



# FCC TEST REPORT

**REPORT NO.:** RF950411H10

**MODEL NO.:** PePLink Surf 200BG

**RECEIVED:** April 11, 2006

**TESTED:** April 12 to 13, 2006

**ISSUED:** April 13, 2006

**APPLICANT:** PePLink Ltd.

**ADDRESS:** 2302, Tai Tung Building 8 Fleming Road,  
Wanchai, Hong Kong

**ISSUED BY:** Advance Data Technology Corporation

**LAB LOCATION:** No. 81-1, Lu Liao Keng, 9 Ling, Wu Lung Tsuen,  
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## 1 CERTIFICATION

**PRODUCT :** PePLink Surf 200BG  
**BRAND NAME :** PePLink  
**MODEL NO. :** PePLink Surf 200BG  
**TESTED:** April 12 to 13, 2006  
**APPLICANT :** PePLink Ltd.  
**TEST ITEM:** MASS-PRODUCTION  
**STANDARDS :** 47 CFR Part 15, Subpart C (Section 15.247),  
ANSI C63.4-2003

The above equipment (Model: PePLink Surf 200BG) 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 :** Carol Liao , **DATE:** April 13, 2006  
( Carol Liao )

**TECHNICAL ACCEPTANCE :** Hank Chung , **DATE:** April 13, 2006  
Responsible for RF ( Hank Chung )

**APPROVED BY :** May Chen , **DATE:** April 13, 2006  
( May Chen, Deputy Manager )



## 2 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

<b>APPLIED STANDARD: 47 CFR Part 15, Subpart C</b>			
<b>Standard Section</b>	<b>Test Type and Limit</b>	<b>Result</b>	<b>REMARK</b>
15.207	AC Power Conducted Emission	PASS	Meet the requirement of limit Minimum passing margin is -8.67 dB at 4.123 MHz
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(c)	Transmitter Radiated Emissions Limit: Table 15.209	PASS	Meet the requirement of limit Minimum passing margin is -0.5 dB at 2390.0 MHz
15.247(d)	Power Spectral Density Limit: max. 8dBm	PASS	Meet the requirement of limit
15.247(c)	Band Edge Measurement Limit: 20 dB less than the peak value of fundamental frequency	PASS	Meet the requirement of limit

### 3 GENERAL INFORMATION

#### 3.1 GENERAL DESCRIPTION OF EUT

<b>PRODUCT</b>	PePLink Surf 200BG
<b>MODEL NO.</b>	PePLink Surf 200BG
<b>FCC ID</b>	SAN-SURF200BG
<b>POWER SUPPLY</b>	DC 5V from power adapter
<b>MODULATION TYPE</b>	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM
<b>RADIO 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>CHANNEL SPACING</b>	5MHz
<b>OUTPUT POWER</b>	802.11b: 223.872mW 802.11g: 158.489mW
<b>ANTENNA TYPE</b>	Dipole antenna
<b>DATA CABLE</b>	NA
<b>I/O PORTS</b>	LAN Port x 1
<b>ASSOCIATED DEVICES</b>	NA

**NOTE:**

1. The EUT was powered by following power adapters:

Adapter 1	
<b>Brand:</b>	HON-KWANG
<b>Model No.:</b>	HK-A115-A05
<b>Input power :</b>	100-240V MAX 50-60Hz 0.45A
<b>Output power :</b>	5V=== 3.0A (SET AT 3.0A)
Adapter 2	
<b>Brand:</b>	SWITCHING
<b>Model No.:</b>	S024AU0500300
<b>Input power :</b>	100-240V ~ 47-63Hz 700mA
<b>Output power :</b>	5V=== 3000mA



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

No.	Gain (dBi)	Cable Loss (dB)	Net Gain (dB)	Antenna Type	Antenna Connector
1	9.0	0.7	8.3	Dipole	RE-TNC
2	5.0	0.7	4.3	Dipole	RE-TNC

From the above antennas, antenna 1 was selected as representative antenna for the test and their data were recorded in this report.

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

### 3.2 DESCRIPTION OF TEST MODES

Operated in 2400 ~ 2483.5MHz band:

For 802.11b/g normal mode: 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		



### 3.3 TEST MODE APPLICABILITY AND TESTED CHANNEL DETAIL:

EUT configure mode	Applicable to				Description
	PLC	RE<1G	RE≥1G	APCM	
-	√	√	√	√	NA

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)
802.11g	1 to 11	11	OFDM	BPSK	6

- The EUT was tested with the following modes:

Test Mode	Description
Mode 1	Adapter 1
Mode 2	Adapter 2

#### **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	11	OFDM	BPSK	6

- The EUT was tested with the following modes:

Test Mode	Description
Mode 1	Adapter 1
Mode 2	Adapter 2



**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	CCK	11
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	CCK	11
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	CCK	11
802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6



### **3.4 GENERAL DESCRIPTION OF APPLIED STANDARDS**

The EUT is a PePLink Surf 200BG. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

**47 CFR Part 15, Subpart C. (15.247)**

**ANSI C63.4 : 2003**

All tests 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 47 CFR Part 15, Subpart B, Class B (DoC). The test report has been issued separately.



### 3.5 DESCRIPTION OF SUPPORT UNITS

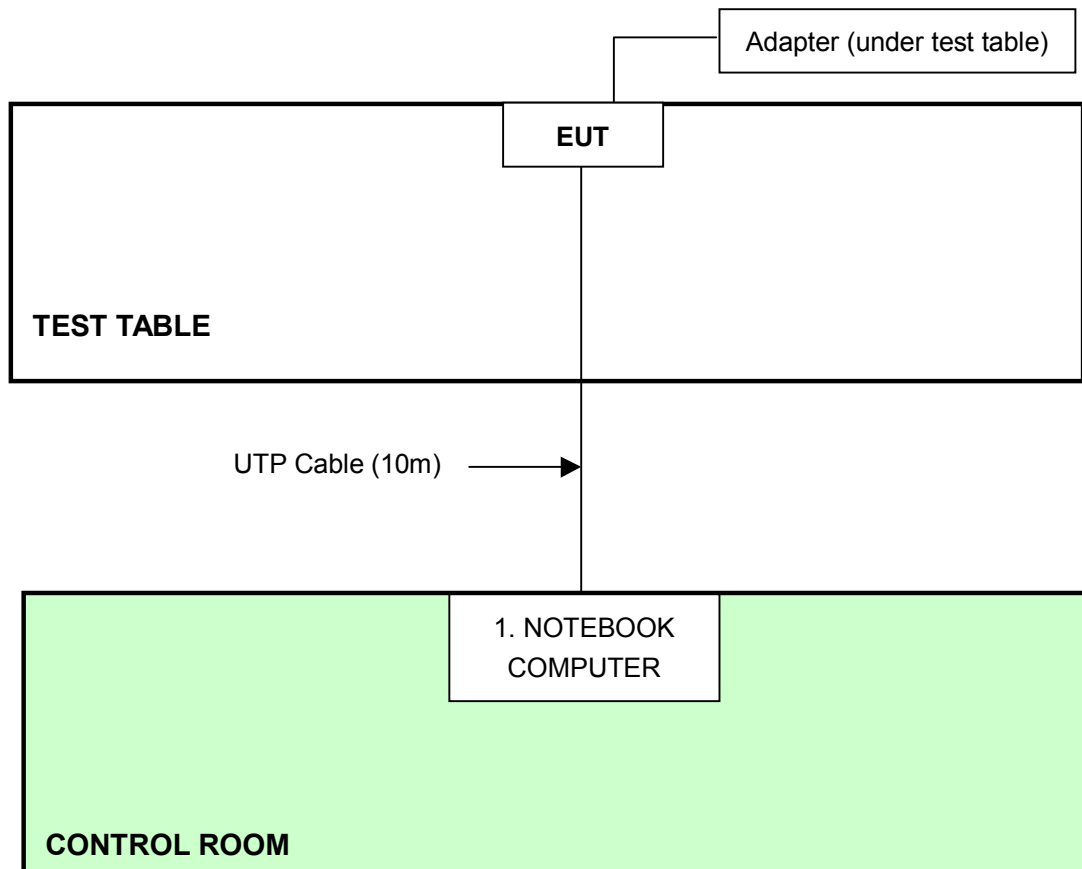
The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	NOTEBOOK COMPUTER	ASUS	A2400H	49NG038481	FCC DoC

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	NA

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

### 3.6 CONFIGURATION OF SYSTEM UNDER TEST



- NOTE:** 1. Support unit 1 was kept in the control room during the test.  
2. Please refer to the photos of test configuration in Item 5 also.



## 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. All emanations from a class 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

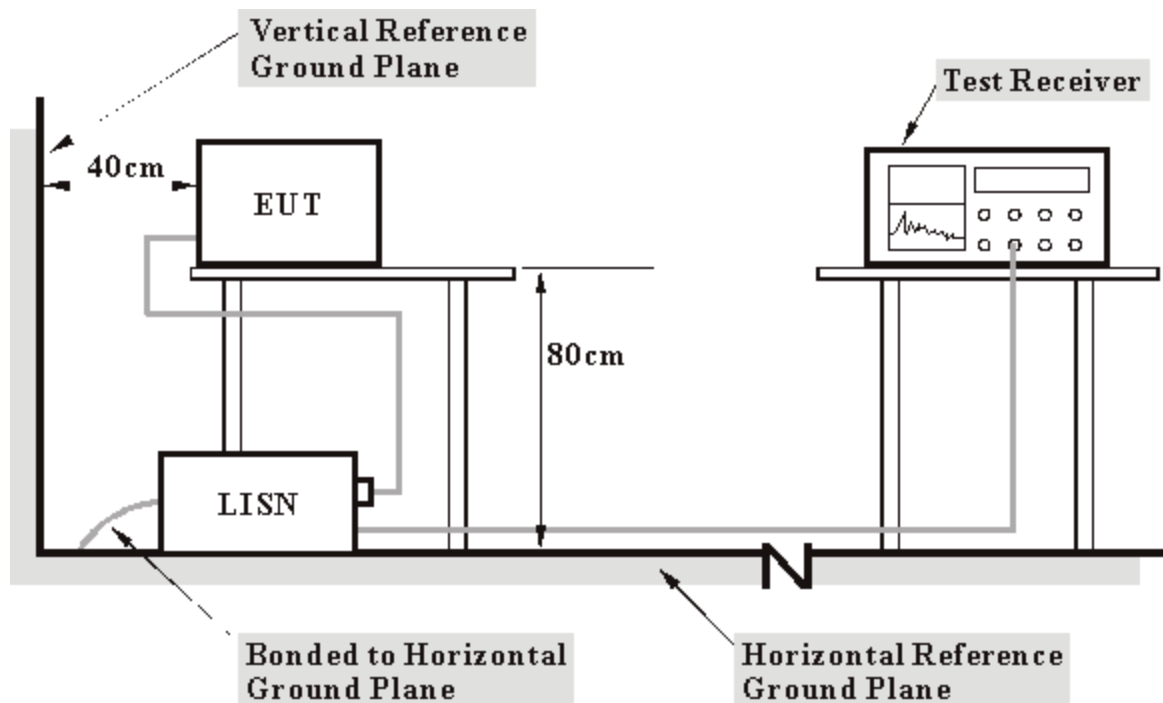
DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
Test Receiver	ESCS 30	100375	Sep. 19, 2006
Line-Impedance Stabilization Network(for EUT)	ENV-216	100071	Nov. 10, 2006
ROHDE & SCHWARZ LISN	KNW-407	8/1395/12	Jul. 19, 2006
RF Signal Cable	RG233/U	Cable_CA_02	Dec. 10, 2006
Terminator(for KYORITSU)	50	2	Oct. 08, 2006
Software	ADT_Cond_V7.3.2	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 ADT Shielded Room No. B.  
 3. The VCCI Con B Registration No. is C-2193.

#### 4.1.3 TEST PROCEDURES

- a. The EUT/HOST was placed 0.4 meters from the conducting wall of the shielded room with EUT/HOST 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/HOST were checked for maximum conducted interference.
- c. The frequency range from 150 kHz to 30 MHz was searched. Emission levels over 10dB under the prescribed limits could not be reported

#### 4.1.4 TEST SETUP



- Note:**
1. Support units were connected to second LISN.
  2. Both of LISNs (AMIN) 80 cm from EUT and at the least 80 cm from other units and other metal planes support units.

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



#### 4.1.5 EUT OPERATING CONDITIONS

- a. Placed the EUT on the testing table.
- b. Prepared other computer system to act as a communication partner and placed it outside of testing area.
- c. The communication partners run test program "IE command" to enable EUT under transmission/receiving condition continuously at specific channel frequency via UTP cable.

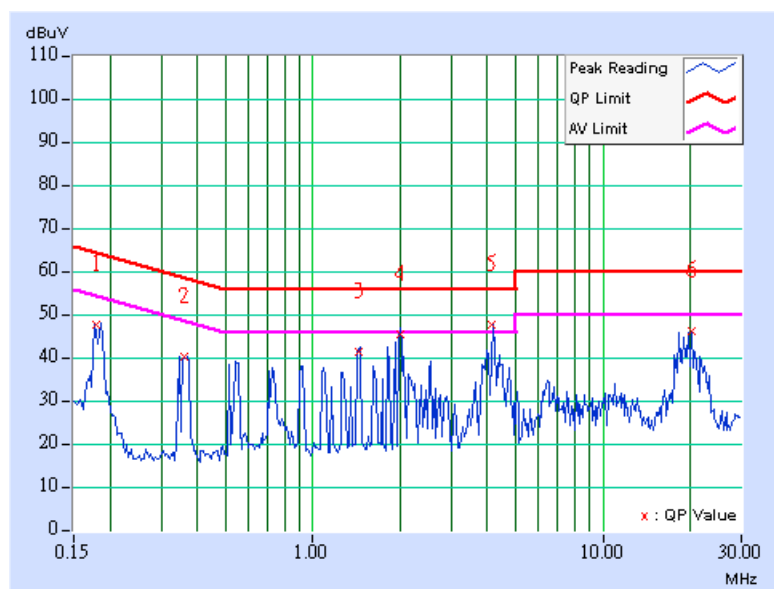


#### 4.1.6 TEST RESULTS

<b>TEST MODE</b>	Mode 1	<b>CHANNEL</b>	Channel 11
<b>MODULATION TYPE</b>	BPSK	<b>6dB BANDWIDTH</b>	9 kHz
<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz	<b>TRANSFER RATE</b>	6Mbps
<b>ENVIRONMENTAL CONDITIONS</b>	20deg. C, 50%RH, 964hPa	<b>PHASE</b>	Line (L)
<b>TESTED BY</b>	Phoenix Huang		

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	0.180	9.60	37.61	-	47.21	-	64.49	54.49	-17.28	-
2	0.360	9.60	30.45	-	40.05	-	58.73	48.73	-18.68	-
3	1.444	9.64	31.44	-	41.08	-	56.00	46.00	-14.92	-
4	1.992	9.70	35.37	-	45.07	-	56.00	46.00	-10.93	-
<b>5</b>	<b>4.123</b>	<b>9.70</b>	<b>37.63</b>	<b>25.66</b>	<b>47.33</b>	<b>35.36</b>	<b>56.00</b>	<b>46.00</b>	<b>-8.67</b>	<b>-10.64</b>
6	20.259	10.10	36.35	-	46.45	-	60.00	50.00	-13.55	-

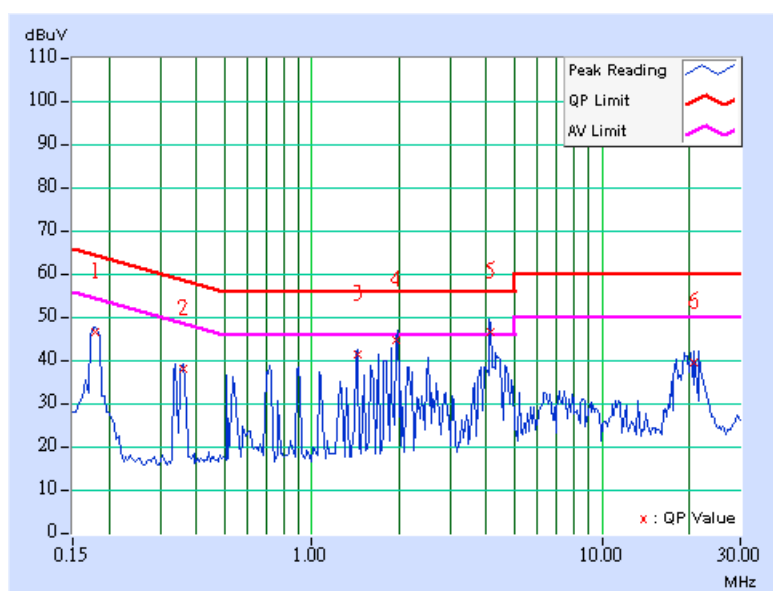
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
  2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
  3. The emission levels of other frequencies were very low against the limit.
  4. Margin value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



<b>TEST MODE</b>	Mode 1	<b>CHANNEL</b>	Channel 11
<b>MODULATION TYPE</b>	BPSK	<b>6dB BANDWIDTH</b>	9 kHz
<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz	<b>TRANSFER RATE</b>	6Mbps
<b>ENVIRONMENTAL CONDITIONS</b>	20deg. C, 50%RH, 964hPa	<b>PHASE</b>	Neutral (N)
<b>TESTED BY</b>	Phoenix Huang		

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	0.179	9.60	36.75	-	46.35	-	64.55	54.55	-18.20	-
2	0.361	9.60	28.14	-	37.74	-	58.71	48.71	-20.97	-
3	1.435	9.64	31.38	-	41.02	-	56.00	46.00	-14.98	-
4	1.954	9.70	34.74	-	44.44	-	56.00	46.00	-11.56	-
5	4.121	9.70	36.59	26.65	46.29	36.35	56.00	46.00	-9.71	-9.65
6	20.811	10.10	29.69	-	39.79	-	60.00	50.00	-20.21	-

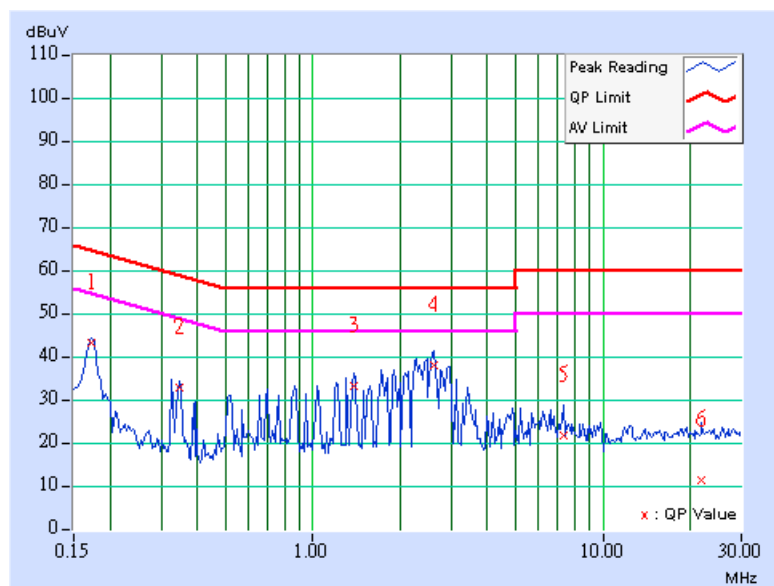
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
  2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
  3. The emission levels of other frequencies were very low against the limit.
  4. Margin value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



<b>TEST MODE</b>	Mode 2	<b>CHANNEL</b>	Channel 11
<b>MODULATION TYPE</b>	BPSK	<b>6dB BANDWIDTH</b>	9 kHz
<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz	<b>TRANSFER RATE</b>	6Mbps
<b>ENVIRONMENTAL CONDITIONS</b>	15deg. C, 65%RH, 964hPa	<b>PHASE</b>	Line (L)
<b>TESTED BY</b>	Rex Huang		

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	0.173	9.60	33.06	-	42.66	-	64.79	54.79	-22.13	-
2	0.348	9.60	22.79	-	32.39	-	59.02	49.02	-26.63	-
3	1.388	9.64	23.20	-	32.84	-	56.00	46.00	-23.16	-
4	2.619	9.70	27.89	-	37.59	-	56.00	46.00	-18.41	-
5	7.332	9.81	11.59	-	21.40	-	60.00	50.00	-38.60	-
6	21.907	10.10	1.21	-	11.31	-	60.00	50.00	-48.69	-

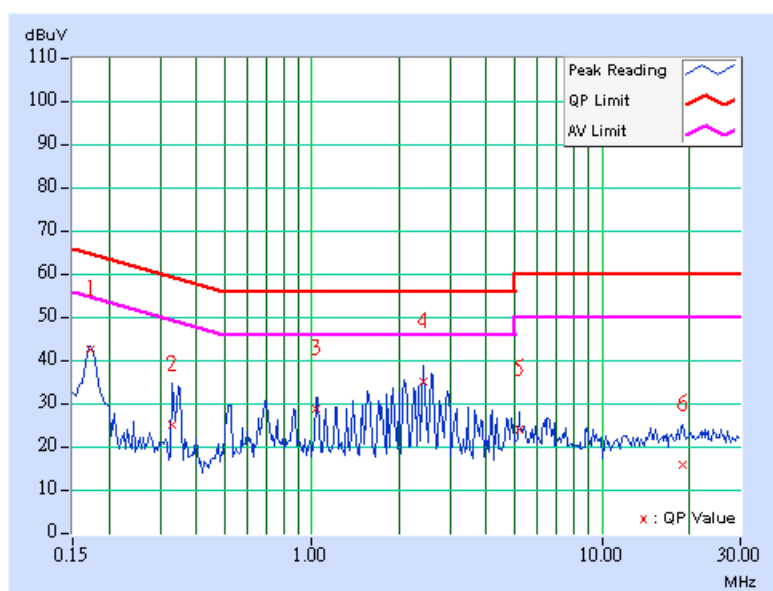
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
  2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
  3. The emission levels of other frequencies were very low against the limit.
  4. Margin value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



<b>TEST MODE</b>	Mode 2	<b>CHANNEL</b>	Channel 11
<b>MODULATION TYPE</b>	BPSK	<b>6dB BANDWIDTH</b>	9 kHz
<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz	<b>TRANSFER RATE</b>	6Mbps
<b>ENVIRONMENTAL CONDITIONS</b>	15deg. C, 65%RH, 964hPa	<b>PHASE</b>	Neutral (N)
<b>TESTED BY</b>	Rex Huang		

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	0.173	9.60	32.66	-	42.26	-	64.79	54.79	-22.53	-
2	0.330	9.60	15.09	-	24.69	-	59.46	49.46	-34.77	-
3	1.033	9.60	18.82	-	28.42	-	56.00	46.00	-27.58	-
4	2.420	9.70	24.96	-	34.66	-	56.00	46.00	-21.34	-
5	5.199	9.74	14.02	-	23.76	-	60.00	50.00	-36.24	-
6	18.895	10.08	5.73	-	15.81	-	60.00	50.00	-44.19	-

- 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
*ADVANTEST Spectrum Analyzer	R3271A	85060311	July 07, 2006
*HP Pre_Amplifier	8449B	3008A01922	Oct. 02, 2006
*ROHDE & SCHWARZ Test Receiver	ESCS 30	100027	Jul. 18, 2006
*CHASE Broadband Antenna	CBL6112B	2798	Dec. 20, 2006
*Schwarzbeck Horn_Antenna	BBHA9120-D1	D123	Sep. 23, 2006
Schwarzbeck Horn_Antenna	BBHA 9170	BBHA9170153	Jan. 05, 2007
SCHWARZBECK Biconical Antenna	VHBA9123	459	Jun. 26, 2006
SCHWARZBECK Periodic Antenna	UPA6108	1148	Jun. 26, 2006
*RF Switches	MP59B	M50867	Jul. 16, 2006
*RF Cable(JETBAO)	9913-30M N-N Cable	STACAB-30M-1GHz-021	Jul. 31, 2006
*Software	ADT_Radiated_V 5.14	NA	NA
*EMCO Antenna Tower	2075-2	9712-2124	NA
*EMCO Turn Table	2081-1.53	9712-2030	NA
*CORCOM AC Filter	MRI2030	107/108	NA

- Note: 1. The calibration interval of the above test instruments is 12 months (36 months for Periodic Antenna) and the calibrations are traceable to NML/ROC and NIST/USA.  
 2. \* = These equipment are used for the final measurement.  
 3. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.  
 4. The test was performed in ADT Open Site No. A.  
 5. The VCCI Site Registration No. is R-782.  
 6. The FCC Site Registration No. is 91097.  
 7. The CANADA Site Registration No. is IC 4824-1.  
 8. The following table is for the measurement uncertainty, which is calculated as per the document CISPR 16-4.

Measurement	Value
Radiated emissions (30MHz-1GHz)	3.30 dB
Radiated emissions (1GHz ~18GHz)	2.25 dB
Radiated emissions (18GHz ~20GHz)	1.88 dB

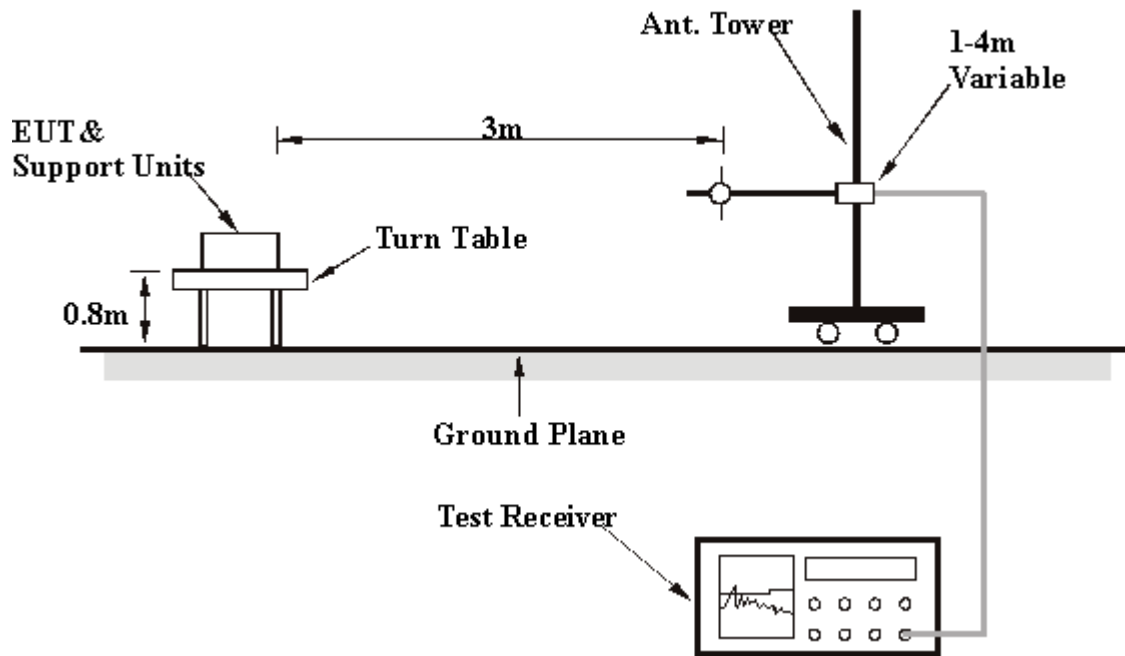
#### 4.2.3 TEST PROCEDURES

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 10 meter open area test site. 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 10 dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10 dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a 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 and video bandwidth of test receiver/spectrum analyzer is 1 MHz for Peak detection at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 10 Hz for Average detection (AV) at frequency above 1GHz.

#### 4.2.4 TEST SETUP



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

#### 4.2.5 EUT OPERATING CONDITIONS

Same as 4.1.5





#### 4.2.6 TEST RESULTS

##### Below 1GHz Worst-Case Data

<b>TEST MODE</b>	Mode 1	<b>CHANNEL</b>	Channel 11
<b>MODULATION TYPE</b>	BPSK	<b>FREQUENCY RANGE</b>	30-1000 MHz
<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz	<b>TRANSFER RATE</b>	6Mbps
<b>ENVIRONMENTAL CONDITIONS</b>	27deg. C, 59%RH, 964hPa	<b>DETECTOR FUNCTION</b>	Quasi-Peak, 120kHz
<b>TESTED BY</b>	Tony Chen		

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

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	125.00	26.60 QP	43.50	-16.90	1.66 H	281	15.00	11.60
2	375.00	33.40 QP	46.00	-12.60	1.00 H	250	16.80	16.60
3	500.00	31.60 QP	46.00	-14.40	1.00 H	254	11.20	20.40
4	625.00	38.80 QP	46.00	-7.20	1.38 H	198	16.00	22.80
5	700.00	28.40 QP	46.00	-17.60	1.35 H	94	4.70	23.70
6	750.00	36.00 QP	46.00	-10.00	1.20 H	242	11.20	24.80
7	875.00	39.40 QP	46.00	-6.60	1.07 H	239	14.30	25.10

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

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	125.00	34.80 QP	43.50	-8.70	1.00 V	5	23.20	11.60
2	375.00	35.10 QP	46.00	-10.90	1.53 V	162	18.50	16.60
3	500.00	40.20 QP	46.00	-5.80	1.76 V	349	19.90	20.40
4	624.99	30.30 QP	46.00	-15.70	1.00 V	154	7.50	22.80
5	700.00	29.90 QP	46.00	-16.10	1.05 V	282	6.20	23.70
6	750.00	32.00 QP	46.00	-14.00	1.04 V	229	7.20	24.80
7	875.00	34.80 QP	46.00	-11.20	1.00 V	2	9.70	25.10

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



**Below 1GHz Worst-Case Data**

<b>TEST MODE</b>	Mode 2	<b>CHANNEL</b>	Channel 11
<b>MODULATION TYPE</b>	BPSK	<b>FREQUENCY RANGE</b>	30-1000 MHz
<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz	<b>TRANSFER RATE</b>	6Mbps
<b>ENVIRONMENTAL CONDITIONS</b>	16deg. C, 65%RH, 964hPa	<b>DETECTOR FUNCTION</b>	Quasi-Peak, 120kHz
<b>TESTED BY</b>	Rex Huang		

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

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	125.00	27.30 QP	43.50	-16.20	1.93 H	264	15.70	11.60
2	250.00	26.50 QP	46.00	-19.50	1.52 H	112	12.80	13.70
3	375.01	33.90 QP	46.00	-12.10	1.00 H	71	17.20	16.60
4	500.00	30.10 QP	46.00	-15.90	1.15 H	172	9.80	20.40
5	624.99	36.10 QP	46.00	-9.90	1.44 H	339	13.40	22.80
6	750.00	37.40 QP	46.00	-8.60	1.13 H	340	12.50	24.80
7	875.01	40.60 QP	46.00	-5.40	1.00 H	25	15.50	25.10

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

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	125.00	37.80 QP	43.50	-5.70	1.00 V	265	26.20	11.60
2	250.00	26.80 QP	46.00	-19.20	1.00 V	112	13.10	13.70
3	375.00	33.40 QP	46.00	-12.60	1.00 V	85	16.80	16.60
4	499.99	36.90 QP	46.00	-9.10	1.00 V	310	16.60	20.40
5	625.01	32.10 QP	46.00	-13.90	1.00 V	36	9.30	22.80
6	750.02	29.60 QP	46.00	-16.40	1.32 V	295	4.80	24.80
7	874.99	33.40 QP	46.00	-12.60	1.21 V	354	8.30	25.10

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



4.2.7 TEST RESULTS - DSSS  
802.11b DSSS modulation

<b>MODE</b>	Channel 1	<b>FREQUENCY RANGE</b>	1000~25000MHz
<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz	<b>DETECTOR FUNCTION &amp; BANDWIDTH</b>	Peak (PK) Average (AV) 1 MHz
<b>ENVIRONMENTAL CONDITIONS</b>	27deg. C, 59%RH, 964hPa	<b>TESTED BY</b>	Tony Chen

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	51.20 PK	74.00	-22.80	1.24 H	235	20.90	30.30
1	2390.00	45.30 AV	54.00	-8.70	1.24 H	235	15.00	30.30
2	*2412.00	103.60 PK			1.24 H	235	73.10	30.50
2	*2412.00	99.40 AV			1.24 H	235	68.90	30.50
3	2688.00	48.80 PK	74.00	-25.20	1.65 H	141	17.50	31.30
3	2688.00	44.90 AV	54.00	-9.10	1.65 H	141	13.60	31.30
4	4824.00	44.10 PK	74.00	-29.90	1.24 H	65	9.00	35.10
4	4824.00	32.10 AV	54.00	-21.90	1.24 H	65	-3.00	35.10
5	7236.00	48.30 PK	74.00	-25.70	1.24 H	124	7.80	40.50
5	7236.00	36.40 AV	54.00	-17.60	1.24 H	124	-4.10	40.50

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	2387.00	68.30 PK	74.00	-5.70	1.07 V	256	38.00	30.30
1	2387.00	47.50 AV	54.00	-6.50	1.07 V	256	17.20	30.30
2	2390.00	58.90 PK	74.00	-15.10	1.04 V	199	28.50	30.30
2	<b>2390.00</b>	<b>53.50 AV</b>	<b>54.00</b>	<b>-0.50</b>	<b>1.04 V</b>	<b>199</b>	<b>23.20</b>	<b>30.30</b>
3	*2412.00	111.20 PK			1.04 V	199	80.70	30.50
3	*2412.00	107.60 AV			1.04 V	199	77.20	30.50
4	2688.00	58.50 PK	91.20	-32.70	1.07 V	19	27.30	31.30
4	2688.00	56.20 AV	87.60	-31.40	1.07 V	19	25.00	31.30
5	4824.00	46.00 PK	74.00	-28.00	1.67 V	6	10.90	35.10
5	4824.00	35.90 AV	54.00	-18.10	1.67 V	6	0.80	35.10
6	7236.00	49.60 PK	74.00	-24.40	1.57 V	345	9.10	40.50
6	7236.00	38.50 AV	54.00	-15.50	1.57 V	345	-2.00	40.50

- 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. The limit value is defined as per 15.247
  6. " \* " : Fundamental frequency



<b>MODE</b>	Channel 6	<b>FREQUENCY RANGE</b>	1000~25000MHz
<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz	<b>DETECTOR FUNCTION &amp; BANDWIDTH</b>	Peak (PK) Average (AV) 1 MHz
<b>ENVIRONMENTAL CONDITIONS</b>	27deg. C, 59%RH, 964hPa	<b>TESTED BY</b>	Tony Chen

<b>ANTENNA POLARITY &amp; TEST DISTANCE: HORIZONTAL AT 3 M</b>								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2437.00	109.00 PK			1.28 H	321	78.30	30.60
1	*2437.00	104.40 AV			1.28 H	321	73.70	30.60
2	2688.00	49.60 PK	74.00	-24.40	1.21 H	239	18.30	31.30
2	2688.00	45.80 AV	54.00	-8.20	1.21 H	239	14.50	31.30
3	4874.00	45.20 PK	74.00	-28.80	1.47 H	12	9.90	35.30
3	4874.00	33.60 AV	54.00	-20.40	1.47 H	12	-1.70	35.30
4	7311.00	49.60 PK	74.00	-24.40	1.54 H	57	8.90	40.70
4	7311.00	36.80 AV	54.00	-17.20	1.54 H	57	-3.90	40.70

<b>ANTENNA POLARITY &amp; TEST DISTANCE: VERTICAL AT 3 M</b>								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2437.00	115.80 PK			1.46 V	90	85.20	30.60
1	*2437.00	112.10 AV			1.46 V	90	81.50	30.60
2	2688.00	59.30 PK	95.80	-36.50	1.27 V	63	28.00	31.30
2	2688.00	57.10 AV	92.10	-35.00	1.27 V	63	25.80	31.30
3	4874.00	48.60 PK	74.00	-25.40	1.75 V	321	13.30	35.30
3	4874.00	37.20 AV	54.00	-16.80	1.75 V	321	1.90	35.30
4	7311.00	50.30 PK	74.00	-23.70	1.75 V	321	9.60	40.70
4	7311.00	38.90 AV	54.00	-15.10	1.75 V	321	-1.80	40.70

- 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. The limit value is defined as per 15.247
  6. “ \* “ : Fundamental frequency



<b>MODE</b>	Channel 11	<b>FREQUENCY RANGE</b>	1000~25000MHz
<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz	<b>DETECTOR FUNCTION &amp; BANDWIDTH</b>	Peak (PK) Average (AV) 1 MHz
<b>ENVIRONMENTAL CONDITIONS</b>	27deg. C, 59%RH, 964hPa	<b>TESTED BY</b>	Tony Chen

### 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	106.40 PK			1.36 H	247	75.60	30.80
1	*2462.00	102.10 AV			1.36 H	247	71.30	30.80
2	2483.50	51.20 PK	74.00	-22.80	1.36 H	247	20.20	30.90
2	2483.50	43.40 AV	54.00	-10.60	1.36 H	247	12.50	30.90
3	2487.00	52.00 PK	74.00	-22.00	1.36 H	247	21.10	30.90
3	2487.00	44.40 AV	54.00	-9.60	1.36 H	247	13.50	30.90
4	2688.00	48.60 PK	74.00	-25.40	1.26 H	210	17.30	31.30
4	2688.00	45.30 AV	54.00	-8.70	1.26 H	210	14.00	31.30
5	4924.00	46.20 PK	74.00	-27.80	1.11 H	269	10.70	35.50
5	4924.00	34.20 AV	54.00	-19.80	1.11 H	269	-1.30	35.50
6	7386.00	48.70 PK	74.00	-25.30	1.56 H	328	7.90	40.80
6	7386.00	35.80 AV	54.00	-18.20	1.56 H	328	-5.00	40.80

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

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2462.00	114.00 PK			1.39 V	182	83.20	30.80
1	*2462.00	110.20 AV			1.39 V	182	79.40	30.80
2	2483.50	58.80 PK	74.00	-15.20	1.34 V	194	27.80	30.90
2	2483.50	51.50 AV	54.00	-2.50	1.34 V	194	20.60	30.90
3	2487.00	59.60 PK	74.00	-14.40	1.34 V	194	28.70	30.90
3	2487.00	52.50 AV	54.00	-1.50	1.34 V	194	21.60	30.90
4	2688.00	58.40 PK	94.00	-35.60	1.20 V	238	27.10	31.30
4	2688.00	56.50 AV	90.20	-33.70	1.20 V	238	25.20	31.30
5	4944.00	48.90 PK	74.00	-25.10	1.14 V	56	13.30	35.60
5	4944.00	36.80 AV	54.00	-17.20	1.14 V	56	1.20	35.60
6	7386.00	51.20 PK	74.00	-22.80	1.07 V	54	10.40	40.80
6	7386.00	39.20 AV	54.00	-14.80	1.07 V	54	-1.60	40.80

**REMARKS:**

1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. The limit value is defined as per 15.247
6. “ \* “ : Fundamental frequency



4.2.8 TEST RESULTS - OFDM  
802.11g Normal OFDM modulation

<b>MODE</b>	Channel 1	<b>FREQUENCY RANGE</b>	1000~25000MHz
<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz	<b>DETECTOR FUNCTION &amp; BANDWIDTH</b>	Peak (PK) Average (AV) 1 MHz
<b>ENVIRONMENTAL CONDITIONS</b>	27deg. C, 59%RH, 964hPa	<b>TESTED BY</b>	Tony Chen

<b>ANTENNA POLARITY &amp; TEST DISTANCE: HORIZONTAL AT 3 M</b>								
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	52.60 PK	74.00	-21.40	1.25 H	67	22.30	30.30
1	2390.00	40.90 AV	54.00	-13.10	1.25 H	67	10.60	30.30
2	*2412.00	98.70 PK			1.25 H	67	68.20	30.50
2	*2412.00	84.90 AV			1.25 H	67	54.40	30.50
3	2688.00	48.60 PK	74.00	-25.40	1.27 H	320	17.30	31.30
3	2688.00	42.30 AV	54.00	-11.70	1.27 H	320	11.00	31.30
4	4824.00	42.50 PK	74.00	-31.50	1.36 H	108	7.40	35.10
4	4824.00	32.40 AV	54.00	-21.60	1.36 H	108	-2.70	35.10
5	7236.00	48.60 PK	74.00	-25.40	1.24 H	214	8.10	40.50
5	7236.00	36.90 AV	54.00	-17.10	1.24 H	214	-3.60	40.50

<b>ANTENNA POLARITY &amp; TEST DISTANCE: VERTICAL AT 3 M</b>								
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	65.00 PK	74.00	-9.00	1.56 V	301	34.70	30.30
1	2390.00	53.10 AV	54.00	-0.90	1.56 V	301	22.80	30.30
2	*2412.00	111.10 PK			1.56 V	301	80.60	30.50
2	*2412.00	97.10 AV			1.56 V	301	66.60	30.50
3	2688.00	58.10 PK	91.10	-33.00	1.24 V	324	26.80	31.30
3	2688.00	55.90 AV	77.10	-21.20	1.24 V	324	24.60	31.30
4	4824.00	43.80 PK	74.00	-30.20	1.56 V	274	8.70	35.10
4	4824.00	32.10 AV	54.00	-21.90	1.56 V	274	-3.00	35.10
5	7236.00	48.20 PK	74.00	-25.80	1.24 V	222	7.70	40.50
5	7236.00	36.70 AV	54.00	-17.30	1.24 V	222	-3.80	40.50

- 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. The limit value is defined as per 15.247
  6. “ \* “ : Fundamental frequency



<b>MODE</b>	Channel 6	<b>FREQUENCY RANGE</b>	1000~25000MHz
<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz	<b>DETECTOR FUNCTION &amp; BANDWIDTH</b>	Peak (PK) Average (AV) 1 MHz
<b>ENVIRONMENTAL CONDITIONS</b>	27deg. C, 59%RH, 964hPa	<b>TESTED BY</b>	Tony Chen

<b>ANTENNA POLARITY &amp; TEST DISTANCE: HORIZONTAL AT 3 M</b>								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2437.00	100.80 PK			1.27 H	258	70.20	30.60
1	*2437.00	87.60 AV			1.27 H	258	57.00	30.60
2	2688.00	49.70 PK	74.00	-24.30	1.20 H	341	18.40	31.30
2	2688.00	43.80 AV	54.00	-10.20	1.20 H	341	12.50	31.30
3	4874.00	43.80 PK	74.00	-30.20	1.08 H	251	8.50	35.30
3	4874.00	32.40 AV	54.00	-21.60	1.08 H	251	-2.90	35.30
4	7311.00	48.20 PK	74.00	-25.80	1.24 H	228	7.50	40.70
4	7311.00	37.20 AV	54.00	-16.80	1.24 H	228	-3.50	40.70

<b>ANTENNA POLARITY &amp; TEST DISTANCE: VERTICAL AT 3 M</b>								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2437.00	114.70 PK			1.48 V	96	84.10	30.60
1	*2437.00	100.90 AV			1.48 V	96	70.30	30.60
2	2688.00	58.60 PK	94.70	-36.10	1.42 V	63	27.30	31.30
2	2688.00	56.30 AV	80.90	-24.60	1.42 V	63	25.00	31.30
3	4874.00	45.50 PK	74.00	-28.50	1.27 V	325	10.20	35.30
3	4874.00	33.70 AV	54.00	-20.30	1.27 V	325	-1.60	35.30
4	7311.00	48.30 PK	74.00	-25.70	1.20 V	310	7.60	40.70
4	7311.00	38.40 AV	54.00	-15.60	1.20 V	310	-2.30	40.70

- 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. The limit value is defined as per 15.247
  6. “ \* “ : Fundamental frequency



<b>MODE</b>	Channel 11	<b>FREQUENCY RANGE</b>	1000~25000MHz
<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz	<b>DETECTOR FUNCTION &amp; BANDWIDTH</b>	Peak (PK) Average (AV) 1 MHz
<b>ENVIRONMENTAL CONDITIONS</b>	27deg. C, 59%RH, 964hPa	<b>TESTED BY</b>	Tony Chen

<b>ANTENNA POLARITY &amp; TEST DISTANCE: HORIZONTAL AT 3 M</b>								
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	99.60 PK			1.52 H	321	68.80	30.80
1	*2462.00	84.10 AV			1.52 H	321	53.30	30.80
2	2483.50	52.50 PK	74.00	-21.50	1.52 H	321	21.60	30.90
2	2483.50	38.40 AV	54.00	-15.60	1.52 H	321	7.50	30.90
3	2688.00	48.90 PK	74.00	-25.10	1.53 H	45	17.60	31.30
3	2688.00	42.10 AV	54.00	-11.90	1.53 H	45	10.80	31.30
4	4924.00	43.50 PK	74.00	-30.50	1.63 H	247	8.00	35.50
4	4924.00	32.50 AV	54.00	-21.50	1.63 H	247	-3.00	35.50
5	7386.00	49.20 PK	74.00	-24.80	1.23 H	210	8.40	40.80
5	7386.00	38.10 AV	54.00	-15.90	1.23 H	210	-2.70	40.80

<b>ANTENNA POLARITY &amp; TEST DISTANCE: VERTICAL AT 3 M</b>								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	*2462.00	112.40 PK			1.39 V	216	81.60	30.80
1	*2462.00	98.50 AV			1.39 V	216	67.70	30.80
2	2483.50	65.30 PK	74.00	-8.70	1.39 V	216	34.40	30.90
2	2483.50	52.80 AV	54.00	-1.20	1.39 V	216	21.90	30.90
3	2688.00	61.50 PK	74.00	-12.50	1.24 V	223	30.20	31.30
3	2688.00	52.60 AV	54.00	-1.40	1.24 V	223	21.30	31.30
4	4924.00	43.50 PK	74.00	-30.50	1.02 V	352	8.00	35.50
4	4924.00	32.50 AV	54.00	-21.50	1.02 V	352	-3.00	35.50
5	7386.00	49.30 PK	74.00	-24.70	1.18 V	254	8.50	40.80
5	7386.00	38.20 AV	54.00	-15.80	1.18 V	254	-2.60	40.80

- REMARKS:**
1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB/m)
  2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
  3. The other emission levels were very low against the limit.
  4. Margin value = Emission level – Limit value.
  5. The limit value is defined as per 15.247
  6. “ \* “ : 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
R&S SPECTRUM ANALYZER	FSP40	100036	Nov. 23, 2006

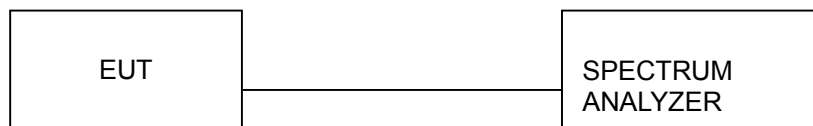
**NOTE:**

- 1.The measurement uncertainty is less than +/- 2.6dB, which is calculated as per the NAMAS document NIS81.
- 2.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 100 kHz VBW. The 6 dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 6 dB.

#### 4.3.4 TEST SETUP



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

#### 4.3.5 EUT OPERATING CONDITIONS

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



#### 4.3.6 TEST RESULTS –DSSS

##### 802.11b DSSS modulation

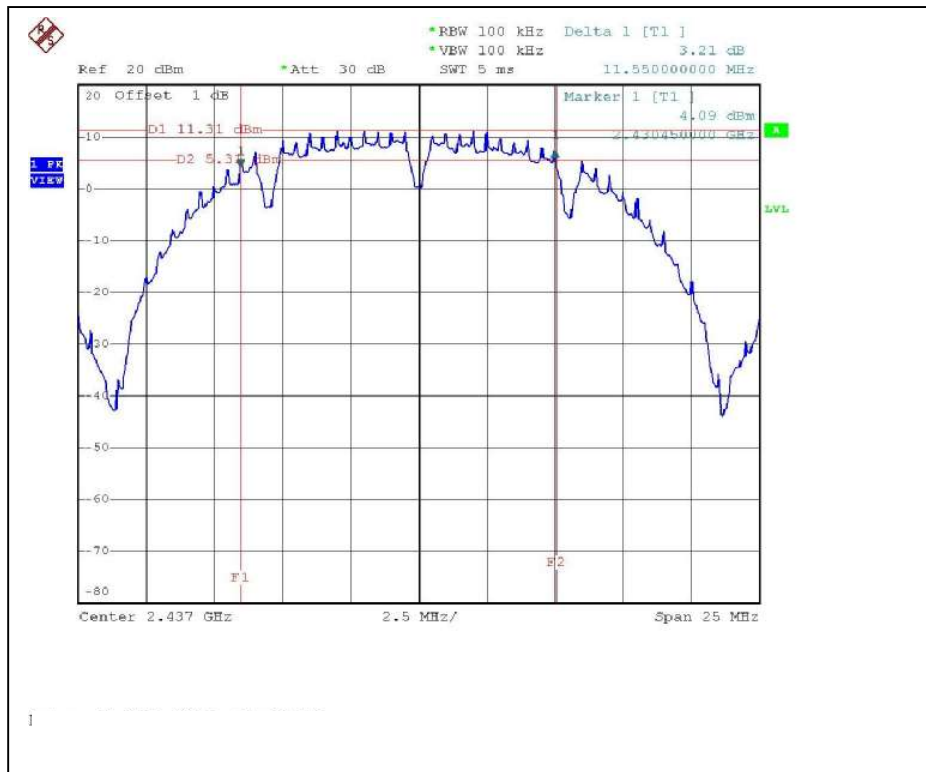
<b>MODULATION TYPE</b>	CCK	<b>TRANSFER RATE</b>	11Mbps
<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz	<b>ENVIRONMENTAL CONDITIONS</b>	20deg. C, 60%RH, 964hPa
<b>TESTED BY</b>	Tony Chen		

<b>CHANNEL</b>	<b>CHANNEL FREQUENCY (MHz)</b>	<b>6 dB BANDWIDTH (MHz)</b>	<b>MINIMUM LIMIT (MHz)</b>	<b>PASS/FAIL</b>
1	2412	12.10	0.5	PASS
6	2437	11.55	0.5	PASS
11	2462	12.05	0.5	PASS

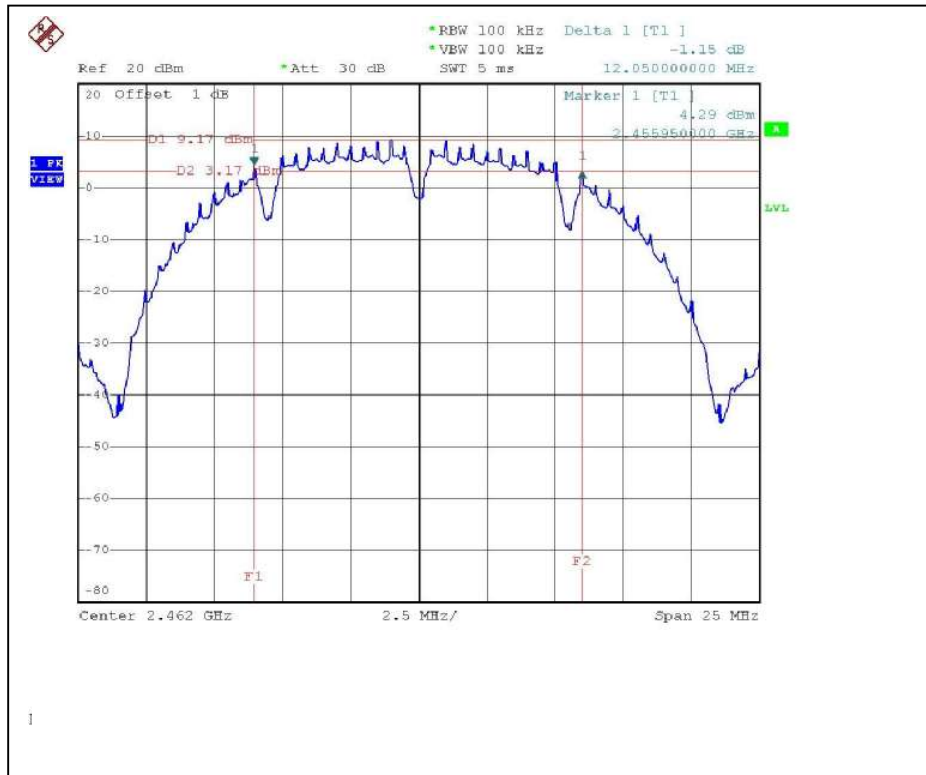
CH1



CH6



CH11





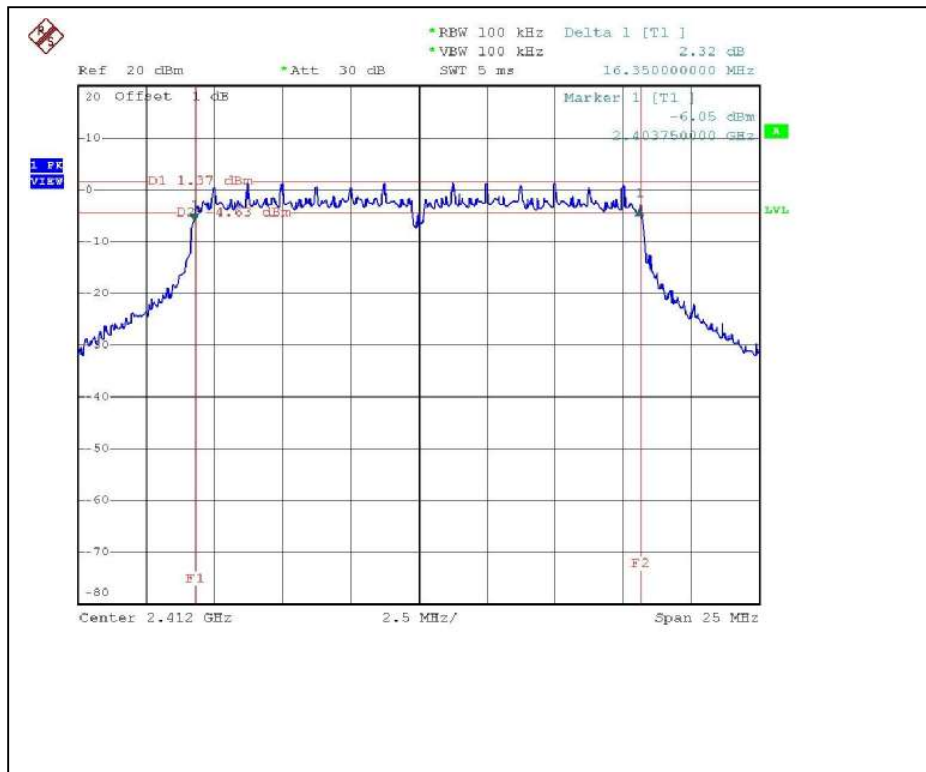
#### 4.3.7 TEST RESULTS-OFDM

##### 802.11g OFDM modulation

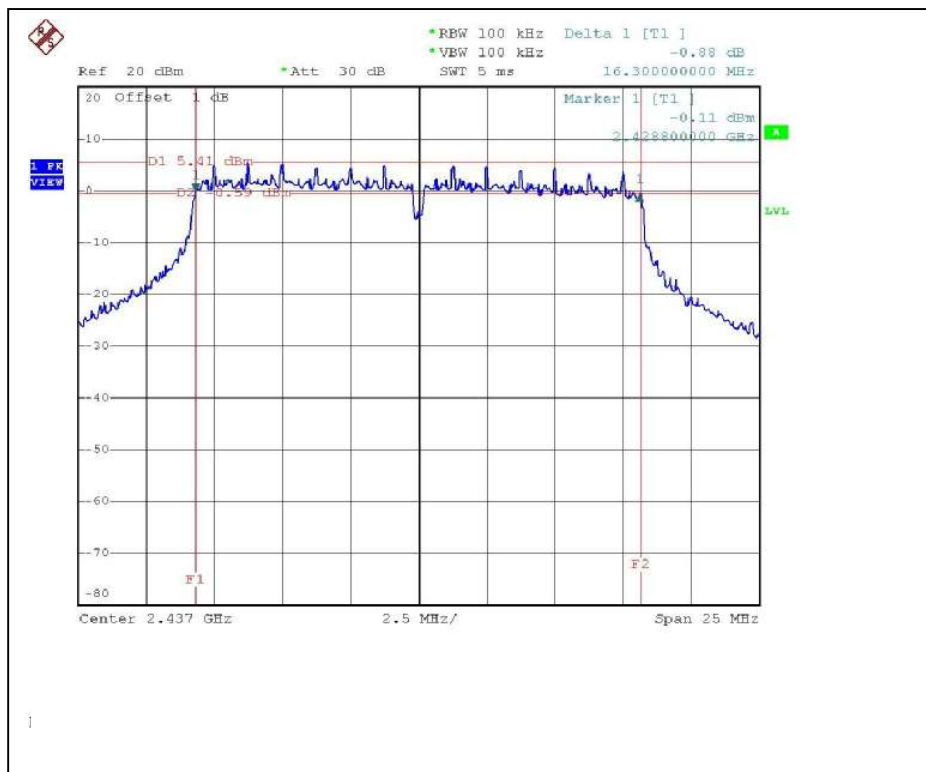
<b>MODULATION TYPE</b>	BPSK	<b>TRANSFER RATE</b>	6Mbps
<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz	<b>ENVIRONMENTAL CONDITIONS</b>	20deg. C, 60%RH, 964hPa
<b>TESTED BY</b>	Tony Chen		

<b>CHANNEL</b>	<b>CHANNEL FREQUENCY (MHz)</b>	<b>6 dB BANDWIDTH (MHz)</b>	<b>MINIMUM LIMIT (MHz)</b>	<b>PASS/FAIL</b>
1	2412	16.35	0.5	PASS
6	2437	16.30	0.5	PASS
11	2462	16.40	0.5	PASS

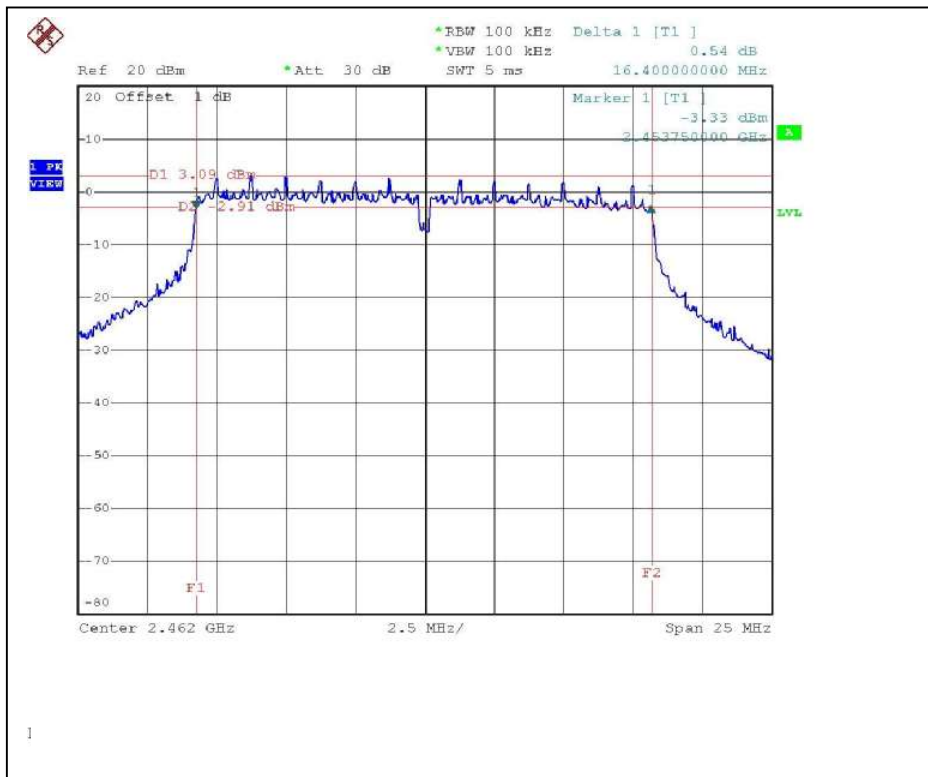
CH1



CH6



CH11



1





#### 4.4 MAXIMUM PEAK OUTPUT POWER

##### 4.4.1 LIMITS OF MAXIMUM PEAK OUTPUT POWER MEASUREMENT

The Maximum Peak Output Power Measurement is 30dBm.

##### 4.4.2 TEST INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
R&S SPECTRUM ANALYZER	FSP40	100036	Nov. 23, 2006
Agilent SIGNAL GENERATOR	E8257C	MY43320668	Dec. 07, 2006
TEKTRONIX OSCILLOSCOPE	TDS380	B016335	Jun. 22, 2006
NARDA DETECTOR	4503A	FSCM99899	NA

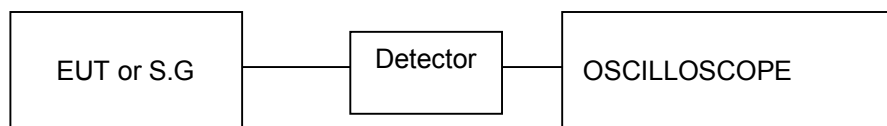
**NOTE:**

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 read the peak 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 TEST SETUP



#### 4.4.5 EUT OPERATING CONDITIONS

Same as Item 4.3.5



#### 4.4.6 TEST RESULTS – DSSS

##### 802.11b DSSS modulation

<b>MODULATION TYPE</b>	CCK	<b>TRANSFER RATE</b>	11Mbps
<b>INPUT POWER (SYSTEM)</b>	120Vac, 60Hz	<b>ENVIRONMENTAL CONDITIONS</b>	20deg. C, 60%RH, 964hPa
<b>TESTED BY</b>	Tony Chen		

Antenna Gain : 9.0 dBi + Antenna Cable 0.7dB loss

<b>CHANNEL</b>	<b>CHANNEL FREQUENCY (MHz)</b>	<b>PEAK POWER OUTPUT (mW)</b>	<b>PEAK POWER OUTPUT (dBm)</b>	<b>PEAK POWER LIMIT (dBm)</b>	<b>PASS/FAIL</b>
1	2412	69.183	18.40	27.7	PASS
6	2437	223.872	23.50	27.7	PASS
11	2462	128.825	21.10	27.7	PASS



#### 4.4.7 TEST RESULTS –OFDM

##### 802.11g OFDM modulation

<b>MODULATION TYPE</b>	BPSK	<b>TRANSFER RATE</b>	6Mbps
<b>INPUT POWER (SYSTEM)</b>	120Vac, 60Hz	<b>ENVIRONMENTAL CONDITIONS</b>	20deg. C, 60%RH, 964hPa
<b>TESTED BY</b>	Tony Chen		

Antenna Gain : 9.0 dBi + Antenna Cable 0.7dB loss

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (mW)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (dBm)	PASS/FAIL
1	2412	91.201	19.60	27.7	PASS
6	2437	158.489	22.00	27.7	PASS
11	2462	120.226	20.80	27.7	PASS



## 4.5 POWER SPECTRAL DENSITY MEASUREMENT

### 4.5.1 LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT

The Maximum of Power Spectral Density Measurement is 8dBm.

### 4.5.2 TEST INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
R&S SPECTRUM ANALYZER	FSP40	100036	Nov. 23, 2006

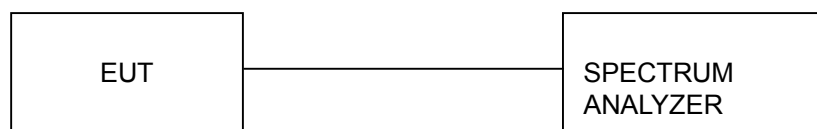
**NOTE:**

- 1.The measurement uncertainty is less than +/- 2.6dB, which is calculated as per the NAMAS document NIS81.
- 2.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 3 kHz RBW and 30 kHz 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 TEST SETUP



#### 4.5.5 EUT OPERATING CONDITIONS

Same as 4.3.5



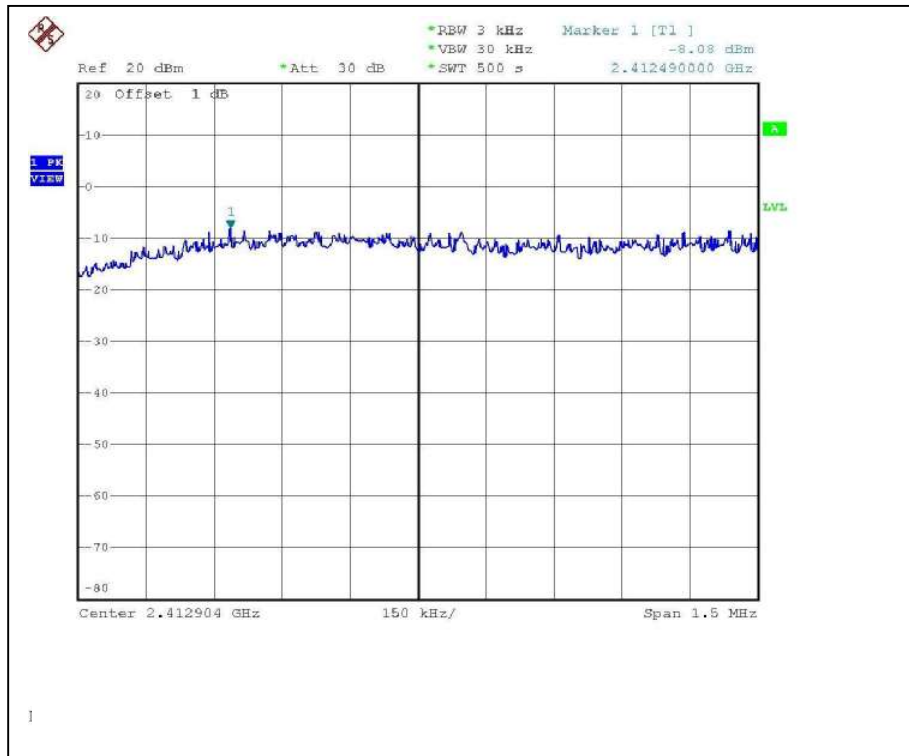
#### 4.5.6 TEST RESULTS –DSSS

##### 802.11b DSSS modulation

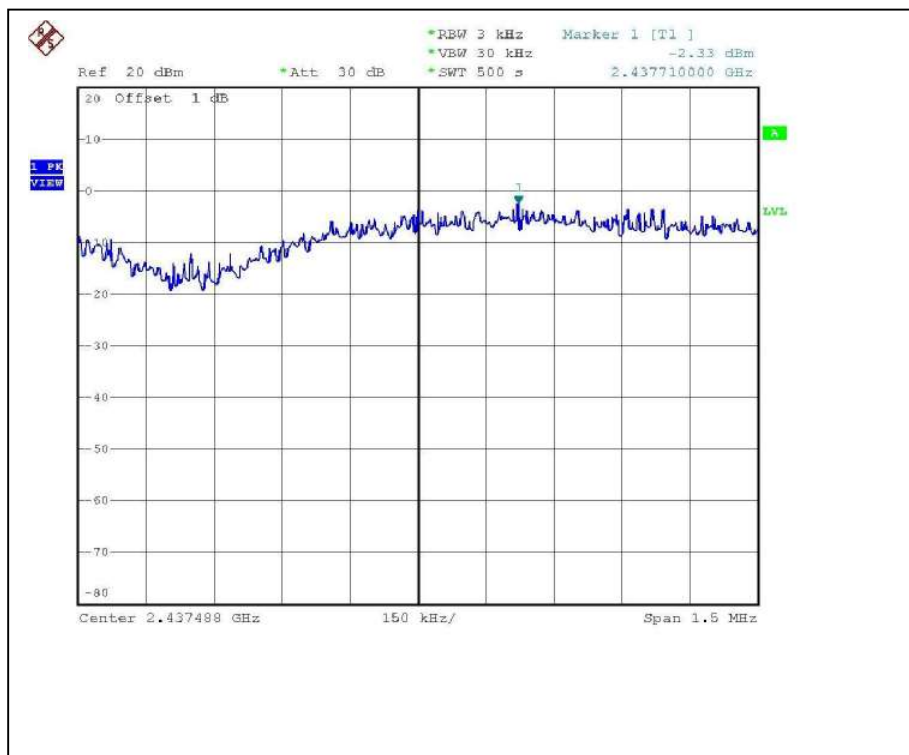
<b>MODULATION TYPE</b>	CCK	<b>TRANSFER RATE</b>	11Mbps
<b>INPUT POWER (SYSTEM)</b>	120Vac, 60Hz	<b>ENVIRONMENTAL CONDITIONS</b>	20deg. C, 60%RH, 964hPa
<b>TESTED BY</b>	Tony Chen		

<b>CHANNEL NUMBER</b>	<b>CHANNEL FREQUENCY (MHz )</b>	<b>RF POWER LEVEL IN 3 KHz BW (dBm)</b>	<b>MAXIMUM LIMIT (dBm)</b>	<b>PASS/FAIL</b>
1	2412	-8.08	8	PASS
6	2437	-2.33	8	PASS
11	2462	-4.45	8	PASS

CH1

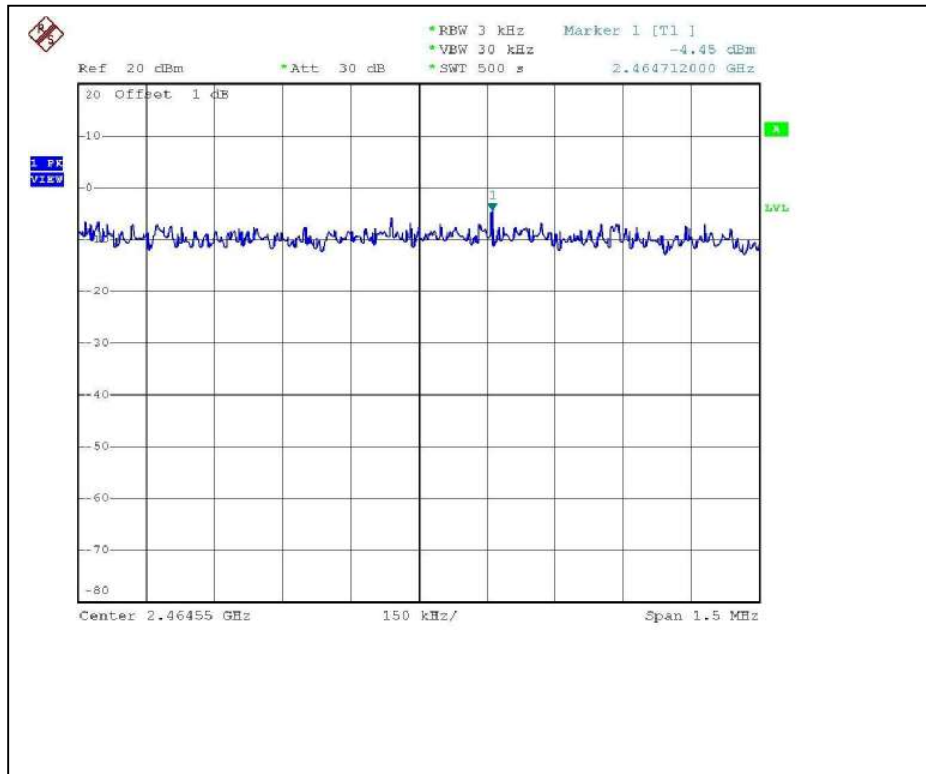


CH6





CH11





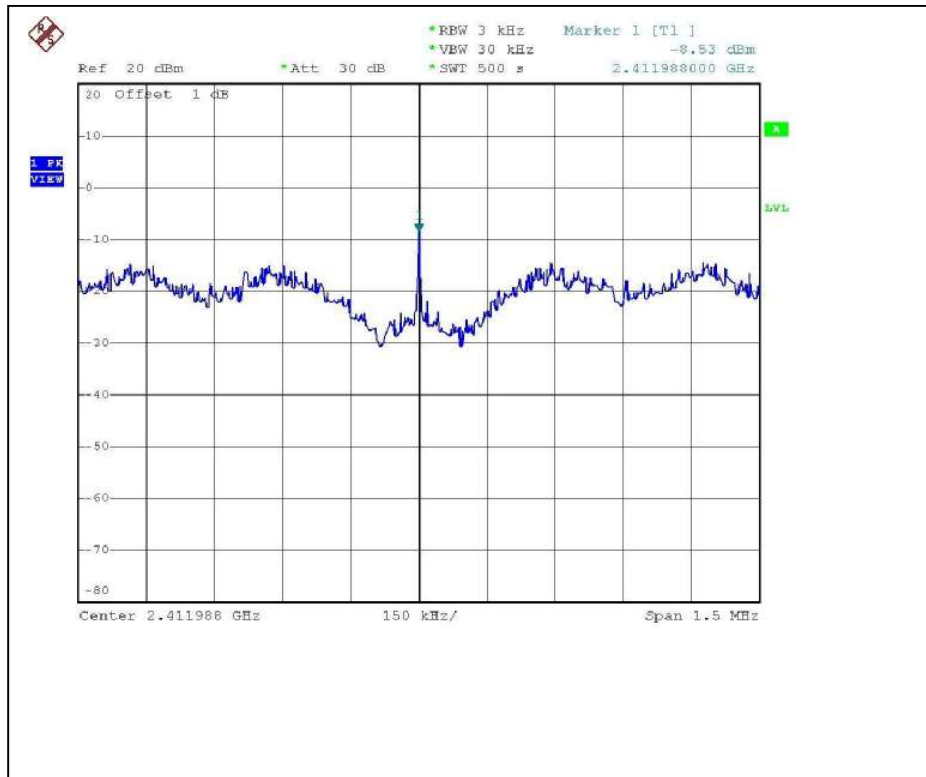
#### 4.5.7 TEST RESULTS –OFDM

##### 802.11g OFDM modulation

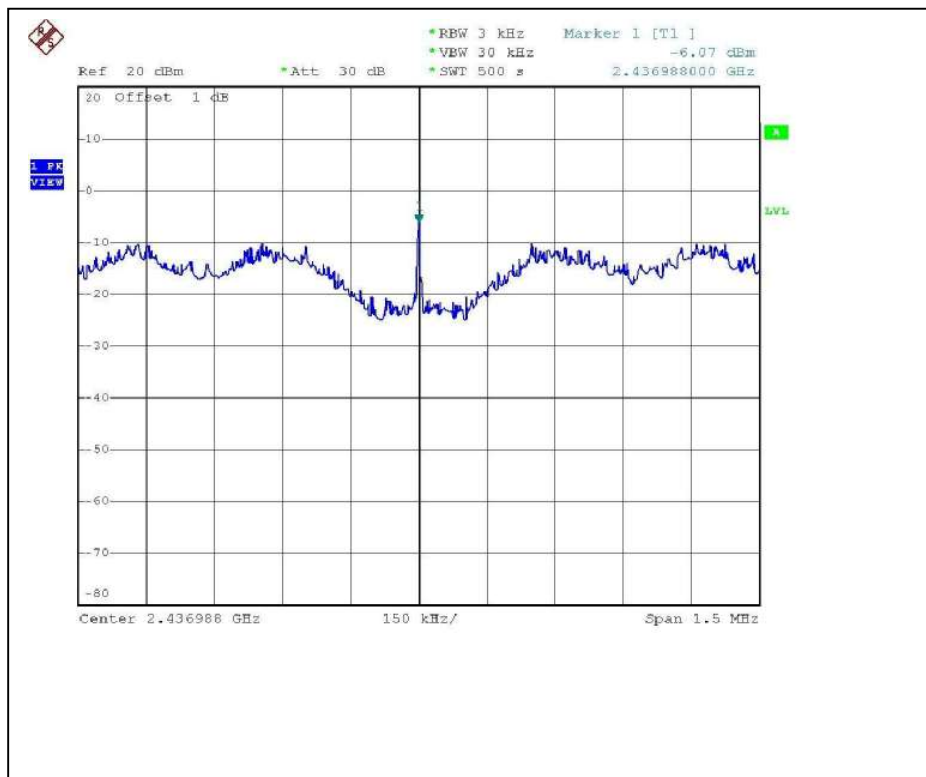
<b>MODULATION TYPE</b>	BPSK	<b>TRANSFER RATE</b>	6Mbps
<b>INPUT POWER (SYSTEM)</b>	120Vac, 60Hz	<b>ENVIRONMENTAL CONDITIONS</b>	22deg. C, 68%RH, 964hPa
<b>TESTED BY</b>	Tony Chen		

<b>CHANNEL NUMBER</b>	<b>CHANNEL FREQUENCY (MHz )</b>	<b>RF POWER LEVEL IN 3 KHz BW (dBm)</b>	<b>MAXIMUM LIMIT (dBm)</b>	<b>PASS/FAIL</b>
1	2412	-8.53	8	PASS
6	2437	-6.07	8	PASS
11	2462	-10.58	8	PASS

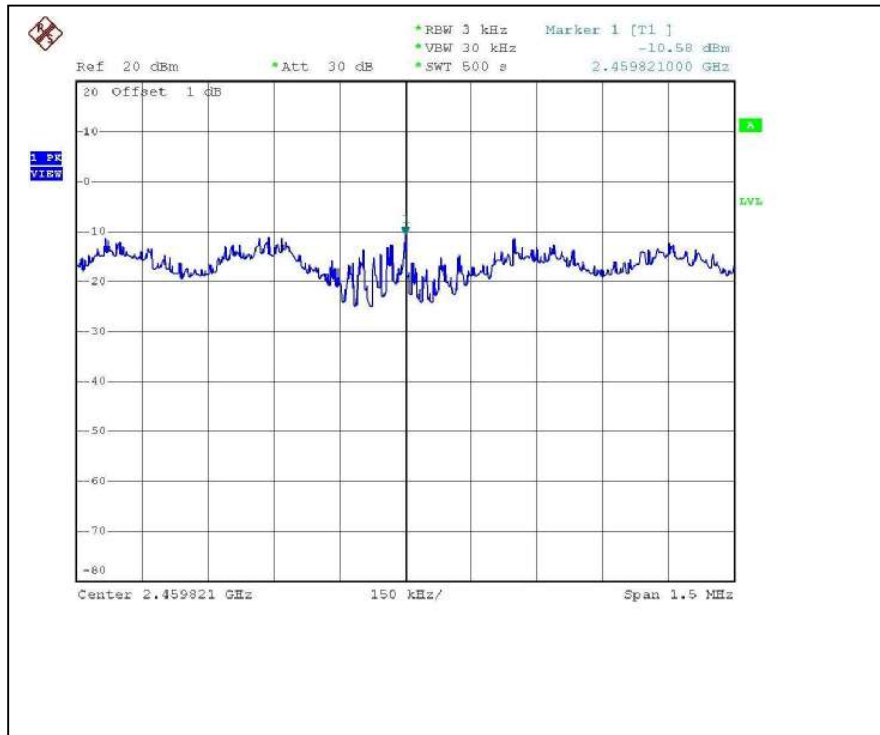
CH1



CH6



CH11





## 4.6 BAND EDGES MEASUREMENT

### 4.6.1 LIMITS OF BAND EDGES MEASUREMENT

Below  $-20\text{dB}$  of the highest emission level of operating band (in 1MHz Resolution Bandwidth).

### 4.6.2 TEST INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
R&S SPECTRUM ANALYZER	FSP40	100036	Nov. 23, 2006

**NOTE:**

- 1.The measurement uncertainty is less than  $\pm 2.6\text{dB}$ , which is calculated as per the NAMAS document NIS81.
- 2.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 RBW spectrum analyzer to 1 MHz and set VBW spectrum analyzer to 1 kHz with suitable frequency span including 1 MHz bandwidth from band edge. The band edges was measured and recorded.

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

### 4.6.4 EUT OPERATING CONDITION

Same as Item 4.3.5



#### 4.6.5 TEST RESULTS - DSSS

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

Note - The delta method is only used up to 2 MHz away from the restricted bandage, The radiated emissions which located in other restricted frequency band, the result, please refer to 4.2.

#### **NOTE (Peak):**

The band edge emission plot of DSSS technique on the following first page show 52.35dB delta 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 is 111.2dBuV/m, so the maximum field strength in restrict band is  $111.2 - 52.35 = 58.85$  dBuV/m which is under 74 dBuV/m limit.

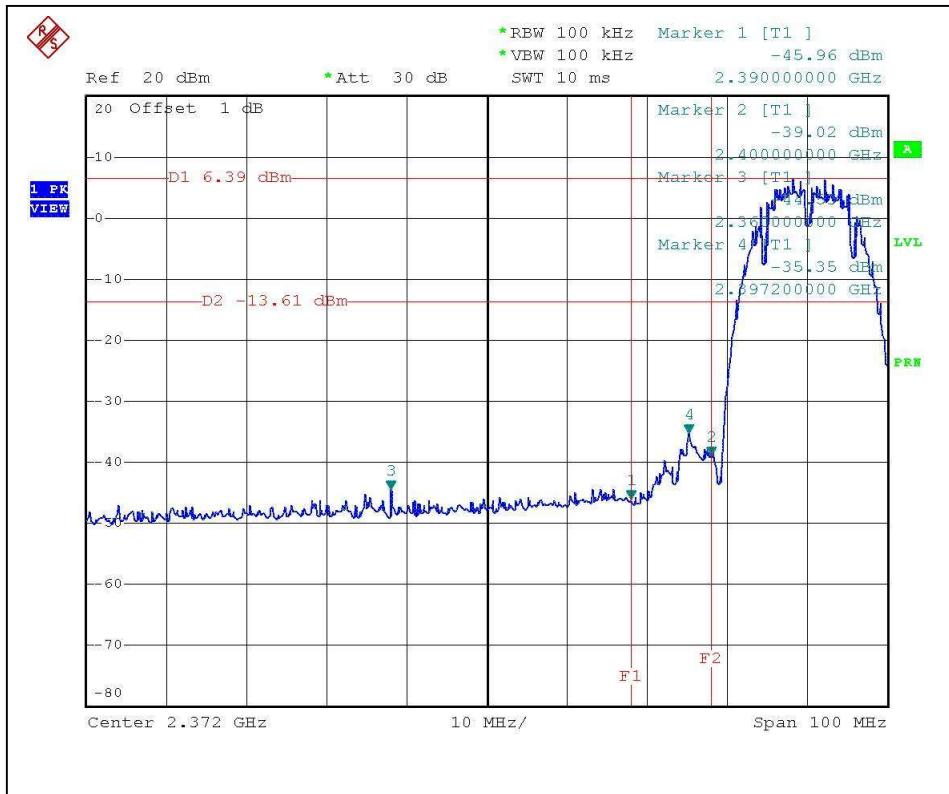
The band edge emission plot of DSSS technique on the following first page shows 55.82dB delta between carrier maximum power and local maximum emission in restrict band (2.4835GHz). The emission of carrier strength list in the test result of channel 11 at the item 4.2 is 114.0dBuV/m, so the maximum field strength in restrict band is  $114.0 - 55.82 = 58.18$  dBuV/m which is under 74 dBuV/m limit.

#### **NOTE (Average):**

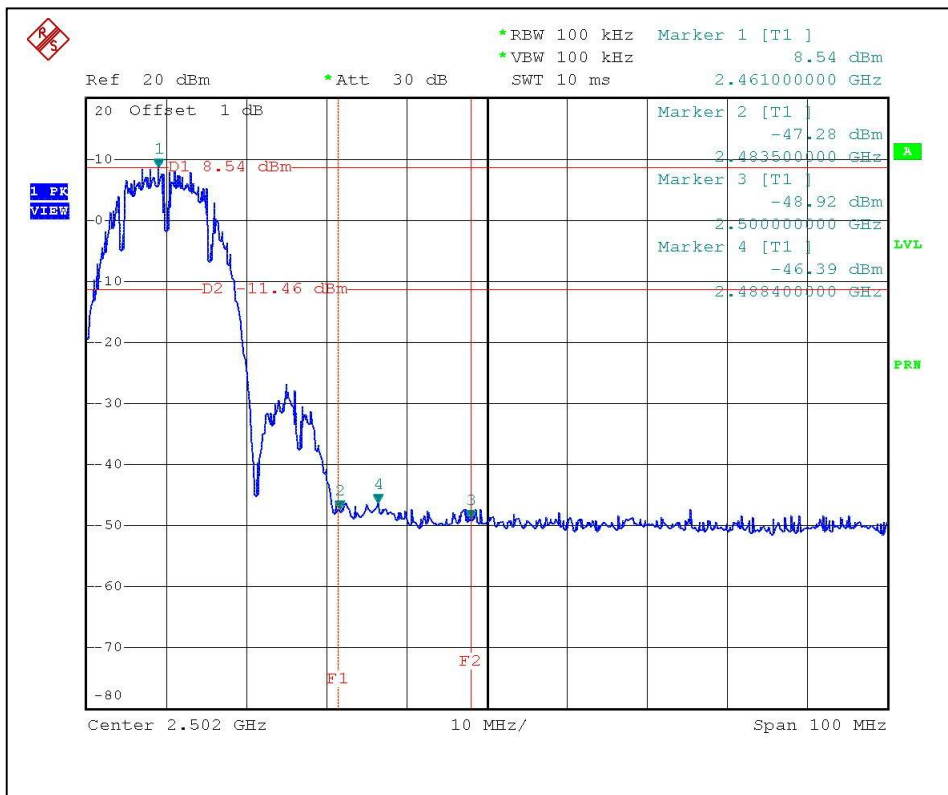
The band edge emission plot of DSSS technique on the following second page shows 54.09dB delta between carrier maximum power and local maximum emission in restrict band (2.3900GHz). The emission of carrier strength list in the test result of channel 1 at the item 4.2 is 107.6dBuV/m, so the maximum field strength in restrict band is  $107.6 - 54.09 = 53.51$  dBuV/m which is under 54 dBuV/m limit.

The band edge emission plot of DSSS technique on the following second page shows 58.56dB delta 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 is 110.2dBuV/m, so the maximum field strength in restrict band is  $110.2 - 58.56 = 51.64$  dBuV/m which is under 54 dBuV/m limit.

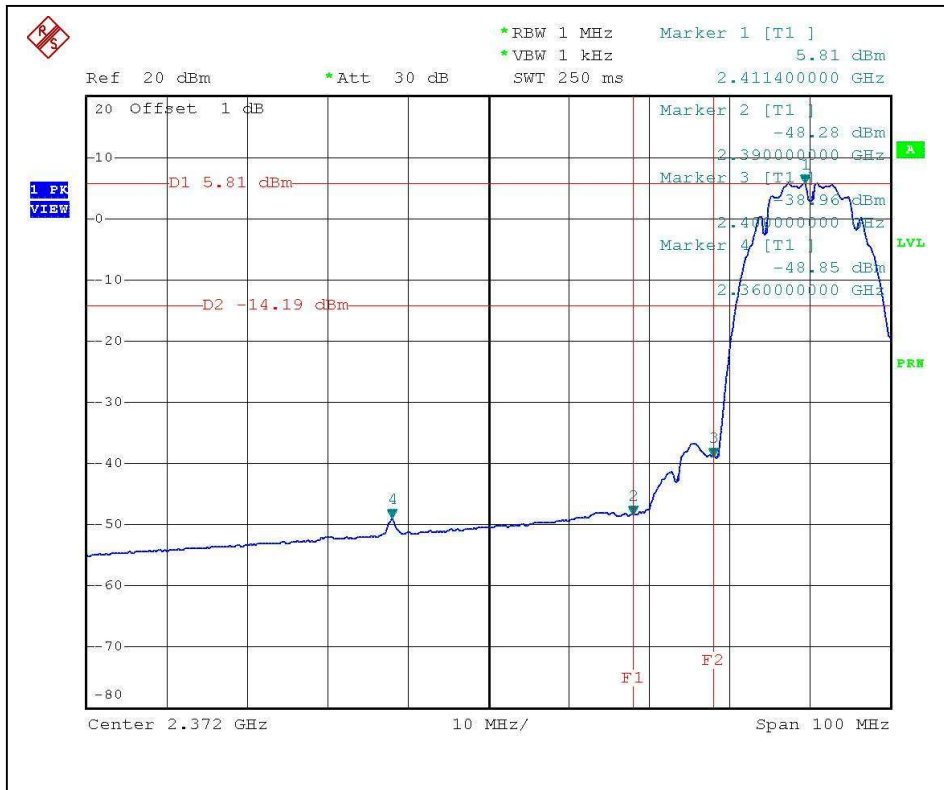
CH1



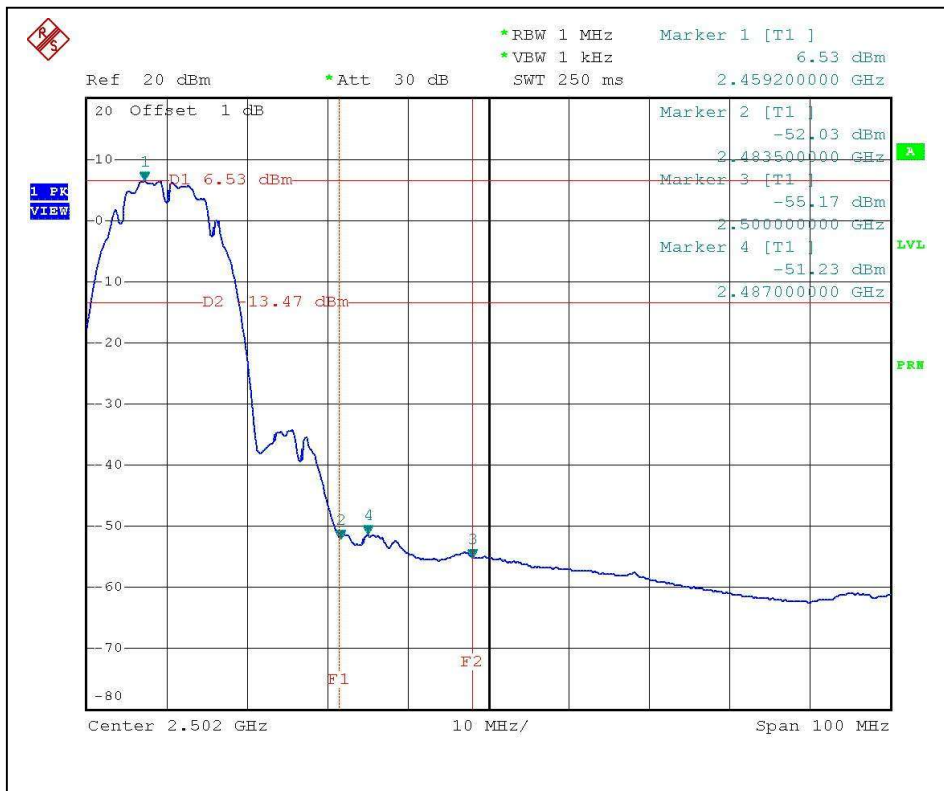
CH11



CH1

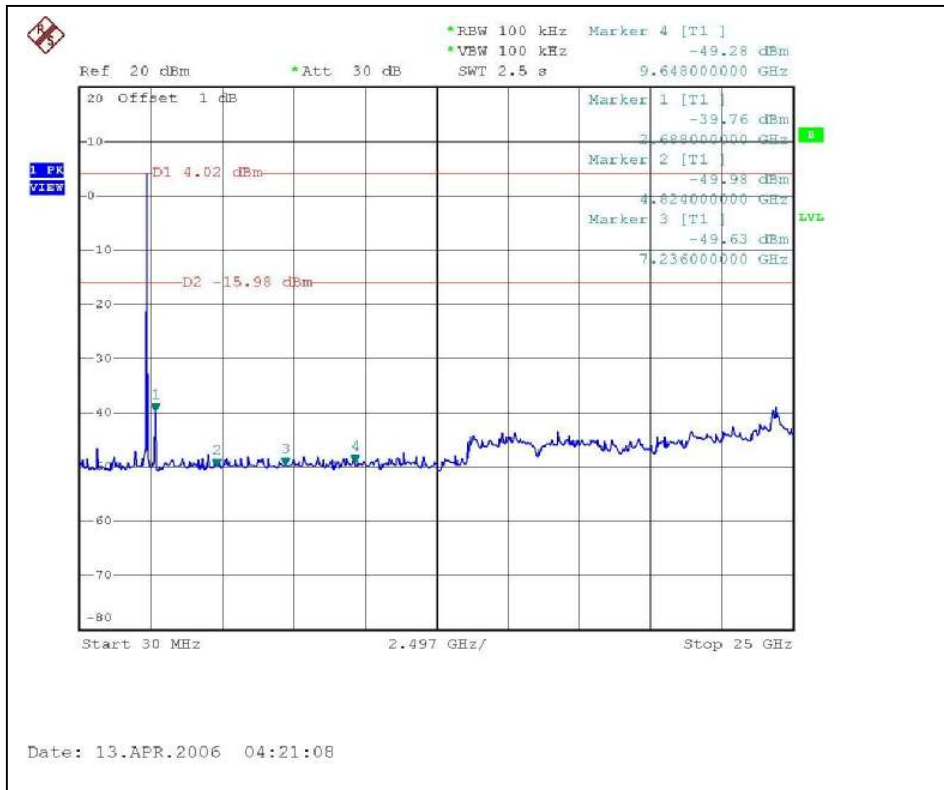


CH11

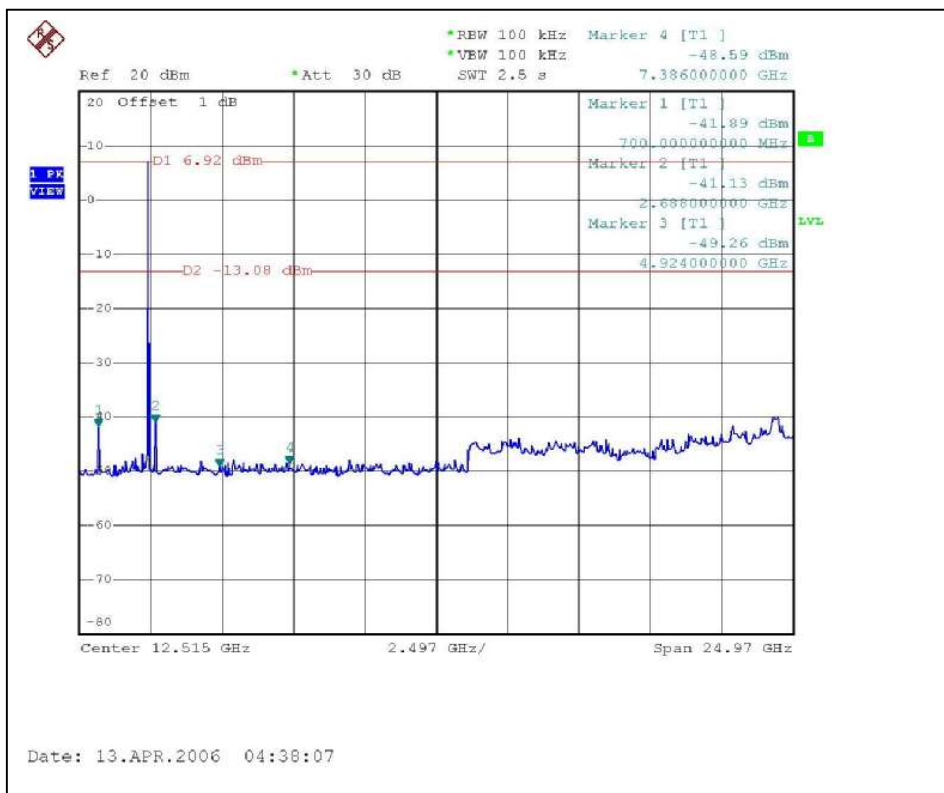




CH1



CH11



#### 4.6.6 TEST RESULTS -OFDM

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

Note - The delta method is only used up to 2 MHz away from the restricted bandage, The radiated emissions which located in other restricted frequency band, the result, please refer to 4.2.

##### **NOTE (Peak):**

The band edge emission plot of OFDM technique on the following first page show 45.37dB delta 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 is 111.1dBuV/m, so the maximum field strength in restrict band is  $111.1-45.37=65.73$ dBuV/m which is under 74 dBuV/m limit.

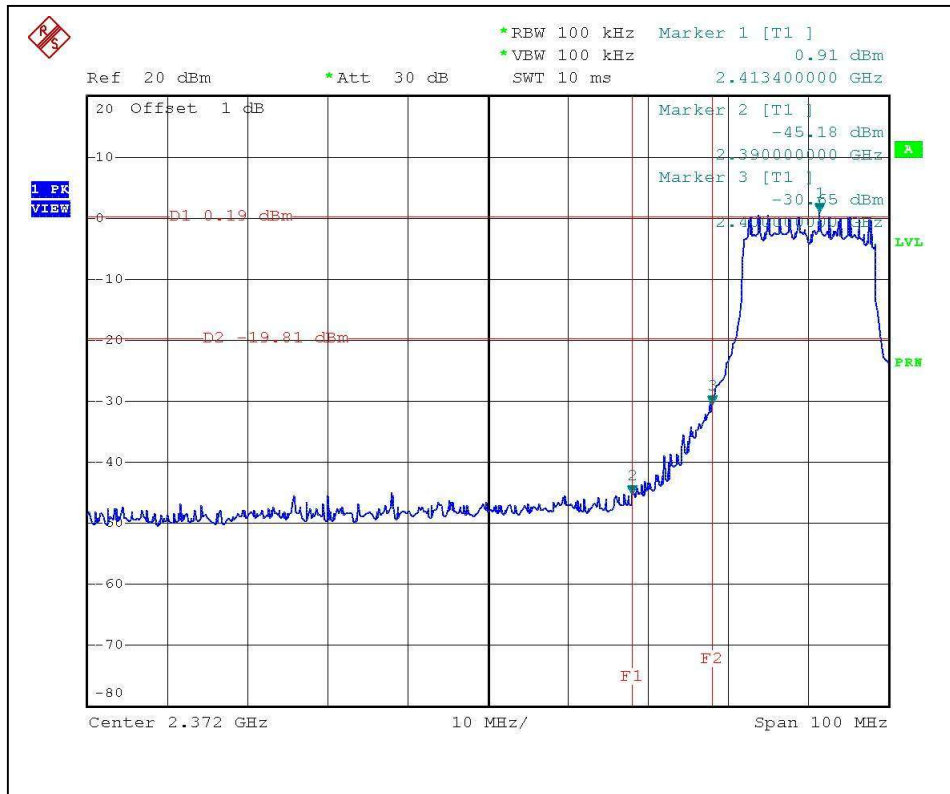
The band edge emission plot of OFDM technique on the following first page shows 47.07dB delta between carrier maximum power and local maximum emission in restrict band (2.4835GHz). The emission of carrier strength list in the test result of channel 11 at the item 4.2 is 112.4dBuV/m, so the maximum field strength in restrict band is  $112.4-47.07=65.33$ dBuV/m which is under 74 dBuV/m limit.

##### **NOTE (Average):**

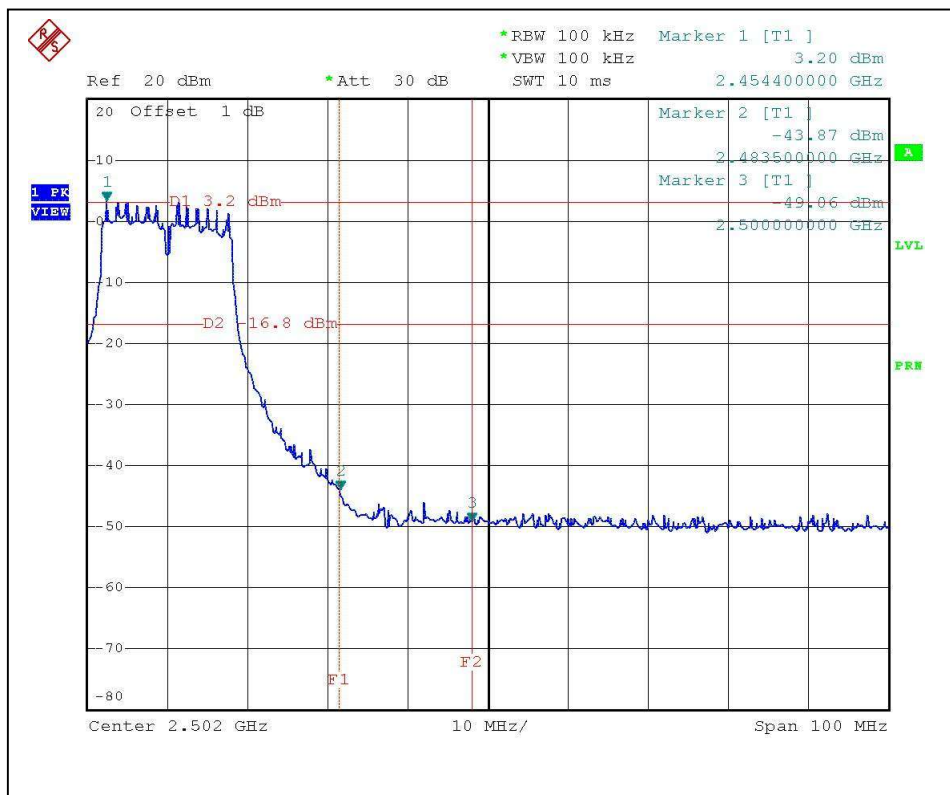
The band edge emission plot of OFDM technique on the following second page shows 44.02dB delta between carrier maximum power and local maximum emission in restrict band (2.3900GHz). The emission of carrier strength list in the test result of channel 1 at the item 4.2 is 97.1dBuV/m, so the maximum field strength in restrict band is  $97.1-44.02=53.08$ dBuV/m which is under 54 dBuV/m limit.

The band edge emission plot of OFDM technique on the following second page shows 45.68dB delta 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 is 98.5dBuV/m, so the maximum field strength in restrict band is  $98.5-45.68=52.82$ dBuV/m which is under 54 dBuV/m limit.

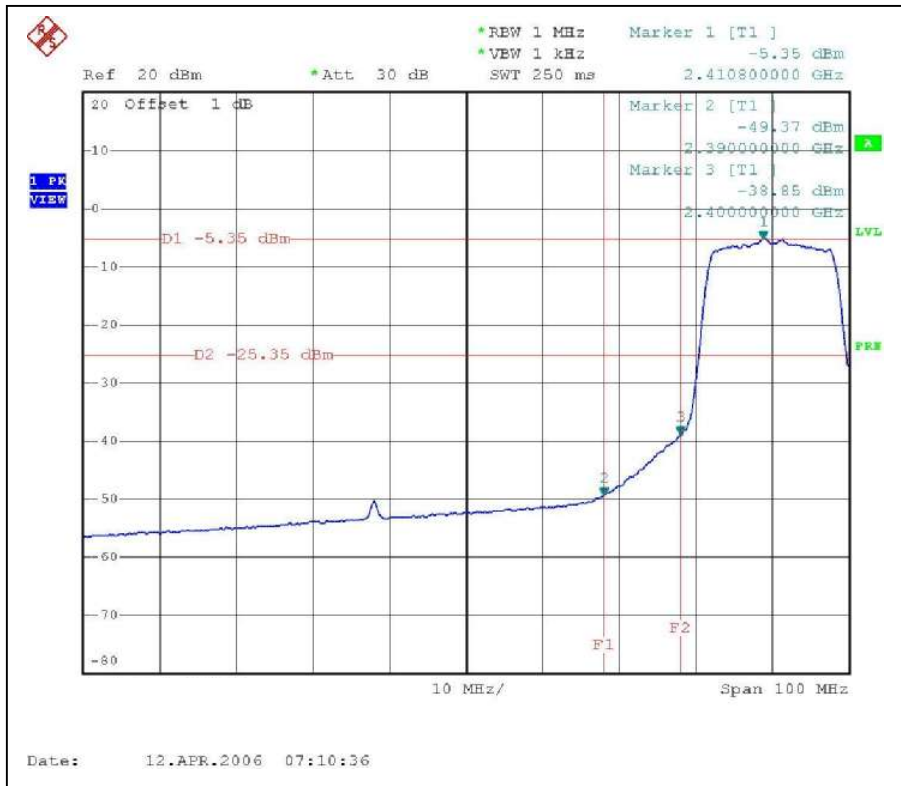
CH1



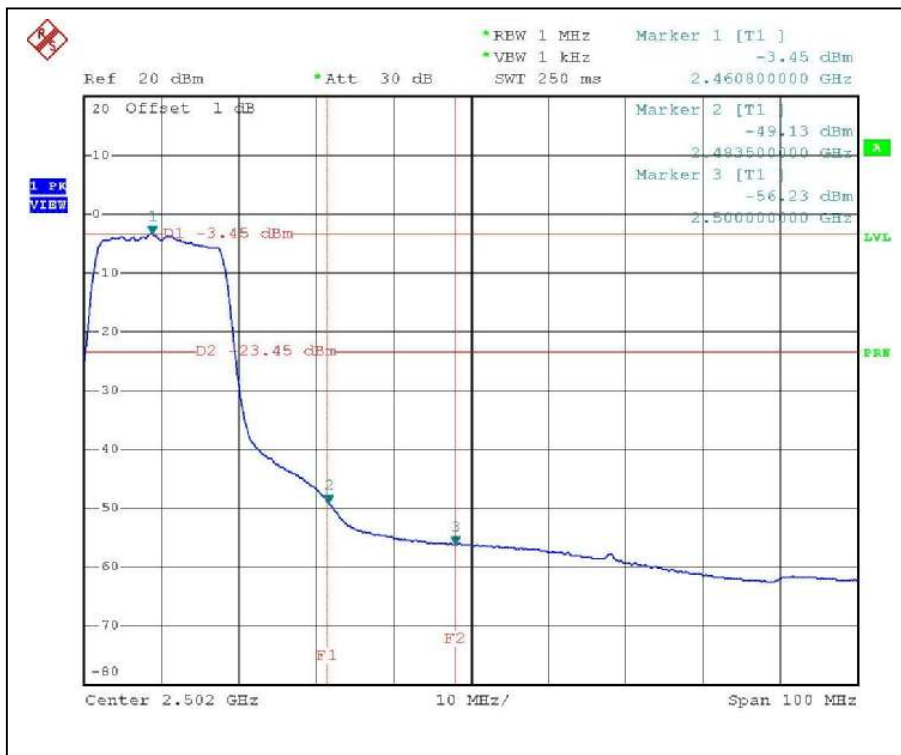
CH11



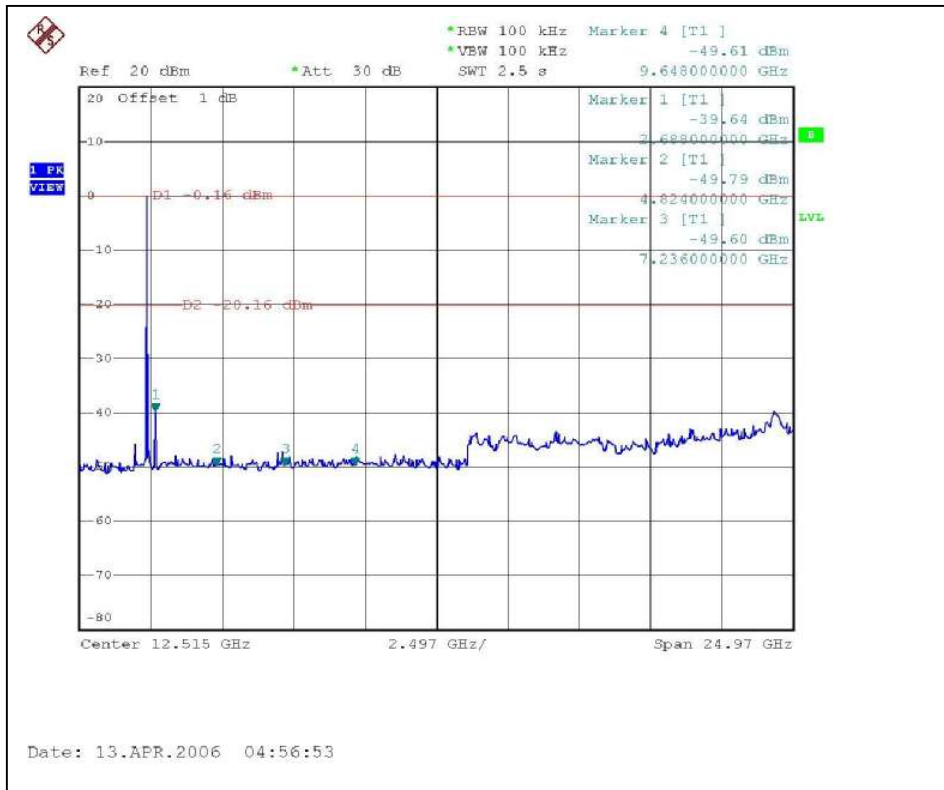
CH1



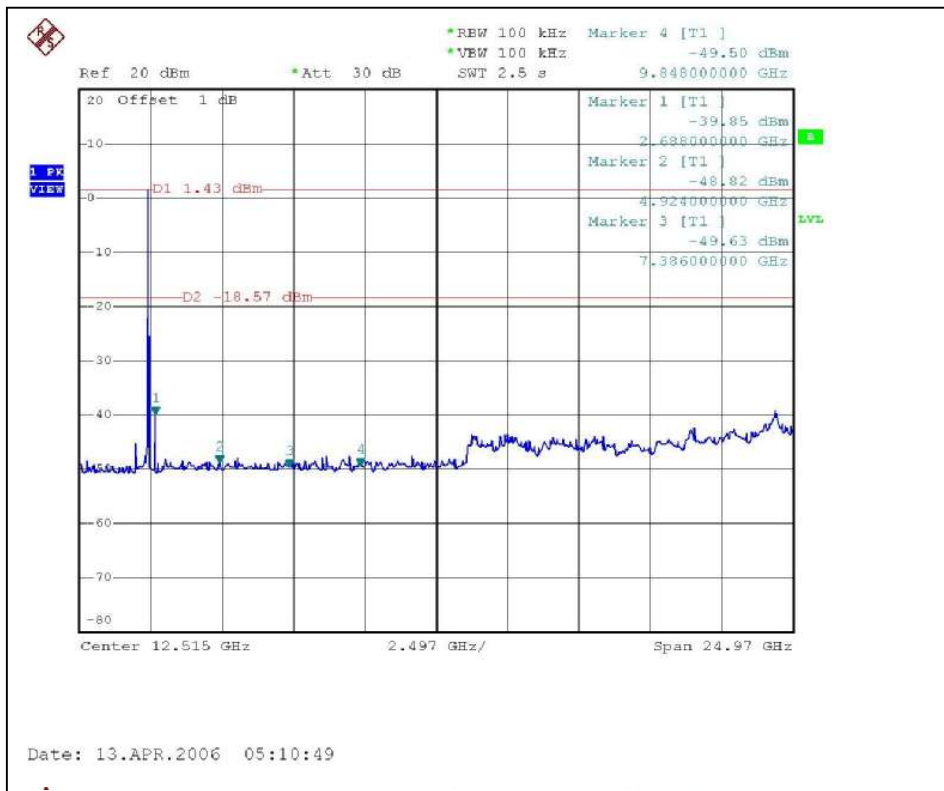
CH11



CH1



CH11





## 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 antennas used in this product are as below:

No.	Gain (dBi)	Cable Loss (dB)	Net Gain (dB)	Antenna Type	Antenna Connector
1	9.0	0.7	8.3	Dipole	RE-TNC
2	5.0	0.7	4.3	Dipole	RE-TNC

## 5 PHOTOGRAPHS OF THE TEST CONFIGURATION CONDUCTED EMISSION TEST



### RADIATED EMISSION TEST







## 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>	CNLA, BSMI, DGT
<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).

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**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.



## **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.