FCC Test Report

Report No.:	RF150513C20A
FCC ID:	E2K-APL290B7
Test Model:	APL29-0B7
Received Date:	May 13, 2015
Test Date:	May 28 ~ Jun. 03, 2015
Issued Date:	Jun. 23, 2015
Applicant:	Dell Inc.
Address:	One Dell Way, Round Rock, Texas 78682, USA
Issued By:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
Lab Address:	No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan, R.O.C.
Test Location:	No. 19, Hwa Ya 2nd Rd., Wen Hwa Vil., Kwei Shan Dist., Taoyuan City 33383, TAIWAN (R.O.C.)

Table of Contents

Release Control Record

Issue No.	Description	Date Issued
RF150513C20A	Original release.	Jun. 23, 2015

1 Certificate of Conformity

Product:	Wireless Network Security Appliance
Brand:	DELL, DELL SONICWALL, SONICWALL (Refer to item 3.1 for more details)
Test Model:	APL29-0B7
Sample Status:	Engineering sample
Applicant:	Dell Inc.
Test Date:	May 28 ~ Jun. 03, 2015
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:** Jun. 23, 2015

Polly Chien / Specialist

Approved by : _____ , **Date:** Jun. 23, 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
15.207 15.407(b)(6)	AC Power Conducted Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -15.63dB at 0.42782MHz.
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 5725.00MHz.
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(g)	Frequency Stability	Pass	Meet the requirement of limit.
15.203	Antenna Requirement	Pass	Antenna connector is R-TNC & R-SMA 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	Expended Uncertainty (k=2) (±)
Conducted Emissions at mains ports	150kHz ~ 30MHz	2.44 dB
Radiated Emissions up to 1 GHz	30MHz ~ 200MHz	3.86 dB
	200MHz ~1000MHz	3.87 dB
Radiated Emissions above 1 GHz	1GHz ~ 18GHz	2.29 dB
	18GHz ~ 40GHz	2.29 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	Wireless Network Security Appliance
Brand	DELL, DELL SONICWALL, SONICWALL (Refer to note for more details)
Test Model	APL29-0B7
Status of EUT	Engineering sample
Power Supply Rating	12Vdc (Adapter)
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 1300Mbps
Operating Frequency	5260 ~ 5320MHz, 5500 ~ 5700MHz
Number of Channel	5260 ~ 5320MHz: 4 for 802.11a, 802.11n (HT20) , 802.11ac (VHT20) 2 for 802.11n (HT40), 802.11ac (VHT40) 1 for 802.11ac (VHT80) 5500 ~ 5700MHz: 8 for 802.11a, 802.11n (HT20), 802.11ac (VHT20) 3 for 802.11n (HT40), 802.11ac (VHT40) 1 for 802.11ac (VHT80)
Output Power	5260 ~ 5320MHz: 227.780mW 5500 ~ 5700MHz: 156.143mW
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	Adapter
Data Cable Supplied	1.8m non-shielded RJ45 cable without core

Note:

1. This report is prepared for FCC class II permissive change.
2. This report is issued as a supplementary report of BV ADT report no.: RF150513C20. The difference compared with the original report is adding 5.26GHz to 5.32GHz and 5.50GHz to 5.70GHz by software.
3. The following brands are for marketing purpose.

Brand	Model	Difference
SONICWALL DELL SONICWALL DELL	APL29-0B7	For marketing purpose.

4. 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)	3TX
802.11n (HT40)	3TX
802.11ac (VHT20)	3TX
802.11ac (VHT40)	3TX
802.11ac (VHT80)	3TX

* 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)

5. The following antennas were provided to the EUT.

No.	Type	Gain(dBi)		Connector
		2.4GHz Band	5GHz Band	
1	DIPOLE	2.5	2.5	R-TNC
2	DIPOLE	2.5	2.5	R-TNC
3	DIPOLE	3	3	R-SMA

6. The EUT consumes power from the following adapters.

Adapter 1	
Brand	AMIGO
Model	AMS118-1203000F2
Input Power	100-240Vac, 50/60Hz, 1.0A Max
Output Power	12Vdc, 3.0A
Power Line	AC 1.75m non-shielded power line without core DC 1.5m power cable with 1 core attached on adapter

Adapter 2	
Brand	Sunny COMPUTER TECHNOLOGY CO., LTD.
Model	SYS1546-3612-T3
Input Power	100-240Vac, 50-60Hz, 1.5A Max
Output Power	12Vdc, 3.0A, 36W MAX
Power Line	AC 1.75m non-shielded power line without core DC 1.85m power cable with 1 core attached on adapter

*After pre-tested two of adapters found adapter 1 was the worst case, therefore chosen for final tests and presented in the test report.

7. The EUT has disabled the 5600-5650MHz band by S/W to avoid 5600-5650MHz.

3.2 Description of Test Modes

FOR 5260 ~ 5320MHz

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

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

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

Channel	Frequency	Channel	Frequency
54	5270 MHz	62	5310 MHz

1 channel is provided for 802.11ac (VHT80):

Channel	Frequency
58	5290 MHz

FOR 5500 ~ 5700MHz

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

Channel	Frequency	Channel	Frequency
100	5500 MHz	116	5580 MHz
104	5520 MHz	132	5660 MHz
108	5540 MHz	136	5680 MHz
112	5560 MHz	140	5700 MHz

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

Channel	Frequency	Channel	Frequency
102	5510 MHz	134	5670 MHz
110	5550 MHz		

1 channel is provided for 802.11ac (VHT80):

Channel	Frequency
106	5530MHz

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 **X-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	5260-5320	52 to 64	52, 60, 64	OFDM	BPSK	6.0
-	802.11n (HT20)		52 to 64	52, 60, 64	OFDM	BPSK	7.2
-	802.11n (HT40)		54 to 62	54, 62	OFDM	BPSK	15.0
-	802.11ac (VHT80)		58	58	OFDM	BPSK	97.5
-	802.11a	5500-5700	100 to 140	100, 116, 140	OFDM	BPSK	6.0
-	802.11n (HT20)		100 to 140	100, 116, 140	OFDM	BPSK	7.2
-	802.11n (HT40)		102 to 134	102, 110, 134	OFDM	BPSK	15.0
-	802.11ac (VHT80)		106	106	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)
-	802.11a	5260-5320	52 to 64	52	OFDM	BPSK	6.0
		5500-5700	100 to 140		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	5260-5320	52 to 64	52	OFDM	BPSK	6.0
		5500-5700	100 to 140		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	5260-5320	52 to 64	52, 60, 64	OFDM	BPSK	6.0
-	802.11n (HT20)		52 to 64	52, 60, 64	OFDM	BPSK	7.2
-	802.11n (HT40)		54 to 62	54, 62	OFDM	BPSK	15.0
-	802.11ac (VHT80)		58	58	OFDM	BPSK	97.5
-	802.11a	5500-5700	100 to 140	100, 116, 140	OFDM	BPSK	6.0
-	802.11n (HT20)		100 to 140	100, 116, 140	OFDM	BPSK	7.2
-	802.11n (HT40)		102 to 134	102, 110, 134	OFDM	BPSK	15.0
-	802.11ac (VHT80)		106	106	OFDM	BPSK	97.5

Test Condition:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RE≥1G	22deg. C, 67%RH	120Vac, 60Hz	Nick Hsu
RE<1G	22deg. C, 67%RH	120Vac, 60Hz	Jones Chang
PLC	20deg. C, 70%RH	120Vac, 60Hz	Jones Chang
APCM	25deg. C, 60%RH	120Vac, 60Hz	Frank Liu

3.3 Duty Cycle of Test Signal

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

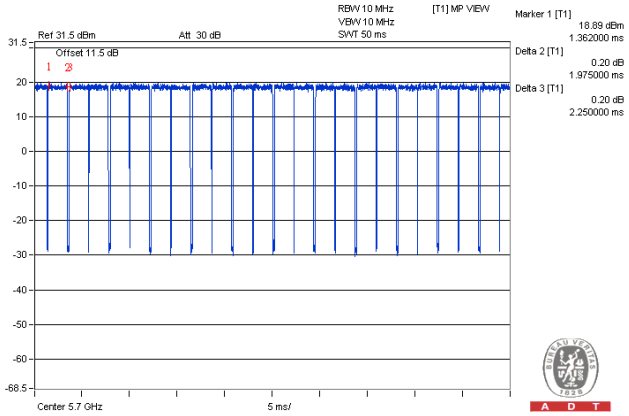
802.11a: Duty cycle = 1.975/2.250 = 0.878, Duty factor = 10 * log(1/0.878) = 0.57

802.11n (HT20): Duty cycle = 1.837/2.037 = 0.902, Duty factor = 10 * log(1/0.902) = 0.45

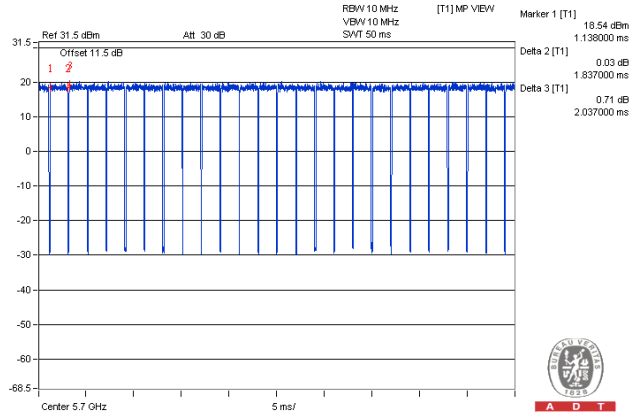
802.11n (HT40): Duty cycle = 0.862/0.987 = 0.873, Duty factor = 10 * log(1/0.873) = 0.59

802.11ac (VHT80): Duty cycle = 0.438/0.588 = 0.745, Duty factor = 10 * log(1/0.745) = 1.28

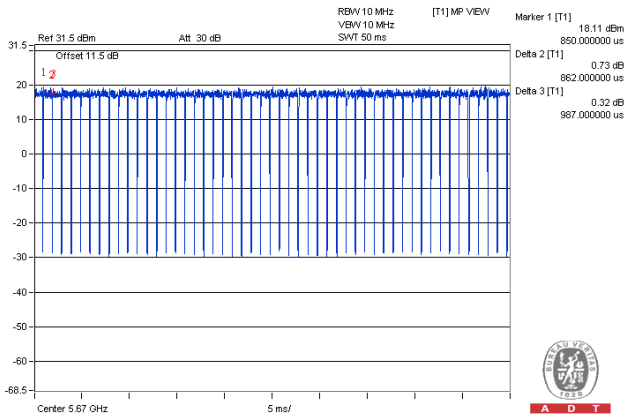
802.11a



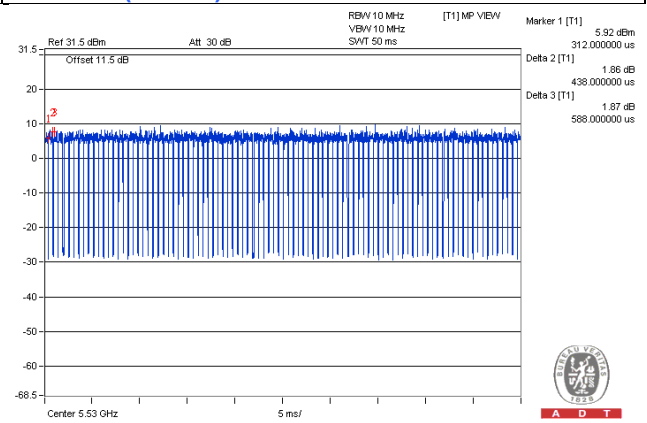
802.11n (HT20)



802.11n (HT40)



802.11ac (VHT80)



3.4 Description of Support Units

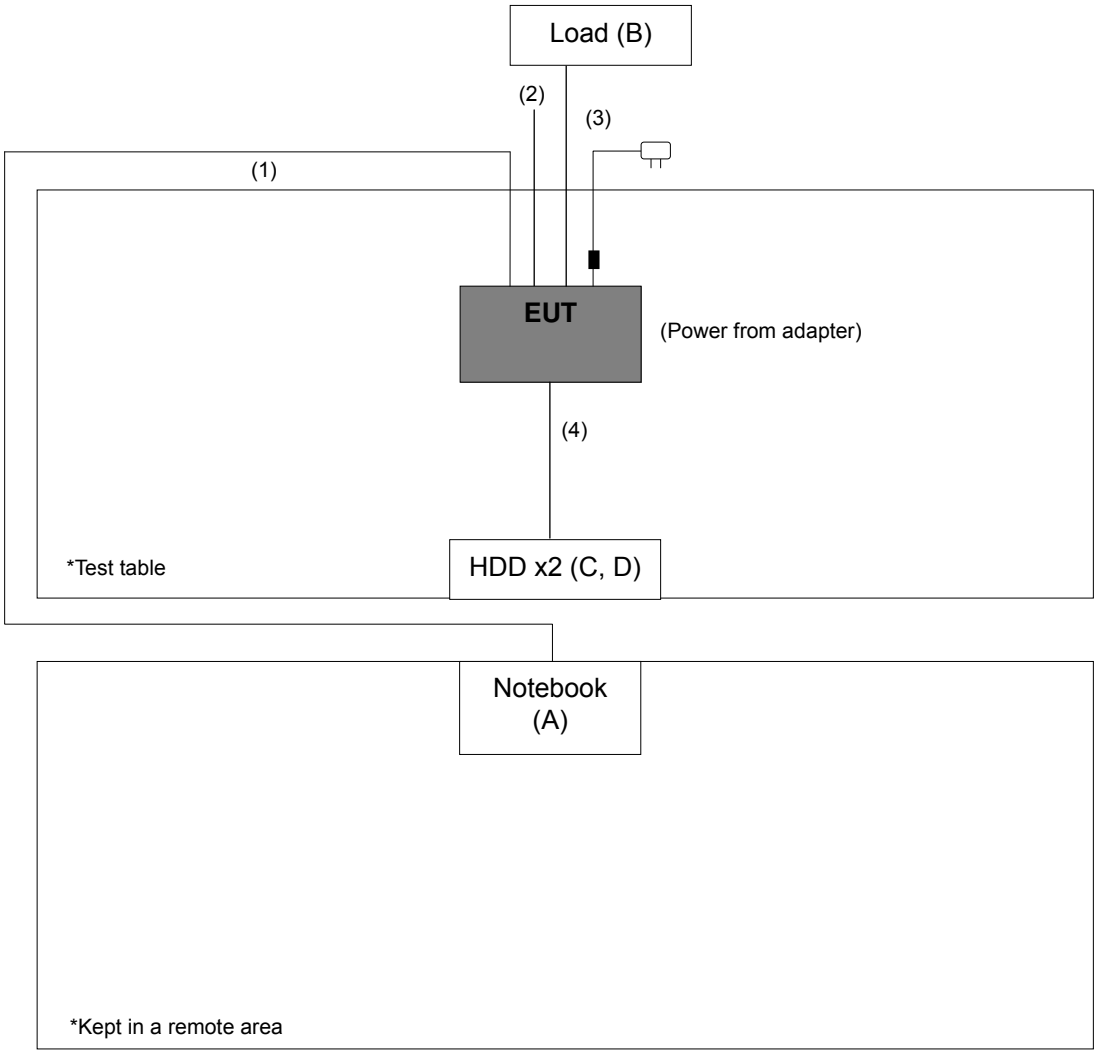
The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

No.	Product	Brand	Model No.	Serial No.	FCC ID
A	Notebook	DELL	E5410	1HC2XM1	FCC DoC Approved
B	Load	NA	NA	NA	NA
C	USB 3.0 HDD	TOSHIBA	V63700-B	53E2CFNUTSX4	NA
D	USB 3.0 HDD	TOSHIBA	V63700-B	633APITLTSX4	NA

No.	Signal Cable Description Of The Above Support Units
1	3m RJ45 cable.
2	1.5m non-shielded console cable w/o core
3	1.8m RJ45 cable x8.
4	0.5m USB cable w/o core x2

Note:
1. All power cords of the above support units are non-shielded (1.8 m).
2. Item A acted as a communication partner to transfer data.
3. The console cable was provided by the client.

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)

789033 D02 General UNII Test Procedures New Rules v01r01

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. Other emissions shall be at least 20dB below the highest level of the desired power:

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

APPLICABLE TO	LIMIT	
789033 D02 General UNII Test Procedures New Rules v01r01	FIELD STRENGTH AT 3m	
	PK:74 (dBμV/m)	AV:54 (dBμV/m)
APPLICABLE TO	EIRP LIMIT	EQUIVALENT FIELD STRENGTH AT 3m
15.407(b)(1)	PK:-27 (dBm/MHz)	PK:68.2(dBμV/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(dBμV/m) [*1] PK:78.2 (dBμV/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:

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

4.1.2 Test Instruments

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
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
High Speed Power Meter	ML2495A	0824011	Jul. 26, 2014	Jul. 25, 2015
Power Sensor	MA2411B	0738171	Jul. 26, 2014	Jul. 25, 2015
26GHz ~ 40GHz Amplifier	EM26400	815221	Oct. 18, 2014	Oct. 17, 2015
WIT Standard Temperature And Humidity Chamber	TH-4S-C	W981030	Jun. 09, 2014	Jun. 08, 2015

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 Procedures

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:

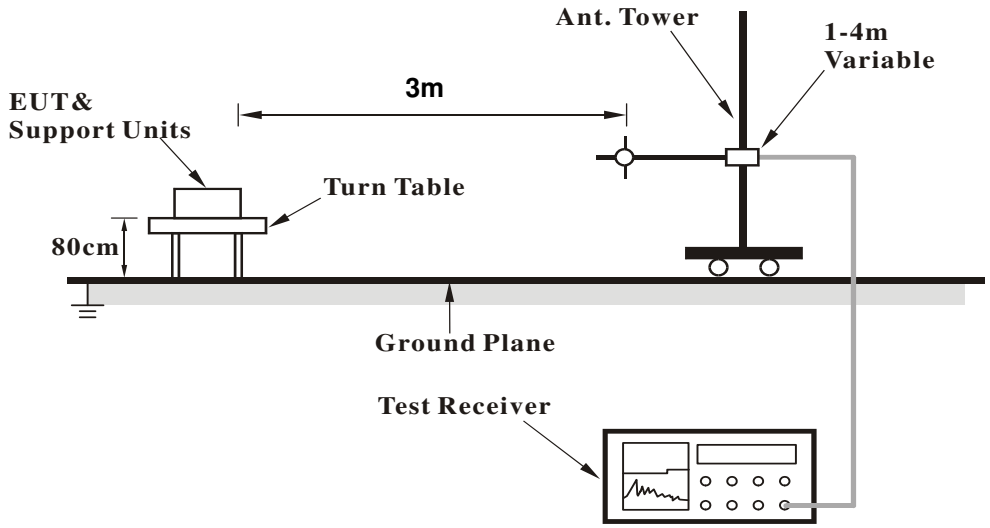
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
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/duty cycle)).
4. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 10Hz (Duty cycle ≥ 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

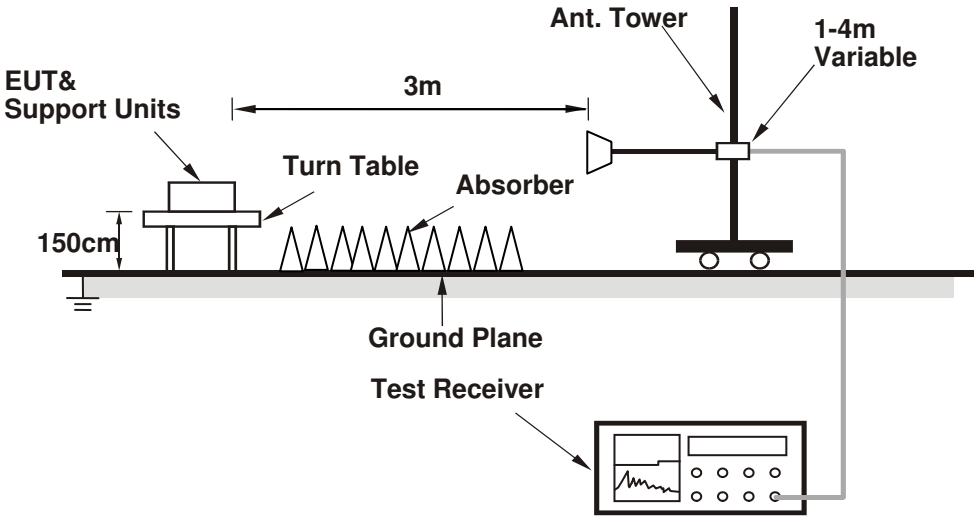
No deviation.

4.1.5 Test Set Up

<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

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

4.1.7 Test Results

Above 1GHz Data

802.11a

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	57.4 PK	74.0	-16.6	1.16 H	184	51.40	6.00
2	5150.00	44.5 AV	54.0	-9.5	1.16 H	184	38.50	6.00
3	*5260.00	106.1 PK			2.01 H	339	66.40	39.70
4	*5260.00	95.8 AV			2.01 H	339	56.10	39.70
5	#10520.00	61.1 PK	74.0	-12.9	1.00 H	150	41.90	19.20
6	#10520.00	48.7 AV	54.0	-5.3	1.00 H	150	29.50	19.20
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	63.6 PK	74.0	-10.4	2.24 V	355	57.60	6.00
2	5150.00	50.9 AV	54.0	-3.1	2.24 V	355	44.90	6.00
3	*5260.00	120.1 PK			2.27 V	210	80.40	39.70
4	*5260.00	109.2 AV			2.27 V	210	69.50	39.70
5	#10520.00	64.1 PK	74.0	-9.9	1.25 V	166	44.90	19.20
6	#10520.00	52.4 AV	54.0	-1.6	1.25 V	166	33.20	19.20

Remark:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5300.00	104.4 PK			1.00 H	244	64.70	39.70
2	*5300.00	95.3 AV			1.00 H	244	55.60	39.70
3	10600.00	60.8 PK	74.0	-13.2	1.02 H	217	41.70	19.10
4	10600.00	47.9 AV	54.0	-6.1	1.02 H	217	28.80	19.10
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	*5300.00	119.0 PK			1.89 V	169	79.30	39.70
2	*5300.00	108.4 AV			1.89 V	169	68.70	39.70
3	10600.00	64.0 PK	74.0	-10.0	1.07 V	170	44.90	19.10
4	10600.00	51.3 AV	54.0	-2.7	1.07 V	170	32.20	19.10

Remark:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5320.00	106.0 PK			1.62 H	340	66.30	39.70
2	*5320.00	95.7 AV			1.62 H	340	56.00	39.70
3	5350.00	57.2 PK	74.0	-16.8	1.19 H	96	51.10	6.10
4	5350.00	44.8 AV	54.0	-9.2	1.19 H	96	38.70	6.10
5	10640.00	59.6 PK	74.0	-14.4	1.33 H	187	40.70	18.90
6	10640.00	46.0 AV	54.0	-8.0	1.33 H	187	27.10	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	*5320.00	117.0 PK			2.22 V	139	77.30	39.70
2	*5320.00	107.0 AV			2.22 V	139	67.30	39.70
3	5350.00	65.5 PK	74.0	-8.5	1.90 V	203	59.40	6.10
4	5350.00	52.2 AV	54.0	-1.8	1.90 V	203	46.10	6.10
5	10640.00	58.9 PK	74.0	-15.1	1.48 V	219	40.00	18.90
6	10640.00	46.9 AV	54.0	-7.1	1.48 V	219	28.00	18.90

Remark:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5280.00	56.7 PK	68.2	-11.5	1.36 H	258	50.60	6.10
2	5360.00	57.4 PK	74.0	-16.6	1.36 H	263	51.30	6.10
3	5360.00	44.2 AV	54.0	-9.8	1.36 H	263	38.10	6.10
4	#5470.00	57.9 PK	74.0	-16.1	1.13 H	29	51.50	6.40
5	#5470.00	45.1 AV	54.0	-8.9	1.13 H	29	38.70	6.40
6	*5500.00	103.1 PK			1.00 H	137	63.10	40.00
7	*5500.00	94.3 AV			1.00 H	137	54.30	40.00
8	11000.00	59.2 PK	74.0	-14.8	1.24 H	251	39.60	19.60
9	11000.00	46.3 AV	54.0	-7.7	1.24 H	251	26.70	19.60
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	#5280.00	64.8 PK	68.2	-3.4	2.07 V	348	58.70	6.10
2	5360.00	63.6 PK	74.0	-10.4	2.18 V	348	57.50	6.10
3	5360.00	52.2 AV	54.0	-1.8	2.18 V	348	46.10	6.10
4	#5470.00	67.2 PK	74.0	-6.8	1.88 V	350	60.80	6.40
5	#5470.00	51.9 AV	54.0	-2.1	1.88 V	350	45.50	6.40
6	*5500.00	115.4 PK			2.20 V	72	75.40	40.00
7	*5500.00	104.7 AV			2.20 V	72	64.70	40.00
8	11000.00	59.4 PK	74.0	-14.6	1.53 V	94	39.80	19.60
9	11000.00	46.1 AV	54.0	-7.9	1.53 V	94	26.50	19.60

Remark:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5280.00	57.5 PK	68.2	-10.7	1.87 H	189	51.40	6.10
2	5360.00	57.8 PK	74.0	-16.2	1.91 H	191	51.70	6.10
3	5360.00	44.8 AV	54.0	-9.2	1.91 H	191	38.70	6.10
4	*5580.00	105.8 PK			1.83 H	342	65.70	40.10
5	*5580.00	95.7 AV			1.83 H	342	55.60	40.10
6	11160.00	58.3 PK	74.0	-15.7	1.24 H	227	39.10	19.20
7	11160.00	44.7 AV	54.0	-9.3	1.24 H	227	25.50	19.20
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	#5280.00	65.0 PK	68.2	-3.2	2.27 V	345	58.90	6.10
2	5360.00	64.1 PK	74.0	-9.9	2.28 V	347	58.00	6.10
3	5360.00	52.2 AV	54.0	-1.8	2.28 V	347	46.10	6.10
4	*5580.00	116.6 PK			1.69 V	155	76.50	40.10
5	*5580.00	106.3 AV			1.69 V	155	66.20	40.10
6	11160.00	57.8 PK	74.0	-16.2	1.48 V	164	38.60	19.20
7	11160.00	45.2 AV	54.0	-8.8	1.48 V	164	26.00	19.20

Remark:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5250.00	56.2 PK	68.2	-12.0	1.52 H	264	50.10	6.10
2	5370.00	56.9 PK	74.0	-17.1	1.25 H	324	50.70	6.20
3	5370.00	44.5 AV	54.0	-9.5	1.25 H	324	38.30	6.20
4	*5700.00	103.2 PK			1.13 H	117	62.90	40.30
5	*5700.00	93.5 AV			1.13 H	117	53.20	40.30
6	#5725.00	56.9 PK	74.0	-17.1	1.06 H	82	50.10	6.80
7	#5725.00	44.2 AV	54.0	-9.8	1.06 H	82	37.40	6.80
8	11400.00	59.3 PK	74.0	-14.7	1.18 H	109	40.80	18.50
9	11400.00	46.0 AV	54.0	-8.0	1.18 H	109	27.50	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	#5260.00	66.2 PK	68.2	-7.8	1.70 V	171	60.10	6.10
2	5370.00	64.6 PK	74.0	-9.4	2.26 V	348	58.40	6.20
3	5370.00	52.2 AV	54.0	-1.8	2.26 V	348	46.00	6.20
4	*5700.00	116.2 PK			1.87 V	170	75.90	40.30
5	*5700.00	106.0 AV			1.87 V	170	65.70	40.30
6	#5725.00	64.4 PK	74.0	-9.6	2.28 V	343	57.60	6.80
7	#5725.00	49.6 AV	54.0	-4.4	2.28 V	343	42.80	6.80
8	11400.00	59.1 PK	74.0	-14.9	1.28 V	109	40.60	18.50
9	11400.00	45.6 AV	54.0	-8.4	1.28 V	109	27.10	18.50

Remark:

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

802.11n (HT20)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	56.7 PK	74.0	-17.3	1.32 H	215	50.70	6.00
2	5150.00	44.2 AV	54.0	-9.8	1.32 H	215	38.20	6.00
3	*5260.00	108.0 PK			1.92 H	341	68.30	39.70
4	*5260.00	97.1 AV			1.92 H	341	57.40	39.70
5	#10520.00	60.5 PK	74.0	-13.5	1.26 H	196	41.30	19.20
6	#10520.00	48.1 AV	54.0	-5.9	1.26 H	196	28.90	19.20
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	59.8 PK	74.0	-14.2	1.24 V	146	53.80	6.00
2	5150.00	48.3 AV	54.0	-5.7	1.24 V	146	42.30	6.00
3	*5260.00	119.1 PK			2.19 V	210	79.40	39.70
4	*5260.00	109.0 AV			2.19 V	210	69.30	39.70
5	#10520.00	65.3 PK	74.0	-8.7	1.24 V	169	46.10	19.20
6	#10520.00	52.1 AV	54.0	-1.9	1.24 V	169	32.90	19.20

Remark:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5300.00	107.8 PK			1.19 H	141	68.10	39.70
2	*5300.00	97.3 AV			1.19 H	141	57.60	39.70
3	10600.00	59.6 PK	74.0	-14.4	1.38 H	236	40.50	19.10
4	10600.00	47.5 AV	54.0	-6.5	1.38 H	236	28.40	19.10
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	*5300.00	119.0 PK			2.02 V	199	79.30	39.70
2	*5300.00	108.7 AV			2.02 V	199	69.00	39.70
3	10600.00	64.5 PK	74.0	-9.5	1.10 V	169	45.40	19.10
4	10600.00	50.9 AV	54.0	-3.1	1.10 V	169	31.80	19.10

Remark:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5320.00	105.4 PK			1.33 H	141	65.70	39.70
2	*5320.00	95.4 AV			1.33 H	141	55.70	39.70
3	5350.00	57.0 PK	74.0	-17.0	1.11 H	201	50.90	6.10
4	5350.00	44.4 AV	54.0	-9.6	1.11 H	201	38.30	6.10
5	10640.00	58.9 PK	74.0	-15.1	1.17 H	97	40.00	18.90
6	10640.00	46.3 AV	54.0	-7.7	1.17 H	97	27.40	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	*5320.00	118.2 PK			2.43 V	167	78.50	39.70
2	*5320.00	107.8 AV			2.43 V	167	68.10	39.70
3	5350.00	68.3 PK	74.0	-5.7	2.27 V	230	62.20	6.10
4	5350.00	52.3 AV	54.0	-1.7	2.27 V	230	46.20	6.10
5	10640.00	58.7 PK	74.0	-15.3	1.54 V	114	39.80	18.90
6	10640.00	46.0 AV	54.0	-8.0	1.54 V	114	27.10	18.90

Remark:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5280.00	57.6 PK	68.2	-10.6	1.57 H	256	51.50	6.10
2	5360.00	58.1 PK	74.0	-15.9	1.48 H	95	52.00	6.10
3	5360.00	47.0 AV	54.0	-7.0	1.48 H	95	40.90	6.10
4	#5470.00	59.3 PK	74.0	-14.7	1.48 H	0	52.90	6.40
5	#5470.00	46.3 AV	54.0	-7.7	1.48 H	0	39.90	6.40
6	*5500.00	106.3 PK			1.57 H	212	66.30	40.00
7	*5500.00	96.1 AV			1.57 H	212	56.10	40.00
8	11000.00	61.3 PK	74.0	-12.7	1.36 H	333	41.70	19.60
9	11000.00	48.2 AV	54.0	-5.8	1.36 H	333	28.60	19.60
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	#5280.00	66.7 PK	68.2	-1.5	2.09 V	7	60.60	6.10
2	5360.00	63.3 PK	74.0	-10.7	2.12 V	0	57.20	6.10
3	5360.00	51.3 AV	54.0	-2.7	2.12 V	0	45.20	6.10
4	#5470.00	70.2 PK	74.0	-3.8	2.08 V	342	63.80	6.40
5	#5470.00	51.8 AV	54.0	-2.2	2.08 V	342	45.40	6.40
6	*5500.00	119.4 PK			2.15 V	349	79.40	40.00
7	*5500.00	109.2 AV			2.15 V	349	69.20	40.00
8	11000.00	62.1 PK	74.0	-11.9	1.53 V	125	42.50	19.60
9	11000.00	49.2 AV	54.0	-4.8	1.53 V	125	29.60	19.60

Remark:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5240.00	57.4 PK	68.2	-10.8	1.70 H	10	51.40	6.00
2	5360.00	57.3 PK	74.0	-16.7	1.63 H	7	51.20	6.10
3	5360.00	44.9 AV	54.0	-9.1	1.63 H	7	38.80	6.10
4	*5580.00	103.3 PK			1.13 H	346	63.20	40.10
5	*5580.00	93.0 AV			1.13 H	346	52.90	40.10
6	11160.00	57.5 PK	74.0	-16.5	1.22 H	251	38.30	19.20
7	11160.00	45.0 AV	54.0	-9.0	1.22 H	251	25.80	19.20
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	64.1 PK	68.2	-4.1	2.26 V	347	58.10	6.00
2	5360.00	64.7 PK	74.0	-9.3	2.23 V	350	58.60	6.10
3	5360.00	52.2 AV	54.0	-1.8	2.23 V	350	46.10	6.10
4	*5580.00	115.8 PK			1.83 V	173	75.70	40.10
5	*5580.00	104.4 AV			1.83 V	173	64.30	40.10
6	11160.00	57.7 PK	74.0	-16.3	1.24 V	83	38.50	19.20
7	11160.00	45.0 AV	54.0	-9.0	1.24 V	83	25.80	19.20

Remark:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5240.00	57.6 PK	68.2	-10.6	1.31 H	357	51.60	6.00
2	5360.00	57.6 PK	74.0	-16.4	1.42 H	343	51.50	6.10
3	5360.00	45.1 AV	54.0	-8.9	1.42 H	343	39.00	6.10
4	*5700.00	104.6 PK			1.60 H	8	64.30	40.30
5	*5700.00	93.6 AV			1.60 H	8	53.30	40.30
6	#5725.00	58.1 PK	74.0	-15.9	1.39 H	3	51.30	6.80
7	#5725.00	45.6 AV	54.0	-8.4	1.39 H	3	38.80	6.80
8	11400.00	58.7 PK	74.0	-15.3	1.21 H	118	40.20	18.50
9	11400.00	46.1 AV	54.0	-7.9	1.21 H	118	27.60	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	66.5 PK	68.2	-1.7	2.22 V	355	60.50	6.00
2	5360.00	64.2 PK	74.0	-9.8	2.34 V	345	58.10	6.10
3	5360.00	52.4 AV	54.0	-1.6	2.34 V	345	46.30	6.10
4	*5700.00	113.0 PK			2.54 V	159	72.70	40.30
5	*5700.00	102.7 AV			2.54 V	159	62.40	40.30
6	#5725.00	68.4 PK	74.0	-5.6	2.01 V	3	61.60	6.80
7	**#5725.00**	**53.0 AV**	**54.0**	**-1.0**	**2.01 V**	**3**	**46.20**	**6.80**
8	11400.00	58.4 PK	74.0	-15.6	1.87 V	86	39.90	18.50
9	11400.00	45.1 AV	54.0	-8.9	1.87 V	86	26.60	18.50

Remark:

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

802.11n (HT40)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5000.00	56.0 PK	74.0	-18.0	1.22 H	118	50.30	5.70
2	5000.00	44.7 AV	54.0	-9.3	1.22 H	118	39.00	5.70
3	*5270.00	104.3 PK			1.14 H	140	64.60	39.70
4	*5270.00	94.2 AV			1.14 H	140	54.50	39.70
5	#10540.00	60.5 PK	74.0	-13.5	1.14 H	231	41.30	19.20
6	#10540.00	48.0 AV	54.0	-6.0	1.14 H	231	28.80	19.20
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	5000.00	59.9 PK	74.0	-14.1	1.27 V	145	54.20	5.70
2	5000.00	50.8 AV	54.0	-3.2	1.27 V	145	45.10	5.70
3	*5270.00	115.6 PK			1.94 V	173	75.90	39.70
4	*5270.00	105.7 AV			1.94 V	173	66.00	39.70
5	#10540.00	61.9 PK	74.0	-12.1	1.16 V	132	42.70	19.20
6	#10540.00	49.7 AV	54.0	-4.3	1.16 V	132	30.50	19.20

Remark:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5310.00	95.8 PK			1.00 H	245	56.10	39.70
2	*5310.00	86.4 AV			1.00 H	245	46.70	39.70
3	5350.00	56.5 PK	74.0	-17.5	1.34 H	142	50.40	6.10
4	5350.00	44.4 AV	54.0	-9.6	1.34 H	142	38.30	6.10
5	10620.00	59.1 PK	74.0	-14.9	1.27 H	76	40.10	19.00
6	10620.00	47.4 AV	54.0	-6.6	1.27 H	76	28.40	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	*5310.00	110.2 PK			1.65 V	169	70.50	39.70
2	*5310.00	101.0 AV			1.65 V	169	61.30	39.70
3	5350.00	63.0 PK	74.0	-11.0	1.78 V	166	56.90	6.10
4	5350.00	52.2 AV	54.0	-1.8	1.78 V	166	46.10	6.10
5	10620.00	59.8 PK	74.0	-14.2	1.15 V	54	40.80	19.00
6	10620.00	46.6 AV	54.0	-7.4	1.15 V	54	27.60	19.00

Remark:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5350.00	56.6 PK	74.0	-17.4	1.41 H	302	50.50	6.10
2	5350.00	44.4 AV	54.0	-9.6	1.41 H	302	38.30	6.10
3	#5470.00	58.4 PK	74.0	-15.6	1.25 H	356	52.00	6.40
4	#5470.00	45.0 AV	54.0	-9.0	1.25 H	356	38.60	6.40
5	*5510.00	94.9 PK			1.00 H	341	54.90	40.00
6	*5510.00	85.4 AV			1.00 H	341	45.40	40.00
7	11020.00	59.9 PK	74.0	-14.1	1.22 H	89	40.50	19.40
8	11020.00	46.4 AV	54.0	-7.6	1.22 H	89	27.00	19.40
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	5350.00	59.8 PK	74.0	-14.2	2.19 V	351	53.70	6.10
2	5350.00	46.6 AV	54.0	-7.4	2.19 V	351	40.50	6.10
3	#5470.00	66.4 PK	74.0	-7.6	2.07 V	14	60.00	6.40
4	#5470.00	52.4 AV	54.0	-1.6	2.07 V	14	46.00	6.40
5	*5510.00	107.9 PK			1.83 V	138	67.90	40.00
6	*5510.00	98.3 AV			1.83 V	138	58.30	40.00
7	11020.00	59.1 PK	74.0	-14.9	1.34 V	72	39.70	19.40
8	11020.00	46.4 AV	54.0	-7.6	1.34 V	72	27.00	19.40

Remark:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5360.00	57.0 PK	74.0	-17.0	1.64 H	329	50.90	6.10
2	5360.00	45.8 AV	54.0	-8.2	1.64 H	329	39.70	6.10
3	#5470.00	58.2 PK	74.0	-15.8	1.38 H	334	51.80	6.40
4	#5470.00	45.6 AV	54.0	-8.4	1.38 H	334	39.20	6.40
5	*5550.00	103.3 PK			1.42 H	333	63.20	40.10
6	*5550.00	93.5 AV			1.42 H	333	53.40	40.10
7	11060.00	59.1 PK	74.0	-14.9	1.41 H	232	39.90	19.20
8	11060.00	47.2 AV	54.0	-6.8	1.41 H	232	28.00	19.20
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	5360.00	61.8 PK	74.0	-12.2	2.05 V	353	55.70	6.10
2	5360.00	52.1 AV	54.0	-1.9	2.05 V	353	46.00	6.10
3	#5470.00	63.2 PK	74.0	-10.8	2.18 V	350	56.80	6.40
4	#5470.00	49.6 AV	54.0	-4.4	2.18 V	350	43.20	6.40
5	*5550.00	115.7 PK			2.20 V	348	75.60	40.10
6	*5550.00	107.0 AV			2.20 V	348	66.90	40.10
7	11060.00	58.6 PK	74.0	-15.4	1.43 V	163	39.40	19.20
8	11060.00	47.1 AV	54.0	-6.9	1.43 V	163	27.90	19.20

Remark:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5360.00	57.1 PK	74.0	-16.9	1.28 H	256	51.00	6.10
2	5360.00	45.7 AV	54.0	-8.3	1.28 H	256	39.60	6.10
3	*5670.00	101.6 PK			1.00 H	244	61.40	40.20
4	*5670.00	92.4 AV			1.00 H	244	52.20	40.20
5	#5725.00	57.0 PK	74.0	-17.0	1.32 H	210	50.20	6.80
6	#5725.00	45.6 AV	54.0	-8.4	1.32 H	210	38.80	6.80
7	11340.00	58.3 PK	74.0	-15.7	1.46 H	202	39.10	19.20
8	11340.00	46.9 AV	54.0	-7.1	1.46 H	202	27.70	19.20
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	5360.00	62.4 PK	74.0	-11.6	2.16 V	351	56.30	6.10
2	5360.00	50.9 AV	54.0	-3.1	2.16 V	351	44.80	6.10
3	*5670.00	113.2 PK			1.45 V	157	73.00	40.20
4	*5670.00	103.4 AV			1.45 V	157	63.20	40.20
5	#5725.00	67.0 PK	74.0	-7.0	2.13 V	358	60.20	6.80
6	#5725.00	52.5 AV	54.0	-1.5	2.13 V	358	45.70	6.80
7	11340.00	58.9 PK	74.0	-15.1	1.18 V	76	39.70	19.20
8	11340.00	46.7 AV	54.0	-7.3	1.18 V	76	27.50	19.20

Remark:

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

802.11ac (VHT80)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5290.00	90.1 PK			1.00 H	240	50.40	39.70
2	*5290.00	80.3 AV			1.00 H	240	40.60	39.70
3	5350.00	57.0 PK	74.0	-17.0	1.06 H	141	50.90	6.10
4	5350.00	45.2 AV	54.0	-8.8	1.06 H	141	39.10	6.10
5	#10580.00	60.1 PK	74.0	-13.9	1.24 H	69	40.80	19.30
6	#10580.00	48.2 AV	54.0	-5.8	1.24 H	69	28.90	19.30
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	*5290.00	106.2 PK			1.74 V	172	66.50	39.70
2	*5290.00	94.9 AV			1.74 V	172	55.20	39.70
3	5350.00	64.0 PK	74.0	-10.0	2.07 V	59	57.90	6.10
4	5350.00	52.2 AV	54.0	-1.8	2.07 V	59	46.10	6.10
5	#10580.00	60.0 PK	74.0	-14.0	1.16 V	84	40.70	19.30
6	#10580.00	48.7 AV	54.0	-5.3	1.16 V	84	29.40	19.30

Remark:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5460.00	57.7 PK	74.0	-16.3	1.40 H	313	51.30	6.40
2	5460.00	45.1 AV	54.0	-8.9	1.40 H	313	38.70	6.40
3	#5470.00	57.8 PK	74.0	-16.2	1.35 H	339	51.40	6.40
4	#5470.00	45.4 AV	54.0	-8.6	1.35 H	339	39.00	6.40
5	*5530.00	91.4 PK			1.35 H	342	51.40	40.00
6	*5530.00	81.9 AV			1.35 H	342	41.90	40.00
7	11060.00	58.6 PK	74.0	-15.4	1.32 H	167	39.40	19.20
8	11060.00	46.3 AV	54.0	-7.7	1.32 H	167	27.10	19.20
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5460.00	62.8 PK	74.0	-11.2	2.07 V	351	56.40	6.40
2	5460.00	49.1 AV	54.0	-4.9	2.07 V	351	42.70	6.40
3	#5470.00	67.1 PK	74.0	-6.9	1.89 V	347	60.70	6.40
4	#5470.00	52.6 AV	54.0	-1.4	1.89 V	347	46.20	6.40
5	*5530.00	104.3 PK			1.97 V	172	64.30	40.00
6	*5530.00	92.7 AV			1.97 V	172	52.70	40.00
7	11060.00	58.7 PK	74.0	-15.3	1.27 V	85	39.50	19.20
8	11060.00	46.9 AV	54.0	-7.1	1.27 V	85	27.70	19.20

Remark:

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

Below 1GHz worst-case data

802.11a

CHANNEL	TX Channel 52	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	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	30.1 QP	40.0	-9.9	1.49 H	194	44.70	-14.60
2	374.04	31.7 QP	46.0	-14.3	1.00 H	50	42.70	-11.00
3	500.42	34.8 QP	46.0	-11.2	1.49 H	190	43.20	-8.40
4	624.85	34.9 QP	46.0	-11.1	1.00 H	33	40.50	-5.60
5	751.23	35.6 QP	46.0	-10.4	1.00 H	127	38.80	-3.20
6	875.67	40.4 QP	46.0	-5.6	1.49 H	180	41.50	-1.10
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	30.20	36.2 QP	40.0	-3.8	1.00 V	66	52.00	-15.80
2	39.04	34.5 QP	40.0	-5.5	1.00 V	9	49.60	-15.10
3	500.42	34.8 QP	46.0	-11.2	1.00 V	163	43.20	-8.40
4	624.85	36.3 QP	46.0	-9.7	1.00 V	89	41.90	-5.60
5	747.34	39.4 QP	46.0	-6.6	1.49 V	18	42.70	-3.30
6	875.67	35.0 QP	46.0	-11.0	1.00 V	161	36.10	-1.10

Remark:

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

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	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	Mar. 02, 2015	Mar. 01, 2016
LISN ROHDE & SCHWARZ (Peripheral)	ESH3-Z5	100311	Jul. 21, 2014	Jul. 20, 2015
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.

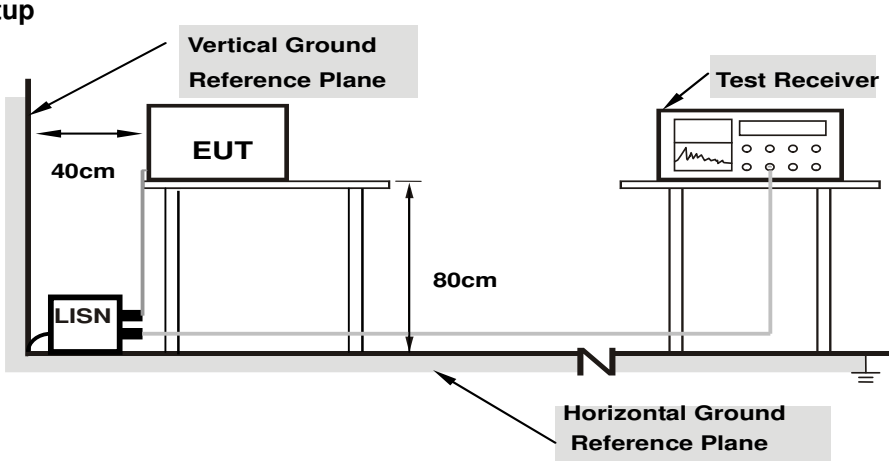
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

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.

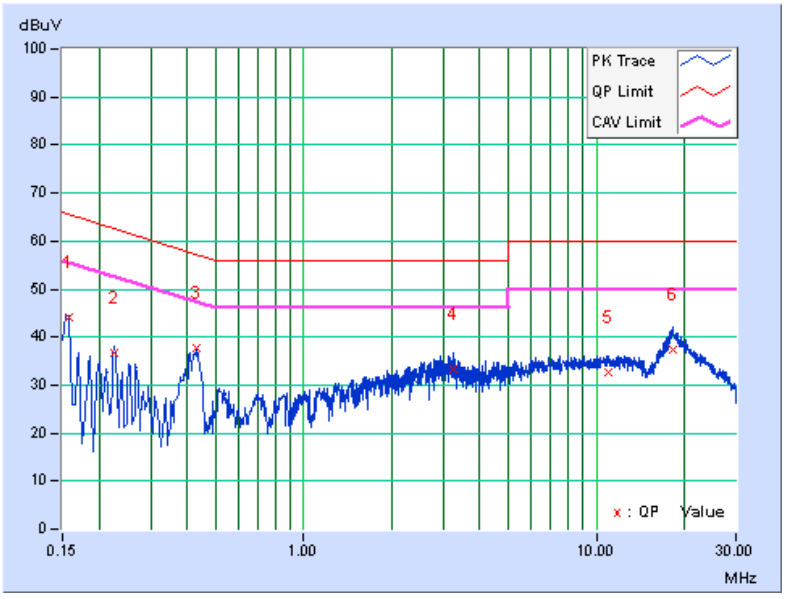
4.2.7 Test Results

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	0.15782	0.05	43.89	30.59	43.94	30.64	65.58	55.58	-21.64	-24.94
2	0.22434	0.06	36.52	24.70	36.58	24.76	62.66	52.66	-26.08	-27.90
3	0.43122	0.06	37.65	31.05	37.71	31.11	57.23	47.23	-19.52	-16.12
4	3.23890	0.16	33.08	25.22	33.24	25.38	56.00	46.00	-22.76	-20.62
5	10.97288	0.49	32.16	26.55	32.65	27.04	60.00	50.00	-27.35	-22.96
6	18.16337	0.82	36.62	31.50	37.44	32.32	60.00	50.00	-22.56	-17.68

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.

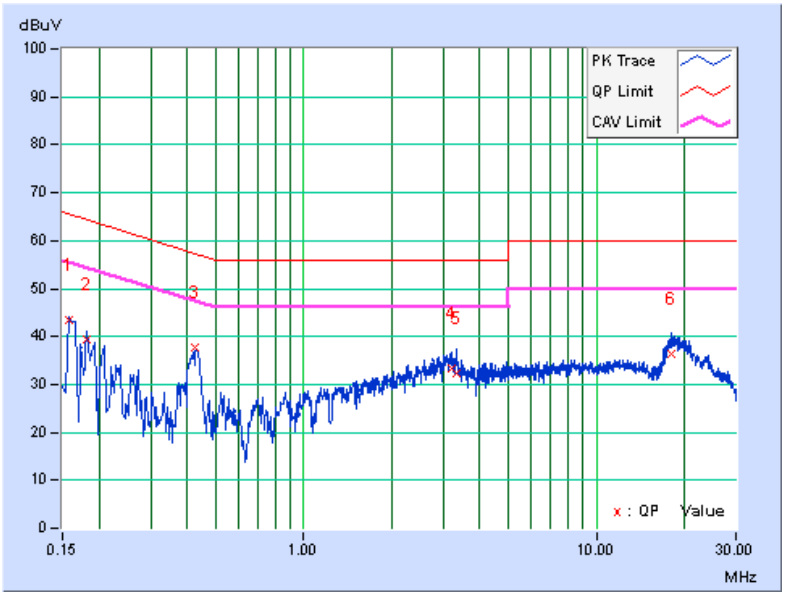


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)

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	0.15802	0.05	43.53	31.27	43.58	31.32	65.57	55.57	-21.99	-24.25
2	0.18128	0.05	39.31	26.25	39.36	26.30	64.43	54.43	-25.07	-28.13
3	**0.42782**	**0.06**	**37.80**	**31.60**	**37.86**	**31.66**	**57.29**	**47.29**	**-19.43**	**-15.63**
4	3.19198	0.16	33.29	25.22	33.45	25.38	56.00	46.00	-22.55	-20.62
5	3.32883	0.16	32.10	23.57	32.26	23.73	56.00	46.00	-23.74	-22.27
6	18.13600	0.67	35.57	30.04	36.24	30.71	60.00	50.00	-23.76	-19.29

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

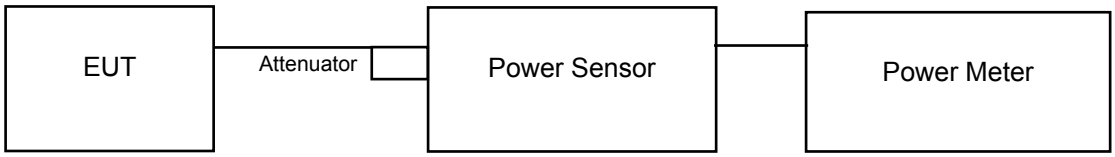
Operation Band	EUT Category		LIMIT
U-NII-1	---	Outdoor Access Point	1 Watt (30 dBm) (Max. e.i.r.p ≦ 125mW(21 dBm) at any elevation angle above 30 degrees as measured from the horizon)
	---	Fixed point-to-point Access Point	1 Watt (30 dBm)
	---	Indoor Access Point	1 Watt (30 dBm)
	---	Mobile and Portable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

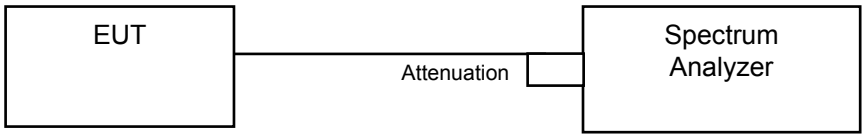
Per KDB 662911 Method of conducted output power measurement on IEEE 802.11 devices,
Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \leq 4$;
Array Gain = 0 dB (i.e., no array gain) for channel widths ≥ 40 MHz for any N_{ANT};
Array Gain = 5 log(N_{ANT}/N_{SS}) dB or 3 dB, whichever is less for 20-MHz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



4.3.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.3.4 Test Procedure

FOR AVERAGE POWER MEASUREMENT

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

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

For 802.11ac (VHT80)

a. Set span to encompass the entire 26 dB EBW (or, alternatively, the entire 99% occupied bandwidth) of the signal.
b. Set sweep trigger to “free run”.
c. Set RBW = 1 MHz.
d. Set VBW ≥ 3 MHz
e. Number of points in sweep ≥ 2 Span / RBW.
f. Sweep time ≤ (number of points in sweep) * T
g. Detector = RMS.
h. Trace mode = max hold.
i. 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 300 kHz RBW and 1MHz VBW. 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

Channel	Frequency (MHz)	Maximum Conducted Power (dBm)			Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
52	5260	17.98	17.82	18.12	188.203	22.75	24.00	Pass
60	5300	17.43	17.68	17.63	171.892	22.35	24.00	Pass
64	5320	17.66	17.52	17.46	170.558	22.32	24.00	Pass
100	5500	17.61	16.31	16.84	148.739	21.72	24.00	Pass
116	5580	16.07	14.77	15.58	106.591	20.28	24.00	Pass
140	5700	15.27	15.22	15.56	102.892	20.12	24.00	Pass

Note:

Chain 0

1. 11dBm + 10log(38.52) = 26.86 dBm > 24dBm.
2. 11dBm + 10log(36.55) = 26.63 dBm > 24dBm.
3. 11dBm + 10log(36.61) = 26.64 dBm > 24dBm.
4. 11dBm + 10log(35.10) = 26.45 dBm > 24dBm.
5. 11dBm + 10log(26.14) = 25.17 dBm > 24dBm.
6. 11dBm + 10log(24.99) = 24.98 dBm > 24dBm.

Chain 1

1. 11dBm + 10log(34.33) = 26.36 dBm > 24dBm.
2. 11dBm + 10log(30.56) = 25.85 dBm > 24dBm.
3. 11dBm + 10log(31.27) = 25.95 dBm > 24dBm.
4. 11dBm + 10log(37.28) = 26.71 dBm > 24dBm.
5. 11dBm + 10log(24.14) = 24.83 dBm > 24dBm.
6. 11dBm + 10log(23.97) = 24.80 dBm > 24dBm.

Chain 2

1. 11dBm + 10log(35.18) = 26.46 dBm > 24dBm.
2. 11dBm + 10log(34.36) = 26.36 dBm > 24dBm.
3. 11dBm + 10log(34.09) = 26.33 dBm > 24dBm.
4. 11dBm + 10log(27.49) = 25.39 dBm > 24dBm.
5. 11dBm + 10log(24.10) = 24.82 dBm > 24dBm.
6. 11dBm + 10log(22.97) = 24.61 dBm > 24dBm.

802.11n (HT20)

Channel	Frequency (MHz)	Maximum Conducted Power (dBm)			Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
52	5260	16.97	17.12	18.26	168.285	22.26	24.00	Pass
60	5300	17.36	17.63	17.66	170.738	22.32	24.00	Pass
64	5320	17.86	17.51	17.46	173.177	22.38	24.00	Pass
100	5500	17.53	15.88	16.63	141.376	21.50	24.00	Pass
116	5580	15.86	14.43	15.26	99.855	19.99	24.00	Pass
140	5700	15.22	14.77	15.39	97.852	19.91	24.00	Pass

Note:

Chain 0

1. 11dBm + 10log(40.43) = 27.07 dBm > 24dBm.
2. 11dBm + 10log(40.38) = 27.06 dBm > 24dBm.
3. 11dBm + 10log(40.64) = 27.09 dBm > 24dBm.
4. 11dBm + 10log(36.99) = 26.68 dBm > 24dBm.
5. 11dBm + 10log(28.20) = 25.50 dBm > 24dBm.
6. 11dBm + 10log(25.75) = 25.11 dBm > 24dBm.

Chain 1

1. 11dBm + 10log(39.20) = 26.93 dBm > 24dBm.
2. 11dBm + 10log(35.19) = 26.46 dBm > 24dBm.
3. 11dBm + 10log(32.08) = 26.06 dBm > 24dBm.
4. 11dBm + 10log(27.55) = 25.40 dBm > 24dBm.
5. 11dBm + 10log(24.83) = 24.95 dBm > 24dBm.
6. 11dBm + 10log(24.63) = 24.91 dBm > 24dBm.

Chain 2

1. 11dBm + 10log(37.61) = 26.75 dBm > 24dBm.
2. 11dBm + 10log(35.60) = 26.51 dBm > 24dBm.
3. 11dBm + 10log(35.09) = 26.45 dBm > 24dBm.
4. 11dBm + 10log(27.29) = 25.36 dBm > 24dBm.
5. 11dBm + 10log(24.28) = 24.85 dBm > 24dBm.
6. 11dBm + 10log(24.21) = 24.84 dBm > 24dBm.

802.11n (HT40)

Channel	Frequency (MHz)	Maximum Conducted Power (dBm)			Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
54	5270	19.14	18.55	18.70	**227.780**	23.58	24.00	Pass
62	5310	12.44	11.84	1.92	34.371	15.36	24.00	Pass
102	5510	11.04	9.45	10.45	32.608	15.13	24.00	Pass
110	5550	17.22	16.69	17.54	**156.143**	21.94	24.00	Pass
134	5670	17.00	17.32	17.14	155.831	21.93	24.00	Pass

Note:
Chain 0
1. 11dBm + 10log(95.28) = 30.79 dBm > 24dBm.
2. 11dBm + 10log(47.69) = 27.78 dBm > 24dBm.
3. 11dBm + 10log(47.12) = 27.73 dBm > 24dBm.
4. 11dBm + 10log(69.81) = 29.44 dBm > 24dBm.
5. 11dBm + 10log(68.08) = 29.33 dBm > 24dBm.

Chain 1
1. 11dBm + 10log(87.95) = 30.44 dBm > 24dBm.
2. 11dBm + 10log(47.93) = 27.81 dBm > 24dBm.
3. 11dBm + 10log(46.62) = 27.69 dBm > 24dBm.
4. 11dBm + 10log(60.33) = 28.81 dBm > 24dBm.
5. 11dBm + 10log(69.94) = 29.45 dBm > 24dBm.

Chain 2
1. 11dBm + 10log(94.11) = 30.74 dBm > 24dBm.
2. 11dBm + 10log(46.40) = 27.67 dBm > 24dBm.
3. 11dBm + 10log(47.59) = 27.78 dBm > 24dBm.
4. 11dBm + 10log(62.41) = 28.95 dBm > 24dBm.
5. 11dBm + 10log(60.31) = 28.80 dBm > 24dBm.

802.11ac (VHT80)

Channel	Frequency (MHz)	Maximum Conducted Power (dBm)			Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2				
58	5290	10.21	9.30	9.33	27.576	14.41	24.00	Pass
106	5530	7.56	5.81	7.00	14.525	11.62	24.00	Pass

Note:
Chain 0
1. 11dBm + 10log(88.90) = 30.49 dBm > 24dBm.
2. 11dBm + 10log(87.98) = 30.44 dBm > 24dBm.

Chain 1
1. 11dBm + 10log(87.47) = 30.42 dBm > 24dBm.
2. 11dBm + 10log(88.76) = 30.48 dBm > 24dBm.

Chain 2
1. 11dBm + 10log(88.49) = 30.47 dBm > 24dBm.
2. 11dBm + 10log(95.06) = 30.78 dBm > 24dBm.

26dB Bandwidth:

802.11a

Channel	Frequency (MHz)	26dBc Bandwidth (MHz)			Pass / Fail
		Chain 0	Chain 1	Chain 2	
52	5260	38.52	34.33	35.18	Pass
60	5300	36.55	30.56	34.36	Pass
64	5320	36.61	31.27	34.09	Pass
100	5500	35.10	37.28	27.49	Pass
116	5580	26.14	24.14	24.10	Pass
140	5700	24.99	23.97	22.97	Pass

802.11n (HT20)

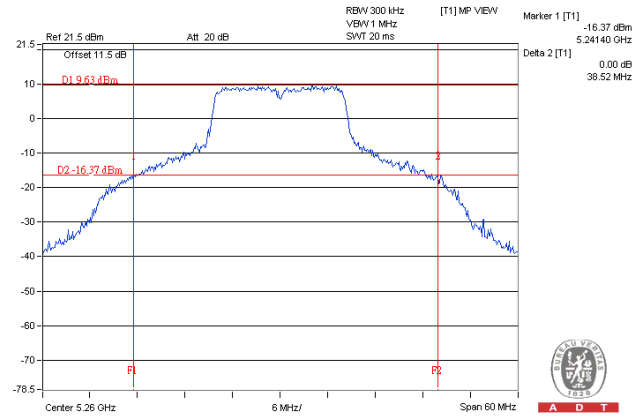
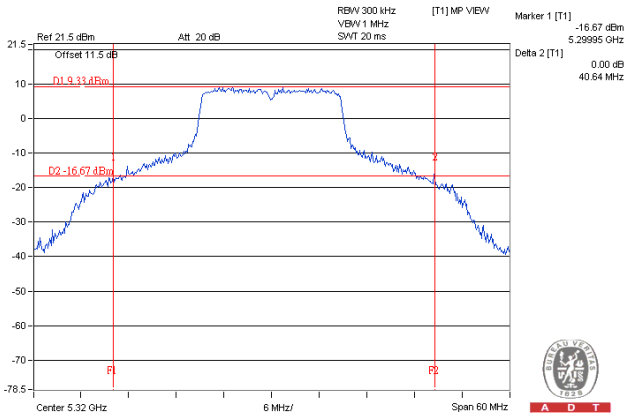
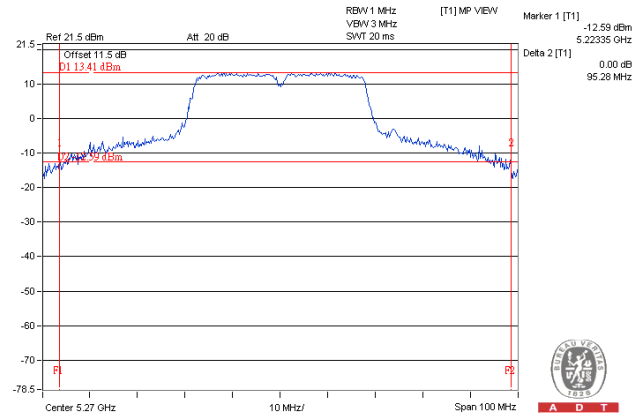
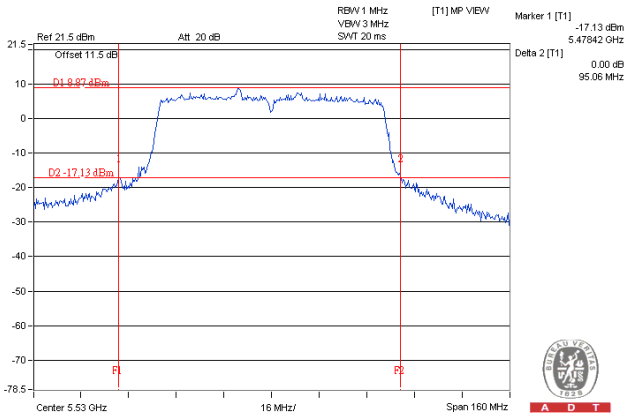
Channel	Frequency (MHz)	26dBc Bandwidth (MHz)			Pass / Fail
		Chain 0	Chain 1	Chain 2	
52	5260	40.43	39.20	37.61	Pass
60	5300	40.38	35.19	35.60	Pass
64	5320	40.64	32.08	35.09	Pass
100	5500	36.99	27.55	27.29	Pass
116	5580	28.20	24.83	24.28	Pass
140	5700	25.75	24.63	24.21	Pass

802.11n (HT40)

Channel	Frequency (MHz)	26dBc Bandwidth (MHz)			Pass / Fail
		Chain 0	Chain 1	Chain 2	
54	5270	95.28	87.95	94.11	Pass
62	5310	47.69	47.93	46.40	Pass
102	5510	47.12	46.62	47.59	Pass
110	5550	69.81	60.33	62.41	Pass
134	5670	68.08	69.94	60.31	Pass

802.11ac (VHT80)

Channel	Frequency (MHz)	26dBc Bandwidth (MHz)			Pass / Fail
		Chain 0	Chain 1	Chain 2	
58	5290	88.90	87.47	88.49	Pass
106	5530	87.98	88.76	95.06	Pass

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

Occupied Bandwidth:

802.11a

Channel	Frequency (MHz)	Occupied Bandwidth (MHz)			Pass / Fail
		Chain 0	Chain 1	Chain 2	
52	5260	20.16	17.88	18.60	Pass
60	5300	19.68	17.64	18.12	Pass
64	5320	19.68	17.40	17.76	Pass
100	5500	19.08	19.08	17.04	Pass
116	5580	17.04	16.92	16.80	Pass
140	5700	16.92	16.80	16.80	Pass

802.11n (HT20)

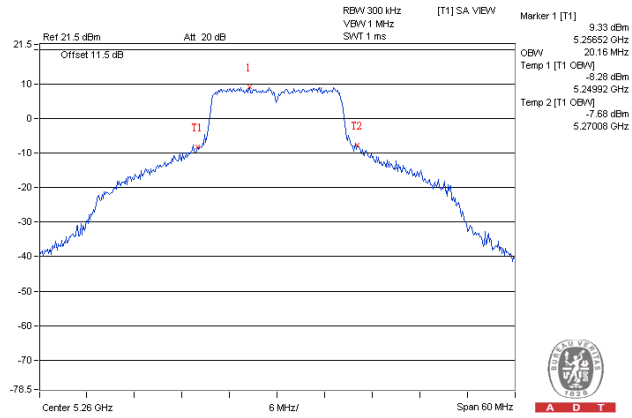
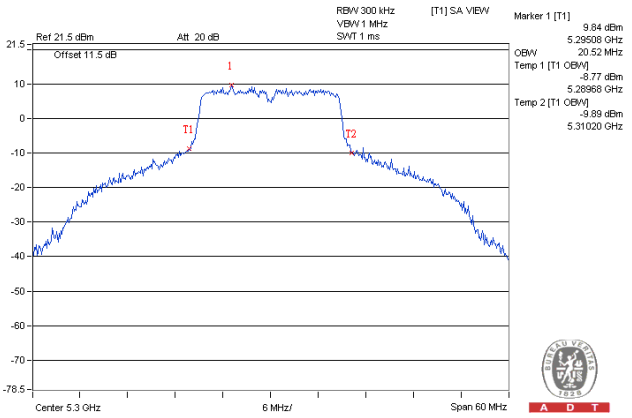
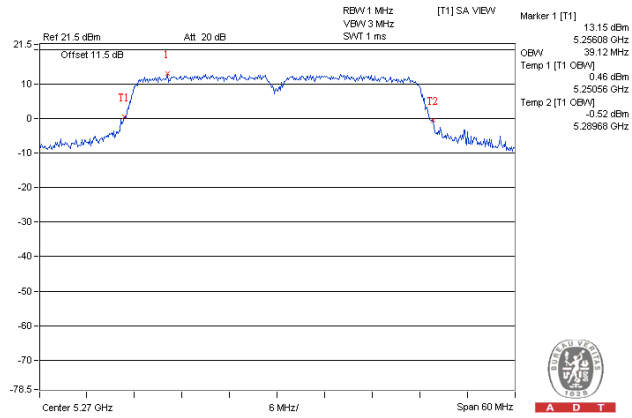
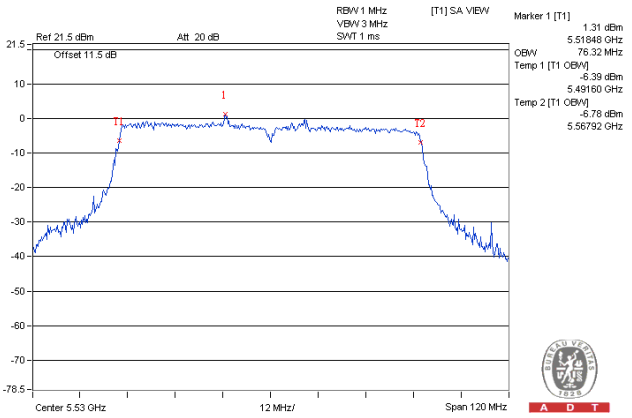
Channel	Frequency (MHz)	Occupied Bandwidth (MHz)			Pass / Fail
		Chain 0	Chain 1	Chain 2	
52	5260	20.40	19.68	19.44	Pass
60	5300	20.52	18.60	18.48	Pass
64	5320	20.16	18.48	18.48	Pass
100	5500	19.80	18.24	18.00	Pass
116	5580	18.00	18.00	18.00	Pass
140	5700	18.00	18.00	18.00	Pass

802.11n (HT40)

Channel	Frequency (MHz)	Occupied Bandwidth (MHz)			Pass / Fail
		Chain 0	Chain 1	Chain 2	
54	5270	39.12	38.16	39.00	Pass
62	5310	36.96	37.20	37.20	Pass
102	5510	37.08	37.08	36.96	Pass
110	5550	37.32	37.44	37.20	Pass
134	5670	37.32	37.32	37.08	Pass

802.11ac (VHT80)

Channel	Frequency (MHz)	Occupied Bandwidth (MHz)			Pass / Fail
		Chain 0	Chain 1	Chain 2	
58	5290	76.08	76.08	76.08	Pass
106	5530	76.32	76.08	76.08	Pass

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

EUT MAXIMUM CONDUCTED POWER

802.11a

Frequency Band (MHz)	Max. Power	
	Output Power (mW)	Output Power (dBm)
5250~5350	188.203	22.75
5470~5725	148.739	21.72

NOTE: Manufacturer provides Transmit Power Control description to meet this requirement.

802.11n (HT20)

Frequency Band (MHz)	Max. Power	
	Output Power (mW)	Output Power (dBm)
5250~5350	173.177	22.38
5470~5725	141.376	21.50

NOTE: Manufacturer provides Transmit Power Control description to meet this requirement.

802.11n (HT40)

Frequency Band (MHz)	Max. Power	
	Output Power (mW)	Output Power (dBm)
5250~5350	227.780	23.58
5470~5725	156.143	21.94

NOTE: Manufacturer provides Transmit Power Control description to meet this requirement.

802.11ac (VHT80)

Frequency Band (MHz)	Max. Power	
	Output Power (mW)	Output Power (dBm)
5250~5350	27.576	14.41
5470~5725	14.525	11.62

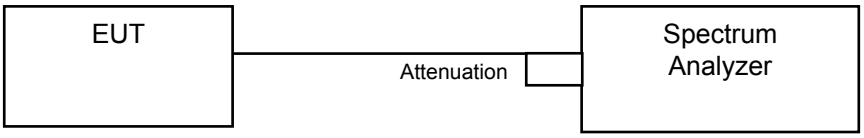
NOTE: Manufacturer provides Transmit Power Control description to meet this requirement.

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 Procedures

Using method SA-2
1) Set span to encompass the entire emission bandwidth (EBW) of the signal.
2) Set RBW = 1 MHz, Set VBW ≥ 3 MHz, 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)

4.4.5 Deviation from Test Standard

No deviation.

4.4.6 EUT Operating Conditions

Same as Item 4.3.6.

4.4.7 Test Results

802.11a

Channel	Frequency (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					
52	5260	4.07	4.23	4.26	8.95	0.57	9.52	9.56	Pass
60	5300	4.10	4.05	4.28	8.91	0.57	9.48	9.56	Pass
64	5320	4.31	4.18	4.12	8.97	0.57	9.54	9.56	Pass
100	5500	5.09	3.77	3.01	8.81	0.57	9.38	9.56	Pass
116	5580	2.36	1.15	1.89	6.59	0.57	7.16	9.56	Pass
140	5700	1.91	1.23	1.93	6.47	0.57	7.04	9.56	Pass

Note: 1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.

2. Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + \ldots + 10^{GN/20})^2/3$]= 7.44 dBi > 6dBi , so the power density limit shall be reduced to 11-(7.44-6) = 9.56dBm.

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

802.11n (HT20)

Channel	Frequency (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					
52	5260	4.54	3.96	4.27	9.03	0.45	9.48	9.56	Pass
60	5300	4.57	3.86	4.39	9.05	0.45	9.50	9.56	Pass
64	5320	4.45	3.56	3.57	8.65	0.45	9.10	9.56	Pass
100	5500	4.69	1.77	2.93	8.07	0.45	8.52	9.56	Pass
116	5580	2.07	1.04	1.51	6.33	0.45	6.78	9.56	Pass
140	5700	1.45	1.01	1.57	6.12	0.45	6.57	9.56	Pass

Note: 1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.

2. Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + \ldots + 10^{GN/20})^2/3$]= 7.44 dBi > 6dBi , so the power density limit shall be reduced to 11-(7.44-6) = 9.56dBm.

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

802.11n (HT40)

Channel	Frequency (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					
54	5270	2.39	1.95	3.23	7.33	0.59	7.92	9.56	Pass
62	5310	-4.14	-4.66	-4.88	0.22	0.59	0.81	9.56	Pass
102	5510	-4.93	-7.36	-6.10	-1.25	0.59	-0.66	9.56	Pass
110	5550	0.59	-0.21	0.74	5.16	0.59	5.75	9.56	Pass
134	5670	0.09	0.29	0.08	4.93	0.59	5.52	9.56	Pass

Note: 1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.

2. Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + \ldots + 10^{GN/20})^2/3$]= 7.44 dBi > 6dBi , so the power density limit shall be reduced to 11-(7.44-6) = 9.56dBm.

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

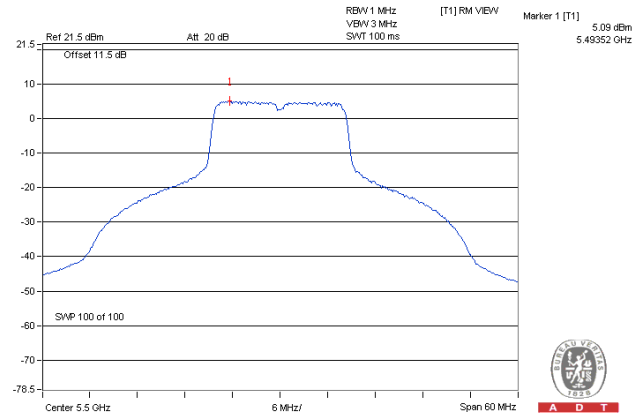
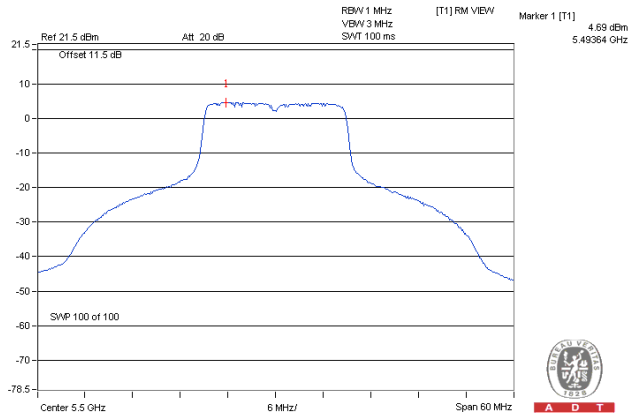
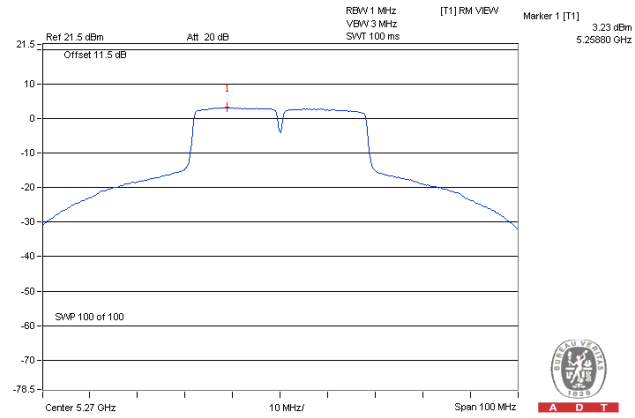
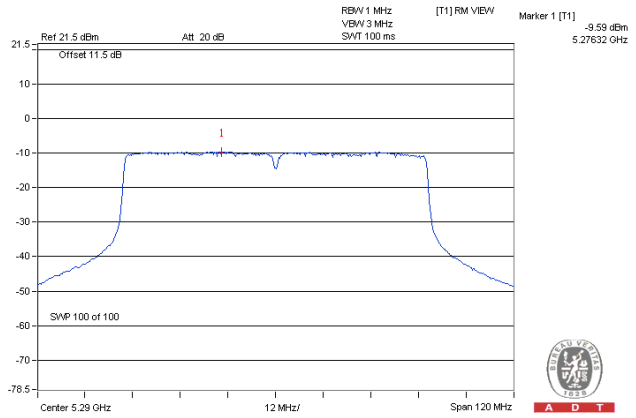
802.11ac (VHT80)

Channel	Frequency (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					
58	5290	-9.59	-10.40	-10.53	-5.38	1.28	-4.10	9.56	Pass
106	5530	-11.58	-13.91	-12.74	-7.87	1.28	-6.59	9.56	Pass

Note: 1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.

2. Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + \ldots + 10^{GN/20})^2/3$]= 7.44 dBi > 6dBi , so the power density limit shall be reduced to 11-(7.44-6) = 9.56dBm.

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

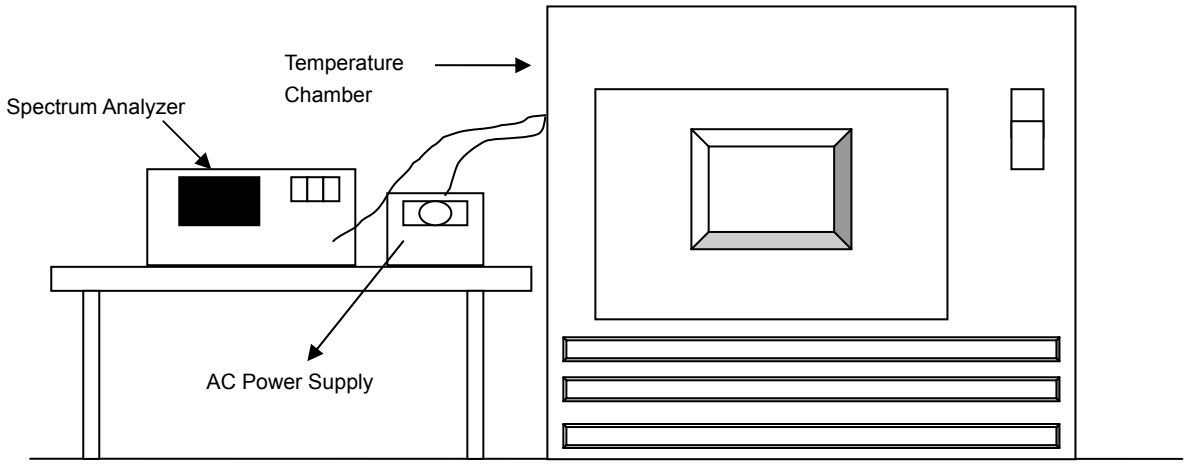
Spectrum Plot of Worst Value	
802.11a	802.11n (HT20)
	
802.11n (HT40)	802.11ac (VHT80)
	

4.5 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

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

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

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

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

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

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

4.5.5 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

Frequemcy Stability Versus Temp.									
Operating Frequency: 5260MHz									
Temp. (℃)	Power Supply (Vac)	0 Minute		2 Minute		5 Minute		10 Minute	
		Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)
50	120	5259.9896	-0.00020	5259.988	-0.00023	5259.9883	-0.00022	5259.9886	-0.00022
40	120	5260.0109	0.00021	5260.0119	0.00023	5260.0125	0.00024	5260.0107	0.00020
30	120	5260.0003	0.00001	5259.9994	-0.00001	5259.9973	-0.00005	5259.9982	-0.00003
20	120	5259.9989	-0.00002	5260.0006	0.00001	5260.0019	0.00004	5260.0025	0.00005
10	120	5260.0095	0.00018	5260.0058	0.00011	5260.0085	0.00016	5260.0084	0.00016
0	120	5260.0268	0.00051	5260.0271	0.00052	5260.0251	0.00048	5260.0238	0.00045
-10	120	5259.9984	-0.00003	5259.9962	-0.00007	5259.9978	-0.00004	5259.9985	-0.00003
-20	120	5259.9947	-0.00010	5259.9938	-0.00012	5259.9965	-0.00007	5259.9965	-0.00007
-30	120	5259.9808	-0.00037	5259.9764	-0.00045	5259.9778	-0.00042	5259.9808	-0.00037

Frequemcy Stability Versus Temp.									
Operating Frequency: 5260MHz									
Temp. (℃)	Power Supply (Vac)	0 Minute		2 Minute		5 Minute		10 Minute	
		Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)
20	138	5259.9982	-0.00003	5260.0016	0.00003	5260.0012	0.00002	5260.0018	0.00003
	120	5259.9989	-0.00002	5260.0006	0.00001	5260.0019	0.00004	5260.0025	0.00005
	102	5259.9982	-0.00003	5260.001	0.00002	5260.0017	0.00003	5260.0018	0.00003

5 Pictures of Test Arrangements

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

Appendix – Information on the Testing Laboratories

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

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

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Web Site: www.bureauveritas-adt.com

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

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