



FCC TEST REPORT

REPORT NO.: RF110906E03-1 R1

MODEL NO.: MC2180

FCC ID: UZ7MC2180

RECEIVED: Sep. 06, 2011

TESTED: Sep. 29 to Oct. 14, 2011

ISSUED: Nov. 03, 2011

APPLICANT: Motorola Solution Inc.

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11742-1300 USA

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

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Table of Contents

RELEASE CONTROL RECORD	4
1. CERTIFICATION	5
2. SUMMARY OF TEST RESULTS	6
2.1 MEASUREMENT UNCERTAINTY	7
3. GENERAL INFORMATION	8
3.1 GENERAL DESCRIPTION OF EUT	8
3.2 DESCRIPTION OF TEST MODES	11
3.2.1 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL	12
3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS	15
3.4 DESCRIPTION OF SUPPORT UNITS.....	16
3.5 CONFIGURATION OF SYSTEM UNDER TEST	17
4. TEST TYPES AND RESULTS	19
4.1 CONDUCTED EMISSION MEASUREMENT	19
4.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT	19
4.1.2 TEST INSTRUMENTS.....	19
4.1.3 TEST PROCEDURES	20
4.1.4 DEVIATION FROM TEST STANDARD	20
4.1.5 TEST SETUP	21
4.1.6 EUT OPERATING CONDITIONS	21
4.1.7 TEST RESULTS (MODE A).....	22
4.1.8 TEST RESULTS (MODE D)	24
4.1.9 TEST RESULTS (MODE E)	26
4.1.10 TEST RESULTS (MODE F).....	28
4.2 RADIATED EMISSION MEASUREMENT	30
4.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT	30
4.2.2 TEST INSTRUMENTS.....	31
4.2.3 TEST PROCEDURES	32
4.2.4 DEVIATION FROM TEST STANDARD	32
4.2.5 TEST SETUP	33
4.2.6 EUT OPERATING CONDITIONS	33
4.2.7 TEST RESULTS	34
4.3 6dB BANDWIDTH MEASUREMENT	74
4.3.1 LIMITS OF 6dB BANDWIDTH MEASUREMENT	74
4.3.2 TEST INSTRUMENTS.....	74
4.3.3 TEST PROCEDURE.....	74
4.3.4 DEVIATION FROM TEST STANDARD	74
4.3.5 TEST SETUP	74
4.3.6 EUT OPERATING CONDITIONS	74
4.3.7 TEST RESULTS	75
4.4 MAXIMUM PEAK OUTPUT POWER.....	78



A D T

4.4.1	LIMITS OF MAXIMUM PEAK OUTPUT POWER MEASUREMENT	78
4.4.2	INSTRUMENTS.....	78
4.4.3	TEST PROCEDURES	78
4.4.4	DEVIATION FROM TEST STANDARD	78
4.4.5	TEST SETUP	78
4.4.6	EUT OPERATING CONDITIONS	78
4.4.7	TEST RESULTS	79
4.5	POWER SPECTRAL DENSITY MEASUREMENT.....	81
4.5.1	LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT	81
4.5.2	TEST INSTRUMENTS.....	81
4.5.3	TEST PROCEDURE.....	81
4.5.4	DEVIATION FROM TEST STANDARD.....	81
4.5.5	TEST SETUP	81
4.5.6	EUT OPERATING CONDITION.....	81
4.5.7	TEST RESULTS	82
4.6	CONDUCTED OUT-BAND EMISSION MEASUREMENT.....	85
4.6.1	LIMITS OF CONDUCTED OUT-BAND EMISSION MEASUREMENT.....	85
4.6.2	TEST INSTRUMENTS.....	85
4.6.3	TEST PROCEDURE.....	85
4.6.4	DEVIATION FROM TEST STANDARD.....	85
4.6.5	EUT OPERATING CONDITION.....	85
4.6.6	TEST RESULTS	85
5.	INFORMATION ON THE TESTING LABORATORIES	98
6.	APPENDIX A - MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB.....	99



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RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF110906E03-1	Original release	Oct. 28, 2011
RF110906E03-1 R1	Modified section 3.1 notes	Nov. 03, 2011



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1. CERTIFICATION

PRODUCT: Mobile Computer
BRAND NAME: MOTOROLA
MODEL NO.: MC2180
TEST SAMPLE: ENGINEERING SAMPLE
APPLICANT: Motorola Solution Inc.
TESTED: Sep. 29 to Oct. 14, 2011
STANDARDS: FCC Part 15, Subpart C (Section 15.247)
ANSI C63.4-2003
ANSI C63.10-2009

The above equipment (Model: MC2180) 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 : Elsie Hsu , **DATE:** Nov. 03, 2011
(Elsie Hsu, Specialist)

APPROVED BY : May Chen , **DATE:** Nov. 03, 2011
(May Chen, Deputy Manager)



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2. SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC Part 15, Subpart C			
Standard Section	Test Type and Limit	Result	Remark
15.207	AC Power Conducted Emission	PASS	Meet the requirement of limit. Minimum passing margin is -10.85dB at 0.150MHz
15.247(a)(2)	Spectrum Bandwidth of a Direct Sequence Spread Spectrum System Limit: min. 500kHz	PASS	Meet the requirement of limit.
15.247(b)	Maximum Peak Output Power Limit: max. 30dBm	PASS	Meet the requirement of limit.
15.247(d)	Radiated Emissions Limit: Table 15.209	PASS	Meet the requirement of limit. Minimum passing margin is -1.0dB at 2487.30MHz & 2390.00MHz & 2483.50MHz
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	No antenna connector is used.



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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)	4 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

PRODUCT	Mobile Computer
MODEL NO.	MC2180
FCC ID	UZ7MC2180
POWER SUPPLY	DC 3.7V from battery DC 5.4V from cradle or power adapter
MODULATION TYPE	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM
MODULATION TECHNOLOGY	DSSS, OFDM
TRANSFER RATE	802.11b: up to 11Mbps 802.11g: up to 54Mbps 802.11n (20MHz, 800ns GI): up to 65 Mbps 802.11n (20MHz, 400ns GI): up to 72.2Mbps
OPERATING FREQUENCY	2412MHz ~ 2.472GHz
NUMBER OF CHANNEL	For 802.11b, 802.11g, 802.11n (20MHz) : 13
MAXIMUM OUTPUT POWER	802.11b: 138.0mW 802.11g: 316.2mW 802.11n (20MHz): 302.0mW
ANTENNA TYPE	Please see note
DATA CABLE	NA
I/O PORTS	microUSB port x 1
ASSOCIATED DEVICES	Battery x 1

NOTE:

1. There are WLAN technology and Bluetooth technology (BT2.0+EDR) used for the EUT. <the Bluetooth test data please refer "RF110906E03 R1">
2. WLAN and Bluetooth technology cannot transmit at same time.
3. There is one antenna provided to this EUT, please refer to the following table:

WLAN & Bluetooth			
Antenna Type	Gain (dBi) include cable loss	Connector Type	Frequency range (MHz)
PIFA	3.2	NA	2400~2500

4. The EUT has three samples which are identical to each other in all aspects except for the following table:

Sample	Brand	Model Name	Data capture (with different touch panel)	Description
1	MOTOROLA	MC2180	SE655 (linear imager)	With WiFi & Bluetooth
2			SE960 (LASER scanner)	
3			SE4500 (imager)	

From the above samples, after pre-tested sample1 was the worst case and it was selected as representative model for the test and its data was recorded in this report.

5. The EUT could be supplied from a Cradle, power adapter and battery as below table:

1-slot Cradle (not for sale together)	
Brand:	MOTOROLA
Model No.:	CRD2100-1000UR
Part No.:	CCRD2100-1000UR
Output power :	5.4V, 3.0A
Adapter (not for sale together)	
Brand:	MOTOROLA
Model No.:	86-14000-249R
Input power :	100-240V, 50/60Hz, 0.6A
Output power :	5.4V, 3.0A DC output cable (unshielded, 1.85m with one core)
Li-ion Battery	
Brand:	MOTOROLA
Part No.:	82-150612-01
Rating:	3.7V, 2400mAh, 8.88Wh

6. The EUT was pre-tested in chamber for radiated test (below 1GHz) under following test modes :

Test Mode	Description
Mode A	Sample1 : X-Z plane: EUT + Adapter
Mode B	Sample1 : Y-Z plane: EUT + Adapter
Mode C	Sample1 : X-Y plane: EUT + Adapter
Mode D	Sample1 : X-Z plane: EUT + USB Charger Cable + Battery
Mode E	Sample1 : X-Z plane: EUT + USB Charger Cable + Adapter
Mode F	Sample1 : X-Z plane: EUT + Cradle + USB Cable + Adapter
Mode G	Sample1 : X-Z plane: EUT + Headset Adapter + Battery
Mode H	Sample1 : X-Z plane: EUT + Headset Adapter + Adapter
Mode I	Sample1 : X-Z plane: EUT + Battery

From the above modes, the worst radiated test (below 1GHz) was found in **Mode A**. Therefore only the test data of the mode was recorded in this report.

7. The EUT also was pre-tested in chamber for radiated test (above 1GHz) under following test modes :

Test Mode	Description
Mode A	Sample1 : X-Y plane: EUT + Adapter
Mode B	Sample1 : Y-Z plane: EUT + Adapter
Mode C	Sample1 : X-Z plane: EUT + Adapter

From the above modes, the worst radiated test (above 1GHz) was found in **Mode A**. Therefore only the test data of the mode was recorded in this report.

8. The EUT is 1 * 1 spatial SISO (1Tx & 1Rx) without beam forming function.

9. When the EUT operating in 802.11n, the software operation, which is defined by manufacturer, MCS (Modulation and Coding Schemes) from 0 to 7.

10. 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.



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3.2 DESCRIPTION OF TEST MODES

Eleven channels are provided for 802.11b, 802.11g, 802.11n (20MHz):

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
1	2412MHz	8	2447MHz
2	2417MHz	9	2452MHz
3	2422MHz	10	2457MHz
4	2427MHz	11	2462MHz
5	2432MHz	12	2467MHz
6	2437MHz	13	2472MHz
7	2442MHz		



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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	OB	
A	√			√	√	X-Y plane : EUT
B		√				X-Z plane : EUT + Adapter
C			√			X-Y plane : EUT + Adapter
D	√					EUT + Headset Adapter + Adapter
E	√					EUT + USB Charger Cable + Adapter
F	√					EUT + Cradle + USB Cable + Adapter

Where **PLC**: Power Line Conducted Emission **RE < 1G**: Radiated Emission below 1GHz
RE [≥] 1G: Radiated Emission above 1GHz **APCM**: Antenna Port Conducted Measurement
OB: Conducted Out-Band Emission Measurement

POWER LINE CONDUCTED EMISSION TEST:

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

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)	COMBINATION MODE
802.11g	1 to 13	13	OFDM	BPSK	6	A
802.11g	1 to 13	13	OFDM	BPSK	6	D
802.11g	1 to 13	13	OFDM	BPSK	6	E
802.11g	1 to 13	13	OFDM	BPSK	6	F



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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)	COMBINATION MODE
802.11g	1 to 13	13	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)	COMBINATION MODE
802.11b	1 to 13	1, 6, 11, 12, 13	DSSS	DBPSK	1	C
802.11g	1 to 13	1, 6, 11, 12, 13	OFDM	BPSK	6	C
802.11n (20MHz)	1 to 13	1, 6, 11, 12, 13	OFDM	BPSK	6.5	C

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)	COMBINATION MODE
802.11b	1 to 13	1, 6, 11, 12, 13	DSSS	DBPSK	1	A
802.11g	1 to 13	1, 6, 11, 12, 13	OFDM	BPSK	6	A
802.11n (20MHz)	1 to 13	1, 6, 11, 12, 13	OFDM	BPSK	6.5	A

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



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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)	COMBINATION MODE
802.11b	1 to 13	1, 6, 11, 12, 13	DSSS	DBPSK	1	A
802.11g	1 to 13	1, 6, 11, 12, 13	OFDM	BPSK	6	A
802.11n (20MHz)	1 to 13	1, 6, 11, 12, 13	OFDM	BPSK	6.5	A

TEST CONDITION:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER (SYSTEM)	TESTED BY
PLC	27deg. C, 62%RH	120Vac, 60Hz	Kyle Huang
RE ³ 1G	25deg. C, 65%RH	120Vac, 60Hz	Evan Huang
RE<1G	26deg. C, 74%RH	120Vac, 60Hz	Rex Huang
APCM	25deg. C, 60%RH	120Vac, 60Hz	Rex Huang
OB	25deg. C, 60%RH	120Vac, 60Hz	Rex Huang



3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS

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

FCC Part 15, Subpart C. (15.247)

ANSI C63.4-2003

ANSI C63.10-2009

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

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



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3.4 DESCRIPTION OF SUPPORT UNITS

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

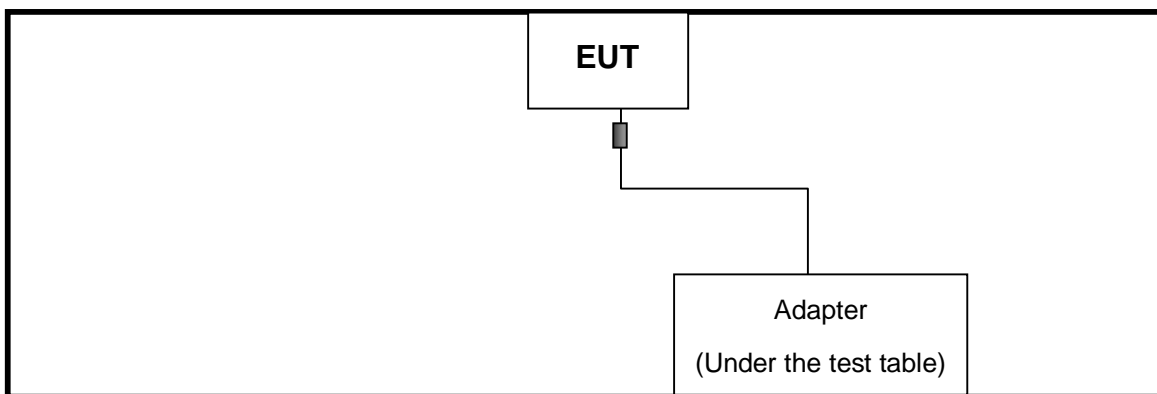
NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	Notebook	DELL	PP32LA	FSLB32S	FCC DoC
2	iPod	Apple	MC749TA/A	CC4DMFJUDFDM	NA
3	Earphone	Motorola	1117	NA	NA

No.	Signal cable description of the above support units
1	NA
2	USB cable, 0.1m
3	Audio cable, 1.2m

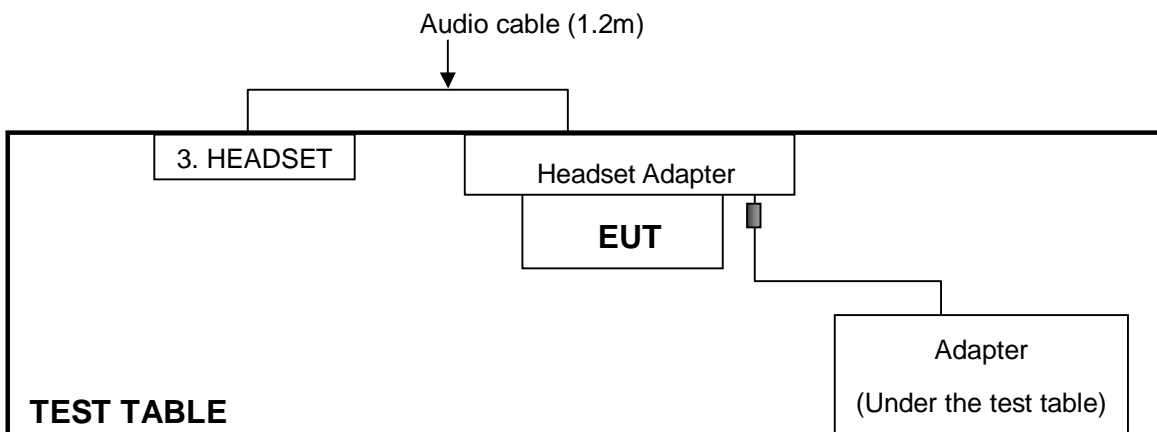
NOTE: All power cords of the above support units are non shielded (1.8m).

3.5 CONFIGURATION OF SYSTEM UNDER TEST

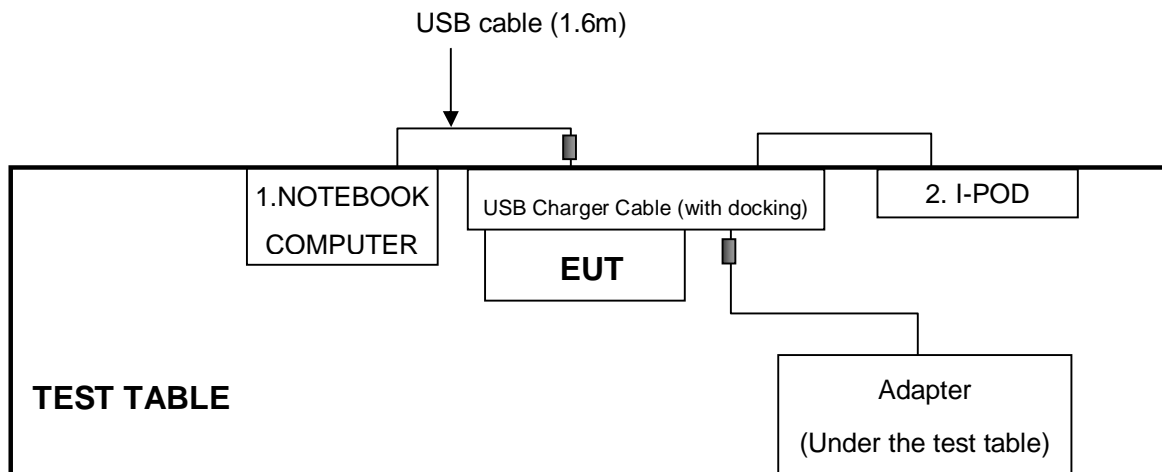
For Conducted test (mode A) and other test items:



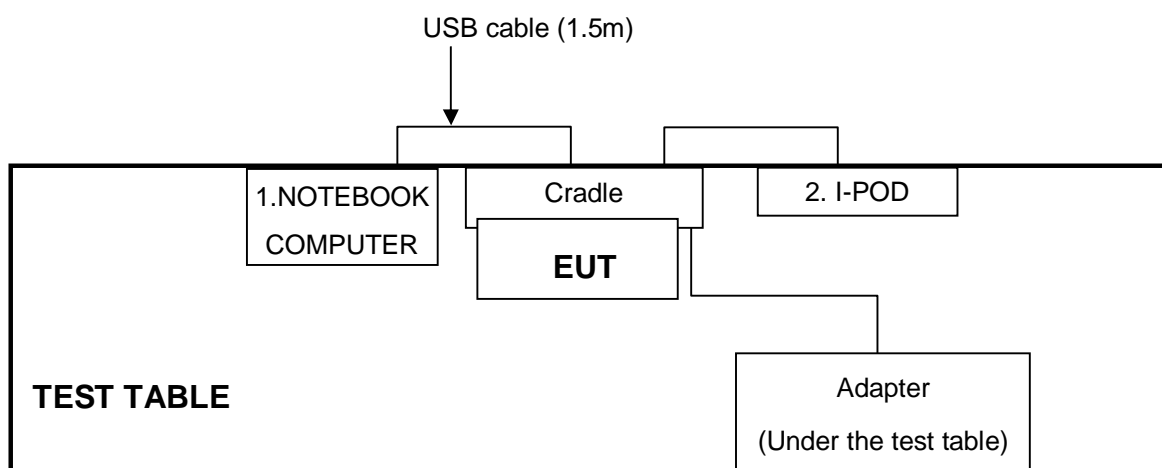
For Conducted test (mode D) :



For Conducted test (mode E) :



For Conducted test (mode F) :



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

Test date: Oct. 05, 2011

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver	ESCS 30	100375	Mar. 09, 2011	Mar. 08, 2012
Line-Impedance Stabilization Network (for EUT)	ENV216	100072	Jun. 10, 2011	Jun. 09, 2012
Line-Impedance Stabilization Network (for Peripheral)	ESH3-Z5	848773/004	Nov. 03, 2010	Nov. 02, 2011
RF Cable (JYBAO)	5DFB	COCCAB-002	Aug. 29, 2011	Aug. 28, 2012
50 ohms Terminator	50	3	Nov. 03, 2010	Nov. 02, 2011
Software	BV ADT_Cond_V7.3.7	NA	NA	NA

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in Shielded Room No. C.
3. The VCCI Con C Registration No. is C-3611.

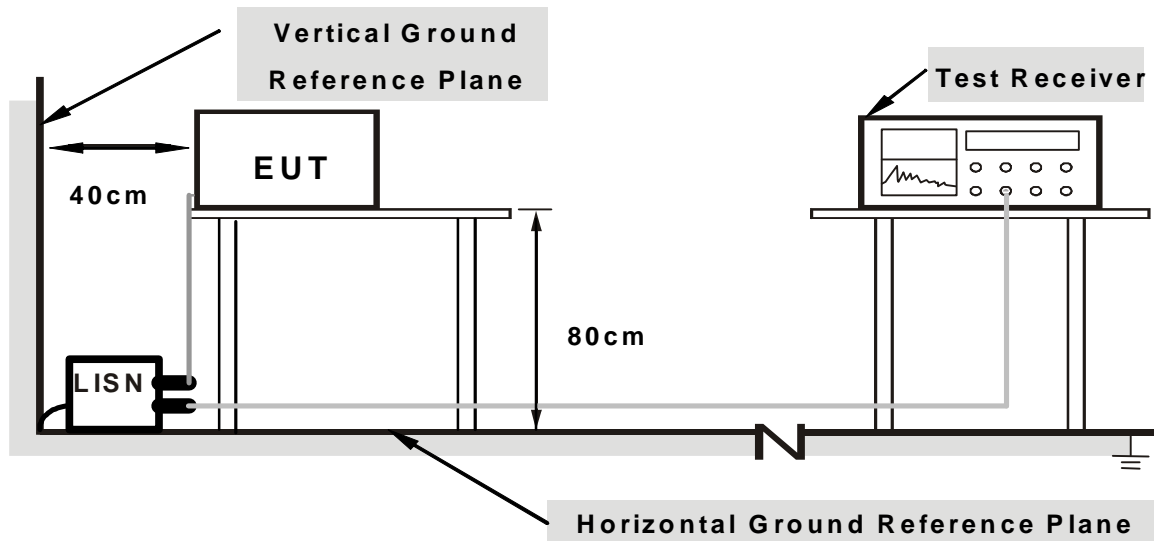
4.1.3 TEST PROCEDURES

- a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.
- b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
- c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) were not recorded.

4.1.4 DEVIATION FROM TEST STANDARD

No deviation

4.1.5 TEST SETUP



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

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

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

4.1.6 EUT OPERATING CONDITIONS

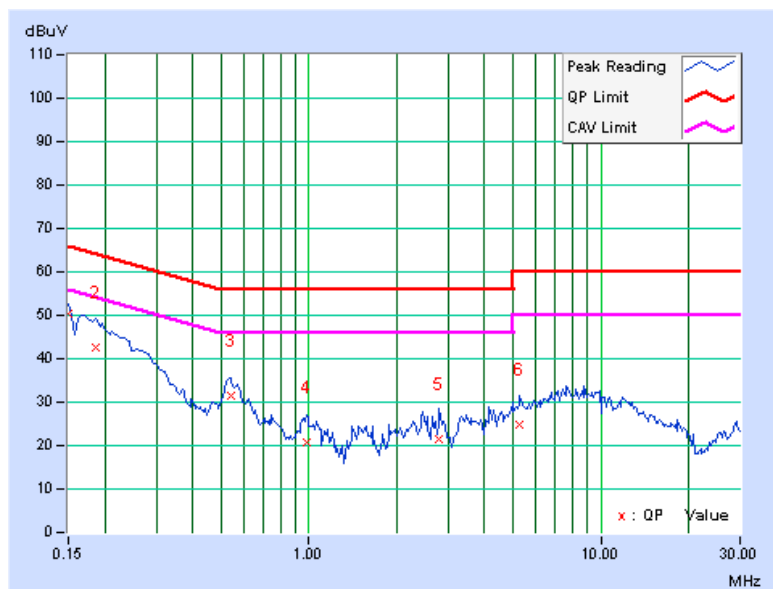
1. Turn on the power of EUT.
2. The EUT runs test program “XWingCon” under transmission / receiver condition continuously at specific channel frequency.

4.1.7 TEST RESULTS (MODE A)

PHASE	Line (L)	6dB BANDWIDTH	9 kHz
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No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
	1	0.150	0.09	50.42	20.56	50.51	20.65	66.00	56.00	-15.49
2	0.185	0.10	42.56	24.12	42.66	24.22	64.25	54.25	-21.60	-30.04
3	0.541	0.12	31.23	25.26	31.35	25.38	56.00	46.00	-24.65	-20.62
4	0.978	0.15	20.58	12.55	20.73	12.70	56.00	46.00	-35.27	-33.30
5	2.805	0.25	21.33	16.43	21.58	16.68	56.00	46.00	-34.42	-29.32
6	5.293	0.37	24.38	17.89	24.75	18.26	60.00	50.00	-35.25	-31.74

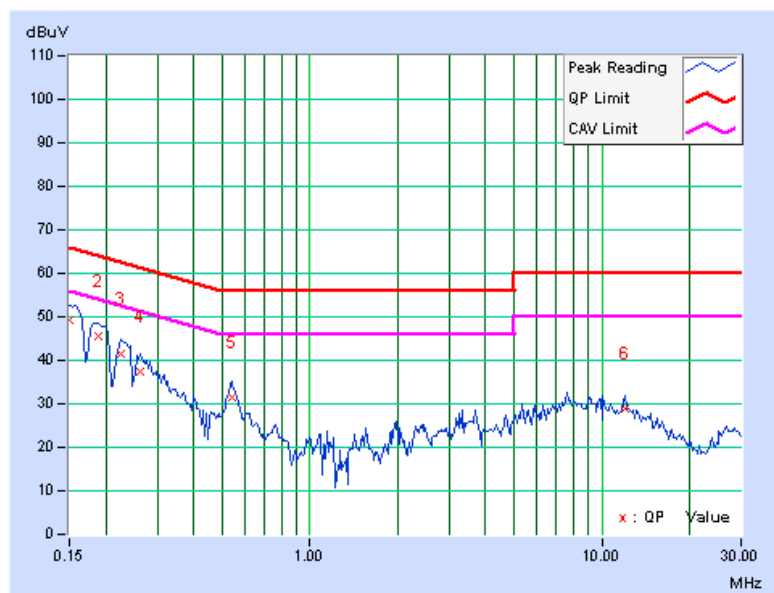
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. The emission levels of other frequencies were very low against the limit.
 3. Margin value = Emission level - Limit value
 4. Correction factor = Insertion loss + Cable loss
 5. Emission Level = Correction Factor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



PHASE	Neutral (N)	6dB BANDWIDTH	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	0.150	0.07	49.23	37.34	49.30	37.41	66.00	56.00	-16.70	-18.59
2	0.189	0.09	45.64	31.48	45.73	31.57	64.08	54.08	-18.35	-22.51
3	0.224	0.09	41.56	24.53	41.65	24.62	62.66	52.66	-21.01	-28.04
4	0.263	0.10	37.43	20.72	37.53	20.82	61.33	51.33	-23.80	-30.51
5	0.541	0.11	31.44	23.66	31.55	23.77	56.00	46.00	-24.45	-22.23
6	11.949	0.46	28.26	24.53	28.72	24.99	60.00	50.00	-31.28	-25.01

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

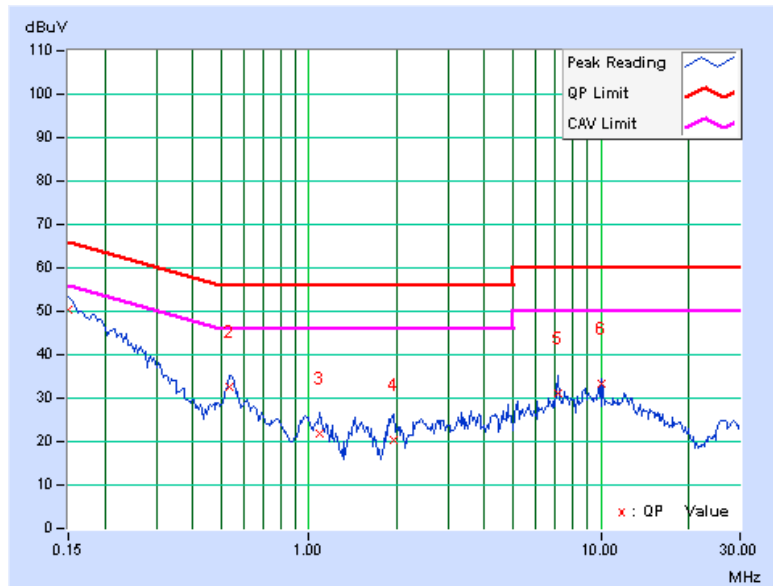


4.1.8 TEST RESULTS (MODE D)

PHASE	Line (L)	6dB BANDWIDTH	9 kHz
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No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
			1	0.150	0.09	50.23	33.99	50.32	34.08	66.00
2	0.533	0.12	32.45	24.34	32.57	24.46	56.00	46.00	-23.43	-21.54
3	1.090	0.15	21.58	15.23	21.73	15.38	56.00	46.00	-34.27	-30.62
4	1.949	0.20	20.29	16.12	20.49	16.32	56.00	46.00	-35.51	-29.68
5	7.168	0.44	30.84	26.64	31.28	27.08	60.00	50.00	-28.72	-22.92
6	10.074	0.55	32.93	30.57	33.48	31.12	60.00	50.00	-26.52	-18.88

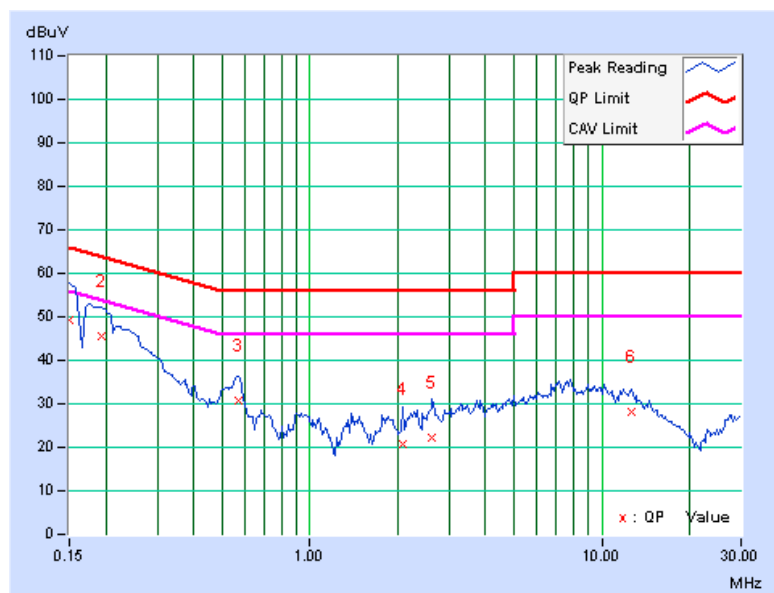
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. The emission levels of other frequencies were very low against the limit.
 3. Margin value = Emission level - Limit value
 4. Correction factor = Insertion loss + Cable loss
 5. Emission Level = Correction Factor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



PHASE	Neutral (N)	6dB BANDWIDTH	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	0.150	0.07	49.23	36.35	49.30	36.42	66.00	56.00	-16.70	-19.58
2	0.193	0.09	45.44	31.73	45.53	31.82	63.91	53.91	-18.38	-22.09
3	0.568	0.12	30.56	23.35	30.68	23.47	56.00	46.00	-25.32	-22.53
4	2.086	0.17	20.58	14.62	20.75	14.79	56.00	46.00	-35.25	-31.21
5	2.629	0.19	21.99	14.84	22.18	15.03	56.00	46.00	-33.82	-30.97
6	12.633	0.48	27.63	22.72	28.11	23.20	60.00	50.00	-31.89	-26.80

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

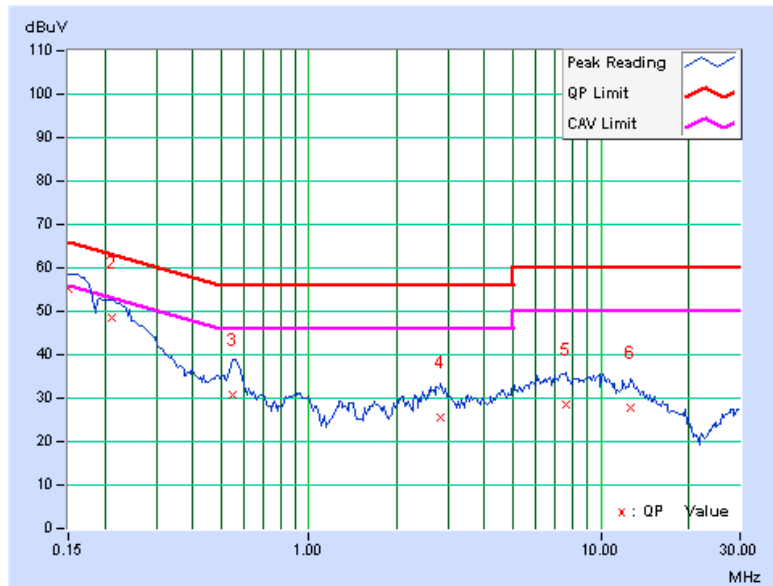


4.1.9 TEST RESULTS (MODE E)

PHASE	Line (L)	6dB BANDWIDTH	9 kHz
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No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
	1	0.150	0.09	55.06	42.53	55.15	42.62	66.00	56.00	-10.85
2	0.213	0.10	48.28	34.90	48.38	35.00	63.11	53.11	-14.73	-18.11
3	0.548	0.12	30.50	22.55	30.62	22.67	56.00	46.00	-25.38	-23.33
4	2.840	0.25	25.47	17.06	25.72	17.31	56.00	46.00	-30.28	-28.69
5	7.594	0.46	28.24	22.03	28.70	22.49	60.00	50.00	-31.30	-27.51
6	12.641	0.61	27.27	22.42	27.88	23.03	60.00	50.00	-32.12	-26.97

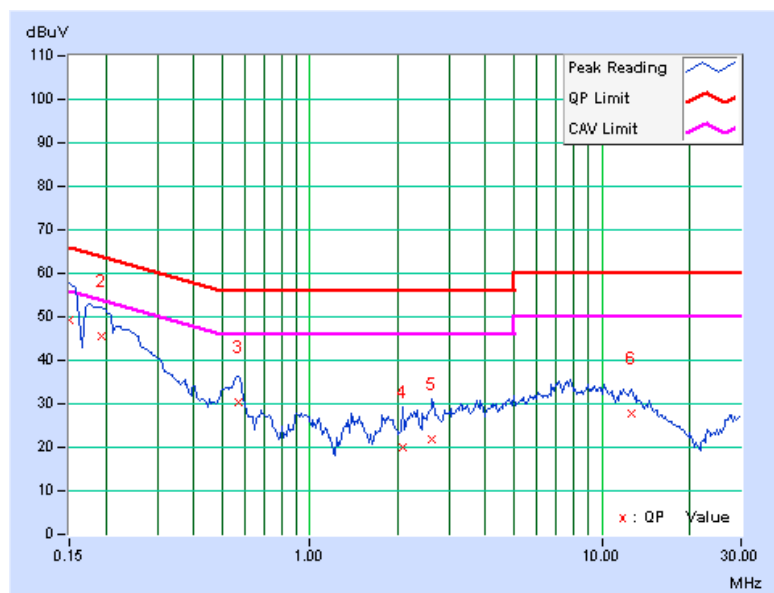
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. The emission levels of other frequencies were very low against the limit.
 3. Margin value = Emission level - Limit value
 4. Correction factor = Insertion loss + Cable loss
 5. Emission Level = Correction Factor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



PHASE	Neutral (N)	6dB BANDWIDTH	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	0.150	0.07	49.06	35.95	49.13	36.02	66.00	56.00	-16.87	-19.98
2	0.193	0.09	45.53	31.69	45.62	31.78	63.91	53.91	-18.29	-22.13
3	0.568	0.12	30.27	22.95	30.39	23.07	56.00	46.00	-25.61	-22.93
4	2.086	0.17	19.91	14.46	20.08	14.63	56.00	46.00	-35.92	-31.37
5	2.629	0.19	21.83	14.70	22.02	14.89	56.00	46.00	-33.98	-31.11
6	12.633	0.48	27.38	22.67	27.86	23.15	60.00	50.00	-32.14	-26.85

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

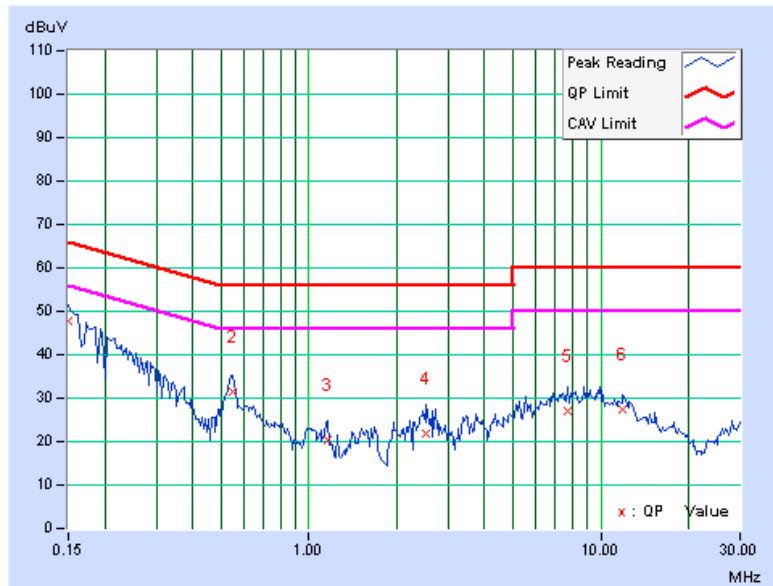


4.1.10 TEST RESULTS (MODE F)

PHASE	Line (L)	6dB BANDWIDTH	9 kHz
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No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
	1	0.150	0.09	47.87	34.36	47.96	34.45	66.00	56.00	-18.04
2	0.548	0.12	31.41	25.68	31.53	25.80	56.00	46.00	-24.47	-20.20
3	1.160	0.16	20.31	14.58	20.47	14.74	56.00	46.00	-35.53	-31.26
4	2.531	0.23	21.67	16.13	21.90	16.36	56.00	46.00	-34.10	-29.64
5	7.719	0.46	26.69	20.38	27.15	20.84	60.00	50.00	-32.85	-29.16
6	11.938	0.59	26.98	22.42	27.57	23.01	60.00	50.00	-32.43	-26.99

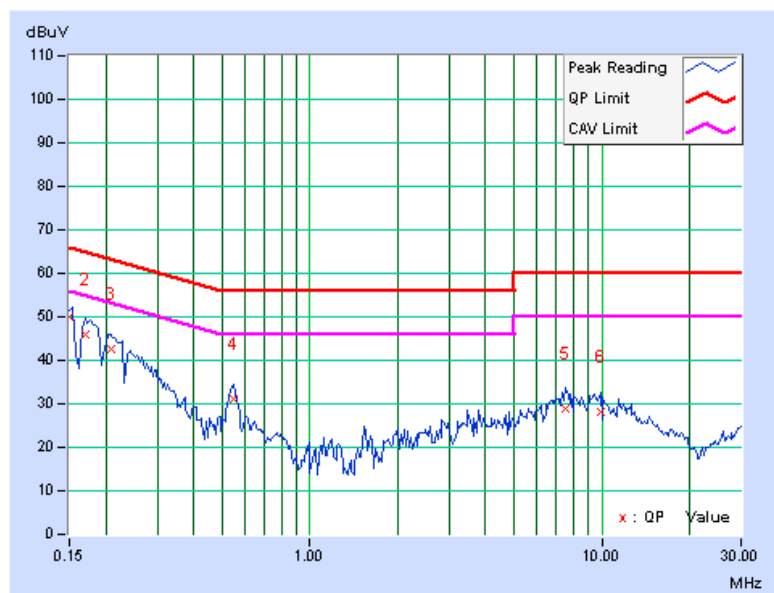
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. The emission levels of other frequencies were very low against the limit.
 3. Margin value = Emission level - Limit value
 4. Correction factor = Insertion loss + Cable loss
 5. Emission Level = Correction Factor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



PHASE	Neutral (N)	6dB BANDWIDTH	9 kHz
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No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
			1	0.150	0.07	49.77	33.36	49.84	33.43	66.00
2	0.170	0.08	45.99	25.40	46.07	25.48	64.98	54.98	-18.91	-29.50
3	0.209	0.09	42.34	27.42	42.43	27.51	63.26	53.26	-20.83	-25.75
4	0.548	0.11	31.06	25.22	31.17	25.33	56.00	46.00	-24.83	-20.67
5	7.555	0.34	28.56	21.78	28.90	22.12	60.00	50.00	-31.10	-27.88
6	9.871	0.41	27.69	22.56	28.10	22.97	60.00	50.00	-31.90	-27.03

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



4.2 RADIATED EMISSION MEASUREMENT

4.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT

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

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

NOTE:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. As shown in 15.35(b), for frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.
4. Section 15.205 restricted bands of operation shall compliance with the limits in Section 15.209.



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4.2.2 TEST INSTRUMENTS

Test date: Sep. 29 to Oct. 14, 2011

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
ROHDE & SCHWARZ Spectrum Analyzer	FSP40	100036	Dec. 08, 2010	Dec. 07, 2011
Agilent PSA Spectrum Analyzer	E4446A	MY48250113	Nov. 30 , 2010	Nov. 29 , 2011
HP Pre_Amplifier	8449B	300801923	Nov. 01, 2010	Oct. 31, 2011
ROHDE & SCHWARZ Test Receiver	ESCS30	847124/029	Sep. 02, 2011	Sep. 01, 2012
SCHWARZBECK TRILOG Broadband Antenna	VULB 9168	138	Apr. 14, 2011	Apr. 13, 2012
Schwarzbeck Horn_Antenna	BBHA9120	D124	Dec. 17, 2010	Dec. 16, 2011
Schwarzbeck Horn_Antenna	BBHA 9170	BBHA9170153	Jan. 17, 2011	Jan. 16, 2012
RF Switches	EMH-011	1001	Sep. 24, 2011	Sep. 23, 2012
RF CABLE (Chaintek)	Sucoflex 106	RF106-102	Jan. 27, 2011	Jan. 26, 2012
RF Cable	8DFB	STCCAB-30M-1GHz	Sep. 24, 2011	Sep. 23, 2012
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, 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 3 meters chamber test. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.
- f. The test-receiver system was set to peak and average detect function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

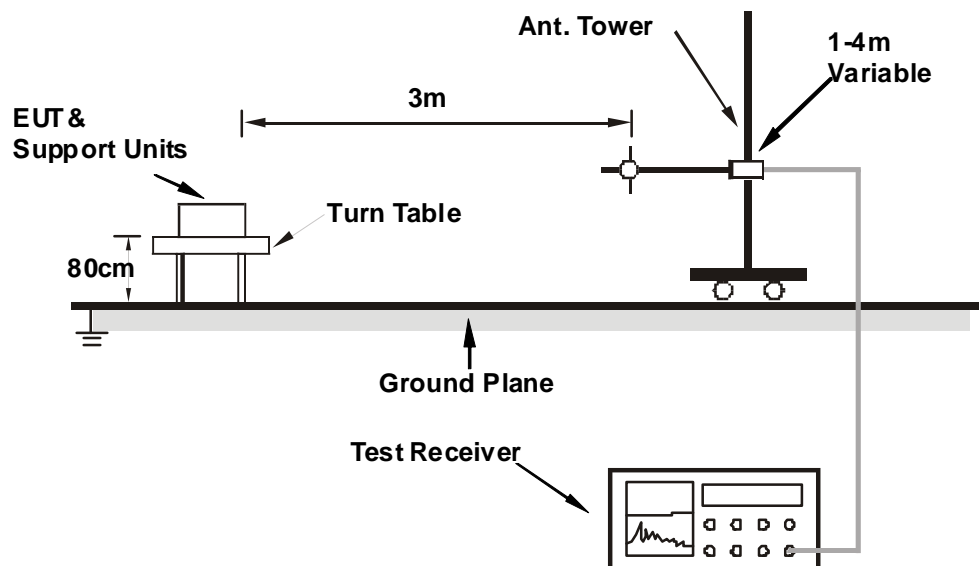
NOTE:

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



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4.2.7 TEST RESULTS

BELOW 1GHz WORST-CASE DATA : 802.11g OFDM MODULATION

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 13	FREQUENCY RANGE	Below 1000MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	26deg. C, 62%RH	TESTED BY	Nick Chang

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	120.00	33.8 QP	43.5	-9.7	4.00 H	245	21.30	12.48
2	200.00	32.8 QP	43.5	-10.7	4.00 H	123	21.58	11.20
3	300.00	39.4 QP	46.0	-6.6	2.83 H	161	23.33	16.03
4	400.00	39.4 QP	46.0	-6.6	1.72 H	227	20.73	18.63
5	500.00	36.8 QP	46.0	-9.2	1.63 H	217	15.52	21.26
6	896.50	39.4 QP	46.0	-6.6	1.00 H	151	11.28	28.10
7	960.01	41.7 QP	54.0	-12.3	1.00 H	263	12.64	29.02
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	68.33	33.6 QP	40.0	-6.4	1.00 V	351	21.15	12.43
2	122.31	34.7 QP	43.5	-8.8	1.00 V	15	21.90	12.79
3	144.00	34.3 QP	43.5	-9.3	1.00 V	172	19.39	14.86
4	200.00	34.2 QP	43.5	-9.4	1.00 V	135	22.95	11.20
5	480.00	38.7 QP	46.0	-7.3	1.00 V	123	17.96	20.73
6	960.01	41.7 QP	54.0	-12.3	1.72 V	23	12.66	29.02

- 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 (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 63%RH	TESTED BY	Nick Chang

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	2386.10	60.6 PK	74.0	-13.4	1.73 H	100	29.29	31.31
2	2386.10	52.8 AV	54.0	-1.2	1.73 H	100	21.49	31.31
3	*2412.00	112.3 PK			1.73 H	100	80.91	31.39
4	*2412.00	104.9 AV			1.73 H	100	73.51	31.39
5	4824.00	43.8 PK	74.0	-30.2	1.16 H	204	7.63	36.17
6	4824.00	32.1 AV	54.0	-21.9	1.16 H	204	-4.07	36.17

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	2386.10	56.7 PK	74.0	-17.3	1.24 V	157	25.39	31.31
2	2386.10	44.8 AV	54.0	-9.2	1.24 V	157	13.49	31.31
3	*2412.00	99.4 PK			1.00 V	65	68.01	31.39
4	*2412.00	93.7 AV			1.00 V	65	62.31	31.39
5	4824.00	43.1 PK	74.0	-30.9	1.10 V	214	6.93	36.17
6	4824.00	30.6 AV	54.0	-23.4	1.10 V	214	-5.57	36.17

- 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	25deg. C, 63%RH	TESTED BY	Nick Chang

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	109.7 PK			1.30 H	99	78.21	31.49
2	*2437.00	102.5 AV			1.30 H	99	71.01	31.49
3	4874.00	43.6 PK	74.0	-30.4	1.15 H	62	7.29	36.31
4	4874.00	32.8 AV	54.0	-21.2	1.15 H	62	-3.51	36.31
5	7311.00	47.7 PK	74.0	-26.3	1.11 H	217	5.47	42.23
6	7311.00	35.4 AV	54.0	-18.6	1.11 H	217	-6.83	42.23
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	104.3 PK			1.00 V	246	72.81	31.49
2	*2437.00	98.2 AV			1.00 V	246	66.71	31.49
3	4874.00	41.7 PK	74.0	-32.3	1.06 V	210	5.39	36.31
4	4874.00	30.1 AV	54.0	-23.9	1.06 V	210	-6.21	36.31
5	7311.00	48.2 PK	74.0	-25.8	1.27 V	54	5.97	42.23
6	7311.00	35.5 AV	54.0	-18.5	1.27 V	54	-6.73	42.23

- 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	25deg. C, 63%RH	TESTED BY	Nick Chang

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	113.9 PK			1.39 H	196	82.32	31.58
2	*2462.00	107.6 AV			1.39 H	196	76.02	31.58
3	2488.20	62.0 PK	74.0	-12.0	1.39 H	165	30.32	31.68
4	2488.20	52.5 AV	54.0	-1.5	1.39 H	165	20.82	31.68
5	4924.00	43.7 PK	74.0	-30.3	1.07 H	195	7.28	36.42
6	4924.00	32.8 AV	54.0	-21.2	1.07 H	195	-3.62	36.42
7	7386.00	48.9 PK	74.0	-25.1	1.07 H	199	6.38	42.52
8	7386.00	36.2 AV	54.0	-17.8	1.07 H	199	-6.32	42.52

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	99.8 PK			1.00 V	110	68.22	31.58
2	*2462.00	94.1 AV			1.00 V	110	62.52	31.58
3	2488.20	55.8 PK	74.0	-18.2	1.51 V	96	24.12	31.68
4	2488.20	43.4 AV	54.0	-10.6	1.51 V	96	11.72	31.68
5	4924.00	41.9 PK	74.0	-32.1	1.21 V	66	5.48	36.42
6	4924.00	30.3 AV	54.0	-23.7	1.21 V	66	-6.12	36.42
7	7386.00	47.9 PK	74.0	-26.1	1.19 V	25	5.38	42.52
8	7386.00	36.1 AV	54.0	-17.9	1.19 V	25	-6.42	42.52

- 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 12	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 63%RH	TESTED BY	Nick Chang

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	*2467.00	108.70 PK			1.39 H	198	77.10	31.60
2	*2467.00	101.50 AV			1.39 H	198	69.90	31.60
3	2484.10	61.30 PK	74.00	-12.70	1.39 H	198	29.64	31.66
4	2484.10	52.90 AV	54.00	-1.10	1.39 H	198	21.24	31.66
5	4934.00	41.50 PK	74.00	-32.50	1.40 H	141	5.06	36.44
6	4934.00	29.20 AV	54.00	-24.80	1.40 H	141	-7.24	36.44

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	*2467.00	94.40 PK			1.45 V	180	62.80	31.60
2	*2467.00	88.30 AV			1.45 V	180	56.70	31.60
3	2483.90	57.20 PK	74.00	-16.80	1.45 V	180	25.54	31.66
4	2483.90	44.70 AV	54.00	-9.30	1.45 V	180	13.04	31.66
5	4934.00	40.90 PK	74.00	-33.10	1.80 V	193	4.46	36.44
6	4934.00	29.00 AV	54.00	-25.00	1.80 V	193	-7.44	36.44

- 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 13	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 63%RH	TESTED BY	Nick Chang

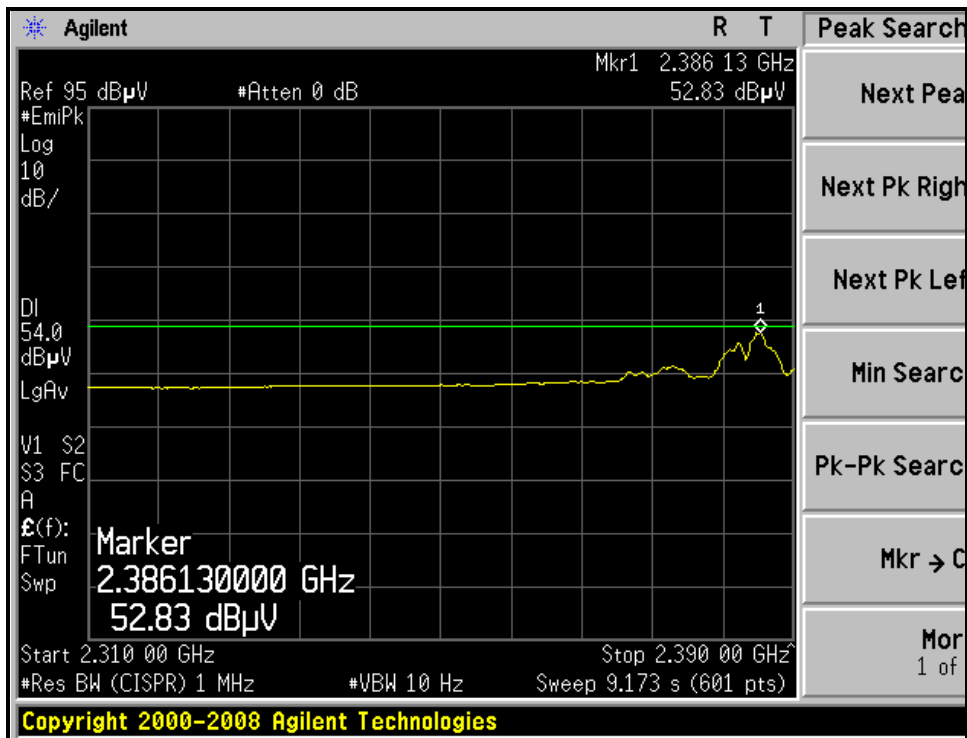
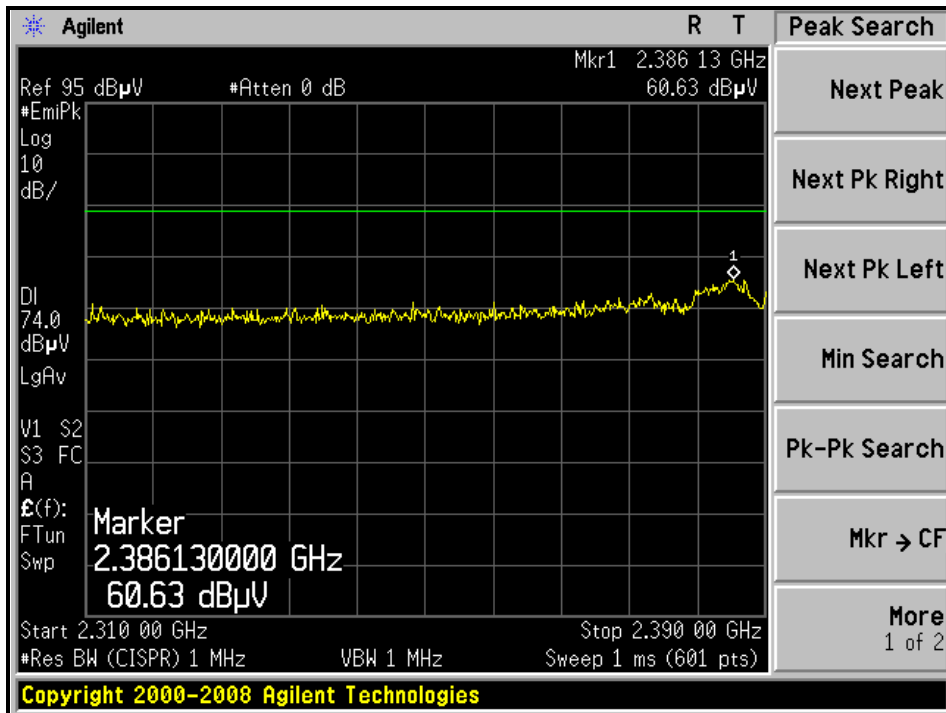
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NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2472.00	105.10 PK			1.39 H	19	73.48	31.62
2	*2472.00	98.10 AV			1.39 H	19	66.48	31.62
3	2487.30	61.20 PK	74.00	-12.80	1.35 H	19	29.53	31.67
4	2487.30	53.00 AV	54.00	-1.0	1.35 H	19	21.33	31.67
5	4944.00	41.80 PK	74.00	-32.20	1.30 H	23	5.35	36.45
6	4944.00	29.40 AV	54.00	-24.60	1.30 H	23	-7.05	36.45
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	*2472.00	93.00 PK			1.91 V	347	61.38	31.62
2	*2472.00	87.10 AV			1.91 V	347	55.48	31.62
3	2487.30	56.40 PK	74.00	-17.60	1.91 V	347	24.73	31.67
4	2487.30	43.90 AV	54.00	-10.10	1.91 V	347	12.23	31.67
5	4944.00	42.00 PK	74.00	-32.00	1.81 V	333	5.55	36.45
6	4944.00	29.30 AV	54.00	-24.70	1.81 V	333	-7.15	36.45

- 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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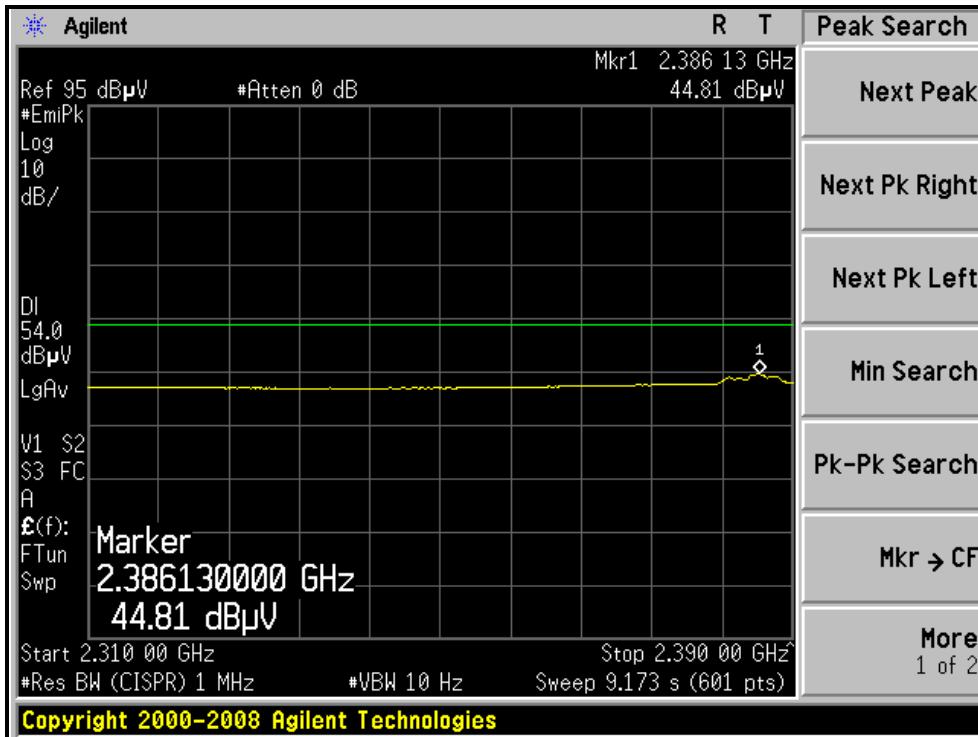
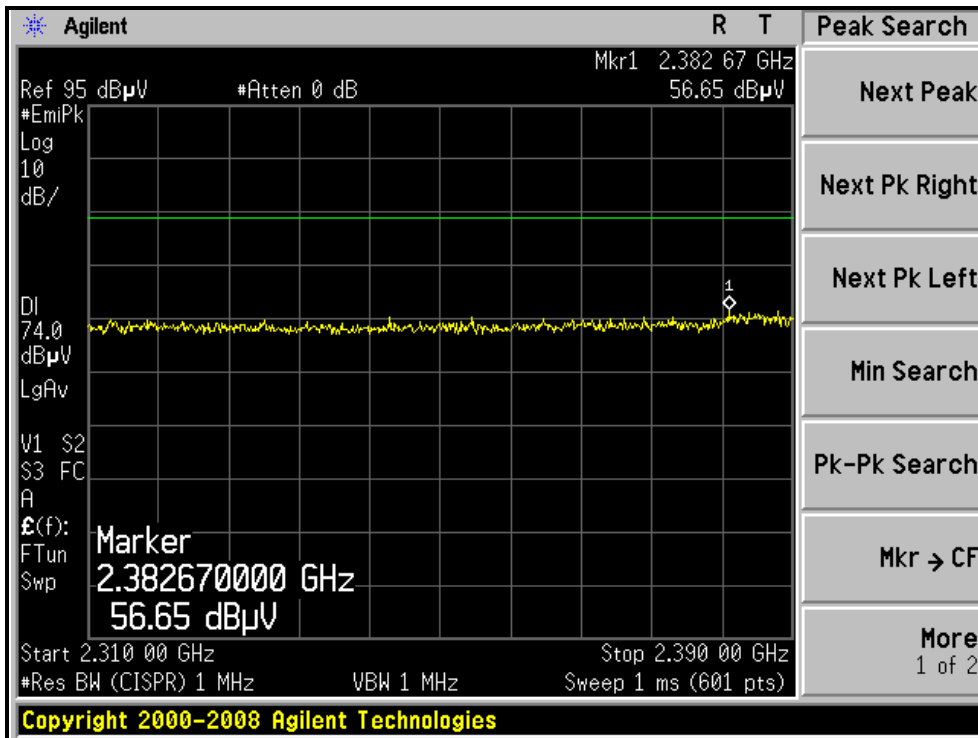
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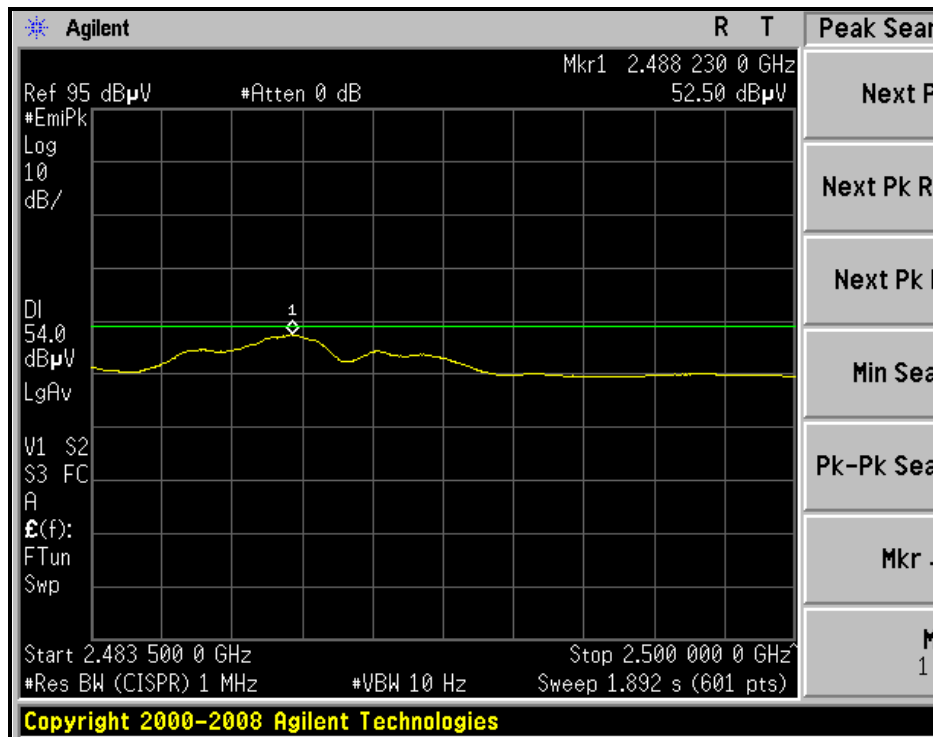
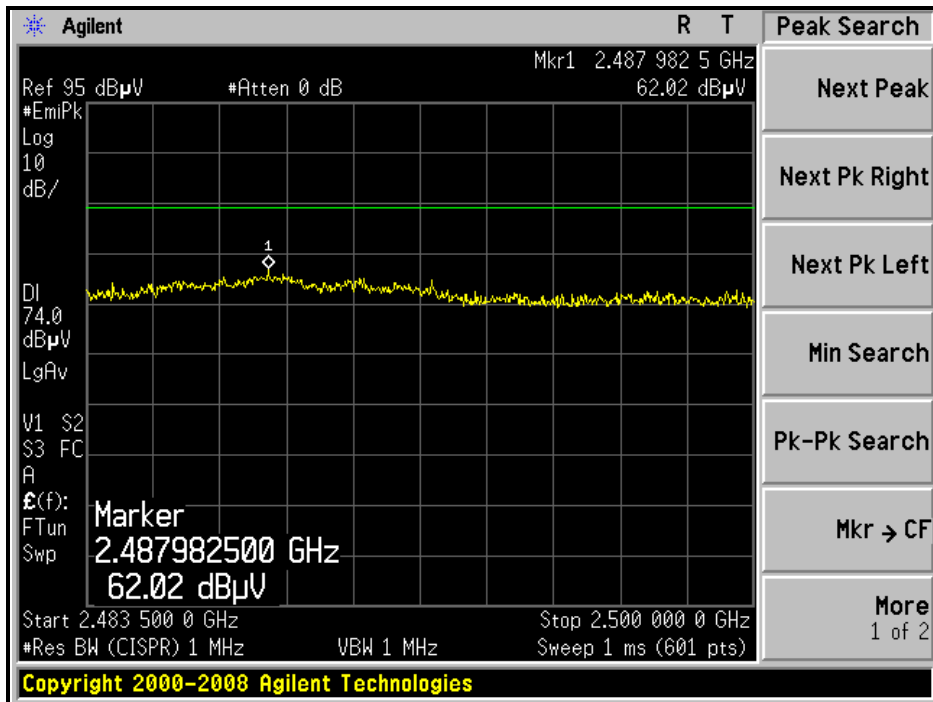
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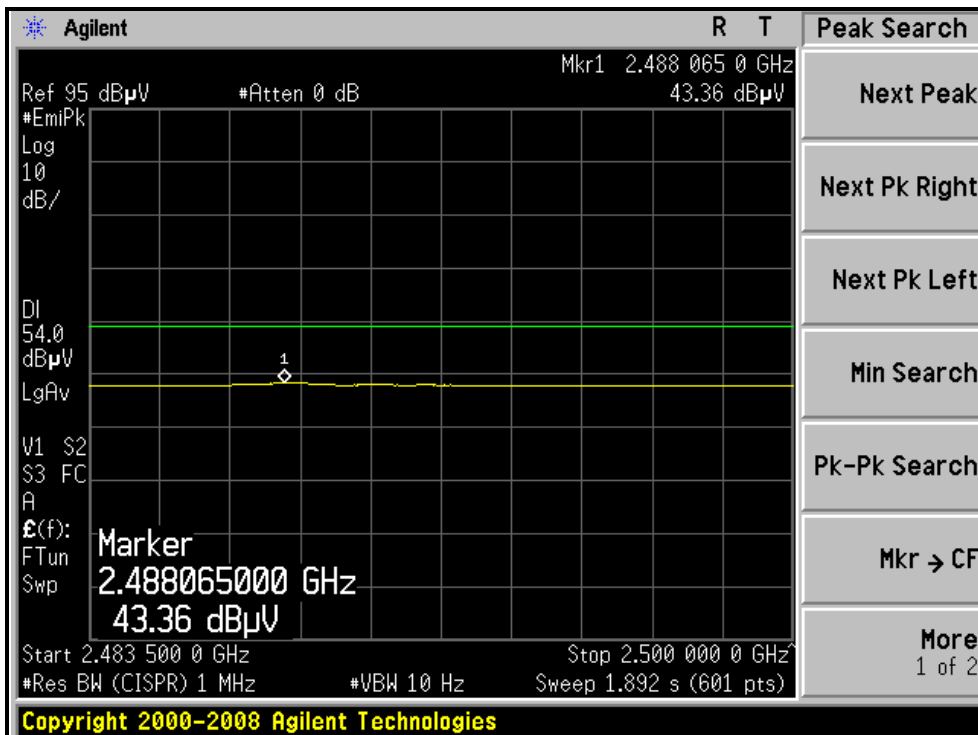
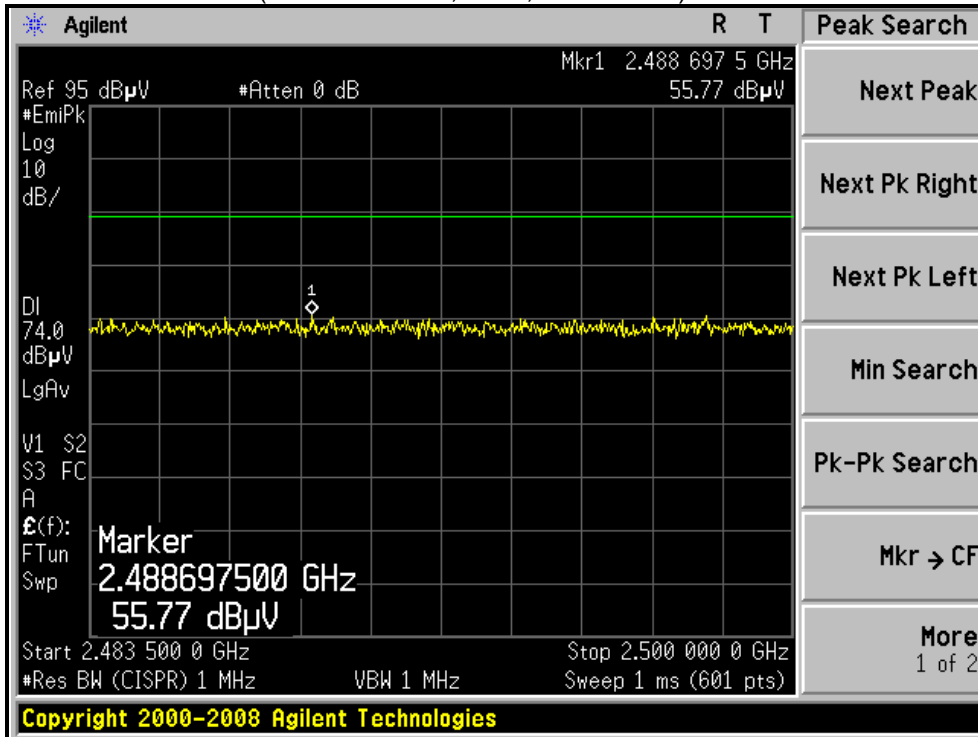
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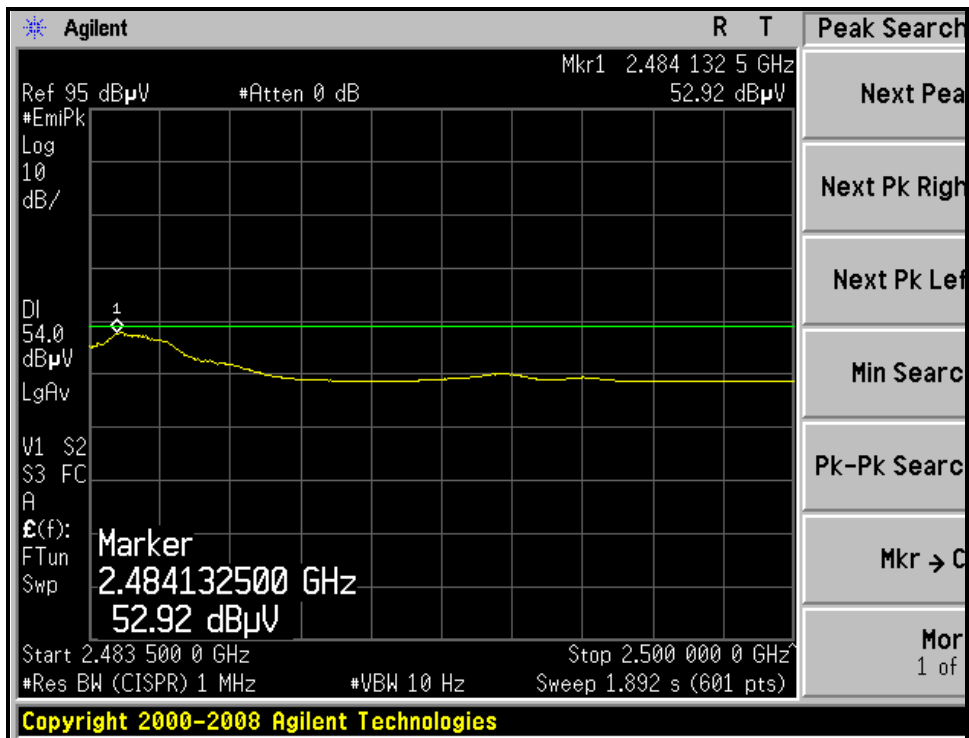
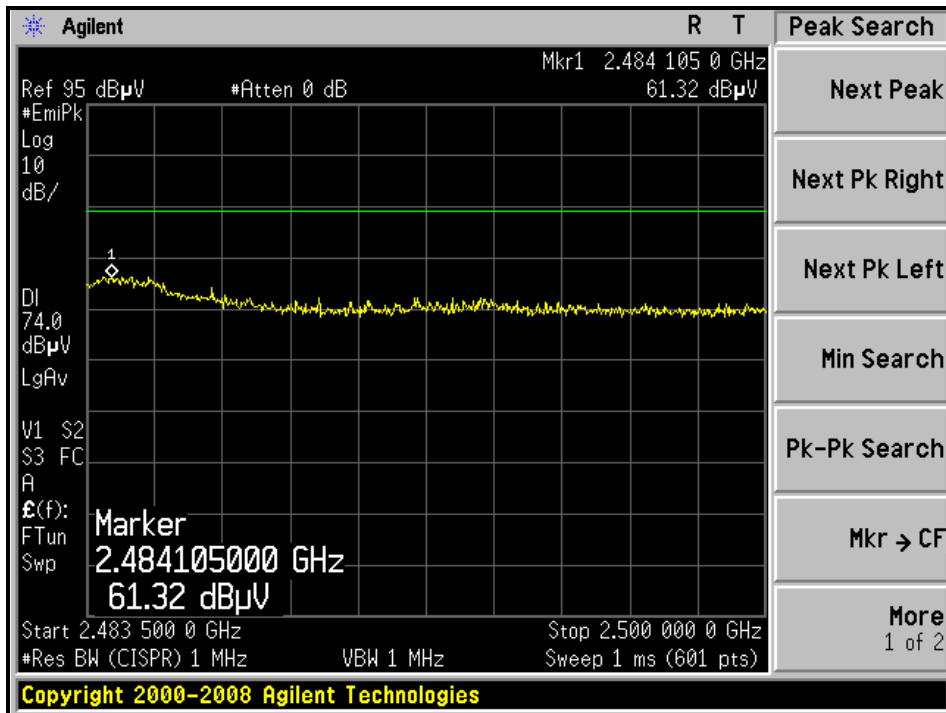
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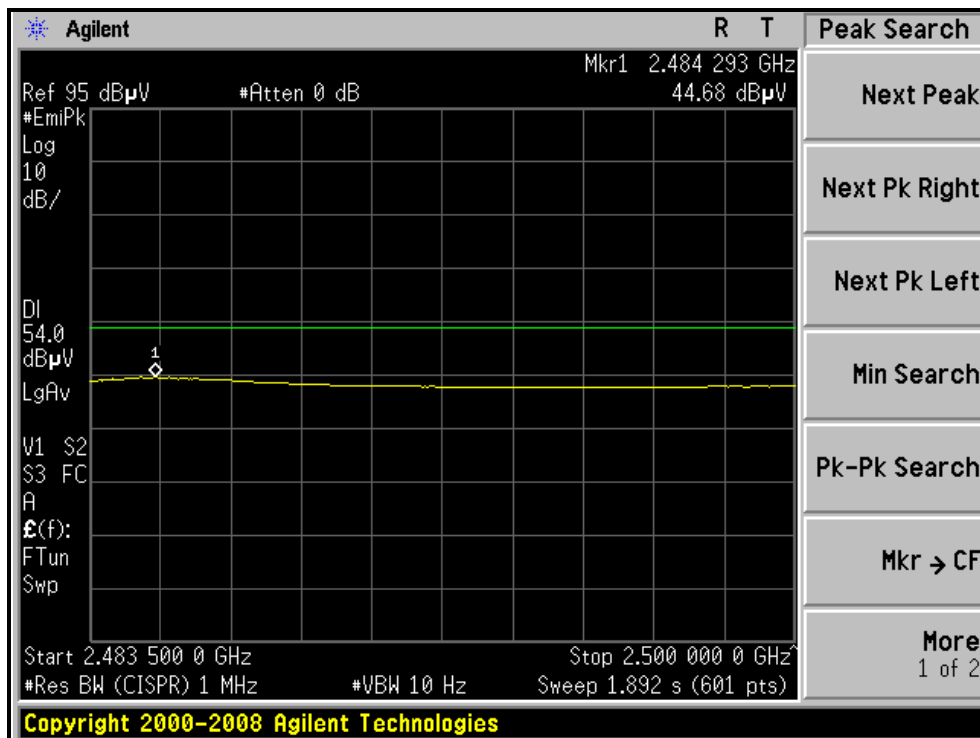
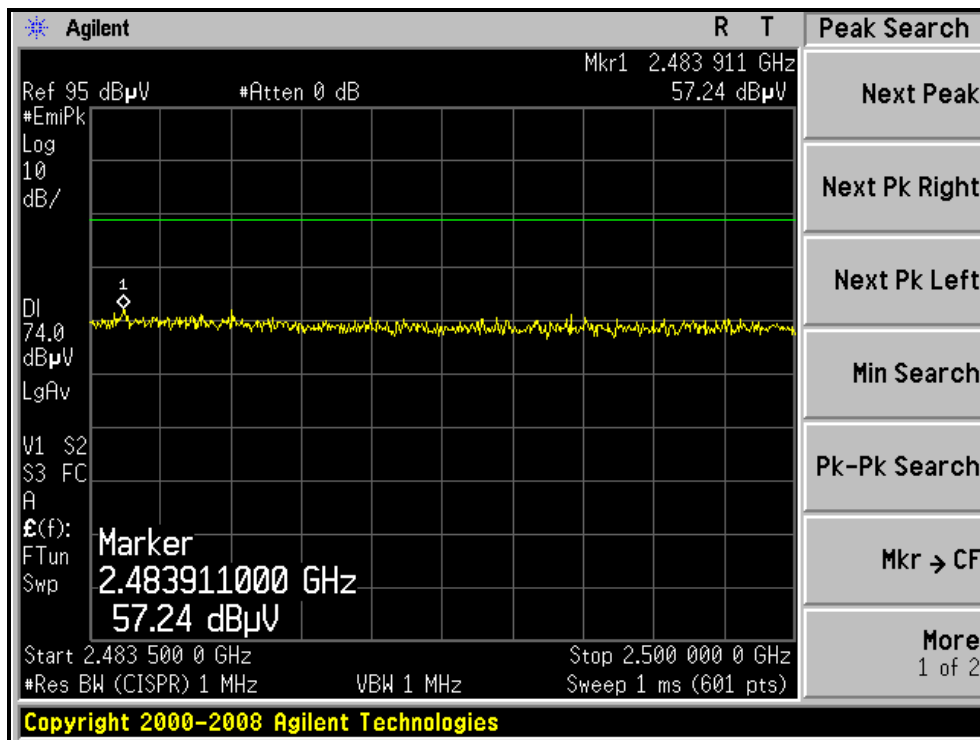
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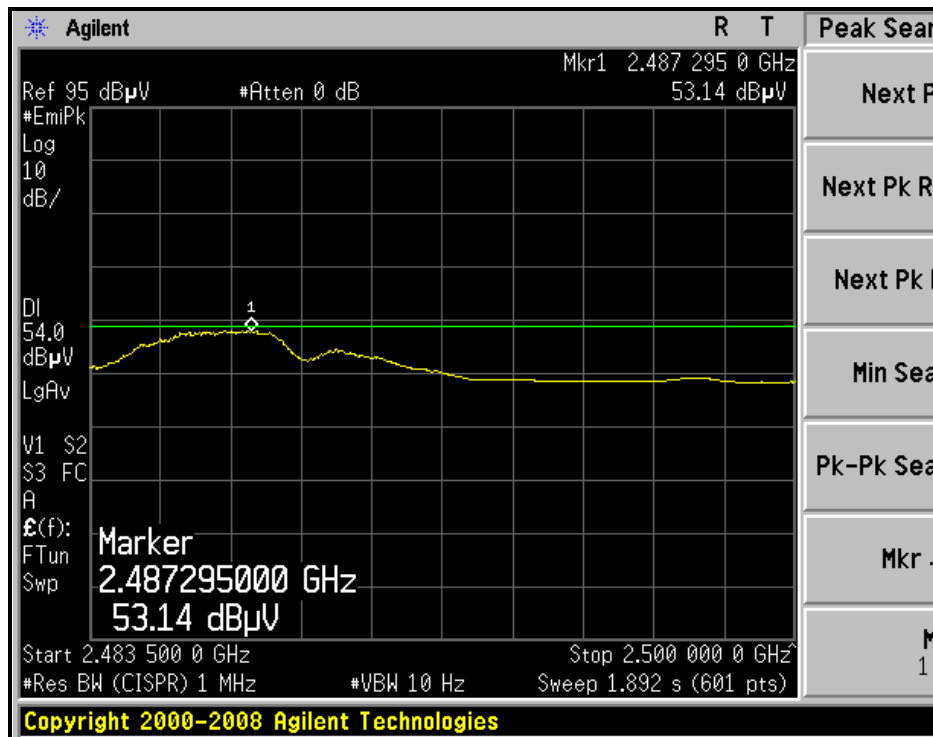
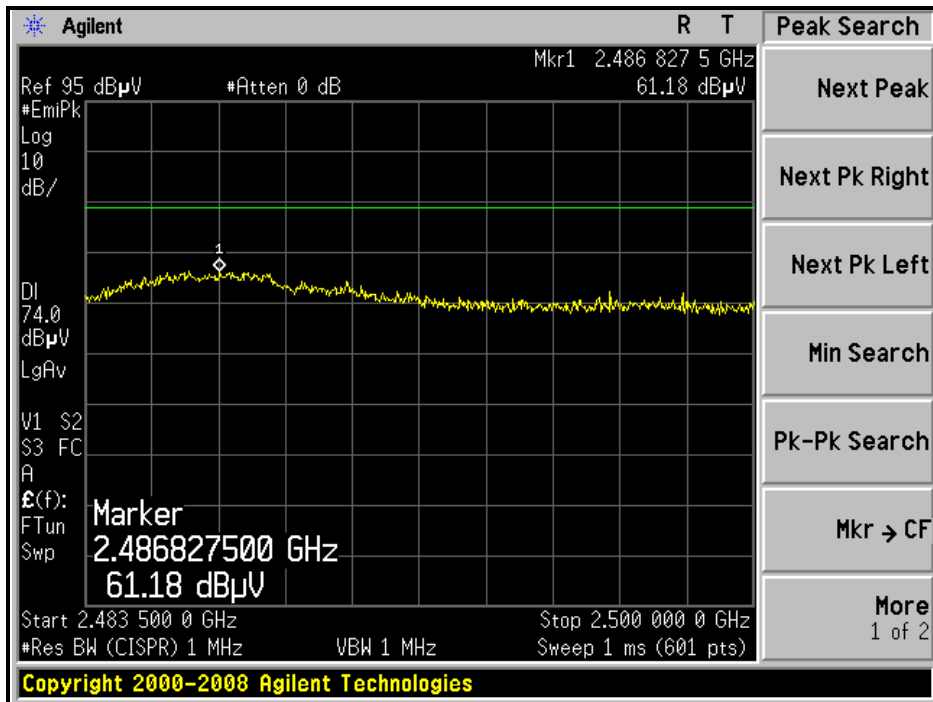
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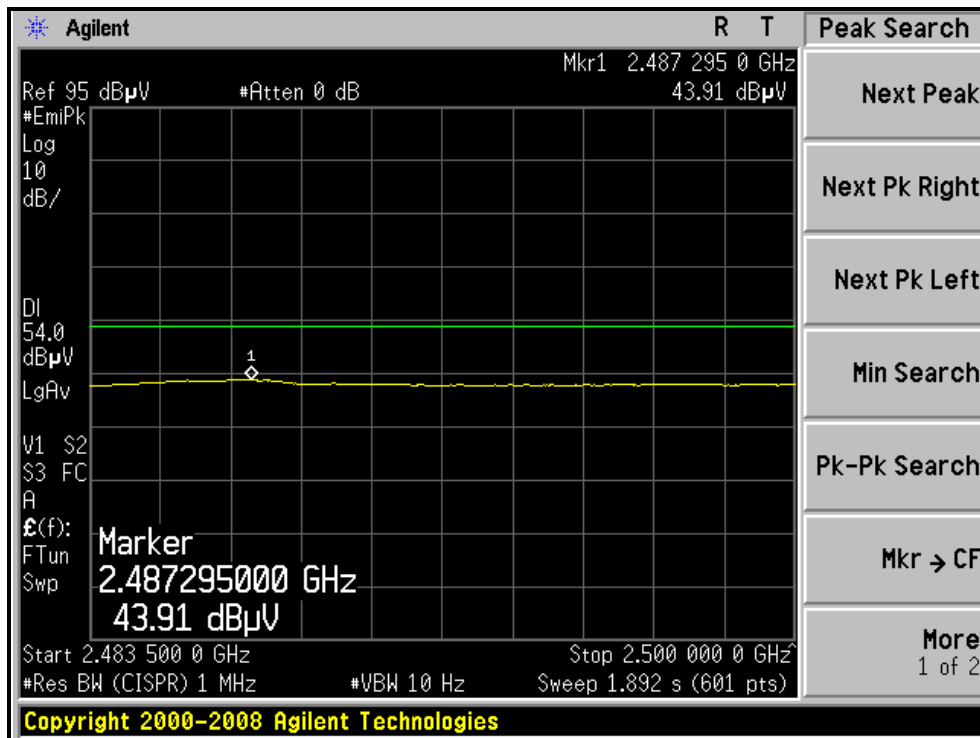
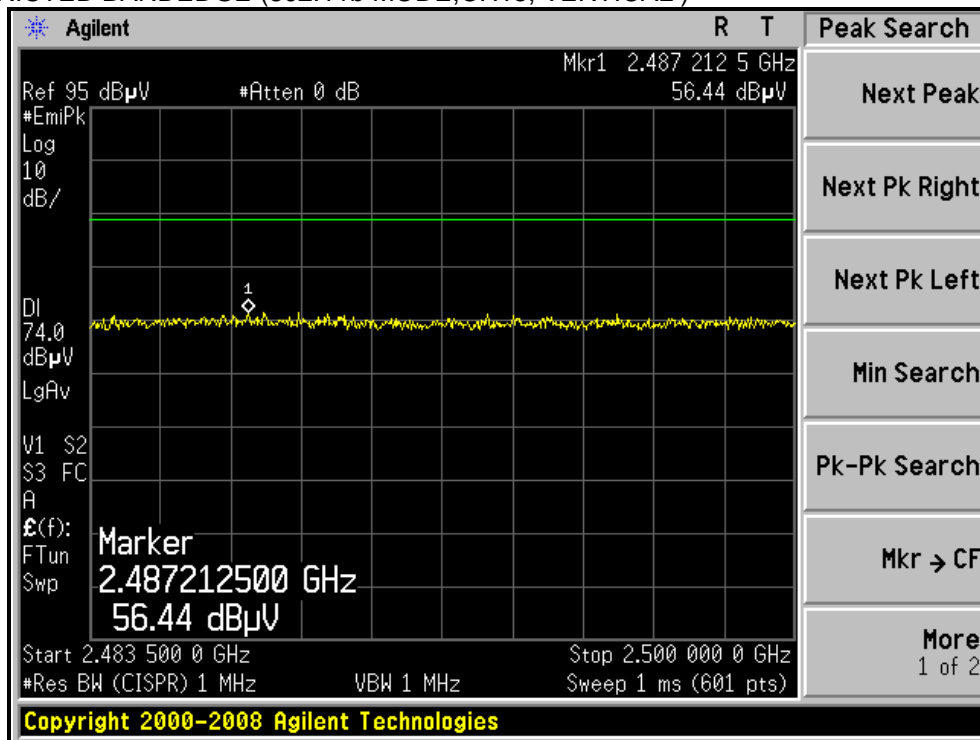
RESTRICTED BANDEDGE (802.11b MODE, CH13, HORIZONTAL)





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RESTRICTED BANDEDGE (802.11b MODE, CH13, VERTICAL)





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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	25deg. C, 63%RH	TESTED BY	Nick Chang

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	72.5 PK	74.0	-1.5	1.40 H	9	41.18	31.32
2	2390.00	48.6 AV	54.0	-5.4	1.40 H	9	17.28	31.32
3	*2412.00	114.2 PK			1.40 H	9	82.81	31.39
4	*2412.00	80.2 AV			1.40 H	9	48.81	31.39
5	4824.00	41.8 PK	74.0	-32.2	1.21 H	61	5.63	36.17
6	4824.00	30.0 AV	54.0	-24.0	1.21 H	61	-6.17	36.17
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	55.7 PK	74.0	-18.3	1.00 V	131	24.38	31.32
2	2390.00	43.2 AV	54.0	-10.8	1.00 V	131	11.88	31.32
3	*2412.00	99.4 PK			1.00 V	131	68.01	31.39
4	*2412.00	71.6 AV			1.00 V	131	40.21	31.39
5	4824.00	41.5 PK	74.0	-32.5	1.48 V	107	5.33	36.17
6	4824.00	29.8 AV	54.0	-24.2	1.48 V	107	-6.37	36.17

- 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	25deg. C, 63%RH	TESTED BY	Nick Chang

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	116.1 PK			1.75 H	95	84.61	31.49
2	*2437.00	89.3 AV			1.75 H	95	57.81	31.49
3	4874.00	41.4 PK	74.0	-32.6	1.35 H	6	5.09	36.31
4	4874.00	30.0 AV	54.0	-24.0	1.35 H	6	-6.31	36.31
5	7311.00	48.6 PK	74.0	-25.4	1.41 H	32	6.37	42.23
6	7311.00	36.2 AV	54.0	-17.8	1.41 H	32	-6.03	42.23

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	105.5 PK			1.68 V	73	74.01	31.49
2	*2437.00	79.1 AV			1.68 V	73	47.61	31.49
3	4874.00	41.9 PK	74.0	-32.1	1.10 V	74	5.59	36.31
4	4874.00	29.9 AV	54.0	-24.1	1.10 V	74	-6.41	36.31
5	7311.00	47.8 PK	74.0	-26.2	1.12 V	84	5.57	42.23
6	7311.00	36.1 AV	54.0	-17.9	1.12 V	84	-6.13	42.23

- 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	25deg. C, 63%RH	TESTED BY	Nick Chang

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	114.5 PK			1.36 H	15	82.92	31.58
2	*2462.00	82.4 AV			1.36 H	15	50.82	31.58
3	2483.50	71.4 PK	74.0	-2.6	1.36 H	15	39.74	31.66
4	2483.50	48.3 AV	54.0	-5.7	1.36 H	15	16.64	31.66
5	4924.00	43.3 PK	74.0	-30.7	1.33 H	4	6.88	36.42
6	4924.00	29.8 AV	54.0	-24.2	1.33 H	4	-6.62	36.42
7	7386.00	48.8 PK	74.0	-25.2	1.12 H	322	6.28	42.52
8	7386.00	36.6 AV	54.0	-17.4	1.12 H	322	-5.92	42.52

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	101.3 PK			1.00 V	66	69.72	31.58
2	*2462.00	72.2 AV			1.00 V	66	40.62	31.58
3	2483.50	57.8 PK	74.0	-16.2	1.00 V	66	26.14	31.66
4	2483.50	43.0 AV	54.0	-11.0	1.00 V	66	11.34	31.66
5	4924.00	42.3 PK	74.0	-31.7	1.08 V	56	5.88	36.42
6	4924.00	29.7 AV	54.0	-24.3	1.08 V	56	-6.72	36.42
7	7386.00	48.5 PK	74.0	-25.5	1.16 V	312	5.98	42.52
8	7386.00	36.3 AV	54.0	-17.7	1.16 V	312	-6.22	42.52

- 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 12	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 63%RH	TESTED BY	Nick Chang

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	*2467.00	108.30 PK			1.37 H	10	76.70	31.60
2	*2467.00	76.20 AV			1.37 H	10	44.60	31.60
3	2483.50	71.50 PK	74.00	-2.50	1.37 H	10	39.84	31.66
4	2483.50	49.60 AV	54.00	-4.40	1.37 H	10	17.94	31.66
5	4934.00	41.00 PK	74.00	-33.00	1.24 H	88	4.56	36.44
6	4934.00	29.40 AV	54.00	-24.60	1.24 H	88	-7.04	36.44

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	*2467.00	97.90 PK			1.40 V	69	66.30	31.60
2	*2467.00	70.10 AV			1.40 V	69	38.50	31.60
3	2483.50	60.80 PK	74.00	-13.20	1.40 V	69	29.14	31.66
4	2483.50	44.70 AV	54.00	-9.30	1.40 V	69	13.04	31.66
5	4934.00	40.80 PK	74.00	-33.20	1.37 V	83	4.36	36.44
6	4934.00	29.20 AV	54.00	-24.80	1.37 V	83	-7.24	36.44

- 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 13	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 63%RH	TESTED BY	Nick Chang

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	*2472.00	94.70 PK			1.09 H	12	63.08	31.62
2	*2472.00	68.50 AV			1.09 H	12	36.88	31.62
3	2483.50	72.40 PK	74.00	-1.60	1.62 H	14	40.74	31.66
4	2483.50	46.50 AV	54.00	-7.50	1.62 H	14	14.84	31.66
5	4944.00	41.80 PK	74.00	-32.20	1.35 H	22	5.35	36.45
6	4944.00	29.40 AV	54.00	-24.60	1.35 H	22	-7.05	36.45

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

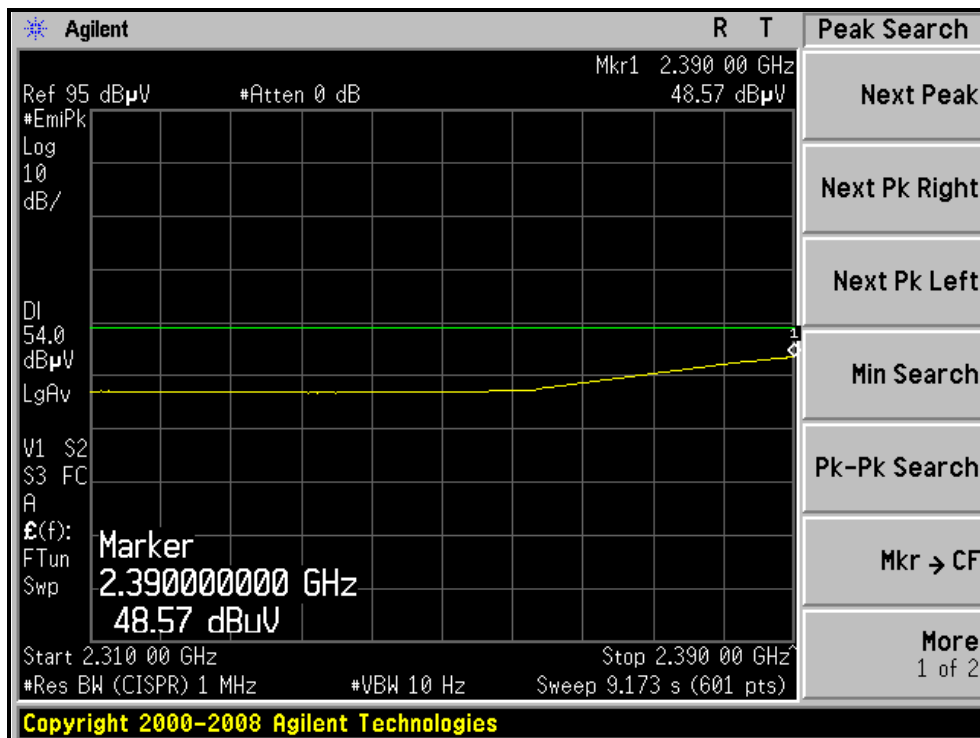
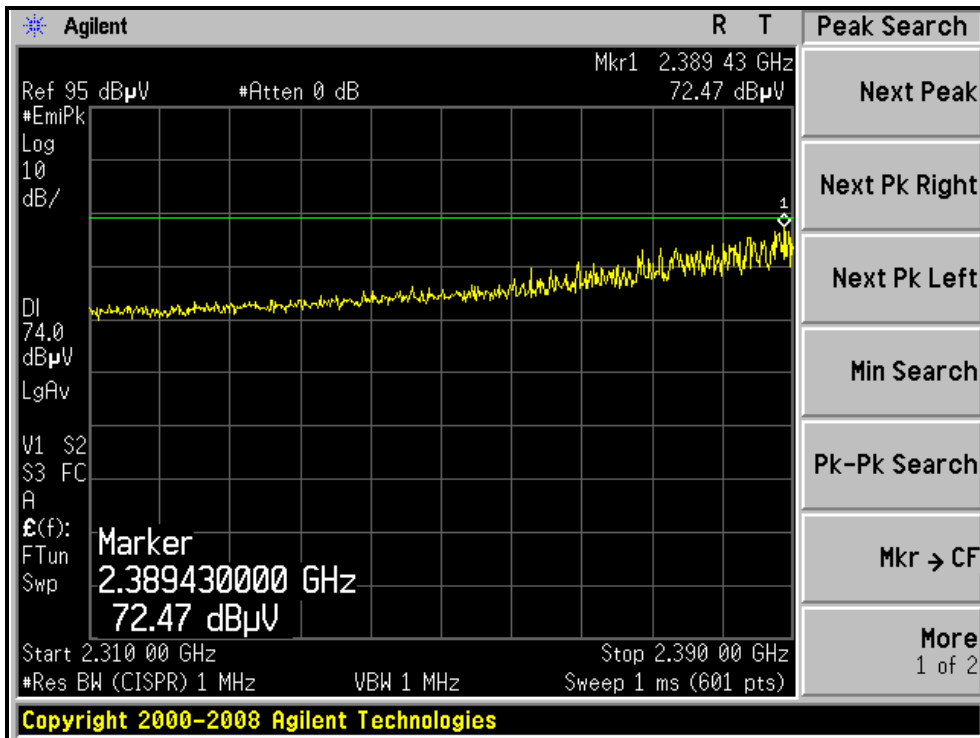
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1	*2472.00	82.00 PK			1.20 V	100	50.38	31.62
2	*2472.00	60.70 AV			1.20 V	100	29.08	31.62
3	2483.50	62.10 PK	74.00	-11.90	1.20 V	100	30.44	31.66
4	2483.50	43.80 AV	54.00	-10.20	1.20 V	100	12.14	31.66
5	4944.00	41.00 PK	74.00	-33.00	1.21 V	99	4.55	36.45
6	4944.00	29.40 AV	54.00	-24.60	1.21 V	99	-7.05	36.45

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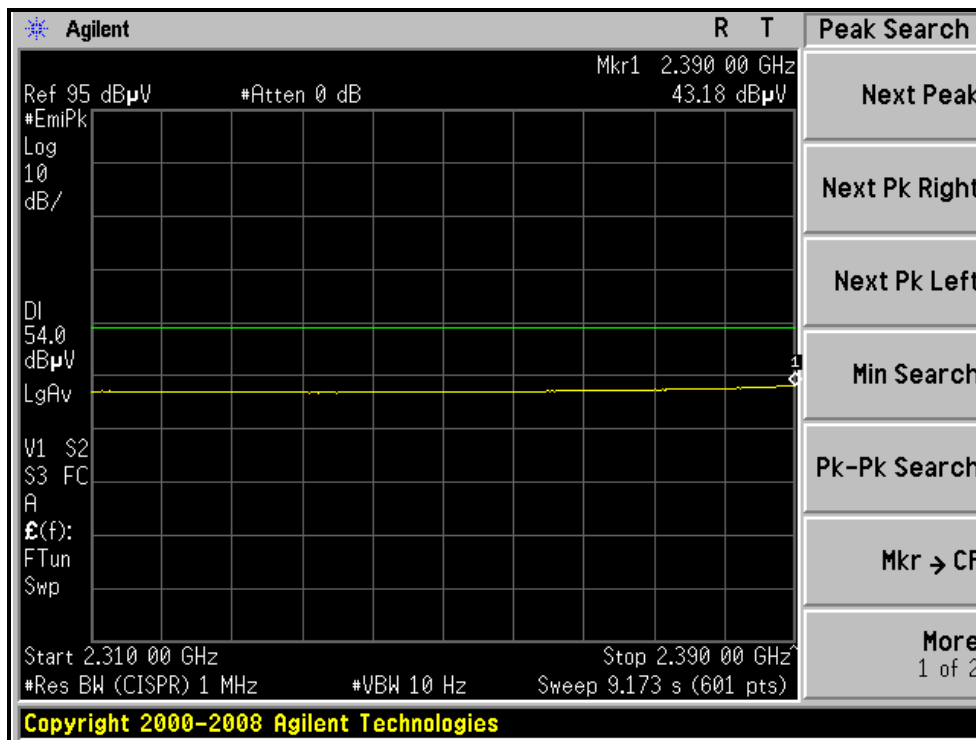
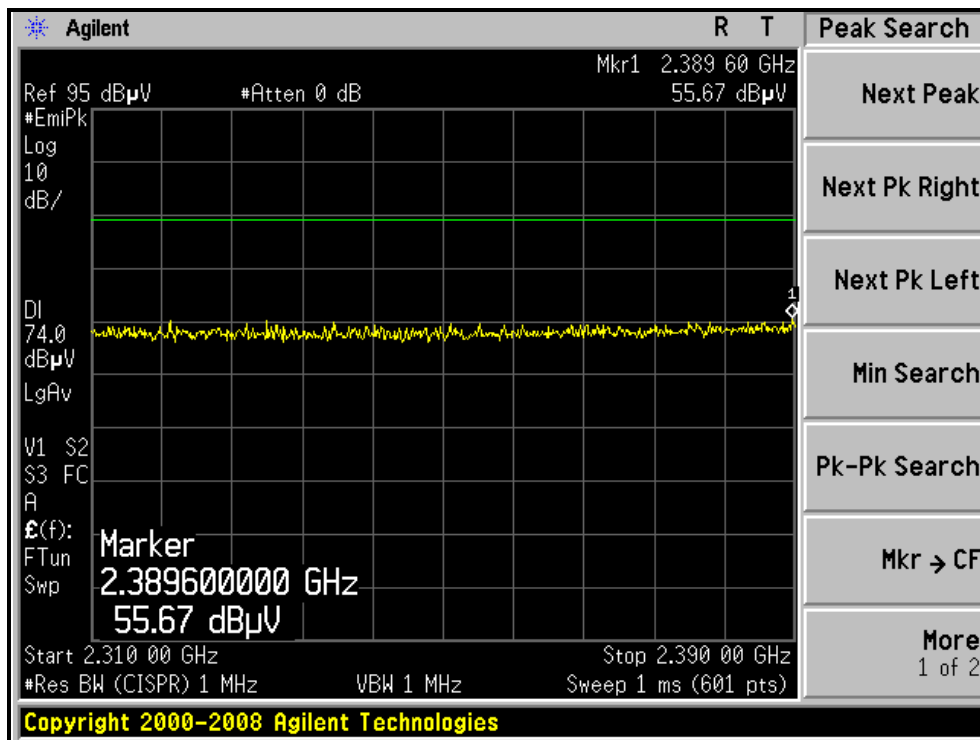
RESTRICTED BANDEDGE (802.11g MODE, CH1, HORIZONTAL)





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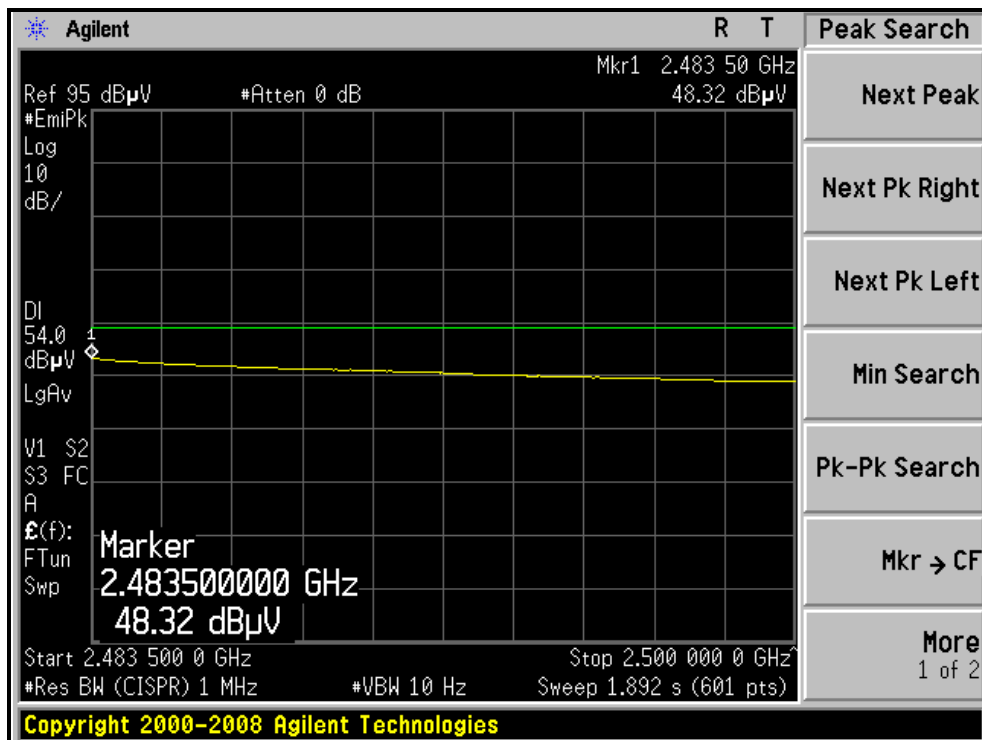
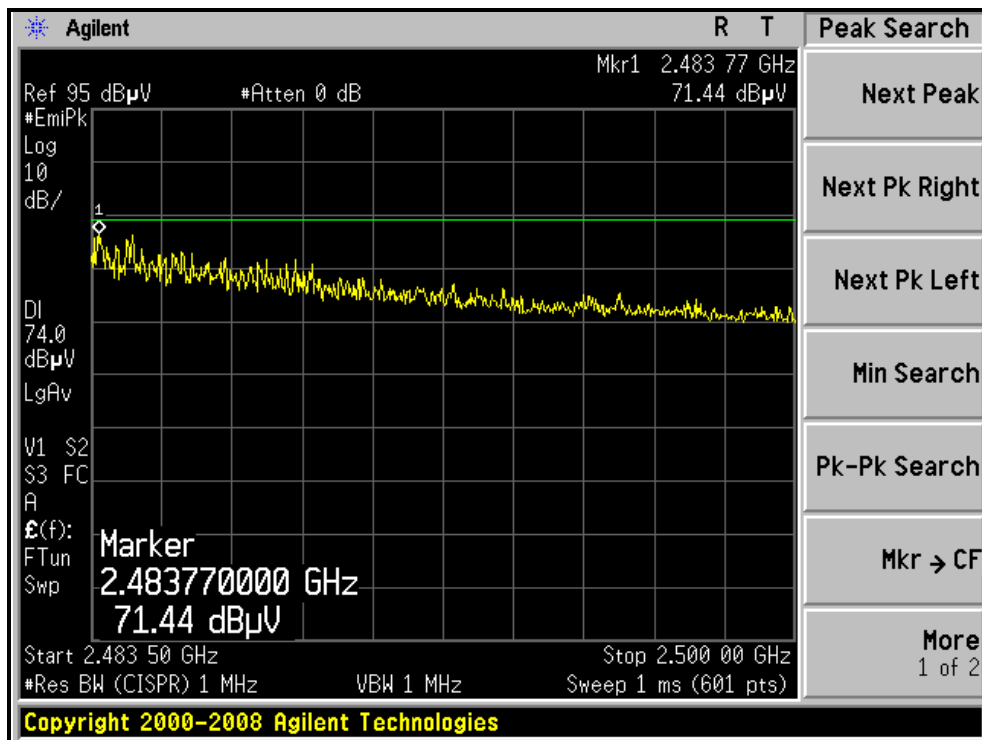
RESTRICTED BANDEDGE (802.11g MODE,CH1, VERTICAL)





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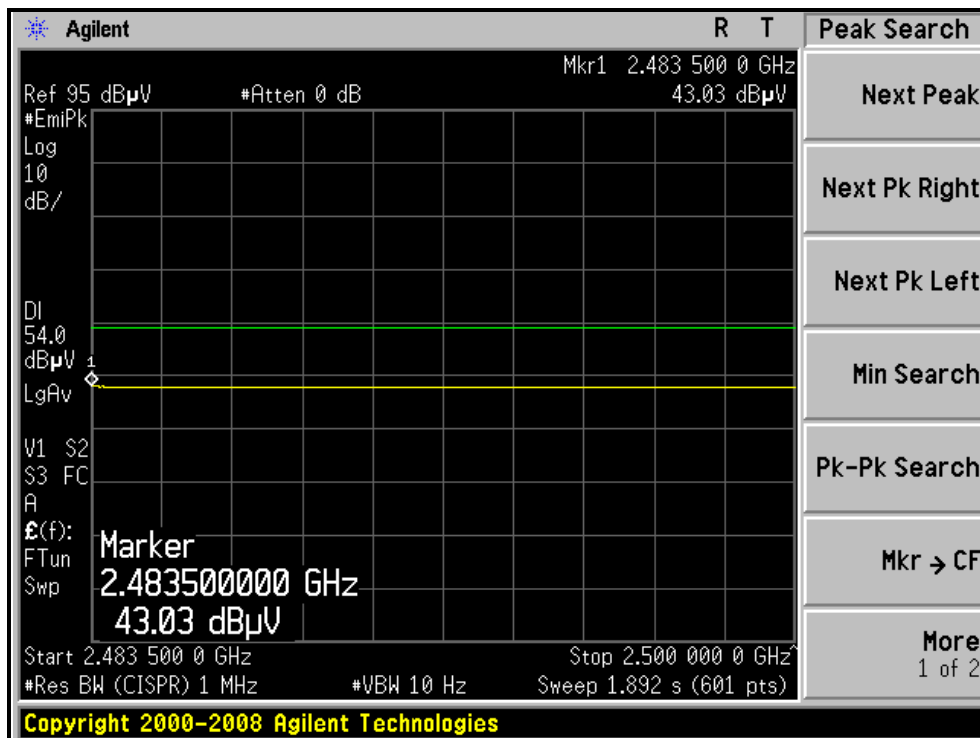
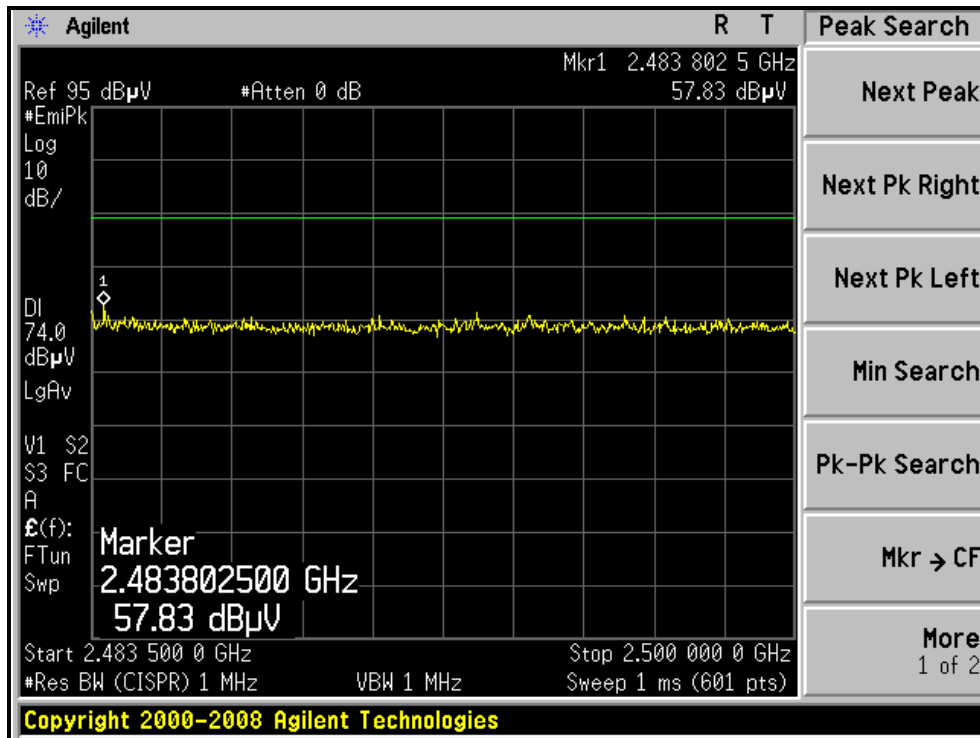
RESTRICTED BANDEDGE (802.11g MODE, CH11, HORIZONTAL)





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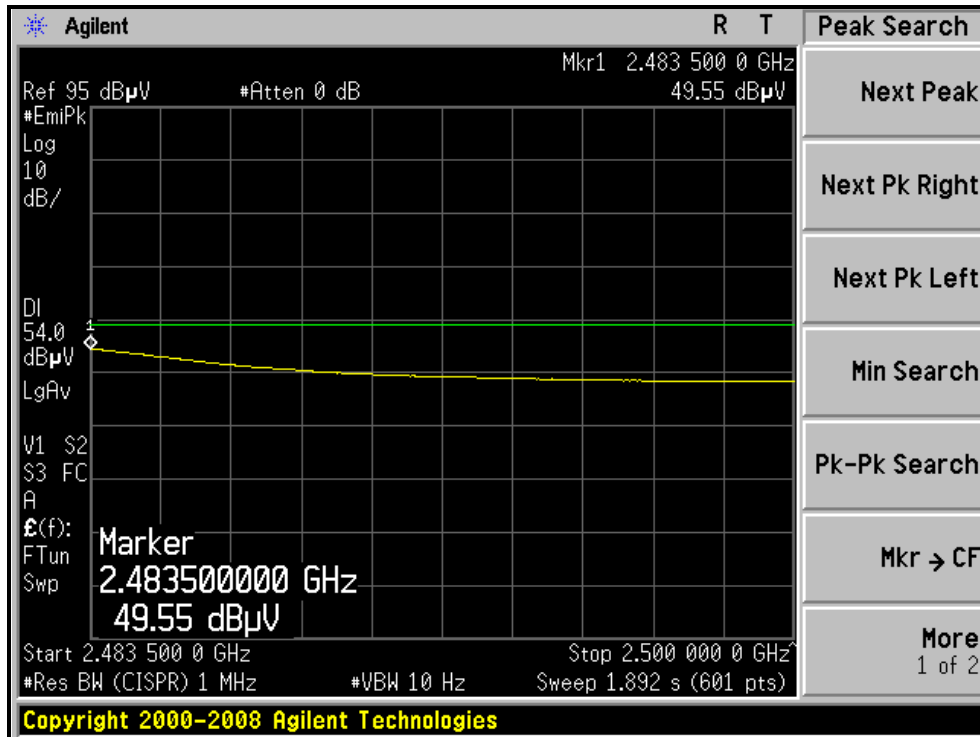
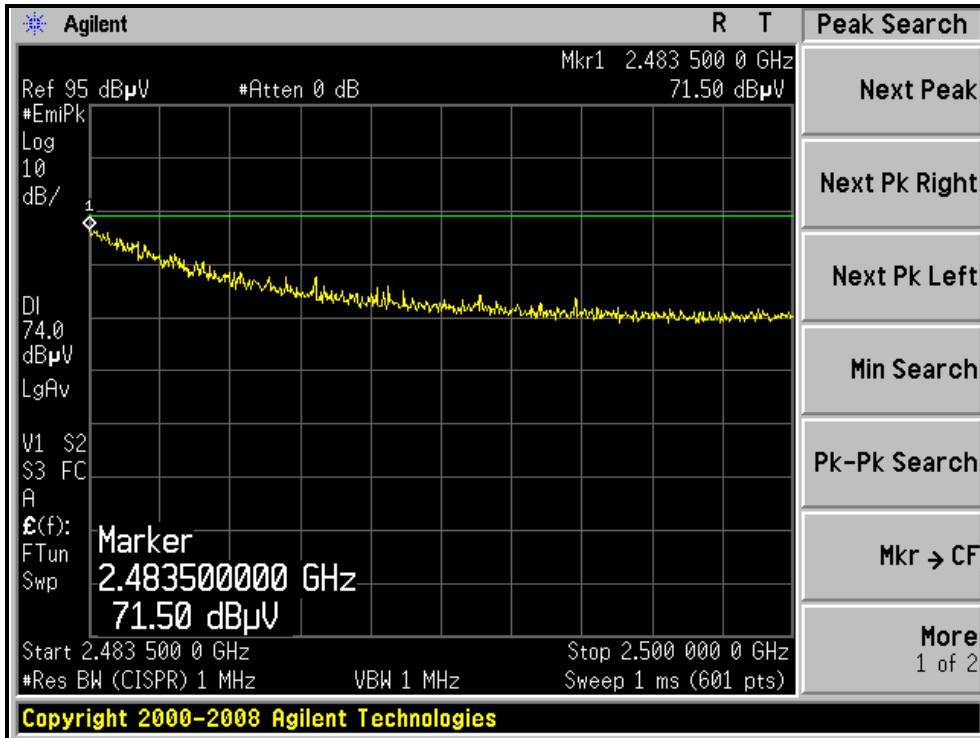
RESTRICTED BANDEDGE (802.11g MODE,CH11, VERTICAL)



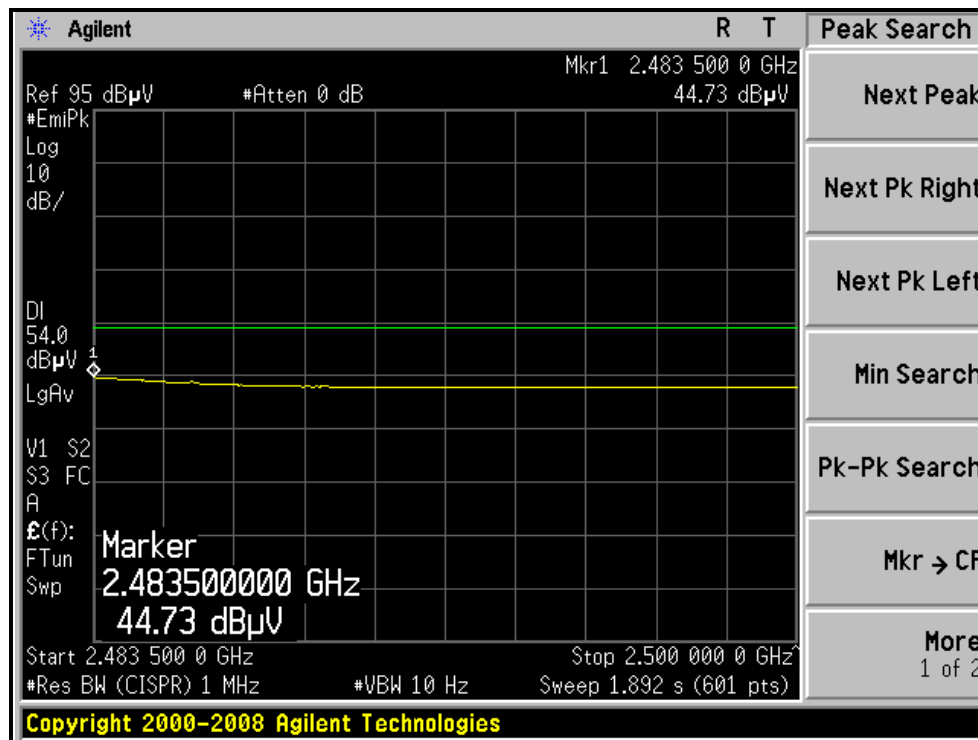
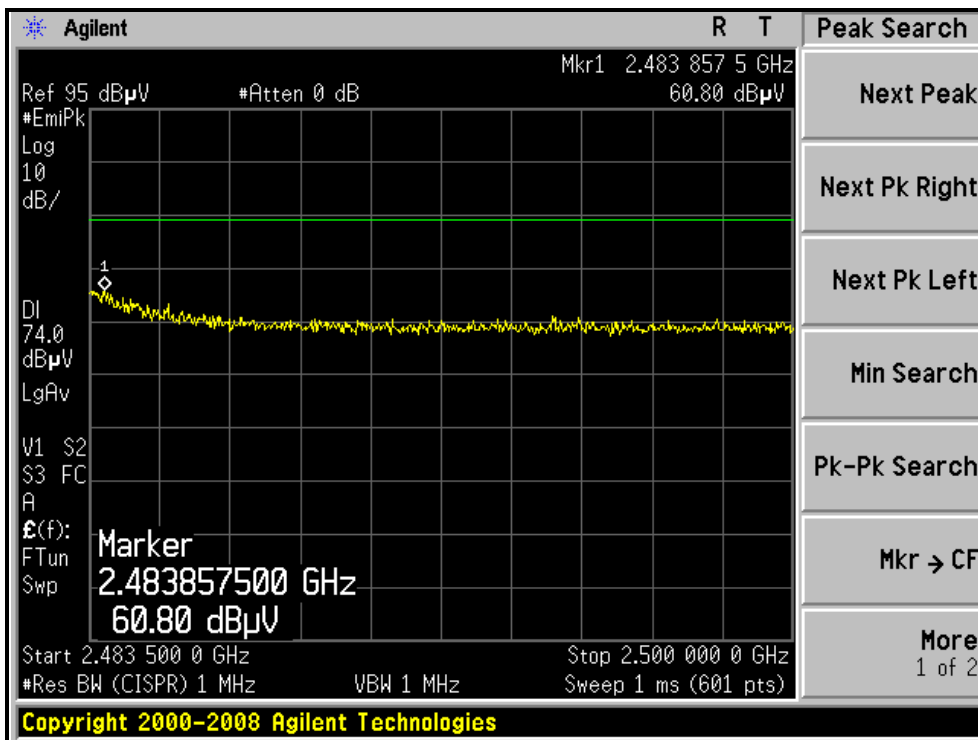


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RESTRICTED BANDEDGE (802.11g MODE,CH12, HORIZONTAL)



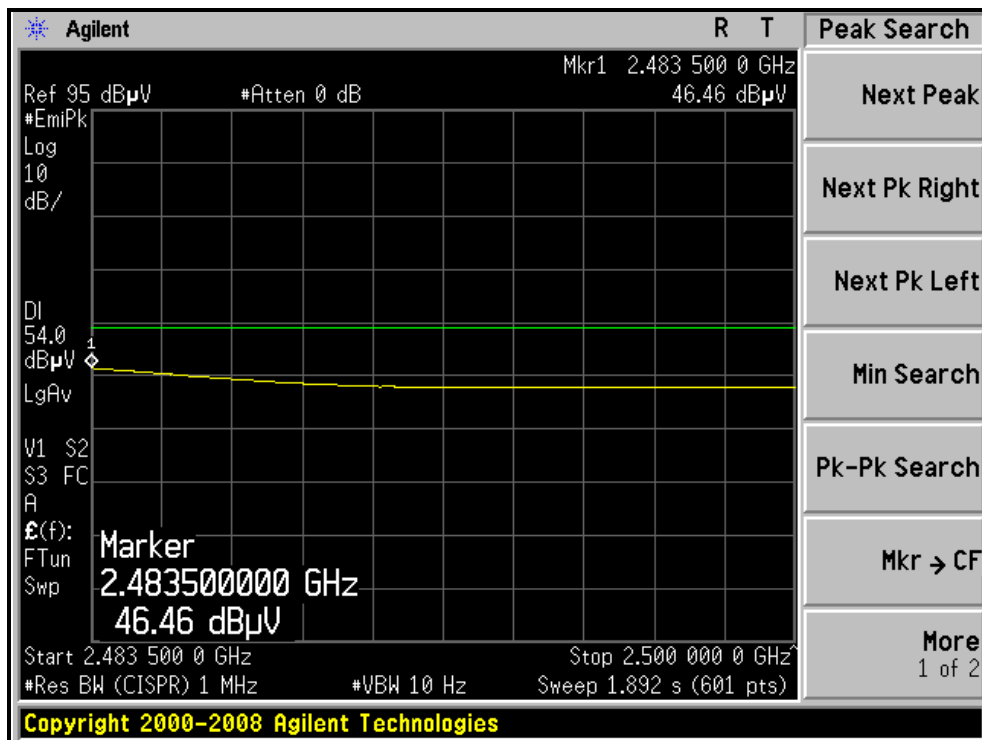
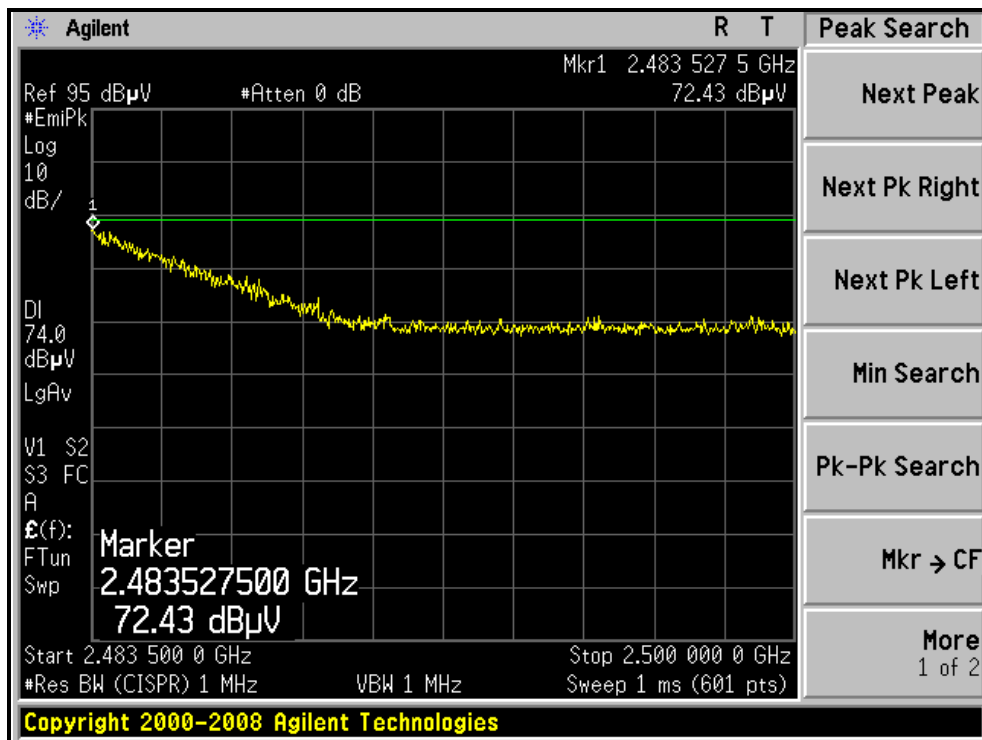
RESTRICTED BANDEDGE (802.11g MODE, CH12, VERTICAL)





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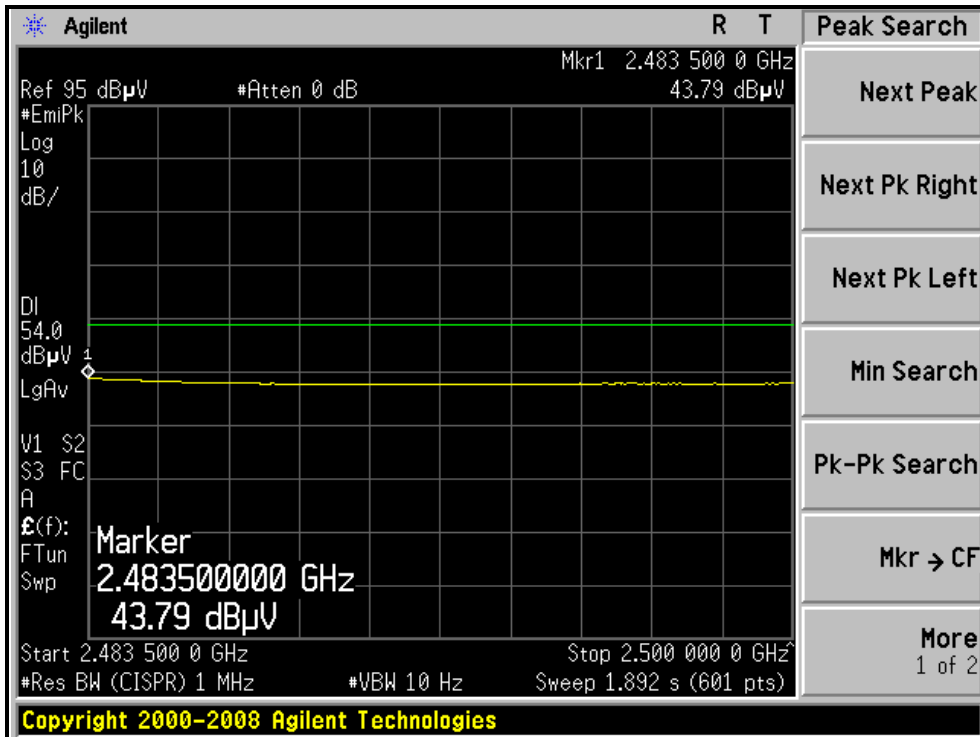
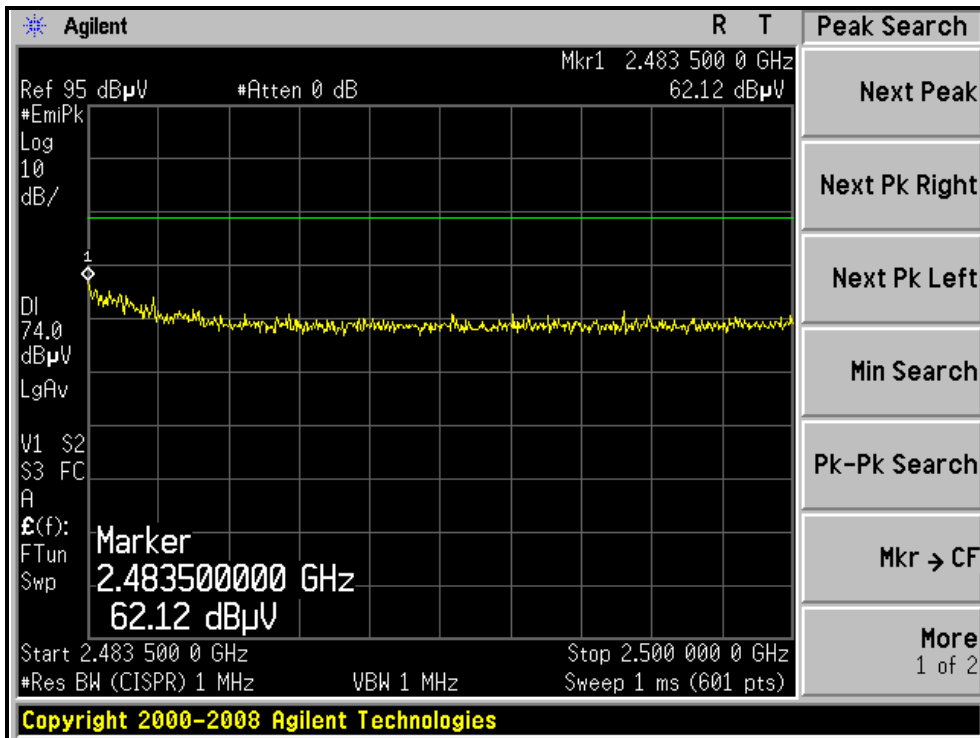
RESTRICTED BANDEDGE (802.11g MODE, CH13, HORIZONTAL)





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RESTRICTED BANDEDGE (802.11g MODE, CH13, 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	25deg. C, 63%RH	TESTED BY	Nick Chang

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	73.0 PK	74.0	-1.0	1.40 H	180	41.68	31.32
2	2390.00	50.6 AV	54.0	-3.4	1.40 H	180	19.28	31.32
3	*2412.00	115.4 PK			1.40 H	165	84.01	31.39
4	*2412.00	77.5 AV			1.40 H	165	46.11	31.39
5	4824.00	41.7 PK	74.0	-32.3	1.17 H	70	5.53	36.17
6	4824.00	29.9 AV	54.0	-24.1	1.17 H	70	-6.27	36.17
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	61.3 PK	74.0	-12.7	1.09 V	65	29.98	31.32
2	2390.00	45.3 AV	54.0	-8.7	1.09 V	65	13.98	31.32
3	*2412.00	107.1 PK			1.09 V	65	75.71	31.39
4	*2412.00	77.3 AV			1.09 V	65	45.91	31.39
5	4824.00	41.3 PK	74.0	-32.7	1.50 V	104	5.13	36.17
6	4824.00	29.8 AV	54.0	-24.2	1.50 V	104	-6.37	36.17

- 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	25deg. C, 63%RH	TESTED BY	Nick Chang

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	113.5 PK			1.32 H	98	82.01	31.49
2	*2437.00	77.1 AV			1.32 H	98	45.61	31.49
3	4874.00	40.9 PK	74.0	-33.1	1.35 H	17	4.59	36.31
4	4874.00	29.7 AV	54.0	-24.3	1.35 H	17	-6.61	36.31
5	7311.00	48.5 PK	74.0	-25.5	1.37 H	22	6.27	42.23
6	7311.00	36.2 AV	54.0	-17.8	1.37 H	22	-6.03	42.23
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	110.9 PK			1.08 V	67	79.41	31.49
2	*2437.00	75.3 AV			1.08 V	67	43.81	31.49
3	4874.00	42.0 PK	74.0	-32.0	1.06 V	62	5.69	36.31
4	4874.00	30.0 AV	54.0	-24.0	1.06 V	62	-6.31	36.31
5	7311.00	47.7 PK	74.0	-26.3	1.09 V	92	5.47	42.23
6	7311.00	36.2 AV	54.0	-17.8	1.09 V	92	-6.03	42.23

- 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	25deg. C, 63%RH	TESTED BY	Nick Chang

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	115.9 PK			1.39 H	196	84.32	31.58
2	*2462.00	77.4 AV			1.39 H	196	45.82	31.58
3	2483.50	68.9 PK	74.0	-5.1	1.39 H	199	37.24	31.66
4	2483.50	48.2 AV	54.0	-5.8	1.39 H	199	16.54	31.66
5	4924.00	43.3 PK	74.0	-30.7	1.26 H	19	6.88	36.42
6	4924.00	29.7 AV	54.0	-24.3	1.26 H	19	-6.72	36.42
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	104.7 PK			1.11 V	75	73.12	31.58
2	*2462.00	72.4 AV			1.11 V	75	40.82	31.58
3	2483.50	63.2 PK	74.0	-10.8	1.11 V	75	31.54	31.66
4	2483.50	44.8 AV	54.0	-9.2	1.11 V	75	13.14	31.66
5	4924.00	42.2 PK	74.0	-31.8	1.79 V	186	5.78	36.42
6	4924.00	29.7 AV	54.0	-24.3	1.79 V	186	-6.72	36.42

- 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 12	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 63%RH	TESTED BY	Nick Chang

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	*2467.00	111.10 PK			1.40 H	196	79.50	31.60
2	*2467.00	73.60 AV			1.40 H	196	42.00	31.60
3	2483.50	73.00 PK	74.00	-1.00	1.39 H	197	41.34	31.66
4	2483.50	50.40 AV	54.00	-3.60	1.39 H	197	18.74	31.66
5	4934.00	40.70 PK	74.00	-33.30	1.24 H	83	4.26	36.44
6	4934.00	29.20 AV	54.00	-24.80	1.24 H	83	-7.24	36.44
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	*2467.00	101.80 PK			1.07 V	65	70.20	31.60
2	*2467.00	70.20 AV			1.07 V	65	38.60	31.60
3	2483.50	66.70 PK	74.00	-7.30	1.07 V	65	35.04	31.66
4	2483.50	46.50 AV	54.00	-7.50	1.07 V	65	14.84	31.66
5	4934.00	40.90 PK	74.00	-33.10	1.35 V	72	4.46	36.44
6	4934.00	29.10 AV	54.00	-24.90	1.35 V	72	-7.34	36.44

- 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 13	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 63%RH	TESTED BY	Nick Chang

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	*2472.00	97.70 PK			1.41 H	163	66.08	31.62
2	*2472.00	67.10 AV			1.41 H	163	35.48	31.62
3	2483.50	73.00 PK	74.00	-1.00	1.40 H	185	41.34	31.66
4	2483.50	46.70 AV	54.00	-7.30	1.40 H	185	15.04	31.66
5	4944.00	41.80 PK	74.00	-32.20	1.37 H	20	5.35	36.45
6	4944.00	29.50 AV	54.00	-24.50	1.37 H	20	-6.95	36.45
7	7416.00	48.00 PK	74.00	-26.00	1.24 H	123	5.40	42.60
8	7416.00	35.40 AV	54.00	-18.60	1.24 H	123	-7.20	42.60

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

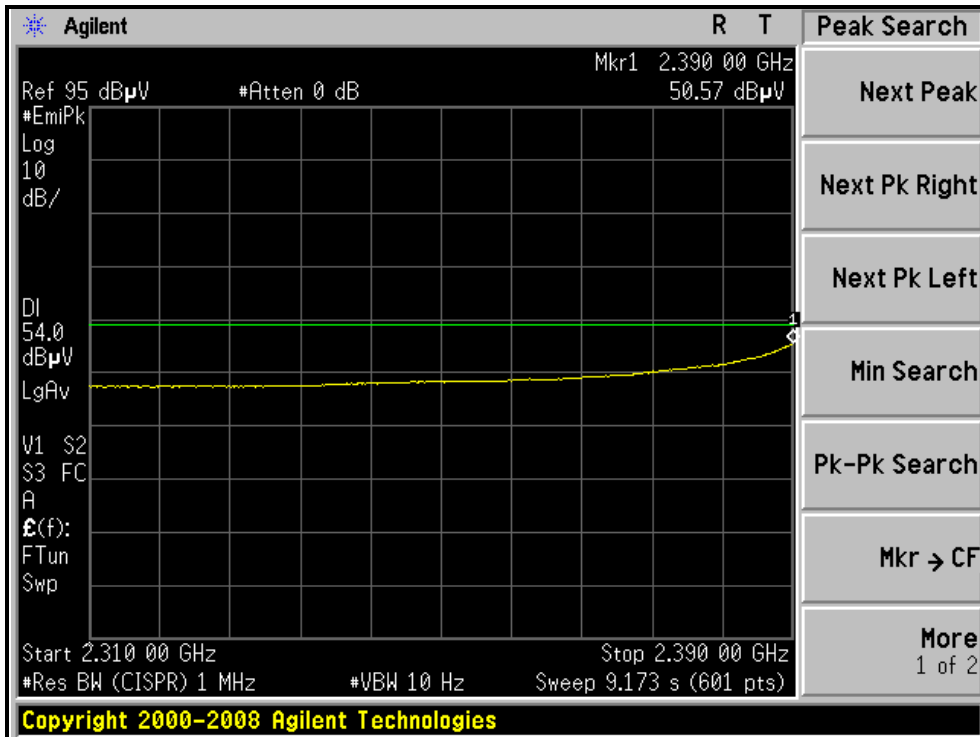
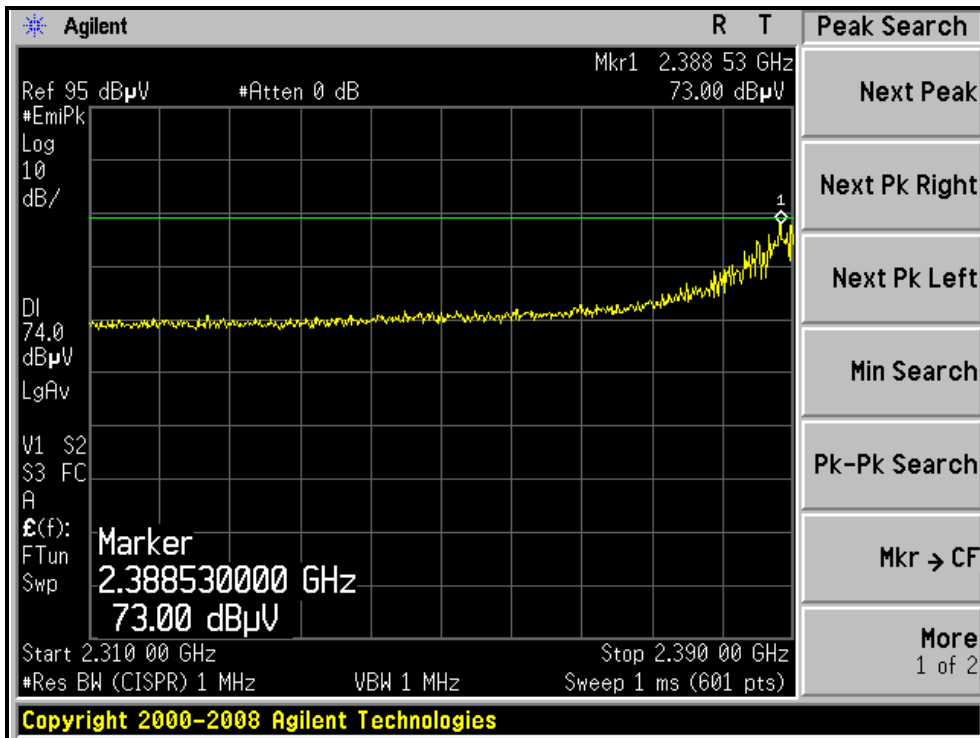
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1	*2472.00	89.00 PK			1.07 V	68	57.38	31.62
2	*2472.00	62.90 AV			1.07 V	68	31.28	31.62
3	2483.50	67.00 PK	74.00	-7.00	1.07 V	68	35.34	31.66
4	2483.50	45.00 AV	54.00	-9.00	1.07 V	68	13.34	31.66
5	4944.00	41.20 PK	74.00	-32.80	1.19 V	111	4.75	36.45
6	4944.00	29.50 AV	54.00	-24.50	1.19 V	111	-6.95	36.45
7	7416.00	47.80 PK	74.00	-26.20	1.20 V	106	5.20	42.60
8	7416.00	35.60 AV	54.00	-18.40	1.20 V	106	-7.00	42.60

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



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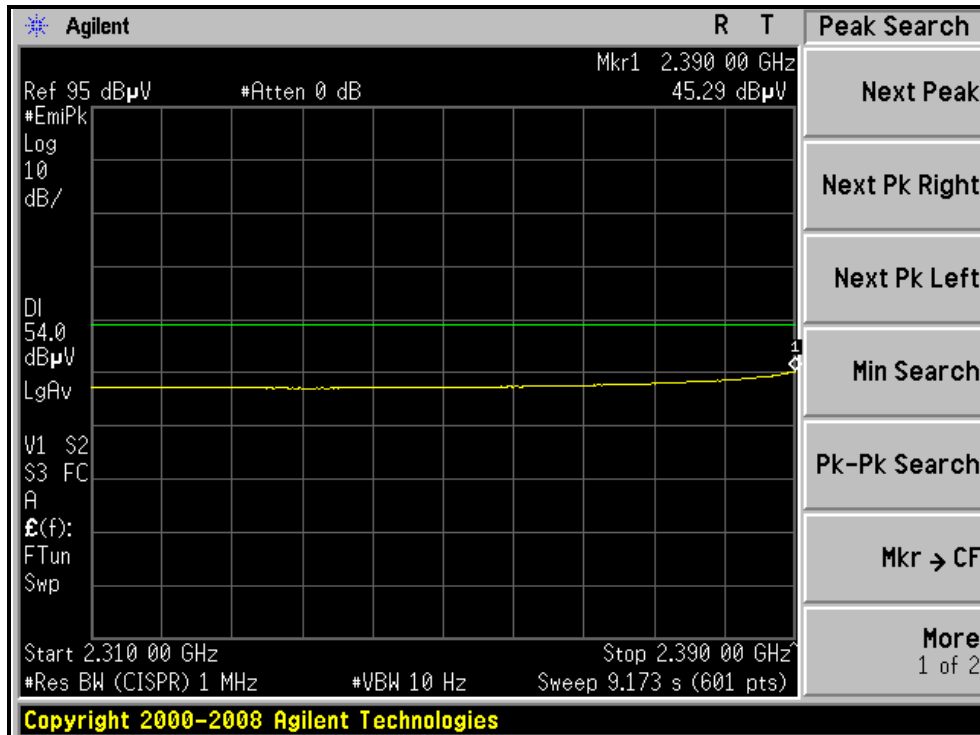
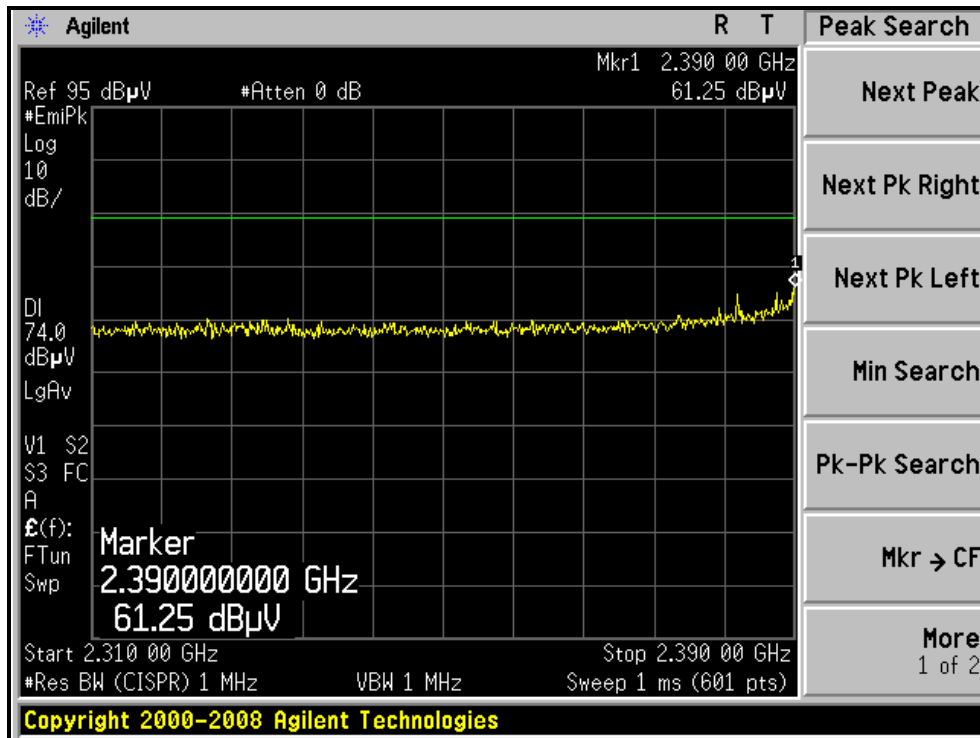
RESTRICTED BANDEDGE (802.11n (20MHz) MODE,CH1, HORIZONTAL)





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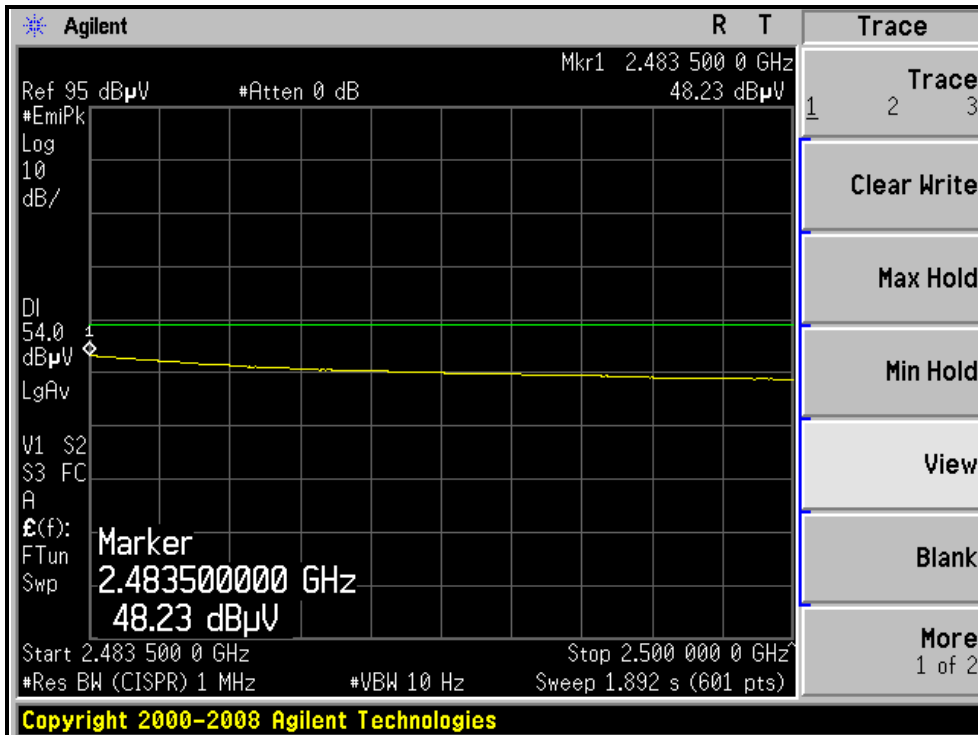
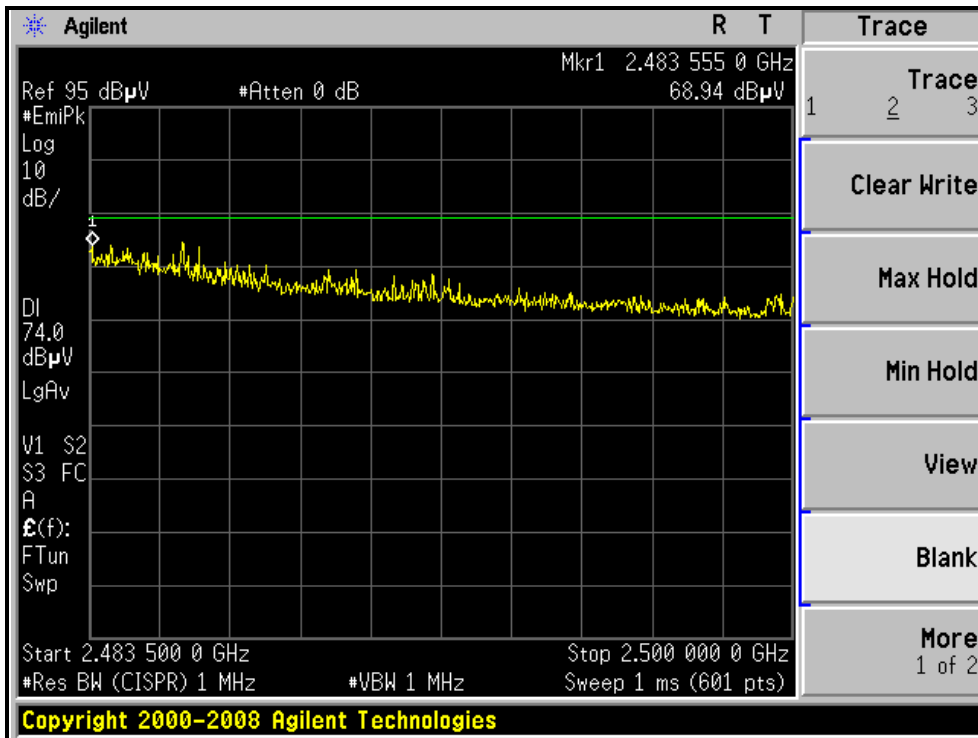
RESTRICTED BANDEDGE (802.11n (20MHz) MODE,CH1, VERTICAL)





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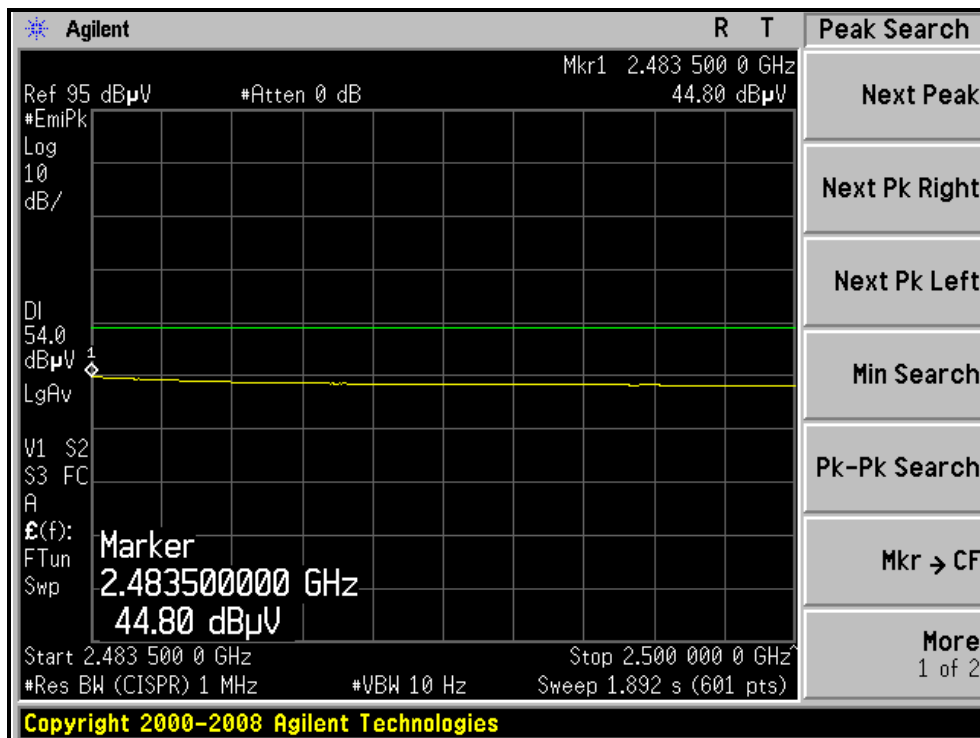
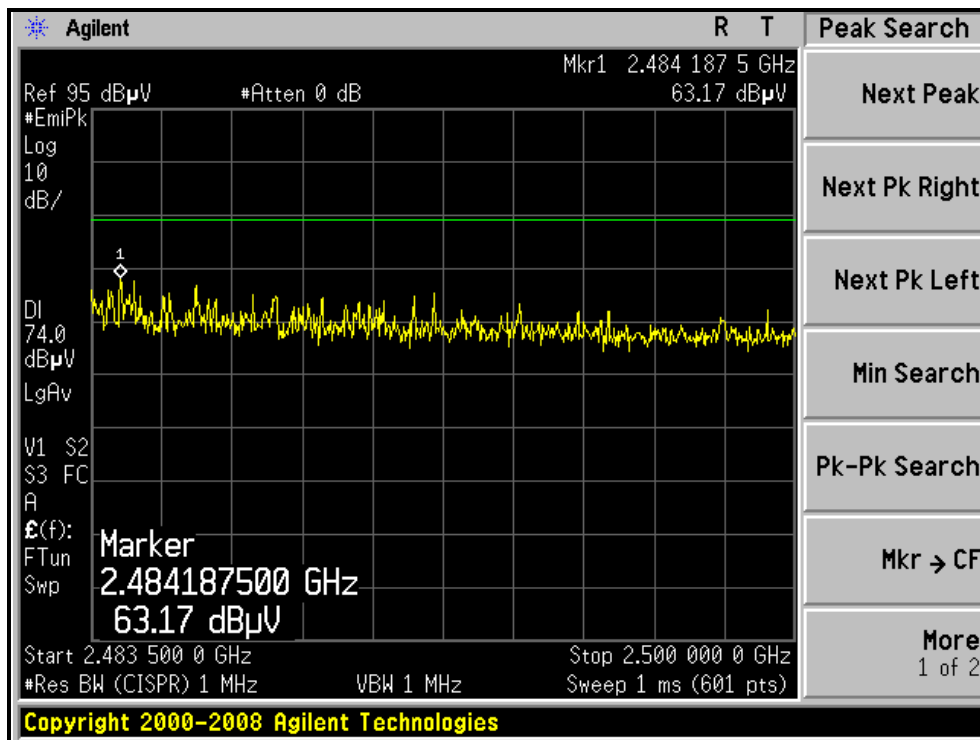
RESTRICTED BANDEDGE (802.11n (20MHz) MODE,CH11, HORIZONTAL)





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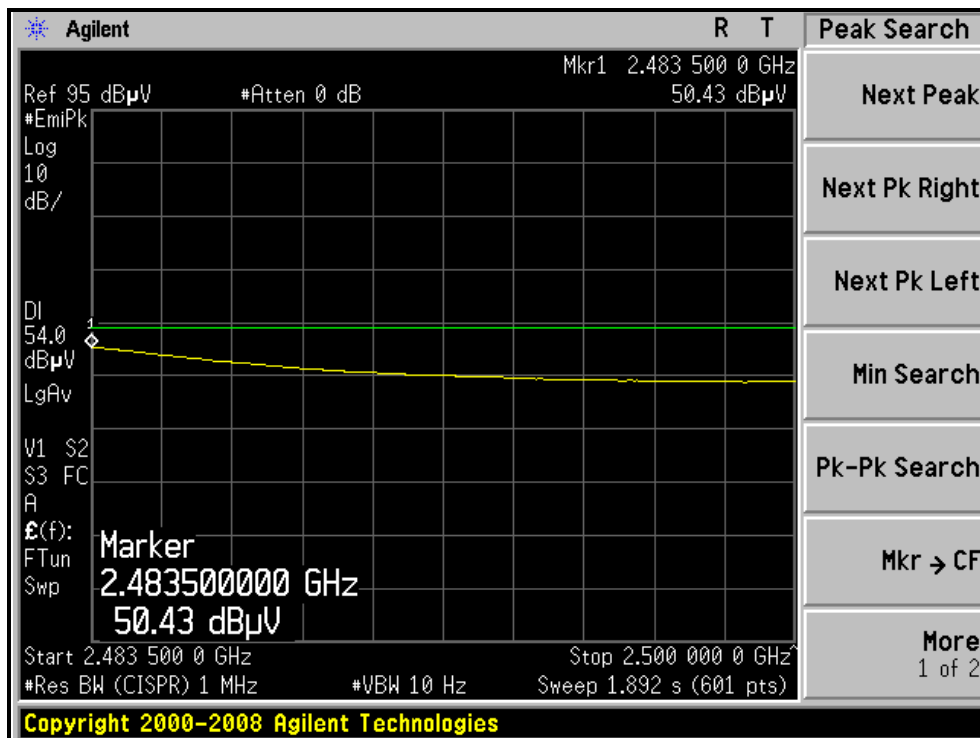
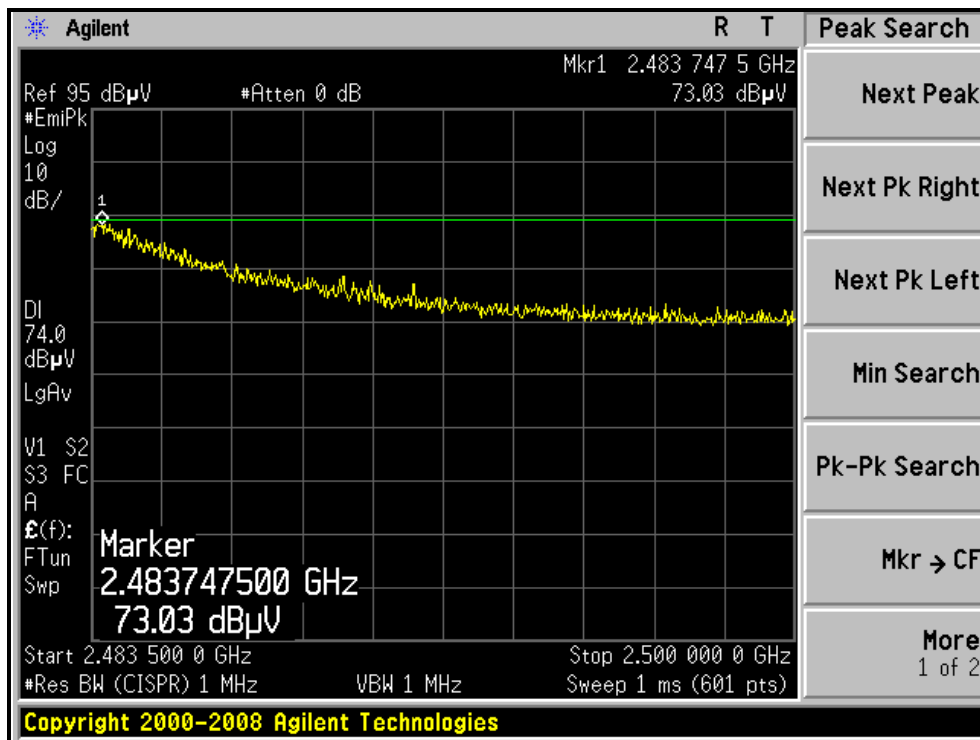
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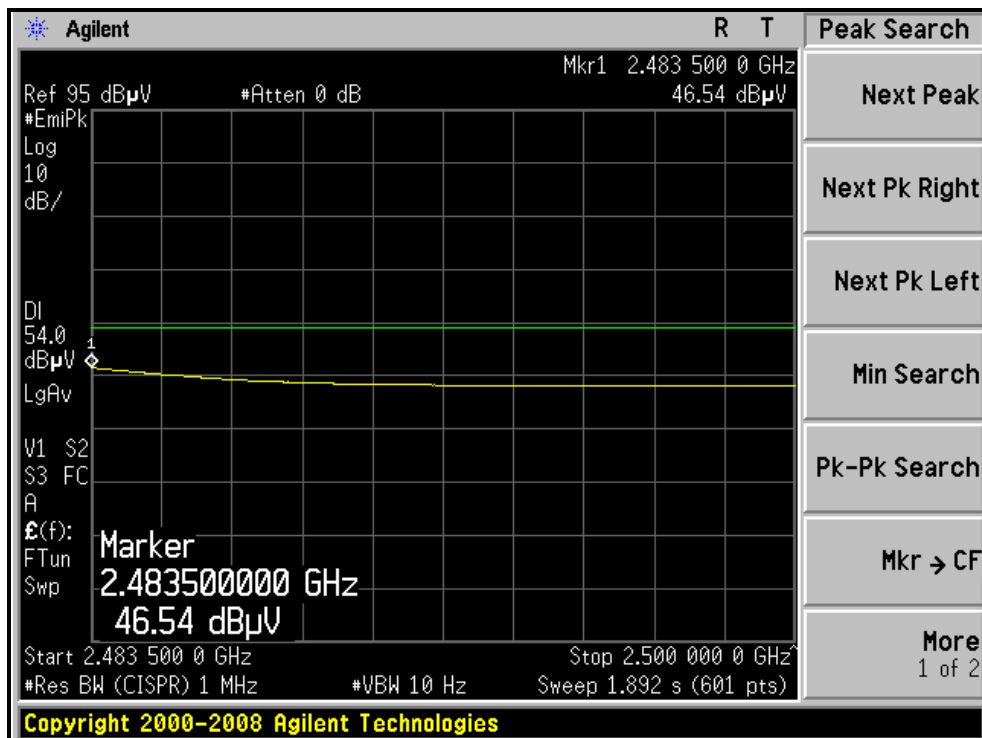
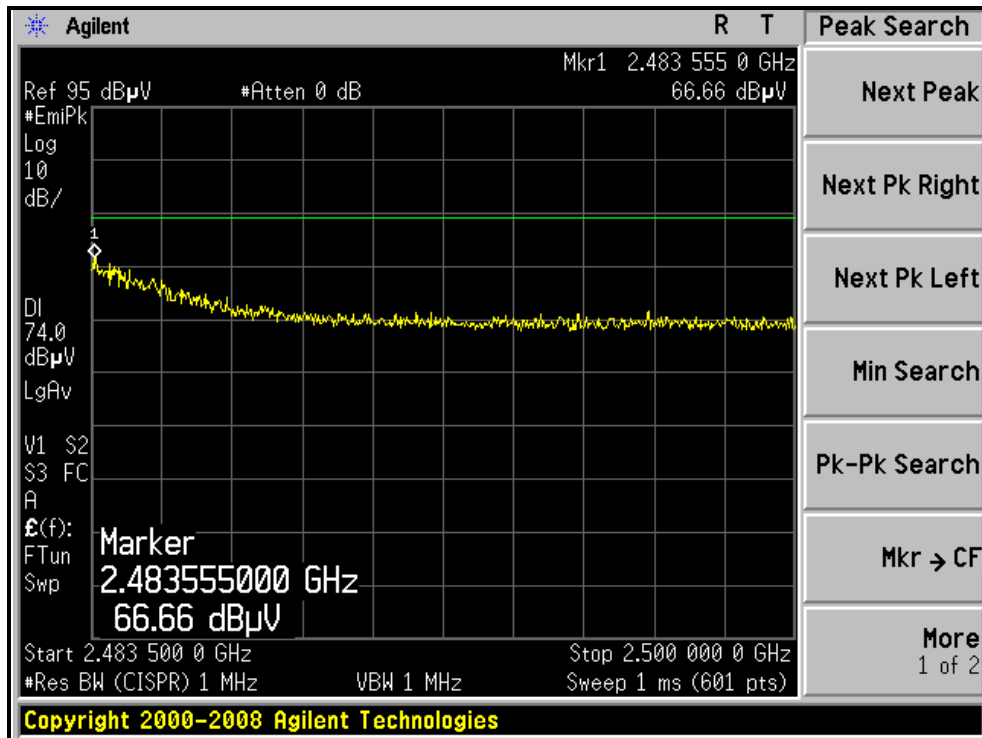
RESTRICTED BANDEDGE (802.11n (20MHz) MODE,CH12, HORIZONTAL)





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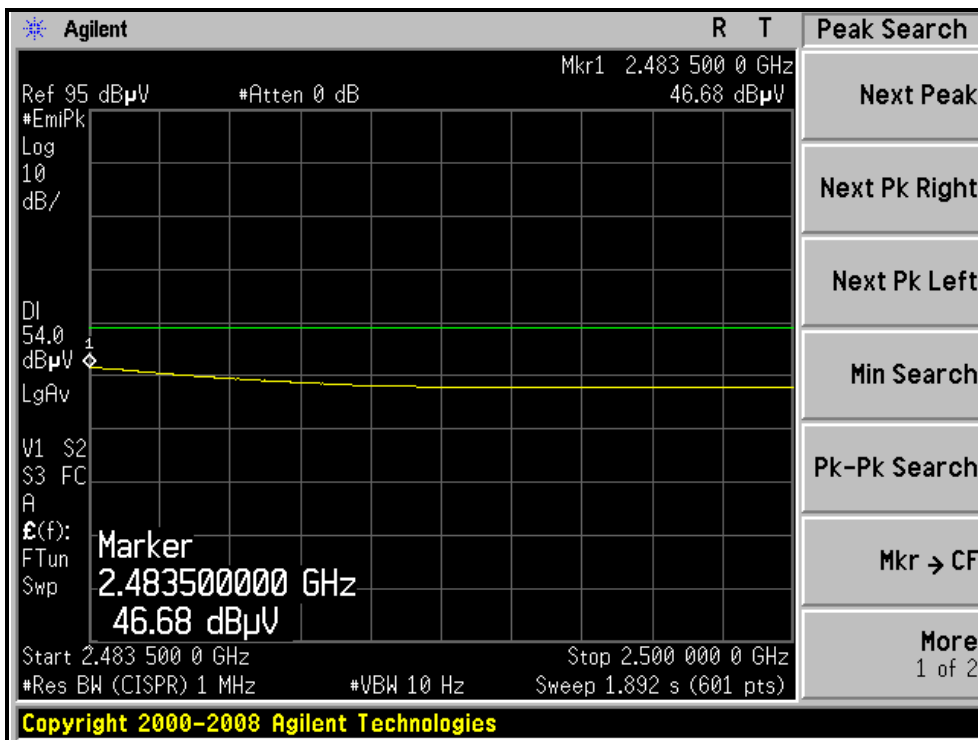
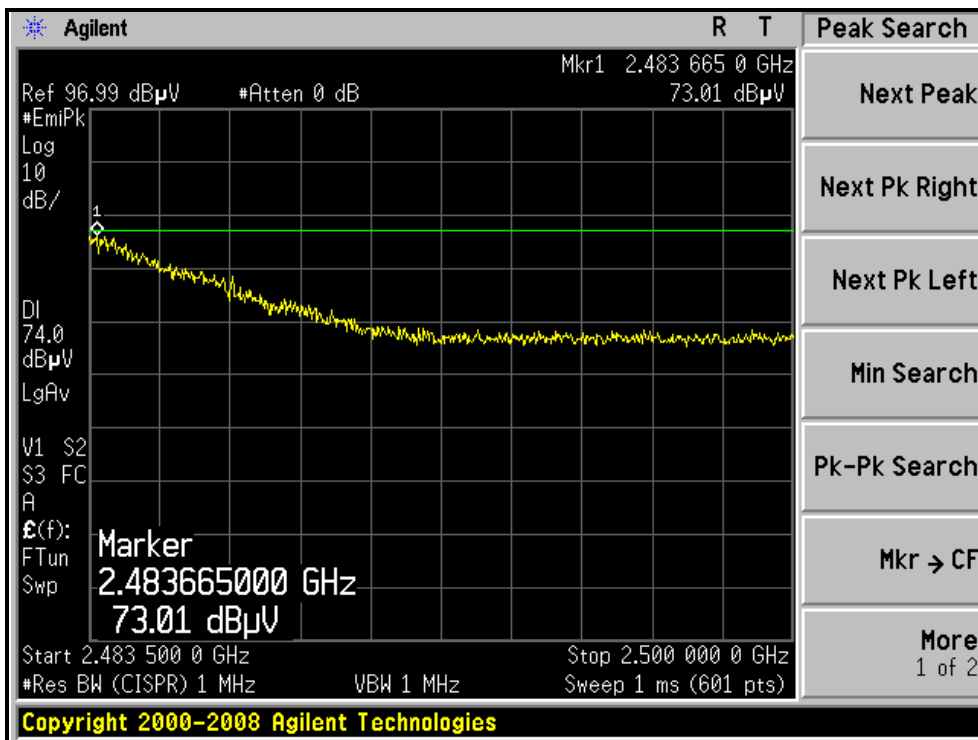
RESTRICTED BANDEDGE (802.11n (20MHz) MODE,CH12, VERTICAL)





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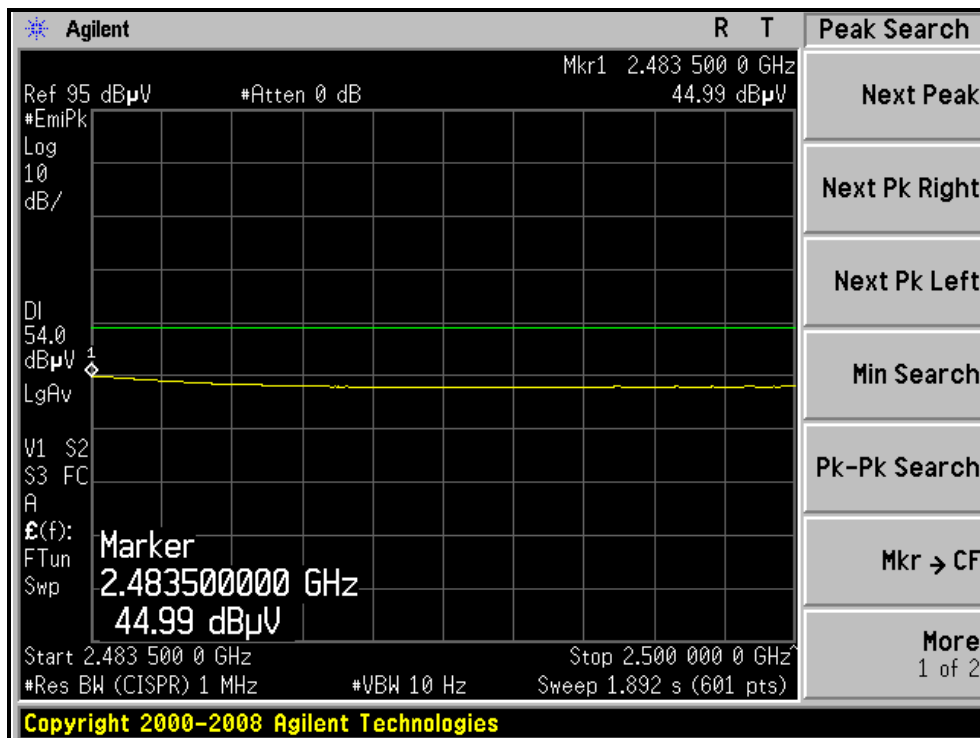
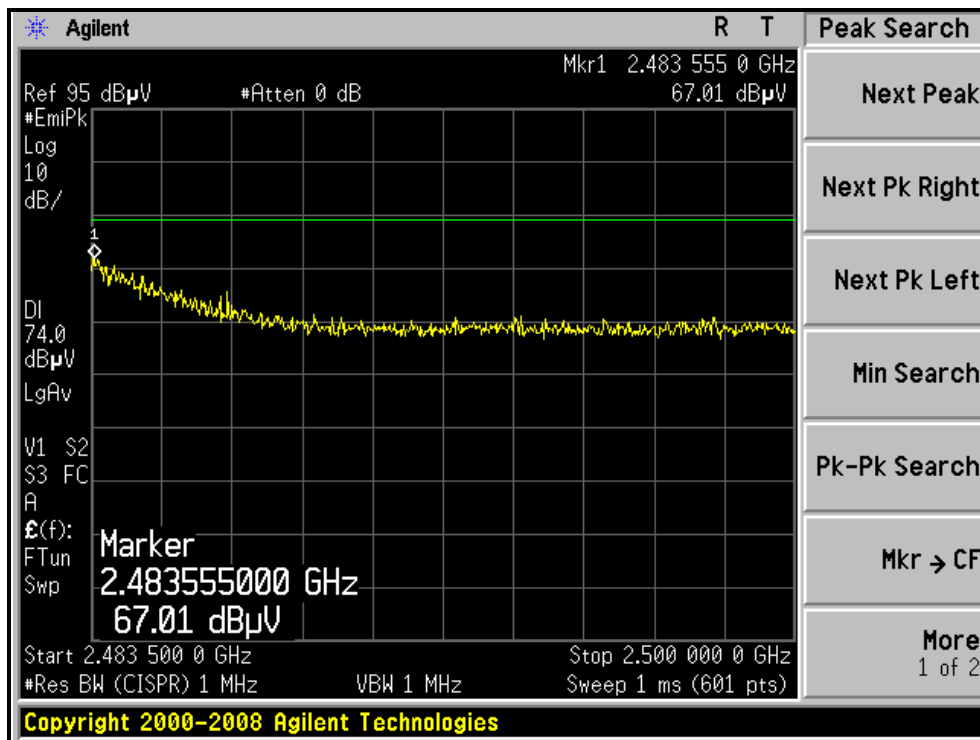
RESTRICTED BANDEDGE (802.11n (20MHz) MODE,CH13, HORIZONTAL)





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RESTRICTED BANDEDGE (802.11n (20MHz) MODE,CH13, VERTICAL)



4.3 6dB BANDWIDTH MEASUREMENT

4.3.1 LIMITS OF 6dB BANDWIDTH MEASUREMENT

The minimum of 6dB Bandwidth Measurement is 0.5 MHz.

4.3.2 TEST INSTRUMENTS

Test date: Oct. 14, 2011

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
R&S Spectrum Analyzer	FSP 40	100060	May 11, 2011	May 10, 2012

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

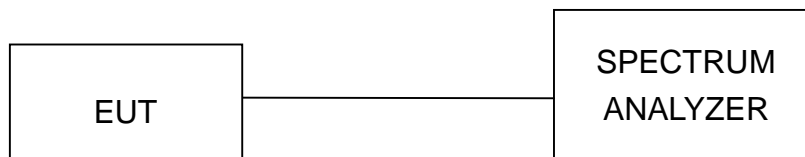
4.3.3 TEST PROCEDURE

The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with 100kHz RBW and 300kHz VBW. The 6dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 6dB.

4.3.4 DEVIATION FROM TEST STANDARD

No deviation

4.3.5 TEST SETUP



4.3.6 EUT OPERATING CONDITIONS

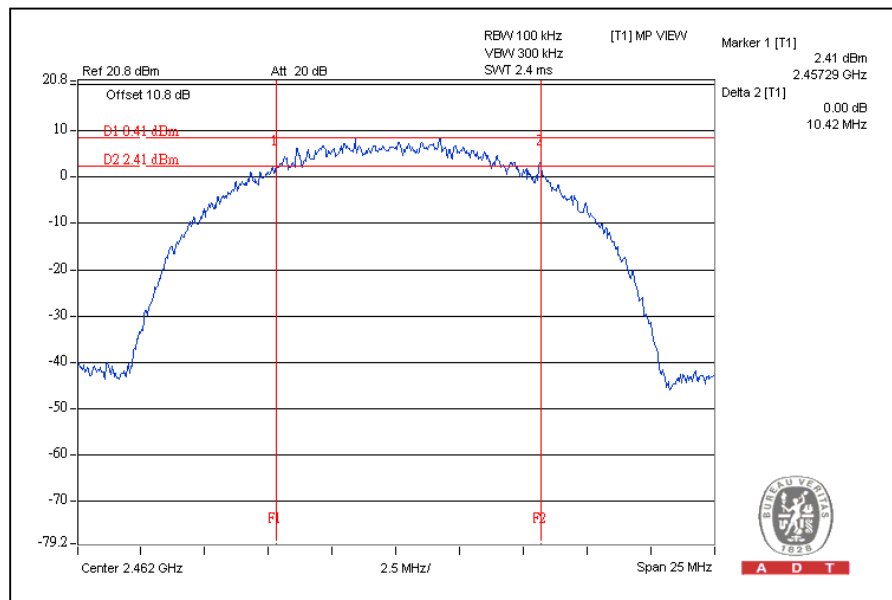
The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

4.3.7 TEST RESULTS

802.11b DSSS MODULATION:

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2412	9.88	0.5	PASS
6	2437	8.85	0.5	PASS
11	2462	10.42	0.5	PASS
12	2467	8.85	0.5	PASS
13	2472	9.98	0.5	PASS

CH11



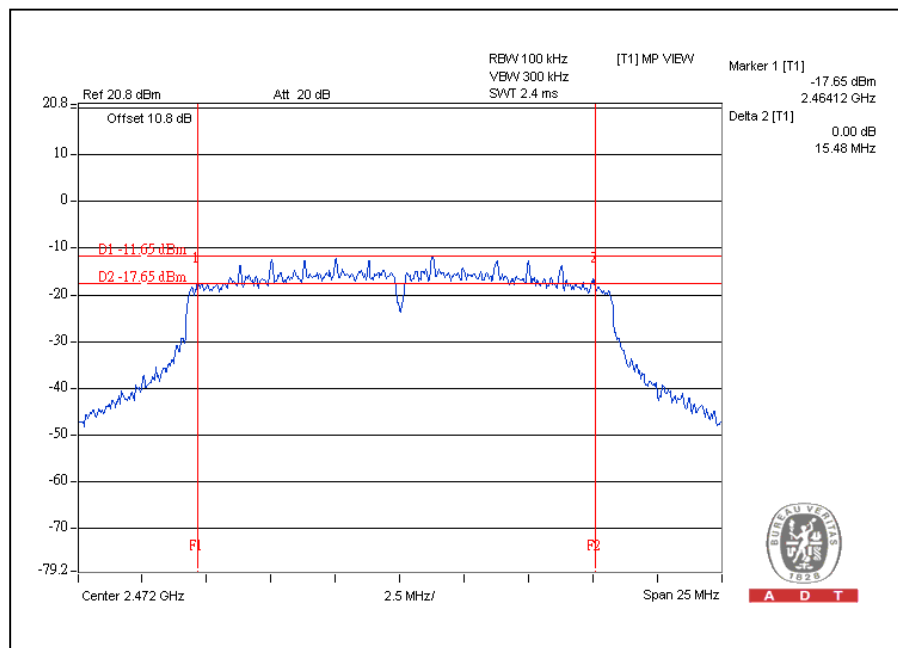


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802.11g OFDM MODULATION:

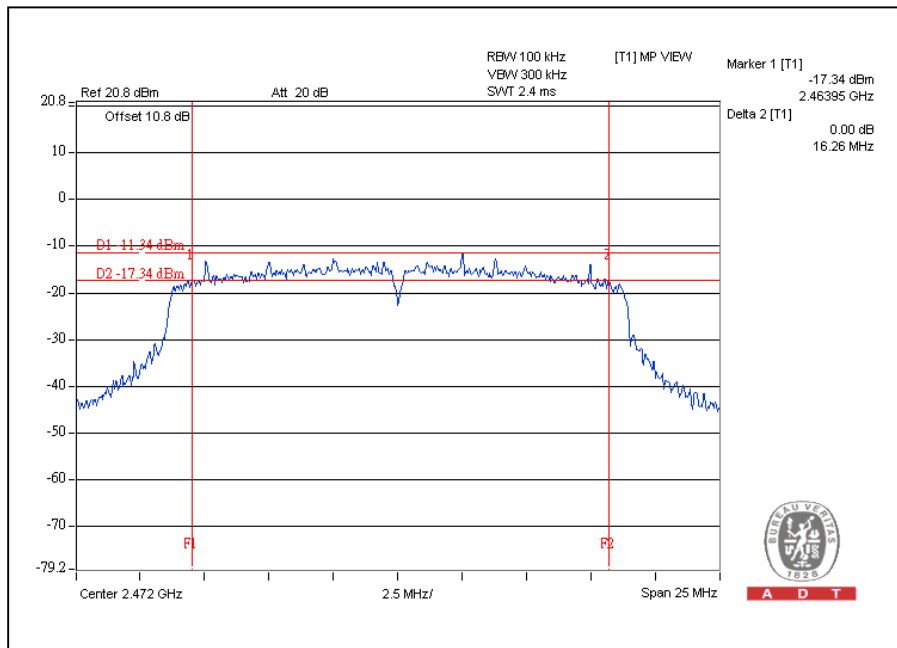
CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2412	15.04	0.5	PASS
6	2437	14.67	0.5	PASS
11	2462	15.15	0.5	PASS
12	2467	15.48	0.5	PASS
13	2472	15.48	0.5	PASS

CH13



802.11n (20MHz) OFDM MODULATION:

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2412	15.17	0.5	PASS
6	2437	15.08	0.5	PASS
11	2462	15.88	0.5	PASS
12	2467	15.11	0.5	PASS
13	2472	16.26	0.5	PASS

CH13


4.4 MAXIMUM PEAK OUTPUT POWER

4.4.1 LIMITS OF MAXIMUM PEAK OUTPUT POWER MEASUREMENT

The Maximum Peak Output Power Measurement is 30dBm.

4.4.2 INSTRUMENTS

Test date: Oct. 14, 2011

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

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

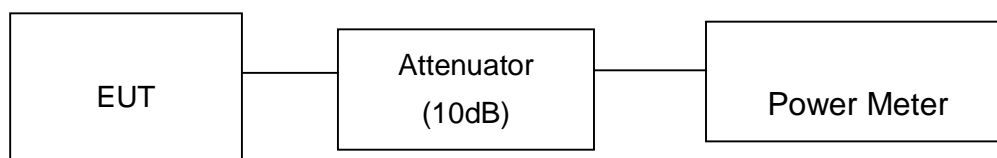
4.4.3 TEST PROCEDURES

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

4.4.4 DEVIATION FROM TEST STANDARD

No deviation

4.4.5 TEST SETUP



4.4.6 EUT OPERATING CONDITIONS

Same as Item 4.3.6



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4.4.7 TEST RESULTS

802.11b DSSS MODULATION:

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER (mW)	PEAK POWER (dBm)	PEAK POWER LIMIT (dBm)	PASS / FAIL
1	2412	85.1	19.3	30	PASS
6	2437	138.0	21.4	30	PASS
11	2462	102.3	20.1	30	PASS
12	2467	31.6	15.0	30	PASS
13	2472	16.2	12.1	30	PASS

802.11g OFDM MODULATION:

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER (mW)	PEAK POWER (dBm)	PEAK POWER LIMIT (dBm)	PASS / FAIL
1	2412	229.1	23.6	30	PASS
6	2437	316.2	25.0	30	PASS
11	2462	263.0	24.2	30	PASS
12	2467	79.4	19.0	30	PASS
13	2472	2.2	3.4	30	PASS



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802.11n (20MHz) OFDM MODULATION:

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER (mW)	PEAK POWER (dBm)	PEAK POWER LIMIT (dBm)	PASS / FAIL
1	2412	158.5	22.0	30	PASS
6	2437	302.0	24.8	30	PASS
11	2462	218.8	23.4	30	PASS
12	2467	66.1	18.2	30	PASS
13	2472	4.7	6.7	30	PASS

Note:

1. The channels 12 and 13 have been reduced power to meet band-edge and other requirement.
2. The power was fixed by firmware and end user cannot change or increase these power level thus possibly causing EMC failures.

4.5 POWER SPECTRAL DENSITY MEASUREMENT

4.5.1 LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT

The Maximum of Power Spectral Density Measurement is 8dBm.

4.5.2 TEST INSTRUMENTS

Test date: Oct. 14, 2011

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
R&S Spectrum Analyzer	FSP 40	100060	May 11, 2011	May 10, 2012

NOTE: 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

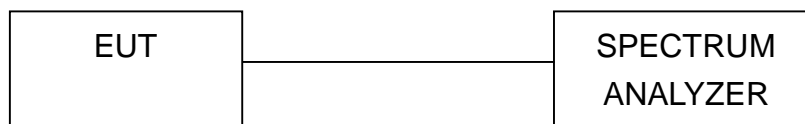
The transmitter output was connected to the spectrum analyzer through an attenuator, the bandwidth of the fundamental frequency was measured with the spectrum analyzer using 3kHz RBW and 30kHz VBW, set sweep time = span/3kHz. The power spectral density was measured and recorded.

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



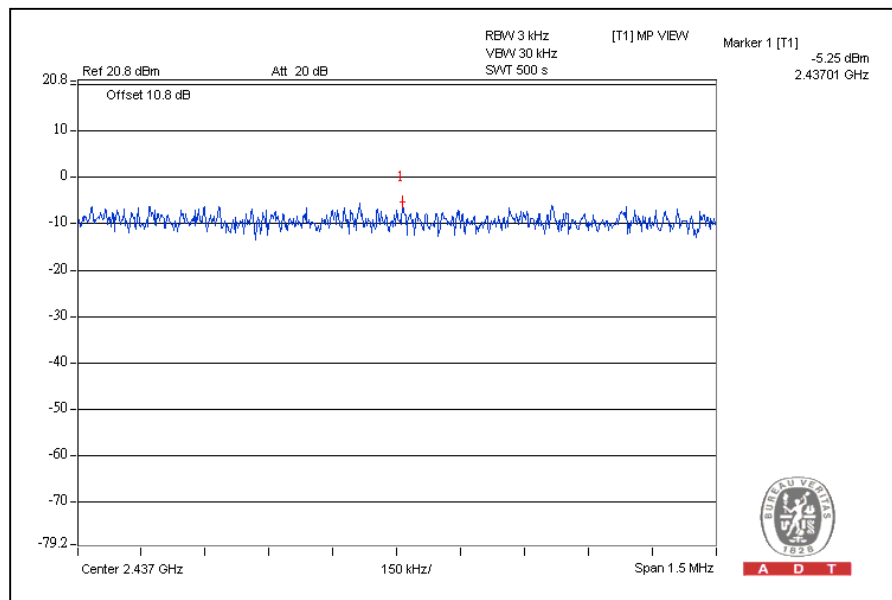
A D T

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	-7.2	8	PASS
6	2437	-5.3	8	PASS
11	2462	-5.5	8	PASS
12	2467	-10.6	8	PASS
13	2472	-13.4	8	PASS

CH6



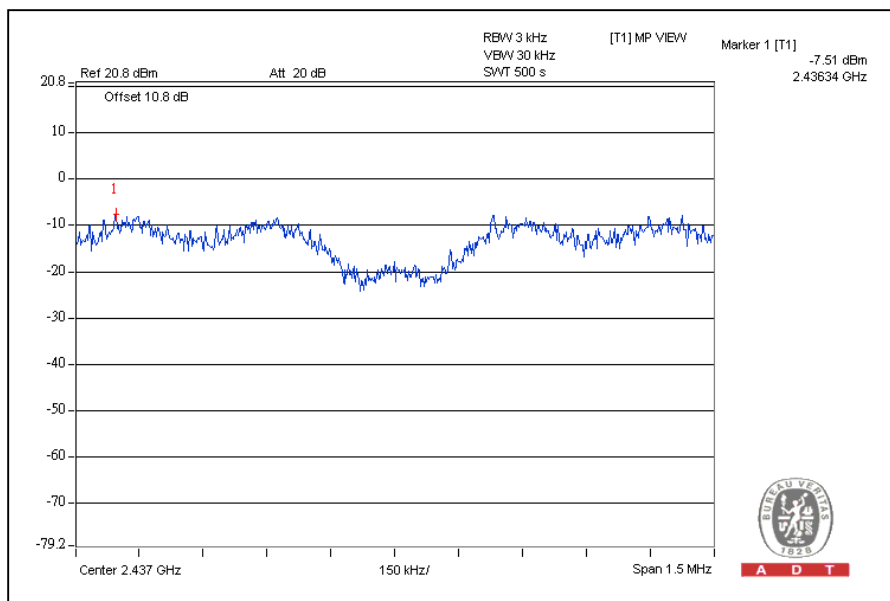


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802.11g OFDM MODULATION:

CHANNEL	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3kHz BW (dBm)	MAXIMUM LIMIT (dBm)	PASS / FAIL
1	2412	-9.7	8	PASS
6	2437	-7.5	8	PASS
11	2462	-9.1	8	PASS
12	2467	-13.8	8	PASS
13	2472	-25.4	8	PASS

CH6



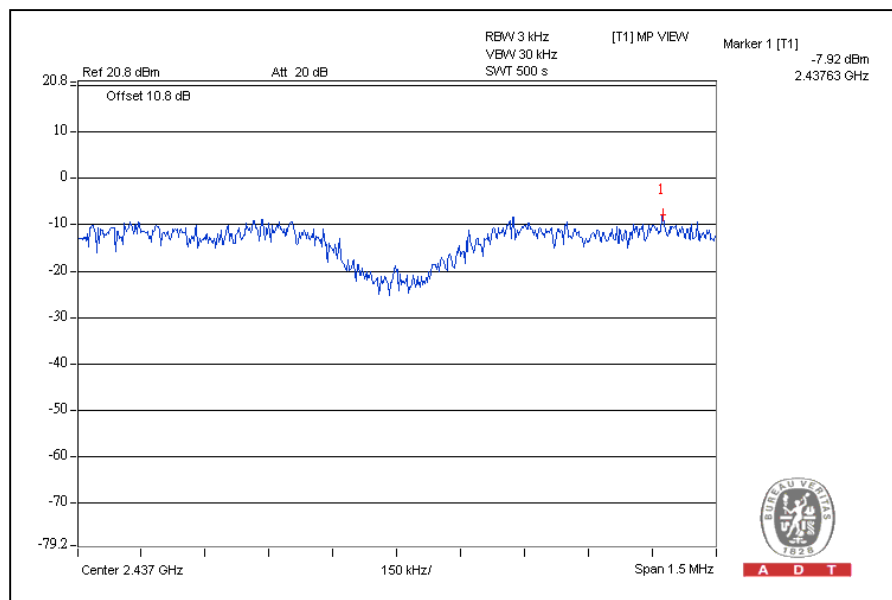


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802.11n (20MHz) OFDM MODULATION:

CHANNEL	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3kHz BW (dBm)	MAXIMUM LIMIT (dBm)	PASS / FAIL
1	2412	-10.7	8	PASS
6	2437	-7.9	8	PASS
11	2462	-10.9	8	PASS
12	2467	-16.0	8	PASS
13	2472	-25.9	8	PASS

CH6



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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

Test date: Oct. 14, 2011

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
R&S Spectrum Analyzer	FSP 40	100060	May 11, 2011	May 10, 2012

NOTE: 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 100MHz or 200MHz 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

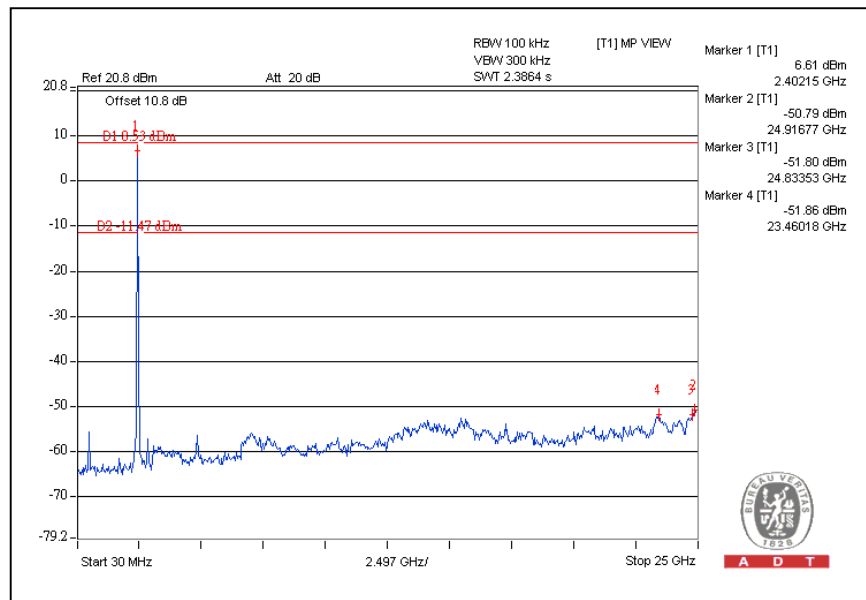
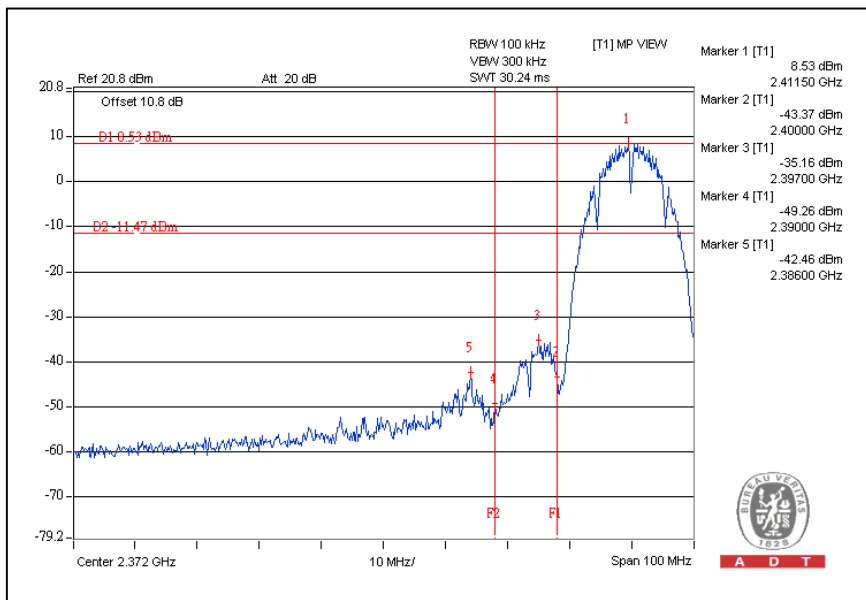
The spectrum plots are attached on the following images. D1 line indicates the highest level, and D2 line indicates the 20dB offset below D1. It shows compliance with the requirement in part 15.247(d).



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802.11b DSSS MODULATION:

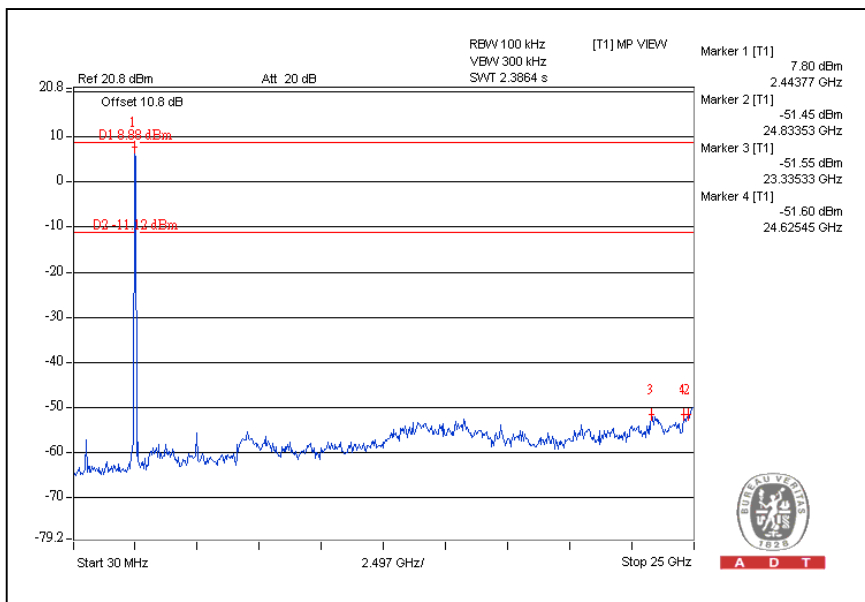
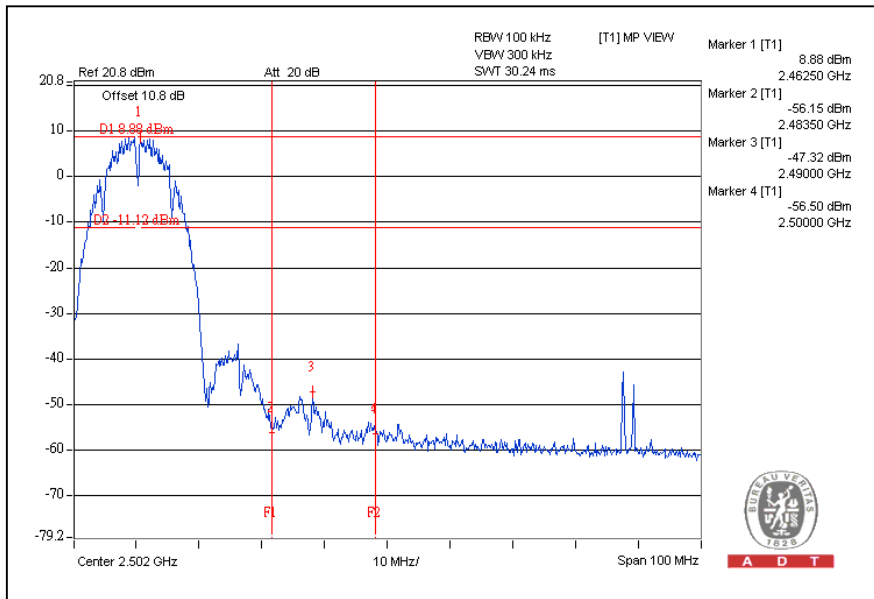
CH1





A D T

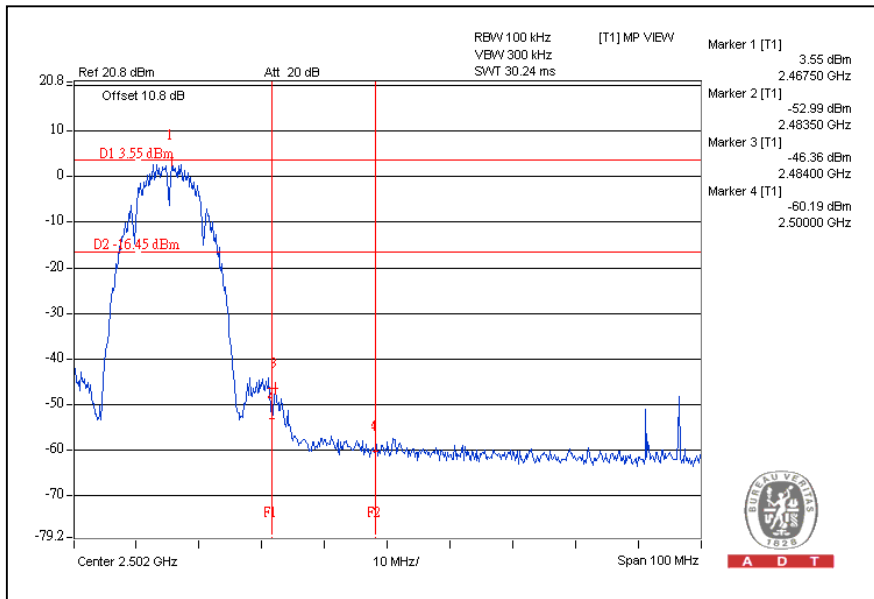
CH11



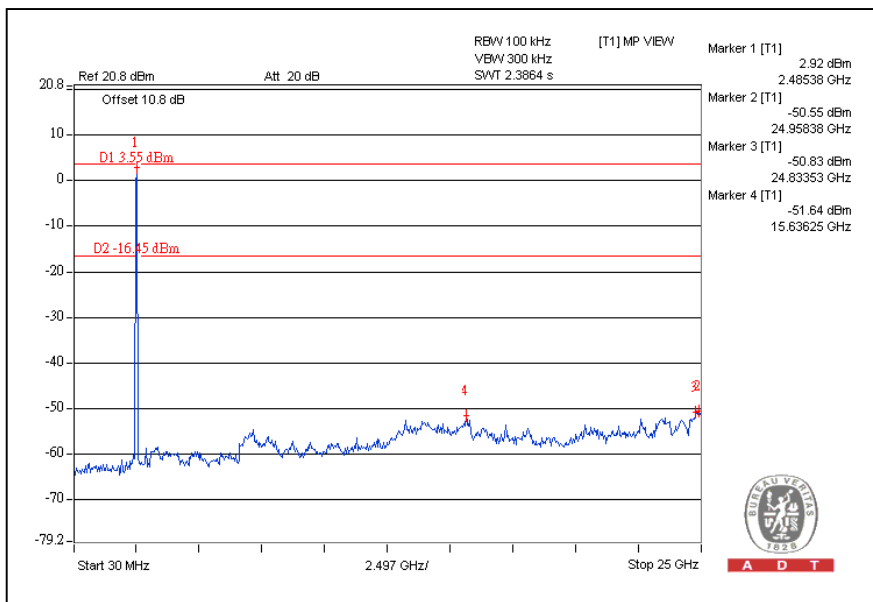


A D T

CH12



A D T

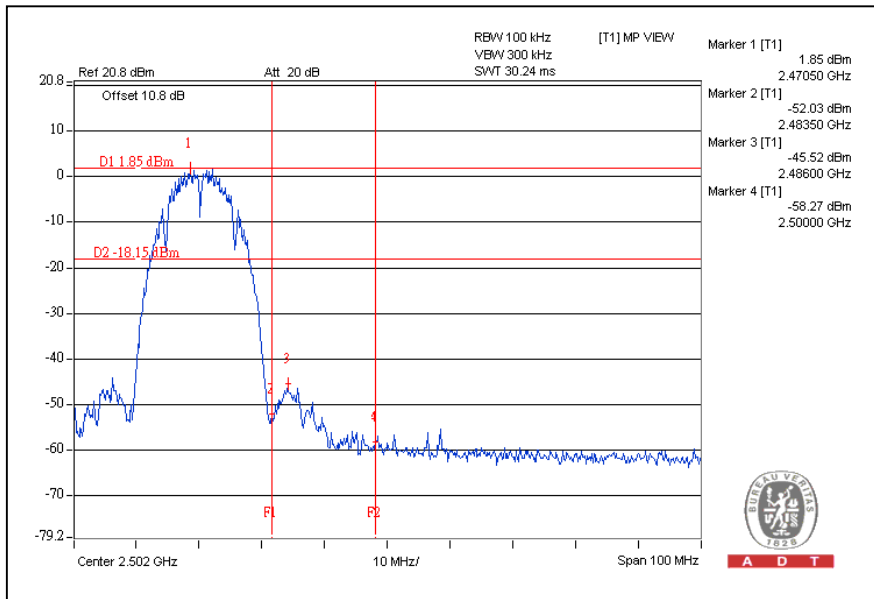


A D T

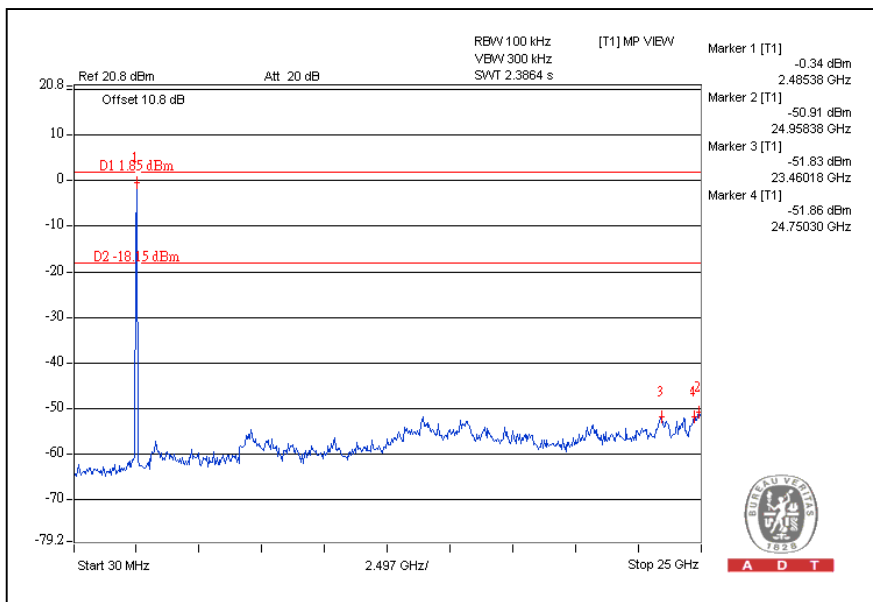


A D T

CH13



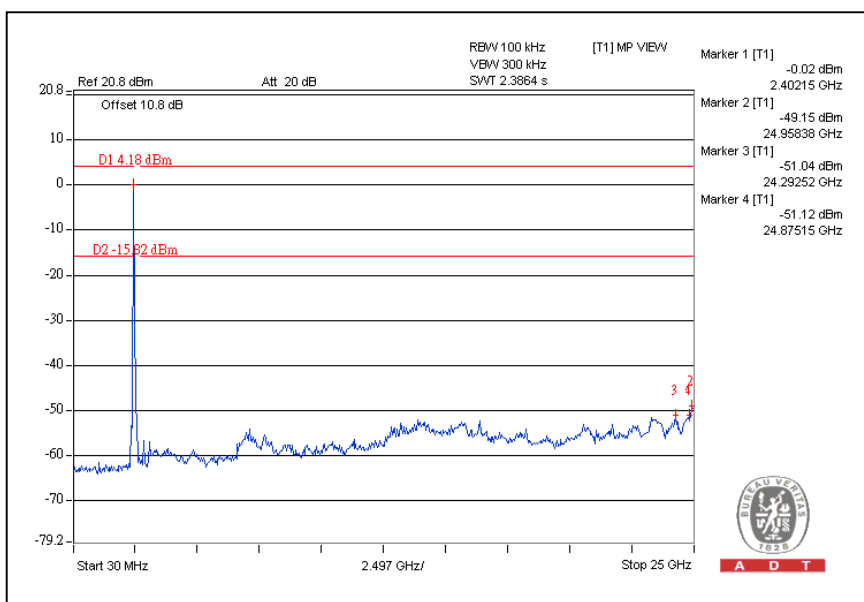
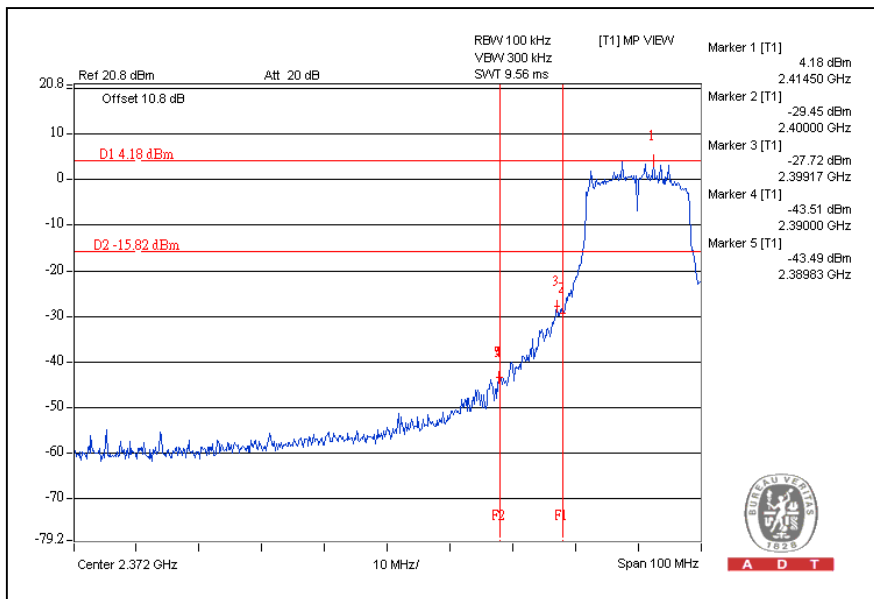
A D T



A D T

802.11g OFDM MODULATION:

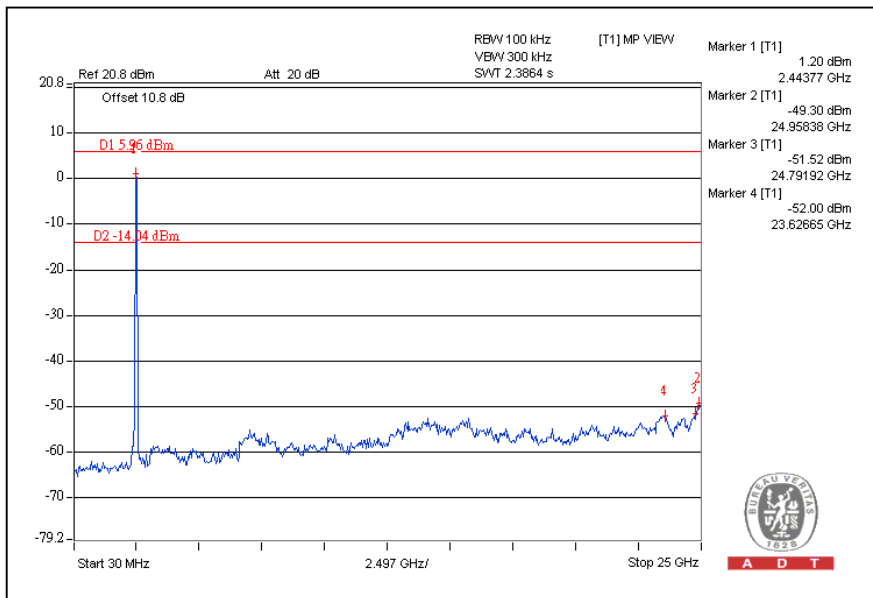
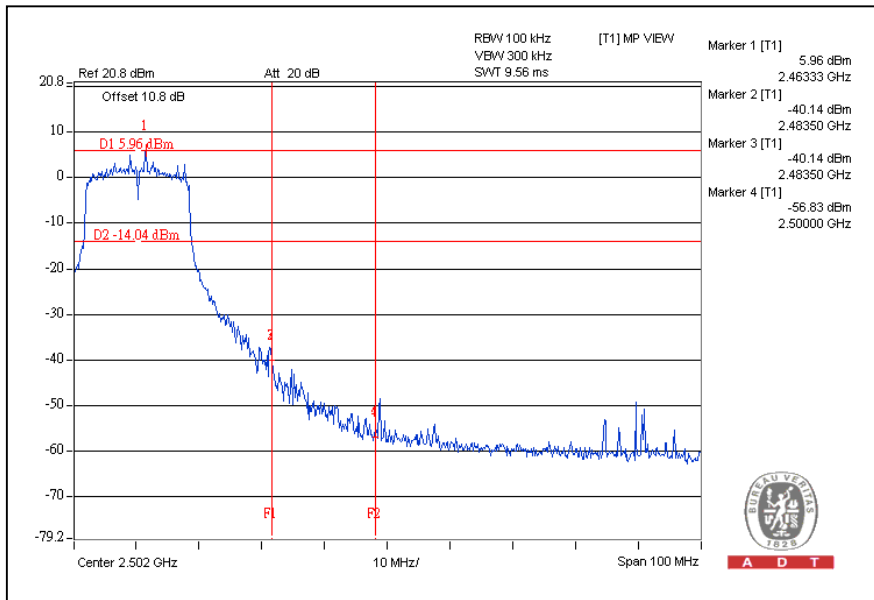
CH1





A D T

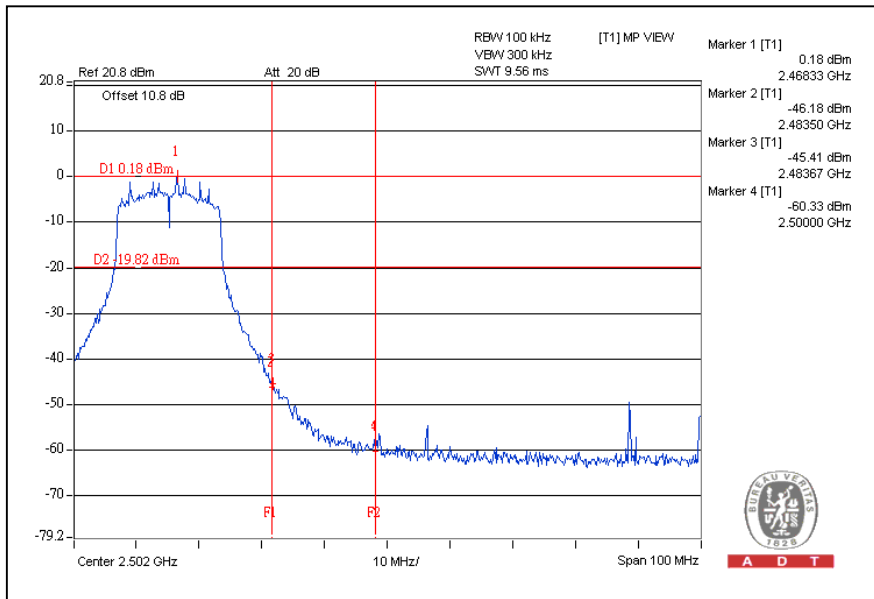
CH11



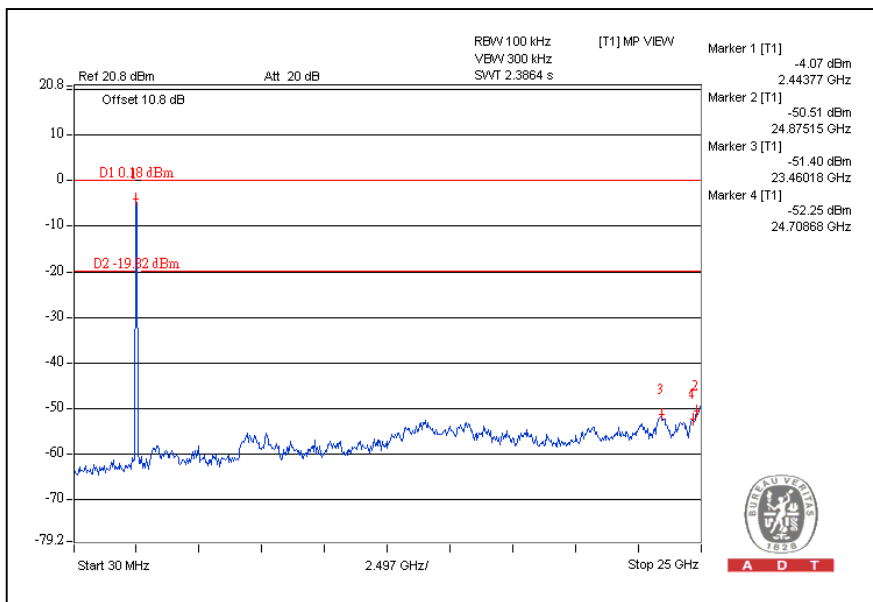


A D T

CH12



A D T

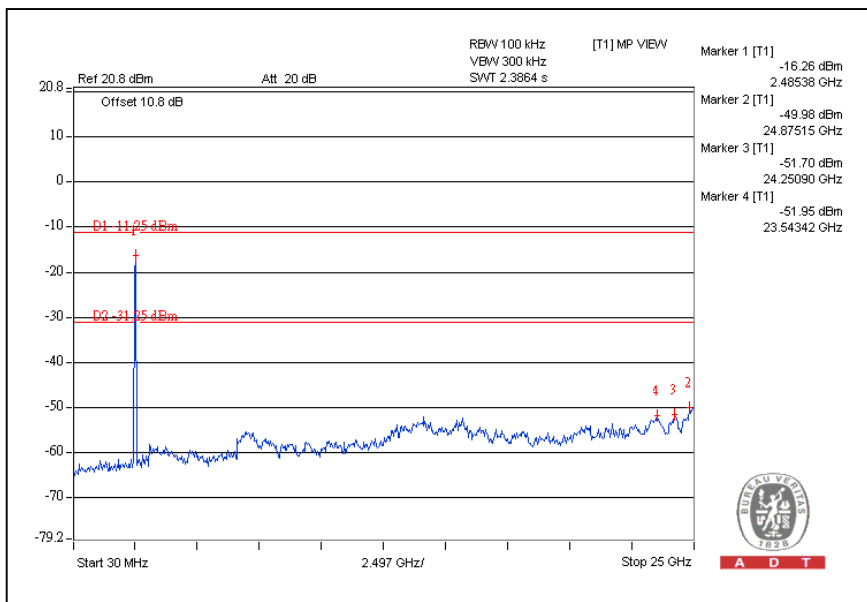
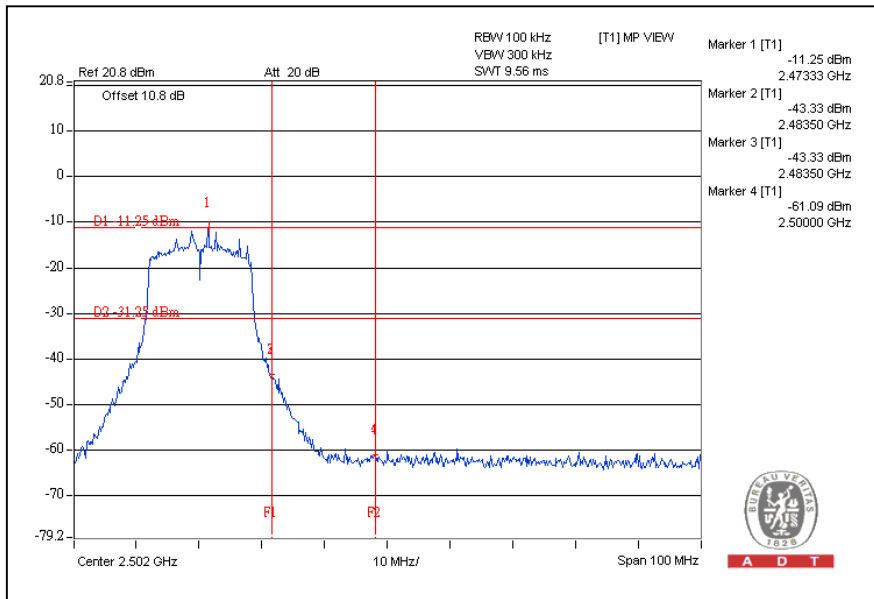


A D T



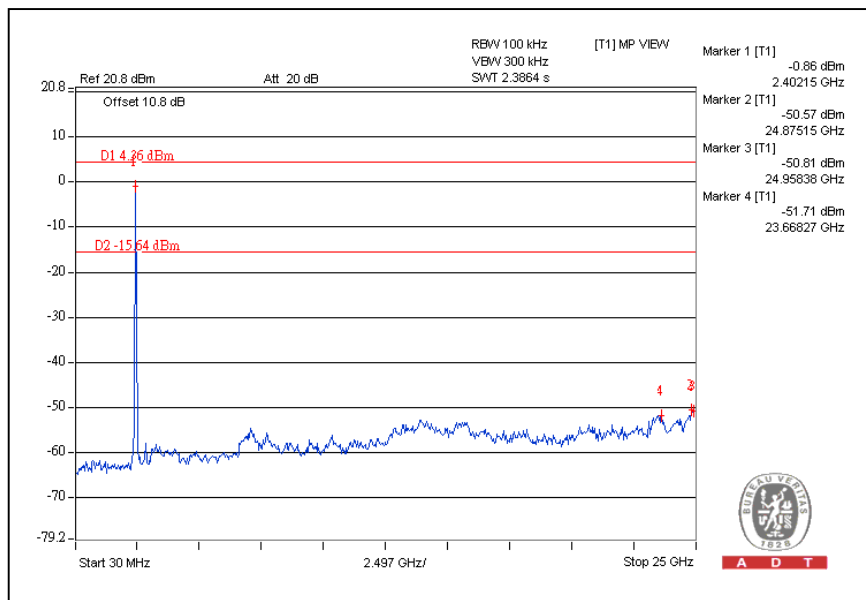
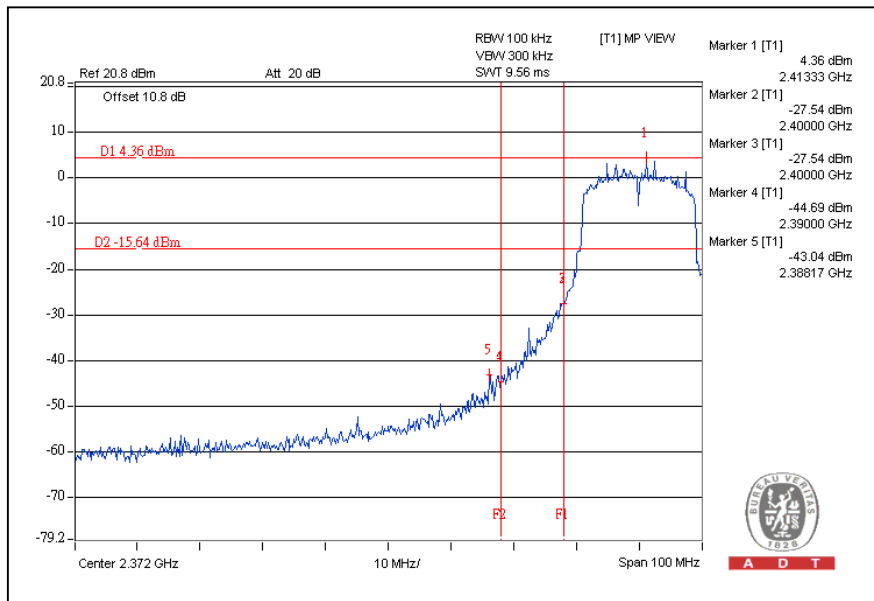
A D T

CH13



802.11n (20MHz) OFDM MODULATION:

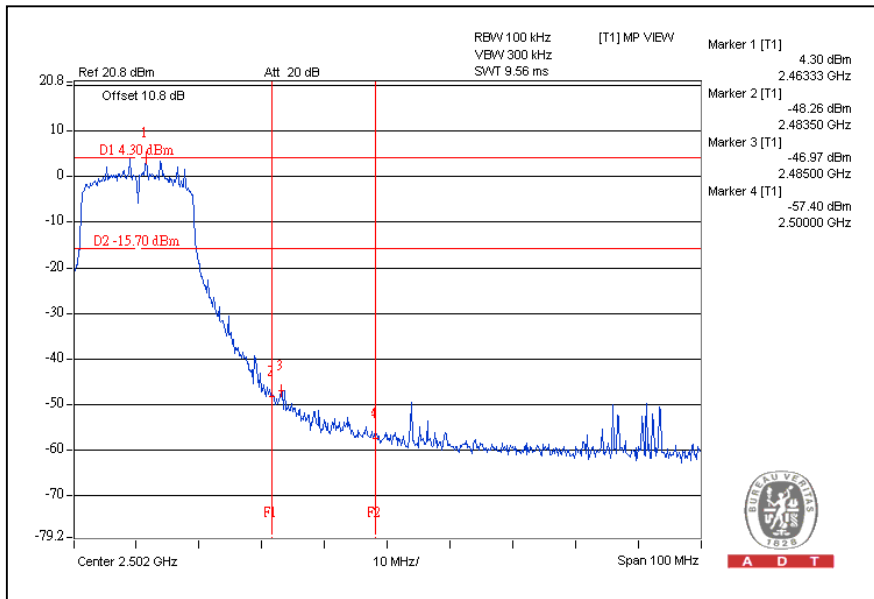
CH1



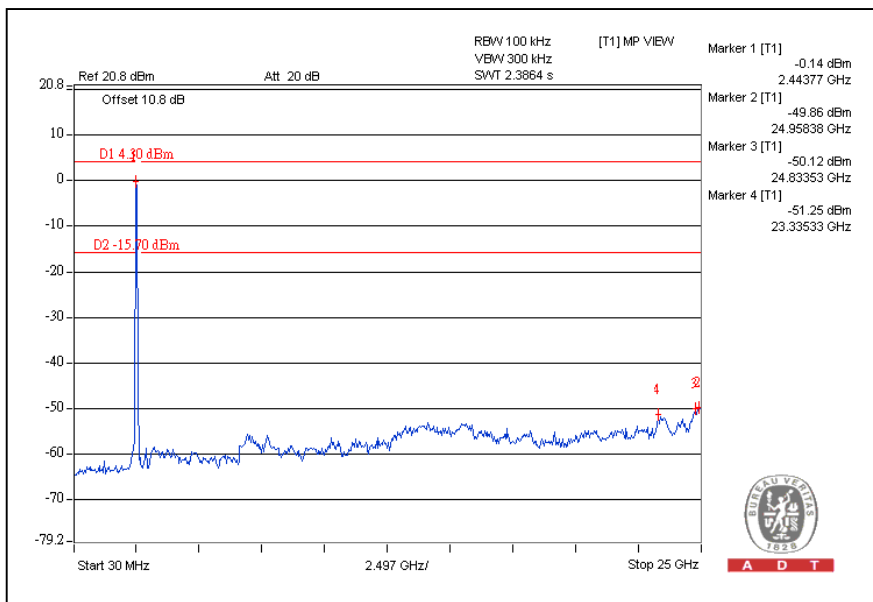


A D T

CH11



A D T

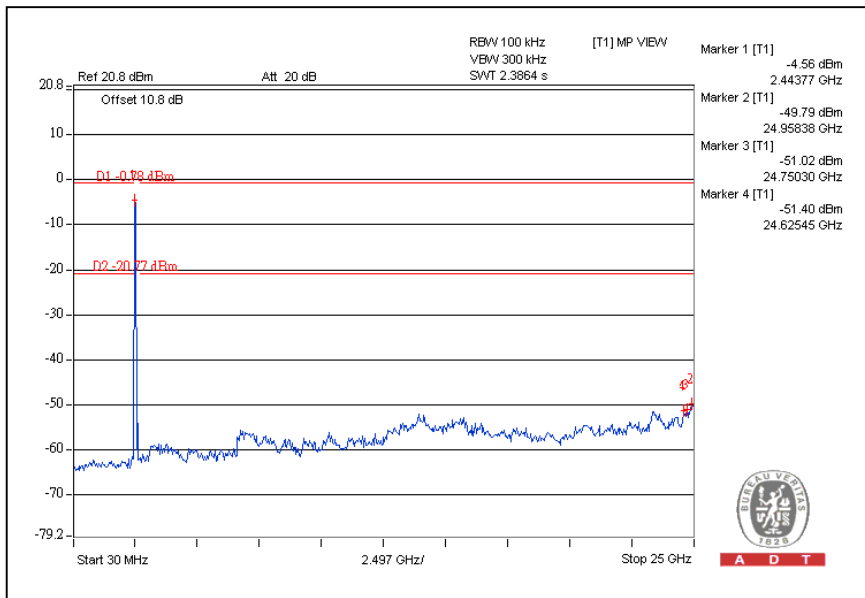
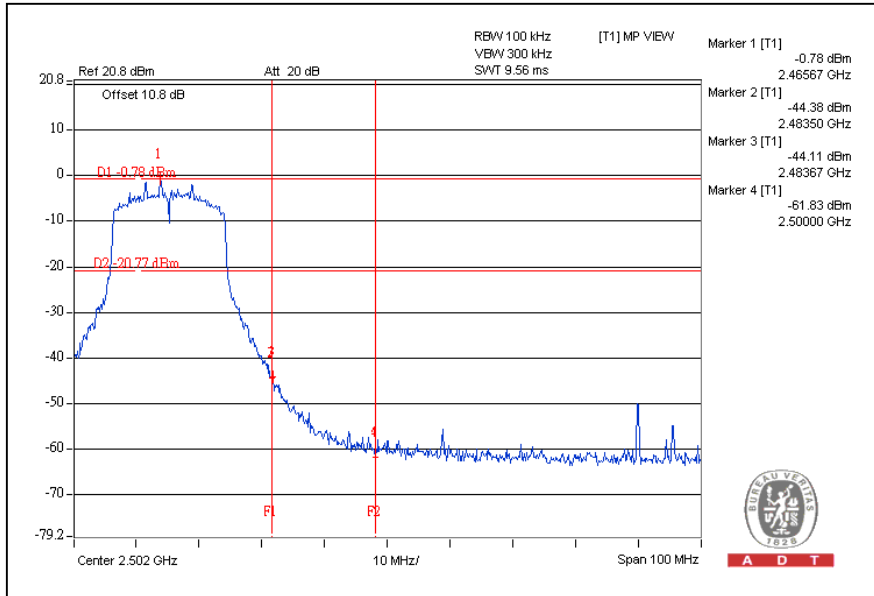


A D T



A D T

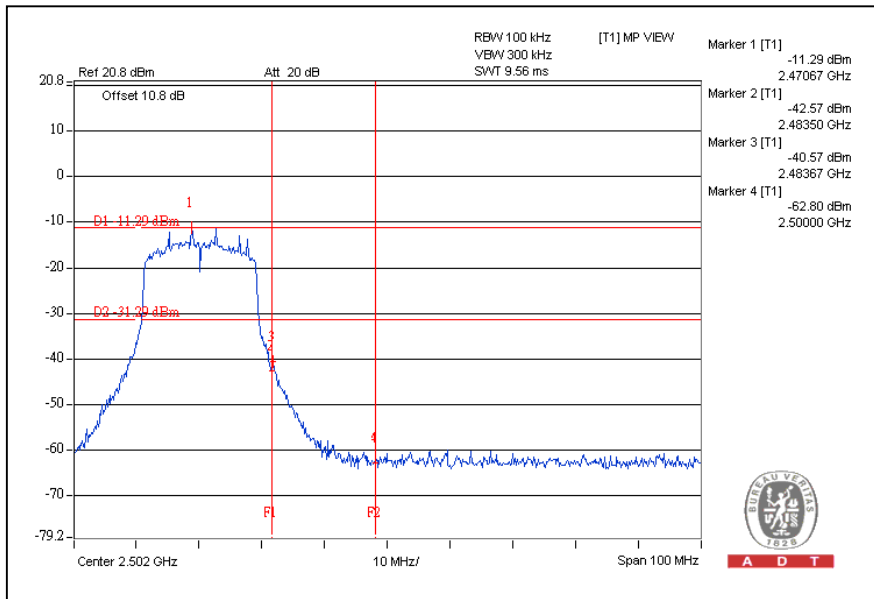
CH12



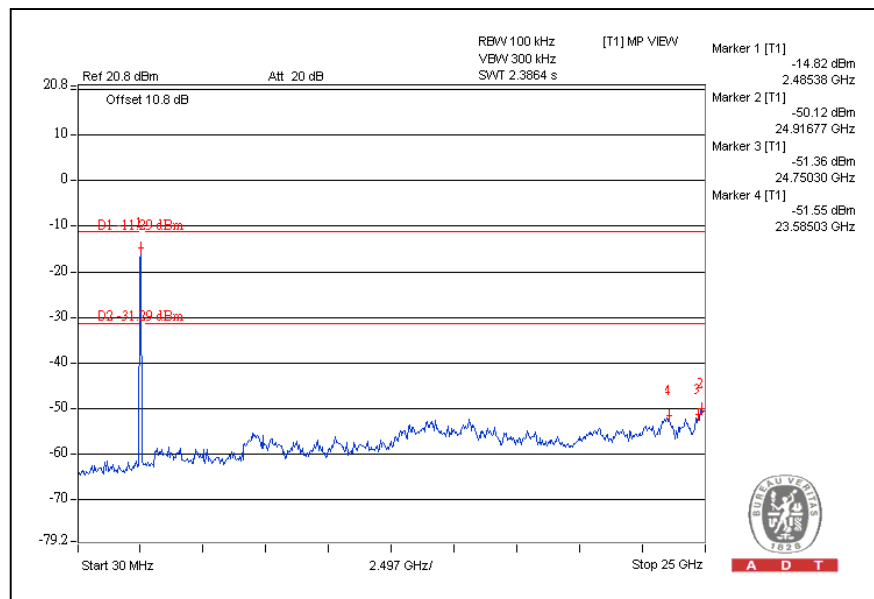


A D T

CH13



A D T



A D T



5. INFORMATION ON THE TESTING LABORATORIES

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are accredited and approved according to ISO/IEC 17025.

Copies of accreditation and authorization 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

Email: service.adt@tw.bureauveritas.com

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 ---