

FCC TEST REPORT (15.407)

REPORT NO.: RF130812C17A-1

MODEL NO.: DNUB-O1

FCC ID: NKR-O1

RECEIVED: Dec. 16, 2013

TESTED: Jan. 08 ~ Jan. 10, 2014

ISSUED: Feb. 17, 2014

APPLICANT: Wistron NeWeb Corp.

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

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TABLE OF CONTENTS

RELEASE CONTROL RECORD	4
1. CERTIFICATION.....	5
2. SUMMARY OF TEST RESULTS	6
2.1 MEASUREMENT UNCERTAINTY	6
3. GENERAL INFORMATION.....	7
3.1 GENERAL DESCRIPTION OF EUT	7
3.2 DESCRIPTION OF TEST MODES.....	9
3.2.1 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL.....	10
3.3 DUTY CYCLE OF TEST SIGNAL.....	12
3.4 DESCRIPTION OF SUPPORT UNITS	13
3.4.1 CONFIGURATION OF SYSTEM UNDER TEST	13
3.5 GENERAL DESCRIPTION OF APPLIED STANDARDS	13
4. TEST TYPES AND RESULTS	15
4.1 RADIATED EMISSION AND BANDEDGE MEASUREMENT	15
4.1.1 LIMITS OF RADIATED EMISSION AND BANDEDGE MEASUREMENT.....	15
4.1.2 LIMITS OF UNWANTED EMISSION OUT OF THE RESTRICTED BANDS	15
4.1.3 TEST INSTRUMENTS.....	16
4.1.4 TEST PROCEDURES	17
4.1.5 DEVIATION FROM TEST STANDARD	17
4.1.6 TEST SETUP	18
4.1.7 EUT OPERATING CONDITION	19
4.1.8 TEST RESULTS	20
4.2 CONDUCTED EMISSION MEASUREMENT	46
4.2.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT	46
4.2.2 TEST INSTRUMENTS.....	46
4.2.3 TEST PROCEDURES	47
4.2.4 DEVIATION FROM TEST STANDARD	47
4.2.5 TEST SETUP	47
4.2.6 EUT OPERATING CONDITIONS	47
4.2.7 TEST RESULTS	48
4.3 PEAK TRANSMIT POWER MEASUREMENT	50
4.3.1 LIMITS OF PEAK TRANSMIT POWER MEASUREMENT	50
4.3.2 TEST SETUP	50
4.3.3 TEST INSTRUMENTS.....	51
4.3.4 TEST PROCEDURE.....	51
4.3.5 DEVIATION FROM TEST STANDARD	51
4.3.6 EUT OPERATING CONDITIONS	51
4.3.7 TEST RESULTS	52
4.4 PEAK POWER SPECTRAL DENSITY MEASUREMENT	58
4.4.1 LIMITS OF PEAK POWER SPECTRAL DENSITY MEASUREMENT	58
4.4.2 TEST SETUP	58
4.4.3 TEST INSTRUMENTS.....	58
4.4.4 TEST PROCEDURES	58
4.4.5 DEVIATION FROM TEST STANDARD	58
4.4.6 EUT OPERATING CONDITIONS	59
4.4.7 TEST RESULTS	60
4.5 PEAK POWER EXCURSION MEASUREMENT	64



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4.5.1	LIMITS OF PEAK POWER EXCURSION MEASUREMENT	64
4.5.2	TEST SETUP	64
4.5.3	TEST INSTRUMENTS.....	64
4.5.4	TEST PROCEDURE.....	64
4.5.5	DEVIATION FROM TEST STANDARD	64
4.5.6	EUT OPERATING CONDITIONS	64
4.5.7	TEST RESULTS	65
4.6	FREQUENCY STABILITY	66
4.6.1	LIMITS OF FREQUENCY STABILITY MEASUREMENT.....	66
4.6.2	TEST SETUP	66
4.6.3	TEST INSTRUMENTS.....	66
4.6.4	TEST PROCEDURE.....	67
4.6.5	DEVIATION FROM TEST STANDARD	67
4.6.6	EUT OPERATING CONDITION	67
4.6.7	TEST RESULTS	68
5.	PHOTOGRAPHS OF THE TEST CONFIGURATION	69
6.	INFORMATION ON THE TESTING LABORATORIES.....	70
7.	APPENDIX A - MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB	71



RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF130812C17A-1	Original release	Feb. 17, 2014

1. CERTIFICATION

PRODUCT: 11abgn 2x2 USB Module

MODEL: DNUB-O1

BRAND: OKI

APPLICANT: Wistron NeWeb Corp.

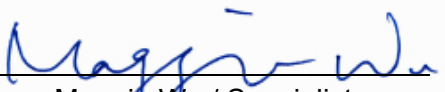
TESTED: Jan. 08 ~ Jan. 10, 2014

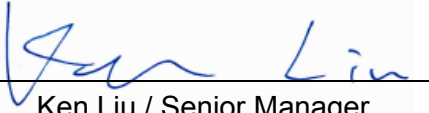
TEST SAMPLE: ENGINEERING SAMPLE

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

ANSI C63.10-2009

The above equipment (model: DNUB-O1) 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. 17, 2014
Maggie Wu / Specialist

APPROVED BY :  , **DATE :** Feb. 17, 2014
Ken Liu / Senior 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 -14.11dB at 0.19692MHz.
15.407(b/1/2/3)(b)(6)	Radiated Emissions	PASS	Meet the requirement of limit. Minimum passing margin is -0.2dB at 11000.00MHz.
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	No antenna connector is used.

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	2.93 dB
	200MHz ~ 1000MHz	2.95 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

EUT	11abgn 2x2 USB Module
MODEL NO.	DNUB-O1
POWER SUPPLY	5Vdc from host equipment
MODULATION TYPE	64QAM, 16QAM, QPSK, BPSK
MODULATION TECHNOLOGY	OFDM
TRANSFER RATE	802.11a: 54.0/ 48.0/ 36.0/ 24.0/ 18.0/ 12.0/ 9.0/ 6.0Mbps 802.11n: up to 300.0Mbps
OPERATING FREQUENCY	5180 ~ 5240MHz, 5260 ~ 5320MHz & 5500 ~ 5700MHz
NUMBER OF CHANNEL	5180 ~ 5240MHz: 4 for 802.11a, 802.11n (20MHz) 2 for 802.11n (40MHz) 5260 ~ 5320MHz: 4 for 802.11a, 802.11n (20MHz) 2 for 802.11n (40MHz) 5500 ~ 5700MHz: 8 for 802.11a, 802.11n (20MHz) 3 for 802.11n (40MHz)
OUTPUT POWER	43.152mW for 5180 ~ 5240MHz 45.082mW for 5260 ~ 5320MHz 45.082mW for 5500 ~ 5700MHz
ANTENNA TYPE	Refer to NOTE as below
ANTENNA CONNECTOR	NA
DATA CABLE	NA
I/O PORTS	Refer to user's manual
ACCESSORY DEVICES	NA

NOTE:

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

MODULATION MODE	TX FUNCTION
802.11b	1TX
802.11g	1TX
802.11a	1TX
802.11n (20MHz)	2TX
802.11n (40MHz)	2TX

2. The antennas used in this EUT are listed in the table as below.

ITEM	TYPE	GAIN (dBi)							
		2400MHz	2450MHz	2500MHz	5150MHz	5350MHz	5600MHz	5785MHz	5850MHz
Ant. 1	Printed	-0.31	-0.02	0.18	1.98	2.62	3.53	4.60	4.75
Ant. 2	Printed	-0.10	-0.05	-0.14	1.70	2.24	2.80	3.98	3.94

From the above antennas, the Ant. 1 was selected as representative antenna for the 802.11 a/b/g test and its data were recorded in this report.

3. 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 5180 ~ 5240MHz

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

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
36	5180 MHz	44	5220 MHz
40	5200 MHz	48	5240 MHz

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

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
38	5190 MHz	46	5230 MHz

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

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

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

3.2.1 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

EUT CONFIGURE MODE	APPLICABLE TO				DESCRIPTION
	RE $\geq$ 1G	RE<1G	PLC	APCM	
-	√	√	√	√	-

Where **RE $\geq$ 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 **Y-plane**.

RADIATED EMISSION TEST (ABOVE 1GHz):

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

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

EUT CONFIGURE MODE	MODE	FREQ. BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
-	802.11a	5180-5240	36 to 48	36, 40, 48	OFDM	BPSK	6.0
-	802.11n (20MHz)		36 to 48	36, 40, 48	OFDM	BPSK	7.2
-	802.11n (40MHz)		38 to 46	38, 46	OFDM	BPSK	15.0
-	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 134	102, 110, 134	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.

EUT CONFIGURE MODE	MODE	FREQ. BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
-	802.11n (20MHz)	5180-5700	36 to 140	100	OFDM	BPSK	7.2

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)
-	802.11n (20MHz)	5180-5700	36 to 140	100	OFDM	BPSK	7.2

ANTENNA PORT CONDUCTED MEASUREMENT:

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

EUT CONFIGURE MODE	MODE	FREQ. BAND (MHz)	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
-	802.11a	5180-5240	36 to 48	36, 40, 48	OFDM	BPSK	6.0
-	802.11n (20MHz)		36 to 48	36, 40, 48	OFDM	BPSK	7.2
-	802.11n (40MHz)		38 to 46	38, 46	OFDM	BPSK	15.0
-	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 134	102, 110, 134	OFDM	BPSK	15.0

TEST CONDITION:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RE $\geq$ 1G	25deg. C, 68%RH	120Vac, 60Hz	Sun Lin
RE<1G	25deg. C, 68%RH	120Vac, 60Hz	Sun Lin
PLC	25deg. C, 68%RH	120Vac, 60Hz	Sun Lin
APCM	25deg. C, 60%RH	120Vac, 60Hz	Nick Chen

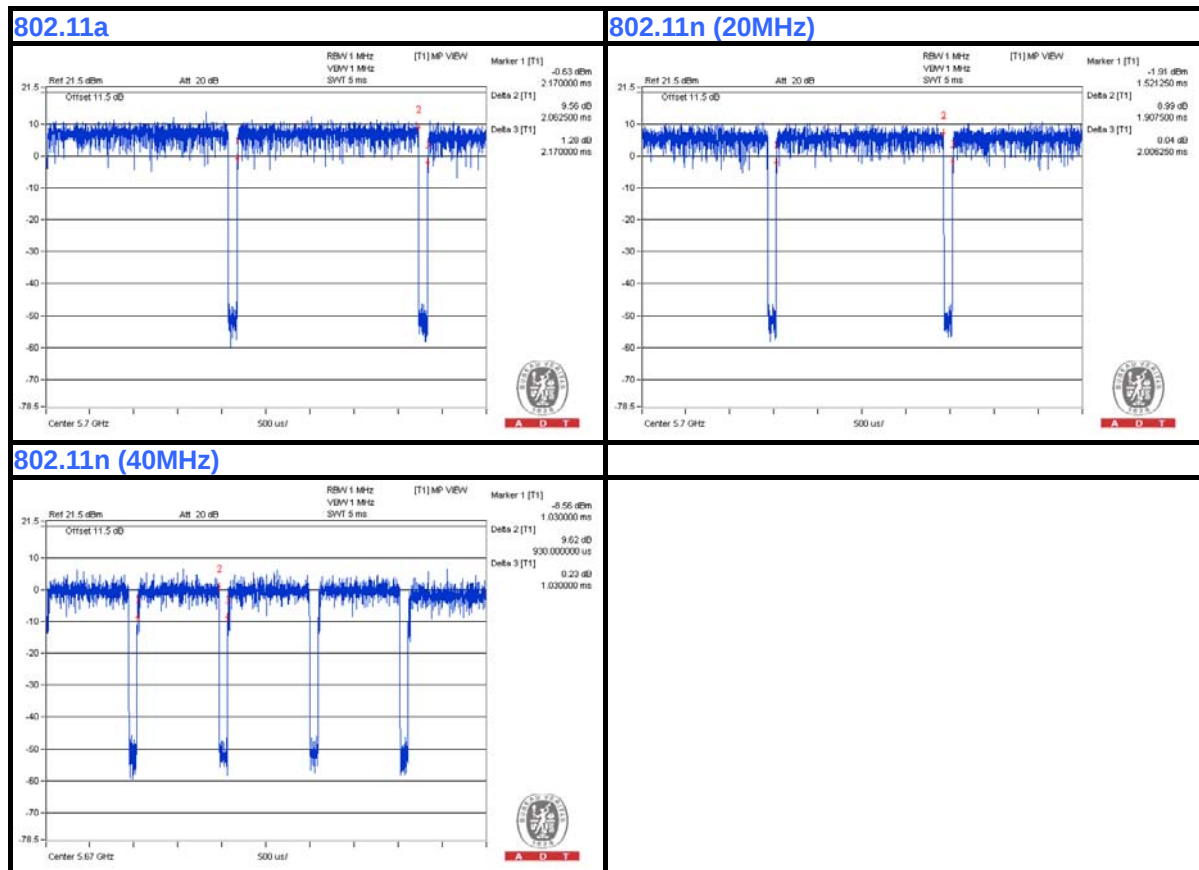
3.3 DUTY CYCLE OF TEST SIGNAL

If duty cycle of test signal is < 98%, duty factor shall be considered.

802.11a: Duty cycle = $2.063/2.170 = 0.951$, Duty factor = $10 * \log(1/0.951) = 0.218$

802.11n (20MHz): Duty cycle = $1.908/2.006 = 0.951$, Duty factor = $10 * \log(1/0.951) = 0.218$

802.11n (40MHz): Duty cycle = $0.930/1.030 = 0.903$, Duty factor = $10 * \log(1/0.903) = 0.443$



3.4 DESCRIPTION OF SUPPORT UNITS

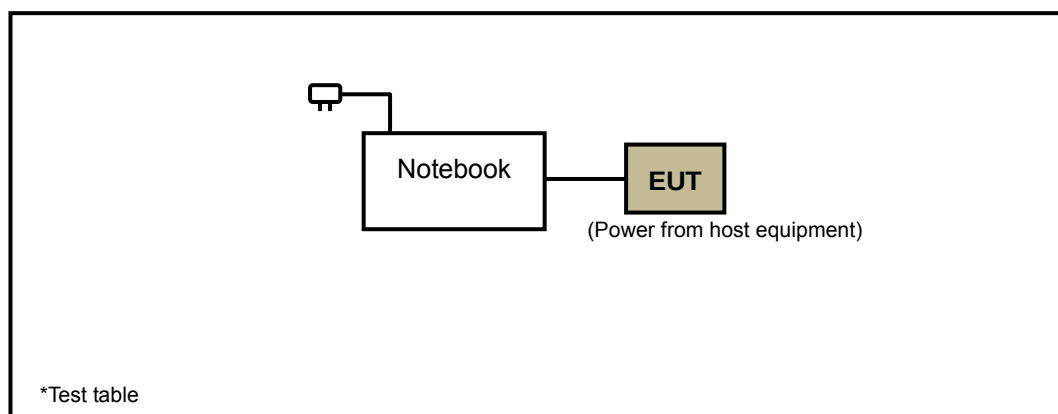
The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	NOTEBOOK	DELL	E5430	FKKCYW1	FCC DoC Approved

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	0.09m USB cable

NOTE: 1. All power cords of the above support units are non shielded (1.8m).
2. Item 1 as a communication partner 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 r03

662911 D01 Multiple Transmitter Output v02

ANSI C63.10-2009

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

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

Tested Date: Jan. 07 ~ Jan. 09, 2014

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
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100269	Jan. 28, 2013	Jan. 27, 2014
BILOG Antenna SCHWARZBECK	VULB9168	9168-156	Mar. 22, 2013	Mar. 21, 2014
HORN Antenna SCHWARZBECK	BBHA 9120 D	9120D-209	Sep. 12, 2013	Sep. 11, 2014
HORN Antenna SCHWARZBECK	BBHA 9170	148	Jul. 15, 2013	Jul. 14, 2014
Preamplifier Agilent	8449B	3008A01911	Aug. 22, 2013	Aug. 21, 2014
Preamplifier Agilent	8447D	2944A10638	Oct. 18, 2013	Oct. 17, 2014
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	248780/4 309222/4 274092/4	Aug. 26, 2013	Aug. 25, 2014
RF signal cable Worken	5D-FB	Cable-HYCH9-01	Aug. 11, 2013	Aug. 10, 2014
Software BV ADT	ADT_Radiated_ V7.6.15.9.4	NA	NA	NA
Antenna Tower EMCO	2070/2080	512.835.4684	NA	NA
Turn Table EMCO	2087-2.03	NA	NA	NA
Antenna Tower & Turn Table Controller EMCO	2090	NA	NA	NA
High Speed Peak Power Meter	ML2495A	0824011	Jul. 29, 2013	Jul. 28, 2014
Power Sensor	MA2411B	0738171	Jul. 29, 2013	Jul. 28, 2014

- 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 9.
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 215374.
5. The IC Site Registration No. is IC 7450F-9.

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:

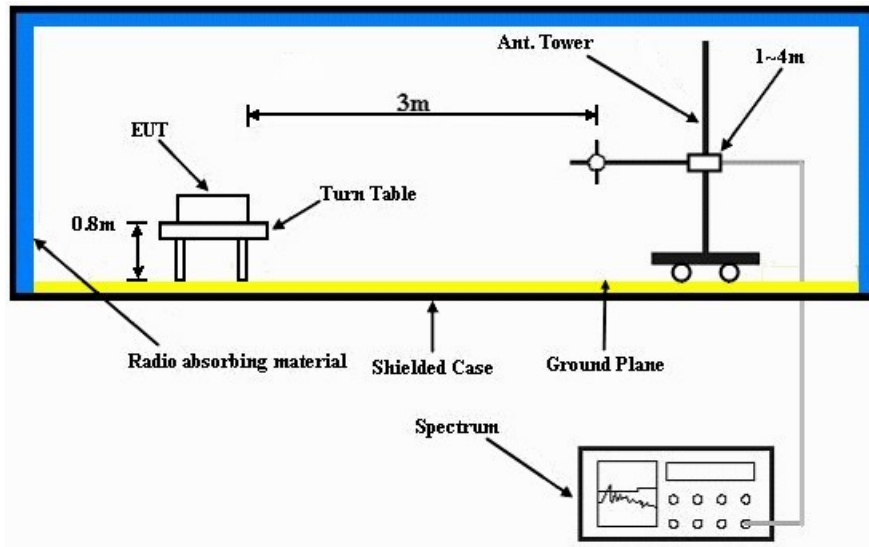
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for Peak detection at frequency above 1GHz.
3. The resolution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

4.1.5 DEVIATION FROM TEST STANDARD

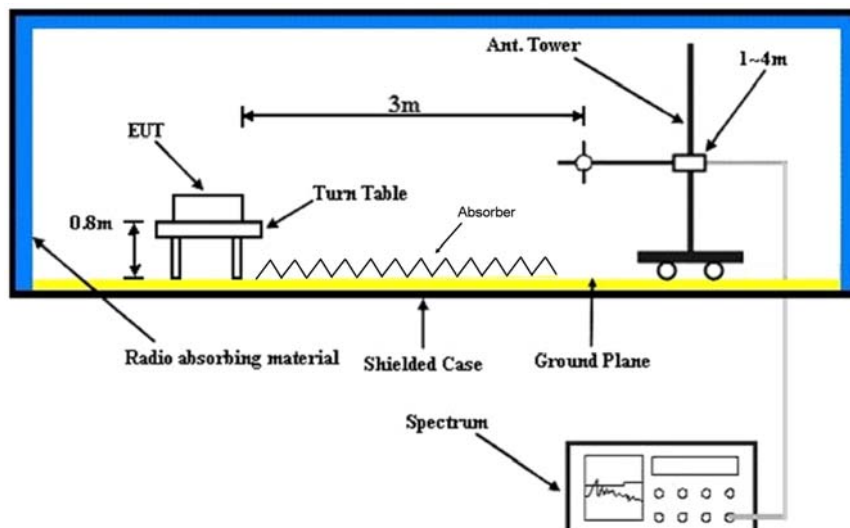
No deviation.

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

4.1.8 TEST RESULTS

ABOVE 1GHz DATA:

802.11a

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 36	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 68%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	5150.00	50.6 PK	74.0	-23.4	1.02 H	31	48.20	2.40
2	5150.00	36.0 AV	54.0	-18.0	1.02 H	31	33.60	2.40
3	*5180.00	101.8 PK			1.02 H	342	62.40	39.40
4	*5180.00	91.0 AV			1.02 H	342	51.60	39.40
5	#10360.00	58.6 PK	74.0	-15.4	1.12 H	201	44.70	13.90
6	#10360.00	46.6 AV	54.0	-7.4	1.12 H	201	32.70	13.90
7	15540.00	62.2 PK	74.0	-11.8	1.32 H	249	47.60	14.60
8	15540.00	50.1 AV	54.0	-3.9	1.32 H	249	35.50	14.60
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	5150.00	67.5 PK	74.0	-6.5	1.00 V	242	65.10	2.40
2	5150.00	49.6 AV	54.0	-4.4	1.00 V	242	47.20	2.40
3	*5180.00	104.8 PK			1.00 V	242	65.40	39.40
4	*5180.00	93.2 AV			1.00 V	242	53.80	39.40
5	#10360.00	59.5 PK	74.0	-14.5	1.02 V	225	45.60	13.90
6	#10360.00	46.4 AV	54.0	-7.6	1.02 V	225	32.50	13.90
7	15540.00	62.5 PK	74.0	-11.5	1.62 V	338	47.90	14.60
8	15540.00	50.3 AV	54.0	-3.7	1.62 V	338	35.70	14.60

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.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 40	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 68%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	*5200.00	102.4 PK			1.02 H	348	62.90	39.50
2	*5200.00	91.4 AV			1.02 H	348	51.90	39.50
3	#10400.00	58.6 PK	74.0	-15.4	1.64 H	312	44.50	14.10
4	#10400.00	46.2 AV	54.0	-7.8	1.64 H	312	32.10	14.10
5	15600.00	63.2 PK	74.0	-10.8	1.48 H	177	48.50	14.70
6	15600.00	50.6 AV	54.0	-3.4	1.48 H	177	35.90	14.70
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	*5200.00	105.1 PK			1.02 V	214	65.60	39.50
2	*5200.00	94.4 AV			1.02 V	214	54.90	39.50
3	#10400.00	59.1 PK	74.0	-14.9	1.40 V	271	45.00	14.10
4	#10400.00	46.9 AV	54.0	-7.1	1.40 V	271	32.80	14.10
5	15600.00	63.1 PK	74.0	-10.9	2.29 V	305	48.40	14.70
6	15600.00	51.1 AV	54.0	-2.9	2.29 V	305	36.40	14.70

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 of the restricted band.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 48	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 68%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	*5240.00	102.5 PK			1.00 H	354	62.90	39.60
2	*5240.00	91.4 AV			1.00 H	354	51.80	39.60
3	#10480.00	60.0 PK	74.0	-14.0	1.60 H	346	44.70	15.30
4	#10480.00	47.5 AV	54.0	-6.5	1.60 H	346	32.20	15.30
5	15720.00	65.1 PK	74.0	-8.9	1.59 H	170	50.80	14.30
6	15720.00	52.2 AV	54.0	-1.8	1.59 H	170	37.90	14.30
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	*5240.00	105.4 PK			1.29 V	210	65.80	39.60
2	*5240.00	94.9 AV			1.29 V	210	55.30	39.60
3	#10480.00	58.1 PK	74.0	-15.9	1.22 V	346	42.80	15.30
4	#10480.00	46.8 AV	54.0	-7.2	1.22 V	346	31.50	15.30
5	15720.00	65.3 PK	74.0	-8.7	1.59 V	351	51.00	14.30
6	15720.00	52.5 AV	54.0	-1.5	1.59 V	351	38.20	14.30

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.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 52	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 68%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	101.7 PK			1.12 H	351	62.10	39.60
2	*5260.00	90.7 AV			1.12 H	351	51.10	39.60
3	#10520.00	60.3 PK	74.0	-13.7	1.26 H	308	44.80	15.50
4	#10520.00	48.1 AV	54.0	-5.9	1.26 H	308	32.60	15.50
5	15780.00	64.7 PK	74.0	-9.3	1.61 H	169	50.70	14.00
6	15780.00	51.2 AV	54.0	-2.8	1.61 H	169	37.20	14.00
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	*5260.00	105.1 PK			1.22 V	227	65.50	39.60
2	*5260.00	95.2 AV			1.22 V	227	55.60	39.60
3	#10520.00	60.3 PK	74.0	-13.7	1.32 V	341	44.80	15.50
4	#10520.00	48.0 AV	54.0	-6.0	1.32 V	341	32.50	15.50
5	15780.00	64.5 PK	74.0	-9.5	1.61 V	354	50.50	14.00
6	15780.00	51.6 AV	54.0	-2.4	1.61 V	354	37.60	14.00

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.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 60	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 68%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	102.0 PK			1.02 H	348	62.40	39.60
2	*5300.00	90.8 AV			1.02 H	348	51.20	39.60
3	10600.00	60.4 PK	74.0	-13.6	1.47 H	322	44.50	15.90
4	10600.00	48.8 AV	54.0	-5.2	1.47 H	322	32.90	15.90
5	15900.00	66.1 PK	74.0	-7.9	1.58 H	167	52.20	13.90
6	15900.00	52.8 AV	54.0	-1.2	1.58 H	167	38.90	13.90
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	*5300.00	105.0 PK			1.24 V	208	65.40	39.60
2	*5300.00	94.6 AV			1.24 V	208	55.00	39.60
3	10600.00	60.5 PK	74.0	-13.5	1.37 V	277	44.60	15.90
4	10600.00	47.8 AV	54.0	-6.2	1.37 V	277	31.90	15.90
5	15900.00	64.8 PK	74.0	-9.2	1.52 V	354	50.90	13.90
6	15900.00	52.2 AV	54.0	-1.8	1.52 V	354	38.30	13.90

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
5. " * ": Fundamental frequency.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 64	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 68%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	101.1 PK			1.00 H	357	61.40	39.70
2	*5320.00	90.1 AV			1.00 H	357	50.40	39.70
3	5350.00	64.0 PK	74.0	-10.0	1.00 H	356	61.40	2.60
4	5350.00	47.2 AV	54.0	-6.8	1.00 H	356	44.60	2.60
5	10640.00	60.6 PK	74.0	-13.4	1.55 H	301	44.70	15.90
6	10640.00	48.1 AV	54.0	-5.9	1.55 H	301	32.20	15.90
7	15960.00	66.5 PK	74.0	-7.5	1.64 H	234	52.20	14.30
8	15960.00	53.6 AV	54.0	-0.4	1.64 H	234	39.30	14.30
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	*5320.00	105.0 PK			1.00 V	72	65.30	39.70
2	*5320.00	94.4 AV			1.00 V	72	54.70	39.70
3	5350.00	68.2 PK	74.0	-5.8	1.00 V	72	65.60	2.60
4	5350.00	50.3 AV	54.0	-3.7	1.00 V	72	47.70	2.60
5	10640.00	63.8 PK	74.0	-10.2	1.35 V	296	47.90	15.90
6	10640.00	49.6 AV	54.0	-4.4	1.35 V	296	33.70	15.90
7	15960.00	66.2 PK	74.0	-7.8	1.61 V	345	51.90	14.30
8	15960.00	53.2 AV	54.0	-0.8	1.61 V	345	38.90	14.30

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.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 100	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 68%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	65.0 PK	74.0	-9.0	1.06 H	358	62.20	2.80
2	5460.00	48.4 AV	54.0	-5.6	1.06 H	358	45.60	2.80
3	#5470.00	68.5 PK	74.0	-5.5	1.06 H	358	65.60	2.90
4	#5470.00	49.1 AV	54.0	-4.9	1.06 H	358	46.20	2.90
5	*5500.00	102.1 PK			1.08 H	358	62.20	39.90
6	*5500.00	91.0 AV			1.08 H	358	51.10	39.90
7	11000.00	65.0 PK	74.0	-9.0	1.47 H	145	48.00	17.00
8	11000.00	51.4 AV	54.0	-2.6	1.47 H	145	34.40	17.00
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	70.2 PK	74.0	-3.8	1.02 V	95	67.40	2.80
2	5460.00	50.8 AV	54.0	-3.2	1.02 V	95	48.00	2.80
3	#5470.00	69.3 PK	74.0	-4.7	1.02 V	95	66.40	2.90
4	#5470.00	52.1 AV	54.0	-1.9	1.02 V	95	49.20	2.90
5	*5500.00	104.5 PK			1.24 V	94	64.60	39.90
6	*5500.00	93.6 AV			1.24 V	94	53.70	39.90
7	11000.00	70.8 PK	74.0	-3.2	1.50 V	262	53.80	17.00
8	11000.00	53.8 AV	54.0	-0.2	1.50 V	262	36.80	17.00

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.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 116	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 68%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	102.4 PK			1.00 H	342	62.40	40.00
2	*5580.00	90.2 AV			1.00 H	342	50.20	40.00
3	11160.00	62.2 PK	74.0	-11.8	1.60 H	262	45.50	16.70
4	11160.00	49.5 AV	54.0	-4.5	1.60 H	262	32.80	16.70
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	104.6 PK			1.00 V	100	64.60	40.00
2	*5580.00	93.0 AV			1.00 V	100	53.00	40.00
3	11160.00	71.2 PK	74.0	-2.8	1.51 V	256	54.50	16.70
4	11160.00	53.5 AV	54.0	-0.5	1.51 V	256	36.80	16.70

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.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 140	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 68%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	104.7 PK			1.00 H	354	64.50	40.20
2	*5700.00	92.7 AV			1.00 H	354	52.50	40.20
3	#5725.00	68.9 PK	74.0	-5.1	1.00 H	352	65.60	3.30
4	#5725.00	52.1 AV	54.0	-1.9	1.00 H	352	48.80	3.30
5	11400.00	65.8 PK	74.0	-8.2	1.62 H	148	50.00	15.80
6	11400.00	51.6 AV	54.0	-2.4	1.62 H	148	35.80	15.80
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	*5700.00	104.2 PK			1.35 V	94	64.00	40.20
2	*5700.00	92.7 AV			1.35 V	94	52.50	40.20
3	#5725.00	67.4 PK	74.0	-6.6	1.36 V	106	64.10	3.30
4	#5725.00	51.1 AV	54.0	-2.9	1.36 V	106	47.80	3.30
5	11400.00	68.3 PK	74.0	-5.7	1.62 V	256	52.50	15.80
6	11400.00	53.6 AV	54.0	-0.4	1.62 V	256	37.80	15.80

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.

802.11n (20MHz)

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 36	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 68%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	5150.00	65.3 PK	74.0	-8.7	1.00 H	26	62.90	2.40
2	5150.00	49.3 AV	54.0	-4.7	1.00 H	26	46.90	2.40
3	*5180.00	101.1 PK			1.00 H	21	61.70	39.40
4	*5180.00	90.8 AV			1.00 H	21	51.40	39.40
5	#10360.00	66.5 PK	74.0	-7.5	1.64 H	174	52.60	13.90
6	#10360.00	52.6 AV	54.0	-1.4	1.64 H	174	38.70	13.90
7	15540.00	64.0 PK	74.0	-10.0	1.60 H	188	49.40	14.60
8	15540.00	51.4 AV	54.0	-2.6	1.60 H	188	36.80	14.60
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	68.8 PK	74.0	-5.2	1.02 V	90	66.40	2.40
2	5150.00	52.6 AV	54.0	-1.4	1.02 V	90	50.20	2.40
3	*5180.00	105.6 PK			1.02 V	90	66.20	39.40
4	*5180.00	95.2 AV			1.02 V	90	55.80	39.40
5	#10360.00	63.6 PK	74.0	-10.4	1.78 V	65	49.70	13.90
6	#10360.00	52.3 AV	54.0	-1.7	1.78 V	65	38.40	13.90
7	15540.00	64.6 PK	74.0	-9.4	1.14 V	207	50.00	14.60
8	15540.00	52.1 AV	54.0	-1.9	1.14 V	207	37.50	14.60

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.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 40	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 68%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	*5200.00	101.4 PK			1.08 H	48	61.90	39.50
2	*5200.00	91.6 AV			1.08 H	48	52.10	39.50
3	#10400.00	64.0 PK	74.0	-10.0	1.72 H	167	49.90	14.10
4	#10400.00	51.2 AV	54.0	-2.8	1.72 H	167	37.10	14.10
5	15600.00	63.2 PK	74.0	-10.8	1.71 H	182	48.50	14.70
6	15600.00	51.1 AV	54.0	-2.9	1.71 H	182	36.40	14.70
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	*5200.00	105.9 PK			1.02 V	100	66.40	39.50
2	*5200.00	95.7 AV			1.02 V	100	56.20	39.50
3	#10400.00	64.7 PK	74.0	-9.3	2.01 V	147	50.60	14.10
4	#10400.00	51.2 AV	54.0	-2.8	2.01 V	147	37.10	14.10
5	15600.00	64.8 PK	74.0	-9.2	1.16 V	217	50.10	14.70
6	15600.00	51.9 AV	54.0	-2.1	1.16 V	217	37.20	14.70

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 of the restricted band.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 48	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 68%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	*5240.00	101.8 PK			1.02 H	27	62.20	39.60
2	*5240.00	92.0 AV			1.02 H	27	52.40	39.60
3	#10480.00	66.8 PK	74.0	-7.2	1.66 H	169	51.50	15.30
4	#10480.00	52.2 AV	54.0	-1.8	1.66 H	169	36.90	15.30
5	15720.00	64.1 PK	74.0	-9.9	1.60 H	172	49.80	14.30
6	15720.00	51.0 AV	54.0	-3.0	1.60 H	172	36.70	14.30
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	*5240.00	105.8 PK			1.08 V	98	66.20	39.60
2	*5240.00	95.8 AV			1.08 V	98	56.20	39.60
3	#10480.00	66.6 PK	74.0	-7.4	1.37 V	201	51.30	15.30
4	#10480.00	53.0 AV	54.0	-1.0	1.37 V	201	37.70	15.30
5	15720.00	63.5 PK	74.0	-10.5	1.24 V	202	49.20	14.30
6	15720.00	51.1 AV	54.0	-2.9	1.24 V	202	36.80	14.30

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.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 52	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 68%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	102.1 PK			1.00 H	22	62.50	39.60
2	*5260.00	92.4 AV			1.00 H	22	52.80	39.60
3	#10520.00	66.3 PK	74.0	-7.7	1.66 H	170	50.80	15.50
4	#10520.00	52.9 AV	54.0	-1.1	1.66 H	170	37.40	15.50
5	15780.00	63.6 PK	74.0	-10.4	1.60 H	170	49.60	14.00
6	15780.00	50.9 AV	54.0	-3.1	1.60 H	170	36.90	14.00
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	*5260.00	105.7 PK			1.01 V	89	66.10	39.60
2	*5260.00	95.7 AV			1.01 V	89	56.10	39.60
3	#10520.00	63.1 PK	74.0	-10.9	1.42 V	216	47.60	15.50
4	#10520.00	51.3 AV	54.0	-2.7	1.42 V	216	35.80	15.50
5	15780.00	62.0 PK	74.0	-12.0	1.24 V	189	48.00	14.00
6	15780.00	50.9 AV	54.0	-3.1	1.24 V	189	36.90	14.00

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.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 60	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 68%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	100.0 PK			1.12 H	28	60.40	39.60
2	*5300.00	90.4 AV			1.12 H	28	50.80	39.60
3	10600.00	64.8 PK	74.0	-9.2	1.57 H	166	48.90	15.90
4	10600.00	51.9 AV	54.0	-2.1	1.57 H	166	36.00	15.90
5	15900.00	64.0 PK	74.0	-10.0	1.58 H	240	50.10	13.90
6	15900.00	51.1 AV	54.0	-2.9	1.58 H	240	37.20	13.90
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	*5300.00	104.2 PK			1.01 V	89	64.60	39.60
2	*5300.00	94.1 AV			1.01 V	89	54.50	39.60
3	10600.00	65.6 PK	74.0	-8.4	1.34 V	215	49.70	15.90
4	10600.00	52.5 AV	54.0	-1.5	1.34 V	215	36.60	15.90
5	15900.00	63.1 PK	74.0	-10.9	1.32 V	195	49.20	13.90
6	15900.00	50.5 AV	54.0	-3.5	1.32 V	195	36.60	13.90

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
5. " * ": Fundamental frequency.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 64	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 68%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	102.7 PK			1.02 H	24	63.00	39.70
2	*5320.00	92.9 AV			1.02 H	24	53.20	39.70
3	5350.00	62.8 PK	74.0	-11.2	1.00 H	24	60.20	2.60
4	5350.00	47.0 AV	54.0	-7.0	1.00 H	24	44.40	2.60
5	10640.00	63.8 PK	74.0	-10.2	1.48 H	169	47.90	15.90
6	10640.00	51.1 AV	54.0	-2.9	1.48 H	169	35.20	15.90
7	15960.00	64.2 PK	74.0	-9.8	1.77 H	226	49.90	14.30
8	15960.00	51.3 AV	54.0	-2.7	1.77 H	226	37.00	14.30
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	*5320.00	105.1 PK			1.00 V	90	65.40	39.70
2	*5320.00	95.1 AV			1.00 V	90	55.40	39.70
3	5350.00	67.1 PK	74.0	-6.9	1.01 V	136	64.50	2.60
4	5350.00	50.8 AV	54.0	-3.2	1.01 V	136	48.20	2.60
5	10640.00	64.1 PK	74.0	-9.9	1.26 V	215	48.20	15.90
6	10640.00	52.3 AV	54.0	-1.7	1.26 V	215	36.40	15.90
7	15960.00	64.1 PK	74.0	-9.9	1.67 V	172	49.80	14.30
8	15960.00	50.8 AV	54.0	-3.2	1.67 V	172	36.50	14.30

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.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 100	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 68%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	66.4 PK	74.0	-7.6	1.08 H	26	63.60	2.80
2	5460.00	46.9 AV	54.0	-7.1	1.08 H	26	44.10	2.80
3	#5470.00	66.4 PK	74.0	-7.6	1.08 H	27	63.50	2.90
4	#5470.00	48.0 AV	54.0	-6.0	1.08 H	27	45.10	2.90
5	*5500.00	102.4 PK			1.05 H	46	62.50	39.90
6	*5500.00	91.2 AV			1.05 H	46	51.30	39.90
7	11000.00	68.8 PK	74.0	-5.2	1.45 H	229	51.80	17.00
8	11000.00	53.4 AV	54.0	-0.6	1.45 H	229	36.40	17.00
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	61.6 PK	74.0	-12.4	1.15 V	88	58.80	2.80
2	5460.00	45.6 AV	54.0	-8.4	1.15 V	88	42.80	2.80
3	#5470.00	69.5 PK	74.0	-4.5	1.15 V	88	66.60	2.90
4	#5470.00	49.9 AV	54.0	-4.1	1.15 V	88	47.00	2.90
5	*5500.00	104.6 PK			1.00 V	90	64.70	39.90
6	*5500.00	94.6 AV			1.00 V	90	54.70	39.90
7	11000.00	67.1 PK	74.0	-6.9	1.60 V	238	50.10	17.00
8	11000.00	53.2 AV	54.0	-0.8	1.60 V	238	36.20	17.00

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.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 116	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 68%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	102.5 PK			1.04 H	29	62.50	40.00
2	*5580.00	91.7 AV			1.04 H	29	51.70	40.00
3	11160.00	64.9 PK	74.0	-9.1	1.48 H	249	48.20	16.70
4	11160.00	53.1 AV	54.0	-0.9	1.48 H	249	36.40	16.70
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	104.0 PK			1.44 V	106	64.00	40.00
2	*5580.00	93.2 AV			1.44 V	106	53.20	40.00
3	11160.00	69.2 PK	74.0	-4.8	1.48 V	238	52.50	16.70
4	11160.00	53.6 AV	54.0	-0.4	1.48 V	238	36.90	16.70

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.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 140	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 68%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	102.0 PK			1.28 H	28	61.80	40.20
2	*5700.00	91.8 AV			1.28 H	28	51.60	40.20
3	#5725.00	65.3 PK	74.0	-8.7	1.11 H	201	62.00	3.30
4	#5725.00	50.0 AV	54.0	-4.0	1.11 H	201	46.70	3.30
5	11400.00	65.8 PK	74.0	-8.2	1.67 H	134	50.00	15.80
6	11400.00	51.9 AV	54.0	-2.1	1.67 H	134	36.10	15.80
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	*5700.00	103.4 PK			1.34 V	95	63.20	40.20
2	*5700.00	93.1 AV			1.34 V	95	52.90	40.20
3	#5725.00	67.5 PK	74.0	-6.5	1.34 V	94	64.20	3.30
4	#5725.00	51.5 AV	54.0	-2.5	1.34 V	94	48.20	3.30
5	11400.00	67.5 PK	74.0	-6.5	1.60 V	256	51.70	15.80
6	11400.00	53.0 AV	54.0	-1.0	1.60 V	256	37.20	15.80

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.

802.11n (40MHz)

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 38	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%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	5150.00	70.4 PK	74.0	-3.6	1.00 H	349	68.00	2.40
2	5150.00	51.7 AV	54.0	-2.3	1.00 H	349	49.30	2.40
3	*5190.00	97.5 PK			1.00 H	349	58.00	39.50
4	*5190.00	87.8 AV			1.00 H	349	48.30	39.50
5	#10380.00	61.3 PK	74.0	-12.7	1.41 H	56	47.20	14.10
6	#10380.00	47.7 AV	54.0	-6.3	1.41 H	56	33.60	14.10
7	15570.00	62.3 PK	74.0	-11.7	1.27 H	85	47.70	14.60
8	15570.00	47.9 AV	54.0	-6.1	1.27 H	85	33.30	14.60
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	69.0 PK	74.0	-5.0	1.00 V	248	66.60	2.40
2	5150.00	52.9 AV	54.0	-1.1	1.00 V	248	50.50	2.40
3	*5190.00	100.9 PK			1.03 V	231	61.40	39.50
4	*5190.00	89.5 AV			1.03 V	231	50.00	39.50
5	#10380.00	62.9 PK	74.0	-11.1	1.61 V	207	48.80	14.10
6	#10380.00	49.2 AV	54.0	-4.8	1.61 V	207	35.10	14.10
7	15570.00	61.8 PK	74.0	-12.2	1.52 V	346	47.20	14.60
8	15570.00	48.1 AV	54.0	-5.9	1.52 V	346	33.50	14.60

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.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 46	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%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	*5230.00	100.1 PK			1.00 H	177	60.50	39.60
2	*5230.00	90.3 AV			1.00 H	177	50.70	39.60
3	5350.00	55.8 PK	74.0	-18.2	1.62 H	30	53.20	2.60
4	5350.00	43.8 AV	54.0	-10.2	1.62 H	30	41.20	2.60
5	#10460.00	61.4 PK	74.0	-12.6	1.02 H	51	46.60	14.80
6	#10460.00	48.8 AV	54.0	-5.2	1.02 H	51	34.00	14.80
7	15690.00	62.5 PK	74.0	-11.5	1.47 H	251	48.10	14.40
8	15690.00	49.3 AV	54.0	-4.7	1.47 H	251	34.90	14.40
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	*5230.00	101.8 PK			1.00 V	249	62.20	39.60
2	*5230.00	90.9 AV			1.00 V	249	51.30	39.60
3	5350.00	56.9 PK	74.0	-17.1	1.02 V	63	54.30	2.60
4	5350.00	44.2 AV	54.0	-9.8	1.02 V	63	41.60	2.60
5	#10460.00	62.8 PK	74.0	-11.2	1.54 V	174	48.00	14.80
6	#10460.00	49.6 AV	54.0	-4.4	1.54 V	174	34.80	14.80
7	15690.00	62.6 PK	74.0	-11.4	1.00 V	182	48.20	14.40
8	15690.00	49.6 AV	54.0	-4.4	1.00 V	182	35.20	14.40

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 of the restricted band.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 54	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%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	5150.00	57.0 PK	74.0	-17.0	1.02 H	51	54.60	2.40
2	5150.00	43.7 AV	54.0	-10.3	1.02 H	51	41.30	2.40
3	*5270.00	98.8 PK			1.00 H	175	59.20	39.60
4	*5270.00	89.3 AV			1.00 H	175	49.70	39.60
5	#10540.00	63.5 PK	74.0	-10.5	1.70 H	188	47.90	15.60
6	#10540.00	50.1 AV	54.0	-3.9	1.70 H	188	34.50	15.60
7	15810.00	61.7 PK	74.0	-12.3	1.57 H	13	47.90	13.80
8	15810.00	48.7 AV	54.0	-5.3	1.57 H	13	34.90	13.80
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	5150.00	57.5 PK	74.0	-16.5	1.05 V	162	55.10	2.40
2	5150.00	45.2 AV	54.0	-8.8	1.05 V	162	42.80	2.40
3	*5270.00	103.6 PK			1.14 V	134	64.00	39.60
4	*5270.00	94.3 AV			1.14 V	134	54.70	39.60
5	#10540.00	63.9 PK	74.0	-10.1	1.61 V	220	48.30	15.60
6	#10540.00	50.1 AV	54.0	-3.9	1.61 V	220	34.50	15.60
7	15810.00	62.5 PK	74.0	-11.5	1.00 V	170	48.70	13.80
8	15810.00	48.9 AV	54.0	-5.1	1.00 V	170	35.10	13.80

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.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 62	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%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	98.3 PK			1.00 H	24	58.70	39.60
2	*5310.00	88.7 AV			1.00 H	24	49.10	39.60
3	5350.00	66.8 PK	74.0	-7.2	1.00 H	174	64.20	2.60
4	5350.00	49.8 AV	54.0	-4.2	1.00 H	174	47.20	2.60
5	10620.00	60.2 PK	74.0	-13.8	1.52 H	62	44.30	15.90
6	10620.00	47.4 AV	54.0	-6.6	1.52 H	62	31.50	15.90
7	15930.00	59.3 PK	74.0	-14.7	1.52 H	114	45.30	14.00
8	15930.00	48.5 AV	54.0	-5.5	1.52 H	114	34.50	14.00
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5310.00	102.0 PK			1.00 V	71	62.40	39.60
2	*5310.00	91.7 AV			1.00 V	71	52.10	39.60
3	5350.00	73.0 PK	74.0	-1.0	1.00 V	70	70.40	2.60
4	5350.00	52.6 AV	54.0	-1.4	1.00 V	70	50.00	2.60
5	10620.00	61.8 PK	74.0	-12.2	1.61 V	219	45.90	15.90
6	10620.00	48.6 AV	54.0	-5.4	1.61 V	219	32.70	15.90
7	15930.00	62.6 PK	74.0	-11.4	1.52 V	114	48.60	14.00
8	15930.00	49.1 AV	54.0	-4.9	1.52 V	114	35.10	14.00

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.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 102	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%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	61.9 PK	74.0	-12.1	1.00 H	28	59.10	2.80
2	5460.00	44.2 AV	54.0	-9.8	1.00 H	28	41.40	2.80
3	#5470.00	68.2 PK	74.0	-5.8	1.00 H	28	65.30	2.90
4	#5470.00	49.2 AV	54.0	-4.8	1.00 H	28	46.30	2.90
5	*5510.00	96.9 PK			1.00 H	213	57.00	39.90
6	*5510.00	87.3 AV			1.00 H	213	47.40	39.90
7	11020.00	63.5 PK	74.0	-10.5	4.00 H	105	46.50	17.00
8	11020.00	49.5 AV	54.0	-4.5	4.00 H	105	32.50	17.00
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	65.4 PK	74.0	-8.6	1.00 V	151	62.60	2.80
2	5460.00	46.3 AV	54.0	-7.7	1.00 V	151	43.50	2.80
3	#5470.00	72.5 PK	74.0	-1.5	1.00 V	151	69.60	2.90
4	#5470.00	53.4 AV	54.0	-0.6	1.00 V	151	50.50	2.90
5	*5510.00	100.2 PK			1.00 V	93	60.30	39.90
6	*5510.00	90.9 AV			1.00 V	93	51.00	39.90
7	11020.00	61.8 PK	74.0	-12.2	1.62 V	200	44.80	17.00
8	11020.00	48.8 AV	54.0	-5.2	1.62 V	200	31.80	17.00

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.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 110	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%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	100.3 PK			1.05 H	32	60.30	40.00
2	*5550.00	90.6 AV			1.05 H	32	50.60	40.00
3	11100.00	62.0 PK	74.0	-12.0	1.05 H	152	45.30	16.70
4	11100.00	49.2 AV	54.0	-4.8	1.05 H	152	32.50	16.70
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	*5550.00	102.0 PK			1.00 V	92	62.00	40.00
2	*5550.00	92.1 AV			1.00 V	92	52.10	40.00
3	11100.00	64.4 PK	74.0	-9.6	1.42 V	242	47.70	16.70
4	11100.00	50.0 AV	54.0	-4.0	1.42 V	242	33.30	16.70

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.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 134	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%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	*5670.00	100.2 PK			1.01 H	357	60.00	40.20
2	*5670.00	91.2 AV			1.01 H	357	51.00	40.20
3	#5725.00	56.9 PK	74.0	-17.1	1.52 H	102	53.60	3.30
4	#5725.00	44.9 AV	54.0	-9.1	1.52 H	102	41.60	3.30
5	11340.00	61.3 PK	74.0	-12.7	1.52 H	114	45.20	16.10
6	11340.00	48.2 AV	54.0	-5.8	1.52 H	114	32.10	16.10
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	*5670.00	101.1 PK			1.00 V	101	60.90	40.20
2	*5670.00	91.6 AV			1.00 V	101	51.40	40.20
3	#5725.00	58.6 PK	74.0	-15.4	1.05 V	142	55.30	3.30
4	#5725.00	45.9 AV	54.0	-8.1	1.05 V	142	42.60	3.30
5	11340.00	64.4 PK	74.0	-9.6	1.45 V	195	48.30	16.10
6	11340.00	49.2 AV	54.0	-4.8	1.45 V	195	33.10	16.10

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.

BELOW 1GHz WORST-CASE DATA: 802.11n (20MHz)

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 100	FREQUENCY RANGE	Below 1000MHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	25deg. C, 68%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	30.00	30.9 QP	40.0	-9.1	1.51 H	210	46.50	-15.60
2	165.80	37.4 QP	43.5	-6.1	1.99 H	102	51.80	-14.40
3	231.76	38.1 QP	46.0	-7.9	1.51 H	117	53.80	-15.70
4	423.82	36.9 QP	46.0	-9.1	1.99 H	89	46.50	-9.60
5	480.08	39.8 QP	46.0	-6.2	1.51 H	27	48.40	-8.60
6	798.24	37.1 QP	46.0	-8.9	1.99 H	246	40.10	-3.00
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	62.98	28.2 QP	40.0	-11.8	1.00 V	99	42.90	-14.70
2	165.80	33.4 QP	43.5	-10.1	1.00 V	217	47.80	-14.40
3	421.88	30.8 QP	46.0	-15.2	1.00 V	177	40.30	-9.50
4	480.08	32.0 QP	46.0	-14.0	1.24 V	45	40.60	-8.60
5	749.74	36.8 QP	46.0	-9.2	1.24 V	209	40.60	-3.80
6	798.24	35.8 QP	46.0	-10.2	1.24 V	180	38.80	-3.00

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

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

Tested Date: Jan. 09, 2014

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. 04, 2013	Feb. 03, 2014
LISN ROHDE & SCHWARZ (Peripheral)	ESH3-Z5	100311	Jul. 17, 2013	Jul. 16, 2014
Software ADT	BV ADT_Cond_ V7.3.7.3	NA	NA	NA

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

4.2.3 TEST PROCEDURES

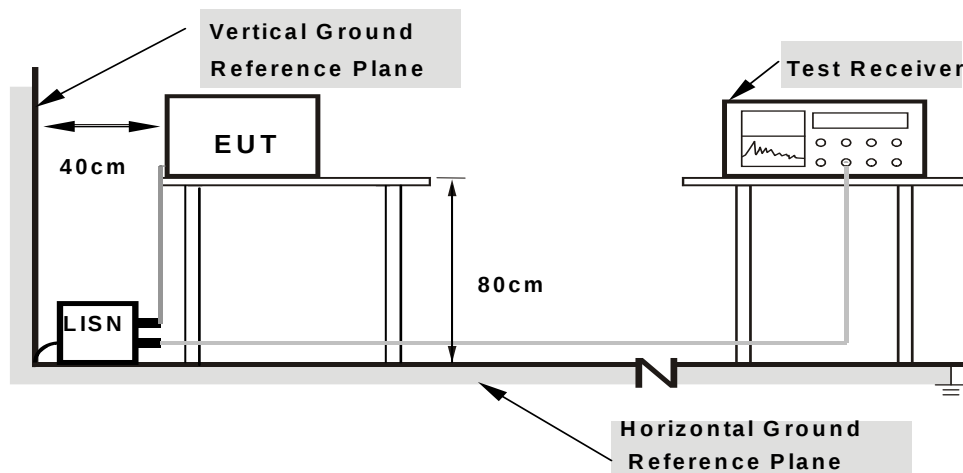
- The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.
- Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
- The frequency range from 150kHz to 30MHz was searched. Emissions levels under (Limit - 20dB) were 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

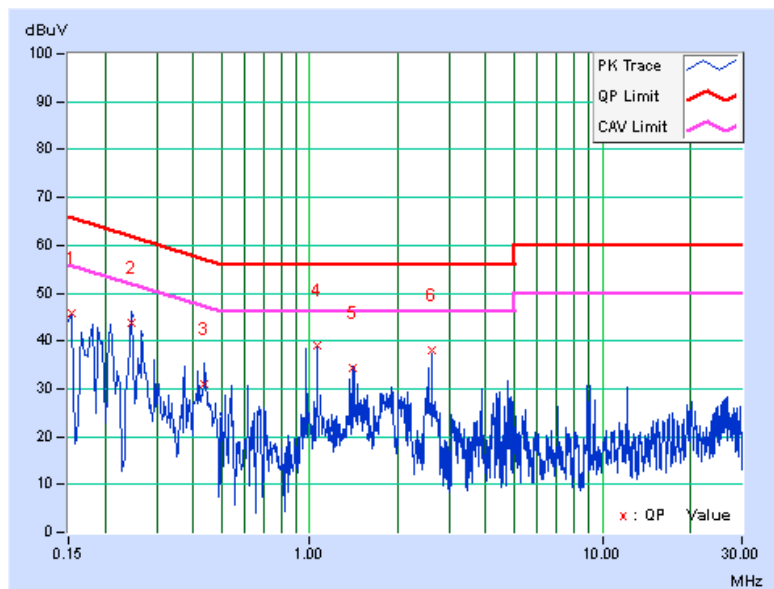
CONDUCTED WORST-CASE DATA: 802.11n (20MHz)

PHASE	Line 1	6dB BANDWIDTH	9kHz
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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	0.15391	0.10	45.85	28.73	45.95	28.83	65.79	55.79	-19.84	-26.96
2	0.24775	0.10	43.56	28.13	43.66	28.23	61.83	51.83	-18.17	-23.60
3	0.43543	0.12	30.71	18.32	30.83	18.44	57.15	47.15	-26.32	-28.71
4	1.06103	0.14	39.06	29.14	39.20	29.28	56.00	46.00	-16.80	-16.72
5	1.39729	0.15	34.08	20.27	34.23	20.42	56.00	46.00	-21.77	-25.58
6	2.61721	0.19	37.89	28.80	38.08	28.99	56.00	46.00	-17.92	-17.01

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

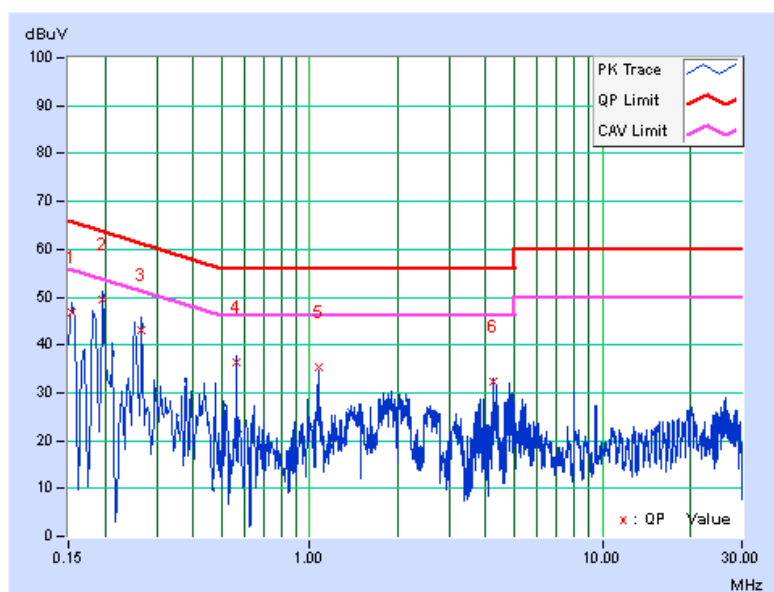


PHASE	Line 2	6dB BANDWIDTH	9kHz
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No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15391	0.11	46.83	28.85	46.94	28.96	65.79	55.79	-18.85	-26.83
2	0.19692	0.11	49.52	33.78	49.63	33.89	63.74	53.74	-14.11	-19.85
3	0.26730	0.12	42.81	26.46	42.93	26.58	61.20	51.20	-18.27	-24.62
4	0.56055	0.13	36.10	28.90	36.23	29.03	56.00	46.00	-19.77	-16.97
5	1.08058	0.14	35.05	29.18	35.19	29.32	56.00	46.00	-20.81	-16.68
6	4.25941	0.22	32.00	24.80	32.22	25.02	56.00	46.00	-23.78	-20.98

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
5.150 ~ 5.250GHz	The lesser of 50mW (17dBm) or 4dBm + 10logB
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 D01 Multiple Transmitter Output v02 Method of conducted output power measurement on IEEE 802.11 devices,

Array Gain = 0 dB (i.e., no array gain) for $NANT \leq 4$;

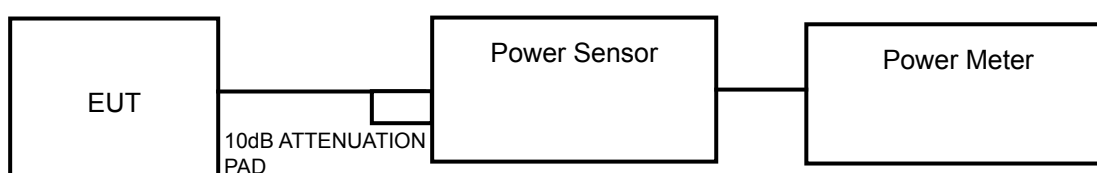
Array Gain = 0 dB (i.e., no array gain) for channel widths ≥ 40 MHz for any NANT;

Array Gain = $5 \log(NANT/NSS)$ dB or 3 dB, whichever is less for 20-MHz channel widths with $NANT \geq 5$.

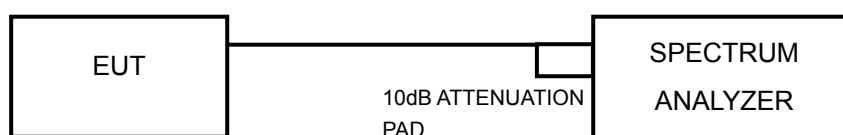
For power measurements on all other devices: Array Gain = $10 \log(NANT/NSS)$ dB.

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

CHANNEL	CHANNEL FREQUENCY (MHz)	AVERAGE POWER (mW)	AVERAGE POWER (dBm)	POWER LIMIT (dBm)	PASS/FAIL
36	5180	34.277	15.35	17	PASS
40	5200	34.198	15.34	17	PASS
48	5240	34.041	15.32	17	PASS
52	5260	35.237	15.47	24	PASS
60	5300	34.198	15.34	24	PASS
64	5320	36.141	15.58	24	PASS
100	5500	31.696	15.01	24	PASS
116	5580	27.669	14.42	24	PASS
140	5700	26.424	14.22	24	PASS

NOTE:

For 5180~5240MHz:

1. $4\text{dBm} + 10\log(26.71) = 18.27\text{dBm} > 17\text{dBm}$.
2. $4\text{dBm} + 10\log(25.00) = 17.98\text{dBm} > 17\text{dBm}$.
3. $4\text{dBm} + 10\log(28.02) = 18.47\text{dBm} > 17\text{dBm}$.

For 5260~5700MHz:

1. $11\text{dBm} + 10\log(28.36) = 25.53\text{dBm} > 24\text{dBm}$.
2. $11\text{dBm} + 10\log(24.09) = 24.82\text{dBm} > 24\text{dBm}$.
3. $11\text{dBm} + 10\log(30.88) = 25.90\text{dBm} > 24\text{dBm}$.
4. $11\text{dBm} + 10\log(28.81) = 25.60\text{dBm} > 24\text{dBm}$.
5. $11\text{dBm} + 10\log(27.97) = 25.47\text{dBm} > 24\text{dBm}$.
6. $11\text{dBm} + 10\log(21.63) = 24.35\text{dBm} > 24\text{dBm}$.

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				
36	5180	12.92	12.51	37.412	15.73	16.98	PASS
40	5200	12.85	12.73	38.025	15.80	17.00	PASS
48	5240	12.99	12.91	39.450	15.96	16.97	PASS
52	5260	13.17	13.04	40.886	16.12	24.00	PASS
60	5300	13.51	13.04	42.576	16.29	23.94	PASS
64	5320	13.11	13.92	45.082	16.54	24.00	PASS
100	5500	13.01	13.41	41.927	16.22	23.98	PASS
116	5580	13.42	13.64	45.082	16.54	24.00	PASS
140	5700	13.29	13.11	41.794	16.21	24.00	PASS

NOTE:

For 5180~5240MHz:

CHAIN 0

1. $4\text{dBm} + 10\log(25.47) = 18.06\text{dBm} > 17\text{dBm}$.
2. $4\text{dBm} + 10\log(25.95) = 18.14\text{dBm} > 17\text{dBm}$.
3. $4\text{dBm} + 10\log(27.37) = 18.37\text{dBm} > 17\text{dBm}$.

CHAIN 1

1. $4\text{dBm} + 10\log(19.84) = 16.98\text{dBm} < 17\text{dBm}$.
2. $4\text{dBm} + 10\log(22.11) = 17.45\text{dBm} > 17\text{dBm}$.
3. $4\text{dBm} + 10\log(19.82) = 16.97\text{dBm} < 17\text{dBm}$.

For 5260~5700MHz:

CHAIN 0

1. $11\text{dBm} + 10\log(24.45) = 24.88\text{dBm} > 24\text{dBm}$.
2. $11\text{dBm} + 10\log(24.95) = 24.97\text{dBm} > 24\text{dBm}$.
3. $11\text{dBm} + 10\log(25.69) = 25.10\text{dBm} > 24\text{dBm}$.
4. $11\text{dBm} + 10\log(23.37) = 24.69\text{dBm} > 24\text{dBm}$.
5. $11\text{dBm} + 10\log(28.33) = 25.52\text{dBm} > 24\text{dBm}$.
6. $11\text{dBm} + 10\log(24.64) = 24.92\text{dBm} > 24\text{dBm}$.

CHAIN 1

1. $11\text{dBm} + 10\log(21.02) = 24.23\text{dBm} > 24\text{dBm}$.
2. $11\text{dBm} + 10\log(19.70) = 23.94\text{dBm} < 24\text{dBm}$.
3. $11\text{dBm} + 10\log(22.57) = 24.54\text{dBm} > 24\text{dBm}$.
4. $11\text{dBm} + 10\log(19.87) = 23.98\text{dBm} < 24\text{dBm}$.
5. $11\text{dBm} + 10\log(21.37) = 24.30\text{dBm} > 24\text{dBm}$.
6. $11\text{dBm} + 10\log(22.88) = 24.595\text{dBm} > 24\text{dBm}$.

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				
38	5190	10.21	10.72	22.298	13.48	17	PASS
46	5230	13.04	13.62	43.152	16.35	17	PASS
54	5270	13.12	13.54	43.152	16.35	24	PASS
62	5310	10.76	10.48	23.081	13.63	24	PASS
102	5510	10.01	11.02	22.670	13.55	24	PASS
110	5550	13.41	13.55	44.566	16.49	24	PASS
134	5670	13.04	13.78	44.015	16.44	24	PASS

NOTE:

For 5190~5230MHz:

CHAIN 0

1. $4\text{dBm} + 10\log(52.80) = 21.23\text{dBm} > 17\text{dBm}$.
2. $4\text{dBm} + 10\log(76.42) = 22.83\text{dBm} > 17\text{dBm}$.

CHAIN 1

1. $4\text{dBm} + 10\log(48.16) = 20.83\text{dBm} > 17\text{dBm}$.
2. $4\text{dBm} + 10\log(80.88) = 23.08\text{dBm} > 17\text{dBm}$.

For 5270~5600MHz:

CHAIN 0

1. $11\text{dBm} + 10\log(81.66) = 30.12\text{dBm} > 24\text{dBm}$.
2. $11\text{dBm} + 10\log(45.71) = 27.60\text{dBm} > 24\text{dBm}$.
3. $11\text{dBm} + 10\log(41.46) = 27.18\text{dBm} > 24\text{dBm}$.
4. $11\text{dBm} + 10\log(83.81) = 30.23\text{dBm} > 24\text{dBm}$.
5. $11\text{dBm} + 10\log(86.14) = 30.35\text{dBm} > 24\text{dBm}$.

CHAIN 1

1. $11\text{dBm} + 10\log(80.42) = 30.05\text{dBm} > 24\text{dBm}$.
2. $11\text{dBm} + 10\log(44.52) = 27.49\text{dBm} > 24\text{dBm}$.
3. $11\text{dBm} + 10\log(43.17) = 27.35\text{dBm} > 24\text{dBm}$.
4. $11\text{dBm} + 10\log(77.77) = 29.91\text{dBm} > 24\text{dBm}$.
5. $11\text{dBm} + 10\log(85.49) = 30.32\text{dBm} > 24\text{dBm}$.

26dB BANDWIDTH:

802.11a

CHANNEL	CHANNEL FREQUENCY (MHz)	26dBc BANDWIDTH (MHz)	PASS / FAIL
36	5180	26.71	PASS
40	5200	25.00	PASS
48	5240	28.02	PASS
52	5260	28.36	PASS
60	5300	24.09	PASS
64	5320	30.88	PASS
100	5500	28.81	PASS
116	5580	27.97	PASS
140	5700	21.63	PASS

802.11n (20MHz)

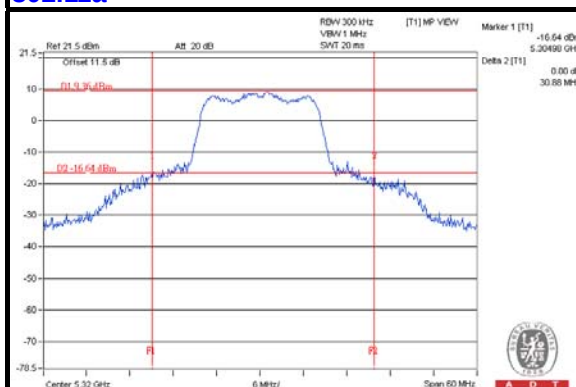
CHANNEL	CHANNEL FREQUENCY (MHz)	26dBc BANDWIDTH (MHz)		PASS / FAIL
		CHAIN 0	CHAIN 1	
36	5180	25.47	19.84	PASS
40	5200	25.95	22.11	PASS
48	5240	27.37	19.82	PASS
52	5260	24.45	21.02	PASS
60	5300	24.95	19.70	PASS
64	5320	25.69	22.57	PASS
100	5500	23.37	19.87	PASS
116	5580	28.33	21.37	PASS
140	5700	24.64	22.88	PASS

802.11n (40MHz)

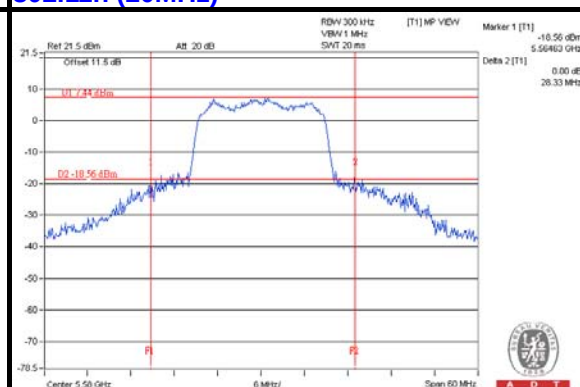
CHANNEL	CHANNEL FREQUENCY (MHz)	26dBc BANDWIDTH (MHz)		PASS / FAIL
		CHAIN 0	CHAIN 1	
38	5190	52.80	48.16	PASS
46	5230	76.42	80.88	PASS
54	5270	81.66	80.42	PASS
62	5310	45.71	44.52	PASS
102	5510	41.46	43.17	PASS
110	5550	83.81	77.77	PASS
134	5670	86.14	85.49	PASS

SPECTRUM PLOT OF WORST VALUE

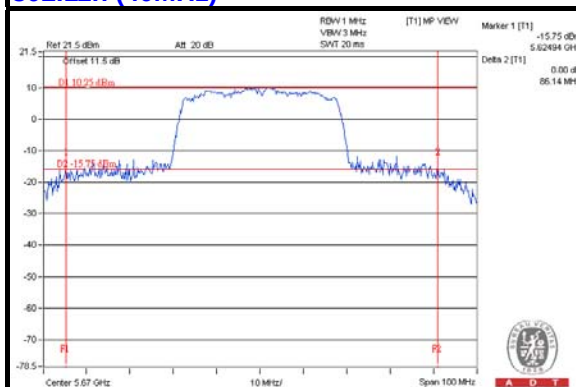
802.11a



802.11n (20MHz)



802.11n (40MHz)



EUT MAXIMUM CONDUCTED POWER

802.11a

FREQUENCY BAND (MHz)	MAX. POWER	
	OUTPUT POWER (mW)	OUTPUT POWER (dBm)
5250~5350	36.141	15.58
5470~5725	31.696	15.01

802.11n (20MHz)

FREQUENCY BAND (MHz)	MAX. POWER	
	OUTPUT POWER (mW)	OUTPUT POWER (dBm)
5250~5350	45.082	16.54
5470~5725	45.082	16.54

802.11n (40MHz)

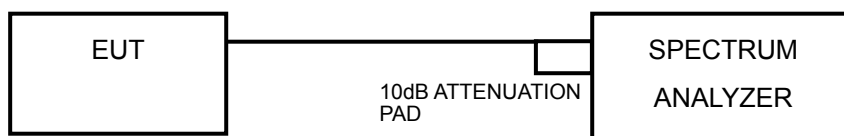
FREQUENCY BAND (MHz)	MAX. POWER	
	OUTPUT POWER (mW)	OUTPUT POWER (dBm)
5250~5350	43.152	16.35
5470~5725	44.566	16.49

4.4 PEAK POWER SPECTRAL DENSITY MEASUREMENT

4.4.1 LIMITS OF PEAK POWER SPECTRAL DENSITY MEASUREMENT

FREQUENCY BAND	LIMIT
5.150 ~ 5.250GHz	4dBm
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-2

- 1) Set span to encompass the entire emission bandwidth (EBW) of the signal.
- 2) Set RBW = 30 KHz, Set VBW $\geq$ 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 and add 10 log (1/duty cycle)

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

CHANNEL	FREQUENCY (MHz)	PSD W/O DUTY FACTOR (dBm)	DUTY FACTOR	PSD WITH DUTY FACTOR (dBm)	MAXIMUM LIMIT (dBm)	PASS/FAIL
36	5180	3.62	0.218	3.838	4	PASS
40	5200	3.67	0.218	3.888	4	PASS
48	5240	3.74	0.218	3.958	4	PASS
52	5260	3.82	0.218	4.038	11	PASS
60	5300	3.80	0.218	4.018	11	PASS
64	5320	4.21	0.218	4.428	11	PASS
100	5500	4.39	0.218	4.608	11	PASS
116	5580	3.42	0.218	3.638	11	PASS
140	5700	2.46	0.218	2.678	11	PASS

NOTE: Refer to section 3.3 for duty cycle spectrum plot.

802.11n (20MHz)

CHAN.	CHAN. FREQ. (MHz)	PSD (dBm)		TOTAL PSD W/O DUTY FACTOR (dBm)	DUTY FACTOR	TOTAL PSD WITH DUTY FACTOR (dBm)	MAX. LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1					
36	5180	0.97	0.54	3.77	0.218	3.988	4	PASS
40	5200	0.96	0.46	3.73	0.218	3.948	4	PASS
48	5240	0.95	0.41	3.70	0.218	3.918	4	PASS
52	5260	1.52	2.02	4.79	0.218	5.008	11	PASS
60	5300	2.03	2.08	5.07	0.218	5.288	11	PASS
64	5320	1.91	2.07	5.00	0.218	5.218	10.82	PASS
100	5500	2.00	2.10	5.06	0.218	5.278	10.82	PASS
116	5580	2.25	2.50	5.39	0.218	5.608	10.82	PASS
140	5700	1.76	2.23	5.01	0.218	5.228	10.82	PASS

NOTE:

- 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.
- For 5180~5240MHz:**
Directional gain = $10 \log[(10^{G_1/20} + 10^{G_2/20} + \dots + 10^{G_N/20})^2 / N_{ANT}] = 4.85 < 6\text{dBi}$, so the limit no need to reduced.
- For 5260~5320MHz:**
Directional gain = $10 \log[(10^{G_1/20} + 10^{G_2/20} + \dots + 10^{G_N/20})^2 / N_{ANT}] = 5.44 < 6\text{dBi}$, so the limit no need to reduced.
- For 5500~5700MHz:**
Directional gain = $10 \log[(10^{G_1/20} + 10^{G_2/20} + \dots + 10^{G_N/20})^2 / N_{ANT}] = 6.18 > 6\text{dBi}$, so the power density limit shall be reduced to $11 - (6.18 - 6) = 10.82\text{dBm}$.
- Refer to section 3.3 for duty cycle spectrum plot.

802.11n (40MHz)

CHAN.	CHAN. FREQ. (MHz)	PSD (dBm)		TOTAL PSD W/O DUTY FACTOR (dBm)	DUTY FACTOR	TOTAL PSD WITH DUTY FACTOR (dBm)	MAX. LIMIT (dBm)	PASS / FAIL
		CHAIN 0	CHAIN 1					
38	5190	-5.23	-5.57	-2.39	0.443	-1.947	4	PASS
46	5230	-2.42	-1.80	0.91	0.443	1.353	4	PASS
54	5270	-2.77	-2.08	0.60	0.443	1.043	11	PASS
62	5310	-5.22	-4.64	-1.91	0.443	-1.467	11	PASS
102	5510	-5.43	-5.09	-2.25	0.443	-1.807	10.82	PASS
110	5550	-2.55	-1.92	0.79	0.443	1.233	10.82	PASS
134	5670	-3.30	-1.64	0.62	0.443	1.063	10.82	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. For 5180~5240MHz:

Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2 / N_{ANT}] = 4.85 < 6\text{dBi}$, so the limit no need to reduced.

For 5260~5320MHz:

Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2 / N_{ANT}] = 5.44 < 6\text{dBi}$, so the limit no need to reduced.

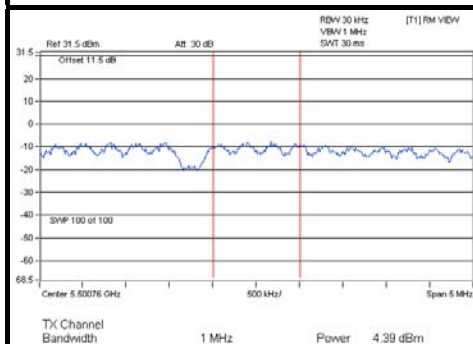
For 5500~5700MHz:

Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + \dots + 10^{GN/20})^2 / N_{ANT}] = 6.18 > 6\text{dBi}$, , so the power density limit shall be reduced to $11 - (6.18 - 6) = 10.82\text{dBm}$.

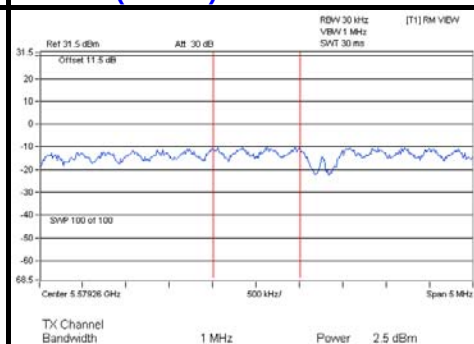
3. Refer to section 3.3 for duty cycle spectrum plot.

SPECTRUM PLOT OF WORST VALUE

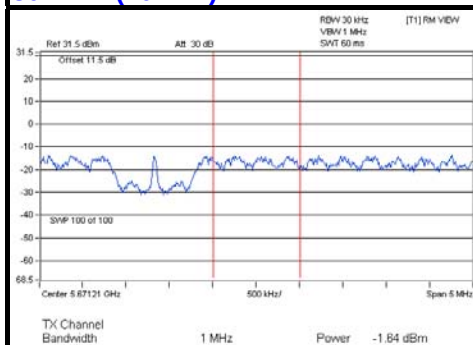
802.11a



802.11n (20MHz)



802.11n (40MHz)

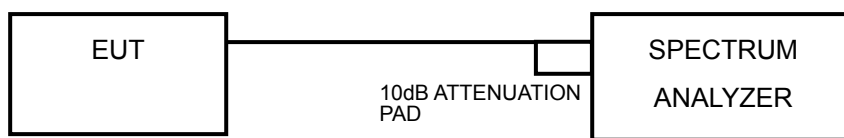


4.5 PEAK POWER EXCURSION MEASUREMENT

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 $\geq$ 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) Measure the PPSD.
- 5) Compute the ratio of the maximum of the peak-max-hold spectrum to the PPSD.
Find the worst channel and modulation mode as above test procedure, and follow KDB 789033 D01 General UNII Test Procedures v01r03 and repeat step 1 to 5 for final testing of each modulation mode on a single channel (all modulation types) in a single operating band to compliance with the peak excursion requirement.

4.5.5 DEVIATION FROM TEST STANDARD

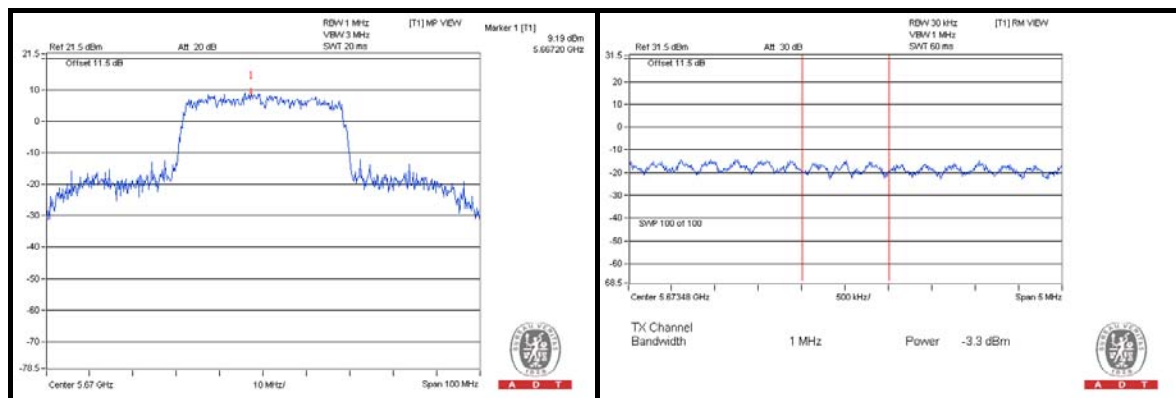
No deviation.

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	12.98	2.46	2.68	10.30	13	PASS
	QPSK		14.12	3.70	3.91	10.21	13	PASS
	16QAM		14.04	4.13	4.35	9.69	13	PASS
	64QAM		14.81	3.65	4.08	10.73	13	PASS
802.11n (20MHz)	BPSK	5700	12.39	1.76	1.98	10.41	13	PASS
	QPSK		12.36	2.22	2.43	9.93	13	PASS
	16QAM		12.92	2.27	2.48	10.44	13	PASS
	64QAM		13.28	1.65	2.03	11.25	13	PASS
802.11n (40MHz)	BPSK	5670	9.19	-3.30	-2.86	12.05	13	PASS
	QPSK		9.41	-1.65	-1.22	10.63	13	PASS
	16QAM		10.60	-1.41	-1.01	11.61	13	PASS
	64QAM		10.55	-1.05	-0.36	10.91	13	PASS

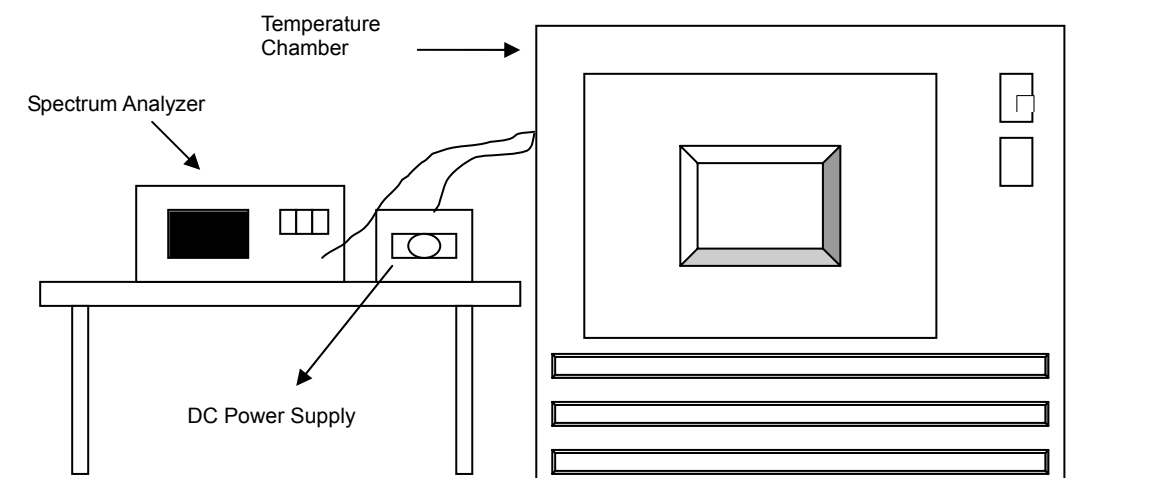


4.6 FREQUENCY STABILITY

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 DC voltage.
- b. Turn the EUT on and couple its output to a spectrum analyzer.
- c. Turn the EUT off and set the chamber to the highest temperature specified.
- d. Allow sufficient time (approximately 30 min) for the temperature of the chamber to stabilize, turn the EUT on and measure the operating frequency after 2, 5, and 10 minutes.
- e. Repeat step 2 and 3 with the temperature chamber set to the lowest temperature.
- f. The test chamber was allowed to stabilize at +20 degree C for a minimum of 30 minutes. The supply voltage was then adjusted on the EUT from 85% to 115% and the frequency record.

4.6.5 DEVIATION FROM TEST STANDARD

No deviation.

4.6.6 EUT OPERATING CONDITION

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

4.6.7 TEST RESULTS

FREQUENCY STABILITY VERSUS TEMP.									
OPERATING FREQUENCY: 5320MHz									
TEMP. (°C)	POWER SUPPLY (Vdc)	0 MINUTE		2 MINUTE		5 MINUTE		10 MINUTE	
		Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)
60	5	5320.0135	0.00025	5320.0142	0.00027	5320.0086	0.00016	5320.0046	0.00009
50	5	5320.0051	0.00010	5320.0056	0.00011	5319.9987	-0.00002	5319.9985	-0.00003
40	5	5320.0112	0.00021	5320.0071	0.00013	5320.0017	0.00003	5320.0099	0.00019
30	5	5319.9907	-0.00017	5319.9856	-0.00027	5319.9849	-0.00028	5319.9836	-0.00031
20	5	5320	0.00000	5320.0066	0.00012	5320.0041	0.00008	5320.0012	0.00002
10	5	5319.9825	-0.00033	5319.9831	-0.00032	5319.9822	-0.00033	5319.9745	-0.00048
0	5	5320.0092	0.00017	5320.0144	0.00027	5320.0109	0.00020	5320.0133	0.00025

FREQUENCY STABILITY VERSUS VOLTAGE									
OPERATING FREQUENCY: 5320MHz									
TEMP. (°C)	POWER SUPPLY (Vdc)	0 MINUTE		2 MINUTE		5 MINUTE		10 MINUTE	
		Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)	Measured Frequency (MHz)	Frequency Drift (%)
20	5.75	5319.9899	-0.00019	5319.9858	-0.00027	5319.9839	-0.00030	5319.9842	-0.00030
	5	5319.9907	-0.00017	5319.9856	-0.00027	5319.9849	-0.00028	5319.9836	-0.00031
	4.25	5319.9914	-0.00016	5319.9848	-0.00029	5319.9841	-0.00030	5319.9835	-0.00031

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:

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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.

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