FCC TEST REPORT

REPORT NO.: RF970627L02
MODEL NO.: WUSB54GSC ver. 2
RECEIVED: Jun. 27, 2008
TESTED: Jul. 02 ~ Jul. 09, 2008
ISSUED: Jul. 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 244, Taipei Hsien, Taiwan, R.O.C.

TEST LOCATION: No. 19, Hwa Ya 2nd Rd, Wen Hwa Tsuen, Kwei Shan Hsiang, Taoyuan Hsien 333, Taiwan, R.O.C.

Testing Laboratory 0528

TESTING CERT # 2177-01

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1 CERTIFICATION

PRODUCT: Compact Wireless-G USB Network Adapter with SpeedBooster

MODEL: WUSB54GSC ver. 2

BRAND: Linksys

APPLICANT: Cisco-Linksys LLC

TESTED: Jul. 02 ~ Jul. 09, 2008

TEST SAMPLE: ENGINEERING SAMPLE

STANDARDS: **FCC Part 15, Subpart C (Section 15.247)**
ANSI C63.4-2003

The above equipment (model: WUSB54GSC ver. 2) 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 : Peggy Chen , **DATE:** Jul. 14, 2008
Peggy Chen / Specialist

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

APPROVED BY : Gary Chang , **DATE:** Jul. 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 -11.21dB at 3.727MHz.
15.247(a)(2)	Spectrum Bandwidth of a Direct Sequence Spread Spectrum System Limit: min. 500kHz	PASS	Meet the requirement of limit.
15.247(b)	Maximum Peak Output Power Limit: max. 30dBm	PASS	Meet the requirement of limit.
15.247(d)	Radiated Emissions Limit: Table 15.209	PASS	Meet the requirement of limit. Minimum passing margin is -1.02dB at 2483.50MHz.
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	30MHz ~ 200MHz	3.19 dB
	200MHz ~1000MHz	3.21 dB
	1GHz ~ 18GHz	2.26 dB
	18GHz ~ 40GHz	1.94 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	Compact Wireless-G USB Network Adapter with SpeedBooster
MODEL NO.	WUSB54GSC ver. 2
FCC ID	Q87-WUSB54GSCV2
POWER SUPPLY	5.0Vdc from host equipment
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	51.642mW
ANTENNA TYPE	Printed antenna with 2.3dBi gain
DATA CABLE	1.5m shielded USB cable without core
I/O PORTS	USB
ACCESSORY DEVICES	NA

NOTE:

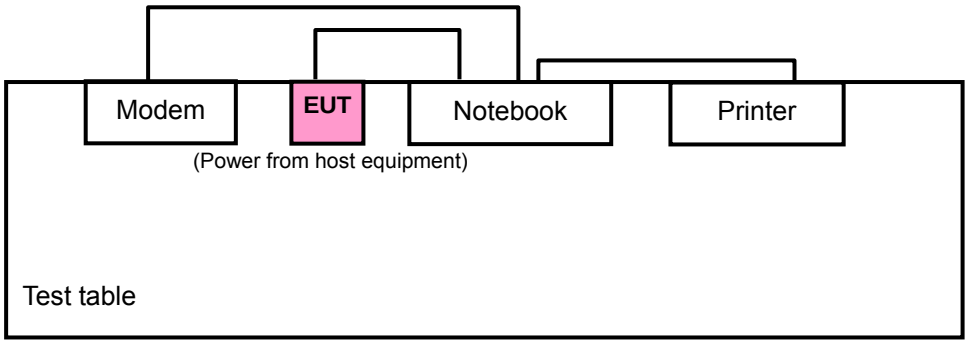
1. The EUT, operates in the 2.4GHz frequency range, lets you connect IEEE 802.11g or IEEE 802.11b devices to the network. With its high-speed data transmissions of up to 54Mbps.
2. The above EUT information was declared by manufacturer and for more detailed features description, please refer to the manufacturer's 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



3.2.2 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

EUT CONFIGURE MODE	APPLICABLE TO				DESCRIPTION
	RE≥1G	RE<1G	PLC	APCM	
-	√	√	√	√	-

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.

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)	AXIS
802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1	X
802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6	X

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, XYZ axis 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)	AXIS
802.11b	1 to 11	1	DSSS	DBPSK	1	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.

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)
802.11b	1 to 11	1	DSSS	DBPSK	1

BANDEDGE MEASUREMENT:

☒ 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.

MODE	AVAILABLE CHANNEL	TESTED CHANNEL	MODULATION TECHNOLOGY	MODULATION TYPE	DATA RATE (Mbps)	AXIS
802.11b	1 to 11	1, 11	DSSS	DBPSK	1	X
802.11g	1 to 11	1, 11	OFDM	BPSK	6	X

ANTENNA PORT CONDUCTED MEASUREMENT:

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

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

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

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	NOTEBOOK COMPUTER	DELL	PP05L	12130898320	E2K24CLNS
2	PRINTER	EPSON	LQ-300+	DCGY054146	FCC DoC Approved
3	MODEM	ACEEX	1414V/3	0401008260	IFAXDM1414

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	NA
2	1.8m braid shielded wire, DB25 connector, w/o core.
3	1.2m braid shielded wire, DB25 & DB9 connector, w/o core.

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

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
Test Receiver ROHDE & SCHWARZ	ESI7	838496/016	Dec. 25, 2008
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100039	Dec. 02, 2008
BILOG Antenna SCHWARZBECK	VULB9168	9168-155	Apr. 29, 2009
HORN Antenna SCHWARZBECK	BBHA 9120D	9120D-408	Jan. 21, 2009
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170242	Jan. 06, 2009
Preamplifier Agilent	8449B	3008A01960	Oct. 30, 2008
Preamplifier Agilent	8447D	2944A10631	Oct. 31, 2008
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	274397/4	Nov. 07, 2008
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	283401/4	Nov. 07, 2008
Software ADT.	ADT_Radiated_V7.6	NA	NA
Antenna Tower inn-co GmbH	MA 4000	010303	NA
Antenna Tower Controller inn-co GmbH	CO2000	019303	NA
Turn Table ADT.	TT100.	TT93021704	NA
Turn Table Controller ADT.	SC100.	SC93021704	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 4.

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

4. The FCC Site Registration No. is 460141.

5. The IC Site Registration No. is IC3789B-4.

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. 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.

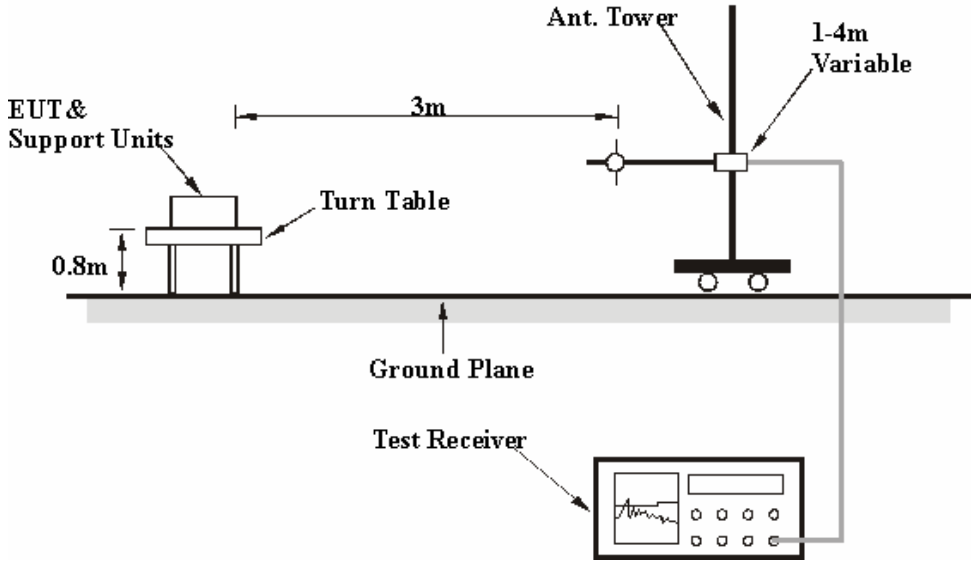
NOTE:

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 10Hz 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. Connected EUT with the notebook system by a USB cable and placed on the testing table.
b. The notebook system ran a test program (provided by manufacturer) to enable EUT under transmission condition continuously at specific channel frequency.
c. The necessary accessories enable the system in full functions.

4.1.7 TEST RESULTS

802.11b DSSS MODULATION

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	23deg. C, 63%RH 1000hPa	TESTED BY	Mark 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	64.55 PK	74.00	-9.45	1.03 H	38	32.82	31.73
2	2390.00	52.39 AV	54.00	-1.61	1.03 H	38	20.66	31.73
3	*2412.00	112.20 PK			1.03 H	38	80.39	31.81
4	*2412.00	107.71 AV			1.03 H	38	75.90	31.81
5	4824.00	52.66 PK	74.00	-21.34	1.95 H	121	14.57	38.09
6	4824.00	47.09 AV	54.00	-6.91	1.95 H	121	9.00	38.09
7	#7236.00	56.37 PK	92.20	-35.83	1.70 H	107	11.87	44.50
8	#7236.00	46.61 AV	87.71	-41.10	1.70 H	107	2.11	44.50
9	#9648.00	58.56 PK	92.20	-33.64	1.00 H	34	10.83	47.73
10	#9648.00	50.03 AV	87.71	-37.68	1.00 H	34	2.30	47.73
11	12060.00	60.70 PK	74.00	-13.30	1.09 H	4	10.86	49.84
12	12060.00	47.80 AV	54.00	-6.20	1.09 H	4	-2.04	49.84

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	59.56 PK	74.00	-14.44	1.08 V	1	27.83	31.73
2	2390.00	48.36 AV	54.00	-5.64	1.08 V	1	16.63	31.73
3	*2412.00	105.84 PK			1.08 V	1	74.03	31.81
4	*2412.00	101.18 AV			1.08 V	1	69.37	31.81
5	4824.00	55.25 PK	74.00	-18.75	1.09 V	55	17.16	38.09
6	4824.00	51.45 AV	54.00	-2.55	1.09 V	55	13.36	38.09
7	#7236.00	57.87 PK	85.84	-27.97	1.87 V	14	13.37	44.50
8	#7236.00	49.22 AV	81.18	-31.96	1.87 V	14	4.72	44.50
9	#9648.00	60.36 PK	85.84	-25.48	1.85 V	93	12.63	47.73
10	#9648.00	54.81 AV	81.18	-26.37	1.85 V	93	7.08	47.73
11	12060.00	60.34 PK	74.00	-13.66	1.84 V	103	10.50	49.84
12	12060.00	46.83 AV	54.00	-7.17	1.84 V	103	-3.01	49.84

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

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	23deg. C, 63%RH 1000hPa	TESTED BY	Mark 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	2380.00	60.21 PK	74.00	-13.79	1.06 H	37	28.51	31.70
2	2380.00	50.31 AV	54.00	-3.69	1.06 H	37	18.61	31.70
3	*2437.00	111.67 PK			1.03 H	32	79.77	31.90
4	*2437.00	106.89 AV			1.03 H	32	74.99	31.90
5	2500.00	61.67 PK	74.00	-12.33	1.00 H	36	29.54	32.13
6	2500.00	52.00 AV	54.00	-2.00	1.00 H	36	19.87	32.13
7	4874.00	50.34 PK	74.00	-23.66	1.69 H	175	12.12	38.22
8	4874.00	42.67 AV	54.00	-11.33	1.69 H	175	4.45	38.22
9	7311.00	55.30 PK	74.00	-18.70	1.87 H	105	10.61	44.69
10	7311.00	44.94 AV	54.00	-9.06	1.87 H	105	0.25	44.69
11	#9748.00	58.72 PK	91.67	-32.95	1.77 H	57	10.83	47.89
12	#9748.00	49.92 AV	86.89	-36.97	1.77 H	57	2.03	47.89
13	12185.00	60.56 PK	74.00	-13.44	1.25 H	10	10.75	49.81
14	12185.00	46.98 AV	54.00	-7.02	1.25 H	10	-2.83	49.81

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

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

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

4. Margin value = Emission level – Limit value.

5. " * ": Fundamental frequency.

6. "#":The radiated frequency is out the restricted band.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 6	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	23deg. C, 63%RH 1000hPa	TESTED BY	Mark Liao

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	2380.00	58.75 PK	74.00	-15.25	1.09 V	4	27.05	31.70
2	2380.00	47.08 AV	54.00	-6.92	1.09 V	4	15.38	31.70
3	*2437.00	105.17 PK			1.09 V	4	73.27	31.90
4	*2437.00	100.57 AV			1.09 V	4	68.67	31.90
5	2500.00	59.58 PK	74.00	-14.42	1.09 V	4	27.45	32.13
6	2500.00	48.70 AV	54.00	-5.30	1.09 V	4	16.57	32.13
7	4874.00	52.81 PK	74.00	-21.19	1.08 V	53	14.59	38.22
8	4874.00	47.95 AV	54.00	-6.05	1.08 V	53	9.73	38.22
9	7311.00	55.81 PK	74.00	-18.19	1.01 V	27	11.12	44.69
10	7311.00	47.01 AV	54.00	-6.99	1.01 V	27	2.32	44.69
11	#9748.00	61.26 PK	85.17	-23.91	1.00 V	53	13.37	47.89
12	#9748.00	54.34 AV	80.57	-26.23	1.00 V	53	6.45	47.89
13	12185.00	60.01 PK	74.00	-13.99	1.56 V	115	10.20	49.81
14	12185.00	46.12 AV	54.00	-7.88	1.56 V	115	-3.69	49.81

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

2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. " * ": Fundamental frequency.
6. "#":The radiated frequency is out the restricted band.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	23deg. C, 63%RH 1000hPa	TESTED BY	Mark 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	111.71 PK			1.02 H	37	79.72	31.99
2	*2462.00	107.12 AV			1.02 H	37	75.13	31.99
3	2483.50	63.74 PK	74.00	-10.26	1.02 H	37	31.67	32.07
4	**2483.50**	**52.98 AV**	**54.00**	**-1.02**	**1.02 H**	**37**	**20.91**	**32.07**
5	4924.00	50.37 PK	74.00	-23.63	1.01 H	44	12.02	38.35
6	4924.00	42.16 AV	54.00	-11.84	1.01 H	44	3.81	38.35
7	7386.00	55.36 PK	74.00	-18.64	1.48 H	2	10.48	44.87
8	7386.00	44.89 AV	54.00	-9.11	1.48 H	2	0.01	44.87
9	#9848.00	61.26 PK	91.71	-30.45	1.13 H	336	13.21	48.05
10	#9848.00	54.06 AV	87.12	-33.06	1.13 H	336	6.01	48.05
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	105.68 PK			1.10 V	41	73.69	31.99
2	*2462.00	101.21 AV			1.10 V	41	69.22	31.99
3	2483.50	58.69 PK	74.00	-15.31	1.10 V	41	26.62	32.07
4	2483.50	49.45 AV	54.00	-4.55	1.10 V	41	17.38	32.07
5	4924.00	53.42 PK	74.00	-20.58	1.21 V	61	15.07	38.35
6	4924.00	45.22 AV	54.00	-8.78	1.21 V	61	6.87	38.35
7	7386.00	54.21 PK	74.00	-19.79	1.52 V	23	9.34	44.87
8	7386.00	41.81 AV	54.00	-12.19	1.52 V	23	-3.06	44.87
9	#9848.00	61.01 PK	85.68	-24.67	1.48 V	55	12.96	48.05
10	#9848.00	53.13 AV	81.21	-28.08	1.48 V	55	5.08	48.05

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

2. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. " * ": Fundamental frequency.
6. "#":The radiated frequency is out the restricted band.

802.11g OFDM MODULATION

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	23deg. C, 63%RH 1000hPa	TESTED BY	Mark 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	65.98 PK	74.00	-8.02	1.02 H	23	34.25	31.73
2	2390.00	50.30 AV	54.00	-3.70	1.02 H	23	18.57	31.73
3	*2412.00	111.88 PK			1.02 H	23	80.07	31.81
4	*2412.00	96.78 AV			1.02 H	23	64.97	31.81
5	4824.00	46.98 PK	74.00	-27.02	1.00 H	121	8.89	38.09
6	4824.00	34.75 AV	54.00	-19.25	1.00 H	121	-3.34	38.09
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	63.05 PK	74.00	-10.95	1.08 V	4	31.32	31.73
2	2390.00	47.92 AV	54.00	-6.08	1.08 V	4	16.19	31.73
3	*2412.00	106.15 PK			1.08 V	4	74.34	31.81
4	*2412.00	91.77 AV			1.08 V	4	59.96	31.81
5	4824.00	49.85 PK	74.00	-24.15	1.09 V	58	11.76	38.09
6	4824.00	37.04 AV	54.00	-16.96	1.09 V	58	-1.05	38.09

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 (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	23deg. C, 63%RH 1000hPa	TESTED BY	Mark 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	60.98 PK	74.00	-13.02	1.02 H	36	29.25	31.73
2	2390.00	47.94 AV	54.00	-6.06	1.02 H	36	16.21	31.73
3	*2437.00	111.56 PK			1.02 H	36	79.66	31.90
4	*2437.00	96.89 AV			1.02 H	36	64.99	31.90
5	2483.50	60.96 PK	74.00	-13.04	1.02 H	36	28.89	32.07
6	2483.50	48.93 AV	54.00	-5.07	1.02 H	36	16.86	32.07
7	4874.00	48.68 PK	74.00	-25.32	1.09 H	126	10.46	38.22
8	4874.00	36.35 AV	54.00	-17.65	1.09 H	126	-1.87	38.22
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	2390.00	57.67 PK	74.00	-16.33	1.08 V	1	25.94	31.73
2	2390.00	46.03 AV	54.00	-7.97	1.08 V	1	14.30	31.73
3	*2437.00	105.94 PK			1.08 V	1	74.04	31.90
4	*2437.00	91.93 AV			1.08 V	1	60.03	31.90
5	2483.50	58.54 PK	74.00	-15.46	1.08 V	1	26.47	32.07
6	2483.50	46.58 AV	54.00	-7.42	1.08 V	1	14.51	32.07
7	4874.00	46.93 PK	74.00	-27.07	1.04 V	105	8.71	38.22
8	4874.00	34.94 AV	54.00	-19.06	1.04 V	105	-3.28	38.22

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

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

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

4. Margin value = Emission level – Limit value.

5. " * ": Fundamental frequency.

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 11	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	23deg. C, 63%RH 1000hPa	TESTED BY	Mark 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	111.50 PK			1.03 H	34	79.51	31.99
2	*2462.00	96.44 AV			1.03 H	34	64.45	31.99
3	2483.50	66.74 PK	74.00	-7.26	1.03 H	34	34.67	32.07
4	2483.50	52.02 AV	54.00	-1.98	1.03 H	34	19.95	32.07
5	4924.00	48.16 PK	74.00	-25.84	1.18 H	85	9.81	38.35
6	4924.00	35.47 AV	54.00	-18.53	1.18 H	85	-2.88	38.35
ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
NO.	FREQ. (MHz)	EMISSION LEVEL (dBuV/m)	LIMIT (dBuV/m)	MARGIN (dB)	ANTENNA HEIGHT (m)	TABLE ANGLE (Degree)	RAW VALUE (dBuV)	CORRECTION FACTOR (dB/m)
1	*2462.00	106.62 PK			1.06 V	6	74.63	31.99
2	*2462.00	91.59 AV			1.06 V	6	59.60	31.99
3	2483.50	61.67 PK	74.00	-12.33	1.06 V	6	29.60	32.07
4	2483.50	48.16 AV	54.00	-5.84	1.06 V	6	16.09	32.07
5	4924.00	47.56 PK	74.00	-26.44	1.08 V	98	9.21	38.35
6	4924.00	35.06 AV	54.00	-18.94	1.08 V	98	-3.29	38.35

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

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

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

4. Margin value = Emission level – Limit value.

5. " * ": Fundamental frequency.

6. "#":The radiated frequency is out the restricted band.

BELOW 1GHz WORST-CASE DATA：802.11b DSSS MODULATION

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	FREQUENCY RANGE	Below 1000MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	23deg. C, 63%RH 1000hPa	TESTED BY	Mark 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	199.05	33.71 QP	43.50	-9.79	1.25 H	64	22.35	11.36
2	265.16	30.96 QP	46.00	-15.04	1.75 H	31	16.95	14.01
3	595.69	34.99 QP	46.00	-11.01	1.50 H	40	11.98	23.01
4	733.73	35.79 QP	46.00	-10.21	1.00 H	133	10.13	25.66
5	865.94	37.62 QP	46.00	-8.38	1.50 H	139	10.07	27.55
6	961.21	38.75 QP	54.00	-15.25	1.00 H	136	9.89	28.86
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	57.12	35.22 QP	40.00	-4.78	1.00 V	52	21.34	13.87
2	121.28	33.67 QP	43.50	-9.83	1.25 V	271	21.51	12.17
3	401.26	32.43 QP	46.00	-13.57	1.50 V	10	15.08	17.35
4	595.69	35.45 QP	46.00	-10.55	1.00 V	10	12.44	23.01
5	733.73	36.51 QP	46.00	-9.49	1.25 V	85	10.85	25.66
6	864.00	37.10 QP	46.00	-8.90	1.25 V	64	9.57	27.52
7	961.21	36.31 QP	54.00	-17.69	1.50 V	1	7.45	28.86

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	100291	Nov. 21, 2008
RF signal cable Woken	5D-FB	Cable-HYC01-01	Jan. 03, 2009
LISN ROHDE & SCHWARZ	ESH3-Z5	100312	Jun. 12, 2009
LISN ROHDE & SCHWARZ	ESH2-Z5	100104	Sep. 11, 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.

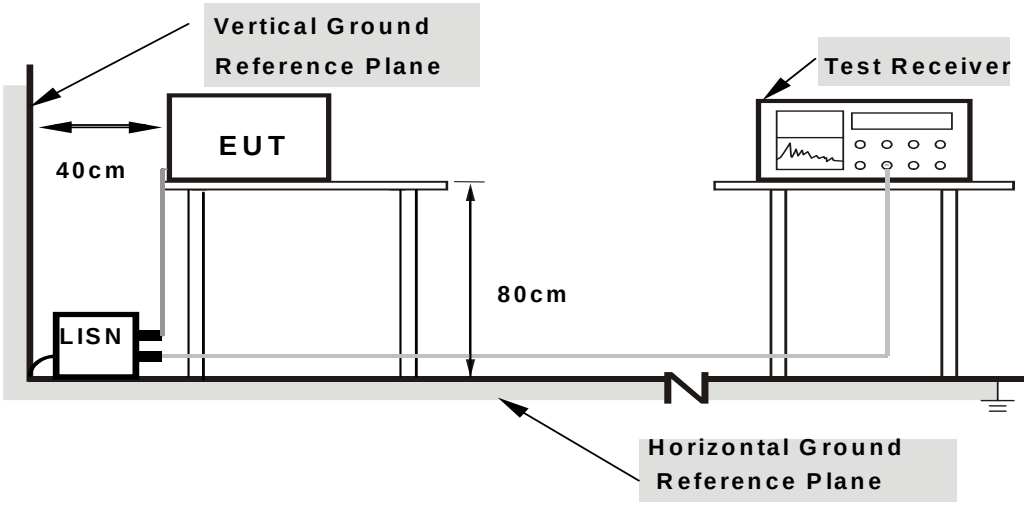
c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

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.

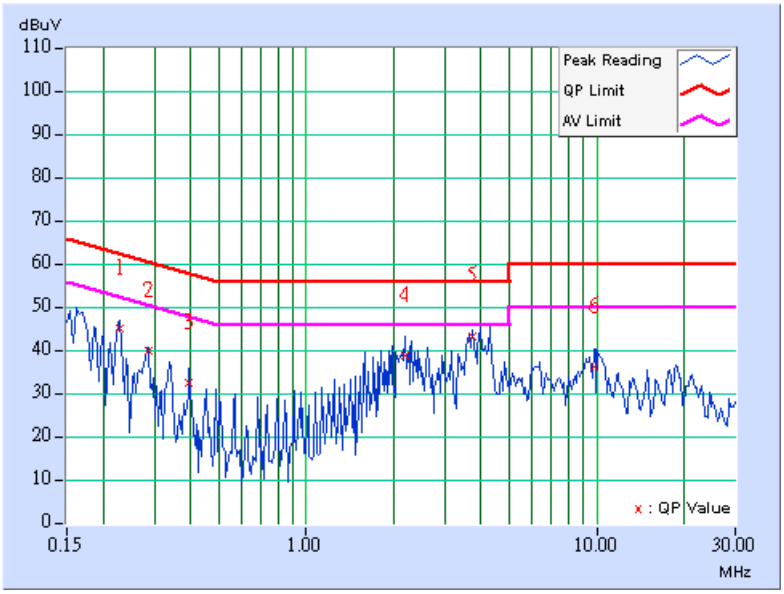
4.2.7 TEST RESULTS

CONDUCTED WORST-CASE DATA：802.11b DSSS MODULATION

EUT TEST CONDITION		MEASUREMENT DETAIL	
CHANNEL	Channel 1	PHASE	Line 1
ENVIRONMENTAL CONDITIONS	20deg. C, 60%RH, 1007hPa	6dB BANDWIDTH	9 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	TESTED BY	Match Tsui

No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.228	0.20	44.80	-	45.00	-	62.52	52.52	-17.52	-
2	0.285	0.20	39.56	-	39.76	-	60.66	50.66	-20.90	-
3	0.396	0.20	32.20	-	32.40	-	57.93	47.93	-25.53	-
4	2.203	0.22	38.20	-	38.42	-	56.00	46.00	-17.58	-
5	3.727	0.37	42.89	-	43.26	-	56.00	46.00	-12.74	-
6	9.840	0.53	35.63	-	36.16	-	60.00	50.00	-23.84	-

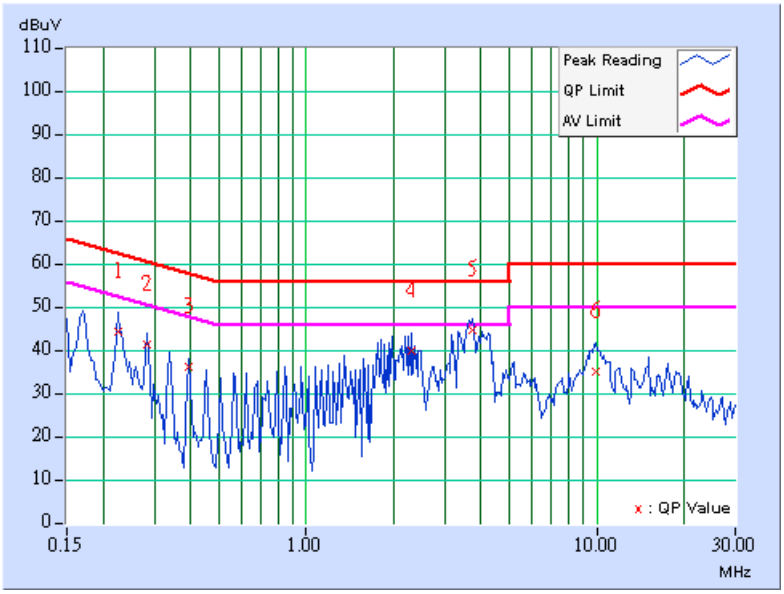
REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission 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 2
MODULATION TYPE	20deg. C, 60%RH, 1007hPa	6dB BANDWIDTH	9 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	TESTED BY	Match Tsui

No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.224	0.20	43.95	-	44.15	-	62.66	52.66	-18.51	-
2	0.283	0.20	41.01	-	41.21	-	60.73	50.73	-19.52	-
3	0.396	0.20	35.68	-	35.88	-	57.93	47.93	-22.05	-
4	2.316	0.23	39.31	-	39.54	-	56.00	46.00	-16.46	-
5	**3.727**	**0.37**	**44.42**	**-**	**44.79**	**-**	**56.00**	**46.00**	**-11.21**	**-**
6	9.945	0.53	34.84	-	35.37	-	60.00	50.00	-24.63	-

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
SPECTRUM ANALYZER	FSP 40	100041	Apr. 21, 2009

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

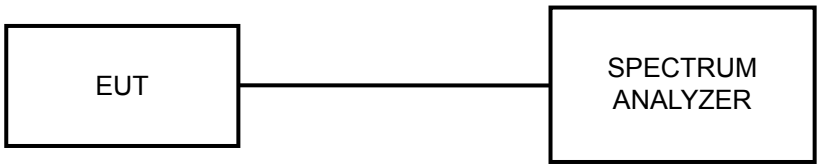
4.3.3 TEST PROCEDURE

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.

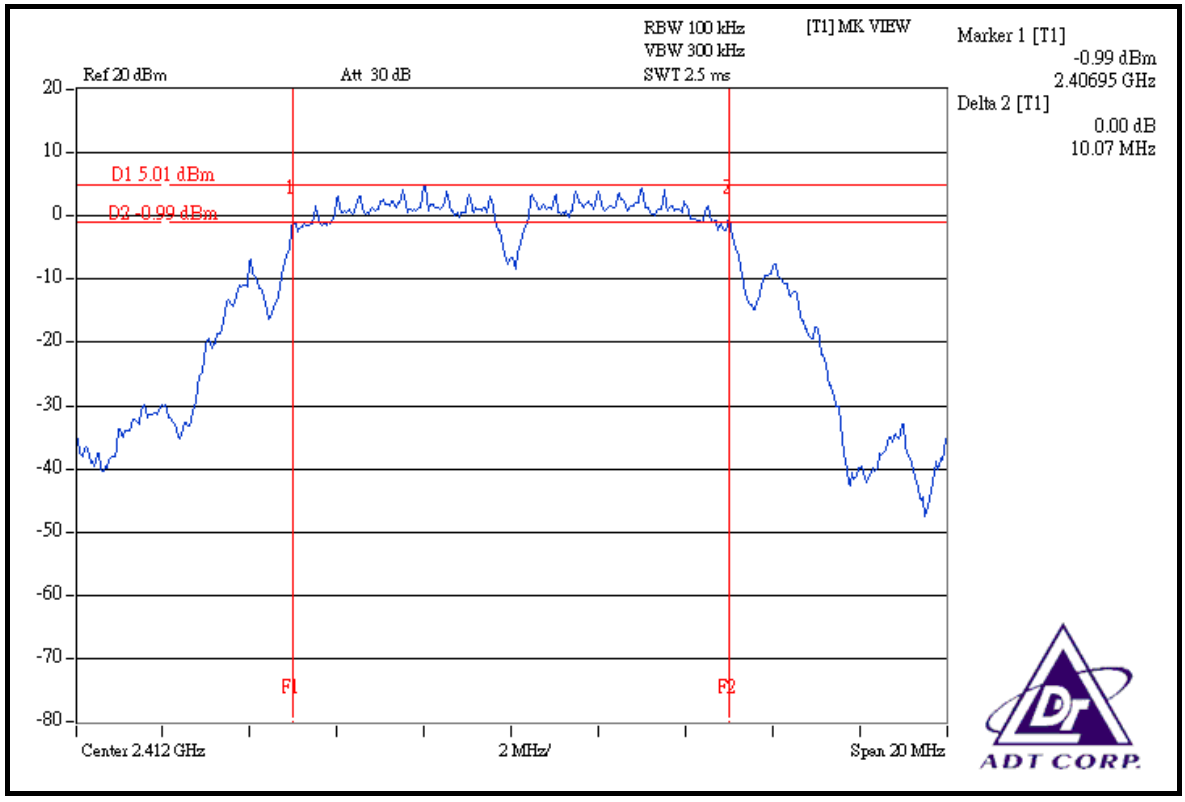
4.3.7 TEST RESULTS

802.11b DSSS MODULATION

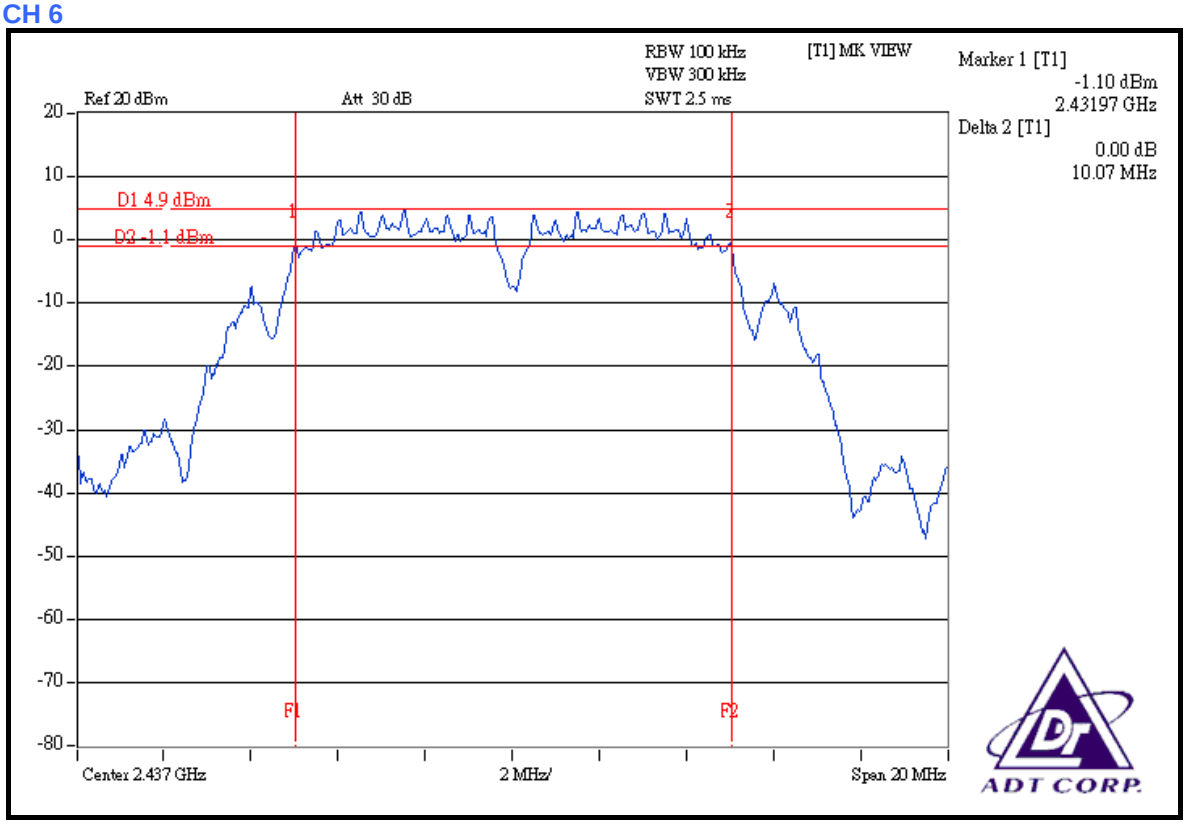
MODULATION TYPE	DBPSK	TRANSFER RATE	1Mbps
INPUT POWER	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH, 1007hPa
TESTED BY	Brad Wu		

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS/FAIL
1	2412	10.07	0.5	PASS
6	2437	10.07	0.5	PASS
11	2462	10.04	0.5	PASS

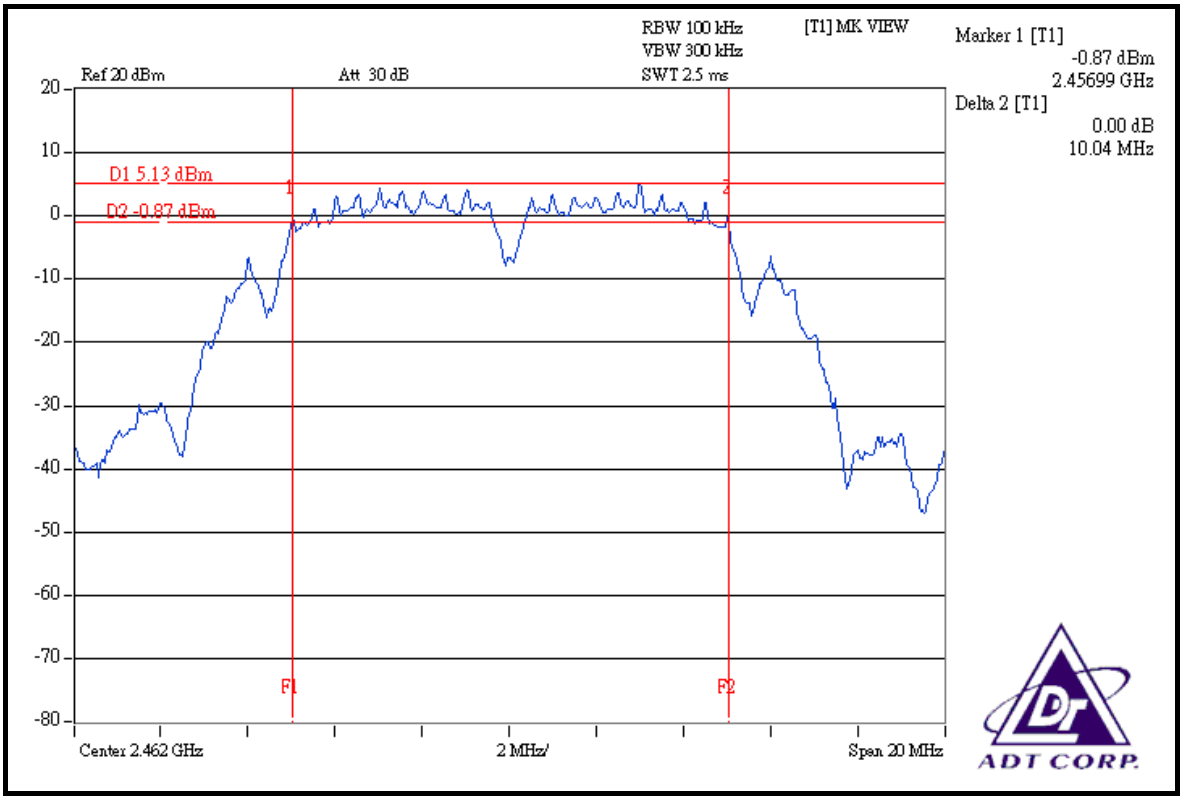
CH 1



CH 6


RBW 100 kHz
VBW 300 kHz
SWT 2.5 ms
[T1] MK VIEW
Marker 1 [T1]
-1.10 dBm
2.43197 GHz
Delta 2 [T1]
0.00 dB
10.07 MHz
Ref 20 dBm
Att 30 dB
D1 4.9 dBm
D2 -1.1 dBm
F1
F2
Center 2.437 GHz
2 MHz/
Span 20 MHz
ADT CORP.

CH 11

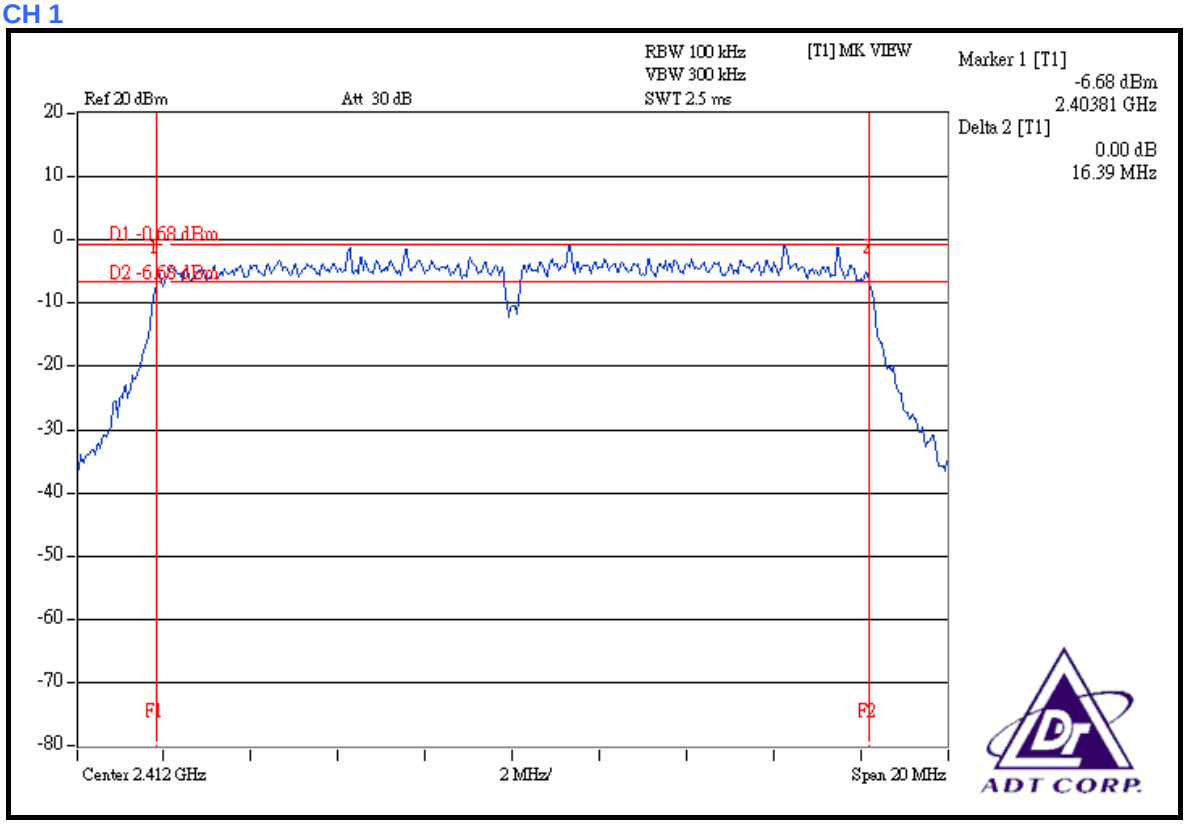

RBW 100 kHz
VBW 300 kHz
SWT 2.5 ms
[T1] MK VIEW
Marker 1 [T1]
-0.87 dBm
2.45699 GHz
Delta 2 [T1]
0.00 dB
10.04 MHz
Ref 20 dBm
Att 30 dB
D1 5.13 dBm
D2 -0.87 dBm
F1
F2
Center 2.462 GHz
2 MHz/
Span 20 MHz
ADT CORP.

802.11g OFDM MODULATION

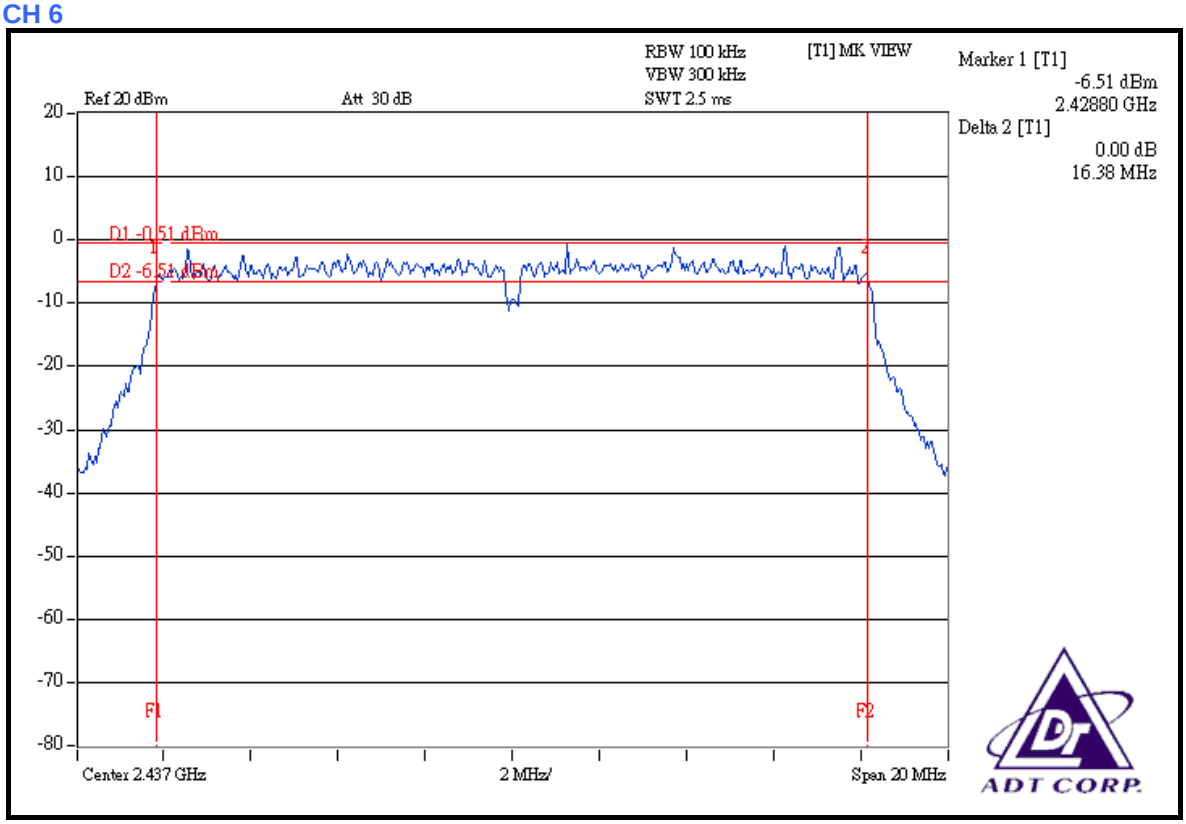
MODULATION TYPE	BPSK	TRANSFER RATE	6Mbps
INPUT POWER	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH, 1007hPa
TESTED BY	Brad Wu		

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS/FAIL
1	2412	16.39	0.5	PASS
6	2437	16.38	0.5	PASS
11	2462	16.42	0.5	PASS

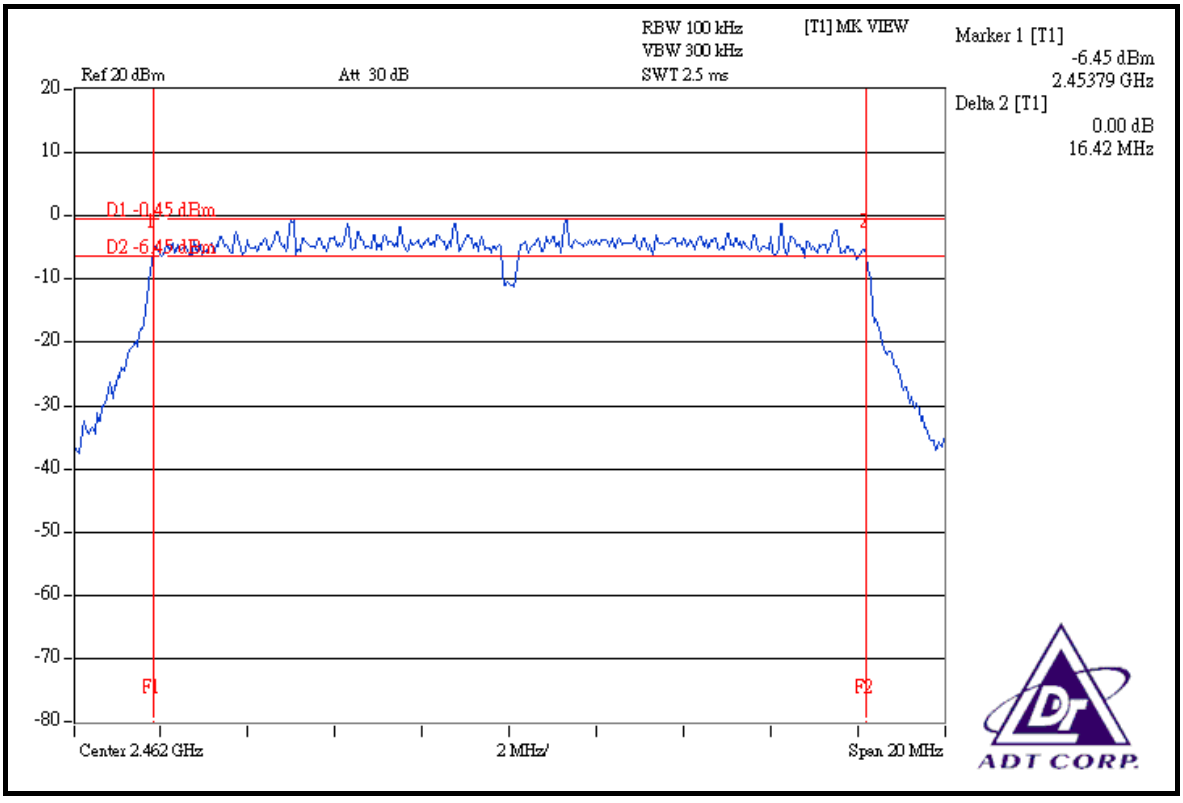
CH 1



CH 6


RBW 100 kHz
VBW 300 kHz
SWT 2.5 ms
[T1] MK VIEW
Marker 1 [T1]
-6.51 dBm
2.42880 GHz
Delta 2 [T1]
0.00 dB
16.38 MHz
Ref 20 dBm
Att 30 dB
D1 -0.51 dBm
D2 -6.51 dBm
F1
F2
Center 2.437 GHz
2 MHz/
Span 20 MHz
ADT CORP.

CH 11


RBW 100 kHz
VBW 300 kHz
SWT 2.5 ms
[T1] MK VIEW
Marker 1 [T1]
-6.45 dBm
2.45379 GHz
Delta 2 [T1]
0.00 dB
16.42 MHz
Ref 20 dBm
Att 30 dB
D1 -0.45 dBm
F1
F2
Center 2.462 GHz
2 MHz/
Span 20 MHz
ADT CORP.

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	100041	Apr. 21, 2009
AGILENT SIGNAL GENERATOR	E8257C	MY43320668	Dec. 25, 2008
TEKTRONIX OSCILLOSCOPE	TDS1012	C037299	Nov. 21, 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	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH, 1007hPa
TESTED BY	Brad Wu		

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (mW)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (dBm)	PASS/FAIL
1	2412	51.642	17.13	30	PASS
6	2437	51.286	17.10	30	PASS
11	2462	50.816	17.06	30	PASS

802.11g OFDM MODULATION

MODULATION TYPE	BPSK	TRANSFER RATE	6Mbps
INPUT POWER	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH, 1007hPa
TESTED BY	Brad Wu		

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (mW)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (dBm)	PASS/FAIL
1	2412	40.087	16.03	30	PASS
6	2437	39.994	16.02	30	PASS
11	2462	39.902	16.01	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	FSP 40	100041	Apr. 21, 2009

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

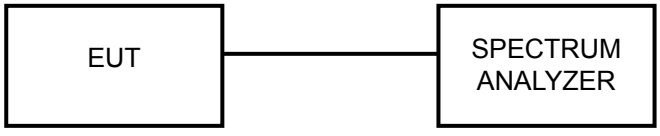
The transmitter output was connected to the spectrum analyzer through an attenuator, the bandwidth of the fundamental frequency was measured with the spectrum analyzer using 3kHz RBW and 30kHz VBW, set sweep time = span/3kHz. The power spectral density was measured and recorded.

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.

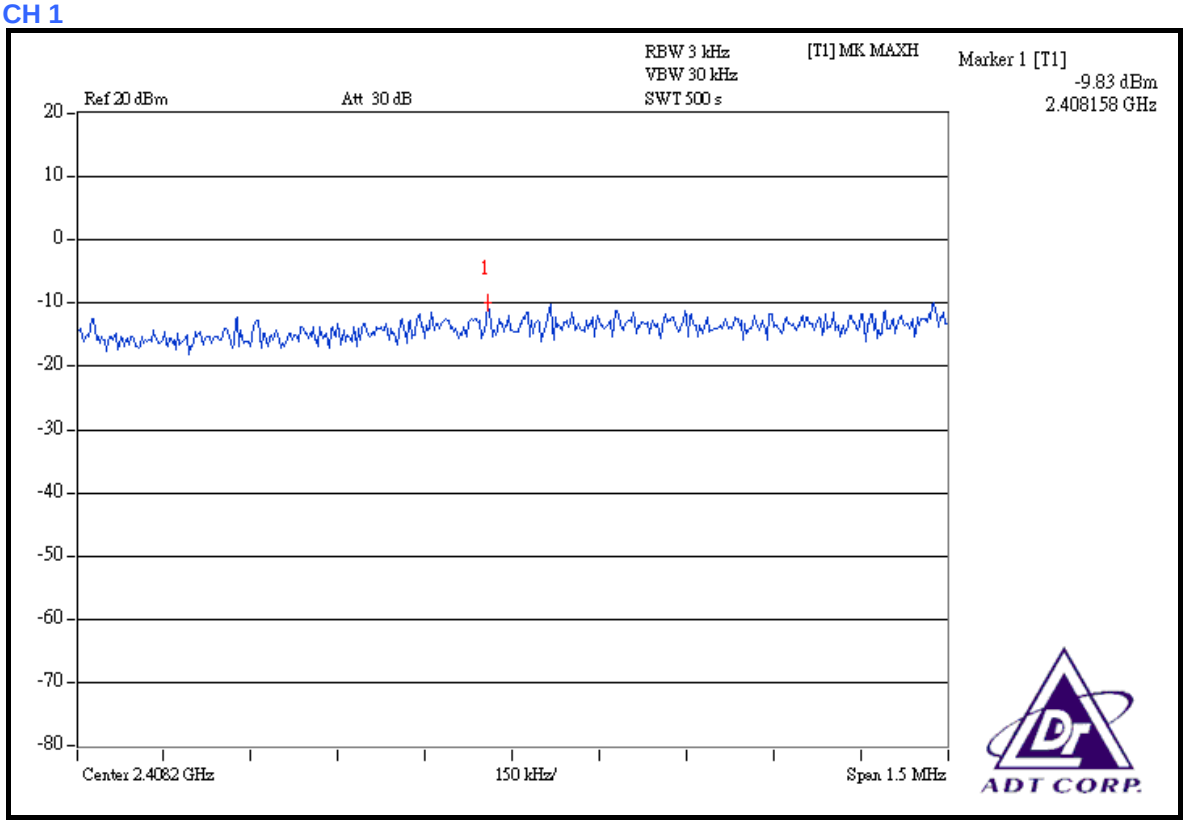
4.5.7 TEST RESULTS

802.11b DSSS MODULATION

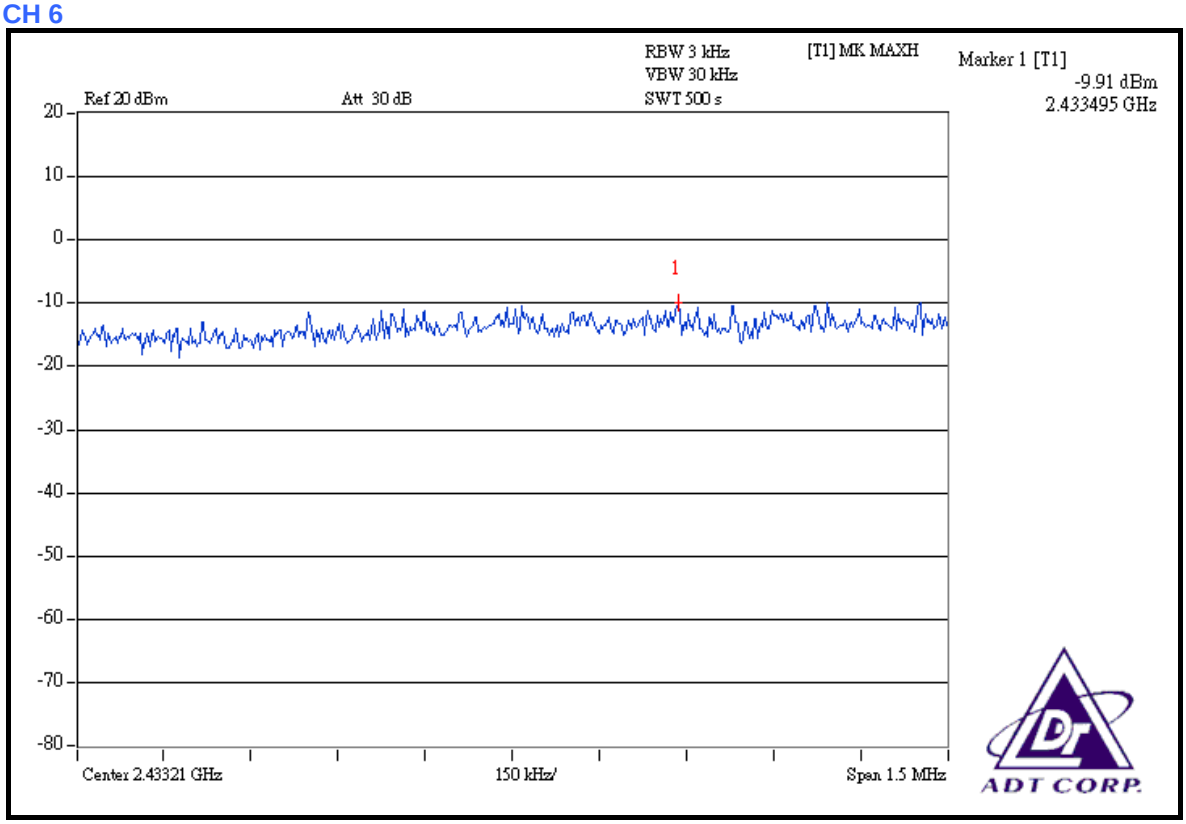
MODULATION TYPE	DBPSK	TRANSFER RATE	1Mbps
INPUT POWER	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH, 1007hPa
TESTED BY	Brad Wu		

CHANNEL	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3 kHz BW (dBm)	MAXIMUM LIMIT (dBm)	PASS/FAIL
1	2412	-9.83	8	PASS
6	2437	-9.91	8	PASS
11	2462	-9.73	8	PASS

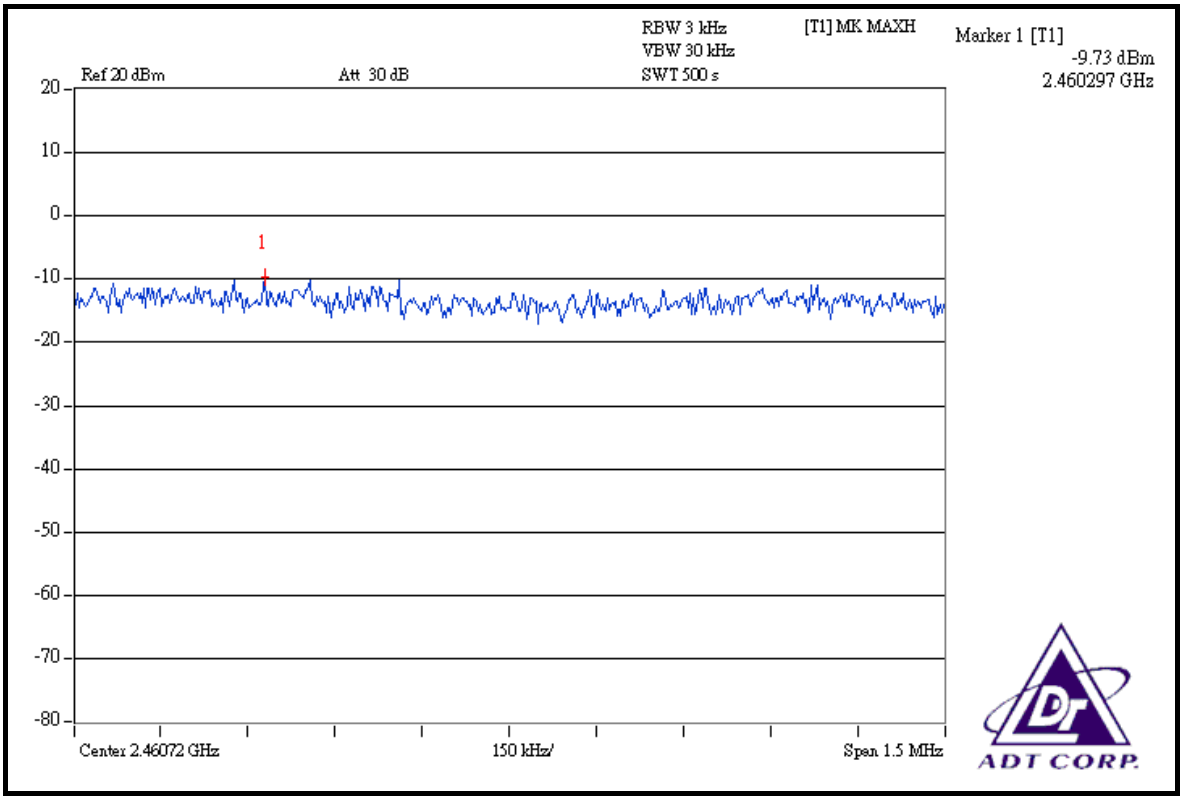
CH 1



CH 6


RBW 3 kHz
VBW 30 kHz
SWT 500 s
[T1] MK MAXH
Marker 1 [T1]
-9.91 dBm
2.433495 GHz
Ref 20 dBm
Att 30 dB
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
1
Center 2.43321 GHz
150 kHz/
Span 1.5 MHz
ADT CORP.

CH 11

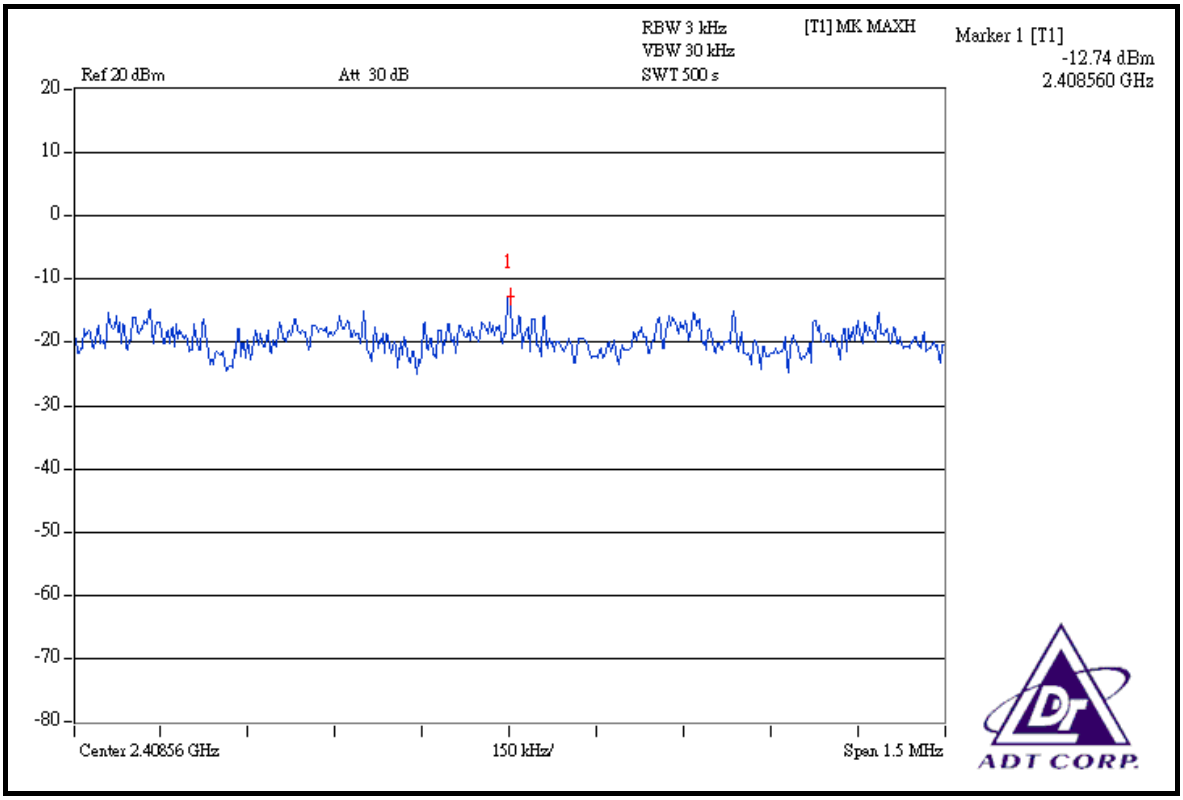

RBW 3 kHz
VBW 30 kHz
SWT 500 s
[T1] MK MAXH
Marker 1 [T1]
-9.73 dBm
2.460297 GHz
Ref 20 dBm
Att 30 dB
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
1
Center 2.46072 GHz
150 kHz/
Span 1.5 MHz
ADT CORP.

802.11g OFDM MODULATION

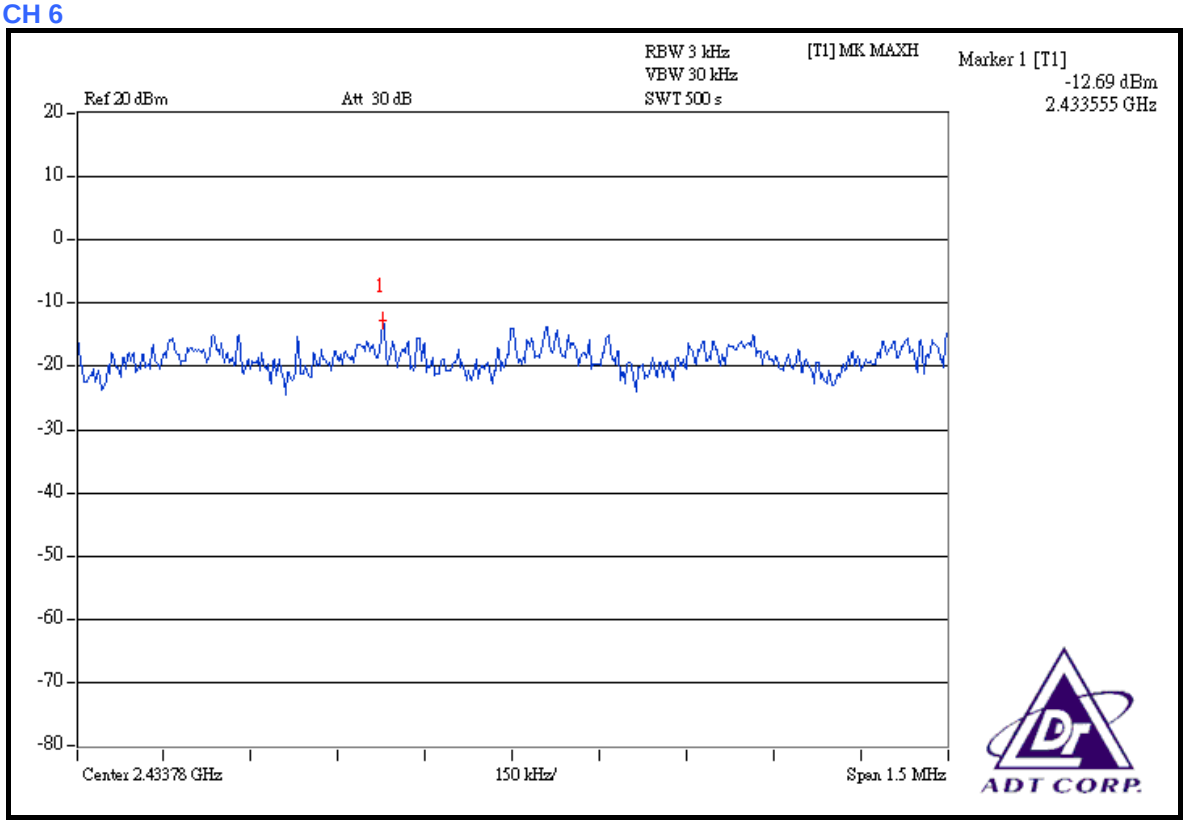
MODULATION TYPE	BPSK	TRANSFER RATE	6Mbps
INPUT POWER	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	25deg. C, 65%RH, 1007hPa
TESTED BY	Brad Wu		

CHANNEL	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3 kHz BW (dBm)	MAXIMUM LIMIT (dBm)	PASS/FAIL
1	2412	-12.74	8	PASS
6	2437	-12.69	8	PASS
11	2462	-12.79	8	PASS

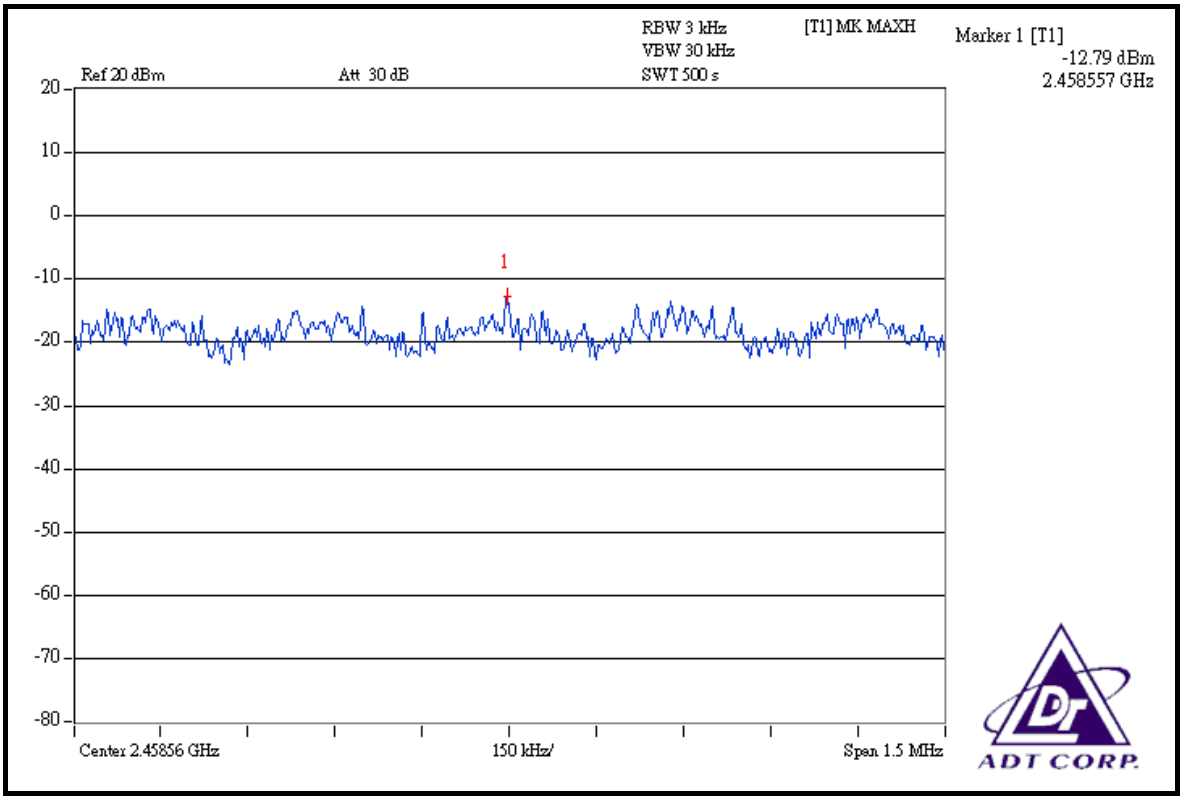
CH 1



CH 6


RBW 3 kHz
VBW 30 kHz
SWT 500 s
[T1] MK MAXH
Marker 1 [T1]
-12.69 dBm
2.433555 GHz
Ref 20 dBm
Att 30 dB
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
1
Center 2.43378 GHz
150 kHz/
Span 1.5 MHz
ADT CORP.

CH 11


RBW 3 kHz
VBW 30 kHz
SWT 500 s
[T1] MK MAXH
Marker 1 [T1]
-12.79 dBm
2.458557 GHz
Ref 20 dBm
Att 30 dB
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80
1
Center 2.45856 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	FSP 40	100041	Apr. 21, 2009

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= 1kHz 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).

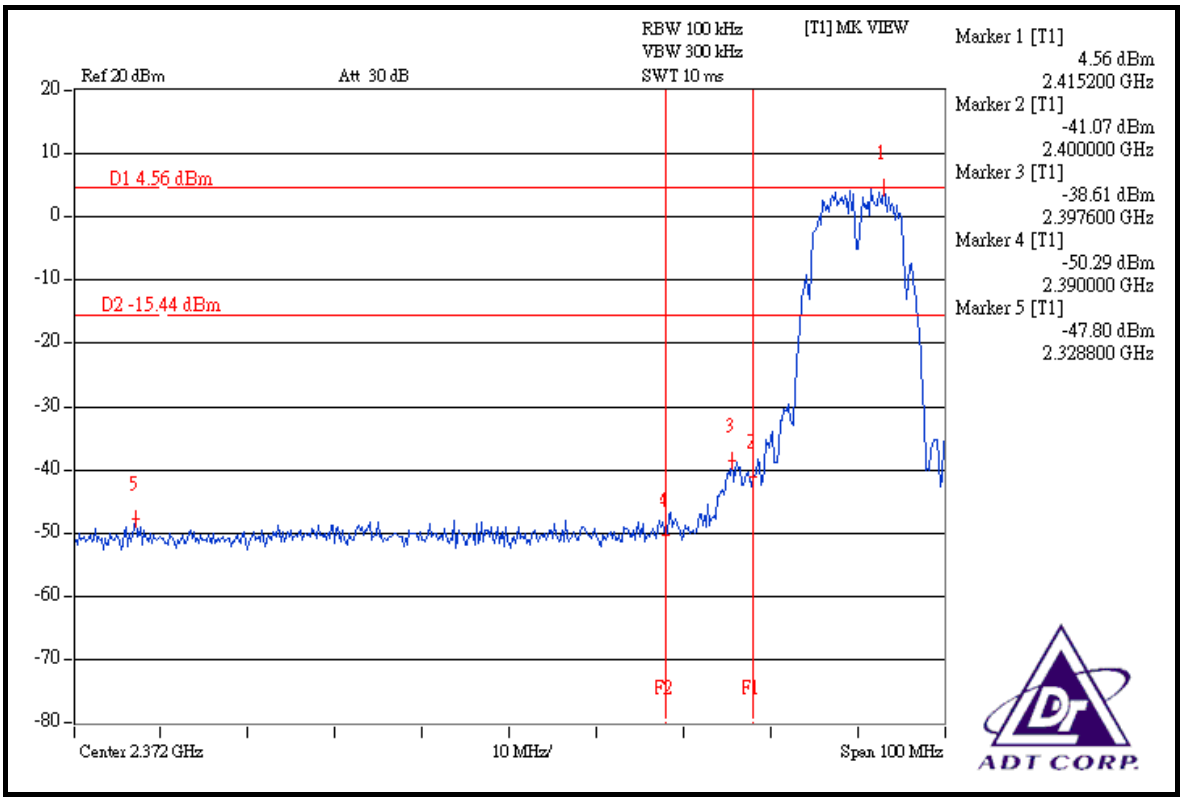
802.11b DSSS MODULATION

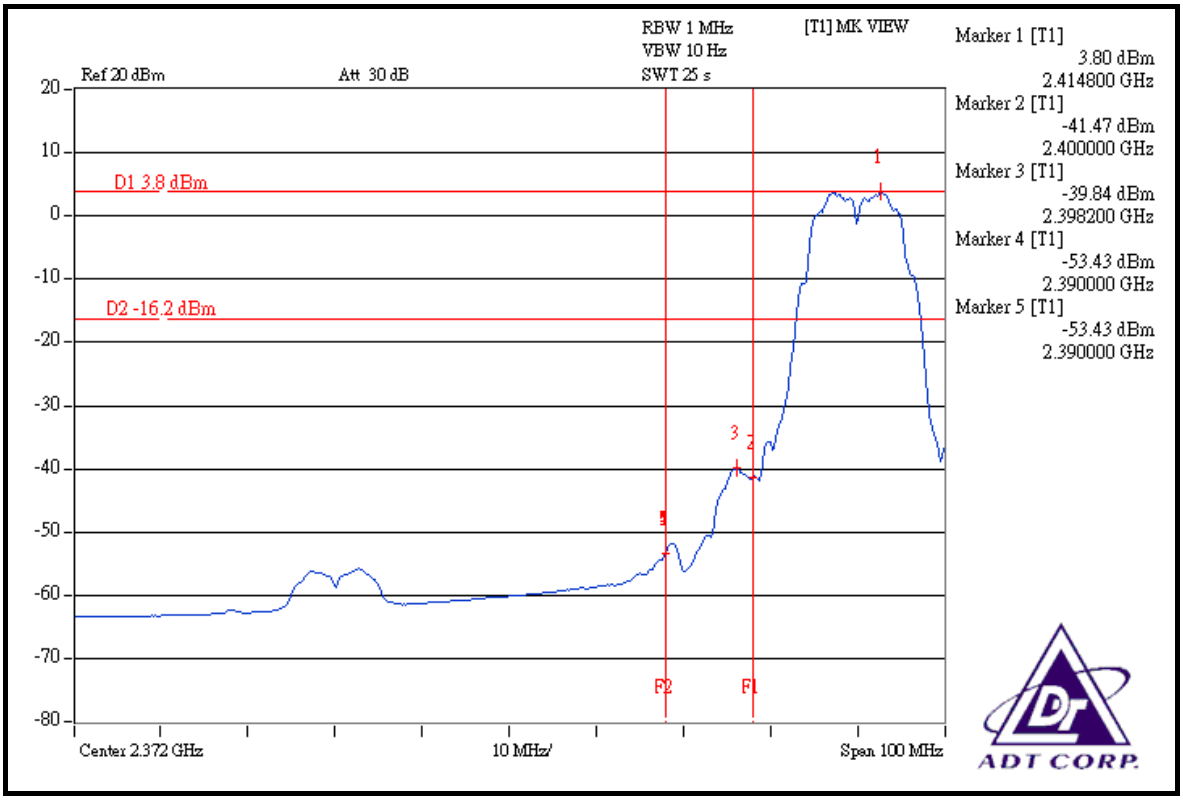
NOTE 1: The band edge emission plot on the next page shows 52.36dBc between carrier maximum power and local maximum emission in restrict band (2.3288GHz). The emission of carrier strength list in the test result of channel 1 at the item 4.2.7 is 112.20dBuV/m (Peak), so the maximum field strength in restrict band is 112.20 – 52.36 = 59.84dBuV/m which is under 74dBuV/m limit.

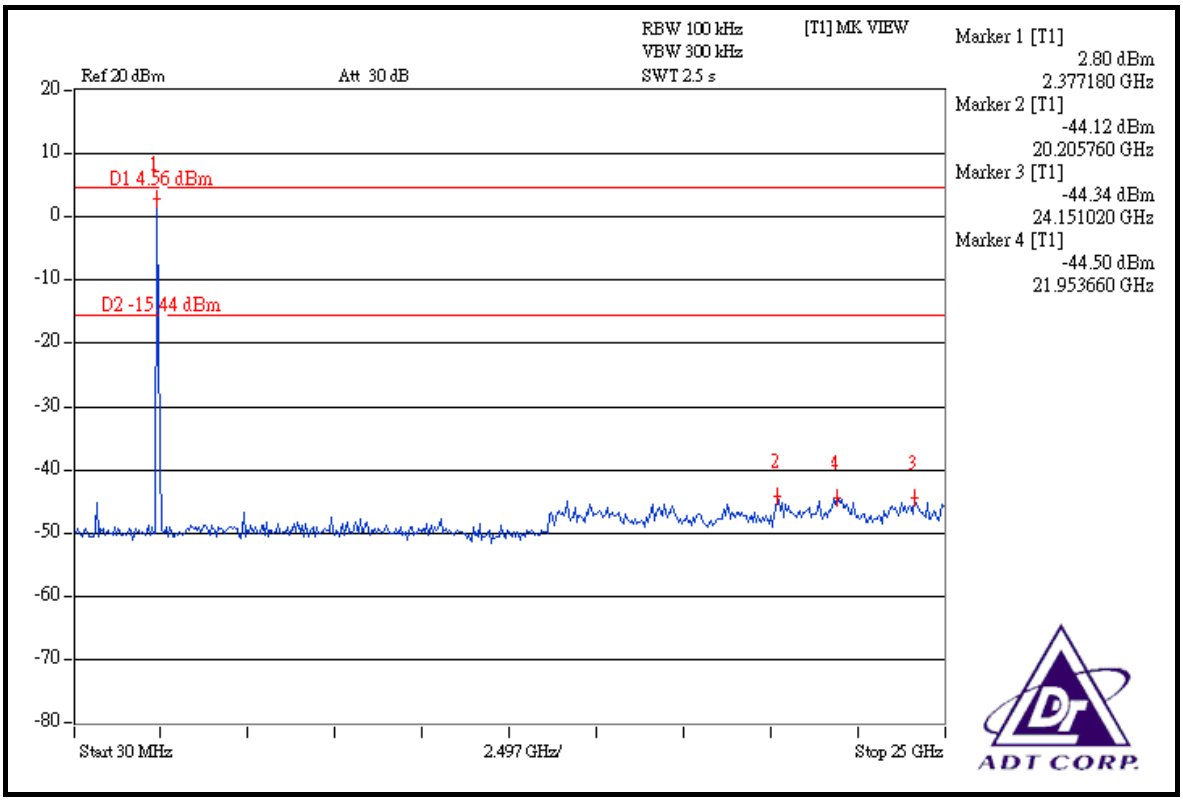
The band edge emission plot on the next page shows 57.23dBc between carrier maximum power and local maximum emission in restrict band (2.3900GHz). The emission of carrier strength list in the test result of channel 1 at the item 4.2.7 is 107.71dBuV/m (Peak), so the maximum field strength in restrict band is 107.71 – 57.23 = 50.48dBuV/m which is under 54dBuV/m limit.

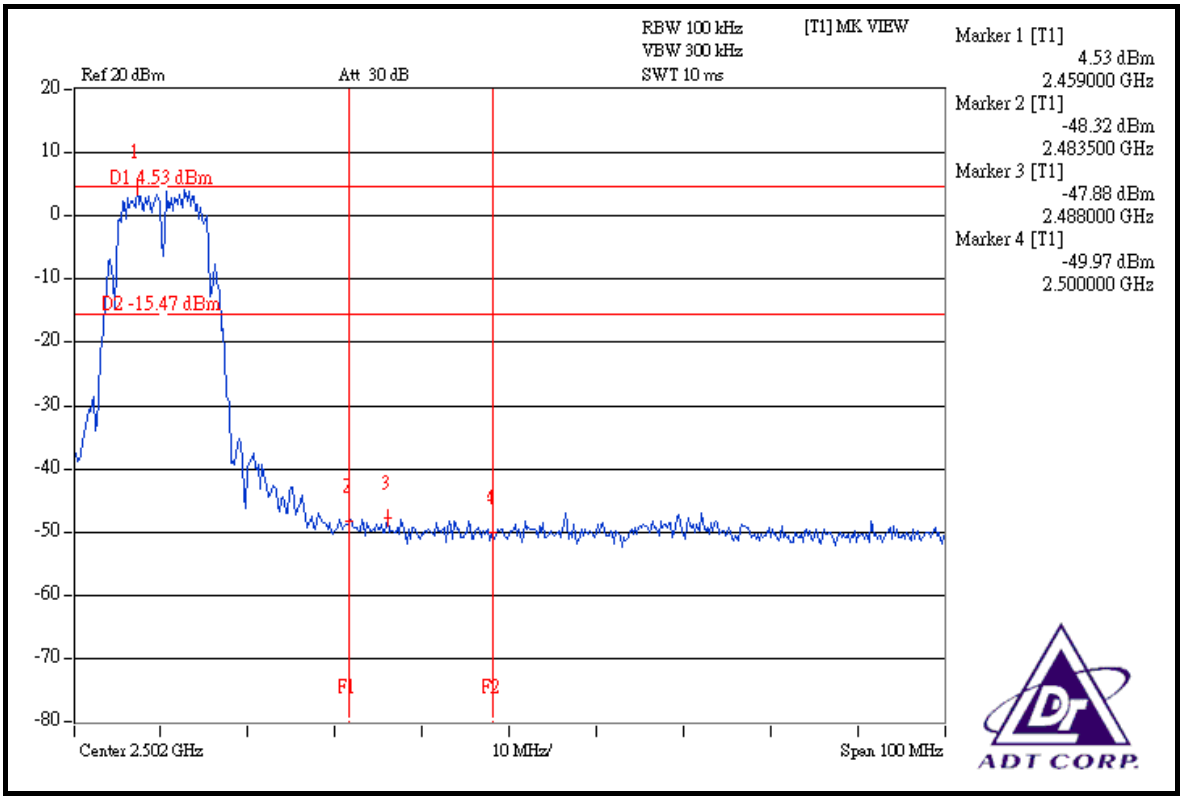
NOTE 2: The band edge emission plot on the next second page shows 52.41dBc between carrier maximum power and local maximum emission in restrict band (2.4880GHz). The emission of carrier strength list in the test result of channel 11 at the item 4.2.7 is 111.71dBuV/m (Peak), so the maximum field strength in restrict band is 111.71 – 52.41 = 59.30dBuV/m which is under 74dBuV/m limit.

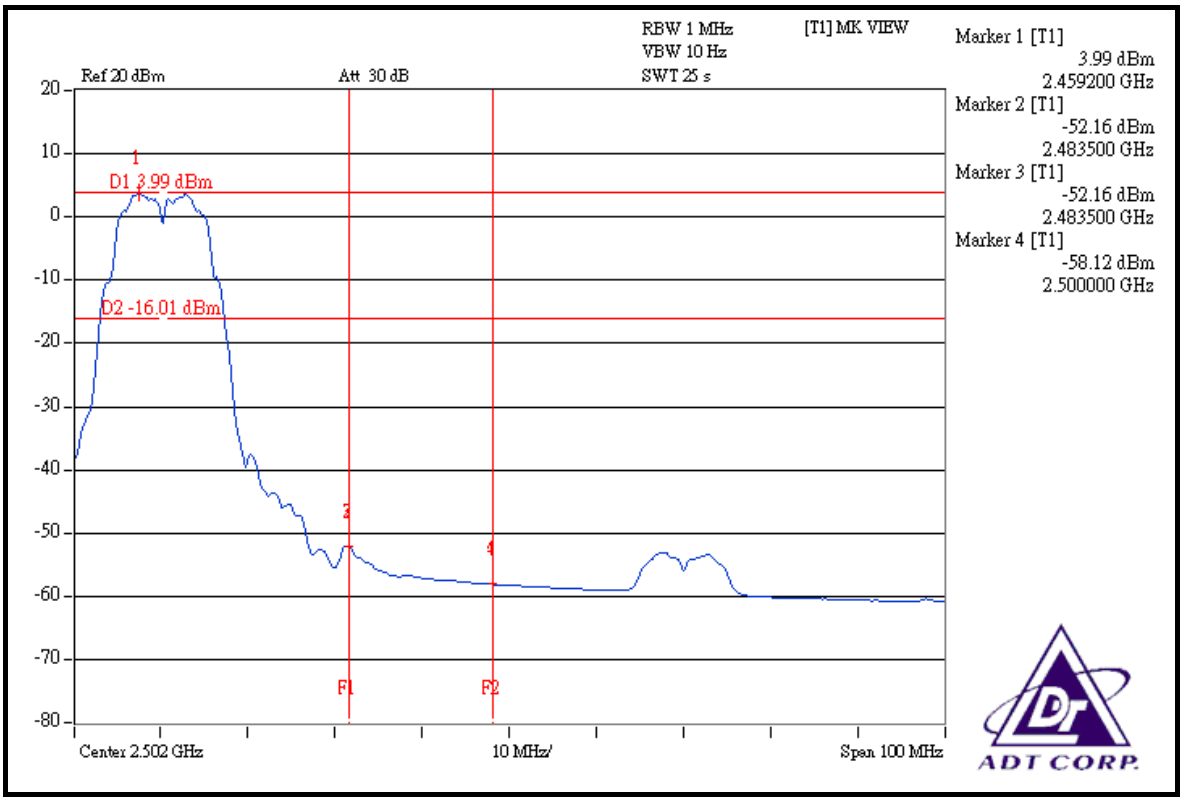
The band edge emission plot on the next third page shows 56.15dBc between carrier maximum power and local maximum emission in restrict band (2.4835GHz). The emission of carrier strength list in the test result of channel 11 at the item 4.2.7 is 107.12dBuV/m (Peak), so the maximum field strength in restrict band is 107.12 – 56.15 = 50.97dBuV/m which is under 54dBuV/m limit.

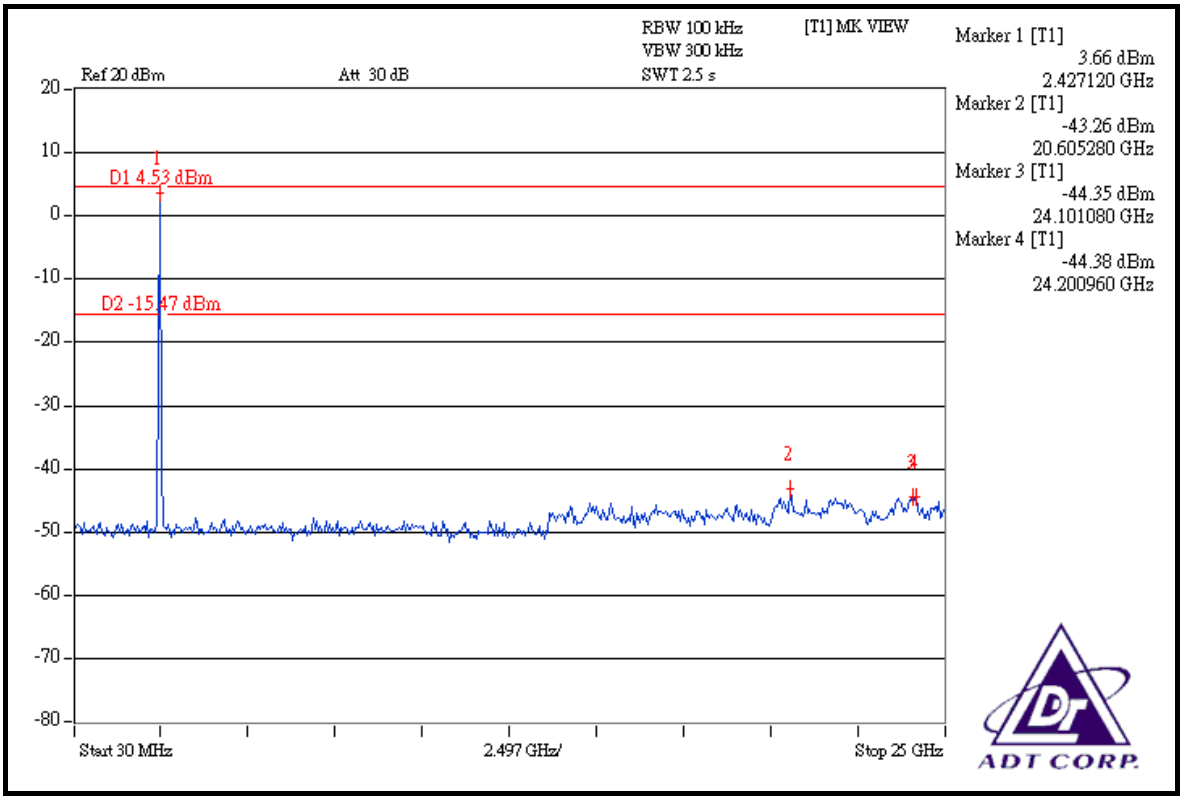

RBW 100 kHz
VBW 300 kHz
SWT 10 ms
[T1] MK VIEW
Ref 20 dBm
Att 30 dB
D1 4.56 dBm
D2 -15.44 dBm
Marker 1 [T1]
4.56 dBm
2.415200 GHz
Marker 2 [T1]
-41.07 dBm
2.400000 GHz
Marker 3 [T1]
-38.61 dBm
2.397600 GHz
Marker 4 [T1]
-50.29 dBm
2.390000 GHz
Marker 5 [T1]
-47.80 dBm
2.328800 GHz
Center 2.372 GHz
10 MHz/
Span 100 MHz
ADT CORP.


RBW 1 MHz
VBW 10 Hz
SWT 25 s
[T1] MK VIEW
Ref 20 dBm
Att 30 dB
D1 3.8 dBm
D2 -16.2 dBm
Marker 1 [T1]
3.80 dBm
2.414800 GHz
Marker 2 [T1]
-41.47 dBm
2.400000 GHz
Marker 3 [T1]
-39.84 dBm
2.398200 GHz
Marker 4 [T1]
-53.43 dBm
2.390000 GHz
Marker 5 [T1]
-53.43 dBm
2.390000 GHz
Center 2.372 GHz
10 MHz/
Span 100 MHz
ADT CORP.


RBW 100 kHz
VBW 300 kHz
SWT 2.5 s
[T1] MK VIEW
Ref 20 dBm
Att 30 dB
D1 4.56 dBm
D2 -15.44 dBm
Marker 1 [T1]
2.80 dBm
2.377180 GHz
Marker 2 [T1]
-44.12 dBm
20.205760 GHz
Marker 3 [T1]
-44.34 dBm
24.151020 GHz
Marker 4 [T1]
-44.50 dBm
21.953660 GHz
Start 30 MHz
2.497 GHz/
Stop 25 GHz


RBW 100 kHz
VBW 300 kHz
SWT 10 ms
[T1] MK VIEW
Ref 20 dBm
Att 30 dB
D1 4.53 dBm
D2 -15.47 dBm
Marker 1 [T1]
4.53 dBm
2.459000 GHz
Marker 2 [T1]
-48.32 dBm
2.483500 GHz
Marker 3 [T1]
-47.88 dBm
2.488000 GHz
Marker 4 [T1]
-49.97 dBm
2.500000 GHz
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 dBm
Att 30 dB
D1 3.99 dBm
D2 -16.01 dBm
Marker 1 [T1]
3.99 dBm
2.459200 GHz
Marker 2 [T1]
-52.16 dBm
2.483500 GHz
Marker 3 [T1]
-52.16 dBm
2.483500 GHz
Marker 4 [T1]
-58.12 dBm
2.500000 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 dBm
Att 30 dB
D1 4.53 dBm
D2 -15.47 dBm
Marker 1 [T1]
3.66 dBm
2.427120 GHz
Marker 2 [T1]
-43.26 dBm
20.605280 GHz
Marker 3 [T1]
-44.35 dBm
24.101080 GHz
Marker 4 [T1]
-44.38 dBm
24.200960 GHz
Start 30 MHz
2.497 GHz/
Stop 25 GHz

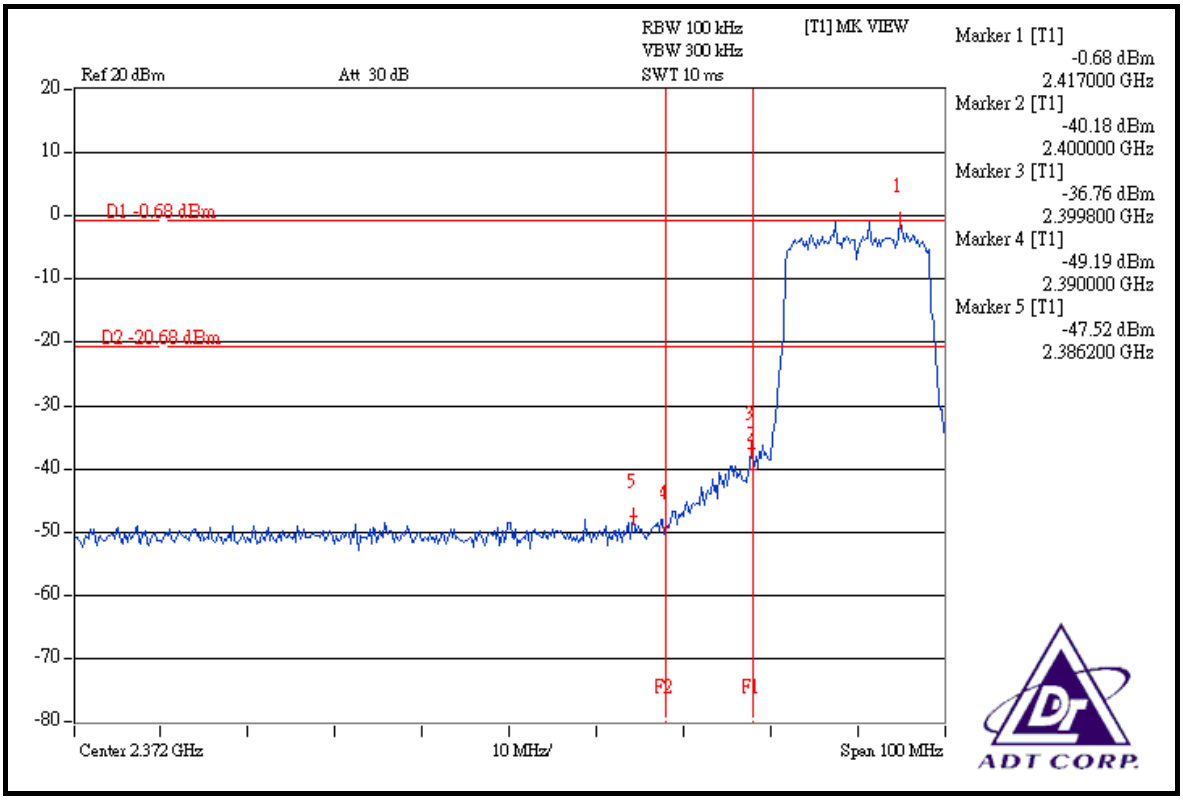
802.11g OFDM MODULATION

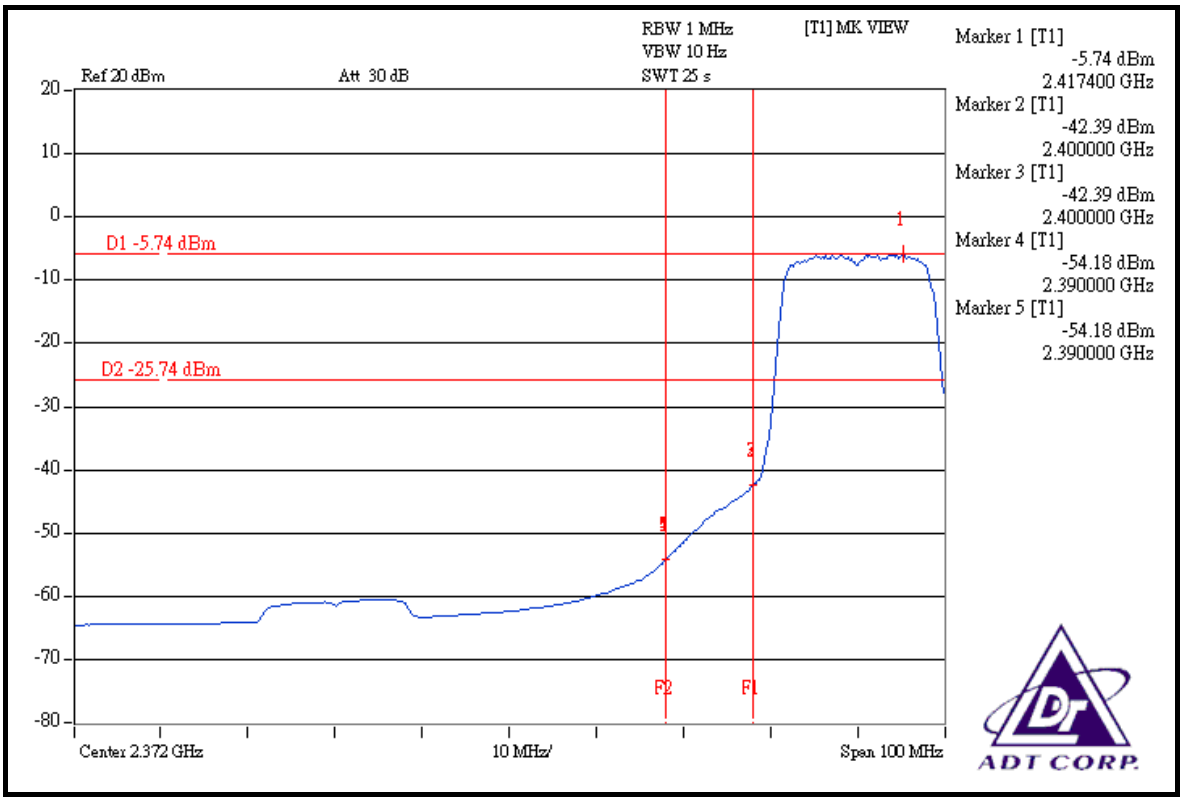
NOTE 1: The band edge emission plot on the next page shows 46.84dBc between carrier maximum power and local maximum emission in restrict band (2.3862GHz). The emission of carrier strength list in the test result of channel 1 at the item 4.2.7 is 111.88dBuV/m (Peak), so the maximum field strength in restrict band is 111.88 – 46.84 = 65.04dBuV/m which is under 74dBuV/m limit.

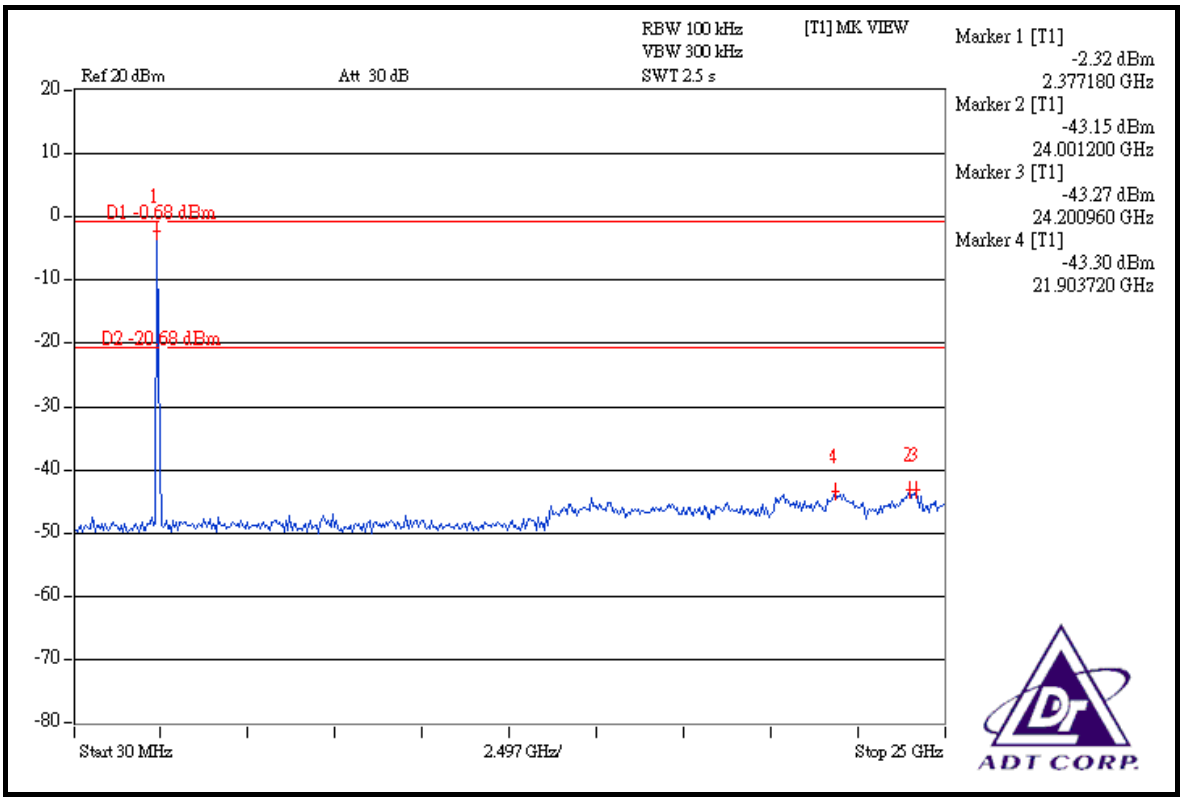
The band edge emission plot on the next page shows 48.44dBc between carrier maximum power and local maximum emission in restrict band (2.3900GHz). The emission of carrier strength list in the test result of channel 1 at the item 4.2.7 is 96.78dBuV/m (Peak), so the maximum field strength in restrict band is 96.78 – 48.44 = 48.34dBuV/m which is under 54dBuV/m limit.

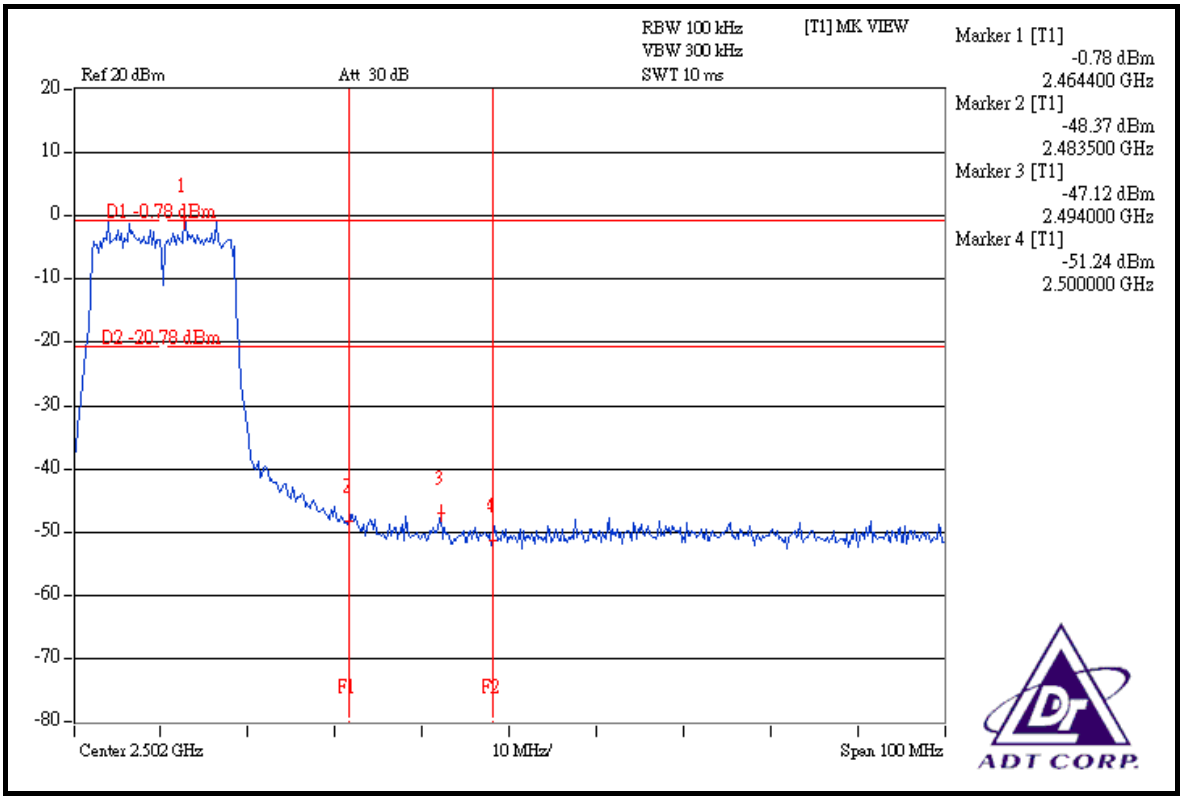
NOTE 2: The band edge emission plot on the next second page shows 46.34dBc between carrier maximum power and local maximum emission in restrict band (2.4940GHz). The emission of carrier strength list in the test result of channel 11 at the item 4.2.7 is 111.50dBuV/m (Peak), so the maximum field strength in restrict band is 111.50 – 46.34 = 65.16dBuV/m which is under 74dBuV/m limit.

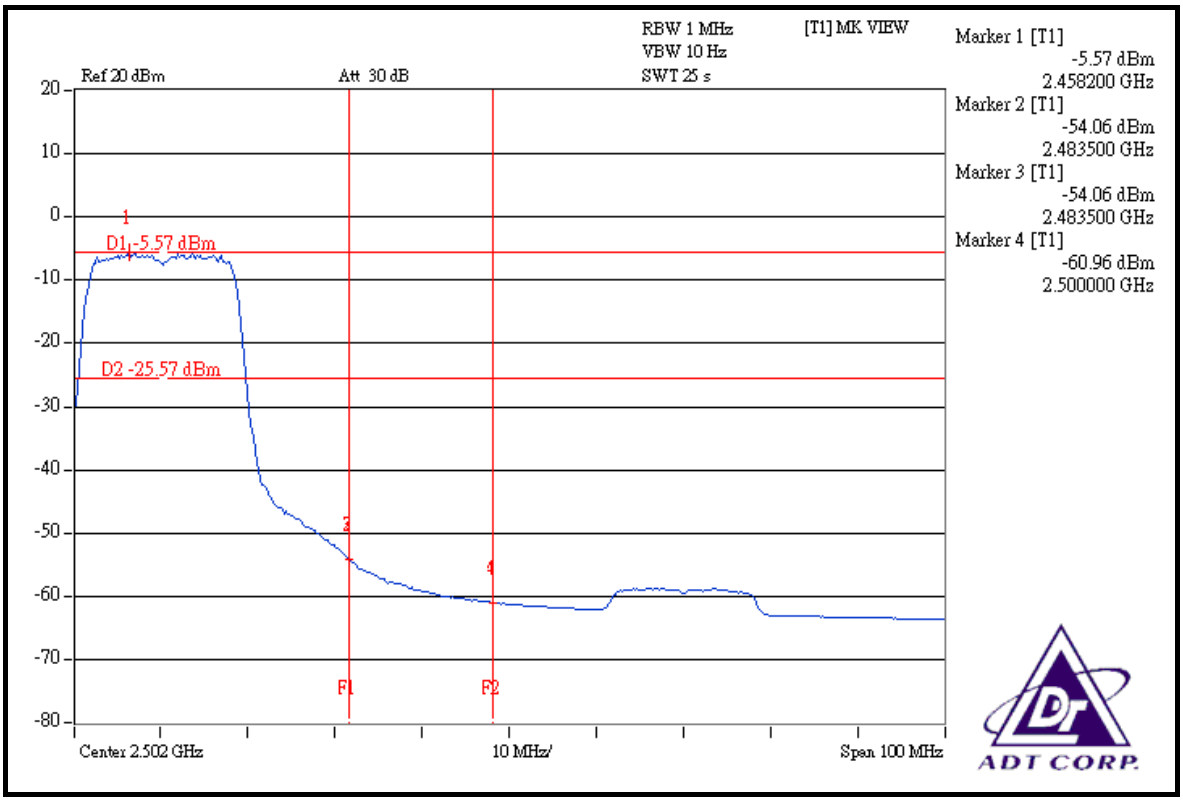
The band edge emission plot on the next third page shows 48.49dBc between carrier maximum power and local maximum emission in restrict band (2.4835GHz). The emission of carrier strength list in the test result of channel 11 at the item 4.2.7 is 96.44dBuV/m (Peak), so the maximum field strength in restrict band is 96.44 – 48.49 = 47.95dBuV/m which is under 54dBuV/m limit.

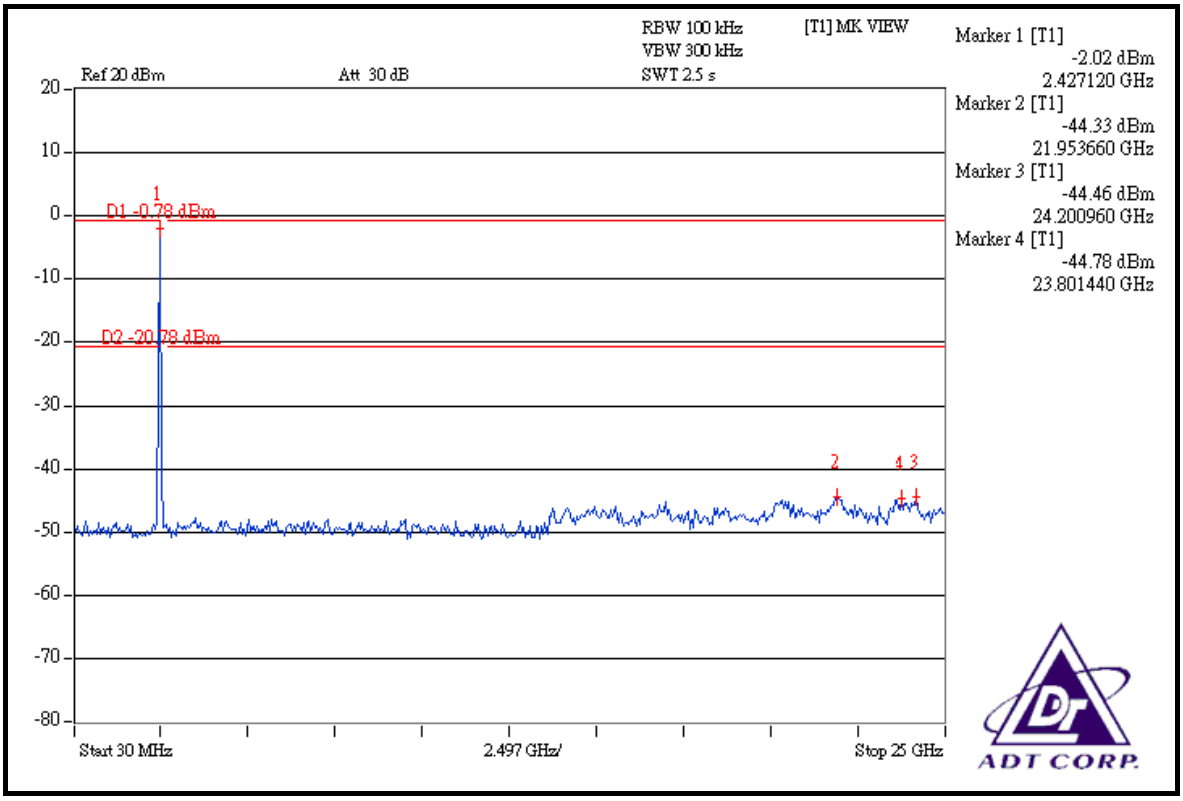

RBW 100 kHz
VBW 300 kHz
SWT 10 ms
[T1] MK VIEW
Ref 20 dBm
Att 30 dB
D1 -0.68 dBm
D2 -20.68 dBm
Marker 1 [T1]
-0.68 dBm
2.417000 GHz
Marker 2 [T1]
-40.18 dBm
2.400000 GHz
Marker 3 [T1]
-36.76 dBm
2.399800 GHz
Marker 4 [T1]
-49.19 dBm
2.390000 GHz
Marker 5 [T1]
-47.52 dBm
2.386200 GHz
Center 2.372 GHz
10 MHz/
Span 100 MHz
ADT CORP.


RBW 1 MHz
VBW 10 Hz
SWT 25 s
[T1] MK VIEW
Ref 20 dBm
Att 30 dB
D1 -5.74 dBm
D2 -25.74 dBm
Marker 1 [T1]
-5.74 dBm
2.417400 GHz
Marker 2 [T1]
-42.39 dBm
2.400000 GHz
Marker 3 [T1]
-42.39 dBm
2.400000 GHz
Marker 4 [T1]
-54.18 dBm
2.390000 GHz
Marker 5 [T1]
-54.18 dBm
2.390000 GHz
Center 2.372 GHz
10 MHz/
Span 100 MHz
ADT CORP.


RBW 100 kHz
VBW 300 kHz
SWT 2.5 s
[T1] MK VIEW
Ref 20 dBm
Att 30 dB
D1 -0.68 dBm
D2 -20.68 dBm
Marker 1 [T1]
-2.32 dBm
2.377180 GHz
Marker 2 [T1]
-43.15 dBm
24.001200 GHz
Marker 3 [T1]
-43.27 dBm
24.200960 GHz
Marker 4 [T1]
-43.30 dBm
21.903720 GHz
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 dBm
Att 30 dB
D1 -0.78 dBm
D2 -20.78 dBm
Marker 1 [T1]
-0.78 dBm
2.464400 GHz
Marker 2 [T1]
-48.37 dBm
2.483500 GHz
Marker 3 [T1]
-47.12 dBm
2.494000 GHz
Marker 4 [T1]
-51.24 dBm
2.500000 GHz
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 dBm
Att 30 dB
Marker 1 [T1]
-5.57 dBm
2.458200 GHz
Marker 2 [T1]
-54.06 dBm
2.483500 GHz
Marker 3 [T1]
-54.06 dBm
2.483500 GHz
Marker 4 [T1]
-60.96 dBm
2.500000 GHz
D1 -5.57 dBm
D2 -25.57 dBm
F1
F2
Center 2.502 GHz
10 MHz/
Span 100 MHz
ADT CORP.


RBW 100 kHz
VBW 300 kHz
SWT 2.5 s
[T1] MK VIEW
Ref 20 dBm
Att 30 dB
Marker 1 [T1]
-2.02 dBm
2.427120 GHz
Marker 2 [T1]
-44.33 dBm
21.953660 GHz
Marker 3 [T1]
-44.46 dBm
24.200960 GHz
Marker 4 [T1]
-44.78 dBm
23.801440 GHz
D1 -0.78 dBm
D2 -20.78 dBm
Start 30 MHz
2.497 GHz/
Stop 25 GHz
ADT CORP.

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 used in this product is printed antenna without antenna connector. The maximum gain of the antenna is 2.3dBi.

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
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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.

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