FCC TEST REPORT

REPORT NO.: RF961221L10
MODEL NO.: WRT54G2 V1
RECEIVED: Jan. 07, 2008
TESTED: Jan. 07 ~ Jan. 08, 2008
ISSUED: Jan. 14, 2008

APPLICANT: Cisco-Linksys LLC

ADDRESS: 121 Theory Drive Irvine, CA 92617 (USA)

ISSUED BY: Advance Data Technology Corporation

LAB ADDRESS: No. 47, 14th Ling, Chia Pau Tsuen, Lin Kou Hsiang, Taipei Hsien, Taiwan, R.O.C.

TEST LOCATION: No. 19, Hwa Ya 2nd Rd., Wen Hwa Tsuen, Kwei Shan Hsiang, Taoyuan Hsien, Taiwan, R.O.C.

No. 81-1, Lu Liao Keng, 9th Ling, Wu Lung Tsuen, Chiung Lin Hsiang, Hsinchu Hsien 307, Taiwan, R.O.C.

Testing Laboratory 0528

ACCREDITED No.: 2177-01

Table of Contents

1 CERTIFICATION....4
2 SUMMARY OF TEST RESULTS....5
2.1 MEASUREMENT UNCERTAINTY....6
3 GENERAL INFORMATION....7
3.1 GENERAL DESCRIPTION OF EUT....7
3.2 DESCRIPTION OF TEST MODES....9
3.2.1 CONFIGURATION OF SYSTEM UNDER TEST....9
3.2.2 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL....11
3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS....12
3.4 DESCRIPTION OF SUPPORT UNITS....13
4 TEST TYPES AND RESULTS....14
4.1 RADIATED EMISSION MEASUREMENT....14
4.1.1 LIMITS OF RADIATED EMISSION MEASUREMENT....14
4.1.2 TEST INSTRUMENTS....15
4.1.3 TEST PROCEDURES....17
4.1.4 DEVIATION FROM TEST STANDARD....17
4.1.5 TEST SETUP....18
4.1.6 EUT OPERATING CONDITIONS....18
4.1.7 TEST RESULTS....19
4.2 CONDUCTED EMISSION MEASUREMENT....47
4.2.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT....47
4.2.2 TEST INSTRUMENTS....47
4.2.3 TEST PROCEDURES....48
4.2.4 DEVIATION FROM TEST STANDARD....48
4.2.5 TEST SETUP....49
4.2.6 EUT OPERATING CONDITIONS....49
4.2.7 TEST RESULTS....50
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....59
4.3.6 EUT OPERATING CONDITIONS....59
4.3.7 TEST RESULTS....60
4.4 MAXIMUM PEAK OUTPUT POWER....64
4.4.1 LIMITS OF MAXIMUM PEAK OUTPUT POWER MEASUREMENT....64
4.4.2 TEST INSTRUMENTS....64
4.4.3 TEST PROCEDURES....65
4.4.4 DEVIATION FROM TEST STANDARD....65
4.4.5 TEST SETUP....65
4.4.6 EUT OPERATING CONDITIONS....65

4.4.7 TEST RESULTS 66
4.5 POWER SPECTRAL DENSITY MEASUREMENT 67
4.5.1 LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT 67
4.5.2 TEST INSTRUMENTS 67
4.5.3 TEST PROCEDURE 67
4.5.4 DEVIATION FROM TEST STANDARD 67
4.5.5 TEST SETUP 67
4.5.6 EUT OPERATING CONDITIONS 67
4.5.7 TEST RESULTS 68
4.6 BAND EDGES MEASUREMENT 72
4.6.1 LIMITS OF BAND EDGES MEASUREMENT 72
4.6.2 TEST INSTRUMENTS 72
4.6.3 TEST PROCEDURE 72
4.6.4 DEVIATION FROM TEST STANDARD 72
4.6.5 EUT OPERATING CONDITION 72
4.6.6 TEST RESULTS 73
4.7 ANTENNA REQUIREMENT 80
4.7.1 STANDARD APPLICABLE 80
4.7.2 ANTENNA CONNECTED CONSTRUCTION 80
5 PHOTOGRAPHS OF THE TEST CONFIGURATION 81
6 INFORMATION ON THE TESTING LABORATORIES 82
7 APPENDIX A – MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB 83

1 CERTIFICATION

PRODUCT:	Wireless-G Broadband Router
MODEL:	WRT54G2 V1
BRAND:	Linksys
APPLICANT:	Cisco-Linksys LLC
TESTED:	Jan. 07 ~ Jan. 08, 2008
TEST SAMPLE:	ENGINEERING SAMPLE
STANDARDS:	**FCC Part 15, Subpart C (Section 15.247)** ANSI C63.4-2003

The above equipment (model: WRT54G2 V1) has been tested by **Advance Data Technology Corporation**, 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 : _____ , **DATE:** Jan. 14, 2008
Joanna Wang / Senior Specialist

TECHNICAL ACCEPTANCE : _____ , **DATE:** Jan. 14, 2008
Responsible for RF Long Chen / Senior Engineer

APPROVED BY : _____ , **DATE:** Jan. 14, 2008
Gary Chang / Assistant 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 -1.57dB at 0.236MHz.
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 -0.50dB at 2491.580MHz and 14472.000MHz.
15.247(e)	Power Spectral Density Limit: max. 8dBm	PASS	Meet the requirement of limit.
15.247(d)	Band Edge Measurement Limit: 20dB less than the peak value of fundamental frequency	PASS	Meet the requirement of limit.

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:

MEASUREMENT	FREQUENCY	UNCERTAINTY
Conducted emissions	9kHz ~ 30MHz	2.44 dB
Radiated emissions (HwaYa Chamber 3)	30MHz ~ 200MHz	3.34 dB
	200MHz ~1000MHz	3.35 dB
Radiated emissions (ADT Open Site No. B)	30MHz-1GHz	3.46 dB
	1GHz ~18GHz	2.32 dB

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

3 GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

PRODUCT	Wireless-G Broadband Router
MODEL NO.	WRT54G2 V1
FCC ID	Q87-WRT54G2V1
POWER SUPPLY	12Vdc from AC 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
FREQUENCY RANGE	2412MHz ~ 2462MHz
NUMBER OF CHANNEL	11
MAXIMUM OUTPUT POWER	114.815mW
ANTENNA TYPE	PIFA antenna with 1.5dBi gain
DATA CABLE	NA
I/O PORTS	Refer to User's Manual
ACCESSORY DEVICES	Adapter

NOTE:

1. The EUT was powered by the following adapter:

ADAPTER 1	
BRAND:	LINKSYS (EXH)
MODEL:	AD12V/0.5A-SW
INPUT:	100-240Vac, 50-60Hz, 0.5A
OUTPUT:	12Vdc, 0.5A
POWER LINE:	1.8m non-shielded cable without core

ADAPTER 2	
BRAND:	LINKSYS (EXH)
MODEL:	LS120V05AE
INPUT:	100-240Vac, 50-60Hz, 0.5A
OUTPUT:	12Vdc, 0.5A
POWER LINE:	1.8m non-shielded cable without core

ADAPTER 3	
BRAND:	LINKSYS (ENG)
MODEL:	LS120V05A
INPUT:	100-240Vac, 50-60Hz, 0.5A
OUTPUT:	12Vdc, 0.5A
POWER LINE:	1.8m non-shielded cable without core

ADAPTER 4	
BRAND:	LINKSYS (ENG)
MODEL:	AD12V/0.5A-SW
INPUT:	100-240Vac, 50-60Hz, 0.2A
OUTPUT:	12Vdc, 0.5A
POWER LINE:	1.8m non-shielded cable without core

2. The EUT, operates in the 2.4GHz frequency range, lets you connect IEEE 802.11g or IEEE 802.11b devices to the network. With its high-speed data transmissions of up to 54Mbps.
3. 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.

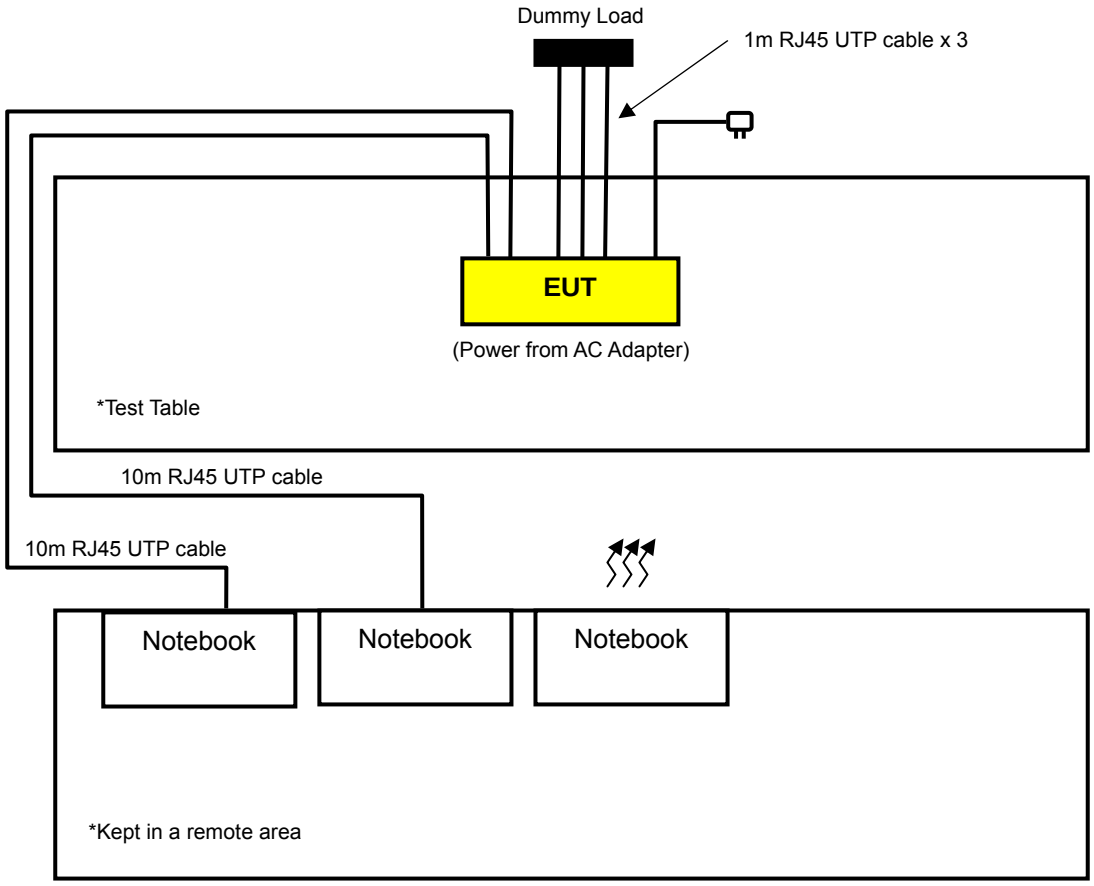
3.2 DESCRIPTION OF TEST MODES

Eleven channels are provided to this EUT.

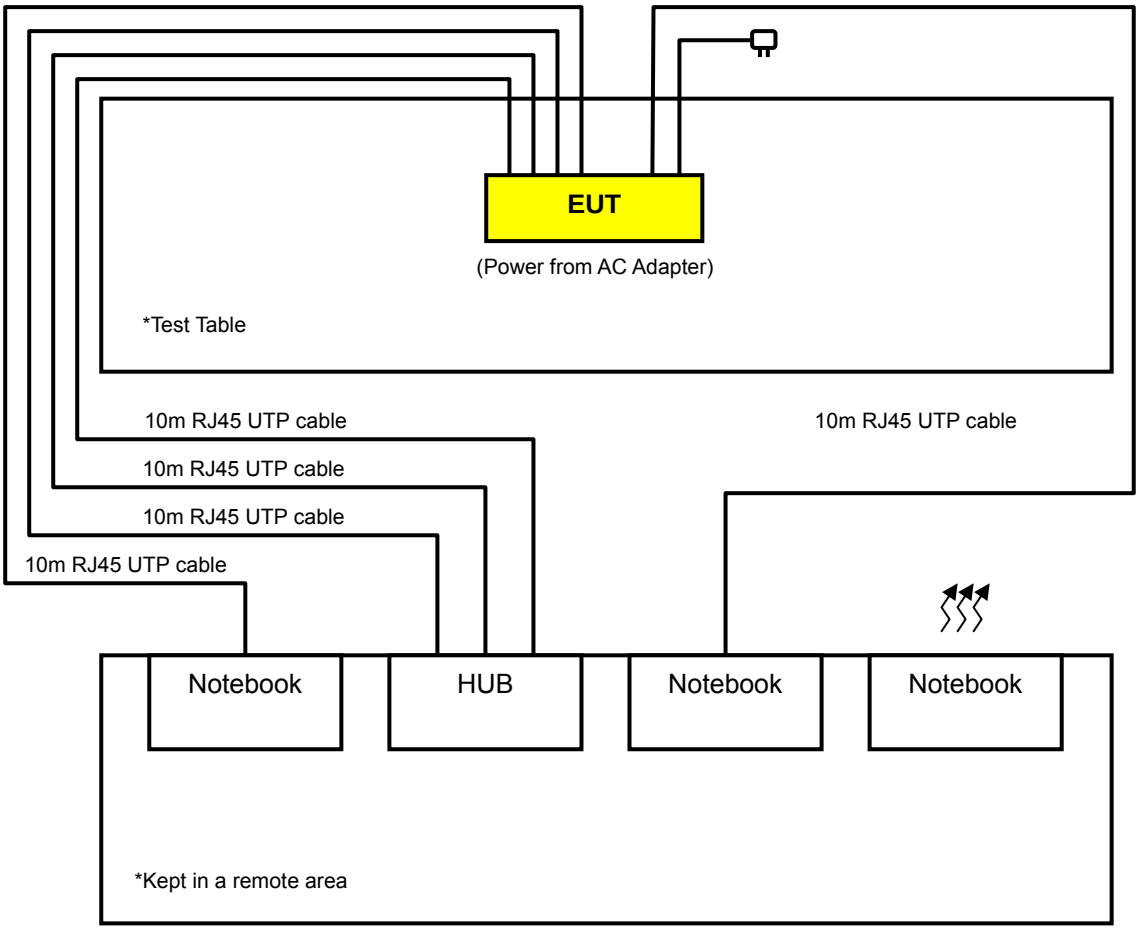
CHANNEL	FREQUENCY	CHANNEL	FREQUENCY
1	2412 MHz	7	2442 MHz
2	2417 MHz	8	2447 MHz
3	2422 MHz	9	2452 MHz
4	2427 MHz	10	2457 MHz
5	2432 MHz	11	2462 MHz
6	2437 MHz		

3.2.1 CONFIGURATION OF SYSTEM UNDER TEST

For Conducted emission, Radiated Emission below 1GHz:



For Radiated Emission above 1GHz:



3.2.2 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

EUT Configure Mode	Applicable to				Description
	RE≥1G	RE<1G	PLC	APCM	
A	√	√	√	√	Adapter 1
B	-	√	√	-	Adapter 2
C	-	√	√	-	Adapter 3
D	-	√	√	-	Adapter 4

Where **PLC:** Power Line Conducted Emission **RE<1G:** Radiated Emission below 1GHz
RE≥1G: Radiated Emission above 1GHz **APCM:** Antenna Port Conducted Measurement

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, XYZ Axis and antenna ports (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)	Axis
A	802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1	X
	802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6	

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.

EUT Configure Mode	Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)	Axis
A, B, C, D	802.11g	1 to 11	1	OFDM	BPSK	6	X

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.

EUT Configure Mode	Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
A, B, C, D	802.11g	1 to 11	1	OFDM	BPSK	6

BANDEDGE 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.

EUT Configure Mode	Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
A	802.11b	1 to 11	1, 11	DSSS	DBPSK	1
	802.11g	1 to 11	1, 11	OFDM	BPSK	6

ANTENNA PORT CONDUCTED MEASUREMENT:

☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).

☒ Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
A	802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1
	802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6

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

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.

For Conducted emission, Radiated Emission below 1GHz:

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	NOTEBOOK COMPUTER	DELL	PP05L	12130898320	E2K24CLNS
2	NOTEBOOK COMPUTER	DELL	PP05L	16484462992	E2K24CLNS
3	NOTEBOOK COMPUTER	DELL	PP05L	CN-04Y212-48643-38E-0145	FCC DoC Approved

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	10m RJ45 UTP cable
2	10m RJ45 UTP cable
3	NA

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

For Radiated Emission above 1GHz:

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	NOTEBOOK COMPUTER	DELL	PP18L	6976685584	FCC DoC Approved
2	NOTEBOOK COMPUTER	DELL	PP19L	CN-OHC416-70166-5CA-0448	PIW632500516610
3	NOTEBOOK COMPUTER	DELL	PP05L	CN-04Y212-48643-38E-0145	FCC DoC Approved
4	HUB	AVSYS	110H8	01-20E-000002	FCC DoC Approved

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	10m RJ45 UTP cable
2	10m RJ45 UTP cable
3	NA
4	10m RJ45 UTP cable x 3

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

4 TEST TYPES AND RESULTS

4.1 RADIATED EMISSION MEASUREMENT

4.1.1 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.

4.1.2 TEST INSTRUMENTS

For frequency below 1 GHz:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
Test Receiver ROHDE & SCHWARZ	ESCI	100424	Jul. 27, 2008
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100041	Feb. 26, 2008
BILOG Antenna SCHWARZBECK	VULB9168	9168-160	May 31, 2008
HORN Antenna SCHWARZBECK	9120D	9120D-209	Jun. 28, 2008
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170243	Dec. 24, 2008
Preamplifier Agilent	8447D	2944A10633	Oct. 28, 2008
Preamplifier Agilent	8449B	3008A01964	Oct. 23, 2008
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	283402/4	Dec. 06, 2008
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	251644/4	Dec. 06, 2008
Software ADT.	ADT_Radiated_V7.6	NA	NA
Antenna Tower inn-co GmbH	MA 4000	013303	NA
Antenna Tower Controller inn-co GmbH	CO2000	017303	NA
Turn Table ADT.	TT100.	TT93021703	NA
Turn Table Controller ADT.	SC100.	SC93021703	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 HwaYa Chamber 3.

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

4. The VCCI Site Registration No. is R-237.

5. The IC Site Registration No. is IC3789B-3.

For frequency above 1 GHz:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
*ADVANTEST Spectrum Analyzer	R3271A	85060311	July 15, 2008
*HP Pre_Amplifier	8449B	3008A01922	Oct. 04, 2008
*ROHDE & SCHWARZ Test Receiver	ESCS 30	841977/002	Nov. 12, 2008
* SCHAFFNER(CHASE) Broadband Antenna	CBL6112B	2798	Aug. 10, 2008
*Schwarzbeck Horn_Antenna	BBHA9120-D1	D123	Oct. 04, 2008
Schwarzbeck Horn_Antenna	BBHA 9170	BBHA9170153	Jan. 25, 2008
*RF Switches	MP59B	6100175593	Aug. 10, 2008
*RF Cable(CHASE)	9913-30M N-N Cable	STBCAB-30M-1G Hz	Aug. 10, 2008
*Software	ADT_Radiated_V7.6.15.8	NA	NA
*CHANCE MOST Antenna Tower	AT-100	CM-A007	NA
*CHANCE MOST Turn Table	TC-008	CM-T007	NA
*CORCOM AC Filter	MRI2030	024/019	NA

NOTE: 1. The calibration interval of the above test instruments is 12 months (36 months for Periodic Antenna) and the calibrations are traceable to NML/ROC and NIST/USA.
2. * = These equipment are used for the final measurement.
3. The horn antenna, HP preamplifier (model: 8449B) and Spectrum Analyzer (model: R3271A) are used only for the measurement of emission frequency above 1GHz if tested.
4. The test was performed in ADT Open Site No. B.
5. The VCCI Site Registration No. is R-847.
6. The FCC Site Registration No. is 92753.
7. The CANADA Site Registration No. is IC 4824A-2.

4.1.3 TEST PROCEDURES

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meters semi-anechoic chamber and open site. The table was rotated 360 degrees to determine the position of the highest radiation.

b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

c. The antenna is a broadband antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

f. If the emission level of the EUT in peak mode was lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions would be re-tested one by one using peak, quasi-peak method or average method as specified and then reported in data sheet.

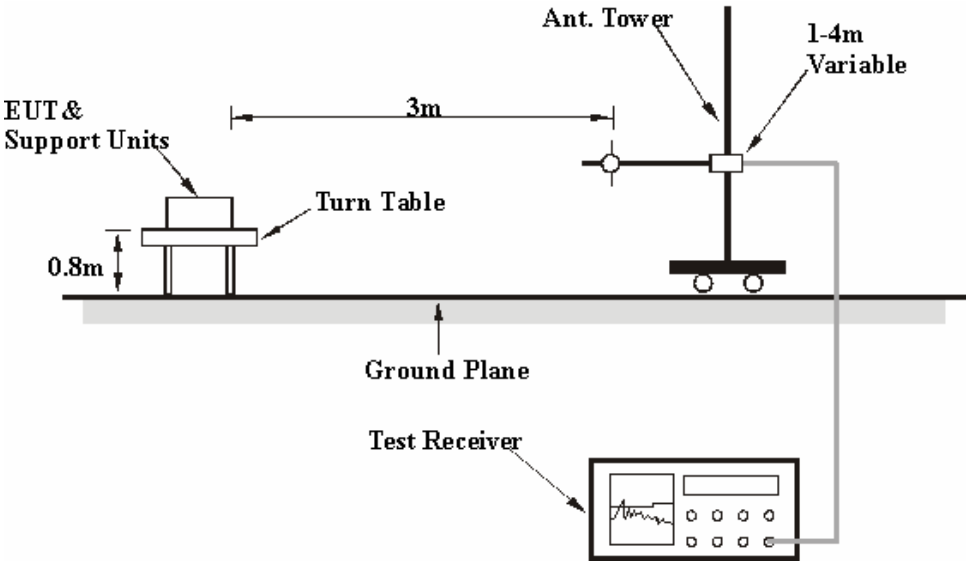
NOTE:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Peak detection (PK) and Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and video bandwidth is 3MHz for Peak detection 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. All modes of operation were investigated and the worst-case emissions are reported.

4.1.4 DEVIATION FROM TEST STANDARD

No deviation.

4.1.5 TEST SETUP



For the actual test configuration, please refer to the attached file (Test Setup Photo).

4.1.6 EUT OPERATING CONDITIONS

a. Placed the EUT on the testing table.
b. Prepared other notebook systems to act as a communication partners and placed them outside of testing area.
c. The communication partners run a test program (provided by manufacturer) to enable EUT under transmission condition continuously at specific channel frequency via an RJ45 cable.
d. The communication partner sent data to EUT by command "PING".

4.1.7 TEST RESULTS

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	18deg. C, 72%RH 1016hPa	TESTED BY	Sky Liao

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	2364.88	57.87 PK	74.00	-16.13	1.72 H	35	27.59	30.28
2	2364.88	46.30 AV	54.00	-7.70	1.72 H	35	16.02	30.28
3	*2412.00	103.60 PK			1.72 H	35	73.11	30.49
4	*2412.00	98.90 AV			1.72 H	35	68.41	30.49
5	4824.00	52.30 PK	74.00	-21.70	1.77 H	337	16.61	35.69
6	4824.00	48.00 AV	54.00	-6.00	1.77 H	337	12.31	35.69
7	7236.00	53.40 PK	74.00	-20.60	1.24 H	88	11.16	42.24
8	7236.00	42.20 AV	54.00	-11.80	1.24 H	88	-0.04	42.24
9	14472.00	64.80 PK	74.00	-9.20	1.62 H	302	15.57	49.23
10	14472.00	51.00 AV	54.00	-3.00	1.62 H	302	1.77	49.23
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2364.72	63.19 PK	74.00	-10.81	1.02 V	325	32.91	30.28
2	2364.72	53.21 AV	54.00	-0.79	1.02 V	325	22.93	30.28
3	*2412.00	113.90 PK			1.00 V	326	83.41	30.49
4	*2412.00	109.20 AV			1.00 V	326	78.71	30.49
5	4824.00	54.00 PK	74.00	-20.00	1.24 V	324	18.31	35.69
6	4824.00	50.20 AV	54.00	-3.80	1.24 V	324	14.51	35.69
7	7236.00	55.60 PK	74.00	-18.40	1.64 V	106	13.36	42.24
8	7236.00	46.20 AV	54.00	-7.80	1.64 V	106	3.96	42.24
9	14472.00	65.50 PK	74.00	-8.50	1.36 V	110	16.27	49.23
10	**14472.00**	**53.50 AV**	**54.00**	**-0.50**	**1.36 V**	**110**	**4.27**	**49.23**

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

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	18deg. C, 72%RH 1016hPa	TESTED BY	Sky Liao

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	2385.20	57.15 PK	74.00	-16.85	1.00 H	163	26.78	30.37
2	2385.20	46.68 AV	54.00	-7.32	1.00 H	163	16.31	30.37
3	*2437.00	103.20 PK			1.17 H	210	72.59	30.61
4	*2437.00	98.50 AV			1.17 H	210	67.89	30.61
5	2483.50	56.35 PK	74.00	-17.65	1.00 H	162	25.53	30.82
6	2483.50	45.90 AV	54.00	-8.10	1.00 H	162	15.08	30.82
7	4874.00	52.00 PK	74.00	-22.00	1.72 H	333	16.20	35.80
8	4874.00	46.80 AV	54.00	-7.20	1.72 H	333	11.00	35.80
9	7311.00	54.80 PK	74.00	-19.20	1.20 H	26	12.28	42.52
10	7311.00	42.80 AV	54.00	-11.20	1.20 H	26	0.28	42.52
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	62.59 PK	74.00	-11.41	1.00 V	327	32.20	30.40
2	2390.00	52.09 AV	54.00	-1.91	1.00 V	327	21.70	30.40
3	*2437.00	112.50 PK			1.00 V	37	81.89	30.61
4	*2437.00	108.00 AV			1.00 V	37	77.39	30.61
5	2484.20	64.36 PK	74.00	-9.64	1.00 V	37	33.54	30.82
6	2484.20	53.46 AV	54.00	-0.54	1.00 V	37	22.64	30.82
7	4874.00	54.00 PK	74.00	-20.00	1.00 V	153	18.20	35.80
8	4874.00	49.80 AV	54.00	-4.20	1.00 V	153	14.00	35.80
9	7311.00	55.80 PK	74.00	-18.20	1.64 V	157	13.28	42.52
10	7311.00	44.40 AV	54.00	-9.60	1.64 V	157	1.88	42.52

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 11	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	18deg. C, 72%RH 1016hPa	TESTED BY	Sky Liao

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	2338.96	57.21 PK	74.00	-16.79	1.16 H	195	27.04	30.17
2	2338.96	45.73 AV	54.00	-8.27	1.16 H	195	15.56	30.17
3	*2462.00	102.80 PK			1.16 H	206	72.08	30.72
4	*2462.00	98.30 AV			1.16 H	206	67.58	30.72
5	2483.50	56.26 PK	74.00	-17.74	1.18 H	207	25.44	30.82
6	2483.50	45.52 AV	54.00	-8.48	1.18 H	207	14.70	30.82
7	4924.00	51.80 PK	74.00	-22.20	1.70 H	330	15.90	35.90
8	4924.00	46.30 AV	54.00	-7.70	1.70 H	330	10.40	35.90
9	7386.00	54.20 PK	74.00	-19.80	1.54 H	15	11.40	42.80
10	7386.00	42.50 AV	54.00	-11.50	1.54 H	15	-0.30	42.80
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2339.60	65.02 PK	74.00	-8.98	1.03 V	326	34.85	30.17
2	2339.60	53.12 AV	54.00	-0.88	1.03 V	326	22.95	30.17
3	*2462.00	112.30 PK			1.00 V	36	81.58	30.72
4	*2462.00	107.80 AV			1.00 V	36	77.08	30.72
5	2491.58	64.85 PK	74.00	-9.15	1.00 V	36	34.00	30.85
6	**2491.58**	**53.50 AV**	**54.00**	**-0.50**	**1.00 V**	**36**	**22.65**	**30.85**
7	4924.00	53.50 PK	74.00	-20.50	1.03 V	8	17.60	35.90
8	4924.00	48.60 AV	54.00	-5.40	1.03 V	8	12.70	35.90
9	7386.00	56.80 PK	74.00	-17.20	1.48 V	110	14.00	42.80
10	7386.00	45.40 AV	54.00	-8.60	1.48 V	110	2.60	42.80

REMARKS: 1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).

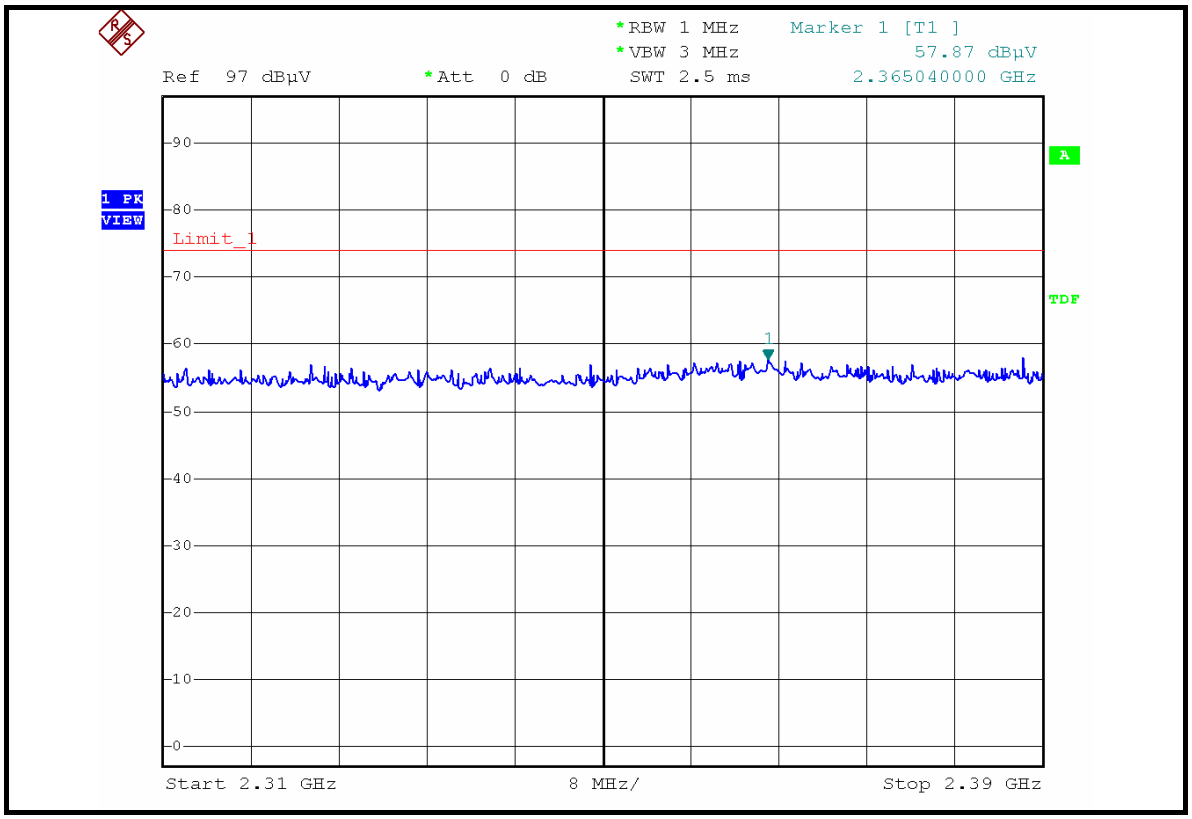
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).

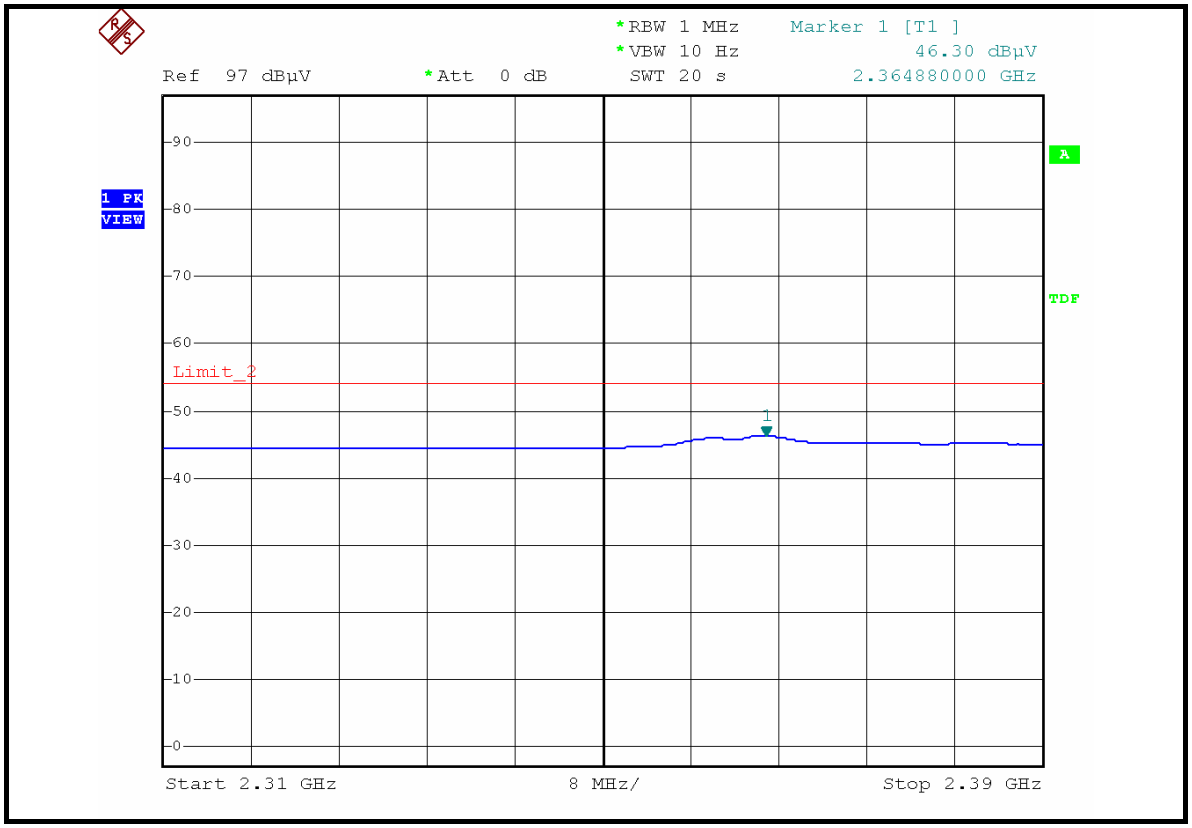
3. The other emission levels were very low against the limit.

4. Margin value = Emission level – Limit value.

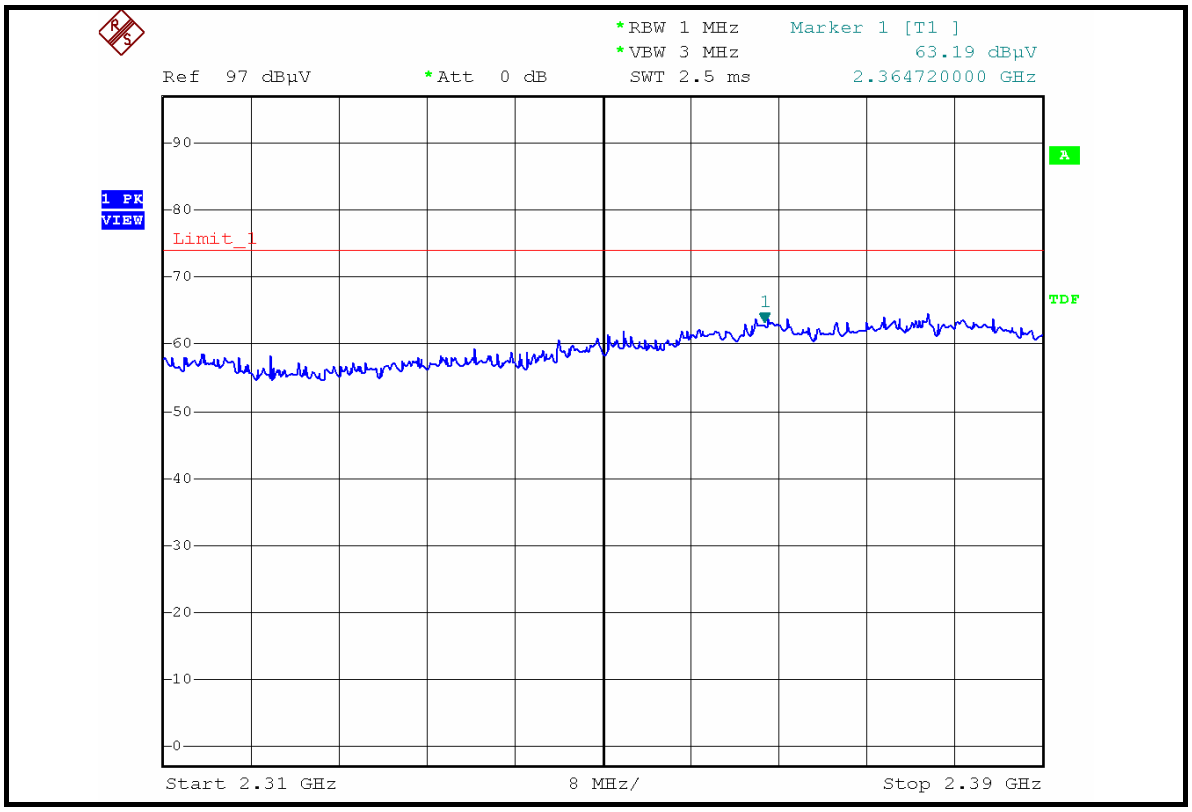
5. " * ": Fundamental frequency.

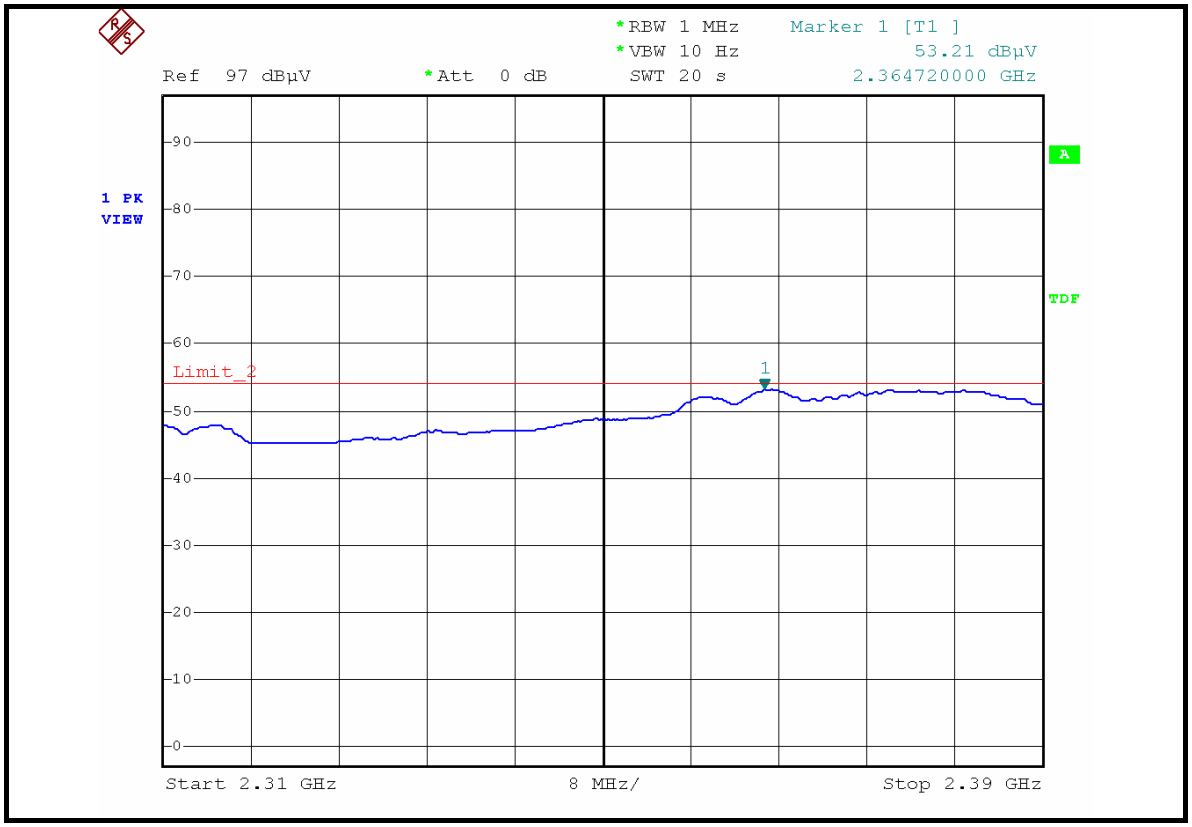
RESTRICTED BANDEDGE (802.11b MODE, CH1, HORIZONTAL)



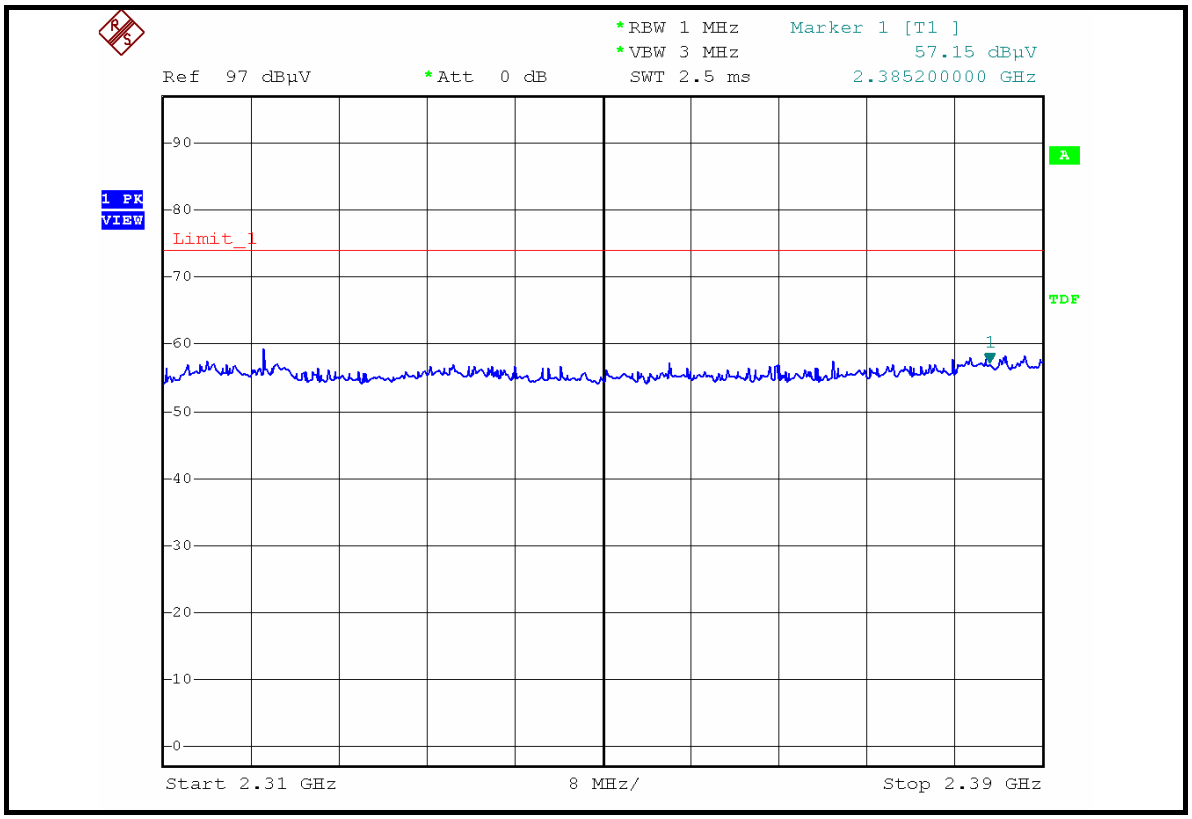


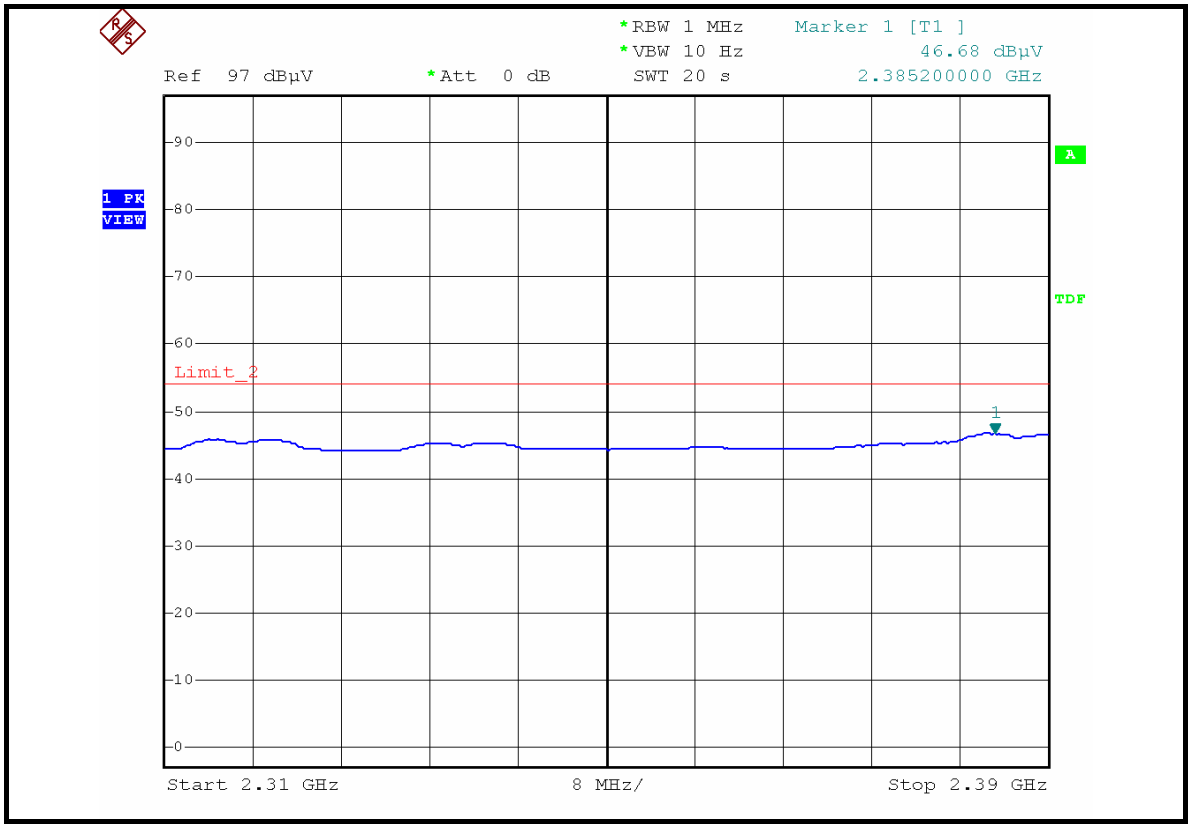
RESTRICTED BANDEDGE (802.11b MODE, CH1, VERTICAL)



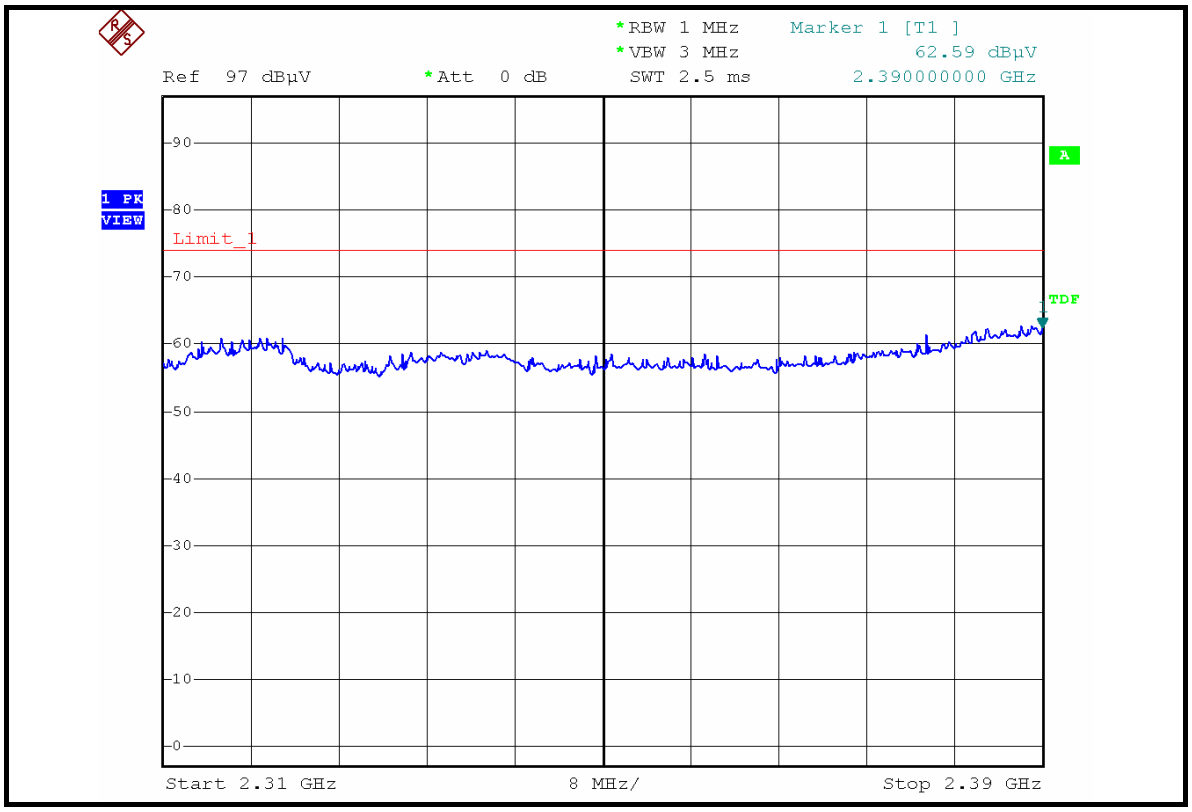


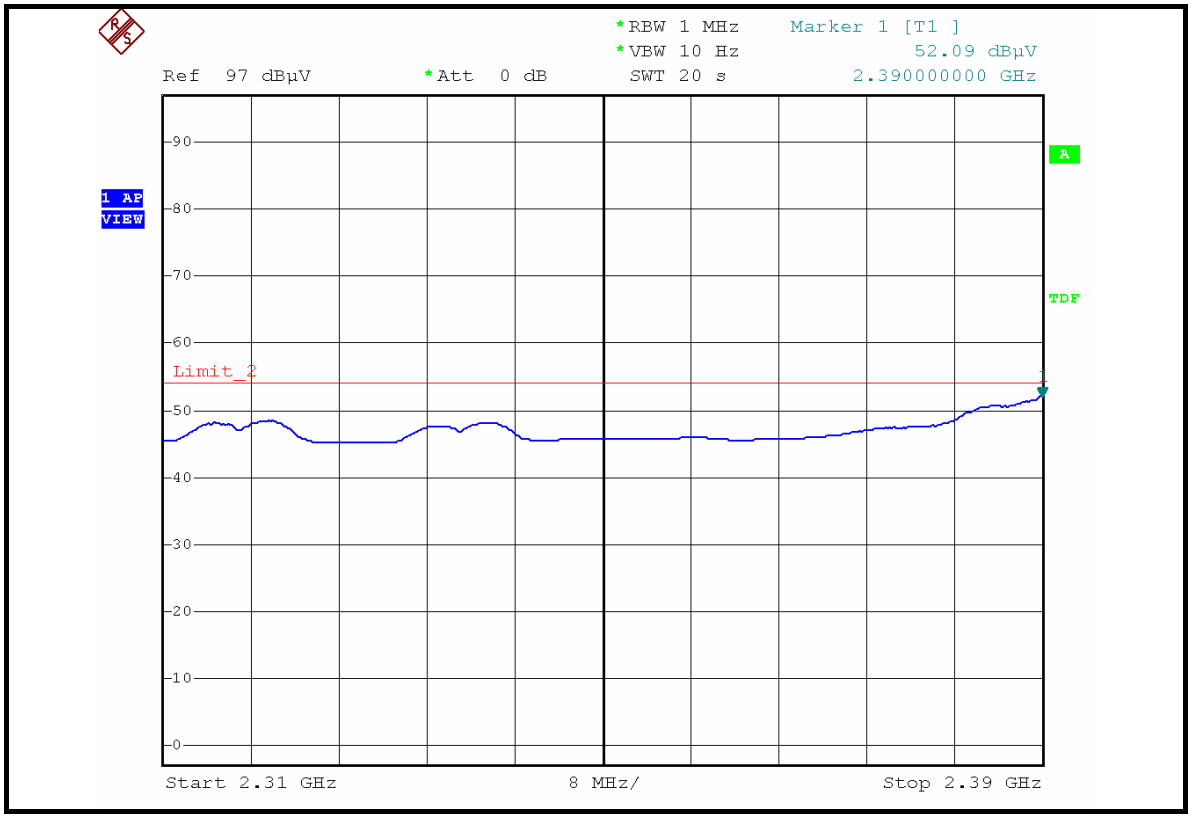
RESTRICTED BANDEDGE (802.11b MODE, CH6, HORIZONTAL)



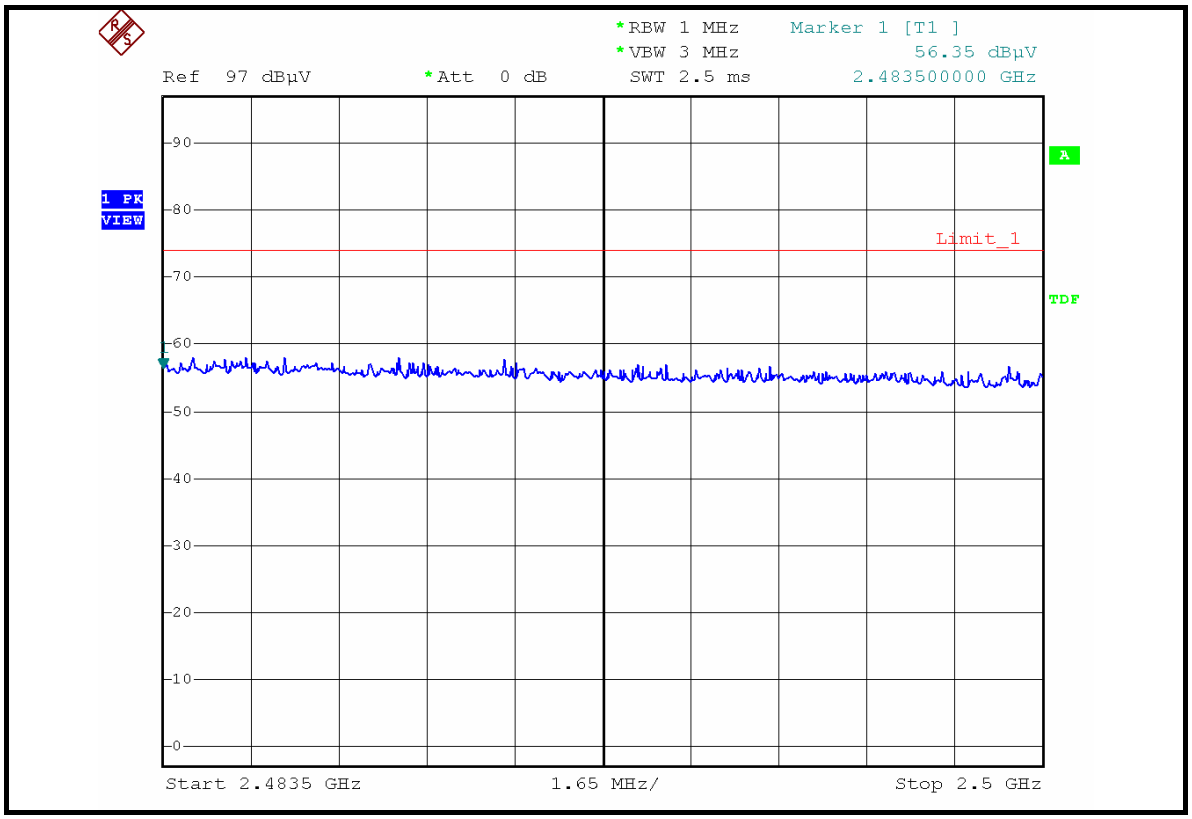


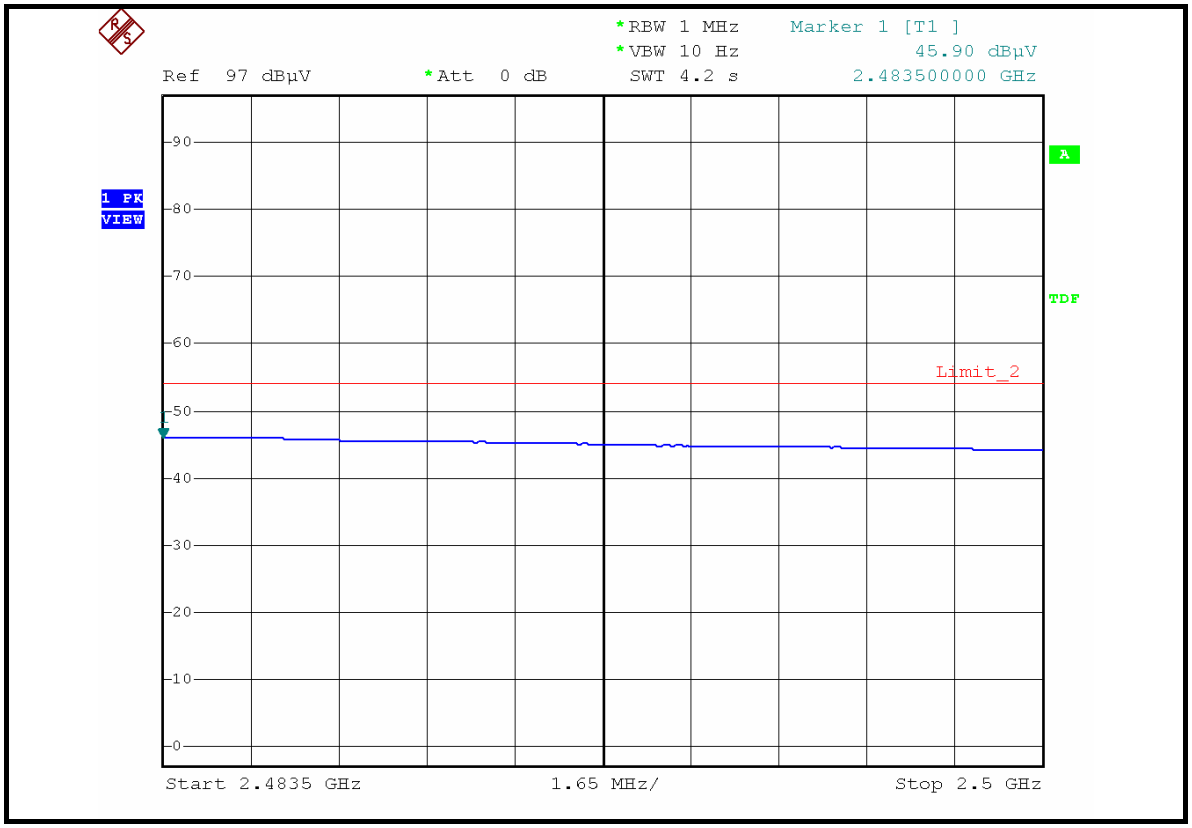
RESTRICTED BANDEDGE (802.11b MODE, CH6, VERTICAL)



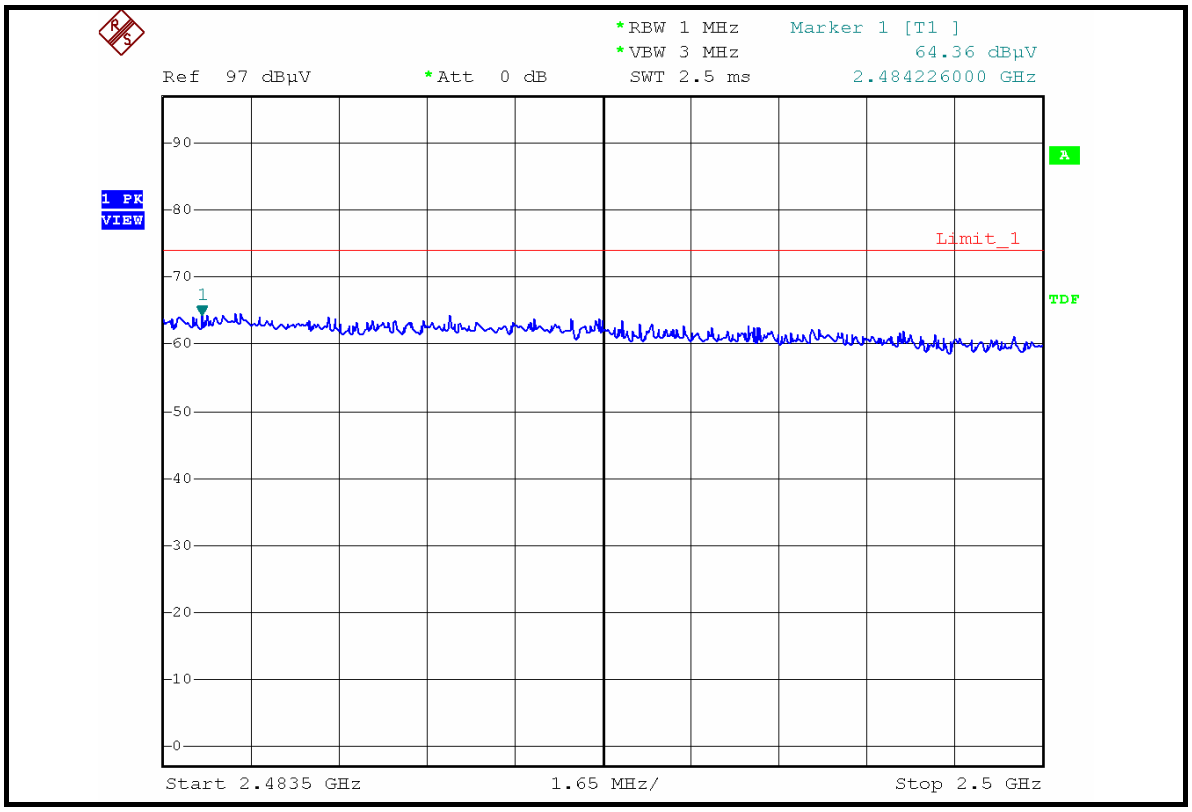


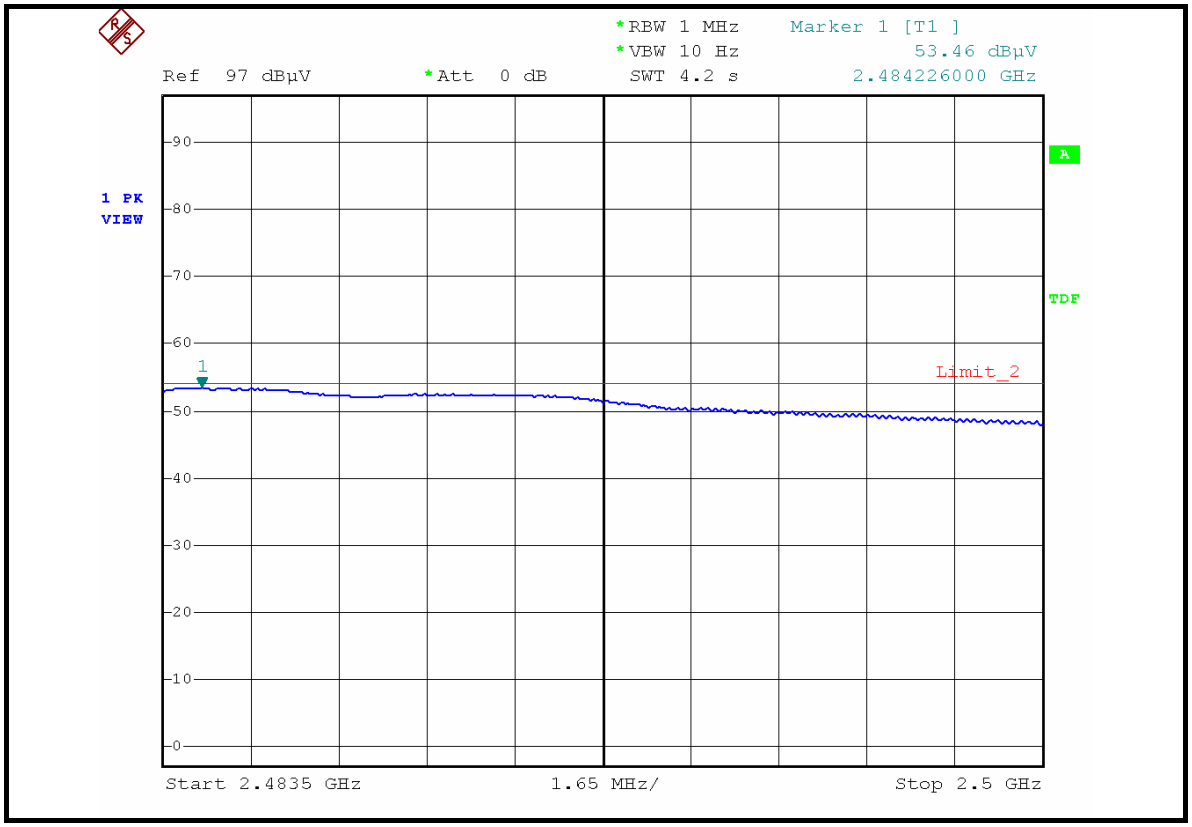
RESTRICTED BANDEDGE (802.11b MODE, CH6, HORIZONTAL)



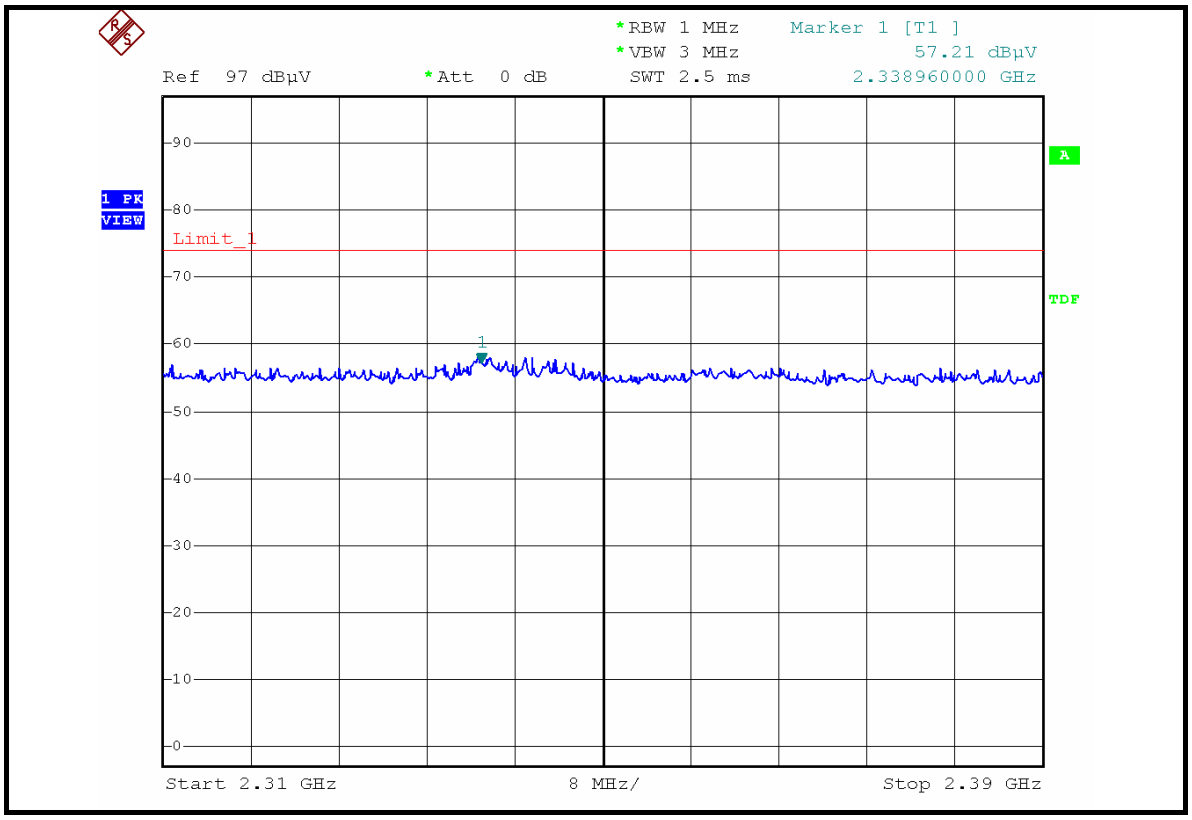


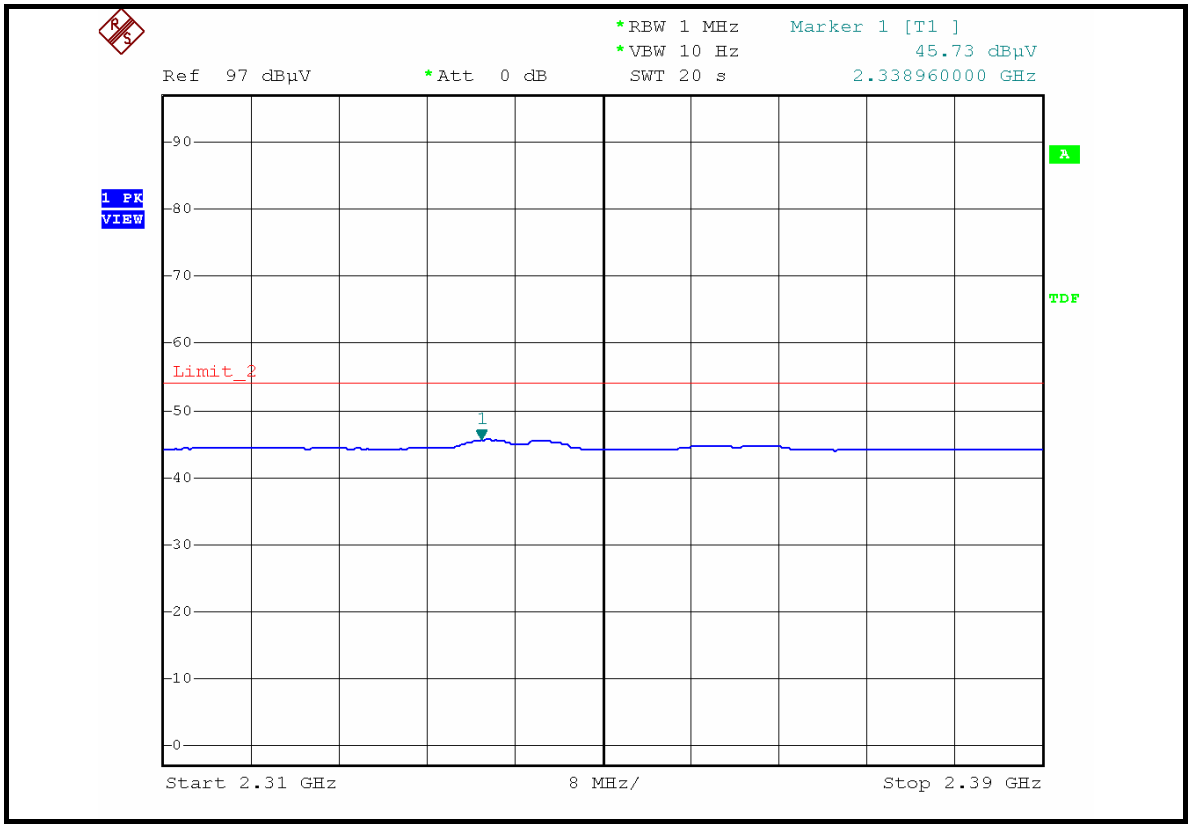
RESTRICTED BANDEDGE (802.11b MODE, CH6, VERTICAL)



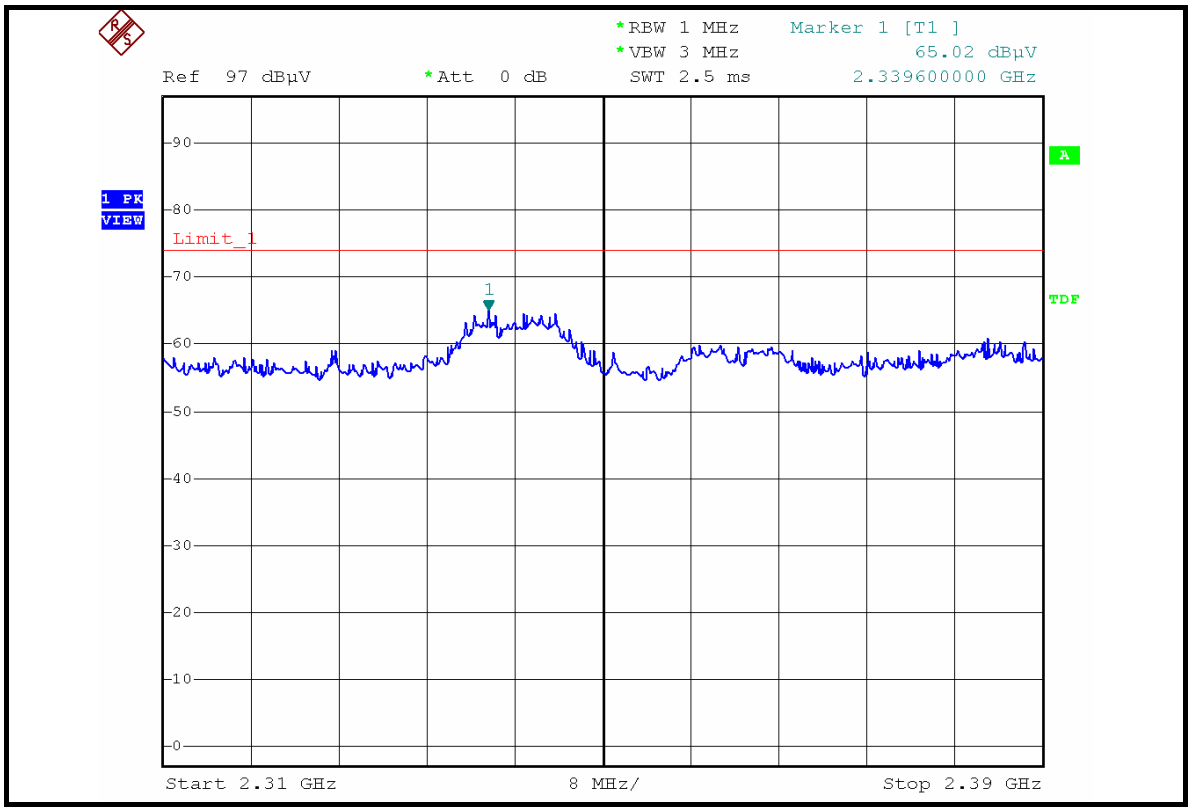


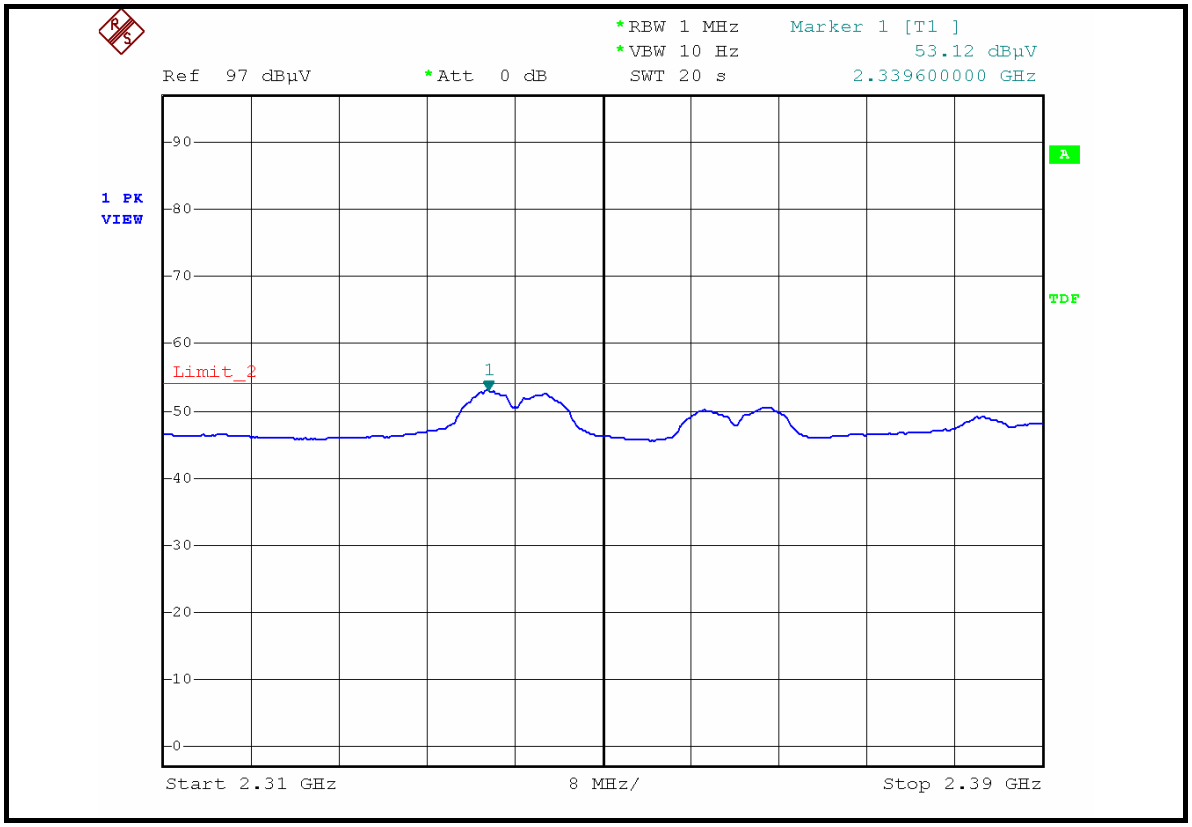
RESTRICTED BANDEDGE (802.11b MODE, CH11, HORIZONTAL)



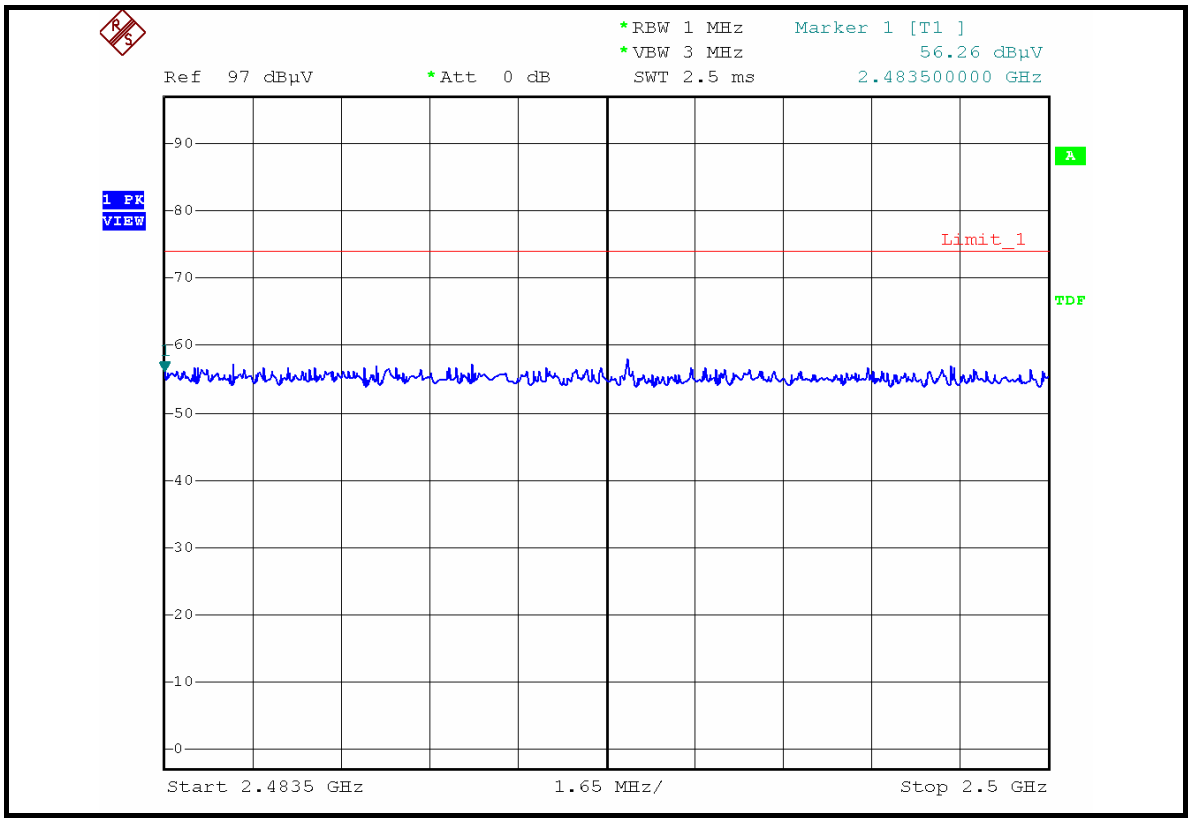


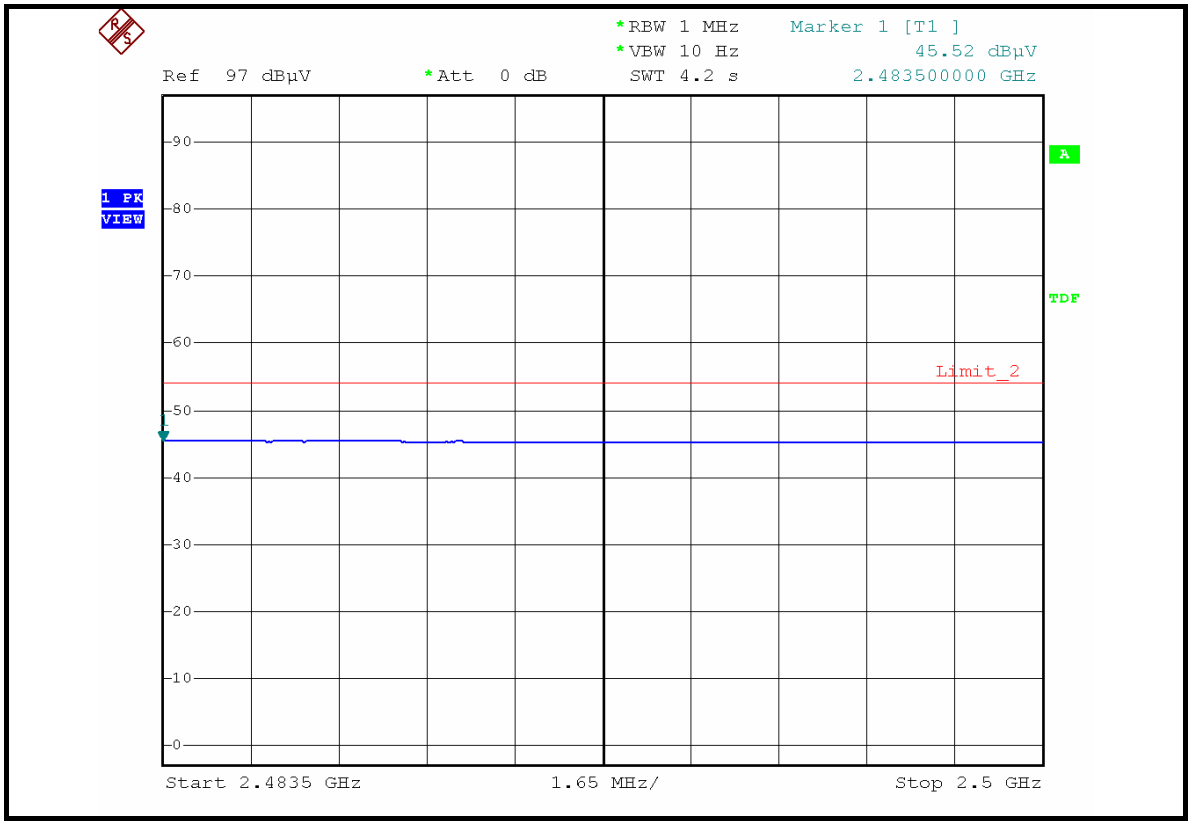
RESTRICTED BANDEDGE (802.11b MODE, CH11, VERTICAL)



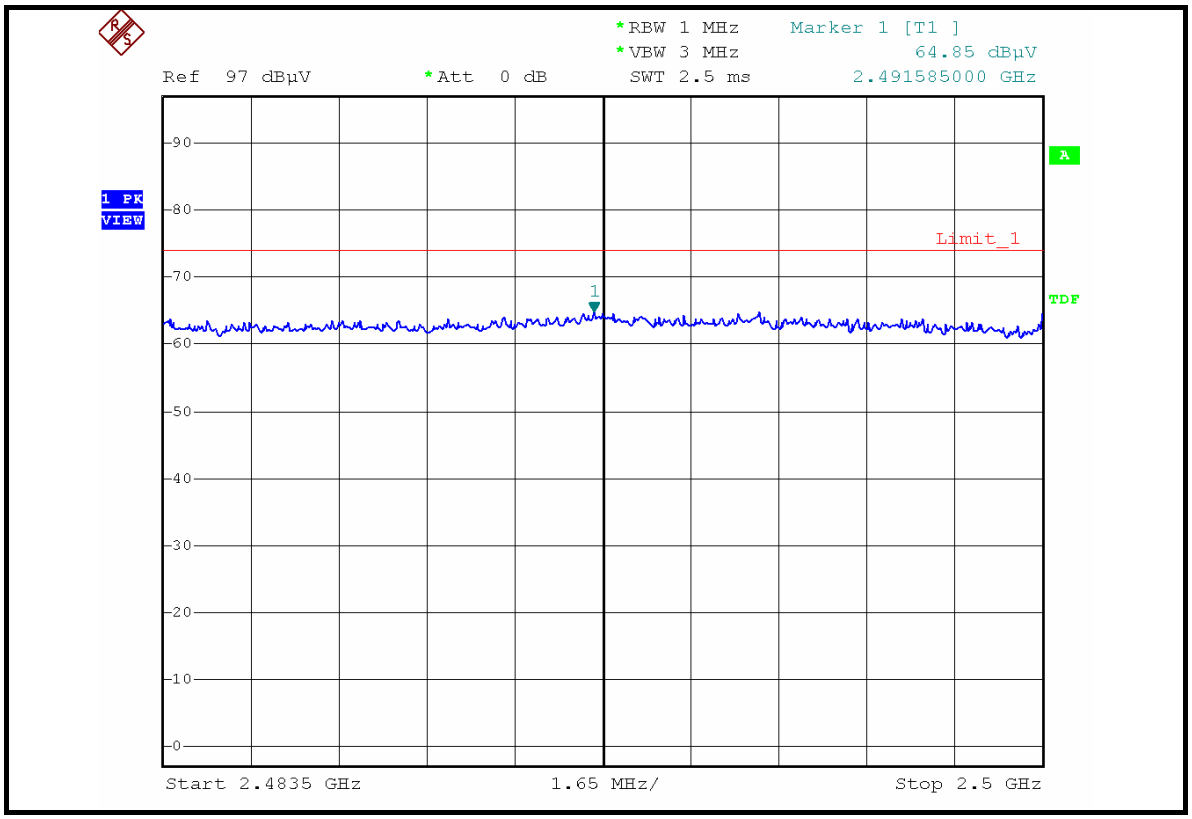


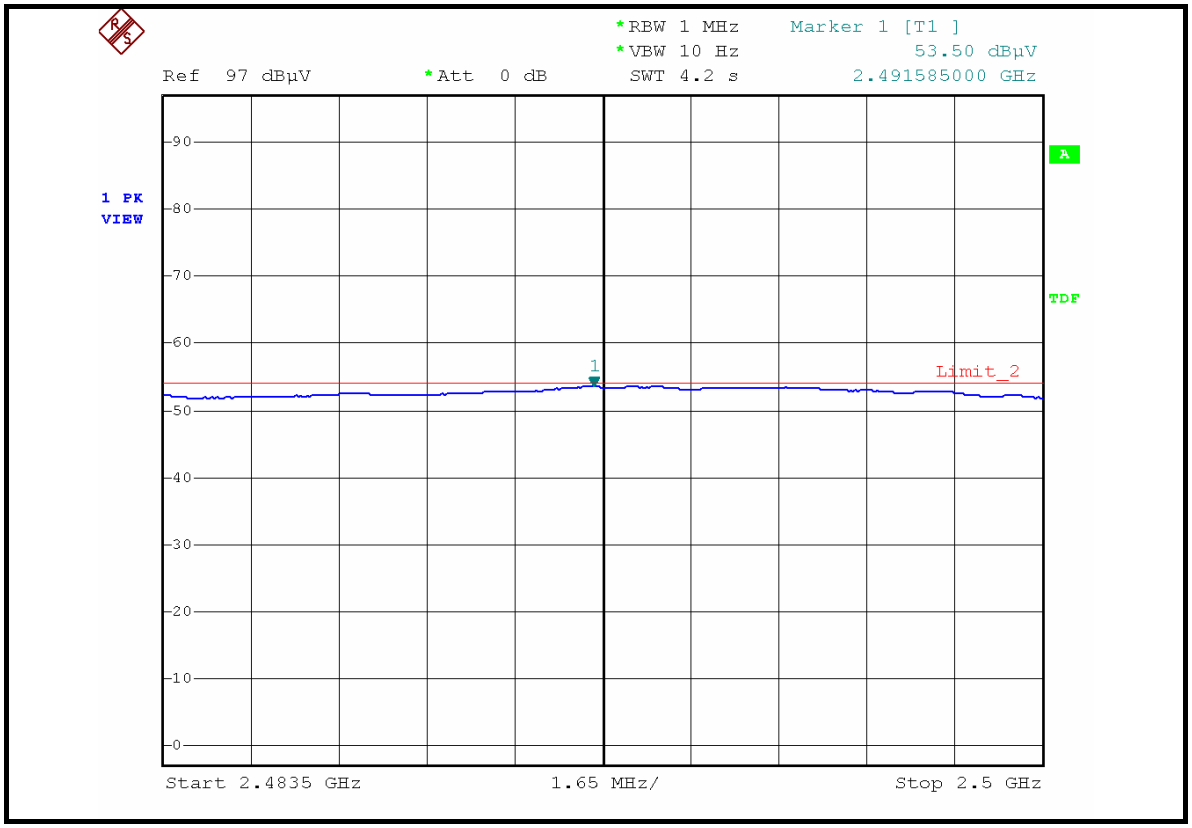
RESTRICTED BANDEDGE (802.11b MODE, CH11, HORIZONTAL)





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	18deg. C, 72%RH 1016hPa	TESTED BY	Sky Liao

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	60.48 PK	74.00	-13.52	1.00 H	193	30.08	30.40
2	2390.00	45.70 AV	54.00	-8.30	1.00 H	193	15.30	30.40
3	*2412.00	102.20 PK			1.00 H	194	71.71	30.49
4	*2412.00	91.50 AV			1.00 H	194	61.01	30.49
5	4824.00	49.20 PK	74.00	-24.80	1.22 H	234	13.51	35.69
6	4824.00	35.20 AV	54.00	-18.80	1.22 H	234	-0.49	35.69
7	7236.00	52.20 PK	74.00	-21.80	1.08 H	28	9.96	42.24
8	7236.00	38.00 AV	54.00	-16.00	1.08 H	28	-4.24	42.24
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	71.73 PK	74.00	-2.27	1.00 V	327	41.34	30.40
2	2390.00	53.00 AV	54.00	-1.00	1.00 V	327	22.60	30.40
3	*2412.00	114.60 PK			1.00 V	327	84.11	30.49
4	*2412.00	102.10 AV			1.00 V	327	71.61	30.49
5	4824.00	51.20 PK	74.00	-22.80	1.22 V	133	15.51	35.69
6	4824.00	38.20 AV	54.00	-15.80	1.22 V	133	2.51	35.69
7	7236.00	52.40 PK	74.00	-21.60	1.16 V	62	10.16	42.24
8	7236.00	38.20 AV	54.00	-15.80	1.16 V	62	-4.04	42.24

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	18deg. C, 72%RH 1016hPa	TESTED BY	Sky Liao

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	56.27 PK	74.00	-17.73	1.03 H	195	25.87	30.40
2	2390.00	44.89 AV	54.00	-9.11	1.03 H	195	14.49	30.40
3	*2437.00	103.20 PK			1.00 H	194	72.59	30.61
4	*2437.00	92.80 AV			1.00 H	194	62.19	30.61
5	2483.50	55.19 PK	74.00	-18.81	1.03 H	195	24.37	30.82
6	2483.50	45.14 AV	54.00	-8.86	1.03 H	195	14.32	30.82
7	4874.00	49.50 PK	74.00	-24.50	1.32 H	220	13.70	35.80
8	4874.00	35.30 AV	54.00	-18.70	1.32 H	220	-0.50	35.80
9	7311.00	52.40 PK	74.00	-21.60	1.16 H	16	9.88	42.52
10	7311.00	38.50 AV	54.00	-15.50	1.16 H	16	-4.02	42.52
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2385.84	64.30 PK	74.00	-9.70	1.00 V	327	33.92	30.38
2	2385.84	52.34 AV	54.00	-1.66	1.00 V	327	21.96	30.38
3	*2437.00	114.30 PK			1.00 V	36	83.69	30.61
4	*2437.00	101.70 AV			1.00 V	36	71.09	30.61
5	2483.50	63.49 PK	74.00	-10.51	1.00 V	36	32.67	30.82
6	2483.50	52.28 AV	54.00	-1.72	1.00 V	36	21.46	30.82
7	4874.00	51.90 PK	74.00	-22.10	1.38 V	144	16.10	35.80
8	4874.00	38.40 AV	54.00	-15.60	1.38 V	144	2.60	35.80
9	7311.00	52.80 PK	74.00	-21.20	1.20 V	74	10.28	42.52
10	7311.00	38.50 AV	54.00	-15.50	1.20 V	74	-4.02	42.52

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 11	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	18deg. C, 72%RH 1016hPa	TESTED BY	Sky Liao

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	101.90 PK			1.00 H	200	71.18	30.72
2	*2462.00	90.80 AV			1.00 H	200	60.08	30.72
3	2483.50	59.93 PK	74.00	-14.07	1.00 H	196	29.11	30.82
4	2483.50	45.24 AV	54.00	-8.76	1.00 H	196	14.42	30.82
5	4924.00	49.20 PK	74.00	-24.80	1.26 H	226	13.30	35.90
6	4924.00	35.00 AV	54.00	-19.00	1.26 H	226	-0.90	35.90
7	7386.00	52.00 PK	74.00	-22.00	1.20 H	20	9.20	42.80
8	7386.00	38.20 AV	54.00	-15.80	1.20 H	20	-4.60	42.80
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	114.00 PK			1.00 V	36	83.28	30.72
2	*2462.00	101.00 AV			1.00 V	36	70.28	30.72
3	2483.50	71.13 PK	74.00	-2.87	1.00 V	36	40.31	30.82
4	2483.50	53.47 AV	54.00	-0.53	1.00 V	36	22.65	30.82
5	4924.00	51.00 PK	74.00	-23.00	1.26 V	138	15.10	35.90
6	4924.00	38.20 AV	54.00	-15.80	1.26 V	138	2.30	35.90
7	7386.00	52.50 PK	74.00	-21.50	1.15 V	78	9.70	42.80
8	7386.00	38.40 AV	54.00	-15.60	1.15 V	78	-4.40	42.80

REMARKS: 1. Emission level (dBuV/m) = Raw Value (dBuV) + Correction Factor (dB/m).

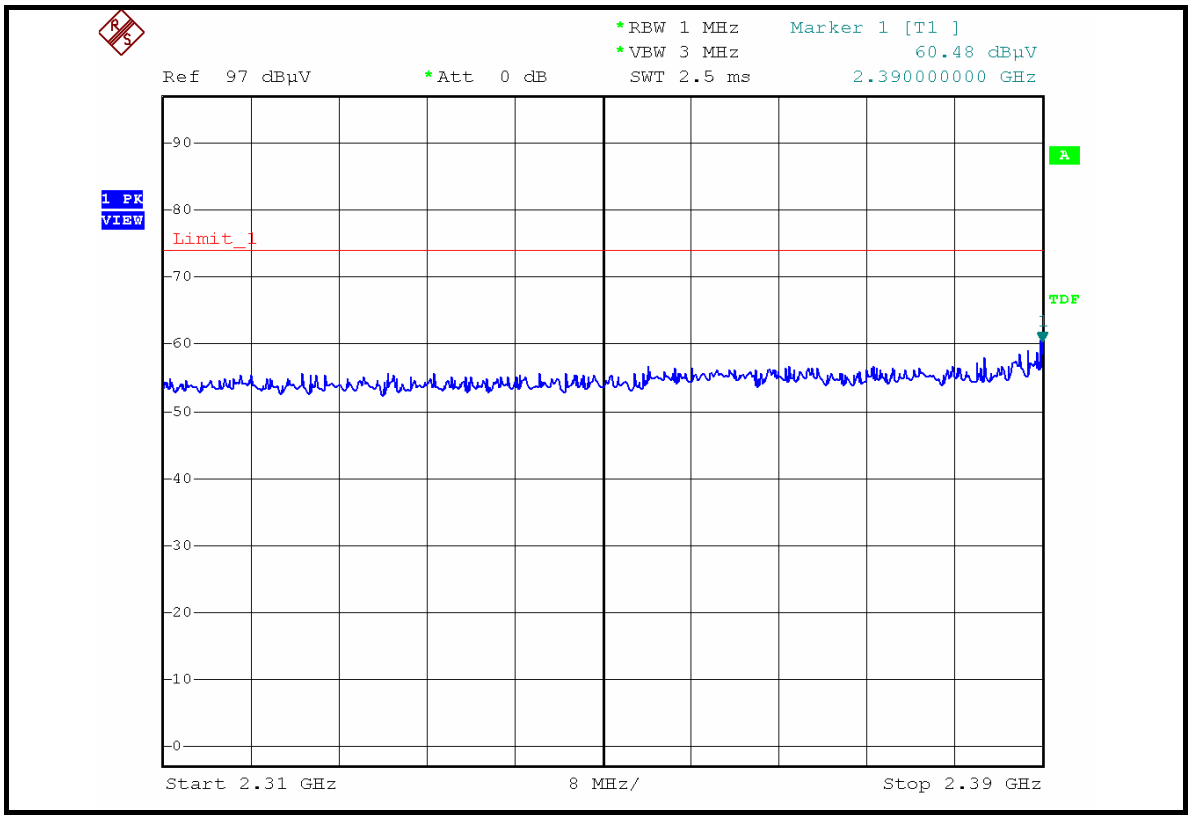
2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).

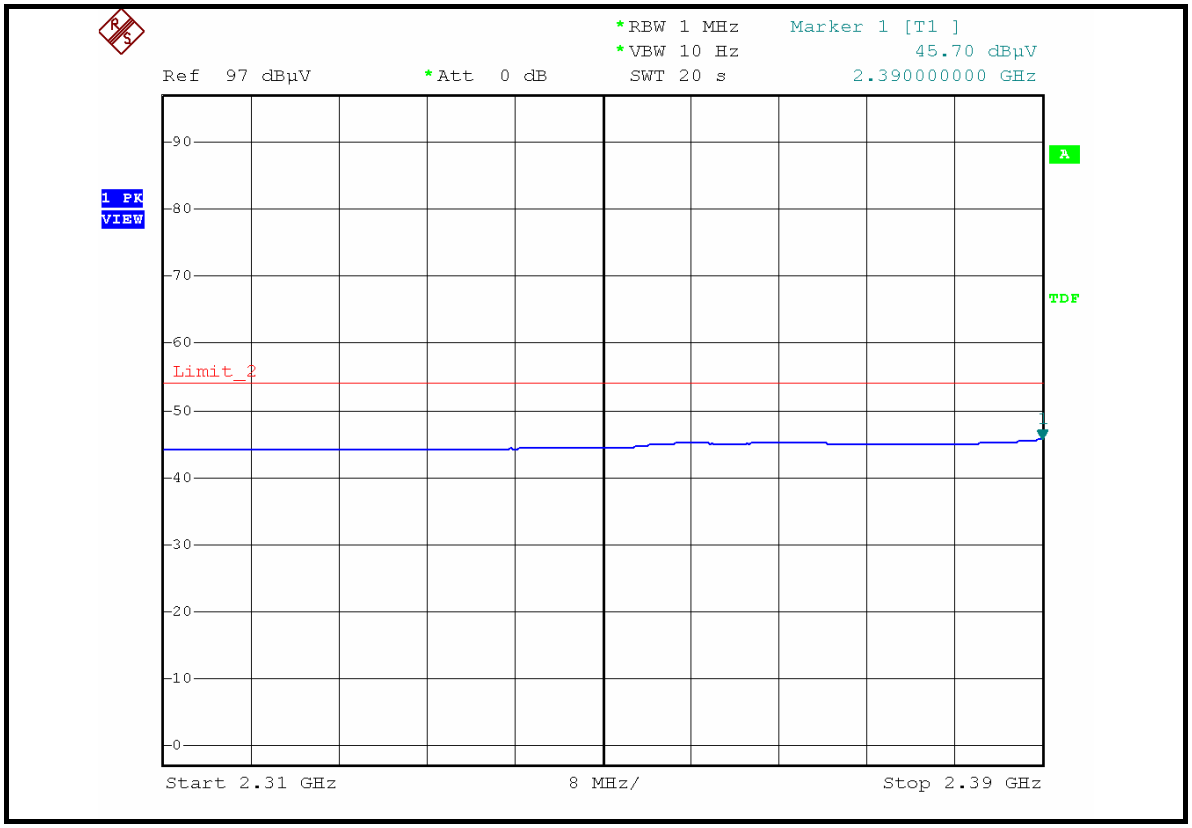
3. The other emission levels were very low against the limit.

4. Margin value = Emission level – Limit value.

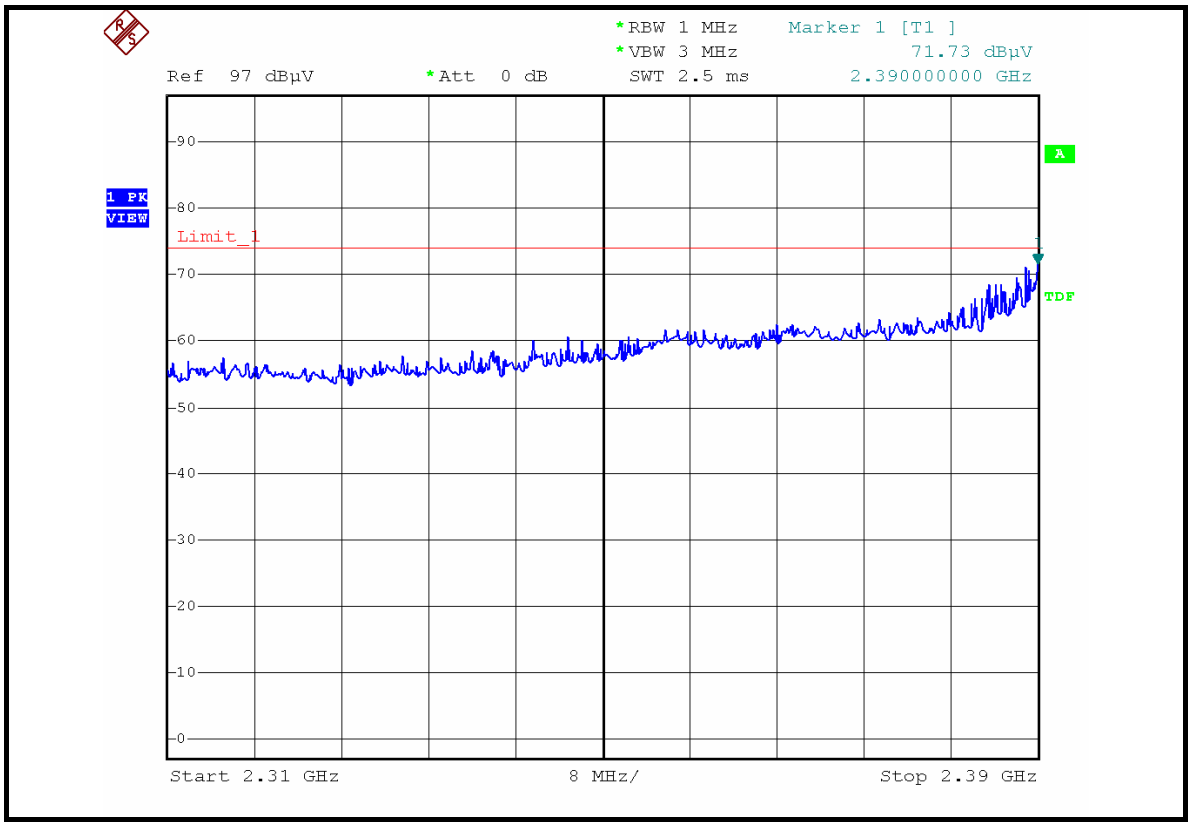
5. " * ": Fundamental frequency.

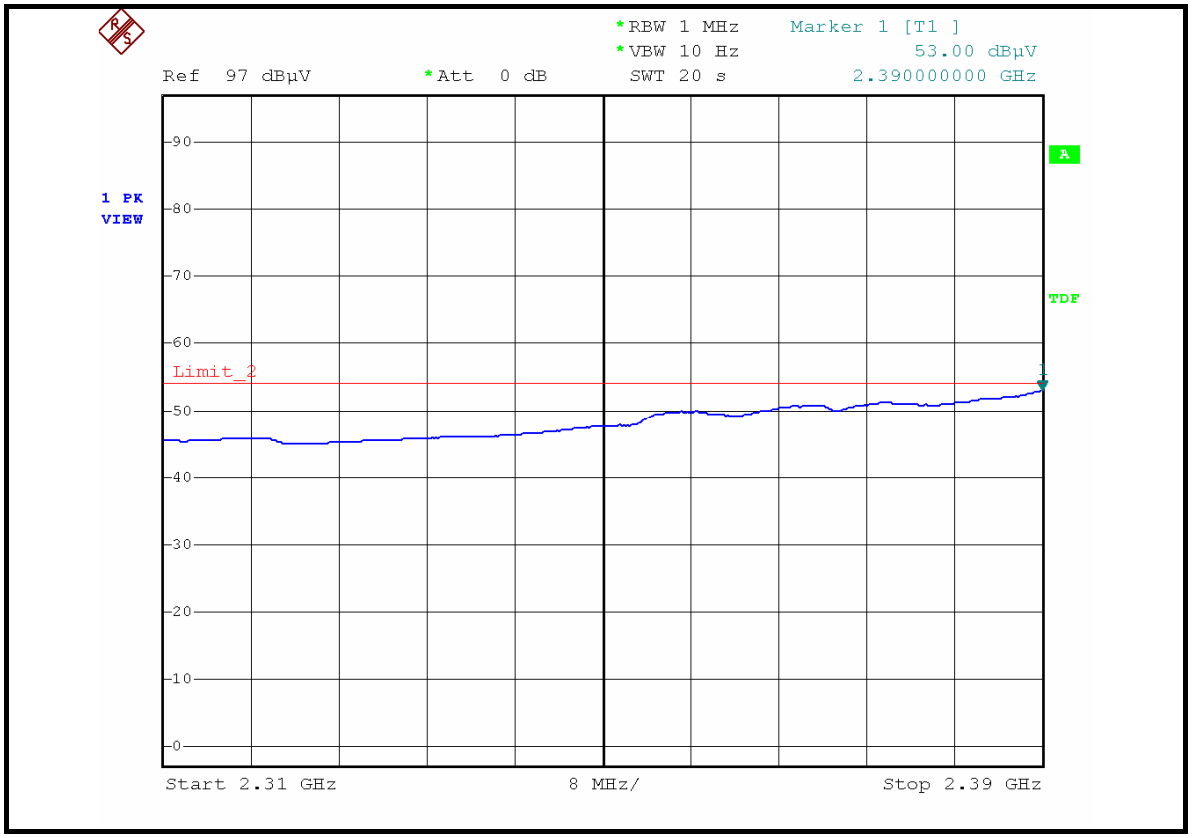
RESTRICTED BANDEDGE (802.11g MODE, CH1, HORIZONTAL)



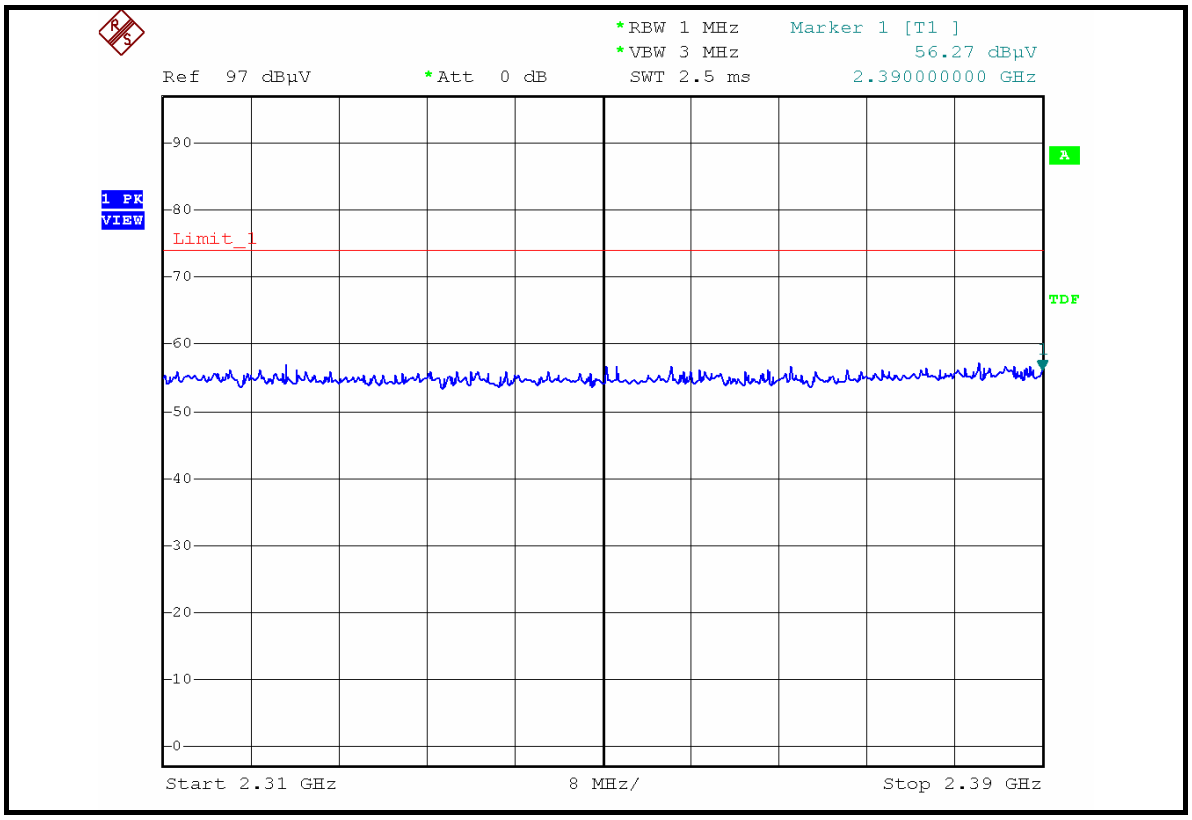


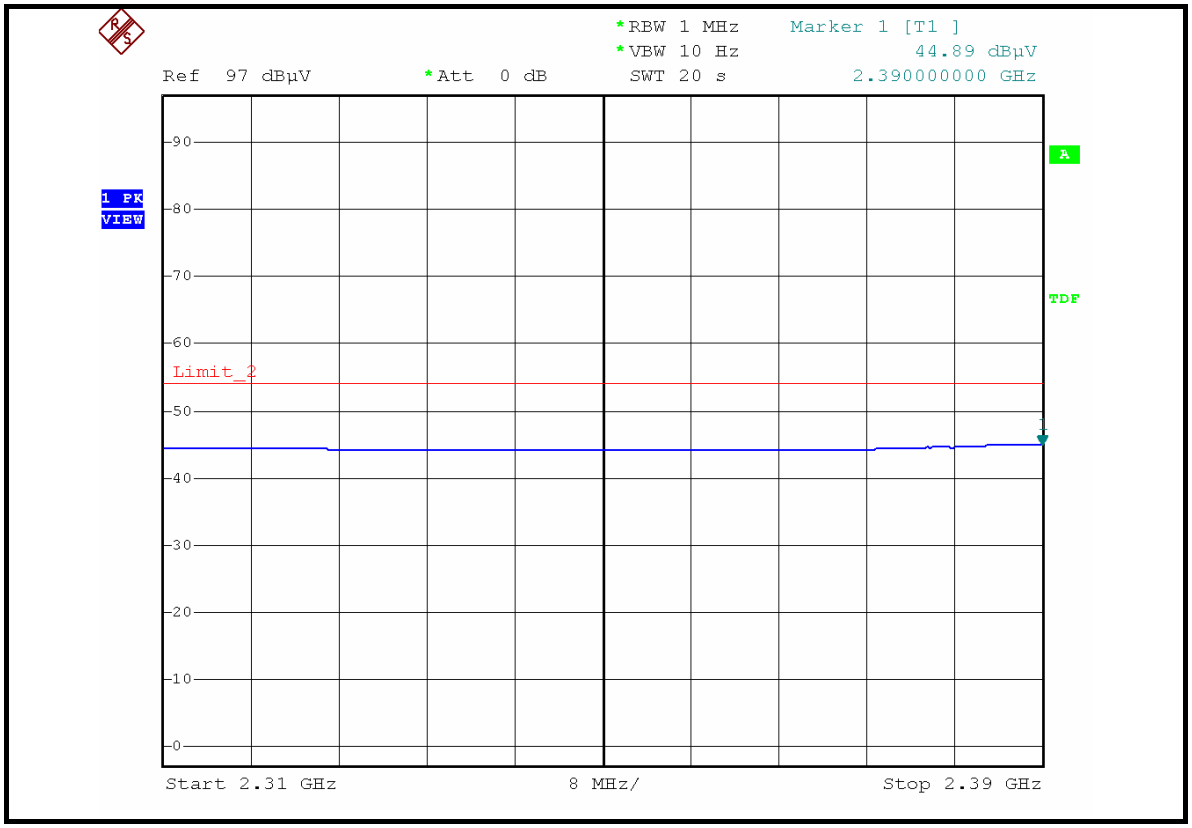
RESTRICTED BANDEDGE (802.11g MODE, CH1, VERTICAL)



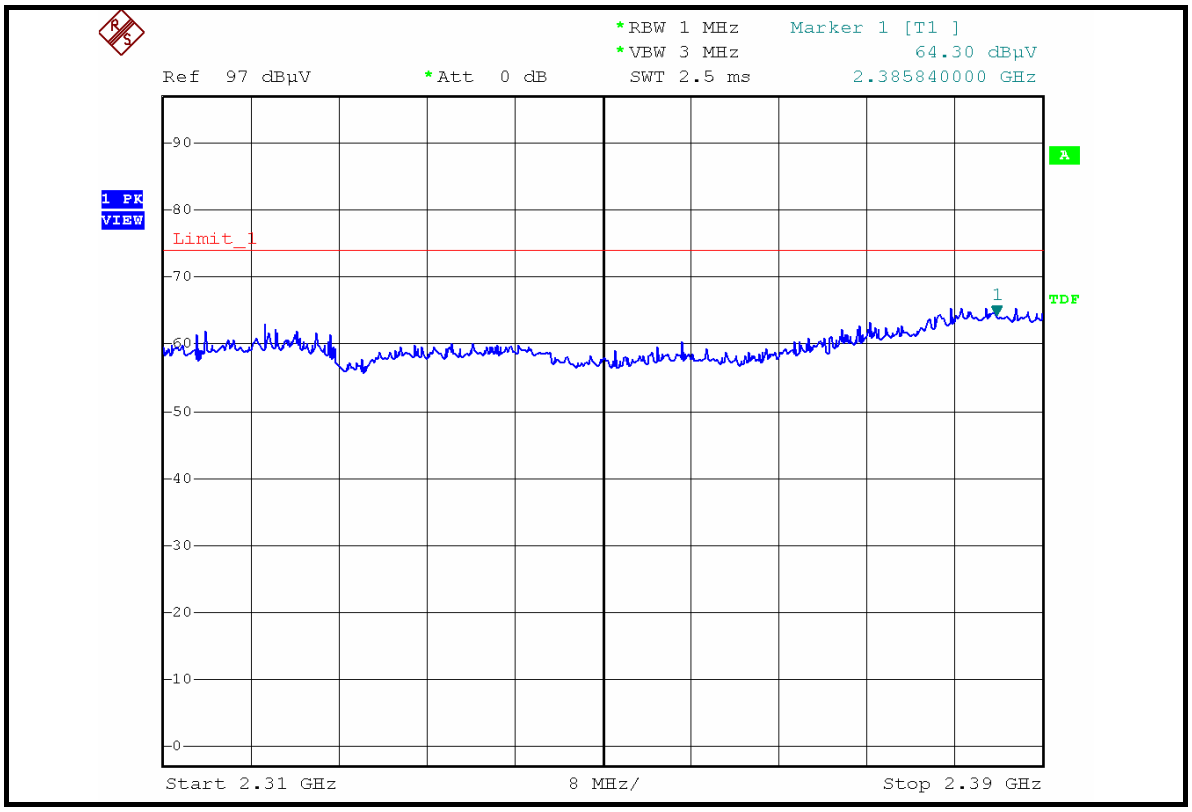


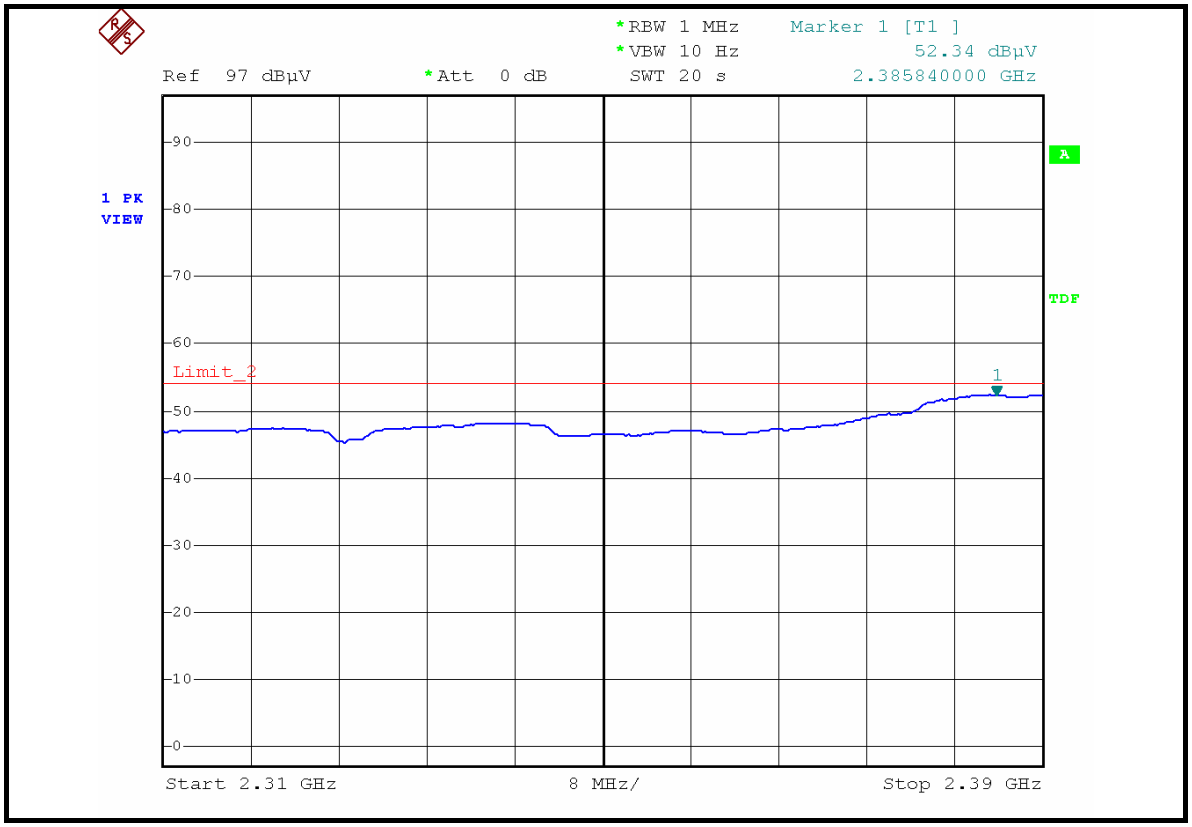
RESTRICTED BANDEDGE (802.11g MODE, CH6, HORIZONTAL)



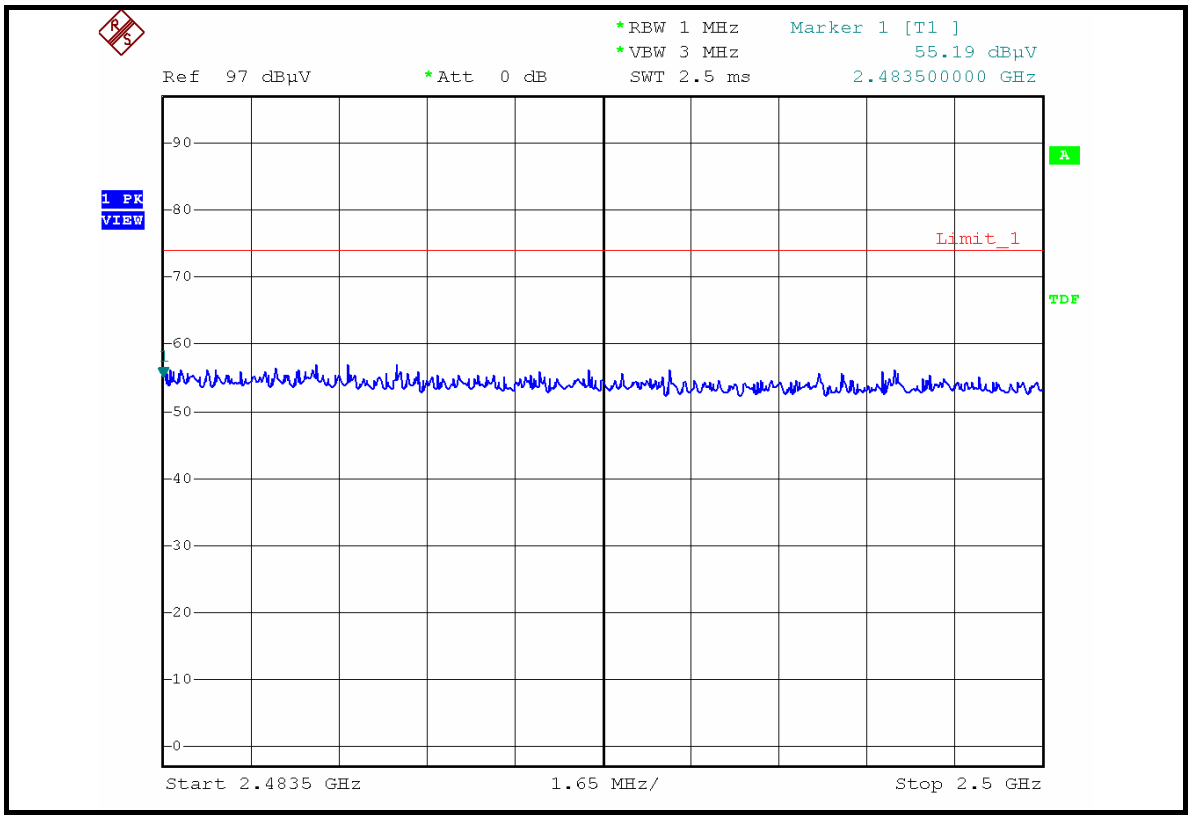


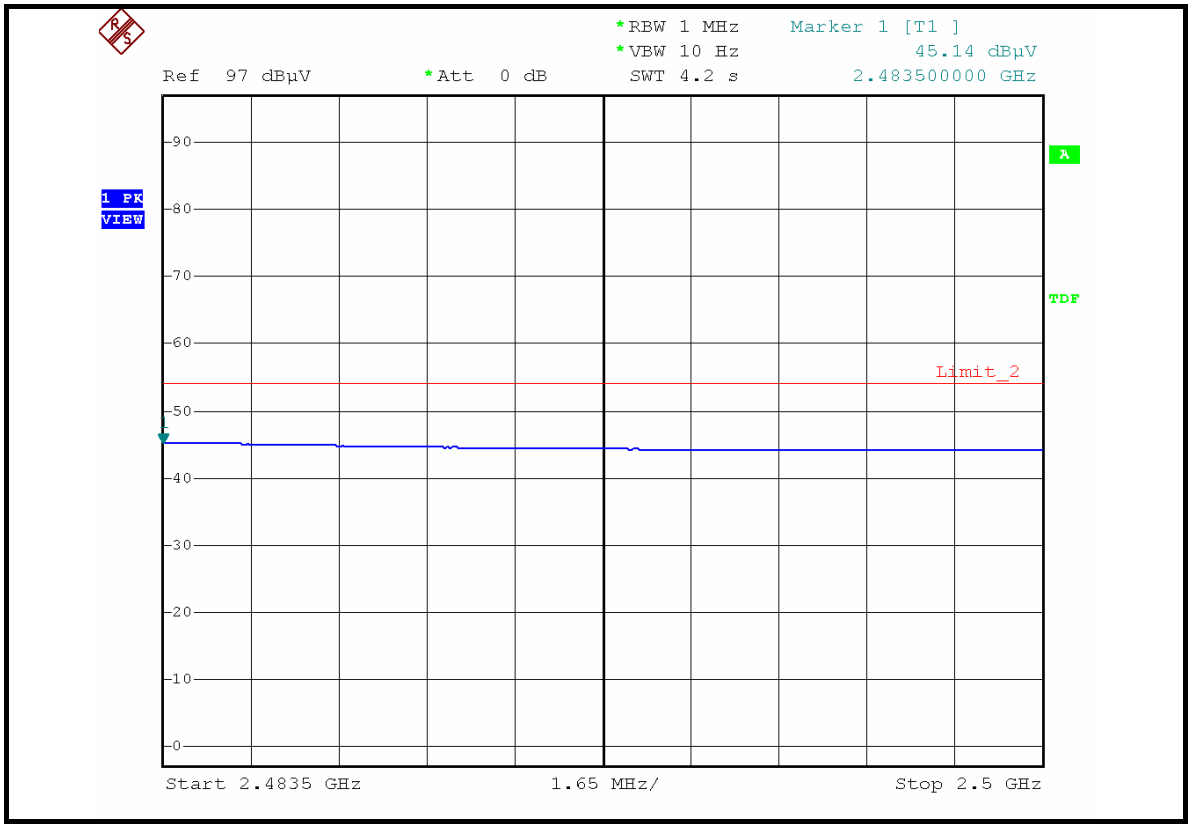
RESTRICTED BANDEDGE (802.11g MODE, CH6, VERTICAL)



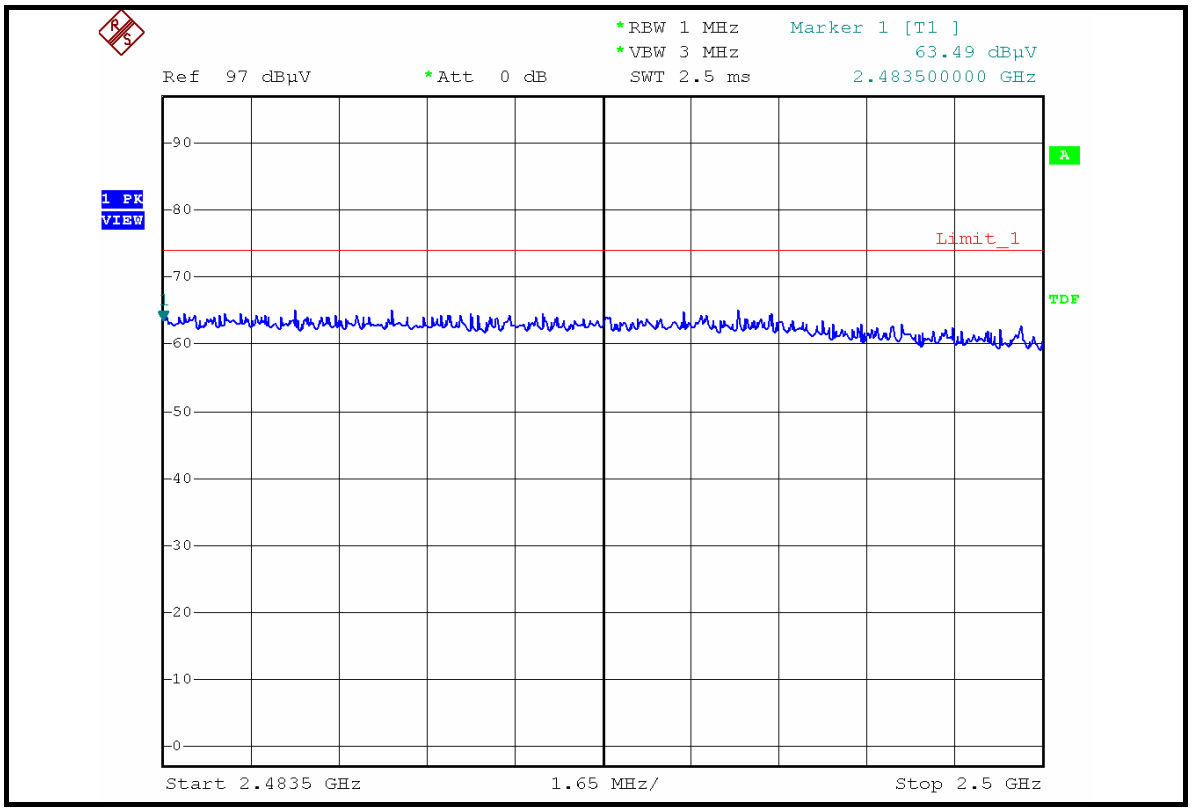


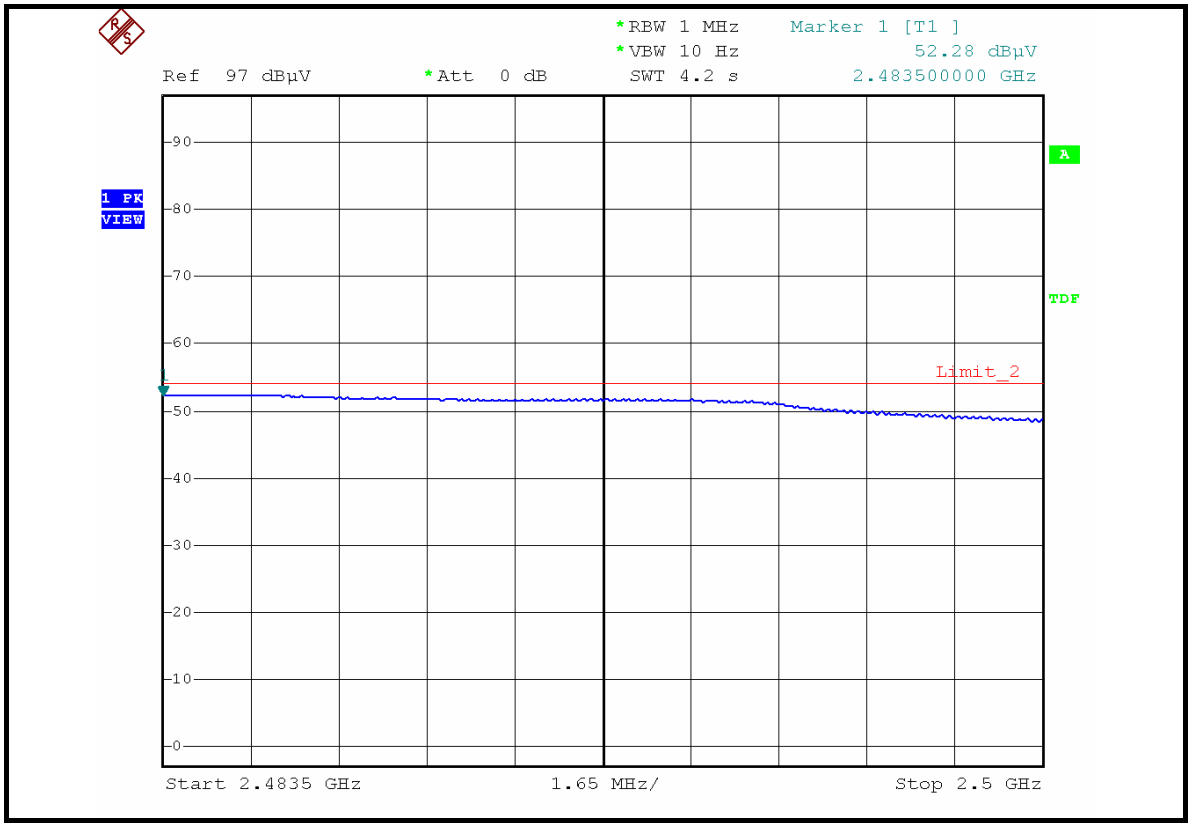
RESTRICTED BANDEDGE (802.11g MODE, CH6, HORIZONTAL)



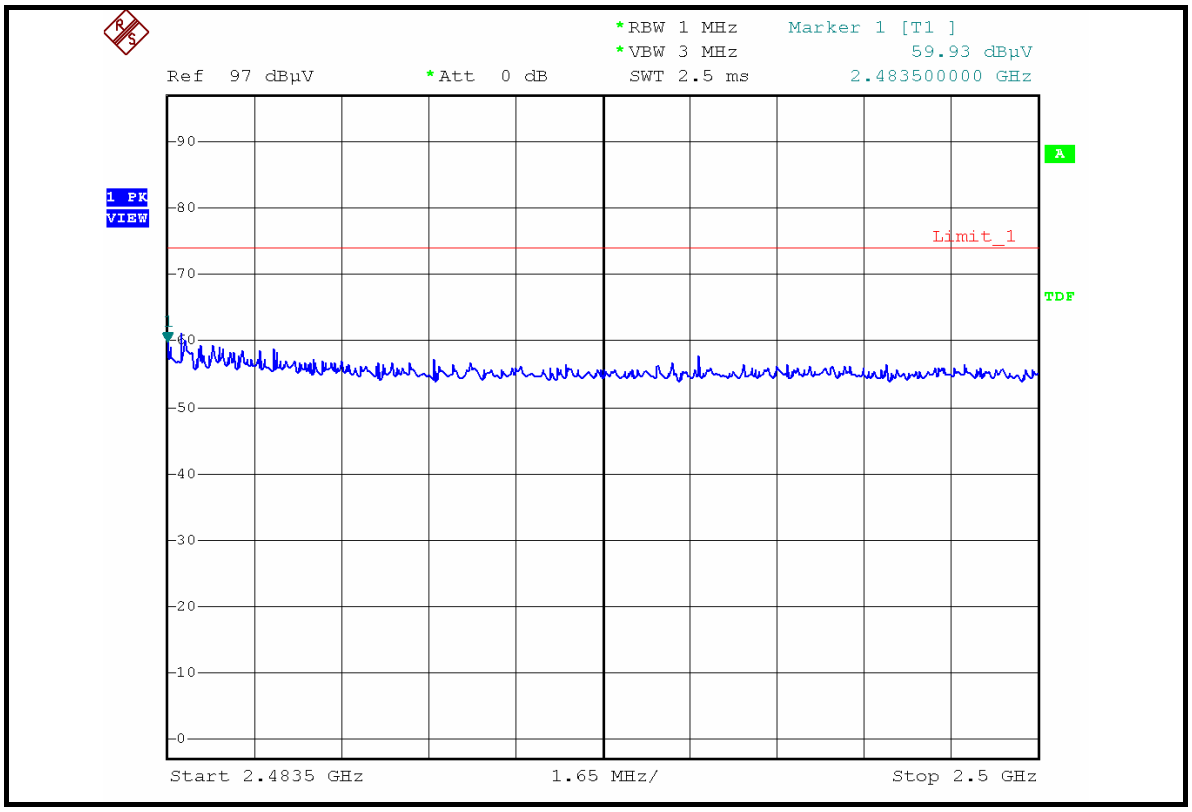


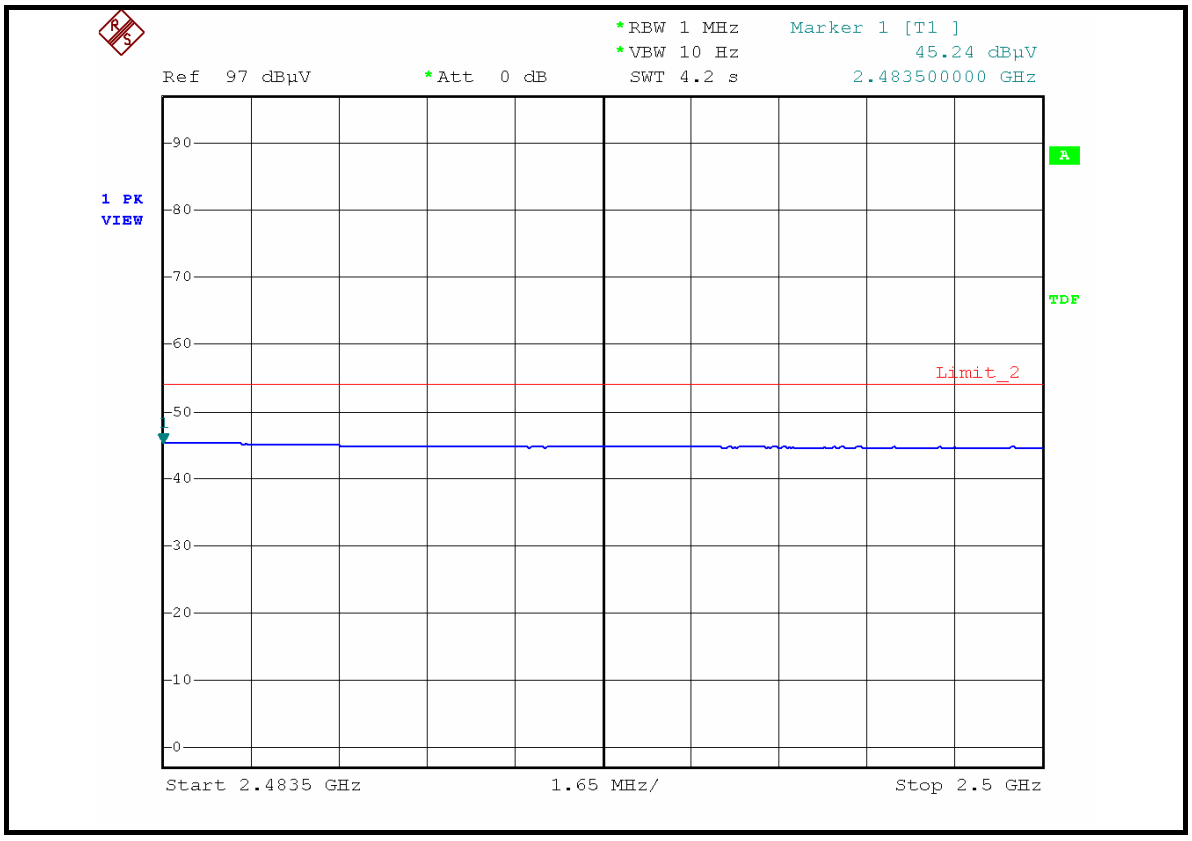
RESTRICTED BANDEDGE (802.11g MODE, CH6, VERTICAL)



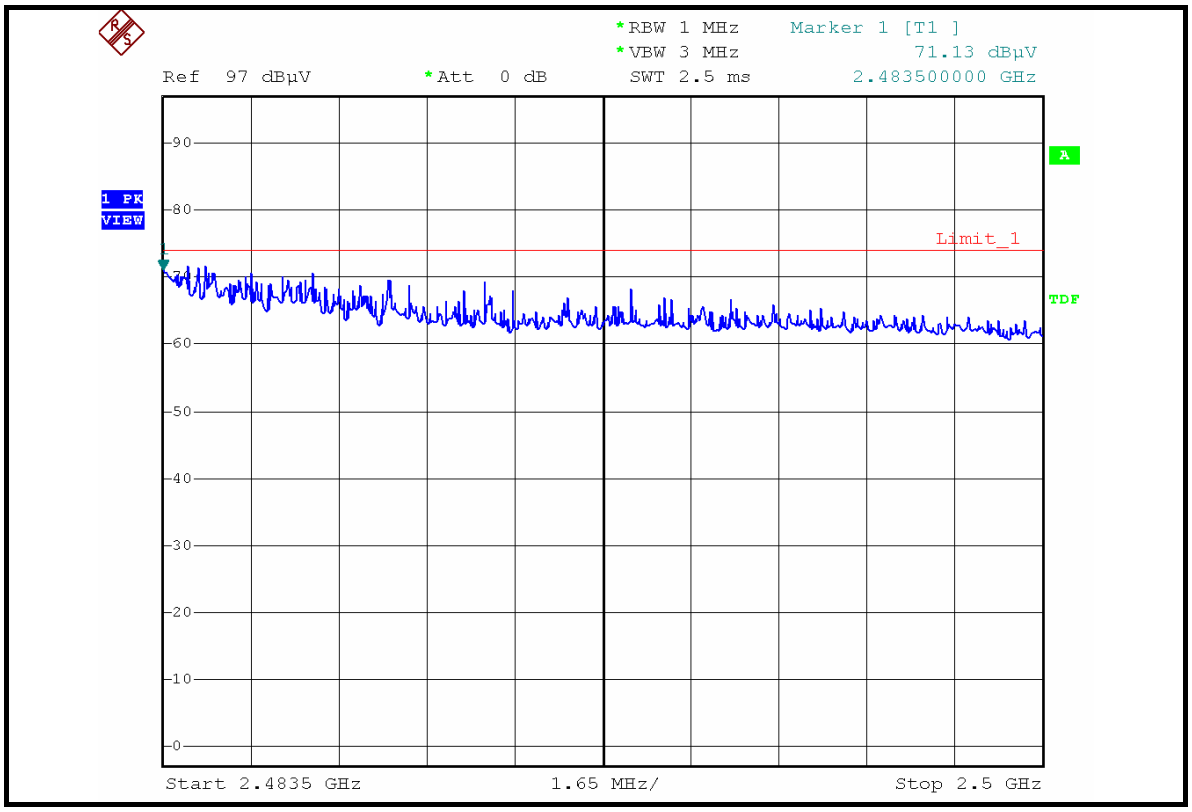


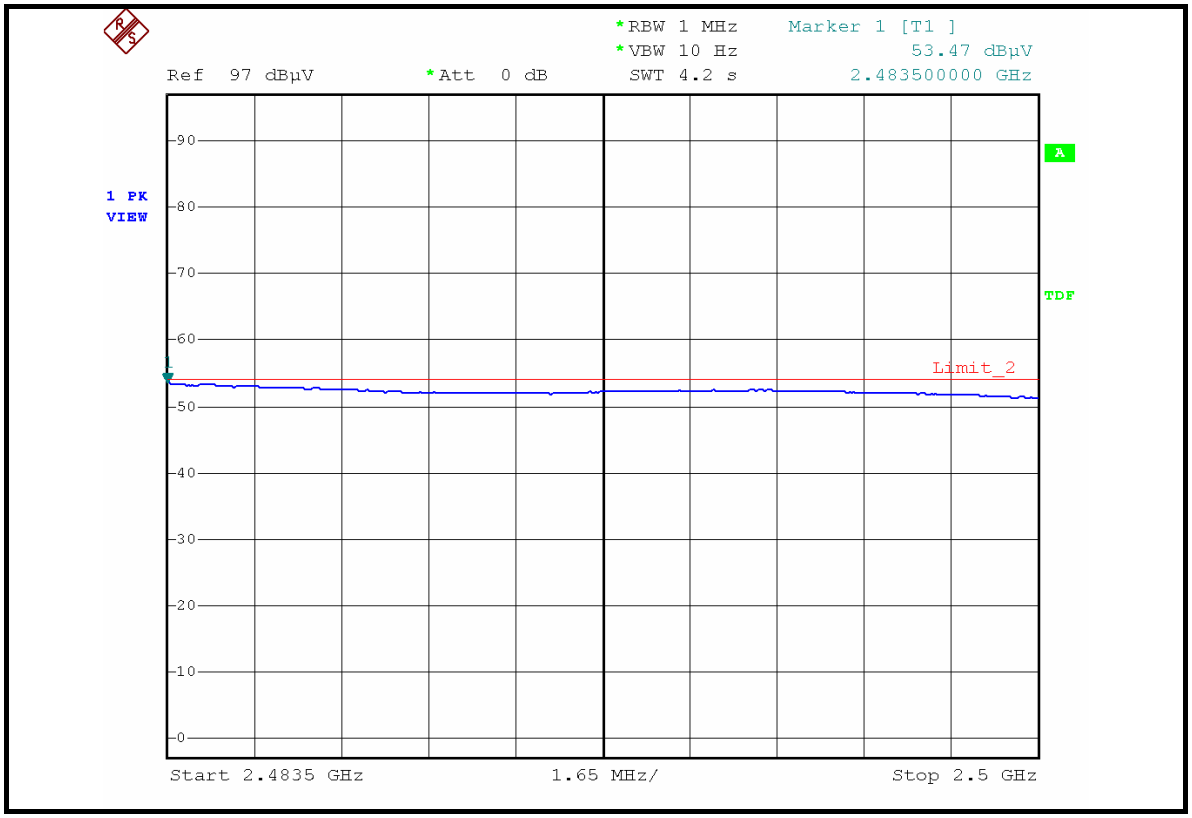
RESTRICTED BANDEDGE (802.11g MODE, CH11, HORIZONTAL)





RESTRICTED BANDEDGE (802.11g MODE, CH11, VERTICAL)





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

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	Below 1000MHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	24deg. C, 68%RH 1016hPa	TEST MODE	A
TESTED BY	Match Tsui		

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	41.57	36.15 QP	40.00	-3.85	2.00 H	340	21.63	14.52
2	119.34	38.03 QP	43.50	-5.47	1.75 H	349	25.47	12.56
3	385.70	36.25 QP	46.00	-9.75	1.00 H	4	18.95	17.31
4	412.92	34.26 QP	46.00	-11.74	2.00 H	352	16.17	18.09
5	479.03	36.81 QP	46.00	-9.19	1.75 H	358	16.90	19.91
6	720.12	38.49 QP	46.00	-7.51	1.00 H	10	13.70	24.78
7	840.67	36.59 QP	46.00	-9.41	1.75 H	181	9.84	26.76
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	59.06	31.30 QP	40.00	-8.70	1.25 V	172	17.24	14.06
2	119.34	32.47 QP	43.50	-11.03	1.00 V	229	19.91	12.56
3	360.43	37.89 QP	46.00	-8.11	1.75 V	97	21.17	16.71
4	479.03	37.61 QP	46.00	-8.39	1.25 V	25	17.69	19.91
5	599.58	35.09 QP	46.00	-10.91	1.00 V	10	12.64	22.45
6	720.12	34.31 QP	46.00	-11.69	1.00 V	226	9.53	24.78

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.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	Below 1000MHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	24deg. C, 68%RH 1016hPa	TEST MODE	B
TESTED BY	Match Tsui		

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	119.34	39.40 QP	43.50	-4.10	1.50 H	52	26.85	12.56
2	239.88	36.57 QP	46.00	-9.43	1.25 H	283	23.53	13.04
3	360.43	40.50 QP	46.00	-5.50	1.00 H	106	23.79	16.71
4	479.03	37.06 QP	46.00	-8.94	1.75 H	28	17.15	19.91
5	599.58	34.26 QP	46.00	-11.74	1.25 H	52	11.81	22.45
6	720.12	37.55 QP	46.00	-8.45	1.00 H	337	12.76	24.78
7	840.67	34.35 QP	46.00	-11.65	1.50 H	358	7.59	26.76
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	60.21	36.21 QP	40.00	-3.79	1.00 V	347	22.27	13.94
2	119.34	38.42 QP	43.50	-5.08	1.00 V	199	25.86	12.56
3	144.61	32.16 QP	43.50	-11.34	1.00 V	172	18.23	13.93
4	179.61	31.80 QP	43.50	-11.70	1.00 V	217	18.78	13.03
5	239.88	37.73 QP	46.00	-8.27	1.00 V	10	24.69	13.04
6	360.43	39.37 QP	46.00	-6.63	1.25 V	298	22.66	16.71
7	479.03	36.56 QP	46.00	-9.44	1.25 V	358	16.65	19.91
8	599.58	33.18 QP	46.00	-12.82	1.75 V	301	10.74	22.45
9	720.12	33.94 QP	46.00	-12.06	1.25 V	352	9.16	24.78

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.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	Below 1000MHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	24deg. C, 68%RH 1016hPa	TEST MODE	C
TESTED BY	Match Tsui		

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	119.34	38.78 QP	43.50	-4.72	1.25 H	25	26.22	12.56
2	179.61	33.86 QP	43.50	-9.64	2.00 H	37	20.83	13.03
3	239.88	35.73 QP	46.00	-10.27	1.00 H	94	22.69	13.04
4	360.43	43.22 QP	46.00	-2.78	1.00 H	28	26.51	16.71
5	479.03	36.03 QP	46.00	-9.97	1.75 H	46	16.12	19.91
6	720.12	37.79 QP	46.00	-8.21	1.25 H	10	13.01	24.78
7	840.67	35.62 QP	46.00	-10.38	1.50 H	154	8.86	26.76
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	60.20	38.21 QP	40.00	-1.79	1.00 V	305	24.27	13.94
2	74.62	37.26 QP	40.00	-2.74	1.25 V	340	25.55	11.71
3	119.34	33.30 QP	43.50	-10.20	1.50 V	190	20.74	12.56
4	179.61	33.17 QP	43.50	-10.33	1.00 V	190	20.14	13.03
5	239.88	35.99 QP	46.00	-10.01	1.00 V	343	22.95	13.04
6	360.43	42.21 QP	46.00	-3.79	1.50 V	7	25.50	16.71
7	479.03	37.07 QP	46.00	-8.93	1.00 V	10	17.16	19.91
8	599.58	35.49 QP	46.00	-10.51	1.00 V	325	13.05	22.45
9	834.84	35.16 QP	46.00	-10.84	2.00 V	10	8.53	26.63

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.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	Below 1000MHz
INPUT POWER	120Vac, 60 Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	24deg. C, 68%RH 1016hPa	TEST MODE	D
TESTED BY	Match Tsui		

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	179.61	30.98 QP	43.50	-12.52	1.25 H	49	17.95	13.03
2	239.88	37.89 QP	46.00	-8.11	1.00 H	322	24.85	13.04
3	360.43	33.26 QP	46.00	-12.74	2.50 H	73	16.55	16.71
4	420.70	33.67 QP	46.00	-12.33	1.75 H	337	15.30	18.37
5	479.03	36.30 QP	46.00	-9.70	1.75 H	37	16.38	19.91
6	599.58	34.21 QP	46.00	-11.79	1.25 H	40	11.77	22.45
7	720.12	37.74 QP	46.00	-8.26	1.00 H	13	12.96	24.78
8	840.67	34.67 QP	46.00	-11.33	1.25 H	10	7.91	26.76
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	60.21	37.35 QP	40.00	-2.65	1.47 V	175	23.41	13.94
2	119.34	32.36 QP	43.50	-11.14	1.25 V	280	19.80	12.56
3	142.67	31.19 QP	43.50	-12.31	1.00 V	208	17.34	13.85
4	179.61	32.86 QP	43.50	-10.64	1.00 V	127	19.83	13.03
5	239.88	38.14 QP	46.00	-7.86	1.00 V	49	25.10	13.04
6	360.43	39.10 QP	46.00	-6.90	1.75 V	346	22.38	16.71
7	479.03	35.21 QP	46.00	-10.79	1.00 V	10	15.29	19.91
8	599.58	35.03 QP	46.00	-10.97	1.75 V	349	12.58	22.45

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.

4.2 CONDUCTED EMISSION MEASUREMENT

4.2.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

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

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

4.2.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
Test Receiver ROHDE & SCHWARZ	ESCS30	100289	Dec. 06, 2008
RF signal cable Woken	5D-FB	Cable-HYC01-01	Jan. 06, 2009
LISN ROHDE & SCHWARZ	ESH3-Z5	100312	Feb. 13, 2008
LISN ROHDE & SCHWARZ	NNBL 8226-2	8226-142	May 07, 2008
Software ADT	ADT_Cond_V3	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 HwaYa Shielded Room 1.
3. The VCCI Site Registration No. is C-2040.

4.2.3 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.

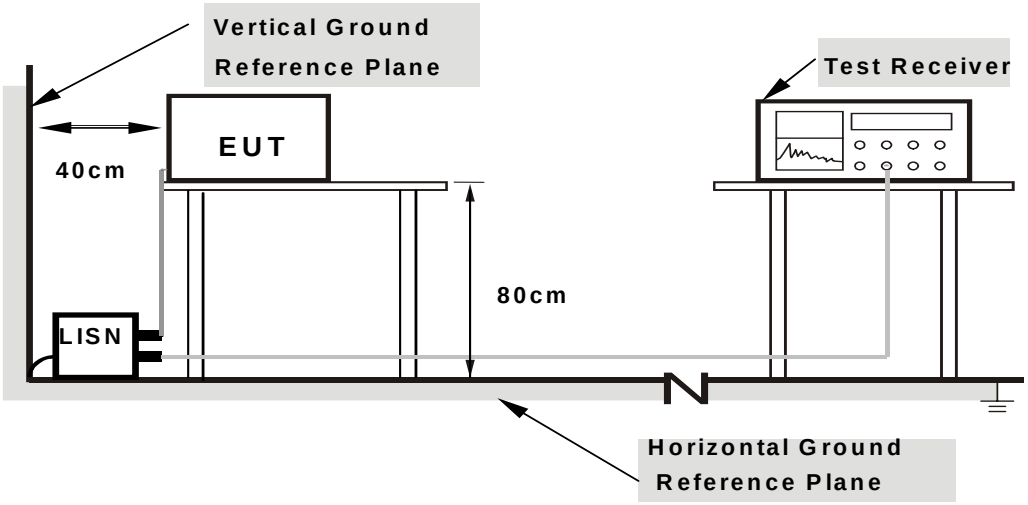
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

NOTE: All modes of operation were investigated and the worst-case emissions are reported.

4.2.4 DEVIATION FROM TEST STANDARD

No deviation.

4.2.5 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 attached file (Test Setup Photo).

4.2.6 EUT OPERATING CONDITIONS

Same as 4.1.6.

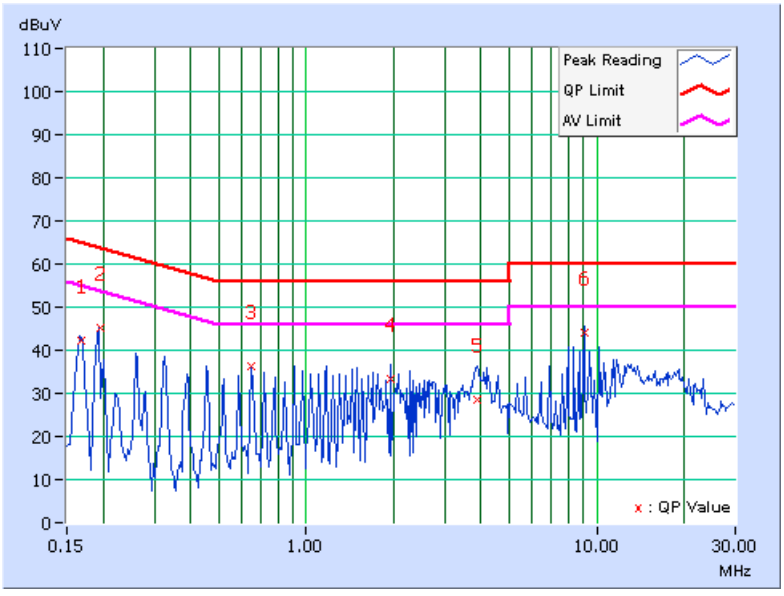
4.2.7 TEST RESULTS

CONDUCTED WORST-CASE DATA

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	PHASE	Line 1
MODULATION TYPE	BPSK	6dB BANDWIDTH	9 kHz
TRANSFER RATE	6Mbps	ENVIRONMENTAL CONDITIONS	22deg. C, 66%RH, 1022hPa
TEST MODE	A	INPUT POWER	120Vac, 60 Hz
TESTED BY	Dean Wang		

	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	0.167	0.21	41.67	-	41.88	-	65.10	55.10	-23.22	-
2	0.196	0.21	44.81	-	45.02	-	63.77	53.77	-18.75	-
3	0.650	0.22	35.87	-	36.09	-	56.00	46.00	-19.91	-
4	1.951	0.26	32.75	-	33.01	-	56.00	46.00	-22.99	-
5	3.901	0.38	27.85	-	28.23	-	56.00	46.00	-27.77	-
6	9.087	0.52	43.74	-	44.26	-	60.00	50.00	-15.74	-

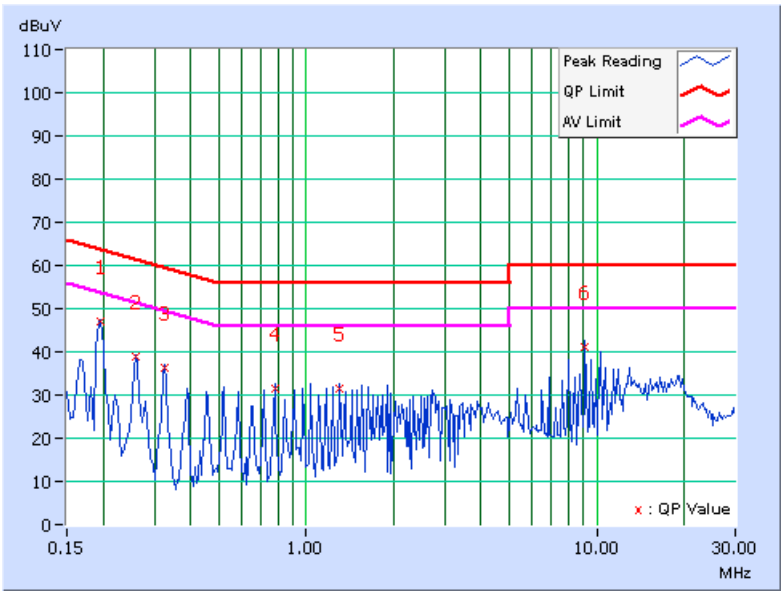
REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission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



EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	PHASE	Line 2
MODULATION TYPE	BPSK	6dB BANDWIDTH	9 kHz
TRANSFER RATE	6Mbps	ENVIRONMENTAL CONDITIONS	22deg. C, 66%RH, 1022hPa
TEST MODE	A	INPUT POWER	120Vac, 60 Hz
TESTED BY	Dean Wang		

	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	0.196	0.21	46.48	-	46.69	-	63.80	53.80	-17.11	-
2	0.261	0.21	38.33	-	38.54	-	61.41	51.41	-22.87	-
3	0.326	0.21	35.81	-	36.02	-	59.56	49.56	-23.54	-
4	0.780	0.23	31.13	-	31.36	-	56.00	46.00	-24.64	-
5	1.301	0.25	30.80	-	31.05	-	56.00	46.00	-24.95	-
6	9.110	0.52	40.64	-	41.16	-	60.00	50.00	-18.84	-

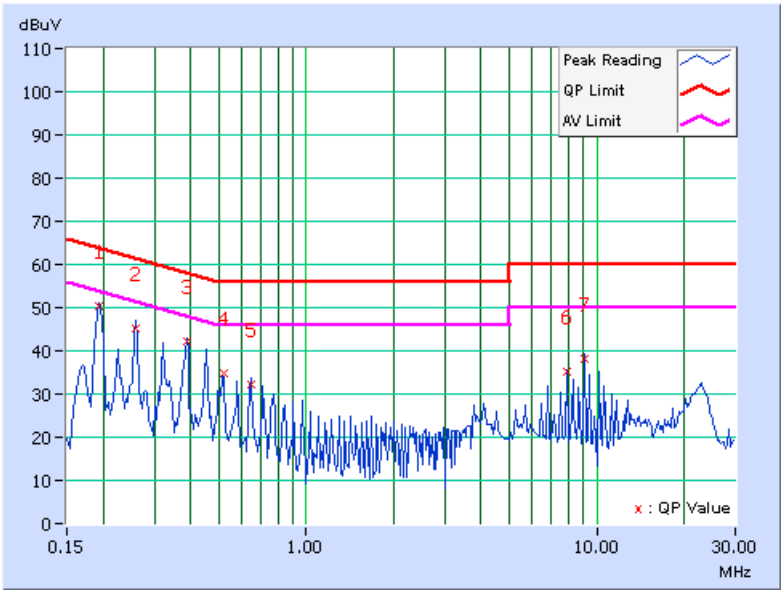
REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission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



EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	PHASE	Line 1
MODULATION TYPE	BPSK	6dB BANDWIDTH	9 kHz
TRANSFER RATE	6Mbps	ENVIRONMENTAL CONDITIONS	22deg. C, 66%RH, 1022hPa
TEST MODE	B	INPUT POWER	120Vac, 60 Hz
TESTED BY	Dean Wang		

	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	0.194	0.21	49.86	-	50.07	-	63.85	53.85	-13.78	-
2	0.261	0.21	44.55	-	44.76	-	61.41	51.41	-16.65	-
3	0.389	0.21	41.73	-	41.94	-	58.09	48.09	-16.15	-
4	0.518	0.22	34.47	-	34.69	-	56.00	46.00	-21.31	-
5	0.647	0.22	31.80	-	32.02	-	56.00	46.00	-23.98	-
6	7.916	0.49	34.52	-	35.01	-	60.00	50.00	-24.99	-
7	9.045	0.52	37.55	-	38.07	-	60.00	50.00	-21.93	-

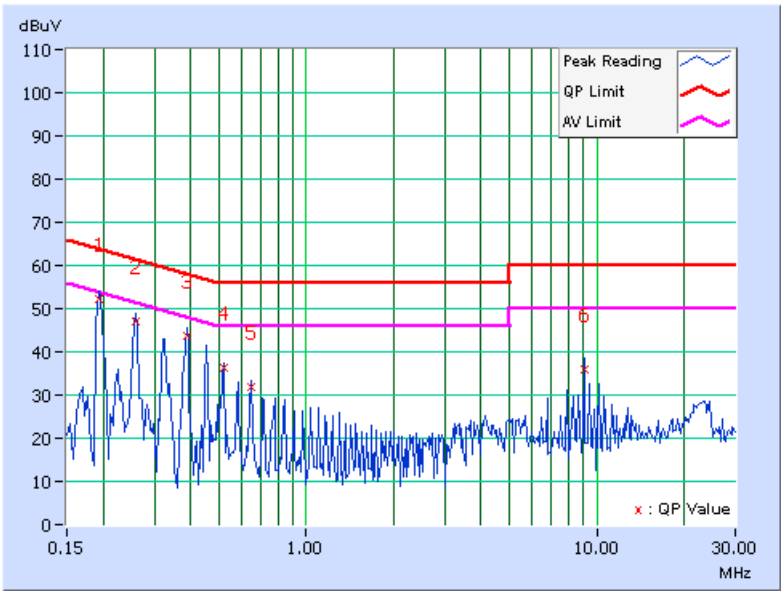
REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission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



EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	PHASE	Line 2
MODULATION TYPE	BPSK	6dB BANDWIDTH	9 kHz
TRANSFER RATE	6Mbps	ENVIRONMENTAL CONDITIONS	22deg. C, 66%RH, 1022hPa
TEST MODE	B	INPUT POWER	120Vac, 60 Hz
TESTED BY	Dean Wang		

	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	0.194	0.21	51.83	-	52.04	-	63.86	53.86	-11.82	-
2	0.259	0.21	46.67	-	46.88	-	61.45	51.45	-14.57	-
3	0.388	0.21	43.15	-	43.36	-	58.10	48.10	-14.74	-
4	0.519	0.22	35.66	-	35.88	-	56.00	46.00	-20.12	-
5	0.649	0.22	31.38	-	31.60	-	56.00	46.00	-24.40	-
6	9.049	0.52	35.44	-	35.96	-	60.00	50.00	-24.04	-

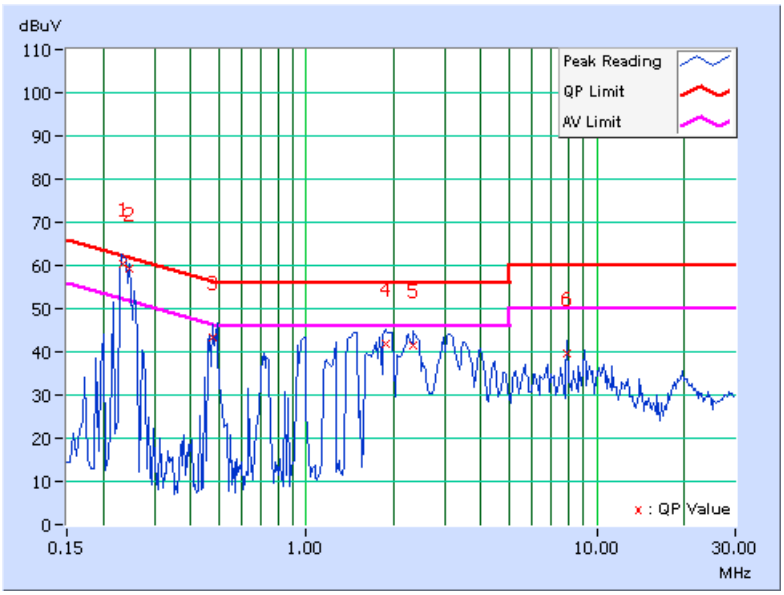
REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission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



EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	PHASE	Line 1
MODULATION TYPE	BPSK	6dB BANDWIDTH	9 kHz
TRANSFER RATE	6Mbps	ENVIRONMENTAL CONDITIONS	22deg. C, 66%RH, 1022hPa
TEST MODE	C	INPUT POWER	120Vac, 60 Hz
TESTED BY	Dean Wang		

	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	0.235	0.21	59.83	42.10	60.04	42.31	62.29	52.29	-2.25	-9.98
2	0.248	0.21	58.80	46.27	59.01	46.48	61.84	51.84	-2.83	-5.36
3	0.478	0.21	42.91	-	43.12	-	56.37	46.37	-13.25	-
4	1.883	0.26	41.30	-	41.56	-	56.00	46.00	-14.44	-
5	2.334	0.28	40.85	-	41.13	-	56.00	46.00	-14.87	-
6	7.910	0.49	39.07	-	39.56	-	60.00	50.00	-20.44	-

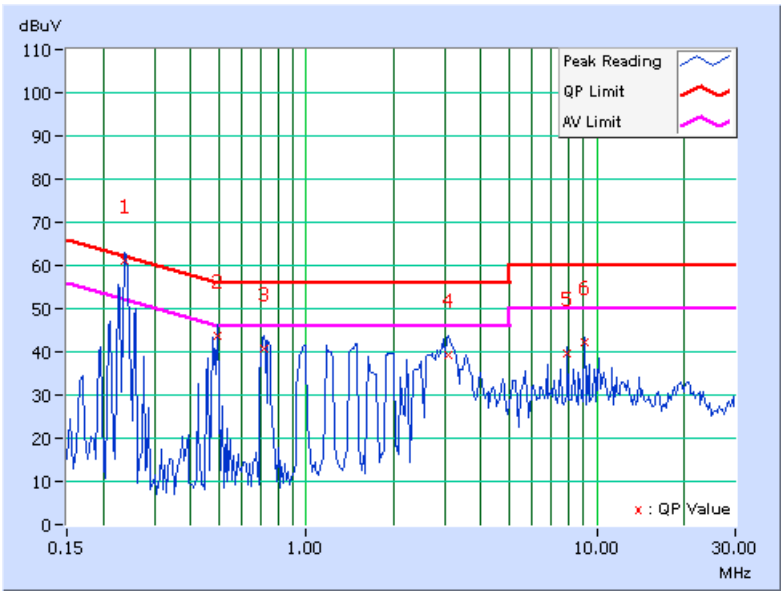
REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission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



EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	PHASE	Line 2
MODULATION TYPE	BPSK	6dB BANDWIDTH	9 kHz
TRANSFER RATE	6Mbps	ENVIRONMENTAL CONDITIONS	22deg. C, 66%RH, 1022hPa
TEST MODE	C	INPUT POWER	120Vac, 60 Hz
TESTED BY	Dean Wang		

	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	**0.236**	**0.21**	**60.46**	**44.61**	**60.67**	**44.82**	**62.24**	**52.24**	**-1.57**	**-7.42**
2	0.494	0.21	43.24	-	43.45	-	56.10	46.10	-12.65	-
3	0.713	0.23	40.35	-	40.58	-	56.00	46.00	-15.42	-
4	3.085	0.33	38.91	-	39.24	-	56.00	46.00	-16.76	-
5	7.910	0.49	38.95	-	39.44	-	60.00	50.00	-20.56	-
6	9.042	0.52	41.77	-	42.29	-	60.00	50.00	-17.71	-

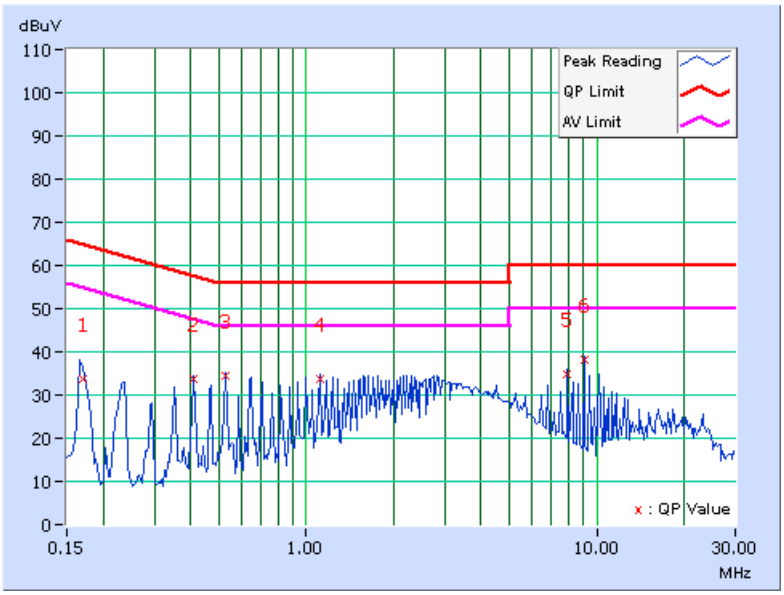
REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission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



EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	PHASE	Line 1
MODULATION TYPE	BPSK	6dB BANDWIDTH	9 kHz
TRANSFER RATE	6Mbps	ENVIRONMENTAL CONDITIONS	22deg. C, 66%RH, 1022hPa
TEST MODE	D	INPUT POWER	120Vac, 60 Hz
TESTED BY	Dean Wang		

	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	0.170	0.21	33.13	-	33.34	-	64.97	54.97	-31.63	-
2	0.412	0.21	33.22	-	33.43	-	57.61	47.61	-24.18	-
3	0.529	0.22	33.93	-	34.15	-	56.00	46.00	-21.85	-
4	1.115	0.24	33.04	-	33.28	-	56.00	46.00	-22.72	-
5	7.918	0.49	34.17	-	34.66	-	60.00	50.00	-25.34	-
6	9.048	0.52	37.53	-	38.05	-	60.00	50.00	-21.95	-

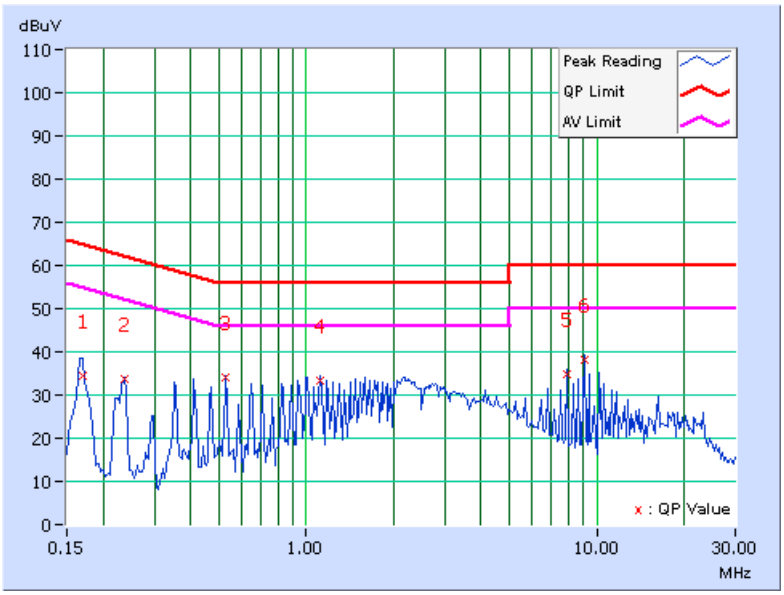
REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission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



EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	PHASE	Line 2
MODULATION TYPE	BPSK	6dB BANDWIDTH	9 kHz
TRANSFER RATE	6Mbps	ENVIRONMENTAL CONDITIONS	22deg. C, 66%RH, 1022hPa
TEST MODE	D	INPUT POWER	120Vac, 60 Hz
TESTED BY	Dean Wang		

	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	0.170	0.21	34.04	-	34.25	-	64.98	54.98	-30.73	-
2	0.236	0.21	33.07	-	33.28	-	62.24	52.24	-28.96	-
3	0.529	0.22	33.67	-	33.89	-	56.00	46.00	-22.51	-
4	1.116	0.24	32.70	-	32.94	-	56.00	46.00	-23.06	-
5	7.919	0.49	34.42	-	34.91	-	60.00	50.00	-25.09	-
6	9.051	0.52	37.54	-	38.06	-	60.00	50.00	-21.94	-

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.



4.3 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 UNTIL
R&S SPECTRUM ANALYZER	FSP40	100036	Dec. 17, 2008

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

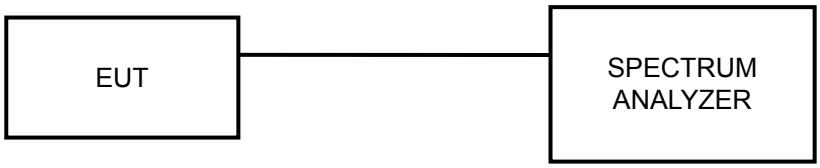
4.3.3 TEST PROCEDURE

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



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

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.

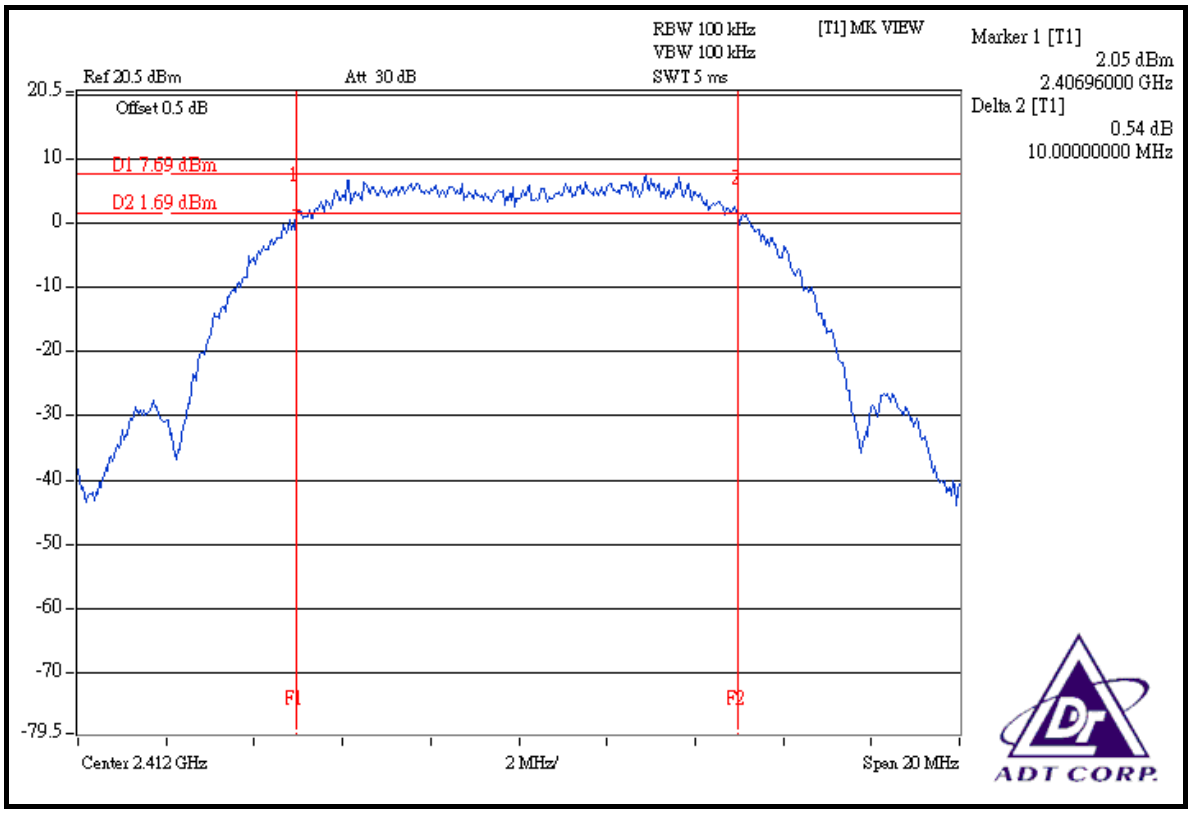
4.3.7 TEST RESULTS

802.11b DSSS MODULATION

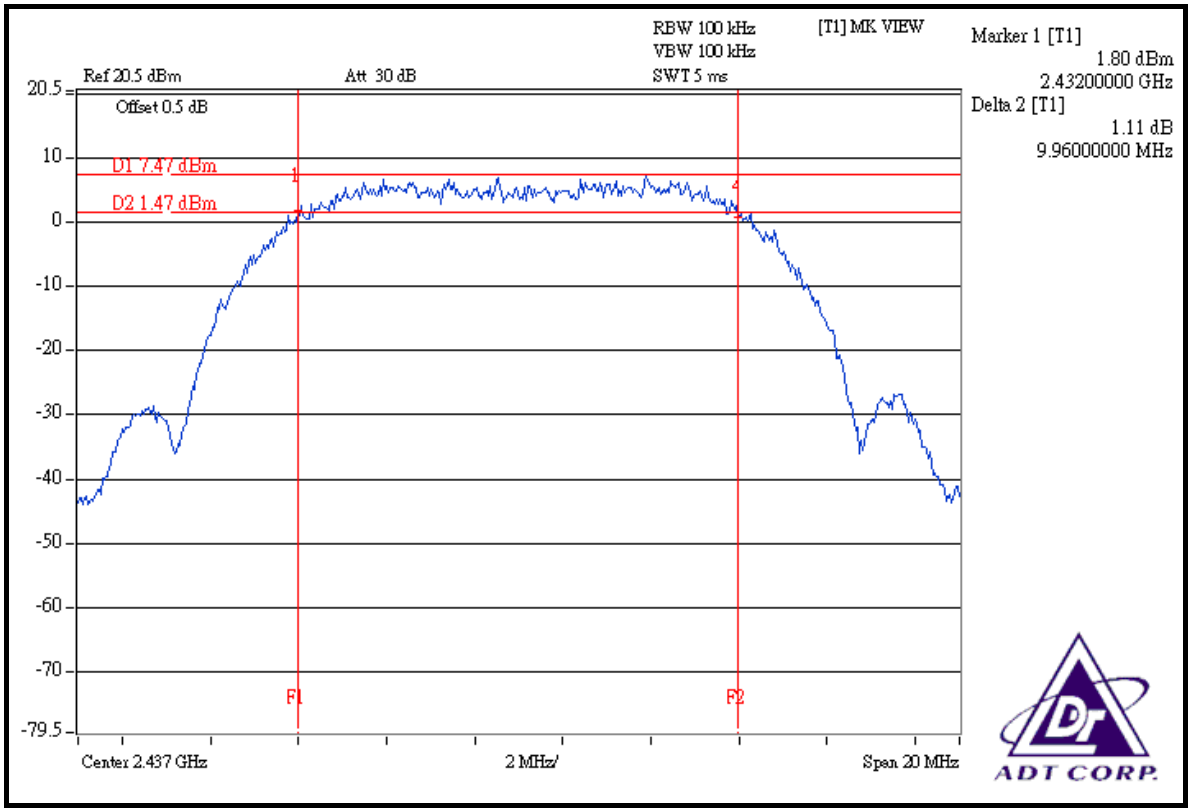
MODULATION TYPE	DBPSK	TRANSFER RATE	1Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	23deg. C, 62%RH, 1016hPa
TESTED BY	Phoenix Huang		

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS/FAIL
1	2412	10.00	0.5	PASS
6	2437	9.96	0.5	PASS
11	2462	10.36	0.5	PASS

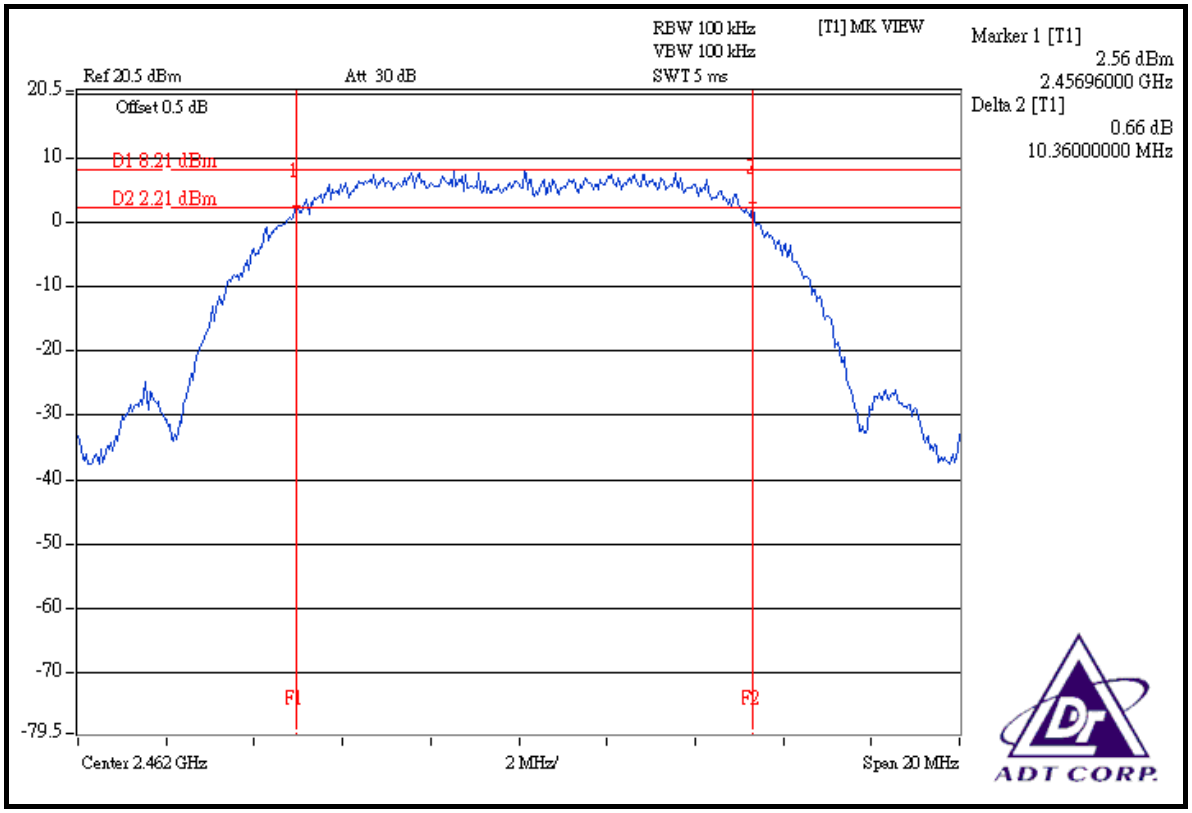
CH1



CH6


RBW 100 kHz
VBW 100 kHz
SWT 5 ms
[T1] MK VIEW
Marker 1 [T1]
1.80 dBm
2.43200000 GHz
Delta 2 [T1]
1.11 dB
9.96000000 MHz
Ref 20.5 dBm
Att 30 dB
Offset 0.5 dB
D1 7.47 dBm
D2 1.47 dBm
20.5
10
0
-10
-20
-30
-40
-50
-60
-70
-79.5
F1
F2
Center 2.437 GHz
2 MHz/
Span 20 MHz

CH11

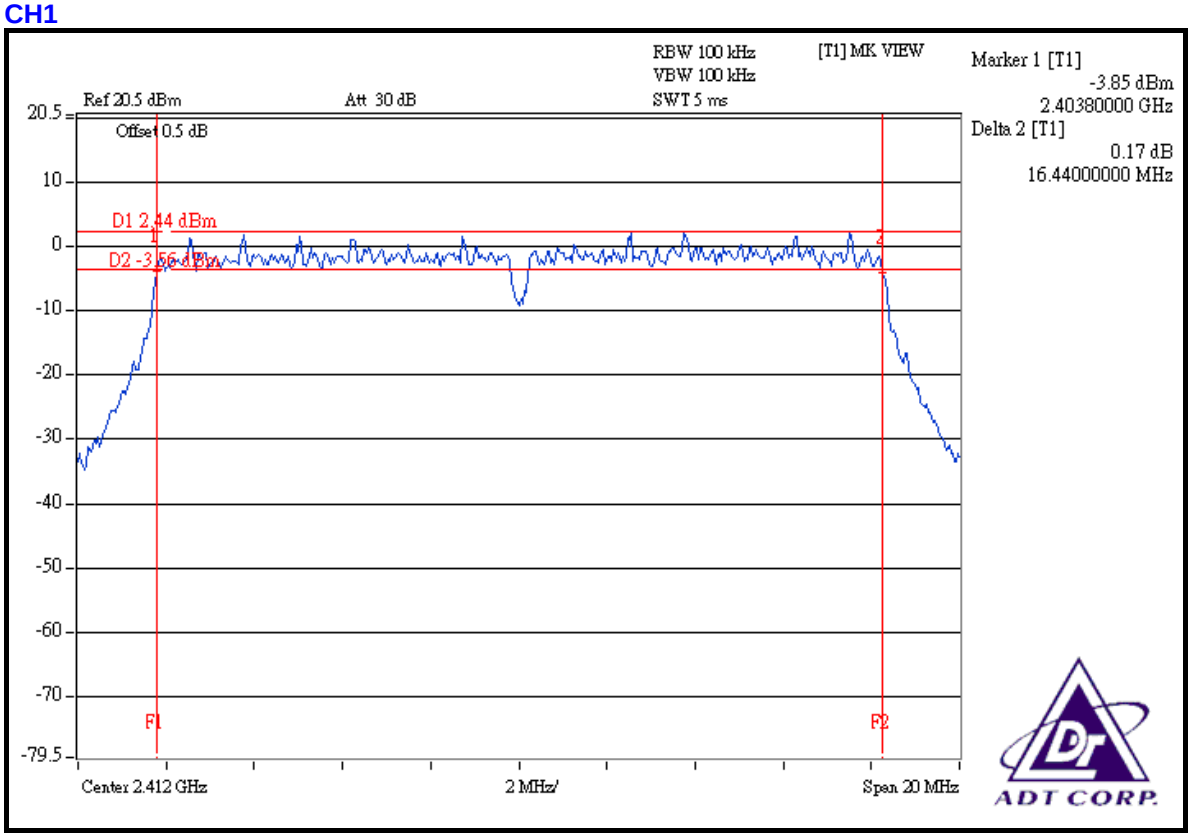

RBW 100 kHz
VBW 100 kHz
SWT 5 ms
[T1] MK VIEW
Marker 1 [T1]
2.56 dBm
2.45696000 GHz
Delta 2 [T1]
0.66 dB
10.36000000 MHz
Ref 20.5 dBm
Att 30 dB
Offset 0.5 dB
D1 8.21 dBm
D2 2.21 dBm
20.5
10
0
-10
-20
-30
-40
-50
-60
-70
-79.5
F1
F2
Center 2.462 GHz
2 MHz/
Span 20 MHz

802.11g OFDM MODULATION

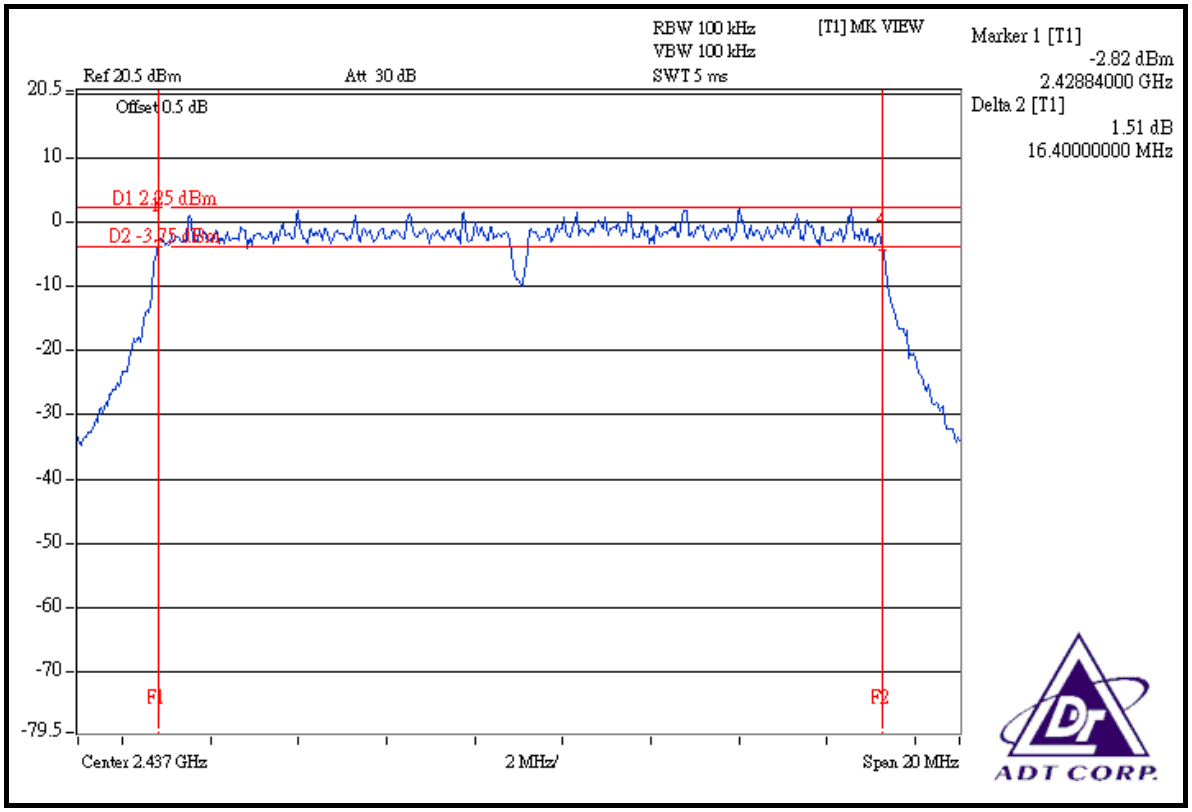
MODULATION TYPE	BPSK	TRANSFER RATE	6Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	23deg. C, 62%RH, 1016hPa
TESTED BY	Phoenix Huang		

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS/FAIL
1	2412	16.44	0.5	PASS
6	2437	16.40	0.5	PASS
11	2462	16.36	0.5	PASS

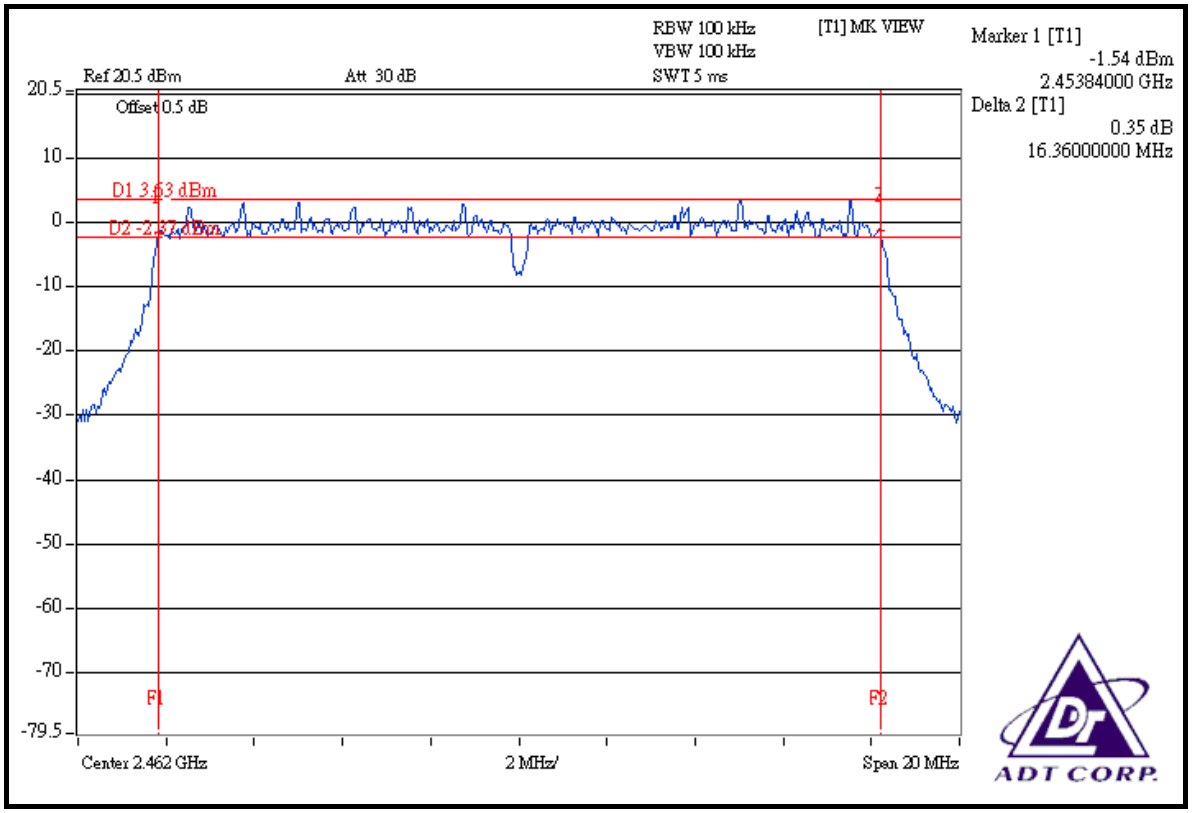
CH1



CH6


RBW 100 kHz
VBW 100 kHz
SWT 5 ms
[T1] MK VIEW
Marker 1 [T1]
-2.82 dBm
2.42884000 GHz
Delta 2 [T1]
1.51 dB
16.40000000 MHz
Ref 20.5 dBm
Att 30 dB
Offset 0.5 dB
D1 2.25 dBm
D2 -3.75 dBm
20.5
10
0
-10
-20
-30
-40
-50
-60
-70
-79.5
F1
F2
Center 2.437 GHz
2 MHz/
Span 20 MHz

CH11


RBW 100 kHz
VBW 100 kHz
SWT 5 ms
[T1] MK VIEW
Marker 1 [T1]
-1.54 dBm
2.45384000 GHz
Delta 2 [T1]
0.35 dB
16.36000000 MHz
Ref 20.5 dBm
Att 30 dB
Offset 0.5 dB
D1 3.63 dBm
D2 -2.37 dBm
20.5
10
0
-10
-20
-30
-40
-50
-60
-70
-79.5
F1
F2
Center 2.462 GHz
2 MHz/
Span 20 MHz

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 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
R&S SPECTRUM ANALYZER	FSP40	100036	Dec. 17, 2008
AGILENT SIGNAL GENERATOR	E8257C	MY43320668	Dec. 25, 2008
TEKTRONIX OSCILLOSCOPE	TDS380	B016335	Jul. 15, 2008
NARDA DETECTOR	4503A	FSCM99899	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

a. A detector was used on the output port of the EUT. An oscilloscope was used to peak the response of the detector.

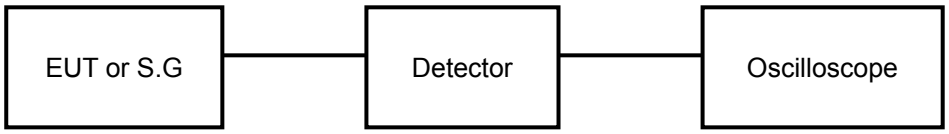
b. Replaced the EUT by the signal generator. The center frequency of the S.G was adjusted to the center frequency of the measured channel.

c. Adjusted the power to have the same peak 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 4.3.6.

4.4.7 TEST RESULTS

802.11b DSSS MODULATION

MODULATION TYPE	DBPSK	TRANSFER RATE	1Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	23deg. C, 62%RH, 1016hPa
TESTED BY	Phoenix Huang		

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (mW)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (dBm)	PASS/FAIL
1	2412	91.201	19.60	30	PASS
6	2437	102.329	20.10	30	PASS
11	2462	85.114	19.30	30	PASS

802.11g OFDM MODULATION

MODULATION TYPE	BPSK	TRANSFER RATE	6Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	23deg. C, 62%RH, 1016hPa
TESTED BY	Phoenix Huang		

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (mW)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (dBm)	PASS/FAIL
1	2412	102.329	20.10	30	PASS
6	2437	114.815	20.60	30	PASS
11	2462	89.125	19.50	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

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
R&S SPECTRUM ANALYZER	FSP40	100036	Dec. 17, 2008

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

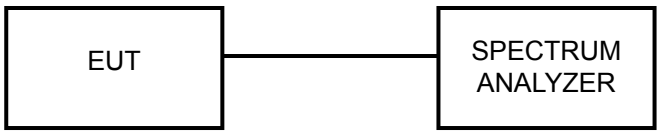
The transmitter output was connected to the spectrum analyzer through an attenuator, the bandwidth of the fundamental frequency was measured with the spectrum analyzer using 3kHz RBW and 30kHz VBW, set sweep time = span/3kHz. The power spectral density was measured and recorded.

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 CONDITIONS

Same as 4.3.6.

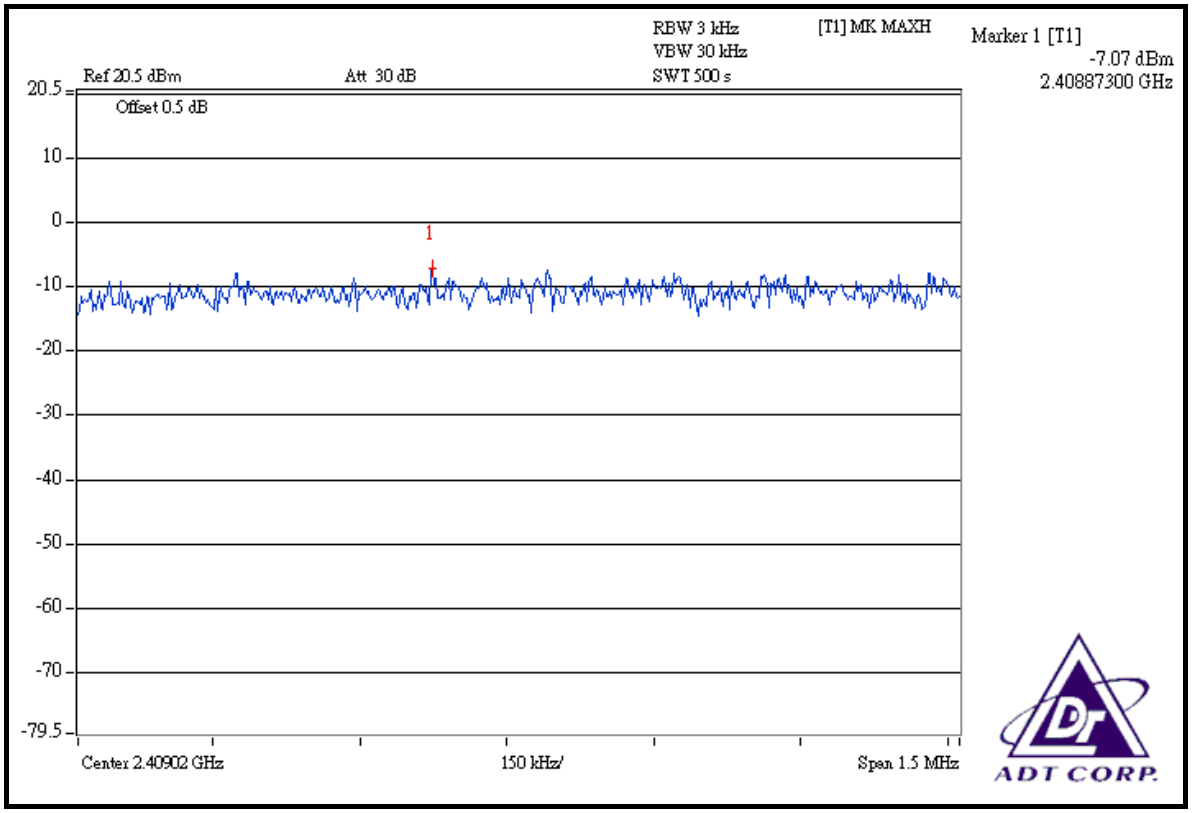
4.5.7 TEST RESULTS

802.11b DSSS MODULATION

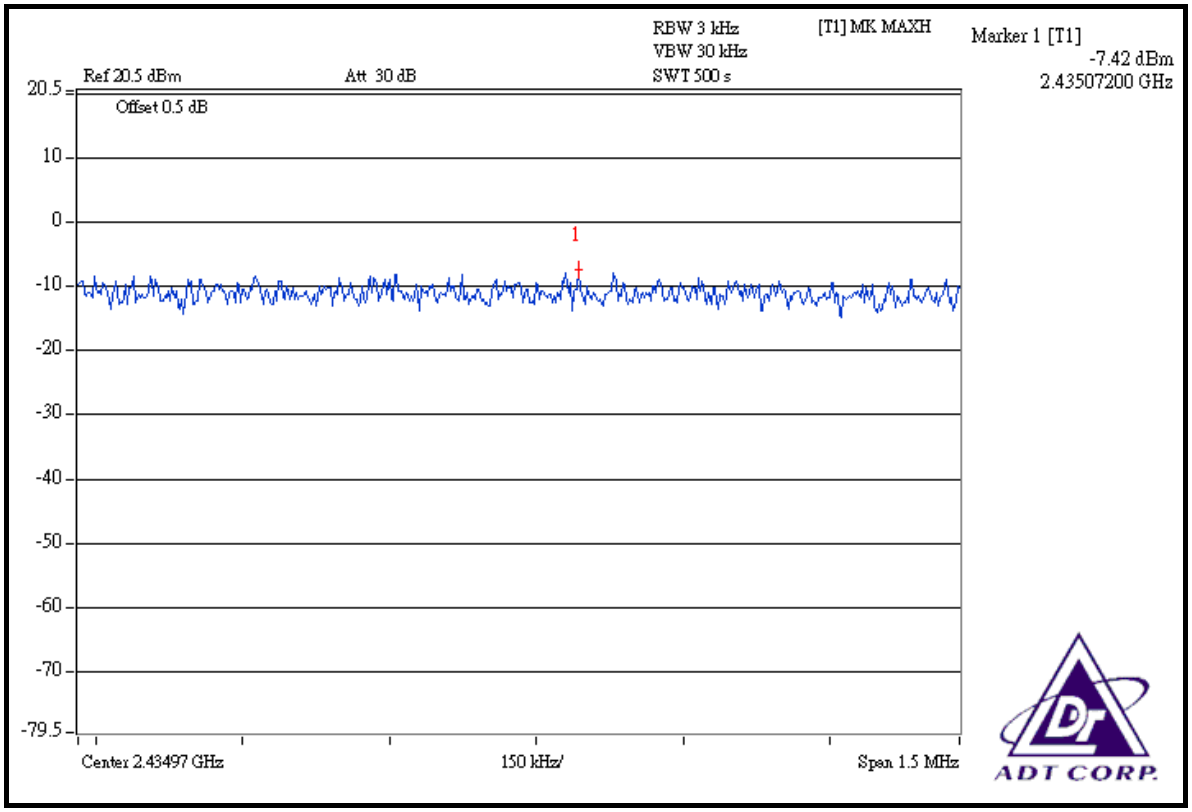
MODULATION TYPE	DBPSK	TRANSFER RATE	1Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	23deg. C, 62%RH, 1016hPa
TESTED BY	Phoenix Huang		

CHANNEL	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3 kHz BW (dBm)	MAXIMUM LIMIT (dBm)	PASS/FAIL
1	2412	-7.07	8	PASS
6	2437	-7.42	8	PASS
11	2462	-7.33	8	PASS

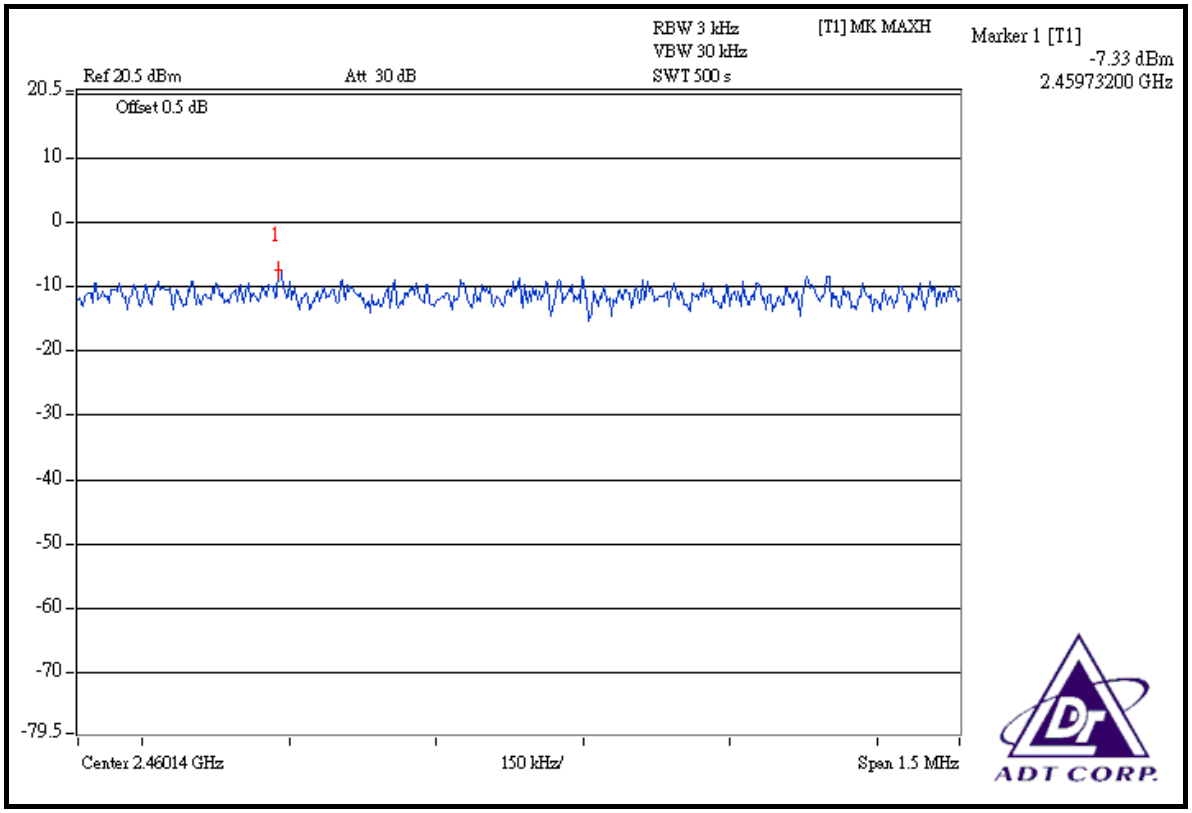
CH1



CH6


RBW 3 kHz
VBW 30 kHz
SWT 500 s
[T1] MK MAXH
Marker 1 [T1]
-7.42 dBm
2.43507200 GHz
Ref 20.5 dBm
Att 30 dB
Offset 0.5 dB
20.5
10
0
-10
-20
-30
-40
-50
-60
-70
-79.5
Center 2.43497 GHz
150 kHz/
Span 1.5 MHz
ADT CORP.

CH11

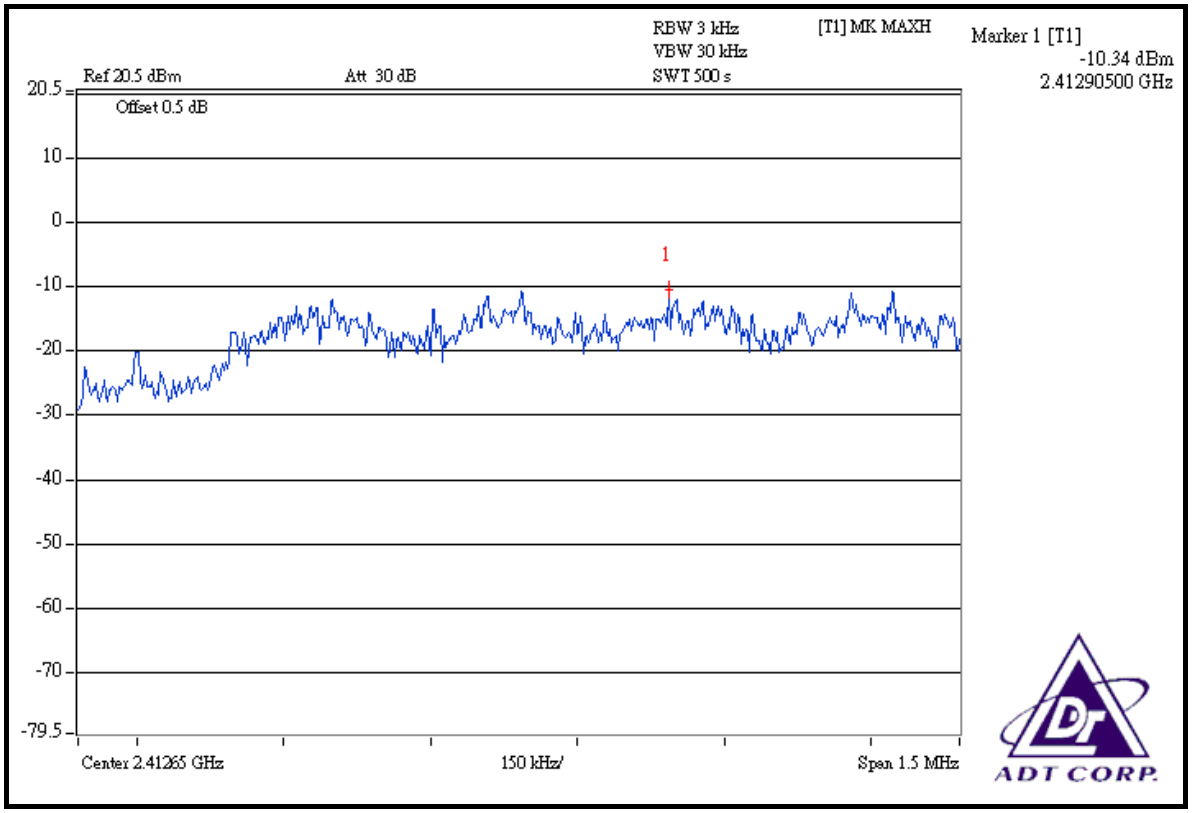

RBW 3 kHz
VBW 30 kHz
SWT 500 s
[T1] MK MAXH
Marker 1 [T1]
-7.33 dBm
2.45973200 GHz
Ref 20.5 dBm
Att 30 dB
Offset 0.5 dB
20.5
10
0
-10
-20
-30
-40
-50
-60
-70
-79.5
Center 2.46014 GHz
150 kHz/
Span 1.5 MHz
ADT CORP.

802.11g OFDM MODULATION

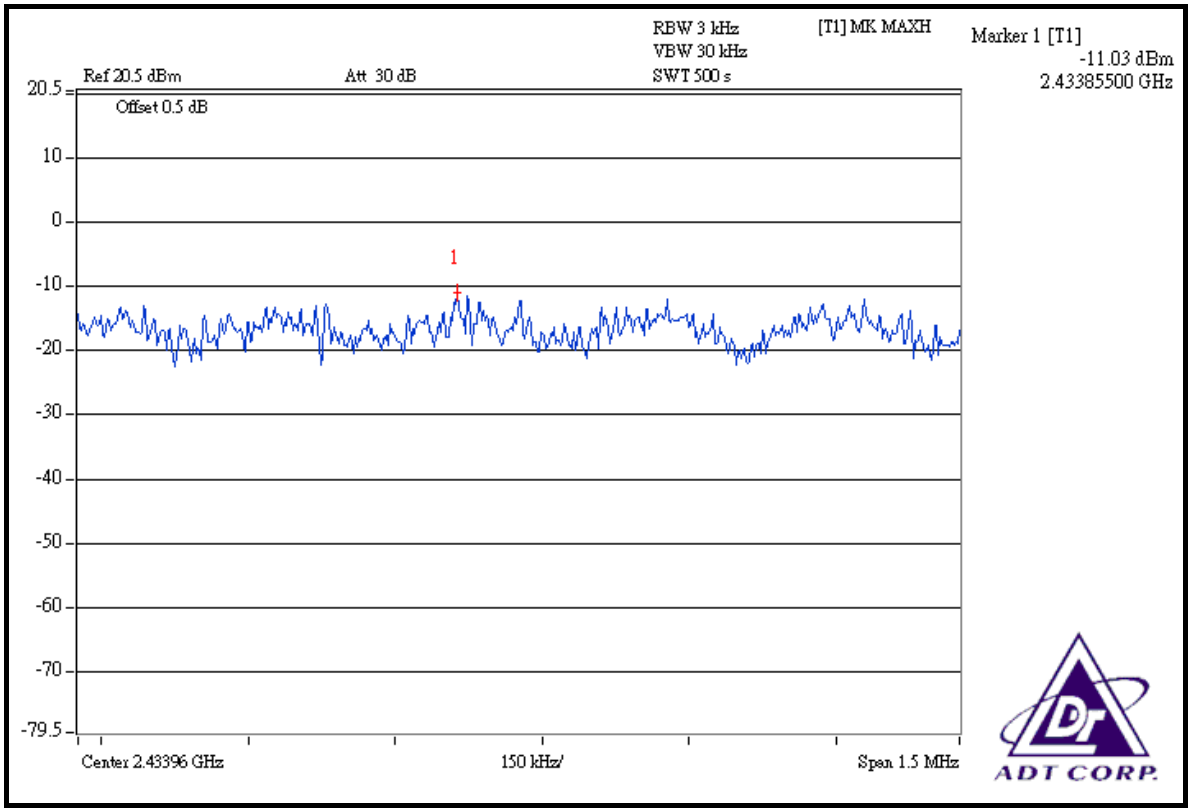
MODULATION TYPE	BPSK	TRANSFER RATE	6Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	23deg. C, 62%RH, 1016hPa
TESTED BY	Phoenix Huang		

CHANNEL	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3 kHz BW (dBm)	MAXIMUM LIMIT (dBm)	PASS/FAIL
1	2412	-10.34	8	PASS
6	2437	-11.03	8	PASS
11	2462	-9.51	8	PASS

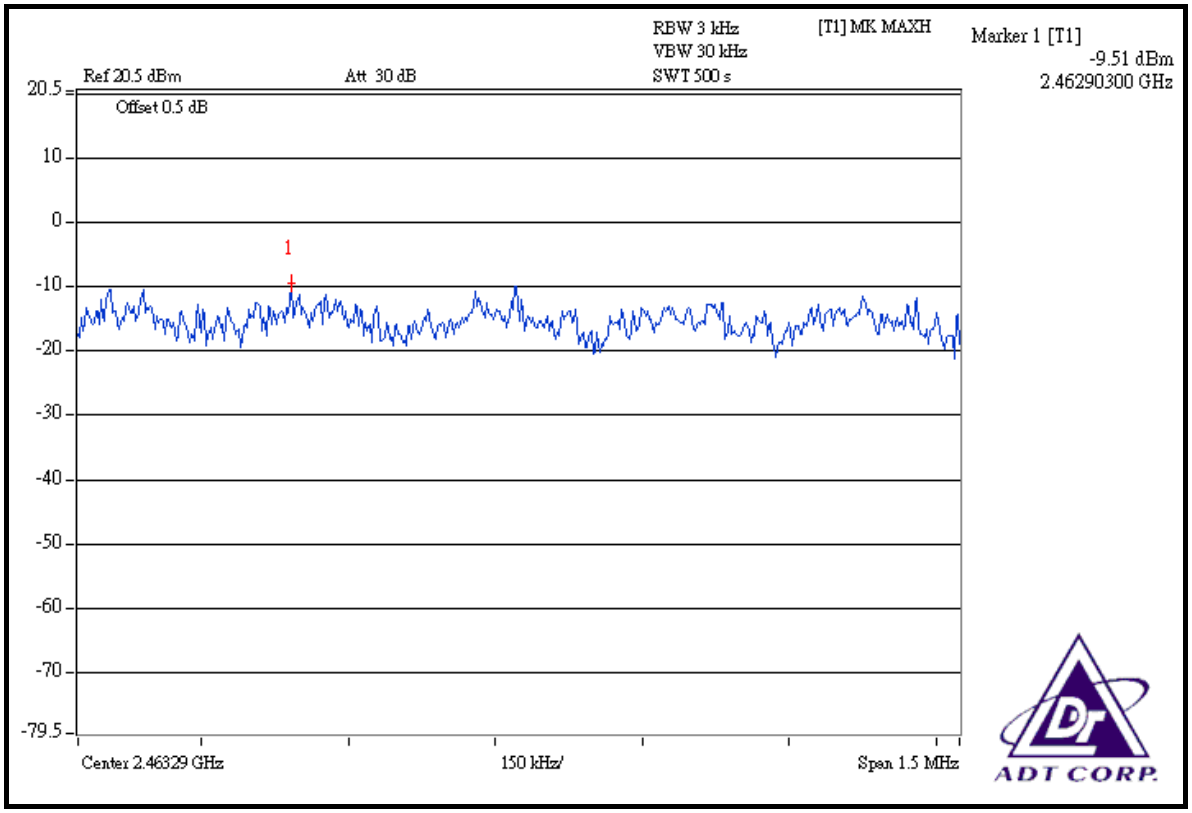
CH1



CH6


RBW 3 kHz
VBW 30 kHz
SWT 500 s
[T1] MK MAXH
Marker 1 [T1]
-11.03 dBm
2.43385500 GHz
Ref 20.5 dBm
Att 30 dB
Offset 0.5 dB
20.5
10
0
-10
-20
-30
-40
-50
-60
-70
-79.5
1
Center 2.43396 GHz
150 kHz/
Span 1.5 MHz
ADT CORP.

CH11


RBW 3 kHz
VBW 30 kHz
SWT 500 s
[T1] MK MAXH
Marker 1 [T1]
-9.51 dBm
2.46290300 GHz
Ref 20.5 dBm
Att 30 dB
Offset 0.5 dB
20.5
10
0
-10
-20
-30
-40
-50
-60
-70
-79.5
1
Center 2.46329 GHz
150 kHz/
Span 1.5 MHz
ADT CORP.

4.6 BAND EDGES MEASUREMENT

4.6.1 LIMITS OF BAND EDGES 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 UNTIL
R&S SPECTRUM ANALYZER	FSP40	100036	Dec. 17, 2008

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 lose cable. Set both RBW and VBW of spectrum analyzer to 100kHz and 300kHz with suitable frequency span including 100MHz bandwidth from band edge. The band edges was measured and recorded.

The spectrum plots (Peak RBW=100kHz, VBW=300kHz; Average RBW=1MHz, VBW= 10Hz are attached on the following pages.

4.6.4 DEVIATION FROM TEST STANDARD

No deviation.

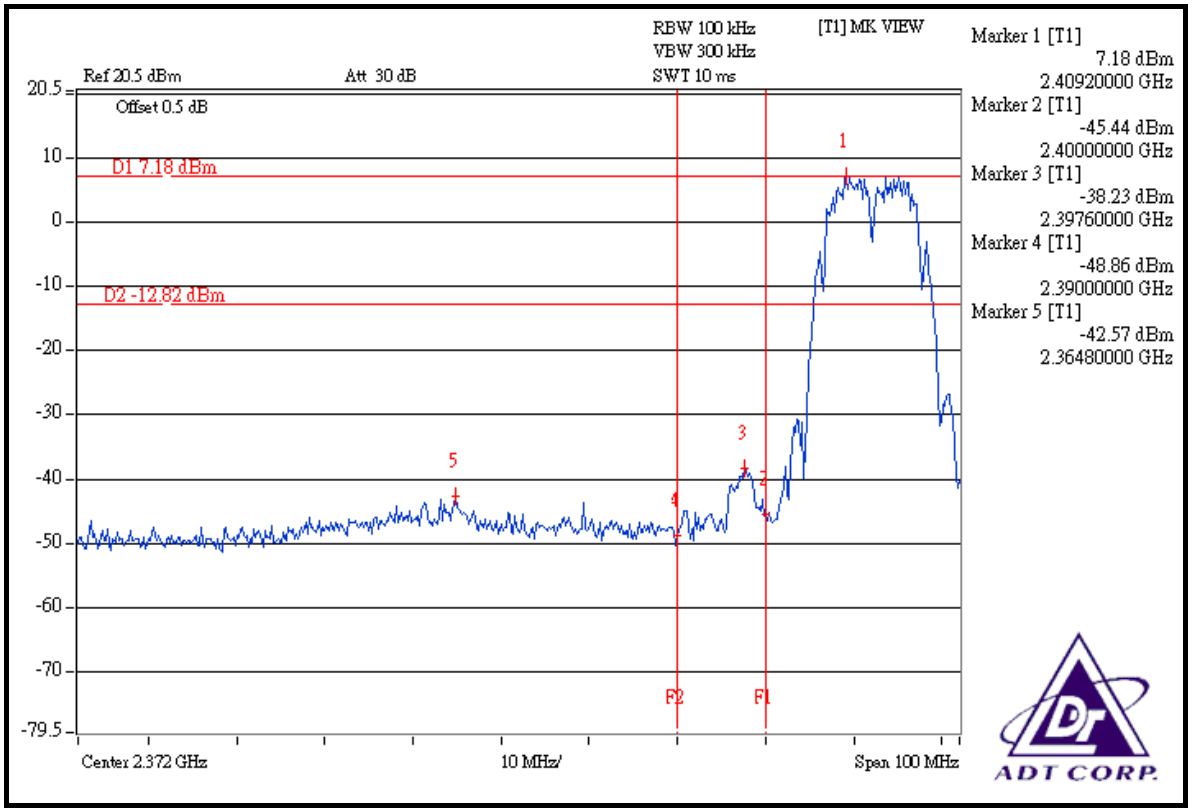
4.6.5 EUT OPERATING CONDITION

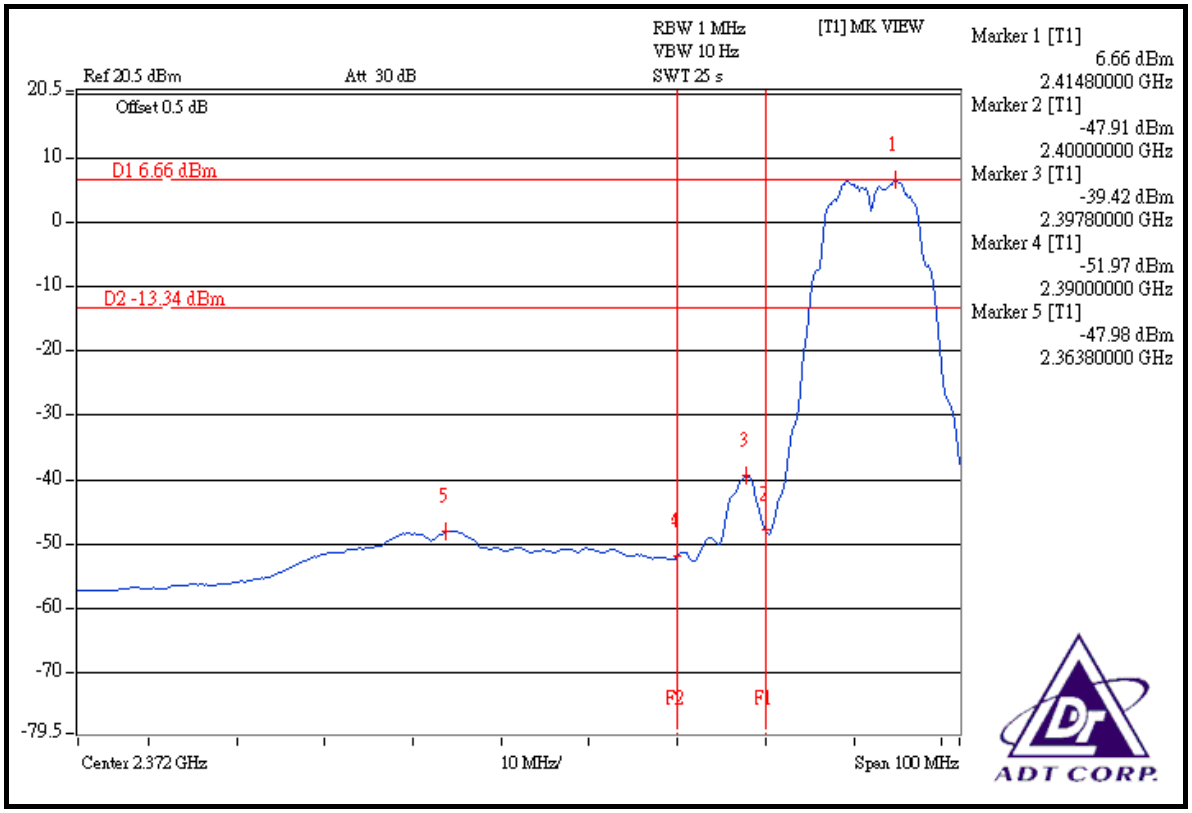
Same as 4.3.6.

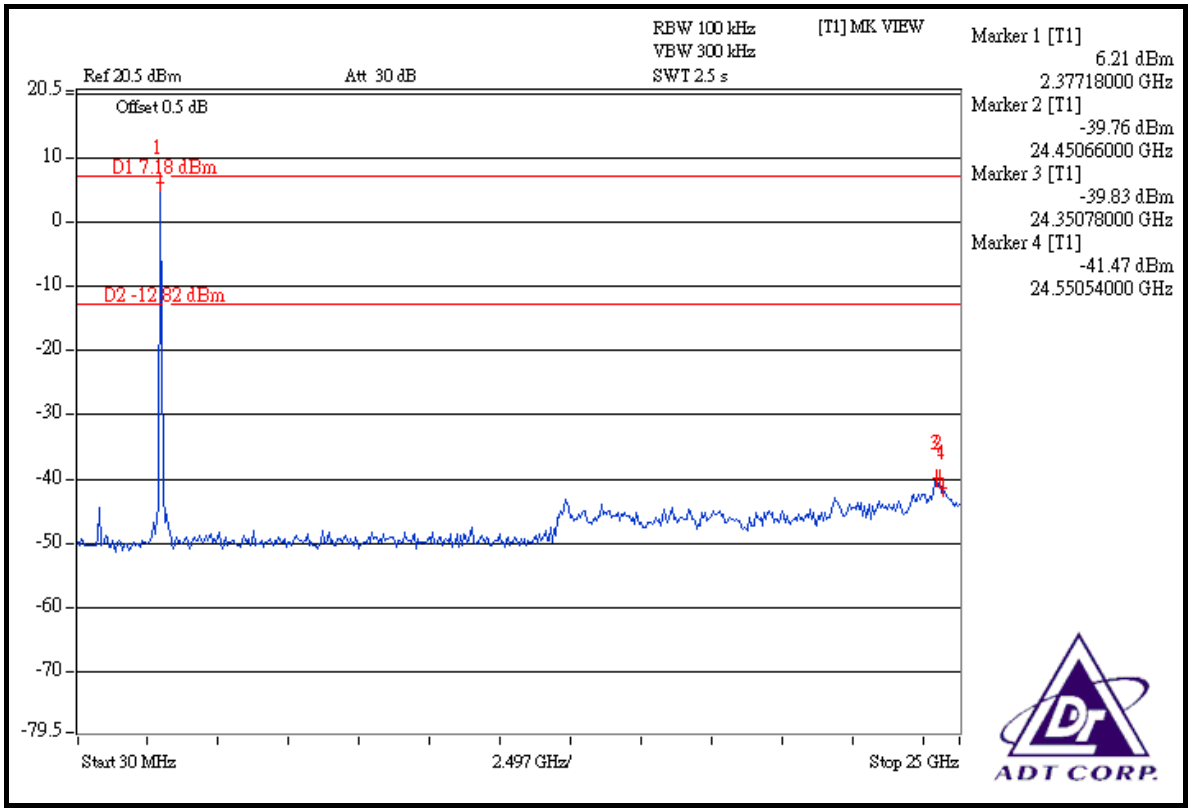
4.6.6 TEST RESULTS

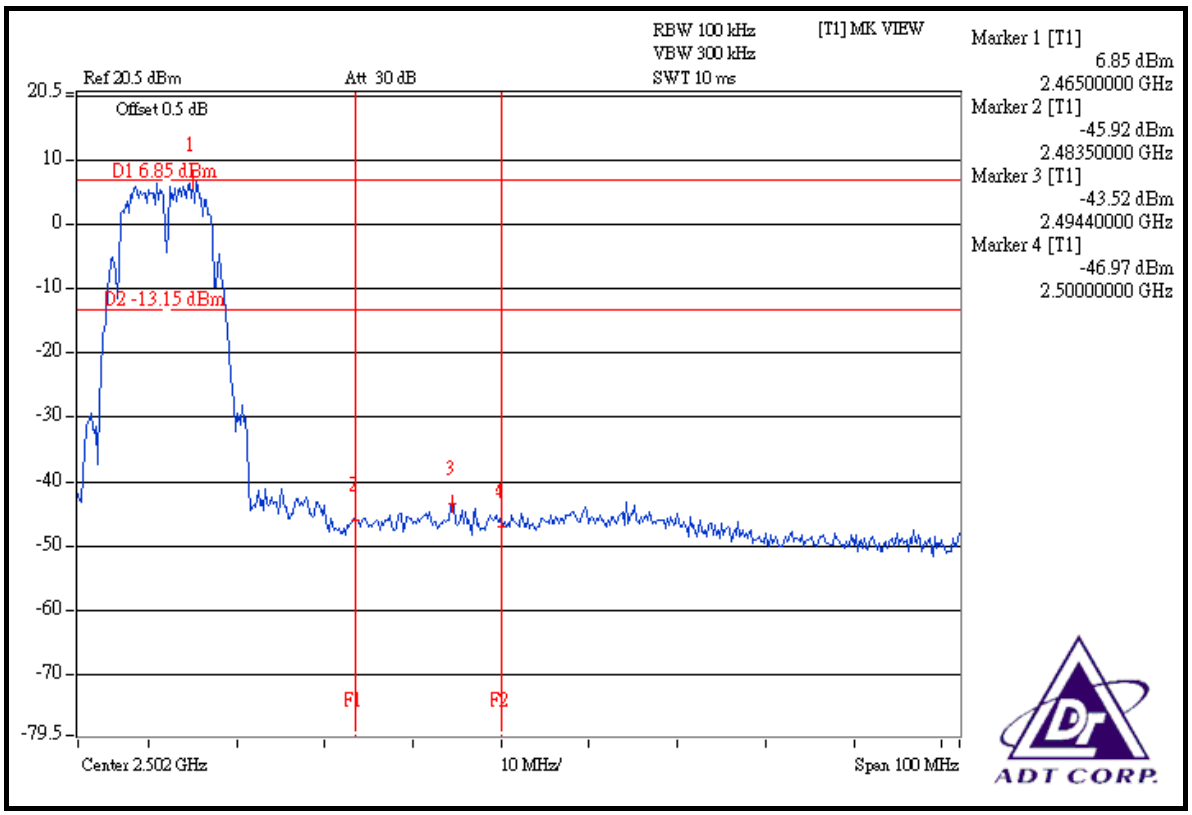
The spectrum plots are attached on the following 12 images. D1 line indicates the highest level, and D2 line indicates the 20dB offset below D1. It shows compliance with the requirement in part 15.247(d).

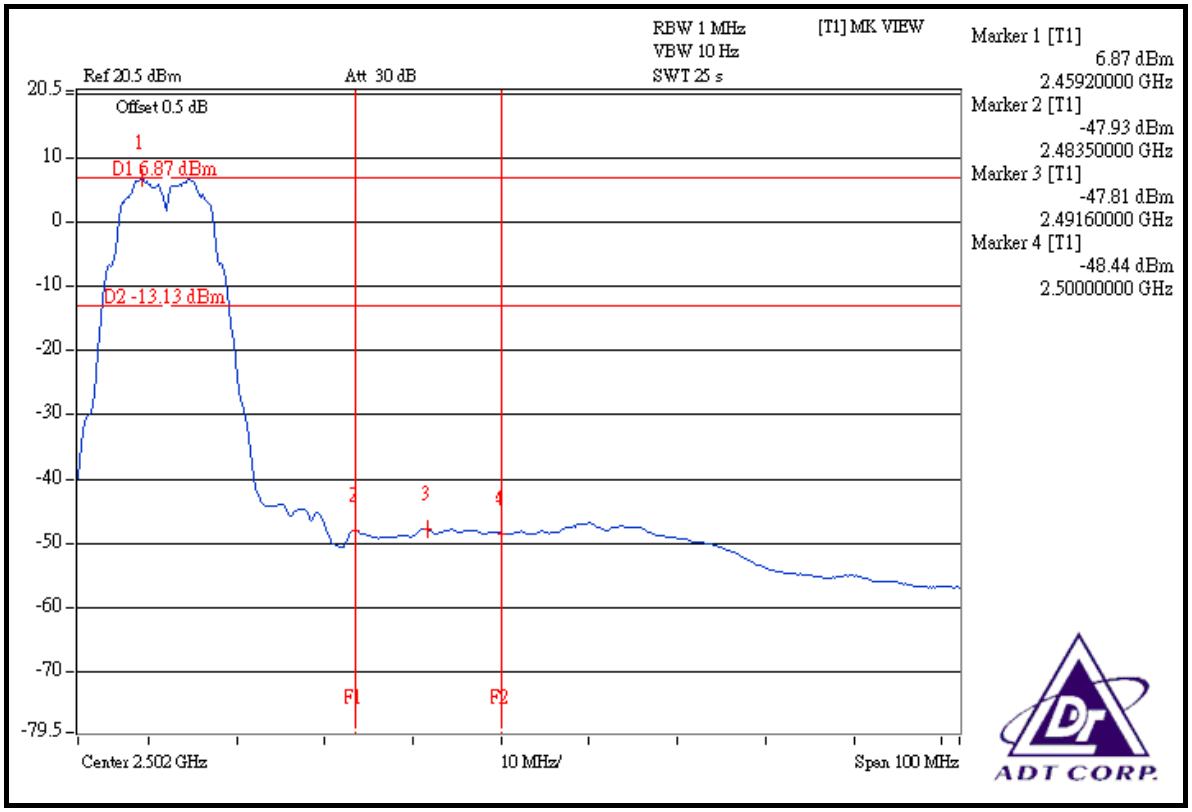
802.11b DSSS MODULATION

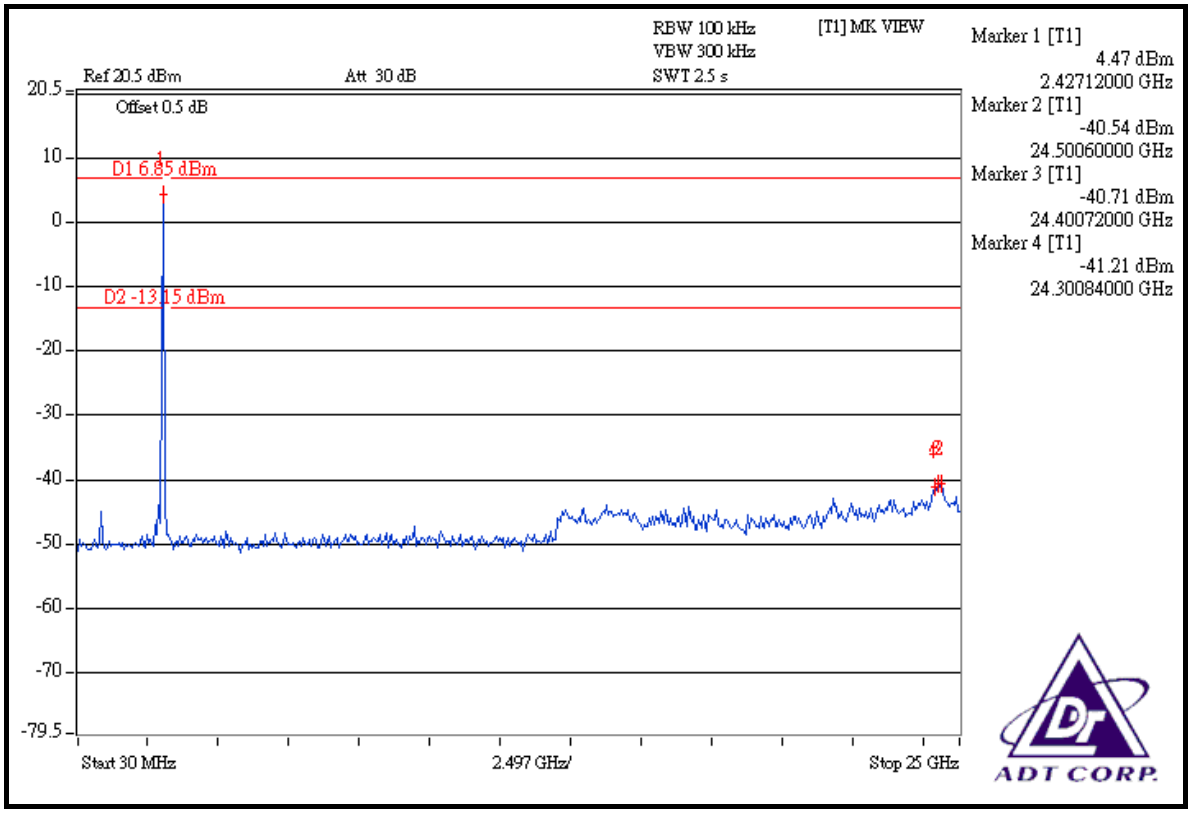




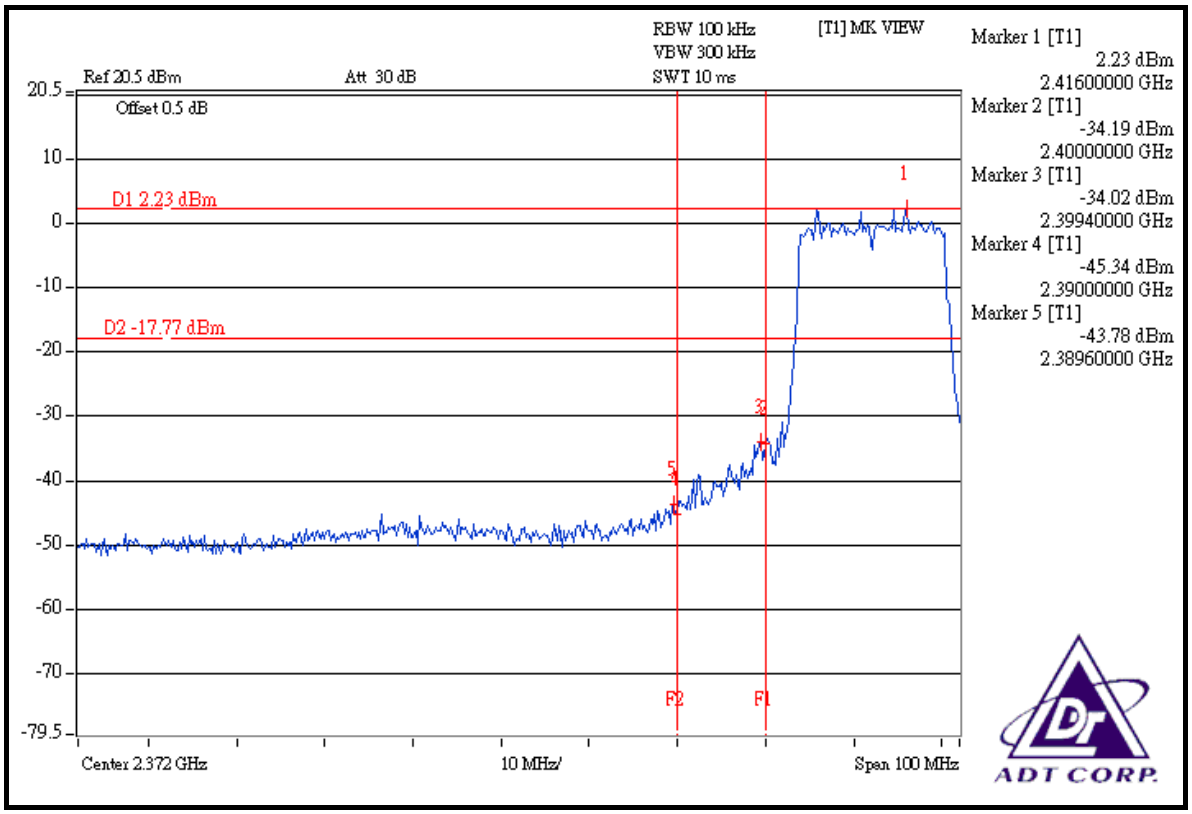

RBW 100 kHz
VBW 300 kHz
SWT 2.5 s
[T1] MK VIEW
Ref 20.5 dBm
Att 30 dB
Offset 0.5 dB
D1 7.18 dBm
D2 -12.82 dBm
Marker 1 [T1]
6.21 dBm
2.37718000 GHz
Marker 2 [T1]
-39.76 dBm
24.45066000 GHz
Marker 3 [T1]
-39.83 dBm
24.35078000 GHz
Marker 4 [T1]
-41.47 dBm
24.55054000 GHz
20.5
10
0
-10
-20
-30
-40
-50
-60
-70
-79.5
Start 30 MHz
2.497 GHz/
Stop 25 GHz
ADT CORP.

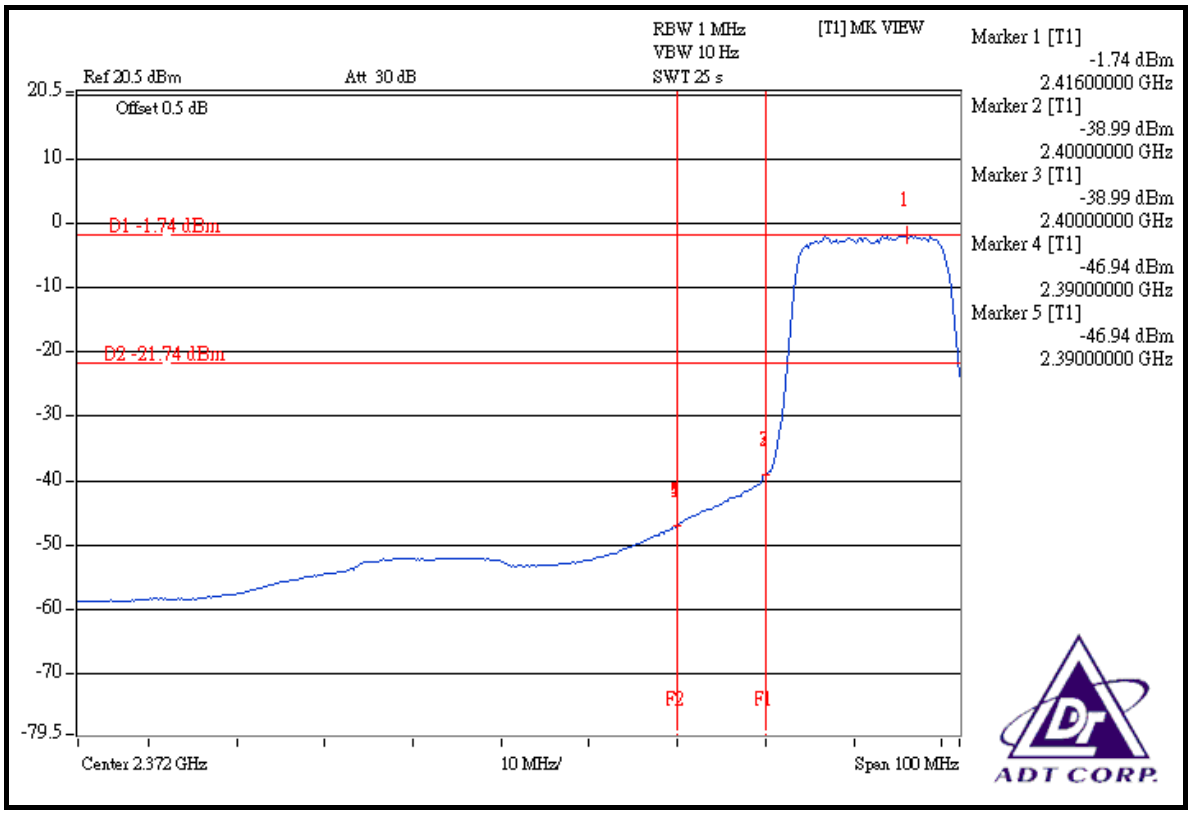

RBW 100 kHz
VBW 300 kHz
SWT 10 ms
[T1] MK VIEW
Ref 20.5 dBm
Att 30 dB
Offset 0.5 dB
D1 6.85 dBm
D2 -13.15 dBm
Marker 1 [T1]
6.85 dBm
2.46500000 GHz
Marker 2 [T1]
-45.92 dBm
2.48350000 GHz
Marker 3 [T1]
-43.52 dBm
2.49440000 GHz
Marker 4 [T1]
-46.97 dBm
2.50000000 GHz
20.5
10
0
-10
-20
-30
-40
-50
-60
-70
-79.5
F1
F2
Center 2.502 GHz
10 MHz/
Span 100 MHz
ADT CORP.

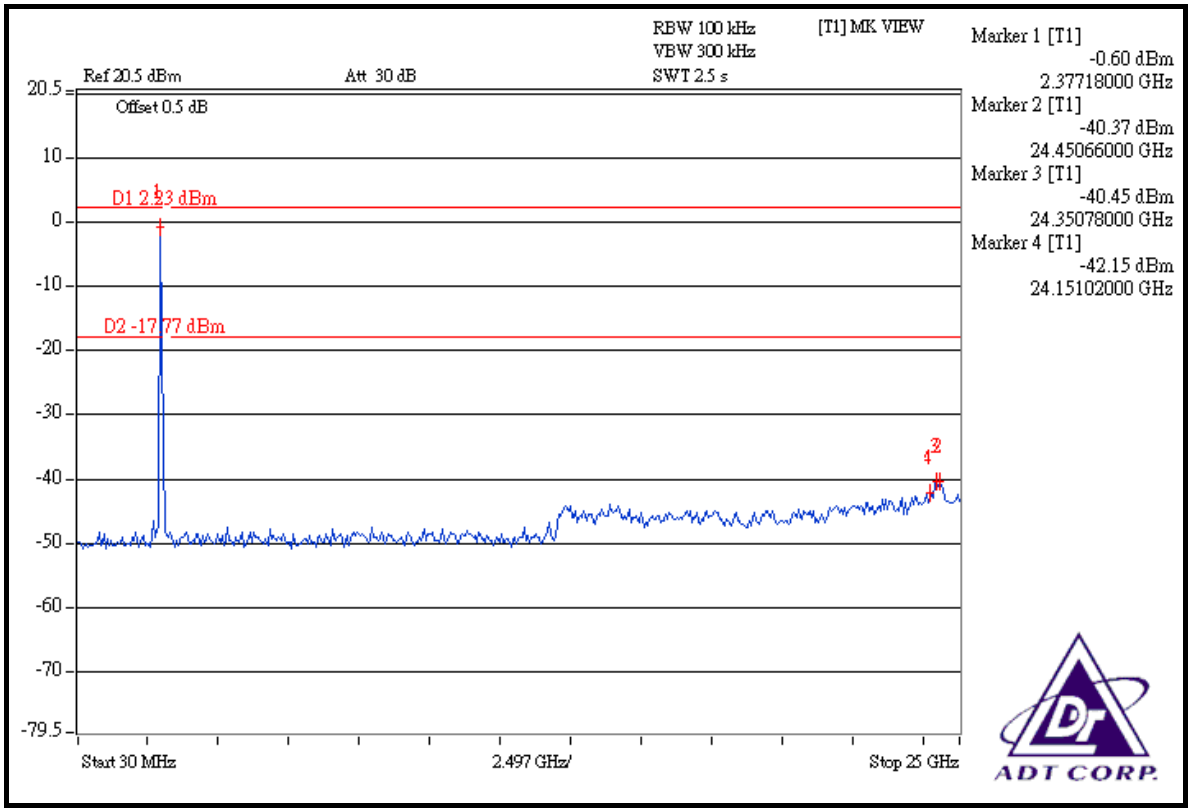

RBW 1 MHz
VBW 10 Hz
SWT 25 s
[T1] MK VIEW
Ref 20.5 dBm
Att 30 dB
Offset 0.5 dB
D1 6.87 dBm
D2 -13.13 dBm
Marker 1 [T1]
6.87 dBm
2.45920000 GHz
Marker 2 [T1]
-47.93 dBm
2.48350000 GHz
Marker 3 [T1]
-47.81 dBm
2.49160000 GHz
Marker 4 [T1]
-48.44 dBm
2.50000000 GHz
Center 2.502 GHz
10 MHz/
Span 100 MHz

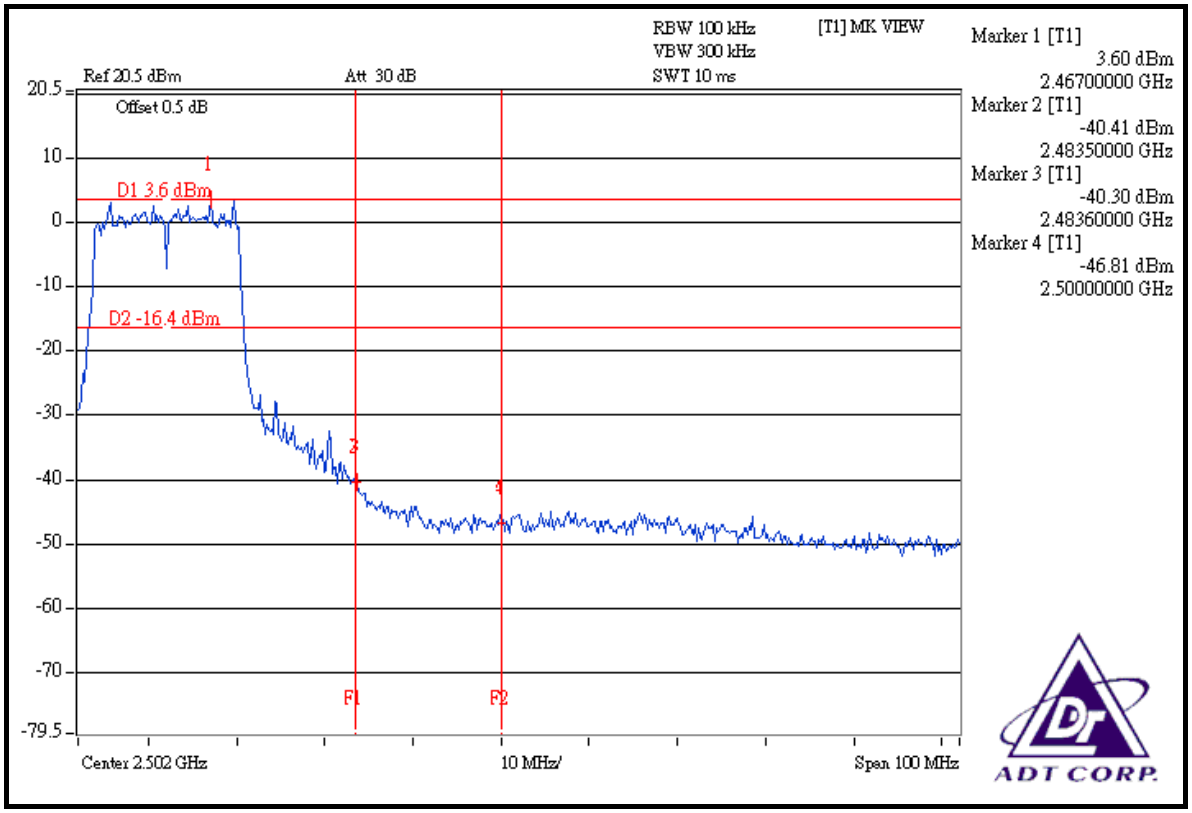

RBW 100 kHz
VBW 300 kHz
SWT 2.5 s
[T1] MK VIEW
Ref 20.5 dBm
Att 30 dB
Offset 0.5 dB
D1 6.85 dBm
D2 -13.15 dBm
Marker 1 [T1]
4.47 dBm
2.42712000 GHz
Marker 2 [T1]
-40.54 dBm
24.50060000 GHz
Marker 3 [T1]
-40.71 dBm
24.40072000 GHz
Marker 4 [T1]
-41.21 dBm
24.30084000 GHz
Start 30 MHz
2.497 GHz/
Stop 25 GHz

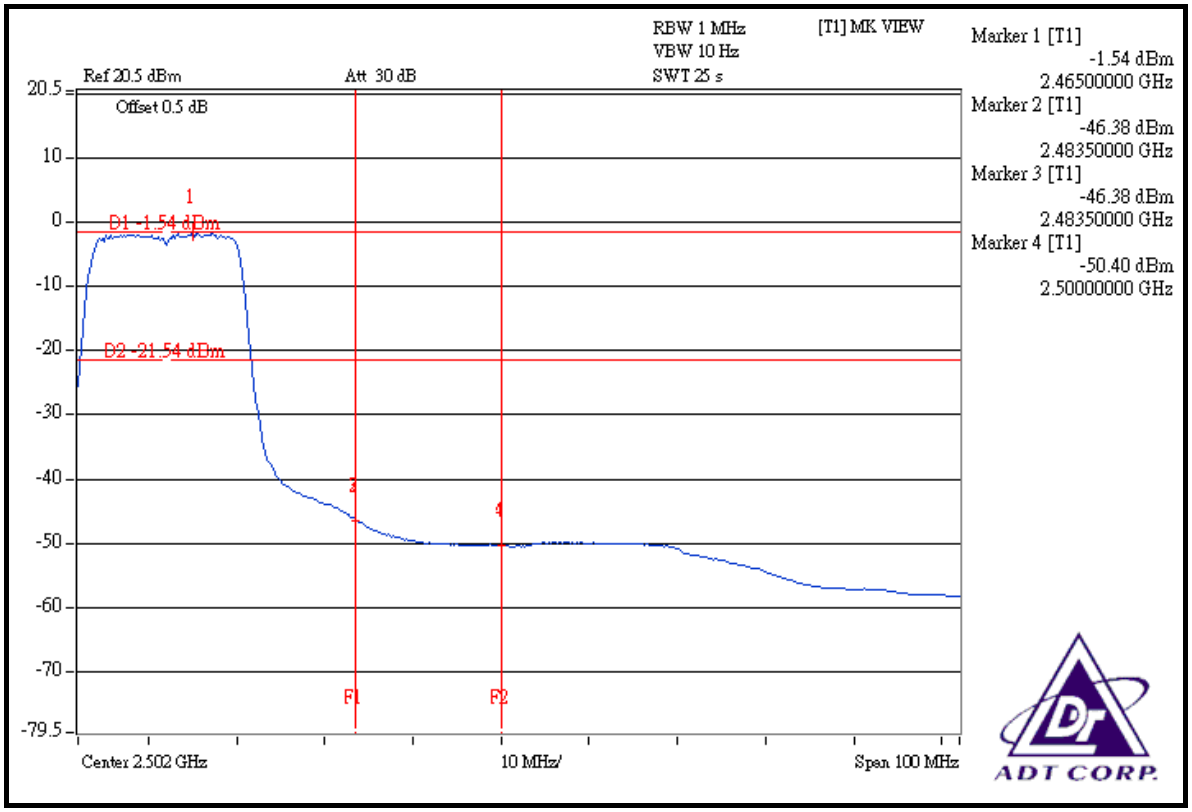
802.11g OFDM MODULATION

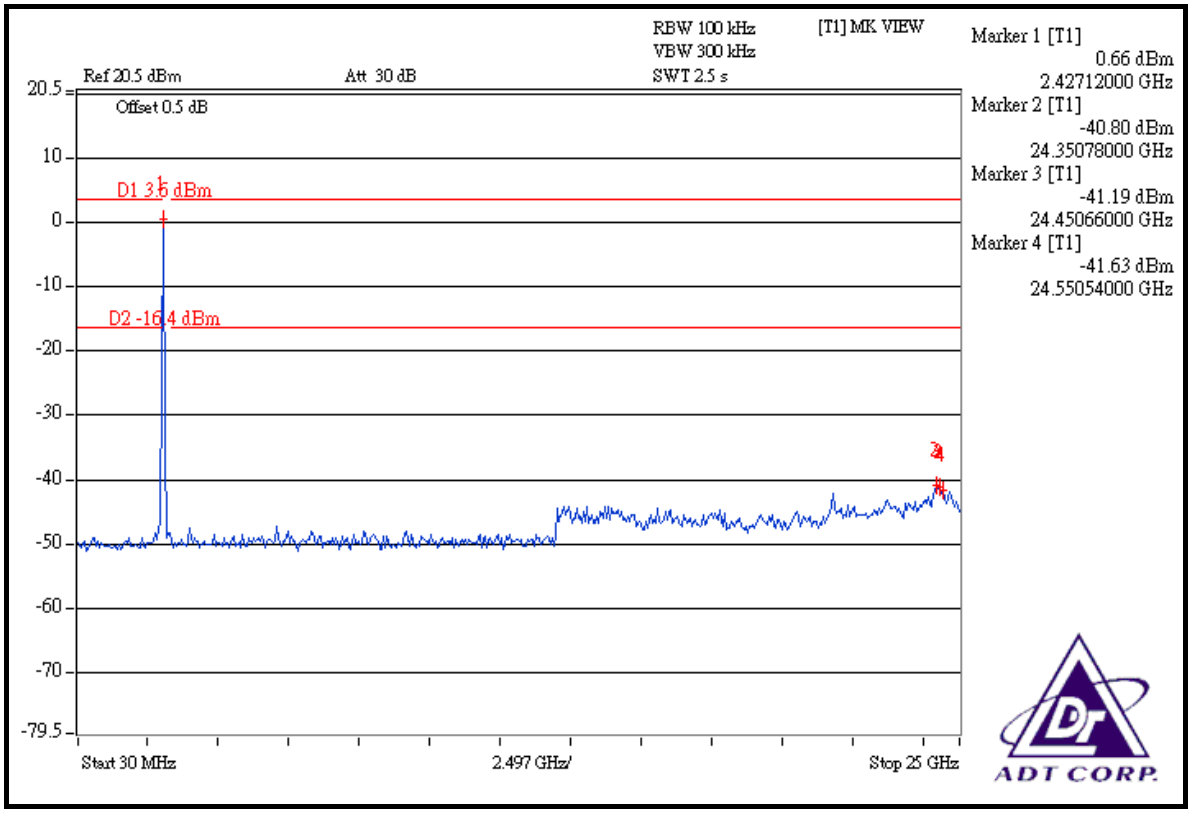





RBW 100 kHz
VBW 300 kHz
SWT 2.5 s
[T1] MK VIEW
Ref 20.5 dBm
Att 30 dB
Offset 0.5 dB
D1 2.23 dBm
D2 -17.77 dBm
Marker 1 [T1]
-0.60 dBm
2.37718000 GHz
Marker 2 [T1]
-40.37 dBm
24.45066000 GHz
Marker 3 [T1]
-40.45 dBm
24.35078000 GHz
Marker 4 [T1]
-42.15 dBm
24.15102000 GHz
20.5
10
0
-10
-20
-30
-40
-50
-60
-70
-79.5
Start 30 MHz
2.497 GHz/
Stop 25 GHz


RBW 100 kHz
VBW 300 kHz
SWT 10 ms
[T1] MK VIEW
Ref 20.5 dBm
Att 30 dB
Offset 0.5 dB
D1 3.6 dBm
D2 -16.4 dBm
Marker 1 [T1]
3.60 dBm
2.46700000 GHz
Marker 2 [T1]
-40.41 dBm
2.48350000 GHz
Marker 3 [T1]
-40.30 dBm
2.48360000 GHz
Marker 4 [T1]
-46.81 dBm
2.50000000 GHz
20.5
10
0
-10
-20
-30
-40
-50
-60
-70
-79.5
F1
F2
Center 2.502 GHz
10 MHz/
Span 100 MHz


RBW 1 MHz
VBW 10 Hz
SWT 25 s
[T1] MK VIEW
Ref 20.5 dBm
Att 30 dB
Offset 0.5 dB
D1 -1.54 dBm
D2 -21.54 dBm
Marker 1 [T1]
-1.54 dBm
2.46500000 GHz
Marker 2 [T1]
-46.38 dBm
2.48350000 GHz
Marker 3 [T1]
-46.38 dBm
2.48350000 GHz
Marker 4 [T1]
-50.40 dBm
2.50000000 GHz
Center 2.502 GHz
10 MHz/
Span 100 MHz


RBW 100 kHz
VBW 300 kHz
SWT 2.5 s
[T1] MK VIEW
Ref 20.5 dBm
Att 30 dB
Offset 0.5 dB
D1 3.6 dBm
D2 -16.4 dBm
Marker 1 [T1]
0.66 dBm
2.42712000 GHz
Marker 2 [T1]
-40.80 dBm
24.35078000 GHz
Marker 3 [T1]
-41.19 dBm
24.45066000 GHz
Marker 4 [T1]
-41.63 dBm
24.55054000 GHz
Start 30 MHz
2.497 GHz/
Stop 25 GHz

4.7 ANTENNA REQUIREMENT

4.7.1 STANDARD APPLICABLE

For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

And according to FCC 47 CFR Section 15.247 (b), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

4.7.2 ANTENNA CONNECTED CONSTRUCTION

The antenna type used in this product is PIFA antenna without antenna connector. The maximum Gain of the antenna is 1.5dBi.

5 PHOTOGRAPHS OF THE TEST CONFIGURATION

Please refer to the attached file (Test Setup Photo).

6 INFORMATION ON THE TESTING LABORATORIES

We, ADT Corp., were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are accredited and approved by the following approval agencies according to ISO/IEC 17025.

USA	FCC, UL, A2LA
Germany	TUV Rheinland
Japan	VCCI
Norway	NEMKO
Canada	INDUSTRY CANADA , CSA
R.O.C.	TAF, BSMI, NCC
Netherlands	Telefication
Singapore	GOST-ASIA(MOU)
Russia	CERTIS(MOU)

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

Linko EMC/RF Lab
Tel: 886-2-26052180
Fax: 886-2-26051924

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

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

Web Site: www.adt.com.tw

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

7 APPENDIX A – MODIFICATIONS RECORDERS FOR ENGINEERING CHANGES TO THE EUT BY THE LAB

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