

**802.11a Turbo OFDM modulation**

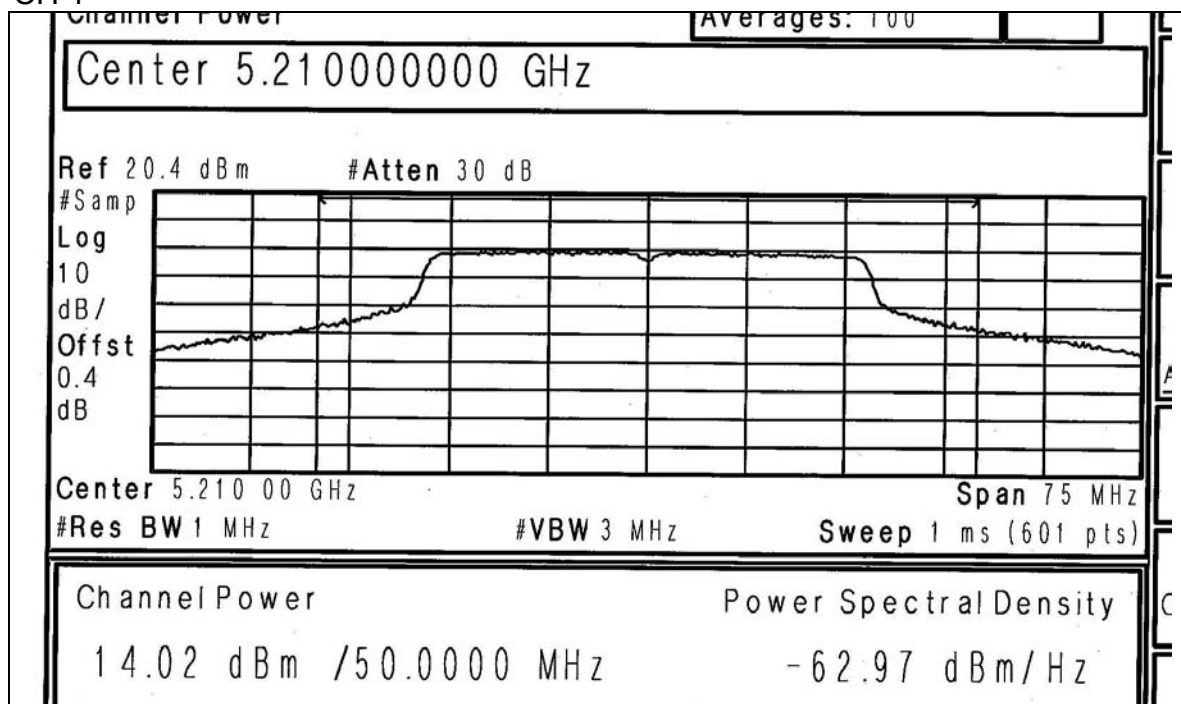
EUT	Mini PCI Wireless Adapter	MODEL	GN-WI01HT
MODULATION TYPE	BPSK	TRANSFER RATE	12Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	25deg.C, 64%RH, 991hPa
TESTED BY	Brad Wu		

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (mW)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (dBm)	26dBc Occupied Bandwidth (MHz)	PASS/FAIL
1	5210	25.235	14.02	17.00	49.14	PASS
2	5250	25.410	14.05	17.00	50.96	PASS
3	5290	19.999	13.01	24.00	48.58	PASS

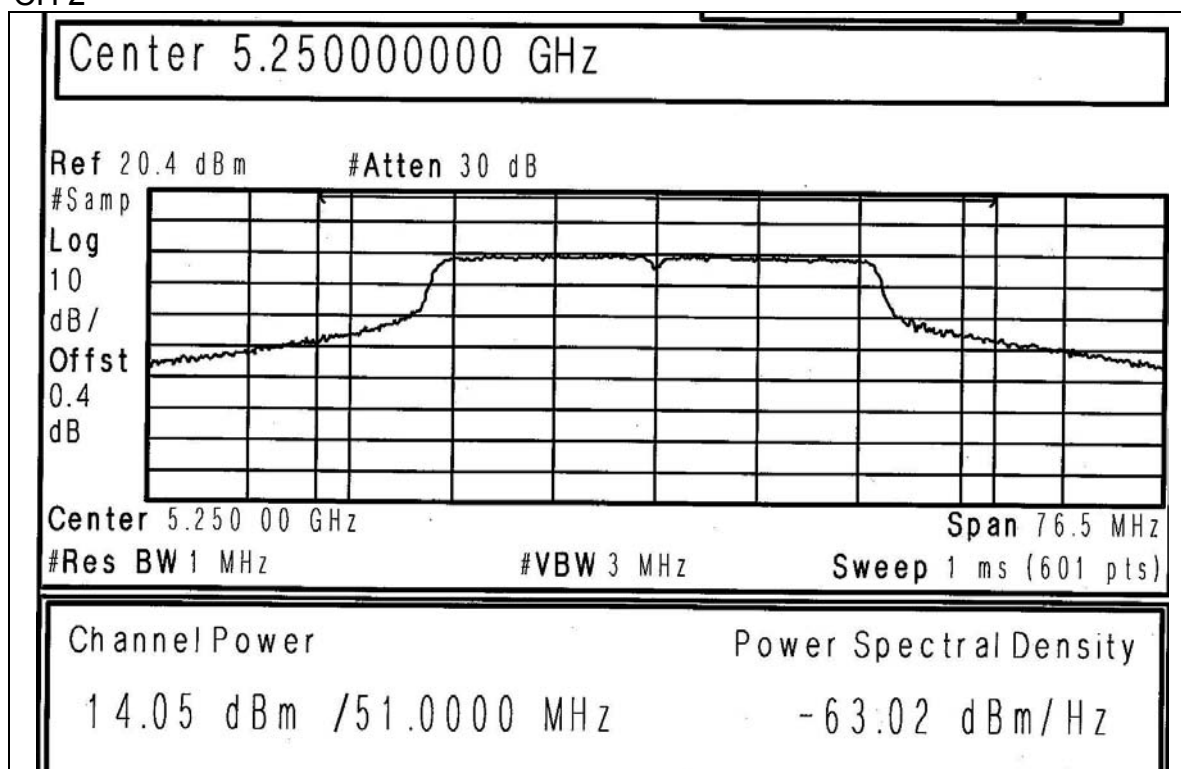
NOTE: The 26dBc Occupied Bandwidth plot, please refer to the following pages.

Peak Power Output:

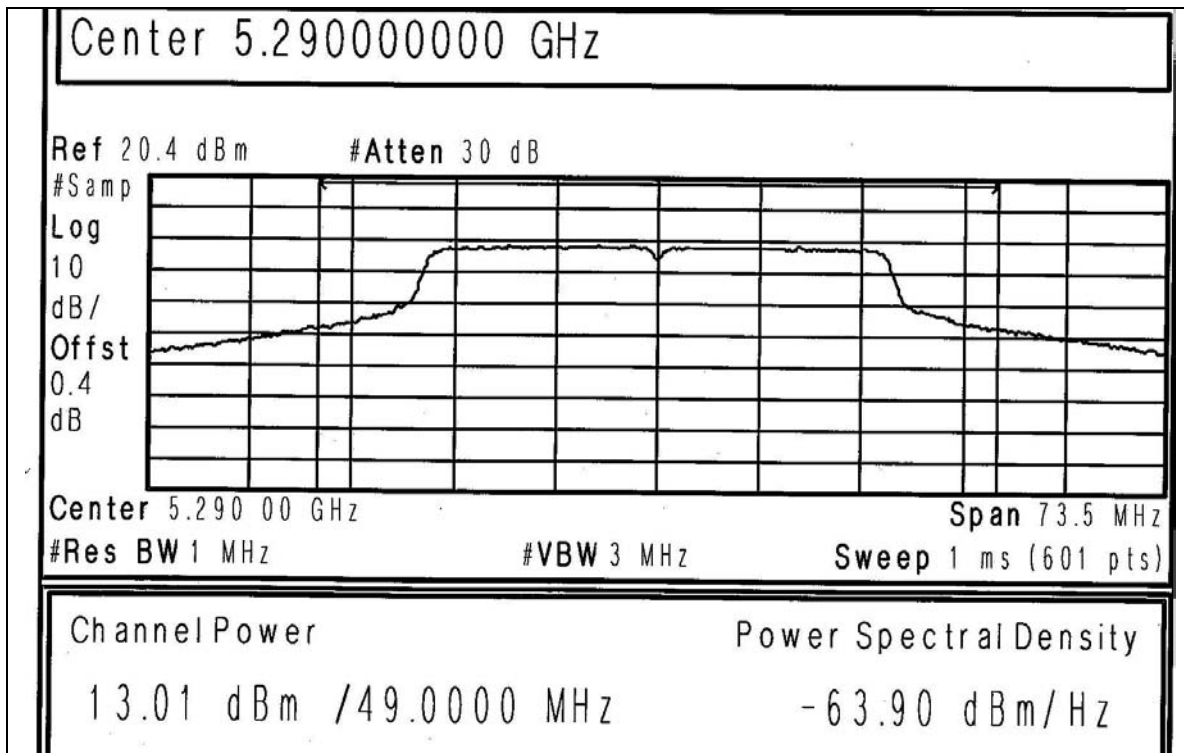
CH 1



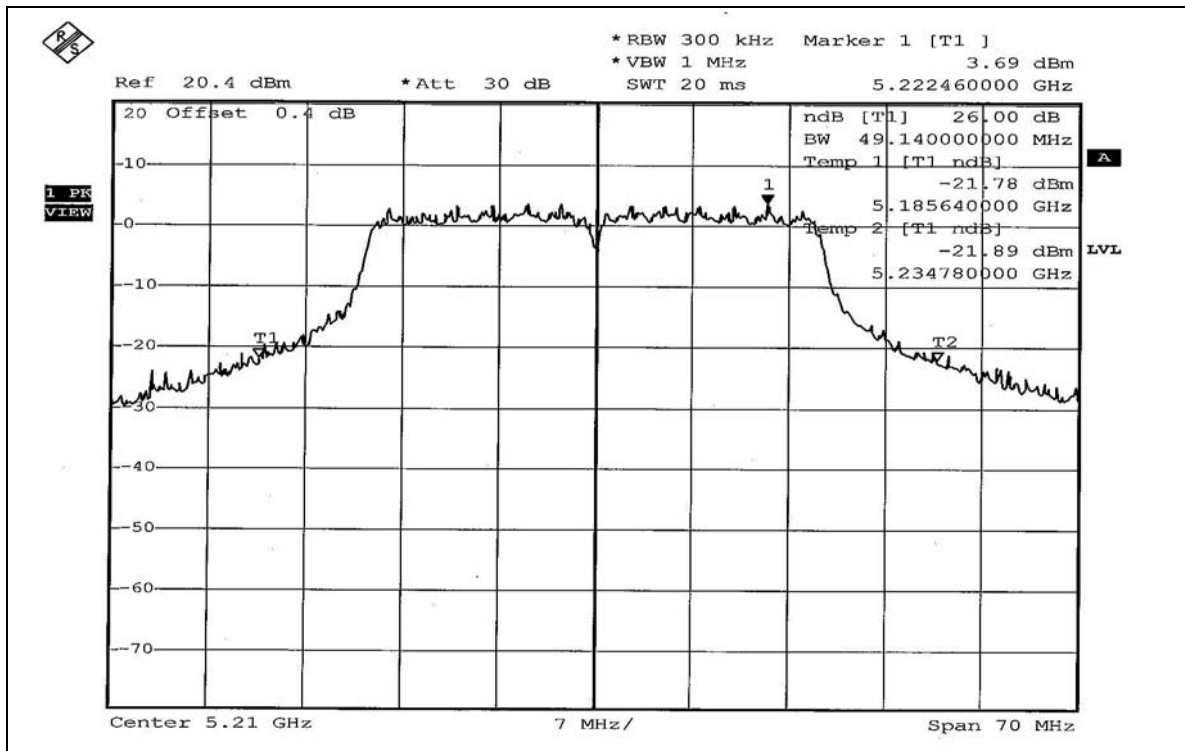
CH 2



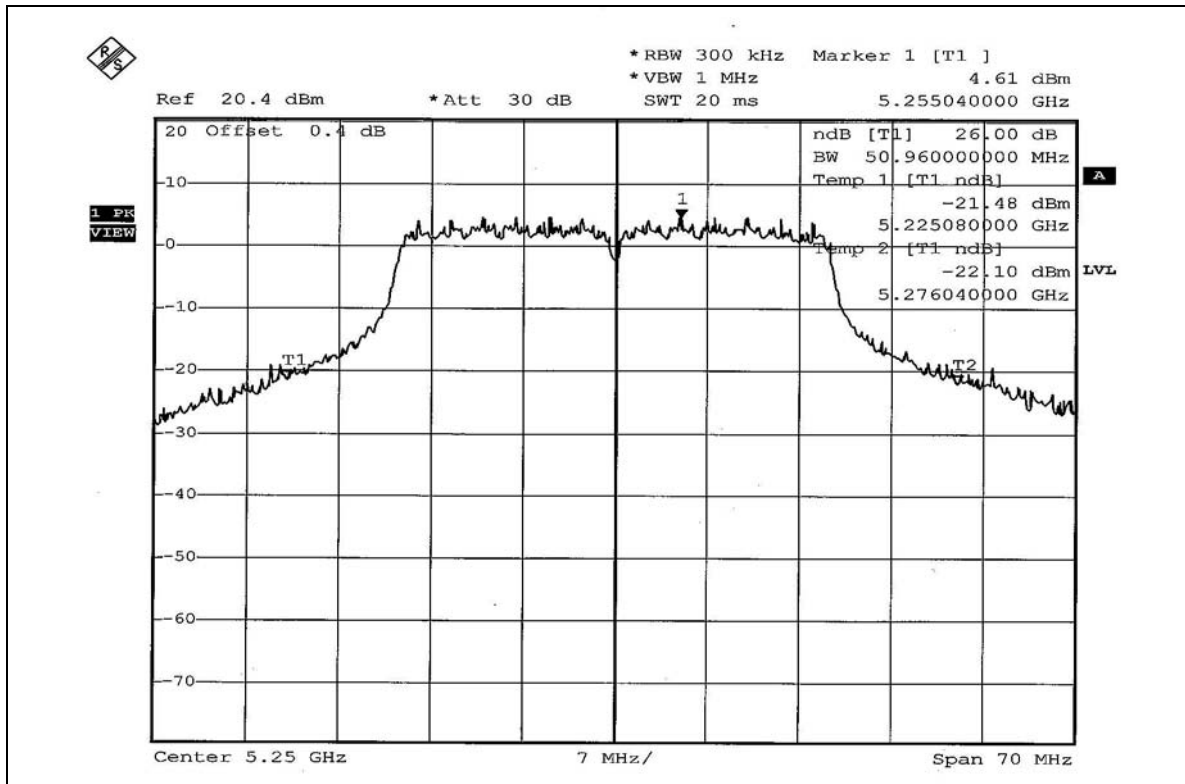
CH 3



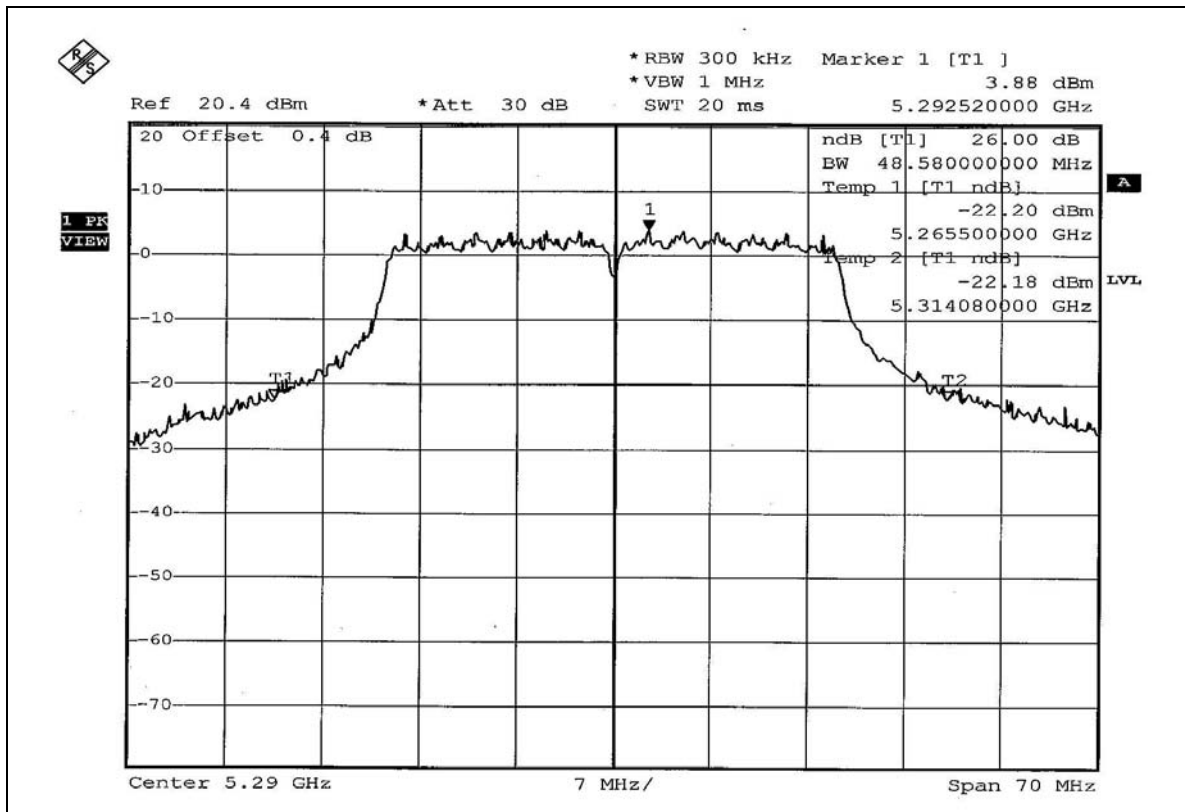
26dB Occupied Bandwidth: CH 1



CH 2



CH 3



4.4 PEAK POWER EXCURSION MEASUREMENT

4.4.1 LIMITS OF PEAK POWER EXCURSION MEASUREMENT

Frequency Band	Limit
5.15 – 5.25 GHz	13dB
5.25 – 5.35 GHz	13dB
5.725 – 5.825 GHz	13dB

4.4.2 TEST INSTRUMENTS

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

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

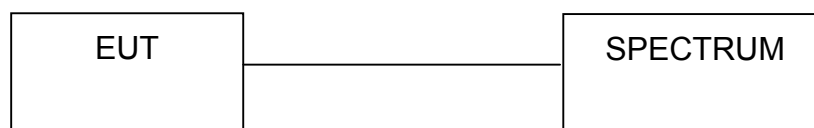
4.4.3 TEST PROCEDURE

1. The transmitter output was connected to the spectrum analyzer.
2. Set the spectrum bandwidth span to view the entire spectrum.
3. Using peak detector and Max-hold function for Trace 1 (RB=1MHz, VB=3MHz) and 2 (RB=1MHz, VB=300KHz).
4. The largest difference between Trace 1 and Trace 2 in any 1MHz band on any frequency was recorded.

4.4.4 DEVIATION FROM TEST STANDARD

No deviation

4.4.5 TEST SETUP



4.4.6 EUT OPERATING CONDITIONS

The software provided by client to enable the EUT under transmission condition continuously at specific channel frequencies individually.

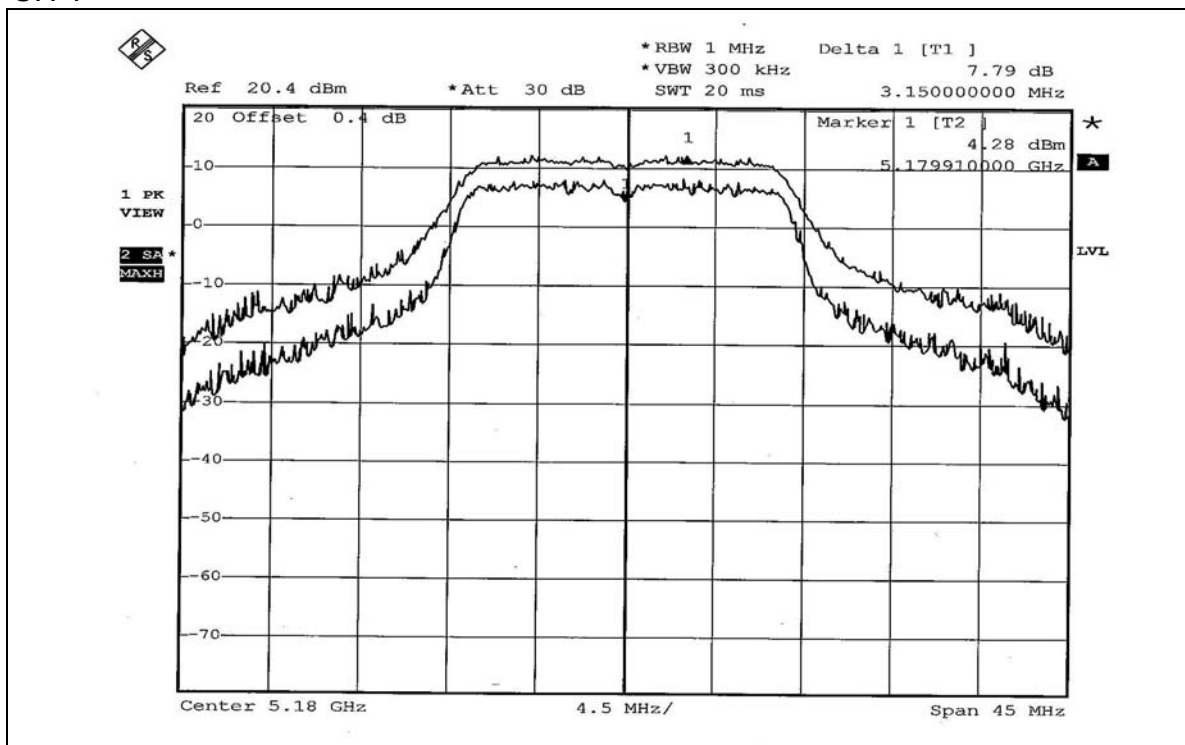
4.4.7 TEST RESULTS

802.11a OFDM modulation

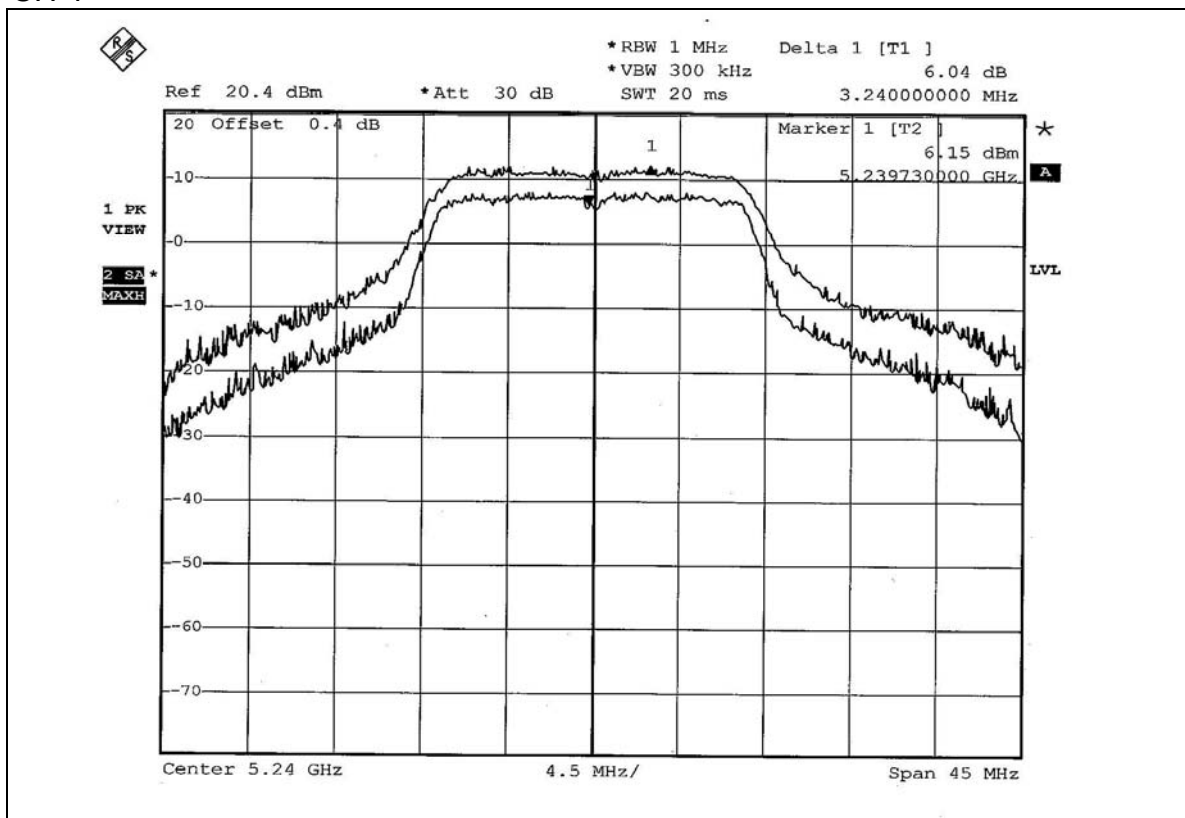
EUT	Mini PCI Wireless Adapter	MODEL	GN-WI01HT
MODULATION TYPE	BPSK	TRANSFER RATE	6Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	25deg.C, 64%RH, 991hPa
TESTED BY	Brad Wu		

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER EXCURSION (dB)	PEAK to AVERAGE EXCURSION LIMIT (dB)	PASS/FAIL
1	5180	7.79	13	PASS
4	5240	6.04	13	PASS
5	5260	7.78	13	PASS
8	5320	7.22	13	PASS

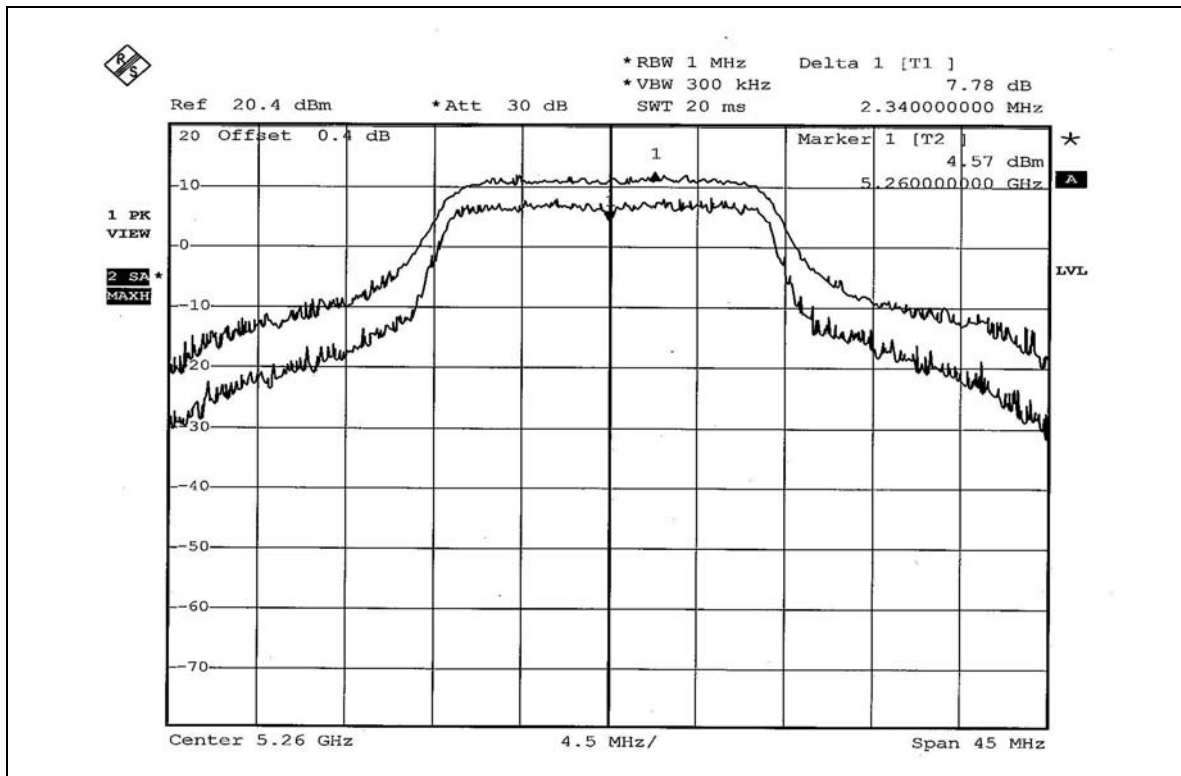
CH 1



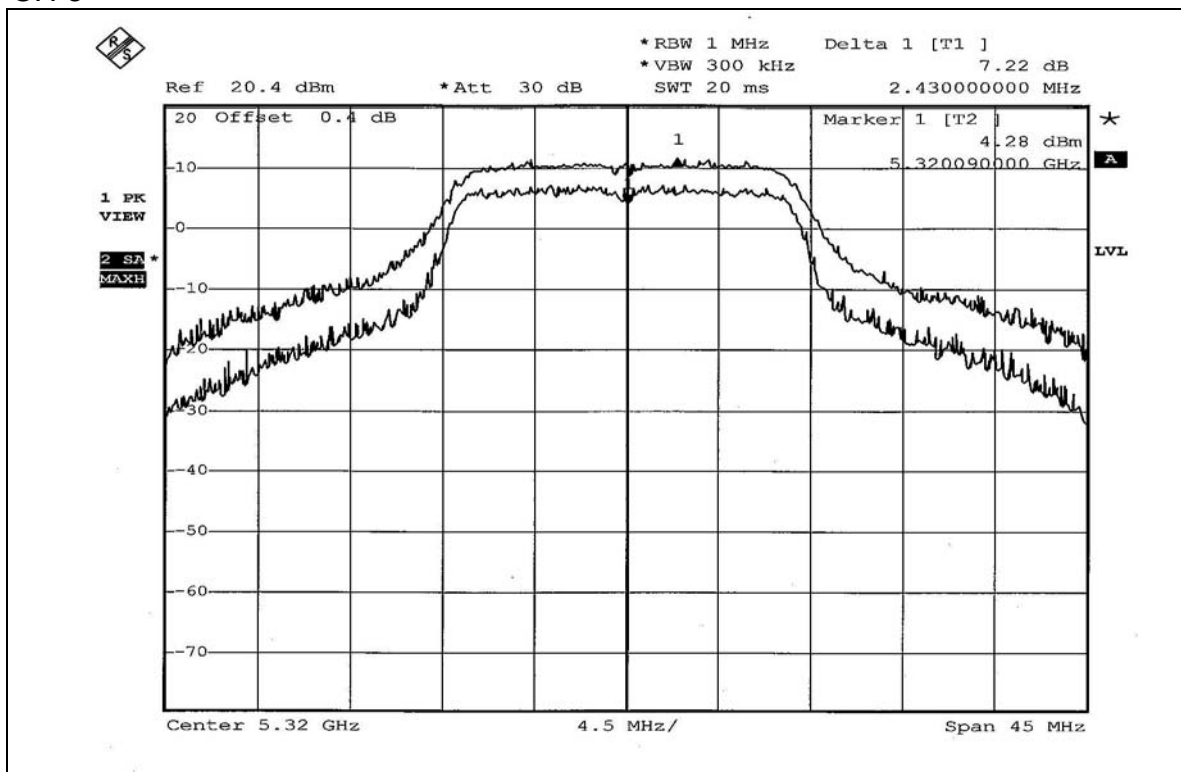
CH 4



CH 5



CH 8

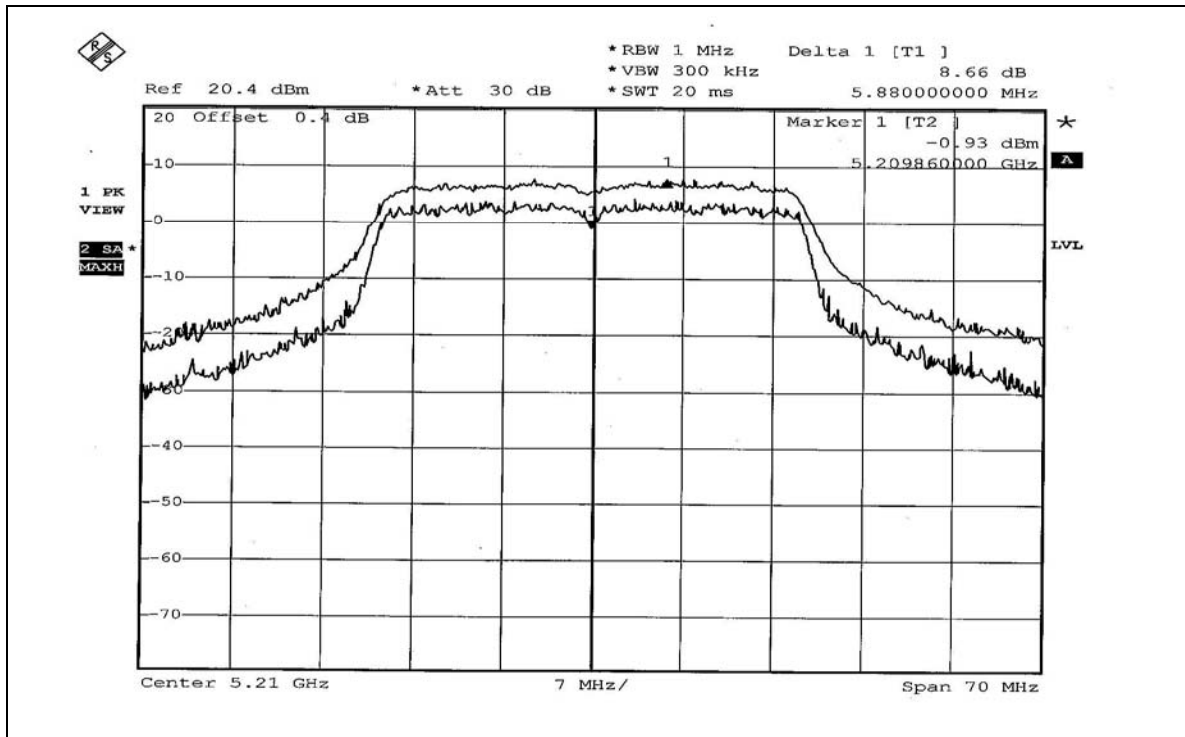


**802.11a Turbo OFDM modulation**

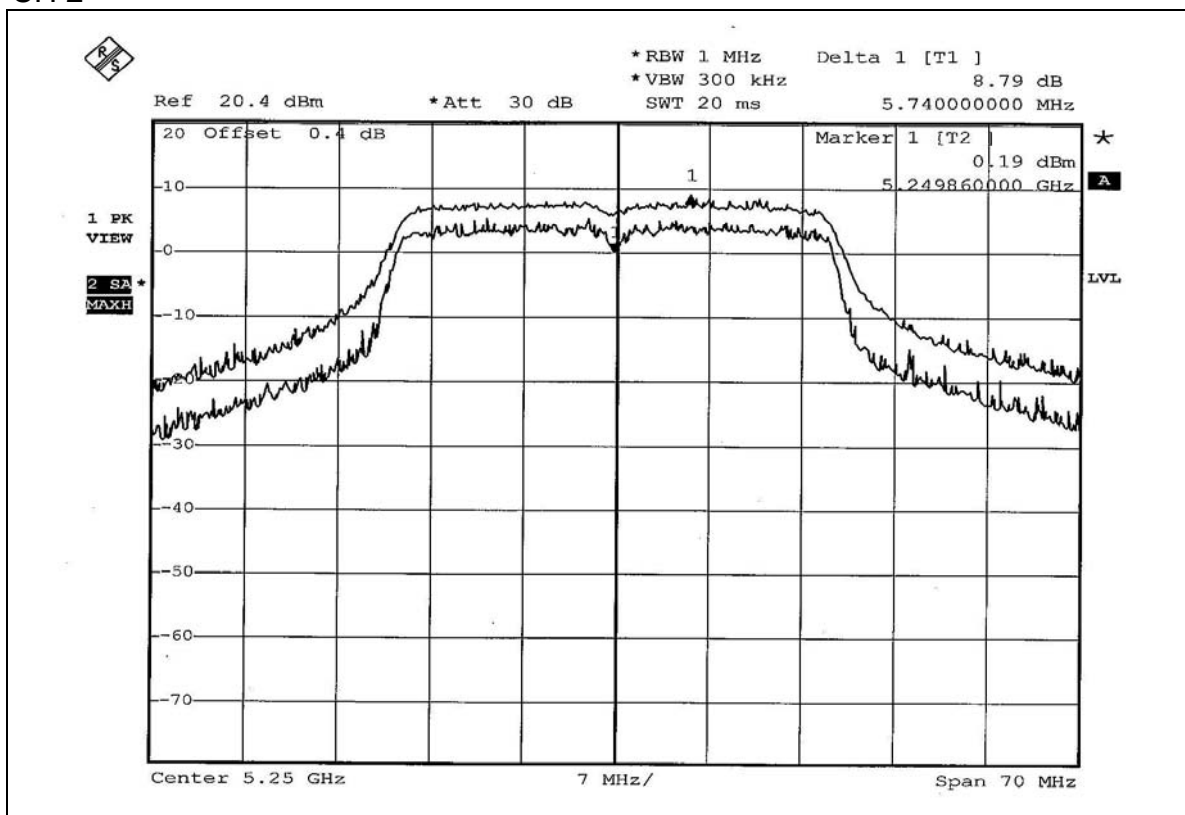
EUT	Mini PCI Wireless Adapter	MODEL	GN-WI01HT
MODULATION TYPE	BPSK	TRANSFER RATE	12Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	25deg.C, 64%RH, 991hPa
TESTED BY	Brad Wu		

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER EXCURSION (dB)	PEAK to AVERAGE EXCURSION LIMIT (dB)	PASS/FAIL
1	5210	8.66	13	PASS
2	5250	8.79	13	PASS
3	5290	8.82	13	PASS

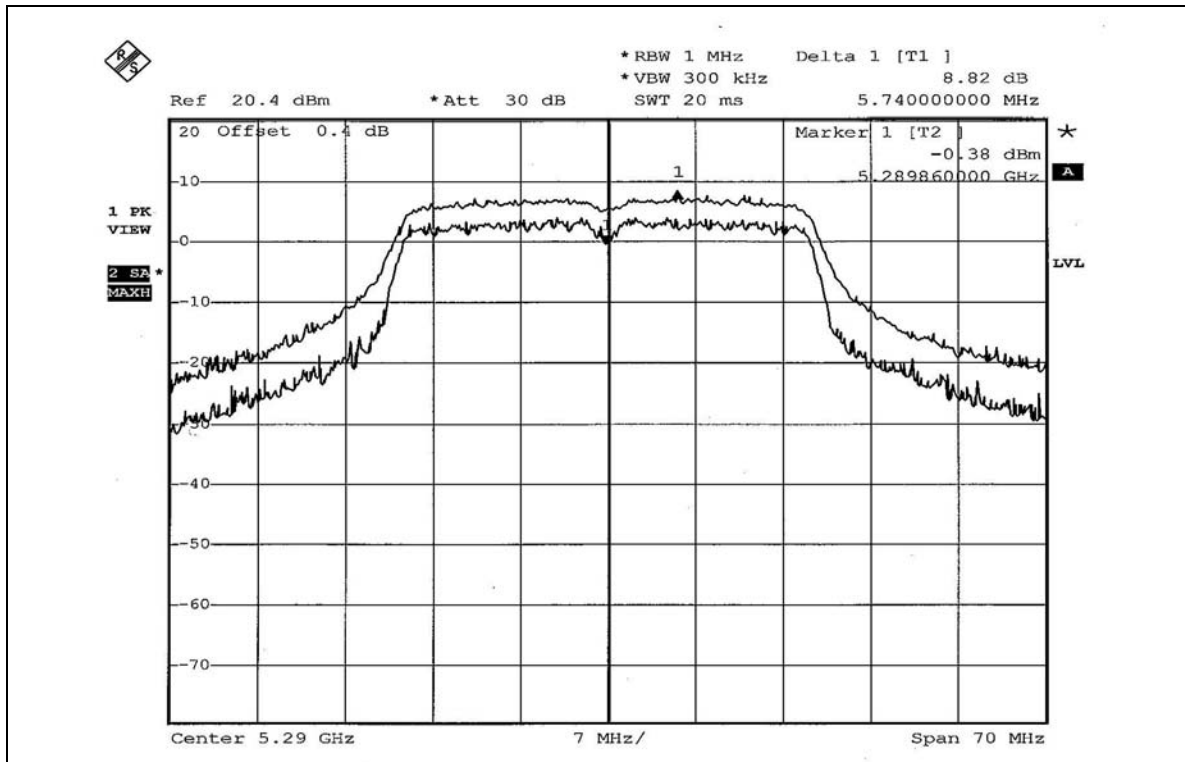
CH 1



CH 2



CH 3



4.5 PEAK POWER SPECTRAL DENSITY MEASUREMENT

4.5.1 LIMITS OF PEAK POWER SPECTRAL DENSITY MEASUREMENT

Frequency Band	Limit
5.15 ~ 5.25GHz	4dBm
5.25 ~ 5.35GHz	11dBm
5.725 ~ 5.825GHz	17dBm

4.5.2 TEST INSTRUMENTS

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

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

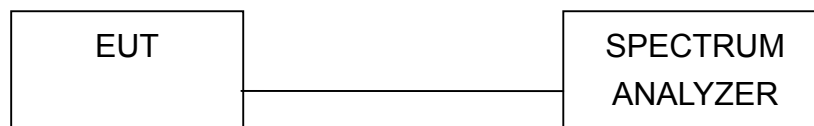
4.5.3 TEST PROCEDURES

1. The transmitter output was connected to the spectrum analyzer.
2. Set RBW=1MHz, VBW=3MHz. The PPSD is the highest level found across the emission in any 1MHz band.

4.5.4 DEVIATION FROM TEST STANDARD

No deviation

4.5.5 TEST SETUP



4.5.6 EUT OPERATING CONDITIONS

Same as 5.3.6

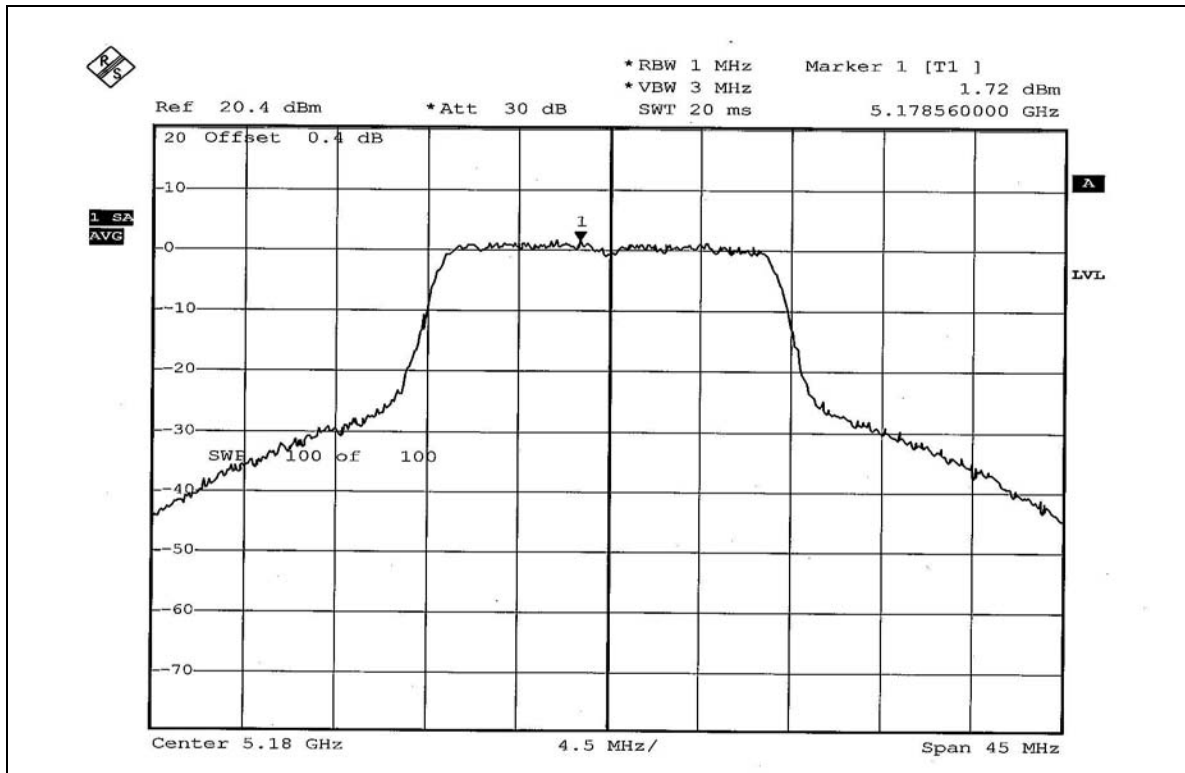
4.5.7 TEST RESULTS

802.11a OFDM modulation

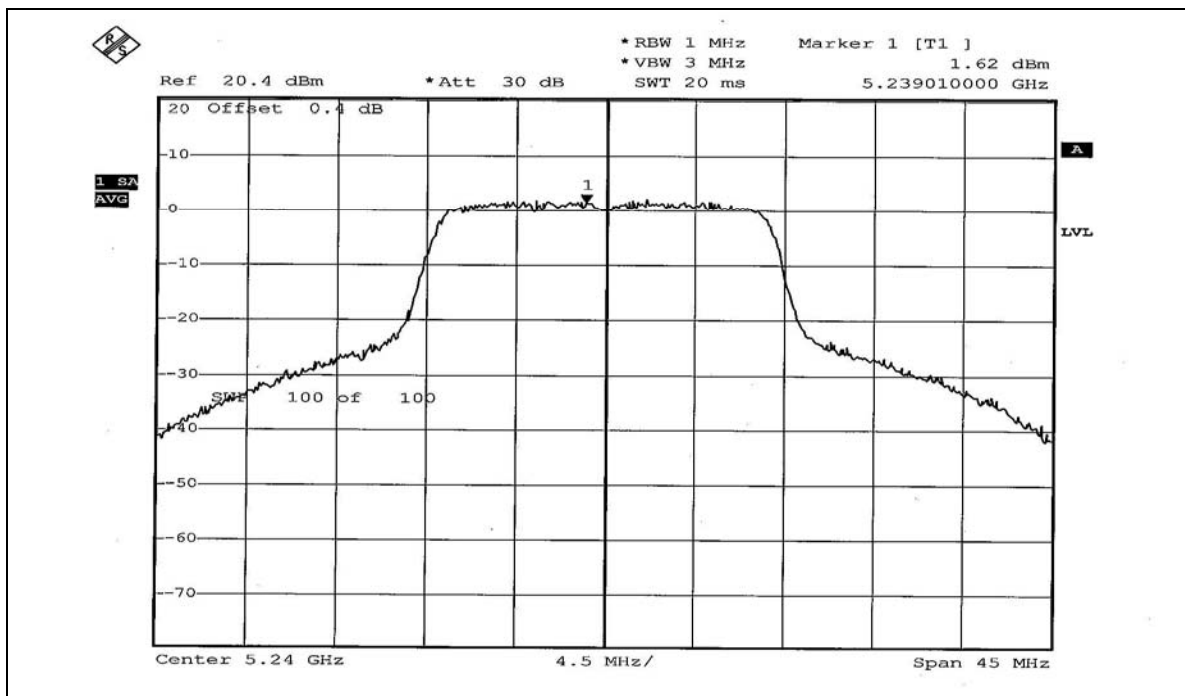
EUT	Mini PCI Wireless Adapter	MODEL	GN-WI01HT
MODULATION TYPE	BPSK	TRANSFER RATE	6Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	25deg.C, 64%RH, 991hPa
TESTED BY	Brad Wu		

CHANNEL	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 1MHz BW (dBm)	MAXIMUM LIMIT (dBm)	PASS/FAIL
1	5180	1.72	4	PASS
4	5240	1.62	4	PASS
5	5260	1.75	11	PASS
8	5320	1.23	11	PASS

CH 1



CH 4



Ref 20.4 dBm *Att 30 dB *RBW 1 MHz Marker 1 [T1] 1.75 dBm
 *VBW 3 MHz SWT 20 ms 5.262880000 GHz

20 Offset 0.4 dB

1 SA
 AVG

100 of 100

Center 5.26 GHz 4.5 MHz/ Span 45 MHz

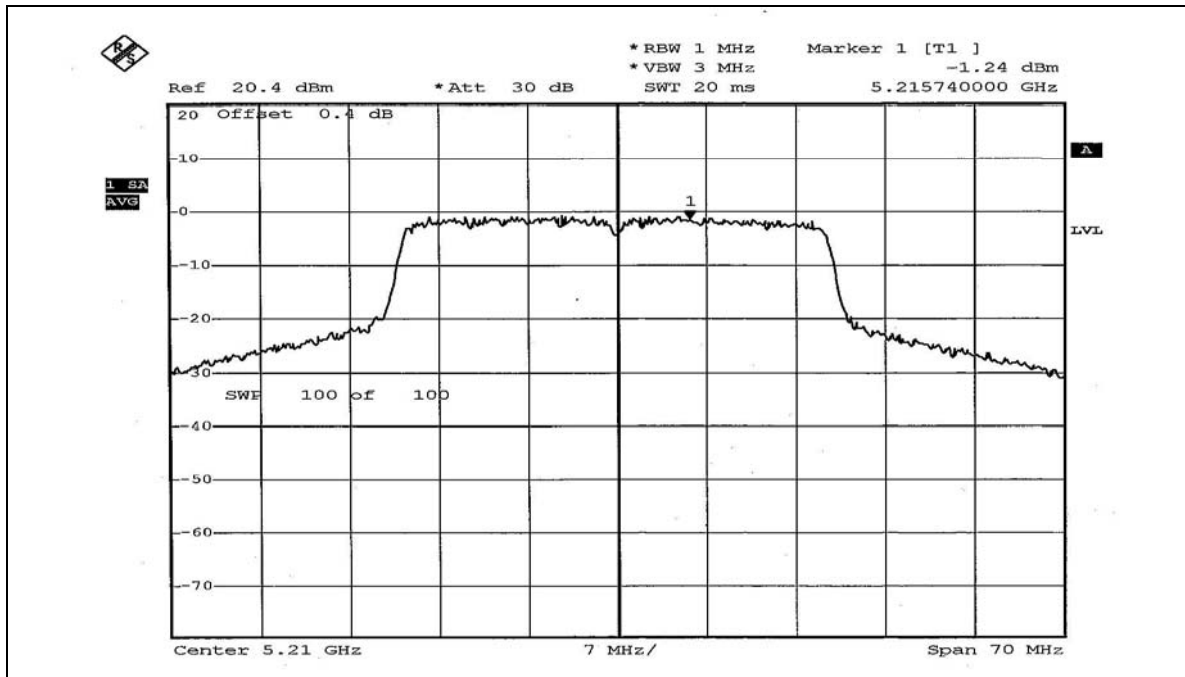
Ref 20.4 dBm *Att 30 dB *RBW 1 MHz Marker 1 [T1] 1.23 dBm
 5.321080000 GHz
 20 Offset 0.4 dB
 1 SA
 AVG
 100 of 100
 LVL
 Center 5.32 GHz 4.5 MHz/ Span 45 MHz

**802.11a Turbo OFDM modulation**

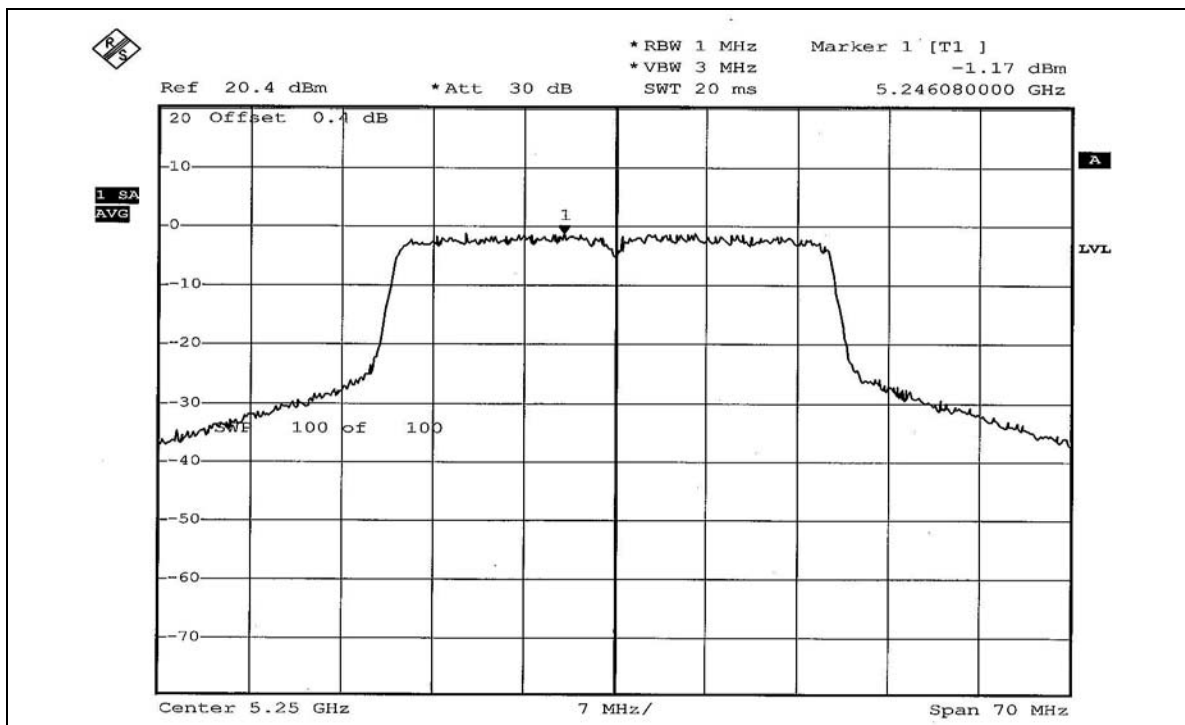
EUT	Mini PCI Wireless Adapter	MODEL	GN-WI01HT
MODULATION TYPE	BPSK	TRANSFER RATE	12Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	25deg.C, 64%RH, 991hPa
TESTED BY	Brad Wu		

CHANNEL	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 1 MHz BW (dBm)	MAXIMUM LIMIT (dBm)	PASS/FAIL
1	5210	-1.24	4	PASS
2	5250	-1.17	11	PASS
3	5290	-2.08	11	PASS

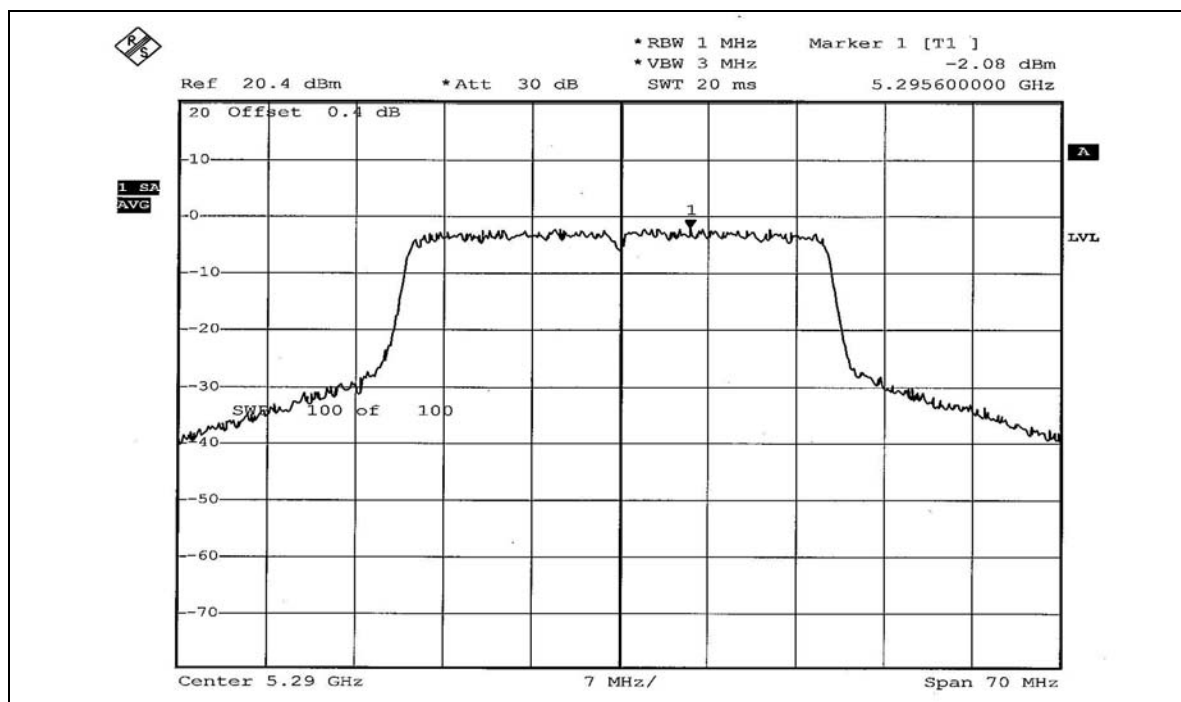
CH 1



CH 2



CH 3



4.6 FREQUENCY STABILITY

4.6.1 LIMITS OF FREQUENCY STABILITY MEASUREMENT

The frequency tolerance of the carrier signal shall be maintained within +/- 0.02% of the operating frequency over a temperature variation of -30 degrees to 50 degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C.

4.6.2 TEST INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
ANRITSU SPECTRUM ANALYZER	MS2667C	M10281	Aug. 12, 2005
WIT STANDARD TEMPERATURE AND HUMIDITY CHAMBER	TH-4S-C	W901030	Aug. 12, 2005

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

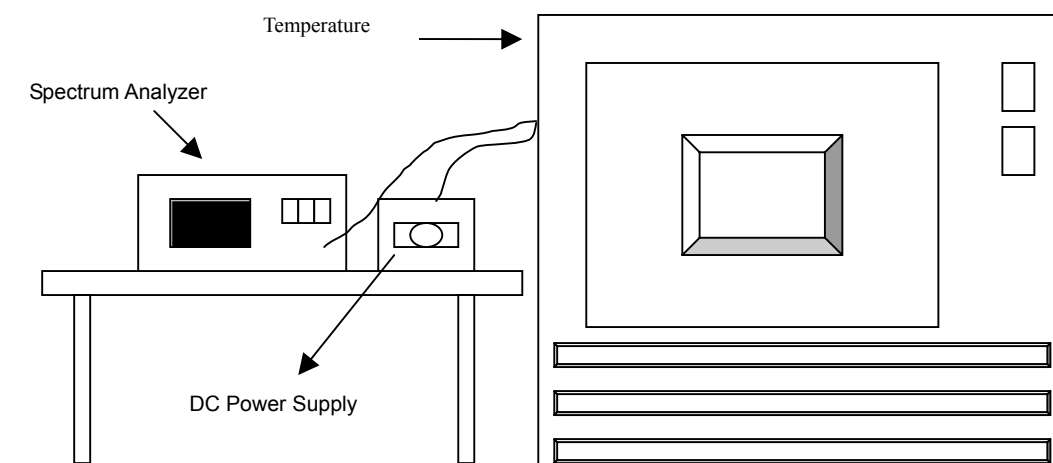
4.6.3 TEST PROCEDURE

1. The EUT was placed inside the environmental test chamber and powered by nominal DC voltage.
2. Turn the EUT on and couple its output to a spectrum analyzer.
3. Turn the EUT off and set the chamber to the highest temperature specified.
4. Allow sufficient time (approximately 30 min) for the temperature of the chamber to stabilize, turn the EUT on and measure the operating frequency after 2, 5, and 10 minutes.
5. Repeat step 2 and 3 with the temperature chamber set to the lowest temperature.
6. The test chamber was allowed to stabilize at +20 degree C for a minimum of 30 minutes. The supply voltage was then adjusted on the EUT from 85% to 115% and the frequency record.

4.6.4 DEVIATION FROM TEST STANDARD

No deviation

4.6.5 TEST SETUP



4.6.6 EUT OPERATING CONDITION

Same as Item 4.3.6

4.6.7 TEST RESULTS

Operating frequency: 5320MHz						Limit : $\pm 0.015\%$			
Temp. (°C)	Power supply (Vac)	0 minute		2 minute		5 minute		10 minute	
		(MHz)	(%)	(MHz)	(%)	(MHz)	(%)	(MHz)	(%)
50	138	5319.9701	-0.0005616	5319.9702	-0.0005608	5319.9702	-0.0005610	5319.9702	-0.0005609
	120	5319.9701	-0.0005614	5319.9701	-0.0005615	5319.9701	-0.0005617	5319.9702	-0.0005610
	102	5319.9702	-0.0005609	5319.9702	-0.0005609	5319.9702	-0.0005606	5319.9701	-0.0005614
40	138	5319.9736	-0.0004960	5319.9737	-0.0004948	5319.9736	-0.0004958	5319.9736	-0.0004956
	120	5319.9736	-0.0004954	5319.9737	-0.0004951	5319.9737	-0.0004952	5319.9736	-0.0004959
	102	5319.9736	-0.0004956	5319.9736	-0.0004958	5319.9737	-0.0004952	5319.9736	-0.0004955
30	138	5319.9774	-0.0004251	5319.9773	-0.0004260	5319.9773	-0.0004263	5319.9774	-0.0004252
	120	5319.9773	-0.0004262	5319.9774	-0.0004254	5319.9773	-0.0004264	5319.9774	-0.0004249
	102	5319.9773	-0.0004260	5319.9774	-0.0004256	5319.9774	-0.0004255	5319.9773	-0.0004261
20	138	5319.9809	-0.0003585	5319.9810	-0.0003578	5319.9809	-0.0003584	5319.9810	-0.0003579
	120	5319.9809	-0.0003583	5319.9810	-0.0003580	5319.9809	-0.0003586	5319.9809	-0.0003583
	102	5319.9809	-0.0003586	5319.9810	-0.0003379	5319.9809	-0.0003582	5319.9809	-0.0003586
10	138	5319.9820	-0.0003379	5319.9820	-0.0003375	5319.9821	-0.0003369	5319.9821	-0.0003369
	120	5319.9820	-0.0003375	5319.9820	-0.0003371	5319.9821	-0.0003373	5319.9821	-0.0003373
	102	5319.9820	-0.0003377	5319.9821	-0.0002638	5319.9820	-0.0003377	5319.9820	-0.0003381
0	138	5319.9859	-0.0002645	5319.9860	-0.0002646	5319.9859	-0.0002643	5319.9859	-0.0002642
	120	5319.9859	-0.0002645	5319.9859	-0.0002636	5319.9860	-0.0002634	5319.9859	-0.0002648
	102	5319.9860	-0.0002637	5319.9860	-0.0001787	5319.9860	-0.0002638	5319.9859	-0.0002646
-10	138	5319.9904	-0.0001798	5319.9905	-0.0001795	5319.9905	-0.0001788	5319.9904	-0.0001798
	120	5319.9905	-0.0001790	5319.9904	-0.0001797	5319.9905	-0.0001792	5319.9904	-0.0001802
	102	5319.9905	-0.0001792	5319.9904	0.0004355	5319.9904	-0.0001797	5319.9904	-0.0001804
-20	138	5320.0231	0.0004350	5320.0232	0.0004348	5320.0232	0.0004358	5320.0232	0.0004354
	120	5320.0232	0.0004359	5320.0231	0.0004354	5320.0232	0.0004354	5320.0232	0.0004357
	102	5320.0232	0.0004356	5320.0232	0.0005793	5320.0231	0.0004349	5320.0232	0.0004358
-30	138	5320.0303	0.0005701	5320.0308	0.0011365	5320.0308	0.0005797	5320.0310	0.0005821
	120	5320.0306	0.0005748	5320.0605	0.0005709	5320.0306	0.0005754	5320.0306	0.0005759
	102	5320.0303	0.0005703	5320.0304	0.0005709	5320.0303	0.0005703	5320.0303	0.0005686

4.7 BAND EDGES MEASUREMENT

4.7.1 TEST INSTRUMENTS

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

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

4.7.2 TEST PROCEDURE

The transmitter output was connected to the spectrum analyzer via a low lose cable. Set both RBW and VBW of spectrum analyzer to 1MHz with suitable frequency span including 100 MHz bandwidth from band edge. The band edges was measured and recorded.

4.7.3 EUT OPERATING CONDITION

The software provided by client to enable the EUT under transmission condition continuously at specific channel frequencies individually.

4.7.4 TEST RESULTS

For signals in the restricted bands above and below the 5.15 to 5.35GHz allocated band a measurement was made of the amplitude of the spurious emissions with respect to the intentional signals. The relative amplitude, in dBc, was applied to the average and peak filed strength of the intentional signal made on the OATS to calculate the field strength of the unintentional signals.

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

**802.11a OFDM modulation****Channel 1 (5180MHz)**

The band edge emission plot on page 64 shows 40.12dBc between carrier maximum power and local maximum emission in restrict band. The emission of carrier strength list in the test result of channel 1 is 106.58dBuV/m (Peak), so the maximum field strength in restrict band is $106.58 - 40.12 = 66.46$ dBuV/m which is under 74dBuV/m limit.

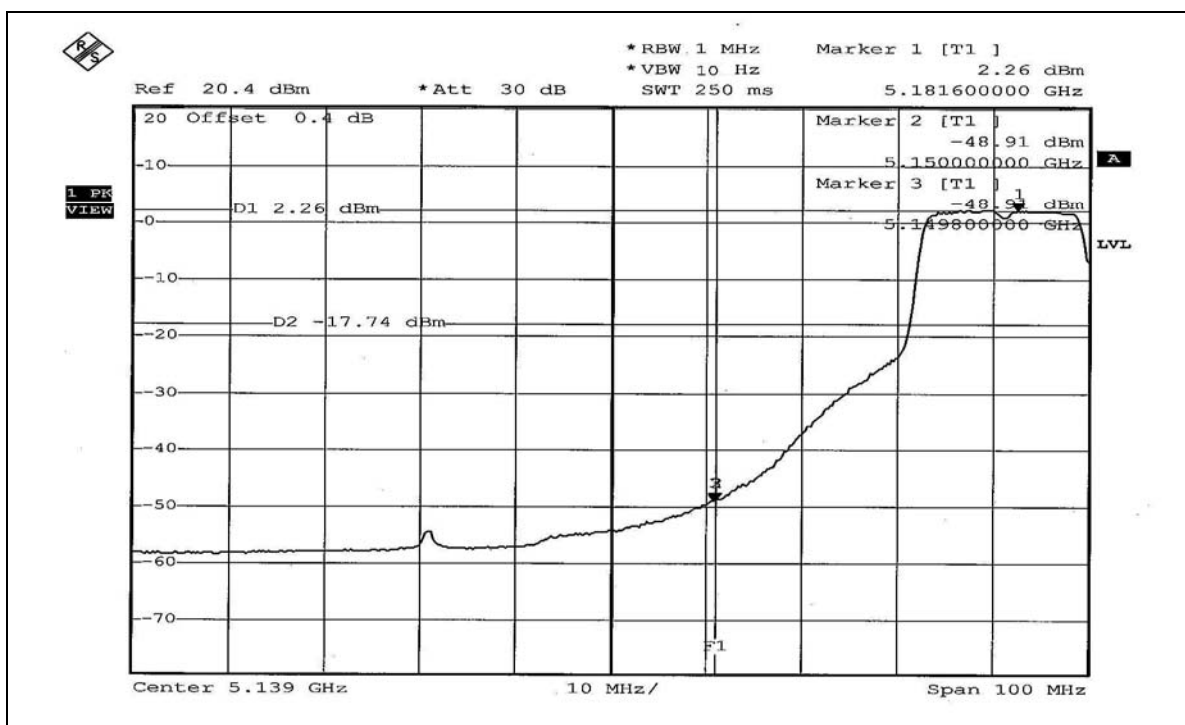
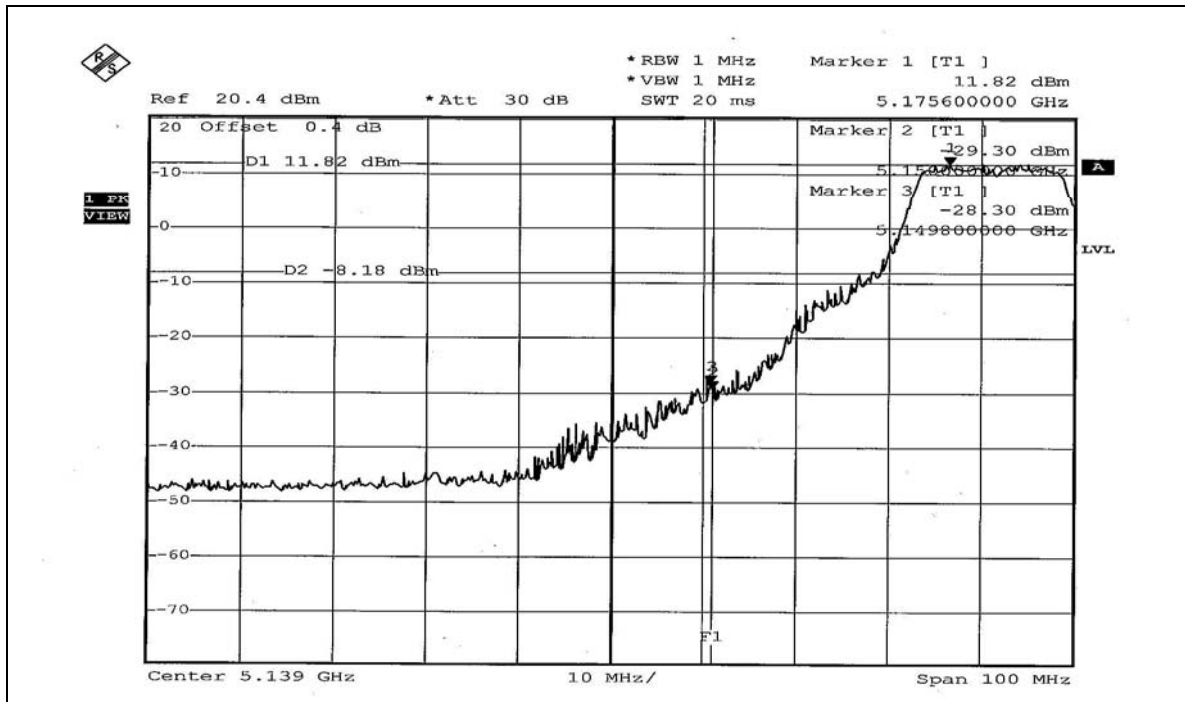
The band edge emission plot on page 64 shows 51.17dBc between carrier maximum power and local maximum emission in restrict band. The emission of carrier strength list in the test result of channel 1 is 96.58dBuV/m (Average), so the maximum field strength in restrict band is $96.58 - 51.17 = 45.41$ dBuV/m which is under 54dBuV/m limit.

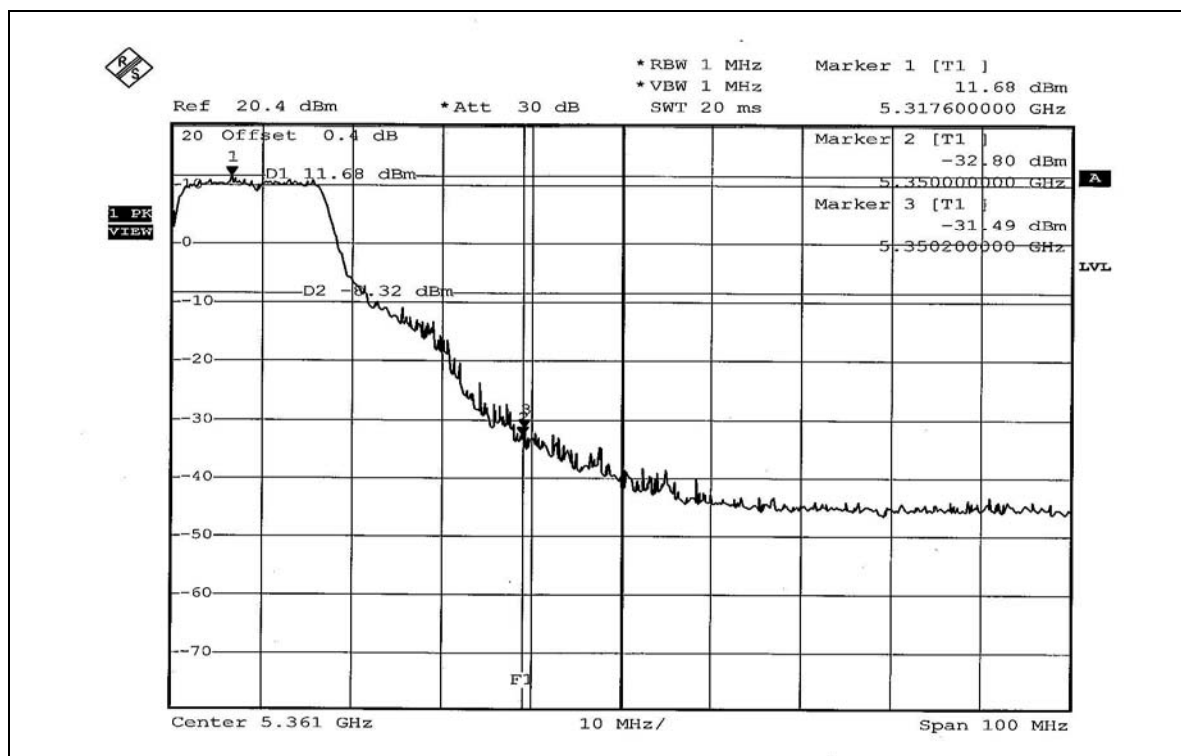
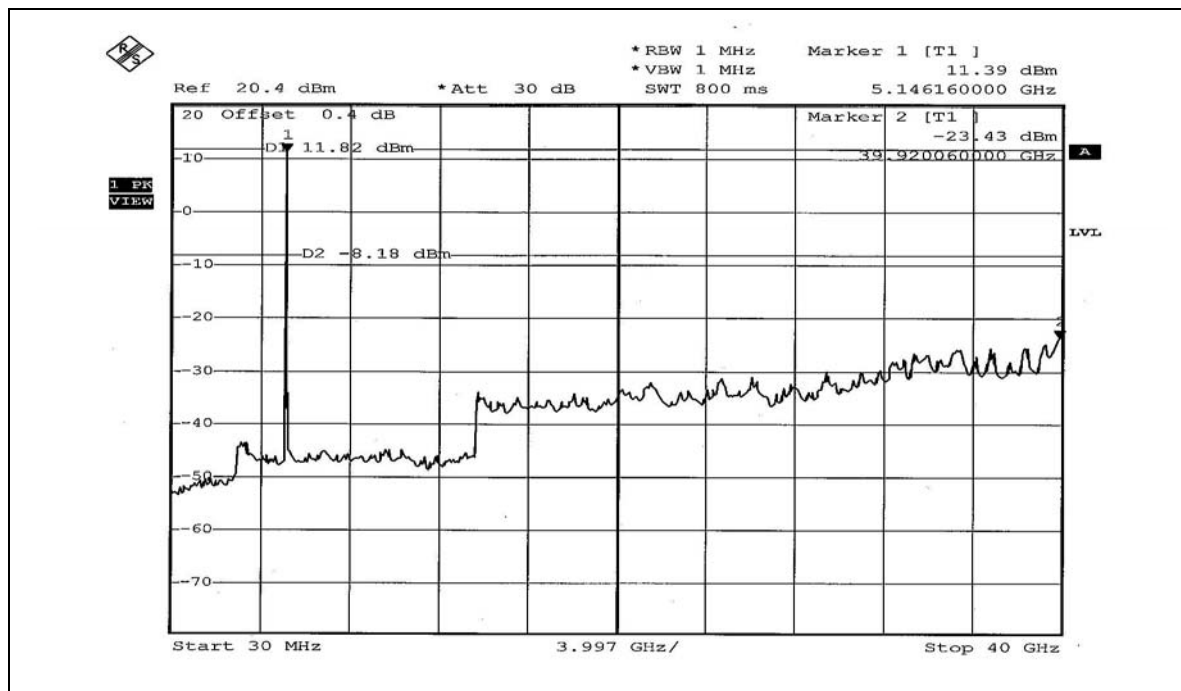
Channel 8 (5320MHz)

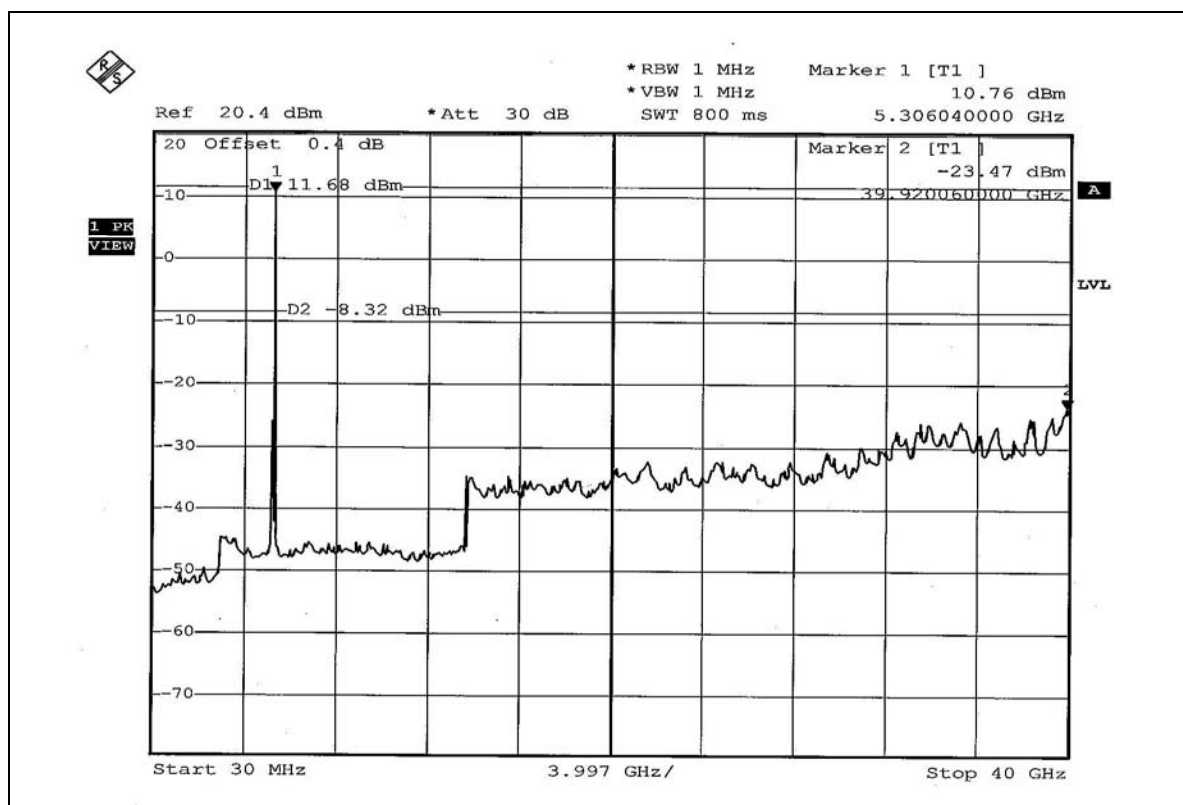
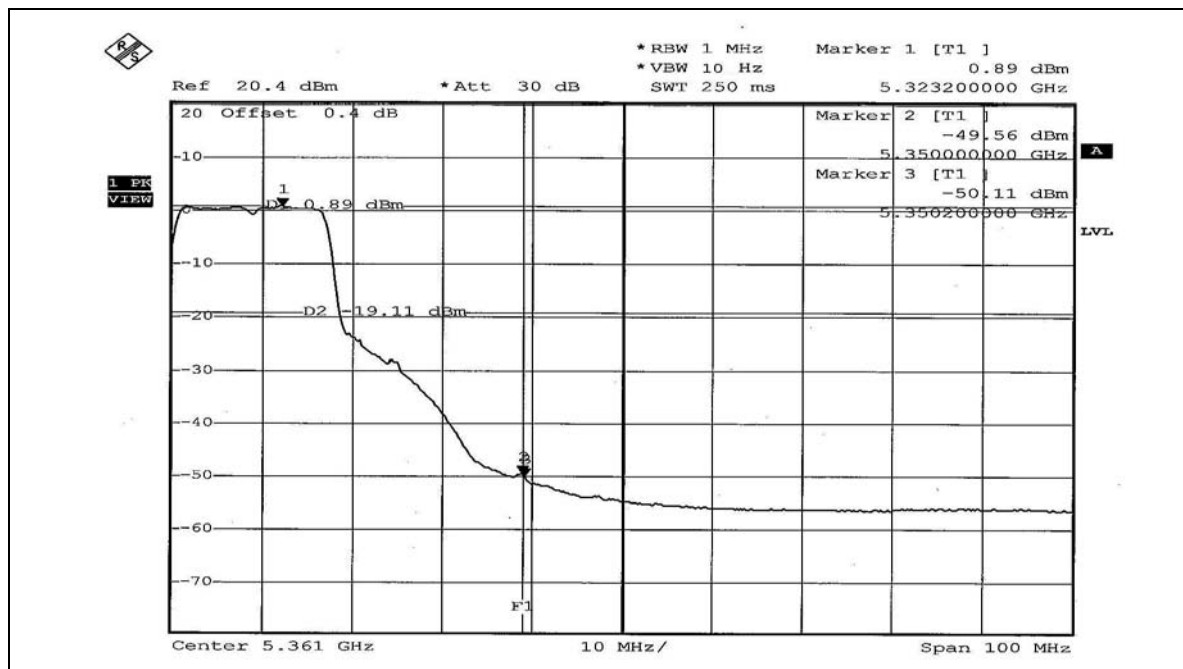
The band edge emission plot on page 65 shows 43.17dBc between carrier maximum power and local maximum emission in restrict band. The emission of carrier strength list in the test result of channel 8 is 104.25dBuV/m (Peak), so the maximum field strength in restrict band is $104.25 - 43.17 = 61.08$ dBuV/m which is under 74dBuV/m limit.

The band edge emission plot on page 66 shows 50.45dBc between carrier maximum power and local maximum emission in restrict band. The emission of carrier strength list in the test result of channel 8 is 94.12dBuV/m (Average), so the maximum field strength in restrict band is $94.12 - 50.45 = 43.67$ dBuV/m which is under 54dBuV/m limit.

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802.11a Turbo OFDM modulation**Channel 1 (5210MHz)**

The band edge emission plot on page 67 shows 41.26dBc between carrier maximum power and local maximum emission in restrict band. The emission of carrier strength list in the test result of channel 1 is 106.56dBuV/m (Peak), so the maximum field strength in restrict band is $106.56 - 41.26 = 65.30$ dBuV/m which is under 74dBuV/m limit.

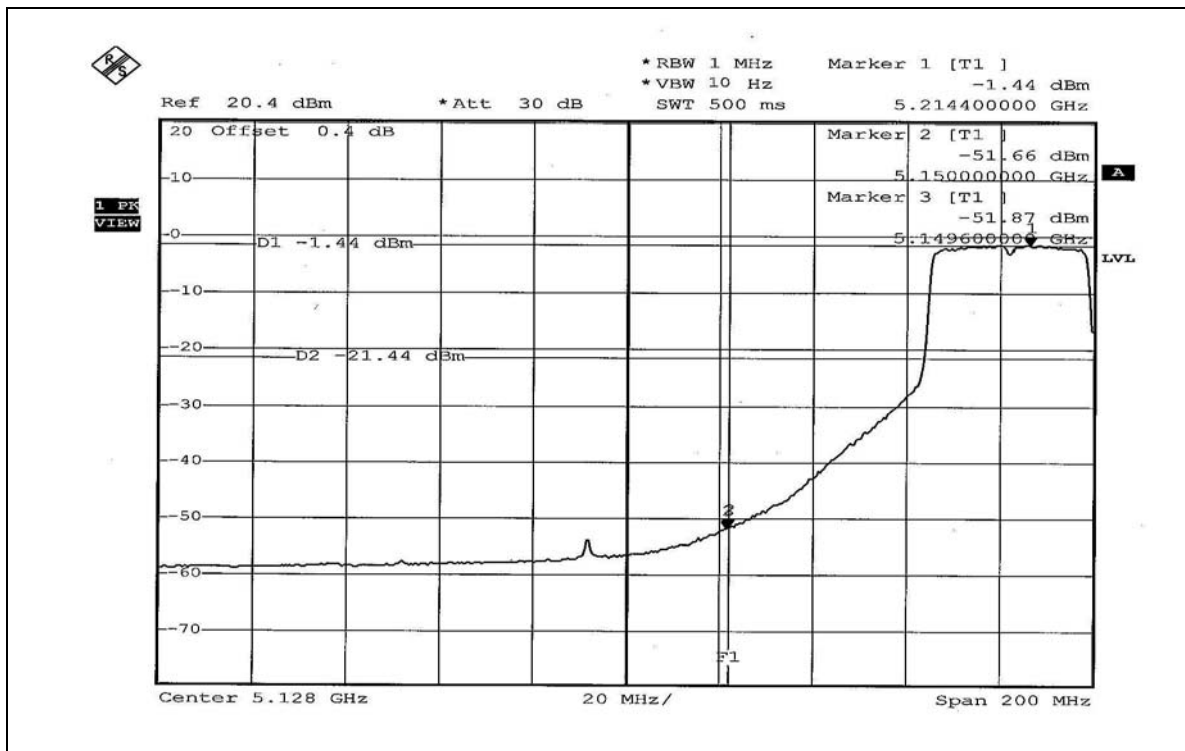
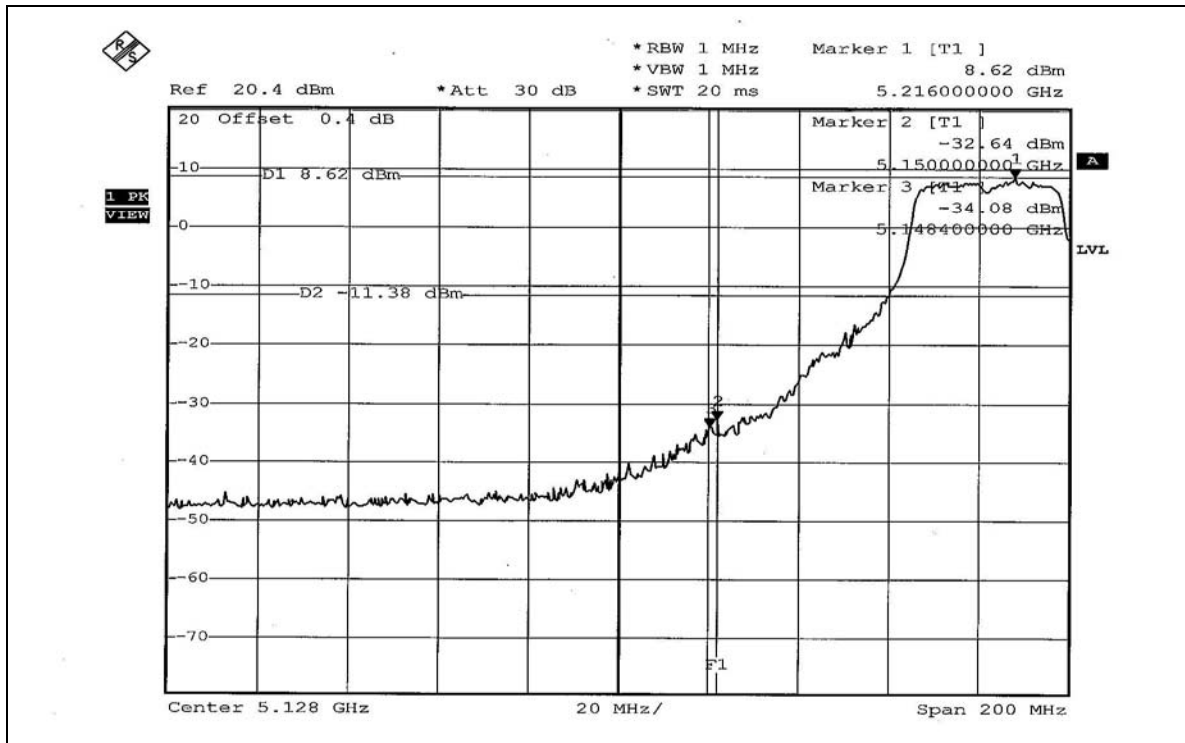
The band edge emission plot on page 67 shows 50.22dBc between carrier maximum power and local maximum emission in restrict band. The emission of carrier strength list in the test result of channel 1 is 96.68dBuV/m (Average), so the maximum field strength in restrict band is $96.68 - 50.22 = 46.46$ dBuV/m which is under 54dBuV/m limit.

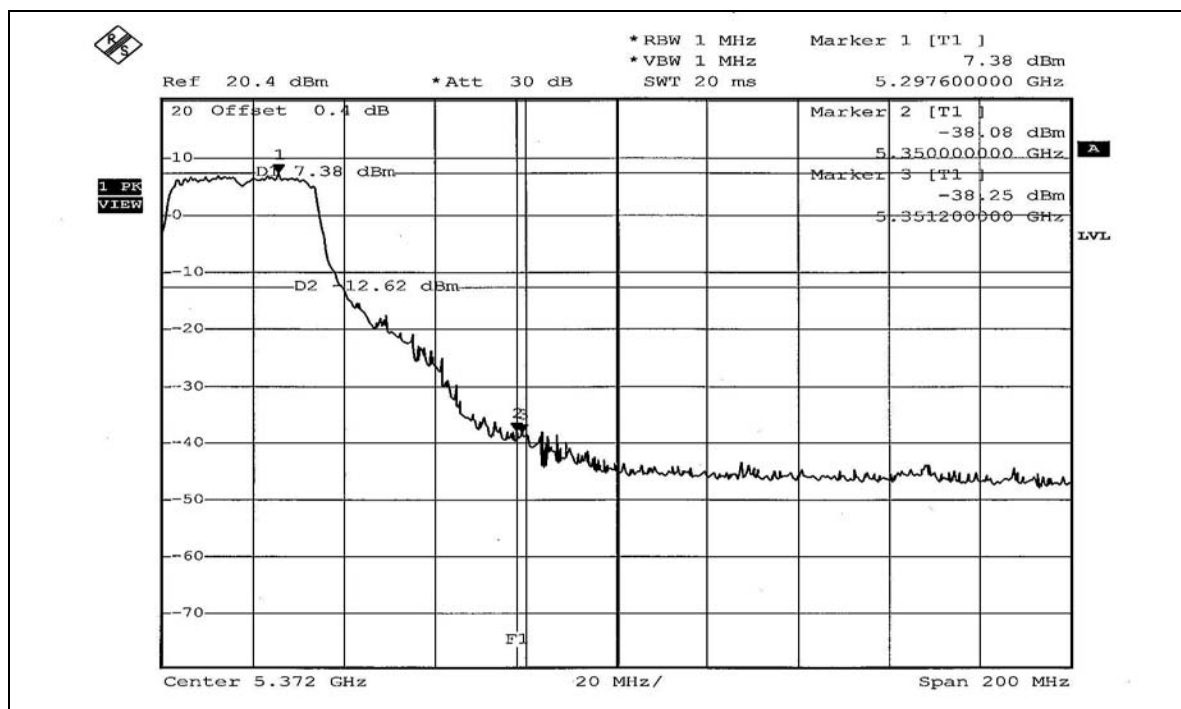
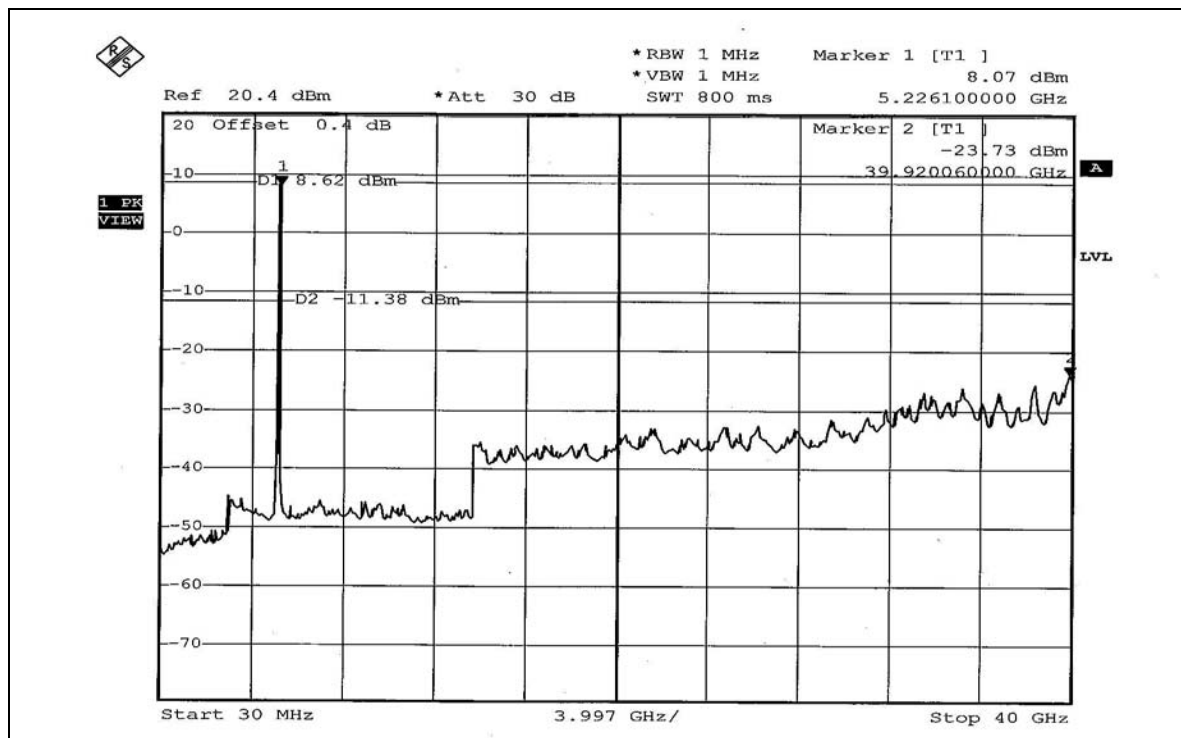
Channel 3 (5290MHz)

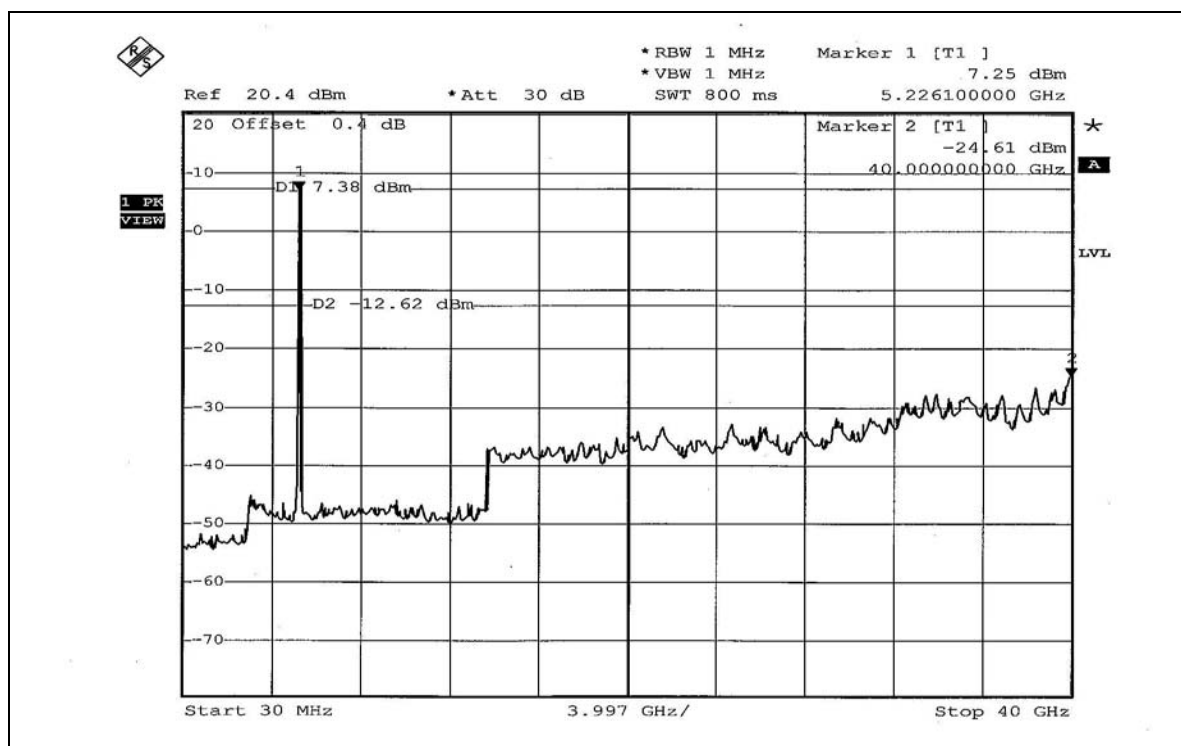
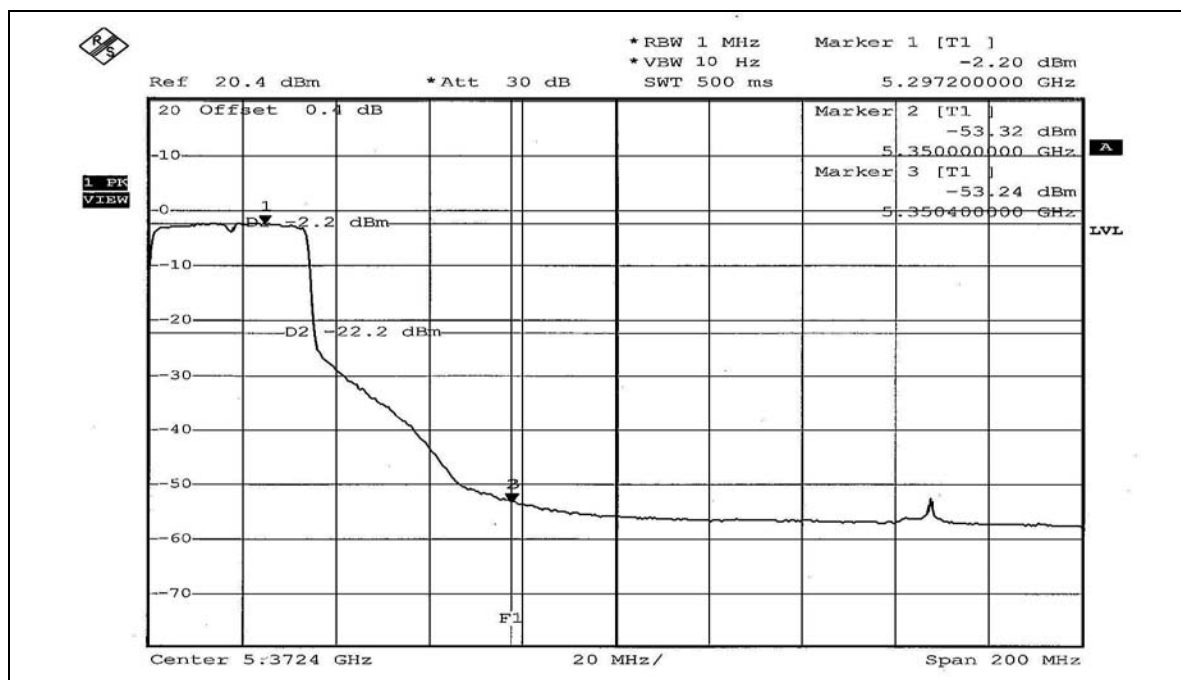
The band edge emission plot on the pages 68 shows 45.46dBc between carrier maximum power and local maximum emission in restrict band. The emission of carrier strength list in the test result of channel 3 is 106.58dBuV/m (Peak), so the maximum field strength in restrict band is $106.58 - 45.46 = 61.12$ dBuV/m which is under 74dBuV/m limit.

The band edge emission plot on the pages 69 shows 51.04dBc between carrier maximum power and local maximum emission in restrict band. The emission of carrier strength list in the test result of channel 3 is 96.12dBuV/m (Average), so the maximum field strength in restrict band is $96.12 - 51.04 = 45.08$ dBuV/m which is under 54dBuV/m limit.

802.11a Turbo OFDM modulation









4.8 ANTENNA REQUIREMENT

4.8.1 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 15.407(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.

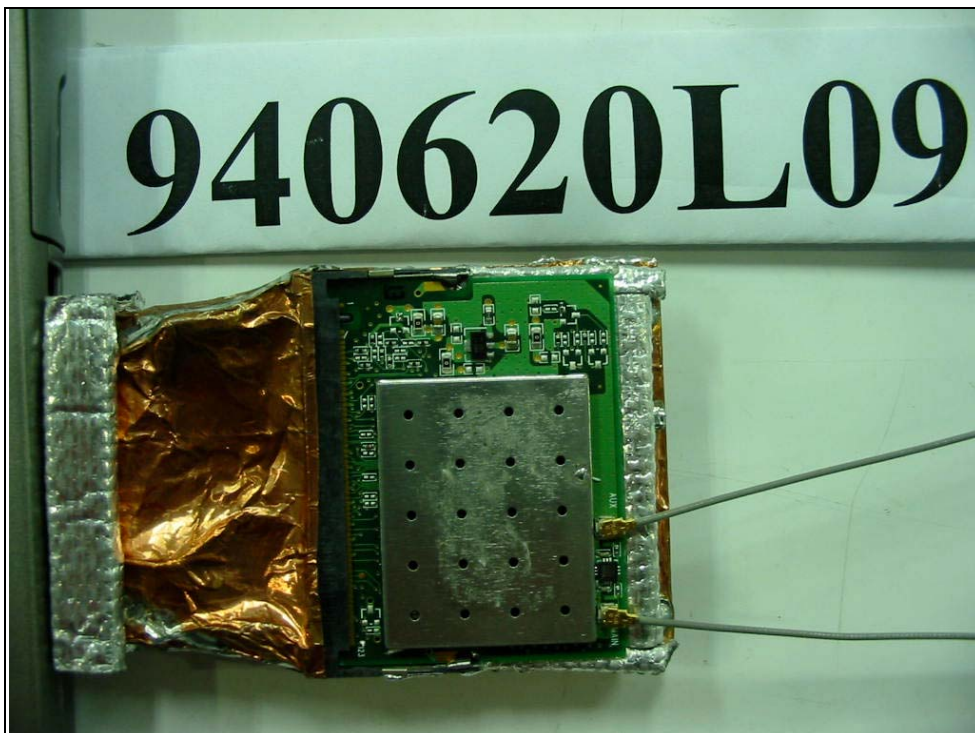
4.8.2 ANTENNA CONNECTED CONSTRUCTION

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

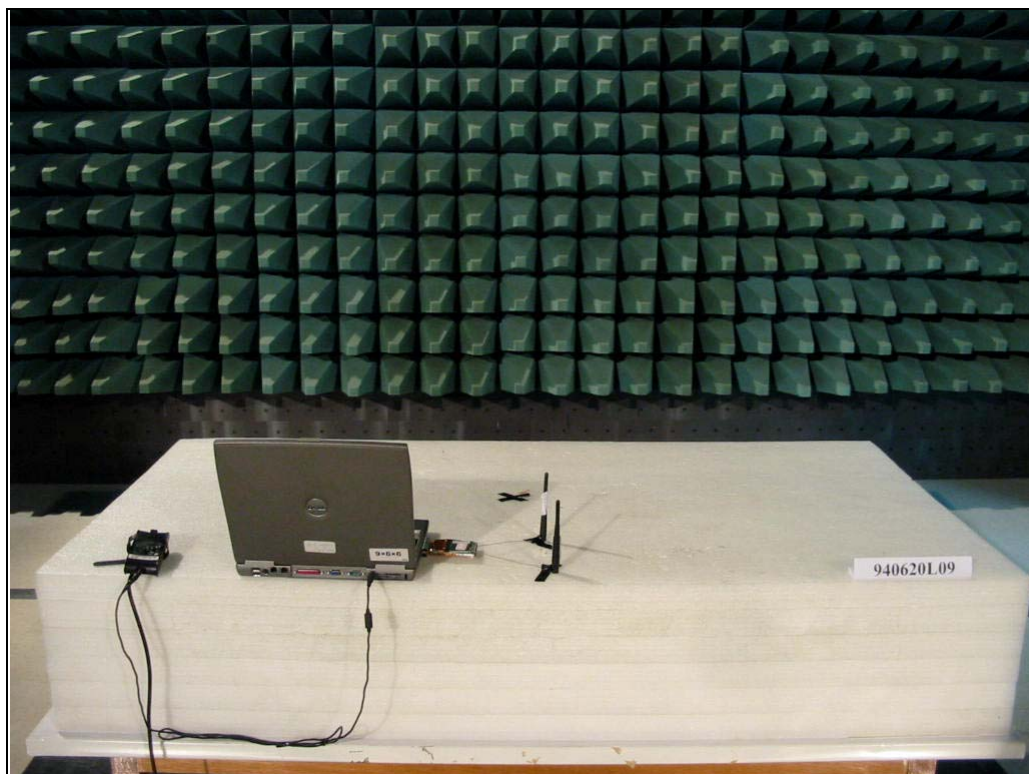
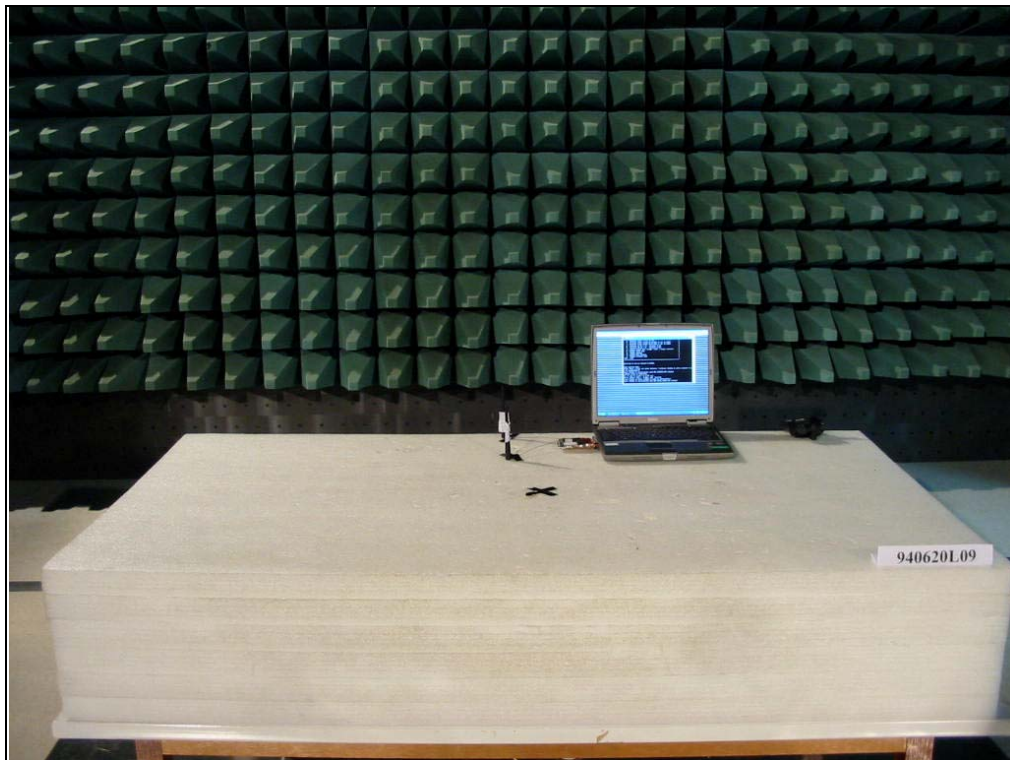
5. PHOTOGRAPHS OF THE TEST CONFIGURATION

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:

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

Copies of accreditation certificates of our laboratories obtained from approval agencies can be downloaded from our web site:

www.adt.com.tw/index.5/phtml. If you have any comments, please feel free to contact us at the following:

Linko EMC/RF Lab:

Tel: 886-2-26052180

Fax: 886-2-26052943

Hsin Chu EMC/RF Lab:

Tel: 886-3-5935343

Fax: 886-3-5935342

Hwa Ya EMC/RF/Safety Telecom Lab:

Tel: 886-3-3183232

Fax: 886-3-3185050

Linko RF Lab.

Tel: 886-3-3270910

Fax: 886-3-3270892

Web Site: www.adt.com.tw

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