



# FCC TEST REPORT (15.247)

**REPORT NO.:** RF130923C41-1  
**MODEL NO.:** KALOS  
**FCC ID:** HFS-FG6Q-BBG  
**RECEIVED:** Sep. 23, 2013  
**TESTED:** Oct. 07, 2013 ~ Oct. 18, 2013  
**ISSUED:** Nov. 25, 2013

**APPLICANT:** Quanta Computer Inc.

**ADDRESS:** No.211, Wen Hwa 2nd Road , Kuei Shan Hsiang  
Tao Yuan Shien, Taiwan

**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
RF130923C41-1	Original release	Nov. 25, 2013



## 1. CERTIFICATION

**PRODUCT:** Tablet  
**MODEL NO.:** KALOS  
**BRAND:** BungBungame  
**APPLICANT:** Quanta Computer Inc.  
**TESTED:** Oct. 07, 2013 ~ Oct. 18, 2013  
**TEST SAMPLE:** Identical Prototype  
**STANDARDS:** **FCC Part 15, Subpart C (Section 15.247)**  
ANSI C63.10-2009

The above equipment (model: KALOS) 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** : Evonne Liu , **DATE** : Nov. 25, 2013  
Evonne Liu / Specialist

**APPROVED BY** : Sam Chen , **DATE** : Nov. 25, 2013  
Sam Chen / Assistant Manager



## 2. SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC PART 15, SUBPART C (SECTION 15.247)			
STANDARD SECTION	TEST TYPE	RESULT	REMARK
15.207	AC Power Conducted Emission	PASS	Meet the requirement of limit. Minimum passing margin is -11.88dB at 0.59531MHz.
15.247(d) 15.209	Radiated Emissions	PASS	Meet the requirement of limit. Minimum passing margin is -1.01dB at 4824MHz.
15.247(d)	Band Edge Measurement	PASS	Meet the requirement of limit.
15.247(a)(2)	6dB bandwidth	PASS	Meet the requirement of limit.
15.247(b)	Conducted power	PASS	Meet the requirement of limit.
15.247(e)	Power Spectral Density	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

<b>EUT</b>	Tablet
<b>MODEL NO.</b>	KALOS
<b>POWER SUPPLY</b>	5.0Vdc from adapter or host equipment 3.7Vdc from battery
<b>MODULATION TYPE</b>	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM
<b>MODULATION TECHNOLOGY</b>	DSSS, OFDM
<b>TRANSFER RATE</b>	802.11b:11.0/ 5.5/ 2.0/ 1.0Mbps 802.11g: 54.0/ 48.0/ 36.0/ 24.0/ 18.0/ 12.0/ 9.0/ 6.0Mbps 802.11a: 54.0/ 48.0/ 36.0/ 24.0/ 18.0/ 12.0/ 9.0/ 6.0Mbps 802.11n: Up to 135Mbps
<b>OPERATING FREQUENCY</b>	<b>2.4GHz:</b> 2412 ~ 2462MHz <b>5.0GHz:</b> 5745 ~ 5825MHz
<b>NUMBER OF CHANNEL</b>	<b>2.4GHz:</b> 11 for 802.11b, 802.11g, 802.11n (20MHz) 7 for 802.11n (40MHz) <b>5.0GHz:</b> 5 for 802.11a, 802.11n (20MHz) 2 for 802.11n (40MHz)
<b>OUTPUT POWER</b>	152.757mW for 2412 ~ 2462MHz 153.462mW for 5745 ~ 5825MHz
<b>ANTENNA TYPE</b>	<b>2.4GHz:</b> PIFA antenna with -2.61dBi gain <b>5.0GHz:</b> PIFA antenna with -2.9dBi gain
<b>ANTENNA CONNECTOR</b>	NA
<b>DATA CABLE</b>	Refer to Note as below
<b>I/O PORTS</b>	Refer to user's manual
<b>ACCESSORY DEVICES</b>	Refer to Note as below

**NOTE:**

1. The EUT contains following accessory devices.

ITEM	BRAND	MODEL	DESCRIPTION
AC Adapter	Tamura	MII050200B	I/P: 100-240Vac, 0.3A, 50-60Hz O/P: 5Vdc, 2A
Li-ion Battery	Getac	FG6Q (P/N: 541385760001)	Rating: 3.7 Vdc,9000mAh
USB Cable	MEC IMEX INCORPORATED	65-15317-300	0.75m cable





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2. The EUT provides one completed transmitter and one receiver.

<b>MODULATION MODE</b>	<b>TX FUNCTION</b>
<b>802.11b</b>	1TX
<b>802.11g</b>	1TX
<b>802.11a</b>	1TX
<b>802.11n (20MHz)</b>	1TX
<b>802.11n (40MHz)</b>	1TX

3. The above EUT information is declared by the 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 2.4GHz:

11 channels are provided for 802.11b, 802.11g and 802.11n (20MHz):

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
1	2412MHz	7	2442MHz
2	2417MHz	8	2447MHz
3	2422MHz	9	2452MHz
4	2427MHz	10	2457MHz
5	2432MHz	11	2462MHz
6	2437MHz		

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

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
3	2422MHz	7	2442MHz
4	2427MHz	8	2447MHz
5	2432MHz	9	2452MHz
6	2437MHz		

#### FOR 5.0GHz:

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

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
149	5745MHz	161	5805MHz
153	5765MHz	165	5825MHz
157	5785MHz		

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

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
151	5755MHz	159	5795MHz



### 3.2.1 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

**FOR 2.4GHz:**

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).

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
-	802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1.0
	802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6.0
	802.11n (20MHz)	1 to 11	1, 6, 11	OFDM	BPSK	MCS0
	802.11n (40MHz)	3 to 9	3, 6, 9	OFDM	BPSK	MCS0

**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	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
-	802.11g	1 to 11	6	OFDM	BPSK	6.0



**POWER LINE CONDUCTED EMISSION TEST:**

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

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
-	802.11g	1 to 11	6	OFDM	BPSK	6.0

**BANDEDGE MEASUREMENT:**

- 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	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
-	802.11b	1 to 11	1, 11	DSSS	DBPSK	1.0
	802.11g	1 to 11	1, 11	OFDM	BPSK	6.0
	802.11n (20MHz)	1 to 11	1, 11	OFDM	BPSK	MCS0
	802.11n (40MHz)	3 to 9	3, 6, 9	OFDM	BPSK	MCS0

**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	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
-	802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1.0
	802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6.0
	802.11n (20MHz)	1 to 11	1, 6, 11	OFDM	BPSK	MCS0
	802.11n (40MHz)	3 to 9	3, 6, 9	OFDM	BPSK	MCS0



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**TEST CONDITION:**

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RE $\geq$ 1G	25deg. C, 65%RH	120Vac, 60Hz	Anson Lin
RE<1G	25deg. C, 65%RH	120Vac, 60Hz	Anson Lin
PLC	25deg. C, 65%RH	120Vac, 60Hz	Johnson Liao
APCM	25deg. C, 65%RH	120Vac, 60Hz	Dylan Yang



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**FOR 5.0GHz:**

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.

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
-	802.11a	149 to 165	149, 157, 165	OFDM	BPSK	6.0
	802.11n (20MHz)	149 to 165	149, 157, 165	OFDM	BPSK	MCS0
	802.11n (40MHz)	151 to 159	151, 159	OFDM	BPSK	MCS0

**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	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
-	802.11a	149 to 165	157	OFDM	BPSK	6.0

**POWER LINE CONDUCTED EMISSION TEST:**

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

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
-	802.11a	149 to 165	157	OFDM	BPSK	6.0



**BANDEDGE MEASUREMENT:**

- 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	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
-	802.11a	149 to 165	149, 157, 165	OFDM	BPSK	6.0
	802.11n (20MHz)	149 to 165	149, 157, 165	OFDM	BPSK	MCS0
	802.11n (40MHz)	151 to 159	151, 159	OFDM	BPSK	MCS0

**ANTENNA PORT CONDUCTED MEASUREMENT:**

- 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	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
-	802.11a	149 to 165	149, 157, 165	OFDM	BPSK	6.0
	802.11n (20MHz)	149 to 165	149, 157, 165	OFDM	BPSK	MCS0
	802.11n (40MHz)	151 to 159	151, 159	OFDM	BPSK	MCS0

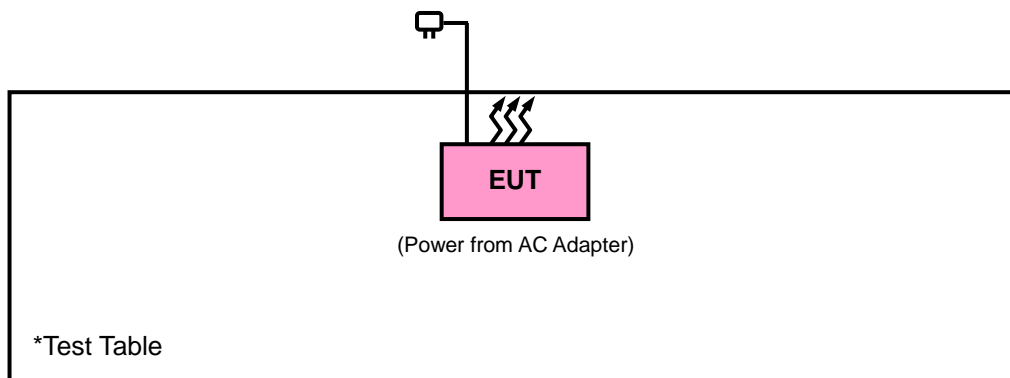
**TEST CONDITION:**

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RE≥1G	25deg. C, 65%RH	120Vac, 60Hz	Anson Lin
RE<1G	25deg. C, 65%RH	120Vac, 60Hz	Anson Lin
PLC	25deg. C, 65%RH	120Vac, 60Hz	Johnson Liao
APCM	25deg. C, 65%RH	120Vac, 60Hz	Dylan Yang

### 3.3 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units.

#### 3.3.1 CONFIGURATION OF SYSTEM UNDER TEST



### 3.4 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 C (15.247)**

ANSI C63.10-2009

KDB 558074 D01 DTS Meas Guidance v03r01

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 (FOR 2.4GHz BAND)

### 4.1 RADIATED EMISSION AND BANDEDGE MEASUREMENT

#### 4.1.1 LIMITS OF RADIATED EMISSION AND BANDEDGE MEASUREMENT

Radiated emissions which fall in the restricted bands must comply with the radiated emission limits specified as below table. Other emissions shall be at least 20dB below the highest level of the desired power:

FREQUENCIES (MHz)	FIELD STRENGTH (microvolts/meter)	MEASUREMENT DISTANCE (meters)
0.009 ~ 0.490	2400/F(kHz)	300
0.490 ~ 1.705	24000/F(kHz)	30
1.705 ~ 30.0	30	30
30 ~ 88	100	3
88 ~ 216	150	3
216 ~ 960	200	3
Above 960	500	3

**NOTE:**

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. For frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.



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#### 4.1.2 TEST INSTRUMENTS

**Test Data: Oct. 07, 2013 ~ Oct. 09, 2013**

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
Test Receiver ROHDE & SCHWARZ	ESCI	100744	Apr. 15, 2013	Apr. 14, 2014
Spectrum Analyzer ROHDE & SCHWARZ	FSU43	101261	Dec. 17, 2012	Dec. 16, 2013
BILOG Antenna SCHWARZBECK	VULB9168	9168-472	Mar. 25, 2013	Mar. 24, 2014
HORN Antenna SCHWARZBECK	BBHA 9120 D	9120D-969	Jan. 07, 2013	Jan. 06, 2014
HORN Antenna SCHWARZBECK	BBHA 9170	9170-480	Dec. 25, 2012	Dec. 24, 2013
Loop Antenna	HFH2-Z2	100070	Jan. 31, 2012	Jan. 30, 2014
Preamplifier EMCI	EMC 012645	980115	Dec. 28, 2012	Dec. 27, 2013
Preamplifier EMCI	EMC 184045	980116	Dec. 28, 2012	Dec. 27, 2013
Preamplifier EMCI	EMC 330H	980112	Dec. 28, 2012	Dec. 27, 2013
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	309219/4	Oct. 19, 2012	Oct. 18, 2013
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	250130/4	Oct. 19, 2012	Oct. 18, 2013
RF signal cable Worken	RG-213	NA	Dec. 29, 2012	Dec. 28, 2013
Software	E3 6.120103	NA	NA	NA
Antenna Tower MF	MFA-440H	NA	NA	NA
Turn Table MF	MFT-201SS	NA	NA	NA
Antenna Tower & Turn Table Controller MF	MF-7802	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 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 10.
  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 690701.
  6. The IC Site Registration No. is IC 7450F-10.

#### 4.1.3 TEST PROCEDURES

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meters 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. Height of receiving antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. If the emission level of the EUT in peak mode was lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

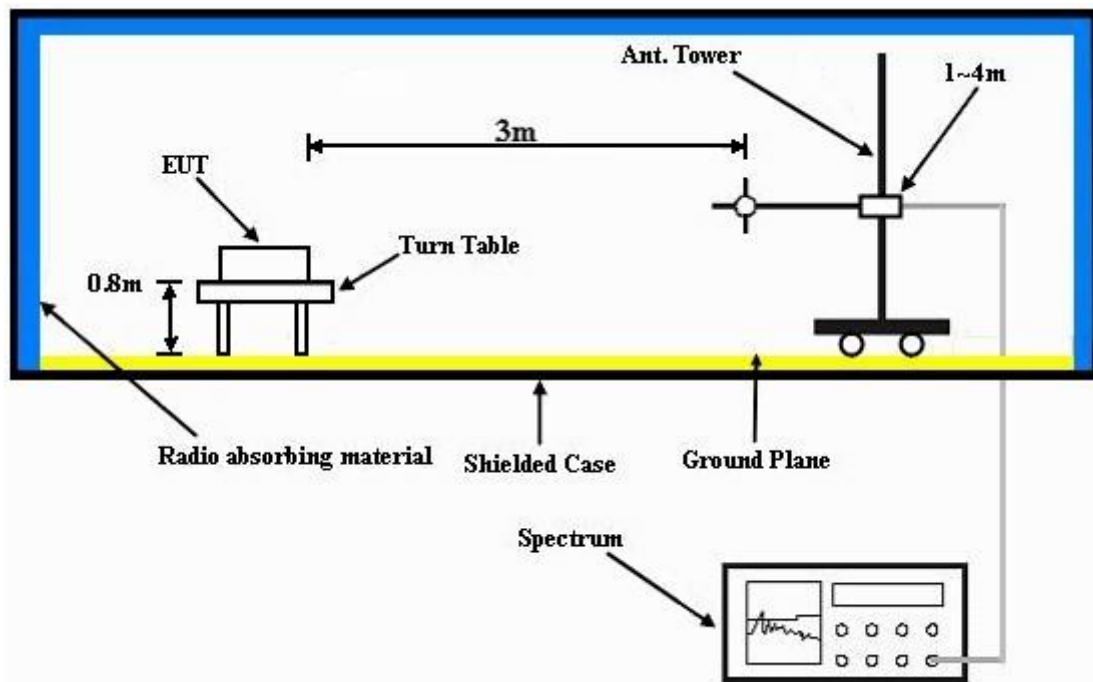
**NOTE:**

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 10Hz for Average detection (AV) at frequency above 1GHz.
4. All modes of operation were investigated and the worst-case emissions are reported.

#### 4.1.4 DEVIATION FROM TEST STANDARD

No deviation.

#### 4.1.5 TEST SETUP



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

#### 4.1.6 EUT OPERATING CONDITIONS

- a. Placed the EUT on a testing table.
- b. Use the software to control the EUT under transmission condition continuously at specific channel frequency.



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## 4.1.7 TEST RESULTS

### ABOVE 1GHz WORST-CASE DATA

#### 802.11b

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	1GHz ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Anson Lin

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	44.6	51.67	54	-9.4	26.91	3.54	37.52	103	138	Average
2390	55.09	62.16	74	-18.91	26.91	3.54	37.52	103	138	Peak
2412	104	111.02			26.96	3.54	37.52	103	138	Average
2412	108.19	115.21			26.96	3.54	37.52	103	138	Peak
2484	35.73	42.3	54	-18.27	27.15	3.6	37.32	103	138	Average
2484	51.45	58.02	74	-22.55	27.15	3.6	37.32	103	138	Peak
4824	52.99	69.31	54	-1.01	30.99	5.77	53.08	114	200	Average
4824	55.6	71.92	74	-18.4	30.99	5.77	53.08	114	200	Peak
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2388	39.5	46.55	54	-14.5	26.91	3.54	37.5	100	292	Average
2388	51.77	58.82	74	-22.23	26.91	3.54	37.5	100	292	Peak
2412	98.33	105.35			26.96	3.54	37.52	100	292	Average
2412	102.49	109.51			26.96	3.54	37.52	100	292	Peak
2490	33.98	40.48	54	-20.02	27.2	3.62	37.32	100	292	Average
2490	50.98	57.48	74	-23.02	27.2	3.62	37.32	100	292	Peak
4824	52.29	68.61	54	-1.71	30.99	5.77	53.08	101	30	Average
4824	54.47	70.79	74	-19.53	30.99	5.77	53.08	101	30	Peak

#### REMARKS:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor  
Margin value = Emission level – Limit value
- 2412MHz: Fundamental frequency.



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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	1GHz ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Anson Lin

**ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M**

FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2388	39.46	46.51	54	-14.54	26.91	3.54	37.5	100	138	Average
2388	53.16	60.21	74	-20.84	26.91	3.54	37.5	100	138	Peak
2437	105.15	111.99			27.06	3.56	37.46	100	138	Average
2437	109.03	115.87			27.06	3.56	37.46	100	138	Peak
2484	42.07	48.64	54	-11.93	27.15	3.6	37.32	100	138	Average
2484	54.23	60.8	74	-19.77	27.15	3.6	37.32	100	138	Peak
4874	52.95	69.14	54	-1.05	31.06	5.8	53.05	100	206	Average
4874	55.04	71.23	74	-18.96	31.06	5.8	53.05	100	206	Peak

**ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M**

FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2388	36.04	43.09	54	-17.96	26.91	3.54	37.5	100	293	Average
2388	51.2	58.25	74	-22.8	26.91	3.54	37.5	100	293	Peak
2437	99.55	106.39			27.06	3.56	37.46	100	293	Average
2437	103.39	110.23			27.06	3.56	37.46	100	293	Peak
2492	37.51	43.94	54	-16.49	27.2	3.62	37.25	100	293	Average
2492	52.45	58.88	74	-21.55	27.2	3.62	37.25	100	293	Peak
4874	52.53	68.72	54	-1.47	31.06	5.8	53.05	100	26	Average
4875	53.97	70.16	74	-20.03	31.06	5.8	53.05	100	26	Peak

**REMARKS:**

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor  
Margin value = Emission level – Limit value
- 2437MHz: Fundamental frequency.



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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	FREQUENCY RANGE	1GHz ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Anson Lin

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2376	34.9	42.02	54	-19.1	26.86	3.52	37.5	100	137	Average
2376	50.34	57.46	74	-23.66	26.86	3.52	37.5	100	137	Peak
2462	104.62	111.33			27.1	3.58	37.39	100	137	Average
2462	109.04	115.75			27.1	3.58	37.39	100	137	Peak
2484	47.58	54.15	54	-6.42	27.15	3.6	37.32	100	137	Average
2484	58.63	65.2	74	-15.37	27.15	3.6	37.32	100	137	Peak
4924	52.17	68.25	54	-1.83	31.12	5.83	53.03	112	204	Average
4924	54.07	70.15	74	-19.93	31.12	5.83	53.03	112	204	Peak
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2388	33.38	40.43	54	-20.62	26.91	3.54	37.5	100	293	Average
2388	49.82	56.87	74	-24.18	26.91	3.54	37.5	100	293	Peak
2462	98.75	105.46			27.1	3.58	37.39	100	293	Average
2462	103.15	109.86			27.1	3.58	37.39	100	293	Peak
2494	42.04	48.47	54	-11.96	27.2	3.62	37.25	100	293	Average
2494	54.16	60.59	74	-19.84	27.2	3.62	37.25	100	293	Peak
4924	52.71	68.79	54	-1.29	31.12	5.83	53.03	115	26	Average
4924	54.49	70.57	74	-19.51	31.12	5.83	53.03	115	26	Peak

**REMARKS:**

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor  
Margin value = Emission level – Limit value
- 2462MHz: Fundamental frequency.



802.11g

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	1GHz ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Anson Lin

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	49.11	56.18	54	-4.89	26.91	3.54	37.52	104	138	Average
2390	71.42	78.49	74	-2.58	26.91	3.54	37.52	104	138	Peak
2412	98.08	105.1			26.96	3.54	37.52	104	138	Average
2412	107.73	114.75			26.96	3.54	37.52	104	138	Peak
2484	35.27	41.84	54	-18.73	27.15	3.6	37.32	104	138	Average
2484	52.27	58.84	74	-21.73	27.15	3.6	37.32	104	138	Peak
4824	40.58	56.9	54	-13.42	30.99	5.77	53.08	100	199	Average
4824	52.45	68.77	74	-21.55	30.99	5.77	53.08	100	199	Peak
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	43.94	51.01	54	-10.06	26.91	3.54	37.52	100	292	Average
2390	64.35	71.42	74	-9.65	26.91	3.54	37.52	100	292	Peak
2412	92.92	99.94			26.96	3.54	37.52	100	292	Average
2412	102.73	109.75			26.96	3.54	37.52	100	292	Peak
2484	34.37	40.94	54	-19.63	27.15	3.6	37.32	100	292	Average
2484	51.44	58.01	74	-22.56	27.15	3.6	37.32	100	292	Peak
4824	38.99	55.31	54	-15.01	30.99	5.77	53.08	114	40	Average
4824	51.06	67.38	74	-22.94	30.99	5.77	53.08	114	40	Peak

**REMARKS:**

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor  
Margin value = Emission level – Limit value
- 2412MHz: Fundamental frequency.





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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	1GHz ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Anson Lin

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	43.87	50.94	54	-10.13	26.91	3.54	37.52	100	140	Average
2390	66.49	73.56	74	-7.51	26.91	3.54	37.52	100	140	Peak
2437	101.5	108.34			27.06	3.56	37.46	100	140	Average
2437	111.57	118.41			27.06	3.56	37.46	100	140	Peak
2484	46.91	53.48	54	-7.09	27.15	3.6	37.32	100	140	Average
2484	71.34	77.91	74	-2.66	27.15	3.6	37.32	100	140	Peak
4874	41.84	58.03	54	-12.16	31.06	5.8	53.05	100	204	Average
4874	52.61	68.8	74	-21.39	31.06	5.8	53.05	100	204	Peak
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2388	40.15	47.2	54	-13.85	26.91	3.54	37.5	100	293	Average
2388	63.53	70.58	74	-10.47	26.91	3.54	37.5	100	293	Peak
2437	96.02	102.86			27.06	3.56	37.46	100	293	Average
2437	105.33	112.17			27.06	3.56	37.46	100	293	Peak
2486	41.93	48.5	54	-12.07	27.15	3.6	37.32	100	293	Average
2486	63.39	69.96	74	-10.61	27.15	3.6	37.32	100	293	Peak
4874	42.02	58.21	54	-11.98	31.06	5.8	53.05	115	27	Average
4874	52.3	68.49	74	-21.7	31.06	5.8	53.05	115	27	Peak

**REMARKS:**

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor  
Margin value = Emission level – Limit value
- 2437MHz: Fundamental frequency.



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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	FREQUENCY RANGE	1GHz ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Anson Lin

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	34.97	42.04	54	-19.03	26.91	3.54	37.52	100	149	Average
2390	49.48	56.55	74	-24.52	26.91	3.54	37.52	100	149	Peak
2462	95.87	102.58			27.1	3.58	37.39	100	149	Average
2462	105.68	112.39			27.1	3.58	37.39	100	149	Peak
2484	46.48	53.05	54	-7.52	27.15	3.6	37.32	100	149	Average
2484	71.7	78.27	74	-2.3	27.15	3.6	37.32	100	149	Peak
4924	37.3	53.38	54	-16.7	31.12	5.83	53.03	100	202	Average
4924	47.56	63.64	74	-26.44	31.12	5.83	53.03	100	202	Peak

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	34.07	41.14	54	-19.93	26.91	3.54	37.52	100	292	Average
2390	48.49	55.56	74	-25.51	26.91	3.54	37.52	100	292	Peak
2462	91.88	98.59			27.1	3.58	37.39	100	292	Average
2462	101.63	108.34			27.1	3.58	37.39	100	292	Peak
2484	43.1	49.67	54	-10.9	27.15	3.6	37.32	100	292	Average
2484	64.53	71.1	74	-9.47	27.15	3.6	37.32	100	292	Peak
4924	37.79	53.87	54	-16.21	31.12	5.83	53.03	102	24	Average
4924	48.4	64.48	74	-25.6	31.12	5.83	53.03	102	24	Peak

**REMARKS:**

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor  
Margin value = Emission level – Limit value
- 2462MHz: Fundamental frequency.



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802.11n (20MHz)

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	1GHz ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Anson Lin

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	48.75	55.82	54	-5.25	26.91	3.54	37.52	102	137	Average
2390	72.54	79.61	74	-1.46	26.91	3.54	37.52	102	137	Peak
2412	97.71	104.73			26.96	3.54	37.52	102	137	Average
2412	107.44	114.46			26.96	3.54	37.52	102	137	Peak
2484	34.9	41.47	54	-19.1	27.15	3.6	37.32	102	137	Average
2484	51.99	58.56	74	-22.01	27.15	3.6	37.32	102	137	Peak
4824	40.31	56.63	54	-13.69	30.99	5.77	53.08	100	199	Average
4824	51.54	67.86	74	-22.46	30.99	5.77	53.08	100	199	Peak
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	43.36	50.43	54	-10.64	26.91	3.54	37.52	100	292	Average
2390	64.43	71.5	74	-9.57	26.91	3.54	37.52	100	292	Peak
2412	92.7	99.72			26.96	3.54	37.52	100	292	Average
2412	102.83	109.85			26.96	3.54	37.52	100	292	Peak
2484	34.34	40.91	54	-19.66	27.15	3.6	37.32	100	292	Average
2484	50.95	57.52	74	-23.05	27.15	3.6	37.32	100	292	Peak
4824	38.76	55.08	54	-15.24	30.99	5.77	53.08	126	40	Average
4824	50.76	67.08	74	-23.24	30.99	5.77	53.08	126	40	Peak

REMARKS:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor  
Margin value = Emission level – Limit value
- 2412MHz: Fundamental frequency.



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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	1GHz ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Anson Lin

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2386	41.92	48.99	54	-12.08	26.91	3.52	37.5	100	136	Average
2386	65.53	72.6	74	-8.47	26.91	3.52	37.5	100	136	Peak
2437	100.29	107.13			27.06	3.56	37.46	100	136	Average
2437	109.6	116.44			27.06	3.56	37.46	100	136	Peak
2486	45.51	52.08	54	-8.49	27.15	3.6	37.32	100	136	Average
2486	64.75	71.32	74	-9.25	27.15	3.6	37.32	100	136	Peak
4874	40.84	57.03	54	-13.16	31.06	5.8	53.05	100	204	Average
4874	52.01	68.2	74	-21.99	31.06	5.8	53.05	100	204	Peak
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	38.25	45.32	54	-15.75	26.91	3.54	37.52	100	293	Average
2390	58.21	65.28	74	-15.79	26.91	3.54	37.52	100	293	Peak
2437	94.92	101.76			27.06	3.56	37.46	100	293	Average
2437	104.22	111.06			27.06	3.56	37.46	100	293	Peak
2486	40.21	46.78	54	-13.79	27.15	3.6	37.32	100	293	Average
2486	60.55	67.12	74	-13.45	27.15	3.6	37.32	100	293	Peak
4874	41.06	57.25	54	-12.94	31.06	5.8	53.05	114	25	Average
4874	52.08	68.27	74	-21.92	31.06	5.8	53.05	114	25	Peak

**REMARKS:**

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor  
Margin value = Emission level – Limit value
- 2437MHz: Fundamental frequency.



A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	FREQUENCY RANGE	1GHz ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Anson Lin

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	34.14	41.21	54	-19.86	26.91	3.54	37.52	100	136	Average
2390	50.47	57.54	74	-23.53	26.91	3.54	37.52	100	136	Peak
2462	95.88	102.59			27.1	3.58	37.39	100	136	Average
2462	105.23	111.94			27.1	3.58	37.39	100	136	Peak
2484	46.73	53.3	54	-7.27	27.15	3.6	37.32	100	136	Average
2484	71.24	77.81	74	-2.76	27.15	3.6	37.32	100	136	Peak
4924	36.02	52.1	54	-17.98	31.12	5.83	53.03	100	202	Average
4924	47.02	63.1	74	-26.98	31.12	5.83	53.03	100	202	Peak
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	34.29	41.36	54	-19.71	26.91	3.54	37.52	100	294	Average
2390	48.24	55.31	74	-25.76	26.91	3.54	37.52	100	294	Peak
2462	91.6	98.31			27.1	3.58	37.39	100	294	Average
2462	101.38	108.09			27.1	3.58	37.39	100	294	Peak
2484	43.52	50.09	54	-10.48	27.15	3.6	37.32	100	294	Average
2484	65.79	72.36	74	-8.21	27.15	3.6	37.32	100	294	Peak
4924	35.18	51.26	54	-18.82	31.12	5.83	53.03	100	26	Average
4924	46.93	63.01	74	-27.07	31.12	5.83	53.03	100	26	Peak

**REMARKS:**

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor  
Margin value = Emission level – Limit value
- 2462MHz: Fundamental frequency.



A D T

802.11n (40MHz)

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 3	FREQUENCY RANGE	1GHz ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Anson Lin

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	52.73	59.8	54	-1.27	26.91	3.54	37.52	102	138	Average
2390	65.56	72.63	74	-8.44	26.91	3.54	37.52	102	138	Peak
2422	88.16	95.05			27.01	3.56	37.46	102	138	Average
2422	97.78	104.67			27.01	3.56	37.46	102	138	Peak
2484	35	41.57	54	-19	27.15	3.6	37.32	102	138	Average
2484	51.96	58.53	74	-22.04	27.15	3.6	37.32	102	138	Peak

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	44.97	52.04	54	-9.03	26.91	3.54	37.52	100	292	Average
2390	60.47	67.54	74	-13.53	26.91	3.54	37.52	100	292	Peak
2422	83.01	89.9			27.01	3.56	37.46	100	292	Average
2422	92.76	99.65			27.01	3.56	37.46	100	292	Peak
2484	34.4	40.97	54	-19.6	27.15	3.6	37.32	100	292	Average
2484	49.87	56.44	74	-24.13	27.15	3.6	37.32	100	292	Peak

REMARKS:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor  
Margin value = Emission level – Limit value
- 2422MHz: Fundamental frequency.



A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	1GHz ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Anson Lin

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	49.45	56.52	54	-4.55	26.91	3.54	37.52	100	138	Average
2390	64.71	71.78	74	-9.29	26.91	3.54	37.52	100	138	Peak
2437	95.9	102.74			27.06	3.56	37.46	100	138	Average
2437	105.25	112.09			27.06	3.56	37.46	100	138	Peak
2486	50.81	57.38	54	-3.19	27.15	3.6	37.32	100	138	Average
2486	68.7	75.27	74	-5.3	27.15	3.6	37.32	100	138	Peak
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	45.14	52.21	54	-8.86	26.91	3.54	37.52	100	292	Average
2390	61.68	68.75	74	-12.32	26.91	3.54	37.52	100	292	Peak
2437	90.71	97.55			27.06	3.56	37.46	100	292	Average
2437	100.03	106.87			27.06	3.56	37.46	100	292	Peak
2484	45.29	51.86	54	-8.71	27.15	3.6	37.32	100	292	Average
2484	62.4	68.97	74	-11.6	27.15	3.6	37.32	100	292	Peak

**REMARKS:**

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor  
Margin value = Emission level – Limit value
- 2437MHz: Fundamental frequency.



A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 9	FREQUENCY RANGE	1GHz ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Anson Lin

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	34.57	41.64	54	-19.43	26.91	3.54	37.52	101	141	Average
2390	50.54	57.61	74	-23.46	26.91	3.54	37.52	101	141	Peak
2452	87.73	94.48			27.06	3.58	37.39	101	141	Average
2452	98.39	105.14			27.06	3.58	37.39	101	141	Peak
2484	52.44	59.01	54	-1.56	27.15	3.6	37.32	101	141	Average
2484	66.62	73.19	74	-7.38	27.15	3.6	37.32	101	141	Peak

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
2390	34.07	41.14	54	-19.93	26.91	3.54	37.52	100	293	Average
2390	49.25	56.32	74	-24.75	26.91	3.54	37.52	100	293	Peak
2452	83.29	90.04			27.06	3.58	37.39	100	293	Average
2452	93.31	100.06			27.06	3.58	37.39	100	293	Peak
2484	44.39	50.96	54	-9.61	27.15	3.6	37.32	100	293	Average
2484	63.5	70.07	74	-10.5	27.15	3.6	37.32	100	293	Peak

**REMARKS:**

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor  
Margin value = Emission level – Limit value
- 2452MHz: Fundamental frequency.





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

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	30MHz ~ 1GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Anson Lin

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
44.85	38.88	55.69	40	-1.12	13.6	0.73	31.14	100	124	Peak
51.87	33.37	51.15	40	-6.63	12.76	0.78	31.32	100	161	Peak
181.2	22.09	41.73	43.5	-21.41	10.67	1.51	31.82	100	147	Peak
360.2	18.7	34.02	46	-27.3	14.38	2.27	31.97	100	223	Peak
555.5	22.06	32.53	46	-23.94	18.59	2.96	32.02	100	141	Peak
774.6	27.56	33.42	46	-18.44	21.87	3.63	31.36	100	135	Peak

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
44.85	38.29	55.1	40	-1.71	13.6	0.73	31.14	100	136	Peak
51.6	32.49	50.16	40	-7.51	12.87	0.77	31.31	100	212	Peak
132.87	20.22	38.89	43.5	-23.28	11.88	1.26	31.81	100	142	Peak
421.1	20.39	34.18	46	-25.61	15.75	2.51	32.05	100	128	Peak
720	26.03	33.11	46	-19.97	21.09	3.49	31.66	100	251	Peak
870.5	27.87	32.88	46	-18.13	23.12	3.88	32.01	100	131	Peak

## 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	100289	Nov. 16, 2012	Nov. 15, 2013
RF signal cable Woken	5D-FB	Cable-HYC01-01	Dec. 28, 2012	Dec. 27, 2013
LISN ROHDE & SCHWARZ (EUT)	ESH2-Z5	100312	Jul. 02, 2013	Jul. 01, 2014
LISN ROHDE & SCHWARZ (Peripheral)	ESH3-Z5	835239/001	Feb. 04, 2013	Feb. 03, 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 2.
3. The VCCI Site Registration No. is C-2047.



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#### 4.2.3 TEST PROCEDURES

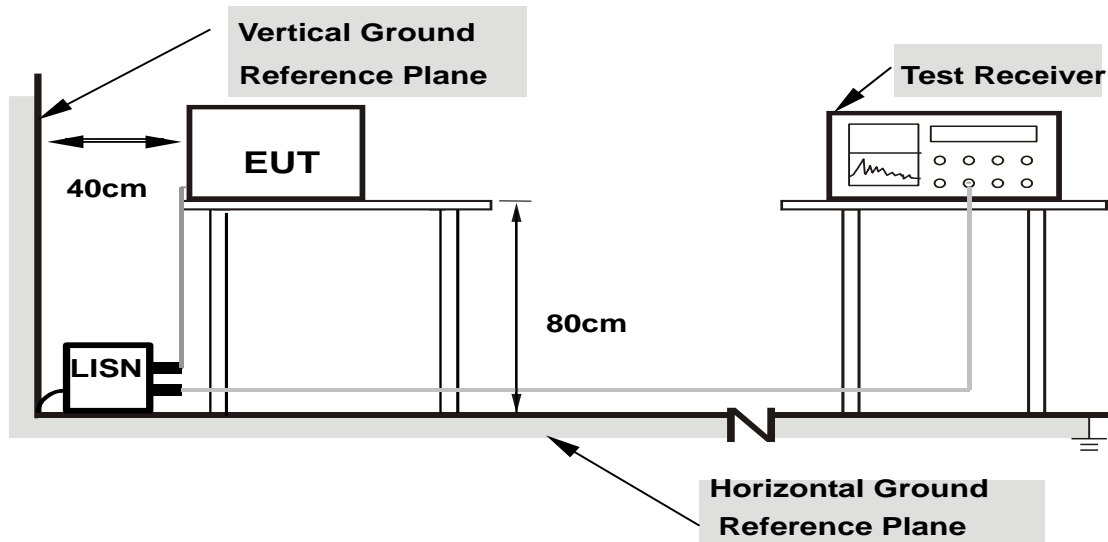
- a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling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

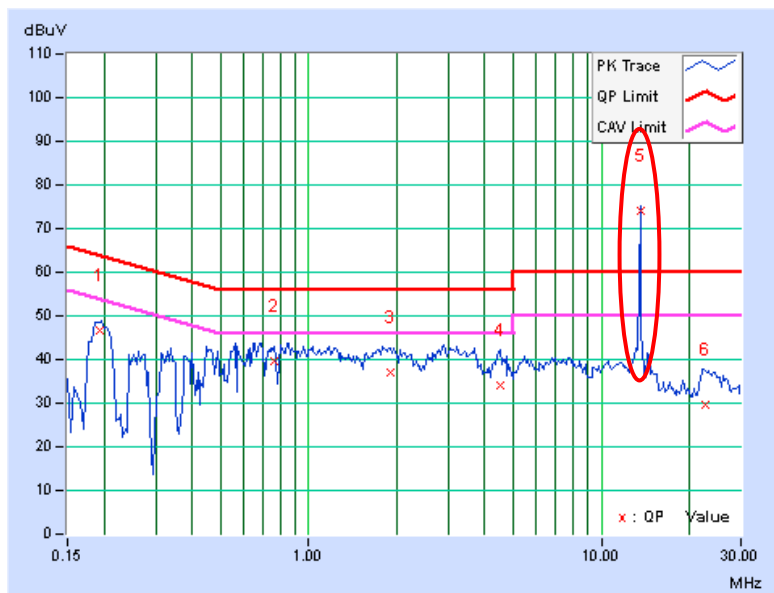
#### CONDUCTED WORST-CASE DATA :

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	0.19297	0.17	46.51	37.37	46.68	37.54	63.91	53.91	-17.23	-16.37
2	0.76328	0.25	39.26	21.74	39.51	21.99	56.00	46.00	-16.49	-24.01
3	1.90781	0.28	36.78	20.94	37.06	21.22	56.00	46.00	-18.94	-24.78
4	4.49766	0.37	33.78	20.38	34.15	20.75	56.00	46.00	-21.85	-25.25
5	13.56016	0.50	73.51	72.92	74.01	73.42	60.00	50.00	14.01	23.42
6	22.63828	0.62	28.96	21.19	29.58	21.81	60.00	50.00	-30.42	-28.19

#### 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.
6. The No. 5 is NFC signal inductive with measurement system. Please see test result for EUT with a suitable dummy load.

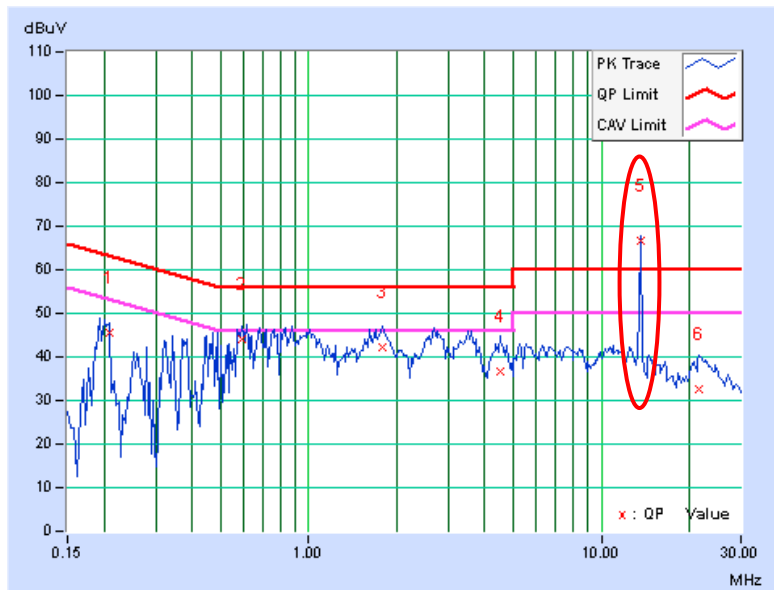


PHASE	Line 2	6dB BANDWIDTH	9kHz
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No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
			1	0.20859	0.18	45.30	29.36	45.48	29.54	63.26
2	<b>0.59531</b>	<b>0.24</b>	<b>43.88</b>	<b>24.50</b>	<b>44.12</b>	<b>24.74</b>	<b>56.00</b>	<b>46.00</b>	<b>-11.88</b>	<b>-21.26</b>
3	1.78672	0.27	41.85	25.92	42.12	26.19	56.00	46.00	-13.88	-19.81
4	4.50156	0.40	36.10	22.16	36.50	22.56	56.00	46.00	-19.50	-23.44
5	13.56016	0.57	65.93	61.65	66.50	62.22	60.00	50.00	6.50	12.22
6	21.66953	0.72	31.84	22.28	32.56	23.00	60.00	50.00	-27.44	-27.00

**REMARKS:**

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level - Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value.
6. The No. 5 is NFC signal inductive with measurement system. Please see test result for EUT with a suitable dummy load.



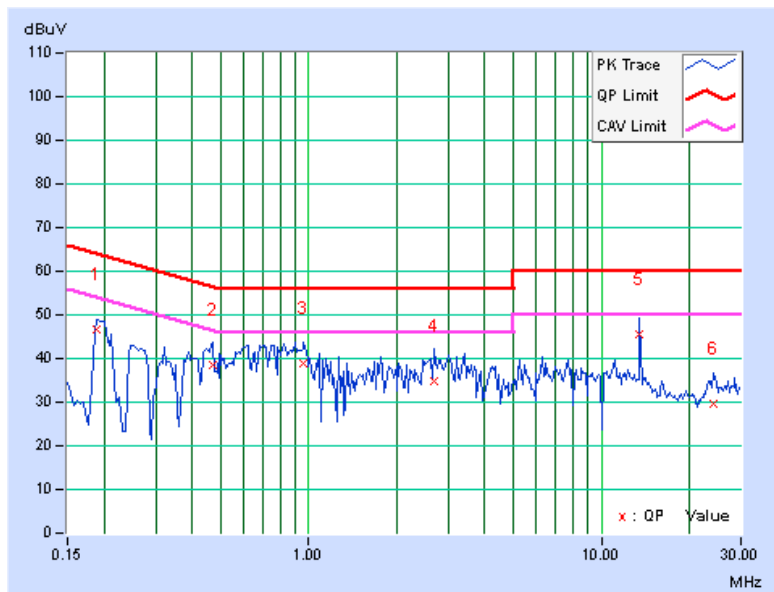
**Test with suitable dummy load**

<b>PHASE</b>	Line 1	<b>6dB BANDWIDTH</b>	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	0.18906	0.17	46.37	36.13	46.54	36.30	64.08
2	0.47031	0.22	38.42	22.07	38.64	22.29	56.51	46.51	-17.87	-24.22
3	0.96250	0.27	38.44	22.49	38.71	22.76	56.00	46.00	-17.29	-23.24
4	2.68359	0.31	34.40	19.13	34.71	19.44	56.00	46.00	-21.29	-26.56
5	13.55859	0.50	45.16	40.30	45.66	40.80	60.00	50.00	-14.34	-9.20
6	24.13672	0.61	28.99	21.40	29.60	22.01	60.00	50.00	-30.40	-27.99

**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.

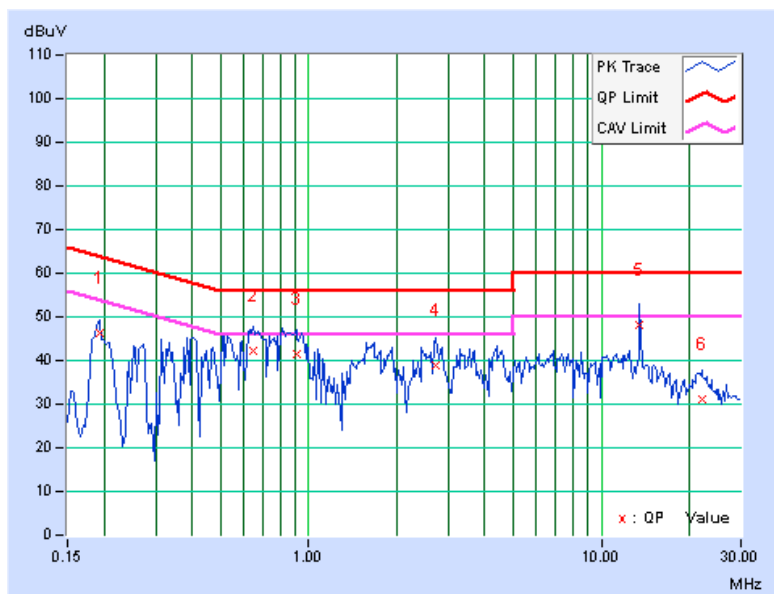


PHASE	Line 2	6dB BANDWIDTH	9kHz
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No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
			1	0.19297	0.18	46.17	35.83	46.35	36.01	63.91
2	0.64609	0.24	42.08	23.44	42.32	23.68	56.00	46.00	-13.68	-22.32
3	0.90781	0.23	41.07	23.98	41.30	24.21	56.00	46.00	-14.70	-21.79
4	2.71094	0.32	38.48	22.99	38.80	23.31	56.00	46.00	-17.20	-22.69
5	13.55469	0.57	47.45	36.36	48.02	36.93	60.00	50.00	-11.98	-13.07
6	21.98828	0.71	30.57	21.31	31.28	22.02	60.00	50.00	-28.72	-27.98

**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.



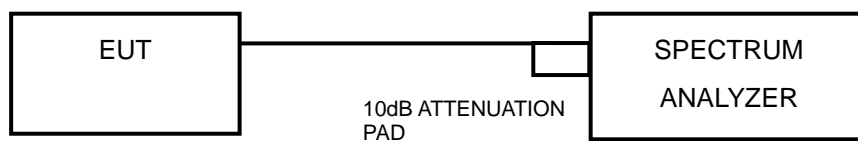


### 4.3 6dB BANDWIDTH MEASUREMENT

#### 4.3.1 LIMITS OF 6dB BANDWIDTH MEASUREMENT

The minimum of 6dB Bandwidth Measurement is 0.5 MHz.

#### 4.3.2 TEST SETUP



#### 4.3.3 TEST INSTRUMENTS

Refer to section 4.1.2 to get information of above instrument.

#### 4.3.4 TEST PROCEDURE

- a. Set resolution bandwidth (RBW) = approximately 1% of the emission bandwidth
- b. Set the video bandwidth (VBW)  $\geq 3 \times$  RBW, Detector = Peak.
- c. Trace mode = max hold.
- d. Sweep = auto couple.
- e. Measure the maximum width of the emission that is constrained by the frequencies associated with the two amplitude points (upper and lower) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission

#### 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 lowest, middle and highest channel frequencies individually.



### 4.3.7 TEST RESULTS

#### 802.11b

CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2412	8.11	0.5	PASS
6	2437	8.10	0.5	PASS
11	2462	8.11	0.5	PASS

#### 802.11g

CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2412	15.38	0.5	PASS
6	2437	15.48	0.5	PASS
11	2462	15.37	0.5	PASS

#### 802.11n (20MHz)

CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2412	15.05	0.5	PASS
6	2437	15.36	0.5	PASS
11	2462	15.46	0.5	PASS

#### 802.11n (40MHz)

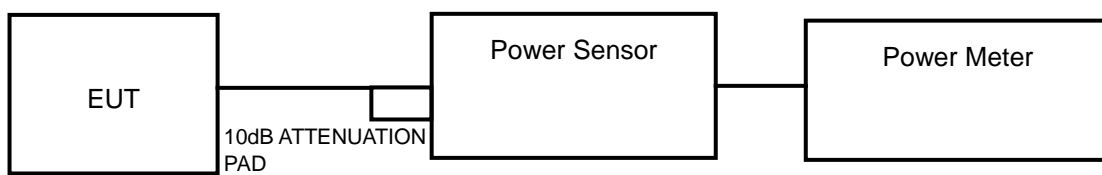
CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
3	2422	36.34	0.5	PASS
6	2437	36.13	0.5	PASS
9	2452	36.43	0.5	PASS

## 4.4 CONDUCTED OUTPUT POWER

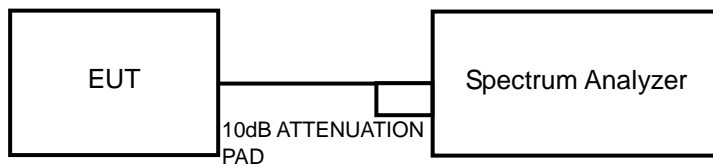
### 4.4.1 LIMITS OF CONDUCTED OUTPUT POWER MEASUREMENT

For systems using digital modulation in the 2400–2483.5 MHz bands: 1 Watt (30dBm)

### 4.4.2 TEST SETUP



or



#### 4.4.3 TEST INSTRUMENTS

Refer to section 4.1.2 to get information of above instrument.

#### 4.4.4 TEST PROCEDURES

A peak power sensor was used on the output port of the EUT. A power meter or spectrum analyzer was used to read the response of the peak power sensor. Record the peak power level.

#### 4.4.5 DEVIATION FROM TEST STANDARD

No deviation.

#### 4.4.6 EUT OPERATING CONDITIONS

Same as Item 4.3.6



#### 4.4.7 TEST RESULTS

##### 802.11b

CHANNEL	FREQUENCY (MHz)	PEAK POWER (mW)	PEAK POWER (dBm)	LIMIT (dBm)	PASS/FAIL
1	2412	52.481	17.2	30	PASS
6	2437	67.298	18.28	30	PASS
11	2462	72.111	18.58	30	PASS

##### 802.11g

CHANNEL	FREQUENCY (MHz)	PEAK POWER (mW)	PEAK POWER (dBm)	LIMIT (dBm)	PASS/FAIL
1	2412	134.896	21.3	30	PASS
6	2437	152.757	21.84	30	PASS
11	2462	125.603	20.99	30	PASS

##### 802.11n (20MHz)

CHANNEL	FREQUENCY (MHz)	PEAK POWER (mW)	PEAK POWER (dBm)	LIMIT (dBm)	PASS/FAIL
1	2412	129.122	21.11	30	PASS
6	2437	143.219	21.56	30	PASS
11	2462	127.350	21.05	30	PASS

##### 802.11n (40MHz)

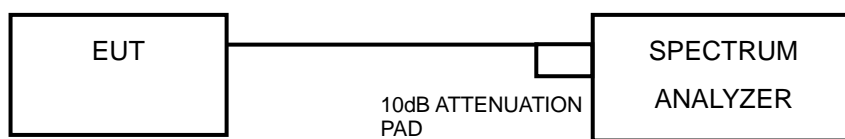
CHANNEL	FREQUENCY (MHz)	PEAK POWER (mW)	PEAK POWER (dBm)	LIMIT (dBm)	PASS/FAIL
3	2422	32.434	15.11	30	PASS
6	2437	34.514	15.38	30	PASS
9	2452	31.989	15.05	30	PASS

## 4.5 POWER SPECTRAL DENSITY MEASUREMENT

### 4.5.1 LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT

The Maximum of Power Spectral Density Measurement is 8dBm.

### 4.5.2 TEST SETUP



### 4.5.3 TEST INSTRUMENTS

Refer to section 4.1.2 to get information of above instrument.

### 4.5.4 TEST PROCEDURE

- a. Set the RBW = 3 kHz, VBW = 10 kHz, Detector = peak.
- b. Sweep time = auto couple, Trace mode = max hold, allow trace to fully stabilize.
- c. Use the peak marker function to determine the maximum power level in any 100 kHz band segment within the fundamental EBW.

### 4.5.5 DEVIATION FROM TEST STANDARD

No deviation.

### 4.5.6 EUT OPERATING CONDITION

Same as Item 4.3.6

## 4.5.7 TEST RESULTS

### 802.11b

Channel	FREQ. (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
1	2412	-9.13	8	PASS
6	2437	-8.37	8	PASS
11	2462	-6.18	8	PASS

### 802.11g

Channel	FREQ. (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
1	2412	-13.13	8	PASS
6	2437	-11.25	8	PASS
11	2462	-13.59	8	PASS

### 802.11n (20MHz)

Channel	FREQ. (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
1	2412	-12.28	8	PASS
6	2437	-10.57	8	PASS
11	2462	-14.34	8	PASS

### 802.11n (40MHz)

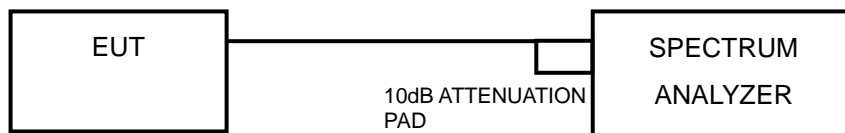
Channel	FREQ. (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
3	2422	-23.04	8	PASS
6	2437	-22.02	8	PASS
9	2452	-23.15	8	PASS

## 4.6 CONDUCTED OUT OF BAND EMISSION MEASUREMENT

### 4.6.1 LIMITS OF CONDUCTED OUT OF BAND EMISSION MEASUREMENT

Below  $-20\text{dB}$  of the highest emission level of operating band (in 100kHz Resolution Bandwidth).

### 4.6.2 TEST SETUP



### 4.6.3 TEST INSTRUMENTS

Refer to section 4.1.2 to get information of above instrument.

### 4.6.4 TEST PROCEDURE

#### MEASUREMENT PROCEDURE REF

1. Set the RBW = 100 kHz.
2. Set the VBW  $\geq$  300 kHz.
3. Detector = peak.
4. Sweep time = auto couple.
5. Trace mode = max hold.
6. Allow trace to fully stabilize.
7. Use the peak marker function to determine the maximum power level in any 100 kHz band segment within the fundamental EBW.





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## MEASUREMENT PROCEDURE OOB

1. Set RBW = 100 kHz.
2. Set VBW  $\geq$  300 kHz.
3. Set span to encompass the spectrum to be examined.
4. Detector = peak.
5. Trace Mode = max hold.
6. Sweep = auto couple.

### 4.6.5 DEVIATION FROM TEST STANDARD

No deviation.

### 4.6.6 EUT OPERATING CONDITION

Same as Item 4.3.6

### 4.6.7 TEST RESULTS

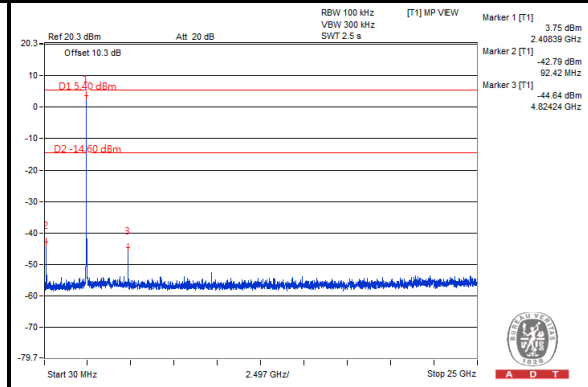
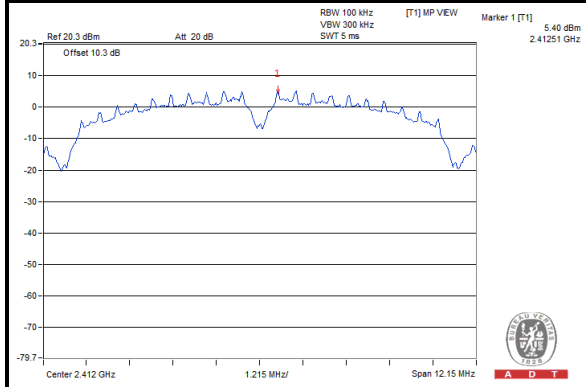
The spectrum plots are attached on the following pages. D1 line indicates the highest level, and D2 line indicates the 20dB offset below D1. It shows compliance with the requirement.



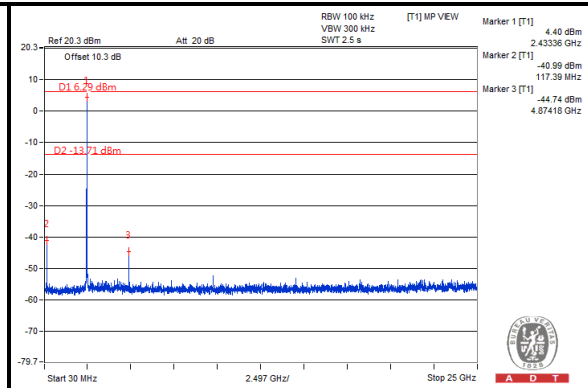
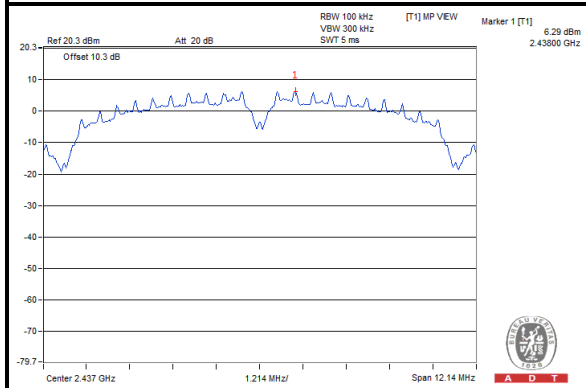
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### 802.11b

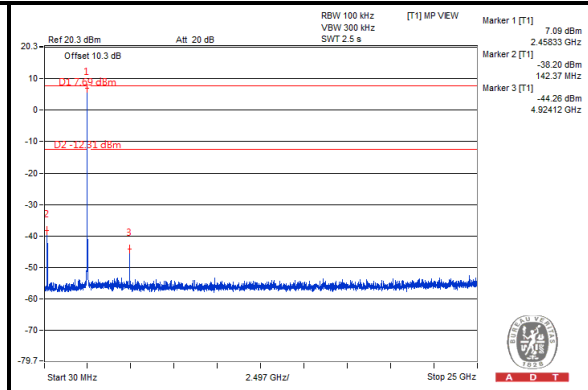
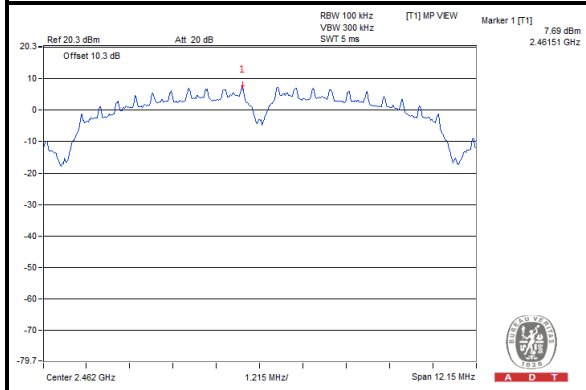
#### CH 1



#### CH 6



#### CH 11

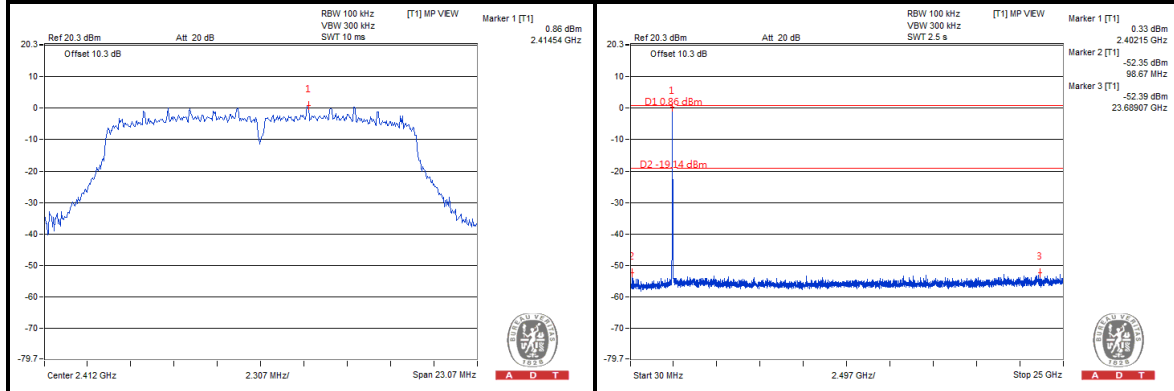




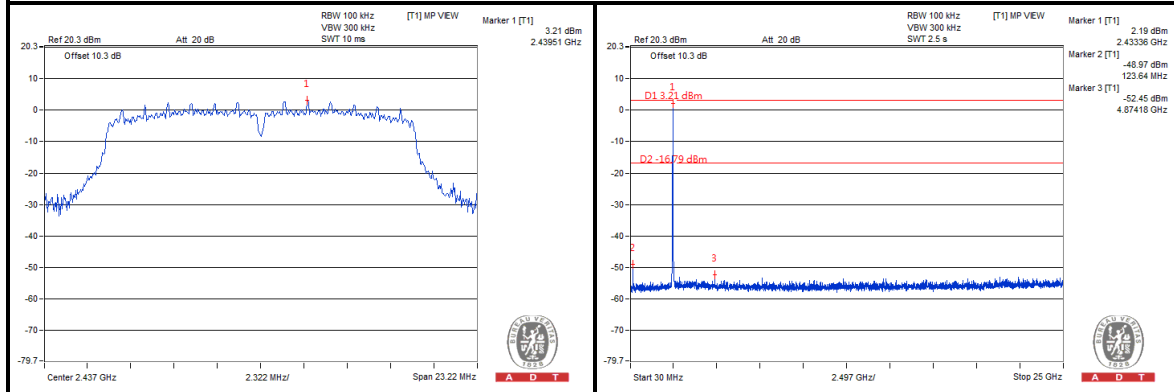
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### 802.11g

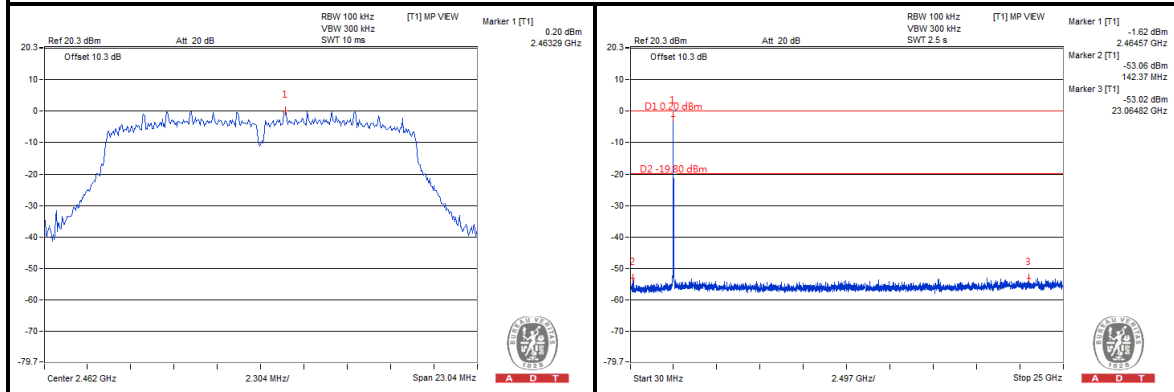
#### CH 1



#### CH 6



#### CH 11

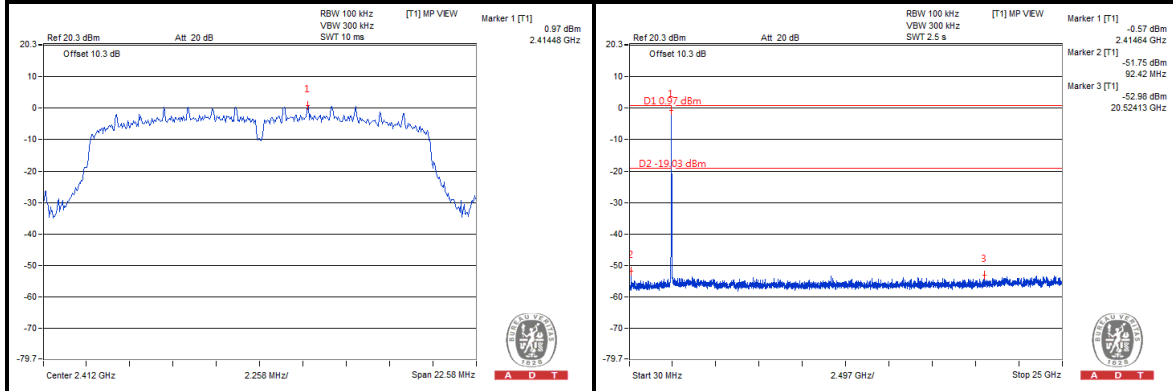




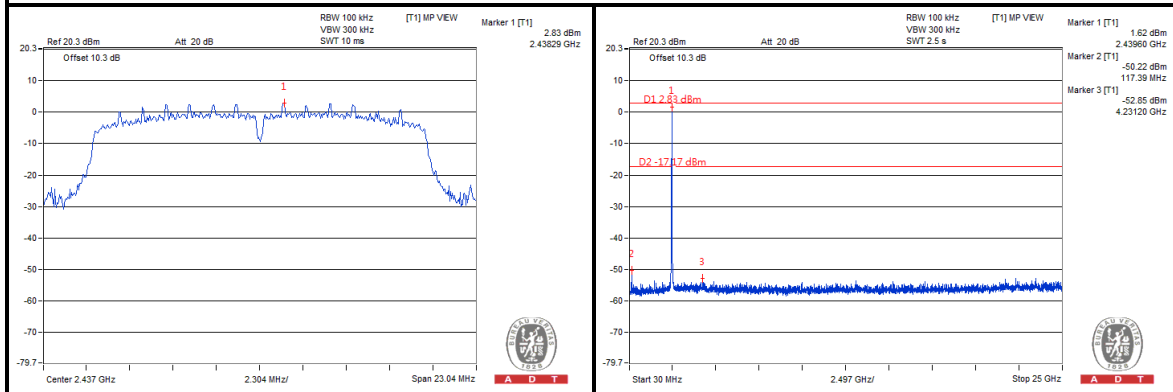
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### 802.11n (20MHz)

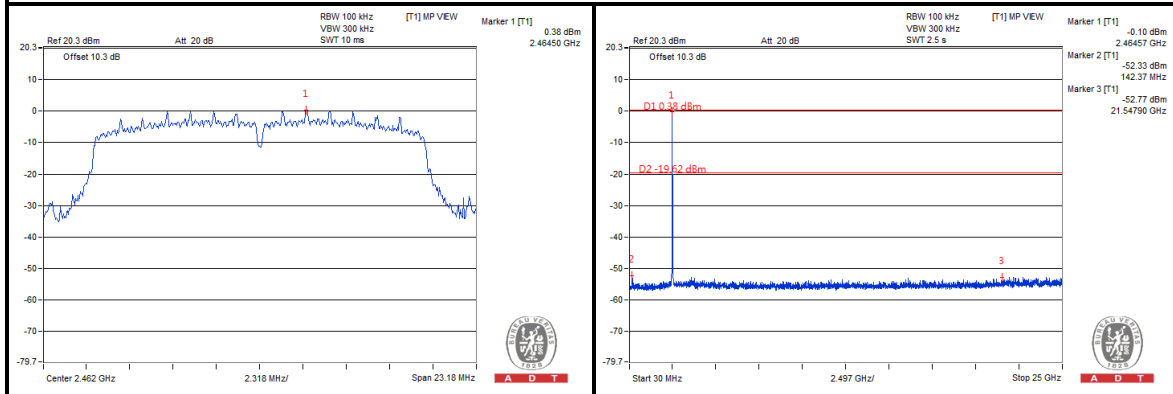
#### CH 1



#### CH 6



#### CH 11

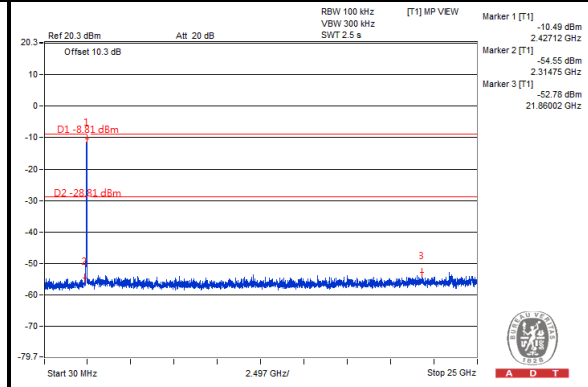
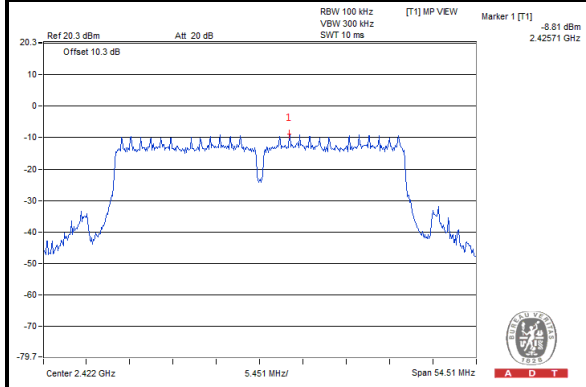




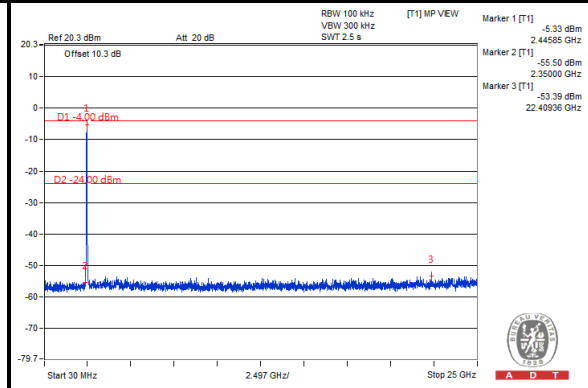
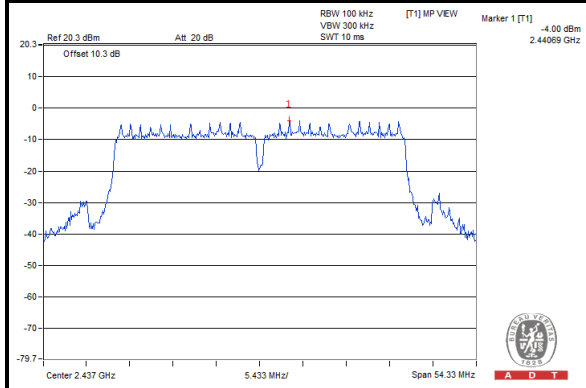
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### 802.11n (40MHz)

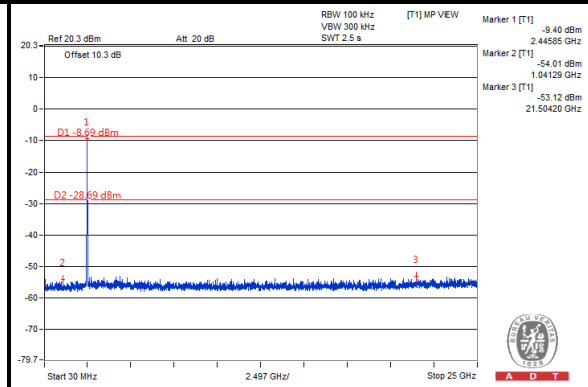
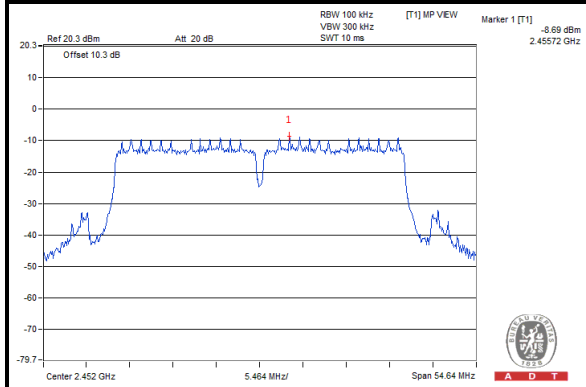
#### CH 3



#### CH 6



#### CH 9



## 5. TEST TYPES AND RESULTS (FOR 5.0GHz BAND)

### 5.1 RADIATED EMISSION AND BANDEDGE MEASUREMENT

#### 5.1.1 LIMITS OF RADIATED EMISSION AND BANDEDGE MEASUREMENT

Radiated emissions which fall in the restricted bands must comply with the radiated emission limits specified as below table. Other emissions shall be at least 20dB below the highest level of the desired power:

FREQUENCIES (MHz)	FIELD STRENGTH (microvolts/meter)	MEASUREMENT DISTANCE (meters)
0.009 ~ 0.490	2400/F(kHz)	300
0.490 ~ 1.705	24000/F(kHz)	30
1.705 ~ 30.0	30	30
30 ~ 88	100	3
88 ~ 216	150	3
216 ~ 960	200	3
Above 960	500	3

**NOTE:**

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. For frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.



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### 5.1.2 TEST INSTRUMENTS

Same as item 4.1.2

### 5.1.3 TEST PROCEDURES

Same as item 4.1.3

### 5.1.4 DEVIATION FROM TEST STANDARD

No deviation.

### 5.1.5 TEST SETUP

Same as item 4.1.5

### 5.1.6 EUT OPERATING CONDITIONS

Same as 4.1.6



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## 5.1.7 TEST RESULTS

## ABOVE 1GHz WORST-CASE DATA

## 802.11a

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 149	FREQUENCY RANGE	1GHz ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Anson Lin

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5725	60.19	60.07	82.39	-22.2	31.96	5.59	37.43	102	188	Average
5725	78.67	78.55	89.05	-10.38	31.96	5.59	37.43	102	188	Peak
5745	102.39	102.27			31.99	5.6	37.47	102	188	Average
5745	109.05	108.93			31.99	5.6	37.47	102	188	Peak
5850	39.83	39.53	82.39	-42.56	32.15	5.66	37.51	102	188	Average
5850	54.54	54.24	89.05	-34.51	32.15	5.66	37.51	102	188	Peak
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5725	54.55	54.43	74.97	-20.42	31.96	5.59	37.43	100	78	Average
5725	72.2	72.08	83.9	-11.7	31.96	5.59	37.43	100	78	Peak
5745	94.97	94.85			31.99	5.6	37.47	100	78	Average
5745	103.9	103.78			31.99	5.6	37.47	100	78	Peak
5850	38.34	38.04	74.97	-36.63	32.15	5.66	37.51	100	78	Average
5850	52.83	52.53	83.9	-31.07	32.15	5.66	37.51	100	78	Peak

## REMARKS:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor  
Margin value = Emission level – Limit value
- 5745MHz: Fundamental frequency.
- 5725MHz & 5850MHz: Out of restricted band





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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 157	FREQUENCY RANGE	1GHz ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Anson Lin

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5725	43.91	43.79	82.41	-38.5	31.96	5.59	37.43	113	192	Average
5725	57.41	57.29	89.18	-31.77	31.96	5.59	37.43	113	192	Peak
5785	102.41	102.29			32.04	5.62	37.54	113	192	Average
5785	109.18	109.06			32.04	5.62	37.54	113	192	Peak
5850	42.9	42.6	82.41	-39.51	32.15	5.66	37.51	113	192	Average
5850	55.91	55.61	89.18	-33.27	32.15	5.66	37.51	113	192	Peak
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5725	39.68	39.56	74.58	-34.9	31.96	5.59	37.43	100	76	Average
5725	54.75	54.63	83.57	-28.82	31.96	5.59	37.43	100	76	Peak
5785	94.58	94.46			32.04	5.62	37.54	100	76	Average
5785	103.57	103.45			32.04	5.62	37.54	100	76	Peak
5850	39.25	38.95	74.58	-35.33	32.15	5.66	37.51	100	76	Average
5850	53.34	53.04	83.57	-30.23	32.15	5.66	37.51	100	76	Peak

**REMARKS:**

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor  
Margin value = Emission level – Limit value
- 5785MHz: Fundamental frequency.
- 5725MHz & 5850MHz: Out of restricted band



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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 165	FREQUENCY RANGE	1GHz ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Anson Lin

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5725	39.63	39.51	82.75	-43.12	31.96	5.59	37.43	112	192	Average
5725	52.85	52.73	89.08	-36.23	31.96	5.59	37.43	112	192	Peak
5825	102.75	102.52			32.12	5.64	37.53	112	192	Average
5825	109.08	108.85			32.12	5.64	37.53	112	192	Peak
5850	57.85	57.55	82.75	-24.9	32.15	5.66	37.51	112	192	Average
5850	74.86	74.56	89.08	-14.22	32.15	5.66	37.51	112	192	Peak
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5725	37.73	37.61	75.03	-37.3	31.96	5.59	37.43	100	158	Average
5725	52.87	52.75	84.04	-31.17	31.96	5.59	37.43	100	158	Peak
5825	95.03	94.8			32.12	5.64	37.53	100	158	Average
5825	104.04	103.81			32.12	5.64	37.53	100	158	Peak
5850	49.34	49.04	75.03	-25.69	32.15	5.66	37.51	100	158	Average
5850	67.07	66.77	84.04	-16.97	32.15	5.66	37.51	100	158	Peak

**REMARKS:**

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor  
Margin value = Emission level – Limit value
- 5825MHz: Fundamental frequency.
- 5725MHz & 5850MHz: Out of restricted band



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## 802.11n (20MHz)

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 149	FREQUENCY RANGE	1GHz ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Anson Lin

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5725	54.48	54.36	79.49	-25.01	31.96	5.59	37.43	114	184	Average
5725	72.17	72.05	87.44	-15.27	31.96	5.59	37.43	114	184	Peak
5745	99.49	99.37			31.99	5.6	37.47	114	184	Average
5745	107.44	107.32			31.99	5.6	37.47	114	184	Peak
5850	40.05	39.75	79.49	-39.44	32.15	5.66	37.51	114	184	Average
5850	52.27	51.97	87.44	-35.17	32.15	5.66	37.51	114	184	Peak
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5725	49.8	49.68	73.5	-23.7	31.96	5.59	37.43	100	11	Average
5725	66.19	66.07	82.38	-16.19	31.96	5.59	37.43	100	11	Peak
5745	93.5	93.38			31.99	5.6	37.47	100	11	Average
5745	102.38	102.26			31.99	5.6	37.47	100	11	Peak
5850	38.25	37.95	73.5	-35.25	32.15	5.66	37.51	100	11	Average
5850	52.58	52.28	82.38	-29.8	32.15	5.66	37.51	100	11	Peak

## REMARKS:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor  
Margin value = Emission level – Limit value
- 5745MHz: Fundamental frequency.
- 5725MHz & 5850MHz: Out of restricted band



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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 157	FREQUENCY RANGE	1GHz ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Anson Lin

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5725	42.36	42.24	79.98	-37.62	31.96	5.59	37.43	102	185	Average
5725	54.89	54.77	87.46	-32.57	31.96	5.59	37.43	102	185	Peak
5785	99.98	99.86			32.04	5.62	37.54	102	185	Average
5785	107.46	107.34			32.04	5.62	37.54	102	185	Peak
5850	41.62	41.32	79.98	-38.36	32.15	5.66	37.51	102	185	Average
5850	53.92	53.62	87.46	-33.54	32.15	5.66	37.51	102	185	Peak
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5725	39.04	38.92	73.77	-34.73	31.96	5.59	37.43	102	155	Average
5725	53.02	52.9	82.7	-29.68	31.96	5.59	37.43	102	155	Peak
5785	93.77	93.65			32.04	5.62	37.54	102	155	Average
5785	102.7	102.58			32.04	5.62	37.54	102	155	Peak
5850	38.19	37.89	73.77	-35.58	32.15	5.66	37.51	102	155	Average
5850	52.83	52.53	82.7	-29.87	32.15	5.66	37.51	102	155	Peak

**REMARKS:**

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor  
Margin value = Emission level – Limit value
- 5785MHz: Fundamental frequency.
- 5725MHz & 5850MHz: Out of restricted band



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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 165	FREQUENCY RANGE	1GHz ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Anson Lin

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5725	40.22	40.1	80.84	-40.62	31.96	5.59	37.43	102	188	Average
5725	54.41	54.29	87.78	-33.37	31.96	5.59	37.43	102	188	Peak
5825	100.84	100.61			32.12	5.64	37.53	102	188	Average
5825	107.78	107.55			32.12	5.64	37.53	102	188	Peak
5850	52.57	52.27	80.84	-28.27	32.15	5.66	37.51	102	188	Average
5850	69.13	68.83	87.78	-18.65	32.15	5.66	37.51	102	188	Peak
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5725	37.75	37.63	73.02	-35.27	31.96	5.59	37.43	101	153	Average
5725	52.02	51.9	81.78	-29.76	31.96	5.59	37.43	101	153	Peak
5825	93.02	92.79			32.12	5.64	37.53	101	153	Average
5825	101.78	101.55			32.12	5.64	37.53	101	153	Peak
5850	44.31	44.01	73.02	-28.71	32.15	5.66	37.51	101	153	Average
5850	57.38	57.08	81.78	-24.4	32.15	5.66	37.51	101	153	Peak

**REMARKS:**

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor  
Margin value = Emission level – Limit value
2. 5825MHz: Fundamental frequency.
3. 5725MHz & 5850MHz: Out of restricted band



802.11n (40MHz)

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 151	FREQUENCY RANGE	1GHz ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Anson Lin

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5725	57.02	56.9	76.13	-19.11	31.96	5.59	37.43	102	184	Average
5725	74.04	73.92	85.11	-11.07	31.96	5.59	37.43	102	184	Peak
5755	96.13	95.99			32.01	5.6	37.47	102	184	Average
5755	105.11	104.97			32.01	5.6	37.47	102	184	Peak
5850	43.31	43.01	76.13	-32.82	32.15	5.66	37.51	102	184	Average
5850	55.84	55.54	85.11	-29.27	32.15	5.66	37.51	102	184	Peak
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5725	51.54	51.42	69.85	-18.31	31.96	5.59	37.43	123	78	Average
5725	69.31	69.19	78.94	-9.63	31.96	5.59	37.43	123	78	Peak
5755	89.85	89.71			32.01	5.6	37.47	123	78	Average
5755	98.94	98.8			32.01	5.6	37.47	123	78	Peak
5850	38.78	38.48	69.85	-31.07	32.15	5.66	37.51	123	78	Average
5850	53.77	53.47	78.94	-25.17	32.15	5.66	37.51	123	78	Peak

REMARKS:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor  
Margin value = Emission level – Limit value
- 5755MHz: Fundamental frequency.
- 5725MHz & 5850MHz: Out of restricted band



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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 159	FREQUENCY RANGE	1GHz ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Anson Lin

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5725	47.19	47.07	76.25	-29.06	31.96	5.59	37.43	102	183	Average
5725	63.76	63.64	84.86	-21.1	31.96	5.59	37.43	102	183	Peak
5795	96.25	96.09			32.07	5.63	37.54	102	183	Average
5795	104.86	104.7			32.07	5.63	37.54	102	183	Peak
5850	48.94	48.64	76.25	-27.31	32.15	5.66	37.51	102	183	Average
5850	64.42	64.12	84.86	-20.44	32.15	5.66	37.51	102	183	Peak
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M										
FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
5725	42.51	42.39	69.91	-27.4	31.96	5.59	37.43	108	18	Average
5725	55.65	55.53	79.01	-23.36	31.96	5.59	37.43	108	18	Peak
5795	89.91	89.75			32.07	5.63	37.54	108	18	Average
5795	99.01	98.85			32.07	5.63	37.54	108	18	Peak
5850	42.7	42.4	69.91	-27.21	32.15	5.66	37.51	108	18	Average
5850	57.33	57.03	79.01	-21.68	32.15	5.66	37.51	108	18	Peak

**REMARKS:**

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor  
Margin value = Emission level – Limit value
- 5795MHz: Fundamental frequency.
- 5725MHz & 5850MHz: Out of restricted band



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

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 157	FREQUENCY RANGE	30MHz ~ 1GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Quasi Peak (QP)
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Anson Lin

**ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M**

FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
44.85	34.21	51.02	40	-5.79	13.6	0.73	31.14	100	114	QP
57	32.2	50.49	40	-7.8	12.25	0.81	31.35	100	193	Peak
89.13	18.68	41.29	43.5	-24.82	8.28	1.02	31.91	100	114	Peak
537.3	22.61	33.25	46	-23.39	18.17	2.91	31.72	100	141	Peak
605.9	24.33	33.69	46	-21.67	19.68	3.11	32.15	100	132	Peak
762	26.9	33.02	46	-19.1	21.7	3.6	31.42	100	314	Peak

**ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M**

FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	READ LEVEL (dBuV)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA FACTOR (dB/m)	CABLE LOSS (dB)	PREAMP FACTOR (dB)	ANTENNA HEIGHT (cm)	TABLE ANGLE (Degree)	REMARK
45.12	33.28	50.2	40	-6.72	13.5	0.74	31.16	100	119	QP
51.33	31.93	49.6	40	-8.07	12.87	0.77	31.31	100	183	Peak
85.35	22.12	44.64	40	-17.88	8.22	1	31.74	100	171	Peak
612.2	23.84	33.07	46	-22.16	19.75	3.12	32.1	100	234	Peak
750.1	26.88	33.09	46	-19.12	21.52	3.57	31.3	100	201	Peak
864.9	27.6	32.63	46	-18.4	23.06	3.86	31.95	100	199	Peak



## 5.2 CONDUCTED EMISSION MEASUREMENT

### 5.2.1 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.

### 5.2.2 TEST INSTRUMENTS

Same as item 4.2.2

### 5.2.3 TEST PROCEDURES

Same as item 4.2.3

### 5.2.4 DEVIATION FROM TEST STANDARD

No deviation.

### 5.2.5 TEST SETUP

Same as item 4.2.5

### 5.2.6 EUT OPERATING CONDITIONS

Same as 4.1.6

### 5.2.7 TEST RESULTS

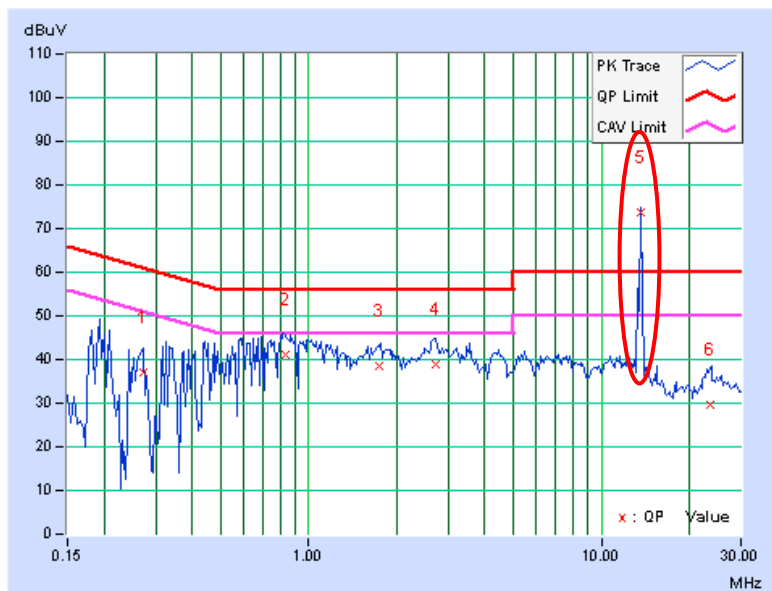
**CONDUCTED WORST-CASE DATA : 802.11a**

<b>PHASE</b>	Line 1	<b>6dB BANDWIDTH</b>	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	0.27109	0.18	36.80	21.75	36.98	21.93	61.08	51.08	-24.10	-29.15
2	0.83359	0.25	40.76	23.36	41.01	23.61	56.00	46.00	-14.99	-22.39
3	1.74766	0.28	38.17	21.20	38.45	21.48	56.00	46.00	-17.55	-24.52
4	2.72422	0.31	38.44	21.50	38.75	21.81	56.00	46.00	-17.25	-24.19
5	13.56016	0.50	73.31	72.74	73.81	73.24	60.00	50.00	13.81	23.24
6	23.47422	0.61	28.92	20.20	29.53	20.81	60.00	50.00	-30.47	-29.19

**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.
6. The No. 5 is NFC signal inductive with measurement system. Please see test result for EUT with a suitable dummy load.

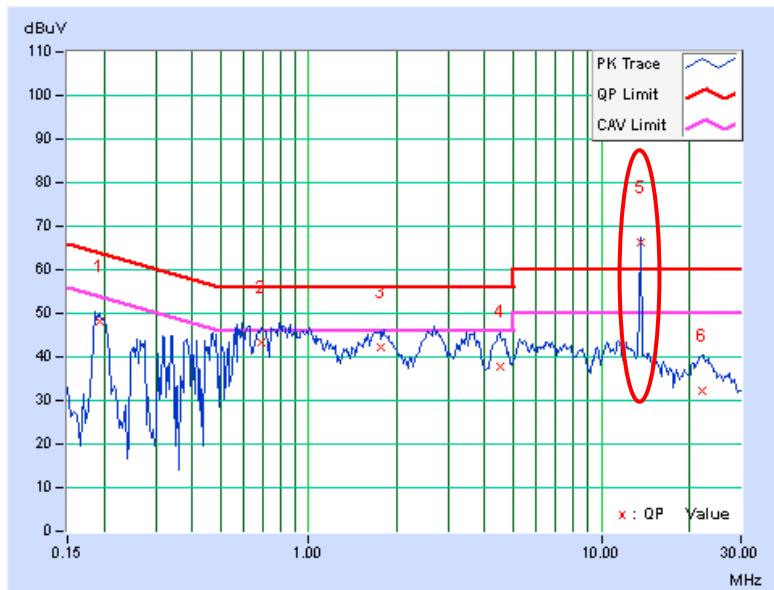


PHASE	Line 2	6dB BANDWIDTH	9kHz
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No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
			1	0.19297	0.18	48.04	36.00	48.22	36.18	63.91
2	0.69297	0.24	43.13	27.43	43.37	27.67	56.00	46.00	-12.63	-18.33
3	1.75547	0.27	41.81	25.82	42.08	26.09	56.00	46.00	-13.92	-19.91
4	4.49766	0.40	37.48	23.99	37.88	24.39	56.00	46.00	-18.12	-21.61
5	13.56016	0.57	65.91	61.63	66.48	62.20	60.00	50.00	6.48	12.20
6	22.16953	0.71	31.66	21.84	32.37	22.55	60.00	50.00	-27.63	-27.45

**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.
6. The No. 5 is NFC signal inductive with measurement system. Please see test result for EUT with a suitable dummy load.



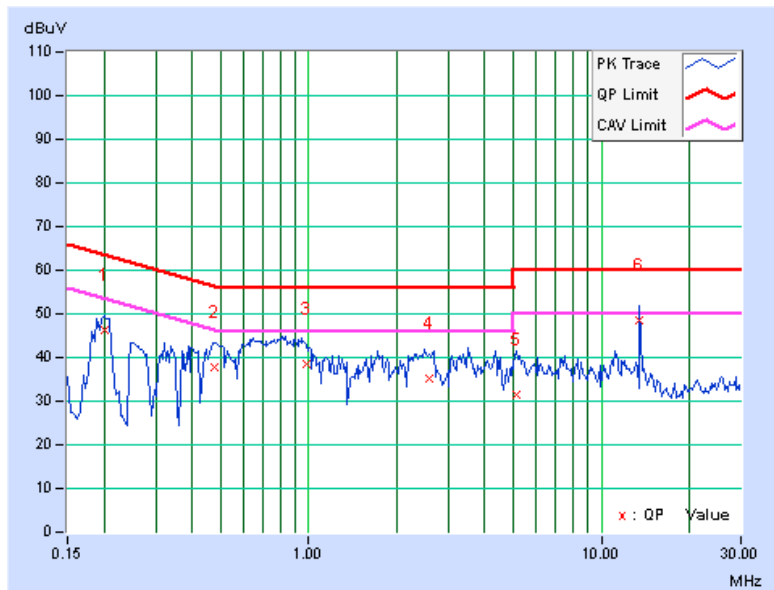
### Test with suitable dummy load

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	0.20078	0.17	46.21	34.14	46.38	34.31	63.58	53.58	-17.20	-19.27
2	0.47813	0.22	37.38	20.81	37.60	21.03	56.37	46.37	-18.77	-25.34
3	0.97813	0.27	38.14	21.63	38.41	21.90	56.00	46.00	-17.59	-24.10
4	2.58203	0.31	34.86	19.19	35.17	19.50	56.00	46.00	-20.83	-26.50
5	5.14063	0.38	31.12	16.95	31.50	17.33	60.00	50.00	-28.50	-32.67
6	13.55859	0.50	47.92	43.31	48.42	43.81	60.00	50.00	-11.58	-6.19

**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.

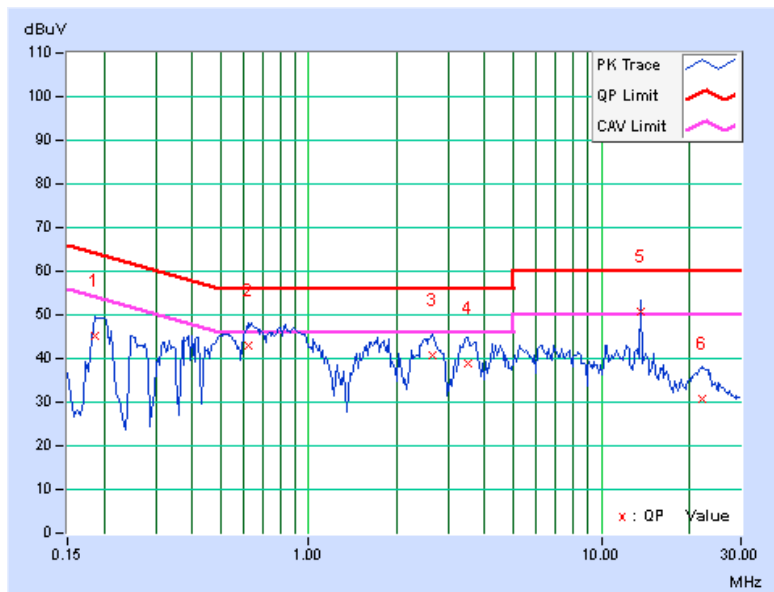


PHASE	Line 2	6dB BANDWIDTH	9kHz
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No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
			1	0.18516	0.18	45.12	30.21	45.30	30.39	64.25
2	0.61875	0.24	42.70	25.90	42.94	26.14	56.00	46.00	-13.06	-19.86
3	2.63672	0.32	40.47	24.86	40.79	25.18	56.00	46.00	-15.21	-20.82
4	3.50000	0.36	38.56	23.75	38.92	24.11	56.00	46.00	-17.08	-21.89
5	13.56250	0.57	50.21	39.75	50.78	40.32	60.00	50.00	-9.22	-9.68
6	22.08984	0.71	30.08	21.24	30.79	21.95	60.00	50.00	-29.21	-28.05

**REMARKS:**

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





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### **5.3 6dB BANDWIDTH MEASUREMENT**

#### **5.3.1 LIMITS OF 6dB BANDWIDTH MEASUREMENT**

The minimum of 6dB Bandwidth Measurement is 0.5MHz.

#### **5.3.2 TEST SETUP**

Same as item 4.3.2

#### **5.3.3 TEST INSTRUMENTS**

Refer to section 4.1.2 to get information of above instrument.

#### **5.3.4 TEST PROCEDURE**

Same as item 4.3.4

#### **5.3.5 DEVIATION FROM TEST STANDARD**

No deviation.

#### **5.3.6 EUT OPERATING CONDITIONS**

Same as item 4.3.6



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### 5.3.7 TEST RESULTS

#### 802.11a

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS/FAIL
149	5745	15.44	0.5	PASS
157	5785	15.81	0.5	PASS
165	5825	15.82	0.5	PASS

#### 802.11n (20MHz)

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS/FAIL
149	5745	15.46	0.5	PASS
157	5785	15.72	0.5	PASS
165	5825	15.50	0.5	PASS

#### 802.11n (40MHz)

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS/FAIL
151	5755	36.36	0.5	PASS
159	5795	36.45	0.5	PASS



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## **5.4 MAXIMUM OUTPUT POWER**

### **5.4.1 LIMITS OF MAXIMUM OUTPUT POWER MEASUREMENT**

For systems using digital modulation in the 5725–5850 MHz bands: 1 Watt (30dBm)

### **5.4.2 TEST SETUP**

Same as Item 4.4.2

### **5.4.3 INSTRUMENTS**

Refer to section 4.1.2 to get information of above instrument.

### **5.4.4 TEST PROCEDURES**

Same as Item 4.4.4

### **5.4.5 DEVIATION FROM TEST STANDARD**

No deviation.

### **5.4.6 EUT OPERATING CONDITIONS**

Same as Item 4.3.6





## 5.4.7 TEST RESULTS

### 802.11a

CHANNEL	CHANNEL FREQUENCY (MHz)	POWER OUTPUT (mW)	POWER OUTPUT (dBm)	POWER LIMIT (dBm)	PASS/FAIL
149	5745	150.314	21.77	30	PASS
157	5785	153.462	21.86	30	PASS
165	5825	149.279	21.74	30	PASS

### 802.11n (20MHz)

CHANNEL	CHANNEL FREQUENCY (MHz)	POWER OUTPUT (mW)	POWER OUTPUT (dBm)	POWER LIMIT (dBm)	PASS/FAIL
149	5745	120.781	20.82	30	PASS
157	5785	142.889	21.55	30	PASS
165	5825	133.660	21.26	30	PASS

### 802.11n (40MHz)

CHANNEL	CHANNEL FREQUENCY (MHz)	POWER OUTPUT (mW)	POWER OUTPUT (dBm)	POWER LIMIT (dBm)	PASS/FAIL
151	5755	126.474	21.02	30	PASS
159	5795	125.314	20.98	30	PASS



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## **5.5 POWER SPECTRAL DENSITY MEASUREMENT**

### **5.5.1 LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT**

The Maximum of Power Spectral Density Measurement is 8dBm.

### **5.5.2 TEST SETUP**

Same as item 4.5.2

### **5.5.3 TEST INSTRUMENTS**

Refer to section 4.1.2 to get information of above instrument.

### **5.5.4 TEST PROCEDURE.**

Same as item 4.5.4

### **5.5.5 DEVIATION FROM TEST STANDARD**

No deviation.

### **5.5.6 EUT OPERATING CONDITION**

Same as item 4.3.6



## 5.5.7 TEST RESULTS

### 802.11a

CHANNEL	CHANNEL FREQUENCY (MHz)	PSD (dBm/3kHz)	MAXIMUM LIMIT (dBm)	PASS/FAIL
149	5745	-11.99	8	PASS
157	5785	-11.70	8	PASS
165	5825	-11.07	8	PASS

### 802.11n (20MHz)

CHANNEL	CHANNEL FREQUENCY (MHz)	PSD (dBm/3kHz)	MAXIMUM LIMIT (dBm)	PASS/FAIL
149	5745	-13.25	8	PASS
157	5785	-13.60	8	PASS
165	5825	-13.95	8	PASS

### 802.11n (40MHz)

CHANNEL	CHANNEL FREQUENCY (MHz)	PSD (dBm/3kHz)	MAXIMUM LIMIT (dBm)	PASS/FAIL
151	5755	-17.53	8	PASS
159	5795	-17.15	8	PASS

## **5.6 CONDUCTED OUT OF BAND EMISSION MEASUREMENT**

### **5.6.1 LIMITS OF OUT OF BAND EMISSION MEASUREMENT**

Below  $-20\text{dB}$  of the highest emission level of operating band (in 100kHz Resolution Bandwidth).

### **5.6.2 TEST SETUP**

Same as Item 4.6.2

### **5.6.3 TEST INSTRUMENTS**

Refer to section 4.1.2 to get information of above instrument.

### **5.6.4 TEST PROCEDURE**

Same as Item 4.6.4

### **5.6.5 DEVIATION FROM TEST STANDARD**

No deviation.

### **5.6.6 EUT OPERATING CONDITION**

Same as Item 4.3.6

### **5.6.7 TEST RESULTS**

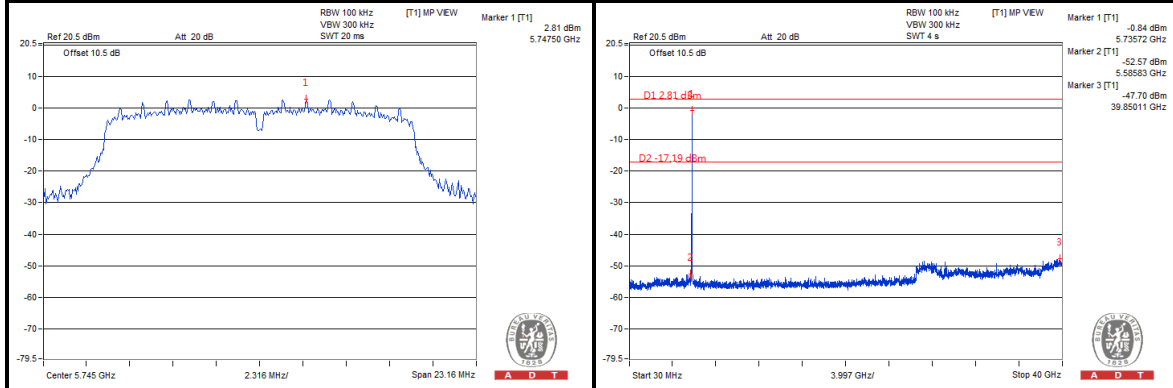
The spectrum plots are attached on the following pages. D1 line indicates the highest level, and D2 line indicates the 20dB offset below D1. It shows compliance with the requirement.



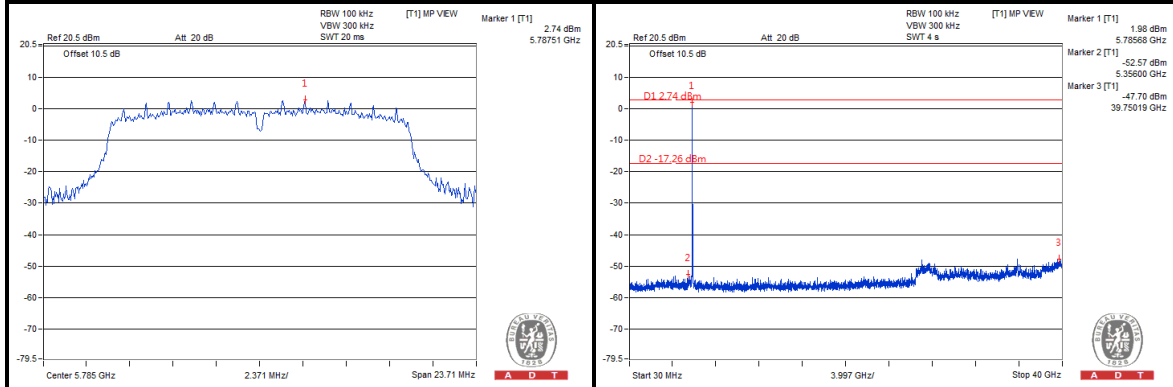
A D T

802.11a

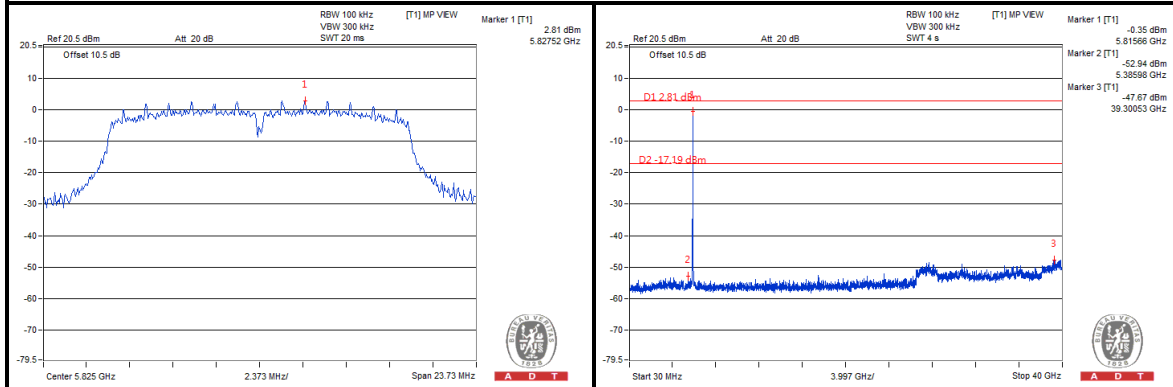
### CH 149



### CH 157



### CH 165

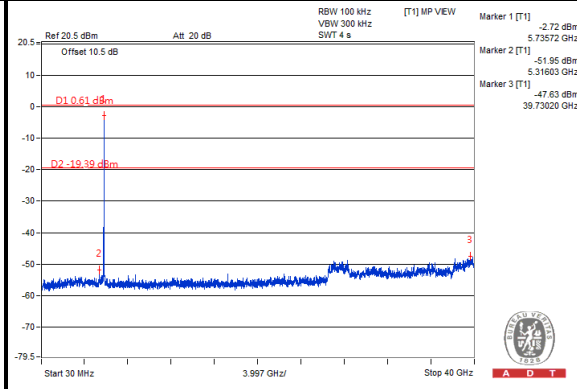
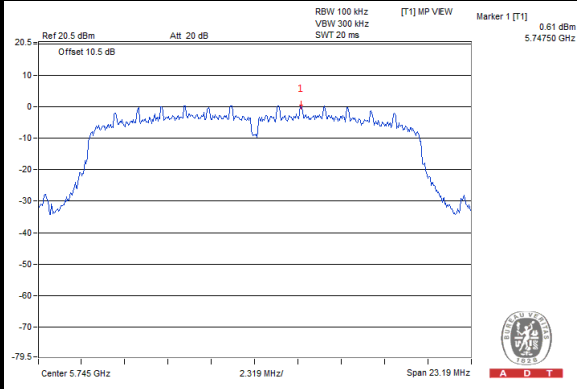




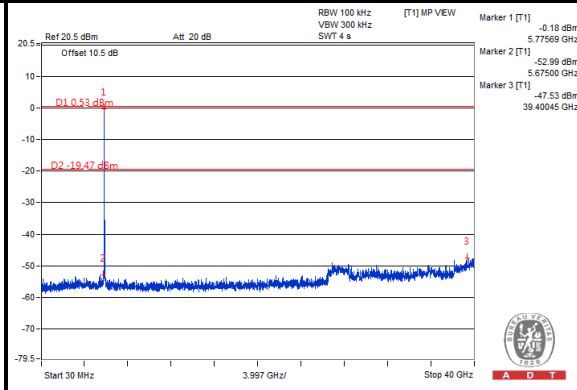
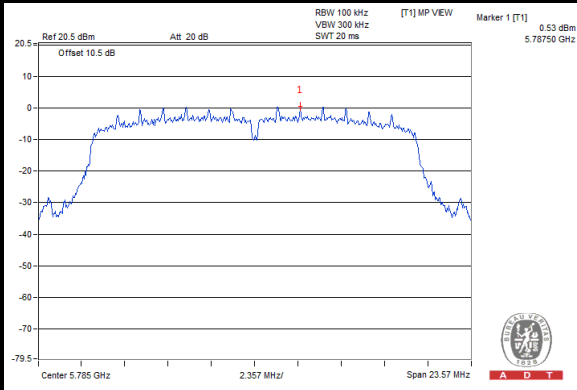
A D T

### 802.11n (20MHz)

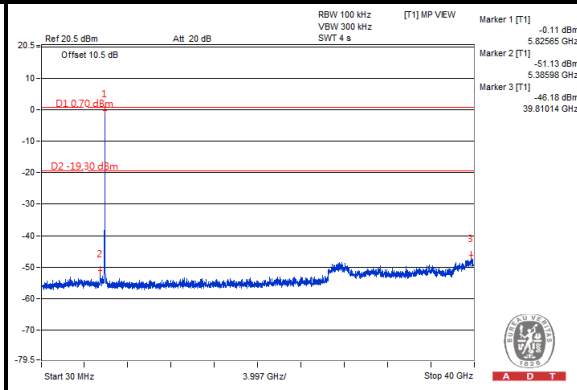
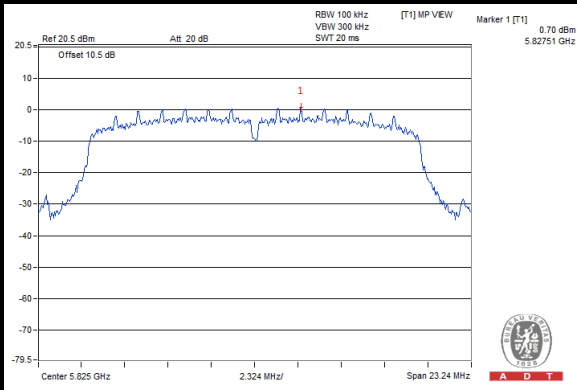
#### CH 149



#### CH 157



#### CH 165

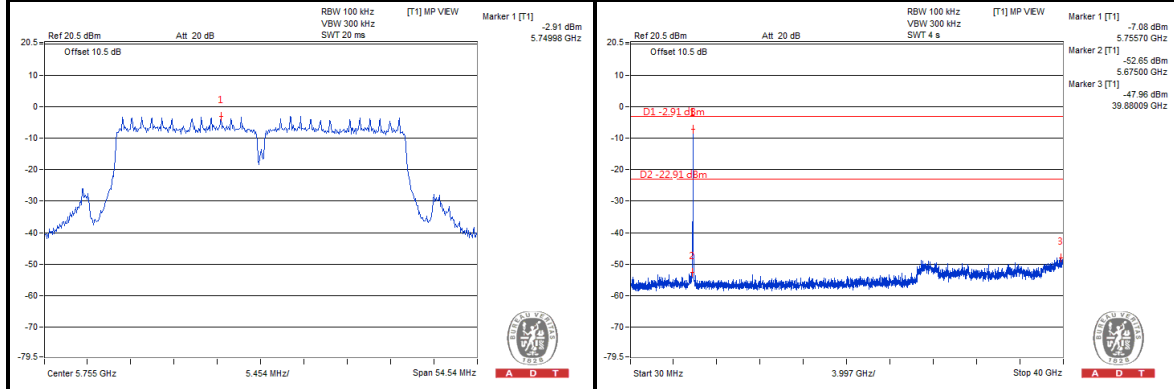




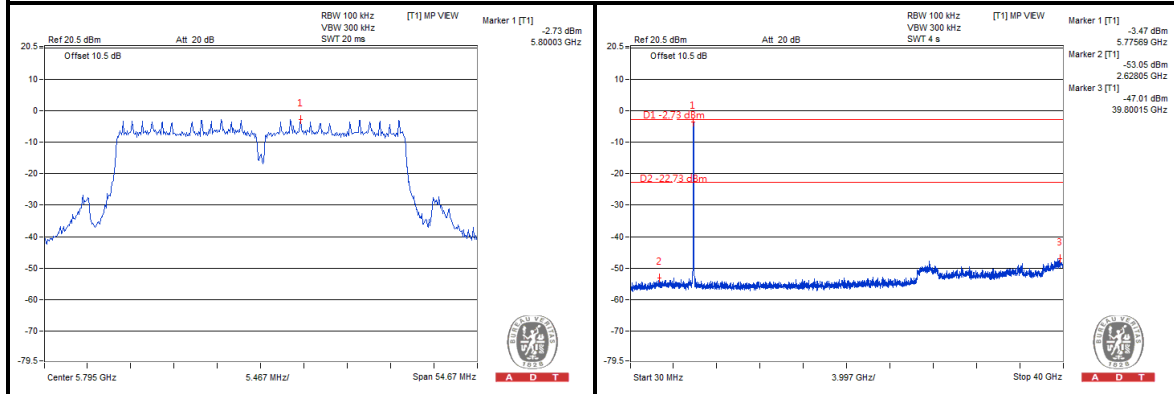
A D T

### 802.11n (40MHz)

#### CH 151



#### CH 159





A D T

## 6. PHOTOGRAPHS OF THE TEST CONFIGURATION

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





## 7. 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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## 8. APPENDIX A - MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB

No any modifications are made to the EUT by the lab during the test.

---END---