

FCC TEST REPORT

REPORT NO.: RF990226H01

MODEL NO.: WMP-N09H

RECEIVED: Feb. 26, 2010

TESTED: Mar. 04 to 17, 2010

ISSUED: Apr. 29, 2010

APPLICANT: Alpha Networks Inc.

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

PRODUCT: 802.11 b/g/n wireless card
BRAND NAME: Alpha
MODEL NO.: WMP-N09H
TEST SAMPLE: MASS-PRODUCTION
TESTED: Mar. 04 to 17, 2010
APPLICANT: Alpha Networks Inc.
STANDARDS: FCC Part 15, Subpart C (Section 15.247),
ANSI C63.4-2003

The above equipment (Model: WMP-N09H) 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:** Apr. 29, 2010
(Midoli Peng, Specialist)

**TECHNICAL
ACCEPTANCE** : Hank Chung , **DATE:** Apr. 29, 2010
(Hank Chung, Deputy Manager)

APPROVED BY : May Chen , **DATE:** Apr. 29, 2010
(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

APPLIED STANDARD: FCC Part 15, Subpart C (Section 15.247)			
Standard Section	Test Type and Limit	Result	Remark
15.207	AC Power Conducted Emission	PASS	Meet the requirement of limit. Minimum passing margin is -7.42dB at 0.291MHz
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 -0.5dB at 2483.55MHz
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 U.FL 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)	3.94 dB
Radiated emissions (1GHz -18GHz)	2.49 dB
Radiated emissions (18GHz -40GHz)	2.70 dB

3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

PRODUCT	802.11 b/g/n wireless card
MODEL NO.	WMP-N09H
FCC ID	RRKWMPN09H
POWER SUPPLY	DC 3.3V±10% from host equipment
MODULATION TYPE	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM
MODULATION TECHNOLOGY	DSSS, OFDM
TRANSFER RATE	802.11b: 11/5.5/2/1Mbps 802.11g: 54/48/36/24/18/12/9/6Mbps HT20 MCS0~7 (800ns GI): 6.5Mbps, 13Mbps, 19.5Mbps, 26Mbps, 39Mbps, 52Mbps, 58.5Mbps, 65Mbps HT20 MCS8~15 (800ns GI): 13Mbps, 26Mbps, 39Mbps, 52Mbps, 78Mbps, 104Mbps, 117Mbps, 130Mbps HT40 MCS0~7 (800ns GI): 13.5Mbps, 27Mbps, 40.5Mbps, 54Mbps, 81Mbps, 108Mbps, 121.5Mbps, 135Mbps HT40 MCS8~15 (800ns GI): 27Mbps, 54Mbps, 81Mbps, 108Mbps, 162Mbps, 216Mbps, 243Mbps, 270Mbps HT20 MCS0~7 (400ns GI): 7.2Mbps, 14.4Mbps, 21.7Mbps, 28.9Mbps, 43.3Mbps, 57.8Mbps, 65.0Mbps, 72.2Mbps HT20 MCS8~15 (400ns GI): 14.444Mbps, 28.889Mbps, 43.333Mbps, 57.778Mbps, 86.667Mbps, 115.556Mbps, 130.000Mbps, 144.444Mbps HT40 MCS0~7 (400ns GI): 15.0Mbps, 30.0Mbps, 45.0Mbps, 60.0Mbps, 90.0Mbps, 120.0Mbps, 135.0Mbps, 150.0Mbps HT40 MCS8~15 (400ns GI): 30.0Mbps, 60.0Mbps, 90.0Mbps, 120.0Mbps, 180.0Mbps, 240.0Mbps, 270.0Mbps, 300.0Mbps
OPRTAING FREQUENCY	2412 ~ 2462MHz
NUMBER OF CHANNEL	11 for 802.11b, 802.11g, 802.11n (20MHz) 7 for 802.11n (40MHz)
MAXIMUM OUTPUT POWER	802.11b: 557.3mW 802.11g: 677.9mW 802.11n (20MHz): 577.4mW 802.11n (40MHz): 328.7mW
ANTENNA TYPE	Please see note 1
ANTENNA CONNECTOR	Please see note 1
DATA CABLE	NA

I/O PORTS	NA
ASSOCIATED DEVICES	NA

NOTE:

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

Antenna A					
Chain	Manufacture	Model name	Gain (dBi)	Type	Connector
Chain (0)	WHA YU GROUP.	C1318-510004-A	1.5dBi (Included cable loss)	PCB	U.FL
Chain (1)	WHA YU GROUP.	C1318-510004-A	1.5dBi (Included cable loss)	PCB	U.FL
Antenna B					
Chain	Manufacture	Model name	Gain (dBi)	Type	Connector
Chain (0)	WHA YU GROUP.	C1318-510005-A	0.1dBi (Included cable loss)	PCB	U.FL
Chain (1)	WHA YU GROUP.	C1318-510005-A	0.1dBi (Included cable loss)	PCB	U.FL
Antenna C					
Chain	Manufacture	Model name	Gain (dBi)	Type	Connector
Chain (0)	WHA YU GROUP.	C1318-510006-A	-0.6dBi (Included cable loss)	PCB	U.FL
Chain (1)	WHA YU GROUP.	C1318-510006-A	-0.6dBi (Included cable loss)	PCB	U.FL
Antenna D					
Chain	Manufacture	Model name	Gain (dBi)	Type	Connector
Chain (0)	WHA YU GROUP.	C1318-510007-A	-0.2dBi (Included cable loss)	PCB	U.FL
Chain (1)	WHA YU GROUP.	C1318-510007-A	-0.2dBi (Included cable loss)	PCB	U.FL
Antenna E					
Chain	Manufacture	Model name	Gain (dBi)	Type	Connector
Chain (0)	WHA YU GROUP.	C1318-510009-A	0.1dBi (Included cable loss)	PCB	U.FL
Chain (1)	WHA YU GROUP.	C1318-510009-A	0.1dBi (Included cable loss)	PCB	U.FL
Antenna F					
Chain	Manufacture	Model name	Gain (dBi)	Type	Connector
Chain (0)	WHA YU GROUP.	C1318-5100011-A	0.5dBi (Included cable loss)	PCB	U.FL
Chain (1)	WHA YU GROUP.	C1318-5100011-A	0.5dBi (Included cable loss)	PCB	U.FL

From the above antenna, the worst case was found in **Antenna A**. Therefore only the test data of the modes were recorded in this report.

2. The EUT incorporates a MIMO function with 802.11n. Physically, the EUT provides two completed transmitters and two completed receivers.
3. 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 PCB Printed antennas. Spatial multiplexing modes for simultaneous transmission using 2 antennas, and for simultaneous receiver using 2 antennas.
4. The EUT complies with 802.11n standards and backwards compatible with 802.11b, 802.11g products.
5. 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		

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	802.11n(20MHz) for MCS0~7	√	√
D	802.11n(20MHz) for MCS8~15	√	√
E	802.11n(40MHz) for MCS0~7	√	√
F	802.11n(40MHz) for MCS8~15	√	√

Note:

- The above information was declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or user's manual.
- Mode A, B, C and E 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
802.11g	1 to 11	6	OFDM	BPSK	6	B

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
802.11g	1 to 11	6	OFDM	BPSK	6	B

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
802.11n (20MHz)	1 to 11	1, 6, 11	OFDM	BPSK	6.5	C
802.11n (40MHz)	1 to 7	1, 4, 7	OFDM	BPSK	13.5	E

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
802.11n (20MHz)	1 to 11	1, 11	OFDM	BPSK	6.5	C
802.11n (40MHz)	1 to 7	1, 7	OFDM	BPSK	13.5	E

✂ 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
802.11n (20MHz)	1 to 11	1, 6, 11	OFDM	BPSK	6.5	C
802.11n (40MHz)	1 to 7	1, 4, 7	OFDM	BPSK	13.5	E

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

TEST CONDITION:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER (SYSTEM)	TESTED BY
RE $\geq$ 1G	24deg. C, 67%RH, 1023 hPa	120Vac, 60Hz	Nick Tsai
RE<1G	23deg. C, 64%RH, 1023 hPa	120Vac, 60Hz	Phoenix Huang
PLC	24deg. C, 63%RH, 1023 hPa	120Vac, 60Hz	Leo Peng
APCM	23deg. C, 54%RH, 1023 hPa	120Vac, 60Hz	Kent Liu

3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is an 802.11 b/g/n wireless card. 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.

3.4 DESCRIPTION OF SUPPORT UNITS

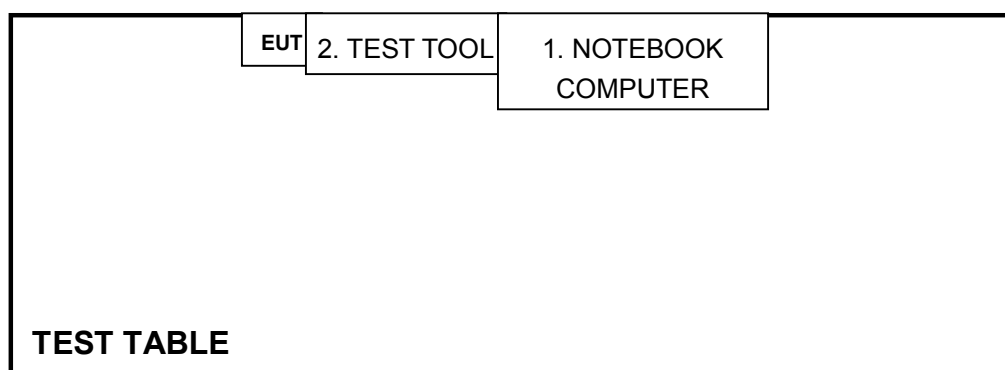
The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	NOTEBOOK COMPUTER	DELL	PP32LA	DSL32S	FCC DoC
2	TEST TOOL	Alpha	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 μ 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

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)	NSLK 8127	8127-523	Sep. 23, 2009	Sep. 22, 2010
Line-Impedance Stabilization Network (for Peripheral)	KNW-407	8-1395-12	May 04, 2009	May 03, 2010
RF Cable (JYEBAO)	5DFB	COACAB-001	Dec. 14, 2009	Dec. 13, 2010
50 ohms Terminator	50	3	Oct. 28, 2009	Oct. 27, 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.

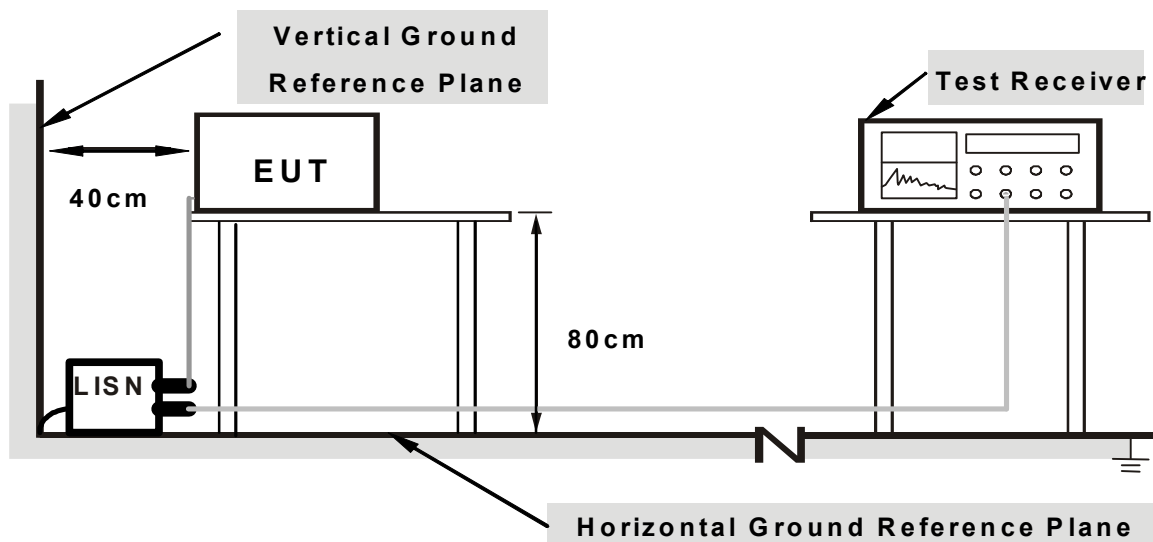
4.1.3 TEST PROCEDURES

- 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 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) were not recorded.

4.1.4 DEVIATION FROM TEST STANDARD

No deviation

4.1.5 TEST SETUP



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

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

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

4.1.6 EUT OPERATING CONDITIONS

1. Connect the EUT with the support unit 1 (Notebook Computer) which placed on a testing table.
2. The communication partner run test program “ART V07 b27 ar928Xall.exe” to enable EUT under transmission/receiving condition continuously at specific channel frequency.

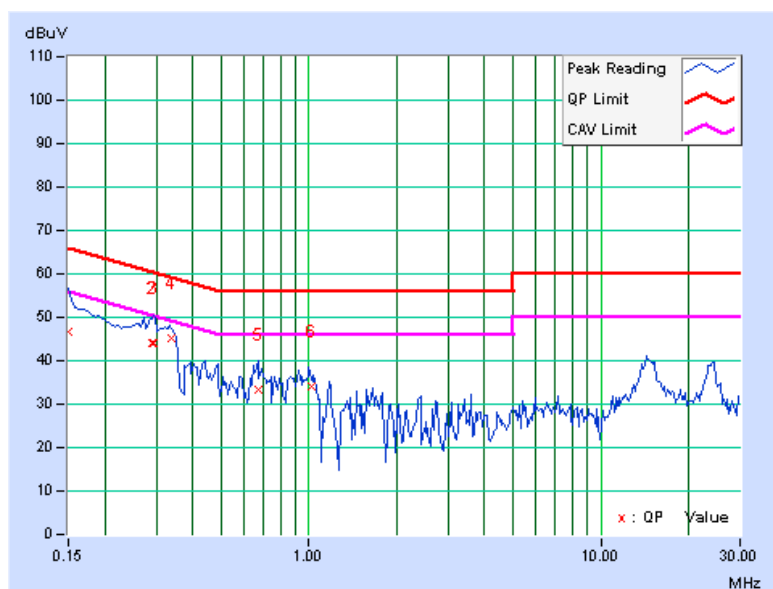
4.1.7 TEST RESULTS

802.11g OFDM MODULATION:

PHASE	Line (L)	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	0.150	0.04	46.60	45.30	46.64	45.34	66.00	56.00	-19.36	-10.66
2	0.292	0.05	44.20	36.68	44.25	36.73	60.46	50.46	-16.21	-13.73
3	0.294	0.05	43.90	38.14	43.95	38.19	60.42	50.42	-16.47	-12.23
4	0.336	0.05	44.96	38.01	45.01	38.06	59.30	49.30	-14.28	-11.23
5	0.670	0.07	33.16	24.62	33.23	24.69	56.00	46.00	-22.77	-21.31
6	1.028	0.09	34.09	28.57	34.18	28.66	56.00	46.00	-21.82	-17.34

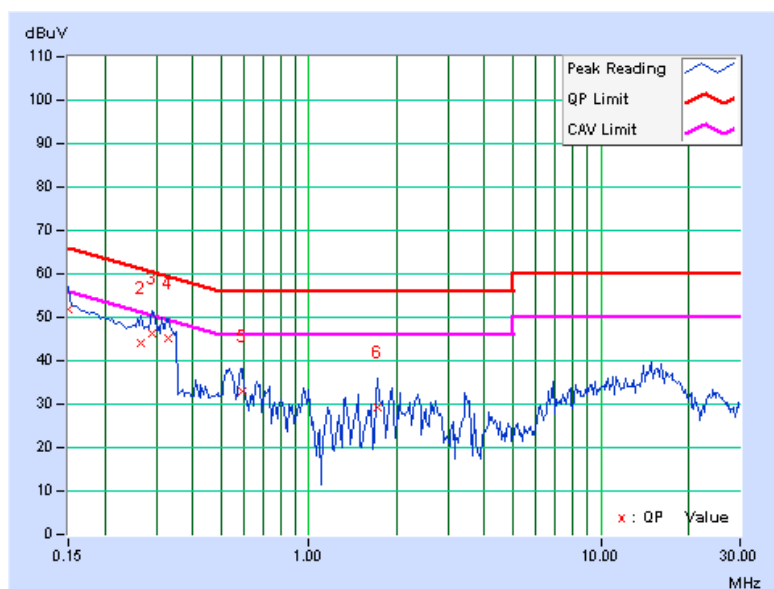
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value = 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
-------	-------------	---------------	-------

No	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
	[MHz]	Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.150	0.05	51.82	47.72	51.87	47.77	66.00	56.00	-14.13	-8.23
2	0.267	0.06	44.12	27.07	44.18	27.13	61.20	51.20	-17.03	-24.08
3	0.291	0.06	46.13	43.03	46.19	43.09	60.51	50.51	-14.32	-7.42
4	0.330	0.06	45.04	37.03	45.10	37.09	59.46	49.46	-14.36	-12.37
5	0.594	0.08	32.87	19.81	32.95	19.89	56.00	46.00	-23.05	-26.11
6	1.730	0.12	28.96	19.01	29.08	19.13	56.00	46.00	-26.92	-26.87

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



4.2 RADIATED EMISSION MEASUREMENT

4.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT

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

Frequencies (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

NOTE:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. As shown in 15.35(b), for frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.

**A D T**

4.2.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
ROHDE & SCHWARZ Spectrum Analyzer	FSP40	100036	Dec. 18, 2009	Dec. 17, 2010
Agilent PSA Spectrum Analyzer	E4446A	MY46180622	Apr. 24 , 2009	Apr. 23 , 2010
HP Pre_Amplifier	8449B	300801923	Nov. 02, 2009	Nov. 01, 2010
ROHDE & SCHWARZ Test Receiver	ESCS30	847124/029	Aug. 28, 2009	Aug. 27, 2010
SCHWARZBECK TRILOG Broadband Antenna	VULB 9168	138	April 29, 2009	April 28, 2010
Schwarzbeck Horn_Antenna	BBHA9120	D124	Dec. 18, 2009	Dec. 17, 2010
Schwarzbeck Horn_Antenna	BBHA 9170	BBHA9170153	Jan. 22, 2010	Jan. 21, 2011
RF Switches	EMH-011	1001	NA	NA
RF CABLE (Chaintek)	Sucoflex 106	28077	Aug. 14, 2009	Aug. 13, 2010
RF Cable	8DFB	STCCAB-30M-1GHz	NA	NA
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.

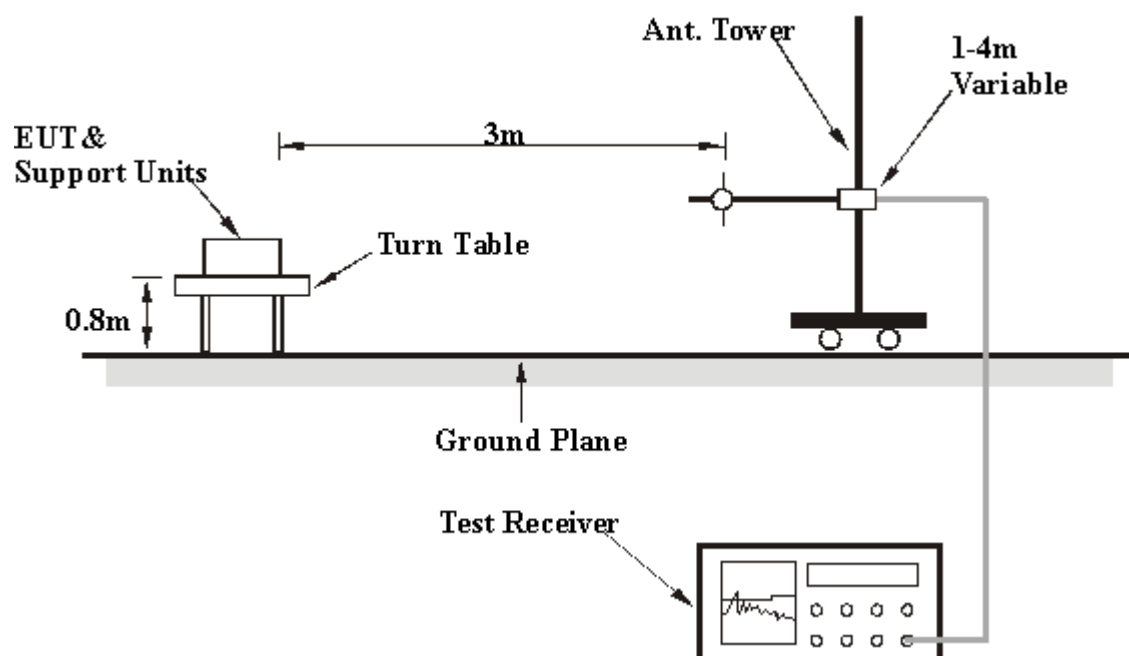
NOTE:

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 : 802.11g OFDM MODULATION

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	Below 1000MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	23deg. C, 64%RH 1023 hPa	TESTED BY	Phoenix 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	133.22	33.7 QP	43.5	-9.8	1.00 H	0	20.32	13.36
2	165.95	38.8 QP	43.5	-4.7	1.78 H	18	24.10	14.68
3	233.17	39.3 QP	46.0	-6.7	1.00 H	358	26.20	13.08
4	433.12	38.7 QP	46.0	-7.3	1.97 H	188	19.28	19.43
5	500.00	29.9 QP	46.0	-16.1	1.88 H	48	8.62	21.31
6	665.98	33.5 QP	46.0	-12.5	1.24 H	216	9.00	24.54
7	733.09	36.5 QP	46.0	-9.5	1.00 H	222	11.07	25.43
8	832.67	31.7 QP	46.0	-14.3	1.00 H	106	4.59	27.11
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	69.14	36.4 QP	40.0	-3.6	1.00 V	240	23.50	12.90
2	166.55	33.7 QP	43.5	-9.8	2.14 V	356	19.00	14.66
3	233.17	32.1 QP	46.0	-13.9	1.59 V	61	19.05	13.08
4	365.98	40.0 QP	46.0	-6.0	1.00 V	19	22.29	17.67
5	433.13	34.6 QP	46.0	-11.5	1.62 V	94	15.12	19.43
6	763.00	32.6 QP	46.0	-13.4	1.53 V	126	6.68	25.95
7	878.87	37.0 QP	46.0	-9.0	1.23 V	19	9.17	27.84
8	976.01	43.5 QP	54.0	-10.5	1.00 V	295	14.71	28.82

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, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24deg. C, 67%RH 1023 hPa	TESTED BY	Nick Tsai

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	2386.00	56.8 PK	74.0	-17.2	1.33 H	152	26.73	30.05
2	2386.00	48.4 AV	54.0	-5.6	1.33 H	152	18.31	30.05
3	*2412.00	107.7 PK			1.31 H	153	77.52	30.15
4	*2412.00	105.0 AV			1.31 H	153	74.85	30.15
5	4824.00	42.3 PK	74.0	-31.7	1.56 H	265	6.91	35.43
6	4824.00	31.1 AV	54.0	-22.9	1.56 H	265	-4.30	35.43
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	2386.13	60.4 PK	74.0	-13.6	1.40 V	177	30.34	30.05
2	2386.13	53.2 AV	54.0	-0.8	1.40 V	177	23.16	30.05
3	*2412.00	113.1 PK			1.36 V	178	82.95	30.15
4	*2412.00	110.4 AV			1.36 V	178	80.25	30.15
5	4824.00	43.3 PK	74.0	-30.7	1.26 V	303	7.87	35.43
6	4824.00	32.9 AV	54.0	-21.1	1.26 V	303	-2.53	35.43

- 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, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24deg. C, 67%RH 1023 hPa	TESTED BY	Nick Tsai

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	53.7 PK	74.0	-20.3	1.22 H	153	23.65	30.06
2	2390.00	42.3 AV	54.0	-11.7	1.22 H	153	12.24	30.06
3	*2437.00	107.7 PK			1.21 H	153	77.50	30.24
4	*2437.00	105.1 AV			1.21 H	153	74.87	30.24
5	2484.80	55.9 PK	74.0	-18.1	1.21 H	153	25.47	30.43
6	2484.80	42.9 AV	54.0	-11.1	1.21 H	153	12.47	30.43
7	4874.00	42.2 PK	74.0	-31.8	1.57 H	269	6.71	35.52
8	4874.00	31.4 AV	54.0	-22.6	1.57 H	269	-4.12	35.52
9	7311.00	50.7 PK	74.0	-23.3	1.57 H	130	8.77	41.96
10	7311.00	37.4 AV	54.0	-16.6	1.57 H	130	-4.57	41.96
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	2389.24	57.3 PK	74.0	-16.7	1.64 V	91	27.24	30.06
2	2389.24	47.8 AV	54.0	-6.2	1.64 V	91	17.78	30.06
3	*2437.00	114.8 PK			1.36 V	182	84.56	30.24
4	*2437.00	111.8 AV			1.36 V	182	81.58	30.24
5	2484.77	57.2 PK	74.0	-16.8	1.38 V	267	26.77	30.43
6	2484.77	48.4 AV	54.0	-5.6	1.38 V	267	17.97	30.43
7	4874.00	43.2 PK	74.0	-30.8	1.25 V	343	7.68	35.52
8	4874.00	34.8 AV	54.0	-19.2	1.25 V	343	-0.72	35.52
9	7311.00	52.0 PK	74.0	-22.0	1.56 V	185	10.04	41.96
10	7311.00	41.6 AV	54.0	-12.4	1.56 V	185	-0.36	41.96

- 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.



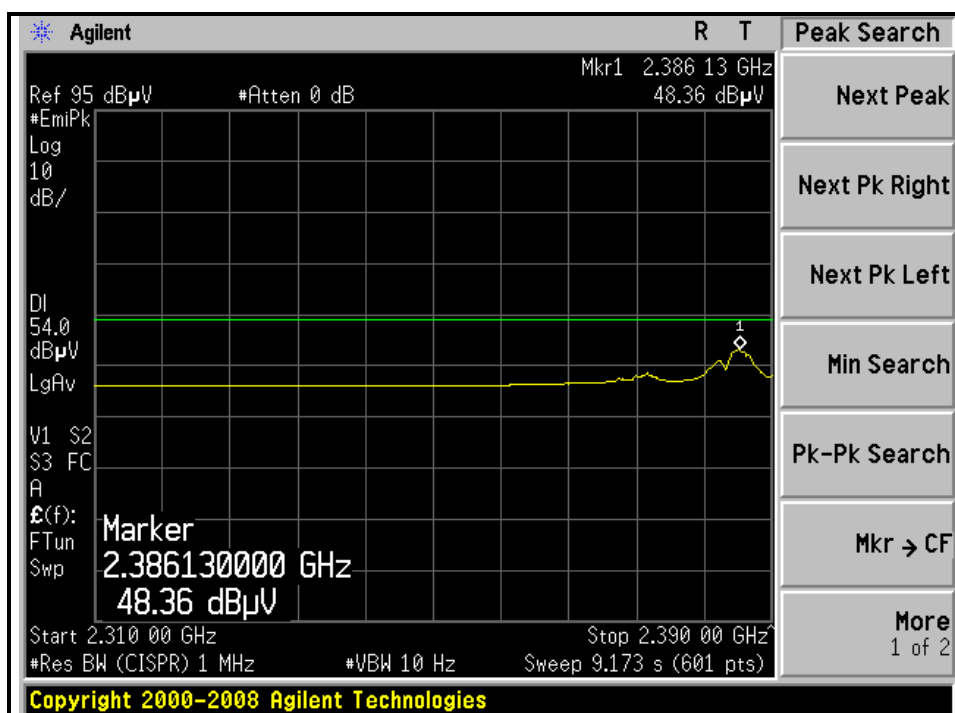
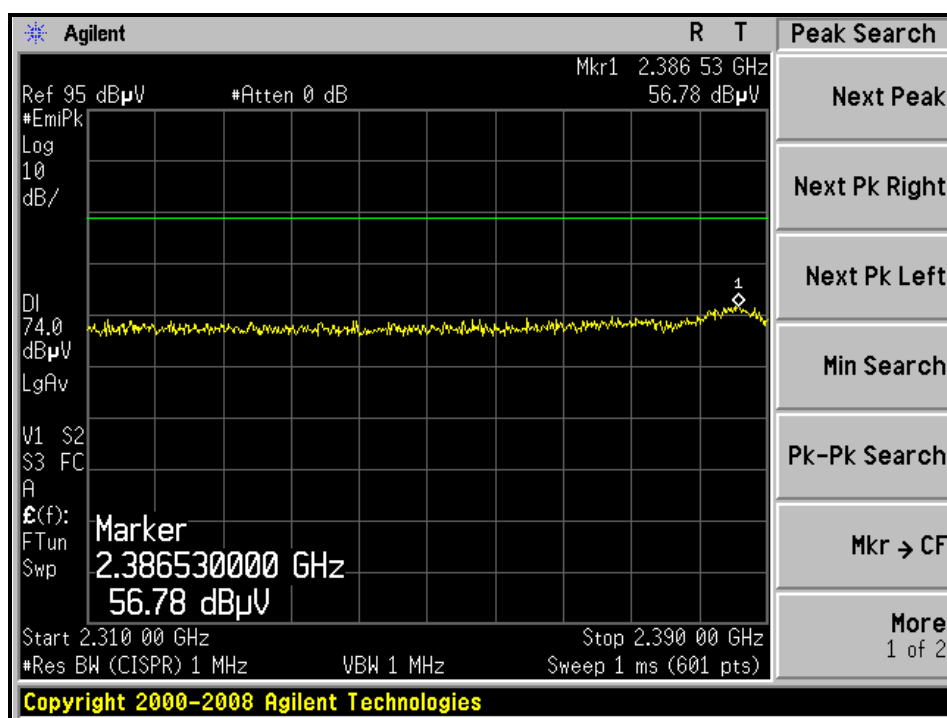
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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24deg. C, 67%RH 1023 hPa	TESTED BY	Nick Tsai

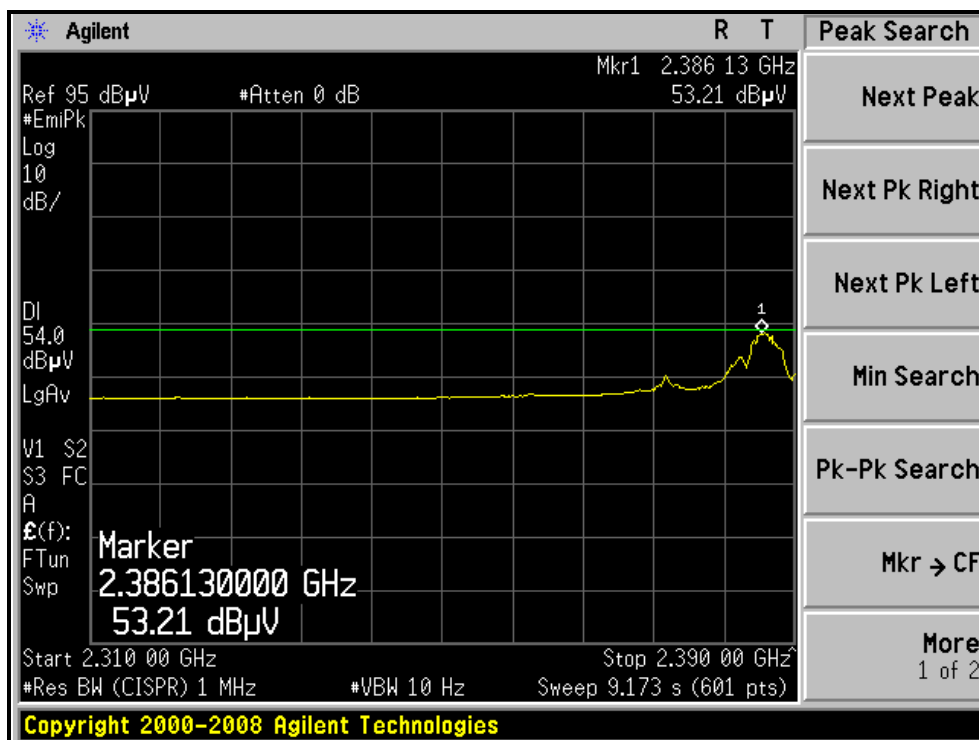
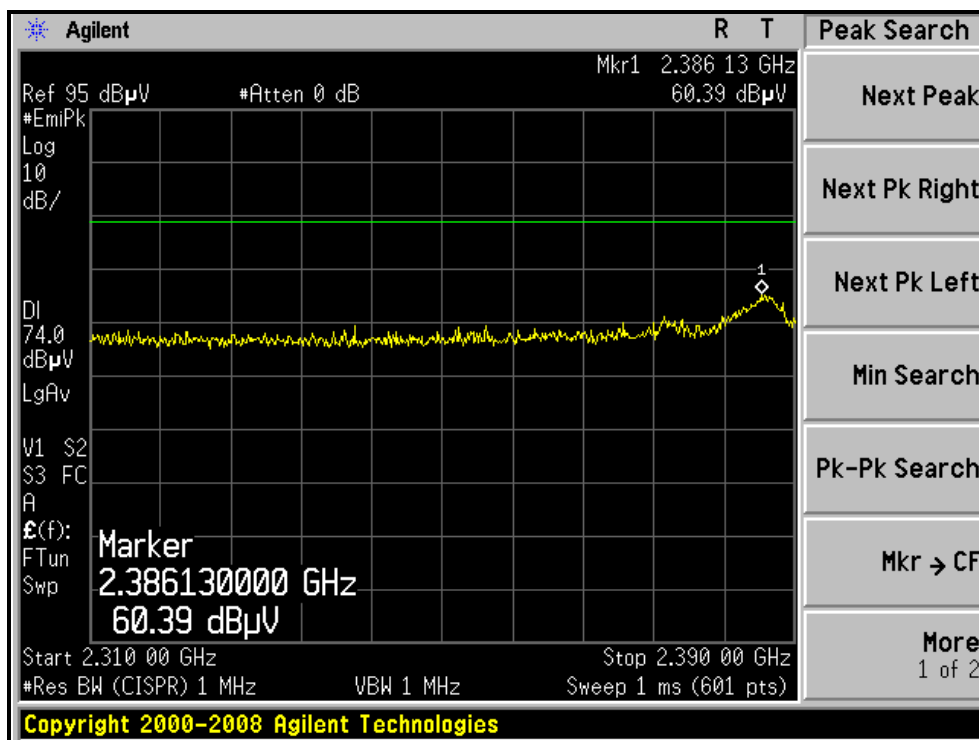
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NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	107.8 PK			1.23 H	152	77.41	30.34
2	*2462.00	104.9 AV			1.23 H	152	74.55	30.34
3	2487.73	57.8 PK	74.0	-16.2	1.23 H	154	27.40	30.44
4	2487.73	49.1 AV	54.0	-4.9	1.23 H	154	18.67	30.44
5	4924.00	42.6 PK	74.0	-31.4	1.56 H	267	7.02	35.62
6	4924.00	31.1 AV	54.0	-22.9	1.56 H	267	-4.51	35.62
7	7386.00	51.2 PK	74.0	-22.8	1.57 H	133	9.14	42.10
8	7386.00	37.4 AV	54.0	-16.6	1.57 H	133	-4.66	42.10
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	114.5 PK			1.35 V	183	84.16	30.34
2	*2462.00	111.7 AV			1.35 V	183	81.36	30.34
3	2487.76	61.0 PK	74.0	-13.0	1.35 V	185	30.59	30.44
4	2487.76	53.4 AV	54.0	-0.6	1.35 V	185	22.96	30.44
5	4924.00	44.7 PK	74.0	-29.3	1.38 V	53	9.08	35.62
6	4924.00	37.0 AV	54.0	-17.0	1.38 V	53	1.38	35.62
7	7386.00	52.0 PK	74.0	-22.0	1.38 V	26	9.90	42.10
8	7386.00	40.0 AV	54.0	-14.0	1.38 V	26	-2.10	42.10

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

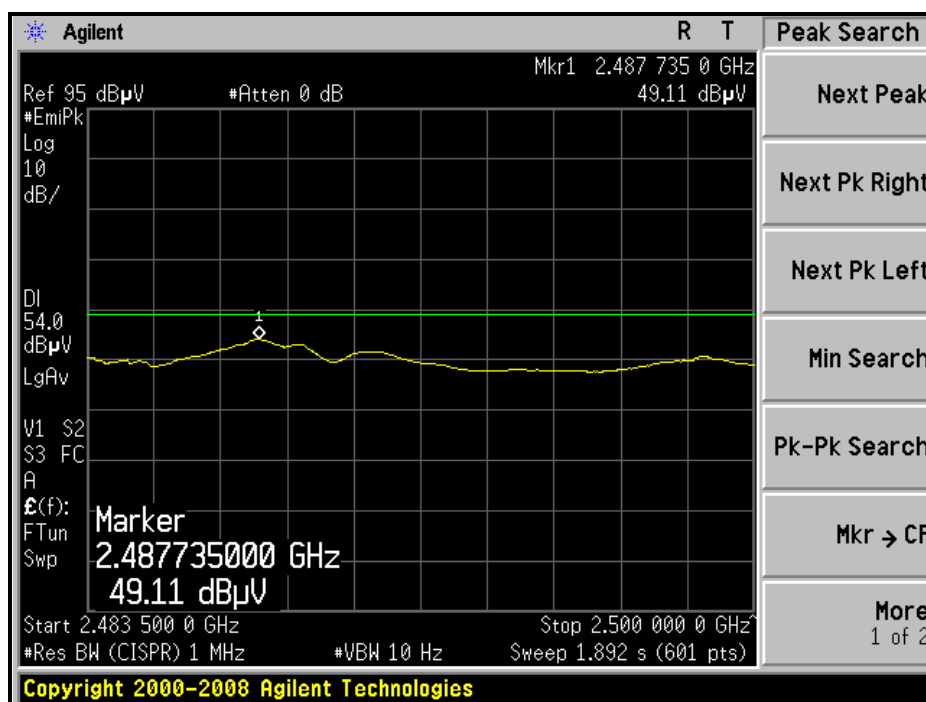
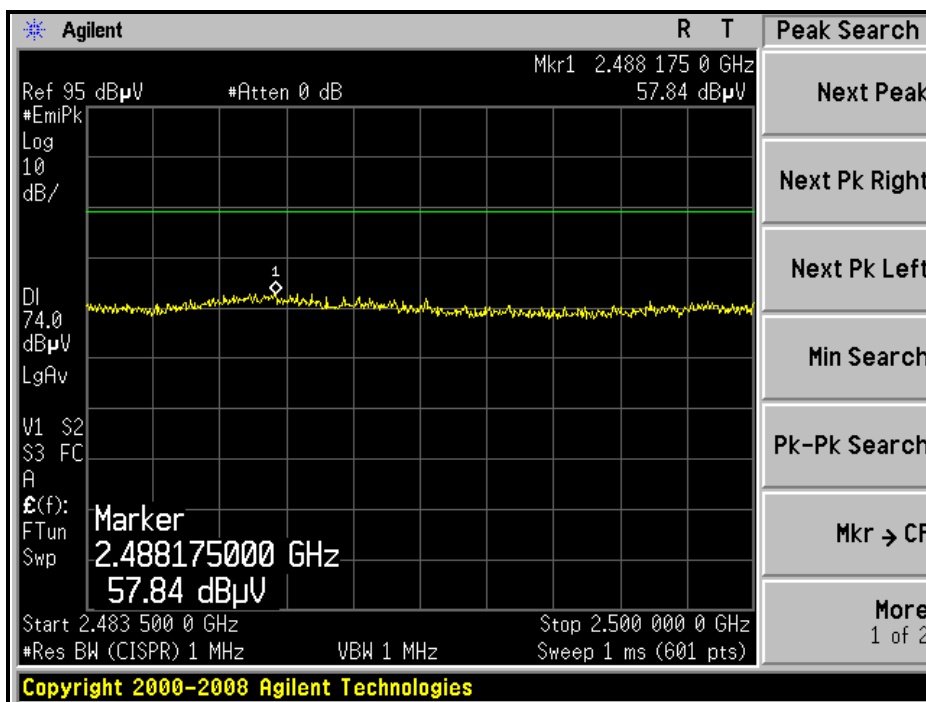
RESTRICTED BANDEDGE (802.11b MODE,CH1, HORIZONTAL)



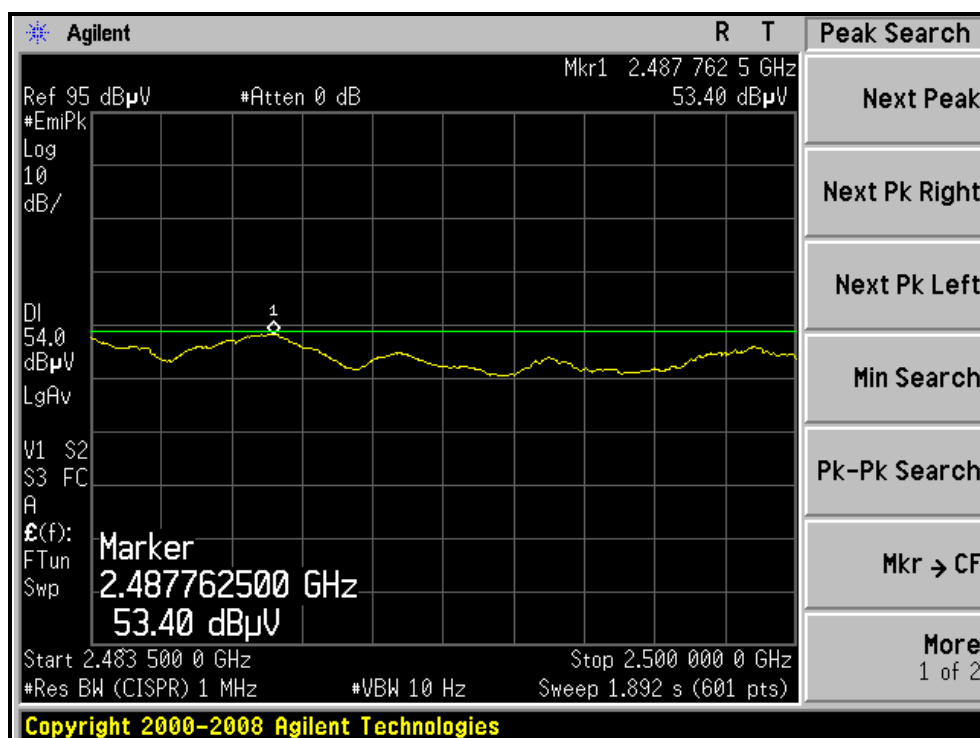
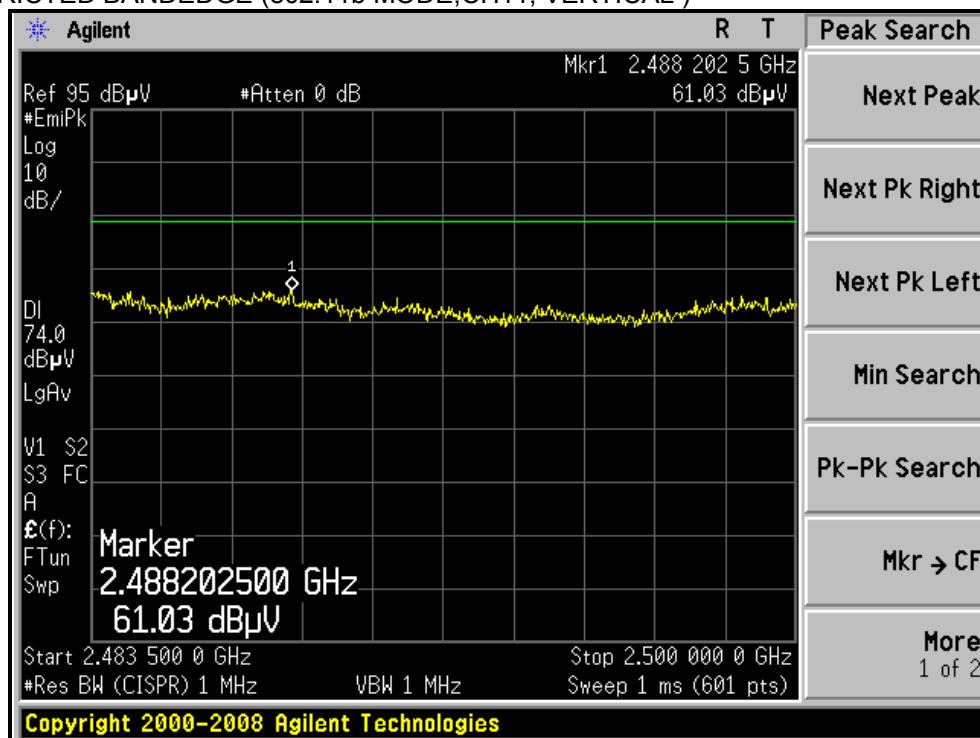
RESTRICTED BANDEDGE (802.11b MODE,CH1, VERTICAL)



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, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24deg. C, 67%RH 1023 hPa	TESTED BY	Nick Tsai

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	69.6 PK	74.0	-4.4	1.33 H	204	39.58	30.06
2	2389.87	45.2 AV	54.0	-8.8	1.33 H	204	15.12	30.06
3	*2412.00	106.3 PK			1.32 H	205	76.15	30.15
4	*2412.00	95.5 AV			1.32 H	205	65.35	30.15
5	4824.00	42.4 PK	74.0	-31.6	1.55 H	272	6.97	35.43
6	4824.00	30.5 AV	54.0	-23.5	1.55 H	272	-4.93	35.43
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	2389.96	73.5 PK	74.0	-0.6	1.17 V	184	43.39	30.06
2	2389.96	49.4 AV	54.0	-4.6	1.17 V	184	19.35	30.06
3	*2412.00	113.3 PK			1.40 V	182	83.15	30.15
4	*2412.00	102.1 AV			1.40 V	182	71.96	30.15
5	4824.00	41.7 PK	74.0	-32.3	1.12 V	350	6.29	35.43
6	4824.00	30.6 AV	54.0	-23.5	1.12 V	350	-4.88	35.43

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



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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24deg. C, 67%RH 1023 hPa	TESTED BY	Nick Tsai

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	63.6 PK	74.0	-10.5	1.58 H	161	33.49	30.06
2	2390.00	46.2 AV	54.0	-7.8	1.58 H	161	16.18	30.06
3	*2437.00	109.6 PK			1.52 H	156	79.34	30.24
4	*2437.00	98.6 AV			1.52 H	156	68.40	30.24
5	2483.50	62.8 PK	74.0	-11.2	1.50 H	156	32.39	30.43
6	2483.50	45.4 AV	54.0	-8.6	1.50 H	156	15.00	30.43
7	4874.00	41.8 PK	74.0	-32.2	1.54 H	271	6.26	35.52
8	4874.00	30.2 AV	54.0	-23.8	1.54 H	271	-5.32	35.52
9	7311.00	50.8 PK	74.0	-23.2	1.58 H	133	8.80	41.96
10	7311.00	36.9 AV	54.0	-17.1	1.58 H	133	-5.06	41.96
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	2389.80	69.2 PK	74.0	-4.8	1.40 V	178	39.14	30.06
2	2389.80	51.0 AV	54.0	-3.0	1.40 V	178	20.94	30.06
3	*2437.00	116.0 PK			1.34 V	183	85.76	30.24
4	*2437.00	104.7 AV			1.34 V	183	74.47	30.24
5	2483.94	68.1 PK	74.0	-5.9	1.35 V	180	37.68	30.43
6	2483.94	50.0 AV	54.0	-4.0	1.35 V	180	19.53	30.43
7	4874.00	42.3 PK	74.0	-31.7	1.10 V	344	6.75	35.55
8	4874.00	31.0 AV	54.0	-23.1	1.10 V	344	-4.60	35.55
9	7311.00	50.9 PK	74.0	-23.1	2.06 V	19	8.86	42.04
10	7311.00	38.4 AV	54.0	-15.6	2.06 V	19	-3.64	42.04

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.



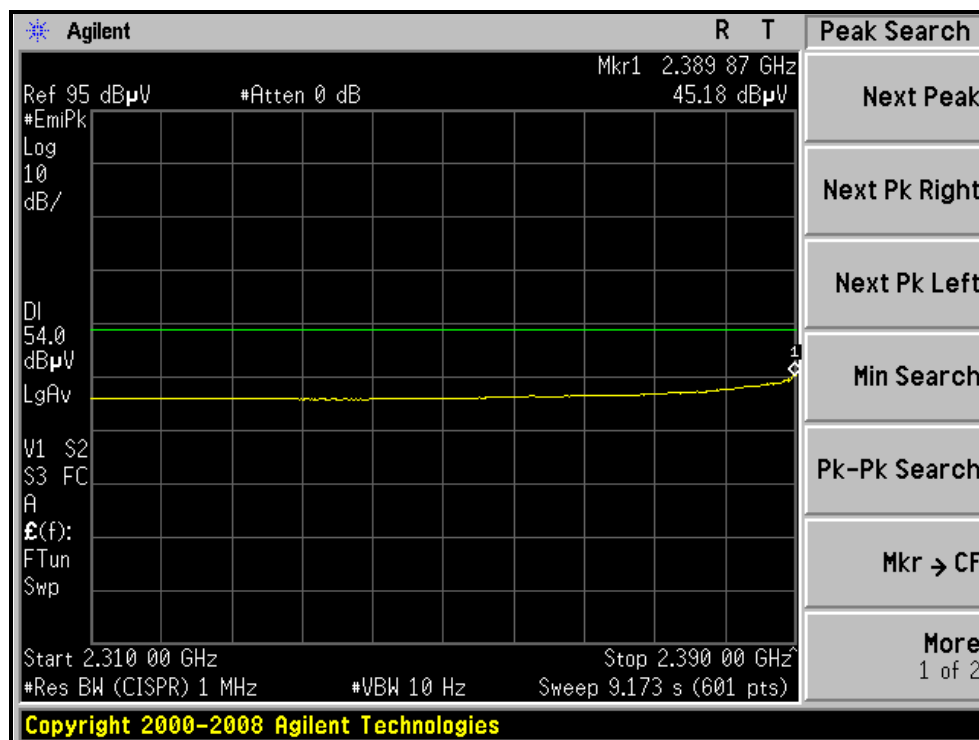
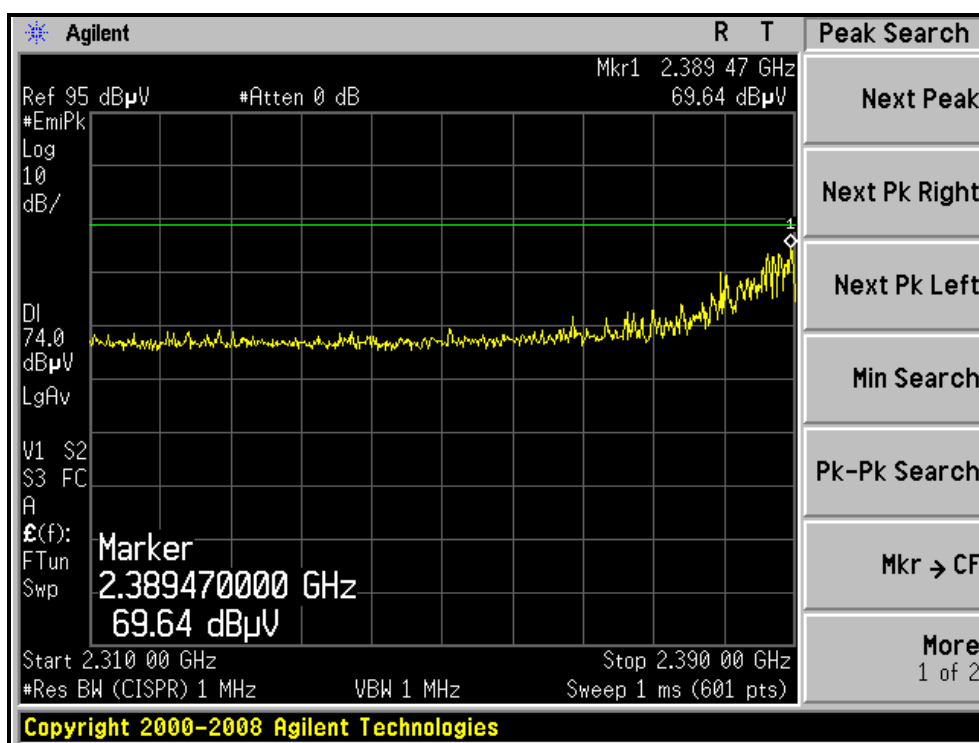
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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24deg. C, 67%RH 1023 hPa	TESTED BY	Nick Tsai

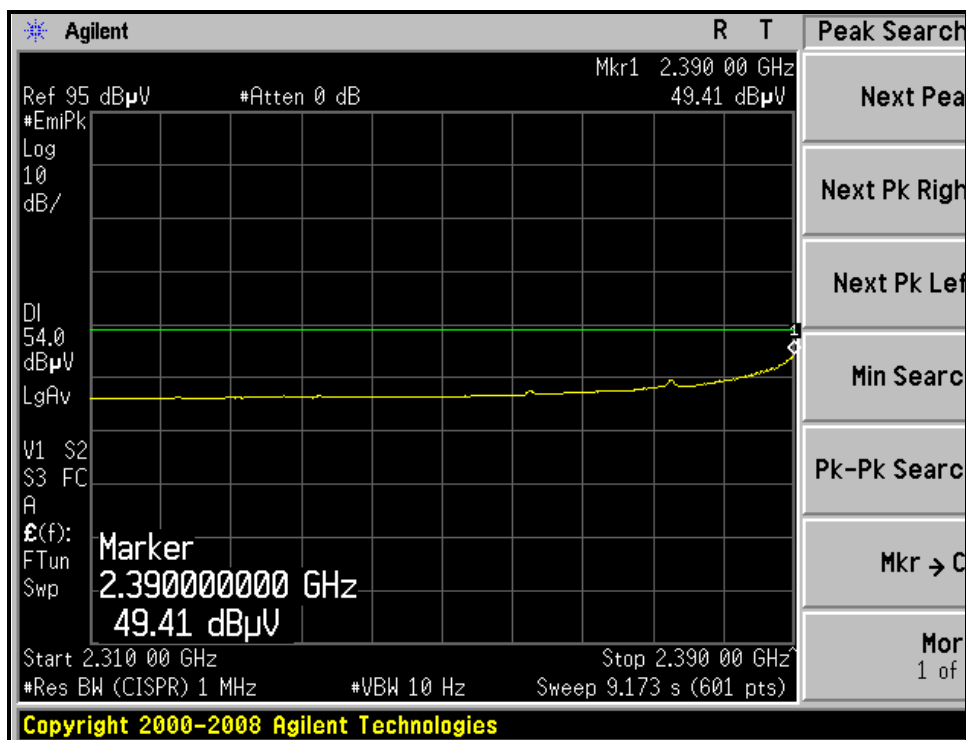
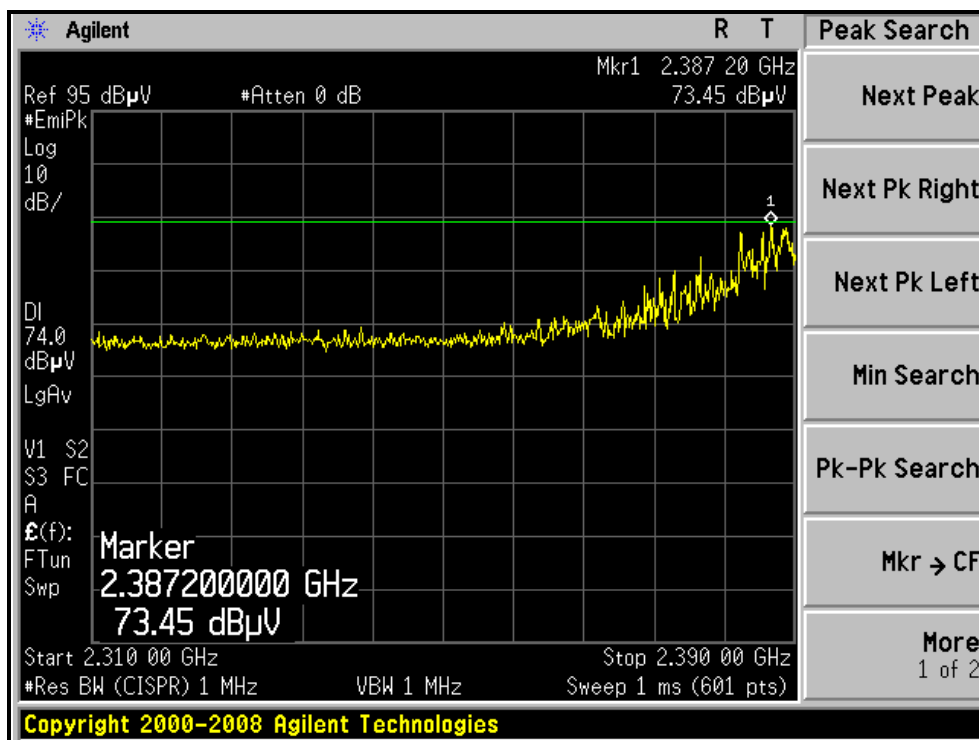
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	107.8 PK			1.51 H	158	77.46	30.34
2	*2462.00	96.2 AV			1.51 H	158	65.87	30.34
3	2483.50	69.2 PK	74.0	-4.8	1.51 H	160	38.80	30.43
4	2483.50	48.3 AV	54.0	-5.7	1.51 H	160	17.86	30.43
5	4924.00	41.3 PK	74.0	-32.7	1.52 H	269	5.70	35.62
6	4924.00	30.4 AV	54.0	-23.7	1.52 H	269	-5.27	35.62
7	7386.00	50.2 PK	74.0	-23.8	1.55 H	135	8.11	42.10
8	7386.00	36.5 AV	54.0	-17.5	1.55 H	135	-5.56	42.10
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	113.7 PK			1.35 V	183	83.33	30.34
2	*2462.00	102.7 AV			1.35 V	183	72.34	30.34
3	2483.55	73.5 PK	74.0	-0.5	1.35 V	181	43.07	30.43
4	2483.55	52.7 AV	54.0	-1.3	1.35 V	181	22.31	30.43
5	4924.00	41.5 PK	74.0	-32.5	1.14 V	352	5.90	35.62
6	4924.00	30.6 AV	54.0	-23.4	1.14 V	352	-4.99	35.62
7	7386.00	50.4 PK	74.0	-23.6	1.98 V	21	8.33	42.10
8	7386.00	38.2 AV	54.0	-15.8	1.98 V	21	-3.89	42.10

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

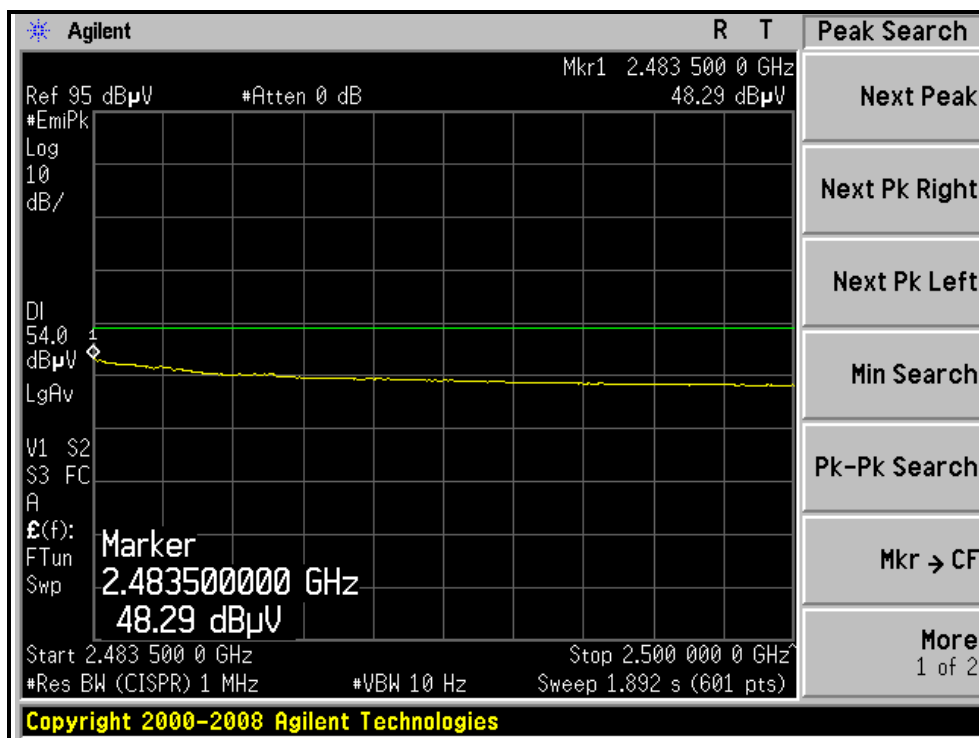
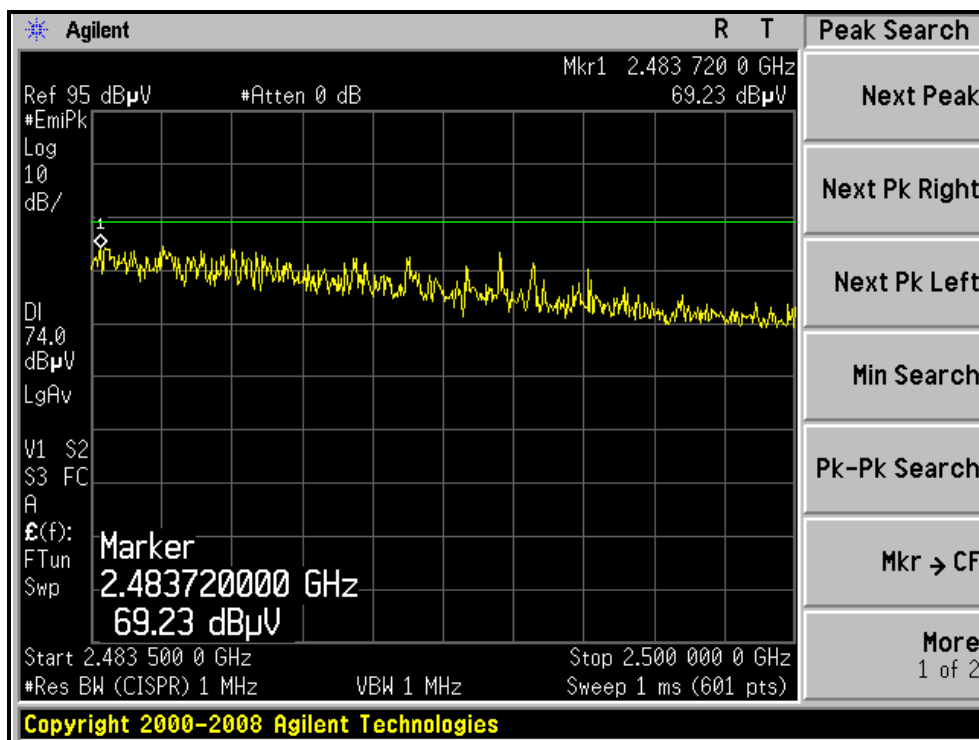
RESTRICTED BANDEDGE (802.11g MODE,CH1, HORIZONTAL)



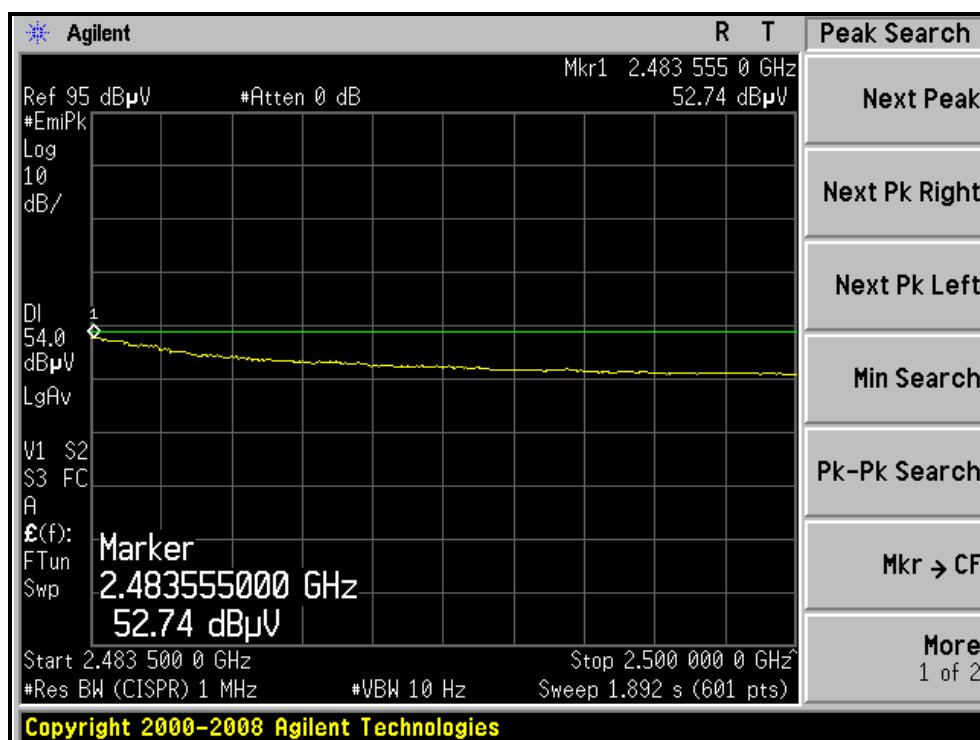
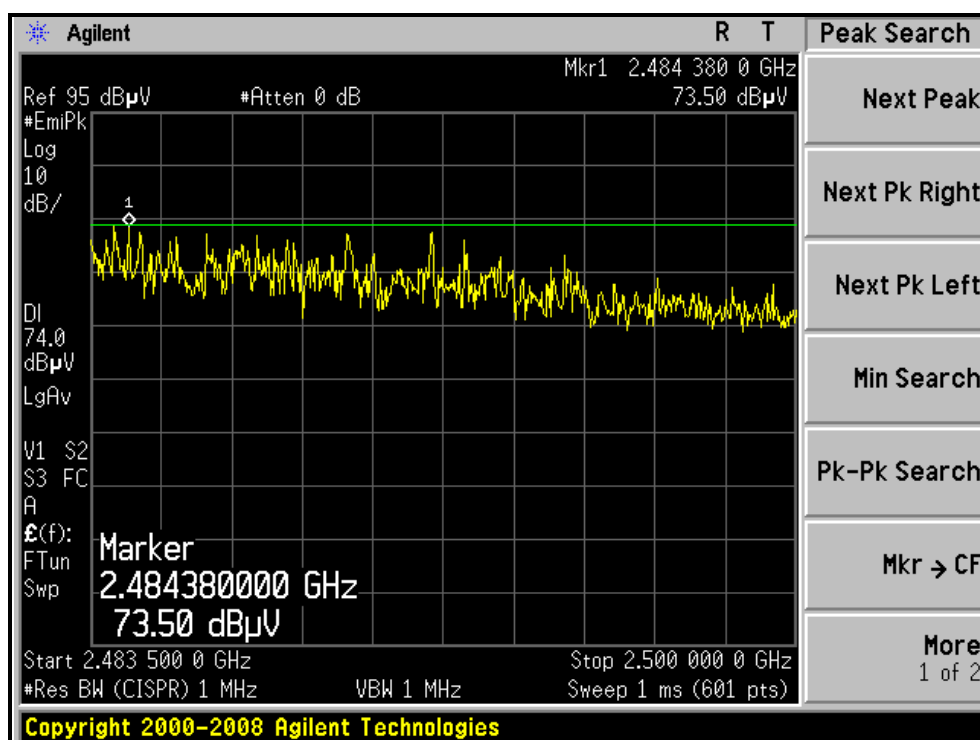
RESTRICTED BANDEDGE (802.11g MODE,CH1, VERTICAL)



RESTRICTED BANDEDGE (802.11g MODE,CH11, HORIZONTAL)



RESTRICTED BANDEDGE (802.11g MODE,CH11, VERTICAL)





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802.11n (20MHz) OFDM MODULATION

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24deg. C, 67%RH 1023 hPa	TESTED BY	Nick Tsai

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	69.0 PK	74.0	-5.0	1.33 H	153	38.91	30.06
2	2390.00	46.4 AV	54.0	-7.6	1.33 H	153	16.37	30.06
3	*2412.00	107.0 PK			1.30 H	152	76.80	30.15
4	*2412.00	96.1 AV			1.30 H	152	65.95	30.15
5	4824.00	41.5 PK	74.0	-32.5	1.56 H	277	6.10	35.43
6	4824.00	30.1 AV	54.0	-23.9	1.56 H	277	-5.37	35.43
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	71.8 PK	74.0	-2.2	1.42 V	185	41.76	30.06
2	2390.00	48.4 AV	54.0	-5.6	1.42 V	185	18.36	30.06
3	*2412.00	113.6 PK			1.37 V	176	83.49	30.15
4	*2412.00	102.1 AV			1.37 V	176	71.93	30.15
5	4824.00	42.0 PK	74.0	-32.0	1.55 V	234	6.53	35.43
6	4824.00	30.2 AV	54.0	-23.8	1.55 V	234	-5.21	35.43

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



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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24deg. C, 67%RH 1023 hPa	TESTED BY	Nick Tsai

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	67.2 PK	74.0	-6.8	1.32 H	153	37.14	30.06
2	2390.00	46.2 AV	54.0	-7.8	1.32 H	153	16.14	30.06
3	*2437.00	110.1 PK			1.31 H	153	79.89	30.24
4	*2437.00	99.8 AV			1.31 H	153	69.55	30.24
5	2483.50	64.9 PK	74.0	-9.1	1.33 H	151	34.44	30.43
6	2483.50	45.4 AV	54.0	-8.6	1.33 H	151	14.97	30.43
7	4874.00	42.7 PK	74.0	-31.3	1.63 H	171	7.19	35.52
8	4874.00	30.1 AV	54.0	-23.9	1.63 H	171	-5.38	35.52
9	7311.00	50.5 PK	74.0	-23.5	1.50 H	134	8.52	41.96
10	7311.00	36.2 AV	54.0	-17.8	1.50 H	134	-5.75	41.96
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	72.3 PK	74.0	-1.7	1.41 V	178	42.23	30.06
2	2390.00	49.8 AV	54.0	-4.2	1.41 V	178	19.78	30.06
3	*2437.00	114.7 PK			1.38 V	186	84.49	30.24
4	*2437.00	103.5 AV			1.38 V	186	73.26	30.24
5	2483.50	72.1 PK	74.0	-1.9	1.34 V	180	41.66	30.43
6	2483.50	49.2 AV	54.0	-4.8	1.34 V	180	18.73	30.43
7	4874.00	42.5 PK	74.0	-31.6	1.54 V	236	6.93	35.52
8	4874.00	30.1 AV	54.0	-23.9	1.54 V	236	-5.41	35.52
9	7311.00	51.4 PK	74.0	-22.7	1.49 V	192	9.39	41.96
10	7311.00	37.6 AV	54.0	-16.4	1.49 V	192	-4.36	41.96

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.



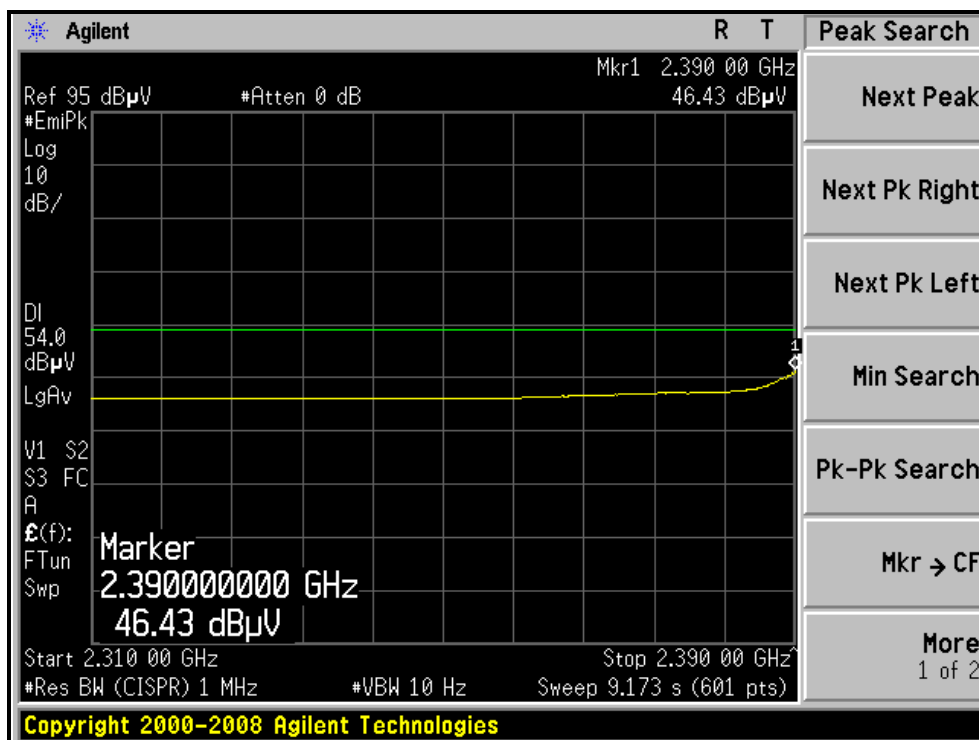
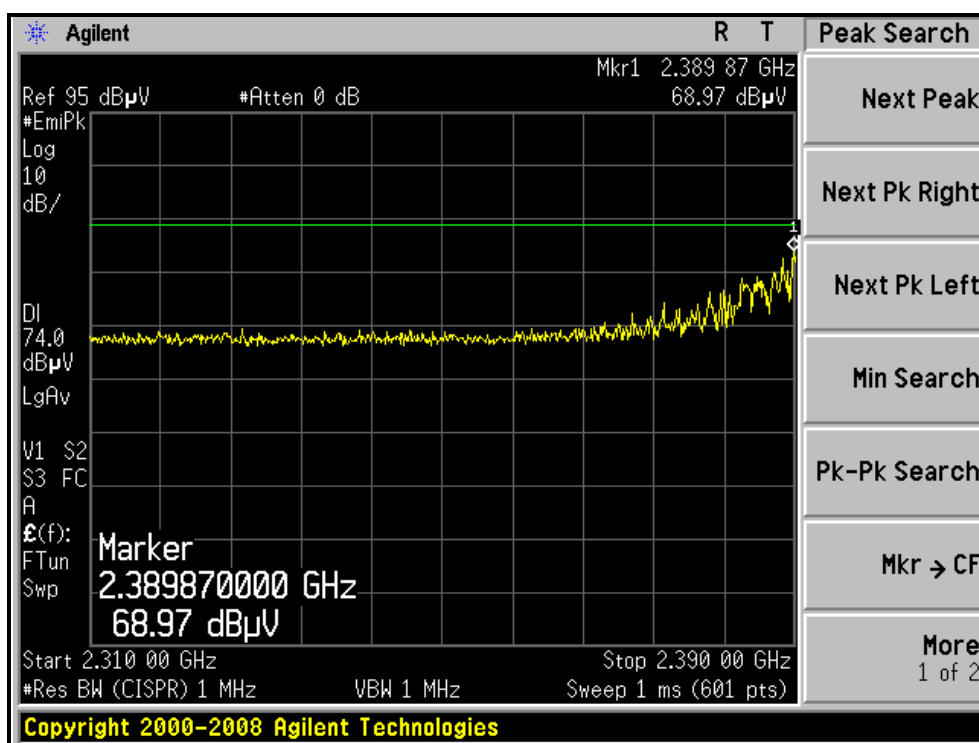
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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24deg. C, 67%RH 1023 hPa	TESTED BY	Nick Tsai

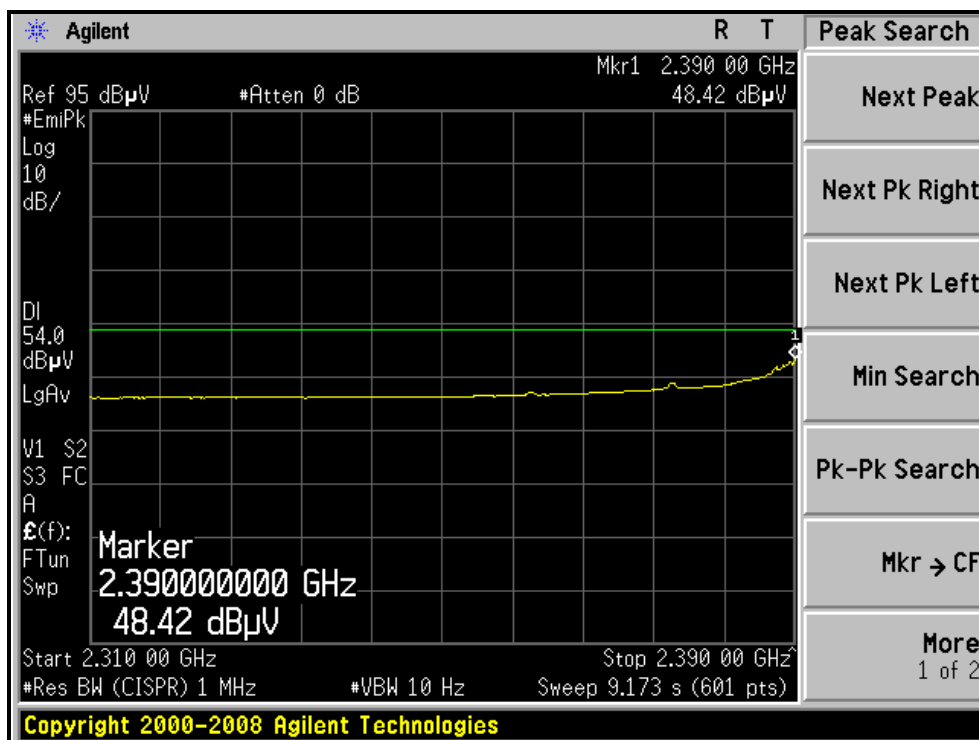
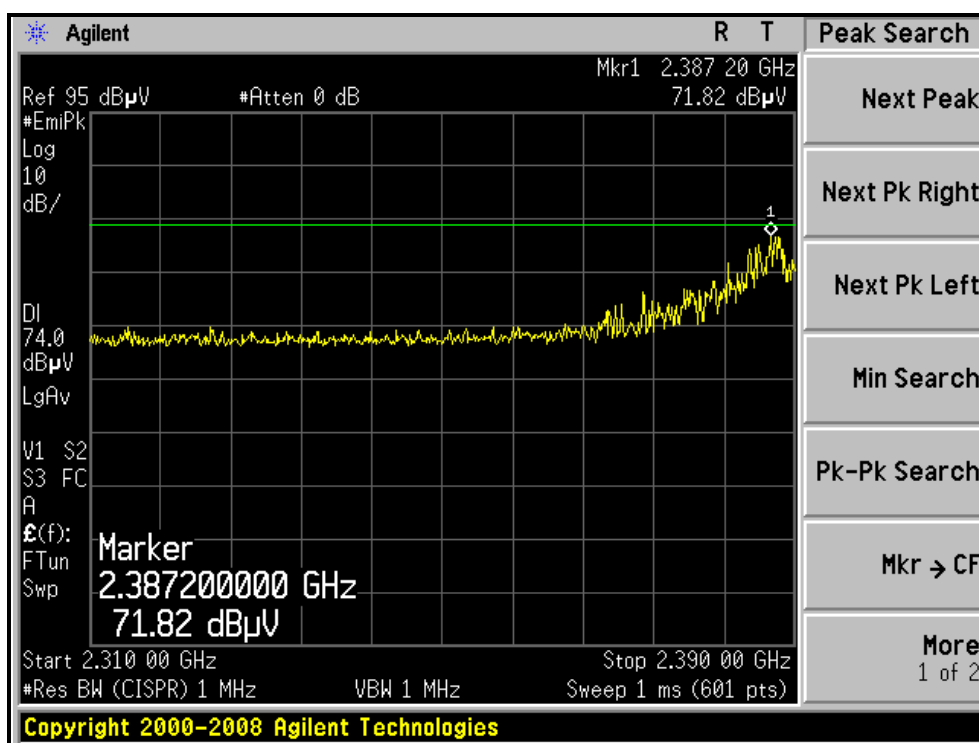
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NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	105.4 PK			1.52 H	158	75.07	30.34
2	*2462.00	95.6 AV			1.52 H	158	65.29	30.34
3	2483.50	67.6 PK	74.0	-6.5	1.50 H	158	37.12	30.43
4	2483.50	46.6 AV	54.0	-7.4	1.50 H	158	16.19	30.43
5	4924.00	42.2 PK	74.0	-31.8	1.49 H	258	6.57	35.62
6	4924.00	30.1 AV	54.0	-23.9	1.49 H	258	-5.51	35.62
7	7386.00	50.2 PK	74.0	-23.8	1.62 H	142	8.06	42.10
8	7386.00	36.6 AV	54.0	-17.5	1.62 H	142	-5.55	42.10
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	113.4 PK			1.54 V	285	83.06	30.34
2	*2462.00	102.5 AV			1.54 V	285	72.12	30.34
3	2483.50	71.9 PK	74.0	-2.1	1.55 V	281	41.46	30.43
4	2483.50	49.5 AV	54.0	-4.5	1.55 V	281	19.06	30.43
5	4924.00	42.7 PK	74.0	-31.3	1.57 V	232	7.11	35.62
6	4924.00	30.2 AV	54.0	-23.8	1.57 V	232	-5.45	35.62
7	7386.00	50.7 PK	74.0	-23.3	1.47 V	193	8.59	42.10
8	7386.00	35.1 AV	54.0	-18.9	1.47 V	193	-6.99	42.10

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

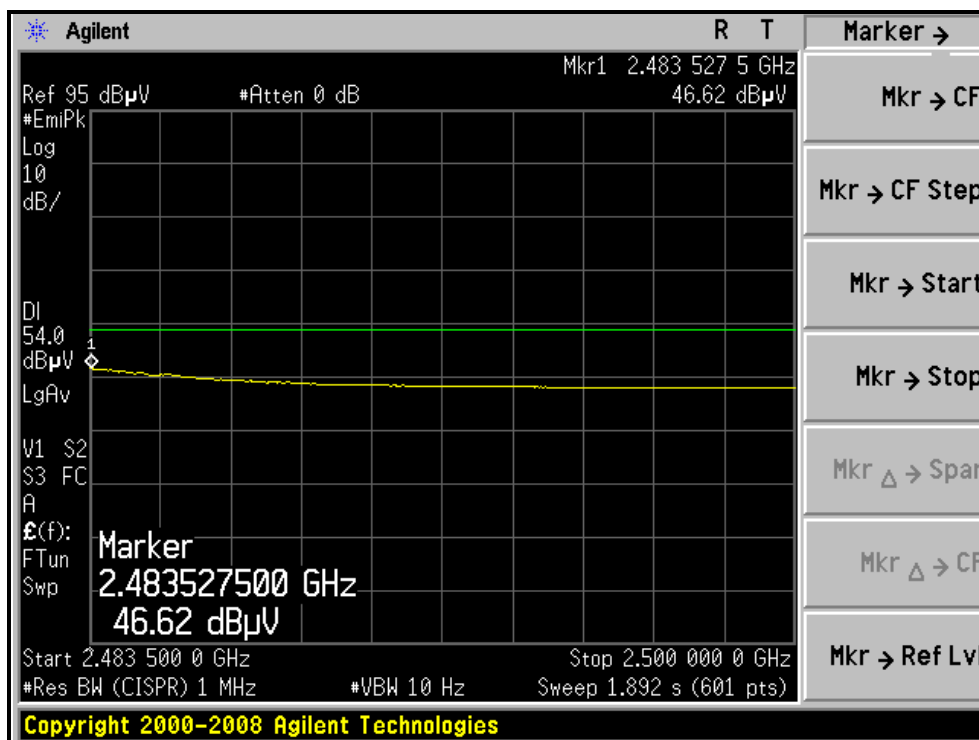
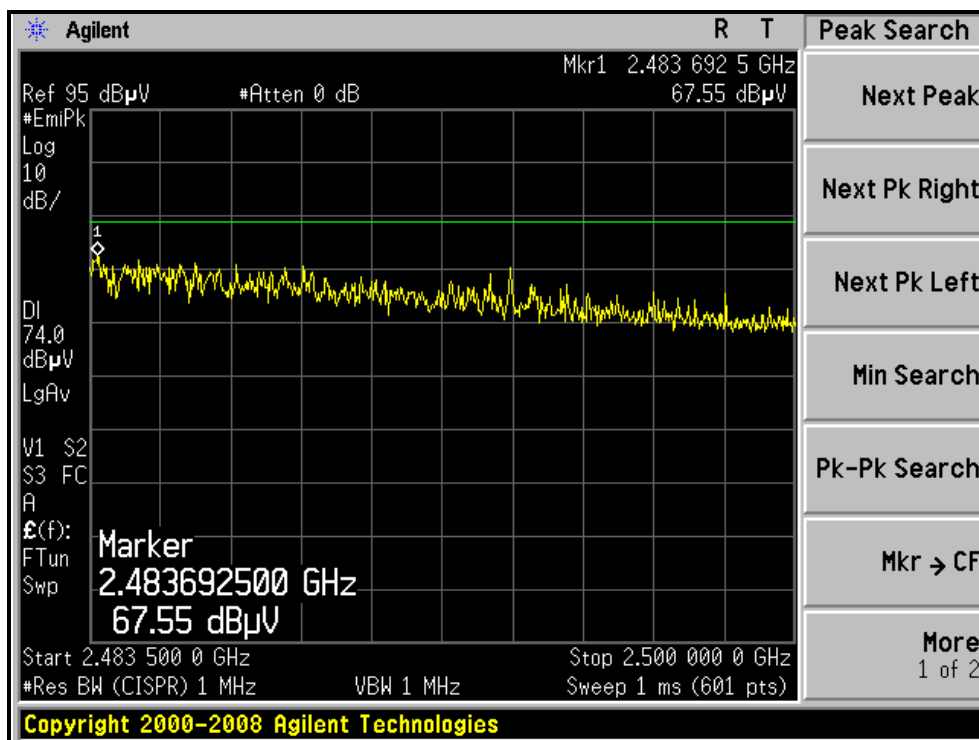
RESTRICTED BANDEDGE (802.11n (20MHz) MODE,CH1, HORIZONTAL)



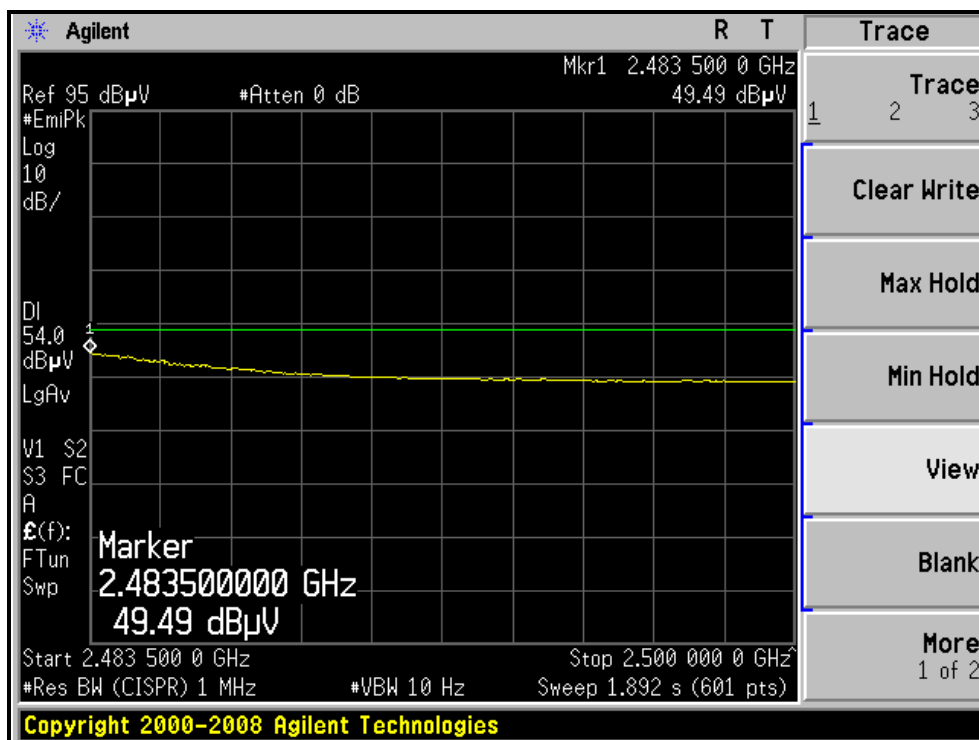
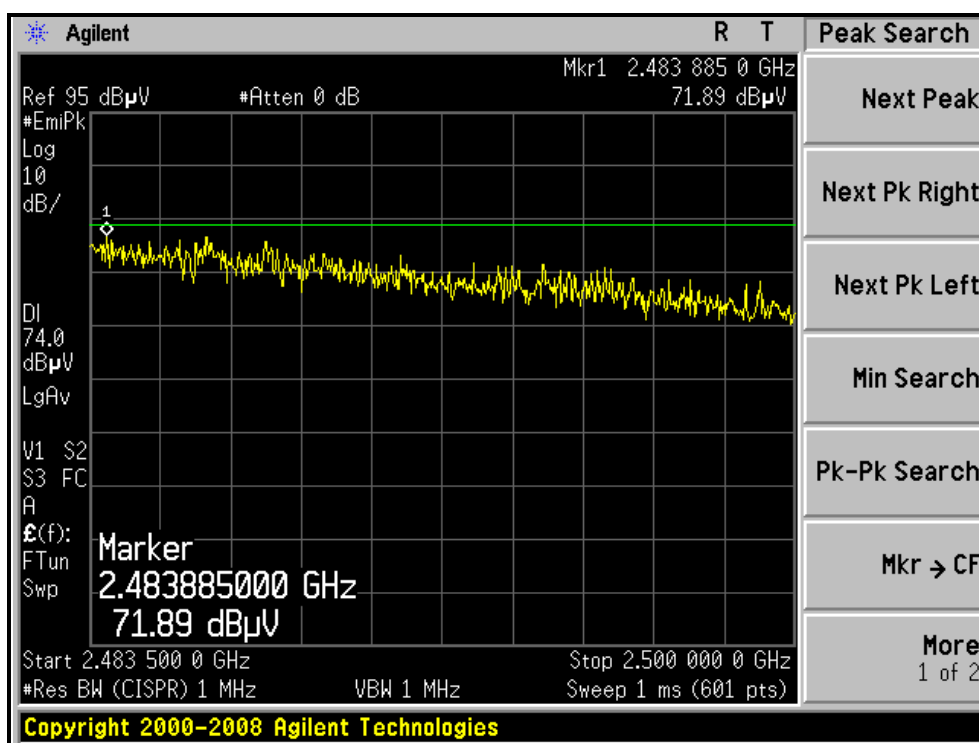
RESTRICTED BANDEDGE (802.11n (20MHz) MODE,CH1, VERTICAL)



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



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





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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	24deg. C, 67%RH 1023 hPa	TESTED BY	Nick Tsai

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	65.3 PK	74.0	-8.7	1.46 H	166	35.26	30.06
2	2390.00	47.1 AV	54.0	-6.9	1.46 H	166	17.06	30.06
3	*2422.00	99.8 PK			1.47 H	167	69.56	30.19
4	*2422.00	88.2 AV			1.47 H	167	58.03	30.19
5	4844.00	41.3 PK	74.0	-32.7	1.52 H	268	5.80	35.47
6	4844.00	30.1 AV	54.0	-23.9	1.52 H	268	-5.37	35.47
7	7266.00	50.1 PK	74.0	-23.9	1.43 H	147	8.24	41.87
8	7266.00	36.2 AV	54.0	-17.8	1.43 H	147	-5.64	41.87
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	73.2 PK	74.0	-0.8	1.37 V	167	43.13	30.06
2	2390.00	51.9 AV	54.0	-2.1	1.37 V	167	21.86	30.06
3	*2422.00	108.8 PK			1.37 V	174	78.56	30.19
4	*2422.00	96.2 AV			1.37 V	174	66.04	30.19
5	4844.00	41.3 PK	74.0	-32.7	1.24 V	207	5.86	35.47
6	4844.00	30.2 AV	54.0	-23.8	1.24 V	207	-5.29	35.47
7	7266.00	50.3 PK	74.0	-23.7	1.53 V	63	8.40	41.87
8	7266.00	37.4 AV	54.0	-16.6	1.53 V	63	-4.47	41.87

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	24deg. C, 67%RH 1023 hPa	TESTED BY	Nick Tsai

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	101.53 PK	74.00			167	71.29	30.24
2	*2437.00	90.91 AV	54.00			167	60.67	30.24
3	2439.00	64.03 PK	74.00	-9.97	1.48 H	167	33.78	30.25
4	2439.00	43.99 AV	54.00	-10.01	1.48 H	167	13.74	30.25
5	2483.50	61.24 PK	74.00	-12.76	1.49 H	166	30.81	30.43
6	2483.50	43.92 AV	54.00	-10.08	1.49 H	166	13.49	30.43
7	4874.00	41.16 PK	74.00	-32.84	1.55 H	264	5.64	35.52
8	4874.00	30.20 AV	54.00	-23.80	1.55 H	264	-5.32	35.52
9	7311.00	50.74 PK	74.00	-23.26	1.44 H	150	8.78	41.96
10	7311.00	36.27 AV	54.00	-17.73	1.44 H	150	-5.69	41.96
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	73.3 PK	74.0	-0.7	1.37 V	167	43.20	30.06
2	2390.00	49.1 AV	54.0	-4.9	1.37 V	167	19.08	30.06
3	*2437.00	110.6 PK			1.38 V	172	80.36	30.24
4	*2437.00	98.6 AV			1.38 V	172	68.31	30.24
5	2483.50	73.3 PK	74.0	-0.7	1.34 V	178	42.87	30.43
6	2483.50	51.8 AV	54.0	-2.2	1.34 V	178	21.33	30.43
7	4874.00	42.2 PK	74.0	-31.8	1.22 V	211	6.71	35.52
8	4874.00	31.2 AV	54.0	-22.8	1.22 V	211	-4.28	35.52
9	7311.00	50.1 PK	74.0	-23.9	1.50 V	64	8.16	41.96
10	7311.00	38.0 AV	54.0	-16.0	1.50 V	64	-3.94	41.96

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.



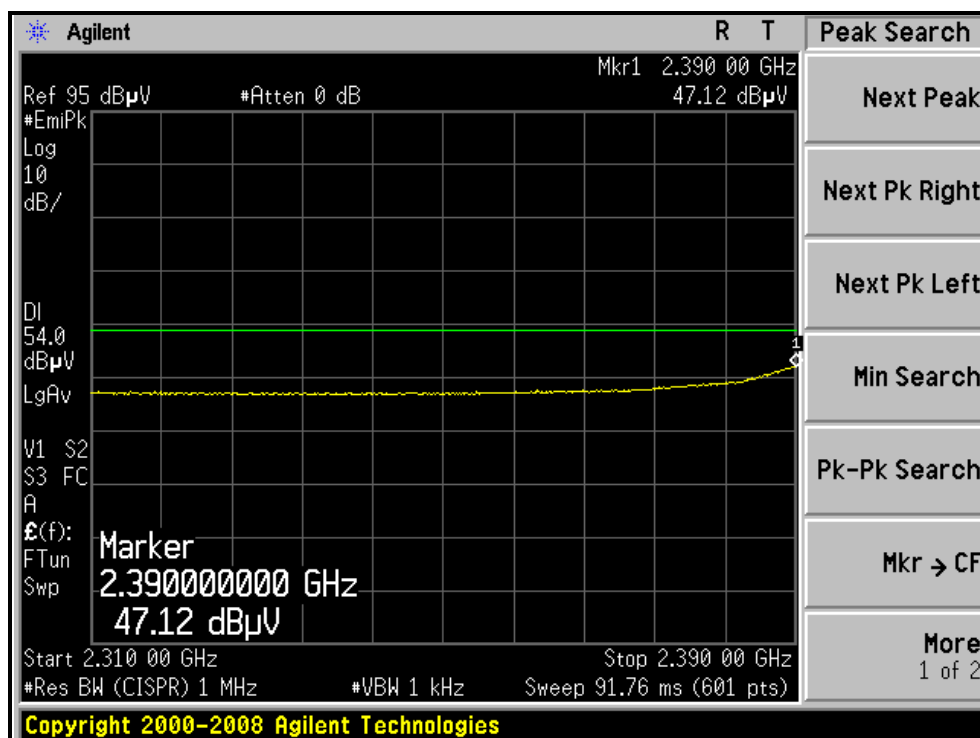
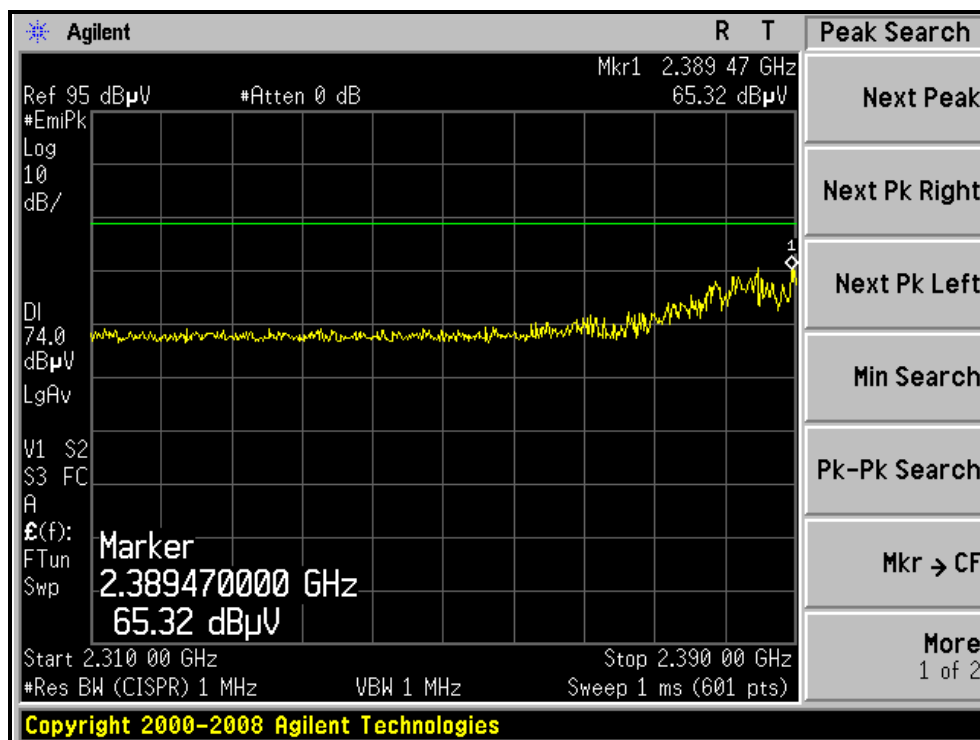
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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 7	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24deg. C, 67%RH 1023 hPa	TESTED BY	Nick Tsai

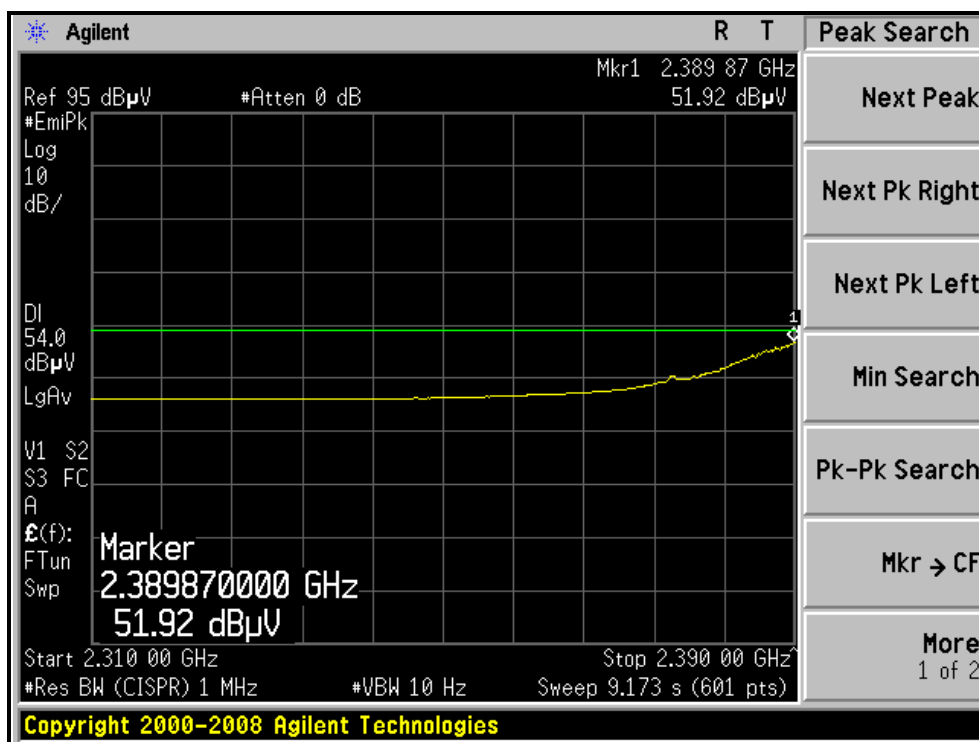
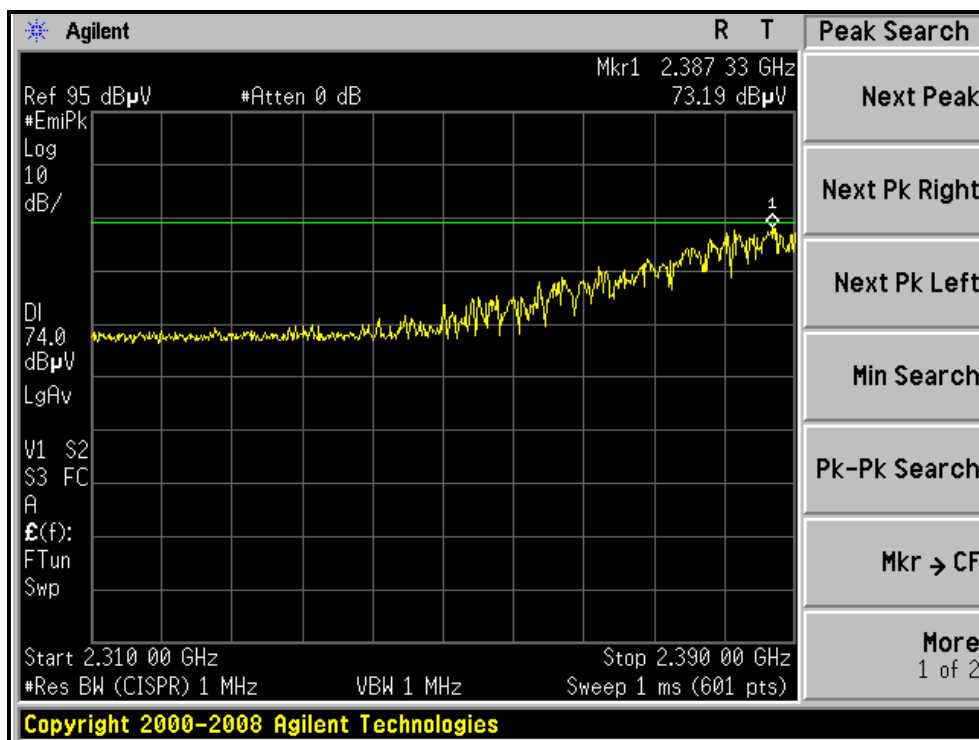
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2452.00	101.7 PK			1.24 H	161	71.35	30.30
2	*2452.00	88.8 AV			1.24 H	161	58.48	30.30
3	2483.90	66.3 PK	74.0	-7.7	1.25 H	158	35.89	30.43
4	2483.90	47.6 AV	54.0	-6.5	1.25 H	158	17.12	30.43
5	4904.00	41.1 PK	74.0	-32.9	1.56 H	266	5.54	35.58
6	4904.00	30.1 AV	54.0	-23.9	1.56 H	266	-5.46	35.58
7	7356.00	49.2 PK	74.0	-24.9	1.48 H	147	7.11	42.04
8	7356.00	36.5 AV	54.0	-17.5	1.48 H	147	-5.54	42.04
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	105.1 PK			1.26 V	207	74.83	30.30
2	*2452.00	93.5 AV			1.26 V	207	63.15	30.30
3	2483.91	72.5 PK	74.0	-1.5	1.26 V	207	42.10	30.43
4	2483.91	52.9 AV	54.0	-1.1	1.26 V	207	22.51	30.43
5	4904.00	41.8 PK	74.0	-32.2	1.21 V	212	6.24	35.58
6	4904.00	30.2 AV	54.0	-23.8	1.21 V	212	-5.37	35.58
7	7356.00	50.3 PK	74.0	-23.7	1.48 V	63	8.30	42.04
8	7356.00	36.5 AV	54.0	-17.5	1.48 V	63	-5.50	42.04

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.

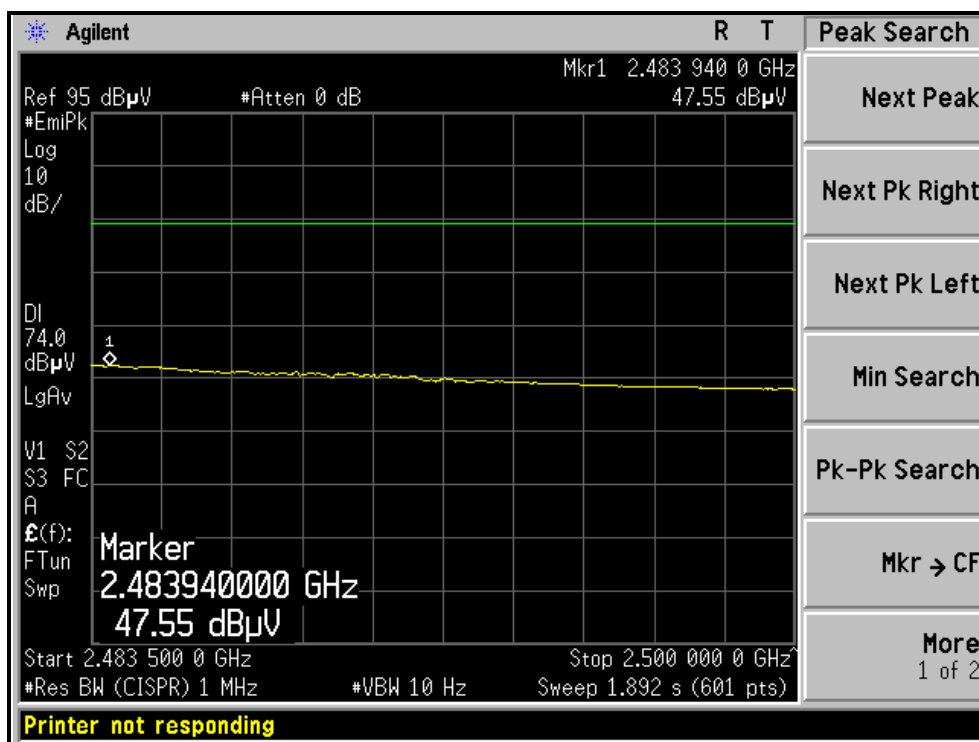
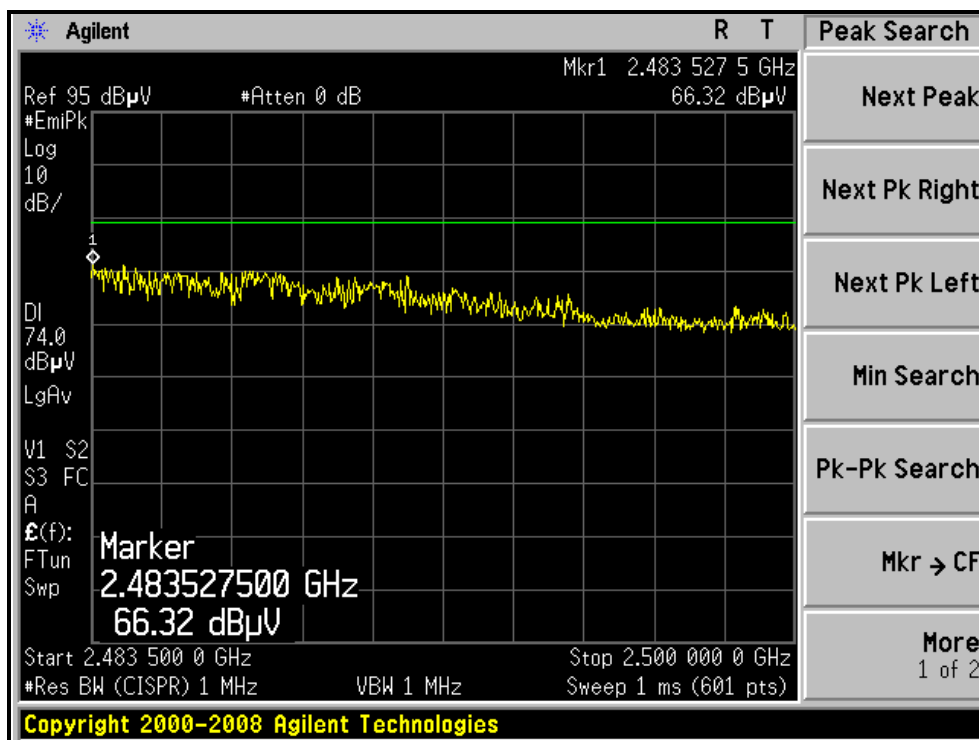
RESTRICTED BANDEDGE (802.11n (40MHz) MODE,CH1, HORIZONTAL)



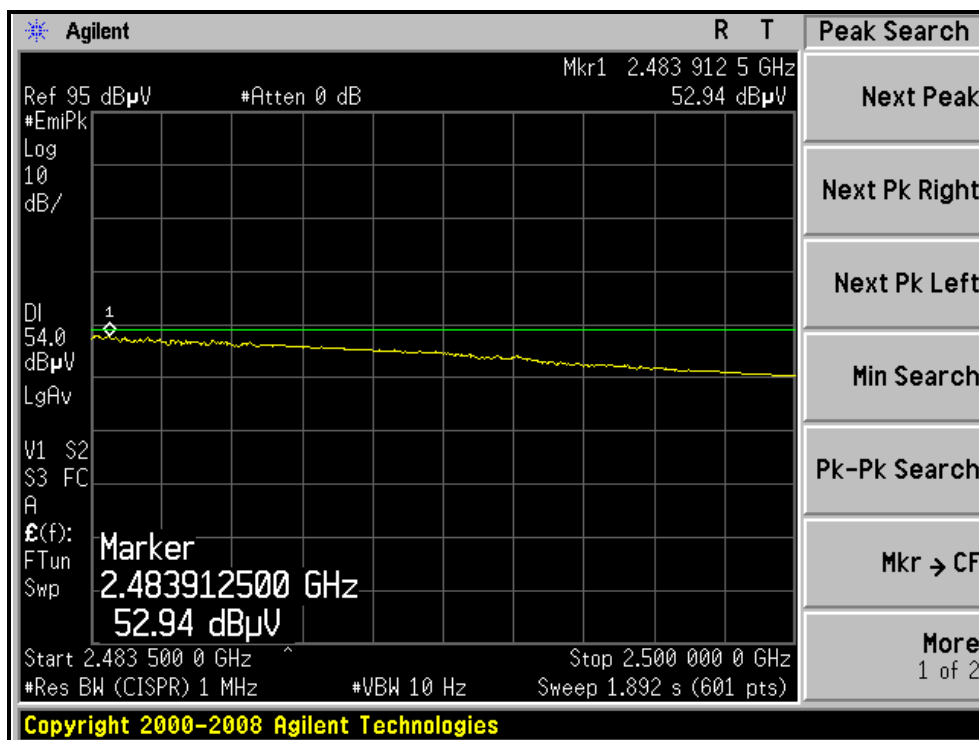
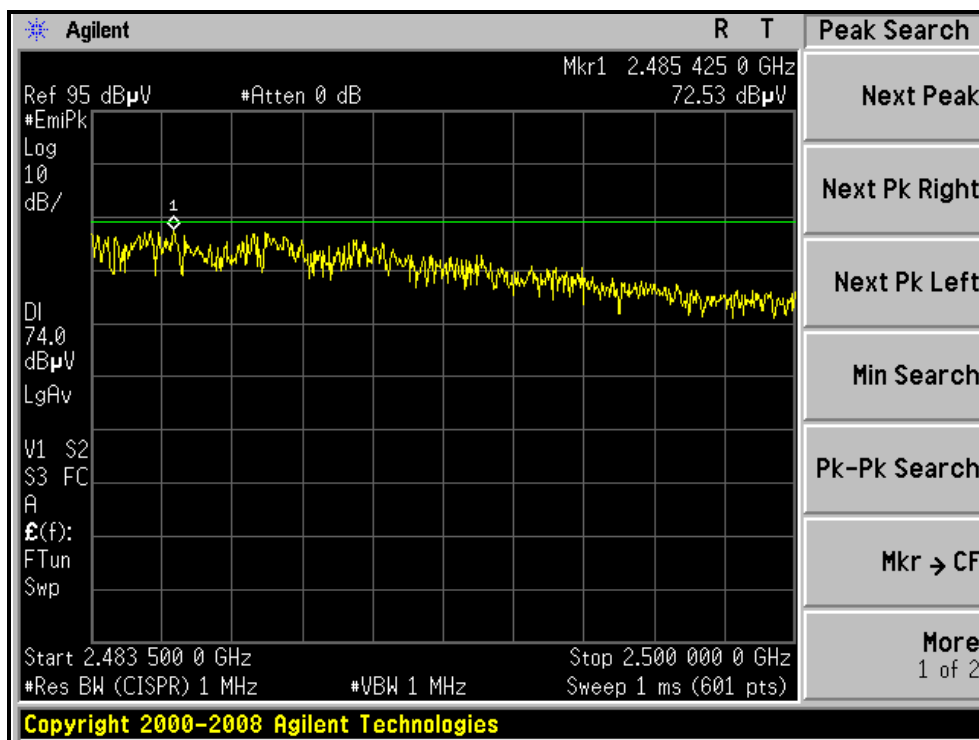
RESTRICTED BANDEDGE (802.11n (40MHz) MODE,CH1, VERTICAL)



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



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

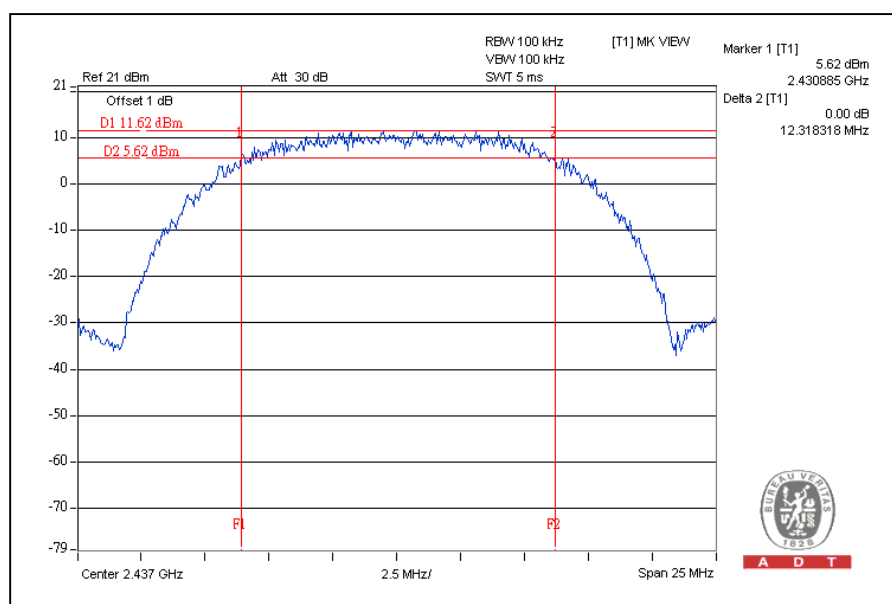
The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

4.3.7 TEST RESULTS

802.11b DSSS MODULATION:

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2412	11.54	0.5	PASS
6	2437	12.32	0.5	PASS
11	2462	11.85	0.5	PASS

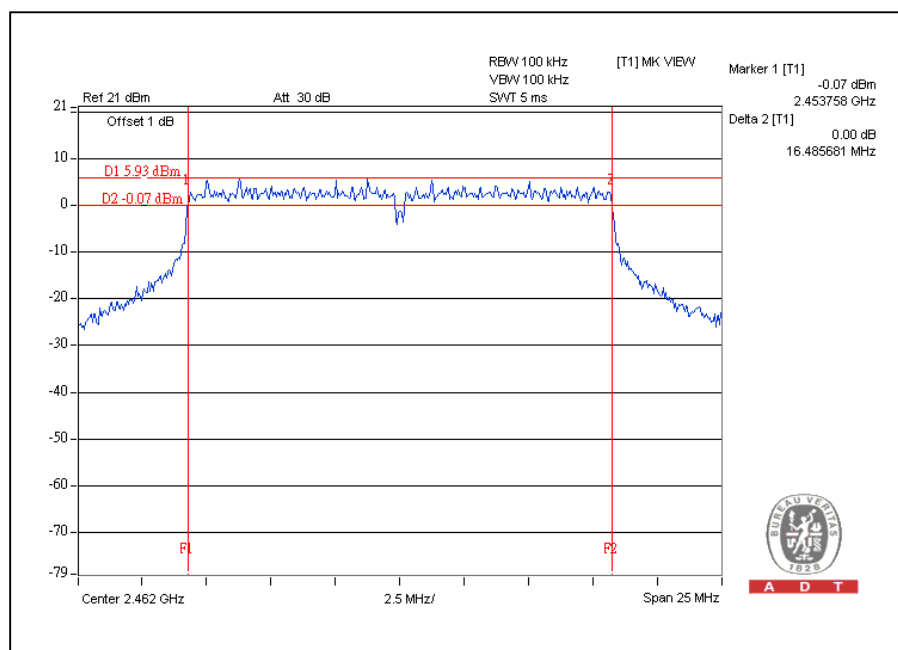
CH6



802.11g OFDM MODULATION:

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2412	16.47	0.5	PASS
6	2437	16.26	0.5	PASS
11	2462	16.49	0.5	PASS

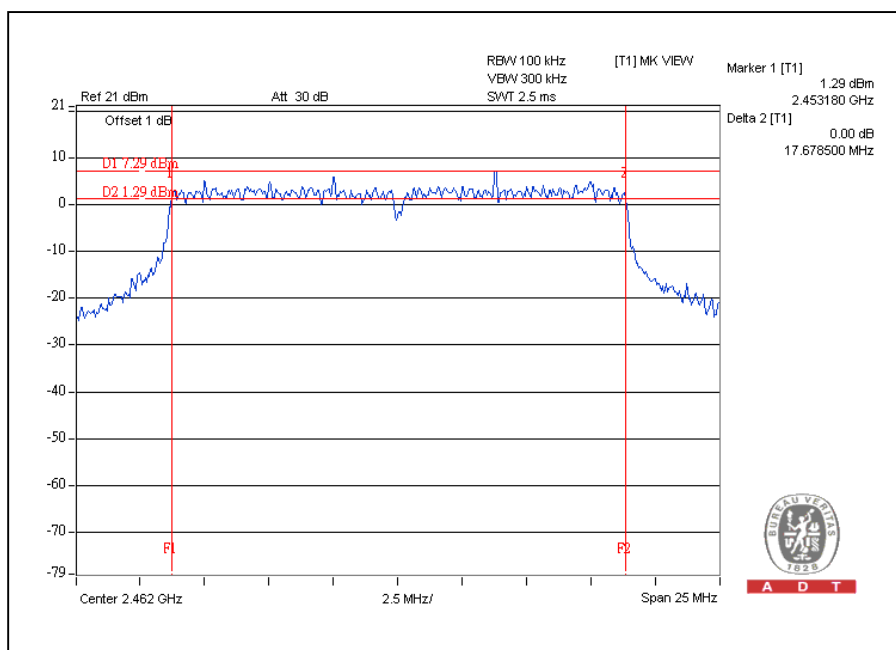
CH11



802.11n (20MHz) OFDM MODULATION:

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2412	17.68	0.5	PASS
6	2437	17.65	0.5	PASS
11	2462	17.68	0.5	PASS

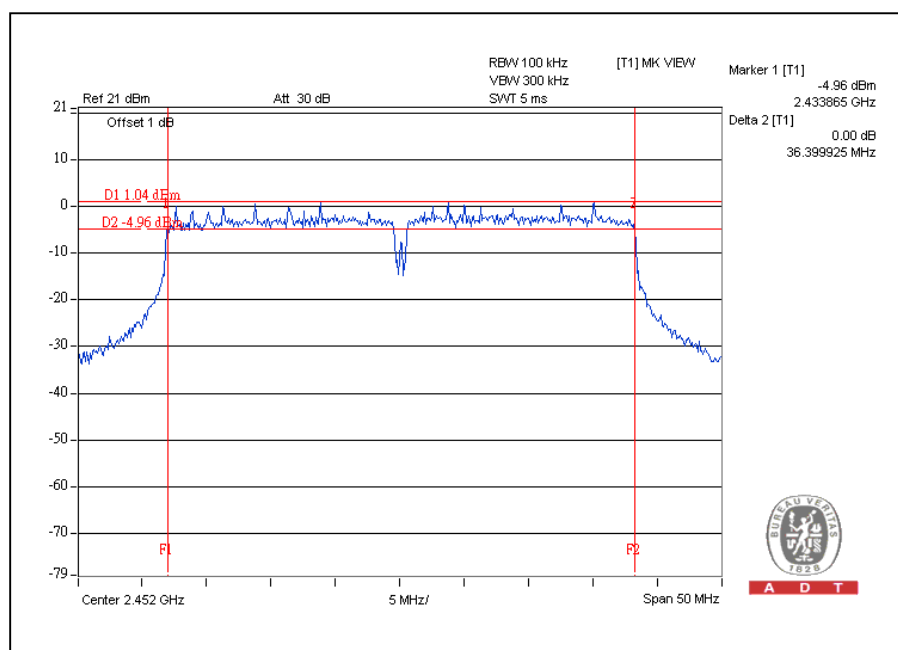
CH11



802.11n (40MHz) OFDM MODULATION:

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2422	35.88	0.5	PASS
4	2437	35.89	0.5	PASS
7	2452	36.40	0.5	PASS

CH7





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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

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.

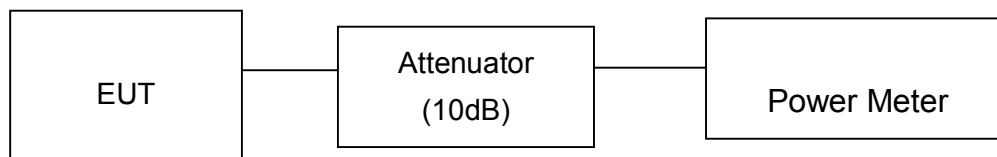
4.4.3 TEST PROCEDURES

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)		TOTAL PEAK POWER (mW)	TOTAL PEAK POWER (dBm)	PEAK POWER LIMIT (dBm)	PASS / FAIL
		CHAIN(0)	CHAIN(1)				
1	2412	22.7	22.1	348.4	25.4	30	PASS
6	2437	24.5	24.4	557.3	27.5	30	PASS
11	2462	24.1	23.9	502.5	27.0	30	PASS

802.11g 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	22.4	343.6	25.4	30	PASS
6	2437	25.4	25.2	677.9	28.3	30	PASS
11	2462	22.8	22.5	368.4	25.7	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	20.8	20.7	237.7	23.8	30	PASS
6	2437	24.8	24.4	577.4	27.6	30	PASS
11	2462	22.2	21.3	300.9	24.8	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)				
1	2422	19.5	19.7	182.5	22.6	30	PASS
4	2437	22.4	21.9	328.7	25.2	30	PASS
7	2452	20.5	20.2	216.9	23.4	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.

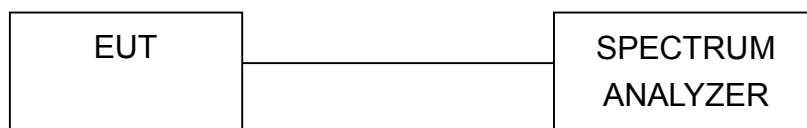
4.5.3 TEST PROCEDURE

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

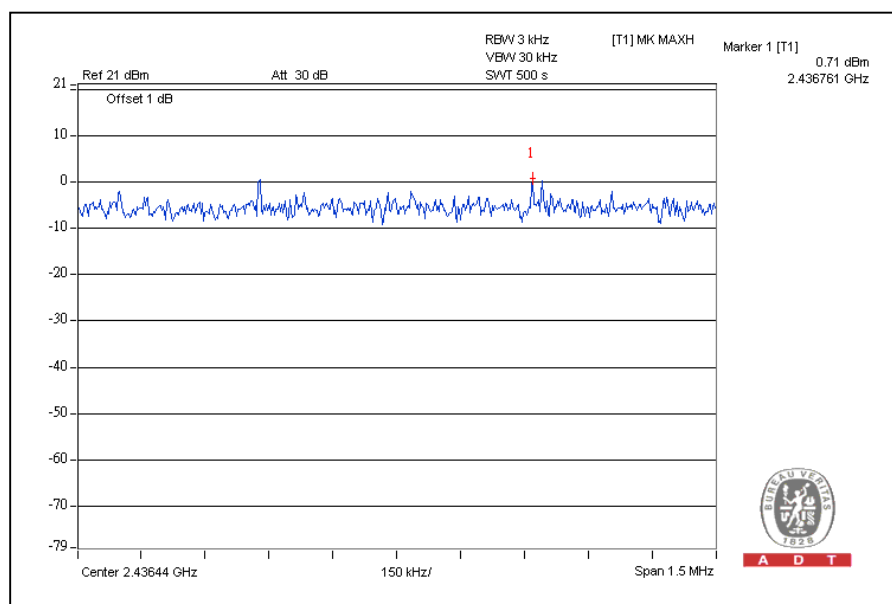
Same as Item 4.3.6

4.5.7 TEST RESULTS

802.11b DSSS 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	-2.3	-4.0	-0.1	8	PASS
6	2437	0.7	-1.9	2.6	8	PASS
11	2462	-1.5	-0.8	1.9	8	PASS

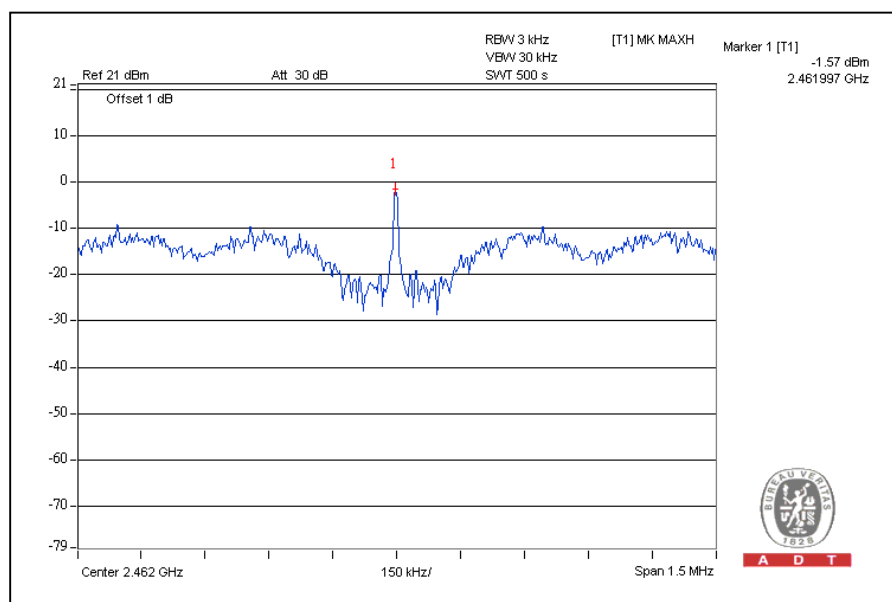
CHAIN(0) CH6



802.11g 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	-4.3	-2.3	-0.2	8	PASS
6	2437	-5.0	-6.8	-2.8	8	PASS
11	2462	-6.2	-1.6	-0.3	8	PASS

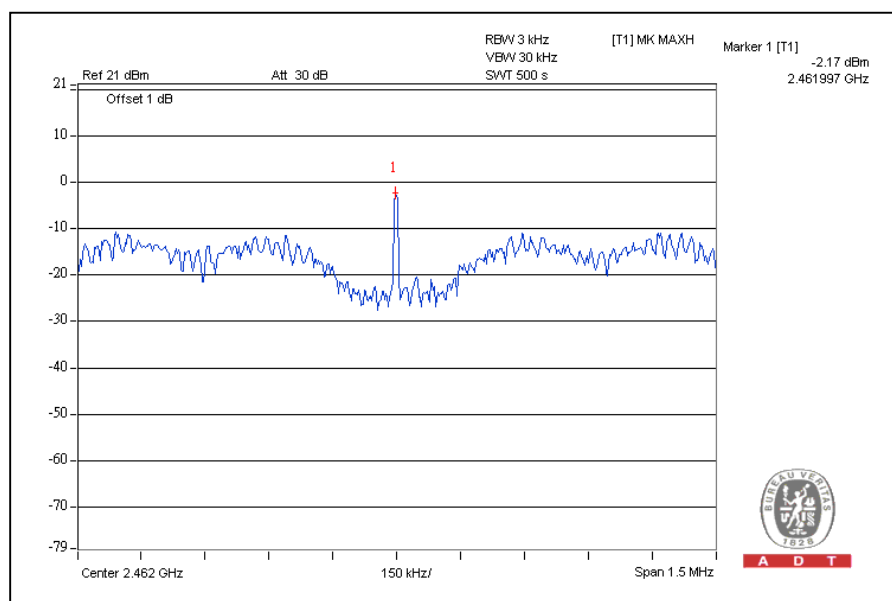
CHAIN(1) CH11



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	-3.3	-10.3	-2.5	8	PASS
6	2437	-4.8	-7.3	-2.9	8	PASS
11	2462	-2.5	-2.2	0.7	8	PASS

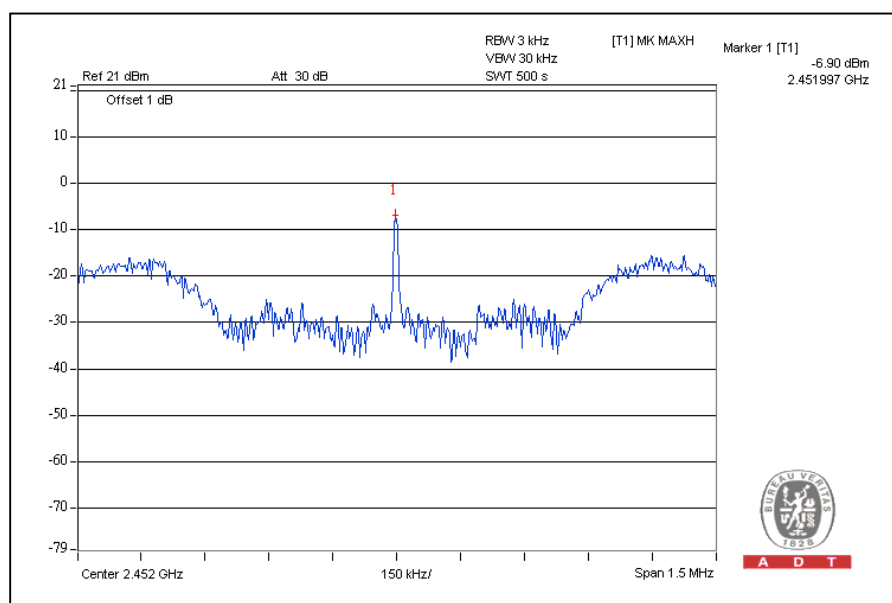
CHAIN(1) CH11



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)			
1	2422	-14.0	-8.1	-7.1	8	PASS
4	2437	-11.4	-10.5	-7.9	8	PASS
7	2452	-13.7	-6.9	-6.1	8	PASS

CHAIN(1) CH7



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 loss 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 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

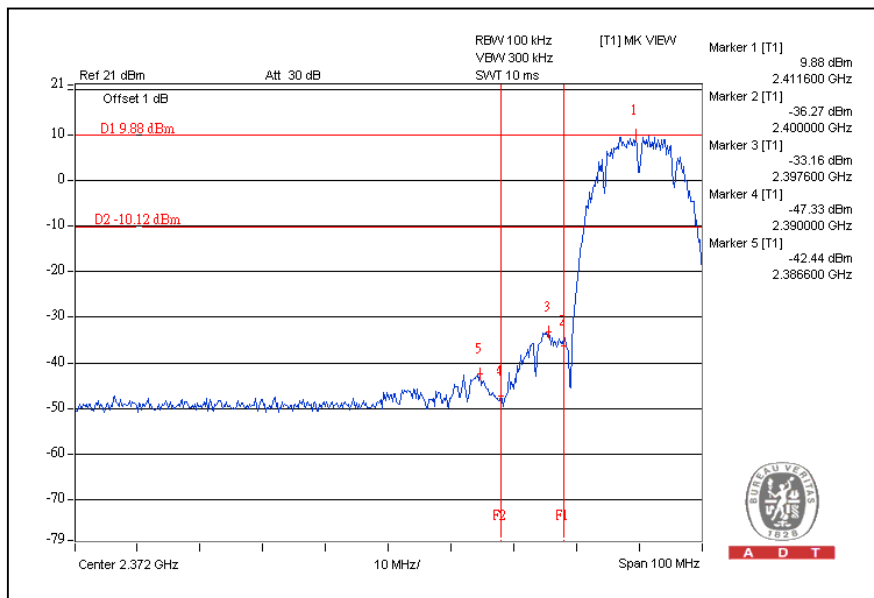
Same as Item 4.3.6

4.6.6 TEST RESULTS

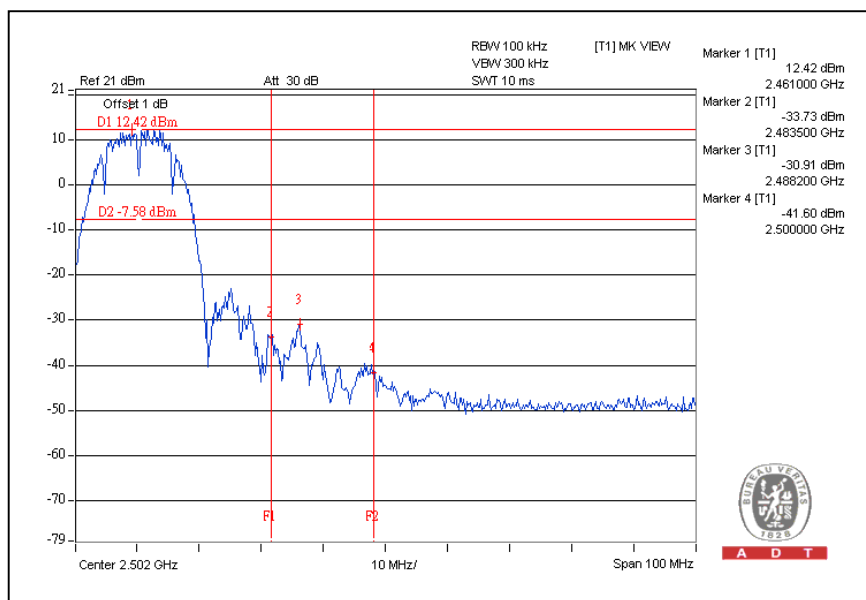
The spectrum plots are attached on the following images. D1 line indicates the highest level, and D2 line indicates the 20dB offset below D1. It shows compliance with the requirement in part 15.247(d).

802.11b DSSS MODULATION:

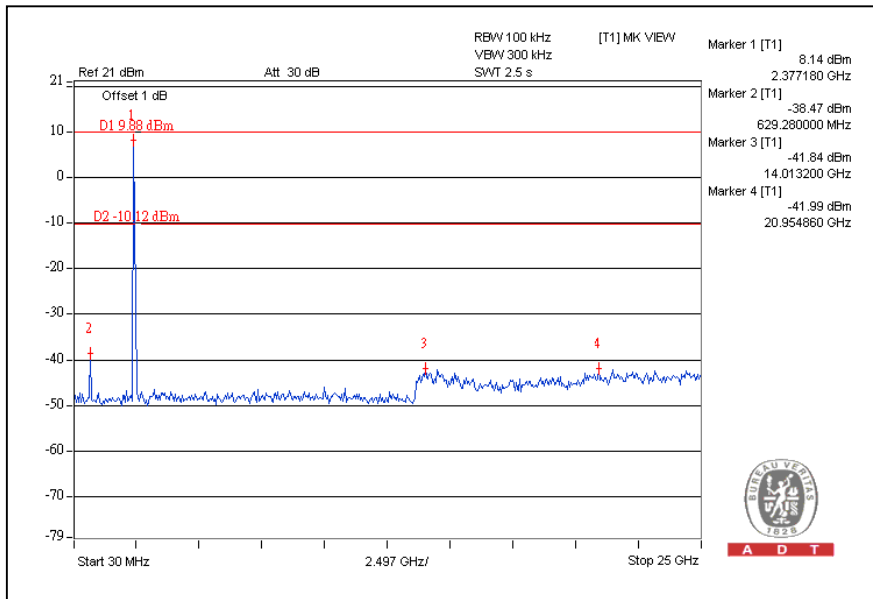
CH1



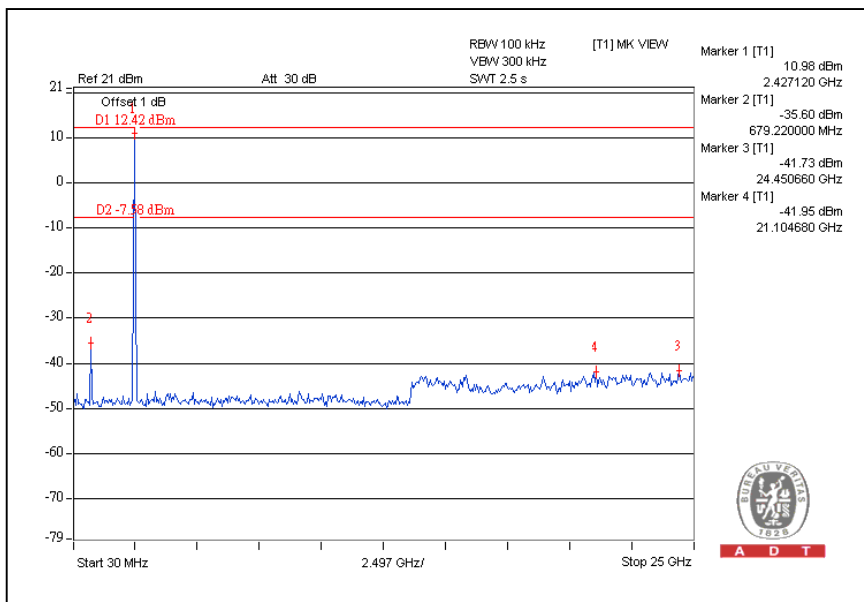
CH11



CH1

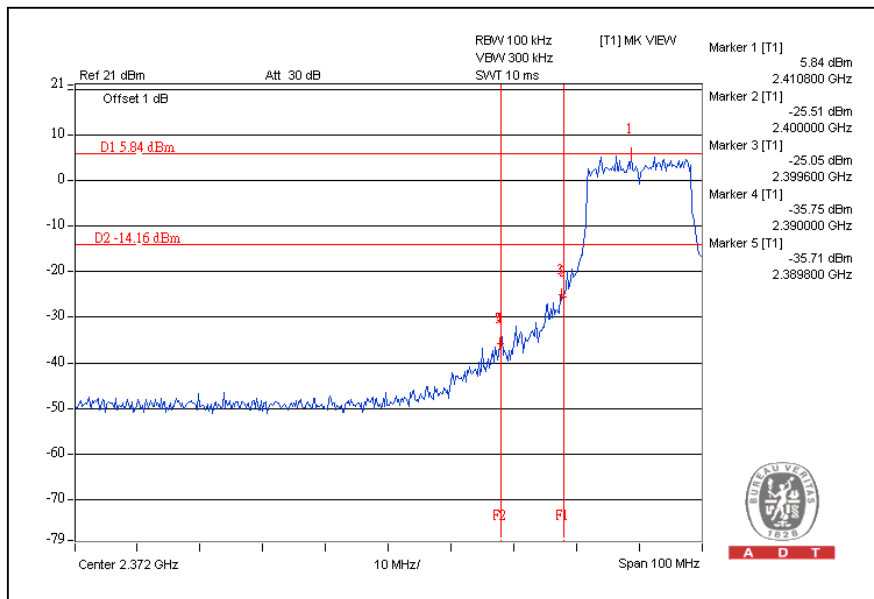


CH11

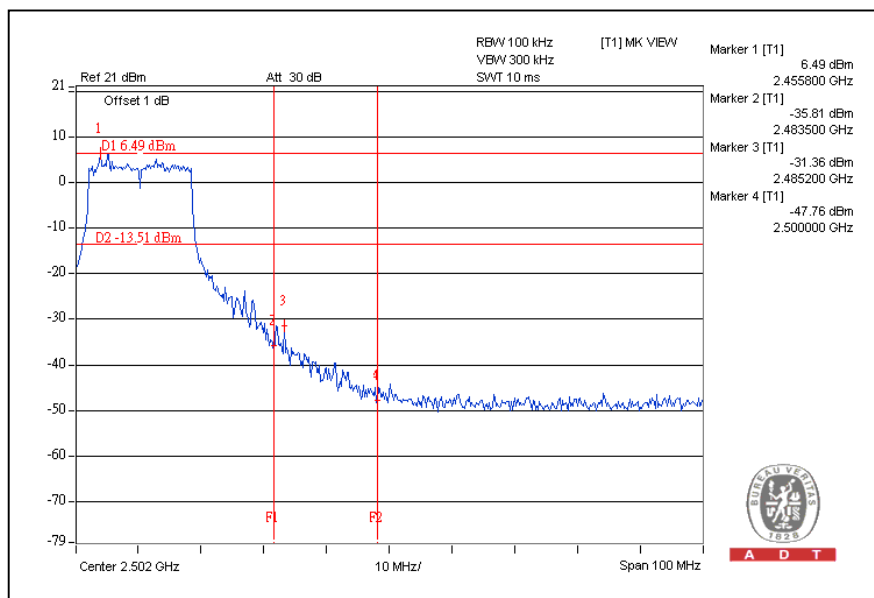


802.11g OFDM MODULATION:

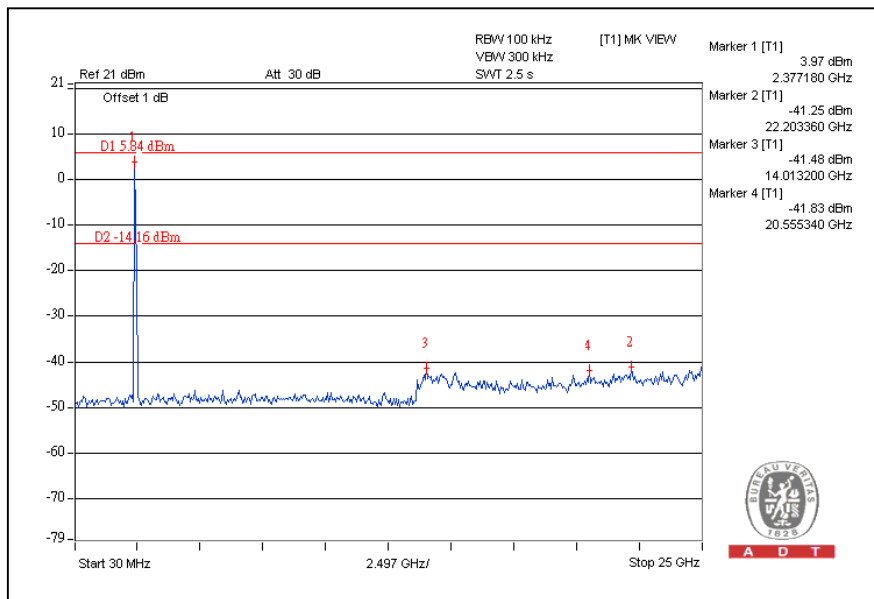
CH1



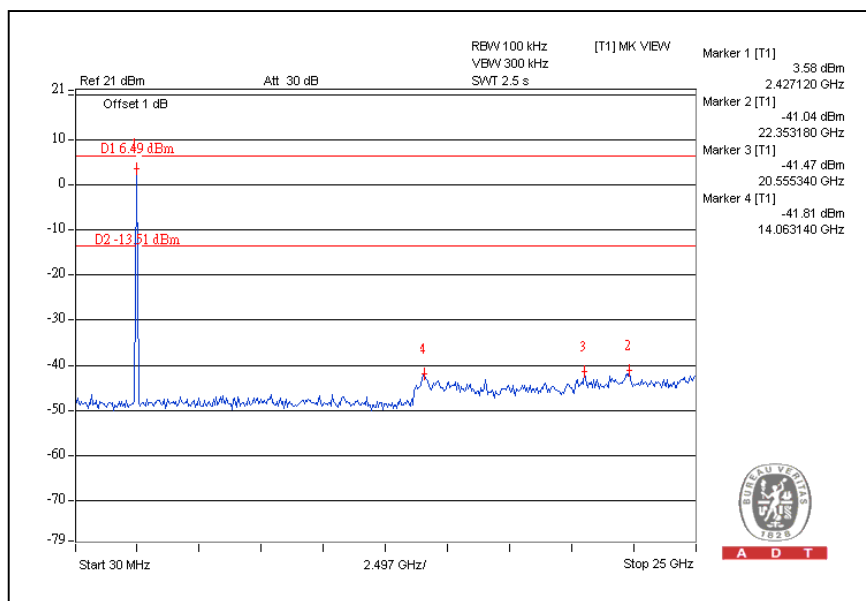
CH11



CH1

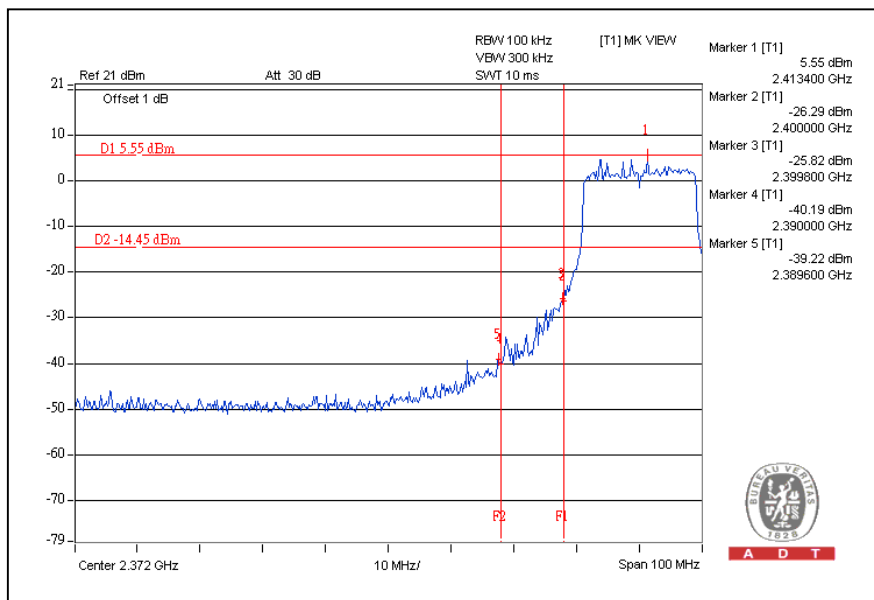


CH11

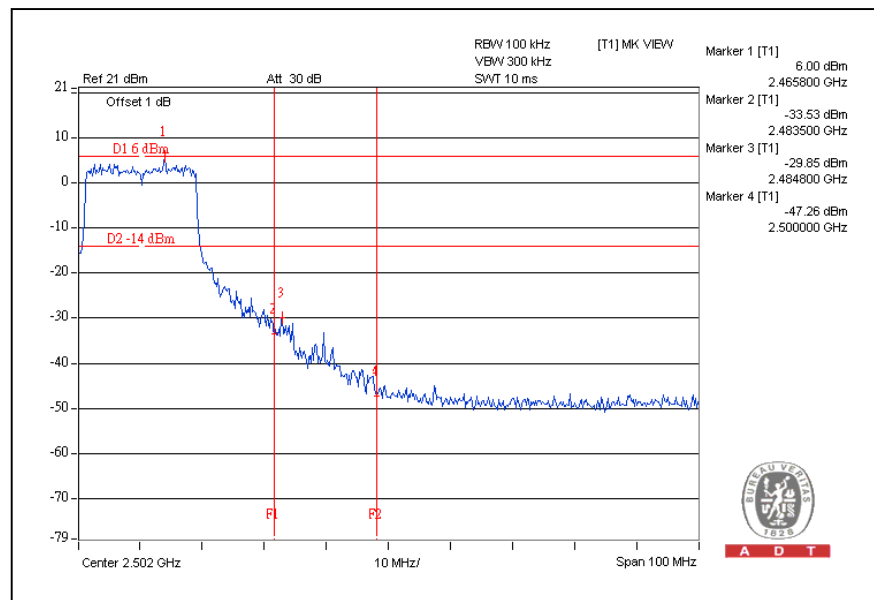


802.11n (20MHz) OFDM MODULATION:

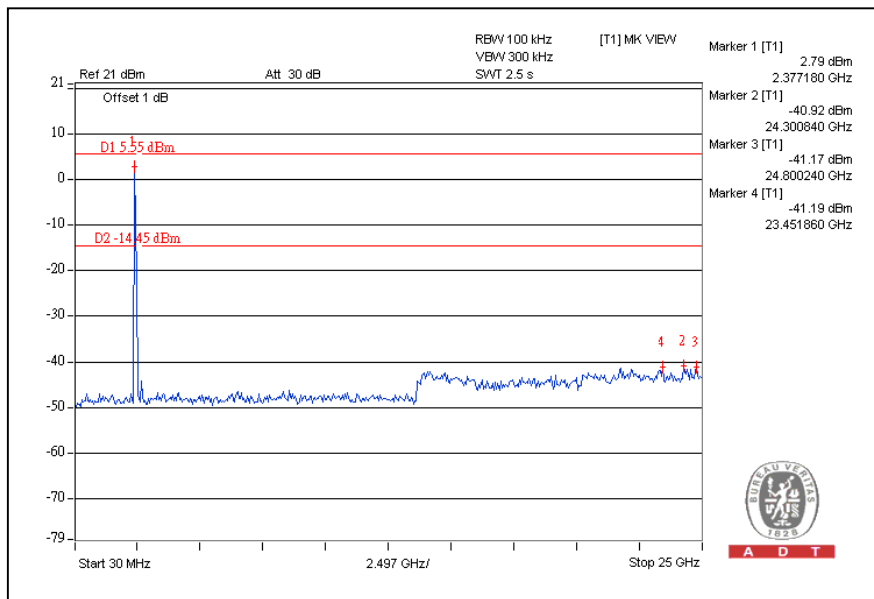
CH1



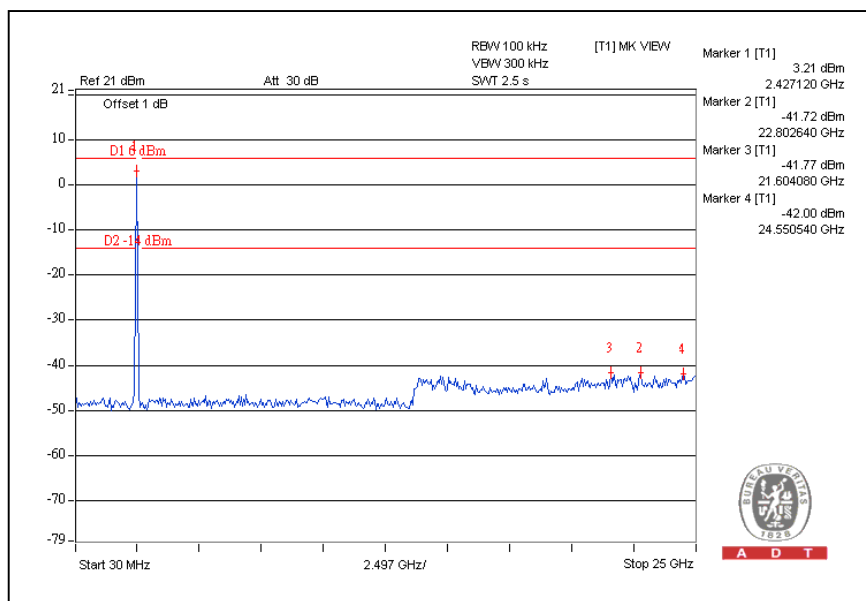
CH11



CH1

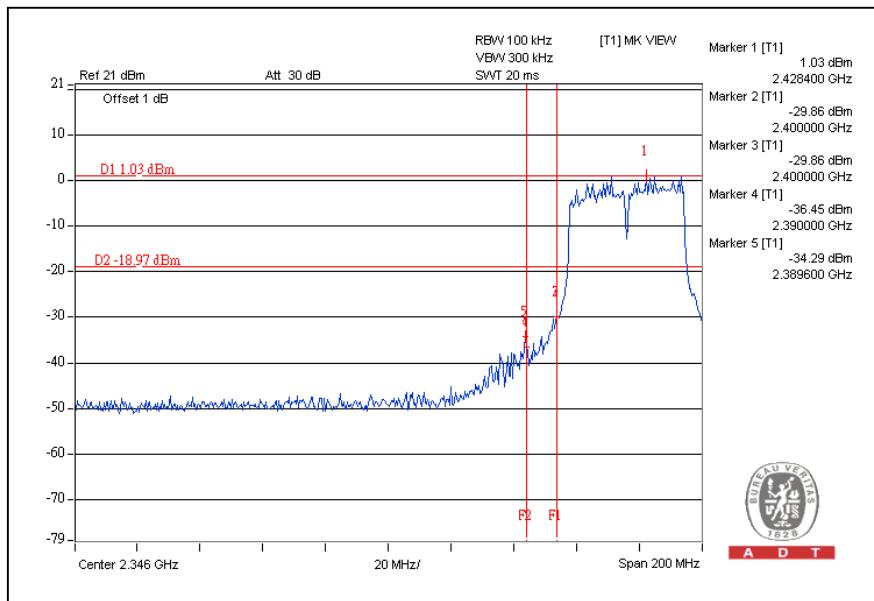


CH11

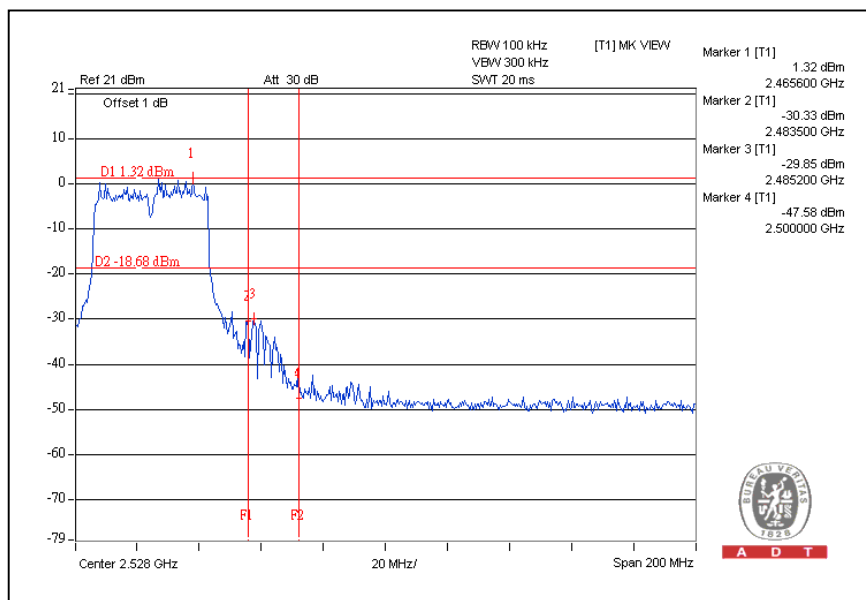


802.11n (40MHz) OFDM MODULATION:

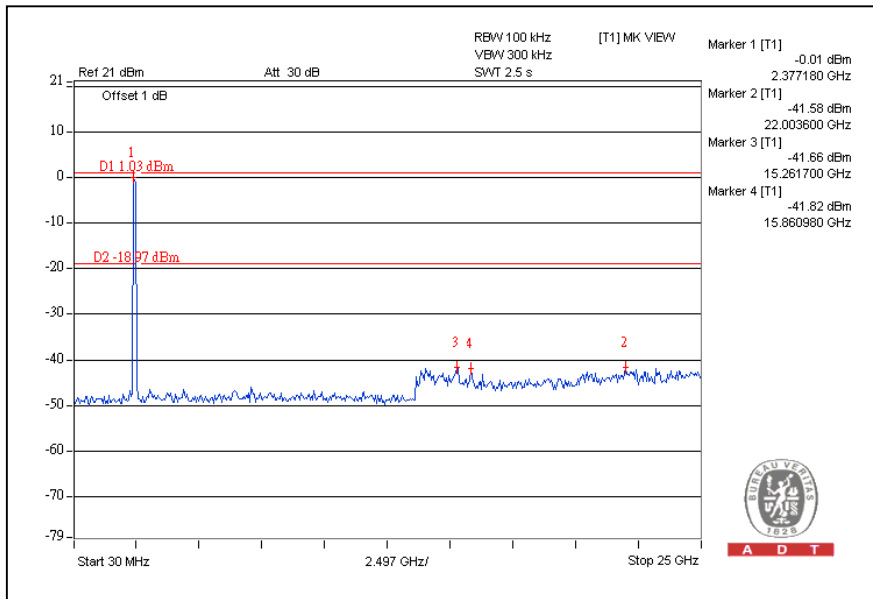
CH1



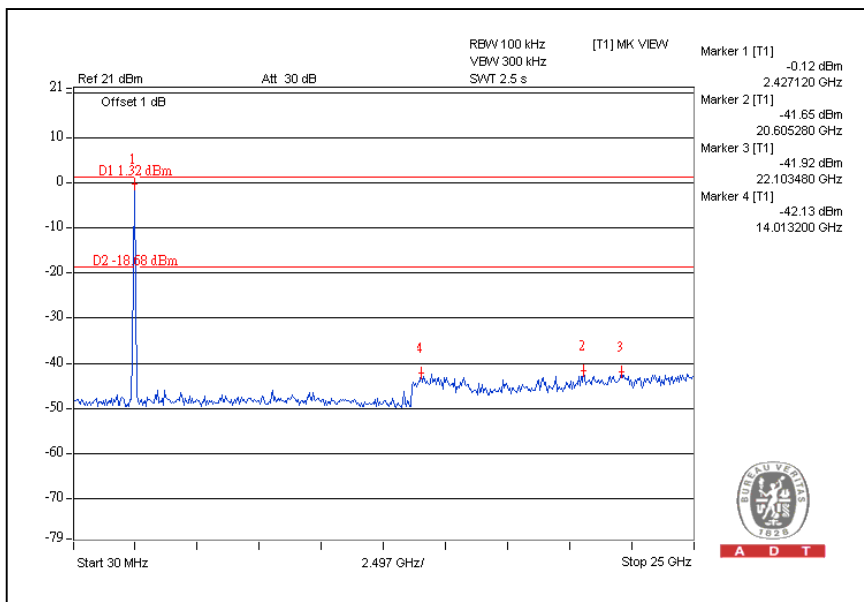
CH7



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 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. 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

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---