

# FCC TEST REPORT

**REPORT NO.:** RF960531A06  
**MODEL NO.:** AIR  
**RECEIVED:** May 31, 2007  
**TESTED:** Aug. 8 ~ 24, 2007  
**ISSUED:** Aug. 28, 2007

**APPLICANT :** ASUSTeK COMPUTER INC.

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R.O.C.

**ISSUED BY :** Advance Data Technology Corporation

**LAB LOCATION:** No. 47, 14<sup>th</sup> Ling, Chia Pau Tsuen, Lin Kou Hsiang,  
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# 1 CERTIFICATION

**PRODUCT:** Asus Internet Radio  
**BRAND NAME:** ASUS  
**MODEL NO.:** AIR  
**APPLICANT:** ASUSTeK COMPUTER INC.  
**TESTED:** Aug. 8 ~ 24, 2007  
**TEST SAMPLE:** ENGINEERING SAMPLE  
**STANDARDS:** FCC Part 15, Subpart C (Section 15.247)  
ANSI C63.4-2003

The above equipment 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** : Celia Chen , **DATE:** Aug. 28, 2007  
( Celia Chen / Specialist )

**TECHNICAL ACCEPTANCE** : Jamison Chan , **DATE:** Aug. 28, 2007  
Responsible for RF ( Jamison Chan / Senior Engineer )

**APPROVED BY** : Ken Liu , **DATE:** Aug. 28, 2007  
( Ken Liu / Deputy Manager )

## 2 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC Part 15, Subpart C			
Standard Section	Test Type and Limit	Result	Remark
15.207	AC Power Conducted Emission	PASS	Meet the requirement of limit. Minimum passing margin is -25.58dB at 0.345MHz.
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)	Transmitter Radiated Emissions Limit: Table 15.209	PASS	Meet the requirement of limit. Minimum passing margin is -6.89dB at 4924.000MHz.
15.247(e)	Power Spectral Density Limit: max. 8dBm	PASS	Meet the requirement of limit.
15.247(d)	Band Edge Measurement Limit: 20 dB 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 ~ 1GHz	3.75 dB
	1GHz ~ 40GHz	2.89 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

<b>PRODUCT</b>	Asus Internet Radio
<b>MODEL NO.</b>	AIR
<b>FCC ID</b>	MSQAIR
<b>POWER SUPPLY</b>	6Vdc from adapter
<b>MODULATION TYPE</b>	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM
<b>MODULATION TECHNOLOGY</b>	DSSS, OFDM
<b>TRANSFER RATE</b>	802.11b:11/5.5/2/1Mbps 802.11g: 54/48/36/24/18/12/9/6Mbps
<b>FREQUENCY RANGE</b>	2412MHz ~ 2462MHz
<b>NUMBER OF CHANNEL</b>	11
<b>MAXIMUM OUTPUT POWER</b>	7.413mW for 802.11b 5.984mW for 802.11g
<b>ANTENNA TYPE</b>	Dipole antenna (R-SMA connector) with 2.28dBi gain
<b>DATA CABLE</b>	Refer to user's manual
<b>I/O PORTS</b>	N/A
<b>ACCESSORY DEVICE</b>	N/A

#### NOTE:

1. The EUT is an Asus Internet Radio with WLAN IEEE802.11b/g (brand name: HL-TECH CORPORATION, model no.: WL-3002).
2. The EUT consumes power from switching power as follows:

Item	Brand Name	Model No.	Power Rating
Adapter	DVE	DSA-150P-05 US 060120	AC I/P: 100-240V, 50/60Hz, 0.5A DC O/P: +6V, 2A

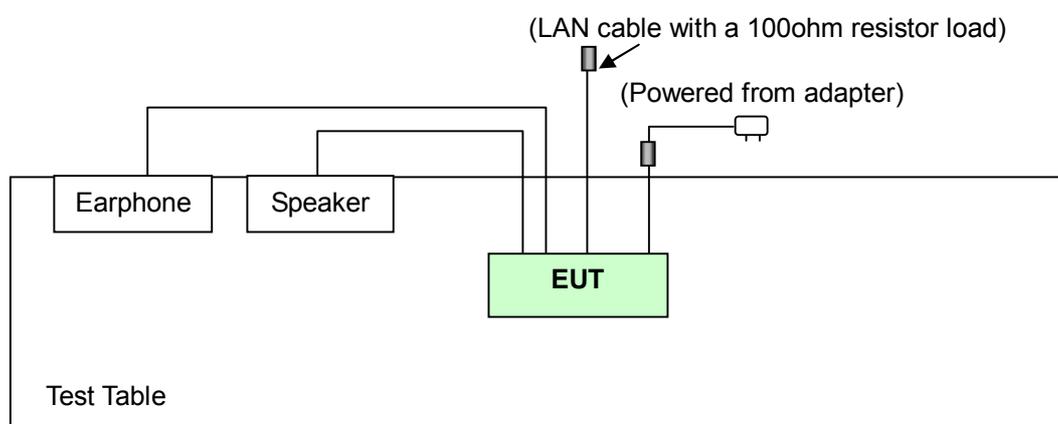
3. The above EUT information was declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or User's Manual.

### 3.2 DESCRIPTION OF TEST MODES

Eleven channels are provided to this EUT.

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

#### 3.2.1 CONFIGURATION OF SYSTEM UNDER TEST



### 3.2.2 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL

EUT Configure Mode	Applicable to				Description
	PLC	RE<1G	RE≥1G	APCM	
-	√	√	√	√	-

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

#### **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, 6, 11	DSSS	DBPSK	1

#### **RADIATED EMISSION TEST (BELOW 1 GHz):**

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

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



**RADIATED EMISSION TEST (ABOVE 1 GHz):**

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

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

**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.

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

**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.

### 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	SPEAKER	SANYO	SYSP-802	SP020421719	N/A
2	EARPHONE	PHILIPS	SBC HL145	N/A	N/A

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	1.8 m wrapped shielded wire, terminated via drain wire, with 3.5 mm phone plug, w/o core.
2	1.2 m wrapped shielded wire, terminated with 3.5mm phone plug via drain wire, w/o core.

- NOTE:** (1) All power cords of the above support units are non-shielded (1.8m).  
(2) One LAN cable was connected to EUT to form an open loop cable, which was terminated with a 100ohm resistor load.

## 4 TEST TYPES AND RESULTS

### 4.1 CONDUCTED EMISSION MEASUREMENT

#### 4.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

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

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

#### 4.1.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
ROHDE & SCHWARZ Test Receiver	ESCS 30	838251/021	Nov. 23, 2007
ROHDE & SCHWARZ Artificial Mains Network (for EUT)	ESH3-Z5	100218	Nov. 21, 2007
LISN With Adapter (for EUT)	AD10	C10Ada-001	Nov. 21, 2007
ROHDE & SCHWARZ Artificial Mains Network (for peripherals)	ESH3-Z5	100219	Nov. 07, 2007
ROHDE & SCHWARZ Artificial Mains Network (for peripherals)	ESH3-Z5	100220	Oct. 26, 2007
Software	ADT_Cond_V7.3.2	NA	NA
Software	ADT_ISN_V7.3.2	NA	NA
RF cable (JYEBAO)	5D-FB	Cable-C10.01	Mar. 01, 2008
SUHNER Terminator (For ROHDE & SCHWARZ LISN)	65BNC-5001	E1-010773	Feb. 11, 2008

- 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 ADT Shielded Room No. 10.
  3. The VCCI Site Registration No. C-1852.

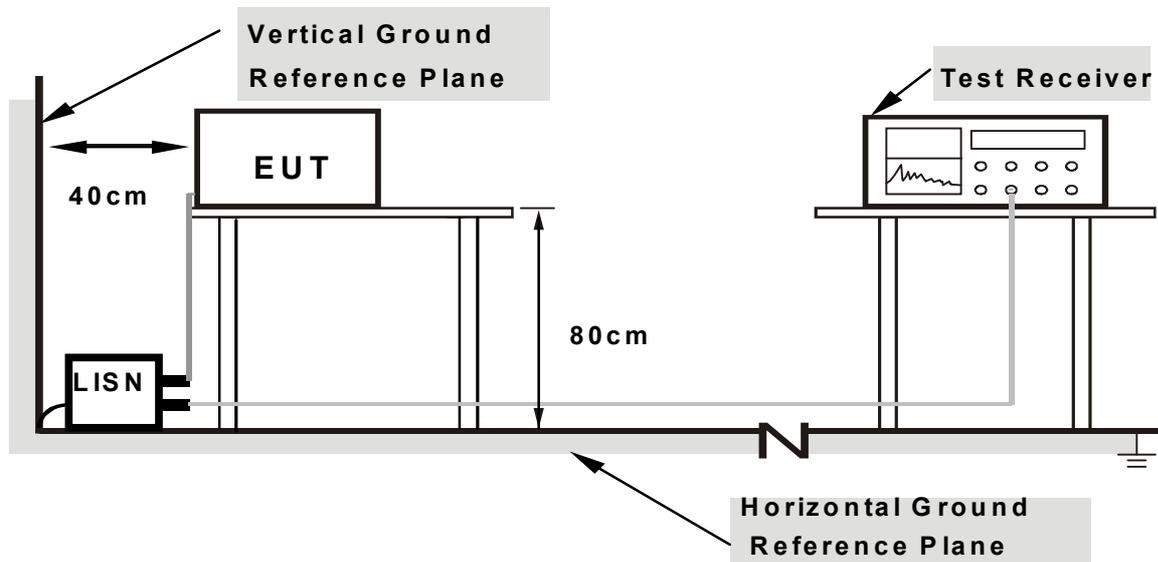
### **4.1.3 TEST PROCEDURES**

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

### **4.1.4 DEVIATION FROM TEST STANDARD**

No deviation.

## 4.1.5 TEST SETUP



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

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

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

## 4.1.6 EUT OPERATING CONDITIONS

- a. Connected the EUT with an AC adapter on testing table.
- b. EUT sent audio messages to earphone and speaker continuously.

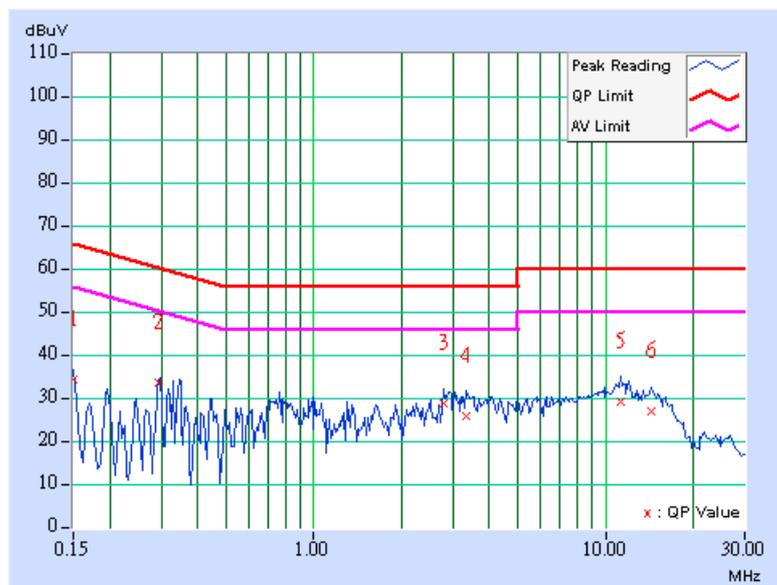
## 4.1.7 TEST RESULTS

### CONDUCTED WORST-CASE DATA

<b>MODULATION TYPE</b>	DBPSK	<b>CHANNEL</b>	1
<b>INPUT POWER</b>	120Vac, 60 Hz	<b>6dB BANDWIDTH</b>	9 kHz
<b>ENVIRONMENTAL CONDITIONS</b>	26 deg. C, 70%RH, 988hPa	<b>PHASE</b>	Line 1
<b>TRANSFER RATE</b>	1Mbps	<b>TESTED BY</b>	Jamison Chan

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.150	0.20	33.58	-	33.78	-	66.00	56.00	-32.22	-
2	0.295	0.20	32.83	-	33.03	-	60.40	50.40	-27.37	-
3	2.797	0.44	27.85	-	28.29	-	56.00	46.00	-27.71	-
4	3.344	0.47	25.05	-	25.52	-	56.00	46.00	-30.48	-
5	11.320	0.81	28.04	-	28.85	-	60.00	50.00	-31.15	-
6	14.313	1.05	25.96	-	27.01	-	60.00	50.00	-32.99	-

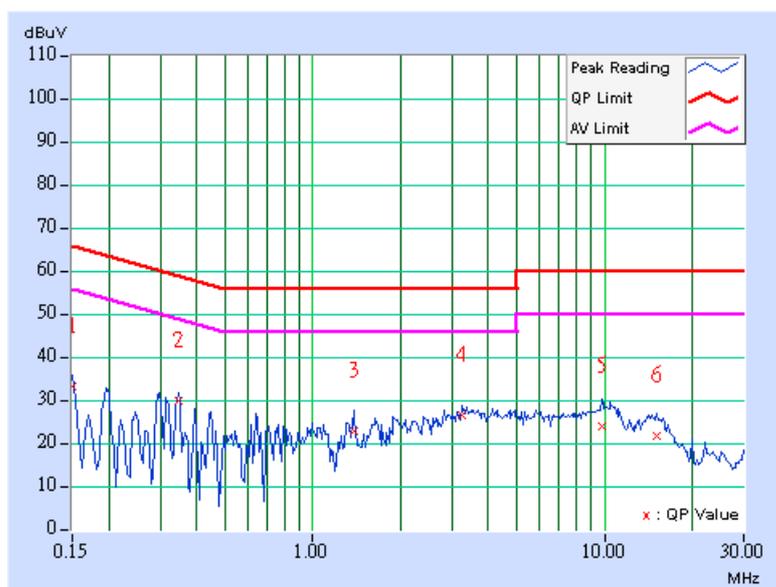
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
  2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
  3. The emission levels of other frequencies were very low against the limit.
  4. Margin value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



<b>MODULATION TYPE</b>	DBPSK	<b>CHANNEL</b>	1
<b>INPUT POWER</b>	120Vac, 60 Hz	<b>6dB BANDWIDTH</b>	9 kHz
<b>ENVIRONMENTAL CONDITIONS</b>	26 deg. C, 70%RH, 988hPa	<b>PHASE</b>	Line 2
<b>TRANSFER RATE</b>	1Mbps	<b>TESTED BY</b>	Jamison Chan

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.150	0.20	32.55	-	32.75	-	66.00	56.00	-33.25	-
2	0.345	0.20	29.19	-	29.39	-	59.07	49.07	-29.68	-
3	1.383	0.30	22.19	-	22.49	-	56.00	46.00	-33.51	-
4	3.262	0.36	25.69	-	26.05	-	56.00	46.00	-29.95	-
5	9.848	0.50	23.14	-	23.64	-	60.00	50.00	-36.36	-
6	15.082	0.80	20.96	-	21.76	-	60.00	50.00	-38.24	-

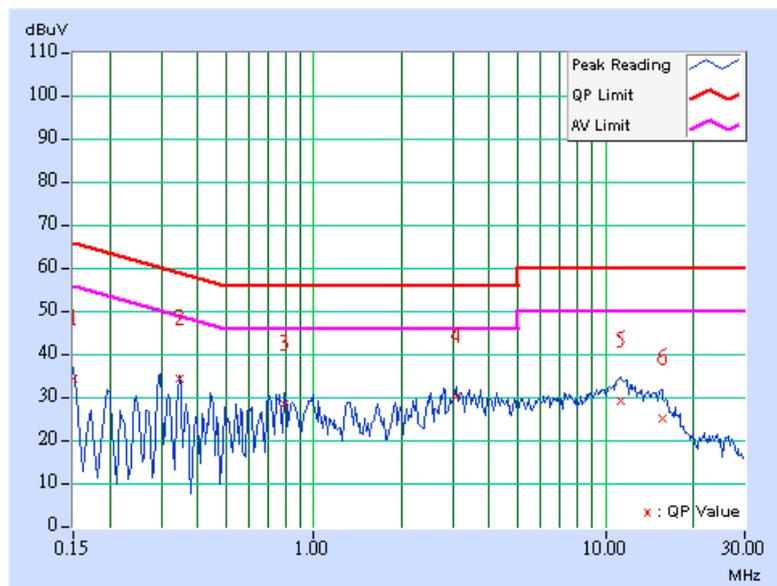
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
  2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
  3. The emission levels of other frequencies were very low against the limit.
  4. Margin value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



<b>MODULATION TYPE</b>	DBPSK	<b>CHANNEL</b>	6
<b>INPUT POWER</b>	120Vac, 60 Hz	<b>6dB BANDWIDTH</b>	9 kHz
<b>ENVIRONMENTAL CONDITIONS</b>	26 deg. C, 70%RH, 988hPa	<b>PHASE</b>	Line 1
<b>TRANSFER RATE</b>	1Mbps	<b>TESTED BY</b>	Jamison Chan

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.150	0.20	33.46	-	33.66	-	66.00	56.00	-32.34	-
2	<b>0.345</b>	<b>0.20</b>	<b>33.29</b>	-	<b>33.49</b>	-	<b>59.07</b>	<b>49.07</b>	<b>-25.58</b>	-
3	0.795	0.33	27.22	-	27.55	-	56.00	46.00	-28.45	-
4	3.070	0.45	29.33	-	29.78	-	56.00	46.00	-26.22	-
5	11.207	0.80	28.11	-	28.91	-	60.00	50.00	-31.09	-
6	15.648	1.14	24.15	-	25.29	-	60.00	50.00	-34.71	-

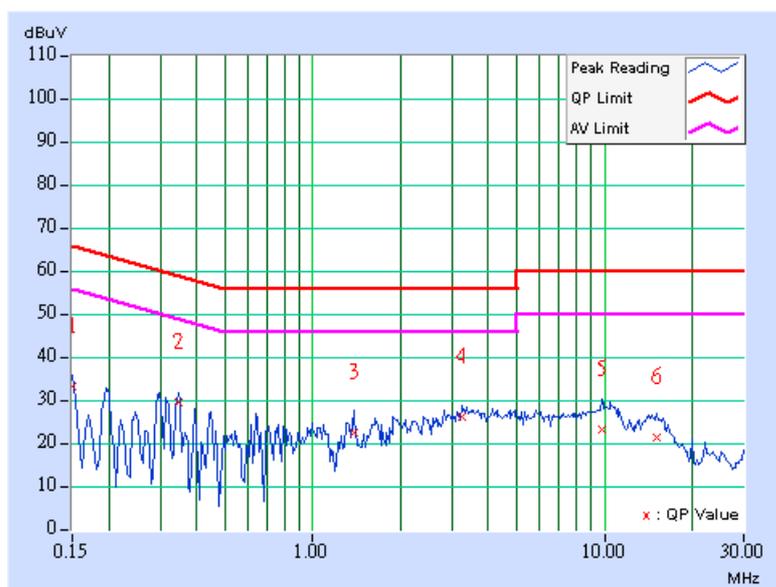
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
  2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
  3. The emission levels of other frequencies were very low against the limit.
  4. Margin value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



<b>MODULATION TYPE</b>	DBPSK	<b>CHANNEL</b>	6
<b>INPUT POWER</b>	120Vac, 60 Hz	<b>6dB BANDWIDTH</b>	9 kHz
<b>ENVIRONMENTAL CONDITIONS</b>	26 deg. C, 70%RH, 988hPa	<b>PHASE</b>	Line 2
<b>TRANSFER RATE</b>	1Mbps	<b>TESTED BY</b>	Jamison Chan

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.150	0.20	32.57	-	32.77	-	66.00	56.00	-33.23	-
2	0.345	0.20	28.66	-	28.86	-	59.07	49.07	-30.21	-
3	1.383	0.30	21.71	-	22.01	-	56.00	46.00	-33.99	-
4	3.260	0.36	25.61	-	25.97	-	56.00	46.00	-30.03	-
5	9.849	0.50	22.71	-	23.21	-	60.00	50.00	-36.79	-
6	15.088	0.80	20.56	-	21.36	-	60.00	50.00	-38.64	-

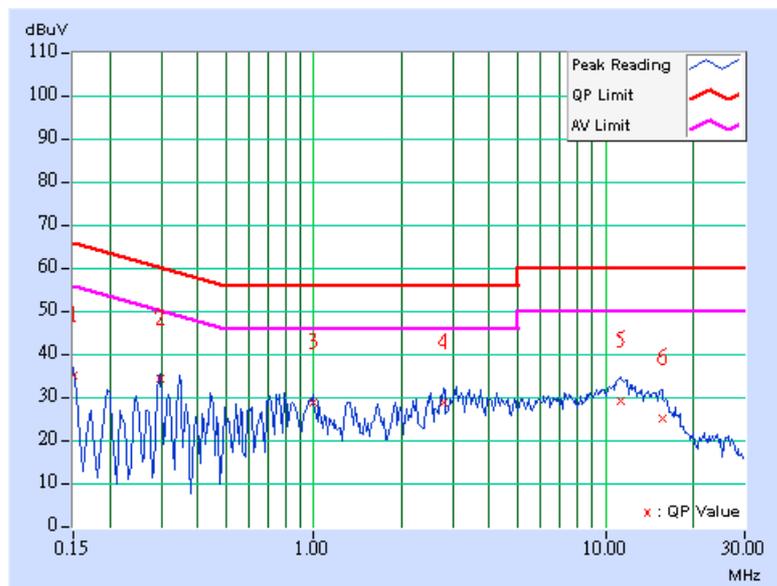
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  2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
  3. The emission levels of other frequencies were very low against the limit.
  4. Margin value = Emission level - Limit value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



<b>MODULATION TYPE</b>	DBPSK	<b>CHANNEL</b>	11
<b>INPUT POWER</b>	120Vac, 60 Hz	<b>6dB BANDWIDTH</b>	9 kHz
<b>ENVIRONMENTAL CONDITIONS</b>	26 deg. C, 70%RH, 988hPa	<b>PHASE</b>	Line 1
<b>TRANSFER RATE</b>	1Mbps	<b>TESTED BY</b>	Jamison Chan

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.150	0.20	33.88	-	34.08	-	66.00	56.00	-31.92	-
2	0.298	0.20	33.30	-	33.50	-	60.29	50.29	-26.79	-
3	0.990	0.40	27.75	-	28.15	-	56.00	46.00	-27.85	-
4	2.789	0.44	27.58	-	28.02	-	56.00	46.00	-27.98	-
5	11.210	0.80	28.25	-	29.05	-	60.00	50.00	-30.95	-
6	15.645	1.14	24.15	-	25.29	-	60.00	50.00	-34.71	-

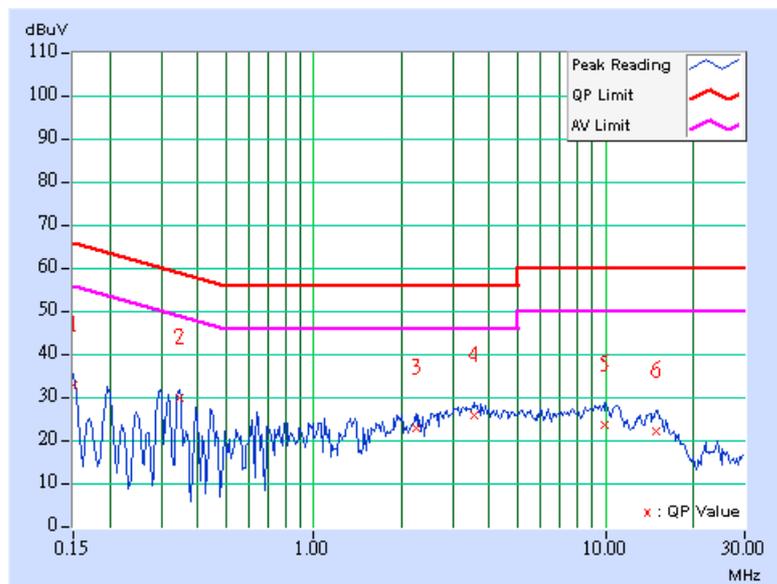
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
  2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
  3. The emission levels of other frequencies were very low against the limit.
  4. Margin value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



<b>MODULATION TYPE</b>	DBPSK	<b>CHANNEL</b>	11
<b>INPUT POWER</b>	120Vac, 60 Hz	<b>6dB BANDWIDTH</b>	9 kHz
<b>ENVIRONMENTAL CONDITIONS</b>	26 deg. C, 70%RH, 988hPa	<b>PHASE</b>	Line 2
<b>TRANSFER RATE</b>	1Mbps	<b>TESTED BY</b>	Jamison Chan

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.150	0.20	32.32	-	32.52	-	66.00	56.00	-33.48	-
2	0.345	0.20	29.23	-	29.43	-	59.07	49.07	-29.64	-
3	2.234	0.31	22.00	-	22.31	-	56.00	46.00	-33.69	-
4	3.555	0.38	25.16	-	25.54	-	56.00	46.00	-30.46	-
5	9.891	0.50	22.79	-	23.29	-	60.00	50.00	-36.71	-
6	14.926	0.80	21.42	-	22.22	-	60.00	50.00	-37.78	-

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



## 4.2 RADIATED EMISSION MEASUREMENT

### 4.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT

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

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

**NOTE:**

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



## 4.2.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
HP Preamplifier	8447D	2432A03504	May 09, 2008
HP Preamplifier	8449B	3008A01924	Sep. 05, 2007
HP Preamplifier	8449B	3008A01638	Sep. 17, 2007
ROHDE & SCHWARZ TEST RECEIVER	ESI7	836697/012	Oct. 24, 2007
Schwarzbeck Antenna	VULB 9168	137	Oct. 01, 2007
Schwarzbeck Antenna	VHBA 9123	480	Apr. 18, 2008
EMCO Horn Antenna	3115	6714	Oct. 24, 2007
EMCO Horn Antenna	3115	9312-4192	Apr. 19, 2008
ADT. Turn Table	TT100	0306	NA
ADT. Tower	AT100	0306	NA
Software	ADT_Radiated_V7.6.15	NA	NA
SUHNER RF cable	SF104-26.5	CABLE-CH6-17m-01	Dec. 11, 2007
ROHDE & SCHWARZ Spectrum Analyzer	FSP 40	100036	Mar. 13, 2008

- NOTE:**
1. The calibration interval of the above test instruments is 12 months. And the calibrations are traceable to NML/ROC and NIST/USA.
  2. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
  3. The test was performed in ADT Chamber No. 6.
  4. The Industry Canada Reference No. IC 3789-6.

### 4.2.3 TEST PROCEDURES

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

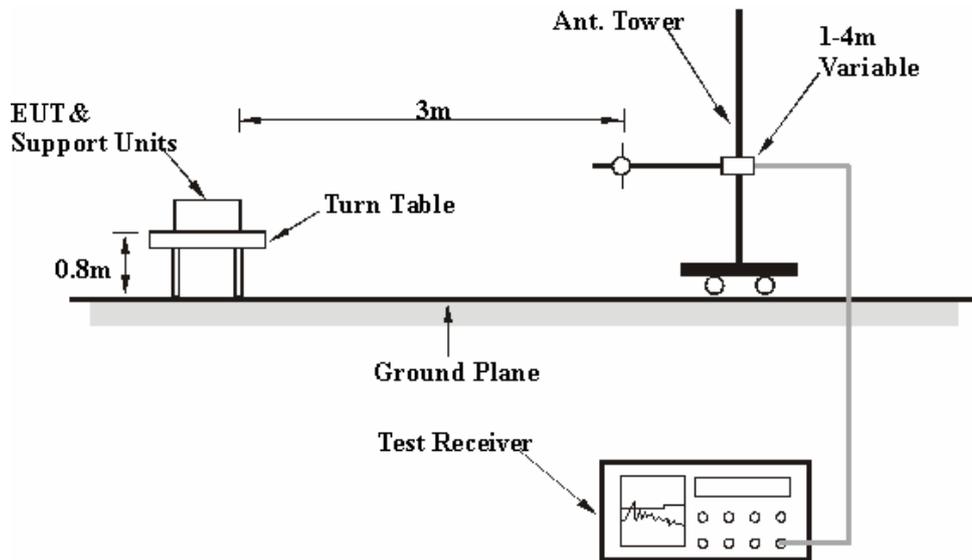
**NOTE:**

1. The resolution bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection at frequency below 1GHz.
2. The resolution bandwidth is 1MHz and video bandwidth of test receiver/spectrum analyzer is 3MHz for Peak detection at frequency above 1GHz. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz for Average detection (AV) at frequency above 1GHz.
3. For measurement of frequency above 1000 MHz, the EUT was set 3 meters away from the interference-receiving antenna.

### 4.2.4 DEVIATION FROM TEST STANDARD

No deviation.

## 4.2.5 TEST SETUP



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

## 4.2.6 EUT OPERATING CONDITIONS

- a. Set the EUT under transmission/receiving condition continuously at specific channel frequency.
- b. EUT sent audio messages to earphone and speaker continuously.

## 4.2.7 TEST RESULTS

### RADIATED WORST-CASE DATA: 802.11b DSSS MODULATION (BELOW 1GHz)

<b>MODULATION TYPE</b>	DBPSK	<b>CHANNEL</b>	1
<b>INPUT POWER</b>	120Vac, 60 Hz	<b>FREQUENCY RANGE</b>	Below 1000MHz
<b>ENVIRONMENTAL CONDITIONS</b>	25 deg. C, 65%RH, 998Pa	<b>DETECTOR FUNCTION</b>	Quasi-Peak
<b>TRANSFER RATE</b>	1Mbps	<b>TESTED BY</b>	Jun Wu

#### 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	239.940	31.29 QP	46.00	-14.71	1.32 H	10	18.19	13.10
2	276.874	32.04 QP	46.00	-13.96	1.28 H	199	16.43	15.61
3	399.339	31.81 QP	46.00	-14.19	1.26 H	139	12.58	19.23
4	461.543	36.86 QP	46.00	-9.14	1.18 H	358	15.96	20.90
5	517.916	32.45 QP	46.00	-13.55	1.27 H	331	9.79	22.66
6	552.906	33.02 QP	46.00	-12.98	1.19 H	349	9.61	23.41
7	685.090	33.73 QP	46.00	-12.27	1.12 H	10	8.20	25.53
8	706.473	38.65 QP	46.00	-7.35	1.08 H	10	12.60	26.05

#### 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	31.944	24.37 QP	40.00	-15.63	1.00 V	262	11.39	12.98
2	134.970	28.10 QP	43.50	-15.40	1.00 V	163	14.73	13.37
3	461.543	37.01 QP	46.00	-8.99	1.00 V	226	16.11	20.90
4	646.212	30.50 QP	46.00	-15.50	1.09 V	40	5.55	24.95
5	706.473	33.86 QP	46.00	-12.14	1.11 V	295	7.81	26.05
6	737.575	36.42 QP	46.00	-9.58	1.15 V	166	8.97	27.45
7	830.882	31.29 QP	46.00	-14.71	1.21 V	253	2.74	28.55
8	922.244	32.76 QP	46.00	-13.24	1.29 V	187	2.98	29.78

- 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.



**RADIATED WORST-CASE DATA: 802.11b DSSS MODULATION (ABOVE 1GHz)**

<b>MODULATION TYPE</b>	DBPSK	<b>CHANNEL</b>	1
<b>INPUT POWER</b>	120Vac, 60 Hz	<b>FREQUENCY RANGE</b>	1 ~ 25GHz
<b>ENVIRONMENTAL CONDITIONS</b>	25 deg. C, 65%RH, 998Pa	<b>DETECTOR FUNCTION</b>	Peak(PK) Average (AV)
<b>TRANSFER RATE</b>	1Mbps	<b>TESTED BY</b>	Jun Wu

**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	2390.000	55.53 PK	74.00	-18.47	1.12 H	78	21.11	34.42
2	2390.000	44.88 AV	54.00	-9.12	1.12 H	78	10.46	34.42
3	*2412.000	96.72 PK			1.12 H	78	62.26	34.46
4	*2412.000	90.99 AV			1.12 H	78	56.53	34.46
5	4824.000	54.82 PK	74.00	-19.18	1.25 H	85	13.37	41.45
6	4824.000	46.21 AV	54.00	-7.79	1.25 H	85	4.76	41.45

**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	2390.000	56.88 PK	74.00	-17.12	1.13 V	183	22.46	34.42
2	2390.000	45.57 AV	54.00	-8.43	1.13 V	183	11.15	34.42
3	*2412.000	106.85 PK			1.13 V	183	72.39	34.46
4	*2412.000	101.16 AV			1.13 V	183	66.70	34.46
5	4824.000	54.07 PK	74.00	-19.93	1.06 V	200	12.62	41.45
6	4824.000	44.04 AV	54.00	-9.96	1.06 V	200	2.59	41.45

- 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.
  5. “ \* “ : Fundamental frequency.

<b>MODULATION TYPE</b>	DBPSK	<b>CHANNEL</b>	6
<b>INPUT POWER</b>	120Vac, 60 Hz	<b>FREQUENCY RANGE</b>	1 ~ 25GHz
<b>ENVIRONMENTAL CONDITIONS</b>	25 deg. C, 65%RH, 998Pa	<b>DETECTOR FUNCTION</b>	Peak(PK) Average (AV)
<b>TRANSFER RATE</b>	1Mbps	<b>TESTED BY</b>	Jun Wu

#### ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2437.000	94.81 PK			1.08 H	78	60.30	34.51
2	*2437.000	88.94 AV			1.08 H	78	54.43	34.51
3	4874.000	54.05 PK	74.00	-19.95	1.24 H	77	12.48	41.57
4	4874.000	44.31 AV	54.00	-9.69	1.24 H	77	2.74	41.57

#### ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2437.000	105.47 PK			1.14 V	183	70.96	34.51
2	*2437.000	99.70 AV			1.14 V	183	65.19	34.51
3	4874.000	54.84 PK	74.00	-19.16	1.15 V	196	13.27	41.57
4	4874.000	46.36 AV	54.00	-7.64	1.15 V	196	4.79	41.57

- 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.

<b>MODULATION TYPE</b>	DBPSK	<b>CHANNEL</b>	11
<b>INPUT POWER</b>	120Vac, 60 Hz	<b>FREQUENCY RANGE</b>	1 ~ 25GHz
<b>ENVIRONMENTAL CONDITIONS</b>	25 deg. C, 65%RH, 998Pa	<b>DETECTOR FUNCTION</b>	Peak(PK) Average (AV)
<b>TRANSFER RATE</b>	1Mbps	<b>TESTED BY</b>	Jun Wu

#### 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	*2462.000	94.92 PK			1.26 H	76	60.36	34.56
2	*2462.000	89.05 AV			1.26 H	76	54.49	34.56
3	2483.500	55.58 PK	74.00	-18.42	1.26 H	76	20.97	34.61
4	2483.500	44.81 AV	54.00	-9.19	1.26 H	76	10.20	34.61
5	4924.000	54.25 PK	74.00	-19.75	1.22 H	68	12.55	41.70
6	4924.000	43.24 AV	54.00	-10.76	1.22 H	68	1.54	41.70

#### 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	*2462.000	106.55 PK			1.10 V	184	71.99	34.56
2	*2462.000	100.86 AV			1.10 V	184	66.30	34.56
3	2483.500	55.40 PK	74.00	-18.60	1.10 V	184	20.79	34.61
4	2483.500	46.07 AV	54.00	-7.93	1.10 V	184	11.46	34.61
5	4924.000	54.91 PK	74.00	-19.09	1.16 V	190	13.21	41.70
6	<b>4924.000</b>	<b>47.11 AV</b>	<b>54.00</b>	<b>-6.89</b>	<b>1.16 V</b>	<b>190</b>	<b>5.41</b>	<b>41.70</b>

- 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.



**RADIATED WORST-CASE DATA: 802.11g OFDM MODULATION (BELOW 1GHz)**

<b>MODULATION TYPE</b>	BPSK	<b>CHANNEL</b>	1
<b>INPUT POWER</b>	120Vac, 60 Hz	<b>FREQUENCY RANGE</b>	Below 1000MHz
<b>ENVIRONMENTAL CONDITIONS</b>	25 deg. C, 65%RH, 998Pa	<b>DETECTOR FUNCTION</b>	Quasi-Peak
<b>TRANSFER RATE</b>	6Mbps	<b>TESTED BY</b>	Jun Wu

**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	220.501	31.01 QP	46.00	-14.99	1.36 H	28	18.58	12.43
2	239.940	31.56 QP	46.00	-14.44	1.37 H	7	18.46	13.10
3	276.874	31.75 QP	46.00	-14.25	1.30 H	13	16.14	15.61
4	399.339	31.92 QP	46.00	-14.08	1.28 H	133	12.69	19.23
5	461.543	37.32 QP	46.00	-8.68	1.16 H	352	16.42	20.90
6	500.421	31.30 QP	46.00	-14.70	1.29 H	1	9.01	22.29
7	646.212	31.42 QP	46.00	-14.58	1.17 H	148	6.47	24.95
8	685.090	33.12 QP	46.00	-12.88	1.05 H	10	7.59	25.53

**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	31.944	24.88 QP	40.00	-15.12	1.00 V	250	11.90	12.98
2	461.543	36.96 QP	46.00	-9.04	1.00 V	232	16.06	20.90
3	646.212	30.49 QP	46.00	-15.51	1.08 V	304	5.54	24.95
4	706.473	34.13 QP	46.00	-11.87	1.15 V	295	8.08	26.05
5	737.575	37.47 QP	46.00	-8.53	1.19 V	157	10.02	27.45
6	830.882	31.17 QP	46.00	-14.83	1.24 V	244	2.62	28.55
7	922.244	33.51 QP	46.00	-12.49	1.36 V	181	3.73	29.78

- 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.



**RADIATED WORST-CASE DATA: 802.11g OFDM MODULATION (ABOVE 1GHz)**

<b>MODULATION TYPE</b>	BPSK	<b>CHANNEL</b>	1
<b>INPUT POWER</b>	120Vac, 60 Hz	<b>FREQUENCY RANGE</b>	1 ~ 25GHz
<b>ENVIRONMENTAL CONDITIONS</b>	25 deg. C, 65%RH, 998Pa	<b>DETECTOR FUNCTION</b>	Peak(PK) Average (AV)
<b>TRANSFER RATE</b>	6Mbps	<b>TESTED BY</b>	Jun Wu

**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	2390.000	55.70 PK	74.00	-18.30	1.09 H	78	-50.28	105.98
2	2390.000	44.54 AV	54.00	-9.46	1.09 H	78	-61.44	105.98
3	*2412.000	95.11 PK			1.09 H	78	-10.87	105.98
4	*2412.000	82.79 AV			1.09 H	78	-23.19	105.98
5	4824.000	52.23 PK	74.00	-21.77	1.00 H	9	-53.75	105.98
6	4824.000	38.94 AV	54.00	-15.06	1.00 H	9	-67.04	105.98

**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	2390.000	58.38 PK	74.00	-15.62	1.11 V	161	23.96	34.42
2	2390.000	45.54 AV	54.00	-8.46	1.11 V	161	11.12	34.42
3	*2412.000	105.13 PK			1.11 V	161	70.67	34.46
4	*2412.000	93.28 AV			1.11 V	161	58.82	34.46
5	4824.000	54.61 PK	74.00	-19.39	1.07 V	195	13.16	41.45
6	4824.000	43.92 AV	54.00	-10.08	1.07 V	195	2.47	41.45

- 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.
  5. “ \* “ : Fundamental frequency.



<b>MODULATION TYPE</b>	BPSK	<b>CHANNEL</b>	6
<b>INPUT POWER</b>	120Vac, 60 Hz	<b>FREQUENCY RANGE</b>	1 ~ 25GHz
<b>ENVIRONMENTAL CONDITIONS</b>	25 deg. C, 65%RH, 998Pa	<b>DETECTOR FUNCTION</b>	Peak(PK) Average (AV)
<b>TRANSFER RATE</b>	6Mbps	<b>TESTED BY</b>	Jun Wu

**ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M**

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2437.000	94.00 PK			1.08 H	79	59.49	34.51
2	*2437.000	81.74 AV			1.08 H	79	47.23	34.51
3	4874.000	53.83 PK	74.00	-20.17	1.25 H	86	12.26	41.57
4	4874.000	42.31 AV	54.00	-11.69	1.25 H	86	0.74	41.57

**ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M**

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2437.000	105.42 PK			1.12 V	183	70.91	34.51
2	*2437.000	93.11 AV			1.12 V	183	58.60	34.51
3	4874.000	53.50 PK	74.00	-20.50	1.07 V	191	11.93	41.57
4	4874.000	44.10 AV	54.00	-9.90	1.07 V	191	2.53	41.57

- 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.



<b>MODULATION TYPE</b>	BPSK	<b>CHANNEL</b>	11
<b>INPUT POWER</b>	120Vac, 60 Hz	<b>FREQUENCY RANGE</b>	1 ~ 25GHz
<b>ENVIRONMENTAL CONDITIONS</b>	25 deg. C, 65%RH, 998Pa	<b>DETECTOR FUNCTION</b>	Peak(PK) Average (AV)
<b>TRANSFER RATE</b>	6Mbps	<b>TESTED BY</b>	Jun Wu

#### 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	*2462.000	92.59 PK			1.26 H	77	58.03	34.56
2	*2462.000	81.51 AV			1.26 H	77	46.95	34.56
3	2483.500	56.01 PK	74.00	-17.99	1.26 H	77	21.40	34.61
4	2483.500	45.02 AV	54.00	-8.98	1.26 H	77	10.41	34.61
5	4924.000	53.76 PK	74.00	-20.24	1.23 H	73	12.06	41.70
6	4924.000	41.57 AV	54.00	-12.43	1.23 H	73	-0.13	41.70

#### 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	*2462.000	105.07 PK			1.12 V	183	70.51	34.56
2	*2462.000	93.10 AV			1.12 V	183	58.54	34.56
3	2483.500	58.93 PK	74.00	-15.07	1.12 V	183	24.32	34.61
4	2483.500	45.20 AV	54.00	-8.80	1.12 V	183	10.59	34.61
5	4924.000	53.67 PK	74.00	-20.33	1.16 V	191	11.97	41.70
6	4924.000	43.90 AV	54.00	-10.10	1.16 V	191	2.20	41.70

- 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.



## 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	100036	Mar. 13, 2008

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

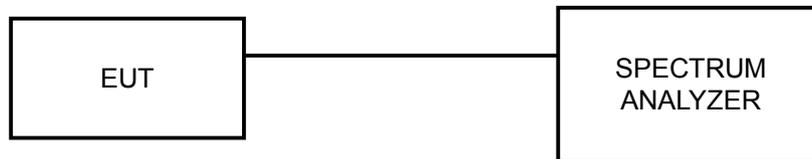
### 4.3.3 TEST PROCEDURE

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 100kHz 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.



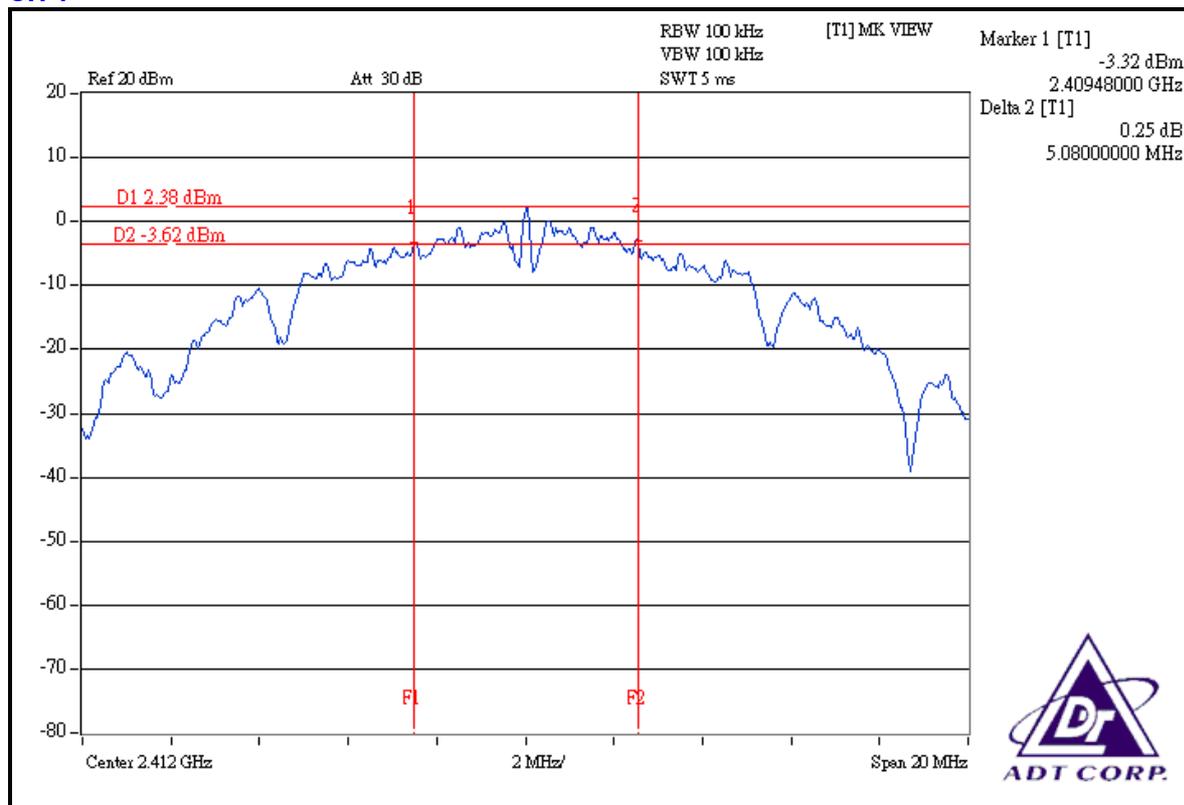
### 4.3.7 TEST RESULTS

#### 802.11b DSSS MODULATION

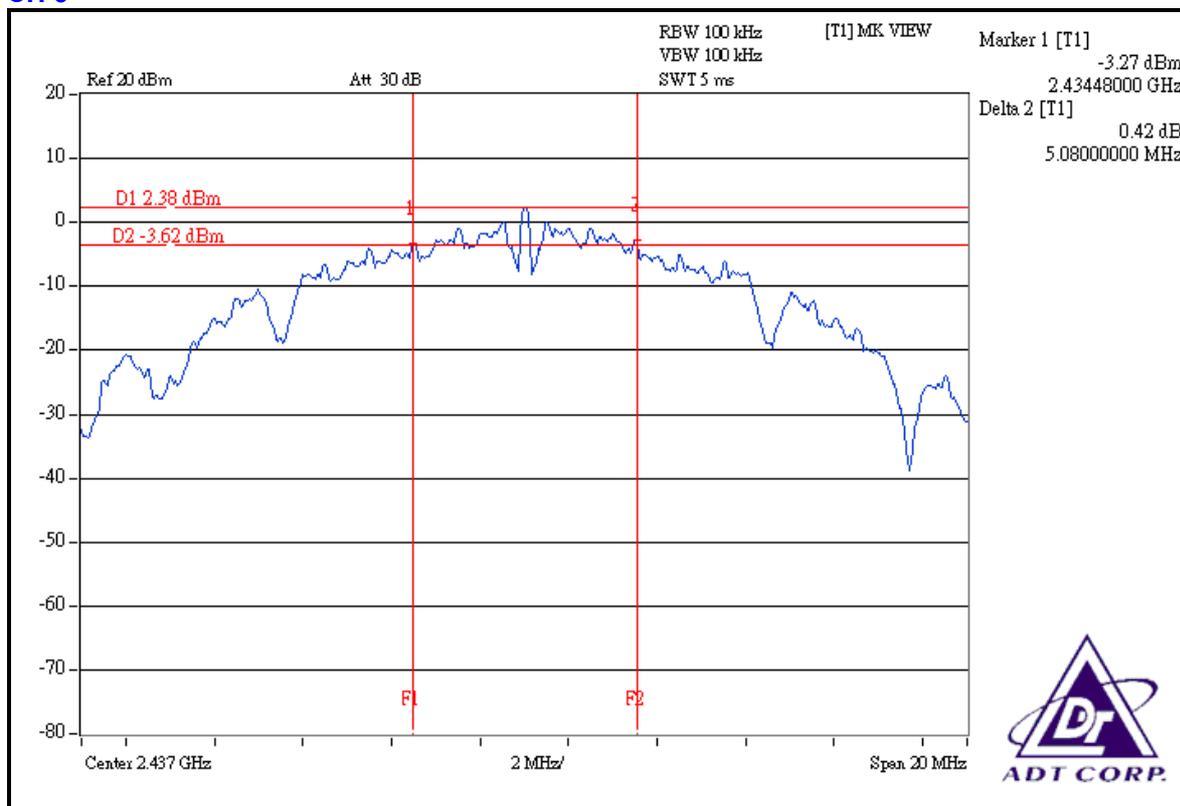
<b>MODULATION TYPE</b>	DBPSK	<b>CHANNEL</b>	1, 6, 11
<b>INPUT POWER</b>	120Vac, 60 Hz	<b>ENVIRONMENTAL CONDITIONS</b>	25 deg. C, 73%RH, 1000hPa
<b>TRANSFER RATE</b>	1Mbps	<b>TESTED BY</b>	Jamison Chan

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS/FAIL
1	2412	5.08	0.5	PASS
6	2437	5.08	0.5	PASS
11	2462	5.08	0.5	PASS

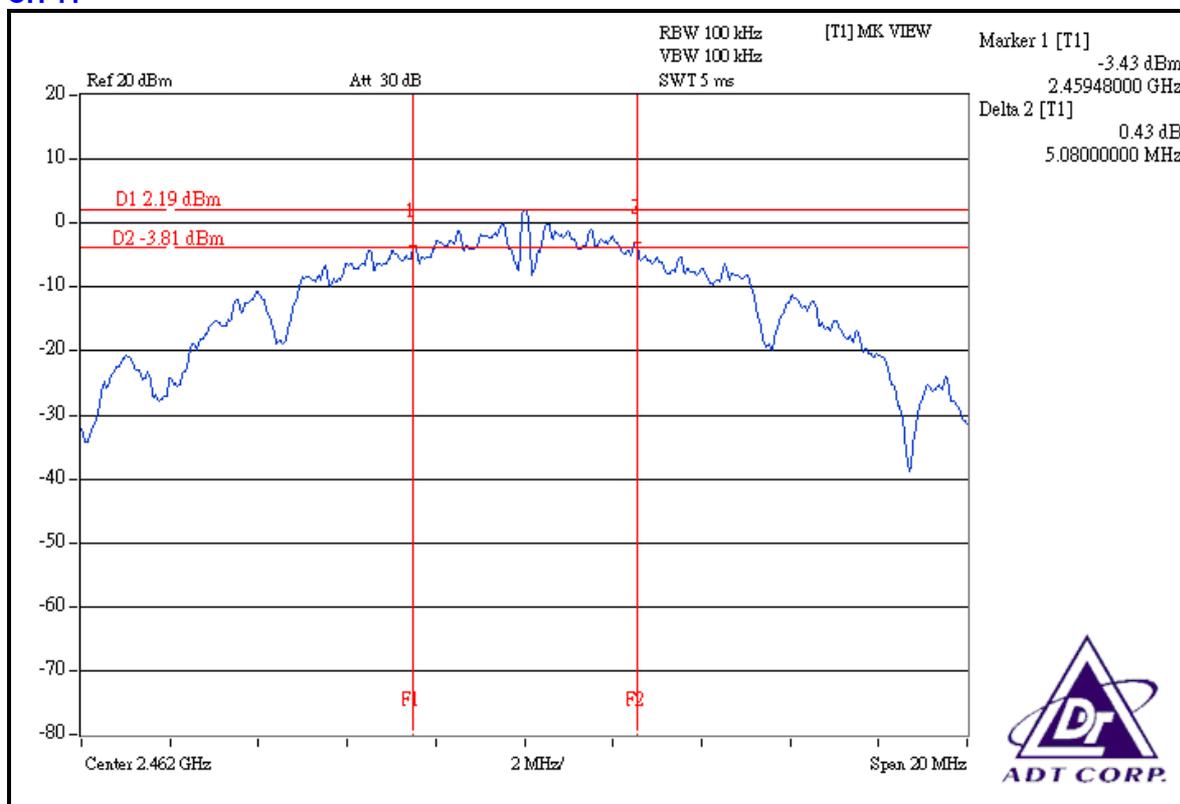
#### CH 1



### CH 6



### CH 11



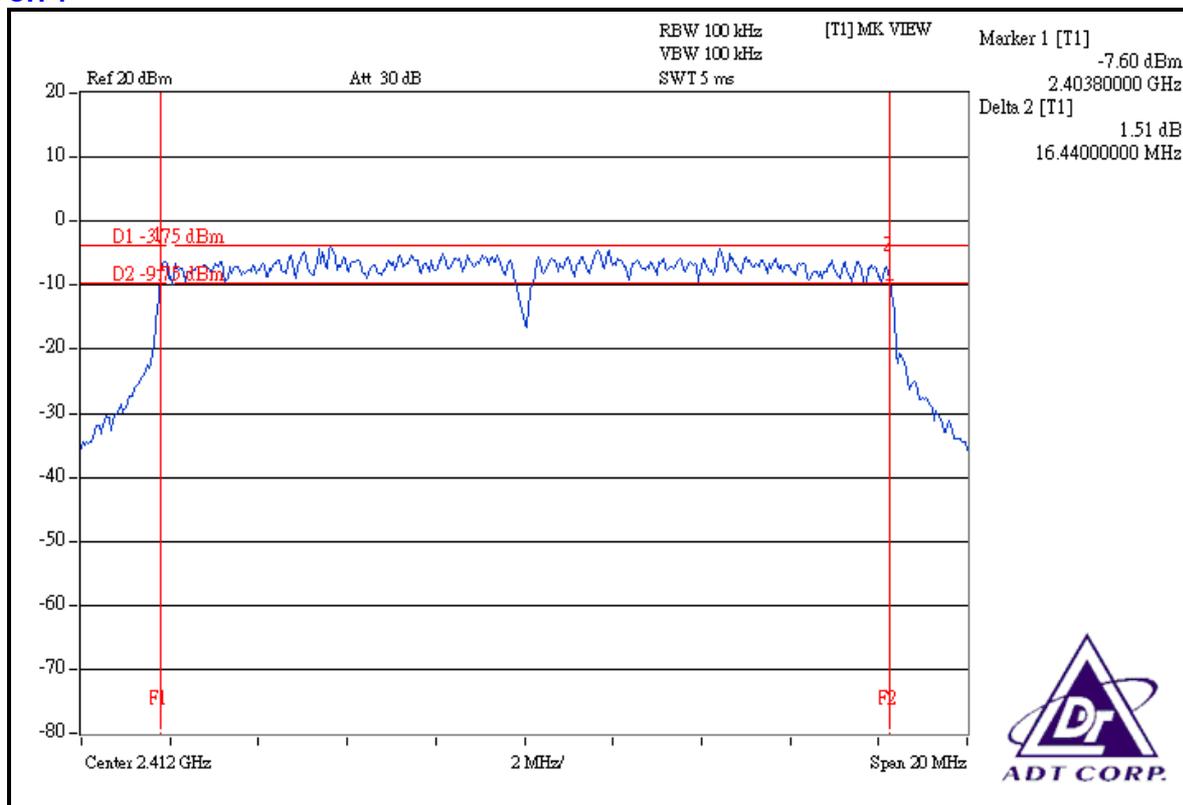


### 802.11g OFDM MODULATION

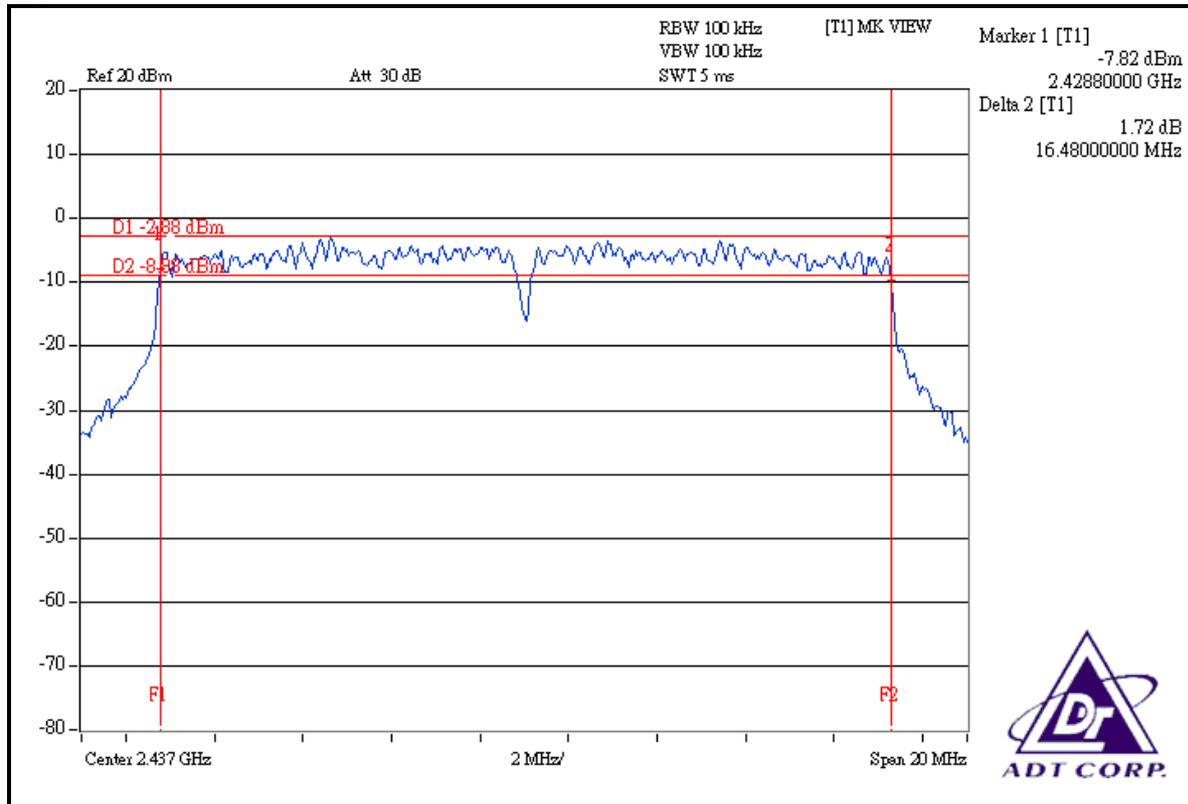
<b>MODULATION TYPE</b>	BPSK	<b>CHANNEL</b>	1, 6, 11
<b>INPUT POWER</b>	120Vac, 60 Hz	<b>ENVIRONMENTAL CONDITIONS</b>	25 deg. C, 73%RH, 1000hPa
<b>TRANSFER RATE</b>	6Mbps	<b>TESTED BY</b>	Jamison Chan

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS/FAIL
1	2412	16.44	0.5	PASS
6	2437	16.48	0.5	PASS
11	2462	16.44	0.5	PASS

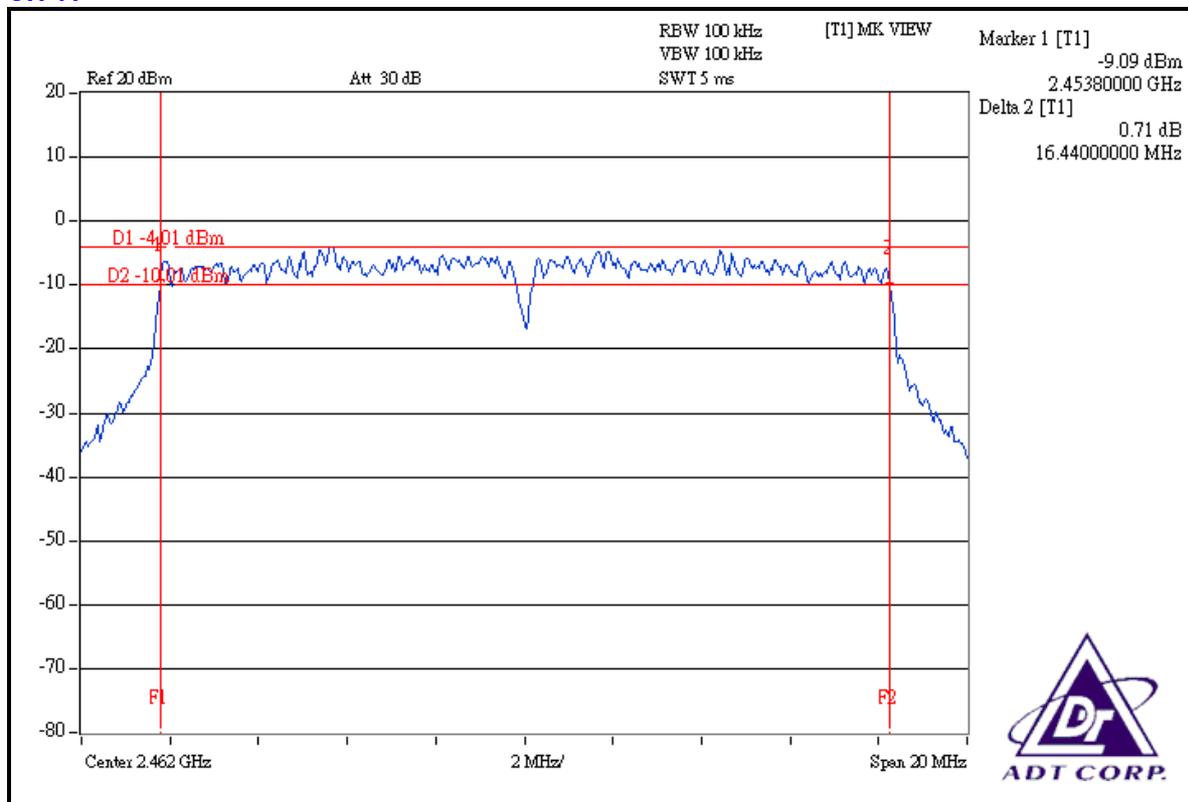
### CH 1



### CH 6



### CH 11





## 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
ROHDE & SCHWARZ Spectrum Analyzer	FSP 40	100036	Mar. 13, 2008
ROHDE & SCHWARZ Signal Generator	SMR 40	100231	Mar. 27, 2008
Tektronix Oscilloscope	TDS1012	C019167	Jan. 16, 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.

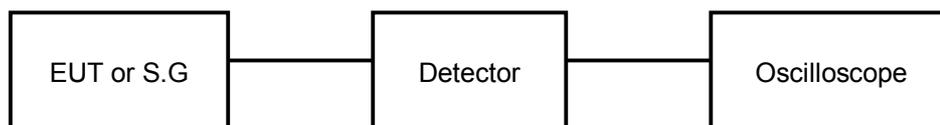
### 4.4.3 TEST PROCEDURES

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

<b>MODULATION TYPE</b>	DBPSK	<b>CHANNEL</b>	1, 6, 11
<b>INPUT POWER</b>	120Vac, 60 Hz	<b>ENVIRONMENTAL CONDITIONS</b>	25 deg. C, 73%RH, 1000hPa
<b>TRANSFER RATE</b>	1Mbps	<b>TESTED BY</b>	Jamison Chan

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (dBm)	PEAK POWER OUTPUT (mW)	PEAK POWER LIMIT (dBm)	PASS/FAIL
1	2412	8.68	7.379	30	PASS
6	2437	8.70	7.413	30	PASS
11	2462	8.52	7.112	30	PASS

### 802.11g OFDM MODULATION

<b>MODULATION TYPE</b>	BPSK	<b>CHANNEL</b>	1, 6, 11
<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz	<b>ENVIRONMENTAL CONDITIONS</b>	25 deg. C, 73%RH, 1000hPa
<b>TRANSFER RATE</b>	6Mbps	<b>TESTED BY</b>	Jamison Chan

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (dBm)	PEAK POWER OUTPUT (mW)	PEAK POWER LIMIT (dBm)	PASS/FAIL
1	2412	6.88	4.875	30	PASS
6	2437	7.77	5.984	30	PASS
11	2462	6.66	4.634	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	100036	Mar. 13, 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

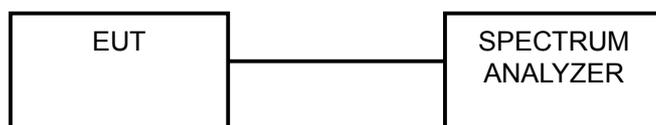
The transmitter output was connected to the spectrum analyzer through an attenuator, the bandwidth of the fundamental frequency was measured with the spectrum analyzer using 3kHz RBW and 30kHz VBW, set sweep time = span/3kHz. The power spectral density was measured and recorded.

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.

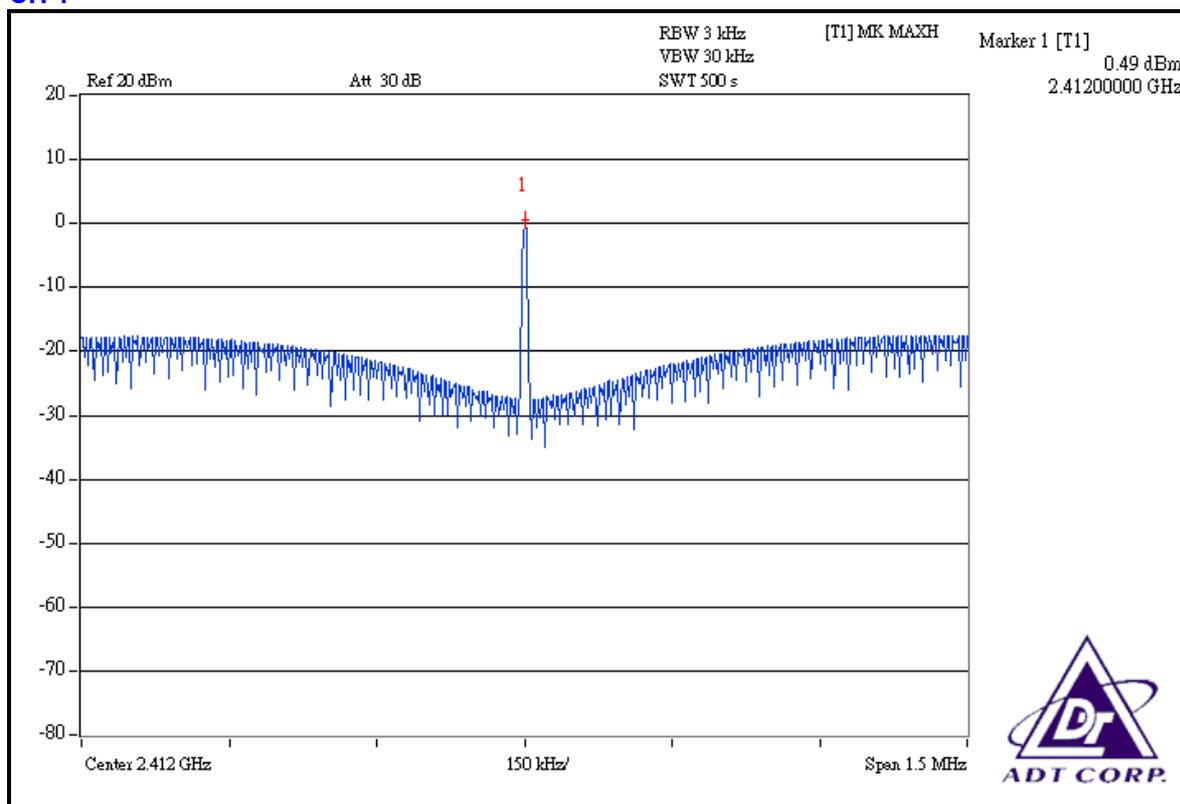
## 4.5.7 TEST RESULTS

### 802.11b DSSS MODULATION

<b>MODULATION TYPE</b>	DBPSK	<b>CHANNEL</b>	1, 6, 11
<b>INPUT POWER</b>	120Vac, 60 Hz	<b>ENVIRONMENTAL CONDITIONS</b>	25 deg. C, 73%RH, 1000hPa
<b>TRANSFER RATE</b>	1Mbps	<b>TESTED BY</b>	Jamison Chan

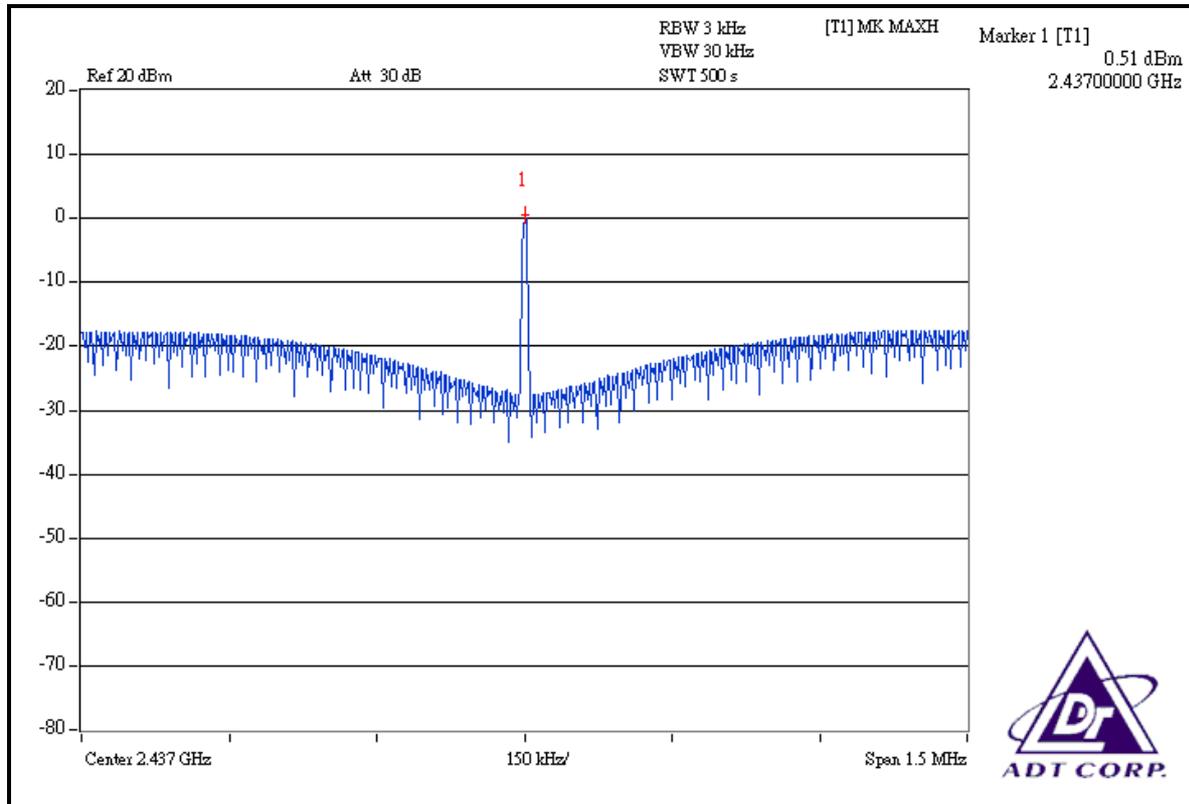
CHANNEL	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3 kHz BW (dBm)	MAXIMUM LIMIT (dBm)	PASS/FAIL
1	2412	0.49	8	PASS
6	2437	0.51	8	PASS
11	2462	0.33	8	PASS

### CH 1

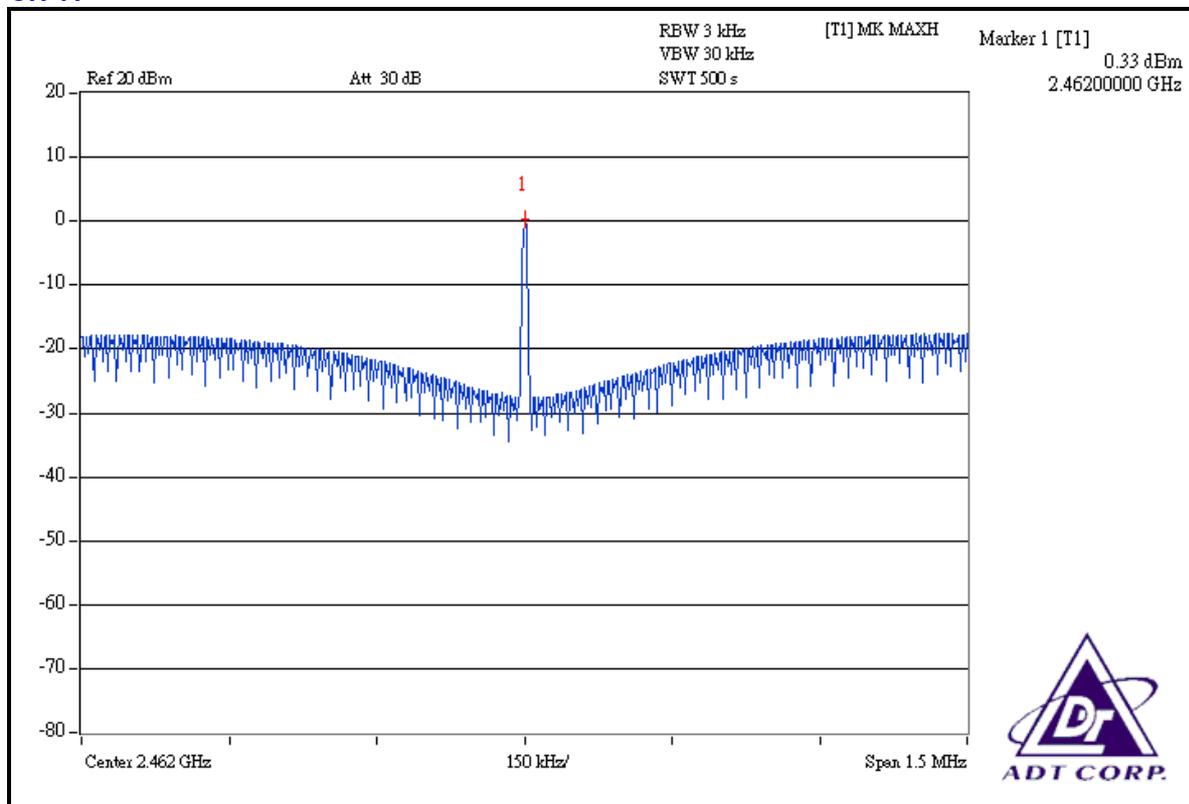




### CH 6



### CH 11



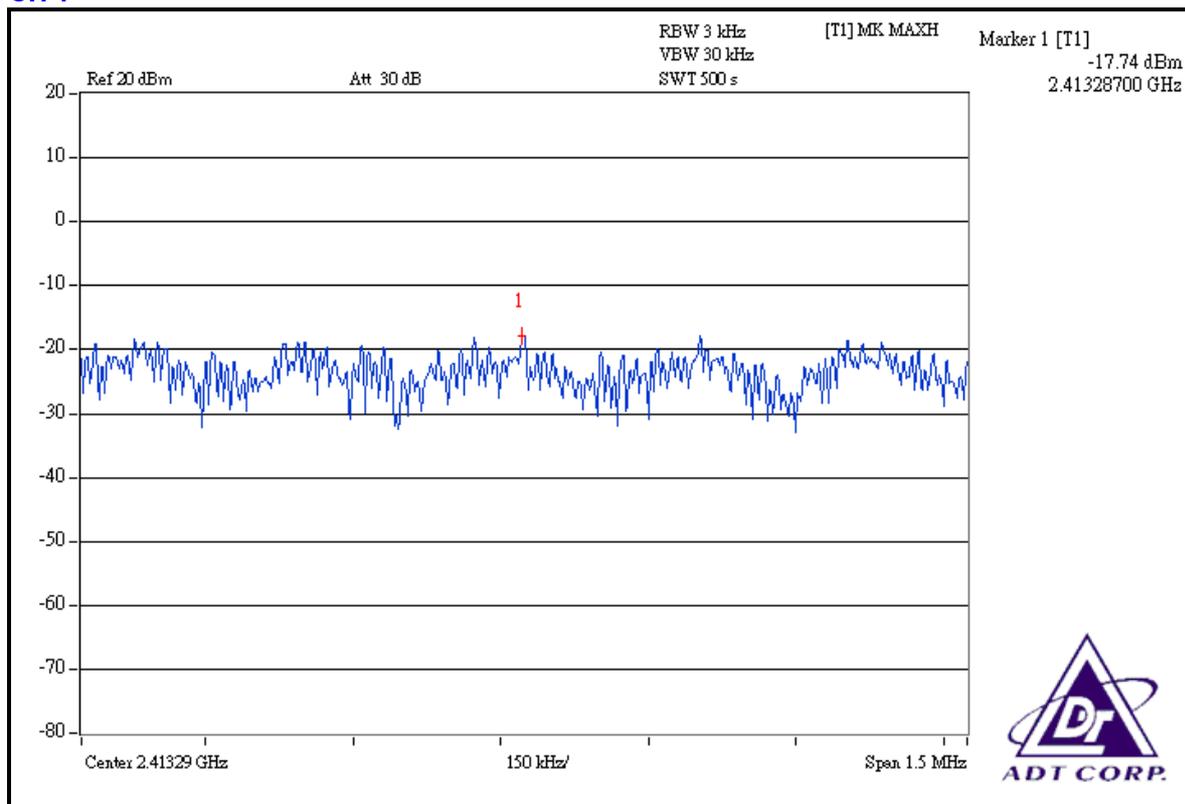


### 802.11g OFDM MODULATION

<b>MODULATION TYPE</b>	BPSK	<b>CHANNEL</b>	1, 6, 11
<b>INPUT POWER</b>	120Vac, 60 Hz	<b>ENVIRONMENTAL CONDITIONS</b>	25 deg. C, 73%RH, 1000hPa
<b>TRANSFER RATE</b>	6Mbps	<b>TESTED BY</b>	Jamison Chan

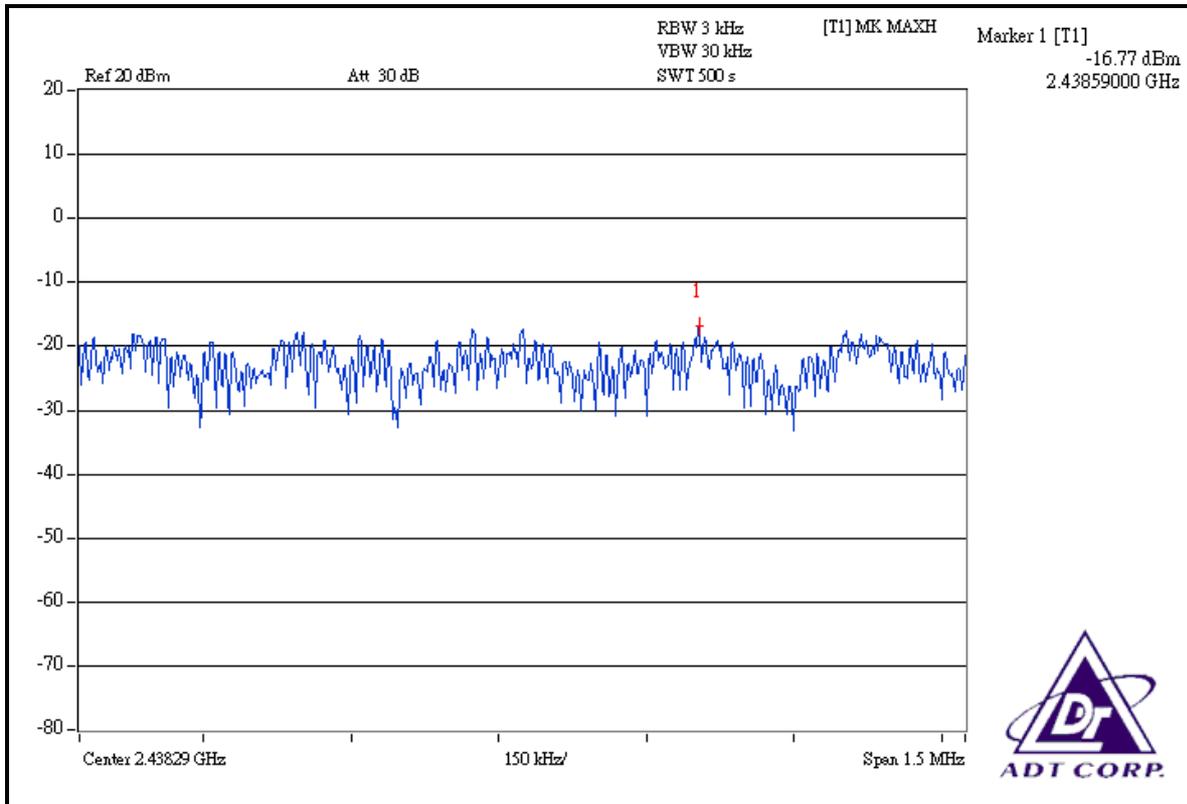
CHANNEL	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3 kHz BW (dBm)	MAXIMUM LIMIT (dBm)	PASS/FAIL
1	2412	-17.74	8	PASS
6	2437	-16.77	8	PASS
11	2462	-17.96	8	PASS

### CH 1

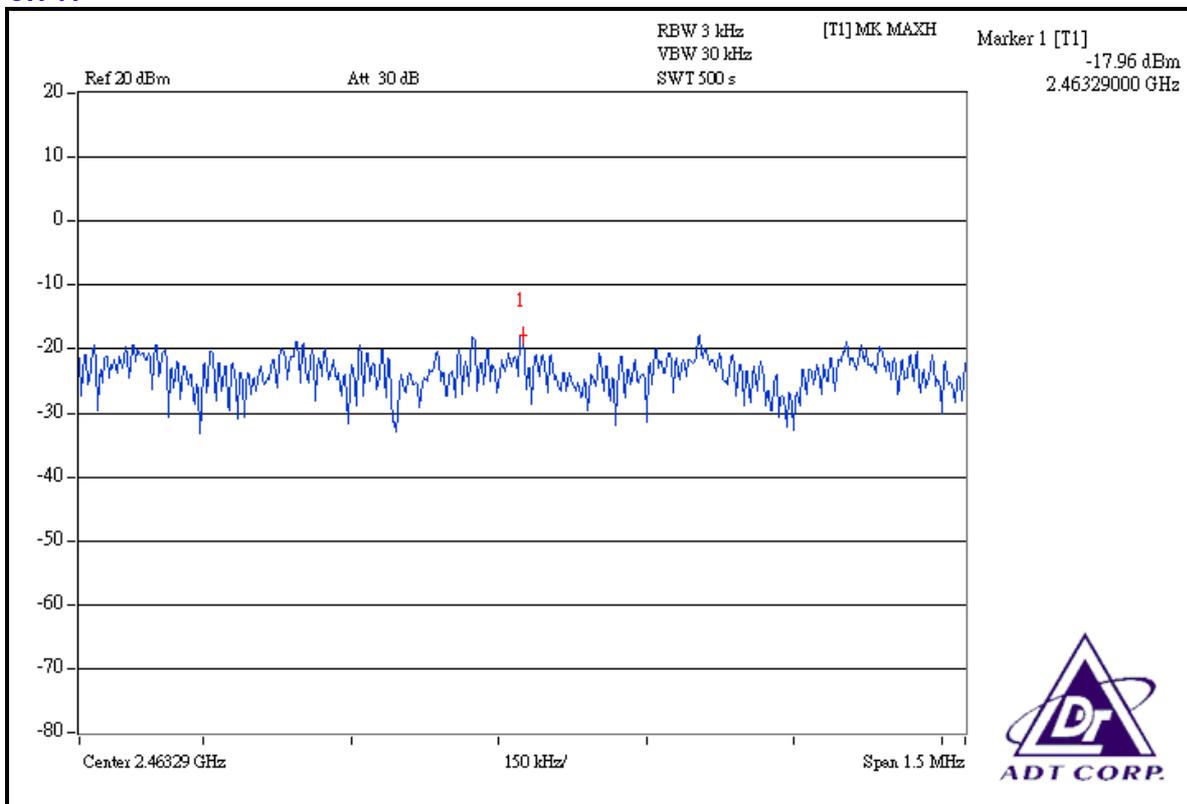




### CH 6



### CH 11





## 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	100036	Mar. 13, 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 loss cable. Set both RBW and VBW of spectrum analyzer to 100kHz with suitable frequency span including 100MHz bandwidth from band edge. The band edges was measured and recorded.

The spectrum plots (Peak RBW=VBW=100kHz; 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).

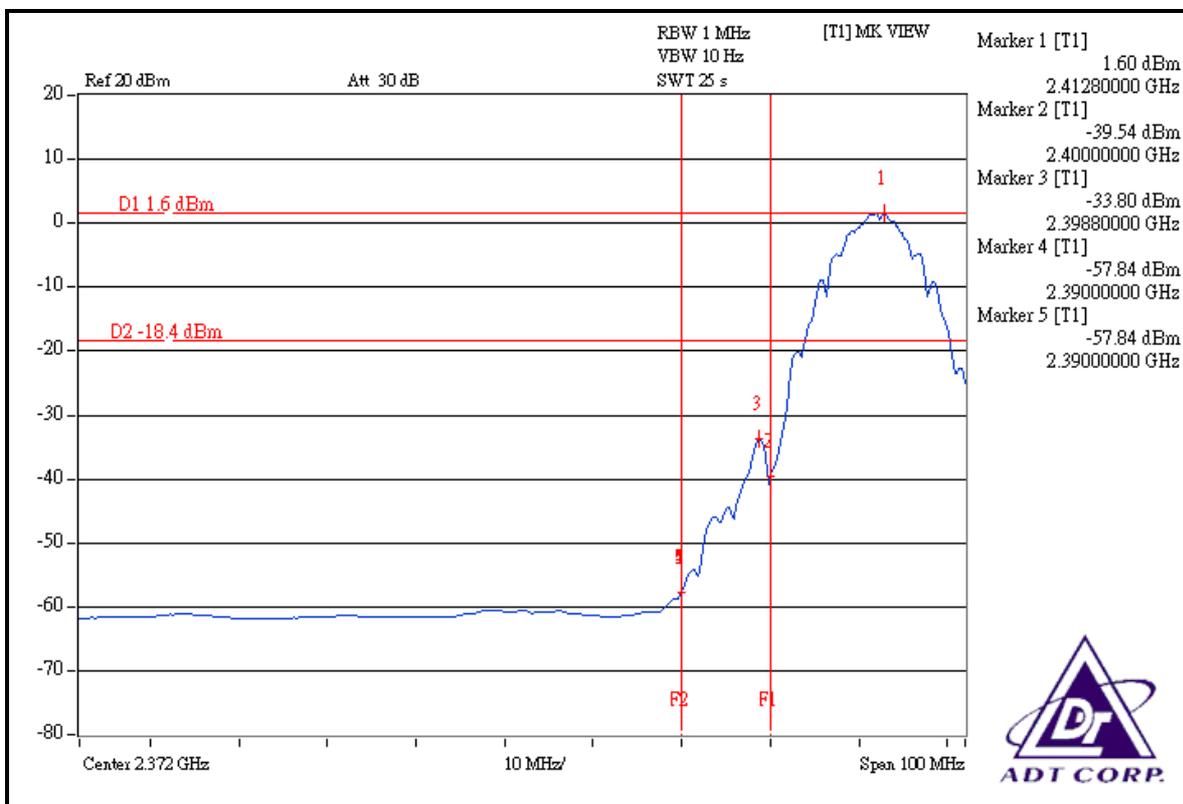
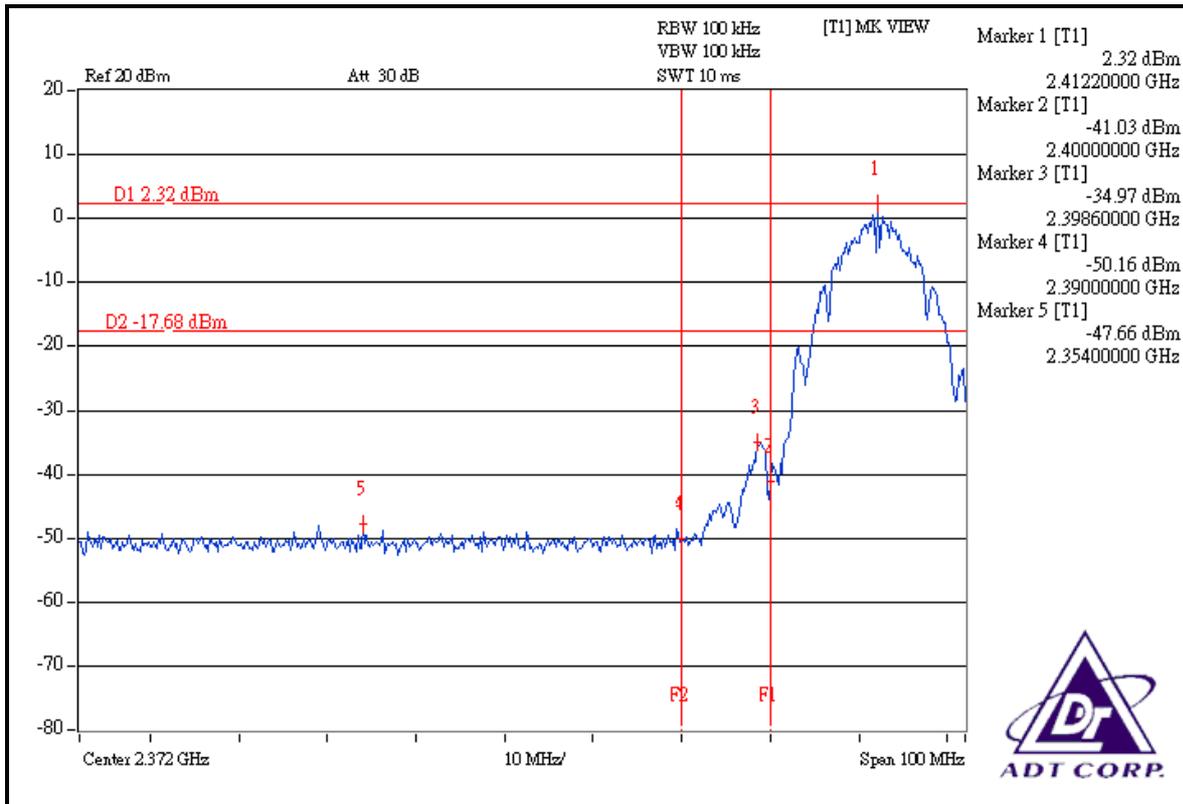
### 802.11b DSSS MODULATION

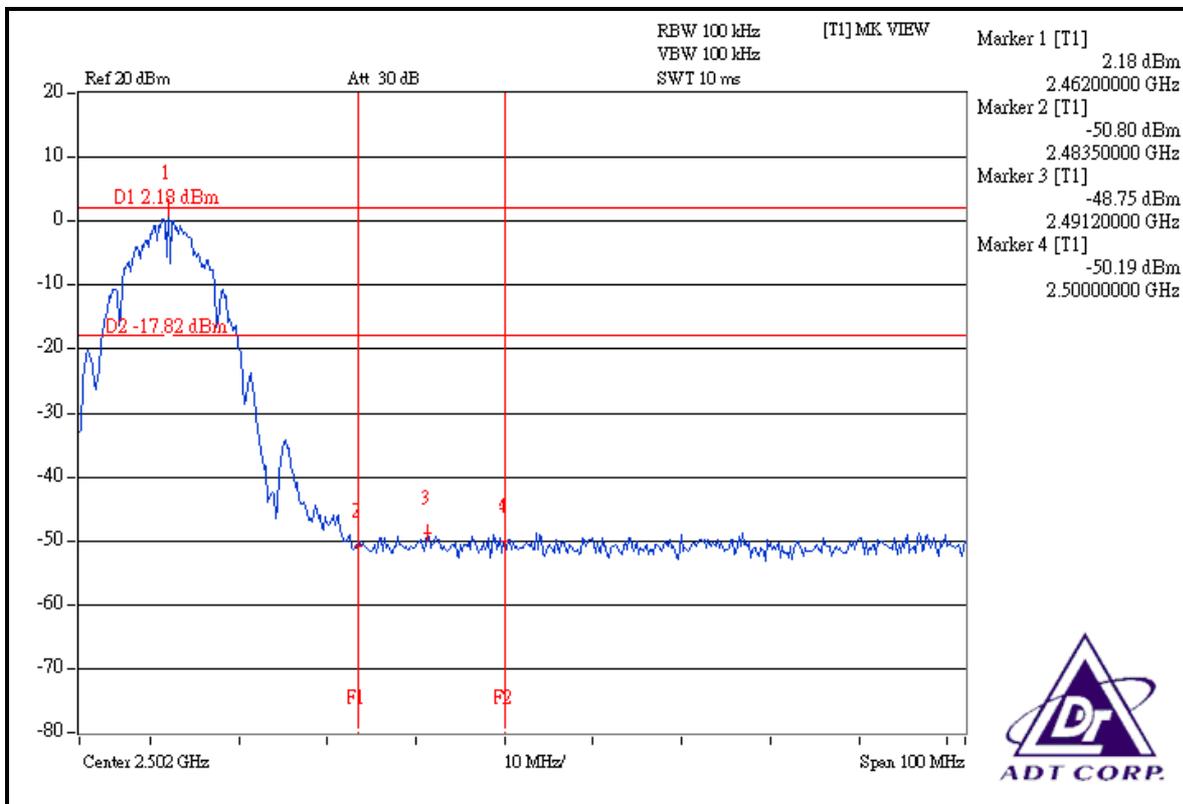
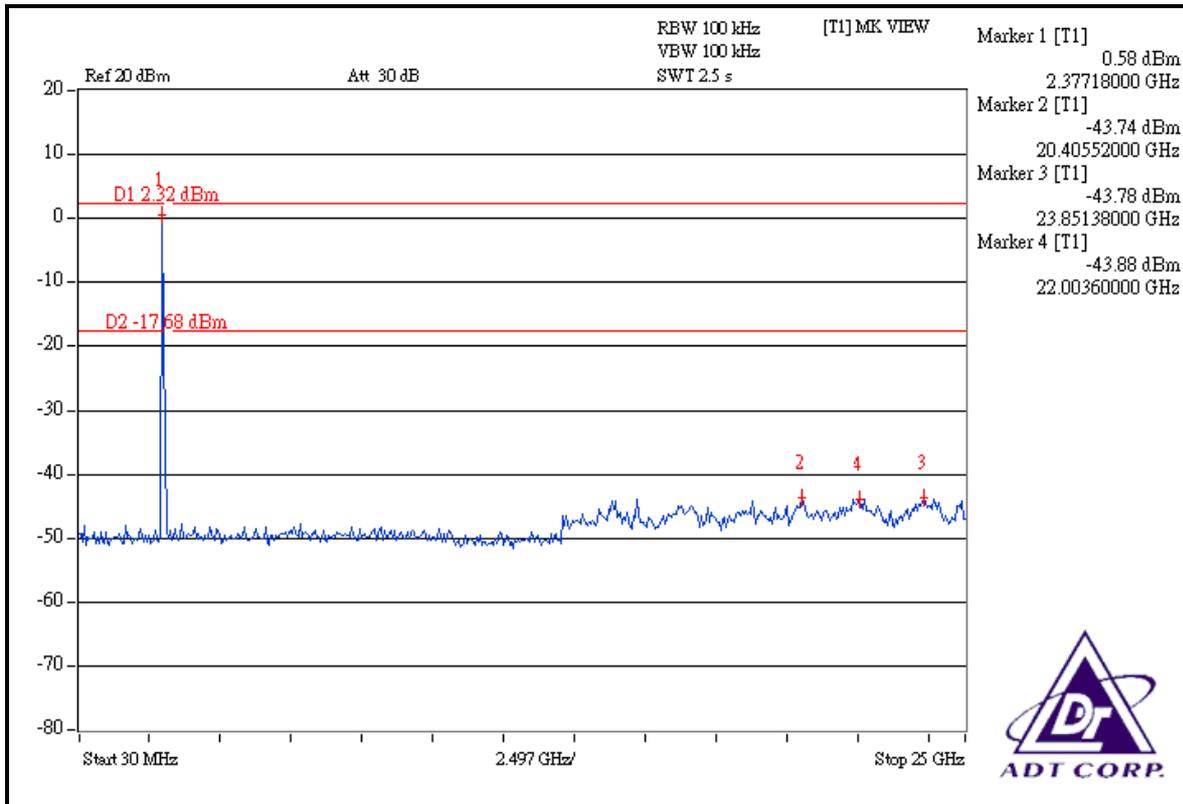
**NOTE 1:** The band edge emission plot on the next page shows 49.98dBc between carrier maximum power and local maximum emission in restrict band (2.3540GHz). The emission of carrier strength list in the test result of channel 1 at the item 4.2.7 is 106.85dBuV/m (Peak), so the maximum field strength in restrict band is  $106.85 - 49.98 = 56.87$ dBuV/m which is under 74dBuV/m limit.

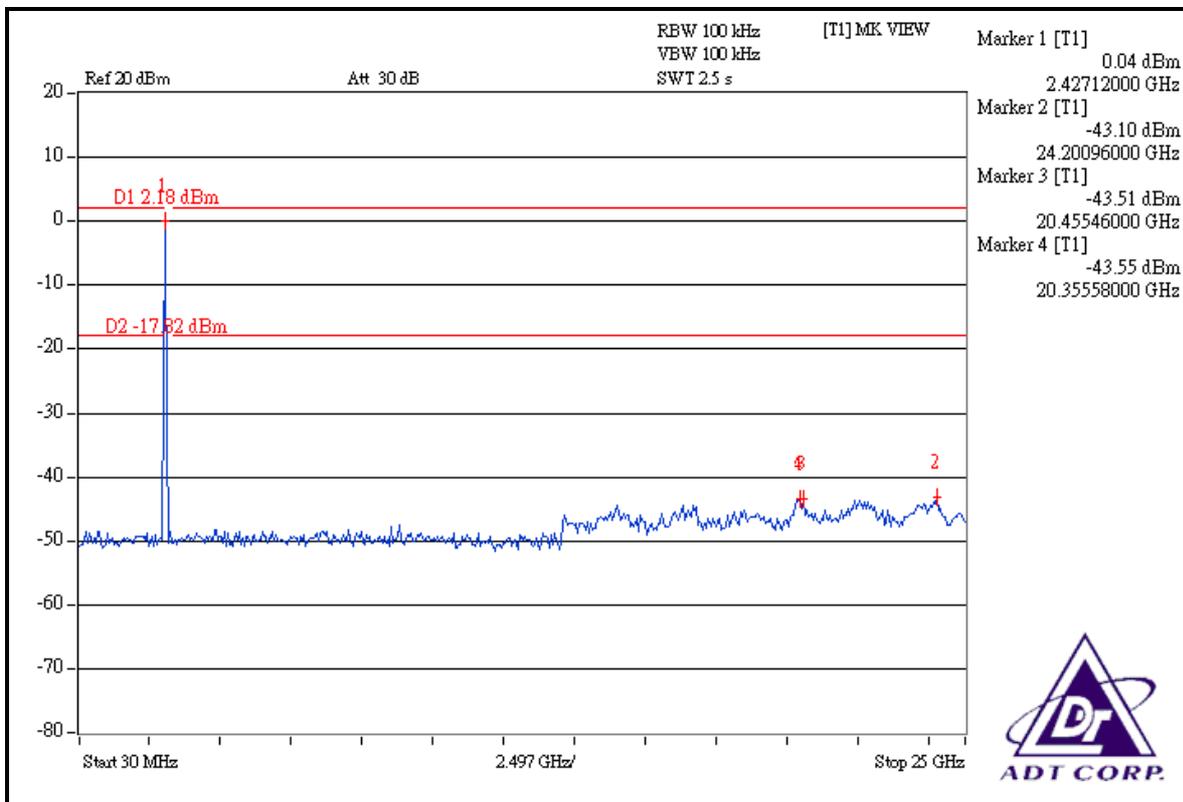
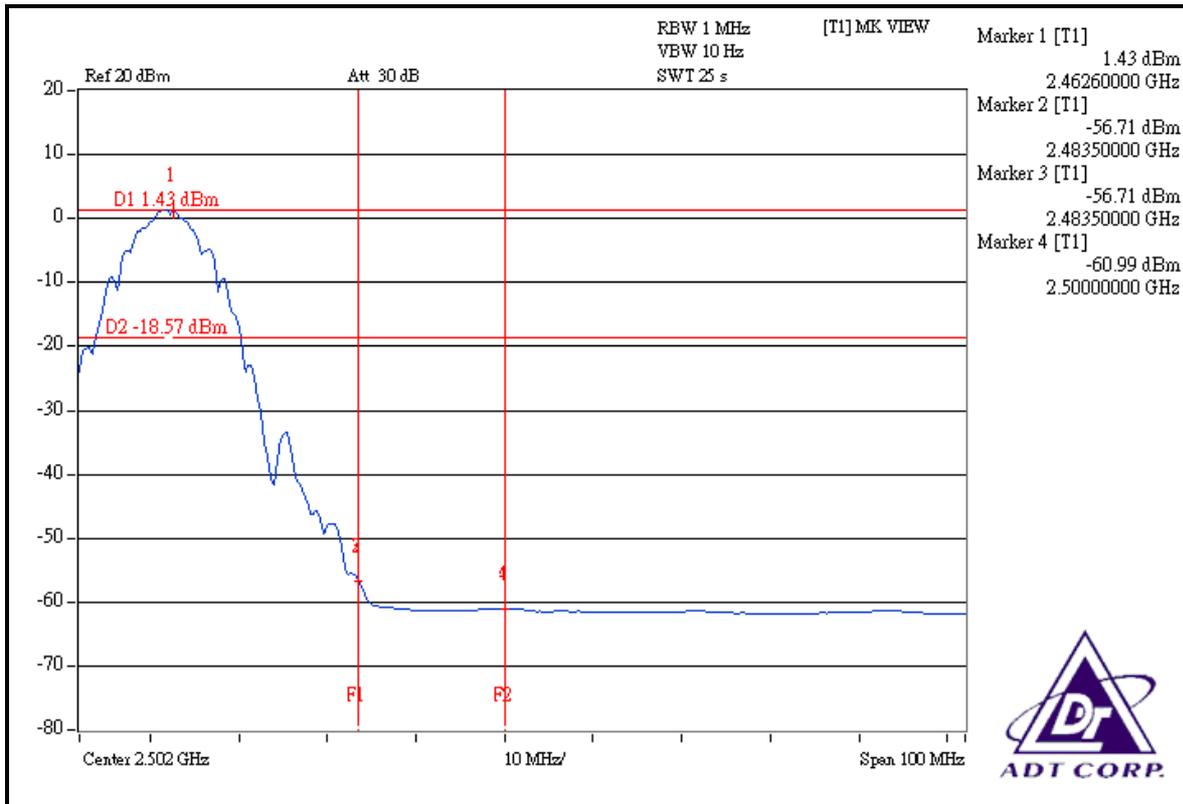
The band edge emission plot of on the next page shows 59.44dBc between carrier maximum power and local maximum emission in restrict band (2.3900GHz). The emission of carrier strength list in the test result of channel 1 at the item 4.2.7 is 101.16dBuV/m (Average), so the maximum field strength in restrict band is  $101.16 - 59.44 = 41.72$ dBuV/m which is under 54dBuV/m limit.

**NOTE 2:** The band edge emission plot on the next second page shows 50.93dBc between carrier maximum power and local maximum emission in restrict band (2.4912GHz). The emission of carrier strength list in the test result of channel 11 at the item 4.2.7 is 106.55dBuV/m (Peak), so the maximum field strength in restrict band is  $106.55 - 50.93 = 55.62$ dBuV/m which is under 74dBuV/m limit.

The band edge emission plot on the next third page shows 58.14dBc 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 100.86dBuV/m (Average), so the maximum field strength in restrict band is  $100.86 - 58.14 = 42.72$ dBuV/m which is under 54dBuV/m limit.







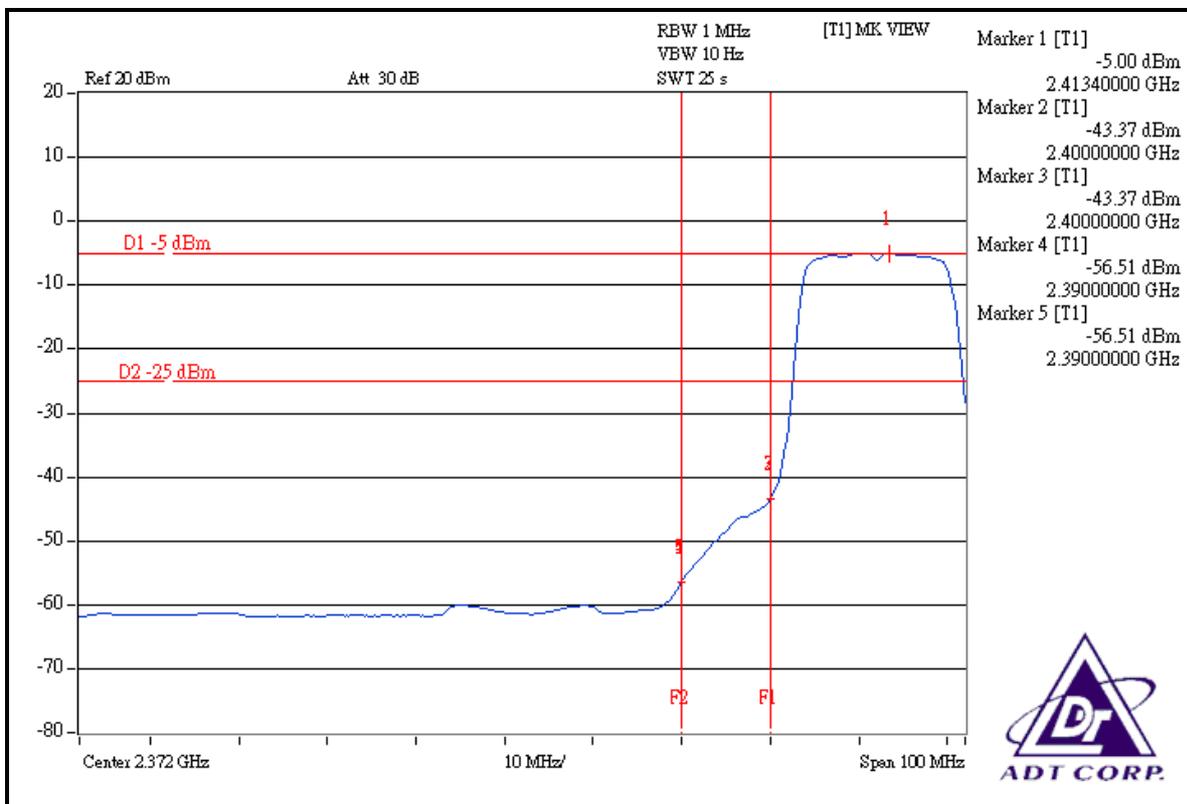
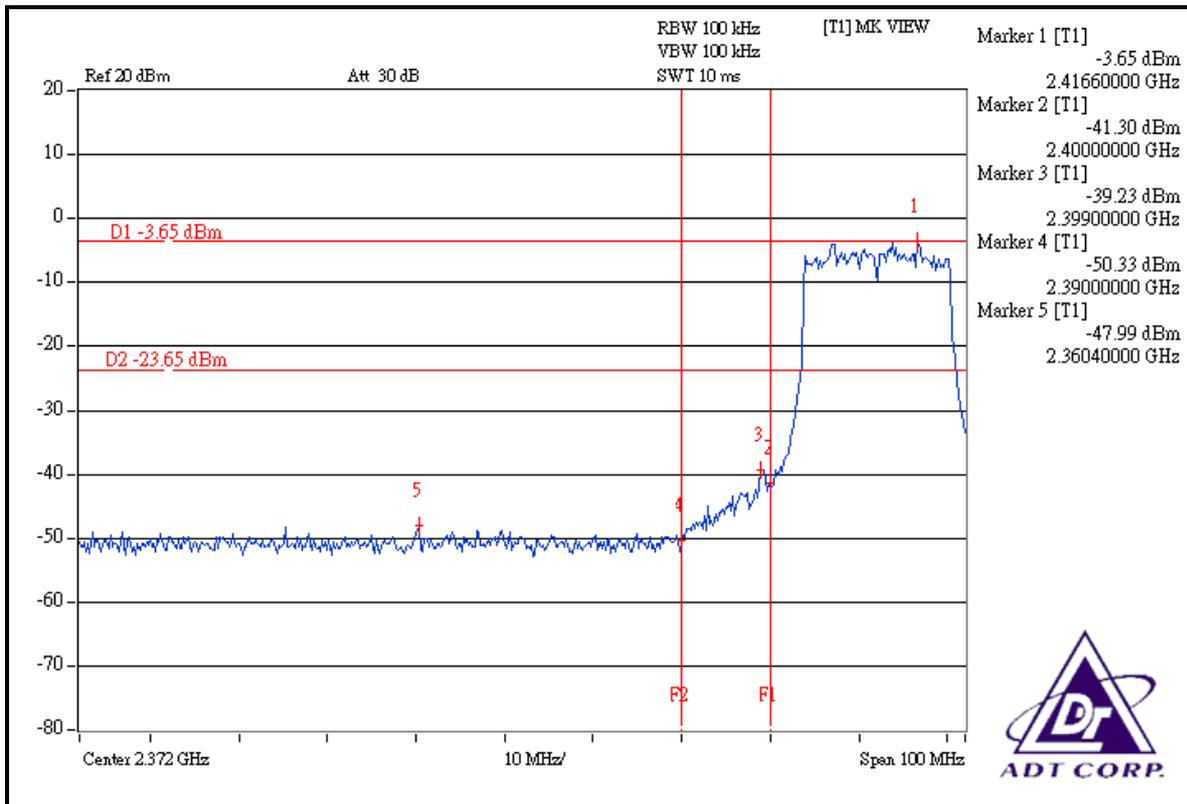
## 802.11g OFDM MODULATION

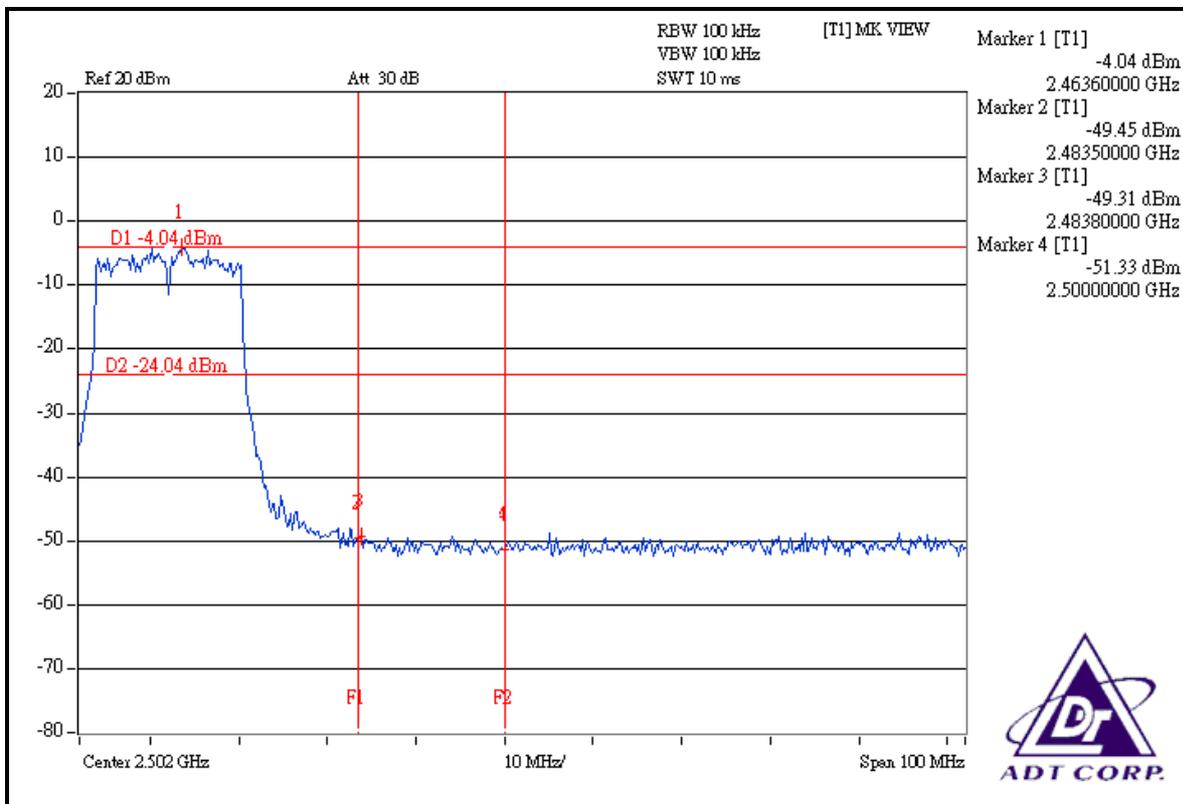
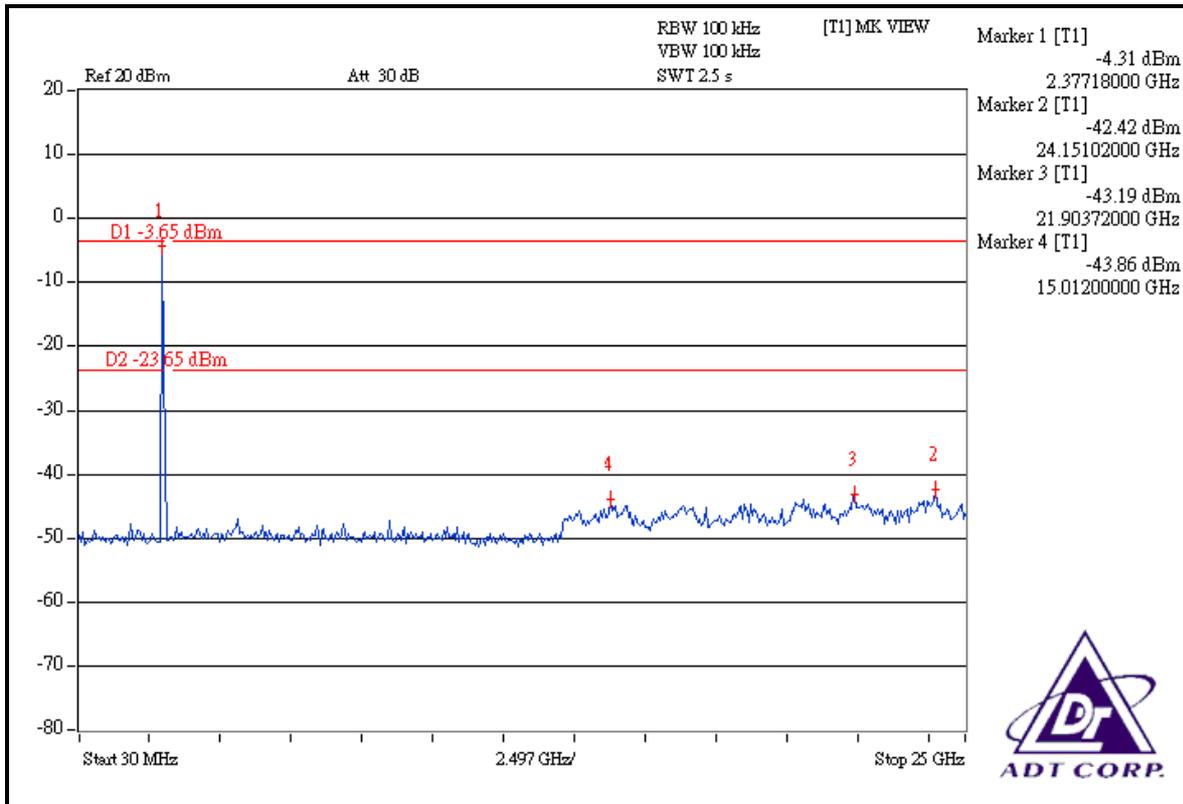
**NOTE 1:** The band edge emission plot on the next page shows 44.34dBc between carrier maximum power and local maximum emission in restrict band (2.3604GHz). The emission of carrier strength list in the test result of channel 1 at the item 4.2.7 is 105.13dBuV/m (Peak), so the maximum field strength in restrict band is  $105.13 - 44.34 = 60.79$ dBuV/m which is under 74dBuV/m limit.

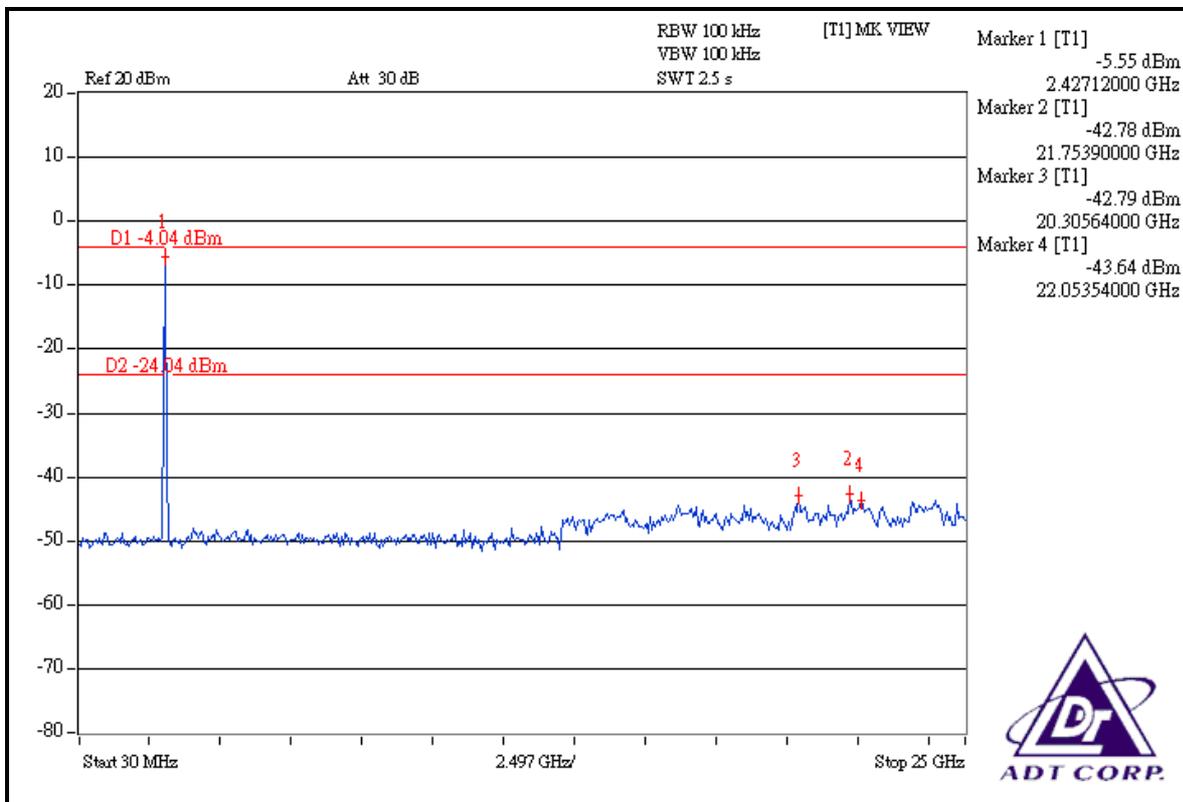
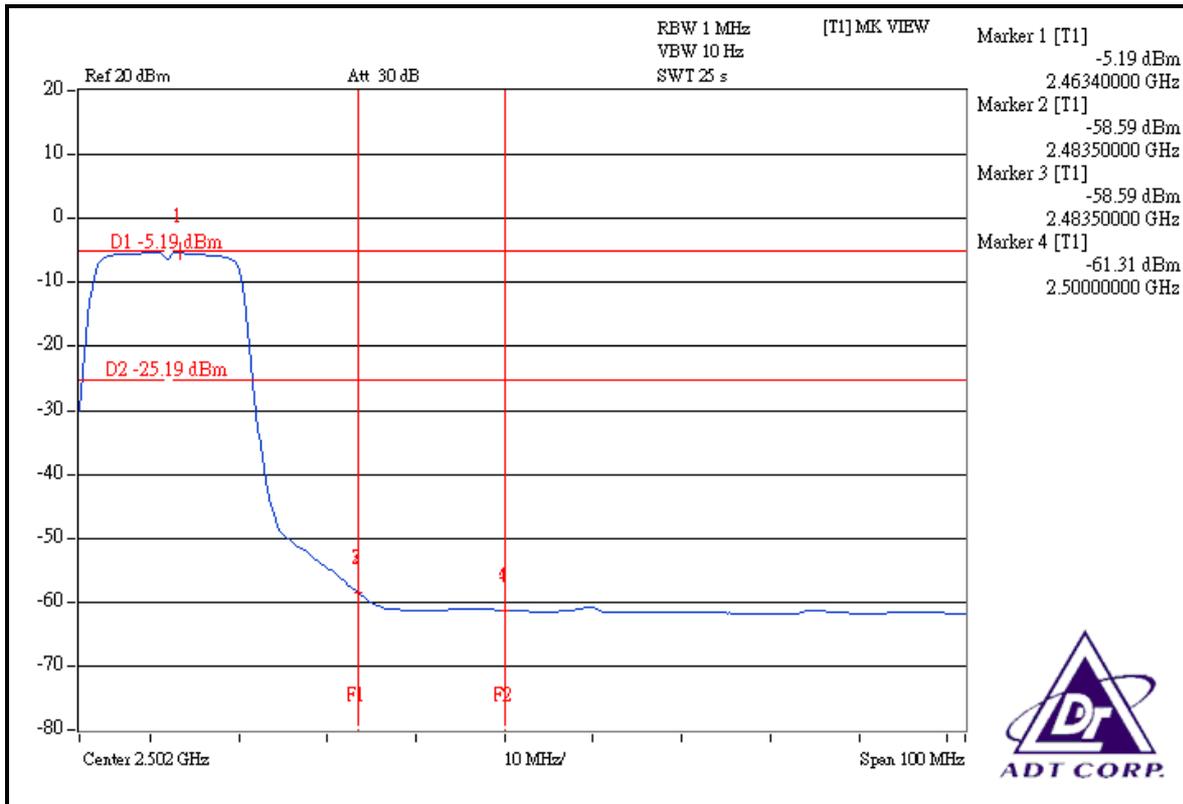
The band edge emission plot of on the next page shows 51.51dBc between carrier maximum power and local maximum emission in restrict band (2.3900GHz). The emission of carrier strength list in the test result of channel 1 at the item 4.2.7 is 93.28dBuV/m (Average), so the maximum field strength in restrict band is  $93.28 - 51.51 = 41.77$ dBuV/m which is under 54dBuV/m limit.

**NOTE 2:** The band edge emission plot on the next second page shows 45.27dBc between carrier maximum power and local maximum emission in restrict band (2.4838GHz). The emission of carrier strength list in the test result of channel 11 at the item 4.2.7 is 105.07dBuV/m (Peak), so the maximum field strength in restrict band is  $105.07 - 45.27 = 59.80$ dBuV/m which is under 74dBuV/m limit.

The band edge emission plot on the next third page shows 53.40dBc 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 93.10dBuV/m (Average), so the maximum field strength in restrict band is  $93.10 - 53.40 = 39.70$ dBuV/m which is under 54dBuV/m limit.









## **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 Dipole antenna with R-SMA antenna connector. The maximum Gain of the antenna is 2.28dBi gain.



## 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.

<b>USA</b>	FCC, UL, A2LA
<b>Germany</b>	TUV Rheinland
<b>Japan</b>	VCCI
<b>Norway</b>	NEMKO
<b>Canada</b>	INDUSTRY CANADA, CSA
<b>R.O.C.</b>	TAF, BSMI, NCC
<b>Netherlands</b>	Telefication
<b>Singapore</b>	PSB, GOST-ASIA(MOU)
<b>Russia</b>	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](http://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](http://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.