802.11a Turbo OFDM modulation

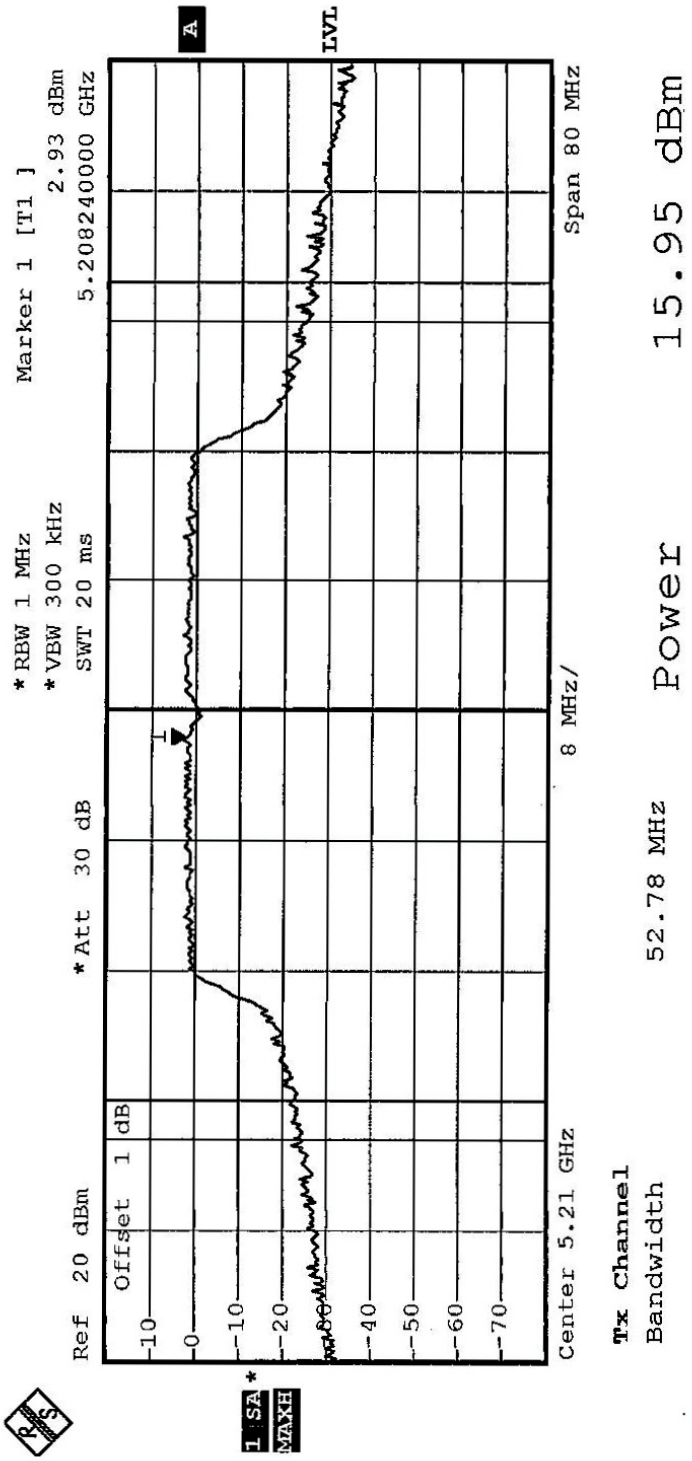
MODULATION TYPE	BPSK	**TRANSFER RATE**	12Mbps
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**ENVIRONMENTAL CONDITIONS**	30deg.C, 65%RH, 969hPa
TESTED BY	Sky Liao		

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (mW)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (dBm)	26dBc Occupied Bandwidth (MHz)	PASS/FAIL
1	5210	39.355	15.95	17.00	52.78	PASS
2	5250	28.840	14.60	17.00	51.52	PASS
3	5290	28.576	14.56	24.00	49.56	PASS

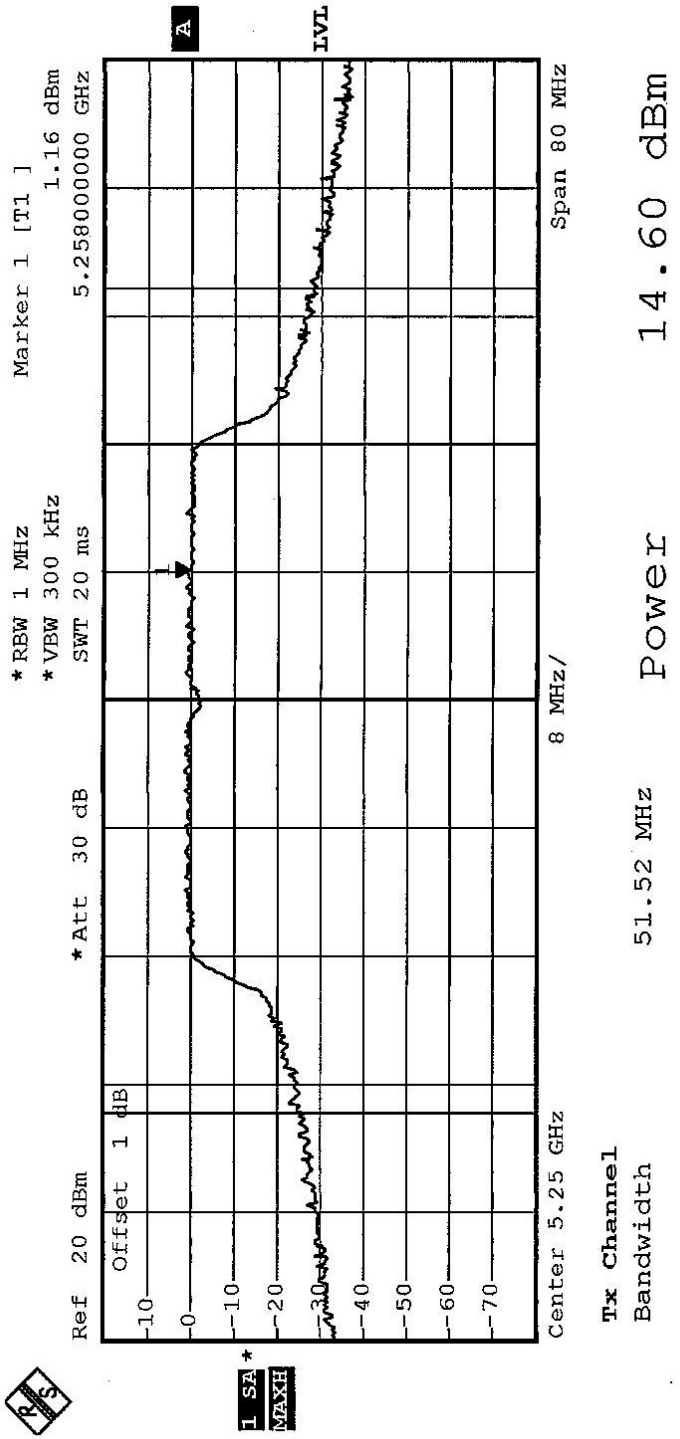
NOTE: The 26dBc Occupied Bandwidth plot, please refer to the following pages.

Peak Power Output:

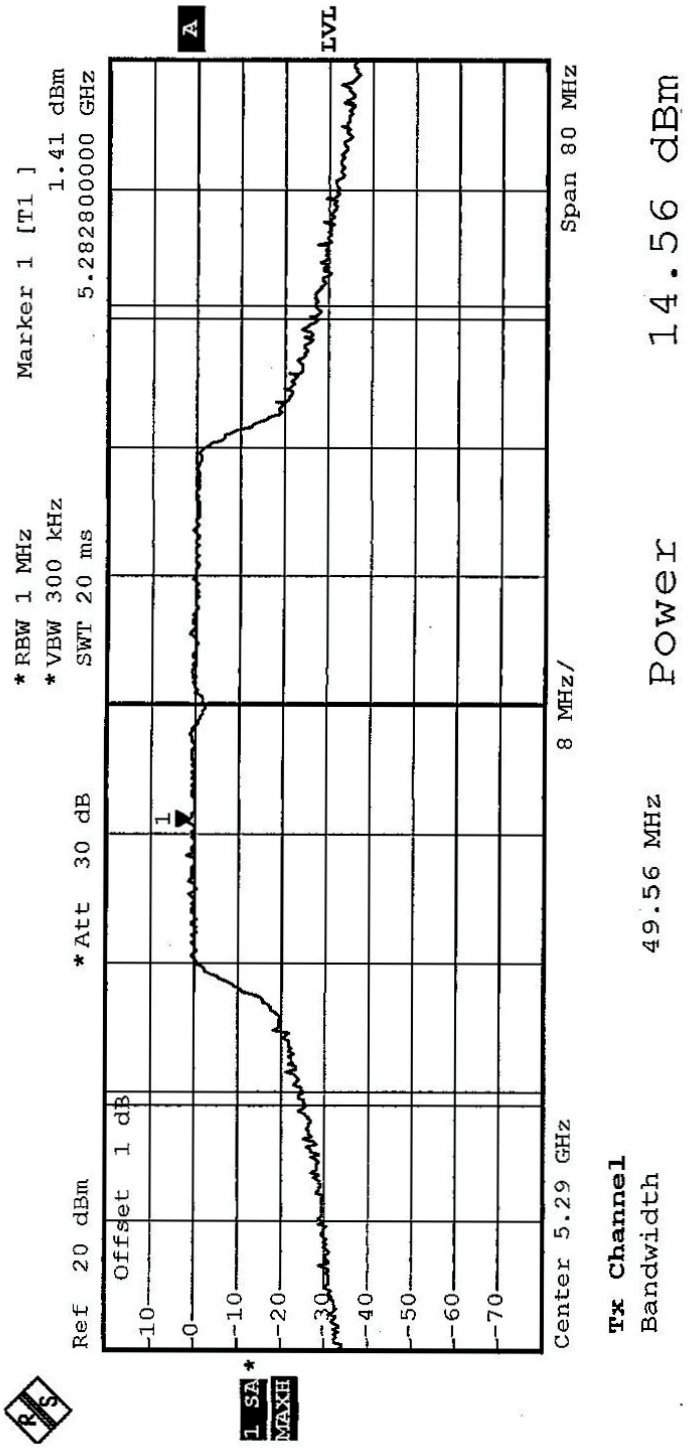
CHANNEL 1



CHANNEL 2

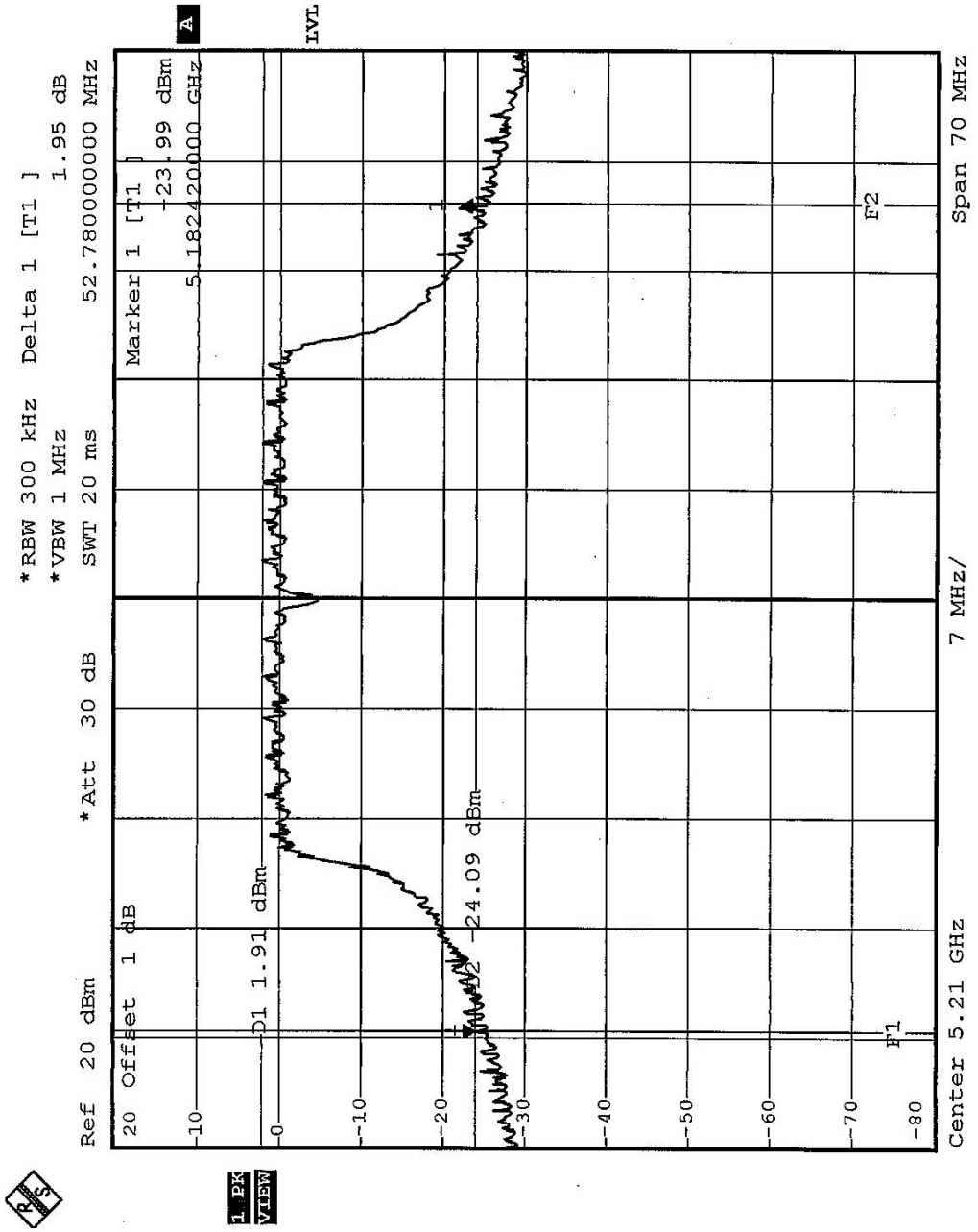

Marker 1 [T1]
1.16 dBm
5.25800000 GHz
*RBW 1 MHz
*VBW 300 kHz
SWT 20 ms
*Att 30 dB
Offset 1 dB
Ref 20 dBm
Center 5.25 GHz
8 MHz/
Span 80 MHz
1 SA
MAXH
A
LVL
Tx Channel
Bandwidth
51.52 MHz
Power
14.60 dBm

CHANNEL 3

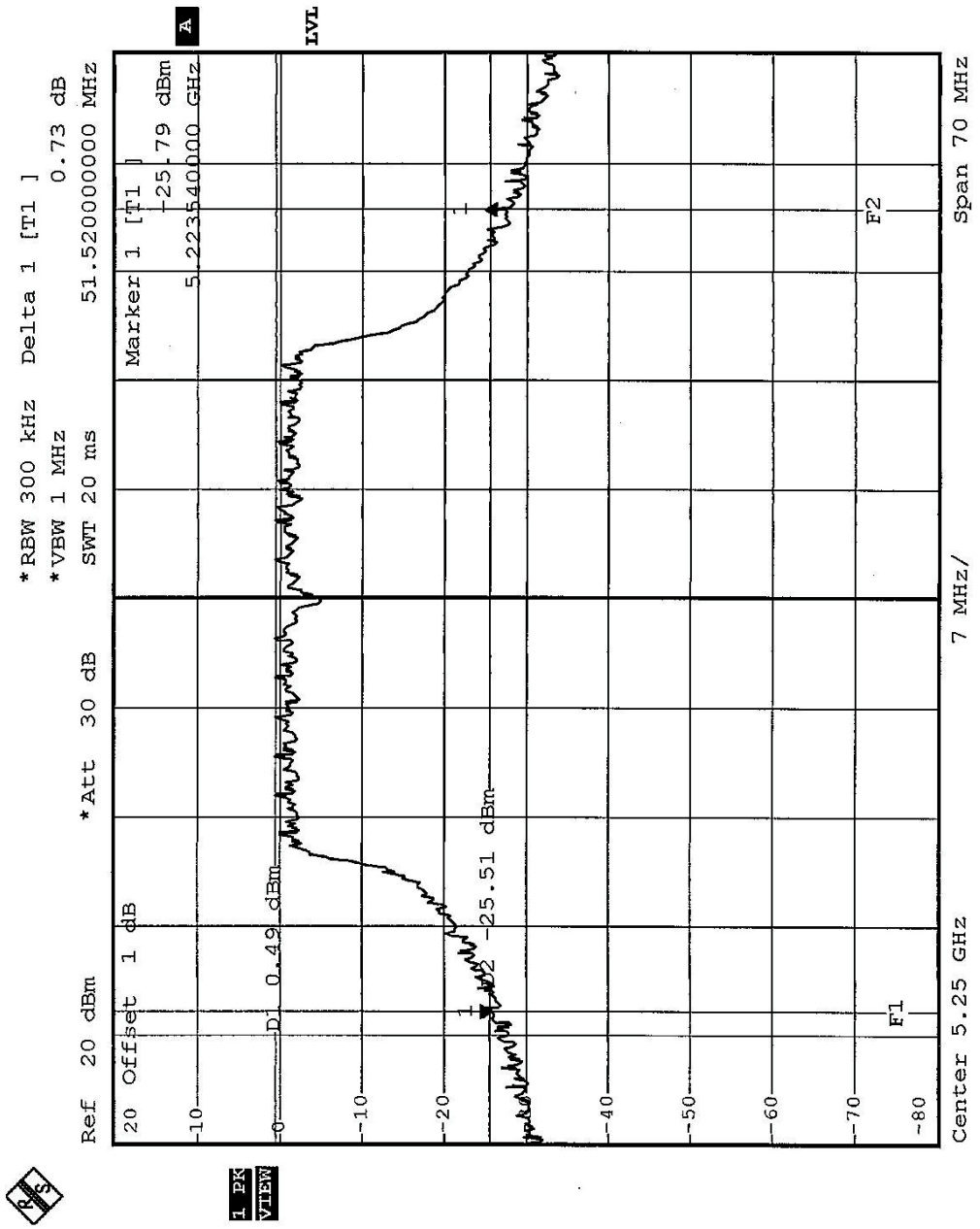

Marker 1 [T1]
1.41 dBm
5.28280000 GHz
*RBW 1 MHz
*VBW 300 kHz
SWT 20 ms
*Att 30 dB
Offset 1 dB
Ref 20 dBm
Center 5.29 GHz
8 MHz/
Span 80 MHz
A
LVL
1 SA
MAXH
Tx Channel
Bandwidth
49.56 MHz
Power
14.56 dBm

26dB Occupied Bandwidth:

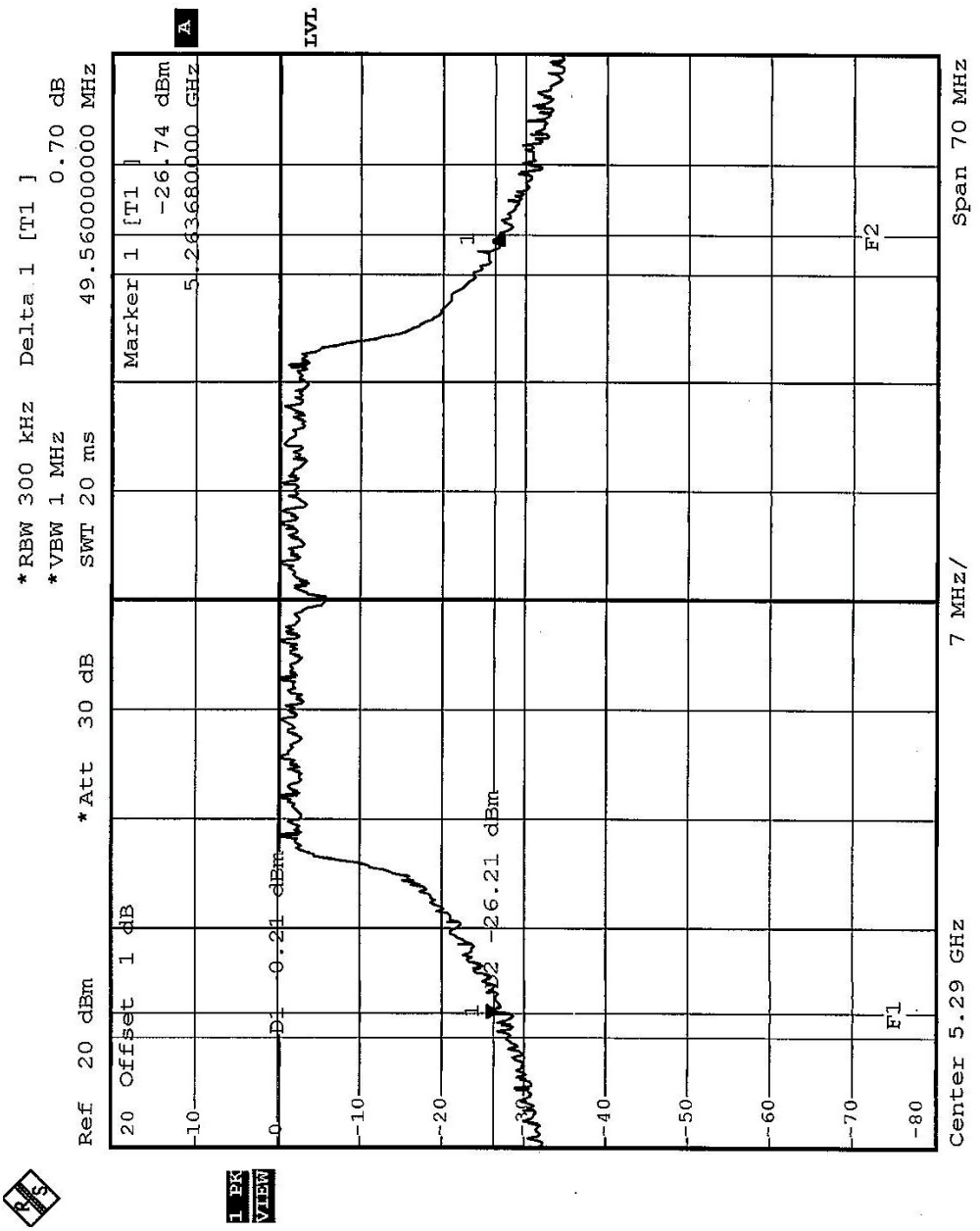
CHANNEL 1



CHANNEL 2


Ref 20 dBm
20 Offset 1 dB
*Att 30 dB
*RBW 300 kHz
*VBW 1 MHz
SWT 20 ms
Delta 1 [T1]
0.73 dB
51.520000000 MHz
Marker 1 [T1]
-25.79 dBm
5.223540000 GHz
D1 0.49 dBm
-25.51 dBm
F1
F2
Center 5.25 GHz
7 MHz/
Span 70 MHz
1 PK
VIEW
LVL
A

CHANNEL 3


*RBW 300 kHz
*VBW 1 MHz
SWT 20 ms
Delta 1 [T1]
0.70 dB
49.560000000 MHz
Marker 1 [T1]
-26.74 dBm
5.263680000 GHz
Ref 20 dBm
20 Offset 1 dB
*Att 30 dB
D1 0.21 dBm
1 -26.21 dBm
Center 5.29 GHz
7 MHz/
Span 70 MHz
F1
F2
1 PK VIEW
LVL
A

4.3 BAND EDGES MEASUREMENT

4.3.1 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. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

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

4.3.2 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 10 Hz with suitable frequency span including 100 MHz bandwidth from band edge. The band edges was measured and recorded.

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

4.3.3 EUT OPERATING CONDITION

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

4.3.4 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

NOTE (Peak):

The band edge emission plot on the following first page shows 45.42dBc 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 107.5dBuV/m (Peak), so the maximum field strength in restrict band is 107.5-45.42=62.08dBuV/m which is under 74dBuV/m limit.

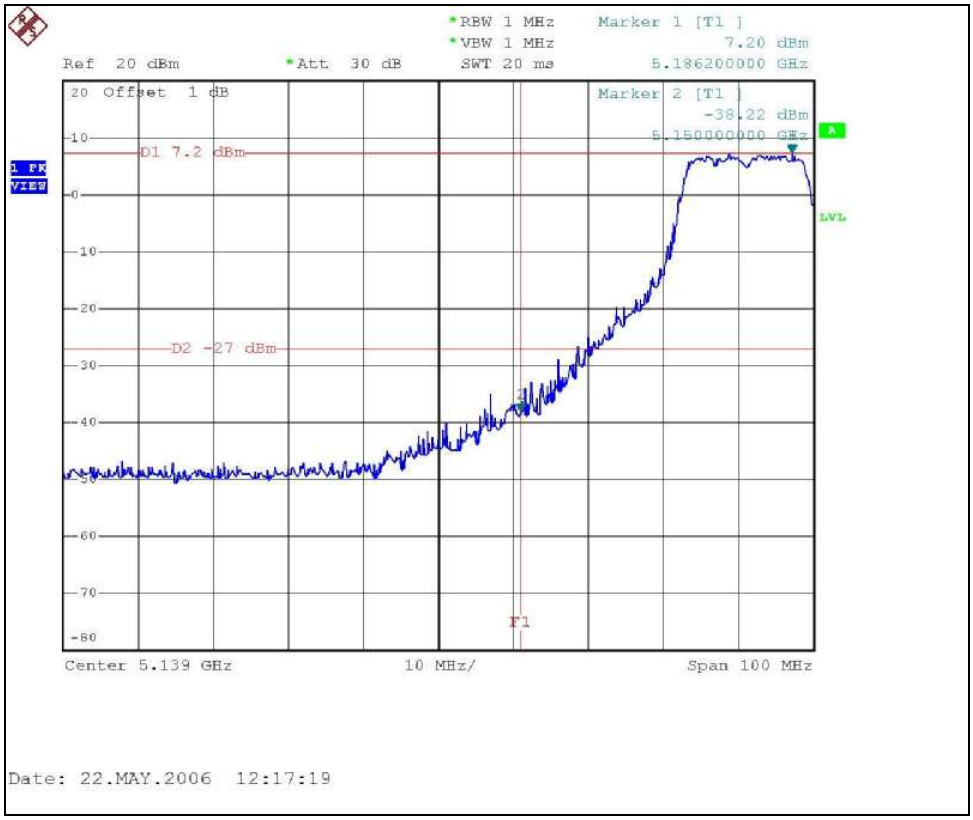
The band edge emission plot on the following first page shows 49.2dBc between carrier maximum power and local maximum emission in restrict band. The emission of carrier strength list in the test result of channel 8 is 106.3dBuV/m (Peak), so the maximum field strength in restrict band is 106.3-49.2=57.1dBuV/m which is under 74dBuV/m limit.

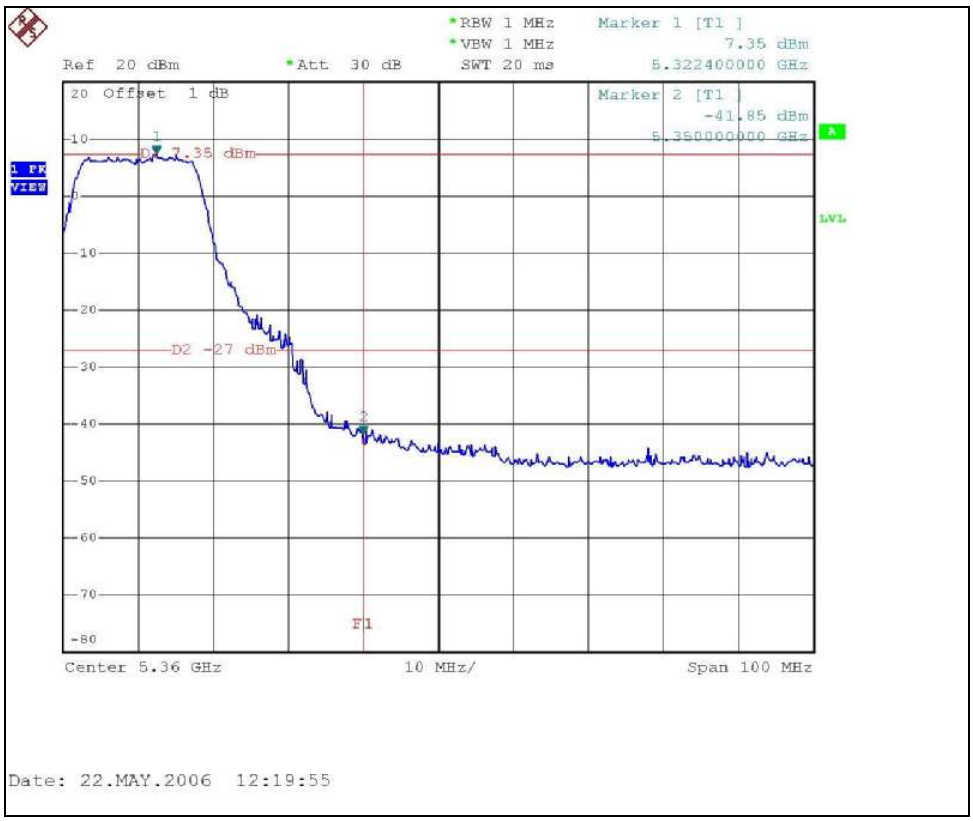
NOTE (Average):

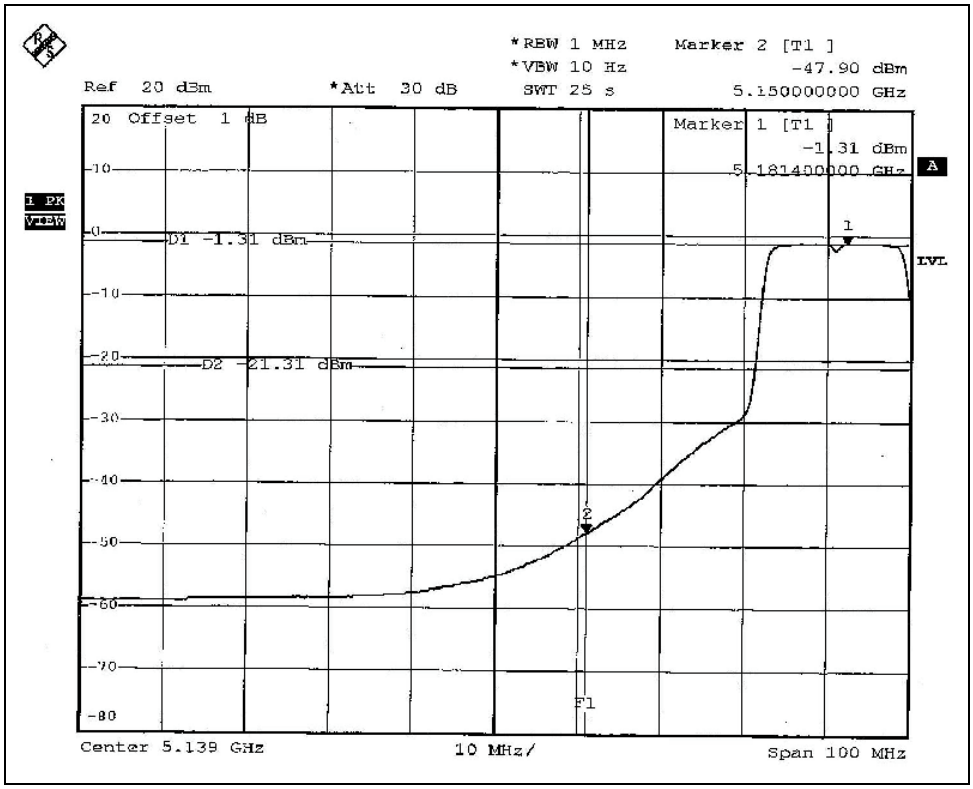
The band edge emission plot on the following second page shows 46.59dBc between carrier maximum power and local maximum emission in restrict band. The emission of carrier strength list in the test result of channel 1 is 96.6dBuV/m (Average), so the maximum field strength in restrict band is 96.6-46.59=50.01dBuV/m which is under 54dBuV/m limit.

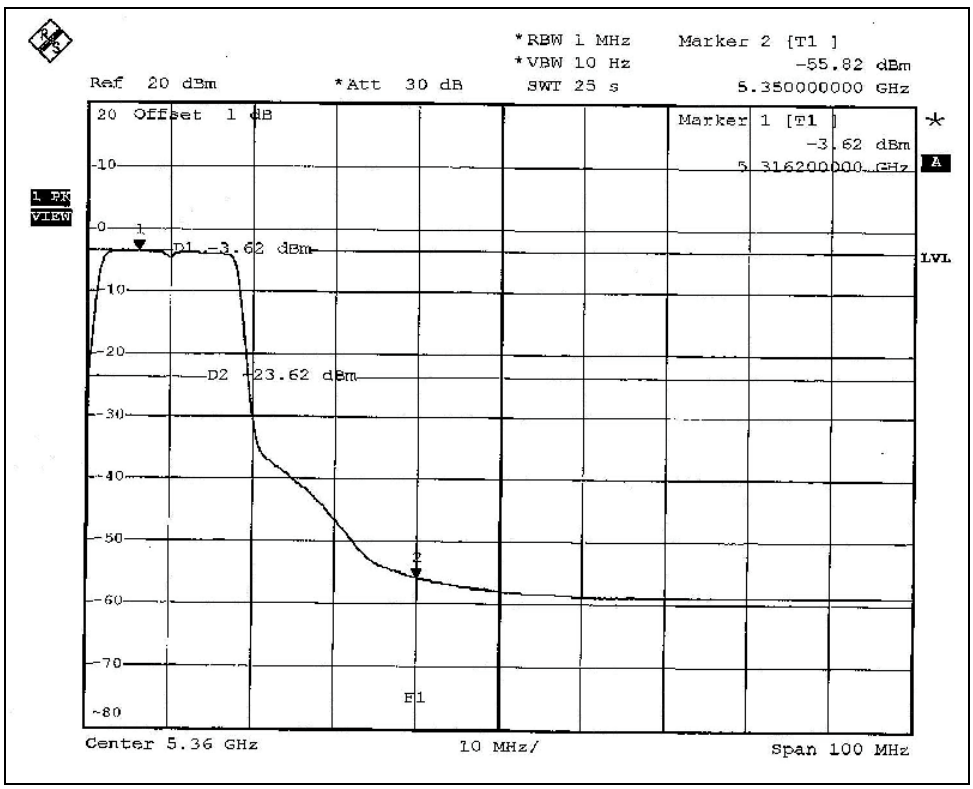
The band edge emission plot on the following second page shows 52.2dBc between carrier maximum power and local maximum emission in restrict band. The emission of carrier strength list in the test result of channel 8 is 96.3dBuV/m (Average), so the maximum field strength in restrict band is 96.3-52.2=44.1dBuV/m which is under 54dBuV/m limit.

802.11a OFDM modulation

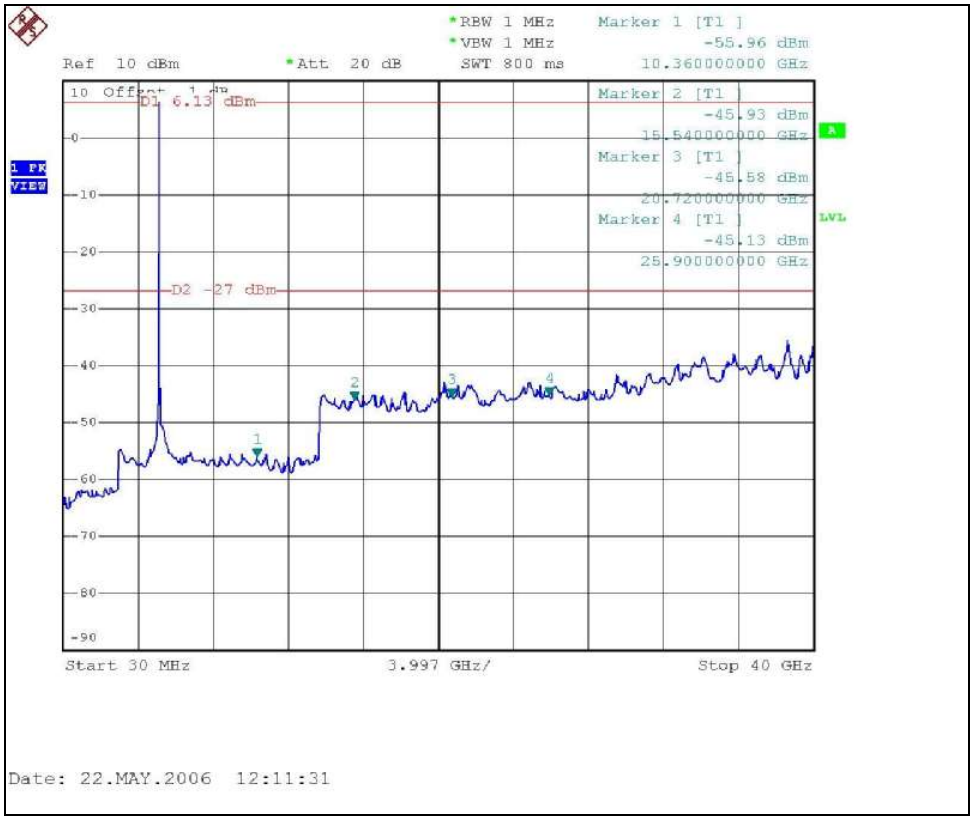




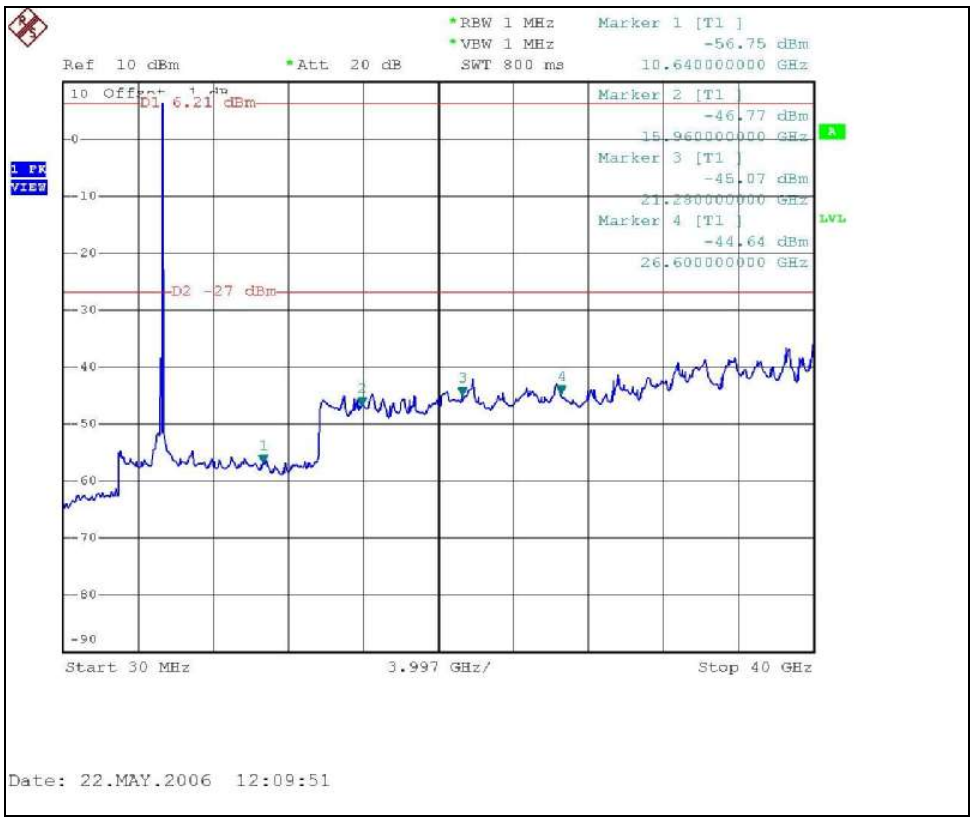

*RBW 1 MHz
*VBW 10 Hz
SWT 25 s
Marker 2 [T1]
-47.90 dBm
5.150000000 GHz
Ref 20 dBm
*Att 30 dB
20 Offset 1 dB
Marker 1 [T1]
-1.31 dBm
5.181400000 GHz
1 PK
VIEW
A
LVL
D1 -1.31 dBm
D2 -21.31 dBm
Center 5.139 GHz
10 MHz/
Span 100 MHz


*RBW 1 MHz
*VBW 10 Hz
SWT 25 s
Marker 2 [T1]
-55.82 dBm
5.350000000 GHz
Ref 20 dBm
*Att 30 dB
20 Offset 1 dB
Marker 1 [T1]
-3.62 dBm
5.316200000 GHz
1 PK
VIEW
A
LVL
D1 -3.62 dBm
D2 -23.62 dBm
Center 5.36 GHz
10 MHz/
Span 100 MHz

CH 1


*RBW 1 MHz
*VBW 1 MHz
Ref 10 dBm
*Att 20 dB
SWT 800 ms
Marker 1 [T1]
-55.96 dBm
10.360000000 GHz
Marker 2 [T1]
-45.93 dBm
15.540000000 GHz
Marker 3 [T1]
-45.58 dBm
20.720000000 GHz
Marker 4 [T1]
-45.13 dBm
25.900000000 GHz
D1 6.13 dBm
D2 -27 dBm
Start 30 MHz
3.997 GHz/
Stop 40 GHz
Date: 22.MAY.2006 12:11:31

CH 8


*RBW 1 MHz
*VBW 1 MHz
Ref 10 dBm
*Att 20 dB
SWT 800 ms
Marker 1 [T1]
-56.75 dBm
10.640000000 GHz
Marker 2 [T1]
-46.77 dBm
15.960000000 GHz
Marker 3 [T1]
-45.07 dBm
21.280000000 GHz
Marker 4 [T1]
-44.64 dBm
26.600000000 GHz
D1 6.21 dBm
D2 -27 dBm
Start 30 MHz
3.997 GHz/
Stop 40 GHz
Date: 22.MAY.2006 12:09:51

802.11a Turbo OFDM modulation

NOTE (Peak):

The band edge emission plot on the following first page shows 41.98dBc 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 104.0dBuV/m (Peak), so the maximum field strength in restrict band is 104.0-41.98=62.02dBuV/m which is under 74dBuV/m limit.

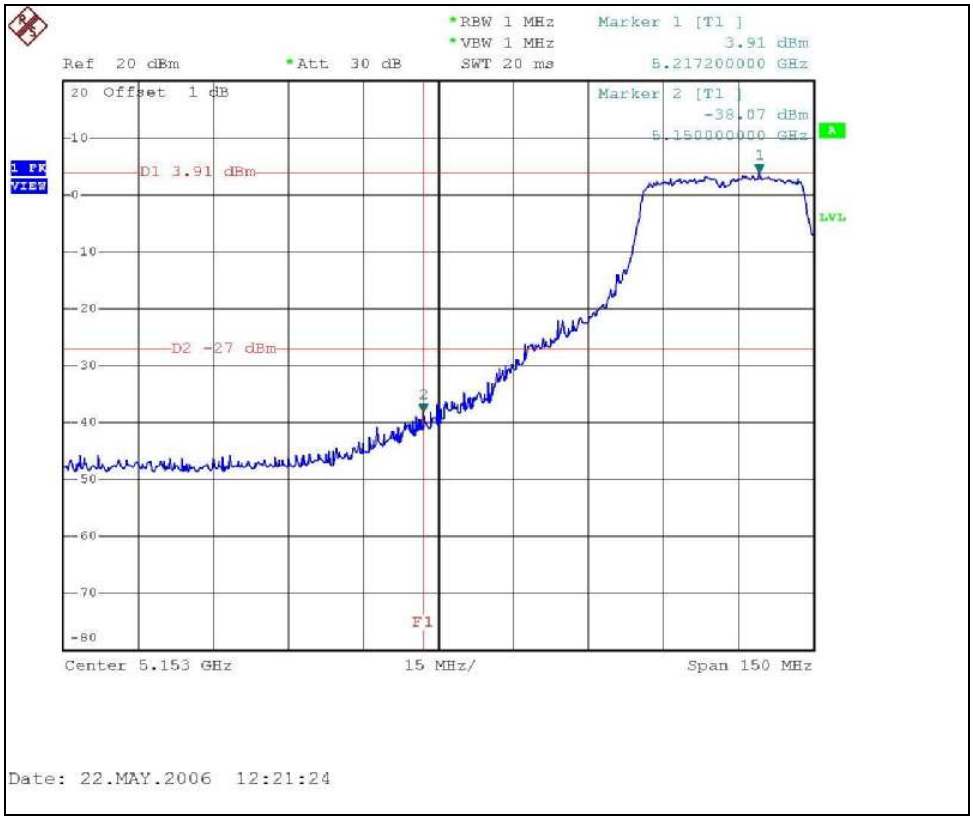
The band edge emission plot on the following first page shows 48.39dBc between carrier maximum power and local maximum emission in restrict band. The emission of carrier strength list in the test result of channel 3 is 102.0dBuV/m (Peak), so the maximum field strength in restrict band is 102.0-48.39=53.61dBuV/m which is under 74dBuV/m limit.

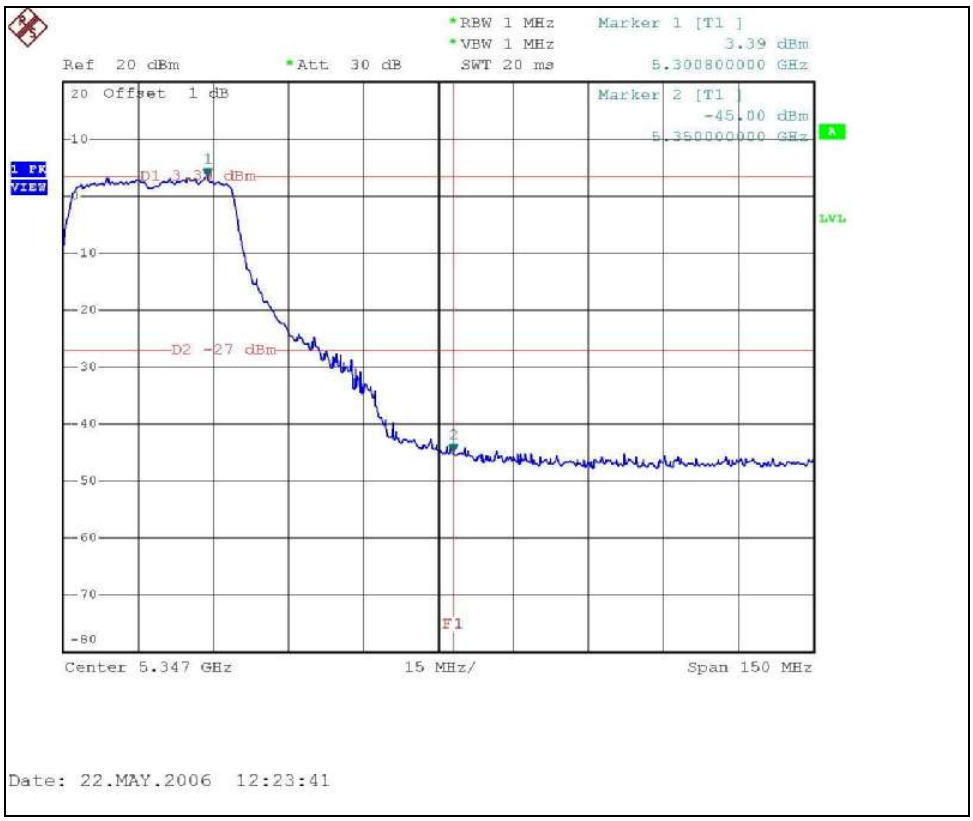
NOTE (Average):

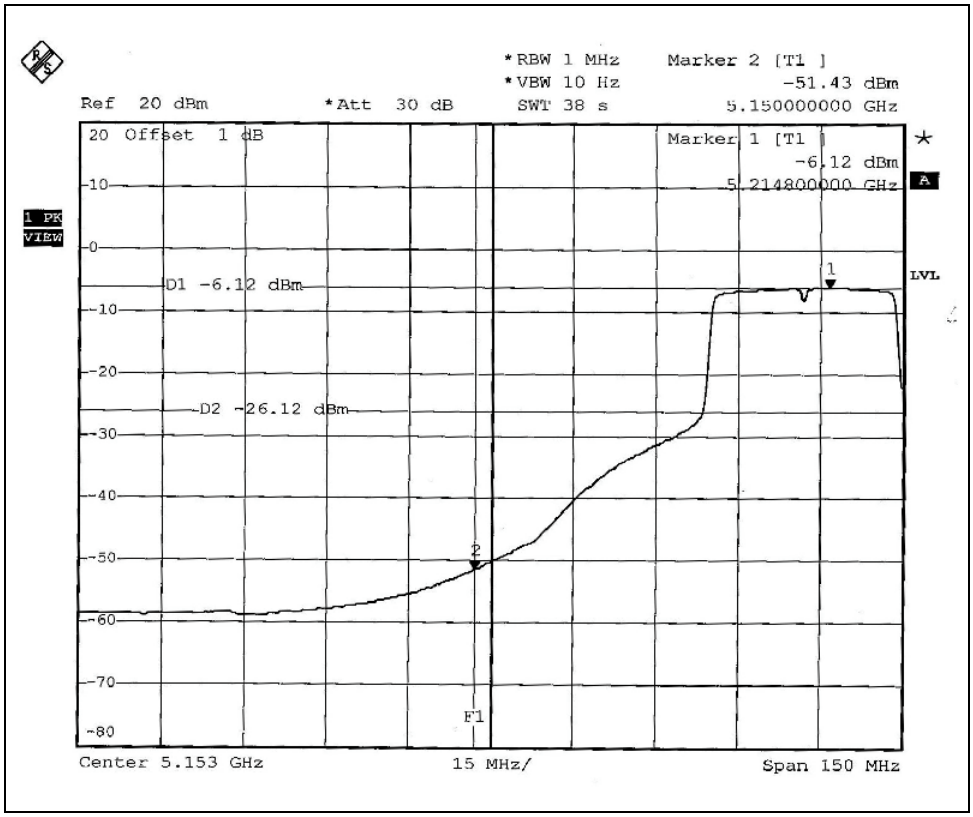
The band edge emission plot on the following second page shows 45.31dBc between carrier maximum power and local maximum emission in restrict band. The emission of carrier strength list in the test result of channel 1 is 94.3dBuV/m (Average), so the maximum field strength in restrict band is 94.3-45.31=48.99dBuV/m which is under 54dBuV/m limit.

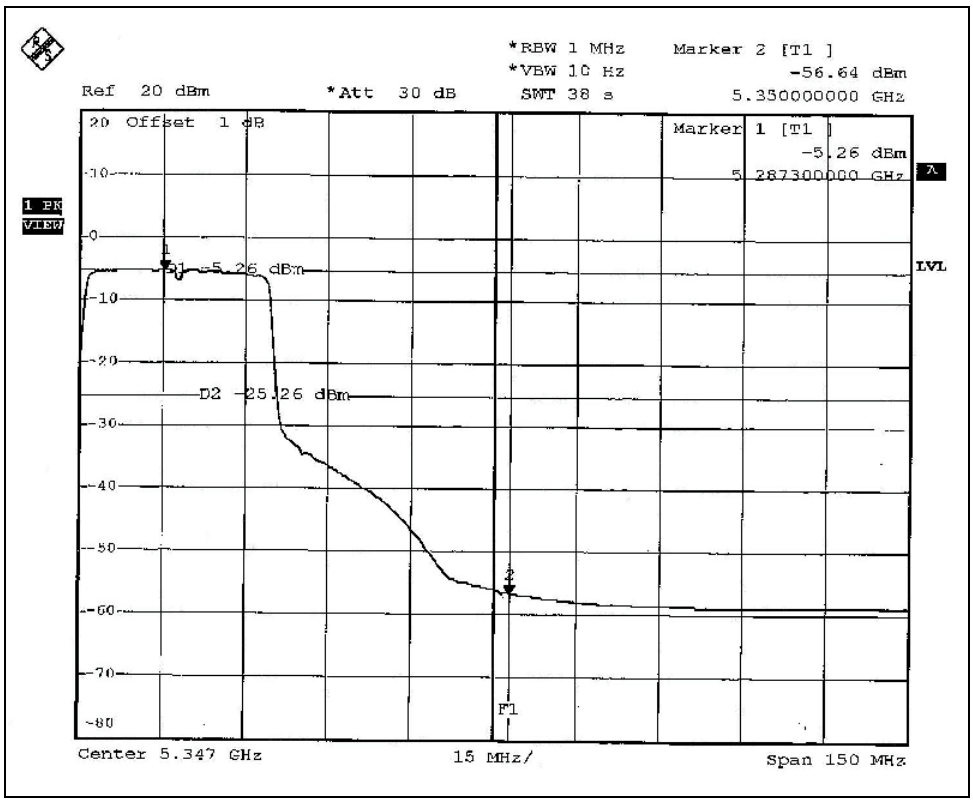
The band edge emission plot on the following second page shows 51.38dBc between carrier maximum power and local maximum emission in restrict band. The emission of carrier strength list in the test result of channel 3 is 93.0dBuV/m (Average), so the maximum field strength in restrict band is 93.0-51.38=41.62dBuV/m which is under 54dBuV/m limit.

802.11a TURBO OFDM modulation

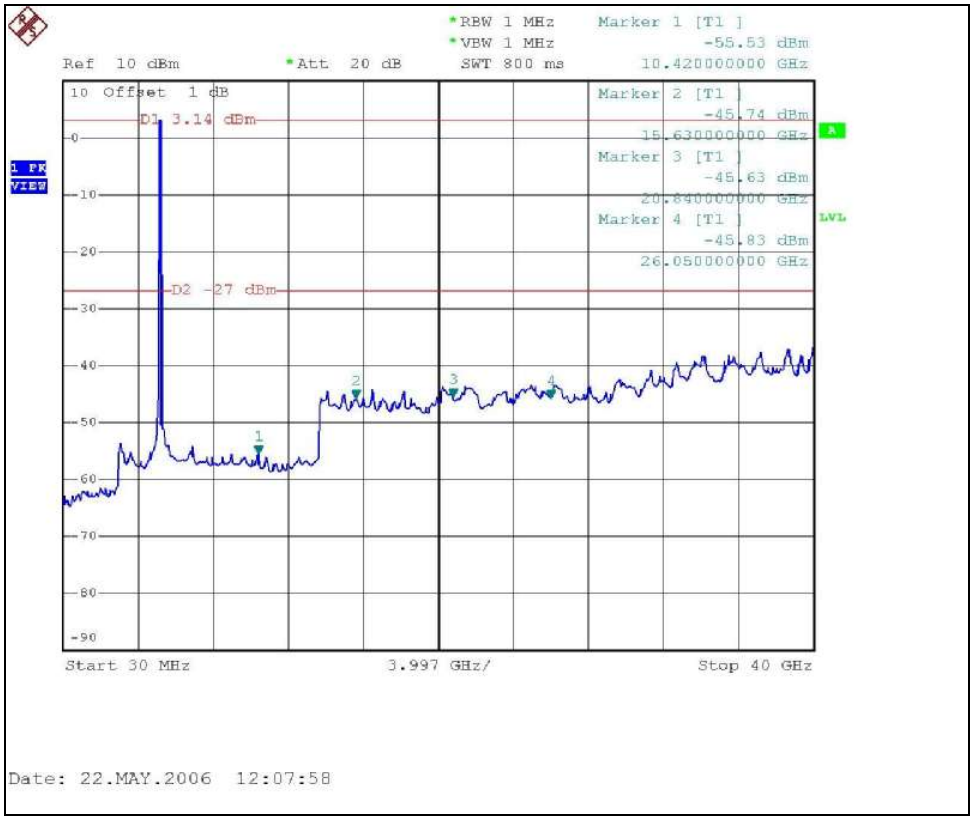




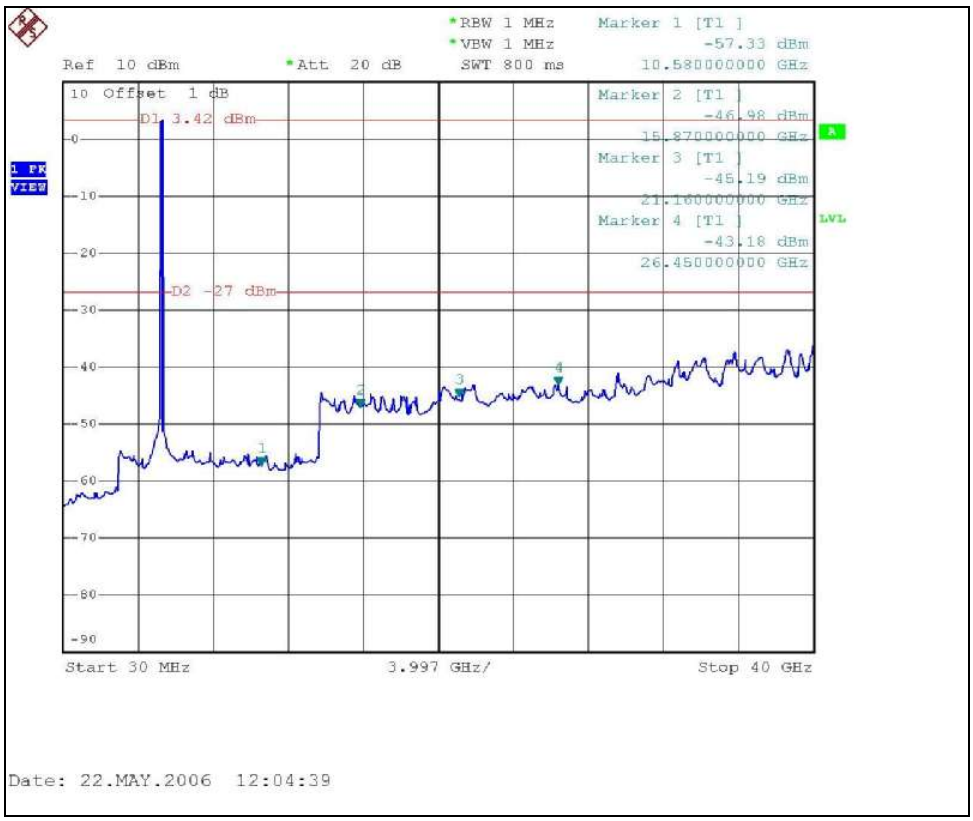

*RBW 1 MHz
*VBW 10 Hz
SWT 38 s
Marker 2 [T1]
-51.43 dBm
5.150000000 GHz
Ref 20 dBm
*Att 30 dB
20 Offset 1 dB
Marker 1 [T1]
-6.12 dBm
5.214800000 GHz
1 PK
VIEW
A
LVL
D1 -6.12 dBm
D2 -26.12 dBm
F1
Center 5.153 GHz
15 MHz/
Span 150 MHz


*RBW 1 MHz
*VBW 10 Hz
SWT 38 s
Marker 2 [T1]
-56.64 dBm
5.350000000 GHz
Ref 20 dBm
*Att 30 dB
20 Offset 1 dB
Marker 1 [T1]
-5.26 dBm
5.287300000 GHz
1 PK
VIEW
A
LVL
D1 -5.26 dBm
D2 -25.26 dBm
F1
Center 5.347 GHz
15 MHz/
Span 150 MHz

CH 1


RBW 1 MHz
VBW 1 MHz
SWT 800 ms
Marker 1 [T1]
-55.53 dBm
10.420000000 GHz
Ref 10 dBm
Att 20 dB
10 Offset 1 dB
D1 3.14 dBm
D2 -27 dBm
Marker 2 [T1]
-45.74 dBm
15.630000000 GHz
Marker 3 [T1]
-45.63 dBm
20.840000000 GHz
Marker 4 [T1]
-45.83 dBm
26.050000000 GHz
1 PK VIEW
LVL
Start 30 MHz
3.997 GHz/
Stop 40 GHz
Date: 22.MAY.2006 12:07:58

CH 3


RBW 1 MHz
VBW 1 MHz
SWT 800 ms
Marker 1 [T1]
-57.33 dBm
10.580000000 GHz
Ref 10 dBm
Att 20 dB
10 Offset 1 dB
D1 3.42 dBm
D2 -27 dBm
Marker 2 [T1]
-46.98 dBm
15.870000000 GHz
Marker 3 [T1]
-45.19 dBm
21.160000000 GHz
Marker 4 [T1]
-43.18 dBm
26.450000000 GHz
1 PK VIEW
LVL
Start 30 MHz
3.997 GHz/
Stop 40 GHz
Date: 22.MAY.2006 12:04:39

4.4 ANTENNA REQUIREMENT

4.4.1 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.

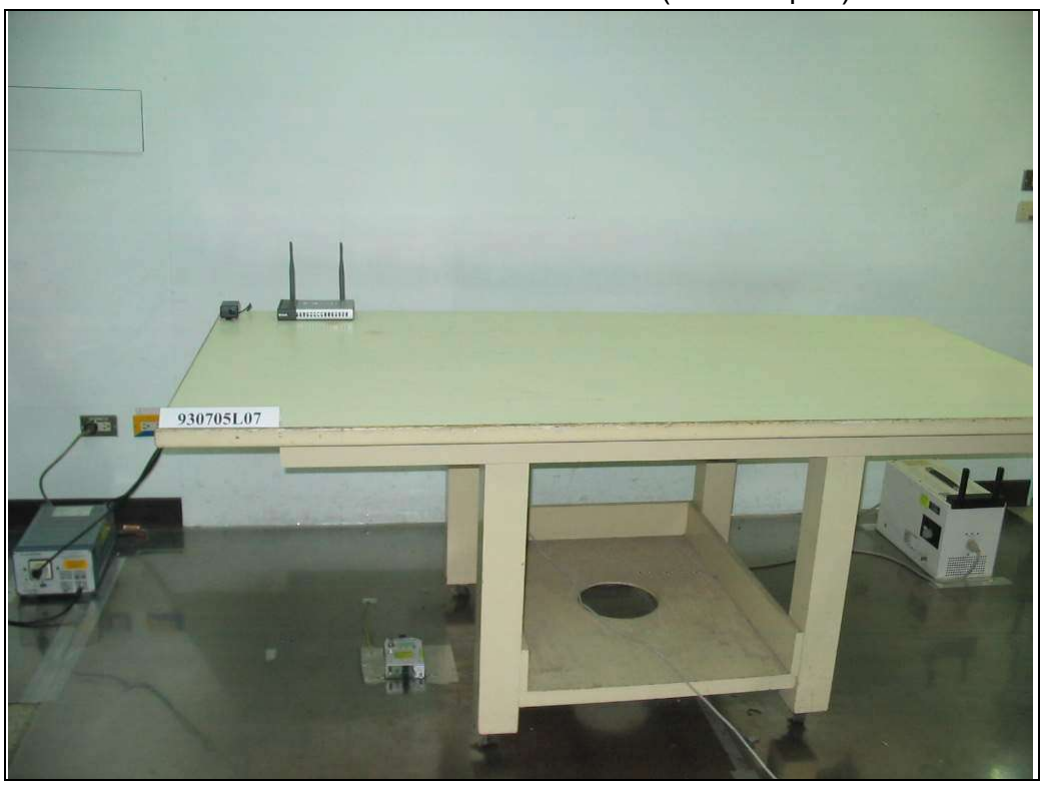
4.4.2 ANTENNA CONNECTED CONSTRUCTION

The antennas used in this product are as below:

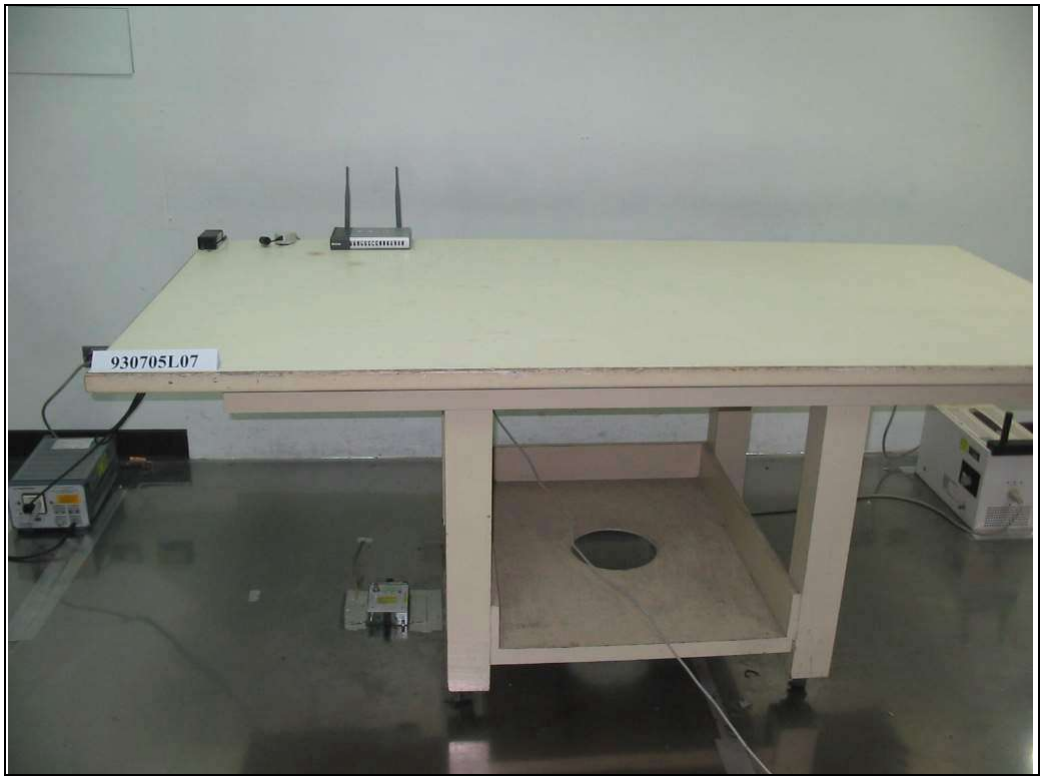
No.	Gain (dBi)	Antenna Type	Antenna Connector
1	5.0	Dipole	RP-SMA
2	-1.07(for 5.15-5.35GHz) 3.02(for 5.725-5.85GHz)	Printed	NA

5. PHOTOGRAPHS OF THE TEST CONFIGURATION

CONDUCTED EMISSION TEST (With Adapter)



(With Adapter+POE)



RADIATED EMISSION TEST (With Adapter)

(With Adapter +POE)

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, 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

Email: service@adt.com.tw
Web Site: 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.