

# FCC TEST REPORT

**REPORT NO.:** RF110411E05

**MODEL NO.:** N21

**FCC ID:** U8G-P1121

**RECEIVED:** Apr. 11, 2011

**TESTED:** May 17 to July 08, 2011

**ISSUED:** July 21, 2011

**APPLICANT:** Pismo Labs Technology Limited

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**ISSUED BY:** Bureau Veritas Consumer Products Services (H.K.)  
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## RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF110411E05	Original release	July 21, 2011

## 1. CERTIFICATION

**PRODUCT:** WLAN 802.11b/g/n Module  
**BRAND NAME:** Pepwave  
**MODEL NO.:** N21  
**TEST SAMPLE:** R&D SAMPLE  
**TESTED:** May 17 to July 08, 2011  
**APPLICANT:** Pismo Labs Technology Limited  
**STANDARDS:** FCC Part 15, Subpart C (Section 15.247)  
ANSI C63.4-2003  
ANSI C63.10-2009

The above equipment (Model: N21) 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** : Phoenix Huang, **DATE:** July 21, 2011  
( Phoenix Huang, Specialist )

**APPROVED BY** : May Chen, **DATE:** July 21, 2011  
( May Chen, Deputy Manager )

## 2. SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC Part 15, Subpart C			
Standard Section	Test Type and Limit	Result	Remark
15.207	AC Power Conducted Emission	PASS	Meet the requirement of limit. Minimum passing margin is -6.83dB at 0.150MHz
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 -0.6dB at 4874.00MHz
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.
15.203	Antenna Requirement	PASS	Antenna connector is R-SMA connector.

## 2.1 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

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

Measurement	Value
Conducted emissions	2.45 dB
Radiated emissions (30MHz-1GHz)	3.81dB
Radiated emissions (1GHz -18GHz)	2.19 dB
Radiated emissions (18GHz -40GHz)	2.56 dB

### 3. GENERAL INFORMATION

#### 3.1 GENERAL DESCRIPTION OF EUT

<b>PRODUCT</b>	WLAN 802.11b/g/n Module
<b>MODEL NO.</b>	N21
<b>FCC ID</b>	U8G-P1121
<b>POWER SUPPLY</b>	DC 3.3V 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>	<ul style="list-style-type: none"> <li>■802.11b: 11 / 5.5 / 2 / 1Mbps</li> <li>■802.11g: 54 / 48 / 36 / 24 / 18 / 12 / 9 / 6Mbps</li> <li>■HT20 MCS0~7 (800ns GI): 6.5Mbps, 13.0Mbps, 19.5Mbps, 26.0Mbps, 39.0Mbps, 52.0Mbps, 58.5Mbps, 65.0Mbps.</li> <li>■HT40 MCS0~7 (800ns GI): 13.5Mbps, 27.0Mbps, 40.5Mbps, 54.0Mbps, 81.0Mbps, 108.0Mbps, 121.5Mbps, 135.0Mbps.</li> <li>■HT20 MCS8~15 (800ns GI): 13.0Mbps, 26.0Mbps, 39.0Mbps, 52.0Mbps, 78.0Mbps, 104.0Mbps, 117.0Mbps, 130.0Mbps.</li> <li>■HT40 MCS8~15 (800ns GI): 27.0Mbps, 81.0Mbps, 108.0Mbps, 162.0Mbps, 216.0Mbps, 243.0Mbps, 270.0Mbps.</li> <li>■HT20 MCS0~7 (400ns GI): 7.2Mbps, 14.4Mbps, 21.7Mbps, 28.9Mbps, 43.3Mbps, 57.8Mbps, 65.0Mbps, 72.2Mbps.</li> <li>■HT40 MCS0~7 (400ns GI): 15.0Mbps, 30.0Mbps, 45.0Mbps, 60.0Mbps, 90.0Mbps, 120.0Mbps, 135.0Mbps, 150.0Mbps.</li> <li>■HT20 MCS8~15 (400ns GI): 14.444Mbps, 28.889Mbps, 43.333Mbps, 57.778Mbps, 86.667Mbps, 115.556Mbps, 130Mbps, 144.444Mbps.</li> <li>■HT40 MCS8~15 (400ns GI): 30.0Mbps, 60.0Mbps, 90.0Mbps, 120.0Mbps, 180.0Mbps, 240.0Mbps, 275.0Mbps, 300.0Mbps.</li> </ul>
<b>FREQUENCY RANGE</b>	2412MHz ~ 2462MHz
<b>NUMBER OF CHANNEL</b>	11 for 802.11b, 802.11g, 802.11n (20MHz) 7 for 802.11n (40MHz)
<b>MAXIMUM OUTPUT POWER</b>	802.11b: 275.4mW 802.11g: 912.0mW 802.11n (20MHz): 933.9mW 802.11n (40MHz): 921.1mW
<b>ANTENNA TYPE</b>	Please see NOTE
<b>DATA CABLE</b>	NA
<b>I/O PORTS</b>	NA
<b>ASSOCIATED DEVICES</b>	NA



**NOTE:**

1. There are two antennas provided to this EUT, please refer to the following table:

Antenna	Antenna Type	Connector Type	Antenna Gain (dBi)	Remark
1	Dipole	R-SMA	5	With Diversity
2	Dipole	R-SMA	4.335	With Diversity

2. The EUT is 2 \* 2 spatial MIMO (2Tx & 2Rx) without beam forming function. The 11b and 11g legacy mode is limited to single transmitter only.
3. When the EUT operating in 802.11n, the software operation, which is defined by manufacturer, MCS (Modulation and Coding Schemes) from 0 to 15.
4. 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, 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 802.11n (40MHz):

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

#### ANTENNA COMBINATION MODE:

COMBINATION MODE	OPERATION MODE	TX CHAIN(0)	TX CHAIN(1)
A	802.11 b	√	
B	802.11 b		√
C	802.11 g	√	
D	802.11 g		√
E	802.11n(20MHz) for MCS0~7	√	
F	802.11n(20MHz) for MCS0~7		√
G	802.11n(20MHz) for MCS8~15	√	√
H	802.11n(40MHz) for MCS0~7	√	
I	802.11n(40MHz) for MCS0~7		√
J	802.11n(40MHz) for MCS8~15	√	√

Note:

1. The above information was declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or user's manual.
2. Mode A, C, G & J the worst modes were selected as representative mode for the report.

### 3.2.1 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

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

Where **PLC**: Power Line Conducted Emission      **RE < 1G**: Radiated Emission below 1GHz  
**RE ≥ 1G**: Radiated Emission above 1GHz      **APCM**: Antenna Port Conducted Measurement  
**OB**: Conducted Out-Band Emission 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)	CONFIGURE / COMBINATION
802.11n (20MHz)	1 to 11	11	OFDM	BPSK	13	G

#### **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)	CONFIGURE / COMBINATION
802.11n (20MHz)	1 to 11	11	OFDM	BPSK	13	G

#### **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)	CONFIGURE / COMBINATION
802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1	A
802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6	C
802.11n (20MHz)	1 to 11	1, 6, 11	OFDM	BPSK	13	G
802.11n (40MHz)	3 to 9	3, 6, 9	OFDM	BPSK	30	J

### **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)	CONFIGURE / COMBINATION
802.11b	1 to 11	1, 11	DSSS	DBPSK	1	A
802.11g	1 to 11	1, 11	OFDM	BPSK	6	C
802.11n (20MHz)	1 to 11	1, 11	OFDM	BPSK	13	G
802.11n (40MHz)	3 to 9	3, 9	OFDM	BPSK	30	J

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

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

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)	CONFIGURE / COMBINATION
802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1	A
802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6	C
802.11n (20MHz)	1 to 11	1, 6, 11	OFDM	BPSK	13	G
802.11n (40MHz)	3 to 9	3, 6, 9	OFDM	BPSK	30	J

※ Bandwidth as show worst chain in report base on preliminary measurement.

### **TEST CONDITION:**

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER (SYSTEM)	TESTED BY
RE <sup>3</sup> 1G	20deg. C, 68%RH, 1005 hPa	120Vac, 60Hz	Frank Liu
RE<1G	25deg. C, 71%RH, 1005 hPa	120Vac, 60Hz	Evan Huang
PLC	23deg. C, 61%RH, 1005 hPa	120Vac, 60Hz	Kent Liu
APCM	25deg. C, 60%RH, 1005 hPa	120Vac, 60Hz	Rex Huang
OB	25deg. C, 60%RH, 1005 hPa	120Vac, 60Hz	Rex Huang



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### **3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS**

The EUT is a RF product. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

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

**ANSI C63.4-2003**

**ANSI C63.10-2009**

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

**NOTE:** The EUT has been verified to comply with the requirements of FCC Part 15, Subpart B, Class B (DoC). The test report has been issued separately.



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### 3.4 DESCRIPTION OF SUPPORT UNITS

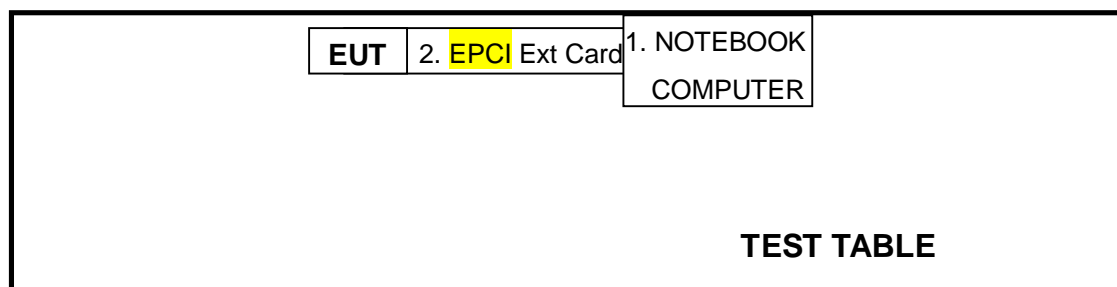
The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	NOTEBOOK COMPUTER	DELL	PP32LA	FSLB32S	FCC DoC
2	MPCI Ext Card	NA	NA	NA	NA

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



## 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)	
	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 0.50 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

**Test date: July 08, 2011**

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver	ESCS 30	100375	Mar. 09, 2011	Mar. 08, 2012
Line-Impedance Stabilization Network (for EUT)	NSLK 8127	8127-522	Sep. 08, 2010	Sep. 07, 2011
Line-Impedance Stabilization Network (for Peripheral)	ESH3-Z5	848773/004	Nov. 03, 2010	Nov. 02, 2011
RF Cable (JYEBAO)	5DFB	COCCAB-002	Aug. 30, 2010	Aug. 29, 2011
50 ohms Terminator	50	3	Nov. 03, 2010	Nov. 02, 2011
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. C.
3. The VCCI Con C Registration No. is C-3611.

#### 4.1.3 TEST PROCEDURES

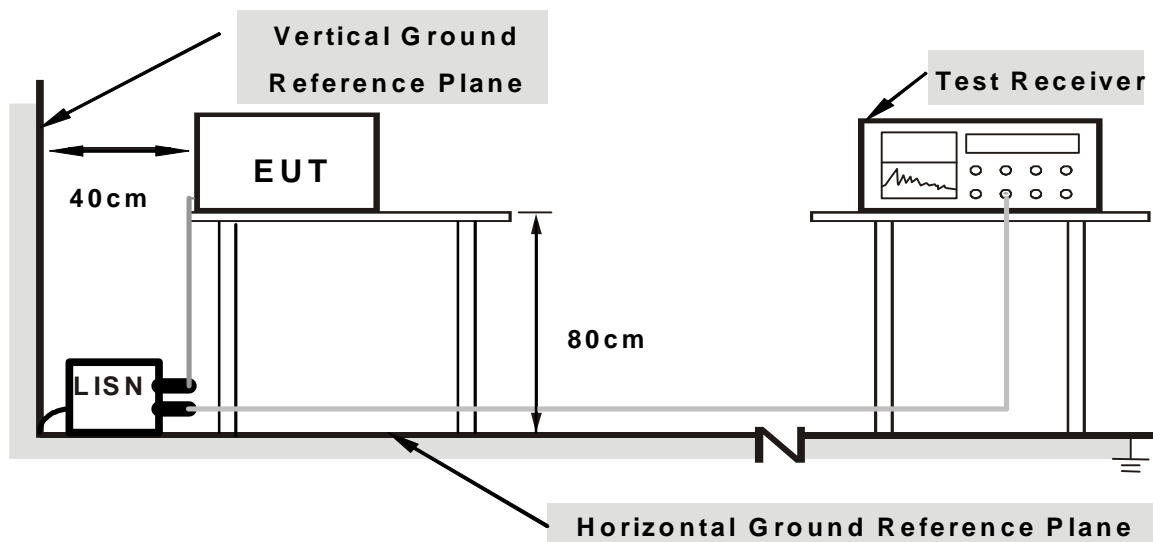
- a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling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

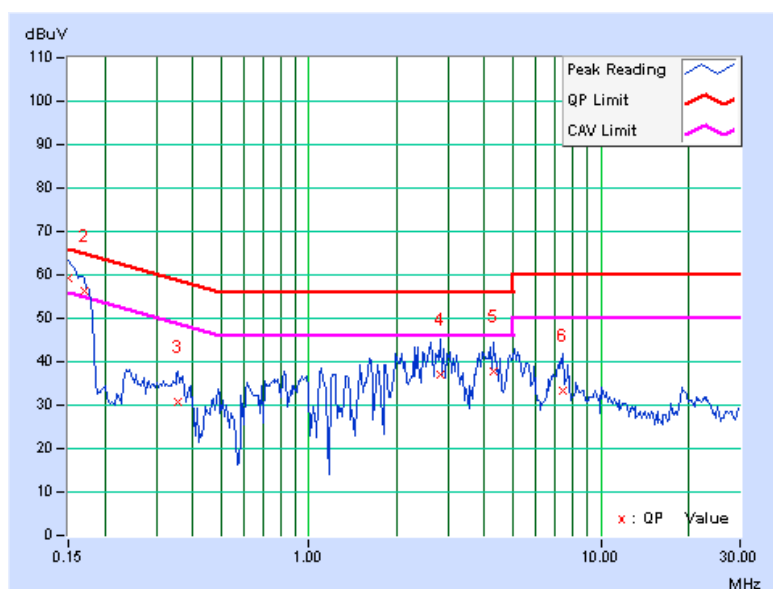
1. Connect the EUT with the support unit 1 (Notebook Computer) which is placed on a testing table.
2. The communication partner run test program “Art R0.9B21” to enable EUT under transmission/receiving condition continuously at specific channel frequency.

#### 4.1.7 TEST RESULTS

PHASE	Line (L)	6dB BANDWIDTH	9 kHz
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No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.150	0.10	59.07	45.05	59.17	45.15	66.00	56.00	-6.83	-10.85
2	0.170	0.11	56.22	43.06	56.33	43.17	64.98	54.98	-8.65	-11.81
3	0.357	0.13	30.57	-	30.70	-	58.80	48.80	-28.10	-
4	2.813	0.18	36.91	-	37.09	-	56.00	46.00	-18.91	-
5	4.316	0.21	37.61	-	37.82	-	56.00	46.00	-18.18	-
6	7.418	0.36	33.02	-	33.38	-	60.00	50.00	-26.62	-

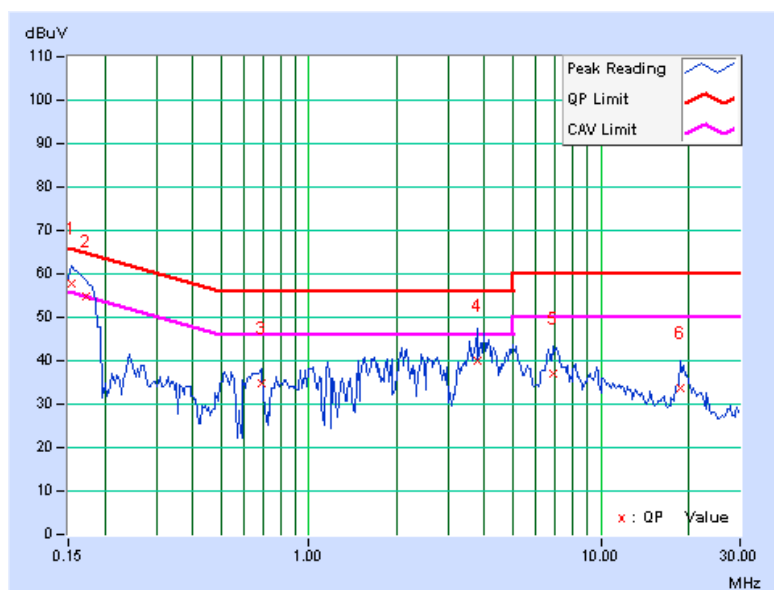
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
  2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
  3. The emission levels of other frequencies were very low against the limit.
  4. Margin value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



PHASE	Neutral (N)	6dB BANDWIDTH	9 kHz
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	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
No		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.154	0.12	57.71	44.99	57.83	45.11	65.79	55.79	-7.96	-10.68
2	0.173	0.13	54.76	43.64	54.89	43.77	64.79	54.79	-9.91	-11.03
3	0.685	0.15	34.53	-	34.68	-	56.00	46.00	-21.32	-
4	3.785	0.27	39.89	-	40.16	-	56.00	46.00	-15.84	-
5	6.836	0.54	36.64	-	37.18	-	60.00	50.00	-22.82	-
6	18.805	1.35	32.45	-	33.80	-	60.00	50.00	-26.20	-

- 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.
4. Section 15.205 restricted bands of operation shall compliance with the limits in Section 15.209.

## 4.2.2 TEST INSTRUMENTS

**For below 1GHz: (Test date: July 06, 2011)**

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Agilent Spectrum Analyzer	E4446A	MY48250254	July 14, 2010	July 13, 2011
Agilent Pre-Selector	N9039A	MY46520311	July 14, 2010	July 13, 2011
Agilent Signal Generator	N5181A	MY49060517	July 14, 2010	July 13, 2011
Mini-Circuits Pre-Amplifier	ZFL-1000VH2B	AMP-ZFL-03	Nov. 16, 2010	Nov. 15, 2011
Agilent Pre-Amplifier	8449B	3008A02578	July 04, 2011	July 03, 2012
Miteq Pre-Amplifier	AFS33-1800265 0-30-8P-44	881786	NA	NA
SCHWARZBECK Trilog Broadband Antenna	VULB 9168	9168-360	Apr. 14, 2011	Apr. 13, 2012
AISI Horn_Antenna	AIH.8018	000032009111 0	Nov. 12, 2010	Nov. 11, 2011
SCHWARZBECK Horn_Antenna	BBHA 9170	9170-424	Oct. 08, 2010	Oct. 07, 2011
RF CABLE	NA	RF104-201 RF104-203 RF104-204	Dec. 27, 2010	Dec. 26, 2011
RF Cable	NA	CHGCAB_001	NA	NA
Software	ADT_Radiated_ V8.7.05	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, preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.

3. The test was performed in 966 Chamber No. G.

4. The FCC Site Registration No. is 966073.

5. The VCCI Site Registration No. is G-137.

6. The CANADA Site Registration No. is IC 7450H-2.]



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**For above 1GHz: (Test date: May 20, 2011)**

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Agilent Spectrum Analyzer	E4446A	MY48250254	July 14, 2010	July 13, 2011
Agilent Pre-Selector	N9039A	MY46520311	July 14, 2010	July 13, 2011
Agilent Signal Generator	N5181A	MY49060517	July 14, 2010	July 13, 2011
Mini-Circuits Pre-Amplifier	ZFL-1000VH2B	AMP-ZFL-03	Nov. 16, 2010	Nov. 15, 2011
Agilent Pre-Amplifier	8449B	3008A02578	July 05, 2010	July 04, 2011
Miteq Pre-Amplifier	AFS33-1800265 0-30-8P-44	881786	NA	NA
SCHWARZBECK Trilog Broadband Antenna	VULB 9168	9168-360	Apr. 14, 2011	Apr. 13, 2012
AISI Horn_Antenna	AIH.8018	000032009111 0	Nov. 12, 2010	Nov. 11, 2011
SCHWARZBECK Horn_Antenna	BBHA 9170	9170-424	Oct. 08, 2010	Oct. 07, 2011
RF CABLE	NA	RF104-201 RF104-203 RF104-204	Dec. 27, 2010	Dec. 26, 2011
RF Cable	NA	CHGCAB_001	NA	NA
Software	ADT_Radiated_ V8.7.05	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, preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.

3. The test was performed in 966 Chamber No. G.

4. The FCC Site Registration No. is 966073.

5. The VCCI Site Registration No. is G-137.

6. The CANADA Site Registration No. is IC 7450H-2.]

#### 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 3 meters chamber room. 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 height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.
- f. The test-receiver system was set to peak and average detect function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

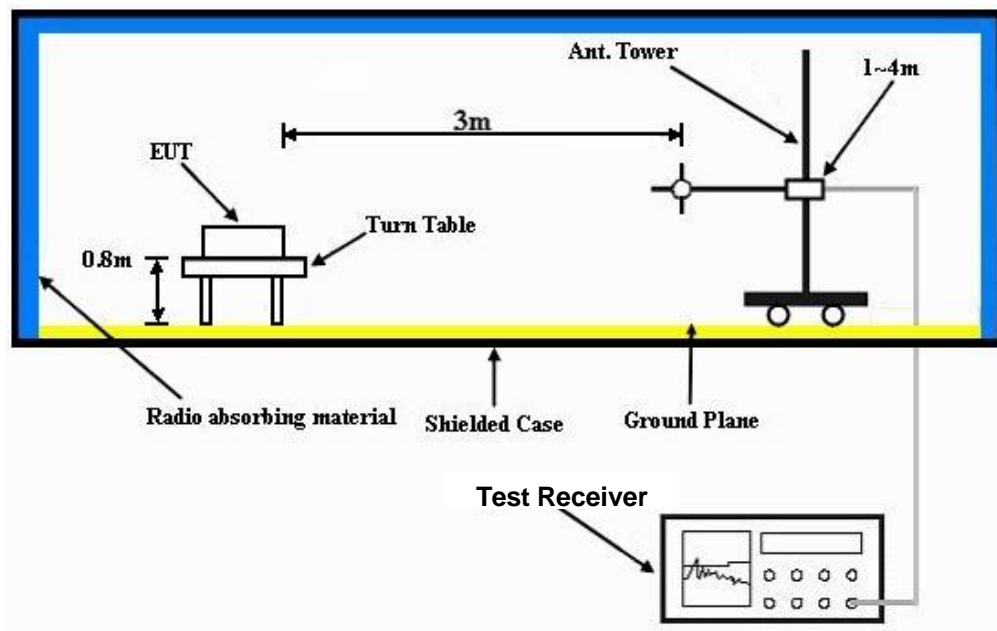
**NOTE:**

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 video bandwidth is 3MHz for Peak detection at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 10Hz for Average detection (AV) at frequency above 1GHz.

#### 4.2.4 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.





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#### 4.2.6 EUT OPERATING CONDITIONS

1. Connect the EUT with the support unit 1 (Notebook Computer) which is placed on a testing table.
2. The communication partner run test program “Art R0.9B21” to enable EUT under transmission/receiving condition continuously at specific channel frequency.

## 4.2.7 TEST RESULTS

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

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	FREQUENCY RANGE	Below 1000MHz
INPUT POWER (SYSTEM)	120Vac / 60Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	25deg. C, 71%RH 1005 hPa	TESTED BY	Evan 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	106.96	37.7 QP	43.5	-5.8	1.65 H	43	27.10	10.58
2	136.46	41.2 QP	43.5	-2.3	2.00 H	351	27.15	14.01
3	162.75	39.1 QP	43.5	-4.4	1.78 H	225	24.68	14.46
4	199.84	40.1 QP	43.5	-3.4	1.50 H	249	28.68	11.38
5	641.42	39.4 QP	46.0	-6.6	1.00 H	64	17.07	22.35
6	725.14	40.3 QP	46.0	-5.7	1.00 H	93	17.08	23.23
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	30.00	34.9 QP	40.0	-5.1	1.00 V	183	21.92	13.01
2	107.21	36.5 QP	43.5	-7.0	2.00 V	119	25.92	10.62
3	166.42	37.2 QP	43.5	-6.3	2.00 V	143	23.04	14.20
4	431.45	34.6 QP	46.0	-11.4	1.00 V	214	16.24	18.38
5	630.61	36.6 QP	46.0	-9.4	1.25 V	359	14.29	22.30
6	897.80	38.3 QP	46.0	-7.7	1.00 V	84	11.83	26.46

- 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.

## ABOVE 1GHz WORST-CASE DATA

### 802.11b DSSS MODULATION

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac / 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	20deg. C, 68%RH 1005 hPa	TESTED BY	Frank 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	2390.00	56.4 PK	74.0	-17.6	1.44 H	328	24.74	31.66
2	2390.00	43.5 AV	54.0	-10.5	1.44 H	328	11.82	31.66
3	*2412.00	100.5 PK			1.44 H	328	68.77	31.73
4	*2412.00	97.6 AV			1.44 H	328	65.87	31.73
5	4824.00	50.2 PK	74.0	-23.8	1.30 H	107	11.23	38.97
6	4824.00	45.0 AV	54.0	-9.0	1.30 H	107	6.03	38.97
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	56.7 PK	74.0	-17.3	1.50 V	95	25.04	31.66
2	2390.00	50.3 AV	54.0	-3.7	1.50 V	95	18.64	31.66
3	*2412.00	112.7 PK			1.50 V	95	80.97	31.73
4	*2412.00	110.7 AV			1.50 V	95	78.97	31.73
5	4824.00	55.0 PK	74.0	-19.0	1.10 V	95	16.03	38.97
6	4824.00	53.3 AV	54.0	-0.7	1.10 V	95	14.33	38.97

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



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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac / 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	20deg. C, 68%RH 1005 hPa	TESTED BY	Frank 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	*2437.00	100.7 PK			1.44 H	321	68.89	31.81
2	*2437.00	97.8 AV			1.44 H	321	65.99	31.81
3	4874.00	56.6 PK	74.0	-17.4	1.31 H	104	17.46	39.14
4	4874.00	45.6 AV	54.0	-8.4	1.31 H	104	6.46	39.14
5	7311.00	52.7 PK	74.0	-21.3	1.00 H	24	6.07	46.63
6	7311.00	40.6 AV	54.0	-13.4	1.00 H	24	-6.03	46.63
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	112.9 PK			1.54 V	87	81.09	31.81
2	*2437.00	110.9 AV			1.54 V	87	79.09	31.81
3	4874.00	56.9 PK	74.0	-17.1	1.00 V	73	17.76	39.14
4	4874.00	53.4 AV	54.0	-0.6	1.00 V	73	14.26	39.14
5	7311.00	52.4 PK	74.0	-21.6	1.00 V	23	5.77	46.63
6	7311.00	40.1 AV	54.0	-13.9	1.00 V	23	-6.53	46.63

**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.



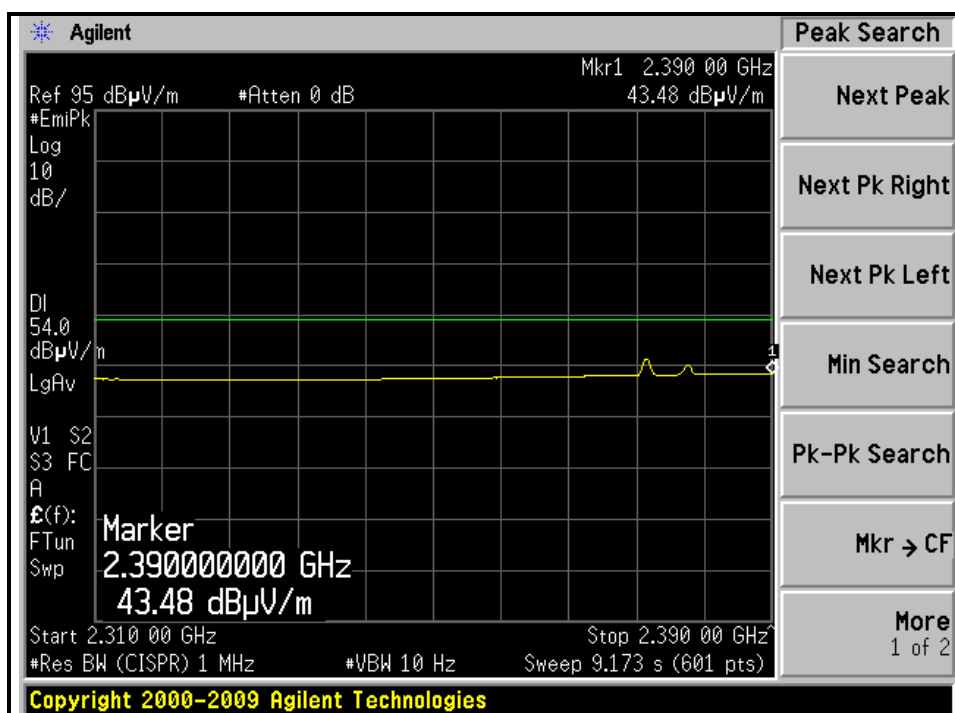
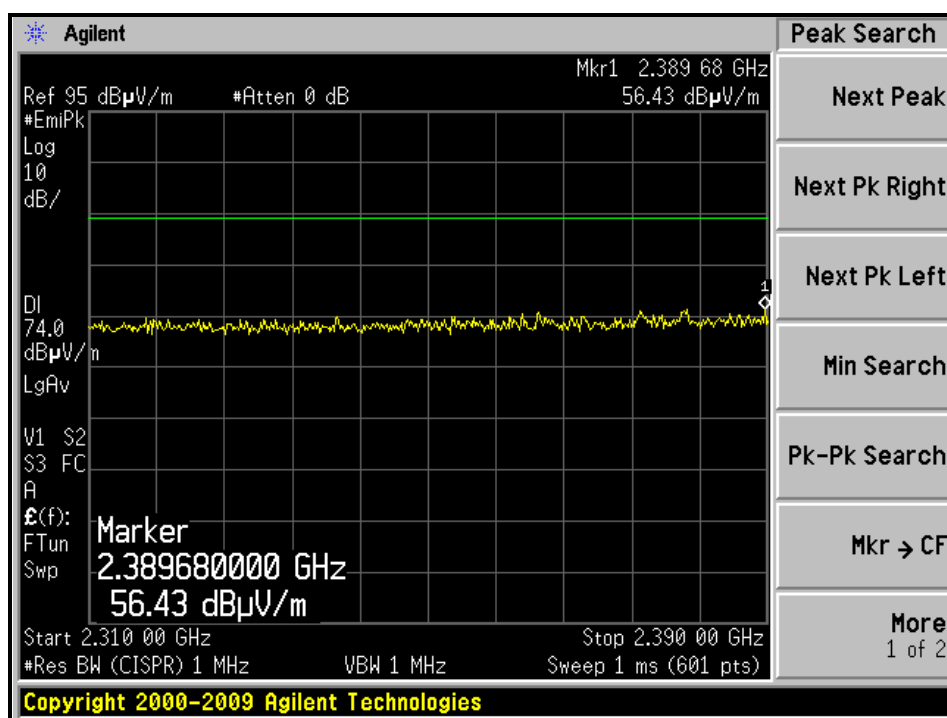
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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac / 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	20deg. C, 68%RH 1005 hPa	TESTED BY	Frank Liu

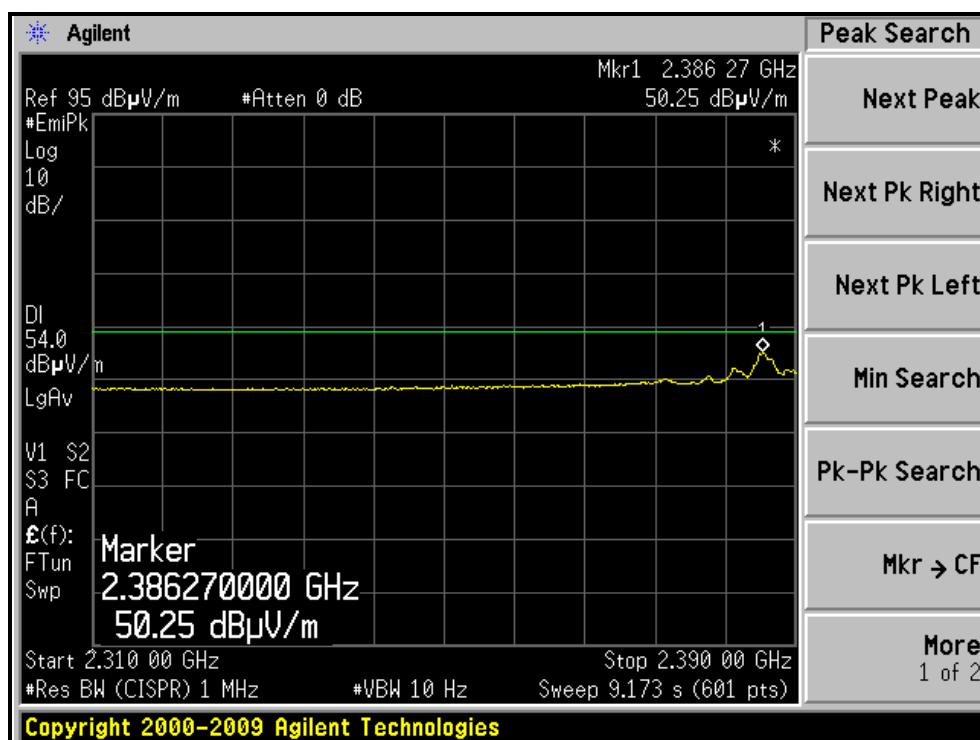
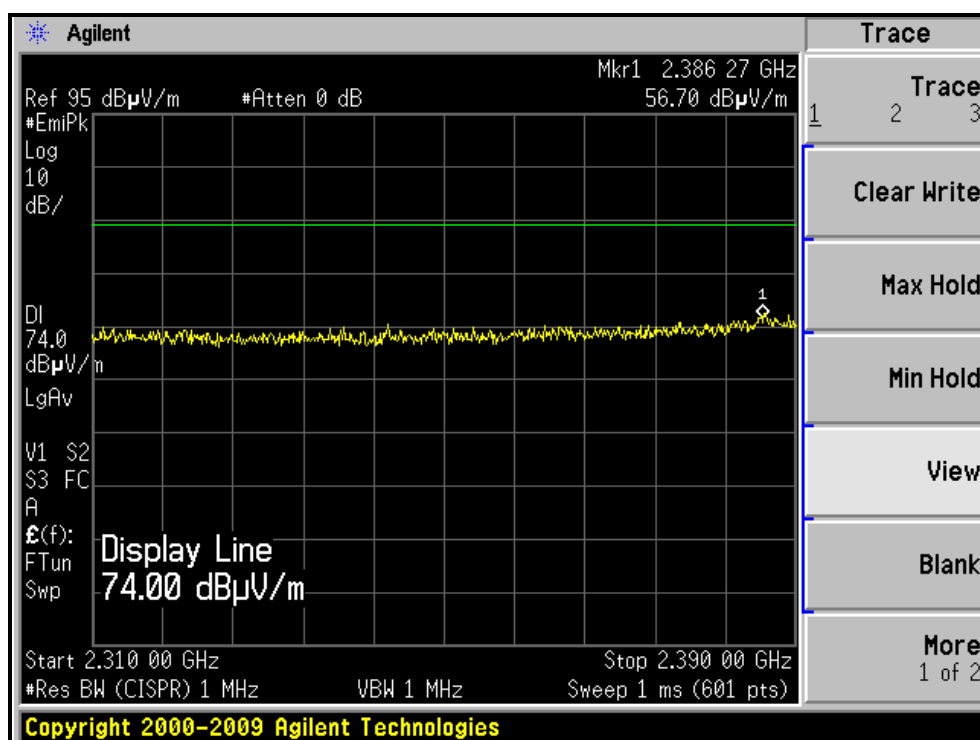
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	100.4 PK			1.53 H	110	68.51	31.89
2	*2462.00	97.6 AV			1.53 H	110	65.71	31.89
3	2483.50	55.9 PK	74.0	-18.1	1.53 H	110	23.93	31.97
4	2483.50	43.2 AV	54.0	-10.8	1.53 H	110	11.23	31.97
5	4924.00	56.3 PK	74.0	-17.7	1.29 H	103	16.99	39.31
6	4924.00	45.4 AV	54.0	-8.6	1.29 H	103	6.09	39.31
7	7386.00	52.9 PK	74.0	-21.1	1.00 H	34	6.30	46.60
8	7386.00	40.7 AV	54.0	-13.3	1.00 H	34	-5.90	46.60
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	113.8 PK			1.49 V	97	81.91	31.89
2	*2462.00	111.2 AV			1.49 V	97	79.31	31.89
3	2487.76	55.5 PK	74.0	-18.5	1.49 V	97	23.52	31.98
4	2487.76	47.0 AV	54.0	-7.0	1.49 V	97	15.02	31.98
5	4924.00	56.8 PK	74.0	-17.2	1.00 V	101	17.49	39.31
6	4924.00	53.1 AV	54.0	-0.9	1.00 V	101	13.79	39.31
7	7386.00	52.6 PK	74.0	-21.4	1.00 V	56	6.00	46.60
8	7386.00	40.4 AV	54.0	-13.6	1.00 V	56	-6.20	46.60

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

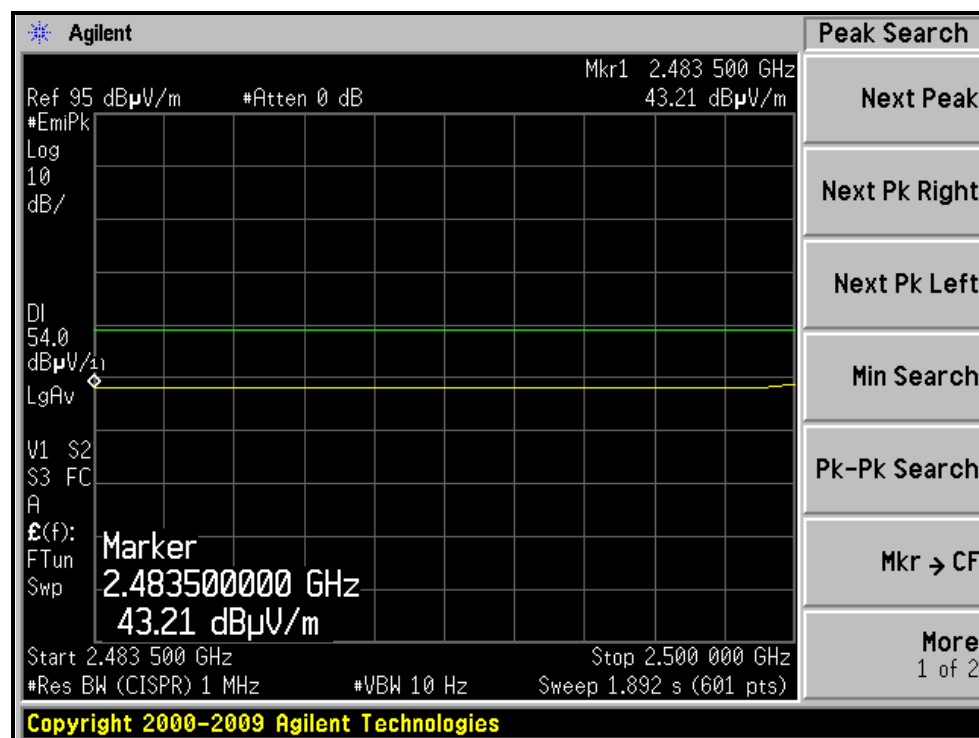
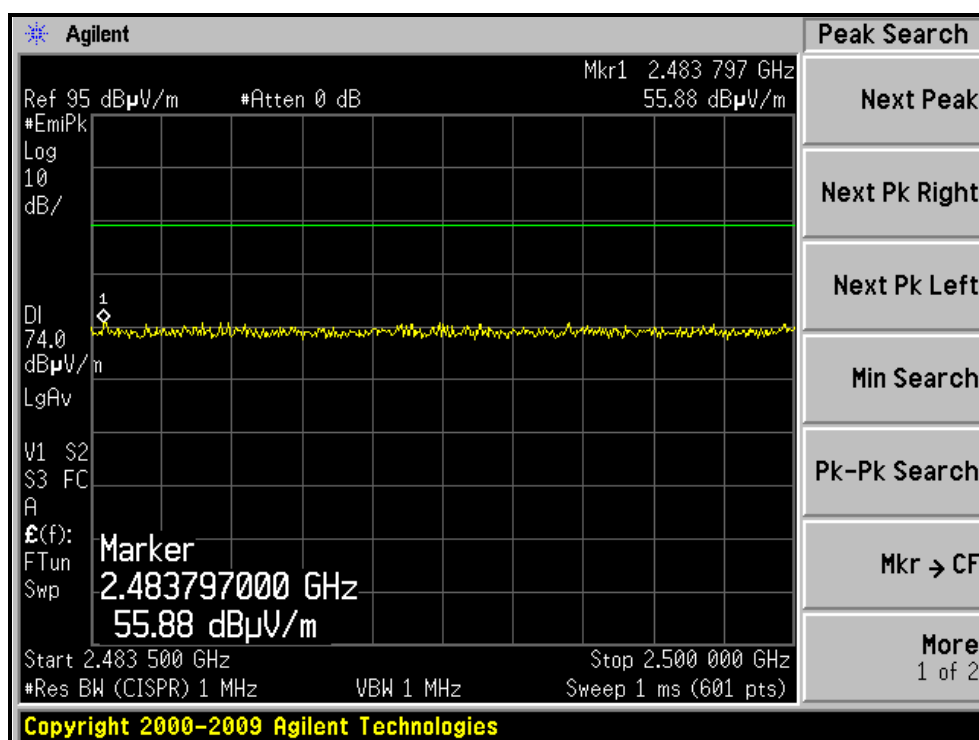
# RESTRICTED BANDEDGE (802.11b MODE,CH1, HORIZONTAL)



# RESTRICTED BANDEDGE (802.11b MODE,CH1, VERTICAL )

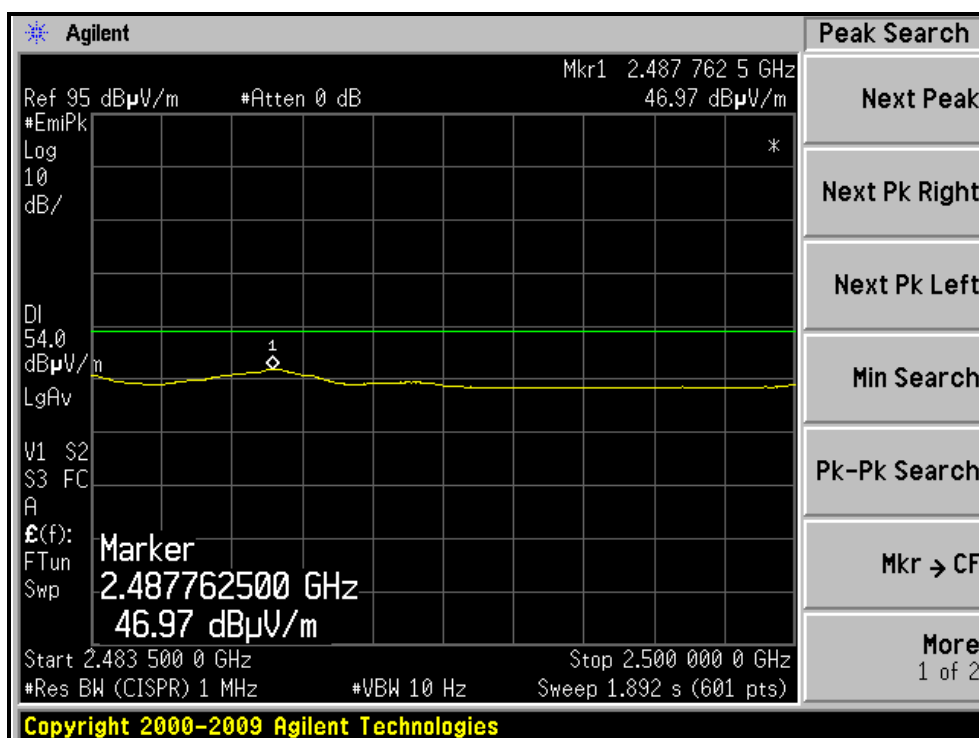
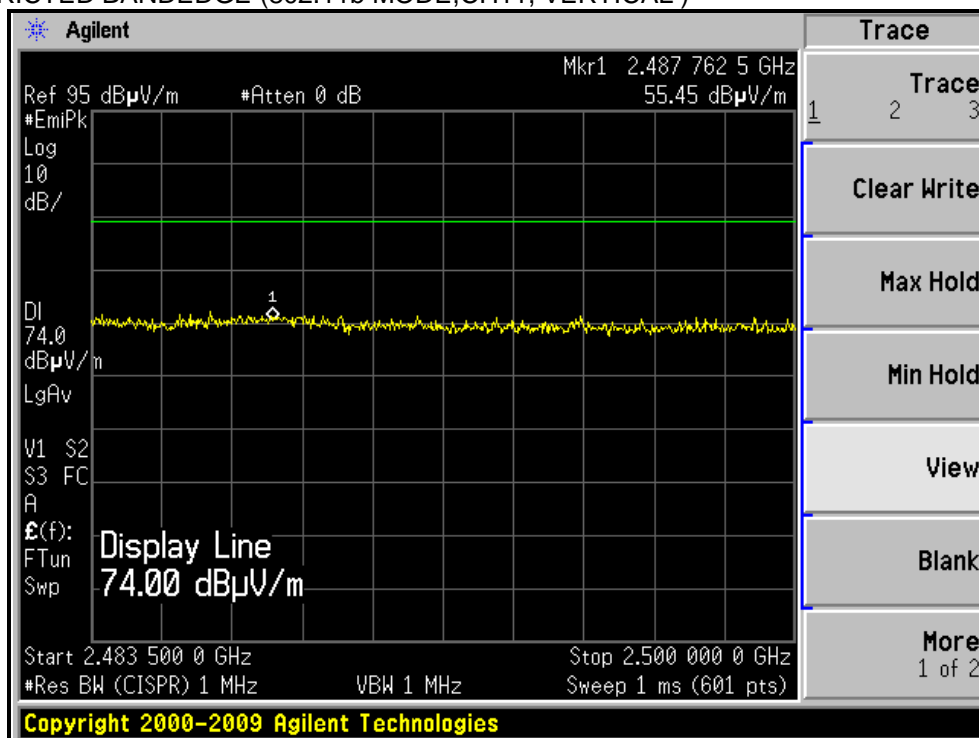


RESTRICTED BANDEDGE (802.11b MODE,CH11, HORIZONTAL )





# RESTRICTED BANDEDGE (802.11b MODE,CH11, VERTICAL )



## 802.11g OFDM MODULATION

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac / 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	20deg. C, 68%RH 1005 hPa	TESTED BY	Frank 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	2390.00	56.2 PK	74.0	-17.8	1.78 H	329	24.56	31.66
2	2390.00	45.8 AV	54.0	-8.2	1.78 H	329	14.14	31.66
3	*2412.00	104.4 PK			1.78 H	329	72.67	31.73
4	*2412.00	94.6 AV			1.78 H	329	62.87	31.73
5	4824.00	56.2 PK	74.0	-17.8	1.24 H	133	17.23	38.97
6	4824.00	45.3 AV	54.0	-8.7	1.24 H	133	6.33	38.97
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	70.7 PK	74.0	-3.3	1.50 V	95	39.04	31.66
2	2390.00	51.2 AV	54.0	-2.8	1.50 V	95	19.54	31.66
3	*2412.00	115.6 PK			1.50 V	95	83.87	31.73
4	*2412.00	105.6 AV			1.50 V	95	73.87	31.73
5	4824.00	60.4 PK	74.0	-13.6	1.00 V	106	21.43	38.97
6	4824.00	50.4 AV	54.0	-3.6	1.00 V	106	11.43	38.97

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

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac / 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	20deg. C, 68%RH 1005 hPa	TESTED BY	Frank 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	*2437.00	104.2 PK			1.76 H	325	72.39	31.81
2	*2437.00	94.3 AV			1.76 H	325	62.49	31.81
3	4874.00	56.7 PK	74.0	-17.3	1.24 H	101	17.56	39.14
4	4874.00	45.1 AV	54.0	-8.9	1.24 H	101	5.96	39.14
5	7311.00	52.4 PK	74.0	-21.6	1.00 H	66	5.77	46.63
6	7311.00	40.2 AV	54.0	-13.8	1.00 H	66	-6.43	46.63
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	72.8 PK	74.0	-1.2	1.49 V	102	41.14	31.66
2	2390.00	52.1 AV	54.0	-1.9	1.49 V	102	20.44	31.66
3	*2437.00	121.6 PK			1.46 V	94	89.79	31.81
4	*2437.00	111.8 AV			1.46 V	94	79.99	31.81
5	2483.50	71.3 PK	74.0	-2.7	1.46 V	94	39.33	31.97
6	2483.50	52.4 AV	54.0	-1.6	1.46 V	94	20.43	31.97
7	4874.00	60.6 PK	74.0	-13.4	1.14 V	96	21.46	39.14
8	4874.00	51.5 AV	54.0	-2.5	1.14 V	96	12.36	39.14
9	7311.00	52.7 PK	74.0	-21.3	1.00 V	59	6.07	46.63
10	7311.00	40.3 AV	54.0	-13.7	1.00 V	59	-6.33	46.63

**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.



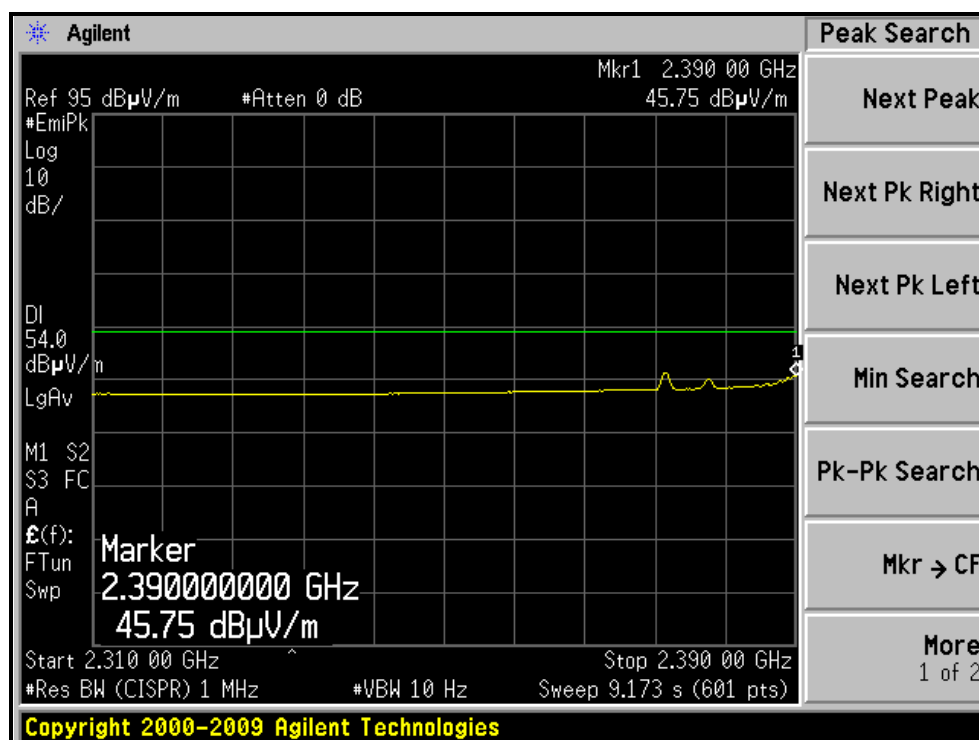
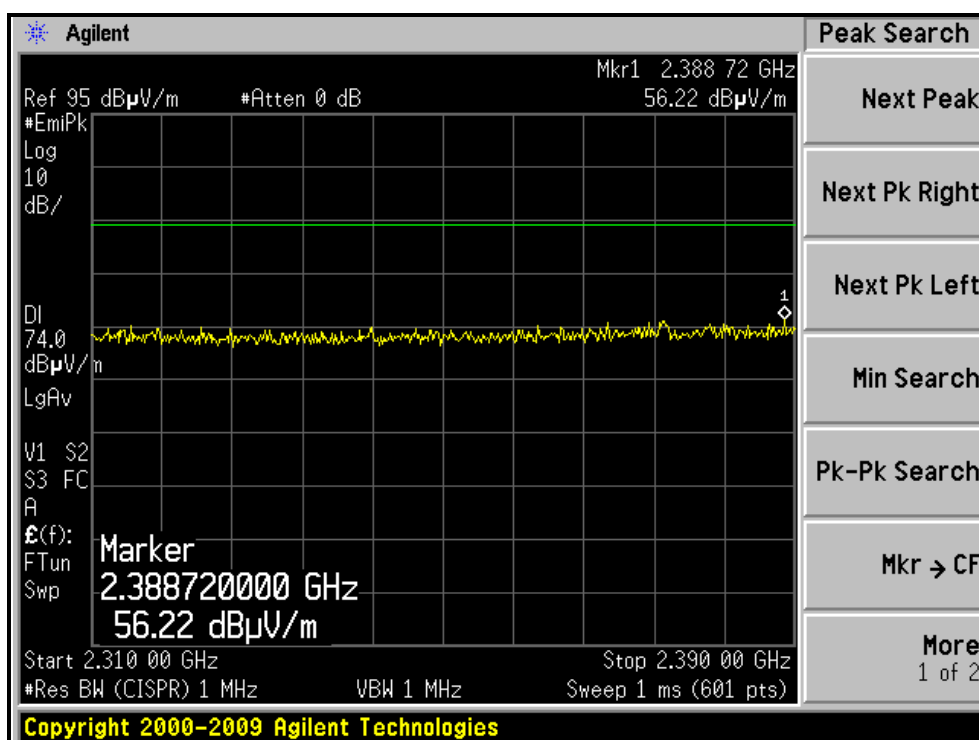
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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac / 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	20deg. C, 68%RH 1005 hPa	TESTED BY	Frank Liu

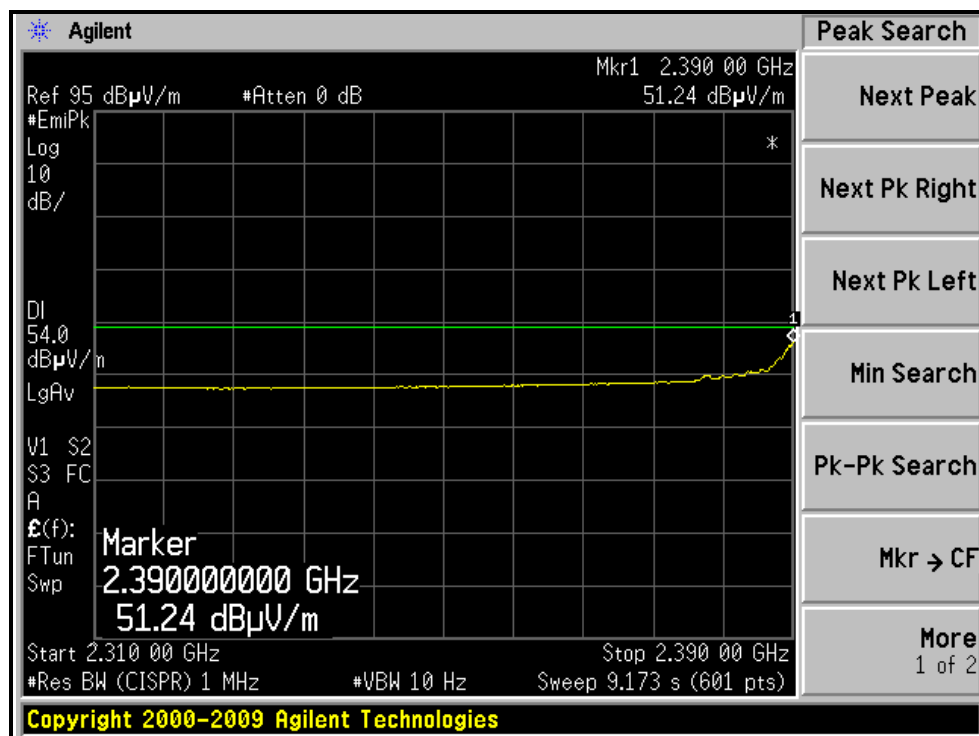
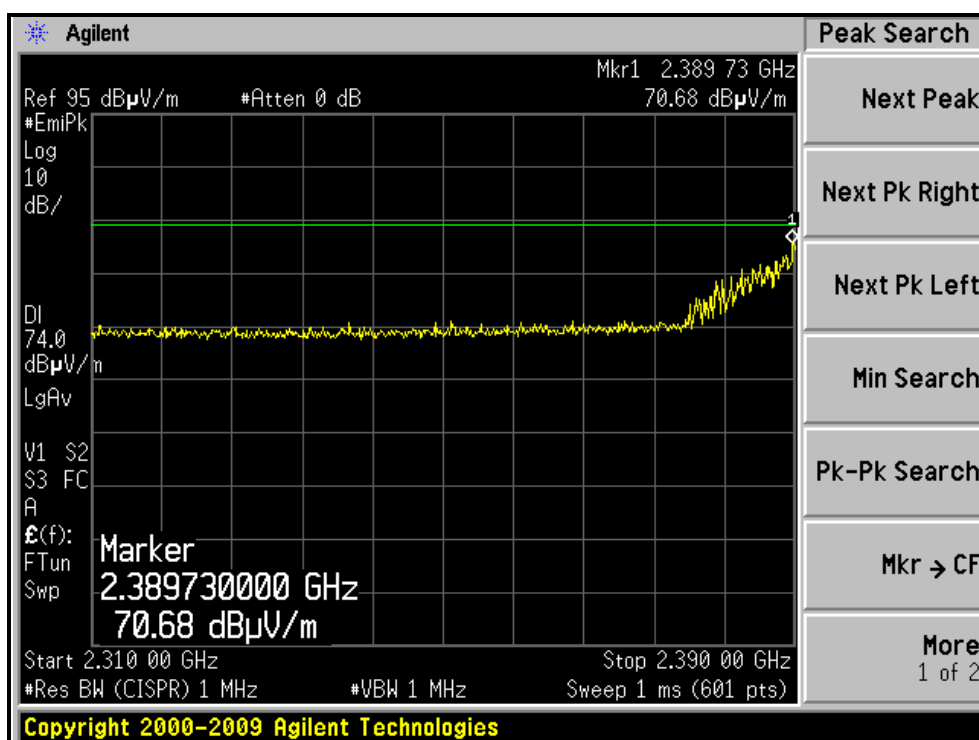
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	104.6 PK			1.57 H	109	72.71	31.89
2	*2462.00	94.6 AV			1.57 H	109	62.71	31.89
3	2483.50	59.7 PK	74.0	-14.3	1.57 H	109	27.73	31.97
4	2483.50	44.3 AV	54.0	-9.7	1.57 H	109	12.33	31.97
5	4924.00	57.0 PK	74.0	-17.0	1.25 H	104	17.69	39.31
6	4924.00	45.2 AV	54.0	-8.8	1.25 H	104	5.89	39.31
7	7386.00	52.6 PK	74.0	-21.4	1.00 H	79	6.00	46.60
8	7386.00	40.3 AV	54.0	-13.7	1.00 H	79	-6.30	46.60
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	117.6 PK			1.46 V	100	85.71	31.89
2	*2462.00	107.9 AV			1.46 V	100	76.01	31.89
3	2483.50	71.3 PK	74.0	-2.7	1.46 V	100	39.33	31.97
4	2483.50	50.6 AV	54.0	-3.4	1.46 V	100	18.63	31.97
5	4924.00	60.6 PK	74.0	-13.4	1.14 V	105	21.29	39.31
6	4924.00	51.4 AV	54.0	-2.6	1.14 V	105	12.09	39.31
7	7386.00	52.4 PK	74.0	-21.6	1.04 V	57	5.80	46.60
8	7386.00	40.2 AV	54.0	-13.8	1.04 V	57	-6.40	46.60

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

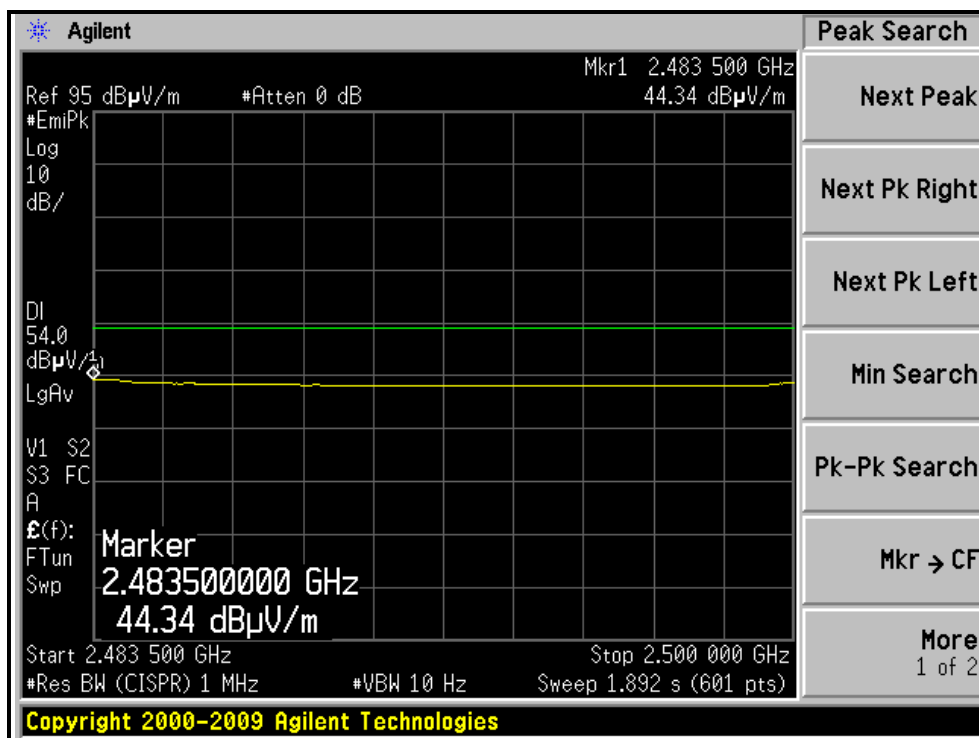
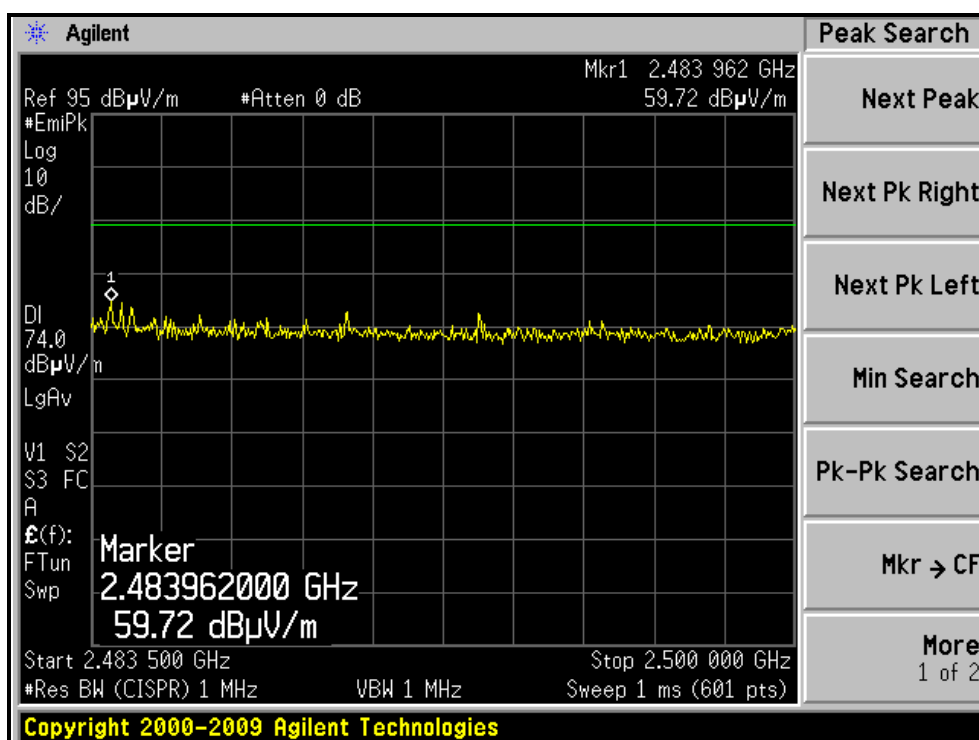
# RESTRICTED BANDEDGE (802.11g MODE,CH1, HORIZONTAL )



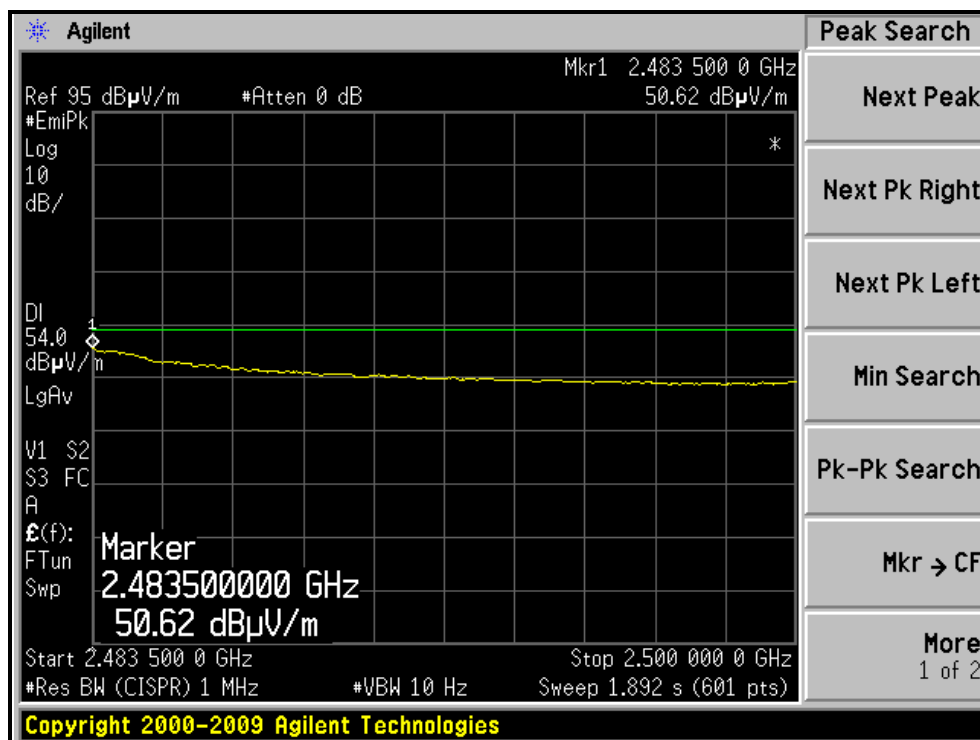
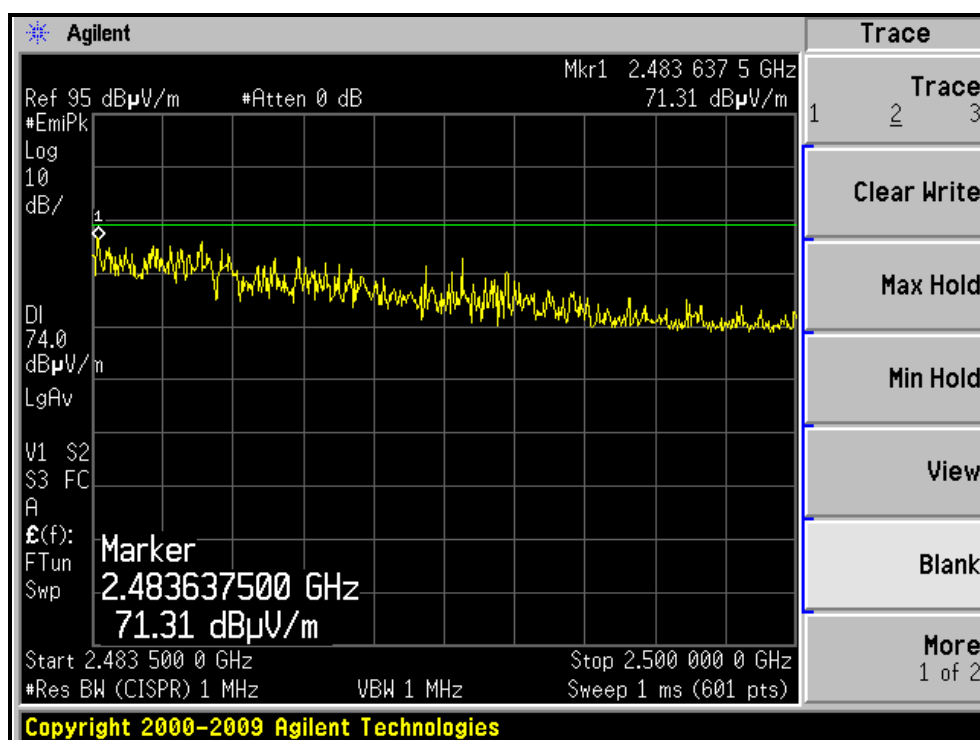
# RESTRICTED BANDEDGE (802.11g MODE,CH1, VERTICAL )



# RESTRICTED BANDEDGE (802.11g MODE,CH11, HORIZONTAL )



# RESTRICTED BANDEDGE (802.11g MODE,CH11, VERTICAL )





### 802.11n (20MHz) OFDM MODULATION

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac / 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	20deg. C, 68%RH 1005 hPa	TESTED BY	Frank 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	2390.00	57.0 PK	74.0	-17.0	1.79 H	329	25.34	31.66
2	2390.00	43.6 AV	54.0	-10.4	1.79 H	329	11.94	31.66
3	*2412.00	104.3 PK			1.79 H	329	72.57	31.73
4	*2412.00	94.2 AV			1.79 H	329	62.47	31.73
5	4824.00	56.7 PK	74.0	-17.3	1.27 H	113	17.73	38.97
6	4824.00	45.0 AV	54.0	-9.0	1.27 H	113	6.03	38.97
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	68.5 PK	74.0	-5.5	1.00 V	108	36.84	31.66
2	2390.00	52.9 AV	54.0	-1.1	1.00 V	108	21.24	31.66
3	*2412.00	118.4 PK			1.00 V	108	86.67	31.73
4	*2412.00	108.3 AV			1.00 V	108	76.57	31.73
5	4824.00	60.9 PK	74.0	-13.1	1.08 V	93	21.93	38.97
6	4824.00	51.6 AV	54.0	-2.4	1.08 V	93	12.63	38.97

**REMARKS:**

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



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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac / 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	20deg. C, 68%RH 1005 hPa	TESTED BY	Frank 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	*2437.00	104.0 PK			1.69 H	324	72.19	31.81
2	*2437.00	94.1 AV			1.69 H	324	62.29	31.81
3	4874.00	56.5 PK	74.0	-17.5	1.23 H	99	17.36	39.14
4	4874.00	45.2 AV	54.0	-8.8	1.23 H	99	6.06	39.14
5	7311.00	52.6 PK	74.0	-21.4	1.04 H	78	5.97	46.63
6	7311.00	40.5 AV	54.0	-13.5	1.04 H	78	-6.13	46.63

**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	72.4 PK	74.0	-1.6	1.49 V	103	40.74	31.66
2	2390.00	52.9 AV	54.0	-1.1	1.49 V	103	21.24	31.66
3	*2437.00	124.6 PK			1.49 V	107	92.79	31.81
4	*2437.00	114.3 AV			1.49 V	107	82.49	31.81
5	2483.50	70.4 PK	74.0	-3.6	1.49 V	103	38.43	31.97
6	2483.50	51.3 AV	54.0	-2.7	1.49 V	103	19.33	31.97
7	4874.00	59.4 PK	74.0	-14.6	1.13 V	95	20.26	39.14
8	4874.00	48.1 AV	54.0	-5.9	1.13 V	95	8.96	39.14
9	7311.00	52.2 PK	74.0	-21.8	1.03 V	45	5.57	46.63
10	7311.00	40.0 AV	54.0	-14.0	1.03 V	45	-6.63	46.63

- 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.



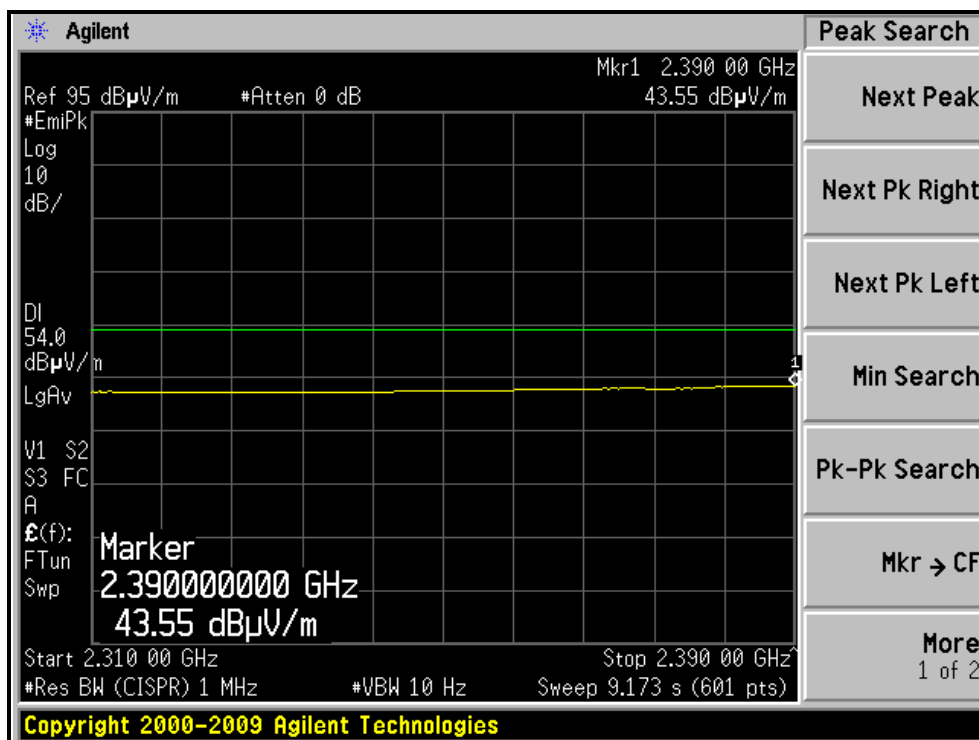
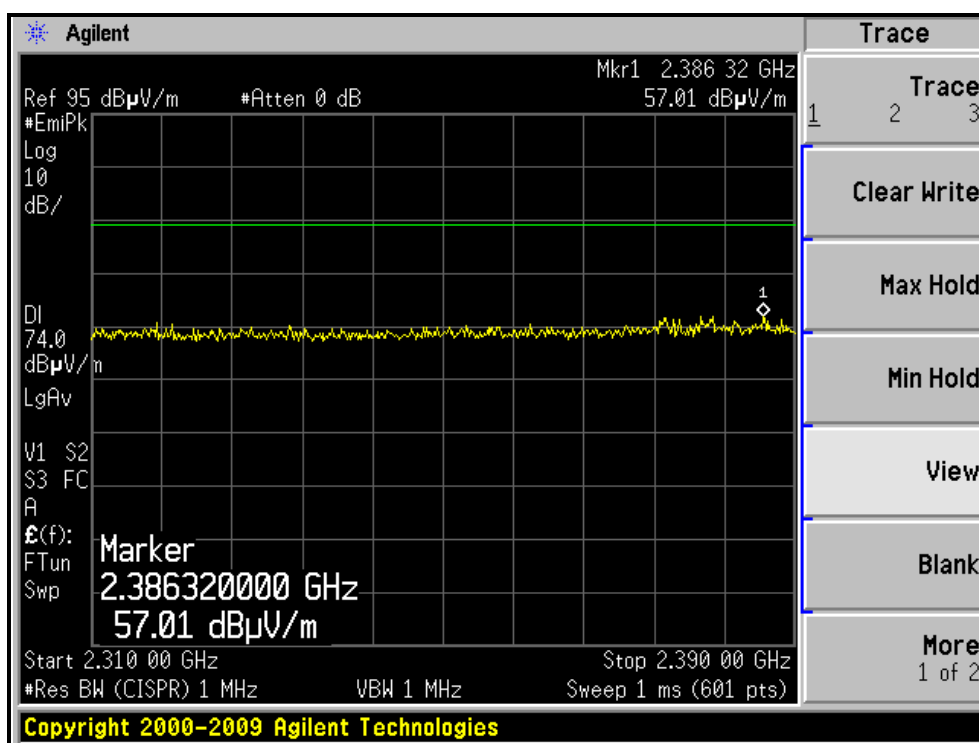
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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac / 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	20deg. C, 68%RH 1005 hPa	TESTED BY	Frank Liu

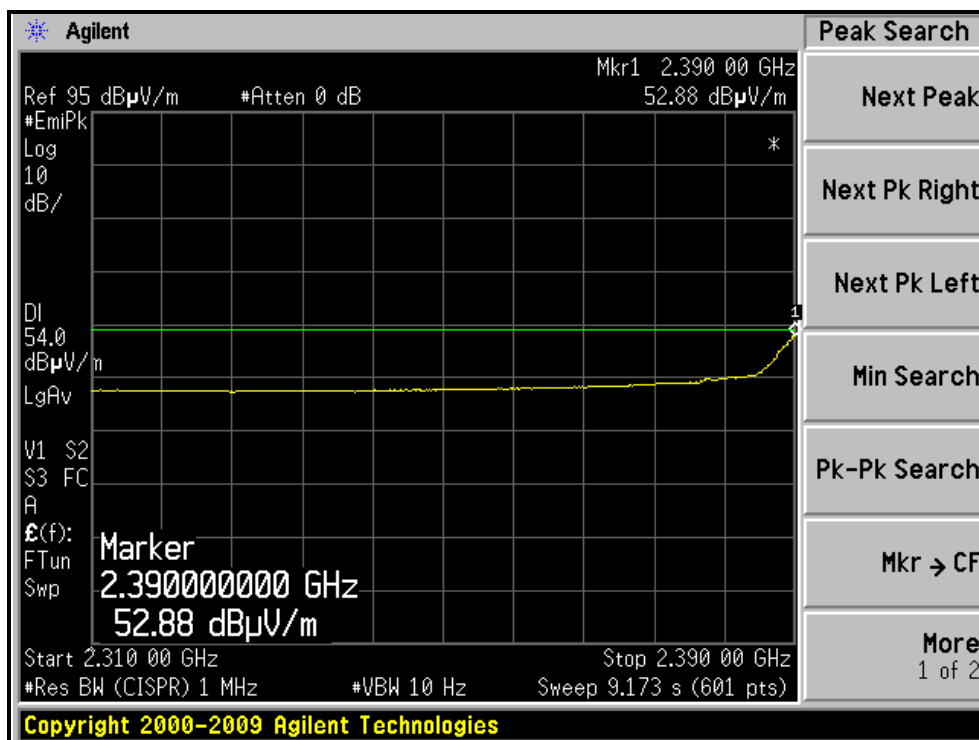
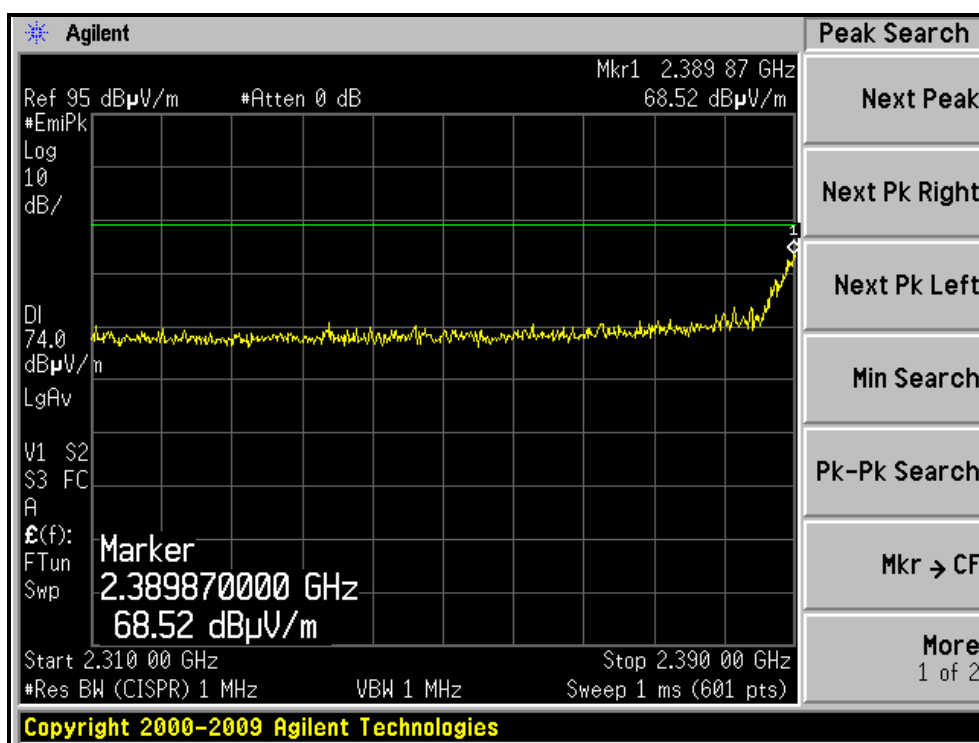
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NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	104.2 PK			1.56 H	111	72.31	31.89
2	*2462.00	95.2 AV			1.56 H	111	63.31	31.89
3	2483.50	60.5 PK	74.0	-13.5	1.56 H	111	28.53	31.97
4	2483.50	44.7 AV	54.0	-9.3	1.56 H	111	12.73	31.97
5	4924.00	56.7 PK	74.0	-17.3	1.21 H	97	17.39	39.31
6	4924.00	45.4 AV	54.0	-8.6	1.21 H	97	6.09	39.31
7	7386.00	52.6 PK	74.0	-21.4	1.02 H	62	6.00	46.60
8	7386.00	40.3 AV	54.0	-13.7	1.02 H	62	-6.30	46.60
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	120.4 PK			1.42 V	98	88.51	31.89
2	*2462.00	110.1 AV			1.42 V	98	78.21	31.89
3	2483.50	71.3 PK	74.0	-2.7	1.42 V	98	39.33	31.97
4	2483.50	52.9 AV	54.0	-1.1	1.42 V	98	20.93	31.97
5	4924.00	60.6 PK	74.0	-13.4	1.14 V	88	21.29	39.31
6	4924.00	51.5 AV	54.0	-2.5	1.14 V	88	12.19	39.31
7	7386.00	52.3 PK	74.0	-21.7	1.03 V	69	5.70	46.60
8	7386.00	40.1 AV	54.0	-13.9	1.03 V	69	-6.50	46.60

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

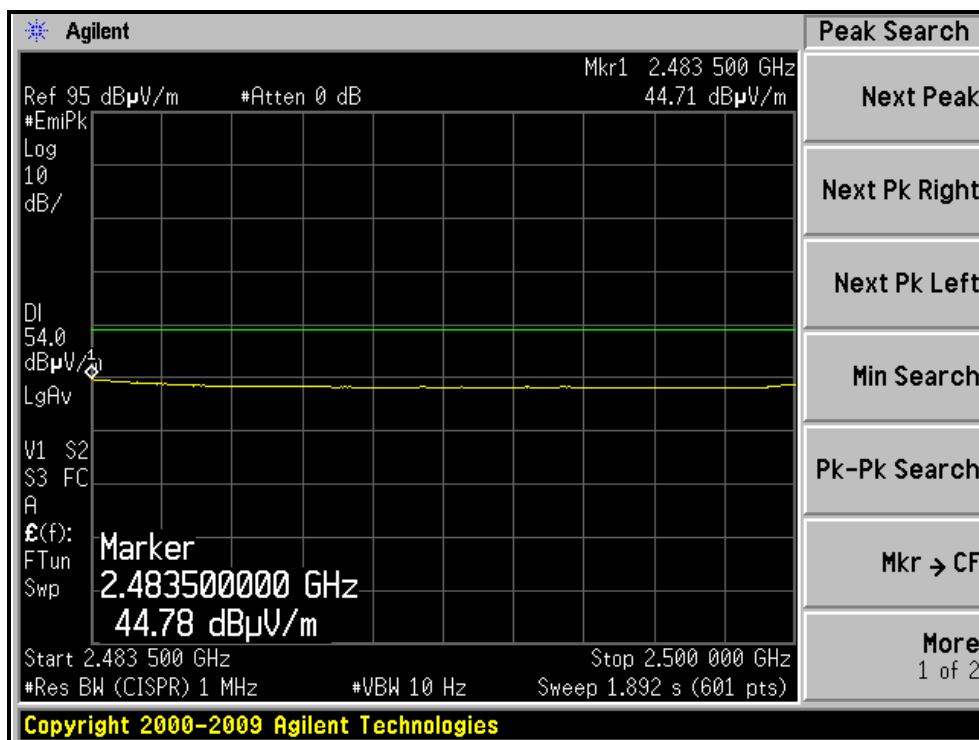
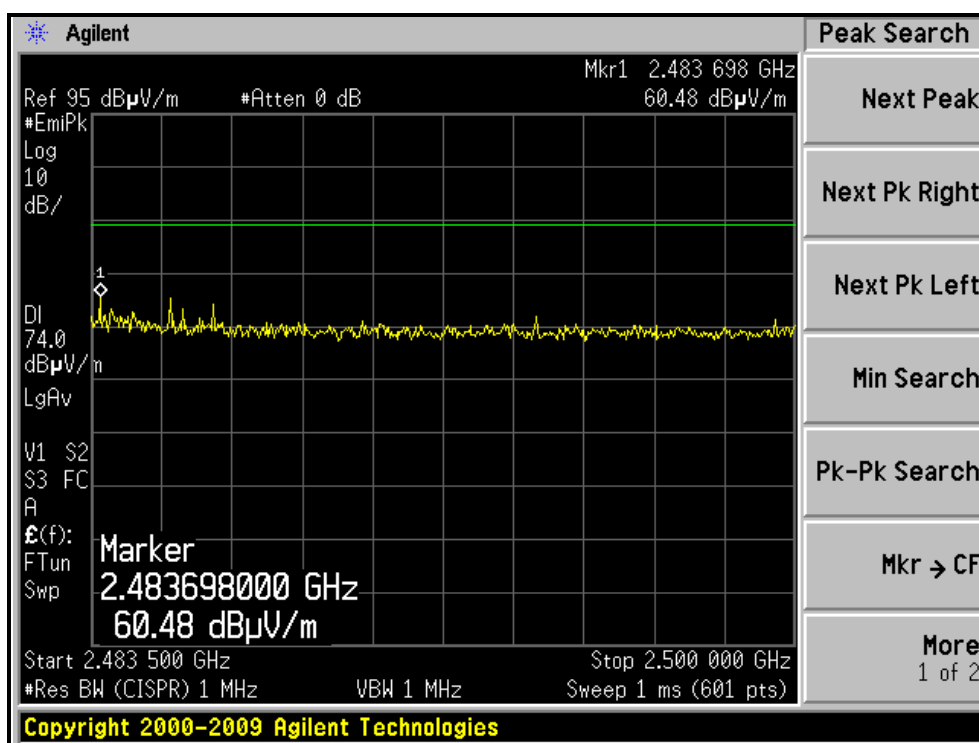
RESTRICTED BANDEDGE (802.11n (20MHz) MODE,CH1, HORIZONTAL )



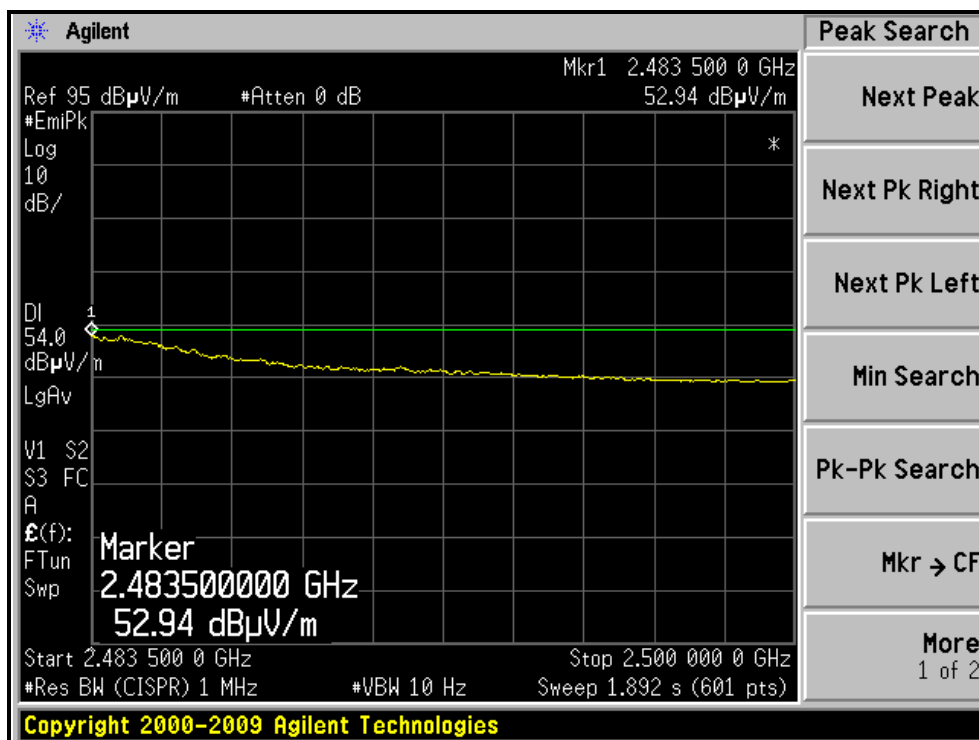
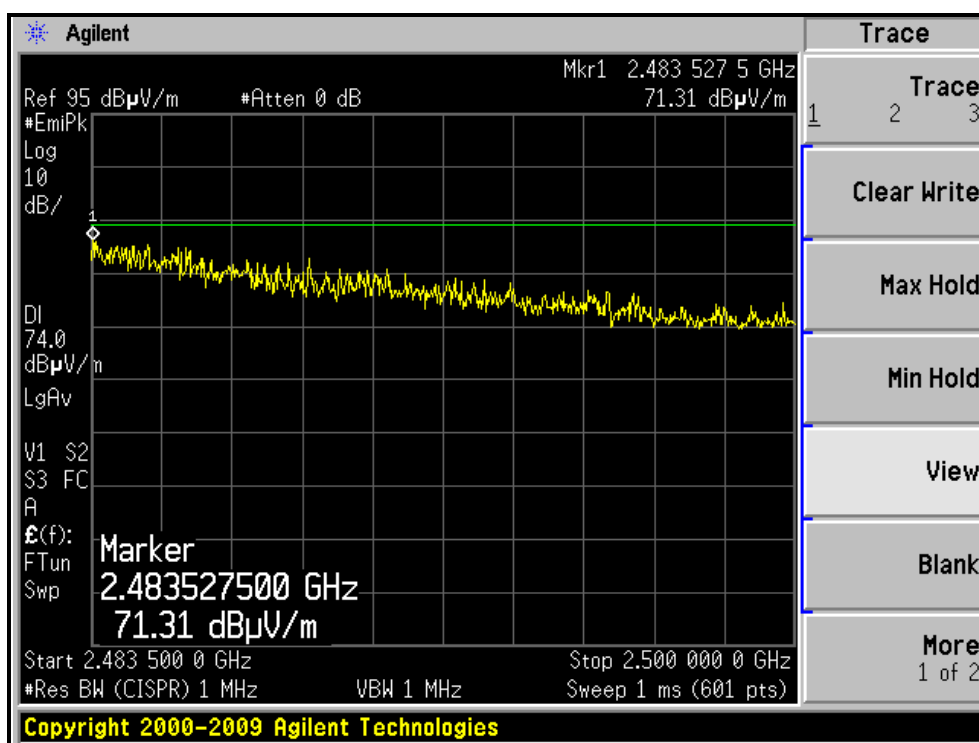
RESTRICTED BANDEDGE (802.11n (20MHz) MODE,CH1, VERTICAL )



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



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



# 802.11n (40MHz) OFDM MODULATION

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 3	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac / 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	20deg. C, 68%RH 1005 hPa	TESTED BY	Frank 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	2390.00	57.8 PK	74.0	-16.2	1.72 H	323	26.14	31.66
2	2390.00	44.8 AV	54.0	-9.2	1.72 H	323	13.14	31.66
3	*2422.00	97.3 PK			1.73 H	323	65.54	31.76
4	*2422.00	86.6 AV			1.73 H	323	54.84	31.76
5	4844.00	53.3 PK	74.0	-20.7	1.24 H	83	14.26	39.04
6	4844.00	41.4 AV	54.0	-12.6	1.24 H	83	2.36	39.04
7	7266.00	52.0 PK	74.0	-22.0	1.00 H	72	5.33	46.67
8	7266.00	40.1 AV	54.0	-13.9	1.00 H	72	-6.57	46.67
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	66.8 PK	74.0	-7.2	1.48 V	110	35.14	31.66
2	2390.00	53.1 AV	54.0	-0.9	1.48 V	110	21.44	31.66
3	*2422.00	112.2 PK			1.48 V	110	80.44	31.76
4	*2422.00	102.1 AV			1.48 V	110	70.34	31.76
5	4844.00	66.4 PK	74.0	-7.6	1.13 V	67	27.36	39.04
6	4844.00	49.3 AV	54.0	-4.7	1.13 V	67	10.26	39.04
7	7266.00	52.4 PK	74.0	-21.6	1.04 V	56	5.73	46.67
8	7266.00	40.3 AV	54.0	-13.7	1.04 V	56	-6.37	46.67

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



EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac / 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	20deg. C, 68%RH 1005 hPa	TESTED BY	Frank 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	*2437.00	97.8 PK			1.69 H	324	65.99	31.81
2	*2437.00	86.9 AV			1.69 H	324	55.09	31.81
3	4874.00	53.4 PK	74.0	-20.6	1.26 H	79	14.26	39.14
4	4874.00	41.3 AV	54.0	-12.7	1.26 H	79	2.16	39.14
5	7311.00	52.2 PK	74.0	-21.8	1.00 H	76	5.57	46.63
6	7311.00	40.1 AV	54.0	-13.9	1.00 H	76	-6.53	46.63
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	68.1 PK	74.0	-5.9	1.50 V	106	36.44	31.66
2	2390.00	53.3 AV	54.0	-0.7	1.50 V	106	21.64	31.66
3	*2437.00	113.2 PK			1.50 V	98	81.39	31.81
4	*2437.00	102.8 AV			1.50 V	98	70.99	31.81
5	2483.50	63.3 PK	74.0	-10.7	1.50 V	98	31.33	31.97
6	2483.50	51.2 AV	54.0	-2.8	1.50 V	98	19.23	31.97
7	4874.00	66.1 PK	74.0	-7.9	1.12 V	59	26.96	39.14
8	4874.00	49.0 AV	54.0	-5.0	1.12 V	59	9.86	39.14
9	7311.00	52.8 PK	74.0	-21.2	1.04 V	68	6.17	46.63
10	7311.00	40.3 AV	54.0	-13.7	1.04 V	68	-6.33	46.63

**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.



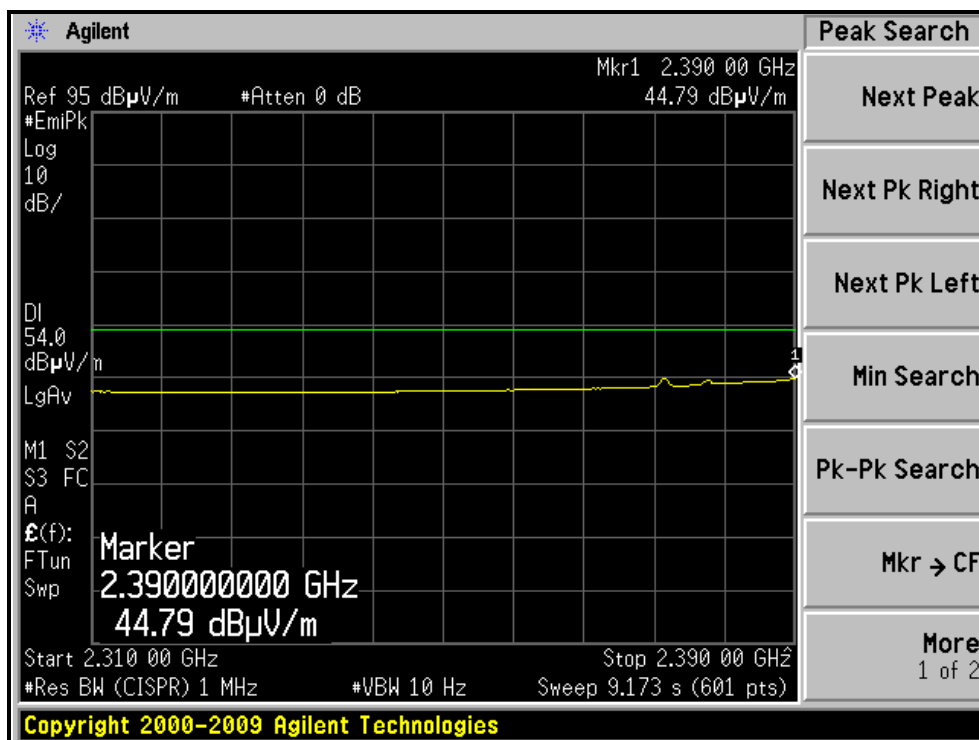
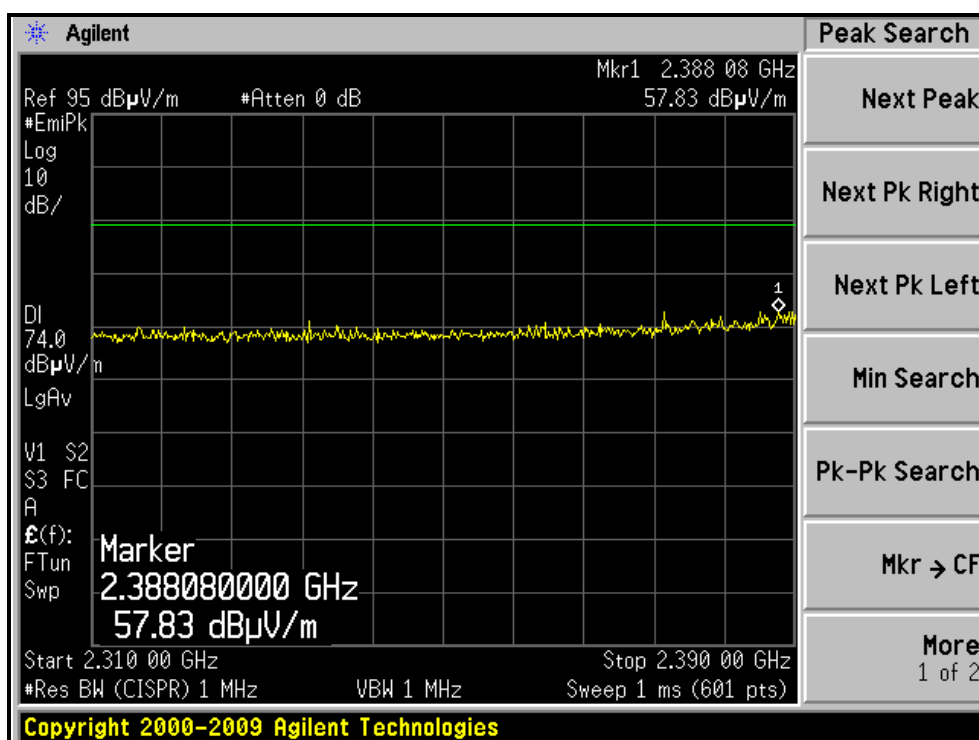
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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 9	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac / 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	20deg. C, 68%RH 1005 hPa	TESTED BY	Frank Liu

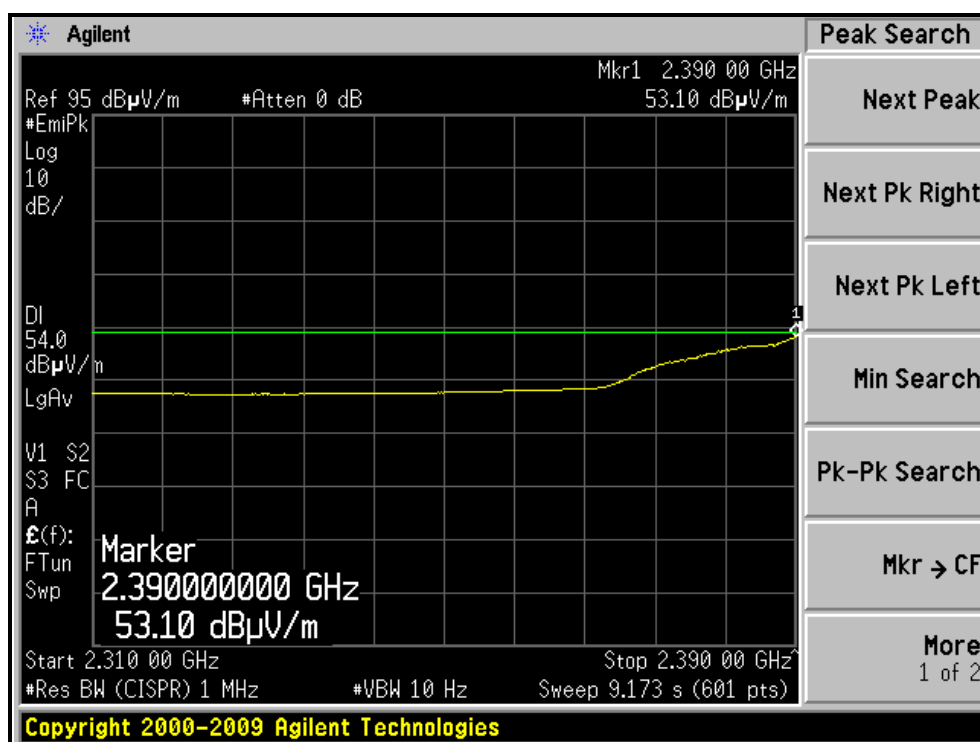
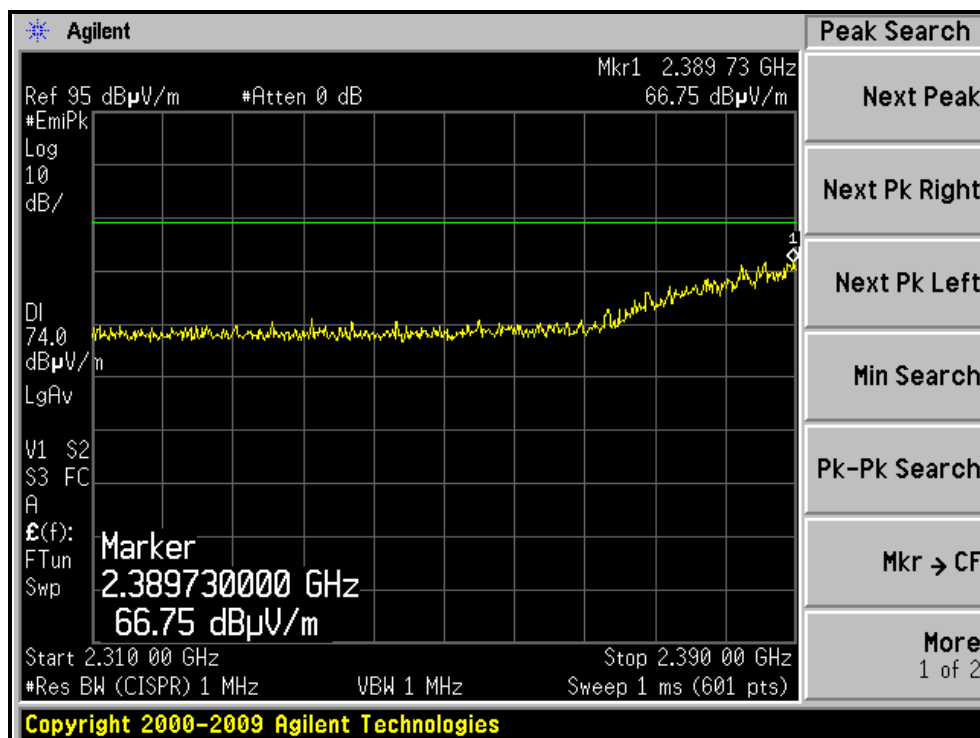
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NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2452.00	99.4 PK			1.78 H	329	67.54	31.86
2	*2452.00	88.6 AV			1.78 H	329	56.74	31.86
3	2483.55	56.6 PK	74.0	-17.4	1.78 H	329	24.63	31.97
4	2483.55	44.0 AV	54.0	-10.0	1.78 H	329	12.03	31.97
5	4904.00	53.8 PK	74.0	-20.2	1.24 H	73	14.56	39.24
6	4904.00	41.5 AV	54.0	-12.5	1.24 H	73	2.26	39.24
7	7356.00	52.9 PK	74.0	-21.1	1.02 H	73	6.29	46.61
8	7356.00	40.4 AV	54.0	-13.6	1.02 H	73	-6.21	46.61
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	113.9 PK			1.44 V	105	82.04	31.86
2	*2452.00	103.4 AV			1.44 V	105	71.54	31.86
3	2483.55	73.2 PK	74.0	-0.8	1.44 V	105	41.23	31.97
4	2483.55	52.3 AV	54.0	-1.7	1.44 V	105	20.33	31.97
5	4904.00	66.3 PK	74.0	-7.7	1.14 V	62	27.06	39.24
6	4904.00	49.2 AV	54.0	-4.8	1.14 V	62	9.96	39.24
7	7356.00	52.9 PK	74.0	-21.1	1.00 V	65	6.29	46.61
8	7356.00	40.3 AV	54.0	-13.7	1.00 V	65	-6.31	46.61

**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.

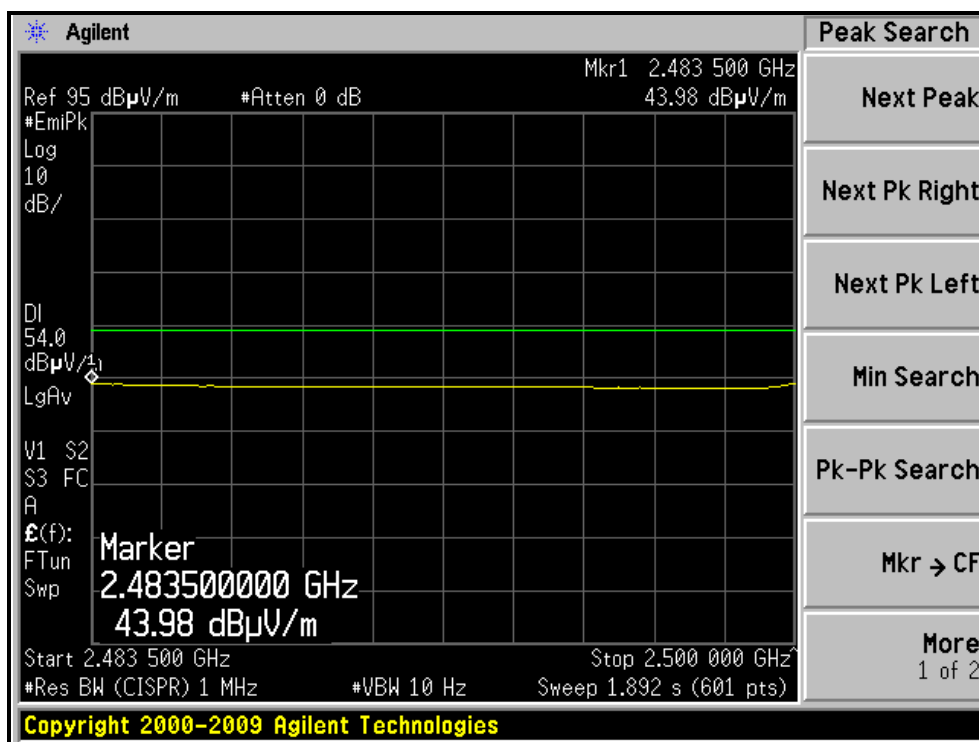
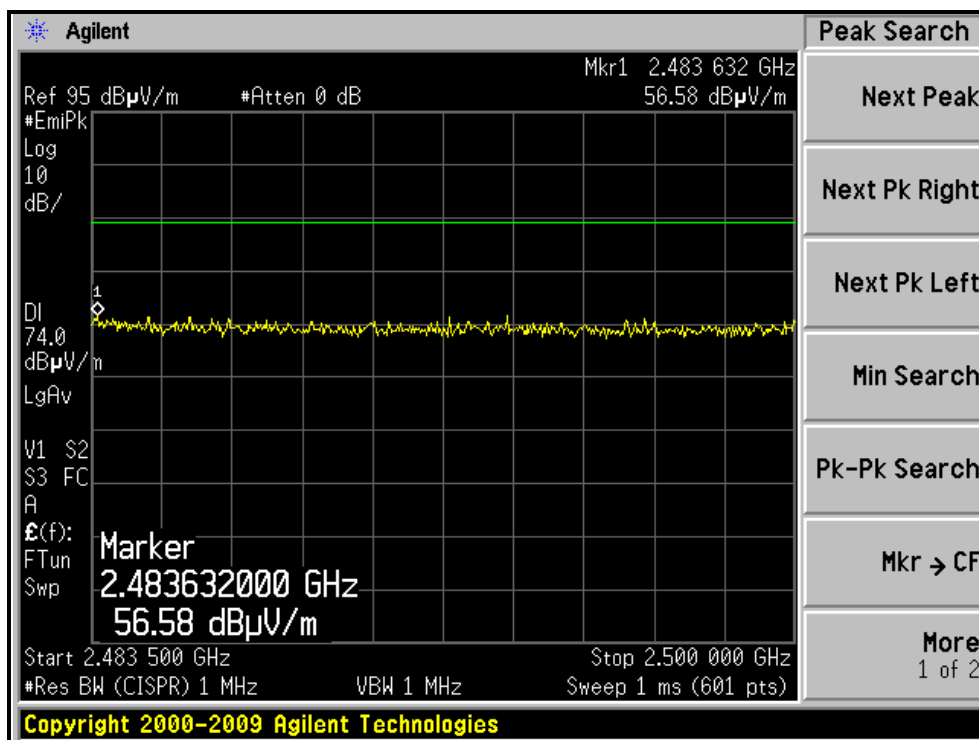
RESTRICTED BANDEDGE (802.11n (40MHz) MODE,CH3, HORIZONTAL )



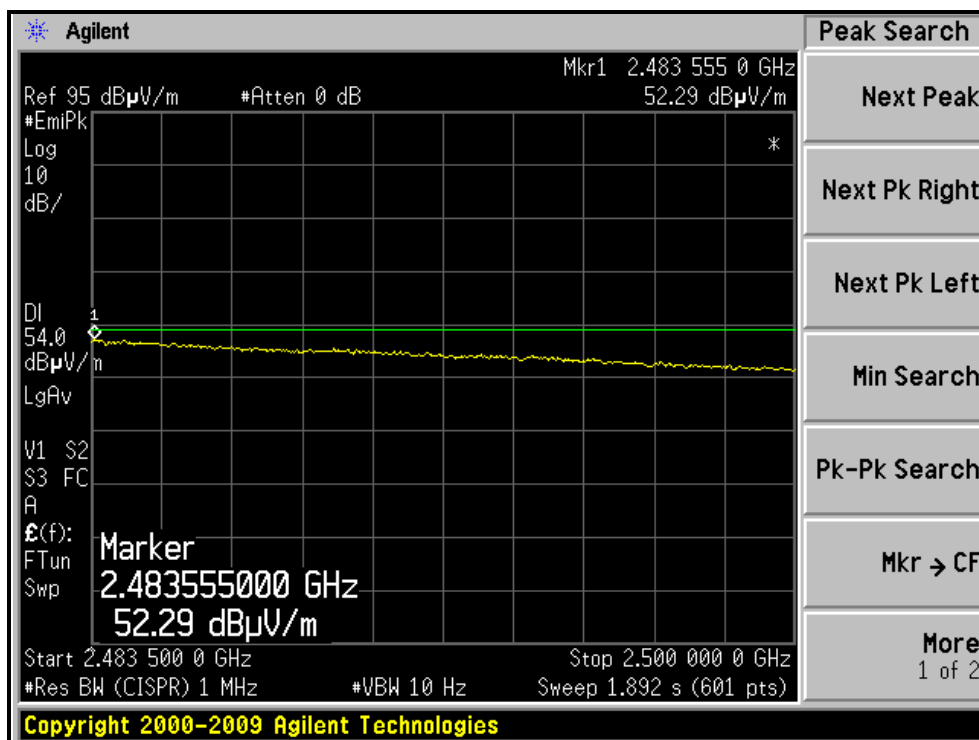
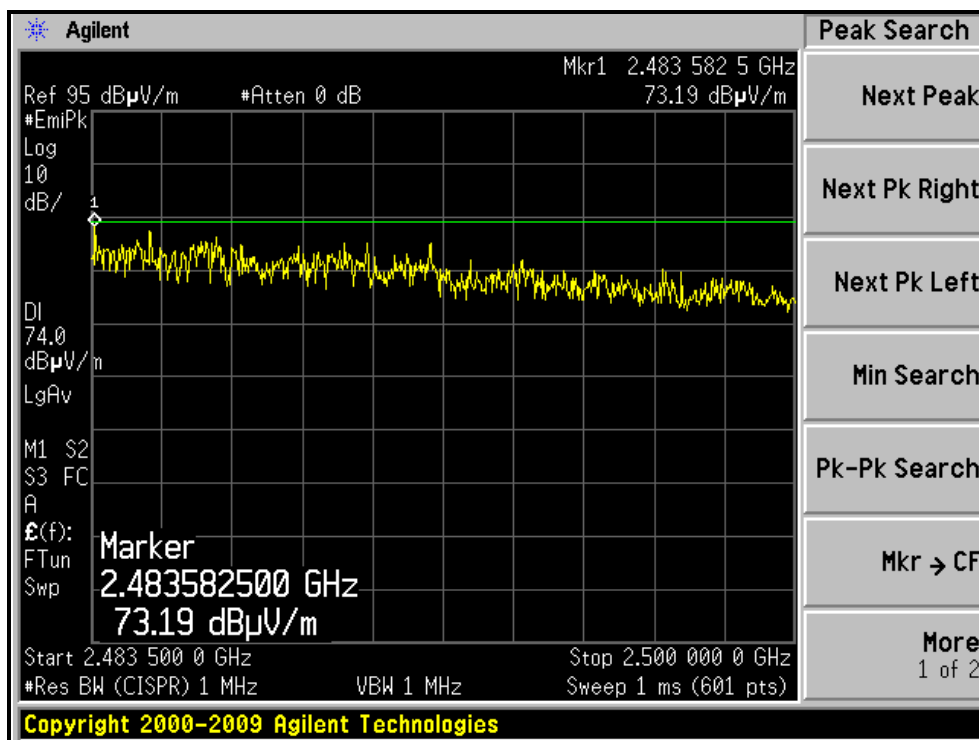
RESTRICTED BANDEDGE (802.11n (40MHz) MODE,CH3, VERTICAL )



RESTRICTED BANDEDGE (802.11n (40MHz) MODE,CH9, HORIZONTAL )



RESTRICTED BANDEDGE (802.11n (40MHz) MODE,CH9, VERTICAL )



### 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

**Test date: May 17, 2011**

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
R&S Spectrum Analyzer	FSP 40	100060	May 11, 2011	May 10, 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.

#### 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 300kHz 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

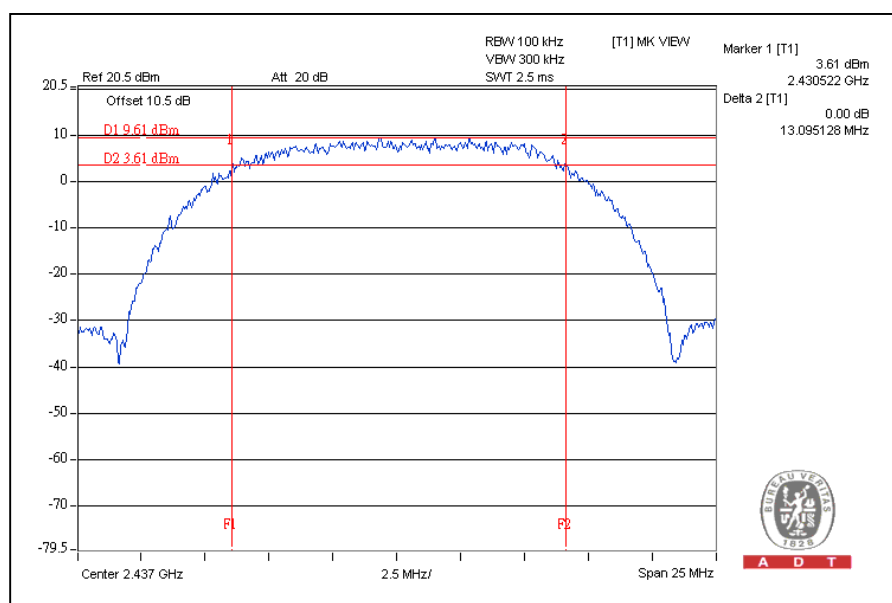
The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

## 4.3.7 TEST RESULTS

### 802.11b DSSS MODULATION:

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2412	12.53	0.5	PASS
6	2437	13.09	0.5	PASS
11	2462	11.63	0.5	PASS

## CH6

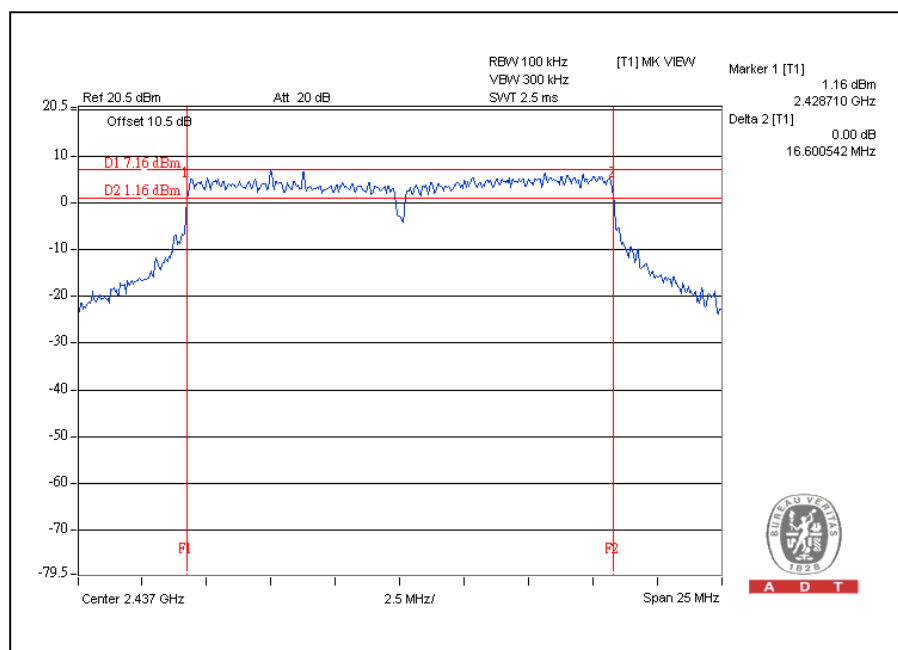




## 802.11g OFDM MODULATION:

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2412	16.51	0.5	PASS
6	2437	16.6	0.5	PASS
11	2462	10.79	0.5	PASS

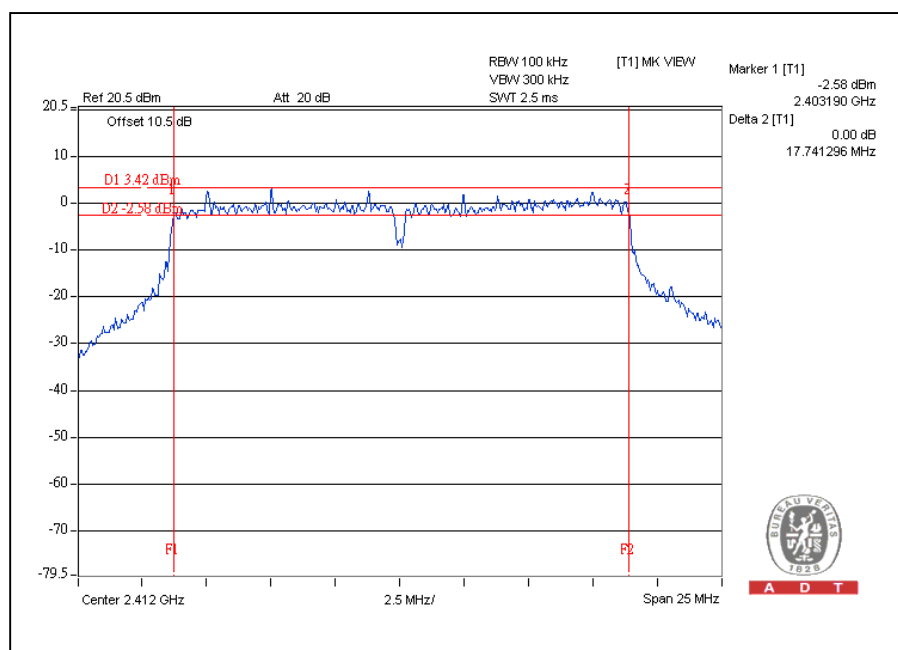
## CH6



## 802.11n (20MHz) OFDM MODULATION:

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2412	17.74	0.5	PASS
6	2437	17.72	0.5	PASS
11	2462	14.85	0.5	PASS

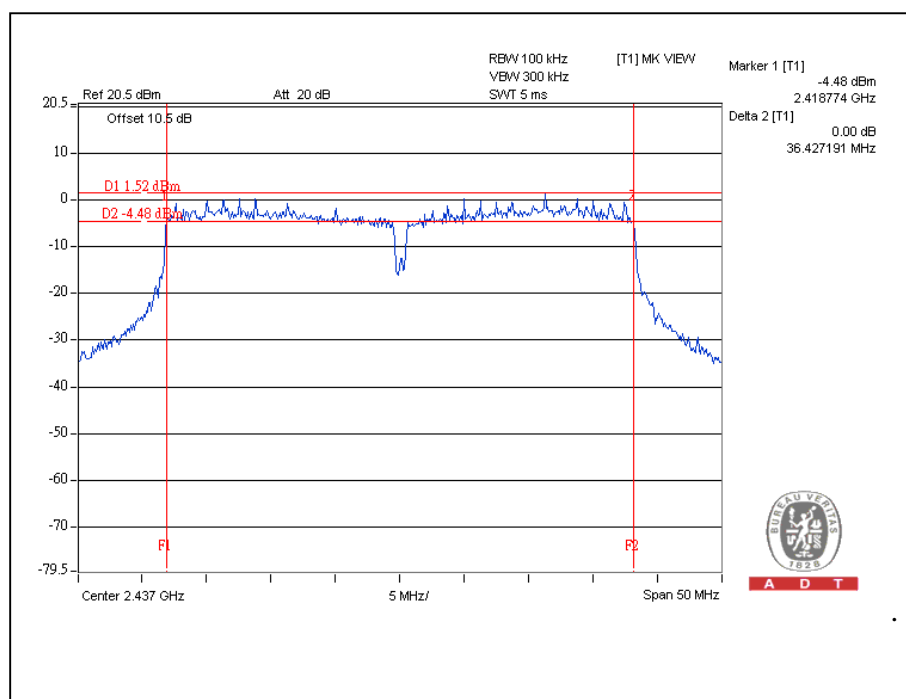
CH1



## 802.11n (40MHz) OFDM MODULATION:

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
3	2422	35.65	0.5	PASS
6	2437	36.42	0.5	PASS
9	2452	29.03	0.5	PASS

## CH6





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#### 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

Test date: May 07, 2011

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Anritsu Power Meter	ML2495A	0824006	May 04, 2011	May 03, 2012
Pulse Power Sensor	MA2411B	0738172	May 03, 2011	May 02, 2012

**NOTE:**

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

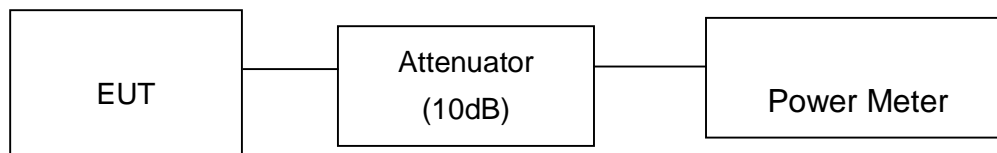
##### 4.4.3 TEST PROCEDURES

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

#### 4.4.7 TEST RESULTS

##### 802.11b DSSS MODULATION:

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (mW)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (dBm)	PASS / FAIL
1	2412	208.9	23.2	30	PASS
6	2437	275.4	24.4	30	PASS
11	2462	234.4	23.7	30	PASS

##### 802.11g OFDM MODULATION:

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (mW)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (dBm)	PASS / FAIL
1	2412	891.3	29.5	30	PASS
6	2437	871.0	29.4	30	PASS
11	2462	912.0	29.6	30	PASS

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

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (dBm)		TOTAL PEAK POWER (mW)	TOTAL PEAK POWER (dBm)	PEAK POWER LIMIT (dBm)	PASS / FAIL
		CHAIN(0)	CHAIN(1)				
1	2412	27.1	25.3	851.7	29.3	30	PASS
6	2437	27.4	25.4	896.3	29.5	30	PASS
11	2462	27.5	25.7	933.9	29.7	30	PASS

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

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (dBm)		TOTAL PEAK POWER (mW)	TOTAL PEAK POWER (dBm)	PEAK POWER LIMIT (dBm)	PASS / FAIL
		CHAIN(0)	CHAIN(1)				
3	2422	27.2	25.3	863.7	29.4	30	PASS
6	2437	27.4	25.7	921.1	29.6	30	PASS
9	2452	27.3	25.4	883.8	29.5	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

**Test date: May 17, 2011**

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
R&S Spectrum Analyzer	FSP 40	100060	May 11, 2011	May 10, 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.

### 4.5.3 TEST PROCEDURE

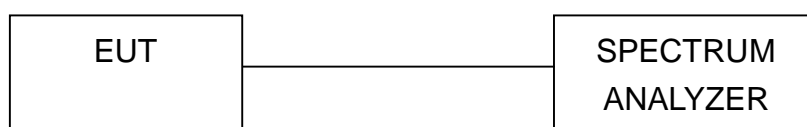
The transmitter output was connected to the spectrum analyzer through an attenuator, the bandwidth of the fundamental frequency was measured with the spectrum analyzer using 3kHz RBW and 30kHz VBW, set sweep time = span/3kHz. The power spectral density was measured and recorded.

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

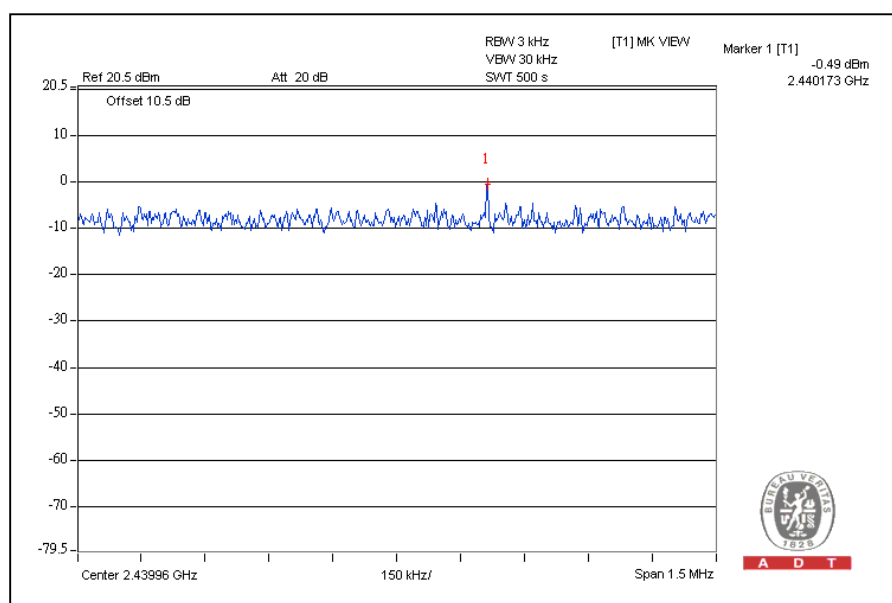
Same as Item 4.3.6

## 4.5.7 TEST RESULTS

### 802.11b DSSS MODULATION:

CHANNEL	CHANNEL FREQUENCY (MHz )	RF POWER LEVEL IN 3kHz BW (dBm)	MAXIMUM LIMIT (dBm)	PASS / FAIL
1	2412	-4.0	8	PASS
6	2437	-0.5	8	PASS
11	2462	-3.6	8	PASS

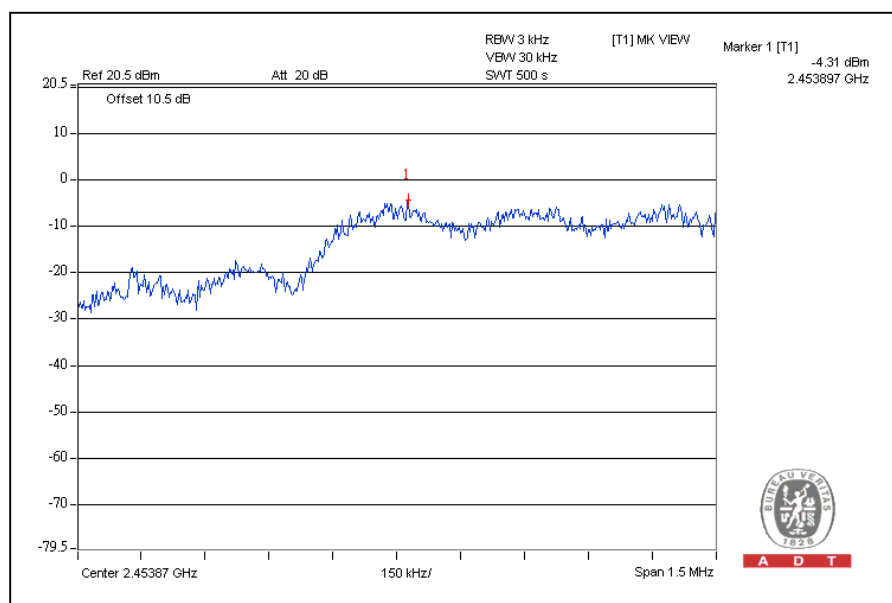
## CH6



## 802.11g OFDM MODULATION:

CHANNEL	CHANNEL FREQUENCY (MHz )	RF POWER LEVEL IN 3kHz BW (dBm)	MAXIMUM LIMIT (dBm)	PASS / FAIL
1	2412	-4.9	8	PASS
6	2437	-5.2	8	PASS
11	2462	-4.3	8	PASS

## CH11

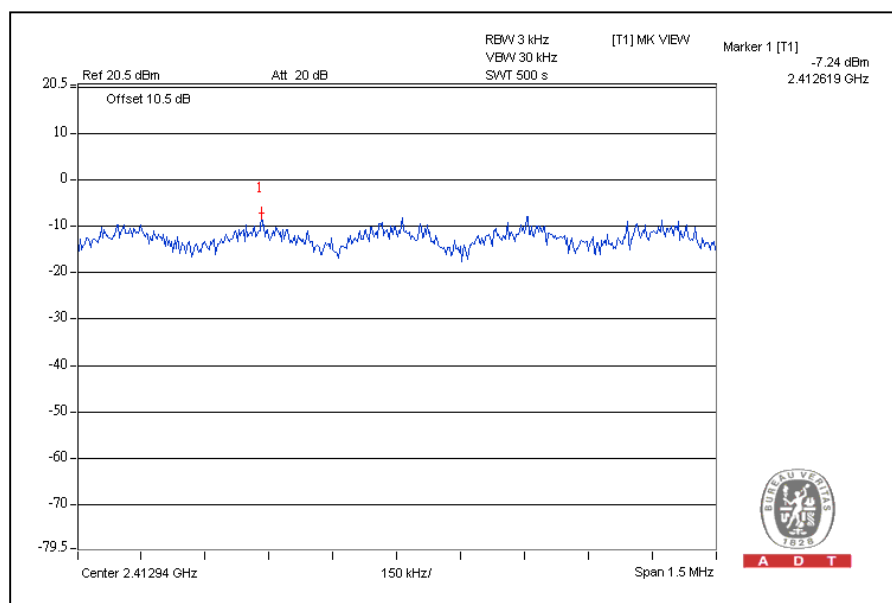




## 802.11n (20MHz) OFDM MODULATION:

CHANNEL	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3kHz BW (dBm)		TOTAL POWER DENSITY (dBm)	MAXIMUM LIMIT (dBm)	PASS / FAIL
		CHAIN(0)	CHAIN(1)			
1	2412	-9.7	-7.2	-5.3	8	PASS
6	2437	-9.3	-8.7	-6.0	8	PASS
11	2462	-8.3	-7.6	-4.9	8	PASS

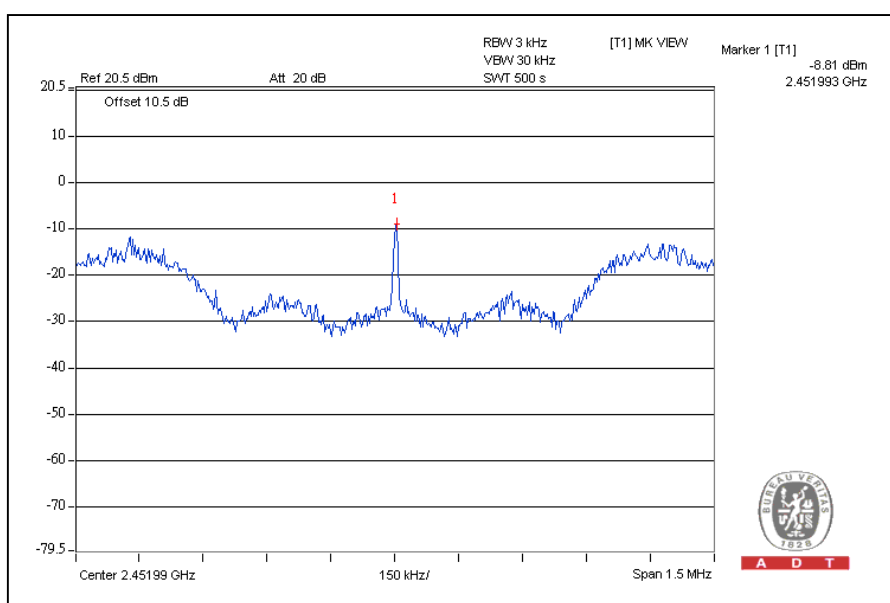
For Chain (1):  
CH1



## 802.11n (40MHz) OFDM MODULATION:

CHANNEL	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3kHz BW (dBm)		TOTAL POWER DENSITY (dBm)	MAXIMUM LIMIT (dBm)	PASS / FAIL
		CHAIN(0)	CHAIN(1)			
3	2422	-12.6	-9.7	-7.9	8	PASS
6	2437	-11.6	-9.5	-7.4	8	PASS
9	2452	-10.2	-8.8	-6.4	8	PASS

For Chain (1):  
CH9



## 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

**Test date: May 17, 2011**

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
R&S Spectrum Analyzer	FSP 40	100060	May 11, 2011	May 10, 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.

### 4.6.3 TEST PROCEDURE

The transmitter output was connected to the spectrum analyzer via a low loss cable. Set RBW of spectrum analyzer to 100kHz and VBW of spectrum analyzer to 300kHz with suitable frequency span including 100 MHz or 200 MHz bandwidth from band edge. The band edges were measured and recorded.

The spectrum plots (RBW = 100kHz, VBW = 300kHz) are attached on the following pages.

### 4.6.4 DEVIATION FROM TEST STANDARD

No deviation

### 4.6.5 EUT OPERATING CONDITION

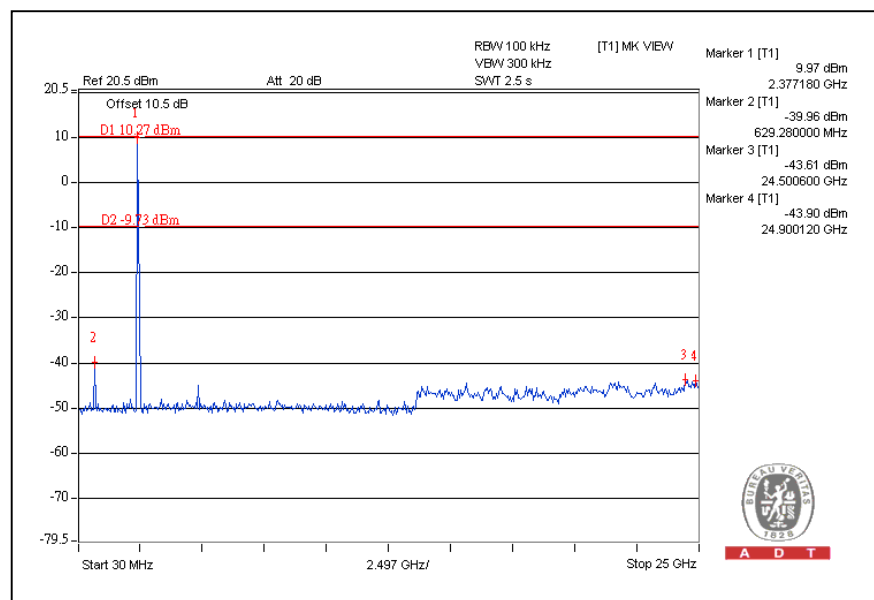
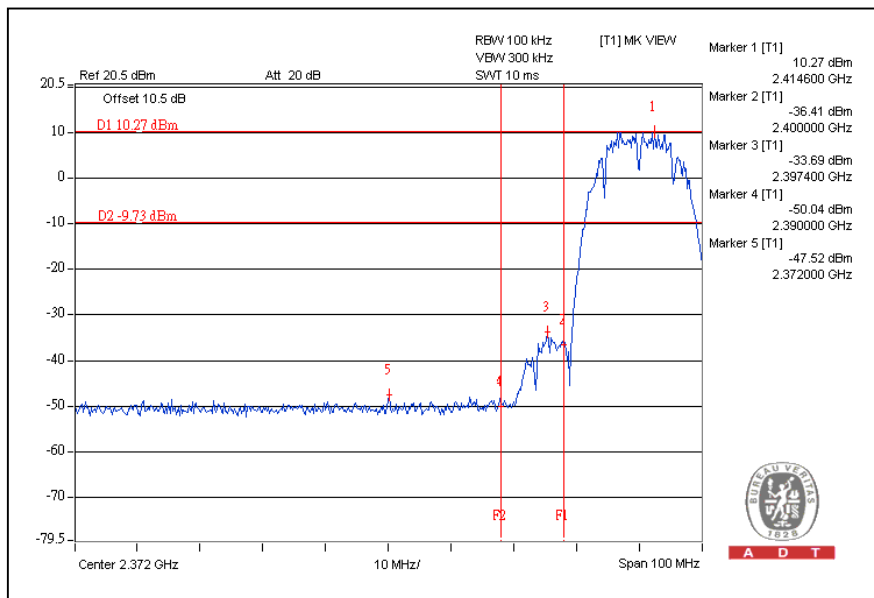
Same as Item 4.3.6

### 4.6.6 TEST RESULTS

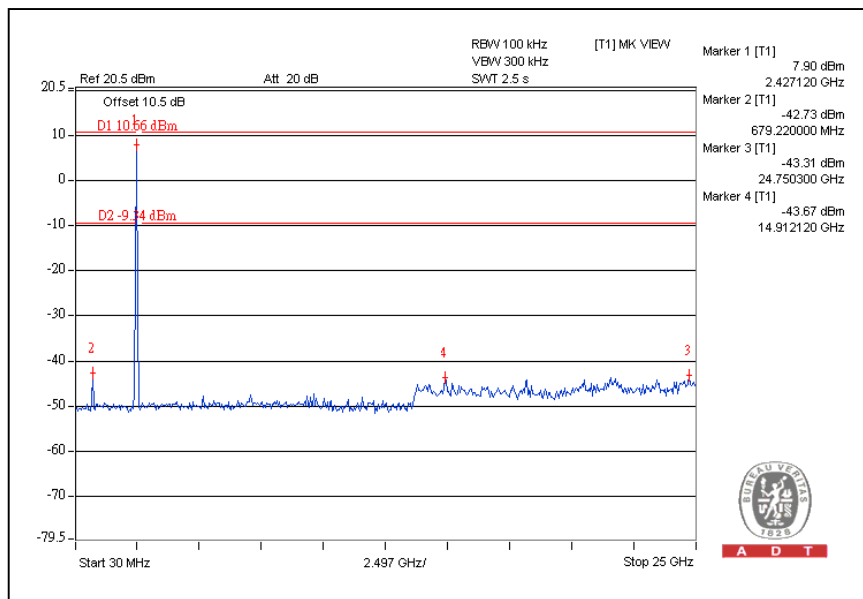
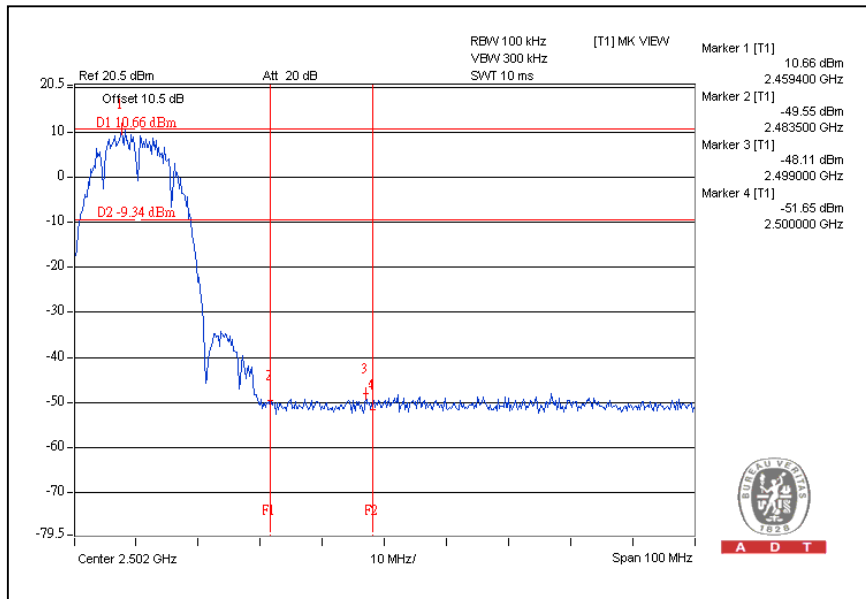
The spectrum plots are attached on the following images. D1 line indicates the highest level, and D2 line indicates the 20dB offset below D1. It shows compliance with the requirement in part 15.247(d).

## 802.11b DSSS MODULATION:

CH1

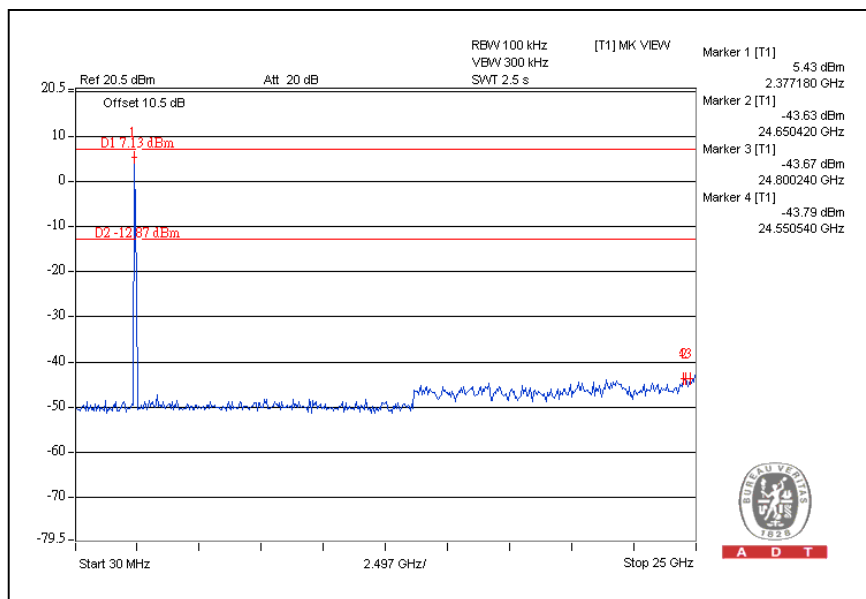
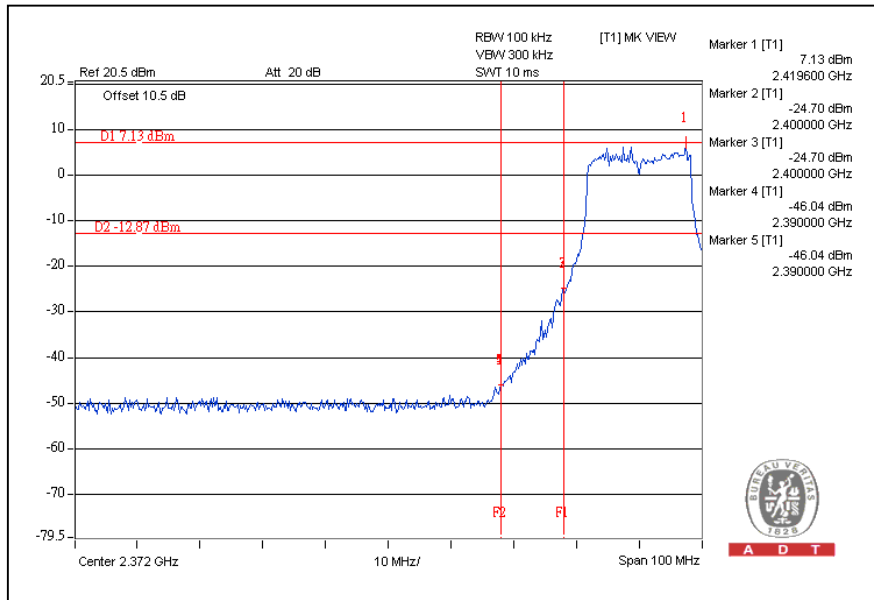


## CH11

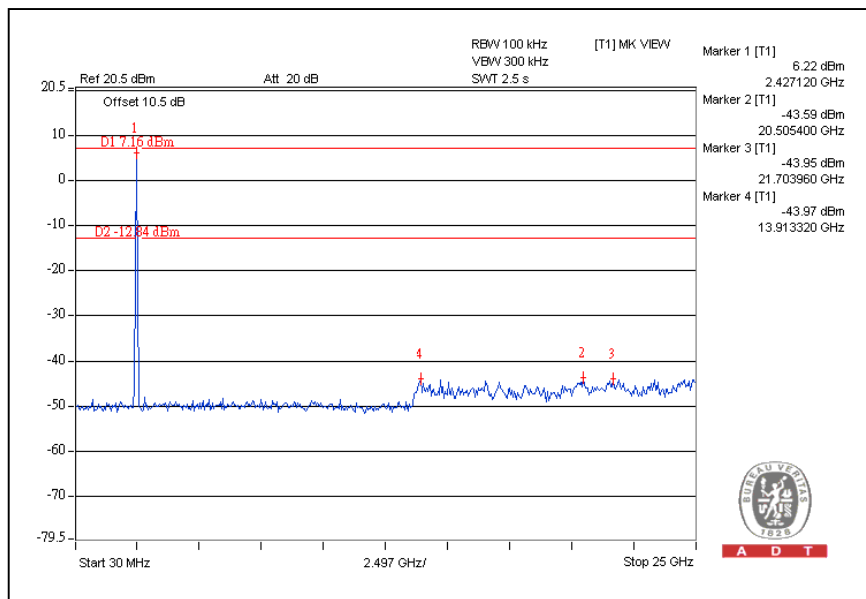
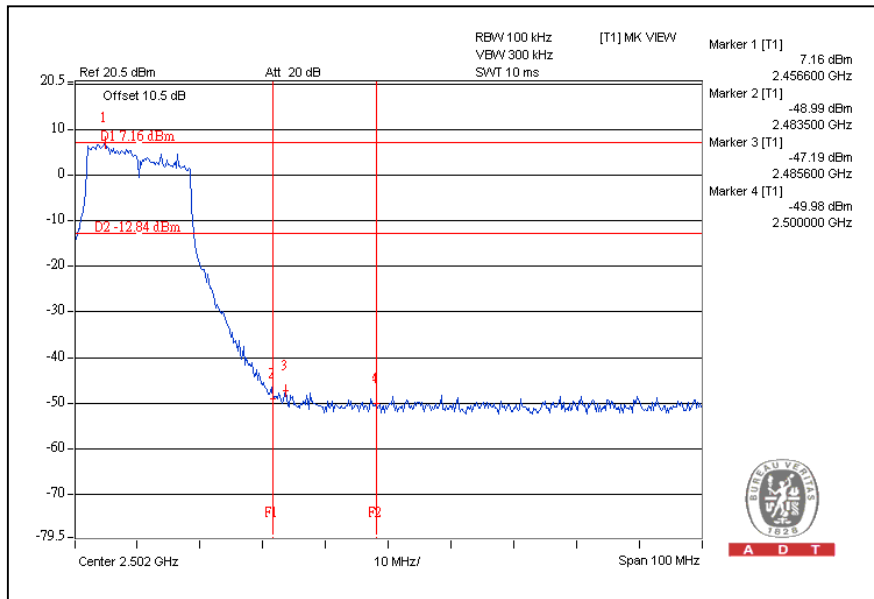


## 802.11g OFDM MODULATION:

CH1



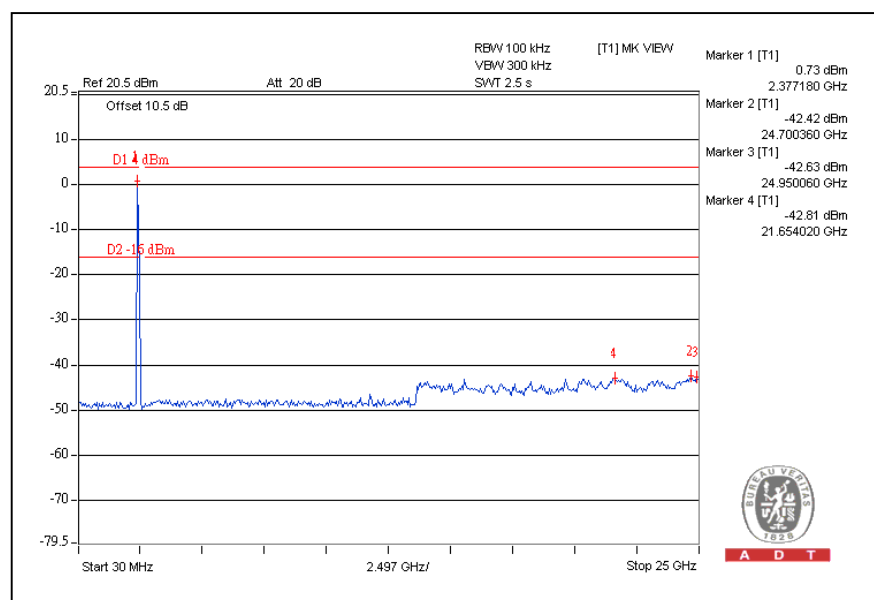
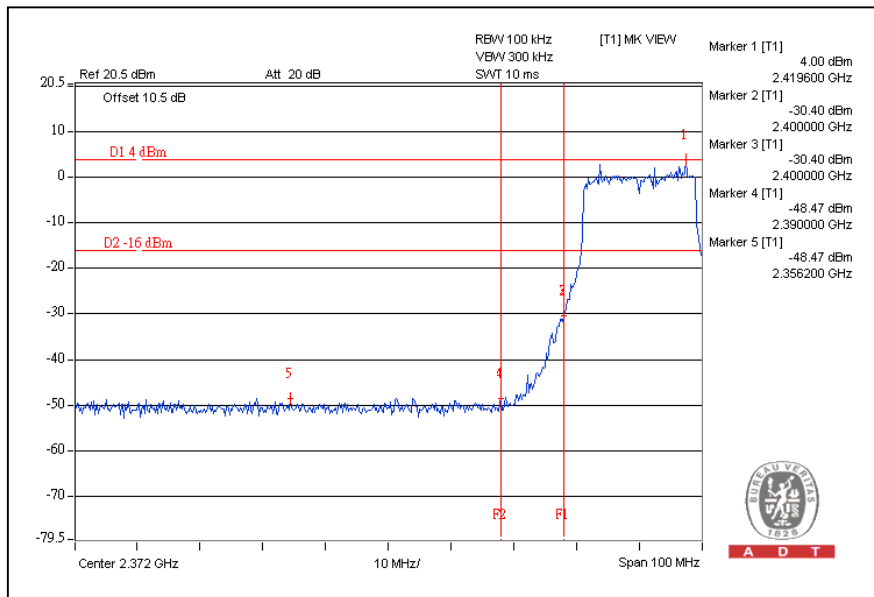
## CH11



## 802.11n (20MHz) OFDM MODULATION:

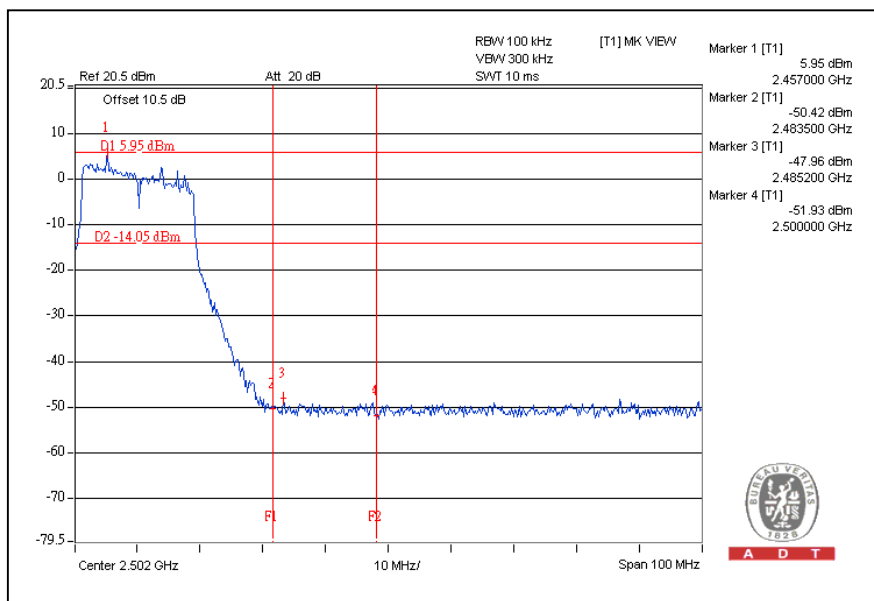
For Chain(0):

CH1

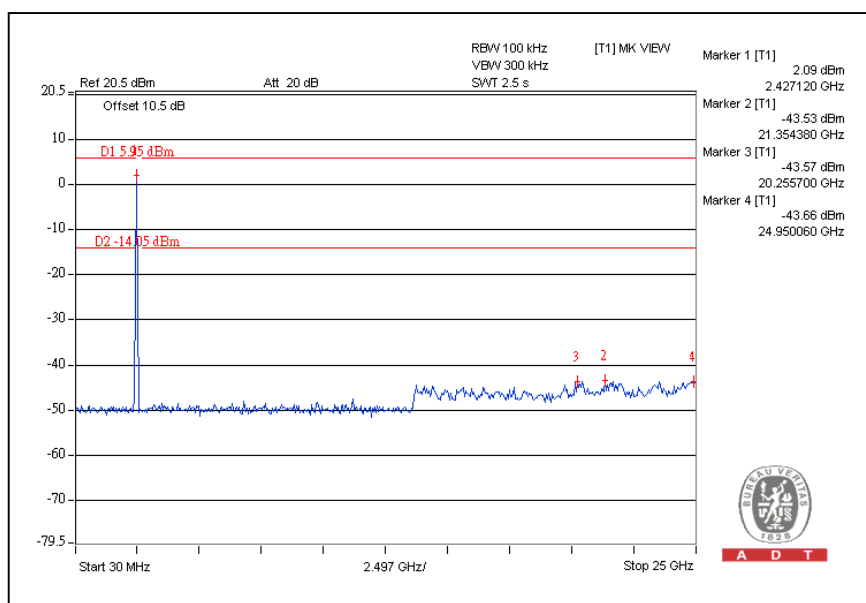




# CH11

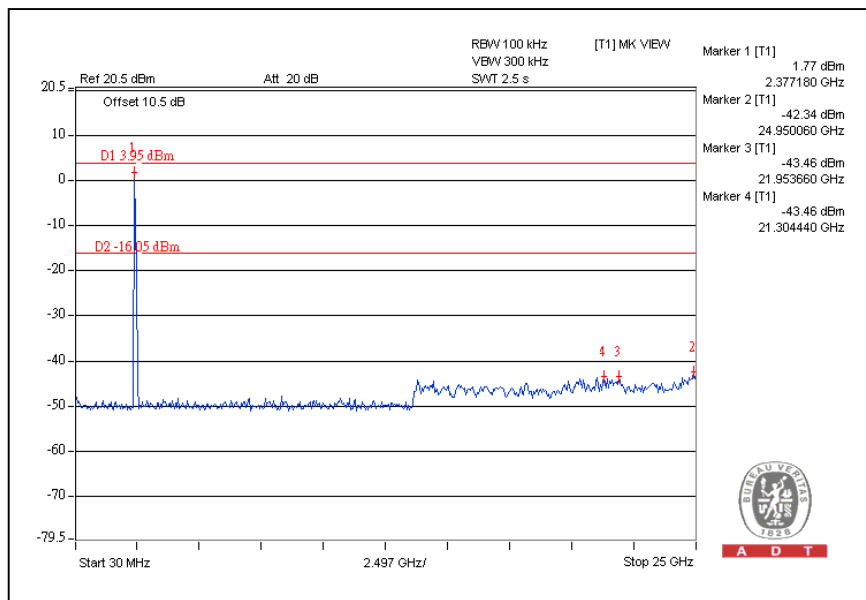
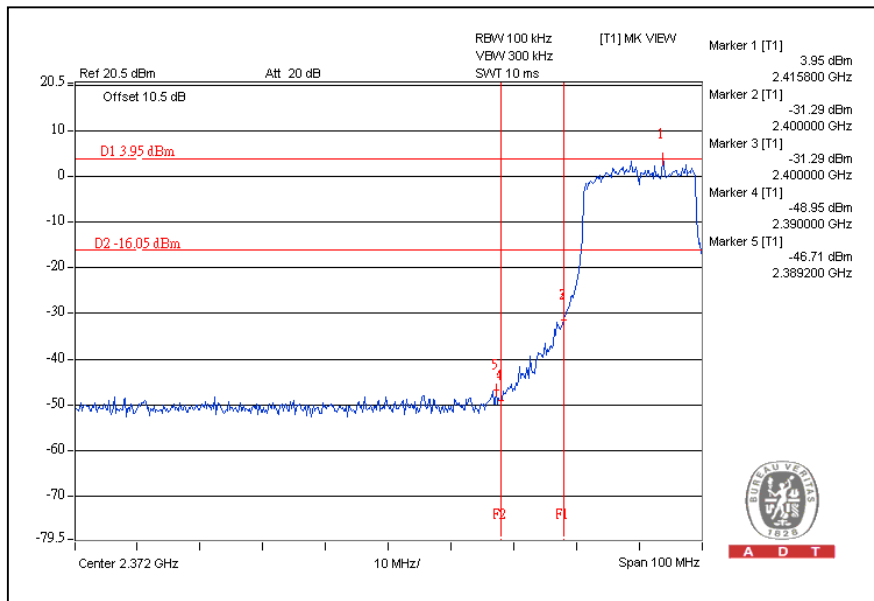


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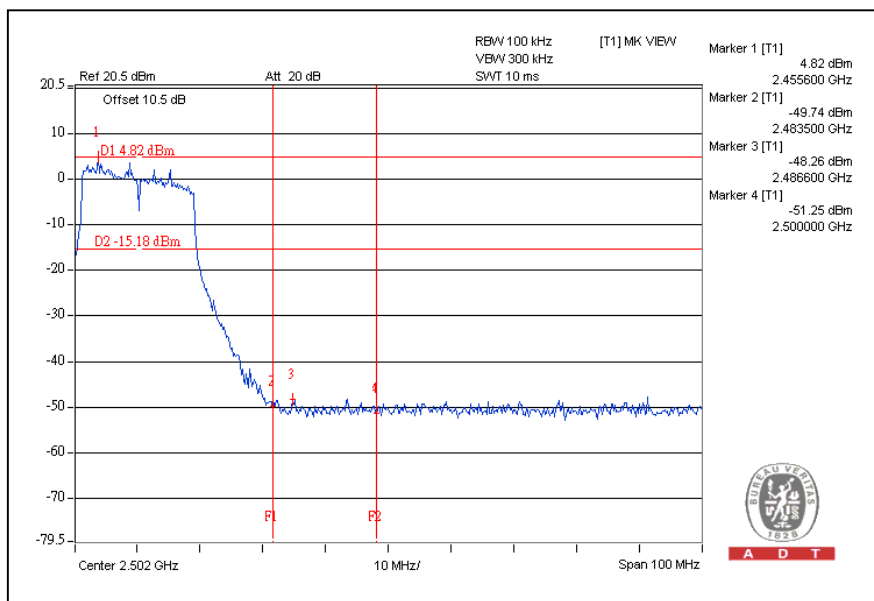


A D T

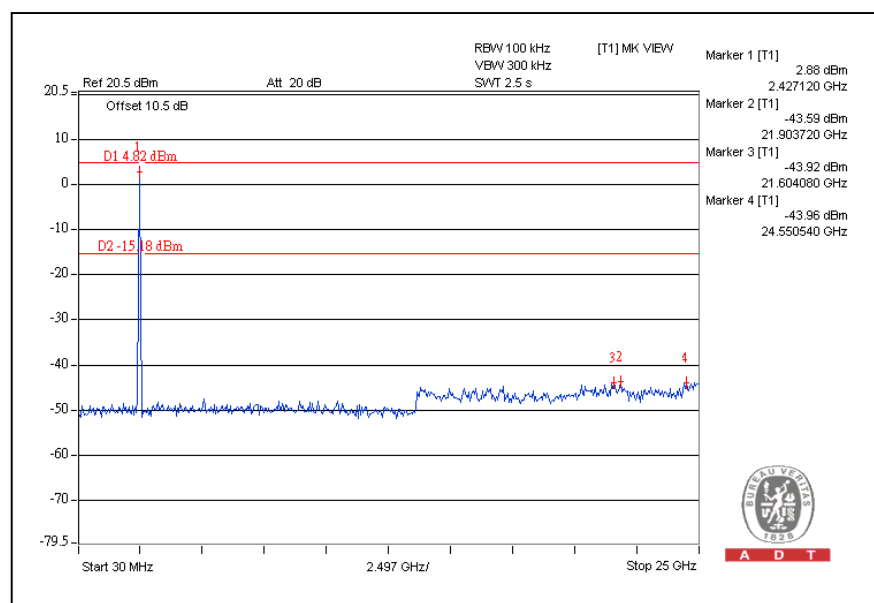
For Chain(1):  
CH1



# CH11



A D T

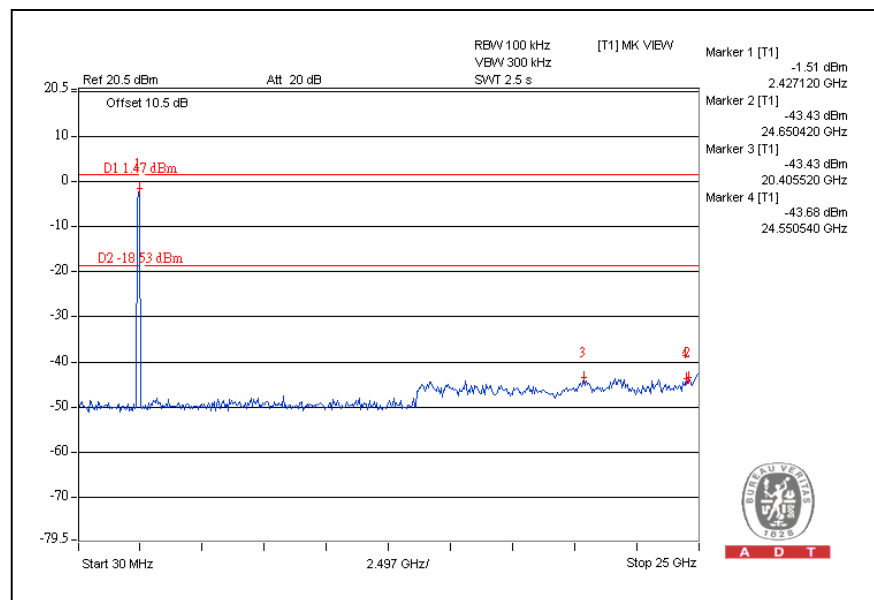
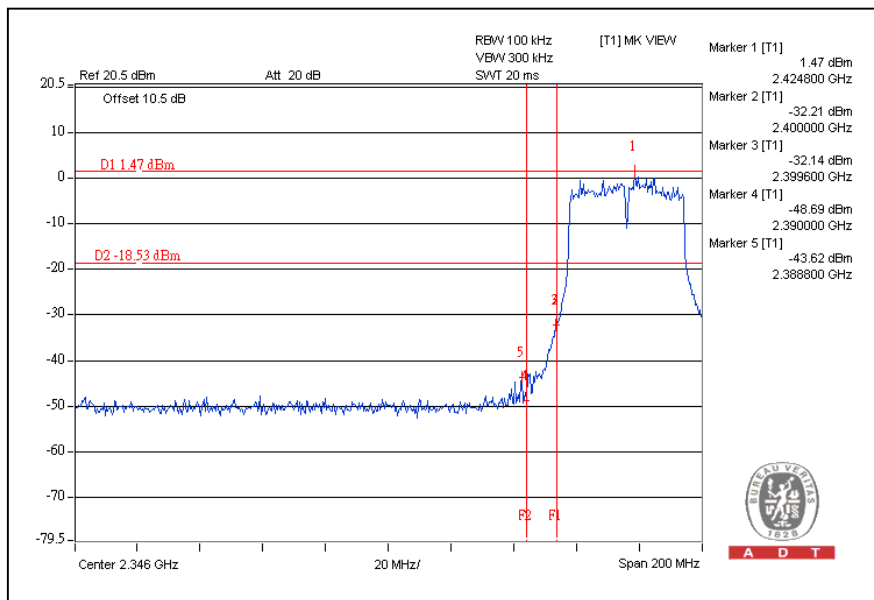


A D T

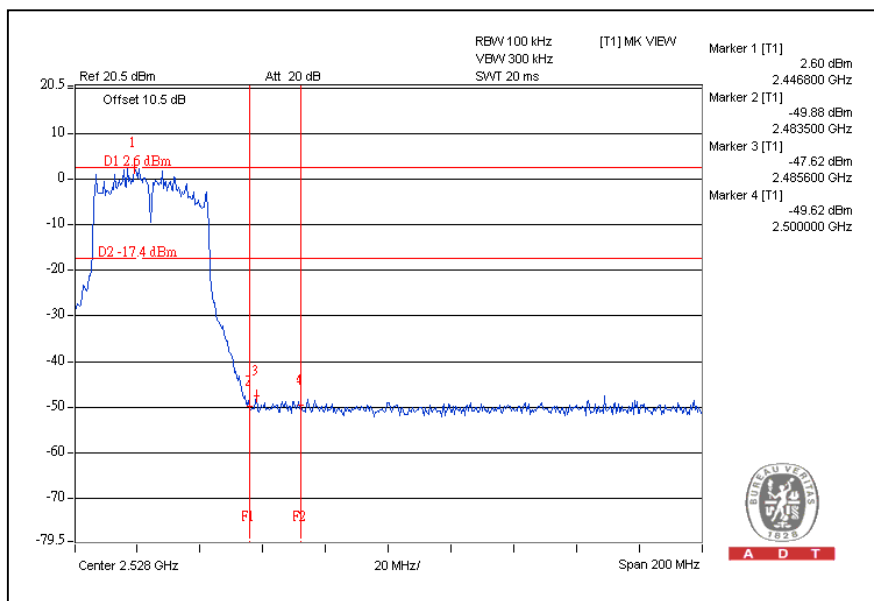
## 802.11n (40MHz) OFDM MODULATION:

For Chain(0):

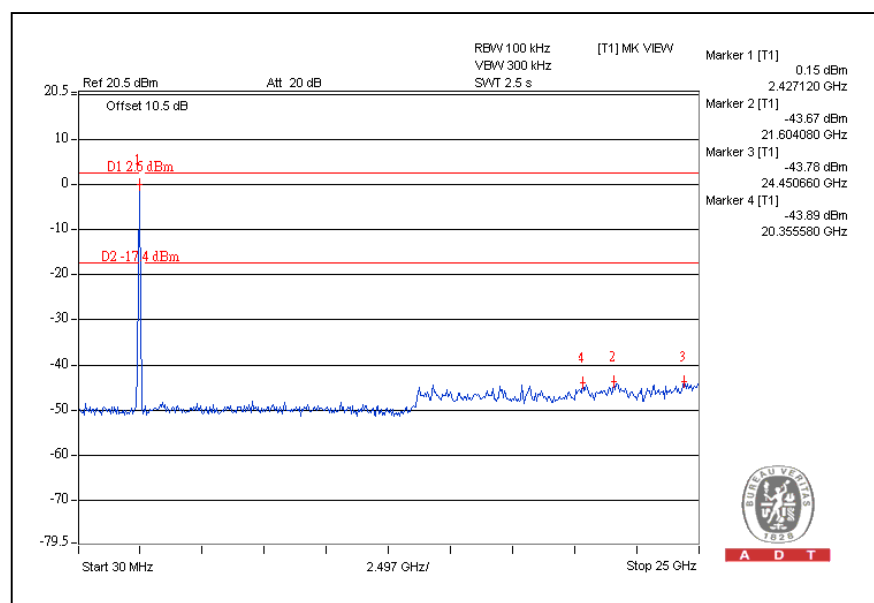
CH3



# CH9

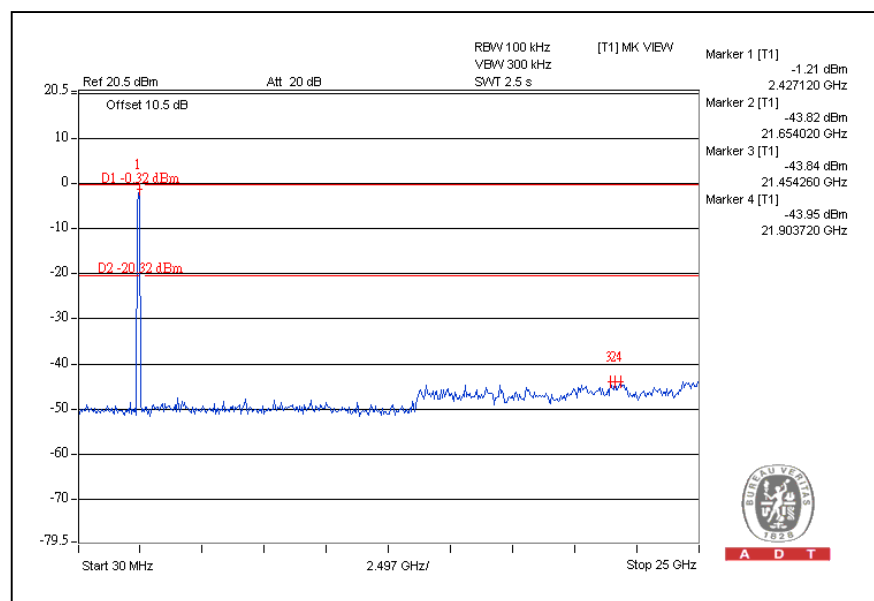
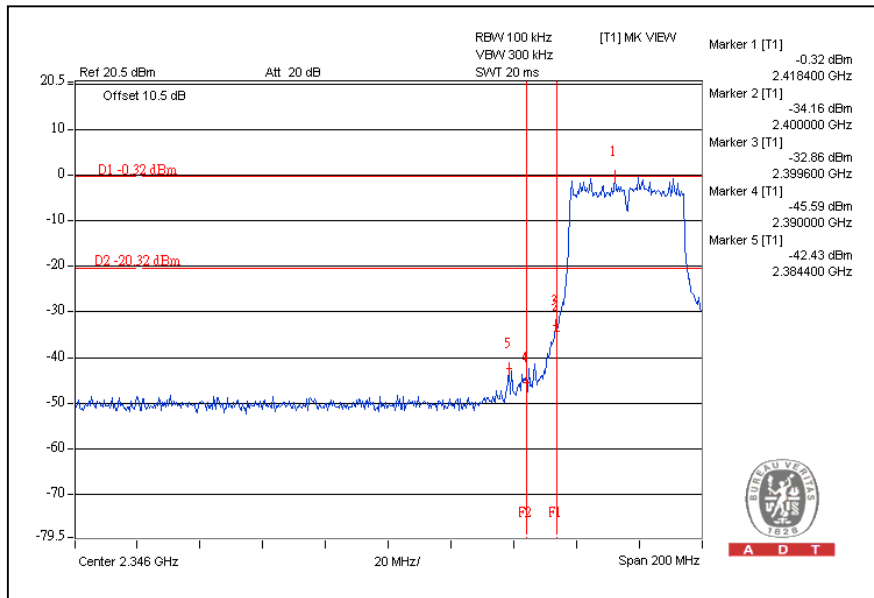


A D T

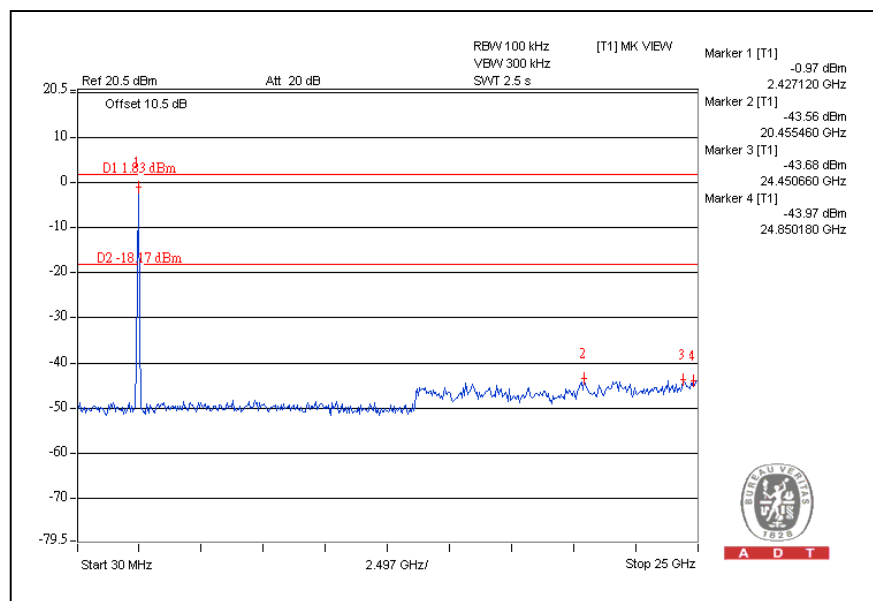
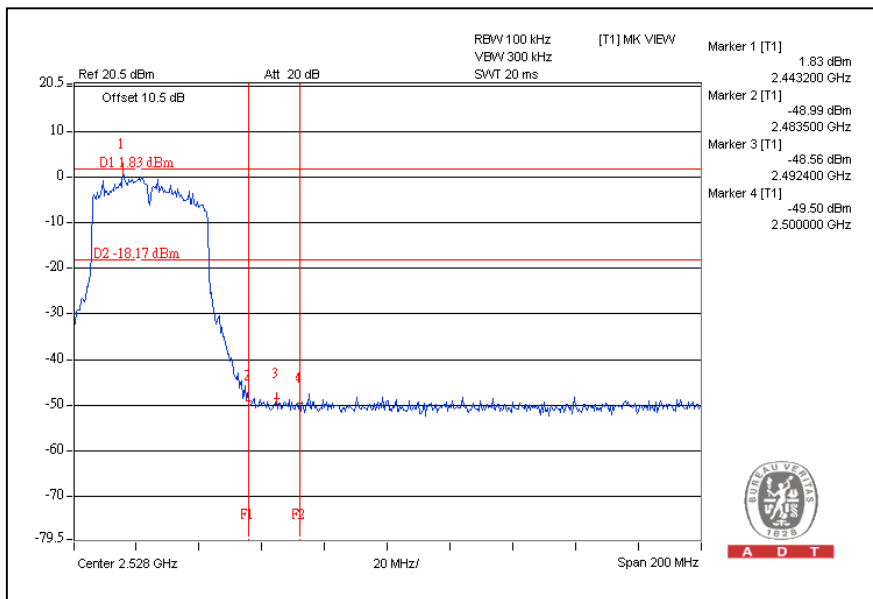


A D T

For Chain(1):  
CH3



## CH9



## 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 according to ISO/IEC 17025:

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

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

**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.





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## **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 ---**