n (HT20)

CH149	
Horizontal	Vertical
	
CH157	
Horizontal	Vertical
	
CH165	
Horizontal	Vertical
	

802.11n (HT40)

CH151	
Horizontal	Vertical
	
CH159	
Horizontal	Vertical
	

802.11ac (VHT80)

CH155	
Horizontal	Vertical
	

Appendix – Information on the Testing Laboratories

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

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Web Site: www.bureauveritas-adt.com

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

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