

FCC TEST REPORT

REPORT NO.: RF110629E02A

MODEL NO.: DIR-615

FCC ID: KA2IR615K1

RECEIVED: June 29, 2011

TESTED: July 08 to Dec. 15, 2011

ISSUED: Feb. 23, 2012

APPLICANT: D-Link Corporation

ADDRESS: No.289, Sinhu 3rd Rd., Neihu District, Taipei
City 114, Taiwan, R.O.C.

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

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

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

TEST LOCATION (2): No. 49, Ln. 206, Wende Rd., Shangshan Tsuen,
Chiung Lin Hsiang, Hsin Chu Hsien 307, Taiwan

This test report consists of 81 pages in total. It may be duplicated completely for legal use with the approval of the applicant. It should not be reproduced except in full, without the written approval of our laboratory. The client should not use it to claim product certification, approval, or endorsement by TAF or any government agencies. The test results in the report only apply to the tested sample.



Table of Contents

RELEASE CONTROL RECORD	4
1. CERTIFICATION	5
2. SUMMARY OF TEST RESULTS	6
2.1 MEASUREMENT UNCERTAINTY	7
3. GENERAL INFORMATION	8
3.1 GENERAL DESCRIPTION OF EUT	8
3.2 DESCRIPTION OF TEST MODES	10
3.2.1 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL	11
3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS	14
3.4 DESCRIPTION OF SUPPORT UNITS.....	15
3.5 CONFIGURATION OF SYSTEM UNDER TEST	16
4. TEST TYPES AND RESULTS	17
4.1 CONDUCTED EMISSION MEASUREMENT	17
4.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT	17
4.1.2 TEST INSTRUMENTS.....	17
4.1.3 TEST PROCEDURES	18
4.1.4 DEVIATION FROM TEST STANDARD	18
4.1.5 TEST SETUP	19
4.1.6 EUT OPERATING CONDITIONS	19
4.1.7 TEST RESULTS (MODE 1)	20
4.1.8 TEST RESULTS (MODE 2)	22
4.2 RADIATED EMISSION MEASUREMENT	24
4.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT	24
4.2.2 TEST INSTRUMENTS.....	25
4.2.3 TEST PROCEDURES	27
4.2.4 DEVIATION FROM TEST STANDARD	27
4.2.5 TEST SETUP	28
4.2.6 EUT OPERATING CONDITIONS	28
4.2.7 TEST RESULTS	29
4.3 6dB BANDWIDTH MEASUREMENT	58
4.3.1 LIMITS OF 6dB BANDWIDTH MEASUREMENT	58
4.3.2 TEST INSTRUMENTS.....	58
4.3.3 TEST PROCEDURE.....	58
4.3.4 DEVIATION FROM TEST STANDARD	58
4.3.5 TEST SETUP	58
4.3.6 EUT OPERATING CONDITIONS	58
4.3.7 TEST RESULTS	59
4.4 MAXIMUM PEAK OUTPUT POWER.....	63
4.4.1 LIMITS OF MAXIMUM PEAK OUTPUT POWER MEASUREMENT	63
4.4.2 INSTRUMENTS.....	63



A D T

4.4.3	TEST PROCEDURES	63
4.4.4	DEVIATION FROM TEST STANDARD	63
4.4.5	TEST SETUP	63
4.4.6	EUT OPERATING CONDITIONS	63
4.4.7	TEST RESULTS	64
4.5	POWER SPECTRAL DENSITY MEASUREMENT	66
4.5.1	LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT	66
4.5.2	TEST INSTRUMENTS	66
4.5.3	TEST PROCEDURE	66
4.5.4	DEVIATION FROM TEST STANDARD	66
4.5.5	TEST SETUP	66
4.5.6	EUT OPERATING CONDITION	66
4.5.7	TEST RESULTS	67
4.6	CONDUCTED OUT-BAND EMISSION MEASUREMENT	71
4.6.1	LIMITS OF CONDUCTED OUT-BAND EMISSION MEASUREMENT	71
4.6.2	TEST INSTRUMENTS	71
4.6.3	TEST PROCEDURE	71
4.6.4	DEVIATION FROM TEST STANDARD	71
4.6.5	EUT OPERATING CONDITION	71
4.6.6	TEST RESULTS	71
5.	INFORMATION ON THE TESTING LABORATORIES	80
6.	APPENDIX A - MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB	81



A D T

RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF110629E02A	Original release	Feb. 23, 2012

1. CERTIFICATION

PRODUCT: Wireless N Router
BRAND NAME: D-Link
MODEL NO.: DIR-615
TEST SAMPLE: MASS-PRODUCTION
APPLICANT: D-Link Corporation
TESTED: July 08 to Dec. 15, 2011
STANDARDS: FCC Part 15, Subpart C (Section 15.247)
ANSI C63.10-2009

The above equipment (Model: DIR-615) 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 : Lori Chung , **DATE:** Feb. 23, 2012
(Lori Chung, Specialist)

APPROVED BY : May Chen , **DATE:** Feb. 23, 2012
(May Chen, Deputy Manager)

2. SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC Part 15, Subpart C			
Standard Section	Test Type and Limit	Result	Remark
15.207	AC Power Conducted Emission	PASS	Meet the requirement of limit. Minimum passing margin is -7.37dB at 0.443MHz
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 -0.6dB at 2390.00MHz
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.

2.1 MEASUREMENT UNCERTAINTY

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

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

Measurement	Value
Conducted emissions	2.45 dB
Radiated emissions (30MHz-1GHz)	4 dB
Radiated emissions (1GHz -18GHz)	2.19 dB
Radiated emissions (18GHz -40GHz)	2.56 dB

3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

PRODUCT	Wireless N Router
MODEL NO.	DIR-615
FCC ID	KA2IR615K1
POWER SUPPLY	DC 12V $\pm 5\%$ from power adapter
MODULATION TYPE	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM
MODULATION TECHNOLOGY	DSSS, OFDM
TRANSFER RATE	802.11b: up to 11Mbps 802.11g: up to 54Mbps 802.11n (20MHz, 800ns GI): up to 130Mbps 802.11n (40MHz, 800ns GI): up to 270Mbps 802.11n (20MHz, 400ns GI): up to 144.444Mbps 802.11n (40MHz, 400ns GI): up to 300Mbps
OPERATING FREQUENCY	2.412 ~ 2.462GHz
NUMBER OF CHANNEL	11 for 802.11b, 802.11g, 802.11n (20MHz) 7 for 802.11n (40MHz)
MAXIMUM OUTPUT POWER	802.11b: 162.2mW 802.11g: 614.3mW 802.11n (20MHz): 670.3mW 802.11n (40MHz): 321.2mW
ANTENNA TYPE	Please see note
DATA CABLE	NA
I/O PORTS	INTERNET port x 1 LAN (Ethernet) (10, 100Mbps) port x 4
ASSOCIATED DEVICES	Adapter x 1

NOTE:

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

Antenna Set	Antenna	Transmitter Circuit	Manufacture	Model No.	Antenna Type	Gain (dBi)
1	1	Chain (0)	WHA YU GROUP	C037-511054-A (SSR-210188)	Dipole	4.0
	2	Chain (1)	WHA YU GROUP	C037-511054-A (SSR-210188)	Dipole	4.0
Antenna Set	Antenna	Transmitter Circuit	Manufacture	Model No.	Antenna Type	Gain (dBi)
2	3	Chain (0)	MAG. LAYERS SCIENTIFIC-TECHNICS CO., LTD	EDA-8709-2G4 C1-A91	Dipole	1.97
	4	Chain (1)	MAG. LAYERS SCIENTIFIC-TECHNICS CO., LTD	EDA-8709-2G4 C1-A90	Dipole	1.96

2. The EUT must be supplied with following two different models could be chosen as following table:

No	Brand	Model No.	Spec.
1	D-Link	SAI006F US	Input: 100-240V, 0.2A, 47-630Hz Output: 12V, 0.5A DC output cable (unshielded, 1.2m)
2	D-Link	AMS47-1200500FU	Input: 100-240V, 0.2A, 50/60Hz Output: 12V, 0.5A DC output cable (unshielded, 1.25m)

From the above adapters, the radiated emissions worse case was found in the **adapter 1**. Therefore only the test data of the adapter was recorded in this report.

3. The EUT is 2 * 2 spatial MIMO (2Tx & 2Rx) without beam forming function. The 11b legacy mode is limited to single transmitter only.
4. When the EUT operating in 802.11n, the software operation, which is defined by manufacturer, MCS (Modulation and Coding Schemes) from 0 to 15.
5. 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

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		

3.2.1 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

EUT CONFIGURE MODE	APPLICABLE TO					DESCRIPTION
	PLC	RE < 1G	RE ³ 1G	APCM	OB	
1	√	√	√	√	√	With antenna 1 & adapter 1
2	√	-	-	-	-	With antenna 1 & adapter 2

Where **PLC**: Power Line Conducted Emission **RE < 1G**: Radiated Emission below 1GHz
RE ³ 1G: Radiated Emission above 1GHz **APCM**: Antenna Port Conducted Measurement
OB: Conducted Out-Band Emission Measurement¹

ANTENNA COMBINATION MODE:

COMBINATION MODE	OPERATION MODE	TX CHAIN(0)	TX CHAIN(1)
A	802.11 b	√	-
B	802.11 g	√	√
C	802.11n (20MHz) for MCS 0~15	√	√
D	802.11n (40MHz) for MCS 0~15	√	√

Note:

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

POWER LINE CONDUCTED EMISSION TEST:

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

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)	COMBINATION MODE
802.11n (20MHz)	1 to 11	6	OFDM	BPSK	6.5	C

RADIATED EMISSION TEST (BELOW 1 GHz):

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

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)	COMBINATION MODE
802.11n (20MHz)	1 to 11	6	OFDM	BPSK	6.5	C

RADIATED EMISSION TEST (ABOVE 1 GHz):

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

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)	COMBINATION MODE
802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1	A
802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6	B
802.11n (20MHz)	1 to 11	1, 6, 11	OFDM	BPSK	6.5	C
802.11n (40MHz)	3 to 9	3, 6, 9	OFDM	BPSK	13.5	D

ANTENNA PORT CONDUCTED MEASUREMENT:

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

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)	COMBINATION MODE
802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1	A
802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6	B
802.11n (20MHz)	1 to 11	1, 6, 11	OFDM	BPSK	6.5	C
802.11n (40MHz)	3 to 9	3, 6, 9	OFDM	BPSK	13.5	D

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, 6, 11	DSSS	DBPSK	1	A
802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6	B
802.11n (20MHz)	1 to 11	1, 6, 11	OFDM	BPSK	6.5	C
802.11n (40MHz)	3 to 9	3, 6, 9	OFDM	BPSK	13.5	D

TEST CONDITION:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
PLC	26deg. C, 60%RH	120Vac, 60Hz	Kyle Huang
RE<1G	20deg. C, 70%RH	120Vac, 60Hz	Frank Liu
RE ³ 1G	22deg. C, 65%RH	120Vac, 60Hz	Even Huang
APCM	25deg. C, 60%RH	120Vac, 60Hz	Rex Huang
OB	25deg. C, 60%RH	120Vac, 60Hz	Rex Huang

3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS

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

FCC Part 15, Subpart C. (15.247)

ANSI C63.10-2009

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

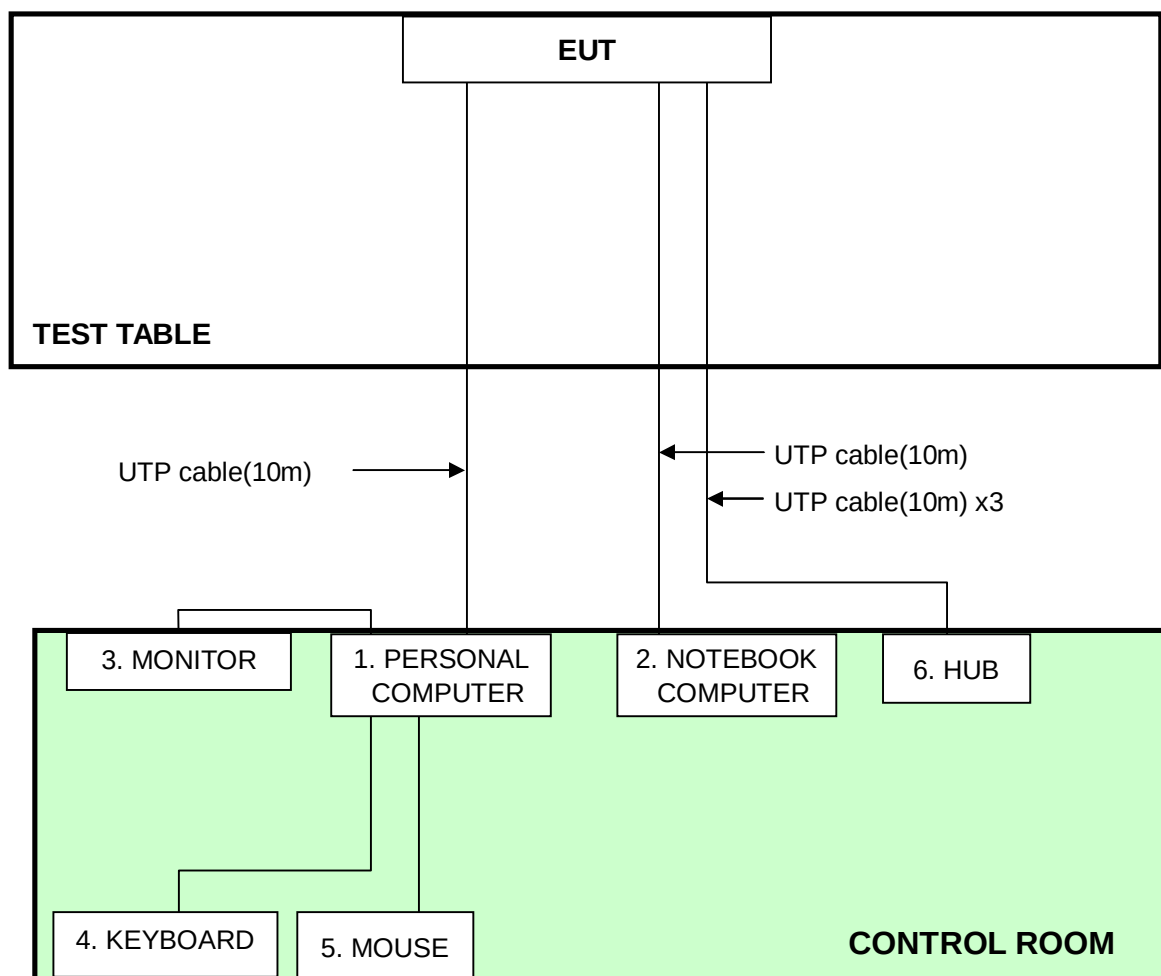
The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

No.	Product	Brand	Model No.	Serial No.	FCC ID
1	PERSONAL COMPUTER	DELL	760L	CN-0D1534-70821-39C-A1VL	NA
2	NOTEBOOK COMPUTER	DELL	PP32LA	FSLB32S	FCC DoC
3	MONITOR	AD1	G1000	240058T00100081	NA
4	KEYBOARD	DELL	SK-8115	CN-0J4635-71616-63I-076F	FCC DoC
5	MOUSE	DELL	M056UOA	FOROBSN	FCC DoC
6	HUB	ZyXEL	ES-116P	S060H02000215	FCC DoC

No.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	UTP cable (10m)
2	UTP cable (10m) × 3
3	UTP cable (10m)
4	VGA cable (1.8m)
5	USB cable (1.7m)
6	USB cable (1.5m)

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

3.5 CONFIGURATION OF SYSTEM UNDER TEST



4. TEST TYPES AND RESULTS

4.1 CONDUCTED EMISSION MEASUREMENT

4.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

FREQUENCY OF EMISSION (MHz)	CONDUCTED LIMIT (dB μ V)	
	Quasi-peak	Average
0.15-0.5	66 to 56	56 to 46
0.5-5	56	46
5-30	60	50

- NOTE:**
1. The lower limit shall apply at the transition frequencies.
 2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50 MHz.

4.1.2 TEST INSTRUMENTS

For test mode 1: test date: July 25, 2011

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
ROHDE & SCHWARZ Test Receiver	ESCS 30	100287	Mar. 02, 2011	Mar. 01, 2012
Line-Impedance Stabilization Network (for EUT)	NSLK 8127	8127-523	Sep. 17, 2010	Sep. 16, 2011
Line-Impedance Stabilization Network (for Peripheral)	ENV-216	100072	June 10, 2011	June 09, 2012
RF Cable (JYEBAO)	5DFB	CONCAB-003	Aug. 06, 2010	Aug. 05, 2011
50 ohms Terminator	50	3	Nov. 03, 2010	Nov. 02, 2011
Software	BV ADT_Cond_V7.3.7	NA	NA	NA

Note:

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in Shielded Room No. A.
3. The VCCI Con A Registration No. is C-817.

For test mode 2 ~ 4: test date: Nov. 25, 2011

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
ROHDE & SCHWARZ Test Receiver	ESCS 30	100287	Mar. 02, 2011	Mar. 01, 2012
Line-Impedance Stabilization Network (for EUT)	NSLK 8127	8127-523	Sep. 16, 2011	Sep. 15, 2012
Line-Impedance Stabilization Network (for Peripheral)	ENV-216	100072	June 10, 2011	June 09, 2012
RF Cable (JYEBAO)	5DFB	CONCAB-003	Aug. 05, 2011	Aug. 04, 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. A.
- 3 The VCCI Con A Registration No. is C-817.

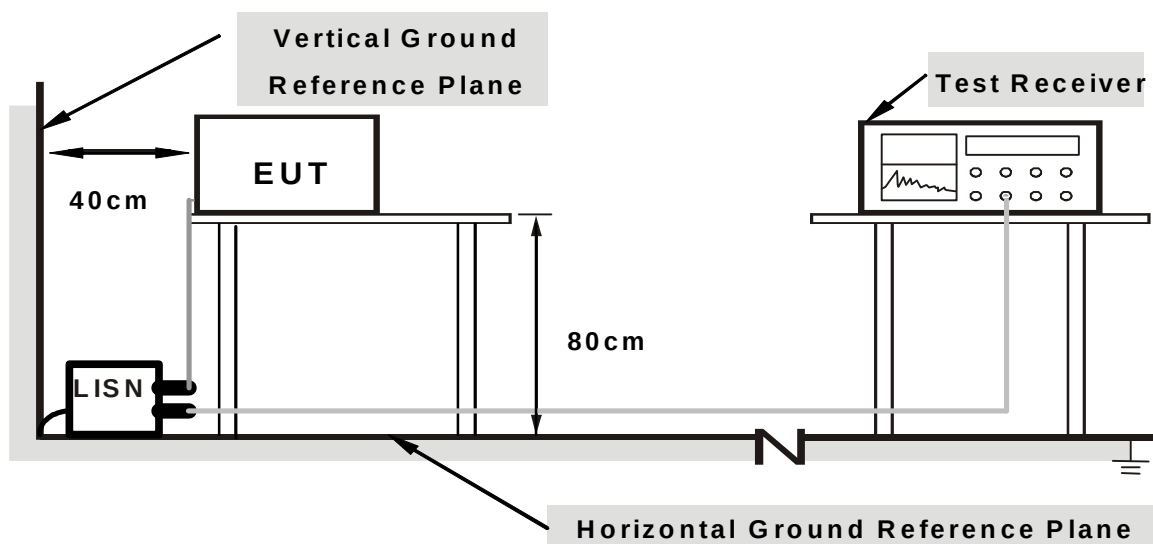
4.1.3 TEST PROCEDURES

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

4.1.4 DEVIATION FROM TEST STANDARD

No deviation

4.1.5 TEST SETUP



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

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

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

4.1.6 EUT OPERATING CONDITIONS

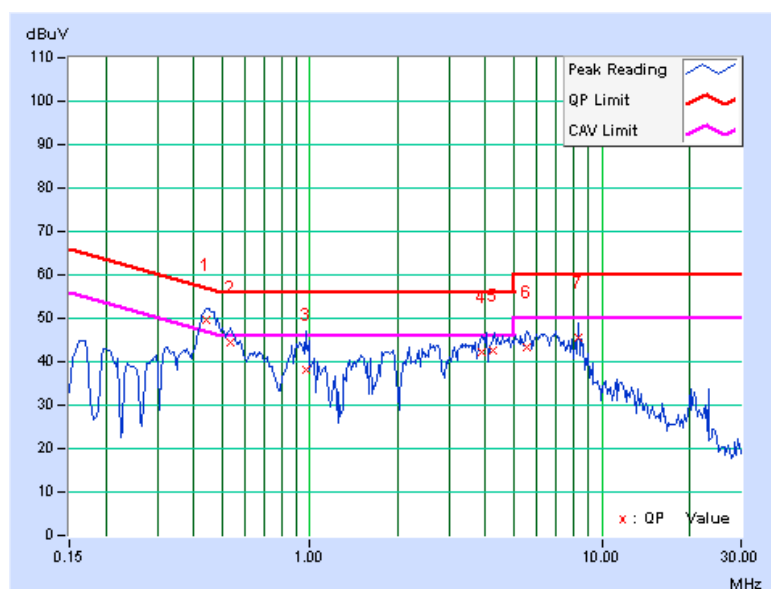
1. Placed the EUT on testing table.
2. Prepared computer systems (support unit 1~2) to act as communication partner and placed it outside of testing area.
3. The communication partner ran test program “TX WL command” to enable EUT under transmission/receiving condition continuously at specific channel frequency.

4.1.7 TEST RESULTS (MODE 1)

PHASE	Line (L)	6dB BANDWIDTH	9 kHz
-------	----------	---------------	-------

No	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
	[MHz]	Factor [dB]	[dB (uV)]	[dB (uV)]	[dB (uV)]	[dB (uV)]	[dB (uV)]	[dB (uV)]	[dB]	[dB]
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.443	0.37	49.26	38.10	49.63	38.47	57.01	47.01	-7.37	-8.53
2	0.537	0.38	44.01	31.50	44.39	31.88	56.00	46.00	-11.61	-14.12
3	0.970	0.42	37.87	27.29	38.29	27.71	56.00	46.00	-17.71	-18.29
4	3.887	0.57	41.70	34.32	42.27	34.89	56.00	46.00	-13.73	-11.11
5	4.219	0.58	42.03	33.74	42.61	34.32	56.00	46.00	-13.39	-11.68
6	5.531	0.65	42.86	33.29	43.51	33.94	60.00	50.00	-16.49	-16.06
7	8.313	0.79	44.64	39.25	45.43	40.04	60.00	50.00	-14.57	-9.96

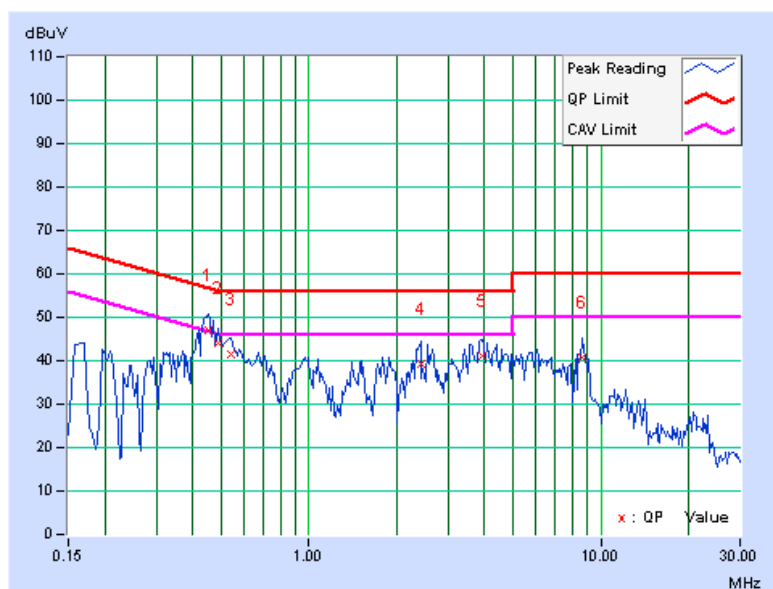
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. The emission levels of other frequencies were very low against the limit.
 3. Margin value = Emission level - Limit value
 4. Correction factor = Insertion loss + Cable loss
 5. Emission Level = Correction Factor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



PHASE	Neutral (N)	6dB BANDWIDTH	9 kHz
-------	-------------	---------------	-------

	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
No		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.455	0.13	46.86	36.09	46.99	36.22	56.79	46.79	-9.80	-10.57
2	0.486	0.13	44.05	34.20	44.18	34.33	56.24	46.24	-12.06	-11.91
3	0.541	0.13	41.52	29.33	41.65	29.46	56.00	46.00	-14.35	-16.54
4	2.418	0.26	38.88	27.25	39.14	27.51	56.00	46.00	-16.86	-18.49
5	3.941	0.33	40.65	32.58	40.98	32.91	56.00	46.00	-15.02	-13.09
6	8.688	0.60	40.30	35.06	40.90	35.66	60.00	50.00	-19.10	-14.34

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

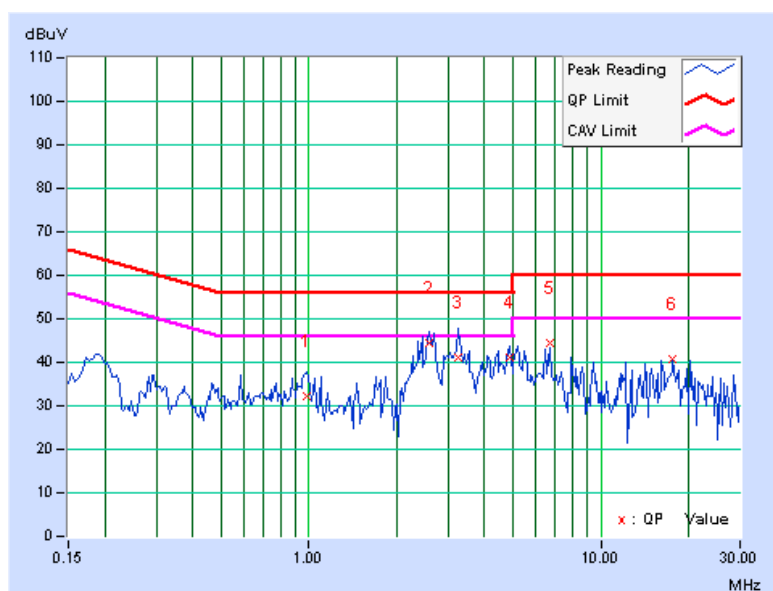


4.1.8 TEST RESULTS (MODE 2)

PHASE	Line (L)	6dB BANDWIDTH	9 kHz
-------	----------	---------------	-------

No	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.986	0.10	32.10	20.10	32.20	20.20	56.00	46.00	-23.80	-25.80
2	2.574	0.23	44.37	33.71	44.60	33.94	56.00	46.00	-11.40	-12.06
3	3.246	0.26	40.73	30.54	40.99	30.80	56.00	46.00	-15.01	-15.20
4	4.887	0.34	40.67	33.67	41.01	34.01	56.00	46.00	-14.99	-11.99
5	6.709	0.43	43.87	39.47	44.30	39.90	60.00	50.00	-15.70	-10.10
6	17.691	0.92	39.90	34.43	40.82	35.35	60.00	50.00	-19.18	-14.65

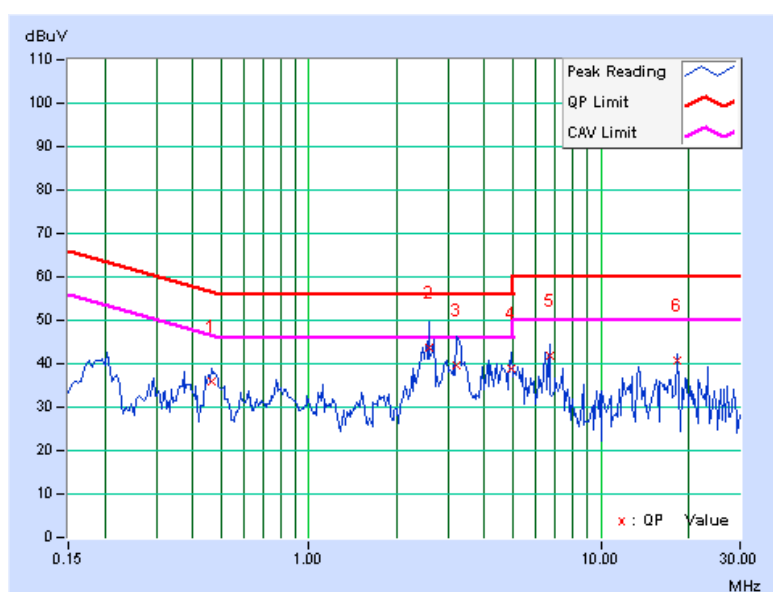
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. The emission levels of other frequencies were very low against the limit.
 3. Margin value = Emission level - Limit value
 4. Correction factor = Insertion loss + Cable loss
 5. Emission Level = Correction Factor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



PHASE	Neutral (N)	6dB BANDWIDTH	9 kHz
-------	-------------	---------------	-------

No	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.466	0.09	35.83	30.38	35.92	30.47	56.58	46.58	-20.66	-16.11
2	2.586	0.23	43.65	30.85	43.88	31.08	56.00	46.00	-12.12	-14.92
3	3.207	0.27	39.28	27.25	39.55	27.52	56.00	46.00	-16.45	-18.48
4	4.945	0.35	38.68	29.38	39.03	29.73	56.00	46.00	-16.97	-16.27
5	6.711	0.42	41.34	33.45	41.76	33.87	60.00	50.00	-18.24	-16.13
6	18.242	0.94	39.71	33.79	40.65	34.73	60.00	50.00	-19.35	-15.27

- 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.

**A D T**

4.2.2 TEST INSTRUMENTS

For Below 1GHz: test date: Dec. 02, 2011

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
ADVANTEST Spectrum Analyzer	U3751	170100022	Nov. 18, 2011	Nov. 17, 2012
HP Pre_Amplifier	8449B	3008A01922	Sep. 23, 2011	Sep. 22, 2012
ROHDE & SCHWARZ Test Receiver	ESCS 30	100375	Mar. 09, 2011	Mar. 08, 2012
SCHWARZBECK Broadband Antenna	VULB-9168	263	Apr. 23, 2011	Apr. 22, 2012
Schwarzbeck Horn_Antenna	BBHA9120	D123	Sep. 06, 2011	Sep. 05, 2012
Schwarzbeck Horn_Antenna	BBHA 9170	BBHA9170153	Jan. 17, 2011	Jan. 16, 2012
RF Switches	EM-H-01-1	1009	July 27, 2011	July 26, 2012
RF Cable	8DFB	STACAB-001	July 27, 2011	July 26, 2012
Software	ADT_Radiated_V7.6.15.9.2	NA	NA	NA
CT Antenna Tower & Turn Table	TT100	ADT01	NA	NA
CORCOM AC Filter	MRI2030	107/108	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 Open Site No. A.

3. The VCCI Site Registration No. is R-782.

4. The FCC Site Registration No. is 91097.

5. The CANADA Site Registration No. is IC 7450G-1.



A D T

For Above 1GHz: test date: July 08, 2011

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Agilent Spectrum Analyzer	E4446A	MY48250253	Aug. 23, 2010	Aug. 22, 2011
Agilent Pre-Selector	N9039A	MY46520310	Aug. 23, 2010	Aug. 22, 2011
Agilent Signal Generator	N5181A	MY49060347	July 30, 2010	July 29, 2011
LIG NEX1 Test Receiver	ER-265	L09068005	Oct. 25, 2010	Oct. 24, 2011
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	NA	NA
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. 08, 2010	Oct. 07, 2011
RF CABLE	NA	RF104-205 RF104-207 RF104-202	Dec. 28, 2010	Dec. 27, 2011
RF Cable	NA	CHHCAB_001	NA	NA
Software	ADT_Radiated_V8.7.05	NA	NA	NA
CT Antenna Tower & Turn Table	NA	NA	NA	NA

- Note: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The horn antenna, preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
3. The test was performed in 966 Chamber No. 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 a 10 meter open area test site for below 1GHz test and at a 3 meters chamber room for above 1GHz test. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.
- f. The test-receiver system was set to peak and average detect function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

NOTE:

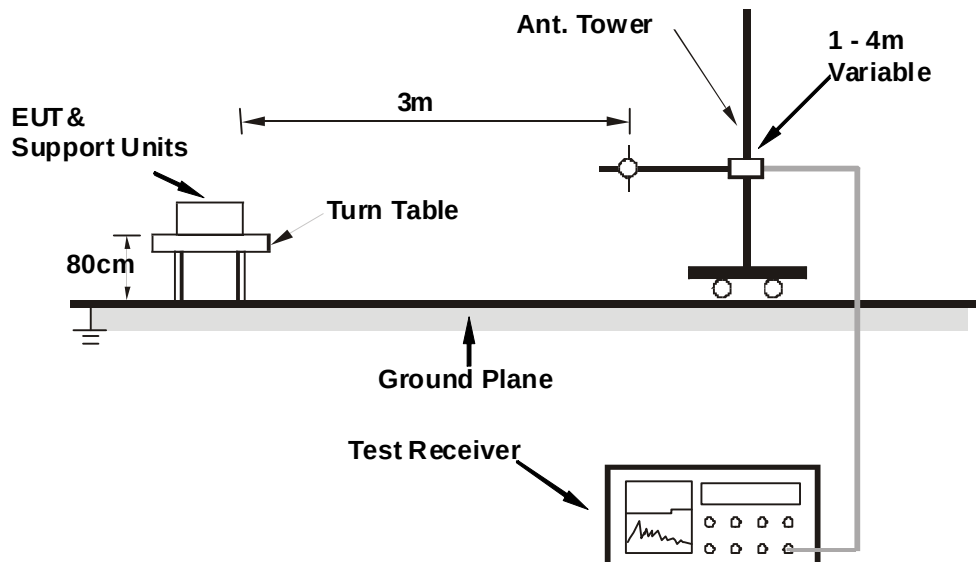
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.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

4.2.4 DEVIATION FROM TEST STANDARD

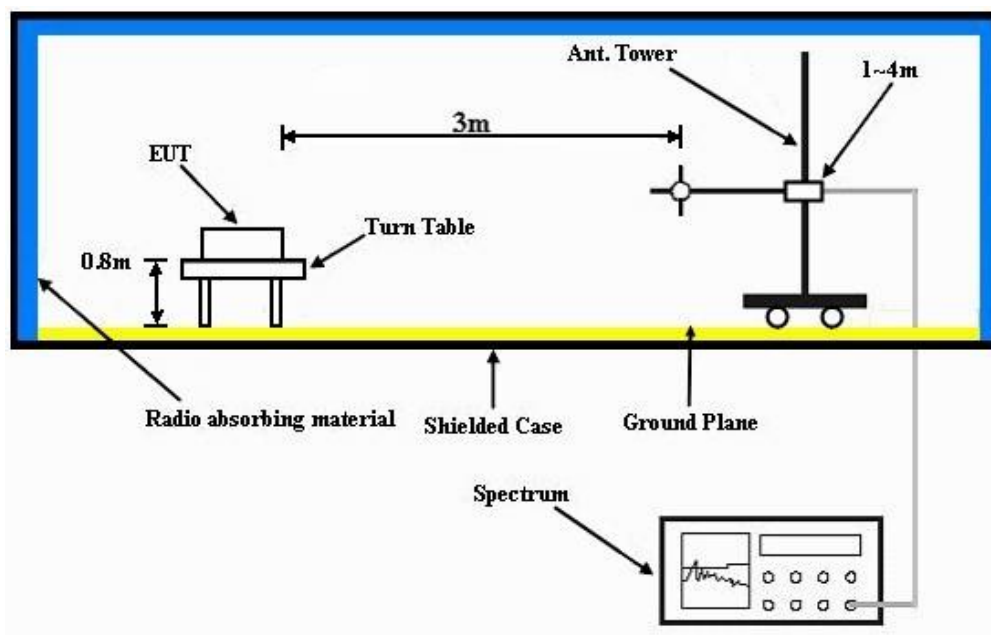
No deviation

4.2.5 TEST SETUP

<Frequency Range below 1GHz>



<Frequency Range above 1GHz>



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

4.2.6 EUT OPERATING CONDITIONS

Same as 4.1.6

4.2.7 TEST RESULTS

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

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	Below 1000MHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	20deg. C, 70%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	125.00	32.6 QP	43.5	-10.9	1.67 H	269	19.68	12.96
2	250.00	40.9 QP	46.0	-5.1	1.00 H	36	26.55	14.31
3	300.00	33.0 QP	46.0	-13.1	1.27 H	15	16.75	16.20
4	500.00	36.3 QP	46.0	-9.8	1.72 H	19	14.19	22.06
5	750.00	37.1 QP	46.0	-8.9	1.08 H	348	9.65	27.46
6	899.99	32.9 QP	46.0	-13.1	1.00 H	136	3.29	29.58
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	45.08	35.6 QP	40.0	-4.4	1.00 V	10	21.41	14.17
2	47.79	36.6 QP	40.0	-3.4	1.00 V	13	22.01	14.63
3	62.77	31.8 QP	40.0	-8.2	1.00 V	298	18.06	13.77
4	69.15	35.5 QP	40.0	-4.6	1.00 V	63	22.56	12.89
5	81.20	34.0 QP	40.0	-6.0	1.08 V	16	24.02	10.00
6	125.00	29.9 QP	43.5	-13.6	1.00 V	284	16.98	12.96
7	250.00	33.5 QP	46.0	-12.6	1.06 V	29	19.14	14.31
8	500.00	39.0 QP	46.0	-7.0	1.08 V	303	16.93	22.06
9	720.00	28.9 QP	46.0	-17.1	1.00 V	225	2.00	26.91

- 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.

ABOVE 1GHz WORST-CASE DATA

802.11b DSSS MODULATION

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	22deg. C, 65%RH	TESTED BY	Evan Huang

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	57.2 PK	74.0	-16.8	1.00 H	22	25.99	31.21
2	2390.00	44.6 AV	54.0	-9.4	1.00 H	22	13.39	31.21
3	*2412.00	100.3 PK			1.00 H	25	69.03	31.27
4	*2412.00	97.7 AV			1.00 H	25	66.43	31.27
5	4824.00	65.9 PK	74.0	-8.1	1.00 H	292	26.48	39.42
6	4824.00	50.9 AV	54.0	-3.1	1.00 H	292	11.48	39.42
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	61.5 PK	74.0	-12.5	1.00 V	338	32.29	31.21
2	2390.00	50.0 AV	54.0	-4.0	1.00 V	338	18.79	31.21
3	*2412.00	110.6 PK			1.00 V	17	79.33	31.27
4	*2412.00	107.4 AV			1.00 V	17	76.13	31.27
5	4824.00	56.6 PK	74.0	-17.4	1.09 V	326	17.18	39.42
6	4824.00	53.0 AV	54.0	-1.0	1.09 V	326	13.58	39.42

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

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	22deg. C, 65%RH	TESTED BY	Evan Huang

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	100.2 PK			1.00 H	19	68.86	31.34
2	*2437.00	97.7 AV			1.00 H	19	66.36	31.34
3	4874.00	65.6 PK	74.0	-8.4	1.00 H	291	25.98	39.62
4	4874.00	50.8 AV	54.0	-3.2	1.00 H	291	11.18	39.62
5	7311.00	56.4 PK	74.0	-17.6	1.39 H	28	12.30	44.10
6	7311.00	43.3 AV	54.0	-10.7	1.39 H	28	-0.80	44.10
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	110.7 PK			1.00 V	341	79.36	31.34
2	*2437.00	107.5 AV			1.00 V	341	76.16	31.34
3	4874.00	56.3 PK	74.0	-17.7	1.06 V	327	16.68	39.62
4	4874.00	52.3 AV	54.0	-1.7	1.06 V	327	12.68	39.62
5	7311.00	56.4 PK	74.0	-17.6	1.15 V	334	12.30	44.10
6	7311.00	44.5 AV	54.0	-9.5	1.15 V	334	0.40	44.10

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



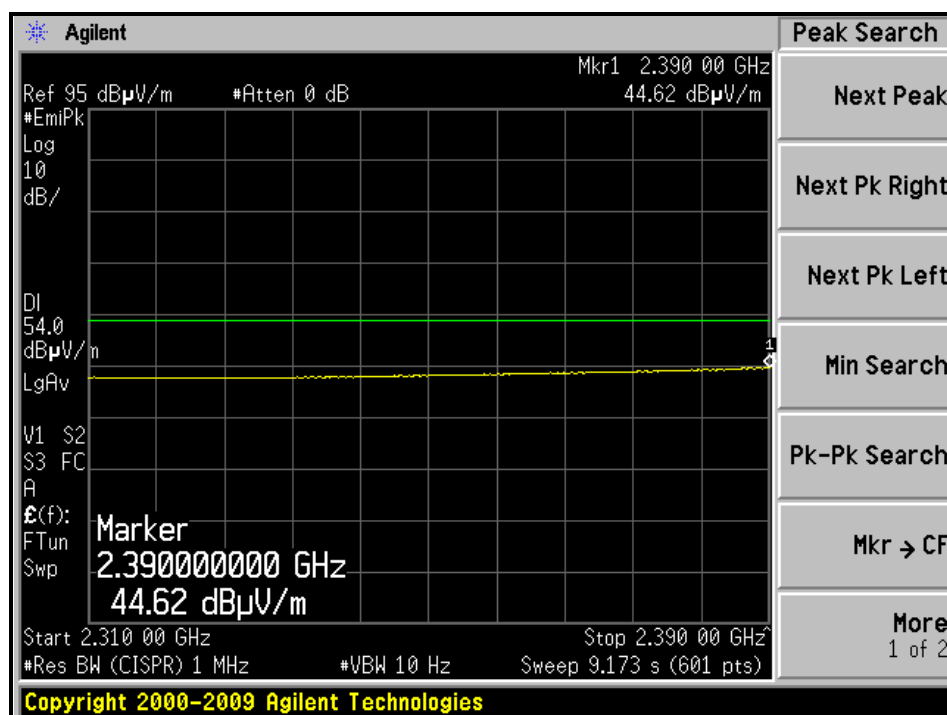
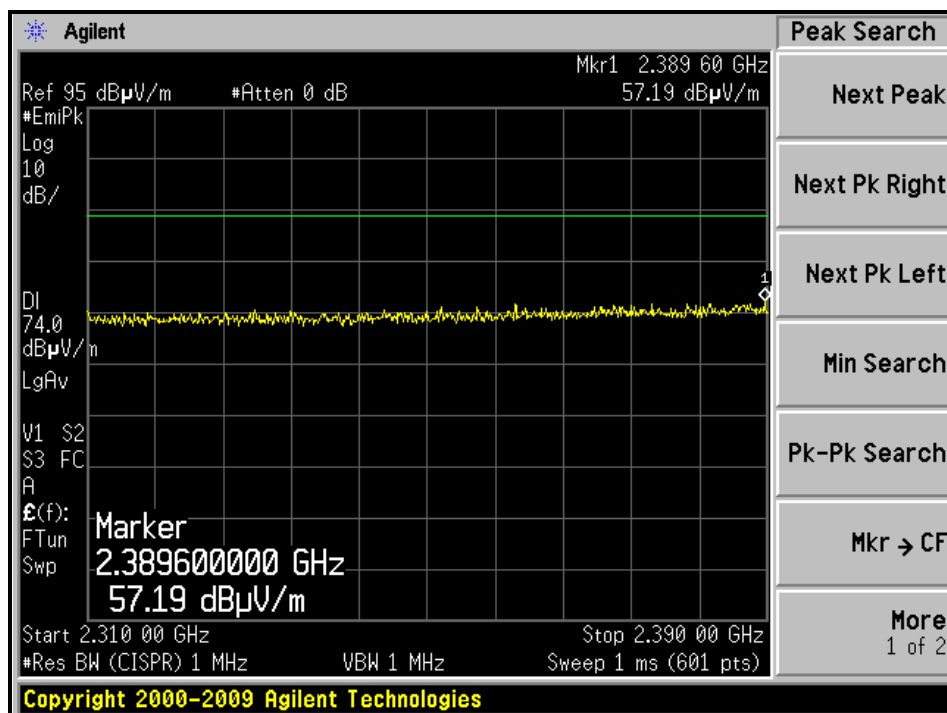
A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	22deg. C, 65%RH	TESTED BY	Evan Huang

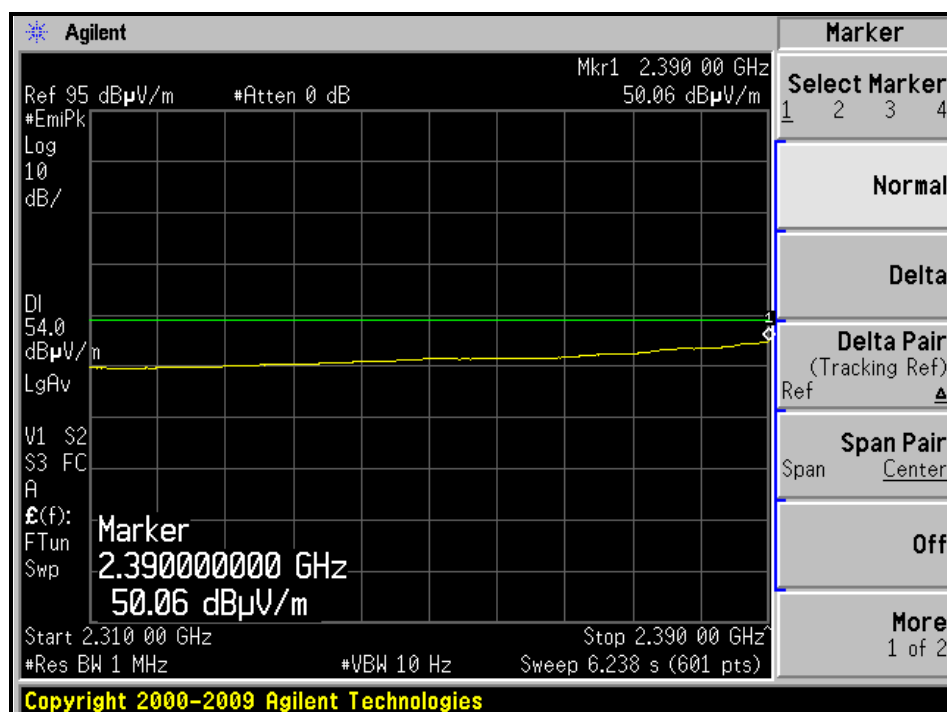
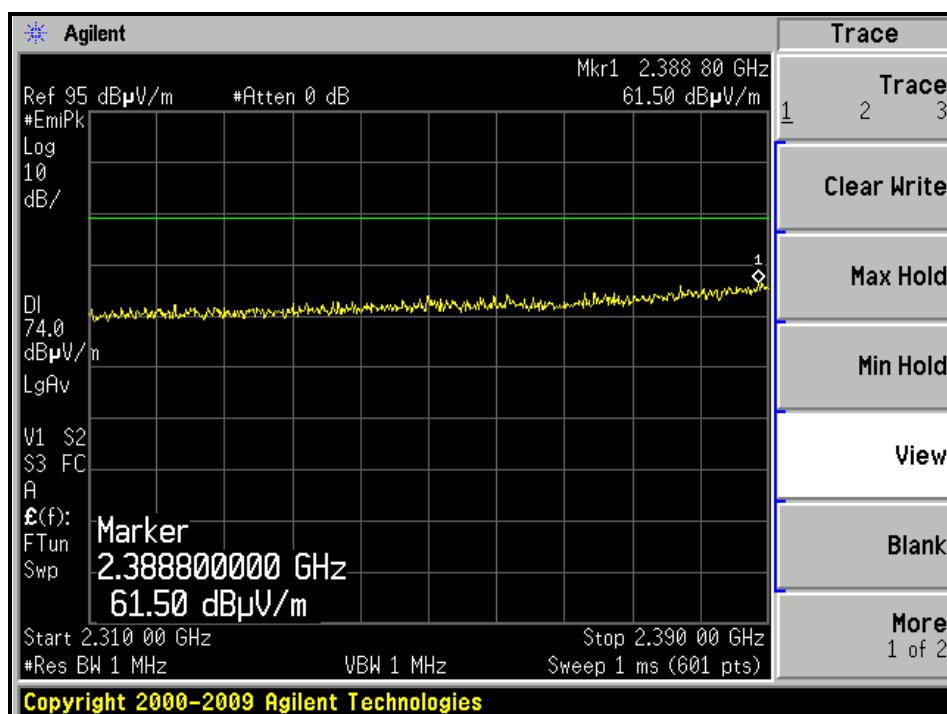
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	100.8 PK			1.19 H	20	69.40	31.40
2	*2462.00	98.0 AV			1.19 H	20	66.60	31.40
3	2483.50	57.0 PK	74.0	-17.0	1.20 H	25	25.54	31.46
4	2483.50	43.9 AV	54.0	-10.1	1.20 H	25	12.44	31.46
5	4924.00	54.7 PK	74.0	-19.3	1.02 H	295	14.88	39.82
6	4924.00	49.8 AV	54.0	-4.2	1.02 H	295	9.98	39.82
7	7386.00	56.1 PK	74.0	-17.9	1.40 H	35	11.93	44.18
8	7386.00	43.2 AV	54.0	-10.8	1.40 H	35	-0.98	44.18
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	106.7 PK			1.69 V	59	75.30	31.40
2	*2462.00	103.5 AV			1.69 V	59	72.10	31.40
3	2483.50	59.9 PK	74.0	-14.1	1.00 V	344	28.44	31.46
4	2483.50	47.8 AV	54.0	-6.2	1.00 V	344	16.34	31.46
5	4924.00	57.1 PK	74.0	-16.9	1.06 V	329	17.28	39.82
6	4924.00	53.1 AV	54.0	-0.9	1.06 V	329	13.28	39.82
7	7386.00	56.9 PK	74.0	-17.1	1.54 V	278	12.72	44.18
8	7386.00	46.3 AV	54.0	-7.7	1.54 V	278	2.15	44.18

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

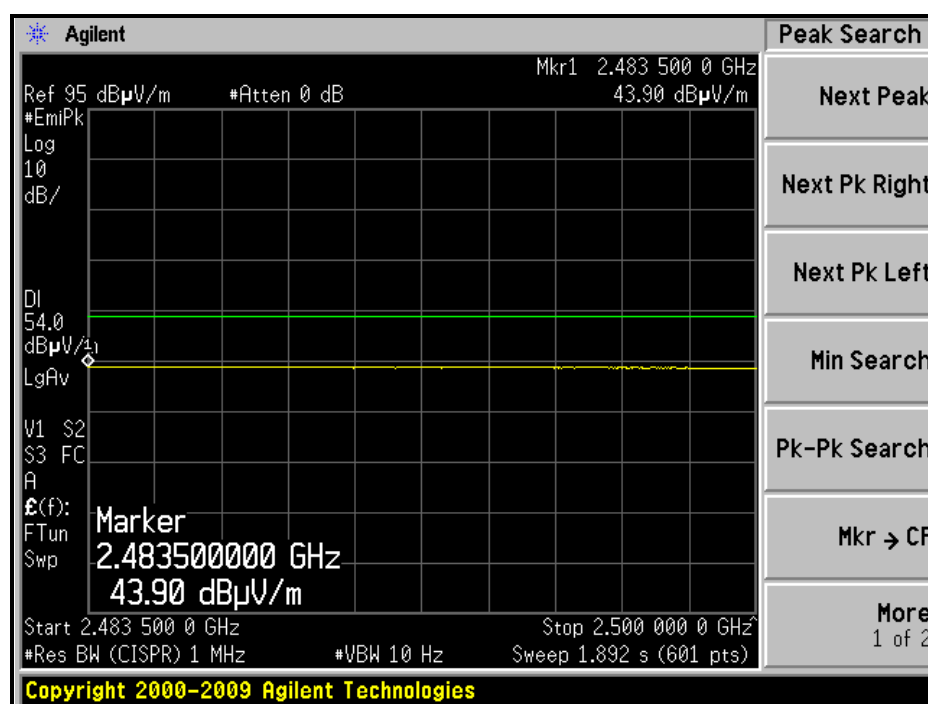
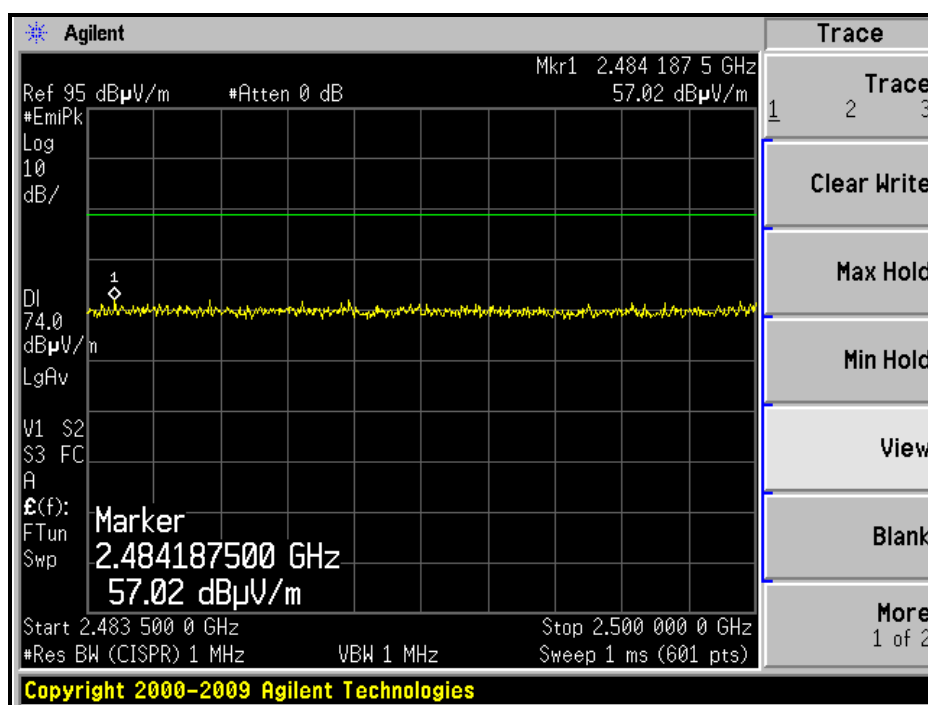
RESTRICTED BANDEDGE (802.11b MODE,CH1, HORIZONTAL)



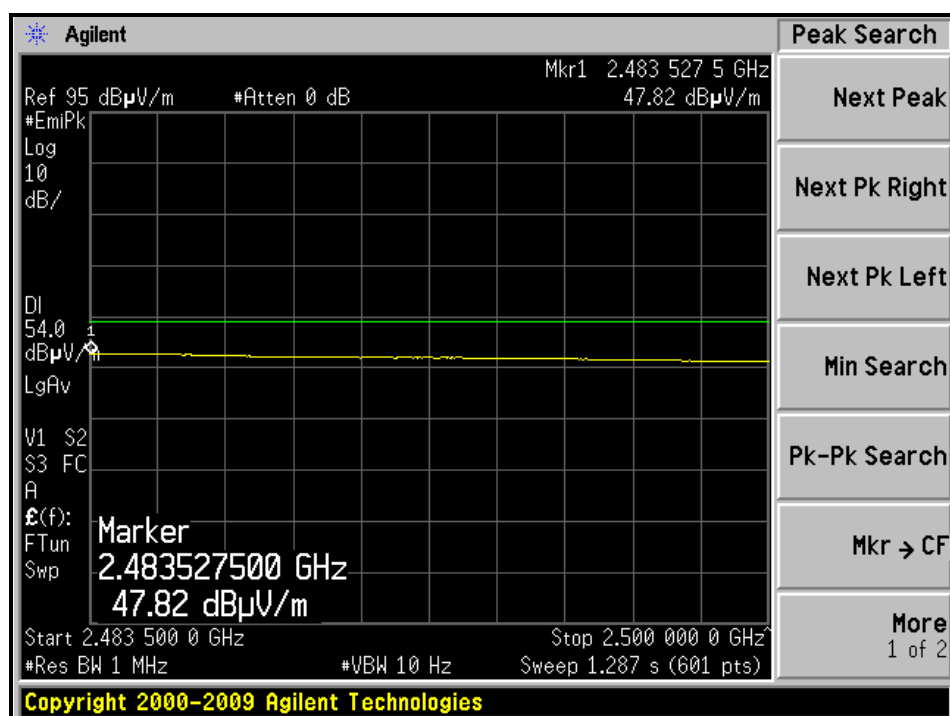
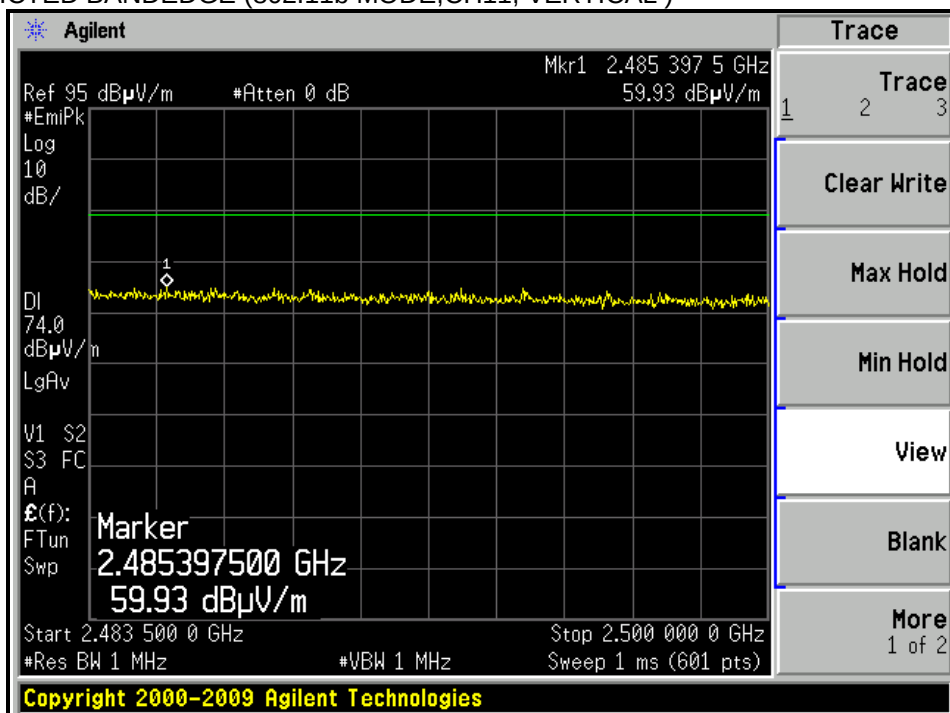
RESTRICTED BANDEDGE (802.11b MODE,CH1, VERTICAL)



RESTRICTED BANDEDGE (802.11b MODE,CH11, HORIZONTAL)



RESTRICTED BANDEDGE (802.11b MODE,CH11, VERTICAL)



802.11g OFDM MODULATION

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	22deg. C, 65%RH	TESTED BY	Evan Huang

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	61.2 PK	74.0	-12.8	1.02 H	20	29.99	31.21
2	2390.00	46.2 AV	54.0	-7.8	1.02 H	20	14.99	31.21
3	*2412.00	100.5 PK			1.00 H	22	69.23	31.27
4	*2412.00	90.2 AV			1.00 H	22	58.93	31.27
5	4824.00	50.6 PK	74.0	-23.4	1.09 H	299	11.18	39.42
6	4824.00	45.6 AV	54.0	-8.4	1.09 H	299	6.18	39.42
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	69.3 PK	74.0	-4.7	1.00 V	160	38.09	31.21
2	2390.00	53.4 AV	54.0	-0.6	1.00 V	160	22.19	31.21
3	*2412.00	112.7 PK			1.14 V	19	81.43	31.27
4	*2412.00	101.7 AV			1.14 V	19	70.43	31.27
5	4824.00	51.4 PK	74.0	-22.6	1.03 V	339	11.98	39.42
6	4824.00	47.1 AV	54.0	-6.9	1.03 V	339	7.68	39.42

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

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	22deg. C, 65%RH	TESTED BY	Evan Huang

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	107.6 PK			1.00 H	21	76.26	31.34
2	*2437.00	96.9 AV			1.00 H	21	65.56	31.34
3	4874.00	50.6 PK	74.0	-23.4	1.08 H	307	10.98	39.62
4	4874.00	45.6 AV	54.0	-8.4	1.08 H	307	5.98	39.62
5	7311.00	55.8 PK	74.0	-18.2	1.36 H	49	11.70	44.10
6	7311.00	42.9 AV	54.0	-11.1	1.36 H	49	-1.20	44.10
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	72.6 PK	74.0	-1.4	1.00 V	156	41.39	31.21
2	2390.00	52.8 AV	54.0	-1.2	1.00 V	156	21.59	31.21
3	*2437.00	117.1 PK			1.00 V	29	85.76	31.34
4	*2437.00	106.4 AV			1.00 V	29	75.06	31.34
5	2484.30	72.4 PK	74.0	-1.6	1.16 V	337	40.94	31.46
6	2484.30	52.8 AV	54.0	-1.2	1.16 V	337	21.34	31.46
7	4874.00	51.8 PK	74.0	-22.2	1.04 V	334	12.18	39.62
8	4874.00	47.3 AV	54.0	-6.7	1.04 V	334	7.68	39.62
9	7311.00	55.9 PK	74.0	-18.1	1.56 V	280	11.80	44.10
10	7311.00	43.2 AV	54.0	-10.8	1.56 V	280	-0.90	44.10

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



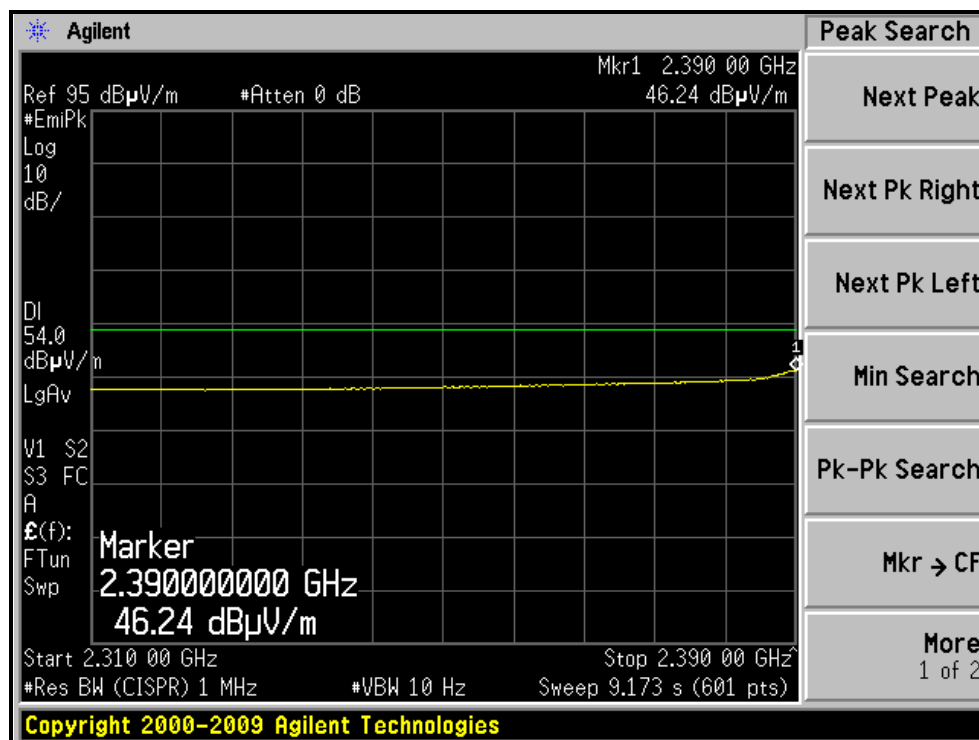
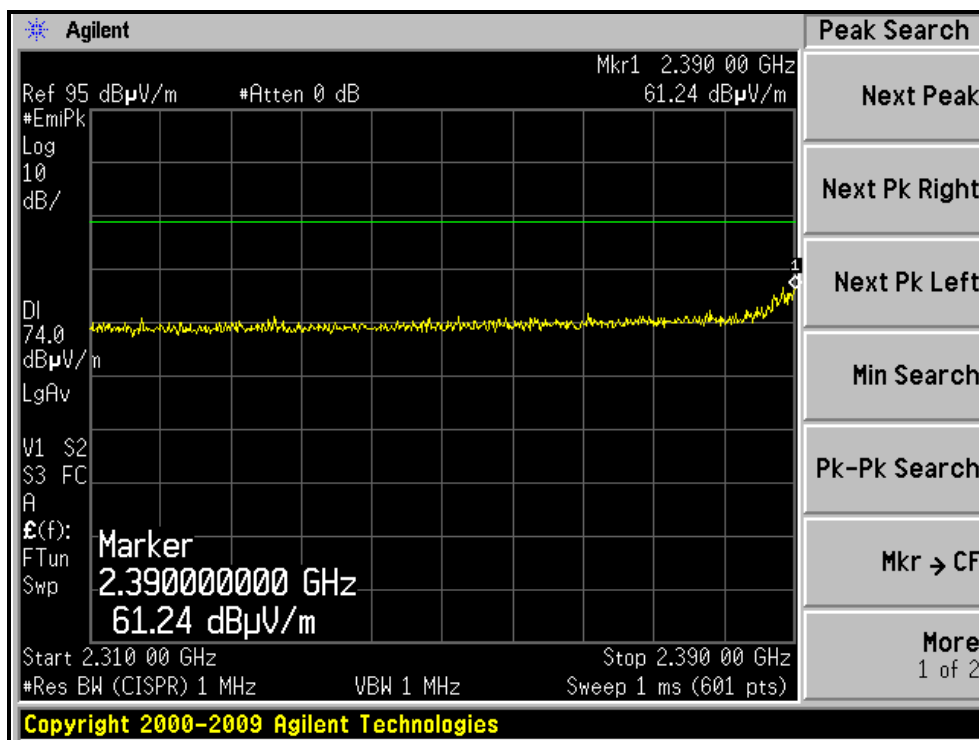
A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	22deg. C, 65%RH	TESTED BY	Evan Huang

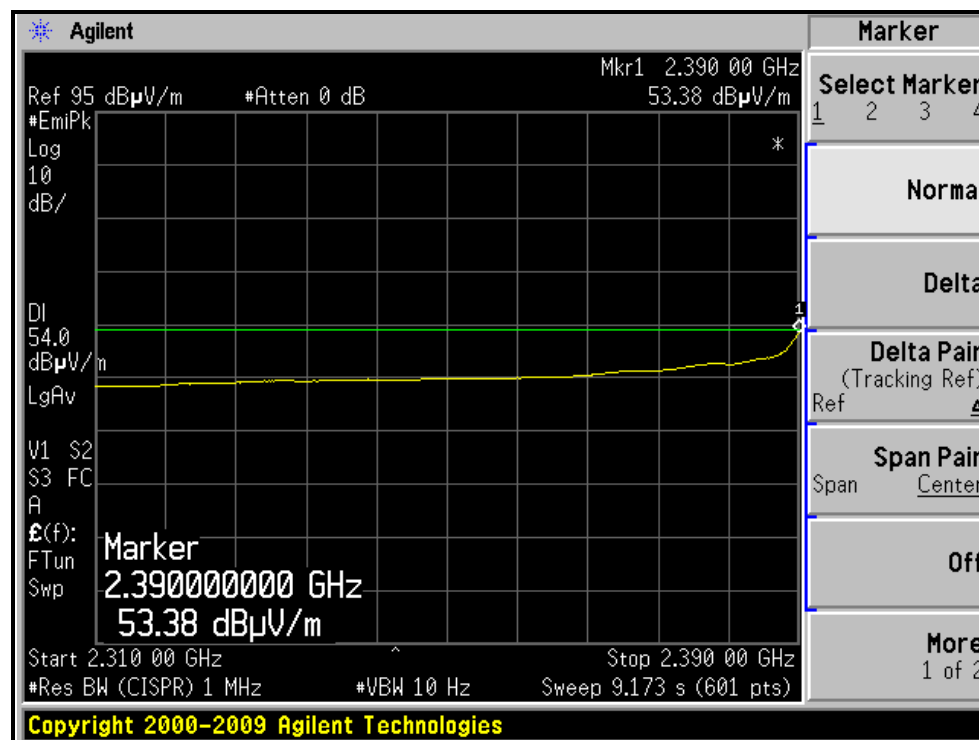
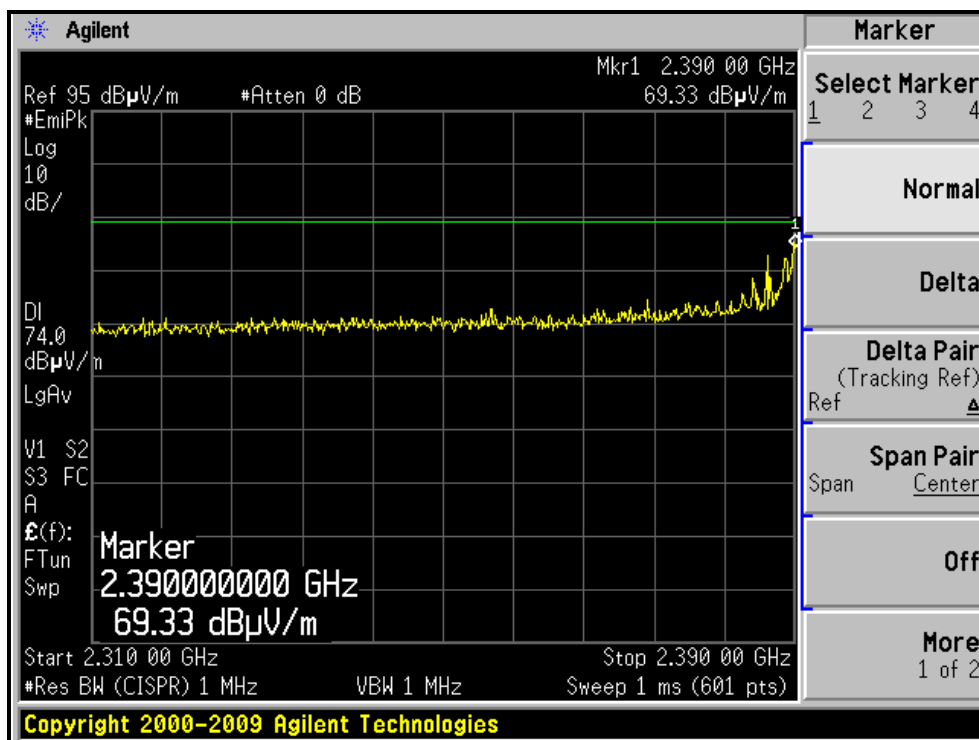
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	101.7 PK			1.22 H	26	70.30	31.40
2	*2462.00	91.1 AV			1.22 H	26	59.70	31.40
3	2483.50	65.1 PK	74.0	-8.9	1.23 H	17	33.64	31.46
4	2483.50	45.9 AV	54.0	-8.1	1.23 H	17	14.44	31.46
5	4924.00	50.7 PK	74.0	-23.3	1.04 H	314	10.88	39.82
6	4924.00	45.7 AV	54.0	-8.3	1.04 H	314	5.88	39.82
7	7386.00	56.2 PK	74.0	-17.8	1.34 H	39	12.02	44.18
8	7386.00	43.2 AV	54.0	-10.8	1.34 H	39	-0.98	44.18
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	112.2 PK			1.14 V	21	80.80	31.40
2	*2462.00	100.8 AV			1.14 V	21	69.40	31.40
3	2483.50	72.0 PK	74.0	-2.0	1.14 V	344	40.54	31.46
4	2483.50	53.3 AV	54.0	-0.7	1.14 V	344	21.84	31.46
5	4924.00	51.5 PK	74.0	-22.5	1.07 V	324	11.68	39.82
6	4924.00	47.1 AV	54.0	-6.9	1.07 V	324	7.28	39.82
7	7386.00	56.1 PK	74.0	-17.9	1.61 V	273	11.92	44.18
8	7386.00	43.5 AV	54.0	-10.5	1.61 V	273	-0.68	44.18

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

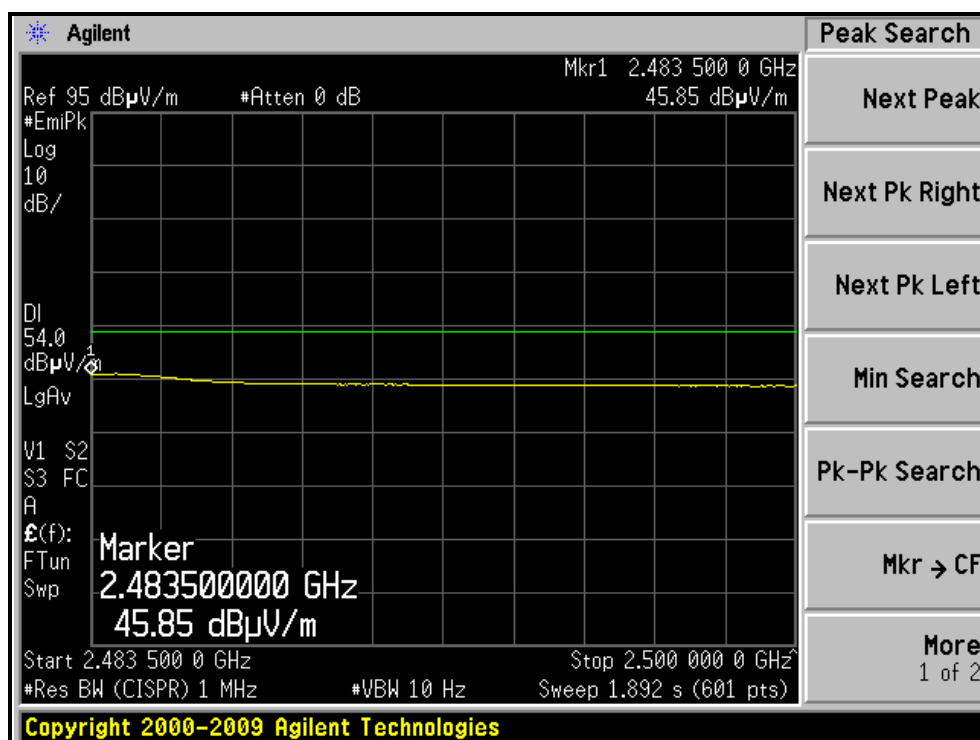
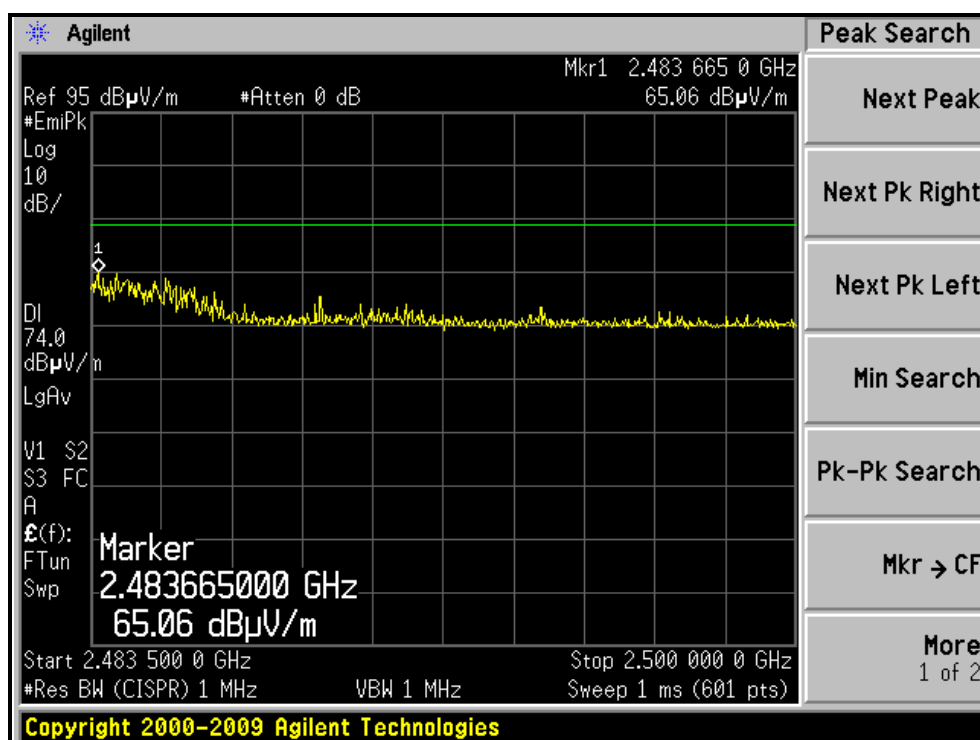
RESTRICTED BANDEDGE (802.11g MODE, CH1, HORIZONTAL)



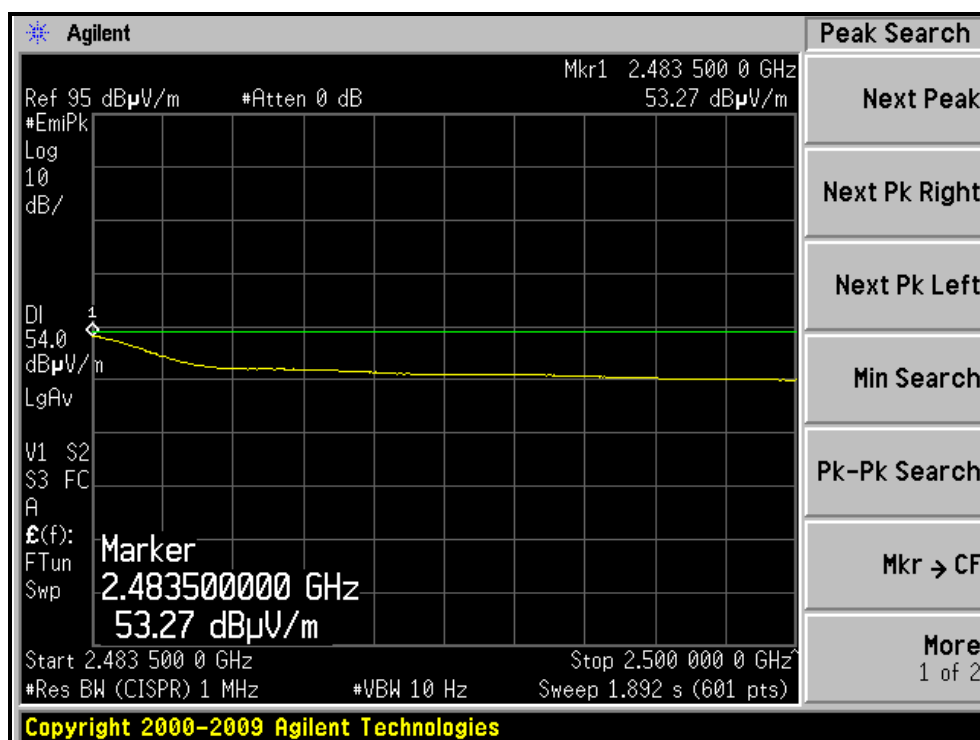
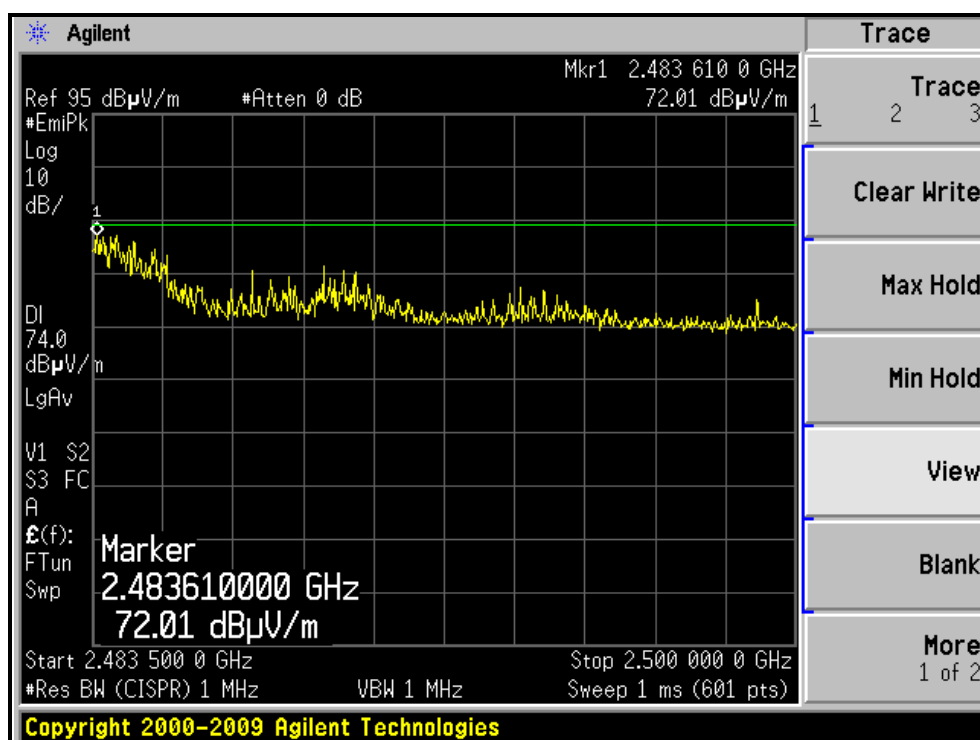
RESTRICTED BANDEDGE (802.11g MODE,CH1, VERTICAL)



RESTRICTED BANDEDGE (802.11g MODE,CH11, HORIZONTAL)



RESTRICTED BANDEDGE (802.11g MODE,CH11, VERTICAL)



802.11n (20MHz) OFDM MODULATION

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	22deg. C, 65%RH	TESTED BY	Evan Huang

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	57.0 PK	74.0	-17.0	1.01 H	28	25.79	31.21
2	2390.00	46.0 AV	54.0	-8.0	1.01 H	28	14.79	31.21
3	*2412.00	99.9 PK			1.00 H	21	68.63	31.27
4	*2412.00	89.6 AV			1.00 H	21	58.33	31.27
5	4824.00	50.9 PK	74.0	-23.1	1.00 H	311	11.48	39.42
6	4824.00	45.8 AV	54.0	-8.2	1.00 H	311	6.38	39.42
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	71.0 PK	74.0	-3.0	1.00 V	341	39.79	31.21
2	2390.00	53.4 AV	54.0	-0.6	1.00 V	341	22.19	31.21
3	*2412.00	111.9 PK			1.12 V	16	80.63	31.27
4	*2412.00	100.4 AV			1.12 V	16	69.13	31.27
5	4824.00	51.9 PK	74.0	-22.1	1.02 V	329	12.48	39.42
6	4824.00	47.3 AV	54.0	-6.7	1.02 V	329	7.88	39.42

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



A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	22deg. C, 65%RH	TESTED BY	Evan Huang

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	108.4 PK			1.03 H	24	77.06	31.34
2	*2437.00	97.4 AV			1.03 H	24	66.06	31.34
3	4874.00	50.4 PK	74.0	-23.6	1.05 H	308	10.78	39.62
4	4874.00	45.6 AV	54.0	-8.4	1.05 H	308	5.98	39.62
5	7311.00	55.4 PK	74.0	-18.6	1.41 H	48	11.30	44.10
6	7311.00	42.8 AV	54.0	-11.2	1.41 H	48	-1.30	44.10
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2389.30	69.3 PK	74.0	-4.7	1.00 V	335	38.09	31.21
2	2389.30	52.7 AV	54.0	-1.3	1.00 V	335	21.49	31.21
3	*2437.00	117.2 PK			1.00 V	340	85.86	31.34
4	*2437.00	106.7 AV			1.00 V	340	75.36	31.34
5	2483.80	72.1 PK	74.0	-1.9	1.00 V	35	40.64	31.46
6	2483.80	52.7 AV	54.0	-1.3	1.00 V	35	21.24	31.46
7	4874.00	51.9 PK	74.0	-22.1	1.08 V	336	12.28	39.62
8	4874.00	47.2 AV	54.0	-6.8	1.08 V	336	7.58	39.62
9	7311.00	56.2 PK	74.0	-17.8	1.56 V	274	12.10	44.10
10	7311.00	43.3 AV	54.0	-10.7	1.56 V	274	-0.80	44.10

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



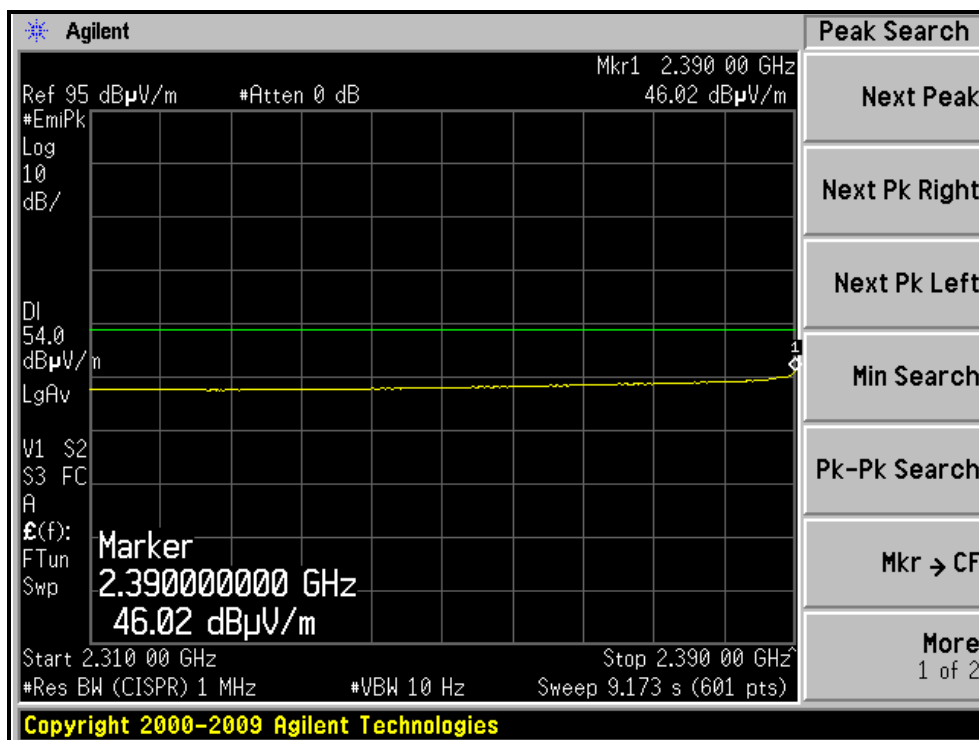
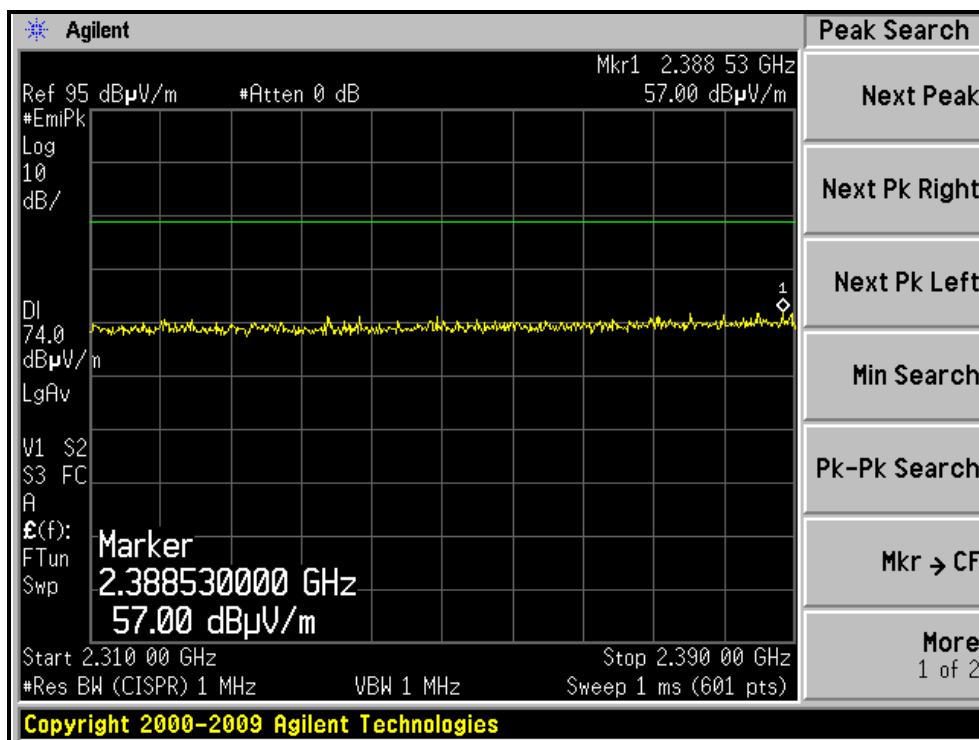
A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	22deg. C, 65%RH	TESTED BY	Evan Huang

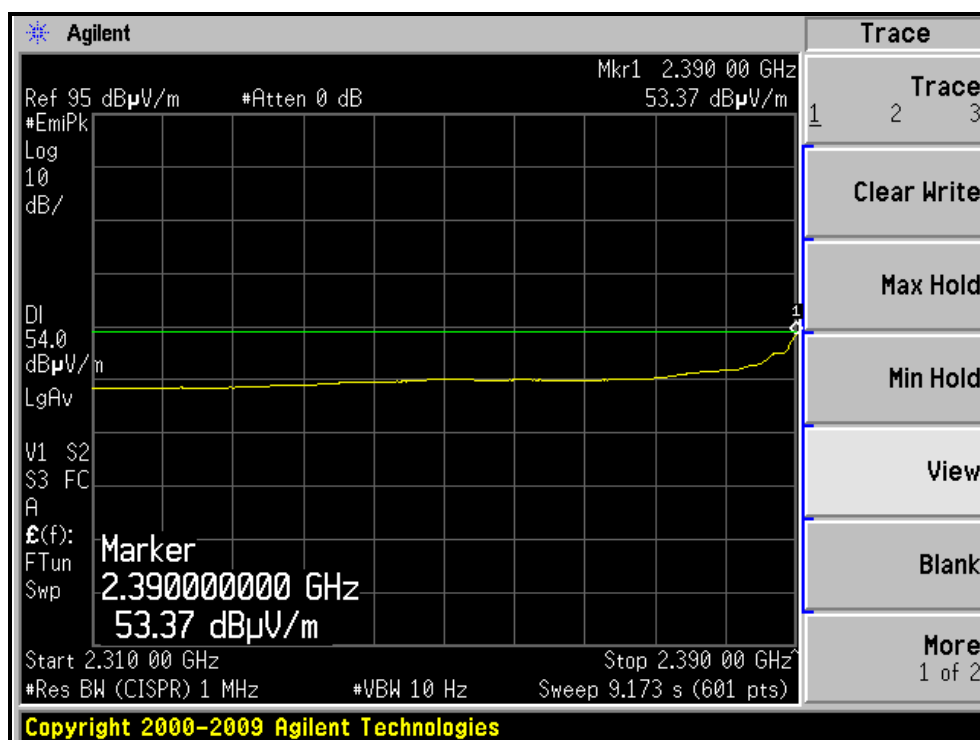
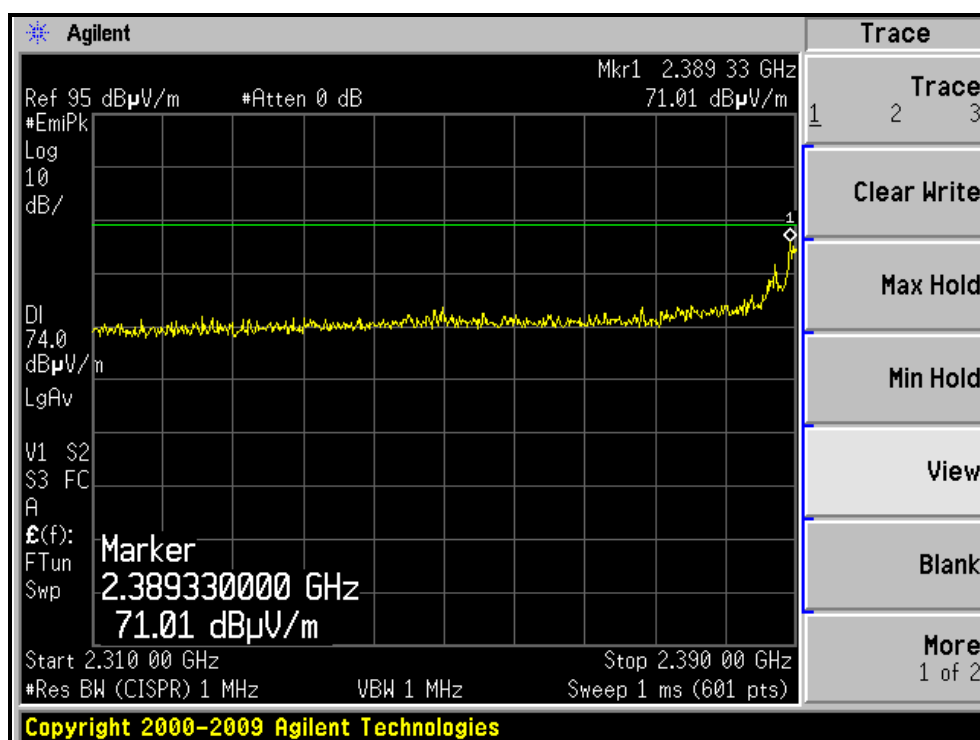
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	104.5 PK			1.22 H	15	73.10	31.40
2	*2462.00	92.7 AV			1.22 H	15	61.30	31.40
3	2483.50	71.6 PK	74.0	-2.4	1.18 H	20	40.14	31.46
4	2483.50	50.2 AV	54.0	-3.8	1.18 H	20	18.74	31.46
5	4924.00	50.5 PK	74.0	-23.5	1.01 H	317	10.68	39.82
6	4924.00	45.5 AV	54.0	-8.5	1.01 H	317	5.68	39.82
7	7386.00	55.8 PK	74.0	-18.2	1.40 H	39	11.62	44.18
8	7386.00	42.9 AV	54.0	-11.1	1.40 H	39	-1.28	44.18
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	107.6 PK			1.19 V	16	76.20	31.40
2	*2462.00	97.2 AV			1.19 V	16	65.80	31.40
3	2483.50	70.5 PK	74.0	-3.5	1.00 V	340	39.04	31.46
4	2483.50	52.8 AV	54.0	-1.2	1.00 V	340	21.34	31.46
5	4924.00	51.7 PK	74.0	-22.3	1.13 V	348	11.88	39.82
6	4924.00	46.9 AV	54.0	-7.1	1.13 V	348	7.08	39.82
7	7386.00	56.0 PK	74.0	-18.0	1.52 V	266	11.82	44.18
8	7386.00	43.2 AV	54.0	-10.8	1.52 V	266	-0.98	44.18

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

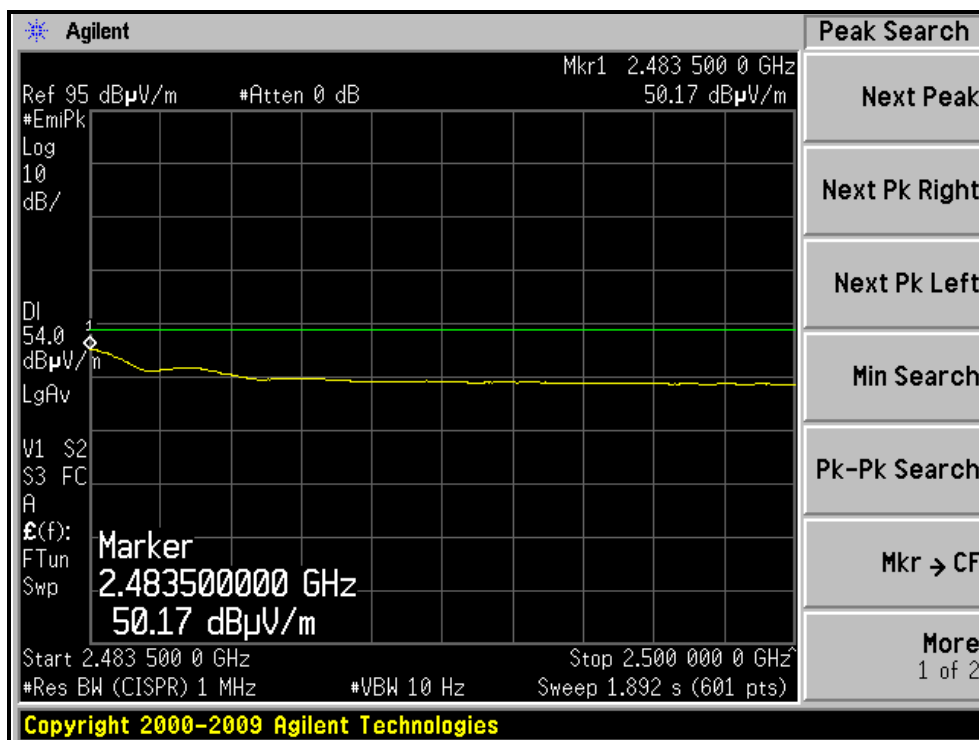
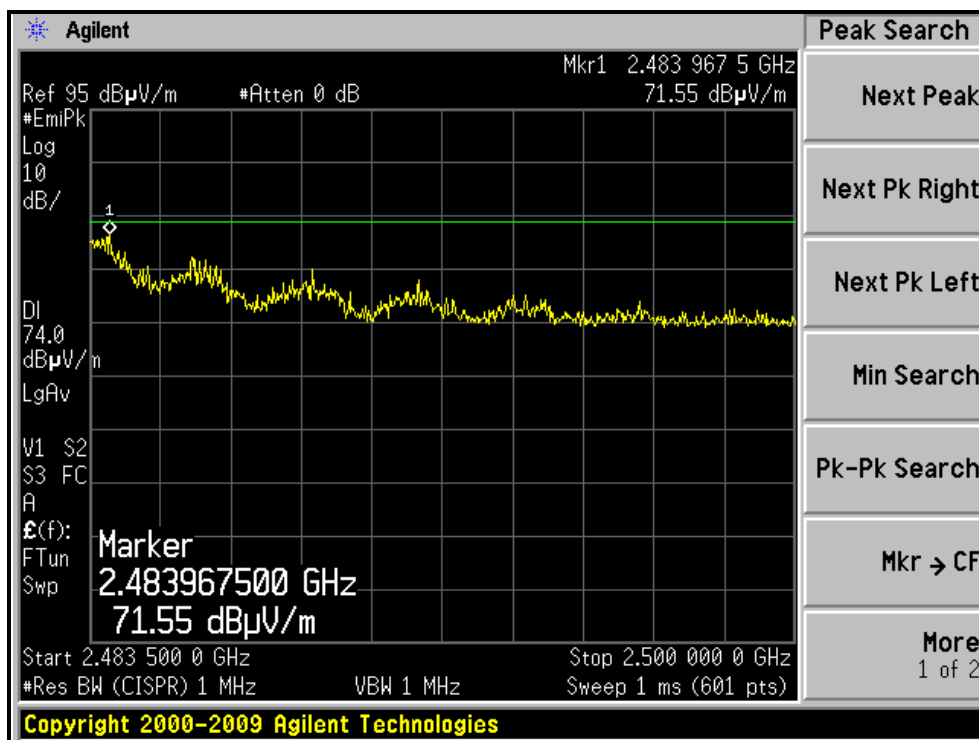
RESTRICTED BANDEDGE (802.11n (20MHz) MODE,CH1, HORIZONTAL)



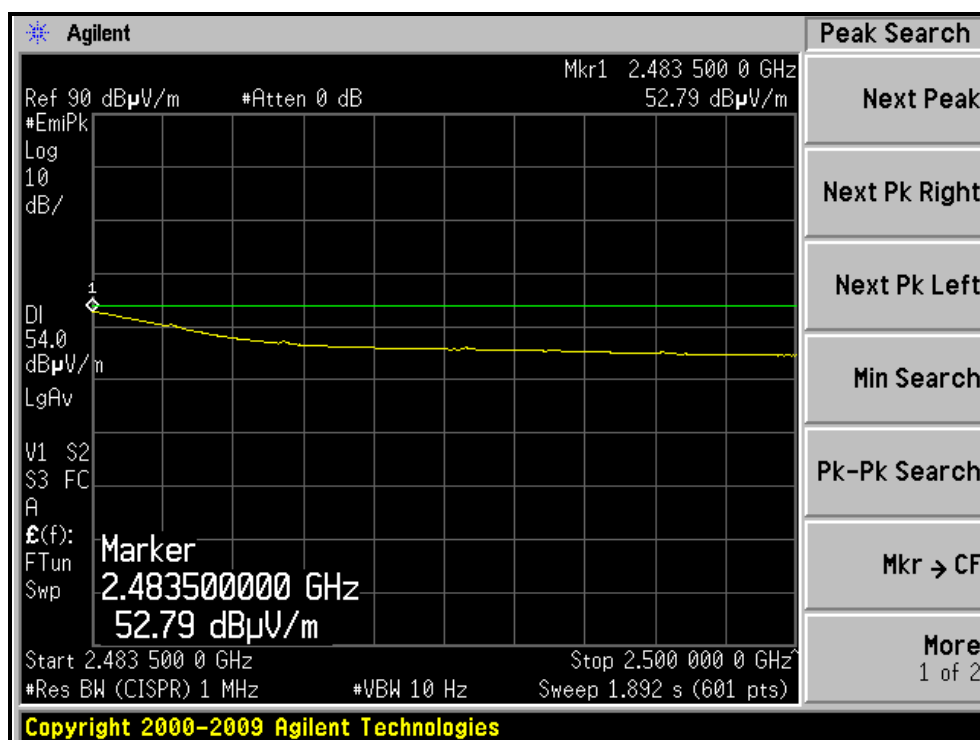
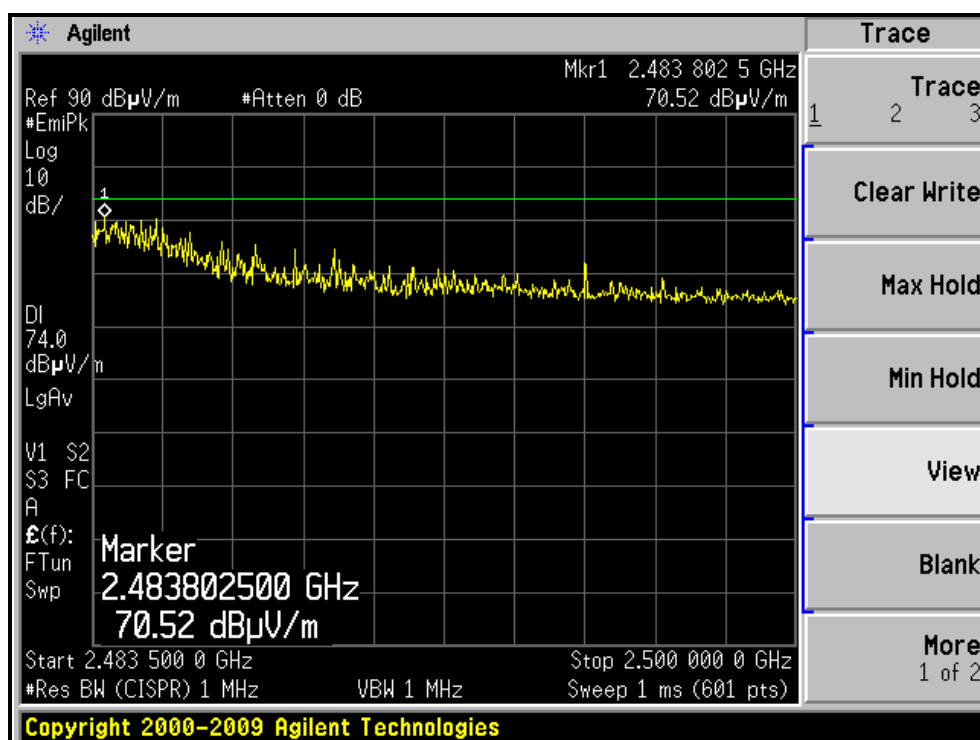
RESTRICTED BANDEDGE (802.11n (20MHz) MODE,CH1, VERTICAL)



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



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





A D T

802.11n (40MHz) OFDM MODULATION

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 3	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	22deg. C, 65%RH	TESTED BY	Evan Huang

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2388.27	61.9 PK	74.0	-12.1	1.06 H	29	30.69	31.21
2	2388.27	47.3 AV	54.0	-6.7	1.06 H	29	16.09	31.21
3	*2422.00	95.2 PK			1.04 H	29	63.90	31.30
4	*2422.00	83.6 AV			1.04 H	29	52.30	31.30
5	4844.00	48.8 PK	74.0	-25.2	1.01 H	316	9.30	39.50
6	4844.00	43.3 AV	54.0	-10.7	1.01 H	316	3.80	39.50
7	7266.00	56.2 PK	74.0	-17.8	1.35 H	43	12.14	44.06
8	7266.00	43.2 AV	54.0	-10.8	1.35 H	43	-0.86	44.06
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2386.90	70.3 PK	74.0	-3.7	1.00 V	154	39.10	31.20
2	2386.90	53.2 AV	54.0	-0.8	1.00 V	154	22.00	31.20
3	*2422.00	105.2 PK			1.00 V	10	73.90	31.30
4	*2422.00	93.8 AV			1.00 V	10	62.50	31.30
5	4844.00	50.3 PK	74.0	-23.7	1.13 V	356	10.80	39.50
6	4844.00	45.7 AV	54.0	-8.3	1.13 V	356	6.20	39.50
7	7266.00	56.1 PK	74.0	-17.9	1.50 V	273	12.04	44.06
8	7266.00	43.5 AV	54.0	-10.5	1.50 V	273	-0.56	44.06

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



A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	22deg. C, 65%RH	TESTED BY	Evan Huang

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	98.6 PK			1.04 H	16	67.26	31.34
2	*2437.00	86.5 AV			1.04 H	16	55.16	31.34
3	4874.00	48.7 PK	74.0	-25.3	1.00 H	315	9.08	39.62
4	4874.00	43.1 AV	54.0	-10.9	1.00 H	315	3.48	39.62
5	7311.00	56.5 PK	74.0	-17.5	1.36 H	46	12.40	44.10
6	7311.00	43.4 AV	54.0	-10.6	1.36 H	46	-0.70	44.10
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2389.50	70.4 PK	74.0	-3.6	1.00 V	19	39.19	31.21
2	2389.50	53.2 AV	54.0	-0.8	1.00 V	19	21.99	31.21
3	*2437.00	108.1 PK			1.00 V	337	76.76	31.34
4	*2437.00	96.2 AV			1.00 V	337	64.86	31.34
5	2484.00	73.3 PK	74.0	-0.7	1.00 V	20	41.84	31.46
6	2484.00	53.1 AV	54.0	-0.9	1.00 V	20	21.64	31.46
7	4874.00	50.6 PK	74.0	-23.4	1.09 V	349	10.98	39.62
8	4874.00	45.7 AV	54.0	-8.3	1.09 V	349	6.08	39.62
9	7311.00	56.0 PK	74.0	-18.0	1.54 V	262	11.90	44.10
10	7311.00	43.4 AV	54.0	-10.6	1.54 V	262	-0.70	44.10

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



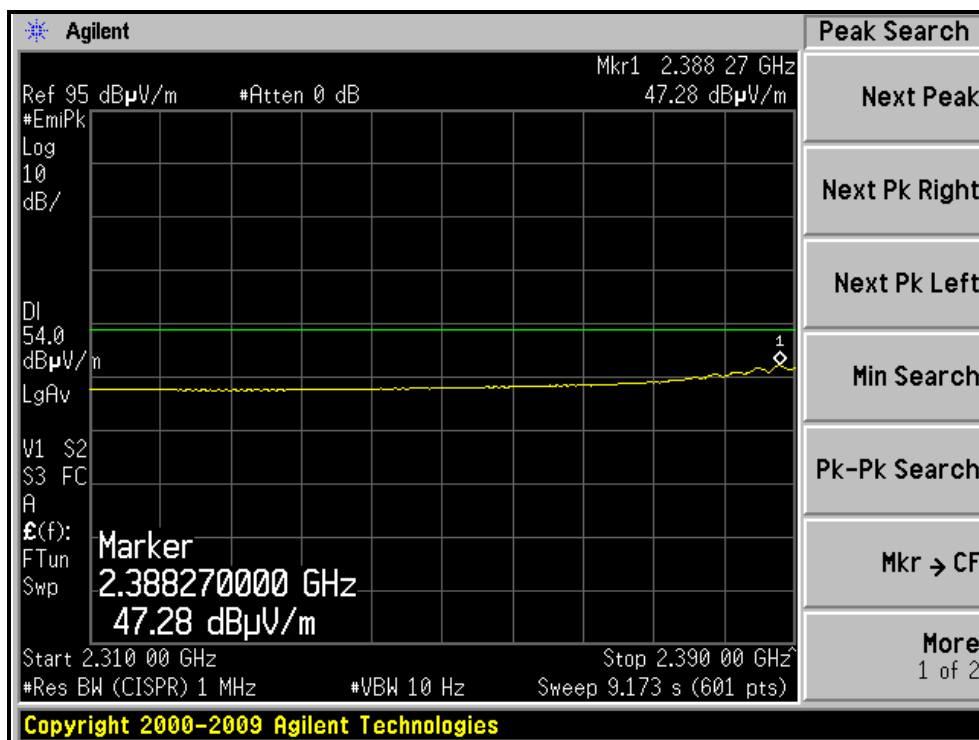
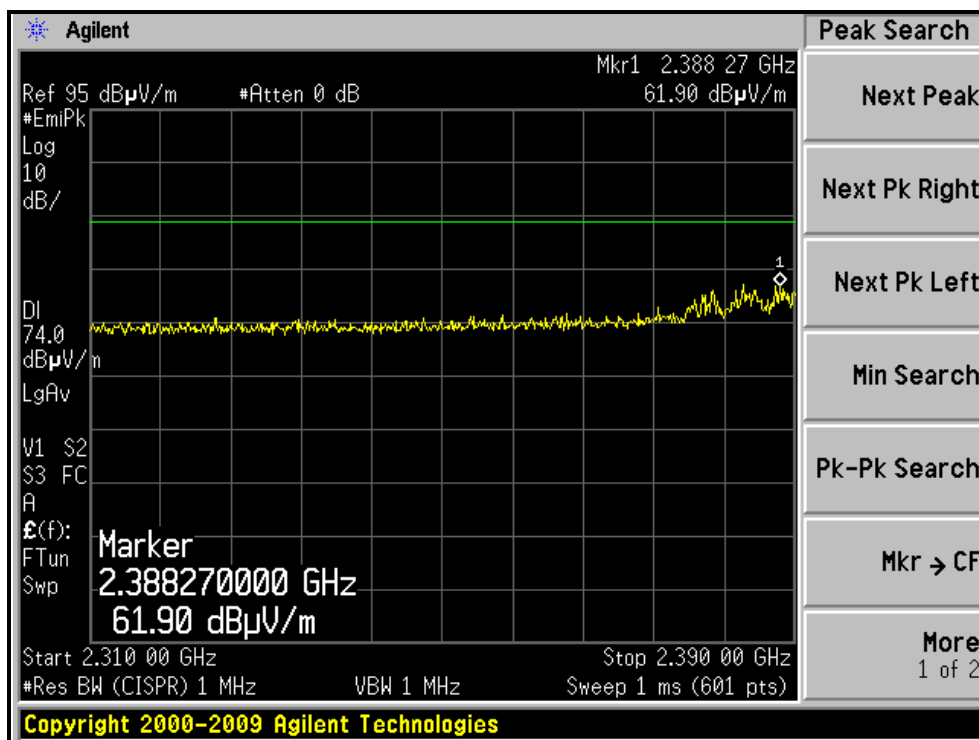
A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 9	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	22deg. C, 65%RH	TESTED BY	Evan Huang

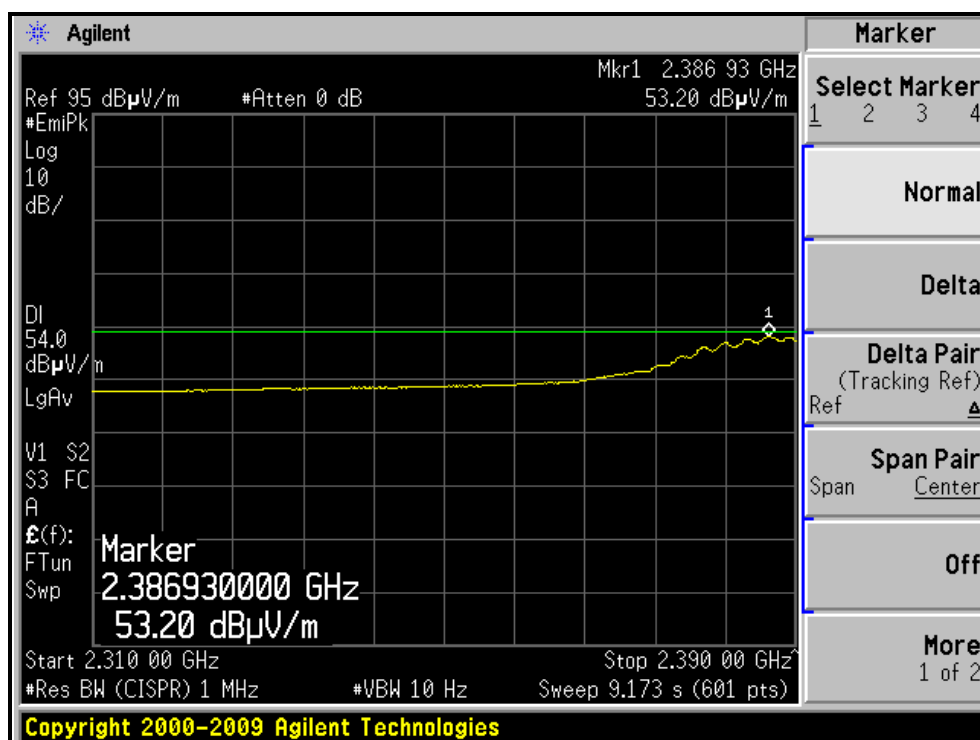
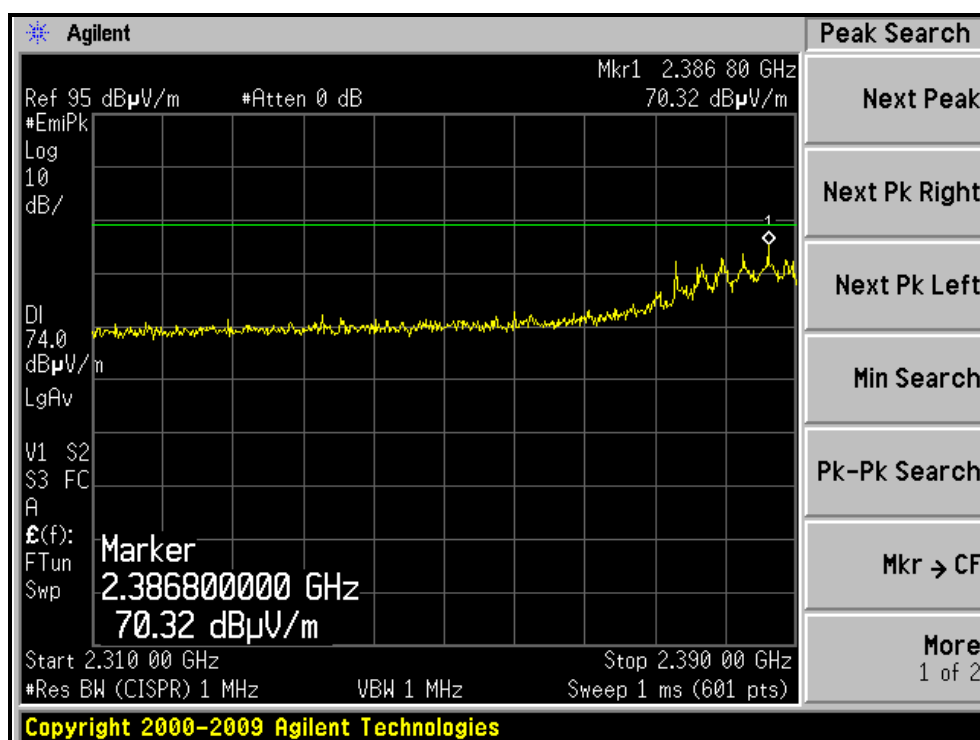
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2452.00	95.0 PK			1.18 H	20	63.62	31.38
2	*2452.00	83.6 AV			1.18 H	20	52.22	31.38
3	2485.00	63.5 PK	74.0	-10.5	1.25 H	20	32.04	31.46
4	2485.00	46.3 AV	54.0	-7.7	1.25 H	20	14.84	31.46
5	4904.00	48.2 PK	74.0	-25.8	1.04 H	304	8.46	39.74
6	4904.00	42.8 AV	54.0	-11.2	1.04 H	304	3.06	39.74
7	7356.00	56.3 PK	74.0	-17.7	1.39 H	41	12.15	44.15
8	7356.00	43.2 AV	54.0	-10.8	1.39 H	41	-0.95	44.15
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	106.1 PK			1.16 V	9	74.72	31.38
2	*2452.00	93.7 AV			1.16 V	9	62.32	31.38
3	2483.50	71.9 PK	74.0	-2.1	1.13 V	22	40.44	31.46
4	2483.50	53.2 AV	54.0	-0.8	1.13 V	22	21.74	31.46
5	4904.00	51.0 PK	74.0	-23.0	1.13 V	360	11.26	39.74
6	4904.00	46.0 AV	54.0	-8.0	1.13 V	360	6.26	39.74
7	7356.00	56.2 PK	74.0	-17.8	1.57 V	255	12.05	44.15
8	7356.00	43.4 AV	54.0	-10.6	1.57 V	255	-0.75	44.15

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

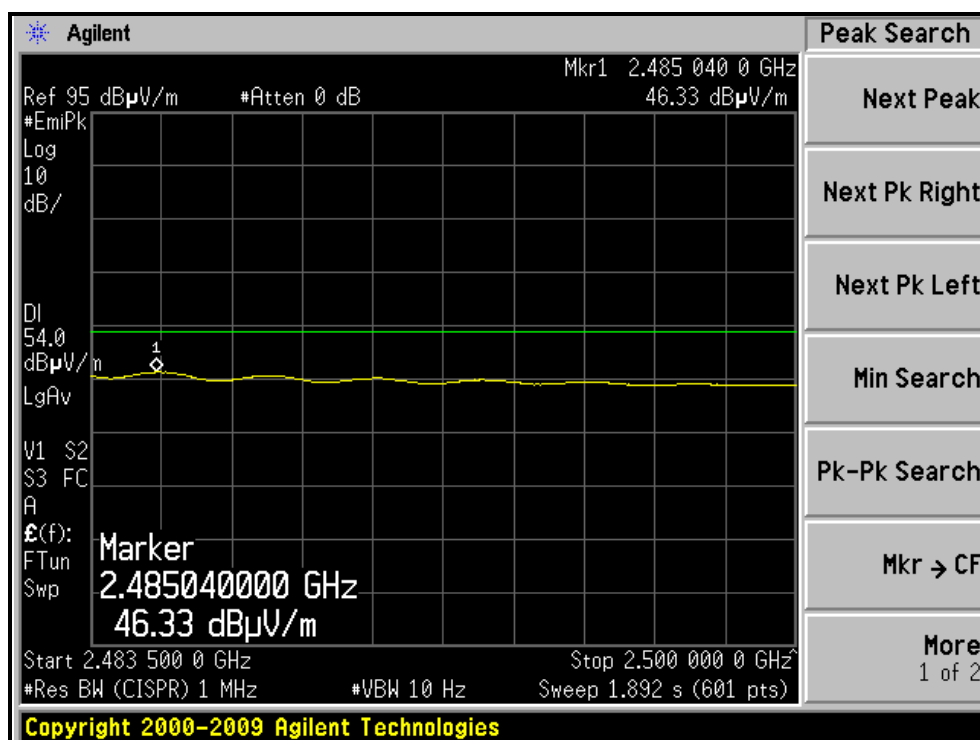
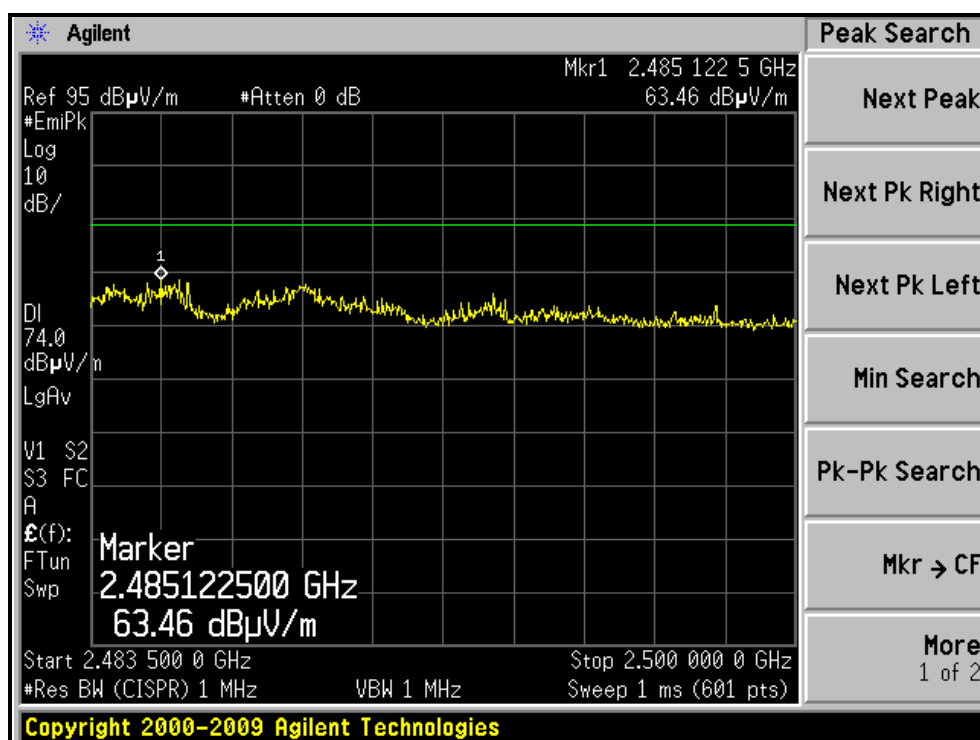
RESTRICTED BANDEDGE (802.11n (40MHz) MODE,CH3, HORIZONTAL)



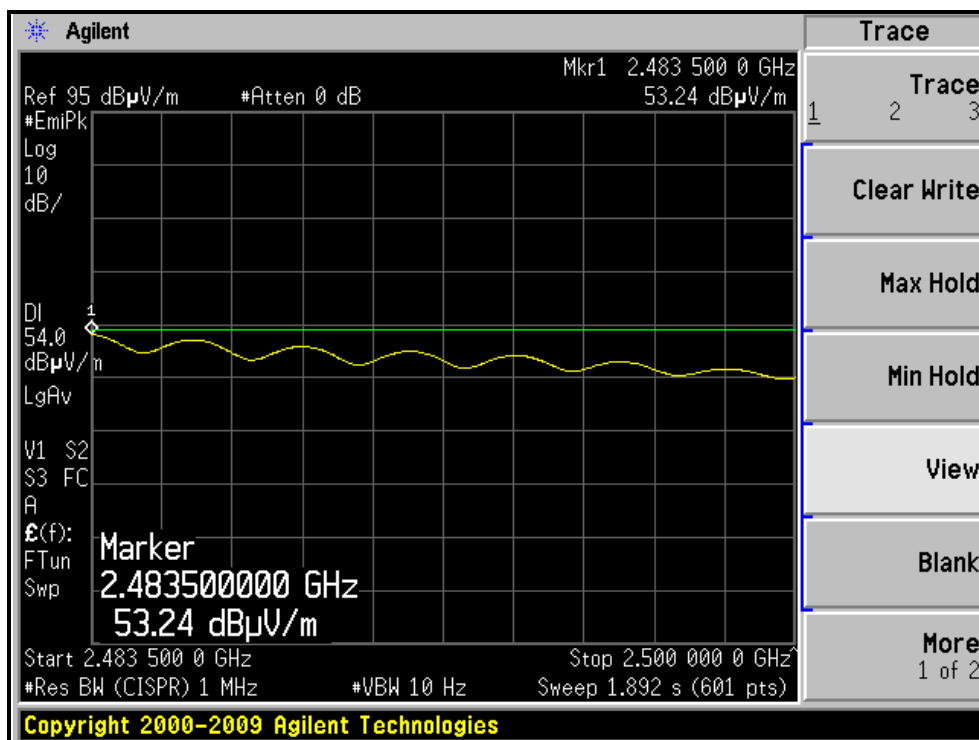
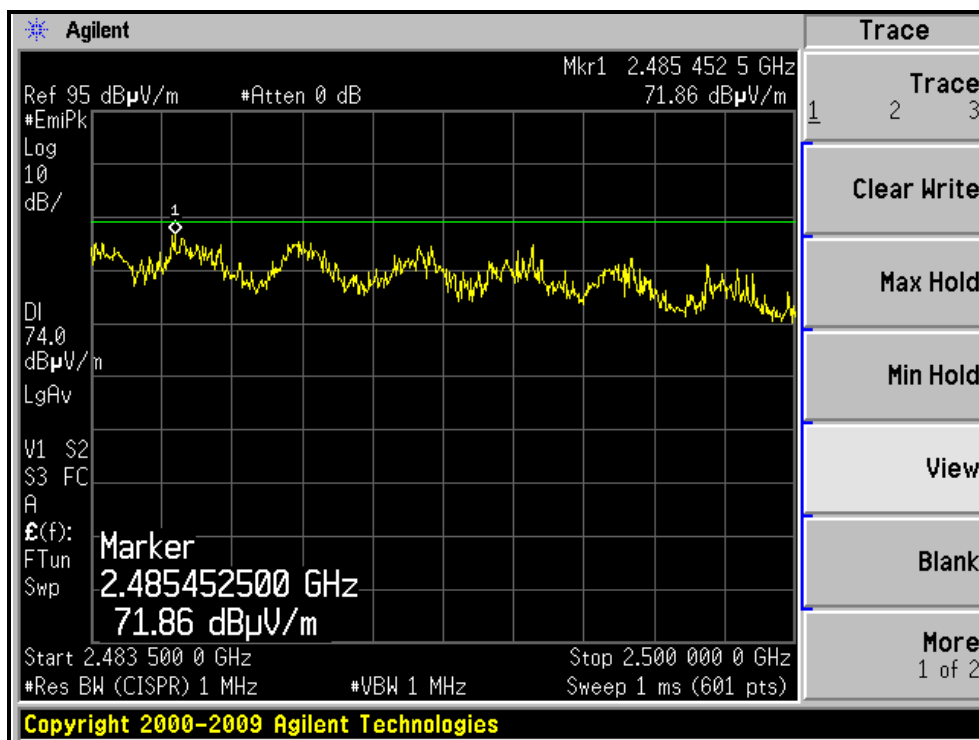
RESTRICTED BANDEDGE (802.11n (40MHz) MODE,CH3, VERTICAL)



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: July 21, 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

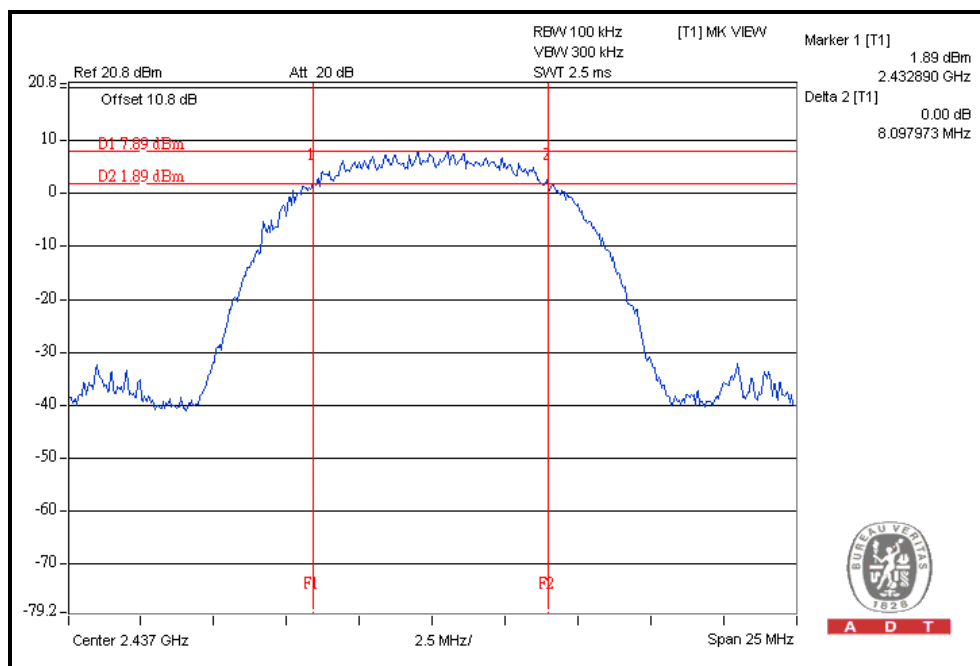
The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

4.3.7 TEST RESULTS

802.11b DSSS MODULATION:

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2412	7.86	0.5	PASS
6	2437	8.09	0.5	PASS
11	2462	7.84	0.5	PASS

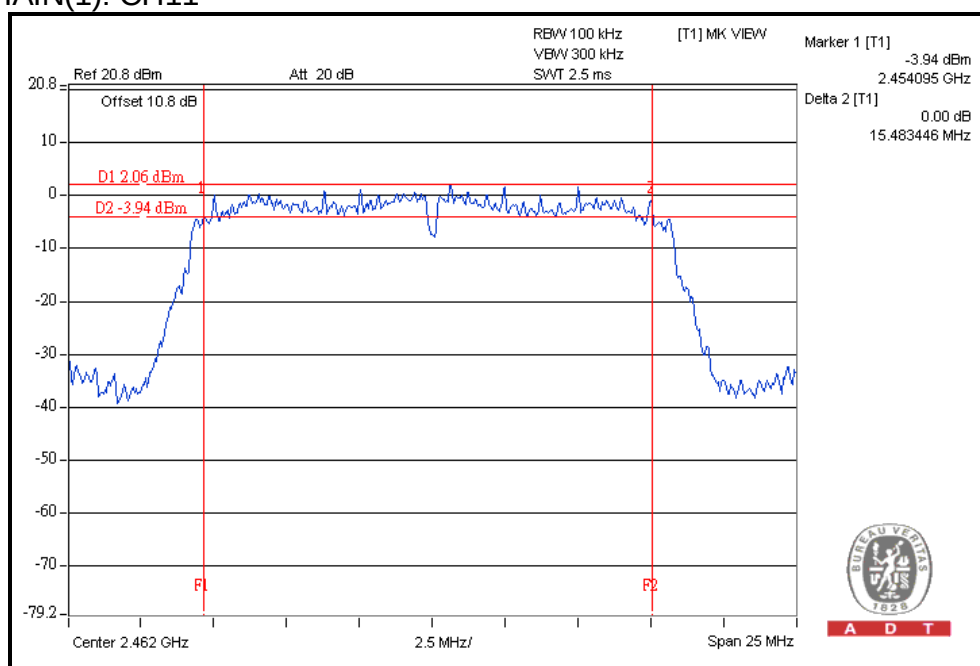
CH6



802.11g OFDM MODULATION:

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN(0)	CHAIN(1)		
1	2412	15.43	14.49	0.5	PASS
6	2437	15.16	15.11	0.5	PASS
11	2462	15.1	15.48	0.5	PASS

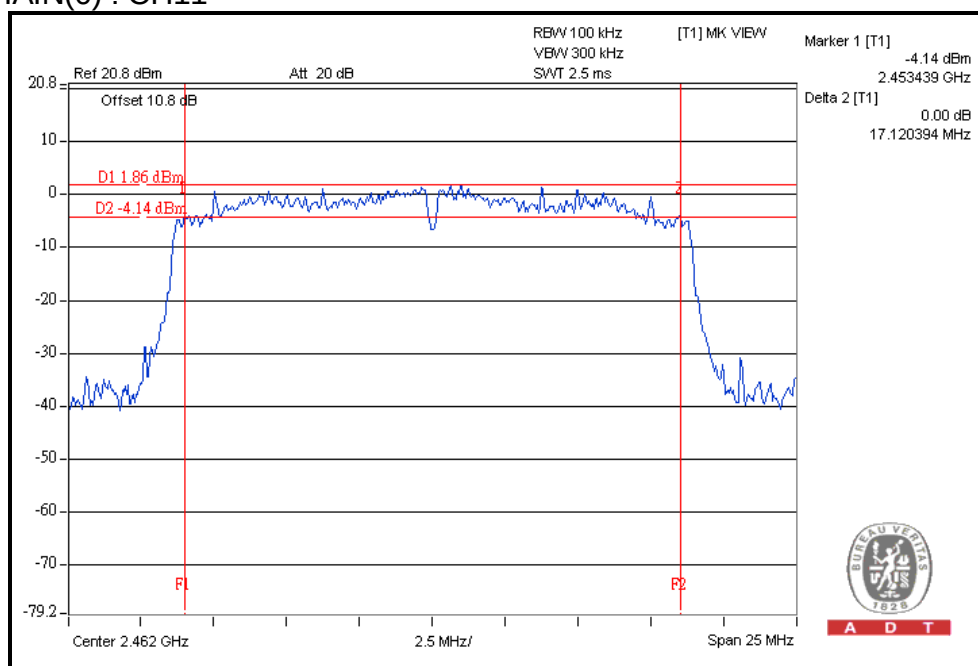
For CHAIN(1): CH11



802.11n (20MHz) OFDM modulation:

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN(0)	CHAIN(1)		
1	2412	14.46	15.95	0.5	PASS
6	2437	15.14	15.15	0.5	PASS
11	2462	17.12	16.07	0.5	PASS

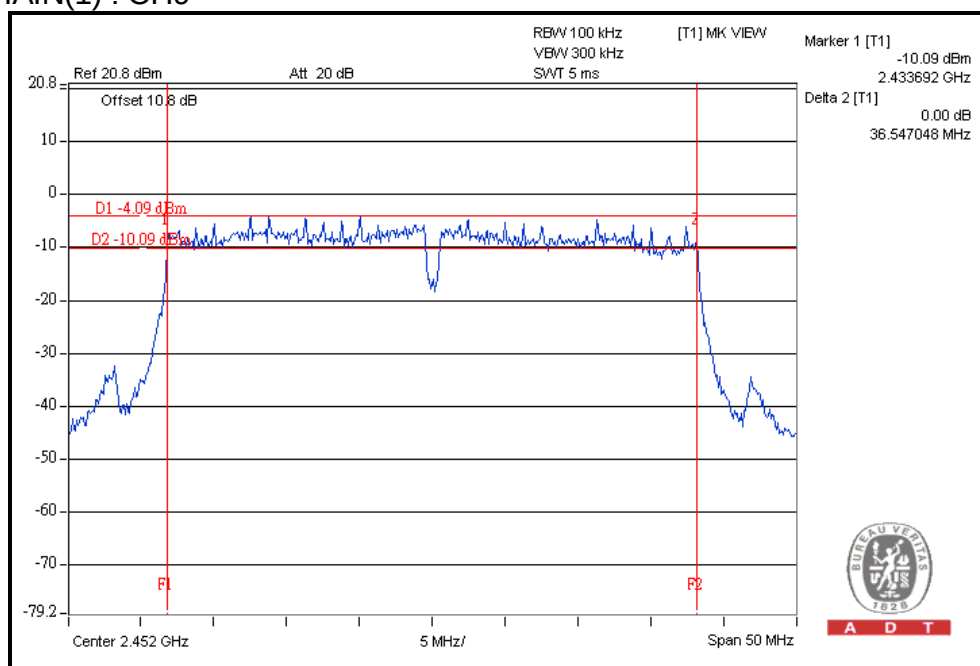
For CHAIN(0) : CH11



802.11n (40MHz) OFDM MODULATION:

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)		MINIMUM LIMIT (MHz)	PASS / FAIL
		CHAIN(0)	CHAIN(1)		
3	2422	34.62	35.25	0.5	PASS
6	2437	35.88	36.5	0.5	PASS
9	2452	36.17	36.54	0.5	PASS

For CHAIN(1) : CH9



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: July 21, 2011

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Agilent SIGNAL GENERATOR	E8257C	MY43320668	Dec. 27, 2010	Dec. 26, 2011
TEKTRONIX OSCILLOSCOPE	TDS 5104	BO51450	May. 17, 2011	May. 16, 2012
NARDA DETECTOR	4503A	FSCM99899	NA	NA

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. A detector was used on the output port of the EUT. An oscilloscope was used to read the response of the detector.
2. Replaced the EUT by the signal generator. The center frequency of the S.G was adjusted to the center frequency of the measured channel.
3. Adjusted the power to have the same reading on oscilloscope. Record the power level.

4.4.4 DEVIATION FROM TEST STANDARD

No deviation

4.4.5 TEST SETUP



4.4.6 EUT OPERATING CONDITIONS

Same as Item 4.3.6

4.4.7 TEST RESULTS

802.11b DSSS MODULATION:

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (mW)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (dBm)	PASS/FAIL
1	2412	162.2	22.1	30	PASS
6	2437	131.8	21.2	30	PASS
11	2462	144.5	21.6	30	PASS

802.11g OFDM MODULATION:

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (dBm)		TOTAL PEAK POWER (mW)	TOTAL PEAK POWER (dBm)	PEAK POWER LIMIT (dBm)	PASS / FAIL
		CHAIN(0)	CHAIN(1)				
1	2412	23.5	23.6	453.0	26.6	30	PASS
6	2437	24.4	25.3	614.3	27.9	30	PASS
11	2462	22.8	22.4	364.3	25.6	30	PASS

802.11n (20MHz) OFDM MODULATION:

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (dBm)		TOTAL PEAK POWER (mW)	TOTAL PEAK POWER (dBm)	PEAK POWER LIMIT (dBm)	PASS / FAIL
		CHAIN(0)	CHAIN(1)				
1	2412	22.6	22.8	372.5	25.7	30	PASS
6	2437	25.1	25.4	670.3	28.3	30	PASS
11	2462	22.7	22.4	360.0	25.6	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	19.1	18.9	158.9	22.0	30	PASS
6	2437	21.8	22.3	321.2	25.1	30	PASS
9	2452	20.3	19.4	194.2	22.9	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: Dec. 15, 2011

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
R&S Spectrum Analyzer	FSP40	100036	Dec. 07, 2011	Dec. 06, 2012

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

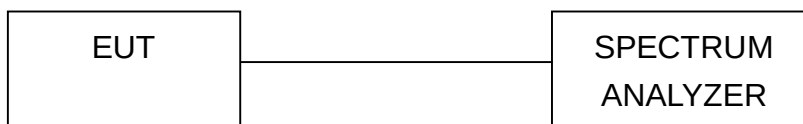
4.5.3 TEST PROCEDURE

The transmitter output was connected to the spectrum analyzer through an attenuator, the bandwidth of the fundamental frequency was measured with the spectrum analyzer using 3kHz RBW and 30kHz VBW, set sweep time = span/3kHz. The power spectral density was measured and recorded. The sweep time is allowed to be longer than span/3kHz for a full response of the mixer in the spectrum analyzer.

4.5.4 DEVIATION FROM TEST STANDARD

No deviation

4.5.5 TEST SETUP



4.5.6 EUT OPERATING CONDITION

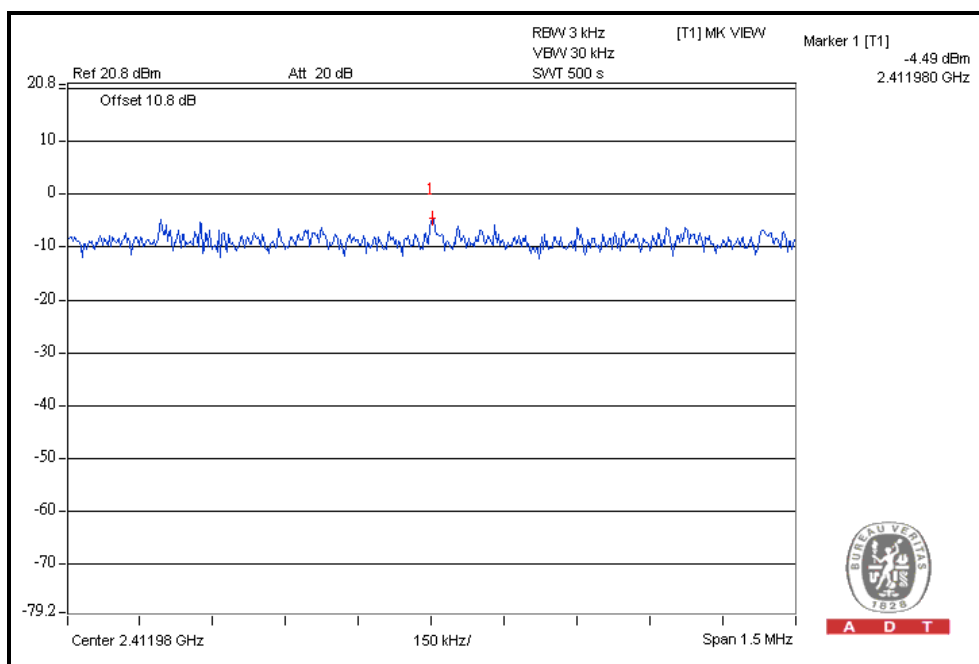
Same as Item 4.3.6

4.5.7 TEST RESULTS

802.11b DSSS MODULATION:

CHANNEL	FREQUENCY (MHz)	PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS / FAIL
1	2412	-4.5	8	PASS
6	2437	-5.6	8	PASS
11	2462	-6.0	8	PASS

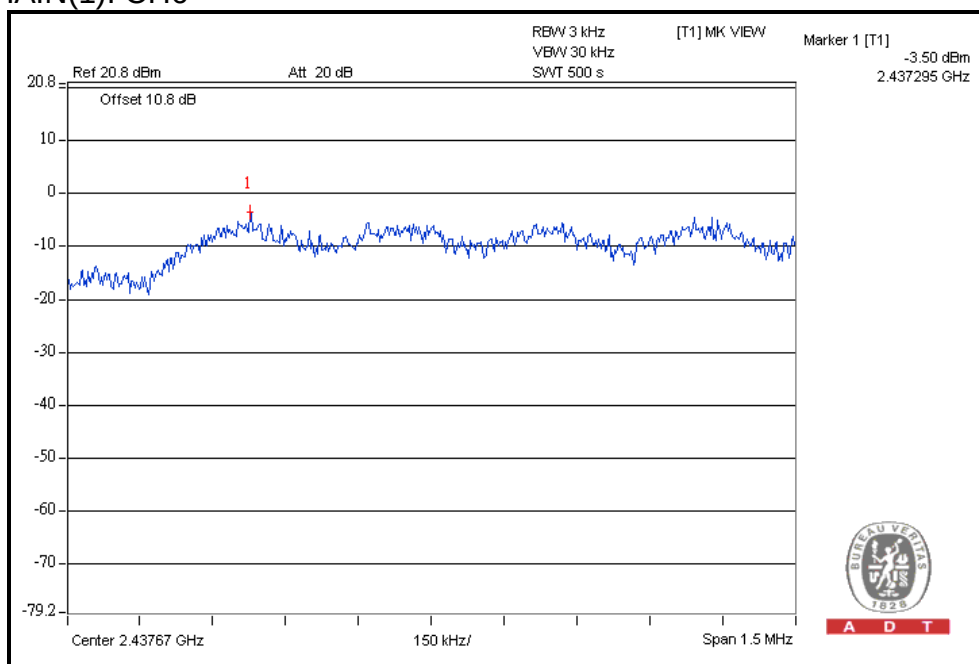
CH1



802.11g OFDM MODULATION:

TX chain	Channel	FREQ. (MHz)	PSD (dBm/3kHz)	10 log (N=2) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	1	2412	-4.5	3.0	-1.5	8	PASS
	6	2437	-5.6	3.0	-2.6	8	PASS
	11	2462	-6.0	3.0	-3.0	8	PASS
1	1	2412	-9.9	3.0	-6.9	8	PASS
	6	2437	-3.5	3.0	-0.5	8	PASS
	11	2462	-11.4	3.0	-8.4	8	PASS

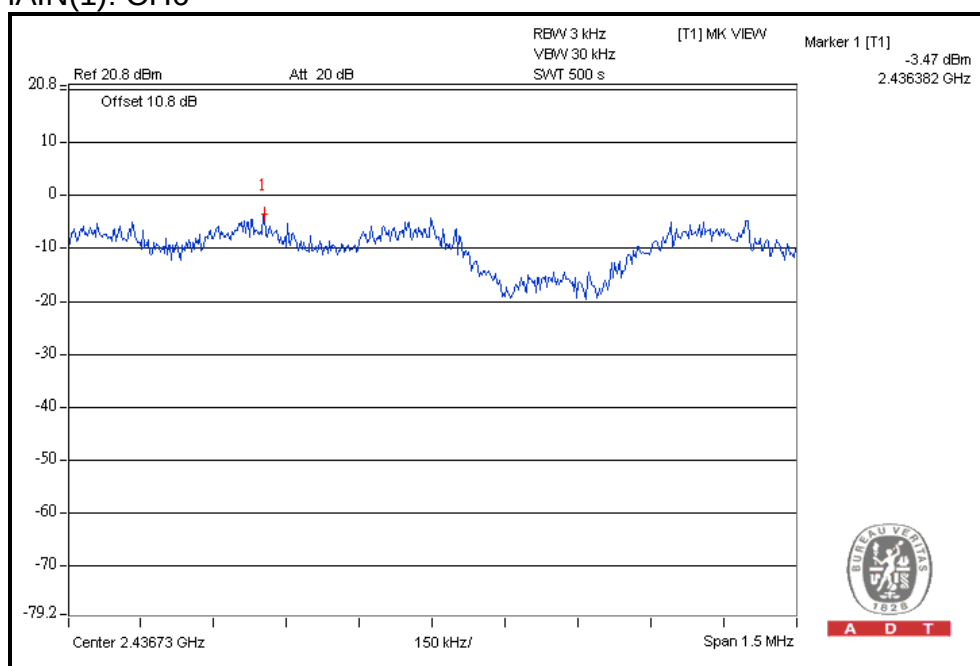
For CHAIN(1): CH6



802.11n (20MHz) OFDM MODULATION:

TX chain	Channel	FREQ. (MHz)	PSD (dBm/3kHz)	10 log (N=2) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	1	2412	-10.8	3.0	-7.8	8	PASS
	6	2437	-3.8	3.0	-0.8	8	PASS
	11	2462	-10.8	3.0	-7.8	8	PASS
1	1	2412	-10.8	3.0	-7.8	8	PASS
	6	2437	-3.5	3.0	-0.5	8	PASS
	11	2462	-8.9	3.0	-5.9	8	PASS

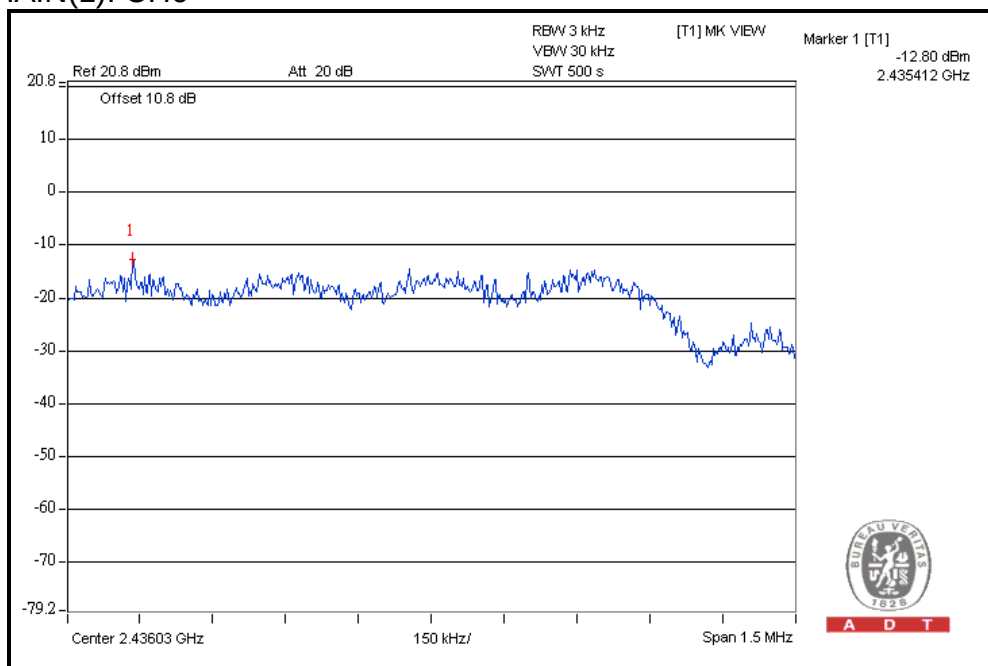
For CHAIN(1): CH6



802.11n (40MHz) OFDM MODULATION:

TX chain	Channel	FREQ. (MHz)	PSD (dBm/3kHz)	10 log (N=2) dB	Total PSD (dBm/3kHz)	Limit (dBm/3kHz)	PASS /FAIL
0	3	2422	-18.1	3.0	-15.1	8	PASS
	6	2437	-15.1	3.0	-12.1	8	PASS
	9	2452	-18.2	3.0	-15.2	8	PASS
1	3	2422	-17.5	3.0	-14.5	8	PASS
	6	2437	-12.8	3.0	-9.8	8	PASS
	9	2452	-17.7	3.0	-14.7	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: July 21, 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 were measured and recorded.

The spectrum plots (RBW = 100kHz, VBW = 300kHz) are attached on the following pages.

4.6.4 DEVIATION FROM TEST STANDARD

No deviation

4.6.5 EUT OPERATING CONDITION

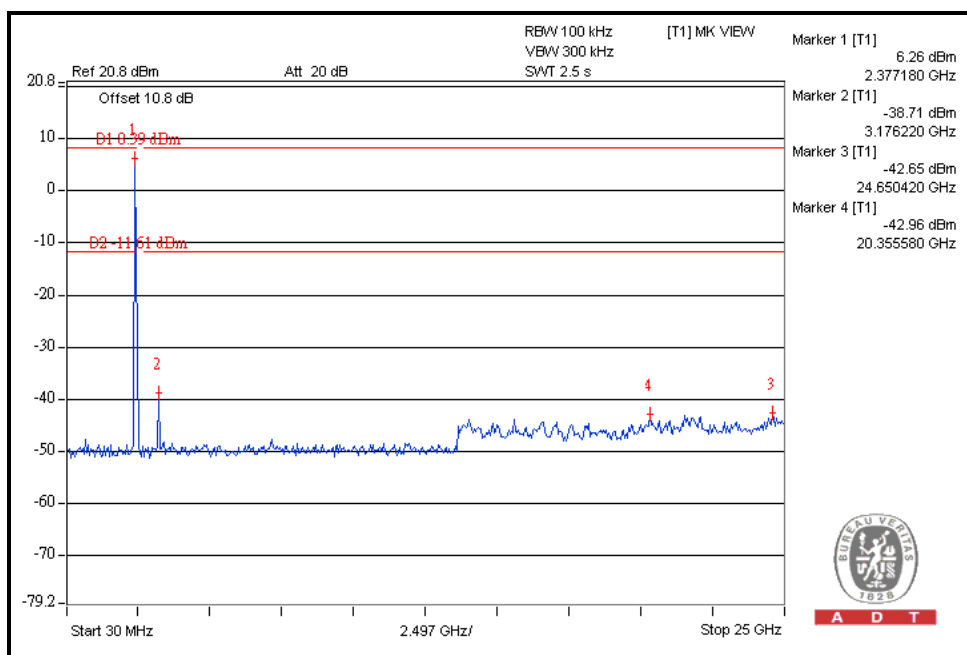
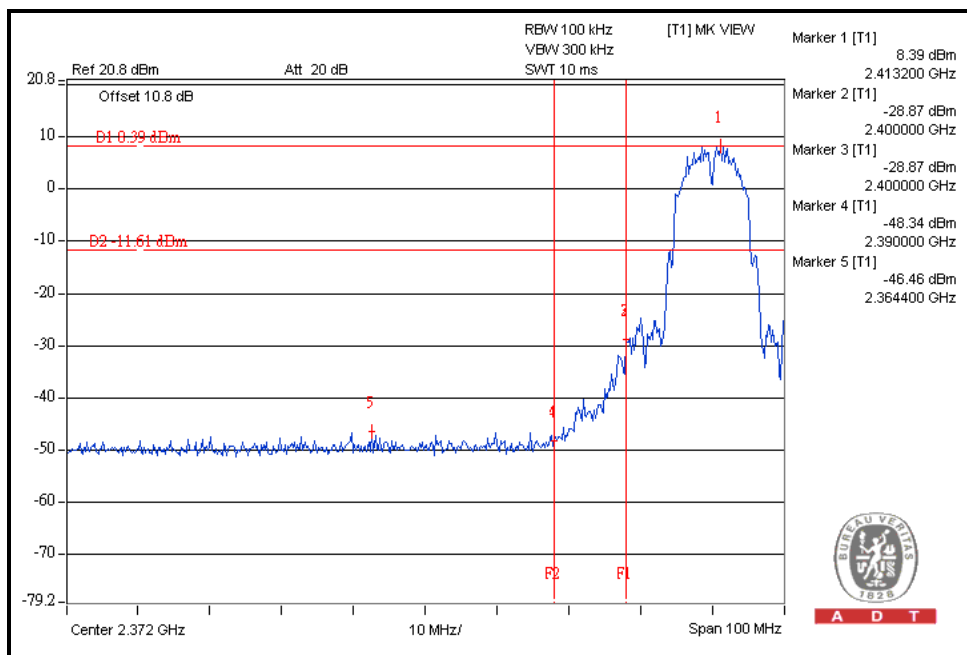
Same as Item 4.3.6

4.6.6 TEST RESULTS

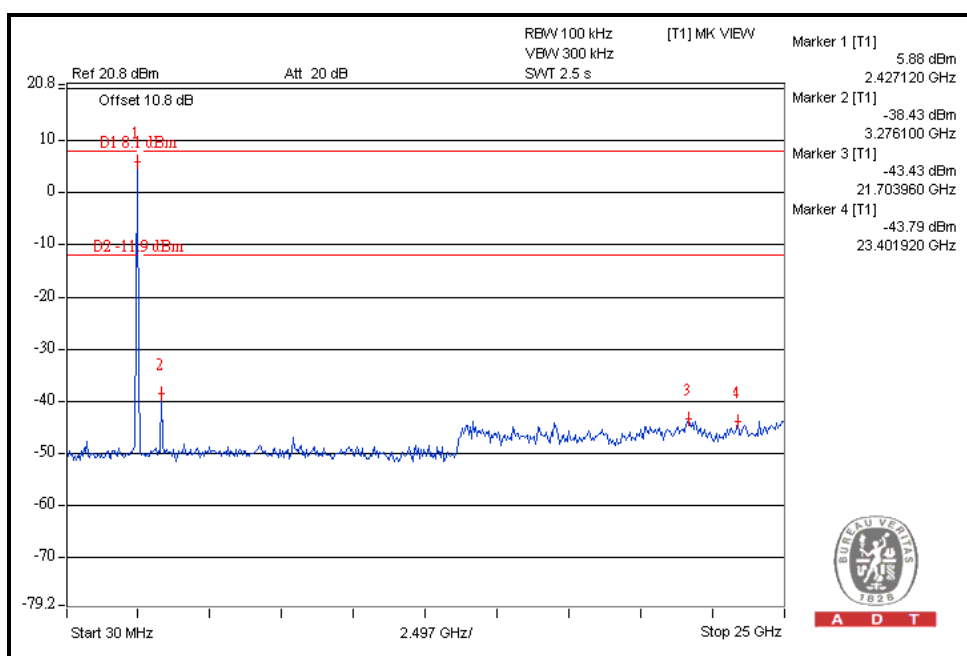
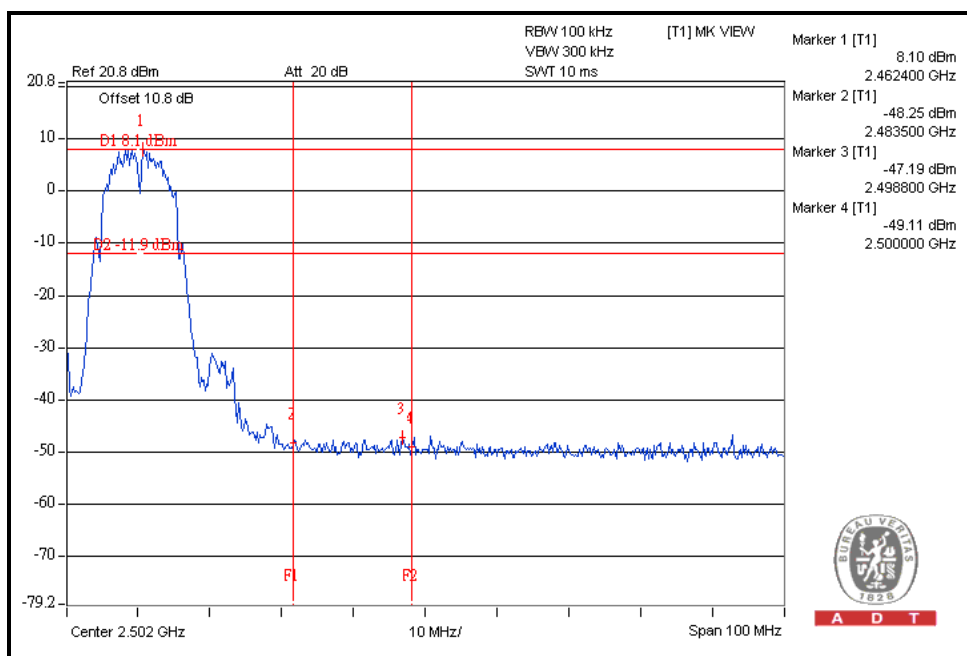
The spectrum plots are attached on the following images. D1 line indicates the highest level, and D2 line indicates the 20dB offset below D1. It shows compliance with the requirement in part 15.247(d).

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

CH1

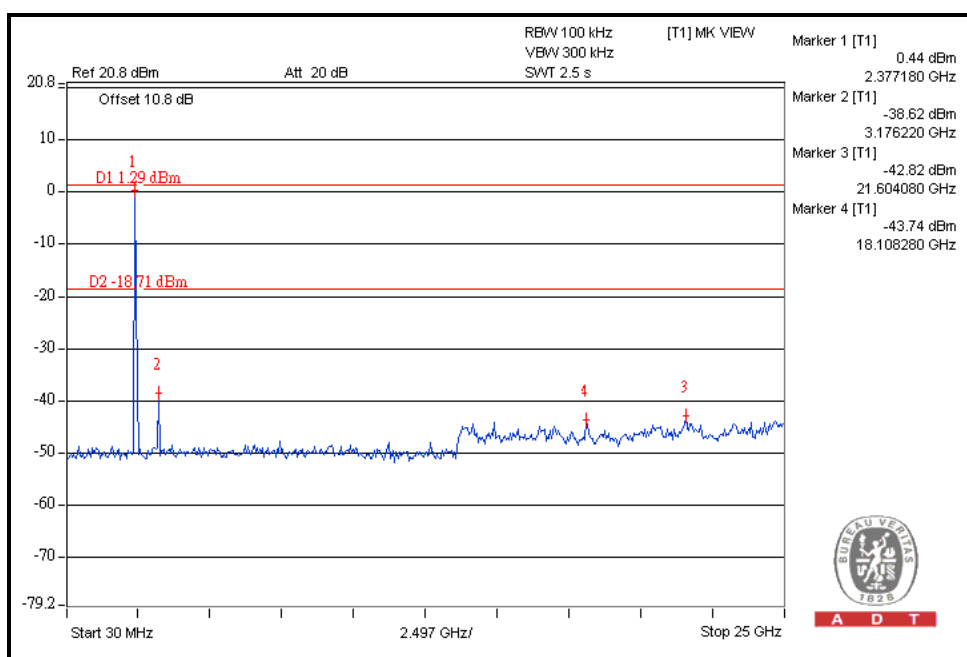
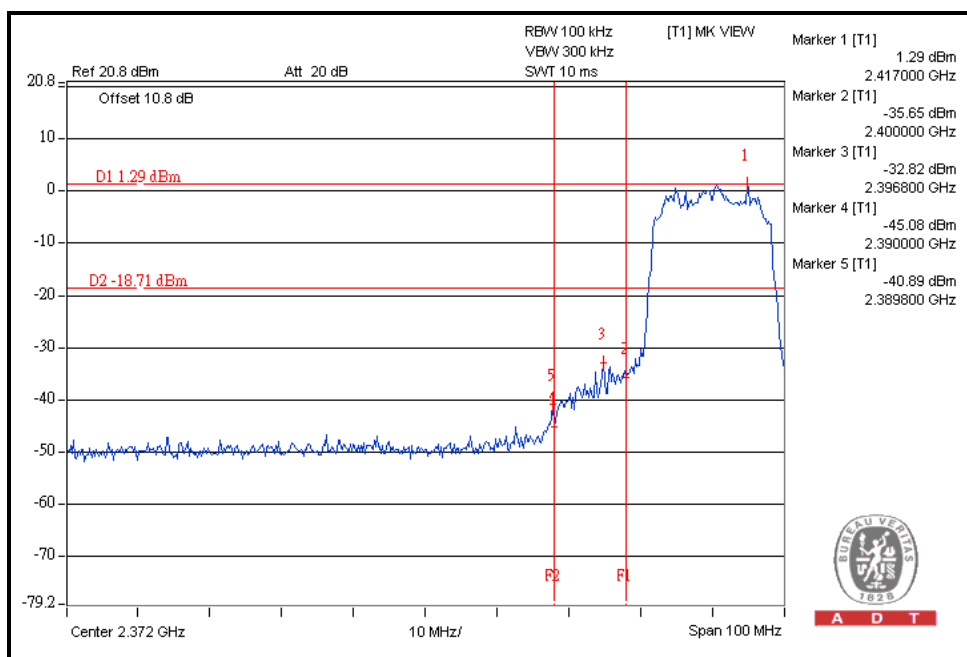


CH11

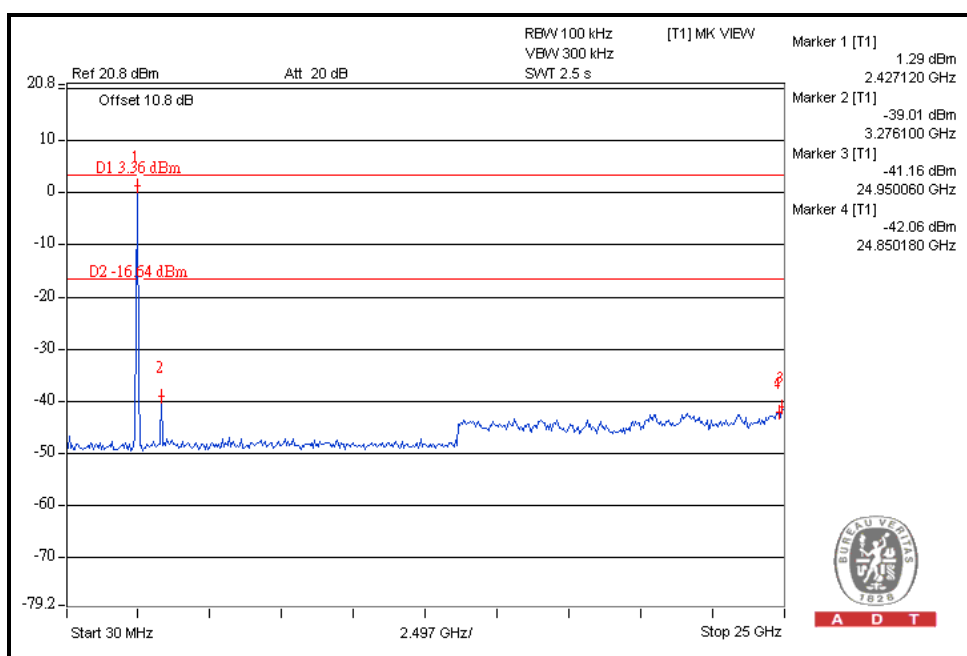
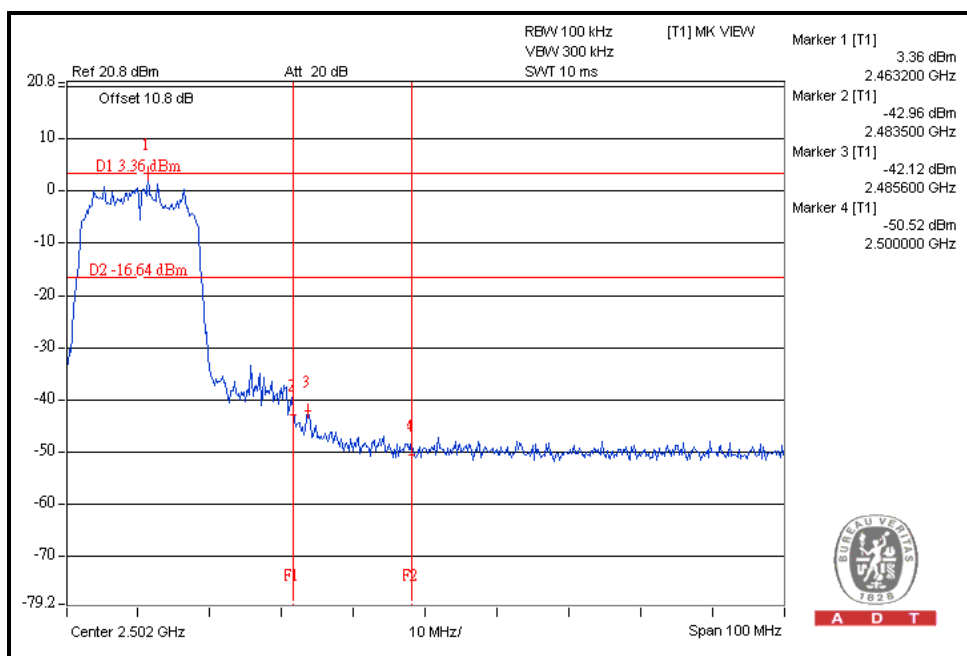


802.11g OFDM MODULATION:

CH1

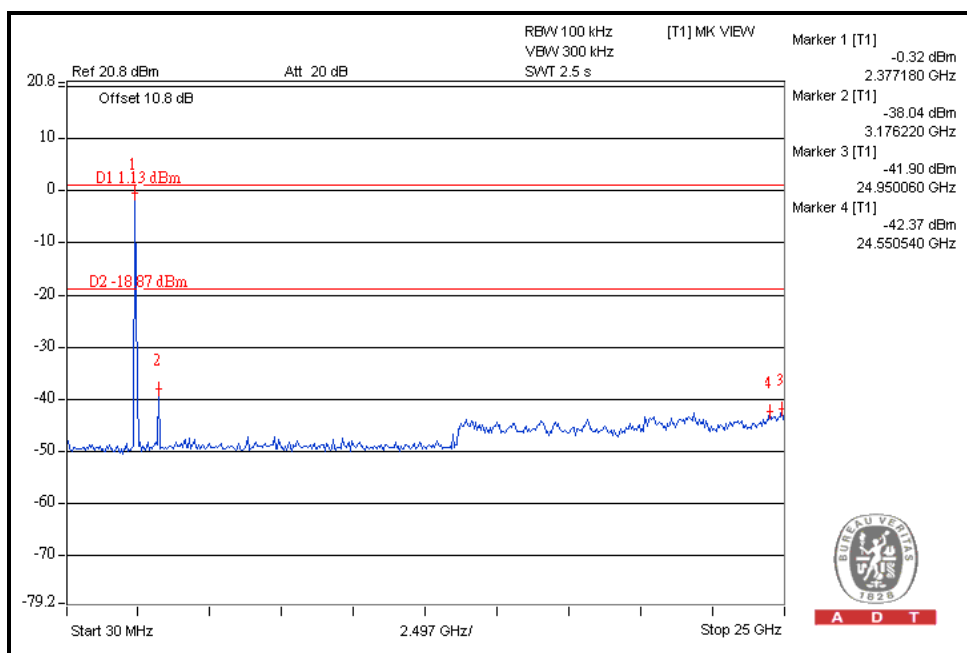
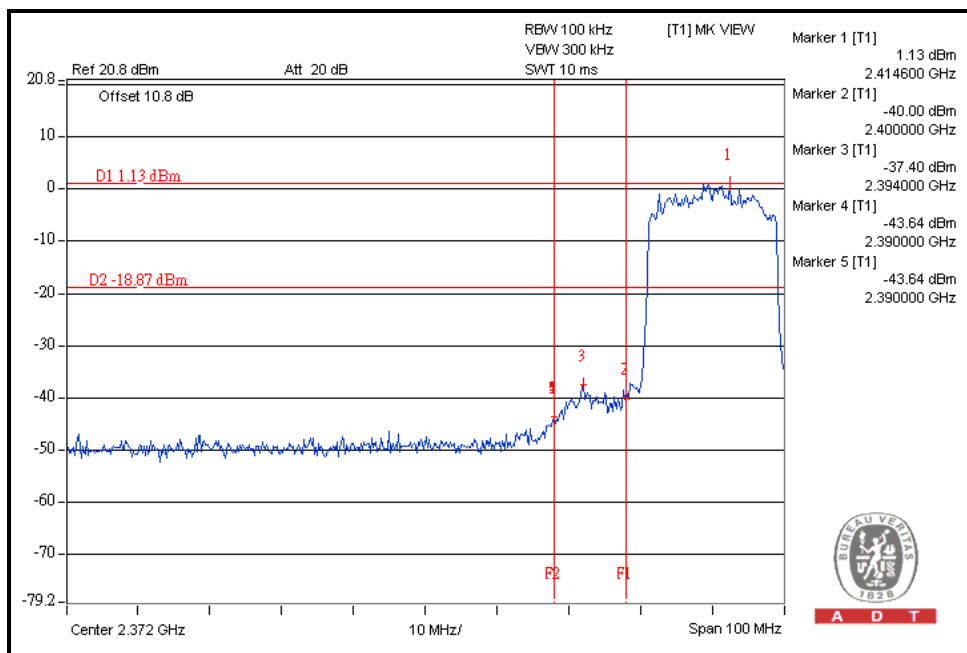


CH11

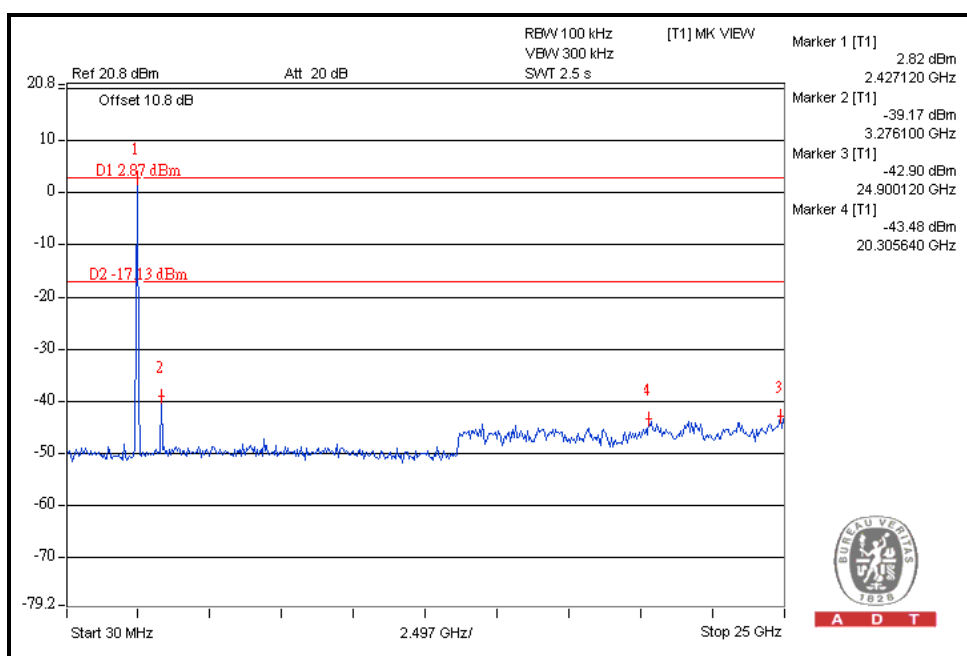
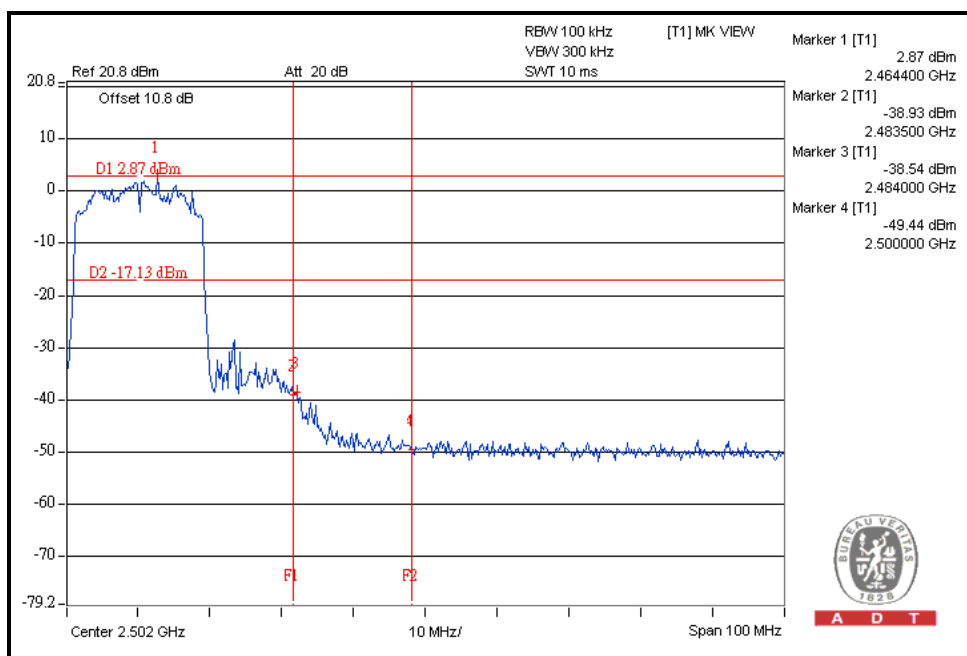


802.11n (20MHz) OFDM MODULATION:

CH1

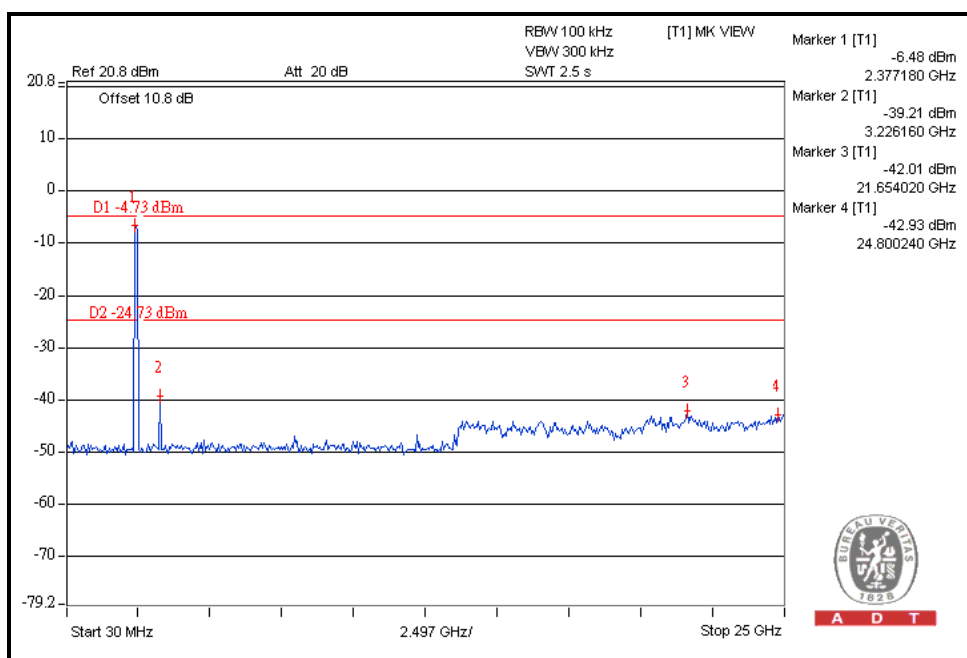
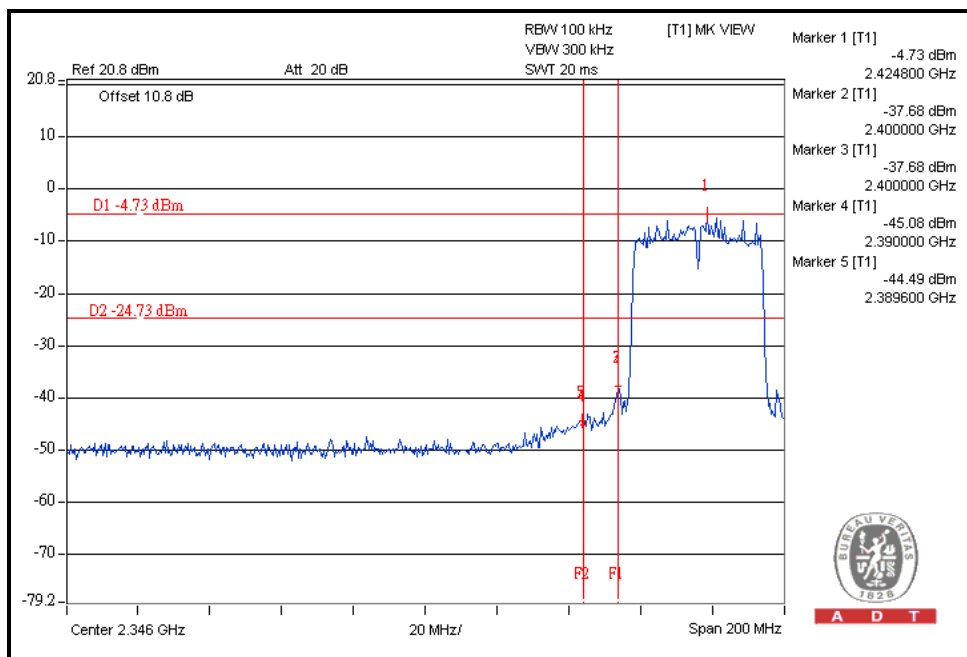


CH11

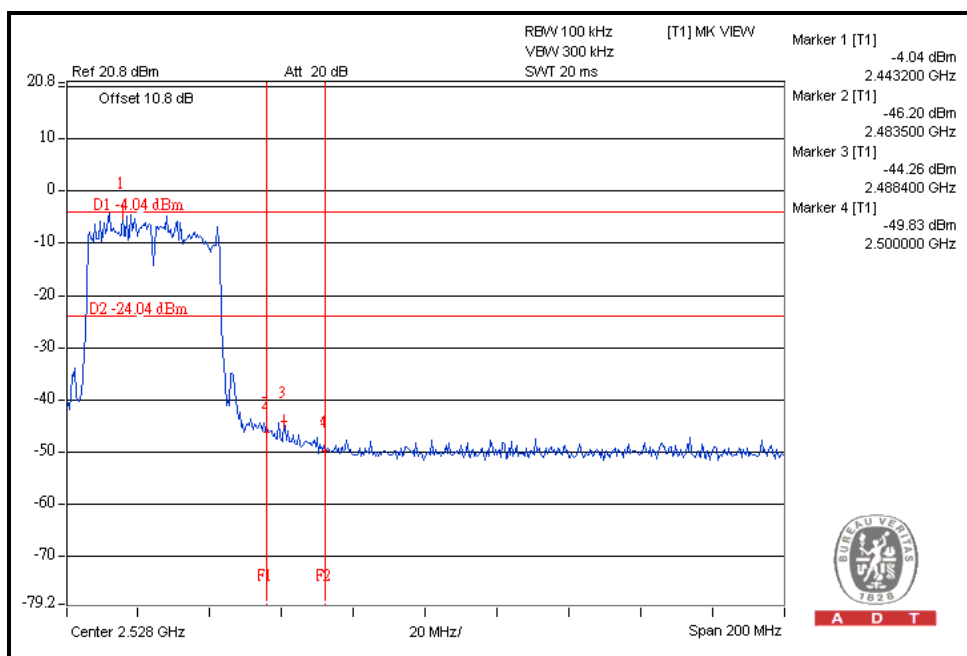


802.11n (40MHz) OFDM MODULATION:

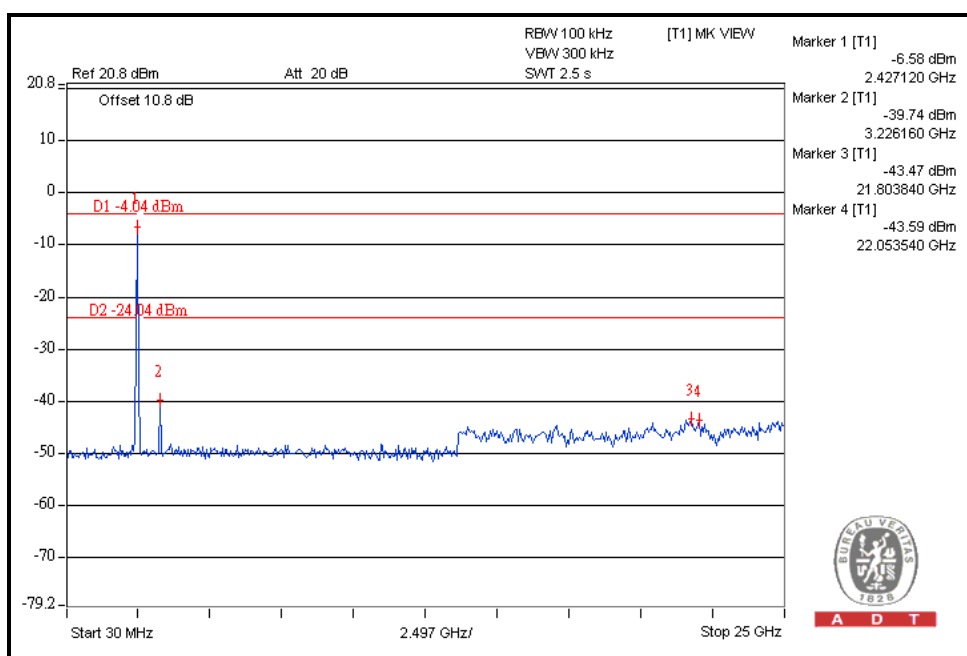
CH3



CH9



A D T



A D T

5. INFORMATION ON THE TESTING LABORATORIES

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

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

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

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

Linko EMC/RF Lab:

Tel: 886-2-26052180

Fax: 886-2-26052943

Hsin Chu EMC/RF Lab:

Tel: 886-3-5935343

Fax: 886-3-5935342

Hwa Ya EMC/RF/Safety/Telecom Lab:

Tel: 886-3-3183232

Fax: 886-3-3185050

Email: service.adt@tw.bureauveritas.com

Web Site: www.adt.com.tw

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



A D T

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

No modifications were made to the EUT by the lab during the test.

--- END ---