



# FCC TEST REPORT

**REPORT NO.:** RF980910H07  
**MODEL NO.:** SP88W8786-MD0-2C2T00  
**RECEIVED:** Sep. 10, 2009  
**TESTED:** Sep. 30 to Oct. 06, 2009  
**ISSUED:** Nov. 02, 2009

**APPLICANT:** Seiko Epson Corporation

**ADDRESS:** 3-3-5 Owa Suwa-shi Nagano-Ken 392-8502,  
Japan.

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

**TEST LOCATION:** No. 81-1, Lu Liao Keng, 9th Ling, Wu Lung  
Tsuen, Chiung Lin Hsiang, Hsin Chu Hsien  
307, Taiwan

This test report consists of 89 pages in total. It may be duplicated completely for legal use with the approval of the applicant. It should not be reproduced except in full, without the written approval of our laboratory. The client should not use it to claim product endorsement by TAF or any government agencies. The test results in the report only apply to the tested sample.





## Table of Contents

1.	CERTIFICATION .....	4
2.	SUMMARY OF TEST RESULTS .....	5
2.1	MEASUREMENT UNCERTAINTY .....	6
3.	GENERAL INFORMATION.....	7
3.1	GENERAL DESCRIPTION OF EUT .....	7
3.2	DESCRIPTION OF TEST MODES .....	8
3.2.1	TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL: .....	9
3.3	GENERAL DESCRIPTION OF APPLIED STANDARDS .....	11
3.4	DESCRIPTION OF SUPPORT UNITS.....	12
3.5	CONFIGURATION OF SYSTEM UNDER TEST .....	13
4.	TEST TYPES AND RESULTS .....	15
4.1	CONDUCTED EMISSION MEASUREMENT.....	15
4.1.1	LIMITS OF CONDUCTED EMISSION MEASUREMENT .....	15
4.1.2	TEST INSTRUMENTS .....	15
4.1.3	TEST PROCEDURES.....	16
4.1.4	DEVIATION FROM TEST STANDARD .....	16
4.1.5	TEST SETUP .....	17
4.1.6	EUT OPERATING CONDITIONS .....	17
4.1.7	TEST RESULTS .....	18
4.2	RADIATED EMISSION MEASUREMENT .....	20
4.2.1	LIMITS OF RADIATED EMISSION MEASUREMENT.....	20
4.2.2	TEST INSTRUMENTS .....	21
4.2.3	TEST PROCEDURES.....	22
4.2.4	DEVIATION FROM TEST STANDARD .....	22
4.2.5	TEST SETUP .....	23
4.2.6	EUT OPERATING CONDITIONS .....	23
	Below 1GHz Test Data .....	24
4.2.7	TEST RESULTS .....	24
	Above 1GHz Test Data.....	25
4.2.8	TEST RESULTS .....	25
4.3	6dB BANDWIDTH MEASUREMENT .....	54
4.3.1	LIMITS OF 6dB BANDWIDTH MEASUREMENT.....	54
4.3.2	TEST INSTRUMENTS .....	54
4.3.3	TEST PROCEDURE.....	55
4.3.4	DEVIATION FROM TEST STANDARD .....	55
4.3.5	TEST SETUP .....	55
4.3.6	EUT OPERATING CONDITIONS .....	55
4.3.7	TEST RESULTS .....	56



A D T

4.4	MAXIMUM PEAK OUTPUT POWER.....	64
4.4.1	LIMITS OF MAXIMUM PEAK OUTPUT POWER MEASUREMENT .....	64
4.4.2	INSTRUMENTS.....	64
4.4.3	TEST PROCEDURES.....	64
4.4.4	DEVIATION FROM TEST STANDARD .....	64
4.4.5	TEST SETUP .....	64
4.4.6	EUT OPERATING CONDITIONS .....	64
4.4.7	TEST RESULTS .....	65
4.5	POWER SPECTRAL DENSITY MEASUREMENT.....	67
4.5.1	LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT .....	67
4.5.2	TEST INSTRUMENTS .....	67
4.5.3	TEST PROCEDURE.....	68
4.5.4	DEVIATION FROM TEST STANDARD .....	68
4.5.5	TEST SETUP .....	68
4.5.6	EUT OPERATING CONDITION.....	68
4.5.7	TEST RESULTS .....	69
4.6	CONDUCTED OUT-BAND EMISSION MEASUREMENT .....	77
4.6.1	LIMITS OF Conducted Out-Band Emission MEASUREMENT.....	77
4.6.2	TEST INSTRUMENTS .....	77
4.6.3	TEST PROCEDURE.....	77
4.6.4	DEVIATION FROM TEST STANDARD .....	78
4.6.5	EUT OPERATING CONDITION.....	78
4.6.6	TEST RESULTS .....	78
4.7	ANTENNA REQUIREMENT .....	87
4.7.1	STANDARD APPLICABLE .....	87
4.7.2	ANTENNA CONNECTED CONSTRUCTION .....	87
5.	INFORMATION ON THE TESTING LABORATORIES .....	88
6.	APPENDIX-A- MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB.....	89




A D T

## 1. CERTIFICATION

**PRODUCT:** IEEE 802.11b/g/n 1x1 WLAN Module  
**BRAND NAME:** Epson  
**MODEL NO.:** SP88W8786-MD0-2C2T00  
**TEST SAMPLE:** ENGINEERING SAMPLE  
**TESTED:** Sep. 30 to Oct. 06, 2009  
**APPLICANT:** Seiko Epson Corporation  
**STANDARDS:** FCC Part 15, Subpart C (Section 15.247),  
ANSI C63.4-2003

The above equipment (Model: SP88W8786-MD0-2C2T00) 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:** Nov. 02, 2009  
( Claire Kuan, Specialist )

**TECHNICAL ACCEPTANCE** :  , **DATE:** Nov. 02, 2009  
Responsible for RF ( Hank Chung, Deputy Manager )

**APPROVED BY** :  , **DATE:** Nov. 02, 2009  
( May Chen, Deputy Manager )



A D T

## 2. SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

<b>APPLIED STANDARD: FCC Part 15, Subpart C (Section 15.247)</b>			
<b>Standard Section</b>	<b>Test Type and Limit</b>	<b>Result</b>	<b>Remark</b>
15.207	AC Power Conducted Emission	PASS	Meet the requirement of limit. Minimum passing margin is -8.22dB at 3.987MHz
15.247(a)(2)	Spectrum Bandwidth of a Direct Sequence Spread Spectrum System Limit: min. 500kHz	PASS	Meet the requirement of limit.
15.247(b)	Maximum Peak Output Power Limit: max. 30dBm	PASS	Meet the requirement of limit.
15.247(d)	Radiated Emissions Limit: Table 15.209	PASS	Meet the requirement of limit. Minimum passing margin is -0.52dB at 2390.00MHz
15.247(e)	Power Spectral Density Limit: max. 8dBm	PASS	Meet the requirement of limit.
15.247(d)	Conducted Out-Band Emission Measurement Limit: 20dB less than the peak value of fundamental frequency	PASS	Meet the requirement of limit.

## 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:

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

Measurement	Value
Conducted emissions	2.44 dB
Radiated emissions (30MHz-1GHz)	3.94 dB
Radiated emissions (1GHz -18GHz)	2.49 dB
Radiated emissions (18GHz -40GHz)	2.70 dB

### 3. GENERAL INFORMATION

#### 3.1 GENERAL DESCRIPTION OF EUT

<b>PRODUCT</b>	IEEE 802.11b/g/n 1x1 WLAN Module
<b>MODEL NO.</b>	SP88W8786-MD0-2C2T00
<b>FCC ID</b>	BKMFBSPP88W8786
<b>POWER SUPPLY</b>	DC 3.3V ± 10% from host equipment
<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 / 5.5 / 2 / 1Mbps 802.11g: 54 / 48 / 36 / 24 / 18 / 12 / 9 / 6Mbps Draft 802.11n (20MHz): 65 / 58.5 / 52 / 39 / 26 / 19.5 / 13 / 6.5Mbps Draft 802.11n (40MHz): 135 / 121.5 / 108 / 81 / 54 / 40.5 / 27 / 13.5Mbps
<b>OPERATING FREQUENCY</b>	2412 ~ 2462MHz
<b>NUMBER OF CHANNEL</b>	11 for 802.11b, 802.11g, draft 802.11n (20MHz) 7 for draft 802.11n (40MHz)
<b>MAXIMUM OUTPUT POWER</b>	802.11b: 295.1mW 802.11g: 354.8mW draft 802.11n (20MHz): 363.1mW draft 802.11n (40MHz): 229.1mW
<b>ANTENNA TYPE</b>	Please see note 1
<b>DATA CABLE</b>	NA
<b>I/O PORT</b>	NA

**NOTE:**

- There is two antennas provided to this EUT, please refer to the following table:

No.	Antenna Type	Gain (dBi)	Antenna Connector
1	PCB Printed	2.93	NA
2	PCB Printed	2.08	NA

**Note: From above antennas, antenna 1 was chosen for final test**

- The EUT incorporates a SISO function with 802.11b, 802.11g, draft 802.11n. Physically, the EUT provides one completed transmitter and receivers.

3. The EUT has two PCB antennas and only one antenna can be configured for the transmission (Transmitter diversity). Also only one antenna configured for the receiving function.
4. The EUT complies with draft 802.11n standards and backwards compatible with 802.11b, 802.11g products.
5. The EUT, operates in the 2.4GHz frequency range, lets you connect IEEE 802.11g or IEEE 802.11b and draft 802.11n technique devices to the network.
6. The above EUT information was 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

Eleven channels are provided for 802.11b, 802.11g, draft 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		

Seven channels are provided for draft 802.11n (40MHz):

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
1	2422MHz	5	2442MHz
2	2427MHz	6	2447MHz
3	2432MHz	7	2452MHz
4	2437MHz		





A D T

### 3.2.1 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL:

EUT CONFIGURE MODE	APPLICABLE TO				DESCRIPTION
	PLC	RE < 1G	RE ≥ 1G	APCM	
-	√	√	√	√	-

Where PLC: Power Line Conducted Emission

RE < 1G: Radiated Emission below 1GHz

RE ≥ 1G: Radiated Emission above 1GHz

APCM: Antenna Port Conducted Measurement

#### **POWER LINE CONDUCTED EMISSION TEST:**

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

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
Draft 802.11n (20MHz)	1 to 11	6	OFDM	BPSK	6.5

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

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

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
Draft 802.11n (20MHz)	1 to 11	6	OFDM	BPSK	6.5



A D T

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

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

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1
802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6
Draft 802.11n (20MHz)	1 to 11	1, 6, 11	OFDM	BPSK	6.5
Draft 802.11n (40MHz)	1 to 7	1, 4, 7	OFDM	BPSK	13.5

### **CONDUCTED OUT-BAND EMISSION 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.

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11b	1 to 11	1, 11	DSSS	DBPSK	1
802.11g	1 to 11	1, 11	OFDM	BPSK	6
Draft 802.11n (20MHz)	1 to 11	1, 11	OFDM	BPSK	6.5
Draft 802.11n (40MHz)	1 to 7	1, 7	OFDM	BPSK	13.5

### **ANTENNA PORT CONDUCTED MEASUREMENT:**

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

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1
802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6
Draft 802.11n (20MHz)	1 to 11	1, 6, 11	OFDM	BPSK	6.5
Draft 802.11n (40MHz)	1 to 7	1, 4, 7	OFDM	BPSK	13.5

### 3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is an IEEE 802.11b/g/n 1x1 WLAN Module. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

#### **FCC Part 15, Subpart C. (15.247)**

#### **ANSI C63.4-2003**

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

**NOTE:** The EUT is also considered as a kind of computer peripheral, because the connection to computer is necessary for typical use. It has been verified to comply with the requirements of FCC Part 15, Subpart B, Class B (DoC). The test report has been issued separately.



A D T

### 3.4 DESCRIPTION OF SUPPORT UNITS

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

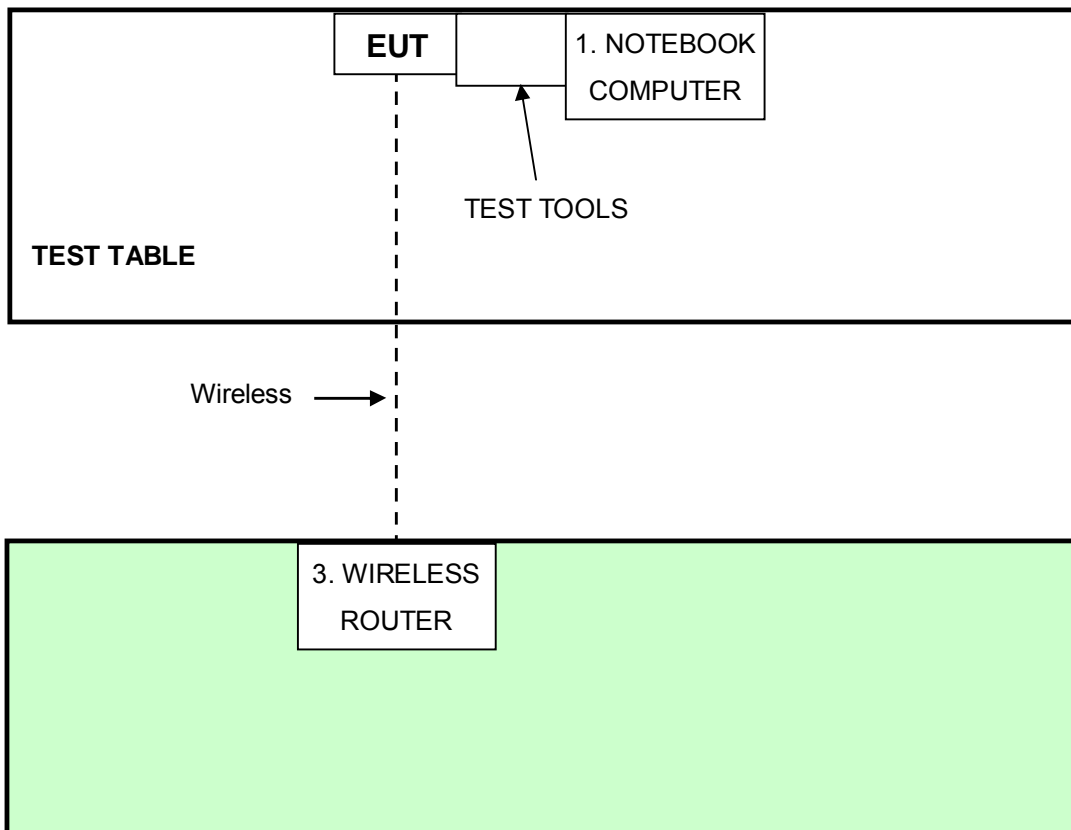
Conducted emission test					
NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	NOTEBOOK COMPUTER	DELL	D531	CN-0XM006-48643-86L-4472	QDS-BRCM1019
2	TEST TOOLS	Hon Hai	NA	NA	NA
3	WIRELESS ROUTER	ABOCOM	WR224GR	060500749P	FCC DoC
Other test					
NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	NOTEBOOK COMPUTER	DELL	D531	CN-0XM006-48643-86L-4472	QDS-BRCM1019
2	TEST TOOLS	Hon Hai	NA	NA	NA

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

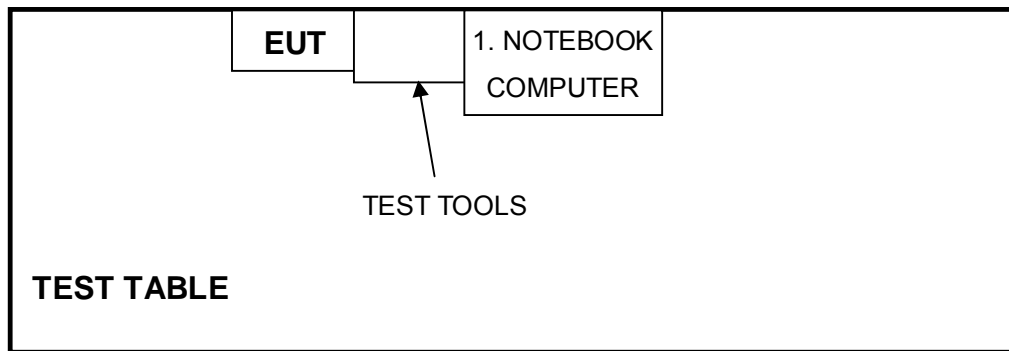
**NOTE:** All power cords of the above support units are non shielded (1.8m).

### 3.5 CONFIGURATION OF SYSTEM UNDER TEST

For conducted emission test:



**For other test:**





A D T

## 4. TEST TYPES AND RESULTS

### 4.1 CONDUCTED EMISSION MEASUREMENT

#### 4.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

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

#### 4.1.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver	ESCS 30	100375	Mar. 23, 2009	Mar. 22, 2010
Line-Impedance Stabilization Network (for Peripheral)	ENV-216	100071	Nov. 26, 2008	Nov. 25, 2009
Line-Impedance Stabilization Network (for EUT)	ESH3-Z5	848773/004	Nov. 05, 2008	Nov. 04, 2009
RF Cable (JYBAO)	5DFB	COBCAB-001	Aug. 14, 2009	Aug. 13, 2010
50 ohms Terminator	50	3	Nov. 05, 2008	Nov. 04, 2009
Software	BV ADT_Cond_V7.3.7	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 Shielded Room No. B.
3. The VCCI Con B Registration No. is C-2193.

#### 4.1.3 TEST PROCEDURES

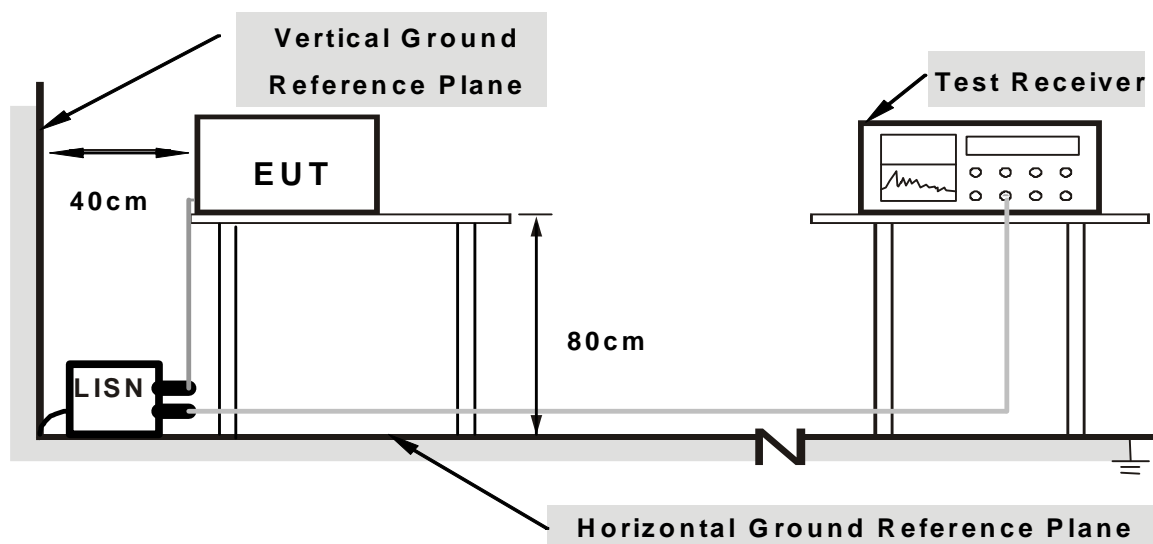
- a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling 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) were not recorded.

#### 4.1.4 DEVIATION FROM TEST STANDARD

No deviation



#### 4.1.5 TEST SETUP



**Note: 1.Support units were connected to second LISN.**

**2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes**

For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

#### 4.1.6 EUT OPERATING CONDITIONS

1. Connect the EUT with the support unit 1 (Notebook computer) which placed on a testing table.
2. The support unit 1 (Notebook computer) act as a server system to communicate with support unit 3 (Wireless Router) which is placed at outside of testing areas.
3. The communication partners run test program “Ping Test” to enable EUT under transmission/receiving condition continuously via wireless transmission.

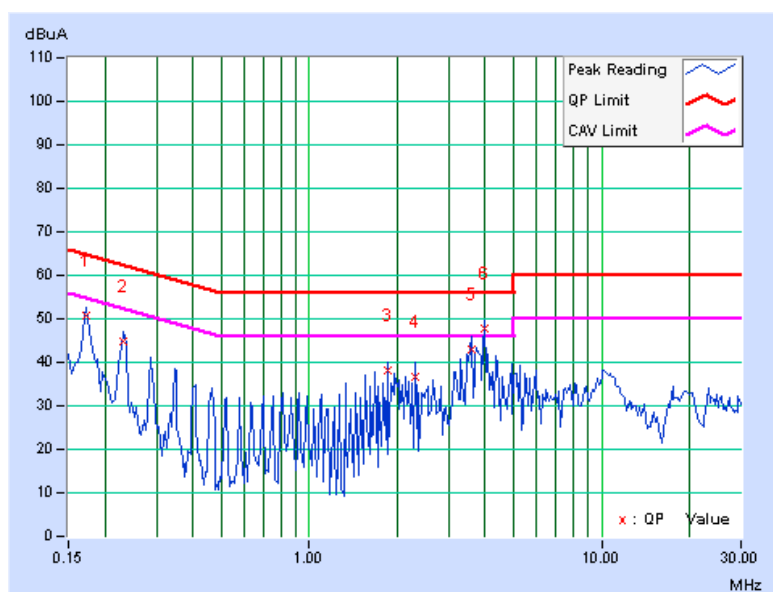
### 4.1.7 TEST RESULTS

#### Draft 802.11n (20MHz) OFDM MODULATION

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	PHASE	Line (L)
MODULATION TYPE	BPSK	6dB BANDWIDTH	9 kHz
TRANSFER RATE	6.5Mbps	INPUT POWER (SYSTEM)	120Vac, 60 Hz
ENVIRONMENTAL CONDITIONS	26deg. C, 63%RH, 965hPa	TESTED BY	Wen Yu

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	0.173	0.17	50.44	43.95	50.61	44.12	64.79	54.79	-14.18	-10.67
2	0.232	0.18	44.45	37.88	44.63	38.06	62.38	52.38	-17.75	-14.32
3	1.848	0.52	37.78	34.88	38.30	35.40	56.00	46.00	-17.70	-10.60
4	2.313	0.54	36.00	31.34	36.54	31.88	56.00	46.00	-19.46	-14.12
5	3.586	0.60	42.50	28.38	43.10	28.98	56.00	46.00	-12.90	-17.02
6	3.987	0.62	47.16	33.69	47.78	34.31	56.00	46.00	-8.22	-11.69

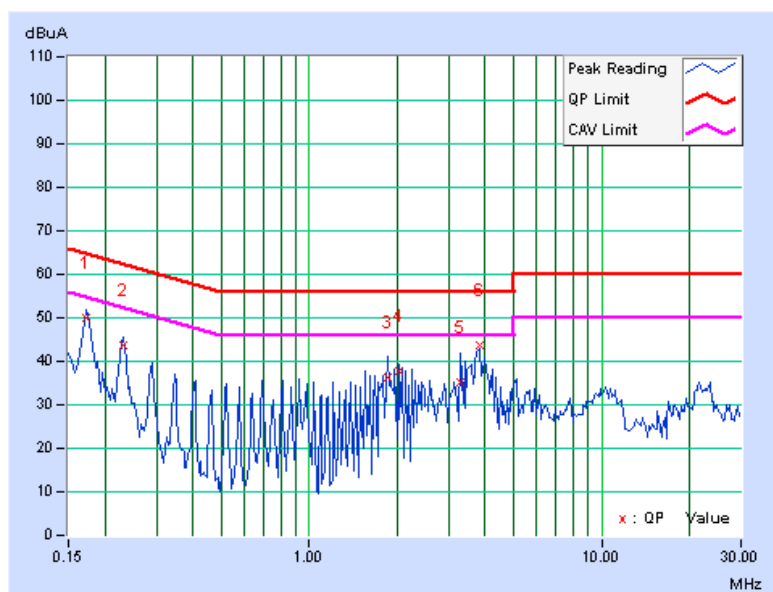
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
  2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
  3. The emission levels of other frequencies were very low against the limit.
  4. Margin value = Emission level - Limit value
  5. Correction factor = Insertion loss + Cable loss
  6. Emission Level = Correction Factor + Reading Value.



EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	PHASE	Neutral (N)
MODULATION TYPE	BPSK	6dB BANDWIDTH	9 kHz
TRANSFER RATE	6.5Mbps	INPUT POWER (SYSTEM)	120Vac, 60 Hz
ENVIRONMENTAL CONDITIONS	26deg. C, 63%RH, 965hPa	TESTED BY	Wen Yu

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	0.173	0.10	49.82	45.17	49.92	45.27	64.79	54.79	-14.87	-9.52
2	0.232	0.11	43.69	37.55	43.80	37.66	62.38	52.38	-18.57	-14.71
3	1.852	0.44	35.70	32.16	36.14	32.60	56.00	46.00	-19.86	-13.40
4	2.020	0.45	37.34	35.78	37.79	36.23	56.00	46.00	-18.21	-9.77
5	3.297	0.51	34.83	24.09	35.34	24.60	56.00	46.00	-20.66	-21.40
6	3.813	0.54	43.19	33.95	43.73	34.49	56.00	46.00	-12.27	-11.51

- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
  2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
  3. The emission levels of other frequencies were very low against the limit.
  4. Margin value = Emission level - Limit value
  5. Correction factor = Insertion loss + Cable loss
  6. Emission Level = Correction Factor + Reading Value.



## 4.2 RADIATED EMISSION MEASUREMENT

### 4.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT

Emissions radiated outside of the specified bands, shall be according to the general radiated limits in 15.209 as following:

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. As shown in 15.35(b), 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

#### 4.2.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
ROHDE & SCHWARZ Spectrum Analyzer	FSP40	100036	Dec. 9, 2008	Dec. 8, 2009
Agilent PSA Spectrum Analyzer	E4446A	MY46180622	Apr. 24 , 2009	Apr. 23 , 2010
HP Pre_Amplifier	8449B	3008A01923	Nov. 10, 2008	Nov. 9, 2009
ROHDE & SCHWARZ Test Receiver	ESCS30	847124/029	Aug. 28, 2009	Aug. 28, 2010
SCHWARZBECK TRILOG Broadband Antenna	VULB 9168	138	April 29, 2009	April 28, 2010
Schwarzbeck Horn_Antenna	BBHA9120	D124	Dec. 09, 2008	Dec. 08, 2009
Schwarzbeck Horn_Antenna	BBHA 9170	BBHA9170153	Jan. 22, 2009	Jan. 21, 2010
R&S Loop Antenna	HFH2-Z2	100070	Jan. 14, 2008	Jan. 13, 2010
RF Switches	EMH-011	08009	Oct. 07, 2008	Oct. 06, 2009
RF CABLE (Chaintek)	Sucoflex 106	28077	Aug. 14, 2009	Aug. 13, 2010
RF Cable	8DFB	STCCAB-30M-1GHz	Oct. 07, 2008	Oct. 06, 2009
Software	ADT_Radiated_V7.6.15.9.2	NA	NA	NA
CT Antenna Tower & Turn Table	NA	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 horn antenna, HP preamplifier (model: 8449B) and Spectrum Analyzer (model: FSP40) are used only for the measurement of emission frequency above 1GHz if tested.  
3. The test was performed in Open Site No. C.  
4. The FCC Site Registration No. is 656396.  
5. The VCCI Site Registration No. is R-1626.  
6. The CANADA Site Registration No. is IC 7450G-3.

#### 4.2.3 TEST PROCEDURES

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 10 meter open area test site. 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 10 dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10 dB margin would be re-tested one by one using the quasi-peak method or average method as specified and then reported in Data sheet peak mode and QP mode.

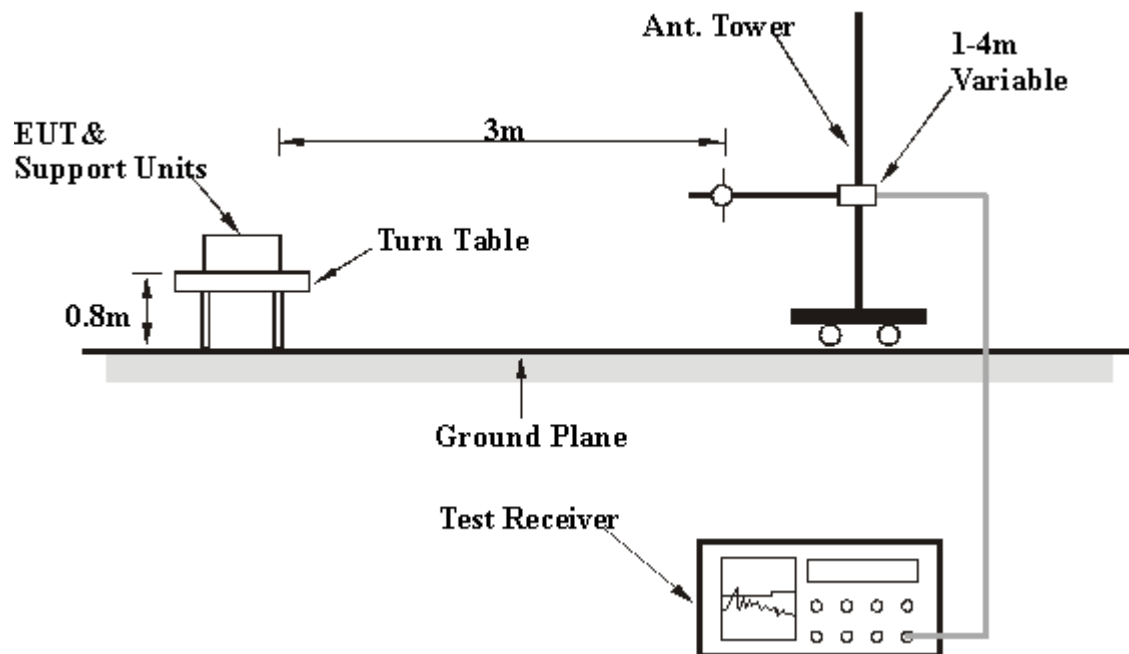
**NOTE:**

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Peak detection (PK) and Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 10 Hz for Average detection (AV) at frequency above 1GHz.

#### 4.2.4 DEVIATION FROM TEST STANDARD

No deviation

#### 4.2.5 TEST SETUP



For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

#### 4.2.6 EUT OPERATING CONDITIONS

1. Connect the EUT with the support unit 1 (Notebook computer) which placed on a testing table.
2. Support unit 1 (Notebook computer) run test program “Dutapiclient\_usb 1.0.1.5” to enable EUT under transmission condition continuously at specific channel frequency.



A D T

**Below 1GHz Test Data**

**4.2.7 TEST RESULTS**

**BELOW 1GHz WORST-CASE DATA : DRAFT 802.11n (20MHz) OFDM MODULATION**

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	Below 1000MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	29deg. C, 65%RH 965 hPa	TESTED BY	Kent Liu

**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	120.00	21.66 QP	43.50	-21.84	1.00 H	308	9.71	11.95
2	240.00	25.33 QP	46.00	-20.67	1.62 H	19	12.00	13.33
3	360.00	33.57 QP	46.00	-12.43	1.92 H	0	16.05	17.52
4	479.99	37.26 QP	46.00	-8.74	1.95 H	1	16.52	20.74
5	800.10	39.32 QP	46.00	-6.68	1.00 H	178	12.69	26.63
6	840.11	37.27 QP	46.00	-8.73	1.00 H	215	10.05	27.22

**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	120.00	26.84 QP	43.50	-16.66	1.32 V	210	14.89	11.95
2	158.02	27.13 QP	43.50	-16.37	1.18 V	302	12.25	14.88
3	201.82	26.62 QP	43.50	-16.88	1.18 V	28	14.69	11.93
4	240.00	22.53 QP	46.00	-23.47	1.51 V	303	9.20	13.33
5	300.00	26.03 QP	46.00	-19.97	1.66 V	184	10.02	16.01
6	333.38	28.11 QP	46.00	-17.89	1.64 V	330	11.26	16.85
7	479.99	34.19 QP	46.00	-11.81	1.77 V	336	13.45	20.74
8	800.10	39.12 QP	46.00	-6.88	1.87 V	196	12.49	26.63

- 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

**Above 1GHz Test Data**

**4.2.8 TEST RESULTS**

**802.11b DSSS MODULATION**

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	26deg. C, 60%RH 965 hPa	TESTED BY	Rex Huang

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	2389.47	59.74 PK	74.00	-14.26	1.30 H	4	29.46	30.28
2	2389.47	47.62 AV	54.00	-6.38	1.30 H	4	17.34	30.28
3	*2412.00	109.60 PK			1.28 H	17	79.24	30.36
4	*2412.00	107.66 AV			1.28 H	17	77.30	30.36
5	4824.00	49.32 PK	74.00	-24.68	1.90 H	46	12.53	36.79
6	4824.00	46.00 AV	54.00	-8.00	1.90 H	46	9.21	36.79

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	2389.33	58.25 PK	74.00	-15.75	1.11 V	101	27.97	30.28
2	2389.33	46.44 AV	54.00	-7.56	1.11 V	101	16.16	30.28
3	*2412.00	108.58 PK			1.11 V	101	78.22	30.36
4	*2412.00	106.02 AV			1.11 V	101	75.66	30.36
5	4824.00	48.52 PK	74.00	-25.48	1.31 V	77	11.73	36.79
6	4824.00	42.33 AV	54.00	-11.67	1.31 V	77	5.54	36.79

- 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	26deg. C, 60%RH 965 hPa	TESTED BY	Rex Huang

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	112.09 PK			1.18 H	177	81.63	30.46
2	*2437.00	110.02 AV			1.18 H	177	79.56	30.46
3	4874.00	48.40 PK	74.00	-25.60	1.89 H	51	11.48	36.92
4	4874.00	43.41 AV	54.00	-10.59	1.89 H	51	6.49	36.92
5	7311.00	53.79 PK	74.00	-20.21	1.83 H	14	10.65	43.14
6	7311.00	46.93 AV	54.00	-7.07	1.83 H	14	3.79	43.14
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	109.26 PK			1.10 V	102	78.80	30.46
2	*2437.00	107.41 AV			1.10 V	102	76.95	30.46
3	4874.00	47.63 PK	74.00	-26.37	1.32 V	67	10.71	36.92
4	4874.00	41.22 AV	54.00	-12.78	1.32 V	67	4.30	36.92
5	7311.00	54.73 PK	74.00	-19.27	1.30 V	149	11.59	43.14
6	7311.00	47.99 AV	54.00	-6.01	1.30 V	149	4.85	43.14

- 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	26deg. C, 60%RH 965 hPa	TESTED BY	Rex Huang

**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	109.90 PK			1.20 H	175	79.35	30.55
2	*2462.00	107.70 AV			1.20 H	175	77.15	30.55
3	2483.50	61.74 PK	74.00	-12.26	1.22 H	168	31.11	30.63
4	2483.50	53.36 AV	54.00	-0.64	1.22 H	168	22.73	30.63
5	4924.00	47.83 PK	74.00	-26.17	1.91 H	65	10.77	37.06
6	4924.00	41.44 AV	54.00	-12.56	1.91 H	65	4.38	37.06
7	7386.00	51.50 PK	74.00	-22.50	1.62 H	15	8.37	43.13
8	7386.00	42.22 AV	54.00	-11.78	1.62 H	15	-0.91	43.13

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

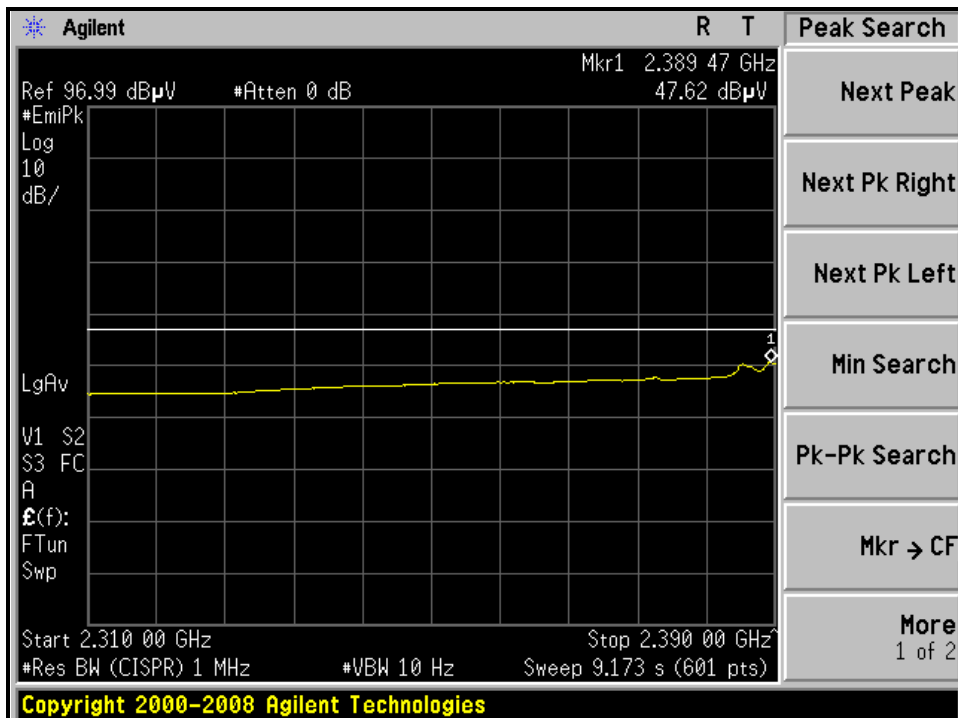
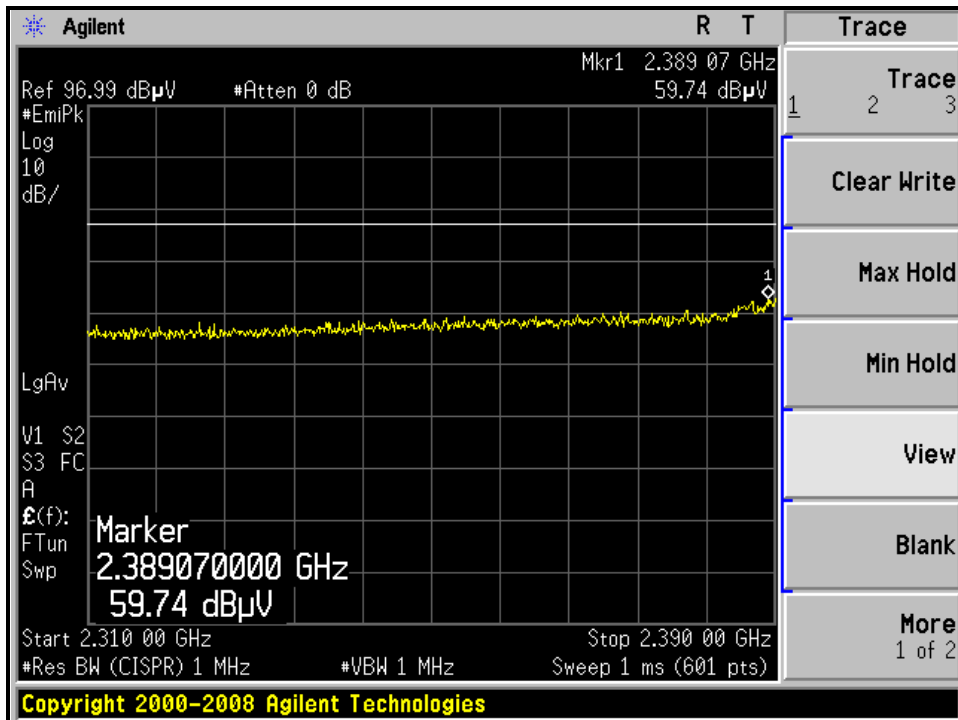
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	109.69 PK			1.12 V	102	79.14	30.55
2	*2462.00	107.15 AV			1.12 V	102	76.60	30.55
3	2483.50	60.57 PK	74.00	-13.43	1.12 V	102	29.94	30.63
4	2483.50	51.37 AV	54.00	-2.63	1.12 V	102	20.74	30.63
5	4924.00	46.81 PK	74.00	-27.19	1.33 V	66	9.75	37.06
6	4924.00	37.57 AV	54.00	-16.43	1.33 V	66	0.51	37.06
7	7386.00	52.26 PK	74.00	-21.74	1.28 V	149	9.13	43.13
8	7386.00	42.41 AV	54.00	-11.59	1.28 V	149	-0.72	43.13

- 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

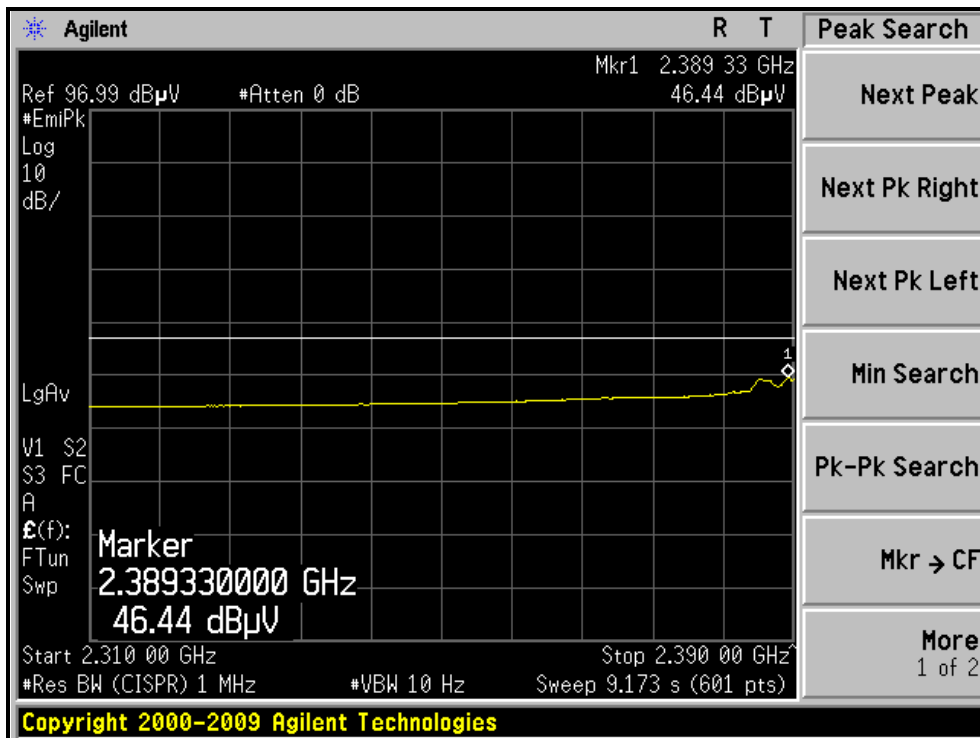
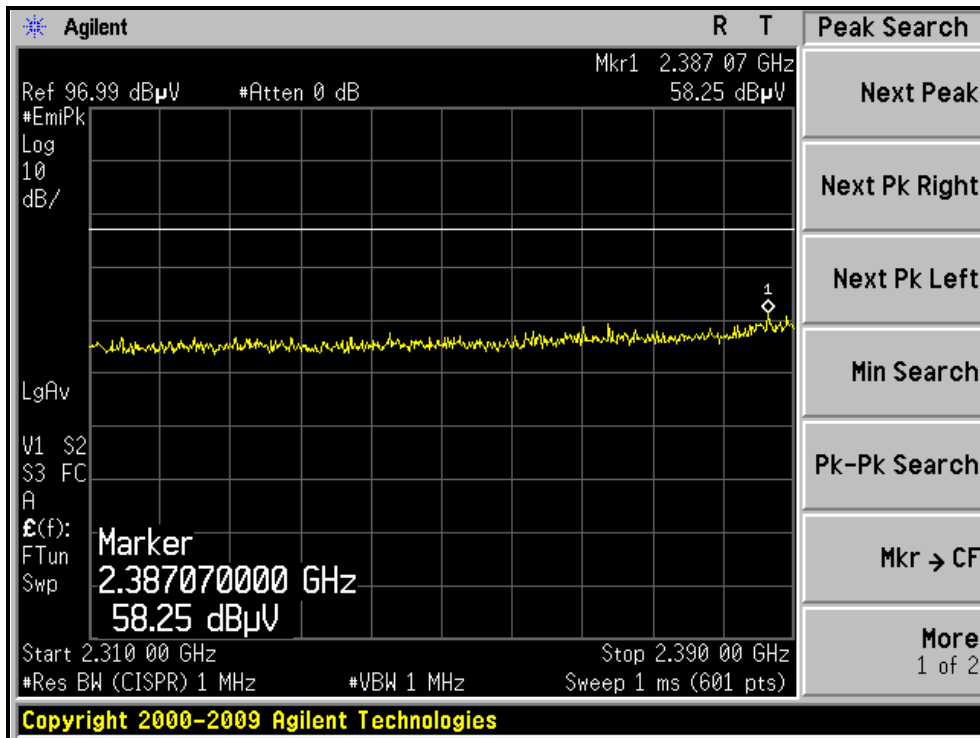
RESTRICTED BANDEDGE (802.11b MODE, CH1, HORIZONTAL )





A D T

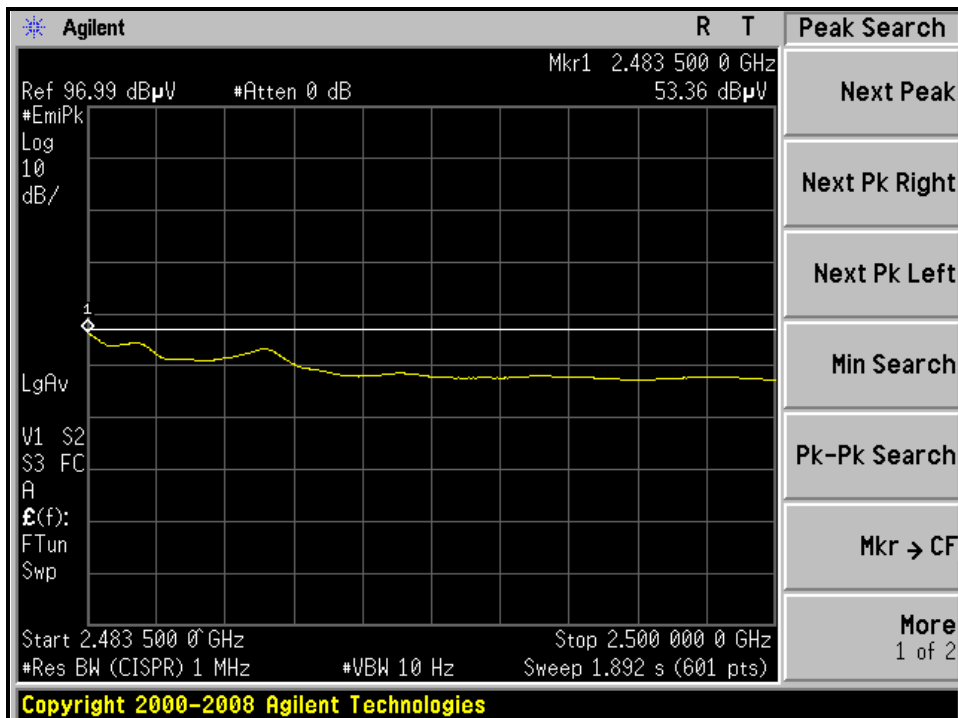
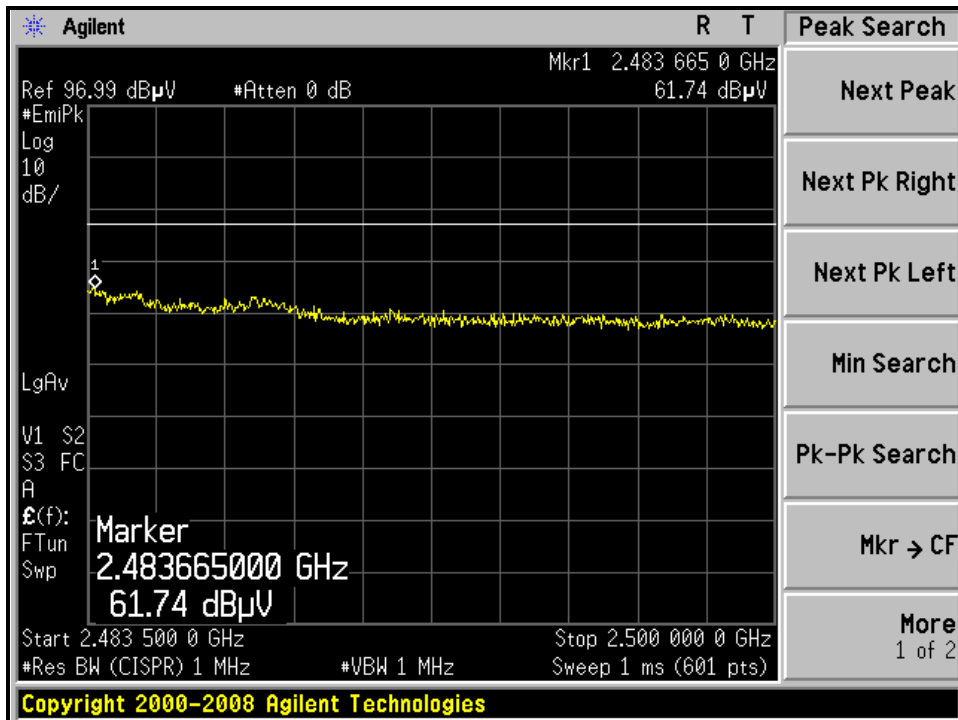
RESTRICTED BANDEDGE (802.11b MODE, CH1, VERTICAL )





A D T

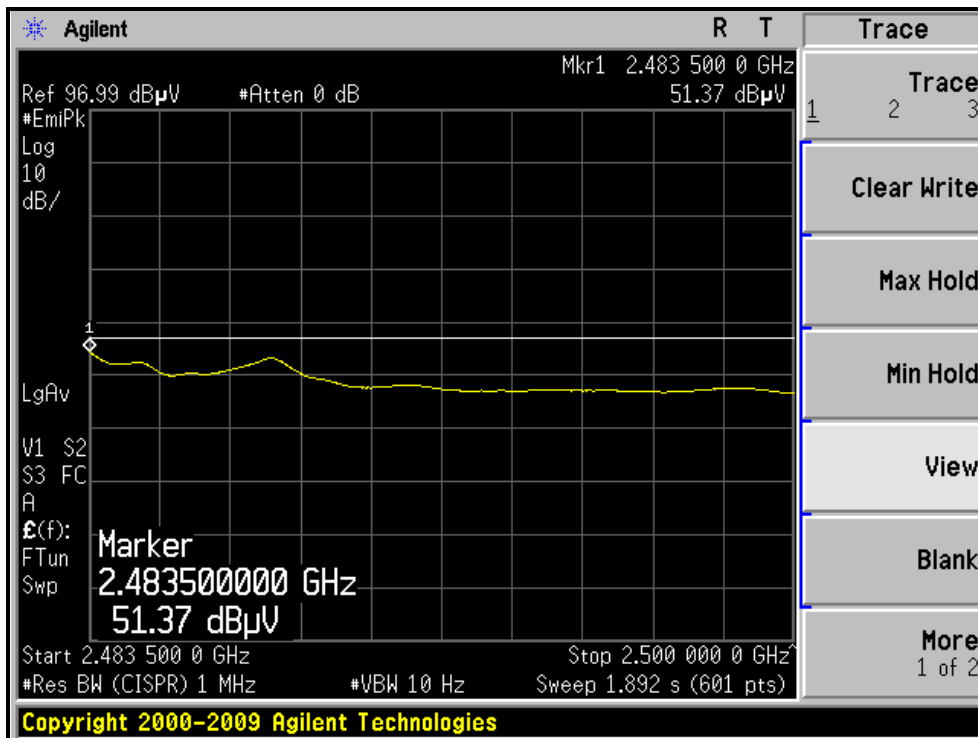
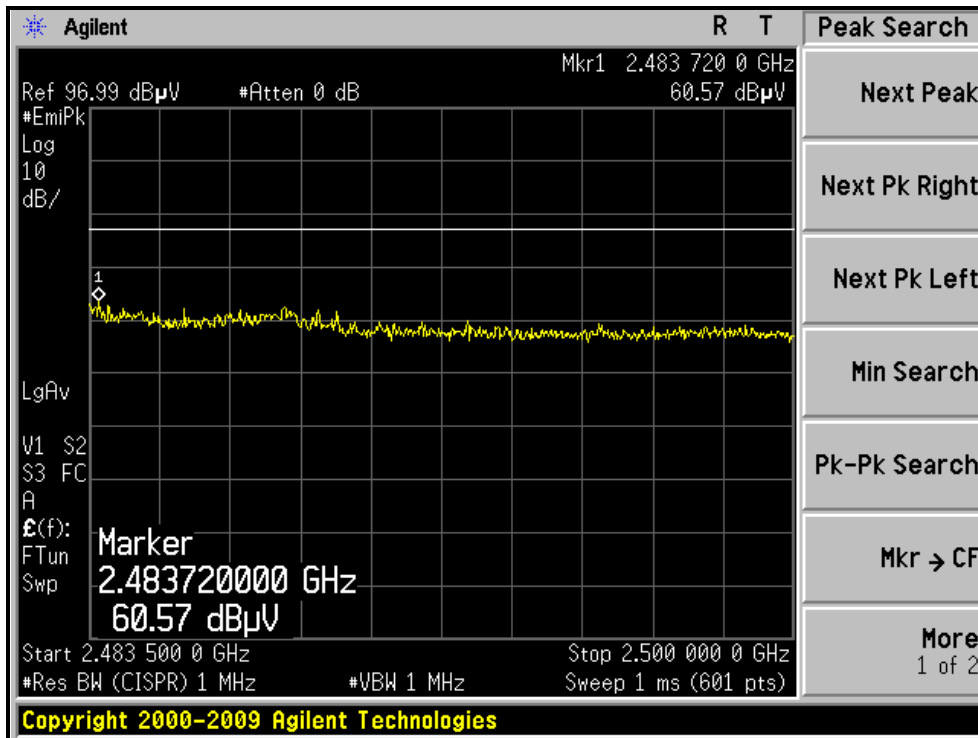
RESTRICTED BANDEDGE (802.11b MODE,CH11, HORIZONTAL )





A D T

RESTRICTED BANDEDGE (802.11b MODE,CH11, VERTICAL )





A D T

**802.11g OFDM MODULATION**

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	26deg. C, 60%RH 965 hPa	TESTED BY	Rex Huang

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	72.80 PK	74.00	-1.20	1.00 H	33	42.52	30.28
2	2390.00	52.53 AV	54.00	-1.47	1.00 H	33	22.25	30.28
3	*2412.00	110.68 PK			1.00 H	35	80.32	30.36
4	*2412.00	102.70 AV			1.00 H	35	72.34	30.36
5	4824.00	46.63 PK	74.00	-27.37	1.87 H	21	9.84	36.79
6	4824.00	33.09 AV	54.00	-20.91	1.87 H	21	-3.70	36.79
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	67.73 PK	74.00	-6.27	1.11 V	102	37.45	30.28
2	2390.00	49.57 AV	54.00	-4.43	1.11 V	102	19.29	30.28
3	*2412.00	105.47 PK			1.11 V	102	75.11	30.36
4	*2412.00	96.66 AV			1.11 V	102	66.30	30.36
5	4824.00	45.52 PK	74.00	-28.48	1.30 V	80	8.73	36.79
6	4824.00	32.67 AV	54.00	-21.33	1.30 V	80	-4.12	36.79

- 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	26deg. C, 60%RH 965 hPa	TESTED BY	Rex Huang

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	109.83 PK			1.18 H	180	79.37	30.46
2	*2437.00	101.27 AV			1.18 H	180	70.81	30.46
3	2483.69	60.41 PK	74.00	-13.59	1.23 H	169	29.78	30.63
4	2483.69	47.71 AV	54.00	-6.29	1.23 H	169	17.08	30.63
5	4874.00	46.65 PK	74.00	-27.35	1.54 H	36	9.73	36.92
6	4874.00	33.60 AV	54.00	-20.40	1.54 H	36	-3.32	36.92
7	7311.00	52.60 PK	74.00	-21.40	1.67 H	16	9.46	43.14
8	7311.00	40.20 AV	54.00	-13.80	1.67 H	16	-2.94	43.14
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	109.14 PK			1.00 V	273	78.68	30.46
2	*2437.00	100.14 AV			1.00 V	273	69.68	30.46
3	4874.00	45.69 PK	74.00	-28.31	1.32 V	74	8.77	36.92
4	4874.00	32.74 AV	54.00	-21.26	1.32 V	74	-4.18	36.92
5	7311.00	51.23 PK	74.00	-22.77	1.31 V	152	8.09	43.14
6	7311.00	38.89 AV	54.00	-15.11	1.31 V	152	-4.25	43.14

- 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	26deg. C, 60%RH 965 hPa	TESTED BY	Rex Huang

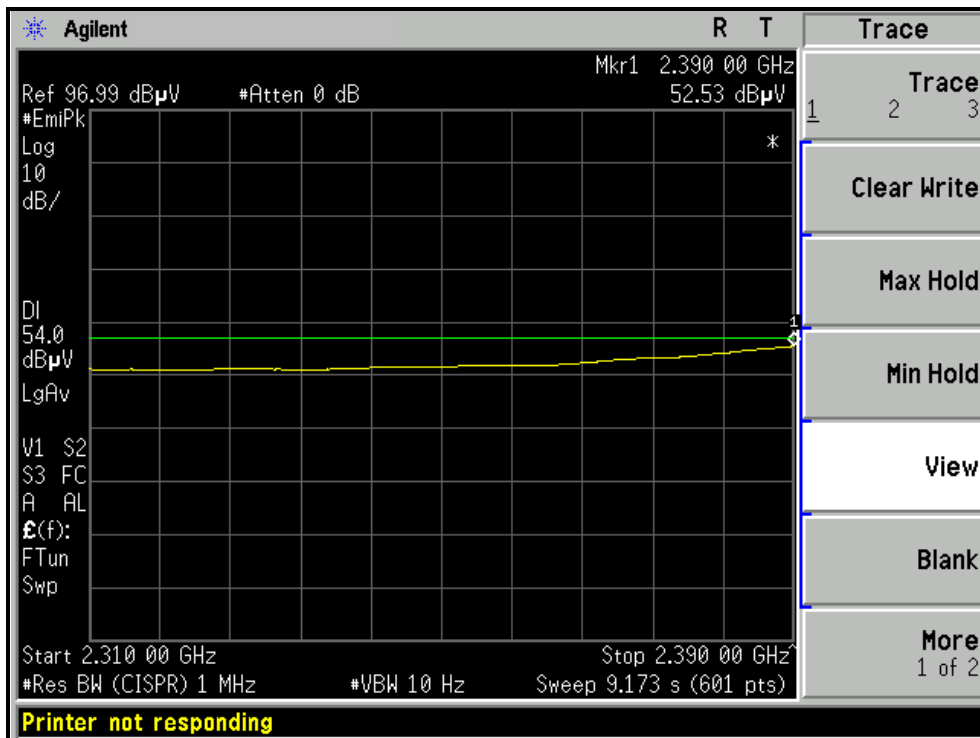
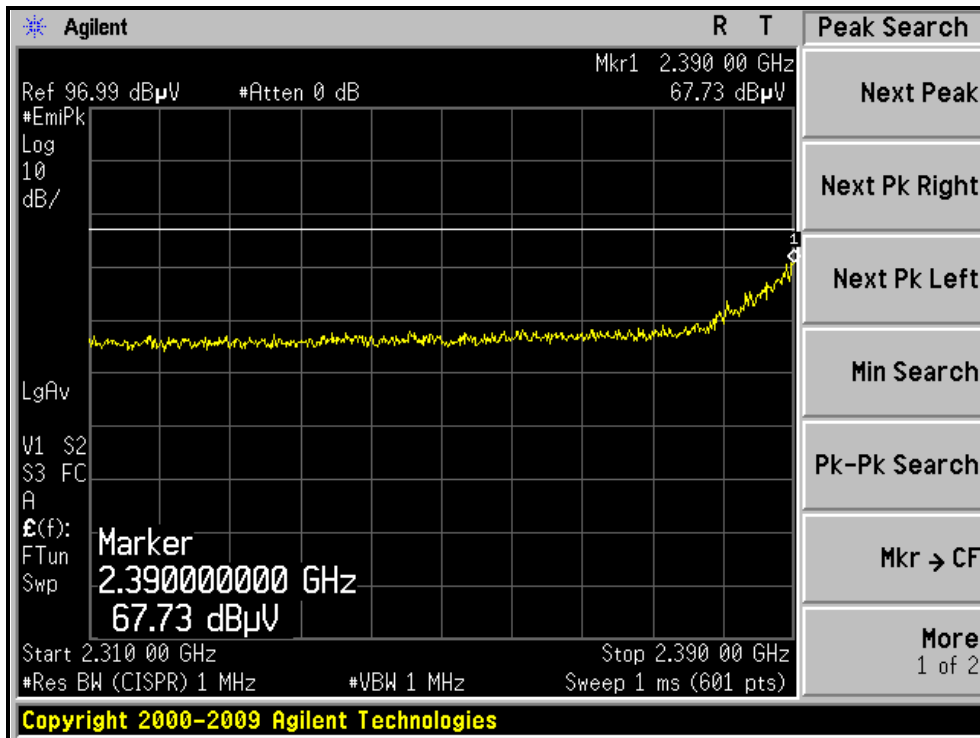
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	108.43 PK			1.00 H	37	77.88	30.55
2	*2462.00	99.88 AV			1.00 H	37	69.33	30.55
3	2483.50	70.52 PK	74.00	-3.48	1.00 H	36	39.89	30.63
4	2483.50	51.48 AV	54.00	-2.52	1.00 H	36	20.85	30.63
5	4924.00	46.84 PK	74.00	-27.16	1.74 H	13	9.78	37.06
6	4924.00	33.27 AV	54.00	-20.73	1.74 H	13	-3.79	37.06
7	7386.00	52.71 PK	74.00	-21.29	1.56 H	22	9.58	43.13
8	7386.00	40.47 AV	54.00	-13.53	1.56 H	22	-2.66	43.13
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	105.47 PK			1.10 V	102	74.92	30.55
2	*2462.00	96.99 AV			1.10 V	102	66.44	30.55
3	2483.50	68.84 PK	74.00	-5.16	1.09 V	102	38.21	30.63
4	2483.50	49.18 AV	54.00	-4.82	1.09 V	102	18.55	30.63
5	4924.00	46.12 PK	74.00	-27.88	1.27 V	84	9.06	37.06
6	4924.00	32.41 AV	54.00	-21.59	1.27 V	84	-4.65	37.06
7	7386.00	51.40 PK	74.00	-22.60	1.29 V	147	8.27	43.13
8	7386.00	38.18 AV	54.00	-15.82	1.29 V	147	-4.95	43.13

- 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

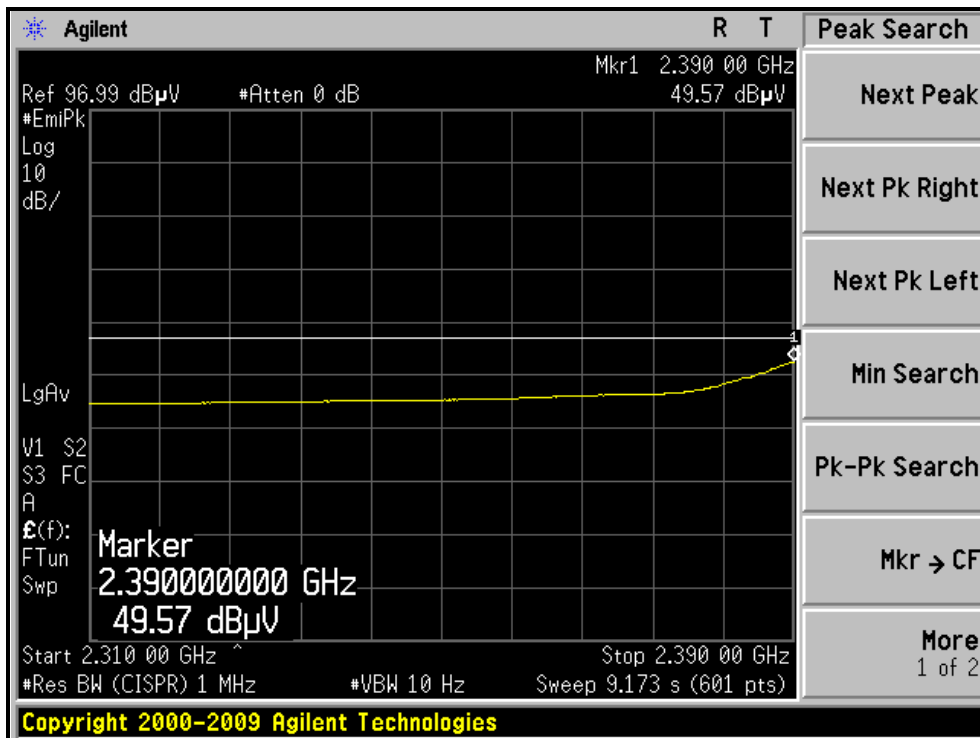
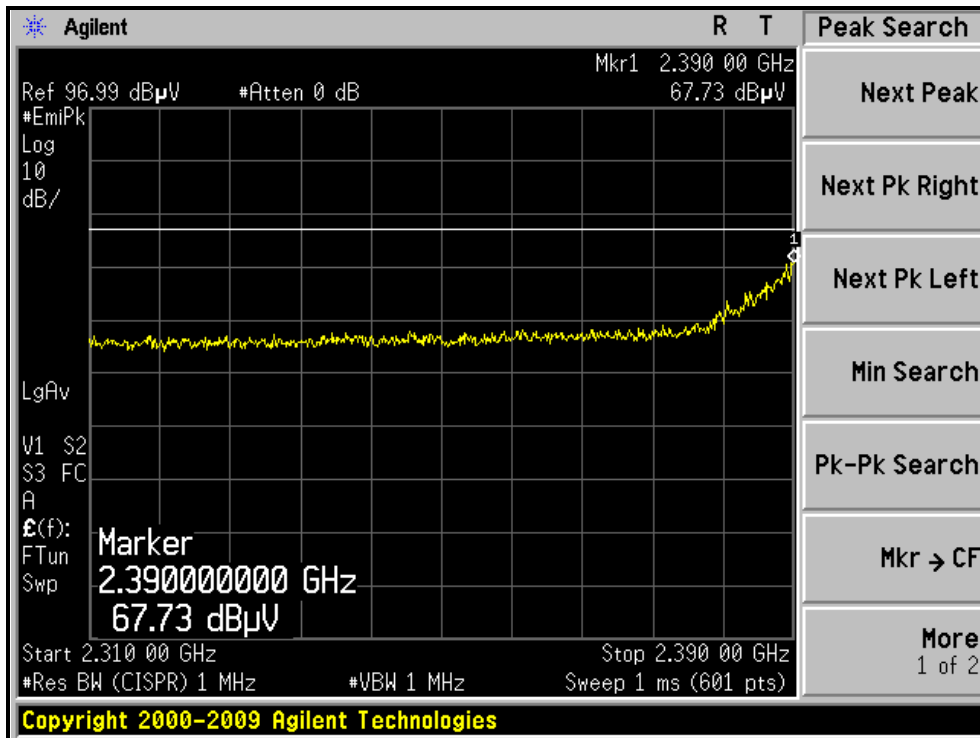
RESTRICTED BANDEDGE (802.11g MODE, CH1, HORIZONTAL )





A D T

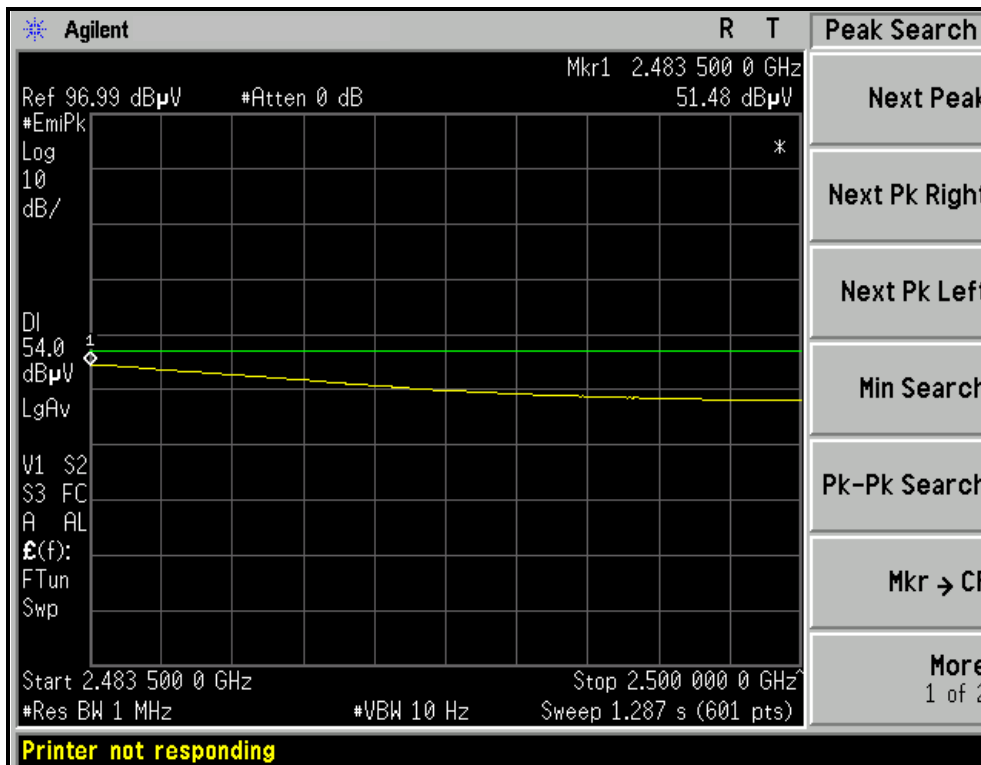
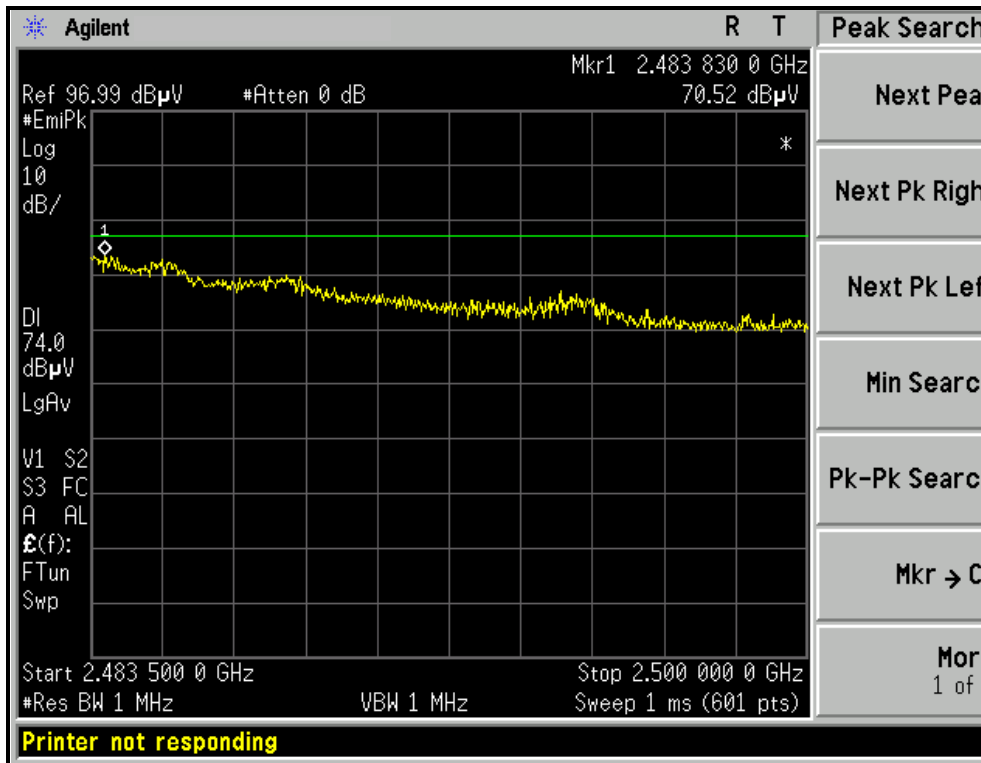
RESTRICTED BANDEDGE (802.11g MODE,CH1, VERTICAL )





A D T

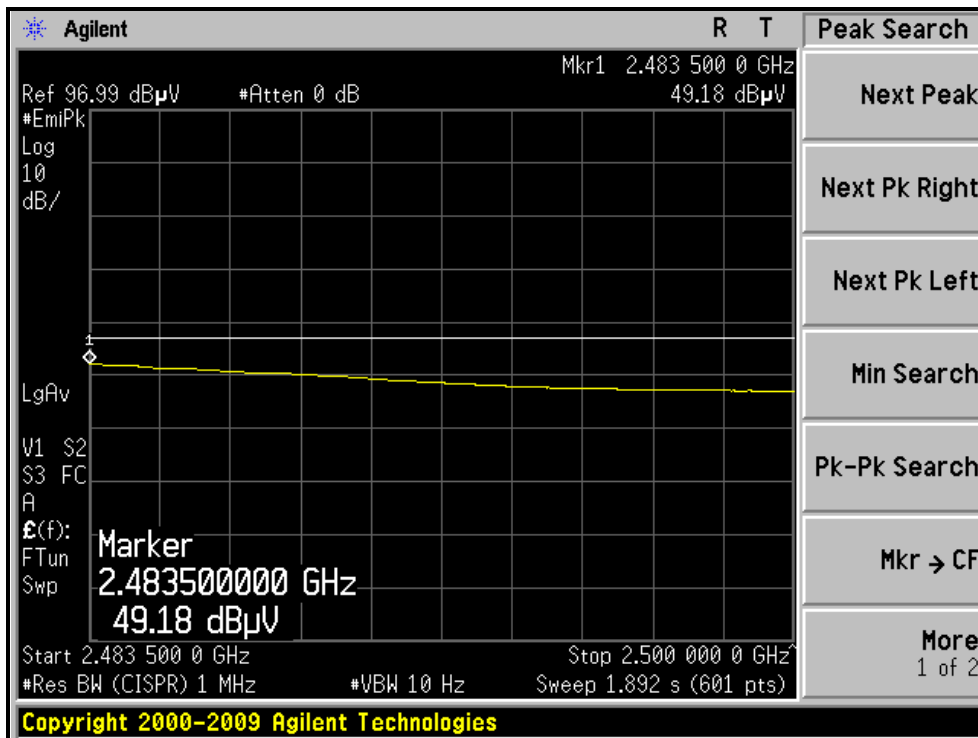
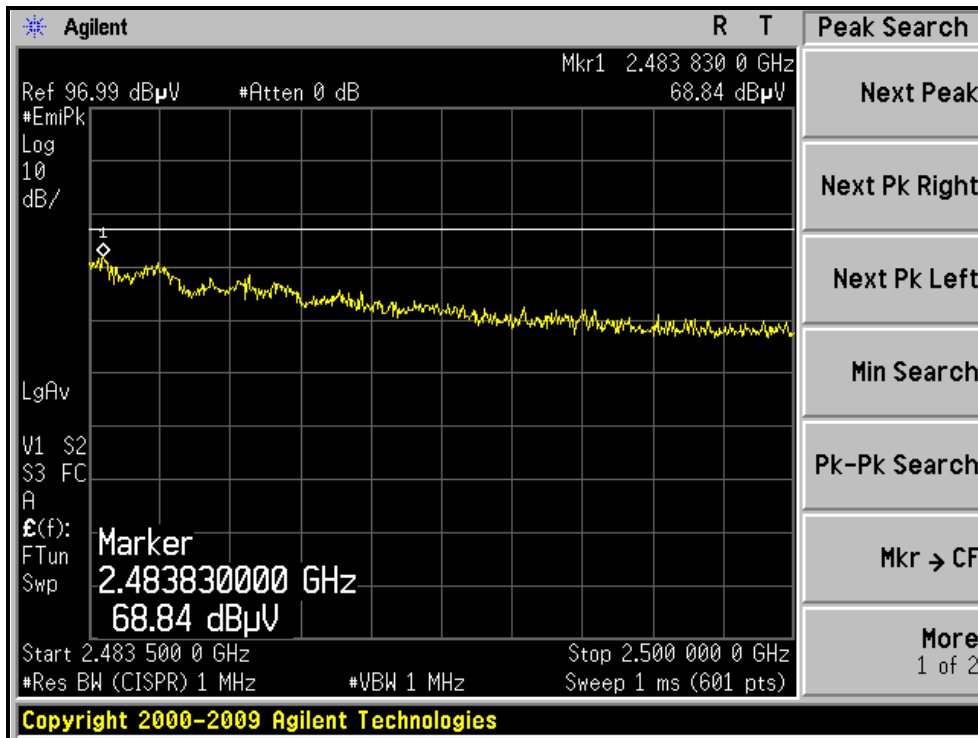
RESTRICTED BANDEDGE (802.11g MODE, CH11, HORIZONTAL )





A D T

RESTRICTED BANDEDGE (802.11g MODE,CH11, VERTICAL )





A D T

### DRAFT 802.11n (20MHz) OFDM MODULATION

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	26deg. C, 60%RH 965 hPa	TESTED BY	Rex Huang

#### 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	72.87 PK	74.00	-1.13	1.00 H	34	42.59	30.28
2	2390.00	52.73 AV	54.00	-1.27	1.00 H	34	22.45	30.28
3	*2412.00	110.88 PK			1.00 H	37	80.52	30.36
4	*2412.00	102.01 AV			1.00 H	37	71.65	30.36
5	4824.00	46.56 PK	74.00	-27.44	1.89 H	17	9.77	36.79
6	4824.00	32.77 AV	54.00	-21.23	1.89 H	17	-4.02	36.79

#### 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	70.30 PK	74.00	-3.70	1.09 V	102	40.02	30.28
2	2390.00	50.52 AV	54.00	-3.48	1.09 V	102	20.24	30.28
3	*2412.00	105.21 PK			1.09 V	102	74.85	30.36
4	*2412.00	96.23 AV			1.09 V	102	65.87	30.36
5	4824.00	45.24 PK	74.00	-28.76	1.34 V	76	8.45	36.79
6	4824.00	32.41 AV	54.00	-21.59	1.34 V	76	-4.38	36.79

- 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	26deg. C, 60%RH 965 hPa	TESTED BY	Rex Huang

**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	110.26 PK			1.18 H	180	79.80	30.46
2	*2437.00	100.76 AV			1.18 H	180	70.30	30.46
3	2483.97	64.40 PK	74.00	-9.60	1.23 H	168	33.77	30.63
4	2483.97	47.89 AV	54.00	-6.11	1.23 H	168	17.26	30.63
5	4874.00	46.48 PK	74.00	-27.52	1.24 H	111	9.56	36.92
6	4874.00	33.50 AV	54.00	-20.50	1.24 H	111	-3.42	36.92
7	7311.00	52.50 PK	74.00	-21.50	1.67 H	16	9.36	43.14
8	7311.00	39.82 AV	54.00	-14.18	1.67 H	16	-3.32	43.14

**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	106.63 PK			1.10 V	102	76.17	30.46
2	*2437.00	98.68 AV			1.10 V	102	68.22	30.46
3	4874.00	45.73 PK	74.00	-28.27	1.31 V	81	8.81	36.92
4	4874.00	32.62 AV	54.00	-21.38	1.31 V	81	-4.30	36.92
5	7311.00	51.47 PK	74.00	-22.53	1.29 V	147	8.33	43.14
6	7311.00	39.02 AV	54.00	-14.98	1.29 V	147	-4.12	43.14

- 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	26deg. C, 60%RH 965 hPa	TESTED BY	Rex Huang

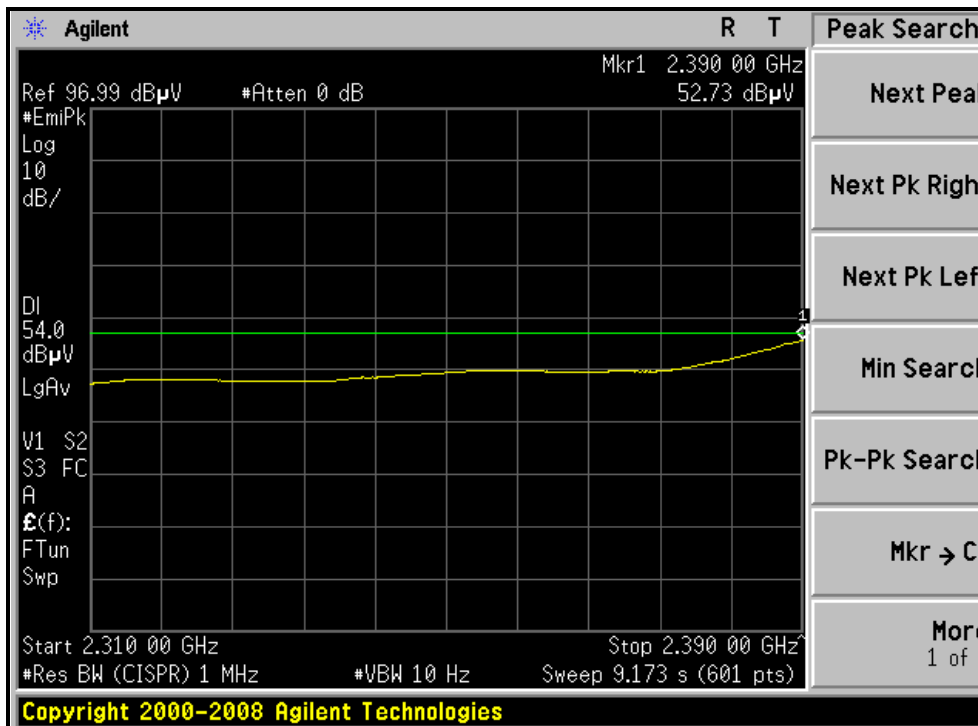
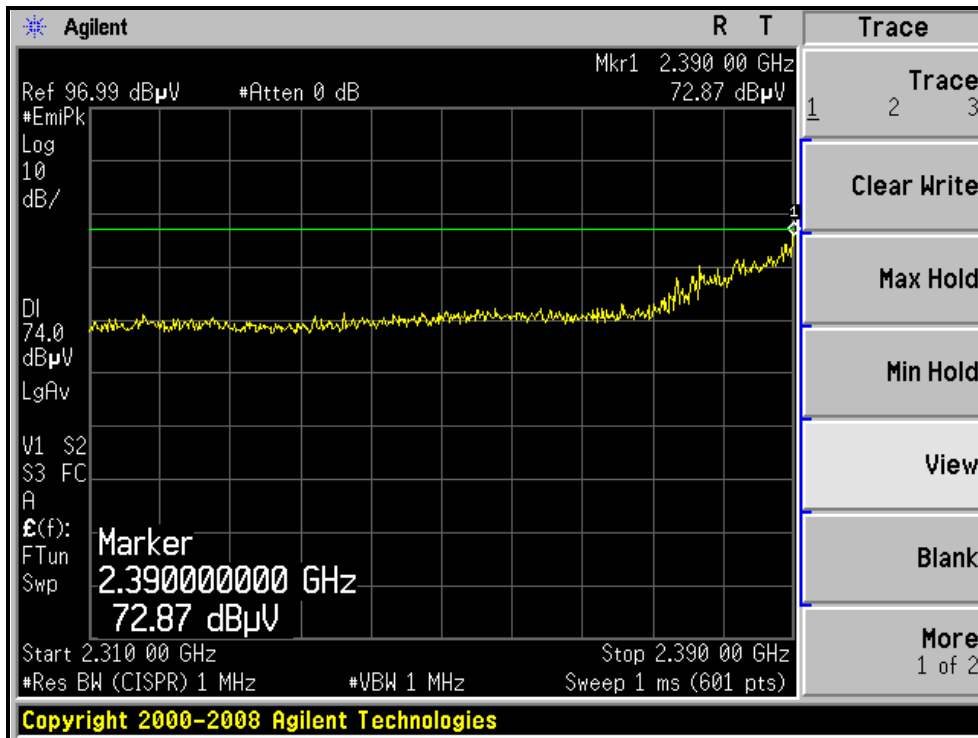
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	108.60 PK			1.00 H	37	78.05	30.55
2	*2462.00	99.69 AV			1.00 H	37	69.14	30.55
3	2483.50	72.27 PK	74.00	-1.73	1.00 H	34	41.64	30.63
4	2483.50	52.12 AV	54.00	-1.88	1.00 H	34	21.49	30.63
5	4924.00	46.49 PK	74.00	-27.51	1.43 H	69	9.43	37.06
6	4924.00	32.95 AV	54.00	-21.05	1.43 H	69	-4.11	37.06
7	7386.00	52.47 PK	74.00	-21.53	1.53 H	46	9.34	43.13
8	7386.00	39.24 AV	54.00	-14.76	1.53 H	46	-3.89	43.13
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	106.09 PK			1.12 V	103	75.54	30.55
2	*2462.00	97.01 AV			1.12 V	103	66.46	30.55
3	2483.50	69.67 PK	74.00	-4.33	1.10 V	103	39.04	30.63
4	2483.50	50.27 AV	54.00	-3.73	1.10 V	103	19.64	30.63
5	4924.00	45.61 PK	74.00	-28.39	1.32 V	78	8.55	37.06
6	4924.00	32.58 AV	54.00	-21.42	1.32 V	78	-4.48	37.06
7	7386.00	51.57 PK	74.00	-22.43	1.30 V	154	8.44	43.13
8	7386.00	38.27 AV	54.00	-15.73	1.30 V	154	-4.86	43.13

- 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

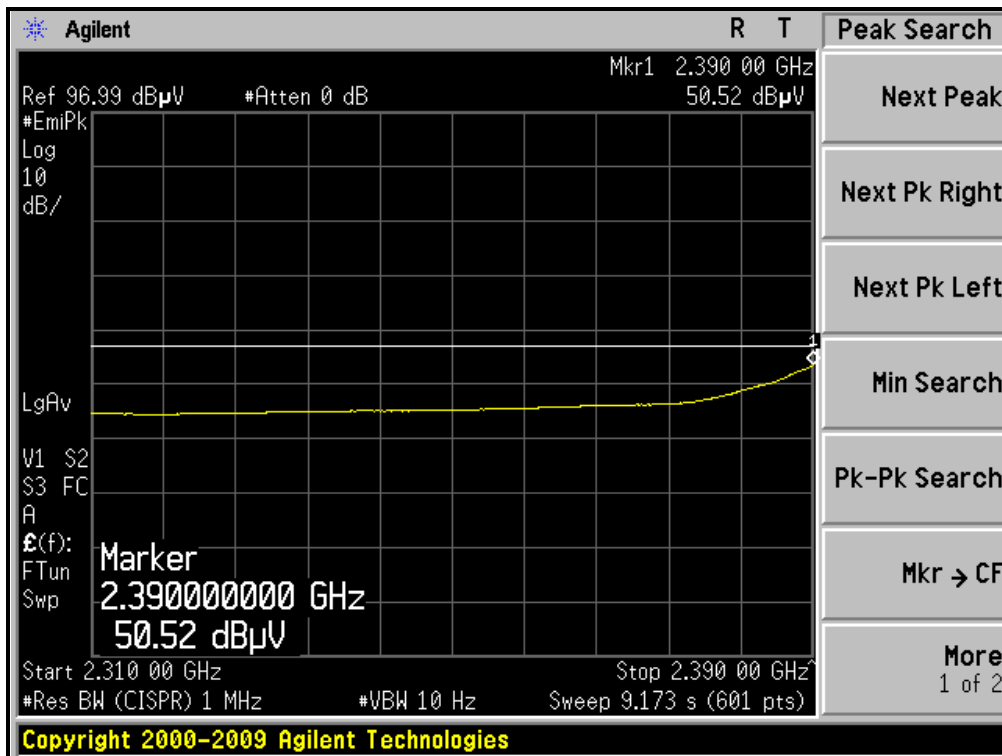
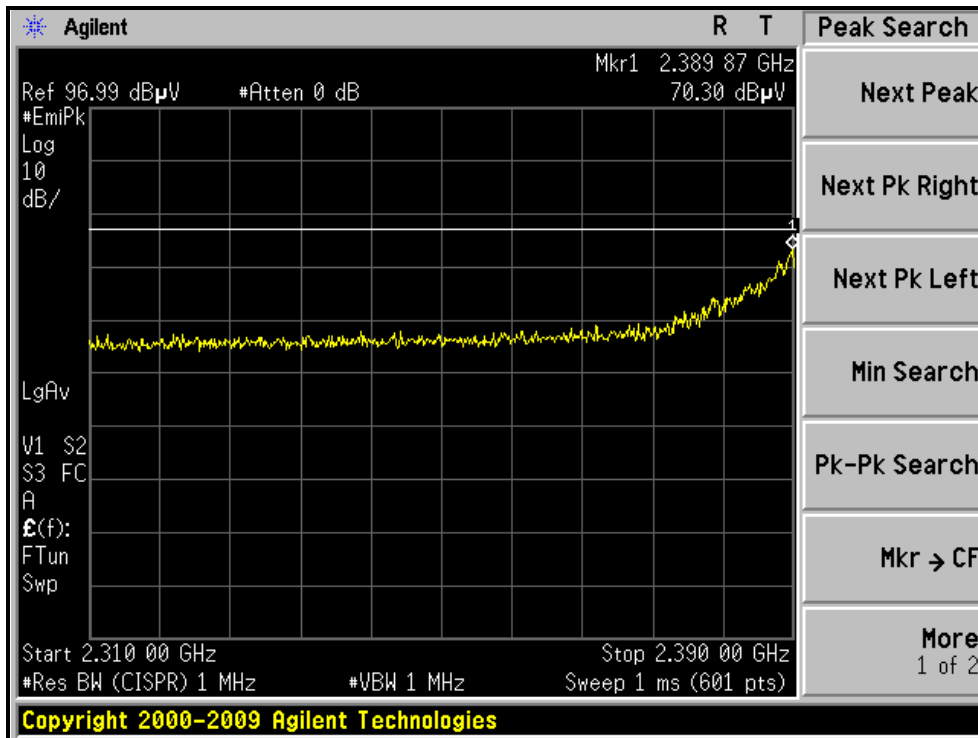
RESTRICTED BANDEDGE (DRAFT 802.11n (20MHz) MODE, CH1, HORIZONTAL )





A D T

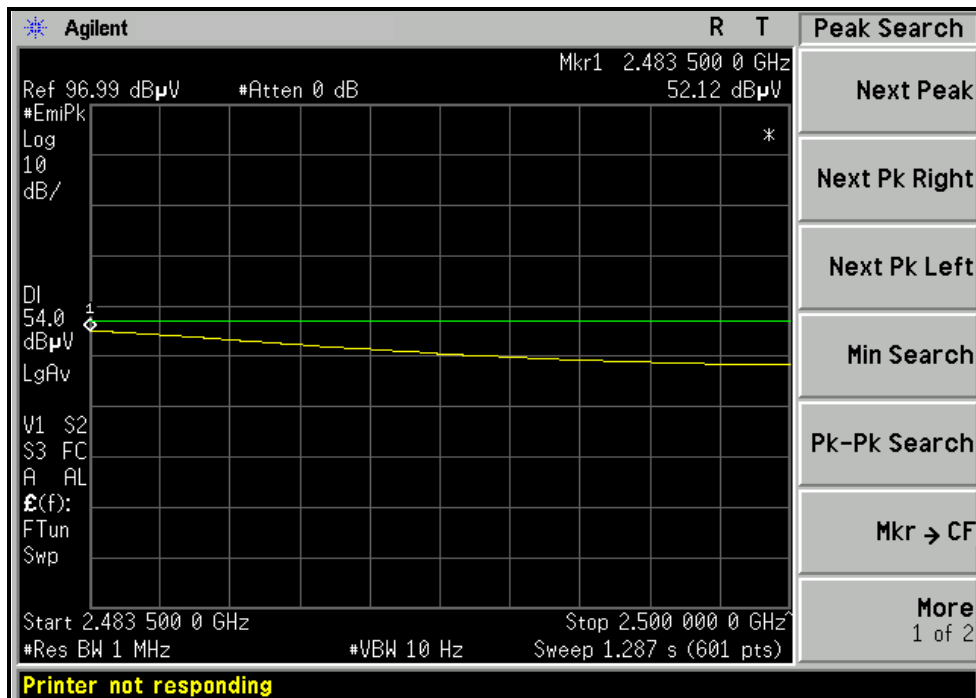
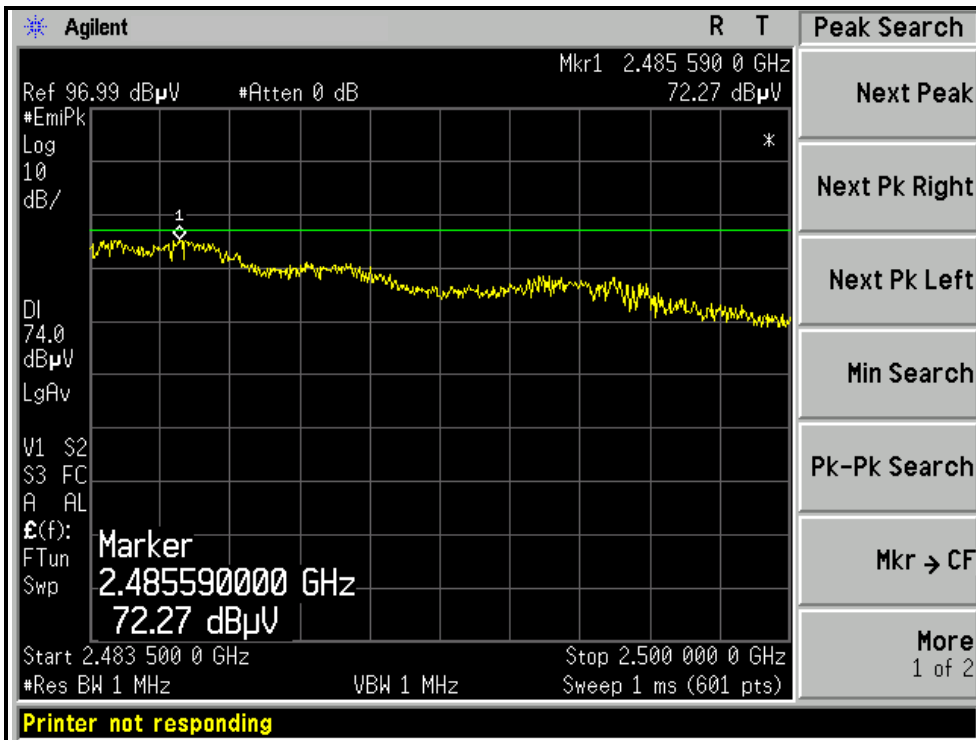
RESTRICTED BANDEDGE (DRAFT 802.11n (20MHz) MODE,CH1, VERTICAL )





A D T

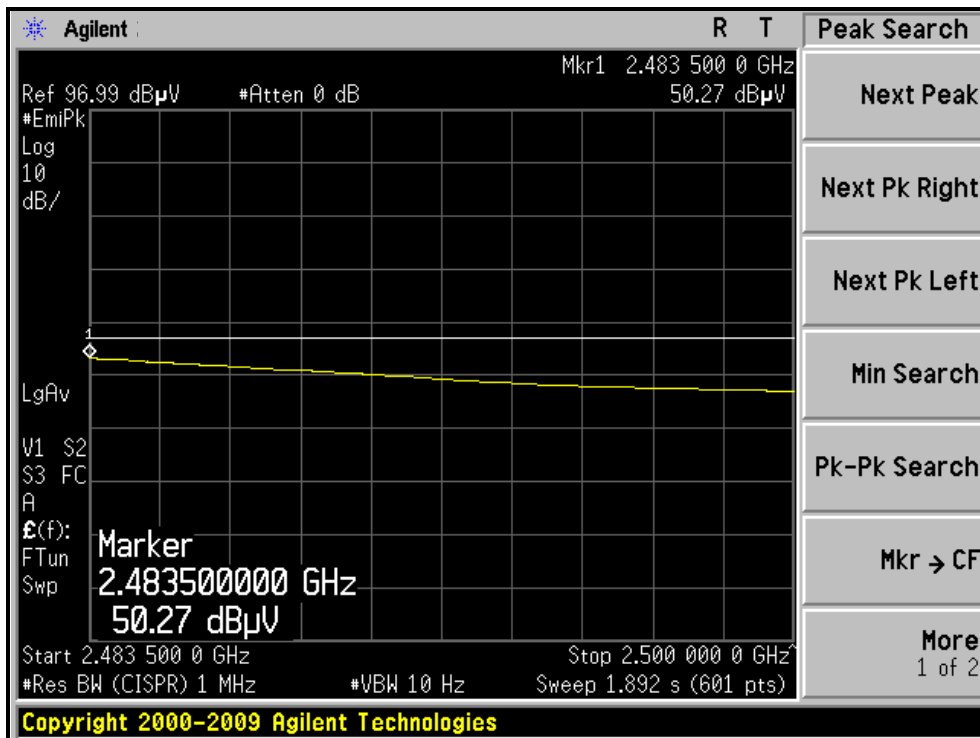
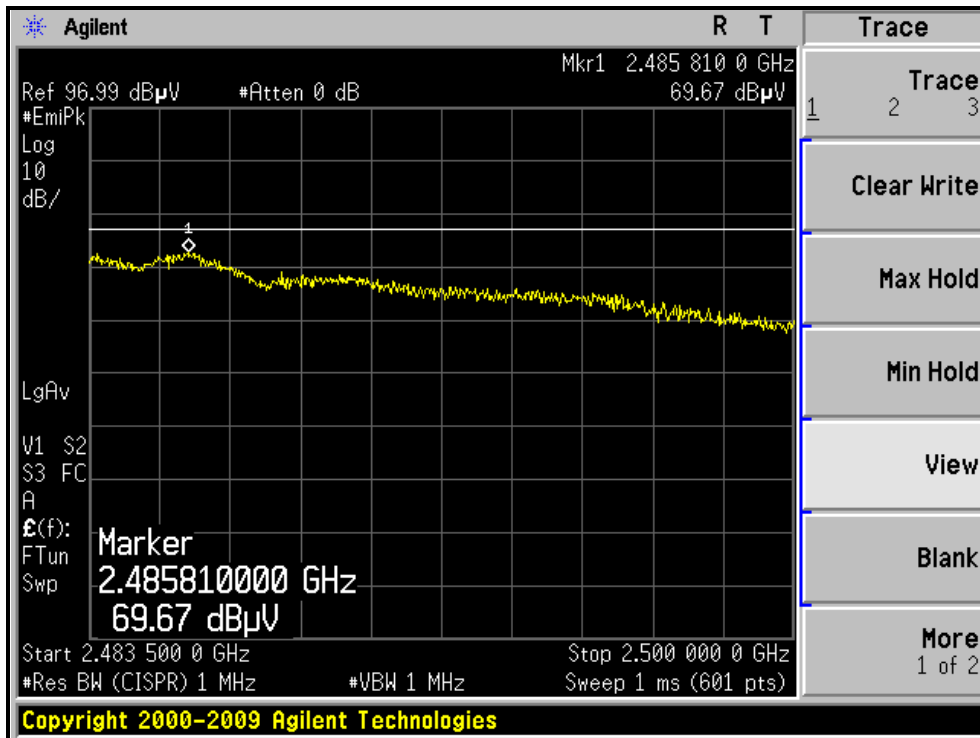
RESTRICTED BANDEDGE (DRAFT 802.11n (20MHz) MODE, CH11, HORIZONTAL )





A D T

RESTRICTED BANDEDGE (DRAFT 802.11n (20MHz) MODE,CH11, VERTICAL )





A D T

**DRAFT 802.11n (40MHz) OFDM MODULATION**

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	26deg. C, 60%RH 965 hPa	TESTED BY	Rex Huang

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	66.03 PK	74.00	-7.97	1.00 H	33	35.75	30.28
2	2390.00	52.79 AV	54.00	-1.21	1.00 H	33	22.51	30.28
3	*2422.00	105.50 PK			1.00 H	36	75.10	30.40
4	*2422.00	95.50 AV			1.00 H	36	65.10	30.40
5	4844.00	45.23 PK	74.00	-28.77	1.89 H	18	8.39	36.84
6	4844.00	32.76 AV	54.00	-21.24	1.89 H	18	-4.08	36.84
7	7266.00	52.02 PK	74.00	-21.98	1.60 H	64	8.88	43.14
8	7266.00	39.01 AV	54.00	-14.99	1.60 H	64	-4.13	43.14
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	63.68 PK	74.00	-10.32	1.09 V	101	33.40	30.28
2	2390.00	49.59 AV	54.00	-4.41	1.09 V	101	19.31	30.28
3	*2422.00	101.09 PK			1.09 V	101	70.69	30.40
4	*2422.00	91.90 AV			1.09 V	101	61.50	30.40
5	4844.00	44.97 PK	74.00	-29.03	1.32 V	84	8.13	36.84
6	4844.00	32.06 AV	54.00	-21.94	1.32 V	84	-4.78	36.84
7	7266.00	51.49 PK	74.00	-22.51	1.28 V	147	8.35	43.14
8	7266.00	38.74 AV	54.00	-15.26	1.28 V	147	-4.40	43.14

- 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 4	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	26deg. C, 60%RH 965 hPa	TESTED BY	Rex Huang

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	69.40 PK	74.00	-4.60	1.00 H	34	39.12	30.28
2	<b>2390.00</b>	<b>53.48 AV</b>	<b>54.00</b>	<b>-0.52</b>	<b>1.00 H</b>	<b>34</b>	<b>23.20</b>	<b>30.28</b>
3	*2437.00	107.55 PK			1.00 H	37	77.09	30.46
4	*2437.00	98.79 AV			1.00 H	37	68.33	30.46
5	2483.50	70.16 PK	74.00	-3.84	1.00 H	35	39.53	30.63
6	2483.50	53.03 AV	54.00	-0.97	1.00 H	35	22.40	30.63
7	4874.00	46.24 PK	74.00	-27.76	1.44 H	83	9.32	36.92
8	4874.00	32.76 AV	54.00	-21.24	1.44 H	83	-4.16	36.92
9	7311.00	52.74 PK	74.00	-21.26	1.53 H	62	9.60	43.14
10	7311.00	39.26 AV	54.00	-14.74	1.53 H	62	-3.88	43.14
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	102.54 PK			1.11 V	103	72.08	30.46
2	*2437.00	94.06 AV			1.11 V	103	63.60	30.46
3	4874.00	45.37 PK	74.00	-28.63	1.32 V	73	8.45	36.92
4	4874.00	32.26 AV	54.00	-21.74	1.32 V	73	-4.66	36.92
5	7311.00	51.66 PK	74.00	-22.34	1.29 V	152	8.52	43.14
6	7311.00	38.81 AV	54.00	-15.19	1.29 V	152	-4.33	43.14

- 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 7	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	26deg. C, 60%RH 965 hPa	TESTED BY	Rex Huang

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	*2452.00	105.05 PK			1.00 H	37	74.54	30.51
2	*2452.00	96.40 AV			1.00 H	37	65.89	30.51
3	2483.50	67.50 PK	74.00	-6.50	1.00 H	36	36.87	30.63
4	2483.50	49.69 AV	54.00	-4.31	1.00 H	36	19.06	30.63
5	4904.00	46.12 PK	74.00	-27.88	1.49 H	78	9.12	37.00
6	4904.00	32.47 AV	54.00	-21.53	1.49 H	78	-4.53	37.00
7	7356.00	52.84 PK	74.00	-21.16	1.57 H	54	9.71	43.13
8	7356.00	39.11 AV	54.00	-14.89	1.57 H	54	-4.02	43.13
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	*2452.00	101.58 PK			1.11 V	102	71.07	30.51
2	*2452.00	92.30 AV			1.11 V	102	61.79	30.51
3	2483.50	65.49 PK	74.00	-8.51	1.11 V	102	34.86	30.63
4	2483.50	47.11 AV	54.00	-6.89	1.11 V	102	16.48	30.63
5	4904.00	45.74 PK	74.00	-28.26	1.31 V	79	8.74	37.00
6	4904.00	32.62 AV	54.00	-21.38	1.31 V	79	-4.38	37.00
7	7356.00	51.65 PK	74.00	-22.35	1.29 V	137	8.52	43.13
8	7356.00	38.43 AV	54.00	-15.57	1.29 V	137	-4.70	43.13

- 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 : DRAFT 802.11n (20MHz) OFDM MODULATION**

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	Below 1000MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	29deg. C, 65%RH 965 hPa	TESTED BY	Kent Liu

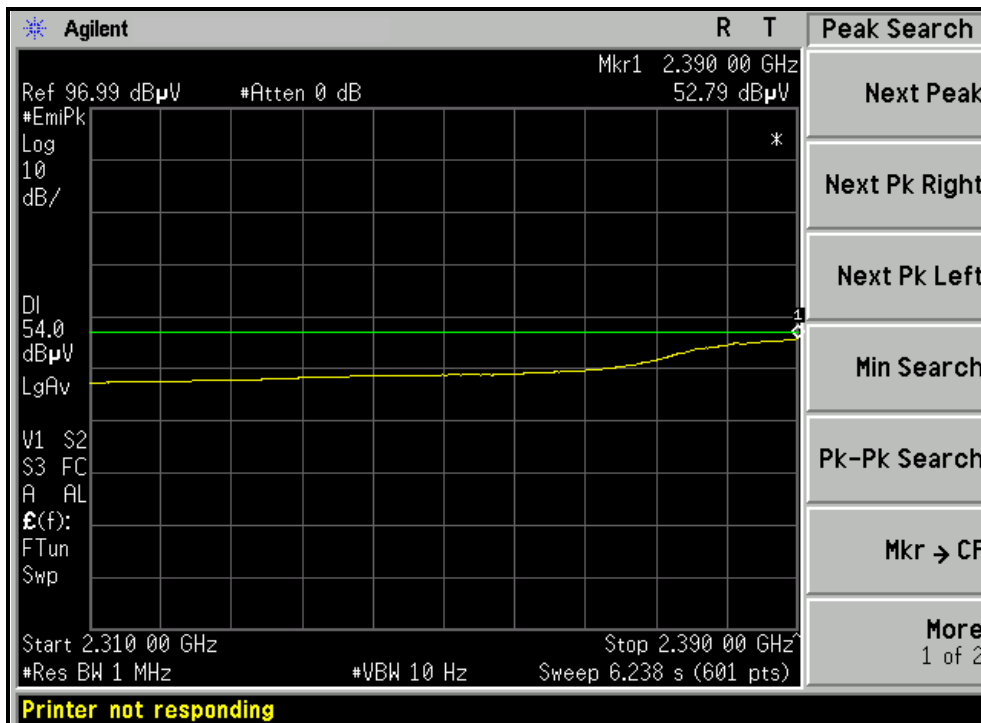
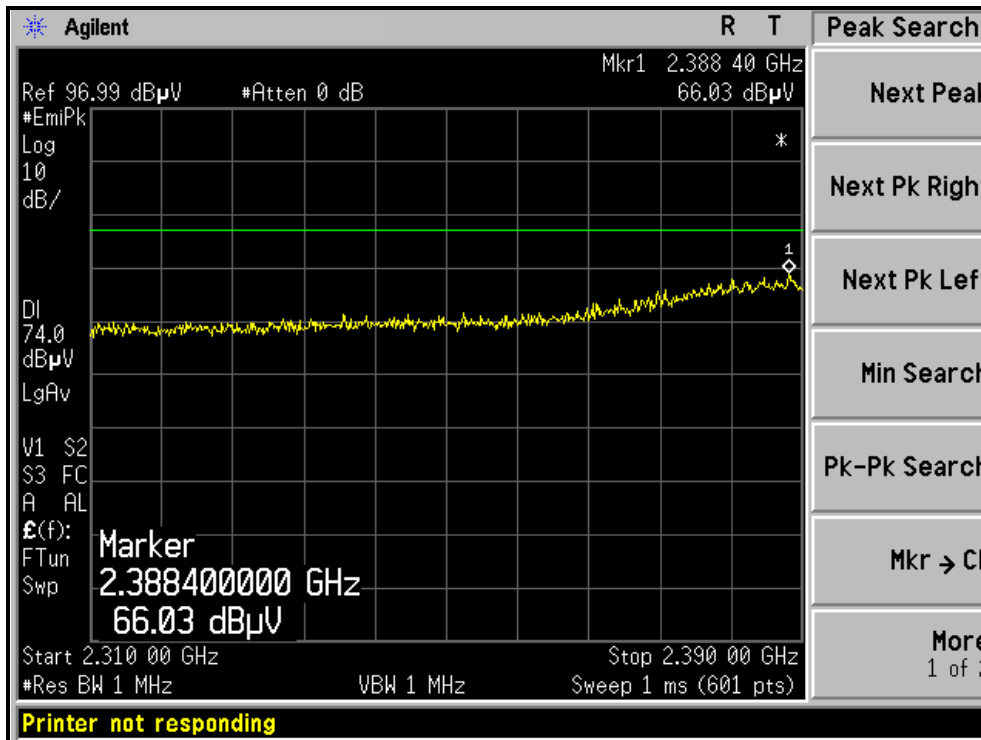
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	120.00	21.66 QP	43.50	-21.84	1.00 H	308	9.71	11.95
2	240.00	25.33 QP	46.00	-20.67	1.62 H	19	12.00	13.33
3	360.00	33.57 QP	46.00	-12.43	1.92 H	0	16.05	17.52
4	479.99	37.26 QP	46.00	-8.74	1.95 H	1	16.52	20.74
5	800.10	39.32 QP	46.00	-6.68	1.00 H	178	12.69	26.63
6	840.11	37.27 QP	46.00	-8.73	1.00 H	215	10.05	27.22
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	120.00	26.84 QP	43.50	-16.66	1.32 V	210	14.89	11.95
2	158.02	27.13 QP	43.50	-16.37	1.18 V	302	12.25	14.88
3	201.82	26.62 QP	43.50	-16.88	1.18 V	28	14.69	11.93
4	240.00	22.53 QP	46.00	-23.47	1.51 V	303	9.20	13.33
5	300.00	26.03 QP	46.00	-19.97	1.66 V	184	10.02	16.01
6	333.38	28.11 QP	46.00	-17.89	1.64 V	330	11.26	16.85
7	479.99	34.19 QP	46.00	-11.81	1.77 V	336	13.45	20.74
8	800.10	39.12 QP	46.00	-6.88	1.87 V	196	12.49	26.63

- 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

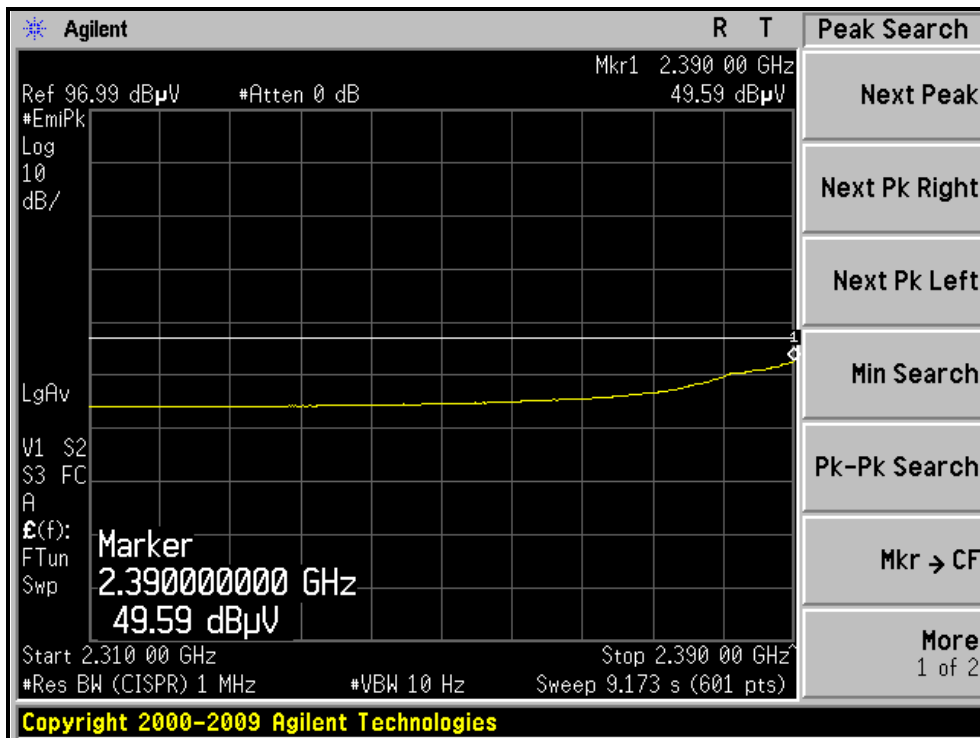
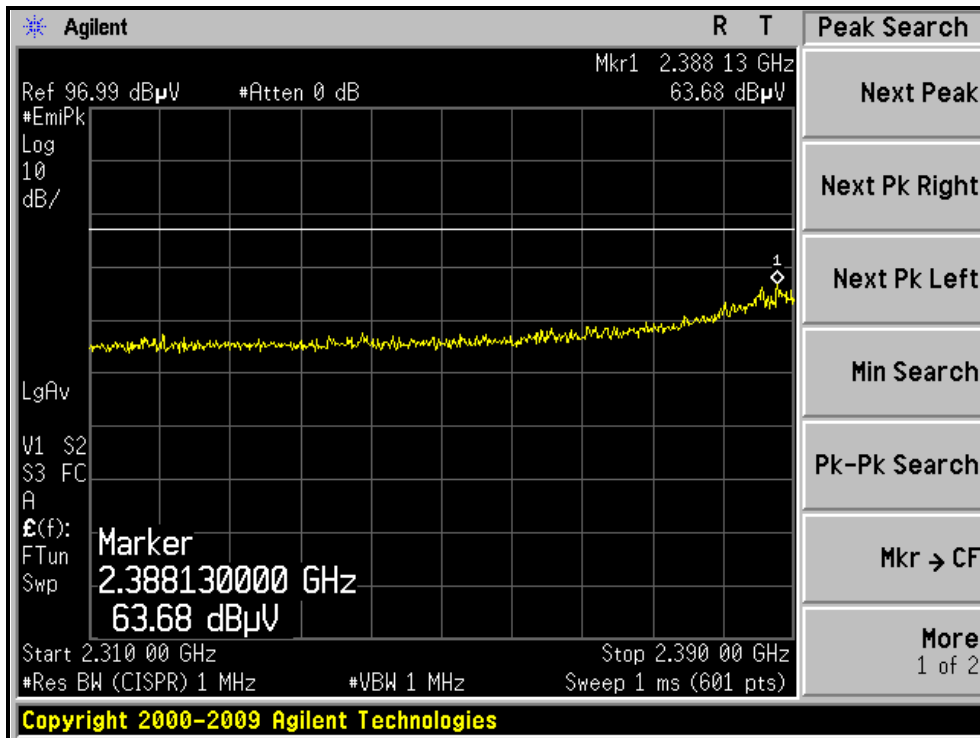
RESTRICTED BANDEDGE (DRAFT 802.11n (40MHz) MODE, CH1, HORIZONTAL )





A D T

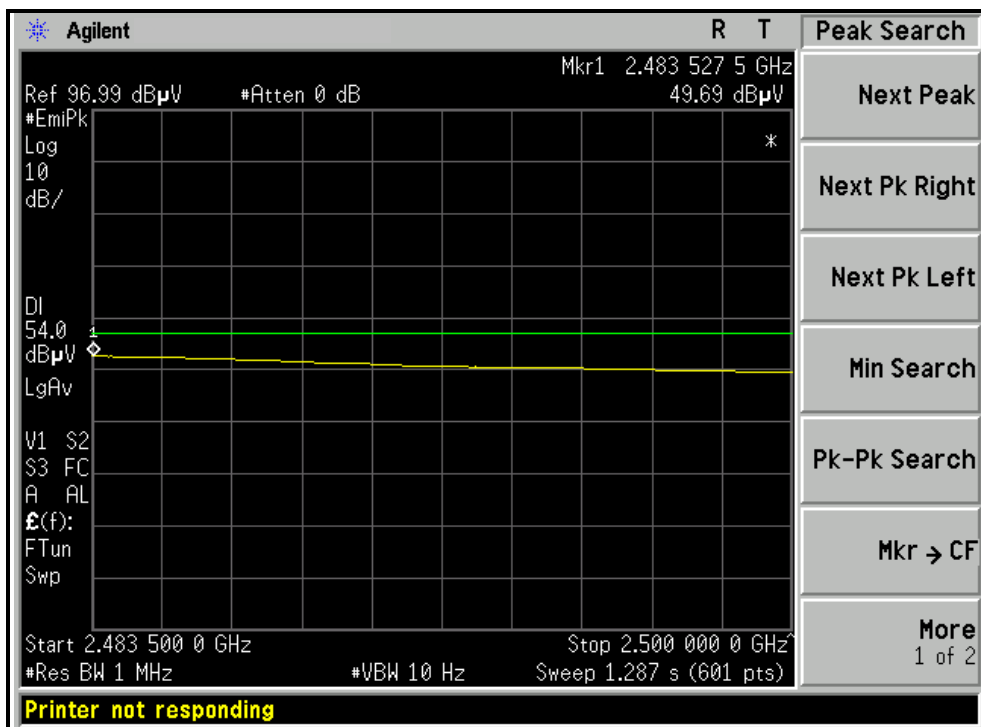
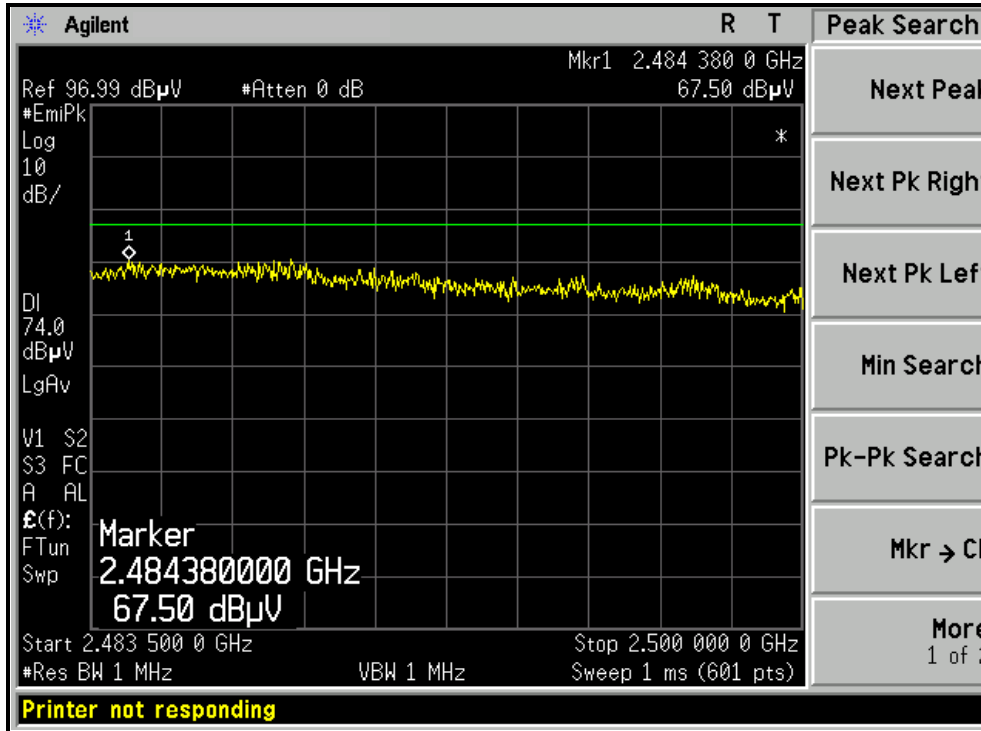
RESTRICTED BANDEDGE (DRAFT 802.11n (40MHz) MODE, CH1, VERTICAL )





A D T

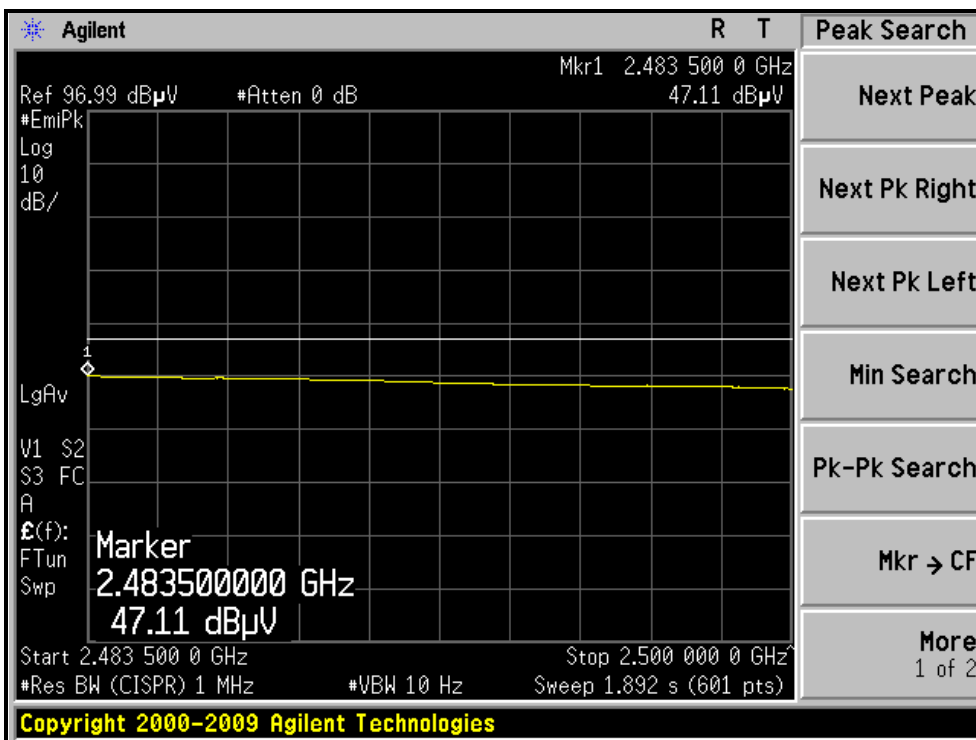
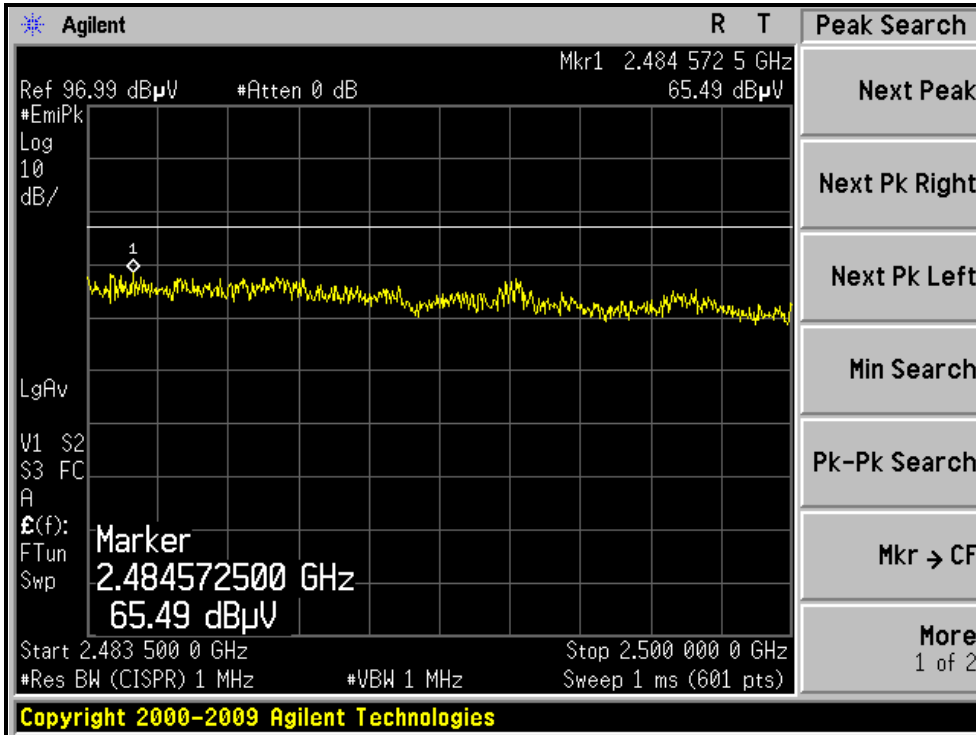
RESTRICTED BANDEDGE (DRAFT 802.11n (40MHz) MODE,CH7, HORIZONTAL )





A D T

RESTRICTED BANDEDGE (DRAFT 802.11n (40MHz) MODE,CH7, VERTICAL )





A D T

### 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 INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
R&S SPECTRUM ANALYZER	FSP40	100037	Aug. 03, 2009	Aug. 02, 2010

**NOTE:**

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

#### 4.3.3 TEST PROCEDURE

The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with 100kHz RBW and 100kHz VBW. The 6dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 6dB.

#### 4.3.4 DEVIATION FROM TEST STANDARD

No deviation

#### 4.3.5 TEST SETUP



#### 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.



A D T

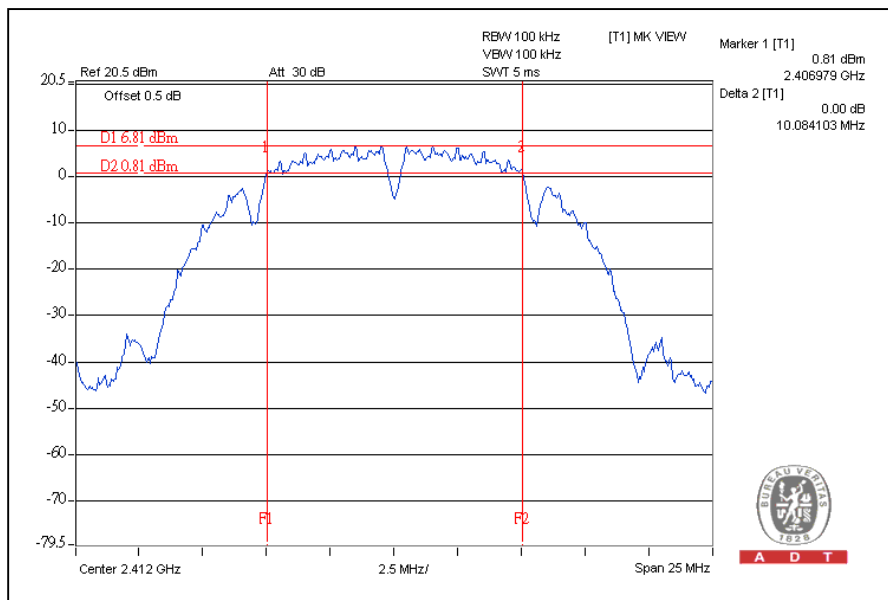
### 4.3.7 TEST RESULTS

#### 802.11b DSSS MODULATION:

<b>MODULATION TYPE</b>	DBPSK	<b>TRANSFER RATE</b>	1Mbps
<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz	<b>ENVIRONMENTAL CONDITIONS</b>	25deg.C, 60%RH, 965hPa
<b>TESTED BY</b>	Eric Lee		

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2412	10.08	0.5	PASS
6	2437	10.11	0.5	PASS
11	2462	10.12	0.5	PASS

CH1

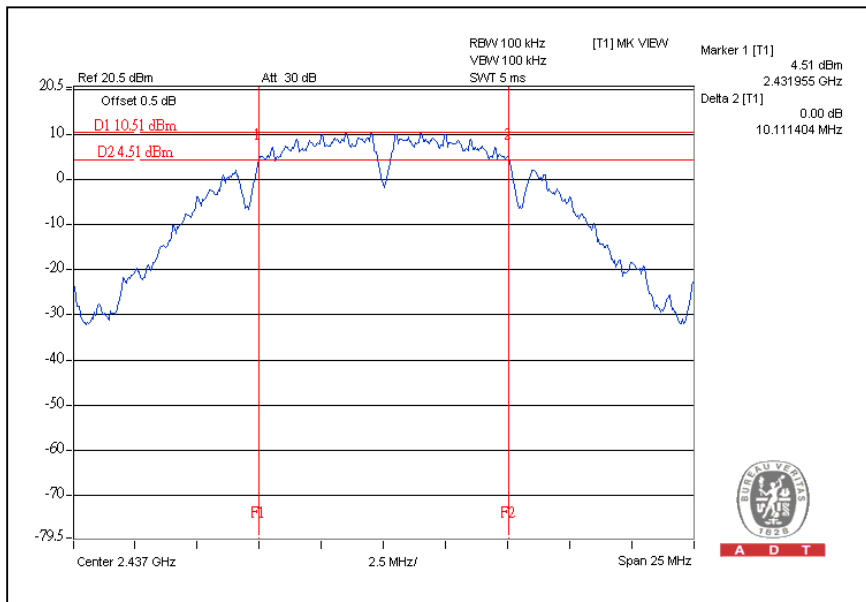




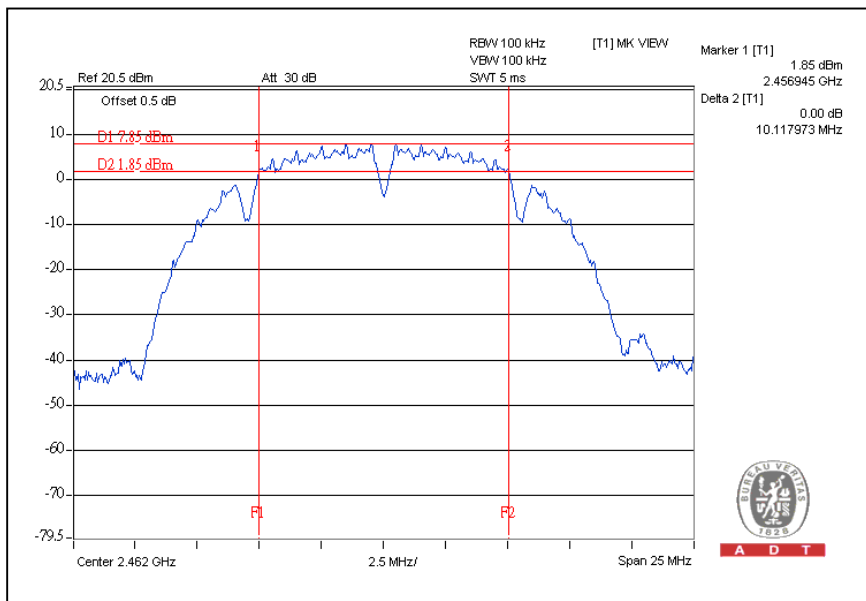


A D T

### CH6



### CH11





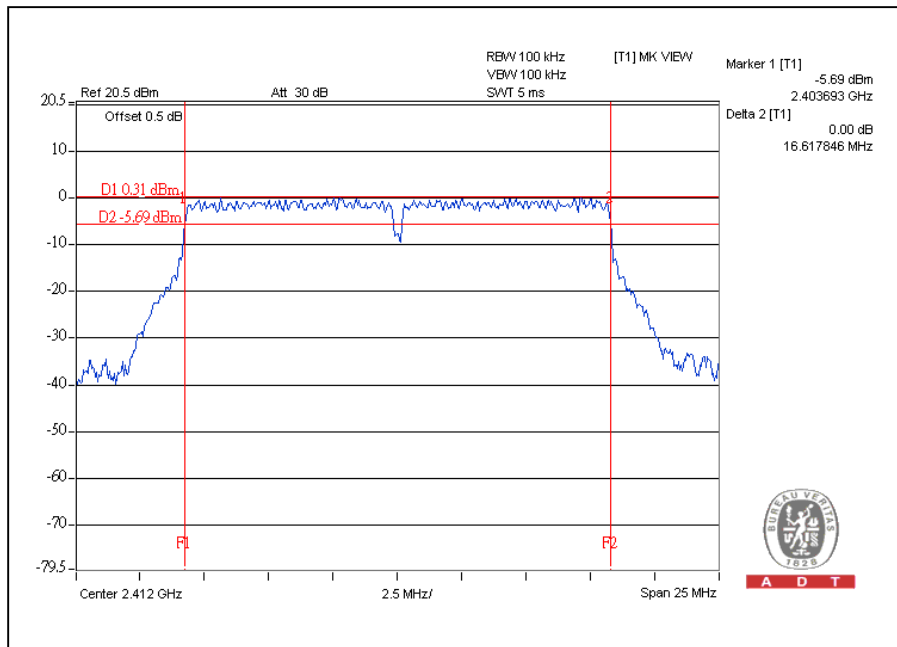
A D T

### 802.11g OFDM MODULATION:

<b>MODULATION TYPE</b>	BPSK	<b>TRANSFER RATE</b>	6Mbps
<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz	<b>ENVIRONMENTAL CONDITIONS</b>	25deg.C, 60%RH, 965hPa
<b>TESTED BY</b>	Eric Lee		

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2412	16.62	0.5	PASS
6	2437	16.62	0.5	PASS
11	2462	16.61	0.5	PASS

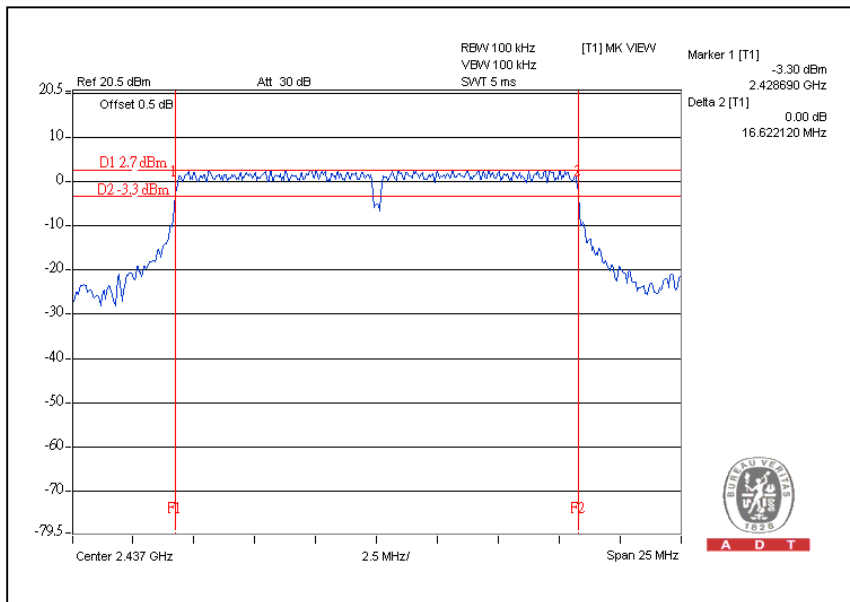
CH1



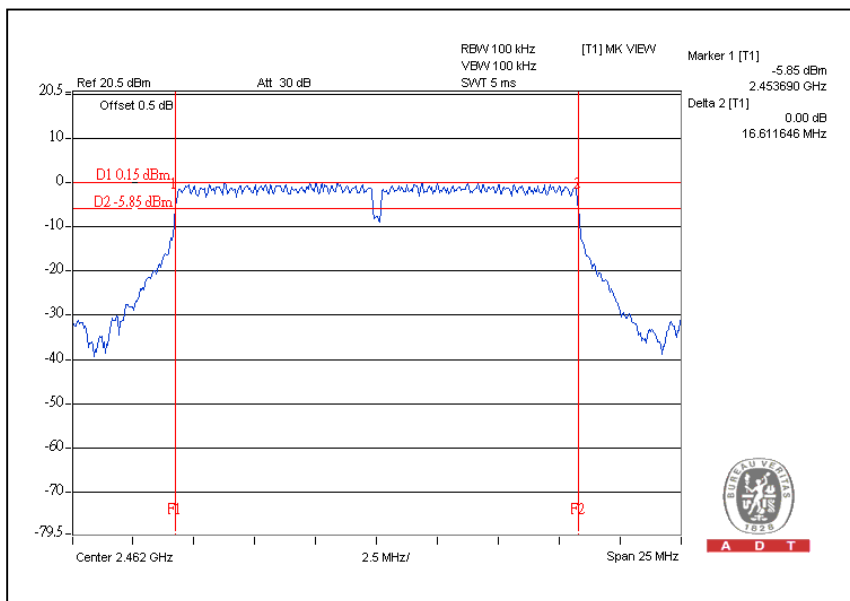


A D T

### CH6



### CH11





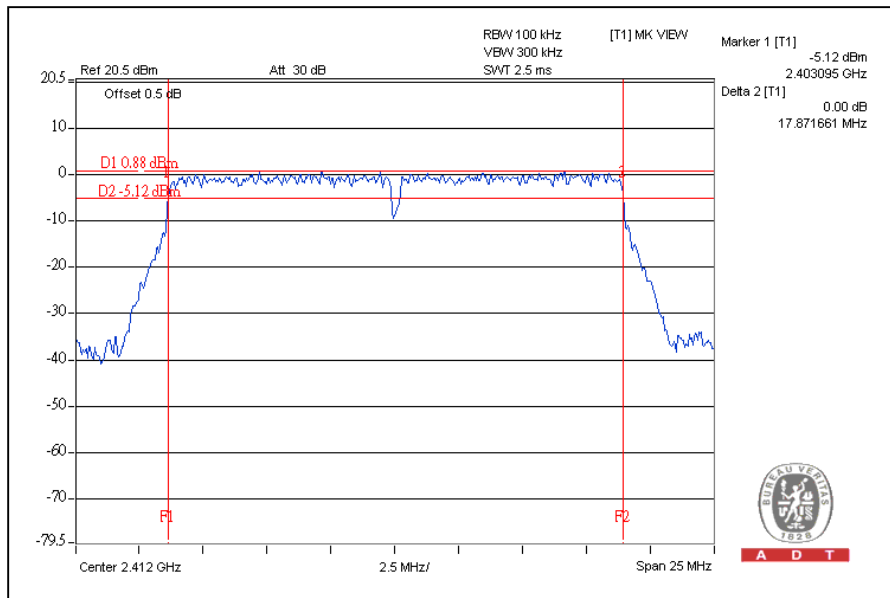
A D T

### DRAFT 802.11n (20MHz) OFDM MODULATION:

<b>MODULATION TYPE</b>	BPSK	<b>TRANSFER RATE</b>	6.5Mbps
<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz	<b>ENVIRONMENTAL CONDITIONS</b>	25deg.C, 60%RH, 965hPa
<b>TESTED BY</b>	Eric Lee		

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2412	17.87	0.5	PASS
6	2437	17.87	0.5	PASS
11	2462	17.88	0.5	PASS

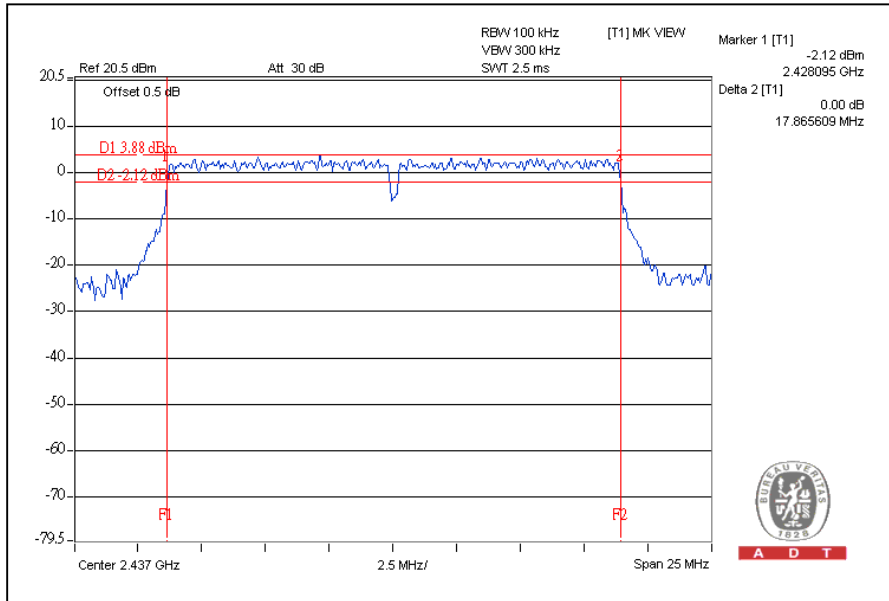
CH1



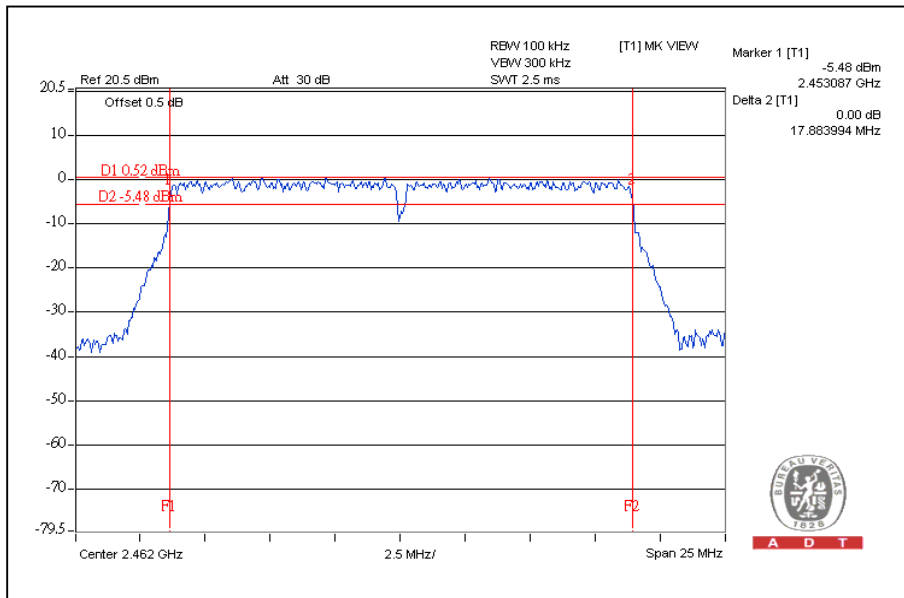


A D T

### CH6



### CH11





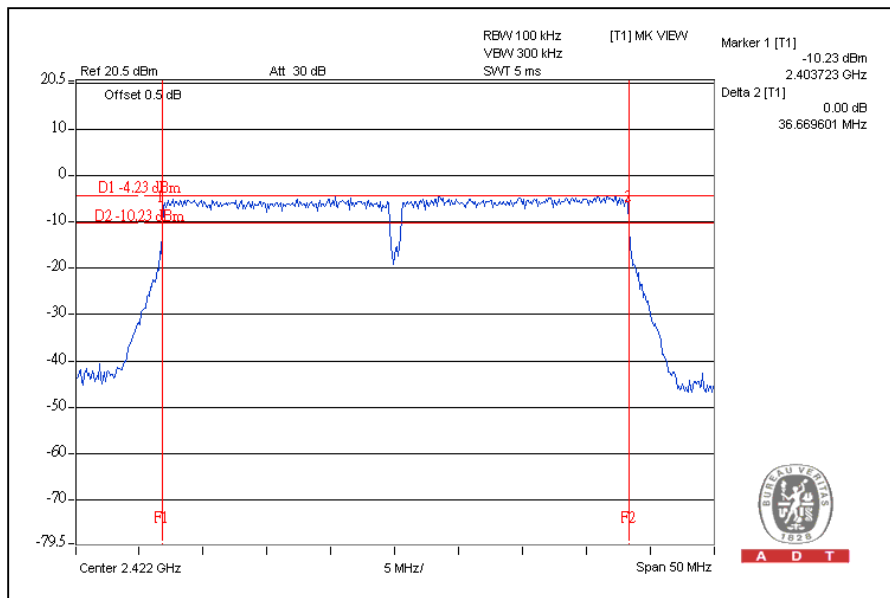
A D T

### DRAFT 802.11n (40MHz) OFDM MODULATION:

<b>MODULATION TYPE</b>	BPSK	<b>TRANSFER RATE</b>	6.5Mbps
<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz	<b>ENVIRONMENTAL CONDITIONS</b>	25deg.C, 60%RH, 965hPa
<b>TESTED BY</b>	Eric Lee		

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2422	36.67	0.5	PASS
4	2437	36.72	0.5	PASS
7	2452	36.71	0.5	PASS

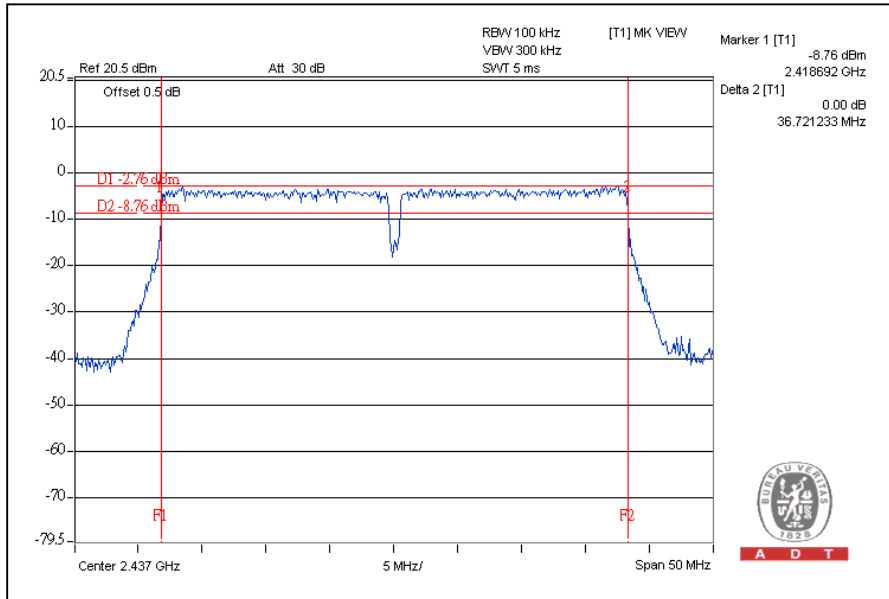
CH1



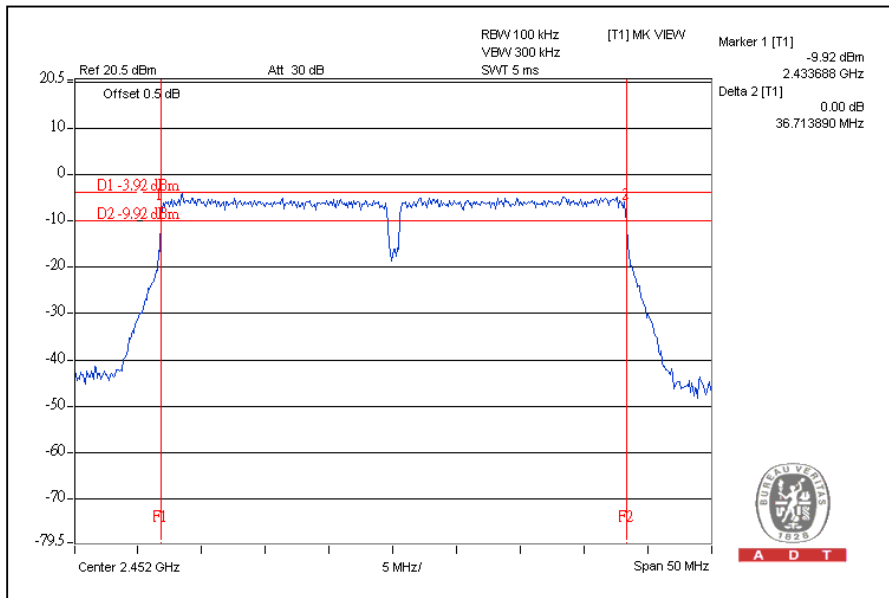


A D T

### CH4



### CH7



#### 4.4 MAXIMUM PEAK OUTPUT POWER

##### 4.4.1 LIMITS OF MAXIMUM PEAK OUTPUT POWER MEASUREMENT

The Maximum Peak Output Power Measurement is 30dBm.

##### 4.4.2 INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Anritsu Power Meter	ML2495A	0824006	April 25, 2009	April 24, 2010
Pulse Power Sensor	MA2411B	0738172	April 25, 2009	April 24, 2010

**NOTE:**

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

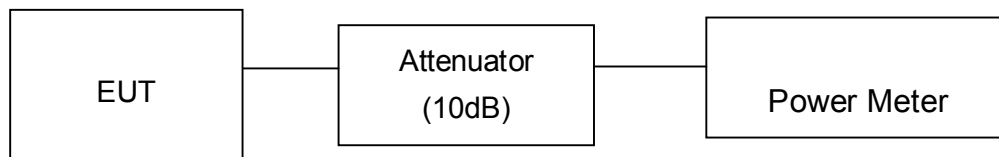
##### 4.4.3 TEST PROCEDURES

1. The transmitter output was connected to the power meter through an attenuator; the bandwidth of the fundamental frequency was measured with the power meter.
2. Record the power level.

##### 4.4.4 DEVIATION FROM TEST STANDARD

No deviation

##### 4.4.5 TEST SETUP



##### 4.4.6 EUT OPERATING CONDITIONS

Same as Item 4.3.6





A D T

#### 4.4.7 TEST RESULTS

##### 802.11b DSSS MODULATION:

<b>MODULATION TYPE</b>	DBPSK	<b>TRANSFER RATE</b>	1Mbps
<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz	<b>ENVIRONMENTAL CONDITIONS</b>	25deg.C, 60%RH, 965hPa
<b>TESTED BY</b>	Eric Lee		

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (mW)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (dBm)	PASS / FAIL
1	2412	199.5	23.0	30	PASS
6	2437	295.1	24.7	30	PASS
11	2462	199.5	23.0	30	PASS

##### 802.11g OFDM MODULATION:

<b>MODULATION TYPE</b>	BPSK	<b>TRANSFER RATE</b>	6Mbps
<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz	<b>ENVIRONMENTAL CONDITIONS</b>	25deg.C, 60%RH, 965hPa
<b>TESTED BY</b>	Eric Lee		

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (mW)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (dBm)	PASS / FAIL
1	2412	309.0	24.9	30	PASS
6	2437	354.8	25.5	30	PASS
11	2462	245.5	23.9	30	PASS



A D T

**DRAFT 802.11n (20MHz) OFDM MODULATION:**

<b>MODULATION TYPE</b>	BPSK	<b>TRANSFER RATE</b>	6.5Mbps
<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz	<b>ENVIRONMENTAL CONDITIONS</b>	25deg.C, 60%RH, 965hPa
<b>TESTED BY</b>	Eric Lee		

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (mW)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (dBm)	PASS / FAIL
1	2412	295.1	24.7	30	PASS
6	2437	363.1	25.6	30	PASS
11	2462	234.4	23.7	30	PASS

**DRAFT 802.11n (40MHz) OFDM MODULATION:**

<b>MODULATION TYPE</b>	BPSK	<b>TRANSFER RATE</b>	6.5Mbps
<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz	<b>ENVIRONMENTAL CONDITIONS</b>	25deg.C, 60%RH, 965hPa
<b>TESTED BY</b>	Eric Lee		

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (mW)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (dBm)	PASS / FAIL
1	2422	190.5	22.8	30	PASS
4	2437	229.1	23.6	30	PASS
7	2452	182.0	22.6	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 INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
R&S SPECTRUM ANALYZER	FSP40	100037	Aug. 03, 2009	Aug. 02, 2010

**NOTE:**

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

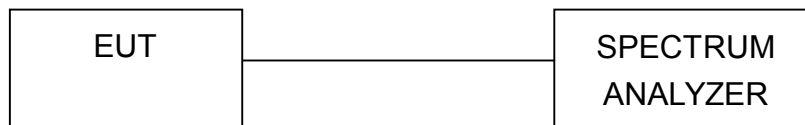
#### 4.5.3 TEST PROCEDURE

The transmitter output was connected to the spectrum analyzer through an attenuator, the bandwidth of the fundamental frequency was measured with the spectrum analyzer using 3kHz RBW and 30kHz VBW, set sweep time = span/3kHz. The power spectral density was measured and recorded. The sweep time is allowed to be longer than span/3kHz for a full response of the mixer in the spectrum analyzer.

#### 4.5.4 DEVIATION FROM TEST STANDARD

No deviation

#### 4.5.5 TEST SETUP



#### 4.5.6 EUT OPERATING CONDITION

Same as Item 4.3.6



A D T

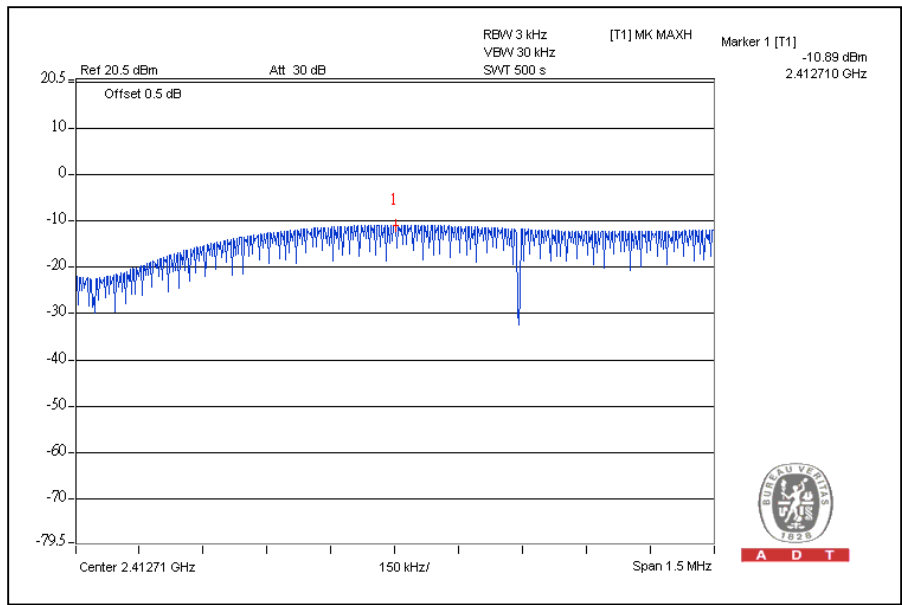
### 4.5.7 TEST RESULTS

#### 802.11b DSSS MODULATION:

<b>MODULATION TYPE</b>	DBPSK	<b>TRANSFER RATE</b>	1Mbps
<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz	<b>ENVIRONMENTAL CONDITIONS</b>	25deg.C, 60%RH, 965hPa
<b>TESTED BY</b>	Eric Lee		

CHANNEL	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3kHz BW (dBm)	MAXIMUM LIMIT (dBm)	PASS / FAIL
1	2412	-10.8	8	PASS
6	2437	-7.4	8	PASS
11	2462	-9.8	8	PASS

#### CH1

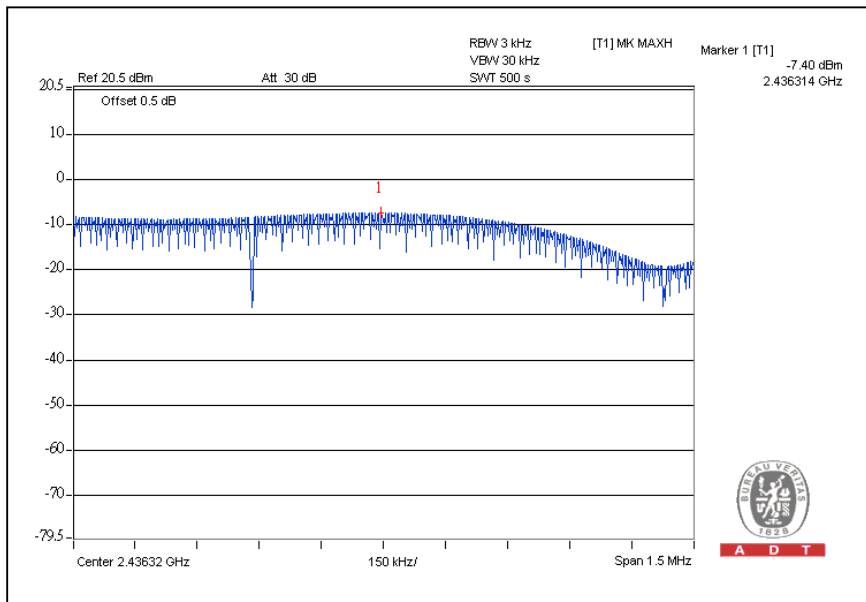


A D T

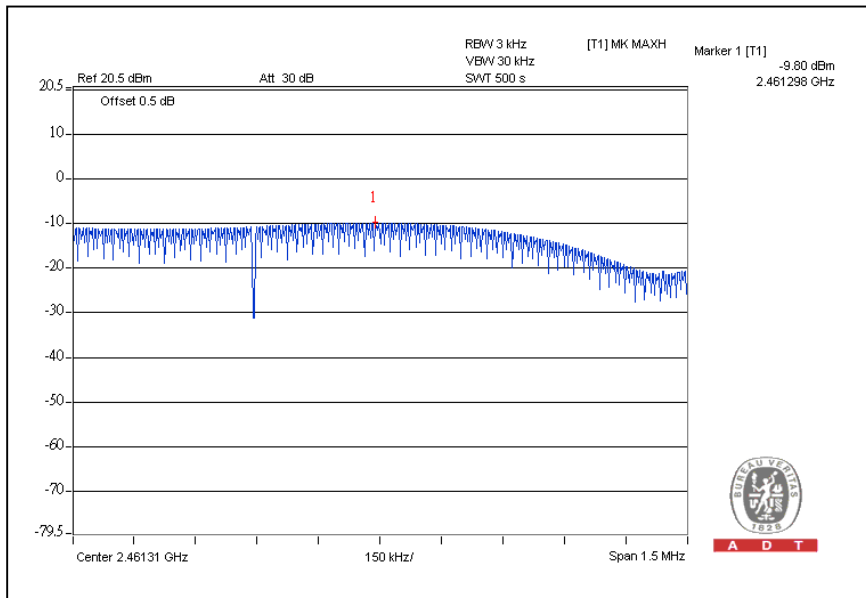


A D T

### CH6



### CH11





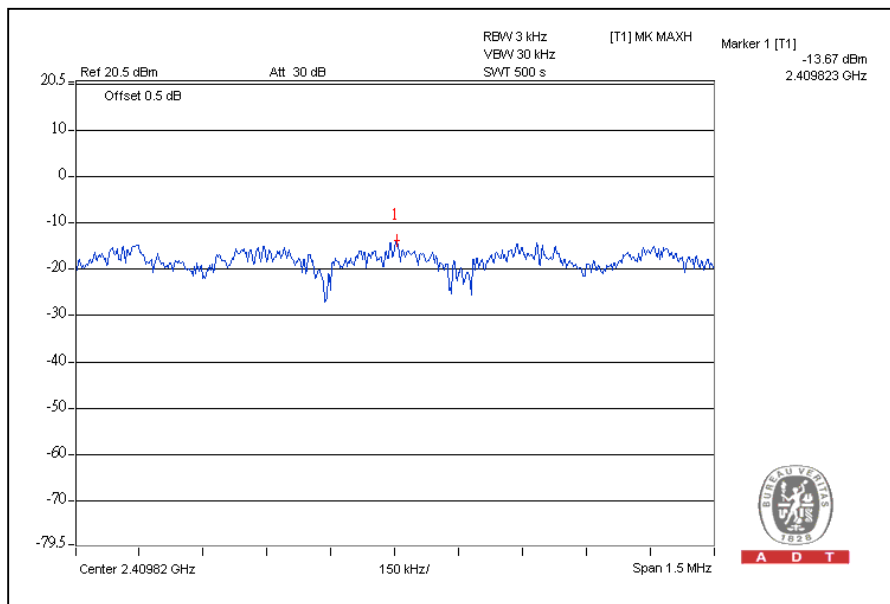
A D T

### 802.11g OFDM MODULATION:

<b>MODULATION TYPE</b>	BPSK	<b>TRANSFER RATE</b>	6Mbps
<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz	<b>ENVIRONMENTAL CONDITIONS</b>	25deg.C, 60%RH, 965hPa
<b>TESTED BY</b>	Eric Lee		

CHANNEL	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3kHz BW (dBm)	MAXIMUM LIMIT (dBm)	PASS / FAIL
1	2412	-13.6	8	PASS
6	2437	-11.2	8	PASS
11	2462	-13.8	8	PASS

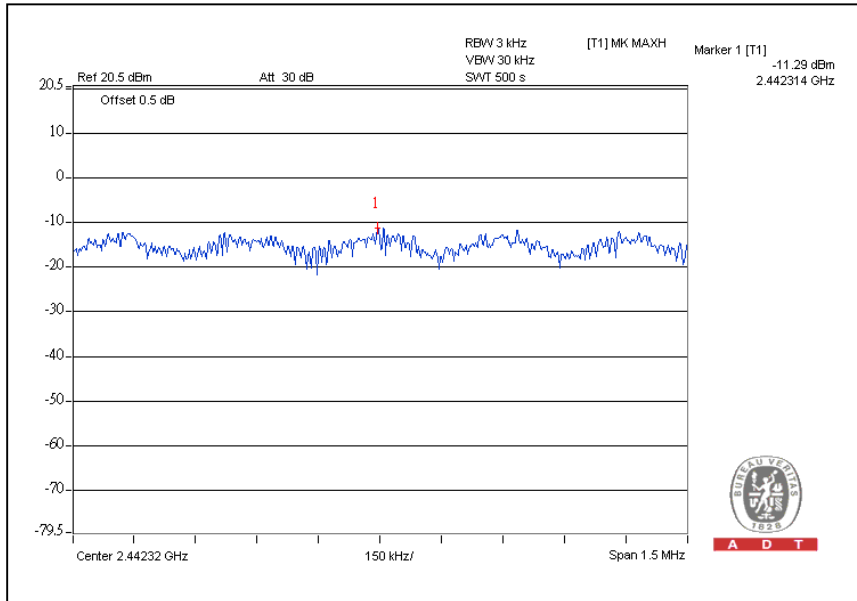
CH1



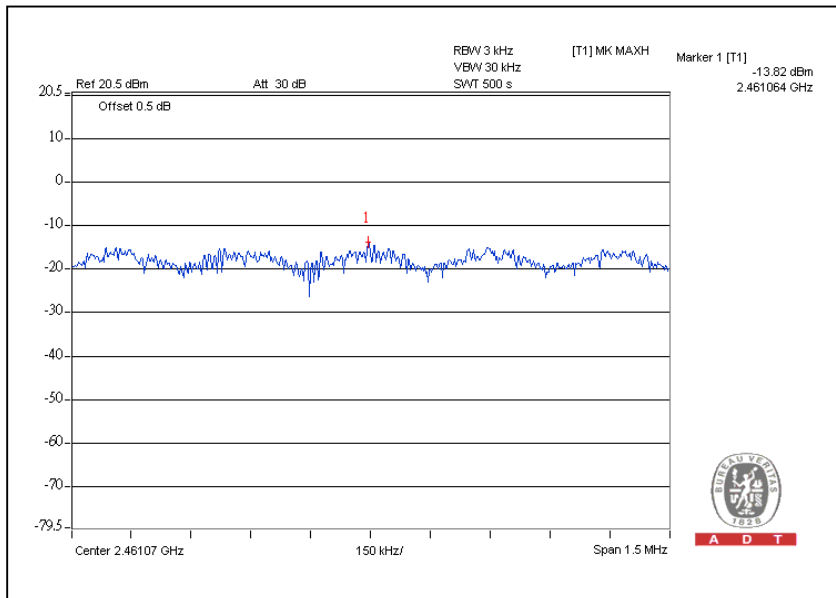


A D T

### CH6



### CH11







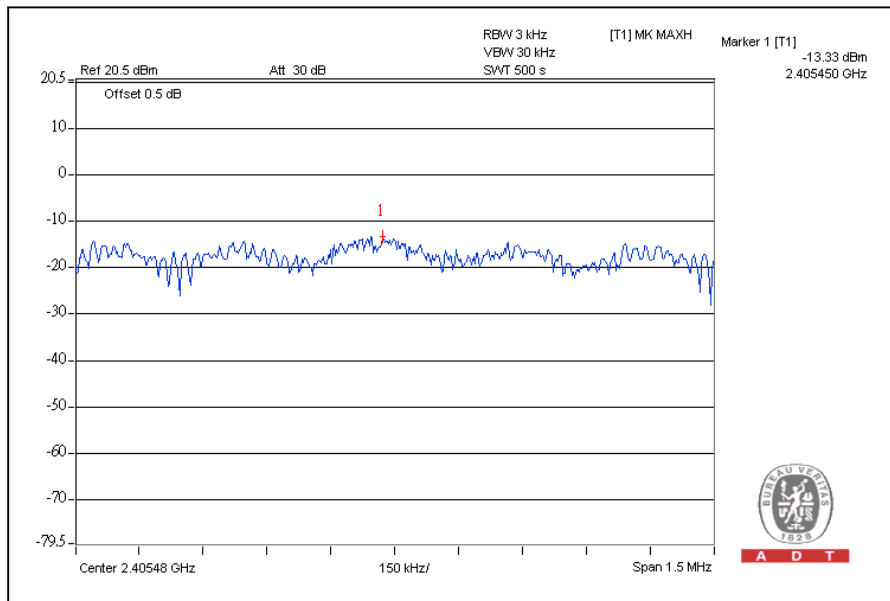
A D T

**DRAFT 802.11n (20MHz) OFDM MODULATION:**

<b>MODULATION TYPE</b>	BPSK	<b>TRANSFER RATE</b>	6.5Mbps
<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz	<b>ENVIRONMENTAL CONDITIONS</b>	25 deg.C, 62%RH, 965hPa
<b>TESTED BY</b>	Eric Lee		

CHANNEL	CHANNEL FREQUENCY (MHz )	RF POWER LEVEL IN 3kHz BW (dBm)	MAXIMUM LIMIT (dBm)	PASS / FAIL
1	2412	-13.3	8	PASS
6	2437	-10.8	8	PASS
11	2462	-13.3	8	PASS

CH1

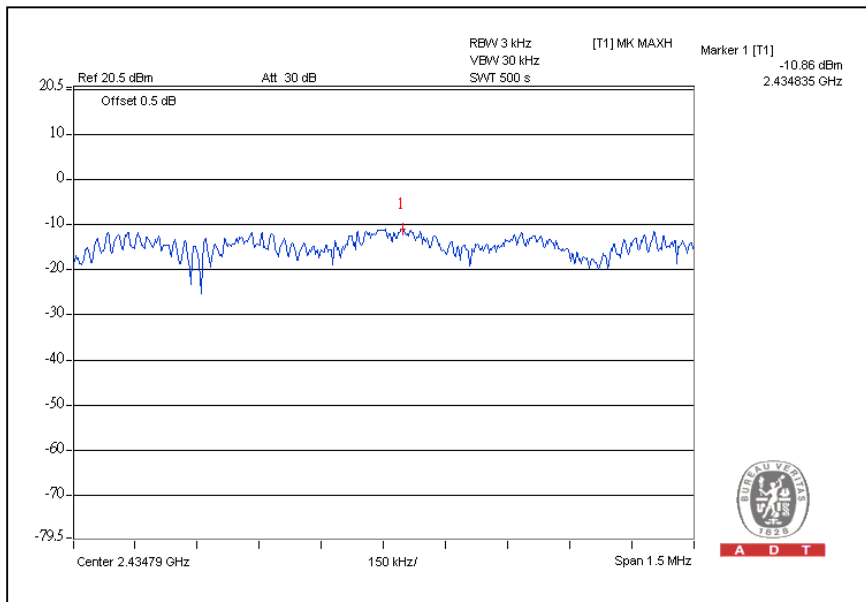


A D T

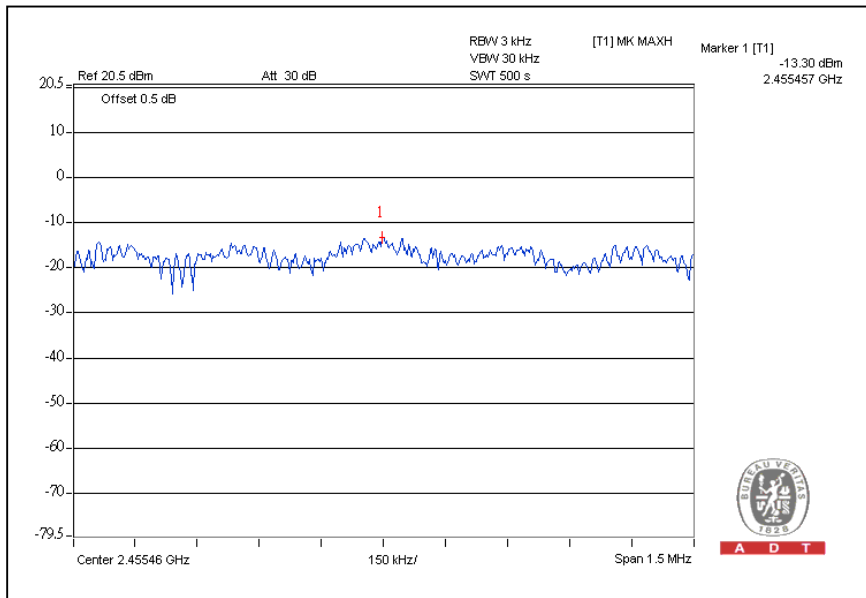


A D T

### CH6



### CH11





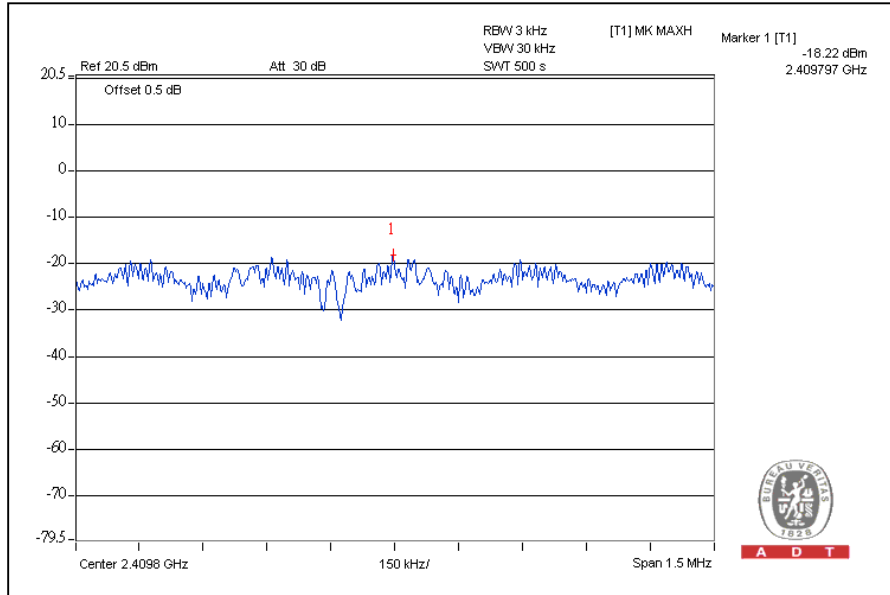
A D T

### DRAFT 802.11n (40MHz) OFDM MODULATION:

<b>MODULATION TYPE</b>	BPSK	<b>TRANSFER RATE</b>	6.5Mbps
<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz	<b>ENVIRONMENTAL CONDITIONS</b>	25deg.C, 60%RH, 965hPa
<b>TESTED BY</b>	Eric Lee		

CHANNEL	CHANNEL FREQUENCY (MHz )	RF POWER LEVEL IN 3kHz BW (dBm)	MAXIMUM LIMIT (dBm)	PASS / FAIL
1	2422	-18.2	8	PASS
4	2437	-15.4	8	PASS
7	2452	-18.5	8	PASS

CH1

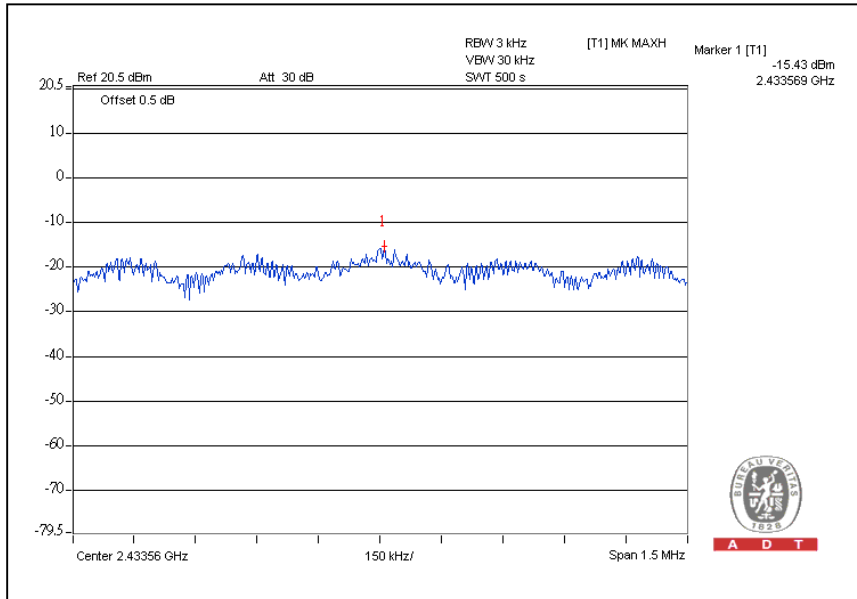


A D T

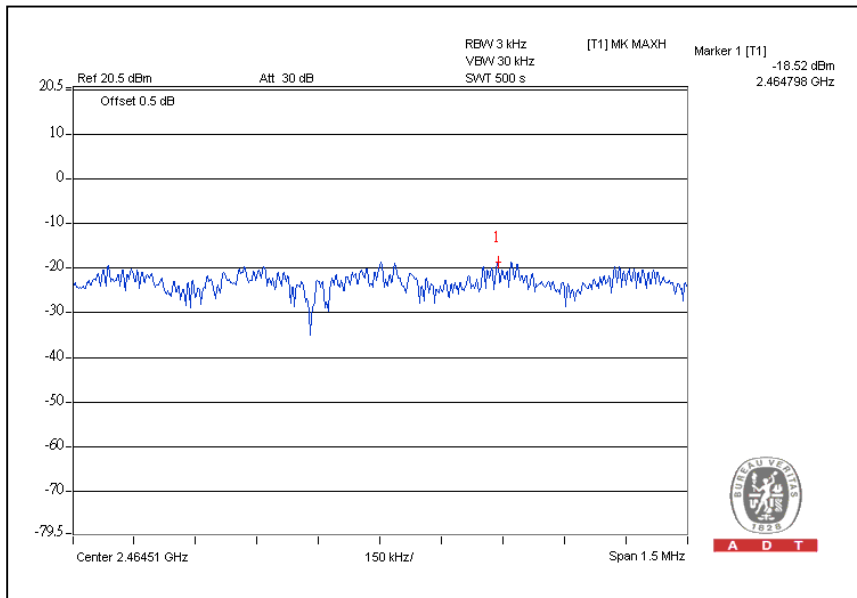


A D T

### CH4



### CH7





A D T

## 4.6 CONDUCTED OUT-BAND EMISSION MEASUREMENT

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

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

### 4.6.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
R&S SPECTRUM ANALYZER	FSP40	100037	Aug. 03, 2009	Aug. 02, 2010

**NOTE:**

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

### 4.6.3 TEST PROCEDURE

The transmitter output was connected to the spectrum analyzer via a low loss cable. Set both RBW and VBW of spectrum analyzer to 100kHz with suitable frequency span including 100 MHz bandwidth from band edge. The band edges was measured and recorded.

The spectrum plots (RBW = VBW = 100kHz) are attached on the following pages.

#### 4.6.4 DEVIATION FROM TEST STANDARD

No deviation

#### 4.6.5 EUT OPERATING CONDITION

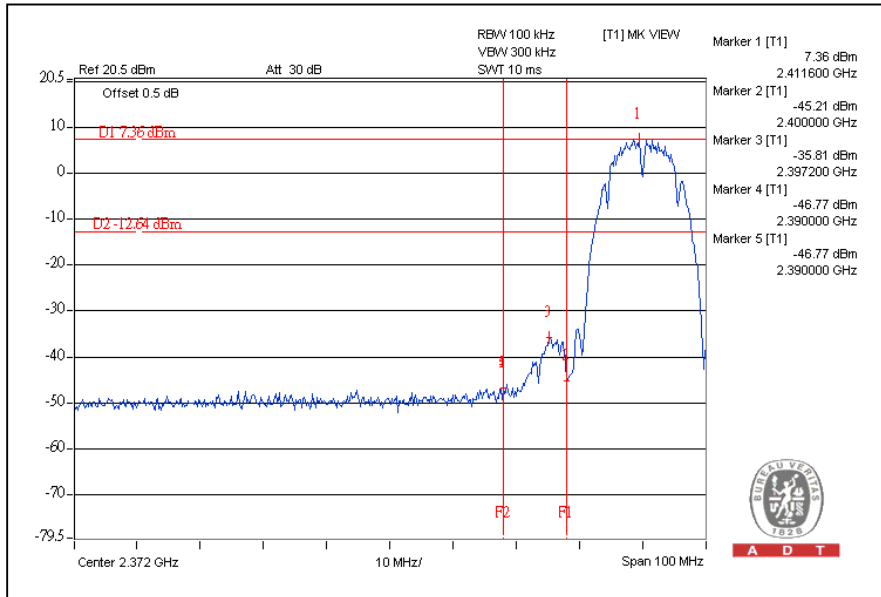
Same as Item 4.3.6

#### 4.6.6 TEST RESULTS

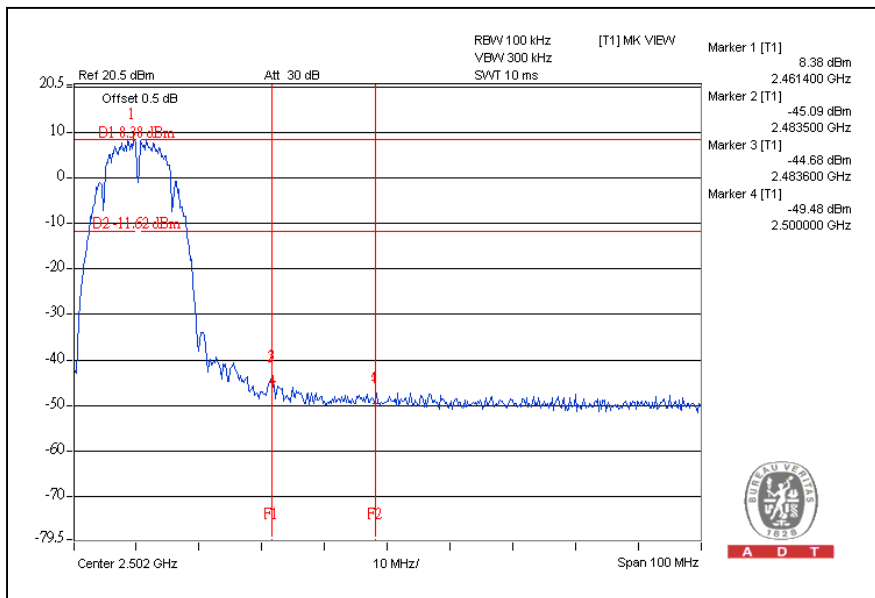
The spectrum plots are attached on the following images. D1 line indicates the highest level, and D2 line indicates the 20dB offset below D1. It shows compliance with the requirement in part 15.247(d).

**802.11b DSSS MODULATION:**

**CH1**



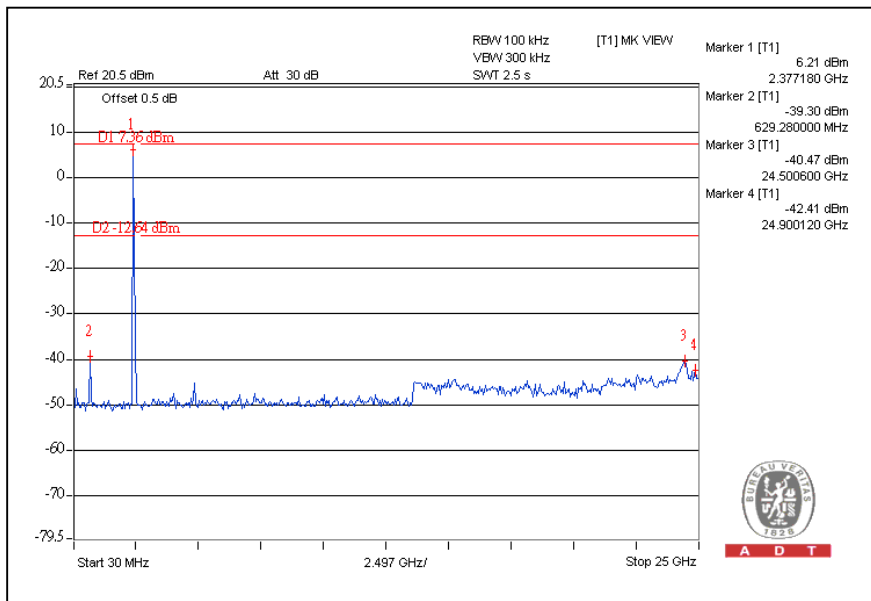
**CH11**



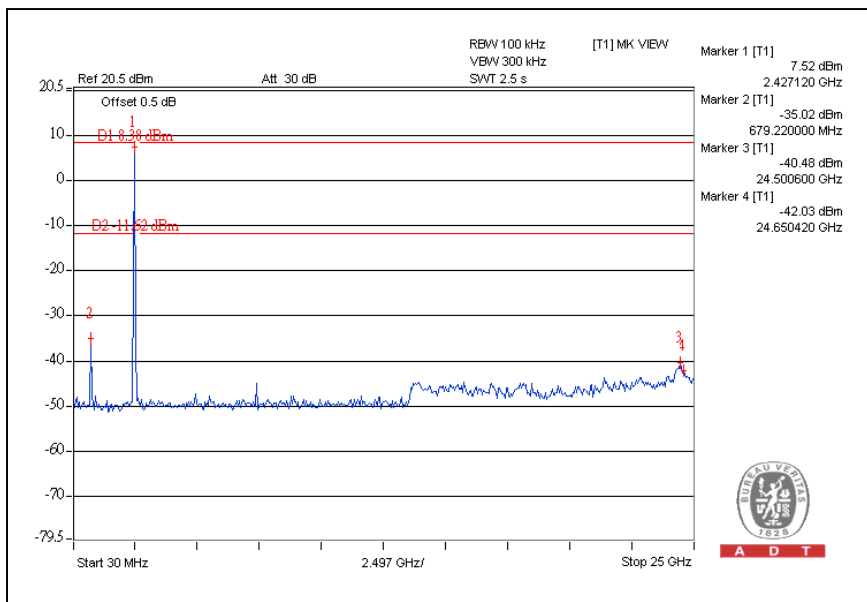


A D T

### CH1



### CH11



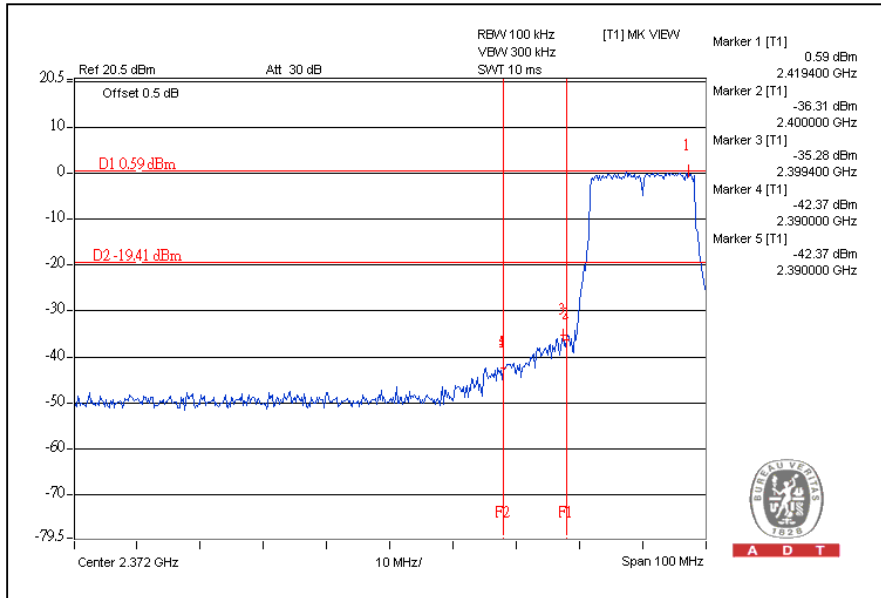




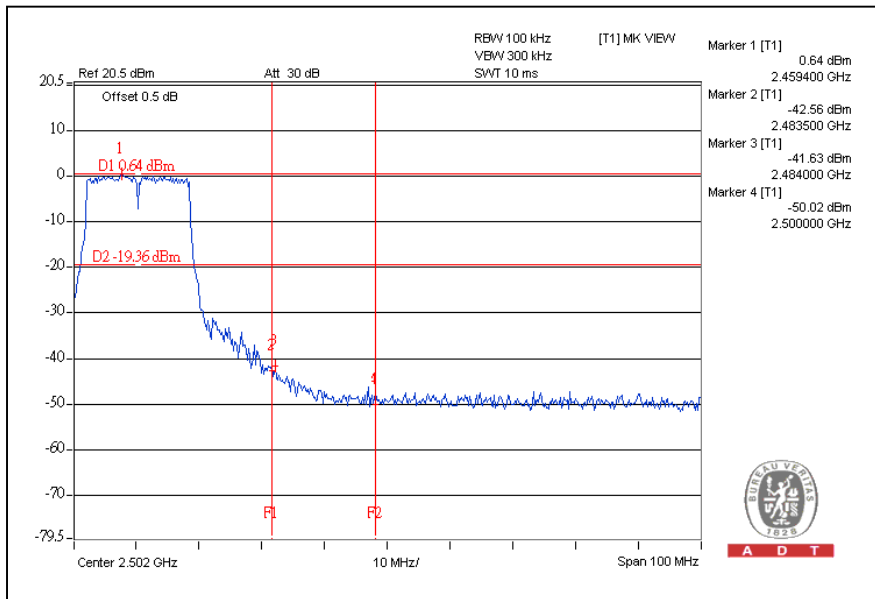
A D T

# 802.11g OFDM MODULATION:

## CH 1



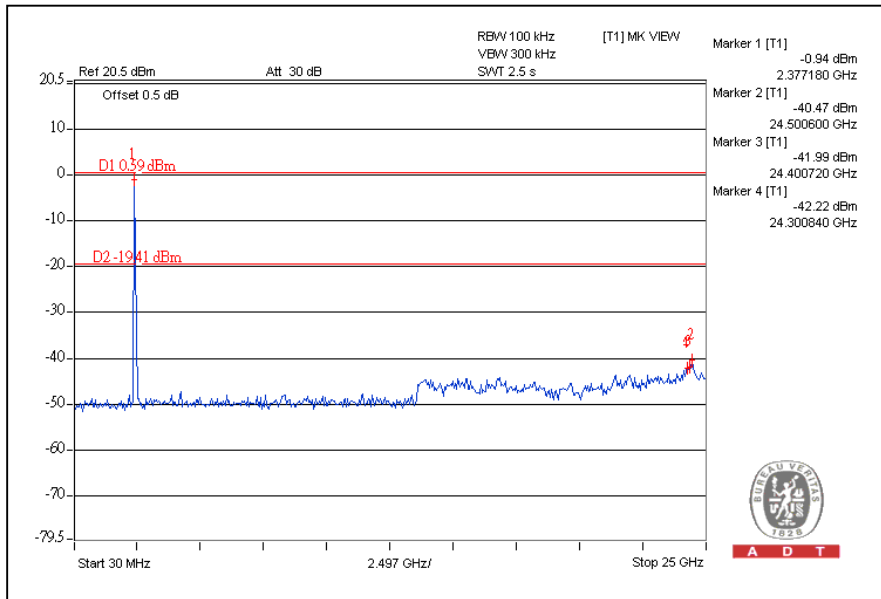
## CH11



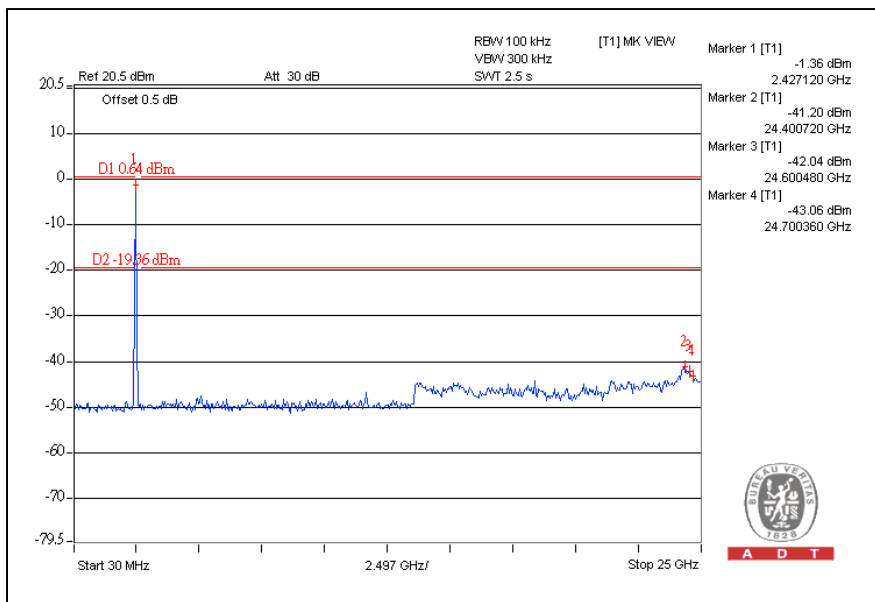


A D T

### CH1



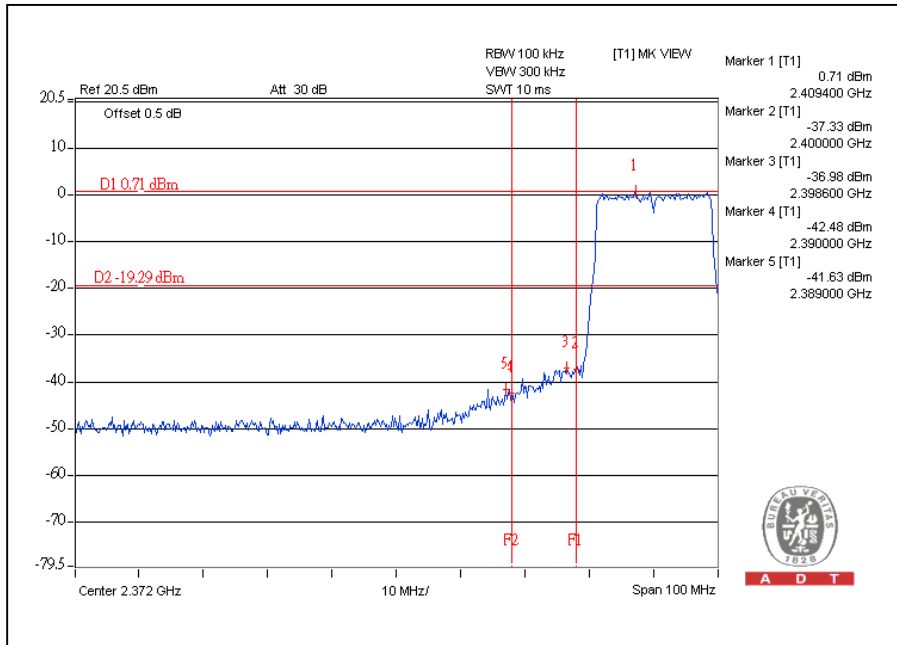
### CH11



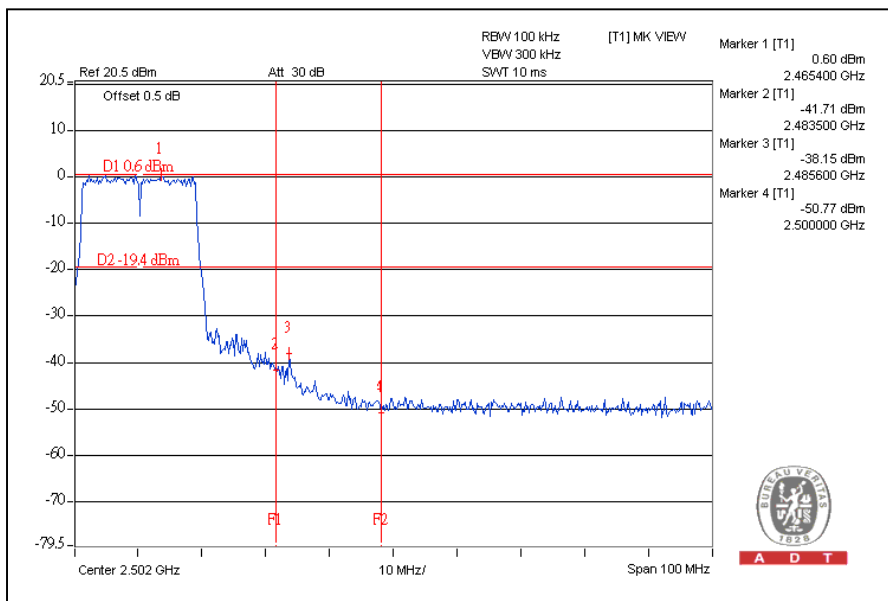


A D T

# DRAFT 802.11n (20MHz) OFDM MODULATION: CH1



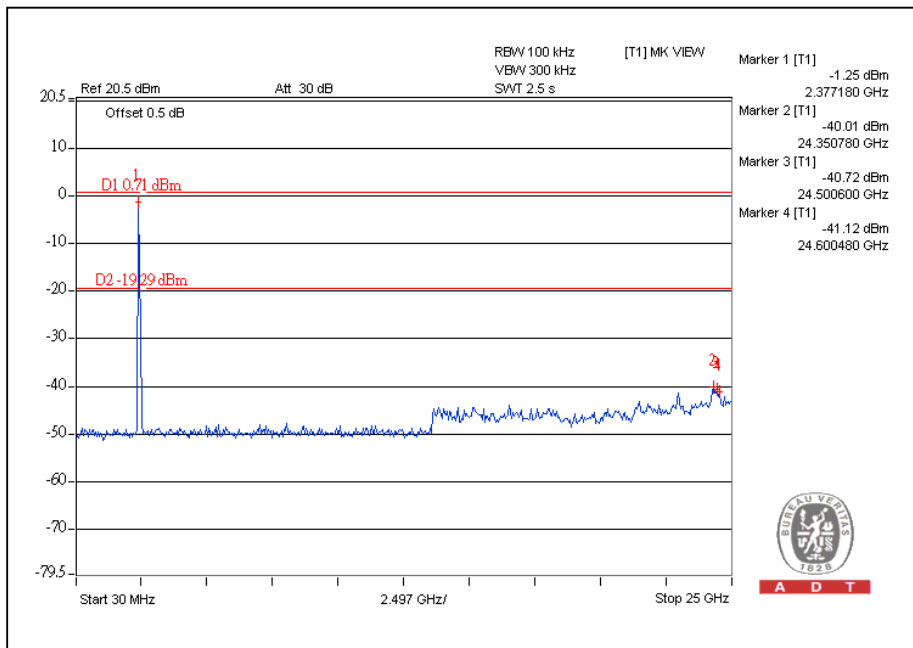
# CH11



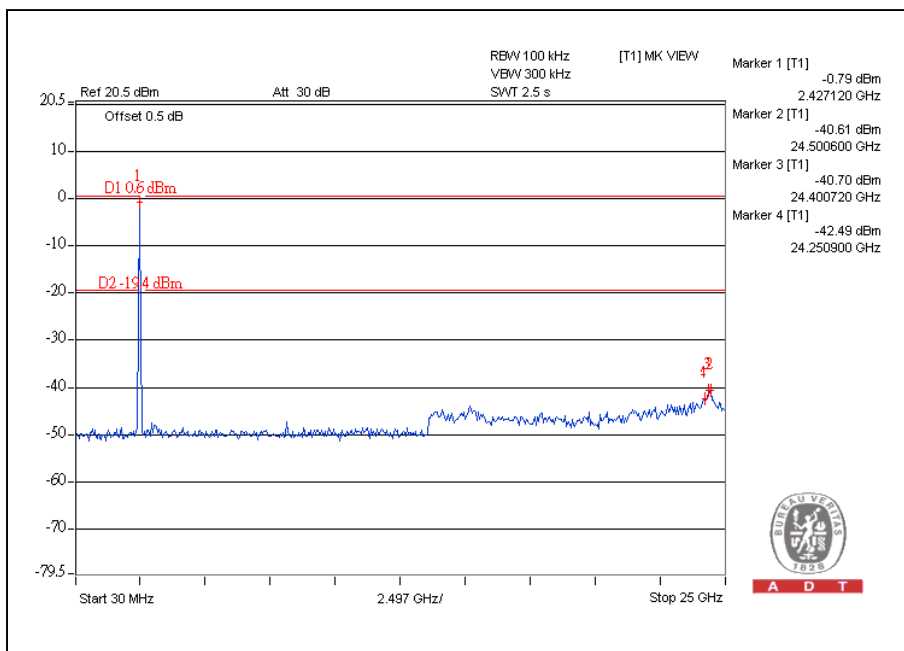


A D T

### CH1



### CH11

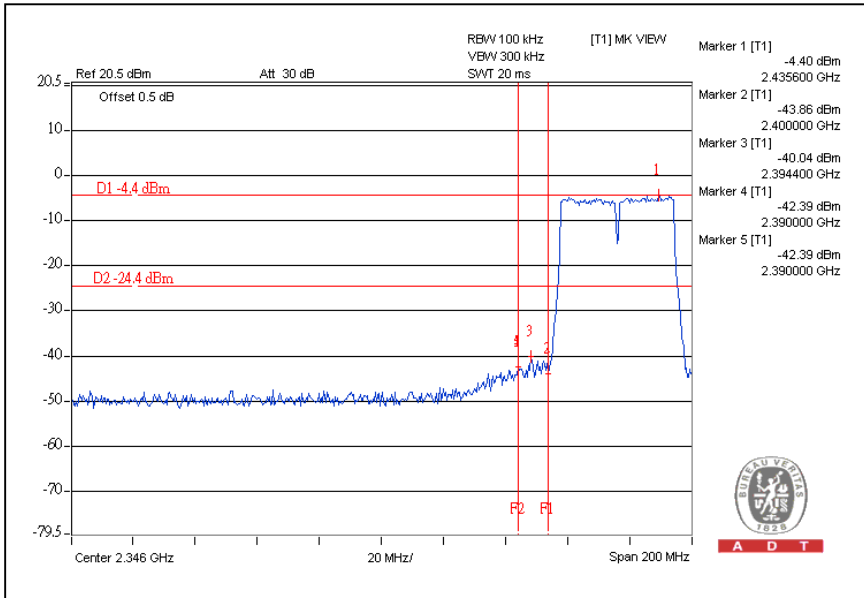




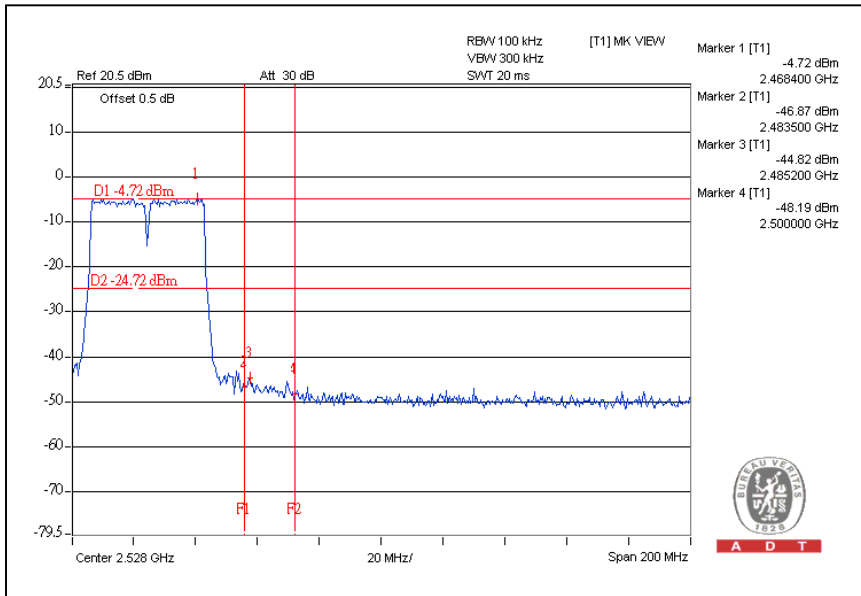
A D T

# DRAFT 802.11n (40MHz) OFDM MODULATION:

## CH1



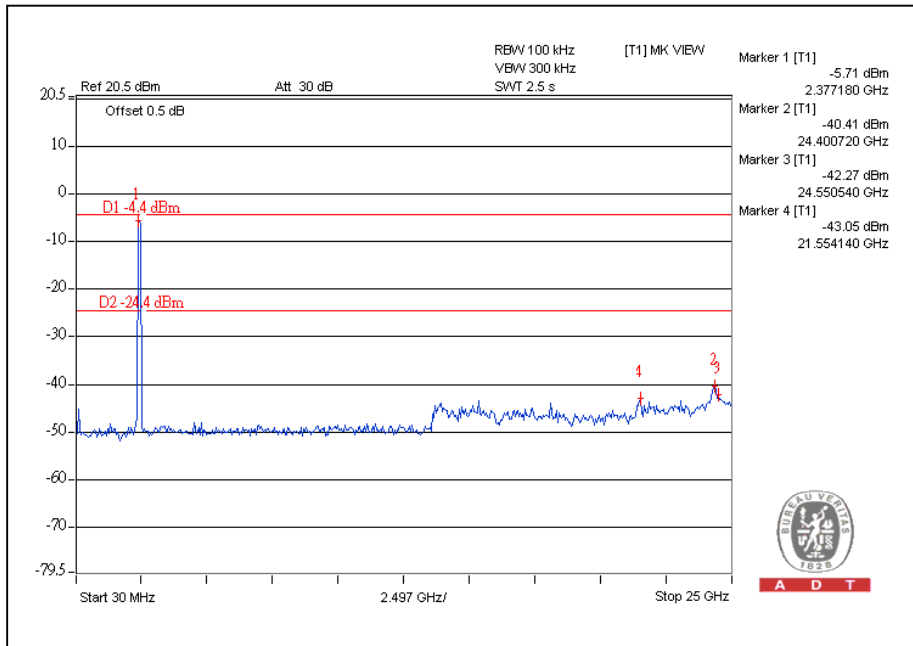
## CH7



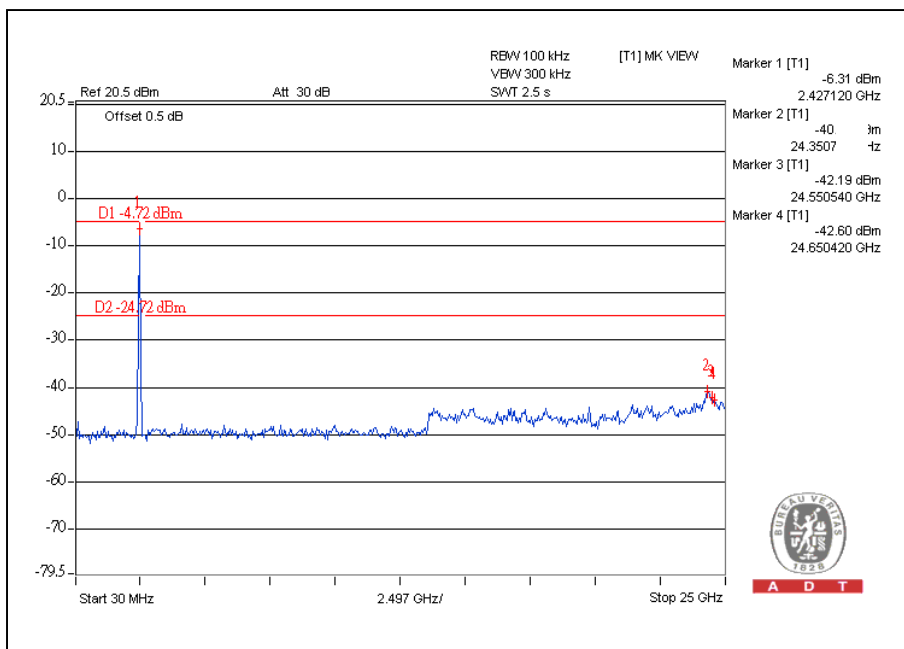


A D T

### CH1



### CH7



## 4.7 ANTENNA REQUIREMENT

### 4.7.1 STANDARD APPLICABLE

For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. And according to FCC 47 CFR Section 15.247 (b), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

### 4.7.2 ANTENNA CONNECTED CONSTRUCTION

There is two antennas provided to this EUT, please refer to the following table:

No.	Antenna Type	Gain (dBi)	Antenna Connector
1	PCB Printed	2.93	NA
2	PCB Printed	2.08	NA

**Note: From above antenna cables, antenna cable 1 was chosen for final test**



A D T

## 5. 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 by the following approval agencies according to ISO/IEC 17025.

<b>USA</b>	FCC, NVLAP
<b>Germany</b>	TUV Rheinland
<b>Japan</b>	VCCI
<b>Norway</b>	NEMKO
<b>Canada</b>	INDUSTRY CANADA, CSA
<b>R.O.C.</b>	TAF, BSMI, NCC
<b>Netherlands</b>	Telefication
<b>Singapore</b>	GOST-ASIA(MOU)
<b>Russia</b>	CERTIS(MOU)

Copies of accreditation certificates of our laboratories obtained from approval agencies can be downloaded from our web site:

[www.adt.com.tw/index.5/phtml](http://www.adt.com.tw/index.5/phtml). If you have any comments, please feel free to contact us at the following:

**Linko EMC/RF Lab:**

Tel: 886-2-26052180  
Fax: 886-2-26052943

**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: 886-3-3185050

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

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





A D T

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

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

---END---