



# FCC TEST REPORT (15.407)

**REPORT NO.:** RF120712C20A R1  
**MODEL NO.:** WNDR4700, WNDR4720  
**FCC ID:** PY311400179  
**RECEIVED:** Jul. 26, 2012  
**TESTED:** Aug. 06 ~ Aug. 10, 2012  
Jan. 04 ~ Jan. 05, 2013  
**ISSUED:** Feb. 05, 2013

**APPLICANT:** NETGEAR, INC.

**ADDRESS:** 350 East Plumeria Drive San Jose, CA 95134

**ISSUED BY:** Bureau Veritas Consumer Products Services  
(H.K.) Ltd., Taoyuan Branch

**LAB ADDRESS:** No. 47, 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.

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## RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF120712C20A	Original release	Aug. 20, 2012
RF120712C20A R1	Due to updated KDB, radiated emission test (above 1GHz), Peak Transmit Power, Peak Power Excursion and Peak Power Spectral Density had been retested	Feb. 05, 2013



# 1. CERTIFICATION

**PRODUCT:** N900 Wireless Dual Band Gigabit Router

**MODEL:** WNDR4700, WNDR4720

**BRAND:** NETGEAR

**APPLICANT:** NETGEAR, INC.

**TESTED:** Aug. 06 ~ Aug. 10, 2012

Jan. 04 ~ Jan. 05, 2013

**TEST SAMPLE:** ENGINEERING SAMPLE

**STANDARDS:** FCC Part 15, Subpart E (Section 15.407)

ANSI C63.10-2009

The above equipment (model: WNDR4700) 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 :** Feb. 05, 2013  
Pettie Chen / Senior Specialist

**APPROVED BY :**  , **DATE :** Feb. 05, 2013  
Ken Liu / Manager

## 2. SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC PART 15, SUBPART E (SECTION 15.407)			
STANDARD SECTION	TEST TYPE	RESULT	REMARK
15.407(b)(6)	AC Power Conducted Emission	PASS	Meet the requirement of limit. Minimum passing margin is -8.09dB at 4.81250MHz.
15.407(b/1/2/3) (b)(6)	Spurious Emissions	PASS	Meet the requirement of limit. Minimum passing margin is -1.0dB at 5725.00MHz.
15.407(a/1/2)	Peak 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 UFL 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	3.19 dB
	200MHz ~ 1000MHz	3.21 dB
	1GHz ~ 18GHz	2.26 dB
	18GHz ~ 40GHz	1.94 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

<b>EUT</b>	N900 Wireless Dual Band Gigabit Router
<b>MODEL NO.</b>	WNDR4700, WNDR4720 (refer to note as below)
<b>POWER SUPPLY</b>	12Vdc (Adapter)
<b>MODULATION TYPE</b>	64QAM, 16QAM, QPSK, BPSK
<b>MODULATION TECHNOLOGY</b>	OFDM
<b>TRANSFER RATE</b>	802.11a: 54.0/ 48.0/ 36.0/ 24.0/ 18.0/ 12.0/ 9.0/ 6.0Mbps 802.11n: up to 450.0Mbps
<b>OPERATING FREQUENCY</b>	5260 ~ 5320MHz & 5500 ~ 5700MHz
<b>NUMBER OF CHANNEL</b>	5260 ~ 5320MHz: 4 for 802.11a, 802.11n (20MHz) 2 for 802.11n (40MHz) 5500 ~ 5700MHz: 7 for 802.11a, 802.11n (20MHz) 2 for 802.11n (40MHz)
<b>OUTPUT POWER</b>	191.307mW for 5260 ~ 5320MHz 193.730mW for 5500 ~ 5700MHz
<b>ANTENNA TYPE</b>	Off board PCB dipole antenna with 3dBi gain
<b>ANTENNA CONNECTOR</b>	UFL
<b>DATA CABLE</b>	NA
<b>I/O PORTS</b>	RJ45, USB
<b>ACCESSORY DEVICE</b>	Adapter

**NOTE:**

1. This report is prepared for FCC class II permissive change. The difference compared with the original report is adding frequency band from 5.26 to 5.32GHz and 5.50 to 5.70GHz by software.
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

3. The following models are provided to this EUT.

Brand Name	Model No.	Difference
NETGEAR	WNDR4700	Without HDD
NETGEAR	WNDR4720	With HDD

4. The following HDDs are provided to EUT.

Brand Name	Model No.	Spec.
WD	WD20EARX-00PASB0	2.0TB
Seagate	ST2000DM001	2000GB

\*WD HDD was the worst for the final tests.

5. The EUT consumes power from the following adapters.

<b>ADAPTER 1</b>	
<b>BRAND</b>	NETGEAR
<b>MODEL</b>	AD8180LF
<b>INPUT POWER</b>	100-240Vac, 50/60Hz, 1.5A
<b>OUTPUT POWER</b>	12Vdc, 5.0A
<b>POEWR LINE</b>	1.5 m non-shielded cable without core

<b>ADAPTER 2</b>	
<b>BRAND</b>	NETGEAR
<b>MODEL</b>	NU60-H120500-11
<b>INPUT POWER</b>	100-240Vac, 50/60Hz, 1.4A
<b>OUTPUT POWER</b>	12.0Vdc, 5.0A
<b>POEWR LINE</b>	1.5 m non-shielded cable with 1 core

\*Adapter 1 was the worst for the final tests.

6. 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):

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

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

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
54	5270 MHz	62	5310 MHz

#### FOR 5500 ~ 5700MHz

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

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
100	5500 MHz	116	5580 MHz
104	5520 MHz	136	5680 MHz
108	5540 MHz	140	5700 MHz
112	5560 MHz		

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

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
102	5510 MHz	110	5550 MHz



### 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

#### **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.

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
802.11a	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 110	102, 110	OFDM	BPSK	15.0

#### **RADIATED EMISSION TEST (BELOW 1GHz):**

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

MODE	FREQ. BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11a	5260-5320	52 to 64	60	OFDM	BPSK	6.0
802.11a	5500-5700	100 to 140	116	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.

MODE	FREQ. BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11a	5260-5320	52 to 64	60	OFDM	BPSK	6.0
802.11a	5500-5700	100 to 140	116	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.

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
802.11a	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 110	102, 110	OFDM	BPSK	15.0

**TEST CONDITION:**

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RE≥1G	26deg. C, 73%RH 16deg. C, 71%RH	120Vac, 60Hz	Jun Wu Sun Lin
RE<1G	24deg. C, 66%RH	120Vac, 60Hz	Jun Wu
PLC	25deg. C, 65%RH	120Vac, 60Hz	Anderson Hong
APCM	25deg. C, 60%RH	120Vac, 60Hz	Mark Liao Frank Liu

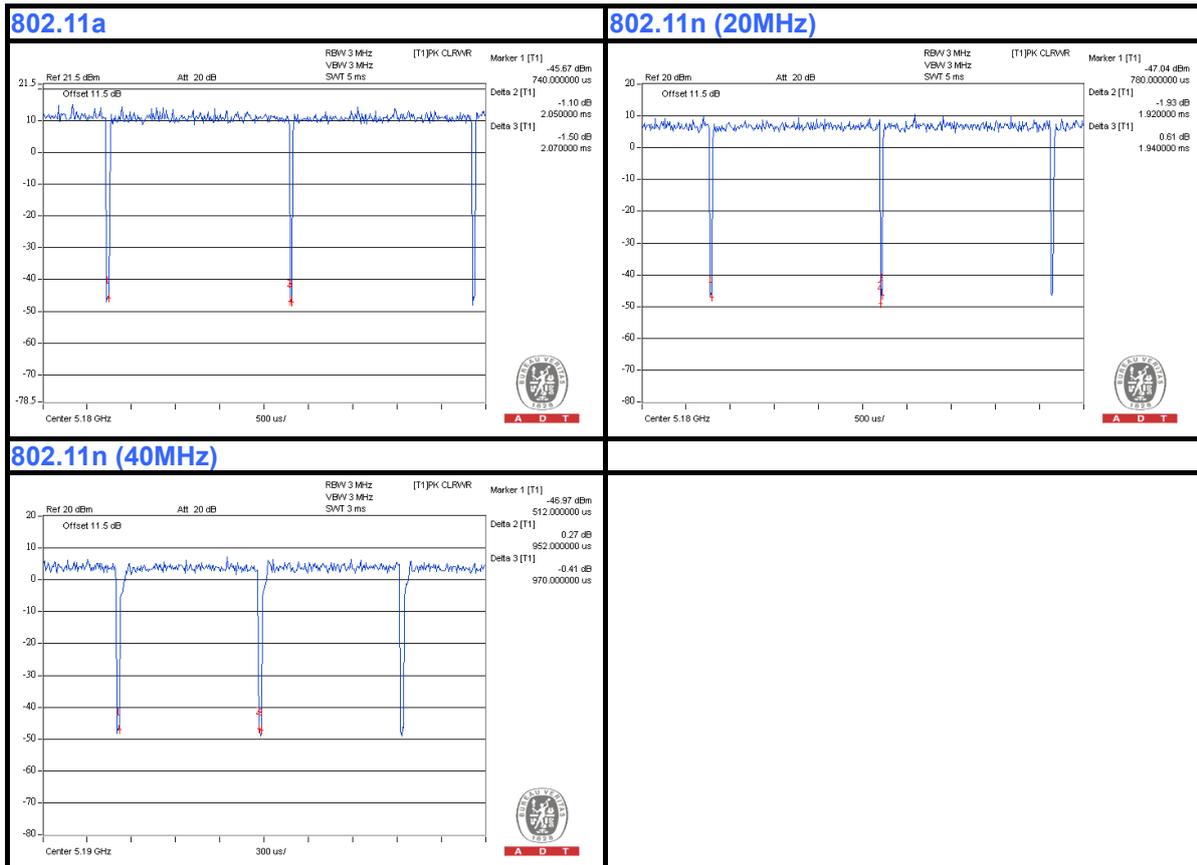
### 3.3 DUTY CYCLE OF TEST SIGNAL

Duty cycle of test signal is > 98 %, duty factor is not required.

**802.11a:** Duty cycle =  $2.05/2.07 = 0.99$

**802.11n (20MHz):** Duty cycle =  $1.92/1.94 = 0.99$

**802.11n (40MHz):** Duty cycle =  $0.952/0.970 = 0.98$





### 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.

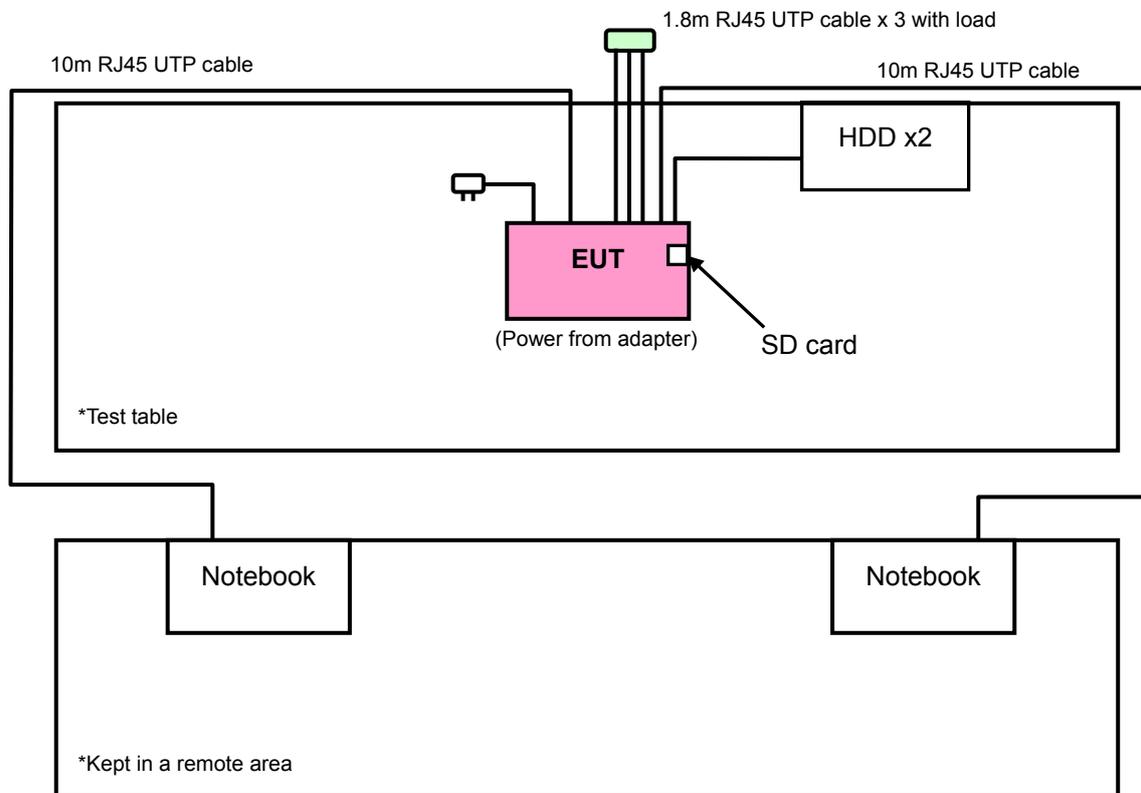
NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	External Hard Disk	WD	WDBACY5000ABL	WX81E71TTS16	FCC DoC Approved
2	External Hard Disk	WD	WDBACY5000ABL	WX81E71WXC27	FCC DoC Approved
3	Notebook	DELL	D820	21498926752	FCC DoC Approved
4	Notebook	DELL	E5420	33MJMQ1	FCC DoC Approved
5	SD Card	Transcend	NA	NA	NA

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	0.45m non-shielded USB cable without core
2	0.45m non-shielded USB cable without core
3	10m RJ45 UTP cable
4	10m RJ45 UTP cable
5	NA

**NOTE:**

1. All power cords of the above support units are non shielded (1.8m).
2. Items 3~4 acted as communication partners to transfer data.

### 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 Procedures v01 r02**

**662911 D01 Multiple Transmitter Output v01 r02**

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	
√	FIELD STRENGTH AT 3m (dBμV/m)	
	PK	AV
	74	54
	EIRP LIMIT (dBm)	EQUIVALENT FIELD STRENGTH AT 3m (dBμV/m)
	PK	PK
	-27	68.3

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

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



#### 4.1.3 TEST INSTRUMENTS

#### For Frequency range 30MHz~1GHz

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
Test Receiver ROHDE & SCHWARZ	ESI7	838496/016	Jan. 03, 2012	Jan. 02, 2013
Spectrum Analyzer ROHDE & SCHWARZ	FSU43	100115	Sep. 05, 2011	Sep. 04, 2012
BILOG Antenna SCHWARZBECK	VULB9168	9168-155	Apr. 06, 2012	Apr. 05, 2013
HORN Antenna SCHWARZBECK	BBHA 9120D	9120D-408	Jan. 05, 2012	Jan. 04, 2013
HORN Antenna SCHWARZBECK	BBHA 9170	148	Jul. 11, 2012	Jul. 10, 2013
Loop Antenna	HFH2-Z2	100070	Jan. 31, 2012	Jan. 30, 2014
Preamplifier Agilent	8449B	3008A01961	Oct. 29, 2011	Oct. 28, 2012
Preamplifier Agilent	8447D	2944A10738	Oct. 29, 2011	Oct. 28, 2012
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	309220/4	Nov. 03, 2011	Nov. 02, 2012
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	250724/4	Nov. 03, 2011	Nov. 02, 2012
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	295012/4	Nov. 03, 2011	Nov. 02, 2012
Software ADT	ADT_Radiated_V7.6.15.9.2	NA	NA	NA
Antenna Tower inn-co GmbH	MA 4000	010303	NA	NA
Antenna Tower Controller inn-co GmbH	CO2000	019303	NA	NA
Turn Table ADT	TT100.	TT93021704	NA	NA
Turn Table Controller ADT	SC100.	SC93021704	NA	NA
26GHz ~ 40GHz Amplifier	EM26400	815221	Oct. 29, 2011	Oct. 28, 2012
High Speed Peak Power Meter	ML2495A	0842014	Apr. 28, 2012	Apr. 27, 2013
Power Sensor	MA2411B	0738404	Apr. 28, 2012	Apr. 27, 2013

- 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 calibration interval of the loop antenna is 24 months and the calibrations are traceable to NML/ROC and NIST/USA.
  3. The test was performed in HwaYa Chamber 4.
  4. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
  5. The FCC Site Registration No. is 460141.
  6. The IC Site Registration No. is IC7450F-4.
  7. Tested Date: Aug. 07, 2012



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**For Frequency range above 1GHz**

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
Test Receiver ROHDE & SCHWARZ	ESCI	100424	Aug. 21, 2012	Aug. 20, 2013
Spectrum Analyzer ROHDE & SCHWARZ	FSP 40	100039	Feb. 03, 2012	Feb. 02, 2013
BILOG Antenna SCHWARZBECK	VULB9168	9168-155	Apr. 06, 2012	Apr. 05, 2013
HORN Antenna SCHWARZBECK	BBHA 9120D	9120D-404	Dec. 22, 2012	Dec. 21, 2013
HORN Antenna SCHWARZBECK	BBHA 9170	148	Jul. 11, 2012	Jul. 10, 2013
Loop Antenna	HFH2-Z2	100070	Jan. 31, 2012	Jan. 30, 2014
Preamplifier Agilent	8449B	3008A01961	Oct. 25, 2012	Oct. 24, 2013
Preamplifier Agilent	8447D	2944A10738	Oct. 23, 2012	Oct. 22, 2013
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	309220/4	Aug. 28, 2012	Aug. 27, 2013
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	250724/4	Aug. 28, 2012	Aug. 27, 2013
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	295012/4	Aug. 28, 2012	Aug. 27, 2013
Software ADT	ADT_Radiated_ V7.6.15.9.2	NA	NA	NA
Antenna Tower inn-co GmbH	MA 4000	010303	NA	NA
Antenna Tower Controller inn-co GmbH	CO2000	019303	NA	NA
Turn Table ADT	TT100.	TT93021704	NA	NA
Turn Table Controller ADT	SC100.	SC93021704	NA	NA
26GHz ~ 40GHz Amplifier	EM26400	815221	Oct. 25, 2012	Oct. 24, 2013
High Speed Peak Power Meter	ML2495A	0842014	Apr. 28, 2012	Apr. 27, 2013
Power Sensor	MA2411B	0738404	Apr. 28, 2012	Apr. 27, 2013

- 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 calibration interval of the loop antenna is 24 months and the calibrations are traceable to NML/ROC and NIST/USA.
  3. The test was performed in HwaYa Chamber 4.
  4. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
  5. The FCC Site Registration No. is 460141.
  6. The IC Site Registration No. is IC7450F-4.
  7. Tested Date: Jan. 04 ~ Jan. 05, 2013

#### 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 chamber. 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.

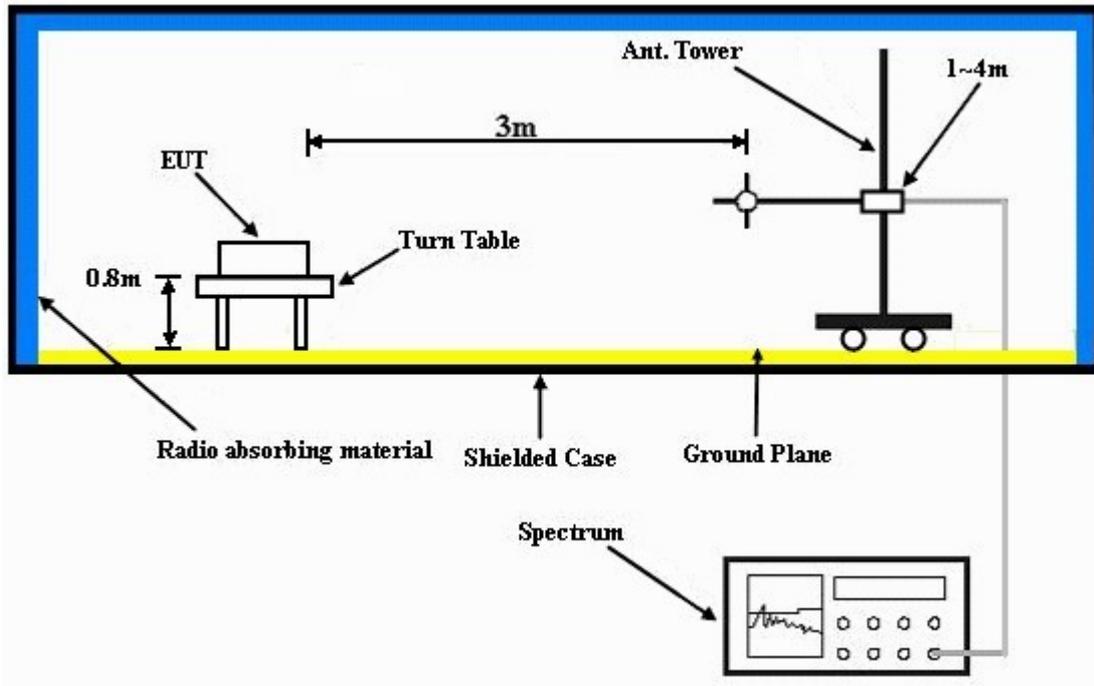
**NOTE:**

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



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

#### 4.1.7 EUT OPERATING CONDITION

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

## 4.1.8 TEST RESULTS

### ABOVE 1GHz DATA :

#### 802.11a

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 52	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	16deg. C, 71%RH	TESTED BY	Sun Lin

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	114.8 PK			1.02 H	302	76.90	37.90
2	*5260.00	104.6 AV			1.02 H	302	66.70	37.90
3	#10520.00	54.2 PK	74.0	-19.8	1.05 H	251	5.10	49.10
4	#10520.00	44.2 AV	54.0	-9.8	1.05 H	251	-4.90	49.10
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	117.2 PK			1.08 V	95	79.30	37.90
2	*5260.00	106.9 AV			1.08 V	95	69.00	37.90
3	#10520.00	55.2 PK	74.0	-18.8	1.16 V	152	6.10	49.10
4	#10520.00	44.2 AV	54.0	-9.8	1.16 V	152	-4.90	49.10

#### 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 the restricted band.



A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 60	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	16deg. C, 71%RH	TESTED BY	Sun Lin

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	114.5 PK			1.05 H	296	76.50	38.00
2	*5300.00	104.2 AV			1.05 H	296	66.20	38.00
3	10600.00	53.8 PK	74.0	-20.2	1.08 H	265	4.80	49.00
4	10600.00	43.8 AV	54.0	-10.2	1.08 H	265	-5.20	49.00
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	*5300.00	117.8 PK			1.09 V	102	79.80	38.00
2	*5300.00	107.2 AV			1.09 V	102	69.20	38.00
3	10600.00	55.6 PK	74.0	-18.4	1.12 V	158	6.60	49.00
4	10600.00	44.5 AV	54.0	-9.5	1.12 V	158	-4.50	49.00

**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.



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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 64	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	26deg. C, 69%RH	TESTED BY	Sun Lin

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	114.0 PK			1.00 H	9	76.00	38.00
2	*5320.00	103.8 AV			1.00 H	9	65.80	38.00
3	5350.00	72.0 PK	74.0	-2.0	1.00 H	26	33.90	38.10
4	5350.00	50.8 AV	54.0	-3.2	1.00 H	26	12.70	38.10
5	10640.00	53.8 PK	74.0	-20.2	1.02 H	262	4.60	49.20
6	10640.00	44.0 AV	54.0	-10.0	1.02 H	262	-5.20	49.20
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	*5320.00	117.4 PK			1.09 V	94	79.40	38.00
2	*5320.00	107.7 AV			1.09 V	94	69.70	38.00
3	5350.00	67.4 PK	74.0	-6.6	1.09 V	103	29.30	38.10
4	5350.00	50.6 AV	54.0	-3.4	1.09 V	103	12.50	38.10
5	10640.00	55.8 PK	74.0	-18.2	1.21 V	157	6.60	49.20
6	10640.00	44.8 AV	54.0	-9.2	1.21 V	157	-4.40	49.20

**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.
6. "#":The radiated frequency is out the restricted band.
4. Margin value = Emission level – Limit value.



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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 100	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	16deg. C, 71%RH	TESTED BY	Sun Lin

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	62.4 PK	74.0	-11.6	1.00 H	21	24.10	38.30
2	5460.00	44.9 AV	54.0	-9.1	1.00 H	21	6.60	38.30
3	#5470.00	69.0 PK	74.0	-5.0	1.00 H	21	30.70	38.30
4	#5470.00	49.0 AV	54.0	-5.0	1.00 H	21	10.70	38.30
5	*5500.00	114.5 PK			1.07 H	28	76.20	38.30
6	*5500.00	104.0 AV			1.07 H	28	65.70	38.30
7	11000.00	53.8 PK	74.0	-20.2	1.04 H	265	4.10	49.70
8	11000.00	43.9 AV	54.0	-10.1	1.04 H	265	-5.80	49.70
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	5460.00	64.3 PK	74.0	-9.7	1.06 V	100	26.00	38.30
2	5460.00	48.4 AV	54.0	-5.6	1.06 V	100	10.10	38.30
3	#5470.00	72.7 PK	74.0	-1.3	1.06 V	100	34.40	38.30
4	#5470.00	51.5 AV	54.0	-2.5	1.06 V	100	13.20	38.30
5	*5500.00	117.2 PK			1.00 V	192	78.90	38.30
6	*5500.00	107.5 AV			1.00 V	192	69.20	38.30
7	11000.00	55.8 PK	74.0	-18.2	1.21 V	162	6.10	49.70
8	11000.00	44.8 AV	54.0	-9.2	1.21 V	162	-4.90	49.70

**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.
6. "#": The radiated frequency is out the restricted band.



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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 116	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	16deg. C, 71%RH	TESTED BY	Sun Lin

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	114.8 PK			1.05 H	32	76.40	38.40
2	*5580.00	104.2 AV			1.05 H	32	65.80	38.40
3	11160.00	54.2 PK	74.0	-19.8	1.09 H	271	4.70	49.50
4	11160.00	44.2 AV	54.0	-9.8	1.09 H	271	-5.30	49.50
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	*5580.00	117.8 PK			1.02 V	189	79.40	38.40
2	*5580.00	107.5 AV			1.02 V	189	69.10	38.40
3	11160.00	55.2 PK	74.0	-18.8	1.18 V	152	5.70	49.50
4	11160.00	44.2 AV	54.0	-9.8	1.18 V	152	-5.30	49.50

**REMARKS:**

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



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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 140	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	16deg. C, 71%RH	TESTED BY	Sun Lin

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	113.7 PK			1.02 H	31	75.00	38.70
2	*5700.00	103.5 AV			1.02 H	31	64.80	38.70
3	#5725.00	67.3 PK	74.0	-6.7	1.03 H	48	28.60	38.70
4	#5725.00	48.0 AV	54.0	-6.0	1.03 H	48	9.30	38.70
5	11400.00	53.4 PK	74.0	-20.6	1.08 H	261	4.00	49.40
6	11400.00	43.2 AV	54.0	-10.8	1.08 H	261	-6.20	49.40
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	*5700.00	115.9 PK			1.16 V	105	77.20	38.70
2	*5700.00	106.0 AV			1.16 V	105	67.30	38.70
3	#5725.00	72.8 PK	74.0	-1.2	1.12 V	108	34.10	38.70
4	#5725.00	52.6 AV	54.0	-1.4	1.12 V	108	13.90	38.70
5	11400.00	55.4 PK	74.0	-18.6	1.15 V	178	6.00	49.40
6	11400.00	44.8 AV	54.0	-9.2	1.15 V	178	-4.60	49.40

**REMARKS:**

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



A D T

802.11n(20MHz)

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 52	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	16deg. C, 71%RH	TESTED BY	Sun Lin

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	115.1 PK			1.08 H	299	77.20	37.90
2	*5260.00	104.8 AV			1.08 H	299	66.90	37.90
3	#10520.00	53.8 PK	74.0	-20.2	1.07 H	248	4.70	49.10
4	#10520.00	44.1 AV	54.0	-9.9	1.07 H	248	-5.00	49.10
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	117.5 PK			1.04 V	212	79.60	37.90
2	*5260.00	107.2 AV			1.04 V	212	69.30	37.90
3	#10520.00	54.5 PK	74.0	-19.5	1.14 V	169	5.40	49.10
4	#10520.00	43.8 AV	54.0	-10.2	1.14 V	169	-5.30	49.10

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 the restricted band.



A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 60	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	16deg. C, 71%RH	TESTED BY	Sun Lin

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	114.2 PK			1.02 H	305	76.20	38.00
2	*5300.00	104.1 AV			1.02 H	305	66.10	38.00
3	10600.00	53.2 PK	74.0	-20.8	1.17 H	242	4.20	49.00
4	10600.00	43.5 AV	54.0	-10.5	1.17 H	242	-5.50	49.00
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	*5300.00	117.2 PK			1.18 V	257	79.20	38.00
2	*5300.00	106.9 AV			1.18 V	257	68.90	38.00
3	10600.00	55.6 PK	74.0	-18.4	1.05 V	137	6.60	49.00
4	10600.00	44.8 AV	54.0	-9.2	1.05 V	137	-4.20	49.00

**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.



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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 64	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	16deg. C, 71%RH	TESTED BY	Sun Lin

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	113.2 PK			1.02 H	15	75.20	38.00
2	*5320.00	103.1 AV			1.02 H	15	65.10	38.00
3	5350.00	71.8 PK	74.0	-2.2	1.08 H	22	33.70	38.10
4	5350.00	50.4 AV	54.0	-3.6	1.08 H	22	12.30	38.10
5	10640.00	53.6 PK	74.0	-20.4	1.08 H	275	4.40	49.20
6	10640.00	43.6 AV	54.0	-10.4	1.08 H	275	-5.60	49.20
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	*5320.00	116.5 PK			1.09 V	103	78.50	38.00
2	*5320.00	106.2 AV			1.09 V	103	68.20	38.00
3	5350.00	71.2 PK	74.0	-2.8	1.14 V	172	33.10	38.10
4	5350.00	51.8 AV	54.0	-2.2	1.14 V	172	13.70	38.10
5	10640.00	55.2 PK	74.0	-18.8	1.15 V	162	6.00	49.20
6	10640.00	44.0 AV	54.0	-10.0	1.15 V	162	-5.20	49.20

**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.



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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 100	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	16deg. C, 71%RH	TESTED BY	Sun Lin

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	61.8 PK	74.0	-12.2	1.05 H	17	23.50	38.30
2	5460.00	44.2 AV	54.0	-9.8	1.05 H	17	5.90	38.30
3	#5470.00	68.4 PK	74.0	-5.6	1.05 H	17	30.10	38.30
4	#5470.00	48.8 AV	54.0	-5.2	1.05 H	17	10.50	38.30
5	*5500.00	113.5 PK			1.02 H	12	75.20	38.30
6	*5500.00	103.2 AV			1.02 H	12	64.90	38.30
7	11000.00	53.4 PK	74.0	-20.6	1.02 H	258	3.70	49.70
8	11000.00	43.2 AV	54.0	-10.8	1.02 H	258	-6.50	49.70
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	5460.00	64.8 PK	74.0	-9.2	1.16 V	96	26.50	38.30
2	5460.00	47.2 AV	54.0	-6.8	1.16 V	96	8.90	38.30
3	#5470.00	72.8 PK	74.0	-1.2	1.16 V	98	34.50	38.30
4	#5470.00	52.0 AV	54.0	-2.0	1.16 V	98	13.70	38.30
5	*5500.00	116.0 PK			1.12 V	295	77.70	38.30
6	*5500.00	106.6 AV			1.12 V	295	68.30	38.30
7	11000.00	55.5 PK	74.0	-18.5	1.12 V	268	5.80	49.70
8	11000.00	44.2 AV	54.0	-9.8	1.12 V	268	-5.50	49.70

**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.
6. "#":The radiated frequency is out the restricted band.



A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 116	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	16deg. C, 71%RH	TESTED BY	Sun Lin

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	114.2 PK			1.07 H	26	75.80	38.40
2	*5580.00	103.6 AV			1.07 H	26	65.20	38.40
3	11160.00	53.8 PK	74.0	-20.2	1.12 H	268	4.30	49.50
4	11160.00	43.9 AV	54.0	-10.1	1.12 H	268	-5.60	49.50
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	*5580.00	116.2 PK			1.04 V	201	77.80	38.40
2	*5580.00	106.1 AV			1.04 V	201	67.70	38.40
3	11160.00	54.8 PK	74.0	-19.2	1.21 V	164	5.30	49.50
4	11160.00	43.9 AV	54.0	-10.1	1.21 V	164	-5.60	49.50

**REMARKS:**

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



A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 140	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	16deg. C, 71%RH	TESTED BY	Sun Lin

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	113.2 PK			1.05 H	18	74.50	38.70
2	*5700.00	102.8 AV			1.05 H	18	64.10	38.70
3	#5725.00	66.8 PK	74.0	-7.2	1.08 H	12	28.10	38.70
4	#5725.00	48.2 AV	54.0	-5.8	1.08 H	12	9.50	38.70
5	11400.00	52.8 PK	74.0	-21.2	1.18 H	258	3.40	49.40
6	11400.00	42.8 AV	54.0	-11.2	1.18 H	258	-6.60	49.40
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	*5700.00	114.8 PK			1.25 V	304	76.10	38.70
2	*5700.00	104.2 AV			1.25 V	304	65.50	38.70
3	#5725.00	72.8 PK	74.0	-1.2	1.27 V	298	34.10	38.70
4	#5725.00	53.0 AV	54.0	-1.0	1.27 V	298	14.30	38.70
5	11400.00	55.2 PK	74.0	-18.8	1.02 V	154	5.80	49.40
6	11400.00	44.0 AV	54.0	-10.0	1.02 V	154	-5.40	49.40

**REMARKS:**

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



A D T

802.11n(40MHz)

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 54	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	16deg. C, 71%RH	TESTED BY	Sun Lin

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	107.2 PK			1.18 H	301	69.20	38.00
2	*5270.00	97.2 AV			1.18 H	301	59.20	38.00
3	#10540.00	52.8 PK	74.0	-21.2	1.06 H	251	3.70	49.10
4	#10540.00	43.2 AV	54.0	-10.8	1.06 H	251	-5.90	49.10
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	*5270.00	111.2 PK			1.05 V	225	73.20	38.00
2	*5270.00	100.8 AV			1.05 V	225	62.80	38.00
3	#10540.00	55.2 PK	74.0	-18.8	1.15 V	185	6.10	49.10
4	#10540.00	44.5 AV	54.0	-9.5	1.15 V	185	-4.60	49.10

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 the restricted band.



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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 62	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	16deg. C, 71%RH	TESTED BY	Sun Lin

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	103.2 PK			1.12 H	299	65.20	38.00
2	*5310.00	93.2 AV			1.12 H	299	55.20	38.00
3	5350.00	60.4 PK	74.0	-13.6	1.16 H	305	22.30	38.10
4	5350.00	47.2 AV	54.0	-6.8	1.16 H	305	9.10	38.10
5	10620.00	52.6 PK	74.0	-21.4	1.08 H	242	3.50	49.10
6	10620.00	42.8 AV	54.0	-11.2	1.08 H	242	-6.30	49.10
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	*5310.00	107.2 PK			1.05 V	18	69.20	38.00
2	*5310.00	97.2 AV			1.05 V	18	59.20	38.00
3	5350.00	64.8 PK	74.0	-9.2	1.05 V	347	26.70	38.10
4	5350.00	52.4 AV	54.0	-1.6	1.05 V	347	14.30	38.10
5	10620.00	55.9 PK	74.0	-18.1	1.02 V	208	6.80	49.10
6	10620.00	44.8 AV	54.0	-9.2	1.02 V	208	-4.30	49.10

**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.



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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 102	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	16deg. C, 71%RH	TESTED BY	Sun Lin

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	56.2 PK	74.0	-17.8	1.16 H	308	17.90	38.30
2	5460.00	42.8 AV	54.0	-11.2	1.16 H	308	4.50	38.30
3	#5470.00	62.2 PK	74.0	-11.8	1.16 H	308	23.90	38.30
4	#5470.00	46.5 AV	54.0	-7.5	1.16 H	308	8.20	38.30
5	*5510.00	101.6 PK			1.18 H	299	63.20	38.40
6	*5510.00	91.5 AV			1.18 H	299	53.10	38.40
7	11020.00	53.2 PK	74.0	-20.8	1.08 H	245	3.60	49.60
8	11020.00	42.8 AV	54.0	-11.2	1.08 H	245	-6.80	49.60
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	5460.00	60.5 PK	74.0	-13.5	1.12 V	194	22.20	38.30
2	5460.00	46.8 AV	54.0	-7.2	1.12 V	194	8.50	38.30
3	#5470.00	66.5 PK	74.0	-7.5	1.12 V	194	28.20	38.30
4	#5470.00	51.8 AV	54.0	-2.2	1.12 V	194	13.50	38.30
5	*5510.00	105.6 PK			1.12 V	14	67.20	38.40
6	*5510.00	95.0 AV			1.12 V	14	56.60	38.40
7	11020.00	54.5 PK	74.0	-19.5	1.24 V	198	4.90	49.60
8	11020.00	44.2 AV	54.0	-9.8	1.24 V	198	-5.40	49.60

**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 the restricted band.



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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 110	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	16deg. C, 71%RH	TESTED BY	Sun Lin

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	107.1 PK			1.05 H	296	68.70	38.40
2	*5550.00	97.2 AV			1.05 H	296	58.80	38.40
3	11100.00	52.6 PK	74.0	-21.4	1.01 H	285	3.10	49.50
4	11100.00	42.8 AV	54.0	-11.2	1.01 H	285	-6.70	49.50
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	*5550.00	111.6 PK			1.09 V	27	73.20	38.40
2	*5550.00	101.0 AV			1.09 V	27	62.60	38.40
3	11100.00	54.8 PK	74.0	-19.2	1.12 V	167	5.30	49.50
4	11100.00	44.2 AV	54.0	-9.8	1.12 V	167	-5.30	49.50

**REMARKS:**

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



A D T

**BELOW 1GHz WORST-CASE DATA : 802.11a**

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 60	FREQUENCY RANGE	Below 1000MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	24deg. C, 66%RH	TESTED BY	Jun Wu

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	70.65	28.2 QP	40.0	-11.8	1.42 H	87	16.00	12.20
2	154.09	32.5 QP	43.5	-11.0	1.38 H	270	18.10	14.40
3	192.89	32.9 QP	43.5	-10.6	1.31 H	260	20.90	12.00
4	245.28	34.3 QP	46.0	-11.7	1.27 H	233	20.90	13.40
5	625.60	34.8 QP	46.0	-11.2	1.22 H	189	11.10	23.70
6	703.22	34.6 QP	46.0	-11.4	1.15 H	331	10.10	24.50
7	765.31	34.3 QP	46.0	-11.7	1.07 H	12	8.10	26.20
8	813.82	35.2 QP	46.0	-10.8	1.00 H	14	7.90	27.30
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	88.11	32.4 QP	43.5	-11.1	1.00 V	97	23.60	8.80
2	185.13	31.7 QP	43.5	-11.8	1.00 V	255	19.10	12.60
3	625.60	34.1 QP	46.0	-11.9	1.06 V	344	10.40	23.70
4	875.91	35.7 QP	46.0	-10.3	1.17 V	10	7.50	28.20
5	899.20	32.2 QP	46.0	-13.8	1.24 V	209	3.70	28.50
6	957.41	32.5 QP	46.0	-13.5	1.33 V	15	3.30	29.20

**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.



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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 116	FREQUENCY RANGE	Below 1000MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	24deg. C, 66%RH	TESTED BY	Jun Wu

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	68.71	28.6 QP	40.0	-11.4	1.42 H	85	16.10	12.50
2	185.13	32.9 QP	43.5	-10.6	1.39 H	274	20.30	12.60
3	204.54	33.1 QP	43.5	-10.4	1.30 H	232	21.40	11.70
4	249.17	34.8 QP	46.0	-11.2	1.28 H	39	21.20	13.60
5	625.60	35.0 QP	46.0	-11.0	1.21 H	169	11.30	23.70
6	749.79	35.5 QP	46.0	-10.5	1.19 H	343	9.70	25.80
7	767.25	36.9 QP	46.0	-9.1	1.14 H	47	10.70	26.20
8	813.82	32.9 QP	46.0	-13.1	1.05 H	3	5.60	27.30
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	70.65	33.2 QP	40.0	-6.8	1.00 V	241	21.00	12.20
2	183.19	31.7 QP	43.5	-11.8	1.00 V	232	18.90	12.80
3	625.60	33.9 QP	46.0	-12.1	1.00 V	354	10.20	23.70
4	759.49	32.5 QP	46.0	-13.5	1.27 V	230	6.50	26.00
5	875.91	35.8 QP	46.0	-10.2	1.33 V	16	7.60	28.20
6	897.26	34.4 QP	46.0	-11.6	1.07 V	6	5.90	28.50
7	930.25	32.1 QP	46.0	-13.9	1.12 V	222	3.20	28.90

**REMARKS:**

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

## 4.2 CONDUCTED EMISSION MEASUREMENT

### 4.2.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

FREQUENCY OF EMISSION (MHz)	CONDUCTED LIMIT (dB $\mu$ V)	
	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	100291	Nov. 23, 2011	Nov. 22, 2012
RF signal cable Woken	5D-FB	Cable-HYC01-01	Dec. 29, 2011	Dec. 28, 2012
LISN ROHDE & SCHWARZ (Peripheral)	ESH3-Z5	100312	Jul. 02, 2012	Jul. 01, 2013
LISN ROHDE & SCHWARZ (EUT)	ESH3-Z5	835239/001	Feb. 07, 2012	Feb. 06, 2013
Software ADT	BV ADT_Cond_ V7.3.7.3	NA	NA	NA

- NOTE:** 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in HwaYa Shielded Room 1.
3. The VCCI Site Registration No. is C-2040.
4. Tested Date: Aug. 10, 2012.

#### 4.2.3 TEST PROCEDURES

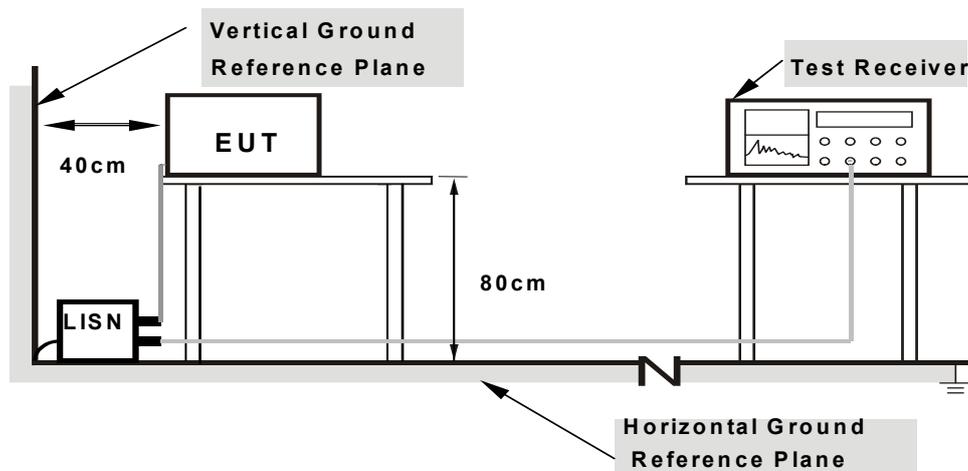
- a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling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

<b>PHASE</b>	Line 1	<b>6dB BANDWIDTH</b>	9kHz
<b>CHANNEL</b>	Channel 60		

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	0.11	45.58	32.53	45.69	32.64	66.00	56.00	-20.31	-23.36
2	0.18516	0.13	41.49	30.74	41.62	30.87	64.25	54.25	-22.64	-23.39
3	0.57969	0.15	31.98	23.91	32.13	24.06	56.00	46.00	-23.87	-21.94
4	4.65234	0.37	41.11	34.55	41.48	34.92	56.00	46.00	-14.52	-11.08
5	7.12500	0.50	44.29	37.43	44.79	37.93	60.00	50.00	-15.21	-12.07
6	9.77344	0.63	47.32	41.15	47.95	41.78	60.00	50.00	-12.05	-8.22

- 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.



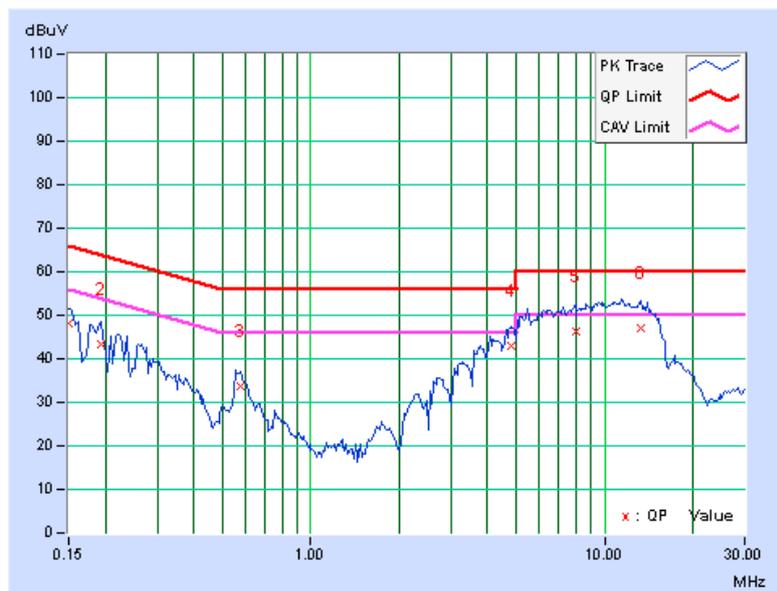


A D T

<b>PHASE</b>	Line 2	<b>6dB BANDWIDTH</b>	9kHz
<b>CHANNEL</b>	Channel 60		

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	0.12	47.89	33.33	48.01	33.45	66.00	56.00	-17.99	-22.55
2	0.19297	0.14	43.10	30.98	43.24	31.12	63.91	53.91	-20.67	-22.79
3	0.57578	0.17	33.56	25.45	33.73	25.62	56.00	46.00	-22.27	-20.38
<b>4</b>	<b>4.81250</b>	<b>0.38</b>	<b>42.53</b>	<b>37.53</b>	<b>42.91</b>	<b>37.91</b>	<b>56.00</b>	<b>46.00</b>	<b>-13.09</b>	<b>-8.09</b>
5	7.97656	0.51	45.77	39.64	46.28	40.15	60.00	50.00	-13.72	-9.85
6	13.32813	0.72	46.34	41.11	47.06	41.83	60.00	50.00	-12.94	-8.17

- 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.



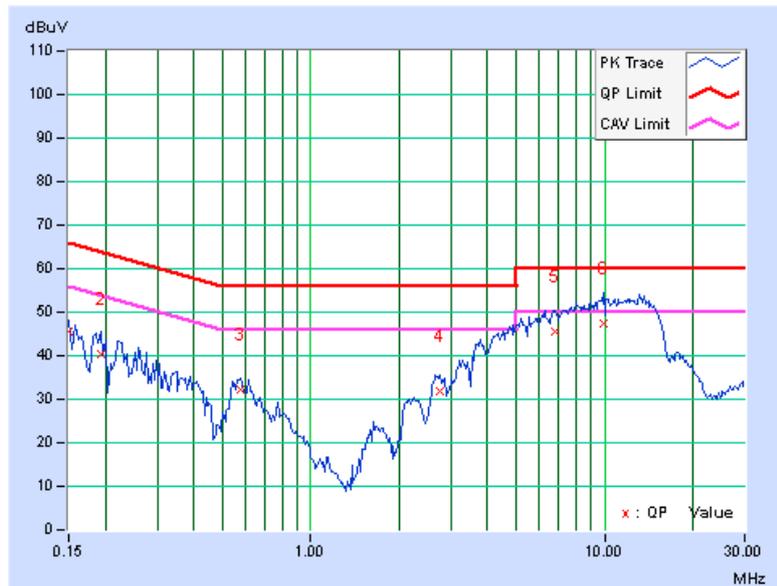


A D T

<b>PHASE</b>	Line 1	<b>6dB BANDWIDTH</b>	9kHz
<b>CHANNEL</b>	Channel 116		

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	0.11	45.58	32.72	45.69	32.83	66.00	56.00	-20.31	-23.17
2	0.19297	0.13	40.19	30.44	40.32	30.57	63.91	53.91	-23.59	-23.34
3	0.57969	0.15	32.22	24.55	32.37	24.70	56.00	46.00	-23.63	-21.30
4	2.75000	0.27	31.65	27.09	31.92	27.36	56.00	46.00	-24.08	-18.64
5	6.76563	0.48	44.99	39.70	45.47	40.18	60.00	50.00	-14.53	-9.82
6	9.94531	0.64	46.79	41.03	47.43	41.67	60.00	50.00	-12.57	-8.33

- 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.



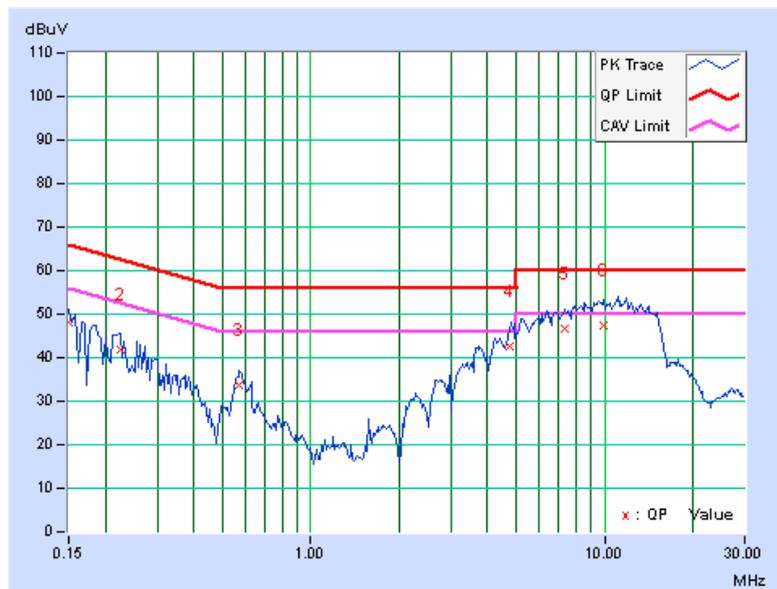


A D T

PHASE	Line 2	6dB BANDWIDTH	9kHz
CHANNEL	Channel 116		

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	0.12	47.87	33.63	47.99	33.75	66.00	56.00	-18.01	-22.25
2	0.22422	0.14	41.64	33.39	41.78	33.53	62.66	52.66	-20.88	-19.13
3	0.57188	0.17	33.71	25.29	33.88	25.46	56.00	46.00	-22.12	-20.54
4	4.73438	0.38	42.15	36.64	42.53	37.02	56.00	46.00	-13.47	-8.98
5	7.28125	0.48	46.29	40.34	46.77	40.82	60.00	50.00	-13.23	-9.18
6	9.96875	0.59	46.91	41.13	47.50	41.72	60.00	50.00	-12.50	-8.28

- 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 PEAK TRANSMIT POWER MEASUREMENT

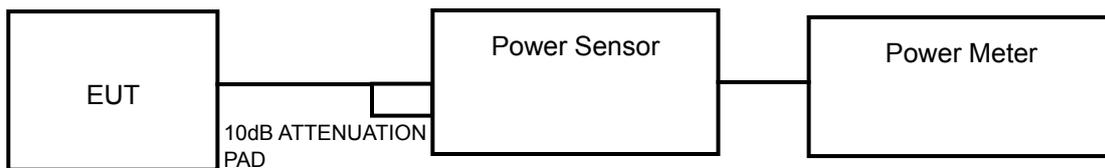
#### 4.3.1 LIMITS OF PEAK TRANSMIT POWER MEASUREMENT

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

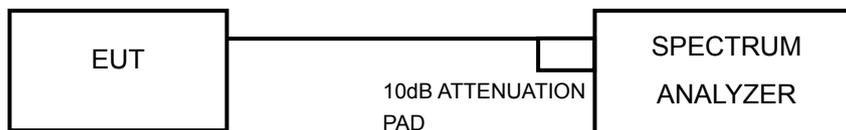
**NOTE:** Where B is the 26dB emission bandwidth in MHz.

#### 4.3.2 TEST SETUP

##### FOR POWER OUTPUT MEASUREMENT



##### FOR 26dB BANDWIDTH



#### 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

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 26dB BANDWIDTH

- 1) Set RBW = approximately 1% of the emission bandwidth.
- 2) Set the VBW > RBW.
- 3) Detector = Peak.
- 4) Trace mode = max hold.
- 5) Measure the maximum width of the emission that is 26 dB down from the peak of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.

#### 4.3.5 DEVIATION 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: 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	17.20	17.00	16.80	150.463	21.77	24	PASS
60	5300	17.00	17.10	16.80	149.268	21.74	24	PASS
64	5320	17.40	17.70	17.50	170.072	22.31	24	PASS
100	5500	17.00	17.10	17.20	153.886	21.87	24	PASS
116	5580	16.80	16.90	17.60	154.385	21.89	24	PASS
140	5700	15.80	16.30	16.30	123.335	20.91	24	PASS

#### 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	17.30	16.80	16.80	149.429	21.74	24	PASS
60	5300	17.30	17.30	17.10	158.692	22.01	24	PASS
64	5320	17.40	17.30	17.00	158.776	22.01	24	PASS
100	5500	16.90	17.20	17.40	156.413	21.94	24	PASS
116	5580	16.70	17.30	17.60	158.021	21.99	24	PASS
140	5700	16.20	16.80	17.10	140.836	21.49	24	PASS

#### 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	18.50	17.80	17.80	<b>191.307</b>	22.82	24	PASS
62	5310	15.60	15.80	15.30	108.211	20.34	24	PASS
102	5510	11.20	11.60	11.60	42.091	16.24	24	PASS
110	5550	18.10	18.00	18.20	<b>193.730</b>	22.87	24	PASS



**26dB BANDWIDTH: 802.11a**

CHANNEL	CHANNEL FREQUENCY (MHz)	26dBc BANDWIDTH (MHz)			PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2	
52	5260	24.65	24.43	24.33	PASS
60	5300	24.70	24.69	24.15	PASS
64	5320	25.01	24.96	24.35	PASS
100	5500	25.27	24.56	24.06	PASS
116	5580	25.41	24.68	24.48	PASS
140	5700	25.10	24.61	24.34	PASS

**802.11n (20MHz)**

CHANNEL	CHANNEL FREQUENCY (MHz)	26dBc BANDWIDTH (MHz)			PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2	
52	5260	26.10	25.71	25.26	PASS
60	5300	25.65	25.41	25.36	PASS
64	5320	25.83	25.61	25.48	PASS
100	5500	25.76	25.88	25.77	PASS
116	5580	26.12	25.87	25.69	PASS
140	5700	25.99	25.29	26.18	PASS

**802.11n (40MHz)**

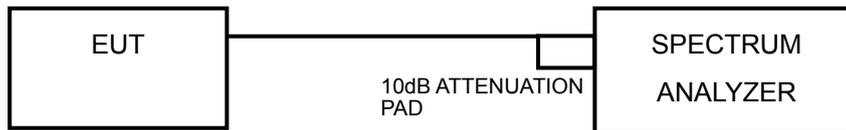
CHANNEL	CHANNEL FREQUENCY (MHz)	26dBc BANDWIDTH (MHz)			PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2	
54	5270	53.46	52.55	52.79	PASS
62	5310	52.93	52.53	53.39	PASS
102	5510	52.77	52.74	53.38	PASS
110	5550	52.17	53.19	53.70	PASS

## 4.4 PEAK POWER SPECTRAL DENSITY MEASUREMENT

### 4.4.1 LIMITS OF PEAK POWER SPECTRAL DENSITY MEASUREMENT

FREQUENCY BAND	LIMIT
5.250 ~ 5.350GHz	11dBm
5.470 ~ 5.725GHz	11dBm

### 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

Using method SA-1

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

### 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

##### 802.11a

CHAN.	CHAN. FREQ. (MHz)	PSD (dBm)			TOTAL POWER DENSITY (dBm)	MAX. LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2			
52	5260	3.77	3.68	3.90	8.56	9.2	PASS
60	5300	4.15	3.96	3.33	8.60	9.2	PASS
64	5320	3.65	3.75	4.01	8.58	9.2	PASS
100	5500	4.08	3.68	4.11	8.73	9.2	PASS
116	5580	3.63	3.75	4.23	8.65	9.2	PASS
140	5700	3.87	3.73	3.96	8.63	9.2	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 =  $3\text{dBi} + 10\log(3) = 7.8\text{dBi} > 6\text{dBi}$  , so the limit shall be reduced to  $11 - (7.8 - 6) = 9.2\text{dBm}$ .

##### 802.11n (20MHz)

CHAN.	CHAN. FREQ. (MHz)	PSD (dBm)			TOTAL POWER DENSITY (dBm)	MAX. LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2			
52	5260	3.43	3.31	3.66	8.24	9.2	PASS
60	5300	3.45	3.37	3.66	8.27	9.2	PASS
64	5320	3.55	3.88	3.85	8.53	9.2	PASS
100	5500	4.01	3.49	3.42	8.42	9.2	PASS
116	5580	3.87	4.23	3.74	8.72	9.2	PASS
140	5700	4.01	3.37	3.60	8.44	9.2	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 =  $3\text{dBi} + 10\log(3) = 7.8\text{dBi} > 6\text{dBi}$  , so the limit shall be reduced to  $11 - (7.8 - 6) = 9.2\text{dBm}$ .



802.11n (40MHz)

CHAN.	CHAN. FREQ. (MHz)	PSD (dBm)			TOTAL POWER DENSITY (dBm)	MAX. LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1	CHAIN 2			
54	5270	1.04	1.51	1.16	6.01	9.2	PASS
62	5310	0.28	-0.65	-0.70	4.44	9.2	PASS
102	5510	-4.67	-4.78	-3.55	0.47	9.2	PASS
110	5550	1.25	0.80	0.93	5.77	9.2	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 =  $3\text{dBi} + 10\log(3) = 7.8\text{dBi} > 6\text{dBi}$  , so the limit shall be reduced to  $11 - (7.8 - 6) = 9.2\text{dBm}$ .

## 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

1. Set RBW = 1 MHz, VBW = 3 MHz. Detector = peak.
2. Trace mode = max-hold. Allow the sweeps to continue until the trace stabilizes.
3. Use the peak search function to find the peak of the spectrum.
4. Use section 4.4.4 to measure the PPSD.
5. 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

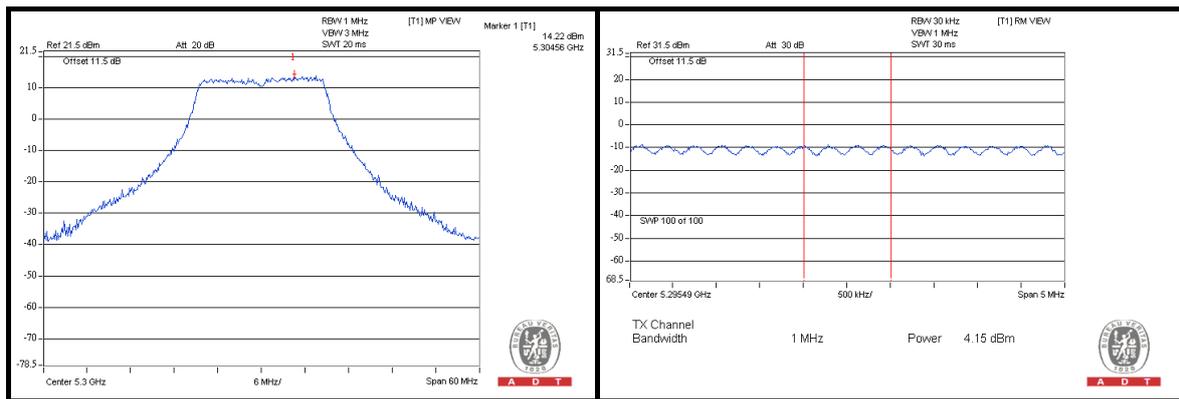


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## 4.5.7 TEST RESULTS

### 802.11a

CHAN.	CHAN. FREQ. (MHz)	PEAK VALUE (dBm)			PPSD (dBm)			PEAK EXCURSION (dB)			LIMIT (dB)	PASS/ FAIL
		CHAIN 0	CHAIN 1	CHAIN 2	CHAIN 0	CHAIN 1	CHAIN 2	CHAIN 0	CHAIN 1	CHAIN 2		
52	5260	12.28	11.84	13.09	3.77	3.68	3.90	8.51	8.16	9.19	13	PASS
60	5300	14.22	12.33	12.36	4.15	3.96	3.33	10.07	8.37	9.03	13	PASS
64	5320	12.79	12.59	12.25	3.65	3.75	4.01	9.14	8.84	8.24	13	PASS
100	5500	13.63	12.05	13.37	4.08	3.68	4.11	9.55	8.37	9.26	13	PASS
116	5580	12.59	11.81	12.58	3.63	3.75	4.23	8.96	8.06	8.35	13	PASS
140	5700	12.63	11.68	12.65	3.87	3.73	3.96	8.76	7.95	8.69	13	PASS

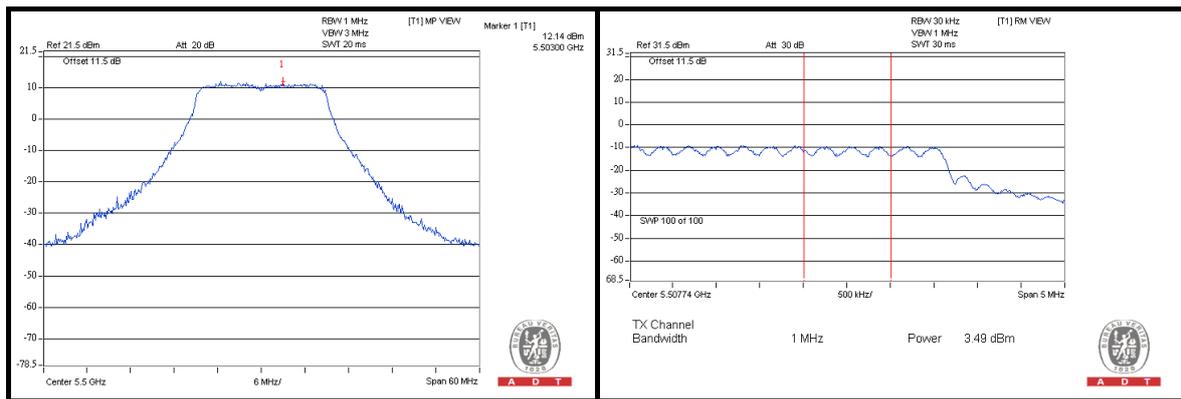




A D T

802.11n (20MHz)

CHAN.	CHAN. FREQ. (MHz)	PEAK VALUE (dBm)			PPSD (dBm)			PEAK EXCURSION (dB)			LIMIT (dB)	PASS/ FAIL
		CHAIN 0	CHAIN 1	CHAIN 2	CHAIN 0	CHAIN 1	CHAIN 2	CHAIN 0	CHAIN 1	CHAIN 2		
52	5260	11.78	11.10	11.74	3.43	3.31	3.66	8.35	7.79	8.08	13	PASS
60	5300	11.53	11.28	11.58	3.45	3.37	3.66	8.08	7.91	7.92	13	PASS
64	5320	12.05	11.58	12.17	3.55	3.88	3.85	8.50	7.70	8.32	13	PASS
100	5500	11.71	12.14	11.67	4.01	3.49	3.42	7.70	8.65	8.25	13	PASS
116	5580	11.60	11.78	11.79	3.87	4.23	3.74	7.73	7.55	8.05	13	PASS
140	5700	11.99	11.06	12.08	4.01	3.37	3.60	7.98	7.69	8.48	13	PASS

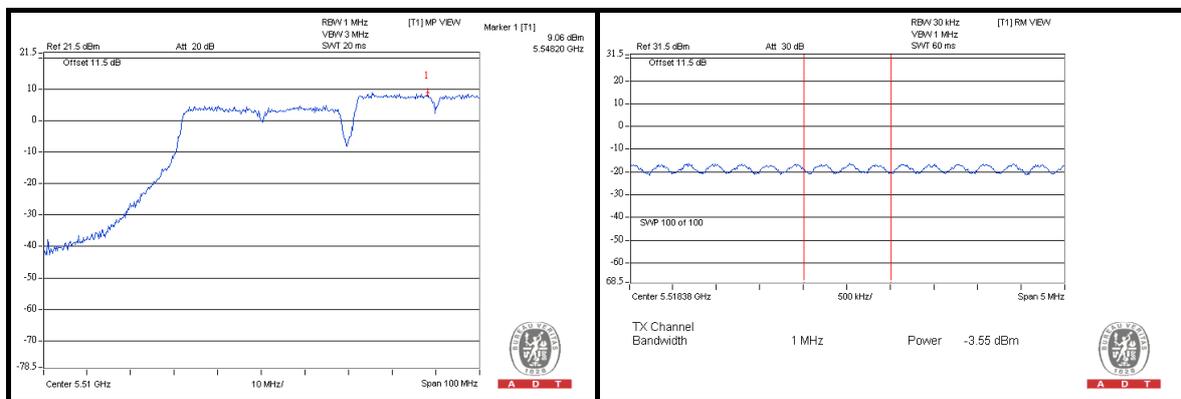




A D T

802.11n (40MHz)

CHAN.	CHAN. FREQ. (MHz)	PEAK VALUE (dBm)			PPSD (dBm)			PEAK EXCURSION (dB)			LIMIT (dB)	PASS/ FAIL
		CHAIN 0	CHAIN 1	CHAIN 2	CHAIN 0	CHAIN 1	CHAIN 2	CHAIN 0	CHAIN 1	CHAIN 2		
54	5270	9.46	9.83	9.93	1.04	1.51	1.16	8.42	8.32	8.77	13	PASS
62	5310	8.04	7.92	8.02	0.28	-0.65	-0.70	7.76	8.57	8.72	13	PASS
102	5510	3.64	3.02	9.06	-4.67	-4.78	-3.55	8.31	7.80	12.61	13	PASS
110	5550	9.02	8.58	9.59	1.25	0.80	0.93	7.77	7.78	8.66	13	PASS

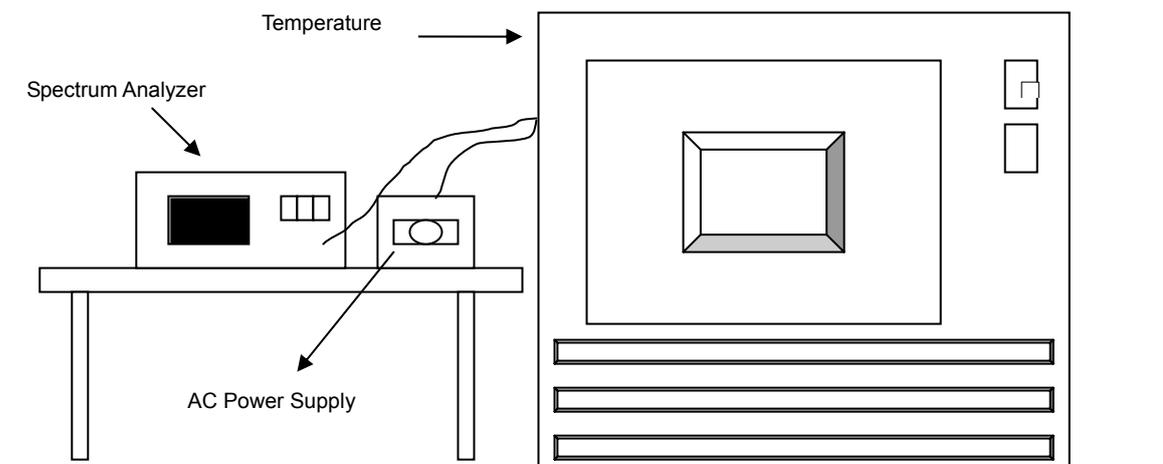


## 4.6 FREQUENCY STABILITY

### 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

FREQUENCY STABILITY VERSUS TEMP.									
OPERATING FREQUENCY: 5320MHz									
TEMP. (°C)	POWER SUPPLY (Vac)	0 MINUTE		2 MINUTE		5 MINUTE		10 MINUTE	
		Measured Frequency (MHz)	Frequency Drift (ppm)						
50	110.0	5320.018038	3.391	5320.018221	3.425	5320.018495	3.477	5320.018394	3.458
40	110.0	5320.018483	3.474	5320.018088	3.400	5320.018247	3.430	5320.018181	3.417
30	110.0	5320.019727	3.708	5320.019641	3.692	5320.020110	3.780	5320.019889	3.739
20	110.0	5320.021257	3.996	5320.021343	4.012	5320.021437	4.030	5320.021227	3.990
10	110.0	5320.022991	4.322	5320.022839	4.293	5320.023013	4.326	5320.022748	4.276
0	110.0	5320.021907	4.118	5320.022381	4.207	5320.021903	4.117	5320.022161	4.166
-10	110.0	5320.019957	3.751	5320.019522	3.670	5320.020442	3.842	5320.019909	3.742
-20	110.0	5320.019203	3.610	5320.019637	3.691	5320.019133	3.596	5320.019201	3.609
-30	110.0	5320.018316	3.443	5320.017933	3.371	5320.018323	3.444	5320.017615	3.311

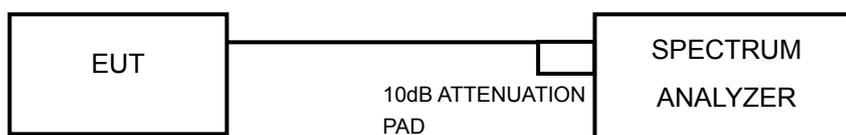
FREQUENCY STABILITY VERSUS VOLTAGE									
OPERATING FREQUENCY: 5320MHz									
TEMP. (°C)	POWER SUPPLY (Vac)	0 MINUTE		2 MINUTE		5 MINUTE		10 MINUTE	
		Measured Frequency (MHz)	Frequency Drift (ppm)						
20	93.5	5320.019995	3.758	5320.019797	3.721	5320.019609	3.686	5320.019799	3.722
	110.0	5320.021257	3.996	5320.021343	4.012	5320.021437	4.030	5320.021227	3.990
	126.5	5320.022887	4.302	5320.023325	4.384	5320.023387	4.396	5320.023369	4.393

## 4.7 20dBc BANDWIDTH FOR CHANNEL CLOSE TO 5600 TO 5650 MHz BAND

### 4.7.1 LIMITS OF PEAK TRANSMIT POWER MEASUREMENT

20dBc point shall not fall in 5600~5650MHz.

### 4.7.2 TEST SETUP



### 4.7.3 TEST INSTRUMENTS

Refer to section 4.1.3 to get information of above instrument.

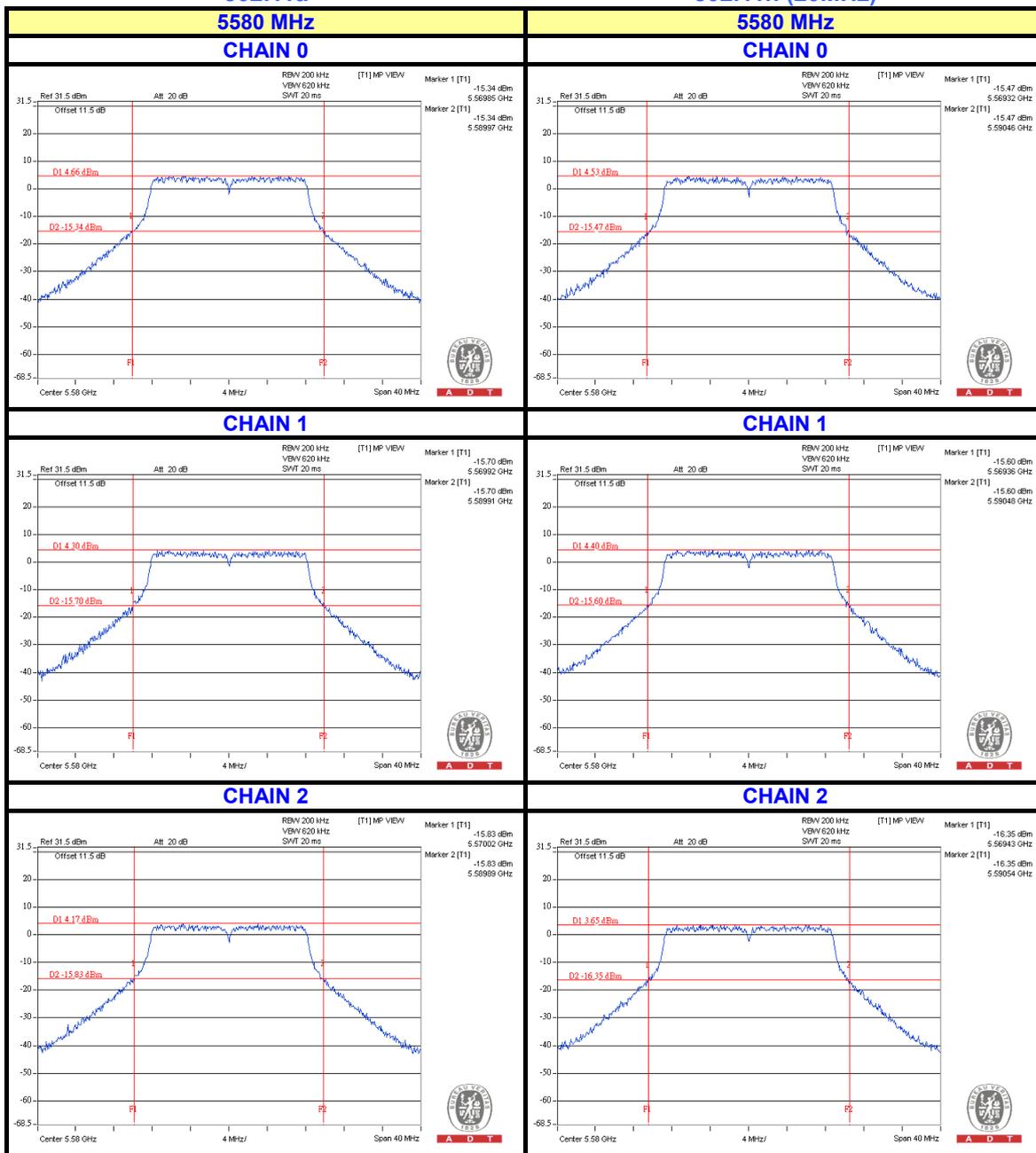


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### 4.7.4 TEST RESULTS

802.11a

802.11n (20MHz)



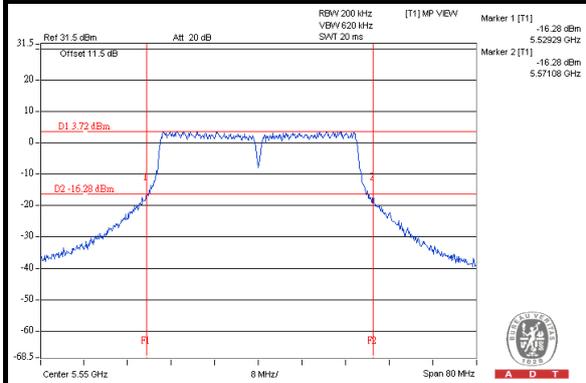


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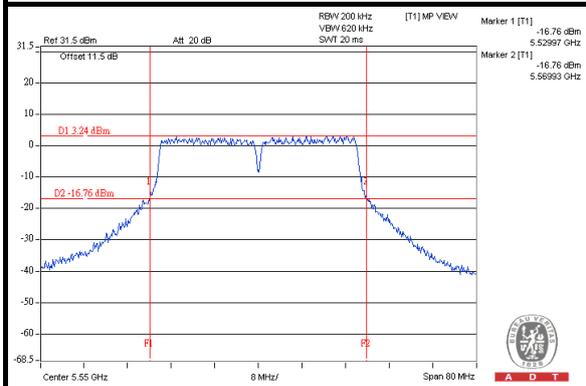
### 802.11n (40MHz)

#### 5550 MHz

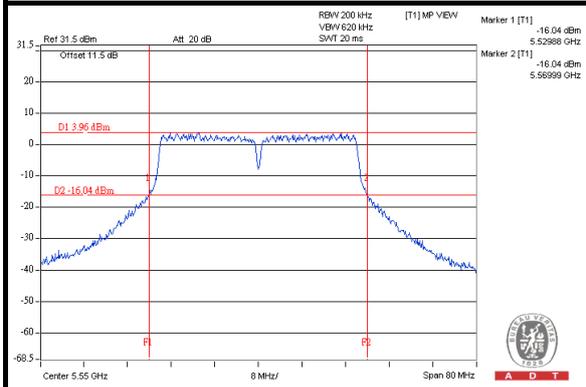
#### CHAIN 0



#### CHAIN 1



#### CHAIN 2





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## 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 Lab:**  
Tel: 886-3-5935343  
Fax: 886-3-5935342

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

**Email:** [service.adt@tw.bureauveritas.com](mailto:service.adt@tw.bureauveritas.com)

**Web Site:** [www.bureauveritas-adt.com](http://www.bureauveritas-adt.com)

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



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## 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---**