

FCC TEST REPORT

REPORT NO.: RF110412E04

MODEL NO.: DIR-645

FCC ID: KA2IR645A1

RECEIVED: Apr. 12, 2011

TESTED: Apr. 12 to May 03, 2011

ISSUED: June 09, 2011

APPLICANT: D-Link Corporation

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ISSUED BY: Bureau Veritas Consumer Products Services (H.K.)
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RELEASE CONTROL RECORD

ISSUE NO.	REASON FOR CHANGE	DATE ISSUED
RF110412E04	Original release	June 09, 2011



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1. CERTIFICATION

PRODUCT: Whole Home Router 1000
BRAND NAME: D-Link
MODEL NO.: DIR-645
TEST SAMPLE: MASS-PRODUCTION
TESTED: Apr. 12 to May 03, 2011
APPLICANT: D-Link Corporation
STANDARDS: FCC Part 15, Subpart C (Section 15.247)
ANSI C63.4-2003
ANSI C63.10-2009

The above equipment (Model: DWR-645) 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 : Amanda Chu, **DATE:** June 09, 2011
(Amanda Chu, Deputy Manager)

APPROVED BY : May Chen, **DATE:** June 09, 2011
(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 -13.83dB at 0.380MHz
15.247(a)(2)	Spectrum Bandwidth of a Direct Sequence Spread Spectrum System Limit: min. 500kHz	PASS	Meet the requirement of limit.
15.247(b)	Maximum Peak Output Power Limit: max. 30dBm	PASS	Meet the requirement of limit.
15.247(d)	Radiated Emissions Limit: Table 15.209	PASS	Meet the requirement of limit. Minimum passing margin is -0.5dB at 7386.00MHz
15.247(e)	Power Spectral Density Limit: max. 8dBm	PASS	Meet the requirement of limit.
15.247(d)	Conducted Out-Band Emission Measurement Limit: 20dB less than the peak value of fundamental frequency	PASS	Meet the requirement of limit.
15.203	Antenna Requirement	PASS	Antenna connector is UFL connector not a standard connector.

2.1 MEASUREMENT UNCERTAINTY

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

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

Measurement	Value
Conducted emissions	2.45 dB
Radiated emissions (30MHz-1GHz)	3.94 dB
Radiated emissions (1GHz -18GHz)	3.30 dB
Radiated emissions (18GHz -40GHz)	2.19 dB

3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

PRODUCT	Whole Home Router 1000
MODEL NO.	DIR-645
FCC ID	KA2IR645A1
POWER SUPPLY	DC 5V from power adapter
MODULATION TYPE	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM
MODULATION TECHNOLOGY	DSSS, OFDM
TRANSFER RATE	802.11b: 11 / 5.5 / 2 / 1Mbps 802.11g: 54 / 48 / 36 / 24 / 18 / 12 / 9 / 6Mbps HT20 MCS0~7 (800ns GI): 6.5Mbps, 13Mbps, 19.5Mbps, 26Mbps, 39Mbps, 52Mbps, 58.5Mbps, 65Mbps, HT20 MCS8~15 (800ns GI): 13Mbps, 26Mbps, 39Mbps, 52Mbps, 78Mbps, 104Mbps, 117Mbps, 130Mbps, HT40 MCS0~7 (800ns GI): 13.5Mbps, 27Mbps, 40.5Mbps, 54Mbps, 81Mbps, 108Mbps, 121.5Mbps, 135Mbps. HT40 MCS8~15 (800ns GI): 27Mbps, 54Mbps, 81Mbps, 108Mbps, 162Mbps, 216Mbps, 243Mbps, 270Mbps. HT20 MCS0~7 (400ns GI): 7.2Mbps, 14.4Mbps, 21.7Mbps, 28.9Mbps, 43.3Mbps, 57.8Mbps, 65.0Mbps, 72.2Mbps HT20 MCS8~15 (400ns GI): 14.444Mbps, 28.889Mbps, 43.333Mbps, 57.778Mbps, 86.667Mbps, 115.556Mbps, 130.000Mbps, 144.444Mbps HT40 MCS0~7 (400ns GI): 15.0Mbps, 30.0Mbps, 45.0Mbps, 60.0Mbps, 90.0Mbps, 120.0Mbps, 135.0Mbps, 150.0Mbps HT40 MCS8~15 (400ns GI): 30.0Mbps, 60.0Mbps, 90.0Mbps, 120.0Mbps, 180.0Mbps, 240.0Mbps, 270.0Mbps, 300.0Mbps
FREQUENCY RANGE	2412MHz ~ 2462MHz
NUMBER OF CHANNEL	11 for 802.11b, 802.11g, 802.11n (20MHz) 7 for 802.11n (40MHz)
MAXIMUM OUTPUT POWER	802.11b: 463.5mW 802.11g: 734.6mW 802.11n (20MHz): 760.4mW 802.11n (40MHz): 720.2mW

ANTENNA TYPE	Please see NOTE
DATA CABLE	Ethernet cable x 1(Unshielded,1.5m)
I/O PORTS	USB port x 1 INTERNET port x 1 LAN port x 4 (Ethernet: 10, 100, 1000Mbps)
ASSOCIATED DEVICES	Adapter x 1

NOTE:

- There are six antennas provided to this EUT, please refer to the following table:

Antenna 1					
Layout	Manufacture	Model name	Antenna Gain	Antenna Type	Connector
			For 2.4GHz Gain (dBi)		
Vertical	Alpha	WAP-N10S	2.95	Dipole	UFL
Antenna 2					
Layout	Manufacture	Model name	Antenna Gain	Antenna Type	Connector
			For 2.4GHz Gain (dBi)		
Vertical	Alpha	WAP-N10S	3.98	Dipole	UFL
Antenna 3					
Layout	Manufacture	Model name	Antenna Gain	Antenna Type	Connector
			For 2.4GHz Gain (dBi)		
Horizontal	Alpha	WAP-N10S	3.23	Dipole	UFL
Antenna 4					
Layout	Manufacture	Model name	Antenna Gain	Antenna Type	Connector
			For 2.4GHz Gain (dBi)		
Horizontal	Alpha	WAP-N10S	4.20	Dipole	UFL
Antenna 5					
Layout	Manufacture	Model name	Antenna Gain	Antenna Type	Connector
			For 2.4GHz Gain (dBi)		
Horizontal	Alpha	WAP-N10S	2.65	Dipole	UFL

Antenna 6					
Layout	Manufacture	Model name	Antenna Gain	Antenna Type	Connector
			For 2.4GHz Gain (dBi)		
Vertical	Alpha	WAP-N10S	3.45	Dipole	UFL

2. According to the above antennas, there are two antennas will transmit simultaneously (one is Horizontal and the other one is Vertical). As the antenna combination must be supplied with one Horizontal and one Vertical antennas, therefore the following antenna combination modes could be chosen as below table:

COMBINATION MODE	Antenna Configuration	
	CHAIN(1)	CHAIN(0)
1	Antenna 3 - H	Antenna 1 - V
2	Antenna 3 - H	Antenna 2 - V
3	Antenna 3 - H	Antenna 6 - V
4	Antenna 4 - H	Antenna 1 - V
5	Antenna 4 - H	Antenna 2 - V
6	Antenna 4 - H	Antenna 6 - V
7	Antenna 5 - H	Antenna 1 - V
8	Antenna 5 - H	Antenna 2 - V
9	Antenna 5 - H	Antenna 6 - V
Note: 1. This report chose the max. Antenna gain to do final test. 2. Antenna 2, 4 were selected as representative antennas for the test.		

3. The EUT is 2 * 2 spatial MIMO (2Tx & 2Rx) with beam forming function.
4. The EUT incorporates CDD function with 802.11b, 802.11g and MIMO function with 802.11n.
5. When the EUT operating in 802.11n, the software operation, which is defined by manufacturer, MCS (Modulation and Coding Schemes) from 0 to 15.

6. The EUT must be supplied with a power adapter and following three different model names could be chosen:

Adapter	Brand	Model No.	Spec.
Adapter 1	D-Link	CF1505-B	AC Input: 100-120V 0.4A, 50/60Hz DC Output: 5V, 2.5A DC Cable: 1.5m (unshielded)
Adapter 2		CF1505-B	AC Input: 100-240V 0.4A, 60Hz DC Output: 5V, 2.5A DC Cable: 1.5m (unshielded)
Adapter 3		AMS3-0502500FU	AC Input: 100-240V 0.5A, 50/60Hz DC Output: 5V, 2.5A DC Cable: 1.5m (unshielded)

The worst radiated emission was found in **Adapter 2**. Therefore only the test data of the mode was recorded in this report.

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

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	
MODE 1	√	-	-	-	With adapter 1
MODE 2	√	√	√	√	With adapter 2
MODE 3	√	-	-	-	With adapter 3

Where **PLC**: Power Line Conducted Emission

RE < 1G: Radiated Emission below 1GHz

RE ³ 1G: Radiated Emission above 1GHz

APCM: Antenna Port Conducted Measurement

ANTENNA COMBINATION MODE:

COMBINATION MODE	OPERATION MODE	TX CHAIN(0)	TX CHAIN(1)
A	802.11 b	√	√
B	802.11 g	√	√
C	802.11n(20MHz) for MCS0~15	√	√
D	802.11n(40MHz) for MCS0~15	√	√
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)
802.11n (20MHz)	1 to 11	6	OFDM	BPSK	6.5

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)
802.11n (20MHz)	1 to 11	6	OFDM	BPSK	6.5

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

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

※ Conducted out band emission as show worst chain in report base on preliminary measurement.

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

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

TEST CONDITION:

APPLICABLE TO	ENVIRONMENTAL CONDITIONS	INPUT POWER	TESTED BY
RE ³ 1G	20deg. C, 63%RH, 1022 hPa	120Vac, 60Hz	Kent Liu
RE<1G	19deg. C, 63%RH, 1022 hPa	120Vac, 60Hz	Kent Liu
PLC	25deg. C, 67%RH, 1022 hPa / 24deg. C, 64%RH, 1022 hPa	120Vac, 60Hz	Frank Liu
APCM	25deg. C, 60%RH, 1022 hPa	120Vac, 60Hz	Kent Liu

3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS

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

FCC Part 15, Subpart C. (15.247)

ANSI C63.4-2003

ANSI C63.10-2009

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

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

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.

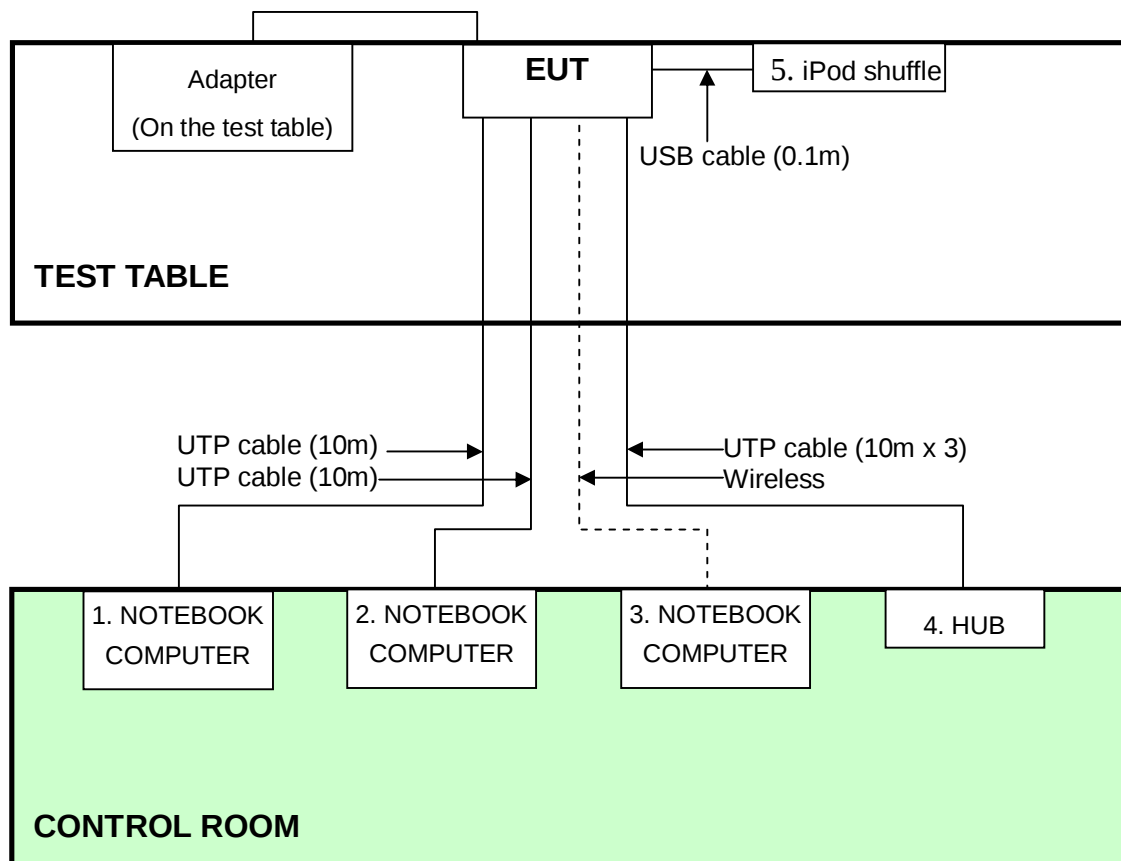
NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	NOTEBOOK COMPUTER	DELL	PP32LA	GSLB32S	FCC DoC
2	NOTEBOOK COMPUTER	DELL	PP32LA	FSLB32S	FCC DoC
3	NOTEBOOK COMPUTER	DELL	PP19L	CN-OHC416-70 166-5CA-0448	PIW632500516610
4	HUB	ZyXEL	ES-116P	S060H0200021 5	FCC DoC
5	iPod shuffle	Apple	MC749TA/A	CC4DMFKUDF DM	NA

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

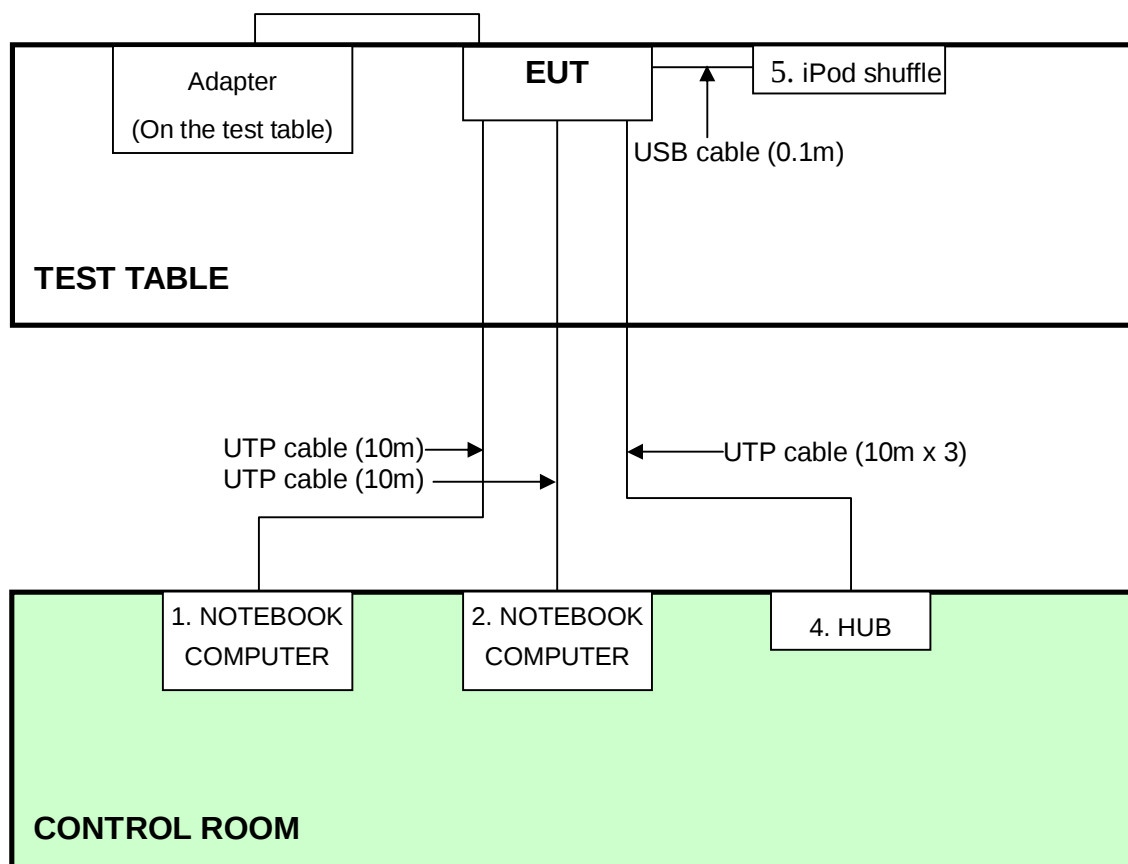
NOTE: All power cords of the above support units are non shielded (1.8m).

3.5 CONFIGURATION OF SYSTEM UNDER TEST

For Conducted Emission test:



For other test items:



4. TEST TYPES AND RESULTS

4.1 CONDUCTED EMISSION MEASUREMENT

4.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

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

- NOTE:**
1. The lower limit shall apply at the transition frequencies.
 2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50 MHz.
 3. All emanations from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

4.1.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Test Receiver	ESCS 30	100375	Mar. 09, 2011	Mar. 08, 2012
Line-Impedance Stabilization Network (for EUT)	NSLK 8127	8127-522	Sep. 08, 2010	Sep. 07, 2011
Line-Impedance Stabilization Network (for Peripheral)	ESH3-Z5	848773/004	Nov. 03, 2010	Nov. 02, 2011
RF Cable (JYEBAO)	5DFB	COCCAB-002	Aug. 30, 2010	Aug. 29, 2011
50 ohms Terminator	50	3	Nov. 03, 2010	Nov. 02, 2011
Software	BV ADT_Cond_V7.3.7	NA	NA	NA

Note:

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

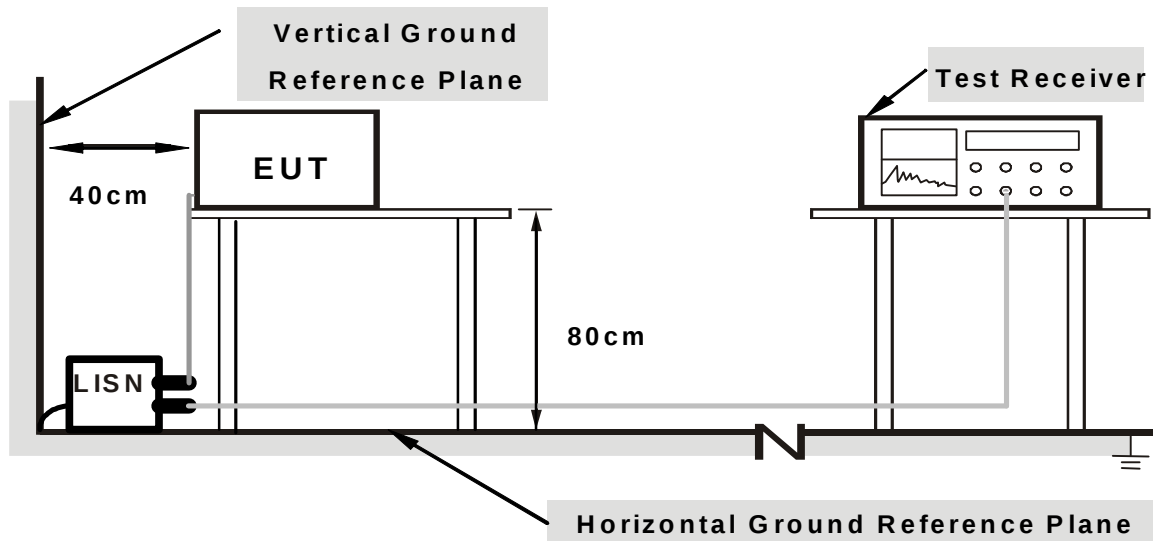
4.1.3 TEST PROCEDURES

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

4.1.4 DEVIATION FROM TEST STANDARD

No deviation

4.1.5 TEST SETUP



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

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

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

4.1.6 EUT OPERATING CONDITIONS

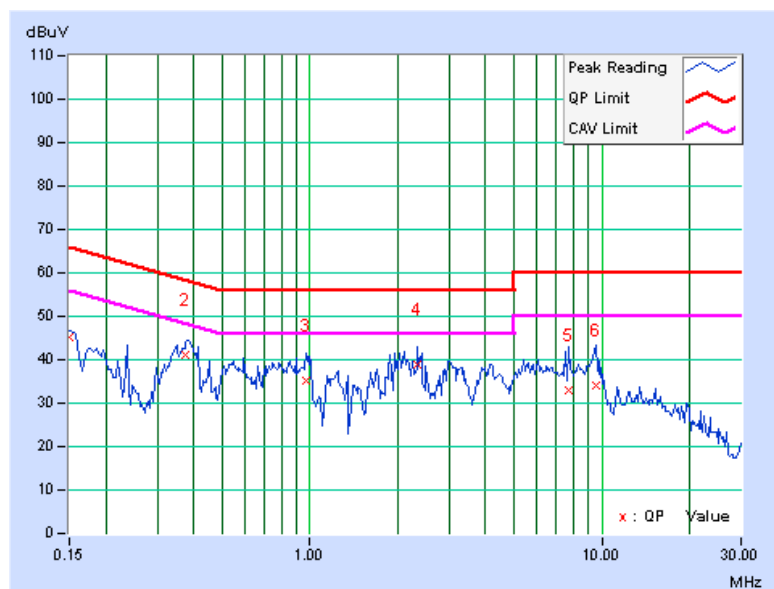
1. Turned on the power of all equipment.
2. Support units 1 ~ 3 (Notebook Computer) ran a test program “Ping.exe” to enable of EUT via UTP cables and wireless continuously.
3. Support units 1 (Notebook Computer) read and wrote messages from iPod shuffle (support unit 5) via EUT.

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 (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
		(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.150	0.10	45.00	34.84	45.10	34.94	66.00	56.00	-20.90	-21.06
2	0.377	0.13	40.96	33.88	41.09	34.01	58.35	48.35	-17.26	-14.34
3	0.974	0.14	35.18	25.58	35.32	25.72	56.00	46.00	-20.68	-20.28
4	2.340	0.17	38.65	27.16	38.82	27.33	56.00	46.00	-17.18	-18.67
5	7.684	0.37	32.72	24.88	33.09	25.25	60.00	50.00	-26.91	-24.75
6	9.590	0.46	33.65	26.64	34.11	27.10	60.00	50.00	-25.89	-22.90

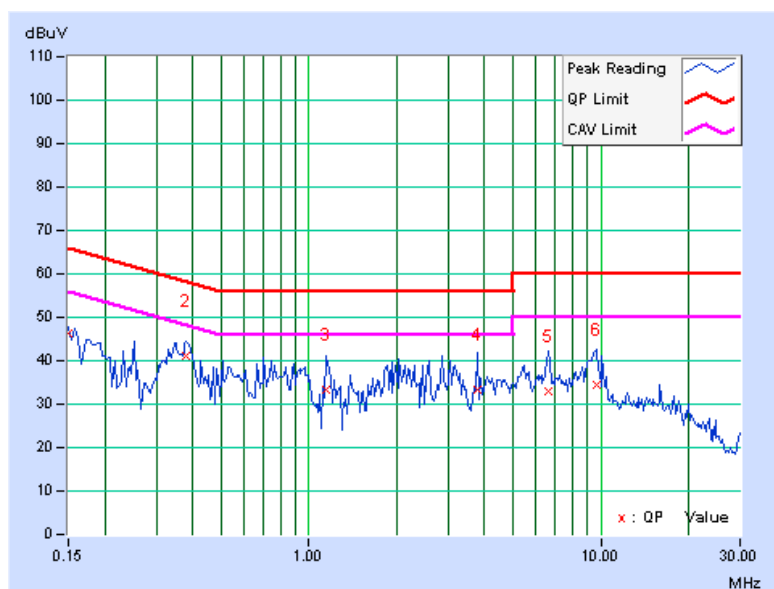
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value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



PHASE	Neutral (N)	6dB BANDWIDTH	9 kHz
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No	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
	[MHz]	Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
		(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.150	0.12	46.32	37.79	46.44	37.91	66.00	56.00	-19.56	-18.09
2	0.380	0.15	40.90	34.29	41.05	34.44	58.27	48.27	-17.22	-13.83
3	1.152	0.16	33.03	23.51	33.19	23.67	56.00	46.00	-22.81	-22.33
4	3.789	0.27	32.93	23.43	33.20	23.70	56.00	46.00	-22.80	-22.30
5	6.582	0.52	32.42	24.81	32.94	25.33	60.00	50.00	-27.06	-24.67
6	9.691	0.80	33.62	26.04	34.42	26.84	60.00	50.00	-25.58	-23.16

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

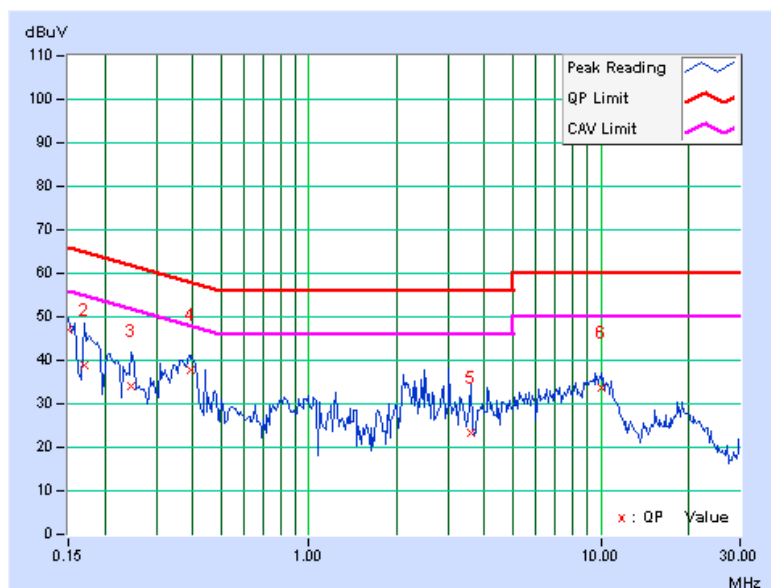


4.1.8 TEST RESULTS (MODE 2)

PHASE	Line (L)	6dB BANDWIDTH	9 kHz
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No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.150	0.10	46.94	37.14	47.04	37.24	66.00	56.00	-18.96	-18.76
2	0.170	0.11	38.86	20.46	38.97	20.57	64.98	54.98	-26.01	-34.41
3	0.248	0.13	33.83	24.98	33.96	25.11	61.84	51.84	-27.88	-26.73
4	0.396	0.13	37.82	28.38	37.95	28.51	57.93	47.93	-19.98	-19.42
5	3.586	0.19	23.15	15.61	23.34	15.80	56.00	46.00	-32.66	-30.20
6	10.059	0.48	33.05	27.67	33.53	28.15	60.00	50.00	-26.47	-21.85

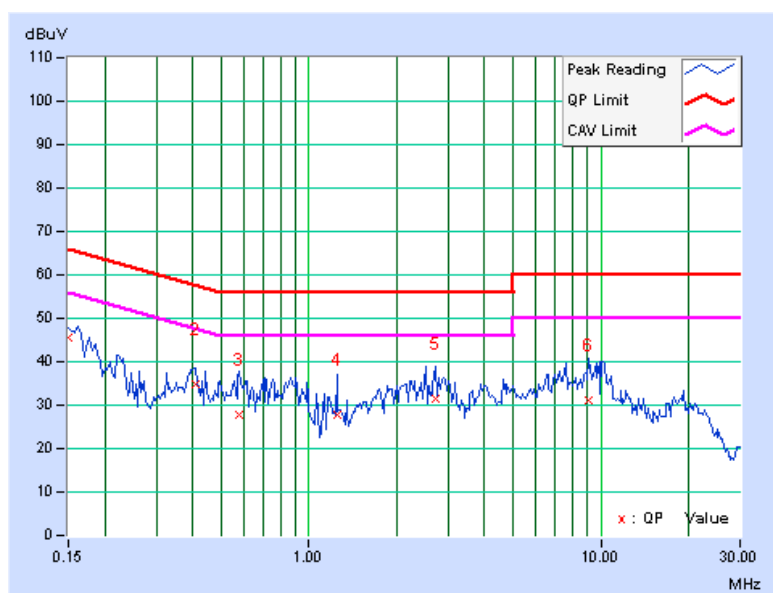
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value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



PHASE	Neutral (N)	6dB BANDWIDTH	9 kHz
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No	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
	[MHz]	Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
		(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.150	0.12	45.42	34.60	45.54	34.72	66.00	56.00	-20.46	-21.28
2	0.408	0.15	34.53	26.69	34.68	26.84	57.69	47.69	-23.01	-20.85
3	0.580	0.15	27.48	16.42	27.63	16.57	56.00	46.00	-28.37	-29.43
4	1.246	0.17	27.74	19.78	27.91	19.95	56.00	46.00	-28.09	-26.05
5	2.727	0.22	31.24	23.01	31.46	23.23	56.00	46.00	-24.54	-22.77
6	9.121	0.75	30.40	24.29	31.15	25.04	60.00	50.00	-28.85	-24.96

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

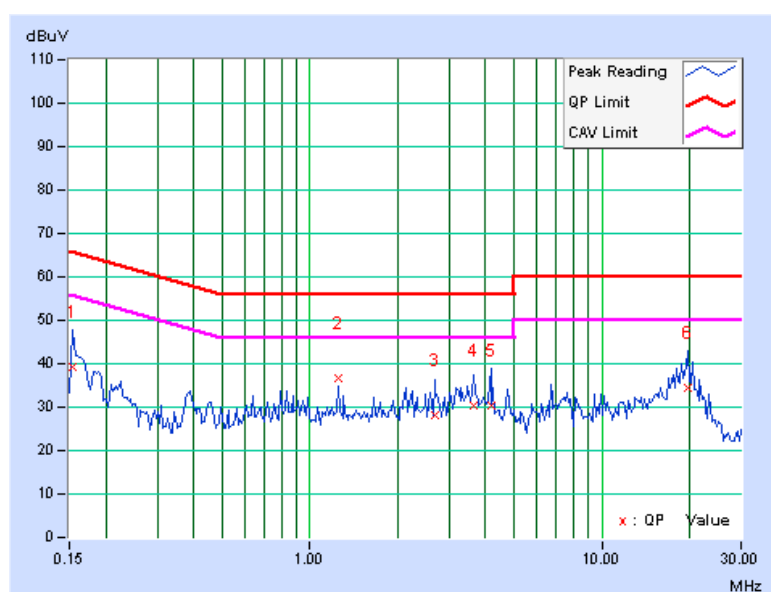


4.1.9 TEST RESULTS (MODE 3)

PHASE	Line (L)	6dB BANDWIDTH	9 kHz
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No	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
	[MHz]	Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.154	0.11	39.32	24.75	39.43	24.86	65.79	55.79	-26.36	-30.93
2	1.254	0.15	36.50	24.04	36.65	24.19	56.00	46.00	-19.35	-21.81
3	2.668	0.17	28.11	23.00	28.28	23.17	56.00	46.00	-27.72	-22.83
4	3.633	0.19	30.25	25.68	30.44	25.87	56.00	46.00	-25.56	-20.13
5	4.160	0.21	30.12	23.54	30.33	23.75	56.00	46.00	-25.67	-22.25
6	19.820	0.66	33.68	27.97	34.34	28.63	60.00	50.00	-25.66	-21.37

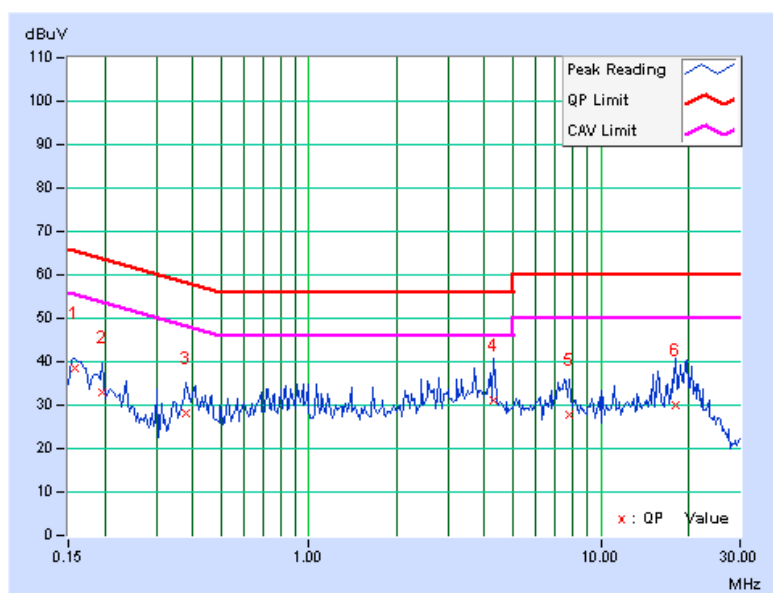
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value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



PHASE	Neutral (N)	6dB BANDWIDTH	9 kHz
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No	Freq.	Corr.	Reading Value		Emission Level		Limit		Margin	
		Factor	[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.158	0.12	38.37	27.26	38.49	27.38	65.58	55.58	-27.09	-28.20
2	0.197	0.14	32.91	20.99	33.05	21.13	63.74	53.74	-30.69	-32.61
3	0.380	0.15	28.14	20.78	28.29	20.93	58.27	48.27	-29.98	-27.34
4	4.285	0.31	30.80	24.44	31.11	24.75	56.00	46.00	-24.89	-21.25
5	7.781	0.63	26.98	21.08	27.61	21.71	60.00	50.00	-32.39	-28.29
6	18.012	1.30	28.58	22.58	29.88	23.88	60.00	50.00	-30.12	-26.12

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



4.2 RADIATED EMISSION MEASUREMENT

4.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT

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

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

NOTE:

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

4.2.2 TEST INSTRUMENTS

Test date: Apr. 26, 2011

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Agilent Spectrum Analyzer	E4446A	MY48250254	July 14, 2010	July 13, 2011
Agilent Pre-Selector	N9039A	MY46520311	July 14, 2010	July 13, 2011
Agilent Signal Generator	N5181A	MY49060517	July 14, 2010	July 13, 2011
Mini-Circuits Pre-Amplifier	ZFL-1000VH2B	AMP-ZFL-03	Nov. 16, 2010	Nov. 15, 2011
Agilent Pre-Amplifier	8449B	3008A02578	July 05, 2010	July 04, 2011
Miteq Pre-Amplifier	AFS33-1800265 0-30-8P-44	881786	NA	NA
SCHWARZBECK Trilog Broadband Antenna	VULB 9168	9168-360	Apr. 14, 2011	Apr. 13, 2012
AISI Horn_Antenna	AIH.8018	000032009111 0	Nov. 12, 2010	Nov. 11, 2011
SCHWARZBECK Horn_Antenna	BBHA 9170	9170-424	Oct. 08, 2010	Oct. 07, 2011
RF CABLE	NA	RF104-201 RF104-203 RF104-204	Dec. 27, 2010	Dec. 26, 2011
RF Cable	NA	CHGCAB_001	NA	NA
Software	ADT_Radiated_ V8.7.05	NA	NA	NA
CT Antenna Tower & Turn Table	NA	NA	NA	NA

- Note: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The horn antenna, preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
3. The test was performed in 966 Chamber No. G.
4. The FCC Site Registration No. is 966073.
5. The VCCI Site Registration No. is G-137.
6. The CANADA Site Registration No. is IC 7450H-2.

4.2.3 TEST PROCEDURES

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

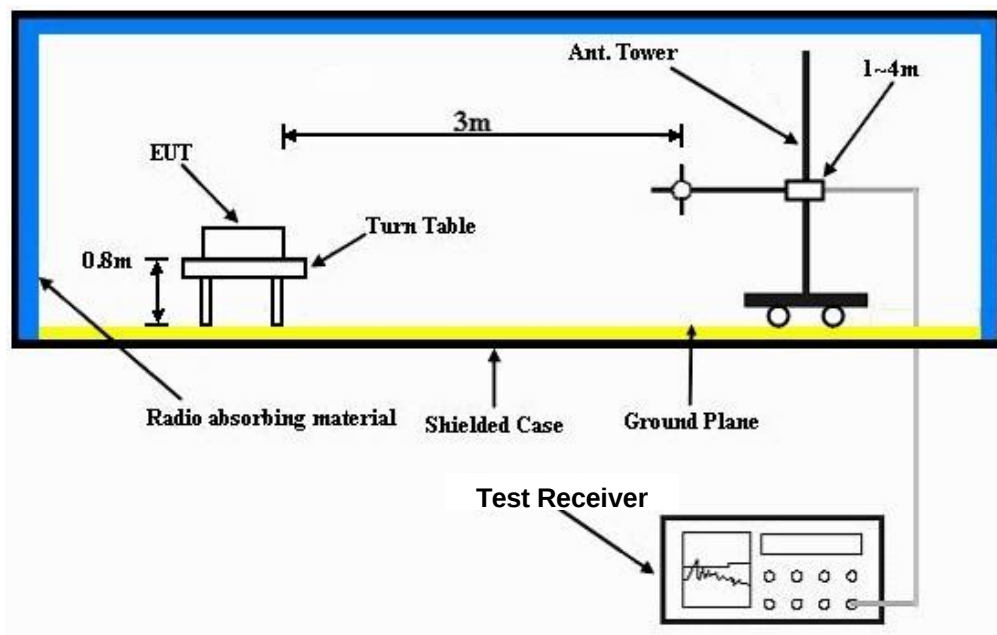
NOTE:

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

4.2.4 DEVIATION FROM TEST STANDARD

No deviation

4.2.5 EST SETUP



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

4.2.6 EUT OPERATING CONDITIONS

1. Turned on the power of all equipment.
2. Prepared other computer system support unit 1 (Notebook Computer) to act as communication partner and placed it outside of testing area.
3. The communication partner ran test program “QA-RT3883-AP-V1.0.4.5.exe” to enable EUT under transmission/receiving condition continuously via one UTP cable.

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	120V / 60Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	19deg. C, 63%RH 1022 hPa	TESTED BY	Kent Liu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	124.97	34.3 QP	43.5	-9.2	1.75 H	270	21.32	13.00
2	149.96	35.5 QP	43.5	-8.0	1.50 H	307	21.55	13.99
3	250.03	40.3 QP	46.0	-5.7	1.00 H	285	26.88	13.42
4	316.11	32.3 QP	46.0	-13.7	1.00 H	234	16.49	15.81
5	374.97	35.3 QP	46.0	-10.7	1.00 H	234	18.21	17.12
6	500.02	39.1 QP	46.0	-6.9	1.50 H	284	18.98	20.10
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	45.18	35.8 QP	40.0	-4.2	1.20 V	154	21.44	14.39
2	125.00	37.2 QP	43.5	-6.3	1.24 V	33	24.21	13.01
3	205.10	34.0 QP	43.5	-9.5	1.23 V	358	22.87	11.09
4	250.00	38.7 QP	46.0	-7.4	1.01 V	224	25.23	13.42
5	375.00	38.2 QP	46.0	-7.8	1.00 V	322	21.10	17.12
6	500.00	31.3 QP	46.0	-14.7	1.00 V	226	11.18	20.10

- 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.

ABOVE 1GHz WORST-CASE DATA

802.11b DSSS MODULATION

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER	120V / 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	20deg. C, 63%RH 1022 hPa	TESTED BY	Kent Liu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	61.5 PK	74.0	-12.5	1.41 H	68	29.84	31.66
2	2390.00	52.7 AV	54.0	-1.3	1.41 H	68	21.04	31.66
3	*2412.00	113.4 PK			1.22 H	0	81.67	31.73
4	*2412.00	110.4 AV			1.22 H	0	78.67	31.73
5	4824.00	52.2 PK	74.0	-21.8	1.20 H	29	13.23	38.97
6	4824.00	46.5 AV	54.0	-7.5	1.20 H	29	7.53	38.97
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	58.8 PK	74.0	-15.2	1.25 V	225	27.14	31.66
2	2390.00	46.0 AV	54.0	-8.0	1.25 V	225	14.34	31.66
3	*2412.00	111.9 PK			1.28 V	218	80.17	31.73
4	*2412.00	108.3 AV			1.28 V	218	76.57	31.73
5	4824.00	55.9 PK	74.0	-18.1	1.05 V	256	16.93	38.97
6	4824.00	53.3 AV	54.0	-0.7	1.05 V	256	14.33	38.97

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



A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER	120V / 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	20deg. C, 63%RH 1022 hPa	TESTED BY	Kent Liu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	114.1 PK			1.36 H	41	82.29	31.81
2	*2437.00	112.1 AV			1.36 H	41	80.29	31.81
3	4874.00	52.4 PK	74.0	-21.6	1.25 H	24	13.26	39.14
4	4874.00	46.6 AV	54.0	-7.4	1.25 H	24	7.46	39.14
5	7311.00	58.9 PK	74.0	-15.1	1.18 H	238	12.27	46.63
6	7311.00	52.6 AV	54.0	-1.4	1.18 H	238	5.97	46.63
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	112.0 PK			1.32 V	204	80.19	31.81
2	*2437.00	108.2 AV			1.32 V	204	76.39	31.81
3	4874.00	53.1 PK	74.0	-20.9	1.07 V	160	13.96	39.14
4	4874.00	49.4 AV	54.0	-4.6	1.07 V	160	10.26	39.14
5	7311.00	59.5 PK	74.0	-14.5	1.08 V	89	12.87	46.63
6	7311.00	52.8 AV	54.0	-1.2	1.08 V	89	6.17	46.63

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



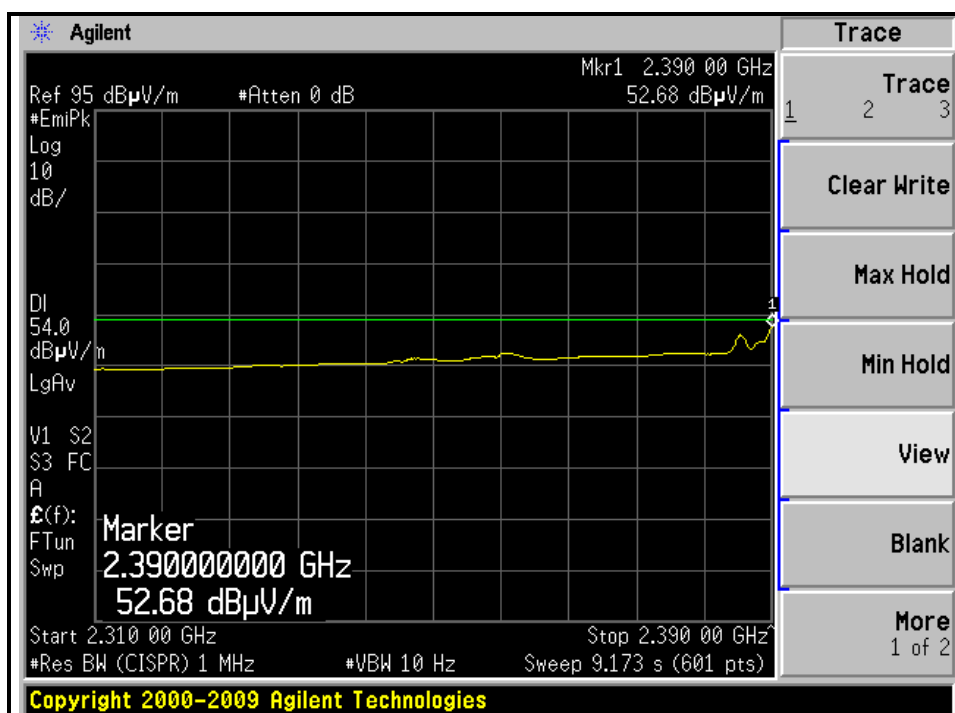
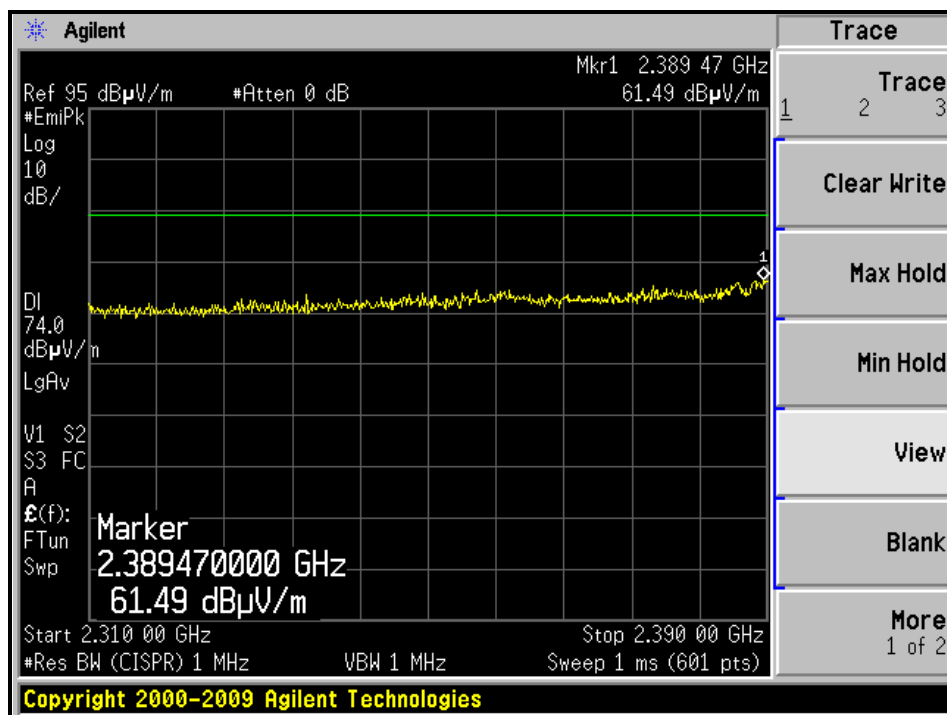
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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER	120V / 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	20deg. C, 63%RH 1022 hPa	TESTED BY	Kent Liu

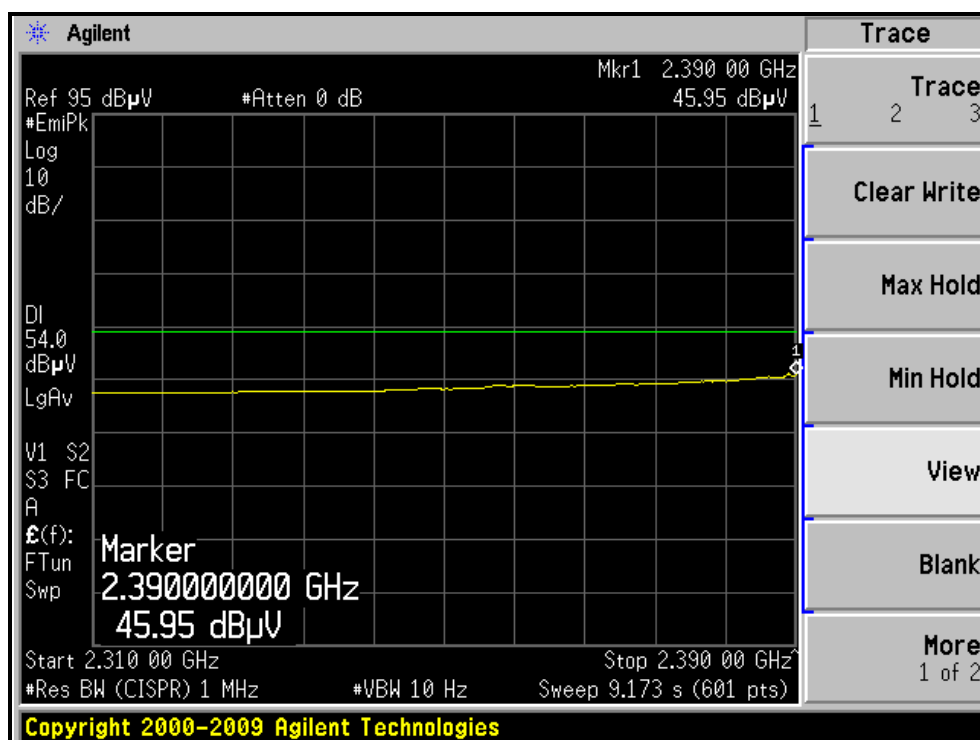
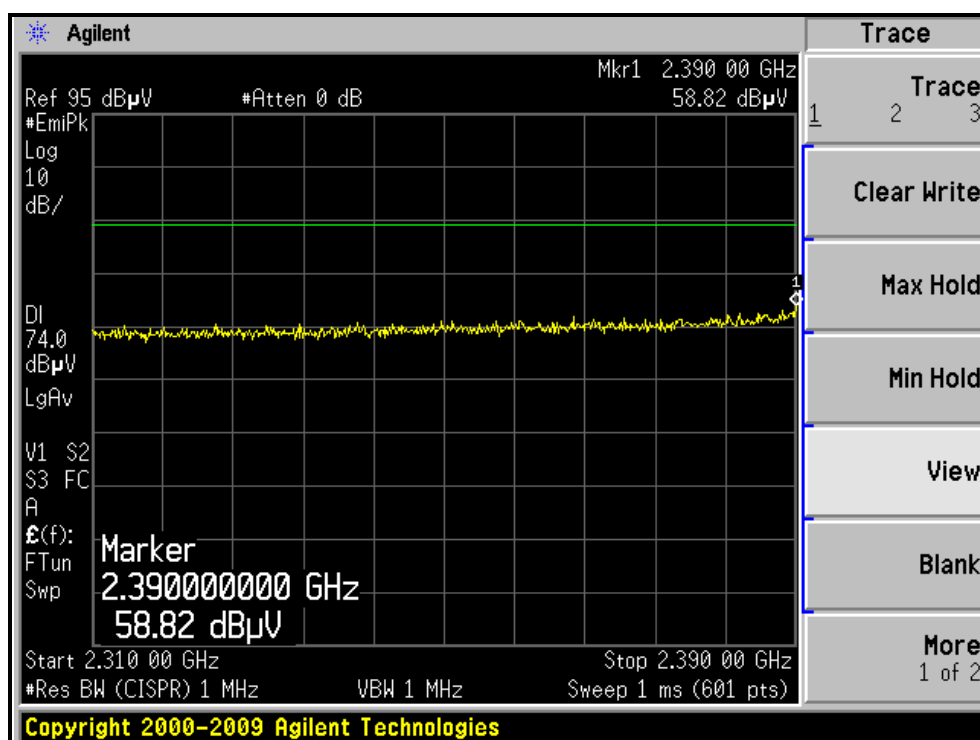
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	115.3 PK			1.37 H	48	83.41	31.89
2	*2462.00	113.1 AV			1.37 H	48	81.21	31.89
3	2484.24	62.1 PK	74.0	-11.9	1.41 H	26	30.13	31.97
4	2484.24	53.4 AV	54.0	-0.6	1.41 H	26	21.43	31.97
5	4924.00	52.2 PK	74.0	-21.8	1.21 H	42	12.89	39.31
6	4924.00	46.9 AV	54.0	-7.1	1.21 H	42	7.59	39.31
7	7386.00	58.6 PK	74.0	-15.4	1.20 H	292	12.00	46.60
8	7386.00	52.5 AV	54.0	-1.5	1.20 H	292	5.90	46.60
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	112.1 PK			1.24 V	217	80.21	31.89
2	*2462.00	108.5 AV			1.24 V	217	76.61	31.89
3	2500.00	57.8 PK	74.0	-16.2	1.27 V	229	25.78	32.02
4	2500.00	45.3 AV	54.0	-8.7	1.27 V	229	13.28	32.02
5	4924.00	52.5 PK	74.0	-21.5	1.06 V	178	13.19	39.31
6	4924.00	48.9 AV	54.0	-5.1	1.06 V	178	9.59	39.31
7	7386.00	59.9 PK	74.0	-14.1	1.06 V	90	13.30	46.60
8	7386.00	53.5 AV	54.0	-0.5	1.06 V	90	6.90	46.60

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

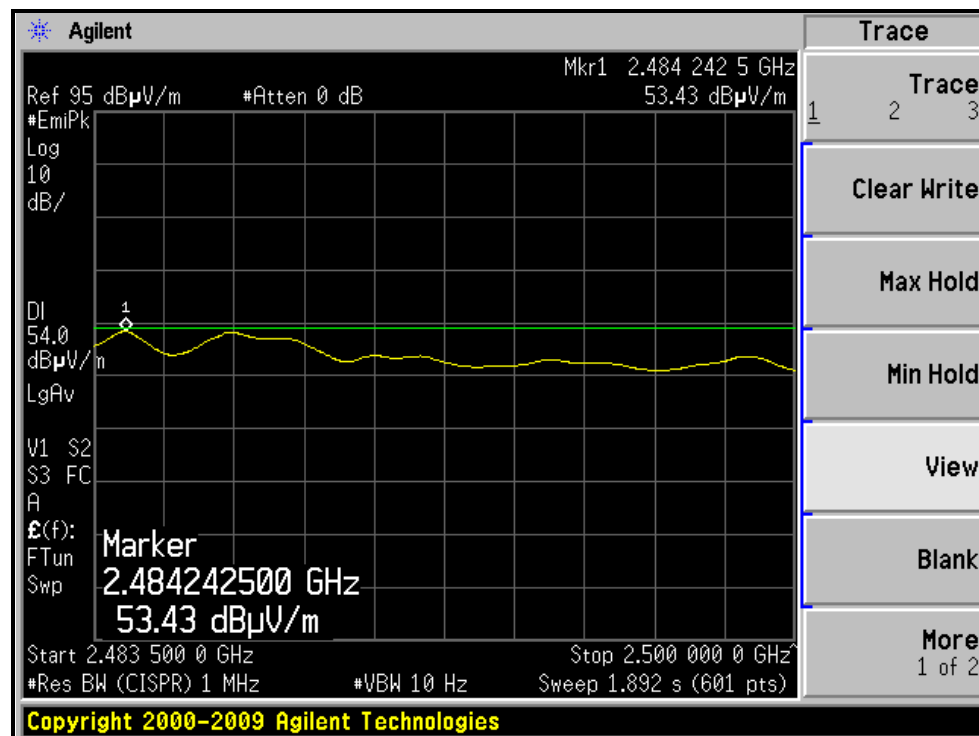
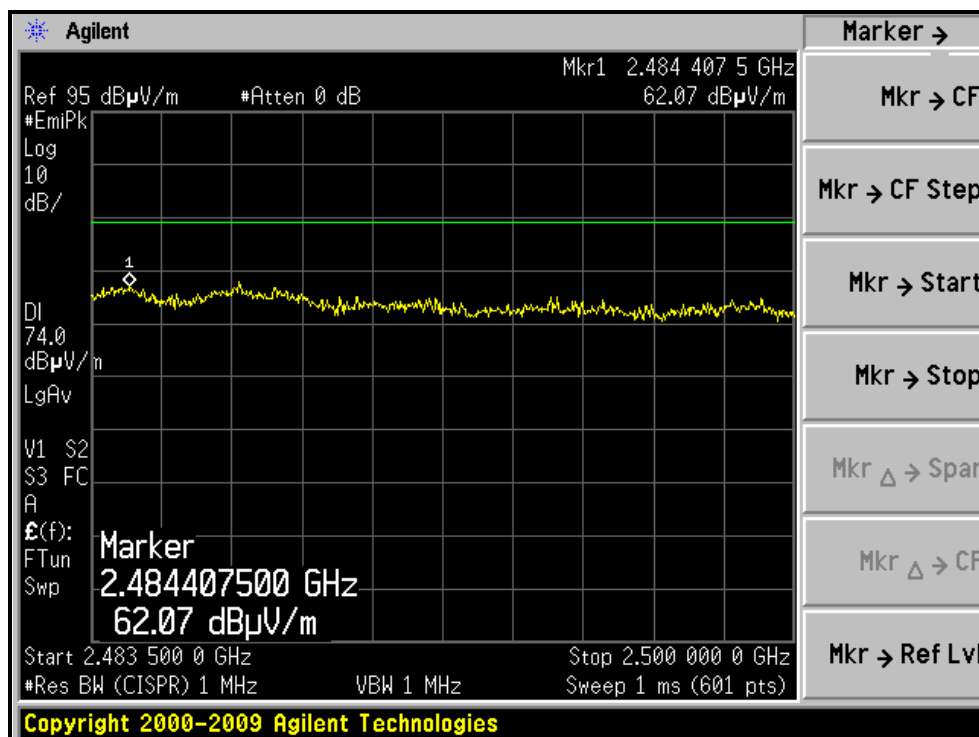
RESTRICTED BANDEDGE (802.11b MODE, CH1, HORIZONTAL)



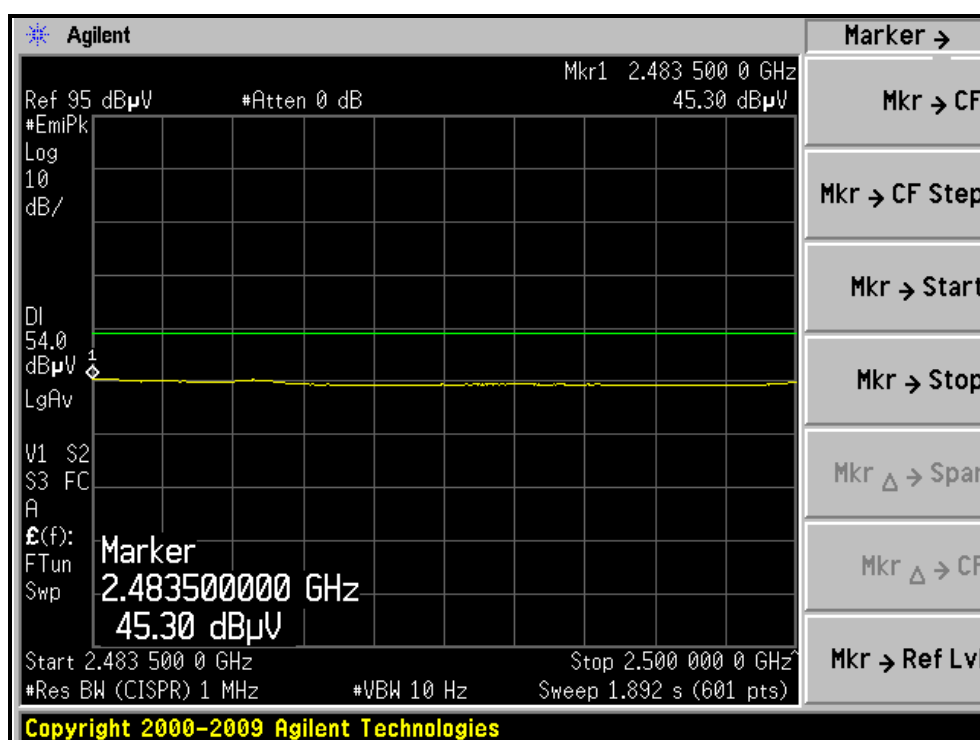
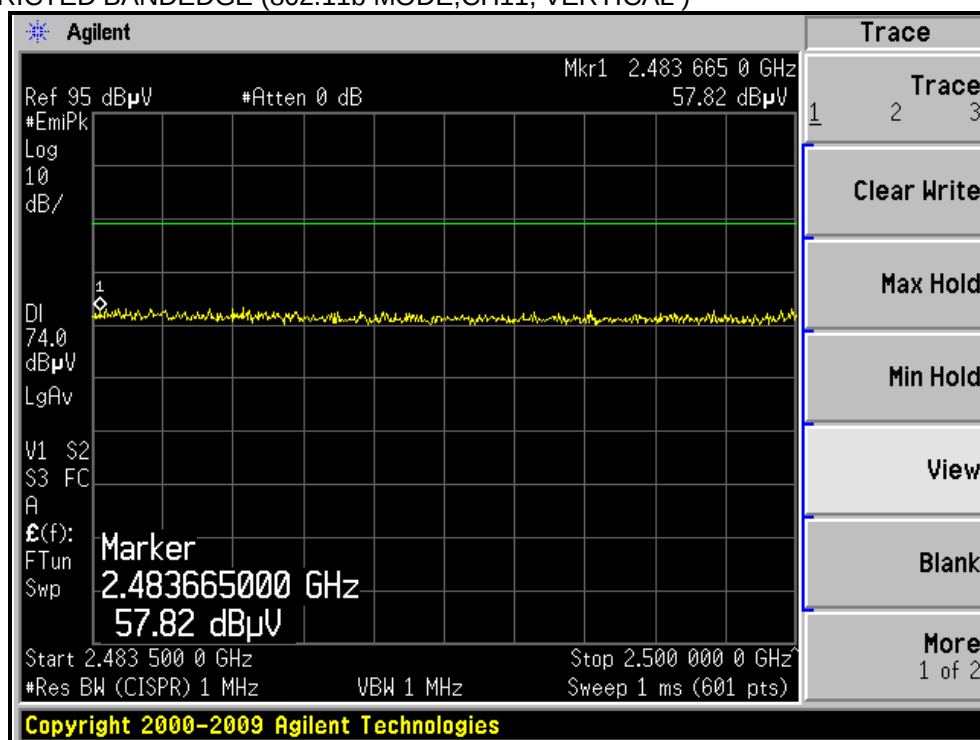
RESTRICTED BANDEDGE (802.11b MODE,CH1, VERTICAL)



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	120V / 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	20deg. C, 63%RH 1022 hPa	TESTED BY	Kent Liu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	64.3 PK	74.0	-9.7	1.19 H	5	32.64	31.66
2	2390.00	49.2 AV	54.0	-4.8	1.19 H	5	17.54	31.66
3	*2412.00	114.4 PK			1.19 H	5	82.67	31.73
4	*2412.00	103.8 AV			1.19 H	5	72.07	31.73
5	4824.00	52.0 PK	74.0	-22.0	1.21 H	54	13.03	38.97
6	4824.00	46.9 AV	54.0	-7.1	1.21 H	54	7.93	38.97
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	63.5 PK	74.0	-10.5	1.25 V	126	31.84	31.66
2	2390.00	47.0 AV	54.0	-7.0	1.25 V	126	15.34	31.66
3	*2412.00	111.1 PK			1.25 V	126	79.37	31.73
4	*2412.00	100.7 AV			1.25 V	126	68.97	31.73
5	4824.00	52.6 PK	74.0	-21.4	1.06 V	169	13.63	38.97
6	4824.00	48.8 AV	54.0	-5.2	1.06 V	169	9.83	38.97

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



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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER	120V / 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	20deg. C, 63%RH 1022 hPa	TESTED BY	Kent 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	2384.60	62.8 PK	74.0	-11.2	1.41 H	56	31.16	31.64
2	2384.60	52.4 AV	54.0	-1.6	1.41 H	56	20.76	31.64
3	*2437.00	114.0 PK			1.65 H	18	82.19	31.81
4	*2437.00	103.1 AV			1.65 H	18	71.29	31.81
5	4874.00	52.4 PK	74.0	-21.6	1.24 H	48	13.26	39.14
6	4874.00	47.1 AV	54.0	-6.9	1.24 H	48	7.96	39.14
7	7311.00	58.4 PK	74.0	-15.6	1.17 H	288	11.77	46.63
8	7311.00	52.3 AV	54.0	-1.7	1.17 H	288	5.67	46.63
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	111.0 PK			1.21 V	138	79.19	31.81
2	*2437.00	100.5 AV			1.21 V	138	68.69	31.81
3	4874.00	51.5 PK	74.0	-22.5	1.22 V	344	12.36	39.14
4	4874.00	42.8 AV	54.0	-11.2	1.22 V	344	3.66	39.14
5	7311.00	55.4 PK	74.0	-18.6	1.00 V	106	8.77	46.63
6	7311.00	43.7 AV	54.0	-10.3	1.00 V	106	-2.93	46.63

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



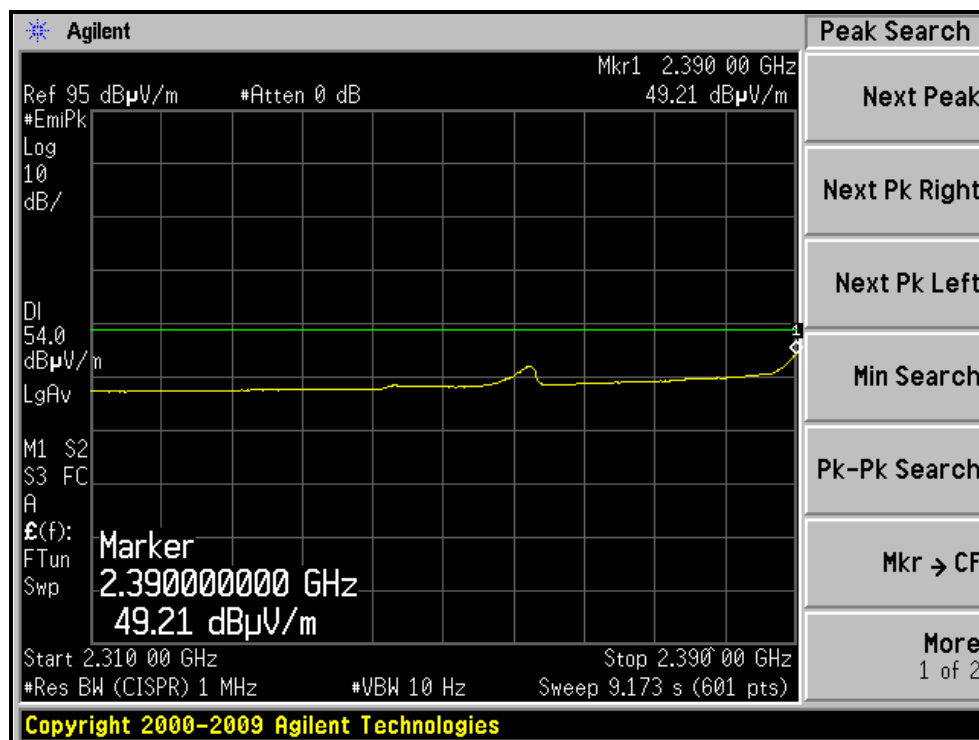
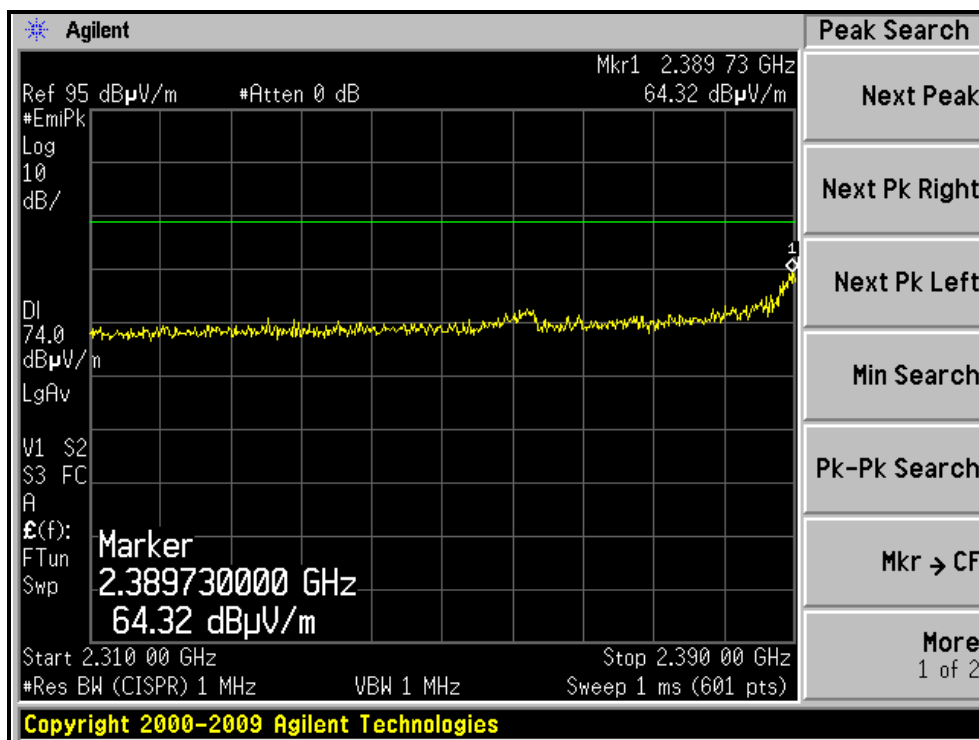
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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER	120V / 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	20deg. C, 63%RH 1022 hPa	TESTED BY	Kent Liu

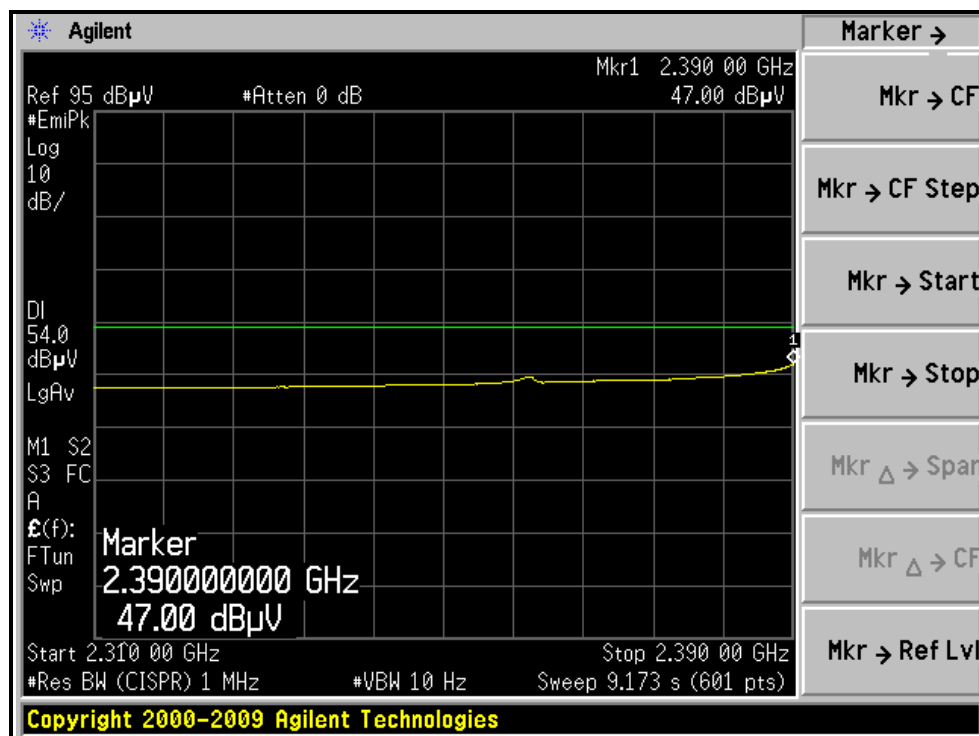
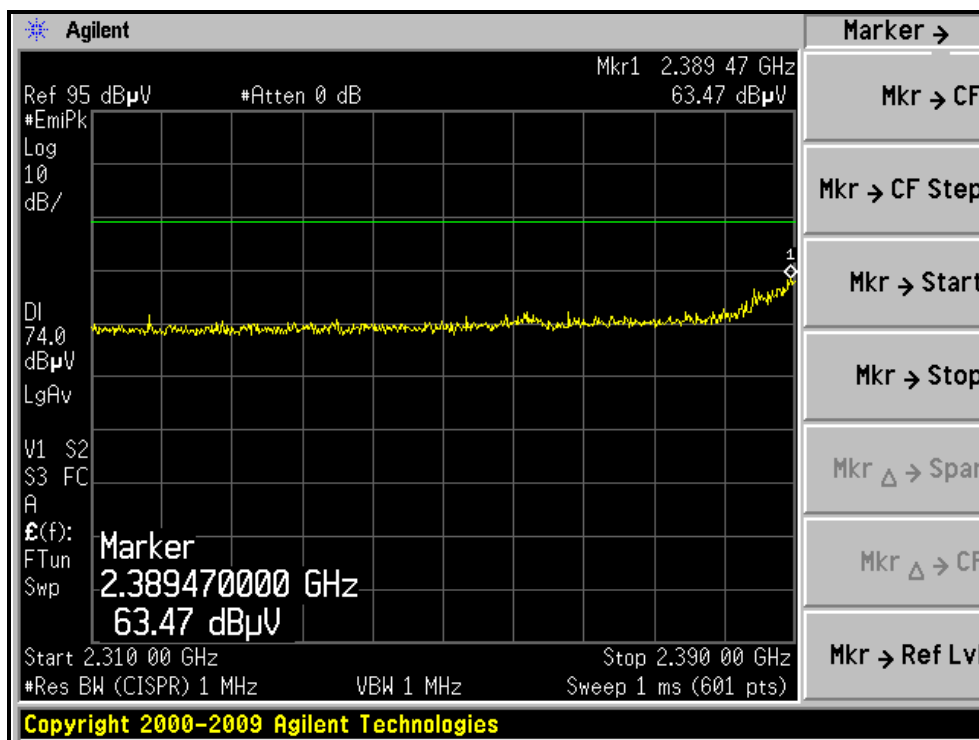
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	115.3 PK			1.67 H	11	83.41	31.89
2	*2462.00	103.9 AV			1.67 H	11	72.01	31.89
3	2483.50	69.7 PK	74.0	-4.3	1.67 H	11	37.73	31.97
4	2483.50	49.5 AV	54.0	-4.5	1.67 H	11	17.53	31.97
5	4924.00	52.2 PK	74.0	-21.8	1.28 H	36	12.89	39.31
6	4924.00	47.0 AV	54.0	-7.0	1.28 H	36	7.69	39.31
7	7386.00	57.9 PK	74.0	-16.1	1.22 H	300	11.30	46.60
8	7386.00	52.1 AV	54.0	-1.9	1.22 H	300	5.50	46.60
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	110.8 PK			1.25 V	138	78.91	31.89
2	*2462.00	100.3 AV			1.25 V	138	68.41	31.89
3	2483.50	64.2 PK	74.0	-9.8	1.25 V	138	32.23	31.97
4	2483.50	46.2 AV	54.0	-7.8	1.25 V	138	14.23	31.97
5	4924.00	51.9 PK	74.0	-22.1	1.25 V	346	12.59	39.31
6	4924.00	43.1 AV	54.0	-10.9	1.25 V	346	3.79	39.31
7	7386.00	55.7 PK	74.0	-18.3	1.00 V	94	9.10	46.60
8	7386.00	43.8 AV	54.0	-10.2	1.00 V	94	-2.80	46.60

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

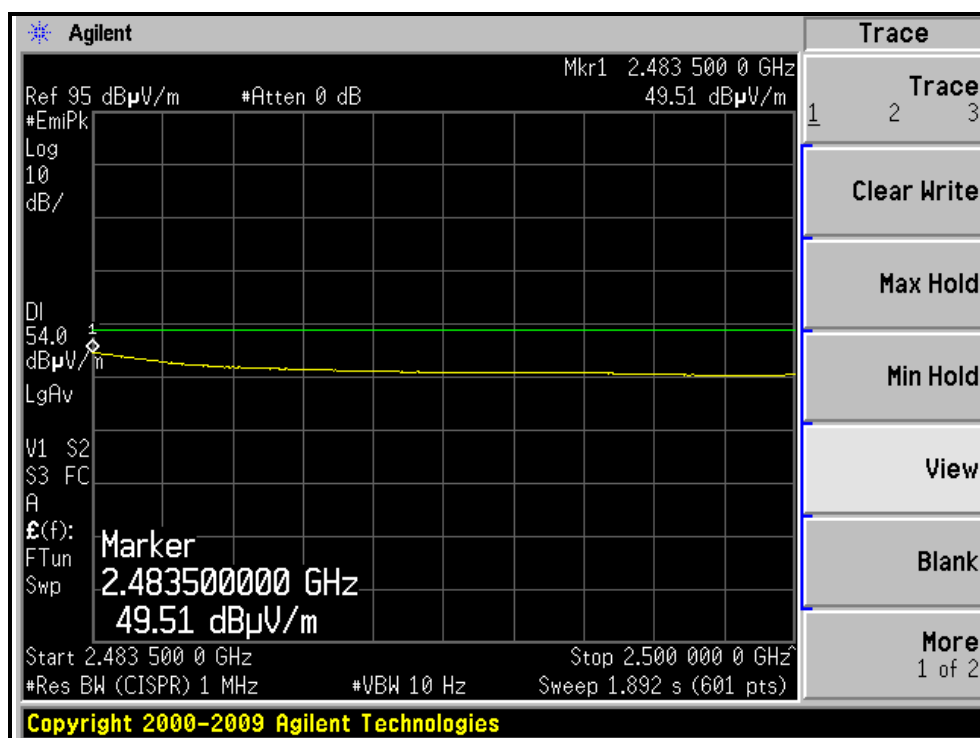
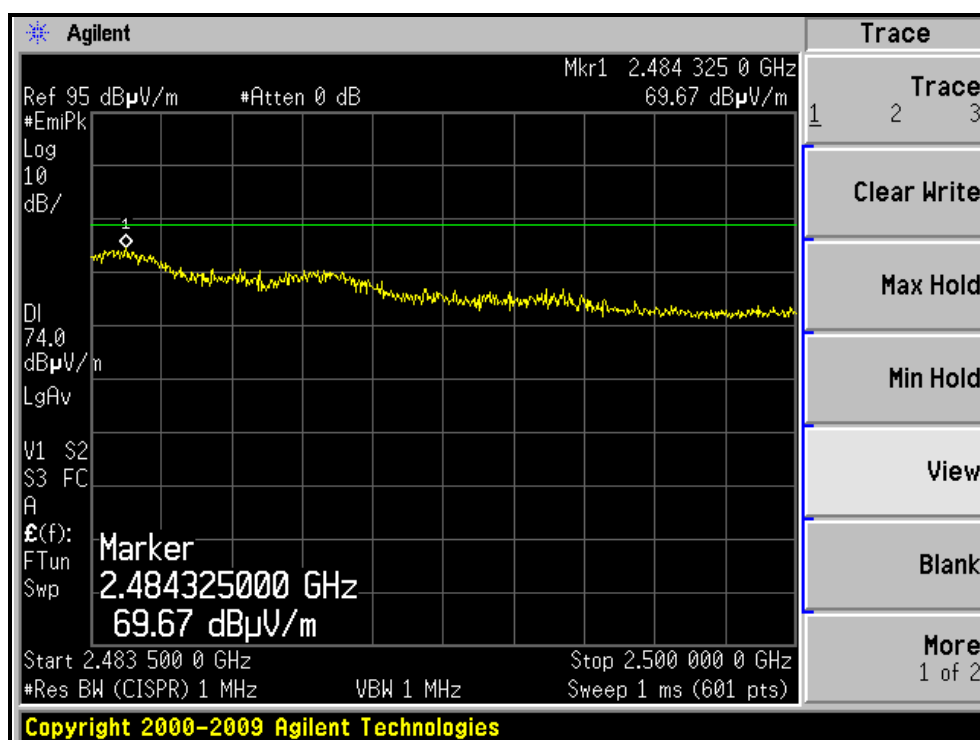
RESTRICTED BANDEDGE (802.11g MODE, CH1, HORIZONTAL)



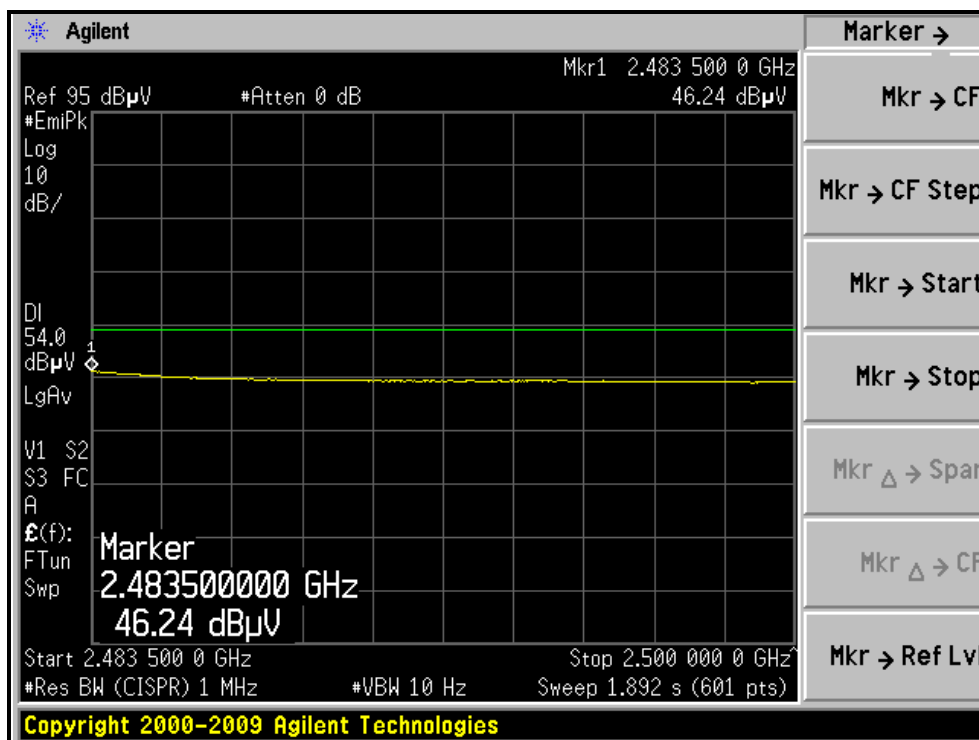
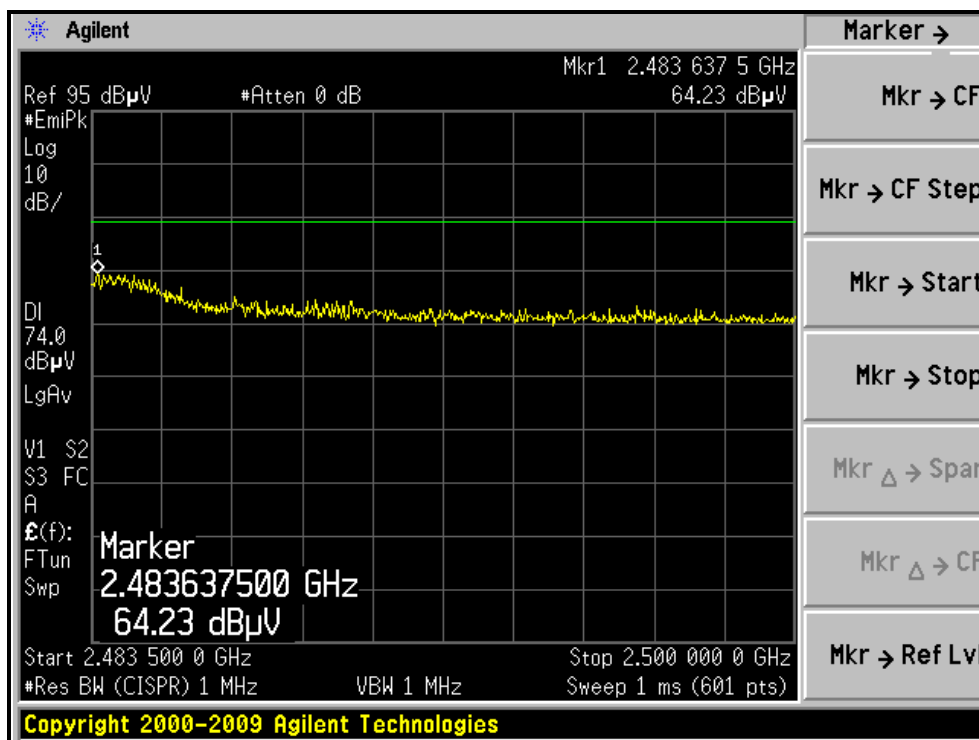
RESTRICTED BANDEDGE (802.11g MODE,CH1, VERTICAL)



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	120V / 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	20deg. C, 63%RH 1022 hPa	TESTED BY	Kent Liu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	73.4 PK	74.0	-0.6	1.20 H	8	41.74	31.66
2	2390.00	50.0 AV	54.0	-4.0	1.20 H	8	18.34	31.66
3	*2412.00	113.3 PK			1.19 H	23	81.57	31.73
4	*2412.00	102.8 AV			1.19 H	23	71.07	31.73
5	4824.00	52.3 PK	74.0	-21.7	1.23 H	40	13.33	38.97
6	4824.00	47.2 AV	54.0	-6.8	1.23 H	40	8.23	38.97
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	71.0 PK	74.0	-3.0	1.25 V	132	39.34	31.66
2	2390.00	46.9 AV	54.0	-7.1	1.25 V	132	15.24	31.66
3	*2412.00	110.7 PK			1.25 V	137	78.97	31.73
4	*2412.00	99.2 AV			1.25 V	137	67.47	31.73
5	4824.00	51.7 PK	74.0	-22.3	1.21 V	353	12.73	38.97
6	4824.00	42.9 AV	54.0	-11.1	1.21 V	353	3.93	38.97

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



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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER	120V / 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	20deg. C, 63%RH 1022 hPa	TESTED BY	Kent Liu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	115.1 PK			1.70 H	4	83.29	31.81
2	*2437.00	103.8 AV			1.70 H	4	71.99	31.81
3	4874.00	52.1 PK	74.0	-21.9	1.29 H	45	12.96	39.14
4	4874.00	47.2 AV	54.0	-6.8	1.29 H	45	8.06	39.14
5	7311.00	57.7 PK	74.0	-16.3	1.27 H	288	11.07	46.63
6	7311.00	52.1 AV	54.0	-1.9	1.27 H	288	5.47	46.63
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	110.9 PK			1.20 V	152	79.09	31.81
2	*2437.00	100.4 AV			1.20 V	152	68.59	31.81
3	4874.00	52.0 PK	74.0	-22.0	1.23 V	337	12.86	39.14
4	4874.00	43.4 AV	54.0	-10.6	1.23 V	337	4.26	39.14
5	7311.00	55.7 PK	74.0	-18.3	1.00 V	81	9.07	46.63
6	7311.00	43.9 AV	54.0	-10.1	1.00 V	81	-2.73	46.63

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



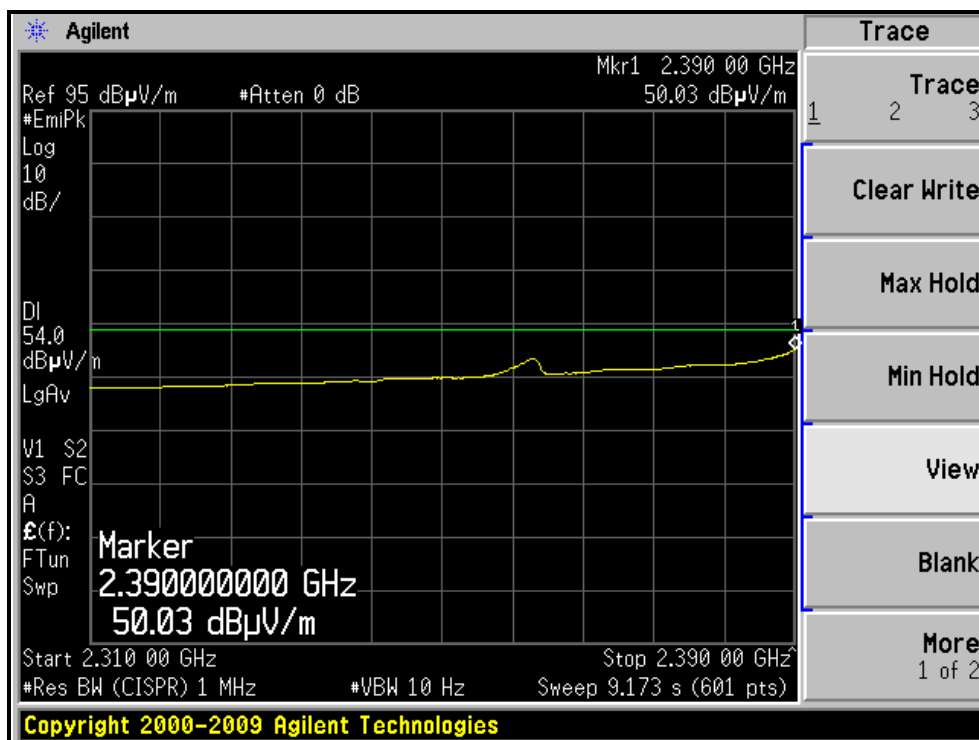
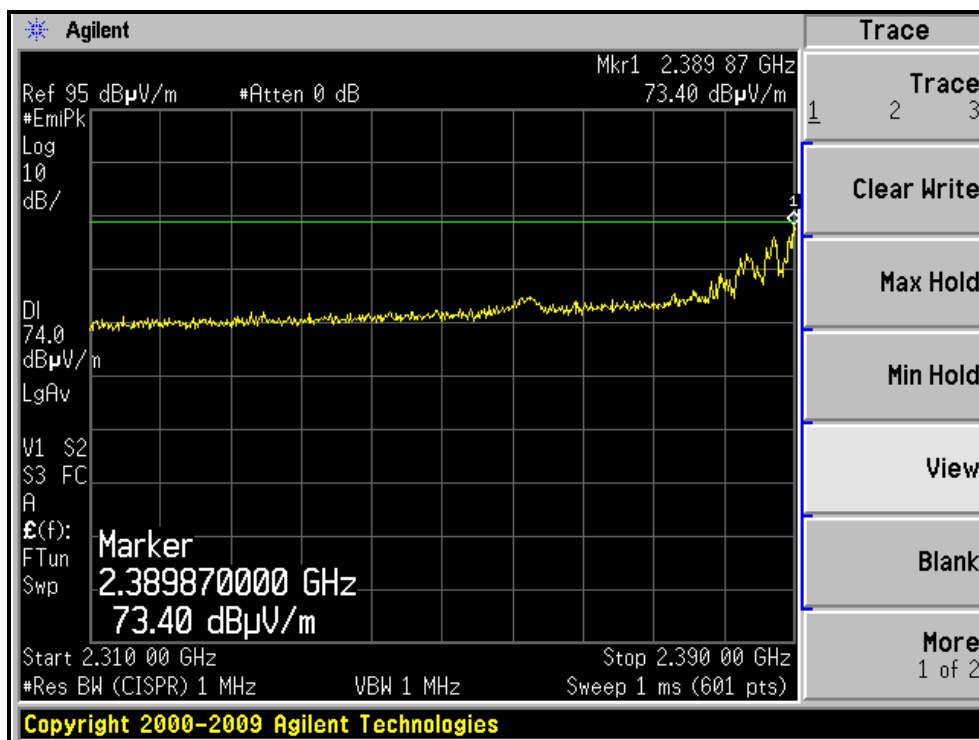
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EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER	120V / 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	20deg. C, 63%RH 1022 hPa	TESTED BY	Kent Liu

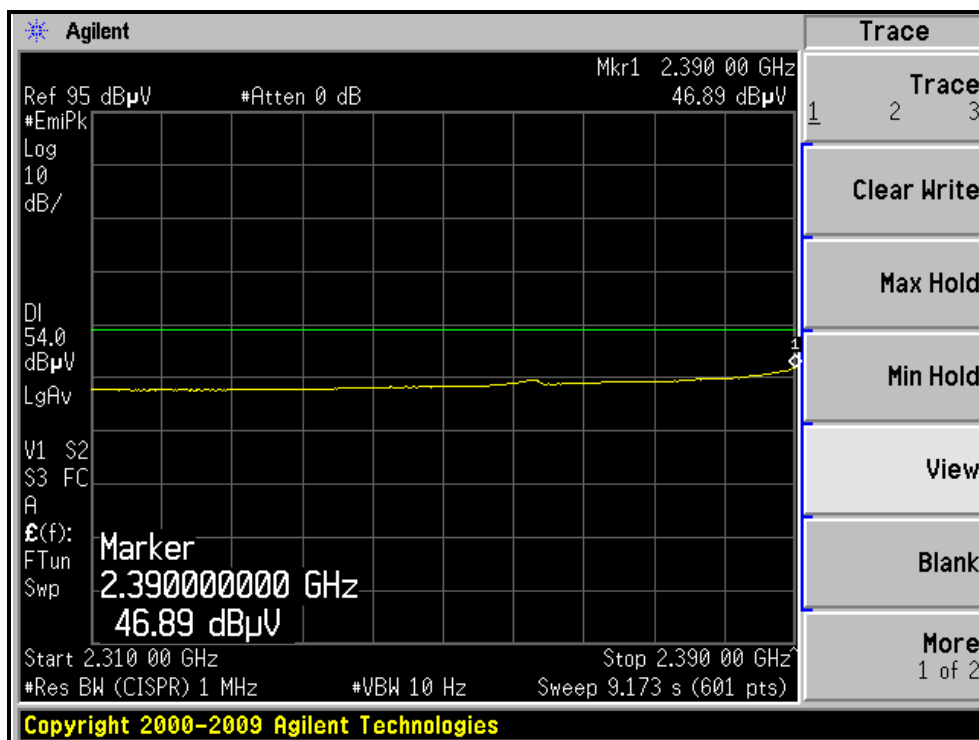
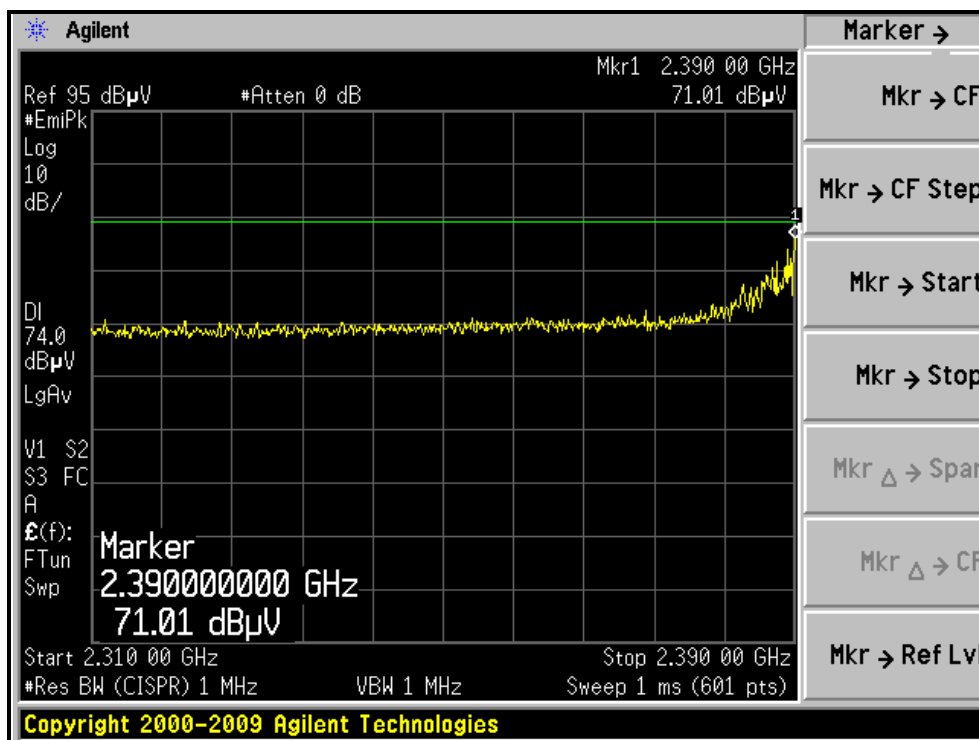
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	113.6 PK			1.61 H	33	81.71	31.89
2	*2462.00	103.2 AV			1.61 H	33	71.31	31.89
3	2483.50	71.1 PK	74.0	-2.9	1.65 H	31	39.13	31.97
4	2483.50	49.7 AV	54.0	-4.3	1.65 H	31	17.73	31.97
5	4924.00	52.2 PK	74.0	-21.8	1.23 H	49	12.89	39.31
6	4924.00	47.1 AV	54.0	-6.9	1.23 H	49	7.79	39.31
7	7386.00	58.4 PK	74.0	-15.6	1.24 H	290	11.80	46.60
8	7386.00	52.3 AV	54.0	-1.7	1.24 H	290	5.70	46.60
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	109.5 PK			1.23 V	128	77.61	31.89
2	*2462.00	98.4 AV			1.23 V	128	66.51	31.89
3	2483.50	67.0 PK	74.0	-7.0	1.23 V	128	35.03	31.97
4	2483.50	45.2 AV	54.0	-8.8	1.23 V	128	13.23	31.97
5	4924.00	52.0 PK	74.0	-22.0	1.22 V	355	12.69	39.31
6	4924.00	42.9 AV	54.0	-11.1	1.22 V	355	3.59	39.31
7	7386.00	55.9 PK	74.0	-18.1	1.00 V	102	9.30	46.60
8	7386.00	44.0 AV	54.0	-10.0	1.00 V	102	-2.60	46.60

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

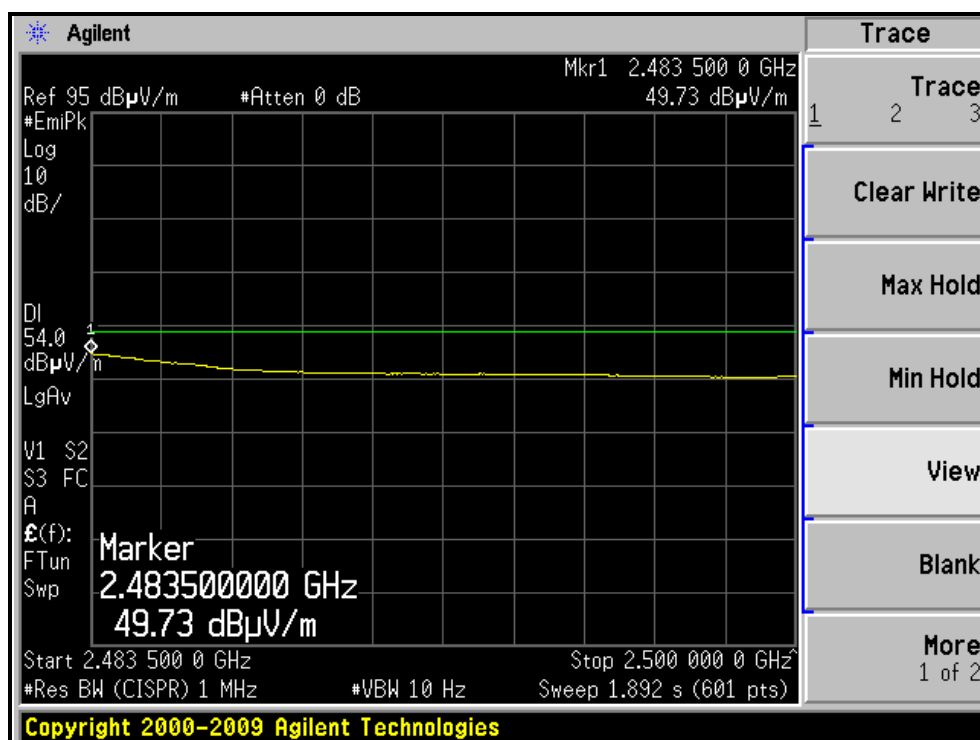
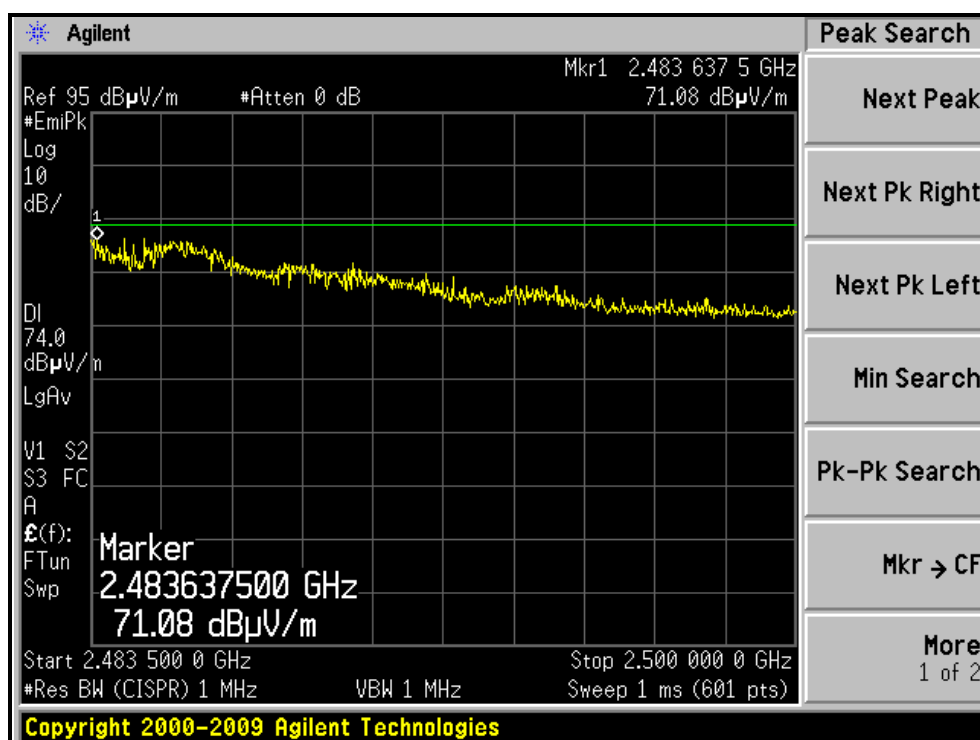
RESTRICTED BANDEDGE (802.11n (20MHz) MODE,CH1, HORIZONTAL)



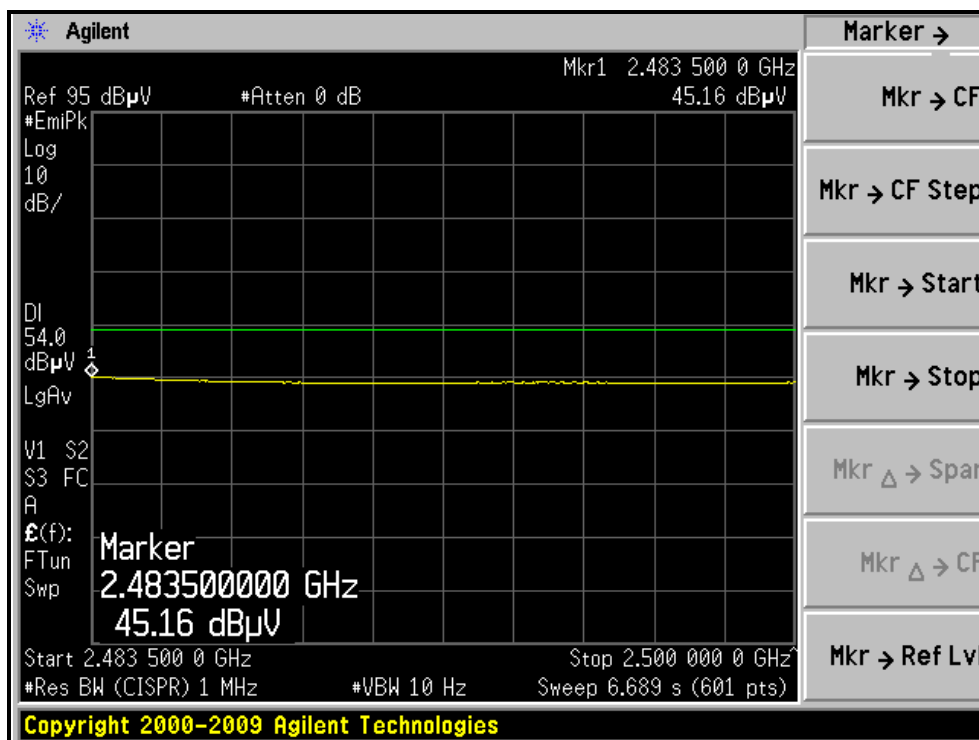
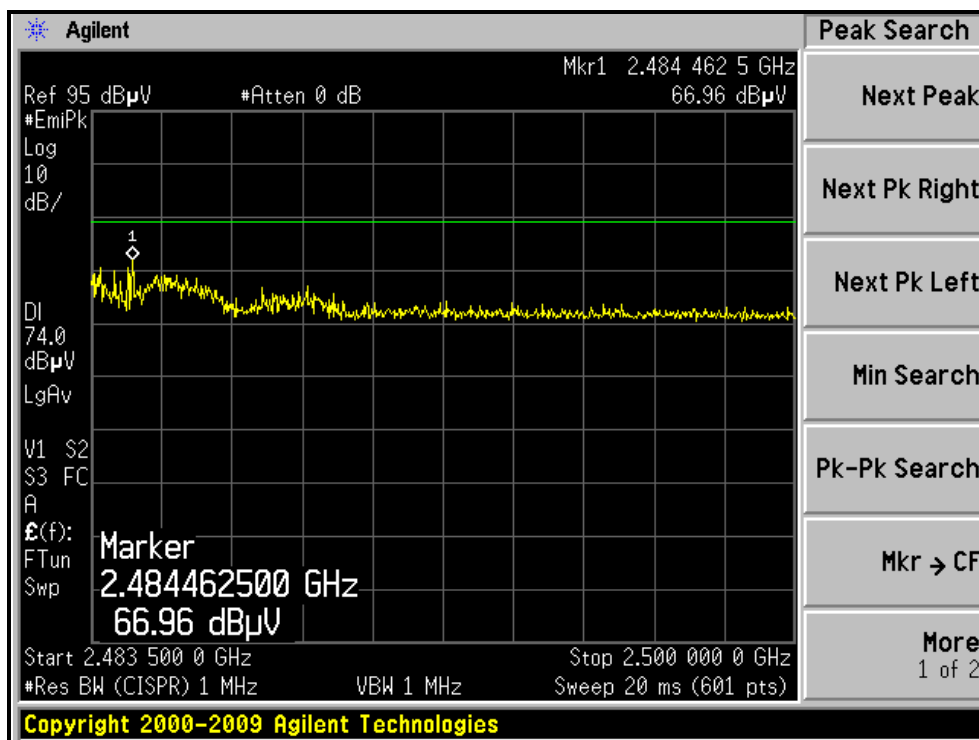
RESTRICTED BANDEDGE (802.11n (20MHz) MODE,CH1, VERTICAL)



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



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



802.11n (40MHz) OFDM MODULATION

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 3	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER	120V / 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	20deg. C, 63%RH 1022 hPa	TESTED BY	Kent Liu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	71.0 PK	74.0	-3.0	1.20 H	9	39.34	31.66
2	2390.00	53.1 AV	54.0	-0.9	1.20 H	9	21.44	31.66
3	*2422.00	109.2 PK			1.19 H	8	77.44	31.76
4	*2422.00	97.9 AV			1.19 H	8	66.14	31.76
5	4844.00	52.0 PK	74.0	-22.0	1.22 H	46	12.96	39.04
6	4844.00	46.7 AV	54.0	-7.3	1.22 H	46	7.66	39.04
7	7266.00	57.9 PK	74.0	-16.1	1.27 H	291	11.23	46.67
8	7266.00	52.1 AV	54.0	-1.9	1.27 H	291	5.43	46.67
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	65.7 PK	74.0	-8.3	1.34 V	172	34.04	31.66
2	2390.00	48.7 AV	54.0	-5.3	1.34 V	172	17.04	31.66
3	*2422.00	103.4 PK			1.33 V	175	71.64	31.76
4	*2422.00	92.8 AV			1.33 V	175	61.04	31.76
5	4844.00	51.7 PK	74.0	-22.3	1.23 V	342	12.66	39.04
6	4844.00	42.9 AV	54.0	-11.1	1.23 V	342	3.86	39.04
7	7266.00	56.0 PK	74.0	-18.0	1.00 V	107	9.33	46.67
8	7266.00	43.9 AV	54.0	-10.1	1.00 V	107	-2.77	46.67

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



A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER	120V / 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	20deg. C, 63%RH 1022 hPa	TESTED BY	Kent Liu

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	71.9 PK	74.0	-2.1	1.41 H	62	40.24	31.66
2	2390.00	51.2 AV	54.0	-2.8	1.41 H	62	19.54	31.66
3	*2437.00	111.4 PK			1.19 H	25	79.59	31.81
4	*2437.00	100.1 AV			1.19 H	25	68.29	31.81
5	4874.00	52.2 PK	74.0	-21.8	1.33 H	31	13.06	39.14
6	4874.00	47.2 AV	54.0	-6.8	1.33 H	31	8.06	39.14
7	7311.00	57.9 PK	74.0	-16.1	1.19 H	302	11.27	46.63
8	7311.00	52.3 AV	54.0	-1.7	1.19 H	302	5.67	46.63
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2437.00	105.6 PK			1.39 V	173	73.79	31.81
2	*2437.00	94.8 AV			1.39 V	173	62.99	31.81
3	4874.00	51.5 PK	74.0	-22.5	1.21 V	351	12.36	39.14
4	4874.00	42.8 AV	54.0	-11.2	1.21 V	351	3.66	39.14
5	7311.00	55.6 PK	74.0	-18.4	1.00 V	81	8.97	46.63
6	7311.00	43.7 AV	54.0	-10.3	1.00 V	81	-2.93	46.63

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



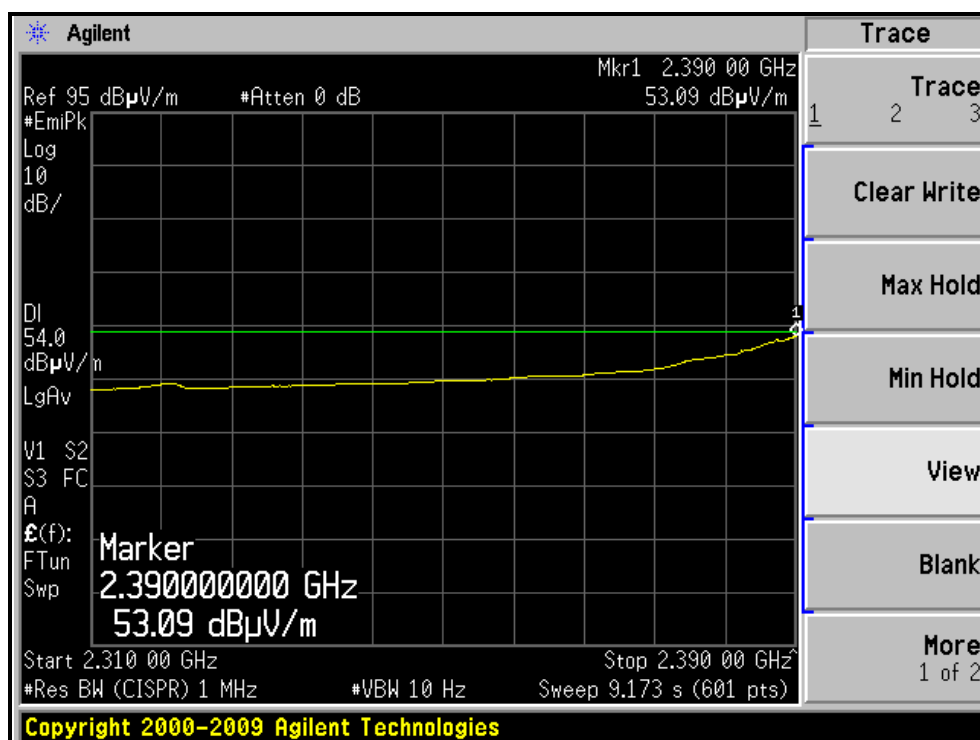
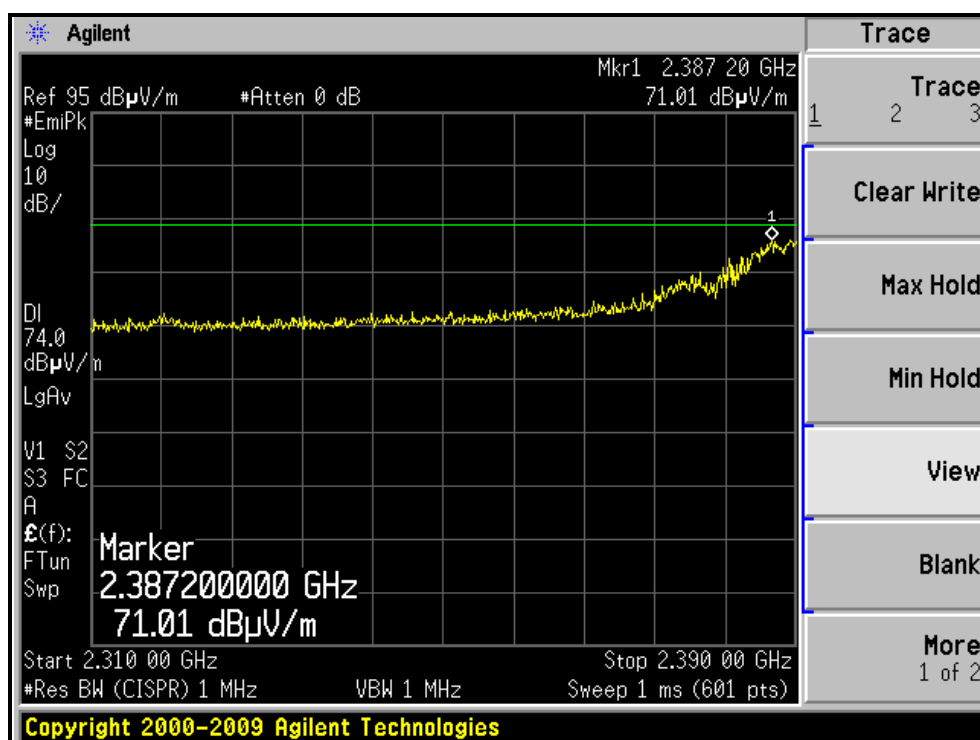
A D T

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 9	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER	120V / 60Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	20deg. C, 63%RH 1022 hPa	TESTED BY	Kent Liu

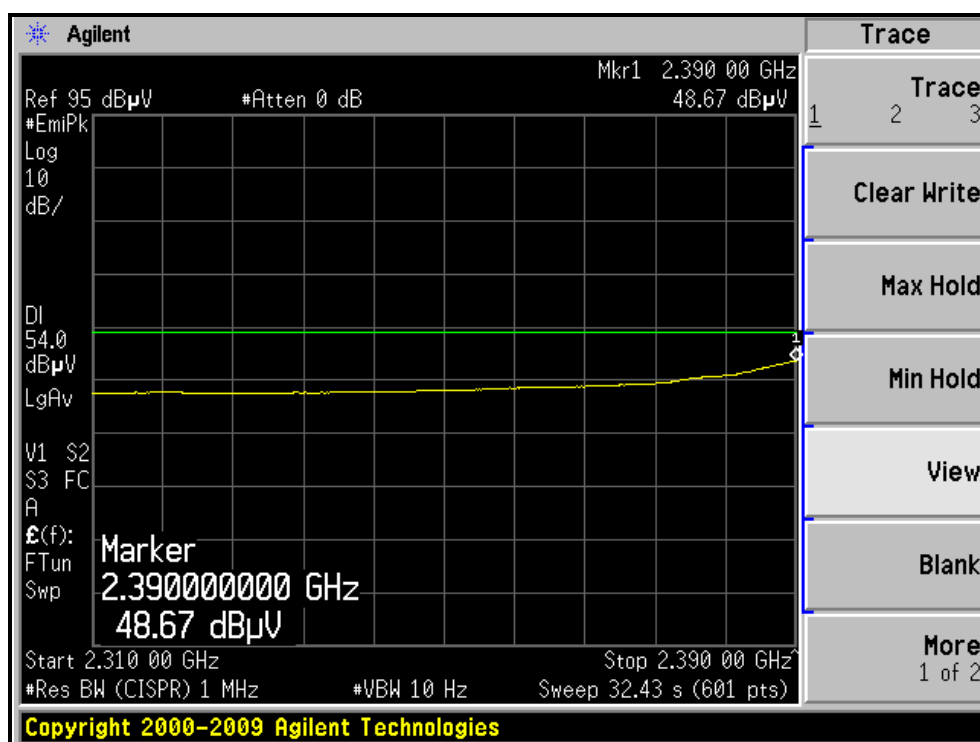
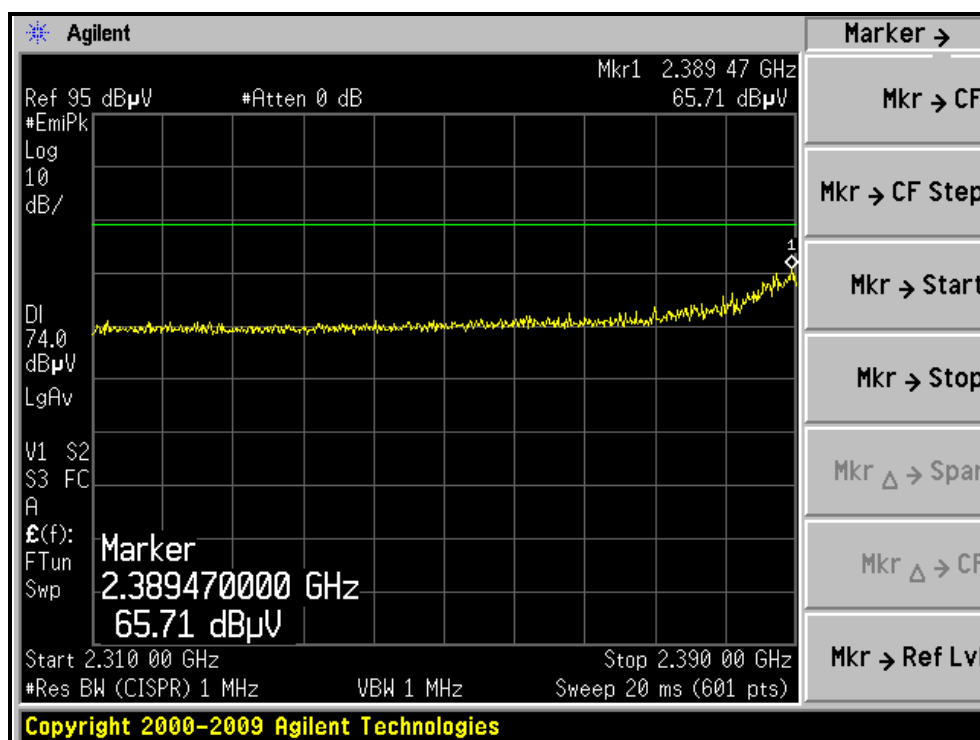
ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2452.00	109.6 PK			1.16 H	21	77.74	31.86
2	*2452.00	98.3 AV			1.16 H	21	66.44	31.86
3	2483.50	73.3 PK	74.0	-0.7	1.16 H	21	41.33	31.97
4	2483.50	53.3 AV	54.0	-0.7	1.16 H	21	21.33	31.97
5	4904.00	52.0 PK	74.0	-22.0	1.17 H	43	12.76	39.24
6	4904.00	46.8 AV	54.0	-7.2	1.17 H	43	7.56	39.24
7	7356.00	58.2 PK	74.0	-15.8	1.25 H	280	11.59	46.61
8	7356.00	52.3 AV	54.0	-1.7	1.25 H	280	5.69	46.61
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2452.00	102.9 PK			1.45 V	125	71.04	31.86
2	*2452.00	92.3 AV			1.45 V	125	60.44	31.86
3	2483.50	66.3 PK	74.0	-7.7	1.45 V	125	34.33	31.97
4	2483.50	47.5 AV	54.0	-6.5	1.45 V	125	15.53	31.97
5	4904.00	51.6 PK	74.0	-22.4	1.18 V	354	12.36	39.24
6	4904.00	42.7 AV	54.0	-11.3	1.18 V	354	3.46	39.24
7	7356.00	55.7 PK	74.0	-18.3	1.00 V	110	9.09	46.61
8	7356.00	43.7 AV	54.0	-10.3	1.00 V	110	-2.91	46.61

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

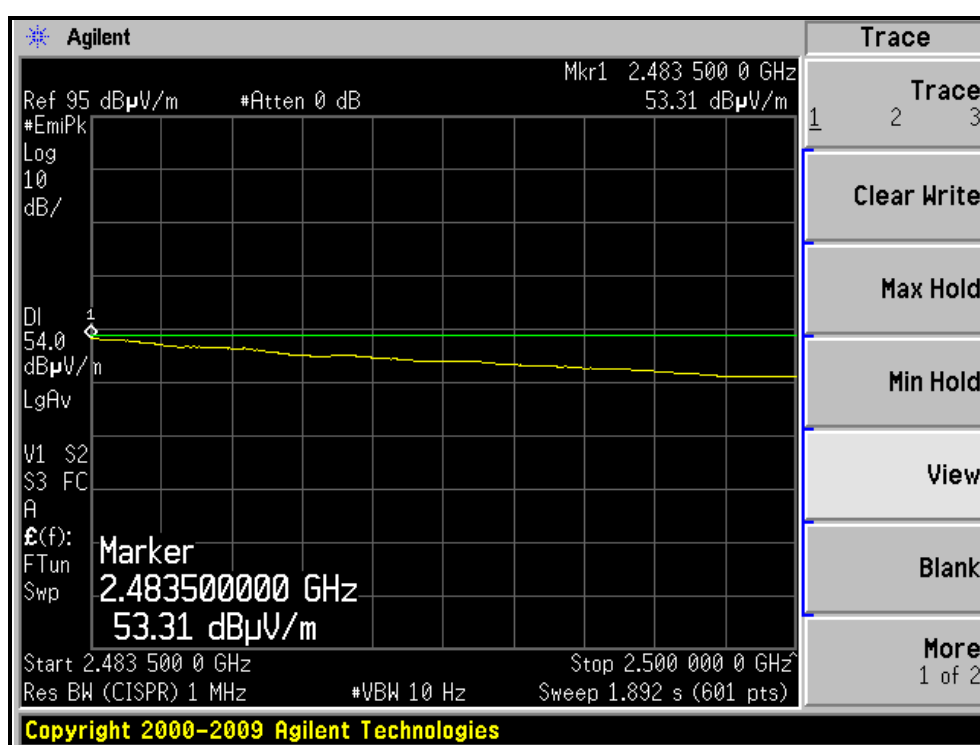
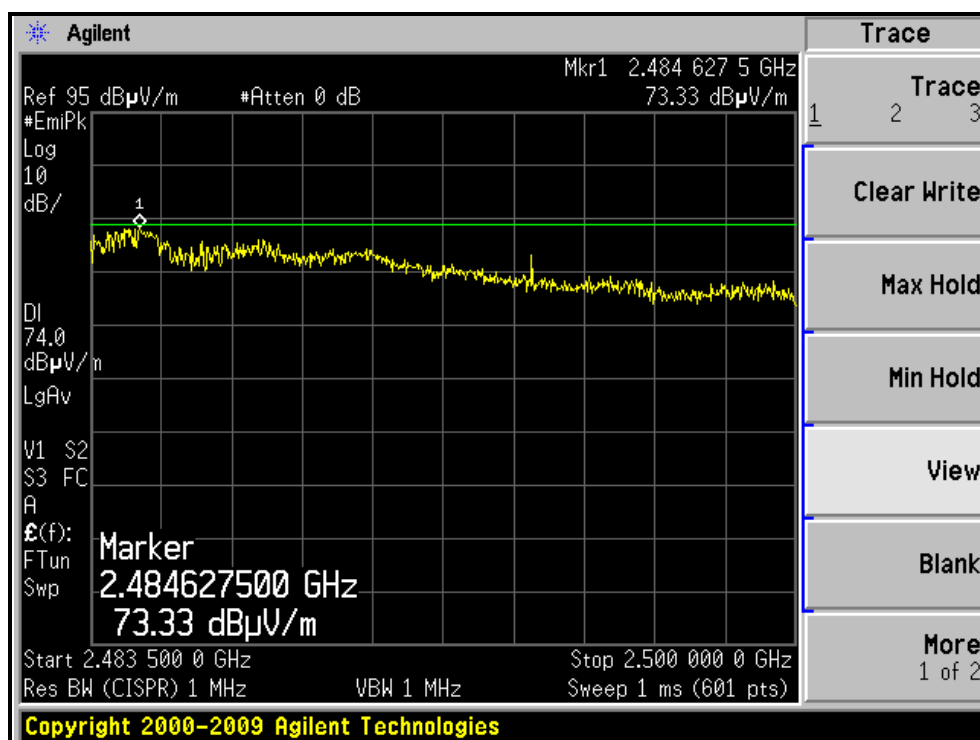
RESTRICTED BANDEDGE (802.11n (40MHz) MODE,CH3, HORIZONTAL)



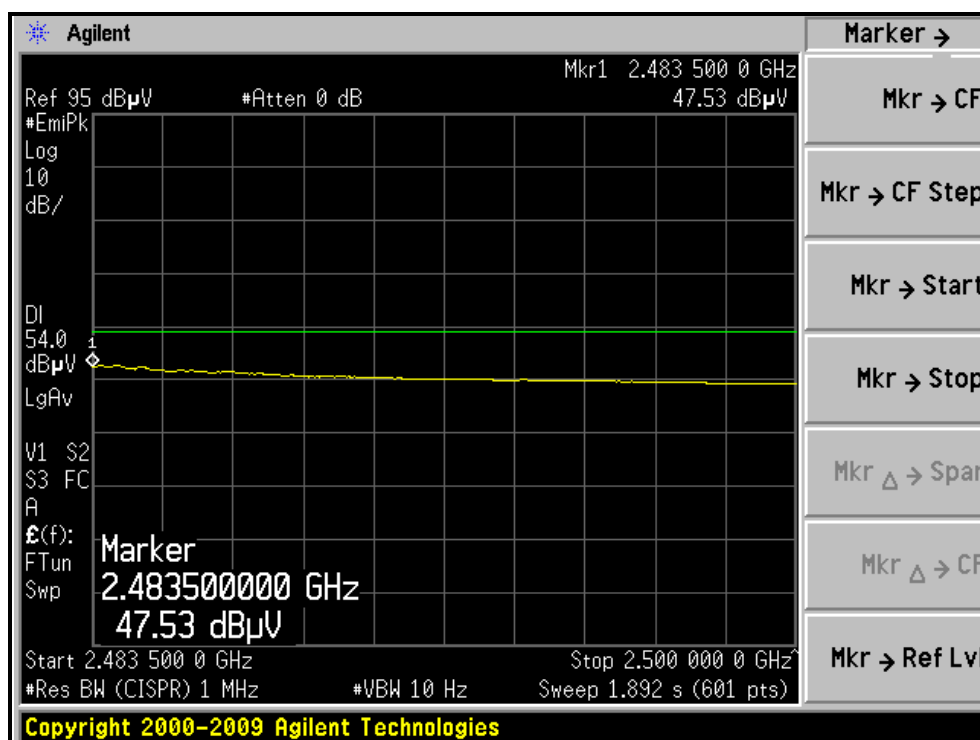
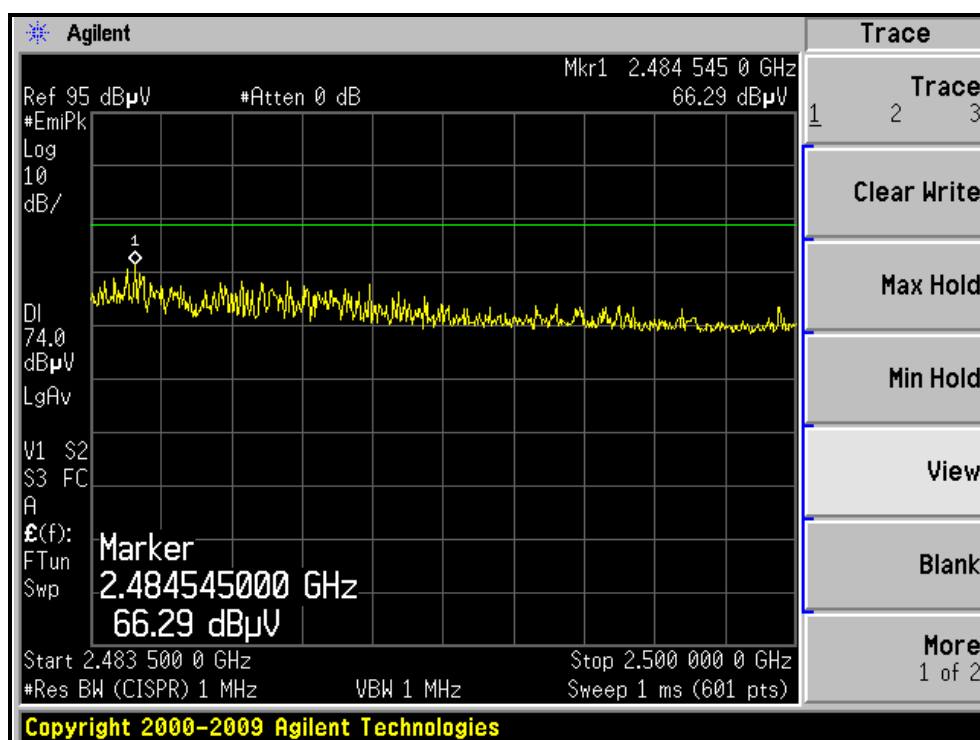
RESTRICTED BANDEDGE (802.11n (40MHz) MODE,CH3, VERTICAL)



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

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

NOTE:

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

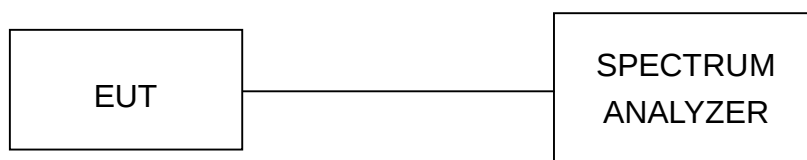
4.3.3 TEST PROCEDURE

The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with 100kHz RBW and 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

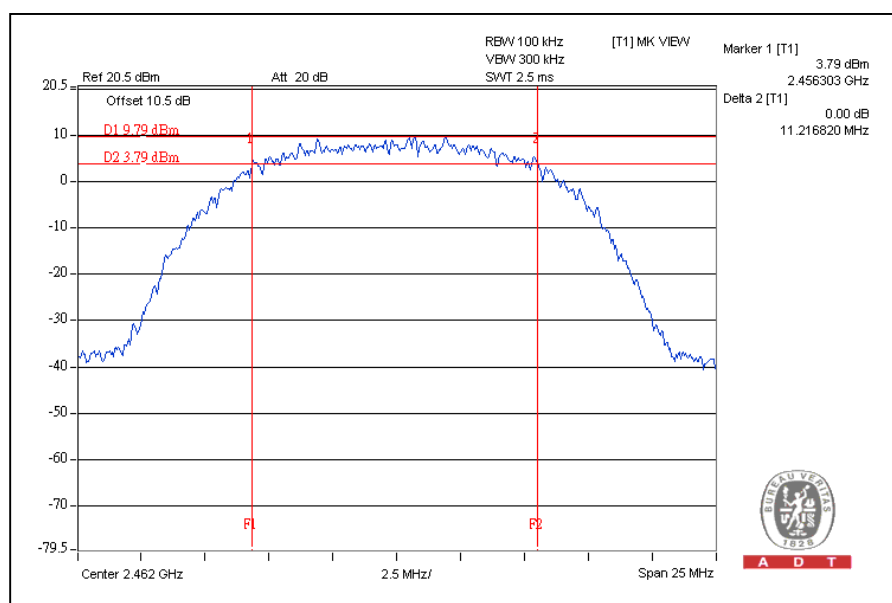
The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

4.3.7 TEST RESULTS

802.11b DSSS MODULATION:

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2412	11.21	0.5	PASS
6	2437	11.14	0.5	PASS
11	2462	11.21	0.5	PASS

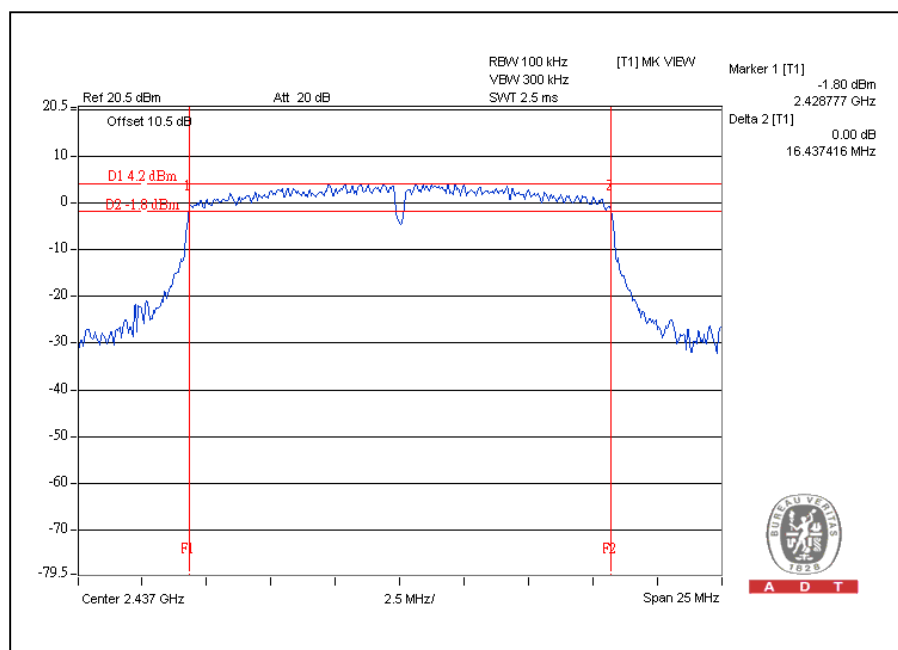
CH11



802.11g OFDM MODULATION:

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2412	16.42	0.5	PASS
6	2437	16.43	0.5	PASS
11	2462	16.43	0.5	PASS

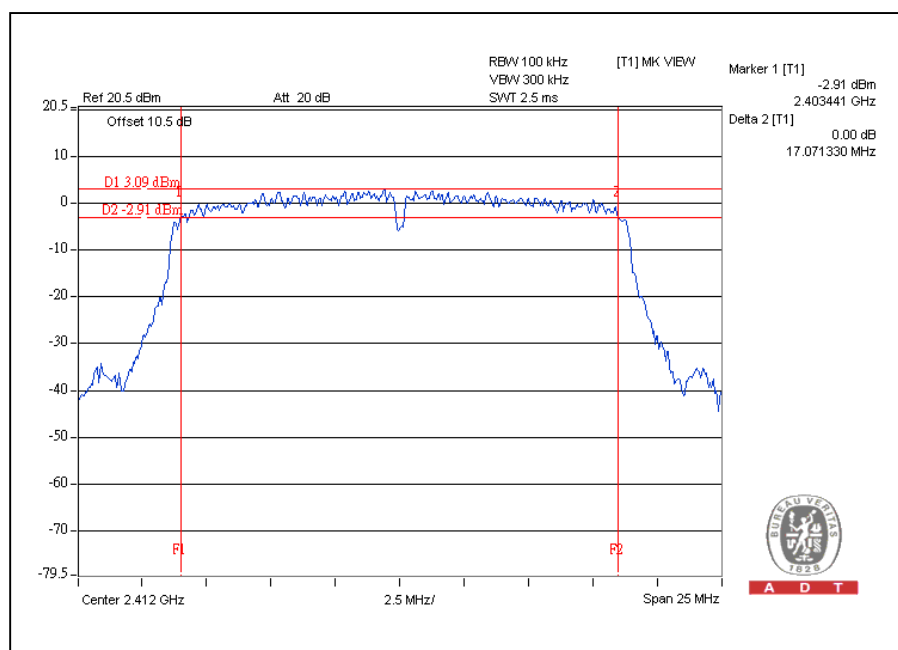
CH6



802.11n (20MHz) OFDM MODULATION:

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
1	2412	17.07	0.5	PASS
6	2437	16.86	0.5	PASS
11	2462	17.01	0.5	PASS

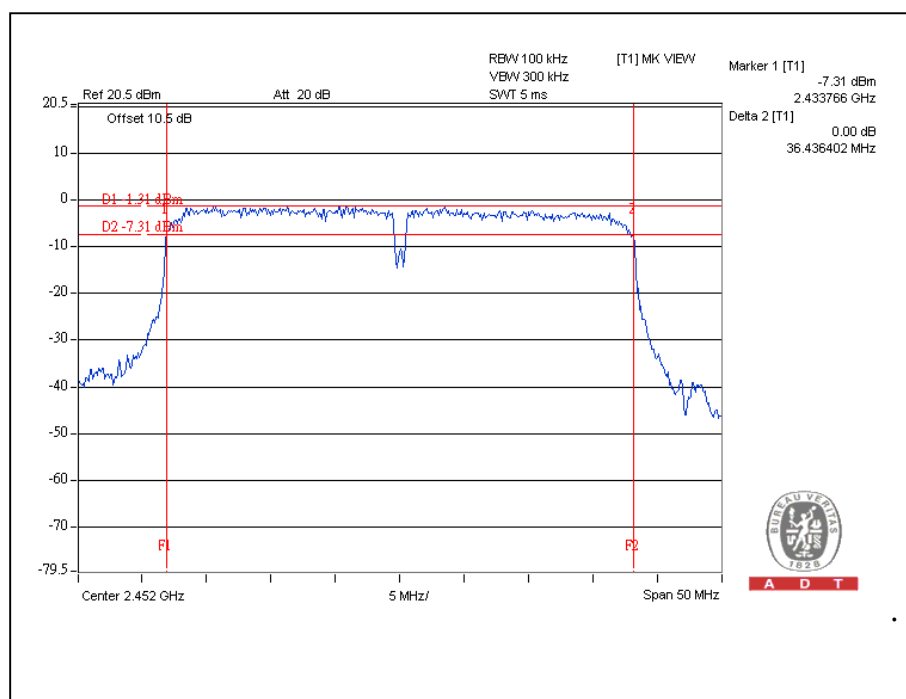
CH1



802.11n (40MHz) OFDM MODULATION:

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS / FAIL
3	2422	35.78	0.5	PASS
6	2437	35.87	0.5	PASS
9	2452	36.43	0.5	PASS

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

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED DATE	CALIBRATED UNTIL
Anritsu Power Meter	ML2495A	0824006	May 04, 2010	May 03, 2011
Pulse Power Sensor	MA2411B	0738172	May 04, 2010	May 03, 2011

NOTE:

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

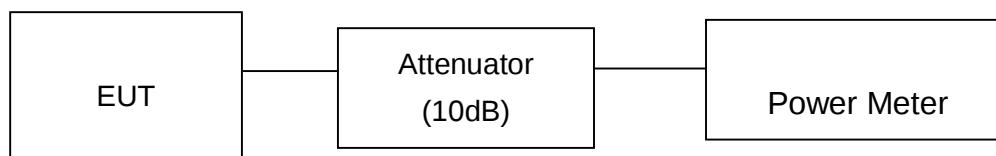
4.4.3 TEST PROCEDURES

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

4.4.4 DEVIATION FROM TEST STANDARD

No deviation

4.4.5 TEST SETUP



4.4.6 EUT OPERATING CONDITIONS

Same as Item 4.3.6

4.4.7 TEST RESULTS

802.11b DSSS MODULATION:

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (dBm)		TOTAL PEAK POWER (mW)	TOTAL PEAK POWER (dBm)	PEAK POWER LIMIT (dBm)	PASS / FAIL
		CHAIN(0)	CHAIN(1)				
1	2412	22.8	23.1	394.7	26.0	28.9	PASS
6	2437	23.7	23.5	458.3	26.6	28.9	PASS
11	2462	23.7	23.6	463.5	26.7	28.9	PASS

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

Effective Legacy Gain (dBi) = 7.1

The effective legacy gain is 7.1dBi, therefore the limit needs to 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	25.6	25.7	734.6	28.7	28.9	PASS
6	2437	25.7	25.5	726.3	28.6	28.9	PASS
11	2462	25.5	25.4	701.6	28.5	28.9	PASS

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

Effective Legacy Gain (dBi) = 7.1

The effective legacy gain is 7.1dBi, 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)				
1	2412	25.8	25.8	760.4	28.8	28.9	PASS
6	2437	25.8	25.8	760.4	28.8	28.9	PASS
11	2462	25.8	25.8	760.4	28.8	28.9	PASS

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

Effective Legacy Gain (dBi) = 7.1

The effective legacy gain is 7.1dBi, therefore the limit needs to reduce.

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	25.5	25.4	701.6	28.5	28.9	PASS
6	2437	25.9	25.2	720.2	28.6	28.9	PASS
9	2452	25.2	25.4	677.9	28.3	28.9	PASS

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

Effective Legacy Gain (dBi) = 7.1

The effective legacy gain is 7.1dBi, therefore the limit needs to reduce.

4.5 POWER SPECTRAL DENSITY MEASUREMENT

4.5.1 LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT

The Maximum of Power Spectral Density Measurement is 8dBm.

4.5.2 TEST INSTRUMENTS

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

NOTE:

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

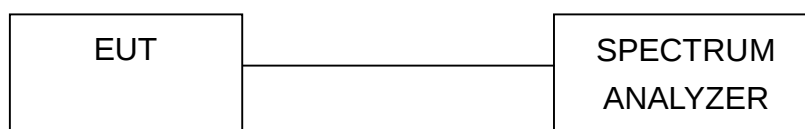
4.5.3 TEST PROCEDURE

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

4.5.4 DEVIATION FROM TEST STANDARD

No deviation

4.5.5 TEST SETUP



4.5.6 EUT OPERATING CONDITION

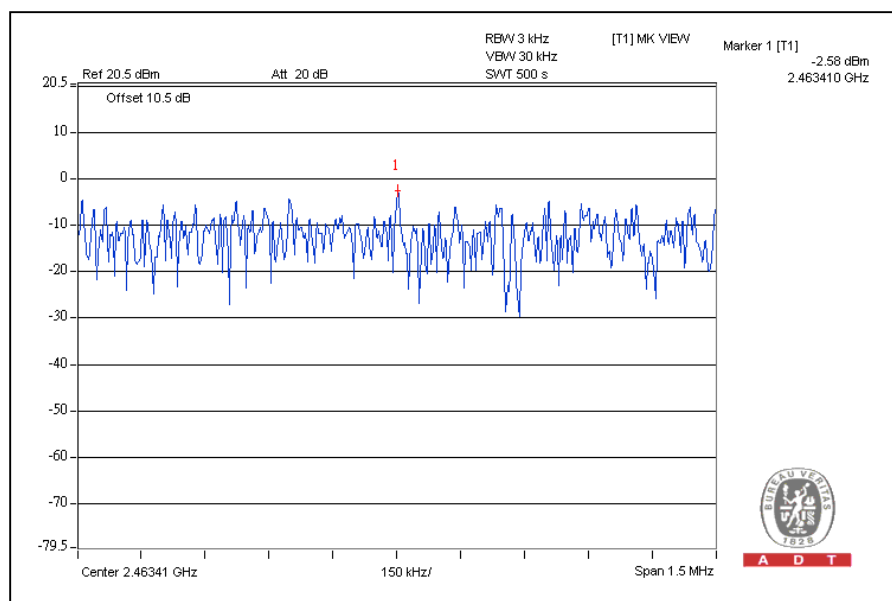
Same as Item 4.3.6

4.5.7 TEST RESULTS

802.11b DSSS MODULATION:

CHANNEL	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3kHz BW (dBm)		TOTAL POWER DENSITY (dBm)	MAXIMUM LIMIT (dBm)	PASS / FAIL
		CHAIN(0)	CHAIN(1)			
1	2412	-3.5	-5.9	-1.5	8	PASS
6	2437	-3.3	-5.0	-1.1	8	PASS
11	2462	-3.6	-2.6	-0.1	8	PASS

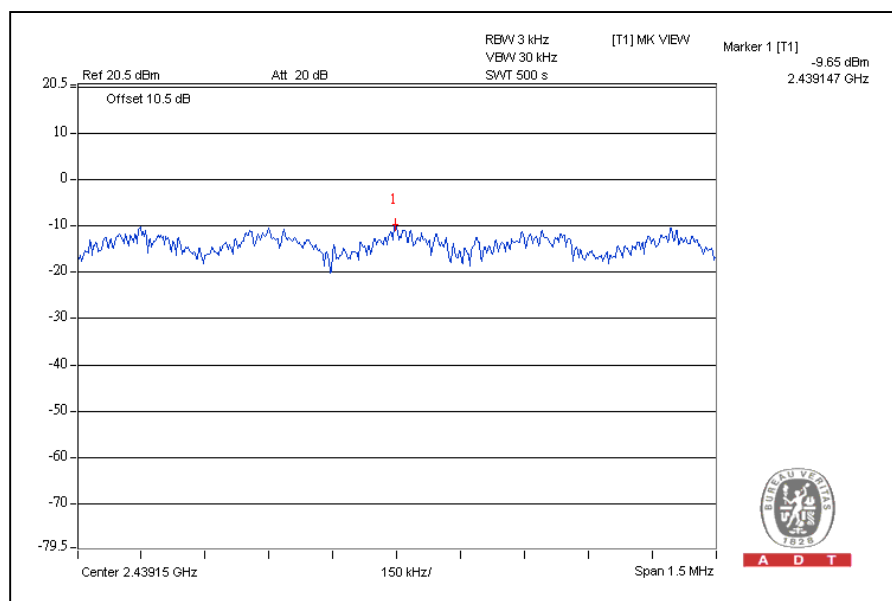
For Chain(1): CH11



802.11g OFDM MODULATION:

CHANNEL	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3kHz BW (dBm)		TOTAL POWER DENSITY (dBm)	MAXIMUM LIMIT (dBm)	PASS / FAIL
		CHAIN(0)	CHAIN(1)			
1	2412	-10.4	-12.0	-8.1	8	PASS
6	2437	-9.7	-10.2	-6.9	8	PASS
11	2462	-10.8	-10.7	-7.7	8	PASS

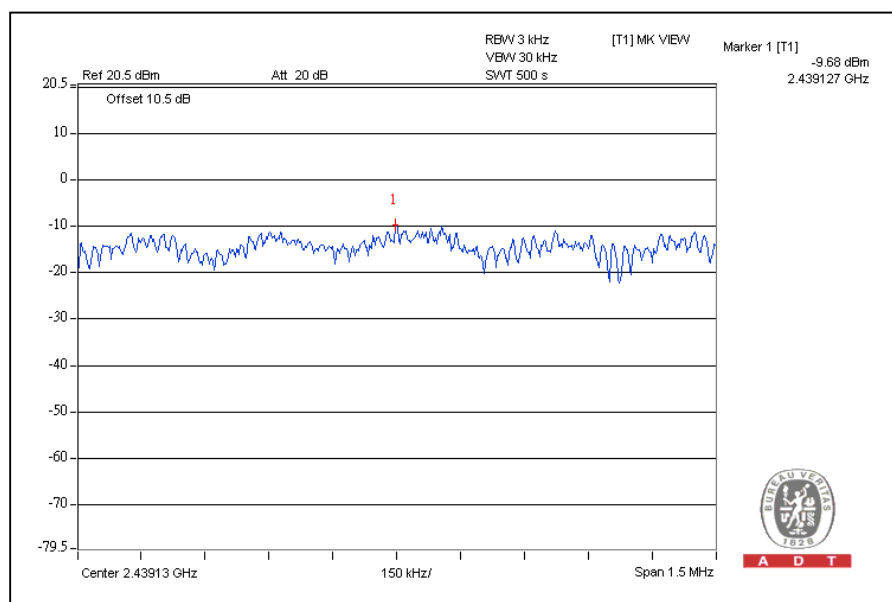
For Chain(0): CH6



802.11n (20MHz) OFDM MODULATION:

CHANNEL	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3kHz BW (dBm)		TOTAL POWER DENSITY (dBm)	MAXIMUM LIMIT (dBm)	PASS / FAIL
		CHAIN(0)	CHAIN(1)			
1	2412	-10.5	-10.8	-7.6	8	PASS
6	2437	-9.7	-10.7	-7.2	8	PASS
11	2462	-10.2	-12.7	-8.3	8	PASS

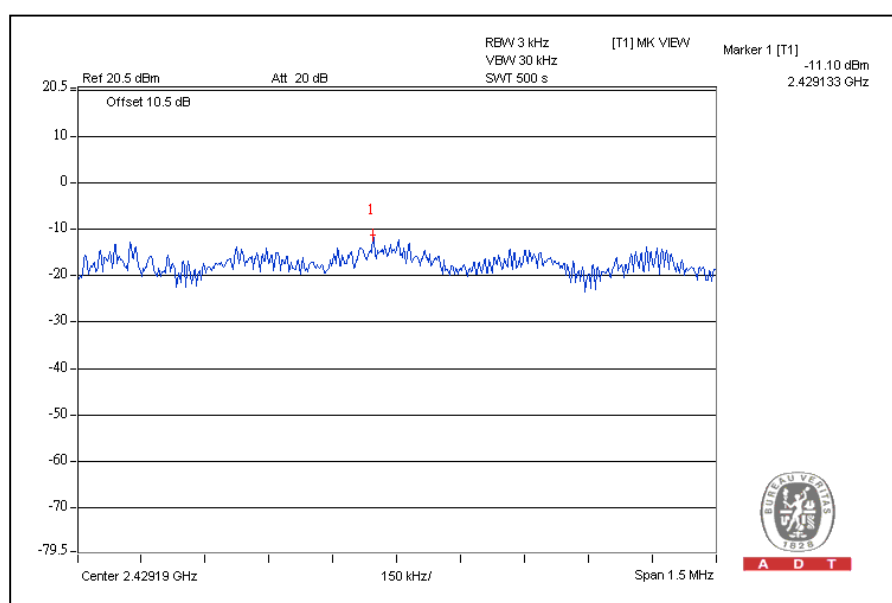
For Chain(0): CH6



802.11n (40MHz) OFDM MODULATION:

CHANNEL	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3kHz BW (dBm)		TOTAL POWER DENSITY (dBm)	MAXIMUM LIMIT (dBm)	PASS / FAIL
		CHAIN(0)	CHAIN(1)			
3	2422	-13.0	-13.2	-10.1	8	PASS
6	2437	-15.1	-11.1	-9.6	8	PASS
9	2452	-14.0	-13.4	-10.7	8	PASS

For Chain(1): CH6



4.6 CONDUCTED OUT-BAND EMISSION MEASUREMENT

4.6.1 LIMITS OF CONDUCTED OUT-BAND EMISSION MEASUREMENT

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

4.6.2 TEST INSTRUMENTS

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

NOTE:

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

4.6.3 TEST PROCEDURE

The transmitter output was connected to the spectrum analyzer via a low loss cable. Set RBW of spectrum analyzer to 100kHz and VBW of spectrum analyzer to 300kHz with suitable frequency span including 100 MHz or 200 MHz bandwidth from band edge. The band edges were measured and recorded.

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

4.6.4 DEVIATION FROM TEST STANDARD

No deviation

4.6.5 EUT OPERATING CONDITION

Same as Item 4.3.6

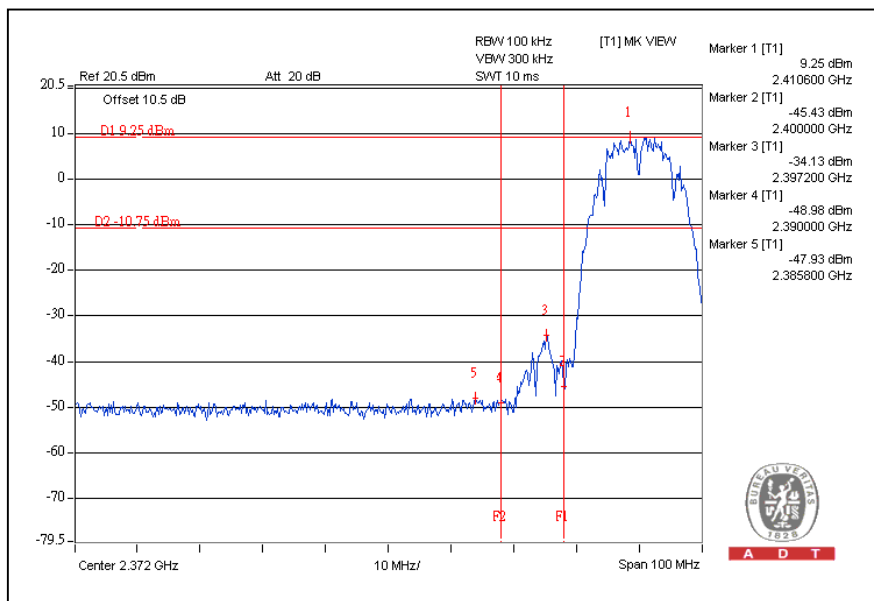
4.6.6 TEST RESULTS

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

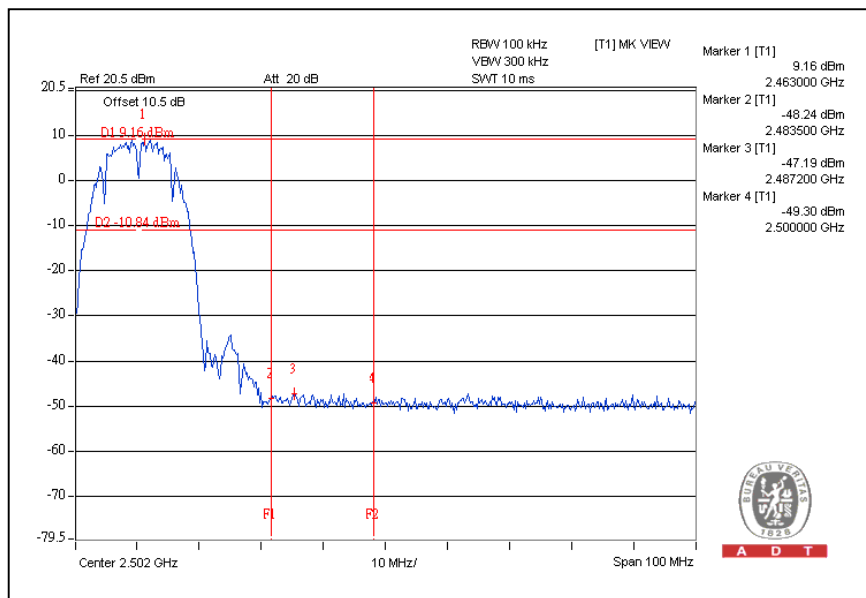
802.11b DSSS MODULATION:

For Chain(0):

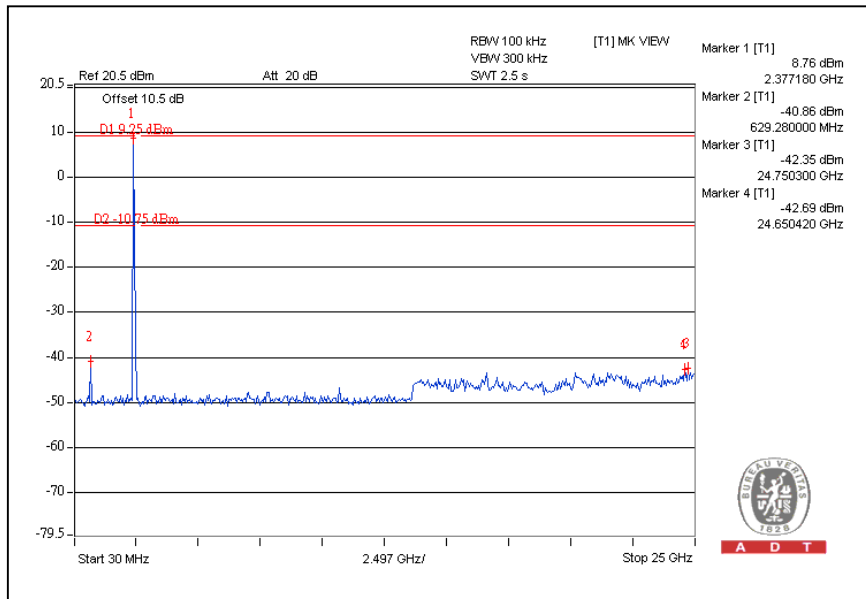
CH1



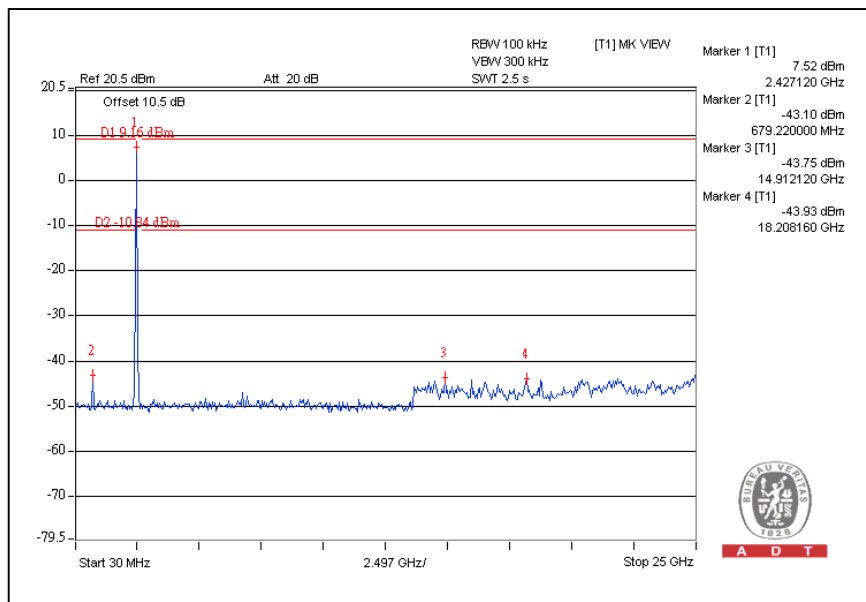
CH11



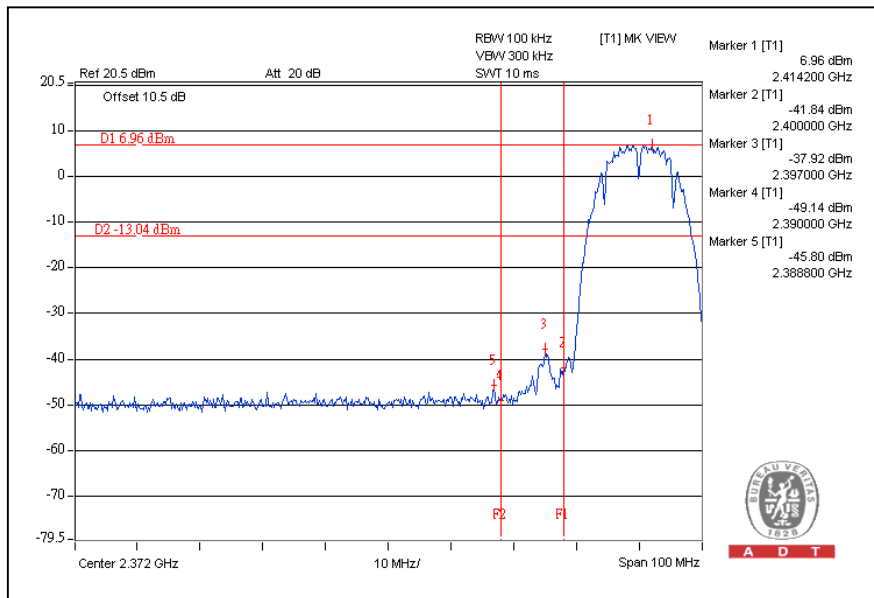
CH1



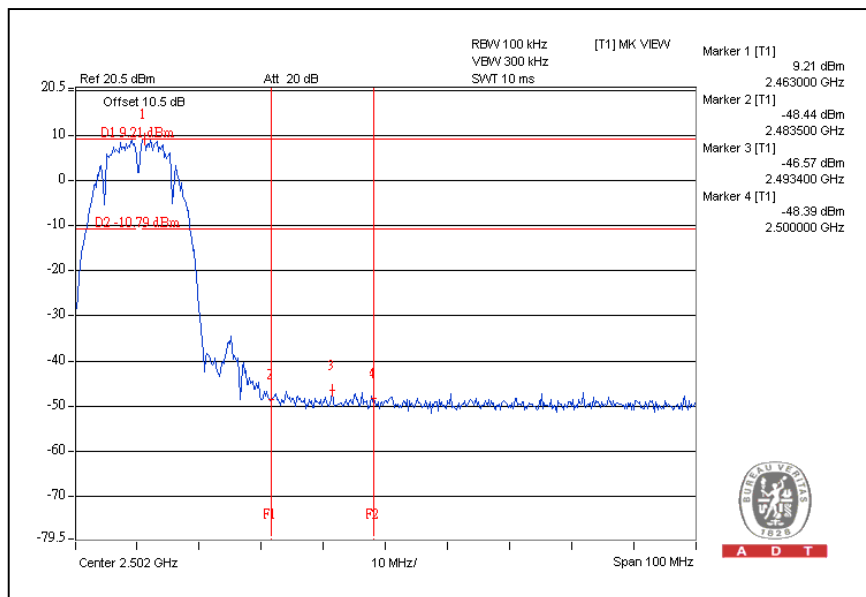
CH11



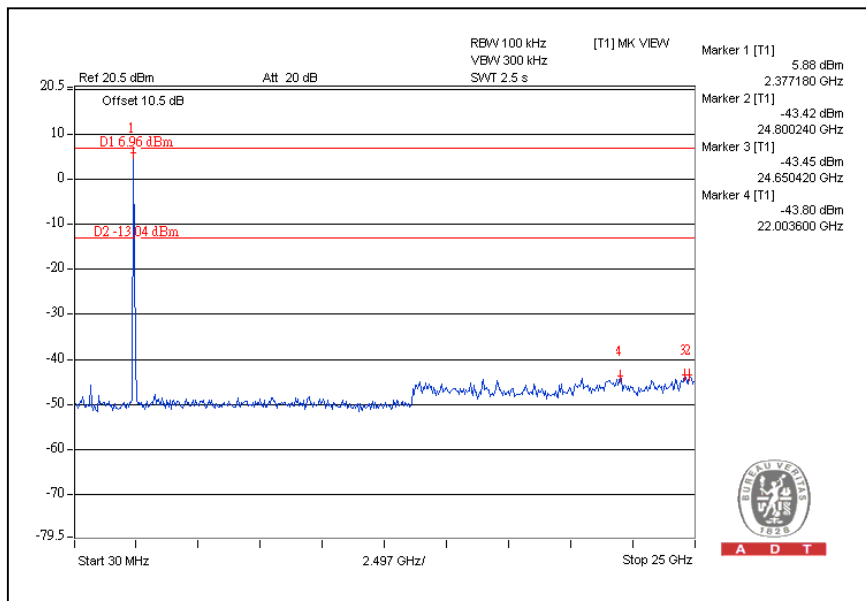
For Chain(1):
CH1



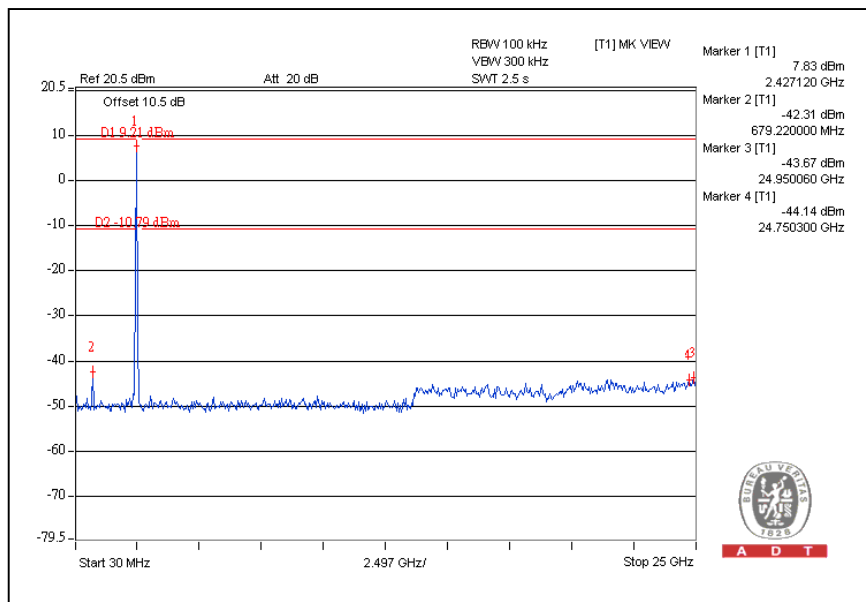
CH11



CH1



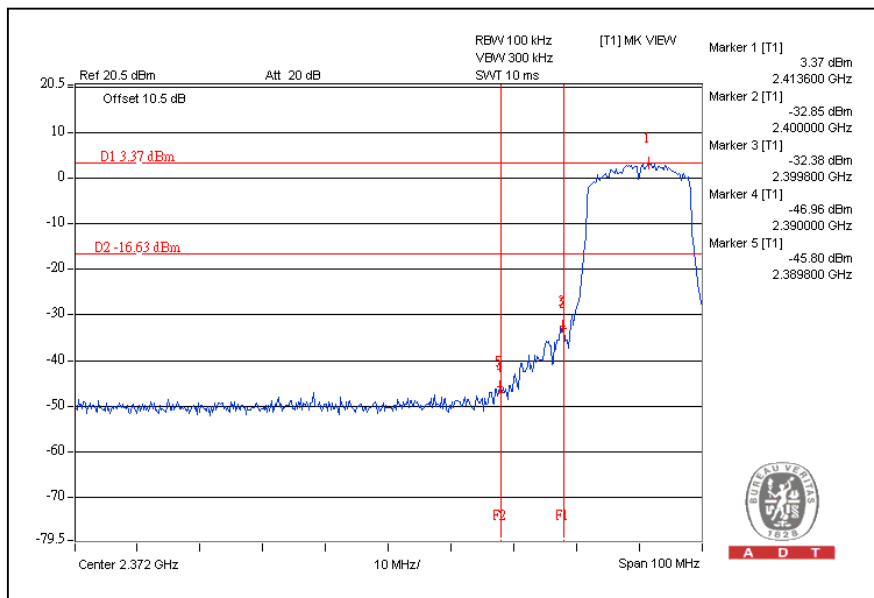
CH11



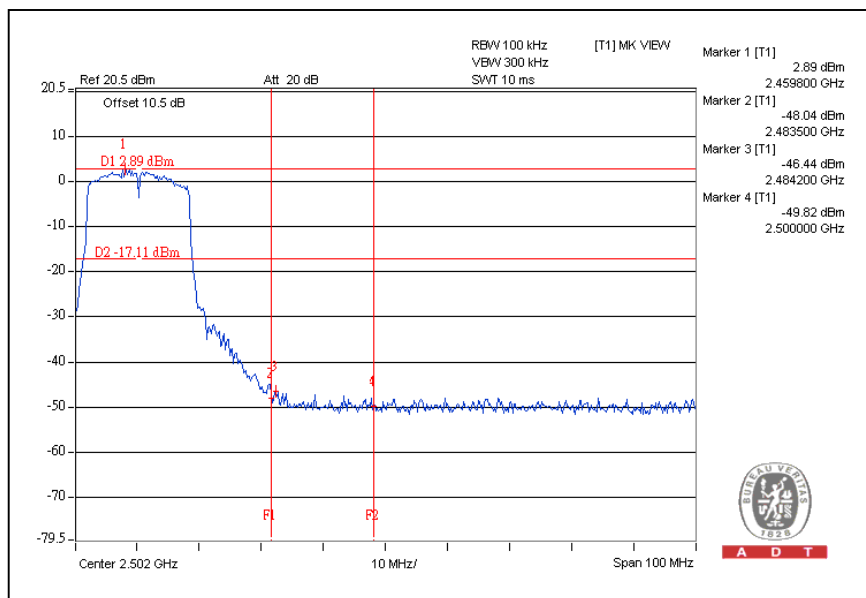
802.11g OFDM MODULATION:

For Chain(0):

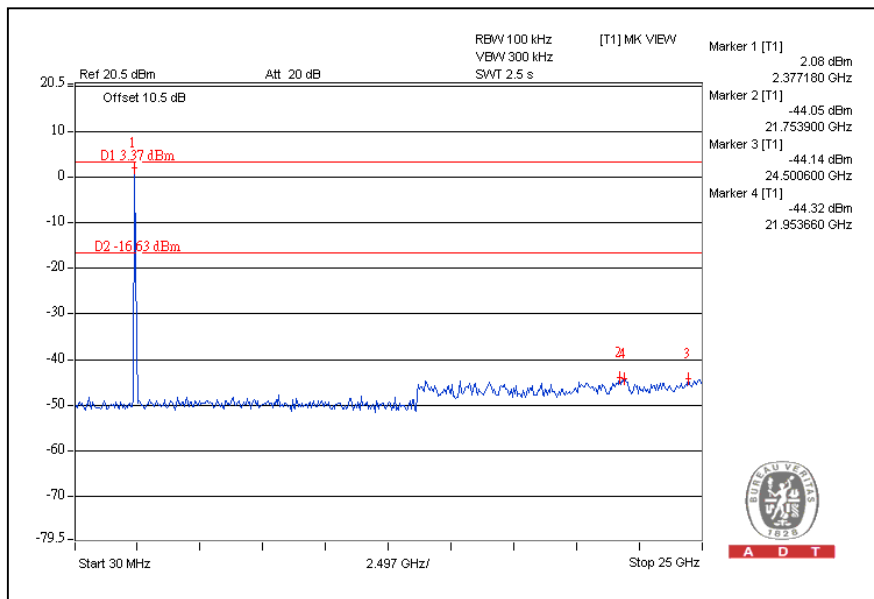
CH1



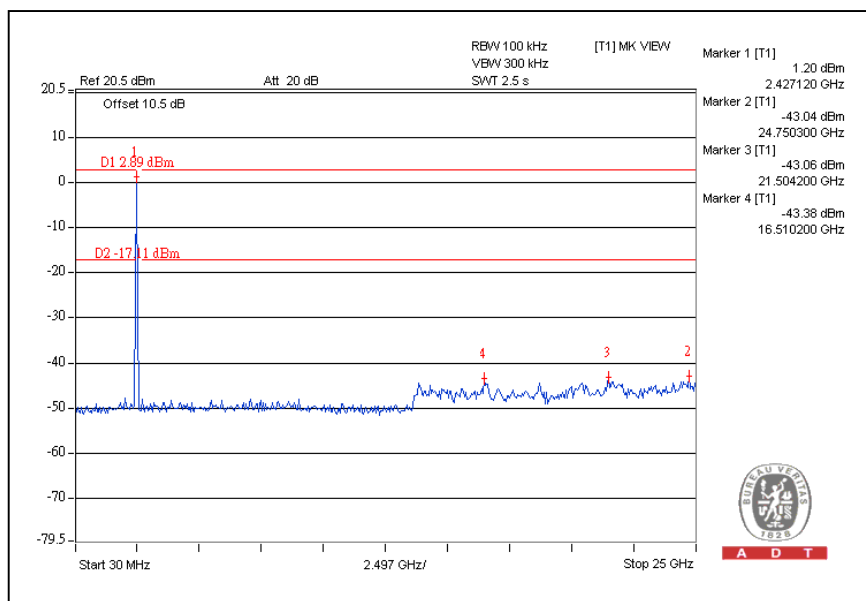
CH11



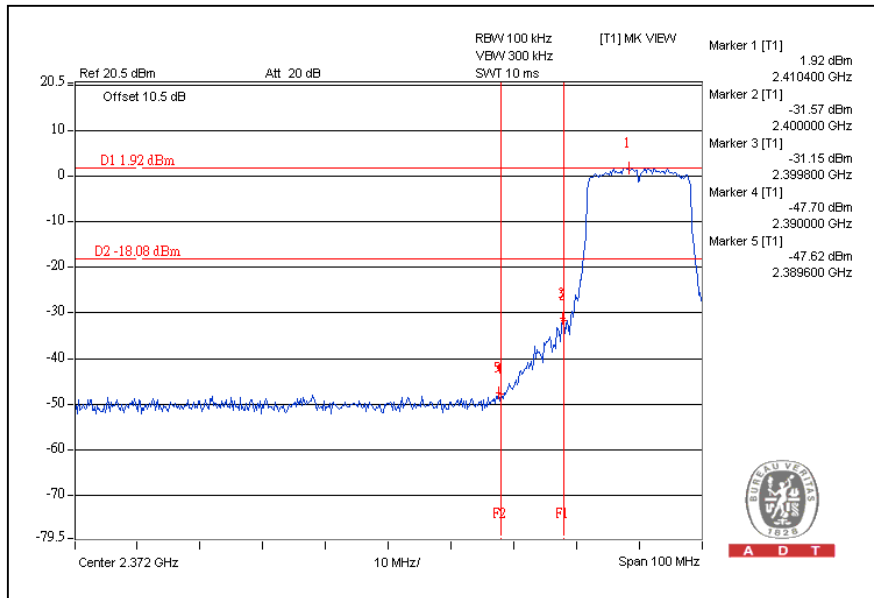
CH1



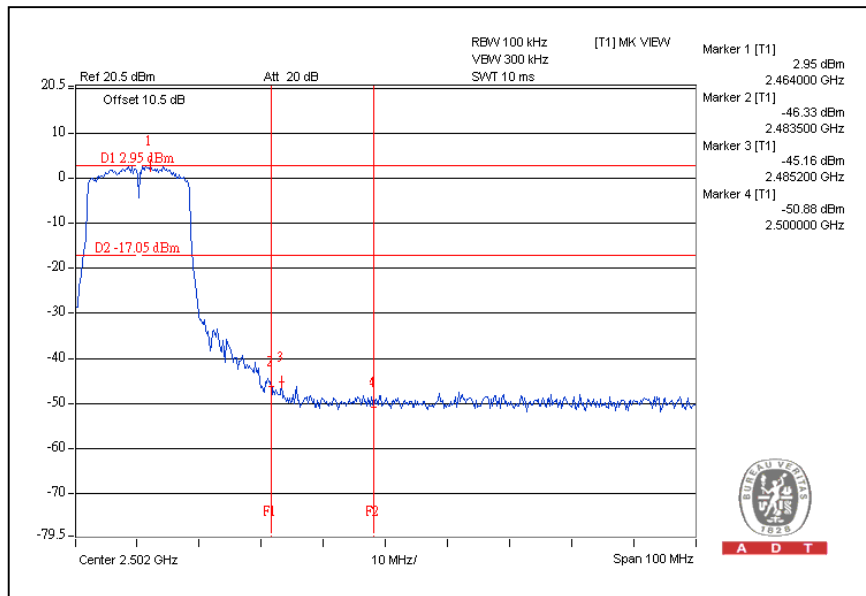
CH11



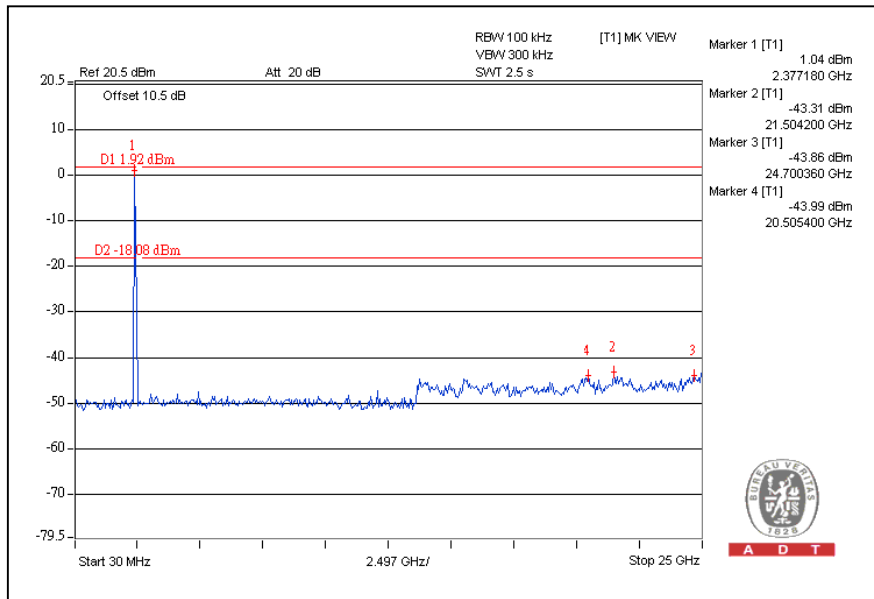
For Chain(1):
CH1



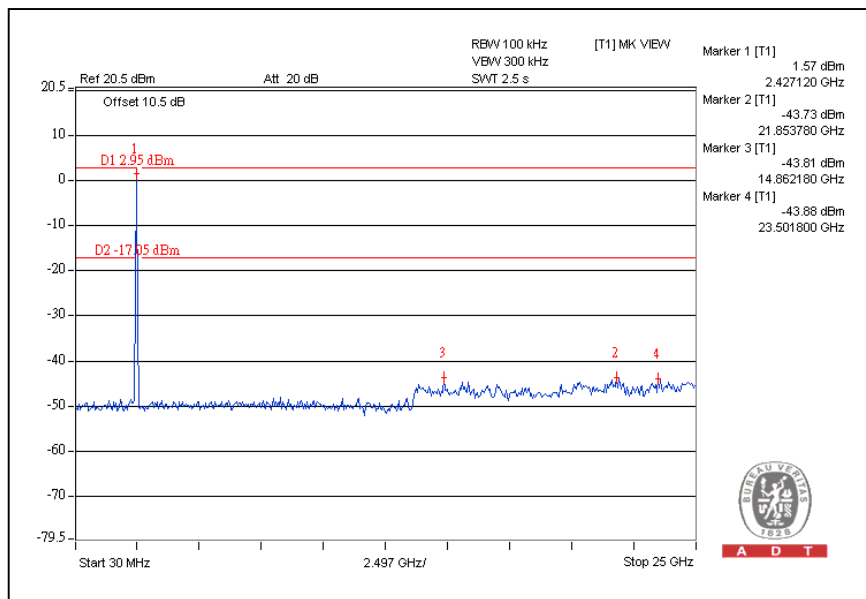
CH11



CH1



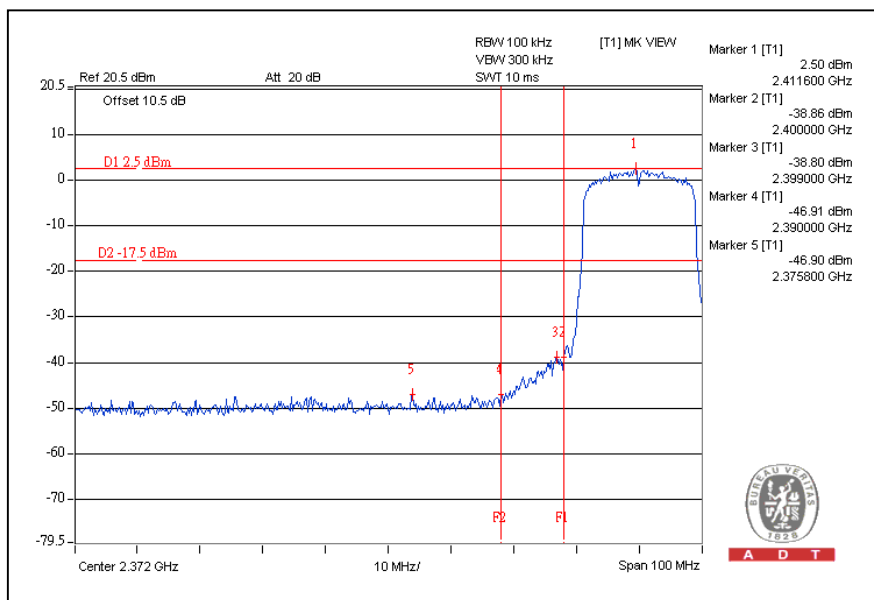
CH11



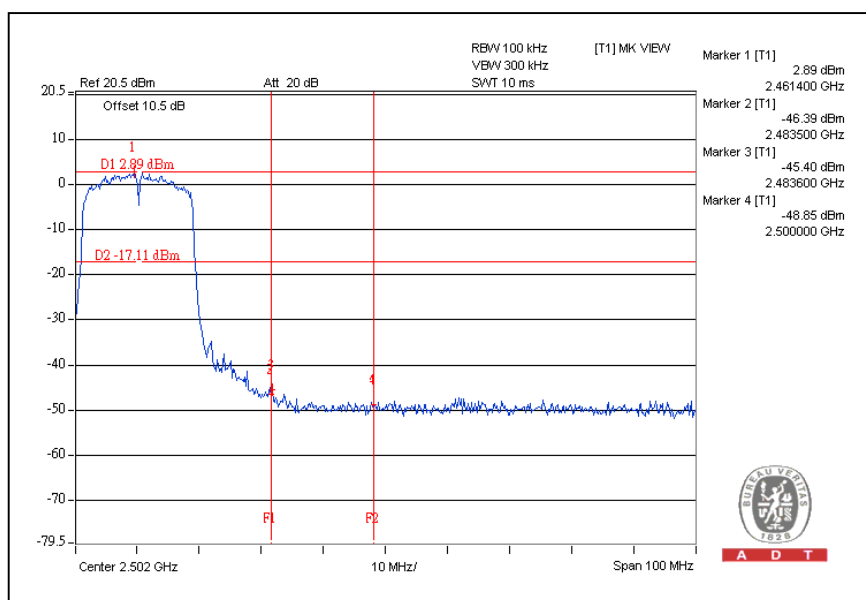
802.11n (20MHz) OFDM MODULATION:

For Chain(0):

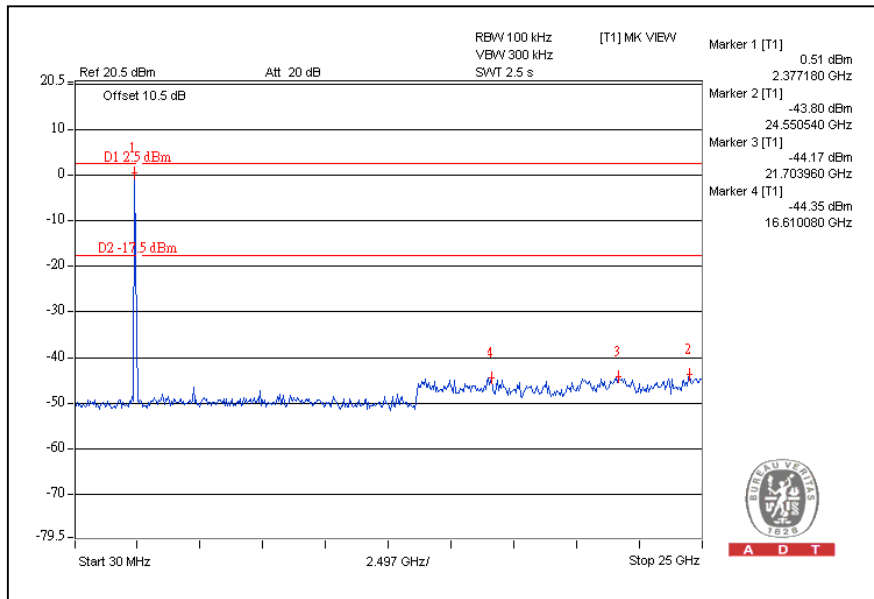
CH1



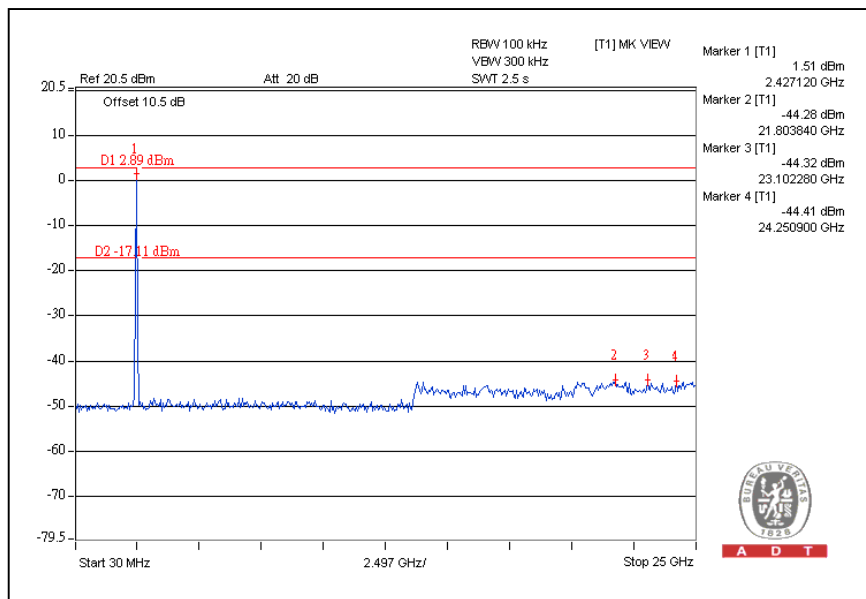
CH11



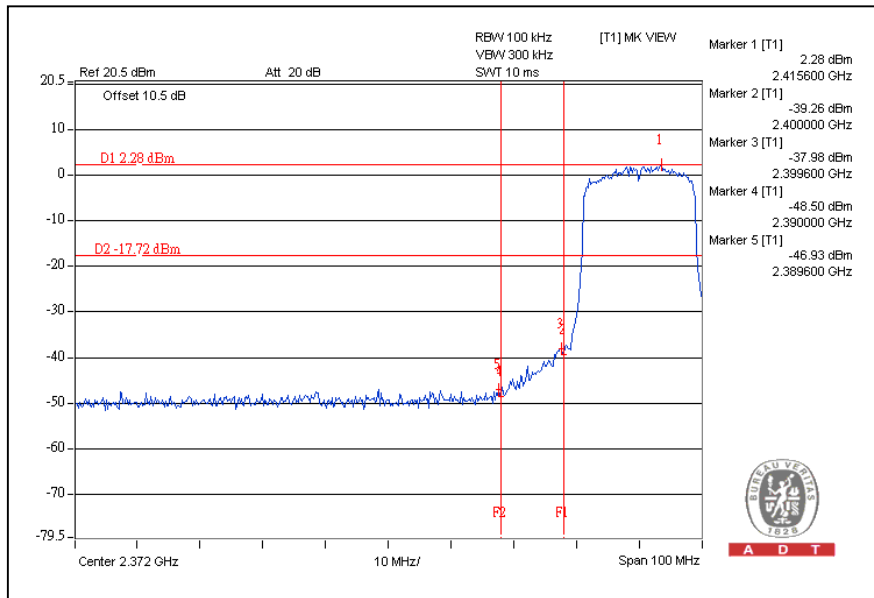
CH1



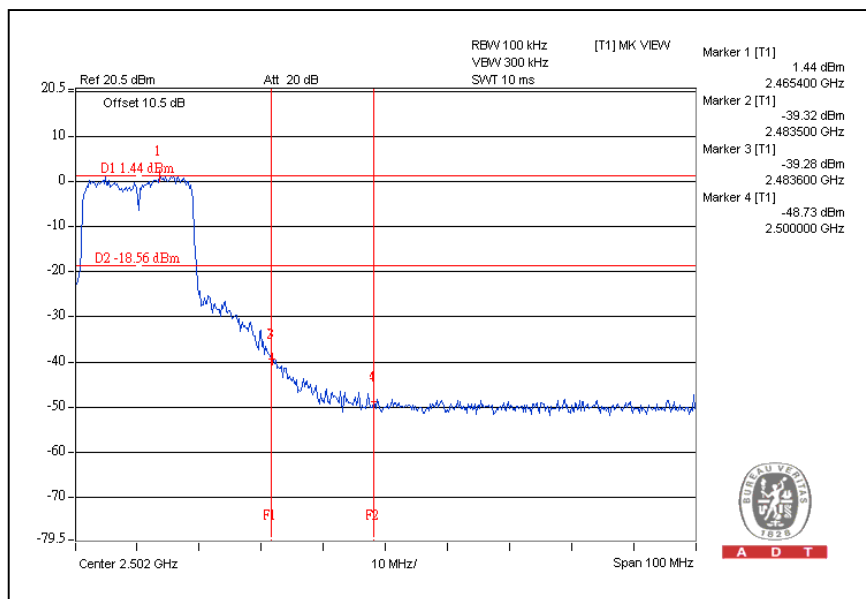
CH11



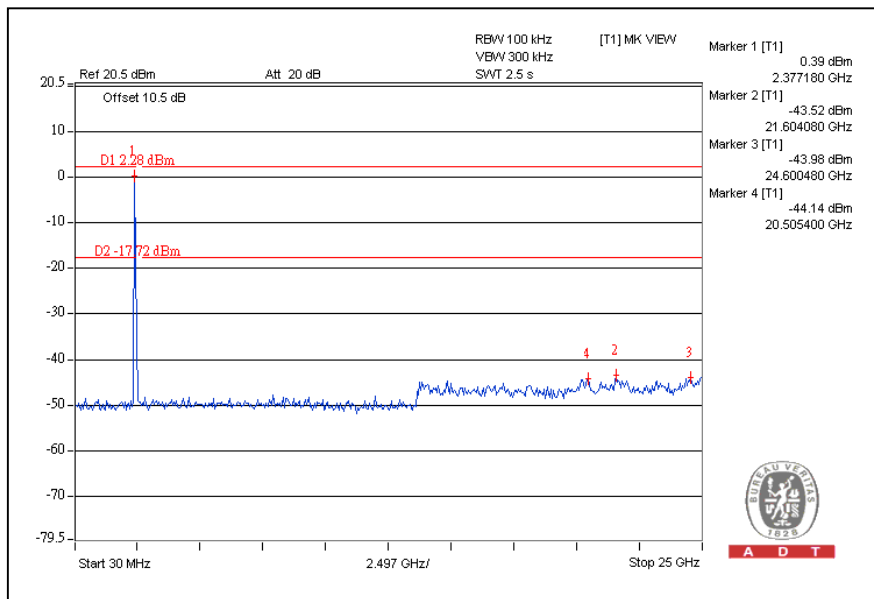
For Chain(1):
CH1



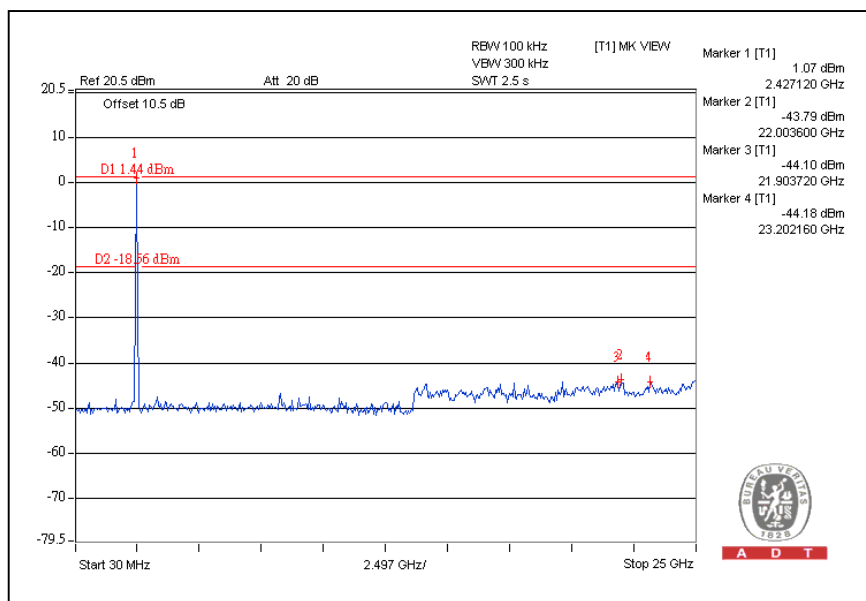
CH11



CH1



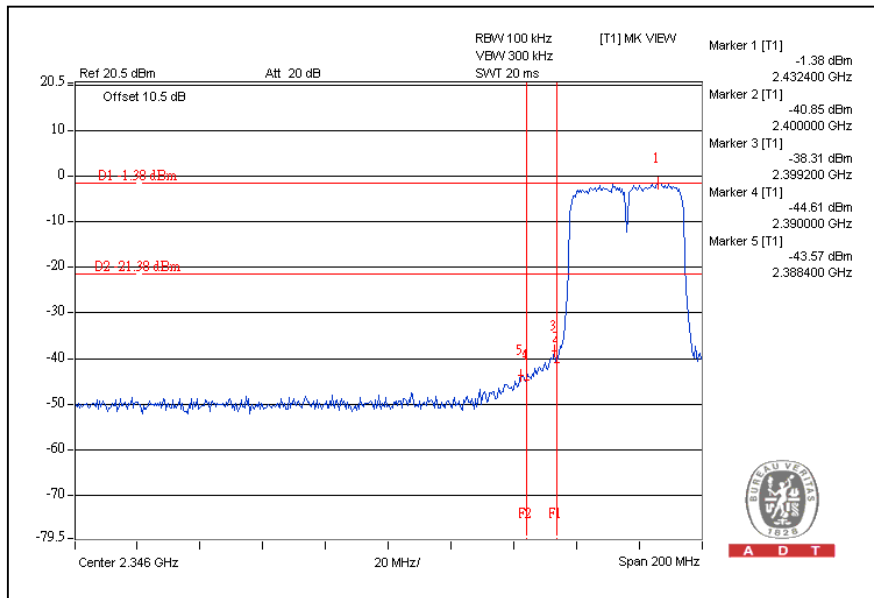
CH11



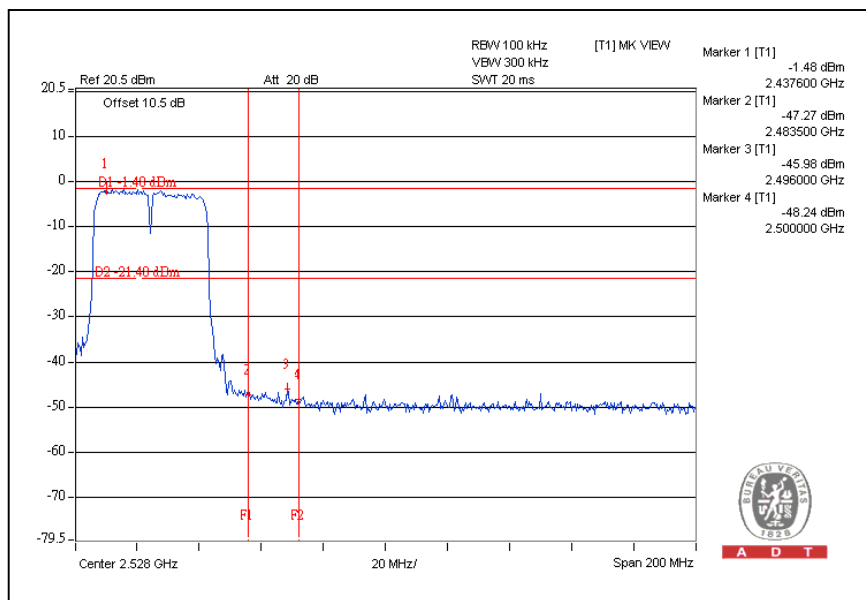
802.11n (40MHz) OFDM MODULATION:

For Chain(0):

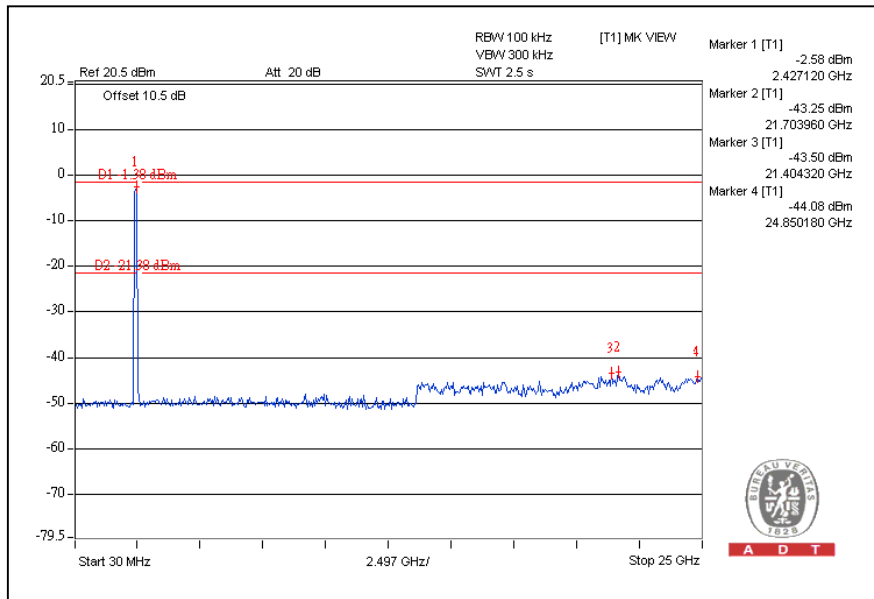
CH3



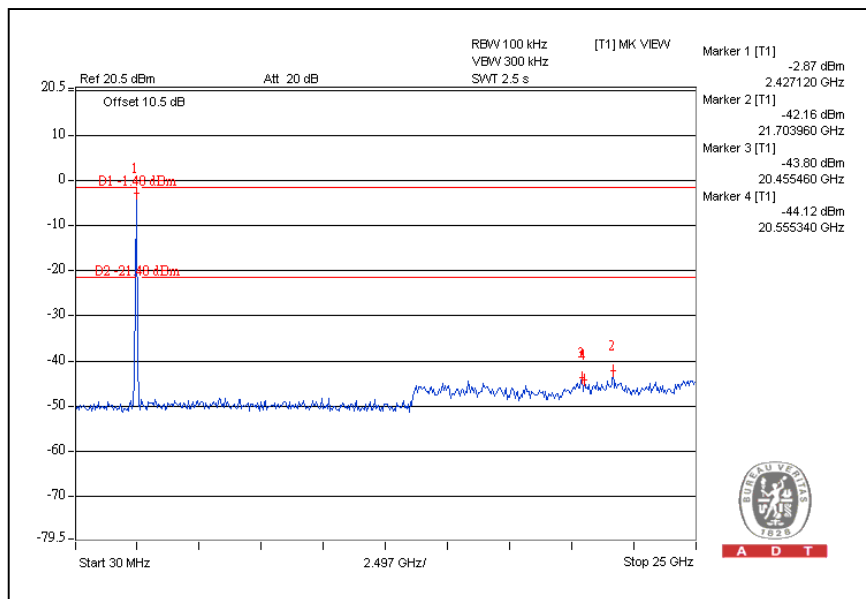
CH9



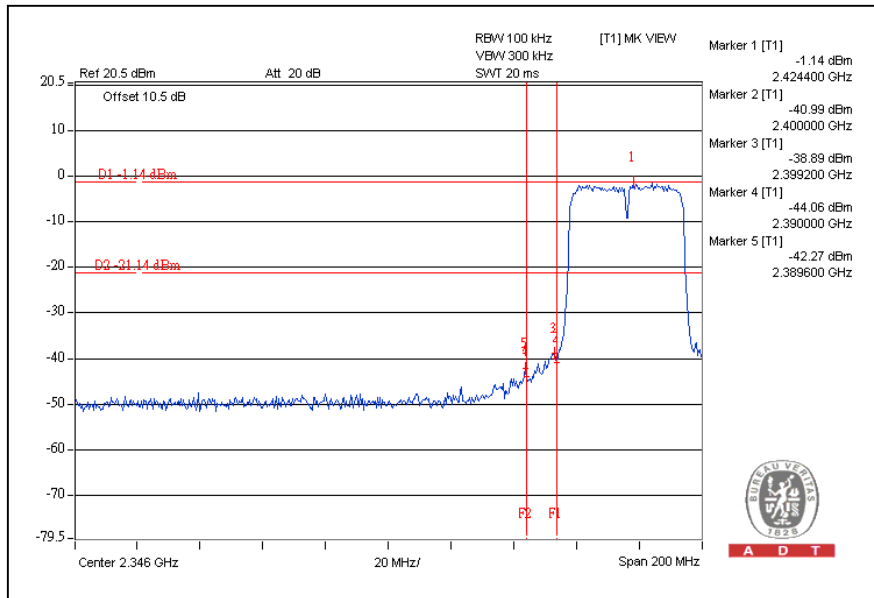
CH3



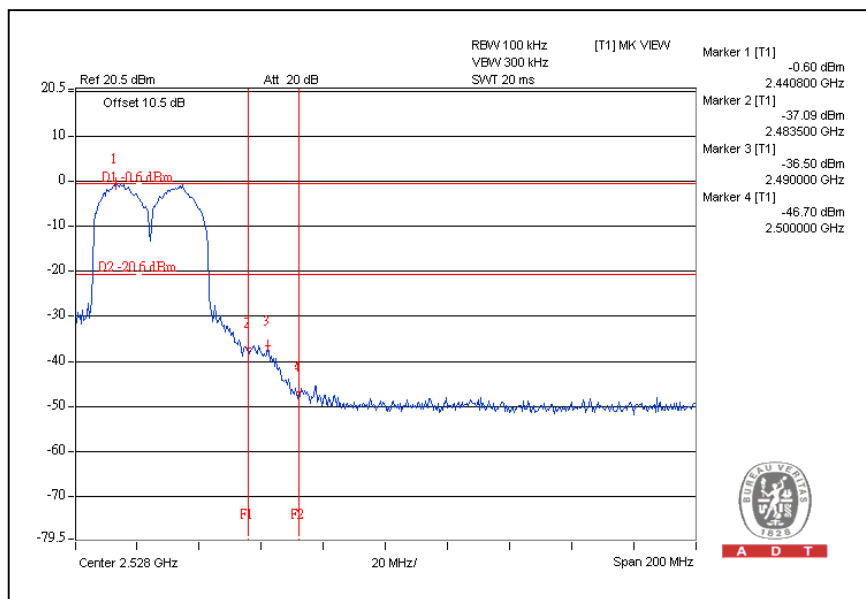
CH9



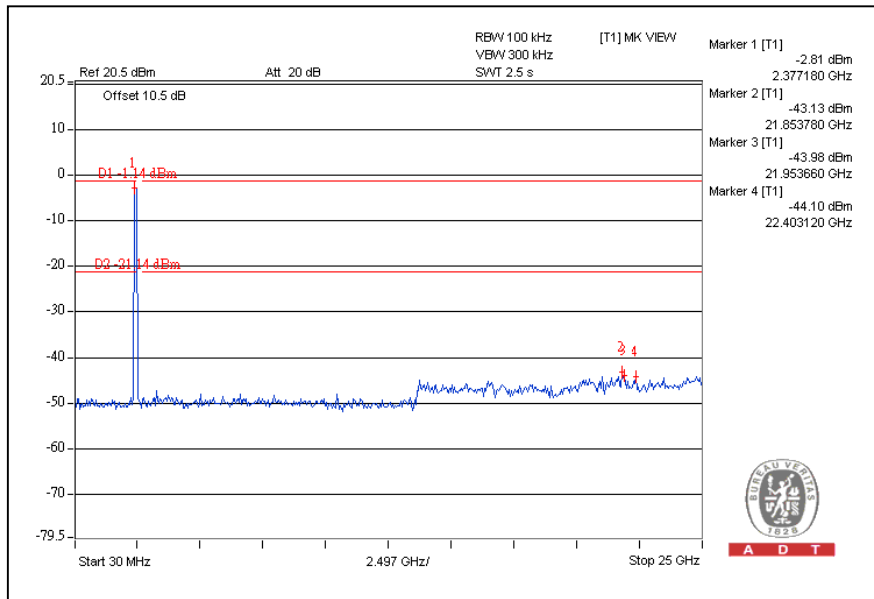
For Chain(1):
CH3



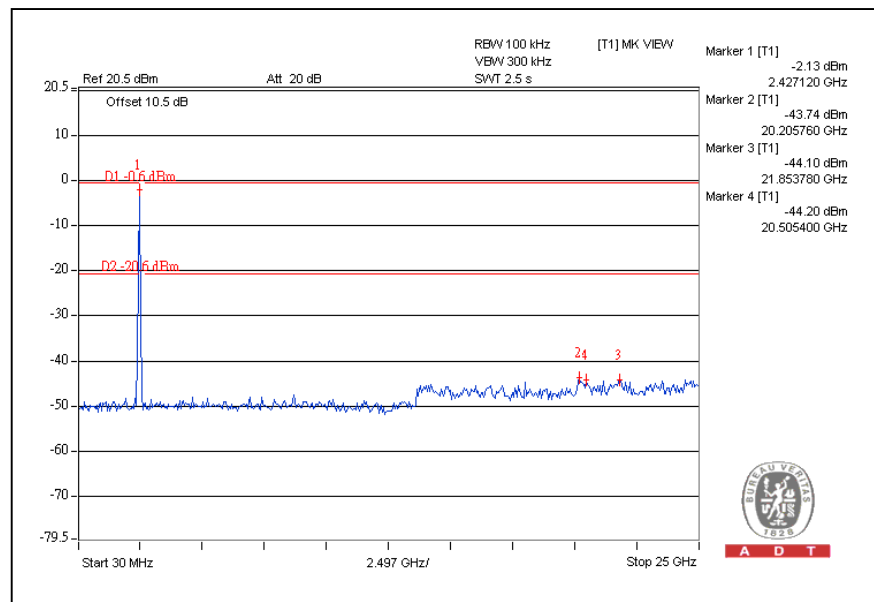
CH9



CH3



CH9



5. INFORMATION ON THE TESTING LABORATORIES

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

Copies of accreditation certificates of our laboratories obtained from approval agencies can be downloaded from our web site: www.adt.com.tw/index.5.phtml.

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

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Email: service@adt.com.tw

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 any modifications are made to the EUT by the lab during the test.

--- END ---