



## 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	August 12, 2004

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

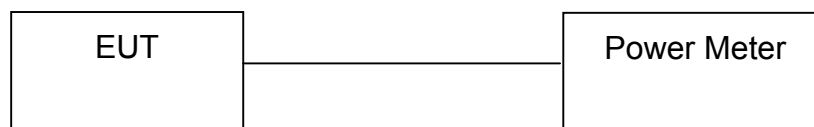
### 5.4.3 TEST PROCEDURE

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=300kHz).
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

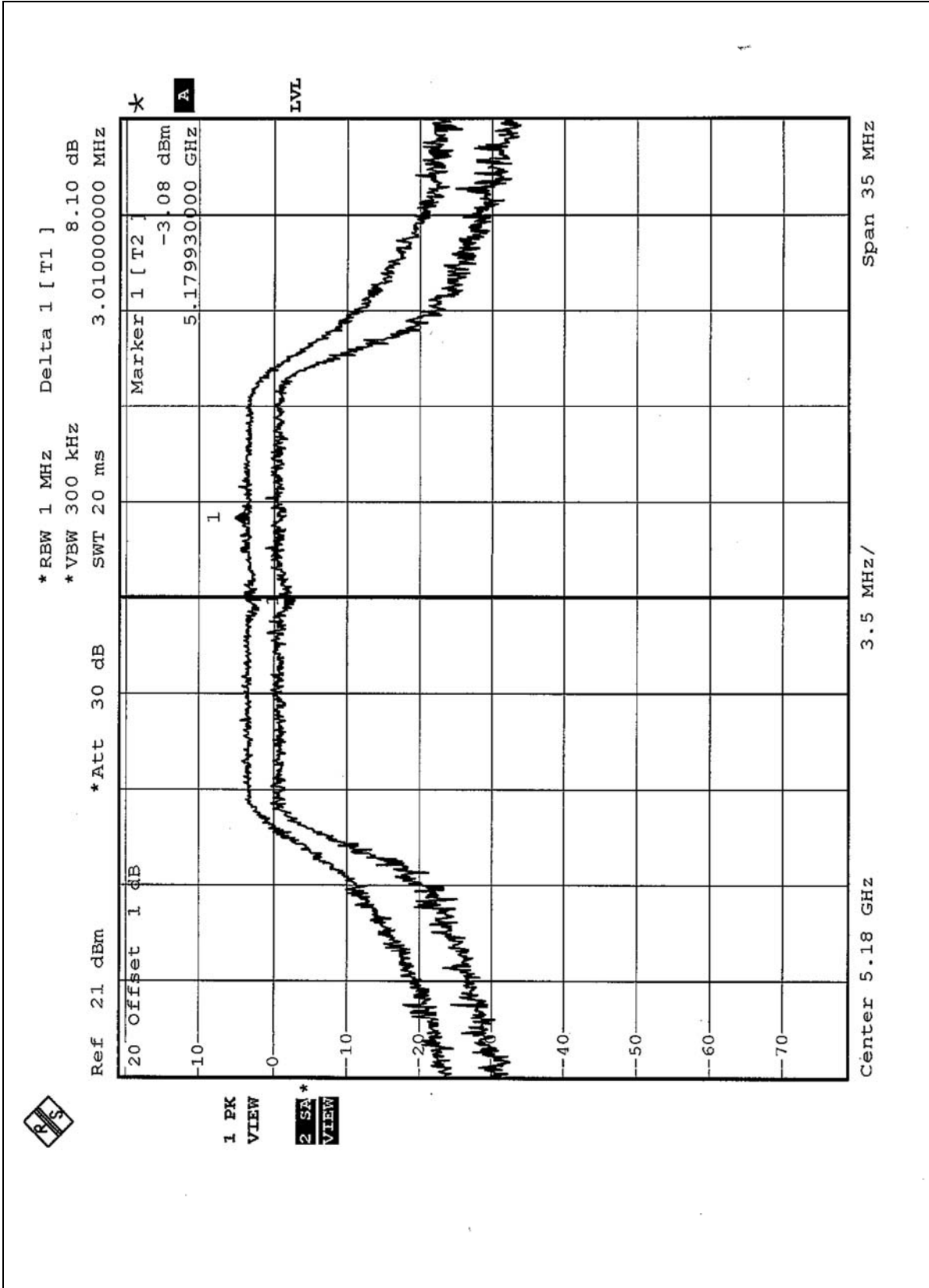
**NORMAL MODE**

<b>EUT</b>	Atheros 11a/g Card Bus Adapter	<b>MODEL</b>	NL-5354CB Plus Aries2
<b>ENVIRONMENTAL CONDITIONS</b>	21deg. C, 60%RH, 991hPa	<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz
<b>TESTED BY</b>	Jamison Chan		

<b>CHANNEL</b>	<b>CHANNEL FREQUENCY (MHz)</b>	<b>PEAK POWER EXCURSION (dB)</b>	<b>PEAK to AVERAGE EXCURSION LIMIT (dB)</b>	<b>PASS/FAIL</b>
1	5180	8.10	13	PASS
4	5240	8.10	13	PASS
5	5260	8.13	13	PASS
8	5320	7.93	13	PASS
9	5745	6.90	13	PASS
12	5805	6.94	13	PASS

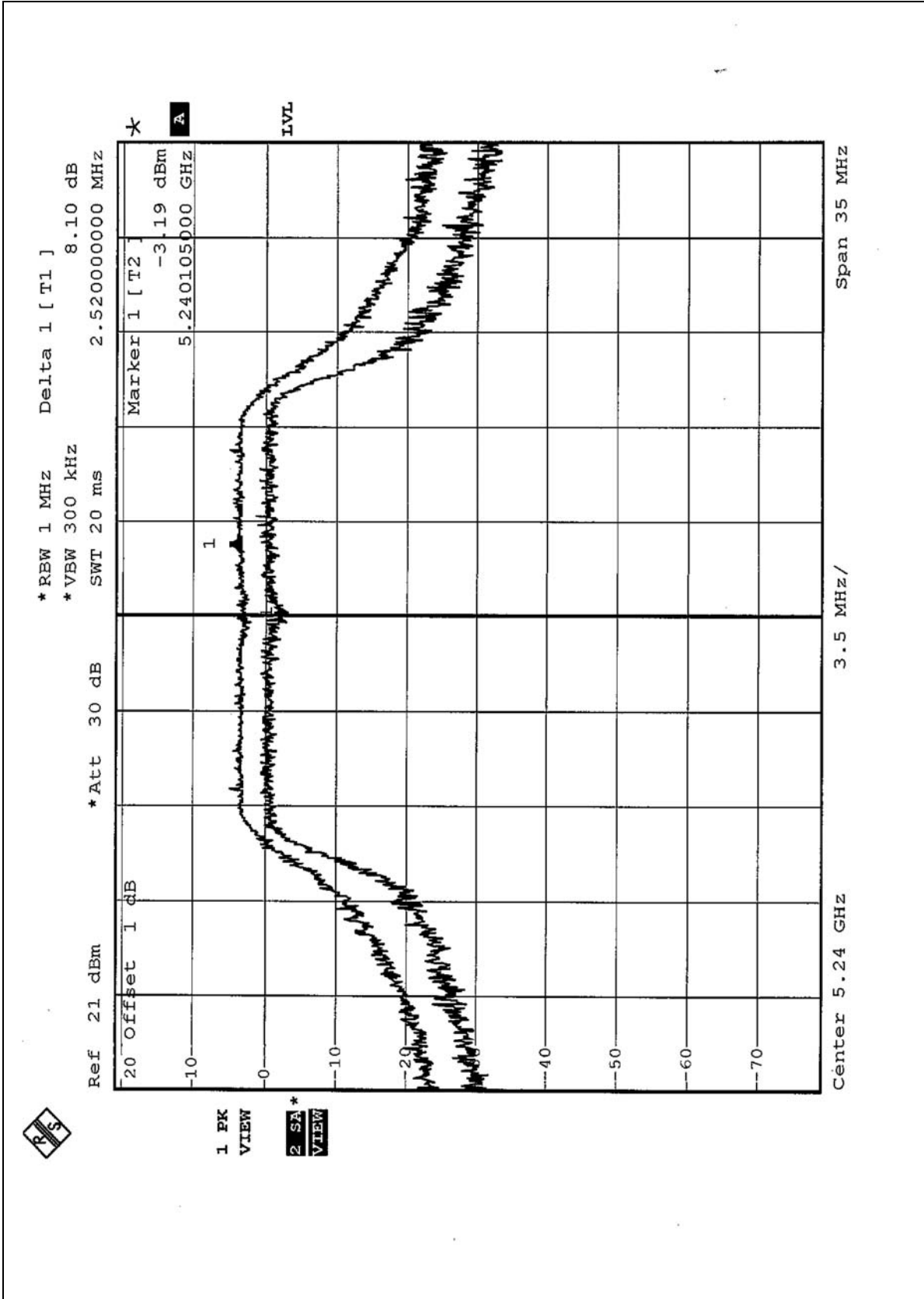


CH1



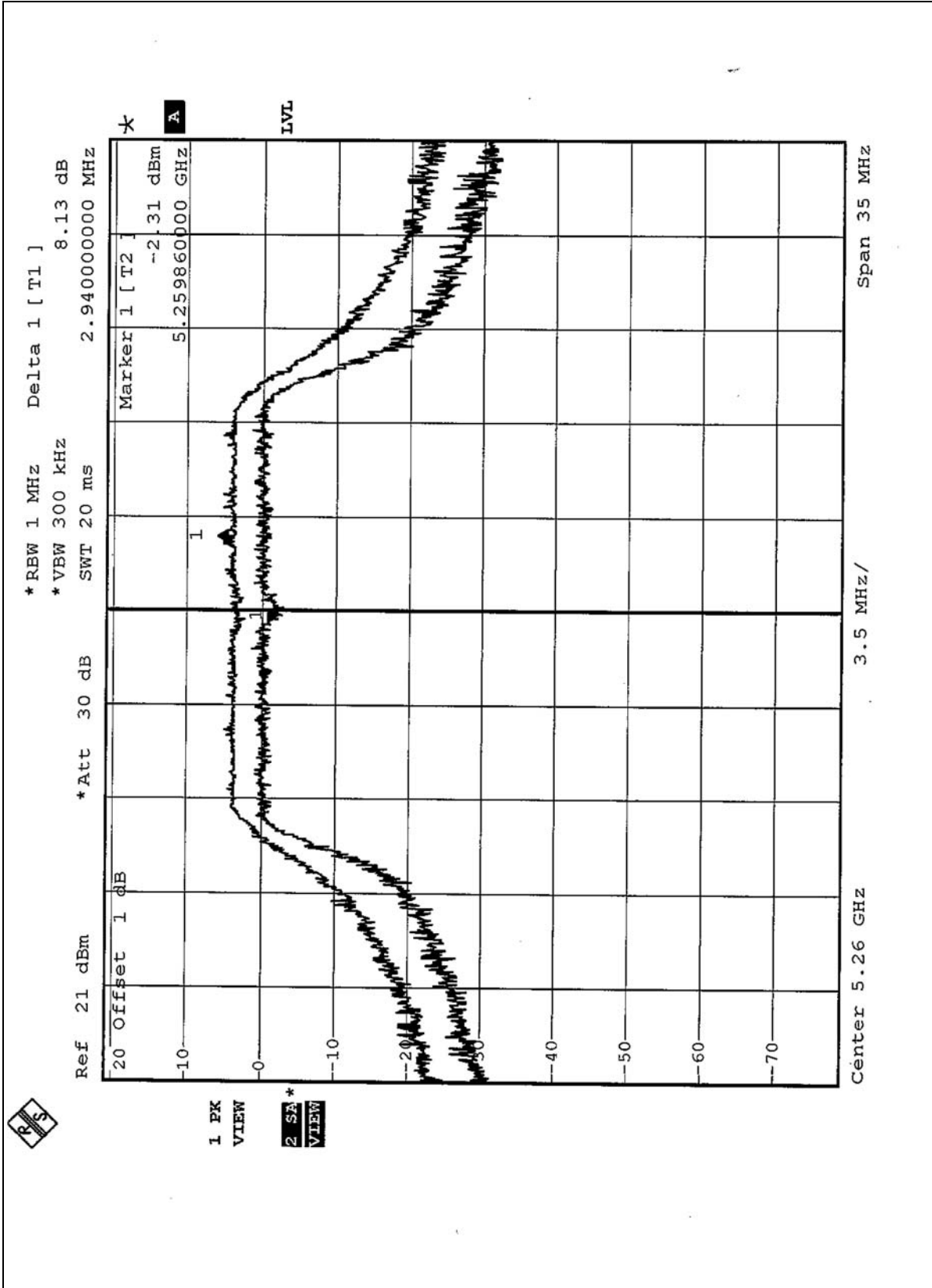


CH4



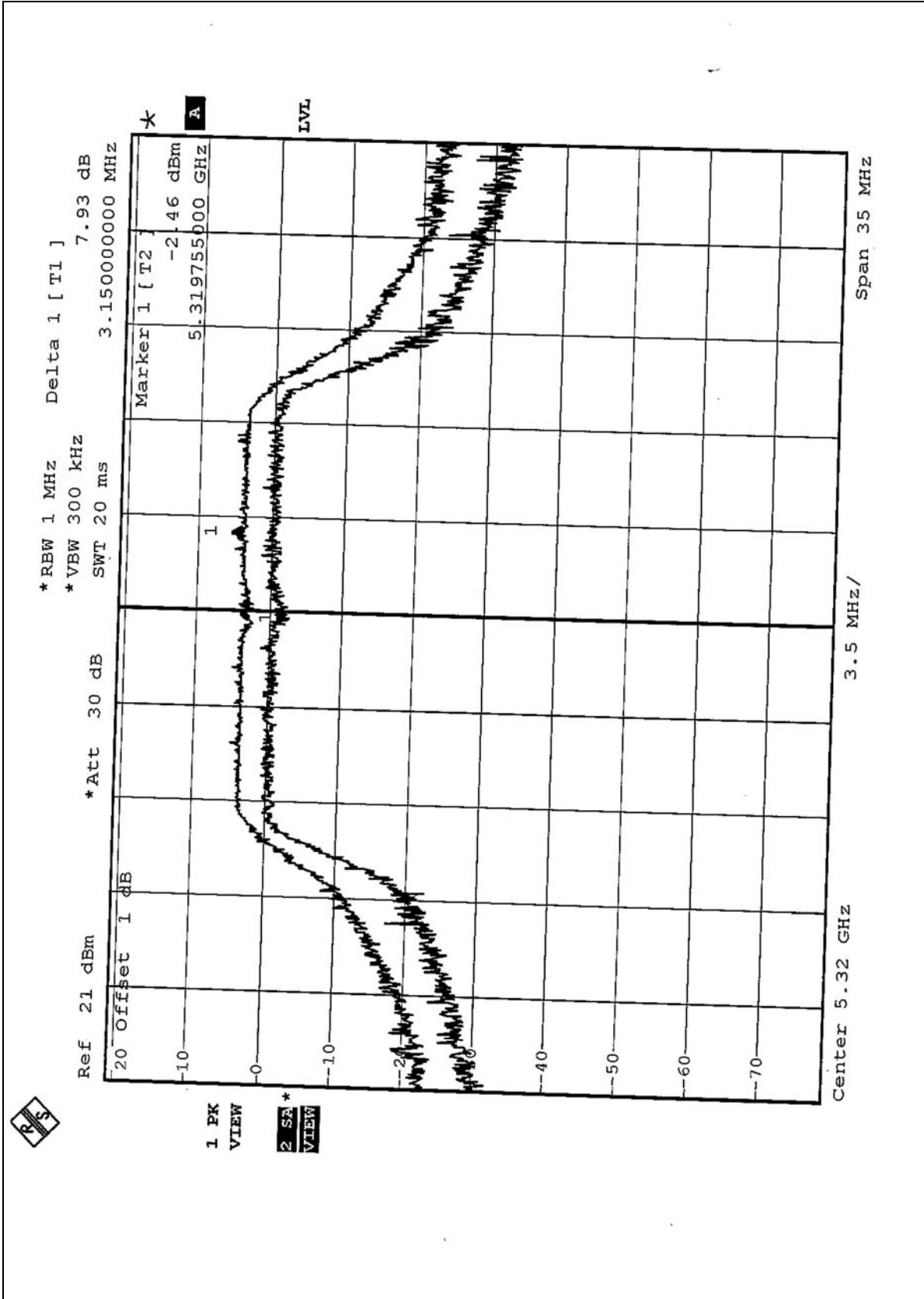


CH 5



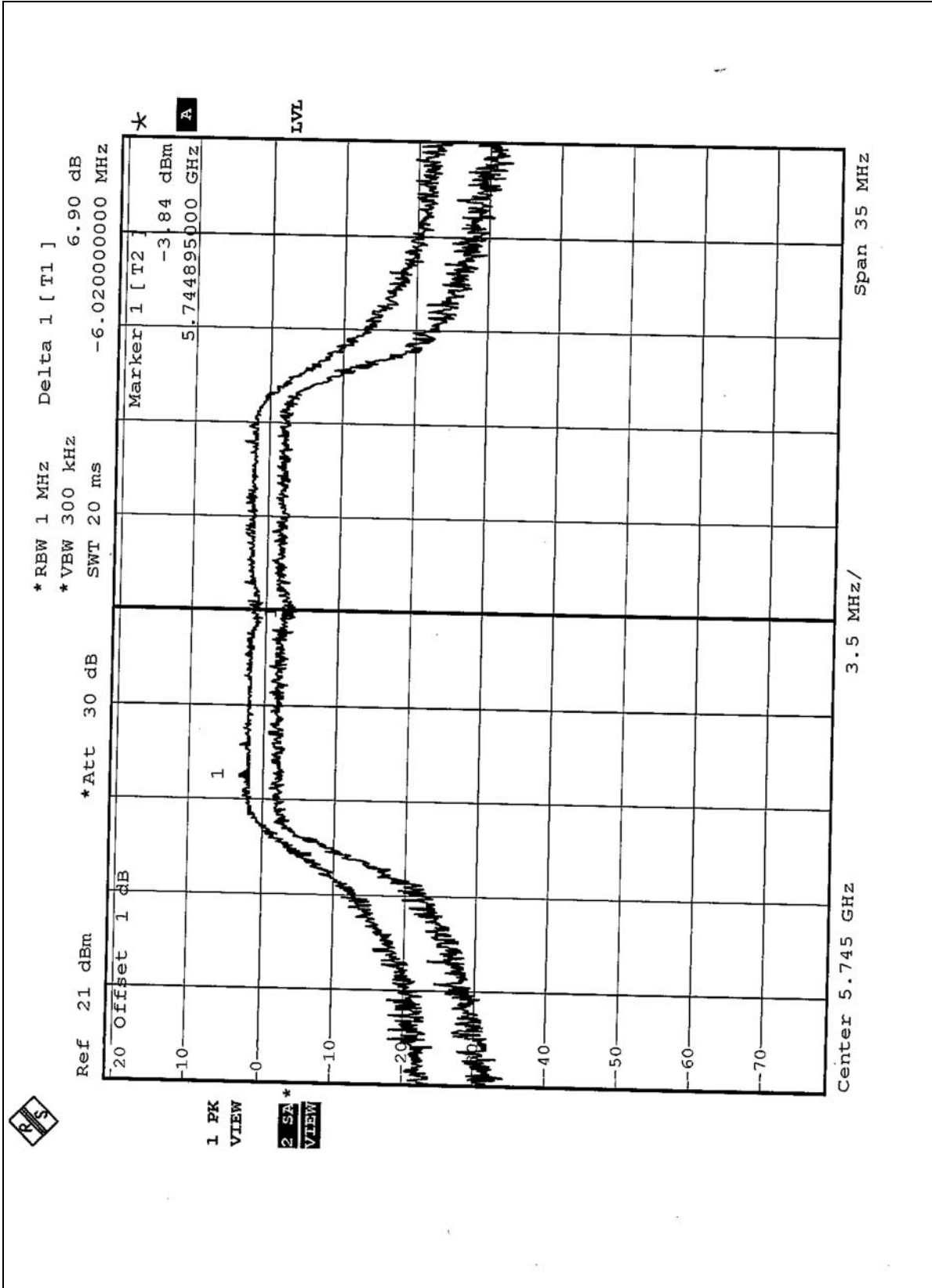


CH 8





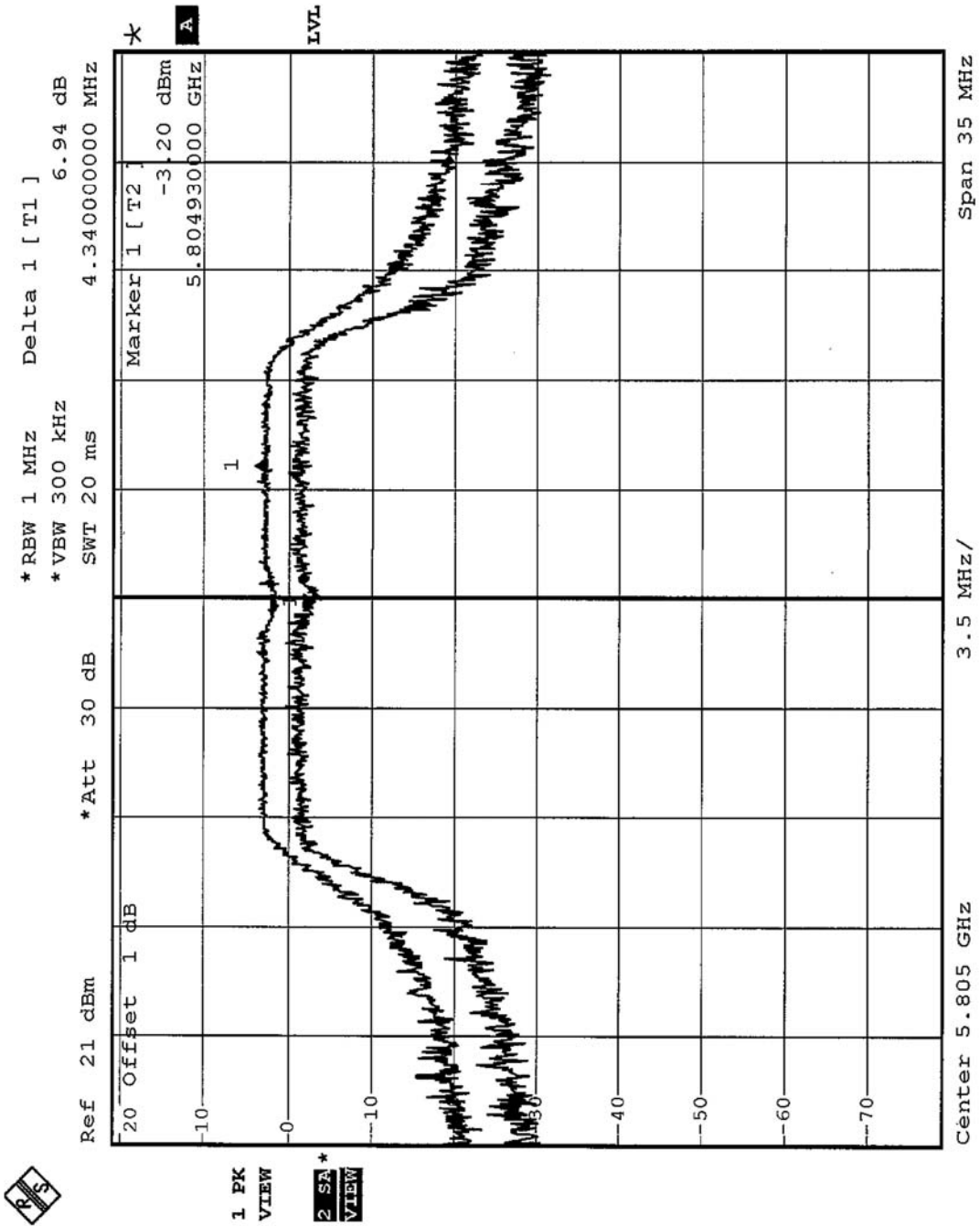
CH 9







CH 12





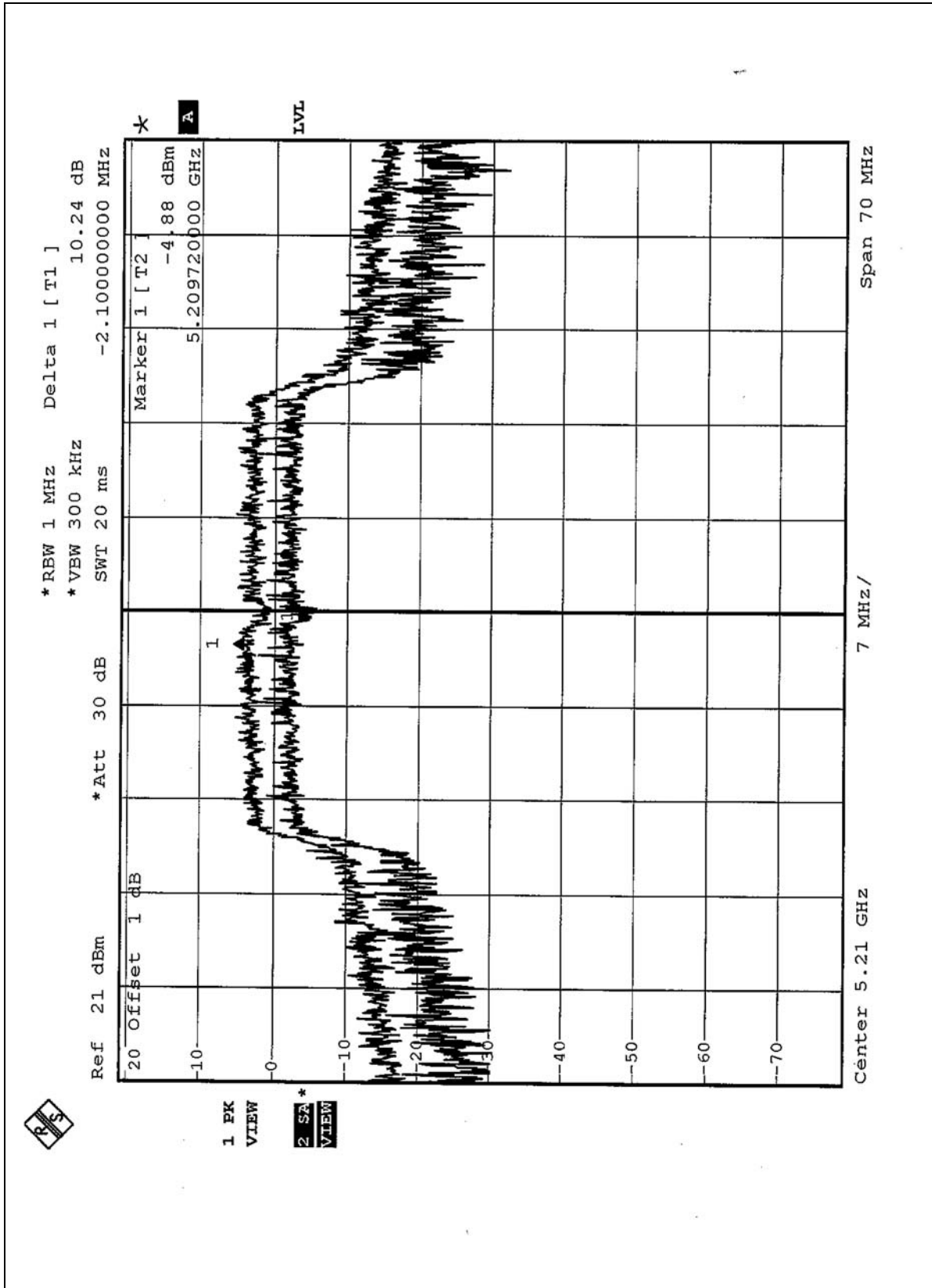
**TURBO MODE**

<b>EUT</b>	Atheros 11a/g Card Bus Adapter	<b>MODEL</b>	NL-5354CB Plus Aries2
<b>ENVIRONMENTAL CONDITIONS</b>	21deg. C, 60%RH, 991hPa	<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz
<b>TESTED BY</b>	Jamison Chan		

<b>CHANNEL</b>	<b>CHANNEL FREQUENCY (MHz)</b>	<b>PEAK POWER EXCURSION (dB)</b>	<b>PEAK to AVERAGE EXCURSION LIMIT (dB)</b>	<b>PASS/FAIL</b>
1	5210	10.24	13	PASS
2	5250	12.51	13	PASS
3	5290	11.25	13	PASS
4	5760	10.58	13	PASS
5	5800	12.32	13	PASS

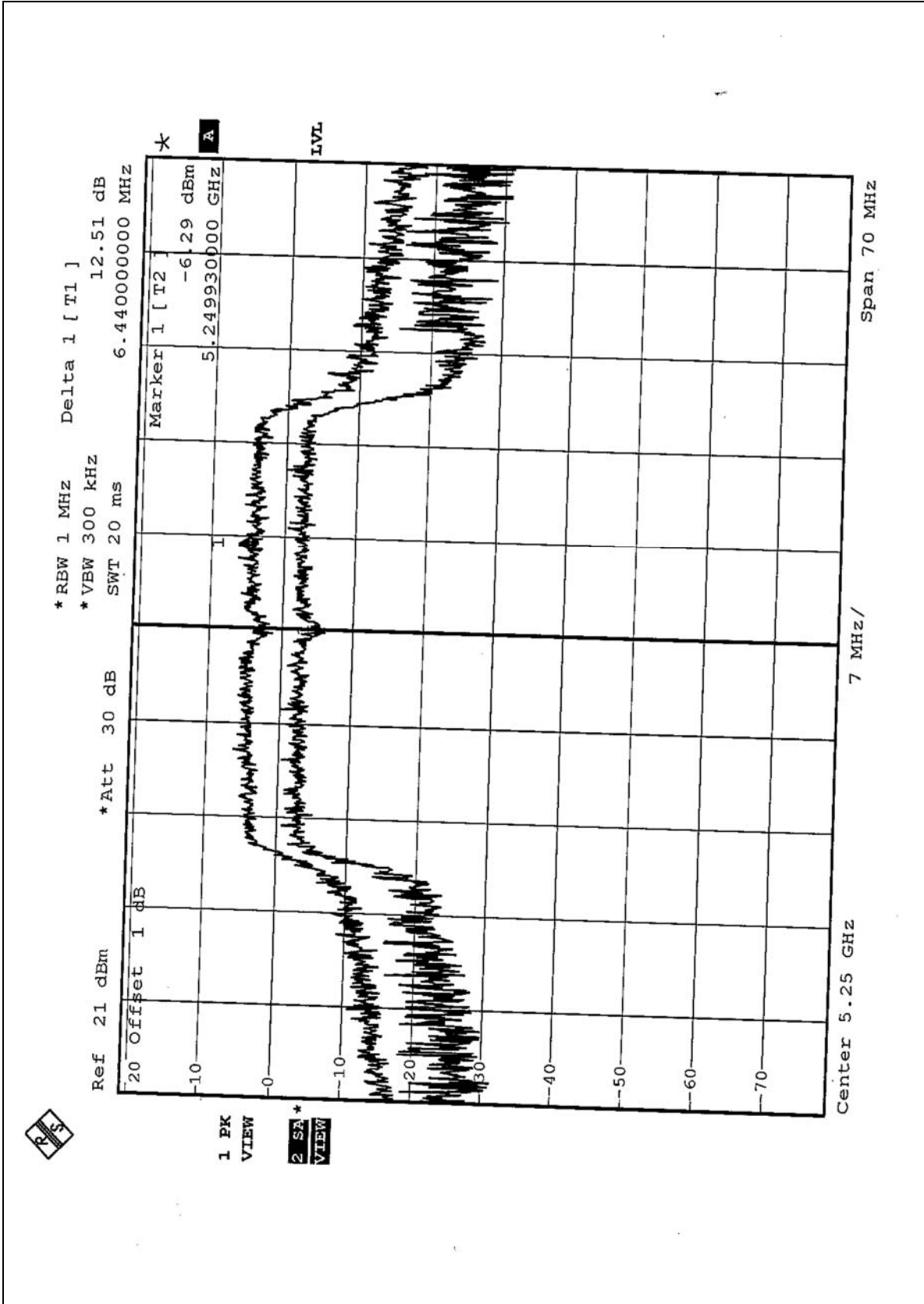


CH1



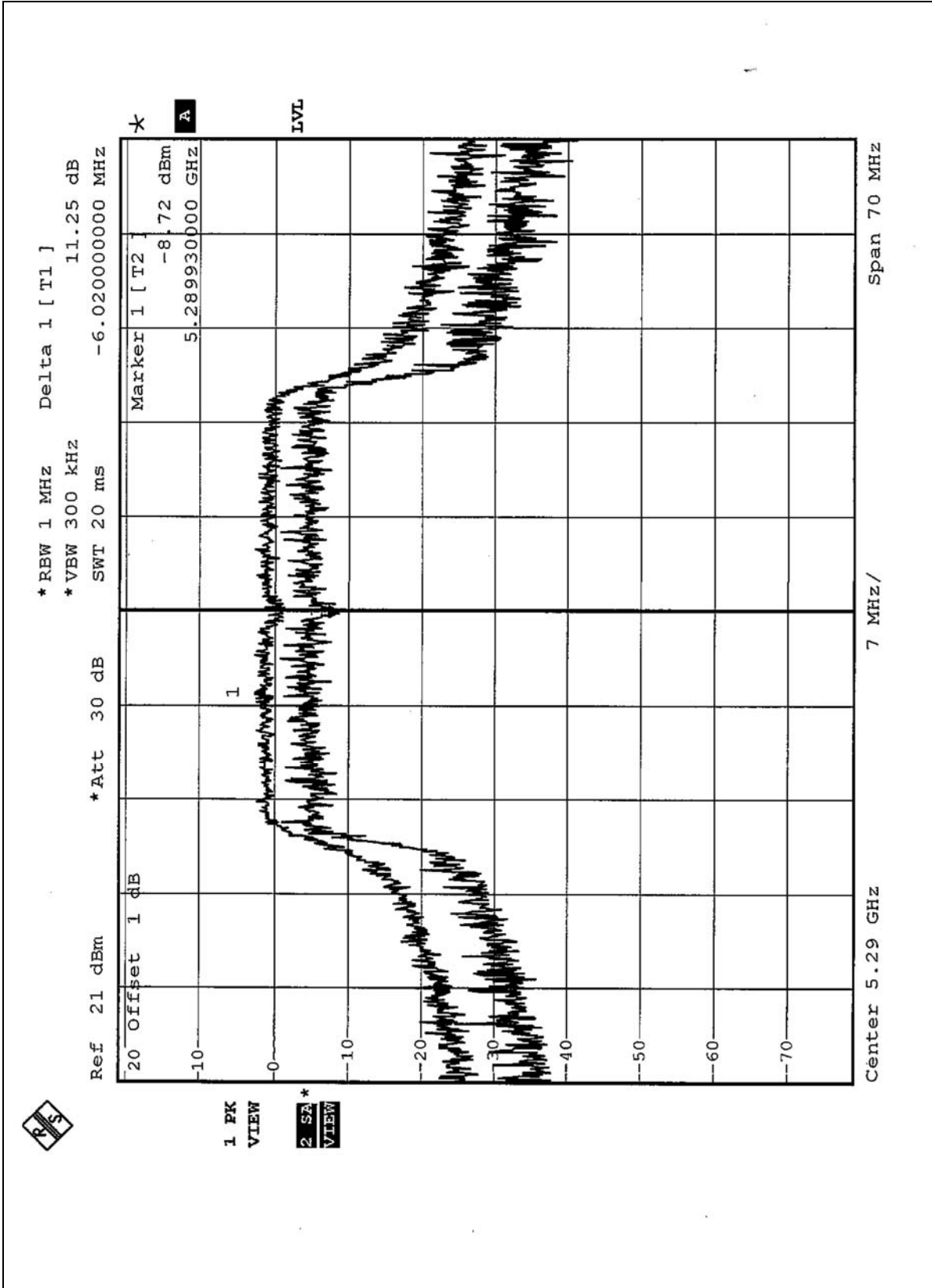


CH2



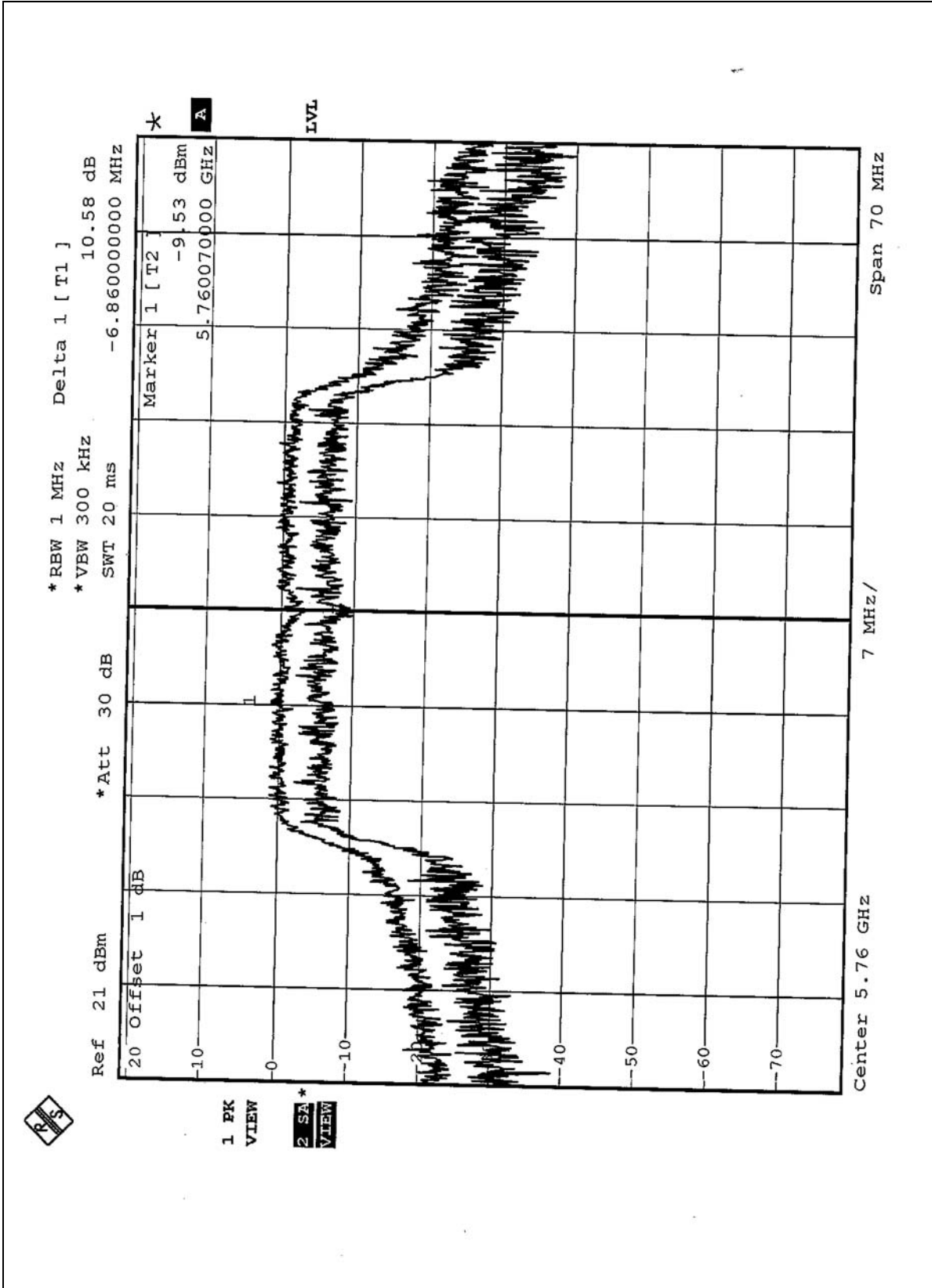


CH 3



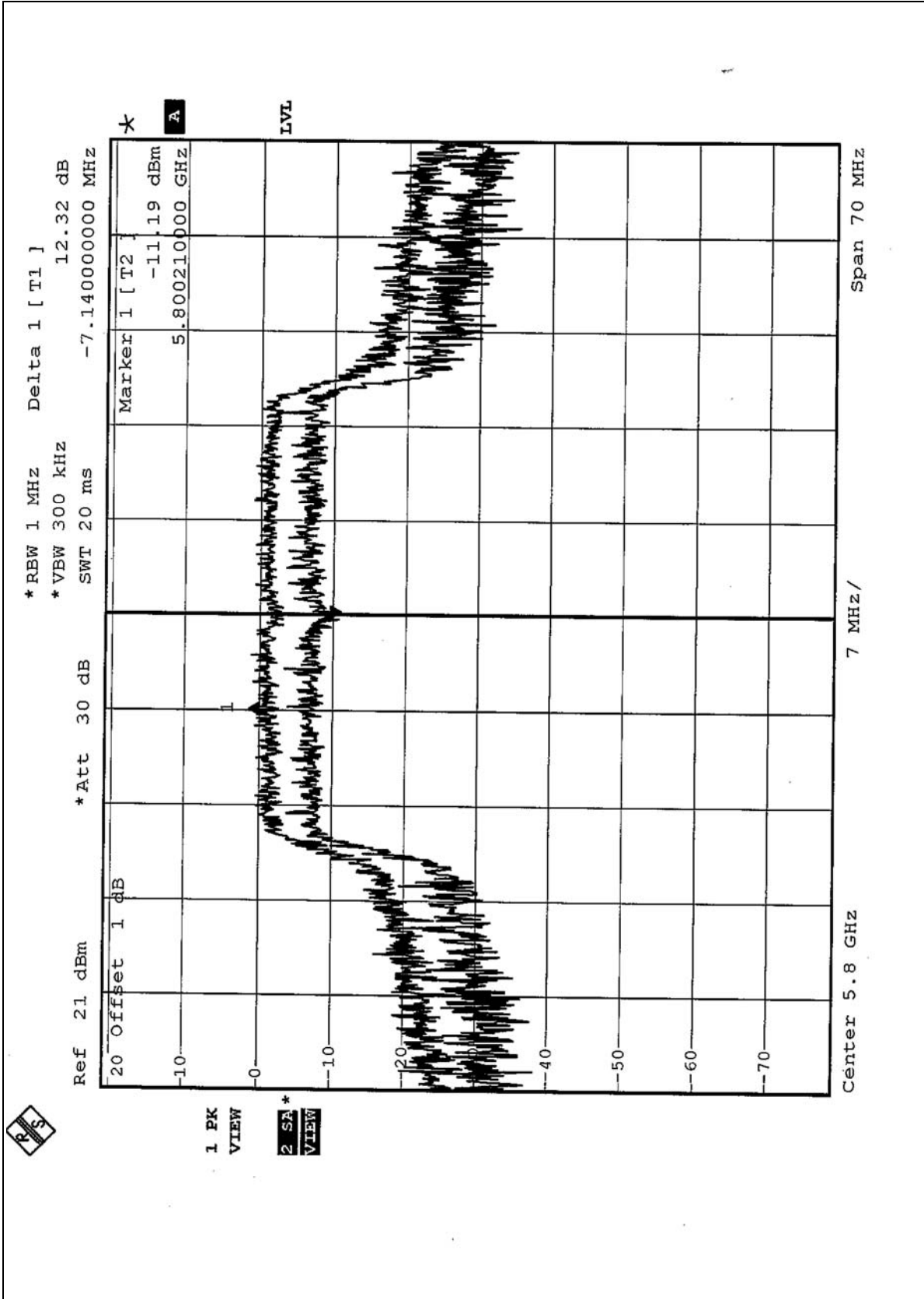


CH 4





CH 5





## 5.5 PEAK POWER SPECTRAL DENSITY MEASUREMENT

### 5.5.1 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

### 5.5.2 TEST INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
SPECTRUM ANALYZER	FSEK30	100049	August 12, 2004
SPECTRUM ANALYZER	8564EC	4208A00660	Nov. 20, 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

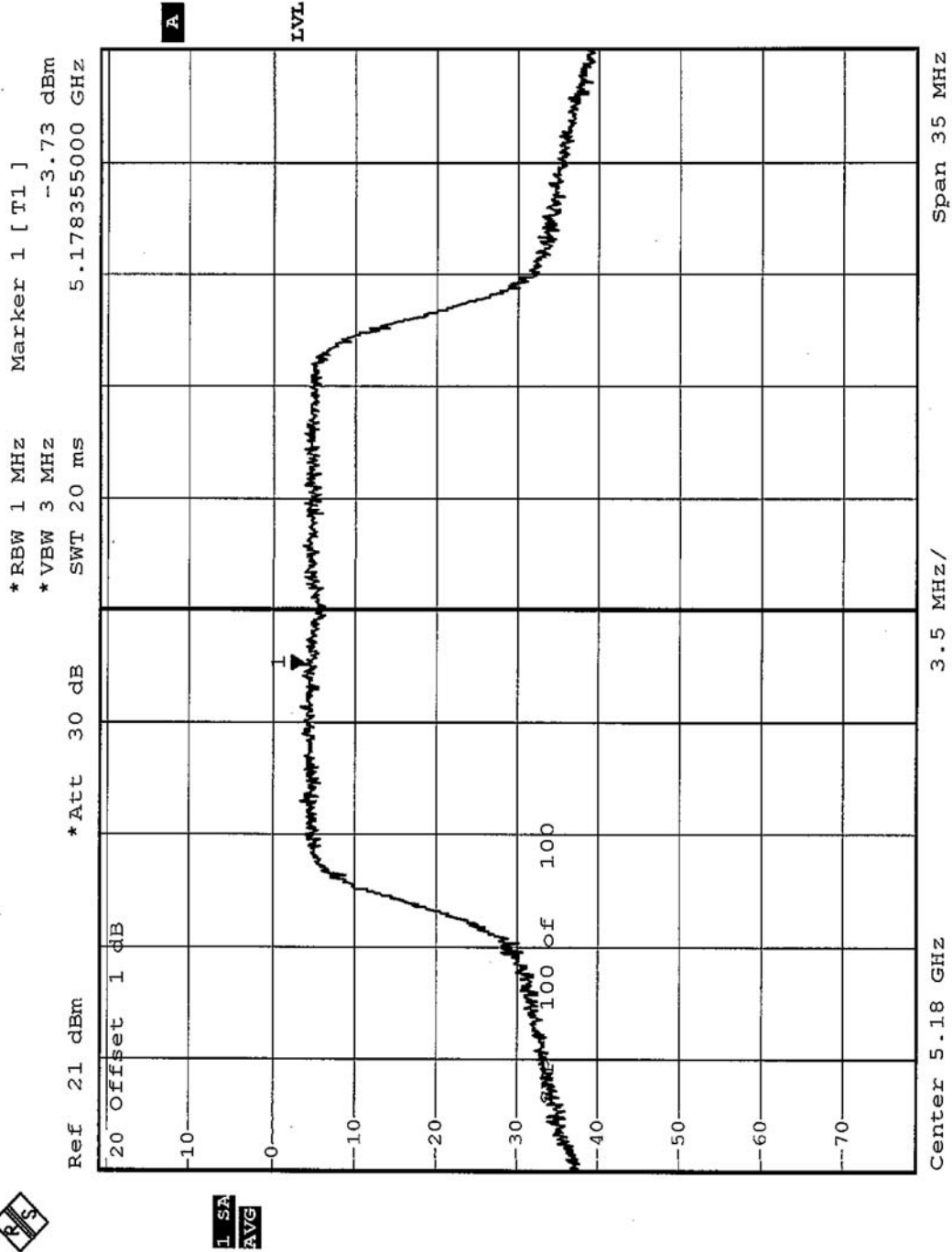
**NORMAL MODE**

<b>EUT</b>	Atheros 11a/g Card Bus Adapter	<b>MODEL</b>	NL-5354CB Plus Aries2
<b>ENVIRONMENTAL CONDITIONS</b>	21deg. C, 60%RH, 991hPa	<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz
<b>TESTED BY</b>	Jamison Chan		

<b>CHANNEL</b>	<b>CHANNEL FREQUENCY (MHz )</b>	<b>RF POWER LEVEL IN 1MHz BW (dBm)</b>	<b>MAXIMUM LIMIT (dBm)</b>	<b>PASS/FAIL</b>
1	5180	-3.73	4	PASS
4	5240	-4.22	4	PASS
5	5260	-4.64	11	PASS
8	5320	-4.16	11	PASS
9	5745	-6.37	17	PASS
12	5805	-5.79	17	PASS

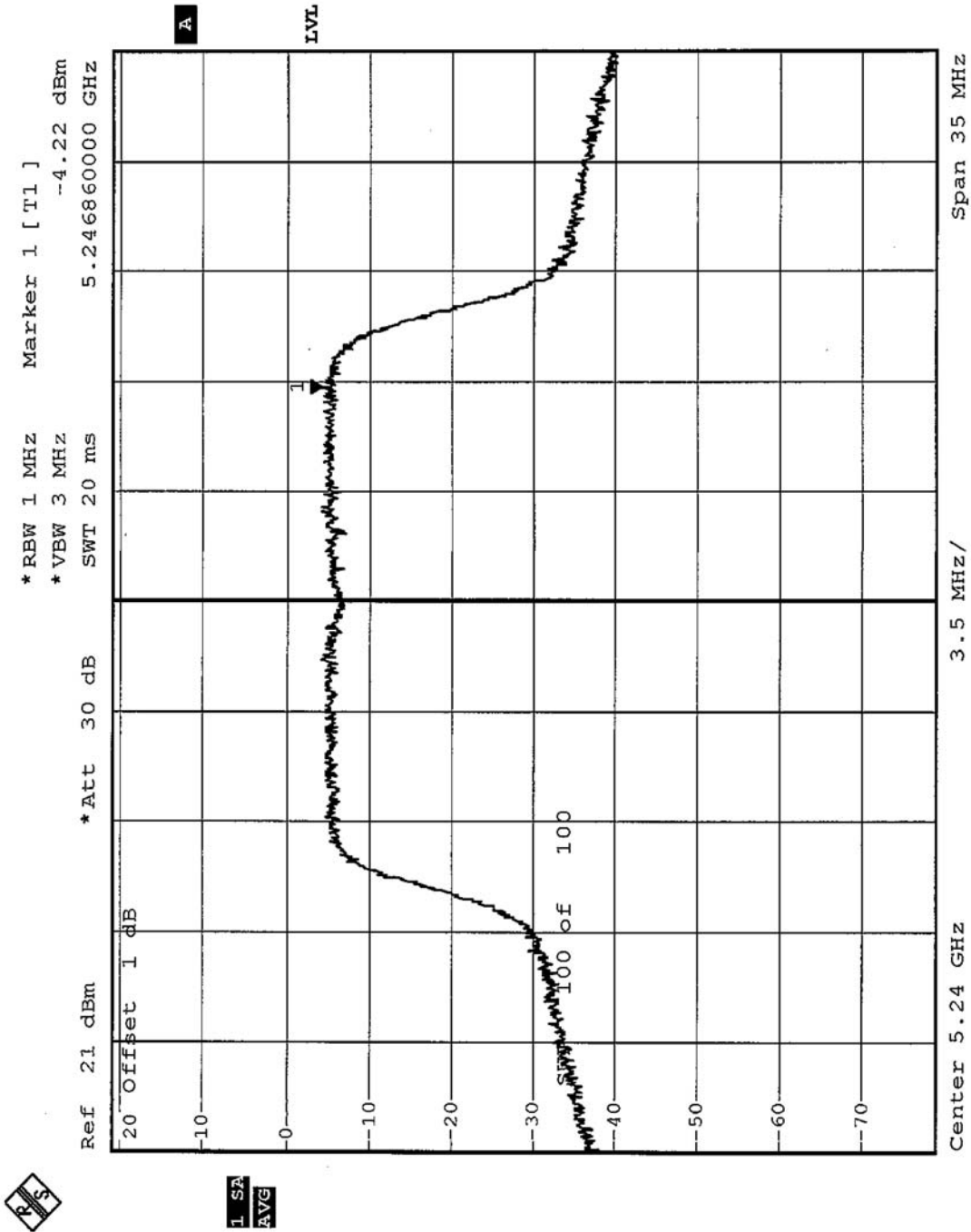


CH 1



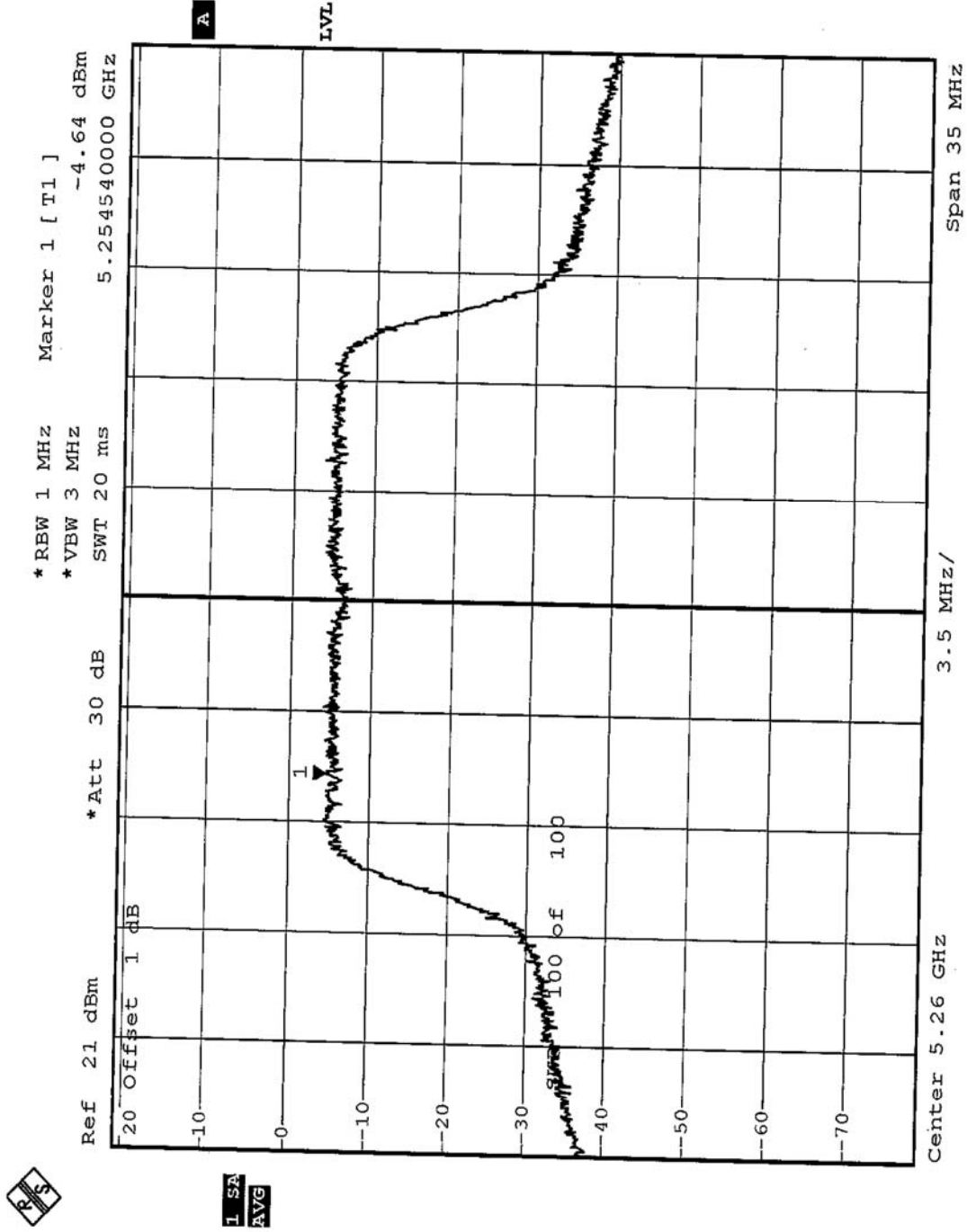


CH 4



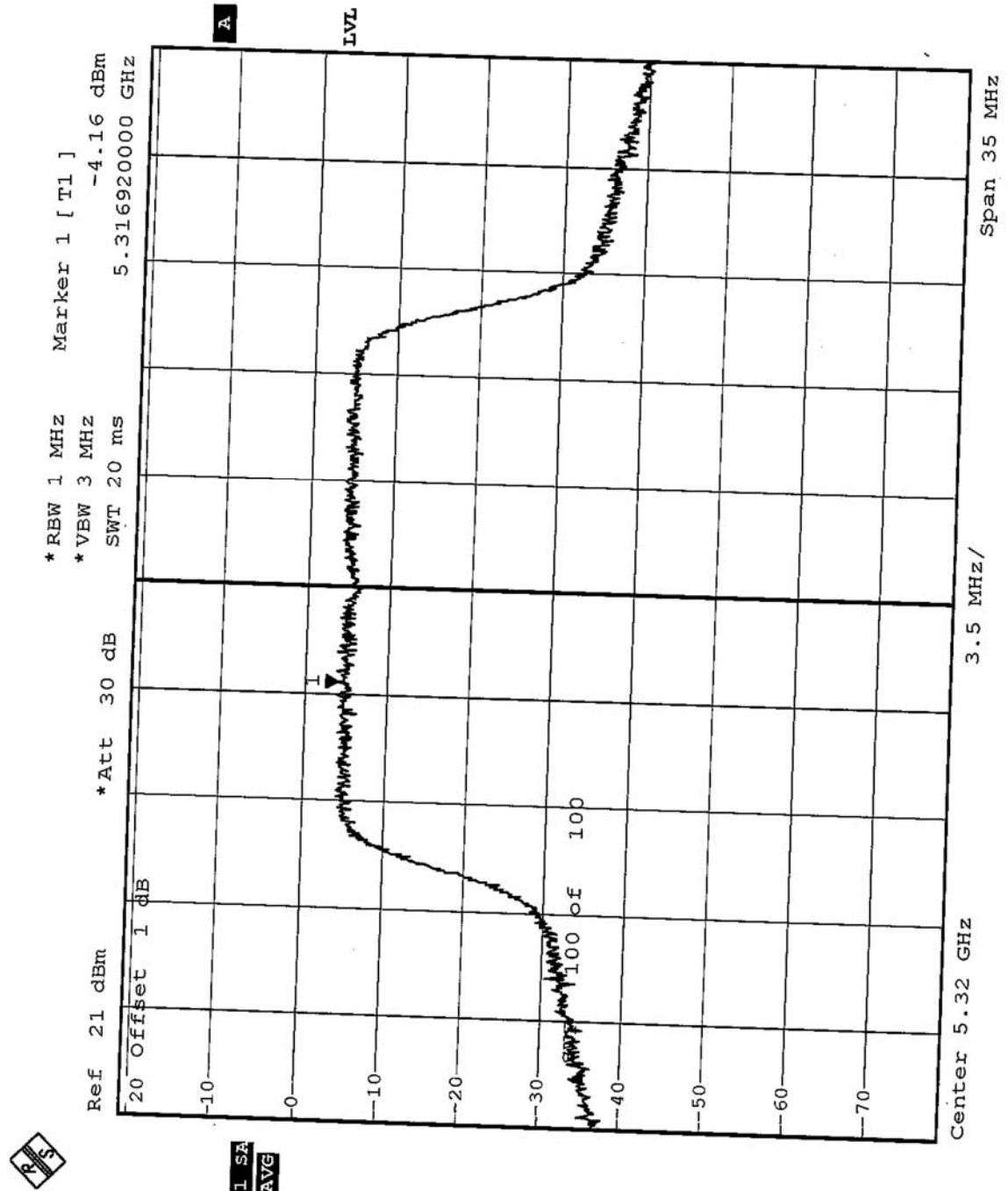


CH 5



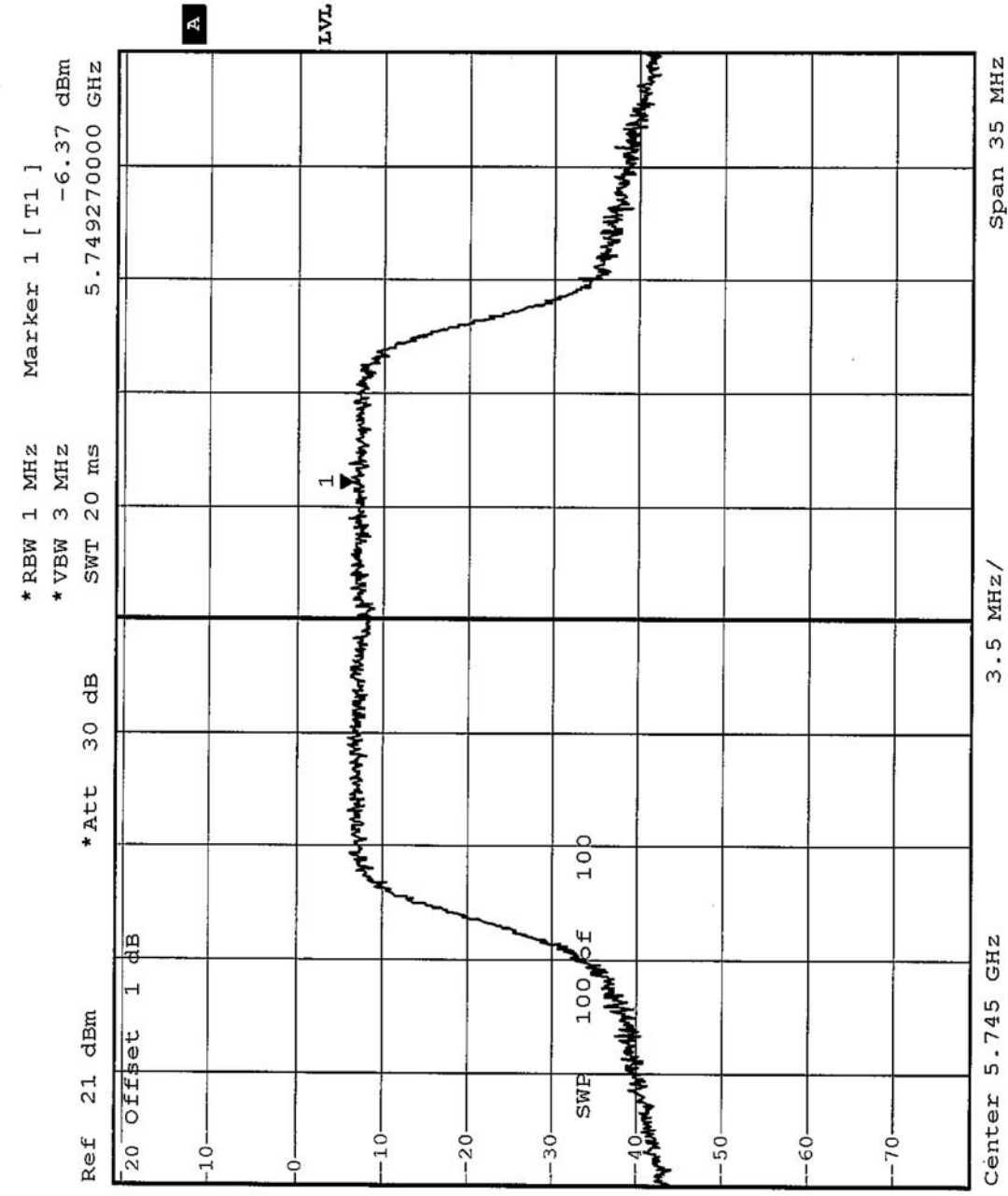


CH 8



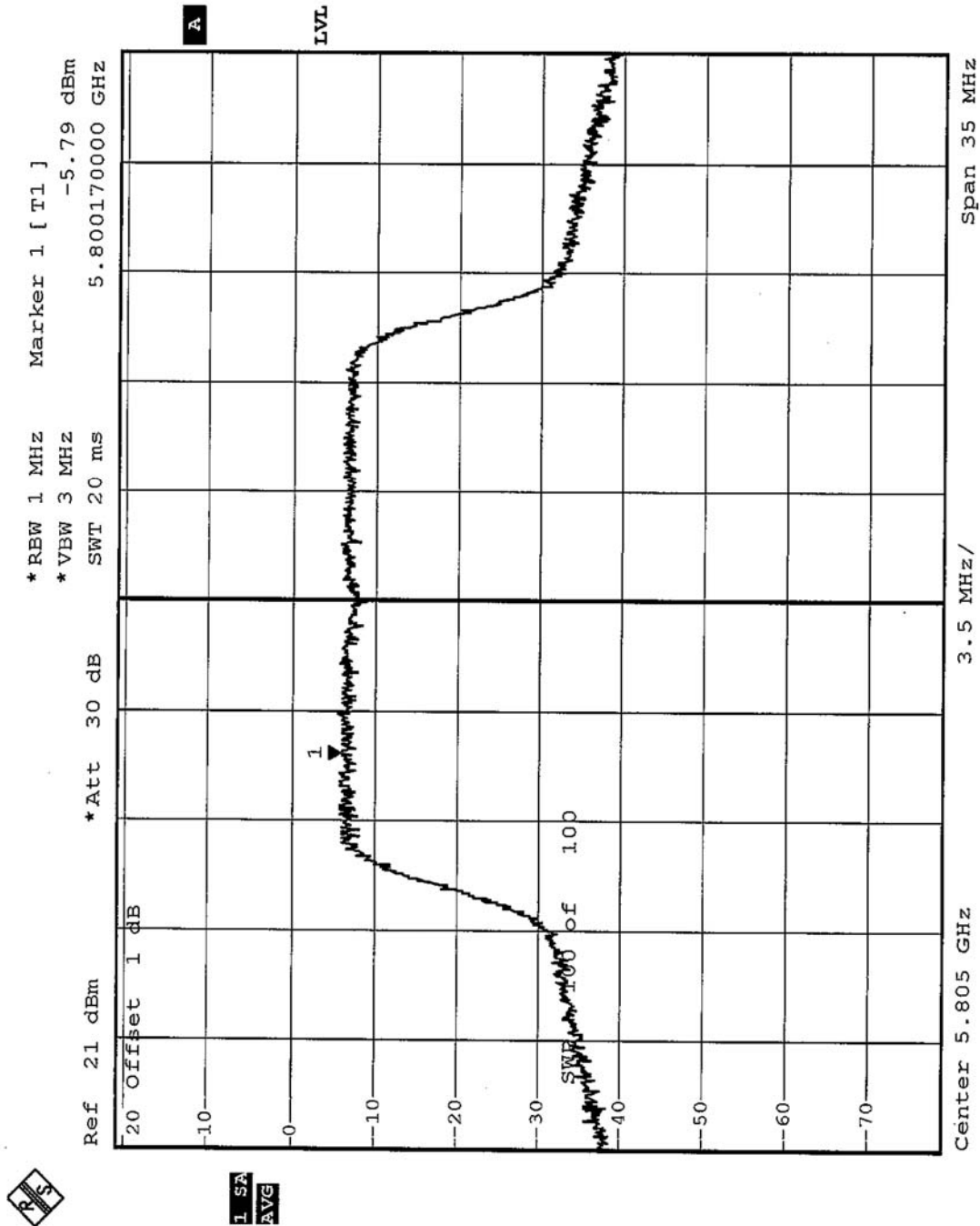


CH 9





CH12







## 5.5.8 TEST RESULTS

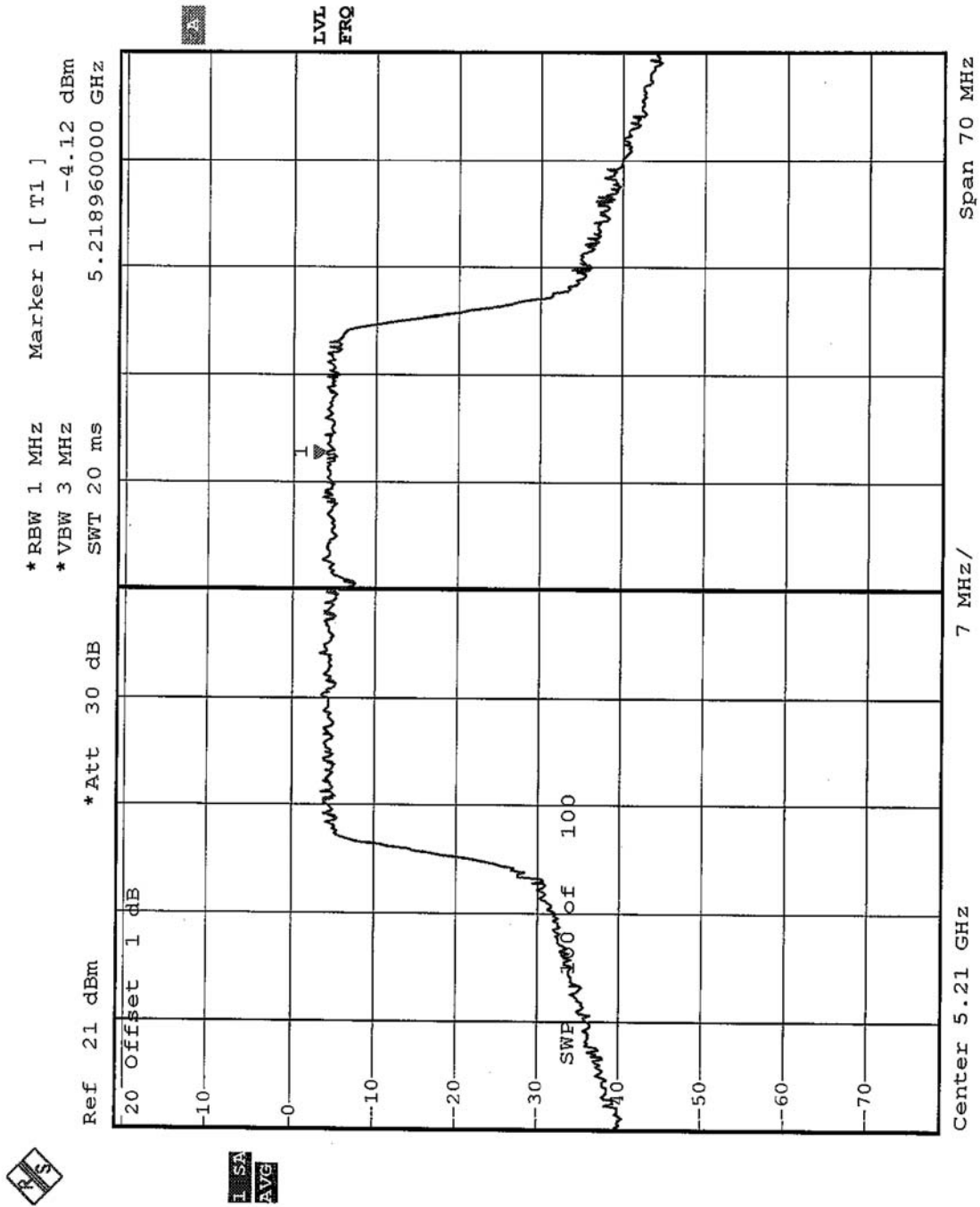
**TURBO MODE**

<b>EUT</b>	Atheros 11a/g Card Bus Adapter	<b>MODEL</b>	NL-5354CB Plus Aries2
<b>ENVIRONMENTAL CONDITIONS</b>	21deg. C, 60%RH, 991hPa	<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz
<b>TESTED BY</b>	Jamison Chan		

<b>CHANNEL</b>	<b>CHANNEL FREQUENCY (MHz 5250)</b>	<b>RF POWER LEVEL IN 1MHz BW (dBm)</b>	<b>MAXIMUM LIMIT (dBm)</b>	<b>PASS/FAIL</b>
1	5210	-4.12	4	PASS
2	5250	-4.01	4	PASS
3	5290	-3.37	11	PASS
4	5760	-2.11	11	PASS
5	5800	-2.60	17	PASS



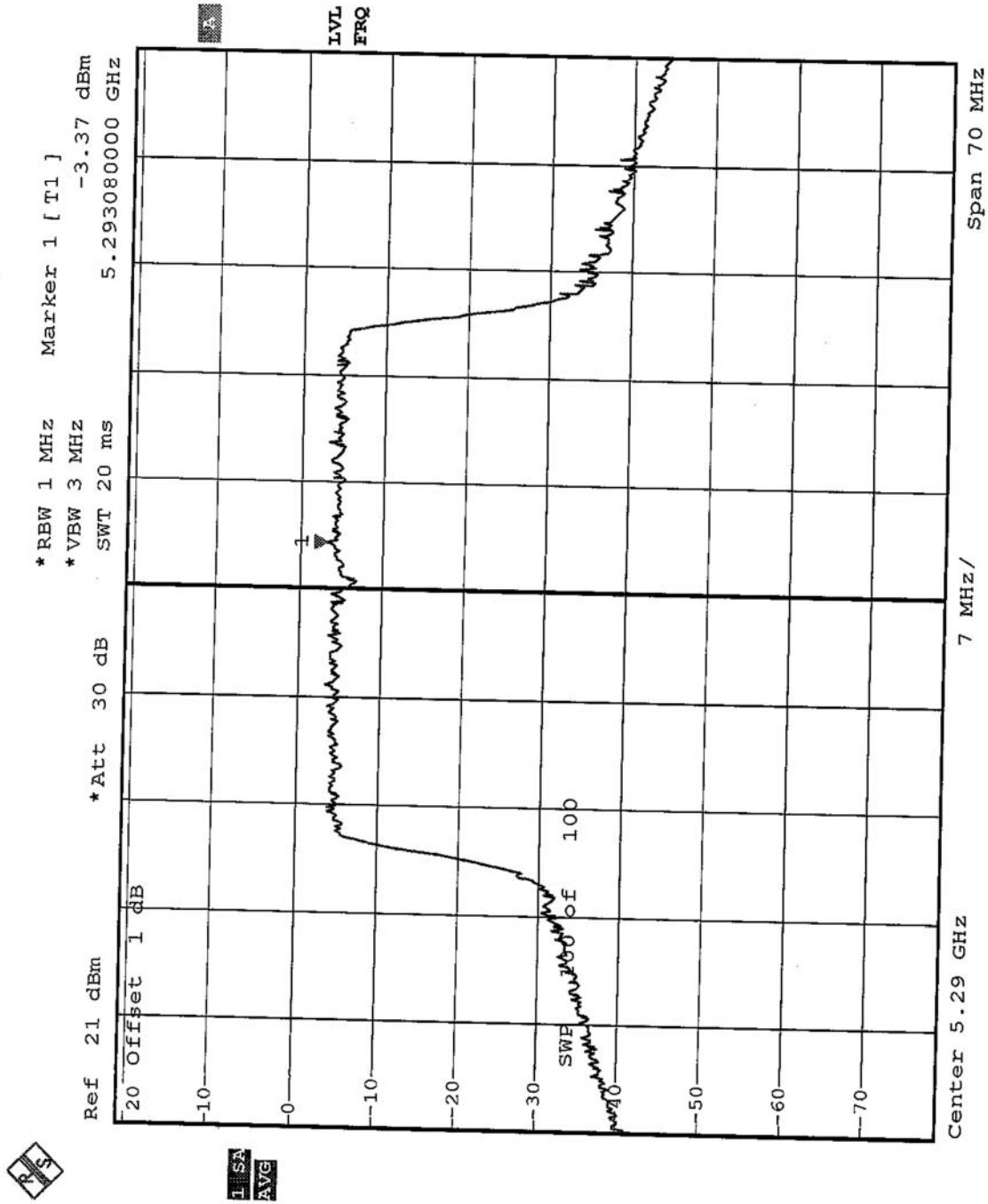
CH 1





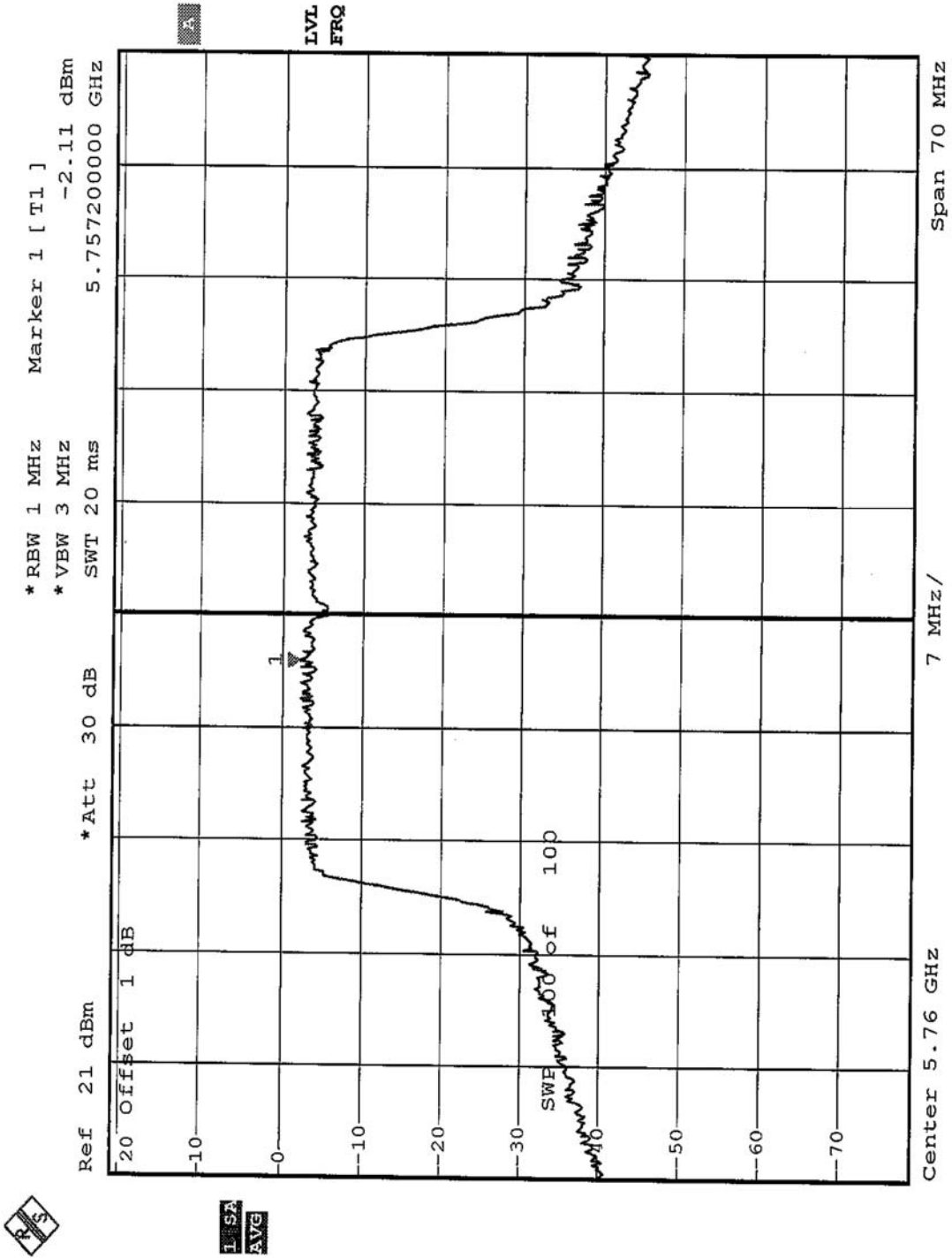


CH 3



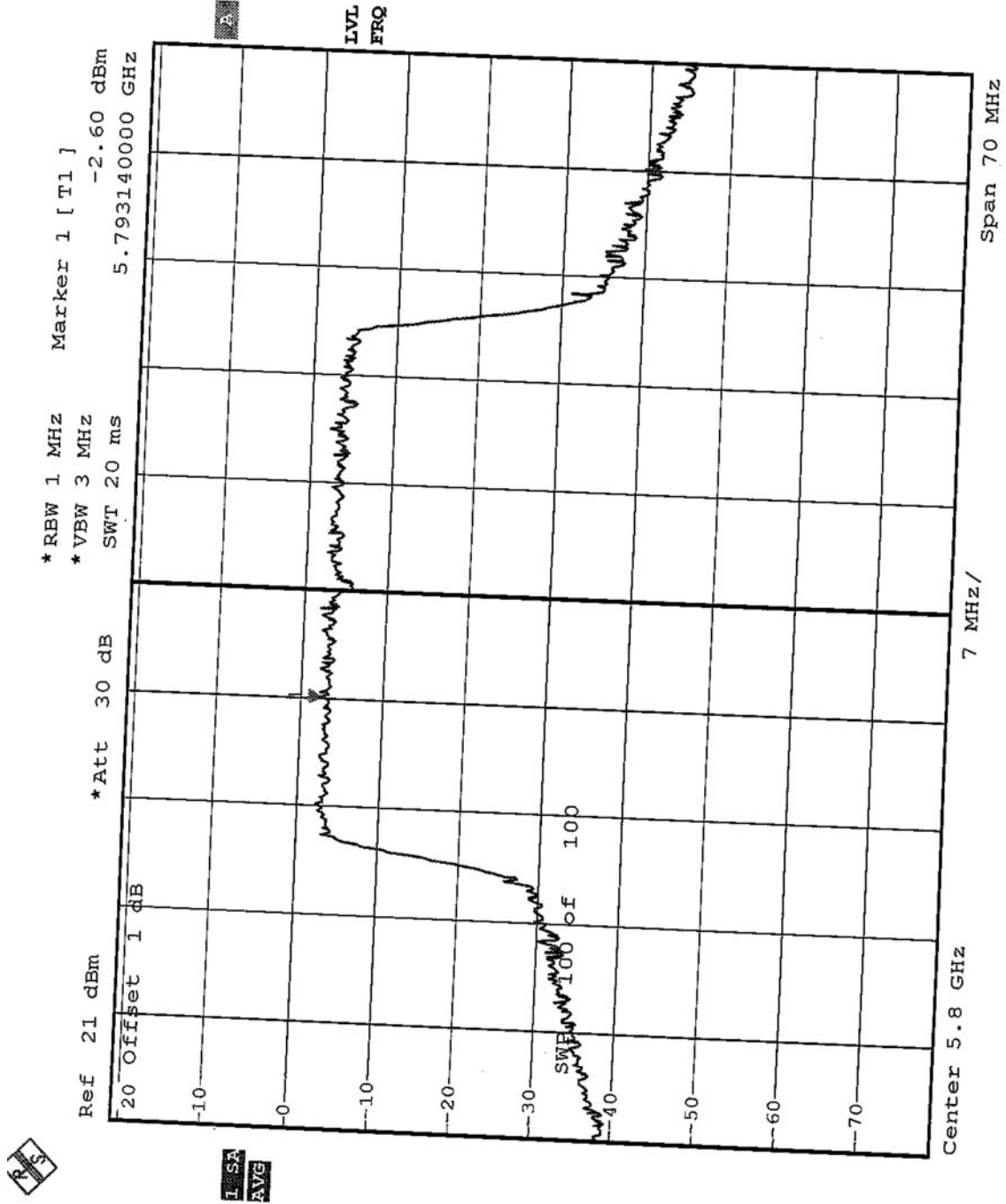


CH 4





CH 5





## 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
ANRITSU SPECTRUM ANALYZER	MS2667C	M10281	Aug. 12, 2004
WIT STANDARD TEMPERATURE AND HUMIDITY CHAMBER	TH-4S-C	W901030	Aug. 12, 2004

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

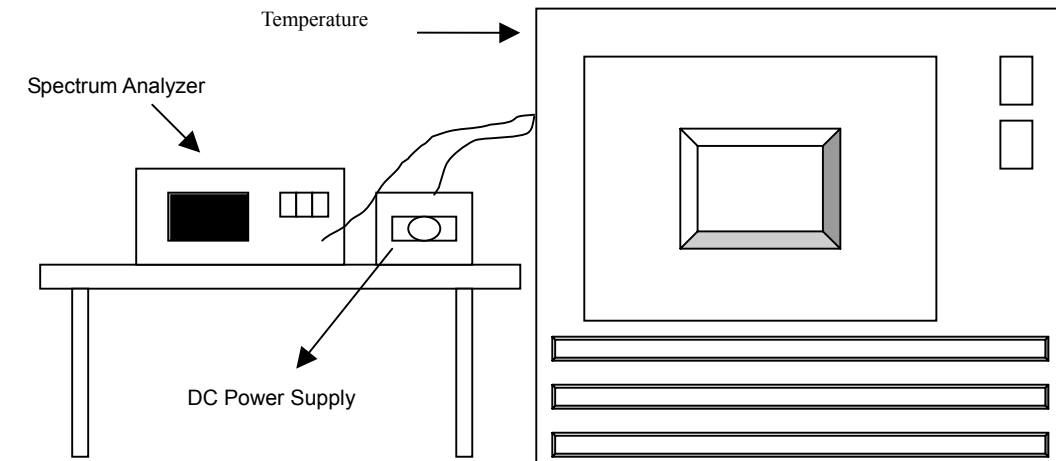
### 5.6.3 TEST PROCEDURE

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

#### 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 : $\pm 0.02\%$			
Temp. (°C)	Power supply (VDC)	2 minute		5 minute		10 minute	
		(MHz)	(%)	(MHz)	(%)	(MHz)	(%)
50	126.5	5320.0316	0.0005940	5320.0323	0.0006071	5320.0340	0.0006391
	110.0	5320.0314	0.0005902	5320.0323	0.0006071	5320.0340	0.0006391
	93.5	5320.0316	0.0005940	5320.0323	0.0006071	5320.0346	0.0006504
40	126.5	5320.0206	0.0003872	5320.0193	0.0003628	5320.0153	0.0002876
	110.0	5320.0206	0.0003872	5320.0191	0.0003590	5320.0153	0.0002876
	93.5	5320.0206	0.0003872	5320.0193	0.0003628	5320.0153	0.0002876
30	126.5	5320.0263	0.0004944	5320.0323	0.0006071	5320.0354	0.0006654
	110.0	5320.0263	0.0004944	5320.0323	0.0006071	5320.0354	0.0006654
	93.5	5320.0263	0.0004944	5320.0323	0.0006071	5320.0354	0.0006654
20	126.5	5320.0193	0.0003628	5320.0204	0.0003872	5320.0214	0.0004023
	110.0	5320.0193	0.0003628	5320.0206	0.0003872	5320.0214	0.0004023
	93.5	5320.0197	0.0003703	5320.0206	-0.0002143	5320.0214	0.0004023
10	126.5	5319.9960	-0.0000752	5319.9886	-0.0002199	5319.9841	-0.0002989
	110.0	5319.9960	-0.0000752	5319.9883	-0.0002143	5319.9843	-0.0002951
	93.5	5319.9960	-0.0000752	5319.9886	-0.0001955	5319.9843	-0.0002951
0	126.5	5319.9983	-0.0000320	5319.9896	-0.0001992	5319.9834	-0.0003120
	110.0	5319.9980	-0.0000376	5319.9894	-0.0001955	5319.9834	-0.0003120
	93.5	5319.9983	-0.0000320	5319.9896	-0.0001617	5319.9836	-0.0003083
-10	126.5	5319.9897	-0.0001936	5319.9914	-0.0001635	5319.9938	-0.0001165
	110.0	5319.9897	-0.0001936	5319.9913	-0.0001617	5319.9940	-0.0001128
	93.5	5319.9897	-0.0001936	5319.9914	-0.0000376	5319.9936	-0.0001203
-20	126.5	5319.9963	-0.0000695	5319.9980	-0.0000376	5319.9986	-0.0000263
	110.0	5319.9963	-0.0000695	5319.9980	-0.0000376	5319.9986	-0.0000263
	93.5	5319.9965	-0.0000658	5319.9980	-0.0000996	5319.9990	-0.0000188
-30	126.5	5319.9960	-0.0000752	5319.9947	-0.0000959	5319.9940	-0.0001128
	110.0	5319.9957	-0.0000808	5319.9949	-0.0000959	5319.9940	-0.0001128
	93.5	5319.9960	-0.0000752	5319.9949	-0.0000959	5319.9942	-0.0001090



## 5.7 BAND EDGES MEASUREMENT

### 5.7.1 TEST INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
SPECTRUM ANALYZER	FSEK30	100049	August 12, 2004

**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 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.

### 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 5.35GHz 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 field 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=300Hz) are attached on the following pages.

Normal Mode: Channel 1 (5180 MHz)

The band edge emission plot on the pages 156 ~ 157 shows 39.59dBc (Peak) / 48.62dBc (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 99.69dBuV/m, so the maximum field strength in restrict band is  $99.69-48.62=51.07$ dBuV/m which is under 54dBuV/m limit.

Normal Mode: Channel 8 (5320 MHz)

The band edge emission plot on the pages 158~ 159 shows 44.45dBc (Peak) / 48.51dBc (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 101.65dBuV/m, so the maximum field strength in restrict band is  $101.65-48.51=53.14$ dBuV/m which is under 54dBuV/m limit.

Turbo Mode: Channel 1 (5210 MHz)

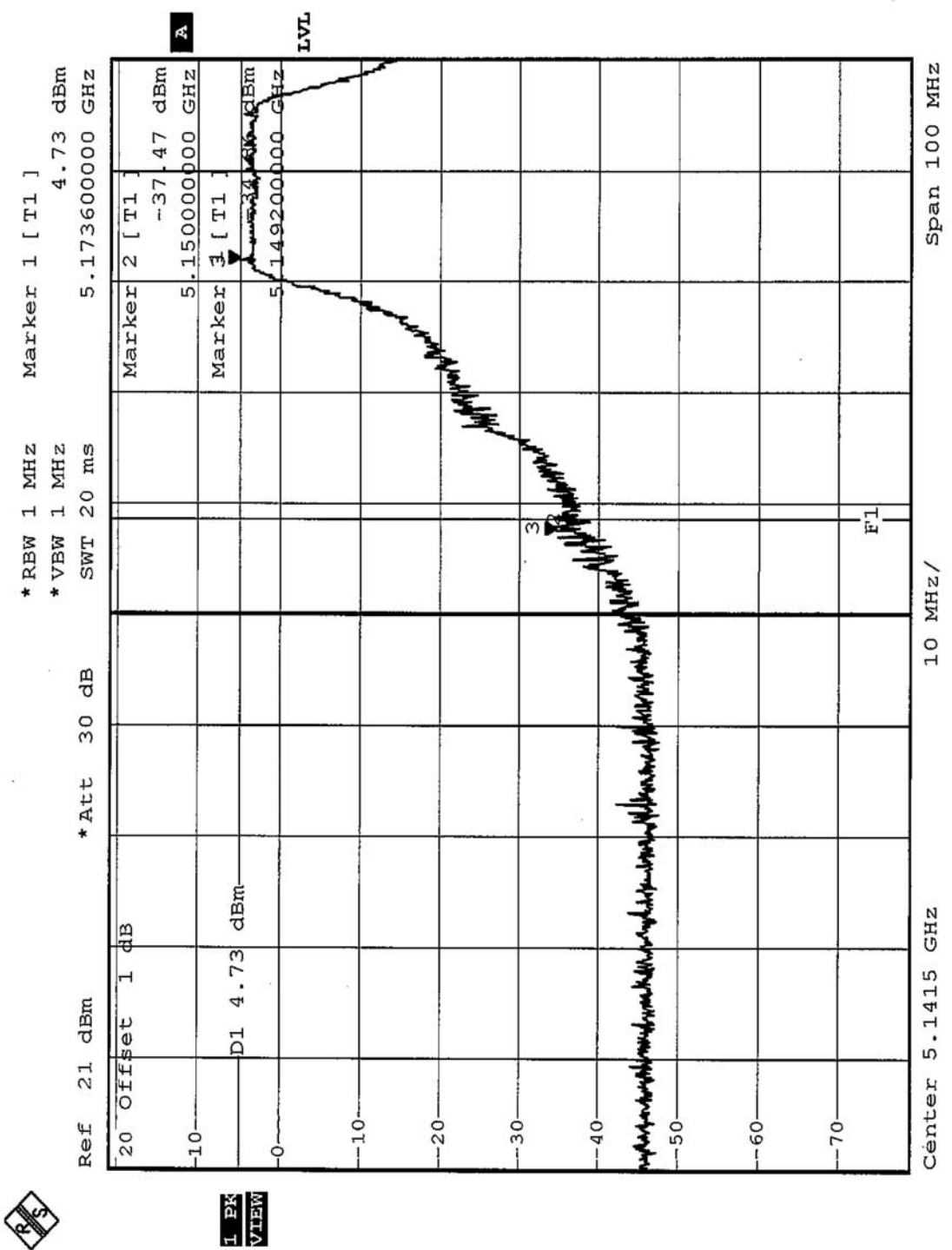
The band edge emission plot on the pages 160 ~161 shows 40.79dBc (Peak) / 49.34dBc (Average) between carrier maximum power and local maximum emission in restrict band. The emission of carrier strength list in the test result of channel 1 (turbo mode) is 95.01dBuV/m, so the maximum field strength in restrict band is  $95.01-49.34=45.67$ dBuV/m which is under 54dBuV/m limit.

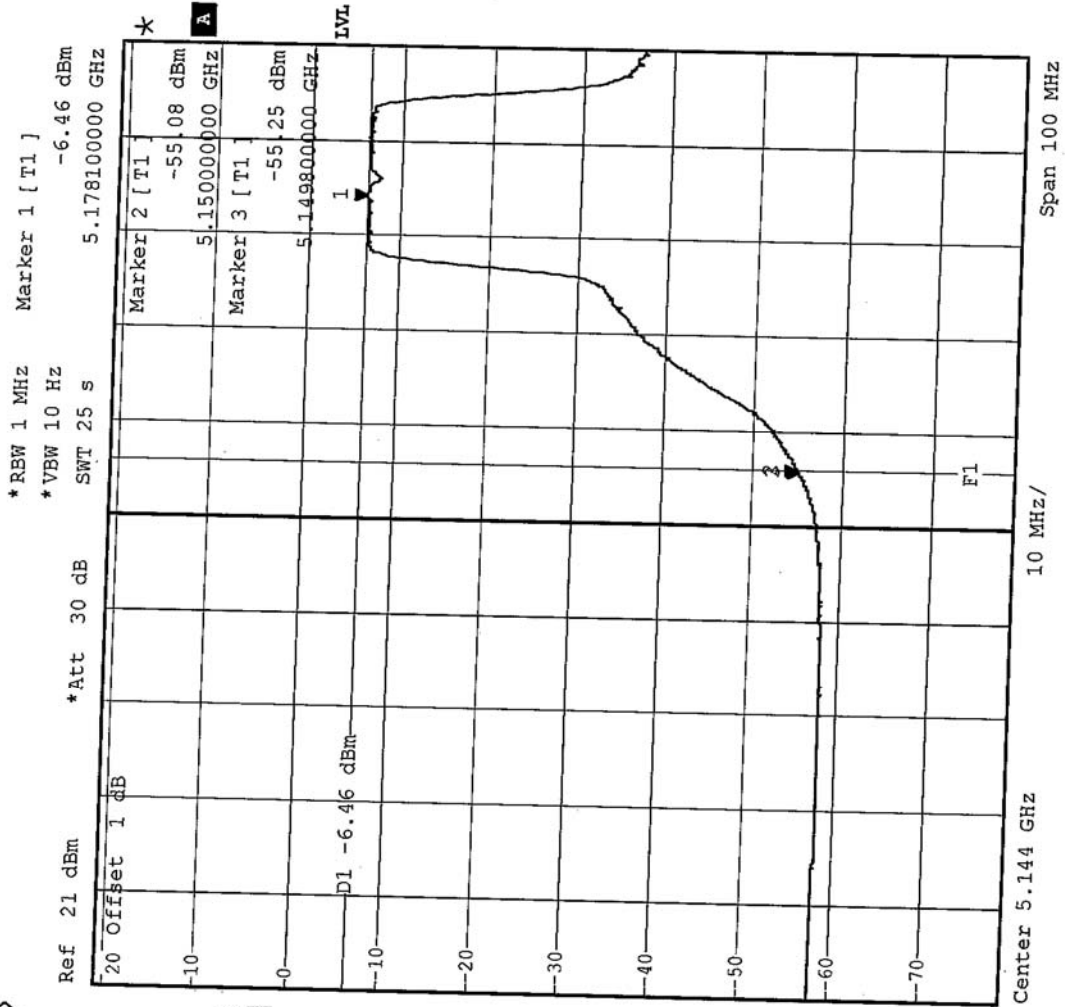
Turbo Mode: Channel 3 (5290 MHz)

The band edge emission plot on the pages 162 ~163 shows 41.90dBc (Peak) / 46.72dBc (Average) between carrier maximum power and local maximum emission in restrict band. The emission of carrier strength list in the test result of channel 3 (turbo mode) is 95.99dBuV/m, so the maximum field strength in restrict band is  $95.99-46.72=49.27$ dBuV/m which is under 54dBuV/m limit.



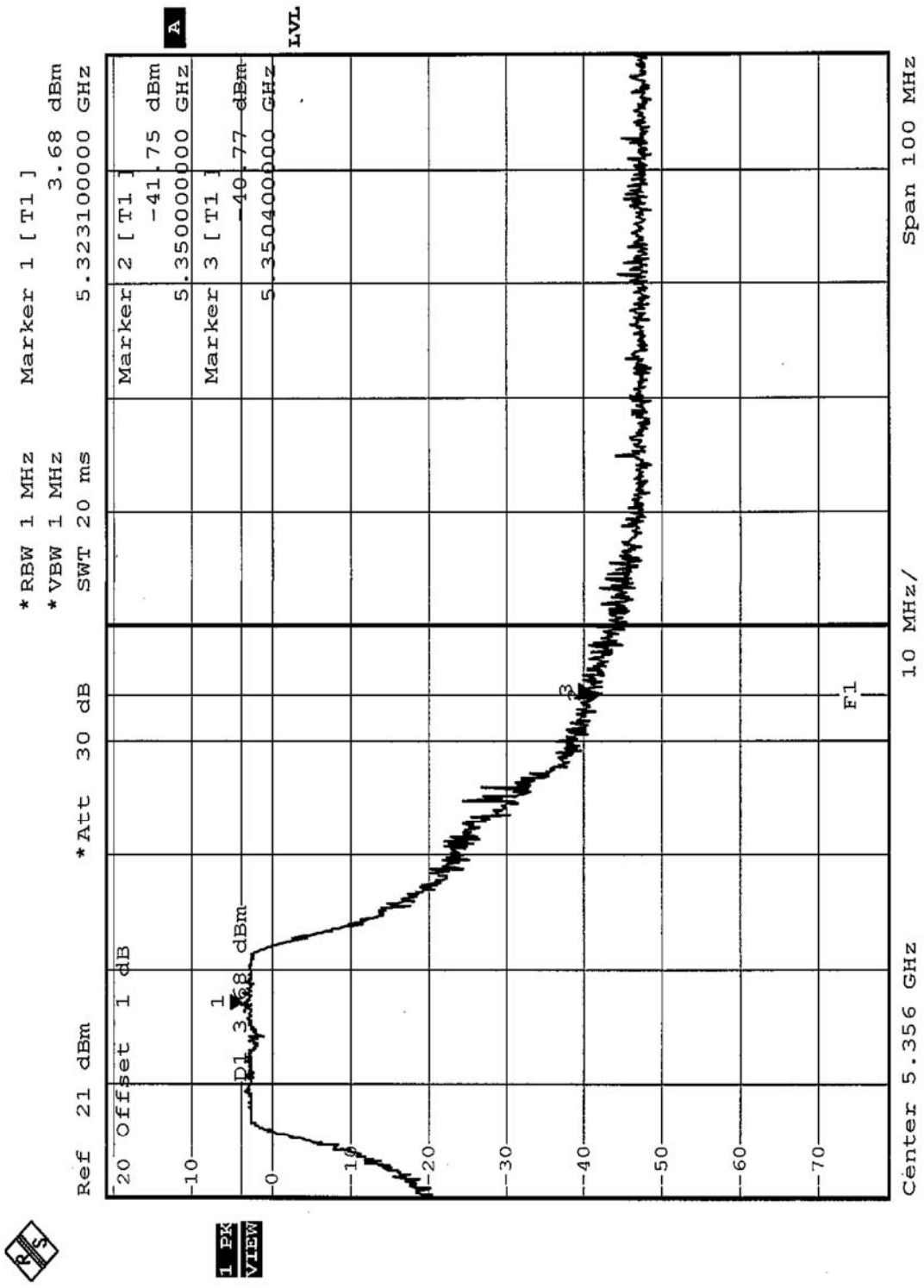
**NORMAL MODE**

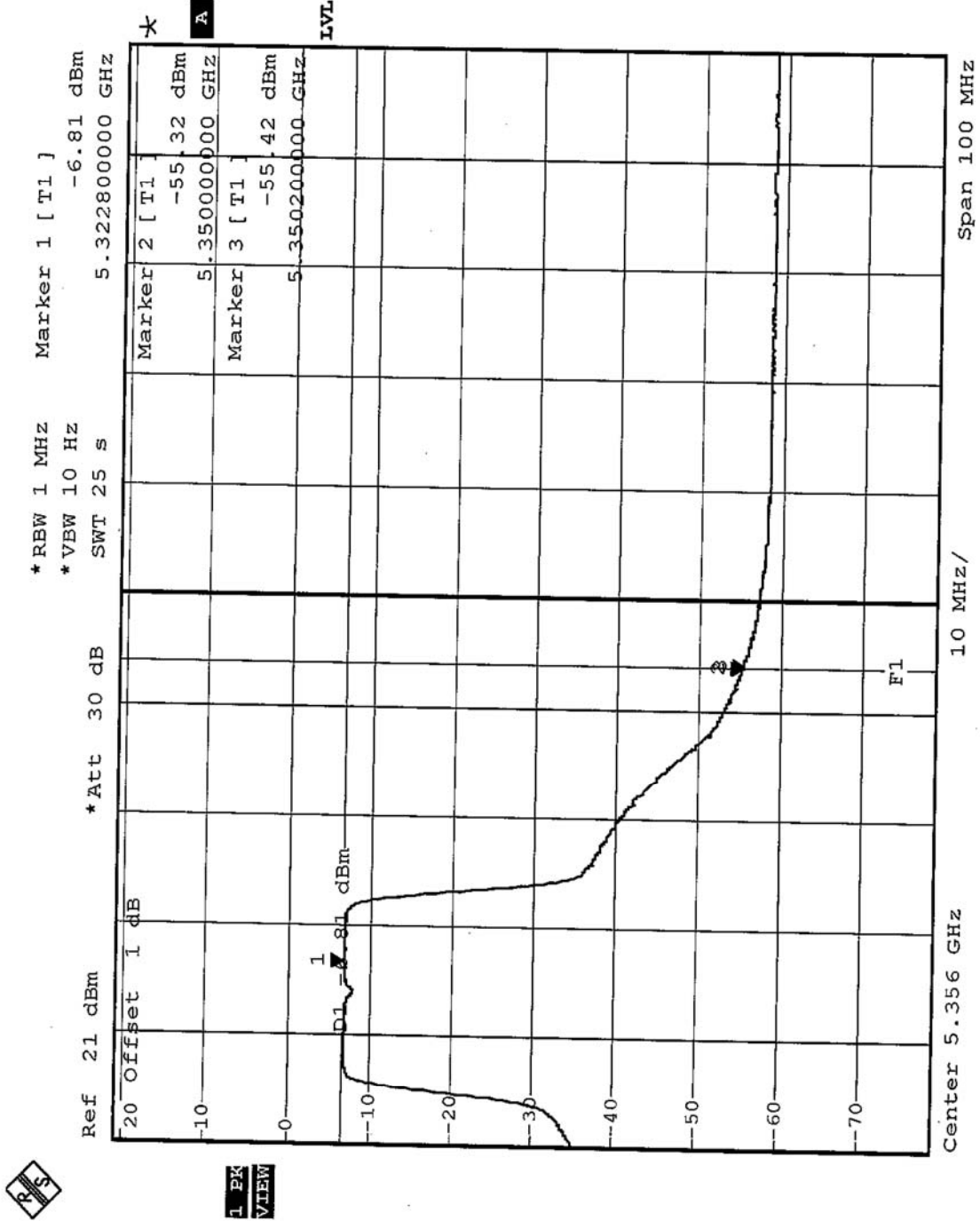




1 PK VIEW

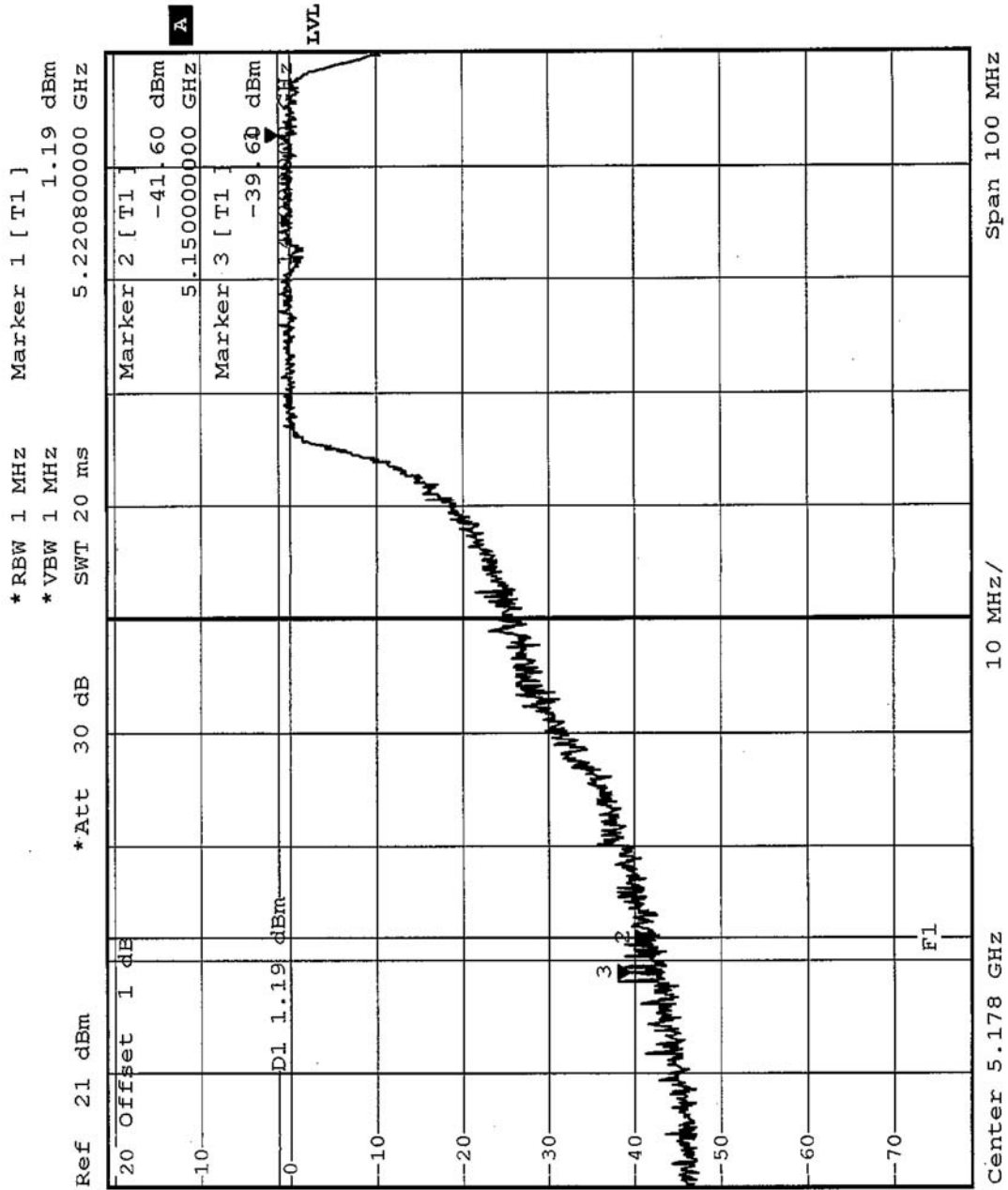
Date: 7 MAY 2004 11:11:11





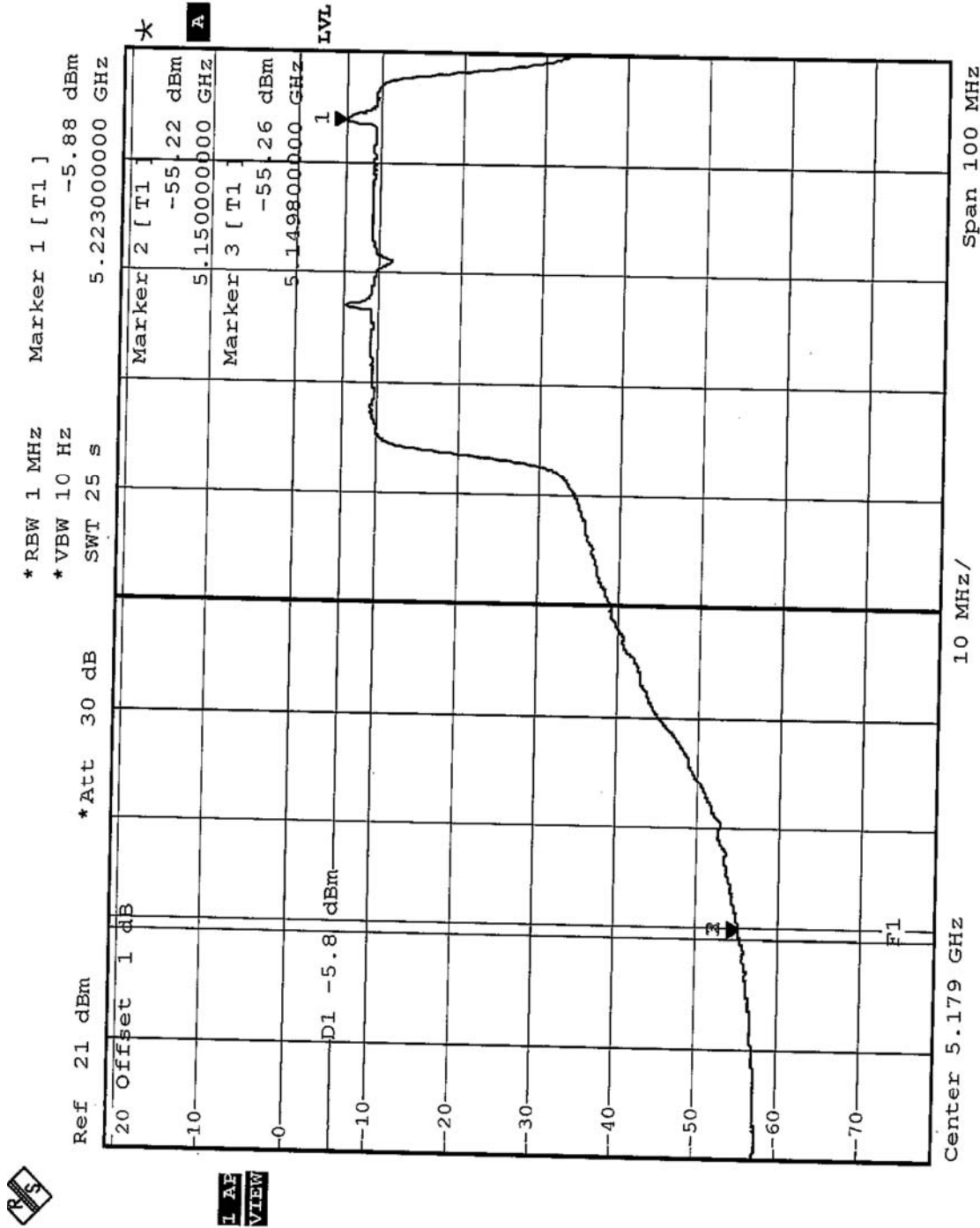


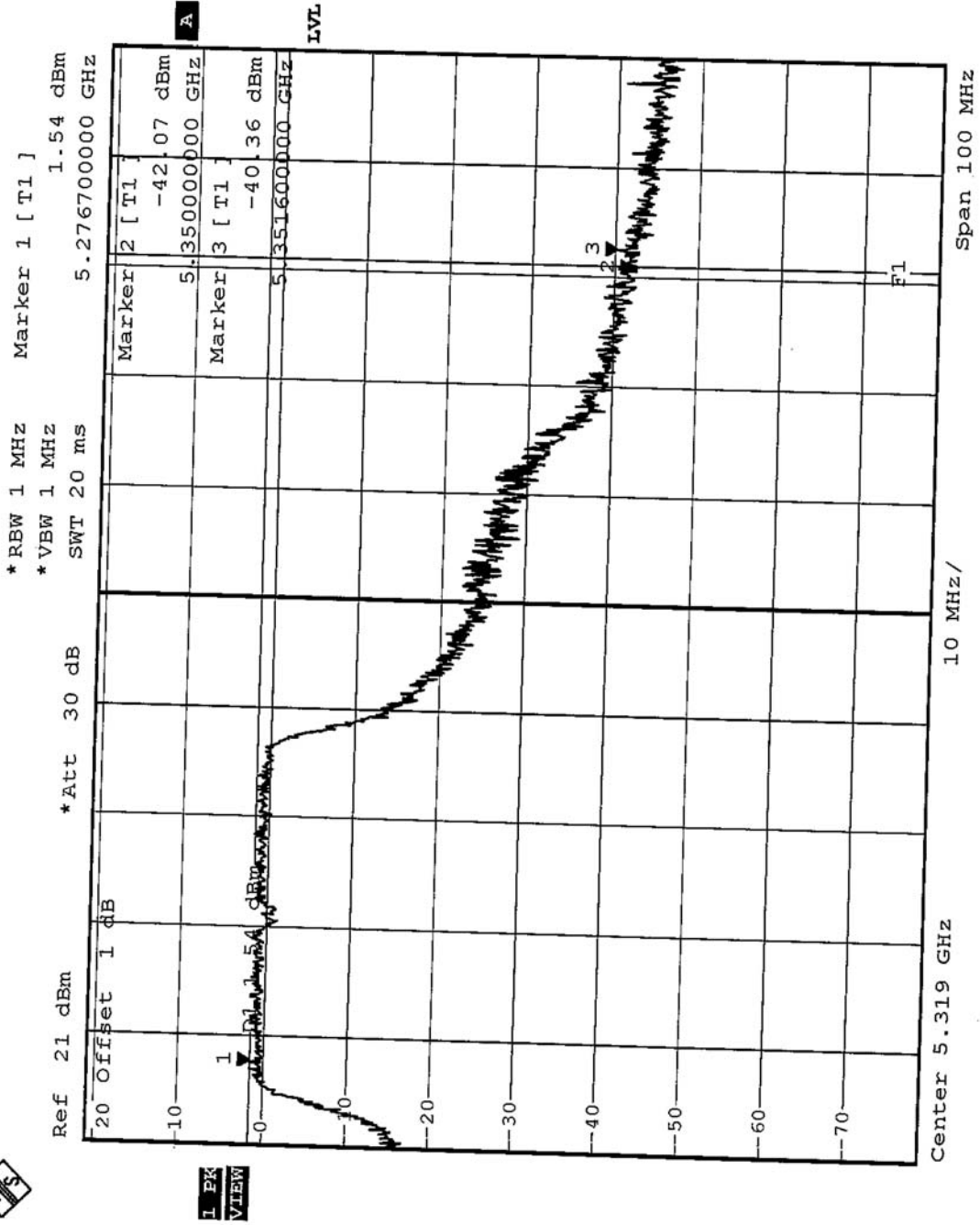
TURBO MODE



1 PK VIEW











## **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 antennas used in this product is printed antenna without connector. The maximum Gain of the antenna is 0dBi.

## 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:

<b>USA</b>	FCC, NVLAP, UL
<b>Germany</b>	TUV Rheinland
<b>Japan</b>	VCCI
<b>New Zealand</b>	MoC
<b>Norway</b>	NEMKO
<b>R.O.C.</b>	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](http://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](mailto:service@mail.adt.com.tw)

**Web Site:** [www.adt.com.tw](http://www.adt.com.tw)

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