

# FCC TEST REPORT

**REPORT NO.:** RF981230H01

**MODEL NO.:** RTL8188CE

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**TESTED:** Jan. 18 to 21, 2010

**ISSUED:** Feb. 08, 2010

**APPLICANT:** Realtek Semiconductor Corp.

**ADDRESS:** No. 2, Innovation Road II, Hsinchu Science  
Park, Hsinchu 300, Taiwan

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

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

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## Table of Contents

1.	CERTIFICATION .....	4
2.	SUMMARY OF TEST RESULTS .....	5
2.1	MEASUREMENT UNCERTAINTY .....	6
3.	GENERAL INFORMATION .....	7
3.1	GENERAL DESCRIPTION OF EUT .....	7
3.2	DESCRIPTION OF TEST MODES .....	13
3.2.1	TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL .....	14
3.3	GENERAL DESCRIPTION OF APPLIED STANDARDS .....	14
3.4	DESCRIPTION OF SUPPORT UNITS.....	18
3.5	CONFIGURATION OF SYSTEM UNDER TEST .....	18
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 .....	22
4.2	RADIATED EMISSION MEASUREMENT .....	24
4.2.1	LIMITS OF RADIATED EMISSION MEASUREMENT .....	24
4.2.2	TEST INSTRUMENTS.....	25
4.2.3	TEST PROCEDURES .....	26
4.2.4	DEVIATION FROM TEST STANDARD .....	26
4.2.5	TEST SETUP .....	27
4.2.6	EUT OPERATING CONDITIONS .....	27
4.2.7	TEST RESULTS .....	28
4.3	6dB BANDWIDTH MEASUREMENT .....	57
4.3.1	LIMITS OF 6dB BANDWIDTH MEASUREMENT .....	57
4.3.2	TEST INSTRUMENTS.....	57
4.3.3	TEST PROCEDURE.....	58
4.3.4	DEVIATION FROM TEST STANDARD .....	58
4.3.5	TEST SETUP .....	58
4.3.6	EUT OPERATING CONDITIONS .....	58
4.3.7	TEST RESULTS .....	59
4.4	MAXIMUM PEAK OUTPUT POWER.....	63
4.4.1	LIMITS OF MAXIMUM PEAK OUTPUT POWER MEASUREMENT .....	63
4.4.2	INSTRUMENTS.....	63
4.4.3	TEST PROCEDURES .....	63
4.4.4	DEVIATION FROM TEST STANDARD .....	63



4.4.5	TEST SETUP .....	63
4.4.6	EUT OPERATING CONDITIONS .....	64
4.4.7	TEST RESULTS .....	65
4.5	POWER SPECTRAL DENSITY MEASUREMENT .....	67
4.5.1	LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT .....	67
4.5.2	TEST INSTRUMENTS .....	67
4.5.3	TEST PROCEDURE .....	68
4.5.4	DEVIATION FROM TEST STANDARD .....	68
4.5.5	TEST SETUP .....	68
4.5.6	EUT OPERATING CONDITION .....	68
4.5.7	TEST RESULTS .....	69
4.6	CONDUCTED OUT-BAND EMISSION MEASUREMENT .....	73
4.6.1	LIMITS OF CONDUCTED OUT-BAND EMISSION MEASUREMENT .....	73
4.6.2	TEST INSTRUMENTS .....	73
4.6.3	TEST PROCEDURE .....	73
4.6.4	DEVIATION FROM TEST STANDARD .....	74
4.6.5	EUT OPERATING CONDITION .....	74
4.6.6	TEST RESULTS .....	74
5.	INFORMATION ON THE TESTING LABORATORIES .....	83
6.	APPENDIX-A- MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB .....	84



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## 1. CERTIFICATION

**PRODUCT:** 802.11b/g/n RTL8188CE miniCard  
**BRAND NAME:** Realtek  
**MODEL NO.:** RTL8188CE  
**TEST SAMPLE:** PROTOTYPE  
**TESTED:** Jan. 18 to 21, 2010  
**APPLICANT:** Realtek Semiconductor Corp.  
**STANDARDS:** FCC Part 15, Subpart C (Section 15.247),  
ANSI C63.4-2003

The above equipment (Model: RTL8188CE) 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:** Feb. 08, 2010  
( Midoli Peng, Specialist )

**TECHNICAL ACCEPTANCE** : Hank Chung , **DATE:** Feb. 08, 2010  
( Hank Chung, Deputy Manager )

**APPROVED BY** : May Chen , **DATE:** Feb. 08, 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 -14.19dB at 0.158MHz
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 -1.5dB at 2483.5MHz
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 IPEX not a standard connector.

## 2.1 MEASUREMENT UNCERTAINTY

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

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

Measurement	Value
Conducted emissions	2.45 dB
Radiated emissions (30MHz-1GHz)	3.94 dB
Radiated emissions (1GHz -18GHz)	2.49 dB
Radiated emissions (18GHz -40GHz)	2.70 dB

### 3. GENERAL INFORMATION

#### 3.1 GENERAL DESCRIPTION OF EUT

<b>PRODUCT</b>	802.11b/g/n RTL8188CE miniCard
<b>MODEL NO.</b>	RTL8188CE
<b>FCC ID</b>	TX2-RTL8188CE
<b>POWER SUPPLY</b>	DC 3.3V from host equipment
<b>MODULATION TYPE</b>	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM
<b>MODULATION TECHNOLOGY</b>	DSSS, OFDM
<b>TRANSFER RATE</b>	802.11b: 11 / 5.5 / 2 / 1Mbps 802.11g: 54 / 48 / 36 / 24 / 18 / 12 / 9 / 6Mbps 802.11n (20MHz, 800ns GI): 65 / 58.5 / 52 / 39 / 26 / 19.5 / 13 / 6.5Mbps 802.11n (40MHz, 800ns GI): 135 / 121.5 / 108 / 81 / 54 / 40.5 / 27 / 13.5Mbps 802.11n (20MHz, 400ns GI): 72.2 / 65 / 57.8 / 43.3 / 28.9 / 21.7 / 14.4 / 7.2Mbps 802.11n (40MHz, 400ns GI): 150 / 135 / 120 / 90 / 60 / 45 / 30 / 15Mbps
<b>OPRTAING FREQUENCY</b>	2412 ~ 2462MHz
<b>NUMBER OF CHANNEL</b>	11 for 802.11b, 802.11g, 802.11n (20MHz) 7 for 802.11n (40MHz)
<b>MAXIMUM OUTPUT POWER</b>	802.11b: 70.8mW 802.11g: 288.4mW 802.11n (20MHz): 281.8mW 802.11n (40MHz): 190.5mW
<b>ANTENNA TYPE</b>	Please see note 2
<b>ANTENNA CONNECTOR</b>	Please see note 2
<b>DATA CABLE</b>	NA
<b>I/O PORTS</b>	NA
<b>ASSOCIATED DEVICES</b>	NA

# NOTE:

1. The EUT has two different types could be chose and please refer the below table:

Brand	Model Name	Type
Realtek	RTL8188CE	One antenna connector
		Two antenna connectors

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

No.	Brand	Model	Antenna type	Gain (dBi) with & w/o cable loss	Cable loss (dB)	Connector type
1	wistron	DQ661500301(Main) DQ661500301(Aux)	PIFA	3.45 3.14	NA	I-PEX
2	Quanta Computer Inc	37LX6AATP00 (Tx1) 37LX6AATP00 (Tx2)	PIFA	1.8 -0.3	-1.40 -2.02	I-PEX
3	Quanta Computer Inc	37LX7AATP00 (Tx1) 37LX7AATP00 (Tx2)	PIFA	0.3 1.7	-1.44 -1.79	I-PEX
4	Quanta Computer Inc	3ASP8AATP20 (Tx1) 3ASP8AATP20 (Tx2)	PIFA	1.0 0.2	-1.36 -1.95	SPD
5	ACON	25.90675.001 (Rx) 25.90676.001 (Tx)	PIFA	-0.39 0.64	NA	U.FL
6	WNC	25.90669.001 (Rx) 25.90670.001 (Tx)	PIFA	-1.53 1.32	NA	I-PEX
7	NISSEI ELECTRIC CO., LTD	3209970 (Rx) 3210002 (Tx)	PIFA	1.88 1.26	NA	U.FL
8	ACON	25.90598.001 (Rx) 25.90597.001 (Tx)	PIFA	1.17 1.04	NA	I-PEX
9	WNC	25.90587.001 (Rx) 25.90586.001 (Tx)	PIFA	1.94 0.59	NA	I-PEX
10	ACON	25.90653.001 (Rx) 25.90654.001 (Tx)	PIFA	-0.42 -0.13	NA	I-PEX
11	WNC	25.90649.001 (Rx) 25.90650.001 (Tx)	PIFA	-0.52 0.31	NA	I-PEX
12	Foxconn	024-01F0-2242 (Rx) 024-01F0-2243 (Tx)	PIFA	1.16 -0.88	NA	SGX0003-02
13	NISSEI ELECTRIC CO., LTD	3176658 (Rx) 3176674 (Tx)	PIFA	-0.83 -0.61	NA	U.FL
14	Foxconn	WDAN-L1WK1001-DF (Rx) WDAN-L1WK1002-DF (Tx)	PIFA	1.71 1.43	NA	FOXCONN
15	Hitachi	HMT14-MAIN (Rx) HMT14-AUX (Tx)	PIFA	1.82 1.54	NA	U.FL
16	ACON	25.90700.001 (Rx) 25.90702.001 (Tx)	PIFA	-1.21 1.27	NA	I-PEX
17	ACON	25.90800.001 (Rx) 25.90802.001 (Tx)	PIFA	1.37 1.21	NA	U.FL





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No.	Brand	Model	Antenna type	Gain (dBi) with & w/o cable loss	Cable loss (dB)	Connector type
18	ACON	APM6P-700033 (Rx) APM6P-700034 (Tx)	PIFA	-0.96 -0.86	NA	I-PEX
19	Amphenol Taiwan Corporation	14G152168231LV (Rx) 14G152168131LV (Tx)	PIFA	-1.85 -1.60	NA	I-PEX
20	ACON	APM6P-700027 (Rx) APM6P-700029 (Tx)	PIFA	-1.32 -0.23	NA	I-PEX
21	TYCO	2023940-1 (Rx) 2023944-1 (Tx)	PIFA	-2.39 1.52	NA	U.FL
22	ACON	APM6P-700028 (Rx) APM6P-700030 (Tx)	PIFA	-1.16 -0.74	NA	I-PEX
23	Tyco Holding (Bermuda) VII Ltd.	2023946-1 (Rx) 2023950-1 (Tx)	PIFA	-0.58 -0.11	NA	U.FL
24	Amphenol SAA	LX-0980-11-000-R (Rx) LX-0983-11-000-R (Tx)	PIFA	1.61 1.57	NA	20351-111R-37
25	NISSEI ELECTRIC CO., LTD	3172525 (Rx) 3172566 (Tx)	PIFA	1.35 1.99	NA	U.FL
26	Amphenol	LX0970-11-000-R (Rx) LX0968-11-000-R (Tx)	PIFA	1.47 1.68	NA	U.FL
27	FOXCONN	WDAN-L1ML3001-DF (Rx) WDAN-L1ML3002-DF (Tx)	PIFA	-0.40 1.10	NA	SGX0003-02
28	NISSEI ELECTRIC CO., LTD	3172467 (Rx) 3172509 (Tx)	PIFA	0.54 1.80	NA	U.FL
29	Quanta	DQ6GC200100 (Rx) DQ6GC200200 (Tx)	PIFA	0.1 -0.4	NA	I-PEX
30	Quanta	DQ6GC300100 (Rx) DQ6GC300200 (Tx)	PIFA	-1.3 0.7	NA	I-PEX
31	QUANTA	QADCPS1_WL_M (Rx) QADCPS1_WL_A (Tx)	PIFA	-0.5 -1.4	NA	I-PEX
32	Quanta Computer Inc	QADCFL3 WL M (Rx) QADCFL3 WL A (Tx)	PIFA	-0.1 -0.1	NA	I-PEX
33	ACON	25.90929.001 (Rx) 25.90930.001 (Tx)	PIFA	-0.04 1.16	NA	U.FL
34	Ethertronics, Inc.	25.90934.001 (Rx) 25.90935.001 (Tx)	PIFA	0.60 -0.59	NA	U.FL
35	WNC	25.90919.001 (Rx) 25.90920.001 (Tx)	PIFA	0.87 -0.93	NA	I-PEX
36	Amphenol	C-1334-11-000-26 (Rx) C-1335-11-000-26 (Tx)	PIFA	-0.37 -2.64	NA	U.FL
37	WNC	25.90979.001 (Rx) 25.90980.001 (Tx)	PIFA	0.77 0.74	NA	I-PEX
38	WNC	81.EEO15.001 (Main) 81.EEO15.002 (Aux)	PIFA	1.52 1.72	1.86 2.03	I-PEX
39	WNC	81.EHD15.003 (Main) 81.EHD15.002 (Aux)	PIFA	0.94 -0.77	1.39 1.71	I-PEX
40	WNC	81.EHD15.005 (Tx1) 81.EHD15.004 (Tx2)	PIFA	0.95 -1.51	1.07 1.61	I-PEX
41	WNC	81.EHD15.004 (Main) 81.EHD15.006 (Aux)	PIFA	-1.51 -0.49	1.61 1.82	I-PEX
42	WNC	81.EHD15.004 (Main) 81.EHD15.007 (Aux)	PIFA	-1.51 -0.09	1.61 1.60	I-PEX
43	WNC	81.EHD15.G09 (Tx1) 81.EHD15.G10 (Tx2)	PIFA	-0.31 -1.21	1.08 1.39	I-PEX



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No.	Brand	Model	Antenna type	Gain (dBi) with & w/o cable loss	Cable loss (dB)	Connector type
44	HON HAI	WDAN-M1WC1001-DF (Main) WDAN-M1MM1001-DF (Aux)	PIFA	-0.28 -1.24	-1.407 1.99	SGX0003-02
45	Amphenol KAE Co., Ltd	SS-03-03-099 (Main) SS-03-03-100 (Aux)	PIFA	0.77 -0.90	1.59 1.76	MHC-231(K AE)
46	HON HAI	WDAN-M1WC1001-DF (Main) WDAN-M1BN1001-DF (Aux)	PIFA	-0.28 -0.14	-1.407 2.30	SGX0003-02
47	HON HAI	WDAN-M1NY1001-DF (Main)	PIFA	0.56	-0.054	SGX0001-00
48	HON HAI	WDAN-M1PB1001-DF (Tx1) WDAN-M1PB1002-DF (Tx2)	PIFA	0.54 -1.40	0.99 1.36	SGX0003-02
49	HON HAI	WDAN-M1SN1002-DF (Main) WDAN-M1SN1001-DF (Aux)	PIFA	0.93 -0.53	-1.357 -1.727	SGX0003-02
50	HON HAI	WDAN-M1OS1001-DF (Main) WDAN-M1OS1002-DF (Aux)	PIFA	0.13 -0.13	-1.871 -2.072	SGX0003-02
51	HON HAI	WDAN-M1WC1002-DF (Main) WDAN-M1WC1001-DF (Aux)	PIFA	0.18 -0.28	-0.866 -1.407	SGX0003-02
52	Hitachi	HFT40 (Tx1) HFT40 (Tx2)	PIFA	0.58 1.12	1.42 2.12	IPEX
53	Hitachi	HFT60 (Tx1) HFT60(Tx2)	PIFA	-1.65 -0.92	1.48 2.18	IPEX
54	WNC	WNC001 (Main) WNC001(Aux)	PIFA	-1.10 1.76	1.17 1.17	IPEX
55	WNC	WNC002 (Main) WNC002 (Aux)	PIFA	-0.37 -0.21	2.28 2.12	IPEX
56	Tyco Holding (Bermuda) VII Ltd.	TBN001 (Main) TBN001 (Aux)	PIFA	3.45 2.41	1.45 2.13	I.P.X
57	Tyco Holding (Bermuda) VII Ltd.	TBN003 (Main) TBN003 (Aux)	PIFA	-1.11 -1.11	1.84 2.16	I.P.X
58	Hitachi	HBV07 (Tx1) HBV07 (Tx2)	PIFA	2.19 -0.33	0.95 0.95	IPEX
59	Hitachi	HBV051 (Tx1) HBV051 (Tx2)	PIFA	2.91 2.82	0.95 0.95	IPEX
60	Hitachi	HBV052 (Tx1) HBV052 (Tx2)	PIFA	0.27 0.02	0.95 0.95	IPEX
61	Hitachi	HBV061 (Tx1) HBV061 (Tx2)	PIFA	1.30 2.42	0.95 0.95	IPEX
62	Hitachi	HBV062 (Tx1) HBV062 (Tx2)	PIFA	-1.04 -1.19	0.95 0.95	IPEX
63	Hitachi	HFT65 (Tx1) HFT65 (Tx2)	PIFA	-1.74 1.16	0.95 0.95	IPEX
64	Hitachi	HCT01 (Main) HCT01 (Aux)	PIFA	0.87 1.94	0.89 0.89	IPEX or HRS
65	FOXCONN	WDAN-TQ (Tx1) WDAN-TQ (Tx2)	PIFA	-0.43 -0.7	2.5 2.5	SGX0001-00
66	tyco	TBN005 TBN006	PIFA	2.09 3.40	NA	IPEX
67	WNC	WNC004 (Main) WNC004 (Aux)	PIFA	2.40 1.50	1.53 1.92	IPEX
68	Tyco Holding (Bermuda) VII Ltd.	TBN008 (Tx1) TBN008 (Tx2)	PIFA	-0.10 -0.92	1.85 2.66	Technova

No.	Brand	Model	Antenna type	Gain (dBi) with & w/o cable loss	Cable loss (dB)	Connector type
69	TYCO	TBN008 (Tx1) TBN008 (Tx2)	PIFA	0.47 0.06	1.81 1.60	IPEX
70	Tyco	TBN008 (Tx1) TBN008 (Tx2)	PIFA	-2.60 -0.26	2.34 2.13	IPEX
71	Tyco	TBN007 (Tx1) TBN007 (Tx2)	PIFA	1.98 1.97	-0.97 -0.97	U.F.L
72	SmartApproach Co., Ltd	03-FR021-016 (Tx1) 03-FR021-016 (Tx2)	PIFA	2.32 0.49	1.03 1.11	IPEX
73	WNC	81XCAE15.G07 (Main) 81XCAE15.G08 (Aux)	PIFA	-3.20 -2.99	NA	IPEX
74	ACON	AMP8P-700130 (Main) AMP8P-700131 (Aux)	PIFA	1.89 -2.13	NA	IPEX
75	WNC	WNC005 (Main) WNC005 (Aux)	PIFA	-2.76 -3.64	1.86 2.54	IPEX
76	WHAYU	MSA-00005A (Main) MSA-00005A (Aux)	PIFA	-2.12 -2.49	-1.55 -2.16	Tnov
77	WNC	WNC003 (Main) WNC003 (Aux)	PIFA	0.52 1.07	1.49 2.13	IPEX
78	Hitachi	HFS23	PIFA	-0.8	0.89	IPEX or HRS
79	Hitachi	HFS40	PIFA	0.64	0.89	IPEX or HRS
80	Tyco Electronic AMPKK	TBN004 (Main) TBN004 (Aux)	PIFA	0.28 -0.83	0.98 0.98	U.FL

From the above antennas, the worst case was found in No. 1. Therefore only the test data of the mode was recorded in this report individually.

3. For radiated test item: The antenna of EUT was pre-tested under the following modes:

Test Mode	Description
Mode A	X-Y Plane
Mode B	Y-Z Plane
<b>Mode C</b>	<b>Z-X Plane</b>

From the above modes, the worst case was found in Mode C. Therefore only the test data of the modes were recorded in this report.

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

Test Mode	Description
Mode D	miniCard with one antenna connector
<b>Mode E</b>	<b>miniCard with two antenna connectors</b>

From the above modes, the worst case was found in Mode E. Therefore only the test data of the modes were recorded in this report.

5. The EUT incorporates a SISO function with 802.11b, 802.11g, 802.11n. Physically, the EUT provides one completed transmitter and receiver.
6. The EUT is 1 \* 1 spatial SISO without beam forming function. The antenna configuration is one transmitter antenna and one receiver antenna, as there is 1 PIFA antenna.



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7. The EUT complies with 802.11n standards and backwards compatible with 802.11b, 802.11g products.
8. The EUT, operates in the 2.4GHz frequency range, lets you connect IEEE 802.11g or IEEE 802.11b and 802.11n technique devices to the network.
9. The above EUT information was declared by the 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 b		√
C	802.11 g	√	
D	802.11 g		√
E	802.11n(20MHz) for MCS0~7	√	
F	802.11n(20MHz) for MCS0~7		√
G	802.11n(40MHz) for MCS0~7	√	
H	802.11n(40MHz) for MCS0~7		√

Note:

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

#### **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 11	6	OFDM	BPSK	6	C

#### **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 11	1, 6, 11	DSSS	DBPSK	1	A
802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6	C
802.11n (20MHz)	1 to 11	1, 6, 11	OFDM	BPSK	6.5	E
802.11n (40MHz)	1 to 7	1, 4, 7	OFDM	BPSK	13.5	G

#### **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 11	1, 11	DSSS	DBPSK	1	A
802.11g	1 to 11	1, 11	OFDM	BPSK	6	C
802.11n (20MHz)	1 to 11	1, 11	OFDM	BPSK	6.5	E
802.11n (40MHz)	1 to 7	1, 7	OFDM	BPSK	13.5	G

#### **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 11	1, 6, 11	DSSS	DBPSK	1	A
802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6	C
802.11n (20MHz)	1 to 11	1, 6, 11	OFDM	BPSK	6.5	E
802.11n (40MHz)	1 to 7	1, 4, 7	OFDM	BPSK	13.5	G

#### **TEST CONDITION:**

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER (SYSTEM)	TESTED BY
RE <sup>3</sup> 1G	25deg. C, 66%RH, 1021 hPa	120Vac, 60Hz	Frank Liu
RE<1G	25deg. C, 66%RH, 1021 hPa	120Vac, 60Hz	Frank Liu
PLC	23deg. C, 56%RH, 1021 hPa	120Vac, 60Hz	Leo Peng
APCM	25deg. C, 60%RH, 1021 hPa	120Vac, 60Hz	Phoenix Huang



### 3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is an 802.11b/g/n RTL8188CE miniCard. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

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

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

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

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

### 3.4 DESCRIPTION OF SUPPORT UNITS

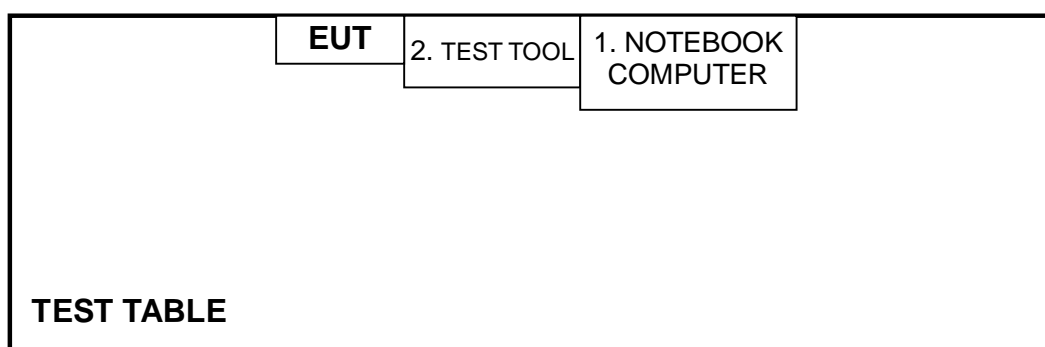
The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	NOTEBOOK COMPUTER	DELL	PP18L	6976685584	FCC DoC
2	TEST TOOL	Realtek	NA	NA	NA

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

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

### 3.5 CONFIGURATION OF SYSTEM UNDER TEST



## 4. TEST TYPES AND RESULTS

### 4.1 CONDUCTED EMISSION MEASUREMENT

#### 4.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

FREQUENCY OF EMISSION (MHz)	CONDUCTED LIMIT (dB $\mu$ V)	
0.15-0.5 0.5-5 5-30	Quasi-peak	Average
	66 to 56	56 to 46
	56 60	46 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.

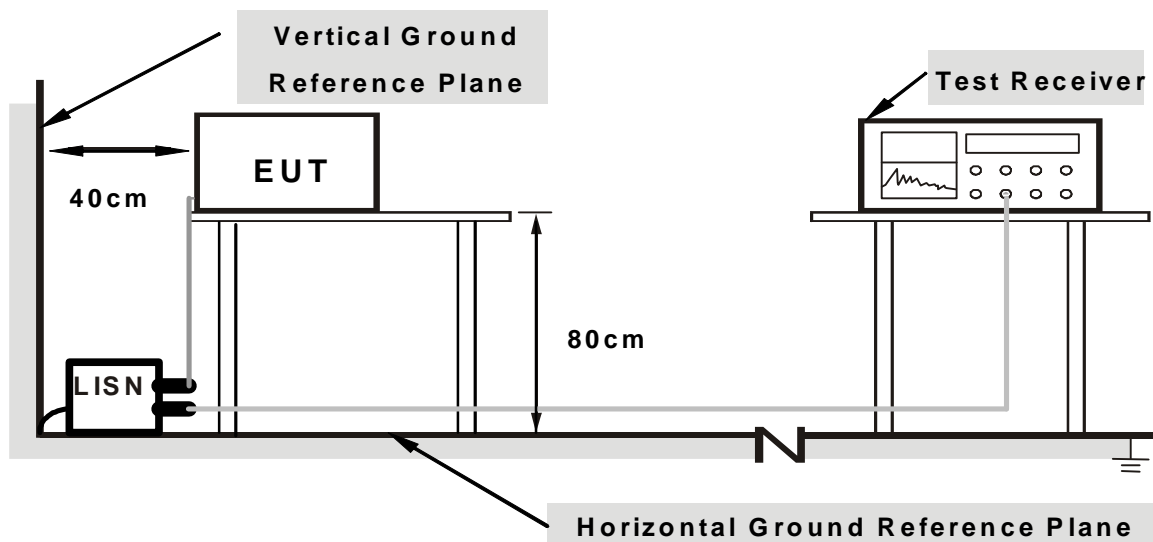
#### 4.1.3 TEST PROCEDURES

- 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 RTL8188CEkHz 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. Plug the EUT into the support unit 1 (Notebook Computer) which placed on a testing table.
2. The communication partner run test program “Realtek 11n Single Chip 92C PCIE WLAN MP Diagnostic Program 0.0008.0105.2010” to enable EUT under transmission/receiving condition continuously at specific channel frequency.

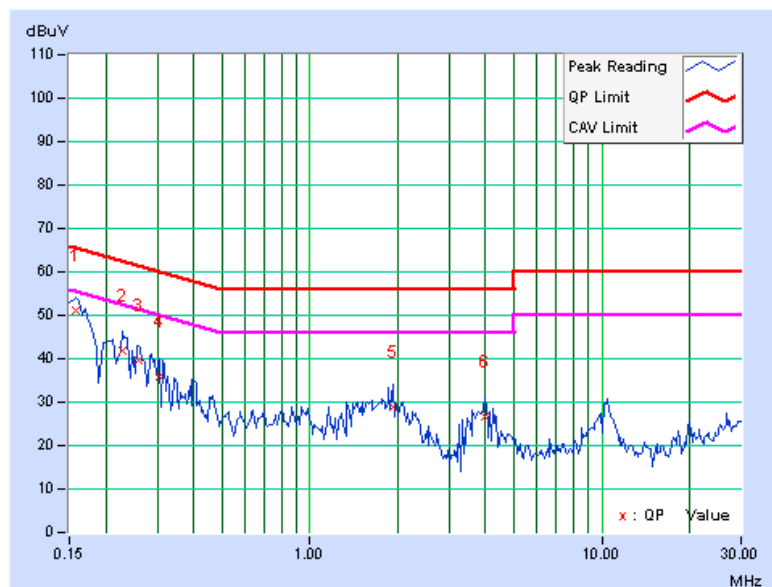
#### 4.1.7 TEST RESULTS

##### 802.11g OFDM MODULATION:

PHASE	Line (L)	6dB BANDWIDTH	9 kHz
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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	0.158	0.04	51.24	-	51.28	-	65.58	55.58	-14.30	-
2	0.229	0.04	41.71	-	41.75	-	62.49	52.49	-20.74	-
3	0.259	0.05	39.67	-	39.72	-	61.45	51.45	-21.74	-
4	0.306	0.05	35.73	-	35.78	-	60.07	50.07	-24.29	-
5	1.930	0.12	28.85	-	28.97	-	56.00	46.00	-27.03	-
6	3.961	0.20	26.38	-	26.58	-	56.00	46.00	-29.42	-

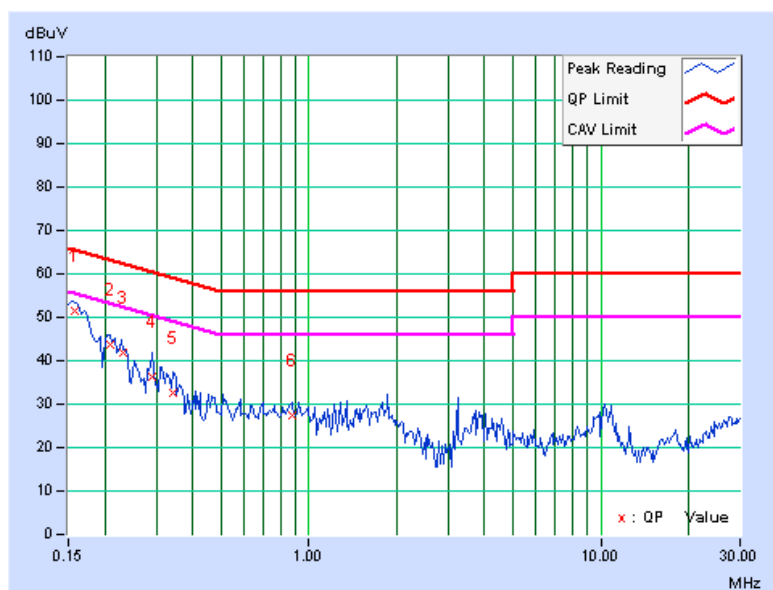
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
  2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
  3. The emission levels of other frequencies were very low against the limit.
  4. Margin value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



PHASE	Neutral (N)	6dB BANDWIDTH	9 kHz
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	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
No		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.158	0.05	51.34	-	51.39	-	65.58	55.58	-14.19	-
2	0.209	0.05	43.65	-	43.70	-	63.26	53.26	-19.56	-
3	0.230	0.05	41.67	-	41.72	-	62.44	52.44	-20.72	-
4	0.291	0.06	36.41	-	36.47	-	60.51	50.51	-24.04	-
5	0.341	0.06	32.39	-	32.45	-	59.17	49.17	-26.71	-
6	0.873	0.09	27.44	-	27.53	-	56.00	46.00	-28.47	-

- 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	RTL8188CE	3
216-960	200	3
Above 960	500	3

**NOTE:**

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



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#### 4.2.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
ROHDE & SCHWARZ Spectrum Analyzer	FSP40	100036	Apr. 03 , 2009	Apr. 02 , 2010
Agilent PSA Spectrum Analyzer	E4446A	MY46180622	Apr. 24 , 2009	Apr. 23 , 2010
HP Pre_Amplifier	8449B	3008A01923	Nov. 02, 2009	Nov. 01, 2010
ROHDE & SCHWARZ Test Receiver	ESCS30	847124/029	Aug. 28, 2009	Aug. 28, 2010
SCHWARZBECK TRILOG Broadband Antenna	VULB 9168	138	April 29, 2009	April 28, 2010
Schwarzbeck Horn_Antenna	BBHA9120	D124	Dec. 18, 2009	Dec. 17, 2010
Schwarzbeck Horn_Antenna	BBHA 9170	BBHA9170153	Jan. 23, 2009	Jan. 22, 2010
RF Switches	EMH-011	08009	Sep. 26, 2009	Sep. 25, 2010
RF CABLE (Chaintek)	Sucoflex 106	28077	Aug. 14, 2009	Aug. 13, 2010
RF Cable	8D	STCCAB-001	Sep. 26, 2009	Sep. 25, 2010
Software	ADT_Radiated_V7.6.15.9.2	NA	NA	NA
CT Antenna Tower & Turn Table	NA	NA	NA	NA

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

2. The horn antenna, HP preamplifier (model: 8449B) and Spectrum Analyzer (model: FSP40) are used only for the measurement of emission frequency above 1GHz if tested.

3. The test was performed in Open Site No. C.

4. The FCC Site Registration No. is 656396.

5. The VCCI Site Registration No. is R-1626.

6. The CANADA Site Registration No. is IC 7450G-3.

#### 4.2.3 TEST PROCEDURES

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 10 meter open area test site. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The antenna is a broadband antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

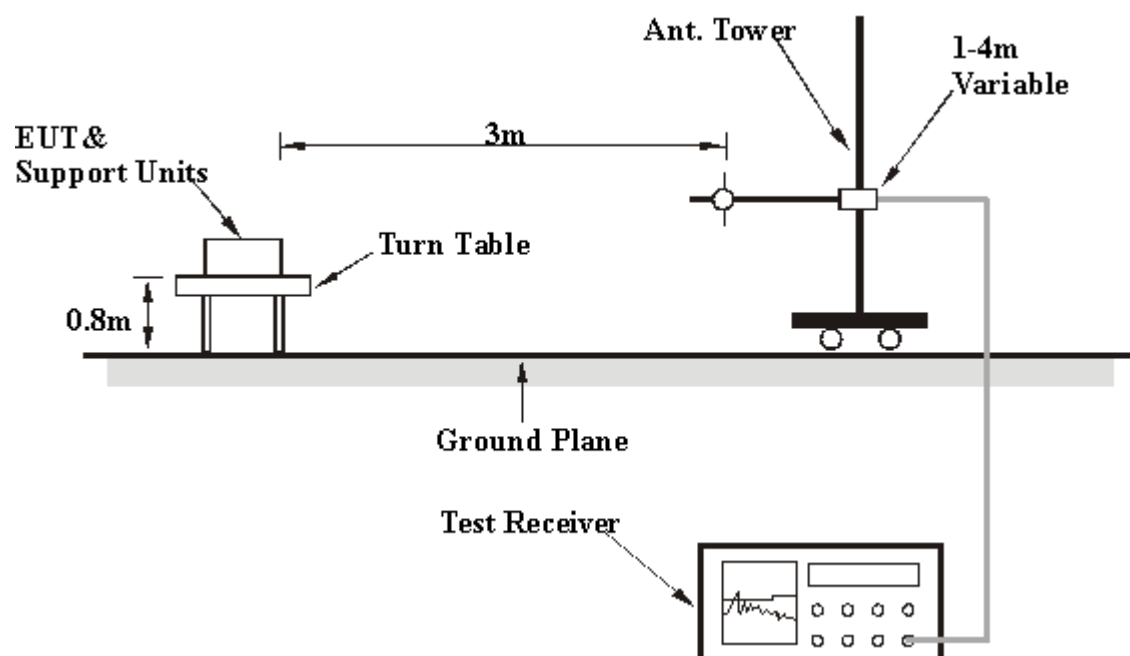
**NOTE:**

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

#### 4.2.4 DEVIATION FROM TEST STANDARD

No deviation

## 4.2.5 TEST SETUP



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

## 4.2.6 EUT OPERATING CONDITIONS

Same as 4.1.6

## 4.2.7 TEST RESULTS

### BELOW 1GHz 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	15deg. C, 60%RH 1021 hPa	TESTED BY	Frank Liu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	158.03	25.6 QP	43.5	-17.9	1.37 H	93	10.71	14.88
2	233.13	33.8 QP	46.0	-12.2	1.01 H	109	20.73	13.08
3	298.72	37.0 QP	46.0	-9.0	1.00 H	11	21.03	15.95
4	398.28	38.4 QP	46.0	-7.6	1.12 H	282	19.88	18.50
5	796.67	33.7 QP	46.0	-12.3	1.12 H	108	7.15	26.57
6	896.67	31.8 QP	46.0	-14.2	1.12 H	357	3.70	28.13
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	79.98	26.7 QP	40.0	-13.3	1.00 V	0	16.28	10.42
2	212.92	28.9 QP	43.5	-14.6	1.00 V	147	16.52	12.34
3	300.00	28.4 QP	46.0	-17.6	1.00 V	94	12.41	16.01
4	390.19	31.5 QP	46.0	-14.5	1.00 V	358	13.18	18.29
5	897.00	33.2 QP	46.0	-12.8	1.14 V	294	5.03	28.14
6	996.50	34.8 QP	54.0	-19.2	1.00 V	165	5.79	29.01

- 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	20deg. C, 68%RH 1021 hPa	TESTED BY	Frank Liu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2332.80	55.3 PK	74.0	-18.7	1.34 H	169	25.42	29.84
2	2332.80	43.2 AV	54.0	-10.8	1.34 H	169	13.33	29.84
3	*2412.00	105.3 PK			1.31 H	174	75.15	30.15
4	*2412.00	102.0 AV			1.31 H	174	71.85	30.15
5	4824.00	46.3 PK	74.0	-27.7	1.32 H	356	10.84	35.46
6	4824.00	41.7 AV	54.0	-12.3	1.32 H	356	6.24	35.46
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	2389.07	55.0 PK	74.0	-19.0	1.01 V	264	24.93	30.06
2	2389.07	44.5 AV	54.0	-9.6	1.01 V	264	14.39	30.06
3	*2412.00	101.9 PK			1.02 V	265	71.75	30.15
4	*2412.00	99.2 AV			1.02 V	265	69.05	30.15
5	4824.00	48.1 PK	74.0	-25.9	1.11 V	11	12.64	35.46
6	4824.00	44.9 AV	54.0	-9.1	1.11 V	11	9.44	35.46

- REMARKS:**
1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
  2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
  3. The other emission levels were very low against the limit.
  4. Margin value = Emission level – Limit value.
  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	20deg. C, 68%RH 1021 hPa	TESTED BY	Frank Liu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	106.3 PK			1.31 H	345	76.06	30.24
2	*2437.00	103.5 AV			1.31 H	345	73.26	30.24
3	4874.00	45.6 PK	74.0	-28.4	1.35 H	275	10.05	35.55
4	4874.00	40.7 AV	54.0	-13.3	1.35 H	275	5.15	35.55
5	7311.00	48.8 PK	74.0	-25.2	1.47 H	44	6.76	42.04
6	7311.00	39.5 AV	54.0	-14.5	1.47 H	44	-2.54	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	*2437.00	102.2 PK			1.02 V	262	71.96	30.24
2	*2437.00	100.3 AV			1.02 V	262	70.06	30.24
3	4874.00	48.0 PK	74.0	-26.0	1.12 V	10	12.45	35.55
4	4874.00	44.8 AV	54.0	-9.2	1.12 V	10	9.25	35.55
5	7311.00	52.0 PK	74.0	-22.0	1.25 V	66	9.96	42.04
6	7311.00	45.3 AV	54.0	-8.7	1.25 V	66	3.26	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.



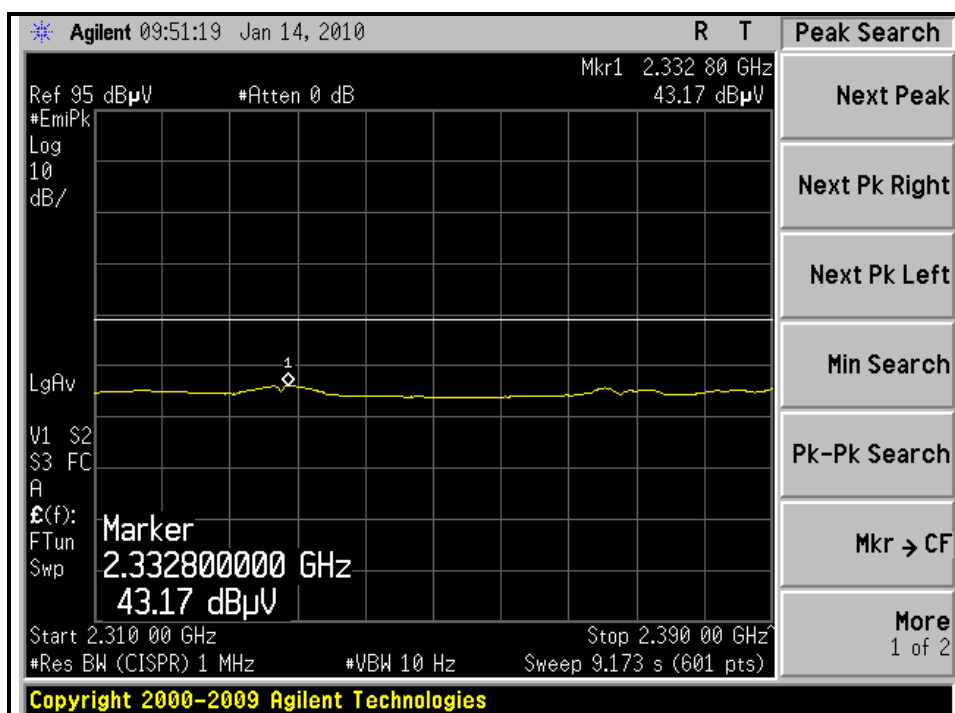
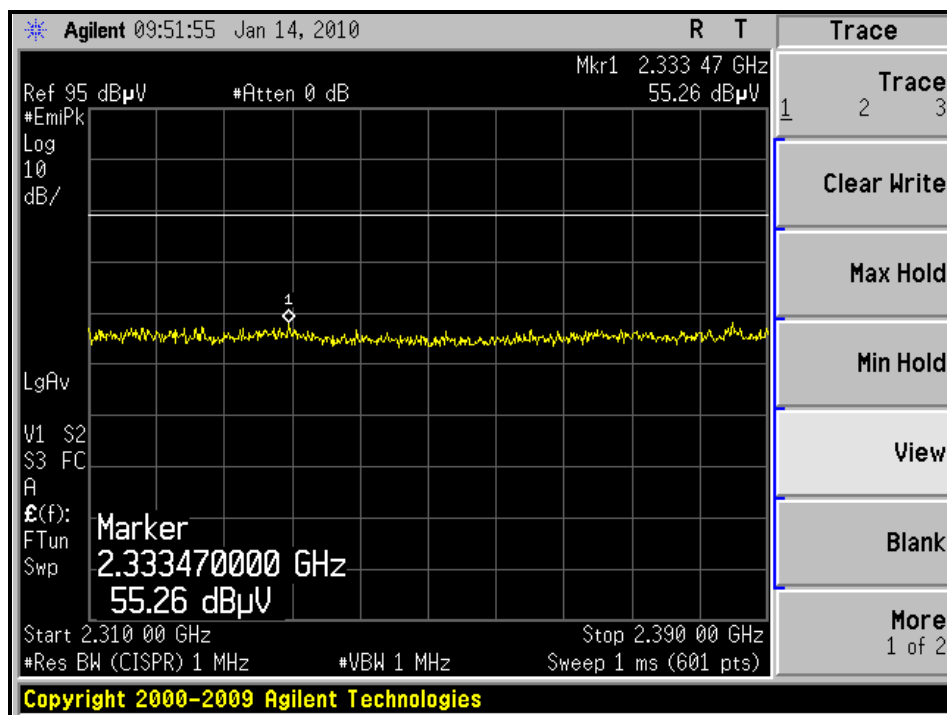
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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	20deg. C, 68%RH 1021 hPa	TESTED BY	Frank Liu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	107.3 PK			1.51 H	344	76.96	30.34
2	*2462.00	104.6 AV			1.51 H	344	74.26	30.34
3	2487.73	56.2 PK	74.0	-17.8	1.54 H	340	25.78	30.44
4	2487.73	47.5 AV	54.0	-6.5	1.54 H	340	17.09	30.44
5	4924.00	50.8 PK	74.0	-23.2	1.33 H	8	15.17	35.63
6	4924.00	48.4 AV	54.0	-5.6	1.33 H	8	12.77	35.63
7	7386.00	52.4 PK	74.0	-21.6	1.39 H	210	10.17	42.23
8	7386.00	43.4 AV	54.0	-10.6	1.39 H	210	1.17	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	*2462.00	103.4 PK			1.00 V	266	73.06	30.34
2	*2462.00	101.2 AV			1.00 V	266	70.86	30.34
3	2487.76	55.1 PK	74.0	-18.9	1.01 V	264	24.67	30.44
4	2487.76	43.9 AV	54.0	-10.1	1.01 V	264	13.50	30.44
5	4924.00	51.5 PK	74.0	-22.5	1.00 V	357	15.87	35.63
6	4924.00	49.2 AV	54.0	-4.8	1.00 V	357	13.57	35.63
7	7386.00	55.7 PK	74.0	-18.3	1.27 V	85	13.51	42.23
8	7386.00	49.5 AV	54.0	-4.5	1.27 V	85	7.27	42.23

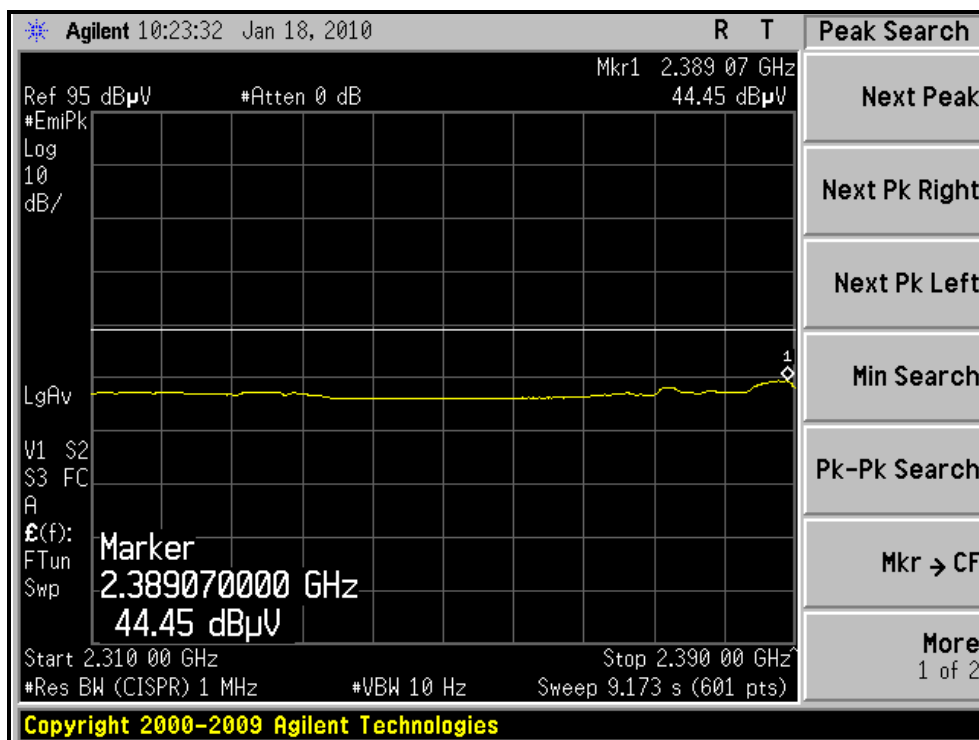
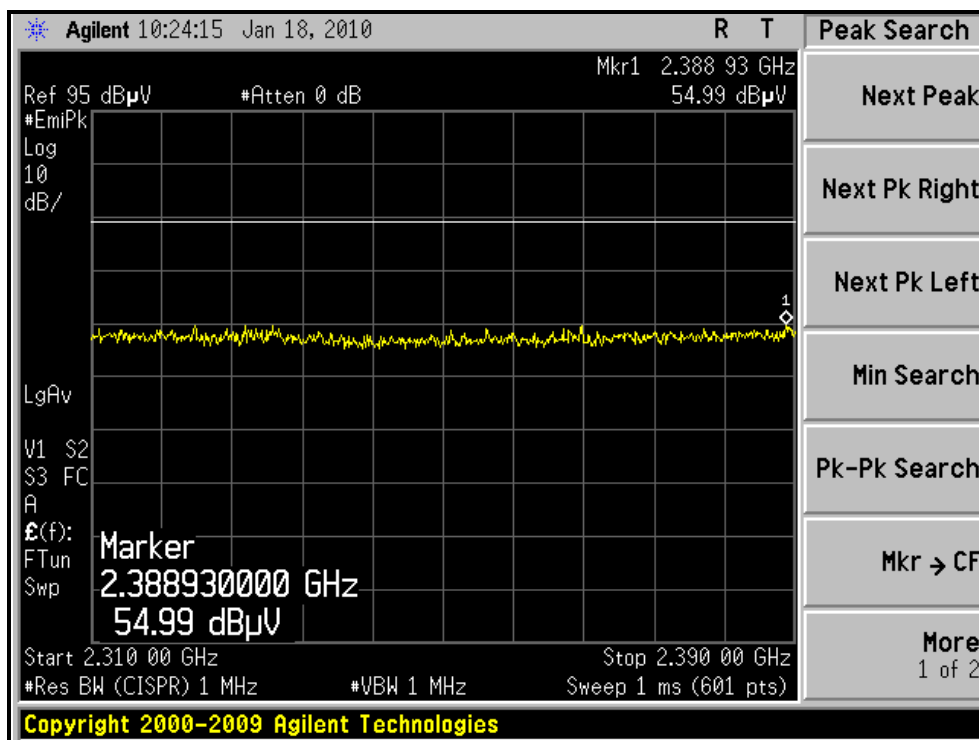
**REMARKS:** 1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).  
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).  
3. The other emission levels were very low against the limit.  
4. Margin value = Emission level – Limit value.  
5. “ \* “: Fundamental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

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

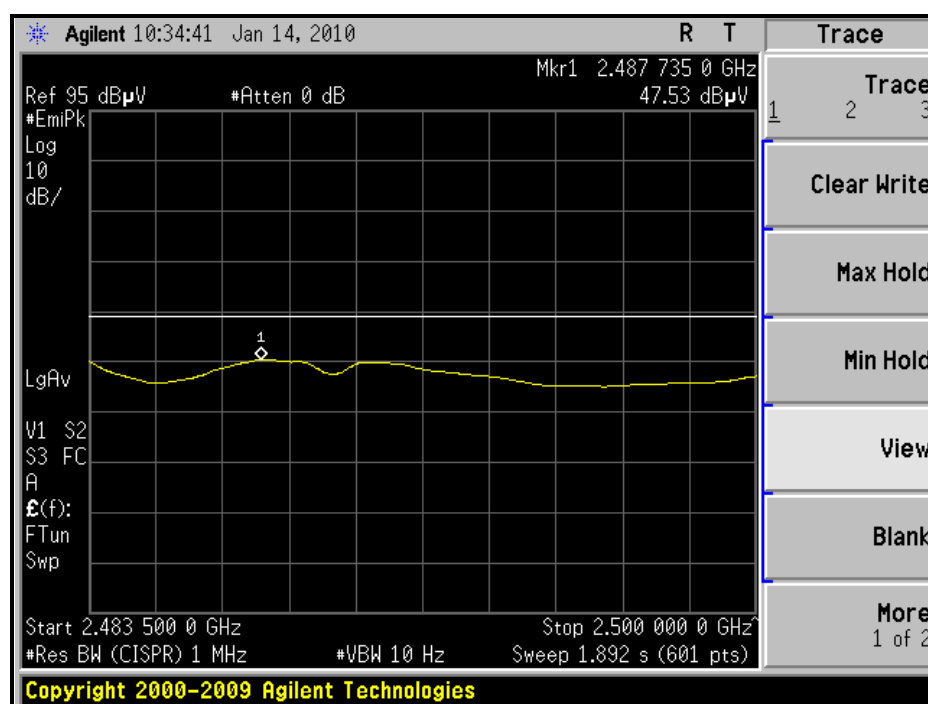
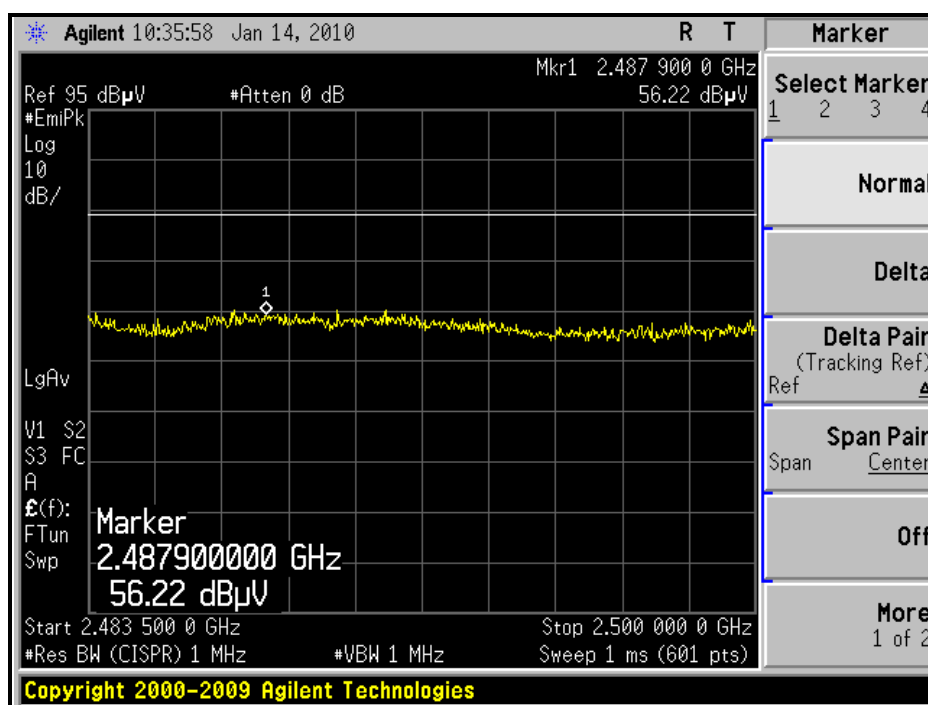




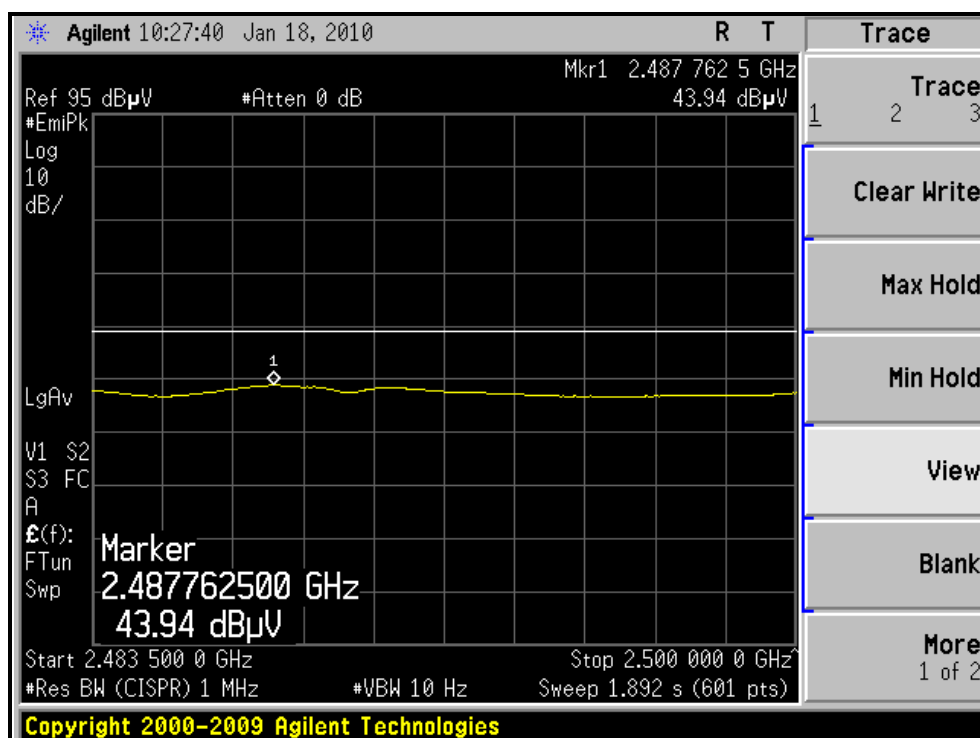
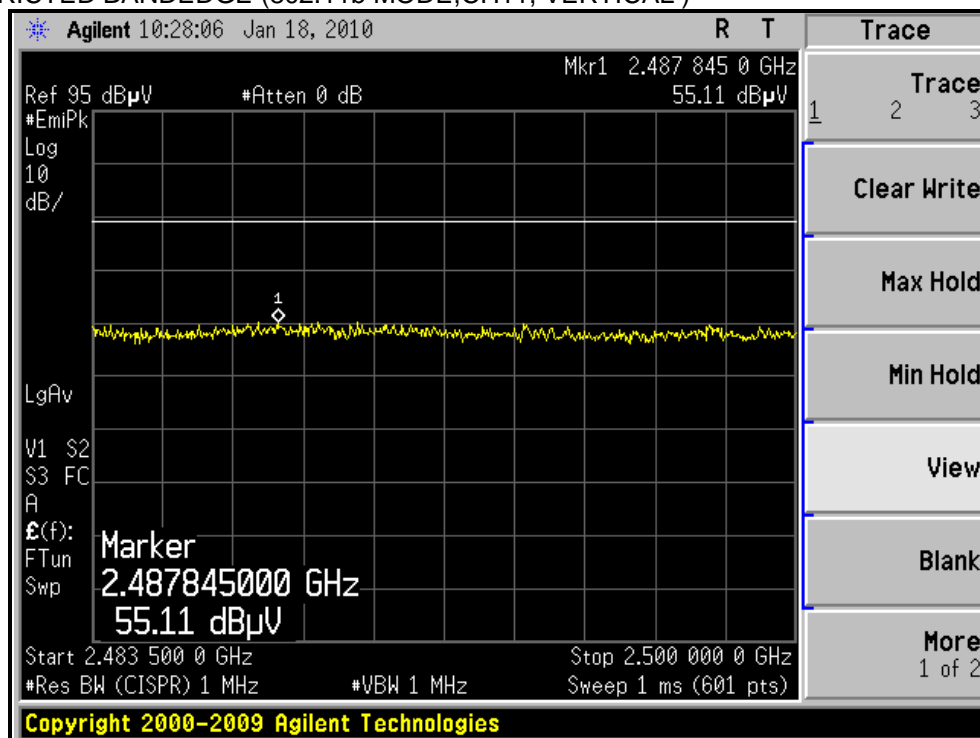
# RESTRICTED BANDEDGE (802.11b MODE,CH1, VERTICAL )



# 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	20deg. C, 68%RH 1021 hPa	TESTED BY	Frank Liu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	60.2 PK	74.0	-13.8	1.61 H	346	30.15	30.06
2	2390.00	44.5 AV	54.0	-9.5	1.61 H	346	14.46	30.06
3	*2412.00	106.2 PK			1.61 H	342	76.05	30.15
4	*2412.00	96.8 AV			1.61 H	342	66.65	30.15
5	4824.00	40.9 PK	74.0	-33.1	1.02 H	28	5.44	35.46
6	4824.00	30.6 AV	54.0	-23.4	1.02 H	28	-4.86	35.46
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	57.1 PK	74.0	-16.9	1.03 V	264	27.05	30.06
2	2390.00	43.5 AV	54.0	-10.5	1.03 V	264	13.42	30.06
3	*2412.00	103.1 PK			1.01 V	262	72.95	30.15
4	*2412.00	93.4 AV			1.01 V	262	63.25	30.15
5	4824.00	41.2 PK	74.0	-32.8	1.03 V	211	5.74	35.46
6	4824.00	30.8 AV	54.0	-23.2	1.03 V	211	-4.66	35.46

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

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	20deg. C, 68%RH 1021 hPa	TESTED BY	Frank Liu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	112.5 PK			1.50 H	346	82.26	30.24
2	*2437.00	103.4 AV			1.50 H	346	73.16	30.24
3	2483.50	66.1 PK	74.0	-7.9	1.52 H	346	35.67	30.43
4	2483.50	51.0 AV	54.0	-3.0	1.52 H	346	20.57	30.43
5	4874.00	42.7 PK	74.0	-31.3	1.00 H	21	7.15	35.55
6	4874.00	32.6 AV	54.0	-21.4	1.00 H	21	-2.95	35.55
7	7311.00	50.3 PK	74.0	-23.7	1.26 H	172	8.26	42.04
8	7311.00	40.4 AV	54.0	-13.6	1.26 H	172	-1.64	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	*2437.00	109.4 PK			1.04 V	265	79.16	30.24
2	*2437.00	100.2 AV			1.04 V	265	69.96	30.24
3	4874.00	44.6 PK	74.0	-29.4	1.02 V	219	9.05	35.55
4	4874.00	34.9 AV	54.0	-19.1	1.02 V	219	-0.65	35.55
5	7311.00	51.2 PK	74.0	-22.8	1.00 V	27	9.16	42.04
6	7311.00	41.3 AV	54.0	-12.7	1.00 V	27	-0.74	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.



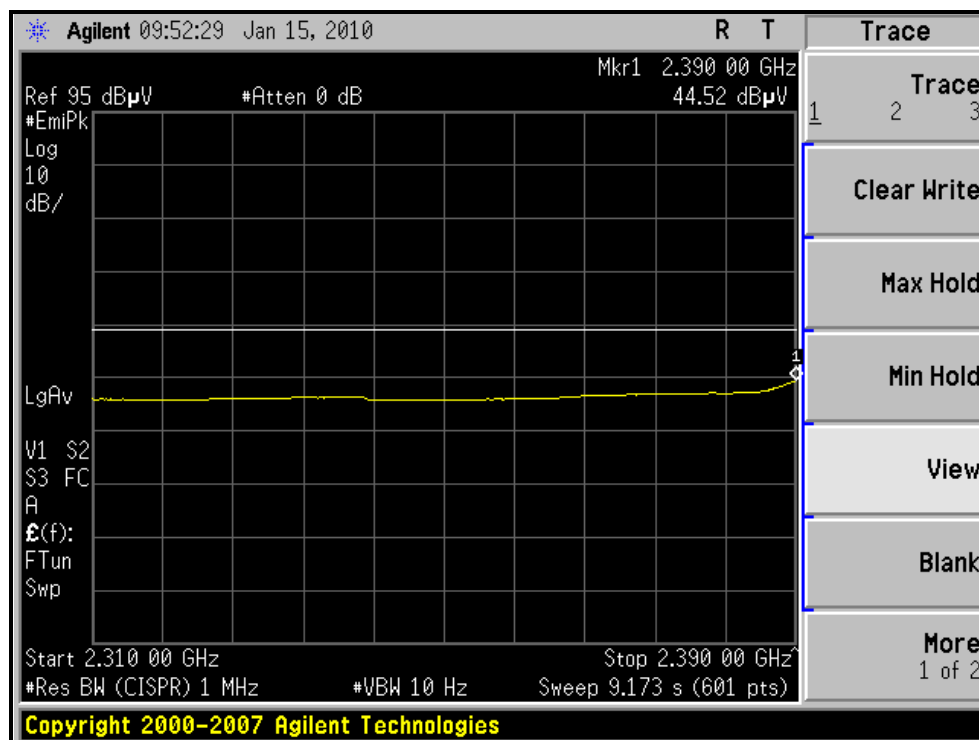
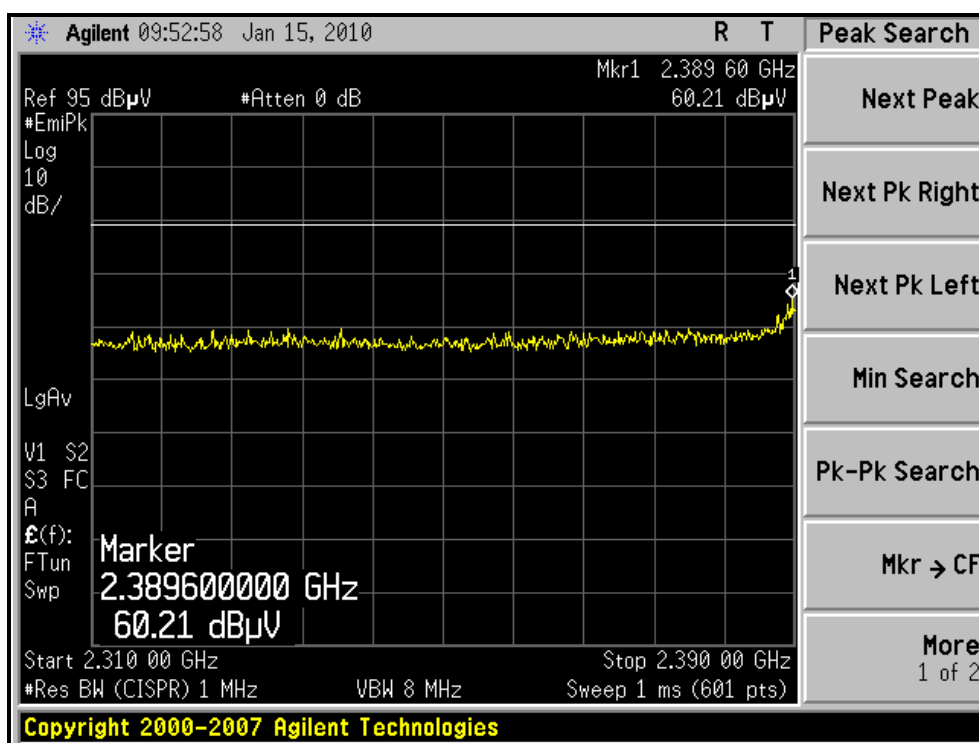
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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	20deg. C, 68%RH 1021 hPa	TESTED BY	Frank Liu

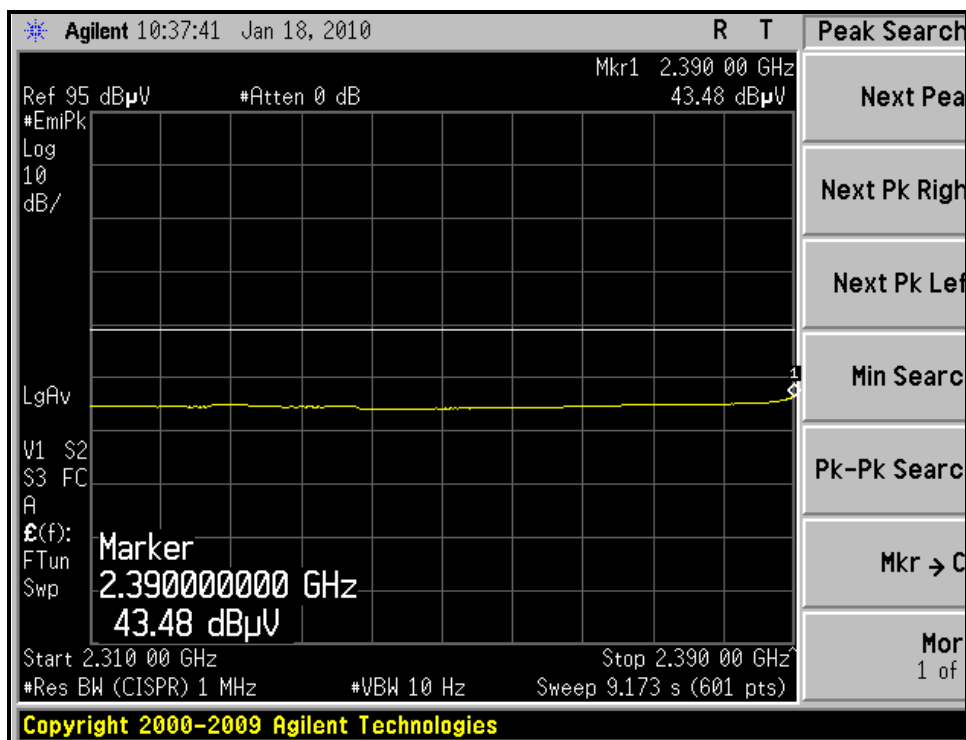
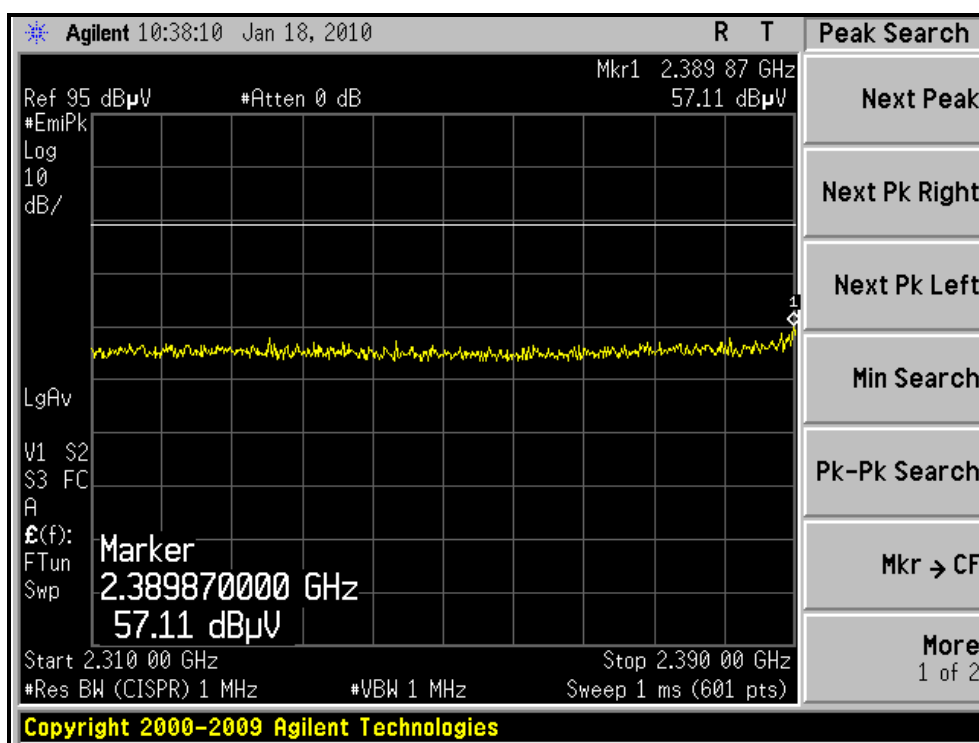
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	107.3 PK			1.50 H	342	76.96	30.34
2	*2462.00	98.4 AV			1.50 H	342	68.06	30.34
3	2483.50	65.8 PK	74.0	-8.2	1.50 H	349	35.36	30.43
4	2483.50	51.6 AV	54.0	-2.4	1.50 H	349	21.13	30.43
5	4924.00	40.7 PK	74.0	-33.3	1.03 H	32	5.07	35.63
6	4924.00	30.3 AV	54.0	-23.7	1.03 H	32	-5.33	35.63
7	7386.00	48.1 PK	74.0	-25.9	1.24 H	134	5.87	42.23
8	7386.00	36.2 AV	54.0	-17.8	1.24 H	134	-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	*2462.00	105.4 PK			1.02 V	262	75.06	30.34
2	*2462.00	95.3 AV			1.02 V	262	64.96	30.34
3	2483.50	62.0 PK	74.0	-12.0	1.03 V	265	31.58	30.43
4	2483.50	46.2 AV	54.0	-7.8	1.03 V	265	15.81	30.43
5	4924.00	41.3 PK	74.0	-32.7	1.04 V	219	5.67	35.63
6	4924.00	30.9 AV	54.0	-23.1	1.04 V	219	-4.73	35.63
7	7386.00	48.2 PK	74.0	-25.8	1.04 V	32	5.97	42.23
8	7386.00	38.7 AV	54.0	-15.3	1.04 V	32	-3.53	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.

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

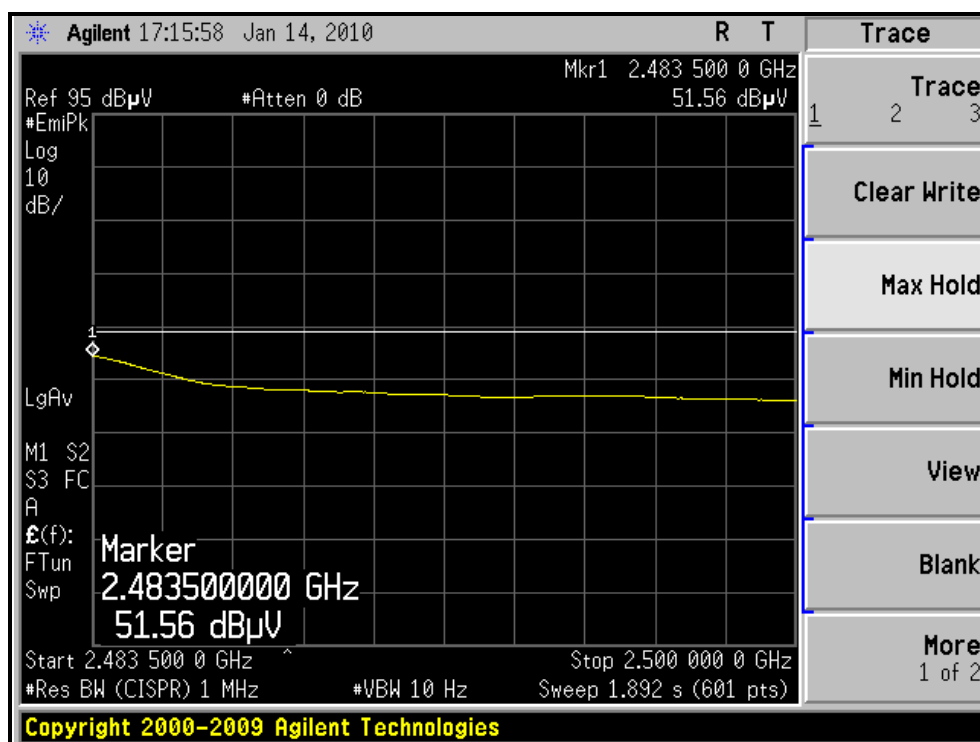
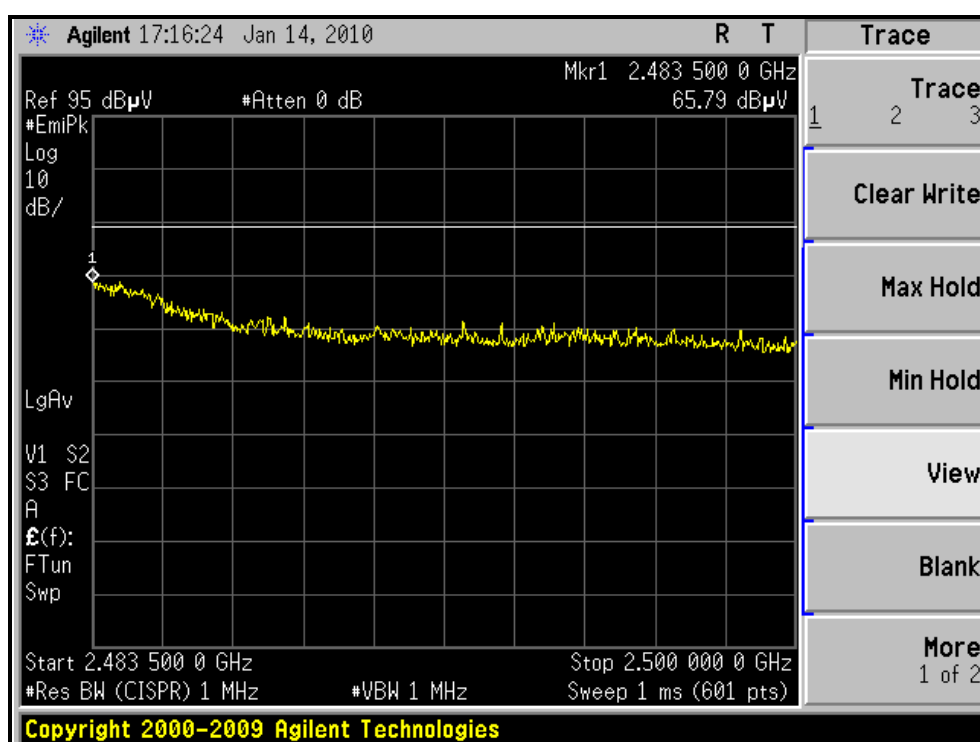


# RESTRICTED BANDEDGE (802.11g MODE,CH1, VERTICAL )

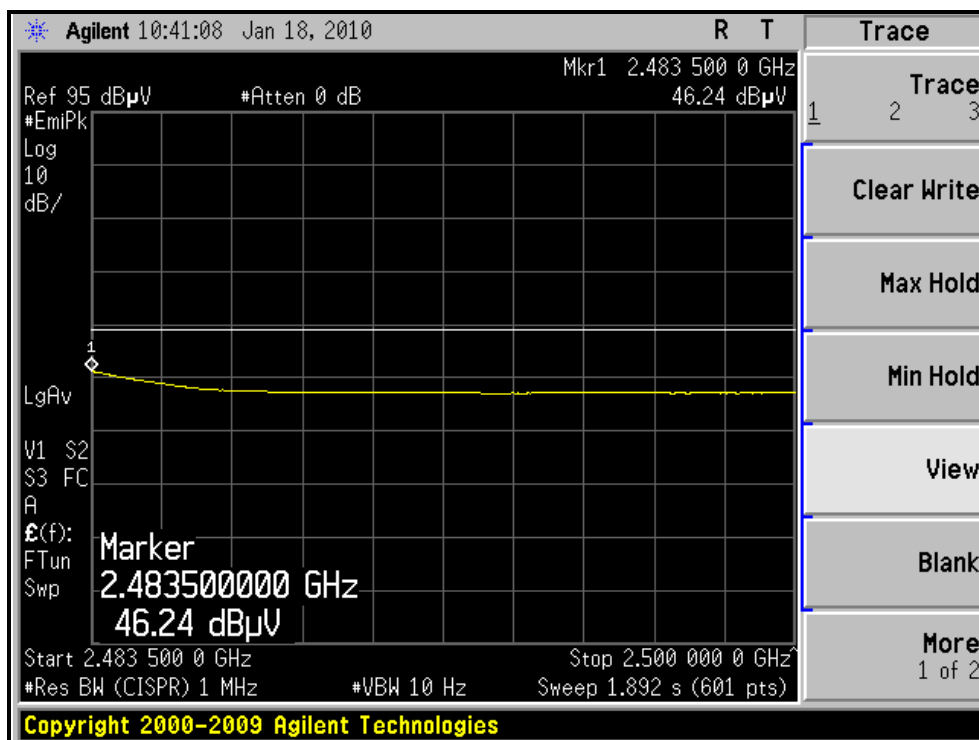
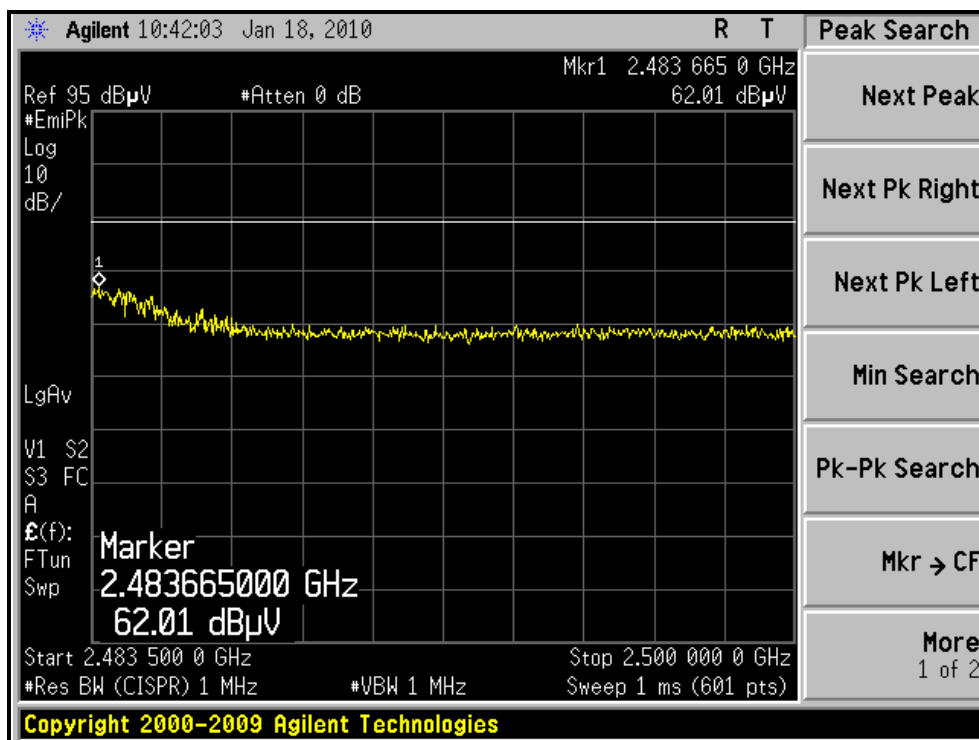




# RESTRICTED BANDEDGE (802.11g MODE,CH11, HORIZONTAL )



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



### 802.11n (20MHz) OFDM MODULATION

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	20deg. C, 68%RH 1021 hPa	TESTED BY	Frank Liu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	53.7 PK	74.0	-20.3	1.33 H	342	23.68	30.06
2	2390.00	43.8 AV	54.0	-10.2	1.33 H	342	13.73	30.06
3	*2412.00	106.1 PK			1.52 H	344	75.95	30.15
4	*2412.00	96.4 AV			1.52 H	344	66.25	30.15
5	4824.00	41.2 PK	74.0	-32.8	1.07 H	39	5.74	35.46
6	4824.00	30.4 AV	54.0	-23.6	1.07 H	39	-5.06	35.46
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	58.2 PK	74.0	-15.9	1.05 V	269	28.09	30.06
2	2390.00	43.8 AV	54.0	-10.3	1.05 V	269	13.69	30.06
3	*2412.00	103.2 PK			1.03 V	251	73.05	30.15
4	*2412.00	93.6 AV			1.03 V	251	63.45	30.15
5	4824.00	41.7 PK	74.0	-32.3	1.04 V	216	6.24	35.46
6	4824.00	30.6 AV	54.0	-23.4	1.04 V	216	-4.86	35.46

- REMARKS:**
1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
  2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
  3. The other emission levels were very low against the limit.
  4. Margin value = Emission level – Limit value.
  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	20deg. C, 68%RH 1021 hPa	TESTED BY	Frank Liu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	112.5 PK			1.52 H	347	82.26	30.24
2	*2437.00	103.2 AV			1.52 H	347	72.96	30.24
3	2483.50	67.8 PK	74.0	-6.2	1.53 H	348	37.37	30.43
4	2483.50	50.9 AV	54.0	-3.1	1.53 H	348	20.47	30.43
5	4874.00	42.9 PK	74.0	-31.1	1.00 H	27	7.35	35.55
6	4874.00	32.4 AV	54.0	-21.6	1.00 H	27	-3.15	35.55
7	7311.00	50.7 PK	74.0	-23.3	1.24 H	173	8.66	42.04
8	7311.00	40.6 AV	54.0	-13.4	1.24 H	173	-1.44	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	*2437.00	109.6 PK			1.04 V	259	79.36	30.24
2	*2437.00	100.4 AV			1.04 V	259	70.16	30.24
3	4874.00	43.8 PK	74.0	-30.2	1.00 V	215	8.25	35.55
4	4874.00	34.3 AV	54.0	-19.7	1.00 V	215	-1.25	35.55
5	7311.00	51.4 PK	74.0	-22.6	1.00 V	32	9.36	42.04
6	7311.00	41.7 AV	54.0	-12.3	1.00 V	32	-0.34	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	20deg. C, 68%RH 1021 hPa	TESTED BY	Frank Liu

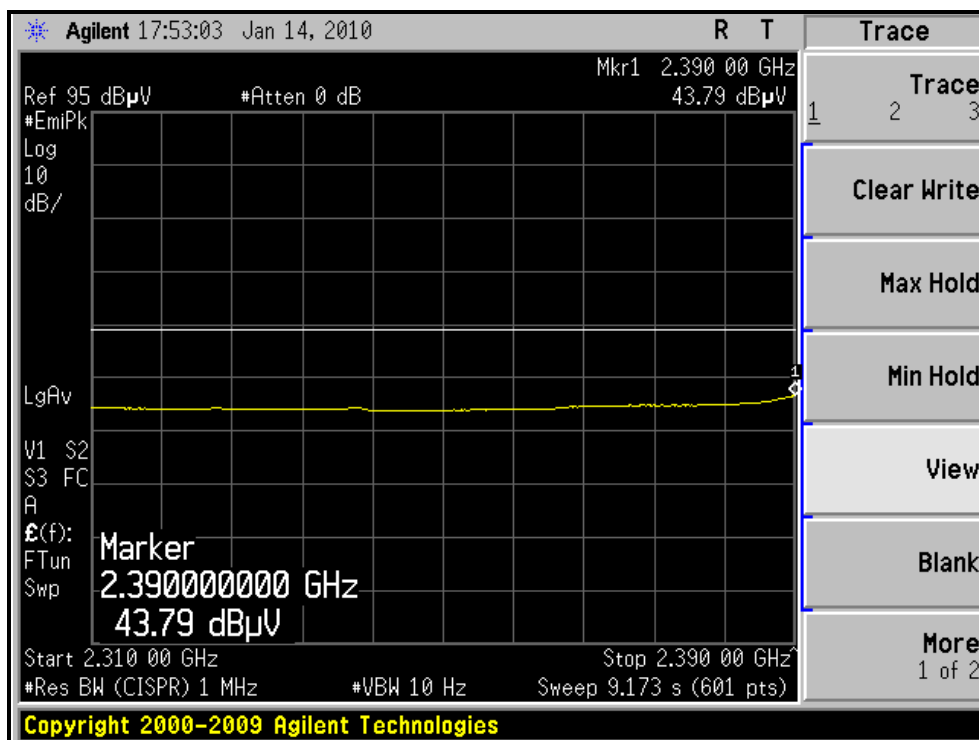
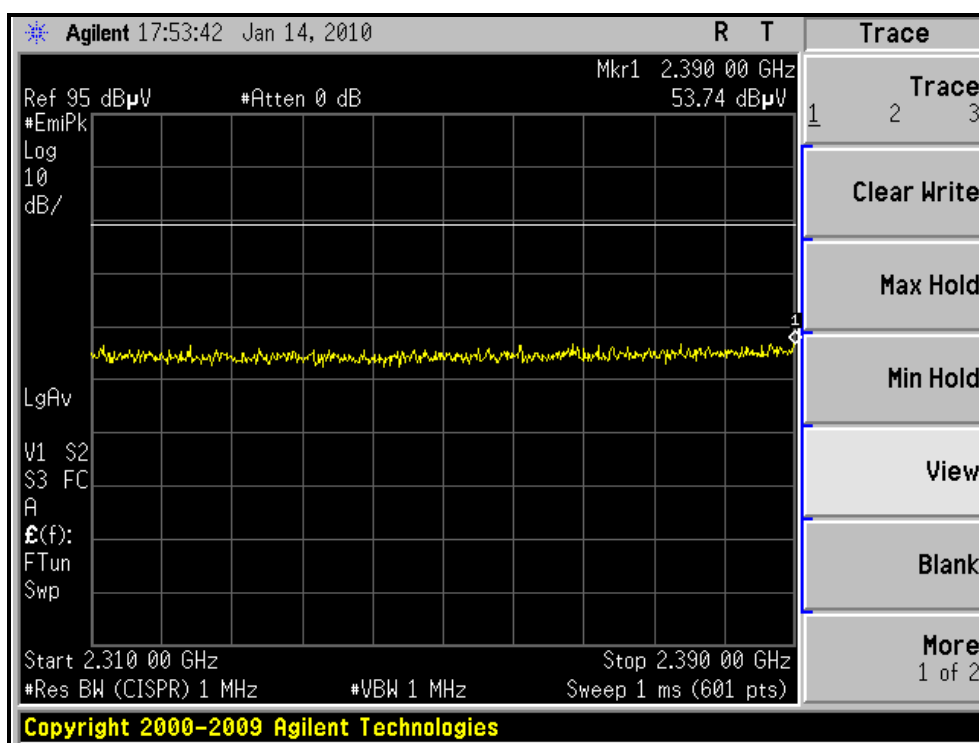
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	106.6 PK			1.51 H	345	76.26	30.34
2	*2462.00	97.4 AV			1.51 H	345	67.06	30.34
3	2483.50	70.9 PK	74.0	-3.1	1.50 H	345	40.50	30.43
4	2483.50	52.4 AV	54.0	-1.6	1.50 H	345	21.95	30.43
5	4924.00	40.3 PK	74.0	-33.7	1.04 H	37	4.67	35.63
6	4924.00	31.4 AV	54.0	-22.6	1.04 H	37	-4.23	35.63
7	7386.00	48.1 PK	74.0	-25.9	1.27 H	135	5.87	42.23
8	7386.00	36.1 AV	54.0	-17.9	1.27 H	135	-6.13	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	*2462.00	103.2 PK			1.02 V	251	72.86	30.34
2	*2462.00	94.2 AV			1.02 V	251	63.86	30.34
3	2483.50	60.3 PK	74.0	-13.8	1.04 V	269	29.82	30.43
4	2483.50	44.8 AV	54.0	-9.2	1.04 V	269	14.33	30.43
5	4924.00	41.6 PK	74.0	-32.4	1.03 V	214	5.97	35.63
6	4924.00	31.7 AV	54.0	-22.3	1.03 V	214	-3.93	35.63
7	7386.00	48.3 PK	74.0	-25.7	1.04 V	34	6.07	42.23
8	7386.00	38.4 AV	54.0	-15.6	1.04 V	34	-3.83	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.

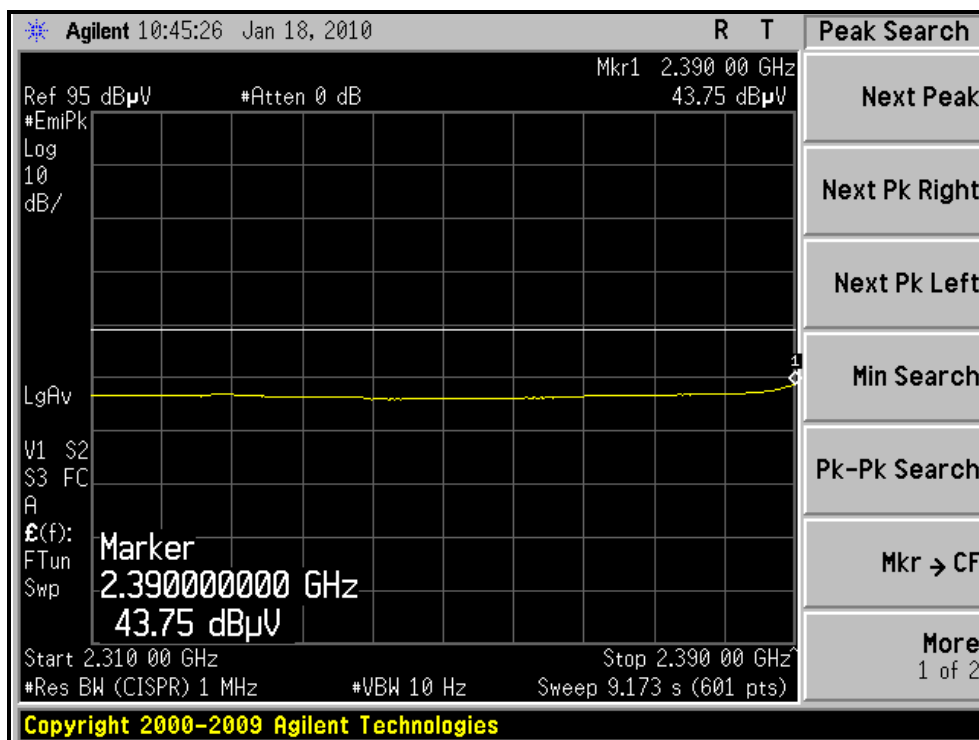
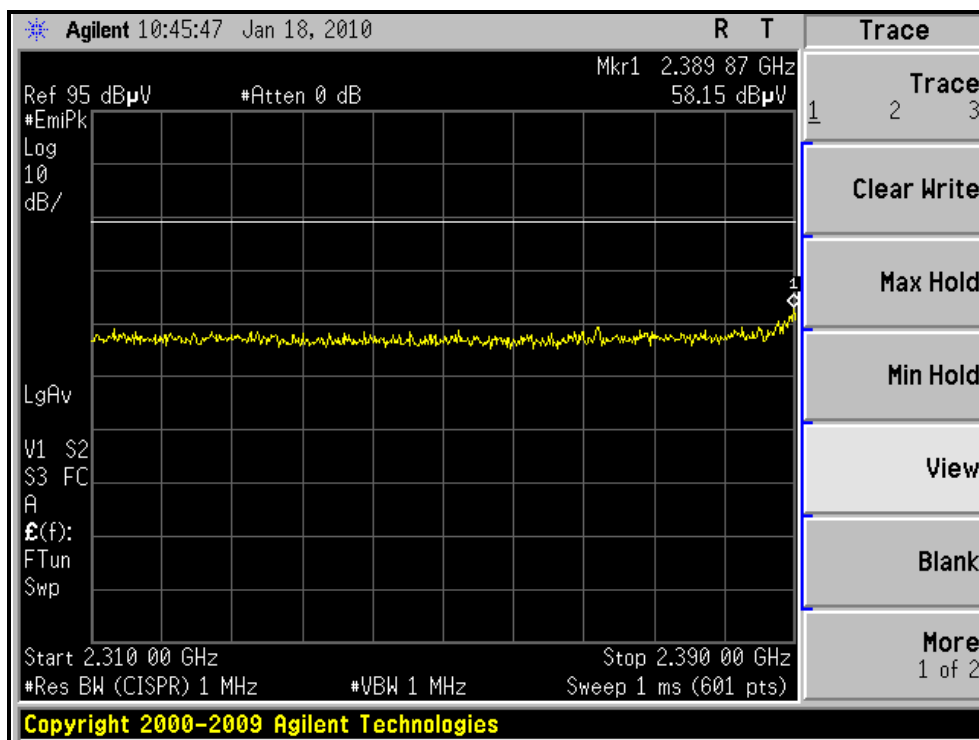


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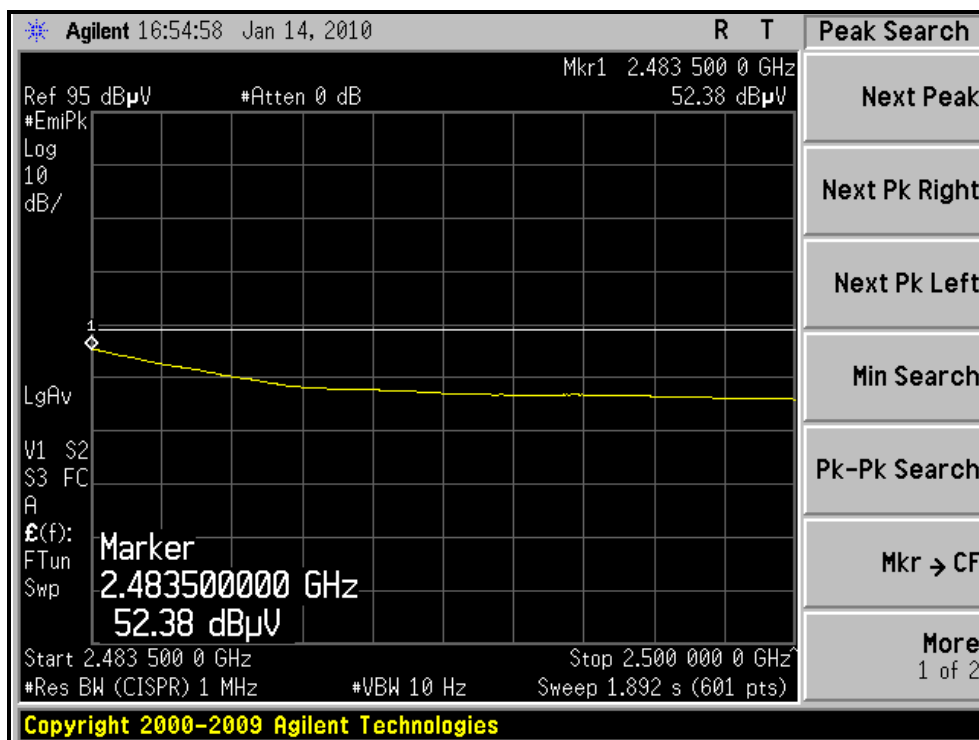
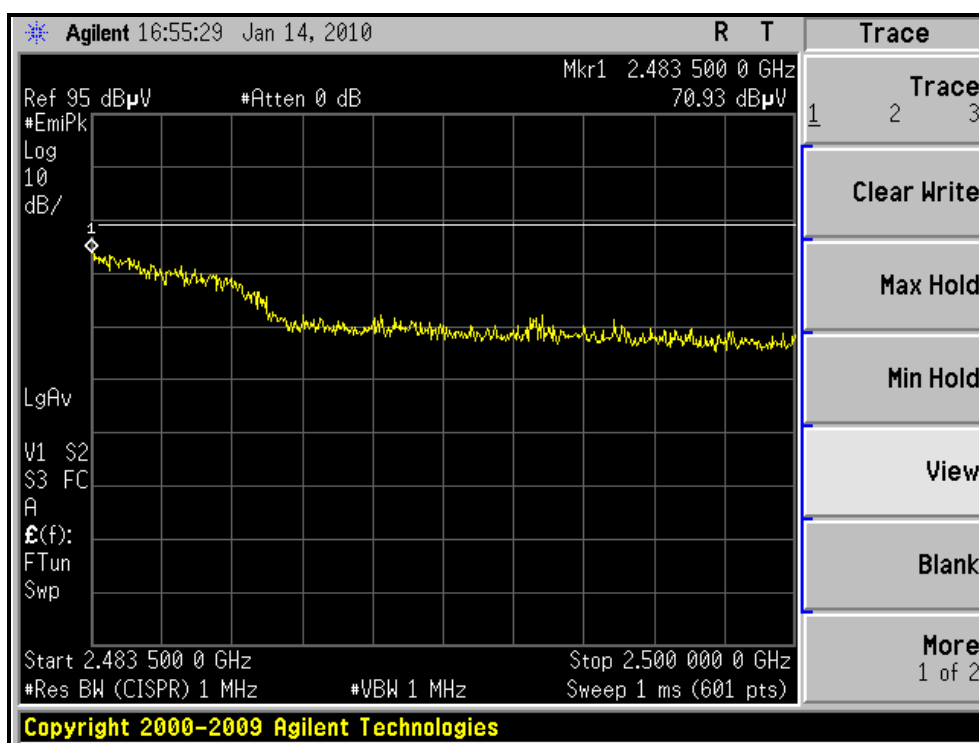
RESTRICTED BANDEDGE (802.11n (20MHz) MODE,CH1, HORIZONTAL )



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

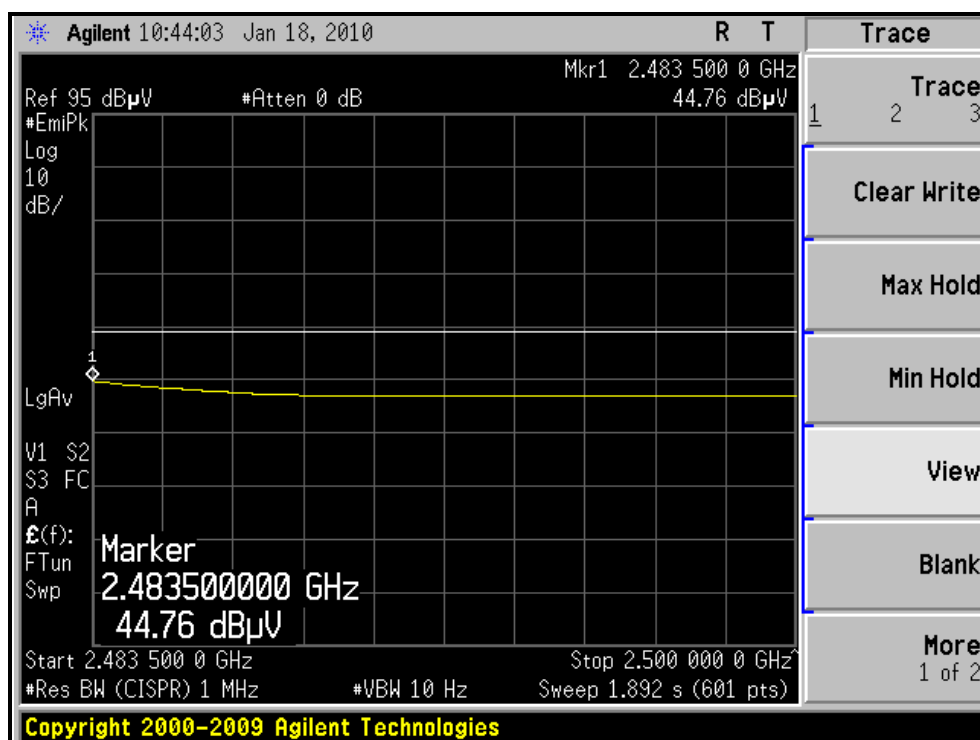
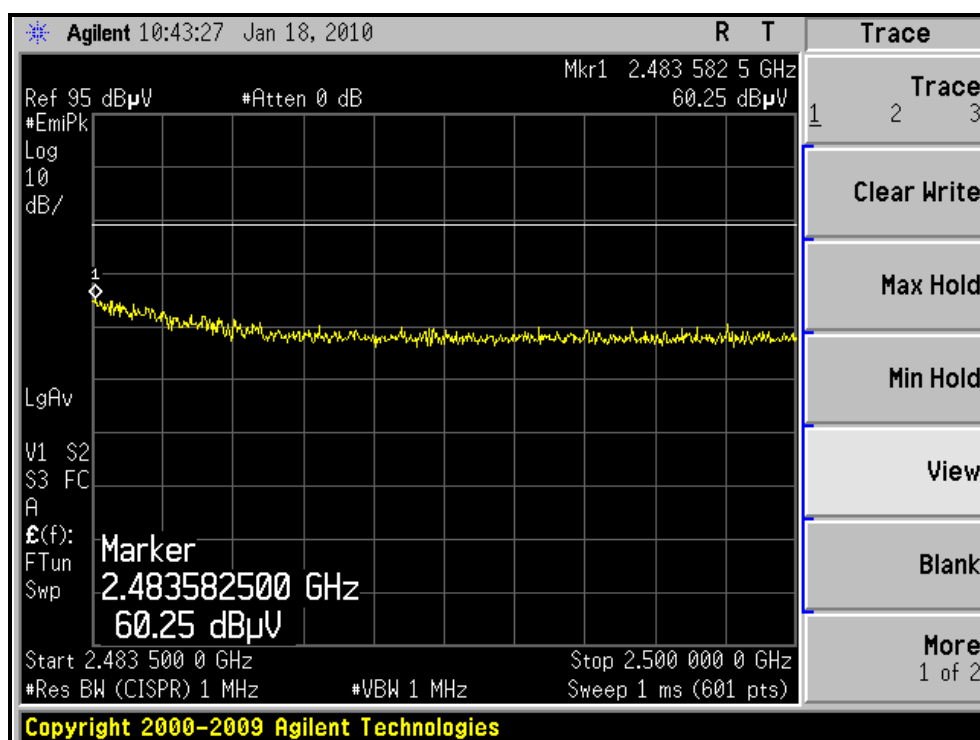


RESTRICTED BANDEDGE (802.11n (20MHz) MODE,CH11, HORIZONTAL )





# 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	20deg. C, 68%RH 1021 hPa	TESTED BY	Frank Liu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	60.0 PK	74.0	-14.0	1.62 H	357	29.97	30.06
2	2390.00	46.3 AV	54.0	-7.7	1.62 H	357	16.21	30.06
3	*2422.00	101.6 PK			1.63 H	346	71.41	30.19
4	*2422.00	93.2 AV			1.63 H	346	63.01	30.19
5	4844.00	40.7 PK	74.0	-33.3	1.07 H	56	5.20	35.50
6	4844.00	31.2 AV	54.0	-22.8	1.07 H	56	-4.30	35.50
7	7266.00	50.2 PK	74.0	-23.8	1.20 H	134	8.27	41.93
8	7266.00	36.1 AV	54.0	-17.9	1.20 H	134	-5.83	41.93
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	56.9 PK	74.0	-17.1	1.03 V	265	26.83	30.06
2	2390.00	44.0 AV	54.0	-10.0	1.03 V	265	13.91	30.06
3	*2422.00	99.4 PK			1.02 V	264	69.21	30.19
4	*2422.00	90.6 AV			1.02 V	264	60.41	30.19
5	4844.00	41.0 PK	74.0	-33.0	1.04 V	213	5.50	35.50
6	4844.00	31.4 AV	54.0	-22.6	1.04 V	213	-4.10	35.50
7	7266.00	50.4 PK	74.0	-23.6	1.03 V	54	8.47	41.93
8	7266.00	38.4 AV	54.0	-15.6	1.03 V	54	-3.53	41.93

- 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	20deg. C, 68%RH 1021 hPa	TESTED BY	Frank Liu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	105.5 PK			1.50 H	340	75.26	30.24
2	*2437.00	96.8 AV			1.50 H	340	66.56	30.24
3	2483.50	65.3 PK	74.0	-8.7	1.51 H	346	34.87	30.43
4	2483.50	51.1 AV	54.0	-2.9	1.51 H	346	20.67	30.43
5	4874.00	40.0 PK	74.0	-34.0	1.07 H	54	4.45	35.55
6	4874.00	31.4 AV	54.0	-22.6	1.07 H	54	-4.15	35.55
7	7311.00	50.4 PK	74.0	-23.6	1.24 H	137	8.36	42.04
8	7311.00	38.2 AV	54.0	-15.8	1.24 H	137	-3.84	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	*2437.00	103.7 PK			1.01 V	259	73.46	30.24
2	*2437.00	94.2 AV			1.01 V	259	63.96	30.24
3	4824.00	42.0 PK	74.0	-32.0	1.07 V	216	6.54	35.46
4	4824.00	31.9 AV	54.0	-22.1	1.07 V	216	-3.56	35.46
5	7311.00	50.7 PK	74.0	-23.3	1.00 V	64	8.66	42.04
6	7311.00	40.2 AV	54.0	-13.8	1.00 V	64	-1.84	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.



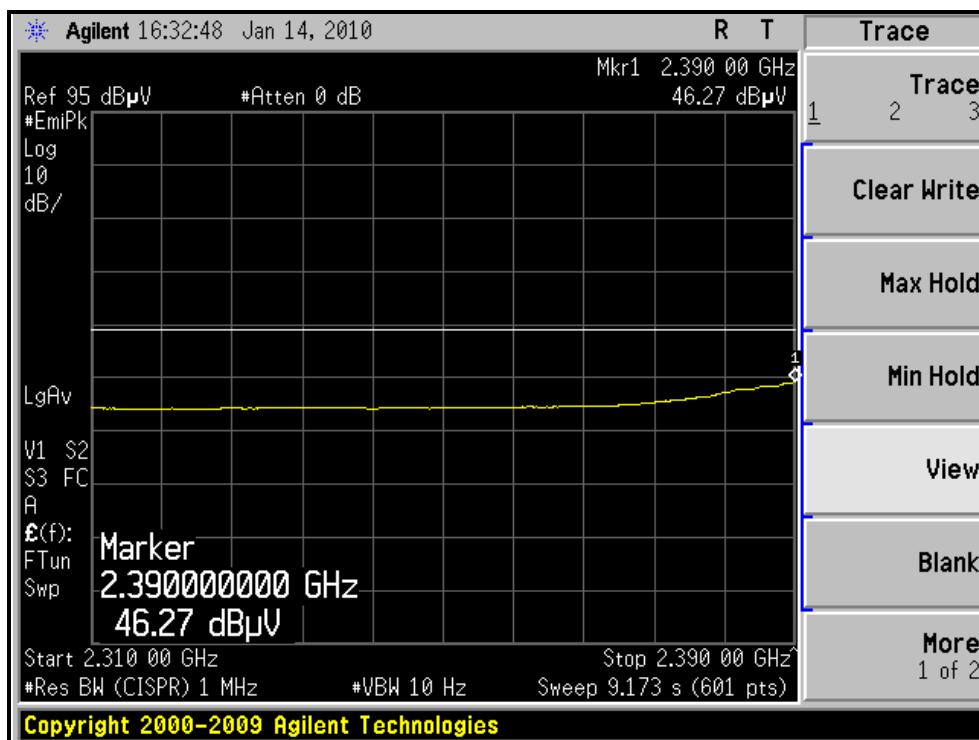
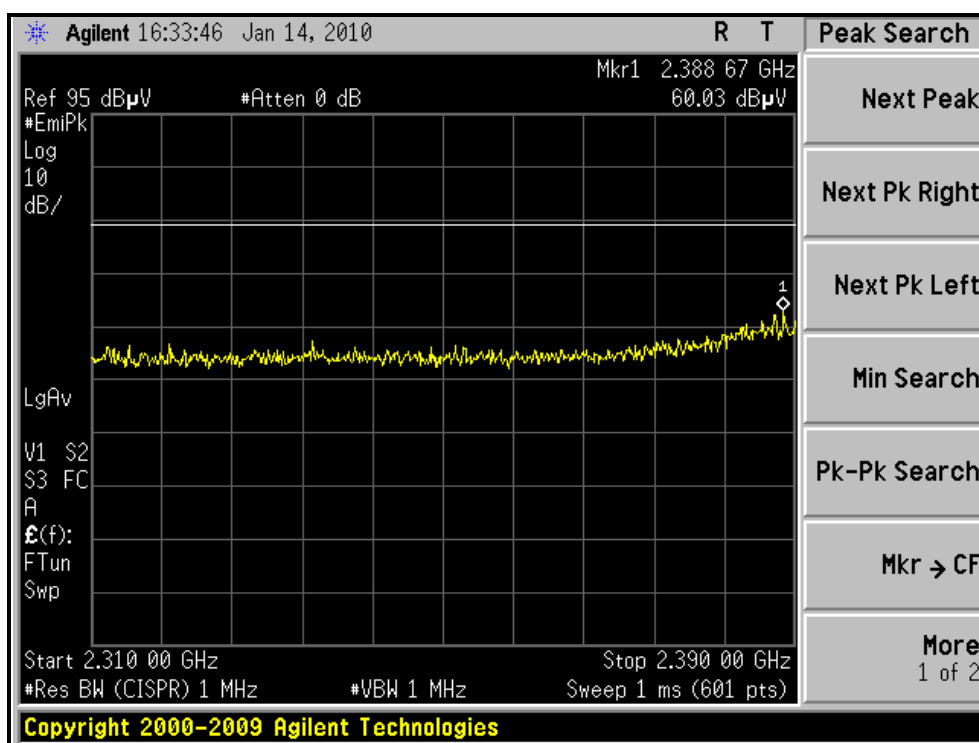
A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 7	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	20deg. C, 68%RH 1021 hPa	TESTED BY	Frank Liu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2452.00	103.0 PK			1.51 H	344	72.70	30.30
2	*2452.00	93.7 AV			1.51 H	344	63.40	30.30
3	2483.50	67.1 PK	74.0	-6.9	1.51 H	347	36.66	30.43
4	2483.50	52.5 AV	54.0	-1.5	1.51 H	347	22.06	30.43
5	4904.00	40.4 PK	74.0	-33.6	1.04 H	43	4.80	35.60
6	4904.00	31.0 AV	54.0	-23.0	1.04 H	43	-4.60	35.60
7	7356.00	48.6 PK	74.0	-25.4	1.21 H	136	6.44	42.16
8	7356.00	36.3 AV	54.0	-17.7	1.21 H	136	-5.86	42.16
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	100.7 PK			1.03 V	274	70.40	30.30
2	*2452.00	91.4 AV			1.03 V	274	61.10	30.30
3	2483.50	60.3 PK	74.0	-13.7	1.03 V	256	29.84	30.43
4	2483.50	45.8 AV	54.0	-8.2	1.03 V	256	15.41	30.43
5	4904.00	41.3 PK	74.0	-32.7	1.02 V	211	5.70	35.60
6	4904.00	31.9 AV	54.0	-22.1	1.02 V	211	-3.70	35.60
7	7356.00	50.7 PK	74.0	-23.3	1.07 V	46	8.54	42.16
8	7356.00	38.7 AV	54.0	-15.3	1.07 V	46	-3.46	42.16

**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.

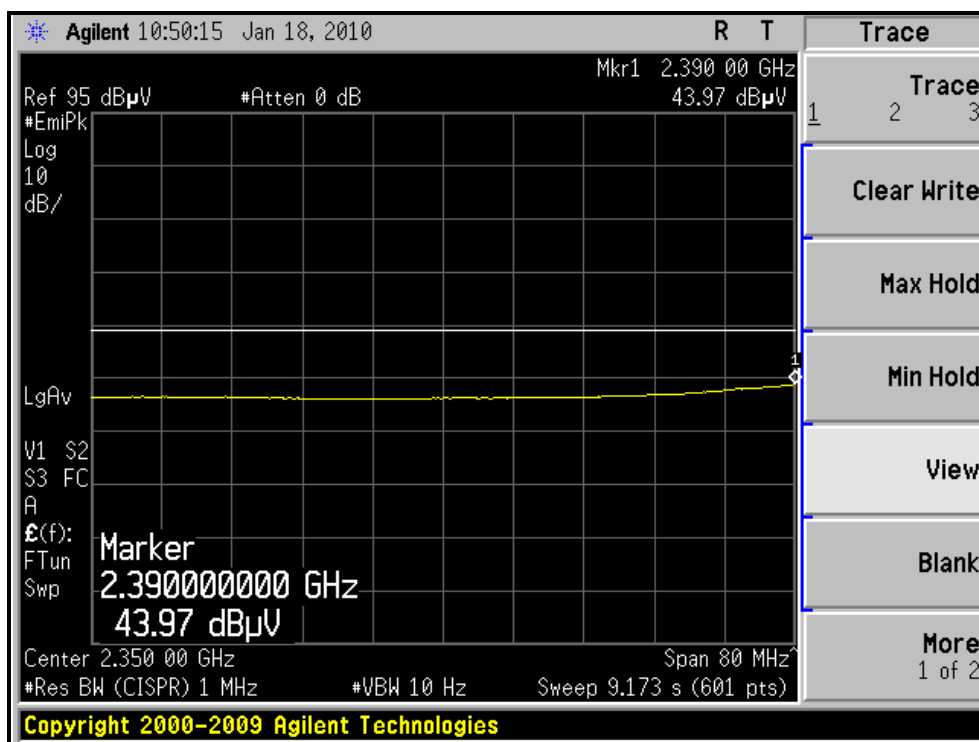
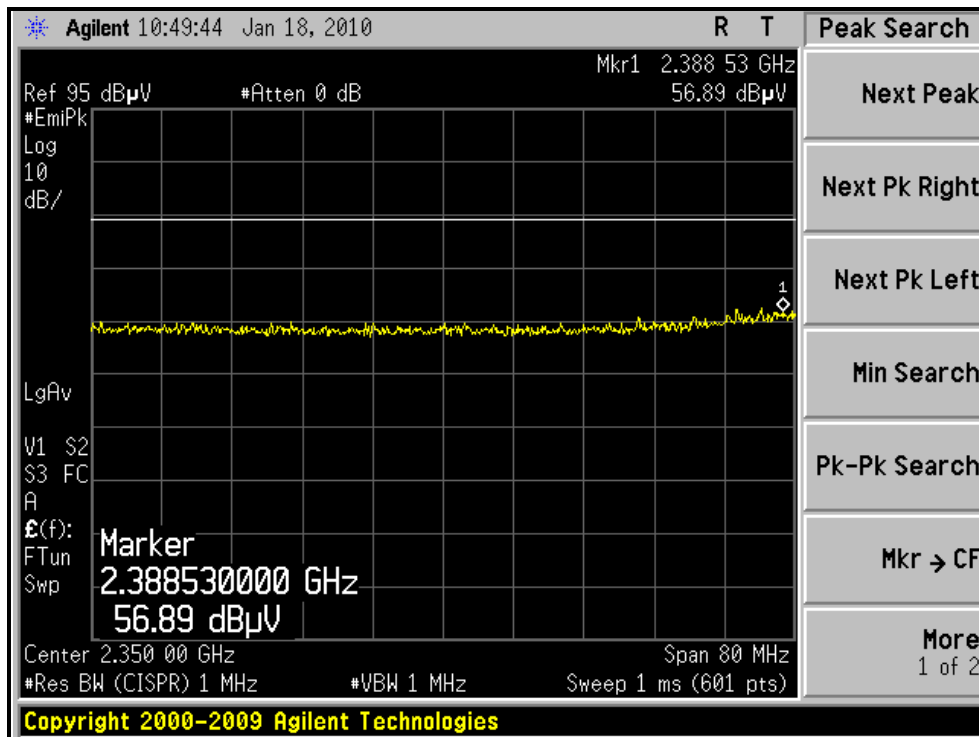
RESTRICTED BANDEDGE (802.11n (40MHz) MODE,CH1, HORIZONTAL )



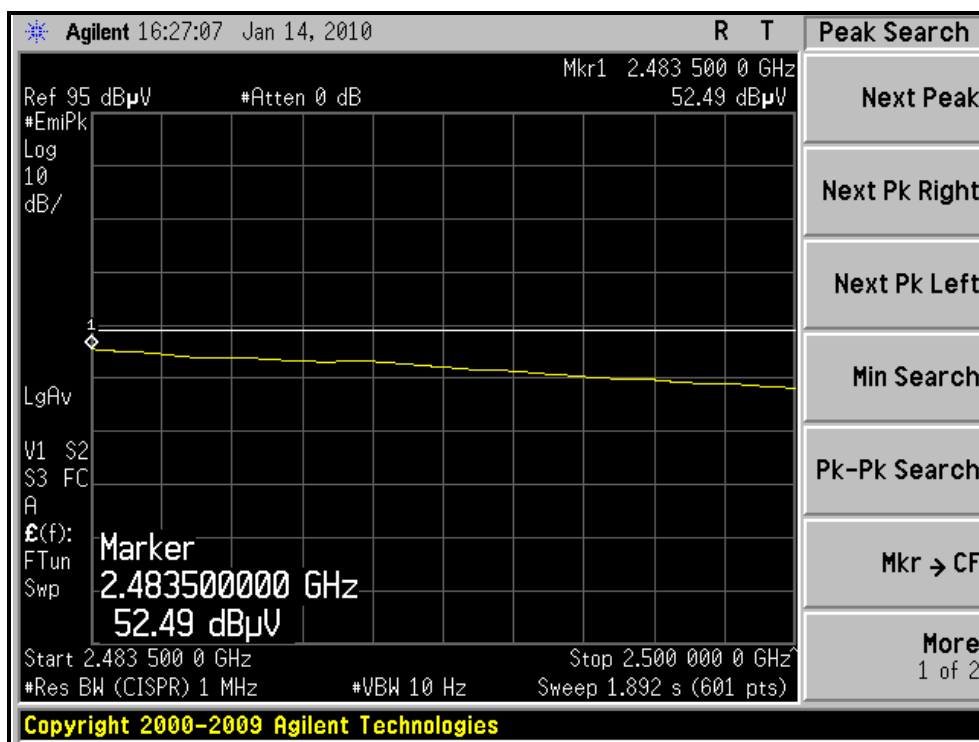
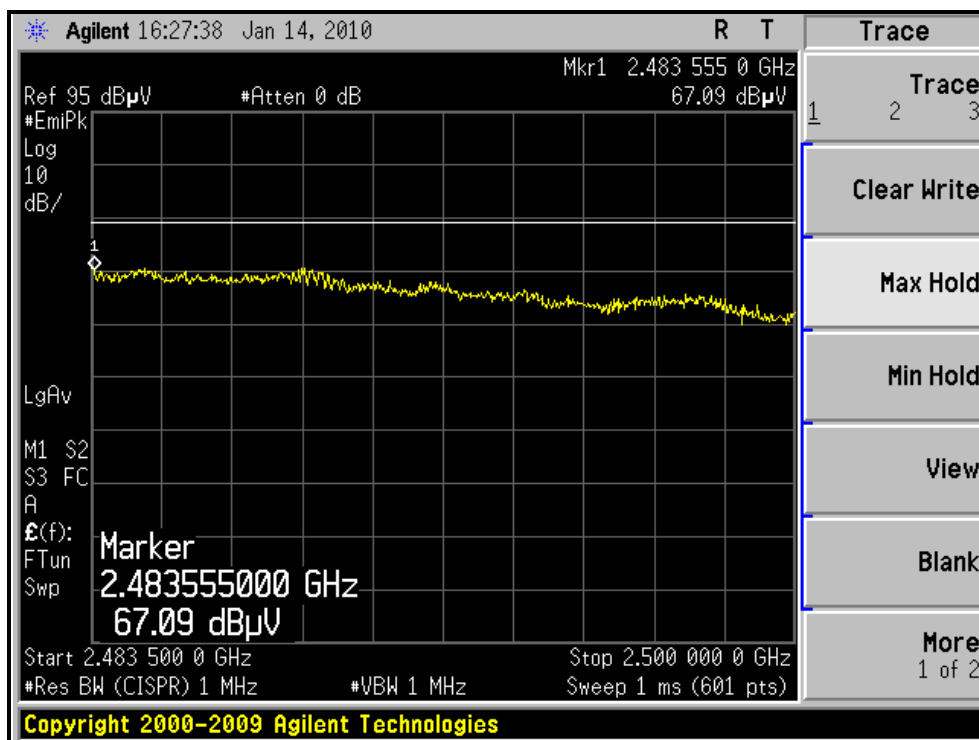


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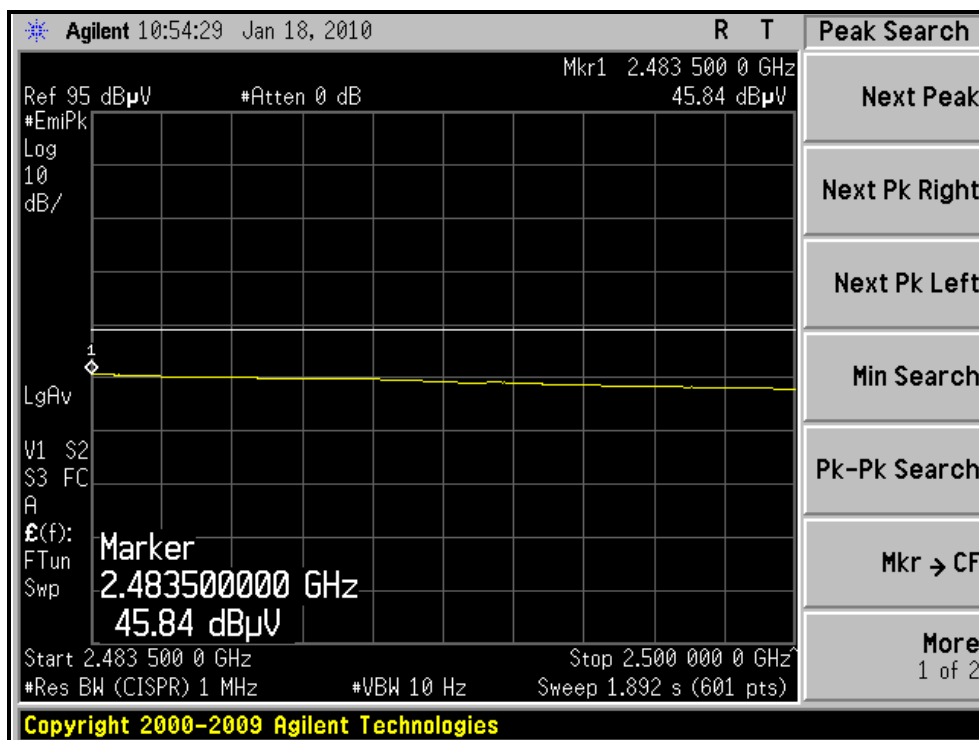
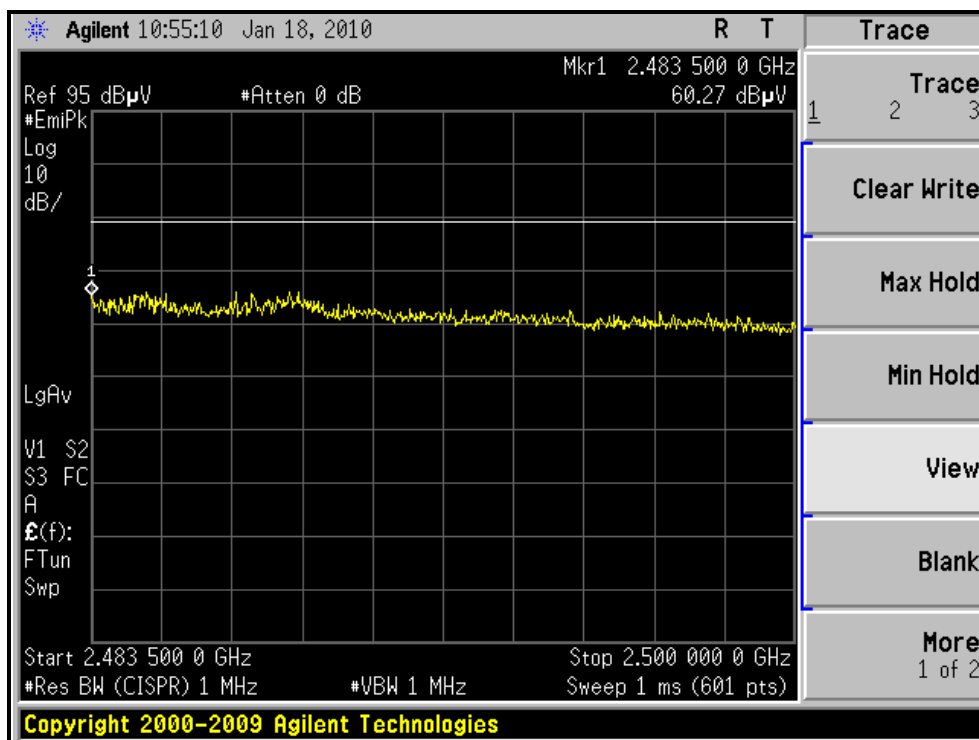
RESTRICTED BANDEDGE (802.11n (40MHz) MODE,CH1, VERTICAL )



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.

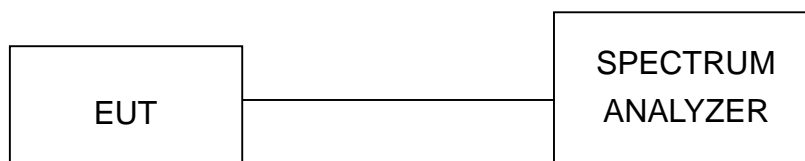
#### 4.3.3 TEST PROCEDURE

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

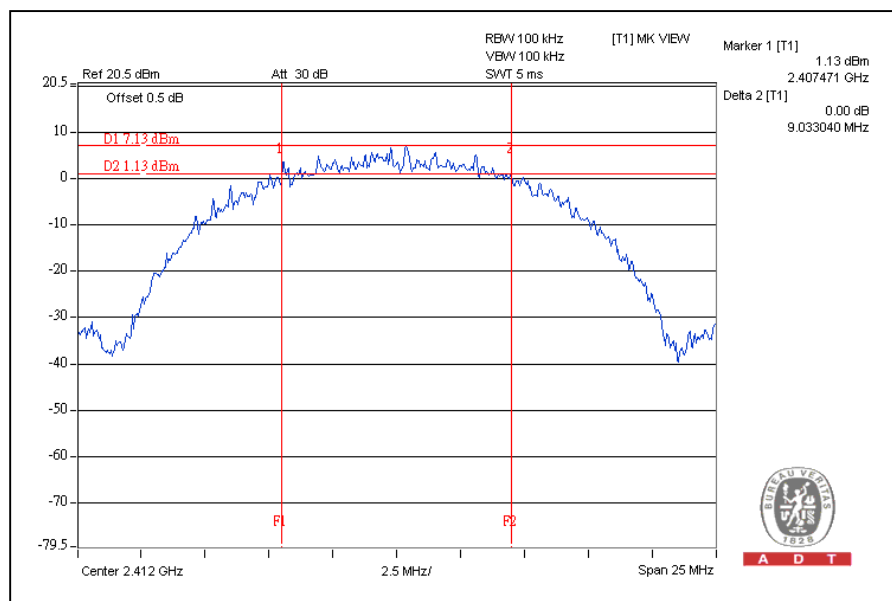
The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

## 4.3.7 TEST RESULTS

### 802.11b DSSS MODULATION:

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2412	9.03	0.5	PASS
6	2437	8.70	0.5	PASS
11	2462	8.93	0.5	PASS

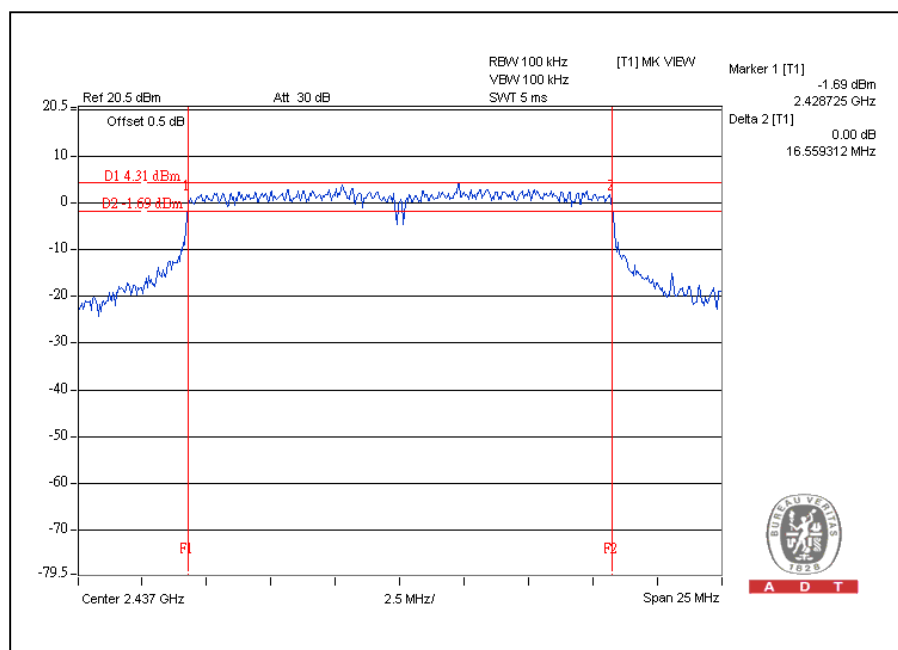
CH1



## 802.11g OFDM MODULATION:

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2412	16.55	0.5	PASS
6	2437	16.55	0.5	PASS
11	2462	16.55	0.5	PASS

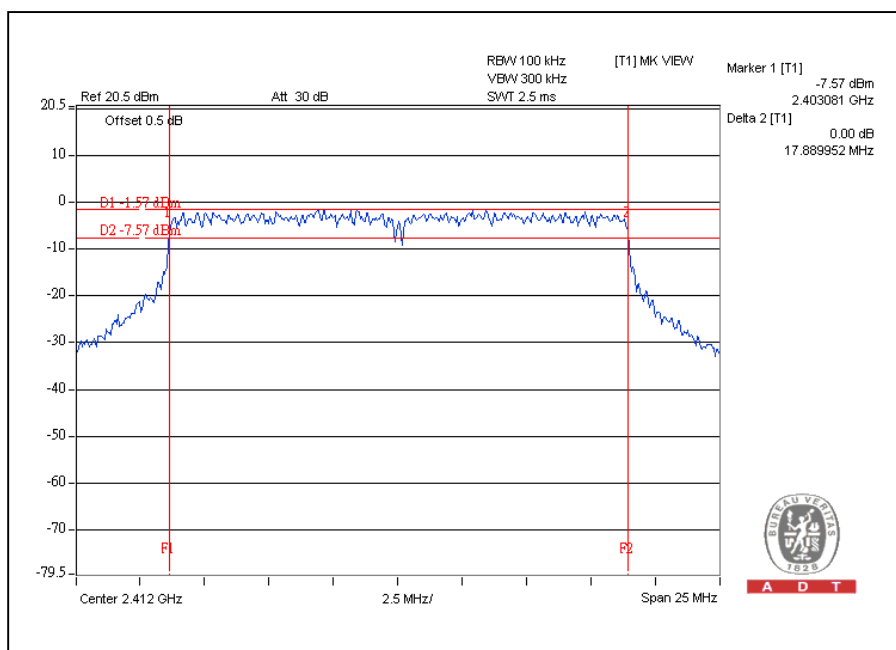
## CH6



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

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2412	17.88	0.5	PASS
6	2437	17.86	0.5	PASS
11	2462	17.87	0.5	PASS

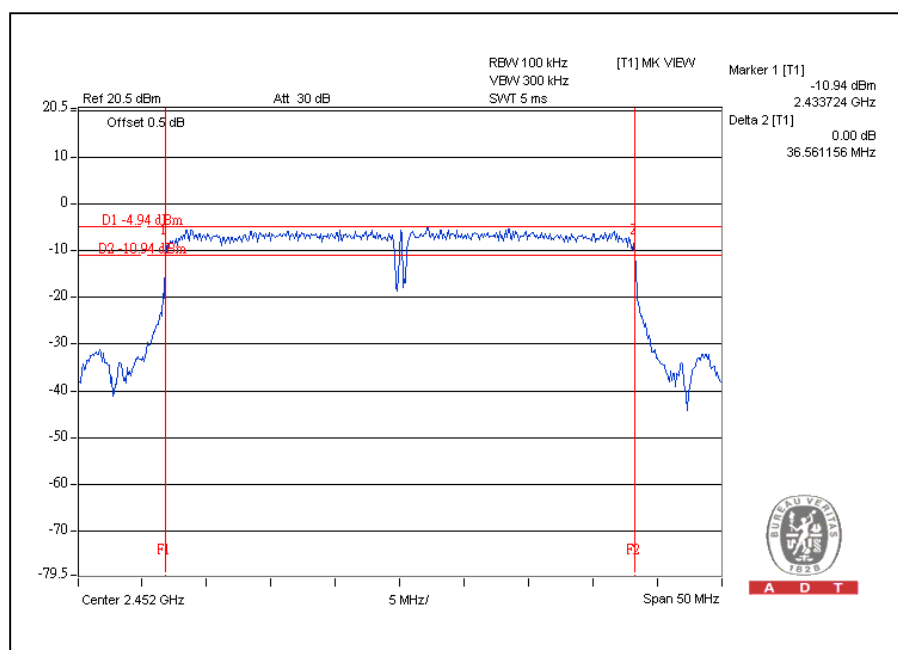
CH1



## 802.11n (40MHz) OFDM MODULATION:

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2422	36.56	0.5	PASS
4	2437	36.52	0.5	PASS
7	2452	36.56	0.5	PASS

CH7



#### 4.4 MAXIMUM PEAK OUTPUT POWER

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

The Maximum Peak Output Power Measurement is 30dBm.

##### 4.4.2 INSTRUMENTS

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

**NOTE:**

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

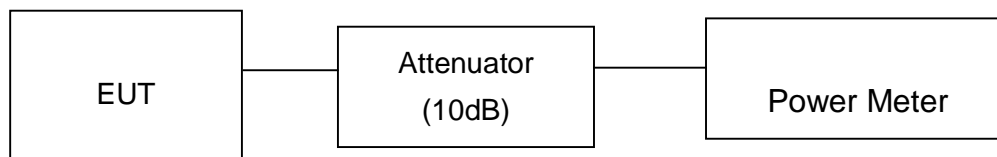
##### 4.4.3 TEST PROCEDURES

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

##### 4.4.4 DEVIATION FROM TEST STANDARD

No deviation

##### 4.4.5 TEST SETUP



#### 4.4.6 EUT OPERATING CONDITIONS

Same as Item 4.3.6



#### 4.4.7 TEST RESULTS

##### 802.11b DSSS MODULATION:

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (dBm)	PEAK POWER OUTPUT (mW)	PEAK POWER LIMIT (dBm)	PASS / FAIL
1	2412	18.1	64.6	30	PASS
6	2437	18.5	70.8	30	PASS
11	2462	18.4	69.2	30	PASS

##### 802.11g OFDM MODULATION:

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (dBm)	PEAK POWER OUTPUT (mW)	PEAK POWER LIMIT (dBm)	PASS / FAIL
1	2412	23.5	223.9	30	PASS
6	2437	24.6	288.4	30	PASS
11	2462	22.3	169.8	30	PASS

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

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (dBm)	PEAK POWER OUTPUT (mW)	PEAK POWER LIMIT (dBm)	PASS / FAIL
1	2412	22.3	169.8	30	PASS
6	2437	24.5	281.8	30	PASS
11	2462	22.1	162.2	30	PASS

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

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (dBm)	PEAK POWER OUTPUT (mW)	PEAK POWER LIMIT (dBm)	PASS / FAIL
1	2422	21.6	144.5	30	PASS
4	2437	22.8	190.5	30	PASS
7	2452	21.6	144.5	30	PASS



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## 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.

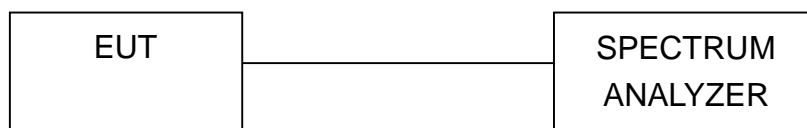
#### 4.5.3 TEST PROCEDURE

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

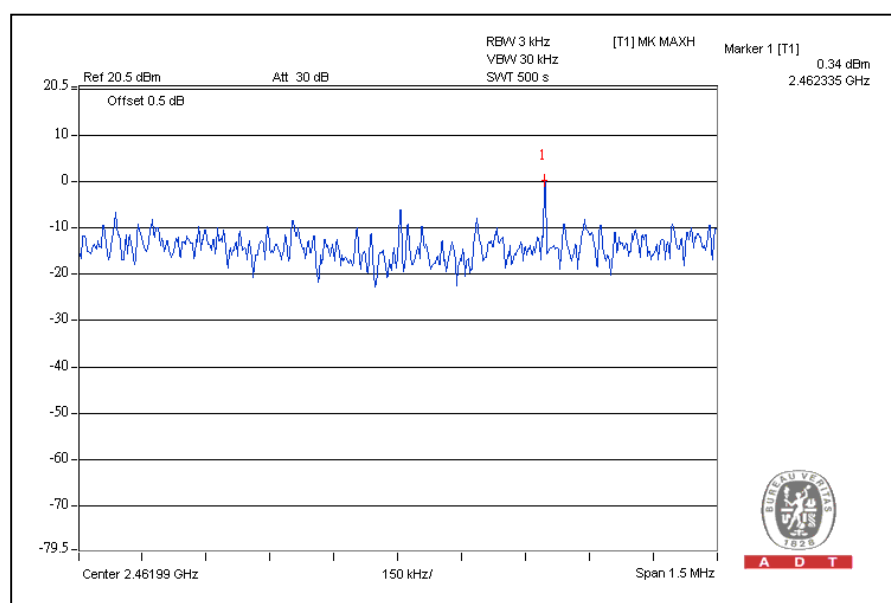
Same as Item 4.3.6

## 4.5.7 TEST RESULTS

### 802.11b DSSS MODULATION:

CHANNEL	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3kHz BW (dBm)	MAXIMUM LIMIT (dBm)	PASS / FAIL
1	2412	-7.7	8	PASS
6	2437	-5.3	8	PASS
11	2462	0.3	8	PASS

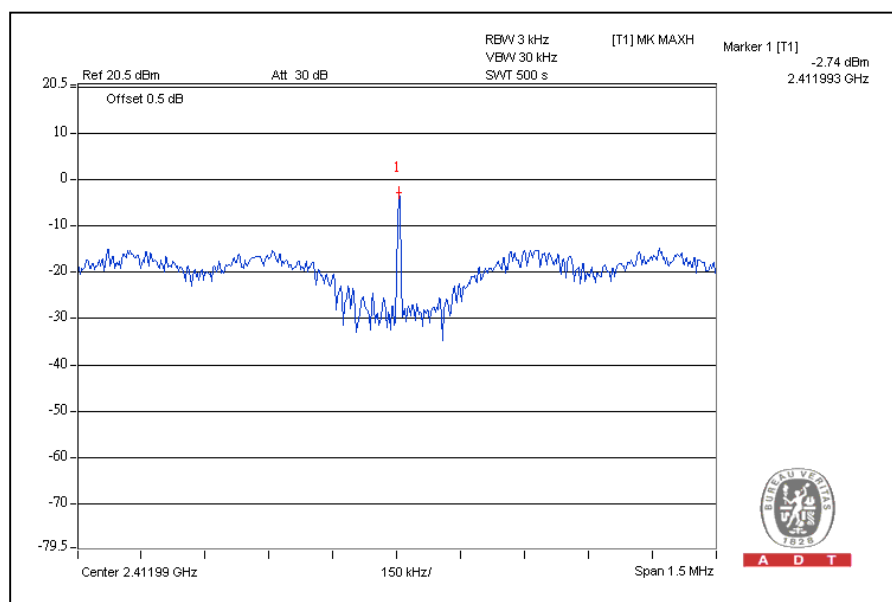
### CH11



## 802.11g OFDM MODULATION:

CHANNEL	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3kHz BW (dBm)	MAXIMUM LIMIT (dBm)	PASS / FAIL
1	2412	-2.7	8	PASS
6	2437	-3.2	8	PASS
11	2462	-6.7	8	PASS

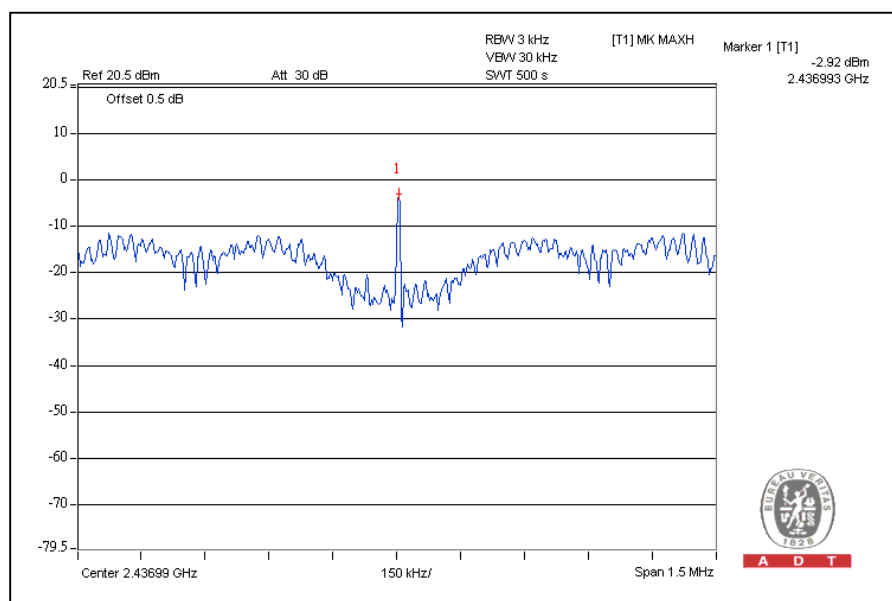
CH1



## 802.11n (20MHz) OFDM MODULATION:

CHANNEL	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3kHz BW (dBm)	MAXIMUM LIMIT (dBm)	PASS / FAIL
1	2412	-6.9	8	PASS
6	2437	-2.9	8	PASS
11	2462	-6.7	8	PASS

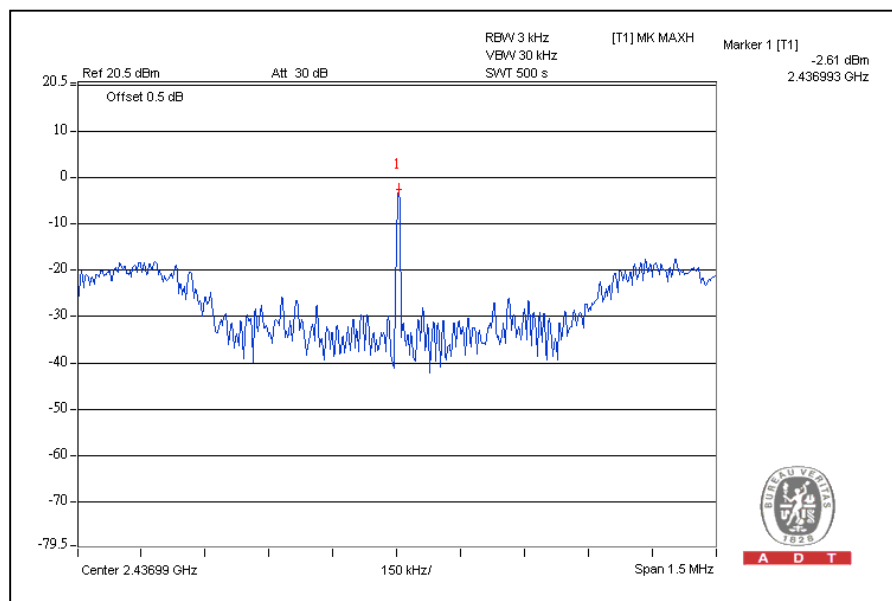
## CH6



## 802.11n (40MHz) OFDM MODULATION:

CHANNEL	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3kHz BW (dBm)	MAXIMUM LIMIT (dBm)	PASS / FAIL
1	2422	-6.5	8	PASS
4	2437	-2.6	8	PASS
7	2452	-6.5	8	PASS

CH4







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## 4.6 CONDUCTED OUT-BAND EMISSION MEASUREMENT

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

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

### 4.6.2 TEST INSTRUMENTS

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

**NOTE:**

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

### 4.6.3 TEST PROCEDURE

The transmitter output was connected to the spectrum analyzer via a low loss cable. Set 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

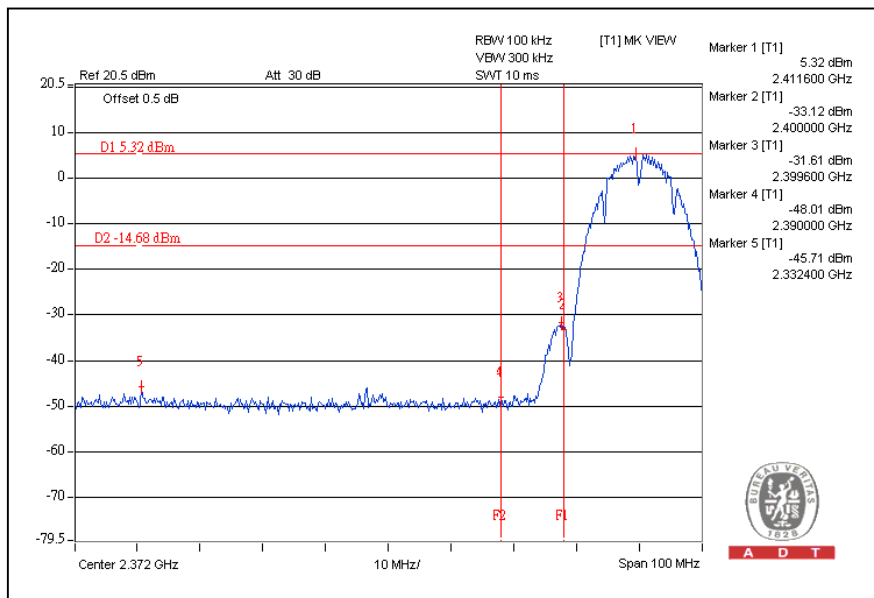
Same as Item 4.3.6

#### 4.6.6 TEST RESULTS

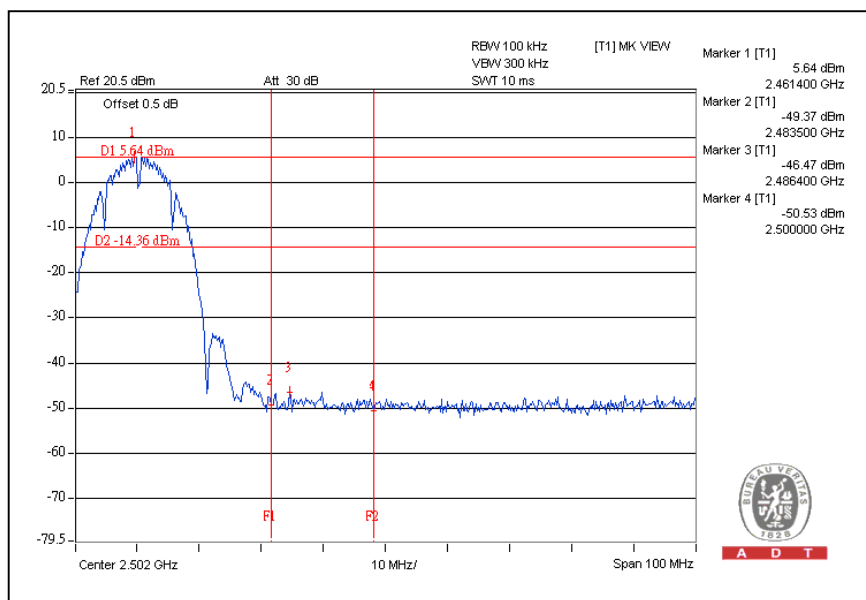
The spectrum plots are attached on the following images. D1 line indicates the highest level, and D2 line indicates the 20dB offset below D1. It shows compliance with the requirement in part 15.247(d).

## 802.11b DSSS MODULATION:

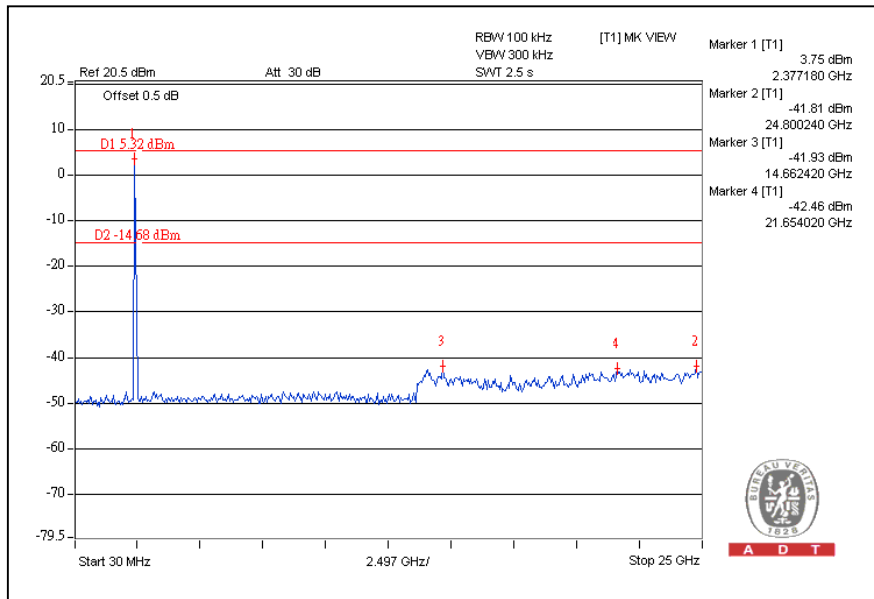
### CH1



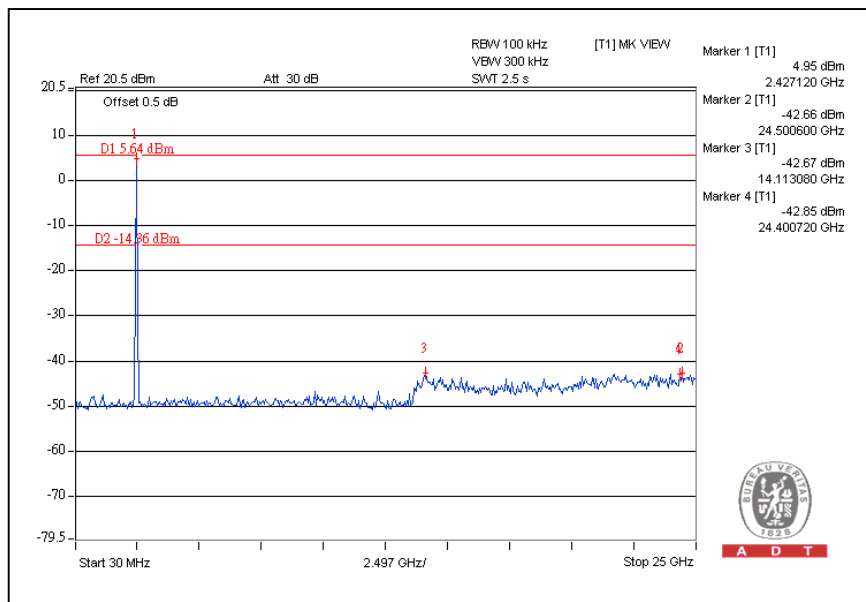
### CH11



## CH1

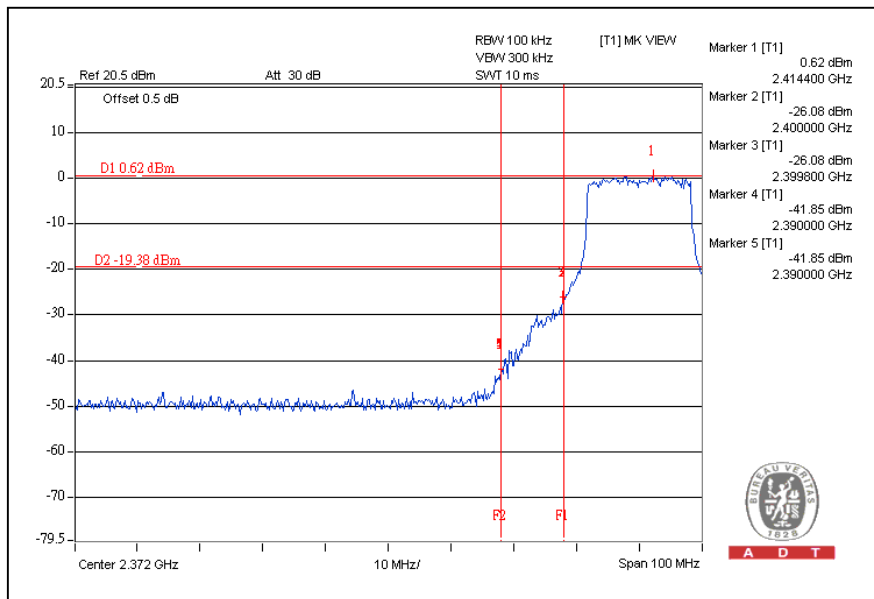


## CH11

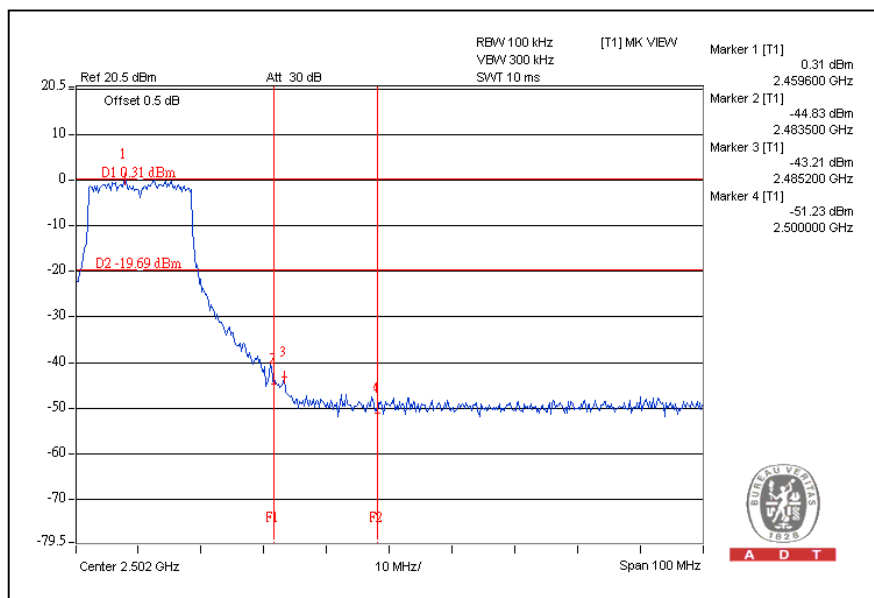


## 802.11g OFDM MODULATION:

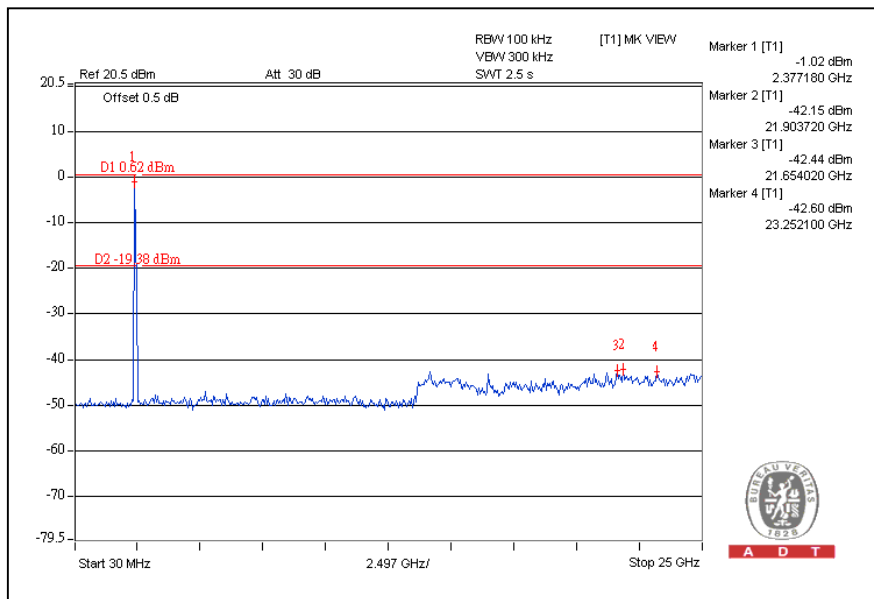
### CH1



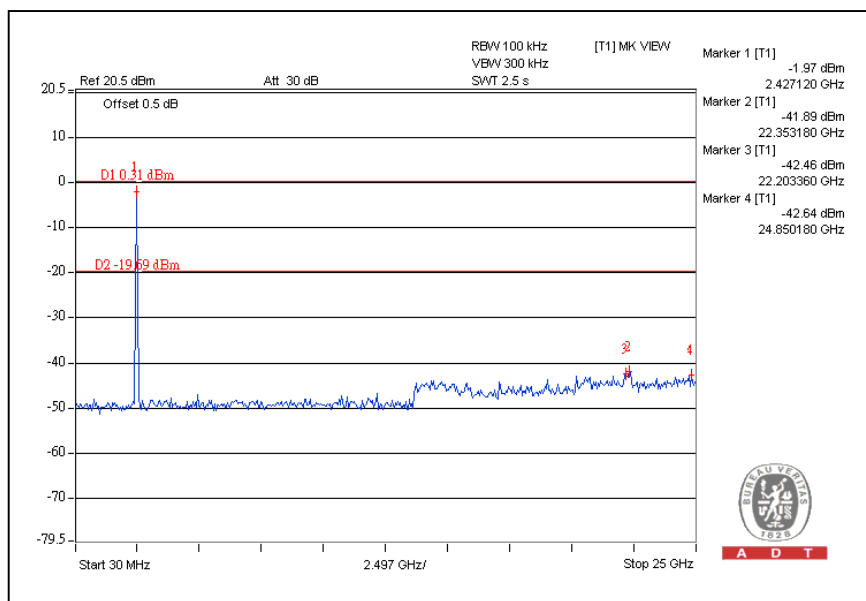
### CH11



## CH1

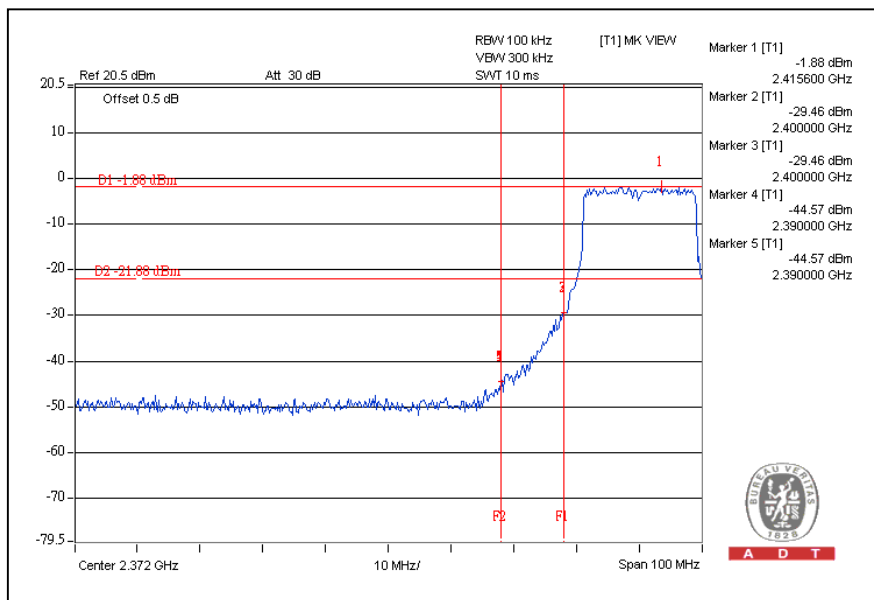


## CH11

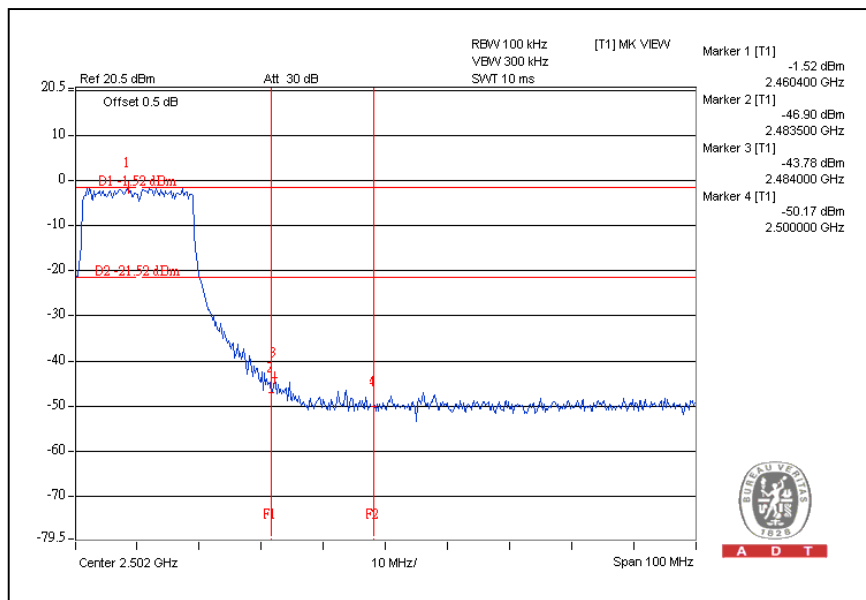


## 802.11n (20MHz) OFDM MODULATION:

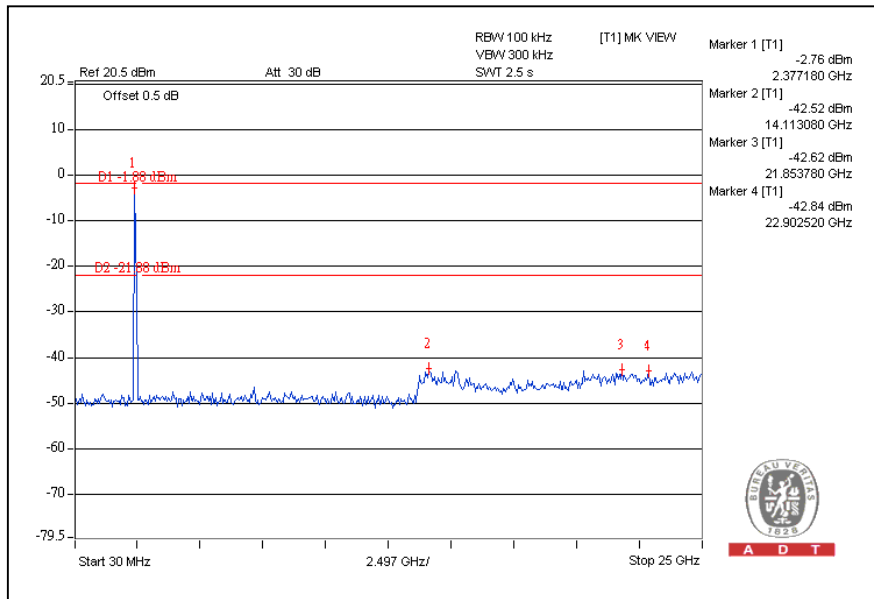
### CH1



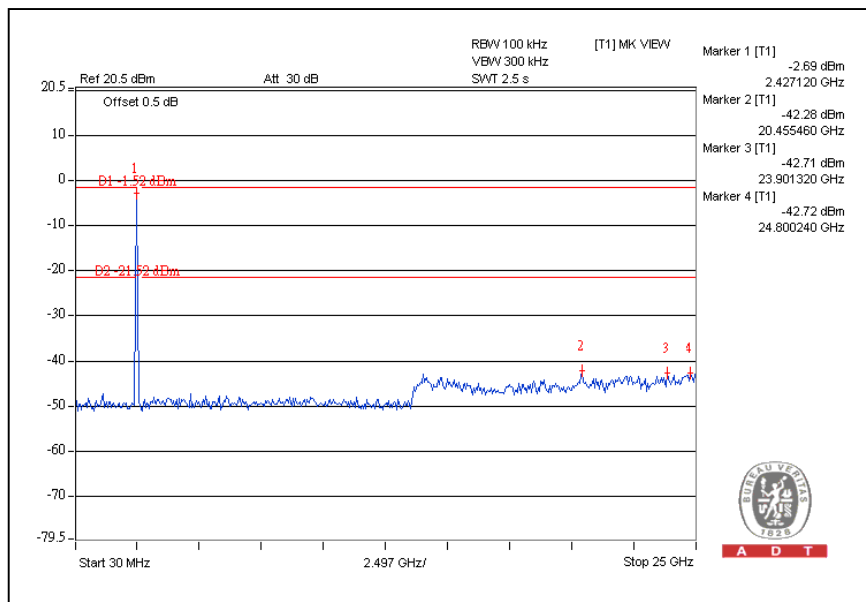
### CH11



## CH1



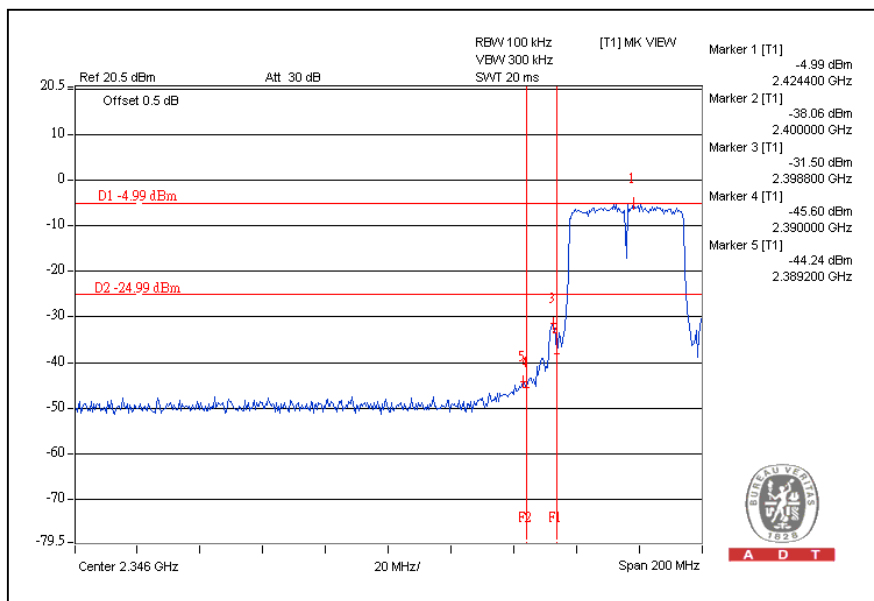
## CH11



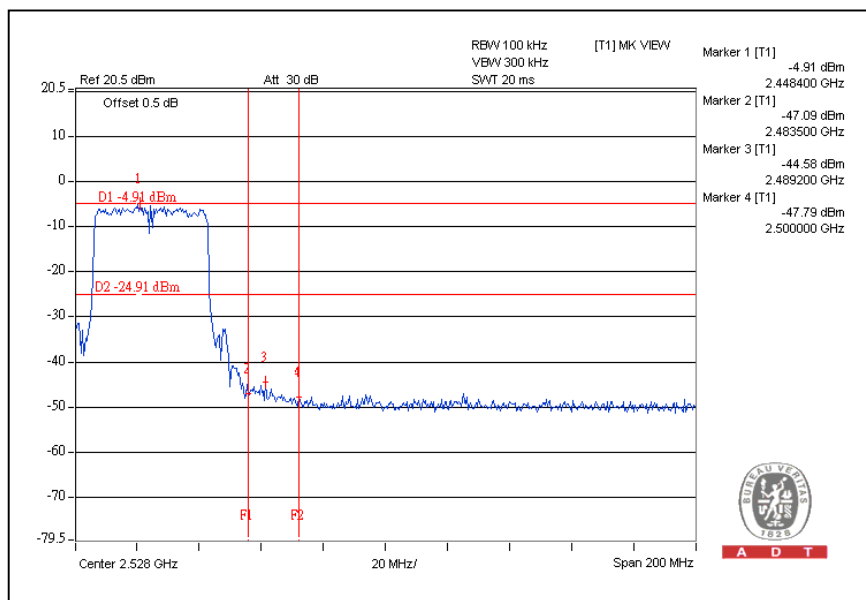


## 802.11n (40MHz) OFDM MODULATION:

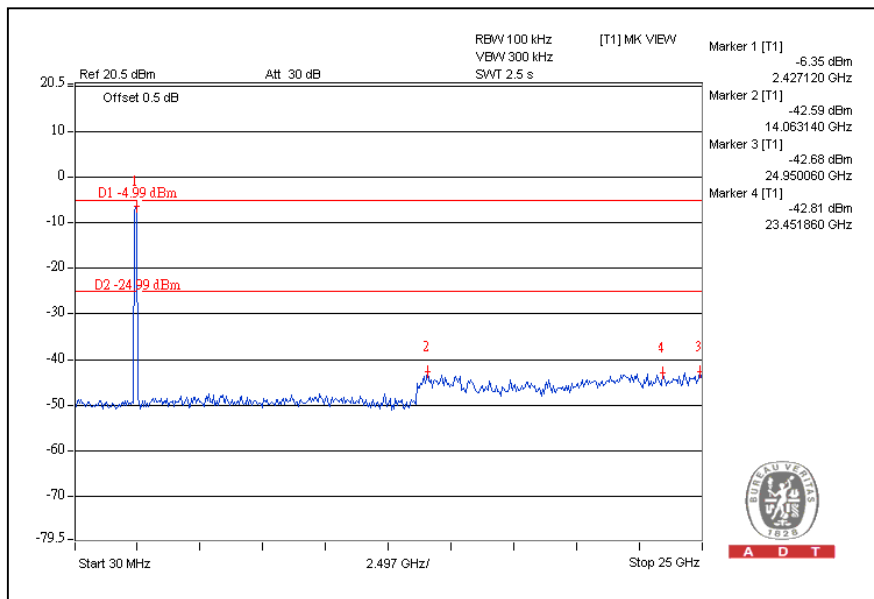
### CH1



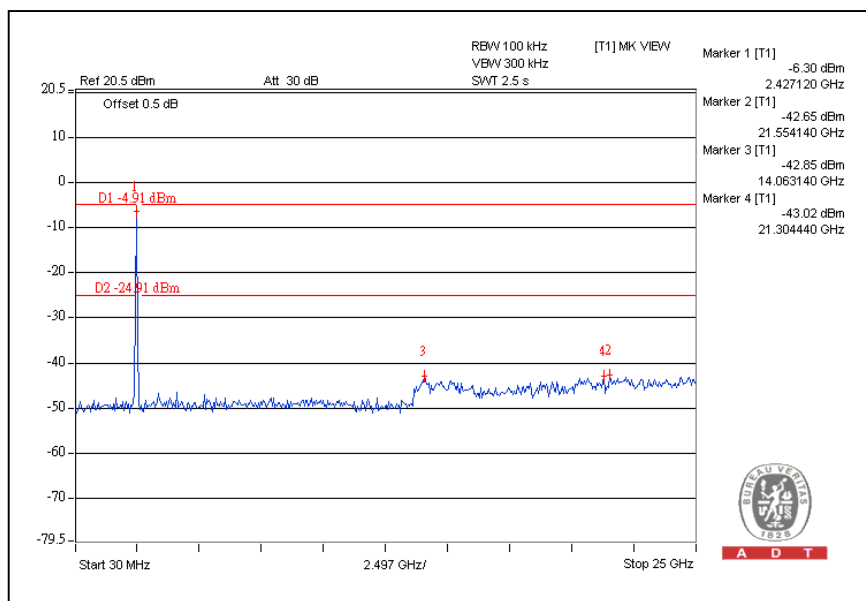
### CH7



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

**Linko EMC/RF Lab:**

Tel: 886-2-26052180

Fax: 886-2-26052943

**Hsin Chu EMC/RF Lab:**

Tel: 886-3-5935343

Fax: 886-3-5935342

**Hwa Ya EMC/RF/Safety Telecom Lab:**

Tel: 886-3-3183232

Fax: 886-3-3185050

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

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



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

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

---END---