



FCC TEST REPORT (15.247)

REPORT NO.: RF111011C17

MODEL NO.: 8017-01620P, WLU5150-D81,
8017-01622P, 8017-01618P, 8017-01619P,
WLU5151-D81

FCC ID: H8N-WLU5150

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APPLICANT: Askey Computer Corp

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RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF111011C17	Original release	Nov. 28, 2011



1. CERTIFICATION

PRODUCT: Wireless LAN Adaptor
BRAND NAME: Panasonic
MODEL NO.: 8017-01620P, WLU5150-D81, 8017-01622P,
8017-01618P, 8017-01619P, WLU5151-D81
TEST SAMPLE: ENGINEERING SAMPLE
APPLICANT: Askey Computer Corp
TESTED: Nov. 08 to 18, 2011
STANDARDS: FCC Part 15, Subpart C (Section 15.247)
ANSI C63.4-2003
ANSI C63.10-2009

The above equipment (Model: 8017-01622P) 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 : Claire Kuan , **DATE:** Nov. 28, 2011
(Claire Kuan, Specialist)

APPROVED BY : May Chen , **DATE:** Nov. 28, 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 -6.13dB at 0.189MHz
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 4924.00MHz
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	No antenna connector is used.



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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 -8.05dB at 0.189MHz
15.247(a)(2)	Spectrum Bandwidth of a Direct Sequence Spread Spectrum System Limit: min. 500kHz	PASS	Meet the requirement of limit.
15.247(b)	Maximum Peak Output Power Limit: max. 30dBm	PASS	Meet the requirement of limit.
15.247(d)	Radiated Emissions Limit: Table 15.209	PASS	Meet the requirement of limit. Minimum passing margin is -1.6dB at 11570.00MHz
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	No antenna connector is used.

NOTE:

1. The EUT was operating in 2400 ~ 2483.5MHz, 5.15~5.35GHz, 5.47~5.6GHz & 5.65~5.725GHz 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 5.15~5.35GHz, 5.47~5.6GHz & 5.65~5.725GHz 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)	3.89 dB
Radiated emissions (1GHz -18GHz)	2.19 dB
Radiated emissions (18GHz -40GHz)	2.56 dB



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3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

PRODUCT	Wireless LAN Adaptor
MODEL NO.	8017-01620P, WLU5150-D81, 8017-01622P, 8017-01618P, 8017-01619P, WLU5151-D81
FCC ID	H8N-WLU5150
POWER SUPPLY	DC 5V from host equipment
MODULATION TYPE	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM
MODULATION TECHNOLOGY	DSSS, OFDM
TRANSFER RATE	802.11b: up to 11Mbps 802.11a / g: up to 54Mbps 802.11n: up to 300Mbps
OPERATING FREQUENCY	For 15.407 802.11a: 5.18 ~ 5.24GHz, 5.26 ~ 5.32GHz, 5.5~5.58GHz & 5.66~5.7GHz
	For 15.247 802.11b & 802.11g: 2.412 ~ 2.462GHz 802.11a: 5.745 ~ 5.825GHz
NUMBER OF CHANNEL	For 15.407 16 for 802.11a, 802.11n (20MHz) 7 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: 77.3mW 802.11n (20MHz): 64.0mW 802.11n (40MHz): 55.8mW For 15.247(2.4GHz) 802.11b: 54.5mW 802.11g: 381.1mW 802.11n (20MHz): 381.2mW 802.11n (40MHz): 200.0mW For 15.247(5GHz) 802.11a: 447.9mW 802.11n (20MHz): 442.9mW 802.11n (40MHz): 392.6mW
ANTENNA TYPE	Please see note
DATA CABLE	NA
I/O PORTS	NA
ASSOCIATED DEVICES	NA

NOTE:

- The EUT has six model names, which are identical to each other in all aspects except for the following:

Brand	Model Name	USB connector type	Note
Panasonic	8017-01620P	mini type USB connector	Different with enclosure shape
	WLU5150-D81	mini type USB connector	
	8017-01622P	A type USB connector	
	8017-01618P	A type USB connector	
	8017-01619P	A type USB connector	
	WLU5151-D81	A type USB connector	

From the above models, model: **8017-01622P** was selected as representative model for the test and its data was recorded in this report.



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

Set	Transmitter Circuit	Brand	P/N	Antenna Type	Gain (dBi)	Antenna Connector
1	Chain (0) Ant 1(L)	Askey	08B1-1PV1000	PCB	Please refer table 1	NA
	Chain (1) Ant 2(R)	Askey	08B1-1PW1000	PCB	Please refer table 1	NA
Set	Transmitter Circuit	Brand	P/N	Antenna Type	Gain (dBi)	Antenna Connector
2	Chain (0) Ant 1(L)	Askey	08B1-1PV1000	PCB	Please refer table 2	NA
	Chain (1) Ant 2(R)	Askey	08B1-1PW1000	PCB	Please refer table 2	NA

Antenna set 1 was used for model: 8017-01620P, WLU5150-D81

Antenna set 2 was used for model: 8017-01622P, 8017-01618P, 8017-01619P, WLU5151-D81

Table 1

Ant 1(L)	Frequency (MHz)	2412	2450	2484	5180	5250	5350	5500	5725	5806
	Peak Gain (dBi)	-0.83	0.40	1.23	2.45	2.21	2.20	3.14	3.73	3.64
	Average Gain(dBi)	-6.59	-6.26	-5.05	-4.09	-2.31	-2.58	-2.95	-2.82	-2.01
	Efficiency (%)	21.92	23.69	31.24	38.97	58.79	55.20	50.73	52.27	62.96
Ant 2(R)	Frequency (MHz)	2412	2450	2484	5180	5250	5350	5500	5725	5806
	Peak Gain (dBi)	-3.76	-2.96	-0.76	0.99	3.21	3.06	3.29	3.49	3.71
	Average Gain(dBi)	-3.76	-2.96	-0.76	0.99	3.21	3.06	3.29	3.49	3.71
	Efficiency (%)	16.08	18.41	28.57	39.12	56.11	55.78	58.86	59.90	63.23

Table 2

Ant 1(L)	Frequency (MHz)	2412	2450	2484	5180	5250	5350	5500	5725	5806
	Peak Gain (dBi)	0.60	1.72	2.15	3.42	3.55	3.81	4.02	3.89	4.39
	Average Gain(dBi)	-4.68	-3.45	-2.90	-2.25	-2.17	-1.91	-1.95	-1.65	-1.67
	Efficiency (%)	34.05	45.24	51.27	59.55	60.71	64.38	63.89	68.43	68.03
Ant 2(R)	Frequency (MHz)	2412	2450	2484	5180	5250	5350	5500	5725	5806
	Peak Gain (dBi)	-3.40	-2.06	-0.70	2.35	2.47	2.64	3.09	3.16	2.79
	Average Gain(dBi)	-7.75	-6.15	-5.06	-1.99	-2.02	-2.00	-2.10	-1.95	-1.83
	Efficiency (%)	16.79	24.27	31.20	63.30	62.83	63.03	61.64	63.83	65.66

3. The EUT was pre-tested in chamber as the following test modes:

Pre-test Mode	Description
Mode A	A type USB connector with X-Y plane
Mode B	A type USB connector with X-Z plane
Mode C	A type USB connector with Y-Z plane
Mode D	mini type USB connector with X-Y plane
Mode E	mini type USB connector with X-Z plane
Mode F	mini type USB connector with Y-Z plane

From the above modes, for 2.4GHz test the worst radiated test (below 1GHz) was found in **Mode A** and the worst radiated test (above 1GHz) was found in **Mode B**. For 5GHz test the worst radiated test was found in **Mode A**. Therefore only the test data of the mode was recorded in this report.

4. 2.4GHz & 5GHz technology cannot transmit at same time.
5. The EUT incorporates CDD function with 802.11a, 802.11b & 802.11g.
6. The EUT is 2 * 2 spatial MIMO (2Tx & 2Rx) without beam forming function.
7. When the EUT operating in 802.11n, the software operation, which is defined by manufacturer, MCS (Modulation and Coding Schemes) from 0 to 15.
8. 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.

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

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)
A	802.11 b	√	√
B	802.11 g	√	√
C	802.11 a	√	√
D	802.11n(20MHz) for MCS0~15	√	√
E	802.11n(40MHz) for MCS0~15	√	√

Note: 1. The above information was declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or user's manual.

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
For 2.4 GHz 802.11n (20MHz)	1 to 11	6	OFDM	BPSK	6.5	D
For 5 GHz 802.11n (20MHz)	149 to 165	157	OFDM	BPSK	6.5	D



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RADIATED EMISSION TEST (BELOW 1 GHz):

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

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)	COMBINATION
For 2.4 GHz 802.11n (20MHz)	1 to 11	6	OFDM	BPSK	6.5	D
For 5 GHz 802.11n (20MHz)	149 to 165	157	OFDM	BPSK	6.5	D

RADIATED EMISSION TEST (ABOVE 1 GHz):

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

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)	COMBINATION
802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1	A
802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6	B
For 2.4 GHz 802.11n (20MHz)	1 to 11	1, 6, 11	OFDM	BPSK	6.5	D
For 2.4 GHz 802.11n (40MHz)	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:

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

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)	COMBINATION
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

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 (SYSTEM)	TESTED BY
PLC	26deg. C, 61%RH	120Vac, 60Hz	Kent Liu
RE<1G	25deg. C, 69%RH	120Vac, 60Hz	Nelson Teng
RE ³ 1G	24deg. C, 63%RH	120Vac, 60Hz	Amos Chuang
APCM	25deg. C, 60%RH	120Vac, 60Hz	Rex Huang
OB	25deg. C, 60%RH	120Vac, 60Hz	Rex Huang

3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS

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

FCC Part 15, Subpart C. (15.247)

ANSI C63.4-2003

ANSI C63.10-2009

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

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

3.4 DESCRIPTION OF SUPPORT UNITS

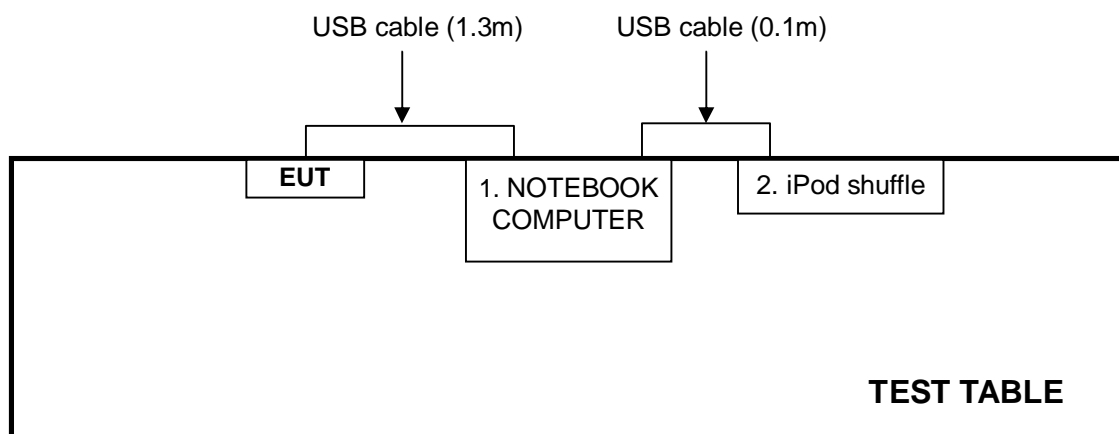
The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	NOTEBOOK COMPUTER	DELL	PP32LA	FSLB32S	FCC DoC
2	iPod shuffle	Apple	MC749TA/A	CC4DN25WDFDM	NA

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	USB Cable (1.3m)
2	USB Cable (0.1m)

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

3.5 CONFIGURATION OF SYSTEM UNDER TEST





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4. TEST TYPES AND RESULTS (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 (dBµV)	
	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: Nov. 18, 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. 07, 2011	Sep. 06, 2012
Line-Impedance Stabilization Network (for Peripheral)	ESH3-Z5	848773/004	Nov. 01, 2011	Oct. 31, 2012
RF Cable (JYBAO)	5DFB	COCCAB-002	Aug. 29, 2011	Aug. 28, 2012
50 ohms Terminator	50	3	Nov. 02, 2011	Nov. 01, 2012
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.

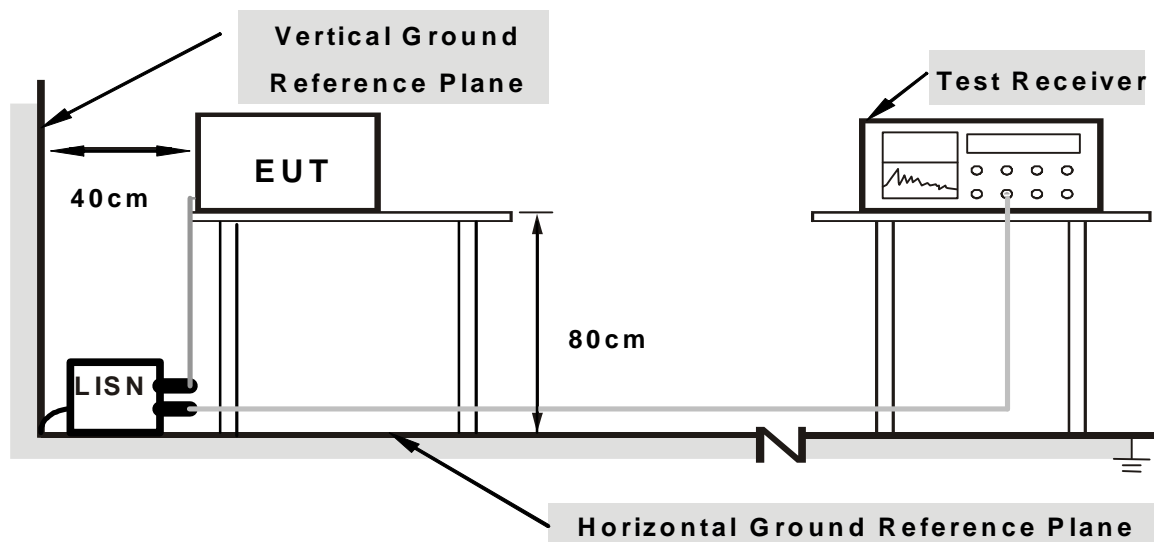
4.1.3 TEST PROCEDURES

- 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

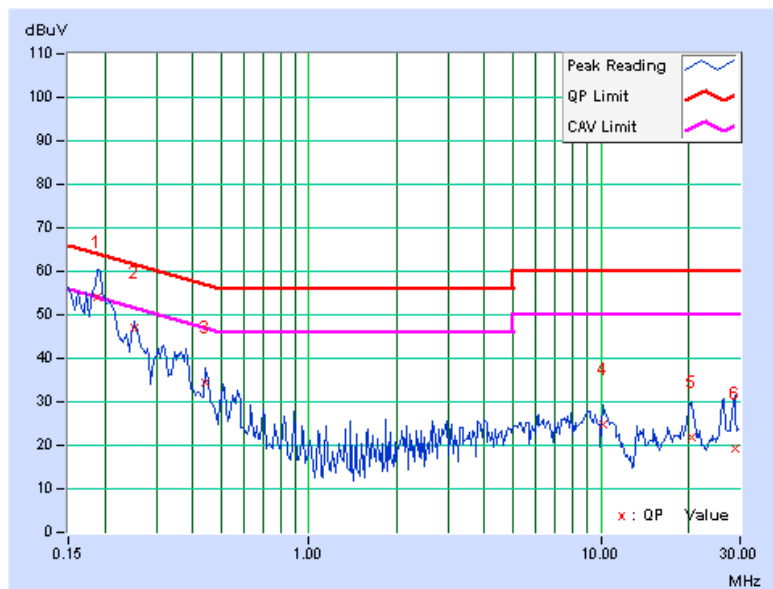
1. Connect the EUT with the support unit 1 (Notebook Computer) which is placed on a testing table.
2. The communication partner run test program “artgui.exe” to enable EUT under transmission/receiving condition continuously at specific channel frequency.

4.1.7 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)	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.189	0.10	53.82	47.21	53.92	47.31	79.00	66.00	-25.08	-18.69
2	0.252	0.10	46.99	39.67	47.09	39.77	79.00	66.00	-31.91	-26.23
3	0.443	0.11	34.19	29.22	34.30	29.33	79.00	66.00	-44.70	-36.67
4	10.148	0.55	24.39	19.28	24.94	19.83	73.00	60.00	-48.06	-40.17
5	20.371	0.79	20.90	14.07	21.69	14.86	73.00	60.00	-51.31	-45.14
6	28.816	0.96	18.13	13.49	19.09	14.45	73.00	60.00	-53.91	-45.55

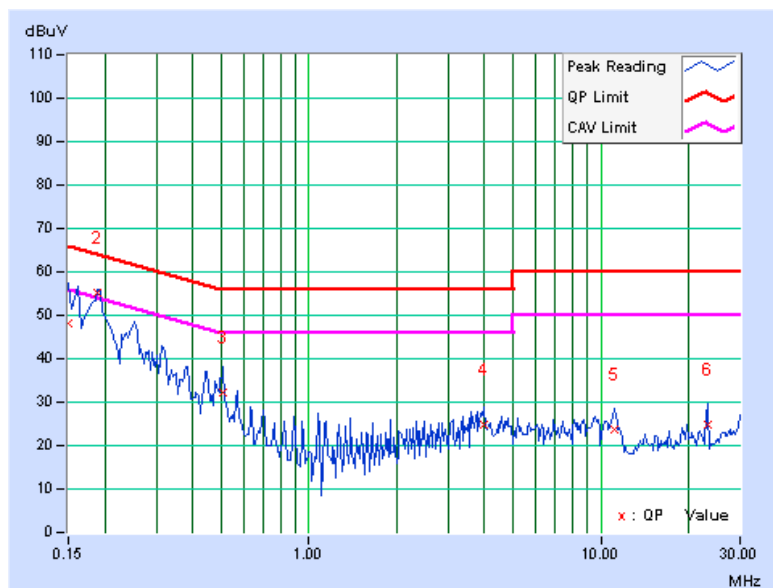
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. The emission levels of other frequencies were very low against the limit.
 3. Margin value = Emission level - Limit value
 4. Correction factor = Insertion loss + Cable loss
 5. Emission Level = Correction Factor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



PHASE	Neutral (N)	6dB BANDWIDTH	9 kHz
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No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
			1	0.150	0.07	48.20	20.61	48.27	20.68	66.00
2	0.189	0.09	54.96	47.86	55.05	47.95	64.08	54.08	-9.03	-6.13
3	0.509	0.11	32.27	26.08	32.38	26.19	56.00	46.00	-23.62	-19.81
4	3.992	0.24	24.61	19.54	24.85	19.78	56.00	46.00	-31.15	-26.22
5	11.160	0.44	23.23	18.93	23.67	19.37	60.00	50.00	-36.33	-30.63
6	23.320	0.74	24.10	17.61	24.84	18.35	60.00	50.00	-35.16	-31.65

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



4.2 RADIATED EMISSION MEASUREMENT

4.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT

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

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

NOTE:

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



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4.2.2 TEST INSTRUMENTS

Test date: Nov. 08 to 10, 2011

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Agilent Spectrum Analyzer	E4446A	MY48250253	Aug. 29, 2011	Aug. 28, 2012
Agilent Pre-Selector	N9039A	MY46520310	Aug. 29, 2011	Aug. 28, 2012
Agilent Signal Generator	N5181A	MY49060347	July 25, 2011	July 24, 2012
Mini-Circuits Pre-Amplifier	ZFL-1000VH2B	AMP-ZFL-04	Nov. 16, 2010	Nov. 15, 2011
Agilent Pre-Amplifier	8449B	3008A02465	Feb. 28, 2011	Feb. 27, 2012
Miteq Pre-Amplifier	AFS33-1800265 0-30-8P-44	881786	Nov. 16, 2010	Nov. 15, 2011
SCHWARZBECK Trilog Broadband Antenna	VULB 9168	9168-361	Apr. 14, 2011	Apr. 13, 2012
AISI Horn_Antenna	AIH.8018	0000220091110	Nov. 22, 2010	Nov. 21, 2011
SCHWARZBECK Horn_Antenna	BBHA 9170	9170-424	Oct. 07, 2011	Oct. 06, 2012
RF CABLE	NA	RF104-205 RF104-207 RF104-202	Dec. 28, 2010	Dec. 27, 2011
RF Cable	NA	CHHCAB_001	Oct. 08, 2011	Oct. 07, 2012
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. H.
4. The FCC Site Registration No. is 797305.
5. The CANADA Site Registration No. is IC 7450H-3.

4.2.3 TEST PROCEDURES

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at 3 meter chamber room. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.
- f. The test-receiver system was set to peak and average detect function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

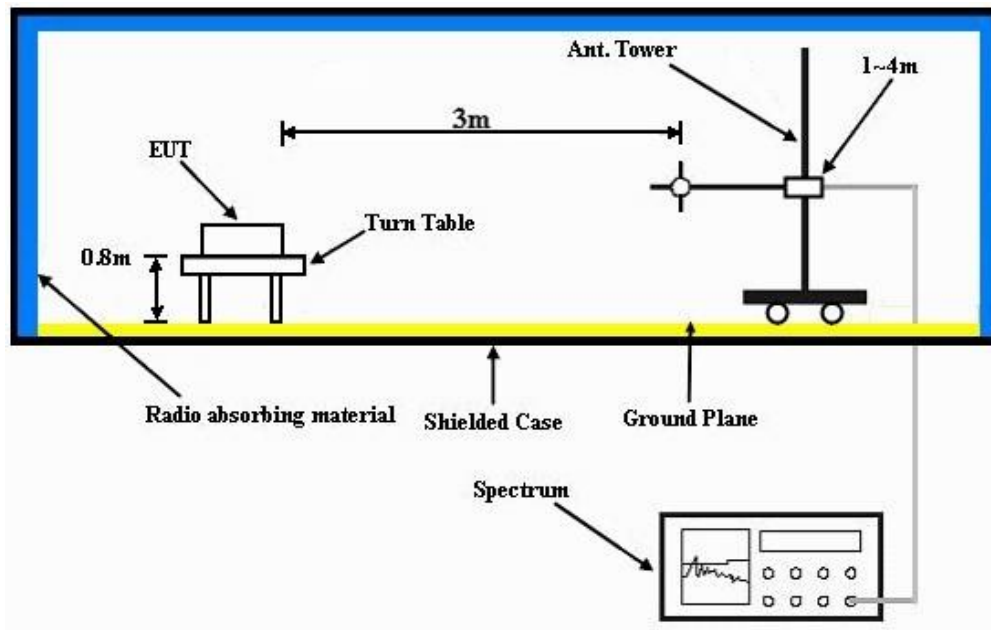
NOTE:

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

4.2.4 DEVIATION FROM TEST STANDARD

No deviation

4.2.5 TEST SETUP



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

4.2.6 EUT OPERATING CONDITIONS

Same as 4.1.6



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4.2.7 TEST RESULTS

BELOW 1GHz WORST-CASE DATA : 802.11n (20MHz) OFDM MODULATION

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	Below 1000MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	27deg. C, 72%RH	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	117.40	33.7 QP	43.5	-9.8	1.50 H	314	21.50	12.17
2	239.96	41.5 QP	46.0	-4.5	1.00 H	354	28.63	12.90
3	335.77	40.6 QP	46.0	-5.4	1.00 H	321	24.37	16.19
4	515.77	41.8 QP	46.0	-4.2	1.50 H	188	21.37	20.41
5	556.27	40.9 QP	46.0	-5.2	1.50 H	195	19.55	21.30
6	960.09	40.9 QP	54.0	-13.1	1.50 H	147	13.08	27.80
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	132.55	32.3 QP	43.5	-11.2	1.00 V	260	18.68	13.61
2	188.69	35.3 QP	43.5	-8.2	1.00 V	258	23.05	12.23
3	240.08	32.8 QP	46.0	-13.2	1.50 V	127	19.91	12.90
4	480.01	40.9 QP	46.0	-5.1	2.00 V	123	21.34	19.58
5	799.51	32.4 QP	46.0	-13.6	1.50 V	217	6.84	25.56
6	959.97	37.2 QP	46.0	-8.8	1.00 V	207	9.36	27.80

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

ABOVE 1GHz WORST-CASE DATA
802.11b DSSS MODULATION

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24deg. C, 63%RH	TESTED BY	Amos Chuang

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	55.7 PK	74.0	-18.3	1.14 H	267	23.82	31.88
2	2390.00	43.4 AV	54.0	-10.6	1.14 H	267	11.52	31.88
3	*2412.00	102.0 PK			1.14 H	267	70.05	31.95
4	*2412.00	99.9 AV			1.14 H	267	67.95	31.95
5	4824.00	54.7 PK	74.0	-19.3	1.03 H	338	13.48	41.22
6	4824.00	50.5 AV	54.0	-3.5	1.03 H	338	9.28	41.22
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	55.2 PK	74.0	-18.8	1.00 V	210	23.32	31.88
2	2390.00	43.2 AV	54.0	-10.8	1.00 V	210	11.32	31.88
3	*2412.00	99.6 PK			1.00 V	209	67.65	31.95
4	*2412.00	96.7 AV			1.00 V	209	64.75	31.95
5	4824.00	56.2 PK	74.0	-17.8	1.03 V	259	14.98	41.22
6	4824.00	53.2 AV	54.0	-0.8	1.03 V	259	11.98	41.22

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



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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24deg. C, 63%RH	TESTED BY	Amos Chuang

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	103.2 PK			2.00 H	229	71.16	32.04
2	*2437.00	100.3 AV			2.00 H	229	68.26	32.04
3	4874.00	55.0 PK	74.0	-19.0	1.04 H	335	13.64	41.36
4	4874.00	50.7 AV	54.0	-3.3	1.04 H	335	9.34	41.36
5	7311.00	54.0 PK	74.0	-20.0	1.36 H	125	8.33	45.67
6	7311.00	42.2 AV	54.0	-11.8	1.36 H	125	-3.47	45.67
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	*2437.00	100.3 PK			1.01 V	222	68.26	32.04
2	*2437.00	97.4 AV			1.01 V	222	65.36	32.04
3	4874.00	56.3 PK	74.0	-17.7	1.02 V	257	14.94	41.36
4	4874.00	53.0 AV	54.0	-1.0	1.02 V	257	11.64	41.36
5	7311.00	53.8 PK	74.0	-20.2	1.42 V	101	8.13	45.67
6	7311.00	41.7 AV	54.0	-12.3	1.42 V	101	-3.97	45.67

- 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.



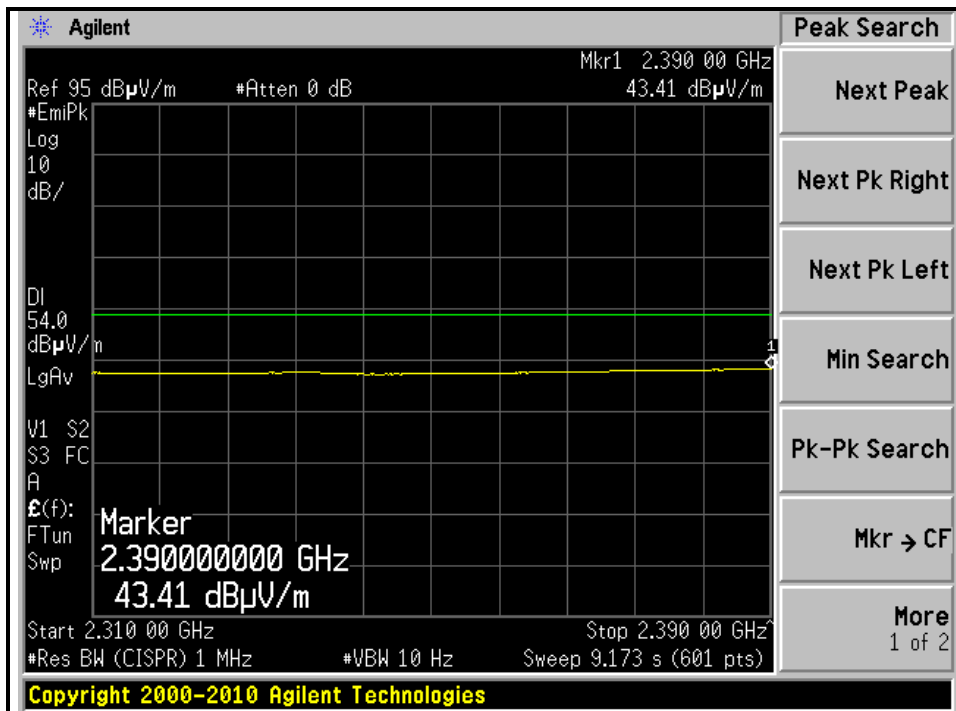
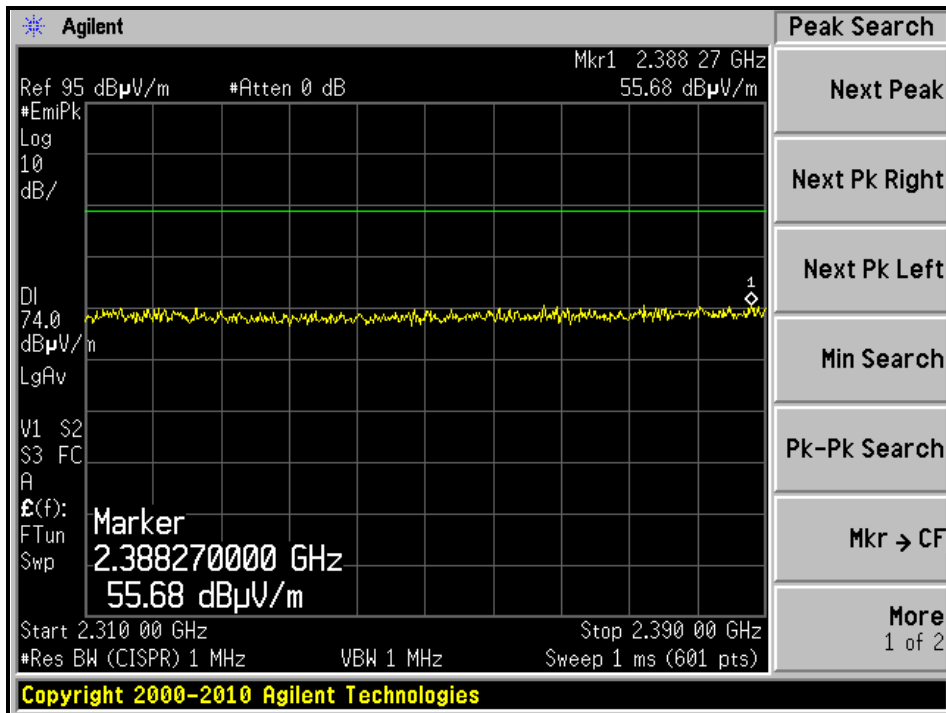
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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24deg. C, 63%RH	TESTED BY	Amos Chuang

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	105.2 PK			1.17 H	276	73.08	32.12
2	*2462.00	102.4 AV			1.17 H	276	70.28	32.12
3	2483.50	56.8 PK	74.0	-17.2	1.17 H	276	24.61	32.19
4	2483.50	44.7 AV	54.0	-9.3	1.17 H	276	12.51	32.19
5	4924.00	54.9 PK	74.0	-19.1	1.03 H	337	13.42	41.48
6	4924.00	50.6 AV	54.0	-3.4	1.03 H	337	9.12	41.48
7	7386.00	53.8 PK	74.0	-20.2	1.34 H	110	7.89	45.91
8	7386.00	42.2 AV	54.0	-11.8	1.34 H	110	-3.71	45.91
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	101.6 PK			1.00 V	211	69.48	32.12
2	*2462.00	99.1 AV			1.00 V	211	66.98	32.12
3	2483.50	56.4 PK	74.0	-17.6	1.00 V	211	24.21	32.19
4	2483.50	43.7 AV	54.0	-10.3	1.00 V	211	11.51	32.19
5	4924.00	56.4 PK	74.0	-17.6	1.02 V	270	14.92	41.48
6	4924.00	53.3 AV	54.0	-0.7	1.02 V	270	11.82	41.48
7	7386.00	53.6 PK	74.0	-20.4	1.43 V	102	7.69	45.91
8	7386.00	41.6 AV	54.0	-12.4	1.43 V	102	-4.31	45.91

- 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.

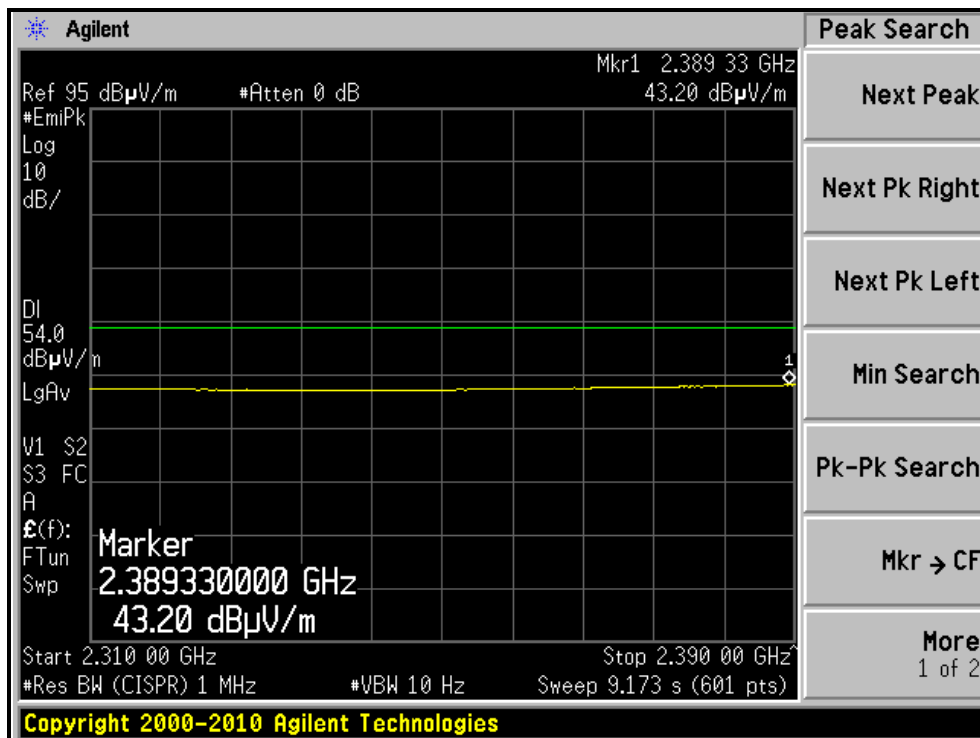
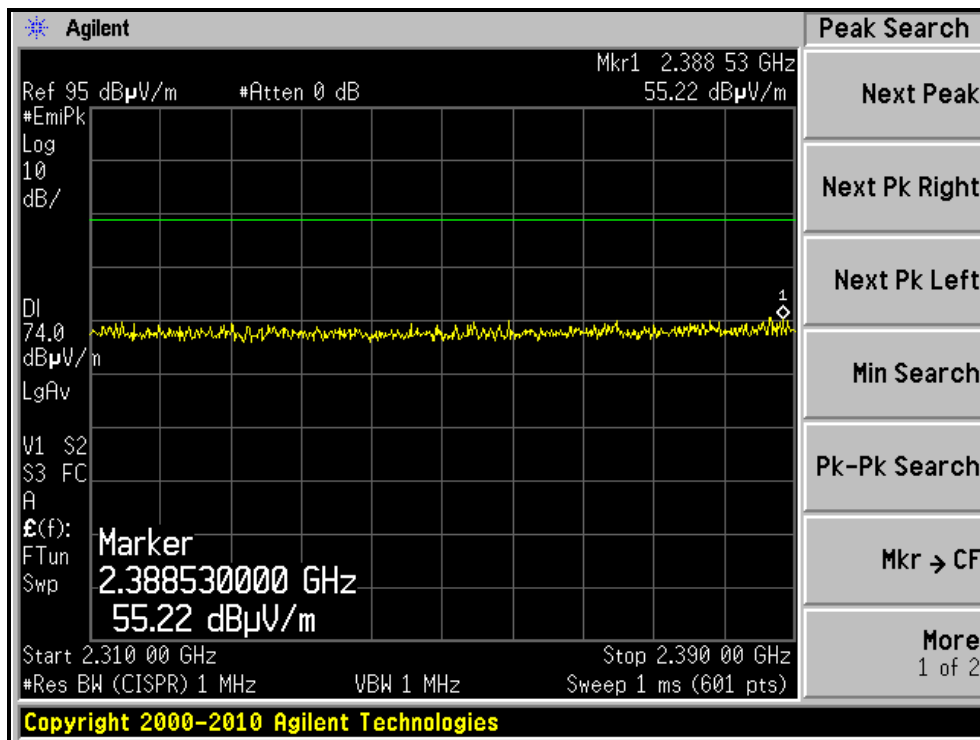
RESTRICTED BANDEDGE (802.11b MODE, CH1, HORIZONTAL)



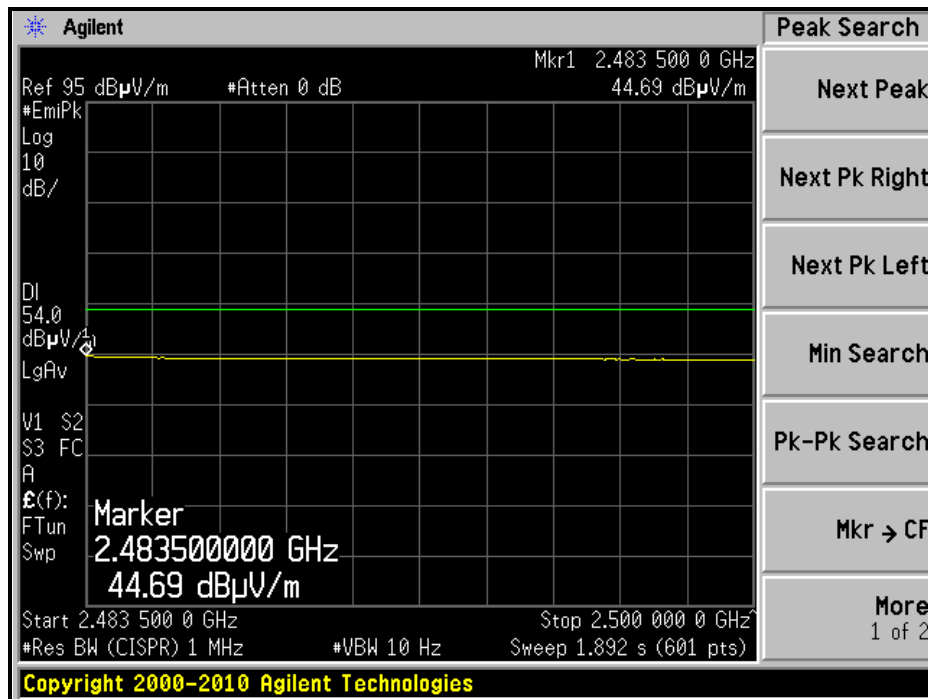
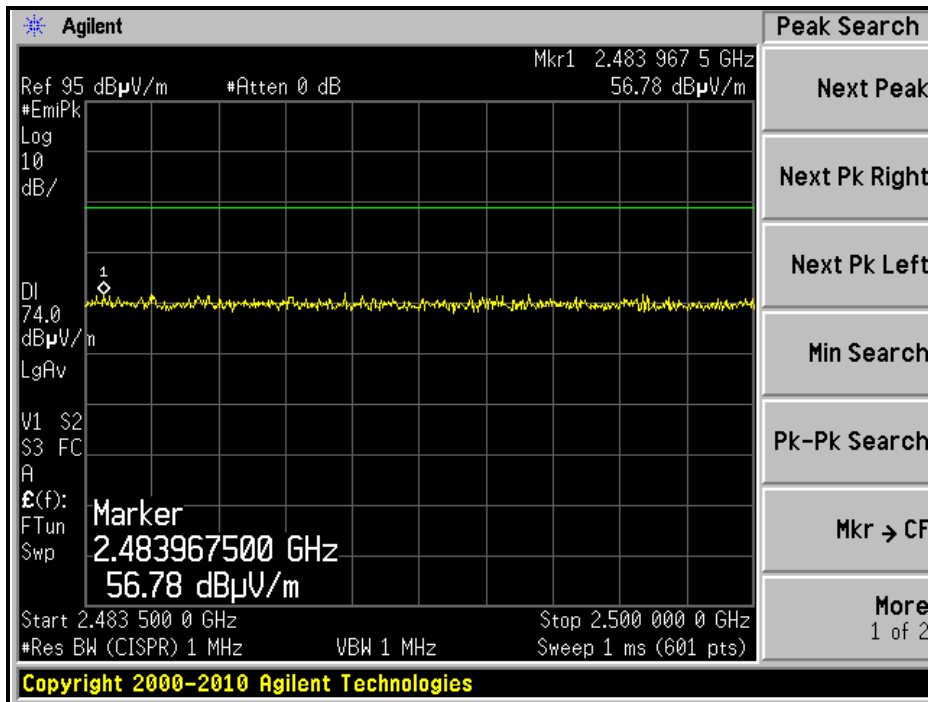


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RESTRICTED BANDEDGE (802.11b MODE, CH1, VERTICAL)



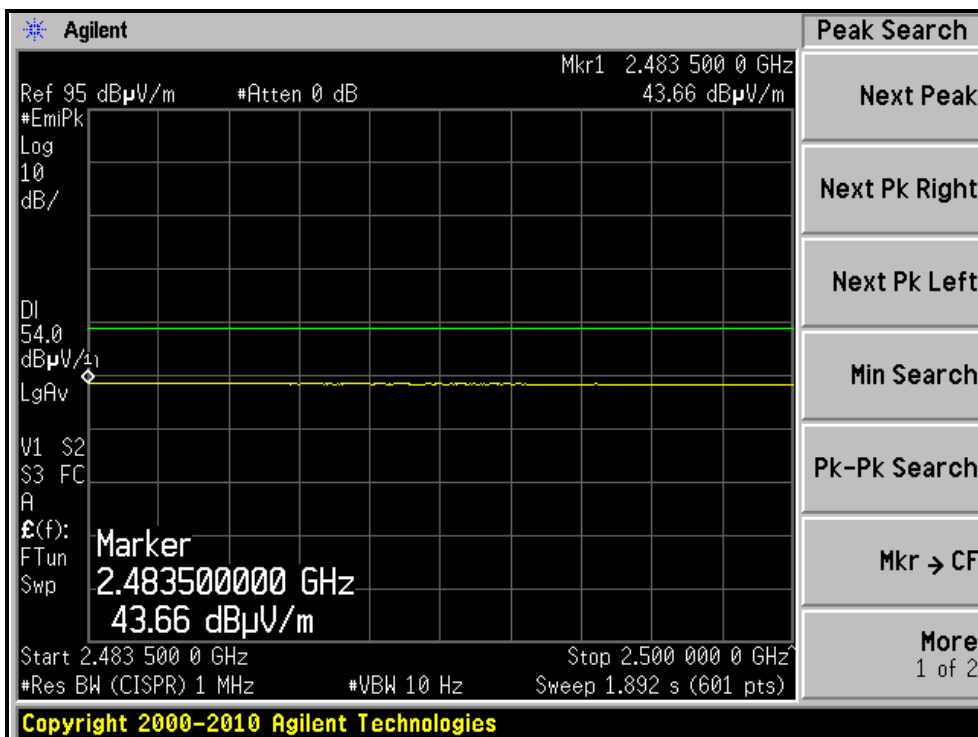
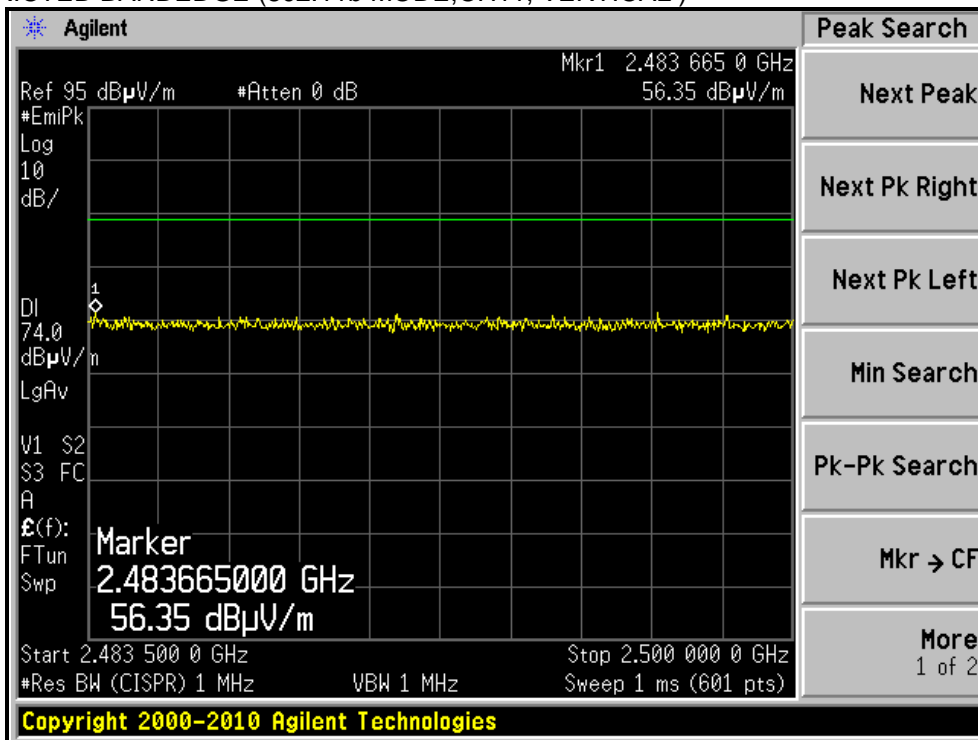
RESTRICTED BANDEDGE (802.11b MODE, CH11, HORIZONTAL)





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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 (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24deg. C, 63%RH	TESTED BY	Amos Chuang

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	72.3 PK	74.0	-1.7	1.21 H	170	40.42	31.88
2	2390.00	53.1 AV	54.0	-0.9	1.21 H	170	21.22	31.88
3	*2412.00	108.5 PK			1.17 H	171	76.55	31.95
4	*2412.00	96.7 AV			1.17 H	171	64.75	31.95
5	4824.00	42.1 PK	74.0	-31.9	1.36 H	300	0.88	41.22
6	4824.00	31.6 AV	54.0	-22.4	1.36 H	300	-9.62	41.22

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	67.0 PK	74.0	-7.0	1.92 V	347	35.12	31.88
2	2390.00	48.3 AV	54.0	-5.7	1.92 V	347	16.42	31.88
3	*2412.00	103.0 PK			1.92 V	347	71.05	31.95
4	*2412.00	91.1 AV			1.92 V	347	59.15	31.95
5	4824.00	45.2 PK	74.0	-28.8	1.12 V	269	3.98	41.22
6	4824.00	34.8 AV	54.0	-19.2	1.12 V	269	-6.42	41.22

- 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 (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24deg. C, 63%RH	TESTED BY	Amos Chuang

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	1.10 H	167	24.52	31.88
2	2390.00	43.9 AV	54.0	-10.1	1.10 H	167	12.02	31.88
3	*2437.00	110.0 PK			1.18 H	172	77.96	32.04
4	*2437.00	97.5 AV			1.18 H	172	65.46	32.04
5	2484.55	57.6 PK	74.0	-16.4	1.18 H	172	25.40	32.20
6	2484.55	44.5 AV	54.0	-9.5	1.18 H	172	12.30	32.20
7	4874.00	42.2 PK	74.0	-31.8	1.32 H	289	0.84	41.36
8	4874.00	31.6 AV	54.0	-22.4	1.32 H	289	-9.76	41.36
9	7311.00	51.8 PK	74.0	-22.2	1.45 H	117	6.13	45.67
10	7311.00	40.1 AV	54.0	-13.9	1.45 H	117	-5.57	45.67

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	*2437.00	109.1 PK			1.33 V	285	77.06	32.04
2	*2437.00	96.7 AV			1.33 V	285	64.66	32.04
3	4874.00	45.7 PK	74.0	-28.3	1.09 V	255	4.34	41.36
4	4874.00	35.2 AV	54.0	-18.8	1.09 V	255	-6.16	41.36
5	7311.00	50.6 PK	74.0	-23.4	1.41 V	123	4.93	45.67
6	7311.00	39.1 AV	54.0	-14.9	1.41 V	123	-6.57	45.67

- 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 11	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24deg. C, 63%RH	TESTED BY	Amos Chuang

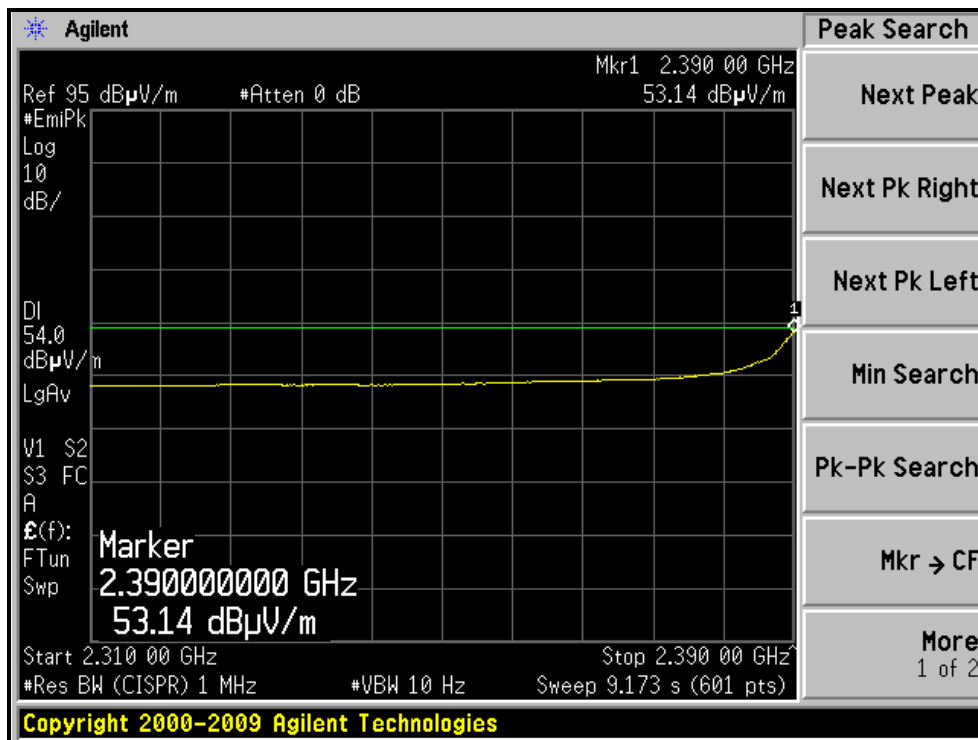
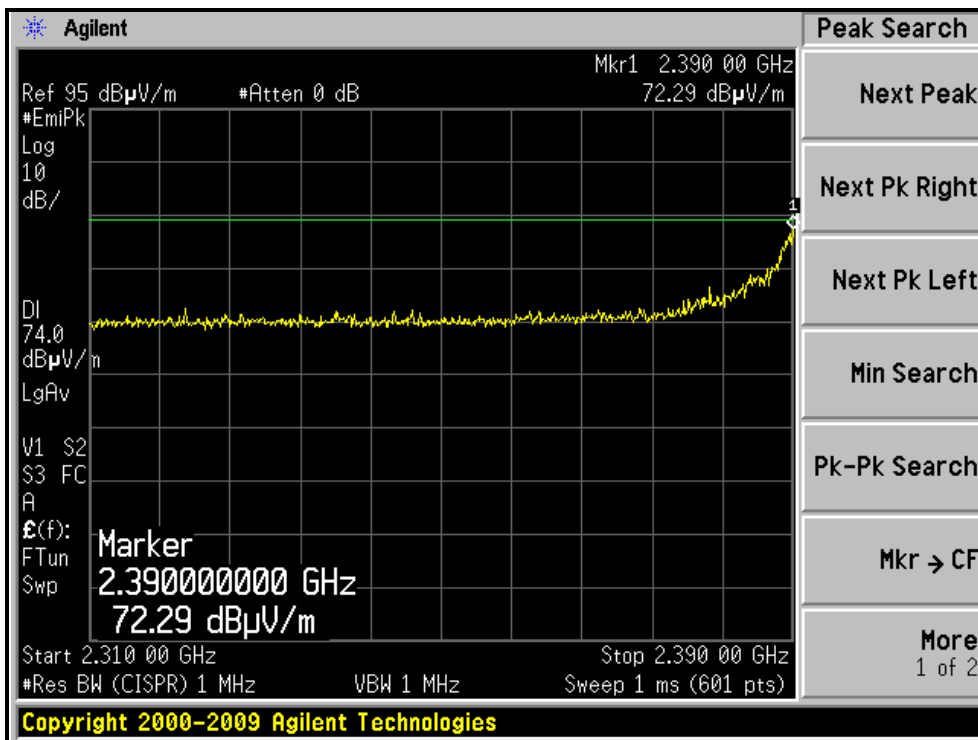
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NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	111.2 PK			1.17 H	166	79.08	32.12
2	*2462.00	99.1 AV			1.17 H	166	66.98	32.12
3	2483.50	73.1 PK	74.0	-0.9	1.14 H	165	40.91	32.19
4	2483.50	52.9 AV	54.0	-1.1	1.14 H	165	20.71	32.19
5	4924.00	42.2 PK	74.0	-31.8	1.31 H	276	0.72	41.48
6	4924.00	31.8 AV	54.0	-22.2	1.31 H	276	-9.68	41.48
7	7386.00	51.4 PK	74.0	-22.6	1.42 H	103	5.49	45.91
8	7386.00	40.0 AV	54.0	-14.0	1.42 H	103	-5.91	45.91
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	107.1 PK			1.00 V	34	74.98	32.12
2	*2462.00	93.7 AV			1.00 V	34	61.58	32.12
3	2483.55	67.3 PK	74.0	-6.7	1.00 V	35	35.11	32.19
4	2483.55	47.6 AV	54.0	-6.4	1.00 V	35	15.41	32.19
5	4924.00	44.2 PK	74.0	-29.8	1.09 V	253	2.72	41.48
6	4924.00	33.6 AV	54.0	-20.4	1.09 V	253	-7.88	41.48
7	7386.00	50.4 PK	74.0	-23.6	1.46 V	113	4.49	45.91
8	7386.00	39.0 AV	54.0	-15.0	1.46 V	113	-6.91	45.91

- 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

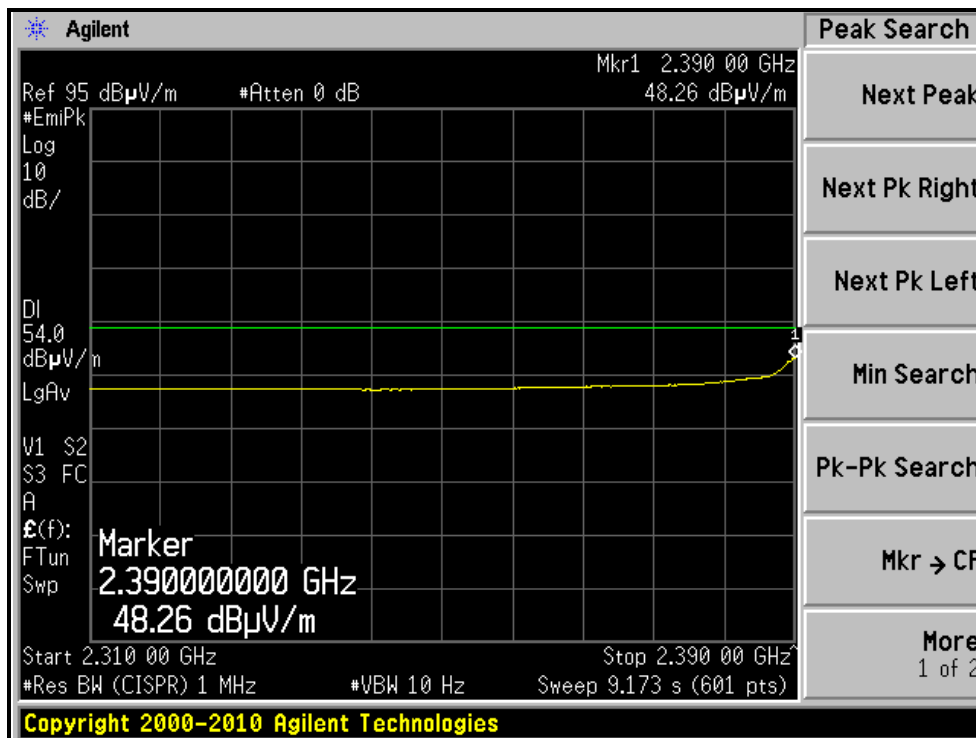
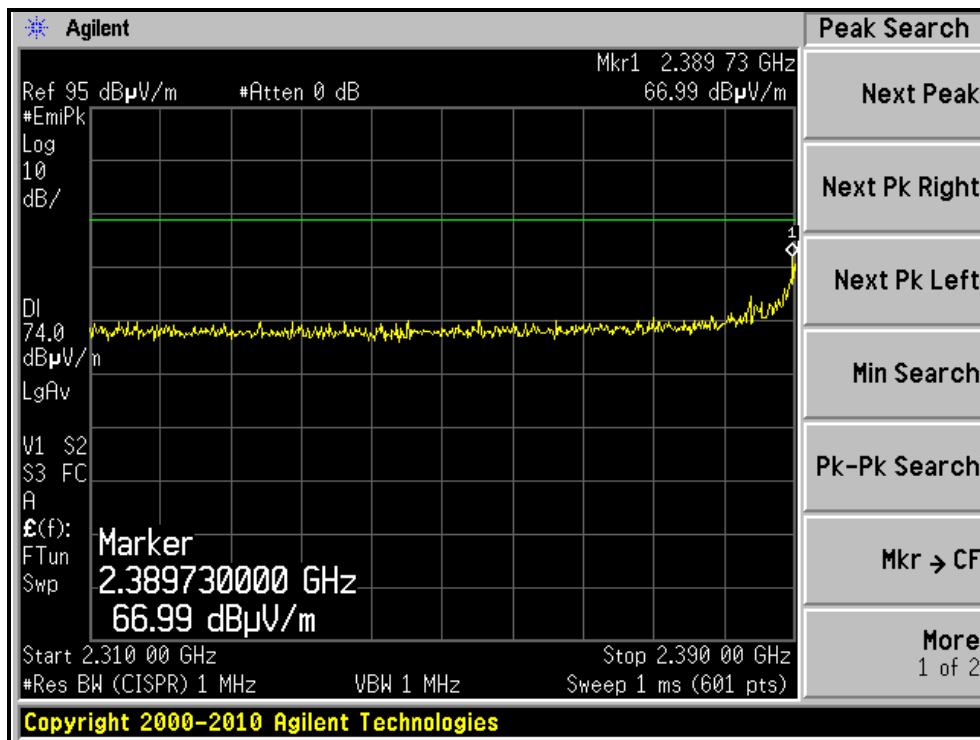
RESTRICTED BANDEDGE (802.11g MODE, CH1, HORIZONTAL)



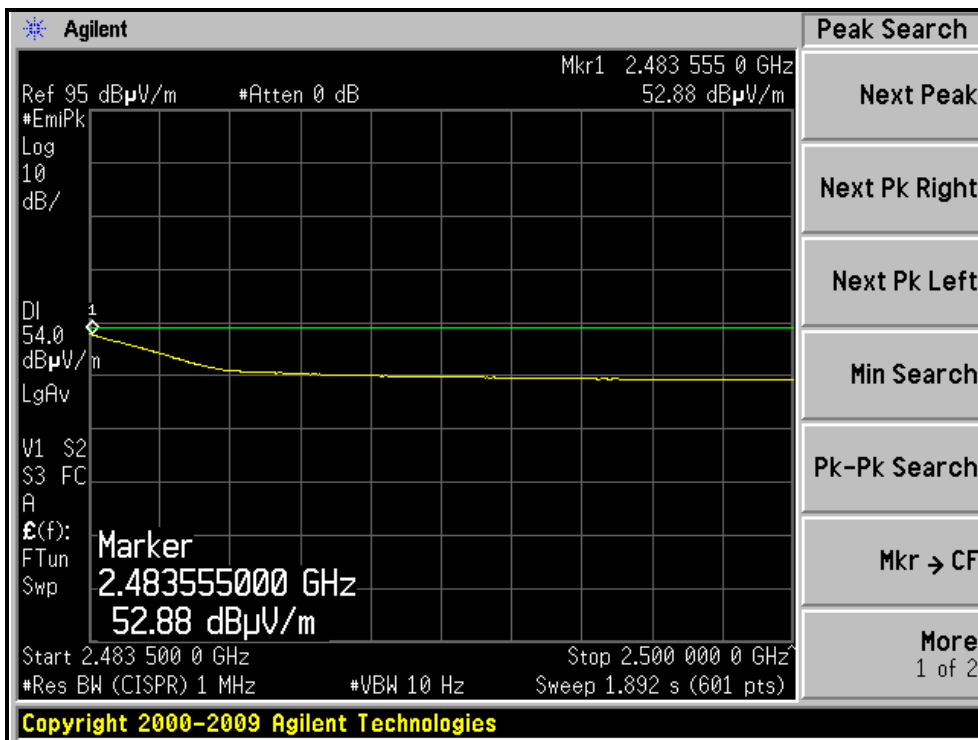
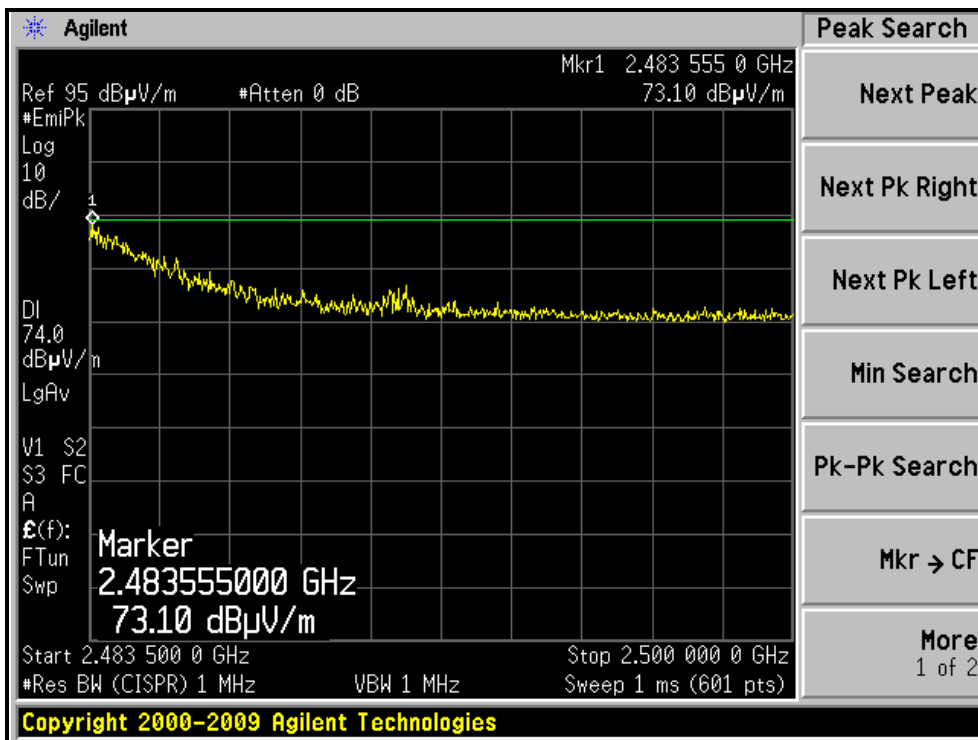


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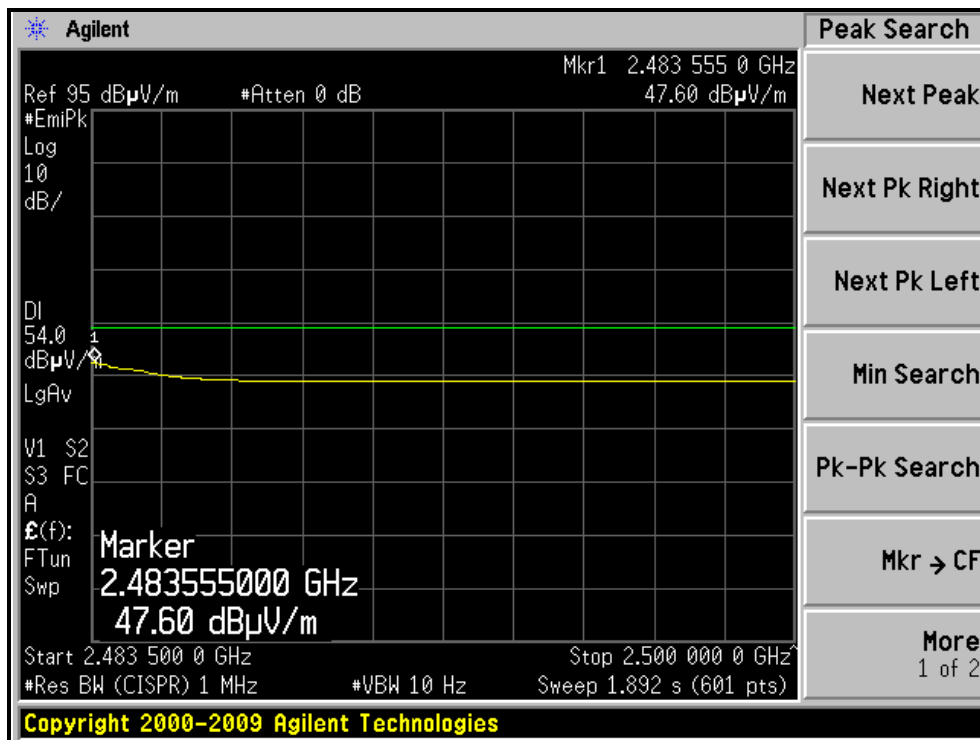
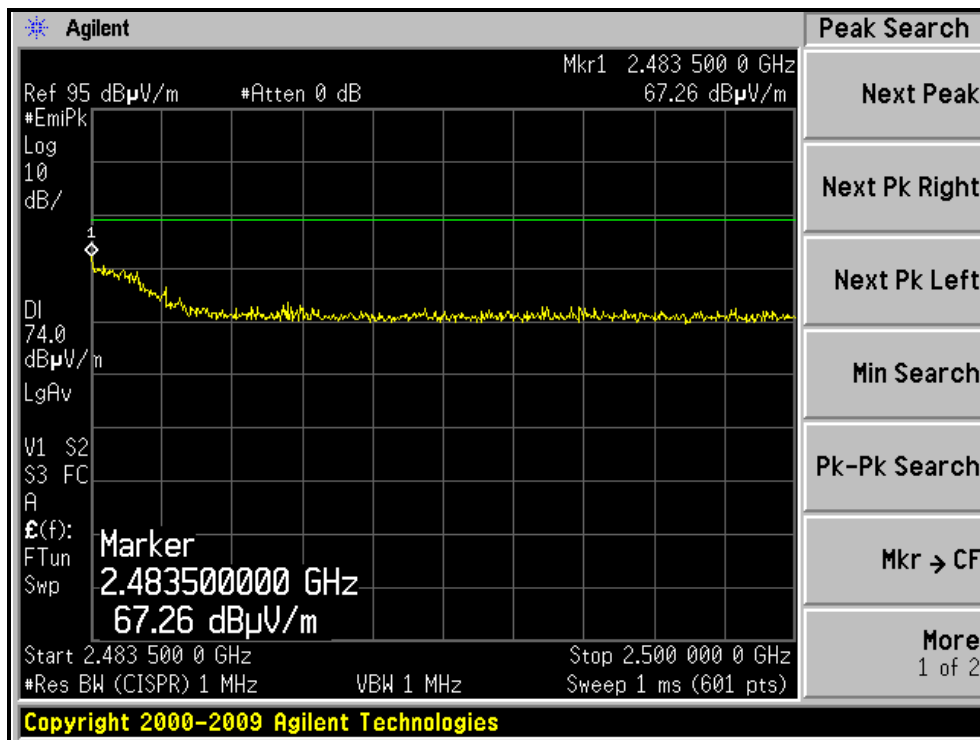
RESTRICTED BANDEDGE (802.11g MODE,CH1, VERTICAL)



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 (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24deg. C, 63%RH	TESTED BY	Amos Chuang

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	72.0 PK	74.0	-2.0	1.17 H	147	40.12	31.88
2	2390.00	52.8 AV	54.0	-1.2	1.17 H	147	20.92	31.88
3	*2412.00	108.1 PK			1.17 H	171	76.15	31.95
4	*2412.00	95.9 AV			1.17 H	171	63.95	31.95
5	4824.00	41.4 PK	74.0	-32.6	1.33 H	274	0.18	41.22
6	4824.00	31.4 AV	54.0	-22.6	1.33 H	274	-9.82	41.22
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	65.8 PK	74.0	-8.2	1.82 V	333	33.92	31.88
2	2390.00	49.5 AV	54.0	-4.5	1.82 V	333	17.62	31.88
3	*2412.00	107.3 PK			1.40 V	264	75.35	31.95
4	*2412.00	94.8 AV			1.40 V	264	62.85	31.95
5	4824.00	43.1 PK	74.0	-30.9	1.03 V	259	1.88	41.22
6	4824.00	32.5 AV	54.0	-21.5	1.03 V	259	-8.72	41.22

- 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 (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24deg. C, 63%RH	TESTED BY	Amos Chuang

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	2388.80	57.6 PK	74.0	-16.4	1.13 H	181	25.72	31.88
2	2388.80	44.7 AV	54.0	-9.3	1.13 H	181	12.82	31.88
3	*2437.00	109.9 PK			1.16 H	173	77.86	32.04
4	*2437.00	97.3 AV			1.16 H	173	65.26	32.04
5	2483.50	57.0 PK	74.0	-17.0	1.20 H	157	24.81	32.19
6	2483.50	44.5 AV	54.0	-9.5	1.20 H	157	12.31	32.19
7	4874.00	41.9 PK	74.0	-32.1	1.32 H	260	0.54	41.36
8	4874.00	31.8 AV	54.0	-22.2	1.32 H	260	-9.56	41.36
9	7311.00	50.8 PK	74.0	-23.2	1.47 H	110	5.13	45.67
10	7311.00	39.7 AV	54.0	-14.3	1.47 H	110	-5.97	45.67
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	*2437.00	108.8 PK			1.37 V	271	76.76	32.04
2	*2437.00	96.2 AV			1.37 V	271	64.16	32.04
3	4874.00	43.5 PK	74.0	-30.5	1.04 V	256	2.14	41.36
4	4874.00	33.1 AV	54.0	-20.9	1.04 V	256	-8.26	41.36
5	7311.00	50.7 PK	74.0	-23.3	1.42 V	101	5.03	45.67
6	7311.00	39.5 AV	54.0	-14.5	1.42 V	101	-6.17	45.67

- 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.



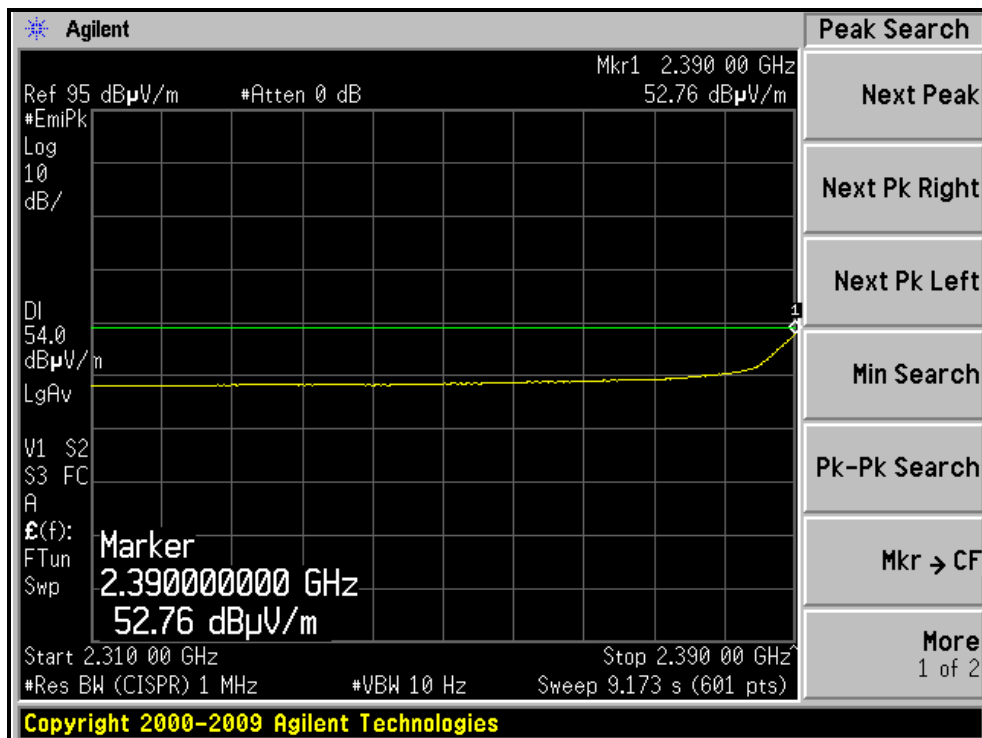
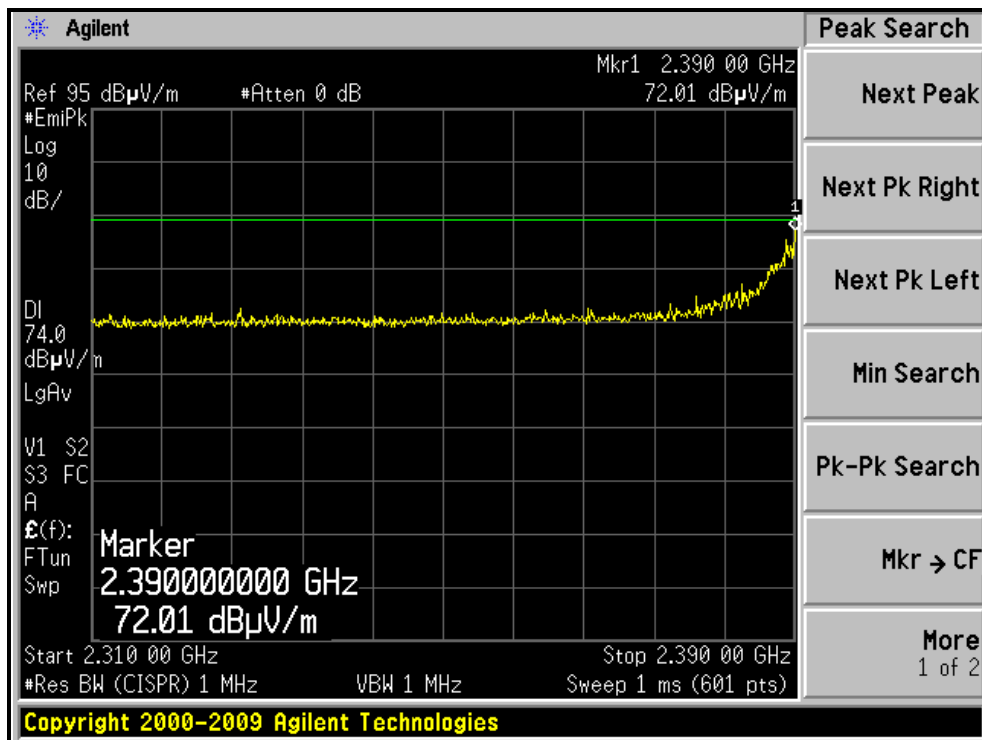
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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24deg. C, 63%RH	TESTED BY	Amos Chuang

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	106.0 PK			1.17 H	169	73.88	32.12
2	*2462.00	93.7 AV			1.17 H	169	61.58	32.12
3	2483.50	72.5 PK	74.0	-1.5	1.16 H	165	40.31	32.19
4	2483.50	52.9 AV	54.0	-1.1	1.16 H	165	20.71	32.19
5	4924.00	43.0 PK	74.0	-31.0	1.32 H	252	1.52	41.48
6	4924.00	32.5 AV	54.0	-21.5	1.32 H	252	-8.98	41.48
7	7386.00	50.7 PK	74.0	-23.3	1.52 H	111	4.79	45.91
8	7386.00	39.3 AV	54.0	-14.7	1.52 H	111	-6.61	45.91
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	103.1 PK			1.24 V	164	70.98	32.12
2	*2462.00	90.4 AV			1.24 V	164	58.28	32.12
3	2483.50	68.9 PK	74.0	-5.1	1.09 V	342	36.71	32.19
4	2483.50	49.8 AV	54.0	-4.2	1.09 V	342	17.61	32.19
5	4924.00	42.9 PK	74.0	-31.1	1.05 V	261	1.42	41.48
6	4924.00	32.4 AV	54.0	-21.6	1.05 V	261	-9.08	41.48
7	7386.00	51.0 PK	74.0	-23.0	1.46 V	103	5.09	45.91
8	7386.00	39.8 AV	54.0	-14.2	1.46 V	103	-6.11	45.91

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

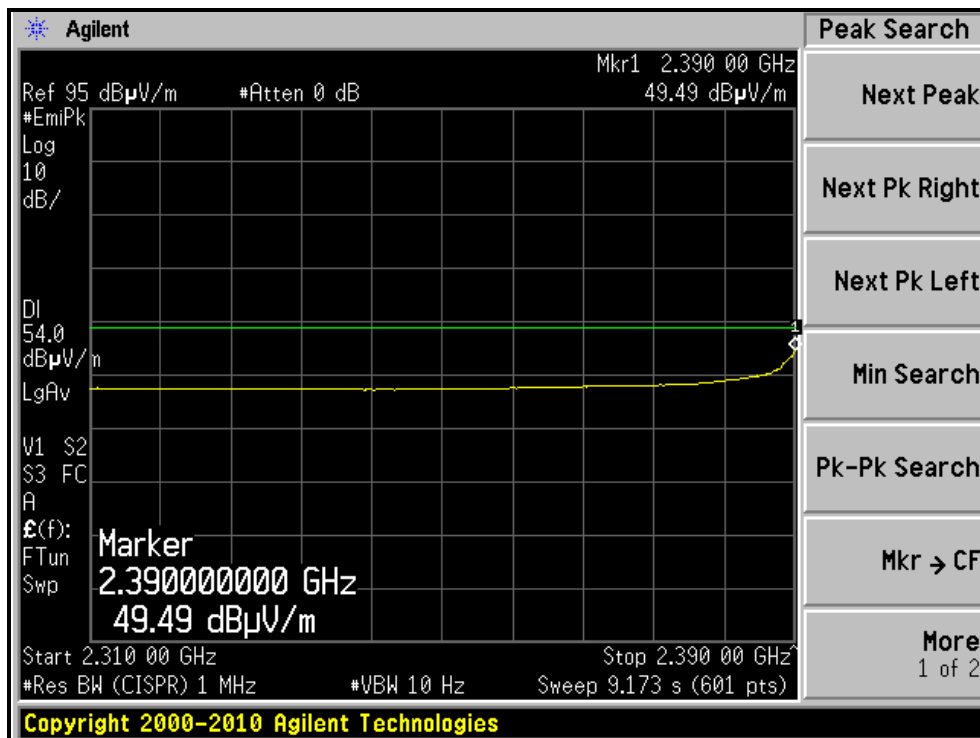
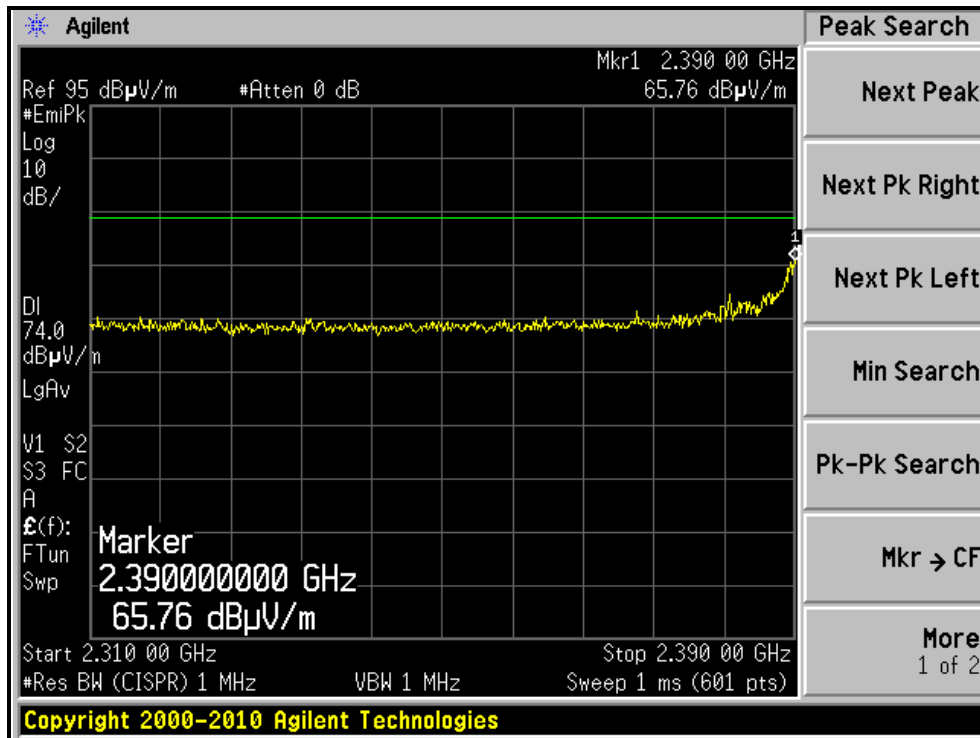
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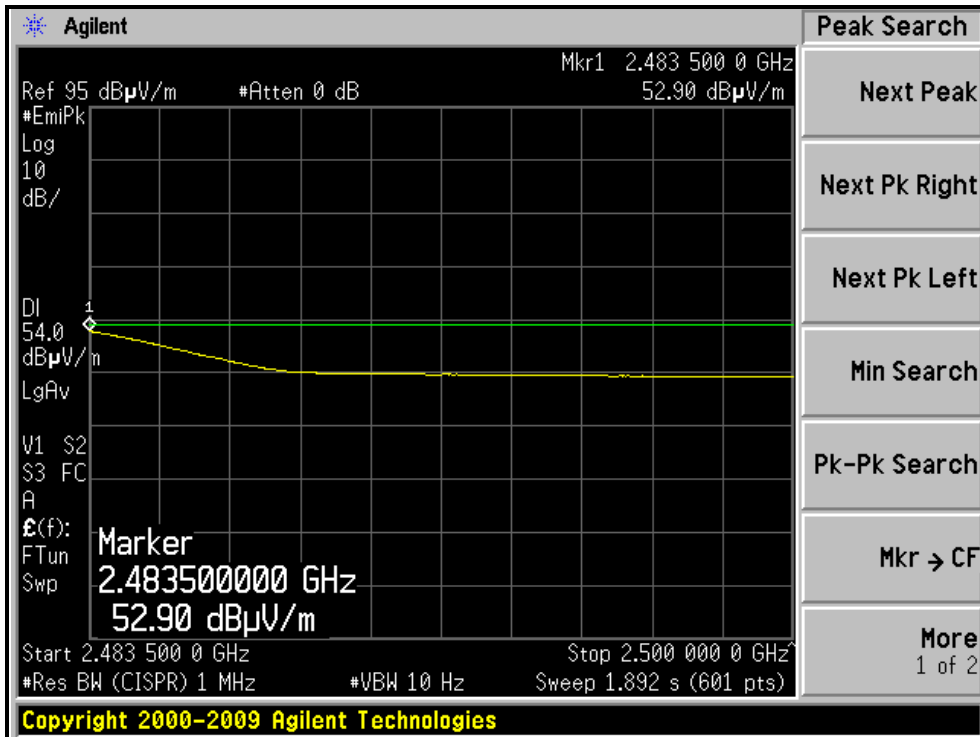
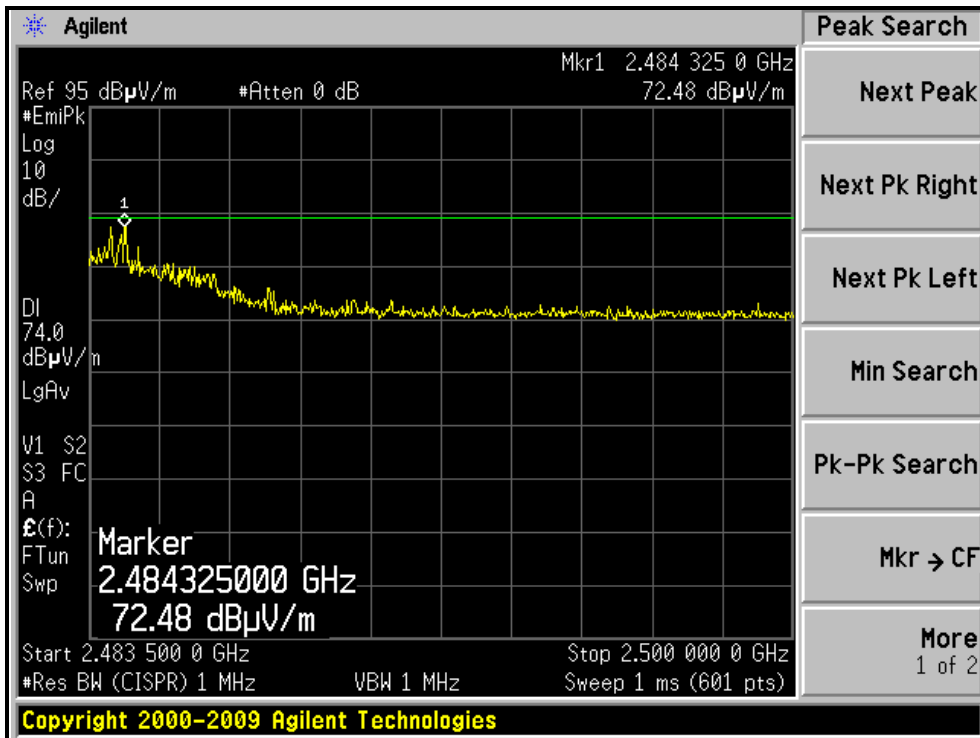


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RESTRICTED BANDEDGE (802.11n (20MHz) MODE,CH1, VERTICAL)



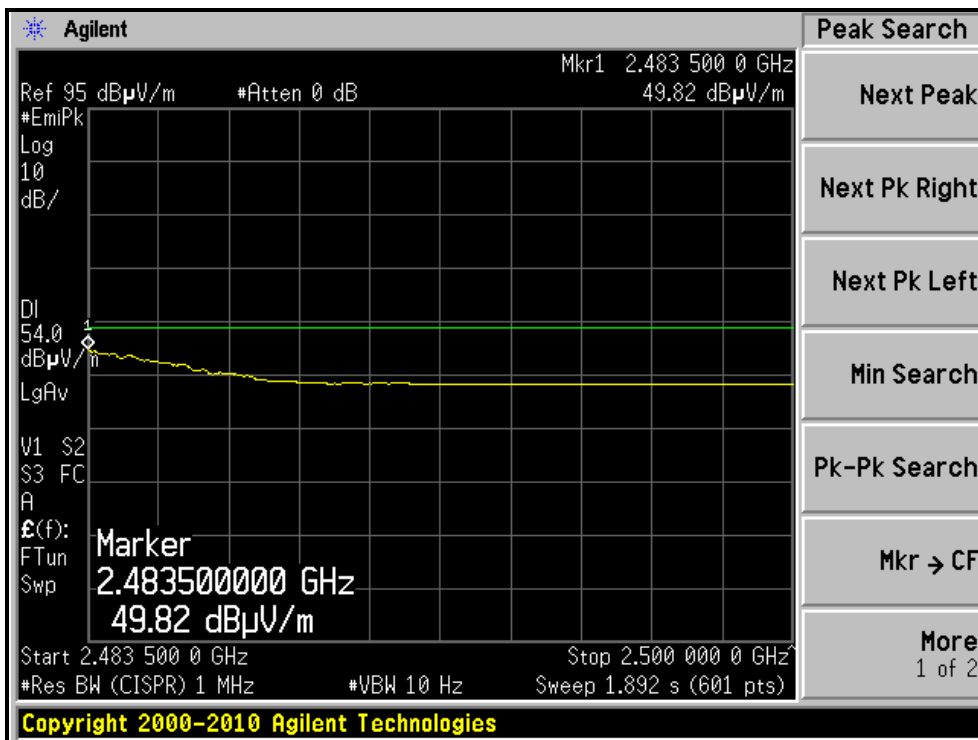
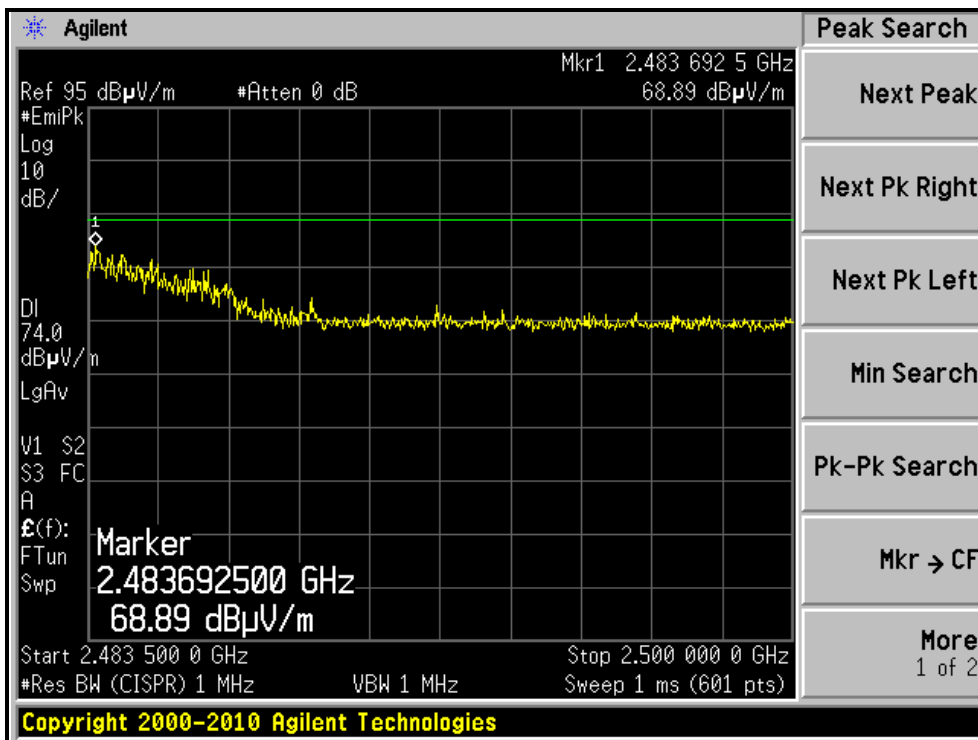
RESTRICTED BANDEDGE (802.11n (20MHz) MODE,CH11, HORIZONTAL)





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 (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24deg. C, 63%RH	TESTED BY	Amos Chuang

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	67.2 PK	74.0	-6.8	1.11 H	166	35.32	31.88
2	2390.00	53.0 AV	54.0	-1.0	1.11 H	166	21.12	31.88
3	*2422.00	103.6 PK			1.10 H	164	71.62	31.98
4	*2422.00	92.1 AV			1.10 H	164	60.12	31.98
5	4844.00	42.4 PK	74.0	-31.6	1.32 H	253	1.12	41.28
6	4844.00	32.1 AV	54.0	-21.9	1.32 H	253	-9.18	41.28
7	7266.00	50.6 PK	74.0	-23.4	1.53 H	96	5.05	45.55
8	7266.00	39.4 AV	54.0	-14.6	1.53 H	96	-6.15	45.55

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	63.3 PK	74.0	-10.7	1.22 V	168	31.42	31.88
2	2390.00	48.8 AV	54.0	-5.2	1.22 V	168	16.92	31.88
3	*2422.00	98.8 PK			1.22 V	167	66.82	31.98
4	*2422.00	86.8 AV			1.22 V	167	54.82	31.98
5	4844.00	42.6 PK	74.0	-31.4	1.05 V	266	1.32	41.28
6	4844.00	32.5 AV	54.0	-21.5	1.05 V	266	-8.78	41.28
7	7266.00	50.7 PK	74.0	-23.3	1.47 V	103	5.15	45.55
8	7266.00	39.6 AV	54.0	-14.4	1.47 V	103	-5.95	45.55

- 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 (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24deg. C, 63%RH	TESTED BY	Amos Chuang

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	68.4 PK	74.0	-5.6	1.12 H	165	36.52	31.88
2	2390.00	53.2 AV	54.0	-0.8	1.12 H	165	21.32	31.88
3	*2437.00	106.3 PK			1.09 H	164	74.26	32.04
4	*2437.00	94.8 AV			1.09 H	164	62.76	32.04
5	2483.50	71.7 PK	74.0	-2.3	1.09 H	162	39.51	32.19
6	2483.50	53.1 AV	54.0	-0.9	1.09 H	162	20.91	32.19
7	4874.00	42.8 PK	74.0	-31.2	1.37 H	253	1.44	41.36
8	4874.00	32.5 AV	54.0	-21.5	1.37 H	253	-8.86	41.36
9	7311.00	51.2 PK	74.0	-22.8	1.49 H	101	5.53	45.67
10	7311.00	39.7 AV	54.0	-14.3	1.49 H	101	-5.97	45.67

- 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 (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24deg. C, 63%RH	TESTED BY	Amos Chuang

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	62.6 PK	74.0	-11.4	1.19 V	165	30.72	31.88
2	2390.00	47.7 AV	54.0	-6.3	1.19 V	165	15.82	31.88
3	*2437.00	101.2 PK			1.20 V	164	69.16	32.04
4	*2437.00	88.8 AV			1.20 V	164	56.76	32.04
5	2483.50	64.8 PK	74.0	-9.2	1.20 V	165	32.61	32.19
6	2483.50	48.6 AV	54.0	-5.4	1.20 V	165	16.41	32.19
7	4874.00	43.7 PK	74.0	-30.3	1.06 V	264	2.34	41.36
8	4874.00	33.6 AV	54.0	-20.4	1.06 V	264	-7.76	41.36
9	7311.00	51.1 PK	74.0	-22.9	1.43 V	99	5.43	45.67
10	7311.00	39.1 AV	54.0	-14.9	1.43 V	99	-6.57	45.67

- 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.



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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 9	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24deg. C, 63%RH	TESTED BY	Amos Chuang

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	104.7 PK			1.07 H	165	72.61	32.09
2	*2452.00	91.7 AV			1.07 H	165	59.61	32.09
3	2483.50	68.1 PK	74.0	-5.9	1.00 H	163	35.91	32.19
4	2483.50	53.0 AV	54.0	-1.0	1.00 H	163	20.81	32.19
5	4904.00	41.9 PK	74.0	-32.1	1.33 H	243	0.46	41.44
6	4904.00	31.6 AV	54.0	-22.4	1.33 H	243	-9.84	41.44
7	7356.00	50.2 PK	74.0	-23.8	1.54 H	105	4.39	45.81
8	7356.00	39.0 AV	54.0	-15.0	1.54 H	105	-6.81	45.81

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

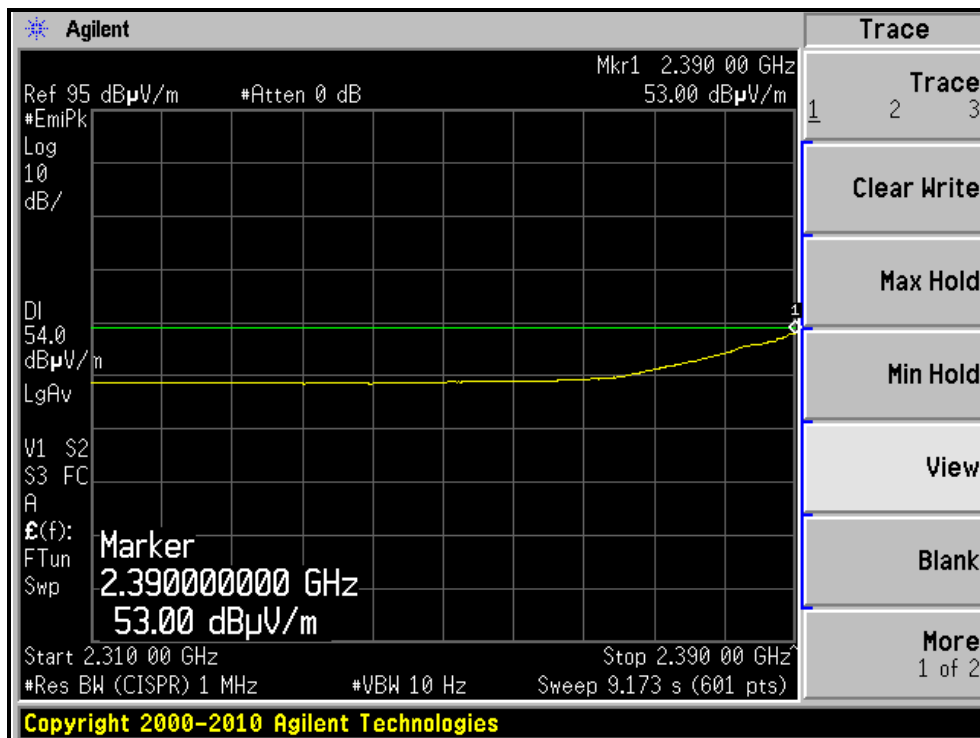
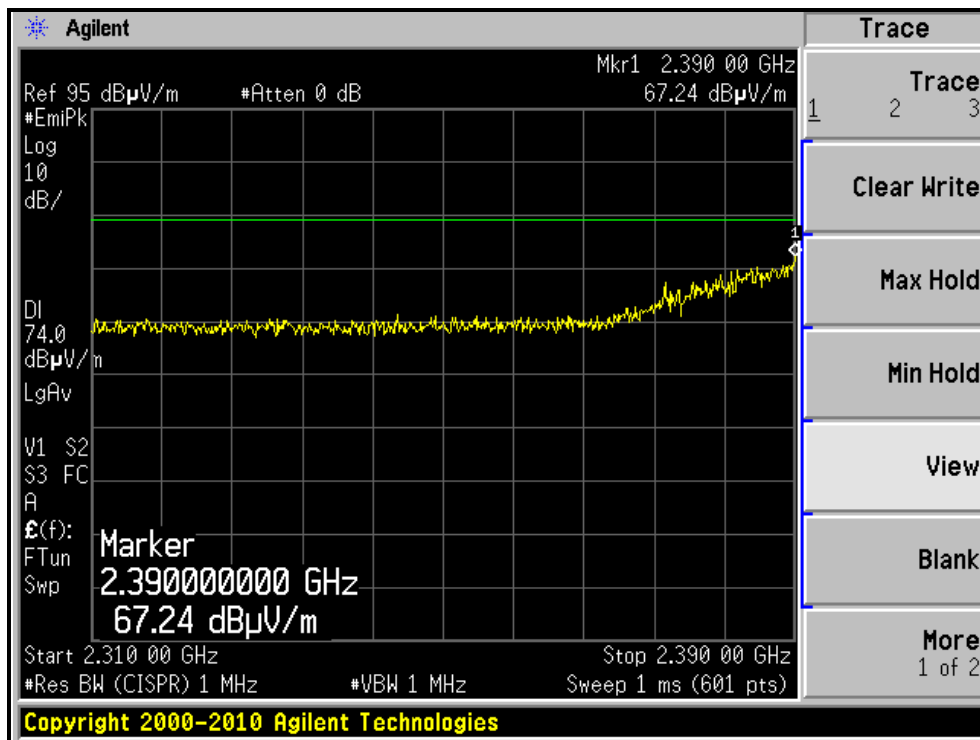
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2452.00	99.7 PK			1.19 V	165	67.61	32.09
2	*2452.00	86.6 AV			1.19 V	165	54.51	32.09
3	2483.50	64.7 PK	74.0	-9.3	1.20 V	165	32.51	32.19
4	2483.50	49.6 AV	54.0	-4.4	1.20 V	165	17.41	32.19
5	4904.00	42.5 PK	74.0	-31.5	1.05 V	255	1.06	41.44
6	4904.00	31.2 AV	54.0	-22.8	1.05 V	255	-10.24	41.44
7	7356.00	51.0 PK	74.0	-23.0	1.42 V	101	5.19	45.81
8	7356.00	39.9 AV	54.0	-14.1	1.42 V	101	-5.91	45.81

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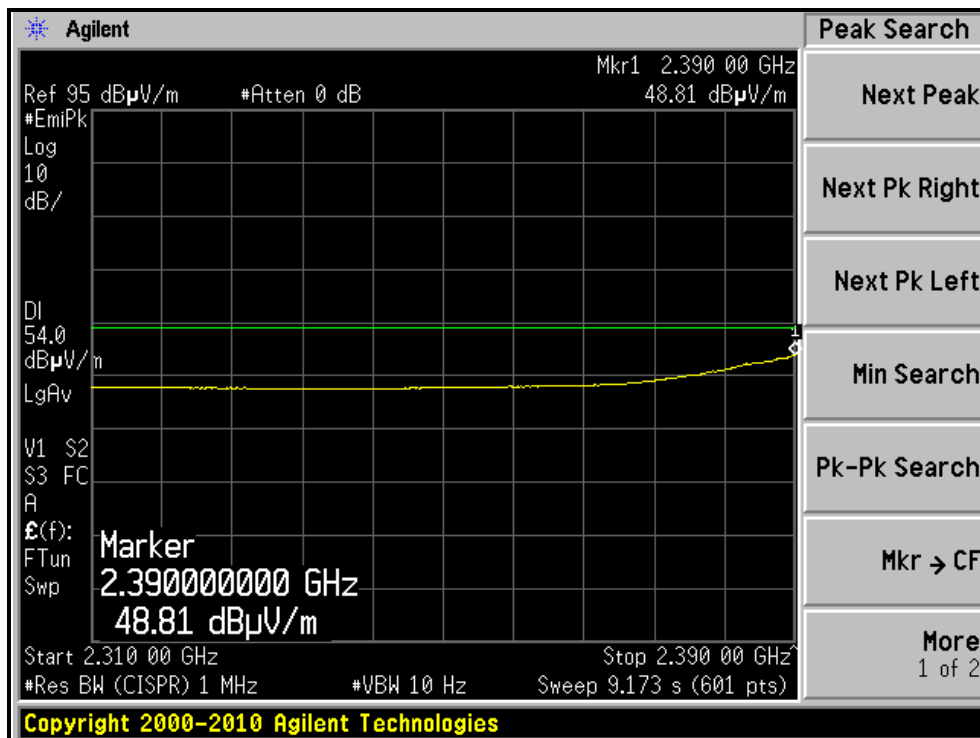
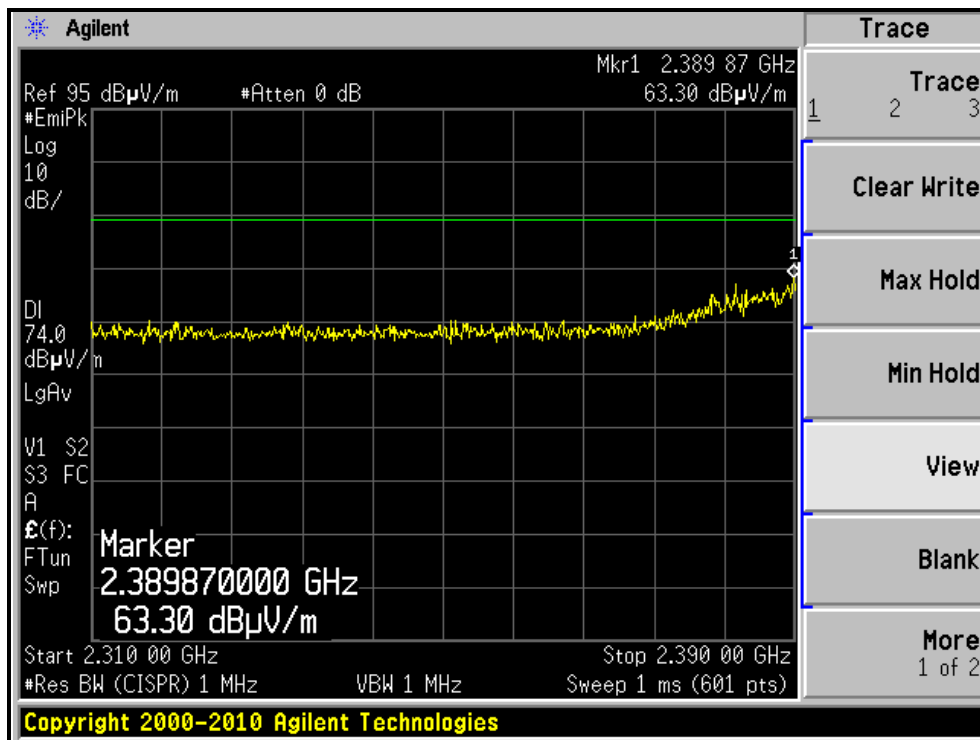
RESTRICTED BANDEDGE (802.11n (40MHz) MODE,CH3, HORIZONTAL)



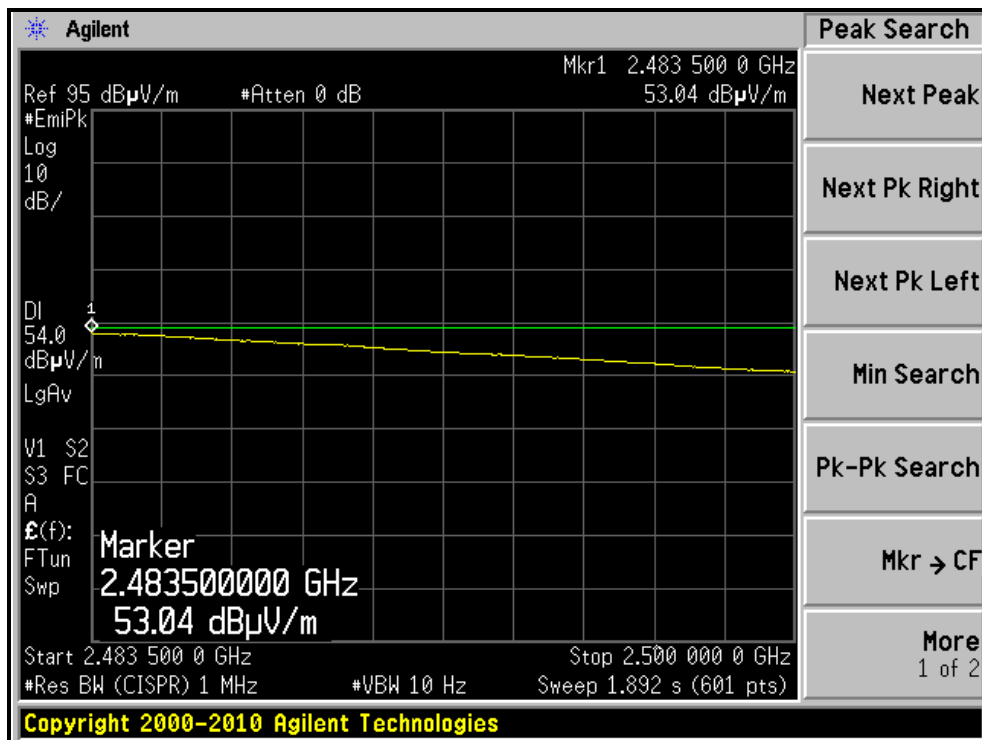
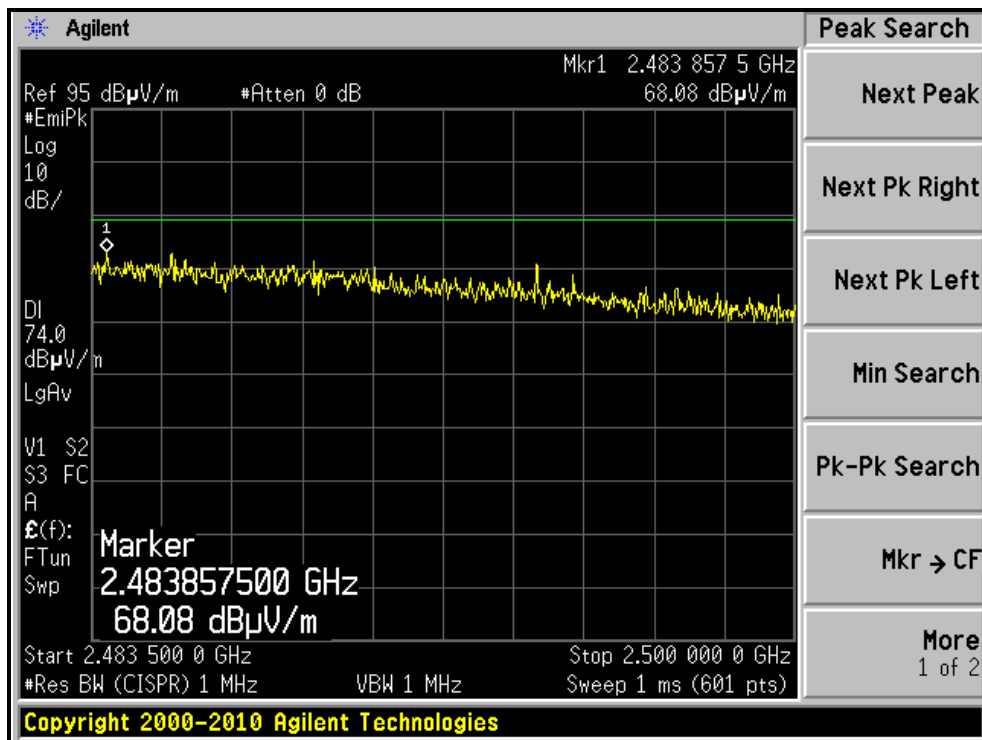


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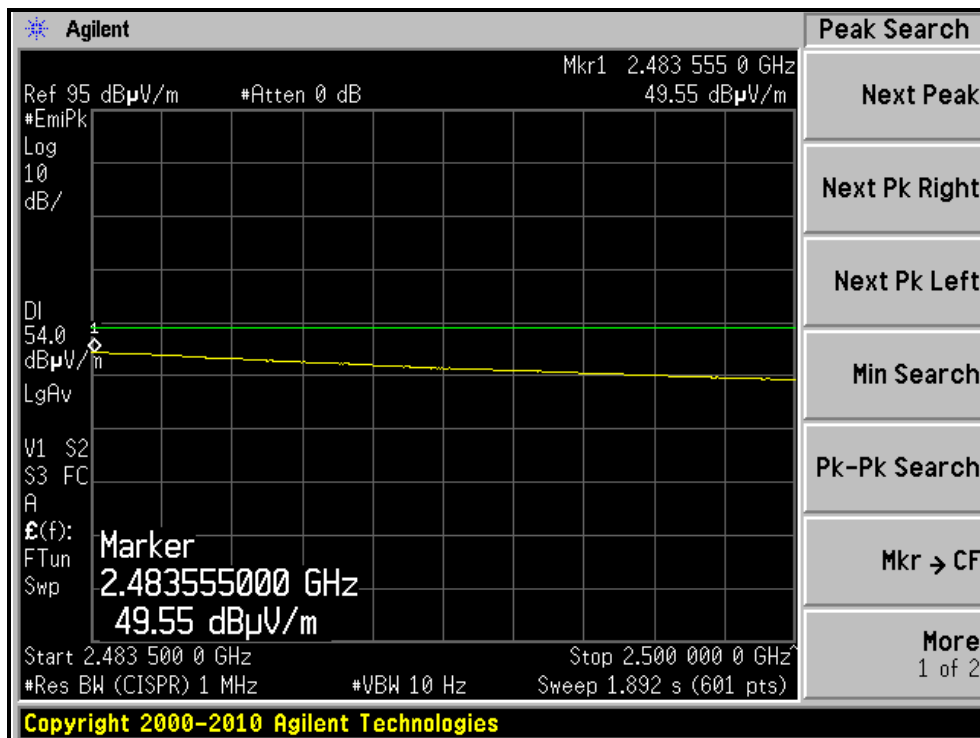
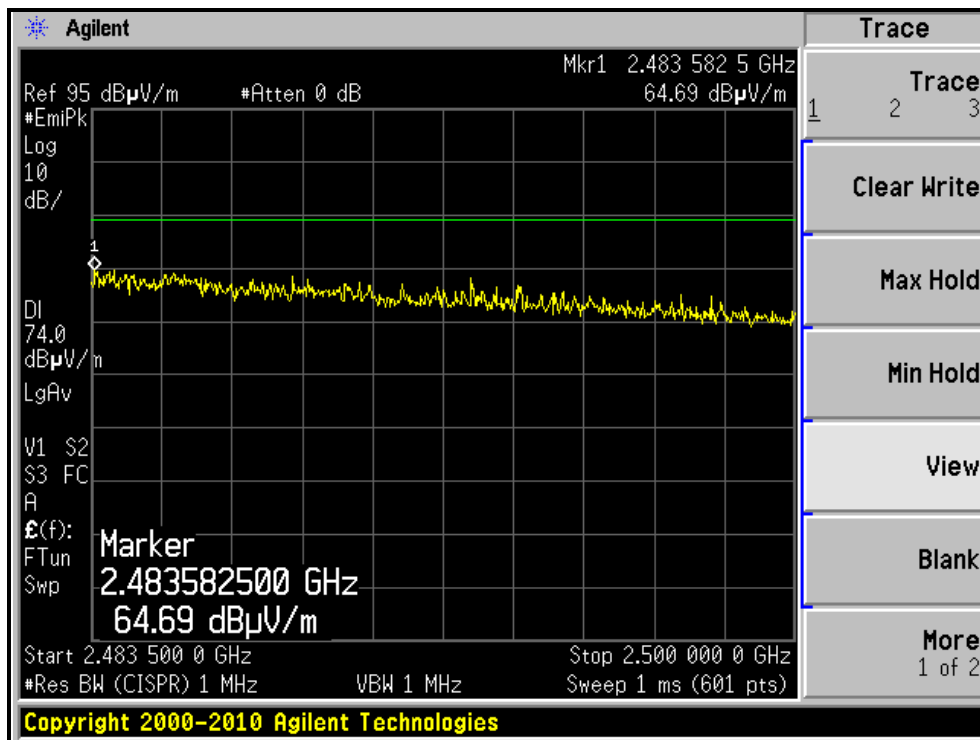
RESTRICTED BANDEDGE (802.11n (40MHz) MODE,CH3, VERTICAL)



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: Oct. 18, 2011

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
R&S Spectrum Analyzer	FSP40	100036	Dec. 08, 2010	Dec. 07, 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.



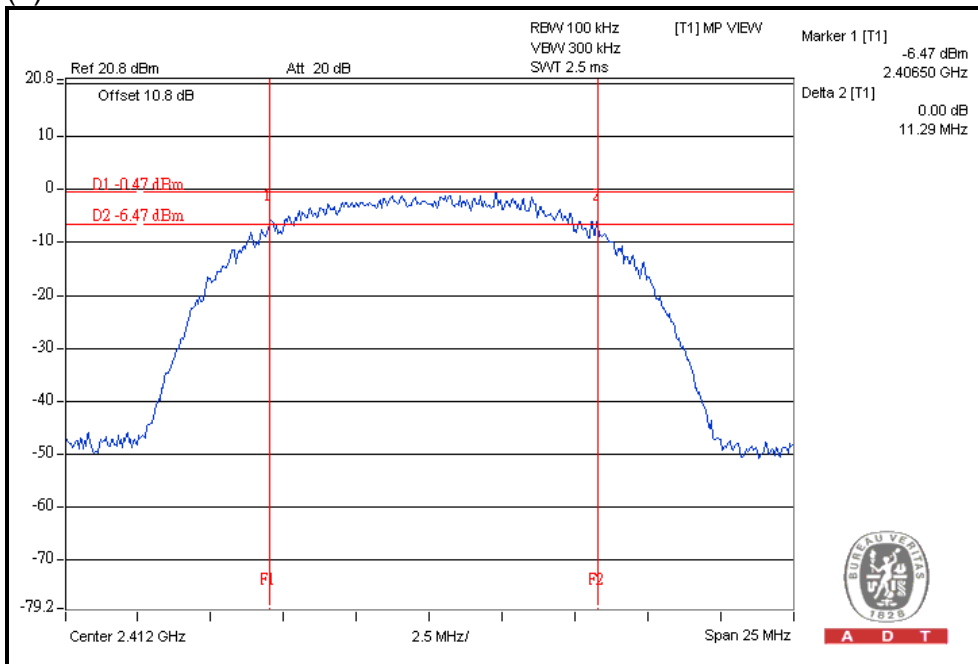
A D T

4.3.7 TEST RESULTS

802.11b DSSS MODULATION:

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN(0)	CHAIN(1)		
1	2412	10.41	11.29	0.5	PASS
6	2437	10.63	10.44	0.5	PASS
11	2462	10.87	10.16	0.5	PASS

CHAIN(1): CH1



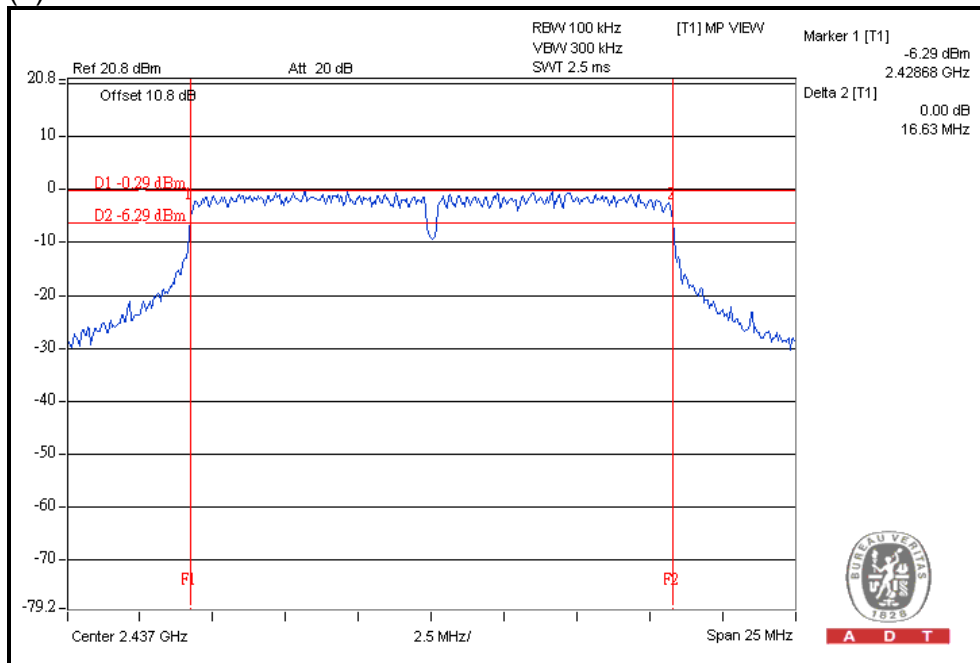


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802.11g OFDM MODULATION:

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN(0)	CHAIN(1)		
1	2412	16.62	16.60	0.5	PASS
6	2437	16.63	16.60	0.5	PASS
11	2462	16.57	16.54	0.5	PASS

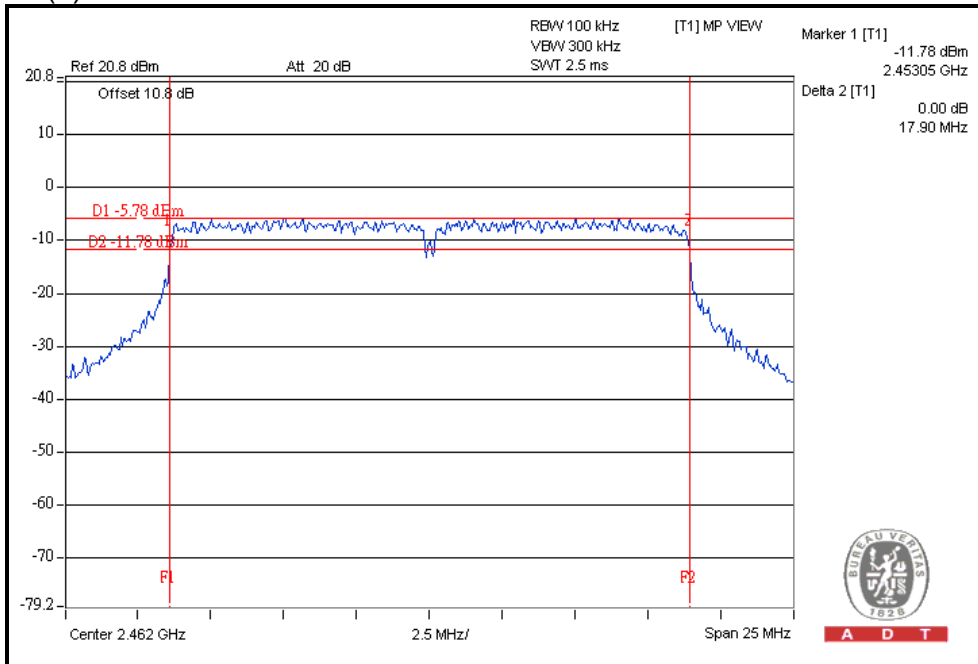
CHAIN(0): CH6



802.11n (20MHz) OFDM modulation:

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN(0)	CHAIN(1)		
1	2412	17.82	17.85	0.5	PASS
6	2437	17.84	17.85	0.5	PASS
11	2462	17.81	17.90	0.5	PASS

For Chain(1) : CH11



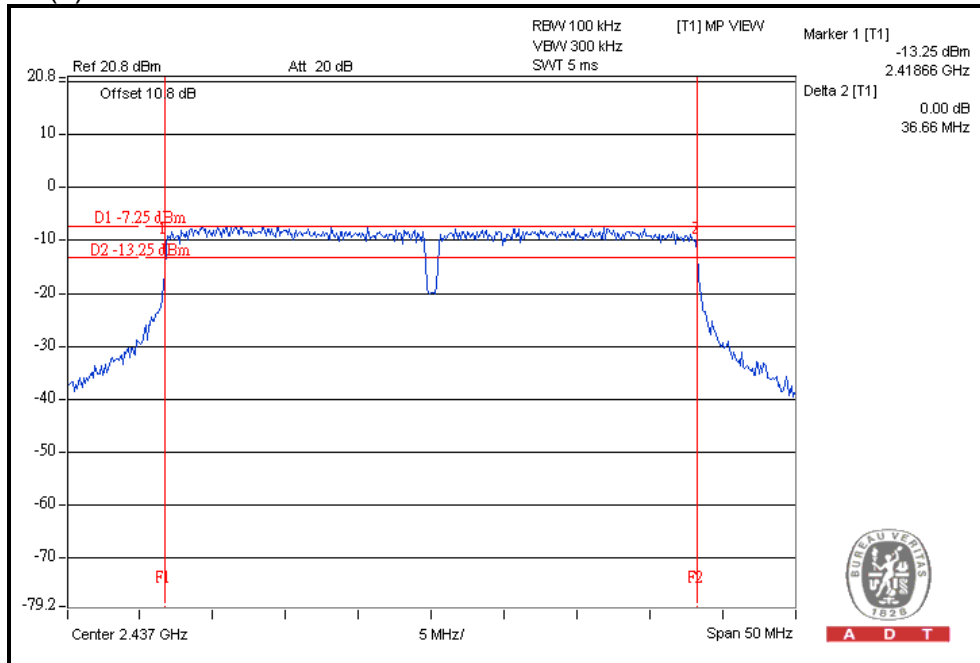


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802.11n (40MHz) OFDM MODULATION:

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN(0)	CHAIN(1)		
3	2422	36.64	36.63	0.5	PASS
6	2437	36.66	36.63	0.5	PASS
9	2452	36.64	36.62	0.5	PASS

For Chain(0) : CH6



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: Nov. 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.

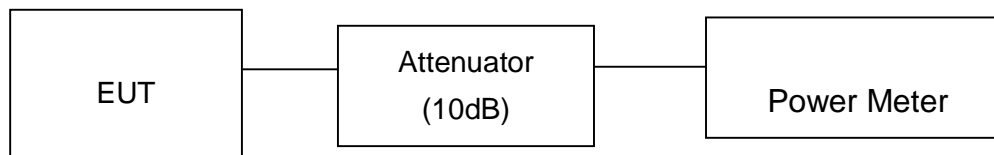
4.4.3 TEST PROCEDURES

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 (dBm)		TOTAL PEAK POWER (mW)	TOTAL PEAK POWER (dBm)	PEAK POWER LIMIT (dBm)	PASS / FAIL
		CHAIN(0)	CHAIN(1)				
1	2412	14.8	13.5	52.6	17.2	30	PASS
6	2437	13.5	13.3	43.8	16.4	30	PASS
11	2462	14.5	14.2	54.5	17.4	30	PASS

$$\text{Directional gain} = 10 \log[(10^{G1/20} + 10^{G2/20})^2 / 2]$$

Effective Legacy Gain (dBi) = 3.9

The effective legacy gain is 3.9dBi, therefore the limit doesn't reduce.

802.11g OFDM MODULATION:

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (dBm)		TOTAL PEAK POWER (mW)	TOTAL PEAK POWER (dBm)	PEAK POWER LIMIT (dBm)	PASS / FAIL
		CHAIN(0)	CHAIN(1)				
1	2412	21.7	22.1	310.1	24.9	30	PASS
6	2437	22.8	22.8	381.1	25.8	30	PASS
11	2462	20.1	19.7	195.7	22.9	30	PASS

$$\text{Directional gain} = 10 \log[(10^{G1/20} + 10^{G2/20})^2 / 2]$$

Effective Legacy Gain (dBi) = 3.9

The effective legacy gain is 3.9dBi, therefore the limit doesn't 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)				
1	2412	21.9	21.7	302.8	24.8	30	PASS
6	2437	22.7	22.9	381.2	25.8	30	PASS
11	2462	18.7	18.4	143.3	21.6	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)				
3	2422	17.2	18.0	115.6	20.6	30	PASS
6	2437	20.0	20.0	200.0	23.0	30	PASS
9	2452	16.7	16.7	93.5	19.7	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: Nov. 11, 2011

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
R&S Spectrum Analyzer	FSP40	100036	Dec. 08, 2010	Dec. 07, 2011

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

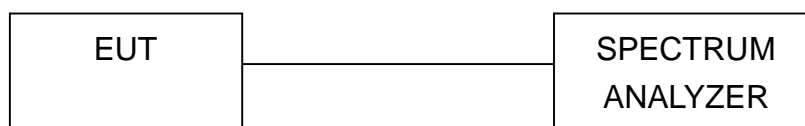
4.5.3 TEST PROCEDURE

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

4.5.7 TEST RESULTS

802.11b DSSS MODULATION:

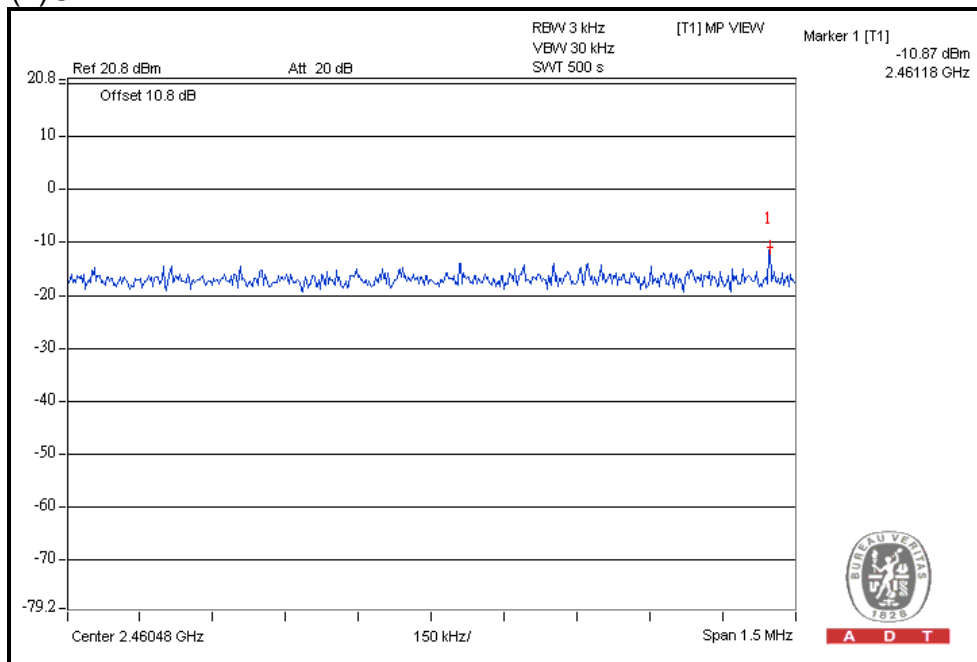
chain	CHAN.	CHAN. FREQ. (MHz)	RF POWER LEVEL IN 3kHz BW (dBm)		TOTAL POWER DENSITY (dBm)	MAX. LIMIT (dBm)	PASS / FAIL
			Measured	10 log (N=2) dB			
0	1	2412	-12.2	3.0	-9.2	8	PASS
	6	2437	-14.6	3.0	-11.6	8	PASS
	11	2462	-13.3	3.0	-10.3	8	PASS
1	1	2412	-13.3	3.0	-10.3	8	PASS
	6	2437	-14.4	3.0	-11.4	8	PASS
	11	2462	-10.9	3.0	-7.9	8	PASS

$$\text{Directional gain} = 10 \log[(10^{G1/20} + 10^{G2/20})^2 / 2]$$

Effective Legacy Gain (dBi) = 3.9

The effective legacy gain is 3.9dBi, therefore the limit doesn't reduce.

CHAIN(1)CH11





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802.11g OFDM MODULATION:

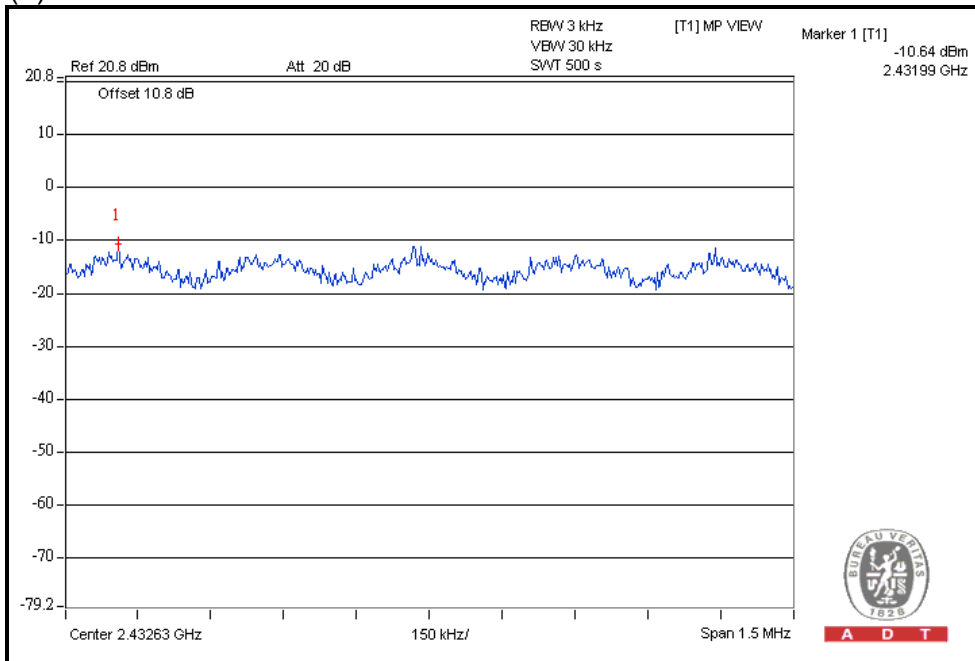
chain	CHAN.	CHAN. FREQ. (MHz)	RF POWER LEVEL IN 3kHz BW (dBm)		TOTAL POWER DENSITY (dBm)	MAX. LIMIT (dBm)	PASS / FAIL
			Measured	10 log (N=2) dB			
0	1	2412	-12.8	3.0	-9.8	8	PASS
	6	2437	-10.6	3.0	-7.6	8	PASS
	11	2462	-14.9	3.0	-11.9	8	PASS
1	1	2412	-12.2	3.0	-9.2	8	PASS
	6	2437	-11.2	3.0	-8.2	8	PASS
	11	2462	-15.4	3.0	-12.4	8	PASS

Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20})^2 / 2]$

Effective Legacy Gain (dBi) = 3.9

The effective legacy gain is 3.9dBi, therefore the limit doesn't reduce.

CHAIN(0)CH6



A D T

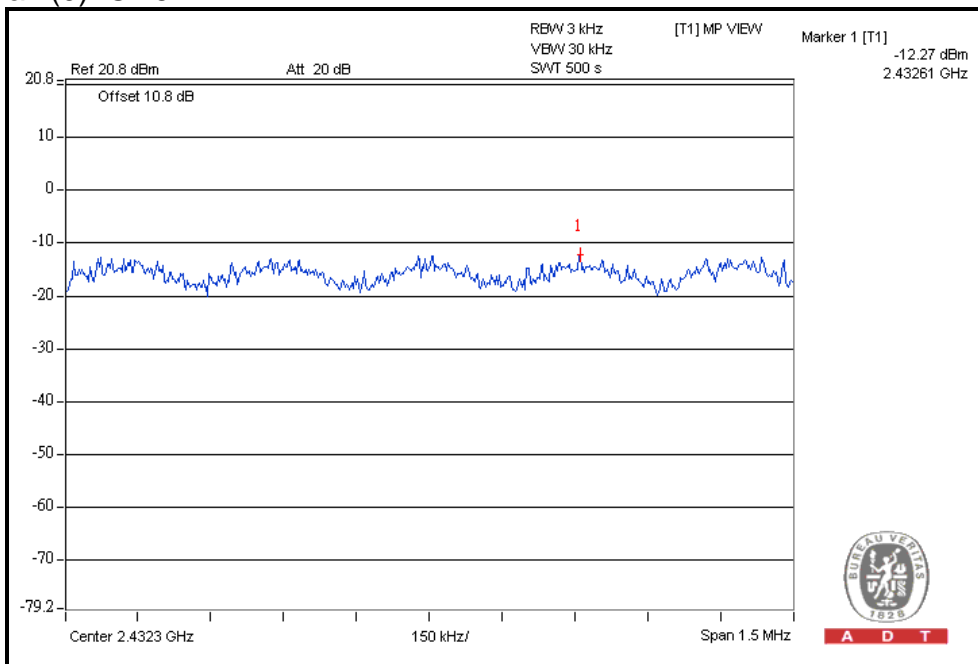


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802.11n (20MHz) OFDM MODULATION:

chain	CHAN.	CHAN. FREQ. (MHz)	RF POWER LEVEL IN 3kHz BW (dBm)		TOTAL POWER DENSITY (dBm)	MAX. LIMIT (dBm)	PASS / FAIL
			Measured	10 log (N=2) dB			
0	1	2412	-12.9	3.0	-9.9	8	PASS
	6	2437	-12.3	3.0	-9.3	8	PASS
	11	2462	-17.0	3.0	-14.0	8	PASS
1	1	2412	-12.9	3.0	-9.9	8	PASS
	6	2437	-12.6	3.0	-9.6	8	PASS
	11	2462	-17.1	3.0	-14.1	8	PASS

For Chain(0): CH6



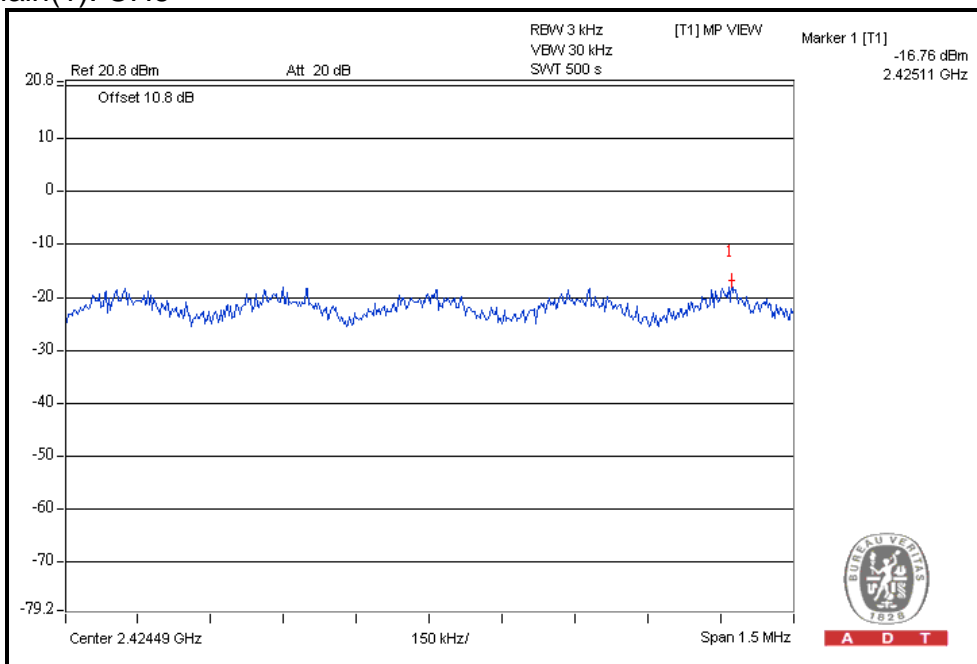


A D T

802.11n (40MHz) OFDM MODULATION:

chain	CHAN.	CHAN. FREQ. (MHz)	RF POWER LEVEL IN 3kHz BW (dBm)		TOTAL POWER DENSITY (dBm)	MAX. LIMIT (dBm)	PASS / FAIL
			Measured	10 log (N=2) dB			
0	3	2422	-21.7	3.0	-18.7	8	PASS
	6	2437	-18.8	3.0	-15.8	8	PASS
	9	2452	-22.1	3.0	-19.1	8	PASS
1	3	2422	-19.9	3.0	-16.9	8	PASS
	6	2437	-16.8	3.0	-13.8	8	PASS
	9	2452	-22.0	3.0	-19.0	8	PASS

For Chain(1): CH6



A D T

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: Nov. 11, 2011

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
R&S Spectrum Analyzer	FSP40	100036	Dec. 08, 2010	Dec. 07, 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

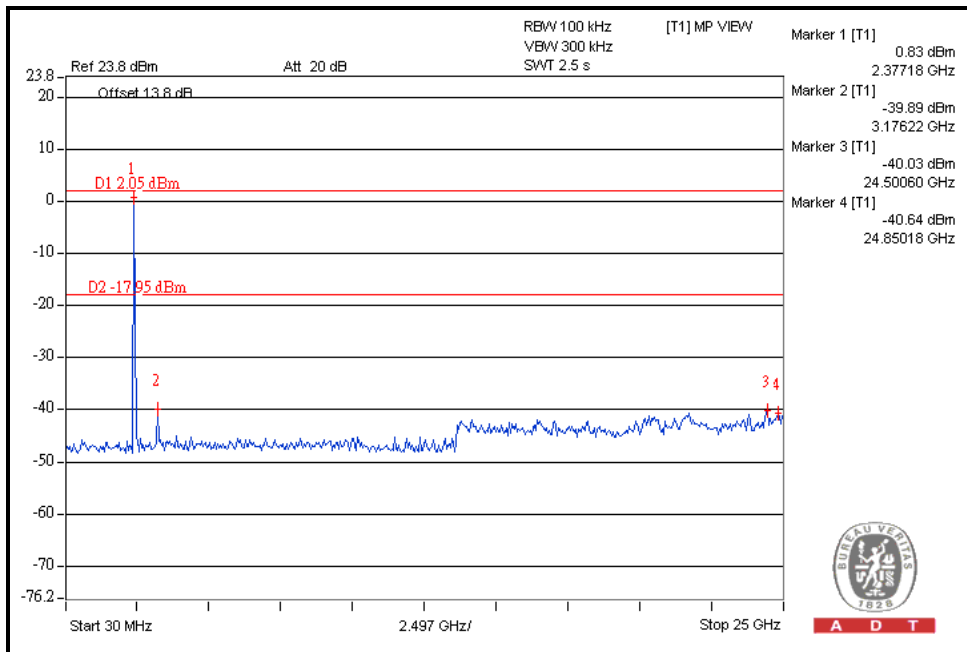
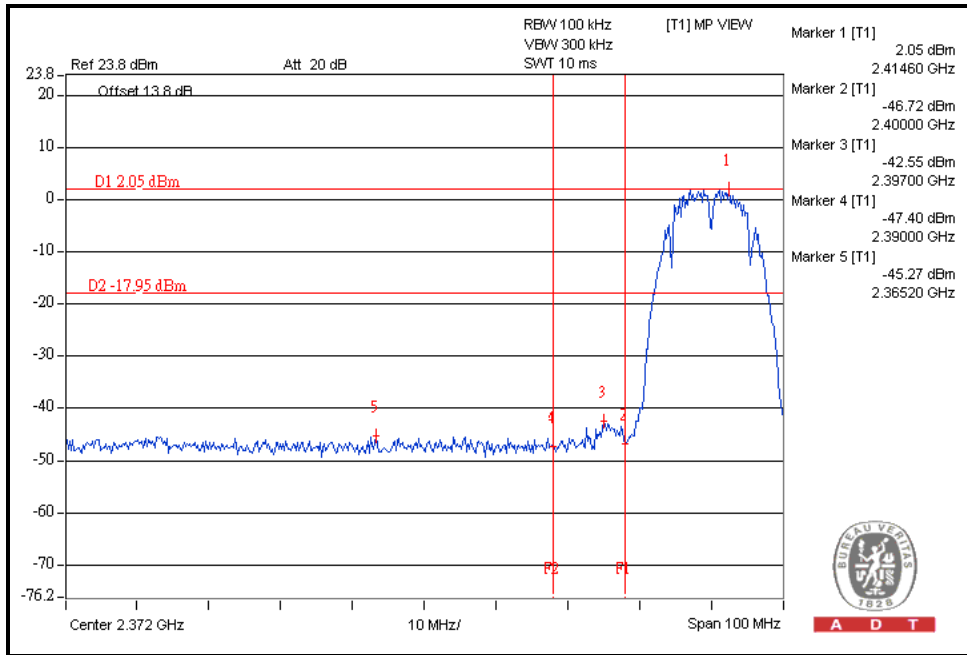
The spectrum plots are attached on the following images. D1 line indicates the highest level, and D2 line indicates the 20dB offset below D1. It shows compliance with the requirement in part 15.247(d).



A D T

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

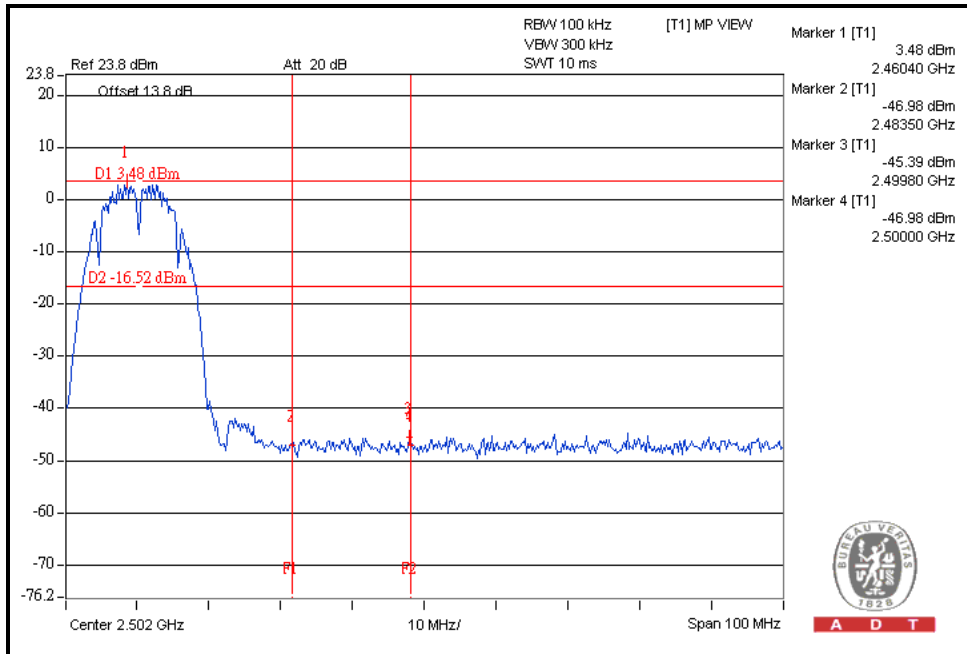
CH1



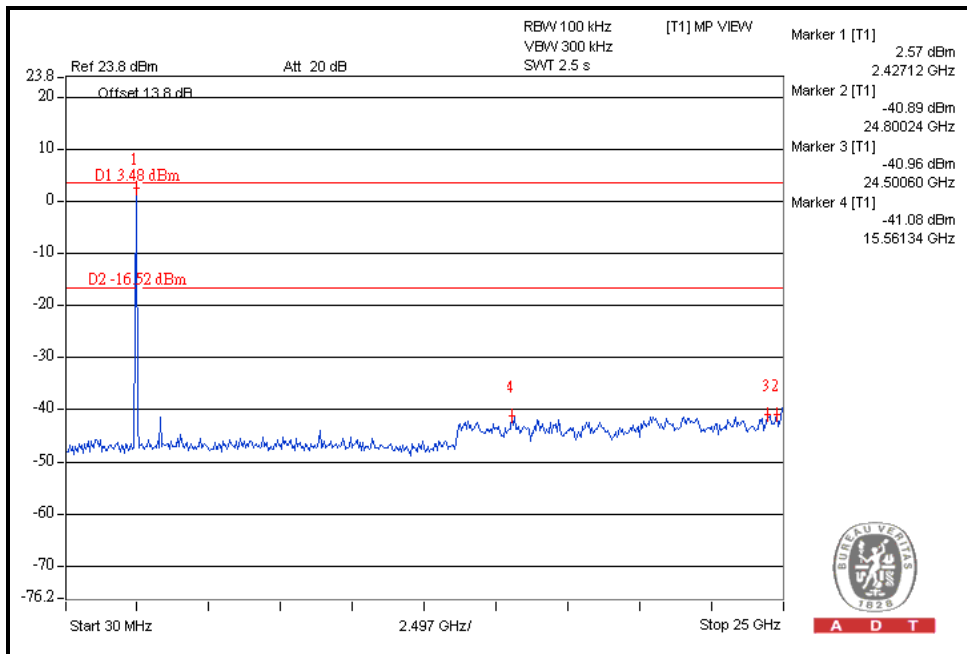


A D T

CH11



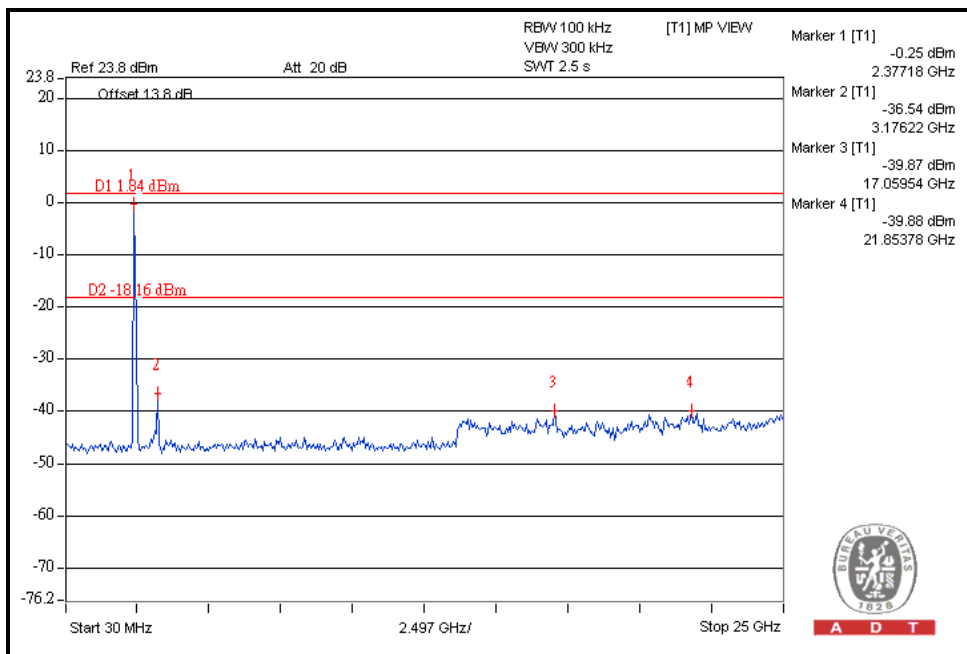
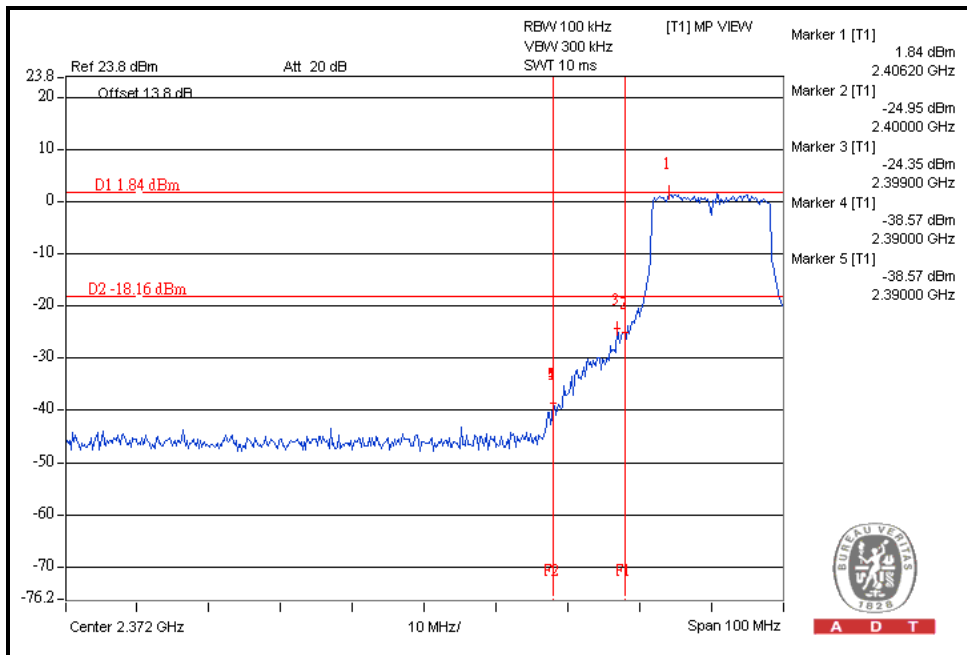
A D T



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802.11g OFDM MODULATION:

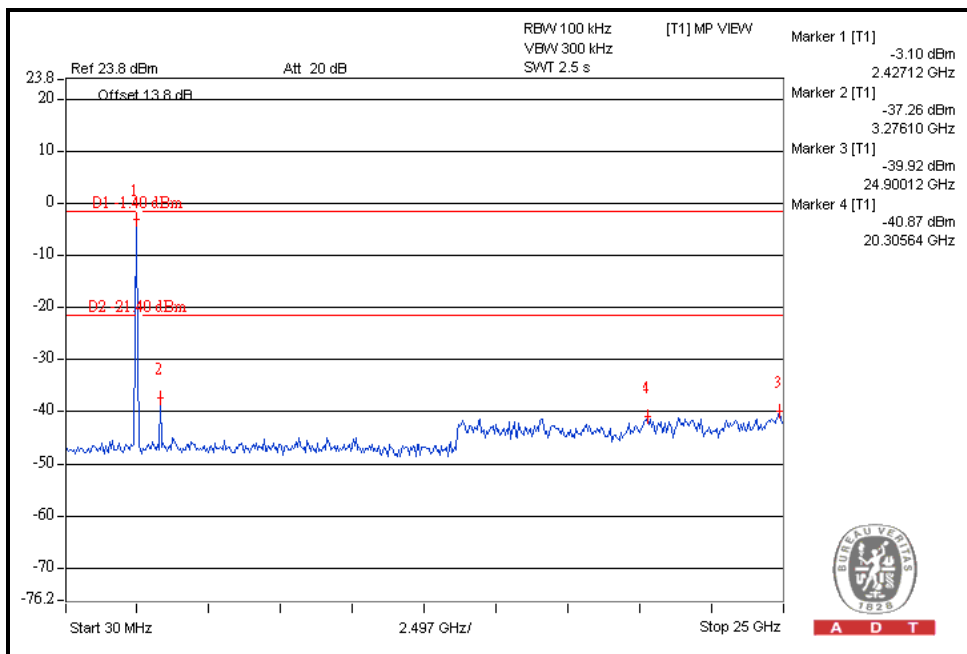
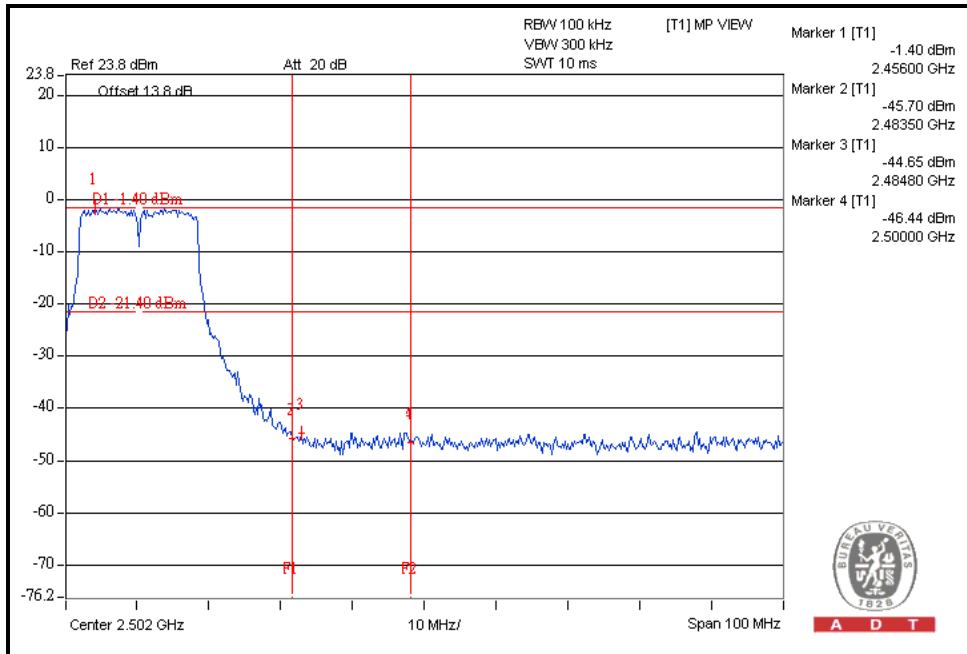
CH1





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CH11

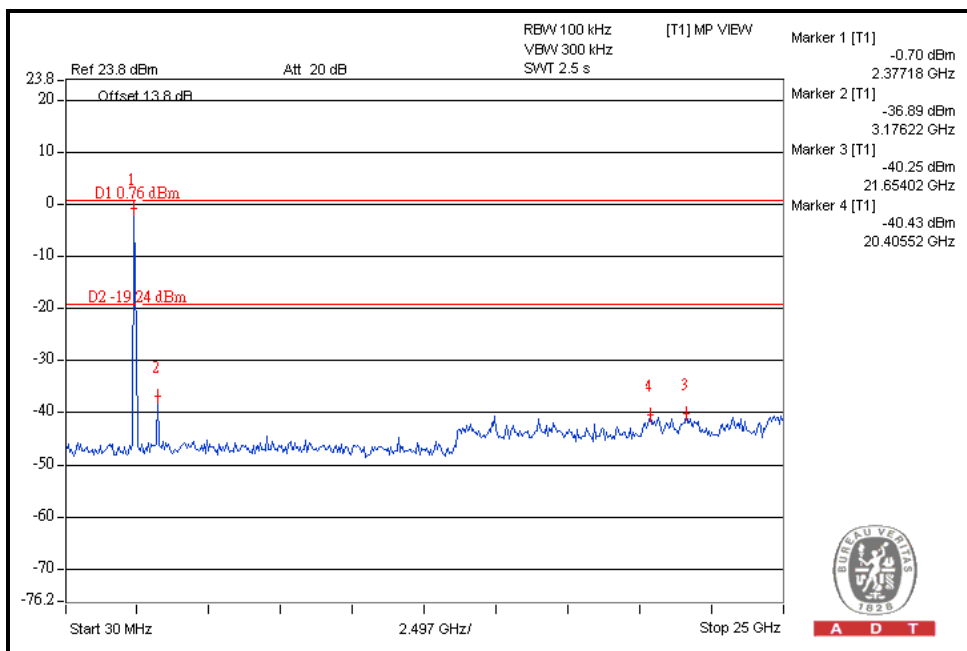
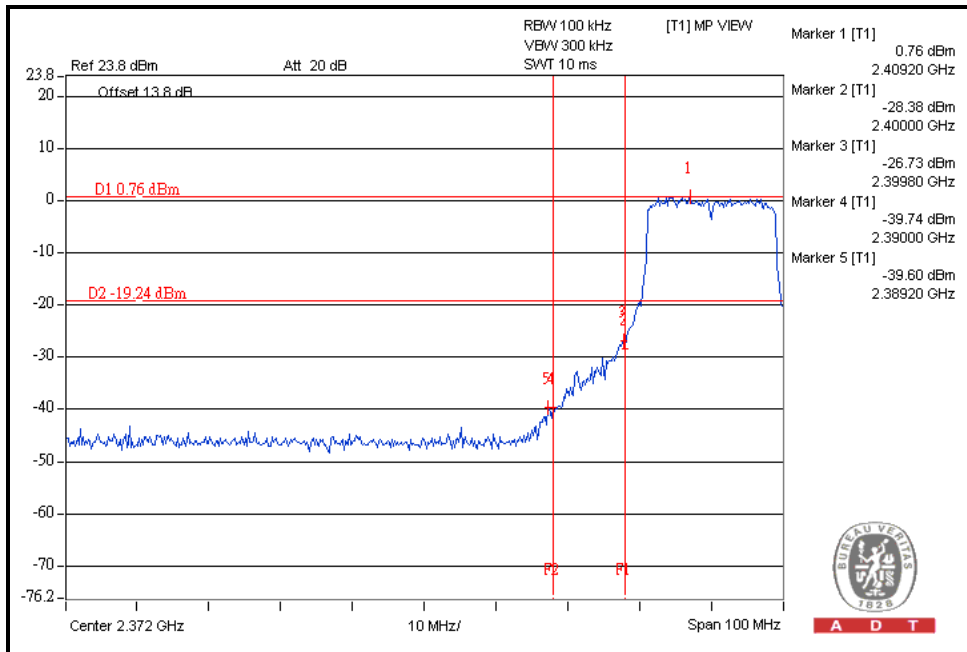




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802.11n (20MHz) OFDM MODULATION:

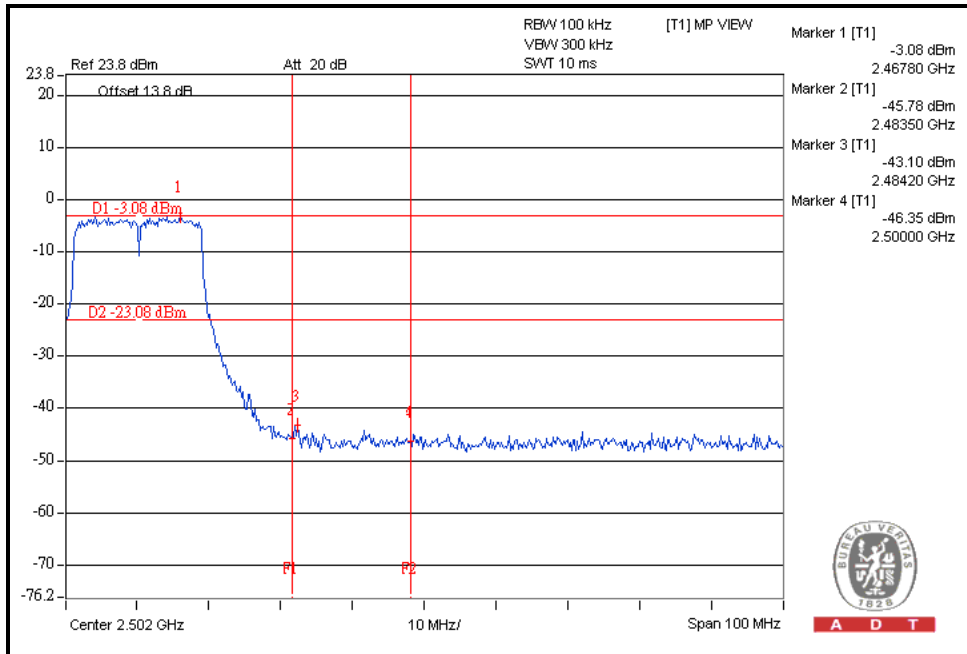
CH1



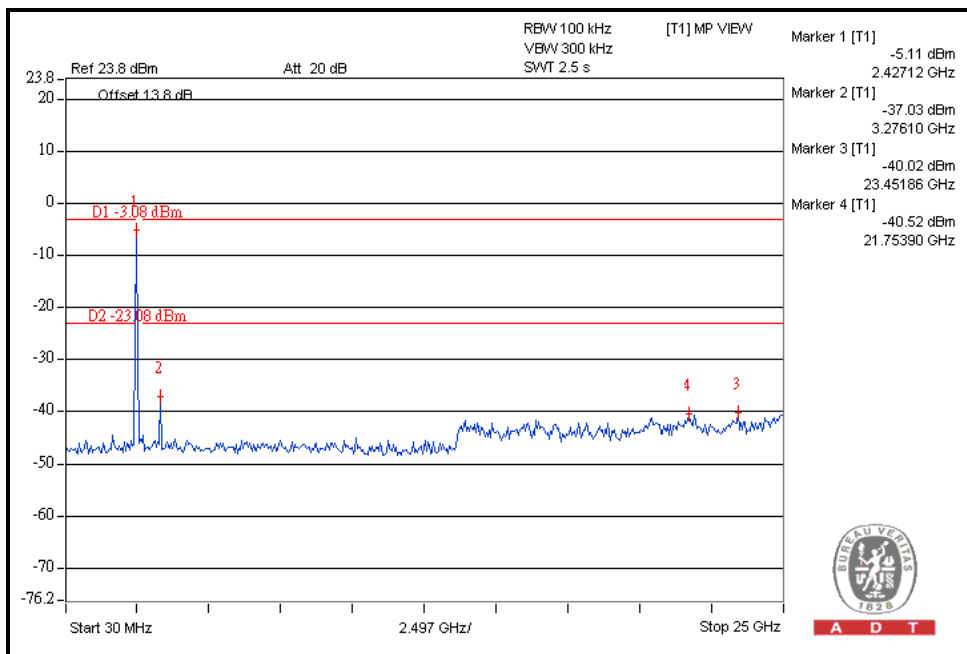


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CH11



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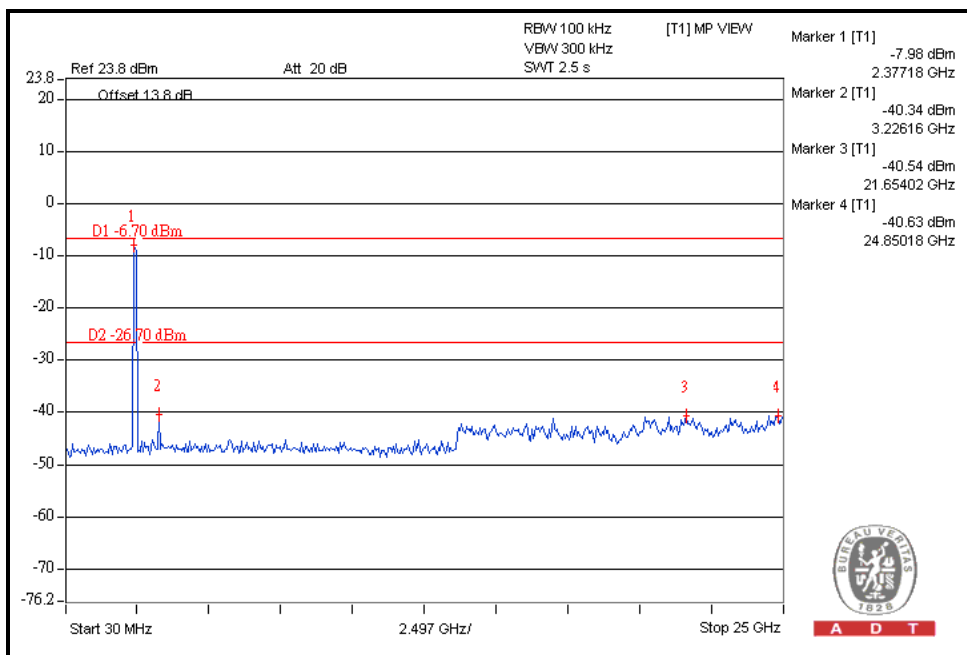
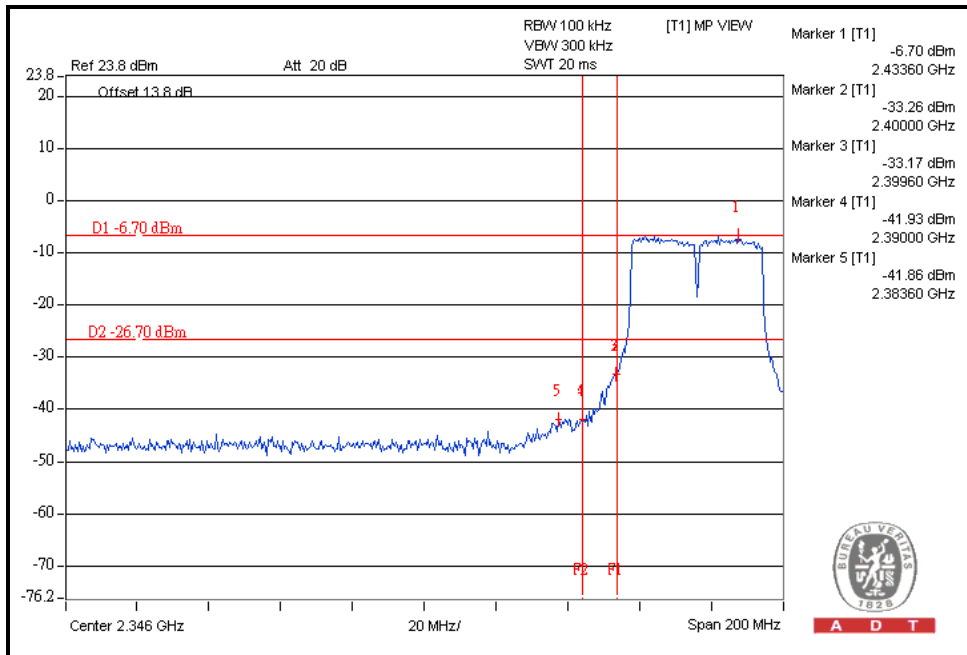
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802.11n (40MHz) OFDM MODULATION:

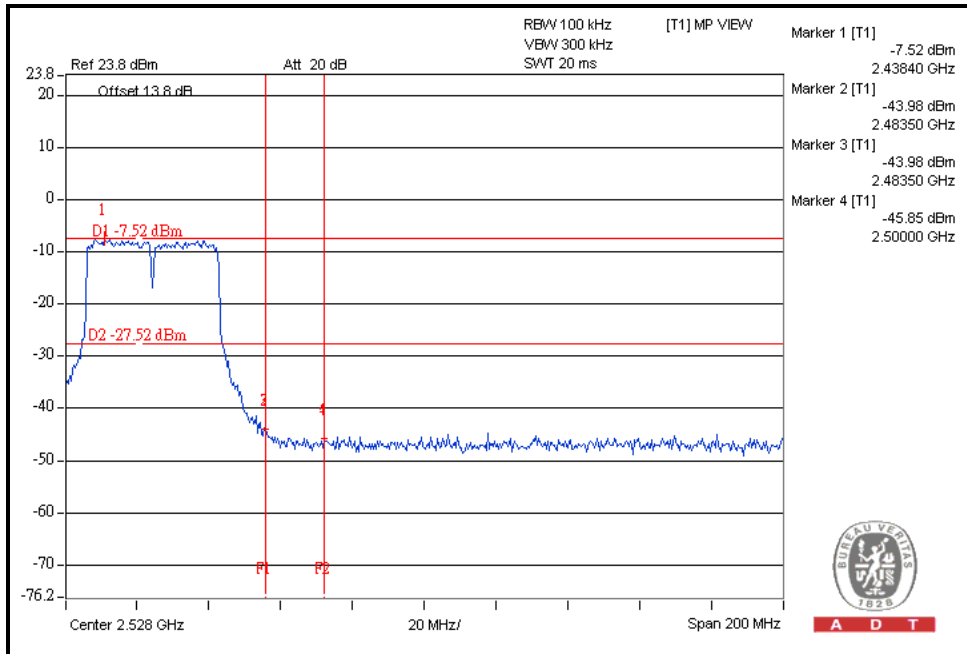
CH3



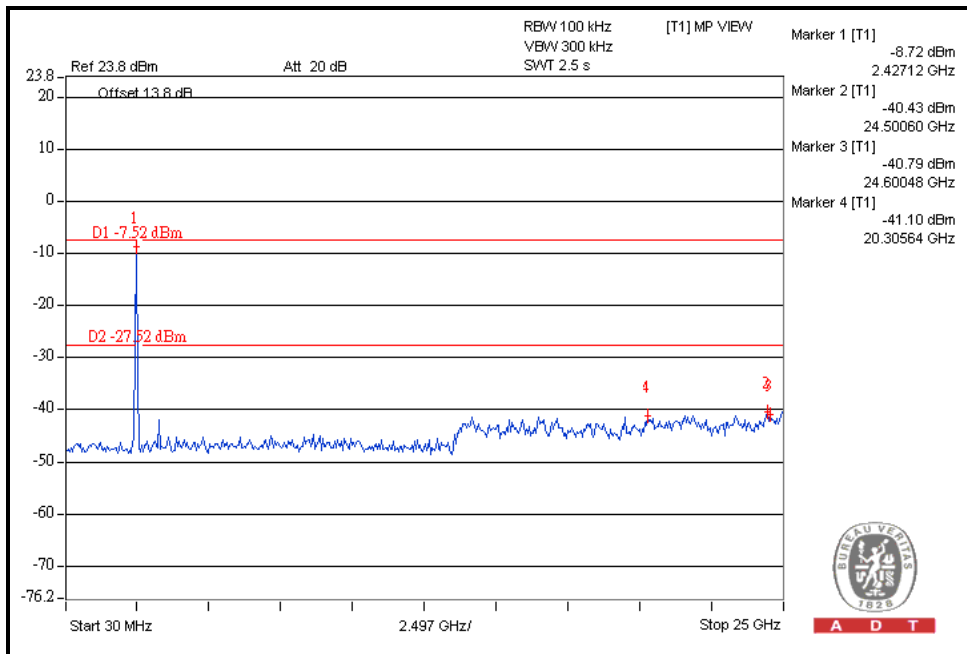


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CH9



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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: Nov. 18, 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. 07, 2011	Sep. 06, 2012
Line-Impedance Stabilization Network (for Peripheral)	ESH3-Z5	848773/004	Nov. 01, 2011	Oct. 31, 2012
RF Cable (JYEBAO)	5DFB	COCCAB-002	Aug. 29, 2011	Aug. 28, 2012
50 ohms Terminator	50	3	Nov. 02, 2011	Nov. 01, 2012
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.



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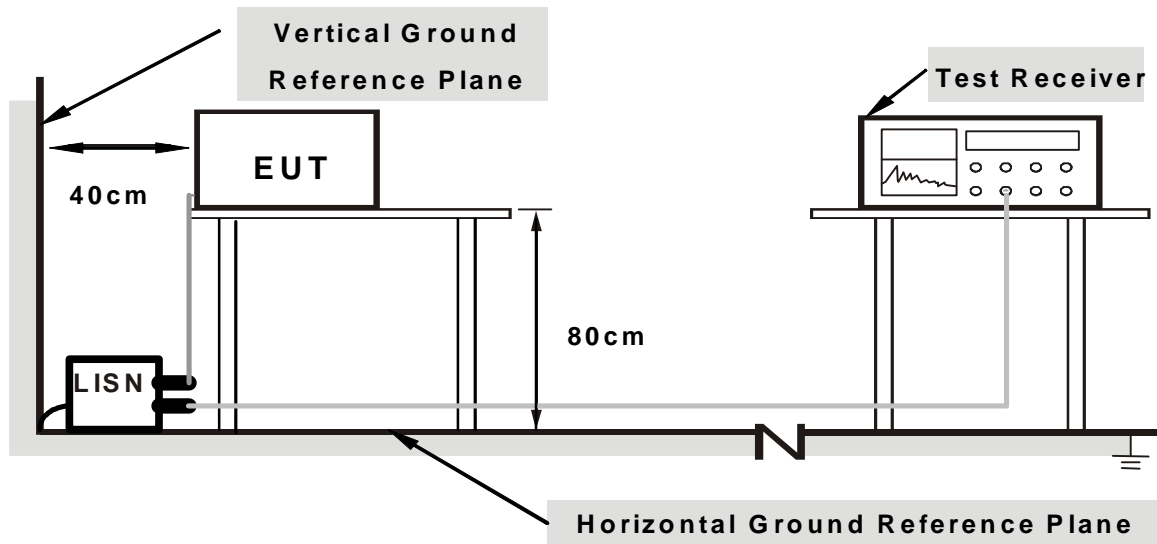
5.1.3 TEST PROCEDURES

- 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

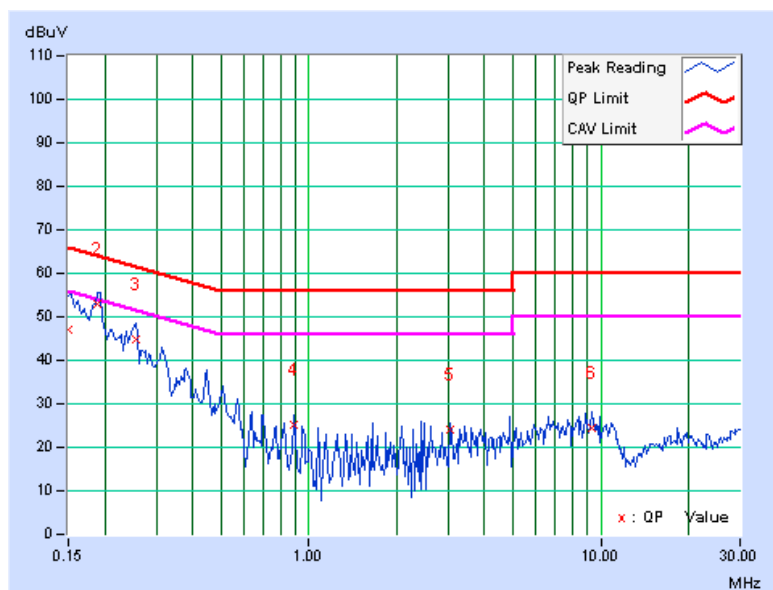
Same as the 4.1.6

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)	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.150	0.09	46.90	20.17	46.99	20.26	66.00	56.00	-19.01	-35.74
2	0.189	0.10	52.86	45.93	52.96	46.03	64.08	54.08	-11.12	-8.05
3	0.255	0.10	44.75	38.02	44.85	38.12	61.58	51.58	-16.72	-13.45
4	0.888	0.14	25.16	22.56	25.30	22.70	56.00	46.00	-30.70	-23.30
5	3.043	0.26	23.88	18.78	24.14	19.04	56.00	46.00	-31.86	-26.96
6	9.316	0.52	24.03	18.79	24.55	19.31	60.00	50.00	-35.45	-30.69

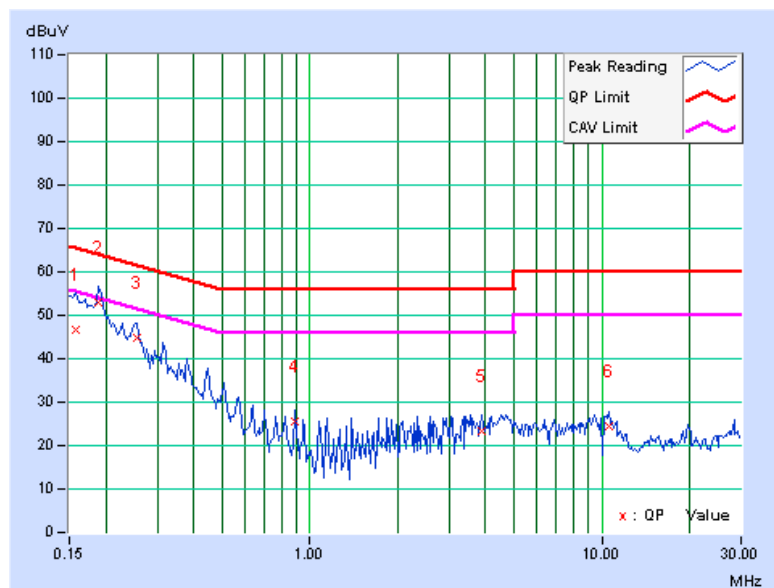
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. The emission levels of other frequencies were very low against the limit.
 3. Margin value = Emission level - Limit value
 4. Correction factor = Insertion loss + Cable loss
 5. Emission Level = Correction Factor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



PHASE	Neutral (N)	6dB BANDWIDTH	9 kHz
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No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.158	0.08	46.57	17.54	46.65	17.62	65.58	55.58	-18.93	-37.96
2	0.189	0.09	52.92	45.81	53.01	45.90	64.08	54.08	-11.07	-8.18
3	0.255	0.10	44.79	37.19	44.89	37.29	61.58	51.58	-16.69	-14.29
4	0.888	0.13	25.50	22.76	25.63	22.89	56.00	46.00	-30.37	-23.11
5	3.863	0.24	23.26	18.84	23.50	19.08	56.00	46.00	-32.50	-26.92
6	10.586	0.42	23.92	19.00	24.34	19.42	60.00	50.00	-35.66	-30.58

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



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: Nov. 08 to 10, 2011

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Agilent Spectrum Analyzer	E4446A	MY48250253	Aug. 29, 2011	Aug. 28, 2012
Agilent Pre-Selector	N9039A	MY46520310	Aug. 29, 2011	Aug. 28, 2012
Agilent Signal Generator	N5181A	MY49060347	July 25, 2011	July 24, 2012
Mini-Circuits Pre-Amplifier	ZFL-1000VH2B	AMP-ZFL-04	Nov. 16, 2010	Nov. 15, 2011
Agilent Pre-Amplifier	8449B	3008A02465	Feb. 28, 2011	Feb. 27, 2012
Miteq Pre-Amplifier	AFS33-1800265 0-30-8P-44	881786	Nov. 16, 2010	Nov. 15, 2011
SCHWARZBECK Trilog Broadband Antenna	VULB 9168	9168-361	Apr. 14, 2011	Apr. 13, 2012
AISI Horn_Antenna	AIH.8018	0000220091110	Nov. 22, 2010	Nov. 21, 2011
SCHWARZBECK Horn_Antenna	BBHA 9170	9170-424	Oct. 07, 2011	Oct. 06, 2012
RF CABLE	NA	RF104-205 RF104-207 RF104-202	Dec. 28, 2010	Dec. 27, 2011
RF Cable	NA	CHHCAB_001	Oct. 08, 2011	Oct. 07, 2012
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. H.
4. The FCC Site Registration No. is 797305.
5. The CANADA Site Registration No. is IC 7450H-3.

5.2.3 TEST PROCEDURES

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter chamber room. 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.

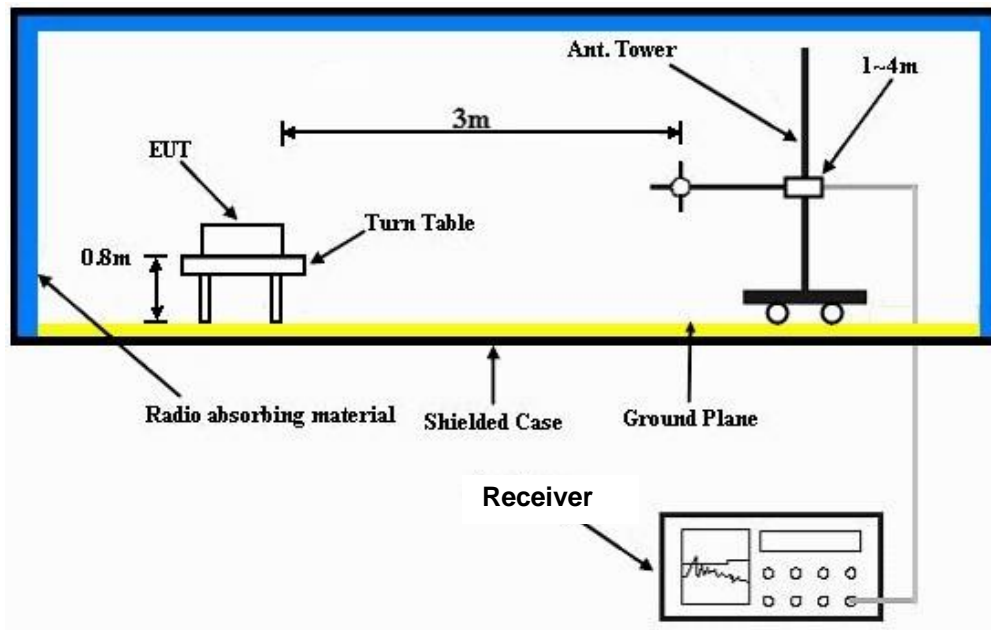
NOTE:

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

Same as the 4.1.6

5.2.7 TEST RESULTS

BELOW 1GHz WORST-CASE DATA : 802.11n (20MHz) OFDM MODULATION

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 157	FREQUENCY RANGE	Below 1000MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	25deg. C, 69%RH	TESTED BY	Nelson Teng

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	116.53	33.8 QP	43.5	-9.8	1.50 H	360	21.72	12.03
2	240.50	41.1 QP	46.0	-4.9	1.25 H	360	28.19	12.92
3	335.64	40.4 QP	46.0	-5.6	1.00 H	320	24.21	16.19
4	516.80	41.6 QP	46.0	-4.4	1.25 H	250	21.21	20.43
5	555.00	41.8 QP	46.0	-4.2	1.50 H	177	20.56	21.27
6	960.13	41.0 QP	54.0	-13.1	1.50 H	125	13.15	27.80
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	133.02	32.3 QP	43.5	-11.2	1.00 V	250	18.66	13.65
2	188.66	35.2 QP	43.5	-8.3	1.25 V	258	23.01	12.23
3	240.11	32.9 QP	46.0	-13.1	1.50 V	125	19.97	12.90
4	480.15	40.9 QP	46.0	-5.1	1.00 V	127	21.35	19.58
5	796.15	33.5 QP	46.0	-12.5	1.50 V	215	8.04	25.47
6	955.34	37.3 QP	46.0	-8.8	1.00 V	200	9.51	27.74

- 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 (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24deg. C, 63%RH	TESTED BY	Amos Chuang

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	114.7 PK			1.27 H	247	72.00	42.70
2	*5745.00	100.0 AV			1.27 H	247	57.30	42.70
3	11490.00	66.5 PK	74.0	-7.5	1.25 H	263	17.19	49.31
4	11490.00	52.1 AV	54.0	-1.9	1.25 H	263	2.79	49.31
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	106.6 PK			1.28 V	75	63.90	42.70
2	*5745.00	94.5 AV			1.28 V	75	51.80	42.70
3	11490.00	64.1 PK	74.0	-9.9	1.26 V	123	14.79	49.31
4	11490.00	50.2 AV	54.0	-3.8	1.26 V	123	0.89	49.31

- 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.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 157	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24deg. C, 63%RH	TESTED BY	Amos Chuang

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	114.2 PK			1.27 H	248	71.44	42.76
2	*5785.00	100.0 AV			1.27 H	248	57.24	42.76
3	11570.00	65.8 PK	74.0	-8.2	1.26 H	272	16.42	49.38
4	11570.00	52.4 AV	54.0	-1.6	1.26 H	272	3.02	49.38
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	107.3 PK			1.28 V	75	64.54	42.76
2	*5785.00	94.4 AV			1.28 V	75	51.64	42.76
3	11570.00	62.9 PK	74.0	-11.1	1.26 V	125	13.52	49.38
4	11570.00	49.9 AV	54.0	-4.1	1.26 V	125	0.52	49.38

- 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 (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24deg. C, 63%RH	TESTED BY	Amos Chuang

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	113.6 PK			1.26 H	257	70.78	42.82
2	*5825.00	99.5 AV			1.26 H	257	56.68	42.82
3	11650.00	64.2 PK	74.0	-9.8	1.24 H	273	14.85	49.35
4	11650.00	51.9 AV	54.0	-2.1	1.24 H	273	2.55	49.35
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	105.0 PK			1.26 V	76	62.18	42.82
2	*5825.00	92.3 AV			1.26 V	76	49.48	42.82
3	11650.00	61.6 PK	74.0	-12.4	1.26 V	122	12.25	49.35
4	11650.00	49.8 AV	54.0	-4.2	1.26 V	122	0.45	49.35

- 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 (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24deg. C, 63%RH	TESTED BY	Amos Chuang

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	113.1 PK			1.27 H	246	70.40	42.70
2	*5745.00	98.6 AV			1.27 H	246	55.90	42.70
3	11490.00	63.9 PK	74.0	-10.1	1.25 H	259	14.59	49.31
4	11490.00	51.5 AV	54.0	-2.5	1.25 H	259	2.19	49.31
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	105.5 PK			1.28 V	74	62.80	42.70
2	*5745.00	93.0 AV			1.28 V	74	50.30	42.70
3	11490.00	63.5 PK	74.0	-10.5	1.27 V	123	14.19	49.31
4	11490.00	50.6 AV	54.0	-3.4	1.27 V	123	1.29	49.31

- 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 (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24deg. C, 63%RH	TESTED BY	Amos Chuang

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	113.0 PK			1.26 H	245	70.24	42.76
2	*5785.00	98.5 AV			1.26 H	245	55.74	42.76
3	11570.00	63.9 PK	74.0	-10.1	1.25 H	265	14.52	49.38
4	11570.00	51.0 AV	54.0	-3.0	1.25 H	265	1.62	49.38

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	106.0 PK			1.27 V	75	63.24	42.76
2	*5785.00	93.0 AV			1.27 V	75	50.24	42.76
3	11570.00	63.9 PK	74.0	-10.1	1.26 V	124	14.52	49.38
4	11570.00	50.8 AV	54.0	-3.2	1.26 V	124	1.42	49.38

- 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

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 165	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24deg. C, 63%RH	TESTED BY	Amos Chuang

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	112.0 PK			1.26 H	250	69.18	42.82
2	*5825.00	96.6 AV			1.26 H	250	53.78	42.82
3	11650.00	61.8 PK	74.0	-12.2	1.24 H	290	12.45	49.35
4	11650.00	49.2 AV	54.0	-4.8	1.24 H	290	-0.15	49.35

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	103.4 PK			1.26 V	76	60.58	42.82
2	*5825.00	90.8 AV			1.26 V	76	47.98	42.82
3	11650.00	60.3 PK	74.0	-13.7	1.26 V	123	10.95	49.35
4	11650.00	48.5 AV	54.0	-5.5	1.26 V	123	-0.85	49.35

- 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 (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24deg. C, 63%RH	TESTED BY	Amos Chuang

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	108.2 PK			1.27 H	254	65.48	42.72
2	*5755.00	90.9 AV			1.27 H	254	48.18	42.72
3	11510.00	61.0 PK	74.0	-13.0	1.25 H	259	11.67	49.33
4	11510.00	48.6 AV	54.0	-5.4	1.25 H	259	-0.73	49.33
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	101.6 PK			1.27 V	76	58.88	42.72
2	*5755.00	86.4 AV			1.27 V	76	43.68	42.72
3	11510.00	60.5 PK	74.0	-13.5	1.27 V	125	11.17	49.33
4	11510.00	48.2 AV	54.0	-5.8	1.27 V	125	-1.13	49.33

- 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

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 159	FREQUENCY RANGE	1 ~ 40GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	24deg. C, 63%RH	TESTED BY	Amos Chuang

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	104.6 PK			1.26 H	251	61.83	42.77
2	*5795.00	89.7 AV			1.26 H	251	46.93	42.77
3	11590.00	59.4 PK	74.0	-14.6	1.26 H	256	10.01	49.39
4	11590.00	47.3 AV	54.0	-6.7	1.26 H	256	-2.09	49.39

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	100.3 PK			1.26 V	76	57.53	42.77
2	*5795.00	85.2 AV			1.26 V	76	42.43	42.77
3	11590.00	59.0 PK	74.0	-15.0	1.26 V	126	9.61	49.39
4	11590.00	46.7 AV	54.0	-7.3	1.26 V	126	-2.69	49.39

- 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: Nov. 11, 2011

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
R&S Spectrum Analyzer	FSP40	100036	Dec. 08, 2010	Dec. 07, 2011

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

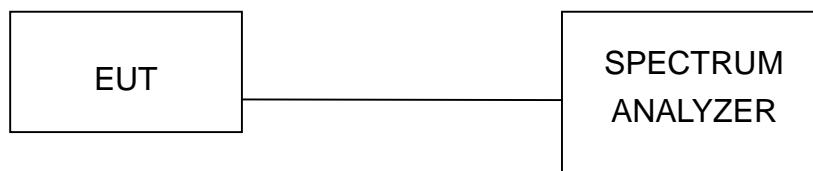
5.3.3 TEST PROCEDURE

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

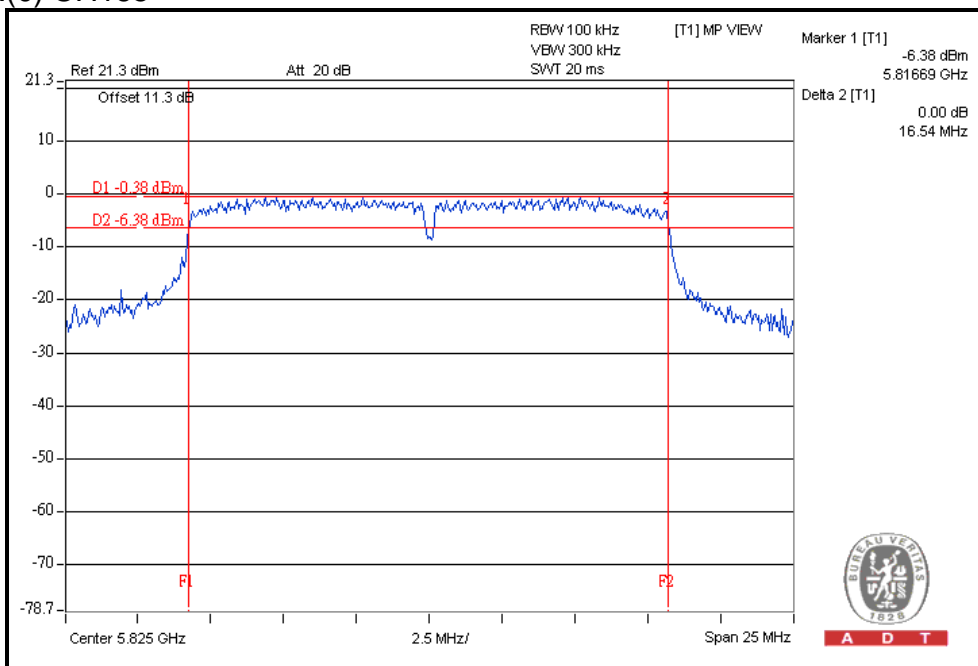
The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

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)		
149	5745	16.53	16.48	0.5	PASS
157	5785	16.51	16.53	0.5	PASS
165	5825	16.54	16.47	0.5	PASS

CHAIN(0) CH165



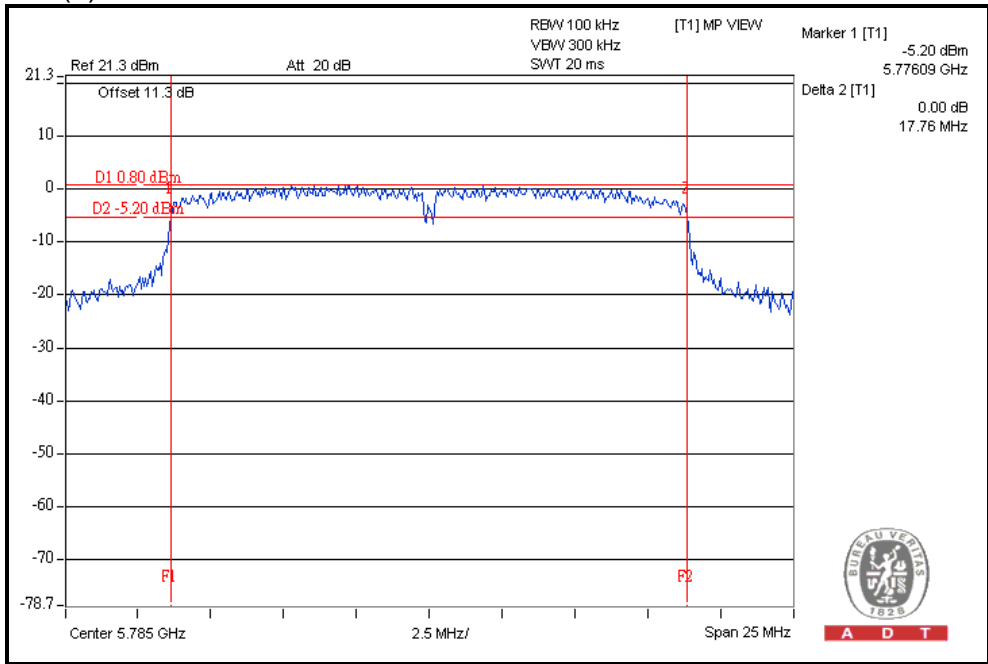


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802.11n (20MHz) OFDM MODULATION:

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN(0)	CHAIN(1)		
149	5745	17.76	17.71	0.5	PASS
157	5785	17.75	17.76	0.5	PASS
165	5825	17.68	17.73	0.5	PASS

For Chain(1): CH157



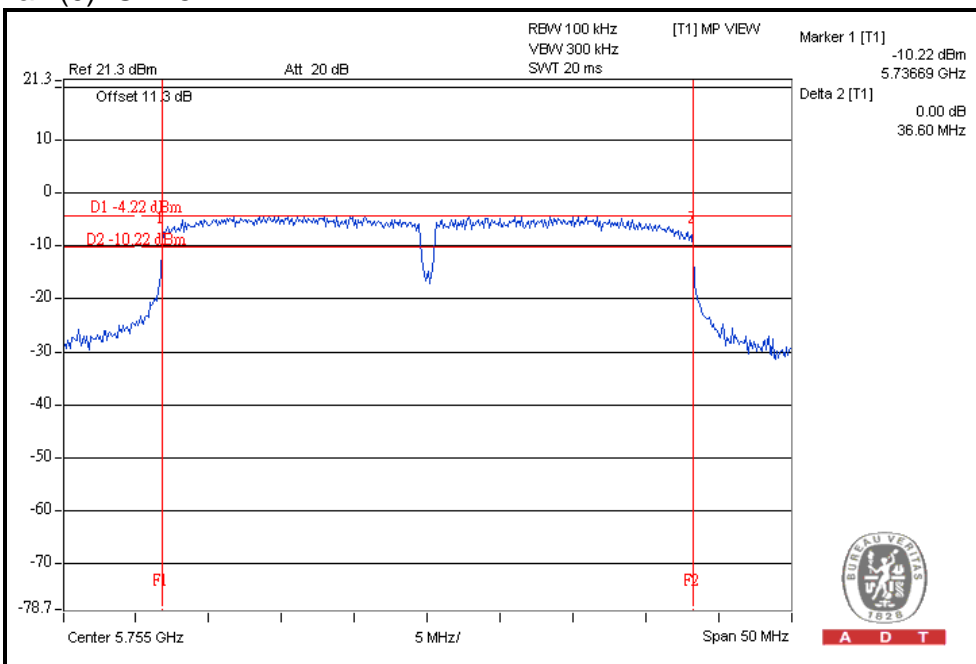


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802.11n (40MHz) OFDM MODULATION:

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN(0)	CHAIN(1)		
151	5755	36.60	36.54	0.5	PASS
159	5795	36.57	36.58	0.5	PASS

For Chain(0): CH151



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: Nov. 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.

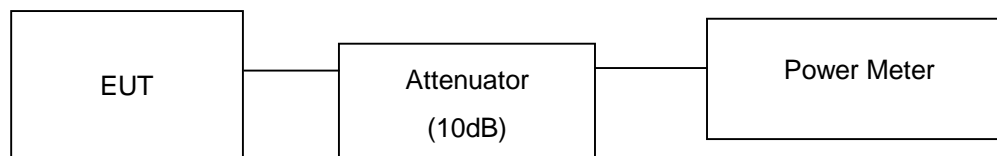
5.4.3 TEST PROCEDURES

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)				
149	5745	23.4	23.6	447.9	26.5	29.2	PASS
157	5785	23.1	23.5	428.0	26.3	29.2	PASS
165	5825	22.8	23.3	404.3	26.1	29.2	PASS

Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20})^2 / 2]$

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)				
149	5745	23.2	23.3	422.7	26.3	30	PASS
157	5785	23.3	23.6	442.9	26.5	30	PASS
165	5825	22.5	23.2	386.8	25.9	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)				
151	5755	22.4	23.4	392.6	25.9	30	PASS
159	5795	22.2	22.5	343.8	25.4	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: Nov. 11, 2011

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
R&S Spectrum Analyzer	FSP40	100036	Dec. 08, 2010	Dec. 07, 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:

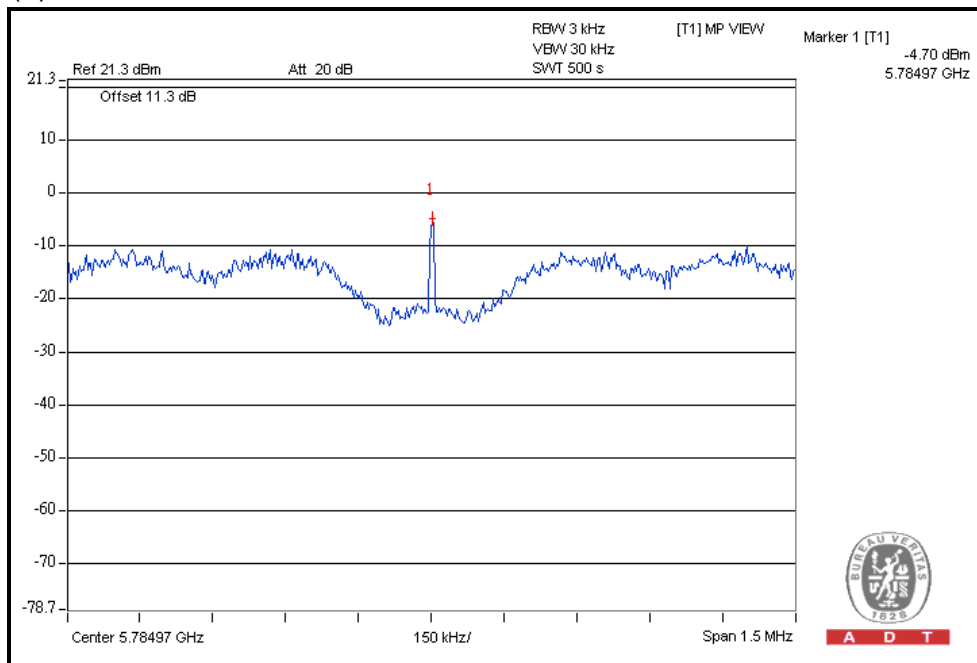
chain	CHAN.	CHAN. FREQ. (MHz)	RF POWER LEVEL IN 3kHz BW (dBm)		TOTAL POWER DENSITY (dBm)	MAX. LIMIT (dBm)	PASS / FAIL
			Measured	10 log (N=2) dB			
0	149	5745	-10.8	3.0	-7.8	7.2	PASS
	157	5785	-9.0	3.0	-6.0	7.2	PASS
	165	5825	-12.0	3.0	-9.0	7.2	PASS
1	149	5745	-8.4	3.0	-5.4	7.2	PASS
	157	5785	-4.7	3.0	-1.7	7.2	PASS
	165	5825	-6.3	3.0	-3.3	7.2	PASS

Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20})^2 / 2]$

Effective Legacy Gain (dBi) = 6.8

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

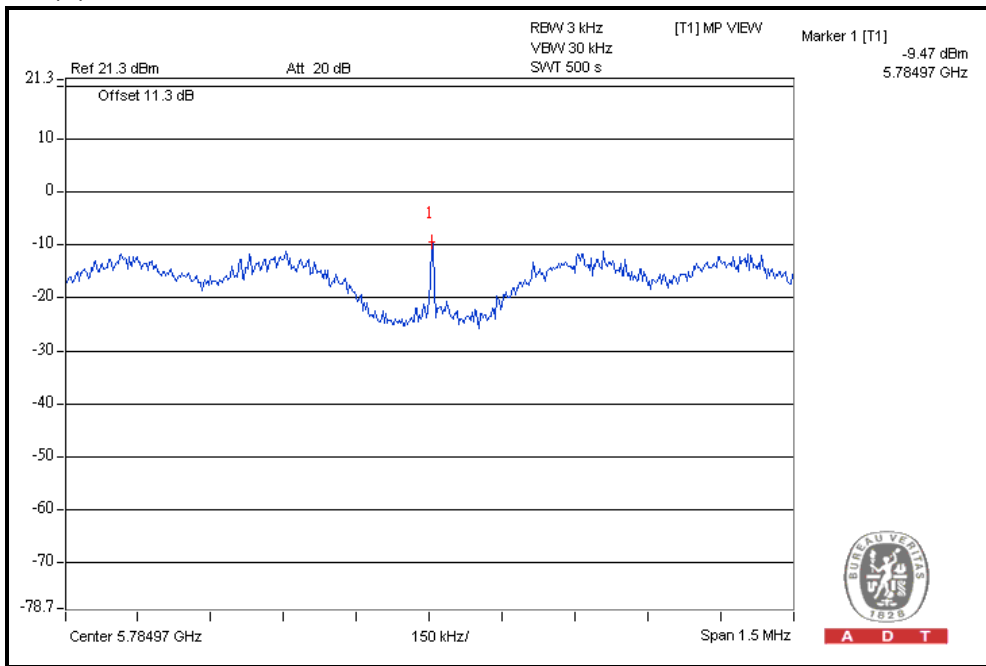
CHAIN(1): CH157



802.11n (20MHz) OFDM MODULATION:

chain	CHAN.	CHAN. FREQ. (MHz)	RF POWER LEVEL IN 3kHz BW (dBm)		TOTAL POWER DENSITY (dBm)	MAX. LIMIT (dBm)	PASS / FAIL
			Measured	10 log (N=2) dB			
0	149	5745	-11.7	3.0	-8.7	8	PASS
	157	5785	-10.6	3.0	-7.6	8	PASS
	165	5825	-12.0	3.0	-9.0	8	PASS
1	149	5745	-10.6	3.0	-7.6	8	PASS
	157	5785	-9.5	3.0	-6.5	8	PASS
	165	5825	-10.7	3.0	-7.7	8	PASS

For Chain(1): CH157



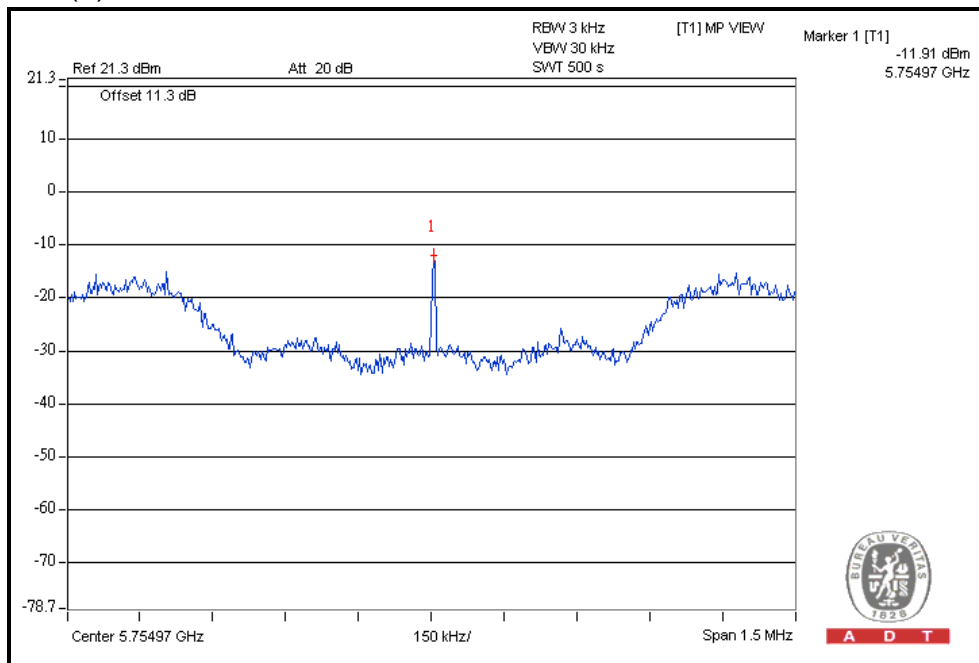


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802.11n (40MHz) OFDM MODULATION:

chain	CHAN.	CHAN. FREQ. (MHz)	RF POWER LEVEL IN 3kHz BW (dBm)		TOTAL POWER DENSITY (dBm)	MAX. LIMIT (dBm)	PASS / FAIL
			Measured	10 log (N=2) dB			
0	151	5755	-15.8	3.0	-12.8	8	PASS
	159	5795	-16.3	3.0	-13.3	8	PASS
1	151	5755	-11.9	3.0	-8.9	8	PASS
	159	5795	-14.3	3.0	-11.3	8	PASS

For Chain(1): 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: Nov. 11, 2011

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
R&S Spectrum Analyzer	FSP40	100036	Dec. 08, 2010	Dec. 07, 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 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

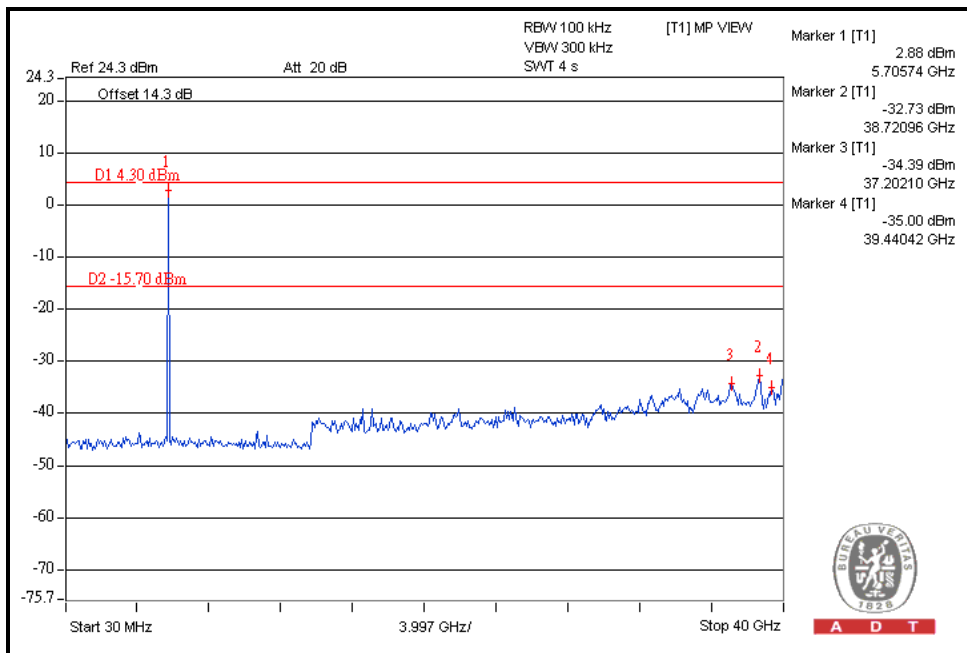
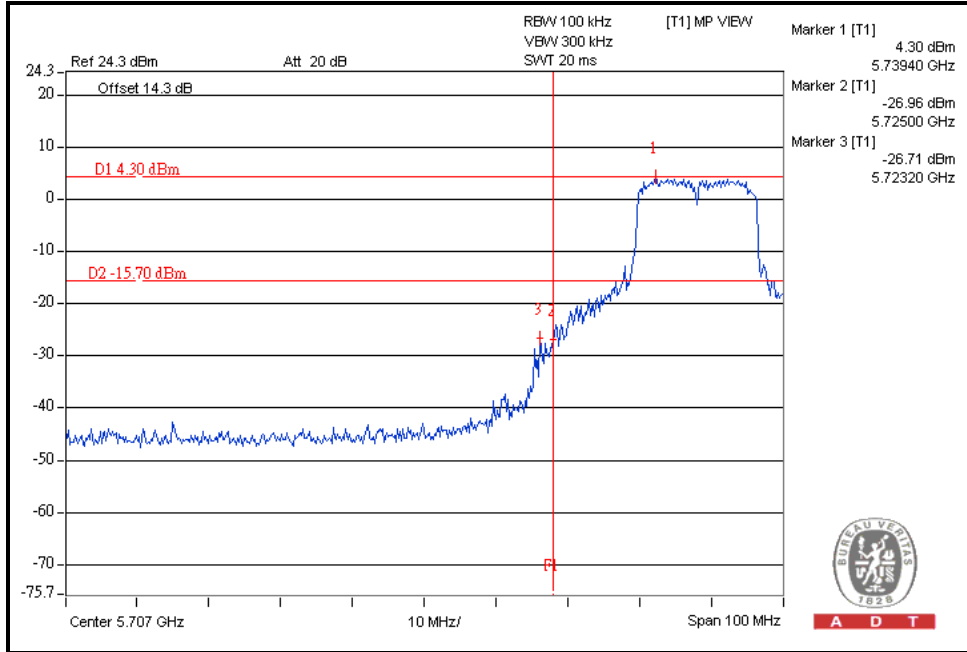
The spectrum plots are attached on the following pages. D2 line indicates the highest level, D1 line indicates the 20dB offset below D2. It shows compliance with the requirement in part 15.247(d).



A D T

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

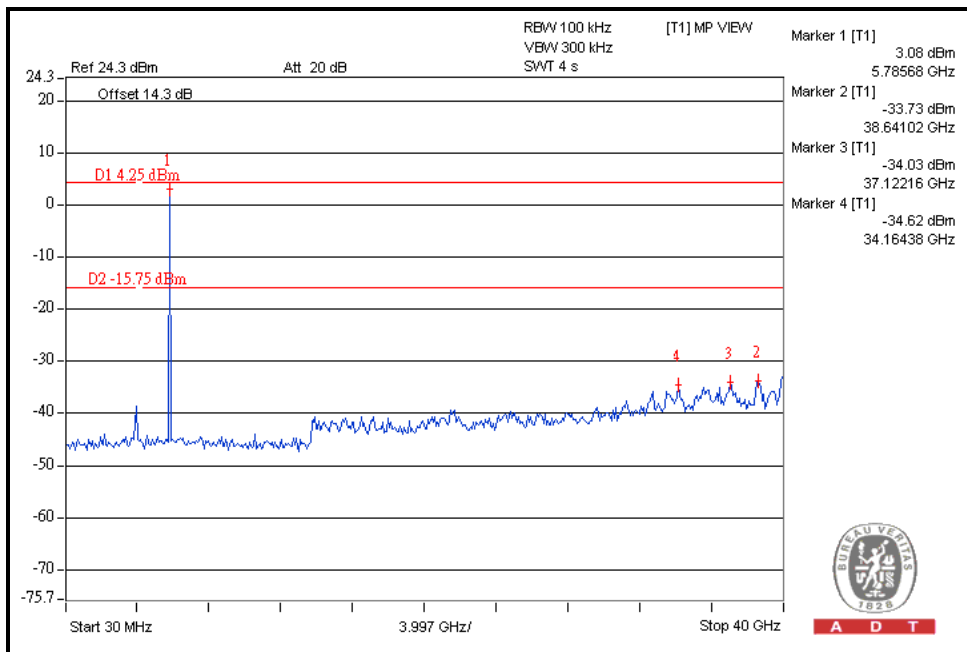
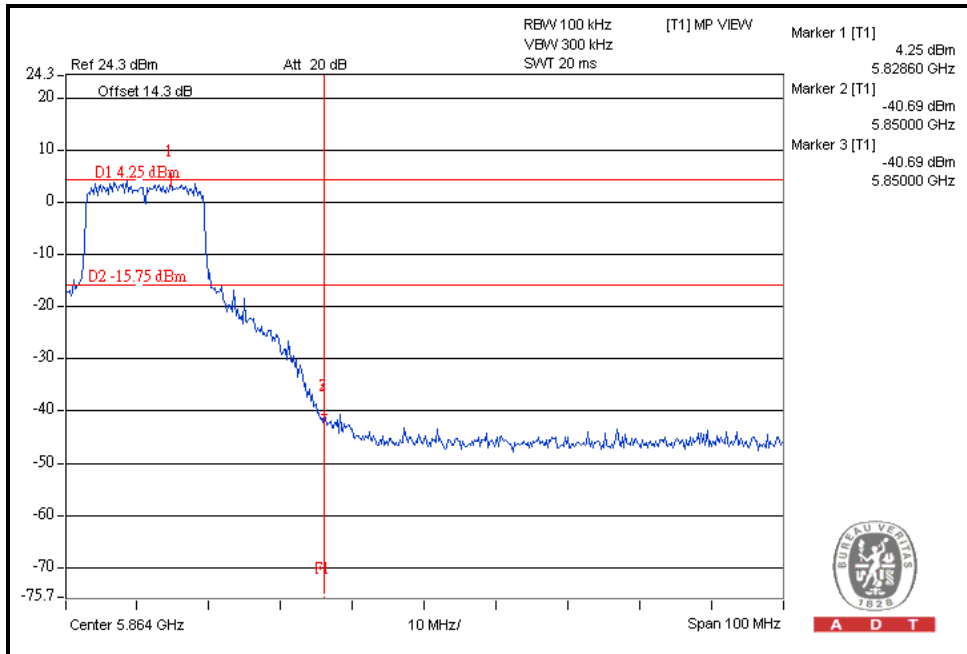
CH149





A D T

CH165

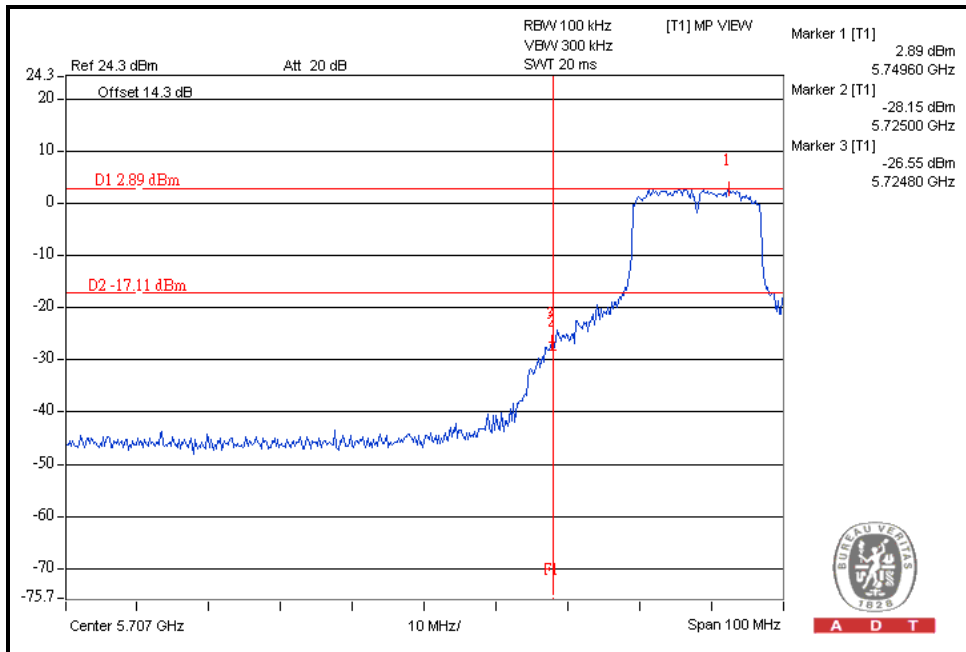




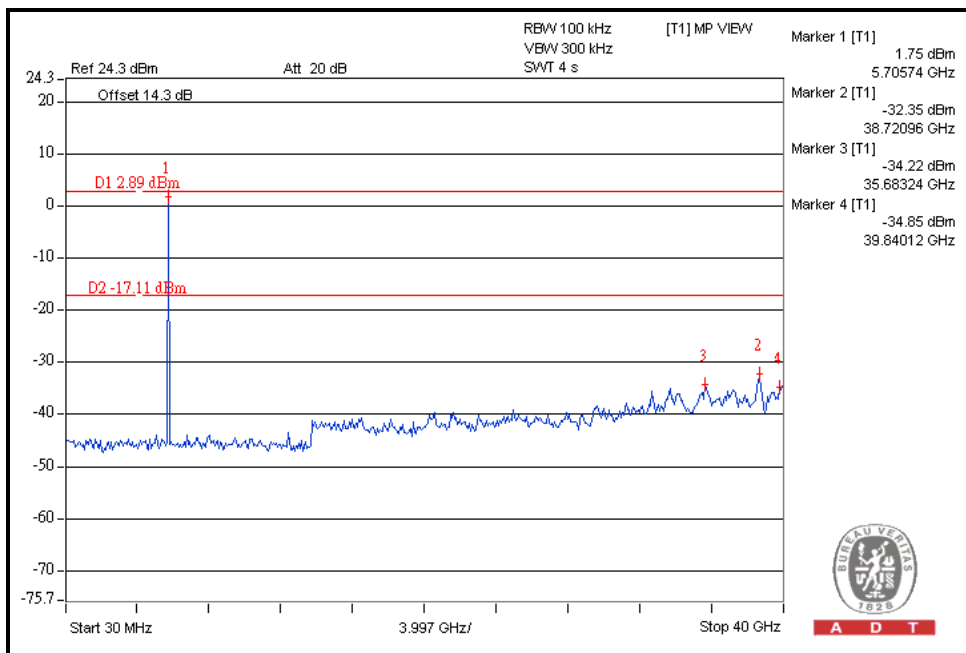
A D T

802.11n (20MHz) OFDM MODULATION:

CH149



A D T

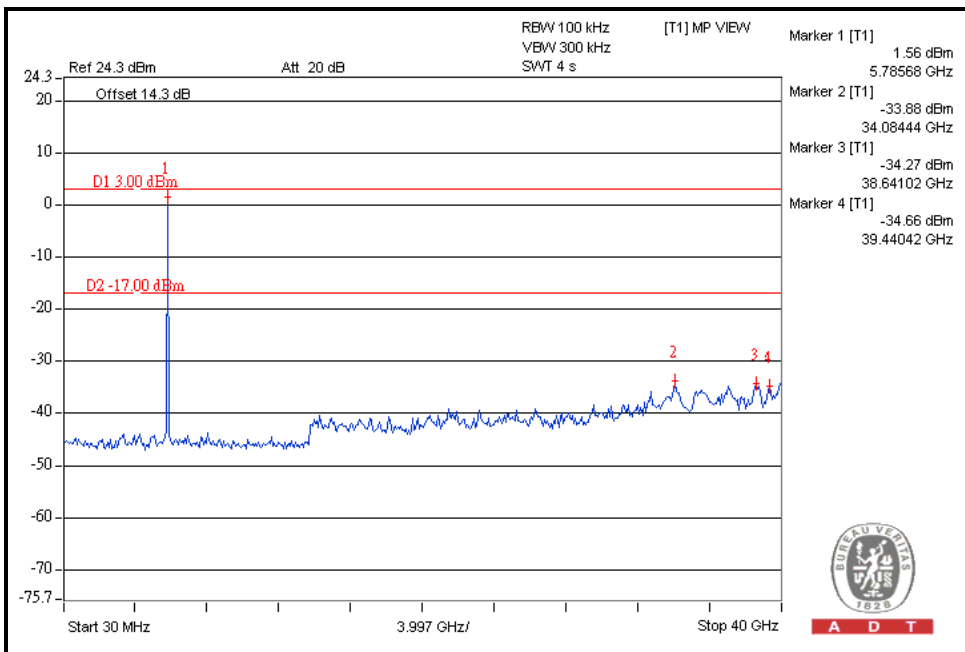
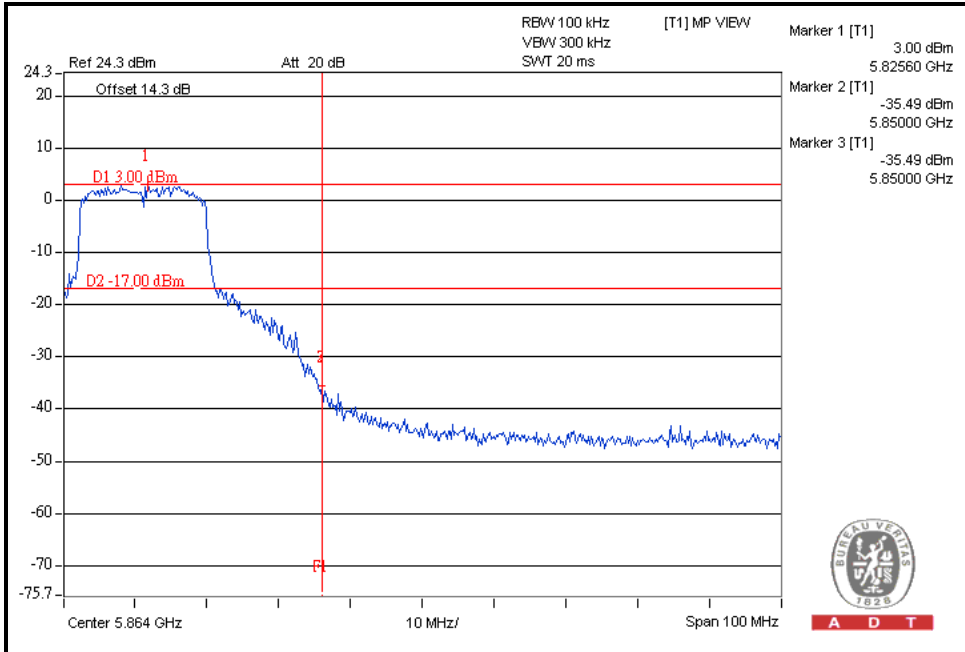


A D T



A D T

CH165

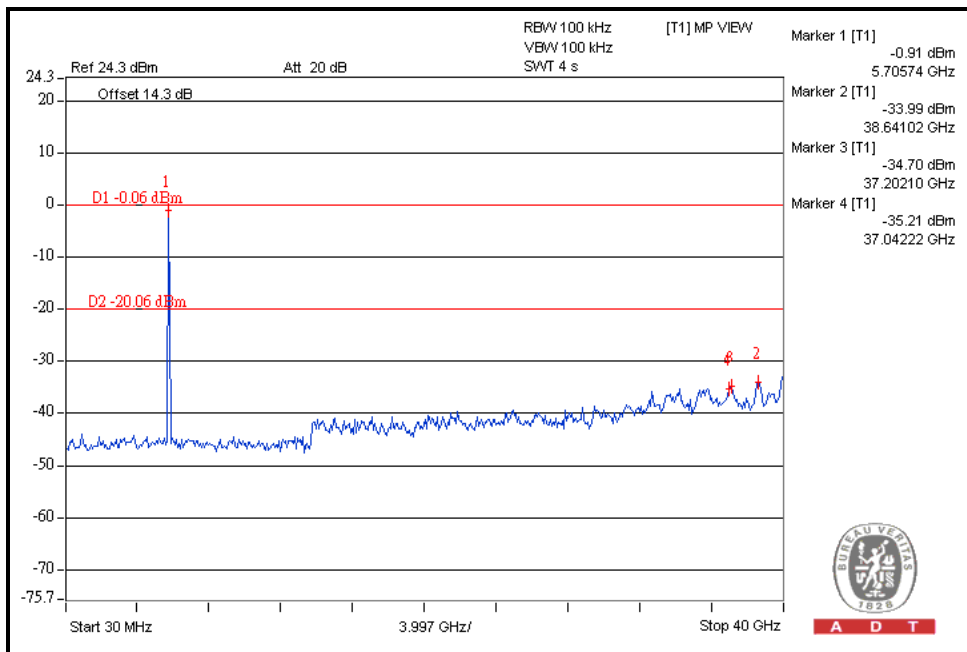
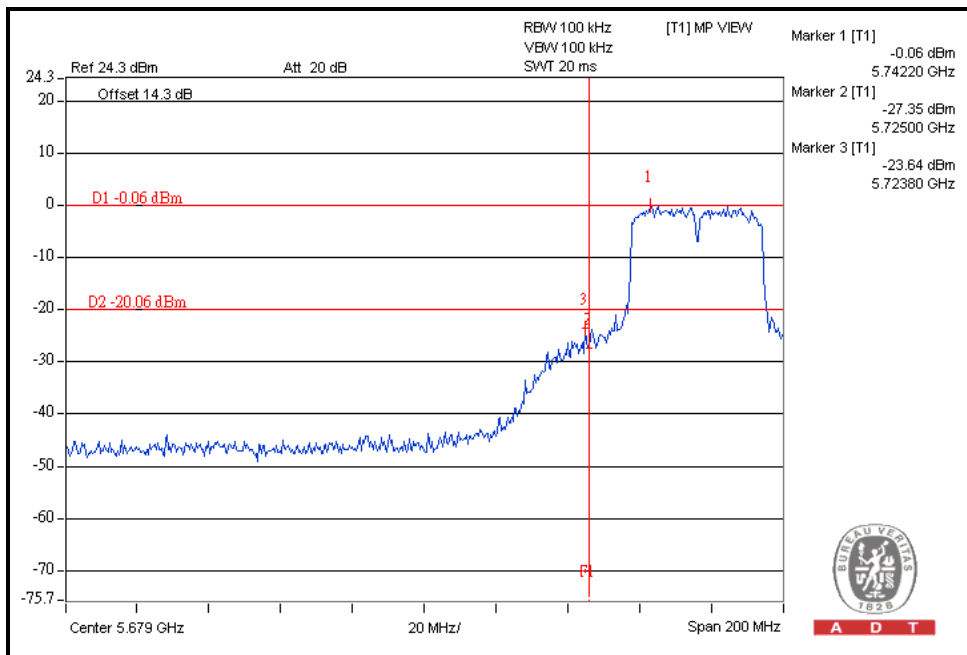




A D T

802.11n (40MHz) OFDM MODULATION:

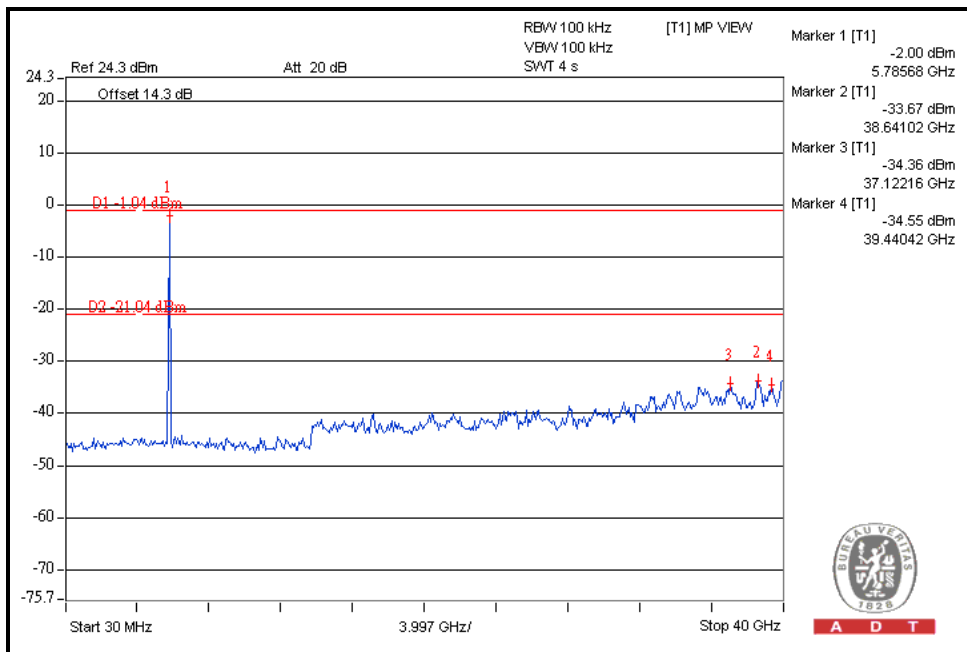
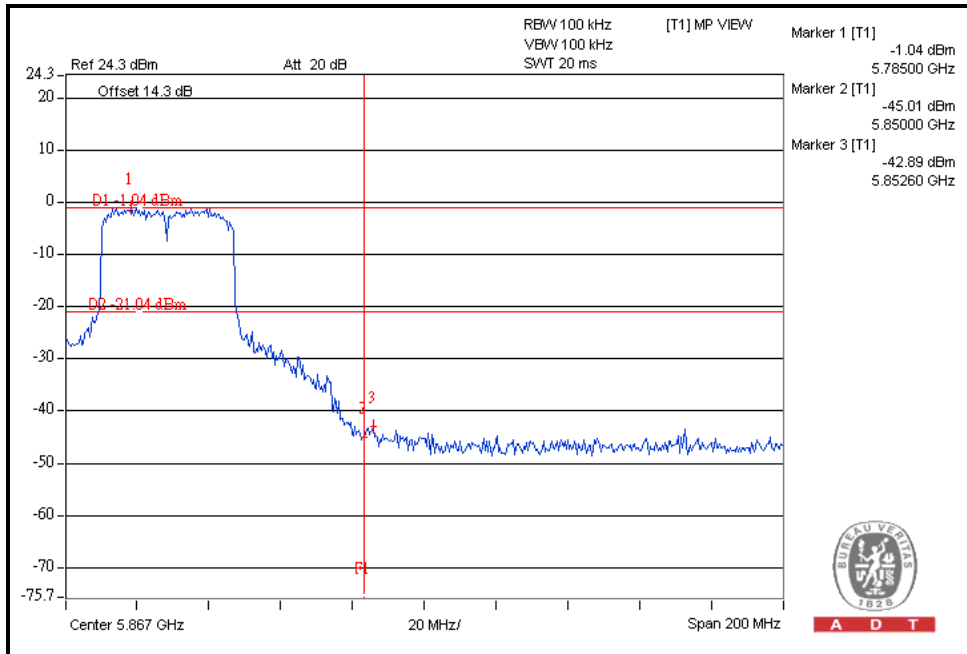
CH151





A D T

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 and authorization certificates of our laboratories obtained from approval agencies can be downloaded from our web site:

www.adt.com.tw/index.5.phtml.

If you have any comments, please feel free to contact us at the following:

Linko EMC/RF Lab:

Tel: 886-2-26052180

Fax: 886-2-26052943

Hsin Chu EMC/RF Lab:

Tel: 886-3-5935343

Fax: 886-3-5935342

Hwa Ya EMC/RF/Safety/Telecom Lab:

Tel: 886-3-3183232

Fax: 886-3-3185050

Email: service.adt@tw.bureauveritas.com

Web Site: www.adt.com.tw

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



A D T

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 ---