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# FCC TEST REPORT

**REPORT NO.:** RF981030H04

**MODEL NO.:** W241, LCS-WRN-2214

**RECEIVED:** Oct. 30, 2009

**TESTED:** Nov. 10 to 16, 2009

**ISSUED:** Dec. 04, 2009

**APPLICANT:** NETRONIX , INC.

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**ISSUED BY:** Bureau Veritas Consumer Products Services (H.K.)  
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## 1. CERTIFICATION

**PRODUCT:** IEEE802.11n Wireless 2T2R Router  
**BRAND NAME:** NETRONIX, Longhsine  
**MODEL NO.:** W241, LCS-WRN-2214  
**TEST SAMPLE:** MASS-PRODUCTION  
**TESTED:** Nov. 10 to 16, 2009  
**APPLICANT:** NETRONIX , INC.  
**STANDARDS:** FCC Part 15, Subpart C (Section 15.247),  
ANSI C63.4-2003

The above equipment (Model: W241) 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** : Midoli Peng , **DATE:** Dec. 04, 2009  
( Midoli Peng, Specialist )

**TECHNICAL ACCEPTANCE** : Hank Chung , **DATE:** Dec. 04, 2009  
( Hank Chung, Deputy Manager )

**APPROVED BY** : May Chen , **DATE:** Dec. 04, 2009  
( May Chen, Deputy Manager )

## 2. SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

For 802.11b & g, 2412~2462MHz Band

<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 -6.57dB at 0.362MHz
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 -1.1dB at 4874.0MHz
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 REVERSE SMA not a standard connector.



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## 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)	3.83 dB
Radiated emissions (1GHz -18GHz)	2.49 dB
Radiated emissions (18GHz -40GHz)	2.70 dB



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### 3. GENERAL INFORMATION

#### 3.1 GENERAL DESCRIPTION OF EUT

<b>PRODUCT</b>	IEEE802.11n Wireless 2T2R Router
<b>MODEL NO.</b>	W241, LCS-WRN-2214
<b>FCC ID</b>	NOI-W241
<b>POWER SUPPLY</b>	DC 5V from power adapter
<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 802.11n (20MHz, 800ns GI): 65 / 58.5 / 52 / 39 / 26 / 19.5 / 13 / 6.5Mbps 802.11n (40MHz, 800ns GI): 135 / 121.5 / 108 / 81 / 54 / 40.5 / 27 / 13.5Mbps 802.11n (20MHz, 400ns GI): 72.2 / 65 / 57.8 / 43.3 / 28.9 / 21.7 / 14.4 / 7.2Mbps 802.11n (40MHz, 400ns GI): 150 / 135 / 120 / 90 / 60 / 45 / 30 / 15Mbps
<b>OPRTAING FREQUENCY</b>	2412 ~ 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: 61.7mW 802.11g: 195.0mW 802.11n (20MHz): 301.7mW 802.11n (40MHz): 284.4mW
<b>ANTENNA TYPE</b>	Please see note 2
<b>ANTENNA CONNECTOR</b>	Please see note 2
<b>DATA CABLE</b>	NA
<b>I/O PORTS</b>	LAN Port x 4 (10/100Mbps) WAN Port x 1 (10/100Mbps)
<b>ASSOCIATED DEVICES</b>	Adapter x1

**NOTE:**

1. The EUT has two brand names and two model names which are identical to each other in all aspects except for the following table:

Brand	Model No.	Difference
NETRONIX	W241	For marketing different
Longshine	LCS-WRN-2214	

From the above models, model: W241 was selected as representative model for the test and its data was recorded in this report.

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

Chain	Antenna Type	Antenna Gain(dBi)	Connector
Chain (0)	Dipole	2	REVERSE SMA
Chain (1)	Dipole	2	REVERSE SMA

3. The EUT was pre-tested under the following modes:

Test Mode	Description
<b>Mode A</b>	<b>Level-set</b>
Mode B	Tower-set

From the above modes, the worst cases were found in **Mode A**. Therefore only the test data of the mode was recorded in this report.

4. The EUT must be supplied with a power adapter as following information:

Brand:	SIL
Model No.:	SSA-5W-05 US 050100N
Input power :	AC 100~240, 0.2A, 50~60Hz
Output power :	DC 5V, 1000mA DC output cable (Unshielded, 1.78m)

5. The EUT incorporates a MIMO function with 802.11n. Physically, the EUT provides two completed transmitters and two completed receivers.
6. The EUT is 2 \* 2 spatial MIMO (2Tx & 2Rx) without beam forming function. The antenna configurations are two transmitter antennas and two receiver antennas, as there are 2 Dipole antennas. Spatial multiplexing modes for simultaneous transmission using 2 antennas, and for simultaneous receiver using 2 antennas. The 11b/g legacy mode is limited to single transmitter only.





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7. The EUT complies with 802.11n standards and backwards compatible with 802.11b, 802.11g products.
8. 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

#### Operated in 2400 ~ 2483.5MHz band:

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



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### 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

#### ANTENNA COMBINATION MODE:

COMBINATION MODE	OPERATION MODE	TX CHAIN(0)	TX CHAIN(1)
A	802.11 b	√	
B	802.11 g	√	
C	DRAFT 802.11n(20MHz) for MCS0~7	√	
D	DRAFT 802.11n(20MHz) for MCS8~15	√	√
E	DRAFT 802.11n(40MHz) for MCS0~7	√	
F	DRAFT 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, B, D and F the worst modes, were selected as representative mode for the report.

#### 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)	TX COMBINATION
For 2.4 GHz 802.11n (20MHz)	1 to 11	6	OFDM	BPSK	6.5	D



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**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)	TX COMBINATION
For 2.4 GHz 802.11n (20MHz)	1 to 11	6	OFDM	BPSK	6.5	D

**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)	TX COMBINATION
802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1	A
802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6	B
For 2.4 GHz 802.11n (20MHz)	1 to 11	1, 6, 11	OFDM	BPSK	6.5	D
For 2.4 GHz 802.11n (40MHz)	1 to 7	1, 4, 7	OFDM	BPSK	13.5	F

**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)	TX COMBINATION
802.11b	1 to 11	1, 11	DSSS	DBPSK	1	A
802.11g	1 to 11	1, 11	OFDM	BPSK	6	B
For 2.4 GHz 802.11n (20MHz)	1 to 11	1, 11	OFDM	BPSK	6.5	D
For 2.4 GHz 802.11n (40MHz)	1 to 7	1, 7	OFDM	BPSK	13.5	F

※ After verification, conducted out band emission as show worst chain in report by investigations.

**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)	TX COMBINATION
802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1	A
802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6	B
For 2.4 GHz 802.11n (20MHz)	1 to 11	1, 6, 11	OFDM	BPSK	6.5	D
For 2.4 GHz 802.11n (40MHz)	1 to 7	1, 4, 7	OFDM	BPSK	13.5	F

※ After verification, bandwidth as show worst chain in report by investigations.

**TEST CONDITION:**

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
<b>RE≥1G</b>	29deg. C, 61%RH, 1017 hPa	120Vac, 60Hz	Frank Liu
<b>RE&lt;1G</b>	26deg. C, 90%RH, 1017 hPa	120Vac, 60Hz	Timmy Hu
<b>PLC</b>	26deg. C, 66%RH, 1017 hPa	120Vac, 60Hz	Andy Ho
<b>APCM</b>	20deg. C, 60%RH, 1017 hPa	120Vac, 60Hz	Eric Lee

### 3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is an IEEE802.11n Wireless 2T2R Router. 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.



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### 3.4 DESCRIPTION OF SUPPORT UNITS

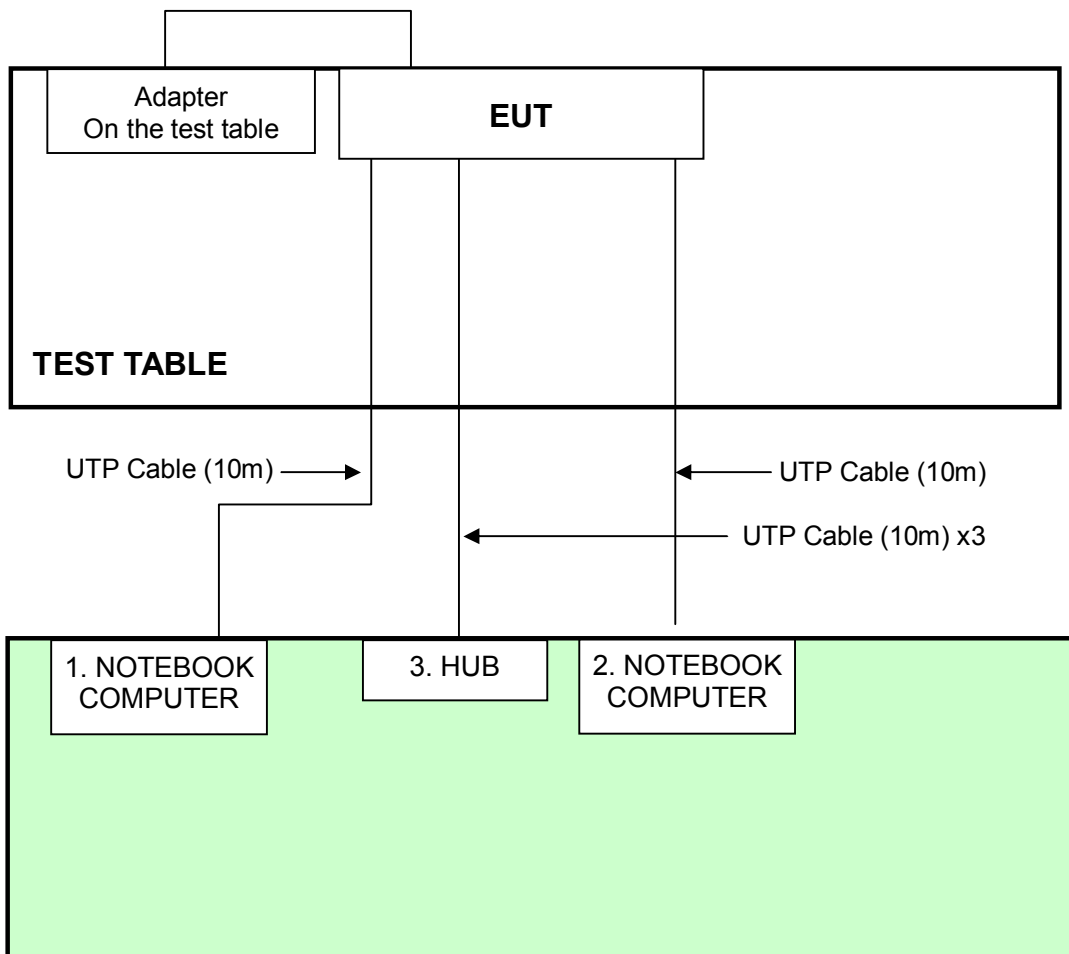
The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	NOTEBOOK COMPUTER	DELL	D531	CN-0XM006-48643-86 L-4472	QDS-BRCM1019
2	NOTEBOOK COMPUTER	DELL	PP18L	6976685584	FCC DoC
3	HUB	ZyXEL	ES-116P	S060H02000215	FCC Doc

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	UTP Cable (10m)
2	UTP Cable (10m)
3	UTP Cable (10m)

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

### 3.5 CONFIGURATION OF SYSTEM UNDER TEST







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## 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	Quasi-peak	Average
0.5-5	66 to 56	56 to 46
5-30	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
ROHDE & SCHWARZ Test Receiver	ESCS 30	100287	Mar. 05, 2009	Mar. 04, 2010
Line-Impedance Stabilization Network (for EUT)	KNW-407	8-1395-12	May 04, 2009	May 03, 2010
Line-Impedance Stabilization Network (for Peripheral)	ENV-216	100072	June 08, 2009	June 07, 2010
RF Cable (JYBAO)	5DFB	COACAB-001	Dec 15, 2008	Dec 14, 2009
50 ohms Terminator	50	3	Nov. 05, 2009	Nov. 04, 2010
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. A.
3. The VCCI Con A Registration No. is C-817.

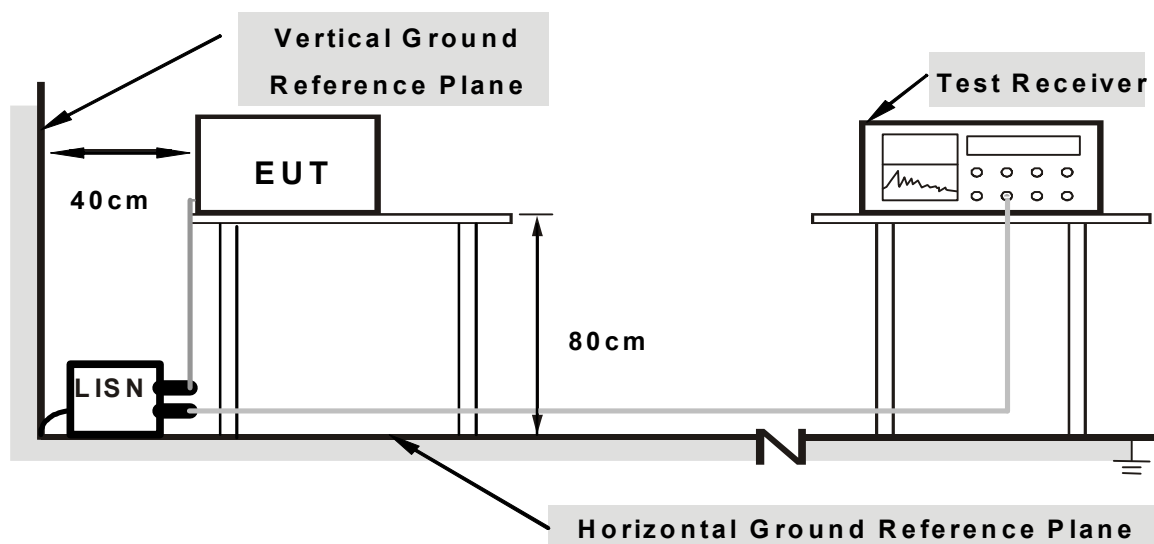
#### 4.1.3 TEST PROCEDURES

- 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 W241kHz 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. Placed the EUT on testing table.
2. Prepared other computer systems (support units 1 ~ 3) to act as communication partners and placed them outside of testing area.
3. The communication partners run test program “MP N Test” to enable EUT under transmission/receiving condition continuously at specific channel frequency.

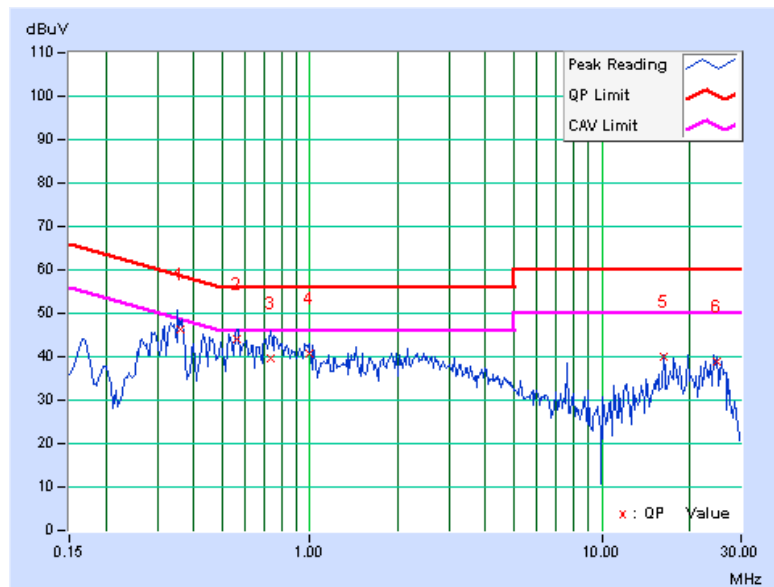
### 4.1.7 TEST RESULTS

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

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	0.363	0.10	46.08	-	46.18	-	58.67
2	0.565	0.07	44.16	-	44.23	-	56.00	46.00	-11.77	-
3	0.736	0.07	39.53	-	39.60	-	56.00	46.00	-16.40	-
4	0.994	0.06	40.68	-	40.74	-	56.00	46.00	-15.26	-
5	16.228	0.39	39.69	-	40.08	-	60.00	50.00	-19.92	-
6	24.902	0.56	38.35	-	38.91	-	60.00	50.00	-21.09	-

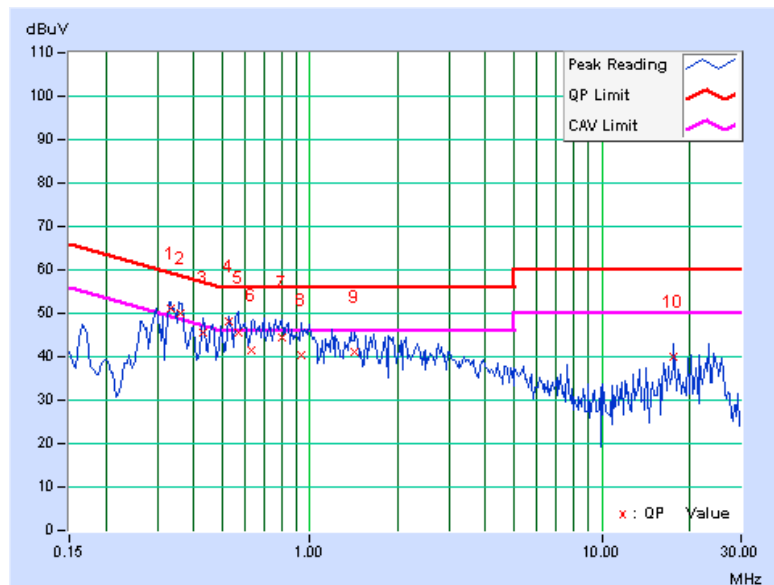
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
  2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
  3. The emission levels of other frequencies were very low against the limit.
  4. Margin value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



<b>PHASE</b>	Neutral (N)	<b>6dB BANDWIDTH</b>	9 kHz
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No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.332	0.12	50.93	42.14	51.05	42.26	59.40	49.40	-8.35	-7.14
<b>2</b>	<b>0.362</b>	<b>0.11</b>	<b>50.05</b>	<b>42.00</b>	<b>50.16</b>	<b>42.11</b>	<b>58.67</b>	<b>48.67</b>	<b>-8.52</b>	<b>-6.57</b>
3	0.431	0.09	45.40	-	45.49	-	57.23	47.23	-11.74	-
4	0.528	0.09	47.89	39.27	47.98	39.36	56.00	46.00	-8.02	-6.64
5	0.568	0.09	45.63	-	45.72	-	56.00	46.00	-10.28	-
6	0.634	0.09	41.54	-	41.63	-	56.00	46.00	-14.37	-
7	0.798	0.08	44.37	-	44.45	-	56.00	46.00	-11.55	-
8	0.931	0.08	40.25	-	40.33	-	56.00	46.00	-15.67	-
9	1.430	0.09	41.20	-	41.29	-	56.00	46.00	-14.71	-
10	17.695	0.46	39.39	-	39.85	-	60.00	50.00	-20.15	-

- 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	W241	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.



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## 4.2.2 TEST INSTRUMENTS

### Below 1GHz test :

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
ADVANTEST Spectrum Analyzer	U3751	160200410	July. 17, 2009	July. 16, 2010
ADVANTEST Spectrum Analyzer	U3772	160100280	Sep. 21, 2009	Sep. 20, 2010
HP Pre_Amplifier	8449B	3008A01922	Sep. 25, 2009	Sep. 24, 2010
ROHDE & SCHWARZ Test Receiver	ESVS 30	841977/002	Oct. 28, 2009	Oct. 27, 2010
SCHAFFNER(CHASE) Broadband Antenna	CBL6112B	2798	April 29, 2009	April 28, 2010
Schwarzbeck Horn_Antenna	BBHA9120-D1	D123	Sep. 21, 2009	Sep. 20, 2010
Schwarzbeck Horn_Antenna	BBHA 9170	BBHA9170153	Jan. 23, 2009	Jan. 22, 2010
RF Switches	MP59B	6100175593	Sep. 01, 2009	Aug. 31, 2010
RF Cable	8DFB	STBCAB-001	Sep. 01, 2009	Aug. 31, 2010
Software	ADT_Radiated_V7.6.15.9.2	NA	NA	NA
CT Antenna Tower & Turn Table	NA	NA	NA	NA
CORCOM AC Filter	MRI2030	024/019	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: U3772) are used only for the measurement of emission frequency above 1GHz if tested.
3. The test was performed in Open Site No. B.
4. The VCCI Site Registration No. is R-847.
5. The FCC Site Registration No. is 92753.
6. The CANADA Site Registration No. is IC 7450G-2.



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**Above 1GHz test**

<b>DESCRIPTION &amp; MANUFACTURER</b>	<b>MODEL NO.</b>	<b>SERIAL NO.</b>	<b>CALIBRATED DATE</b>	<b>CALIBRATED UNTIL</b>
ROHDE & SCHWARZ Spectrum Analyzer	FSP40	100036	Dec. 09, 2008	Dec. 08, 2009
Agilent PSA Spectrum Analyzer	E4446A	MY46180622	Apr. 24 , 2009	Apr. 23 , 2010
HP Pre_Amplifier	8449B	3008A01923	Nov. 02, 2009	Nov. 01, 2010
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
RF Switches	EMH-011	08009	Sep. 26, 2009	Sep. 25, 2010
RF CABLE (Chaintek)	Sucoflex 106	28077	Aug. 14, 2009	Aug. 13, 2010
RF Cable	8D	STCCAB-001	Sep. 26, 2009	Sep. 25, 2010
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 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

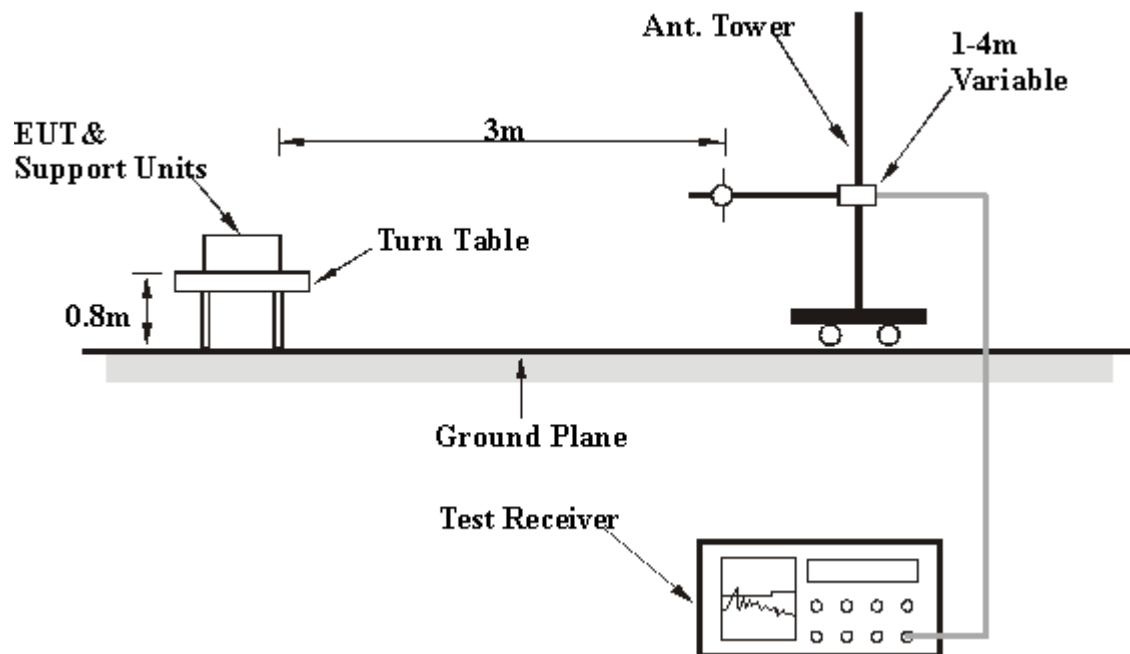
**NOTE:**

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for 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

Same as 4.1.6

## 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	120Vac, 60 Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	26deg. C, 90%RH 1017 hPa	TESTED BY	Timmy Hu

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	111.38	30.5 QP	43.5	-13.0	1.44 H	303	18.36	12.16
2	125.00	31.0 QP	43.5	-12.5	1.33 H	66	18.50	12.53
3	250.21	32.6 QP	46.0	-13.4	1.22 H	333	18.60	13.97
4	375.00	36.0 QP	46.0	-10.1	1.55 H	55	18.63	17.32
5	499.99	38.7 QP	46.0	-7.3	1.00 H	320	18.40	20.32
6	891.12	39.4 QP	46.0	-6.6	1.00 H	79	14.72	24.69
7	1000.00	41.8 QP	54.0	-12.2	1.00 H	233	16.29	25.47
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	64.20	33.2 QP	40.0	-6.8	1.00 V	224	26.32	6.89
2	112.38	35.8 QP	43.5	-7.8	1.00 V	125	23.54	12.21
3	125.00	28.4 QP	43.5	-15.1	1.00 V	25	15.87	12.53
4	225.00	32.5 QP	46.0	-13.5	1.00 V	17	19.97	12.50
5	250.03	37.6 QP	46.0	-8.4	1.00 V	51	23.67	13.96
6	375.30	38.6 QP	46.0	-7.4	1.00 V	291	21.30	17.33
7	499.99	41.5 QP	46.0	-4.5	1.00 V	244	21.17	20.32
8	891.12	37.4 QP	46.0	-8.7	1.33 V	31	12.66	24.69
9	1000.00	39.6 QP	54.0	-14.4	1.06 V	100	14.17	25.47

- 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.



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## ABOVE 1GHz WORST-CASE DATA

### 802.11b DSSS MODULATION

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	29deg. C, 61%RH 1017 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	2386.93	54.6 PK	74.0	-19.4	1.00 H	139	24.32	30.27
2	2390.00	41.6 AV	54.0	-12.4	1.00 H	139	11.35	30.28
3	*2412.00	90.7 PK			1.00 H	140	60.31	30.36
4	*2412.00	87.9 AV			1.00 H	140	57.52	30.36
5	4824.00	48.2 PK	74.0	-25.8	1.47 H	296	11.37	36.79
6	4824.00	42.7 AV	54.0	-11.3	1.47 H	296	5.91	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	2372.80	54.6 PK	74.0	-19.5	1.00 V	274	24.33	30.22
2	2372.80	42.4 AV	54.0	-11.6	1.00 V	274	12.15	30.22
3	*2412.00	103.2 PK			1.00 V	262	72.81	30.36
4	*2412.00	100.8 AV			1.00 V	262	70.44	30.36
5	4824.00	54.9 PK	74.0	-19.1	1.41 V	360	18.10	36.79
6	4824.00	52.5 AV	54.0	-1.5	1.41 V	360	15.69	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.



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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	29deg. C, 61%RH 1017 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	90.7 PK			1.00 H	161	60.27	30.46
2	*2437.00	88.0 AV			1.00 H	161	57.54	30.46
3	4874.00	48.5 PK	74.0	-25.5	1.46 H	231	11.58	36.92
4	4874.00	42.6 AV	54.0	-11.4	1.46 H	231	5.68	36.92
5	7311.00	51.3 PK	74.0	-22.7	1.30 H	333	8.12	43.14
6	7311.00	38.9 AV	54.0	-15.1	1.30 H	333	-4.28	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	105.8 PK			1.00 V	200	75.34	30.46
2	*2437.00	103.6 AV			1.00 V	200	73.14	30.46
3	4874.00	55.2 PK	74.0	-18.8	1.10 V	261	18.25	36.92
4	<b>4874.00</b>	<b>52.9 AV</b>	<b>54.0</b>	<b>-1.1</b>	<b>1.10 V</b>	<b>261</b>	<b>15.98</b>	<b>36.92</b>
5	7311.00	52.6 PK	74.0	-21.4	1.59 V	278	9.50	43.14
6	7311.00	42.7 AV	54.0	-11.3	1.59 V	278	-0.42	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.



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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	29deg. C, 61%RH 1017 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	94.7 PK			1.00 H	114	64.12	30.55
2	*2462.00	91.9 AV			1.00 H	114	61.39	30.55
3	2487.94	54.5 PK	74.0	-19.5	1.00 H	147	23.88	30.65
4	2487.94	42.1 AV	54.0	-11.9	1.00 H	147	11.48	30.65
5	4924.00	49.7 PK	74.0	-24.3	1.43 H	214	12.64	37.06
6	4924.00	43.5 AV	54.0	-10.5	1.43 H	214	6.44	37.06
7	7386.00	54.8 PK	74.0	-19.2	1.31 H	310	11.67	43.13
8	7386.00	42.1 AV	54.0	-11.9	1.31 H	310	-1.03	43.13

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

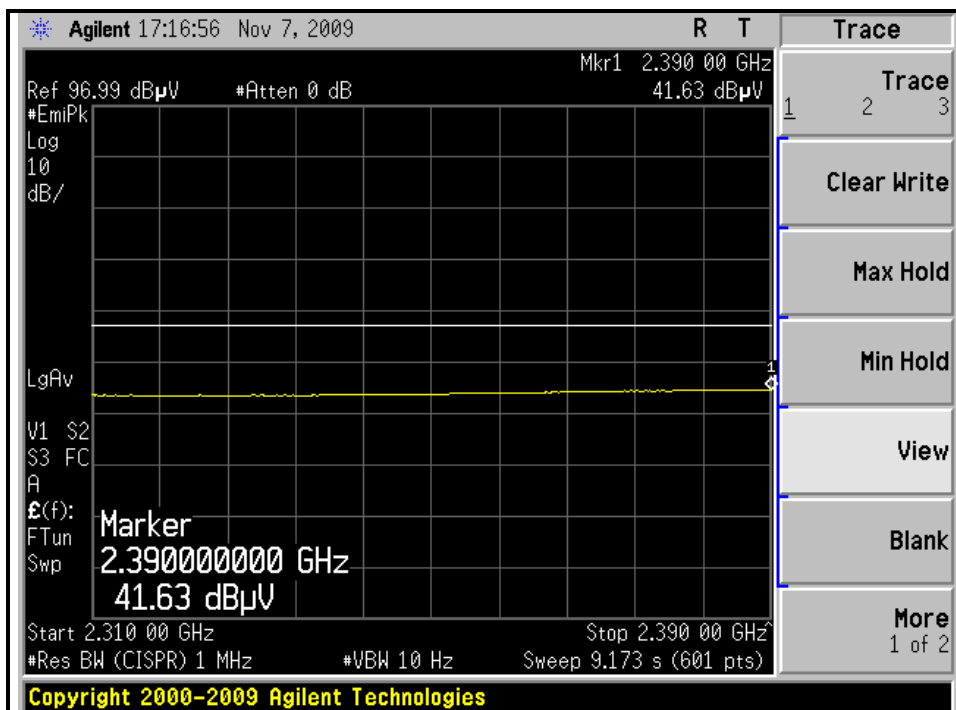
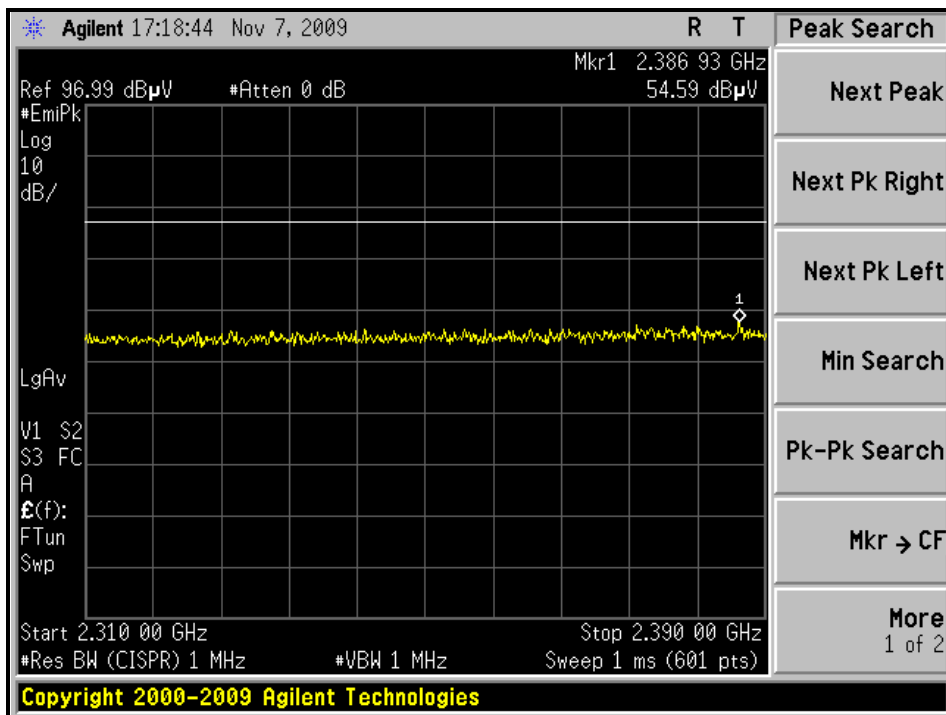
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	106.8 PK			1.00 V	172	76.25	30.55
2	*2462.00	104.5 AV			1.00 V	172	73.90	30.55
3	2487.71	57.9 PK	74.0	-16.1	1.00 V	146	27.24	30.64
4	2487.71	48.0 AV	54.0	-6.0	1.00 V	146	17.35	30.64
5	4924.00	53.2 PK	74.0	-20.8	1.32 V	266	16.10	37.06
6	4924.00	50.6 AV	54.0	-3.4	1.32 V	266	13.51	37.06
7	7386.00	54.8 PK	74.0	-19.2	1.36 V	271	11.69	43.13
8	7386.00	46.9 AV	54.0	-7.1	1.36 V	271	3.79	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.



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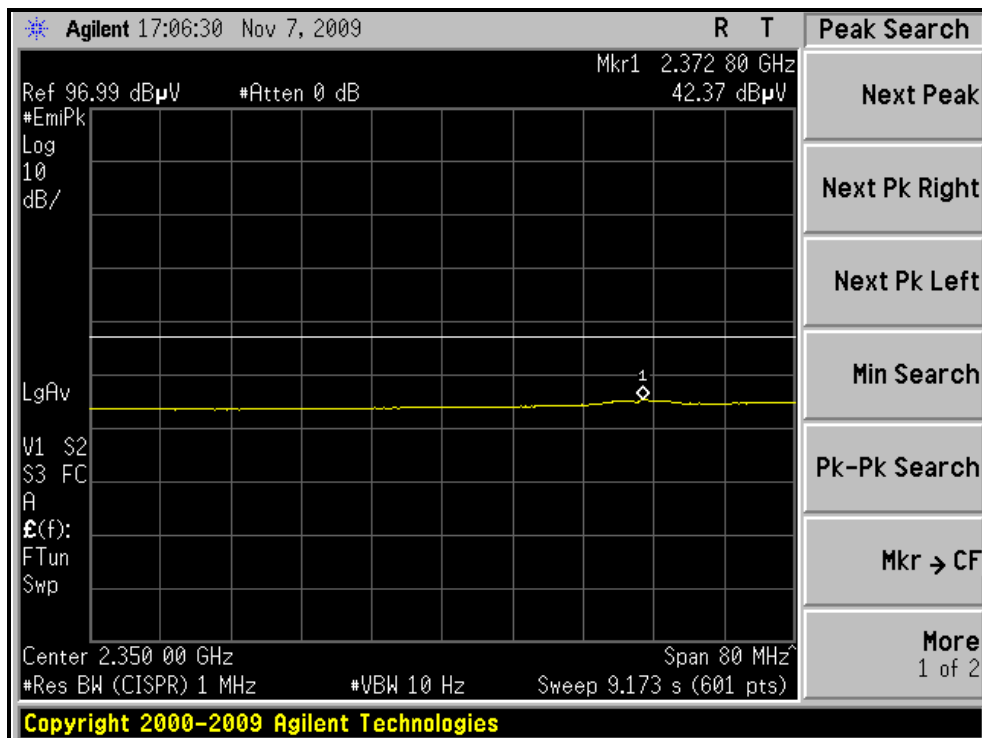
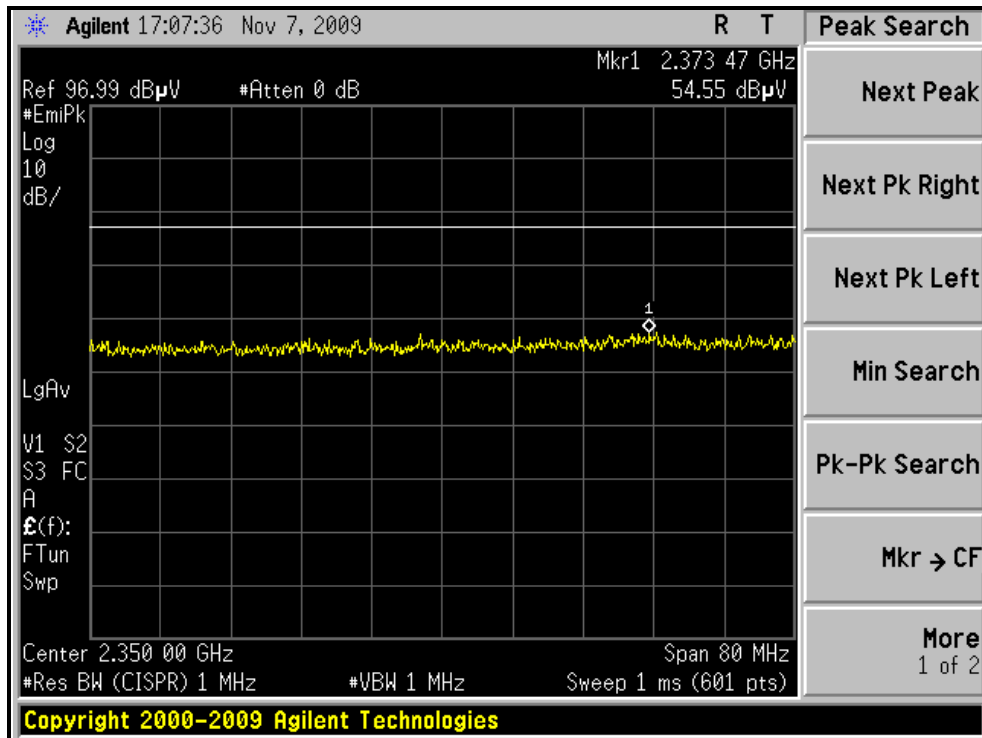
RESTRICTED BANDEDGE (802.11b MODE, CH1, HORIZONTAL )





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

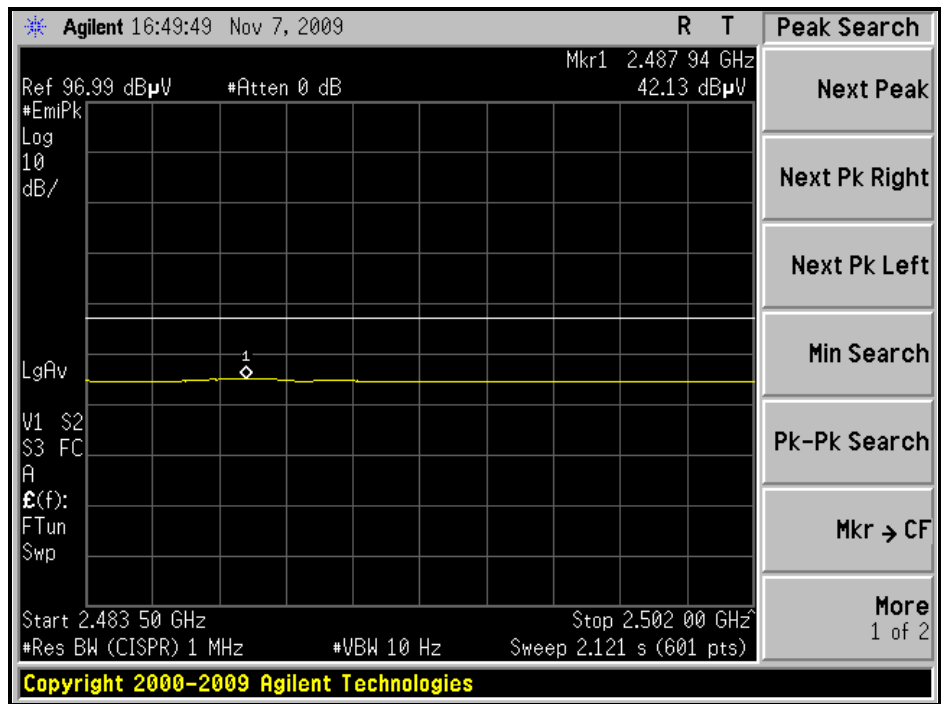
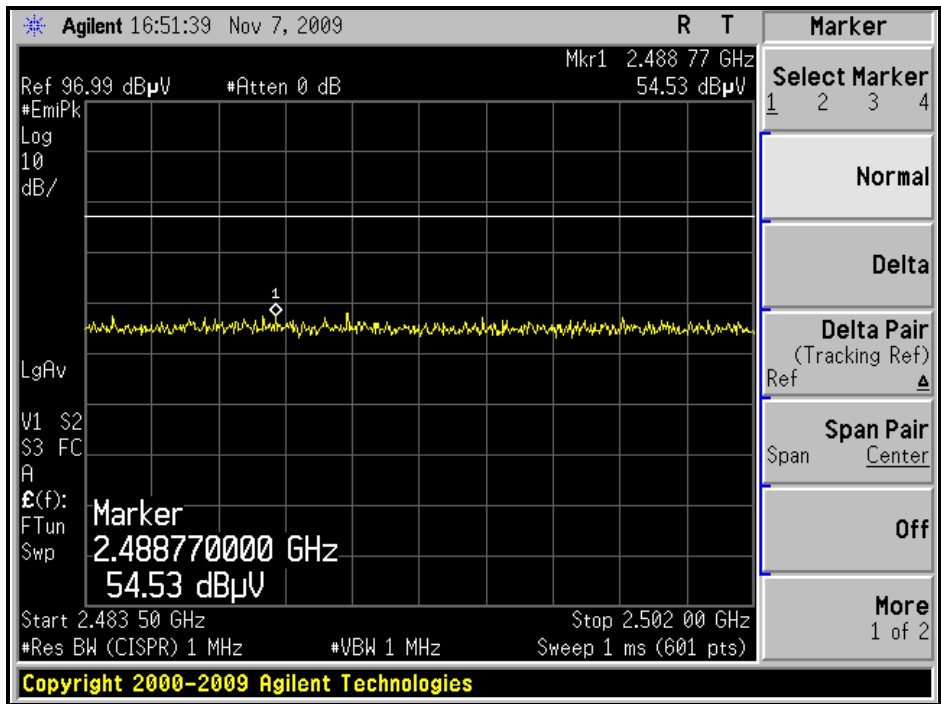






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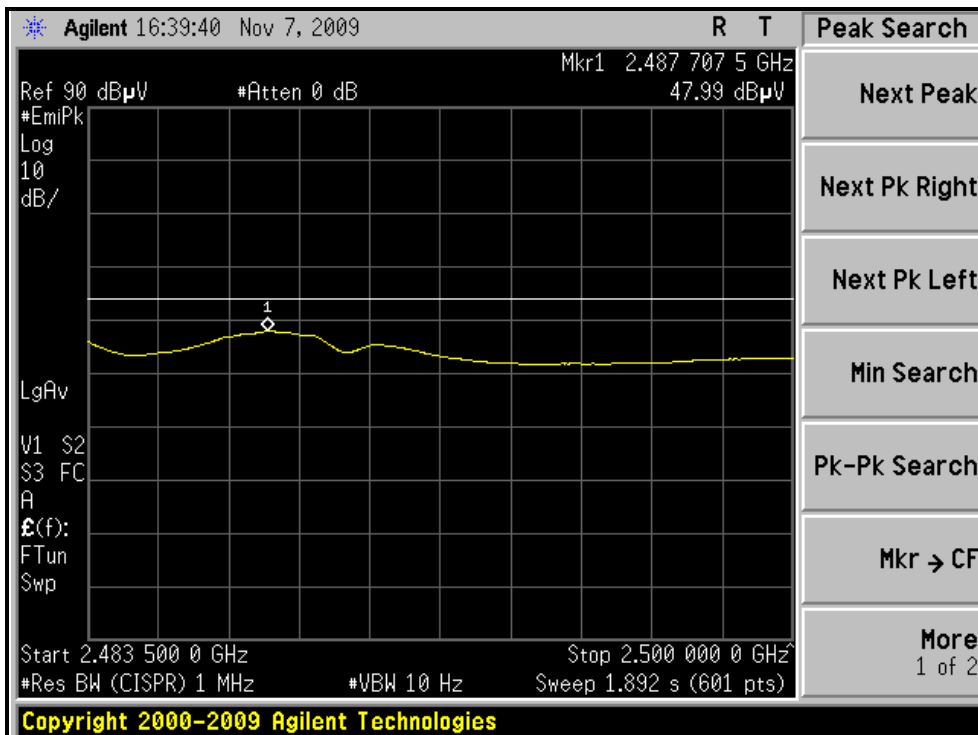
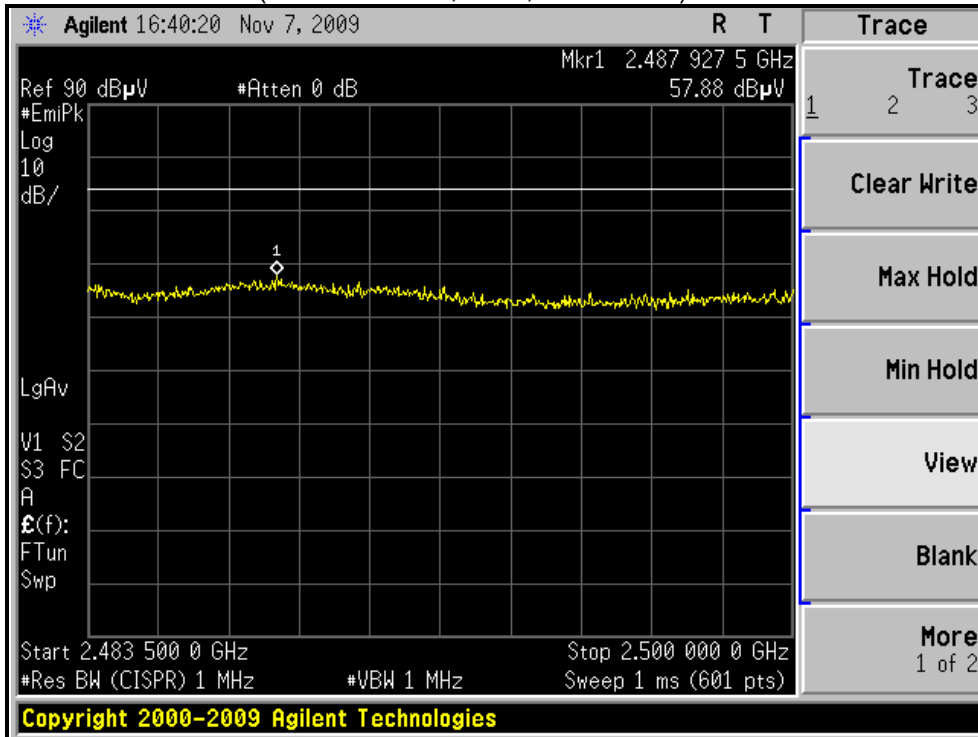
RESTRICTED BANDEDGE (802.11b MODE, CH11, HORIZONTAL )





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RESTRICTED BANDEDGE (802.11b MODE, CH11, VERTICAL )





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**802.11g OFDM MODULATION**

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	29deg. C, 61%RH 1017 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	55.0 PK	74.0	-19.0	1.24 H	43	24.69	30.28
2	2390.00	42.8 AV	54.0	-11.2	1.24 H	43	12.55	30.28
3	*2412.00	95.5 PK			1.00 H	139	65.09	30.36
4	*2412.00	86.4 AV			1.00 H	139	55.99	30.36
5	4824.00	43.9 PK	74.0	-30.1	1.67 H	299	7.15	36.79
6	4824.00	35.4 AV	54.0	-18.6	1.67 H	299	-1.40	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	63.0 PK	74.0	-11.0	1.00 V	116	32.69	30.28
2	2390.00	48.9 AV	54.0	-5.1	1.00 V	116	18.62	30.28
3	*2412.00	106.3 PK			1.00 V	262	75.95	30.36
4	*2412.00	97.7 AV			1.00 V	262	67.29	30.36
5	4824.00	53.7 PK	74.0	-20.3	1.46 V	299	16.92	36.79
6	4824.00	40.7 AV	54.0	-13.3	1.46 V	299	3.94	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.



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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	29deg. C, 61%RH 1017 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	94.2 PK			1.00 H	160	63.78	30.46
2	*2437.00	85.4 AV			1.00 H	160	54.98	30.46
3	4874.00	43.2 PK	74.0	-30.8	1.65 H	300	6.29	36.92
4	4874.00	33.6 AV	54.0	-20.4	1.65 H	300	-3.29	36.92
5	7311.00	50.8 PK	74.0	-23.2	1.38 H	17	7.62	43.14
6	7311.00	39.4 AV	54.0	-14.6	1.38 H	17	-3.70	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	108.9 PK			1.00 V	272	78.45	30.46
2	*2437.00	99.7 AV			1.00 V	272	69.26	30.46
3	4874.00	51.3 PK	74.0	-22.7	1.46 V	299	14.35	36.92
4	4874.00	39.9 AV	54.0	-14.1	1.46 V	299	2.94	36.92
5	7311.00	56.8 PK	74.0	-17.2	1.52 V	11	13.70	43.14
6	7311.00	43.5 AV	54.0	-10.5	1.52 V	11	0.33	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.



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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	29deg. C, 61%RH 1017 hPa	TESTED BY	Frank Liu

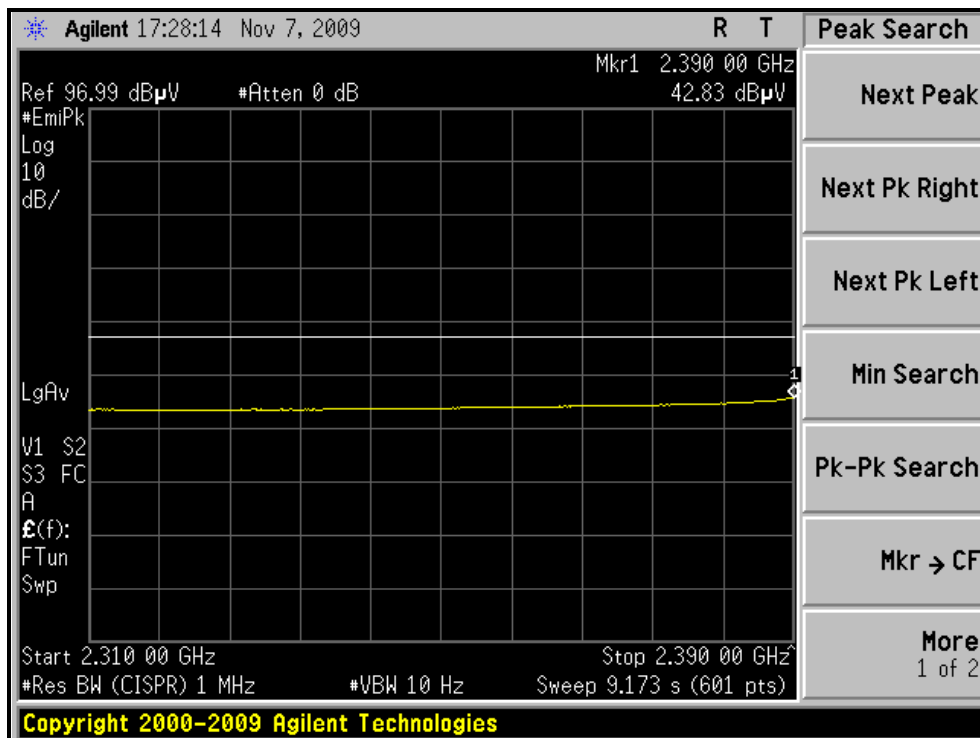
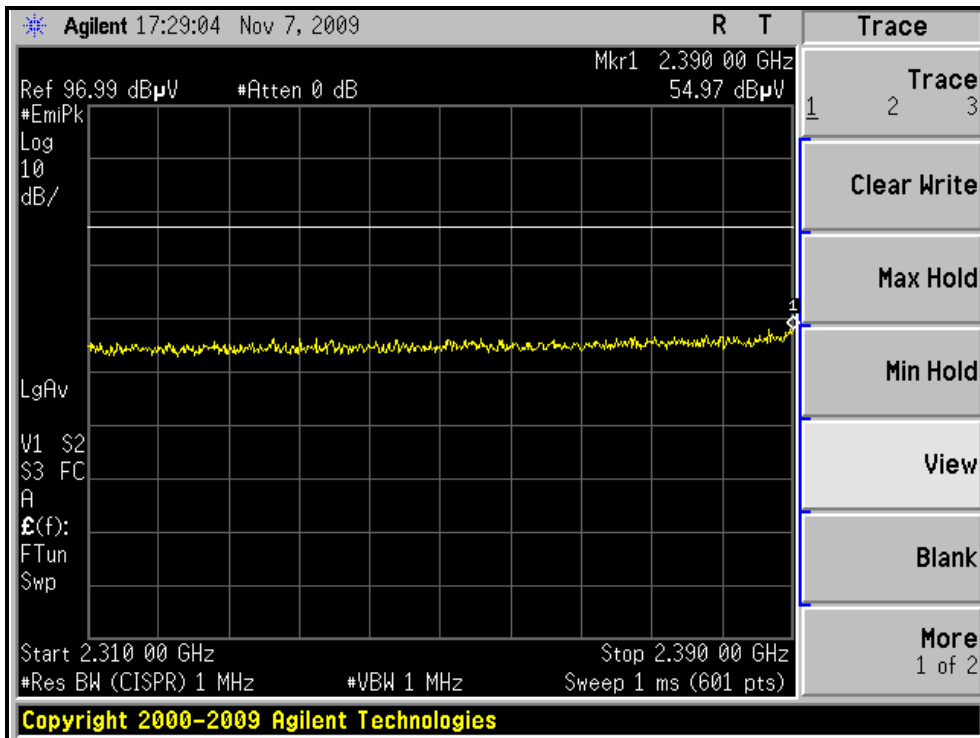
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	95.3 PK			1.00 H	114	64.78	30.55
2	*2462.00	86.7 AV			1.00 H	114	56.14	30.55
3	2483.50	58.3 PK	74.0	-15.7	1.00 H	147	27.66	30.63
4	2483.50	43.8 AV	54.0	-10.2	1.00 H	147	13.19	30.63
5	4924.00	44.9 PK	74.0	-29.1	1.65 H	302	7.88	37.06
6	4924.00	35.6 AV	54.0	-18.4	1.65 H	302	-1.49	37.06
7	7386.00	51.3 PK	74.0	-22.7	1.37 H	14	8.21	43.13
8	7386.00	39.6 AV	54.0	-14.4	1.37 H	14	-3.52	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	107.9 PK			1.00 V	170	77.36	30.55
2	*2462.00	98.7 AV			1.00 V	170	68.15	30.55
3	2483.50	67.1 PK	74.0	-6.9	1.00 V	146	36.49	30.63
4	2483.50	51.0 AV	54.0	-3.1	1.00 V	146	20.32	30.63
5	4924.00	51.0 PK	74.0	-23.0	1.44 V	262	13.91	37.06
6	4924.00	38.6 AV	54.0	-15.4	1.44 V	262	1.53	37.06
7	7386.00	55.2 PK	74.0	-18.8	1.52 V	9	12.11	43.13
8	7386.00	42.4 AV	54.0	-11.6	1.52 V	9	-0.69	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.



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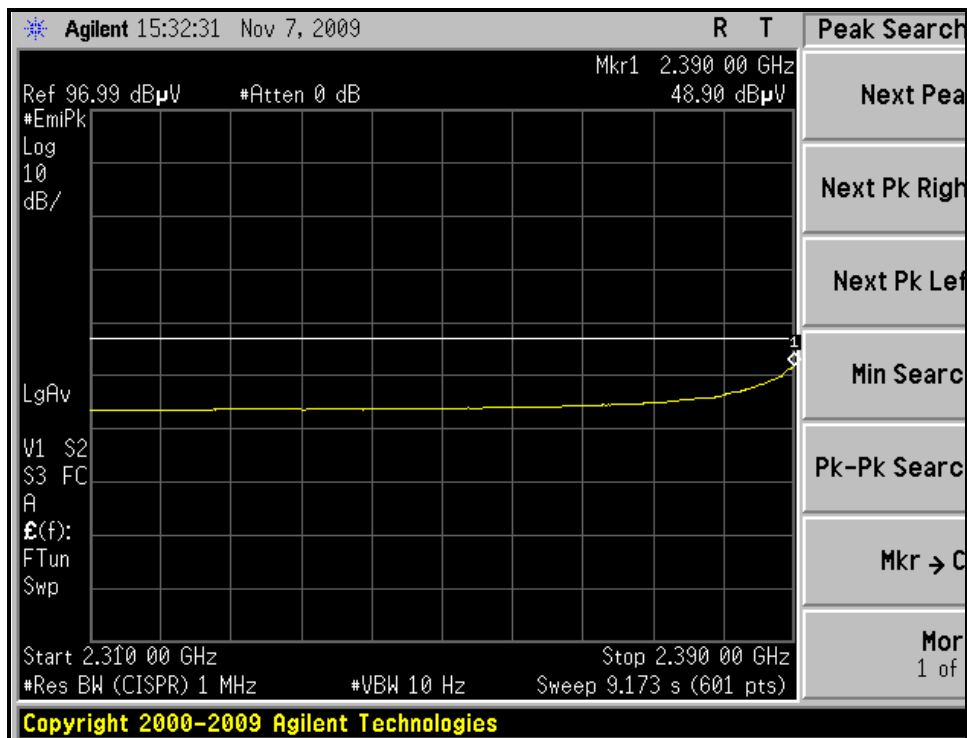
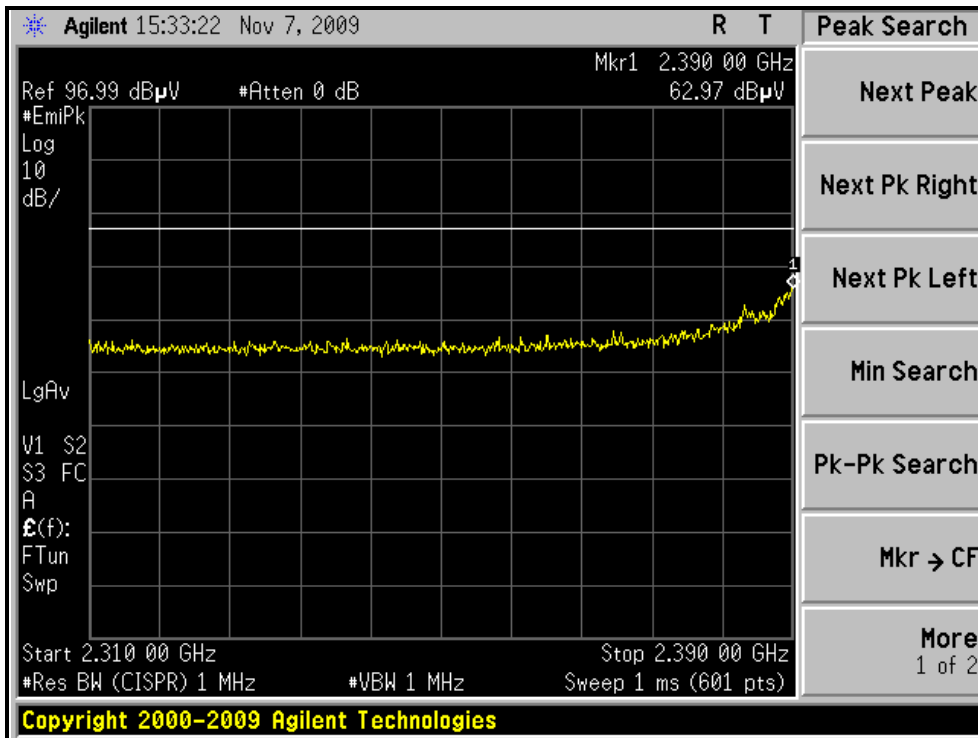
RESTRICTED BANDEDGE (802.11g MODE, CH1, HORIZONTAL )





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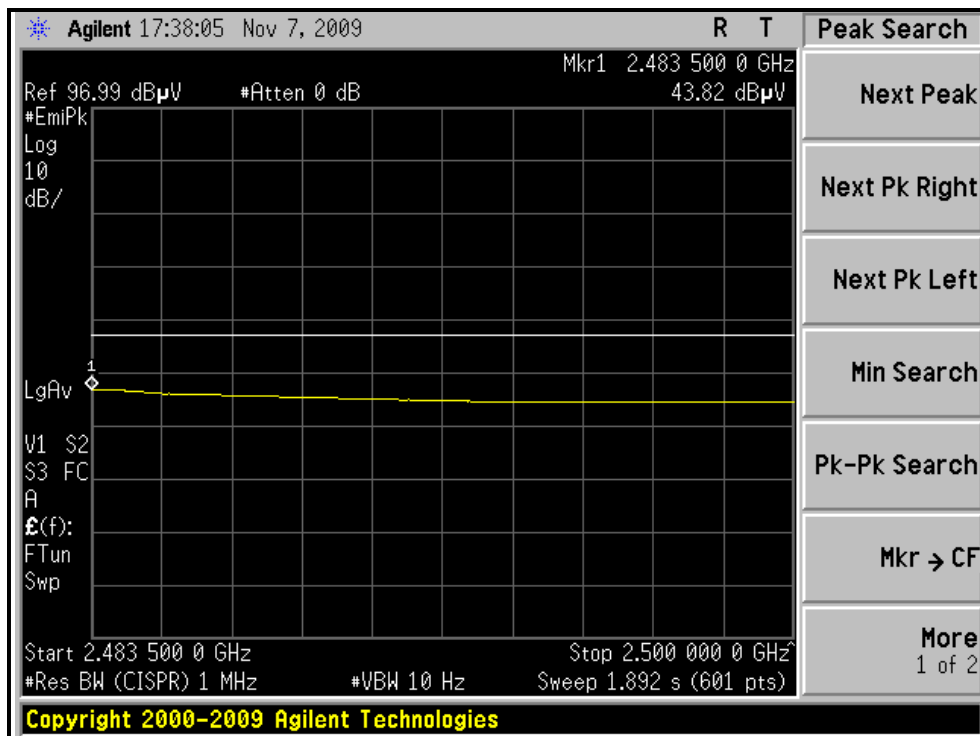
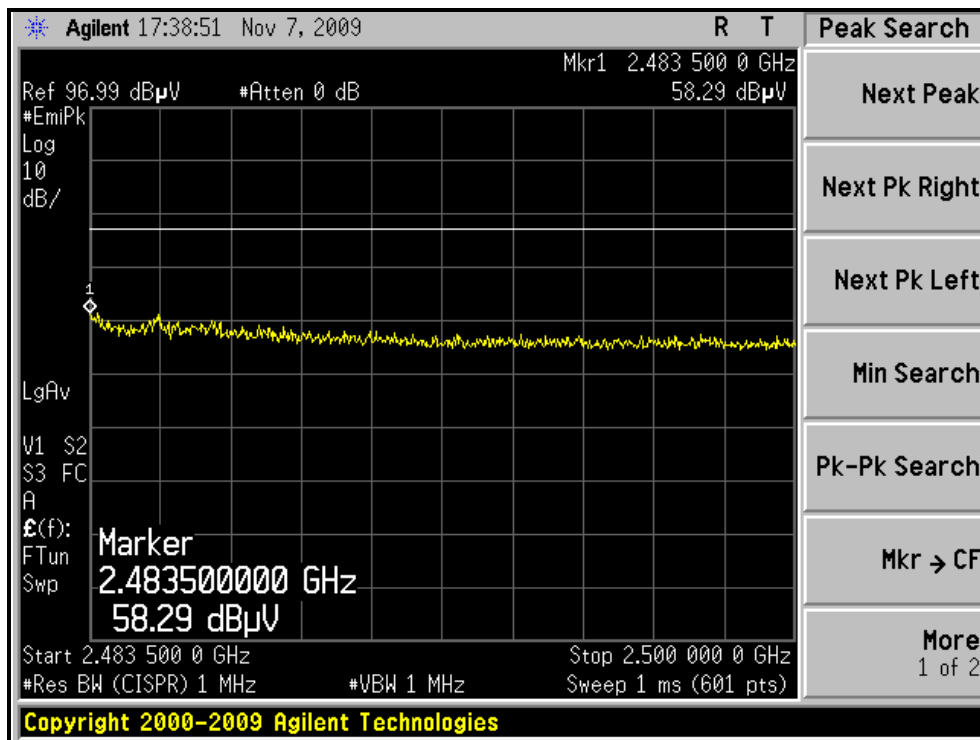
### RESTRICTED BANDEDGE (802.11g MODE,CH1, VERTICAL )





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RESTRICTED BANDEDGE (802.11g MODE, CH11, HORIZONTAL )

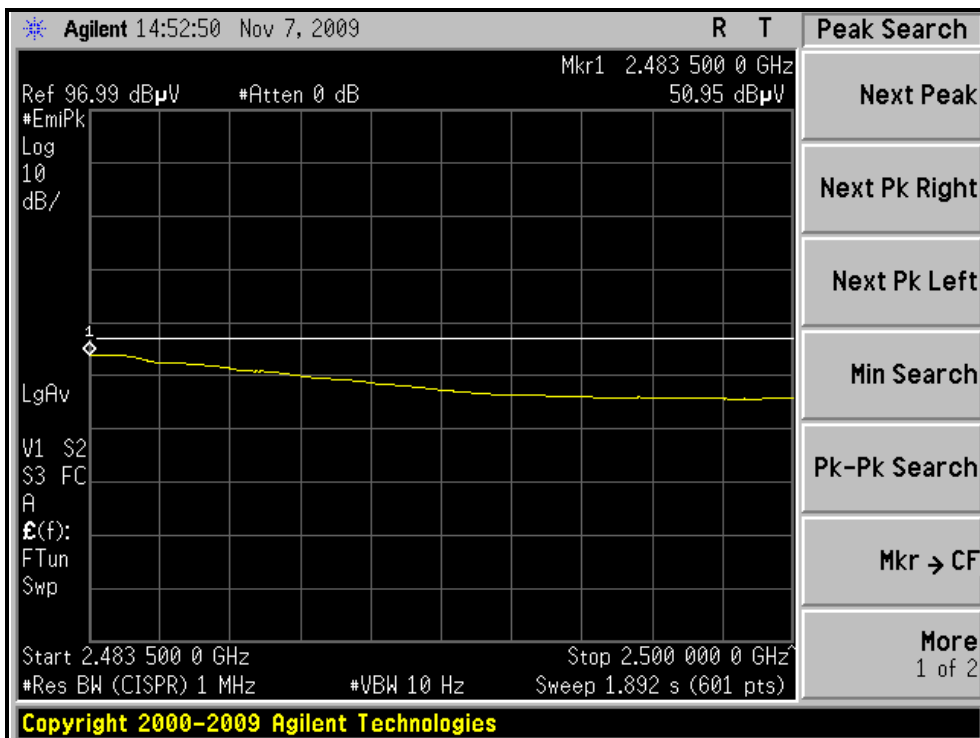
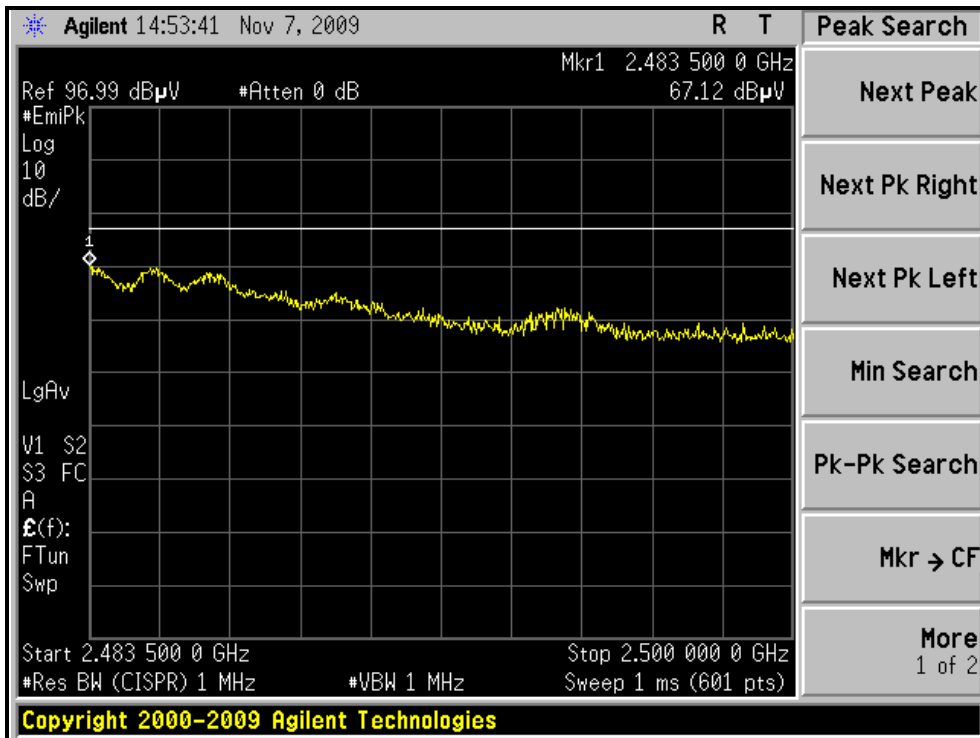






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RESTRICTED BANDEDGE (802.11g MODE, CH11, VERTICAL )





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

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	29deg. C, 61%RH 1017 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	54.6 PK	74.0	-19.4	1.08 H	138	24.28	30.28
2	2390.00	42.6 AV	54.0	-11.4	1.08 H	138	12.28	30.28
3	*2412.00	95.9 PK			1.00 H	138	65.56	30.36
4	*2412.00	86.1 AV			1.00 H	138	55.77	30.36
5	4824.00	43.7 PK	74.0	-30.3	1.64 H	283	6.91	36.79
6	4824.00	35.8 AV	54.0	-18.2	1.64 H	283	-0.99	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	61.5 PK	74.0	-12.5	1.00 V	13	31.25	30.28
2	2390.00	48.7 AV	54.0	-5.3	1.00 V	13	18.46	30.28
3	*2412.00	107.1 PK			1.00 V	262	76.78	30.36
4	*2412.00	96.9 AV			1.00 V	262	66.49	30.36
5	4824.00	50.4 PK	74.0	-23.6	1.46 V	300	13.58	36.79
6	4824.00	37.9 AV	54.0	-16.1	1.46 V	300	1.15	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.



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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	29deg. C, 61%RH 1017 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	94.7 PK			1.00 H	160	64.21	30.46
2	*2437.00	85.8 AV			1.00 H	160	55.32	30.46
3	4874.00	43.1 PK	74.0	-30.9	1.62 H	281	6.18	36.92
4	4874.00	35.4 AV	54.0	-18.6	1.62 H	281	-1.52	36.92
5	7311.00	50.9 PK	74.0	-23.1	1.32 H	23	7.76	43.14
6	7311.00	40.3 AV	54.0	-13.7	1.32 H	23	-2.84	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	108.3 PK			1.00 V	273	77.81	30.46
2	*2437.00	98.8 AV			1.00 V	273	68.33	30.46
3	4874.00	50.6 PK	74.0	-23.4	1.45 V	298	13.70	36.92
4	4874.00	37.8 AV	54.0	-16.2	1.45 V	298	0.85	36.92
5	7311.00	52.6 PK	74.0	-21.4	1.43 V	152	9.50	43.14
6	7311.00	39.5 AV	54.0	-14.5	1.43 V	152	-3.64	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.



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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	29deg. C, 61%RH 1017 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	95.3 PK			1.00 H	113	64.70	30.55
2	*2462.00	86.3 AV			1.00 H	113	55.77	30.55
3	2483.50	56.7 PK	74.0	-17.3	1.00 H	148	26.06	30.63
4	2483.50	43.8 AV	54.0	-10.3	1.00 H	148	13.12	30.63
5	4924.00	43.6 PK	74.0	-30.4	1.62 H	273	6.54	37.06
6	4924.00	36.3 AV	54.0	-17.7	1.62 H	273	-0.76	37.06
7	7386.00	51.3 PK	74.0	-22.7	1.36 H	29	8.17	43.13
8	7386.00	40.6 AV	54.0	-13.4	1.36 H	29	-2.53	43.13

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

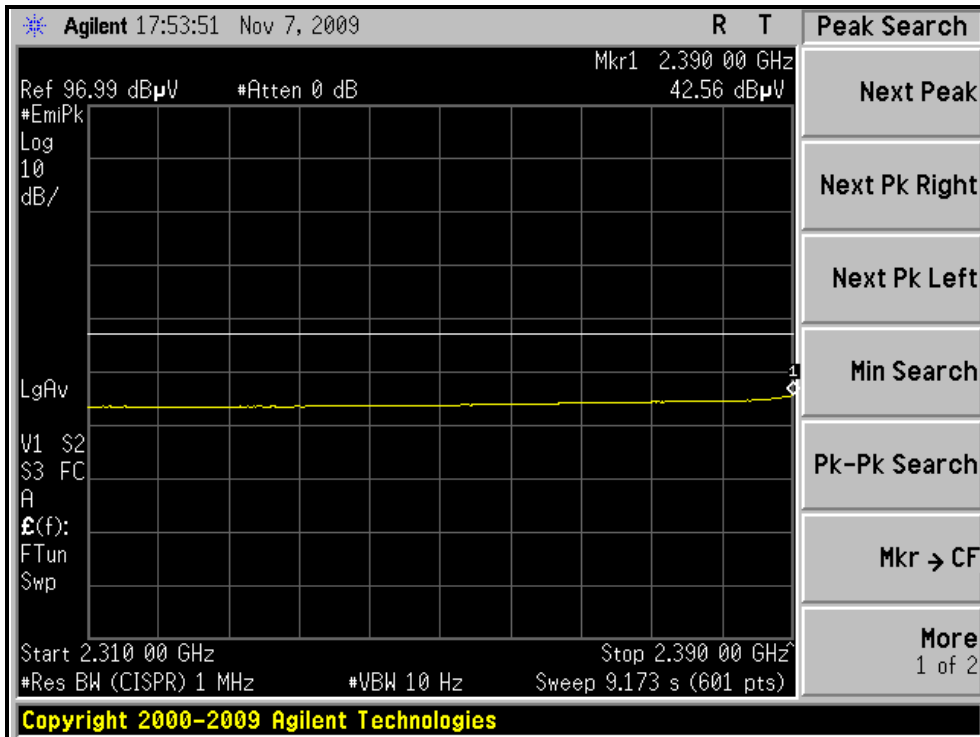
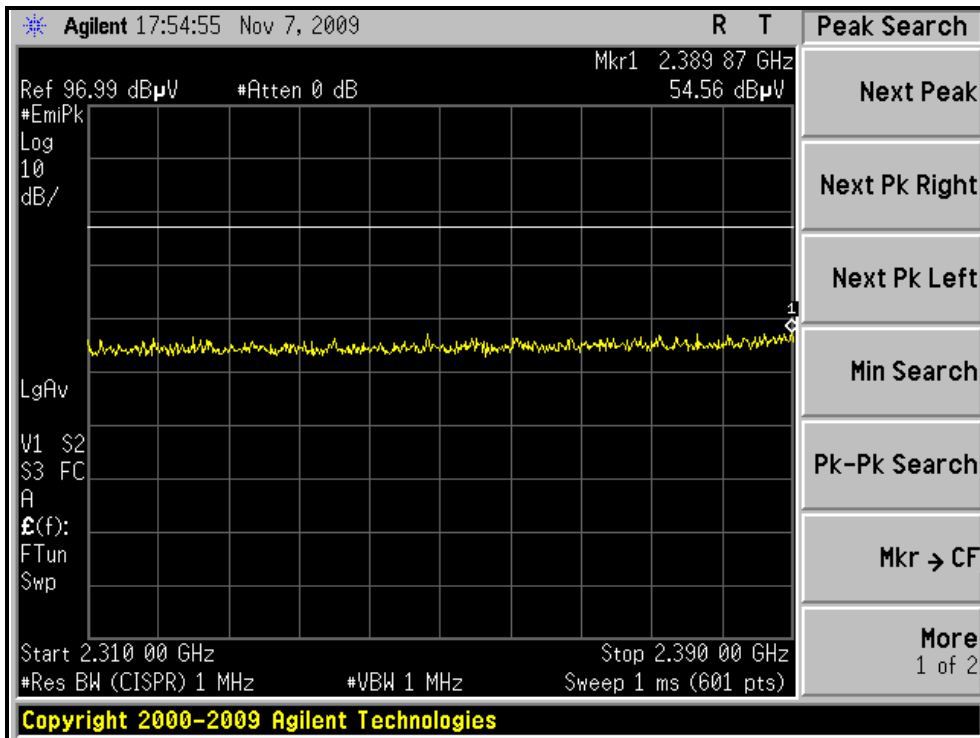
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	107.3 PK			1.00 V	170	76.74	30.55
2	*2462.00	98.2 AV			1.00 V	170	67.68	30.55
3	2483.50	49.82 AV	74.0	-4.2	1.00 V	273	19.19	30.63
4	2487.27	65.96 PK	54.0	-8.0	1.00 V	273	35.32	30.64
5	4924.00	50.2 PK	74.0	-23.8	1.45 V	299	13.13	37.06
6	4924.00	37.7 AV	54.0	-16.3	1.45 V	299	0.62	37.06
7	7386.00	52.5 PK	74.0	-21.5	1.44 V	155	9.35	43.13
8	7386.00	37.4 AV	54.0	-16.6	1.44 V	155	-5.72	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.



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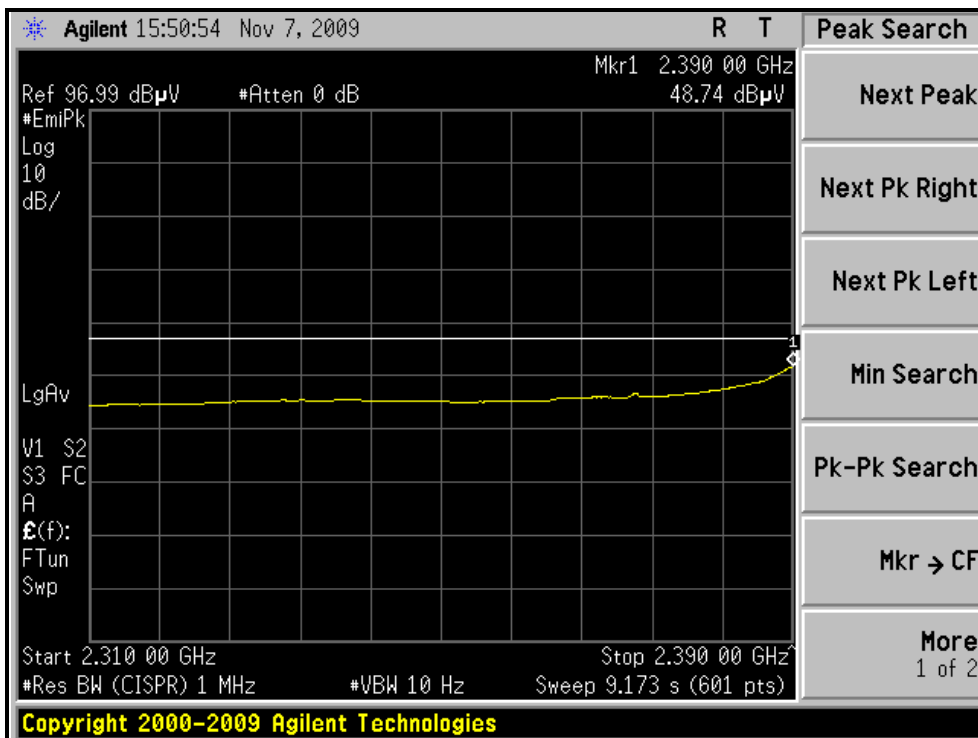
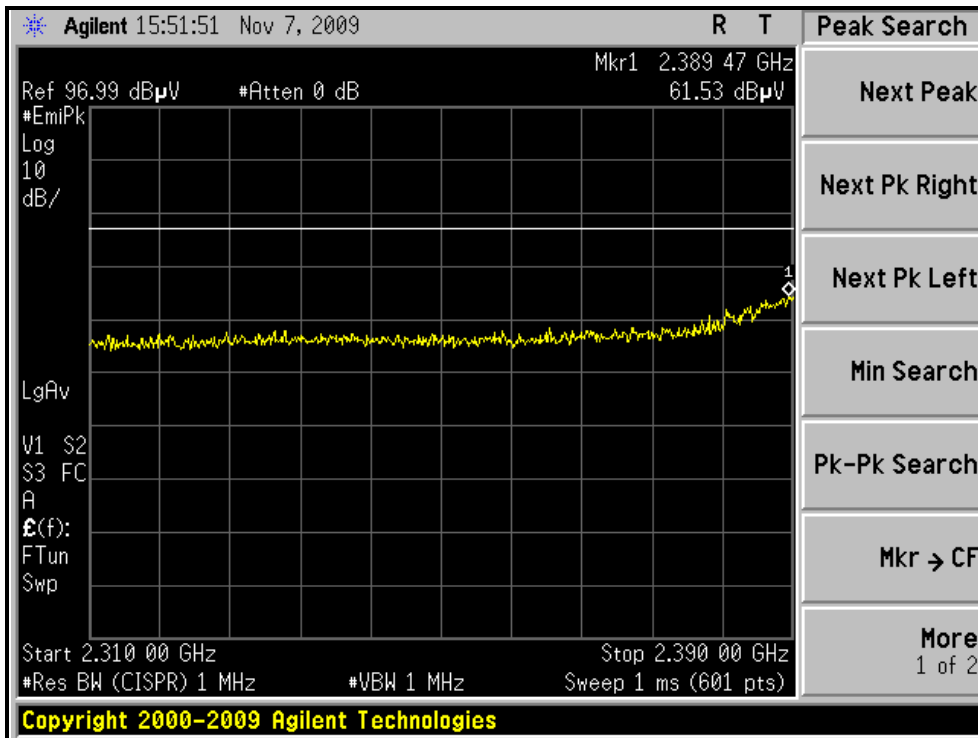
RESTRICTED BANDEDGE (802.11n (20MHz) MODE,CH1, HORIZONTAL )





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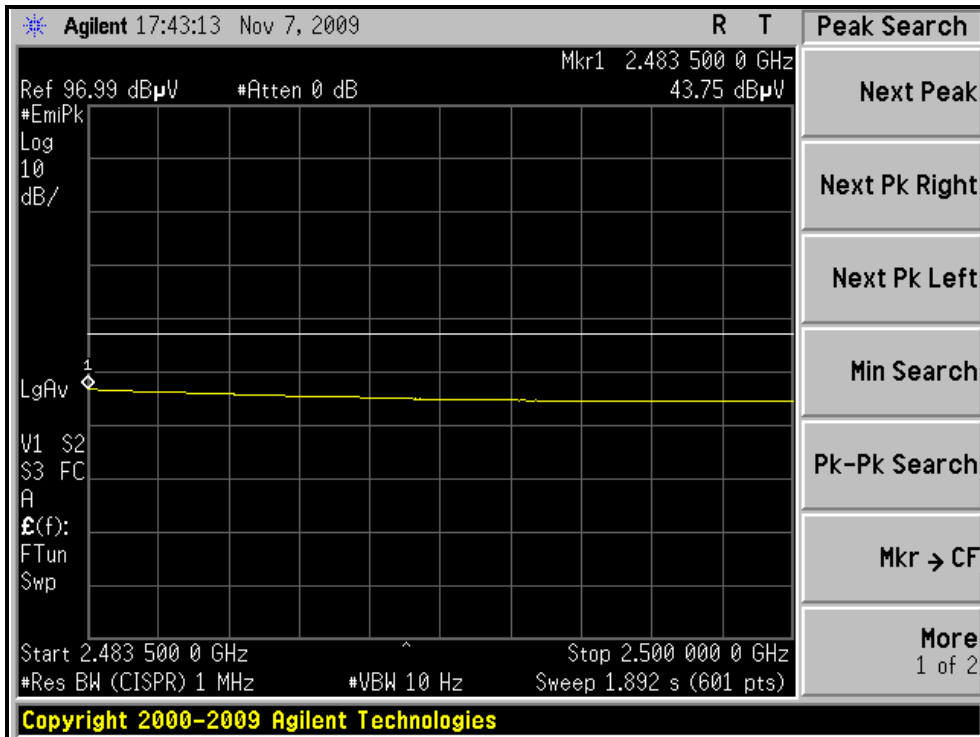
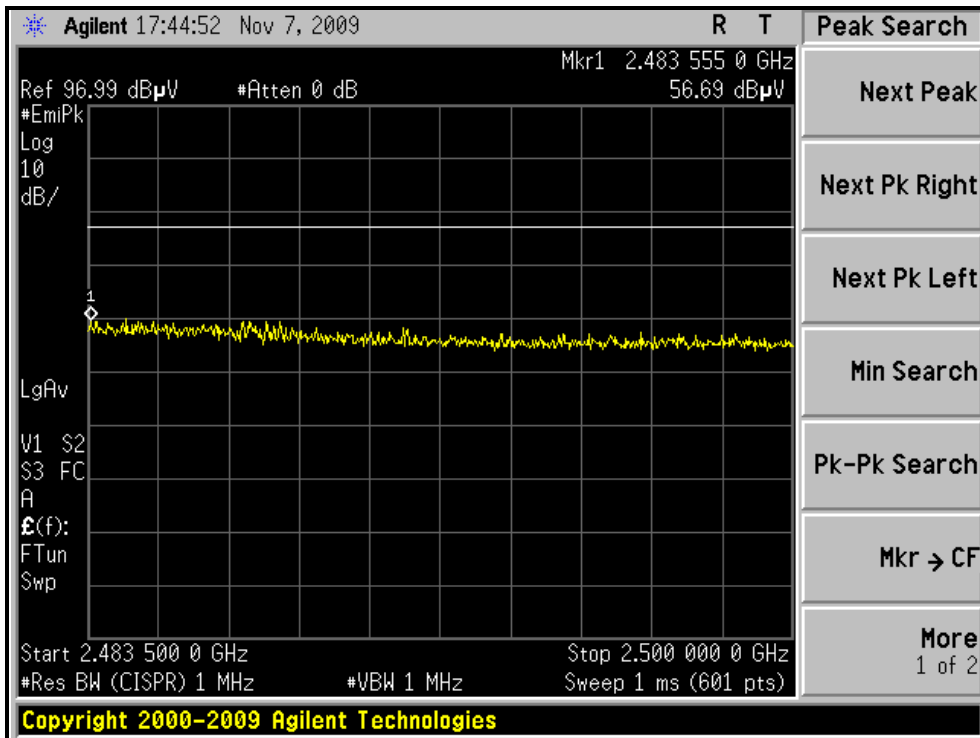
RESTRICTED BANDEDGE (802.11n (20MHz) MODE,CH1, VERTICAL )





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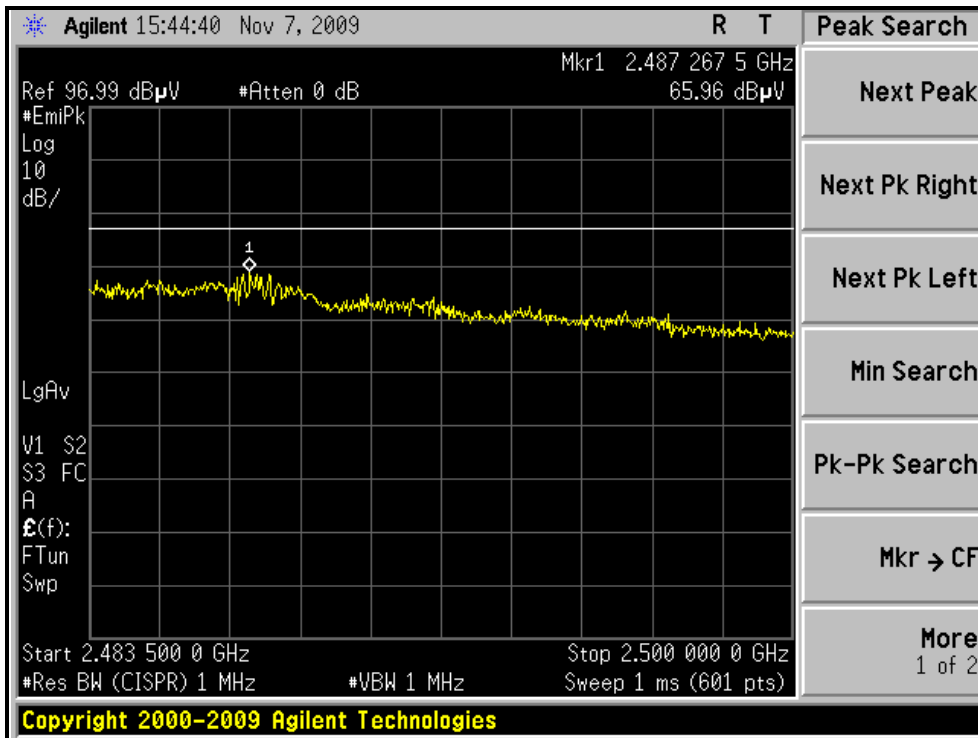
RESTRICTED BANDEDGE (802.11n (20MHz) MODE,CH11, HORIZONTAL )





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RESTRICTED BANDEDGE (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	29deg. C, 61%RH 1017 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	2389.87	55.9 PK	74.0	-18.1	1.41 H	14	25.58	30.28
2	2389.87	43.4 AV	54.0	-10.6	1.41 H	14	13.08	30.28
3	*2422.00	92.0 PK			1.00 H	138	61.63	30.40
4	*2422.00	82.9 AV			1.00 H	138	52.47	30.40
5	4844.00	49.4 PK	74.0	-24.6	1.88 H	240	12.55	36.84
6	4844.00	37.2 AV	54.0	-16.8	1.88 H	240	0.34	36.84
7	7266.00	50.9 PK	74.0	-23.1	1.61 H	19	7.78	43.14
8	7266.00	39.5 AV	54.0	-14.5	1.61 H	19	-3.67	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	2389.73	65.2 PK	74.0	-8.8	1.00 V	14	34.96	30.28
2	2389.73	50.9 AV	54.0	-3.1	1.00 V	14	20.60	30.28
3	*2422.00	105.9 PK			1.00 V	273	75.53	30.40
4	*2422.00	96.1 AV			1.00 V	273	65.68	30.40
5	4844.00	53.3 PK	74.0	-20.7	1.47 V	301	16.46	36.84
6	4844.00	39.9 AV	54.0	-14.1	1.47 V	301	3.05	36.84
7	7266.00	54.7 PK	74.0	-19.3	1.35 V	273	11.57	43.14
8	7266.00	40.3 AV	54.0	-13.8	1.35 V	273	-2.89	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.



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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	29deg. C, 61%RH 1017 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	91.6 PK			1.00 H	161	61.11	30.46
2	*2437.00	82.1 AV			1.00 H	161	51.64	30.46
3	4874.00	48.5 PK	74.0	-25.5	1.89 H	239	11.58	36.92
4	4874.00	36.6 AV	54.0	-17.4	1.89 H	239	-0.31	36.92
5	7311.00	50.6 PK	74.0	-23.4	1.60 H	20	7.42	43.14
6	7311.00	38.8 AV	54.0	-15.2	1.60 H	20	-4.32	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	105.6 PK			1.00 V	273	75.16	30.46
2	*2437.00	95.9 AV			1.00 V	273	65.44	30.46
3	4874.00	51.2 PK	74.0	-22.8	1.47 V	298	14.32	36.92
4	4874.00	38.4 AV	54.0	-15.6	1.47 V	298	1.52	36.92
5	7311.00	53.1 PK	74.0	-20.9	1.36 V	271	10.00	43.14
6	7311.00	39.6 AV	54.0	-14.4	1.36 V	271	-3.50	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.



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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	29deg. C, 61%RH 1017 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	*2452.00	91.1 PK			1.00 H	113	60.54	30.51
2	*2452.00	82.0 AV			1.00 H	113	51.44	30.51
3	2484.82	56.4 PK	74.0	-17.7	1.00 H	147	25.72	30.63
4	2484.82	43.2 AV	54.0	-10.8	1.00 H	147	12.57	30.63
5	4904.00	47.2 PK	74.0	-26.8	1.89 H	238	10.23	37.00
6	4904.00	35.9 AV	54.0	-18.2	1.89 H	238	-1.15	37.00
7	7356.00	49.4 PK	74.0	-24.6	1.58 H	22	6.25	43.13
8	7356.00	38.1 AV	54.0	-15.9	1.58 H	22	-5.07	43.13

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

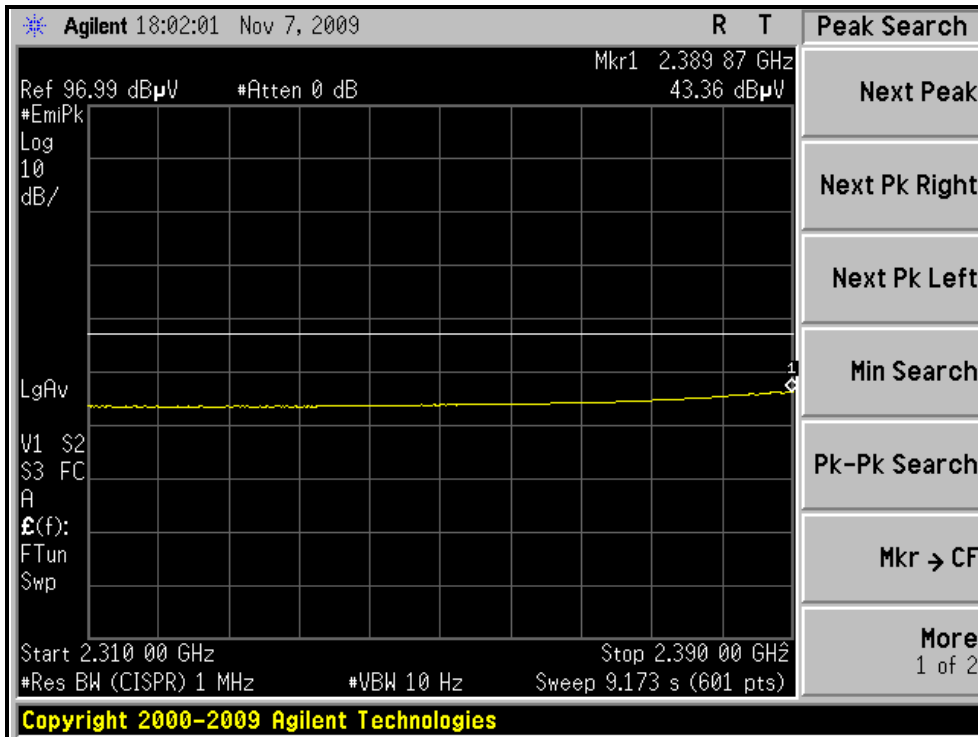
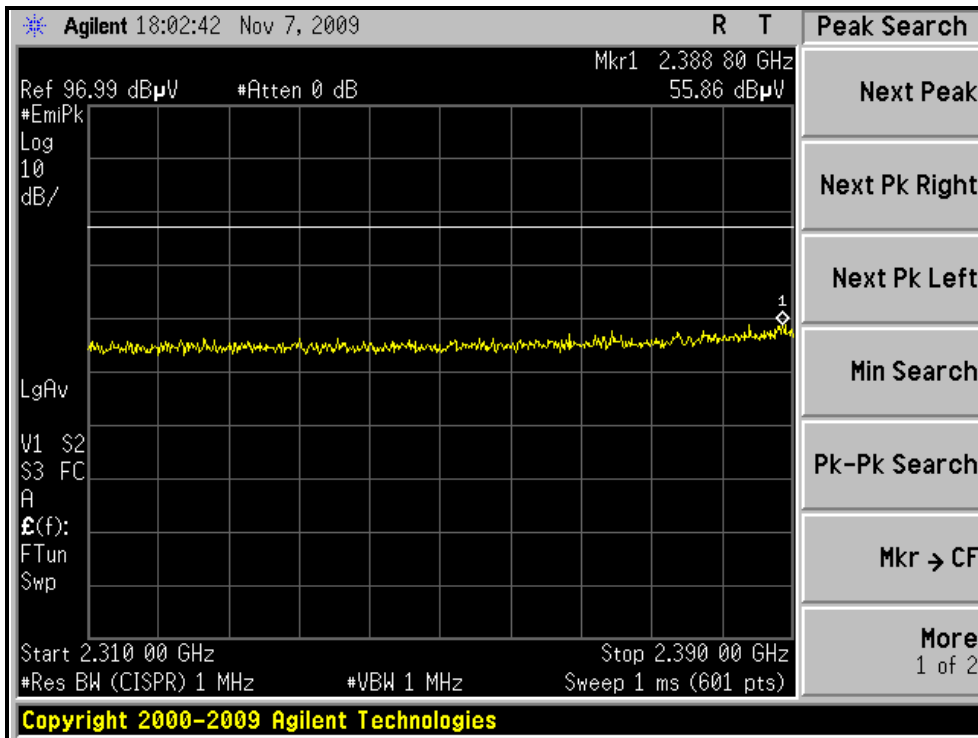
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2452.00	104.2 PK			1.00 V	273	73.72	30.51
2	*2452.00	95.0 AV			1.00 V	273	64.45	30.51
3	2487.52	65.5 PK	74.0	-8.5	1.00 V	273	34.87	30.64
4	2487.52	50.4 AV	54.0	-3.6	1.00 V	273	19.75	30.64
5	4904.00	49.3 PK	74.0	-24.7	1.47 V	304	12.30	37.00
6	4904.00	37.3 AV	54.0	-16.7	1.47 V	304	0.30	37.00
7	7356.00	52.2 PK	74.0	-21.8	1.36 V	272	9.08	43.13
8	7356.00	39.3 AV	54.0	-14.7	1.36 V	272	-3.86	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

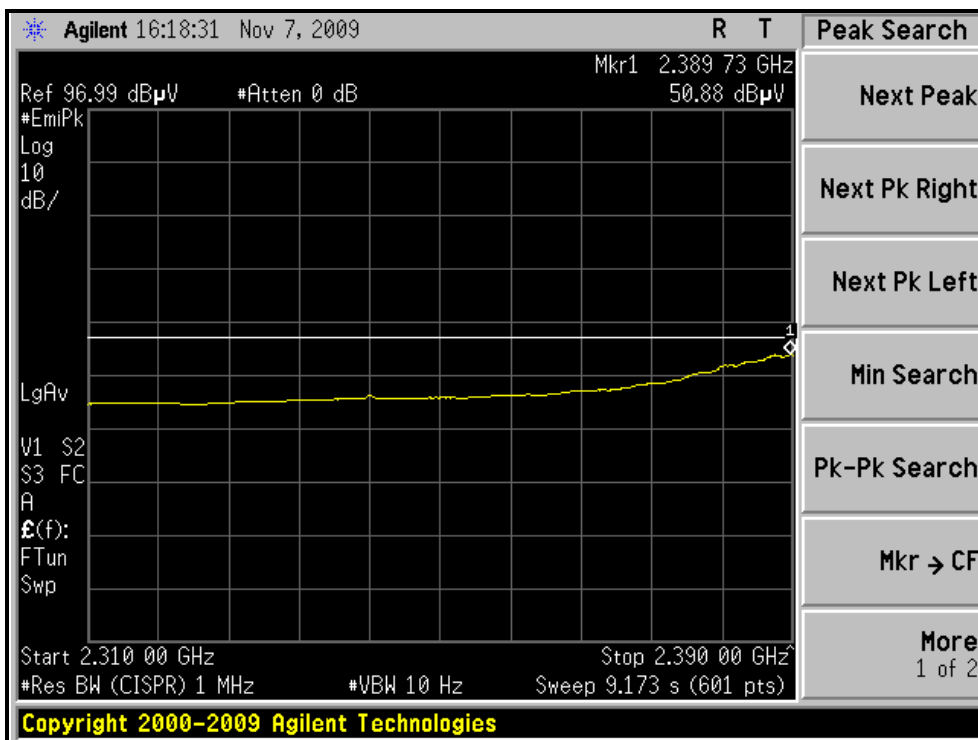
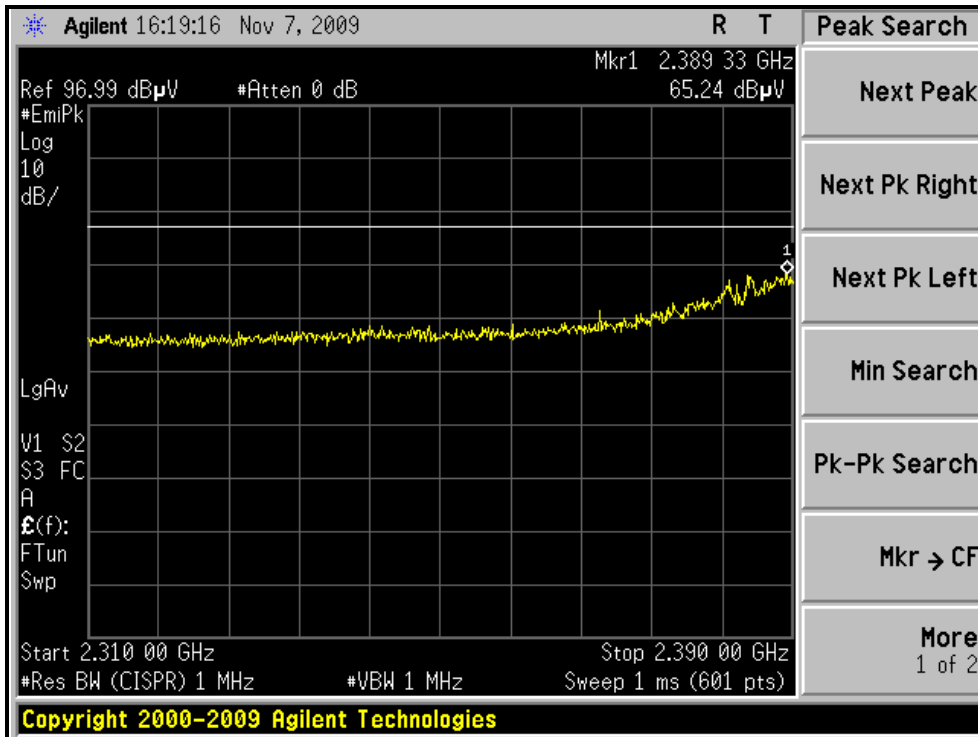
RESTRICTED BANDEDGE (802.11n (40MHz) MODE,CH1, HORIZONTAL )





A D T

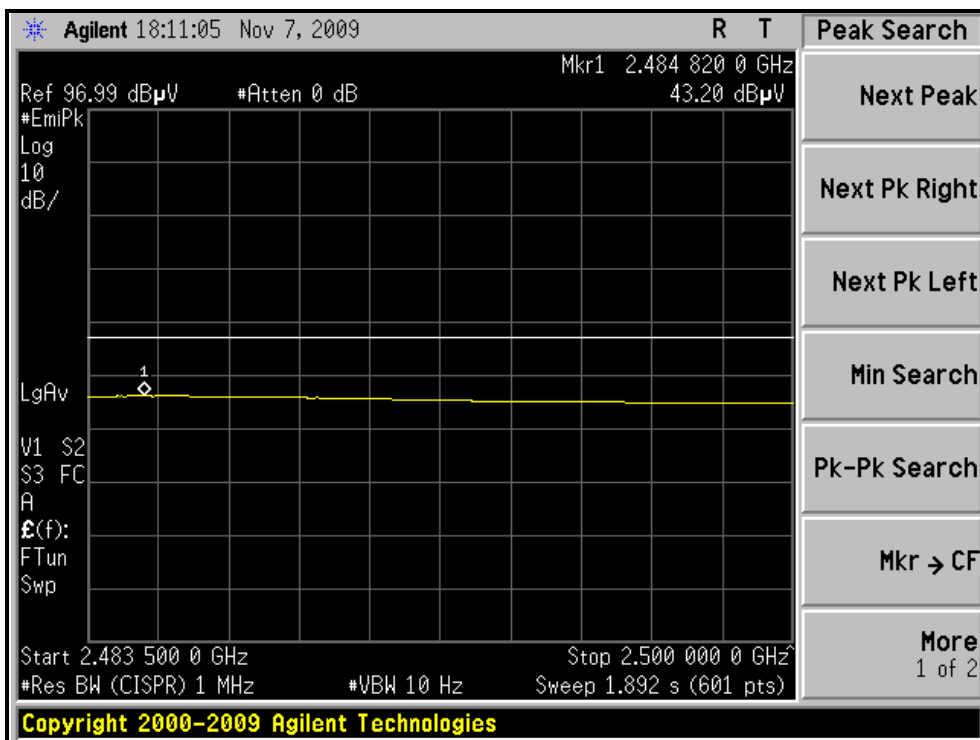
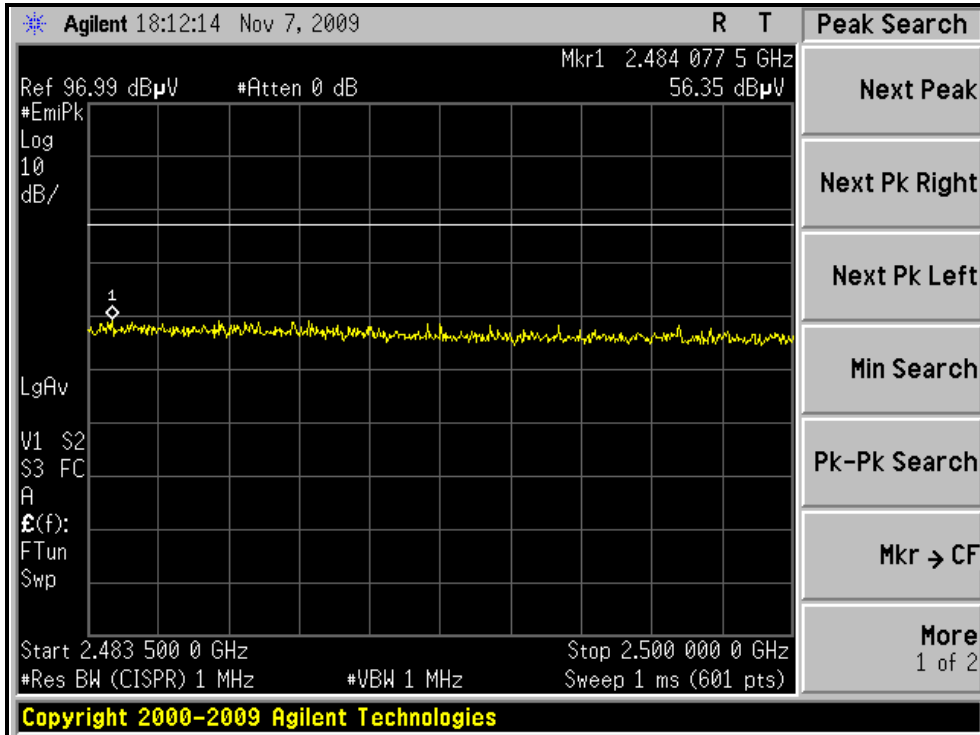
RESTRICTED BANDEDGE (802.11n (40MHz) MODE,CH1, VERTICAL )





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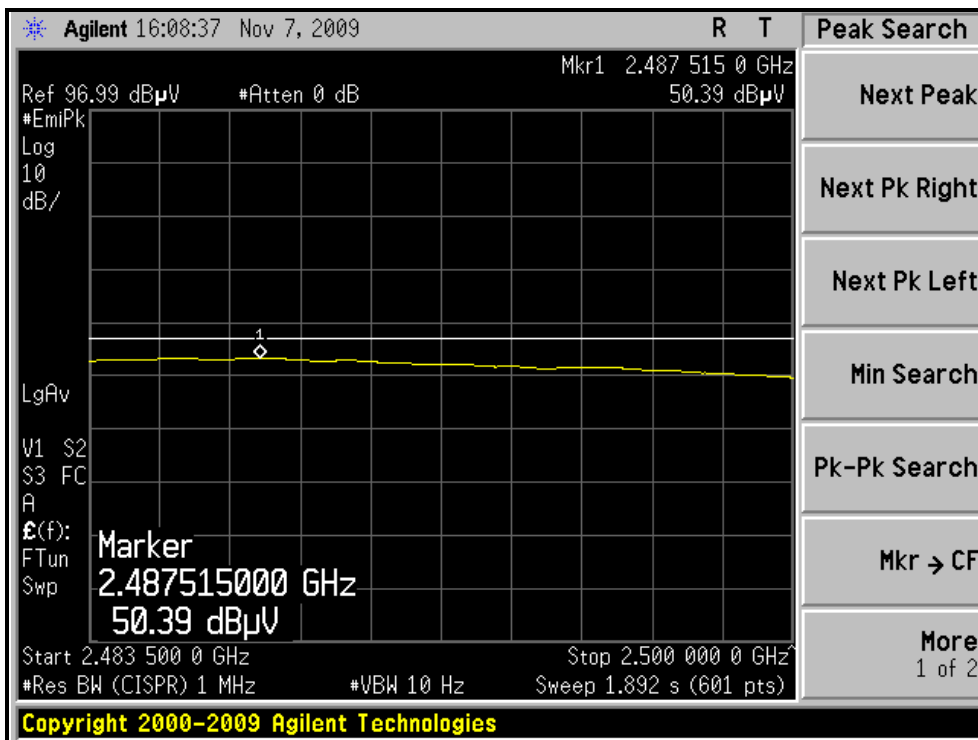
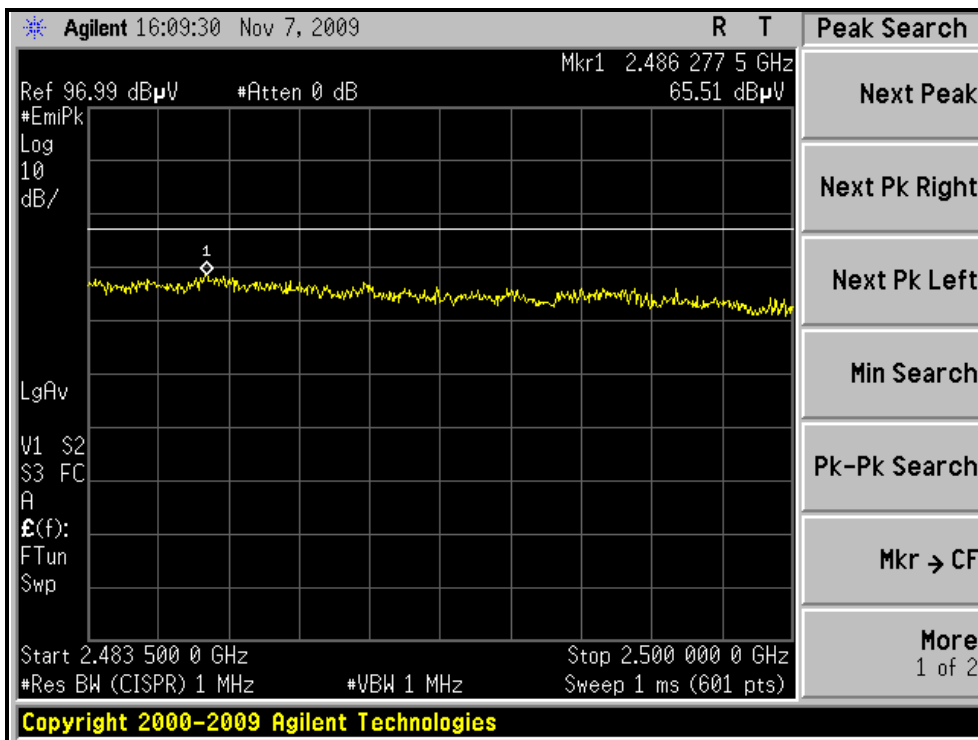
RESTRICTED BANDEDGE (802.11n (40MHz) MODE,CH7, HORIZONTAL )





A D T

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

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

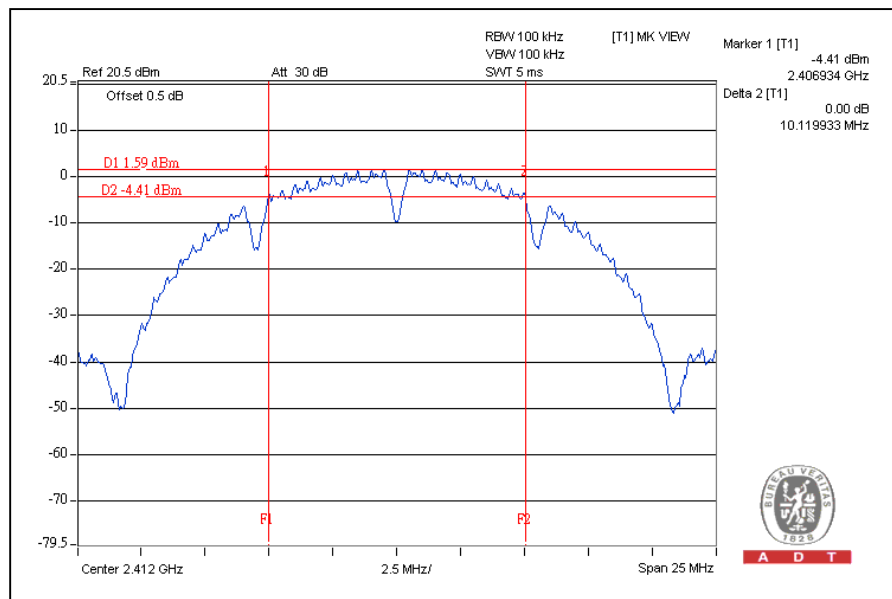
The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

### 4.3.7 TEST RESULTS

#### 802.11b DSSS MODULATION:

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

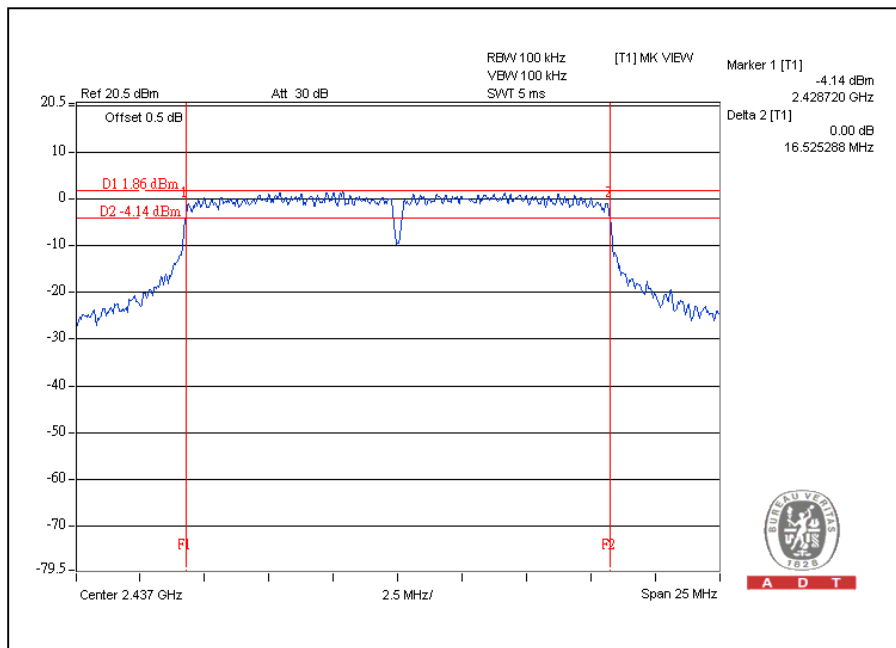
CH1



**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	16.53	0.5	PASS
11	2462	16.53	0.5	PASS

**CH6**



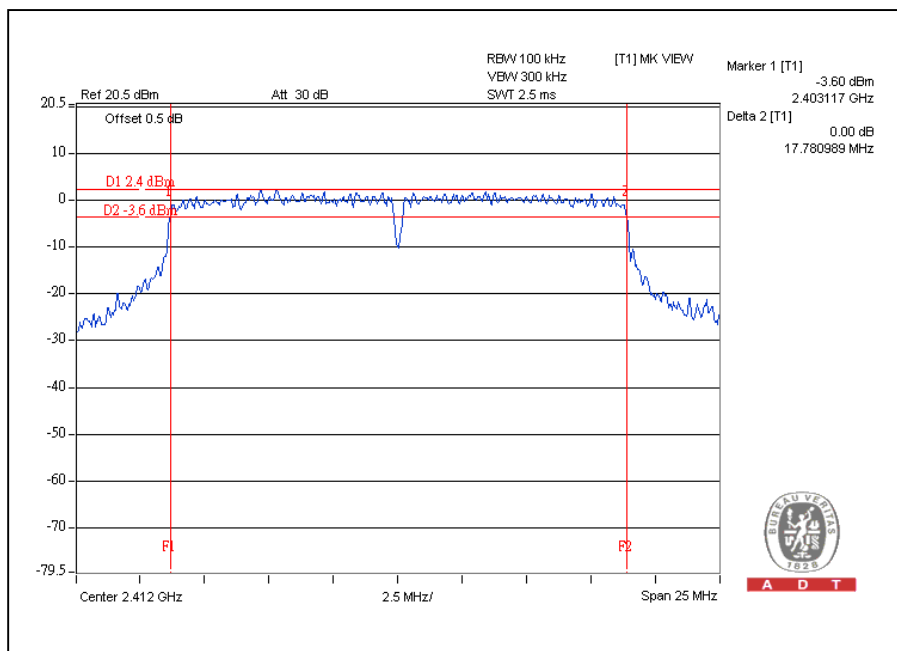


A D T

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

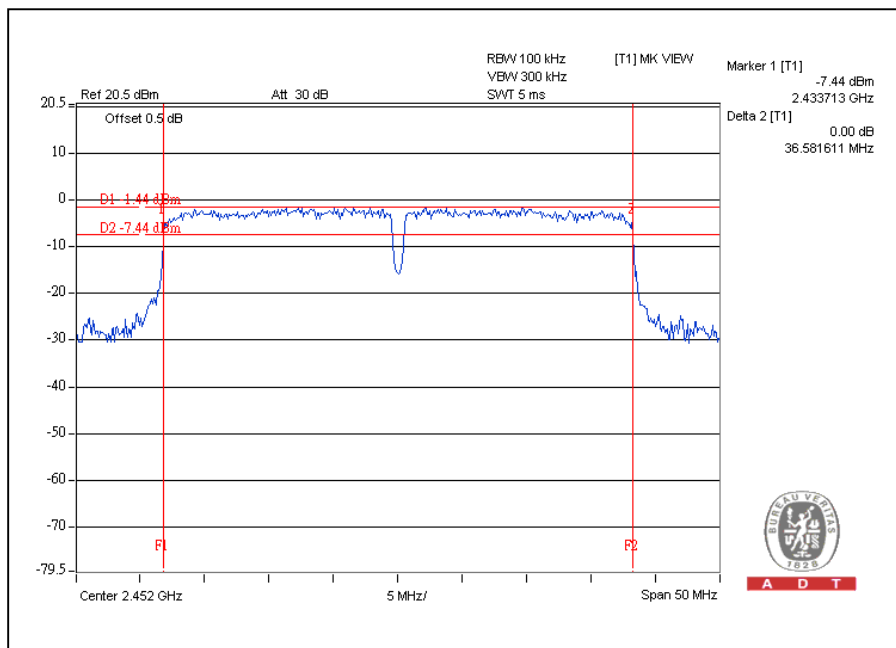
CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2412	17.78	0.5	PASS
6	2437	17.77	0.5	PASS
11	2462	17.78	0.5	PASS

CH1



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

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2422	36.54	0.5	PASS
4	2437	36.57	0.5	PASS
7	2452	36.58	0.5	PASS

**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.

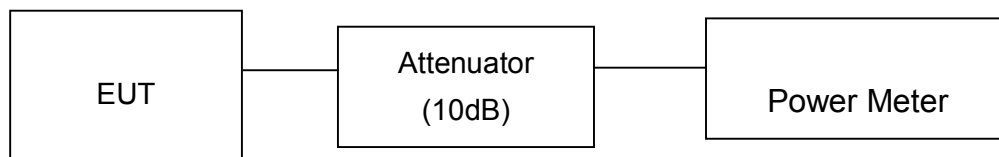
##### 4.4.3 TEST PROCEDURES

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



#### 4.4.7 TEST RESULTS

##### 802.11b DSSS MODULATION:

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (dBm)	PEAK POWER OUTPUT (mW)	PEAK POWER LIMIT (dBm)	PASS / FAIL
1	2412	15.3	33.9	30	PASS
6	2437	17.4	55.0	30	PASS
11	2462	17.9	61.7	30	PASS

##### 802.11g OFDM MODULATION:

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (dBm)	PEAK POWER OUTPUT (mW)	PEAK POWER LIMIT (dBm)	PASS / FAIL
1	2412	22.9	195.0	30	PASS
6	2437	22.9	195.0	30	PASS
11	2462	22.8	190.5	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	22.3	21.2	301.7	24.8	30	PASS
6	2437	22.3	20.4	279.5	24.5	30	PASS
11	2462	22.4	19.4	260.9	24.2	30	PASS





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### 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)				
1	2422	22.0	21.0	284.4	24.5	30	PASS
4	2437	22.1	20.5	274.4	24.4	30	PASS
7	2452	22.2	19.8	261.5	24.2	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.

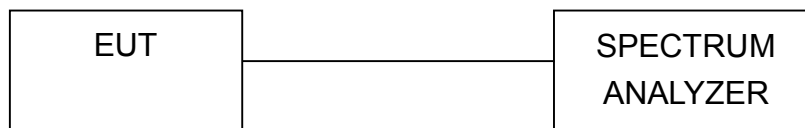
#### 4.5.3 TEST PROCEDURE

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



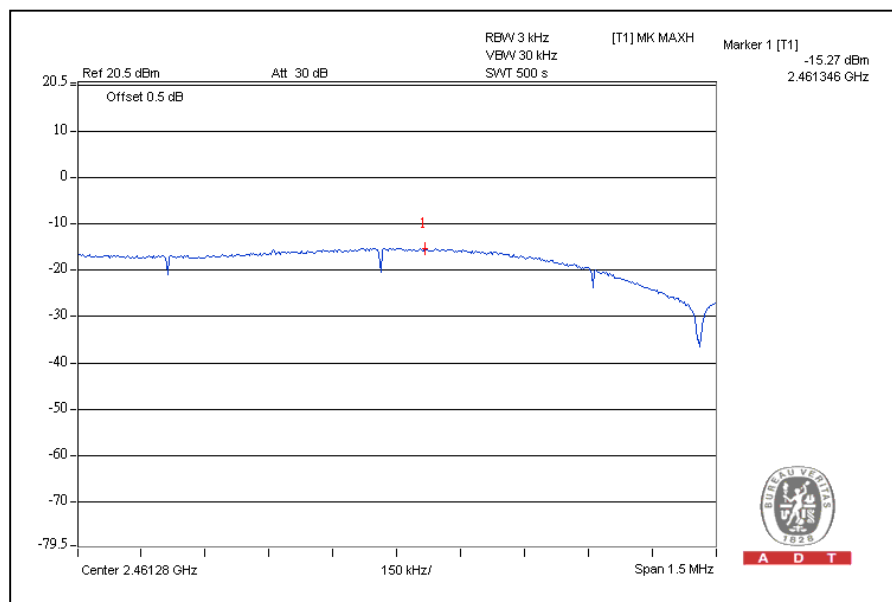
A D T

### 4.5.7 TEST RESULTS

#### 802.11b DSSS MODULATION:

CHANNEL	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3kHz BW (dBm)	MAXIMUM LIMIT (dBm)	PASS / FAIL
1	2412	-18.9	8	PASS
6	2437	-17.8	8	PASS
11	2462	-15.3	8	PASS

#### CH11



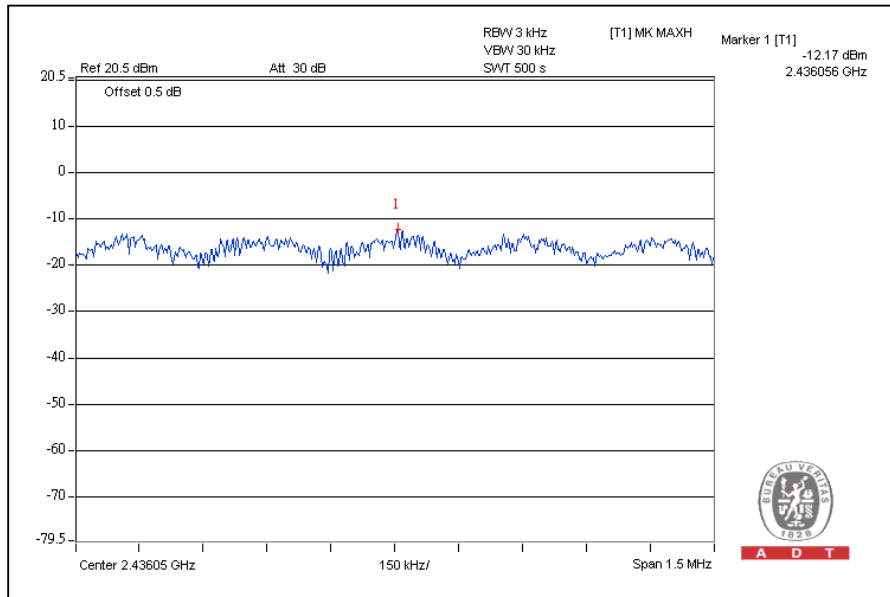


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### 802.11g OFDM MODULATION:

CHANNEL	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3kHz BW (dBm)	MAXIMUM LIMIT (dBm)	PASS / FAIL
1	2412	-12.3	8	PASS
6	2437	-12.2	8	PASS
11	2462	-12.3	8	PASS

CH6



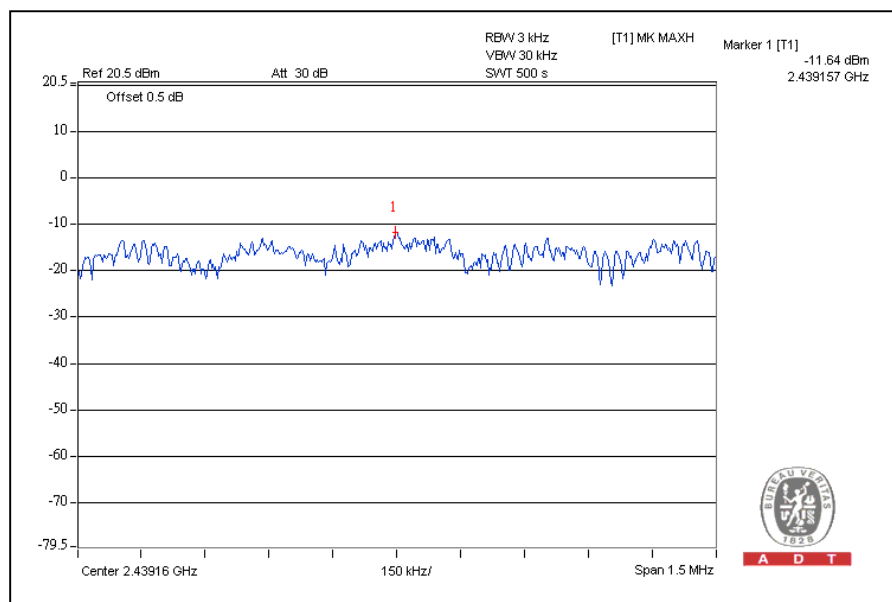


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### 802.11n (20MHz) OFDM MODULATION:

CHANNEL	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3kHz BW (dBm)		TOTAL POWER DENSITY (mW)	TOTAL POWER DENSITY (dBm)	MAXIMUM LIMIT (dBm)	PASS / FAIL
		CHAIN(0)	CHAIN(1)				
1	2412	-12.0	-12.1	0.1	-10.0	8	PASS
6	2437	-12.5	-11.6	0.1	-10.0	8	PASS
11	2462	-11.7	-12.8	0.1	-10.0	8	PASS

### CH6



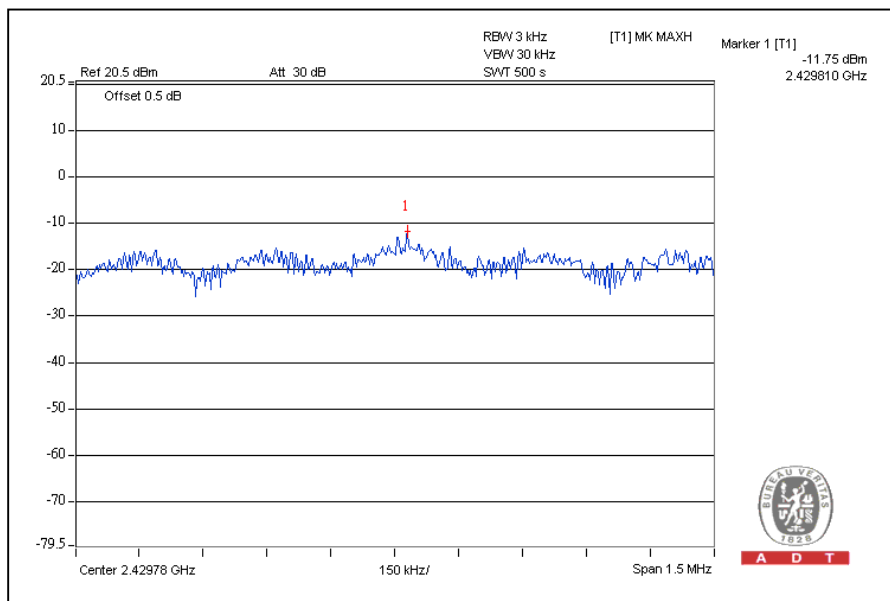


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### 802.11n (40MHz) OFDM MODULATION:

CHANNEL	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3kHz BW (dBm)		TOTAL POWER DENSITY (mW)	TOTAL POWER DENSITY (dBm)	MAXIMUM LIMIT (dBm)	PASS / FAIL
		CHAIN(0)	CHAIN(1)				
1	2422	-11.8	-13.3	0.1	-10.0	8	PASS
4	2437	-12.9	-13.6	0.1	-10.0	8	PASS
7	2452	-12.1	-15.5	0.1	-10.0	8	PASS

CH1



## 4.6 CONDUCTED OUT-BAND EMISSION MEASUREMENT

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

Below -20dB 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 lose cable. Set RBW of spectrum analyzer to 100kHz and VBW of spectrum analyzer to 300kHz with suitable frequency span including 100 MHz bandwidth from band edge. The band edges was 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

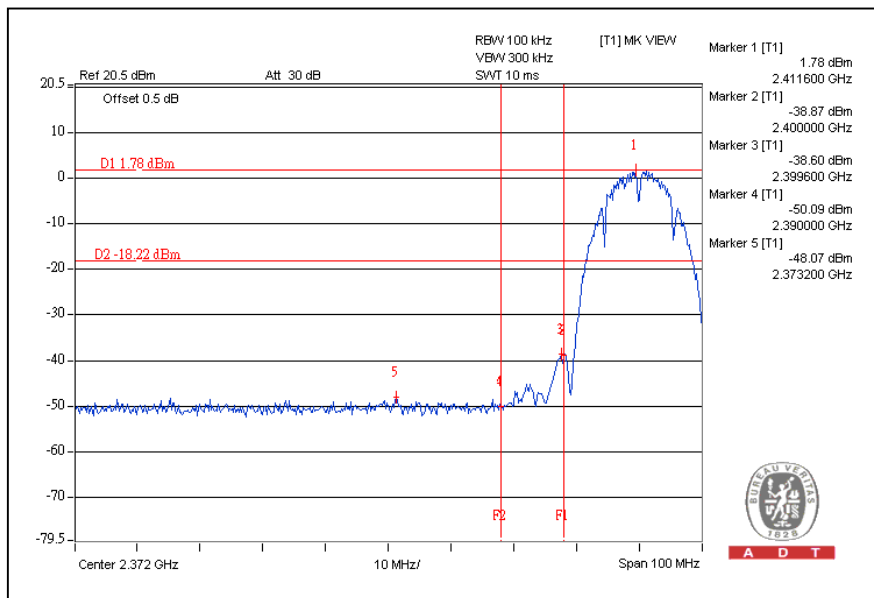
Same as Item 4.3.6

#### 4.6.6 TEST RESULTS

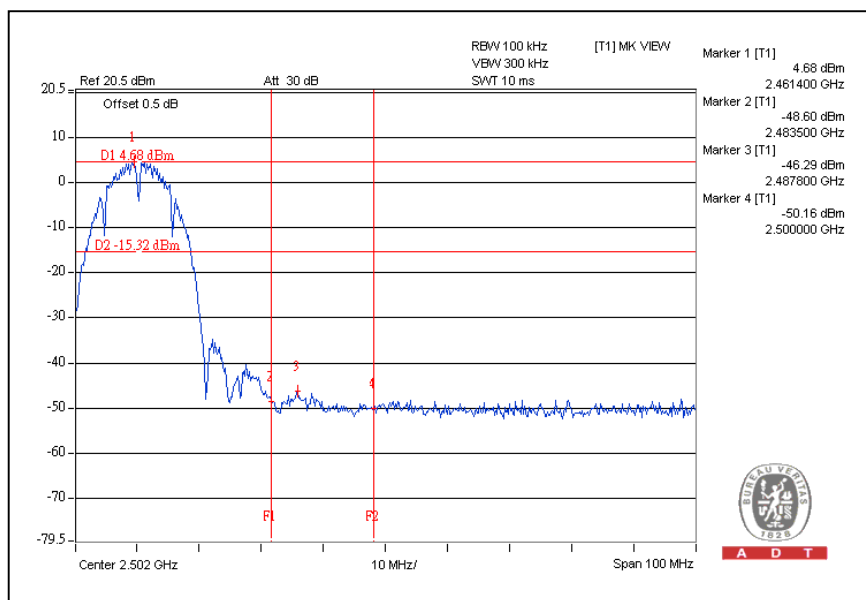
The spectrum plots are attached on the following images. D1 line indicates the highest level, and D2 line indicates the 20dB offset below D1. It shows compliance with the requirement in part 15.247(d).

## 802.11b DSSS MODULATION:

### CH1



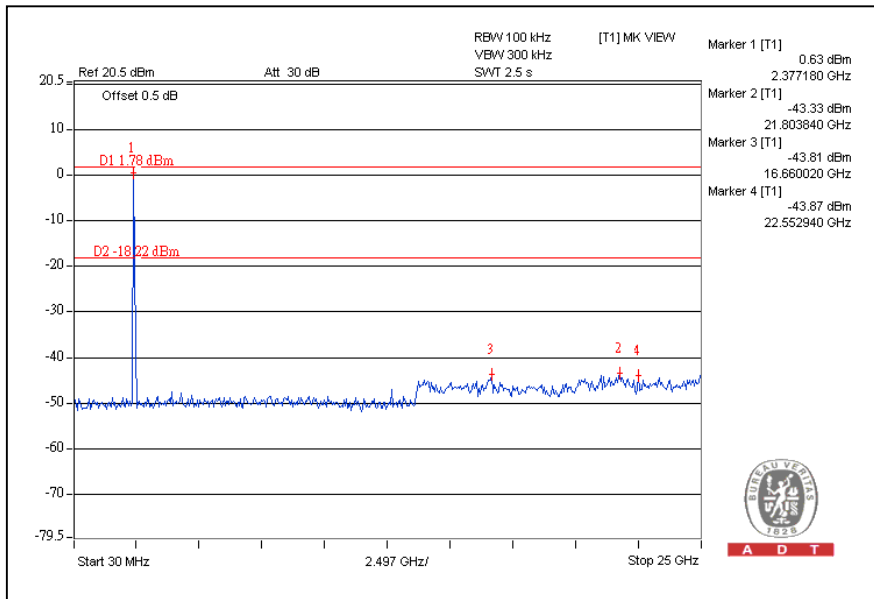
### CH11



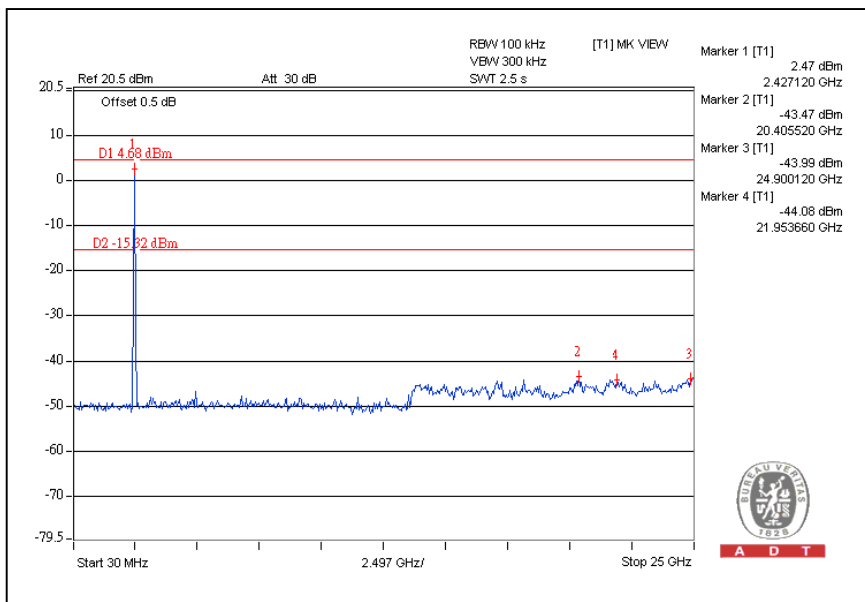


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### CH1



### CH11

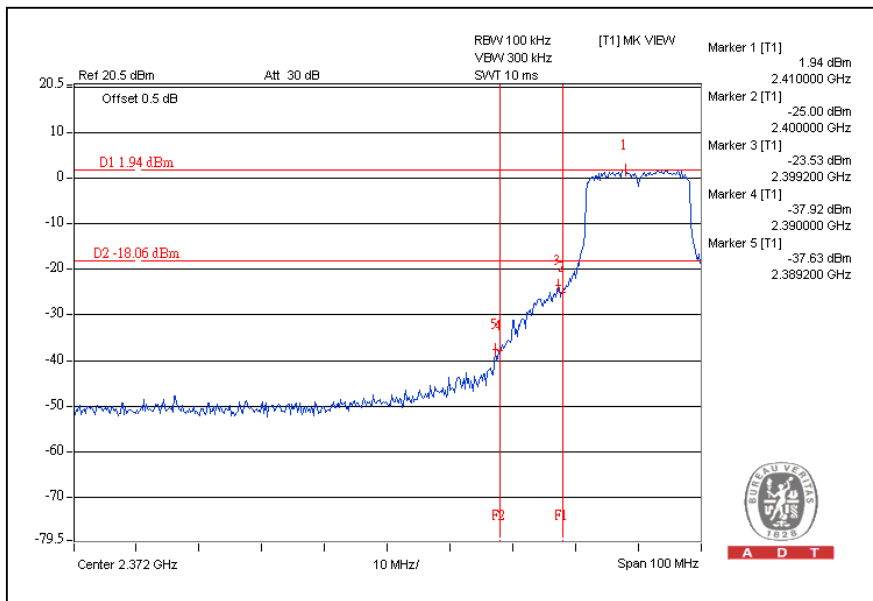




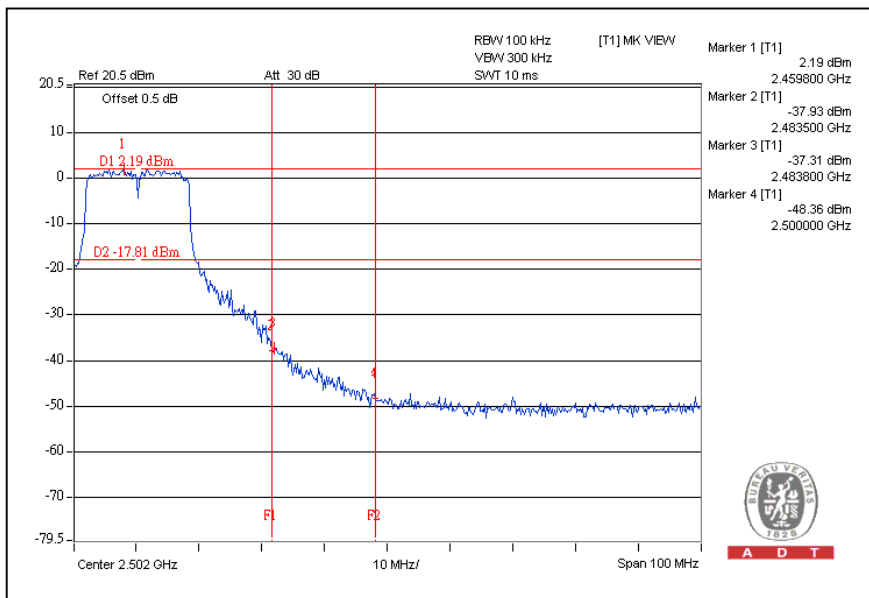
A D T

## 802.11g OFDM MODULATION:

CH1



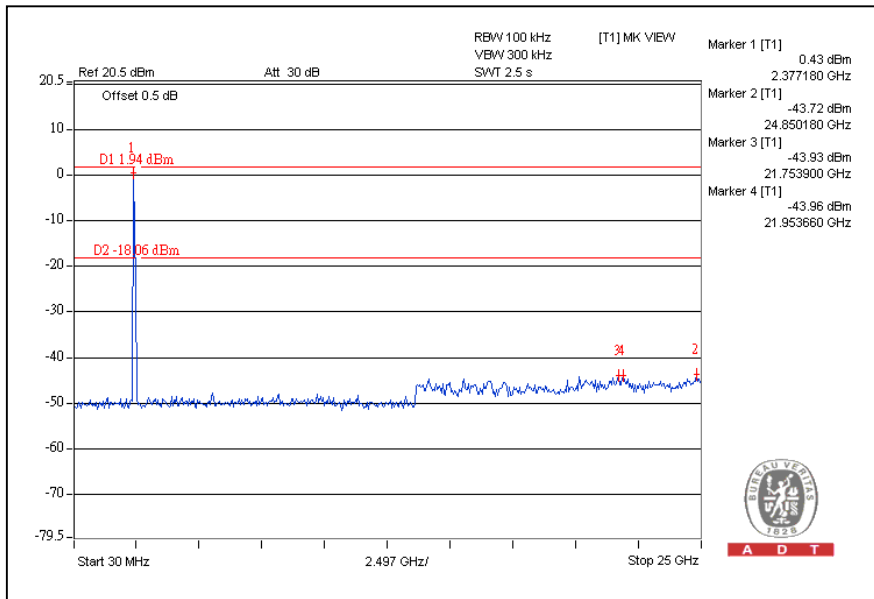
CH11



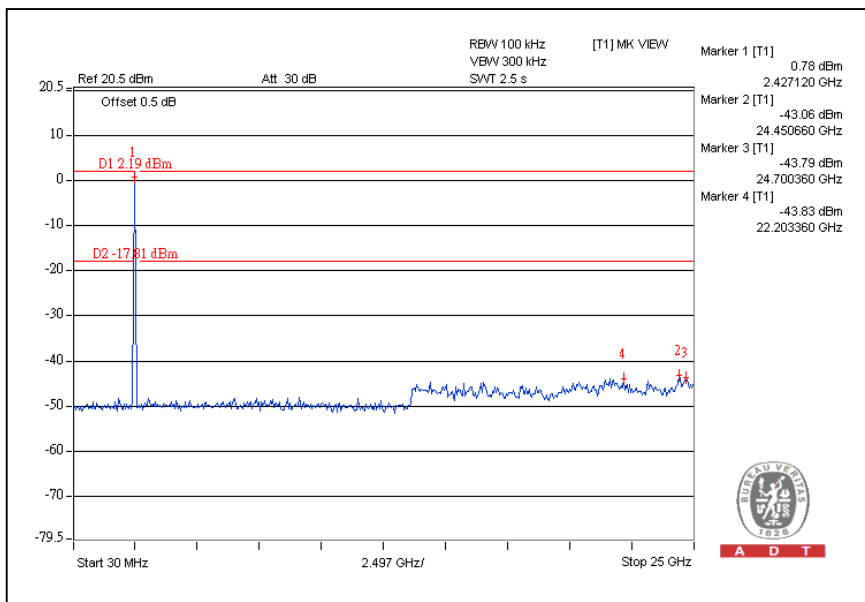


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### CH1

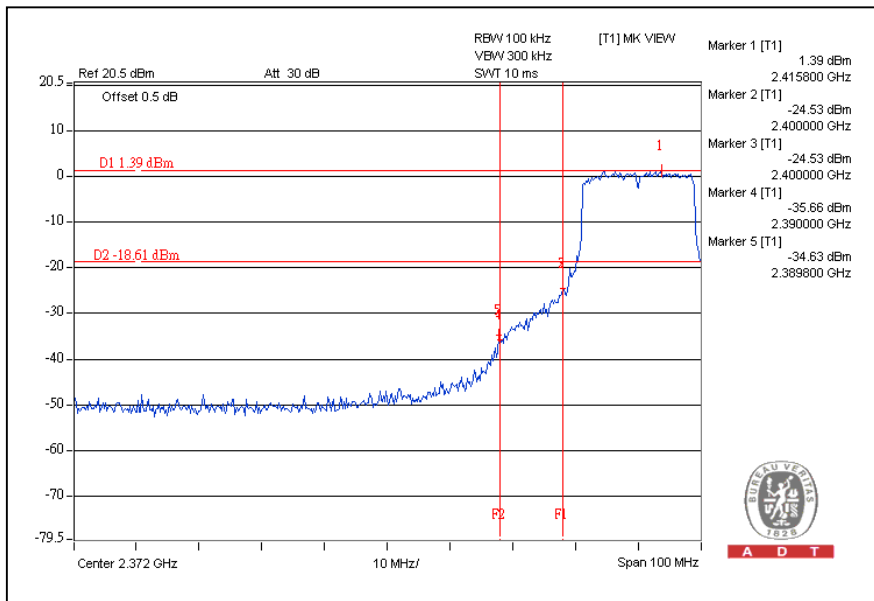


### CH11

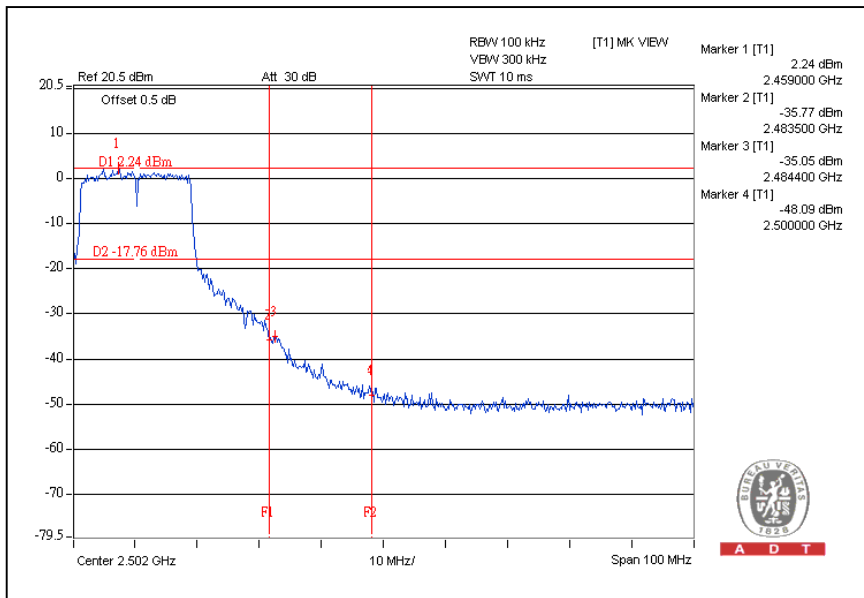


## 802.11n (20MHz) OFDM MODULATION:

### CH1



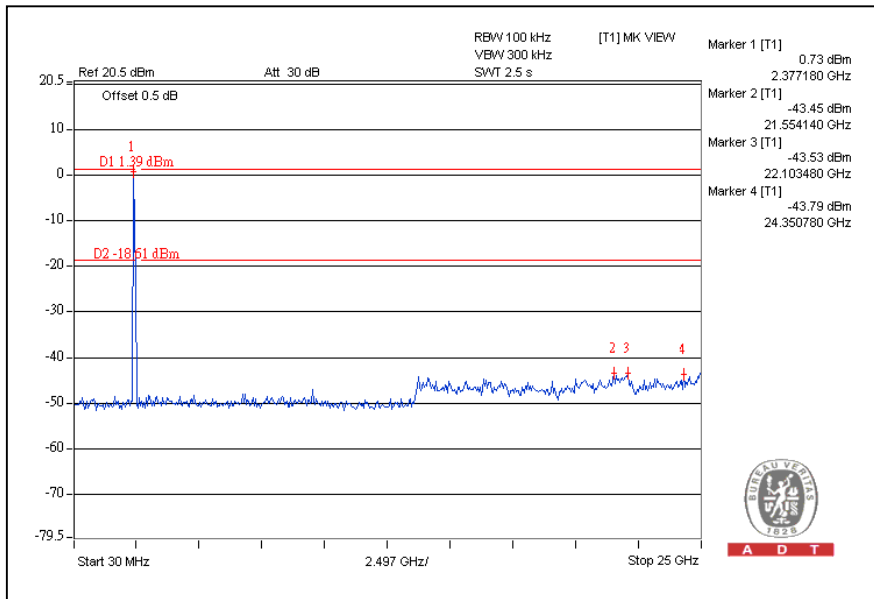
### CH11



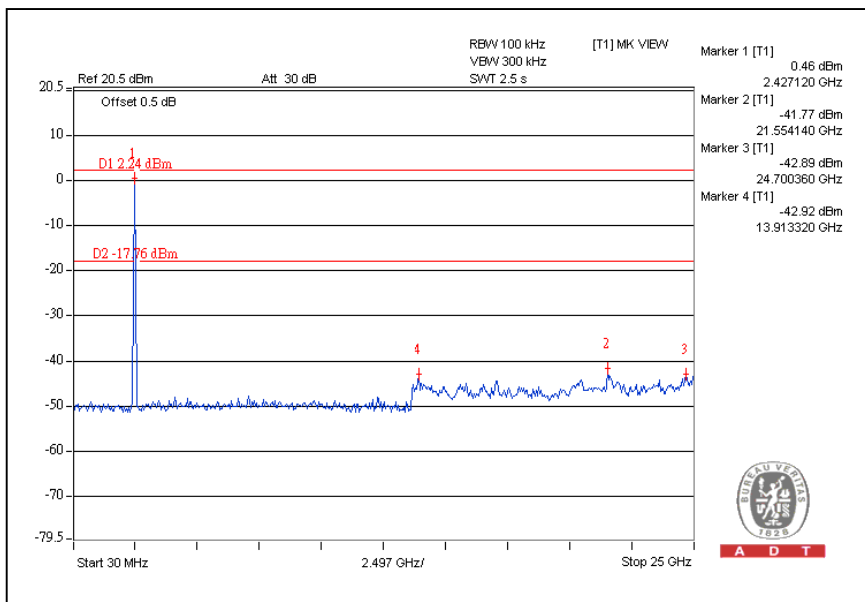


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### CH1

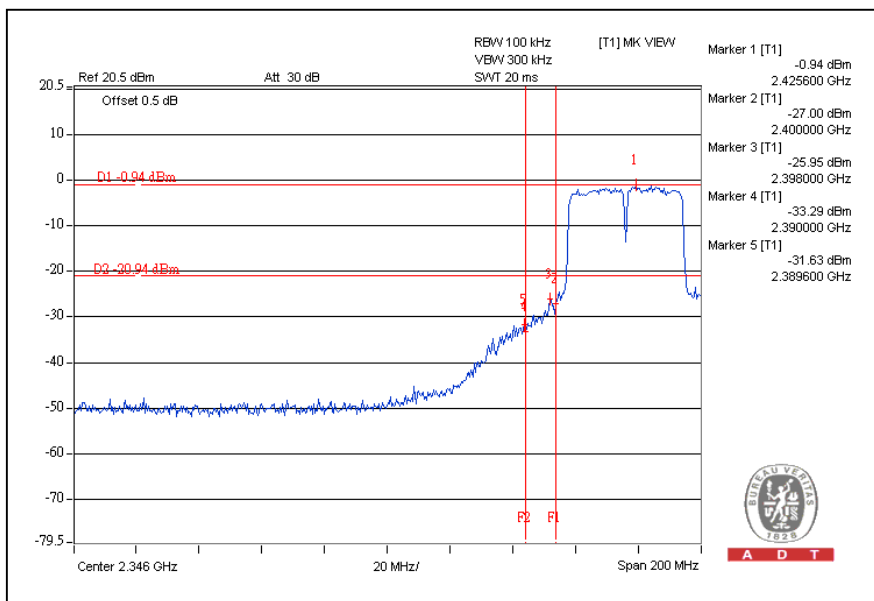


### CH11

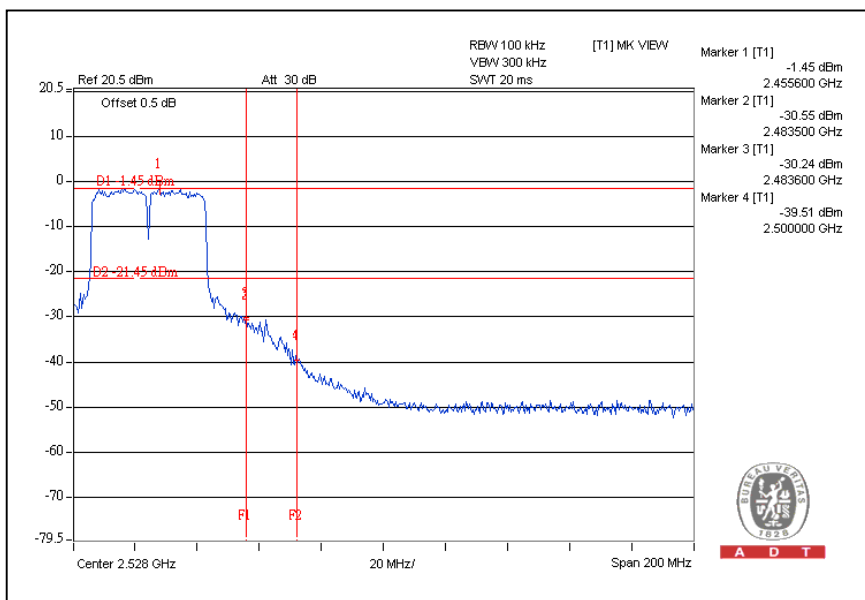


## 802.11n (40MHz) OFDM MODULATION:

### CH1

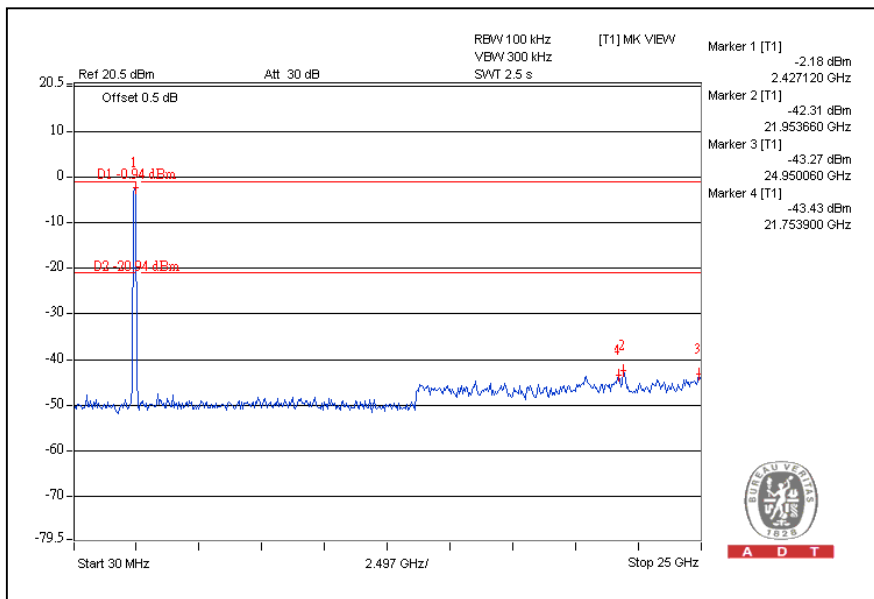


### CH7

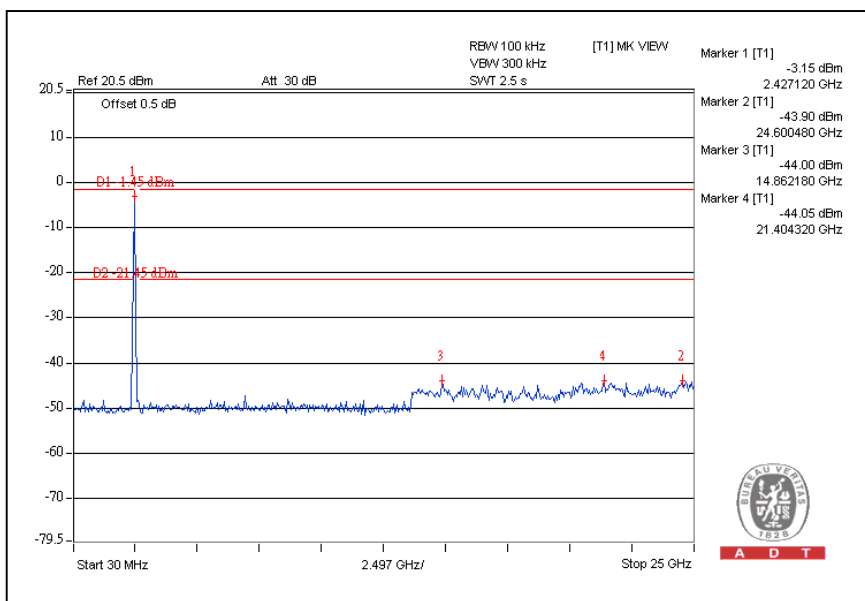




### CH1



### CH7



## 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



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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---