FCC TEST REPORT
(15.407)

REPORT NO.:	RF140910C20A
MODEL NO.:	APL27-0B1
FCC ID:	E2K-APL270B1
RECEIVED:	Sep. 10, 2014
TESTED:	Sep. 15 ~ Sep. 30, 2014
ISSUED:	Oct. 22, 2014

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 Tsuen, Kwei Shan Hsiang, Taoyuan Hsien 333, Taiwan, R.O.C.

This report should not be used by the client to claim product certification, approval, or endorsement by TAF or any government agencies.

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RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF140910C20A	Original release	Oct. 22, 2014

1. CERTIFICATION

PRODUCT:	Wireless Access Point
MODEL:	APL27-0B1
BRAND:	Dell, Dell Sonicwall, Sonicwall
APPLICANT:	Dell Inc.
TESTED:	Sep. 15 ~ Sep. 30, 2014
TEST SAMPLE:	ENGINEERING SAMPLE
STANDARDS:	**FCC Part 15, Subpart E (Section 15.407)**
	ANSI C63.10-2009

The above equipment (model: APL27-0B1) 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 :** Oct. 22, 2014
Pettie Chen / Senior Specialist

APPROVED BY : _____ **, DATE :** Oct. 22, 2014
Ken Liu / Senior Manager

2. SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

47 CFR FCC Part 15, Subpart E (SECTION 15.407 Under Old Rule)			
FCC Clause	**Test Item**	**Result**	**Remarks**
15.407(b)(6)	AC Power Conducted Emission	PASS	Meet the requirement of limit. Minimum passing margin is -2.24dB at 28.55078MHz.
15.407(b/1/2/3) (b)(6)	Radiated Emissions	PASS	Meet the requirement of limit. Minimum passing margin is -1.0dB at 5470.00, 5725.00MHz.
15.407(a/1/2)	Max Average Transmit Power	PASS	Meet the requirement of limit.
15.407(a)(6)	Peak Power Excursion	PASS	Meet the requirement of limit.
15.407(a/1/2)	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 IPEX not a standard connector.

2.1 MEASUREMENT UNCERTAINTY

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

MEASUREMENT	FREQUENCY	UNCERTAINTY
Conducted emissions	9kHz~30MHz	2.44 dB
Radiated emissions	30MHz ~ 200MHz	3.86 dB
	200MHz ~1000MHz	3.87 dB
	1GHz ~ 18GHz	2.29 dB
	18GHz ~ 40GHz	2.29 dB

This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k = 2.

3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

EUT	Wireless Access Point
MODEL NO.	APL27-0B1
POWER SUPPLY	52Vdc from PoE
MODULATION TYPE	256QAM, 64QAM, 16QAM, QPSK, BPSK
MODULATION TECHNOLOGY	OFDM
TRANSFER RATE	802.11a: 54/48/36/24/18/12/9/6Mbps 802.11n: up to 450Mbps 802.11ac: up to 1299.9Mbps
OPERATING FREQUENCY	5260 ~ 5320MHz, 5500 ~ 5700MHz
NUMBER OF CHANNEL	5260 ~ 5320MHz: 4 for 802.11a, 802.11n (20MHz), 802.11ac (20MHz) 2 for 802.11n (40MHz), 802.11ac (40MHz) 1 for 802.11ac (80MHz) 5500 ~ 5700MHz: 8 for 802.11a, 802.11n (20MHz), 802.11ac (20MHz) 3 for 802.11n (40MHz), 802.11ac (40MHz) 1 for 802.11ac (80MHz)
OUTPUT POWER	5260 ~ 5320MHz: 47.726mW 5500 ~ 5700MHz: 212.823mW
ANTENNA TYPE	Refer to Note
ANTENNA CONNECTOR	IPEX
DATA CABLE	NA
I/O PORTS	Refer to user's manual
ACCESSORY DEVICES	NA

NOTE:

1. This report is prepared for FCC class II permissive change. This report is issued as a supplementary report of BV ADT report no.: RF140910C20-1. Difference compared with the original report is adding 5260~5320MHz and 5500~5700MHz band. Therefore, the EUT was re-tested and presented in the test report.

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

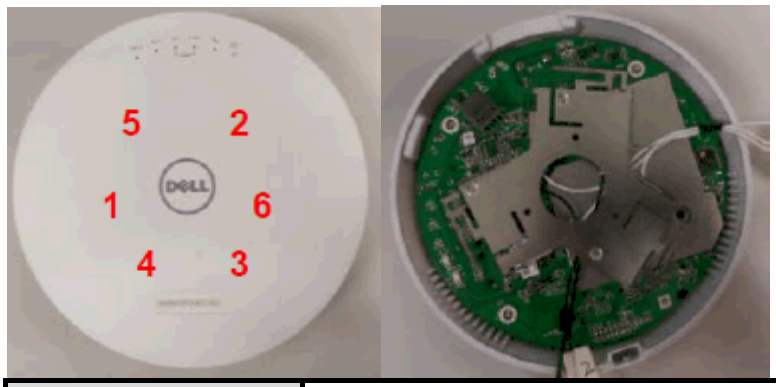
MODULATION MODE	TX FUNCTION
802.11a	3TX
802.11n (20MHz)	3TX
802.11n (40MHz)	3TX
802.11ac (20MHz)	3TX
802.11ac (40MHz)	3TX
802.11ac (80MHz)	3TX

*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 PoE. (Support units only)

PoE	
Model:	PE911
Input:	100~240Vac, 50/60Hz
Output:	52Vdc, 0.5A
Power Cord:	1m non-shielded cable without core

4. The following antennas were provided to the EUT.



Ant. Type			PIFA antenna								
Ant. Gain(dBi)	Frequency (MHz)										
	2400	2450	2500	5150	5250	5350	5450	5550	5650	5750	5850
Ant 1	2.87	2.84	3.88	-	-	-	-	-	-	-	-
Ant 2	2.33	2.49	4.29	-	-	-	-	-	-	-	-
Ant 3	2.92	2.85	3.73	-	-	-	-	-	-	-	-
Ant 4	-	-	-	5.41	5.25	5.89	5.71	6.09	5.89	5.83	5.57
Ant 5	-	-	-	5.78	5.66	5.97	6.13	5.66	5.94	5.01	5.18
Ant 6	-	-	-	5.94	5.76	6.04	5.35	4.94	5.14	5.13	5.51

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

3.2 DESCRIPTION OF TEST MODES

FOR 5260 ~ 5320MHz

4 channels are provided for 802.11a, 802.11n (20MHz), 802.11ac (20MHz):

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
52	5260 MHz	60	5300 MHz
56	5280 MHz	64	5320 MHz

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

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
54	5270 MHz	62	5310 MHz

1 channel is provided for 802.11ac (80MHz):

CHANNEL	FREQUENCY
58	5290MHz

FOR 5500 ~ 5700MHz

8 channels are provided for 802.11a, 802.11n (20MHz), 802.11ac (20MHz):

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 (40MHz), 802.11ac (40MHz):

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
102	5510 MHz	134	5670 MHz
110	5550 MHz		

1 channel is provided for 802.11ac (80MHz):

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 **RE<1G:** Radiated Emission below 1GHz
PLC: Power Line Conducted Emission **APCM:** Antenna Port Conducted Measurement

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

RADIATED EMISSION TEST (ABOVE 1GHz):

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

EUT CONFIGURE MODE	MODE	FREQ. BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
-	802.11a	5260-5320	52 to 64	52, 60, 64	OFDM	BPSK	6.0
-	802.11n (20MHz)		52 to 64	52, 60, 64	OFDM	BPSK	7.2
-	802.11n (40MHz)		54 to 62	54, 62	OFDM	BPSK	15.0
-	802.11ac (80MHz)		58	58	OFDM	BPSK	97.5
-	802.11a	5500-5700	100 to 140	100, 116, 140	OFDM	BPSK	6.0
-	802.11n (20MHz)		100 to 140	100, 116, 140	OFDM	BPSK	7.2
-	802.11n (40MHz)		102 to 134	102, 110, 134	OFDM	BPSK	15.0
-	802.11ac (80MHz)		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	5180-5700	36 to 140	60	OFDM	BPSK	6.0

POWER LINE CONDUCTED EMISSION TEST:

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

EUT CONFIGURE MODE	MODE	FREQ. BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
-	802.11a	5180-5700	36 to 140	60	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 (20MHz)		52 to 64	52, 60, 64	OFDM	BPSK	7.2
-	802.11n (40MHz)		54 to 62	54, 62	OFDM	BPSK	15.0
-	802.11ac (80MHz)		58	58	OFDM	BPSK	97.5
-	802.11a	5500-5700	100 to 140	100, 116, 140	OFDM	BPSK	6.0
-	802.11n (20MHz)		100 to 140	100, 116, 140	OFDM	BPSK	7.2
-	802.11n (40MHz)		102 to 134	102, 110, 134	OFDM	BPSK	15.0
-	802.11ac (80MHz)		106	106	OFDM	BPSK	97.5

TEST CONDITION:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER (SYSTEM)	TESTED BY
RE≥1G	26deg. C, 64%RH	120Vac, 60Hz	Alan Wu
RE<1G	25deg. C, 65%RH	120Vac, 60Hz	Chris Lin
PLC	23deg. C, 74%RH	120Vac, 60Hz	Brad Tung
APCM	24deg. C, 64%RH	120Vac, 60Hz	Match Tsui

3.3 DUTY CYCLE OF TEST SIGNAL

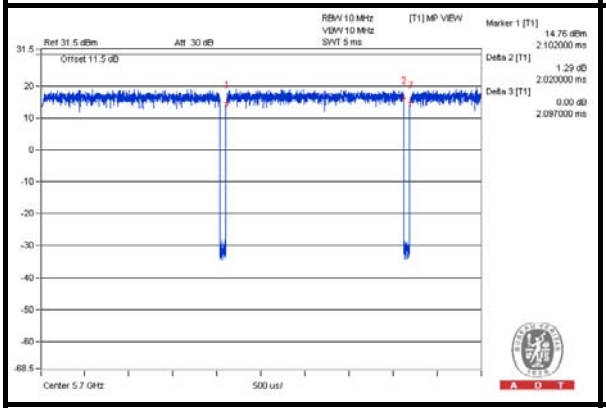
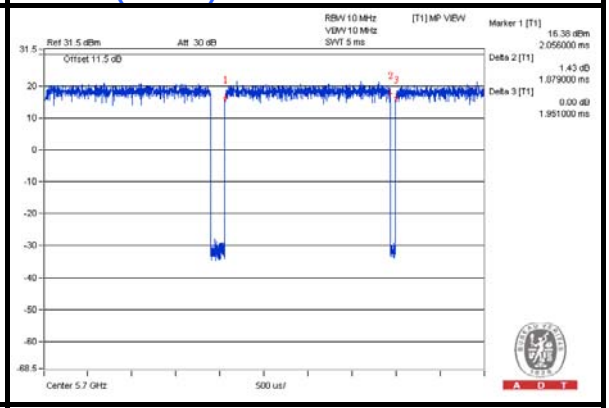
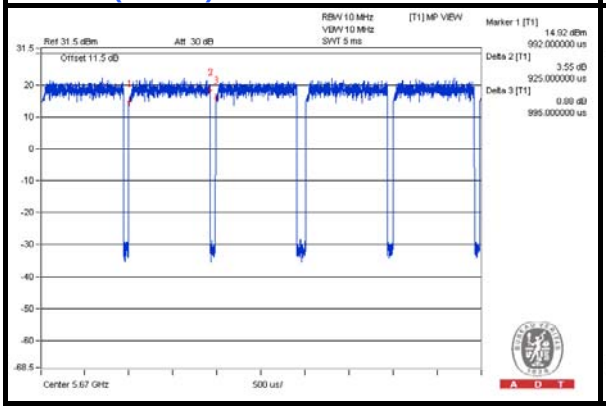
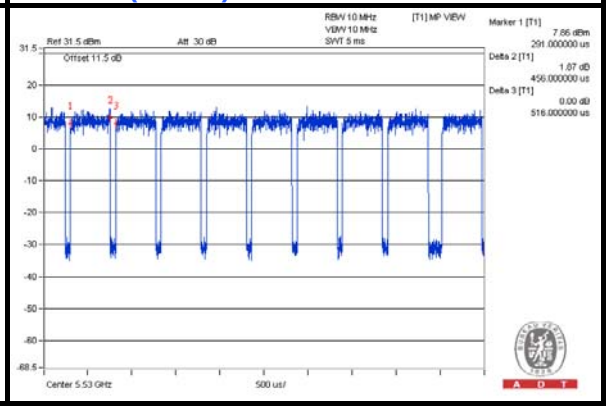
MODULATION TYPE: BPSK

802.11a: Duty cycle = 2.02/2.097 = 0.963, Duty factor = 10 * log(1/0.963) = 0.16

802.11n (20MHz): Duty cycle = 1.879/1.951 = 0.963, Duty factor = 10 * log(1/0.963) = 0.16

802.11n (40MHz): Duty cycle = 0.925/0.995 = 0.93, Duty factor = 10 * log(1/0.93) = 0.32

802.11ac (80MHz): Duty cycle = 0.456/0.516 = 0.884, Duty factor = 10 * log(1/0.884) = 0.54

802.11a	802.11n (20MHz)
	
802.11n (40MHz)	**802.11ac (80MHz)**
	

MODULATION TYPE: QPSK

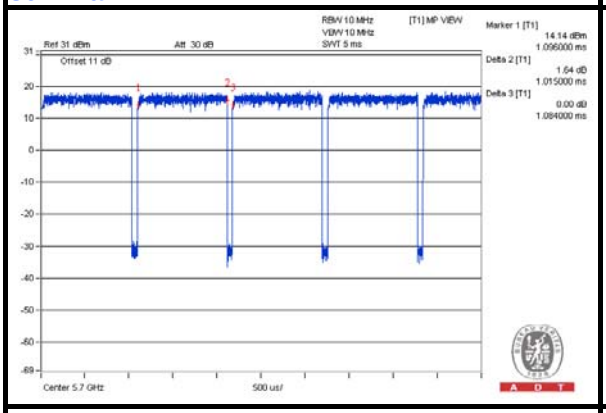
802.11a: Duty cycle = 1.015/1.084 = 0.936, Duty factor = 10 * log(1/0.936) = 0.29

802.11n (20MHz): Duty cycle = 0.956/1.043 = 0.917, Duty factor = 10 * log(1/0.917) = 0.38

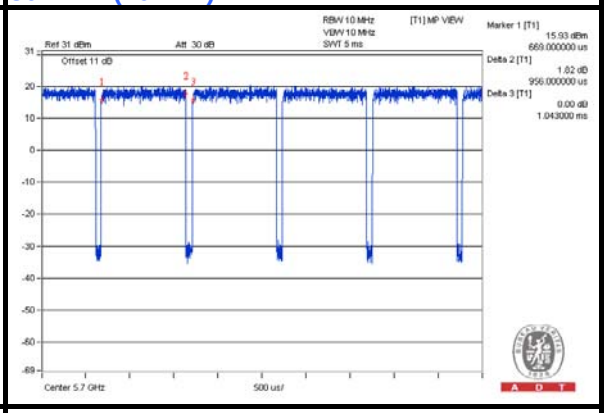
802.11n (40MHz): Duty cycle = 0.48/0.546 = 0.879, Duty factor = 10 * log(1/0.879) = 0.56

802.11ac (80MHz): Duty cycle = 0.248/0.308 = 0.805, Duty factor = 10 * log(1/0.805) = 0.94

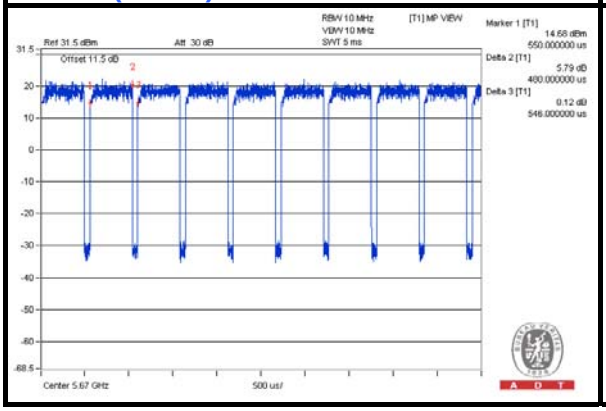
802.11a



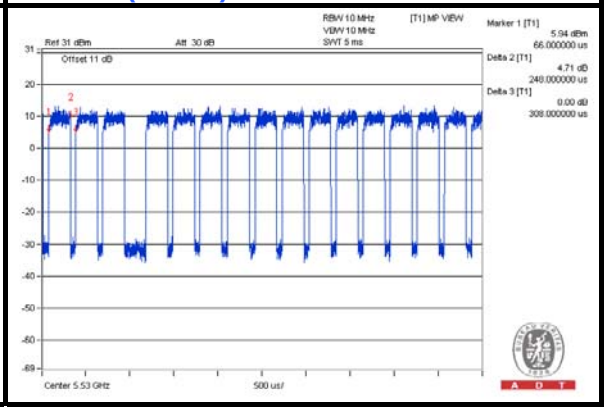
802.11n (20MHz)



802.11n (40MHz)



802.11ac (80MHz)



MODULATION TYPE: 16QAM

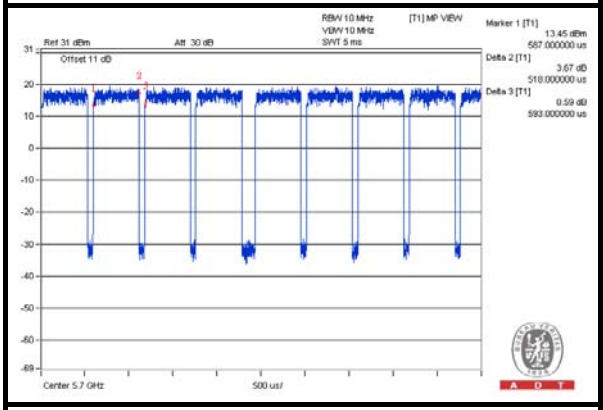
802.11a: Duty cycle = 0.518/0.593 = 0.874, Duty factor = 10 * log(1/0.874) = 0.59

802.11n (20MHz): Duty cycle = 0.495/0.564 = 0.878, Duty factor = 10 * log(1/0.878) = 0.57

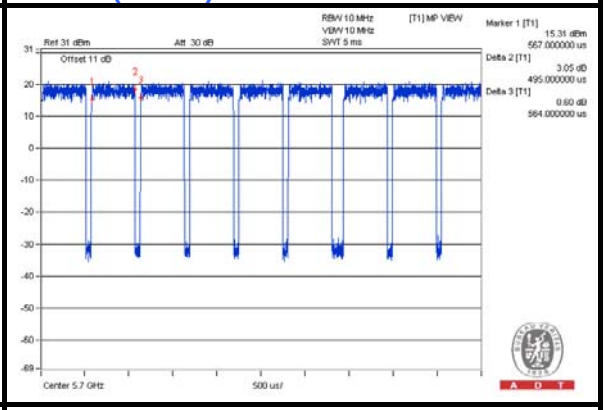
802.11n (40MHz): Duty cycle = 0.254/0.323 = 0.786, Duty factor = 10 * log(1/0.786) = 1.04

802.11ac (80MHz): Duty cycle = 0.143/0.321 = 0.445, Duty factor = 10 * log(1/0.445) = 3.51

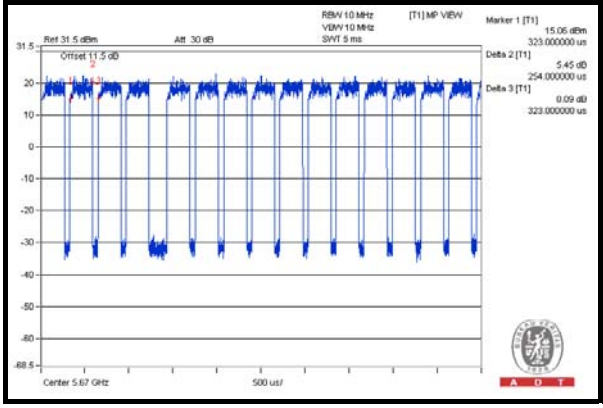
802.11a



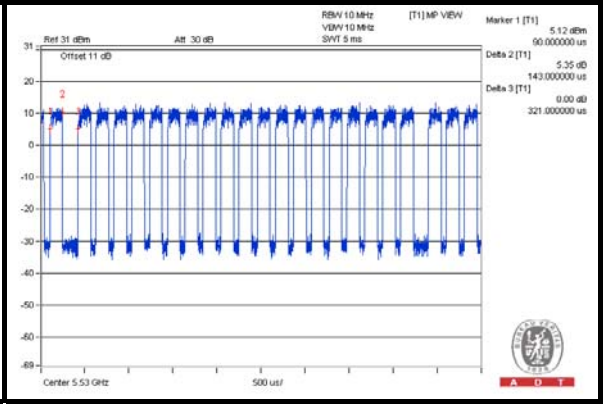
802.11n (20MHz)



802.11n (40MHz)



802.11ac (80MHz)



MODULATION TYPE: 64QAM

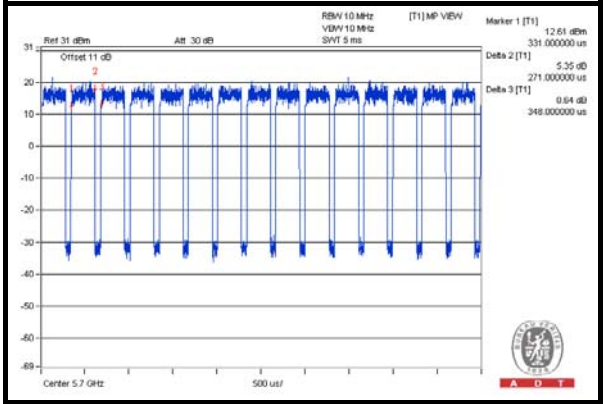
802.11a: Duty cycle = 0.271/0.348 = 0.779, Duty factor = 10 * log(1/0.779) = 1.09

802.11n (20MHz): Duty cycle = 0.491/0.562 = 0.874, Duty factor = 10 * log(1/0.874) = 0.59

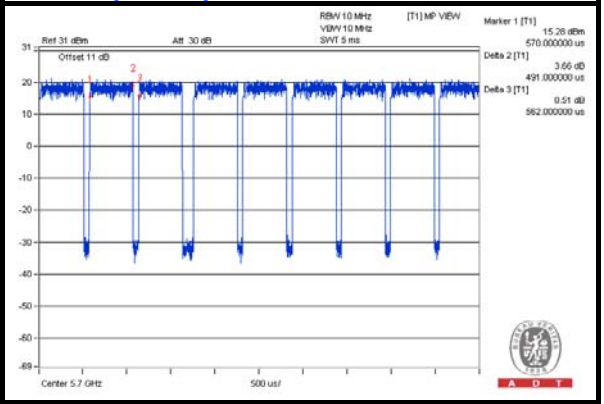
802.11n (40MHz): Duty cycle = 0.145/0.213 = 0.681, Duty factor = 10 * log(1/0.681) = 1.67

802.11ac (80MHz): Duty cycle = 0.09/0.151 = 0.596, Duty factor = 10 * log(1/0.596) = 2.25

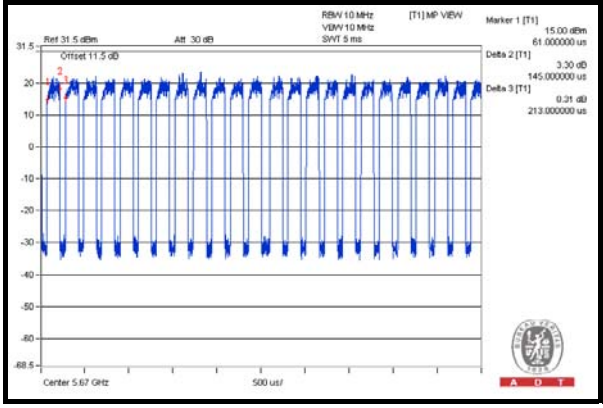
802.11a



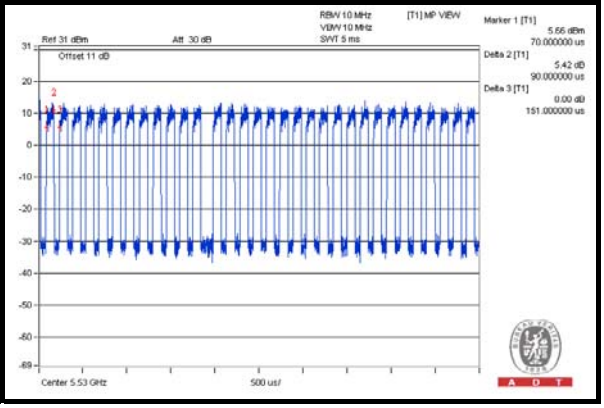
802.11n (20MHz)



802.11n (40MHz)



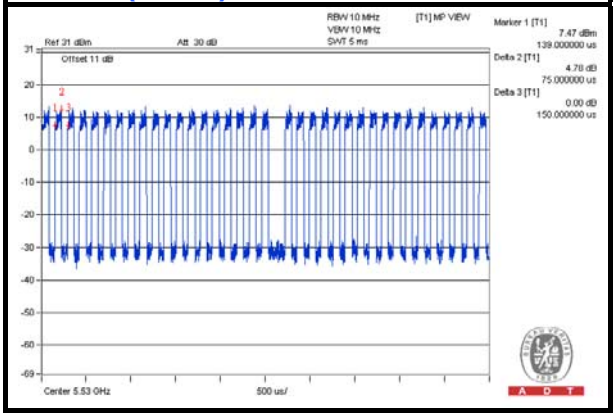
802.11ac (80MHz)



MODULATION TYPE: 256QAM

802.11ac (80MHz): Duty cycle = 0.075/0.15 = 0.50, Duty factor = 10 * log(1/0.50) = 3.01

802.11ac (80MHz)



3.4 DESCRIPTION OF SUPPORT UNITS

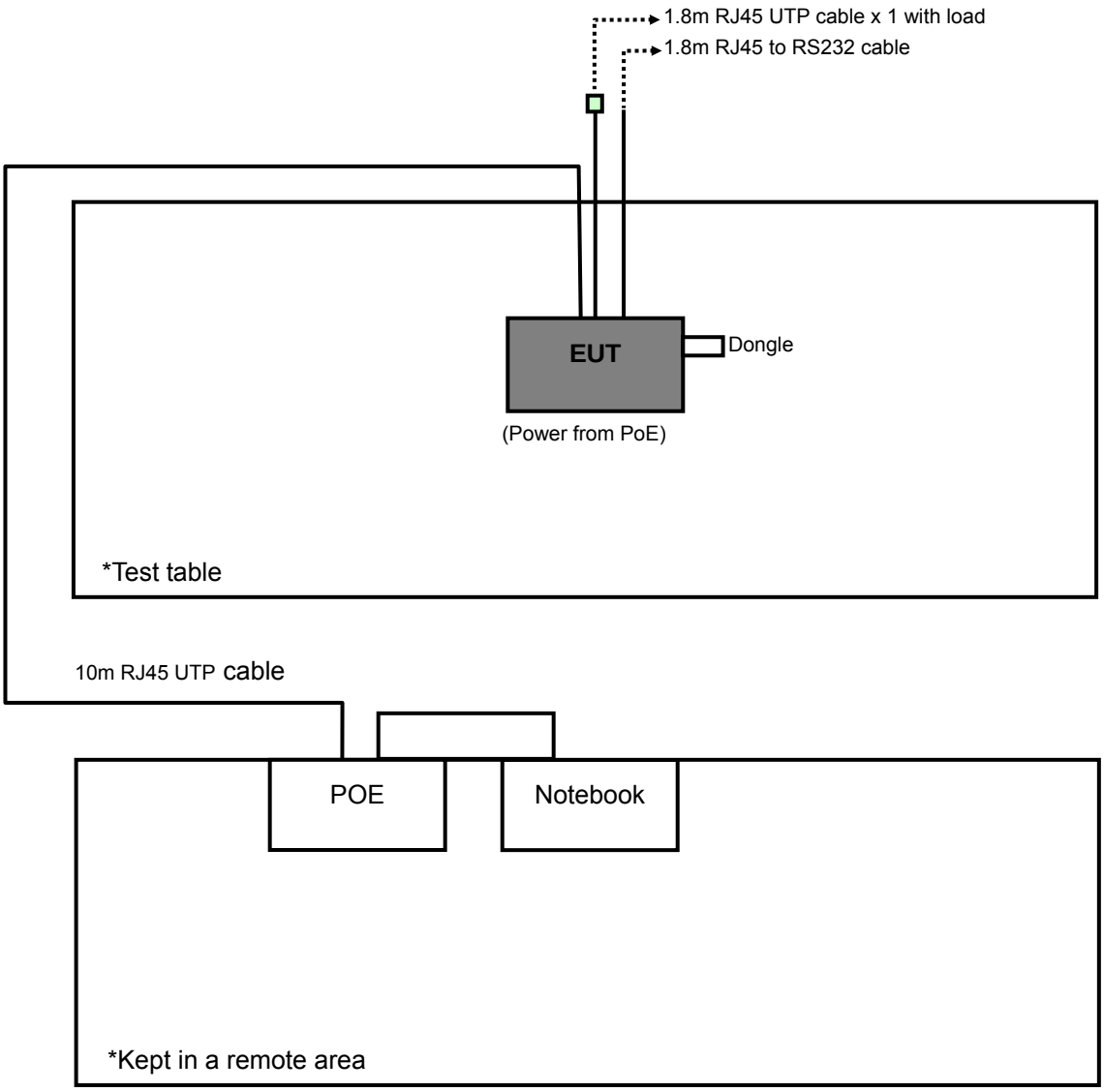
The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	Notebook	DELL	E5410	1HC2XM1	FCC DoC Approved
2	PoE	NA	PE911	NA	NA
3	Dongle	SANDISK	SDCZ6-1024	NA	NA

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	10m RJ45 UTP cable
2	NA
3	NA

NOTE:
1. All power cords of the above support units are non-shielded (1.8m).
2. Item 1, 2 acted as communication partners to transfer data.
3. Item 2 was provided by 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 D01 General UNII Test Procedure Old Rules v01r04
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.

4.1.2 LIMITS OF UNWANTED EMISSION OUT OF THE RESTRICTED BANDS

APPLICABLE TO	LIMIT	
789033 D01 General UNII Test Procedure Old Rules v01r04	FIELD STRENGTH AT 3m	
	PK:74 (dBμV/m)	AV:54 (dBμV/m)
APPLICABLE TO	**EIRP LIMIT**	**EQUIVALENT FIELD STRENGTH AT 3m**
15.407	PK:-27 (dBm/MHz)	PK:68.2(dBμV/m)

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).

4.1.3 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
Test Receiver ROHDE & SCHWARZ	ESIB7	100187	Jan. 02, 2014	Jan. 01, 2015
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100039	Mar. 03, 2014	Mar. 02, 2015
BILOG Antenna SCHWARZBECK	VULB9168	9168-160	Feb. 26, 2014	Feb. 25, 2015
HORN Antenna SCHWARZBECK	9120D	209	Aug. 25, 2014	Aug. 24, 2015
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170241	Feb. 17, 2014	Feb. 16, 2015
Preamplifier Agilent	8447D	2944A10633	Oct. 07, 2014	Oct. 05, 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 inn-co GmbH	CO2000	017303	NA	NA
Turn Table BV ADT	TT100	TT93021703	NA	NA
Turn Table Controller BV ADT	SC100	SC93021703	NA	NA
High Speed Peak Power Meter	ML2495A	0824011	Jul. 26, 2014	Jul. 25, 2015
Power Sensor	MA2411B	0738171	Jul. 26, 2014	Jul. 25, 2015
WIT Standard Temperature And Humidity Chamber	TH-4S-C	W981030	Jun. 9, 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.

4.1.4 TEST PROCEDURES

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic camber. 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 antenna is a broadband antenna, and its height 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 Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

NOTE:

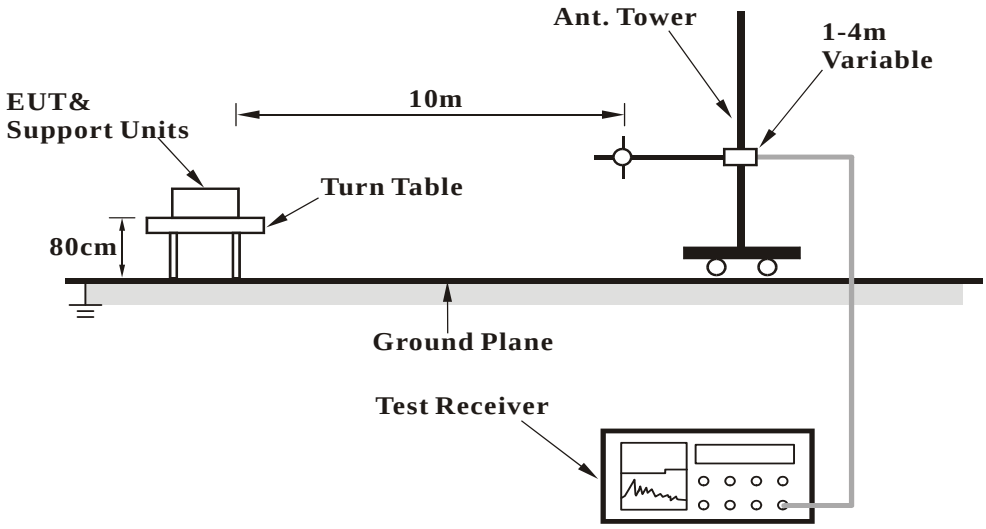
1. For emission measurements above 1 GHz, the EUT shall be placed at a height of 1.5 m above the ground at 3 meter chamber room for test
2. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
4. 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)).
5. 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.
6. All modes of operation were investigated and the worst-case emissions are reported.

4.1.5 DEVIATION FROM TEST STANDARD

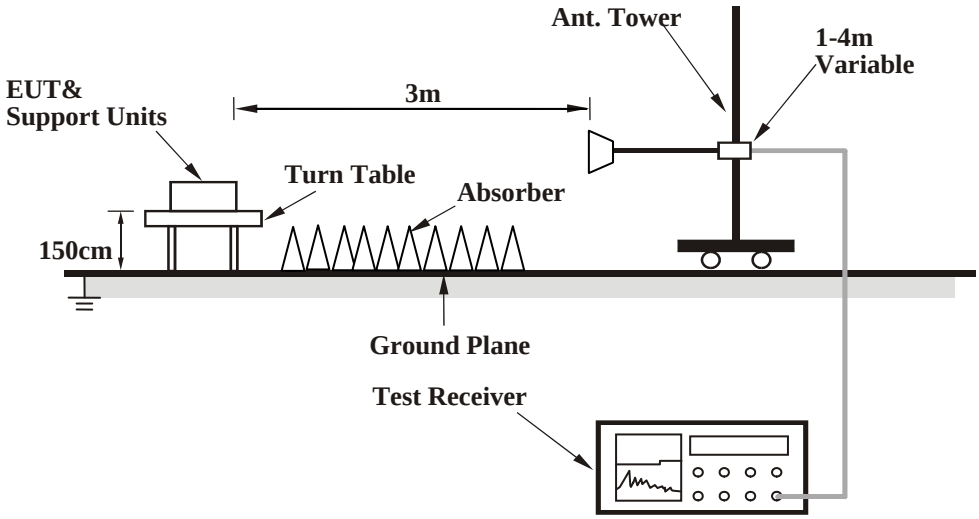
No deviation.

4.1.6 TEST SETUP

Frequency range 30MHz~1GHz



Frequency range above 1GHz



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

4.1.7 EUT OPERATING CONDITION

a. Connected the EUT with a notebook through a USB cable and placed on a testing table.
b. The notebook ran a test program (provided by manufacturer) to enable EUT under transmission condition continuously at specific channel frequency.

4.1.8 TEST RESULTS

ABOVE 1GHz DATA：

802.11a

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	56.8 PK	74.0	-17.2	1.14 H	73	50.40	6.40
2	5150.00	44.6 AV	54.0	-9.4	1.14 H	73	38.20	6.40
3	*5260.00	111.5 PK			1.37 H	22	71.50	40.00
4	*5260.00	101.4 AV			1.37 H	22	61.40	40.00
5	#10520.00	60.3 PK	74.0	-13.7	1.03 H	306	41.00	19.30
6	#10520.00	48.2 AV	54.0	-5.8	1.03 H	306	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	5150.00	57.5 PK	74.0	-16.5	1.23 V	75	51.10	6.40
2	5150.00	45.8 AV	54.0	-8.2	1.23 V	75	39.40	6.40
3	*5260.00	112.9 PK			1.36 V	31	72.90	40.00
4	*5260.00	103.5 AV			1.36 V	31	63.50	40.00
5	#10520.00	60.4 PK	74.0	-13.6	1.02 V	138	41.10	19.30
6	#10520.00	47.7 AV	54.0	-6.3	1.02 V	138	28.40	19.30

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5300.00	109.7 PK			1.00 H	21	69.70	40.00
2	*5300.00	100.2 AV			1.00 H	21	60.20	40.00
3	10600.00	61.2 PK	74.0	-12.8	1.13 H	60	41.60	19.60
4	10600.00	47.7 AV	54.0	-6.3	1.13 H	60	28.10	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	*5300.00	111.1 PK			1.27 V	10	71.10	40.00
2	*5300.00	101.6 AV			1.27 V	10	61.60	40.00
3	10600.00	60.3 PK	74.0	-13.7	1.00 V	202	40.70	19.60
4	10600.00	48.0 AV	54.0	-6.0	1.00 V	202	28.40	19.60

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5320.00	111.7 PK			1.42 H	25	71.70	40.00
2	*5320.00	101.2 AV			1.42 H	25	61.20	40.00
3	5350.00	58.0 PK	74.0	-16.0	1.09 H	316	51.60	6.40
4	5350.00	45.3 AV	54.0	-8.7	1.09 H	316	38.90	6.40
5	10620.00	59.9 PK	74.0	-14.1	1.28 H	45	40.40	19.50
6	10620.00	47.1 AV	54.0	-6.9	1.28 H	45	27.60	19.50
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	*5320.00	111.6 PK			1.35 V	26	71.60	40.00
2	*5320.00	102.1 AV			1.35 V	26	62.10	40.00
3	5350.00	57.6 PK	74.0	-16.4	1.06 V	129	51.20	6.40
4	5350.00	45.6 AV	54.0	-8.4	1.06 V	129	39.20	6.40
5	10640.00	60.5 PK	74.0	-13.5	1.10 V	107	41.00	19.50
6	10640.00	46.7 AV	54.0	-7.3	1.10 V	107	27.20	19.50

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5460.00	61.9 PK	74.0	-12.1	1.20 H	55	55.60	6.30
2	5460.00	46.5 AV	54.0	-7.5	1.20 H	55	40.20	6.30
3	#5470.00	72.2 PK	74.0	-1.8	1.13 H	47	65.90	6.30
4	#5470.00	47.9 AV	54.0	-6.1	1.13 H	47	41.60	6.30
5	*5500.00	117.3 PK			1.23 H	45	77.40	39.90
6	*5500.00	106.8 AV			1.23 H	45	66.90	39.90
7	11000.00	60.0 PK	74.0	-14.0	1.06 H	172	39.90	20.10
8	11000.00	48.0 AV	54.0	-6.0	1.06 H	172	27.90	20.10
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	5460.00	61.9 PK	74.0	-12.1	1.00 V	23	55.60	6.30
2	5460.00	46.5 AV	54.0	-7.5	1.00 V	23	40.20	6.30
3	#5470.00	72.9 PK	74.0	-1.1	1.00 V	20	66.60	6.30
4	#5470.00	50.7 AV	54.0	-3.3	1.00 V	20	44.40	6.30
5	*5500.00	119.7 PK			1.00 V	7	79.80	39.90
6	*5500.00	109.6 AV			1.00 V	7	69.70	39.90
7	11000.00	59.6 PK	74.0	-14.4	1.09 V	7	39.50	20.10
8	11000.00	47.4 AV	54.0	-6.6	1.09 V	7	27.30	20.10

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5580.00	115.4 PK			1.03 H	30	75.40	40.00
2	*5580.00	105.5 AV			1.03 H	30	65.50	40.00
3	11160.00	61.2 PK	74.0	-12.8	1.38 H	287	41.50	19.70
4	11160.00	48.5 AV	54.0	-5.5	1.38 H	287	28.80	19.70
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5580.00	118.4 PK			1.00 V	20	78.40	40.00
2	*5580.00	108.5 AV			1.00 V	20	68.50	40.00
3	11160.00	62.5 PK	74.0	-11.5	1.01 V	323	42.80	19.70
4	11160.00	49.1 AV	54.0	-4.9	1.01 V	323	29.40	19.70

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5700.00	112.0 PK			1.00 H	34	71.80	40.20
2	*5700.00	102.5 AV			1.00 H	34	62.30	40.20
3	#5725.00	70.8 PK	74.0	-3.2	1.24 H	318	64.10	6.70
4	#5725.00	48.0 AV	54.0	-6.0	1.24 H	318	41.30	6.70
5	11400.00	61.8 PK	74.0	-12.2	1.08 H	339	43.20	18.60
6	11400.00	48.9 AV	54.0	-5.1	1.08 H	339	30.30	18.60
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5700.00	115.4 PK			1.24 V	41	75.20	40.20
2	*5700.00	105.2 AV			1.24 V	41	65.00	40.20
3	#5725.00	72.7 PK	74.0	-1.3	1.35 V	315	66.00	6.70
4	#5725.00	49.5 AV	54.0	-4.5	1.35 V	315	42.80	6.70
5	11400.00	61.3 PK	74.0	-12.7	1.41 V	32	42.70	18.60
6	11400.00	48.9 AV	54.0	-5.1	1.41 V	32	30.30	18.60

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)
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 (20MHz)

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	1.23 H	82	50.30	6.40
2	5150.00	45.0 AV	54.0	-9.0	1.23 H	82	38.60	6.40
3	*5260.00	111.0 PK			1.40 H	21	71.00	40.00
4	*5260.00	101.2 AV			1.40 H	21	61.20	40.00
5	#10520.00	60.9 PK	74.0	-13.1	1.06 H	16	41.60	19.30
6	#10520.00	48.2 AV	54.0	-5.8	1.06 H	16	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	5150.00	57.4 PK	74.0	-16.6	1.18 V	52	51.00	6.40
2	5150.00	44.8 AV	54.0	-9.2	1.18 V	52	38.40	6.40
3	*5260.00	112.8 PK			1.37 V	35	72.80	40.00
4	*5260.00	102.8 AV			1.37 V	35	62.80	40.00
5	#10520.00	59.6 PK	74.0	-14.4	1.02 V	261	40.30	19.30
6	#10520.00	48.1 AV	54.0	-5.9	1.02 V	261	28.80	19.30

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5300.00	109.7 PK			1.07 H	28	69.70	40.00
2	*5300.00	100.1 AV			1.07 H	28	60.10	40.00
3	10600.00	60.9 PK	74.0	-13.1	1.04 H	56	41.30	19.60
4	10600.00	47.2 AV	54.0	-6.8	1.04 H	56	27.60	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	*5300.00	109.9 PK			1.00 V	328	69.90	40.00
2	*5300.00	100.2 AV			1.00 V	328	60.20	40.00
3	10600.00	60.7 PK	74.0	-13.3	1.00 V	266	41.10	19.60
4	10600.00	47.8 AV	54.0	-6.2	1.00 V	266	28.20	19.60

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5320.00	108.8 PK			1.31 H	23	68.80	40.00
2	*5320.00	99.4 AV			1.31 H	23	59.40	40.00
3	5350.00	57.5 PK	74.0	-16.5	1.08 H	164	51.10	6.40
4	5350.00	45.1 AV	54.0	-8.9	1.08 H	164	38.70	6.40
5	10640.00	58.4 PK	74.0	-15.6	1.17 H	70	38.90	19.50
6	10640.00	45.5 AV	54.0	-8.5	1.17 H	70	26.00	19.50
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	*5320.00	110.9 PK			1.00 V	323	70.90	40.00
2	*5320.00	100.6 AV			1.00 V	323	60.60	40.00
3	5350.00	57.8 PK	74.0	-16.2	1.06 V	95	51.40	6.40
4	5350.00	45.4 AV	54.0	-8.6	1.06 V	95	39.00	6.40
5	10640.00	59.3 PK	74.0	-14.7	1.10 V	243	39.80	19.50
6	10640.00	46.1 AV	54.0	-7.9	1.10 V	243	26.60	19.50

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5460.00	61.2 PK	74.0	-12.8	1.00 H	330	54.90	6.30
2	5460.00	45.5 AV	54.0	-8.5	1.00 H	330	39.20	6.30
3	#5470.00	68.4 PK	74.0	-5.6	1.00 H	330	62.10	6.30
4	#5470.00	47.1 AV	54.0	-6.9	1.00 H	330	40.80	6.30
5	*5500.00	114.9 PK			1.20 H	49	75.00	39.90
6	*5500.00	105.4 AV			1.20 H	49	65.50	39.90
7	11000.00	60.4 PK	74.0	-13.6	1.05 H	254	40.30	20.10
8	11000.00	48.1 AV	54.0	-5.9	1.05 H	254	28.00	20.10
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	5460.00	63.1 PK	74.0	-10.9	1.00 V	23	56.80	6.30
2	5460.00	47.1 AV	54.0	-6.9	1.00 V	23	40.80	6.30
3	#5470.00	72.9 PK	74.0	-1.1	1.00 V	19	66.60	6.30
4	#5470.00	49.9 AV	54.0	-4.1	1.00 V	19	43.60	6.30
5	*5500.00	118.6 PK			1.00 V	9	78.70	39.90
6	*5500.00	109.2 AV			1.00 V	9	69.30	39.90
7	11000.00	61.1 PK	74.0	-12.9	1.00 V	225	41.00	20.10
8	11000.00	48.1 AV	54.0	-5.9	1.00 V	225	28.00	20.10

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5580.00	116.6 PK			1.29 H	292	76.60	40.00
2	*5580.00	106.4 AV			1.29 H	292	66.40	40.00
3	11160.00	60.0 PK	74.0	-14.0	1.08 H	87	40.30	19.70
4	11160.00	48.1 AV	54.0	-5.9	1.08 H	87	28.40	19.70
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5580.00	119.4 PK			1.09 V	10	79.40	40.00
2	*5580.00	109.0 AV			1.09 V	10	69.00	40.00
3	11160.00	60.6 PK	74.0	-13.4	1.05 V	77	40.90	19.70
4	11160.00	47.6 AV	54.0	-6.4	1.05 V	77	27.90	19.70

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5700.00	114.0 PK			1.35 H	323	73.80	40.20
2	*5700.00	103.3 AV			1.35 H	323	63.10	40.20
3	**#5725.00**	**73.0 PK**	**74.0**	**-1.0**	**1.50 H**	**291**	**66.30**	**6.70**
4	#5725.00	39.2 AV	54.0	-14.8	1.50 H	291	32.50	6.70
5	11400.00	62.9 PK	74.0	-11.1	1.08 H	339	44.30	18.60
6	11400.00	50.0 AV	54.0	-4.0	1.08 H	339	31.40	18.60
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5700.00	115.2 PK			1.00 V	45	75.00	40.20
2	*5700.00	104.8 AV			1.00 V	45	64.60	40.20
3	#5725.00	72.2 PK	74.0	-1.8	1.33 V	43	65.50	6.70
4	#5725.00	48.6 AV	54.0	-5.4	1.33 V	43	41.90	6.70
5	11400.00	62.2 PK	74.0	-11.8	1.00 V	318	43.60	18.60
6	11400.00	49.0 AV	54.0	-5.0	1.00 V	318	30.40	18.60

REMARKS:

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

802.11n (40MHz)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	57.3 PK	74.0	-16.7	1.21 H	253	50.90	6.40
2	5150.00	44.8 AV	54.0	-9.2	1.21 H	253	38.40	6.40
3	*5270.00	109.2 PK			1.45 H	20	69.20	40.00
4	*5270.00	98.8 AV			1.45 H	20	58.80	40.00
5	#10540.00	60.1 PK	74.0	-13.9	1.12 H	71	40.80	19.30
6	#10540.00	48.1 AV	54.0	-5.9	1.12 H	71	28.80	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	5150.00	56.7 PK	74.0	-17.3	1.20 V	88	50.30	6.40
2	5150.00	45.0 AV	54.0	-9.0	1.20 V	88	38.60	6.40
3	*5270.00	110.3 PK			1.36 V	36	70.30	40.00
4	*5270.00	99.8 AV			1.36 V	36	59.80	40.00
5	#10540.00	61.0 PK	74.0	-13.0	1.11 V	290	41.70	19.30
6	#10540.00	48.1 AV	54.0	-5.9	1.11 V	290	28.80	19.30

REMARKS:

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

CHANNEL	TX Channel 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	106.8 PK			1.00 H	21	66.80	40.00
2	*5310.00	97.3 AV			1.00 H	21	57.30	40.00
3	5350.00	58.0 PK	74.0	-16.0	1.02 H	331	51.60	6.40
4	5350.00	44.9 AV	54.0	-9.1	1.02 H	331	38.50	6.40
5	10620.00	59.9 PK	74.0	-14.1	1.05 H	69	40.40	19.50
6	10620.00	46.9 AV	54.0	-7.1	1.05 H	69	27.40	19.50
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	*5310.00	108.1 PK			1.00 V	325	68.10	40.00
2	*5310.00	97.9 AV			1.00 V	325	57.90	40.00
3	5350.00	57.4 PK	74.0	-16.6	1.12 V	164	51.00	6.40
4	5350.00	44.8 AV	54.0	-9.2	1.12 V	164	38.40	6.40
5	10620.00	59.4 PK	74.0	-14.6	1.03 V	253	39.90	19.50
6	10620.00	47.0 AV	54.0	-7.0	1.03 V	253	27.50	19.50

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5460.00	60.0 PK	74.0	-14.0	1.00 H	320	53.70	6.30
2	5460.00	45.1 AV	54.0	-8.9	1.00 H	320	38.80	6.30
3	#5470.00	70.2 PK	74.0	-3.8	1.00 H	326	63.90	6.30
4	#5470.00	52.2 AV	54.0	-1.8	1.00 H	326	45.90	6.30
5	*5510.00	108.6 PK			1.00 H	44	68.70	39.90
6	*5510.00	98.8 AV			1.00 H	44	58.90	39.90
7	11020.00	60.4 PK	74.0	-13.6	1.00 H	294	40.40	20.00
8	11020.00	47.7 AV	54.0	-6.3	1.00 H	294	27.70	20.00
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	5460.00	58.8 PK	74.0	-15.2	1.02 V	21	52.50	6.30
2	5460.00	45.0 AV	54.0	-9.0	1.02 V	21	38.70	6.30
3	#5470.00	71.6 PK	74.0	-2.4	1.00 V	18	65.30	6.30
4	**#5470.00**	**53.0 AV**	**54.0**	**-1.0**	**1.00 V**	**18**	**46.70**	**6.30**
5	*5510.00	112.7 PK			1.00 V	18	72.80	39.90
6	*5510.00	103.0 AV			1.00 V	18	63.10	39.90
7	11020.00	60.4 PK	74.0	-13.6	1.09 V	124	40.40	20.00
8	11020.00	47.2 AV	54.0	-6.8	1.09 V	124	27.20	20.00

REMARKS:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB)
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)
FREQUENCY RANGE	1GHz ~ 40GHz		Average (AV)

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5550.00	113.2 PK			1.13 H	45	73.20	40.00
2	*5550.00	103.1 AV			1.13 H	45	63.10	40.00
3	11100.00	60.2 PK	74.0	-13.8	1.04 H	89	40.60	19.60
4	11100.00	47.5 AV	54.0	-6.5	1.04 H	89	27.90	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	*5550.00	115.5 PK			1.00 V	13	75.50	40.00
2	*5550.00	105.7 AV			1.00 V	13	65.70	40.00
3	11100.00	59.8 PK	74.0	-14.2	1.06 V	273	40.20	19.60
4	11100.00	47.4 AV	54.0	-6.6	1.06 V	273	27.80	19.60

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5670.00	110.4 PK			1.00 H	38	70.30	40.10
2	*5670.00	99.9 AV			1.00 H	38	59.80	40.10
3	#5725.00	67.2 PK	74.0	-6.8	1.31 H	20	60.50	6.70
4	#5725.00	47.5 AV	54.0	-6.5	1.31 H	20	40.80	6.70
5	11340.00	60.2 PK	74.0	-13.8	1.03 H	1	40.90	19.30
6	11340.00	48.5 AV	54.0	-5.5	1.03 H	1	29.20	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	*5670.00	112.2 PK			1.08 V	13	72.10	40.10
2	*5670.00	102.9 AV			1.08 V	13	62.80	40.10
3	#5725.00	70.5 PK	74.0	-3.5	1.33 V	45	63.80	6.70
4	#5725.00	50.2 AV	54.0	-3.8	1.33 V	45	43.50	6.70
5	11340.00	61.7 PK	74.0	-12.3	1.01 V	240	42.40	19.30
6	11340.00	46.5 AV	54.0	-7.5	1.01 V	240	27.20	19.30

REMARKS:

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

802.11ac (80MHz)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	56.9 PK	74.0	-17.1	1.19 H	145	50.50	6.40
2	5150.00	45.5 AV	54.0	-8.5	1.19 H	145	39.10	6.40
3	*5290.00	103.7 PK			1.00 H	20	63.70	40.00
4	*5290.00	94.1 AV			1.00 H	20	54.10	40.00
5	5350.00	63.2 PK	74.0	-10.8	1.05 H	43	56.80	6.40
6	5350.00	47.5 AV	54.0	-6.5	1.05 H	43	41.10	6.40
7	#10580.00	61.1 PK	74.0	-12.9	1.05 H	311	41.50	19.60
8	#10580.00	47.7 AV	54.0	-6.3	1.05 H	311	28.10	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	5150.00	57.4 PK	74.0	-16.6	1.05 V	326	51.00	6.40
2	5150.00	45.7 AV	54.0	-8.3	1.05 V	326	39.30	6.40
3	*5290.00	105.5 PK			1.12 V	325	65.50	40.00
4	*5290.00	95.2 AV			1.12 V	325	55.20	40.00
5	5350.00	63.4 PK	74.0	-10.6	1.22 V	16	57.00	6.40
6	5350.00	47.9 AV	54.0	-6.1	1.22 V	16	41.50	6.40
7	#10580.00	60.4 PK	74.0	-13.6	1.02 V	260	40.80	19.60
8	#10580.00	48.0 AV	54.0	-6.0	1.02 V	260	28.40	19.60

REMARKS:

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

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5460.00	64.3 PK	74.0	-9.7	1.20 H	36	58.00	6.30
2	5460.00	51.3 AV	54.0	-2.7	1.20 H	36	45.00	6.30
3	#5470.00	65.8 PK	74.0	-8.2	1.22 H	41	59.50	6.30
4	#5470.00	50.2 AV	54.0	-3.8	1.22 H	41	43.90	6.30
5	*5530.00	104.4 PK			1.11 H	37	64.50	39.90
6	*5530.00	95.2 AV			1.11 H	37	55.30	39.90
7	11060.00	59.8 PK	74.0	-14.2	1.04 H	79	40.00	19.80
8	11060.00	46.8 AV	54.0	-7.2	1.04 H	79	27.00	19.80
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5460.00	64.7 PK	74.0	-9.3	1.06 V	23	58.40	6.30
2	5460.00	50.5 AV	54.0	-3.5	1.06 V	23	44.20	6.30
3	#5470.00	69.3 PK	74.0	-4.7	1.10 V	20	63.00	6.30
4	#5470.00	52.7 AV	54.0	-1.3	1.10 V	20	46.40	6.30
5	*5530.00	107.2 PK			1.00 V	20	67.30	39.90
6	*5530.00	98.1 AV			1.00 V	20	58.20	39.90
7	11060.00	59.6 PK	74.0	-14.4	1.11 V	302	39.80	19.80
8	11060.00	47.0 AV	54.0	-7.0	1.11 V	302	27.20	19.80

REMARKS:

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

BELOW 1GHz WORST-CASE DATA

802.11a

CHANNEL	TX Channel 60	**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	32.6 QP	40.0	-7.4	1.99 H	314	47.20	-14.60
2	132.95	28.3 QP	43.5	-15.2	1.99 H	66	43.20	-14.90
3	249.60	28.7 QP	46.0	-17.3	1.00 H	215	42.90	-14.20
4	500.42	33.7 QP	46.0	-12.3	1.49 H	304	42.00	-8.30
5	720.12	35.0 QP	46.0	-11.0	1.00 H	189	39.00	-4.00
6	819.28	38.4 QP	46.0	-7.6	1.49 H	186	40.30	-1.90
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	57.32	32.3 QP	40.0	-7.7	1.00 V	207	46.90	-14.60
2	99.89	36.4 QP	43.5	-7.1	1.00 V	205	55.20	-18.80
3	374.04	27.5 QP	46.0	-18.5	1.00 V	336	38.20	-10.70
4	500.42	28.4 QP	46.0	-17.6	1.00 V	33	36.70	-8.30
5	624.85	34.2 QP	46.0	-11.8	1.49 V	163	39.70	-5.50
6	821.23	33.8 QP	46.0	-12.2	1.49 V	295	35.60	-1.80

REMARKS:

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

4.2 CONDUCTED EMISSION MEASUREMENT

4.2.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

FREQUENCY OF EMISSION (MHz)	CONDUCTED LIMIT (dBμV)	
	Quasi-peak	Average
0.15 ~ 0.5	66 to 56	56 to 46
0.5 ~ 5	56	46
5 ~ 30	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.

3. All emanations from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

4.2.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
Test Receiver ROHDE & SCHWARZ	ESCS30	100289	Nov. 29, 2013	Nov. 28, 2014
RF signal cable Woken	5D-FB	Cable-HYC01-01	Dec. 27, 2013	Dec. 26, 2014
LISN ROHDE & SCHWARZ (EUT)	ESH3-Z5	835239/001	Feb. 13, 2014	Feb. 12, 2015
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

Notes: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

2. The test was performed in HwaYa Shielded Room 1.

3. The VCCI Site Registration No. is C-2040.

4.2.3 TEST PROCEDURES

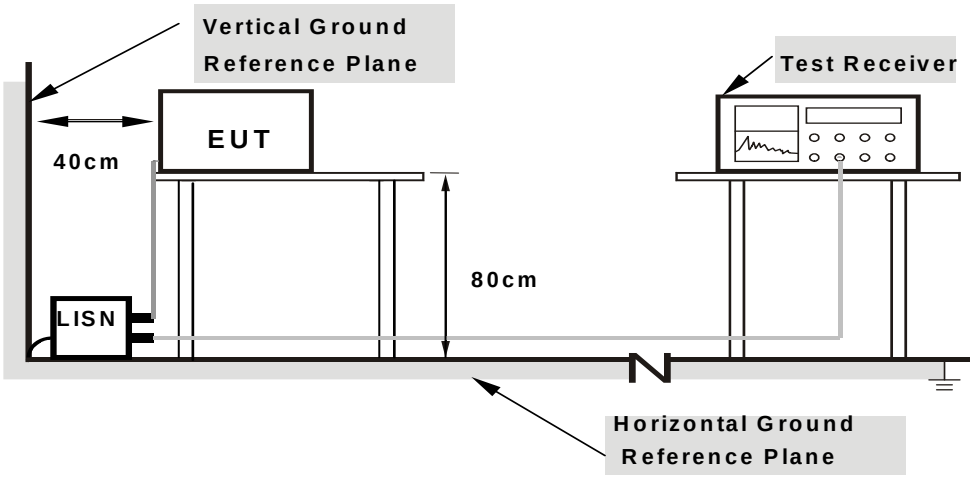
a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling 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: All modes of operation were investigated and the worst-case emissions are reported.

4.2.4 DEVIATION FROM TEST STANDARD

No deviation.

4.2.5 TEST SETUP



Note: 1.Support units were connected to second LISN.
2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

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

4.2.6 EUT OPERATING CONDITIONS

Same as 4.1.6.

4.2.7 TEST RESULTS

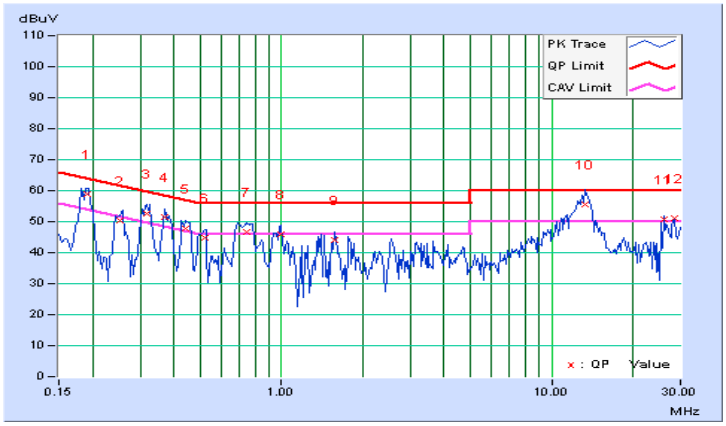
CONDUCTED WORST-CASE DATA: 802.11a

PHASE	Line 1	6dB BANDWIDTH	9kHz

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	0.19016	0.07	58.98	46.98	59.05	47.05	64.03	54.03	-4.98	-6.98
2	0.25392	0.07	50.48	40.96	50.55	41.03	61.63	51.63	-11.08	-10.60
3	0.31797	0.08	52.68	42.40	52.76	42.48	59.76	49.76	-7.00	-7.28
4	0.36875	0.08	51.26	39.50	51.34	39.58	58.53	48.53	-7.19	-8.95
5	0.43906	0.08	47.72	36.42	47.80	36.50	57.08	47.08	-9.28	-10.58
6	0.52118	0.09	44.54	32.30	44.63	32.39	56.00	46.00	-11.37	-13.61
7	0.73984	0.10	46.64	32.90	46.74	33.00	56.00	46.00	-9.26	-13.00
8	0.98984	0.11	45.72	31.38	45.83	31.49	56.00	46.00	-10.17	-14.51
9	1.57422	0.13	43.76	28.84	43.89	28.97	56.00	46.00	-12.11	-17.03
10	13.30078	0.68	54.92	40.74	55.60	41.42	60.00	50.00	-4.40	-8.58
11	26.03125	1.22	49.36	45.30	50.58	46.52	60.00	50.00	-9.42	-3.48
12	**28.55078**	**1.30**	**49.96**	**46.46**	**51.26**	**47.76**	**60.00**	**50.00**	**-8.74**	**-2.24**

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

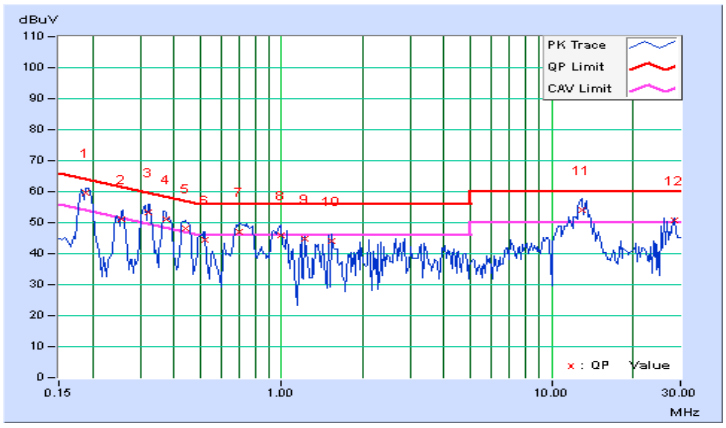


PHASE	Line 2	6dB BANDWIDTH	9kHz

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	0.18915	0.05	59.44	47.36	59.49	47.41	64.07	54.07	-4.58	-6.66
2	0.25539	0.06	51.10	40.92	51.16	40.98	61.58	51.58	-10.42	-10.60
3	0.32029	0.06	53.28	42.32	53.34	42.38	59.70	49.70	-6.36	-7.32
4	0.37266	0.07	50.94	40.80	51.01	40.87	58.44	48.44	-7.43	-7.57
5	0.43906	0.07	47.92	36.70	47.99	36.77	57.08	47.08	-9.09	-10.31
6	0.52109	0.07	44.48	32.26	44.55	32.33	56.00	46.00	-11.45	-13.67
7	0.70078	0.08	47.10	32.64	47.18	32.72	56.00	46.00	-8.82	-13.28
8	0.98984	0.09	45.84	31.88	45.93	31.97	56.00	46.00	-10.07	-14.03
9	1.22525	0.10	44.74	31.44	44.84	31.54	56.00	46.00	-11.16	-14.46
10	1.54297	0.12	43.92	30.90	44.04	31.02	56.00	46.00	-11.96	-14.98
11	12.94922	0.58	53.38	39.20	53.96	39.78	60.00	50.00	-6.04	-10.22
12	28.55047	1.10	49.62	45.84	50.72	46.94	60.00	50.00	-9.28	-3.06

REMARKS:

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



4.3 TRANSMIT POWER MEASUREMENT

4.3.1 LIMITS OF TRANSMIT POWER MEASUREMENT

FREQUENCY BAND	LIMIT
5.250 ~ 5.350GHz	The lesser of 250mW (24dBm) or 11dBm + 10logB
5.470 ~ 5.725GHz	The lesser of 250mW (24dBm) or 11dBm + 10logB

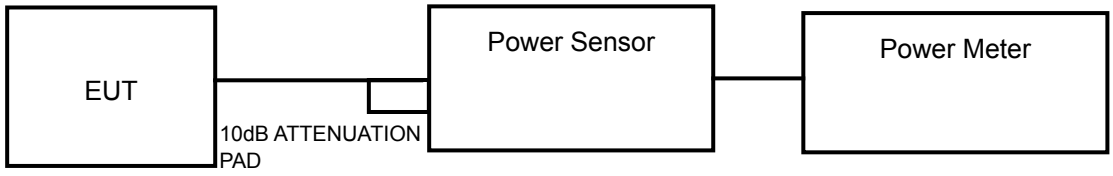
NOTE: Where B is the 26dB emission bandwidth in MHz.

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

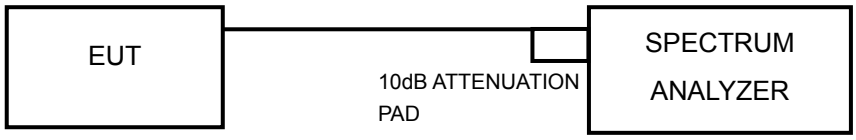
Array Gain = 0 dB (i.e., no array gain) for $N_{ANT} \leq 4$;
Array Gain = 0 dB (i.e., no array gain) for channel widths ≥ 40 MHz for any N_{ANT};
Array Gain = 5 log(N_{ANT}/N_{SS}) dB or 3 dB, whichever is less for 20-MHz channel widths with $N_{ANT} \geq 5$.
For power measurements on all other devices: Array Gain = 10 log(N_{ANT}/N_{SS}) dB.

4.3.2 TEST SETUP

FOR POWER OUTPUT MEASUREMENT
For 802.11a, 802.11n (20MHz), 802.11n (40MHz)



For 802.11ac (80MHz)



4.3.3 TEST INSTRUMENTS

Refer to section 4.1.3 to get information of above instrument.

4.3.4 TEST PROCEDURE

FOR AVERAGE POWER MEASUREMENT

For 802.11a, 802.11n (20MHz), 802.11n (40MHz)

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 (80MHz)

1) Set span to encompass the entire emission bandwidth (EBW) of the signal.
2) Set RBW = 1 MHz.
3) Set VBW ≥ 3 MHz.
4) Number of points in sweep ≥ 2 Span / RBW.
5) Sweep time = auto.
6) Set trigger to free run (duty cycle≥98 percent); Set video trigger (duty cycle < 98 percent).
7) Detector = RMS.
8) Trace average at least 100 traces in power averaging mode.
9) Compute power by integrating the spectrum across the 26 dB EBW of the signal.

4.3.5 DEVIATION FROM TEST STANDARD

No deviation.

4.3.6 EUT OPERATING CONDITIONS

The software provided by client to enable the EUT under transmission condition continuously at specific channel frequencies individually.

4.3.7 TEST RESULTS

POWER OUTPUT:

For 5260~5320MHz, 5500~5700MHz:

802.11a

CHAN.	CHAN. FREQ. (MHz)	AVERAGE POWER (dBm)			TOTAL POWER (mW)	TOTAL POWER (dBm)	POWER LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2				
52	5260	11.63	12.16	12.07	47.105	16.73	24.00	PASS
60	5300	10.93	11.55	12.00	42.526	16.29	24.00	PASS
64	5320	10.94	11.71	12.13	43.573	16.39	24.00	PASS
100	5500	14.01	13.87	14.20	75.858	18.80	24.00	PASS
116	5580	13.99	13.59	13.61	70.878	18.51	24.00	PASS
140	5700	13.80	13.48	13.39	68.099	18.33	24.00	PASS

NOTE:

CHAIN 0:

1. 11dBm + 10log(22.71) = 24.56 dBm > 24dBm
2. 11dBm + 10log(23.41) = 24.69 dBm > 24dBm
3. 11dBm + 10log(22.15) = 24.45 dBm > 24dBm
4. 11dBm + 10log(22.33) = 24.49 dBm > 24dBm
5. 11dBm + 10log(23.23) = 24.66 dBm > 24dBm
6. 11dBm + 10log(22.39) = 24.50 dBm > 24dBm

CHAIN 1:

1. 11dBm + 10log(22.02) = 24.43 dBm > 24dBm
2. 11dBm + 10log(22.26) = 24.48 dBm > 24dBm
3. 11dBm + 10log(22.29) = 24.48 dBm > 24dBm
4. 11dBm + 10log(22.41) = 24.50 dBm > 24dBm
5. 11dBm + 10log(22.10) = 24.44 dBm > 24dBm
6. 11dBm + 10log(22.74) = 24.57 dBm > 24dBm

CHAIN 2:

1. 11dBm + 10log(21.80) = 24.38 dBm > 24dBm
2. 11dBm + 10log(22.17) = 24.46 dBm > 24dBm
3. 11dBm + 10log(22.48) = 24.52 dBm > 24dBm
4. 11dBm + 10log(22.51) = 24.52 dBm > 24dBm
5. 11dBm + 10log(22.01) = 24.43 dBm > 24dBm
6. 11dBm + 10log(22.35) = 24.49 dBm > 24dBm

802.11n (20MHz)

CHAN.	CHAN. FREQ. (MHz)	AVERAGE POWER (dBm)			TOTAL POWER (mW)	TOTAL POWER (dBm)	POWER LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2				
52	5260	11.32	11.92	11.59	43.533	16.39	24.00	PASS
60	5300	10.83	11.73	11.87	42.382	16.27	24.00	PASS
64	5320	10.92	11.47	12.19	42.945	16.33	24.00	PASS
100	5500	15.38	15.26	15.57	104.146	20.18	24.00	PASS
116	5580	15.28	15.21	15.02	98.687	19.94	24.00	PASS
140	5700	15.49	15.36	15.22	103.022	20.13	24.00	PASS

NOTE:

CHAIN 0:

1. 11dBm + 10log(23.52) = 24.59 dBm > 24dBm
2. 11dBm + 10log(23.47) = 24.67 dBm > 24dBm
3. 11dBm + 10log(23.36) = 24.62 dBm > 24dBm
4. 11dBm + 10log(23.19) = 24.65 dBm > 24dBm
5. 11dBm + 10log(23.23) = 24.66 dBm > 24dBm
6. 11dBm + 10log(23.66) = 24.74 dBm > 24dBm

CHAIN 1:

1. 11dBm + 10log(23.63) = 24.55 dBm > 24dBm
2. 11dBm + 10log(23.17) = 24.59 dBm > 24dBm
3. 11dBm + 10log(23.79) = 24.71 dBm > 24dBm
4. 11dBm + 10log(23.40) = 24.69 dBm > 24dBm
5. 11dBm + 10log(24.13) = 24.83 dBm > 24dBm
6. 11dBm + 10log(24.65) = 24.92 dBm > 24dBm

CHAIN 2:

1. 11dBm + 10log(23.07) = 24.61 dBm > 24dBm
2. 11dBm + 10log(23.37) = 24.62 dBm > 24dBm
3. 11dBm + 10log(23.75) = 24.59 dBm > 24dBm
4. 11dBm + 10log(22.99) = 24.62 dBm > 24dBm
5. 11dBm + 10log(23.58) = 24.73 dBm > 24dBm
6. 11dBm + 10log(23.44) = 24.70 dBm > 24dBm

802.11n (40MHz)

CHAN.	CHAN. FREQ. (MHz)	AVERAGE POWER (dBm)			TOTAL POWER (mW)	TOTAL POWER (dBm)	POWER LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2				
54	5270	11.79	12.16	12.09	**47.726**	16.79	24.00	PASS
62	5310	11.31	11.84	12.13	45.128	16.54	24.00	PASS
102	5510	15.61	14.92	16.07	107.896	20.33	24.00	PASS
110	5550	18.53	17.84	19.07	**212.823**	23.28	24.00	PASS
134	5670	18.61	18.38	17.63	199.419	23.00	24.00	PASS

NOTE:

CHAIN 0:

1. 11dBm + 10log(25.23) = 25.02 dBm > 24dBm
2. 11dBm + 10log(25.69) = 25.10 dBm > 24dBm
3. 11dBm + 10log(45.93) = 27.62 dBm > 24dBm
4. 11dBm + 10log(46.05) = 27.63 dBm > 24dBm
5. 11dBm + 10log(47.07) = 27.73 dBm > 24dBm

CHAIN 1:

1. 11dBm + 10log(46.92) = 27.71 dBm > 24dBm
2. 11dBm + 10log(45.28) = 27.56 dBm > 24dBm
3. 11dBm + 10log(46.51) = 27.68 dBm > 24dBm
4. 11dBm + 10log(45.78) = 27.61 dBm > 24dBm
5. 11dBm + 10log(46.00) = 27.63 dBm > 24dBm

CHAIN 2:

1. 11dBm + 10log(45.39) = 27.57 dBm > 24dBm
2. 11dBm + 10log(45.81) = 27.61 dBm > 24dBm
3. 11dBm + 10log(45.30) = 27.56 dBm > 24dBm
4. 11dBm + 10log(46.16) = 27.64 dBm > 24dBm
5. 11dBm + 10log(45.69) = 27.60 dBm > 24dBm

802.11ac (80MHz)

CHAN.	CHAN. FREQ. (MHz)	AVERAGE POWER (dBm)			TOTAL POWER (mW)	TOTAL POWER (dBm)	POWER LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2				
58	5290	11.11	11.63	11.88	42.884	16.32	24.00	PASS
106	5530	13.08	12.38	13.67	60.903	17.85	24.00	PASS

NOTE:

CHAIN 0:

1. 11dBm + 10log(85.71) = 30.44 dBm > 24dBm
2. 11dBm + 10log(87.19) = 30.40 dBm > 24dBm

CHAIN 1:

1. 11dBm + 10log(87.36) = 30.41 dBm > 24dBm
2. 11dBm + 10log(88.16) = 30.45 dBm > 24dBm

CHAIN 2:

1. 11dBm + 10log(88.44) = 30.41 dBm > 24dBm
2. 11dBm + 10log(87.58) = 30.42 dBm > 24dBm

26dB BANDWIDTH:

802.11a

CHANNEL	CHANNEL FREQUENCY (MHz)	26dB BANDWIDTH (MHz)			PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2	
52	5260	22.71	22.02	21.80	PASS
60	5300	23.41	22.26	22.17	PASS
64	5320	22.15	22.29	22.48	PASS
100	5500	22.33	22.41	22.51	PASS
116	5580	23.23	22.10	22.01	PASS
140	5700	22.39	22.74	22.35	PASS

802.11n (20MHz)

CHANNEL	CHANNEL FREQUENCY (MHz)	26dB BANDWIDTH (MHz)			PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2	
52	5260	23.52	23.63	23.07	PASS
60	5300	23.47	23.17	23.37	PASS
64	5320	23.36	23.79	23.75	PASS
100	5500	23.19	23.40	22.99	PASS
116	5580	23.23	24.13	23.58	PASS
140	5700	23.66	24.65	23.44	PASS

802.11n (40MHz)

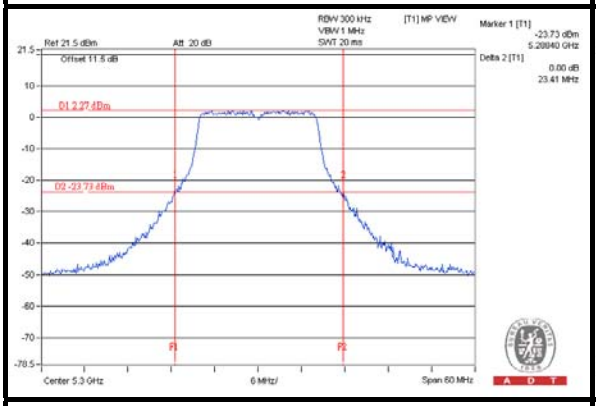
CHANNEL	CHANNEL FREQUENCY (MHz)	26dB BANDWIDTH (MHz)			PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2	
54	5270	25.23	46.92	45.39	PASS
62	5310	25.69	45.28	45.81	PASS
102	5510	45.93	46.51	45.30	PASS
110	5550	46.05	45.78	46.16	PASS
134	5670	47.07	46.00	45.69	PASS

802.11ac (80MHz)

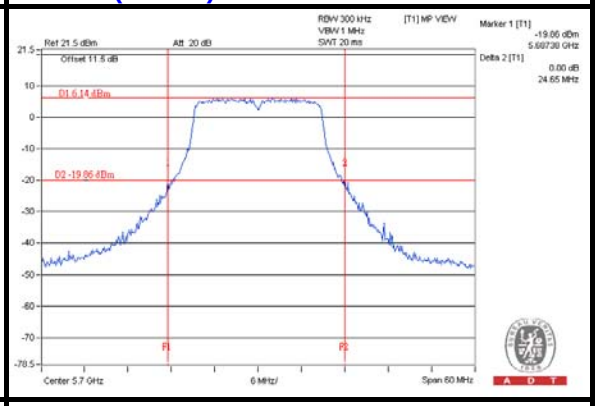
CHANNEL	CHANNEL FREQUENCY (MHz)	26dB BANDWIDTH (MHz)			PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2	
58	5290	85.71	87.36	88.44	PASS
106	5530	87.19	88.16	87.58	PASS

SPECTRUM PLOT OF WORST VALUE

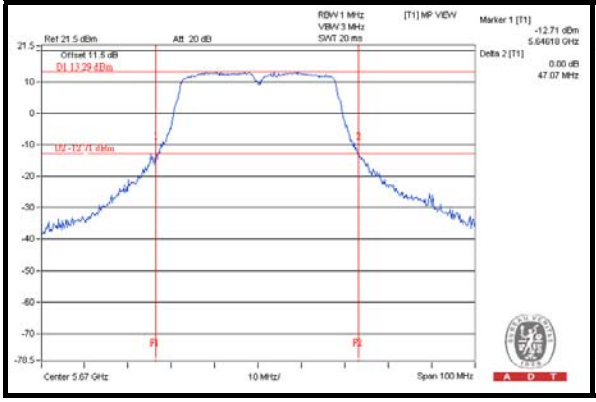
802.11a



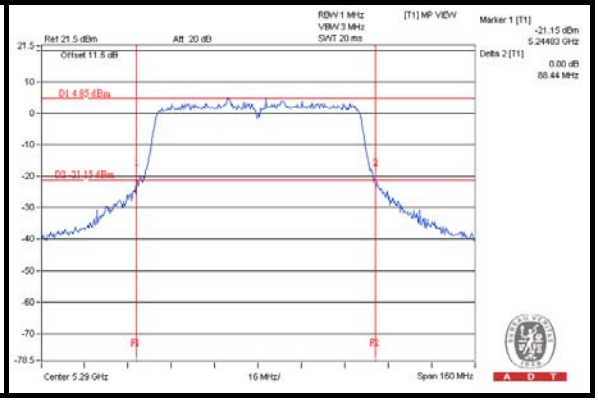
802.11n (20MHz)



802.11n (40MHz)



802.11ac (80MHz)

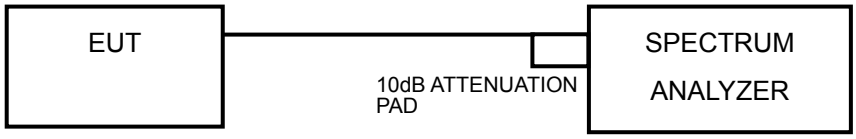


4.4 PEAK POWER SPECTRAL DENSITY MEASUREMENT

4.4.1 LIMITS OF PEAK POWER SPECTRAL DENSITY MEASUREMENT

FREQUENCY BAND	LIMIT
5.250 ~ 5.350GHz	Power spectral density shall not exceed 11 dBm in any 1.0 MHz band.
5.470 ~ 5.725GHz	Power spectral density shall not exceed 11 dBm in any 1.0 MHz band.

4.4.2 TEST SETUP



4.4.3 TEST INSTRUMENTS

Refer to section 4.1.3 to get information of above instrument.

4.4.4 TEST PROCEDURES

1) Set span to encompass the entire emission bandwidth (EBW) of the signal.
2) Set RBW = 30 kHz, Set VBW ≥ 1 MHz, Detector = RMS.
3) Set Channel power measure = 1MHz.
4) Sweep time = auto, trigger set to “free run”.
5) Trace average at least 100 traces in power averaging mode.
6) Record the max value.

4.4.5 DEVIATION FROM TEST STANDARD

No deviation.

4.4.6 EUT OPERATING CONDITIONS

Same as 4.3.6.

4.4.7 TEST RESULTS

5250MHz ~ 5350MHz

802.11a

Chan.	Freq. (MHz)	PSD (dBm)			DUTY FACTOR	TOTAL PSD WITH DUTY FACTOR (dBm)	Max. Limit (dBm)	Pass / Fail
		CHAIN 0	CHAIN 1	CHAIN 2				
52	5260	-1.16	-0.63	-1.34	0.16	3.90	6.26	PASS
60	5300	-1.82	-1.38	-1.31	0.16	3.44	6.26	PASS
64	5320	-1.87	-1.39	-1.05	0.16	3.51	6.26	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[$(10^{G1/20} + 10^{G2/20} + \ldots + 10^{GN/20})^2/3$]= 10.74dBi> 6dBi, so the power density limit shall be reduced to 11-(10.74-6) = 6.26dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11n (20MHz)

Chan.	Freq. (MHz)	PSD (dBm)			DUTY FACTOR	TOTAL PSD WITH DUTY FACTOR (dBm)	Max. Limit (dBm)	Pass / Fail
		CHAIN 0	CHAIN 1	CHAIN 2				
52	5260	-2.40	-1.86	-1.90	0.16	2.89	6.26	PASS
60	5300	-2.94	-1.41	-2.13	0.16	2.82	6.26	PASS
64	5320	-2.67	-2.39	-1.61	0.16	2.74	6.26	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[$(10^{G1/20} + 10^{G2/20} + \ldots + 10^{GN/20})^2/3$]= 10.74dBi> 6dBi, so the power density limit shall be reduced to 11-(10.74-6) = 6.26dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11n (40MHz)

Chan.	Freq. (MHz)	PSD (dBm)			DUTY FACTOR	TOTAL PSD WITH DUTY FACTOR (dBm)	Max. Limit (dBm)	Pass / Fail
		CHAIN 0	CHAIN 1	CHAIN 2				
54	5270	-4.61	-6.44	-7.49	0.32	-0.93	6.26	PASS
62	5310	-3.63	-6.85	-6.81	0.32	-0.40	6.26	PASS

NOTE:

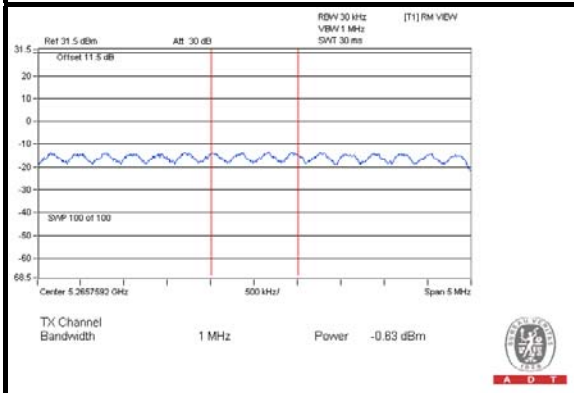
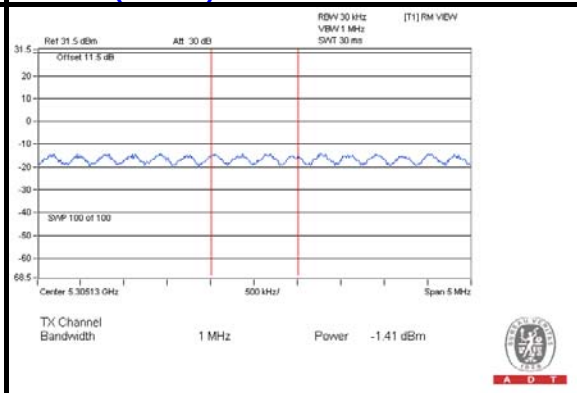
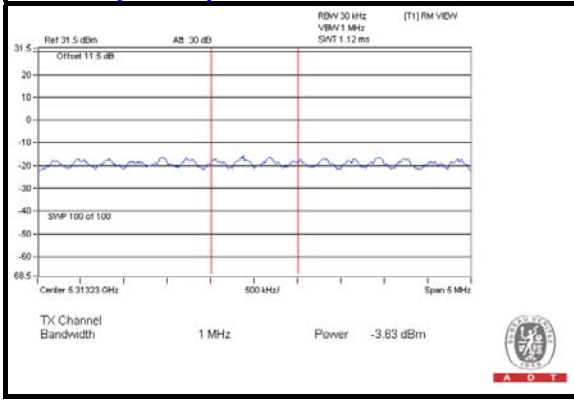
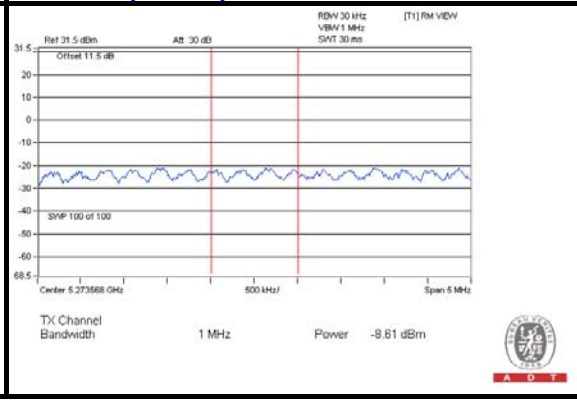
1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + ... + 10^{GN/20})^2/3$]= 10.74dBi> 6dBi, so the power density limit shall be reduced to 11-(10.74-6) = 6.26dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ac (80MHz)

Chan.	Freq. (MHz)	PSD (dBm)			DUTY FACTOR	TOTAL PSD WITH DUTY FACTOR (dBm)	Max. Limit (dBm)	Pass / Fail
		CHAIN 0	CHAIN 1	CHAIN 2				
58	5290	-8.61	-8.73	-8.76	0.54	-3.39	6.26	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[$(10^{G1/20} + 10^{G2/20} + ... + 10^{GN/20})^2/3$]= 10.74dBi> 6dBi, so the power density limit shall be reduced to 11-(10.74-6) = 6.26dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

SPECTRUM PLOT OF WORST VALUE	
802.11a	**802.11n (20MHz)**
	
802.11n (40MHz)	**802.11ac (80MHz)**
	

5470MHz ~ 5725MHz

802.11a

Chan.	Freq. (MHz)	PSD (dBm)			DUTY FACTOR	TOTAL PSD WITH DUTY FACTOR (dBm)	Max. Limit (dBm)	Pass / Fail
		CHAIN 0	CHAIN 1	CHAIN 2				
100	5500	1.04	1.01	1.33	0.16	6.06	6.36	PASS
116	5580	1.30	0.85	0.94	0.16	5.97	6.36	PASS
140	5700	1.21	0.83	0.81	0.16	5.89	6.36	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[$(10^{G1/20} + 10^{G2/20} + \ldots + 10^{GN/20})^2/3$]= 10.64dBi> 6dBi, so the power density limit shall be reduced to 11-(10.64-6) = 6.36dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11n (20MHz)

Chan.	Freq. (MHz)	PSD (dBm)			DUTY FACTOR	TOTAL PSD WITH DUTY FACTOR (dBm)	Max. Limit (dBm)	Pass / Fail
		CHAIN 0	CHAIN 1	CHAIN 2				
100	5500	1.15	0.99	1.57	0.16	6.18	6.36	PASS
116	5580	1.46	0.95	1.25	0.16	6.16	6.36	PASS
140	5700	1.47	1.04	1.59	0.16	6.31	6.36	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[$(10^{G1/20} + 10^{G2/20} + \ldots + 10^{GN/20})^2/3$]= 10.64dBi> 6dBi, so the power density limit shall be reduced to 11-(10.64-6) = 6.36dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11n (40MHz)

Chan.	Freq. (MHz)	PSD (dBm)			DUTY FACTOR	TOTAL PSD WITH DUTY FACTOR (dBm)	Max. Limit (dBm)	Pass / Fail
		CHAIN 0	CHAIN 1	CHAIN 2				
102	5510	-1.50	-2.07	-1.34	0.32	3.46	6.36	PASS
110	5550	0.82	0.58	1.76	0.32	6.17	6.36	PASS
134	5670	1.00	0.58	0.62	0.32	5.82	6.36	PASS

NOTE:

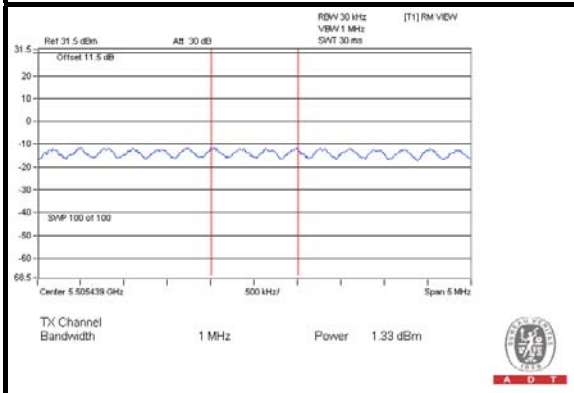
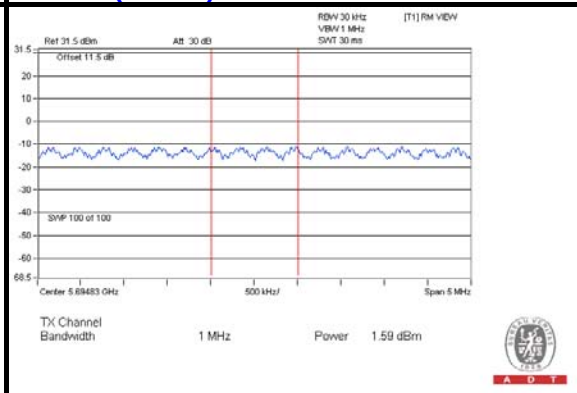
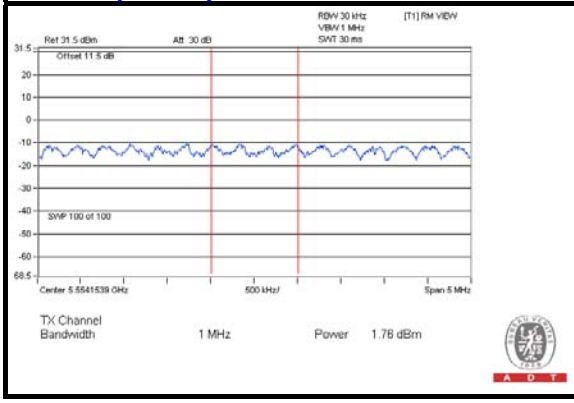
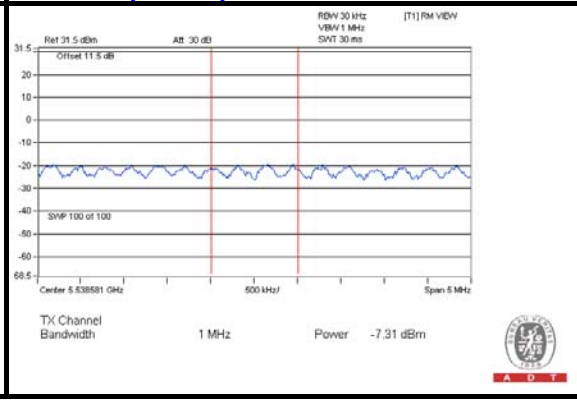
1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = 10 log[$(10^{G1/20} + 10^{G2/20} + ... + 10^{GN/20})^2/3$]= 10.64dBi> 6dBi, so the power density limit shall be reduced to 11-(10.64-6) = 6.36dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ac (80MHz)

Chan.	Freq. (MHz)	PSD (dBm)			DUTY FACTOR	TOTAL PSD WITH DUTY FACTOR (dBm)	Max. Limit (dBm)	Pass / Fail
		CHAIN 0	CHAIN 1	CHAIN 2				
106	5530	-7.86	-7.96	-7.31	0.54	-2.39	6.36	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[$(10^{G1/20} + 10^{G2/20} + ... + 10^{GN/20})^2/3$]= 10.64dBi> 6dBi, so the power density limit shall be reduced to 11-(10.64-6) = 6.36dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

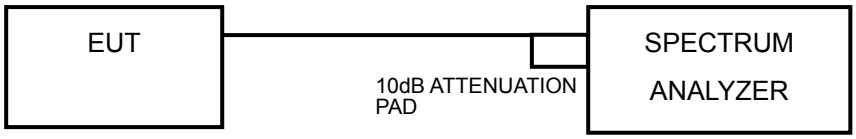
SPECTRUM PLOT OF WORST VALUE	
802.11a	**802.11n (20MHz)**
	
802.11n (40MHz)	**802.11ac (80MHz)**
	

4.5 PEAK POWER EXCURSION MEASUREMENT

4.5.1 LIMITS OF PEAK POWER EXCURSION MEASUREMENT

Shall not exceed 13 dB.

4.5.2 TEST SETUP



4.5.3 TEST INSTRUMENTS

Refer to section 4.1.3 to get information of above instrument.

4.5.4 TEST PROCEDURE

a) Set RBW = 1 MHz.
b) VBW ≥ 3 MHz.
c) Detector = peak.
d) Trace mode = max-hold.
e) Allow the sweeps to continue until the trace stabilizes.
f) Use the peak search function to find the peak of the spectrum.
g) Use the procedure found under F) to measure the PPSD.
h) Compute the ratio of the maximum of the peak-max-hold spectrum to the PPSD.

4.5.5 DEVIATION FROM TEST STANDARD

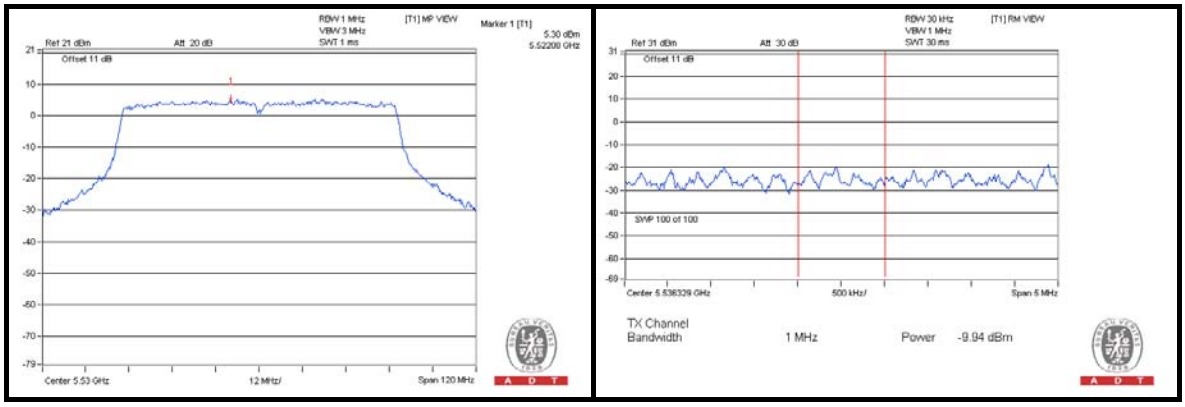
No deviation.

4.5.6 EUT OPERATING CONDITIONS

Same as 4.2.6

4.5.7 TEST RESULTS

MODULATION MODE	MODULATION TYPE	CHAN. FREQ. (MHz)	PEAK VALUE (dBm)	PPSD WITHOUT DUTY FACTOR (dBm)	PPSD WITH DUTY FACTOR (dBm)	PEAK EXCURSION (dB)	LIMIT (dB)	PASS /FAIL
802.11a	BPSK	5700	11.99	1.21	1.37	10.62	13	PASS
	QPSK		12.03	0.55	0.84	11.19	13	PASS
	16QAM		11.47	-0.46	0.13	11.34	13	PASS
	64QAM		12.01	-0.73	0.36	11.65	13	PASS
802.11n (20MHz)	BPSK	5700	12.87	1.47	1.63	11.24	13	PASS
	QPSK		12.91	1.27	1.65	11.26	13	PASS
	16QAM		14.13	1.17	1.74	12.39	13	PASS
	64QAM		14.13	0.68	1.27	12.86	13	PASS
802.11n (40MHz)	BPSK	5670	12.73	1.00	1.32	11.41	13	PASS
	QPSK		14.48	1.40	1.96	12.52	13	PASS
	16QAM		14.06	0.09	1.13	12.93	13	PASS
	64QAM		14.55	0.22	1.89	12.66	13	PASS
802.11ac (80MHz)	BPSK	5530	5.28	-7.86	-7.32	12.60	13	PASS
	QPSK		5.85	-7.75	-6.81	12.66	13	PASS
	16QAM		6.01	-8.81	-5.30	11.31	13	PASS
	64QAM		5.30	-9.94	-7.69	12.99	13	PASS
	256QAM		5.34	-9.96	-6.95	12.29	13	PASS

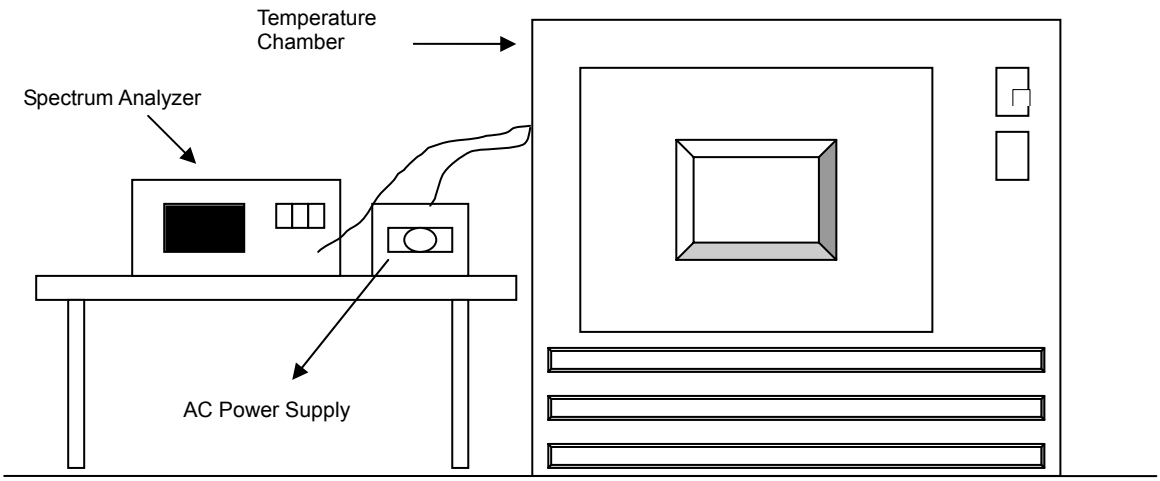


4.6 FREQUENCY STABILITY

4.6.1 LIMITS OF FREQUENCY STABILITY MEASUREMENT

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

4.6.2 TEST SETUP



4.6.3 TEST INSTRUMENTS

Refer to section 4.1.3 to get information of above instrument.

4.6.4 TEST PROCEDURE

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

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

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

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

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

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

4.6.5 DEVIATION FROM TEST STANDARD

No deviation.

4.6.6 EUT OPERATING CONDITION

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

4.6.7 TEST RESULTS

FREQUEMCY STABILITY VERSUS TEMP.									
OPERATING FREQUENCY: 5320MHz									
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	5320.0145	0.00027	5320.0125	0.00023	5320.0132	0.00025	5320.0144	0.00027
40	120	5320.0004	0.00001	5319.9983	-0.00003	5319.9980	-0.00004	5320.0028	0.00005
30	120	5319.9818	-0.00034	5319.9835	-0.00031	5319.9836	-0.00031	5319.9849	-0.00028
20	120	5319.9958	-0.00008	5319.9969	-0.00006	5319.9957	-0.00008	5319.9956	-0.00008
10	120	5319.9794	-0.00039	5319.9769	-0.00043	5319.9769	-0.00043	5319.9766	-0.00044
0	120	5320.0145	0.00027	5320.0125	0.00023	5320.0132	0.00025	5320.0144	0.00027

FREQUEMCY STABILITY VERSUS VOLTAGE									
OPERATING FREQUENCY: 5320MHz									
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	5319.9821	-0.00034	5319.9827	-0.00033	5319.9846	-0.00029	5319.9853	-0.00028
	120	5319.9818	-0.00034	5319.9835	-0.00031	5319.9836	-0.00031	5319.9849	-0.00028
	102	5319.9818	-0.00034	5319.9834	-0.00031	5319.9826	-0.00033	5319.9857	-0.00027

5. PHOTOGRAPHS OF THE TEST CONFIGURATION

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

6. 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:

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

Hsin Chu EMC/RF/Telecom Lab:
Tel: 886-3-5935343
Fax: 886-3-5935342

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

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

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

7. APPENDIX A – MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB

No modifications were made to the EUT by the lab during the test.

---END---