FCC Test Report

Report No.:	RF150513C25A
FCC ID:	E2K-APL280B5
Test Model:	APL28-0B5
Received Date:	May 13, 2015
Test Date:	Jun. 01 ~ Jun. 26, 2015
Issued Date:	Jun. 26, 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.)

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Release Control Record

Issue No.	Description	Date Issued
RF150513C25A	Original release	Jun. 26, 2015

1 Certificate of Conformity

Product:	Wireless Network Security Appliance
Brand:	DELL, DELL SONICWALL, SONICWALL
Test Model:	APL28-0B5
Sample Status:	Engineering sample
Applicant:	Dell Inc.
Test Date:	Jun. 01 ~ Jun. 26, 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 : Celine Chou , **Date:** Jun. 26, 2015

Celine Chou / Specialist

Approved by : Ken Liu , **Date:** Jun. 26, 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 -12.21dB at 0.16036MHz.
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 5280.00MHz and 10600.00MHz.
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 connectors are R-TNC and 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
Test Model	APL28-0B5
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 450Mbps 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: 226.423mW 5500 ~ 5700MHz: 186.659mW
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. The difference compared with the original report (BV ADT report no.: RF150513C25-1) is adding 5.26GHz to 5.32GHz and 5.50GHz to 5.70GHz by software.
2. The EUT incorporates a MIMO function. Physically, the EUT provides 3 completed transmitters and 3 receivers.

Modulation Mode	TX Function
802.11a	3TX
802.11n (HT20)	3TX
802.11n (HT40)	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)

3. The EUT uses following adapters.

Adapter 1	
Brand	AMIGO
Model	AMS117-1202000F2
Input	100-240Vac, 50/60Hz, 0.8A Max
Output	12Vdc, 2.0A
Power Line	AC: 1.75m non-shielded without core DC: 1.5m cable with one core

Adapter 2	
Brand	Sunny COMPUTER TECHNOLOGY CO., LTD.
Model	SYS1544-2412-T3
Input	100-240Vac, 1.0A MAX, 50-60Hz
Output	+12Vdc, 2.0A
Power Line	AC: 1.75m non-shielded without core DC: 1.85m cable with one core

4. 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

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	
A	√	√	√	√	Power by adapter 1
B	-	√	√	-	Power by adapter 2

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

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

Note: 1. The EUT had been pre-tested on the positioned of each 3 axis. The worst case was found when positioned on **Y-plane**.
2. "-" means no effect.

Radiated Emission Test (Above 1GHz):

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

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

EUT CONFIGURE MODE	MODE	FREQ. BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
A	802.11a	5260-5320	52 to 64	52, 60, 64	OFDM	BPSK	6.0
A	802.11n (HT20)		52 to 64	52, 60, 64	OFDM	BPSK	7.2
A	802.11n (HT40)		54 to 62	54, 62	OFDM	BPSK	15.0
A	802.11ac (VHT80)		58	58	OFDM	BPSK	97.5
A	802.11a	5500-5700	100 to 140	100, 116, 140	OFDM	BPSK	6.0
A	802.11n (HT20)		100 to 140	100, 116, 140	OFDM	BPSK	7.2
A	802.11n (HT40)		102 to 134	102, 110, 134	OFDM	BPSK	15.0
A	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)
A, B	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)
A, B	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)
A	802.11a	5260-5320	52 to 64	52, 60, 64	OFDM	BPSK	6.0
A	802.11n (HT20)		52 to 64	52, 60, 64	OFDM	BPSK	7.2
A	802.11n (HT40)		54 to 62	54, 62	OFDM	BPSK	15.0
A	802.11ac (VHT80)		58	58	OFDM	BPSK	97.5
A	802.11a	5500-5700	100 to 140	100, 116, 140	OFDM	BPSK	6.0
A	802.11n (HT20)		100 to 140	100, 116, 140	OFDM	BPSK	7.2
A	802.11n (HT40)		102 to 134	102, 110, 134	OFDM	BPSK	15.0
A	802.11ac (VHT80)		106	106	OFDM	BPSK	97.5

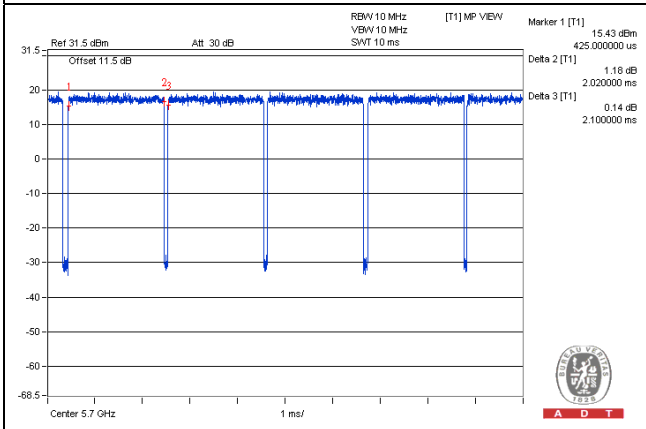
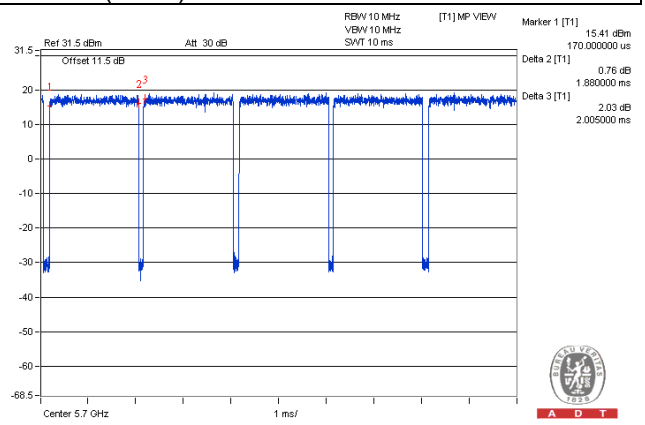
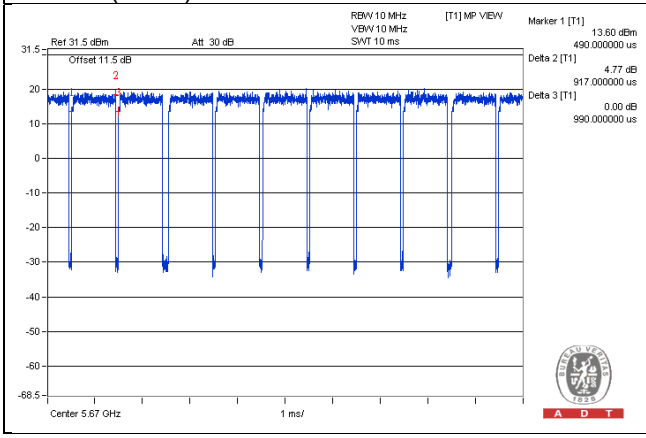
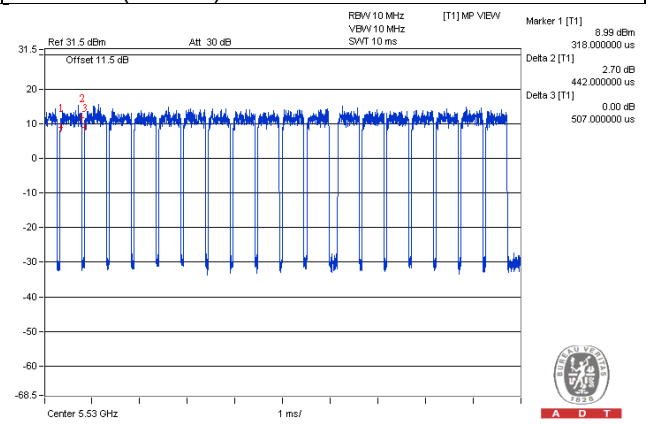
Test Condition:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RE≥1G	18deg. C, 70%RH	120Vac, 60Hz	Jones Chang
RE<1G	18deg. C, 70%RH	120Vac, 60Hz	Nick Hsu
PLC	18deg. C, 70%RH	120Vac, 60Hz	Nick Hsu
APCM	25deg. C, 60%RH	120Vac, 60Hz	Nick Hsu

3.3 Duty Cycle of Test Signal

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

802.11a: Duty cycle = 2.020/2.100 = 0.962, Duty factor = 10 * log(1/0.962) = 0.17
802.11n (HT20): Duty cycle = 1.880/2.005 = 0.938, Duty factor = 10 * log(1/0.938) = 0.28
802.11n (HT40): Duty cycle = 0.917/0.990 = 0.926, Duty factor = 10 * log(1/0.926) = 0.33
802.11ac (VHT80): Duty cycle = 0.442/0.507 = 0.872, Duty factor = 10 * log(1/0.872) = 0.60

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.

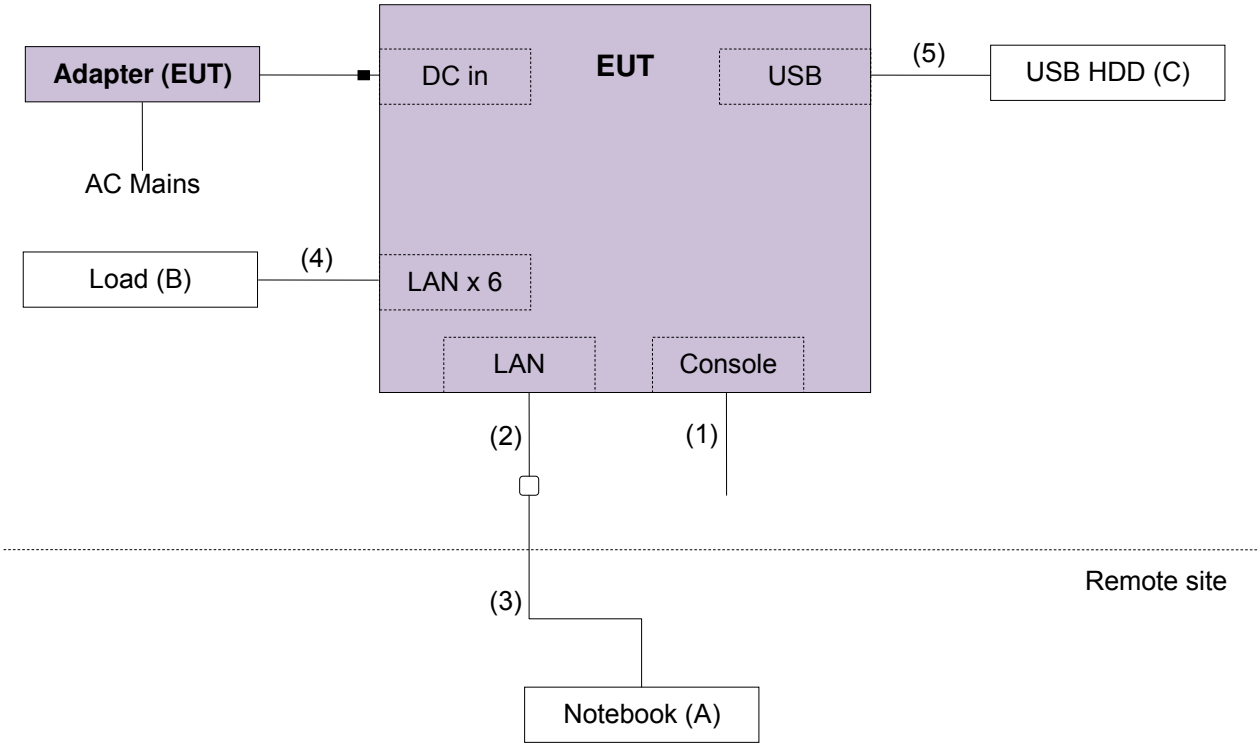
ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Notebook	DELL	E5410	6RP2YM1	FCC DoC Approved	-
B.	Load	NA	NA	NA	NA	-
C.	USB HDD	WD	WDBACY5000ABL-01	WXS1CC1D3606	FCC DoC Approved	-

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.

ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	Console	1	1.8	N	0	Provided by the client
2.	RJ45, Cat5e	1	1.8	N	0	Accessory of EUT
3.	RJ45, Cat5e	1	3	N	0	-
4.	RJ45, Cat5e	6	1.8	N	0	-
5.	USB	1	1.8	Y	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)

789033 D02 General UNII Test Procedures New Rules v01r01

662911 D01 Multiple Transmitter Output v02r01

ANSI C63.10-2009

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

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

4 Test Types and Results

4.1 Radiated Emission and Bandedge Measurement

4.1.1 Limits of Radiated Emission and Bandedge Measurement

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

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

Note:

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

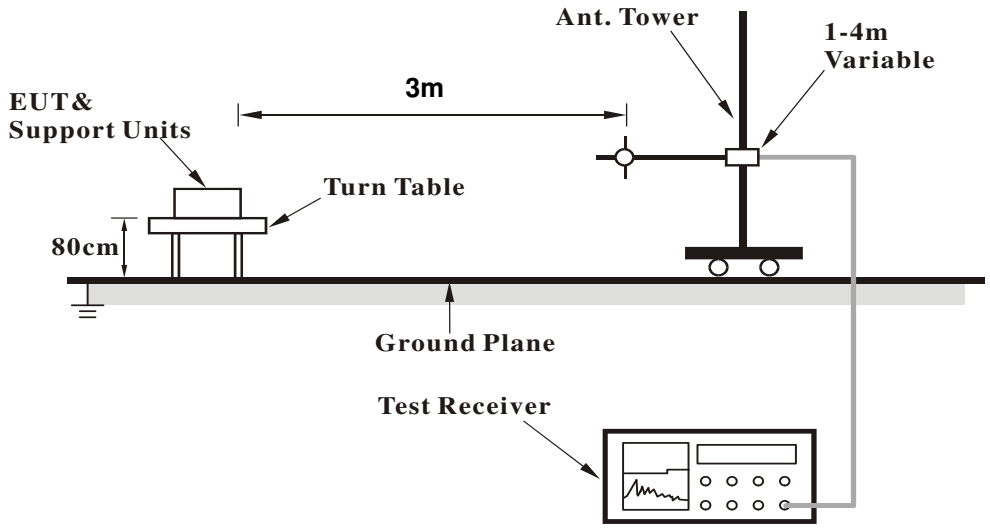
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.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

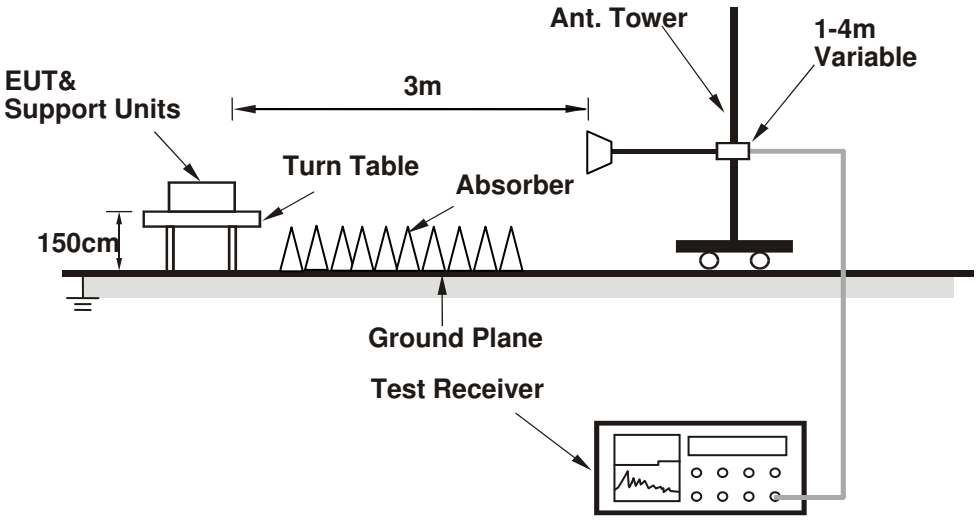
No deviation.

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 HDD 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".
e. The necessary accessories enable the system in full functions.

4.1.7 Test Results

Above 1GHz Data

802.11a

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5260.00	122.2 PK			1.58 H	327	82.50	39.70
2	*5260.00	112.0 AV			1.58 H	327	72.30	39.70
3	5350.00	63.0 PK	74.0	-11.0	1.81 H	336	56.90	6.10
4	5350.00	51.2 AV	54.0	-2.8	1.81 H	336	45.10	6.10
5	#10520.00	67.4 PK	74.0	-6.6	1.58 H	300	48.20	19.20
6	#10520.00	52.9 AV	54.0	-1.1	1.58 H	300	33.70	19.20
7	15780.00	63.4 PK	74.0	-10.6	1.55 H	244	45.30	18.10
8	15780.00	50.5 AV	54.0	-3.5	1.55 H	244	32.40	18.10
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	*5260.00	116.6 PK			3.14 V	257	76.90	39.70
2	*5260.00	106.3 AV			3.14 V	257	66.60	39.70
3	5350.00	58.3 PK	74.0	-15.7	2.85 V	259	52.20	6.10
4	5350.00	47.8 AV	54.0	-6.2	2.85 V	259	41.70	6.10
5	#10520.00	65.3 PK	74.0	-8.7	2.37 V	255	46.10	19.20
6	#10520.00	51.5 AV	54.0	-2.5	2.37 V	255	32.30	19.20
7	15780.00	62.6 PK	74.0	-11.4	2.01 V	176	44.50	18.10
8	15780.00	49.7 AV	54.0	-4.3	2.01 V	176	31.60	18.10

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)
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	5150.00	64.7 PK	74.0	-9.3	1.80 H	330	58.70	6.00
2	5150.00	51.1 AV	54.0	-2.9	1.80 H	330	45.10	6.00
3	*5300.00	122.5 PK			1.57 H	326	82.80	39.70
4	*5300.00	112.1 AV			1.57 H	326	72.40	39.70
5	5350.00	64.6 PK	74.0	-9.4	1.78 H	328	58.50	6.10
6	5350.00	51.8 AV	54.0	-2.2	1.78 H	328	45.70	6.10
7	10600.00	66.7 PK	74.0	-7.3	1.60 H	304	47.60	19.10
8	**10600.00**	**53.0 AV**	**54.0**	**-1.0**	**1.60 H**	**304**	**33.90**	**19.10**
9	15900.00	63.4 PK	74.0	-10.6	1.98 H	241	45.50	17.90
10	15900.00	50.6 AV	54.0	-3.4	1.98 H	241	32.70	17.90
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	59.0 PK	74.0	-15.0	2.75 V	249	53.00	6.00
2	5150.00	47.2 AV	54.0	-6.8	2.75 V	249	41.20	6.00
3	*5300.00	114.3 PK			3.11 V	253	74.60	39.70
4	*5300.00	104.0 AV			3.11 V	253	64.30	39.70
5	5350.00	58.6 PK	74.0	-15.4	2.70 V	269	52.50	6.10
6	5350.00	47.3 AV	54.0	-6.7	2.70 V	269	41.20	6.10
7	10600.00	65.8 PK	74.0	-8.2	2.45 V	258	46.70	19.10
8	10600.00	51.9 AV	54.0	-2.1	2.45 V	258	32.80	19.10
9	15900.00	62.3 PK	74.0	-11.7	1.98 V	196	44.40	17.90
10	15900.00	49.4 AV	54.0	-4.6	1.98 V	196	31.50	17.90

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5320.00	119.2 PK			1.84 H	328	79.50	39.70
2	*5320.00	109.4 AV			1.84 H	328	69.70	39.70
3	5350.00	70.7 PK	74.0	-3.3	1.81 H	339	64.60	6.10
4	5350.00	52.9 AV	54.0	-1.1	1.81 H	339	46.80	6.10
5	10640.00	61.8 PK	74.0	-12.2	1.51 H	237	42.90	18.90
6	10640.00	48.8 AV	54.0	-5.2	1.51 H	237	29.90	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	*5320.00	112.0 PK			3.06 V	257	72.30	39.70
2	*5320.00	101.4 AV			3.06 V	257	61.70	39.70
3	5350.00	59.6 PK	74.0	-14.4	2.90 V	259	53.50	6.10
4	5350.00	46.6 AV	54.0	-7.4	2.90 V	259	40.50	6.10
5	10640.00	61.4 PK	74.0	-12.6	2.45 V	256	42.50	18.90
6	10640.00	48.7 AV	54.0	-5.3	2.45 V	256	29.80	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)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	**#5280.00**	**67.2 PK**	**68.2**	**-1.0**	**1.91 H**	**199**	**61.10**	**6.10**
2	5350.00	55.0 PK	74.0	-19.0	1.67 H	331	48.90	6.10
3	5350.00	52.6 AV	54.0	-1.4	1.67 H	331	46.50	6.10
4	#5470.00	68.8 PK	74.0	-5.2	1.62 H	331	62.40	6.40
5	#5470.00	52.9 AV	54.0	-1.1	1.62 H	331	46.50	6.40
6	*5500.00	118.7 PK			1.59 H	325	78.70	40.00
7	*5500.00	108.7 AV			1.59 H	325	68.70	40.00
8	11000.00	62.1 PK	74.0	-11.9	1.58 H	298	42.50	19.60
9	11000.00	49.1 AV	54.0	-4.9	1.58 H	298	29.50	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	59.0 PK	68.2	-9.2	2.36 V	300	52.90	6.10
2	5360.00	58.4 PK	74.0	-15.6	2.39 V	250	52.30	6.10
3	5360.00	47.0 AV	54.0	-7.0	2.39 V	250	40.90	6.10
4	#5470.00	60.4 PK	74.0	-13.6	2.92 V	241	54.00	6.40
5	#5470.00	46.7 AV	54.0	-7.3	2.92 V	241	40.30	6.40
6	*5500.00	112.6 PK			3.03 V	253	72.60	40.00
7	*5500.00	102.3 AV			3.03 V	253	62.30	40.00
8	11000.00	61.7 PK	74.0	-12.3	1.95 V	189	42.10	19.60
9	11000.00	48.8 AV	54.0	-5.2	1.95 V	189	29.20	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)
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	66.8 PK	68.2	-1.4	1.91 H	194	60.70	6.10
2	5360.00	65.7 PK	74.0	-8.3	1.63 H	328	59.60	6.10
3	5360.00	52.2 AV	54.0	-1.8	1.63 H	328	46.10	6.10
4	*5580.00	116.7 PK			1.58 H	326	76.60	40.10
5	*5580.00	106.3 AV			1.58 H	326	66.20	40.10
6	11600.00	60.6 PK	74.0	-13.4	1.62 H	311	42.10	18.50
7	11600.00	47.7 AV	54.0	-6.3	1.62 H	311	29.20	18.50
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5280.00	58.2 PK	68.2	-10.0	1.00 V	345	52.10	6.10
2	5360.00	59.3 PK	74.0	-14.7	2.48 V	244	53.20	6.10
3	5360.00	46.9 AV	54.0	-7.1	2.48 V	244	40.80	6.10
4	*5580.00	109.7 PK			3.08 V	254	69.60	40.10
5	*5580.00	99.3 AV			3.08 V	254	59.20	40.10
6	11600.00	60.3 PK	74.0	-13.7	1.82 V	190	41.80	18.50
7	11600.00	47.3 AV	54.0	-6.7	1.82 V	190	28.80	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)
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	#5280.00	66.9 PK	68.2	-1.3	1.91 H	195	60.80	6.10
2	5350.00	65.0 PK	74.0	-9.0	1.63 H	330	58.90	6.10
3	5350.00	51.9 AV	54.0	-2.1	1.63 H	330	45.80	6.10
4	*5700.00	115.5 PK			1.91 H	335	75.20	40.30
5	*5700.00	105.4 AV			1.91 H	335	65.10	40.30
6	#5725.00	63.0 PK	74.0	-11.0	1.40 H	336	56.20	6.80
7	#5725.00	48.4 AV	54.0	-5.6	1.40 H	336	41.60	6.80
8	11400.00	60.5 PK	74.0	-13.5	1.58 H	300	42.00	18.50
9	11400.00	47.5 AV	54.0	-6.5	1.58 H	300	29.00	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	#5280.00	58.0 PK	68.2	-10.2	2.30 V	291	51.90	6.10
2	5360.00	58.8 PK	74.0	-15.2	2.38 V	250	52.70	6.10
3	5360.00	47.5 AV	54.0	-6.5	2.38 V	250	41.40	6.10
4	*5700.00	107.4 PK			3.06 V	258	67.10	40.30
5	*5700.00	96.5 AV			3.06 V	258	56.20	40.30
6	#5725.00	57.4 PK	74.0	-16.6	3.04 V	249	50.60	6.80
7	#5725.00	46.1 AV	54.0	-7.9	3.04 V	249	39.30	6.80
8	11400.00	60.1 PK	74.0	-13.9	1.72 V	188	41.60	18.50
9	11400.00	46.9 AV	54.0	-7.1	1.72 V	188	28.40	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)
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	5080.00	63.4 PK	74.0	-10.6	1.70 H	327	57.60	5.80
2	5080.00	50.3 AV	54.0	-3.7	1.70 H	327	44.50	5.80
3	*5260.00	121.9 PK			1.52 H	326	82.20	39.70
4	*5260.00	111.9 AV			1.52 H	326	72.20	39.70
5	5350.00	61.8 PK	74.0	-12.2	1.81 H	322	55.70	6.10
6	5350.00	49.7 AV	54.0	-4.3	1.81 H	322	43.60	6.10
7	#10520.00	64.5 PK	74.0	-9.5	1.60 H	302	45.30	19.20
8	#10520.00	51.4 AV	54.0	-2.6	1.60 H	302	32.20	19.20
9	15780.00	63.1 PK	74.0	-10.9	1.50 H	240	45.00	18.10
10	15780.00	50.1 AV	54.0	-3.9	1.50 H	240	32.00	18.10
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	*5260.00	115.3 PK			3.00 V	267	75.60	39.70
2	*5260.00	104.9 AV			3.00 V	267	65.20	39.70
3	5350.00	60.1 PK	74.0	-13.9	2.89 V	267	54.00	6.10
4	5350.00	36.4 AV	54.0	-17.6	2.89 V	267	30.30	6.10
5	#10520.00	63.1 PK	74.0	-10.9	2.27 V	255	43.90	19.20
6	#10520.00	50.9 AV	54.0	-3.1	2.27 V	255	31.70	19.20
7	15780.00	62.1 PK	74.0	-11.9	1.67 V	191	44.00	18.10
8	15780.00	49.4 AV	54.0	-4.6	1.67 V	191	31.30	18.10

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)
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	5150.00	61.9 PK	74.0	-12.1	1.88 H	327	55.90	6.00
2	5150.00	49.7 AV	54.0	-4.3	1.88 H	327	43.70	6.00
3	*5300.00	121.0 PK			1.60 H	332	81.30	39.70
4	*5300.00	110.6 AV			1.60 H	332	70.90	39.70
5	5350.00	66.0 PK	74.0	-8.0	1.72 H	329	59.90	6.10
6	5350.00	51.5 AV	54.0	-2.5	1.72 H	329	45.40	6.10
7	10600.00	66.0 PK	74.0	-8.0	1.60 H	303	46.90	19.10
8	10600.00	52.1 AV	54.0	-1.9	1.60 H	303	33.00	19.10
9	15900.00	62.7 PK	74.0	-11.3	1.97 H	241	44.80	17.90
10	15900.00	48.8 AV	54.0	-5.2	1.97 H	241	30.90	17.90
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	58.0 PK	74.0	-16.0	2.70 V	250	52.00	6.00
2	5150.00	47.0 AV	54.0	-7.0	2.70 V	250	41.00	6.00
3	*5300.00	114.0 PK			2.95 V	257	74.30	39.70
4	*5300.00	103.6 AV			2.95 V	257	63.90	39.70
5	5350.00	58.4 PK	74.0	-15.6	2.66 V	271	52.30	6.10
6	5350.00	47.1 AV	54.0	-6.9	2.66 V	271	41.00	6.10
7	10600.00	63.4 PK	74.0	-10.6	2.49 V	254	44.30	19.10
8	10600.00	50.4 AV	54.0	-3.6	2.49 V	254	31.30	19.10
9	15900.00	61.3 PK	74.0	-12.7	1.87 V	180	43.40	17.90
10	15900.00	48.4 AV	54.0	-5.6	1.87 V	180	30.50	17.90

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5320.00	119.4 PK			1.59 H	330	79.70	39.70
2	*5320.00	109.3 AV			1.59 H	330	69.60	39.70
3	5350.00	66.5 PK	74.0	-7.5	1.86 H	328	60.40	6.10
4	5350.00	52.7 AV	54.0	-1.3	1.86 H	328	46.60	6.10
5	10640.00	61.7 PK	74.0	-12.3	1.49 H	235	42.80	18.90
6	10640.00	48.6 AV	54.0	-5.4	1.49 H	235	29.70	18.90
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5320.00	112.0 PK			3.05 V	258	72.30	39.70
2	*5320.00	102.0 AV			3.05 V	258	62.30	39.70
3	5350.00	59.3 PK	74.0	-14.7	2.78 V	261	53.20	6.10
4	5350.00	47.0 AV	54.0	-7.0	2.78 V	261	40.90	6.10
5	10640.00	61.4 PK	74.0	-12.6	2.45 V	255	42.50	18.90
6	10640.00	48.4 AV	54.0	-5.6	2.45 V	255	29.50	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)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5280.00	66.5 PK	68.2	-1.7	1.92 H	198	60.40	6.10
2	5350.00	64.2 PK	74.0	-9.8	1.72 H	333	58.10	6.10
3	5350.00	51.6 AV	54.0	-2.4	1.72 H	333	45.50	6.10
4	#5470.00	69.7 PK	74.0	-4.3	1.64 H	329	63.30	6.40
5	#5470.00	52.9 AV	54.0	-1.1	1.64 H	329	46.50	6.40
6	*5500.00	117.2 PK			1.63 H	327	77.20	40.00
7	*5500.00	107.4 AV			1.63 H	327	67.40	40.00
8	11000.00	61.7 PK	74.0	-12.3	1.63 H	312	42.10	19.60
9	11000.00	48.7 AV	54.0	-5.3	1.63 H	312	29.10	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	58.7 PK	68.2	-9.5	2.33 V	244	52.60	6.10
2	5360.00	59.2 PK	74.0	-14.8	2.45 V	256	53.10	6.10
3	5360.00	46.9 AV	54.0	-7.1	2.45 V	256	40.80	6.10
4	#5470.00	60.2 PK	74.0	-13.8	3.02 V	268	53.80	6.40
5	#5470.00	46.4 AV	54.0	-7.6	3.02 V	268	40.00	6.40
6	*5500.00	111.7 PK			3.02 V	270	71.70	40.00
7	*5500.00	101.6 AV			3.02 V	270	61.60	40.00
8	11000.00	62.2 PK	74.0	-11.8	1.99 V	192	42.60	19.60
9	11000.00	48.3 AV	54.0	-5.7	1.99 V	192	28.70	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)
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	66.6 PK	68.2	-1.6	1.95 H	190	60.50	6.10
2	5360.00	66.0 PK	74.0	-8.0	1.68 H	327	59.90	6.10
3	5360.00	52.5 AV	54.0	-1.5	1.68 H	327	46.40	6.10
4	*5580.00	116.0 PK			1.94 H	330	75.90	40.10
5	*5580.00	106.4 AV			1.94 H	330	66.30	40.10
6	11600.00	60.2 PK	74.0	-13.8	1.55 H	321	41.70	18.50
7	11600.00	47.2 AV	54.0	-6.8	1.55 H	321	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	#5280.00	59.0 PK	68.2	-9.2	2.34 V	275	52.90	6.10
2	5360.00	59.1 PK	74.0	-14.9	2.34 V	255	53.00	6.10
3	5360.00	37.0 AV	54.0	-17.0	2.34 V	255	30.90	6.10
4	*5580.00	109.4 PK			2.95 V	253	69.30	40.10
5	*5580.00	99.5 AV			2.95 V	253	59.40	40.10
6	11600.00	59.9 PK	74.0	-14.1	2.01 V	177	41.40	18.50
7	11600.00	46.7 AV	54.0	-7.3	2.01 V	177	28.20	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)
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	#5280.00	66.3 PK	68.2	-1.9	1.98 H	193	60.20	6.10
2	5350.00	64.7 PK	74.0	-9.3	1.66 H	334	58.60	6.10
3	5350.00	52.0 AV	54.0	-2.0	1.66 H	334	45.90	6.10
4	*5700.00	115.1 PK			1.68 H	324	74.80	40.30
5	*5700.00	105.1 AV			1.68 H	324	64.80	40.30
6	#5725.00	61.3 PK	74.0	-12.7	1.86 H	325	54.50	6.80
7	#5725.00	49.6 AV	54.0	-4.4	1.86 H	325	42.80	6.80
8	11400.00	60.5 PK	74.0	-13.5	1.60 H	333	42.00	18.50
9	11400.00	47.4 AV	54.0	-6.6	1.60 H	333	28.90	18.50
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	#5280.00	60.8 PK	68.2	-7.4	2.43 V	283	54.70	6.10
2	5360.00	59.5 PK	74.0	-14.5	2.55 V	246	53.40	6.10
3	5360.00	46.9 AV	54.0	-7.1	2.55 V	246	40.80	6.10
4	*5700.00	108.4 PK			3.00 V	257	68.10	40.30
5	*5700.00	98.0 AV			3.00 V	257	57.70	40.30
6	#5725.00	58.9 PK	74.0	-15.1	3.00 V	257	52.10	6.80
7	#5725.00	46.7 AV	54.0	-7.3	3.00 V	257	39.90	6.80
8	11400.00	59.9 PK	74.0	-14.1	1.98 V	200	41.40	18.50
9	11400.00	46.7 AV	54.0	-7.3	1.98 V	200	28.20	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)
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	*5270.00	118.8 PK			1.75 H	327	79.10	39.70
2	*5270.00	108.1 AV			1.75 H	327	68.40	39.70
3	5350.00	61.7 PK	74.0	-12.3	1.50 H	323	55.60	6.10
4	5350.00	49.3 AV	54.0	-4.7	1.50 H	323	43.20	6.10
5	#10540.00	62.0 PK	74.0	-12.0	1.64 H	300	42.80	19.20
6	#10540.00	48.9 AV	54.0	-5.1	1.64 H	300	29.70	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	*5270.00	111.4 PK			2.98 V	258	71.70	39.70
2	*5270.00	101.2 AV			2.98 V	258	61.50	39.70
3	5350.00	56.7 PK	74.0	-17.3	2.56 V	256	50.60	6.10
4	5350.00	45.6 AV	54.0	-8.4	2.56 V	256	39.50	6.10
5	#10540.00	61.7 PK	74.0	-12.3	2.21 V	256	42.50	19.20
6	#10540.00	48.5 AV	54.0	-5.5	2.21 V	256	29.30	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)
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	111.6 PK			1.75 H	328	71.90	39.70
2	*5310.00	101.4 AV			1.75 H	328	61.70	39.70
3	5350.00	58.4 PK	74.0	-15.6	1.26 H	330	52.30	6.10
4	5350.00	52.9 AV	54.0	-1.1	1.26 H	330	46.80	6.10
5	10620.00	60.9 PK	74.0	-13.1	1.61 H	301	41.90	19.00
6	10620.00	47.8 AV	54.0	-6.2	1.61 H	301	28.80	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	104.6 PK			2.97 V	257	64.90	39.70
2	*5310.00	94.4 AV			2.97 V	257	54.70	39.70
3	5350.00	58.2 PK	74.0	-15.8	2.68 V	258	52.10	6.10
4	5350.00	46.4 AV	54.0	-7.6	2.68 V	258	40.30	6.10
5	10620.00	60.5 PK	74.0	-13.5	2.11 V	250	41.50	19.00
6	10620.00	47.4 AV	54.0	-6.6	2.11 V	250	28.40	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)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.
6. " # ": The radiated frequency is out of the restricted band.

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5350.00	58.9 PK	74.0	-15.1	1.67 H	310	52.80	6.10
2	5350.00	47.7 AV	54.0	-6.3	1.67 H	310	41.60	6.10
3	#5470.00	67.3 PK	74.0	-6.7	1.89 H	329	60.90	6.40
4	#5470.00	52.1 AV	54.0	-1.9	1.89 H	329	45.70	6.40
5	*5510.00	109.1 PK			1.56 H	329	69.10	40.00
6	*5510.00	99.1 AV			1.56 H	329	59.10	40.00
7	11020.00	61.1 PK	74.0	-12.9	1.61 H	310	41.70	19.40
8	11020.00	48.2 AV	54.0	-5.8	1.61 H	310	28.80	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	59.3 PK	74.0	-14.7	2.20 V	255	53.20	6.10
2	5350.00	46.8 AV	54.0	-7.2	2.20 V	255	40.70	6.10
3	#5470.00	63.0 PK	74.0	-11.0	3.03 V	256	56.60	6.40
4	#5470.00	48.9 AV	54.0	-5.1	3.03 V	256	42.50	6.40
5	*5510.00	101.9 PK			3.00 V	268	61.90	40.00
6	*5510.00	92.3 AV			3.00 V	268	52.30	40.00
7	11020.00	60.8 PK	74.0	-13.2	1.95 V	179	41.40	19.40
8	11020.00	47.9 AV	54.0	-6.1	1.95 V	179	28.50	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)
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	#5280.00	66.3 PK	68.2	-1.9	1.84 H	195	60.20	6.10
2	5360.00	62.8 PK	74.0	-11.2	1.85 H	326	56.70	6.10
3	5360.00	51.1 AV	54.0	-2.9	1.85 H	326	45.00	6.10
4	*5550.00	116.6 PK			1.82 H	327	76.50	40.10
5	*5550.00	106.4 AV			1.82 H	327	66.30	40.10
6	11100.00	61.3 PK	74.0	-12.7	1.70 H	313	42.40	18.90
7	11100.00	48.3 AV	54.0	-5.7	1.70 H	313	29.40	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	#5280.00	59.5 PK	68.2	-8.7	2.25 V	241	53.40	6.10
2	5360.00	58.2 PK	74.0	-15.8	2.99 V	266	52.10	6.10
3	5360.00	47.0 AV	54.0	-7.0	2.99 V	266	40.90	6.10
4	*5550.00	108.6 PK			3.02 V	265	68.50	40.10
5	*5550.00	98.6 AV			3.02 V	265	58.50	40.10
6	11100.00	61.1 PK	74.0	-12.9	1.89 V	213	42.20	18.90
7	11100.00	48.0 AV	54.0	-6.0	1.89 V	213	29.10	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)
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	#5280.00	66.0 PK	68.2	-2.2	2.12 H	189	59.90	6.10
2	5360.00	63.3 PK	74.0	-10.7	1.74 H	326	57.20	6.10
3	5360.00	50.5 AV	54.0	-3.5	1.74 H	326	44.40	6.10
4	*5670.00	116.1 PK			1.76 H	188	75.90	40.20
5	*5670.00	105.7 AV			1.76 H	188	65.50	40.20
6	#5725.00	66.6 PK	74.0	-7.4	1.88 H	338	59.80	6.80
7	#5725.00	52.1 AV	54.0	-1.9	1.88 H	338	45.30	6.80
8	11340.00	61.4 PK	74.0	-12.6	1.77 H	320	42.20	19.20
9	11340.00	48.5 AV	54.0	-5.5	1.77 H	320	29.30	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	58.6 PK	68.2	-9.6	2.44 V	255	52.50	6.10
2	5400.00	59.1 PK	74.0	-14.9	2.86 V	255	52.80	6.30
3	5400.00	46.4 AV	54.0	-7.6	2.86 V	255	40.10	6.30
4	*5670.00	107.0 PK			2.93 V	265	66.80	40.20
5	*5670.00	96.9 AV			2.93 V	265	56.70	40.20
6	#5725.00	61.9 PK	74.0	-12.1	2.97 V	265	55.10	6.80
7	#5725.00	48.5 AV	54.0	-5.5	2.97 V	265	41.70	6.80
8	11340.00	61.2 PK	74.0	-12.8	1.89 V	245	42.00	19.20
9	11340.00	48.0 AV	54.0	-6.0	1.89 V	245	28.80	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)
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	105.7 PK			1.82 H	328	66.00	39.70
2	*5290.00	95.9 AV			1.82 H	328	56.20	39.70
3	5350.00	67.2 PK	74.0	-6.8	1.27 H	328	61.10	6.10
4	5350.00	52.6 AV	54.0	-1.4	1.27 H	328	46.50	6.10
5	#10580.00	60.4 PK	74.0	-13.6	1.59 H	302	41.10	19.30
6	#10580.00	47.6 AV	54.0	-6.4	1.59 H	302	28.30	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	97.6 PK			2.99 V	266	57.90	39.70
2	*5290.00	88.2 AV			2.99 V	266	48.50	39.70
3	5350.00	58.0 PK	74.0	-16.0	2.50 V	267	51.90	6.10
4	5350.00	47.0 AV	54.0	-7.0	2.50 V	267	40.90	6.10
5	#10580.00	60.2 PK	74.0	-13.8	2.44 V	270	40.90	19.30
6	#10580.00	47.3 AV	54.0	-6.7	2.44 V	270	28.00	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)
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	5360.00	61.6 PK	74.0	-12.4	1.99 H	189	55.50	6.10
2	5360.00	48.1 AV	54.0	-5.9	1.99 H	189	42.00	6.10
3	#5470.00	68.1 PK	74.0	-5.9	1.69 H	332	61.70	6.40
4	#5470.00	52.6 AV	54.0	-1.4	1.69 H	332	46.20	6.40
5	*5530.00	104.1 PK			1.62 H	333	64.10	40.00
6	*5530.00	103.0 AV			1.62 H	333	63.00	40.00
7	11060.00	60.7 PK	74.0	-13.3	1.55 H	322	41.50	19.20
8	11060.00	47.7 AV	54.0	-6.3	1.55 H	322	28.50	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	5360.00	57.9 PK	74.0	-16.1	2.72 V	249	51.80	6.10
2	5360.00	46.1 AV	54.0	-7.9	2.72 V	249	40.00	6.10
3	#5470.00	58.6 PK	74.0	-15.4	2.81 V	254	52.20	6.40
4	#5470.00	46.6 AV	54.0	-7.4	2.81 V	254	40.20	6.40
5	*5530.00	96.0 PK			3.00 V	277	56.00	40.00
6	*5530.00	86.6 AV			3.00 V	277	46.60	40.00
7	11060.00	60.6 PK	74.0	-13.4	2.03 V	205	41.40	19.20
8	11060.00	47.4 AV	54.0	-6.6	2.03 V	205	28.20	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)
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		
TEST MODE	A		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	39.62	32.2 QP	40.0	-7.8	1.99 H	111	47.20	-15.00
2	49.34	31.1 QP	40.0	-8.9	1.99 H	99	45.50	-14.40
3	111.56	27.3 QP	43.5	-16.2	1.49 H	119	44.60	-17.30
4	500.42	30.5 QP	46.0	-15.5	1.49 H	153	38.90	-8.40
5	624.85	29.7 QP	46.0	-16.3	1.00 H	174	35.30	-5.60
6	875.67	35.5 QP	46.0	-10.5	1.49 H	146	36.60	-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	30.00	30.6 QP	40.0	-9.4	1.01 V	183	46.30	-15.70
2	59.06	28.5 QP	40.0	-11.5	1.01 V	312	43.00	-14.50
3	107.67	24.4 QP	43.5	-19.1	2.00 V	175	42.20	-17.80
4	191.28	22.7 QP	43.5	-20.8	1.01 V	69	39.20	-16.50
5	500.42	30.5 QP	46.0	-15.5	1.01 V	6	38.90	-8.40
6	875.67	34.2 QP	46.0	-11.8	1.50 V	172	35.30	-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)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value

CHANNEL	TX Channel 52	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	30MHz ~ 1GHz		
TEST MODE	B		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	39.62	34.8 QP	40.0	-5.2	2.00 H	86	49.80	-15.00
2	57.12	31.2 QP	40.0	-8.8	2.00 H	299	45.80	-14.60
3	111.56	25.6 QP	43.5	-17.9	1.50 H	256	42.90	-17.30
4	201.00	27.7 QP	43.5	-15.8	2.00 H	149	44.50	-16.80
5	624.85	29.8 QP	46.0	-16.2	1.01 H	160	35.40	-5.60
6	875.67	37.8 QP	46.0	-8.2	1.50 H	140	38.90	-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	29.90	29.2 QP	40.0	-10.8	1.49 V	273	44.90	-15.70
2	49.34	30.1 QP	40.0	-9.9	1.49 V	349	44.50	-14.40
3	193.22	23.5 QP	43.5	-20.0	1.00 V	272	40.20	-16.70
4	374.04	24.7 QP	46.0	-21.3	1.49 V	310	35.70	-11.00
5	667.63	29.7 QP	46.0	-16.3	1.49 V	183	34.70	-5.00
6	875.67	36.4 QP	46.0	-9.6	1.00 V	184	37.50	-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)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value

4.2 Conducted Emission Measurement

4.2.1 Limits of Conducted Emission Measurement

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

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

4.2.2 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Date Of Calibration	Due Date Of Calibration
Test Receiver ROHDE & SCHWARZ	ESCS30	100288	Apr. 27, 2015	Apr. 26, 2016
RF signal cable Woken	5D-FB	Cable-HYCO2-01	Dec. 26, 2014	Dec. 25, 2015
LISN ROHDE & SCHWARZ (EUT)	ESH2-Z5	100100	Dec. 30, 2014	Dec. 29, 2015
LISN ROHDE & SCHWARZ (Peripheral)	ESH3-Z5	100312	Jul. 10, 2014	Jul. 09, 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 2.
3. The VCCI Site Registration No. is C-2047.

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.

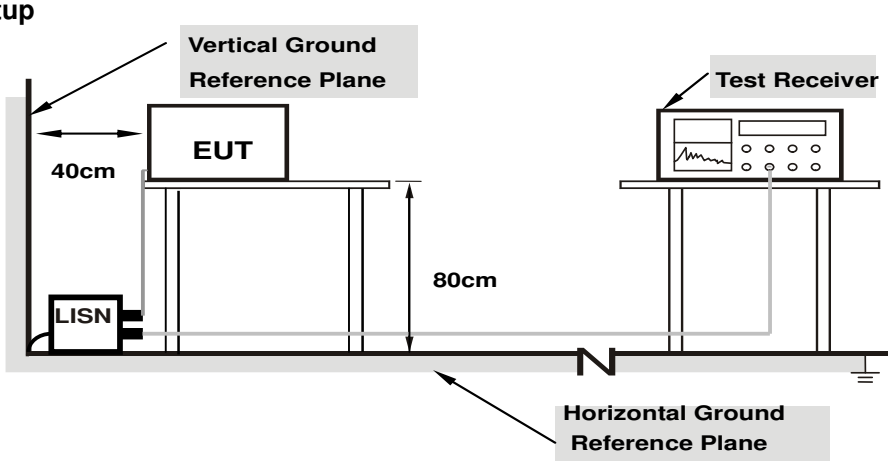
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

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.

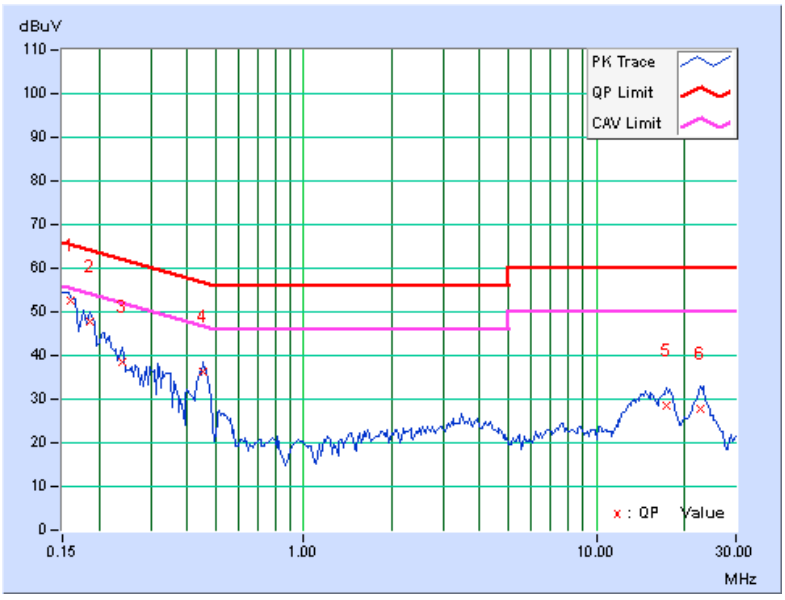
4.2.7 Test Results

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

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	**0.16036**	**0.17**	**52.26**	**43.07**	**52.43**	**43.24**	**65.45**	**55.45**	**-13.02**	**-12.21**
2	0.18516	0.17	47.65	37.90	47.82	38.07	64.25	54.25	-16.43	-16.18
3	0.23984	0.17	38.17	30.20	38.34	30.37	62.10	52.10	-23.76	-21.73
4	0.45469	0.18	36.17	33.03	36.35	33.21	56.79	46.79	-20.43	-13.57
5	17.35938	0.58	28.00	23.10	28.58	23.68	60.00	50.00	-31.42	-26.32
6	22.65234	0.57	27.19	22.43	27.76	23.00	60.00	50.00	-32.24	-27.00

Remarks:

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

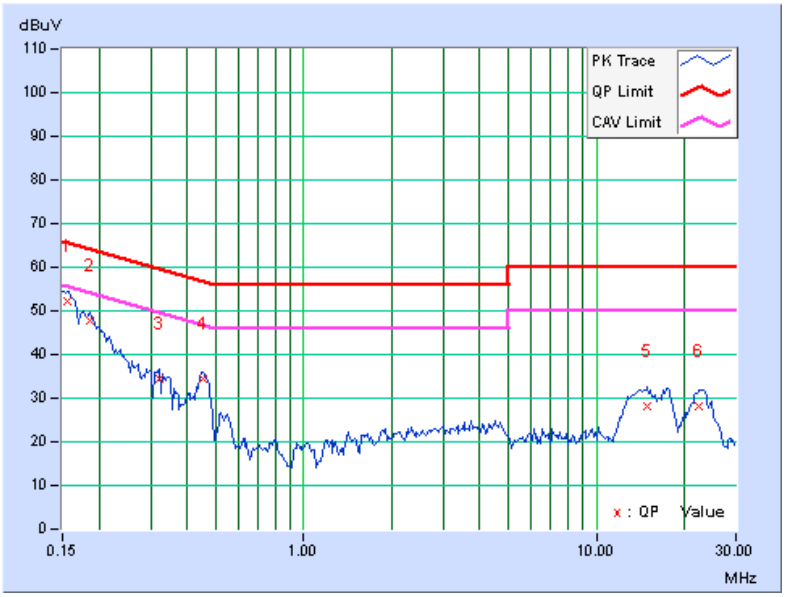


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test mode	A		

No	Freq.	Corr. Factor	Reading Value [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	0.15509	0.18	51.91	42.18	52.09	42.36	65.72	55.72	-13.64	-13.37
2	0.18516	0.18	47.45	37.05	47.63	37.23	64.25	54.25	-16.62	-17.02
3	0.32188	0.19	34.43	27.08	34.62	27.27	59.66	49.66	-25.04	-22.39
4	0.45450	0.20	34.13	30.87	34.33	31.07	56.79	46.79	-22.46	-15.72
5	14.89844	0.65	27.43	22.47	28.08	23.12	60.00	50.00	-31.92	-26.88
6	22.46484	0.73	27.48	22.72	28.21	23.45	60.00	50.00	-31.79	-26.55

Remarks:

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

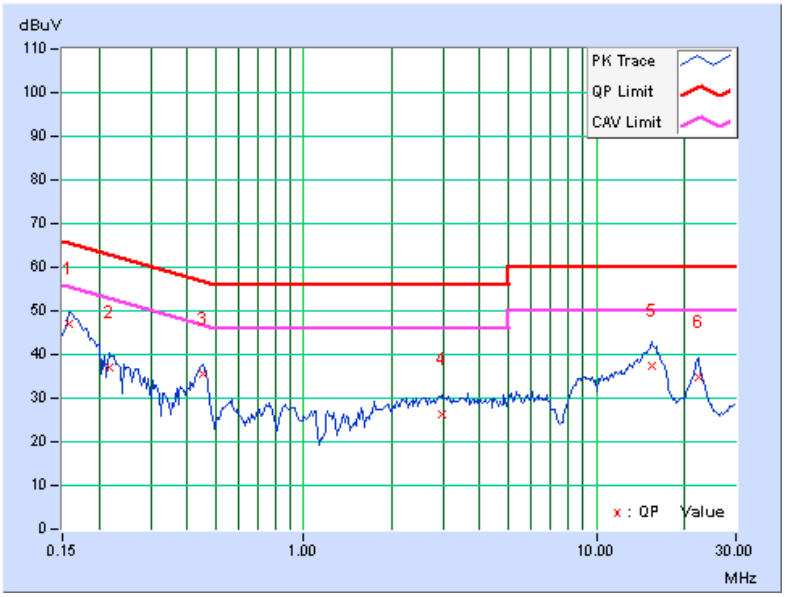


Phase	Line (L)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test mode	B		

No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15781	0.17	47.05	28.23	47.22	28.40	65.58	55.58	-18.36	-27.18
2	0.21641	0.17	37.05	22.17	37.22	22.34	62.96	52.96	-25.73	-30.61
3	0.45078	0.18	35.53	30.53	35.71	30.71	56.86	46.86	-21.15	-16.15
4	2.97266	0.31	26.09	19.03	26.40	19.34	56.00	46.00	-29.60	-26.66
5	15.41797	0.54	36.72	31.54	37.26	32.08	60.00	50.00	-22.74	-17.92
6	22.34766	0.58	34.27	29.30	34.85	29.88	60.00	50.00	-25.15	-20.12

Remarks:

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

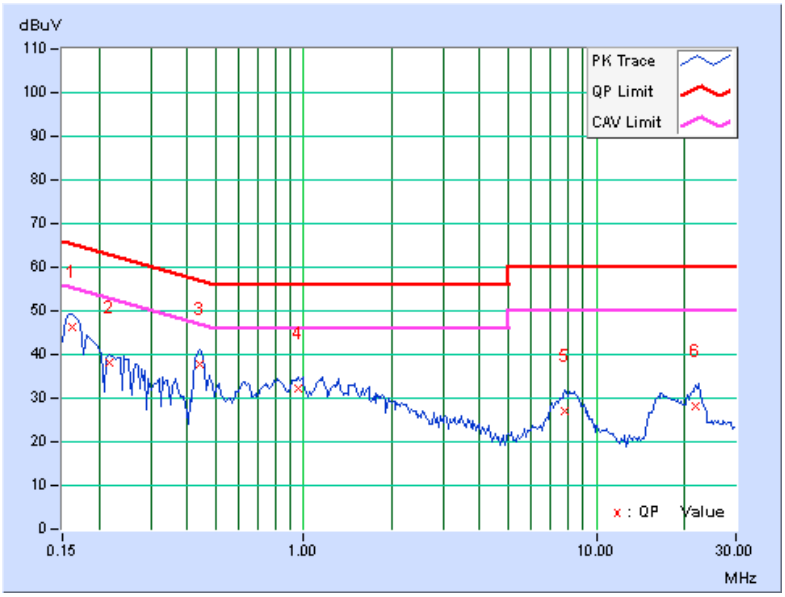


Phase	Neutral (N)	Detector Function	Quasi-Peak (QP) / Average (AV)
Test mode	B		

No	Freq.	Corr. Factor	Reading Value [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	0.16172	0.18	46.16	31.00	46.34	31.18	65.38	55.38	-19.04	-24.20
2	0.21641	0.18	37.83	23.13	38.01	23.31	62.96	52.96	-24.94	-29.64
3	0.44025	0.20	37.75	29.78	37.95	29.98	57.06	47.06	-19.10	-17.07
4	0.95859	0.24	31.80	26.33	32.04	26.57	56.00	46.00	-23.96	-19.43
5	7.78906	0.47	26.74	21.30	27.21	21.77	60.00	50.00	-32.79	-28.23
6	21.75391	0.75	27.22	21.20	27.97	21.95	60.00	50.00	-32.03	-28.05

Remarks:

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



4.3 Transmit Power Measurment

4.3.1 Limits of Transmit Power Measurement

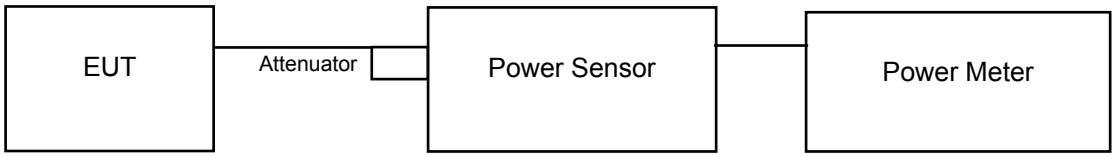
Operation Band	EUT Category		LIMIT
U-NII-1	---	Outdoor Access Point	1 Watt (30 dBm) (Max. e.i.r.p ≦ 125mW(21 dBm) at any elevation angle above 30 degrees as measured from the horizon)
	---	Fixed point-to-point Access Point	1 Watt (30 dBm)
	---	Indoor Access Point	1 Watt (30 dBm)
	---	Mobile and Portable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

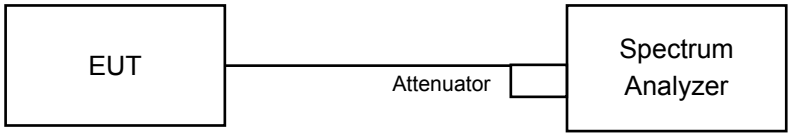
Per KDB 662911 Method of conducted output power measurement on IEEE 802.11 devices,
Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \leq 4$;
Array Gain = 0 dB (i.e., no array gain) for channel widths ≥ 40 MHz for any N_{ANT};
Array Gain = 5 log(N_{ANT}/N_{SS}) dB or 3 dB, whichever is less for 20-MHz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

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

b. Set sweep trigger to “free run”.

c. Set RBW = 1 MHz.

d. Set VBW ≥ 3 MHz

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

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

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

h. Detector = RMS.

i. Trace mode = max hold.

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

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	17.23	17.54	17.11	161.003	22.07	24.00	Pass
60	5300	17.12	17.03	16.92	151.193	21.80	24.00	Pass
64	5320	17.44	16.36	17.35	153.039	21.85	24.00	Pass
100	5500	16.49	16.37	16.02	127.911	21.07	24.00	Pass
116	5580	14.78	15.18	14.99	94.572	19.76	24.00	Pass
140	5700	14.86	15.04	14.59	91.309	19.61	24.00	Pass

Note:
Chain 0
1. 11dBm + 10log (26.74) = 25.27 > 24dBm
2. 11dBm + 10log (30.94) = 25.91 > 24dBm
3. 11dBm + 10log (36.95) = 26.68 > 24dBm
4. 11dBm + 10log (32.10) = 26.07 > 24dBm
5. 11dBm + 10log (24.66) = 24.92 > 24dBm
6. 11dBm + 10log (23.63) = 24.73 > 24dBm

Chain 1
1. 11dBm + 10log (27.45) = 25.39 > 24dBm
2. 11dBm + 10log (35.15) = 26.46 > 24dBm
3. 11dBm + 10log (36.47) = 26.62 > 24dBm
4. 11dBm + 10log (31.58) = 25.99 > 24dBm
5. 11dBm + 10log (23.97) = 24.80 > 24dBm
6. 11dBm + 10log (23.42) = 24.70 > 24dBm

Chain 2
1. 11dBm + 10log (29.12) = 25.64 > 24dBm
2. 11dBm + 10log (25.63) = 25.09 > 24dBm
3. 11dBm + 10log (26.67) = 25.26 > 24dBm
4. 11dBm + 10log (24.09) = 24.82 > 24dBm
5. 11dBm + 10log (22.89) = 24.60 > 24dBm
6. 11dBm + 10log (23.14) = 24.64 > 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	17.32	17.28	16.83	155.602	21.92	24.00	Pass
60	5300	17.54	17.02	16.23	149.080	21.73	24.00	Pass
64	5320	17.43	16.53	17.32	154.264	21.88	24.00	Pass
100	5500	16.51	16.23	16.12	127.673	21.06	24.00	Pass
116	5580	14.78	15.11	15.05	94.484	19.75	24.00	Pass
140	5700	14.73	14.97	14.66	90.364	19.56	24.00	Pass

Note:
Chain 0
1. 11dBm + 10log (38.45) = 26.85 > 24dBm
2. 11dBm + 10log (41.20) = 27.15 > 24dBm
3. 11dBm + 10log (39.98) = 27.02 > 24dBm
4. 11dBm + 10log (31.53) = 25.99 > 24dBm
5. 11dBm + 10log (25.47) = 25.06 > 24dBm
6. 11dBm + 10log (24.73) = 24.93 > 24dBm

Chain 1
1. 11dBm + 10log (29.67) = 25.72 > 24dBm
2. 11dBm + 10log (29.33) = 25.67 > 24dBm
3. 11dBm + 10log (28.37) = 25.53 > 24dBm
4. 11dBm + 10log (24.99) = 24.98 > 24dBm
5. 11dBm + 10log (25.17) = 25.01 > 24dBm
6. 11dBm + 10log (24.99) = 24.98 > 24dBm

Chain 2
1. 11dBm + 10log (33.63) = 26.27 > 24dBm
2. 11dBm + 10log (29.56) = 25.71 > 24dBm
3. 11dBm + 10log (29.36) = 25.68 > 24dBm
4. 11dBm + 10log (25.05) = 24.99 > 24dBm
5. 11dBm + 10log (24.71) = 24.93 > 24dBm
6. 11dBm + 10log (25.16) = 25.01 > 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	18.19	18.84	19.24	**226.423**	23.55	24.00	Pass
62	5310	13.14	11.25	11.44	47.873	16.80	24.00	Pass
102	5510	10.49	10.26	10.32	32.576	15.13	24.00	Pass
110	5550	17.68	18.23	17.89	**186.659**	22.71	24.00	Pass
134	5670	17.57	17.64	17.68	173.838	22.40	24.00	Pass

Note:
Chain 0
1. 11dBm + 10log (91.43) = 30.61 > 24dBm
2. 11dBm + 10log (48.68) = 27.87 > 24dBm
3. 11dBm + 10log (59.13) = 28.72 > 24dBm
4. 11dBm + 10log (84.91) = 30.29 > 24dBm
5. 11dBm + 10log (73.48) = 29.66 > 24dBm

Chain 1
1. 11dBm + 10log (81.70) = 30.12 > 24dBm
2. 11dBm + 10log (46.57) = 27.68 > 24dBm
3. 11dBm + 10log (47.02) = 27.72 > 24dBm
4. 11dBm + 10log (71.95) = 29.57 > 24dBm
5. 11dBm + 10log (66.17) = 29.21 > 24dBm

Chain 2
1. 11dBm + 10log (81.67) = 30.12 > 24dBm
2. 11dBm + 10log (46.04) = 27.63 > 24dBm
3. 11dBm + 10log (49.25) = 27.92 > 24dBm
4. 11dBm + 10log (70.19) = 29.46 > 24dBm
5. 11dBm + 10log (65.59) = 29.17 > 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	10.10	8.35	8.55	24.233	13.84	24.00	Pass
106	5530	7.05	7.02	7.03	15.152	11.80	24.00	Pass

Note:
Chain 0
1. 11dBm + 10log (89.13) = 30.50 > 24dBm
2. 11dBm + 10log (88.12) = 30.45 > 24dBm

Chain 1
1. 11dBm + 10log (87.85) = 30.44 > 24dBm
2. 11dBm + 10log (89.30) = 30.51 > 24dBm

Chain 2
1. 11dBm + 10log (86.86) = 30.39 > 24dBm
2. 11dBm + 10log (87.68) = 30.43 > 24dBm

26dB Bandwidth:

802.11a

Channel	Channel Frequency (MHz)	26dBc Bandwidth (MHz)			Pass / Fail
		Chain 0	Chain 1	Chain 2	
52	5260	26.74	27.45	29.12	Pass
60	5300	30.94	35.15	25.63	Pass
64	5320	36.95	36.47	26.67	Pass
100	5500	32.10	31.58	24.09	Pass
116	5580	24.66	23.97	22.89	Pass
140	5700	23.63	23.42	23.14	Pass

802.11n (HT20)

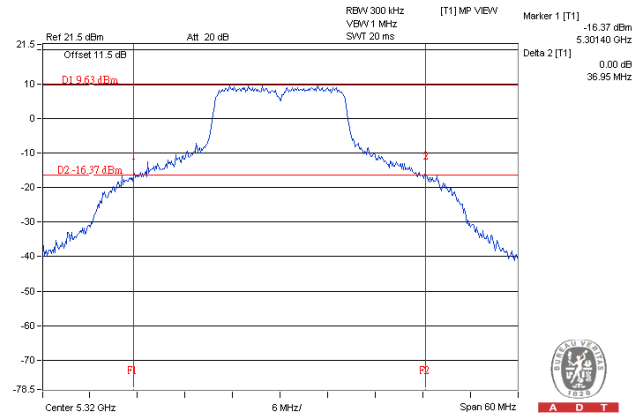
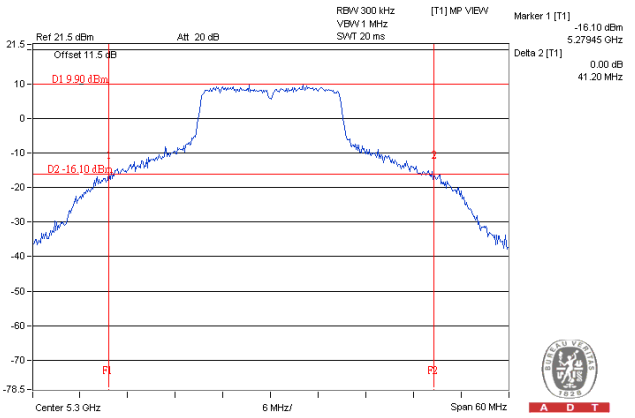
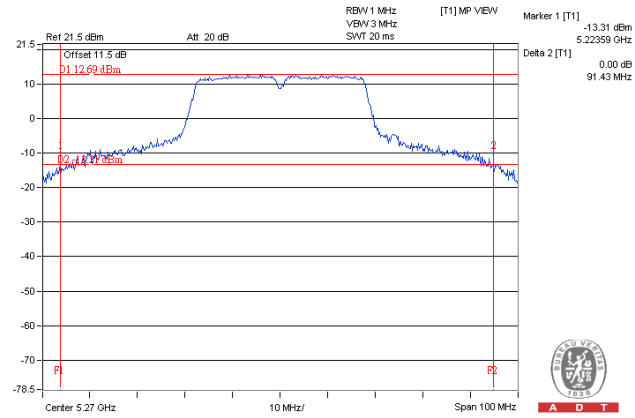
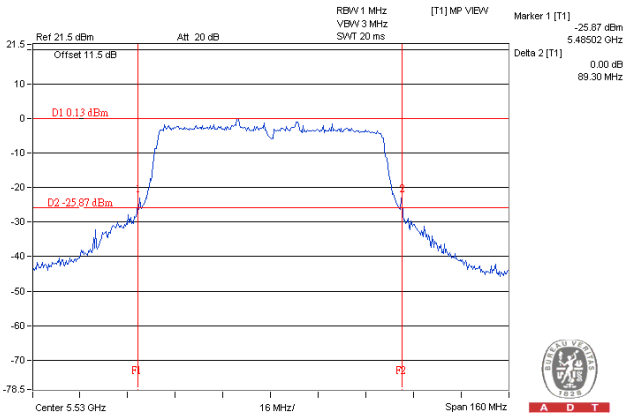
Channel	Channel Frequency (MHz)	26dBc Bandwidth (MHz)			Pass / Fail
		Chain 0	Chain 1	Chain 2	
52	5260	38.45	29.67	33.63	Pass
60	5300	41.20	29.33	29.56	Pass
64	5320	39.98	28.37	29.36	Pass
100	5500	31.53	24.99	25.05	Pass
116	5580	25.47	25.17	24.71	Pass
140	5700	24.73	24.99	25.16	Pass

802.11n (HT40)

Channel	Channel Frequency (MHz)	26dBc Bandwidth (MHz)			Pass / Fail
		Chain 0	Chain 1	Chain 2	
54	5270	91.43	81.70	81.67	Pass
62	5310	48.68	46.57	46.04	Pass
102	5510	59.13	47.02	49.25	Pass
110	5550	84.91	71.95	70.19	Pass
134	5670	73.48	66.17	65.59	Pass

802.11ac (VHT80)

Channel	Channel Frequency (MHz)	26dBc Bandwidth (MHz)			Pass / Fail
		Chain 0	Chain 1	Chain 2	
58	5290	89.13	87.85	86.86	Pass
106	5530	88.12	89.30	87.68	Pass

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

Occupied Bandwidth:

802.11a

Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)		
		Chain 0	Chain 1	Chain 2
52	5260	17.04	17.16	17.16
60	5300	17.40	18.48	17.04
64	5320	19.32	19.56	16.92
100	5500	17.52	17.52	16.92
116	5580	16.92	16.92	16.68
140	5700	16.92	16.92	16.80

802.11n (HT20)

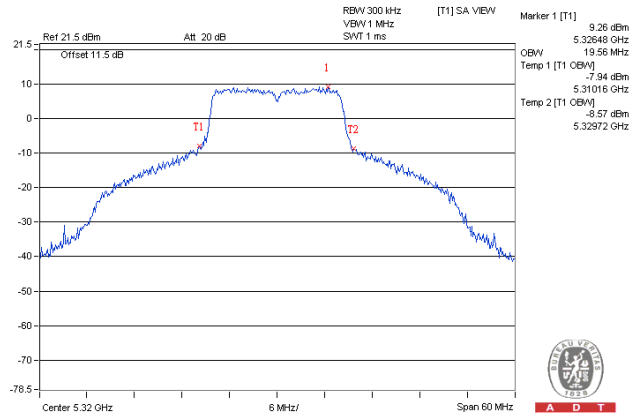
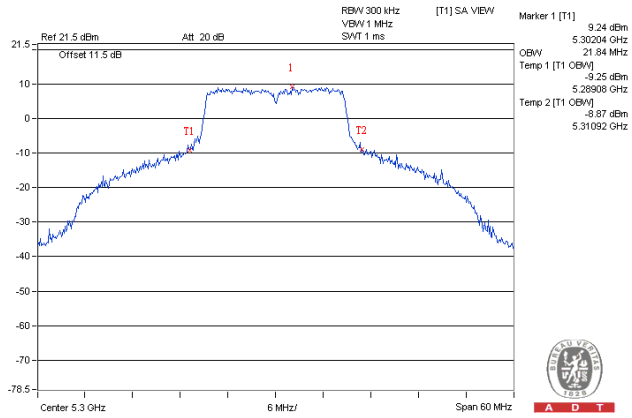
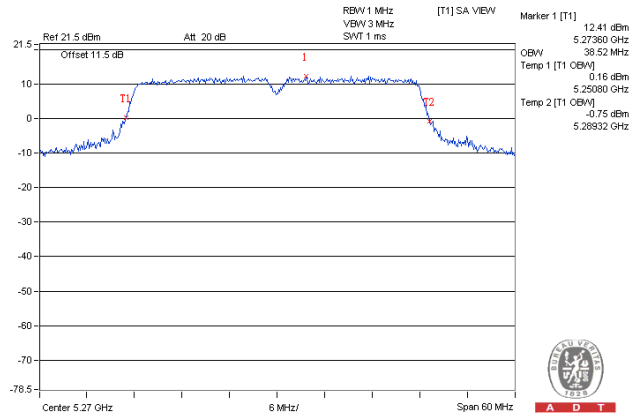
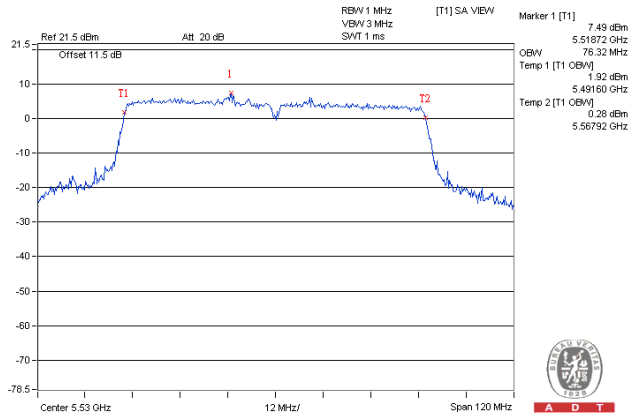
Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)		
		Chain 0	Chain 1	Chain 2
52	5260	19.92	18.24	18.36
60	5300	21.84	18.36	18.36
64	5320	20.16	18.12	18.12
100	5500	18.48	18.00	18.00
116	5580	18.00	18.12	17.88
140	5700	17.88	17.88	17.88

802.11n (HT40)

Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)		
		Chain 0	Chain 1	Chain 2
54	5270	38.52	37.80	37.92
62	5310	37.20	37.08	37.08
102	5510	37.44	37.08	36.96
110	5550	37.92	37.44	37.44
134	5670	37.56	37.56	37.20

802.11ac (VHT80)

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

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	161.003	22.07
5470~5725	127.911	21.07

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	155.602	21.92
5470~5725	127.673	21.06

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	226.423	23.55
5470~5725	186.659	22.71

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	24.233	13.84
5470~5725	15.152	11.80

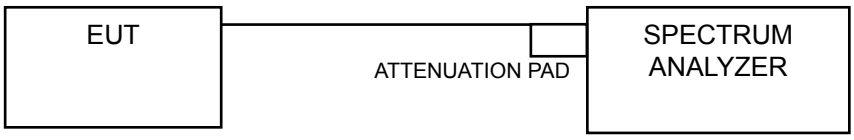
Note: Manufacturer provides Transmit Power Control description to meet this requirement.

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

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

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

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

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

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

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

Chan.	Freq. (MHz)	PSD (dBm)			Total PSD w/o duty factor (dBm)	Duty factor	Total PSD with duty factor (dBm)	Max. Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2					
52	5260	4.35	4.30	3.87	8.95	0.17	9.12	9.56	Pass
60	5300	4.39	4.49	3.28	8.86	0.17	9.03	9.56	Pass
64	5320	4.44	4.40	3.53	8.91	0.17	9.08	9.56	Pass
100	5500	2.79	2.92	2.46	7.50	0.17	7.67	9.56	Pass
116	5580	1.43	1.67	1.61	6.34	0.17	6.51	9.56	Pass
140	5700	1.08	1.12	1.27	5.93	0.17	6.10	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)

Chan.	Freq. (MHz)	PSD (dBm)			Total PSD w/o duty factor (dBm)	Duty factor	Total PSD with duty factor (dBm)	Max. Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2					
52	5260	4.12	3.32	4.09	8.63	0.28	8.91	9.56	Pass
60	5300	4.69	3.77	3.63	8.83	0.28	9.11	9.56	Pass
64	5320	4.32	3.78	3.23	8.57	0.28	8.85	9.56	Pass
100	5500	2.53	2.17	2.07	7.03	0.28	7.31	9.56	Pass
116	5580	1.23	1.50	1.51	6.18	0.28	6.46	9.56	Pass
140	5700	0.71	0.93	0.78	5.58	0.28	5.86	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)

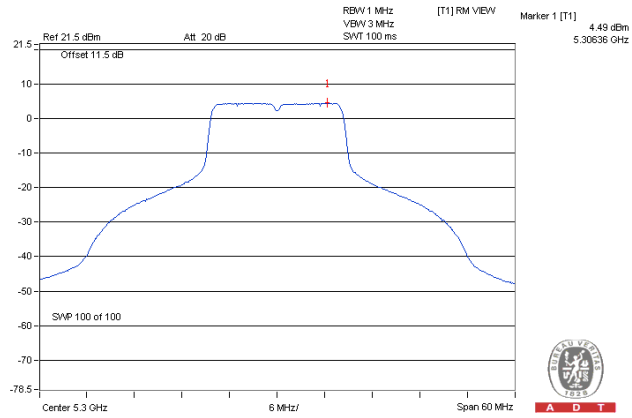
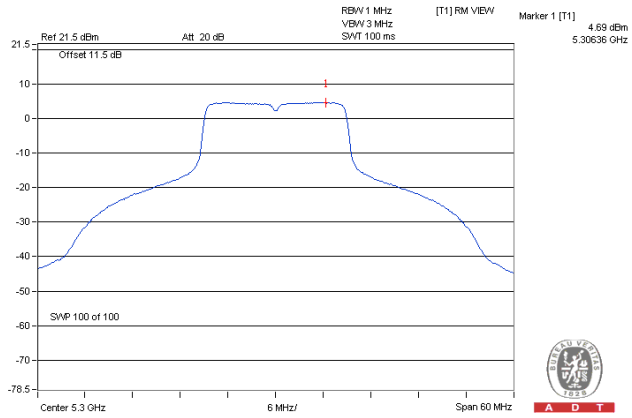
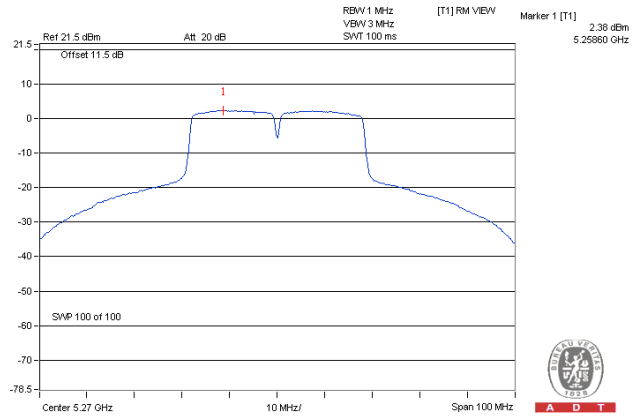
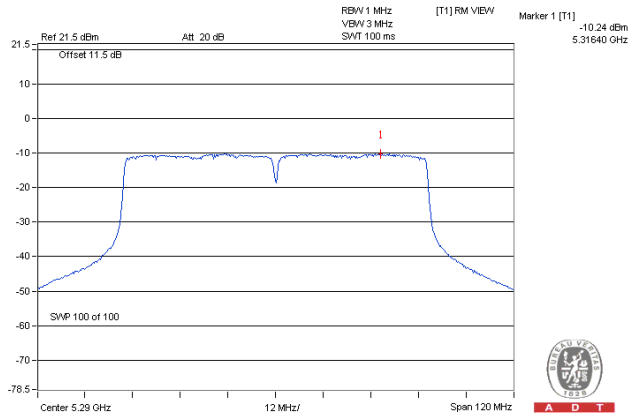
Chan.	Freq. (MHz)	PSD (dBm)			Total PSD w/o duty factor (dBm)	Duty factor	Total PSD with duty factor (dBm)	Max. Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2					
54	5270	1.73	2.12	2.38	6.86	0.33	7.19	9.56	Pass
62	5310	-3.79	-5.47	-5.34	-0.02	0.33	0.31	9.56	Pass
102	5510	-6.45	-6.70	-1.25	0.76	0.33	1.09	9.56	Pass
110	5550	0.63	1.47	1.09	5.85	0.33	6.18	9.56	Pass
134	5670	0.62	0.69	0.72	5.45	0.33	5.78	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)

Chan.	Freq. (MHz)	PSD (dBm)			Total PSD w/o duty factor (dBm)	Duty factor	Total PSD with duty factor (dBm)	Max. Limit (dBm)	Pass / Fail
		Chain 0	Chain 1	Chain 2					
58	5290	-10.24	-11.83	-11.25	-6.29	0.60	-5.69	9.56	Pass
106	5530	-13.14	-13.22	-13.29	-8.45	0.60	-7.85	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.

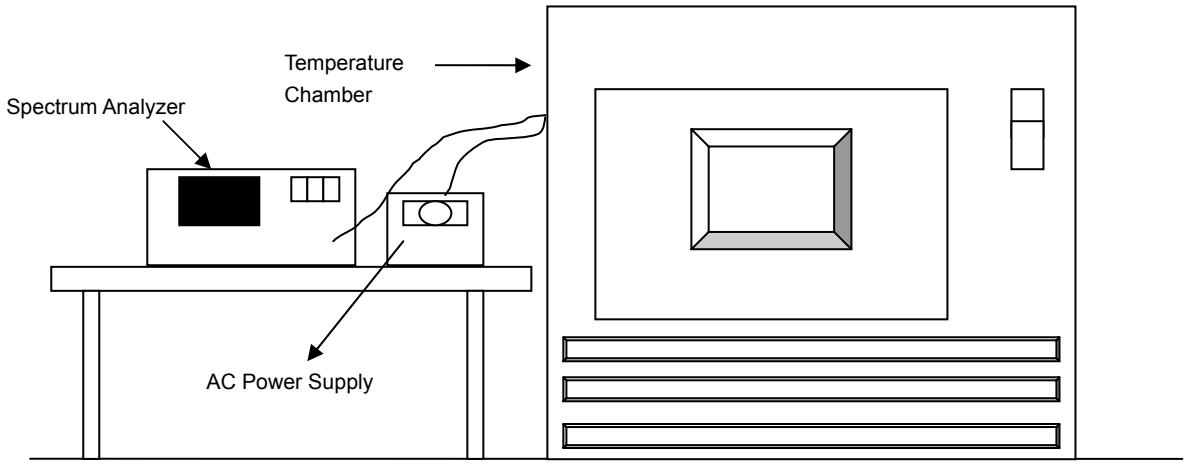
Spectrum Plot of Worst Value	
802.11a	802.11n (HT20)
	
802.11n (HT40)	802.11ac (VHT80)
	

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 (%)
40	120	5260.0169	0.00032	5260.0159	0.00030	5260.0135	0.00026	5260.0140	0.00027
30	120	5260.0133	0.00025	5260.0131	0.00025	5260.0134	0.00025	5260.0135	0.00026
20	120	5259.9999	0.00000	5260.0032	0.00006	5260.0005	0.00001	5259.9982	-0.00003
10	120	5260.0170	0.00032	5260.0159	0.00030	5260.0143	0.00027	5260.0151	0.00029
0	120	5259.9767	-0.00044	5259.9789	-0.00040	5259.9803	-0.00037	5259.9769	-0.00044

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	5260.0004	0.00001	5260.0026	0.00005	5260.0002	0.00000	5259.9976	-0.00005
	120	5259.9999	0.00000	5260.0032	0.00006	5260.0005	0.00001	5259.9982	-0.00003
	102	5260.0000	0.00000	5260.0034	0.00006	5260.0001	0.00000	5259.999	-0.00002

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

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