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FCC TEST REPORT (15.247)

REPORT NO.: RF110421E04

MODEL NO.: NBG5715, HGW-501HN-M

FCC ID: I88NBG5715

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ISSUED: Aug. 03, 2011

APPLICANT: ZyXEL Communications Corporation

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Table of Contents

RELEASE CONTROL RECORD	5
1. CERTIFICATION	6
2. SUMMARY OF TEST RESULTS	7
2.1 MEASUREMENT UNCERTAINTY	9
3. GENERAL INFORMATION	10
3.1 GENERAL DESCRIPTION OF EUT	10
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	18
3.4 DESCRIPTION OF SUPPORT UNITS.....	19
3.5 CONFIGURATION OF SYSTEM UNDER TEST	20
4. TEST TYPES AND RESULTS (802.11b & g, 2400 ~ 2483.5MHz Band)	22
4.1 CONDUCTED EMISSION MEASUREMENT	22
4.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT	22
4.1.2 TEST INSTRUMENTS.....	22
4.1.3 TEST PROCEDURES	23
4.1.4 DEVIATION FROM TEST STANDARD	23
4.1.5 TEST SETUP	24
4.1.6 EUT OPERATING CONDITIONS	24
4.1.7 TEST RESULTS	25
4.2 RADIATED EMISSION MEASUREMENT	27
4.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT	27
4.2.2 TEST INSTRUMENTS.....	28
4.2.3 TEST PROCEDURES	29
4.2.4 DEVIATION FROM TEST STANDARD	29
4.2.5 TEST SETUP	30
4.2.6 EUT OPERATING CONDITIONS	30
4.2.7 TEST RESULTS	31
4.3 6dB BANDWIDTH MEASUREMENT	60
4.3.1 LIMITS OF 6dB BANDWIDTH MEASUREMENT	60
4.3.2 TEST INSTRUMENTS.....	60
4.3.3 TEST PROCEDURE.....	60
4.3.4 DEVIATION FROM TEST STANDARD	60
4.3.5 TEST SETUP	60
4.3.6 EUT OPERATING CONDITIONS	60
4.3.7 TEST RESULTS	61
4.4 MAXIMUM PEAK OUTPUT POWER.....	65
4.4.1 LIMITS OF MAXIMUM PEAK OUTPUT POWER MEASUREMENT	65
4.4.2 INSTRUMENTS.....	65
4.4.3 TEST PROCEDURES	65



A D T

4.4.4	DEVIATION FROM TEST STANDARD	65
4.4.5	TEST SETUP	65
4.4.6	EUT OPERATING CONDITIONS	65
4.4.7	TEST RESULTS	66
4.5	POWER SPECTRAL DENSITY MEASUREMENT	68
4.5.1	LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT	68
4.5.2	TEST INSTRUMENTS.....	68
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	73
4.6.5	EUT OPERATING CONDITION	73
4.6.6	TEST RESULTS	73
5.	TEST TYPES AND RESULTS (802.11a, 5725~5850MHz Band).....	82
5.1	CONDUCTED EMISSION MEASUREMENT	82
5.1.1	LIMITS OF CONDUCTED EMISSION MEASUREMENT	82
5.1.2	TEST INSTRUMENTS.....	82
5.1.3	TEST PROCEDURES	83
5.1.4	DEVIATION FROM TEST STANDARD	83
5.1.5	TEST SETUP	84
5.1.6	EUT OPERATING CONDITIONS	84
5.1.7	TEST RESULTS	85
5.2	RADIATED EMISSION MEASUREMENT	87
5.2.1	LIMITS OF RADIATED EMISSION MEASUREMENT	87
5.2.2	TEST INSTRUMENTS.....	88
5.2.3	TEST PROCEDURES	89
5.2.4	DEVIATION FROM TEST STANDARD	89
5.2.5	TEST SETUP	90
5.2.6	EUT OPERATING CONDITIONS	90
5.2.7	TEST RESULTS	91
5.3	6dB BANDWIDTH MEASUREMENT	100
5.3.1	LIMITS OF 6dB BANDWIDTH MEASUREMENT	100
5.3.2	TEST INSTRUMENTS.....	100
5.3.3	TEST PROCEDURE.....	100
5.3.4	DEVIATION FROM TEST STANDARD	100
5.3.5	TEST SETUP	100



A D T

5.3.6	EUT OPERATING CONDITIONS	100
5.3.7	TEST RESULTS	101
5.4	MAXIMUM PEAK OUTPUT POWER.....	104
5.4.1	LIMITS OF MAXIMUM PEAK OUTPUT POWER MEASUREMENT	104
5.4.2	INSTRUMENTS.....	104
5.4.3	TEST PROCEDURES	104
5.4.4	DEVIATION FROM TEST STANDARD.....	104
5.4.5	TEST SETUP	104
5.4.6	EUT OPERATING CONDITIONS	104
5.4.7	TEST RESULTS	105
5.5	POWER SPECTRAL DENSITY MEASUREMENT.....	106
5.5.1	LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT	106
5.5.2	TEST INSTRUMENTS.....	106
5.5.3	TEST PROCEDURE.....	106
5.5.4	DEVIATION FROM TEST STANDARD.....	106
5.5.5	TEST SETUP	106
5.5.6	EUT OPERATING CONDITION.....	107
5.5.7	TEST RESULTS	108
5.6	CONDUCTED OUT-BAND EMISSION MEASUREMENT.....	111
5.6.1	LIMITS OF CONDUCTED OUT-BAND EMISSION MEASUREMENT.....	111
5.6.2	TEST INSTRUMENTS.....	111
5.6.3	TEST PROCEDURE.....	111
5.6.4	DEVIATION FROM TEST STANDARD.....	111
5.6.5	EUT OPERATING CONDITION.....	111
5.6.6	TEST RESULTS	111
6.	INFORMATION ON THE TESTING LABORATORIES	118
7.	APPENDIX A - MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB.....	119



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RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF110421E04	Original release	Aug. 03, 2011



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1. CERTIFICATION

PRODUCT: Simultaneous Dual-Band Wireless N Media Router
BRAND NAME: ZyXEL, MitraStar
MODEL NO.: NBG5715, HGW-501HN-M
TEST SAMPLE: MASS-PRODUCTION
APPLICANT: ZyXEL Communications Corporation
TESTED: Apr. 28 to May 12, 2011
STANDARDS: FCC Part 15, Subpart C (Section 15.247)
ANSI C63.4-2003
ANSI C63.10-2009

The above equipment (Model: NBG5715) has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

PREPARED BY : Phoenix Huang , **DATE:** Aug. 03, 2011
(Phoenix Huang, Specialist)

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

2. SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

For 2.4GHz, 2412~2462MHz Band

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 -25.64dB at 0.184MHz
15.247(a)(2)	Spectrum Bandwidth of a Direct Sequence Spread Spectrum System Limit: min. 500kHz	PASS	Meet the requirement of limit.
15.247(b)	Maximum Peak Output Power Limit: max. 30dBm	PASS	Meet the requirement of limit.
15.247(d)	Radiated Emissions Limit: Table 15.209	PASS	Meet the requirement of limit. Minimum passing margin is -0.5dB at 2349.20MHz, 2359.70MHz, 2360.13MHz & 4874.00MHz
15.247(e)	Power Spectral Density Limit: max. 8dBm	PASS	Meet the requirement of limit.
15.247(d)	Conducted Out-Band Emission Measurement Limit: 20dB less than the peak value of fundamental frequency	PASS	Meet the requirement of limit.
15.203	Antenna Requirement	PASS	Antenna connector is R-SMA not a standard connector.



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For 5GHz, 5725~5850MHz Band

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 -25.63dB at 0.184MHz
15.247(a)(2)	Spectrum Bandwidth of a Direct Sequence Spread Spectrum System Limit: min. 500kHz	PASS	Meet the requirement of limit.
15.247(b)	Maximum Peak Output Power Limit: max. 30dBm	PASS	Meet the requirement of limit.
15.247(d)	Radiated Emissions Limit: Table 15.209	PASS	Meet the requirement of limit. Minimum passing margin is -0.7dB at 11570.00MHz, 11590.00MHz & 11650.00MHz
15.247(e)	Power Spectral Density Limit: max. 8dBm	PASS	Meet the requirement of limit.
15.247(d)	Conducted Out-Band Emission Measurement Limit: 20dB less than the peak value of fundamental frequency	PASS	Meet the requirement of limit.
15.203	Antenna Requirement	PASS	Antenna connector is R-SMA not a standard connector.

NOTE:

1. The EUT was operating in 2400 ~ 2483.5MHz, 5.15~5.25GHz and 5.725~5.850GHz frequencies band. This report was recorded the RF parameters including 2400 ~ 2483.5MHz and 5.725~5.850GHz. For the 5.15~5.25GHz RF parameters was recorded in another test report.



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2.1 MEASUREMENT UNCERTAINTY

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

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

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



3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

PRODUCT	Simultaneous Dual-Band Wireless N Media Router
MODEL NO.	NBG5715, HGW-501HN-M
FCC ID	I88NBG5715
POWER SUPPLY	DC 12V from power adapter (Class II, AC 2 Pin)
MODULATION TYPE	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM
MODULATION TECHNOLOGY	DSSS, OFDM
TRANSFER RATE	<ul style="list-style-type: none"> ■802.11b: 11 / 5.5 / 2 / 1Mbps ■802.11g: 54 / 48 / 36 / 24 / 18 / 12 / 9 / 6Mbps ■802.11a: 54 / 48 / 36 / 24 / 18 / 12 / 9 / 6Mbps ■HT20 MCS0~7 (800ns GI): 6.5Mbps, 13Mbps, 19.5Mbps, 26Mbps, 39Mbps, 52Mbps, 58.5Mbps, 65Mbps, ■HT20 MCS8~15 (800ns GI): 13Mbps, 26Mbps, 39Mbps, 52Mbps, 78Mbps, 104Mbps, 117Mbps, 130Mbps. ■HT20 MCS16~23 (800ns GI): 19.5Mbps,39Mbps, 58.5Mbps, 78Mbps, 117Mbps, 156Mbps, 175.5Mbps, 195Mbps. ■HT40 MCS0~7 (800ns GI): 13.5Mbps, 27Mbps, 40.5Mbps, 54Mbps, 81Mbps, 108Mbps, 121.5Mbps, 135Mbps. ■HT40 MCS8~15 (800ns GI): 27Mbps, 54Mbps, 81Mbps, 108Mbps, 162Mbps, 216Mbps, 243Mbps, 270Mbps. ■HT40 MCS16~23 (800ns GI): 40.5Mbps, 81Mbps, 121.5Mbps, 162Mbps, 243Mbps, 324Mbps, 364.5Mbps, 405Mbps. ■HT20 MCS0~7 (400ns GI): 7.2Mbps, 14.4Mbps, 21.7Mbps, 28.9Mbps, 43.3Mbps, 57.8Mbps, 65.0Mbps, 72.2Mbps, ■HT20 MCS8~15 (400ns GI): 14.444Mbps, 28.889Mbps, 43.333Mbps, 57.778Mbps, 86.667Mbps, 115.556Mbps, 130.000Mbps, 144.444Mbps. ■HT20 MCS16~23 (400ns GI): 21.7Mbps, 43.3Mbps, 65Mbps, 86.7Mbps,130Mbps, 173.3Mbps, 195Mbps, 216.7Mbps. ■HT40 MCS0~7 (400ns GI): 15.0Mbps, 30.0Mbps, 45.0Mbps, 60.0Mbps, 90.0Mbps, 120.0Mbps, 135.0Mbps, 150.0Mbps, ■HT40 MCS8~15 (400ns GI): 30.0Mbps, 60.0Mbps, 90.0Mbps, 120.0Mbps, 180.0Mbps, 240.0Mbps, 270.0Mbps, 300.0Mbps. ■HT40 MCS16~23 (400ns GI): 45Mbps,90.0Mbps, 135Mbps, 180.0Mbps, 270.0Mbps, 360.0Mbps, 405Mbps, 450.0Mbps.



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OPERATING FREQUENCY	For 15.407 802.11a: 5.18 ~ 5.24GHz
	For 15.247 802.11b & 802.11g: 2.412 ~ 2.462GHz 802.11a: 5.745 ~ 5.825GHz
NUMBER OF CHANNEL	For 15.407 4 for 802.11a, 802.11n (20MHz) 2 for 802.11n (40MHz)
	For 15.247(2.4GHz) 11 for 802.11b, 802.11g, 802.11n (20MHz) 7 for 802.11n (40MHz)
	For 15.247(5GHz) 5 for 802.11a, 802.11n (20MHz) 2 for 802.11n (40MHz)
MAXIMUM OUTPUT POWER	For 15.407 802.11a: 22.9mW 802.11n (20MHz): 29.6mW 802.11n (40MHz): 46.8 mW
	For 15.247(2.4GHz) 802.11b: 53.7mW 802.11g: 501.9mW 802.11n (20MHz): 483.6mW 802.11n (40MHz): 501.9mW
	For 15.247(5GHz) 802.11a: 275.7mW 802.11n (20MHz): 276.2mW 802.11n (40MHz): 280.2mW
ANTENNA TYPE	Please see NOTE
DATA CABLE	NA
I/O PORTS	LAN port (Ethernet: 10, 100, 1000Mbps) x 4 WAN port x 1 USB port x 2
ASSOCIATED DEVICES	Adapter x 1

NOTE:

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

Brand	Model No.	Description
ZyXEL	NBG5715	For marketing requirement to separate difference models.
MitraStar	HGW-501HN-M	

From the above models, model: **NBG5715** was selected as representative model for the test and its data was recorded in this report.

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

Transmitter Circuit	Manufacturer	Model name	Peak Gain (Included Cable loss)	Antenna Type	Connector Type
Chain (0)	ARISTOTLE	RFA-25-C2M2-M10-1	2.4G & 5G: 2dBi	Dipole	R-SMA
Chain (1)			2.4G & 5G: 2dBi	Dipole	R-SMA
Chain (2)			2.4G & 5G: 2dBi	Dipole	R-SMA

3. The EUT must be supplied with a power adapter:

Brand:	DVE
Model No.:	DSA-24CA-12 120200
Input power :	100-240V 50/60Hz, 0.8A
Output power :	DC 12V, 2A DC output cable (Unshielded, 1.55m, With one core)

4. The EUT is 3 * 3 spatial MIMO (3Tx & 3Rx) without beam forming function. The 11b legacy mode is limited to single transmitter only.
5. The EUT incorporates CDD function with 802.11a, 802.11g and MIMO function with 802.11n.
6. When the EUT operating in 802.11n, the software operation, which is defined by manufacturer, MCS (Modulation and Coding Schemes) from 0 to 23.
7. 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
3	2422MHz	7	2442MHz
4	2427MHz	8	2447MHz
5	2432MHz	9	2452MHz
6	2437MHz		

Operated in 5725 ~ 5850MHz band:

Five channels are provided for 802.11a, 802.11n (20MHz):

CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
149	5745 MHz	161	5805 MHz
153	5765 MHz	165	5825 MHz
157	5785 MHz		

Two channels are provided for 802.11n (40MHz):

CHANNEL	FREQUENCY
151	5755 MHz
159	5795 MHz



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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	
-	√	√	√	√	√	-

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

ANTENNA COMBINATION MODE:

COMBINATION MODE	OPERATION MODE	TX CHAIN(0)	TX CHAIN(1)	TX CHAIN(2)
A	802.11 b	√	-	-
B	802.11 g	√	√	√
C	802.11 a	√	√	√
D	802.11n(20MHz) for MCS0~23	√	√	√
E	802.11n(40MHz) for MCS0~23	√	√	√

Note: The above information was declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or user's manual.

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
For 2.4 GHz 802.11g	1 to 11	6	OFDM	BPSK	6	B
802.11a	149 to 165	149	OFDM	BPSK	6	C



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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
For 2.4 GHz 802.11g	1 to 11	6	OFDM	BPSK	6	B
802.11a	149 to 165	149	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	B
For 2.4 GHz 802.11n (20MHz)	1 to 11	1, 6, 11	OFDM	BPSK	6.5	D
For 2.4 GHz 802.11n (40MHz)	3 to 9	3, 6, 9	OFDM	BPSK	13.5	E
802.11a	149 to 165	149, 157, 165	OFDM	BPSK	6	C
For 5 GHz 802.11n (20MHz)	149 to 165	149, 157, 165	OFDM	BPSK	6.5	D
For 5 GHz 802.11n (40MHz)	151 to 159	151, 159	OFDM	BPSK	13.5	E

ANTENNA PORT CONDUCTED 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, 6, 11	DSSS	DBPSK	1	A
802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6	B
For 2.4 GHz 802.11n (20MHz)	1 to 11	1, 6, 11	OFDM	BPSK	6.5	D
For 2.4 GHz 802.11n (40MHz)	3 to 9	3, 6, 9	OFDM	BPSK	13.5	E
802.11a	149 to 165	149, 157, 165	OFDM	BPSK	6	C
For 5 GHz 802.11n (20MHz)	149 to 165	149, 157, 165	OFDM	BPSK	6.5	D
For 5 GHz 802.11n (40MHz)	151 to 159	151, 159	OFDM	BPSK	13.5	E

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

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	B
For 2.4 GHz 802.11n (20MHz)	1 to 11	1, 11	OFDM	BPSK	6.5	D
For 2.4 GHz 802.11n (40MHz)	3 to 9	3, 9	OFDM	BPSK	13.5	E
802.11a	149 to 165	149, 165	OFDM	BPSK	6	C
For 5 GHz 802.11n (20MHz)	149 to 165	149, 165	OFDM	BPSK	6.5	D
For 5 GHz 802.11n (40MHz)	151 to 159	151, 159	OFDM	BPSK	13.5	E



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TEST CONDITION:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
PLC	24deg. C, 69%RH, 1005 hPa	120Vac, 60Hz	Andy Ho
RE ³ 1G	20deg. C, 63%RH, 1005 hPa	120Vac, 60Hz	Frank Liu
	17deg. C, 67%RH, 1005 hPa	120Vac, 60Hz	Kent Liu
RE<1G	17deg. C, 69%RH, 1005 hPa	120Vac, 60Hz	Frank Liu
APCM	25deg. C, 60%RH, 1005 hPa	120Vac, 60Hz	Rex Huang
OB	25deg. C, 60%RH, 1005 hPa	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.

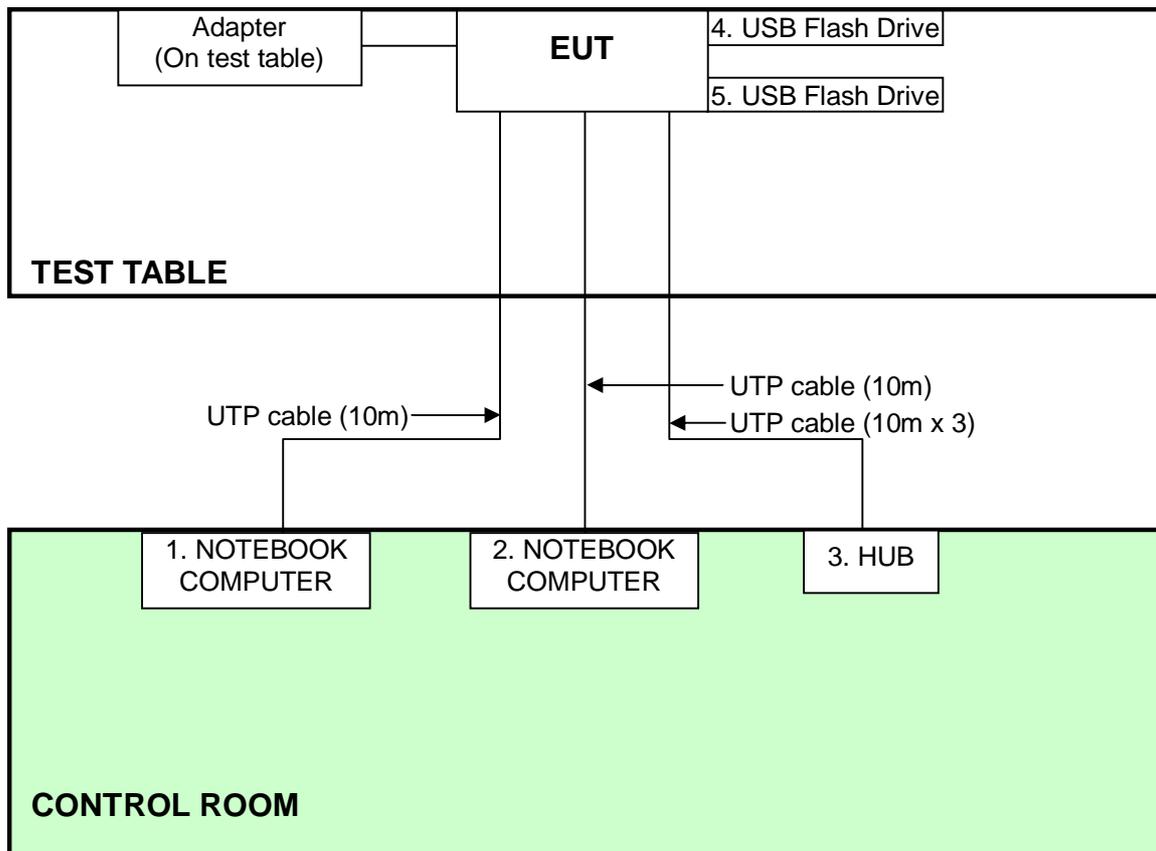
NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	NOTEBOOK COMPUTER	DELL	PP19L	CN-OHC416-70 166-5CA-0448	PIW632500516610
2	NOTEBOOK COMPUTER	DELL	PP32LA	FSLB32S	FCC DoC
3	HUB	ZyXEL	ES-116P	S060H0200021 5	FCC DoC
4	USB Flash Disk (For Conducted test)	Transcend	JF168	NA	NA
	iPod shuffle	Apple	MC749TA/A	CC4DN29UDFD M	NA
5	USB Flash Disk (For Conducted test)	Transcend	NA	NA	NA
	iPod shuffle	Apple	MC749TA/A	CC4DN25WDF DM	NA

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	UTP Cable, 10m
2	UTP Cable, 10m
3	UTP Cable, 10m
4	NA
	USB Cable W/O Core, 0.1m
5	NA
	USB Cable W/O Core, 0.1m

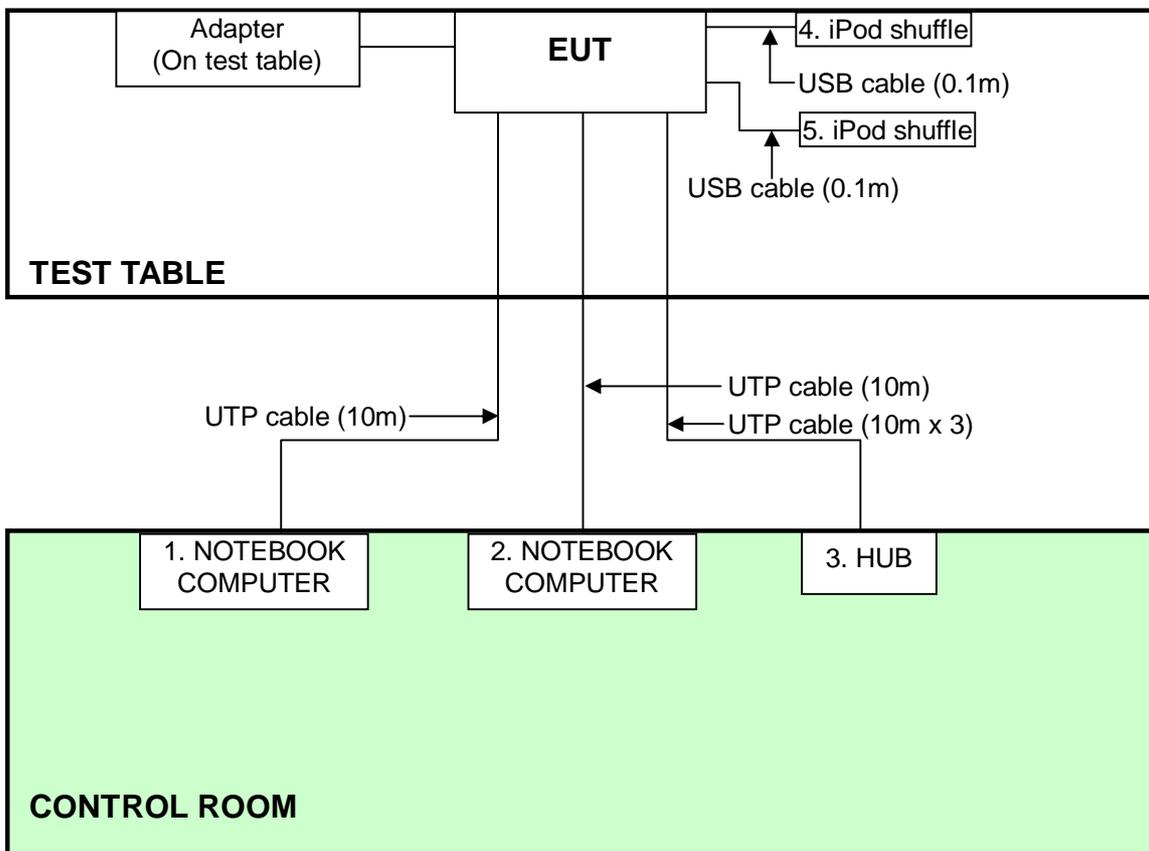
NOTE: All power cords of the above support units are non shielded (1.8m).

3.5 CONFIGURATION OF SYSTEM UNDER TEST

For Conducted test:



For Other test:



4. TEST TYPES AND RESULTS (802.11b & g, 2400 ~ 2483.5MHz Band)

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: Apr. 28, 2011

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver	ESCS 30	100375	Mar. 09, 2011	Mar. 08, 2012
Line-Impedance Stabilization Network (for EUT)	NSLK 8127	8127-522	Sep. 08, 2010	Sep. 07, 2011
Line-Impedance Stabilization Network (for Peripheral)	ESH3-Z5	848773/004	Nov. 03, 2010	Nov. 02, 2011
RF Cable (JYEBAO)	5DFB	COCCAB-002	Aug. 30, 2010	Aug. 29, 2011
50 ohms Terminator	50	3	Oct. 07, 2010	Oct. 06, 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.

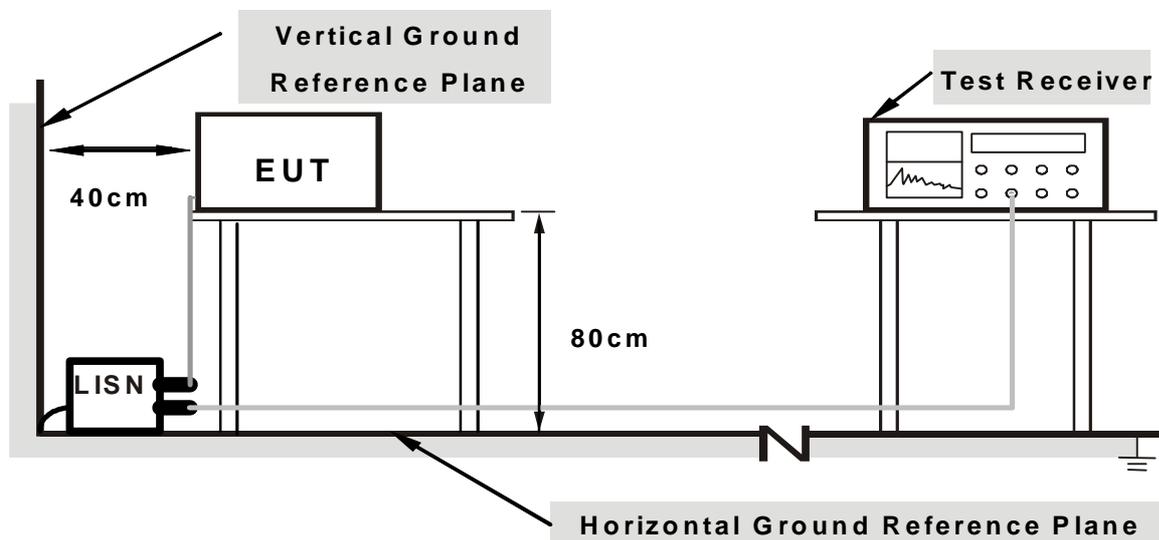
4.1.3 TEST PROCEDURES

- 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

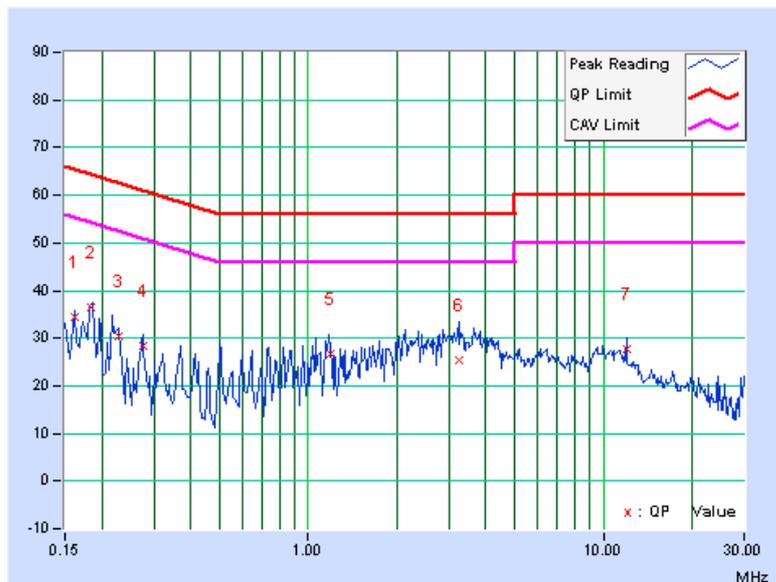
1. Placed the EUT on testing table.
2. Prepared computer system (support unit 2) to act as communication partner and placed it outside of testing area.
3. The communication partners ran test program “RT3593QA.exe” to enable EUT under transmission/receiving condition continuously via one UTP cable transmission.

4.1.7 TEST RESULTS

PHASE	Line (L)	6dB BANDWIDTH	9 kHz
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No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
			1	0.162	0.11	34.46	-	34.57	-	65.37
2	0.184	0.12	36.29	-	36.41	-	64.31	54.31	-27.89	-
3	0.229	0.13	30.23	-	30.36	-	62.50	52.50	-32.14	-
4	0.275	0.13	28.31	-	28.44	-	60.96	50.96	-32.52	-
5	1.191	0.14	26.64	-	26.78	-	56.00	46.00	-29.22	-
6	3.235	0.18	25.11	-	25.29	-	56.00	46.00	-30.71	-
7	11.998	0.51	27.23	-	27.74	-	60.00	50.00	-32.26	-

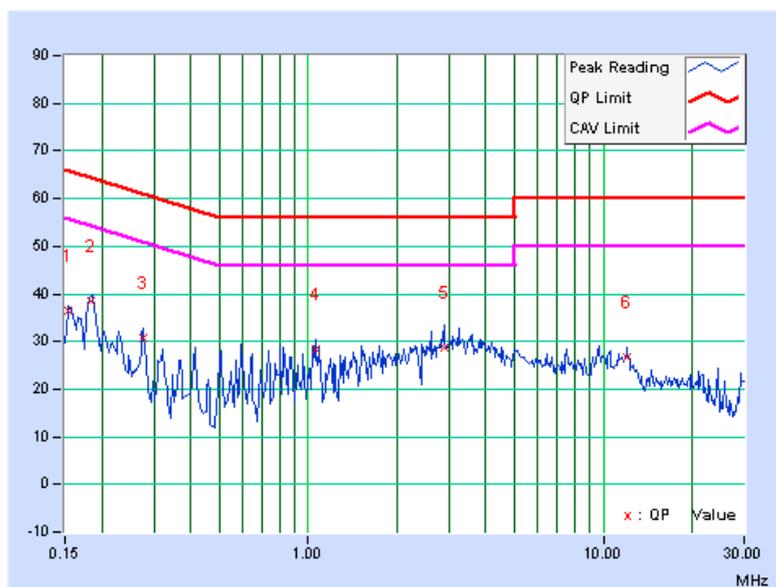
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value = 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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No	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
	[MHz]	Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
		(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.154	0.12	36.34	-	36.46	-	65.79	55.79	-29.33	-
2	0.184	0.13	38.52	-	38.65	-	64.29	54.29	-25.64	-
3	0.275	0.14	30.69	-	30.83	-	60.97	50.97	-30.13	-
4	1.057	0.16	28.12	-	28.28	-	56.00	46.00	-27.72	-
5	2.893	0.23	28.44	-	28.67	-	56.00	46.00	-27.33	-
6	11.997	0.95	25.72	-	26.67	-	60.00	50.00	-33.33	-

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



4.2 RADIATED EMISSION MEASUREMENT

4.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT

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

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

NOTE:

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



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4.2.2 TEST INSTRUMENTS

Test date: Apr. 29 to May 05, 2011

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Agilent Spectrum Analyzer	E4446A	MY48250254	July 14, 2010	July 13, 2011
Agilent Pre-Selector	N9039A	MY46520311	July 14, 2010	July 13, 2011
Agilent Signal Generator	N5181A	MY49060517	July 14, 2010	July 13, 2011
Mini-Circuits Pre-Amplifier	ZFL-1000VH2B	AMP-ZFL-03	Nov. 16, 2010	Nov. 15, 2011
Agilent Pre-Amplifier	8449B	3008A02578	July 05, 2010	July 04, 2011
Miteq Pre-Amplifier	AFS33-1800265 0-30-8P-44	881786	NA	NA
SCHWARZBECK Trilog Broadband Antenna	VULB 9168	9168-360	Apr. 14, 2011	Apr. 13, 2012
AISI Horn_Antenna	AIH.8018	000032009111 0	Nov. 12, 2010	Nov. 11, 2011
SCHWARZBECK Horn_Antenna	BBHA 9170	9170-424	Oct. 08, 2010	Oct. 07, 2011
RF CABLE	NA	RF104-201 RF104-203 RF104-204	Dec. 27, 2010	Dec. 26, 2011
RF Cable	NA	CHGCAB_001	NA	NA
Software	ADT_Radiated_V8.7.05	NA	NA	NA
CT Antenna Tower & Turn Table	NA	NA	NA	NA

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

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

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

4. The FCC Site Registration No. is 966073.

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

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

4.2.3 TEST PROCEDURES

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at 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.

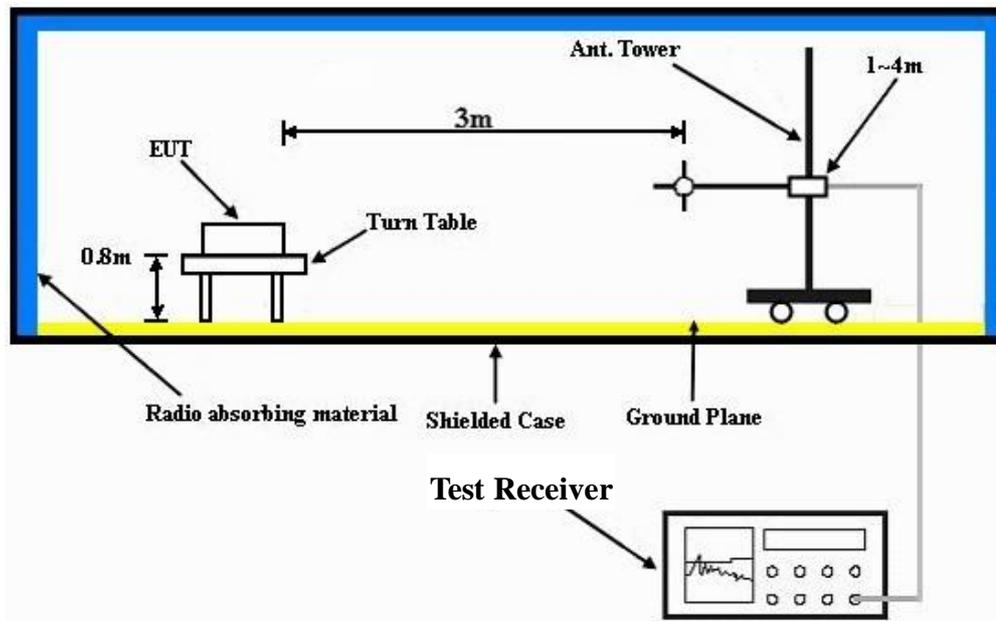
NOTE:

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

1. Placed the EUT on testing table.
2. Prepared computer system (support unit 2) to act as communication partner and placed it outside of testing area.
3. The communication partners ran test program “RT3593QA.exe” to enable EUT under transmission/receiving condition continuously via one UTP cable transmission.



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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 6	FREQUENCY RANGE	Below 1000MHz
INPUT POWER	120Vac / 60Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	17deg. C, 69%RH 1005 hPa	TESTED BY	Frank Liu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	125.01	40.1 QP	43.5	-3.5	2.00 H	278	27.04	13.01
2	250.03	40.7 QP	46.0	-5.3	1.00 H	303	27.30	13.42
3	414.48	37.4 QP	46.0	-8.6	1.00 H	224	19.35	18.03
4	446.76	35.3 QP	46.0	-10.7	1.50 H	0	16.50	18.80
5	500.02	41.7 QP	46.0	-4.3	1.50 H	313	21.64	20.10
6	624.96	43.5 QP	46.0	-2.5	1.00 H	328	20.78	22.71
7	874.95	42.9 QP	46.0	-3.1	1.00 H	360	16.53	26.37
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	124.97	41.2 QP	43.5	-2.4	1.50 V	0	28.15	13.00
2	410.67	30.2 QP	46.0	-15.8	1.00 V	220	12.24	17.94
3	500.02	42.5 QP	46.0	-3.5	1.00 V	353	22.42	20.10
4	624.96	43.8 QP	46.0	-2.2	1.50 V	0	21.11	22.71
5	921.60	43.9 QP	46.0	-2.2	1.00 V	233	16.86	26.99
6	953.82	42.4 QP	46.0	-3.6	1.50 V	349	15.18	27.26

- 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	120Vac / 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	20deg. C, 63%RH 1005 hPa	TESTED BY	Frank Liu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	56.4 PK	74.0	-17.6	1.45 H	211	24.74	31.66
2	2390.00	44.5 AV	54.0	-9.5	1.45 H	211	12.84	31.66
3	*2412.00	95.7 PK			1.45 H	211	63.97	31.73
4	*2412.00	92.4 AV			1.45 H	211	60.67	31.73
5	4824.00	55.4 PK	74.0	-18.6	1.63 H	113	16.43	38.97
6	4824.00	53.1 AV	54.0	-0.9	1.63 H	113	14.13	38.97
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2389.00	59.5 PK	74.0	-14.5	1.04 V	335	27.85	31.65
2	2389.00	51.1 AV	54.0	-2.9	1.04 V	335	19.45	31.65
3	*2412.00	105.6 PK			1.04 V	338	73.87	31.73
4	*2412.00	102.8 AV			1.04 V	338	71.07	31.73
5	4824.00	55.4 PK	74.0	-18.6	1.44 V	133	16.43	38.97
6	4824.00	52.2 AV	54.0	-1.8	1.44 V	133	13.23	38.97

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



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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER	120Vac / 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	20deg. C, 63%RH 1005 hPa	TESTED BY	Frank Liu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	95.7 PK			1.44 H	214	63.89	31.81
2	*2437.00	92.3 AV			1.44 H	214	60.49	31.81
3	4874.00	55.9 PK	74.0	-18.1	1.58 H	114	16.76	39.14
4	4874.00	53.3 AV	54.0	-0.7	1.58 H	114	14.16	39.14
5	7311.00	53.7 PK	74.0	-20.3	1.00 H	219	7.07	46.63
6	7311.00	42.2 AV	54.0	-11.8	1.00 H	219	-4.43	46.63

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	105.3 PK			1.03 V	332	73.49	31.81
2	*2437.00	102.4 AV			1.03 V	332	70.59	31.81
3	4874.00	56.0 PK	74.0	-18.0	1.24 V	122	16.86	39.14
4	4874.00	53.5 AV	54.0	-0.5	1.24 V	122	14.36	39.14
5	7311.00	53.1 PK	74.0	-20.9	1.02 V	32	6.47	46.63
6	7311.00	42.6 AV	54.0	-11.4	1.02 V	32	-4.03	46.63

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



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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER	120Vac / 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	20deg. C, 63%RH 1005 hPa	TESTED BY	Frank Liu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

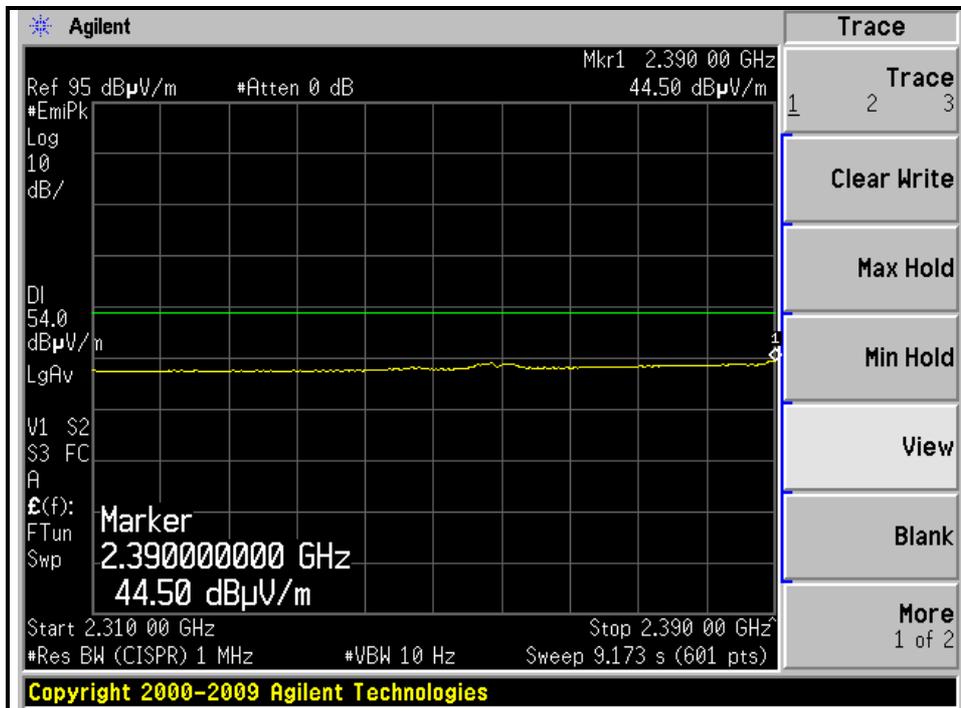
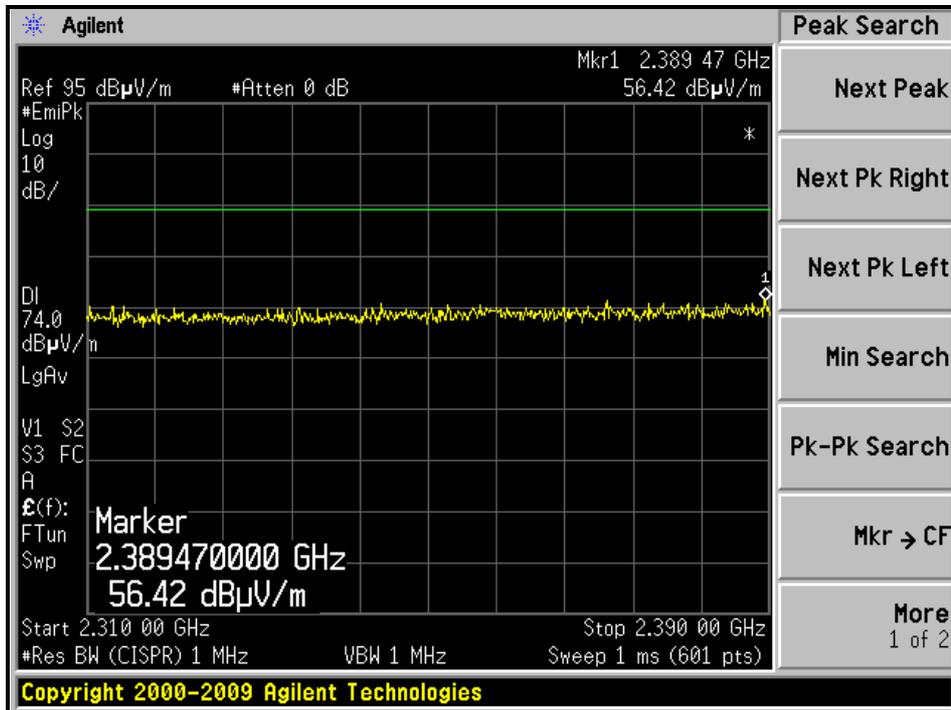
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	95.2 PK			1.43 H	255	63.31	31.89
2	*2462.00	92.1 AV			1.43 H	255	60.21	31.89
3	2483.50	54.2 PK	74.0	-19.8	1.45 H	213	22.23	31.97
4	2483.50	44.4 AV	54.0	-9.6	1.45 H	213	12.43	31.97
5	4924.00	55.2 PK	74.0	-18.8	1.61 H	114	15.89	39.31
6	4924.00	53.0 AV	54.0	-1.0	1.61 H	114	13.69	39.31
7	7386.00	53.6 PK	74.0	-20.4	1.00 H	211	7.00	46.60
8	7386.00	42.1 AV	54.0	-11.9	1.00 H	211	-4.50	46.60

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

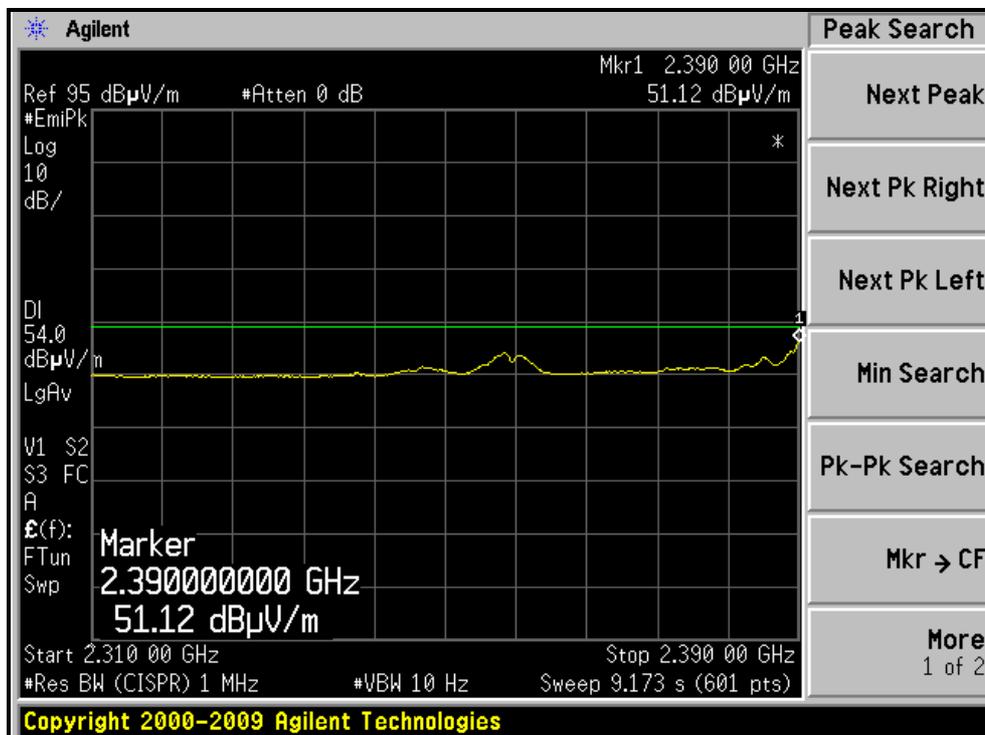
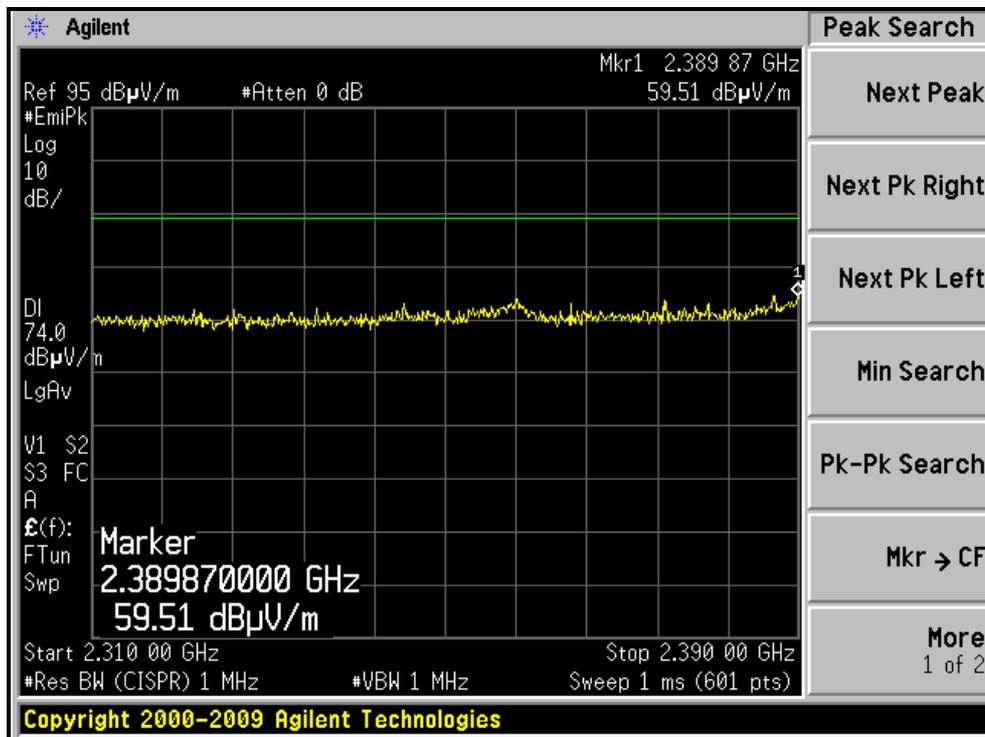
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1	*2462.00	104.2 PK			1.00 V	335	72.31	31.89
2	*2462.00	101.3 AV			1.00 V	335	69.41	31.89
3	2483.74	60.7 PK	74.0	-13.3	1.00 V	335	28.73	31.97
4	2483.74	51.9 AV	54.0	-2.1	1.00 V	335	19.93	31.97
5	4924.00	56.7 PK	74.0	-17.3	1.40 V	134	17.39	39.31
6	4924.00	52.9 AV	54.0	-1.1	1.40 V	134	13.59	39.31
7	7386.00	53.4 PK	74.0	-20.6	1.03 V	24	6.80	46.60
8	7386.00	42.8 AV	54.0	-11.2	1.03 V	24	-3.80	46.60

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

RESTRICTED BANDEDGE (802.11b MODE, CH1, HORIZONTAL)



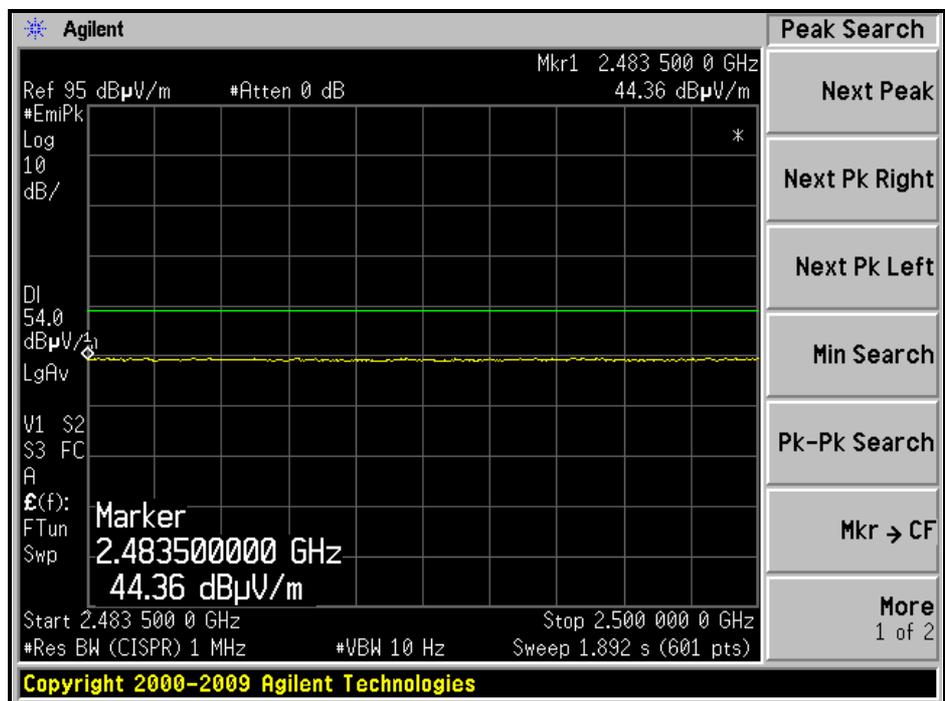
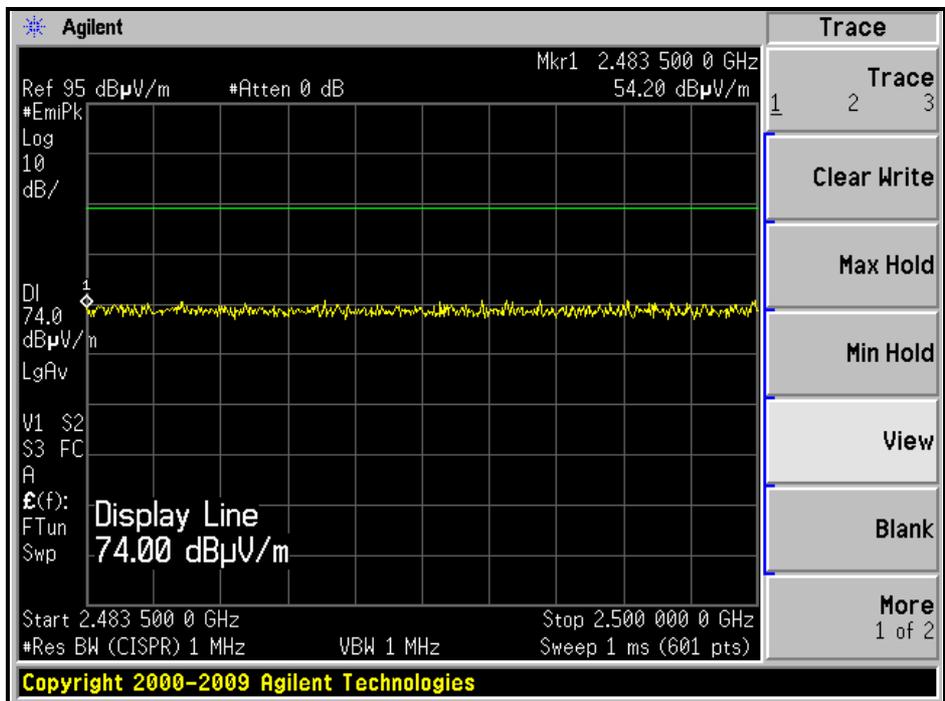
RESTRICTED BANDEDGE (802.11b MODE, CH1, VERTICAL)





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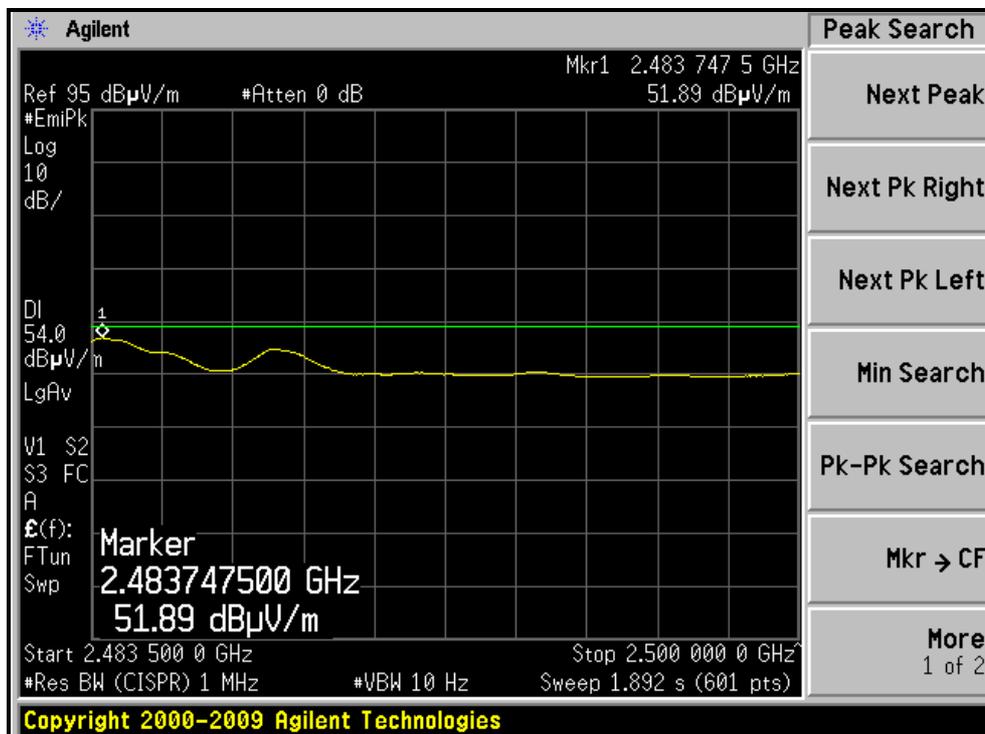
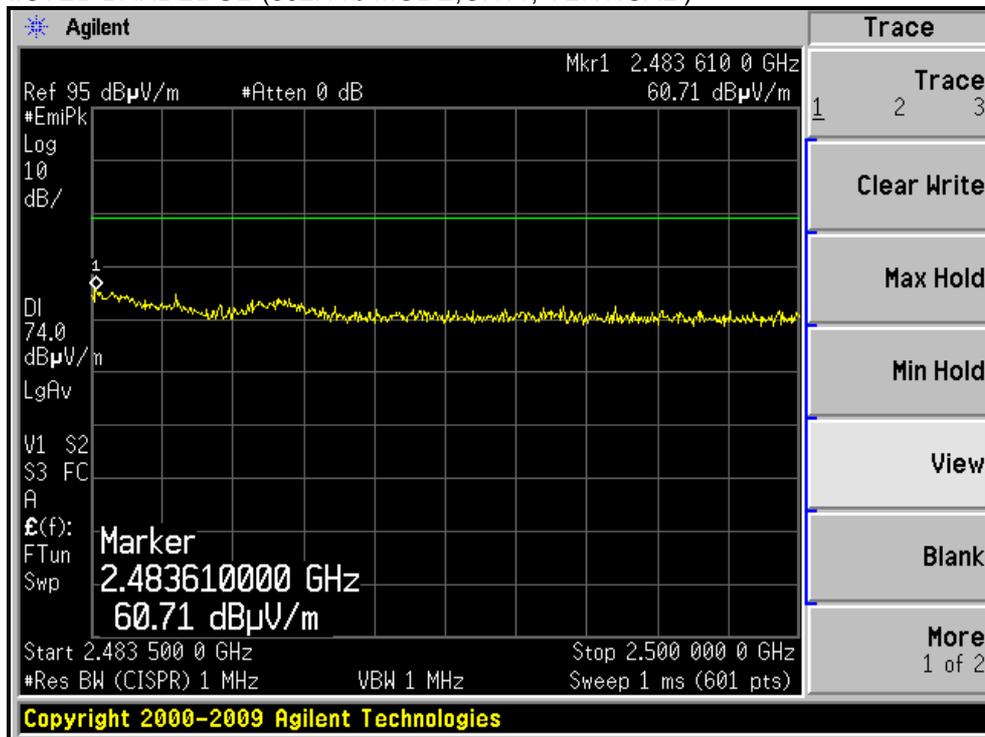
RESTRICTED BANDEDGE (802.11b MODE, CH11, HORIZONTAL)





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RESTRICTED BANDEDGE (802.11b MODE, CH11, VERTICAL)





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802.11g OFDM MODULATION

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER	120Vac / 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	20deg. C, 63%RH 1005 hPa	TESTED BY	Frank Liu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2359.70	57.2 PK	74.0	-16.8	1.45 H	219	25.64	31.56
2	2359.70	44.9 AV	54.0	-9.1	1.45 H	219	13.34	31.56
3	*2412.00	97.3 PK			1.44 H	209	65.57	31.73
4	*2412.00	87.9 AV			1.44 H	209	56.17	31.73
5	4824.00	51.9 PK	74.0	-22.1	1.40 H	89	12.93	38.97
6	4824.00	42.2 AV	54.0	-11.8	1.40 H	89	3.23	38.97
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2359.70	63.8 PK	74.0	-10.2	1.08 V	3	32.24	31.56
2	2359.70	53.5 AV	54.0	-0.5	1.08 V	3	21.94	31.56
3	*2412.00	108.6 PK			1.00 V	350	76.87	31.73
4	*2412.00	99.7 AV			1.00 V	350	67.97	31.73
5	4824.00	51.1 PK	74.0	-22.9	1.43 V	142	12.13	38.97
6	4824.00	41.3 AV	54.0	-12.7	1.43 V	142	2.33	38.97

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



A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER	120Vac / 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	20deg. C, 63%RH 1005 hPa	TESTED BY	Frank Liu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	97.2 PK			1.44 H	213	65.39	31.81
2	*2437.00	87.4 AV			1.44 H	213	55.59	31.81
3	4874.00	57.1 PK	74.0	-16.9	1.43 H	22	17.96	39.14
4	4874.00	44.3 AV	54.0	-9.7	1.43 H	22	5.16	39.14
5	7311.00	52.3 PK	74.0	-21.7	1.65 H	217	5.67	46.63
6	7311.00	42.4 AV	54.0	-11.6	1.65 H	217	-4.23	46.63

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2384.50	63.4 PK	74.0	-10.6	1.22 V	7	31.76	31.64
2	2384.50	53.1 AV	54.0	-0.9	1.22 V	7	21.46	31.64
3	*2437.00	108.4 PK			1.00 V	351	76.59	31.81
4	*2437.00	99.6 AV			1.00 V	351	67.79	31.81
5	4874.00	56.3 PK	74.0	-17.7	1.42 V	149	17.16	39.14
6	4874.00	41.3 AV	54.0	-12.7	1.42 V	149	2.16	39.14
7	7311.00	52.4 PK	74.0	-21.6	1.04 V	39	5.77	46.63
8	7311.00	42.1 AV	54.0	-11.9	1.04 V	39	-4.53	46.63

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



A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER	120Vac / 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	20deg. C, 63%RH 1005 hPa	TESTED BY	Frank Liu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	99.3 PK			1.46 H	246	67.41	31.89
2	*2462.00	89.3 AV			1.46 H	246	57.41	31.89
3	2483.50	56.2 PK	74.0	-17.8	1.46 H	246	24.23	31.97
4	2483.50	43.7 AV	54.0	-10.3	1.46 H	246	11.73	31.97
5	4924.00	56.9 PK	74.0	-17.1	1.37 H	30	17.59	39.31
6	4924.00	44.2 AV	54.0	-9.8	1.37 H	30	4.89	39.31
7	7386.00	52.3 PK	74.0	-21.7	1.65 H	231	5.70	46.60
8	7386.00	42.6 AV	54.0	-11.4	1.65 H	231	-4.00	46.60

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

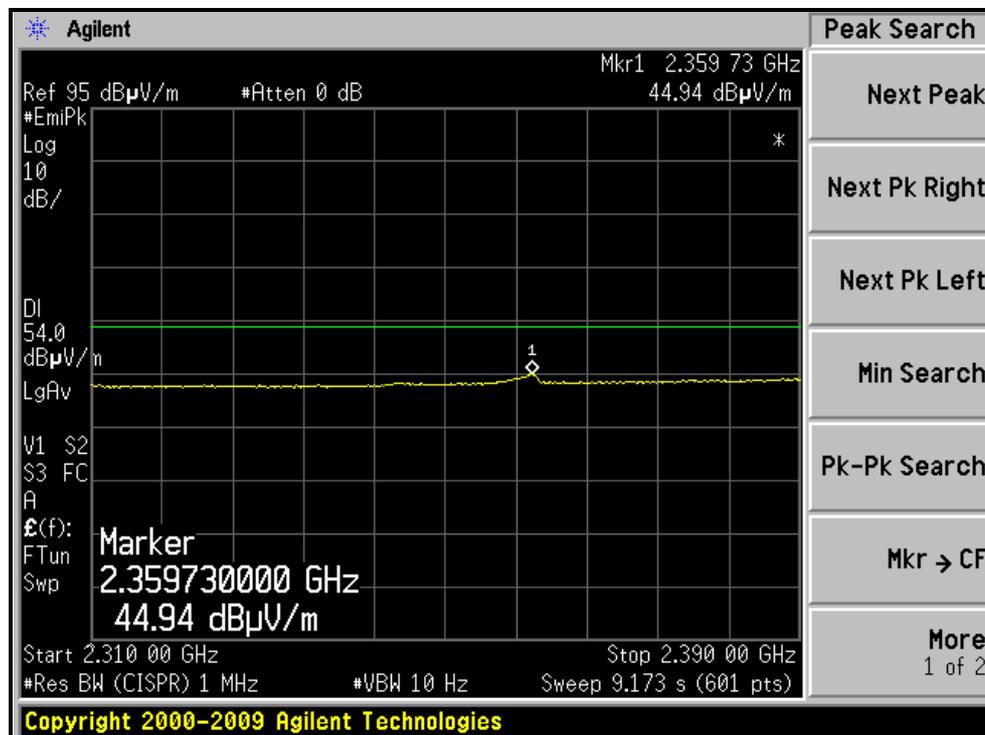
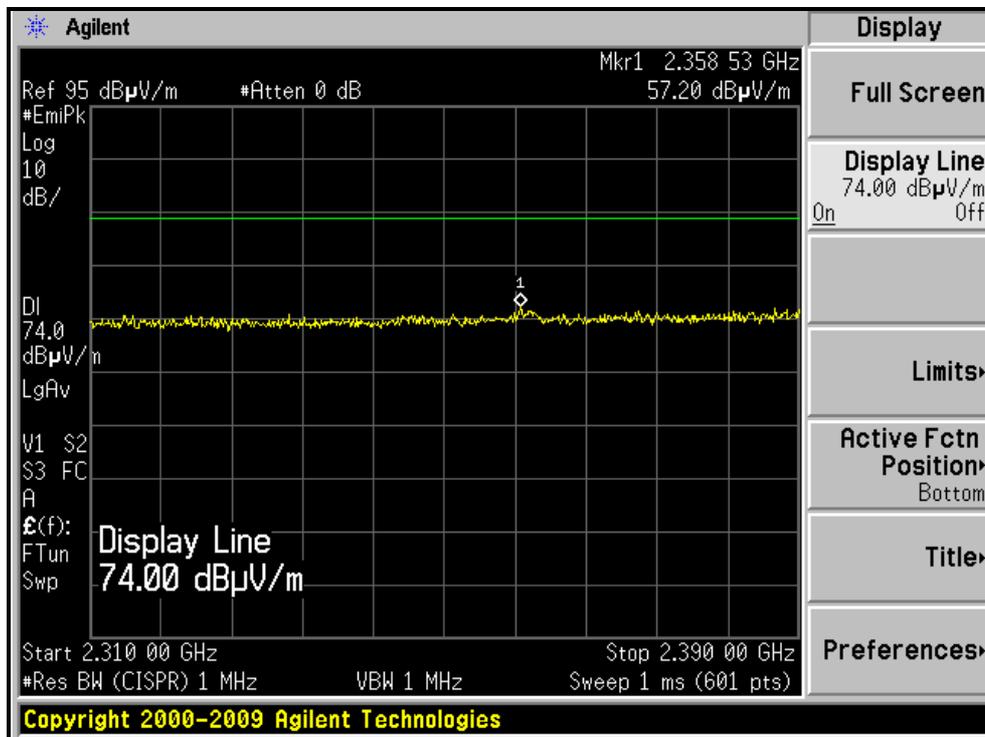
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	108.3 PK			1.00 V	349	76.41	31.89
2	*2462.00	99.4 AV			1.00 V	349	67.51	31.89
3	2483.50	58.2 PK	74.0	-15.8	1.00 V	340	26.23	31.97
4	2483.50	45.9 AV	54.0	-8.1	1.00 V	340	13.93	31.97
5	4924.00	56.0 PK	74.0	-18.0	1.47 V	149	16.69	39.31
6	4924.00	41.3 AV	54.0	-12.7	1.47 V	149	1.99	39.31
7	7386.00	52.2 PK	74.0	-21.8	1.09 V	36	5.60	46.60
8	7386.00	42.1 AV	54.0	-11.9	1.09 V	36	-4.50	46.60

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



A D T

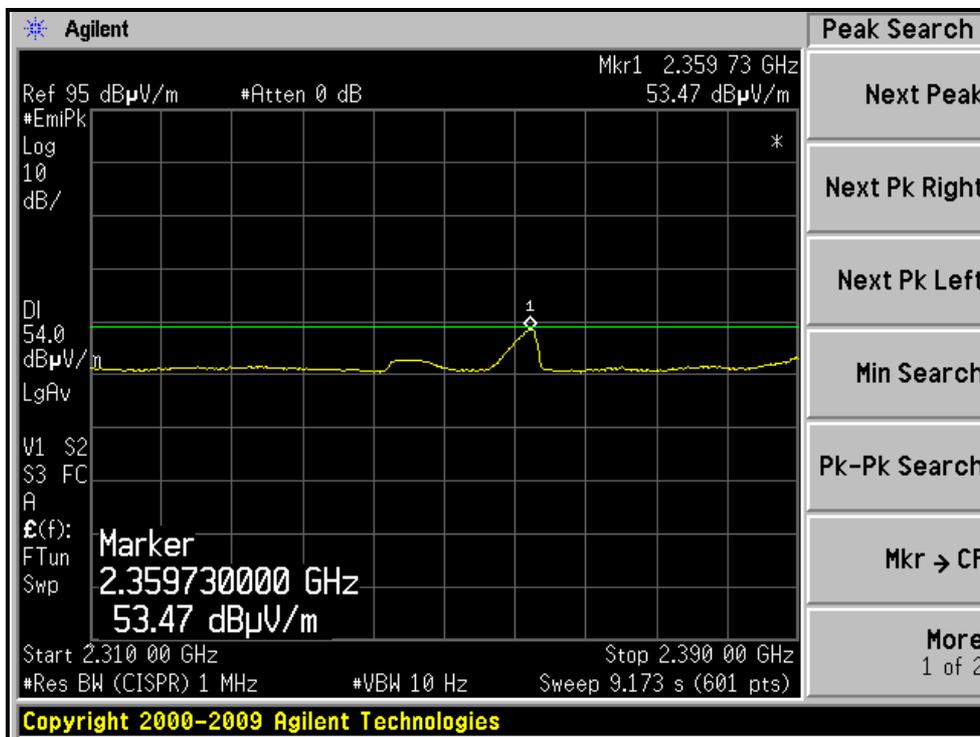
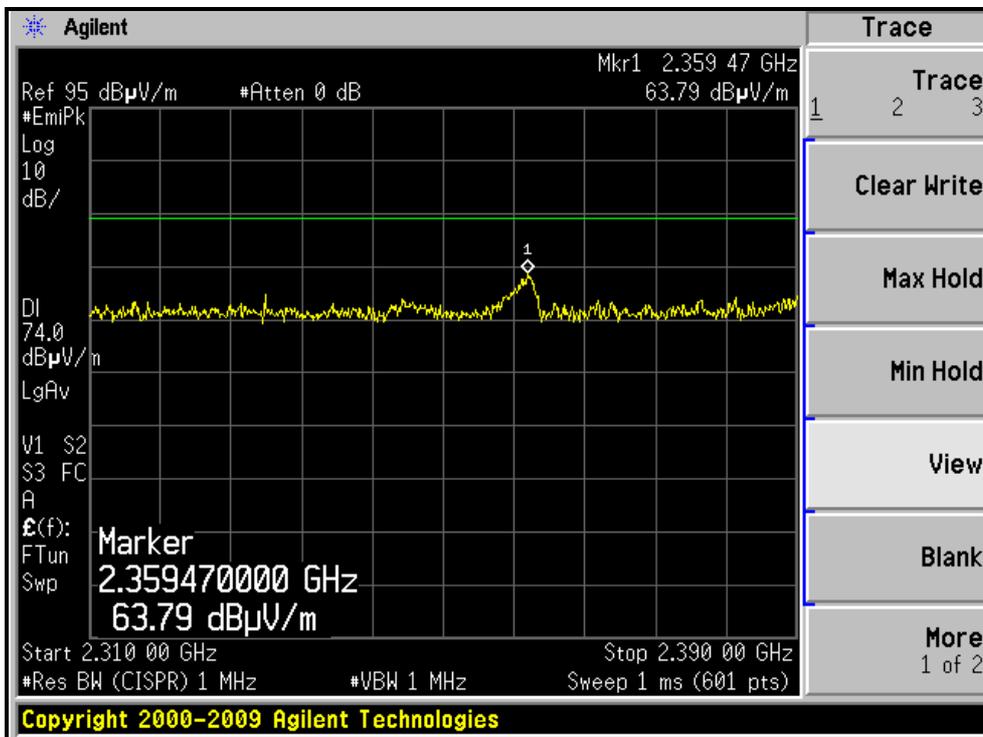
RESTRICTED BANDEDGE (802.11g MODE, CH1, HORIZONTAL)





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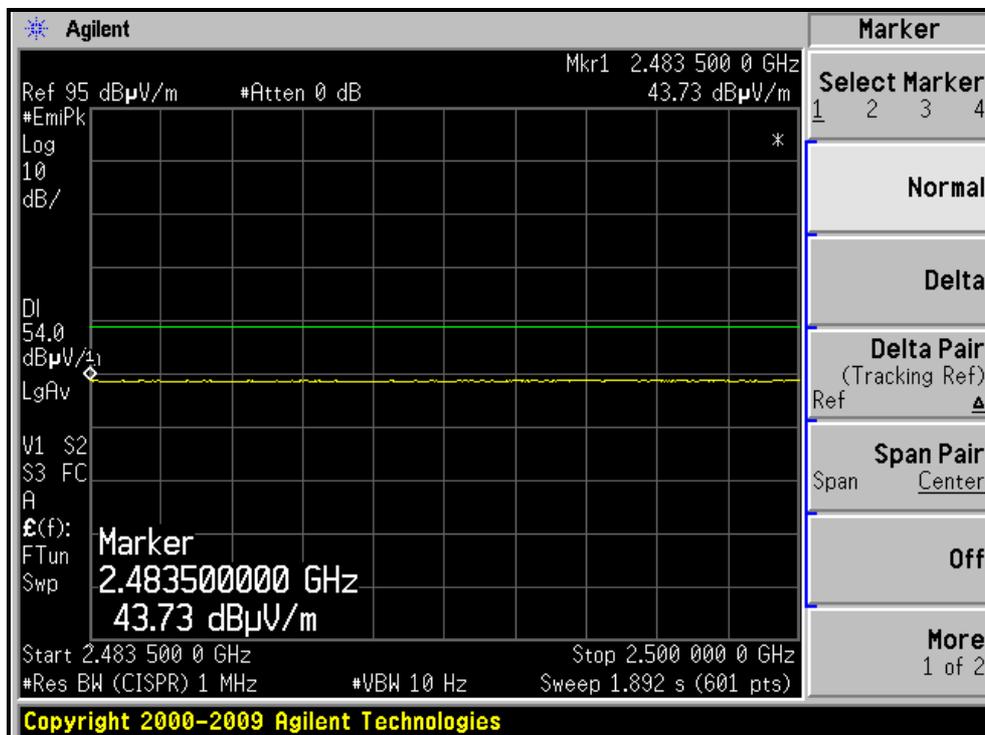
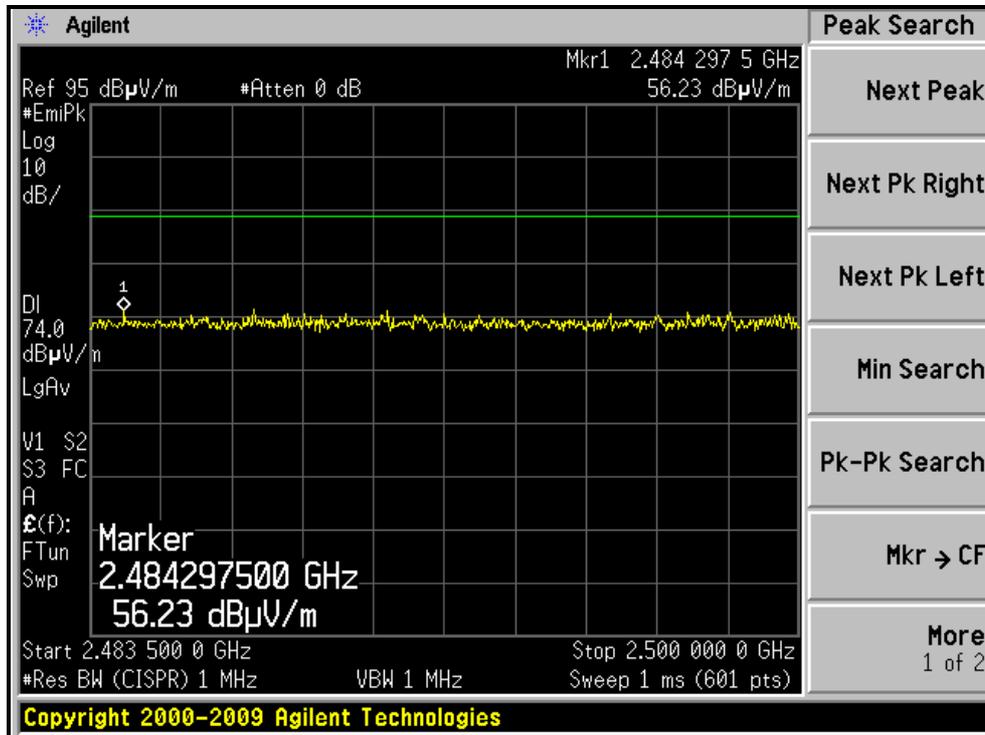
RESTRICTED BANDEDGE (802.11g MODE,CH1, VERTICAL)



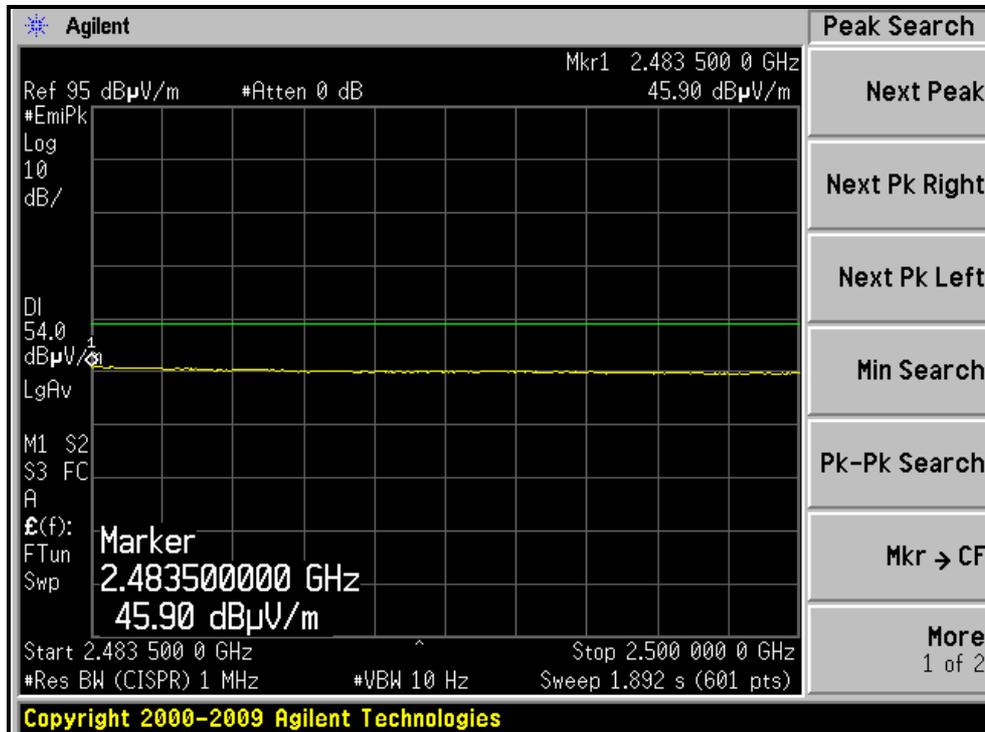
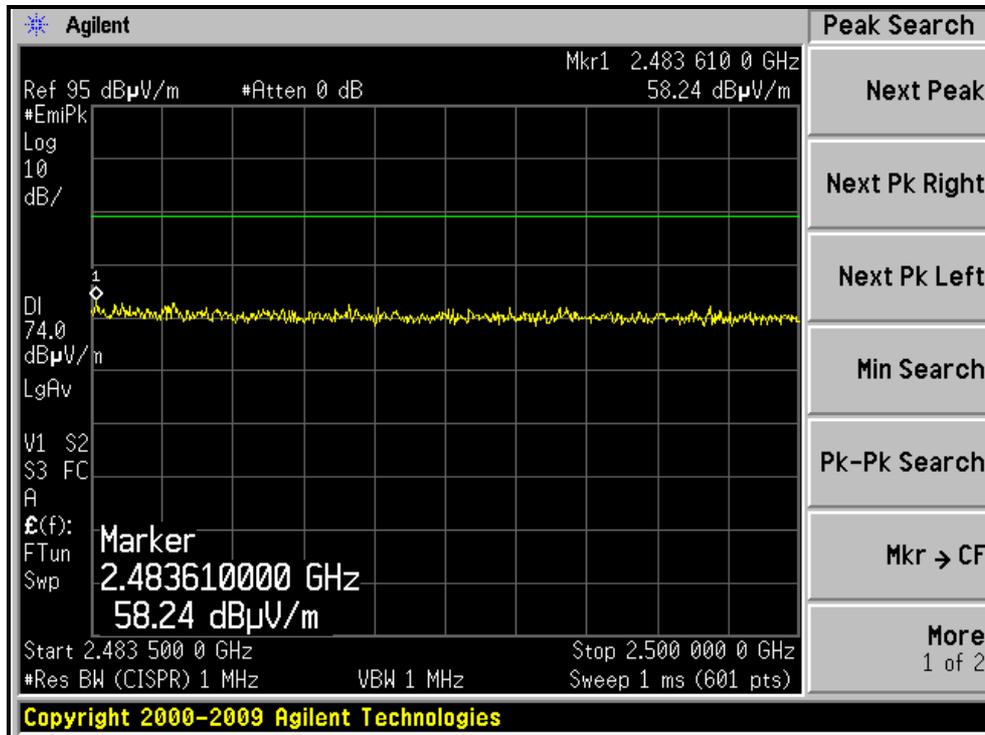


A D T

RESTRICTED BANDEDGE (802.11g MODE,CH11, HORIZONTAL)



RESTRICTED BANDEDGE (802.11g MODE, CH11, VERTICAL)





A D T

802.11n (20MHz) OFDM MODULATION

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER	120Vac / 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	20deg. C, 63%RH 1005 hPa	TESTED BY	Frank Liu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2360.13	55.4 PK	74.0	-18.6	1.44 H	249	23.74	31.66
2	2360.13	43.8 AV	54.0	-10.2	1.44 H	249	12.14	31.66
3	*2412.00	98.1 PK			1.44 H	249	66.37	31.73
4	*2412.00	88.4 AV			1.44 H	249	56.67	31.73
5	4824.00	56.8 PK	74.0	-17.2	1.45 H	34	17.83	38.97
6	4824.00	44.2 AV	54.0	-9.8	1.45 H	34	5.23	38.97

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2360.13	63.0 PK	74.0	-11.0	1.00 V	360	31.44	31.56
2	2360.13	53.5 AV	54.0	-0.5	1.00 V	360	21.94	31.56
3	*2412.00	107.9 PK			1.00 V	360	76.17	31.73
4	*2412.00	98.1 AV			1.00 V	360	66.37	31.73
5	4824.00	56.1 PK	74.0	-17.9	1.40 V	139	17.13	38.97
6	4824.00	41.1 AV	54.0	-12.9	1.40 V	139	2.13	38.97

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



A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER	120Vac / 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	20deg. C, 63%RH 1005 hPa	TESTED BY	Frank Liu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	99.3 PK			1.41 H	246	67.49	31.81
2	*2437.00	89.4 AV			1.41 H	246	57.59	31.81
3	4874.00	56.7 PK	74.0	-17.3	1.38 H	31	17.56	39.14
4	4874.00	44.0 AV	54.0	-10.0	1.38 H	31	4.86	39.14
5	7311.00	52.3 PK	74.0	-21.7	1.60 H	205	5.67	46.63
6	7311.00	42.2 AV	54.0	-11.8	1.60 H	205	-4.43	46.63

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2385.20	62.5 PK	74.0	-11.5	1.00 V	350	30.86	31.64
2	2385.20	53.2 AV	54.0	-0.8	1.00 V	350	21.56	31.64
3	*2437.00	108.8 PK			1.00 V	350	76.99	31.81
4	*2437.00	99.2 AV			1.00 V	350	67.39	31.81
5	4874.00	56.8 PK	74.0	-17.2	1.38 V	139	17.66	39.14
6	4874.00	41.5 AV	54.0	-12.5	1.38 V	139	2.36	39.14
7	7311.00	52.4 PK	74.0	-21.6	1.04 V	51	5.77	46.63
8	7311.00	41.9 AV	54.0	-12.1	1.04 V	51	-4.73	46.63

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



A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER	120Vac / 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	20deg. C, 63%RH 1005 hPa	TESTED BY	Frank Liu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	98.8 PK			1.44 H	247	66.91	31.89
2	*2462.00	89.4 AV			1.44 H	247	57.51	31.89
3	2483.50	54.7 PK	74.0	-19.3	1.44 H	247	22.73	31.97
4	2483.50	43.5 AV	54.0	-10.5	1.44 H	247	11.53	31.97
5	4924.00	57.2 PK	74.0	-16.8	1.37 H	34	17.89	39.31
6	4924.00	44.4 AV	54.0	-9.6	1.37 H	34	5.09	39.31
7	7386.00	52.0 PK	74.0	-22.0	1.59 H	227	5.40	46.60
8	7386.00	42.4 AV	54.0	-11.6	1.59 H	227	-4.20	46.60

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

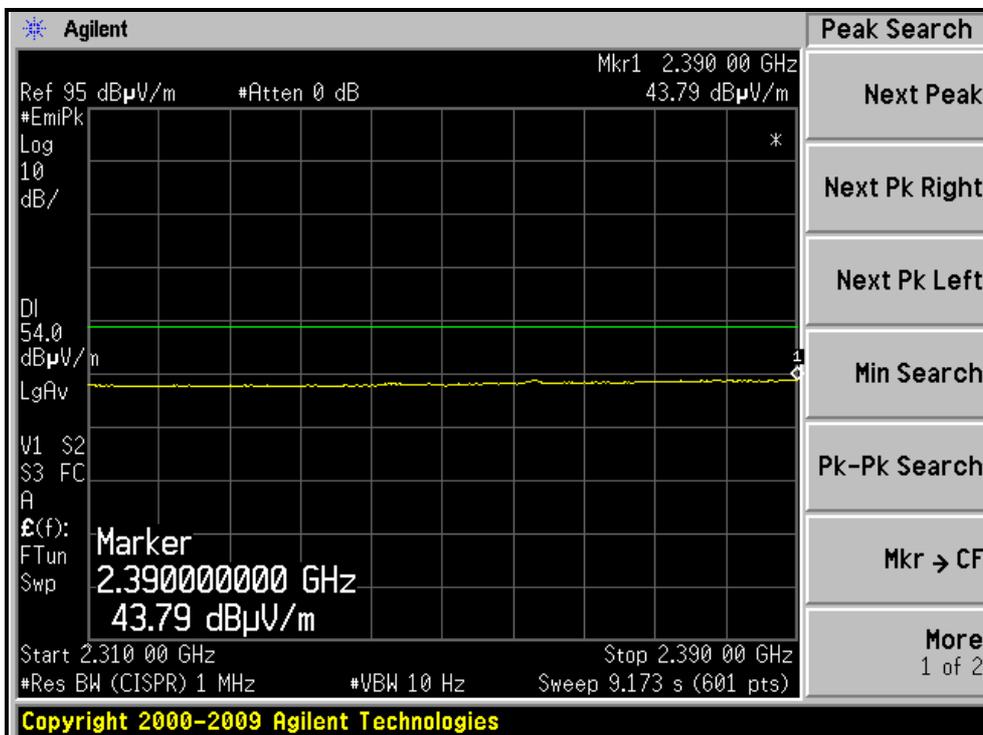
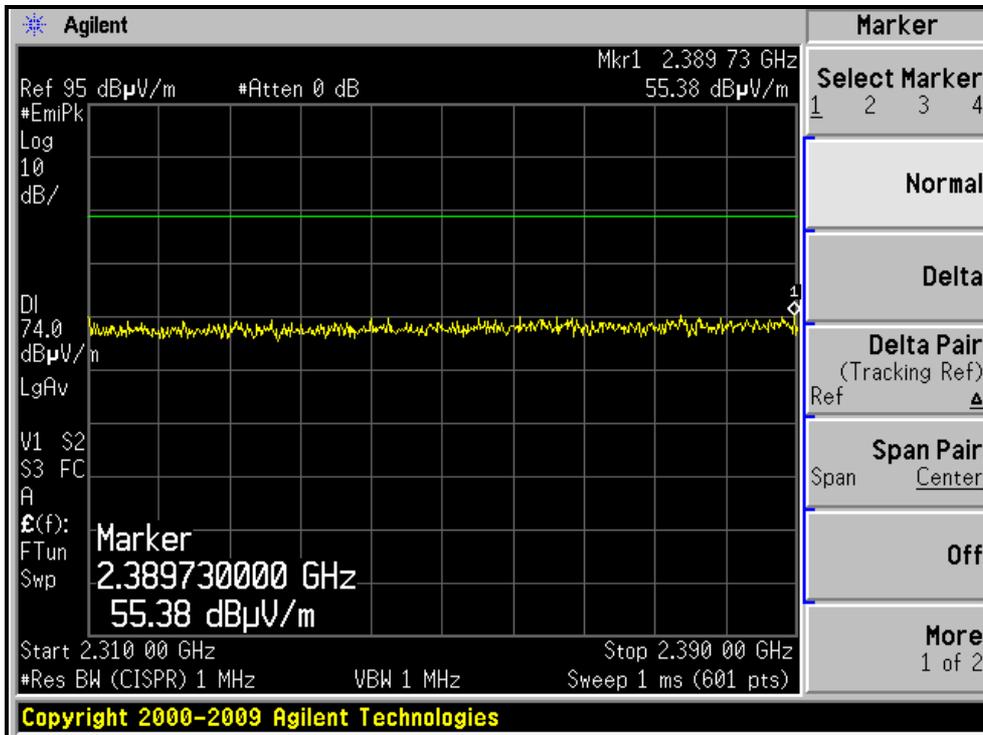
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	108.4 PK			1.00 V	6	76.51	31.89
2	*2462.00	99.1 AV			1.00 V	6	67.21	31.89
3	2483.50	57.8 PK	74.0	-16.2	1.00 V	7	25.83	31.97
4	2483.50	46.3 AV	54.0	-7.7	1.00 V	7	14.33	31.97
5	4924.00	55.9 PK	74.0	-18.1	1.38 V	150	16.59	39.31
6	4924.00	41.2 AV	54.0	-12.8	1.38 V	150	1.89	39.31
7	7386.00	52.5 PK	74.0	-21.5	1.05 V	35	5.90	46.60
8	7386.00	42.1 AV	54.0	-11.9	1.05 V	35	-4.50	46.60

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



A D T

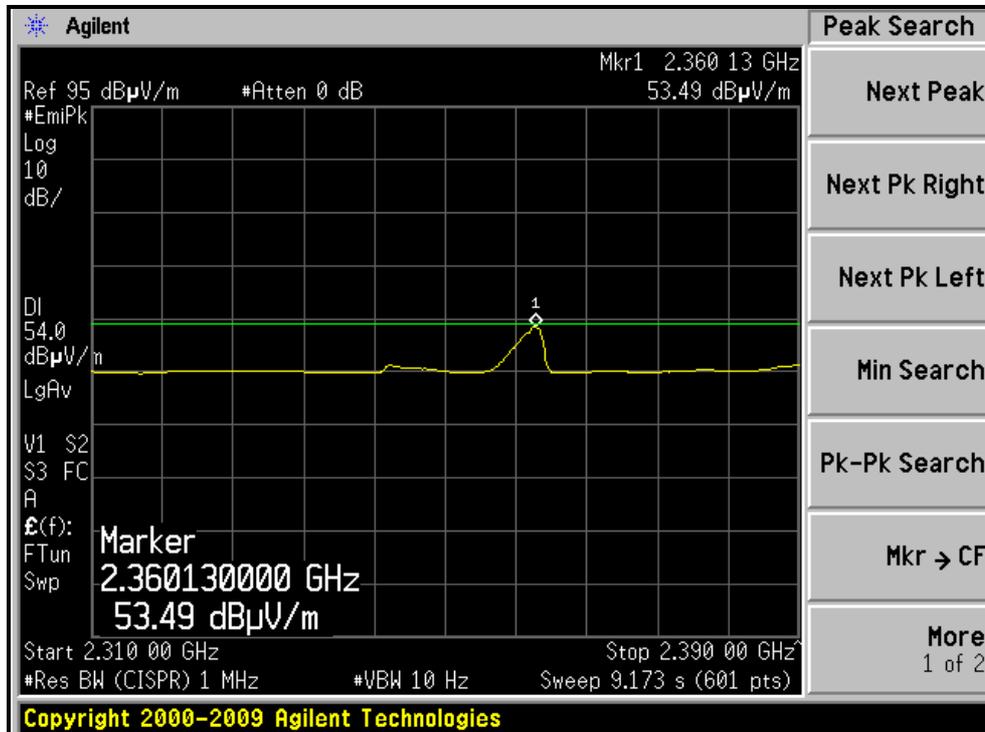
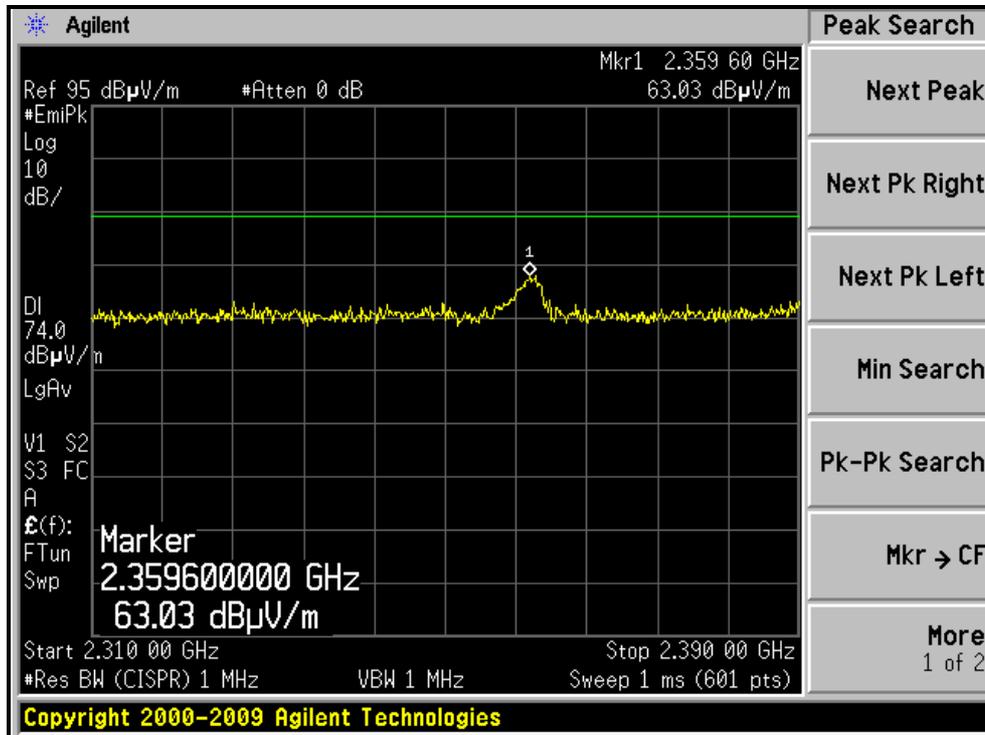
RESTRICTED BANDEDGE (802.11n (20MHz) MODE,CH1, HORIZONTAL)





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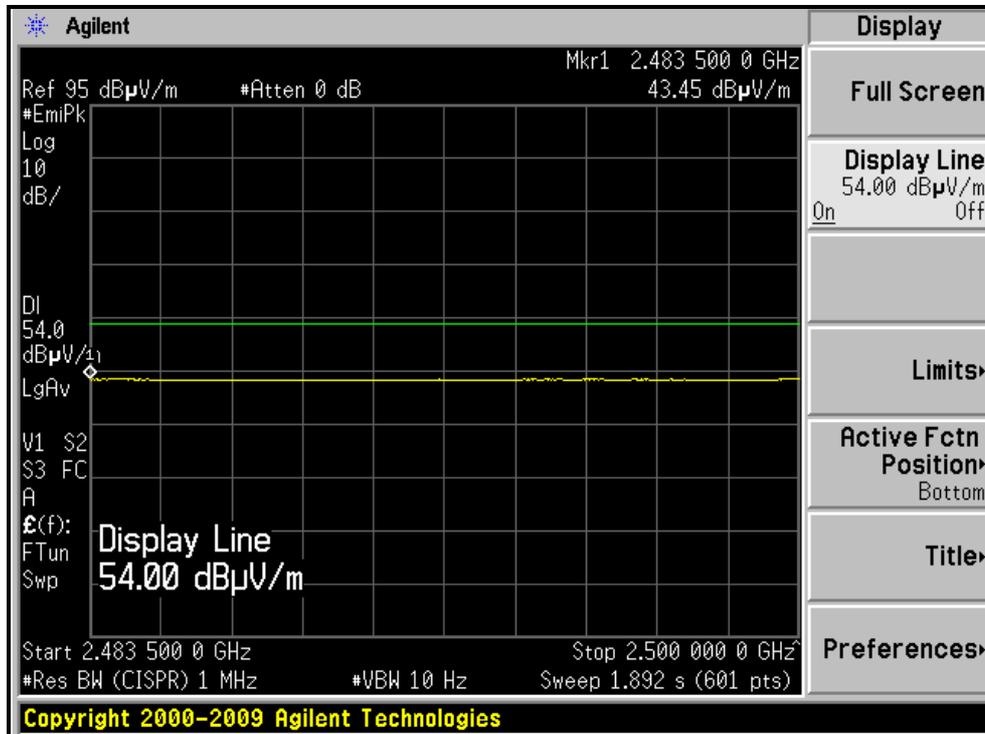
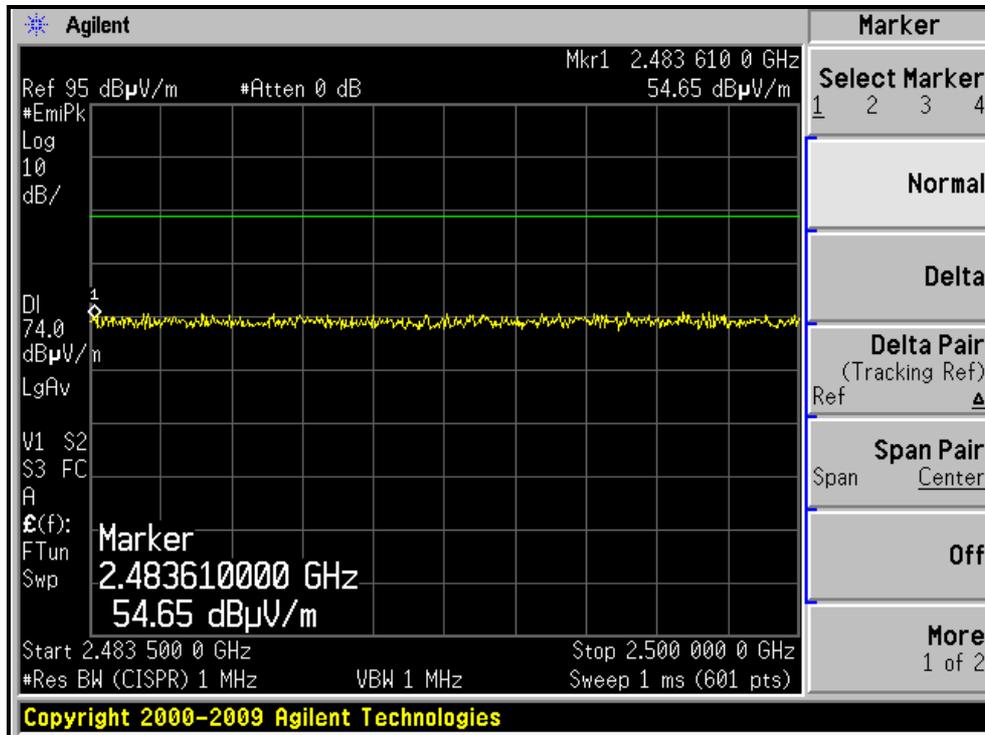
RESTRICTED BANDEDGE (802.11n (20MHz) MODE,CH1, VERTICAL)





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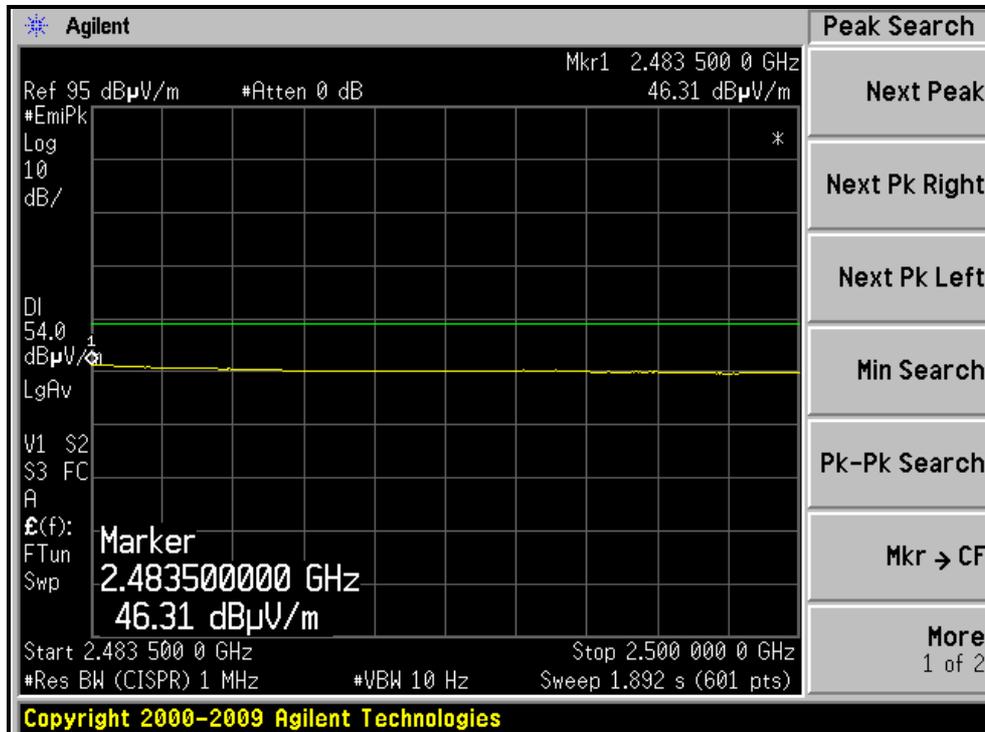
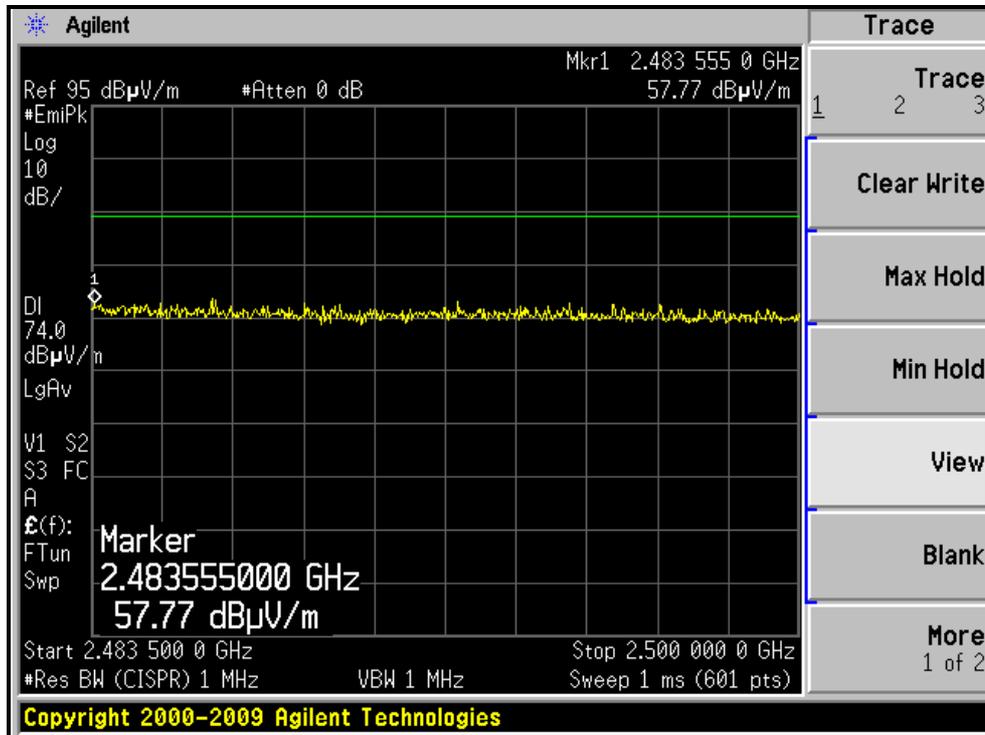
RESTRICTED BANDEDGE (802.11n (20MHz) MODE,CH11, HORIZONTAL)





A D T

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





A D T

802.11n (40MHz) OFDM MODULATION

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 3	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER	120Vac / 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	20deg. C, 63%RH 1005 hPa	TESTED BY	Frank Liu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	55.2 PK	74.0	-18.8	1.46 H	249	23.54	31.66
2	2390.00	44.0 AV	54.0	-10.0	1.46 H	249	12.34	31.66
3	*2422.00	98.1 PK			1.46 H	249	66.34	31.76
4	*2422.00	88.4 AV			1.46 H	249	56.64	31.76
5	4844.00	56.3 PK	74.0	-17.7	1.34 H	59	17.26	39.04
6	4844.00	42.4 AV	54.0	-11.6	1.34 H	59	3.36	39.04
7	7266.00	52.1 PK	74.0	-21.9	1.54 H	223	5.43	46.67
8	7266.00	42.6 AV	54.0	-11.4	1.54 H	223	-4.07	46.67

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2317.87	63.7 PK	74.0	-10.3	1.00 V	338	32.28	31.42
2	2317.87	52.9 AV	54.0	-1.1	1.00 V	338	21.48	31.42
3	*2422.00	108.2 PK			1.00 V	338	76.44	31.76
4	*2422.00	98.3 AV			1.00 V	338	66.54	31.76
5	4844.00	55.3 PK	74.0	-18.7	1.36 V	154	16.26	39.04
6	4844.00	39.3 AV	54.0	-14.7	1.36 V	154	0.26	39.04
7	7266.00	52.3 PK	74.0	-21.7	1.03 V	37	5.63	46.67
8	7266.00	42.4 AV	54.0	-11.6	1.03 V	37	-4.27	46.67

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



A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER	120Vac / 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	20deg. C, 63%RH 1005 hPa	TESTED BY	Frank Liu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	99.2 PK			1.43 H	241	67.39	31.81
2	*2437.00	89.3 AV			1.43 H	241	57.49	31.81
3	4874.00	56.2 PK	74.0	-17.8	1.37 H	69	17.06	39.14
4	4874.00	42.1 AV	54.0	-11.9	1.37 H	69	2.96	39.14
5	7311.00	52.4 PK	74.0	-21.6	1.00 H	324	5.77	46.63
6	7311.00	42.3 AV	54.0	-11.7	1.00 H	324	-4.33	46.63

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2332.80	62.5 PK	74.0	-11.5	1.00 V	339	31.03	31.47
2	2332.80	53.4 AV	54.0	-0.6	1.00 V	339	21.93	31.47
3	*2437.00	109.3 PK			1.00 V	334	77.49	31.81
4	*2437.00	99.4 AV			1.00 V	334	67.59	31.81
5	4874.00	55.7 PK	74.0	-18.3	1.37 V	151	16.56	39.14
6	4874.00	39.2 AV	54.0	-14.8	1.37 V	151	0.06	39.14
7	7311.00	52.6 PK	74.0	-21.4	1.03 V	49	5.97	46.63
8	7311.00	42.6 AV	54.0	-11.4	1.03 V	49	-4.03	46.63

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



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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 9	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER	120Vac / 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	20deg. C, 63%RH 1005 hPa	TESTED BY	Frank Liu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2452.00	99.3 PK			1.44 H	249	67.44	31.86
2	*2452.00	89.2 AV			1.44 H	249	57.34	31.86
3	2483.50	56.1 PK	74.0	-17.9	1.44 H	249	24.13	31.97
4	2483.50	44.1 AV	54.0	-9.9	1.44 H	249	12.13	31.97
5	4904.00	52.4 PK	74.0	-21.6	1.00 H	72	13.16	39.24
6	4904.00	42.6 AV	54.0	-11.4	1.00 H	72	3.36	39.24
7	7356.00	52.6 PK	74.0	-21.4	1.00 H	321	5.99	46.61
8	7356.00	42.3 AV	54.0	-11.7	1.00 H	321	-4.31	46.61

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

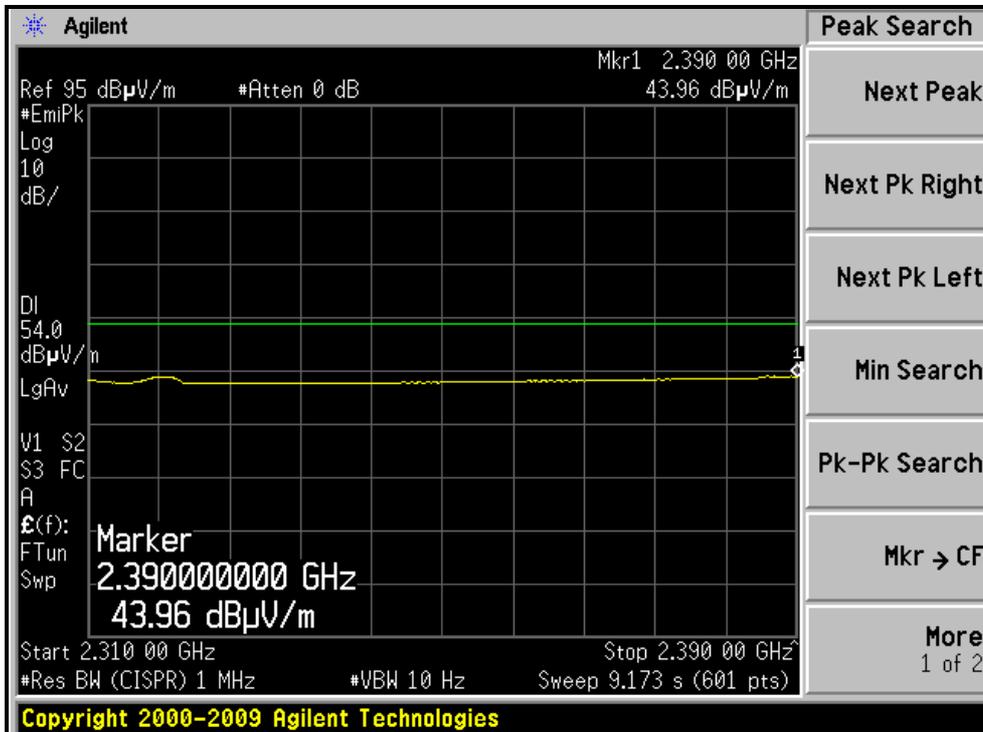
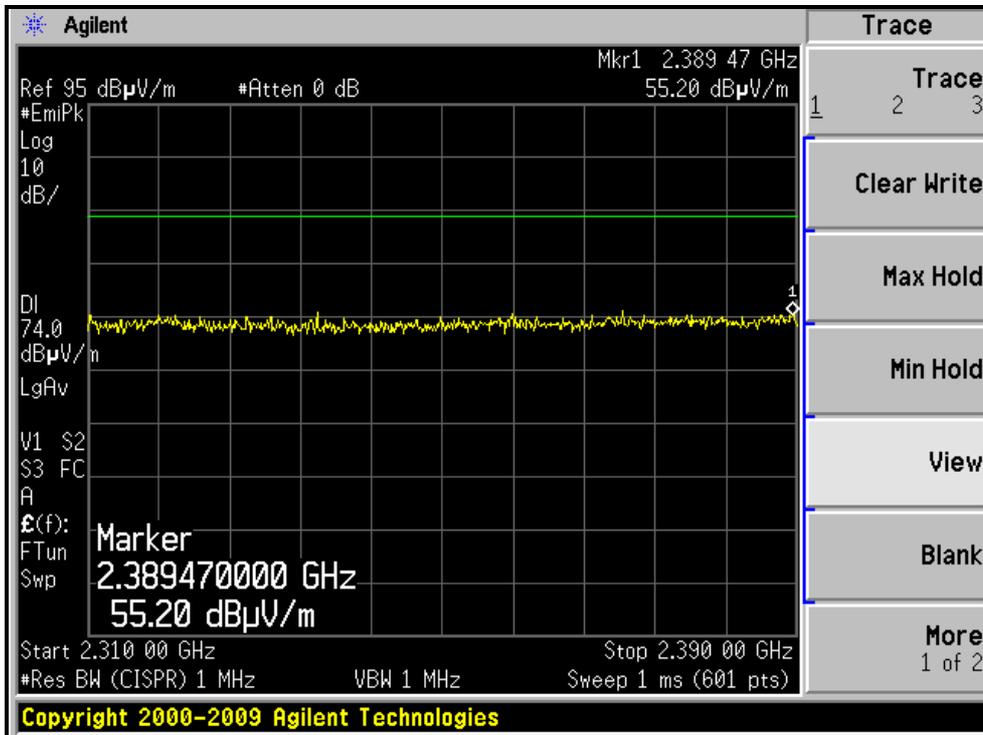
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2349.20	63.4 PK	74.0	-10.6	1.00 V	20	31.88	31.52
2	2349.20	53.5 AV	54.0	-0.5	1.00 V	20	21.98	31.52
3	*2452.00	109.3 PK			1.00 V	0	77.44	31.86
4	*2452.00	99.2 AV			1.00 V	0	67.34	31.86
5	2483.50	59.7 PK	74.0	-14.3	1.00 V	0	27.73	31.97
6	2483.50	47.8 AV	54.0	-6.2	1.00 V	0	15.83	31.97
7	4904.00	52.8 PK	74.0	-21.2	1.04 V	56	13.56	39.24
8	4904.00	42.7 AV	54.0	-11.3	1.04 V	56	3.46	39.24
9	7356.00	52.7 PK	74.0	-21.3	1.00 V	336	6.09	46.61
10	7356.00	43.9 AV	54.0	-10.1	1.00 V	336	-2.71	46.61

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

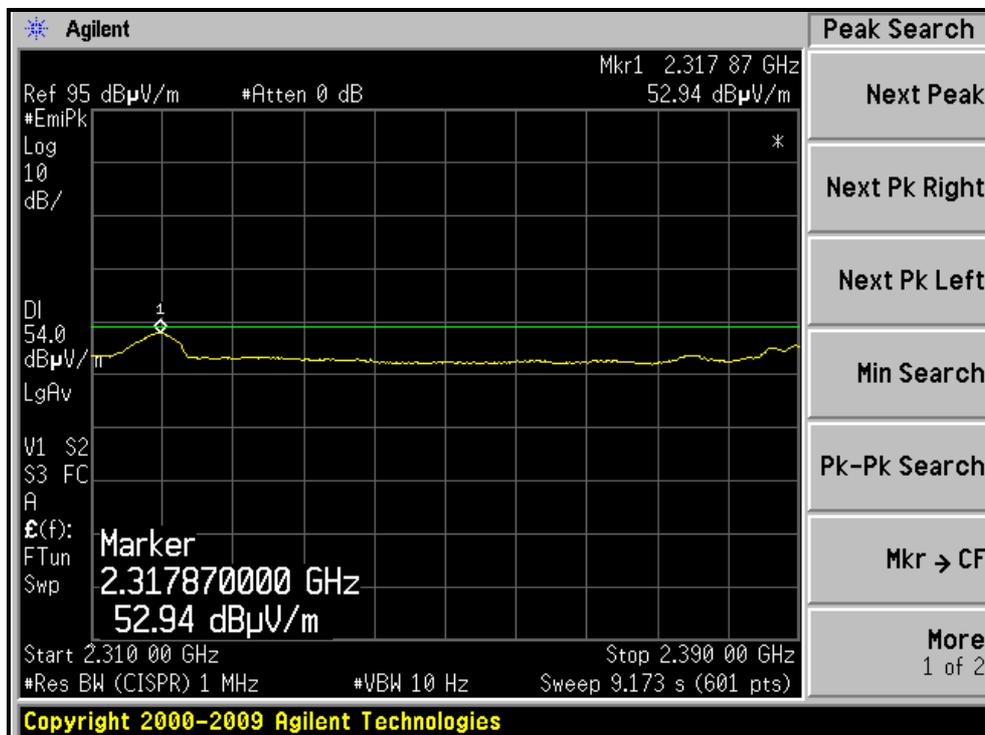
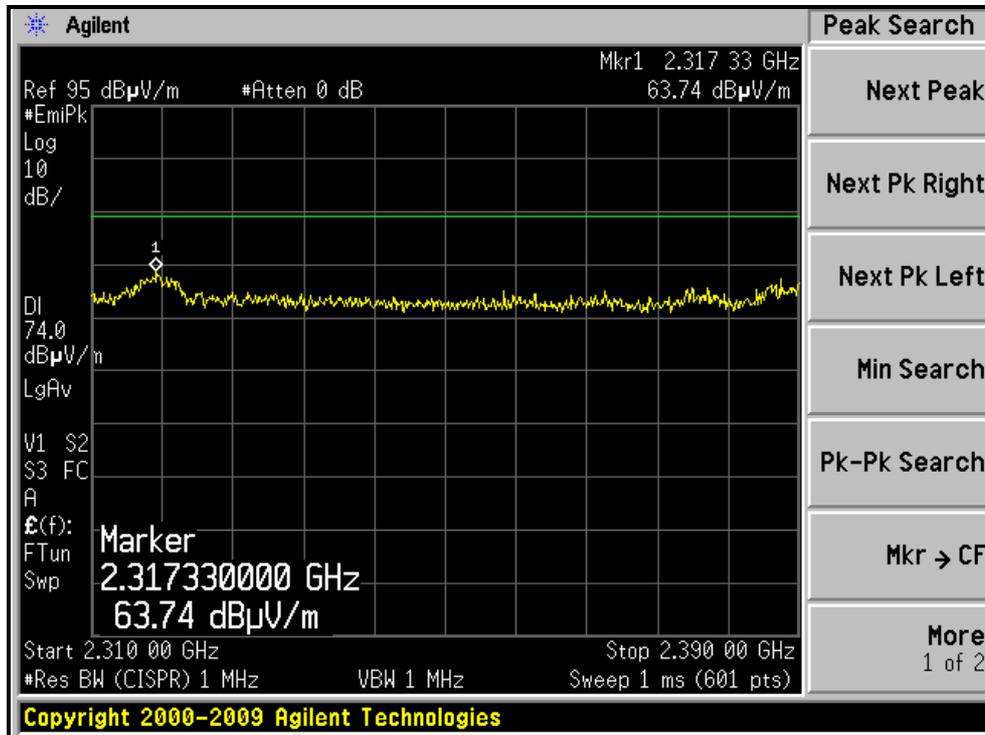


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RESTRICTED BANDEDGE (802.11n (40MHz) MODE,CH3, HORIZONTAL)



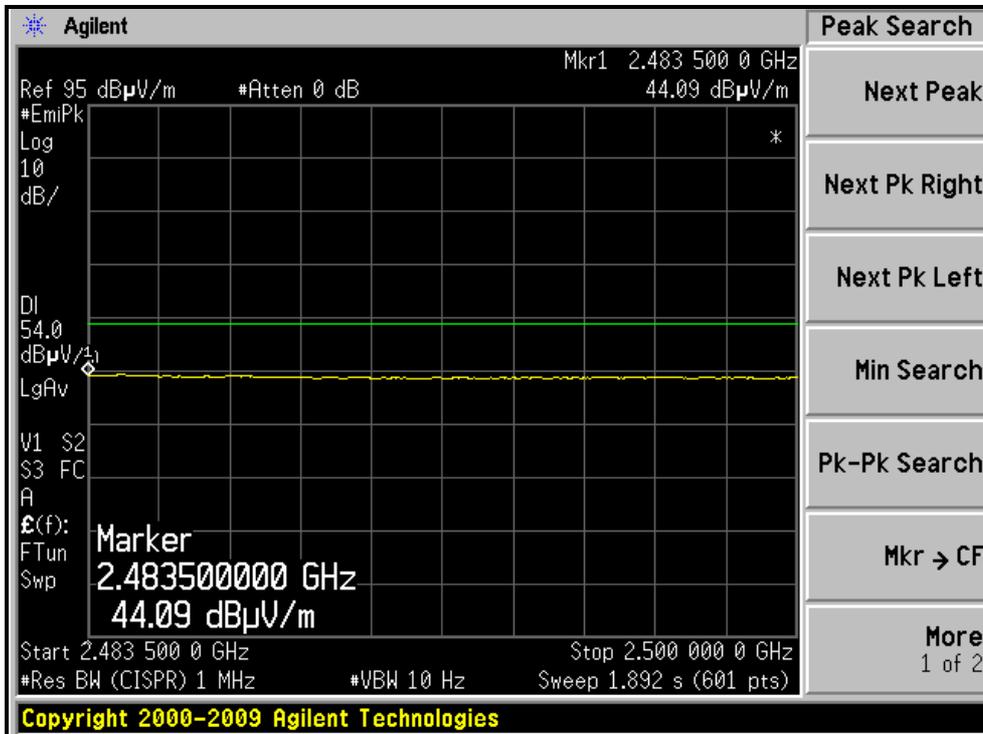
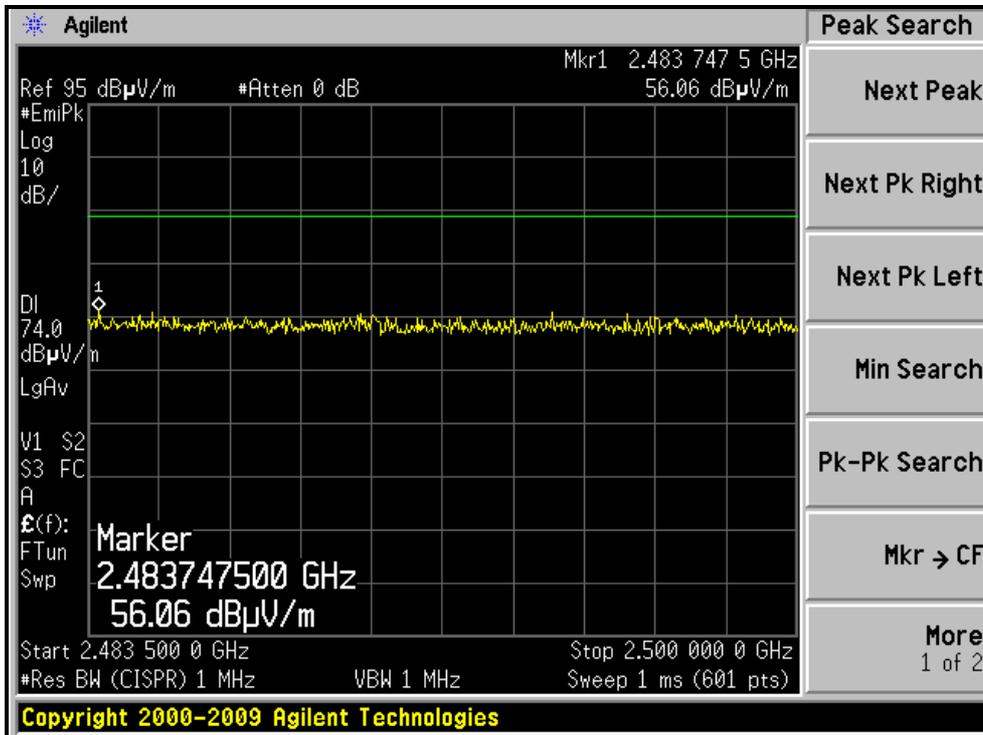
RESTRICTED BANDEDGE (802.11n (40MHz) MODE,CH3, VERTICAL)



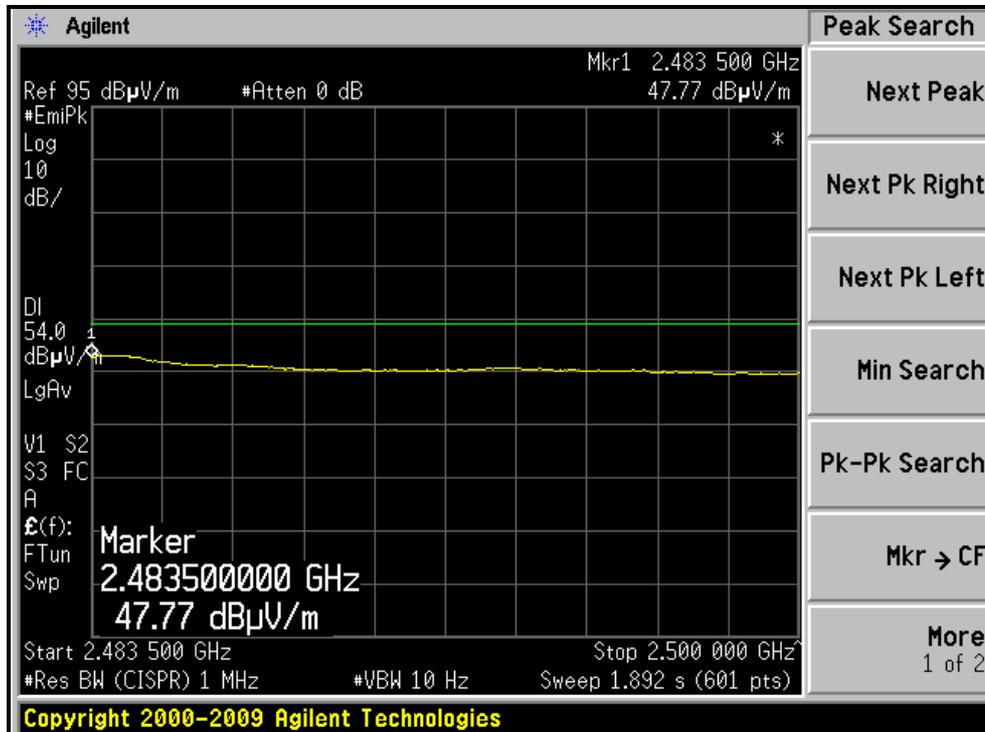
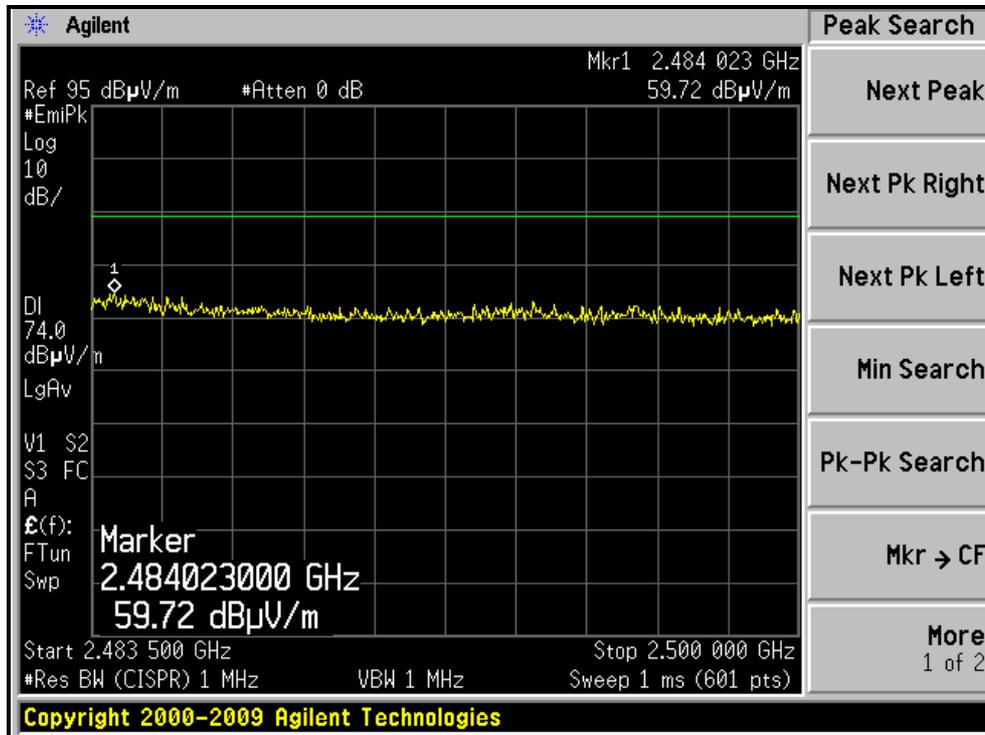


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RESTRICTED BANDEDGE (802.11n (40MHz) MODE,CH9, HORIZONTAL)



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



4.3 6dB BANDWIDTH MEASUREMENT

4.3.1 LIMITS OF 6dB BANDWIDTH MEASUREMENT

The minimum of 6dB Bandwidth Measurement is 0.5 MHz.

4.3.2 TEST INSTRUMENTS

Test date: May 11, 2011

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
R&S Spectrum Analyzer	FSP 40	100060	May 17, 2010	May 16, 2011

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.



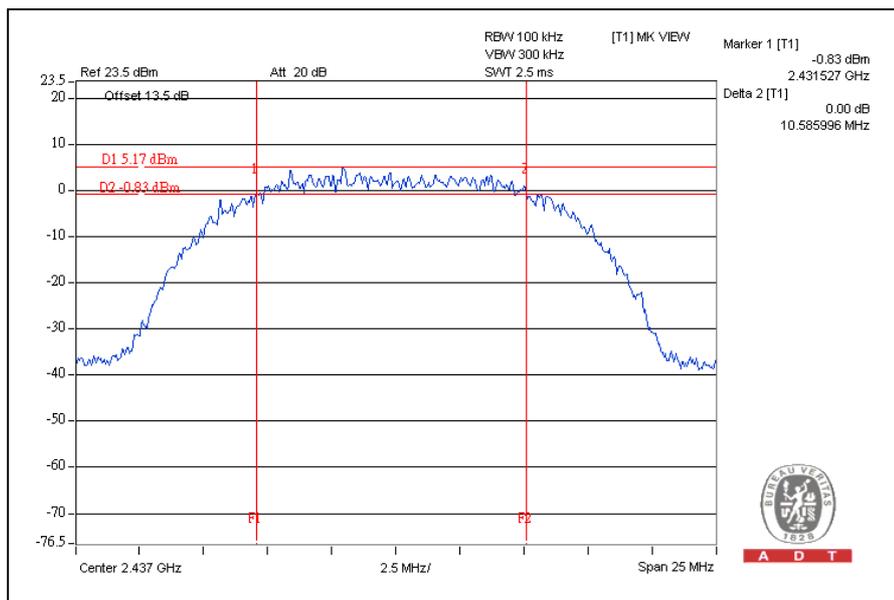
A D T

4.3.7 TEST RESULTS

802.11b DSSS MODULATION:

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2412	10.53	0.5	PASS
6	2437	10.58	0.5	PASS
11	2462	10.52	0.5	PASS

CH6



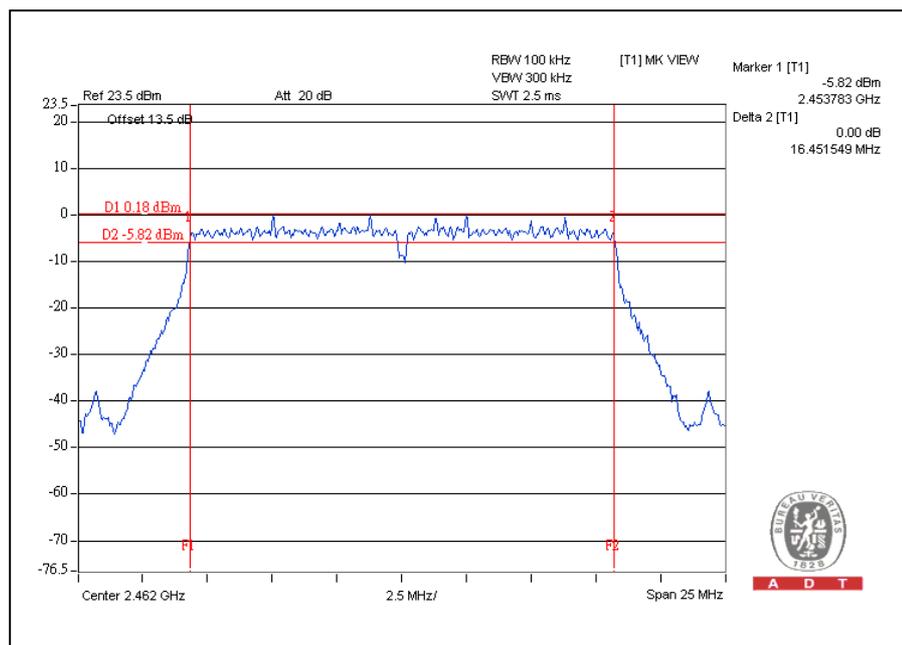


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802.11g OFDM MODULATION:

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)			MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN(0)	CHAIN(1)	CHAIN(2)		
1	2412	16.40	16.30	16.20	0.5	PASS
6	2437	16.41	16.32	16.20	0.5	PASS
11	2462	16.45	16.33	16.20	0.5	PASS

For CHAIN(0)
CH11



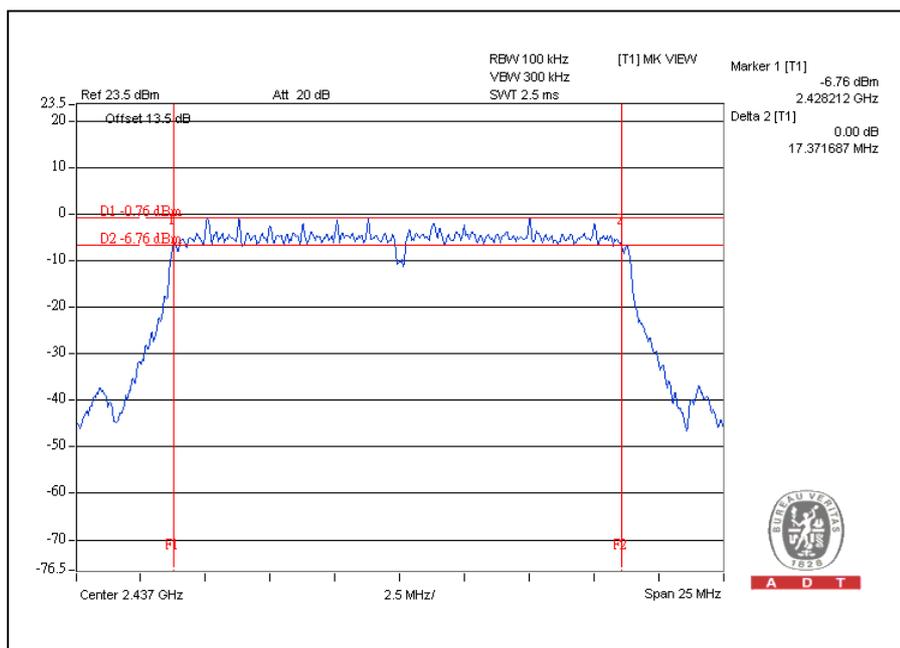


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802.11n (20MHz) OFDM MODULATION:

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)			MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN(0)	CHAIN(1)	CHAIN(2)		
1	2412	17.35	17.20	17.20	0.5	PASS
6	2437	17.37	17.21	17.20	0.5	PASS
11	2462	17.11	17.00	17.00	0.5	PASS

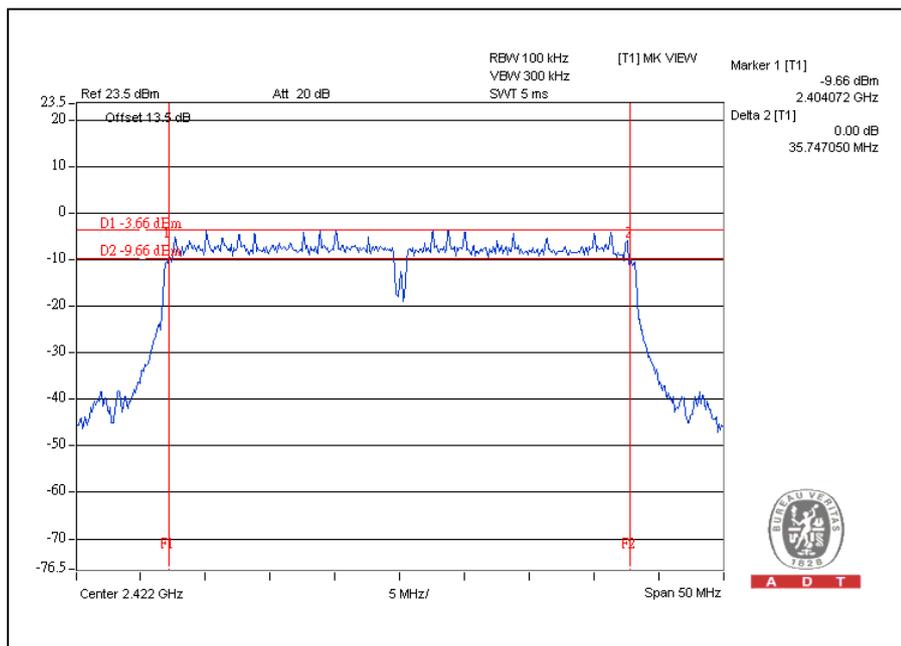
For CHAIN(0)
CH6



802.11n (40MHz) OFDM MODULATION:

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)			MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN(0)	CHAIN(1)	CHAIN(2)		
3	2422	35.74	35.62	35.74	0.5	PASS
6	2437	35.49	35.41	35.49	0.5	PASS
9	2452	35.59	35.48	35.59	0.5	PASS

For CHAIN(0)
CH3



4.4 MAXIMUM PEAK OUTPUT POWER

4.4.1 LIMITS OF MAXIMUM PEAK OUTPUT POWER MEASUREMENT

The Maximum Peak Output Power Measurement is 30dBm.

4.4.2 INSTRUMENTS

Test date: May 11, 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.

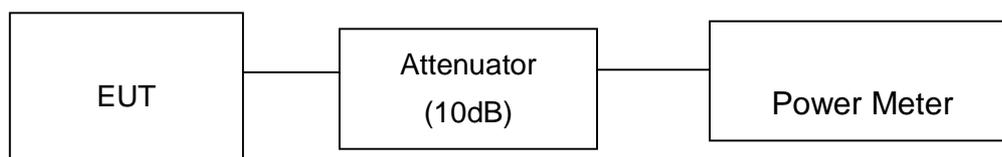
4.4.3 TEST PROCEDURES

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 OUTPUT (mW)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (dBm)	PASS / FAIL
1	2412	43.7	16.4	30	PASS
6	2437	53.7	17.3	30	PASS
11	2462	42.7	16.3	30	PASS

802.11g OFDM MODULATION:

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (dBm)			TOTAL PEAK POWER (mW)	TOTAL PEAK POWER (dBm)	PEAK POWER LIMIT (dBm)	PASS / FAIL
		CHAIN(0)	CHAIN(1)	CHAIN(2)				
1	2412	22.1	22.2	22.0	486.6	26.9	29.2	PASS
6	2437	22.2	22.1	22.4	501.9	27.0	29.2	PASS
11	2462	22.2	22.0	22.3	494.3	26.9	29.2	PASS

Directional gain = gain of antenna element + 10 log (3)

Effective Legacy Gain (dBi)=6.8

The effective legacy gain is 6.8dBi, therefore the limit needs to reduce.



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802.11n (20MHz) OFDM MODULATION:

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (dBm)			TOTAL PEAK POWER (mW)	TOTAL PEAK POWER (dBm)	PEAK POWER LIMIT (dBm)	PASS / FAIL
		CHAIN(0)	CHAIN(1)	CHAIN(2)				
1	2412	20.3	20.1	19.6	300.7	24.8	30	PASS
6	2437	21.9	21.7	21.6	447.3	26.5	30	PASS
11	2462	21.8	22.0	22.4	483.6	26.8	30	PASS

802.11n (40MHz) OFDM MODULATION:

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (dBm)			TOTAL PEAK POWER (mW)	TOTAL PEAK POWER (dBm)	PEAK POWER LIMIT (dBm)	PASS / FAIL
		CHAIN(0)	CHAIN(1)	CHAIN(2)				
3	2422	20.0	20.3	20.1	309.5	24.9	30	PASS
6	2437	22.0	22.1	22.1	482.9	26.8	30	PASS
9	2452	22.1	22.4	22.2	501.9	27.0	30	PASS

4.5 POWER SPECTRAL DENSITY MEASUREMENT

4.5.1 LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT

The Maximum of Power Spectral Density Measurement is 8dBm.

4.5.2 TEST INSTRUMENTS

Test date: May 11, 2011

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
R&S Spectrum Analyzer	FSP 40	100060	May 17, 2010	May 16, 2011

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

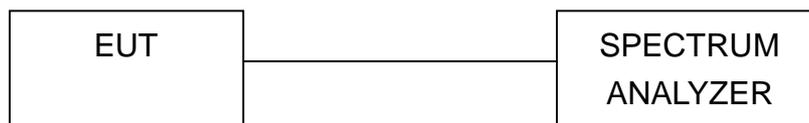
The transmitter output was connected to the spectrum analyzer through an attenuator, the bandwidth of the fundamental frequency was measured with the spectrum analyzer using 3kHz RBW and 30kHz VBW, set sweep time = span/3kHz. The power spectral density was measured and recorded.

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



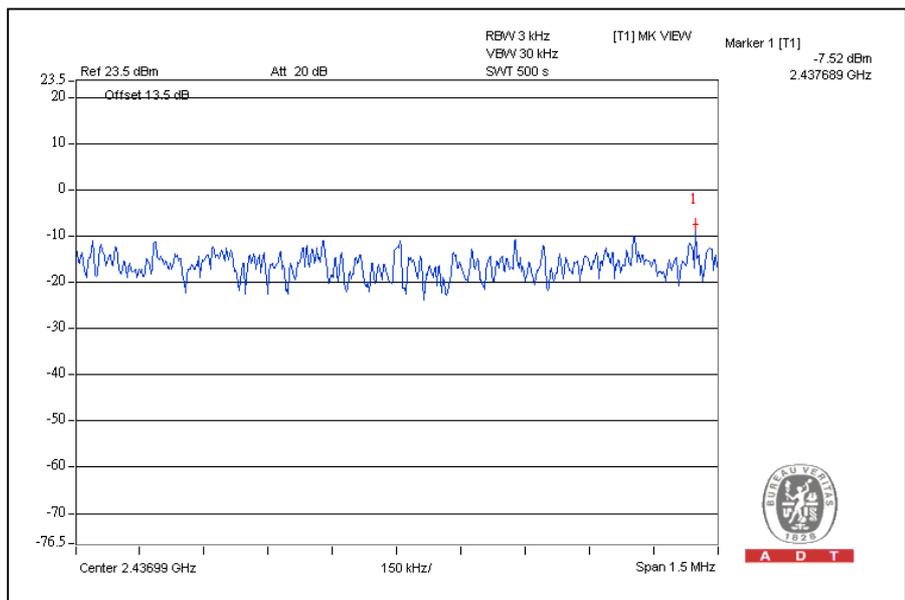
A D T

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	-10.1	8	PASS
6	2437	-7.5	8	PASS
11	2462	-9.9	8	PASS

CH6



802.11g OFDM MODULATION:

CHANNEL	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3kHz BW (dBm)			TOTAL POWER DENSITY (dBm)	MAXIMUM LIMIT (dBm)	PASS / FAIL
		CHAIN(0)	CHAIN(1)	CHAIN(2)			
1	2412	-14.5	-15.4	-14.4	-10.0	7.2	PASS
6	2437	-14.4	-14.2	-15.6	-9.9	7.2	PASS
11	2462	-14.9	-15.0	-15.2	-10.3	7.2	PASS

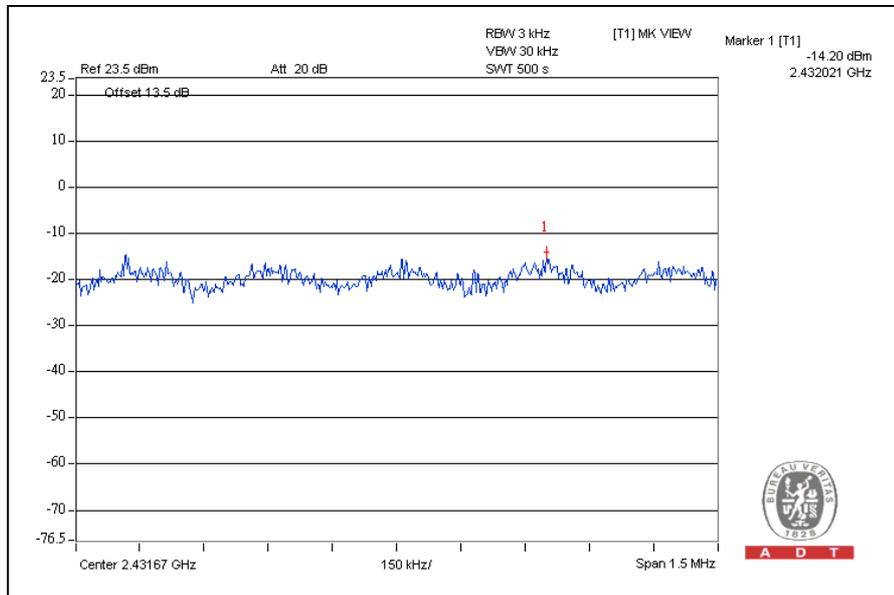
Directional gain = gain of antenna element + 10 log (3)

Effective Legacy Gain (dBi)=6.8

The effective legacy gain is 6.8dBi, therefore the limit needs to reduce.

For CHAIN(1)

CH6



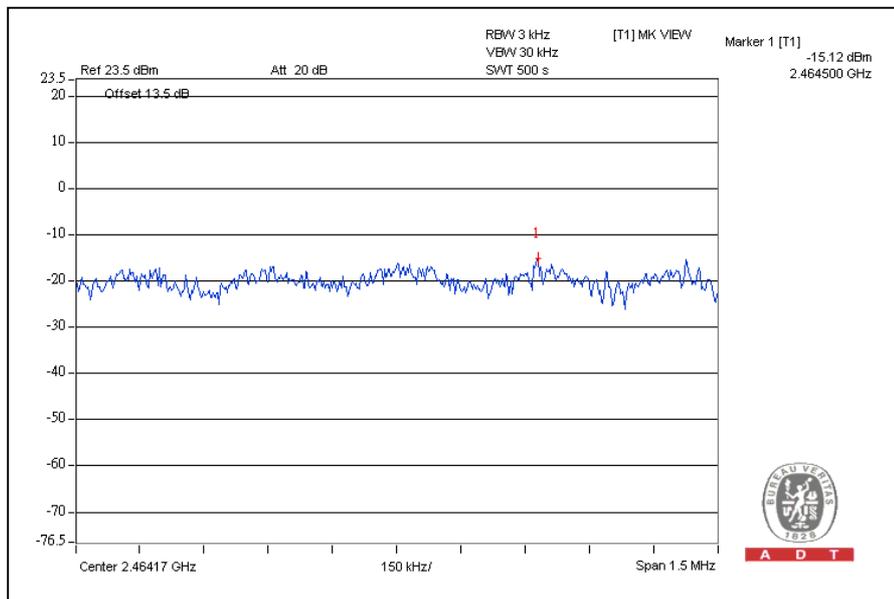


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802.11n (20MHz) OFDM MODULATION:

CHANNEL	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3kHz BW (dBm)			TOTAL POWER DENSITY (dBm)	MAXIMUM LIMIT (dBm)	PASS / FAIL
		CHAIN(0)	CHAIN(1)	CHAIN(2)			
1	2412	-16.1	-16.9	-16.9	-11.8	8	PASS
6	2437	-15.5	-15.2	-15.3	-10.6	8	PASS
11	2462	-16.1	-15.1	-15.5	-10.8	8	PASS

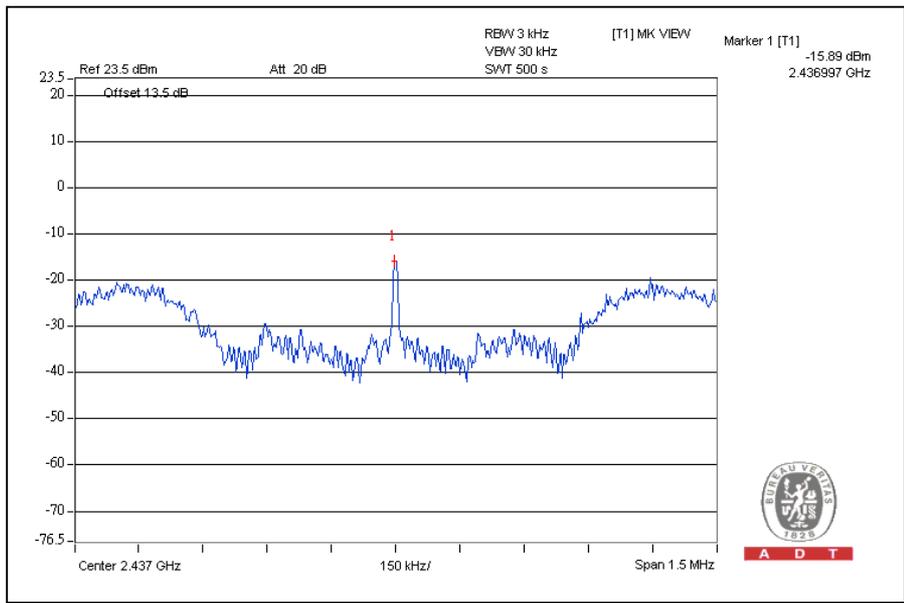
For CHAIN(1)
CH11



802.11n (40MHz) OFDM MODULATION:

CHANNEL	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3kHz BW (dBm)			TOTAL POWER DENSITY (dBm)	MAXIMUM LIMIT (dBm)	PASS / FAIL
		CHAIN(0)	CHAIN(1)	CHAIN(2)			
3	2422	-16.7	-18.6	-17.8	-12.9	8	PASS
6	2437	-15.9	-17.9	-17.7	-12.3	8	PASS
9	2452	-18.0	-16.9	-17.4	-12.6	8	PASS

For CHAIN(0)
CH6



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: May 11, 2011

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
R&S Spectrum Analyzer	FSP 40	100060	May 17, 2010	May 16, 2011

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

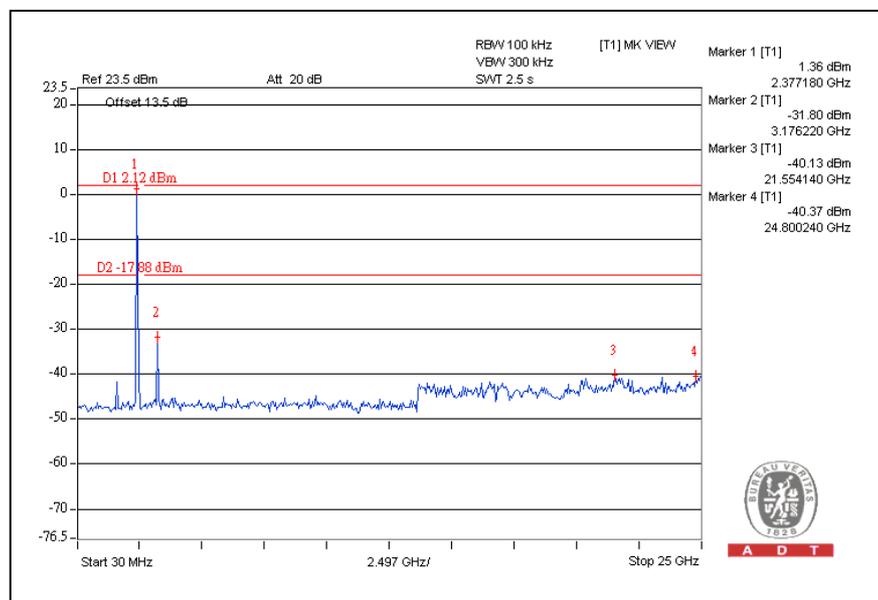
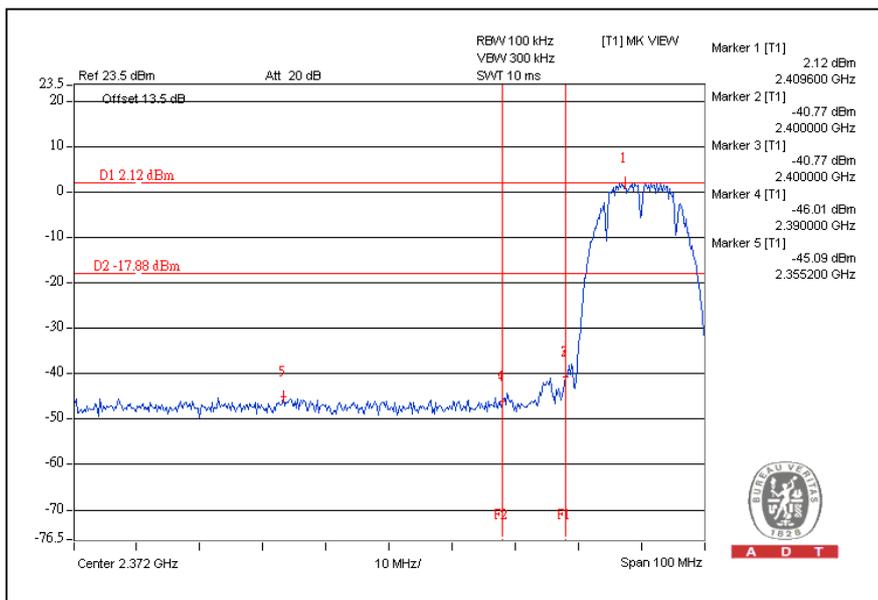
The spectrum plots are attached on the following images. D1 line indicates the highest level, and D2 line indicates the 20dB offset below D1. It shows compliance with the requirement in part 15.247(d).



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Performing measurements: Measure and add 10 log(N) dB 802.11b DSSS MODULATION:

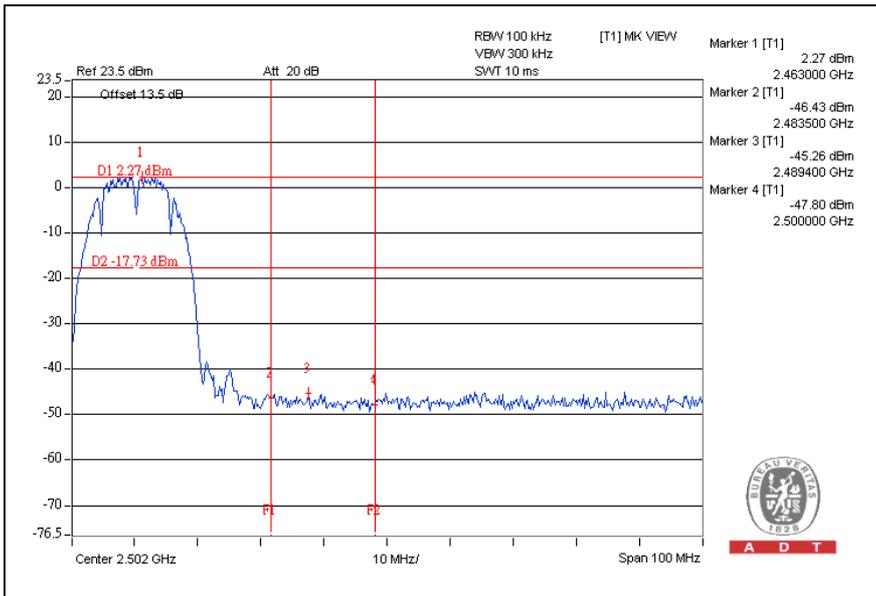
CH1



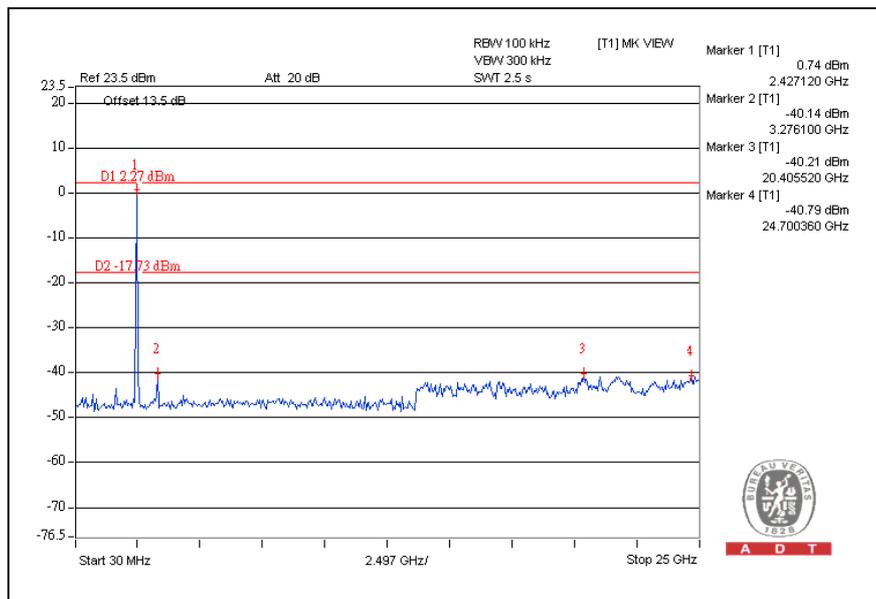


A D T

CH11



A D T



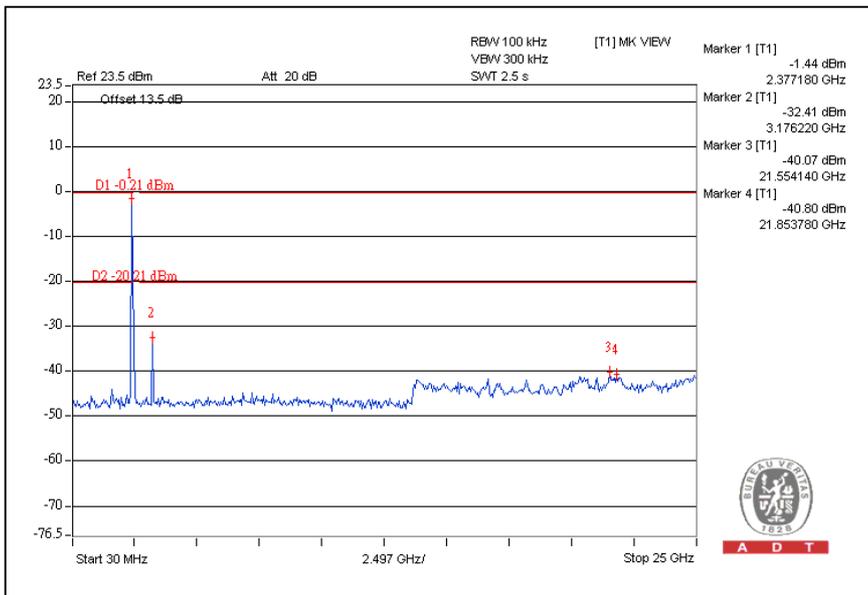
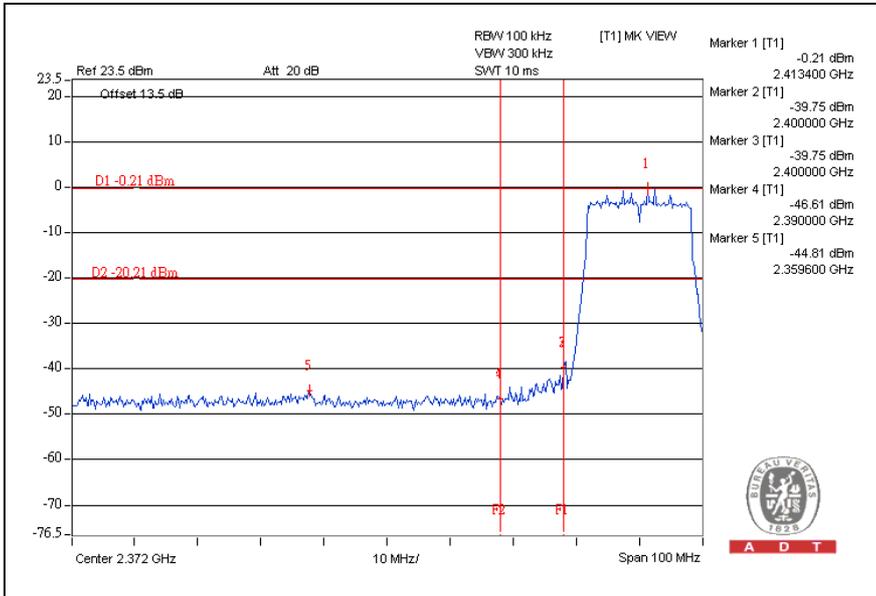
A D T



A D T

802.11g OFDM MODULATION:

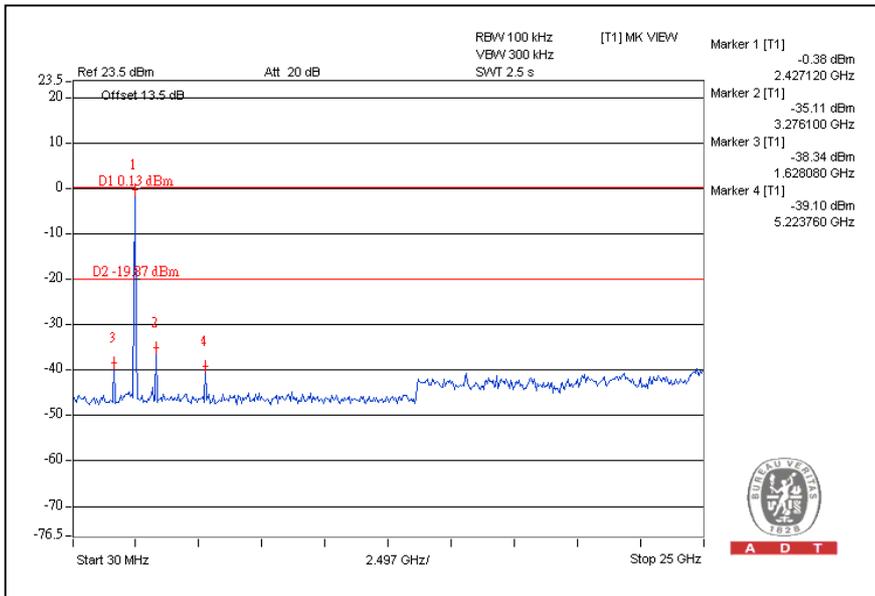
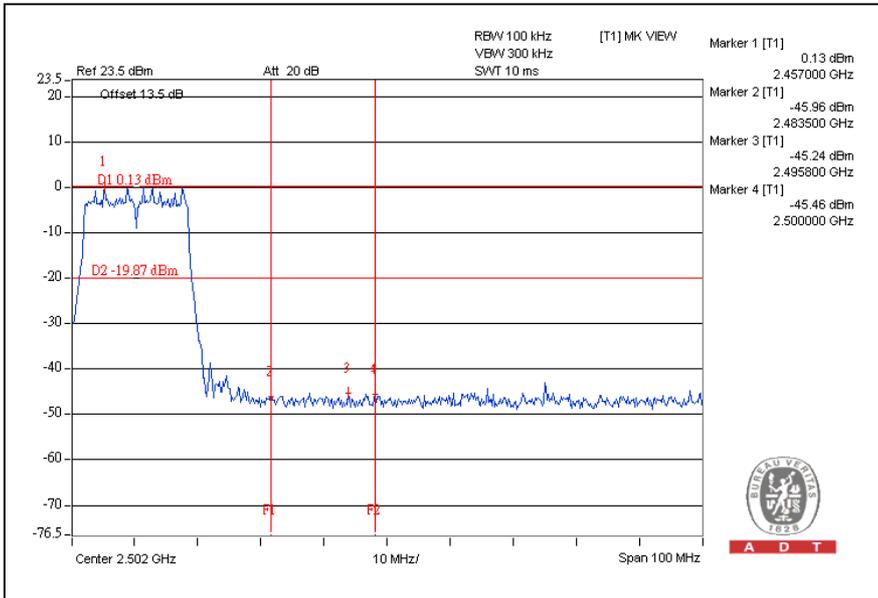
CH1





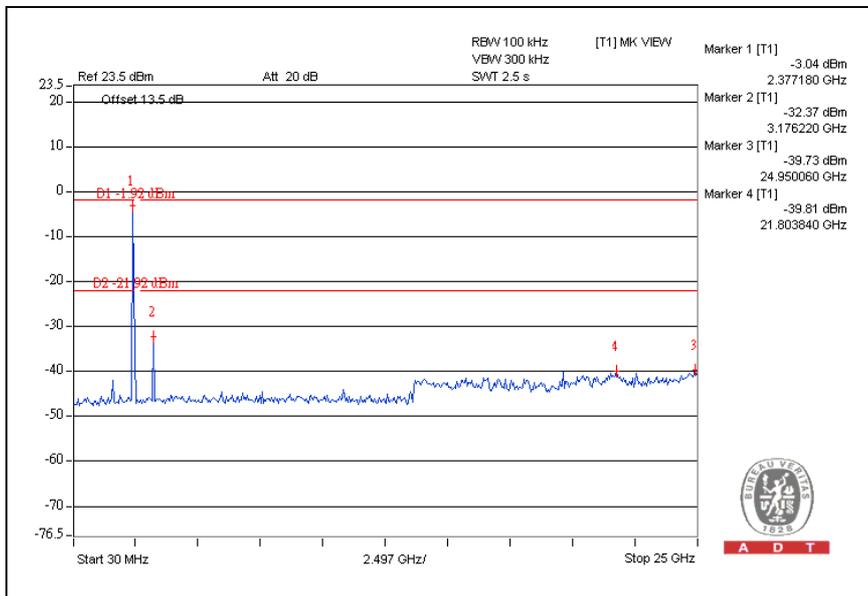
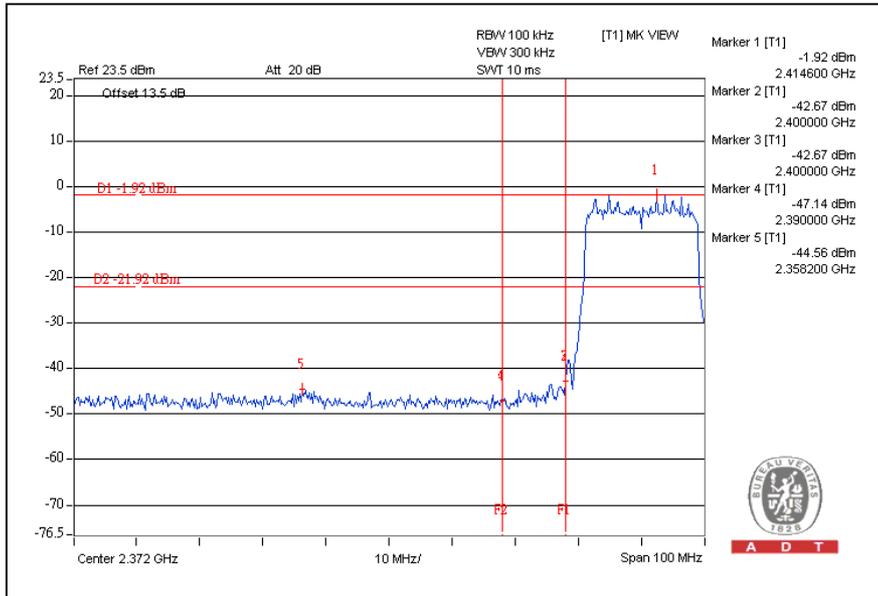
A D T

CH11



802.11n (20MHz) OFDM MODULATION:

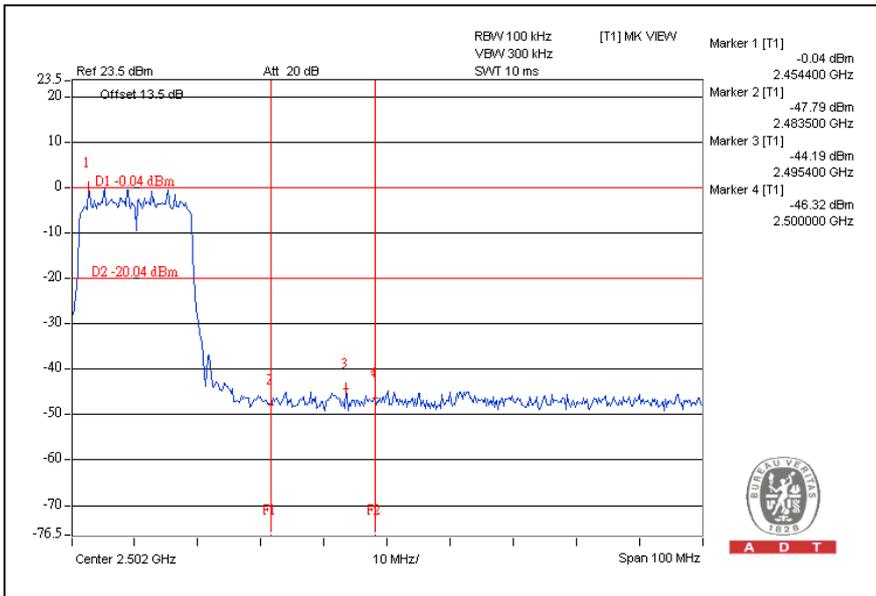
CH1



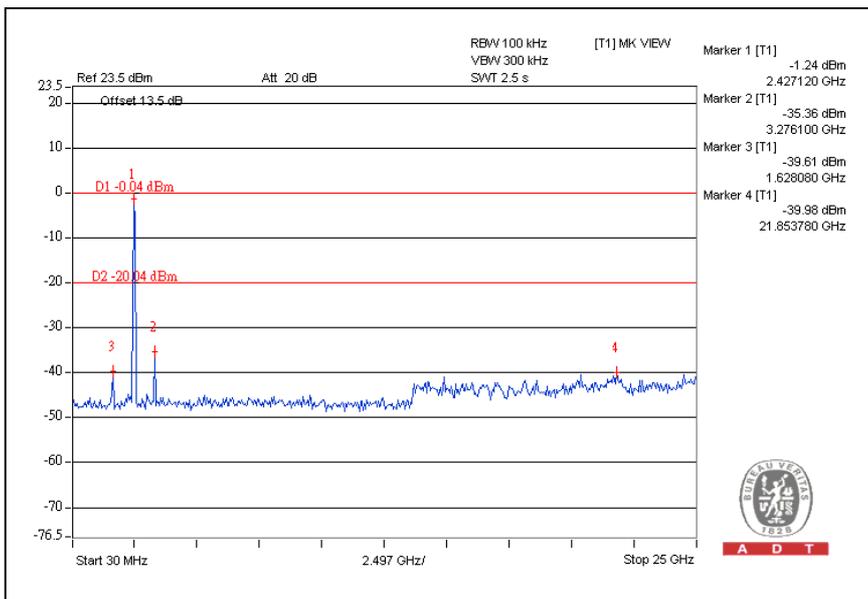


A D T

CH11



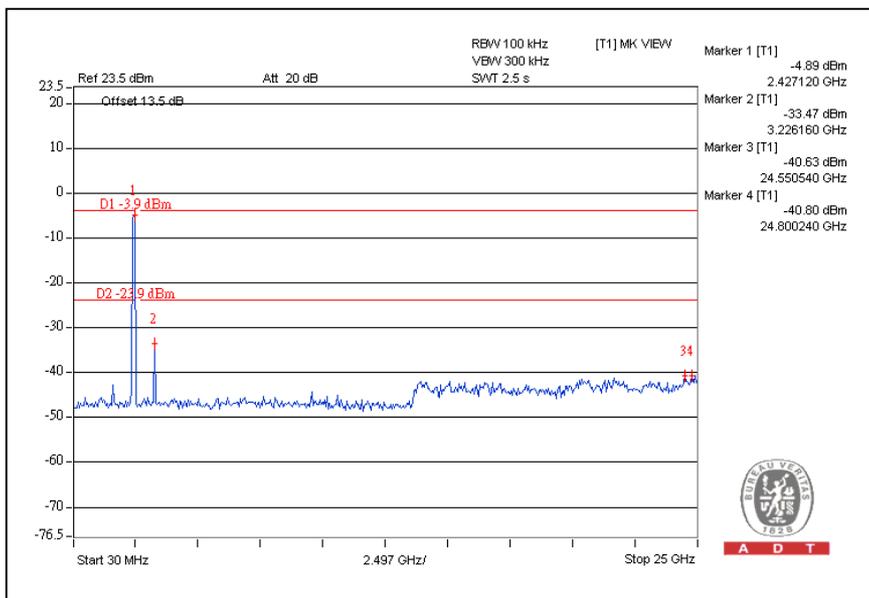
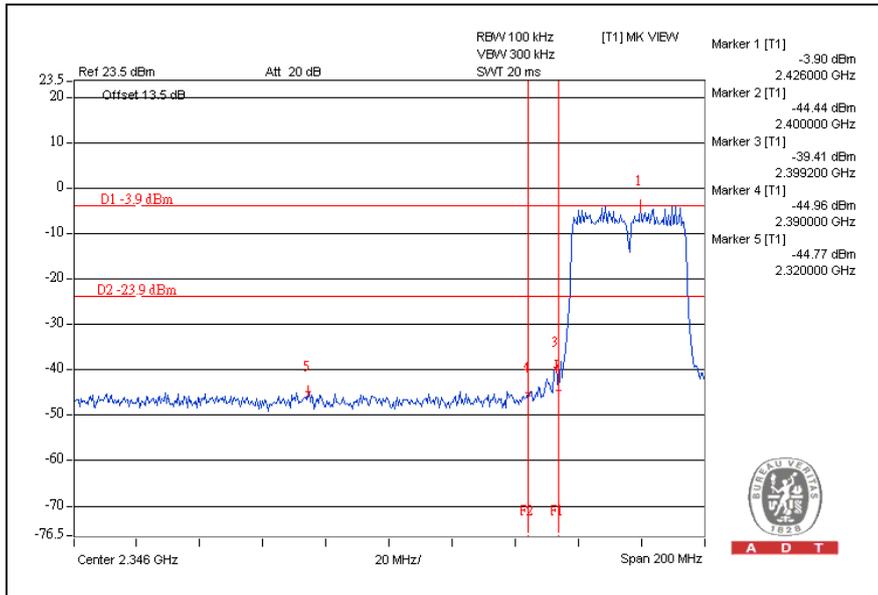
A D T



A D T

802.11n (40MHz) OFDM MODULATION:

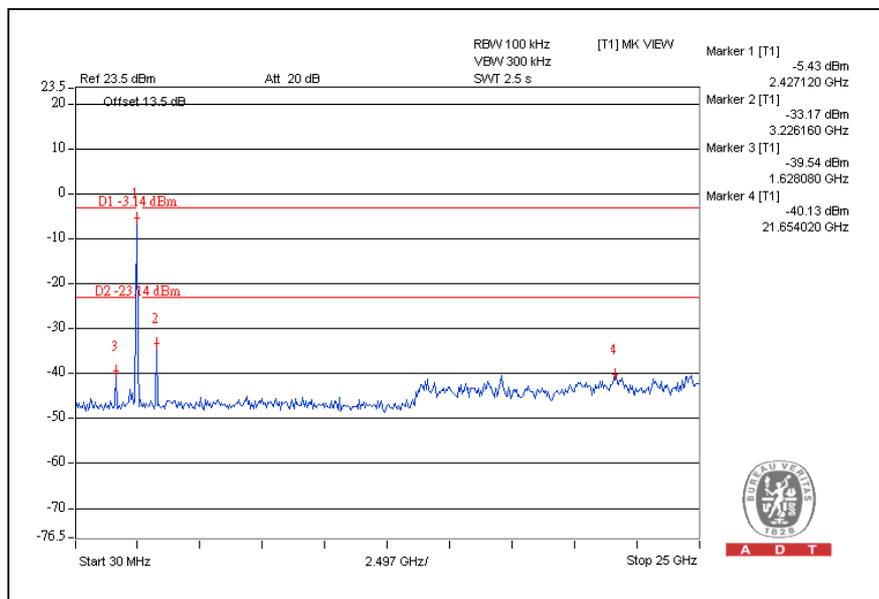
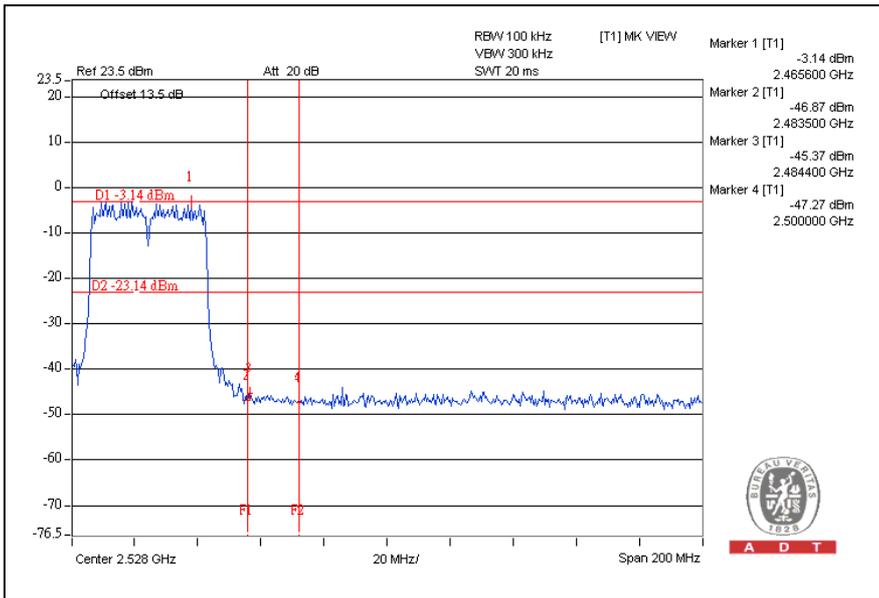
CH3





A D T

CH9





A D T

5. TEST TYPES AND RESULTS (802.11a, 5725~5850MHz Band)

5.1 CONDUCTED EMISSION MEASUREMENT

5.1.1 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.

5.1.2 TEST INSTRUMENTS

Test date: Apr. 28, 2011

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver	ESCS 30	100375	Mar. 09, 2011	Mar. 08, 2012
Line-Impedance Stabilization Network (for EUT)	NSLK 8127	8127-522	Sep. 08, 2010	Sep. 07, 2011
Line-Impedance Stabilization Network (for Peripheral)	ESH3-Z5	848773/004	Nov. 03, 2010	Nov. 02, 2011
RF Cable (JYEBAO)	5DFB	COCCAB-002	Aug. 30, 2010	Aug. 29, 2011
50 ohms Terminator	50	3	Oct. 07, 2010	Oct. 06, 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.

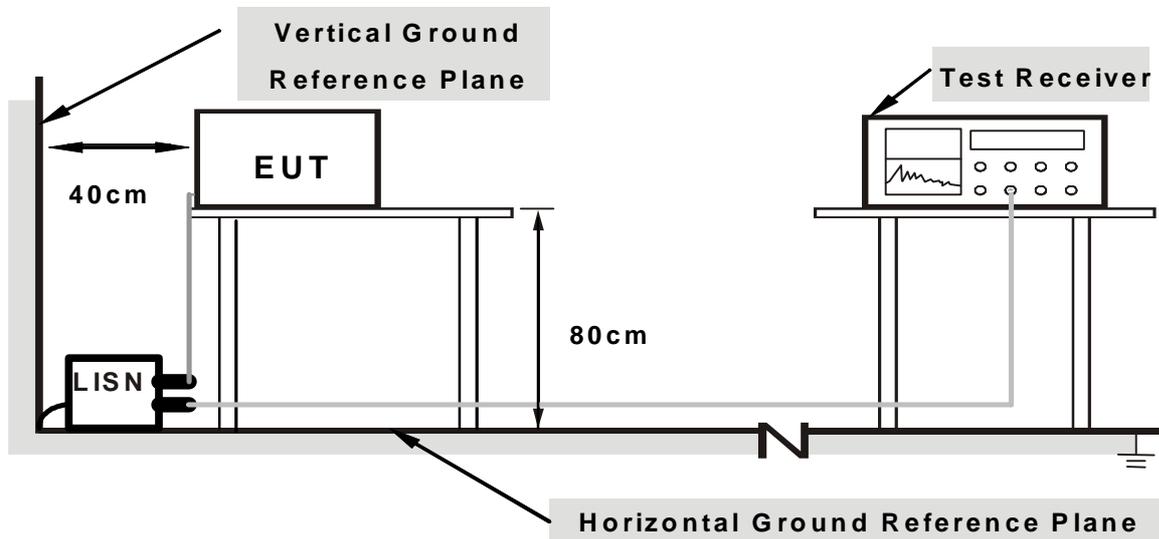
5.1.3 TEST PROCEDURES

- 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.

5.1.4 DEVIATION FROM TEST STANDARD

No deviation

5.1.5 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.

5.1.6 EUT OPERATING CONDITIONS

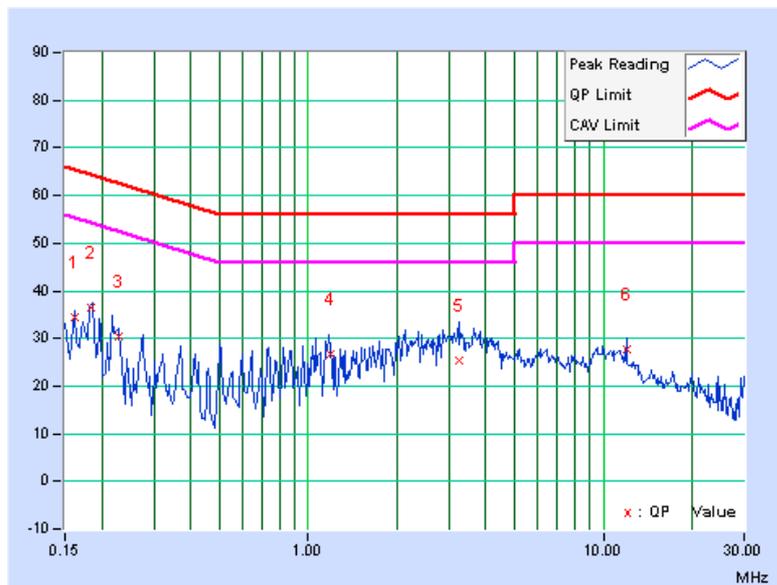
1. Placed the EUT on testing table.
2. Prepared computer system (support unit 2) to act as communication partner and placed it outside of testing area.
3. The communication partners ran test program “RT3883QA.exe” to enable EUT under transmission/receiving condition continuously via one UTP cable transmission.

5.1.7 TEST RESULTS

PHASE	Line (L)	6dB BANDWIDTH	9 kHz
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No	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
	[MHz]	Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
		(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.162	0.11	34.45	-	34.56	-	65.37	55.37	-30.81	-
2	0.184	0.12	36.31	-	36.43	-	64.31	54.31	-27.88	-
3	0.229	0.13	30.21	-	30.34	-	62.50	52.50	-32.16	-
4	1.191	0.14	26.63	-	26.77	-	56.00	46.00	-29.23	-
5	3.235	0.18	25.15	-	25.33	-	56.00	46.00	-30.67	-
6	11.998	0.51	27.24	-	27.75	-	60.00	50.00	-32.25	-

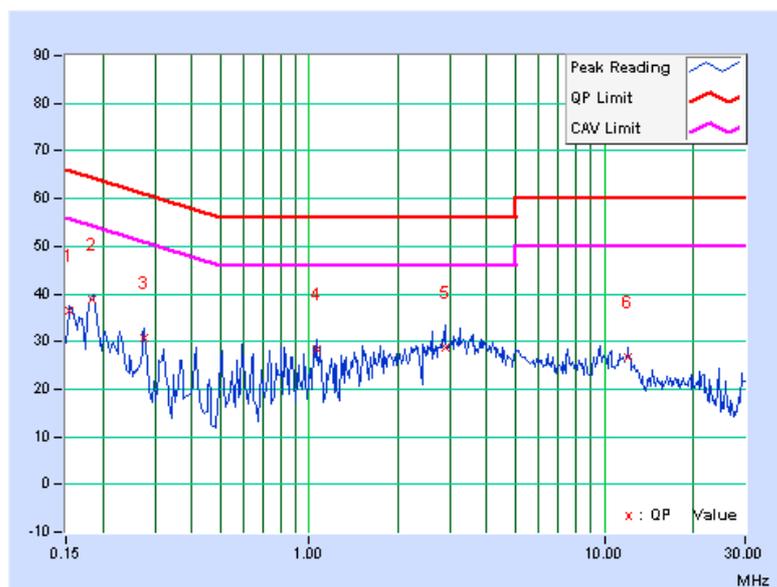
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value = 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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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	0.154	0.12	36.42	-	36.54	-	65.79
2	0.184	0.13	38.53	-	38.66	-	64.29	54.29	-25.63	-
3	0.275	0.14	30.71	-	30.85	-	60.97	50.97	-30.11	-
4	1.057	0.16	28.23	-	28.39	-	56.00	46.00	-27.61	-
5	2.893	0.23	28.40	-	28.63	-	56.00	46.00	-27.37	-
6	11.997	0.95	25.69	-	26.64	-	60.00	50.00	-33.36	-

- 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.





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5.2 RADIATED EMISSION MEASUREMENT

5.2.1 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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5.2.2 TEST INSTRUMENTS

Test date: Apr. 29 to May 06, 2011

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Agilent Spectrum Analyzer	E4446A	MY48250254	July 14, 2010	July 13, 2011
Agilent Pre-Selector	N9039A	MY46520311	July 14, 2010	July 13, 2011
Agilent Signal Generator	N5181A	MY49060517	July 14, 2010	July 13, 2011
Mini-Circuits Pre-Amplifier	ZFL-1000VH2B	AMP-ZFL-03	Nov. 16, 2010	Nov. 15, 2011
Agilent Pre-Amplifier	8449B	3008A02578	July 05, 2010	July 04, 2011
Miteq Pre-Amplifier	AFS33-1800265 0-30-8P-44	881786	NA	NA
SCHWARZBECK Trilog Broadband Antenna	VULB 9168	9168-360	Apr. 14, 2011	Apr. 13, 2012
AISI Horn_Antenna	AIH.8018	000032009111 0	Nov. 12, 2010	Nov. 11, 2011
SCHWARZBECK Horn_Antenna	BBHA 9170	9170-424	Oct. 08, 2010	Oct. 07, 2011
RF CABLE	NA	RF104-201 RF104-203 RF104-204	Dec. 27, 2010	Dec. 26, 2011
RF Cable	NA	CHGCAB_001	NA	NA
Software	ADT_Radiated_V8.7.05	NA	NA	NA
CT Antenna Tower & Turn Table	NA	NA	NA	NA

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

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

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

4. The FCC Site Registration No. is 966073.

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

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

5.2.3 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.

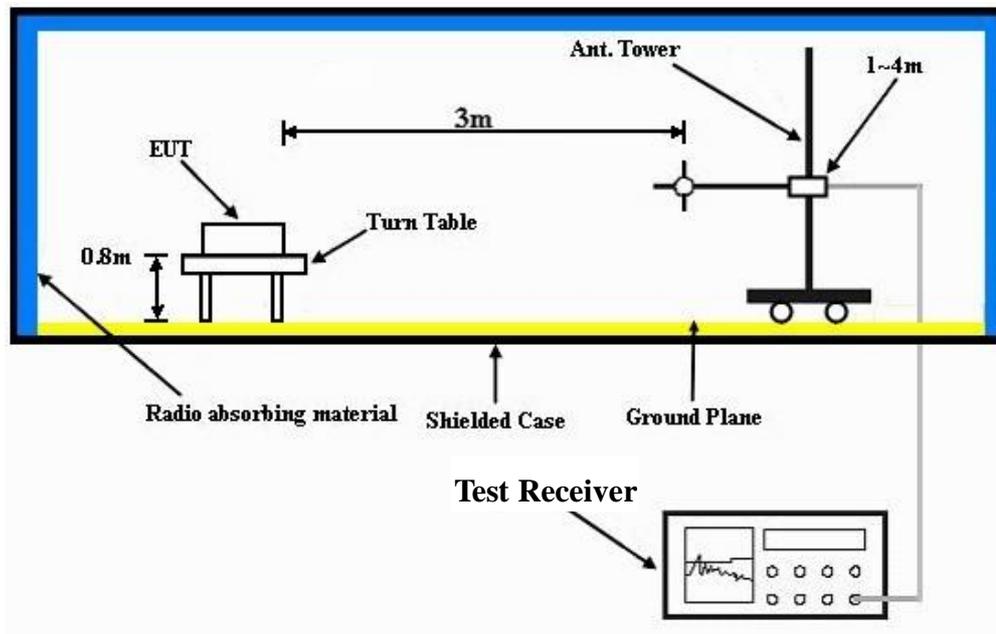
NOTE:

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.

5.2.4 DEVIATION FROM TEST STANDARD

No deviation

5.2.5 TEST SETUP



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

5.2.6 EUT OPERATING CONDITIONS

1. Placed the EUT on testing table.
2. Prepared computer system (support unit 2) to act as communication partner and placed it outside of testing area.
3. The communication partners ran test program “RT3883QA.exe” to enable EUT under transmission/receiving condition continuously via one UTP cable transmission.

5.2.7 TEST RESULTS

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

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 149	FREQUENCY RANGE	Below 1000MHz
INPUT POWER (SYSTEM)	120Vac / 60Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	17deg. C, 69%RH 1005 hPa	TESTED BY	Frank Liu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	124.36	40.1 QP	43.5	-3.4	2.00 H	279	27.15	12.96
2	250.83	40.8 QP	46.0	-5.2	1.00 H	310	27.35	13.46
3	414.66	37.2 QP	46.0	-8.8	1.00 H	221	19.17	18.04
4	446.80	35.3 QP	46.0	-10.7	1.50 H	1	16.49	18.80
5	499.93	41.6 QP	46.0	-4.4	1.50 H	310	21.52	20.10
6	625.11	43.6 QP	46.0	-2.4	1.00 H	327	20.88	22.72
7	874.65	42.9 QP	46.0	-3.1	1.00 H	359	16.51	26.36
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	124.85	41.0 QP	43.5	-2.5	1.25 V	11	28.03	12.99
2	409.98	30.7 QP	46.0	-15.3	1.25 V	224	12.74	17.93
3	500.00	43.1 QP	46.0	-2.9	1.25 V	350	23.01	20.10
4	624.88	43.9 QP	46.0	-2.1	1.50 V	2	21.20	22.71
5	921.50	43.9 QP	46.0	-2.1	1.00 V	234	16.90	26.98
6	954.09	42.5 QP	46.0	-3.5	1.50 V	350	15.20	27.26

- 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

802.11a OFDM MODULATION

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 149	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER	120Vac / 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	17deg. C, 67%RH 1005 hPa	TESTED BY	Frank Liu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5745.00	103.2 PK			1.11 H	238	61.65	41.55
2	*5745.00	90.8 AV			1.11 H	238	49.25	41.55
3	11490.00	66.4 PK	74.0	-7.6	1.04 H	296	18.69	47.71
4	11490.00	52.8 AV	54.0	-1.2	1.04 H	296	5.09	47.71

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	*5745.00	110.2 PK			1.00 V	69	68.65	41.55
2	*5745.00	97.8 AV			1.00 V	69	56.25	41.55
3	11490.00	56.3 PK	74.0	-17.7	1.02 V	298	8.59	47.71
4	11490.00	44.8 AV	54.0	-9.2	1.02 V	298	-2.91	47.71

- REMARKS:**
1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
 2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level – Limit value.
 5. “ * “: Fundamental frequency.
 6. The limit value is defined as per 15.247.



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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 157	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER	120Vac / 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	17deg. C, 67%RH 1005 hPa	TESTED BY	Frank Liu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5785.00	103.4 PK			1.11 H	231	61.72	41.68
2	*5785.00	90.4 AV			1.11 H	231	48.72	41.68
3	11570.00	66.3 PK	74.0	-7.7	1.03 H	294	18.55	47.75
4	11570.00	53.3 AV	54.0	-0.7	1.03 H	294	5.55	47.75

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	*5785.00	110.1 PK			1.00 V	73	68.42	41.68
2	*5785.00	97.3 AV			1.00 V	73	55.62	41.68
3	11570.00	56.9 PK	74.0	-17.1	1.03 V	297	9.15	47.75
4	11570.00	44.4 AV	54.0	-9.6	1.03 V	297	-3.35	47.75

- REMARKS:**
1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
 2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level – Limit value.
 5. “ * “: Fundamental frequency.
 6. The limit value is defined as per 15.247.



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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 165	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER	120Vac / 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	17deg. C, 67%RH 1005 hPa	TESTED BY	Frank Liu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5825.00	103.7 PK			1.11 H	234	61.92	41.78
2	*5825.00	90.6 AV			1.11 H	234	48.82	41.78
3	11650.00	66.2 PK	74.0	-7.8	1.04 H	294	18.37	47.83
4	11650.00	53.2 AV	54.0	-0.8	1.04 H	294	5.37	47.83
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	*5825.00	110.3 PK			1.00 V	89	68.52	41.78
2	*5825.00	97.6 AV			1.00 V	89	55.82	41.78
3	11650.00	56.8 PK	74.0	-17.2	1.04 V	283	8.97	47.83
4	11650.00	44.7 AV	54.0	-9.3	1.04 V	283	-3.13	47.83

- REMARKS:**
1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
 2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level – Limit value.
 5. “ * “: Fundamental frequency.
 6. The limit value is defined as per 15.247.



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802.11n (20MHz) OFDM MODULATION

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 149	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER	120Vac / 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	17deg. C, 67%RH 1005 hPa	TESTED BY	Frank Liu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5745.00	103.5 PK			1.11 H	239	61.95	41.55
2	*5745.00	90.4 AV			1.11 H	239	48.85	41.55
3	11490.00	65.8 PK	74.0	-8.2	1.04 H	296	18.09	47.71
4	11490.00	52.1 AV	54.0	-1.9	1.04 H	296	4.39	47.71
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	*5745.00	110.4 PK			1.00 V	79	68.85	41.55
2	*5745.00	97.3 AV			1.00 V	79	55.75	41.55
3	11490.00	56.7 PK	74.0	-17.3	1.07 V	293	8.99	47.71
4	11490.00	44.6 AV	54.0	-9.4	1.07 V	293	-3.11	47.71

- REMARKS:**
1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
 2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level – Limit value.
 5. “ * “: Fundamental frequency.
 6. The limit value is defined as per 15.247.



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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 157	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER	120Vac / 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	17deg. C, 67%RH 1005 hPa	TESTED BY	Frank Liu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5785.00	103.7 PK			1.13 H	246	62.02	41.68
2	*5785.00	90.7 AV			1.13 H	246	49.02	41.68
3	11570.00	66.8 PK	74.0	-7.2	1.03 H	295	19.05	47.75
4	11570.00	53.0 AV	54.0	-1.0	1.03 H	295	5.25	47.75

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	*5785.00	110.7 PK			1.00 V	83	69.02	41.68
2	*5785.00	97.9 AV			1.00 V	83	56.22	41.68
3	11570.00	56.9 PK	74.0	-17.1	1.06 V	294	9.15	47.75
4	11570.00	44.9 AV	54.0	-9.1	1.06 V	294	-2.85	47.75

- REMARKS:**
1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
 2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level – Limit value.
 5. “ * “: Fundamental frequency.
 6. The limit value is defined as per 15.247.



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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 165	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER	120Vac / 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	17deg. C, 67%RH 1005 hPa	TESTED BY	Frank Liu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5825.00	103.6 PK			1.14 H	247	61.82	41.78
2	*5825.00	90.8 AV			1.14 H	247	49.02	41.78
3	11650.00	67.1 PK	74.0	-6.9	1.04 H	294	19.27	47.83
4	11650.00	53.3 AV	54.0	-0.7	1.04 H	294	5.47	47.83
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	*5825.00	110.4 PK			1.00 V	79	68.62	41.78
2	*5825.00	97.8 AV			1.00 V	79	56.02	41.78
3	11650.00	57.2 PK	74.0	-16.8	1.04 V	283	9.37	47.83
4	11650.00	45.1 AV	54.0	-8.9	1.04 V	283	-2.73	47.83

- REMARKS:**
1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
 2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level – Limit value.
 5. “ * ”: Fundamental frequency.
 6. The limit value is defined as per 15.247.



A D T

802.11n (40MHz) OFDM MODULATION

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 151	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER	120Vac / 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	17deg. C, 67%RH 1005 hPa	TESTED BY	Frank Liu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5755.00	103.9 PK			1.12 H	249	62.31	41.59
2	*5755.00	90.5 AV			1.12 H	249	48.91	41.59
3	11510.00	64.3 PK	74.0	-9.7	1.04 H	296	16.58	47.72
4	11510.00	51.3 AV	54.0	-2.7	1.04 H	296	3.58	47.72
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	*5755.00	106.5 PK			1.02 V	65	64.91	41.59
2	*5755.00	93.4 AV			1.02 V	65	51.81	41.59
3	11510.00	57.3 PK	74.0	-16.7	1.07 V	279	9.58	47.72
4	11510.00	45.2 AV	54.0	-8.8	1.07 V	279	-2.52	47.72

- REMARKS:**
1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
 2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level – Limit value.
 5. “ * “: Fundamental frequency.
 6. The limit value is defined as per 15.247.



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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 159	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER	120Vac / 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	17deg. C, 67%RH 1005 hPa	TESTED BY	Frank Liu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*5795.00	104.3 PK			1.11 H	243	62.60	41.70
2	*5795.00	90.7 AV			1.11 H	243	49.00	41.70
3	11590.00	66.2 PK	74.0	-7.8	1.03 H	298	18.44	47.76
4	11590.00	53.3 AV	54.0	-0.7	1.03 H	298	5.54	47.76

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	*5795.00	107.4 PK			1.00 V	68	65.70	41.70
2	*5795.00	93.9 AV			1.00 V	68	52.20	41.70
3	11590.00	57.4 PK	74.0	-16.6	1.06 V	283	9.64	47.76
4	11590.00	45.4 AV	54.0	-8.6	1.06 V	283	-2.36	47.76

- REMARKS:**
1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).
 2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level – Limit value.
 5. “ * “: Fundamental frequency.
 6. The limit value is defined as per 15.247.

5.3 6dB BANDWIDTH MEASUREMENT

5.3.1 LIMITS OF 6dB BANDWIDTH MEASUREMENT

The minimum of 6dB Bandwidth Measurement is 0.5 MHz.

5.3.2 TEST INSTRUMENTS

Test date: May 12, 2011

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
R&S Spectrum Analyzer	FSP 40	100060	May 17, 2010	May 16, 2011

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

5.3.3 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.

5.3.4 DEVIATION FROM TEST STANDARD

No deviation

5.3.5 TEST SETUP



5.3.6 EUT OPERATING CONDITIONS

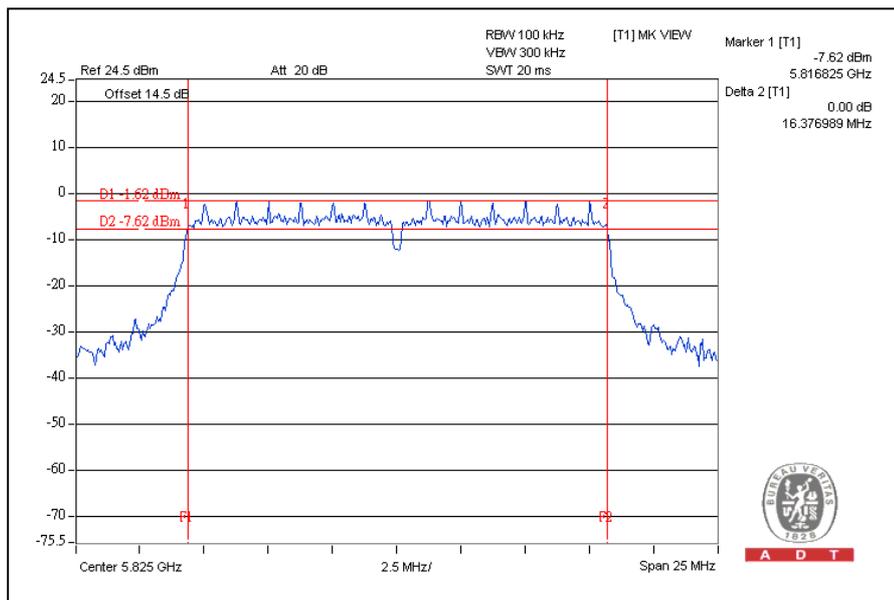
The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

5.3.7 TEST RESULTS

802.11a OFDM MODULATION:

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)			MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN(0)	CHAIN(1)	CHAIN(2)		
149	5745	16.32	16.21	16.20	0.5	PASS
157	5785	16.36	16.25	16.28	0.5	PASS
165	5825	16.37	16.27	16.24	0.5	PASS

For CHAIN(0)
CH165



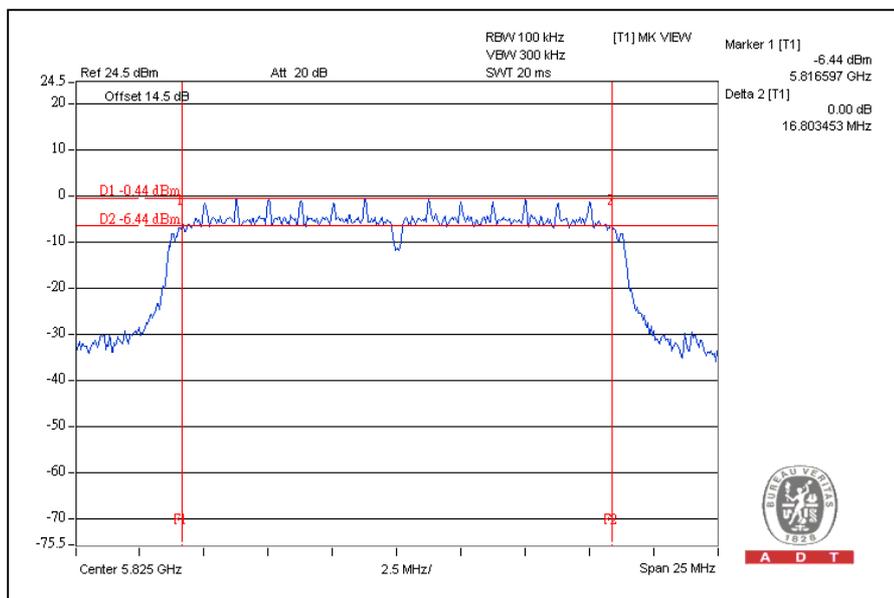


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802.11n (20MHz) OFDM MODULATION:

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)			MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN(0)	CHAIN(1)	CHAIN(2)		
149	5745	16.08	15.95	16.00	0.5	PASS
157	5785	16.19	16.10	16.08	0.5	PASS
165	5825	16.80	16.70	16.70	0.5	PASS

For CHAIN(0)
CH165



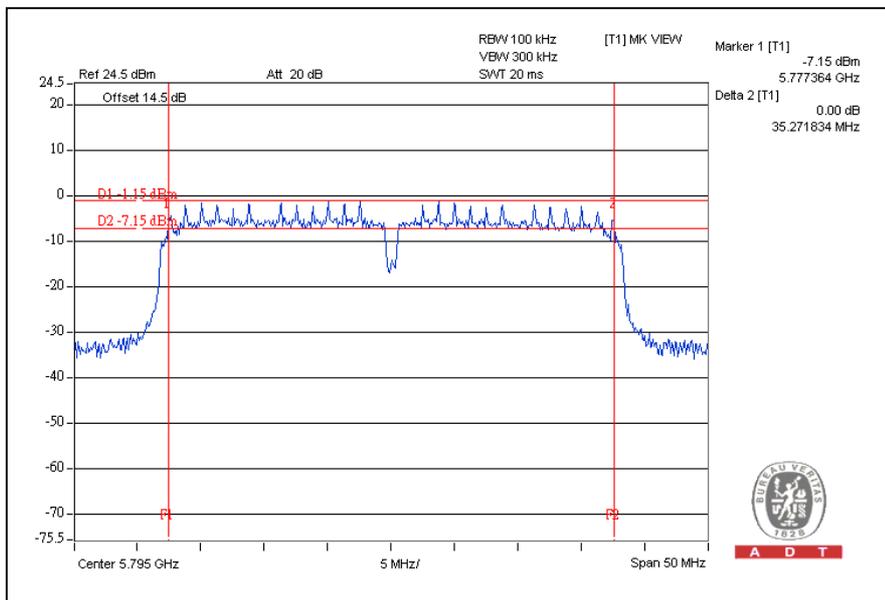


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802.11n (40MHz) OFDM MODULATION:

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)			MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN(0)	CHAIN(1)	CHAIN(2)		
151	5755	35.26	35.20	35.16	0.5	PASS
159	5795	35.27	35.21	35.20	0.5	PASS

For CHAIN(0)
CH159



5.4 MAXIMUM PEAK OUTPUT POWER

5.4.1 LIMITS OF MAXIMUM PEAK OUTPUT POWER MEASUREMENT

The Maximum Peak Output Power Measurement is 30dBm.

5.4.2 INSTRUMENTS

Test date: May 12, 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.

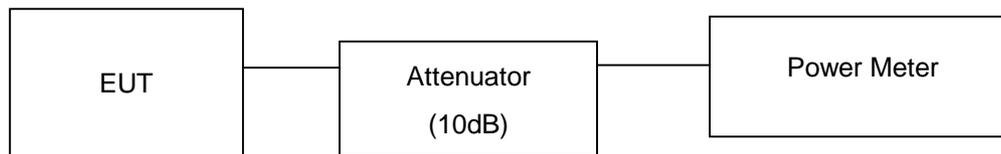
5.4.3 TEST PROCEDURES

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.

5.4.4 DEVIATION FROM TEST STANDARD

No deviation

5.4.5 TEST SETUP



5.4.6 EUT OPERATING CONDITIONS

Same as Item 4.3.6

5.4.7 TEST RESULTS

802.11a OFDM MODULATION:

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (dBm)			TOTAL PEAK POWER (mW)	TOTAL PEAK POWER (dBm)	PEAK POWER LIMIT (dBm)	PASS / FAIL
		CHAIN(0)	CHAIN(1)	CHAIN(2)				
149	5745	19.7	19.6	19.6	275.7	24.4	29.2	PASS
157	5785	19.5	19.4	19.1	257.5	24.1	29.2	PASS
165	5825	17.2	18.5	17.3	177.0	22.5	29.2	PASS

Directional gain = gain of antenna element + 10 log (3)

Effective Legacy Gain (dBi)=6.8

The effective legacy gain is 6.8dBi, therefore the limit needs to reduce.

802.11n (20MHz) OFDM MODULATION:

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (dBm)			TOTAL PEAK POWER (mW)	TOTAL PEAK POWER (dBm)	PEAK POWER LIMIT (dBm)	PASS / FAIL
		CHAIN(0)	CHAIN(1)	CHAIN(2)				
149	5745	19.7	19.9	19.3	276.2	24.4	30	PASS
157	5785	19.2	19.4	18.9	247.9	23.9	30	PASS
165	5825	18.0	18.6	17.4	190.5	22.8	30	PASS

802.11n (40MHz) OFDM MODULATION:

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (dBm)			TOTAL PEAK POWER (mW)	TOTAL PEAK POWER (dBm)	PEAK POWER LIMIT (dBm)	PASS / FAIL
		CHAIN(0)	CHAIN(1)	CHAIN(2)				
151	5755	19.7	19.9	19.5	280.2	24.5	30	PASS
159	5795	19.2	19.4	19.4	257.4	24.1	30	PASS

5.5 POWER SPECTRAL DENSITY MEASUREMENT

5.5.1 LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT

The Maximum of Power Spectral Density Measurement is 8dBm.

5.5.2 TEST INSTRUMENTS

Test date: May 12, 2011

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
R&S Spectrum Analyzer	FSP 40	100060	May 17, 2010	May 16, 2011

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

5.5.3 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 3 kHz RBW and 30 kHz VBW, set sweep time = span/3 kHz. The power spectral density was measured and recorded.

The sweep time is allowed to be longer than span/3 kHz for a full response of the mixer in the spectrum analyzer.

5.5.4 DEVIATION FROM TEST STANDARD

No deviation

5.5.5 TEST SETUP



5.5.6 EUT OPERATING CONDITION

Same as Item 4.3.6

5.5.7 TEST RESULTS

802.11a OFDM MODULATION:

CHANNEL	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3kHz BW (dBm)			TOTAL POWER DENSITY (dBm)	MAXIMUM LIMIT (dBm)	PASS / FAIL
		CHAIN(0)	CHAIN(1)	CHAIN(2)			
149	5745	-13.8	-14.7	-15.2	-9.8	7.2	PASS
157	5785	-15.1	-15.4	-15.2	-10.5	7.2	PASS
165	5825	-18.3	-14.4	-17.5	-11.6	7.2	PASS

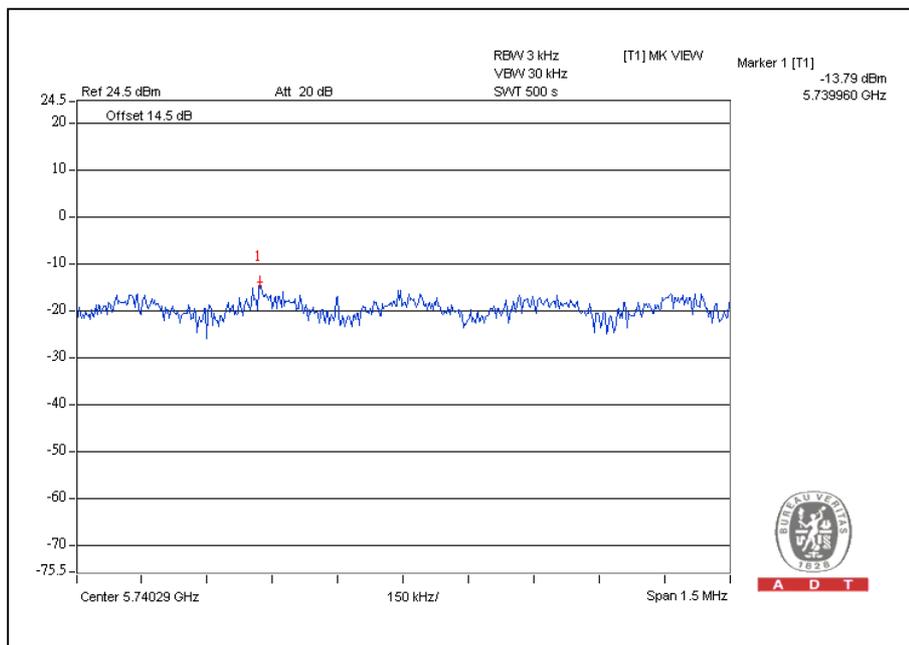
Directional gain = gain of antenna element + 10 log (3)

Effective Legacy Gain (dBi)=6.8

The effective legacy gain is 6.8dBi, therefore the limit needs to reduce.

For CHAIN(0)

CH149



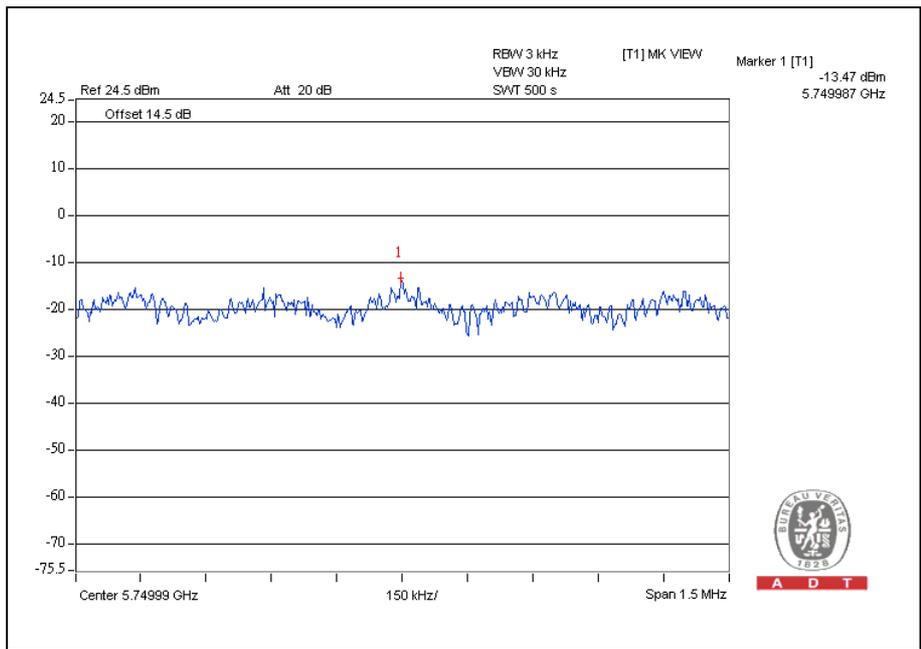


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802.11n (20MHz) OFDM MODULATION:

CHANNEL	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3kHz BW (dBm)			TOTAL POWER DENSITY (dBm)	MAXIMUM LIMIT (dBm)	PASS / FAIL
		CHAIN(0)	CHAIN(1)	CHAIN(2)			
149	5745	-14.8	-13.5	-14.5	-9.5	8	PASS
157	5785	-15.8	-15.1	-15.6	-10.7	8	PASS
165	5825	-16.4	-16.9	-16.4	-11.8	8	PASS

For CHAIN(1)
CH149



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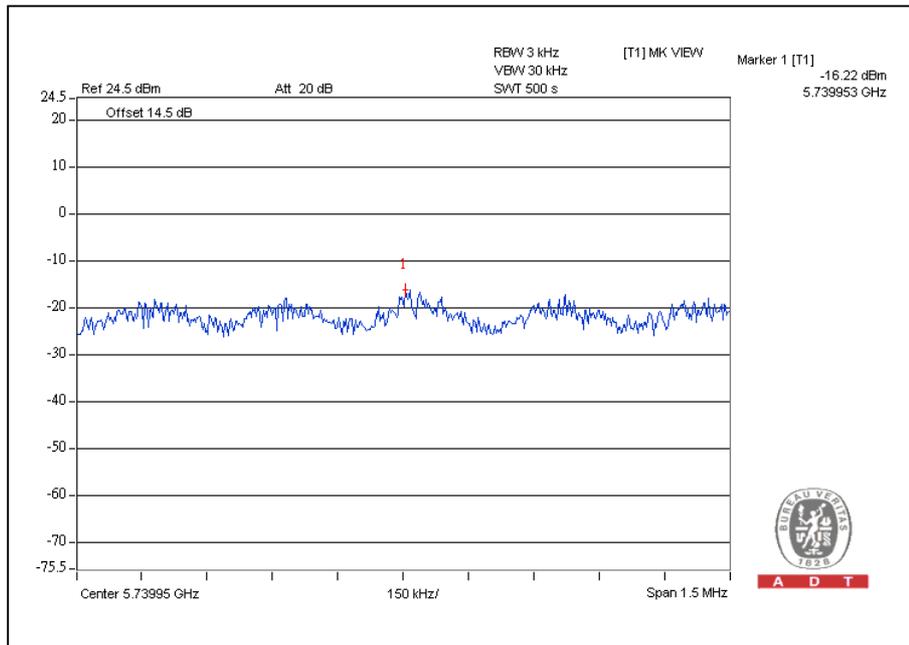


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802.11n (40MHz) OFDM MODULATION:

CHANNEL	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3kHz BW (dBm)			TOTAL POWER DENSITY (dBm)	MAXIMUM LIMIT (dBm)	PASS / FAIL
		CHAIN(0)	CHAIN(1)	CHAIN(2)			
151	5755	-16.2	-17.1	-16.7	-11.9	8	PASS
159	5795	-17.1	-17.2	-16.3	-12.1	8	PASS

For CHAIN(0)
CH151





5.6 CONDUCTED OUT-BAND EMISSION MEASUREMENT

5.6.1 LIMITS OF CONDUCTED OUT-BAND EMISSION MEASUREMENT

Below -20dB of the highest emission level of operating band (in 100kHz Resolution Bandwidth).

5.6.2 TEST INSTRUMENTS

Test date: May 12, 2011

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
R&S Spectrum Analyzer	FSP 40	100060	May 17, 2010	May 16, 2011

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

5.6.3 TEST PROCEDURE

The transmitter output was connected to the spectrum analyzer via a low loss cable. Set RBW of spectrum analyzer to 100 kHz 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.

5.6.4 DEVIATION FROM TEST STANDARD

No deviation

5.6.5 EUT OPERATING CONDITION

Same as Item 4.3.6

5.6.6 TEST RESULTS

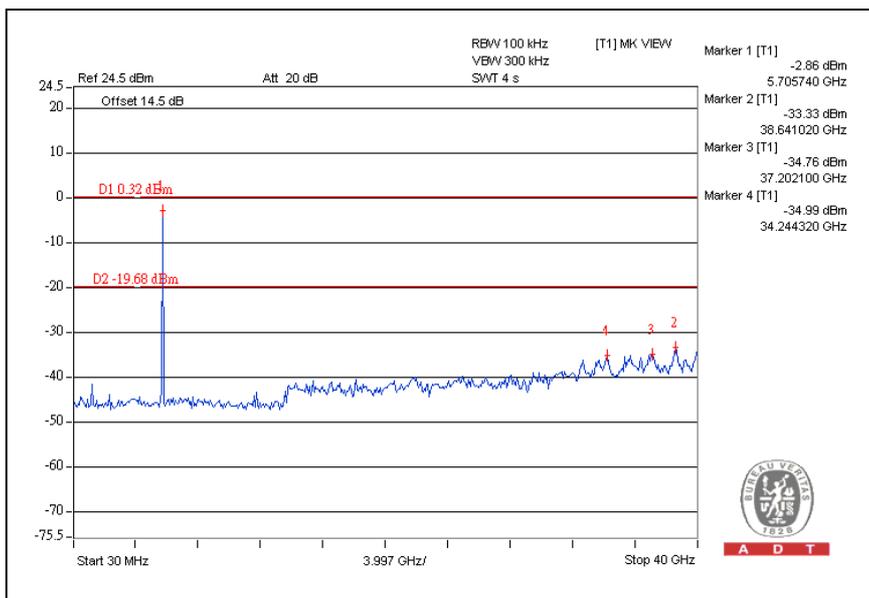
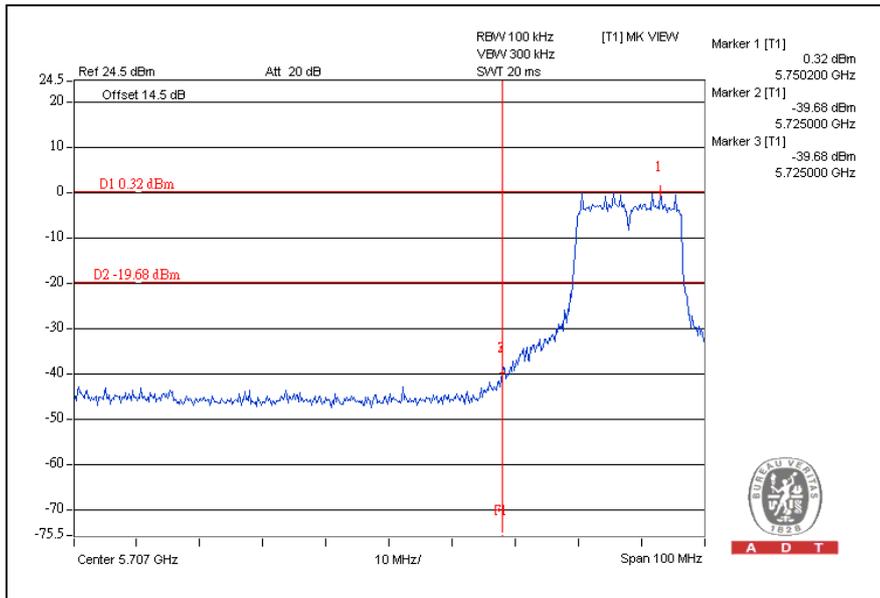
The spectrum plots are attached on the following pages. D2 line indicates the highest level, D1 line indicates the 20dB offset below D2. It shows compliance with the requirement in part 15.247(d).



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Performing measurements: Measure and add 10 log(N) dB 802.11a OFDM modulation

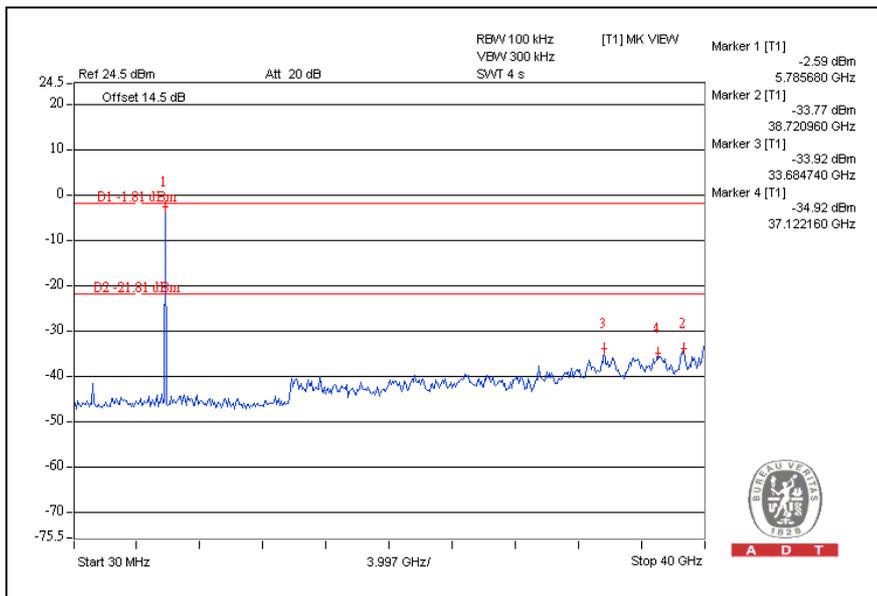
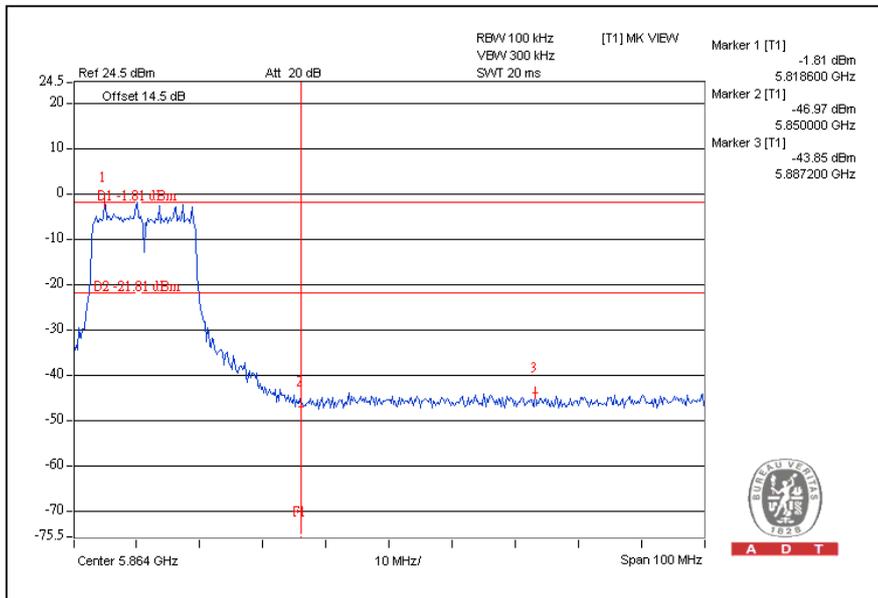
CH149





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CH165

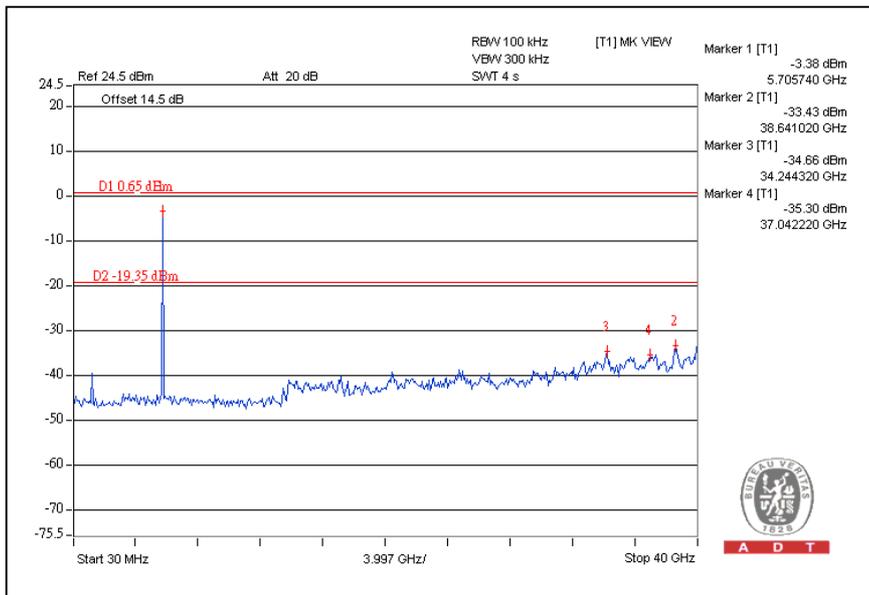
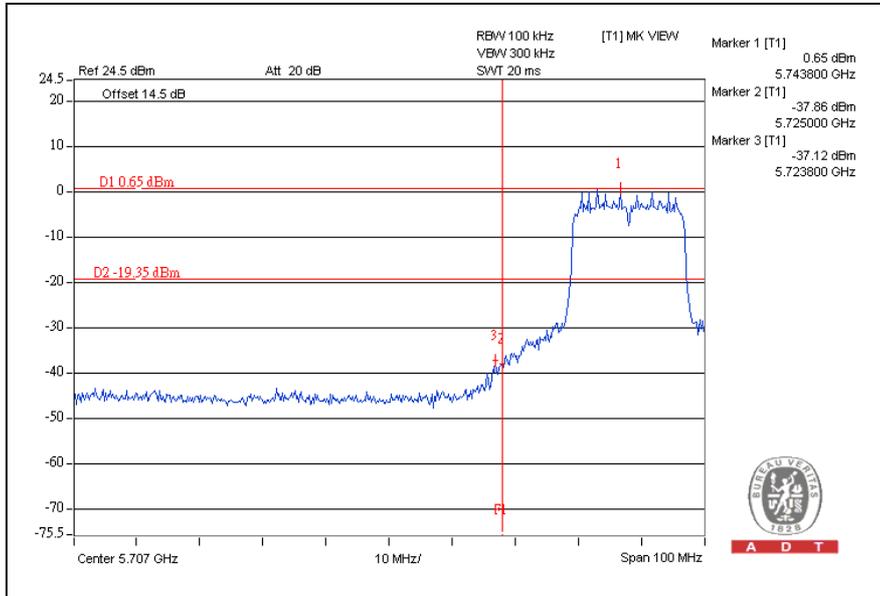




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802.11n (20MHz) OFDM MODULATION:

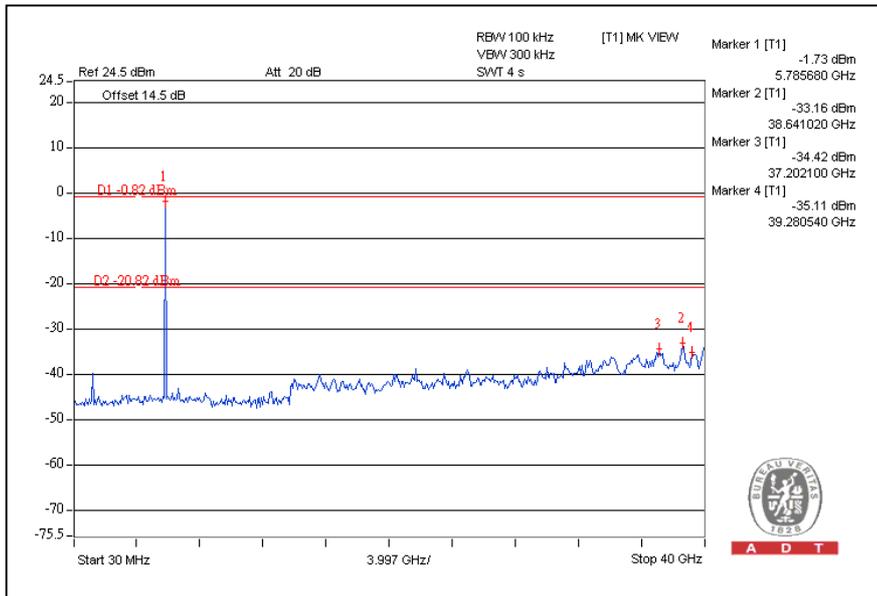
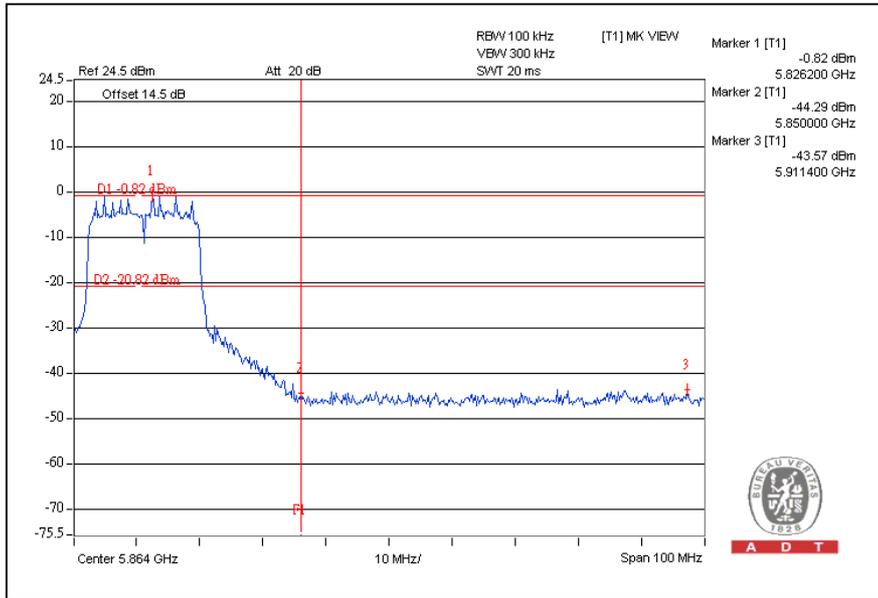
CH149





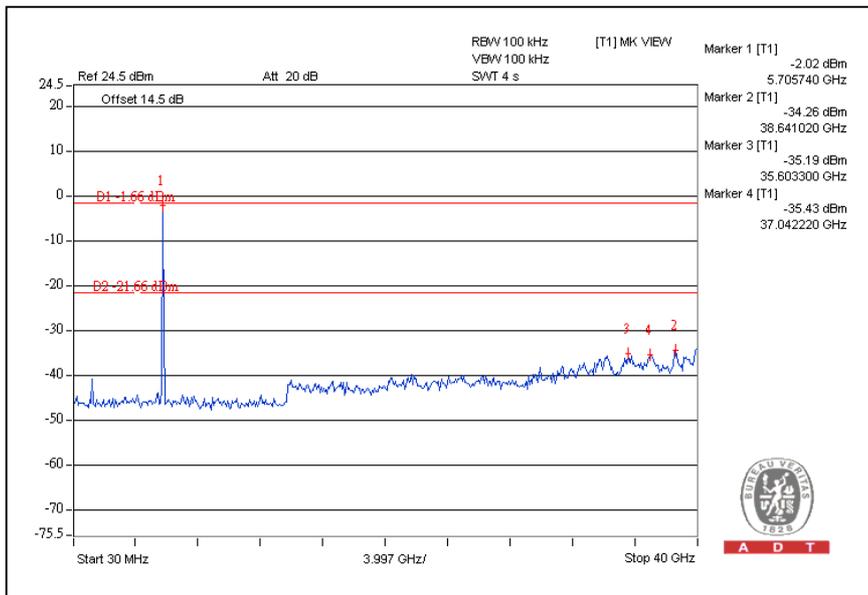
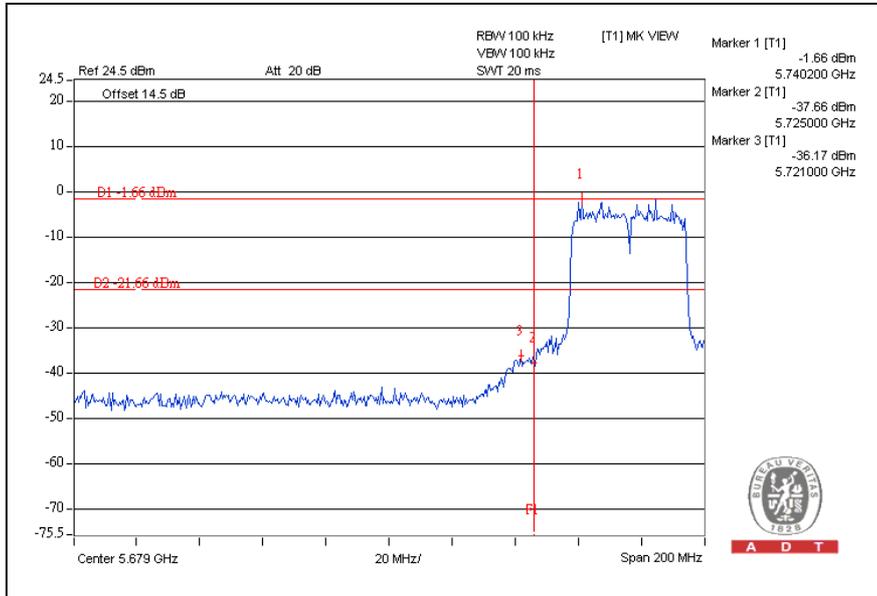
A D T

CH165



802.11n (40MHz) OFDM MODULATION:

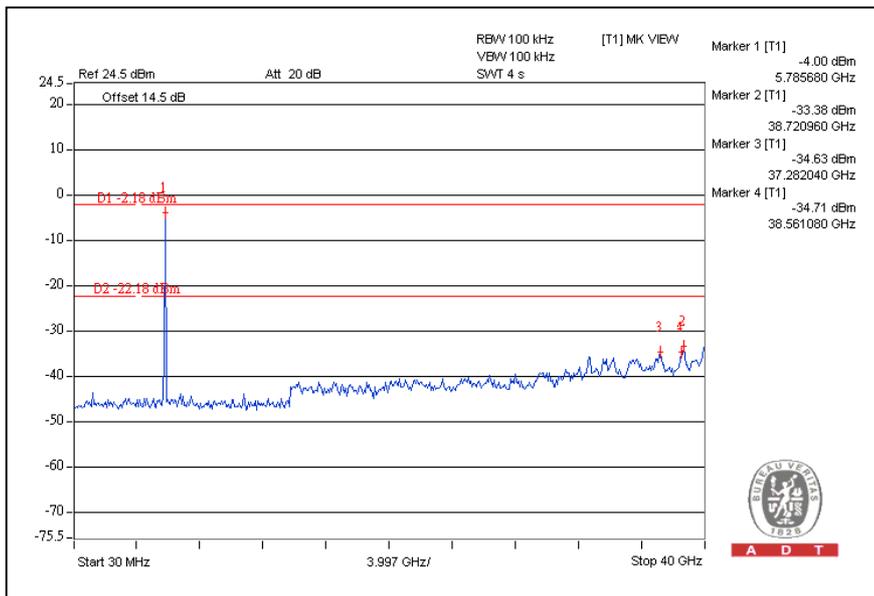
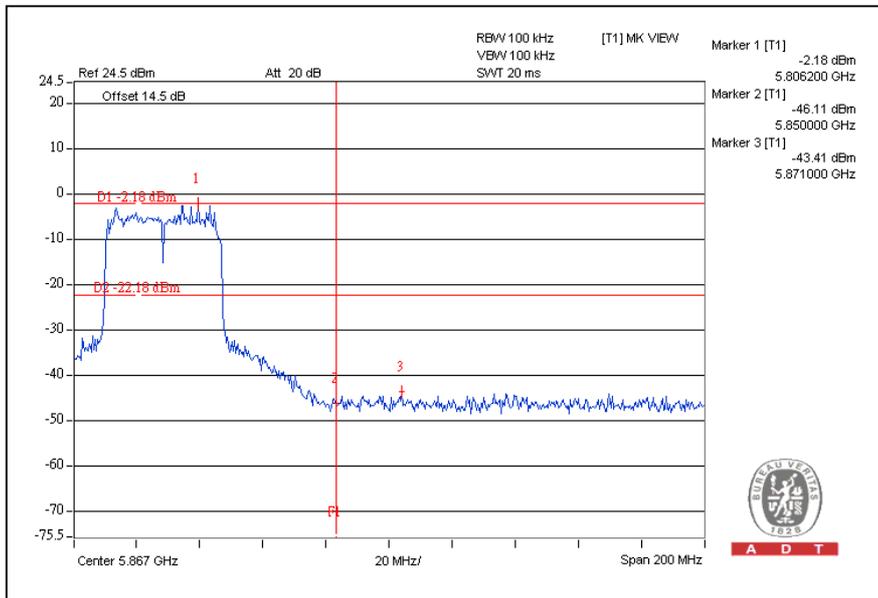
CH151





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CH159





6. INFORMATION ON THE TESTING LABORATORIES

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

Copies of accreditation certificates of our laboratories obtained from approval agencies can be downloaded from our web site: www.adt.com.tw/index.5.phtml. If you have any comments, please feel free to contact us at the following:

Linko EMC/RF Lab:
Tel: 886-2-26052180
Fax: 886-2-26052943

Hsin Chu EMC/RF Lab:
Tel: 886-3-5935343
Fax: 886-3-5935342

Hwa Ya EMC/RF/Safety Telecom Lab:
Tel: 886-3-3183232
Fax: 886-3-3185050

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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7.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 ---