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.

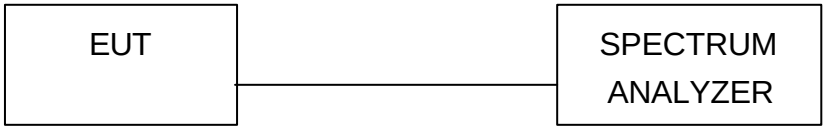
4.5.3 TEST PROCEDURES

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

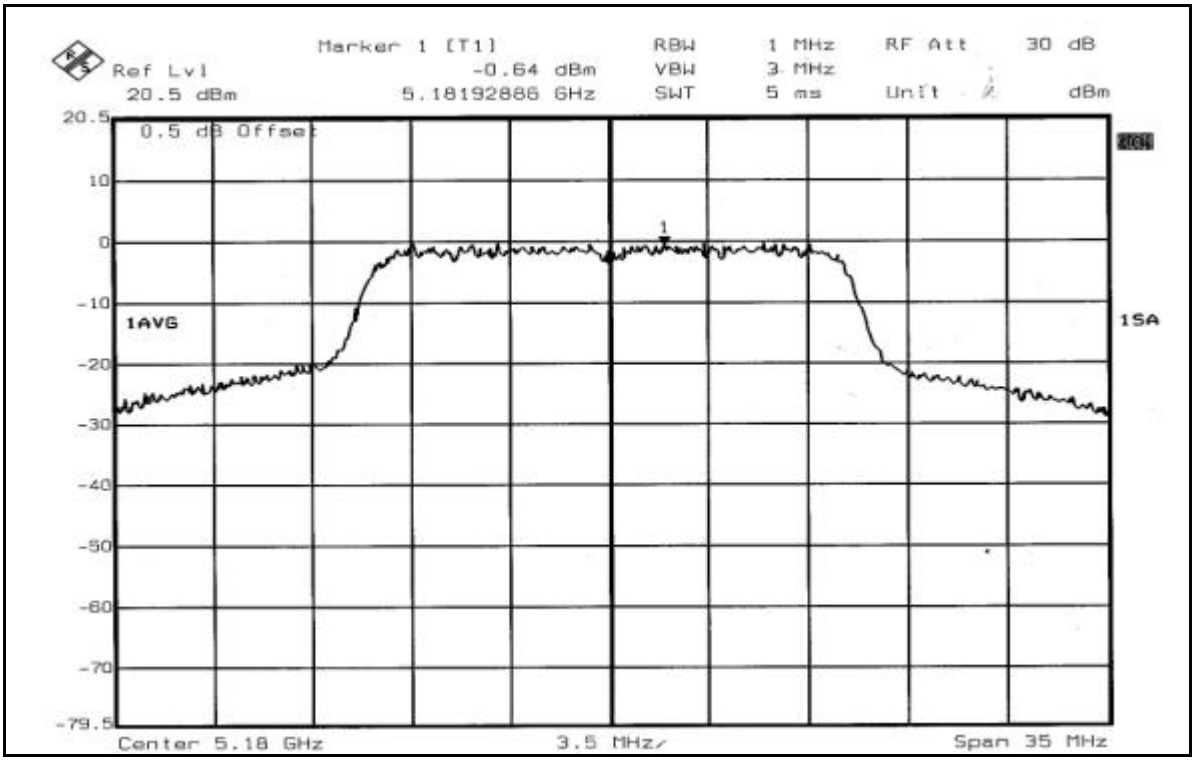
4.5.7 TEST RESULTS

802.11a OFDM modulation

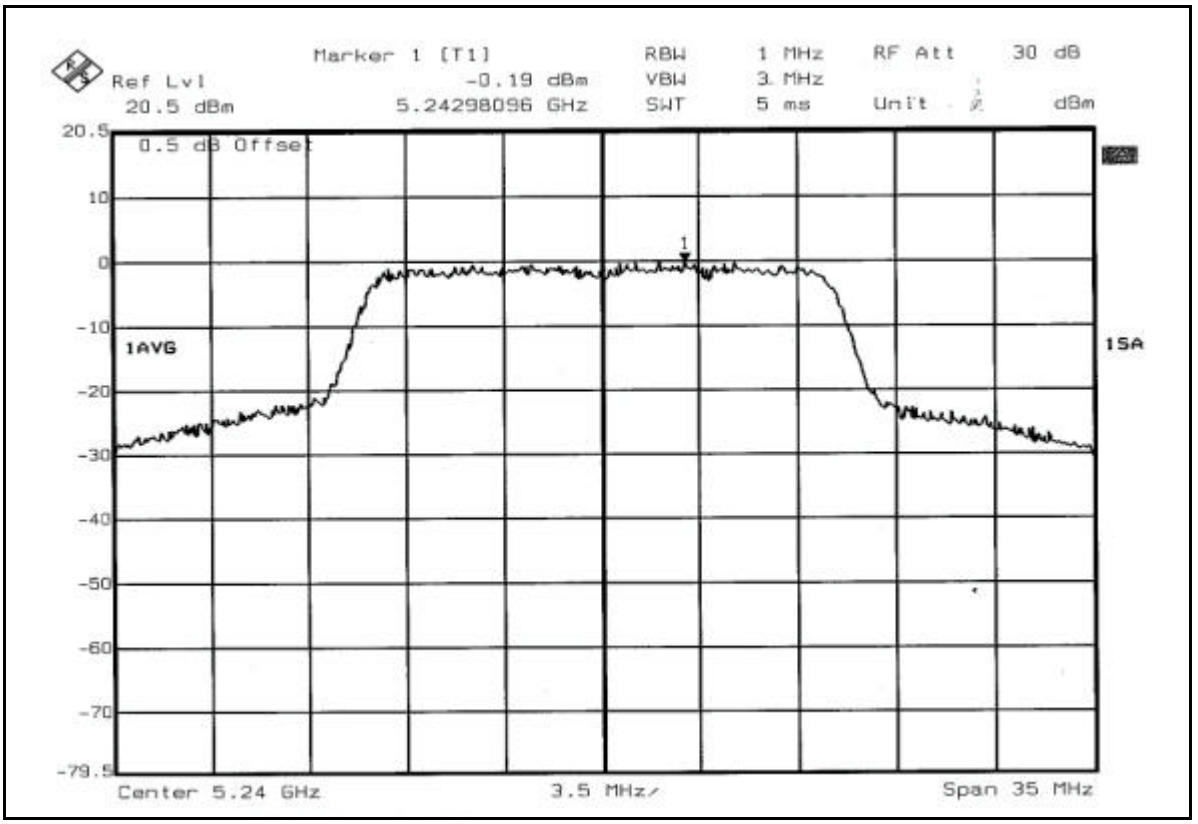
EUT	Wireless A/G USB Adapter	**MODEL**	F6D3050
MODULATION TYPE	BPSK	**TRANSFER RATE**	6Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**ENVIRONMENTAL CONDITIONS**	24deg.C, 64%RH, 991hPa
TESTED BY	Leo Hung		

CHANNEL	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 1MHz BW (dBm)	MAXIMUM LIMIT (dBm)	PASS/FAIL
1	5180	-0.64	4	PASS
4	5240	-0.19	4	PASS
5	5260	-0.39	11	PASS
8	5320	-0.15	11	PASS

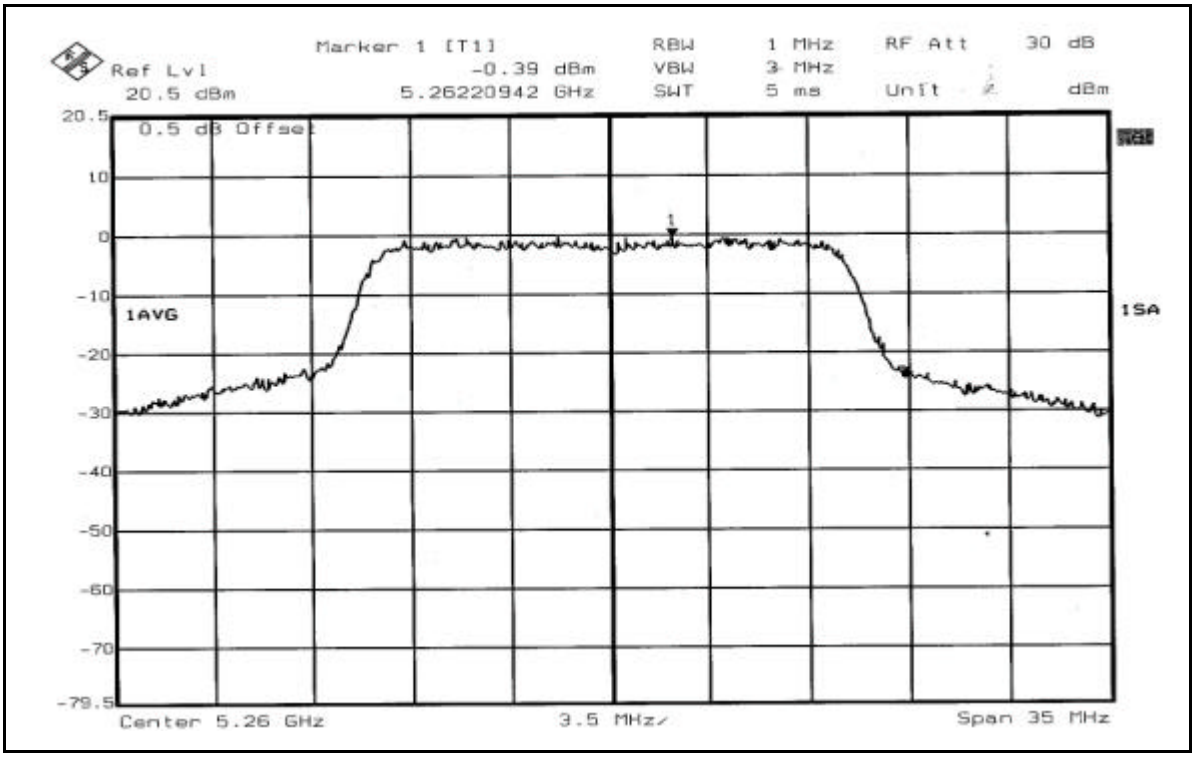
CH1


Marker 1 [T1]
-0.64 dBm
5.18192886 GHz
RBW 1 MHz
VBW 3 MHz
SWT 5 ms
RF Att 30 dB
Unit dBm
Ref Lvl
20.5 dBm
0.5 dB Offset
1AVG
1SA
Center 5.18 GHz
3.5 MHz/
Span 35 MHz

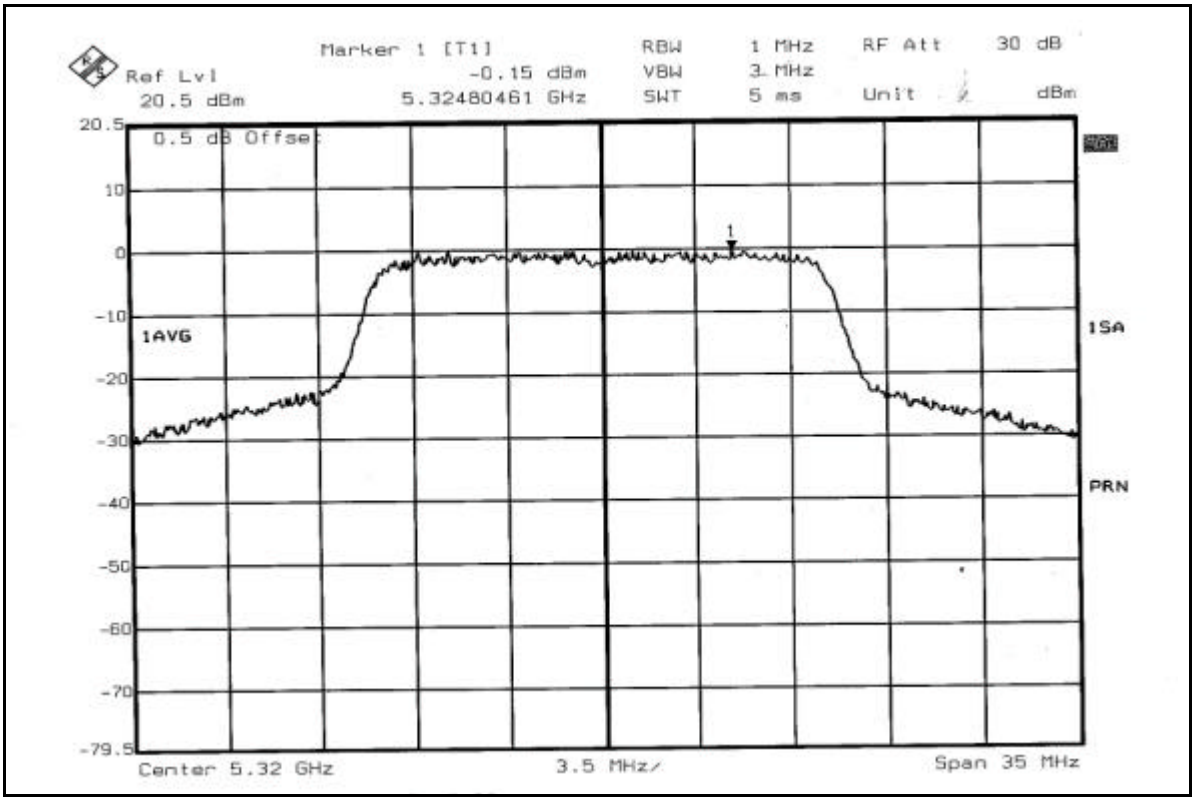
CH4


Marker 1 [T1]
-0.19 dBm
5.24298096 GHz
RBW 1 MHz
VBW 3 MHz
SWT 5 ms
RF Att 30 dB
Unit dBm
Ref Lvl
20.5 dBm
0.5 dB Offset
1AVG
1SA
Center 5.24 GHz
3.5 MHz/
Span 35 MHz

CH5


Marker 1 [T1]
-0.39 dBm
5.26220942 GHz
RBW 1 MHz
VBW 3 MHz
SWT 5 ms
RF Att 30 dB
Unit dBm
Ref Lvl
20.5 dBm
0.5 dB Offset
1AVG
1SA
Center 5.26 GHz
3.5 MHz/
Span 35 MHz

CH8

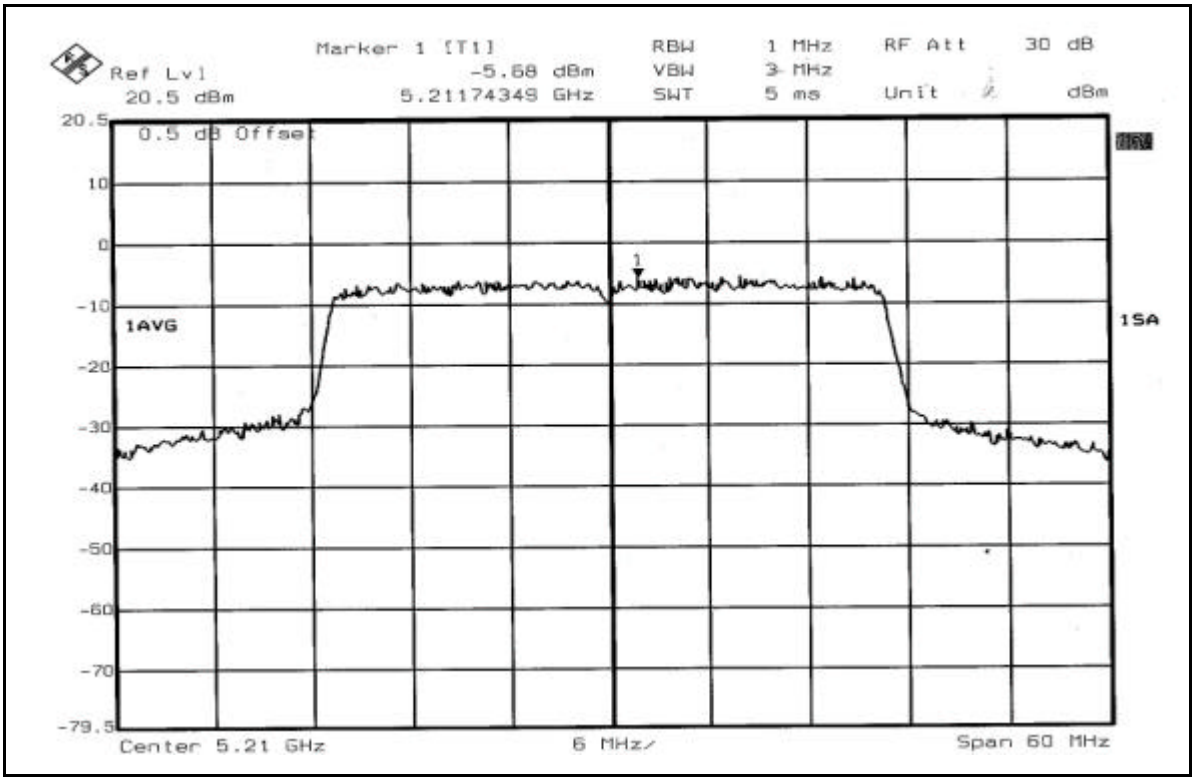

Marker 1 [T1]
-0.15 dBm
5.32480461 GHz
RBW 1 MHz
VBW 3 MHz
SWT 5 ms
RF Att 30 dB
Unit dBm
Ref Lvl
20.5 dBm
0.5 dB Offset
1AVG
1SA
PRN
Center 5.32 GHz
3.5 MHz/
Span 35 MHz

802.11a Turbo OFDM modulation

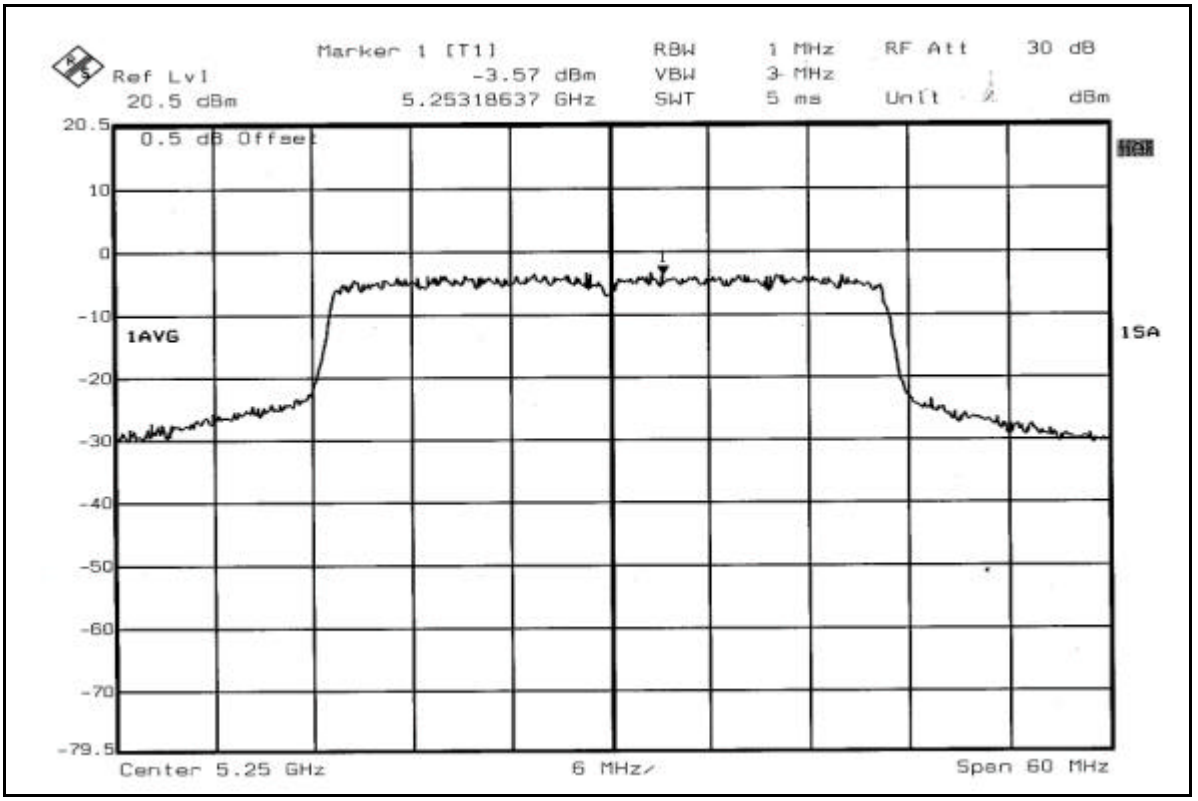
EUT	Wireless A/G USB Adapter	**MODEL**	F6D3050
MODULATION TYPE	BPSK	**TRANSFER RATE**	12Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**ENVIRONMENTAL CONDITIONS**	24deg.C, 64%RH, 991hPa
TESTED BY	Leo Hung		

CHANNEL	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 1 MHz BW (dBm)	MAXIMUM LIMIT (dBm)	PASS/FAIL
1	5210	-5.68	4	PASS
2	5250	-3.57	4	PASS
3	5290	-3.34	11	PASS

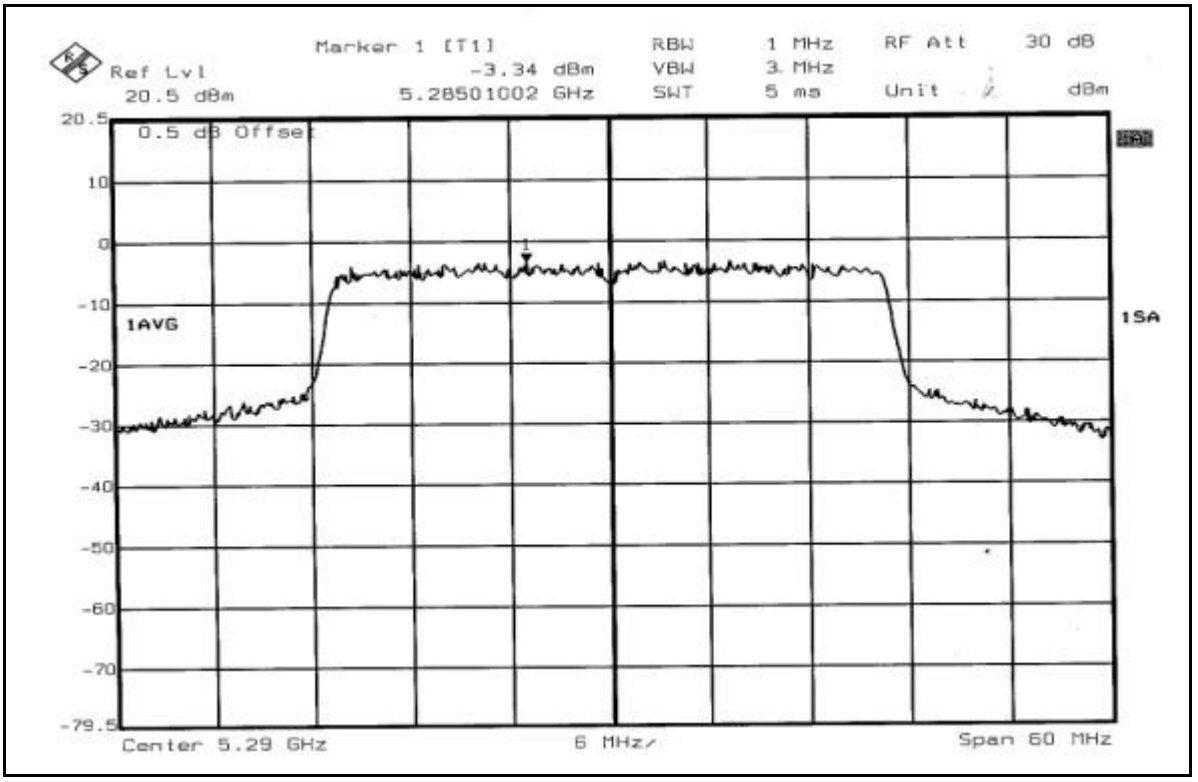
CH1


Marker 1 [T1]
-5.68 dBm
5.21174349 GHz
RBW 1 MHz
VBW 3 MHz
SWT 5 ms
RF Att 30 dB
Unit dBm
Ref Lvl
20.5 dBm
0.5 dB Offset
1AVG
1SA
Center 5.21 GHz
6 MHz/
Span 60 MHz

CH2


Marker 1 [T1]
-3.57 dBm
5.25318637 GHz
RBW 1 MHz
VBW 3 MHz
SWT 5 ms
RF Att 30 dB
Unit dBm
Ref Lvl
20.5 dBm
0.5 dB Offset
1AVG
1SA
Center 5.25 GHz
6 MHz/
Span 60 MHz

CH3


Marker 1 [T1]
-3.34 dBm
5.28501002 GHz
RBW 1 MHz
VBW 3 MHz
SWT 5 ms
RF Att 30 dB
Unit dBm
Ref Lvl
20.5 dBm
0.5 dB Offset
1AVG
1SA
20.5
10
0
-10
-20
-30
-40
-50
-60
-70
-79.5
Center 5.29 GHz
6 MHz/
Span 60 MHz

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.

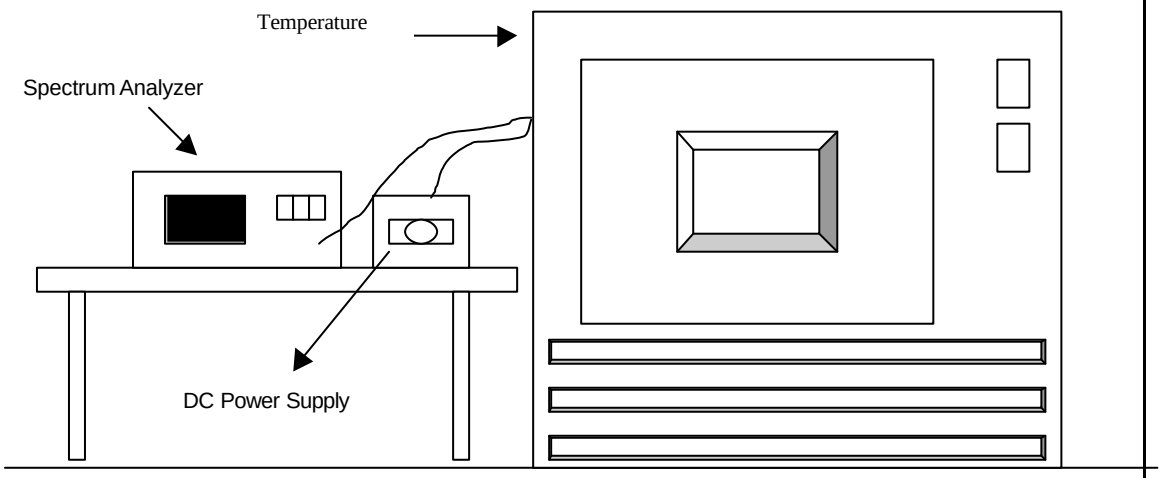
4.6.3 TEST PROCEDURE

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

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

4.6.7 TEST RESULTS

Operating frequency: 5320MHz				Limit : ± 0.015%			
Temp. (°C)	Power supply (Vac)	2 minute		5 minute		10 minute	
		(MHz)	(%)	(MHz)	(%)	(MHz)	(%)
50	102	5319.9690	-0.0005827	5320.0110	0.0002068	5320.0098	0.0001842
	120	5320.0114	0.0002143	5320.0106	0.0001992	5320.0098	0.0001842
	138	5320.0114	0.0002143	5320.0102	0.0001917	5320.0094	0.0001767
40	102	5319.9578	-0.0007932	5319.9576	-0.0007970	5319.9578	-0.0007932
	120	5319.9574	-0.0008008	5319.9576	-0.0007970	5319.9578	-0.0007932
	138	5319.9578	-0.0007932	5319.9578	-0.0007932	5319.9580	-0.0007895
30	102	5319.9586	-0.0007782	5319.9584	-0.0007820	5319.9580	-0.0007895
	120	5319.9586	-0.0007782	5319.9582	-0.0007857	5319.9580	-0.0007895
	138	5319.9584	-0.0007820	5319.9584	-0.0007820	5319.9580	-0.0007895
20	102	5319.9606	-0.0007406	5319.9602	-0.0007481	5319.9600	-0.0007519
	120	5319.9602	-0.0007481	5319.9602	-0.0007481	5319.9602	-0.0007481
	138	5319.9602	-0.0007481	5319.9600	-0.0007519	5319.9602	-0.0007481
10	102	5319.9650	-0.0006579	5319.9652	-0.0006541	5319.9656	-0.0006466
	120	5319.9652	-0.0006541	5319.9656	-0.0006466	5319.9654	-0.0006504
	138	5319.9652	-0.0006541	5319.9652	-0.0006541	5319.9656	-0.0006466
0	102	5319.9800	-0.0003759	5319.9800	-0.0003759	5319.9798	-0.0003797
	120	5319.9798	-0.0003797	5319.9800	-0.0003759	5319.9796	-0.0003835
	138	5319.9800	-0.0003759	5319.9800	-0.0003759	5319.9796	-0.0003835
-10	102	5319.9882	-0.0002218	5319.9880	-0.0002256	5319.9876	-0.0002331
	120	5319.9886	-0.0002143	5319.9878	-0.0002293	5319.9874	-0.0002368
	138	5319.9880	-0.0002256	5319.9876	-0.0002331	5319.9876	-0.0002331
-20	102	5319.9916	-0.0001579	5319.9916	-0.0001579	5319.9916	-0.0001579
	120	5319.9914	-0.0001617	5319.9916	-0.0001579	5319.9916	-0.0001579
	138	5319.9916	-0.0001579	5319.9916	-0.0001579	5319.9916	-0.0001579
-30	102	5319.9986	-0.0000263	5319.9982	-0.0000338	5319.9992	-0.0000150
	120	5319.9992	-0.0000150	5319.9988	-0.0000226	5319.9990	-0.0000188
	138	5319.9982	-0.0000338	5319.9992	-0.0000150	5319.9988	-0.0000226

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 the page 70 shows 36.99dBc 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 110.62dBuV/m (Peak), so the maximum field strength in restrict band is 110.62-36.99=73.63dBuV/m which is under 74dBuV/m limit.

The band edge emission plot on the page 70 shows 47.65Bc 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 101.24dBuV/m (Average), so the maximum field strength in restrict band is 101.24-47.65=53.59dBuV/m which is under 54dBuV/m limit.

Channel 8 (5320MHz)

The band edge emission plot on the page 71 shows 41.71dBc 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 109.76BuV/m (Peak), so the maximum field strength in restrict band is 109.76-41.71=68.05dBuV/m which is under 74dBuV/m limit.

Channel 8 (5320MHz)

The band edge emission plot on the page 72 shows 51.16dBc 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 99.68BuV/m (Average), so the maximum field strength in restrict band is 99.68-51.16=48.52dBuV/m which is under 54dBuV/m limit.

802.11a Turbo OFDM modulation

Channel 1 (5210MHz)

The band edge emission plot on the page 73 shows 42.81dBc 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 103.69dBuV/m (Peak), so the maximum field strength in restrict band is 103.69-42.81=60.88dBuV/m which is under 74dBuV/m limit.

Channel 1 (5210MHz)

The band edge emission plot on the page 73 shows 50.94dBc 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 94.50dBuV/m (Average), so the maximum field strength in restrict band is 94.50-50.94=43.56dBuV/m which is under 54dBuV/m limit.

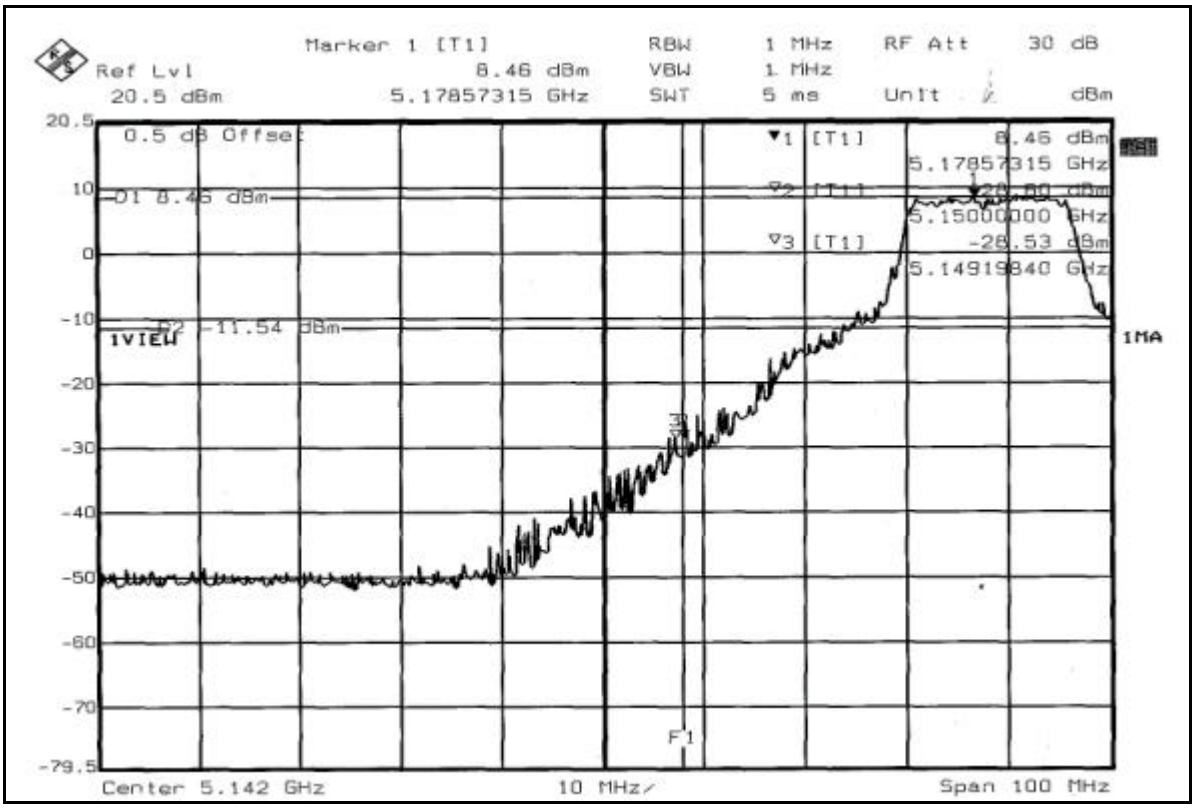
Channel 3 (5290MHz)

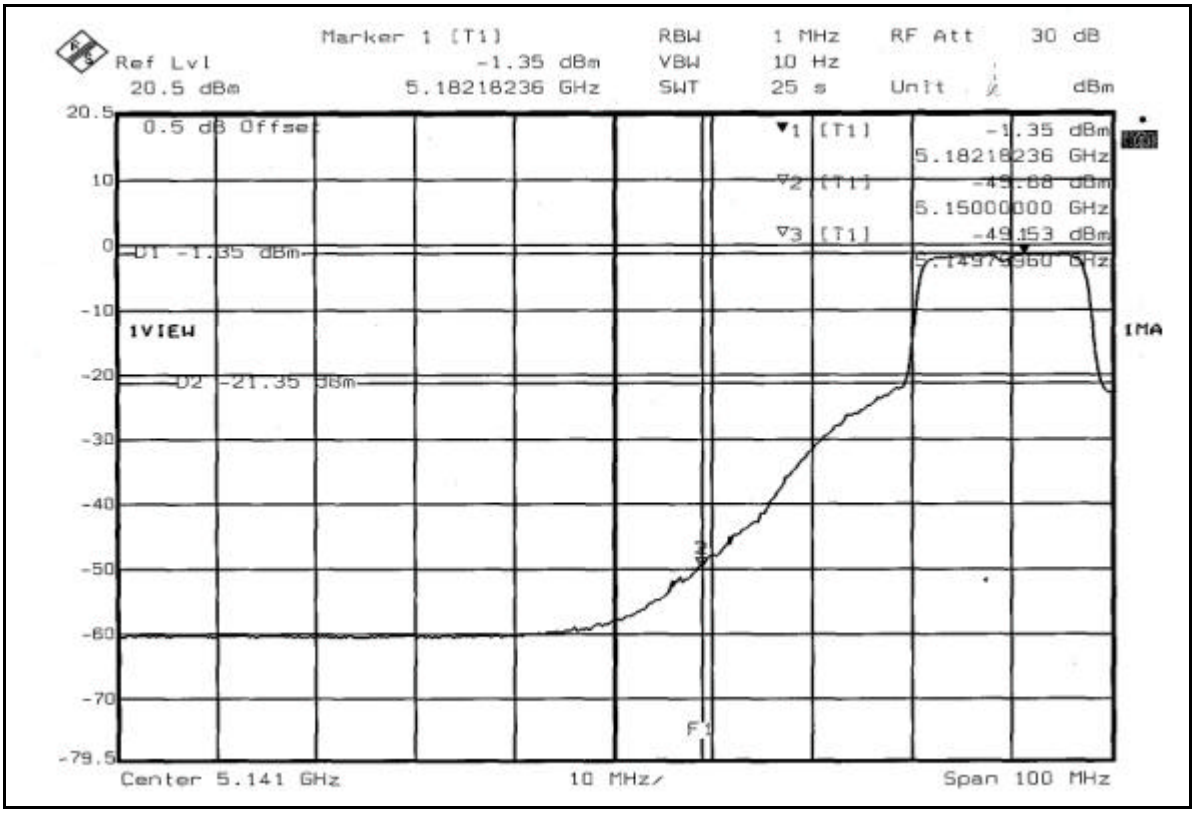
The band edge emission plot on the page 74 shows 42.30dBc between carrier maximum power and local maximum emission in restrict band. The emission of carrier strength list in the test result of channel 3 is 106.85dBuV/m (Peak), so the maximum field strength in restrict band is 106.85-42.30=64.55dBuV/m which is under 74dBuV/m limit.

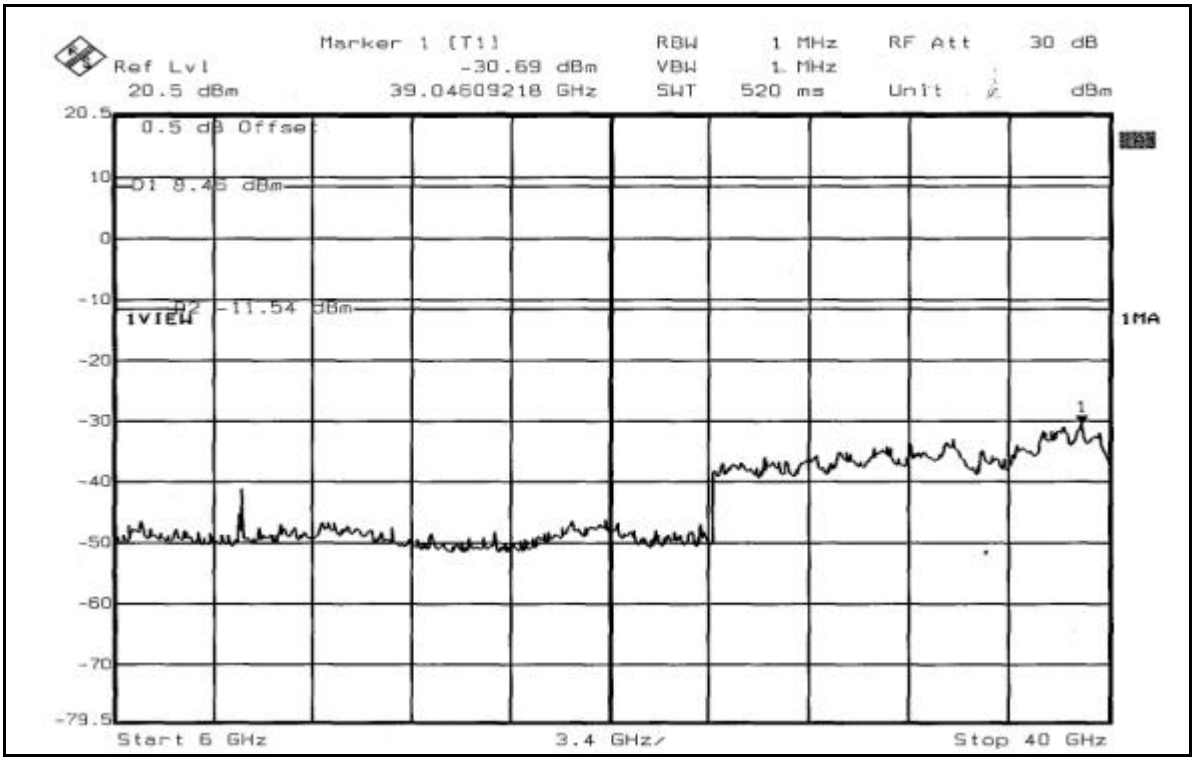
Channel 3 (5290MHz)

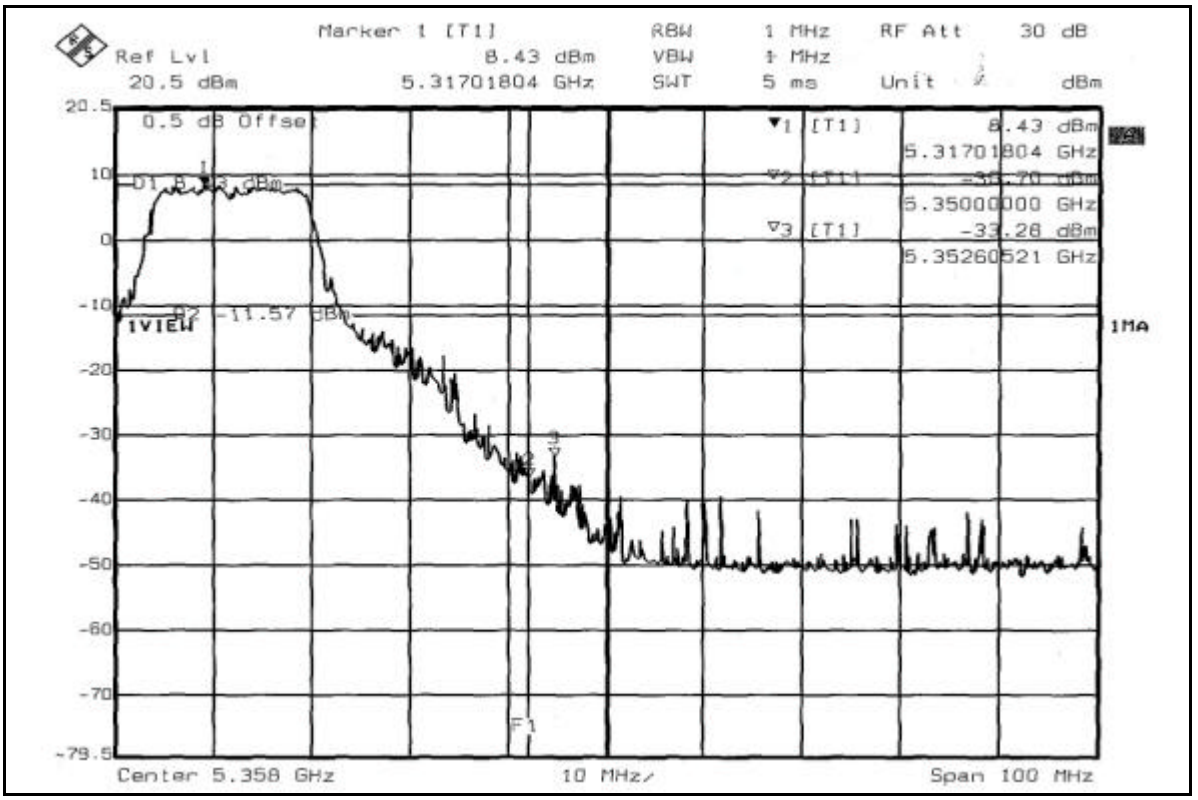
The band edge emission plot on the page 75 shows 51.16dBc between carrier maximum power and local maximum emission in restrict band. The emission of carrier strength list in the test result of channel 3 is 97.25dBuV/m (Average), so the maximum field strength in restrict band is 97.25-51.16=46.09dBuV/m which is under 54dBuV/m limit.

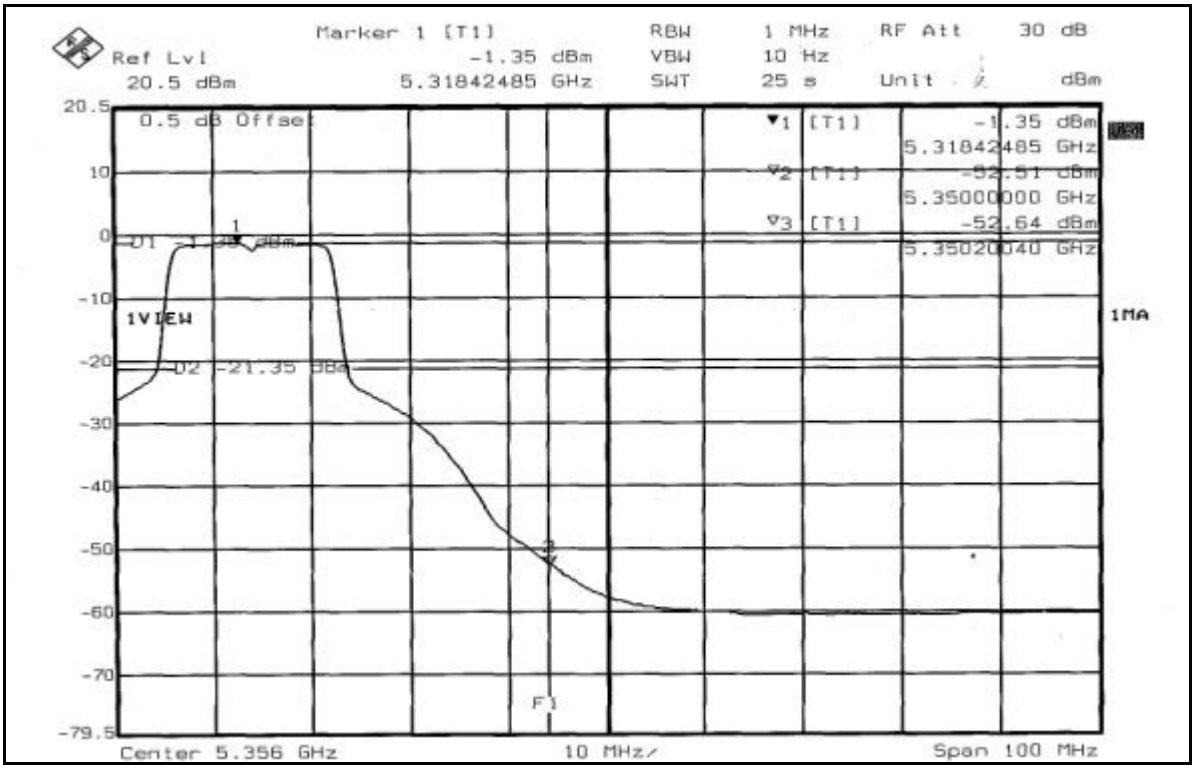
802.11a OFDM modulation

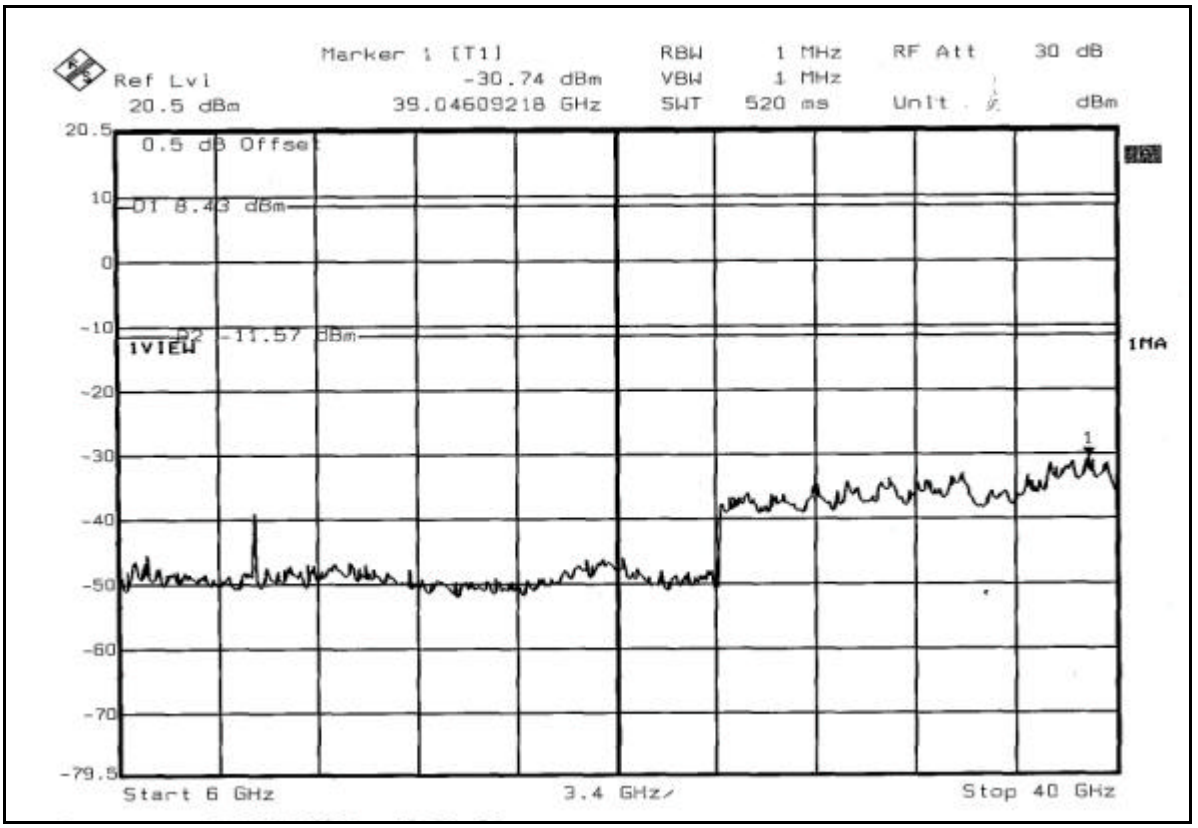




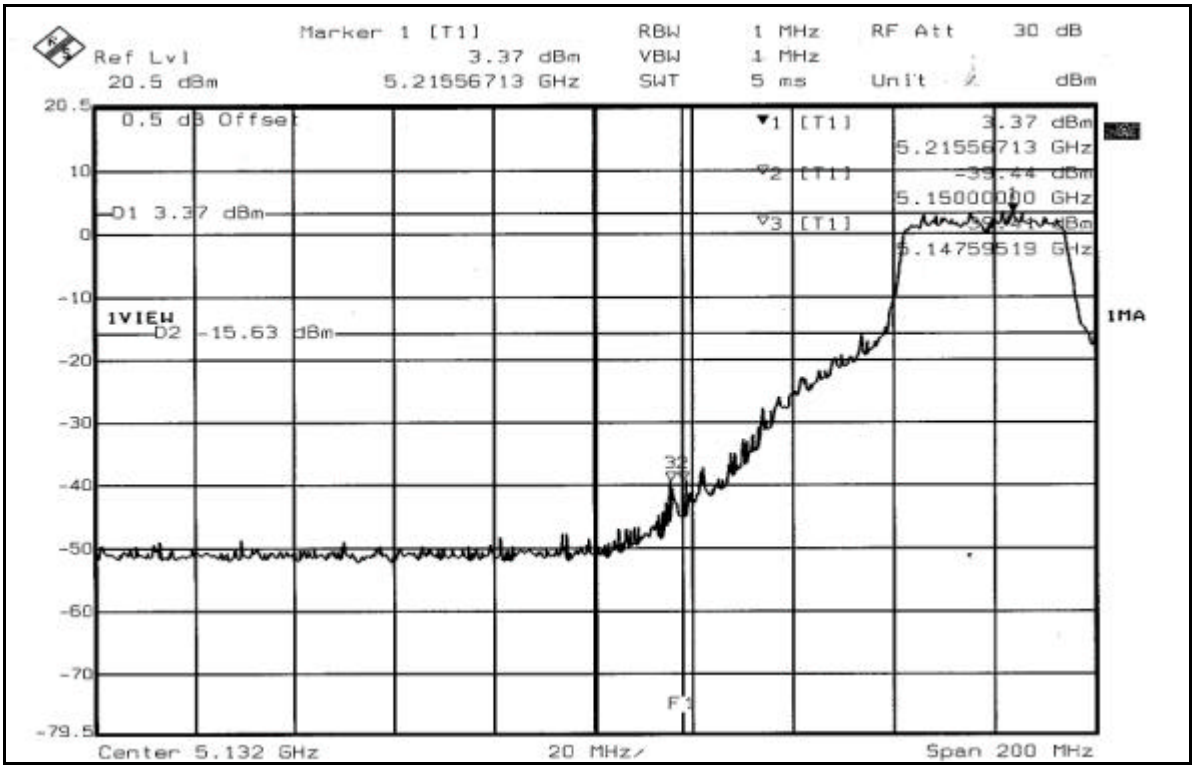

Marker 1 [T1]
RBW 1 MHz
RF Att 30 dB
Ref Lvl
-30.69 dBm
VBW 1 MHz
20.5 dBm
39.04609218 GHz
SWT 520 ms
Unit dBm
0.5 dB Offset
D1 8.45 dBm
D2 -11.54 dBm
1VIEW
1MA
Start 6 GHz
3.4 GHz/
Stop 40 GHz

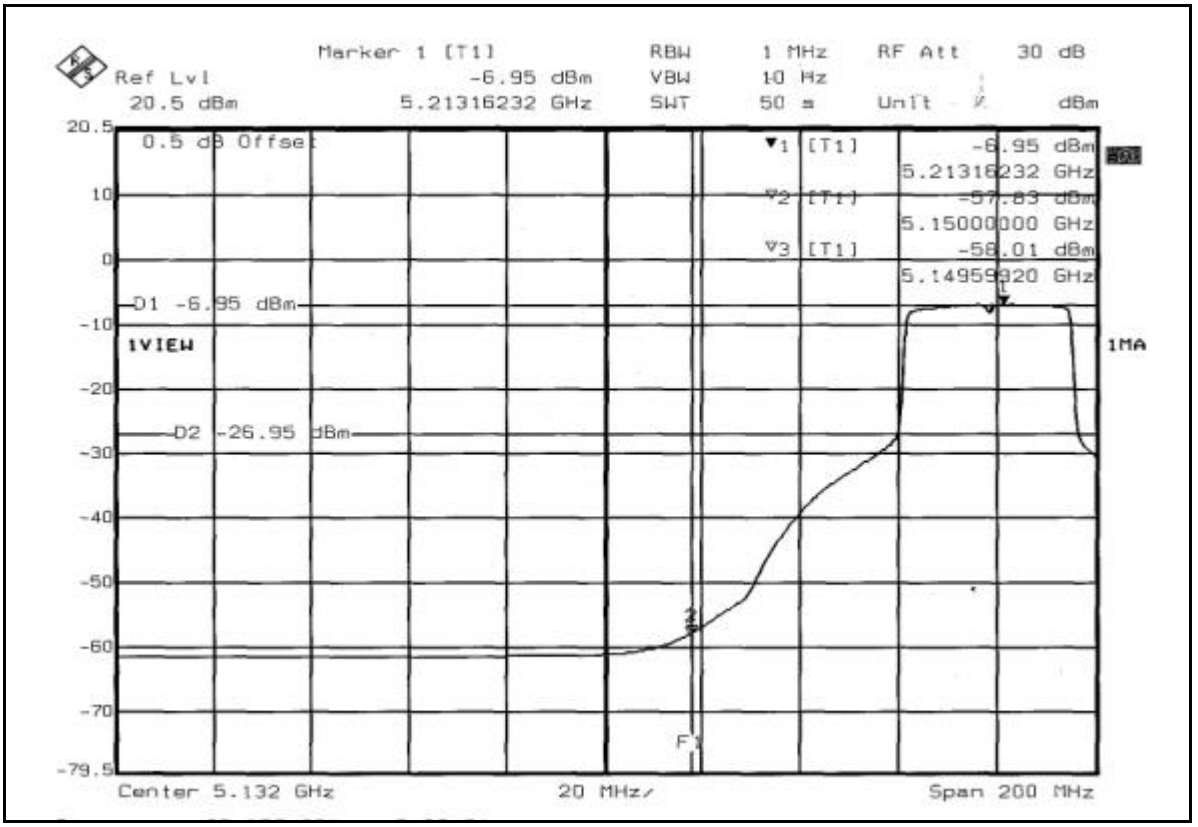

Marker 1 [T1]
RBW 1 MHz
RF Att 30 dB
Ref Lvl
8.43 dBm
VBW 1 MHz
20.5 dBm
5.31701804 GHz
SWT 5 ms
Unit dBm
0.5 dB Offset
▼1 [T1] 8.43 dBm
5.31701804 GHz
▽2 [T1] -35.70 dBm
5.35000000 GHz
▽3 [T1] -33.28 dBm
5.35260521 GHz
D1 8.43 dBm
D2 -11.57 dBm
1VIEW
1MA
Center 5.358 GHz
10 MHz/
Span 100 MHz

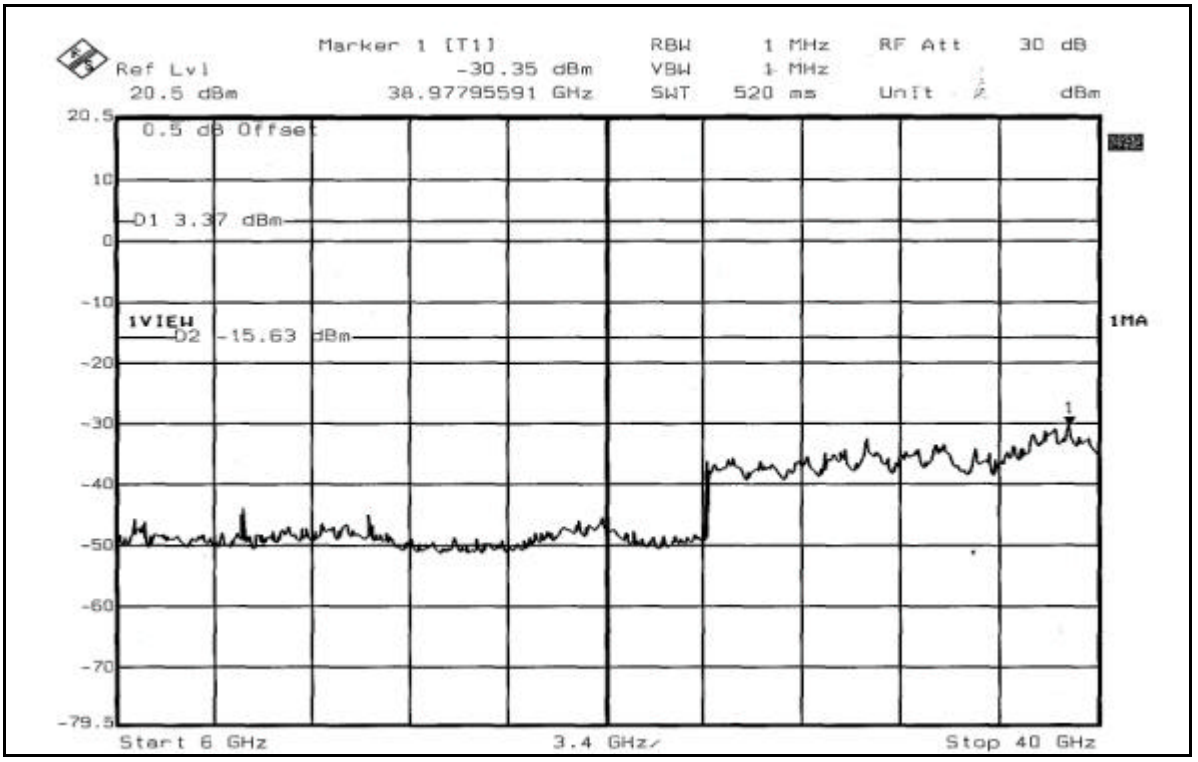

Marker 1 [T1]
RBW 1 MHz
RF Att 30 dB
Ref Lvl
-1.35 dBm
VBW 10 Hz
20.5 dBm
5.31842485 GHz
SWT 25 s
Unit dBm
0.5 dB Offset
▼1 [T1] -1.35 dBm
5.31842485 GHz
▽2 [T1] -52.51 dBm
5.35000000 GHz
▽3 [T1] -52.64 dBm
5.35020040 GHz
D1 -1.35 dBm
1VIEW
D2 -21.35 dBm
1MA
F1
Center 5.356 GHz
10 MHz/
Span 100 MHz

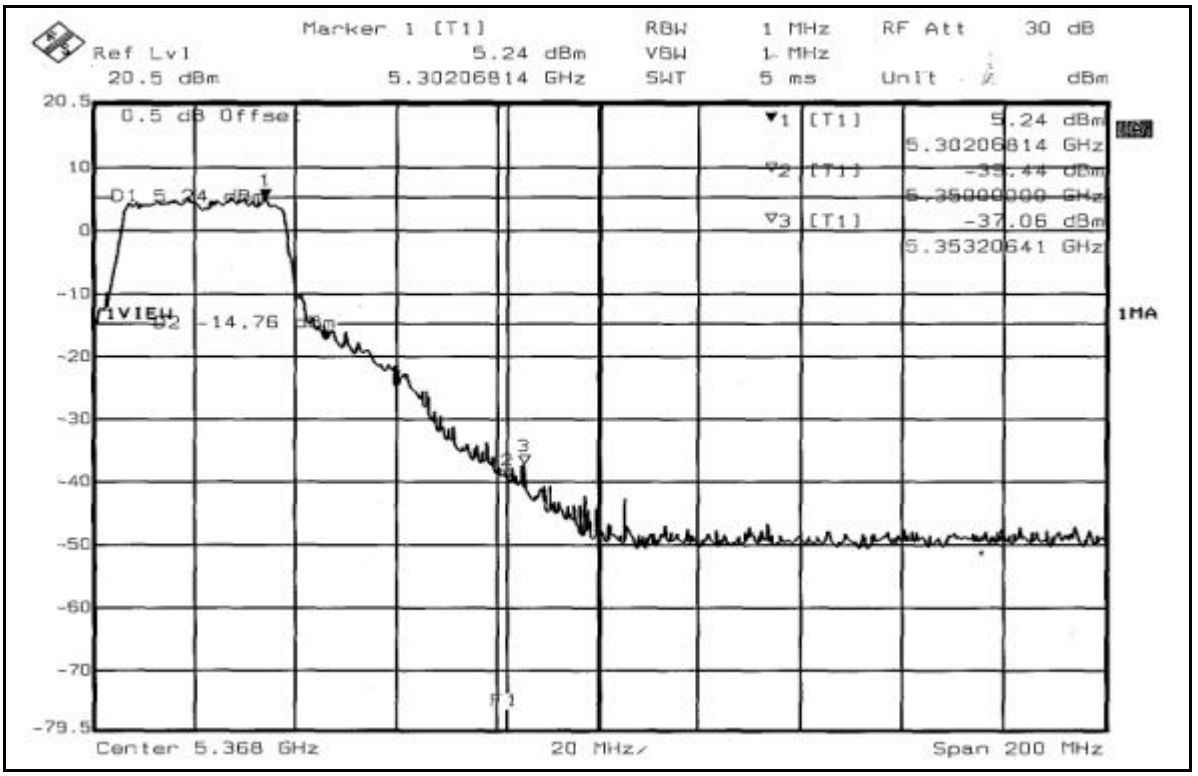

Marker 1 [T1]
RBW 1 MHz
RF Att 30 dB
Ref Lvl
-30.74 dBm
VBW 1 MHz
20.5 dBm
39.04609218 GHz
SWT 520 ms
Unit dBm
0.5 dB Offset
D1 8.43 dBm
1VIEW
D2 -11.57 dBm
1MA
Start 6 GHz
3.4 GHz/
Stop 40 GHz

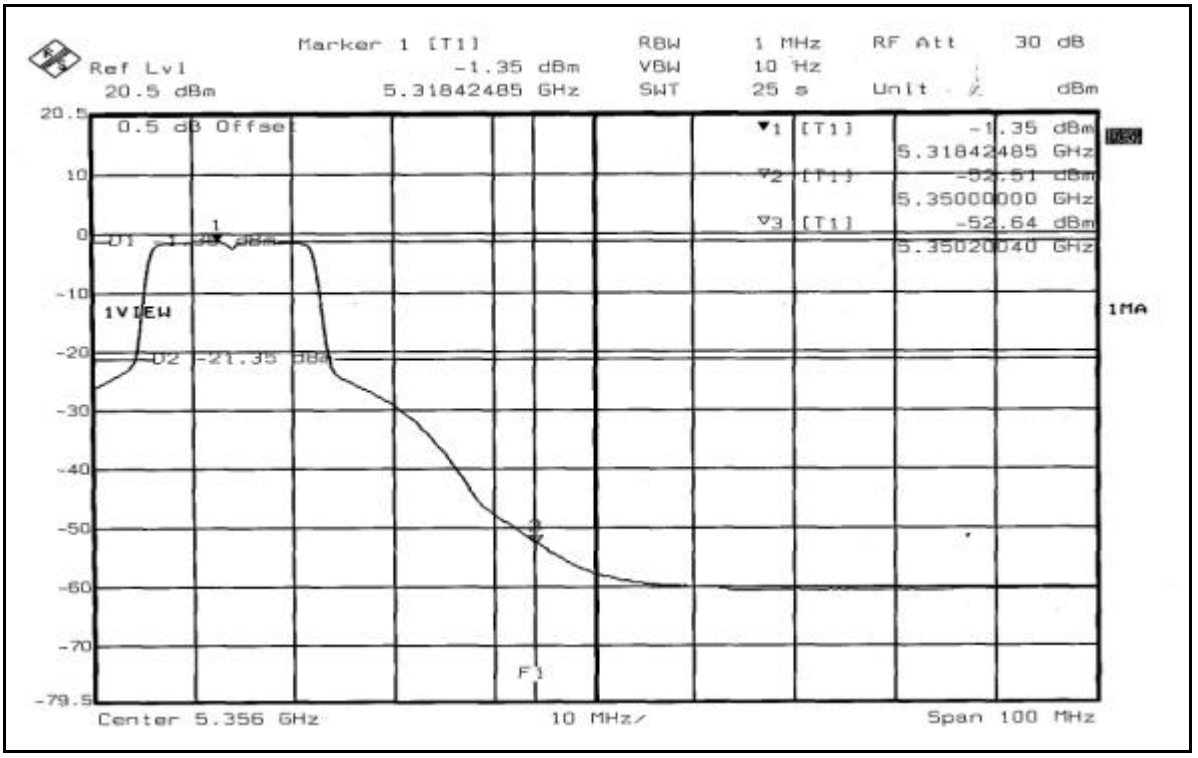
802.11a Turbo OFDM modulation

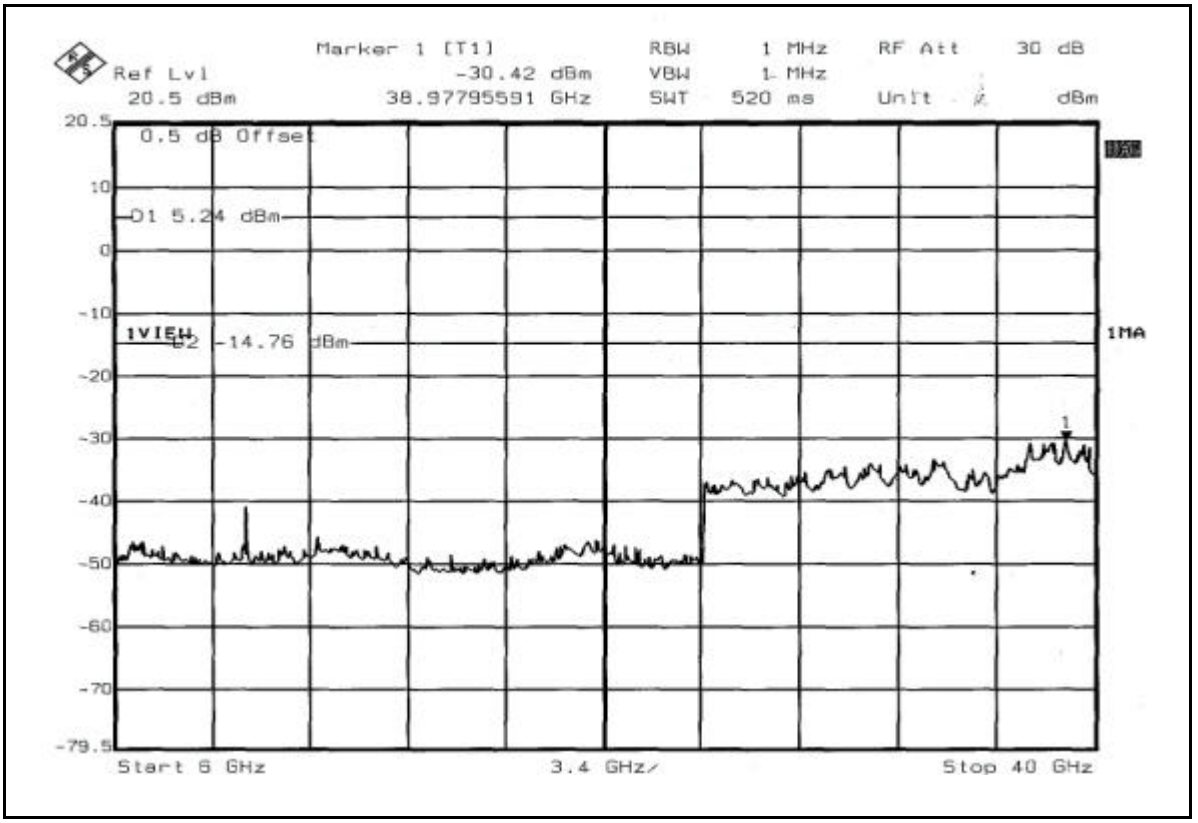





Marker 1 [T1]
-30.35 dBm
38.97795591 GHz
RBW 1 MHz
VBW 1 MHz
SWT 520 ms
RF Att 30 dB
Unit dBm
Ref Lvl
20.5 dBm
0.5 dB Offset
D1 3.37 dBm
1VIEW
D2 -15.63 dBm
1MA
Start 6 GHz
3.4 GHz/
Stop 40 GHz


Marker 1 [T1]
5.24 dBm
5.30206814 GHz
RBW 1 MHz
VBW 1 MHz
SWT 5 ms
RF Att 30 dB
Unit dBm
Ref Lvl
20.5 dBm
0.5 dB Offset
D1 5.24 dBm
1VIEW
D2 -14.76 dBm
1MA
▼1 [T1] 5.24 dBm
5.30206814 GHz
▽2 [T1] -35.44 dBm
5.35000000 GHz
▽3 [T1] -37.06 dBm
5.35320641 GHz
Center 5.368 GHz
20 MHz/
Span 200 MHz


Marker 1 [T1]
Ref Lvl
20.5 dBm
-1.35 dBm
5.31842485 GHz
RBW 1 MHz
VBW 10 Hz
SWT 25 s
RF Att 30 dB
Unit dBm
0.5 dB Offset
D1 -1.35 dBm
D2 -21.35 dBm
1VIEW
1MA
F1
Center 5.356 GHz
10 MHz/
Span 100 MHz


Marker 1 [T1]
Ref Lvl
20.5 dBm
-30.42 dBm
38.97795591 GHz
RBW 1 MHz
VBW 1 MHz
SWT 520 ms
RF Att 30 dB
Unit dBm
0.5 dB Offset
D1 5.24 dBm
D2 -14.76 dBm
1VIEW
1MA
Start 6 GHz
3.4 GHz/
Stop 40 GHz

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 Printed antenna without antenna connector. The maximum Gain of the antenna is 2.9dBi.

5. PHOTOGRAPHS OF THE TEST CONFIGURATION

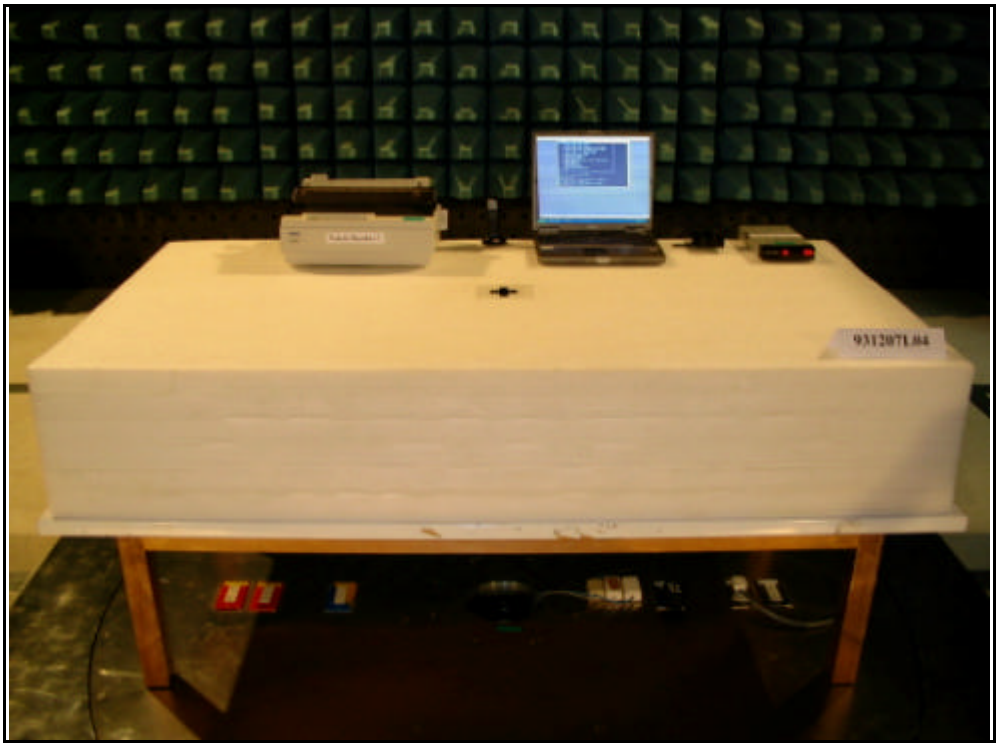
CONDUCTED EMISSION TEST

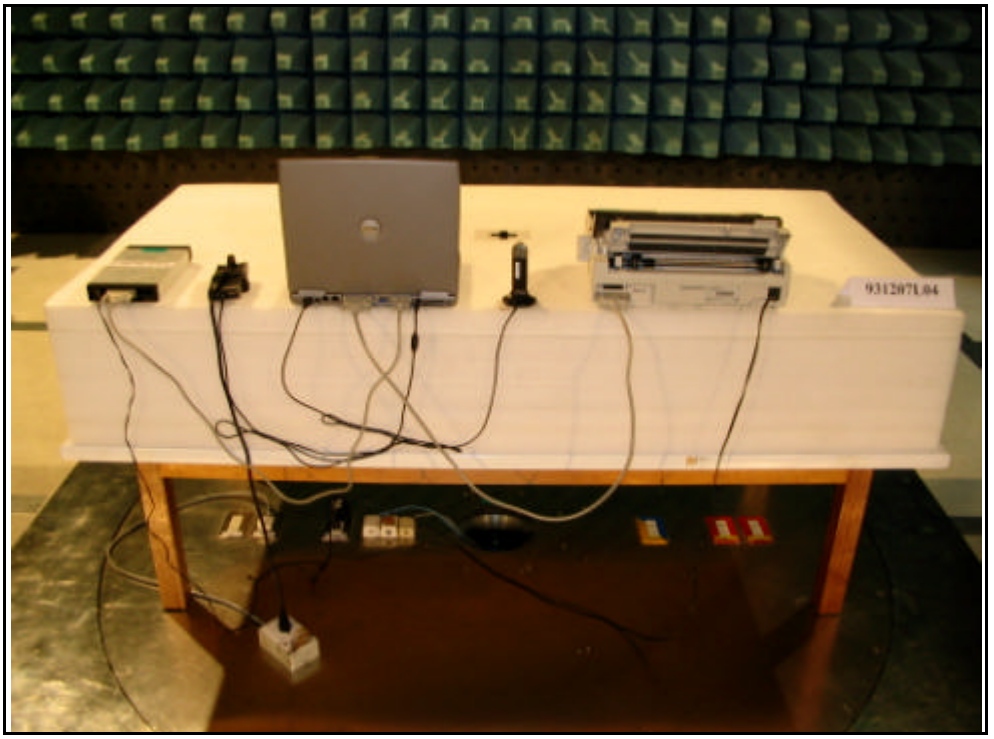
Test Mode 1

Test Mode 2

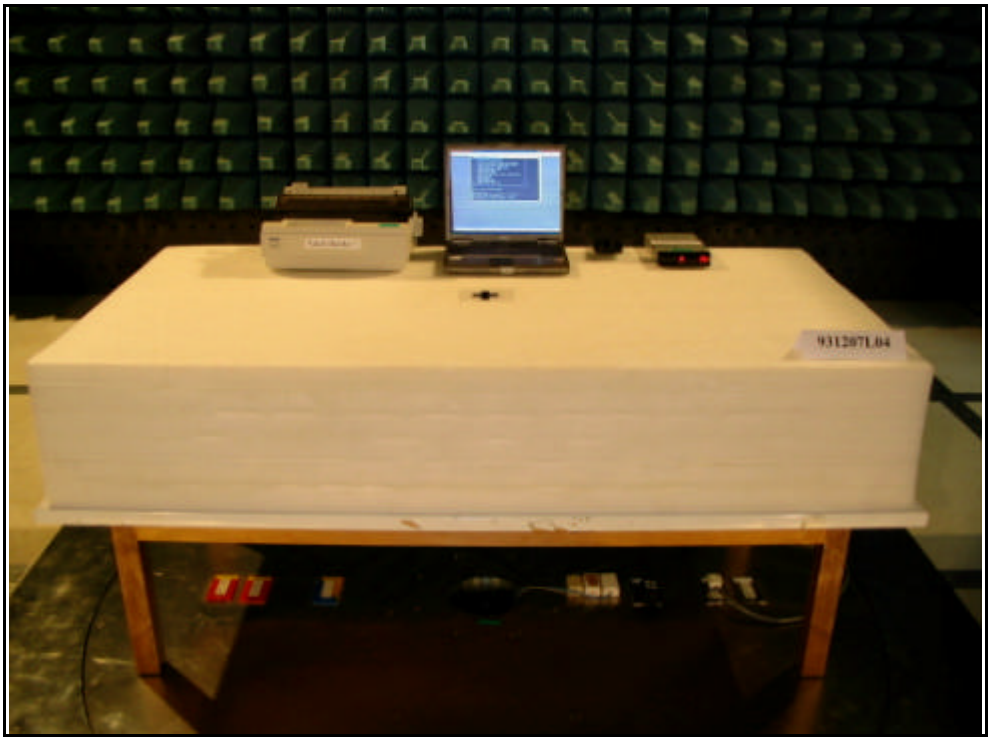
RADIATED EMISSION TEST

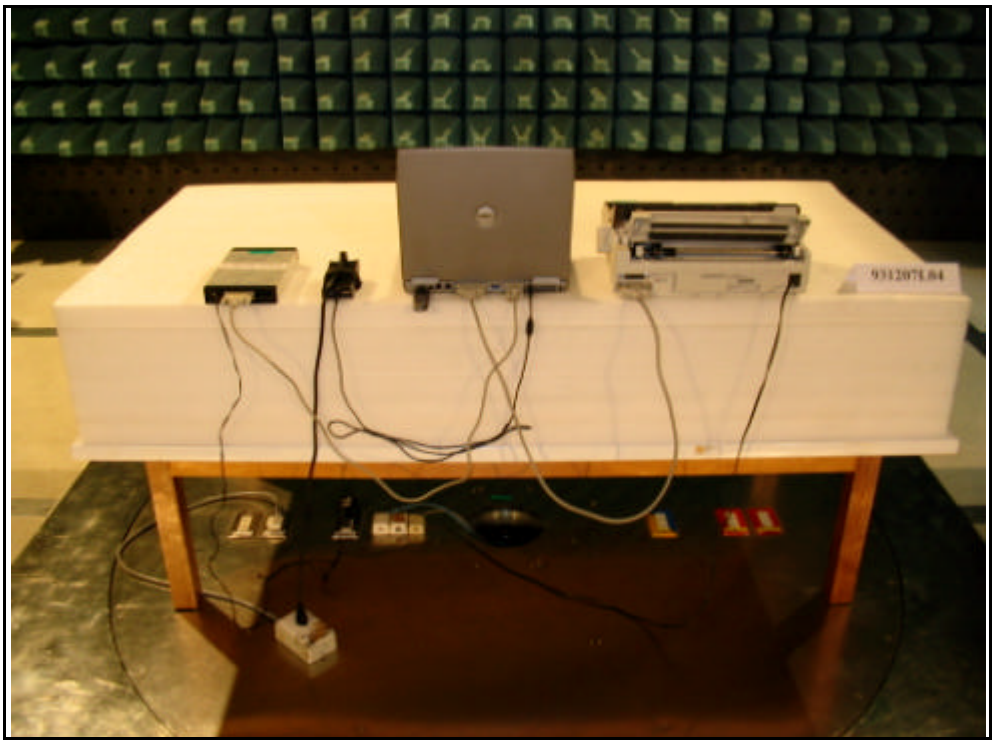
Test Mode 1





Test Mode 2





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

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Linko RF Lab.
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Web Site: www.adt.com.tw

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