



## **4.7 ANTENNA REQUIREMENT**

### **4.7.1 STANDARD APPLICABLE**

For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. And according to FCC 47 CFR Section 15.247 (b), if transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

### **4.7.2 ANTENNA CONNECTED CONSTRUCTION**

The antenna used in this product is Dipole antenna with UFL antenna connector. The maximum Gain of the antenna is 1.8dBi.



## 5. TEST TYPES AND RESULTS (802.11a 5725~5850MHz Band)

### 5.1 CONDUCTED EMISSION MEASUREMENT

#### 5.1.1 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:**
- The lower limit shall apply at the transition frequencies.
    - The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50 MHz.
    - 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.

#### 5.1.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
Test Receiver ROHDE & SCHWARZ	ESCS30	100291	Nov. 16, 2005
RF signal cable Woken	5D-FB	Cable-HYC01-01	Jan. 09, 2006
LISN SCHWARZBECK	NNBL 8226-2	8226-142	May 02, 2006
LISN ROHDE & SCHWARZ	ESH2-Z5	100104	Feb. 15, 2006
Software ADT	ADT_Cond_V3	NA	NA

- NOTE:**
- The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
  - The test was performed in HwaYa Shielded Room 1.
  - The VCCI Site Registration No. is C-2040.



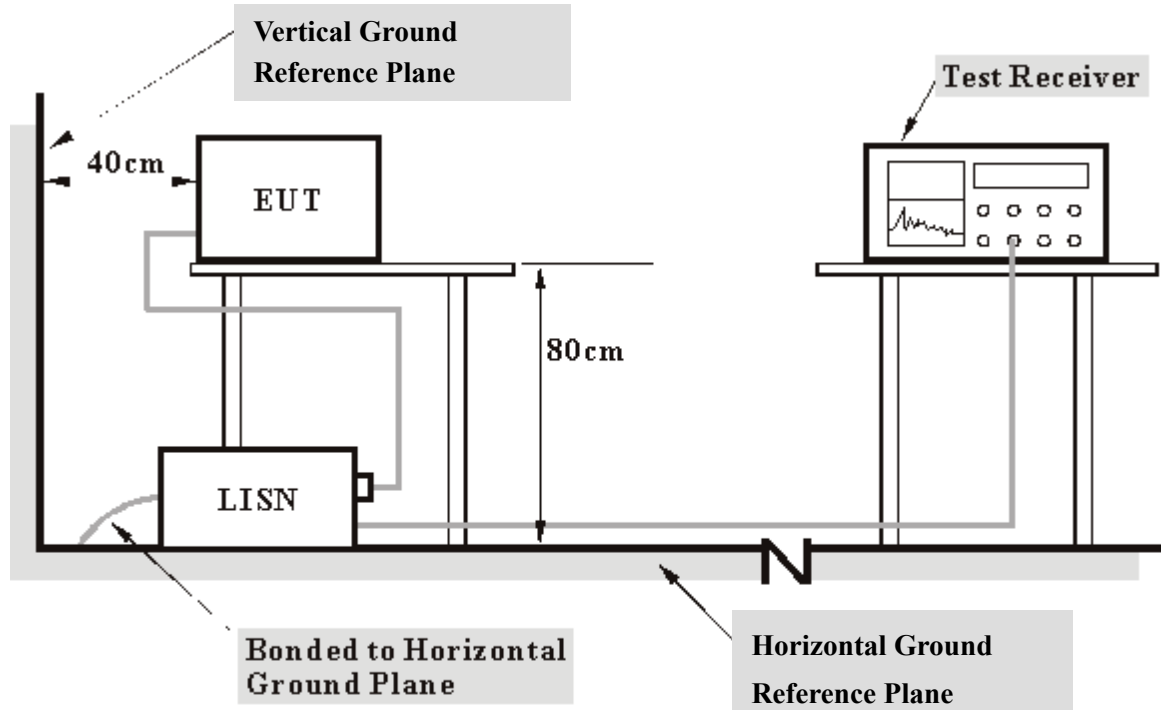
### 5.1.3 TEST PROCEDURES

- 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) was not recorded.

### 5.1.4 DEVIATION FROM TEST STANDARD

No deviation

### 5.1.5 TEST SETUP



- Note:**
1. Support units were connected to second LISN.
  2. Both of LISNs (AMN) 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.

### 5.1.6 EUT OPERATING CONDITIONS

Same as 4.1.6



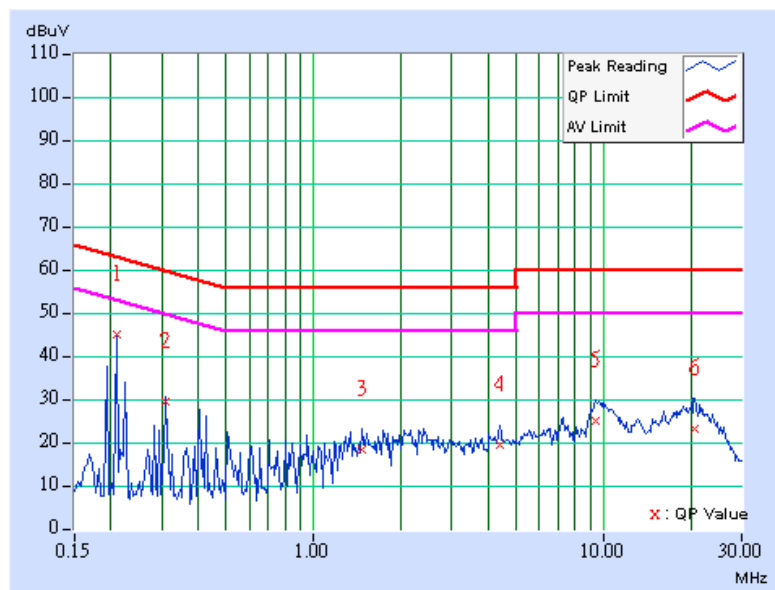
5.1.7 TEST RESULTS

**Conducted Worst-Case Data**

<b>EUT</b>	Mini PCI Wireless Adapter	<b>MEASUREMENT DETAIL</b>	
<b>MODEL</b>	GN-WI01HT	<b>PHASE</b>	Line 1
<b>CHANNEL</b>	Channel 3	<b>6dB BANDWIDTH</b>	9 kHz
<b>MODULATION TYPE</b>	BPSK	<b>ENVIRONMENTAL CONDITIONS</b>	25deg. C, 66%RH, 991hPa
<b>TRANSFER RATE</b>	6Mbps	<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz
<b>TESTED BY</b>	Richard Chen		

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
			1	0.209	0.11	44.04	-	44.15	-	63.26
2	0.310	0.11	28.66	-	28.77	-	59.97	49.97	-31.20	-
3	1.478	0.25	17.62	-	17.87	-	56.00	46.00	-38.13	-
4	4.395	0.40	18.69	-	19.09	-	56.00	46.00	-36.91	-
5	9.391	0.52	24.19	-	24.71	-	60.00	50.00	-35.29	-
6	20.754	1.08	22.32	-	23.40	-	60.00	50.00	-36.60	-

- 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.

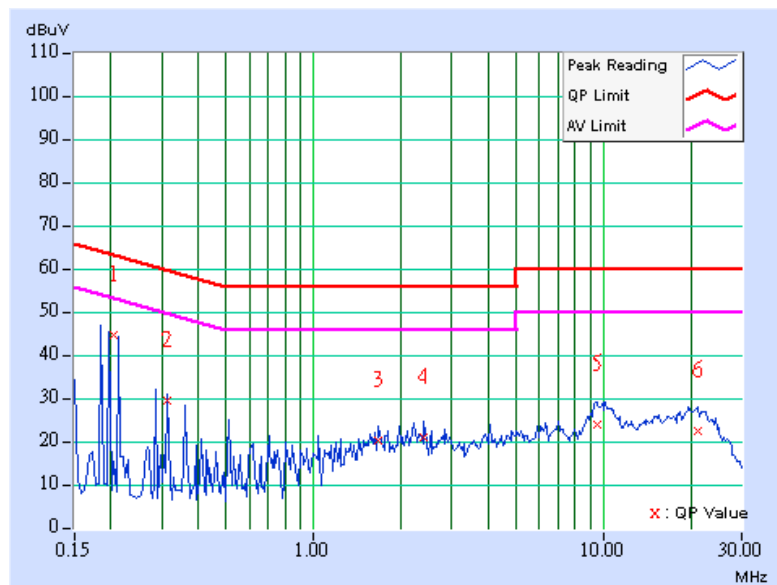




<b>EUT</b>	Mini PCI Wireless Adapter	<b>MEASUREMENT DETAIL</b>	
<b>MODEL</b>	GN-WI01HT	<b>PHASE</b>	Line 2
<b>CHANNEL</b>	Channel 3	<b>6dB BANDWIDTH</b>	9 kHz
<b>MODULATION TYPE</b>	BPSK	<b>ENVIRONMENTAL CONDITIONS</b>	25deg. C, 66%RH, 991hPa
<b>TRANSFER RATE</b>	6Mbps	<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz
<b>TESTED BY</b>	Richard Chen		

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
			1	0.205	0.11	44.16	-	44.27	-	63.42
2	0.311	0.11	28.78	-	28.89	-	59.95	49.95	-31.06	-
3	1.676	0.25	19.71	-	19.96	-	56.00	46.00	-36.04	-
4	2.402	0.29	20.40	-	20.69	-	56.00	46.00	-35.31	-
5	9.469	0.44	23.42	-	23.86	-	60.00	50.00	-36.14	-
6	21.098	0.76	21.96	-	22.72	-	60.00	50.00	-37.28	-

- 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.





## 5.2 RADIATED EMISSION MEASUREMENT

### 5.2.1 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.



## 5.2.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
Test Receiver ROHDE & SCHWARZ	ESI7	100033	May. 19, 2006
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100039	Nov. 21, 2006
BILOG Antenna SCHWARZBECK	VULB9168	9168-160	Jun. 01, 2006
HORN Antenna SCHWARZBECK	9120D	9120D-408	Jan. 17, 2006
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA9170243	Jan. 23, 2006
Preamplifier Agilent	8447D	2944A10633	Nov. 09, 2005
Preamplifier Agilent	8449B	3008A01964	Nov. 06, 2005
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	218183/4	Jan. 26, 2006
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	218195/4	Jan. 26, 2006
Software ADT.	ADT_Radiated_V5.14	NA	NA
Antenna Tower inn-co GmbH	MA 4000	013303	NA
Antenna Tower Controller inn-co GmbH	CO2000	017303	NA
Turn Table ADT.	TT100.	TT93021703	NA
Turn Table Controller ADT.	SC100.	SC93021703	NA

- NOTE:**
1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
  2. The test was performed in HwaYa Chamber 2.
  3. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
  4. The VCCI Site Registration No. is R-237.
  5. The IC Site Registration No. is IC4924-3.





### 5.2.3 TEST PROCEDURES

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter 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 or average method as specified and then reported in a data sheet.

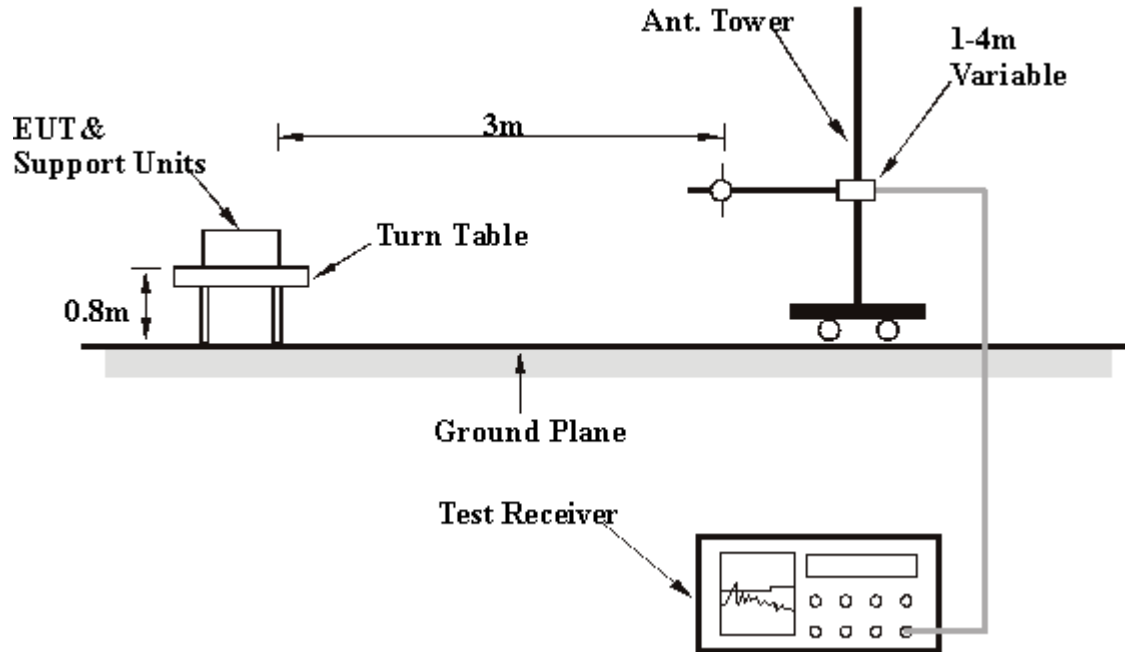
**NOTE:**

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.

### 5.2.4 DEVIATION FROM TEST STANDARD

No deviation

### 5.2.5 TEST SETUP



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

### 5.2.6 EUT OPERATING CONDITIONS

Same as 4.1.6

### 5.2.7 TEST RESULTS

#### Below 1GHz Worst-Case Data

<b>EUT</b>	Mini PCI Wireless Adapter	<b>MEASUREMENT DETAIL</b>	
<b>MODEL</b>	GN-WI01HT	<b>FREQUENCY RANGE</b>	Below 1000MHz
<b>CHANNEL</b>	Channel 3	<b>DETECTOR FUNCTION</b>	Quasi-Peak
<b>MODULATION TYPE</b>	BPSK	<b>ENVIRONMENTAL CONDITIONS</b>	22deg. C, 60%RH, 991hPa
<b>TRANSFER RATE</b>	6Mbps	<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz
<b>TESTED BY</b>	Brad 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	101.13	39.50 QP	43.50	-4.00	2.00 H	4	28.59	10.92
2	133.47	40.83 QP	43.50	-2.67	2.00 H	244	27.08	13.75
3	167.96	40.53 QP	43.50	-2.97	1.50 H	4	26.67	13.86
4	203.52	39.70 QP	43.50	-3.80	1.50 H	10	28.51	11.19
5	400.76	41.19 QP	46.00	-4.81	1.00 H	238	24.79	16.40
6	442.79	42.80 QP	46.00	-3.20	2.00 H	280	25.30	17.50

#### 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	34.31	31.89 QP	40.00	-8.11	1.00 V	46	17.69	14.20
2	117.30	37.93 QP	43.50	-5.57	1.50 V	196	25.37	12.56
3	167.96	39.74 QP	43.50	-3.76	1.50 V	136	25.89	13.86
4	401.83	42.94 QP	46.00	-3.06	1.00 V	310	26.51	16.43
5	441.71	43.62 QP	46.00	-2.38	1.00 V	268	26.15	17.47
6	906.23	38.16 QP	46.00	-7.84	1.00 V	358	13.28	24.89

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

**802.11a OFDM modulation**

<b>EUT</b>	Mini PCI Wireless Adapter	<b>MEASUREMENT DETAIL</b>	
<b>MODEL</b>	GN-WI01HT	<b>FREQUENCY RANGE</b>	1 ~ 40 GHz
<b>CHANNEL</b>	Channel 1	<b>DETECTOR FUNCTION</b>	Peak(PK) Average (AV)
<b>MODULATION TYPE</b>	BPSK	<b>ENVIRONMENTAL CONDITIONS</b>	22deg. C, 70%RH, 991hPa
<b>TRANSFER RATE</b>	6Mbps	<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz
<b>TESTED BY</b>	Morgan 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	#3830.00	48.58 PK	74.00	-25.42	1.05 H	325	14.30	34.28
1	#3830.00	41.25 AV	54.00	-12.75	1.05 H	325	6.97	34.28
2	#5120.00	46.25 PK	74.00	-27.75	1.11 H	320	8.79	37.46
3	5725.00	66.89 PK	75.98	-9.09	1.05 H	32	28.73	38.16
4	*5745.00	95.98 PK			1.05 H	32	57.79	38.19
4	*5745.00	86.12 AV			1.05 H	32	47.93	38.19
5	#11490.00	60.12 PK	74.00	-13.88	1.08 H	321	12.14	47.98
5	#11490.00	40.25 AV	54.00	-13.75	1.08 H	321	-7.73	47.98
6	17235.00	64.25 PK	75.98	-11.73	1.05 H	325	12.46	51.79

**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	#3830.00	50.36 PK	74.00	-23.64	1.35 V	321	16.08	34.28
1	#3830.00	43.21 AV	54.00	-10.79	1.35 V	321	8.93	34.28
2	#5120.00	51.25 PK	74.00	-22.75	1.20 V	350	13.79	37.46
2	#5120.00	44.25 AV	54.00	-9.75	1.20 V	350	6.79	37.46
3	5725.00	76.25 PK	85.85	-9.6	1.32 V	253	38.09	38.16
4	*5745.00	105.85 PK			1.32 V	253	67.66	38.19
4	*5745.00	96.05 AV			1.32 V	253	57.86	38.19
5	#11490.00	64.25 PK	74.00	-9.75	1.32 V	152	16.27	47.98
5	#11490.00	42.36 AV	54.00	-11.64	1.32 V	152	-5.62	47.98
6	17235.00	66.58 PK	85.85	-19.27	1.00 V	336	14.78	51.79

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

<b>EUT</b>	Mini PCI Wireless Adapter	<b>MEASUREMENT DETAIL</b>	
<b>MODEL</b>	GN-WI01HT	<b>FREQUENCY RANGE</b>	1 ~ 40 GHz
<b>CHANNEL</b>	Channel 3	<b>DETECTOR FUNCTION</b>	Peak(PK) Average (AV)
<b>MODULATION TYPE</b>	BPSK	<b>ENVIRONMENTAL CONDITIONS</b>	22deg. C, 70%RH, 991hPa
<b>TRANSFER RATE</b>	6Mbps	<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz
<b>TESTED BY</b>	Morgan 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	#3856.00	48.12 PK	74.00	-25.88	1.15 H	269	13.77	34.35
2	#5120.00	48.98 PK	74.00	-25.02	1.05 H	258	11.52	37.46
3	*5785.00	97.36 PK			1.03 H	196	59.12	38.24
3	*5785.00	87.45 AV			1.03 H	196	49.21	38.24
4	#11570.00	49.58 PK	74.00	-24.42	1.02 H	269	1.70	47.88
4	#11570.00	40.15 AV	54.00	-13.85	1.02 H	269	-7.73	47.88
5	17355.00	59.12 PK	77.36	-18.24	1.08 H	315	6.58	52.54

<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	#3856.00	51.02 PK	74.00	-22.98	1.20 V	261	16.67	34.35
1	#3856.00	41.36 AV	54.00	-12.64	1.20 V	261	7.01	34.35
2	#5120.00	50.12 PK	74.00	-23.88	1.25 V	315	12.66	37.46
2	#5120.00	40.12 AV	54.00	-13.88	1.25 V	315	2.66	37.46
3	*5785.00	107.45 PK			1.26 V	248	69.21	38.24
3	*5785.00	97.85 AV			1.26 V	248	59.61	38.24
4	#11570.00	51.36 PK	74.00	-22.64	1.03 V	256	3.48	47.88
4	#11570.00	41.26 AV	54.00	-12.74	1.03 V	256	-6.62	47.88
5	17355.00	69.31 PK	87.45	-18.14	1.00 V	35	16.77	52.54

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

<b>EUT</b>	Mini PCI Wireless Adapter	<b>MEASUREMENT DETAIL</b>	
<b>MODEL</b>	GN-WI01HT	<b>FREQUENCY RANGE</b>	1 ~ 40 GHz
<b>CHANNEL</b>	Channel 5	<b>DETECTOR FUNCTION</b>	Peak(PK) Average (AV)
<b>MODULATION TYPE</b>	BPSK	<b>ENVIRONMENTAL CONDITIONS</b>	22deg. C, 70%RH, 991hPa
<b>TRANSFER RATE</b>	6Mbps	<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz
<b>TESTED BY</b>	Morgan 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	#3883.00	51.02 PK	74.00	-22.98	1.00 H	302	16.59	34.43
2	#5120.00	49.36 PK	74.00	-24.64	1.21 H	126	11.90	37.46
3	*5825.00	97.12 PK			1.25 H	320	58.83	38.29
3	*5825.00	68.36 AV			1.25 H	320	30.07	38.29
4	5850.00	68.25 PK	77.12	-8.87	1.02 H	32	29.92	38.33
5	#11650.00	48.25 PK	74.00	-25.75	1.45 H	332	0.44	47.81
5	#11650.00	39.56 AV	54.00	-14.44	1.45 H	332	-8.25	47.81
6	17475.00	64.12 PK	77.12	-13.00	1.05 H	32	10.76	53.36

### 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	#3883.00	51.25 PK	74.00	-22.75	1.56 V	325	16.82	34.43
1	#3883.00	41.80 AV	54.00	-12.20	1.56 V	325	7.37	34.43
2	#5120.00	52.26 PK	74.00	-21.74	1.44 V	320	14.80	37.46
2	#5120.00	45.87 AV	54.00	-8.13	1.44 V	320	8.41	37.46
3	*5825.00	106.21 PK			1.35 V	325	67.92	38.29
3	*5825.00	97.25 AV			1.35 V	325	58.96	38.29
4	5850.00	77.58 PK	86.21	-8.63	1.35 V	325	39.25	38.33
5	#11650.00	51.25 PK	74.00	-22.75	1.56 V	325	3.44	47.81
5	#11650.00	42.25 AV	54.00	-11.75	1.56 V	325	-5.56	47.81
6	17475.00	66.95 PK	86.21	-19.26	1.02 V	58	13.59	53.36

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

**802.11a Turbo OFDM modulation**

<b>EUT</b>	Mini PCI Wireless Adapter	<b>MEASUREMENT DETAIL</b>	
<b>MODEL</b>	GN-WI01HT	<b>FREQUENCY RANGE</b>	1 ~ 40 GHz
<b>CHANNEL</b>	Channel 1	<b>DETECTOR FUNCTION</b>	Peak(PK) Average (AV)
<b>MODULATION TYPE</b>	BPSK	<b>ENVIRONMENTAL CONDITIONS</b>	22deg. C, 70%RH, 991hPa
<b>TRANSFER RATE</b>	12Mbps	<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz
<b>TESTED BY</b>	Morgan 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	#3840.00	48.24 PK	74.00	-25.76	1.00 H	160	13.93	34.31
1	#3840.00	40.37 AV	54.00	-13.63	1.00 H	160	6.06	34.31
2	#5120.00	52.12 PK	74.00	-21.88	1.30 H	214	14.66	37.46
2	#5120.00	42.02 AV	54.00	-11.98	1.30 H	214	4.56	37.46
3	5725.00	70.12 PK	75.71	-5.59	1.32 H	202	31.96	38.16
4	*5760.00	95.71 PK			1.29 H	256	57.50	38.21
4	*5760.00	85.25 AV			1.29 H	256	47.04	38.21
5	#11520.00	66.12 PK	74.00	-7.88	1.25 H	320	18.17	47.95
5	#11520.00	48.12 AV	54.00	-5.88	1.25 H	320	0.17	47.95
6	17280.00	66.12 PK	75.71	-9.59	1.20 H	250	14.05	52.07

**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	#3840.00	49.97 PK	74.00	-24.03	1.24 V	1	15.66	34.31
1	#3840.00	43.44 AV	54.00	-10.56	1.24 V	1	9.13	34.31
2	#5120.00	54.36 PK	74.00	-19.64	1.53 V	331	16.90	37.46
2	#5120.00	44.50 AV	54.00	-9.50	1.53 V	331	7.04	37.46
3	5725.00	76.26 PK	85.88	-9.62	1.75 V	258	38.10	38.16
4	*5760.00	105.88 PK			1.75 V	258	67.67	38.21
4	*5760.00	96.00 AV			1.75 V	258	57.79	38.21
5	#11520.00	68.09 PK	74.00	-5.91	1.75 V	257	20.14	47.95
5	#11520.00	51.92 AV	54.00	-2.08	1.75 V	257	3.97	47.95
6	17280.00	68.29 PK	85.88	-17.59	1.10 V	53	16.22	52.07

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

<b>EUT</b>	Mini PCI Wireless Adapter	<b>MEASUREMENT DETAIL</b>	
<b>MODEL</b>	GN-WI01HT	<b>FREQUENCY RANGE</b>	1 ~ 40 GHz
<b>CHANNEL</b>	Channel 2	<b>DETECTOR FUNCTION</b>	Peak(PK) Average (AV)
<b>MODULATION TYPE</b>	BPSK	<b>ENVIRONMENTAL CONDITIONS</b>	22deg. C, 70%RH, 991hPa
<b>TRANSFER RATE</b>	12Mbps	<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz
<b>TESTED BY</b>	Morgan 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	#3866.00	51.12 PK	74.00	-22.88	1.02 H	325	16.74	34.38
1	#3866.00	44.21 AV	54.00	-9.79	1.02 H	325	9.83	34.38
2	#5120.00	50.02 PK	74.00	-23.98	1.00 H	251	12.56	37.46
2	#5120.00	43.02 AV	54.00	-10.98	1.00 H	251	5.56	37.46
3	*5800.00	96.15 PK			1.00 H	253	57.89	38.26
3	*5800.00	87.12 AV			1.00 H	253	48.86	38.26
4	5850.00	67.12 PK	76.15	-9.03	1.00 H	253	28.80	38.33
5	#11600.00	66.02 PK	74.00	-7.98	1.05 H	320	18.18	47.84
5	#11600.00	50.12 AV	54.00	-3.88	1.05 H	320	2.28	47.84
6	17400.00	65.25 PK	76.15	-10.9	1.20 H	325	12.42	52.83

### 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	#3866.00	51.45 PK	74.00	-22.55	1.25 V	2	17.07	34.38
1	#3866.00	44.12 AV	54.00	-9.88	1.25 V	2	9.74	34.38
2	#5120.00	50.45 PK	74.00	-23.55	1.29 V	5	12.99	37.46
2	#5120.00	44.15 AV	54.00	-9.85	1.29 V	5	6.69	37.46
3	*5800.00	106.74 PK			1.18 V	229	68.48	38.26
3	*5800.00	97.06 AV			1.18 V	229	58.80	38.26
4	5850.00	70.25 PK	86.74	-16.49	1.18 V	147	31.92	38.33
5	#11600.00	68.23 PK	74.00	-5.77	1.58 V	256	20.39	47.84
5	#11600.00	52.02 AV	54.00	-1.98	1.58 V	256	4.18	47.84
6	17400.00	68.58 PK	86.74	-18.16	1.21 V	25	15.75	52.83

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





### 5.3 6dB BANDWIDTH MEASUREMENT

#### 5.3.1 LIMITS OF 6dB BANDWIDTH MEASUREMENT

The minimum of 6dB Bandwidth Measurement is 0.5 MHz.

#### 5.3.2 TEST INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
R&S SPECTRUM ANALYZER	FSEK30	100049	Aug. 12, 2005

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

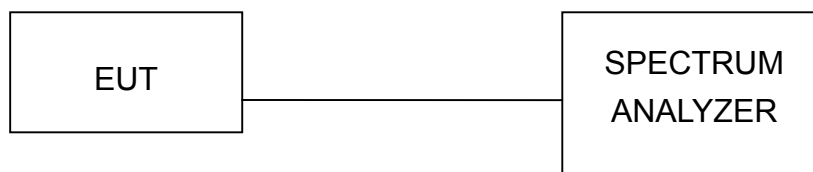
### 5.3.3 TEST PROCEDURE

The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with 100kHz RBW and 100kHz VBW. The 6dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 6dB.

### 5.3.4 DEVIATION FROM TEST STANDARD

No deviation

### 5.3.5 TEST SETUP



### 5.3.6 EUT OPERATING CONDITIONS

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



5.3.7 TEST RESULTS

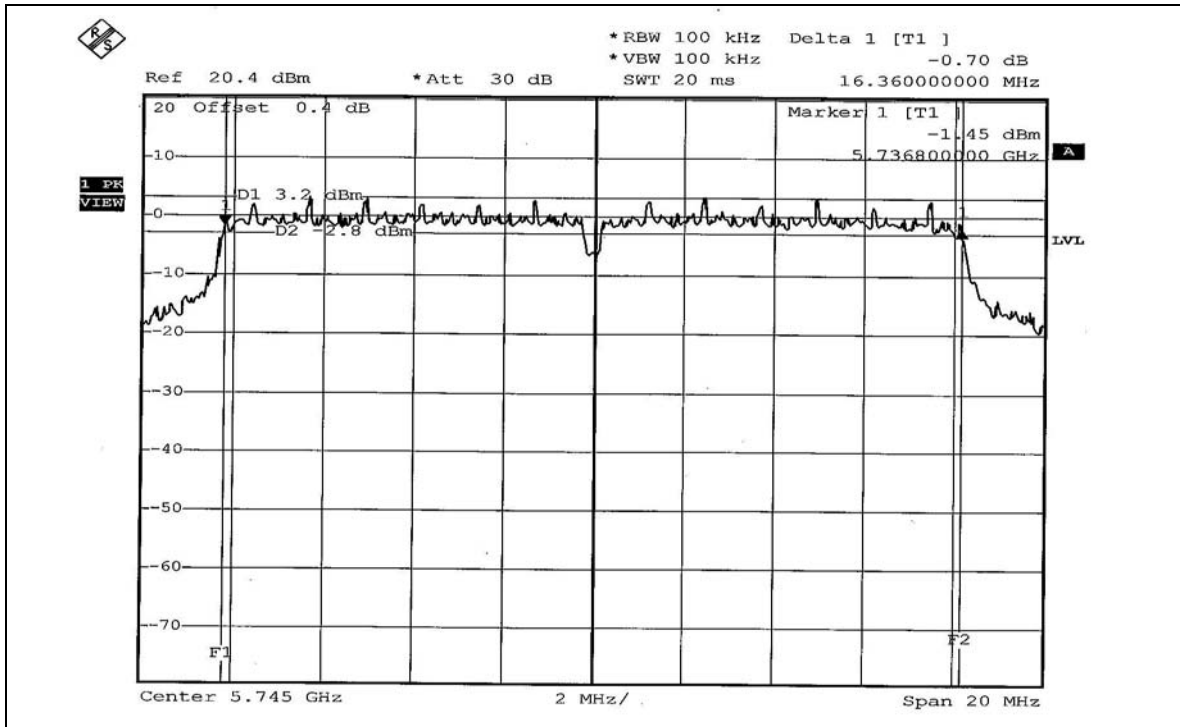
**802.11a OFDM modulation**

<b>EUT</b>	Mini PCI Wireless Adapter	<b>MODEL</b>	GN-WI01HT
<b>MODULATION TYPE</b>	BPSK	<b>TRANSFER RATE</b>	6Mbps
<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz	<b>ENVIRONMENTAL CONDITIONS</b>	25deg.C, 64%RH, 991hPa
<b>TESTED BY</b>	Brad Wu		

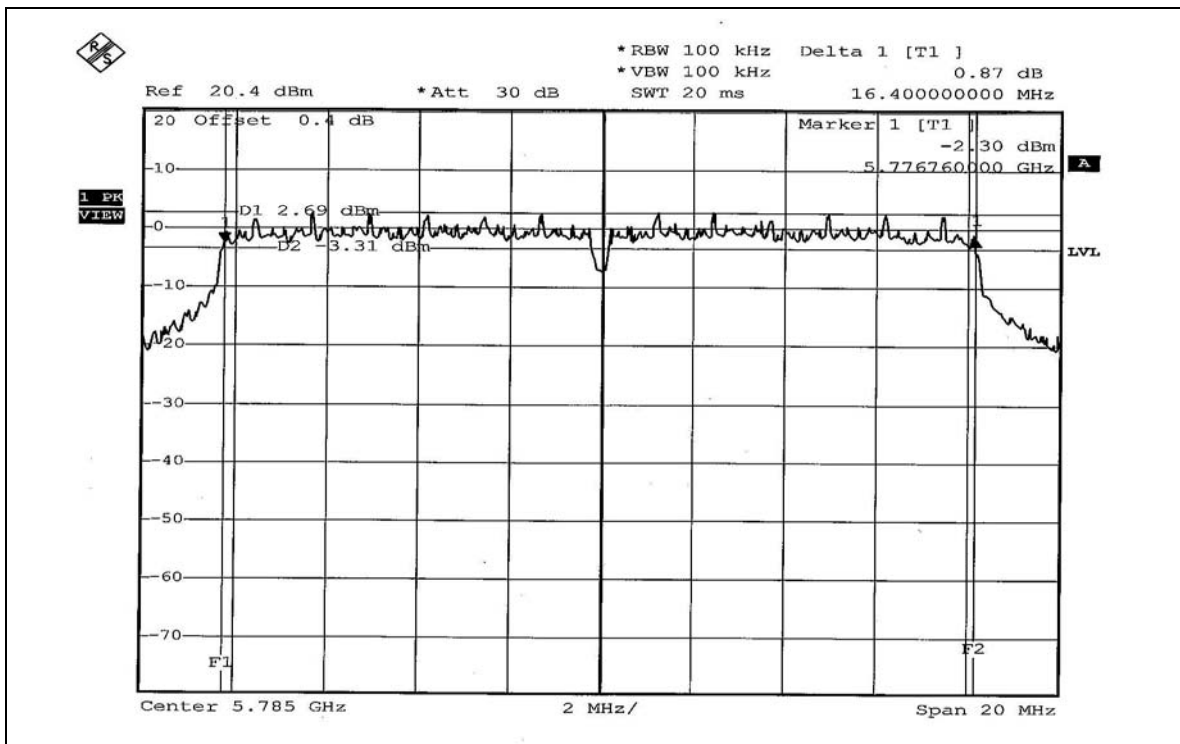
<b>CHANNEL</b>	<b>CHANNEL FREQUENCY (MHz)</b>	<b>6dB BANDWIDTH (MHz)</b>	<b>MINIMUM LIMIT (MHz)</b>	<b>PASS/FAIL</b>
1	5745	16.36	0.5	PASS
3	5785	16.40	0.5	PASS
5	5825	16.40	0.5	PASS



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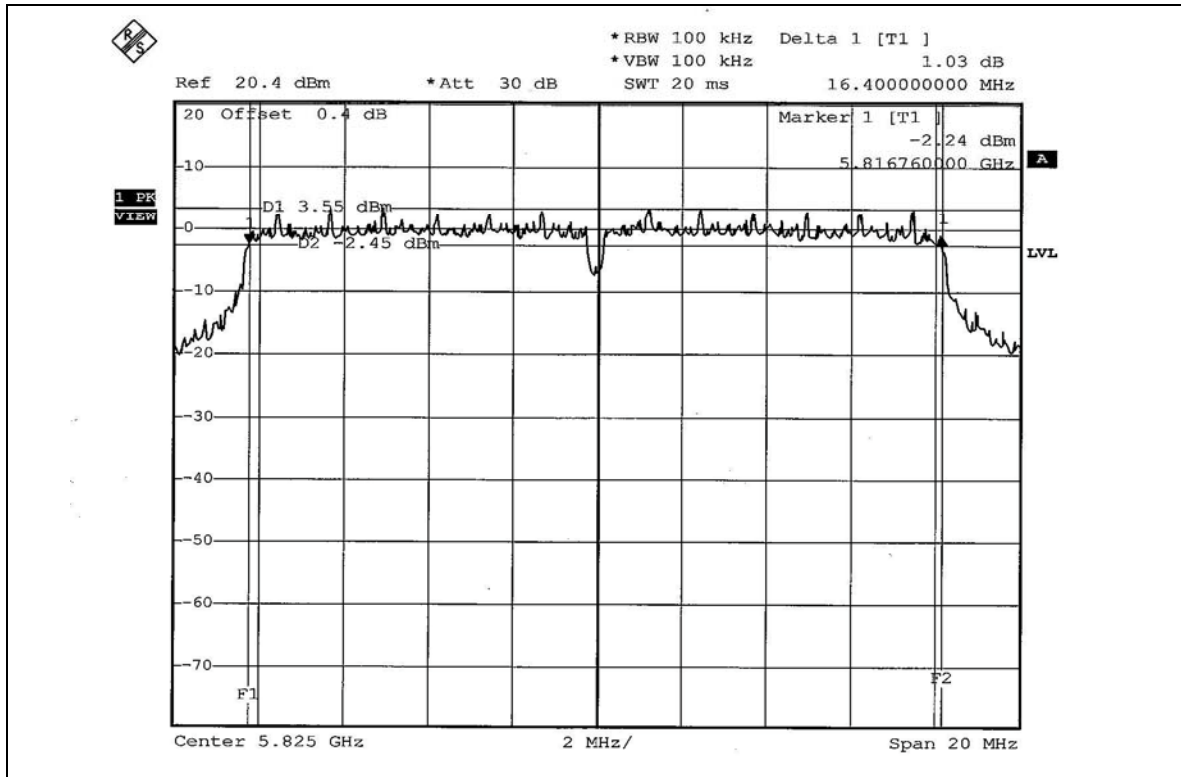


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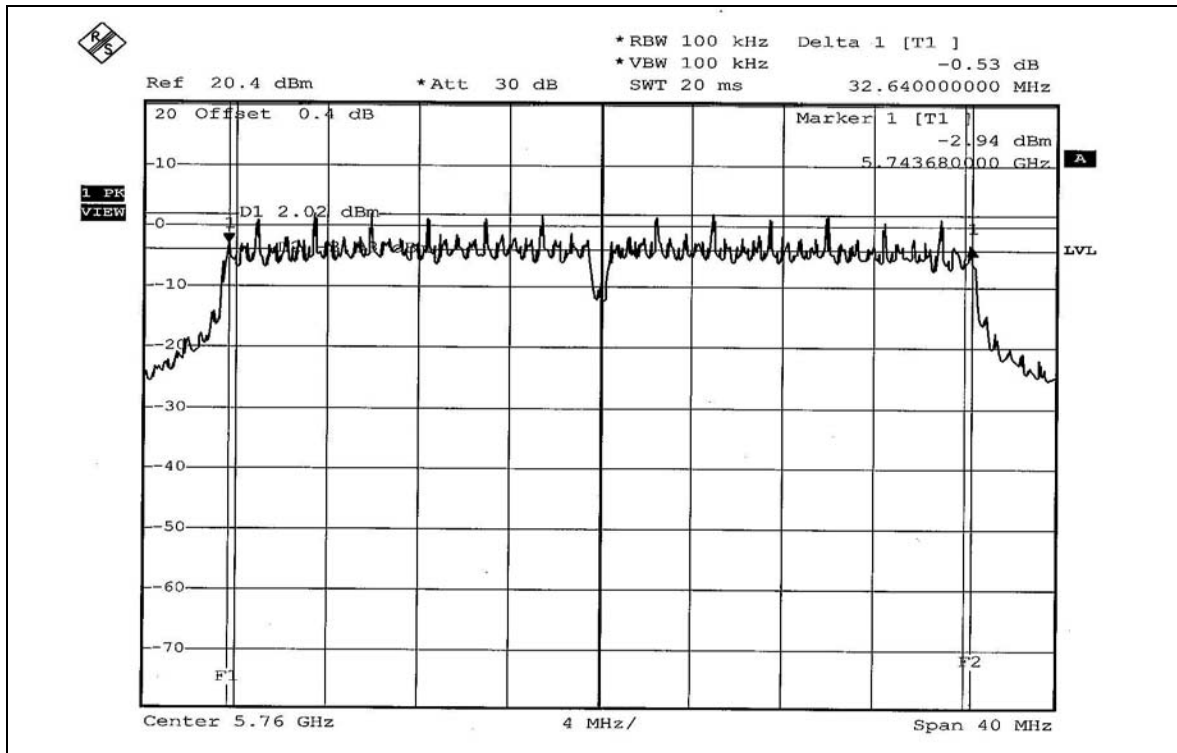
**802.11a Turbo OFDM modulation**

<b>EUT</b>	Mini PCI Wireless Adapter	<b>MODEL</b>	GN-WI01HT
<b>MODULATION TYPE</b>	BPSK	<b>TRANSFER RATE</b>	12Mbps
<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz	<b>ENVIRONMENTAL CONDITIONS</b>	25deg.C, 64%RH, 991hPa
<b>TESTED BY</b>	Brad Wu		

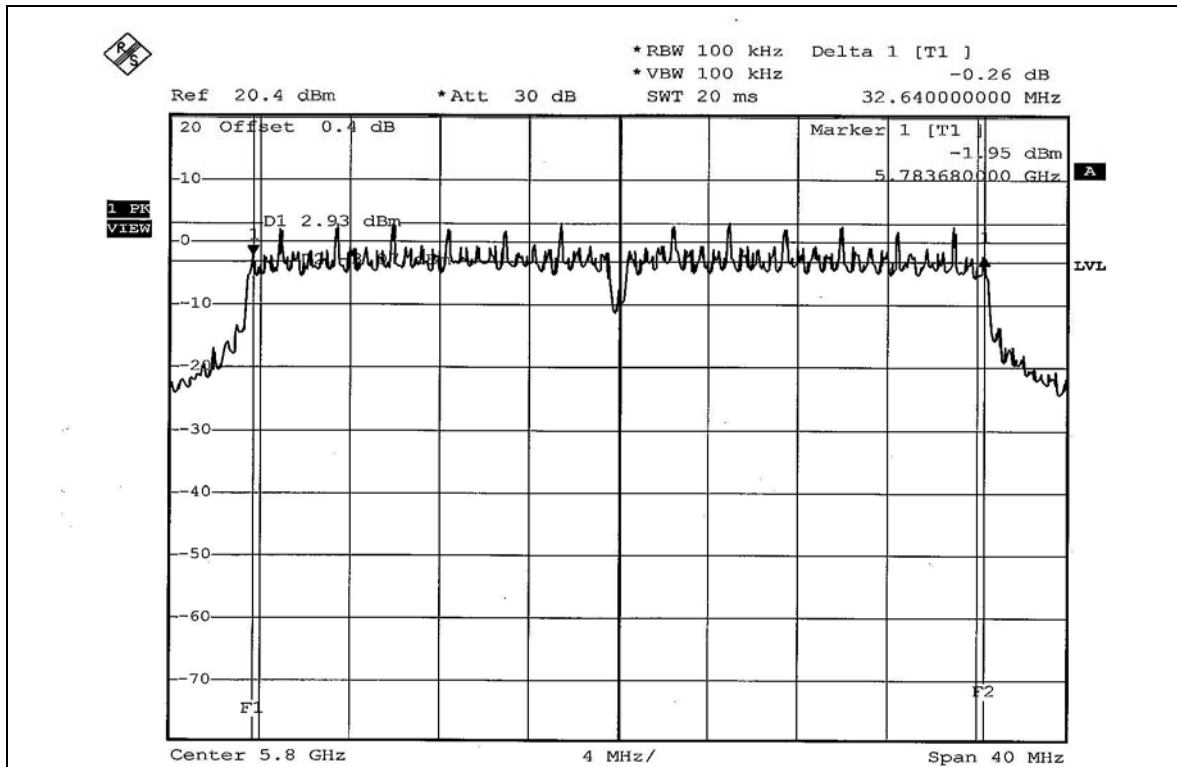
<b>CHANNEL</b>	<b>CHANNEL FREQUENCY (MHz)</b>	<b>6dB BANDWIDTH (MHz)</b>	<b>MINIMUM LIMIT (MHz)</b>	<b>PASS/FAIL</b>
1	5760	32.64	0.5	PASS
2	5800	32.64	0.5	PASS



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## 5.4 MAXIMUM PEAK OUTPUT POWER

### 5.4.1 LIMITS OF MAXIMUM PEAK OUTPUT POWER MEASUREMENT

The Maximum Peak Output Power Measurement is 30dBm.

### 5.4.2 INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
R&S SPECTRUM ANALYZER	FSEK30	100049	Aug. 12, 2005
AGILENT SIGNAL GENERATOR	E8257C	MY43320668	Dec. 31, 2005
TEKTRONIX OSCILLOSCOPE	TDS 1012	C019167	Feb. 01, 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..



### 5.4.3 TEST PROCEDURES

1. A detector was used on the output port of the EUT. An oscilloscope was used to read 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 reading on oscilloscope. Record the power level.

### 5.4.4 DEVIATION FROM TEST STANDARD

No deviation

### 5.4.5 TEST SETUP



### 5.4.6 EUT OPERATING CONDITIONS

Same as Item 5.3.6



## 5.4.7 TEST RESULTS

## 802.11a OFDM modulation

<b>EUT</b>	Mini PCI Wireless Adapter	<b>MODEL</b>	GN-WI01HT
<b>MODULATION TYPE</b>	BPSK	<b>TRANSFER RATE</b>	6Mbps
<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz	<b>ENVIRONMENTAL CONDITIONS</b>	25deg.C, 64%RH, 991hPa
<b>TESTED BY</b>	Brad Wu		

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (mW)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (dBm)	PASS/FAIL
1	5745	28.379	14.53	30	PASS
3	5785	26.546	14.24	30	PASS
5	5825	27.733	14.43	30	PASS

## 802.11a Turbo OFDM modulation

<b>EUT</b>	Mini PCI Wireless Adapter	<b>MODEL</b>	GN-WI01HT
<b>MODULATION TYPE</b>	BPSK	<b>TRANSFER RATE</b>	12Mbps
<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz	<b>ENVIRONMENTAL CONDITIONS</b>	25deg.C, 64%RH, 991hPa
<b>TESTED BY</b>	Brad Wu		

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (mW)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (dBm)	PASS/FAIL
1	5760	19.999	13.01	30	PASS
2	5800	27.416	14.38	30	PASS



## 5.5 POWER SPECTRAL DENSITY MEASUREMENT

### 5.5.1 LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT

The Maximum of Power Spectral Density Measurement is 8dBm.

### 5.5.2 TEST INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
R&S SPECTRUM ANALYZER	FSEK30	100049	Aug. 12, 2005

**NOTES:**

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

### 5.5.3 TEST PROCEDURE

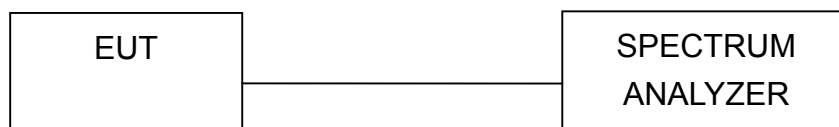
The transmitter output was connected to the spectrum analyzer through an attenuator, the bandwidth of the fundamental frequency was measured with the spectrum analyzer using 3 kHz RBW and 30 kHz VBW, set sweep time = span/3 kHz. The power spectral density was measured and recorded.

The sweep time is allowed to be longer than span/3 kHz for a full response of the mixer in the spectrum analyzer.

### 5.5.4 DEVIATION FROM TEST STANDARD

No deviation

### 5.5.5 TEST SETUP



### 5.5.6 EUT OPERATING CONDITION

Same as Item 5.3.6



## 5.5.7 TEST RESULTS

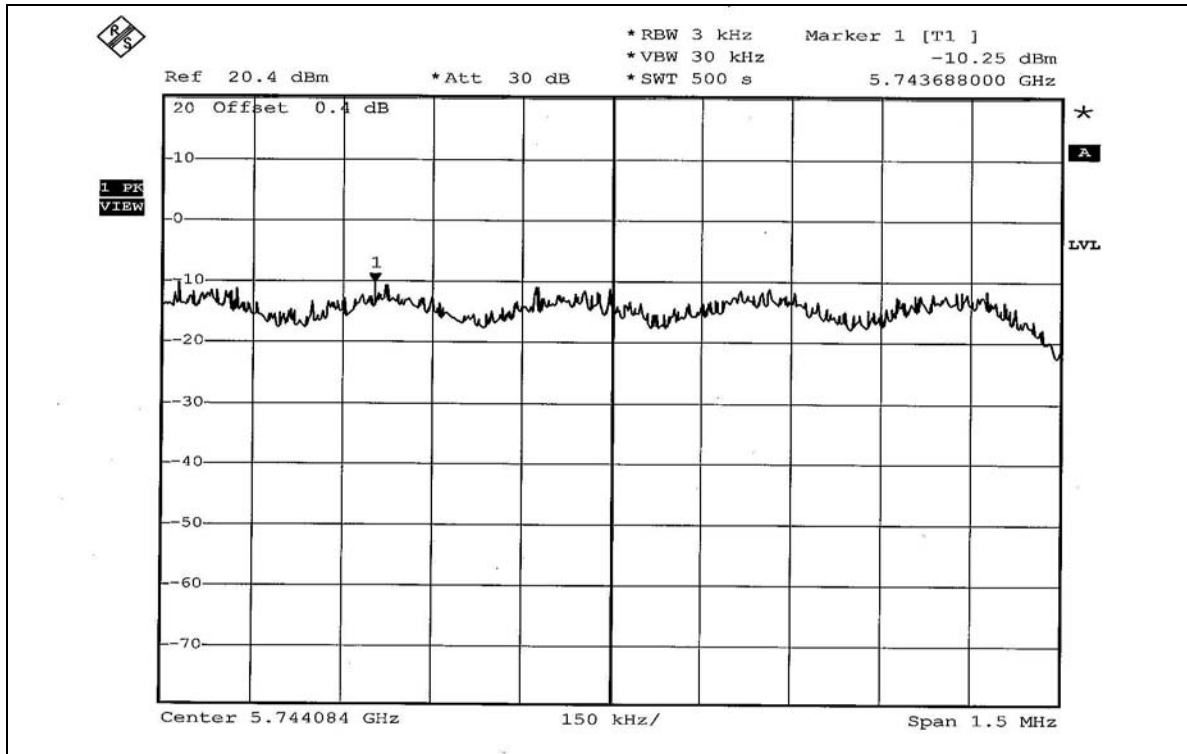
**802.11a OFDM modulation**

<b>EUT</b>	Mini PCI Wireless Adapter	<b>MODEL</b>	GN-WI01HT
<b>MODULATION TYPE</b>	BPSK	<b>TRANSFER RATE</b>	6Mbps
<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz	<b>ENVIRONMENTAL CONDITIONS</b>	25deg.C, 64%RH, 991hPa
<b>TESTED BY</b>	Brad Wu		

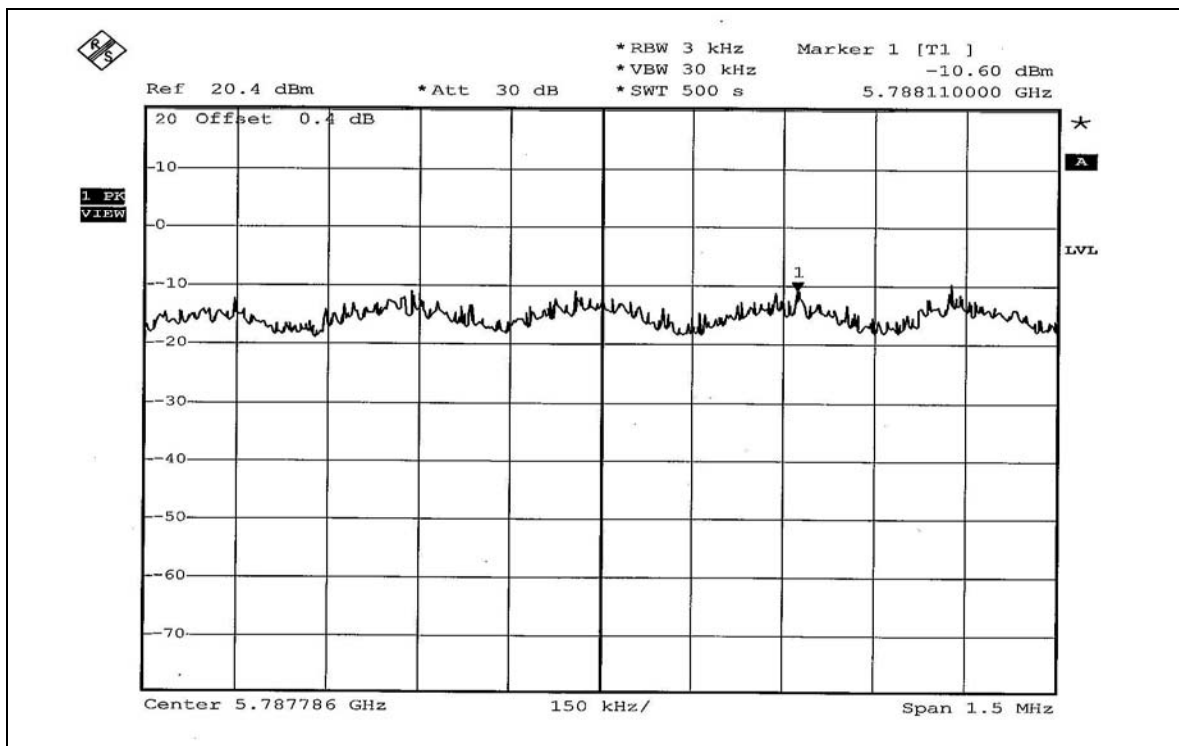
<b>CHANNEL</b>	<b>CHANNEL FREQUENCY (MHz )</b>	<b>RF POWER LEVEL IN 3 kHz BW (dBm)</b>	<b>MAXIMUM LIMIT (dBm)</b>	<b>PASS/FAIL</b>
1	5745	-10.25	8	PASS
3	5785	-10.60	8	PASS
5	5825	-10.14	8	PASS



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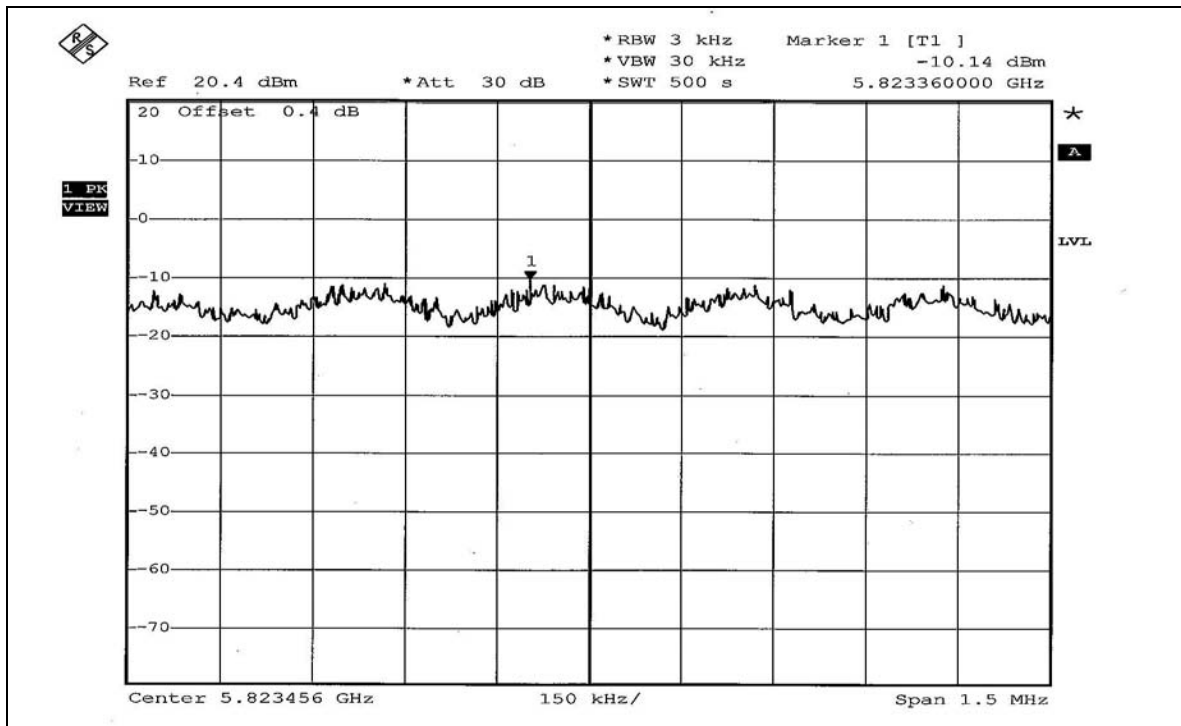


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**802.11a Turbo OFDM modulation**

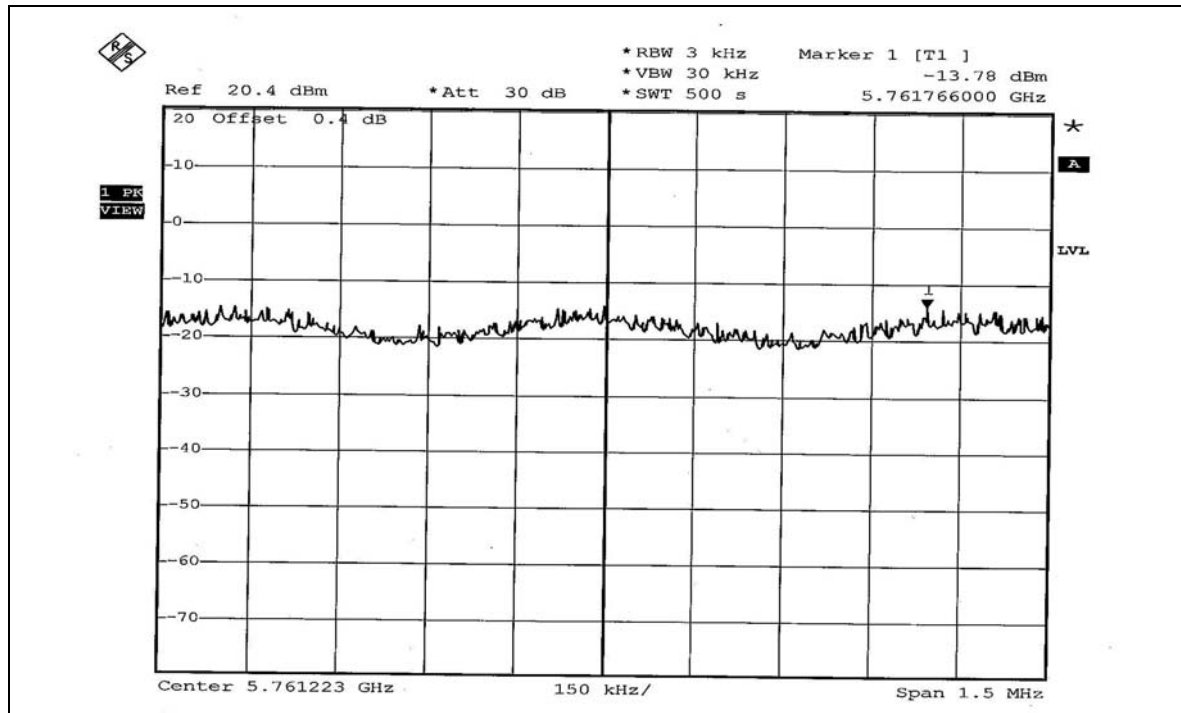
<b>EUT</b>	Mini PCI Wireless Adapter	<b>MODEL</b>	GN-WI01HT
<b>MODULATION TYPE</b>	BPSK	<b>TRANSFER RATE</b>	12Mbps
<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz	<b>ENVIRONMENTAL CONDITIONS</b>	25deg.C, 64%RH, 991hPa
<b>TESTED BY</b>	Brad Wu		

<b>CHANNEL</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	5760	-13.78	8	PASS
2	5800	-12.49	8	PASS

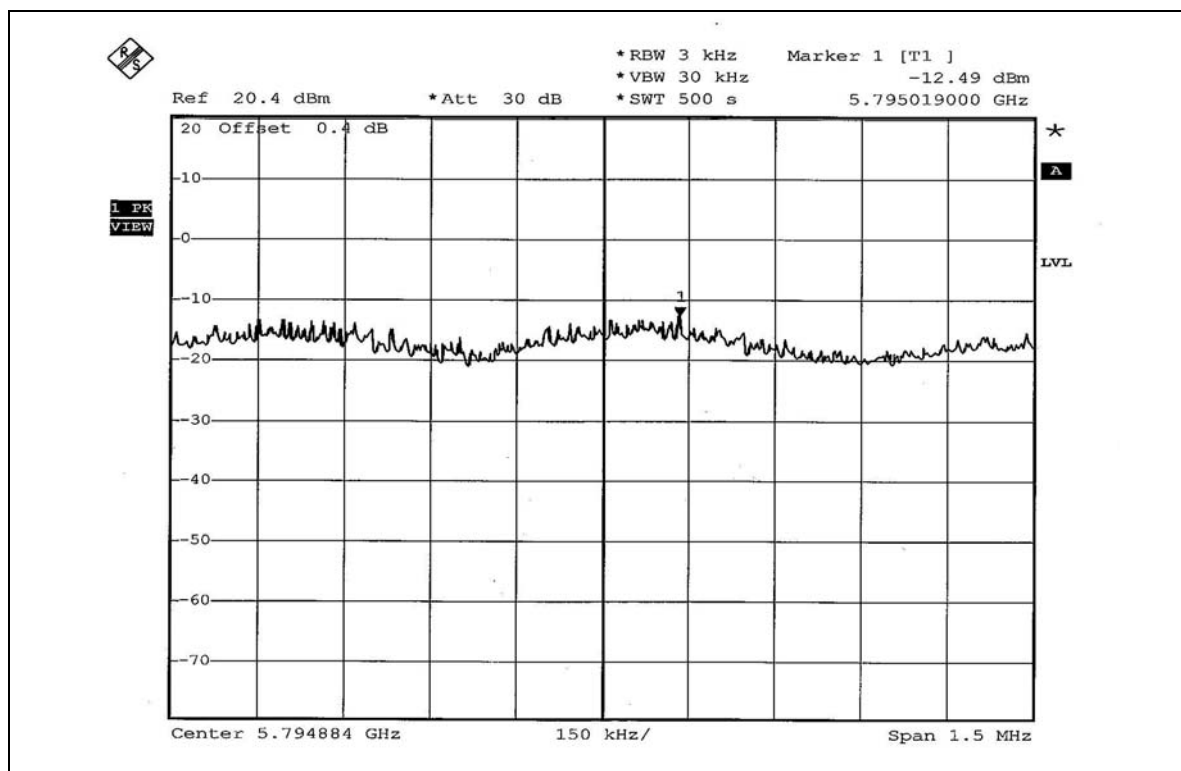




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## 5.6 BAND EDGES MEASUREMENT

### 5.6.1 LIMITS OF BAND EDGES MEASUREMENT

Below  $-20\text{dB}$  of the highest emission level of operating band (in 100kHz Resolution Bandwidth).

### 5.6.2 TEST INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
R&S SPECTRUM ANALYZER	FSEK30	100049	Aug. 12, 2005

**NOTES:**

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

### 5.6.3 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 100 kHz with suitable frequency span including 100 MHz bandwidth from band edge. The band edges was measured and recorded.

### 5.6.4 DEVIATION FROM TEST STANDARD

No deviation



### 5.6.5 EUT OPERATING CONDITION

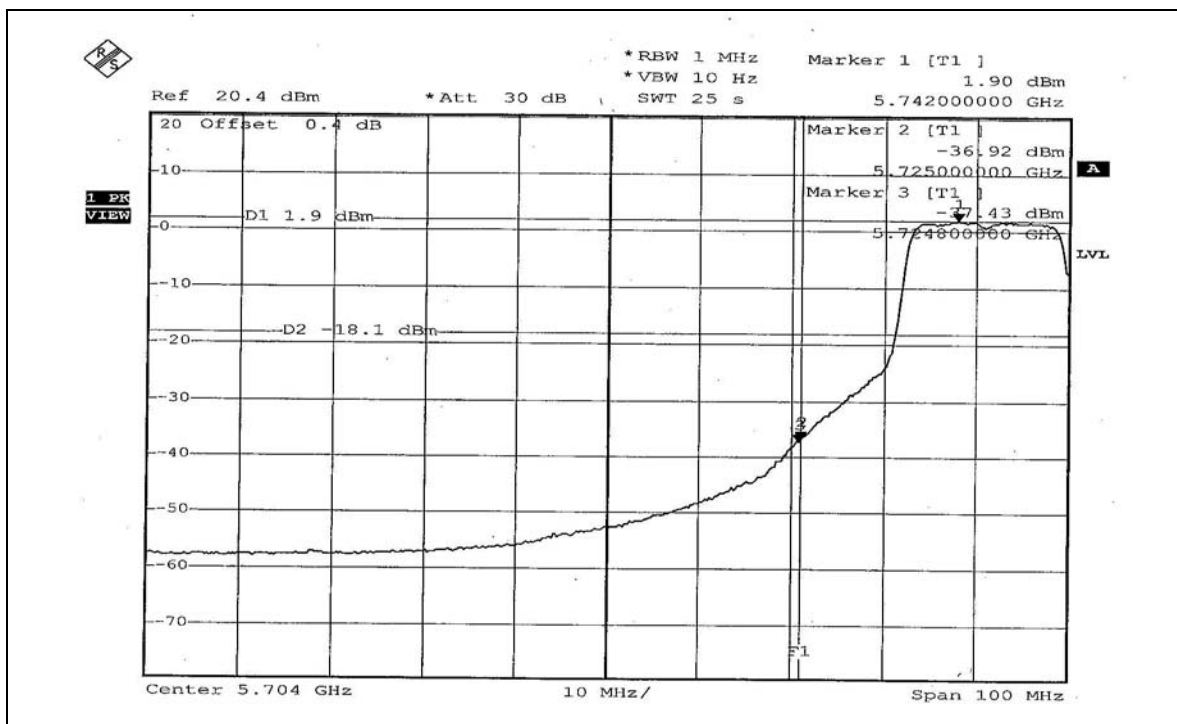
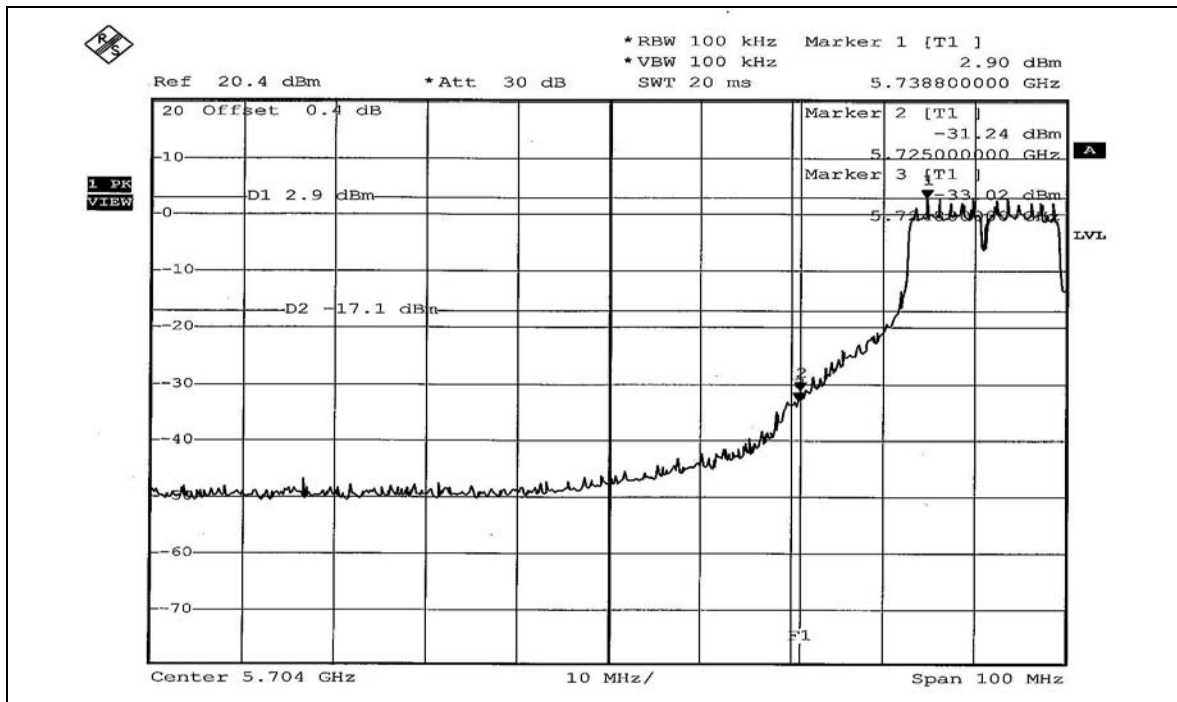
Same as Item 5.9.6

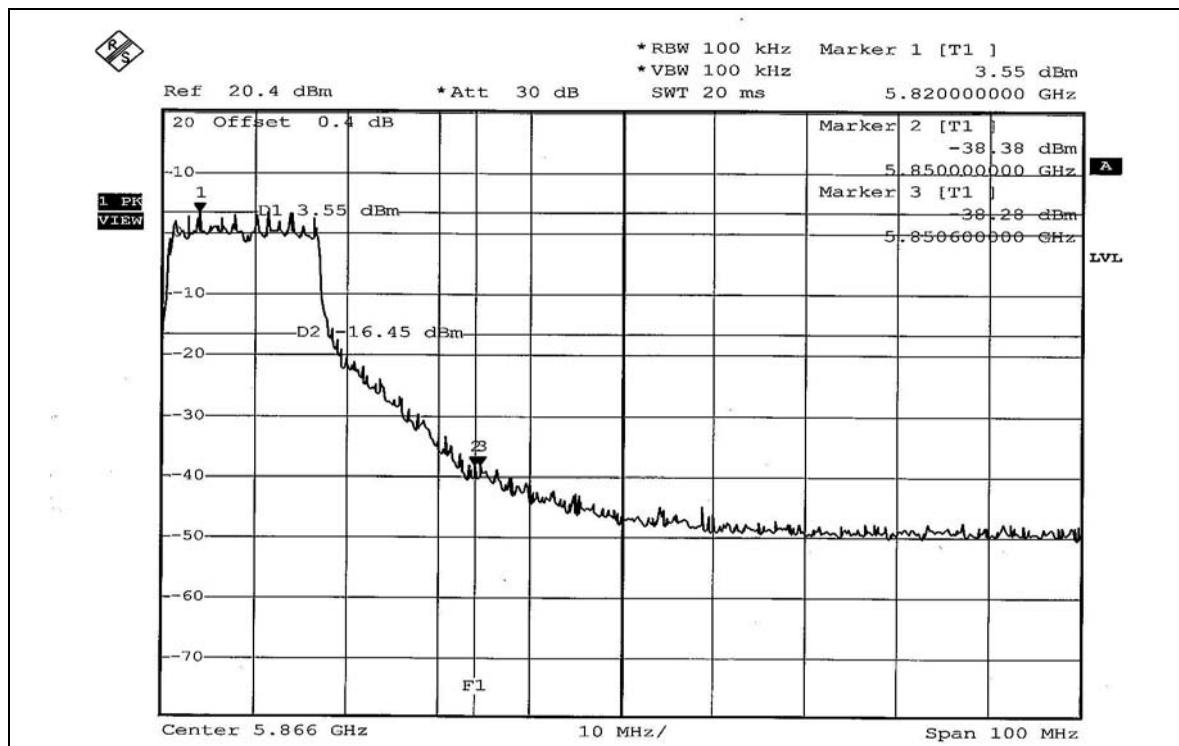
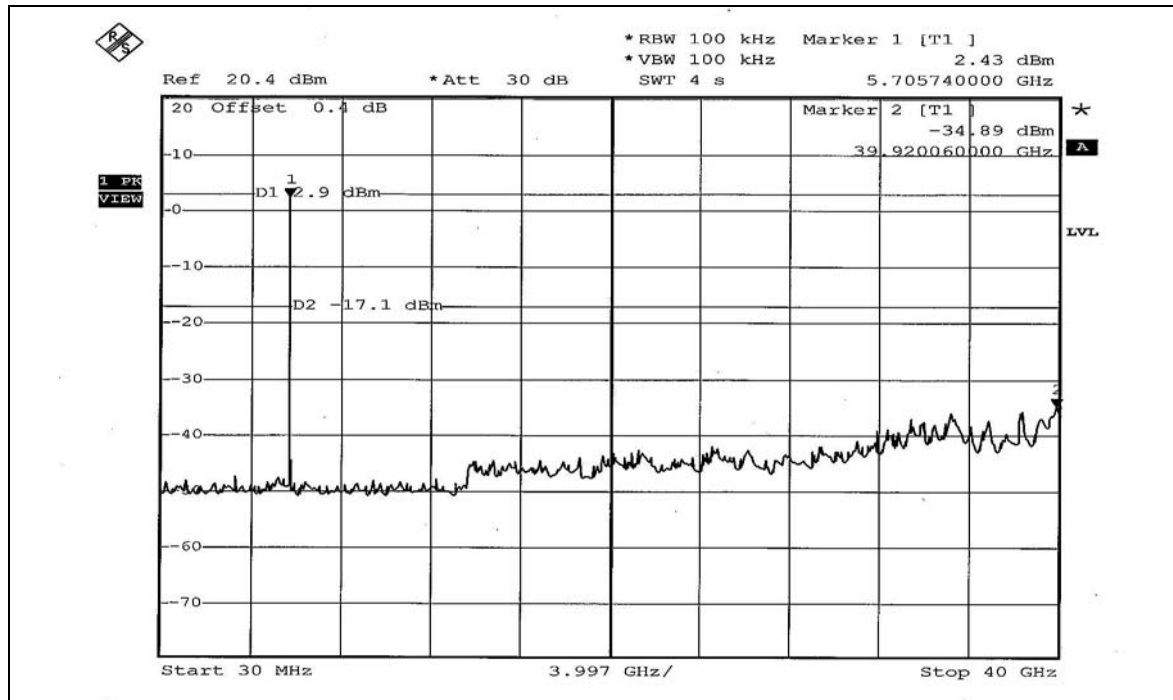
### 5.6.6 TEST RESULTS

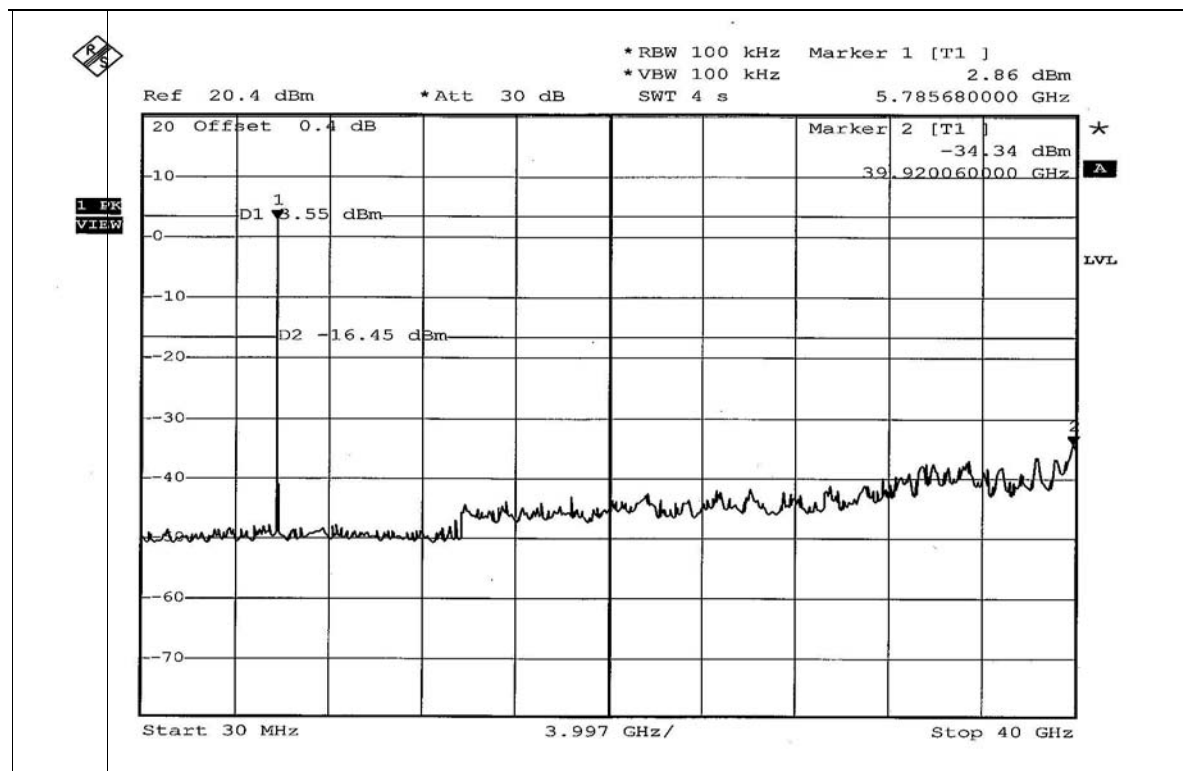
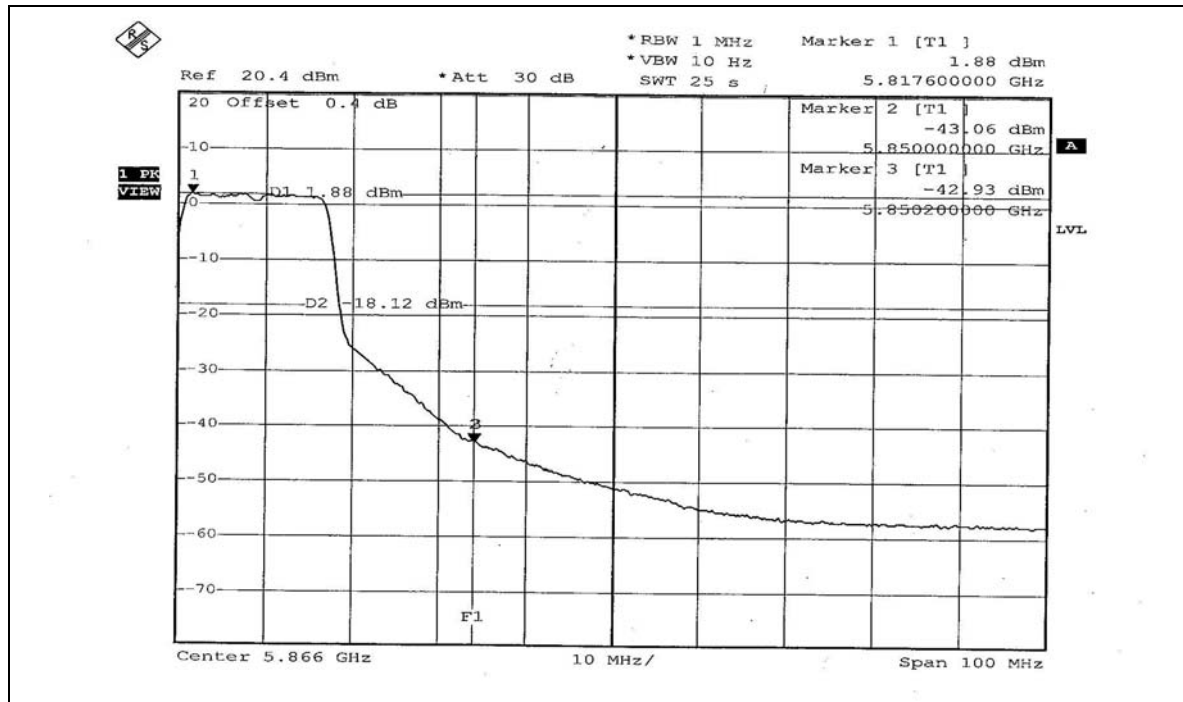
The spectrum plots are attached on the following pages. D2 line indicates the highest level, D1 line indicates the 20dB offset below D2. It shows compliance with the requirement in part 15.247(d).



802.11a OFDM modulation

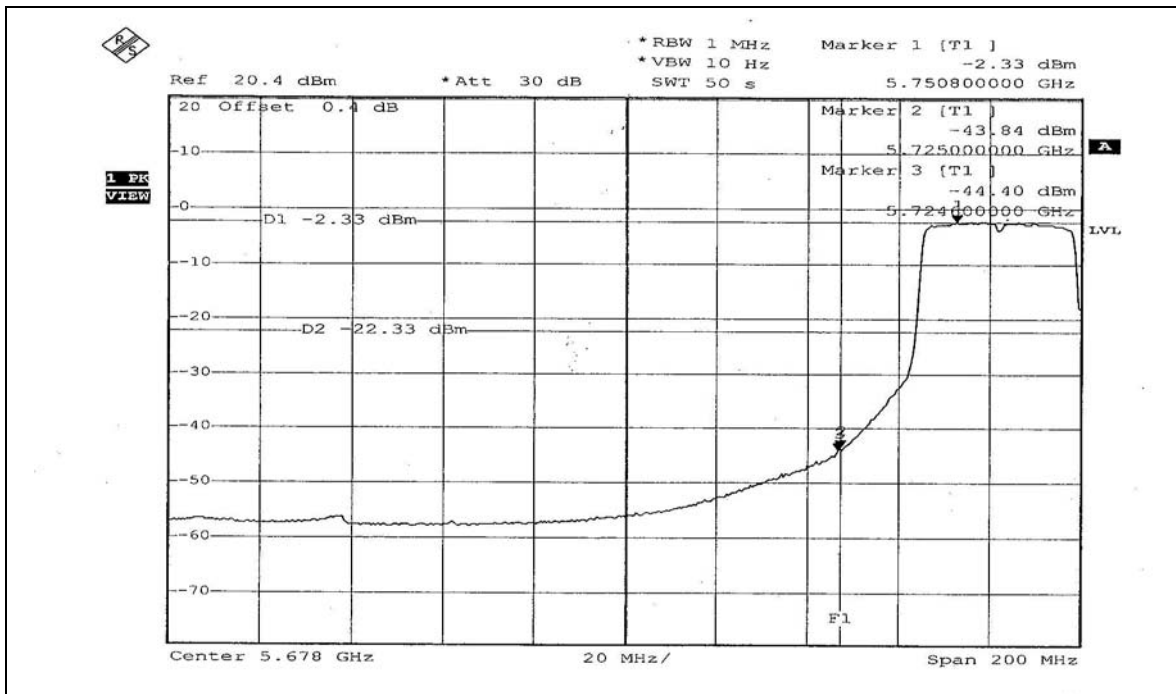
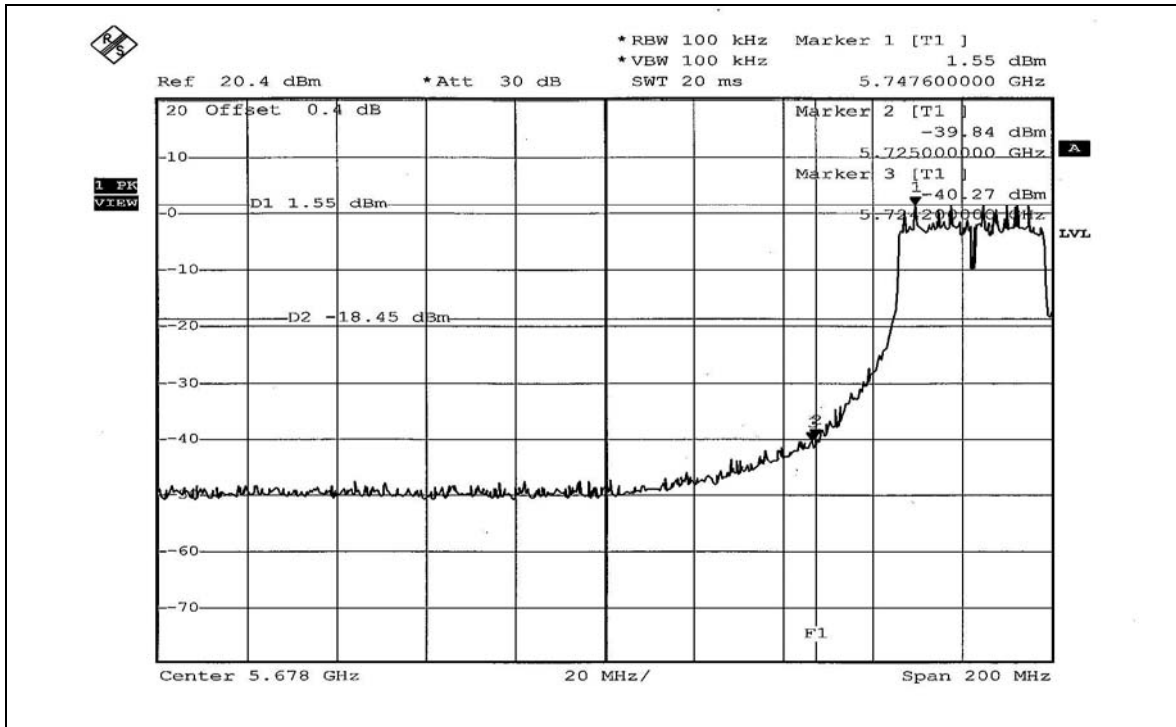


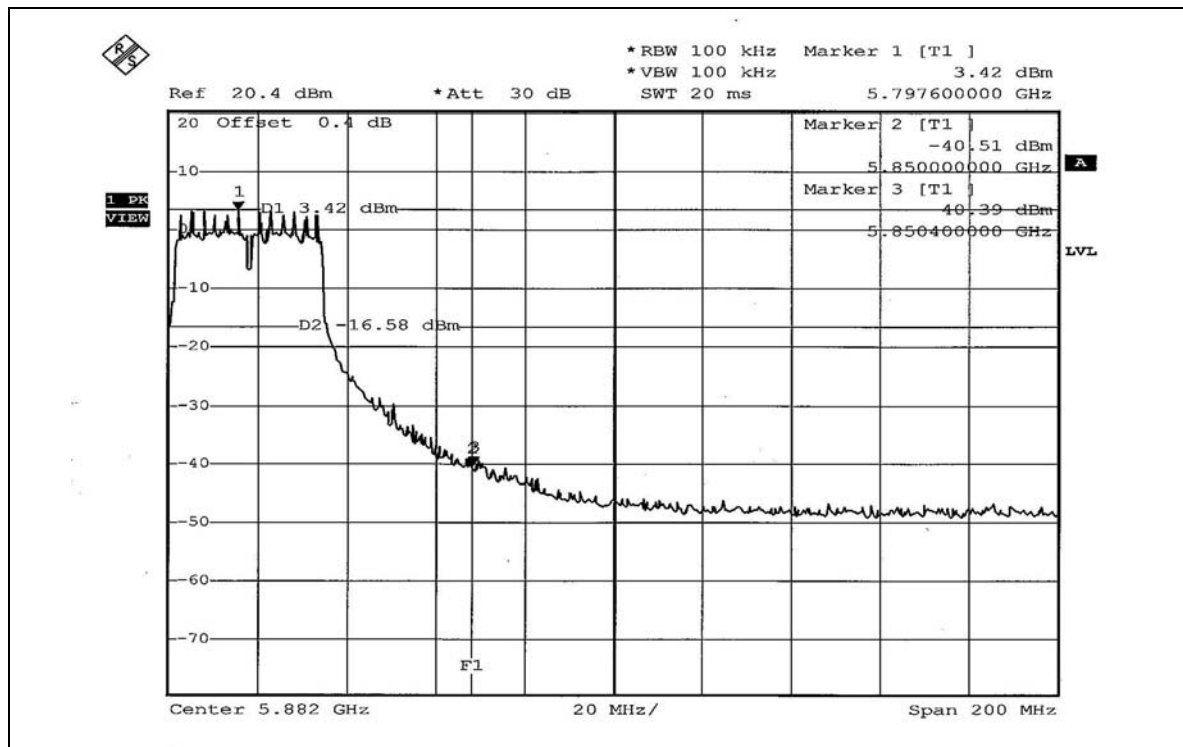
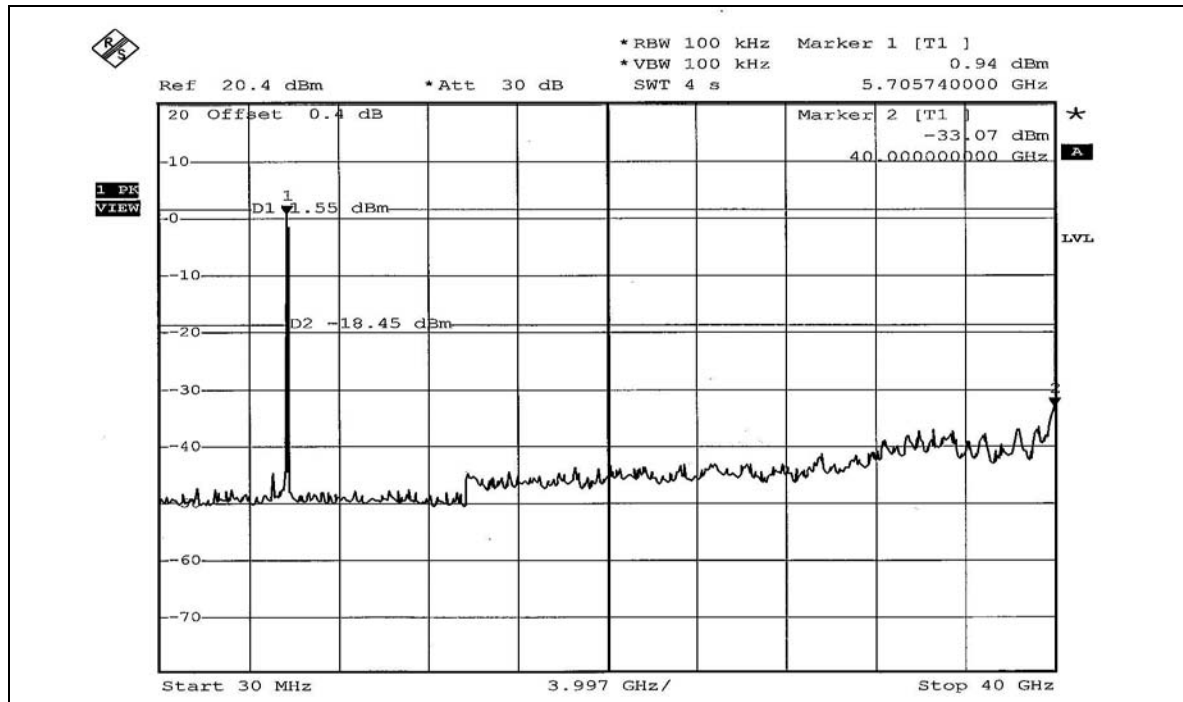




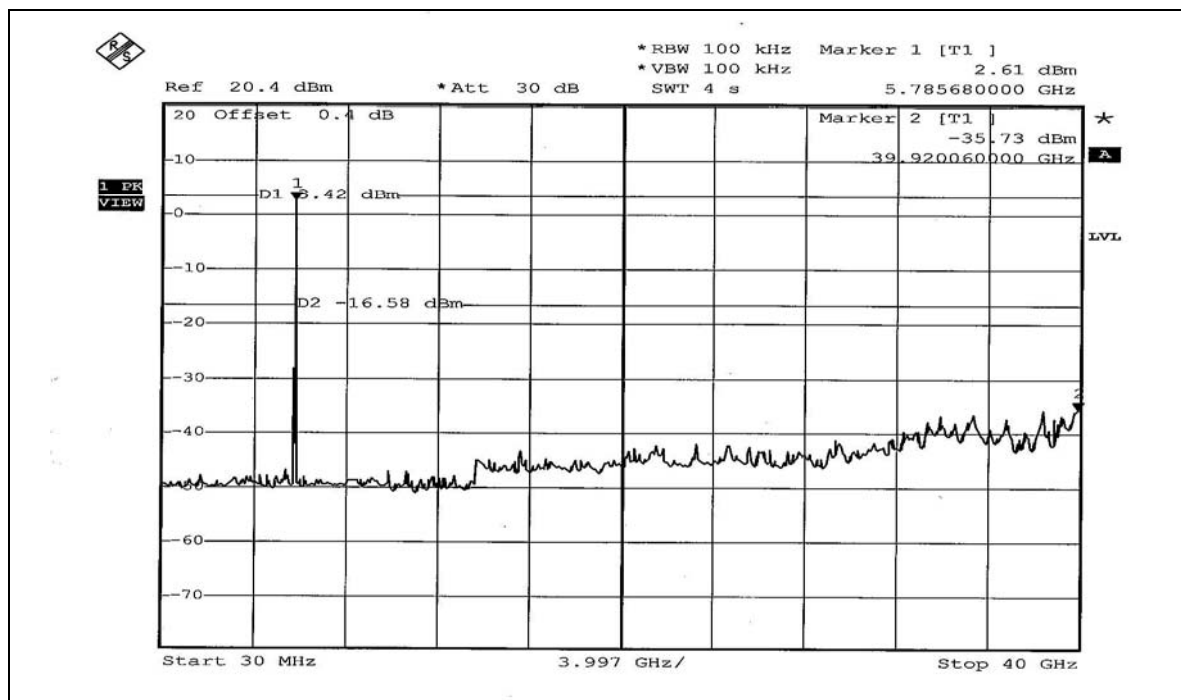
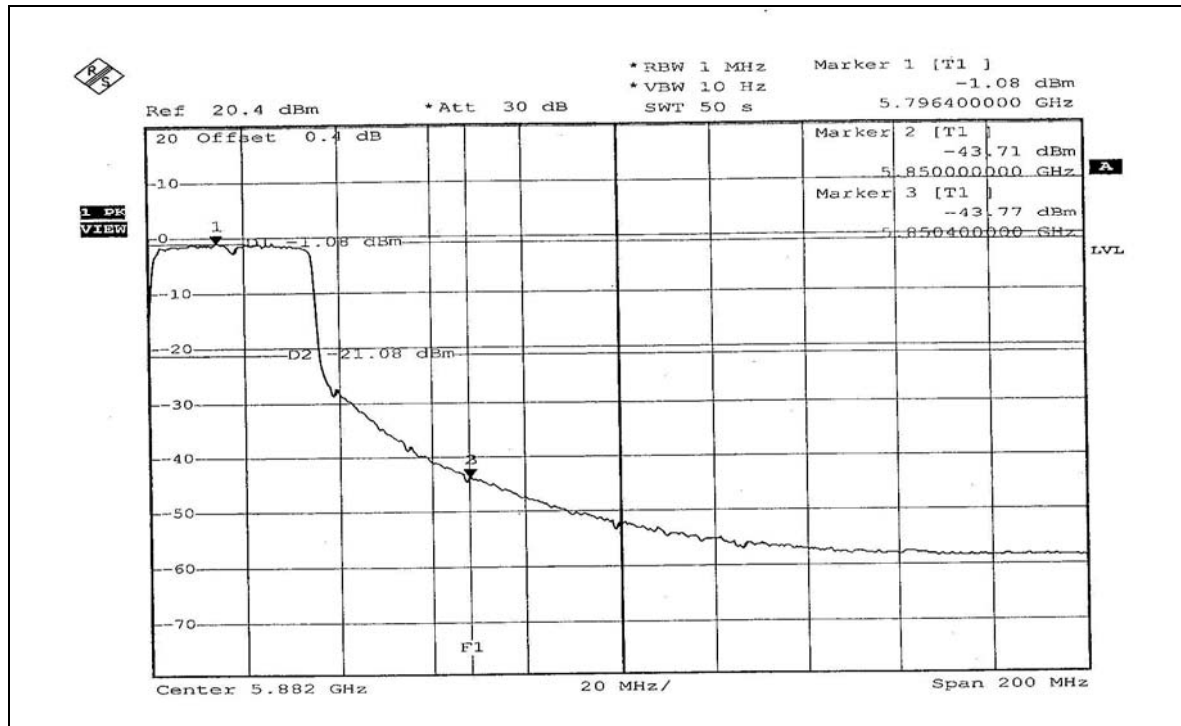


802.11a Turbo OFDM modulation











## **5.7 ANTENNA REQUIREMENT**

### **5.7.1 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(a), 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.

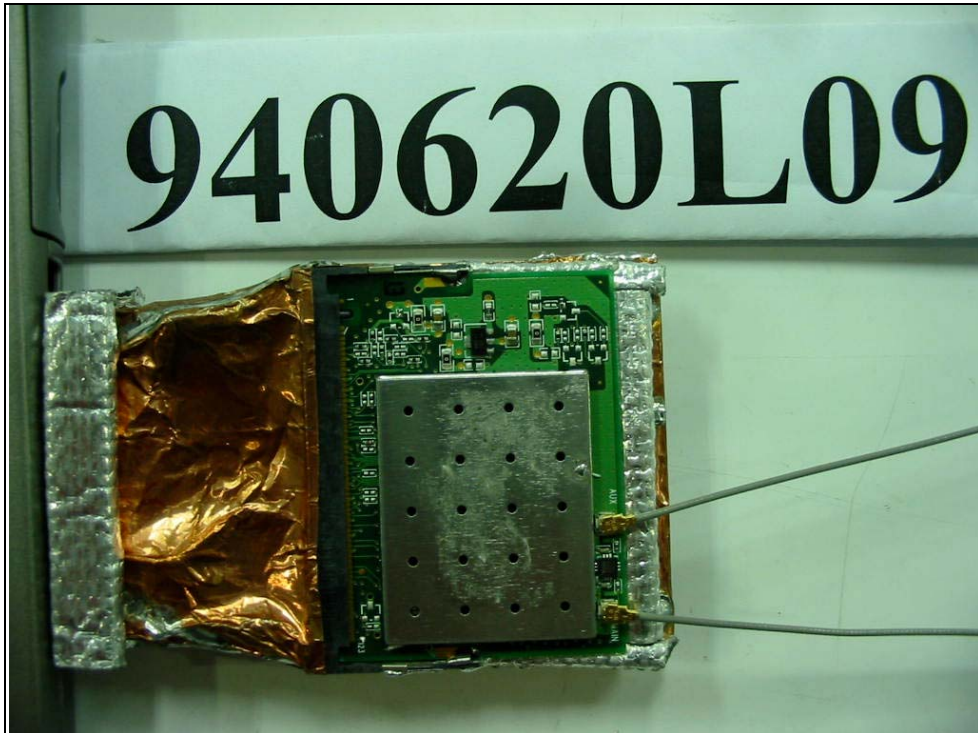
### **5.7.2 ANTENNA CONNECTED CONSTRUCTION**

The antenna used in this product is Dipole antenna with UFL antenna connector. The maximum Gain of the antenna is 1.2dBi.

## 6. PHOTOGRAPHS OF THE TEST CONFIGURATION

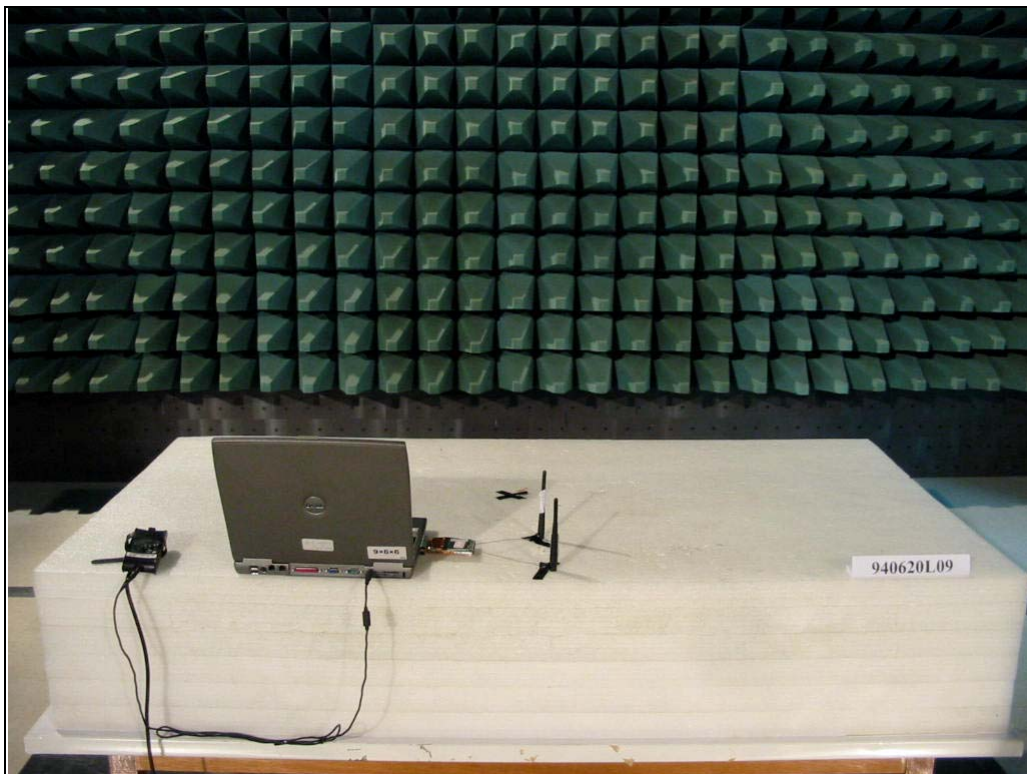
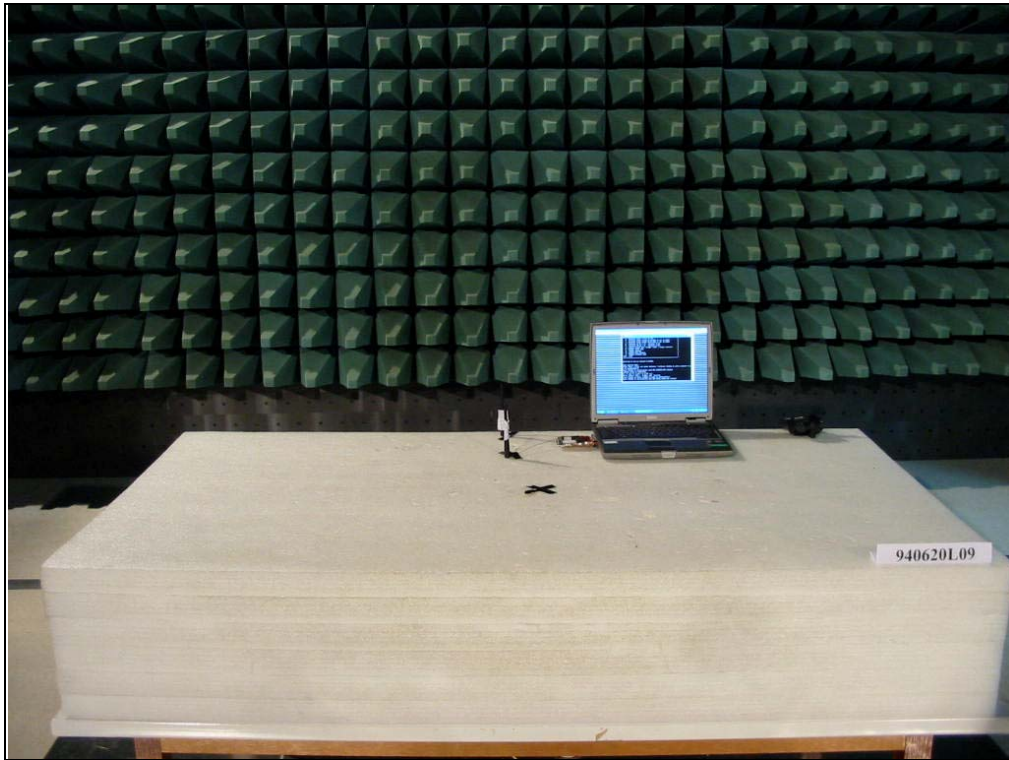
### CONDUCTED EMISSION TEST







### RADIATED EMISSION TEST







## 7. 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, NVLAP, 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). If you have any comments, please feel free to contact us at the following:

**Linko EMC/RF Lab:**

Tel: 886-2-26052180

Fax: 886-2-26052943

**Hsin Chu EMC/RF Lab:**

Tel: 886-3-5935343

Fax: 886-3-5935342

**Hwa Ya EMC/RF/Safety Telecom Lab:**

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