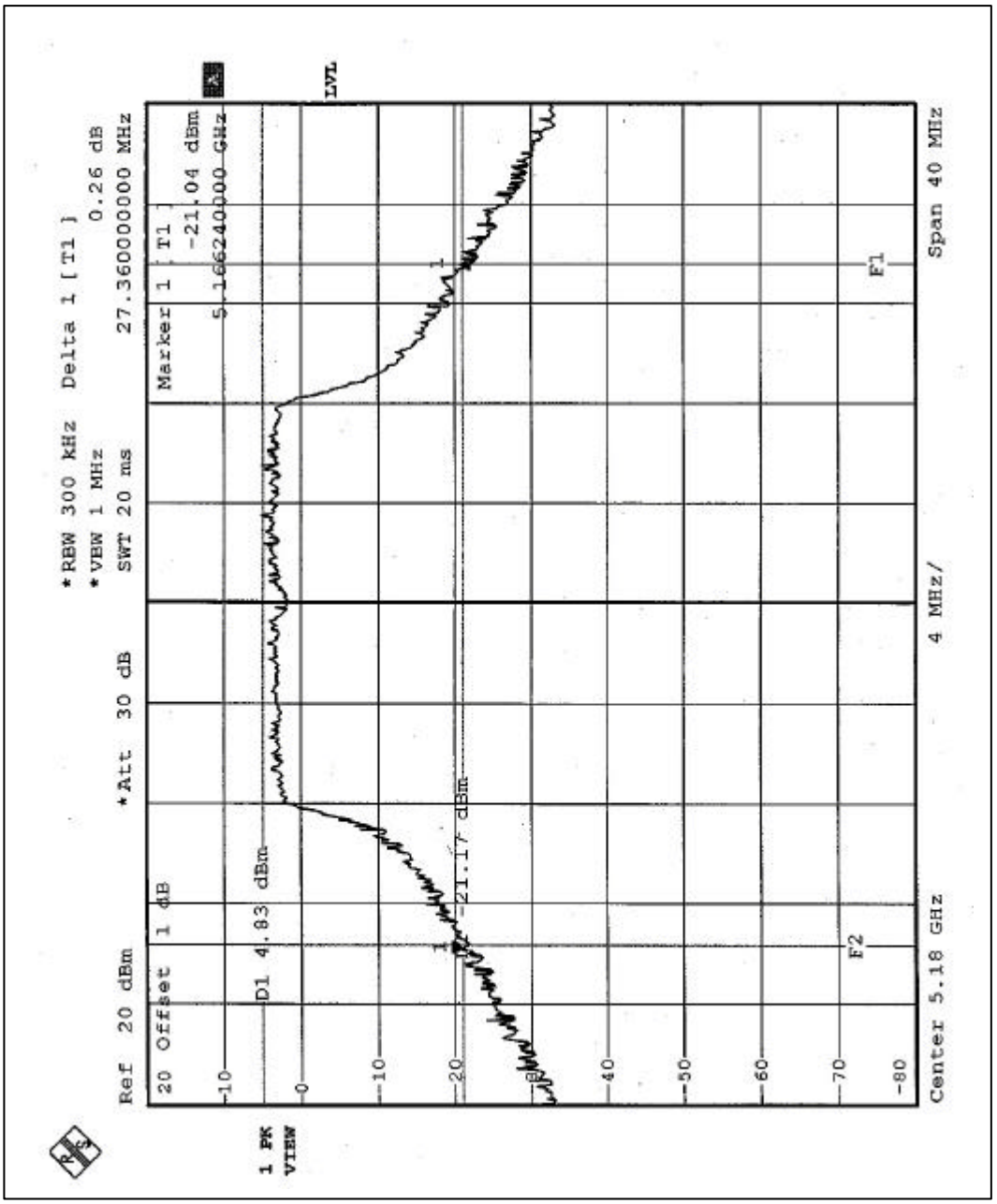
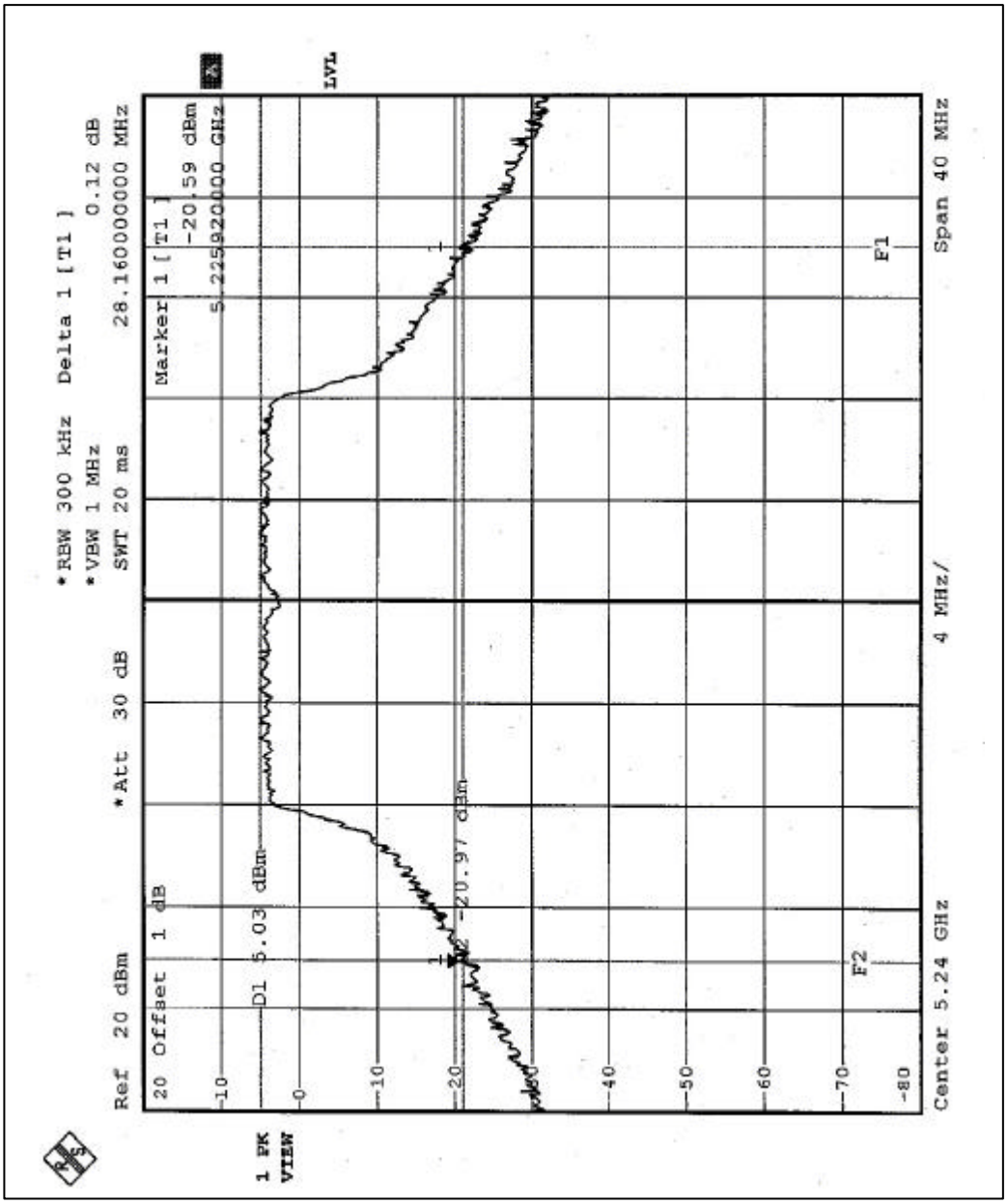
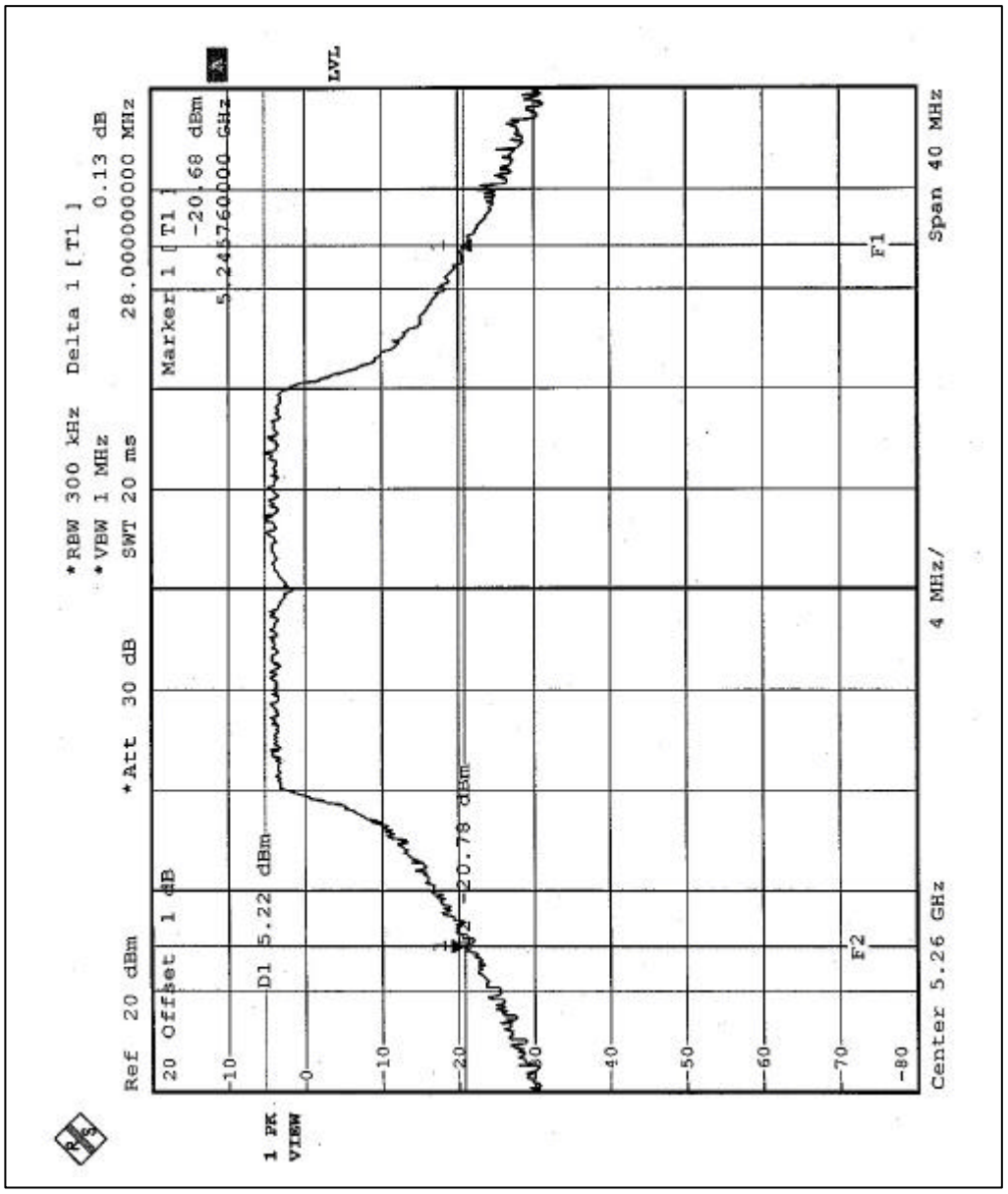
CHANNEL 1


RBW 300 kHz
VBW 1 MHz
SWT 20 ms
Delta 1 [T1]
0.26 dB
27.36000000 MHz
Marker 1 [T1]
-21.04 dBm
5.16624000 GHz
Ref 20 dBm
Offset 1 dB
Att 30 dB
D1 4.83 dBm
-21.17 dBm
Center 5.18 GHz
4 MHz/
Span 40 MHz
F1
F2
1 PK
VIEW
LVL

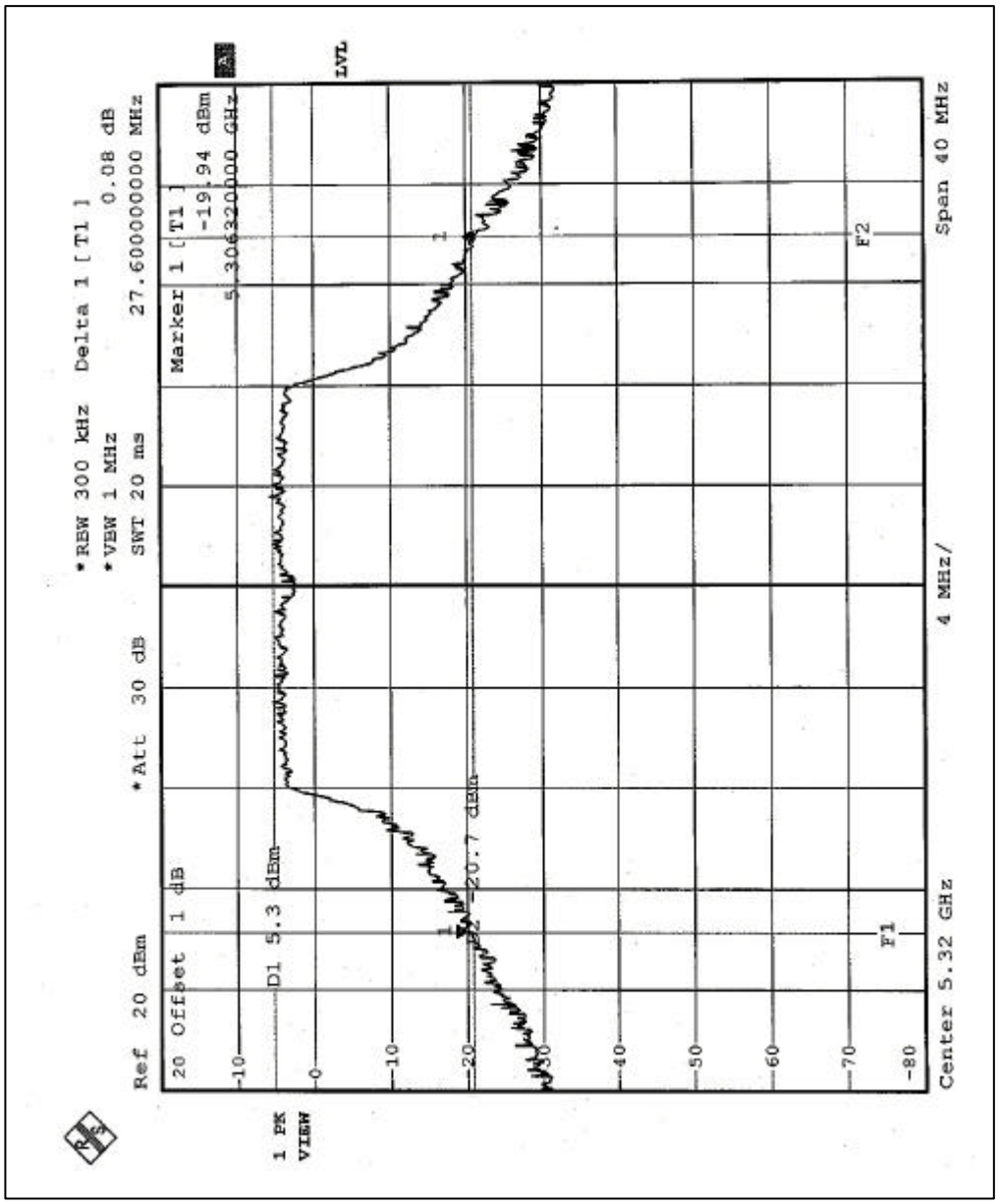
CHANNEL 4


RBW 300 kHz
VBW 1 MHz
SWT 20 ms
Delta 1 [T1]
0.12 dB
28.16000000 MHz
Marker 1 [T1]
-20.59 dBm
5.22592000 GHz
Ref 20 dBm
20 Offset 1 dB
Att 30 dB
D1 5.03 dBm
-20.97 dBm
1 PK
VIEW
LVL
F1
F2
Span 40 MHz
4 MHz/
Center 5.24 GHz

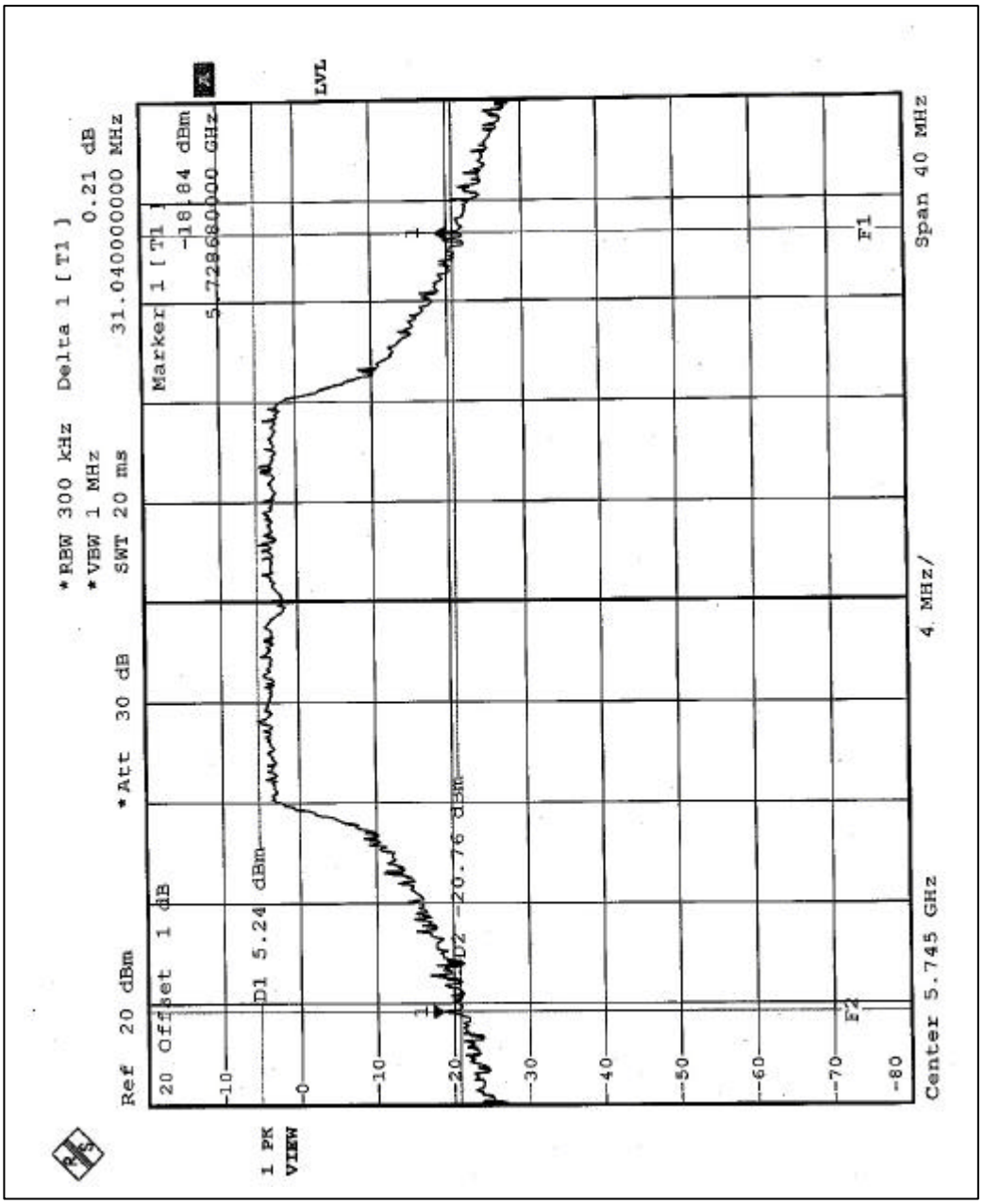
CHANNEL 5


RBW 300 kHz
VBW 1 MHz
SWT 20 ms
Att 30 dB
Ref 20 dBm
Offset 1 dB
Delta 1 [T1]
0.13 dB
28.000000000 MHz
Marker 1 [T1]
-20.68 dBm
5.245760000 GHz
D1 5.22 dBm
-20.78 dBm
F1
F2
Center 5.26 GHz
4 MHz/
Span 40 MHz
1 PK
VIEW

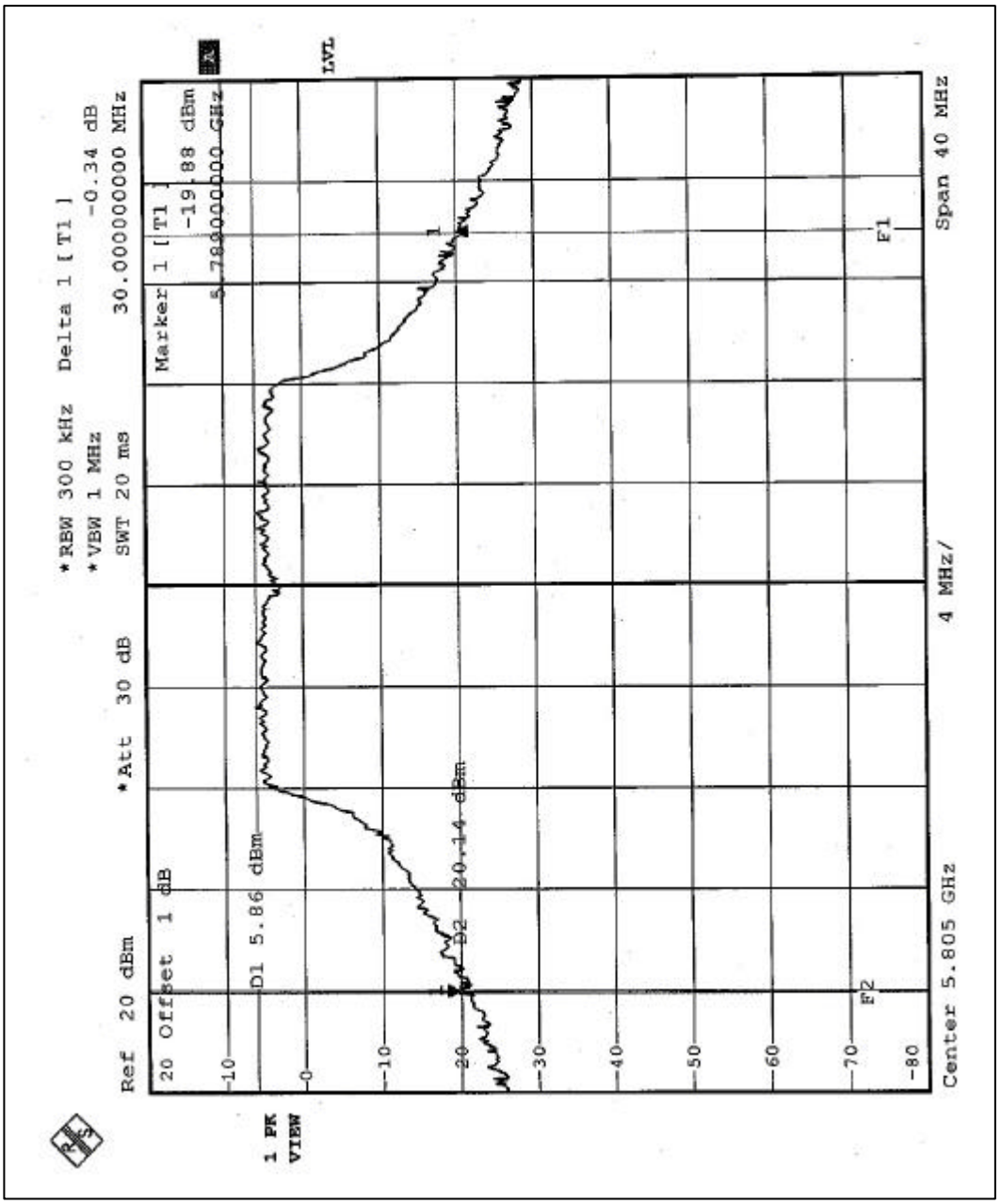
CHANNEL 8


RBW 300 kHz
VBW 1 MHz
SWT 20 ms
Delta 1 [T1]
0.08 dB
27.600000000 MHz
Marker 1 [T1]
-19.94 dBm
5.306320000 GHz
Ref 20 dBm
20 Offset 1 dB
Att 30 dB
D1 5.3 dBm
-20.7 dBm
1 PK
VIEW
Center 5.32 GHz
4 MHz/
Span 40 MHz
F1
F2

CHANNEL9


RBW 300 kHz
VBW 1 MHz
SWT 20 ms
Delta 1 [T1]
0.21 dB
31.04000000 MHz
Marker 1 [T1]
-18.84 dBm
5.728680000 GHz
Ref 20 dBm
Offset 1 dB
Att 30 dB
D1 5.24 dBm
D2 -20.76 dBm
Center 5.745 GHz
4 MHz/
Span 40 MHz
1 PK
VIEW
LVL
F1
F2

CHANNEL 12


RBW 300 kHz
VBW 1 MHz
SWT 20 ms
Delta 1 [T1]
-0.34 dB
30.000000000 MHz
Marker 1 [T1]
-19.88 dBm
5.780000000 GHz
Ref 20 dBm
Offset 1 dB
Att 30 dB
D1 5.86 dBm
D2 -20.14 dBm
Center 5.805 GHz
4 MHz/
Span 40 MHz
1 PK VIEW

5.4 PEAK POWER EXCURSION MEASUREMENT

5.4.1 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

5.4.2 TEST INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
SPECTRUM ANALYZER	FSEK30	100049	July 24, 2003

NOTE:

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

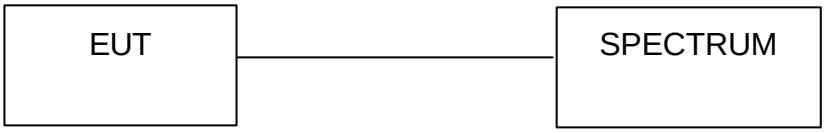
5.4.3 TEST PROCEDURE

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=30KHz).
4. The largest difference between Trace 1 and Trace 2 in any 1MHz band on any frequency was recorded.

5.4.4 DEVIATION FROM TEST STANDARD

No deviation

5.4.5 TEST SETUP



5.4.6 EUT OPERATING CONDITIONS

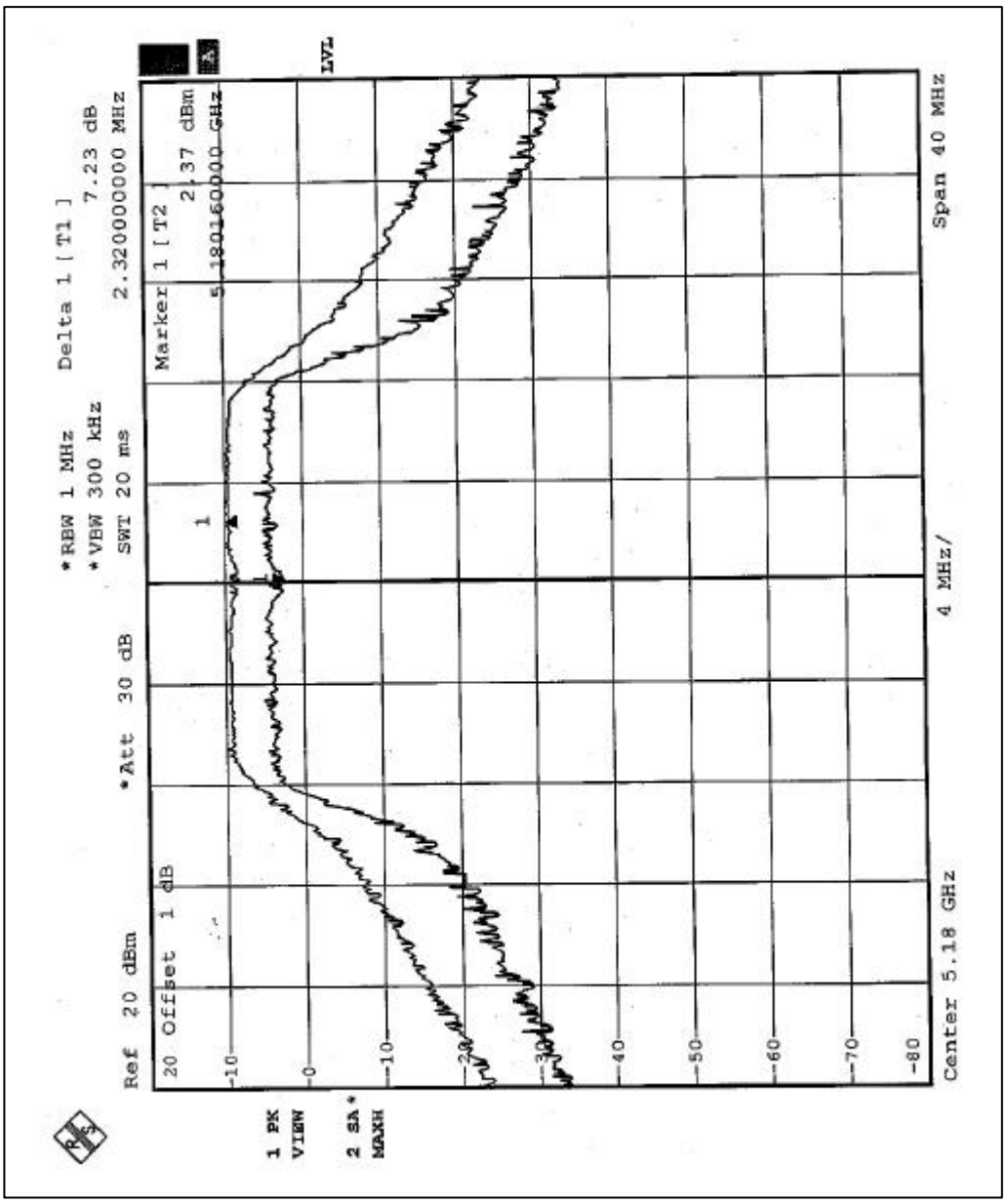
The software provided by client to enable the EUT under transmission condition continuously at specific channel frequencies individually.

5.4.7 TEST RESULTS

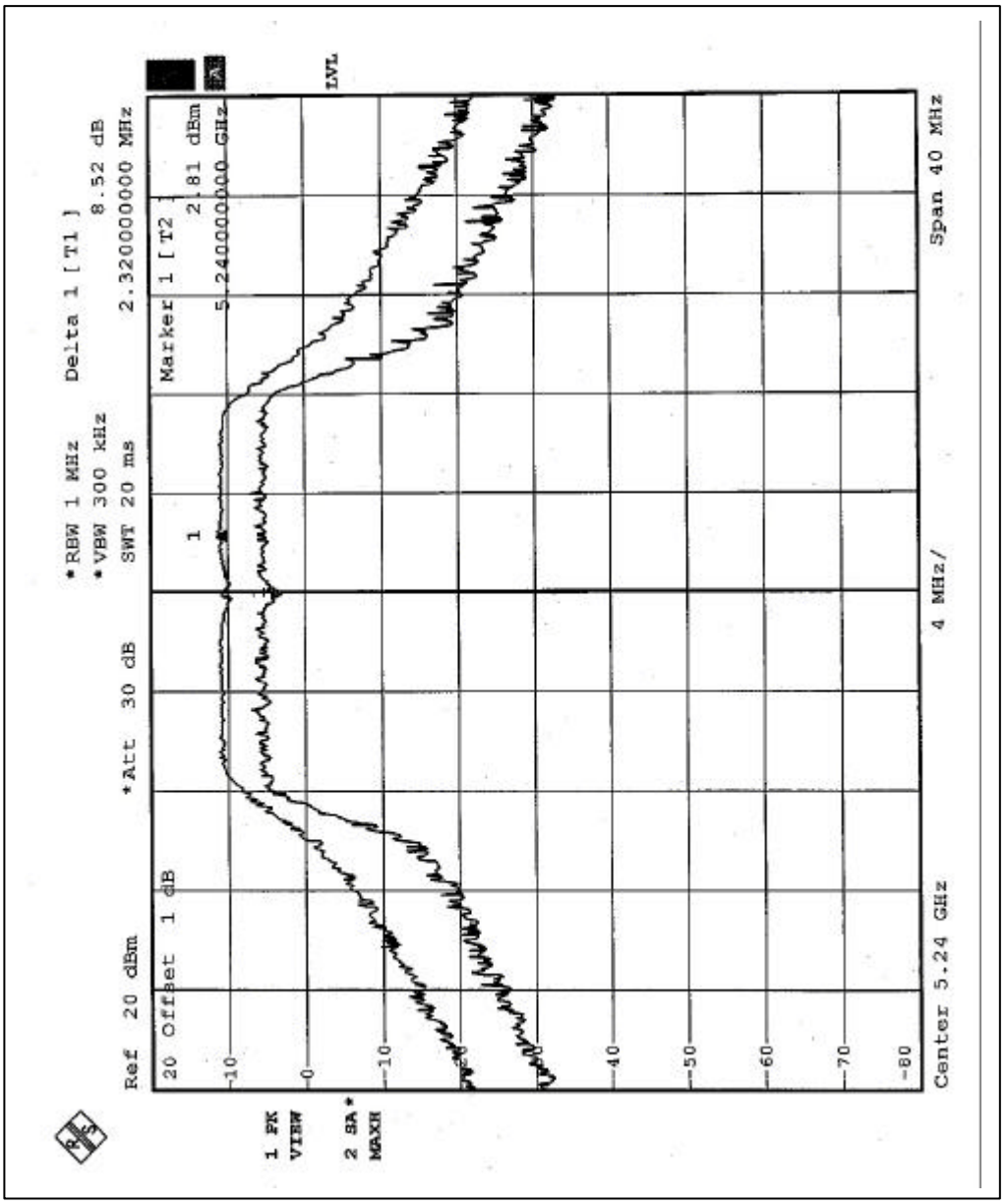
EUT	Netgear 802.11a/g Wireless PCI Adapter	**MODEL**	WAG311
MODE	Normal	**INPUT POWER (SYSTEM)**	120Vac, 60 Hz
ENVIRONMENTAL CONDITIONS	27eg. C, 56RH, 976 hPa	**TESTED BY**	Eric Lee

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER EXCURSION (dB)	PEAK to AVERAGE EXCURSION LIMIT (dB)	PASS/FAIL
1	5180	7.23	13	PASS
4	5240	8.52	13	PASS
5	5260	8.50	13	PASS
8	5320	5.57	13	PASS
9	5745	8.13	13	PASS
12	5805	8.52	13	PASS

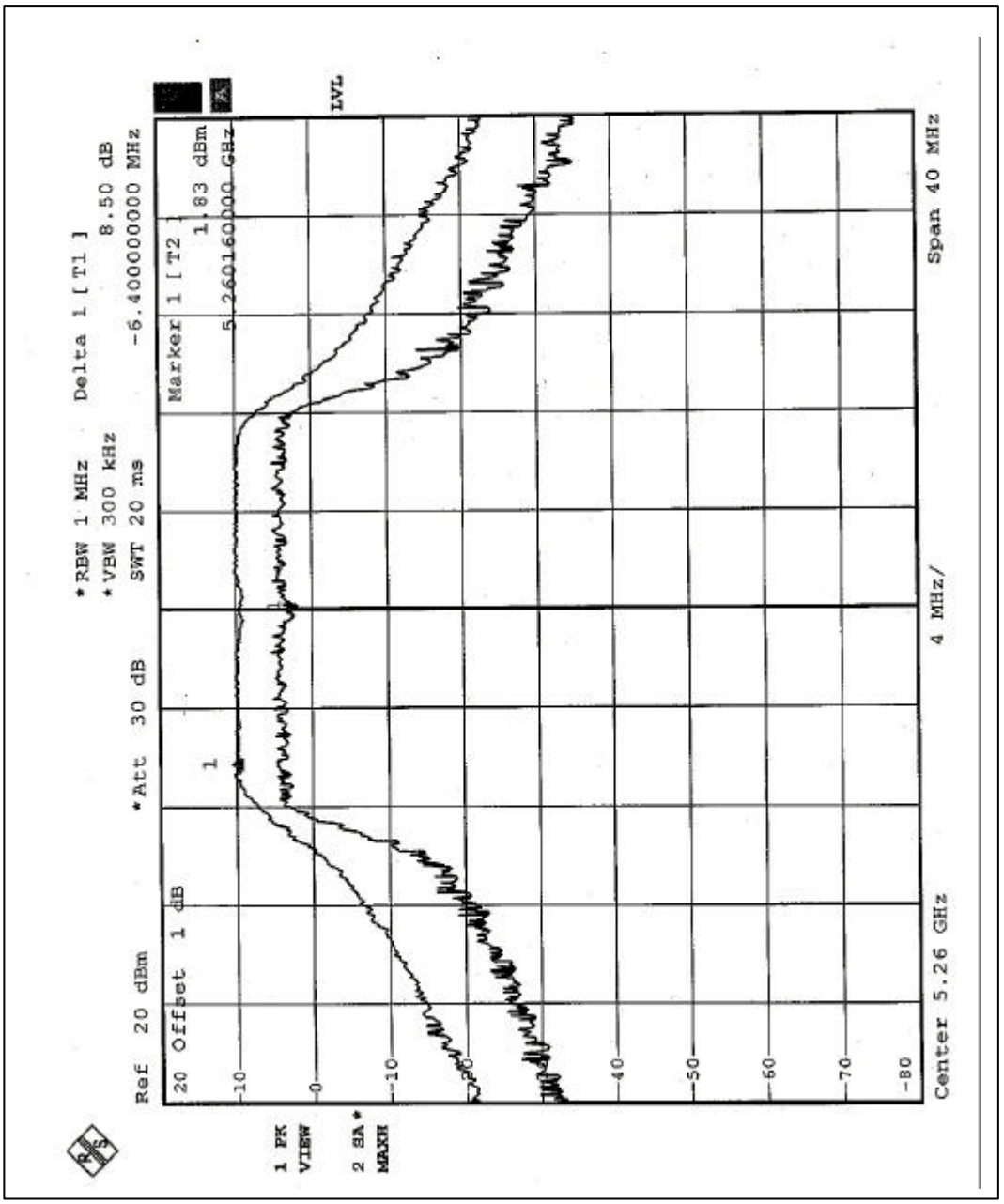
CHANNEL 1


RBW 1 MHz
VBW 300 kHz
SWT 20 ms
Delta 1 [T1]
7.23 dB
2.320000000 MHz
Marker 1 [T2]
2.37 dBm
5.180160000 GHz
Ref 20 dBm
Offset 1 dB
Att 30 dB
Center 5.18 GHz
4 MHz/
Span 40 MHz
1 PK VIEW
2 SA MAXH
LVL

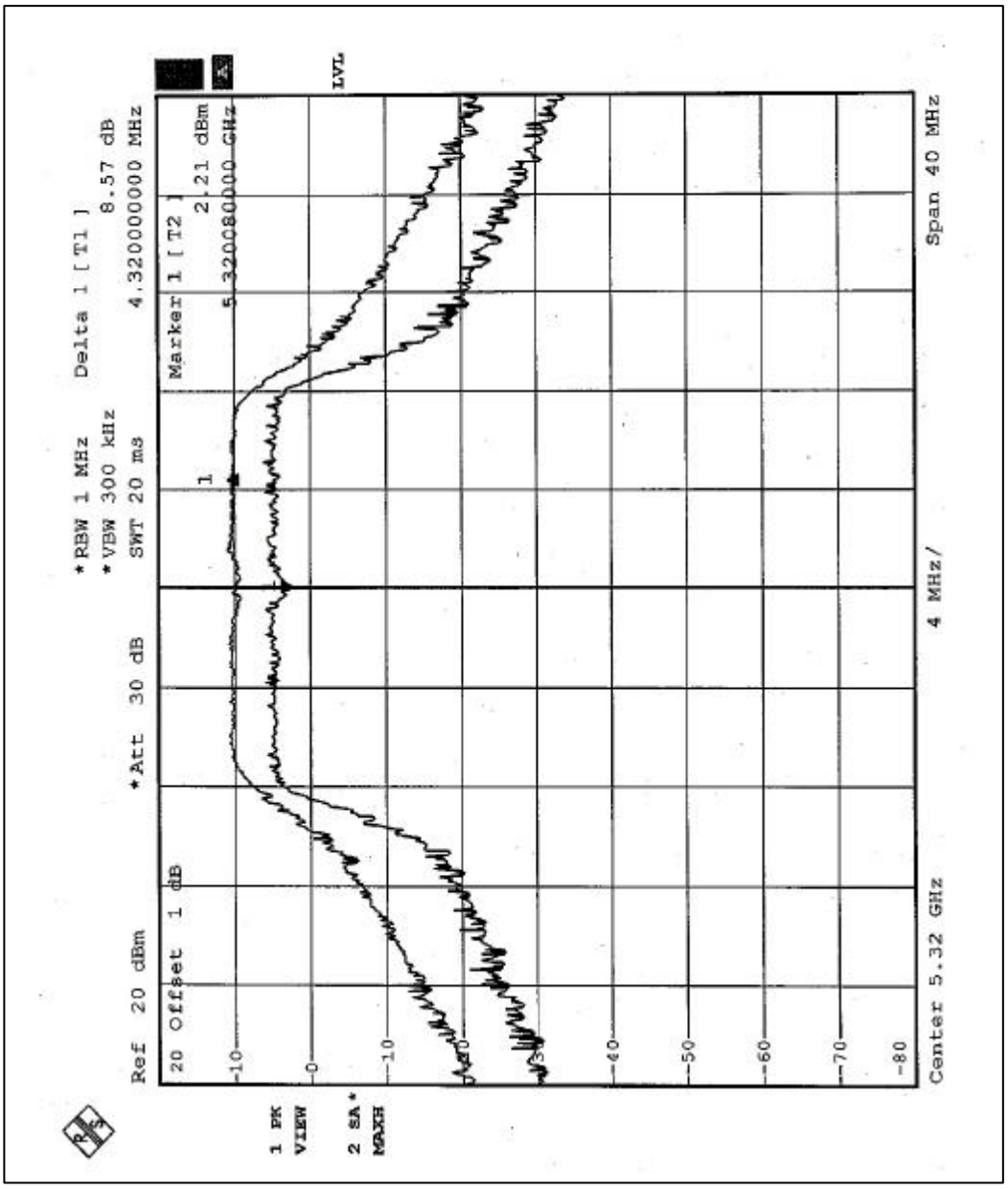
CHANNEL 4


Ref 20 dBm
Offset 1 dB
*Att 30 dB
*RBW 1 MHz
*VBW 300 kHz
SWT 20 ms
Delta 1 [T1]
8.52 dB
2.320000000 MHz
Marker 1 [T2]
2.81 dBm
5.240000000 GHz
Center 5.24 GHz
4 MHz/
Span 40 MHz
1 PK VIEW
2 SA* MAXH

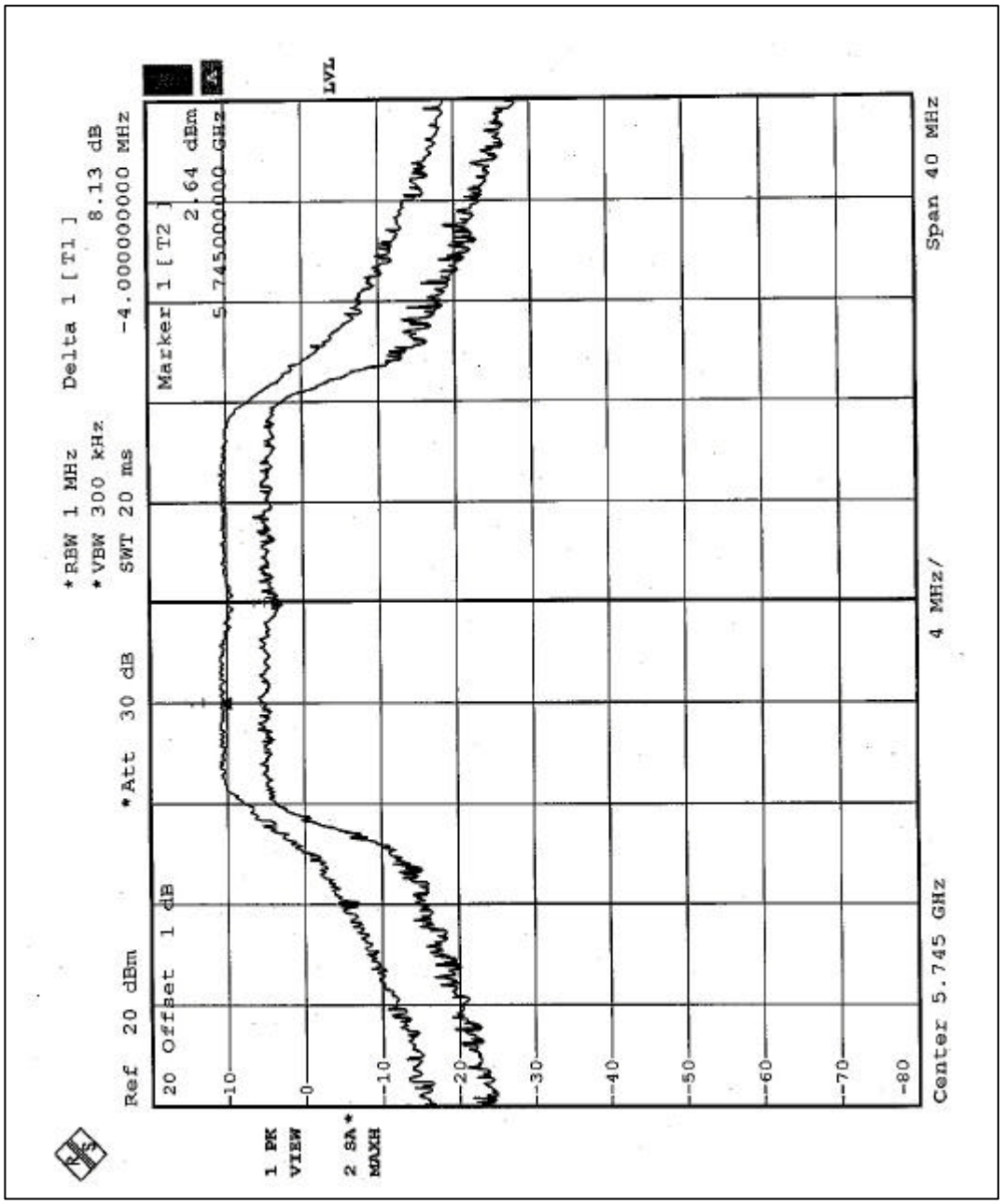
CHANNEL 5


Ref 20 dBm
20 Offset 1 dB
*Att 30 dB
*RBW 1 MHz
*VBW 300 kHz
SWT 20 ms
Delta 1 [T1]
8.50 dB
-6.40000000 MHz
Marker 1 [T2]
1.83 dBm
5.26160000 GHz
Center 5.26 GHz
4 MHz/
Span 40 MHz
1 PK VIEW
2 SA* MAXH
LVL

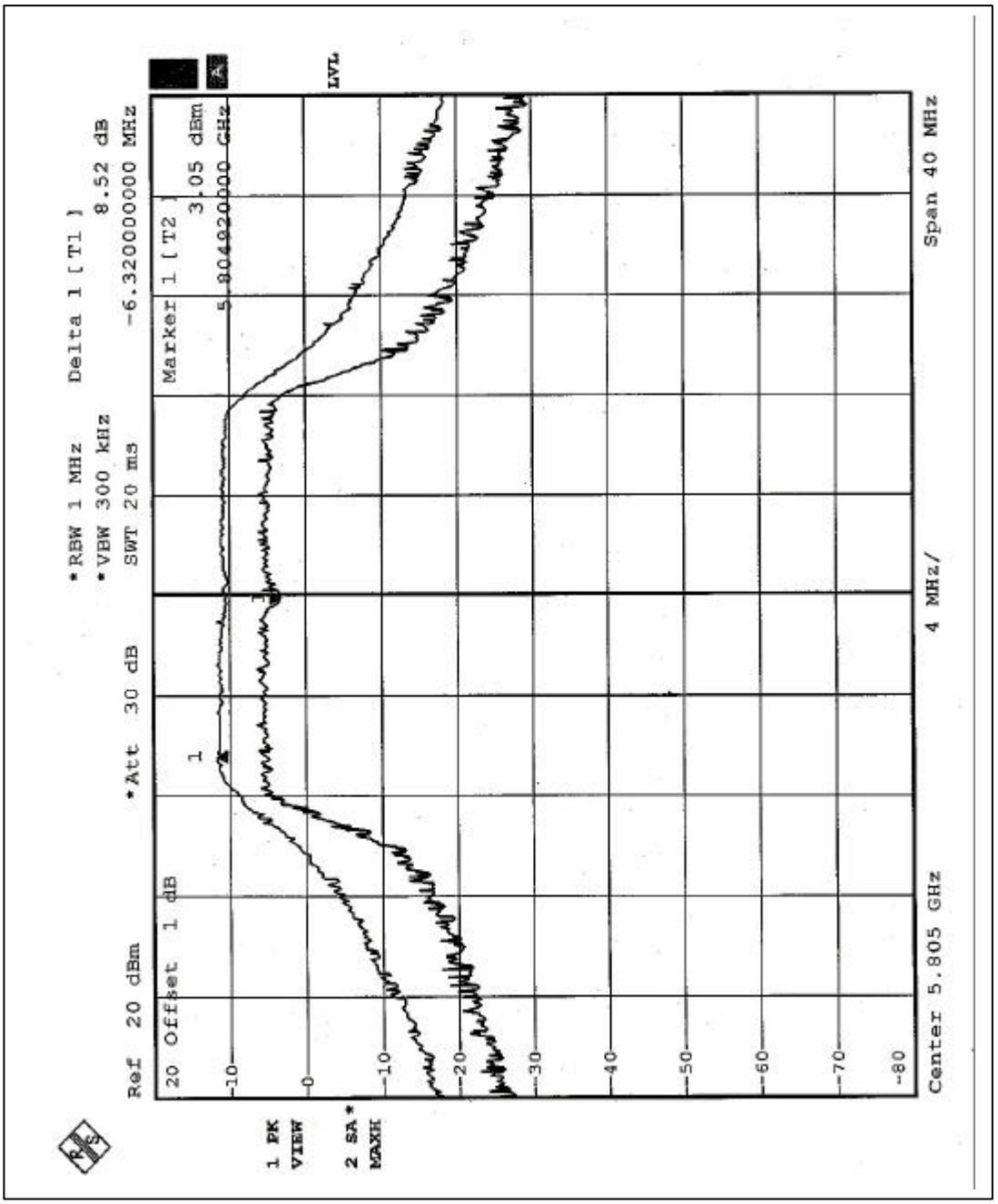
CHANNEL 8


RBW 1 MHz
VBW 300 kHz
SWT 20 ms
Delta 1 [T1]
8.57 dB
4.320000000 MHz
Marker 1 [T2]
2.21 dBm
5.320080000 GHz
Ref 20 dBm
Offset 1 dB
Att 30 dB
Center 5.32 GHz
4 MHz/
Span 40 MHz
1 PK VIEW
2 SA* MAXH

CHANNEL 9


Ref 20 dBm
20 Offset 1 dB
*Att 30 dB
*RBW 1 MHz
*VBW 300 kHz
SWT 20 ms
Delta 1 [T1]
8.13 dB
-4.000000000 MHz
Marker 1 [T2]
2.64 dBm
5.745000000 GHz
LVL
Center 5.745 GHz
4 MHz/
Span 40 MHz
1 PK VIEW
2 SA* MAXH

CHANNEL 12


RBW 1 MHz
VBW 300 kHz
SWT 20 ms
Delta 1 [T1]
8.52 dB
-6.320000000 MHz
Marker 1 [T2]
3.05 dBm
5.804920000 GHz
Ref 20 dBm
Offset 1 dB
Att 30 dB
Center 5.805 GHz
4 MHz/
Span 40 MHz
1 PK VIEW
2 SA * MAXH

5.5 PEAK POWER SPECTRAL DENSITY MEASUREMENT

5.5.1 LIMITS OF PEAK POWER SPECTRAL DENSITY MEASUREMENT

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

5.5.2 TEST INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
SPECTRUM ANALYZER	FSEK30	100049	July 24, 2003

NOTE:

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

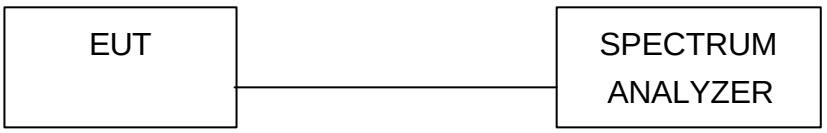
5.5.3 TEST PROCEDURES

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.

5.5.4 DEVIATION FROM TEST STANDARD

No deviation

5.5.5 TEST SETUP



5.5.6 EUT OPERATING CONDITIONS

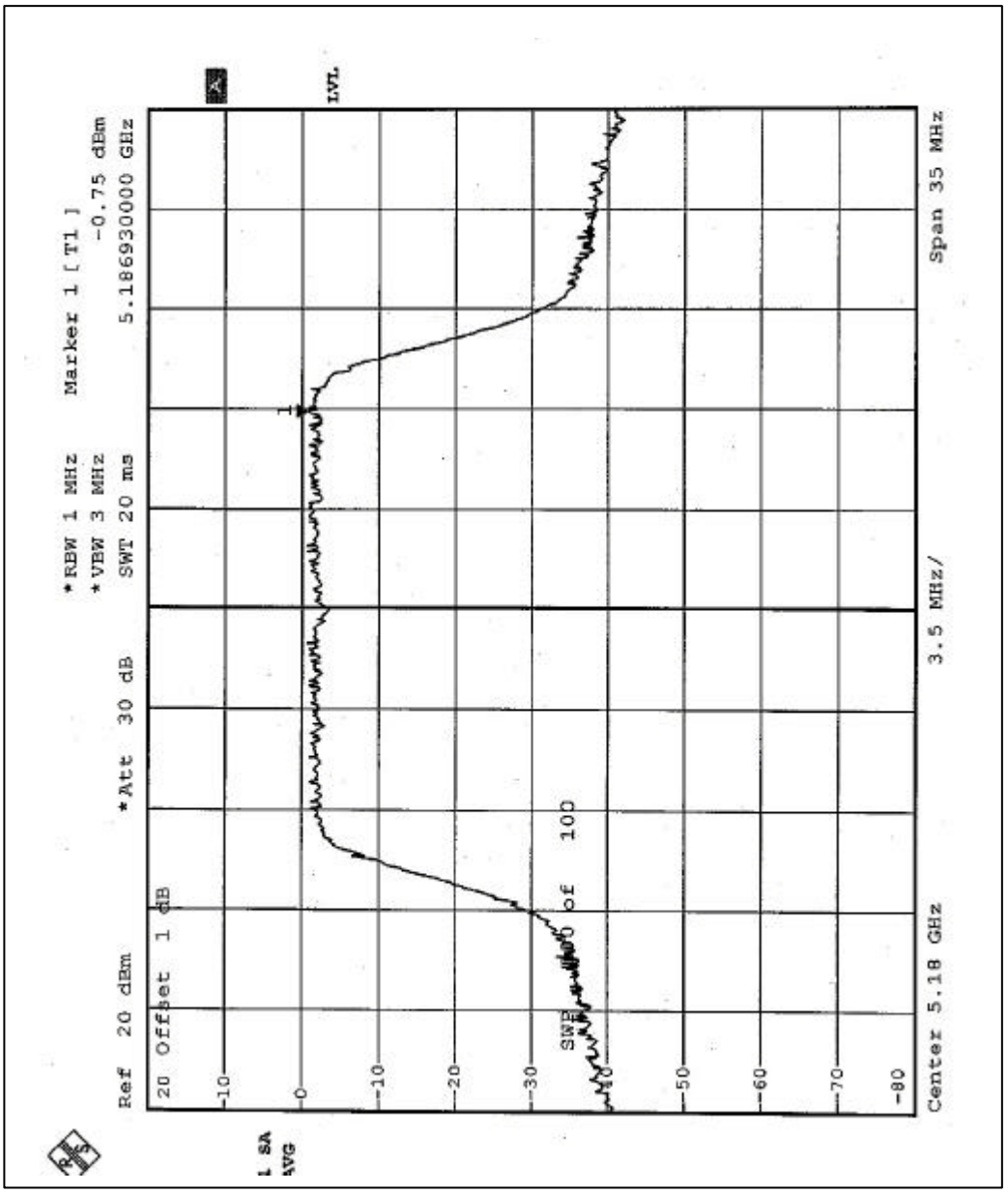
Same as 5.3.6

5.5.7 TEST RESULTS

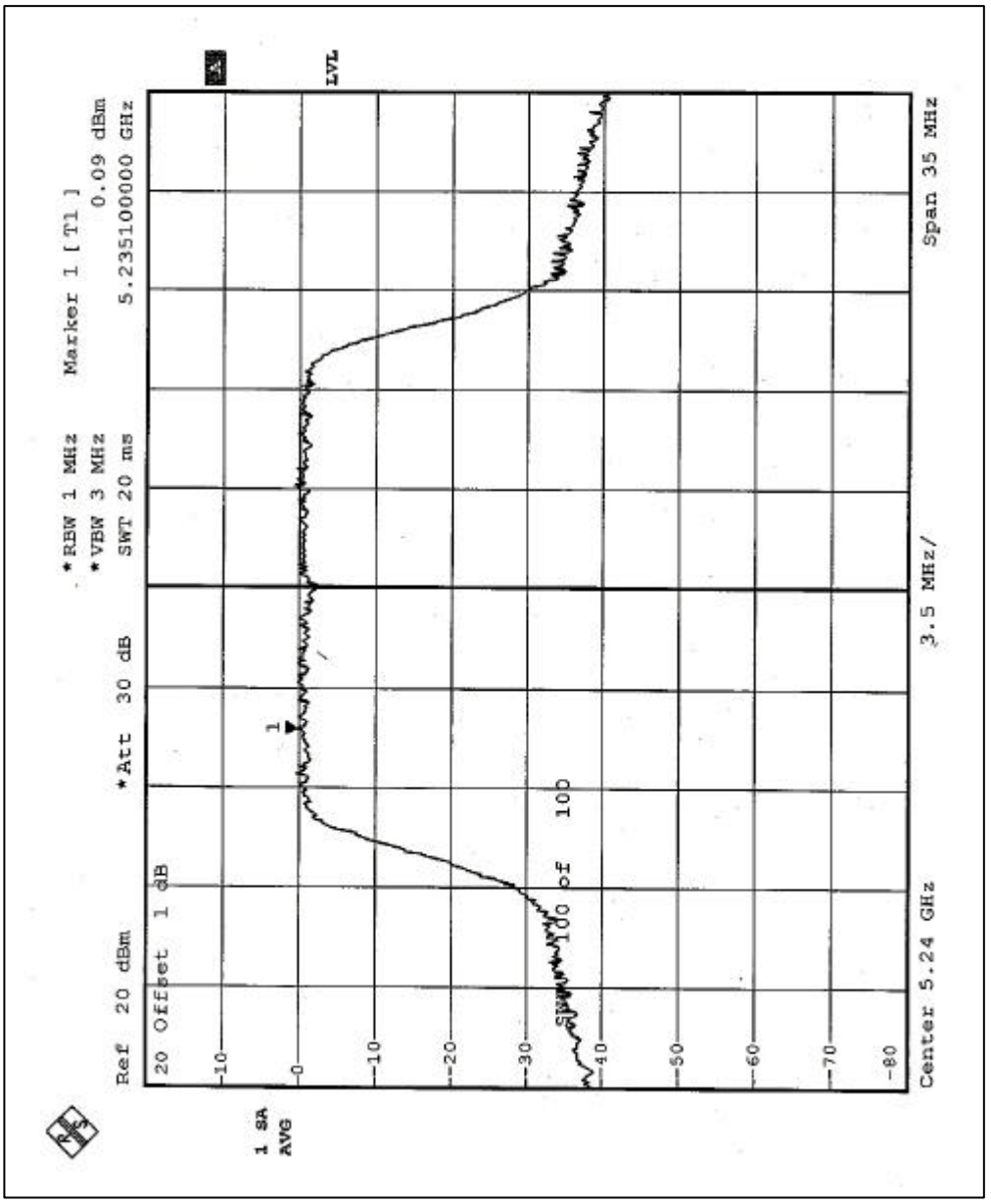
EUT	Netgear 802.11a/g Wireless PCI Adapter	**MODEL**	WAG311
MODE	Normal	**INPUT POWER (SYSTEM)**	120Vac, 60 Hz
ENVIRONMENTAL CONDITIONS	27eg. C, 56RH, 976 hPa	**TESTED BY**	Eric Lee

CHANNEL NUMBER	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 1 MHz BW (dBm)	MAXIMUM LIMIT (dBm)	PASS/FAIL
1	5180	-0.75	4	PASS
4	5240	0.09	4	PASS
5	5260	0.45	11	PASS
8	5320	0.71	11	PASS
9	5745	0.39	17	PASS
12	5805	1.18	17	PASS

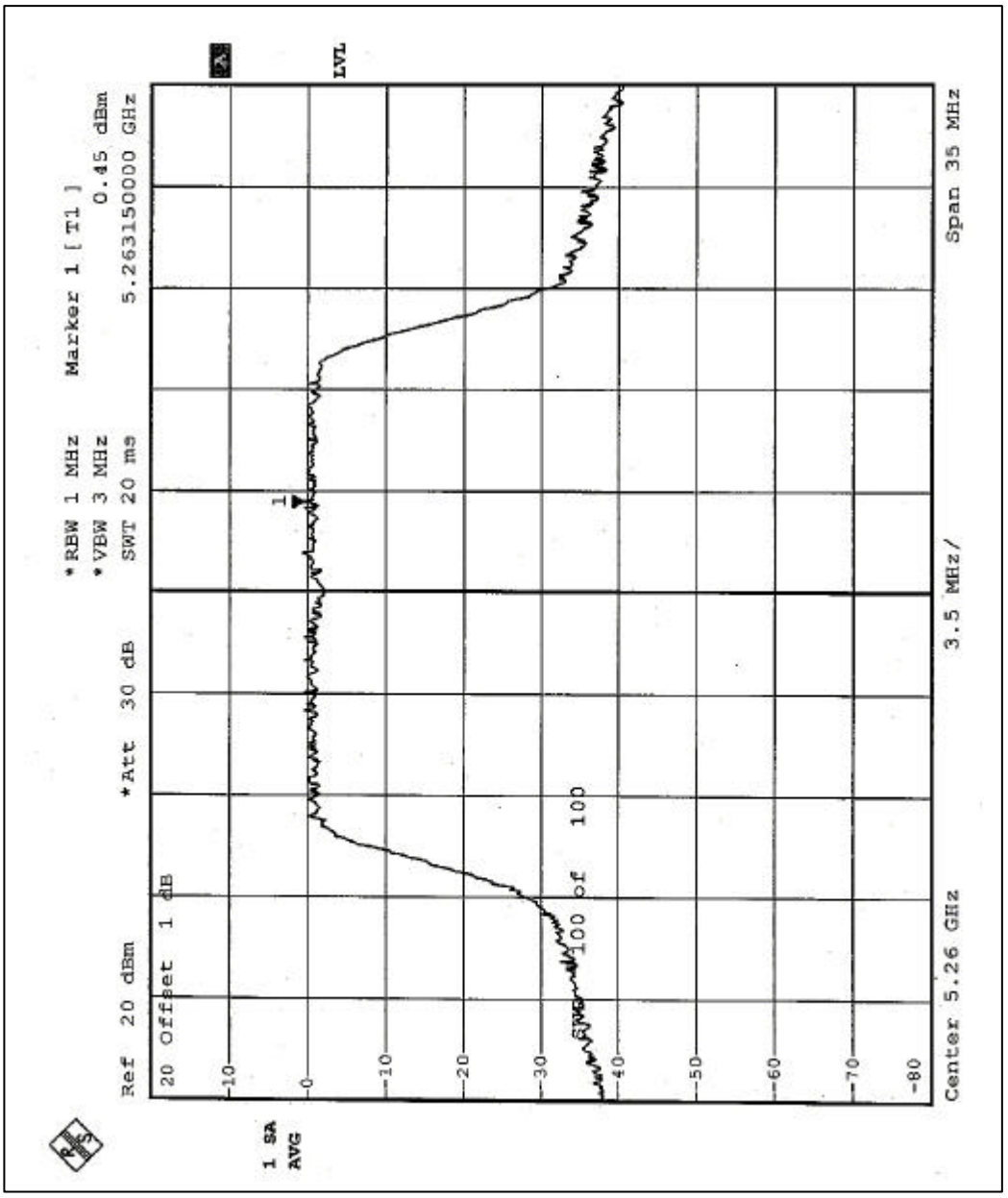
CHANNEL 1


Ref 20 dBm
20 Offset 1 dB
*Att 30 dB
*VBW 3 MHz
SWT 20 ms
Marker 1 [T1]
-0.75 dBm
5.186930000 GHz
Center 5.18 GHz
3.5 MHz/
Span 35 MHz
SWP
100 of 100

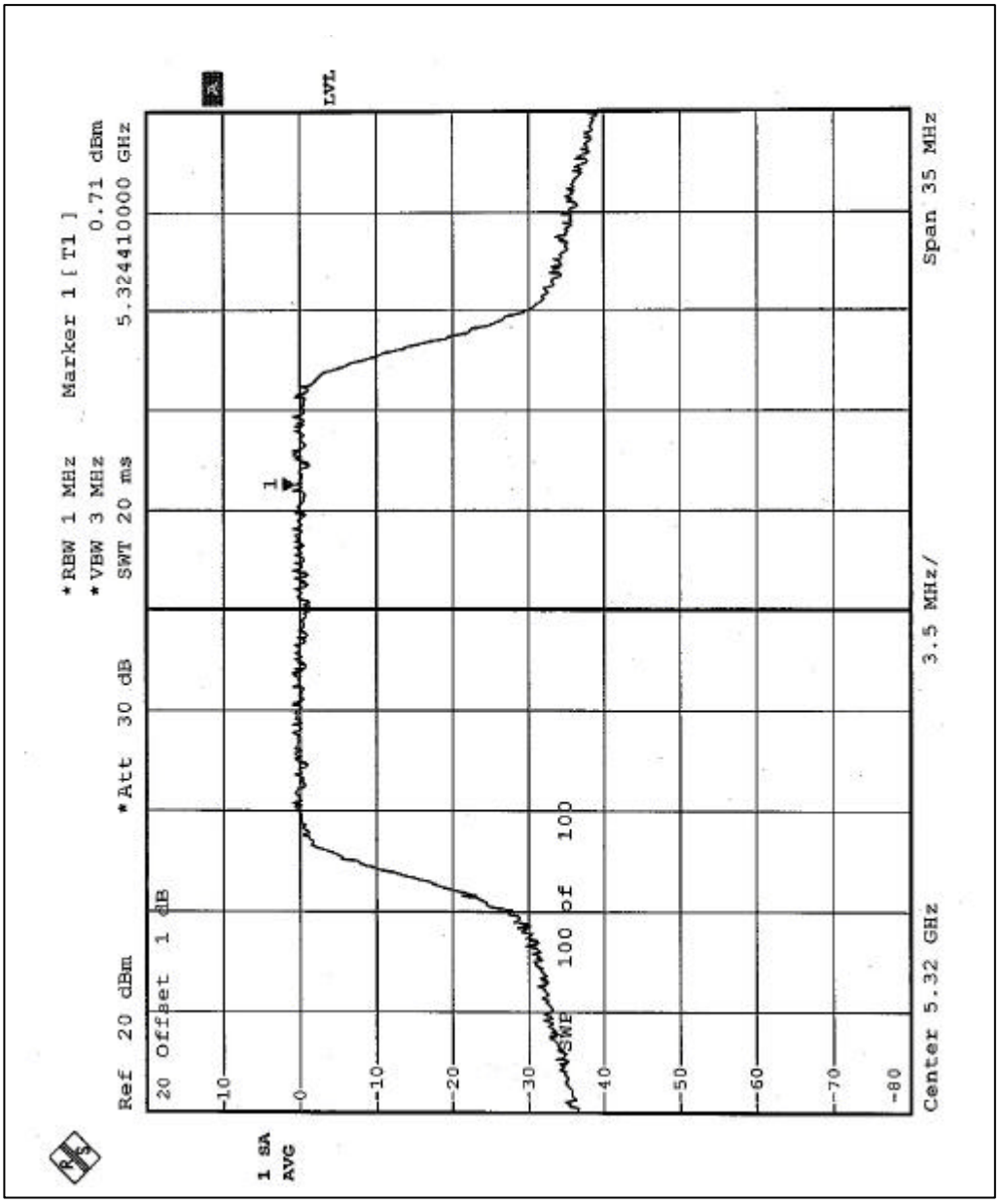
CHANNEL 4


Ref 20 dBm
20 Offset 1 dB
*Att 30 dB
*RBW 1 MHz
*VBW 3 MHz
SWT 20 ms
Marker 1 [T1]
0.09 dBm
5.235100000 GHz
Span 35 MHz
3.5 MHz/
Center 5.24 GHz
1 SA
AVG
100 of 100

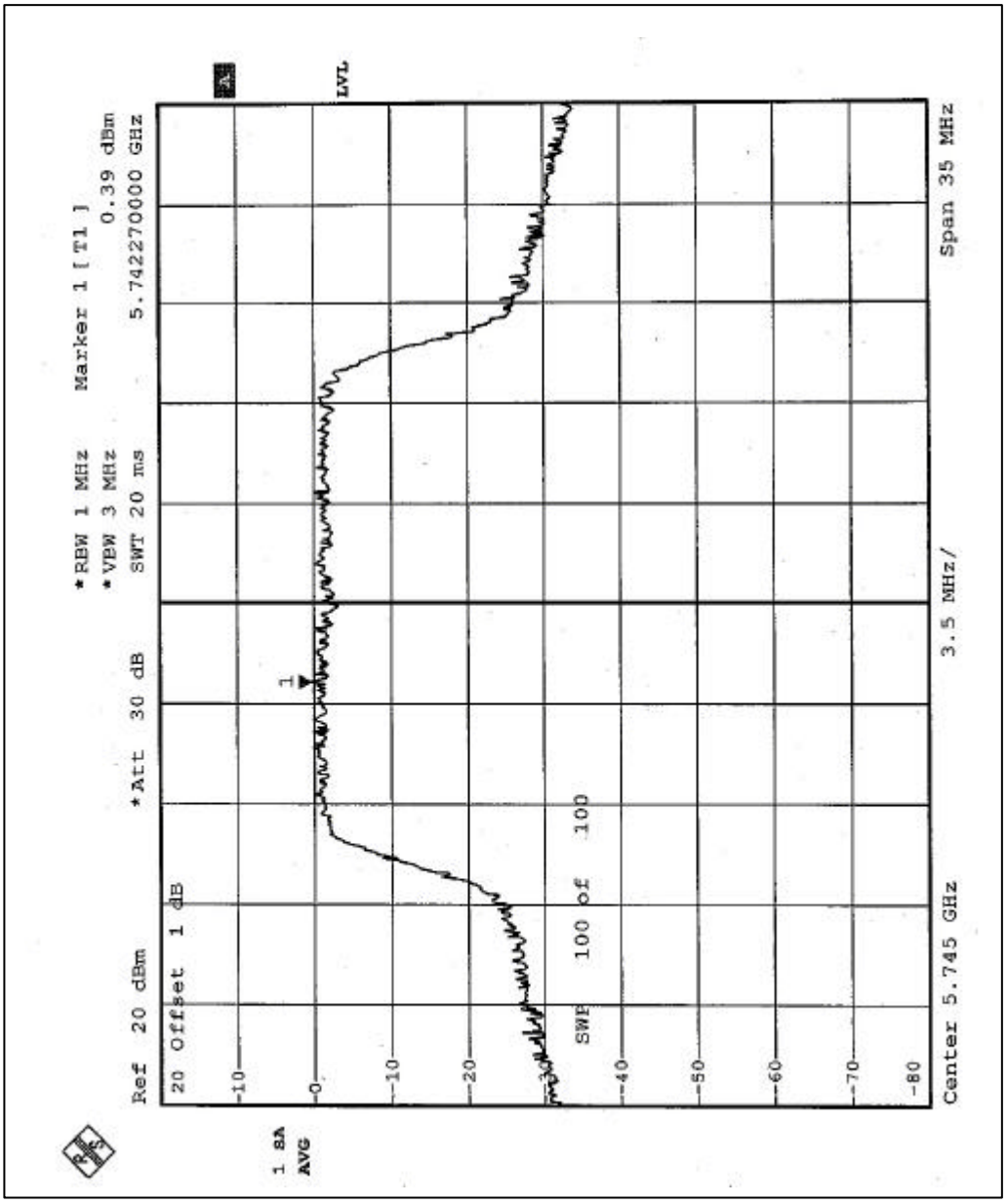
CHANNEL 5


Ref 20 dBm
20 Offset 1 dB
*Att 30 dB
*RBW 1 MHz
*VBW 3 MHz
SWT 20 ms
Marker 1 [T1]
0.45 dBm
5.263150000 GHz
Center 5.26 GHz
3.5 MHz/
Span 35 MHz
1 SA
AVG
100 of 100
LVL

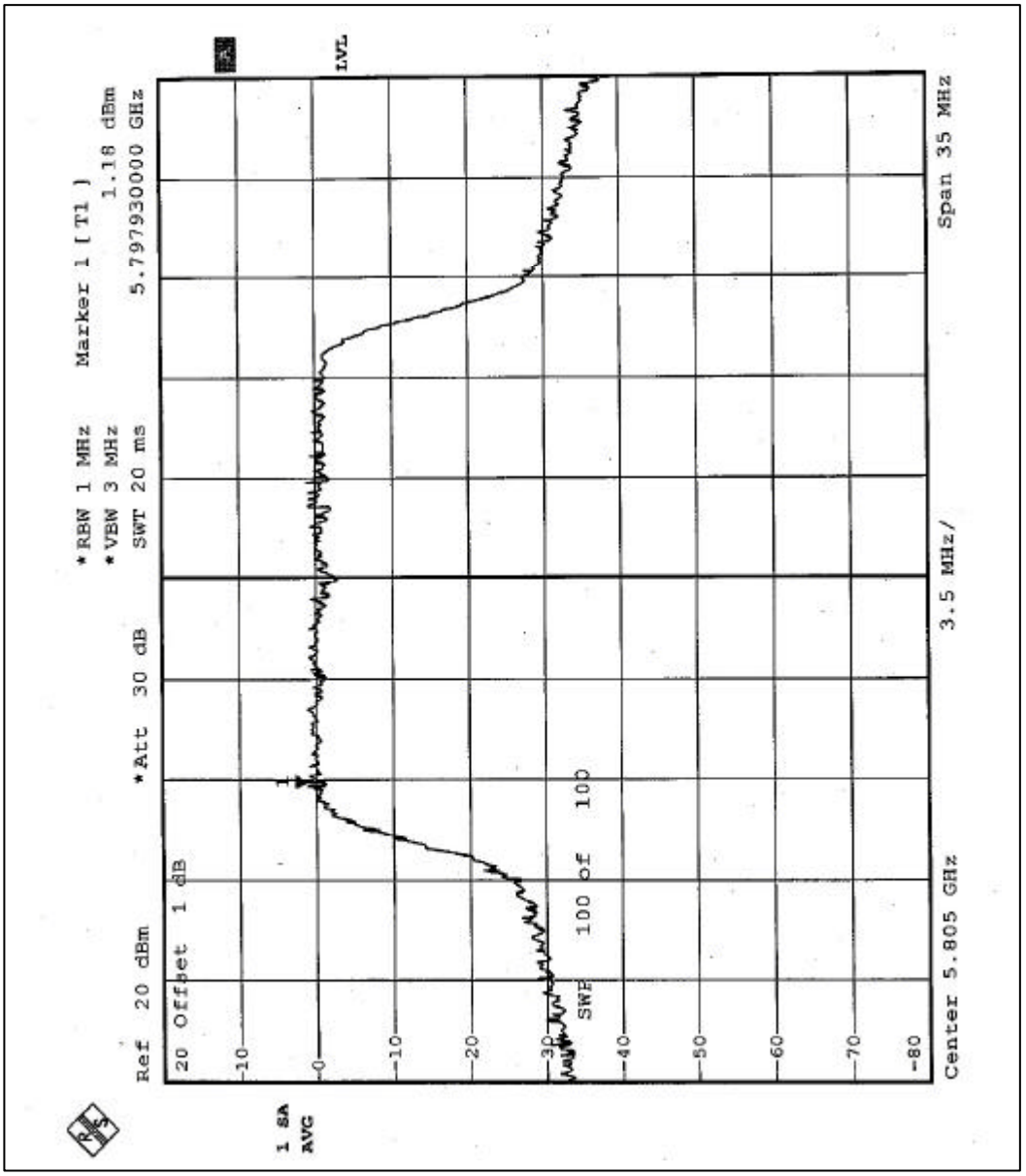
CHANNEL 8


Ref 20 dBm
20 Offset 1 dB
*Att 30 dB
*VBW 3 MHz
SWT 20 ms
*RBW 1 MHz
Marker 1 [T1]
0.71 dBm
5.324410000 GHz
1 SA
AVG
Center 5.32 GHz
3.5 MHz/
Span 35 MHz
SWE 100 of 100

CHANNEL 9


Marker 1 [T1]
0.39 dBm
5.742270000 GHz
*RBW 1 MHz
*VBW 3 MHz
SWT 20 ms
*Att 30 dB
Ref 20 dBm
20 Offset 1 dB
1 SA
AVG
SWP 100 of 100
Center 5.745 GHz
3.5 MHz/
Span 35 MHz

CHANNEL 12


Ref 20 dBm
20 Offset 1 dB
*Att 30 dB
*RBW 1 MHz
*VBW 3 MHz
SWT 20 ms
Marker 1 [T1]
1.18 dBm
5.797930000 GHz
Center 5.805 GHz
3.5 MHz/
Span 35 MHz
1 SA
AVG
SWP 100 of 100

5.6 FREQUENCY STABILITY

5.6.1 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.

5.6.2 TEST INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
SPECTRUM ANALYZER	FSEK30	100049	July 24, 2003

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

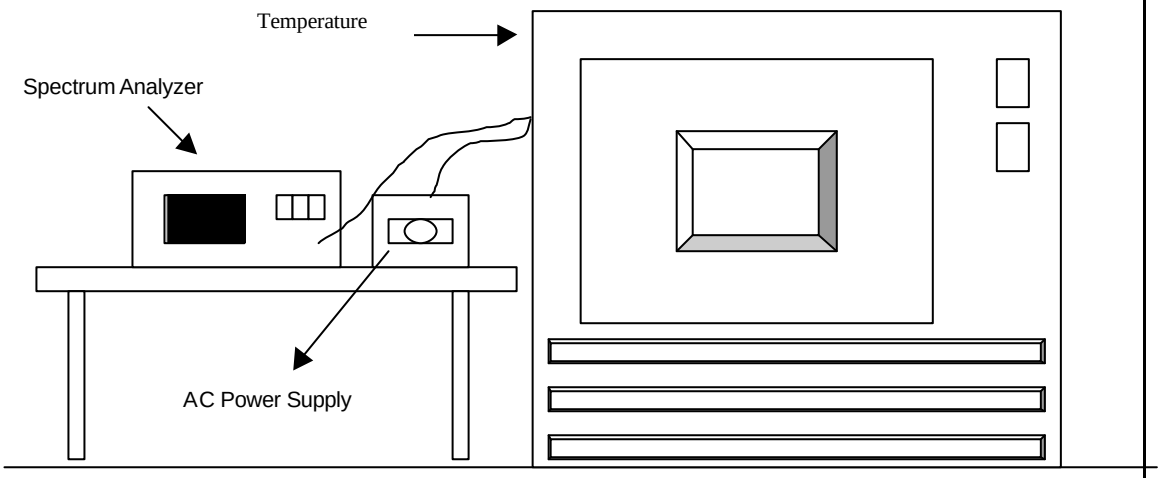
5.6.3 TEST PROCEDURE

1. The EUT was placed inside the environmental test chamber and powered by nominal AC 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.

5.6.4 DEVIATION FROM TEST STANDARD

No deviation

5.6.5 TEST SETUP



5.6.6 EUT OPERATING CONDITION

Same as Item 4.1.6

5.6.7 TEST RESULTS

Operating frequency: 5320MHz				Limit : ± 0.02%			
Temp. (℃)	Power supply (VAC)	2 minute		5 minute		10 minute	
		(MHz)	(%)	(MHz)	(%)	(MHz)	(%)
50	126.5	5320.0366	0.000688%	5320.0367	0.000690%	5320.0368	0.000692%
	110.0	5320.0364	0.000684%	5320.0366	0.000688%	5320.0368	0.000692%
	93.5	5320.0366	0.000688%	5320.0364	0.000684%	5320.0368	0.000692%
40	126.5	5319.9881	-0.000224%	5319.9976	-0.000045%	5319.9973	-0.000051%
	110.0	5319.9882	-0.000222%	5319.9976	-0.000045%	5319.9975	-0.000047%
	93.5	5319.9981	-0.000036%	5319.9979	-0.000039%	5319.9972	-0.000053%
30	126.5	5319.9922	-0.000147%	5319.9919	-0.000152%	5319.9917	-0.000156%
	110.0	5319.9922	-0.000147%	5319.9921	-0.000148%	5319.9918	-0.000154%
	93.5	5319.9922	-0.000147%	5319.9919	-0.000152%	5319.9916	-0.000158%
20	126.5	5320.0071	0.000133%	5320.0068	0.000128%	5320.0065	0.000122%
	110.0	5320.0072	0.000135%	5320.0072	0.000135%	5320.0069	0.000130%
	93.5	5320.0071	0.000133%	5320.0068	0.000128%	5320.0065	0.000122%
10	126.5	5320.0124	0.000233%	5320.0122	0.000229%	5320.0119	0.000224%
	110.0	5320.0124	0.000233%	5320.0122	0.000229%	5320.0121	0.000227%
	93.5	5320.0124	0.000233%	5320.0121	0.000227%	5320.0118	0.000222%
0	126.5	5320.023	0.000432%	5320.0180	0.000338%	5320.0180	0.000338%
	110.0	5320.023	0.000432%	5320.0210	0.000395%	5320.0190	0.000357%
	93.5	5320.021	0.000395%	5320.0180	0.000338%	5320.0180	0.000338%
-10	126.5	5320.0306	0.000575%	5320.0290	0.000545%	5320.0270	0.000508%
	110.0	5320.0304	0.000571%	5320.0310	0.000583%	5320.0290	0.000545%
	93.5	5320.0304	0.000571%	5320.0280	0.000526%	5320.0270	0.000508%
-20	126.5	5320.0300	0.000564%	5320.0250	0.000470%	5320.0210	0.000395%
	110.0	5320.0300	0.000564%	5320.0280	0.000526%	5320.0240	0.000451%
	93.5	5320.0300	0.000564%	5320.0240	0.000451%	5320.0220	0.000414%
-30	126.5	5320.0116	0.000218%	5320.0111	0.000209%	5320.0108	0.000203%
	110.0	5320.0116	0.000218%	5320.0113	0.000212%	5320.0111	0.000209%
	93.5	5320.0116	0.000218%	5320.0111	0.000209%	5320.0108	0.000203%

5.7 BAND EDGES MEASUREMENT

5.7.1 TEST INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
SPECTRUM ANALYZER	FSEK30	100049	July 24, 2003

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

5.7.2 TEST PROCEDURE

The transmitter output was connected to the spectrum analyzer via a low lose cable. Set RBW of spectrum analyzer to 1MHz and VBW of spectrum analyzer to 300Hz with suitable frequency span including 100 MHz bandwidth from band edge. The band edges was measured and recorded.

5.7.3 EUT OPERATING CONDITION

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

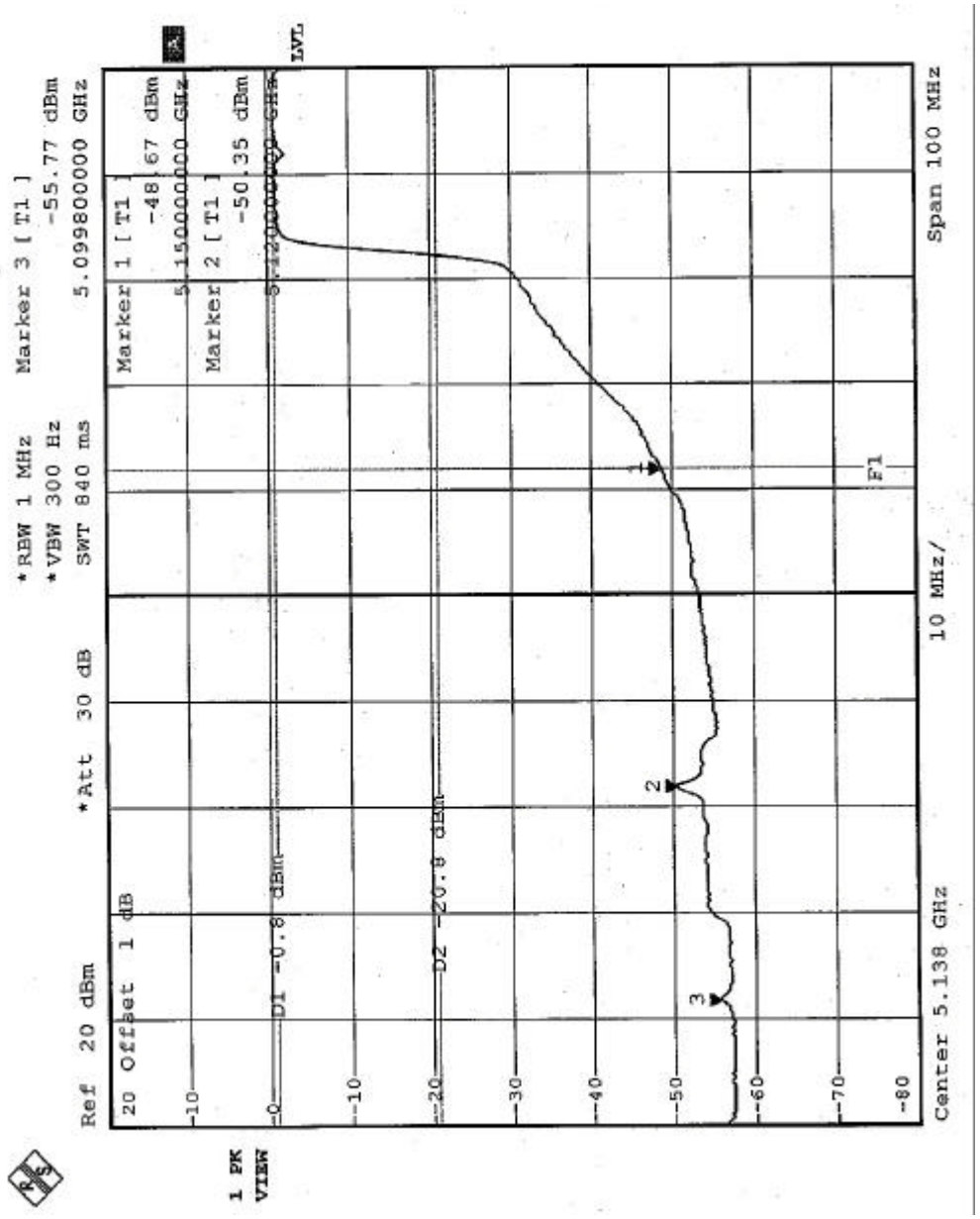
5.7.4 TEST RESULTS

For signals in the restricted bands above and below the 5.15 to 5.35 GHz 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 (Average RBW=1MHz, VBW=300Hz) are attached on the following 8 pages.

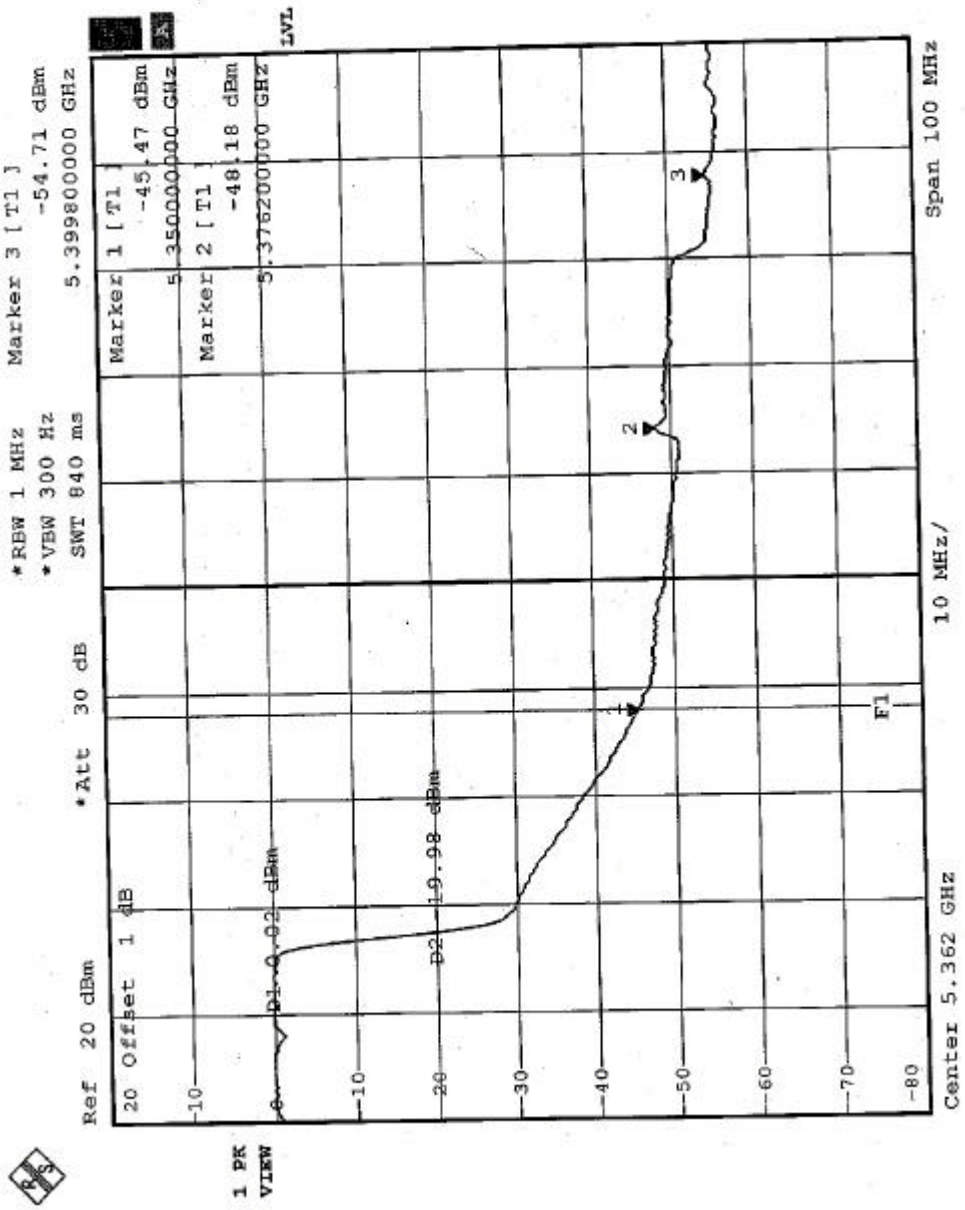
Normal Mode: Channel 1 (5180 MHz)

The band edge emission plot on the following page shows 47.87dBc (Average) between carrier maximum power and local maximum emission in restrict band. The emission of carrier strength list in the test result of channel 1 (normal mode) is 98.2dBuV/m, so the maximum field strength in restrict band is 98.2-47.87=50.33dBuV/m which is under 54dBuV/m limit.



Normal Mode: Channel 8 (5320 MHz)

The band edge emission plot on the following page shows 45.45dBc (Average) between carrier maximum power and local maximum emission in restrict band. The emission of carrier strength list in the test result of channel 8 (normal mode) is 98.3dBuV/m, so the maximum field strength in restrict band is 98.3-45.45=52.85dBuV/m which is under 54dBuV/m limit.



5.8 ANTENNA REQUIREMENT

5.8.1 STANDARD APPLICABLE

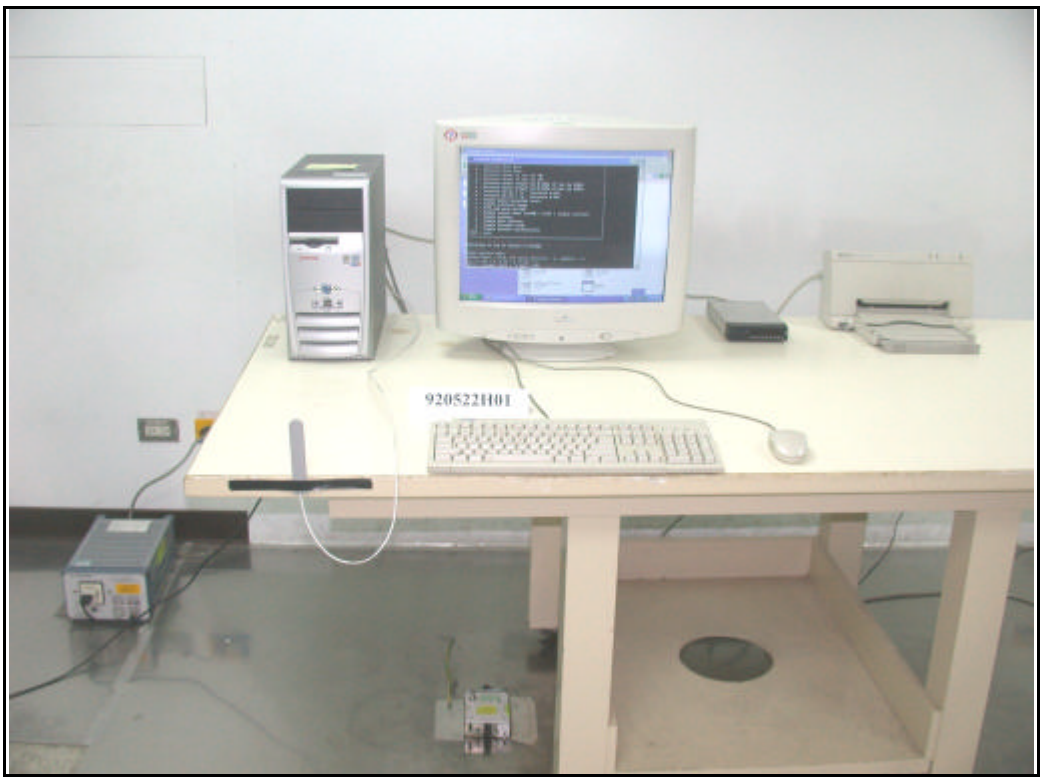
For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.
And according to FCC 47 CFR Section 15.407(a), if transmitting antennas of directional 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.

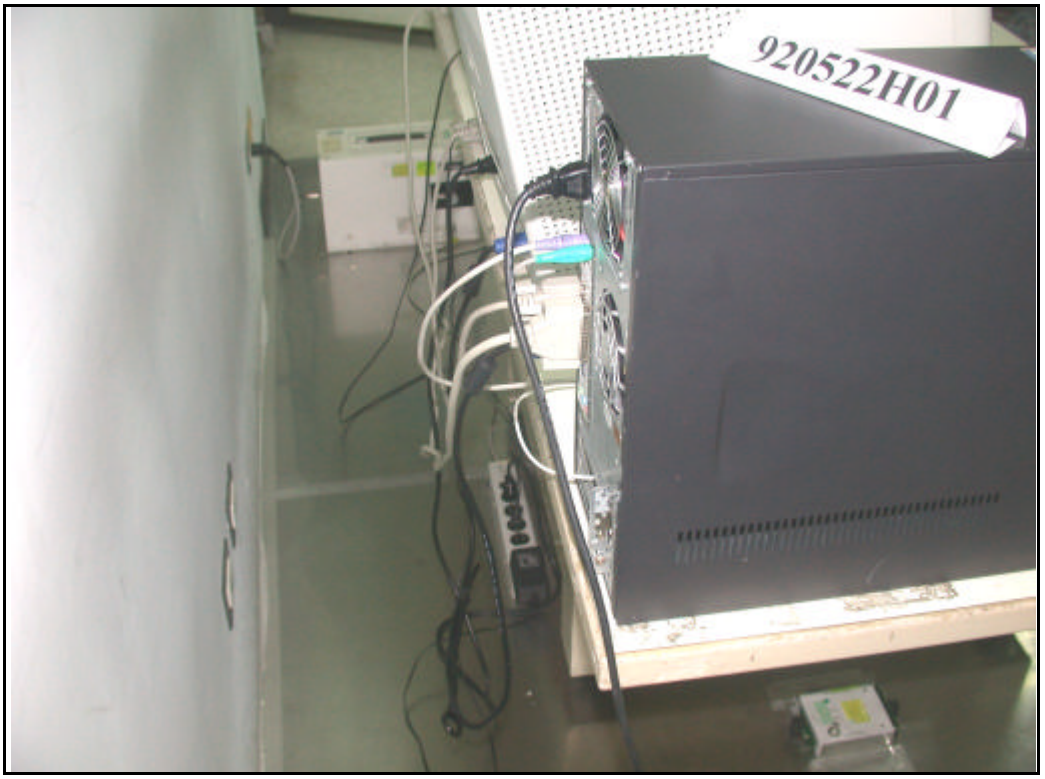
5.8.2 ANTENNA CONNECTED CONSTRUCTION

The antenna used in this product is Dipole Antenna with MCX connector. The maximum Effective Gain of the antenna is 2.5dBi (5.75GHz).

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 and Safety consultation. Our laboratories are accredited and approved by the following approval agencies according to ISO/IEC 17025, Guide 25 or EN 45001:

USA	FCC, NVLAP, UL
Germany	TUV Rheinland
Japan	VCCI
New Zealand	MoC
Norway	NEMKO
R.O.C.	BSMI, DGT, CNLA

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:

Lin Kou EMC Lab:
Tel: 886-2-26052180
Fax: 886-2-26052943

Hsin Chu EMC Lab:
Tel: 886-35-935343
Fax: 886-35-935342

Lin Kou Safety Lab:
Tel: 886-2-26093195
Fax: 886-2-26093184

Lin Kou RF&Telecom Lab
Tel: 886-3-3270910
Fax: 886-3-3270892

Email: service@mail.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.