



A D T

# FCC TEST REPORT (15.247)

**REPORT NO.:** RF120423C23A  
**MODEL NO.:** WMTC-159N(Refer to item 3.1 for the more details)  
**FCC ID:** MXF-9901100078  
**RECEIVED:** Apr. 23, 2012  
**TESTED:** Apr. 27 ~ Apr. 30, 2012 (For all tests except AC Power Conducted Emission and radiated emission (Frequency 30MHz~1GHz) test)  
Sep. 10 ~ Oct. 03, 2012 (For AC Power Conducted Emission and radiated emission (Frequency 30MHz~1GHz) test)  
**ISSUED:** Oct. 15, 2012

**APPLICANT:** Gemtek Technology Co., Ltd.  
**ADDRESS:** No. 15-1, Zhonghua Rd, Hsinchu Industrial Park, Hsinchu County, Taiwan, R.O.C. 303

**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.

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



This report is for your exclusive use. Any copying or replication of this report to or for any other person or entity, or use of our name or trademark, is permitted only with our prior written permission. This report sets forth our findings solely with respect to the test samples identified herein. The results set forth in this report are not indicative or representative of the quality or characteristics of the lot from which a test sample was taken or any similar or identical product unless specifically and expressly noted. Our report includes all of the tests requested by you and the results thereof based upon the information that you provided to us. You have 60 days from date of issuance of this report to notify us of any material error or omission caused by our negligence, provided, however, that such notice shall be in writing and shall specifically address the issue you wish to raise. A failure to raise such issue within the prescribed time shall constitute your unqualified acceptance of the completeness of this report, the tests conducted and the correctness of the report contents. Unless specific mention, the uncertainty of measurement has been explicitly taken into account to declare the compliance or non-compliance to the specification.



# TABLE OF CONTENTS

RELEASE CONTROL RECORD .....	5
1. CERTIFICATION .....	6
2. SUMMARY OF TEST RESULTS .....	7
2.1 MEASUREMENT UNCERTAINTY .....	7
3. GENERAL INFORMATION .....	8
3.1 GENERAL DESCRIPTION OF EUT .....	8
3.2 DESCRIPTION OF TEST MODES .....	10
3.2.1 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL .....	11
3.3 DESCRIPTION OF SUPPORT UNITS .....	15
3.3.1 CONFIGURATION OF SYSTEM UNDER TEST .....	16
3.4 GENERAL DESCRIPTION OF APPLIED STANDARDS .....	17
4. TEST TYPES AND RESULTS (FOR 2.4GHz BAND) .....	18
4.1 RADIATED EMISSION AND BANDEDGE MEASUREMENT .....	18
4.1.1 LIMITS OF RADIATED EMISSION AND BANDEDGE MEASUREMENT .....	18
4.1.2 TEST INSTRUMENTS .....	19
4.1.3 TEST PROCEDURES .....	21
4.1.4 DEVIATION FROM TEST STANDARD .....	21
4.1.5 TEST SETUP .....	22
4.1.6 EUT OPERATING CONDITIONS .....	22
4.1.7 TEST RESULTS .....	23
4.2 CONDUCTED EMISSION MEASUREMENT .....	36
4.2.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT .....	36
4.2.2 TEST INSTRUMENTS .....	36
4.2.3 TEST PROCEDURES .....	37
4.2.4 DEVIATION FROM TEST STANDARD .....	37
4.2.5 TEST SETUP .....	37
4.2.6 EUT OPERATING CONDITIONS .....	37
4.2.7 TEST RESULTS .....	38
4.3 6dB BANDWIDTH MEASUREMENT .....	46
4.3.1 LIMITS OF 6dB BANDWIDTH MEASUREMENT .....	46
4.3.2 TEST SETUP .....	46
4.3.3 TEST INSTRUMENTS .....	46
4.3.4 TEST PROCEDURE .....	46
4.3.5 DEVIATION FROM TEST STANDARD .....	46
4.3.6 EUT OPERATING CONDITIONS .....	46
4.3.7 TEST RESULTS .....	47
4.4 CONDUCTED OUTPUT POWER .....	48
4.4.1 LIMITS OF CONDUCTED OUTPUT POWER MEASUREMENT .....	48
4.4.2 TEST SETUP .....	48
4.4.3 TEST INSTRUMENTS .....	48
4.4.4 TEST PROCEDURES .....	48
4.4.5 DEVIATION FROM TEST STANDARD .....	48
4.4.6 EUT OPERATING CONDITIONS .....	48
4.4.7 TEST RESULTS .....	49
4.5 POWER SPECTRAL DENSITY MEASUREMENT .....	50
4.5.1 LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT .....	50
4.5.2 TEST SETUP .....	50
4.5.3 TEST INSTRUMENTS .....	50
4.5.4 TEST PROCEDURE .....	50
4.5.5 DEVIATION FROM TEST STANDARD .....	50



4.5.6	EUT OPERATING CONDITION .....	50
4.5.7	TEST RESULTS .....	51
4.6	CONDUCTED OUT OF BAND EMISSION MEASUREMENT .....	52
4.6.1	LIMITS OF CONDUCTED OUT OF BAND EMISSION MEASUREMENT .....	52
4.6.2	TEST SETUP .....	52
4.6.3	TEST INSTRUMENTS .....	52
4.6.4	TEST PROCEDURE .....	52
4.6.5	DEVIATION FROM TEST STANDARD .....	53
4.6.6	EUT OPERATING CONDITION .....	53
4.6.7	TEST RESULTS .....	53
4.6.8	TEST RESULTS .....	54
5.	TEST TYPES AND RESULTS (FOR 5.0GHz BAND) .....	57
5.1	RADIATED EMISSION AND BANDEDGE MEASUREMENT .....	57
5.1.1	LIMITS OF RADIATED EMISSION AND BANDEDGE MEASUREMENT .....	57
5.1.2	TEST INSTRUMENTS .....	58
5.1.3	TEST PROCEDURES .....	58
5.1.4	DEVIATION FROM TEST STANDARD .....	58
5.1.5	TEST SETUP .....	58
5.1.6	EUT OPERATING CONDITIONS .....	58
5.1.7	TEST RESULTS .....	59
5.2	CONDUCTED EMISSION MEASUREMENT .....	71
5.2.1	LIMITS OF CONDUCTED EMISSION MEASUREMENT .....	71
5.2.2	TEST INSTRUMENTS .....	71
5.2.3	TEST PROCEDURES .....	71
5.2.4	DEVIATION FROM TEST STANDARD .....	71
5.2.5	TEST SETUP .....	71
5.2.6	EUT OPERATING CONDITIONS .....	71
5.2.7	TEST RESULTS .....	72
5.3	6dB BANDWIDTH MEASUREMENT .....	80
5.3.1	LIMITS OF 6dB BANDWIDTH MEASUREMENT .....	80
5.3.2	TEST SETUP .....	80
5.3.3	TEST INSTRUMENTS .....	80
5.3.4	TEST PROCEDURE .....	80
5.3.5	DEVIATION FROM TEST STANDARD .....	80
5.3.6	EUT OPERATING CONDITIONS .....	80
5.3.7	TEST RESULTS .....	81
5.4	CONDUCTED OUTPUT POWER .....	82
5.4.1	LIMITS OF CONDUCTED OUTPUT POWER MEASUREMENT .....	82
5.4.2	TEST SETUP .....	82
5.4.3	INSTRUMENTS .....	82
5.4.4	TEST PROCEDURES .....	82
5.4.5	DEVIATION FROM TEST STANDARD .....	82
5.4.6	EUT OPERATING CONDITIONS .....	82
5.4.7	TEST RESULTS .....	83
5.5	POWER SPECTRAL DENSITY MEASUREMENT .....	84
5.5.1	LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT .....	84
5.5.2	TEST SETUP .....	84
5.5.3	TEST INSTRUMENTS .....	84
5.5.4	TEST PROCEDURE .....	84
5.5.5	DEVIATION FROM TEST STANDARD .....	84
5.5.6	EUT OPERATING CONDITION .....	84
5.5.7	TEST RESULTS .....	85
5.6	CONDUCTED OUT OF BAND EMISSION MEASUREMENT .....	86



A D T

5.6.1	LIMITS OF CONDUCTED OUT OF BAND EMISSION MEASUREMENT .....	86
5.6.2	TEST SETUP .....	86
5.6.3	TEST INSTRUMENTS .....	86
5.6.4	TEST PROCEDURE .....	86
5.6.5	DEVIATION FROM TEST STANDARD .....	86
5.6.6	EUT OPERATING CONDITION .....	86
5.6.7	TEST RESULTS .....	86
6.	PHOTOGRAPHS OF THE TEST CONFIGURATION.....	90
7.	INFORMATION ON THE TESTING LABORATORIES .....	91
8.	APPENDIX A - MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB.....	92



A D T

## RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF120423C23A	Original release	Oct. 15, 2012



A D T

## 1. CERTIFICATION

**PRODUCT:** WiFi Display (Refer to item 3.1 for the more details)

**MODEL NO.:** WMTC-159N (Refer to item 3.1 for the more details)

**BRAND:** Gemtek

**APPLICANT:** Gemtek Technology Co., Ltd.

**TESTED:** Apr. 27 ~ Apr. 30, 2012 (For all tests except AC Power Conducted Emission and radiated emission (Frequency 30MHz~1GHz) test)  
Sep. 10 ~ Oct. 03, 2012 (For AC Power Conducted Emission and radiated emission (Frequency 30MHz~1GHz) test)

**TEST SAMPLE:** ENGINEERING SAMPLE

**STANDARDS:** **FCC Part 15, Subpart C (Section 15.247)**

ANSI C63.10-2009

The above equipment (model: WMTC-159N) has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

PREPARED BY :  , DATE : Oct. 15, 2012  
Pettie Chen / Senior Specialist

APPROVED BY :  , DATE : Oct. 15, 2012  
Ken Liu / 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 -7.56dB at 0.38828MHz.
15.247(d) 15.209	Radiated Emissions	PASS	Meet the requirement of limit. Minimum passing margin is -1.0dB at 2390.00, 2483.50 & 11570.00MHz.
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	3.19 dB
	200MHz ~1000MHz	3.21 dB
	1GHz ~ 18GHz	2.26 dB
	18GHz ~ 40GHz	1.94 dB

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



### 3. GENERAL INFORMATION

#### 3.1 GENERAL DESCRIPTION OF EUT

<b>EUT</b>	WiFi Display (Refer to Note for the more details)
<b>MODEL NO.</b>	WMTC-159N (Refer to Note for the more details)
<b>POWER SUPPLY</b>	100-240Vac
<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 135.0Mbps
<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) <b>5.0GHz:</b> 5 for 802.11a, 802.11n (20MHz) 2 for 802.11n (40MHz)
<b>OUTPUT POWER</b>	184.927mW for 2412 ~ 2462MHz 221.309mW for 5745 ~ 5825MHz
<b>ANTENNA TYPE</b>	<b>2.4GHz:</b> PIFA antenna with 2.68dBi gain <b>5.0GHz:</b> PIFA antenna with 4.74dBi gain
<b>ANTENNA CONNECTOR</b>	N/A
<b>DATA CABLE</b>	1.0m shielded USB cable without core 1.0m shielded HDMI cable without core 1.5m shielded HDMI cable without core
<b>I/O PORTS</b>	Refer to user's manual
<b>ACCESSORY DEVICES</b>	Adapter

**NOTE:**

1. This report is issued as a supplementary report to the original BVADT report no.: RF120423C23. The differences compared with the original report are changing applicant, product name, adding a product name, model, three adapters and two HDMI cables. Therefore, only the AC Power Conducted Emission and radiated emission (Frequency 30MHz~1GHz) test had been tested for this addendum and the original test data was kept in this report.
2. The following models are electrically identical, different product name and model names are for marketing purpose.

PRODUCT	MODEL
WiFi Display	WMTC-159N
Wireless Media Receiver	WIFIDISPLAY5901VW

3. The frequency bands used in this EUT are listed as follows:

Frequency Band (MHz)	2412~2462	5745~5825
802.11b	√	
802.11g	√	
802.11a		√
802.11n (20MHz)	√	√
802.11n (40MHz)		√

4. The EUT provides one completed transmitter and one receiver

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

5. The EUT consumes power from the following adapters.

ADAPTER 1	
<b>BRAND:</b>	AOEM
<b>MODEL:</b>	ADS005M-W 050100
<b>INPUT:</b>	100-240Vac, 50-60Hz, 0.2A
<b>OUTPUT:</b>	5Vdc, 1.0A

ADAPTER 2	
<b>BRAND:</b>	PHIHONG
<b>MODEL:</b>	PSA05A-050Q-H
<b>INPUT:</b>	100-240Vac, 50-60Hz, 0.2A
<b>OUTPUT:</b>	5Vdc, 1.0A

ADAPTER 3	
<b>BRAND:</b>	DVE
<b>MODEL:</b>	DSA-5PFK-05 FUS 050100a
<b>INPUT:</b>	100-240Vac, 50/60Hz, 0.2A
<b>OUTPUT:</b>	5Vdc, 1.0A

6. The USB interface is used for power input only and does not have communication function.

7. 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 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		

#### FOR 5.0GHz (5745 ~ 5825MHz):

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	
A	√	√	√	√	Power from host equipment
B	-	√	√	-	Power from adapter 1
C	-	√	√	-	Power from adapter 2
D	-	√	√	-	Power from adapter 3

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

**NOTE:**

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

**NOTE:** “-” means no effect.

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

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

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
A	802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1.0
A	802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6.0
A	802.11n (20MHz)	1 to 11	1, 6, 11	OFDM	BPSK	7.2

#### **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)
A, B, C, D	802.11n (20MHz)	1 to 11	6	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	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
A, B, C, D	802.11n (20MHz)	1 to 11	6	OFDM	BPSK	7.2

**BANDEGE 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)
A	802.11b	1 to 11	1, 11	DSSS	DBPSK	1.0
A	802.11g	1 to 11	1, 11	OFDM	BPSK	6.0
A	802.11n (20MHz)	1 to 11	1, 11	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	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
A	802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1.0
A	802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6.0
A	802.11n (20MHz)	1 to 11	1, 6, 11	OFDM	BPSK	7.2

**TEST CONDITION:**

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RE≥1G	25deg. C, 65%RH	120Vac, 60Hz	Alan Wu
RE<1G	25deg. C, 65%RH	120Vac, 60Hz	Cedric Wu
PLC	26deg. C, 65%RH	120Vac, 60Hz	Cedric Wu
APCM	25deg. C, 65%RH	120Vac, 60Hz	Mark Liao



A D T

**FOR 5.0GHz (5745 ~ 5825MHz):**

EUT CONFIGURE MODE	APPLICABLE TO				DESCRIPTION
	RE≥1G	RE<1G	PLC	APCM	
A	√	√	√	√	Power from host equipment
B	-	√	√	-	Power from adapter 1
C	-	√	√	-	Power from adapter 2
D	-	√	√	-	Power from adapter 3

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

**NOTE:**  
The EUT had been pre-tested on the positioned of each 3 axis. The worst case was found when positioned on **X-plane**.  
**NOTE:** “-” means no effect.

**RADIATED EMISSION TEST (ABOVE 1GHz):**

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

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
A	802.11a	149 to 165	149, 157, 165	OFDM	BPSK	6.0
A	802.11n (20MHz)	149 to 165	149, 157, 165	OFDM	BPSK	7.2
A	802.11n (40MHz)	151 to 159	151, 159	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	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
A, B, C, D	802.11n (40MHz)	151 to 159	159	OFDM	BPSK	15.0



**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)
A, B, C, D	802.11n (40MHz)	151 to 159	159	OFDM	BPSK	15.0

**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)
A	802.11a	149 to 165	149, 165	OFDM	BPSK	6.0
A	802.11n (20MHz)	149 to 165	149, 165	OFDM	BPSK	7.2
A	802.11n (40MHz)	151 to 159	151, 159	OFDM	BPSK	15.0

**ANTENNA PORT CONDUCTED MEASUREMENT:**

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

EUT CONFIGURE MODE	MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
A	802.11a	149 to 165	149, 157, 165	OFDM	BPSK	6.0
A	802.11n (20MHz)	149 to 165	149, 157, 165	OFDM	BPSK	7.2
A	802.11n (40MHz)	151 to 159	151, 159	OFDM	BPSK	15.0

**TEST CONDITION:**

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RE≥1G	25deg. C, 65%RH	120Vac, 60Hz	Alan Wu
RE<1G	25deg. C, 65%RH	120Vac, 60Hz	Cedric Wu
PLC	26deg. C, 65%RH	120Vac, 60Hz	Cedric Wu
APCM	25deg. C, 65%RH	120Vac, 60Hz	Mark Liao



A D T

### 3.3 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.

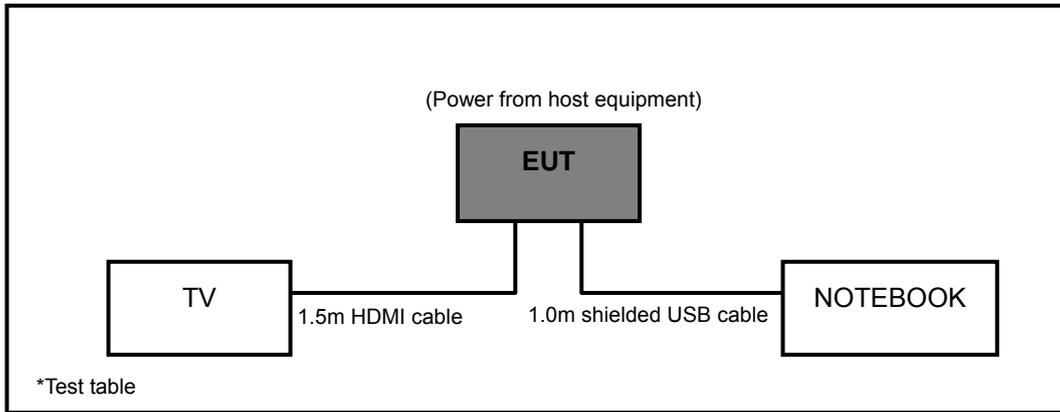
NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	NOTEBOOK	DELL	E5420	33MJMQ1	N/A
2	LED TV MONITOR	PANASONIC	TH-L32E30W	12500043	FCC DoC Approved

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	NA
2	NA

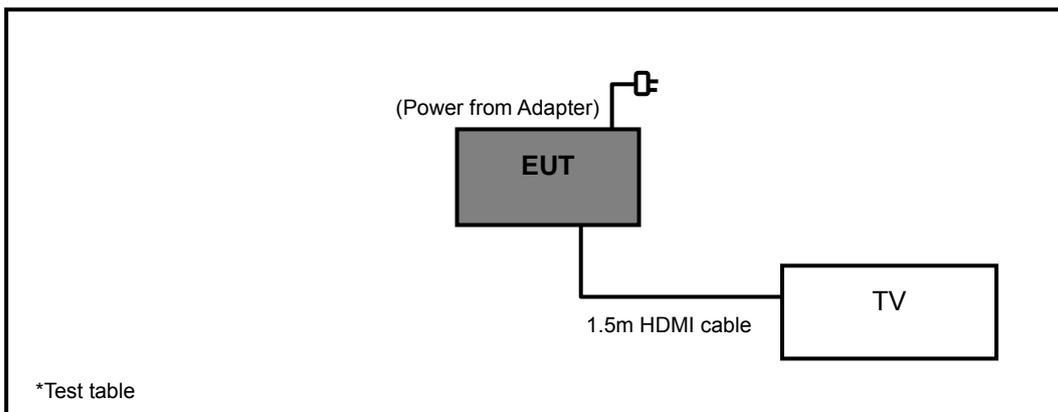
**NOTE:** All power cords of the above support units are non shielded (1.8m).

### 3.3.1 CONFIGURATION OF SYSTEM UNDER TEST

#### Test Mode A



#### Test Mode B, C, D





A D T

### **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)**

**558074 D01 DTS Meas Guidance v01**

**ANSI C63.10-2009**

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



## 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.



A D T

#### 4.1.2 TEST INSTRUMENTS

For tested date: Apr. 27 ~ Apr. 30, 2012

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
Test Receiver ROHDE & SCHWARZ	ESIB7	100212	Aug. 02, 2011	Aug. 01, 2012
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100041	Jul. 21, 2011	Jul. 20, 2012
BILOG Antenna SCHWARZBECK	VULB9168	9168-160	Apr. 06, 2012	Apr. 05, 2013
HORN Antenna SCHWARZBECK	9120D	209	Aug. 25, 2011	Aug. 24, 2012
HORN Antenna SCHWARZBECK	BBHA 9170	148	Jul. 20, 2011	Jul. 19, 2012
Preamplifier Agilent	8447D	2944A10633	Oct. 29, 2011	Oct. 28, 2012
Preamplifier Agilent	8449B	3008A01964	Oct. 29, 2011	Oct. 28, 2012
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	250723/4	Aug. 30, 2011	Aug. 29, 2012
RF signal cable HUBER+SUHNNER	SUCOFLEX 106	12738/6+309224/4	Aug. 30, 2011	Aug. 29, 2012
Software ADT.	ADT_Radiated_ V7.6.15.9.2	NA	NA	NA
Antenna Tower inn-co GmbH	MA 4000	013303	NA	NA
Antenna Tower Controller inn-co GmbH	CO2000	017303	NA	NA
Turn Table ADT.	TT100	TT93021703	NA	NA
Turn Table Controller ADT.	SC100	SC93021703	NA	NA
High Speed Peak Power Meter	ML2495A	0824011	Aug. 04, 2011	Aug. 03, 2012
Power Sensor	MA2411B	0738171	Aug. 04, 2011	Aug. 03, 2012

- NOTE:**
1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
  2. The test was performed in HwaYa Chamber 3.
  3. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
  4. The FCC Site Registration No. is 988962.
  5. The IC Site Registration No. is IC 7450F-3.



A D T

**For tested date: Sep. 10 ~ Oct. 03, 2012**

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
Test Receiver ROHDE & SCHWARZ	ESIB7	100212	Aug. 06, 2012	Aug. 05, 2013
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100039	Feb. 03, 2012	Feb. 02, 2013
BILOG Antenna SCHWARZBECK	VULB9168	9168-160	Apr. 06, 2012	Apr. 05, 2013
HORN Antenna SCHWARZBECK	9120D	209	Sep. 03, 2012	Sep. 02, 2013
HORN Antenna SCHWARZBECK	BBHA 9170	148	Jul. 11, 2012	Jul. 10, 2013
Loop Antenna	HFH2-Z2	100070	Jan. 31, 2012	Jan. 30, 2014
Preamplifier Agilent	8447D	2944A10633	Oct. 29, 2011	Oct. 28, 2012
Preamplifier Agilent	8449B	3008A01964	Oct. 29, 2011	Oct. 28, 2012
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	250723/4	Aug. 28, 2012	Aug. 27, 2013
RF signal cable HUBER+SUHNNER	SUCOFLEX 106	12738/6+309224/4	Aug. 28, 2012	Aug. 27, 2013
Software ADT.	ADT_Radiated_ V7.6.15.9.2	NA	NA	NA
Antenna Tower inn-co GmbH	MA 4000	013303	NA	NA
Antenna Tower Controller inn-co GmbH	CO2000	017303	NA	NA
Turn Table ADT.	TT100	TT93021703	NA	NA
Turn Table Controller ADT.	SC100	SC93021703	NA	NA
26GHz ~ 40GHz Amplifier	EM26400	815221	Oct. 29, 2011	Oct. 28, 2012

- 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 3.
  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 988962.
  6. The IC Site Registration No. is IC 7450F-3.



A D T

#### 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. 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 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.

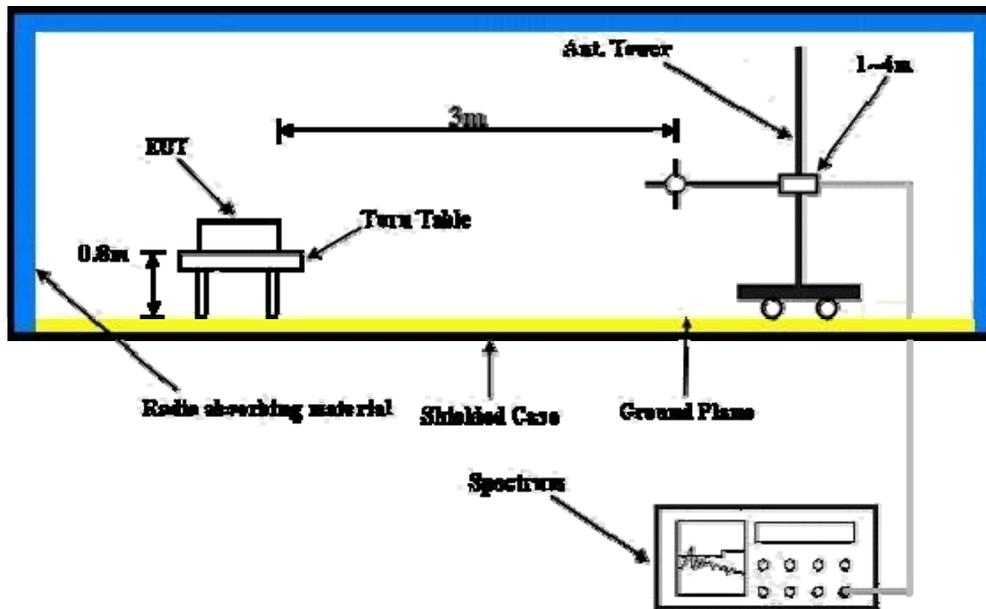
**NOTE:**

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 100kHz and video bandwidth is 300kHz for Peak detection at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 1kHz for Average detection (AV) at frequency above 1GHz.
4. All modes of operation were investigated and the worst-case emissions are reported.

#### 4.1.4 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

##### Test Mode A

- The EUT connected with a notebook and TV via a USB cable and HDMI cable and placed on the testing table.
- The notebook run a test program (provided by manufacturer) to enable EUT under transmission condition continuously at specific channel frequency.

##### Test Mode B

- The EUT connected with a TV via a HDMI cable and placed on the testing table.
- Set the EUT under transmission condition continuously at specific channel frequency.



A D T

4.1.7 TEST RESULTS  
ABOVE 1GHz DATA: 802.11b

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	55.4 PK	74.0	-18.6	1.34 H	299	24.10	31.30
2	2390.00	45.0 AV	54.0	-9.0	1.34 H	299	13.70	31.30
3	*2412.00	105.3 PK			1.34 H	299	73.90	31.40
4	*2412.00	101.5 AV			1.34 H	299	70.10	31.40
5	4824.00	46.5 PK	74.0	-27.5	1.15 H	210	9.30	37.20
6	4824.00	34.6 AV	54.0	-19.4	1.15 H	210	-2.60	37.20
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	54.4 PK	74.0	-19.6	1.69 V	69	23.10	31.30
2	2390.00	43.8 AV	54.0	-10.2	1.69 V	69	12.50	31.30
3	*2412.00	100.5 PK			1.69 V	69	69.10	31.40
4	*2412.00	96.7 AV			1.69 V	69	65.30	31.40
5	4824.00	46.7 PK	74.0	-27.3	1.62 V	124	9.50	37.20
6	4824.00	34.1 AV	54.0	-19.9	1.62 V	124	-3.10	37.20

REMARKS:

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



A D T

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	105.5 PK			1.32 H	298	74.00	31.50
2	*2437.00	101.6 AV			1.32 H	298	70.10	31.50
3	4874.00	46.2 PK	74.0	-27.8	1.00 H	196	8.90	37.30
4	4874.00	33.8 AV	54.0	-20.2	1.00 H	196	-3.50	37.30
5	7311.00	51.6 PK	74.0	-22.4	1.13 H	45	8.10	43.50
6	7311.00	38.7 AV	54.0	-15.3	1.13 H	45	-4.80	43.50
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	100.1 PK			1.79 V	48	68.60	31.50
2	*2437.00	96.3 AV			1.79 V	48	64.80	31.50
3	4874.00	46.5 PK	74.0	-27.5	1.29 V	117	9.20	37.30
4	4874.00	33.7 AV	54.0	-20.3	1.29 V	117	-3.60	37.30
5	7311.00	51.0 PK	74.0	-23.0	1.03 V	93	7.50	43.50
6	7311.00	38.5 AV	54.0	-15.5	1.03 V	93	-5.00	43.50

**REMARKS:**

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



A D T

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	106.5 PK			1.31 H	298	74.90	31.60
2	*2462.00	102.5 AV			1.31 H	298	70.90	31.60
3	2483.50	55.9 PK	74.0	-18.1	1.31 H	298	24.30	31.60
4	2483.50	46.1 AV	54.0	-7.9	1.31 H	298	14.50	31.60
5	4924.00	46.3 PK	74.0	-27.7	1.18 H	211	8.90	37.40
6	4924.00	34.3 AV	54.0	-19.7	1.18 H	211	-3.10	37.40
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	*2462.00	100.3 PK			1.59 V	69	68.70	31.60
2	*2462.00	96.6 AV			1.59 V	69	65.00	31.60
3	2483.50	54.6 PK	74.0	-19.4	1.58 V	69	23.00	31.60
4	2483.50	43.8 AV	54.0	-10.2	1.58 V	69	12.20	31.60
5	4924.00	46.5 PK	74.0	-27.5	1.63 V	125	9.10	37.40
6	4924.00	33.9 AV	54.0	-20.1	1.63 V	125	-3.50	37.40

**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.



A D T

802.11g

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	69.8 PK	74.0	-4.2	1.34 H	297	38.50	31.30
2	<b>2390.00</b>	<b>53.0 AV</b>	<b>54.0</b>	<b>-1.0</b>	<b>1.34 H</b>	<b>297</b>	<b>21.70</b>	<b>31.30</b>
3	*2412.00	106.4 PK			1.34 H	297	75.00	31.40
4	*2412.00	95.5 AV			1.34 H	297	64.10	31.40
5	4824.00	46.5 PK	74.0	-27.5	1.14 H	211	9.30	37.20
6	4824.00	33.8 AV	54.0	-20.2	1.14 H	211	-3.40	37.20
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	64.7 PK	74.0	-9.3	1.71 V	73	33.40	31.30
2	2390.00	50.1 AV	54.0	-3.9	1.71 V	73	18.80	31.30
3	*2412.00	102.5 PK			1.71 V	73	71.10	31.40
4	*2412.00	91.9 AV			1.71 V	73	60.50	31.40
5	4824.00	46.2 PK	74.0	-27.8	1.63 V	125	9.00	37.20
6	4824.00	33.5 AV	54.0	-20.5	1.63 V	125	-3.70	37.20

REMARKS:

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



A D T

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	107.4 PK			1.32 H	297	75.90	31.50
2	*2437.00	96.3 AV			1.32 H	297	64.80	31.50
3	4874.00	46.8 PK	74.0	-27.2	1.15 H	215	9.50	37.30
4	4874.00	34.2 AV	54.0	-19.8	1.15 H	215	-3.10	37.30
5	7311.00	51.3 PK	74.0	-22.7	1.15 H	51	7.80	43.50
6	7311.00	38.5 AV	54.0	-15.5	1.15 H	51	-5.00	43.50
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	102.6 PK			1.70 V	72	71.10	31.50
2	*2437.00	91.7 AV			1.70 V	72	60.20	31.50
3	4874.00	46.5 PK	74.0	-27.5	1.65 V	121	9.20	37.30
4	4874.00	33.7 AV	54.0	-20.3	1.65 V	121	-3.60	37.30
5	7311.00	50.8 PK	74.0	-23.2	1.05 V	95	7.30	43.50
6	7311.00	38.2 AV	54.0	-15.8	1.05 V	95	-5.30	43.50

**REMARKS:**

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



A D T

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

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	*2462.00	106.4 PK			1.30 H	300	74.80	31.60
2	*2462.00	95.8 AV			1.30 H	300	64.20	31.60
3	2483.50	70.1 PK	74.0	-3.9	1.30 H	300	38.50	31.60
4	<b>2483.50</b>	<b>53.0 AV</b>	<b>54.0</b>	<b>-1.0</b>	<b>1.30 H</b>	<b>300</b>	<b>21.40</b>	<b>31.60</b>
5	4924.00	46.7 PK	74.0	-27.3	1.15 H	213	9.30	37.40
6	4924.00	34.0 AV	54.0	-20.0	1.15 H	213	-3.40	37.40
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	*2462.00	102.4 PK			1.62 V	72	70.80	31.60
2	*2462.00	91.5 AV			1.62 V	72	59.90	31.60
3	2483.50	65.5 PK	74.0	-8.5	1.62 V	72	33.90	31.60
4	2483.50	49.6 AV	54.0	-4.4	1.62 V	72	18.00	31.60
5	4924.00	46.5 PK	74.0	-27.5	1.65 V	123	9.10	37.40
6	4924.00	33.8 AV	54.0	-20.2	1.65 V	123	-3.60	37.40

**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.



A D T

802.11n (20MHz)

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

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	2390.00	72.7 PK	74.0	-1.3	1.32 H	298	41.40	31.30
2	2390.00	53.0 AV	54.0	-1.0	1.32 H	298	21.70	31.30
3	*2412.00	104.6 PK			1.32 H	298	73.20	31.40
4	*2412.00	93.9 AV			1.32 H	298	62.50	31.40
5	4824.00	46.2 PK	74.0	-27.8	1.15 H	218	9.00	37.20
6	4824.00	33.5 AV	54.0	-20.5	1.15 H	218	-3.70	37.20
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	65.5 PK	74.0	-8.5	1.69 V	73	34.20	31.30
2	2390.00	49.5 AV	54.0	-4.5	1.69 V	73	18.20	31.30
3	*2412.00	100.4 PK			1.69 V	73	69.00	31.40
4	*2412.00	89.8 AV			1.69 V	73	58.40	31.40
5	4824.00	46.0 PK	74.0	-28.0	1.65 V	131	8.80	37.20
6	4824.00	33.4 AV	54.0	-20.6	1.65 V	131	-3.80	37.20

REMARKS:

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



A D T

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

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	*2437.00	108.0 PK			1.30 H	297	76.50	31.50
2	*2437.00	96.6 AV			1.30 H	297	65.10	31.50
3	4874.00	47.1 PK	74.0	-26.9	1.18 H	212	9.80	37.30
4	4874.00	34.5 AV	54.0	-19.5	1.18 H	212	-2.80	37.30
5	7311.00	51.5 PK	74.0	-22.5	1.17 H	55	8.00	43.50
6	7311.00	38.8 AV	54.0	-15.2	1.17 H	55	-4.70	43.50
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	103.1 PK			1.69 V	72	71.60	31.50
2	*2437.00	91.9 AV			1.69 V	72	60.40	31.50
3	4874.00	46.7 PK	74.0	-27.3	1.61 V	125	9.40	37.30
4	4874.00	33.9 AV	54.0	-20.1	1.61 V	125	-3.40	37.30
5	7311.00	50.9 PK	74.0	-23.1	1.11 V	91	7.40	43.50
6	7311.00	38.5 AV	54.0	-15.5	1.11 V	91	-5.00	43.50

**REMARKS:**

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



A D T

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

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	*2462.00	104.6 PK			1.29 H	301	73.00	31.60
2	*2462.00	93.1 AV			1.29 H	301	61.50	31.60
3	2483.50	68.9 PK	74.0	-5.1	1.29 H	301	37.30	31.60
4	2483.50	52.8 AV	54.0	-1.2	1.29 H	301	21.20	31.60
5	4924.00	46.0 PK	74.0	-28.0	1.18 H	221	8.60	37.40
6	4924.00	33.4 AV	54.0	-20.6	1.18 H	221	-4.00	37.40
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	*2462.00	100.5 PK			1.72 V	314	68.90	31.60
2	*2462.00	89.6 AV			1.72 V	314	58.00	31.60
3	2483.50	65.7 PK	74.0	-8.3	1.72 V	314	34.10	31.60
4	2483.50	50.7 AV	54.0	-3.3	1.72 V	314	19.10	31.60
5	4924.00	45.8 PK	74.0	-28.2	1.66 V	132	8.40	37.40
6	4924.00	33.2 AV	54.0	-20.8	1.66 V	132	-4.20	37.40

**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.



A D T

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

**802.11n (20MHz)**

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	Below 1000MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Cedric Wu
TEST MODE	A		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	66.77	34.1 QP	40.0	-5.9	1.99 H	171	21.40	12.70
2	161.85	37.9 QP	43.5	-5.6	1.00 H	134	23.90	14.00
3	326.78	36.6 QP	46.0	-9.4	1.00 H	273	21.00	15.60
4	549.93	35.5 QP	46.0	-10.5	1.50 H	234	14.50	21.00
5	664.41	41.5 QP	46.0	-4.5	1.25 H	58	18.80	22.70
6	825.46	34.5 QP	46.0	-11.5	1.50 H	246	8.60	25.90

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	64.61	28.6 QP	40.0	-11.4	2.00 V	225	15.70	12.90
2	324.84	36.1 QP	46.0	-9.9	1.25 V	251	20.50	15.60
3	425.74	35.8 QP	46.0	-10.2	1.75 V	10	17.60	18.20
4	664.41	35.4 QP	46.0	-10.6	2.00 V	64	12.70	22.70
5	852.63	35.4 QP	46.0	-10.6	1.25 V	334	9.20	26.20
6	932.19	41.4 QP	46.0	-4.6	1.50 V	170	14.30	27.10

**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.



A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	Below 1000MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	28deg. C, 75%RH	TESTED BY	Cedric Wu
TEST MODE	B		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	222.00	36.1 QP	46.0	-9.9	1.49 H	287	24.40	11.70
2	328.72	39.8 QP	46.0	-6.2	1.00 H	149	24.40	15.40
3	381.11	36.2 QP	46.0	-9.8	1.00 H	164	19.50	16.70
4	474.25	32.6 QP	46.0	-13.4	1.74 H	180	13.70	18.90
5	825.46	31.7 QP	46.0	-14.3	1.99 H	321	6.80	24.90
6	932.19	35.4 QP	46.0	-10.6	1.74 H	269	9.30	26.10
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	262.75	33.6 QP	46.0	-12.4	1.50 V	181	20.20	13.40
2	326.78	38.7 QP	46.0	-7.3	1.25 V	155	23.30	15.40
3	396.64	33.5 QP	46.0	-12.5	1.50 V	17	16.40	17.10
4	491.72	32.9 QP	46.0	-13.1	1.00 V	338	13.60	19.30
5	594.56	28.4 QP	46.0	-17.6	1.00 V	48	7.00	21.40
6	825.46	33.7 QP	46.0	-12.3	1.25 V	2	8.80	24.90

**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.



A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	Below 1000MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	28deg. C, 75%RH	TESTED BY	Cedric Wu
TEST MODE	C		

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	218.12	36.1 QP	46.0	-9.9	1.00 H	267	24.50	11.60
2	326.78	40.9 QP	46.0	-5.1	1.00 H	157	25.50	15.40
3	373.35	36.3 QP	46.0	-9.7	1.00 H	164	19.80	16.50
4	472.31	32.5 QP	46.0	-13.5	1.74 H	187	13.70	18.80
5	621.72	30.5 QP	46.0	-15.5	1.49 H	242	8.80	21.70
6	932.19	36.9 QP	46.0	-9.1	1.49 H	242	10.80	26.10
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	262.75	33.3 QP	46.0	-12.7	1.75 V	168	19.90	13.40
2	324.84	38.8 QP	46.0	-7.2	1.00 V	154	23.40	15.40
3	383.05	35.2 QP	46.0	-10.8	1.50 V	34	18.50	16.70
4	472.31	31.9 QP	46.0	-14.1	1.00 V	0	13.10	18.80
5	825.46	35.3 QP	46.0	-10.7	1.25 V	4	10.40	24.90
6	932.19	39.3 QP	46.0	-6.7	1.50 V	170	13.20	26.10

**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.



A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	Below 1000MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	28deg. C, 75%RH	TESTED BY	Cedric Wu
TEST MODE	D		

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	140.50	29.8 QP	43.5	-13.7	1.25 H	139	16.30	13.50
2	237.52	36.6 QP	46.0	-9.4	1.25 H	234	24.20	12.40
3	326.78	39.3 QP	46.0	-6.7	1.00 H	197	23.90	15.40
4	447.09	33.8 QP	46.0	-12.2	1.50 H	158	15.60	18.20
5	594.56	33.4 QP	46.0	-12.6	1.25 H	166	12.00	21.40
6	850.69	30.3 QP	46.0	-15.7	1.50 H	16	5.10	25.20

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	68.71	27.8 QP	40.0	-12.2	1.00 V	256	15.40	12.40
2	235.58	31.9 QP	46.0	-14.1	1.49 V	196	19.60	12.30
3	348.13	36.1 QP	46.0	-9.9	1.49 V	77	20.20	15.90
4	468.43	33.0 QP	46.0	-13.0	1.00 V	24	14.30	18.70
5	639.19	30.1 QP	46.0	-15.9	1.49 V	9	8.30	21.80
6	932.19	37.6 QP	46.0	-8.4	1.49 V	178	11.50	26.10

**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.



A D T

## 4.2 CONDUCTED EMISSION MEASUREMENT

### 4.2.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

FREQUENCY OF EMISSION (MHz)	CONDUCTED LIMIT (dB $\mu$ V)	
	Quasi-peak	Average
0.15 ~ 0.5	66 to 56	56 to 46
0.5 ~ 5	56	46
5 ~ 30	60	50

- NOTE:** 1. The lower limit shall apply at the transition frequencies.  
2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.  
3. All emanations from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

### 4.2.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	DATE OF CALIBRATION	DUE DATE OF CALIBRATION
Test Receiver ROHDE & SCHWARZ	ESCS30	100291	Nov. 23, 2011	Nov. 22, 2012
RF signal cable Woken	5D-FB	Cable-HYC01-01	Dec. 29, 2011	Dec. 28, 2012
LISN ROHDE & SCHWARZ (Peripheral)	ESH3-Z5	100312	Jul. 02, 2012	Jul. 01, 2013
LISN ROHDE & SCHWARZ (EUT)	ESH3-Z5	835239/001	Feb. 07, 2012	Feb. 06, 2013
Software ADT	BV ADT_Cond_ V7.3.7.3	NA	NA	NA

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

#### 4.2.3 TEST PROCEDURES

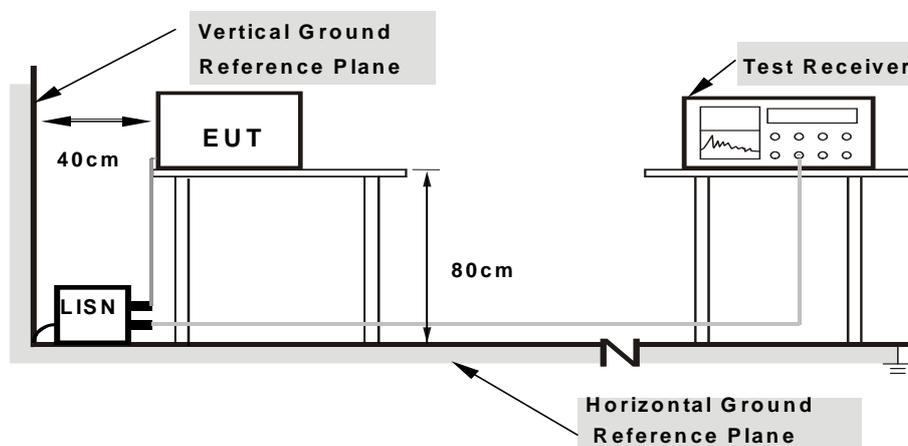
- a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling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



A D T

## 4.2.7 TEST RESULTS

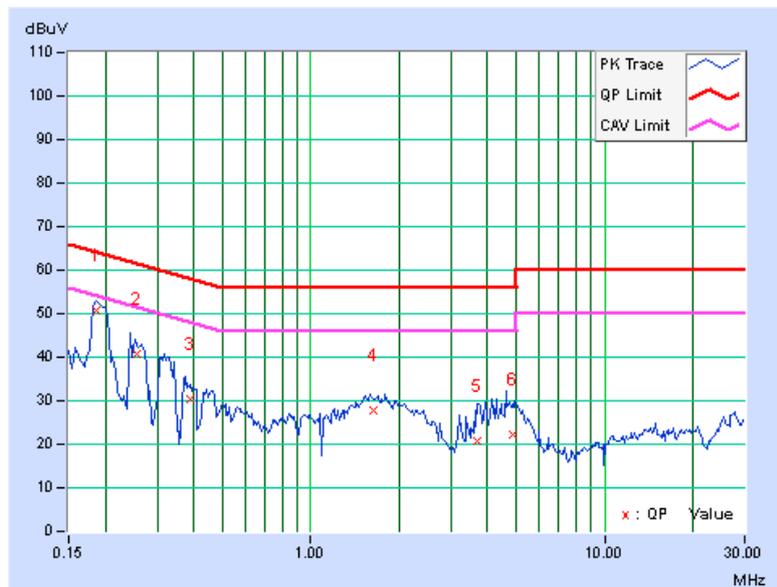
### CONDUCTED WORST-CASE DATA : 802.11n(20MHz)

PHASE	Line 1	6dB BANDWIDTH	9kHz
TEST MODE	A		

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	0.18516	0.22	50.58	34.50	50.80	34.72	64.25	54.25	-13.46	-19.54
2	0.25547	0.23	40.45	27.59	40.68	27.82	61.58	51.58	-20.90	-23.76
3	0.38828	0.24	30.24	15.67	30.48	15.91	58.10	48.10	-27.62	-32.19
4	1.63672	0.33	27.57	13.14	27.90	13.47	56.00	46.00	-28.10	-32.53
5	3.70313	0.43	20.14	6.43	20.57	6.86	56.00	46.00	-35.43	-39.14
6	4.87891	0.45	21.93	6.98	22.38	7.43	56.00	46.00	-33.62	-38.57

### 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.

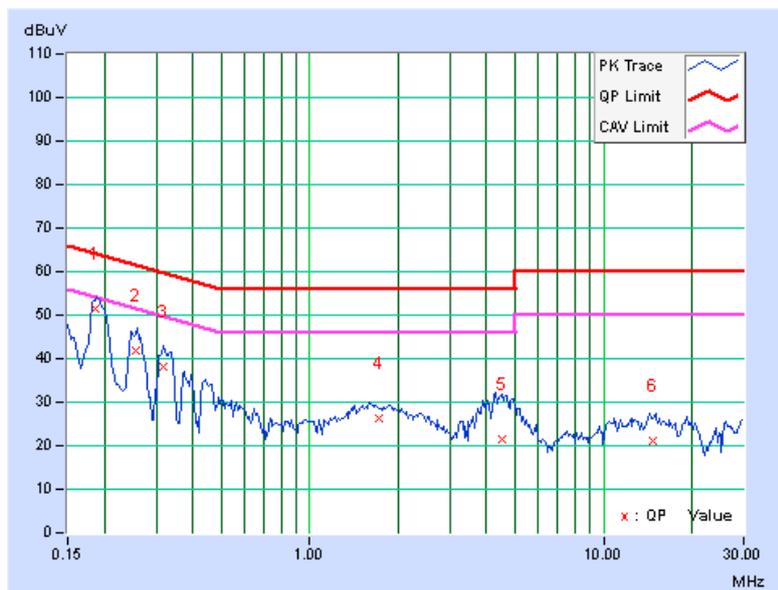


PHASE	Line 2	6dB BANDWIDTH	9kHz
TEST MODE	A		

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	0.20	51.32	34.88	51.52	35.08	64.25
2	0.25547	0.21	41.52	28.17	41.73	28.38	61.58	51.58	-19.85	-23.20
3	0.31797	0.21	37.91	24.70	38.12	24.91	59.76	49.76	-21.64	-24.85
4	1.71094	0.30	25.97	11.96	26.27	12.26	56.00	46.00	-29.73	-33.74
5	4.50000	0.45	21.20	5.14	21.65	5.59	56.00	46.00	-34.35	-40.41
6	14.67578	0.74	20.31	13.15	21.05	13.89	60.00	50.00	-38.95	-36.11

**REMARKS:**

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





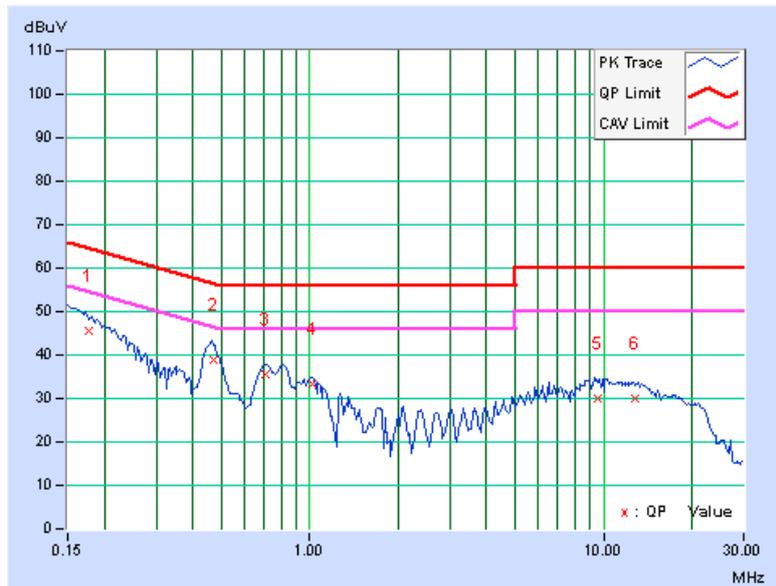
A D T

PHASE	Line 1	6dB BANDWIDTH	9kHz
TEST MODE	B		

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	0.16172	0.21	47.38	35.40	47.59	35.61	65.38	55.38	-17.79	-19.77
2	0.45859	0.25	39.14	32.30	39.39	32.55	56.72	46.72	-17.33	-14.17
3	0.75938	0.28	33.22	25.93	33.50	26.21	56.00	46.00	-22.50	-19.79
4	5.96094	0.47	32.24	23.60	32.71	24.07	60.00	50.00	-27.29	-25.93
5	12.43359	0.59	36.18	27.16	36.77	27.75	60.00	50.00	-23.23	-22.25
6	16.92969	0.71	33.88	23.80	34.59	24.51	60.00	50.00	-25.41	-25.49

**REMARKS:**

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





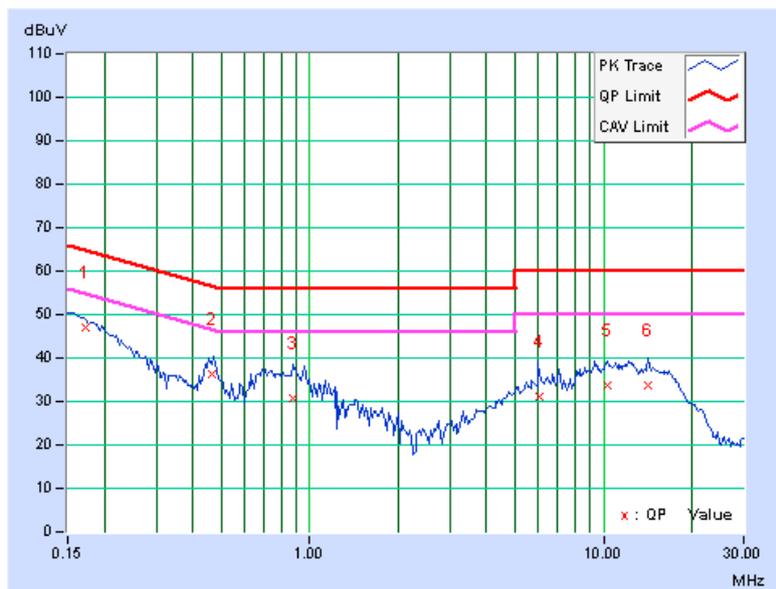
A D T

PHASE	Line 2	6dB BANDWIDTH	9kHz
TEST MODE	B		

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	0.17344	0.20	46.94	34.34	47.14	34.54	64.79
2	0.46250	0.23	36.15	26.81	36.38	27.04	56.65	46.65	-20.27	-19.61
3	0.87266	0.26	30.59	22.77	30.85	23.03	56.00	46.00	-25.15	-22.97
4	6.08203	0.49	30.45	20.99	30.94	21.48	60.00	50.00	-29.06	-28.52
5	10.34766	0.62	33.02	23.45	33.64	24.07	60.00	50.00	-26.36	-25.93
6	14.11719	0.72	32.93	23.48	33.65	24.20	60.00	50.00	-26.35	-25.80

**REMARKS:**

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





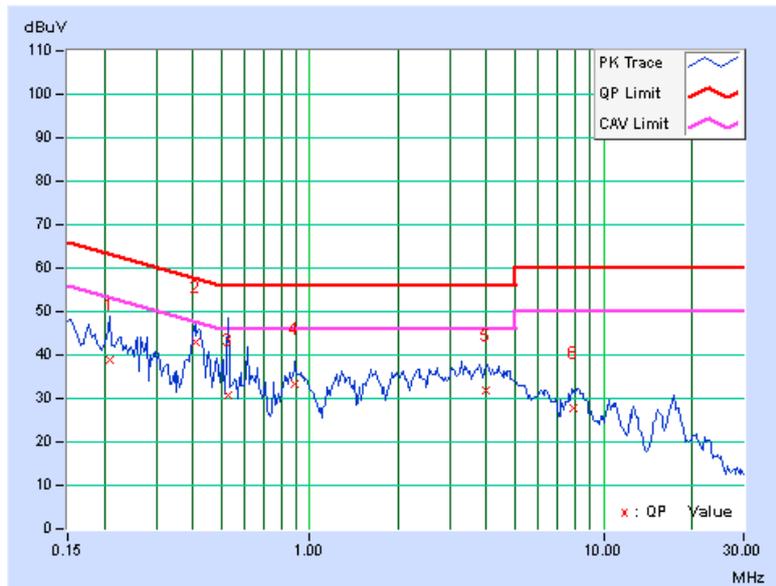
A D T

PHASE	Line 1	6dB BANDWIDTH	9kHz
TEST MODE	C		

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	0.22	38.57	27.24	38.79	27.46	63.26
2	0.40781	0.24	42.86	37.73	43.10	37.97	57.69	47.69	-14.59	-9.72
3	0.52500	0.25	30.53	25.06	30.78	25.31	56.00	46.00	-25.22	-20.69
4	0.88438	0.30	32.98	29.85	33.28	30.15	56.00	46.00	-22.72	-15.85
5	3.96094	0.44	31.56	25.48	32.00	25.92	56.00	46.00	-24.00	-20.08
6	7.88672	0.49	27.23	18.46	27.72	18.95	60.00	50.00	-32.28	-31.05

**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.





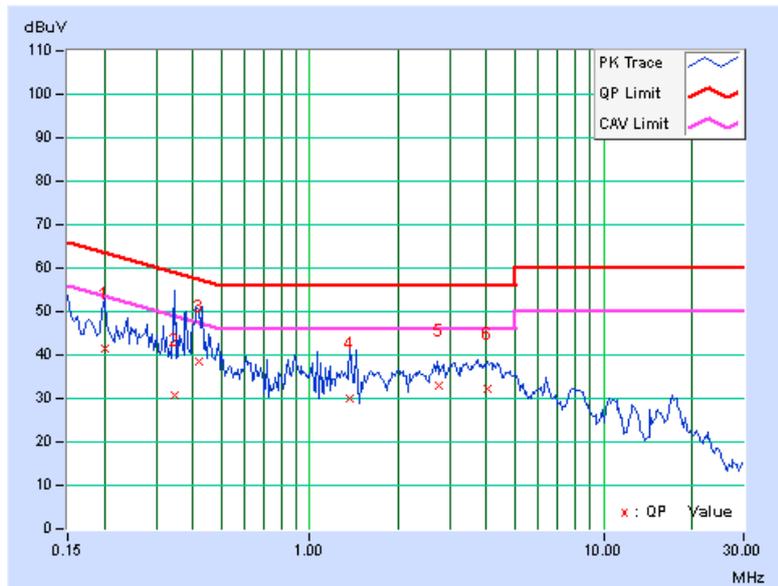
A D T

PHASE	Line 2	6dB BANDWIDTH	9kHz
TEST MODE	C		

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	0.20078	0.20	41.36	30.55	41.56	30.75	63.58
2	0.34531	0.21	30.56	22.28	30.77	22.49	59.07	49.07	-28.30	-26.58
3	0.41953	0.22	38.30	31.04	38.52	31.26	57.46	47.46	-18.94	-16.20
4	1.37500	0.29	29.86	22.84	30.15	23.13	56.00	46.00	-25.85	-22.87
5	2.73828	0.35	32.65	27.96	33.00	28.31	56.00	46.00	-23.00	-17.69
6	4.01953	0.43	31.85	26.18	32.28	26.61	56.00	46.00	-23.72	-19.39

**REMARKS:**

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





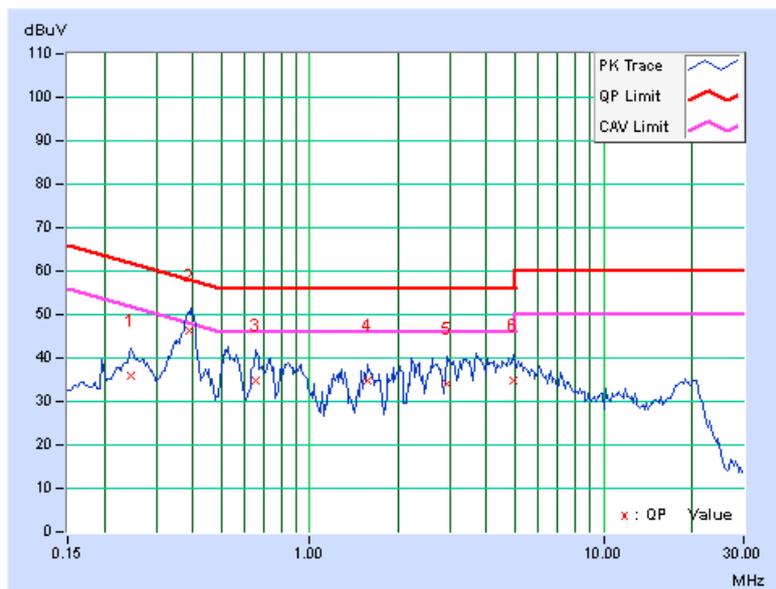
A D T

PHASE	Line 1	6dB BANDWIDTH	9kHz
TEST MODE	D		

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	0.24766	0.22	35.87	29.00	36.09	29.22	61.84
2	<b>0.38828</b>	<b>0.24</b>	<b>46.16</b>	<b>40.30</b>	<b>46.40</b>	<b>40.54</b>	<b>58.10</b>	<b>48.10</b>	<b>-11.70</b>	<b>-7.56</b>
3	0.65781	0.27	34.56	28.37	34.83	28.64	56.00	46.00	-21.17	-17.36
4	1.58203	0.33	34.32	28.44	34.65	28.77	56.00	46.00	-21.35	-17.23
5	2.93750	0.39	33.54	24.91	33.93	25.30	56.00	46.00	-22.07	-20.70
6	4.92578	0.45	34.53	25.85	34.98	26.30	56.00	46.00	-21.02	-19.70

**REMARKS:**

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





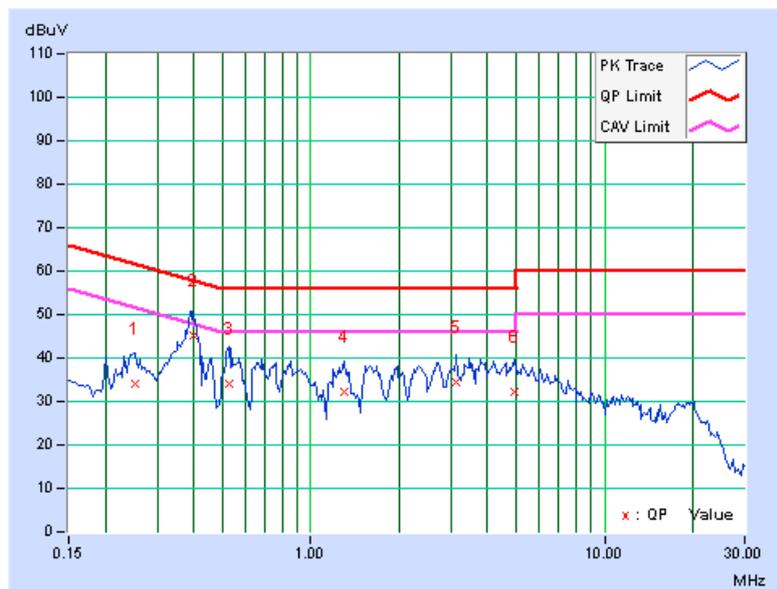
A D T

PHASE	Line 2	6dB BANDWIDTH	9kHz
TEST MODE	D		

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	0.25156	0.21	33.78	26.58	33.99	26.79	61.71	51.71	-27.72	-24.92
2	0.40000	0.22	44.89	39.37	45.11	39.59	57.85	47.85	-12.74	-8.26
3	0.52500	0.23	33.92	27.43	34.15	27.66	56.00	46.00	-21.85	-18.34
4	1.29297	0.28	31.91	25.21	32.19	25.49	56.00	46.00	-23.81	-20.51
5	3.10938	0.38	33.89	26.51	34.27	26.89	56.00	46.00	-21.73	-19.11
6	4.94141	0.46	31.74	23.24	32.20	23.70	56.00	46.00	-23.80	-22.30

**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.

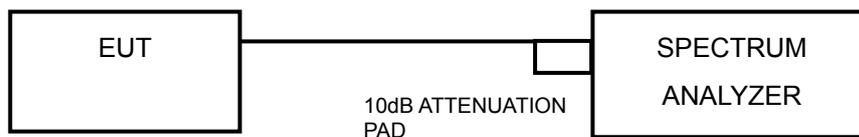


### 4.3 6dB BANDWIDTH MEASUREMENT

#### 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	10.30	0.5	PASS
6	2437	10.31	0.5	PASS
11	2462	10.30	0.5	PASS

#### 802.11g

CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2412	16.46	0.5	PASS
6	2437	16.46	0.5	PASS
11	2462	16.45	0.5	PASS

#### 802.11n (20MHz)

CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2412	17.73	0.5	PASS
6	2437	17.72	0.5	PASS
11	2462	17.76	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



### 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 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.



A D T

#### 4.4.7 TEST RESULTS

##### 802.11b

CHANNEL	FREQUENCY (MHz)	PEAK POWER (mW)	PEAK POWER (dBm)	LIMIT (dBm)	PASS/FAIL
1	2412	51.761	17.14	30	PASS
6	2437	51.523	17.12	30	PASS
11	2462	50.816	17.06	30	PASS

##### 802.11g

CHANNEL	FREQUENCY (MHz)	PEAK POWER (mW)	PEAK POWER (dBm)	LIMIT (dBm)	PASS/FAIL
1	2412	166.341	22.21	30	PASS
6	2437	151.705	21.81	30	PASS
11	2462	136.458	21.35	30	PASS

##### 802.11n (20MHz)

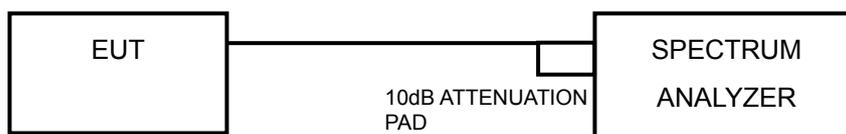
CHANNEL	FREQUENCY (MHz)	PEAK POWER (mW)	PEAK POWER (dBm)	LIMIT (dBm)	PASS/FAIL
1	2412	135.519	21.32	30	PASS
6	2437	184.927	22.67	30	PASS
11	2462	132.130	21.21	30	PASS

## 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 = 100 kHz, VBW =300 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.
- d. Scale the observed power level to an equivalent value in 3 kHz by adjusting (reducing) the measured power by a bandwidth correction factor (BWCF) where  $BWCF = 10\log(3 \text{ kHz}/100\text{kHz})$

### 4.5.5 DEVIATION FROM TEST STANDARD

No deviation.

### 4.5.6 EUT OPERATING CONDITION

Same as Item 4.3.6



A D T

## 4.5.7 TEST RESULTS

### 802.11b

Channel	FREQ. (MHz)	PSD (dBm/100kHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
1	2412	3.21	-12.02	8	PASS
6	2437	3.18	-12.05	8	PASS
11	2462	2.99	-12.24	8	PASS

### 802.11g

Channel	FREQ. (MHz)	PSD (dBm/100kHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
1	2412	3.86	-11.37	8	PASS
6	2437	3.46	-11.77	8	PASS
11	2462	2.97	-12.26	8	PASS

### 802.11n (20MHz)

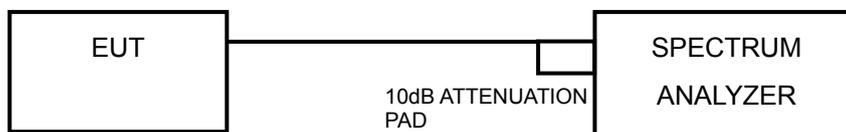
Channel	FREQ. (MHz)	PSD (dBm/100kHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
1	2412	3.15	-12.08	8	PASS
6	2437	4.27	-10.96	8	PASS
11	2462	2.80	-12.43	8	PASS

## 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.



A D T

## 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

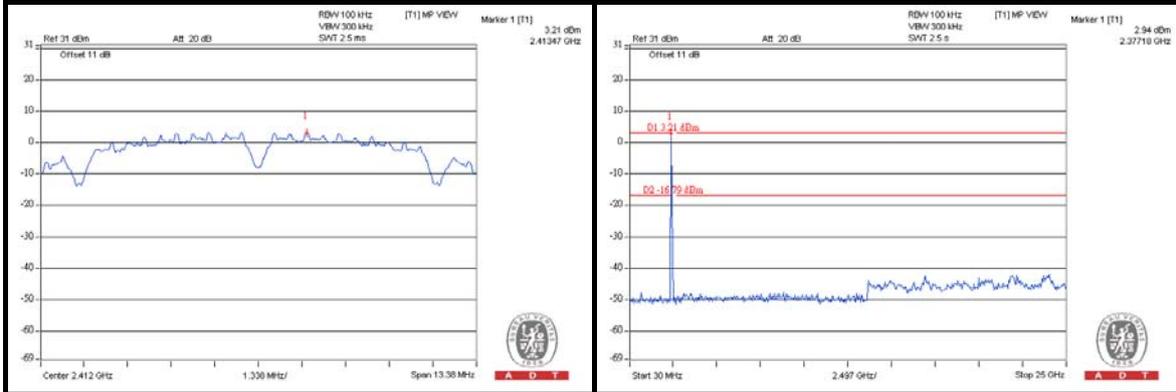
### 4.6.7 TEST RESULTS

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.

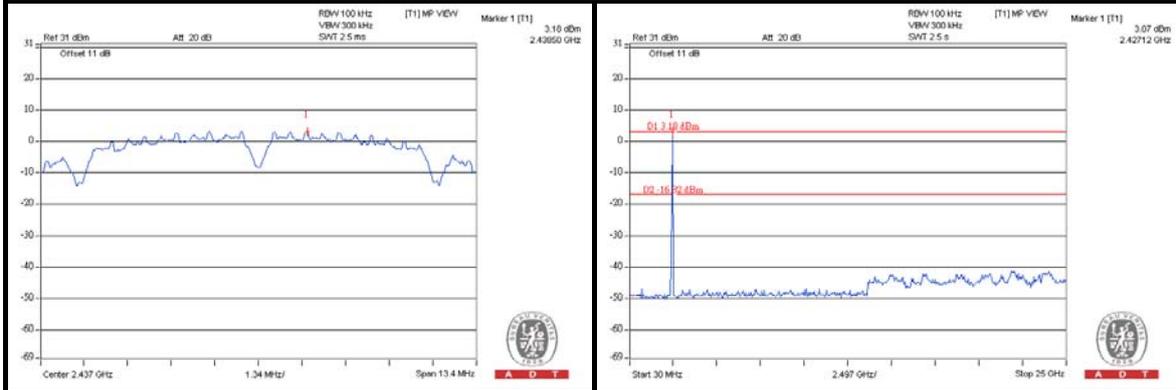
## 4.6.8 TEST RESULTS

### 802.11b

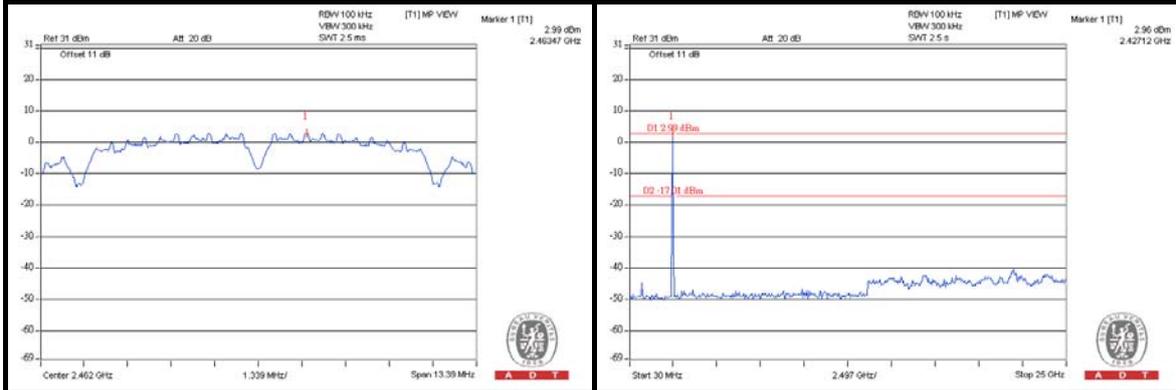
#### CH 1

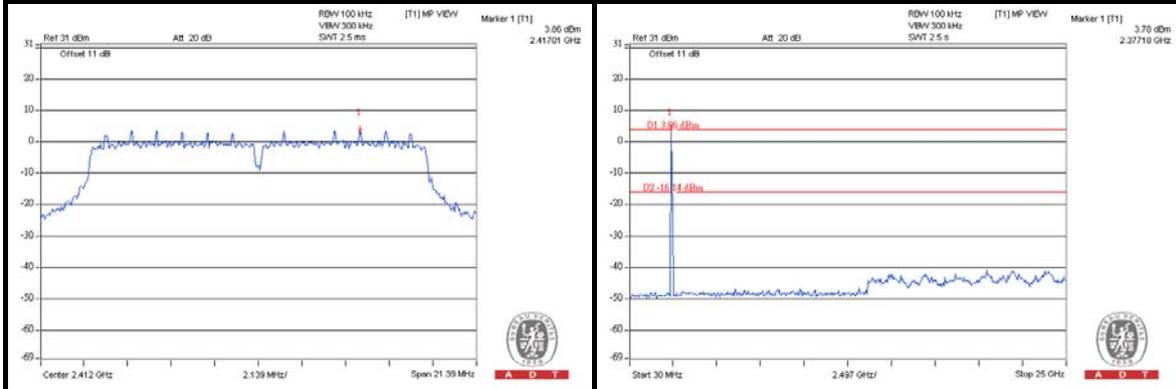
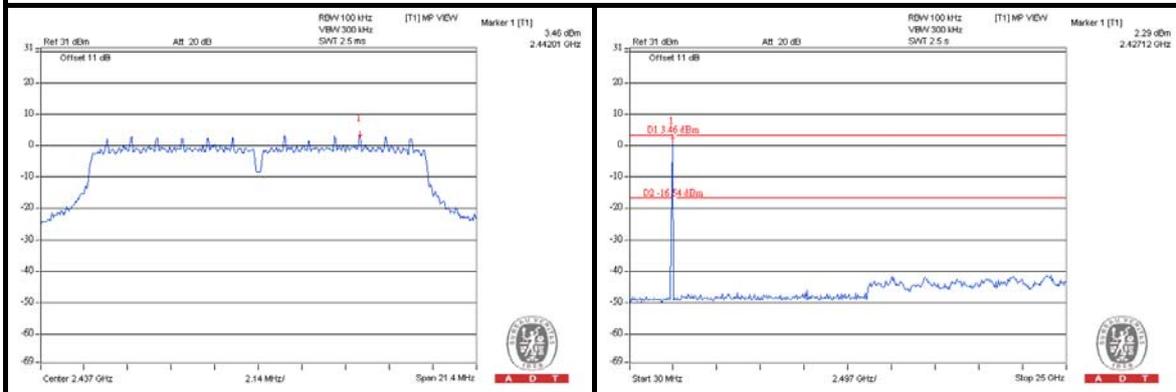
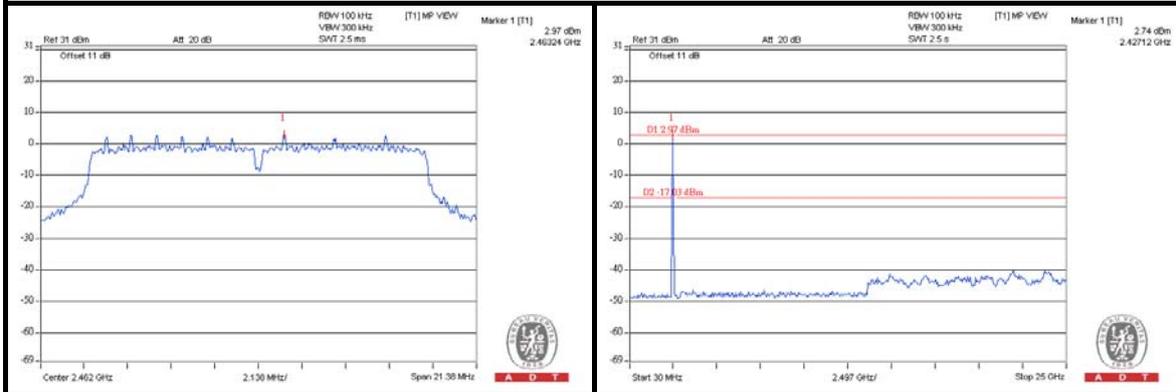


#### CH 6



#### CH 11



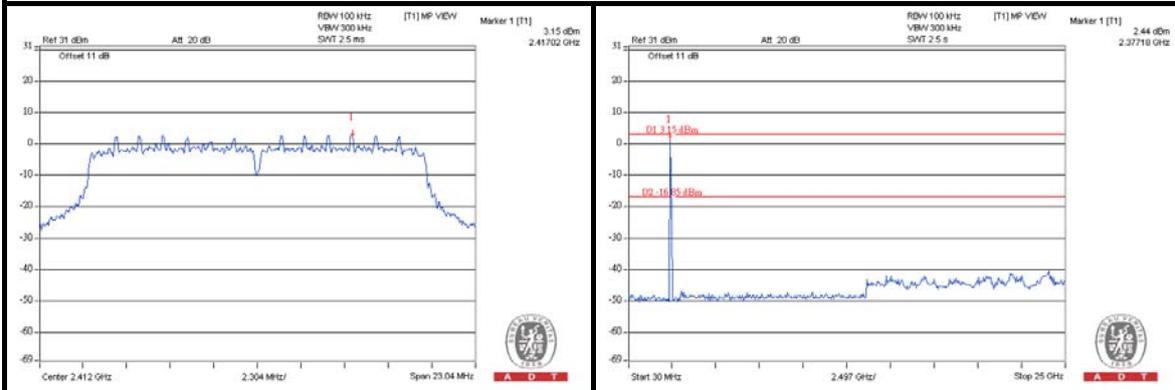
**802.11g****CH 1****CH 6****CH 11**



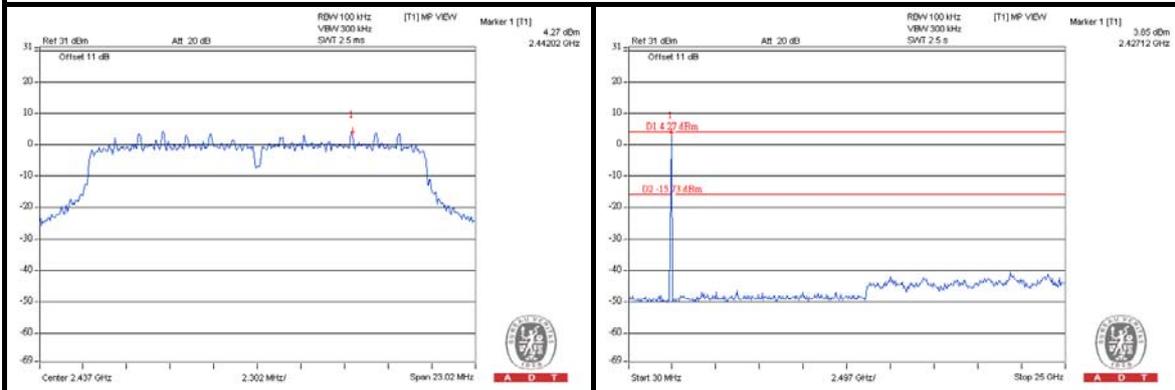
A D T

### 802.11n (20MHz)

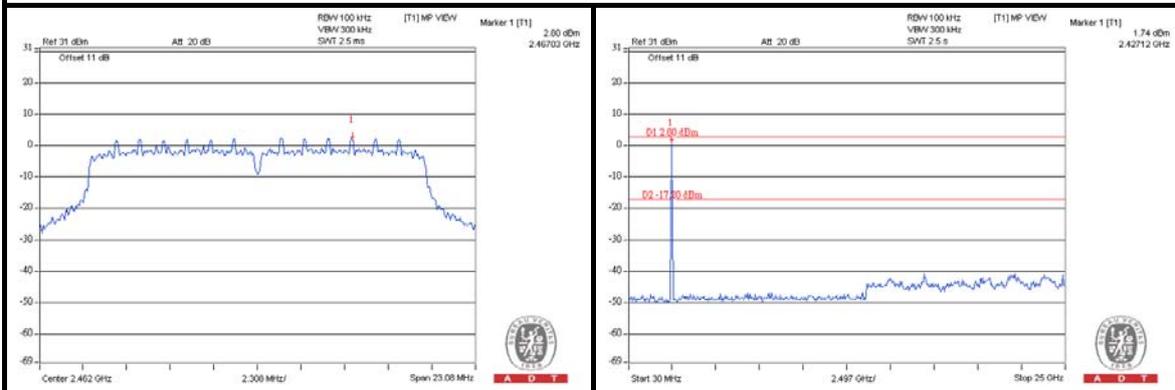
#### CH 1



#### CH 6



#### CH 11





## 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.



A D T

#### 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 item 4.1.6.



A D T

5.1.7 TEST RESULTS  
 ABOVE 1GHz DATA: 802.11a

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	4758.00	56.5 PK	74.0	-17.5	1.00 H	41	19.40	37.10
2	4758.00	45.1 AV	54.0	-8.9	1.00 H	41	8.00	37.10
3	#5725.00	75.2 PK	86.9	-11.7	1.80 H	52	36.40	38.80
4	#5725.00	56.4 AV	76.3	-19.9	1.80 H	52	17.60	38.80
5	*5745.00	106.9 PK			1.80 H	52	68.10	38.80
6	*5745.00	96.3 AV			1.80 H	52	57.50	38.80
7	11490.00	65.8 PK	74.0	-8.2	1.58 H	58	15.70	50.10
8	11490.00	51.5 AV	54.0	-2.5	1.58 H	58	1.40	50.10

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	4758.00	57.6 PK	74.0	-16.4	1.00 V	340	20.50	37.10
2	4758.00	46.4 AV	54.0	-7.6	1.00 V	340	9.30	37.10
3	#5725.00	75.1 PK	89.4	-14.3	1.23 V	312	36.30	38.80
4	#5725.00	57.7 AV	78.7	-21.0	1.23 V	312	18.90	38.80
5	*5745.00	109.4 PK			1.23 V	312	70.60	38.80
6	*5745.00	98.7 AV			1.23 V	312	59.90	38.80
7	11490.00	66.8 PK	74.0	-7.2	1.72 V	334	16.70	50.10
8	11490.00	52.7 AV	54.0	-1.3	1.72 V	334	2.60	50.10

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.
7. The limit value is defined as per 15.247.



A D T

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	4758.00	56.7 PK	74.0	-17.3	1.00 H	35	19.60	37.10
2	4758.00	45.3 AV	54.0	-8.7	1.00 H	35	8.20	37.10
3	*5785.00	106.5 PK			1.80 H	54	67.60	38.90
4	*5785.00	95.7 AV			1.80 H	54	56.80	38.90
5	11570.00	66.2 PK	74.0	-7.8	1.56 H	55	16.20	50.00
6	11570.00	51.9 AV	54.0	-2.1	1.56 H	55	1.90	50.00
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	4758.00	58.0 PK	74.0	-16.0	1.00 V	340	20.90	37.10
2	4758.00	46.6 AV	54.0	-7.4	1.00 V	340	9.50	37.10
3	*5785.00	108.3 PK			1.22 V	312	69.40	38.90
4	*5785.00	97.7 AV			1.22 V	312	58.80	38.90
5	11570.00	67.4 PK	74.0	-6.6	1.69 V	329	17.40	50.00
6	11570.00	53.0 AV	54.0	-1.0	1.69 V	329	3.00	50.00

**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 limit value is defined as per 15.247.



A D T

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	4758.00	57.0 PK	74.0	-17.0	1.00 H	41	19.90	37.10
2	4758.00	45.5 AV	54.0	-8.5	1.00 H	41	8.40	37.10
3	*5825.00	106.4 PK			1.79 H	55	67.50	38.90
4	*5825.00	95.6 AV			1.79 H	55	56.70	38.90
5	#5850.00	64.8 PK	86.4	-21.6	1.79 H	55	25.80	39.00
6	#5850.00	46.8 AV	75.6	-28.8	1.79 H	55	7.80	39.00
7	11650.00	65.7 PK	74.0	-8.3	1.55 H	61	15.70	50.00
8	11650.00	51.3 AV	54.0	-2.7	1.55 H	61	1.30	50.00
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	4758.00	58.0 PK	74.0	-16.0	1.00 V	345	20.90	37.10
2	4758.00	46.7 AV	54.0	-7.3	1.00 V	345	9.60	37.10
3	*5825.00	109.3 PK			1.21 V	312	70.40	38.90
4	*5825.00	98.0 AV			1.21 V	312	59.10	38.90
5	#5850.00	64.5 PK	89.3	-24.8	1.21 V	312	25.50	39.00
6	#5850.00	47.3 AV	78.0	-30.7	1.21 V	312	8.30	39.00
7	11650.00	67.2 PK	74.0	-6.8	1.73 V	319	17.20	50.00
8	11650.00	52.5 AV	54.0	-1.5	1.73 V	319	2.50	50.00

**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.
7. The limit value is defined as per 15.247.



A D T

802.11n (20MHz)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	3857.00	54.3 PK	74.0	-19.7	1.61 H	351	19.50	34.80
2	3857.00	42.6 AV	54.0	-11.4	1.61 H	351	7.80	34.80
3	#5725.00	76.4 PK	87.9	-11.5	1.56 H	56	37.60	38.80
4	#5725.00	56.4 AV	77.1	-20.7	1.56 H	56	17.60	38.80
5	*5745.00	107.9 PK			1.56 H	56	69.10	38.80
6	*5745.00	97.1 AV			1.56 H	56	58.30	38.80
7	11490.00	67.0 PK	74.0	-7.0	1.45 H	55	16.90	50.10
8	11490.00	52.1 AV	54.0	-1.9	1.45 H	55	2.00	50.10

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	3857.00	56.3 PK	74.0	-17.7	1.21 V	311	21.50	34.80
2	3857.00	47.9 AV	54.0	-6.1	1.21 V	311	13.10	34.80
3	#5725.00	79.1 PK	88.9	-9.8	1.22 V	308	40.30	38.80
4	#5725.00	57.3 AV	77.9	-20.6	1.22 V	308	18.50	38.80
5	*5745.00	108.9 PK			1.22 V	308	70.10	38.80
6	*5745.00	97.9 AV			1.22 V	308	59.10	38.80
7	11490.00	67.0 PK	74.0	-7.0	1.70 V	323	16.90	50.10
8	11490.00	52.5 AV	54.0	-1.5	1.70 V	323	2.40	50.10

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.
7. The limit value is defined as per 15.247.



A D T

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	3857.00	53.5 PK	74.0	-20.5	1.65 H	351	18.70	34.80
2	3857.00	41.7 AV	54.0	-12.3	1.65 H	351	6.90	34.80
3	*5785.00	107.2 PK			1.80 H	51	68.30	38.90
4	*5785.00	96.2 AV			1.80 H	51	57.30	38.90
5	11570.00	67.0 PK	74.0	-7.0	1.57 H	56	17.00	50.00
6	11570.00	52.4 AV	54.0	-1.6	1.57 H	56	2.40	50.00
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	3857.00	56.1 PK	74.0	-17.9	1.18 V	303	21.30	34.80
2	3857.00	47.0 AV	54.0	-7.0	1.18 V	303	12.20	34.80
3	*5785.00	108.7 PK			1.22 V	309	69.80	38.90
4	*5785.00	97.4 AV			1.22 V	309	58.50	38.90
5	11570.00	67.6 PK	74.0	-6.4	1.69 V	327	17.60	50.00
6	11570.00	52.7 AV	54.0	-1.3	1.69 V	327	2.70	50.00

**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 limit value is defined as per 15.247.



A D T

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	3857.00	54.0 PK	74.0	-20.0	1.65 H	350	19.20	34.80
2	3857.00	42.3 AV	54.0	-11.7	1.65 H	350	7.50	34.80
3	*5825.00	107.0 PK			1.80 H	63	68.10	38.90
4	*5825.00	95.9 AV			1.80 H	63	57.00	38.90
5	#5850.00	63.0 PK	87.0	-24.0	1.80 H	63	24.00	39.00
6	#5850.00	45.9 AV	75.9	-30.0	1.80 H	63	6.90	39.00
7	11650.00	67.4 PK	74.0	-6.6	1.41 H	53	17.40	50.00
8	11650.00	52.4 AV	54.0	-1.6	1.41 H	53	2.40	50.00
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	3857.00	55.9 PK	74.0	-18.1	1.19 V	301	21.10	34.80
2	3857.00	47.5 AV	54.0	-6.5	1.19 V	301	12.70	34.80
3	*5825.00	108.2 PK			1.20 V	307	69.30	38.90
4	*5825.00	97.5 AV			1.20 V	307	58.60	38.90
5	#5850.00	65.2 PK	88.2	-23.0	1.20 V	307	26.20	39.00
6	#5850.00	47.0 AV	77.5	-30.5	1.20 V	307	8.00	39.00
7	11650.00	67.1 PK	74.0	-6.9	1.74 V	320	17.10	50.00
8	11650.00	52.7 AV	54.0	-1.3	1.74 V	320	2.70	50.00

**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.
7. The limit value is defined as per 15.247.



A D T

802.11n (40MHz)

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	3837.00	53.5 PK	74.0	-20.5	1.46 H	351	18.70	34.80
2	3837.00	41.2 AV	54.0	-12.8	1.46 H	351	6.40	34.80
3	#5725.00	72.8 PK	84.0	-11.2	1.54 H	53	34.00	38.80
4	#5725.00	56.2 AV	72.7	-16.5	1.54 H	53	17.40	38.80
5	*5755.00	104.0 PK			1.54 H	53	65.20	38.80
6	*5755.00	92.7 AV			1.54 H	53	53.90	38.80
7	11510.00	63.1 PK	74.0	-10.9	1.60 H	58	13.00	50.10
8	11510.00	50.3 AV	54.0	-3.7	1.60 H	58	0.20	50.10
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	3837.00	54.9 PK	74.0	-19.1	1.02 V	301	20.10	34.80
2	3837.00	46.1 AV	54.0	-7.9	1.02 V	301	11.30	34.80
3	#5725.00	75.2 PK	85.4	-10.2	1.23 V	311	36.40	38.80
4	#5725.00	58.9 AV	74.4	-15.5	1.23 V	311	20.10	38.80
5	*5755.00	105.4 PK			1.23 V	311	66.60	38.80
6	*5755.00	94.4 AV			1.23 V	311	55.60	38.80
7	11510.00	63.2 PK	74.0	-10.8	1.69 V	323	13.10	50.10
8	11510.00	50.7 AV	54.0	-3.3	1.69 V	323	0.60	50.10

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.
7. The limit value is defined as per 15.247.



A D T

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

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	3837.00	53.8 PK	74.0	-20.2	1.51 H	349	19.00	34.80
2	3837.00	41.5 AV	54.0	-12.5	1.51 H	349	6.70	34.80
3	*5795.00	104.3 PK			1.52 H	55	65.40	38.90
4	*5795.00	92.6 AV			1.52 H	55	53.70	38.90
5	#5850.00	58.8 PK	84.3	-25.5	1.52 H	55	19.80	39.00
6	#5850.00	44.8 AV	72.6	-27.8	1.52 H	55	5.80	39.00
7	11590.00	63.4 PK	74.0	-10.6	1.61 H	61	13.40	50.00
8	11590.00	50.6 AV	54.0	-3.4	1.61 H	61	0.60	50.00
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	3837.00	55.3 PK	74.0	-18.7	1.03 V	303	20.50	34.80
2	3837.00	46.5 AV	54.0	-7.5	1.03 V	303	11.70	34.80
3	*5795.00	105.9 PK			1.21 V	311	67.00	38.90
4	*5795.00	94.6 AV			1.21 V	311	55.70	38.90
5	#5850.00	61.2 PK	85.9	-24.7	1.21 V	311	22.20	39.00
6	#5850.00	44.7 AV	74.6	-29.9	1.21 V	311	5.70	39.00
7	11590.00	64.3 PK	74.0	-9.7	1.68 V	330	14.30	50.00
8	11590.00	50.8 AV	54.0	-3.2	1.68 V	330	0.80	50.00

**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.
7. The limit value is defined as per 15.247.



A D T

**BELOW 1GHz WORST-CASE DATA : 802.11n (40MHz)**

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 159	FREQUENCY RANGE	Below 1000MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH	TESTED BY	Cedric Wu
TEST MODE	A		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	200.66	29.7 QP	43.5	-13.8	1.50 H	298	18.80	10.90
2	326.78	38.8 QP	46.0	-7.2	1.00 H	142	23.40	15.40
3	390.81	32.5 QP	46.0	-13.5	1.00 H	171	15.60	16.90
4	540.23	32.8 QP	46.0	-13.2	1.50 H	106	12.50	20.30
5	627.54	35.0 QP	46.0	-11.0	1.00 H	85	13.30	21.70
6	840.99	32.8 QP	46.0	-13.2	1.50 H	50	7.70	25.10

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	62.89	31.2 QP	40.0	-8.8	1.00 V	259	18.10	13.10
2	97.81	29.4 QP	43.5	-14.1	1.00 V	158	20.30	9.10
3	336.48	34.9 QP	46.0	-11.1	1.49 V	83	19.30	15.60
4	468.43	33.0 QP	46.0	-13.0	1.00 V	19	14.30	18.70
5	567.39	30.5 QP	46.0	-15.5	1.00 V	10	9.60	20.90
6	825.46	30.8 QP	46.0	-15.2	1.49 V	83	5.90	24.90

**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.



A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 159	FREQUENCY RANGE	Below 1000MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	26deg. C, 71%RH	TESTED BY	Cedric Wu
TEST MODE	B		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	249.17	37.5 QP	46.0	-8.5	1.24 H	224	24.70	12.80
2	315.14	38.0 QP	46.0	-8.0	1.00 H	187	22.90	15.10
3	377.23	34.5 QP	46.0	-11.5	1.00 H	151	17.90	16.60
4	466.49	32.1 QP	46.0	-13.9	1.24 H	141	13.40	18.70
5	637.25	31.9 QP	46.0	-14.1	1.00 H	76	10.10	21.80
6	848.75	33.2 QP	46.0	-12.8	1.00 H	314	8.00	25.20

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	59.01	30.9 QP	40.0	-9.1	1.00 V	269	17.40	13.50
2	105.58	29.1 QP	43.5	-14.4	1.25 V	138	19.10	10.00
3	251.11	33.4 QP	46.0	-12.6	1.25 V	117	20.50	12.90
4	355.89	37.3 QP	46.0	-8.7	1.25 V	68	21.20	16.10
5	443.21	32.9 QP	46.0	-13.1	1.00 V	84	14.80	18.10
6	594.56	31.4 QP	46.0	-14.6	1.00 V	347	10.00	21.40

**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.



A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 159	FREQUENCY RANGE	Below 1000MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	26deg. C, 71%RH	TESTED BY	Cedric Wu
TEST MODE	C		

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	253.05	34.9 QP	46.0	-11.1	1.00 H	73	21.90	13.00
2	313.20	38.9 QP	46.0	-7.1	1.00 H	183	23.80	15.10
3	452.91	31.9 QP	46.0	-14.1	1.25 H	140	13.50	18.40
4	594.56	31.3 QP	46.0	-14.7	1.25 H	176	9.90	21.40
5	734.27	29.3 QP	46.0	-16.7	1.25 H	63	6.30	23.00
6	879.80	35.4 QP	46.0	-10.6	1.00 H	150	9.90	25.50
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	254.99	30.8 QP	46.0	-15.2	1.50 V	124	17.70	13.10
2	313.20	37.0 QP	46.0	-9.0	1.50 V	162	21.90	15.10
3	363.65	37.4 QP	46.0	-8.6	1.50 V	82	21.10	16.30
4	497.54	38.8 QP	46.0	-7.2	1.00 V	323	19.40	19.40
5	633.36	31.2 QP	46.0	-14.8	1.50 V	10	9.40	21.80
6	800.24	29.4 QP	46.0	-16.6	1.50 V	7	4.80	24.60

**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.



A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 159	FREQUENCY RANGE	Below 1000MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	26deg. C, 71%RH	TESTED BY	Cedric Wu
TEST MODE	D		

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	72.59	23.5 QP	40.0	-16.5	1.00 H	215	11.90	11.60
2	251.11	35.8 QP	46.0	-10.2	1.00 H	63	22.90	12.90
3	328.72	36.4 QP	46.0	-9.6	1.00 H	137	21.00	15.40
4	462.61	30.7 QP	46.0	-15.3	1.24 H	146	12.10	18.60
5	637.25	36.9 QP	46.0	-9.1	1.00 H	77	15.10	21.80
6	687.70	33.9 QP	46.0	-12.1	1.24 H	56	11.80	22.10

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	111.40	25.9 QP	43.5	-17.6	1.24 V	152	15.20	10.70
2	284.09	32.3 QP	46.0	-13.7	1.24 V	10	18.10	14.20
3	336.48	34.7 QP	46.0	-11.3	1.24 V	95	19.10	15.60
4	594.56	32.2 QP	46.0	-13.8	1.00 V	336	10.80	21.40
5	825.46	31.8 QP	46.0	-14.2	1.00 V	105	6.90	24.90
6	932.19	34.4 QP	46.0	-11.6	1.00 V	302	8.30	26.10

**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.

## 5.2 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 item 4.1.6.

### 5.2.7 TEST RESULTS

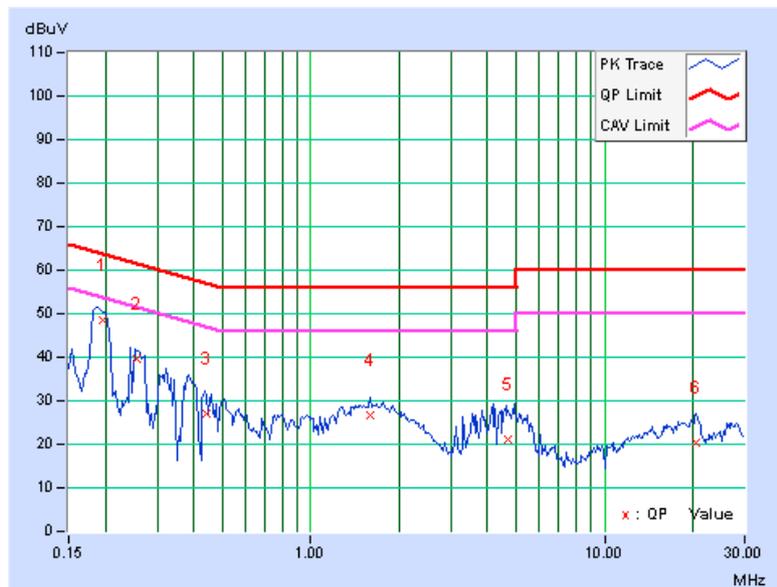
#### CONDUCTED WORST-CASE DATA : 802.11n (40MHz)

<b>PHASE</b>	Line 1	<b>6dB BANDWIDTH</b>	9kHz
<b>TEST MODE</b>	A		

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	0.19687	0.22	48.35	35.36	48.57	35.58	63.74
2	0.25547	0.23	39.22	25.76	39.45	25.99	61.58	51.58	-22.13	-25.59
3	0.43906	0.24	26.72	13.27	26.96	13.51	57.08	47.08	-30.11	-33.56
4	1.60156	0.33	26.21	14.27	26.54	14.60	56.00	46.00	-29.46	-31.40
5	4.70703	0.45	20.60	5.35	21.05	5.80	56.00	46.00	-34.95	-40.20
6	20.53906	0.79	19.42	13.14	20.21	13.93	60.00	50.00	-39.79	-36.07

#### REMARKS:

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





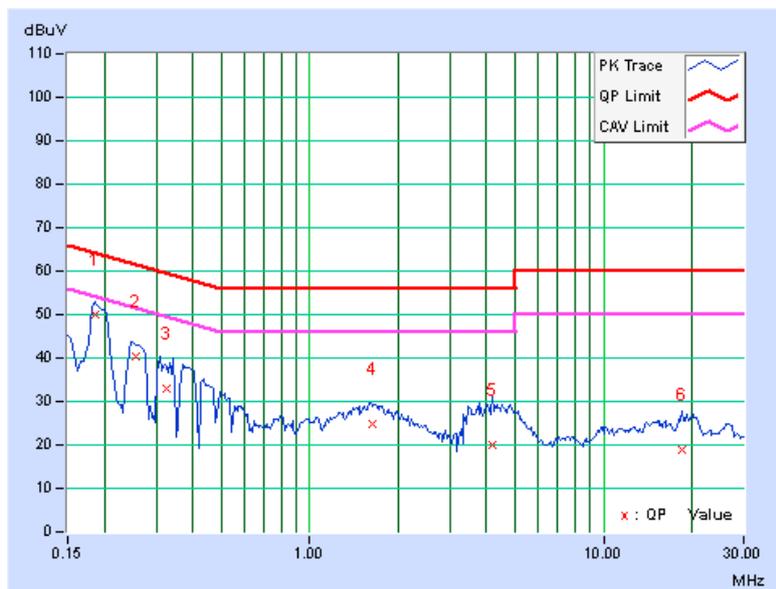
A D T

PHASE	Line 2	6dB BANDWIDTH	9kHz
TEST MODE	A		

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	0.18516	0.20	49.95	33.66	50.15	33.86	64.25	54.25	-14.10	-20.39
2	0.25547	0.21	40.07	26.11	40.28	26.32	61.58	51.58	-21.30	-25.26
3	0.32578	0.21	32.92	18.39	33.13	18.60	59.56	49.56	-26.43	-30.96
4	1.62500	0.29	24.61	11.32	24.90	11.61	56.00	46.00	-31.10	-34.39
5	4.19531	0.44	19.56	1.37	20.00	1.81	56.00	46.00	-36.00	-44.19
6	18.58203	0.84	18.05	10.85	18.89	11.69	60.00	50.00	-41.11	-38.31

**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.

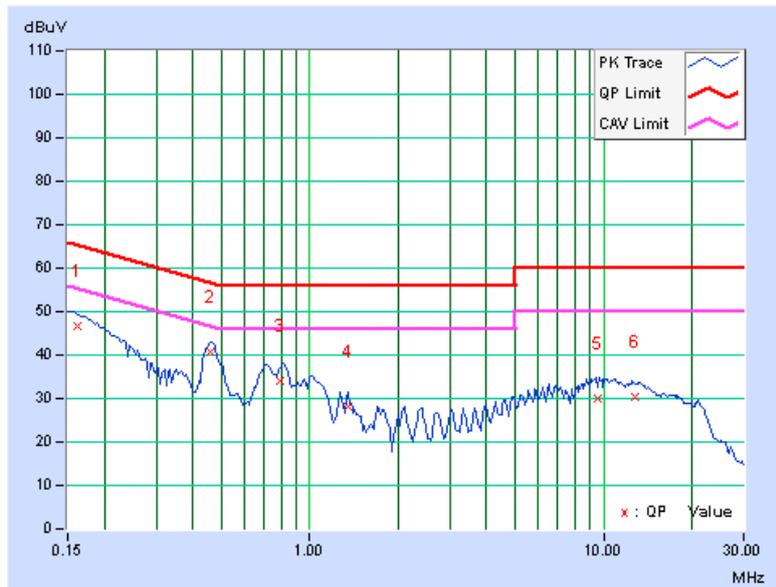


PHASE	Line 1	6dB BANDWIDTH	9kHz
TEST MODE	B		

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	0.16172	0.21	46.59	35.12	46.80	35.33	65.38	55.38	-18.58	-20.05
2	0.45859	0.25	40.31	34.81	40.56	35.06	56.72	46.72	-16.16	-11.66
3	0.79453	0.29	33.78	27.80	34.07	28.09	56.00	46.00	-21.93	-17.91
4	1.35547	0.32	27.84	20.90	28.16	21.22	56.00	46.00	-27.84	-24.78
5	9.58594	0.51	29.31	22.53	29.82	23.04	60.00	50.00	-30.18	-26.96
6	12.83984	0.60	29.88	22.38	30.48	22.98	60.00	50.00	-29.52	-27.02

**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.

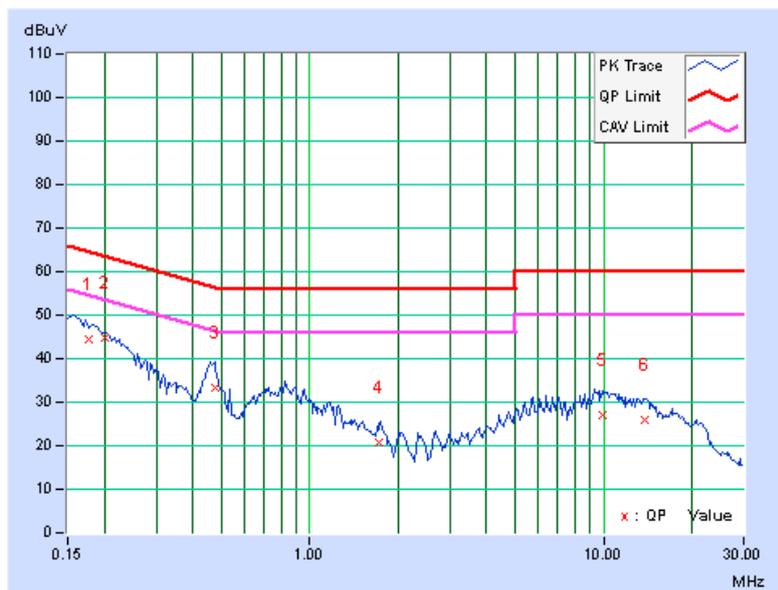


PHASE	Line 2	6dB BANDWIDTH	9kHz
TEST MODE	B		

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	0.17734	0.20	44.06	31.97	44.26	32.17	64.61	54.61	-20.35	-22.44
2	0.20078	0.20	44.55	32.16	44.75	32.36	63.58	53.58	-18.83	-21.22
3	0.47422	0.23	32.92	27.57	33.15	27.80	56.44	46.44	-23.29	-18.64
4	1.71484	0.30	20.34	13.16	20.64	13.46	56.00	46.00	-35.36	-32.54
5	9.97656	0.61	26.54	19.06	27.15	19.67	60.00	50.00	-32.85	-30.33
6	13.89063	0.72	25.04	16.55	25.76	17.27	60.00	50.00	-34.24	-32.73

**REMARKS:**

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





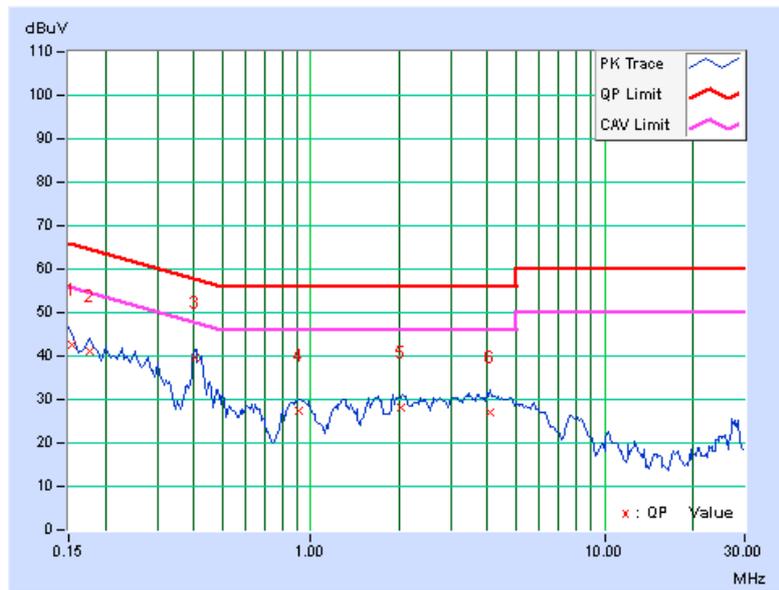
A D T

PHASE	Line 1	6dB BANDWIDTH	9kHz
TEST MODE	C		

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	0.21	42.40	33.55	42.61	33.76	65.79	55.79	-23.18	-22.03
2	0.17734	0.21	40.79	31.00	41.00	31.21	64.61	54.61	-23.61	-23.40
3	0.40391	0.24	39.34	37.07	39.58	37.31	57.77	47.77	-18.19	-10.46
4	0.90781	0.30	27.21	24.75	27.51	25.05	56.00	46.00	-28.49	-20.95
5	2.02344	0.34	27.67	23.33	28.01	23.67	56.00	46.00	-27.99	-22.33
6	4.08594	0.44	26.43	21.47	26.87	21.91	56.00	46.00	-29.13	-24.09

**REMARKS:**

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





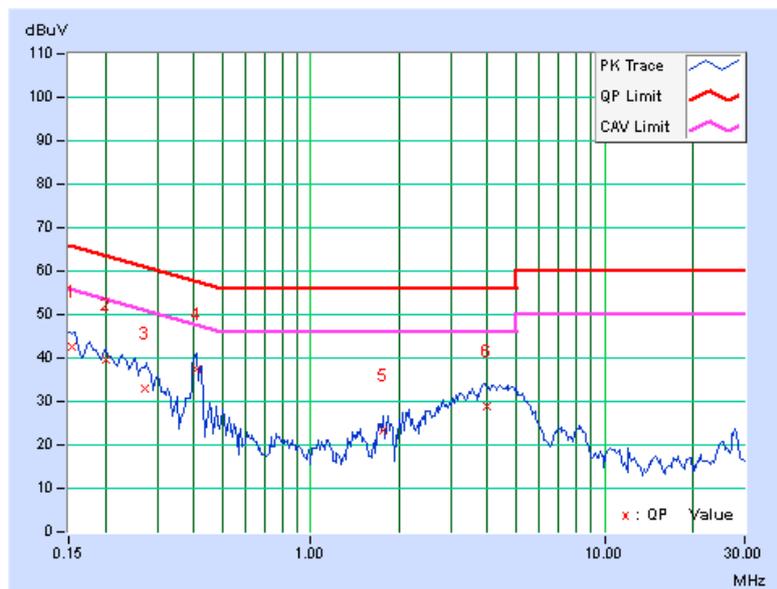
A D T

PHASE	Line 2	6dB BANDWIDTH	9kHz
TEST MODE	C		

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	0.20	42.54	33.94	42.74	34.14	65.79	55.79	-23.04	-21.64
2	0.20078	0.20	39.43	26.16	39.63	26.36	63.58	53.58	-23.95	-27.22
3	0.27109	0.21	32.74	19.53	32.95	19.74	61.08	51.08	-28.14	-31.35
4	0.40781	0.22	37.01	24.64	37.23	24.86	57.69	47.69	-20.46	-22.83
5	1.76953	0.30	23.11	14.25	23.41	14.55	56.00	46.00	-32.59	-31.45
6	3.98047	0.43	28.44	15.63	28.87	16.06	56.00	46.00	-27.13	-29.94

**REMARKS:**

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





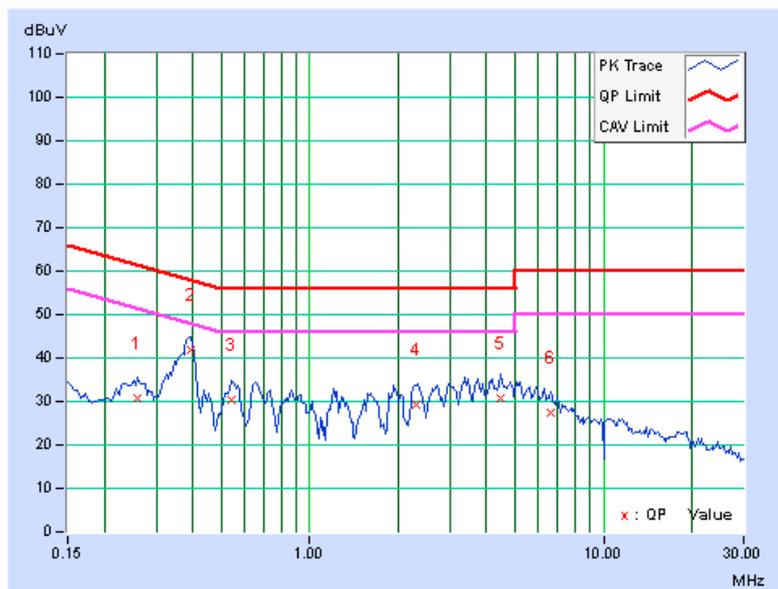
A D T

PHASE	Line 1	6dB BANDWIDTH	9kHz
TEST MODE	D		

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	0.25938	0.23	30.57	25.30	30.80	25.53	61.45	51.45	-30.66	-25.93
2	0.39219	0.24	41.43	36.83	41.67	37.07	58.02	48.02	-16.35	-10.95
3	0.54063	0.26	30.29	25.68	30.55	25.94	56.00	46.00	-25.45	-20.06
4	2.31641	0.36	29.02	23.24	29.38	23.60	56.00	46.00	-26.62	-22.40
5	4.44531	0.45	30.30	22.84	30.75	23.29	56.00	46.00	-25.25	-22.71
6	6.57813	0.47	26.84	18.71	27.31	19.18	60.00	50.00	-32.69	-30.82

**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.

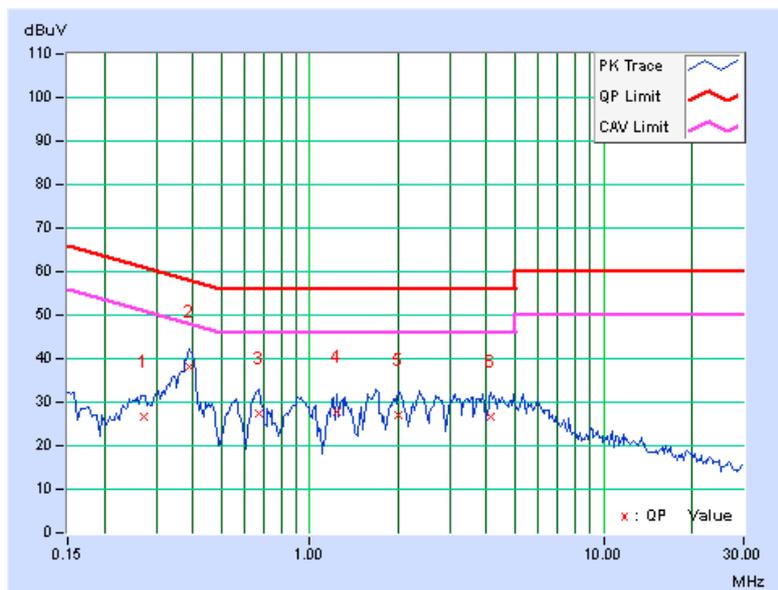


PHASE	Line 2	6dB BANDWIDTH	9kHz
TEST MODE	D		

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	0.21	26.56	20.79	26.77	21.00	61.08	51.08	-34.32	-30.09
2	0.38828	0.22	37.91	32.50	38.13	32.72	58.10	48.10	-19.97	-15.38
3	0.66953	0.24	27.32	21.20	27.56	21.44	56.00	46.00	-28.44	-24.56
4	1.23828	0.28	27.38	19.93	27.66	20.21	56.00	46.00	-28.34	-25.79
5	2.01563	0.31	26.89	20.11	27.20	20.42	56.00	46.00	-28.80	-25.58
6	4.15625	0.43	26.06	20.37	26.49	20.80	56.00	46.00	-29.51	-25.20

**REMARKS:**

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





A D T

### **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.



A D T

### 5.3.7 TEST RESULTS

#### 802.11a

CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
149	5745	16.39	0.5	PASS
157	5785	16.41	0.5	PASS
165	5825	16.41	0.5	PASS

#### 802.11n (20MHz)

CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
149	5745	17.65	0.5	PASS
157	5785	17.62	0.5	PASS
165	5825	17.65	0.5	PASS

#### 802.11n (40MHz)

CHANNEL	FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
151	5755	36.28	0.5	PASS
159	5795	36.27	0.5	PASS



A D T

## **5.4 CONDUCTED OUTPUT POWER**

### **5.4.1 LIMITS OF CONDUCTED 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	FREQUENCY (MHz)	PEAK POWER (mW)	PEAK POWER (dBm)	LIMIT (dBm)	PASS/FAIL
149	5745	216.272	23.35	30	PASS
157	5785	204.644	23.11	30	PASS
165	5825	211.349	23.25	30	PASS

#### 802.11n (20MHz)

CHANNEL	FREQUENCY (MHz)	PEAK POWER (mW)	PEAK POWER (dBm)	LIMIT (dBm)	PASS/FAIL
149	5745	210.863	23.24	30	PASS
157	5785	209.411	23.21	30	PASS
165	5825	206.538	23.15	30	PASS

#### 802.11n (40MHz)

CHANNEL	FREQUENCY (MHz)	PEAK POWER (mW)	PEAK POWER (dBm)	LIMIT (dBm)	PASS/FAIL
151	5755	213.796	23.30	30	PASS
159	5795	221.309	23.45	30	PASS



A D T

## **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.



A D T

## 5.5.7 TEST RESULTS

### 802.11a

Channel	FREQ. (MHz)	PSD (dBm/100kHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
149	5745	5.37	-9.86	8	PASS
157	5785	5.15	-10.08	8	PASS
165	5825	5.11	-10.12	8	PASS

### 802.11n (20MHz)

Channel	FREQ. (MHz)	PSD (dBm/100kHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
149	5745	5.72	-9.51	8	PASS
157	5785	5.79	-9.44	8	PASS
165	5825	5.65	-9.58	8	PASS

### 802.11n (40MHz)

Channel	FREQ. (MHz)	PSD (dBm/100kHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
151	5755	1.58	-13.65	8	PASS
159	5795	1.57	-13.66	8	PASS



A D T

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

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

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

### **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**

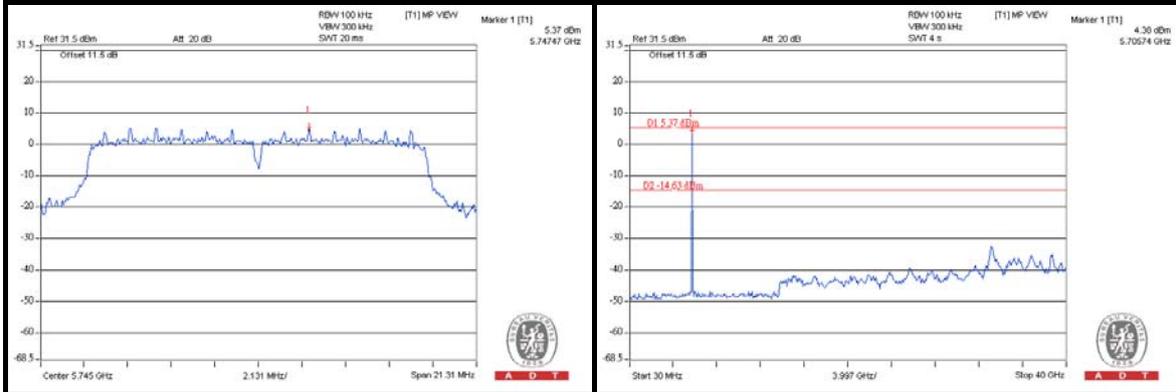
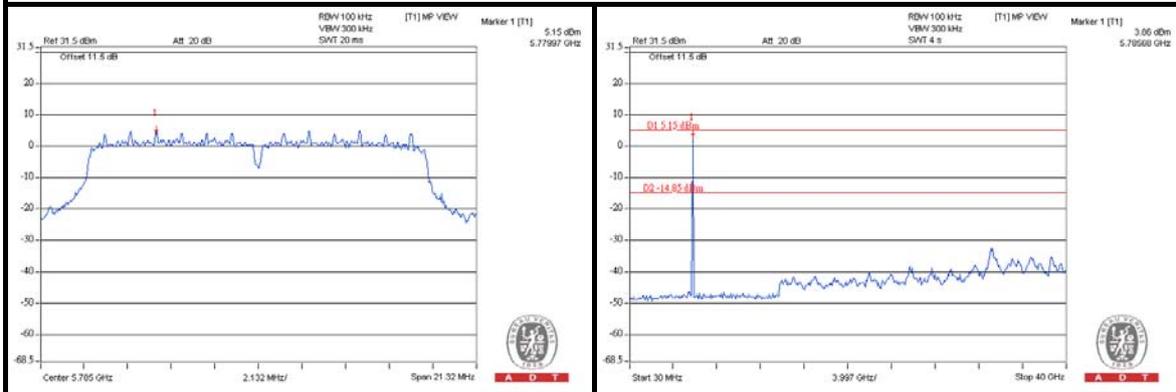
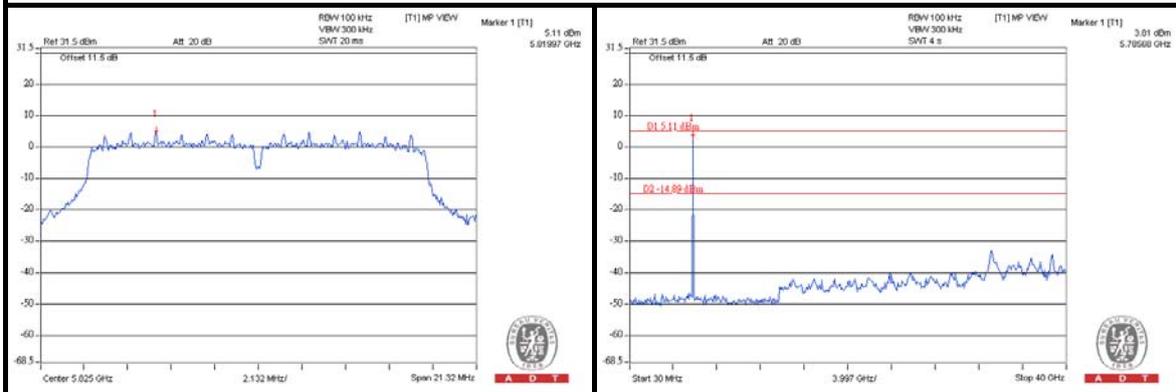
No deviation.

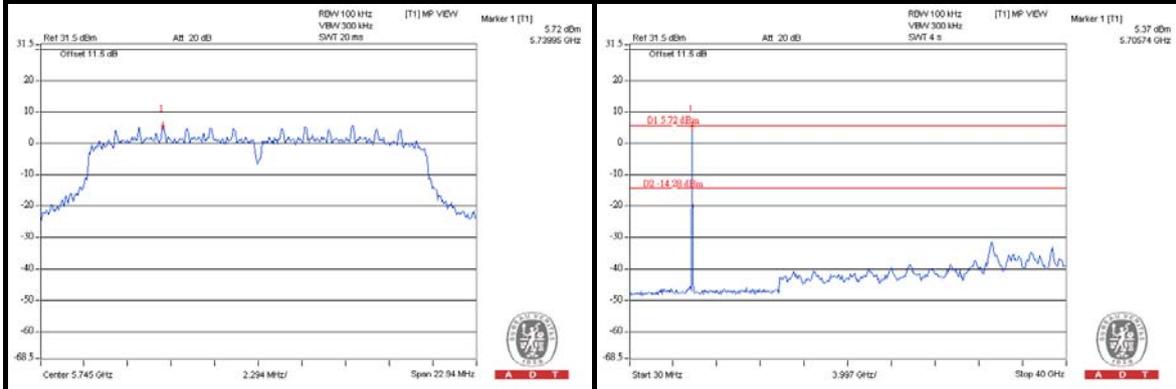
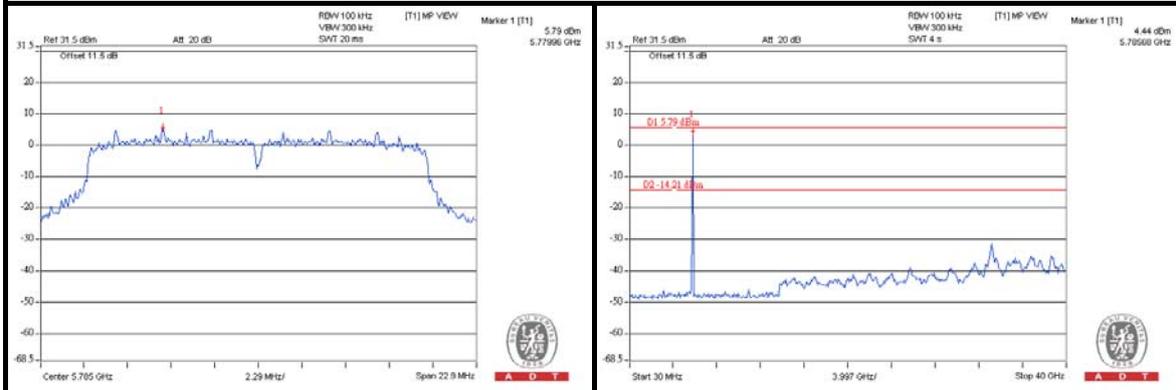
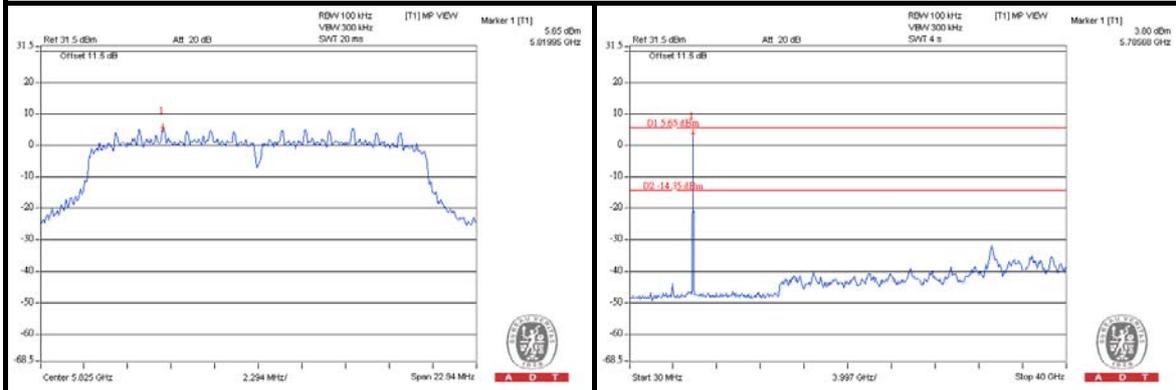
### **5.6.6 EUT OPERATING CONDITION**

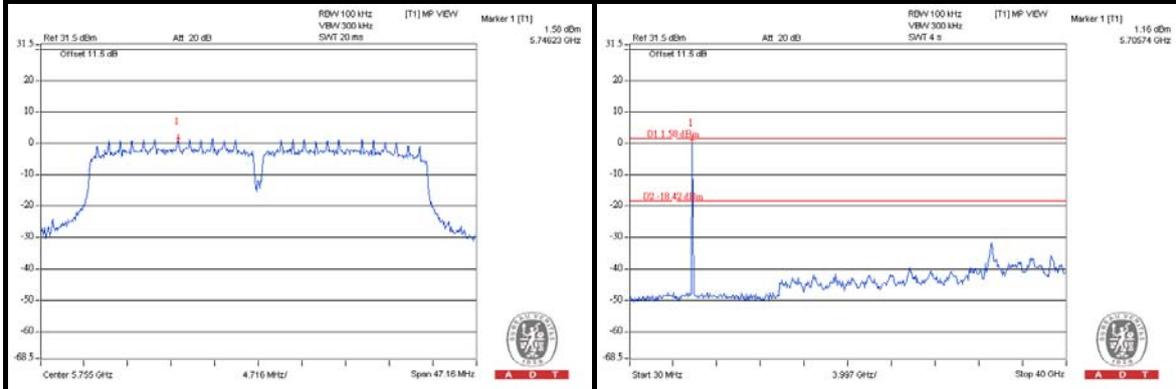
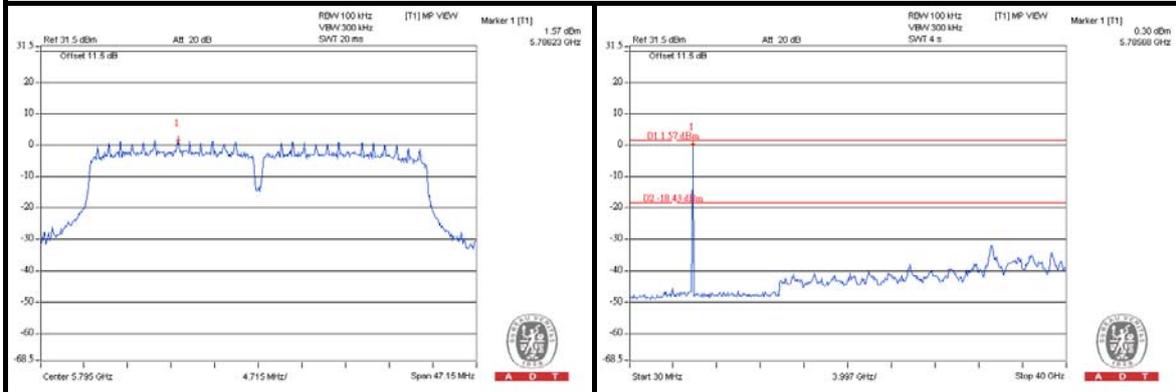
Same as Item 4.3.6

### **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.

**802.11a****CH 149****CH 157****CH 165**

**802.11n (20MHz)****CH 149****CH 157****CH 165**

**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).



A D T

## 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.



A D T

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

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

**---END---**