

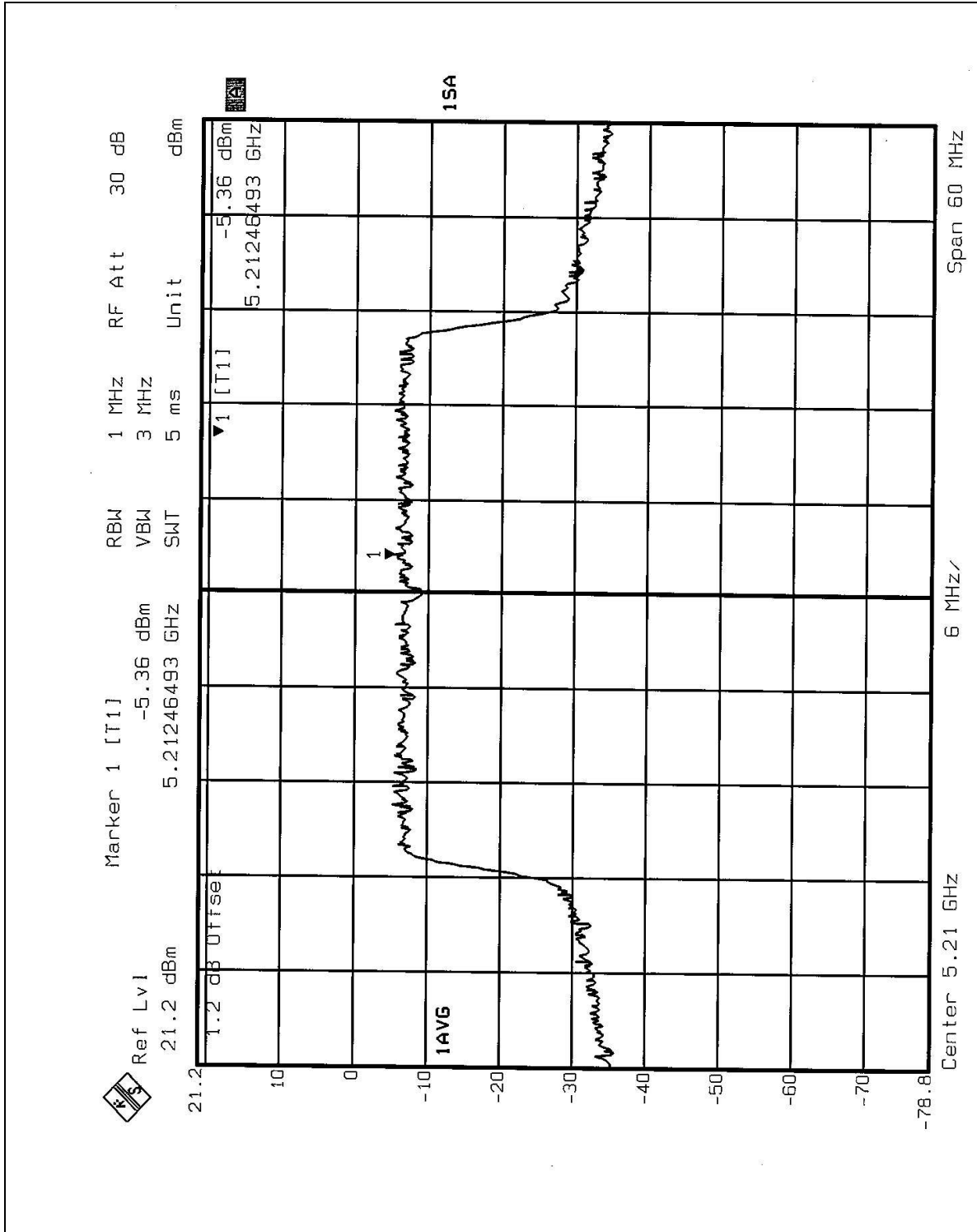


<b>EUT</b>	Wireless LAN and Mini PCI	<b>MODEL</b>	A13QBF
<b>MODE</b>	Turbo	<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz
<b>ENVIRONMENTAL CONDITIONS</b>	26deg. C, 66%RH, 1005 hPa	<b>TESTED BY</b>	Ansen Lei

<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	5210	-5.36	4	PASS
2	5250	-4.55	4	PASS
3	5290	-4.86	11	PASS

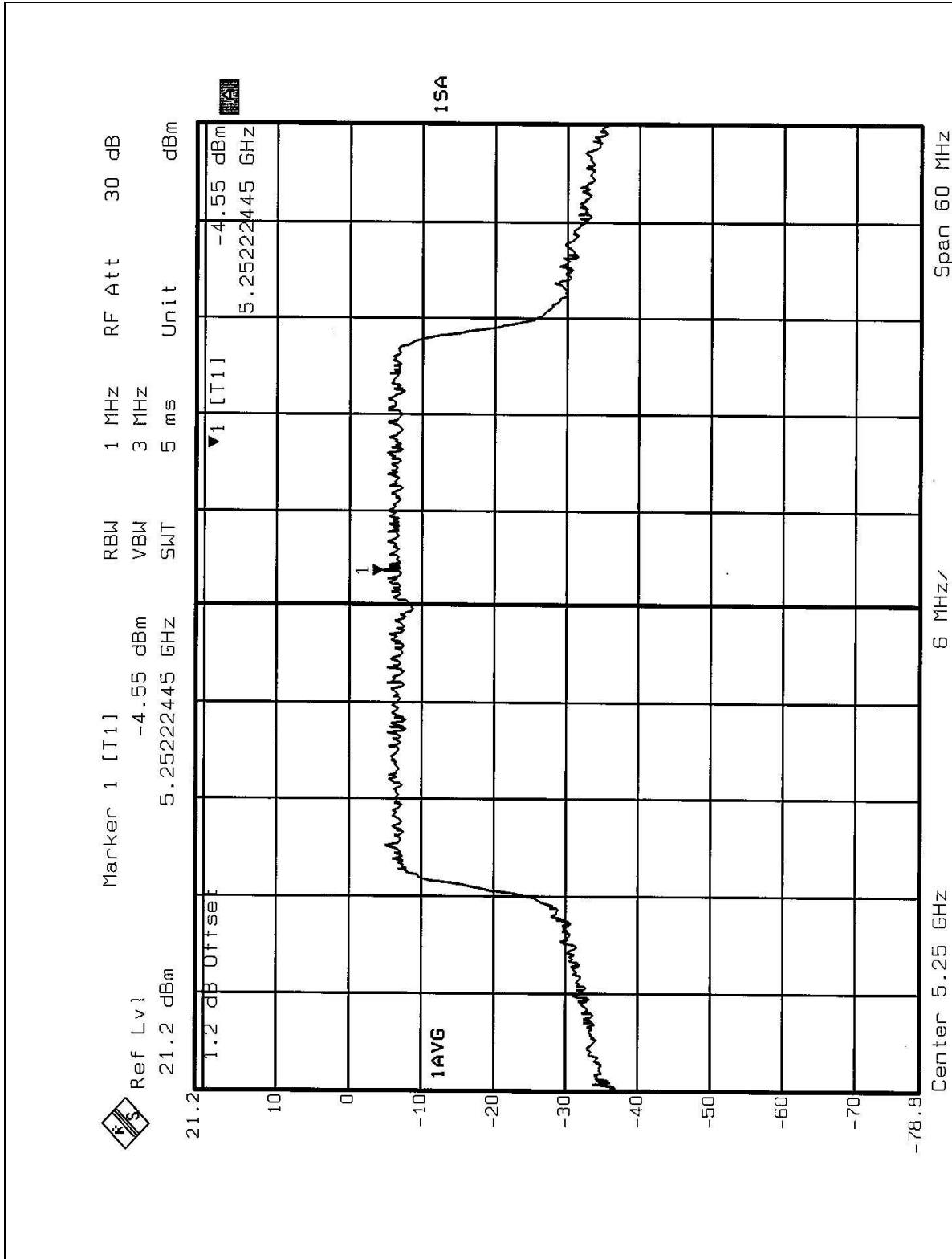


CHANNEL 1



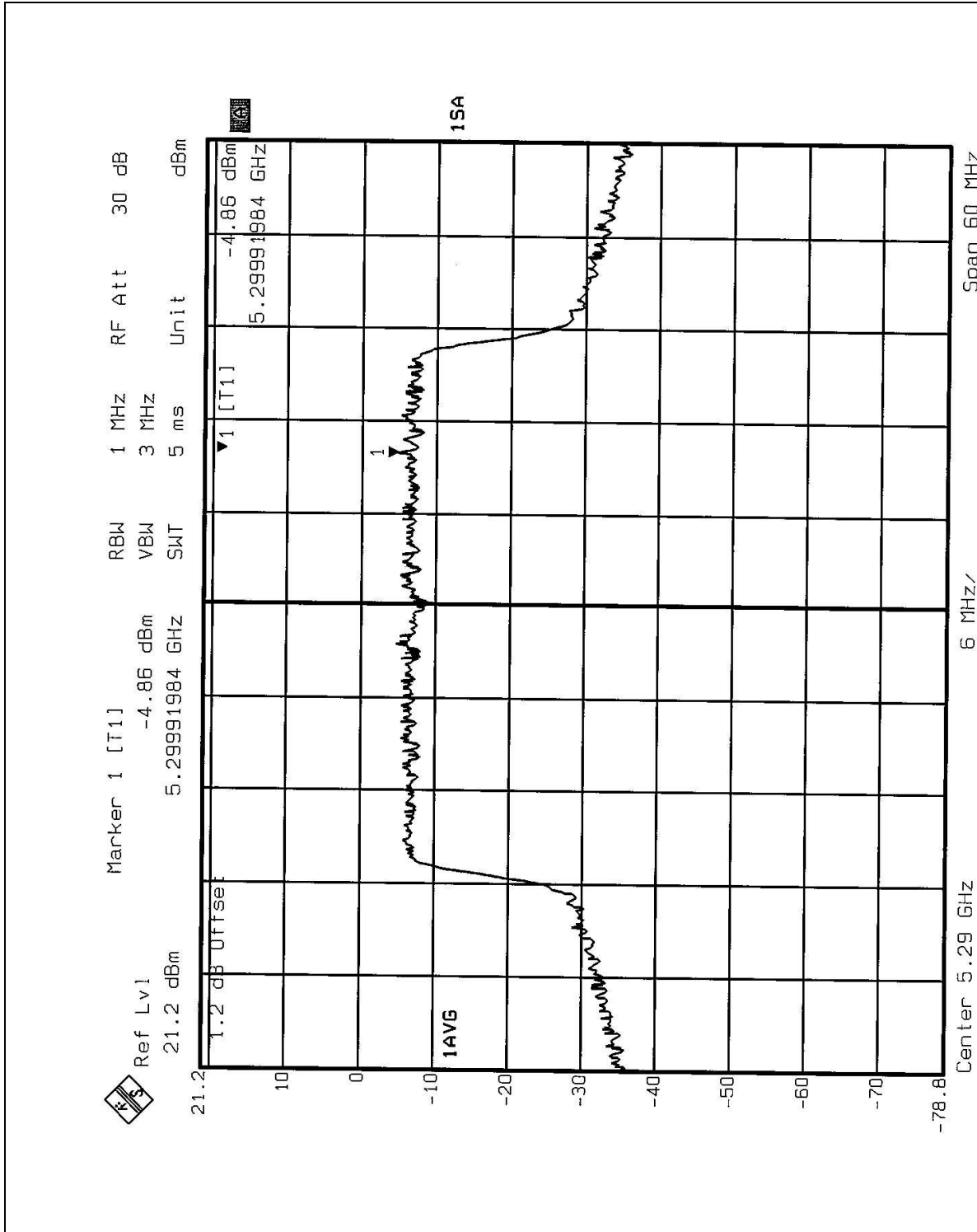


CHANNEL 2





CHANNEL 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	Mar. 15, 2003
WIT STANDARD TEMPERATURE AND HUMIDITY CHAMBER	TH-4S-C	W901030	Jun. 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.

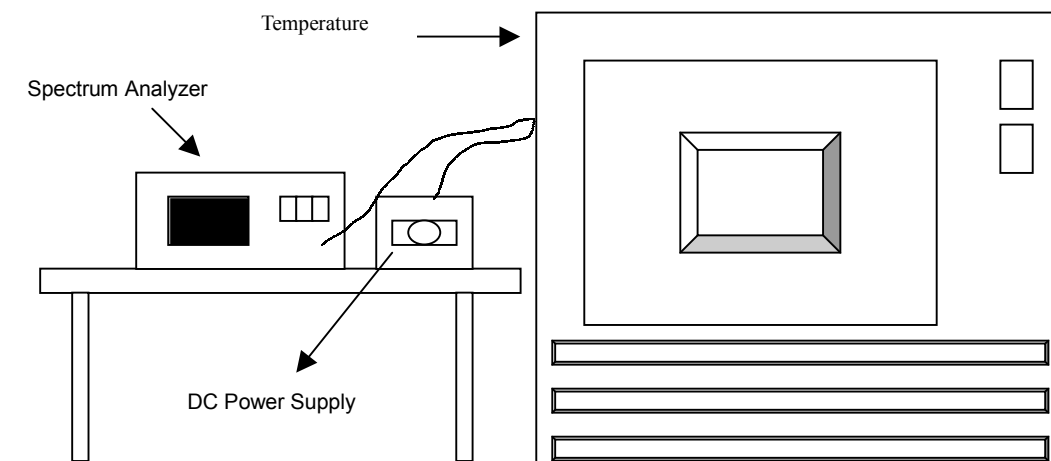
### 4.6.3 TEST PROCEDURE

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 4.1.6



4.6.7 TEST RESULTS

		Operating frequency: 5180MHz				Limit : ± 0.02%	
Temp. (°C)	Power supply (VDC)	2 minute		5 minute		10 minute	
		(MHz)	(%)	(MHz)	(%)	(MHz)	(%)
50	126.5	5180.0043	0.0000830	5180.0057	0.0001100	5180.0067	0.0001293
	110.0	5180.0043	0.0000830	5180.0057	0.0001100	5180.0067	0.0001293
	93.5	5180.0052	0.0001004	5180.0054	0.0001042	5180.0062	0.0001197
40	126.5	5179.9947	-0.0001023	5179.9943	-0.0001100	5179.9940	-0.0001158
	110.0	5179.9947	-0.0001023	5179.9973	-0.0000521	5179.9940	-0.0001158
	93.5	5179.9945	-0.0001062	5179.9946	-0.0001042	5179.9945	-0.0001062
30	126.5	5179.9877	-0.0002375	5179.9873	-0.0002452	5179.9880	-0.0002317
	110.0	5179.9877	-0.0002375	5179.9873	-0.0002452	5179.9880	-0.0002317
	93.5	5179.9873	-0.0002452	5179.9875	-0.0002413	5179.9880	-0.0002317
20	126.5	5179.9927	-0.0001409	5179.9923	-0.0001486	5179.9923	-0.0001486
	110.0	5179.9927	-0.0001409	5179.9923	-0.0001486	5179.9923	-0.0001486
	93.5	5179.9923	-0.0001486	5179.9926	-0.0001429	5179.9925	-0.0001448
10	126.5	5179.9973	-0.0000521	5179.9970	-0.0000579	5179.9980	-0.0000386
	110.0	5179.9973	-0.0000521	5179.9970	-0.0000579	5179.9980	-0.0000386
	93.5	5179.9969	-0.0000598	5179.9973	-0.0000521	5179.9984	-0.0000309
0	126.5	5180.0017	0.0000328	5180.0020	0.0000386	5180.0027	0.0000521
	110.0	5180.0017	0.0000328	5180.0020	0.0000386	5180.0027	0.0000521
	93.5	5180.0014	0.0000270	5180.0024	0.0000463	5180.0022	0.0000425
-10	126.5	5180.0123	0.0002375	5180.0127	0.0002452	5180.0137	0.0002645
	110.0	5180.0123	0.0002375	5180.0127	0.0002452	5180.0137	0.0002645
	93.5	5180.0125	0.0002413	5180.0124	0.0002394	5180.0141	0.0002722
-20	126.5	5180.0133	0.0002568	5180.0123	0.0002375	5180.0127	0.0002452
	110.0	5180.0133	0.0002568	5180.0123	0.0002375	5180.0127	0.0002452
	93.5	5180.0136	0.0002625	5180.0127	0.0002452	5180.0132	0.0002548
-30	126.5	5180.0093	0.0001795	5180.0100	0.0001931	5180.0090	0.0001737
	110.0	5180.0093	0.0001795	5180.0100	0.0001931	5180.0090	0.0001737
	93.5	5180.0096	0.0001853	5180.0107	0.0002066	5180.0092	0.0001776



## 4.7 BAND EDGES MEASUREMENT

### 4.7.1 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.

### 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 100MHz 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 5.35 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.

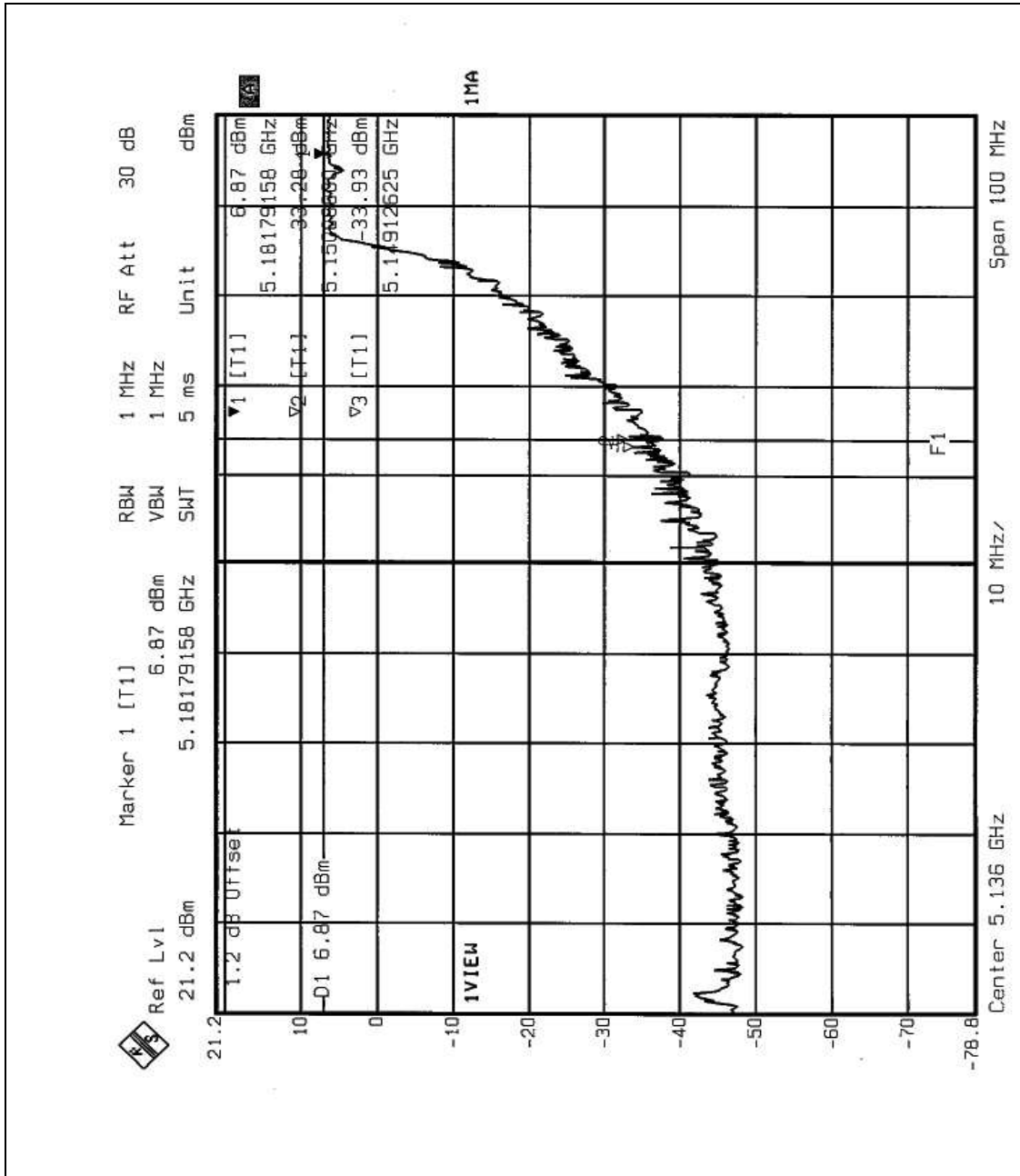
The spectrum plots (Peak RBW=VBW=1MHz; Average RBW=1MHz, VBW=300Hz) are attached on the following pages.

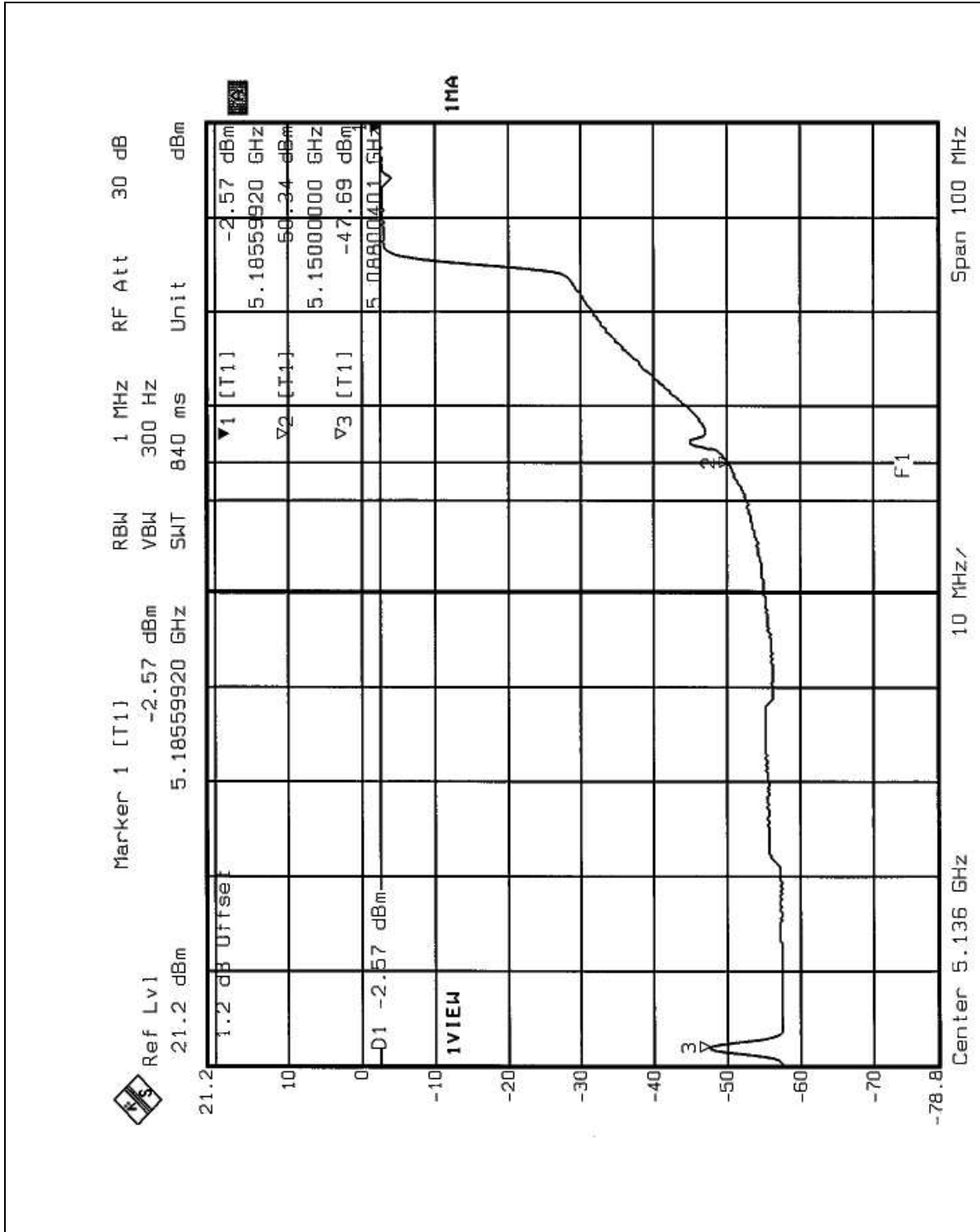




Normal Mode: Channel 1 (5180 MHz)

The band edge emission plot on the following 2 pages shows 40.15dBc (Peak) / 45.12dBc (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 96.90dBuV/m, so the maximum field strength in restrict band is  $96.90 - 45.12 = 51.78$  dBuV/m which is under 54dBuV/m limit.

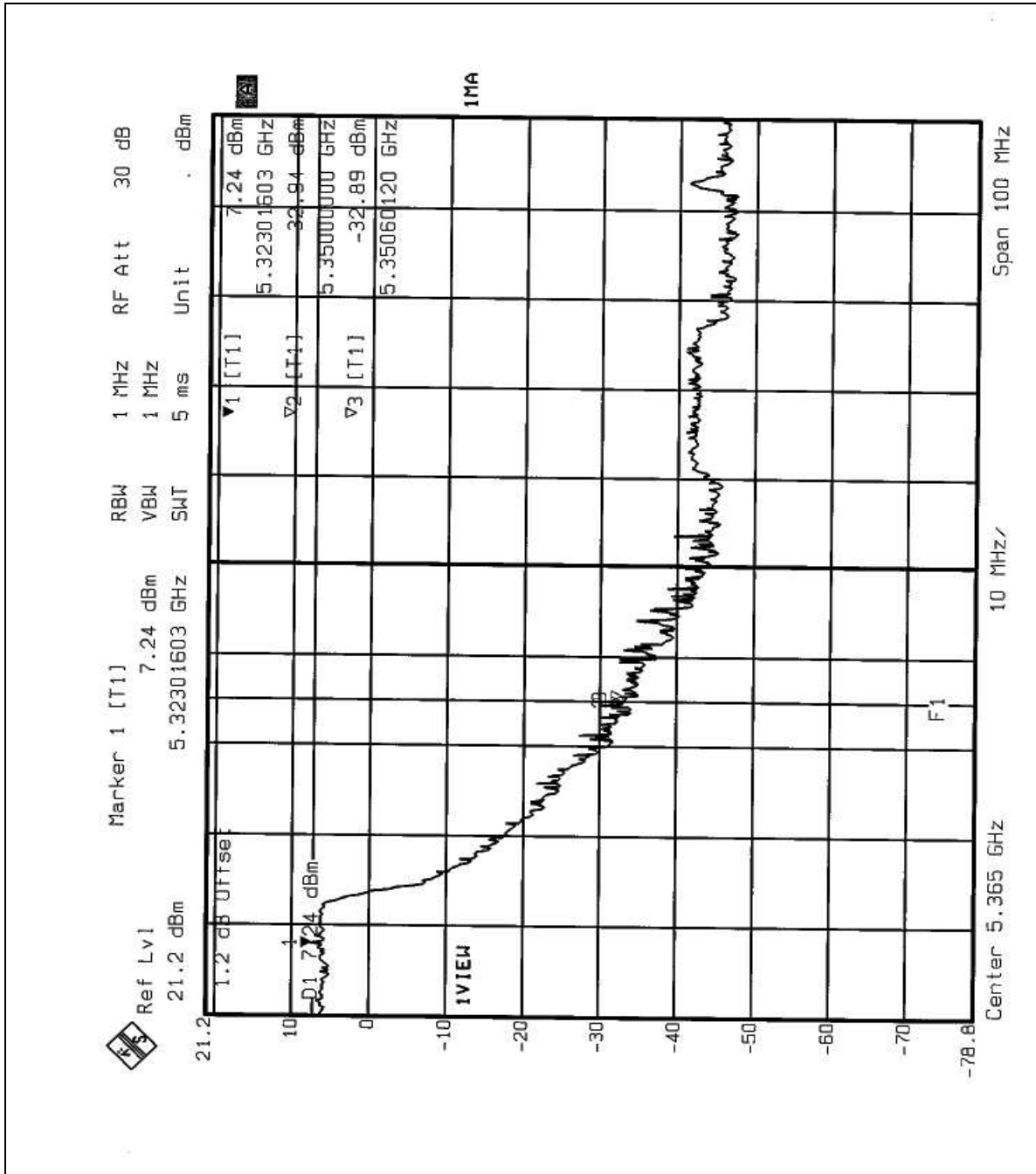


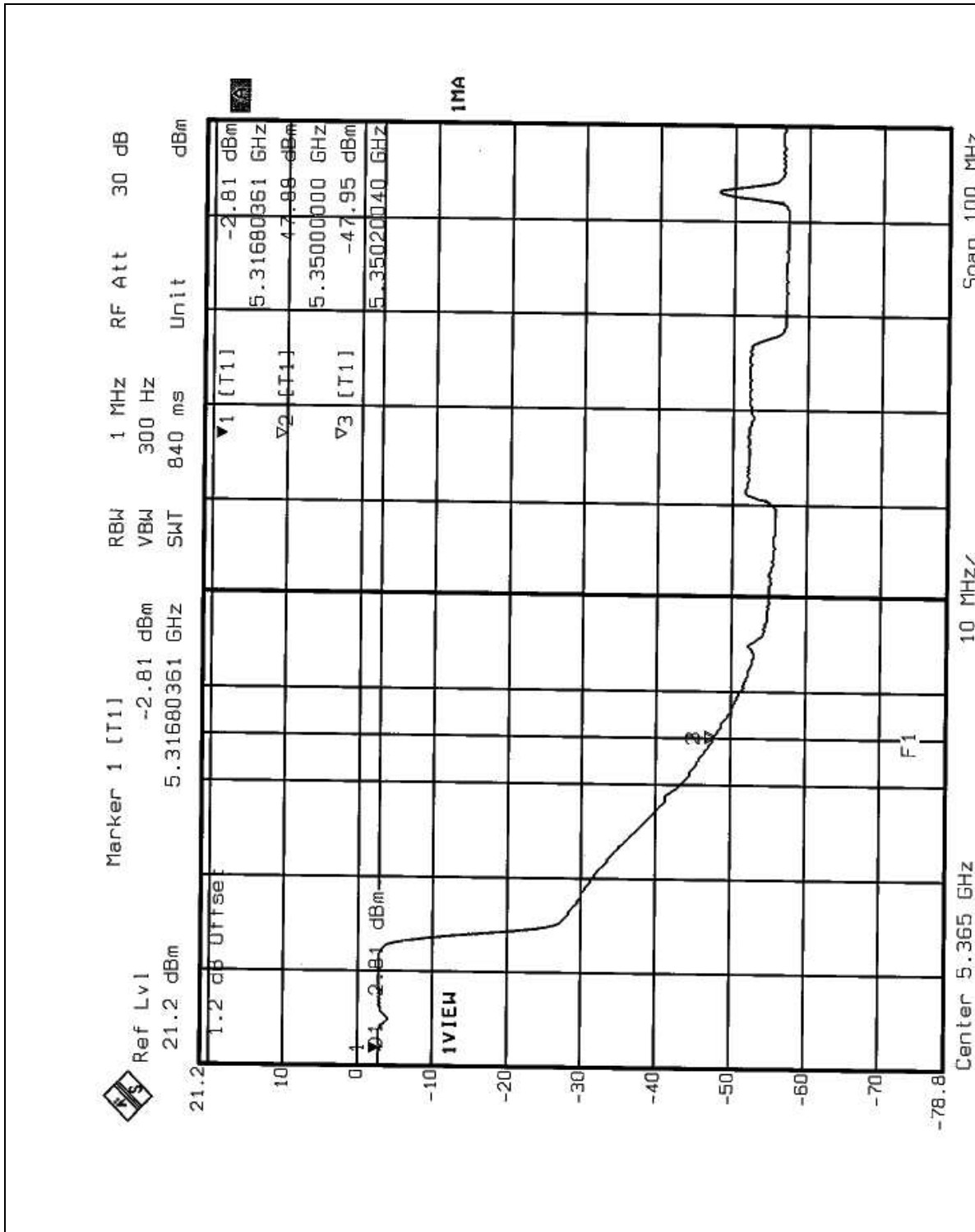




Normal Mode: Channel 8 (5320 MHz)

The band edge emission plot on the following 2 pages shows 40.13dBc (Peak) / 45.07dBc (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 96.10dBuV/m, so the maximum field strength in restrict band is  $96.10 - 45.07 = 51.03$  dBuV/m which is under 54dBuV/m limit.

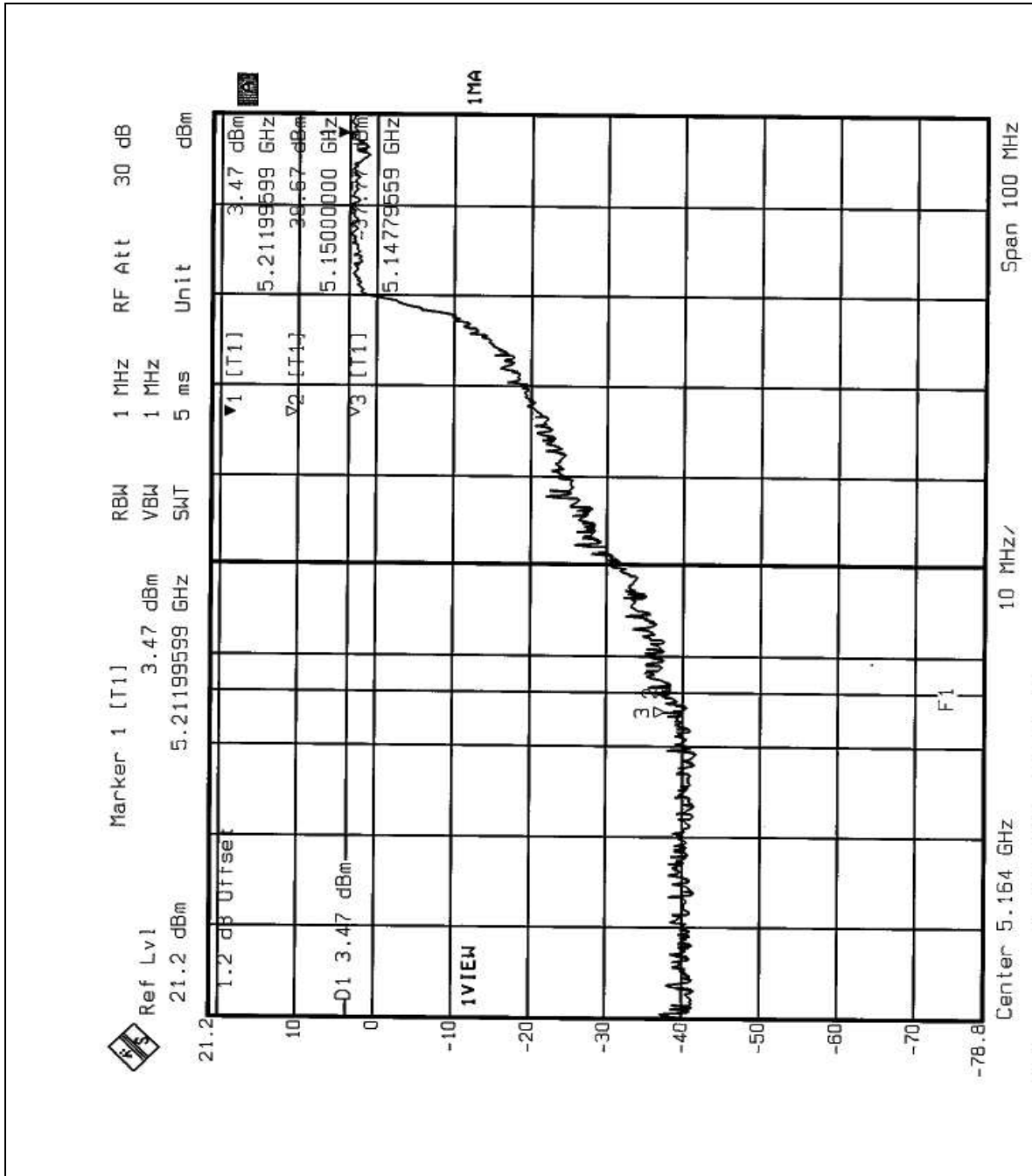


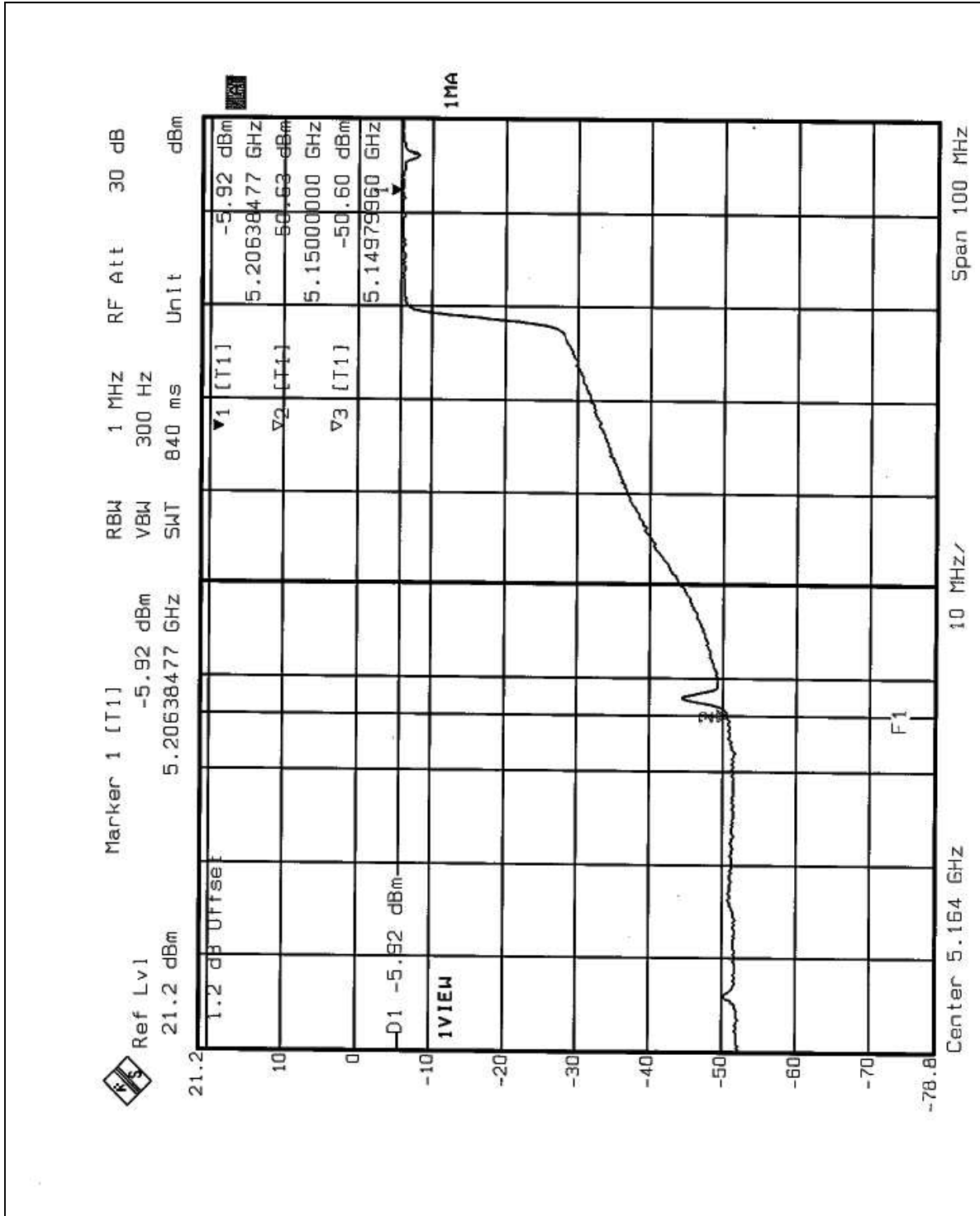




Turbo Mode: Channel 1 (5210 MHz)

The band edge emission plot on the following 2 pages shows 41.24dBc (Peak) / 44.68dBc (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 93.20dBuV/m, so the maximum field strength in restrict band is  $93.20 - 44.68 = 48.52$  dBuV/m which is under 54dBuV/m limit.

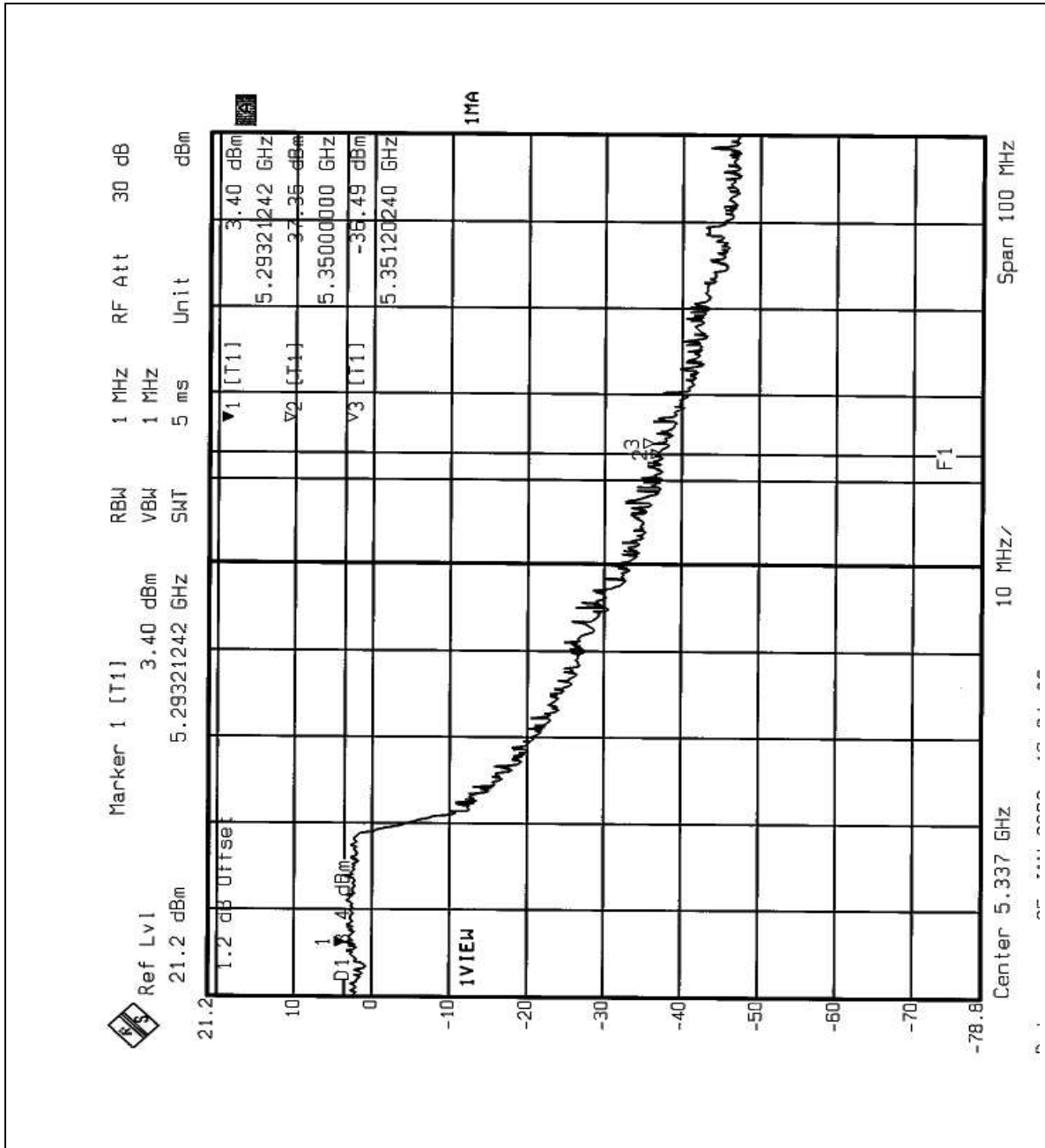


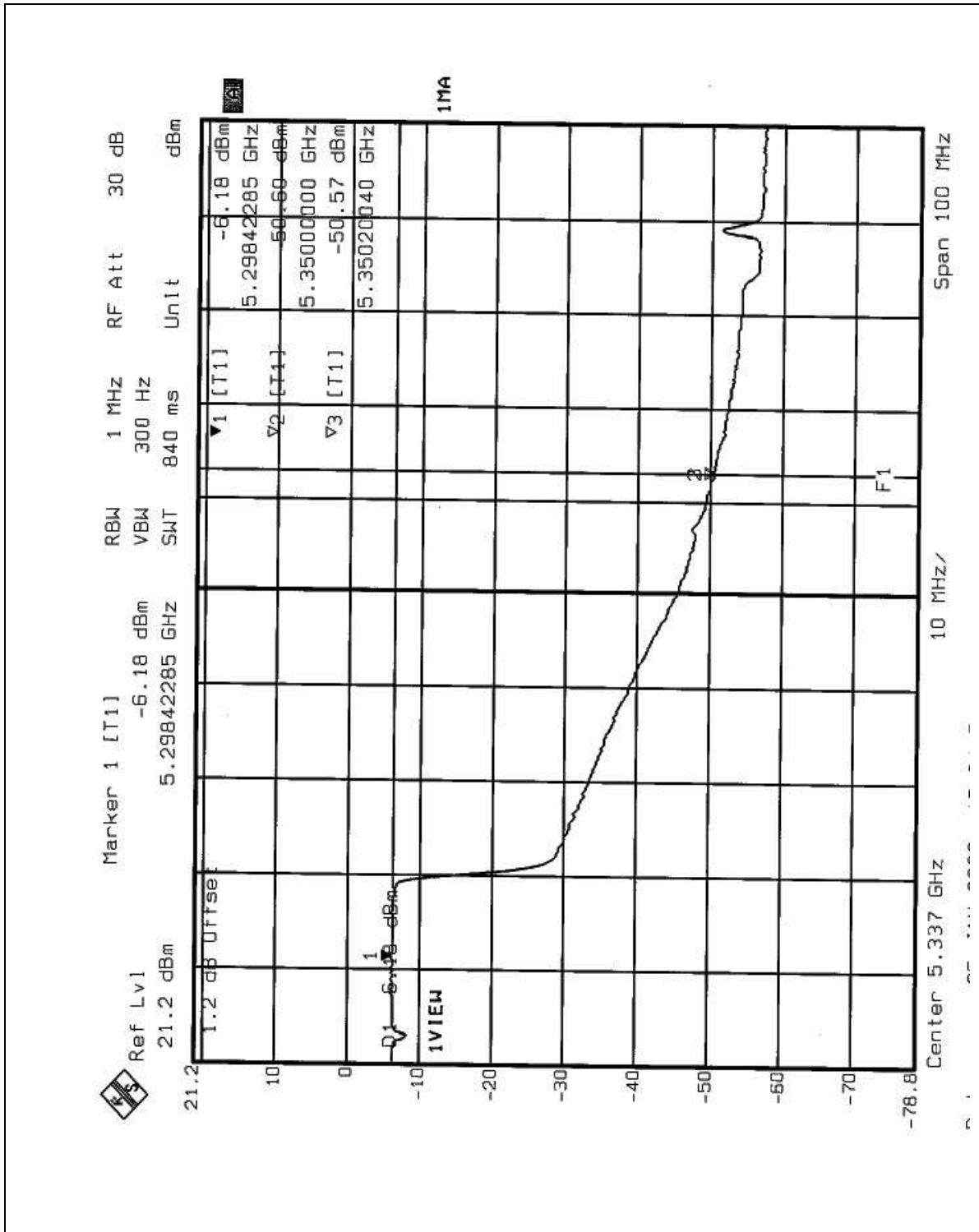




Turbo Mode: Channel 3 (5290 MHz)

The band edge emission plot on the following 2 pages shows 39.89dBc (Peak) / 44.39dBc (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 (normal mode) is 90.10dBuV/m, so the maximum field strength in restrict band is  $90.10 - 44.39 = 45.71$  dBuV/m which is under 54dBuV/m limit.







**FOR FREQUENCY 5.725~5.850GHz****4.8 6dB BANDWIDTH MEASUREMENT****4.8.1 LIMITS OF 6dB BANDWIDTH MEASUREMENT**

The minimum of 6dB Bandwidth Measurement is 0.5 MHz.

**4.8.2 TEST INSTRUMENTS**

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

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

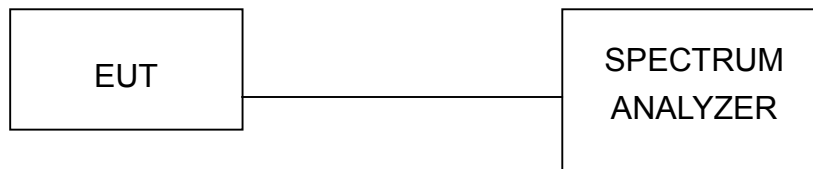
#### 4.8.3 TEST PROCEDURE

The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with 100kHz RBW and 100kHz VBW. The 6dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 6dB.

#### 4.8.4 DEVIATION FROM TEST STANDARD

No deviation

#### 4.8.5 TEST SETUP



#### 4.8.6 EUT OPERATING CONDITIONS

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.



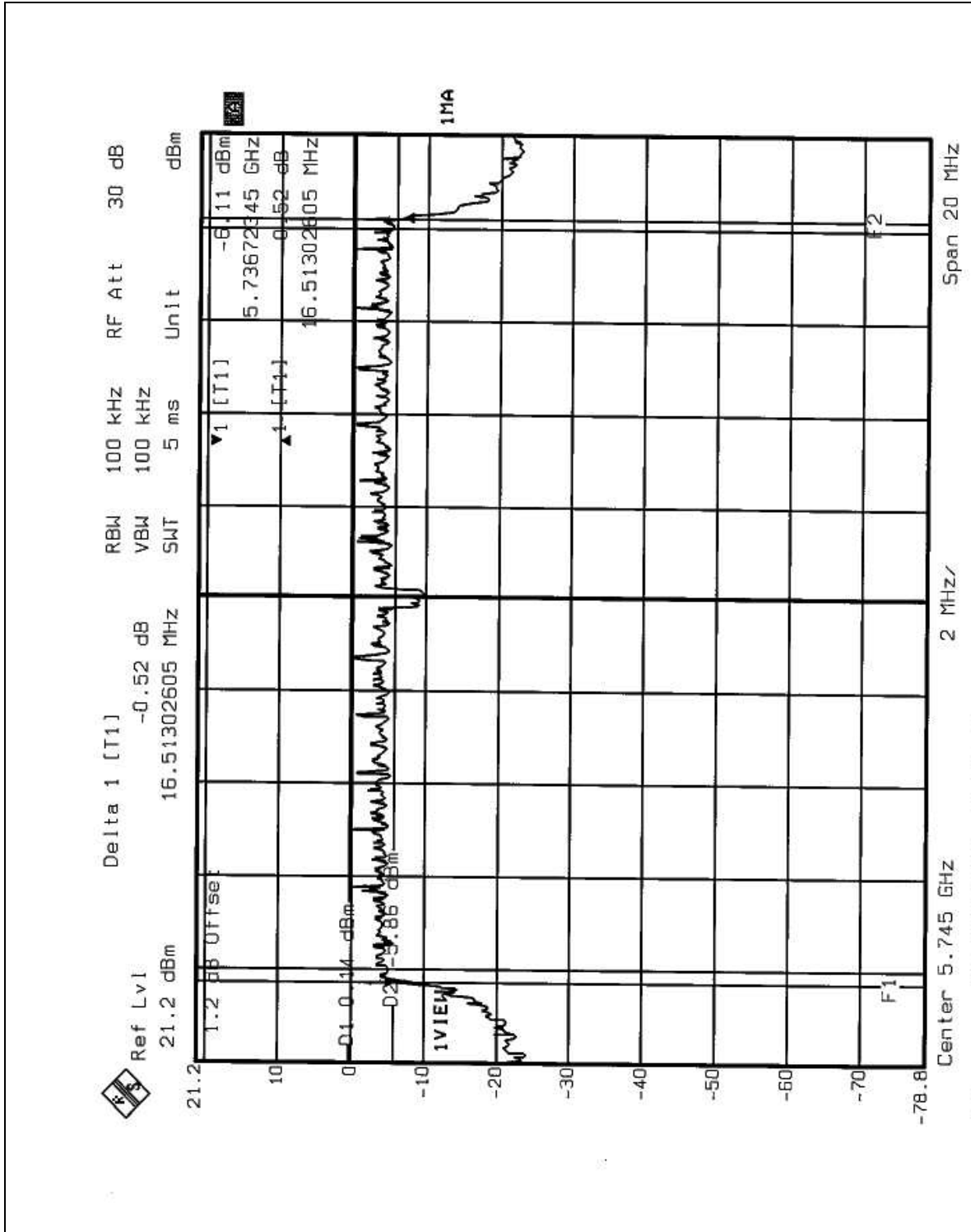
## 4.8.7 TEST RESULTS

<b>EUT</b>	Wireless LAN and Mini PCI	<b>MODEL</b>	A13QBF
<b>MODE</b>	Normal	<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz
<b>ENVIRONMENTAL CONDITIONS</b>	25deg. C, 65%RH, 1005 hPa	<b>TESTED BY</b>	Ansen Lei

<b>CHANNEL</b>	<b>CHANNEL FREQUENCY (MHz)</b>	<b>6dB BANDWIDTH (MHz)</b>	<b>MINIMUM LIMIT (MHz)</b>	<b>PASS/FAIL</b>
9	5745	16.513	0.5	PASS
11	5785	16.513	0.5	PASS
13	5825	16.472	0.5	PASS

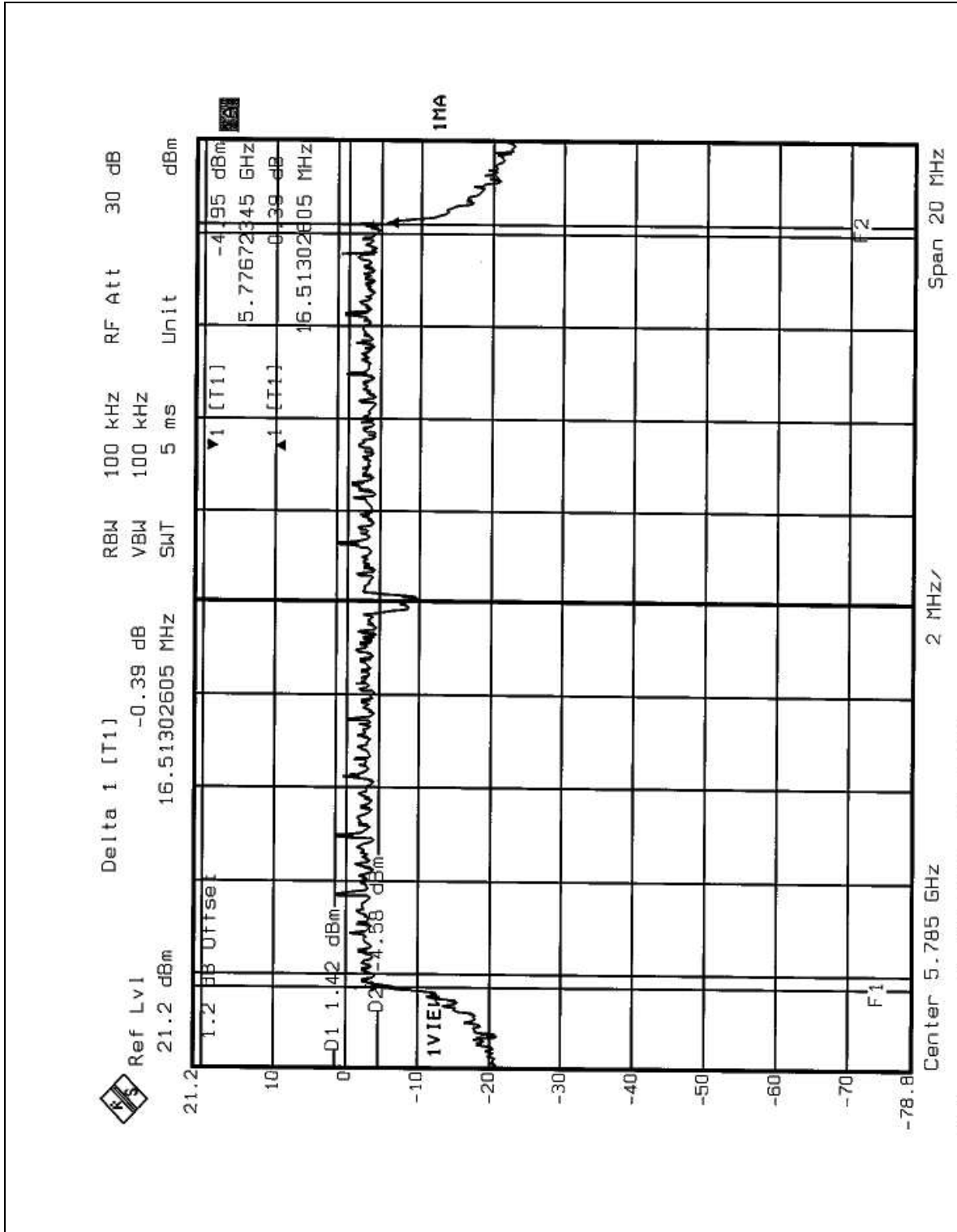


CHANNEL 9



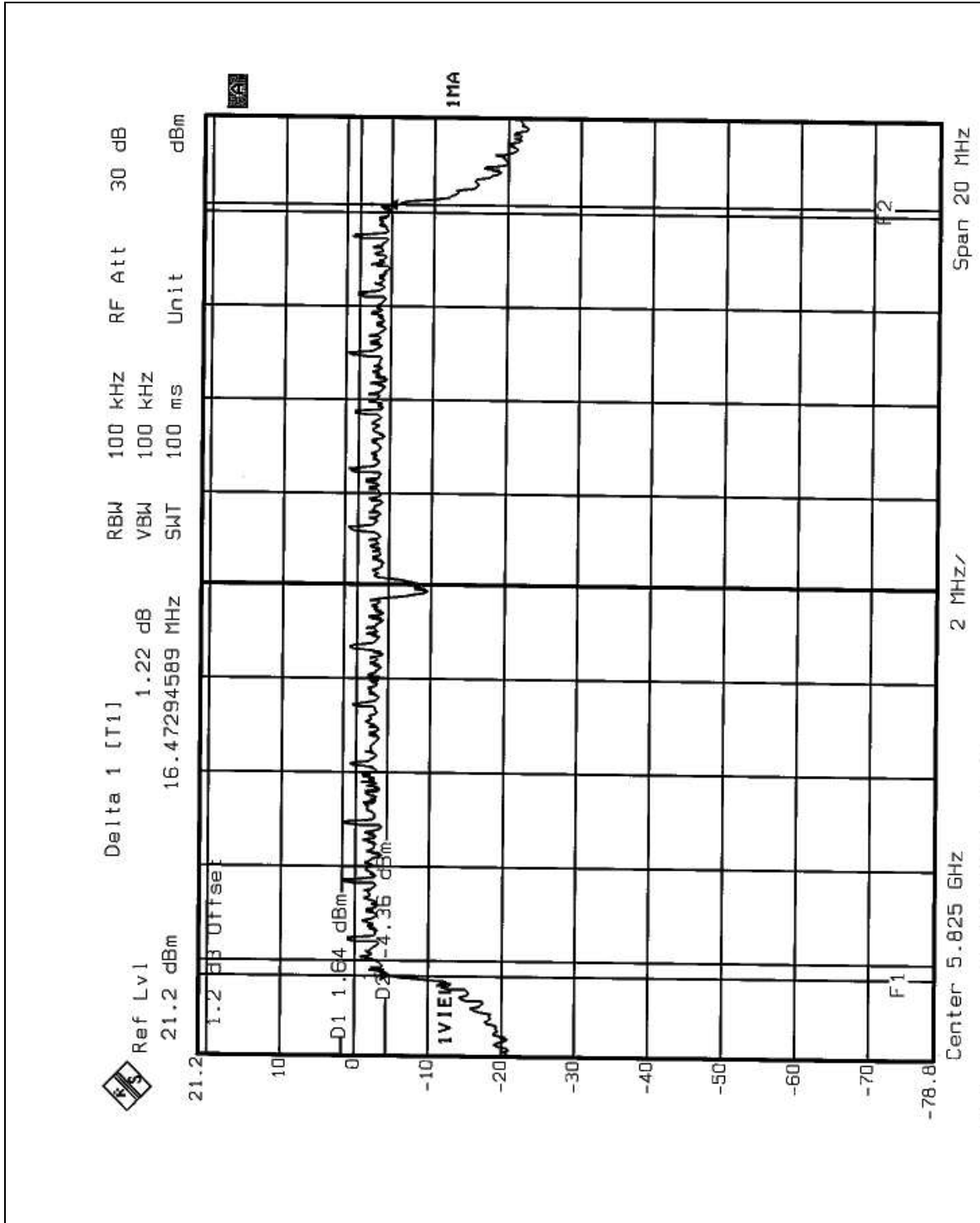


CHANNEL 11





CHANNEL 13



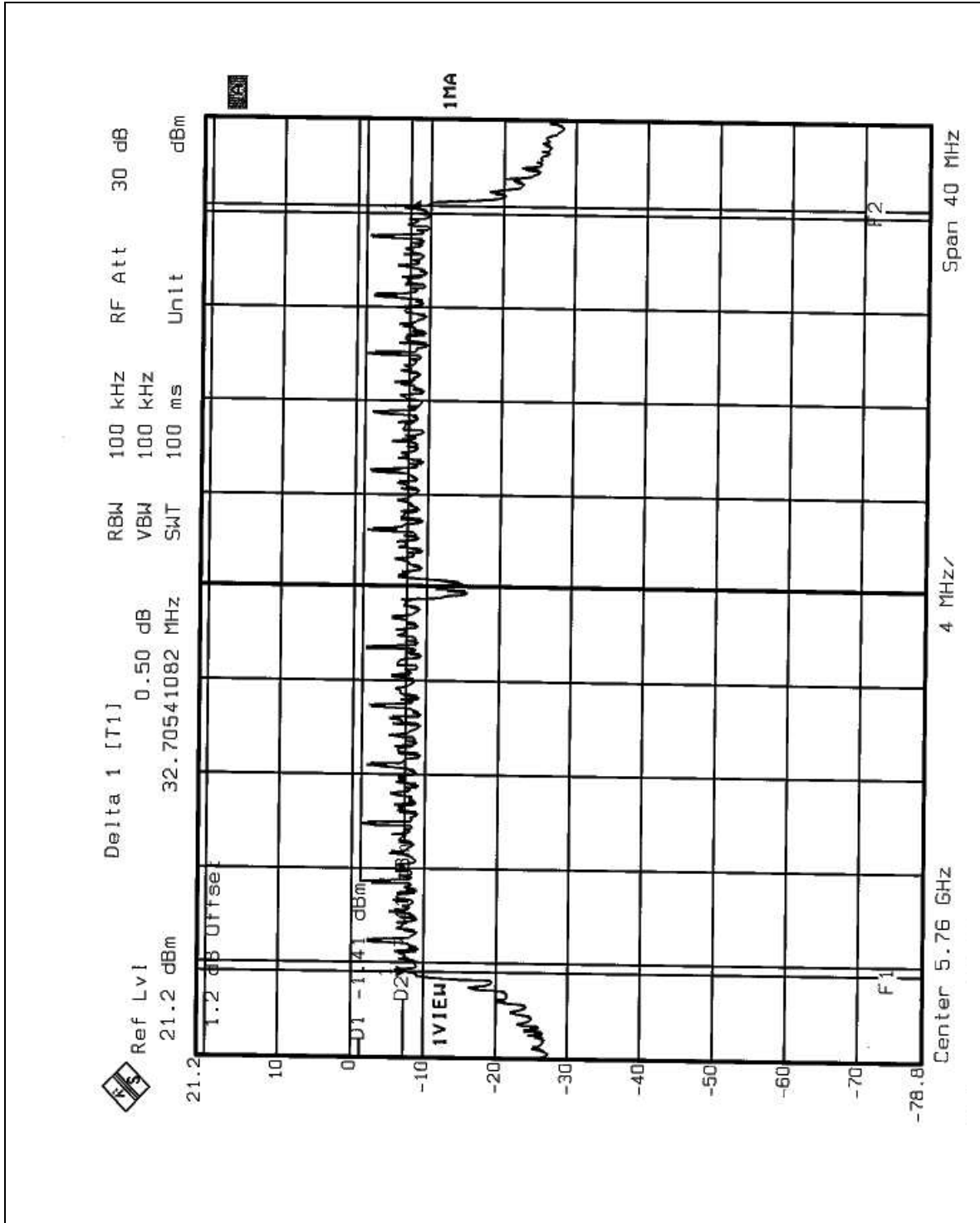


<b>EUT</b>	Wireless LAN and Mini PCI	<b>MODEL</b>	A13QBF
<b>MODE</b>	Turbo	<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz
<b>ENVIRONMENTAL CONDITIONS</b>	25deg. C, 65%RH, 1005 hPa	<b>TESTED BY</b>	Ansen Lei

<b>CHANNEL</b>	<b>CHANNEL FREQUENCY (MHz)</b>	<b>6dB BANDWIDTH (MHz)</b>	<b>MINIMUM LIMIT (MHz)</b>	<b>PASS/FAIL</b>
4	5760	32.705	0.5	PASS
5	5800	32.705	0.5	PASS

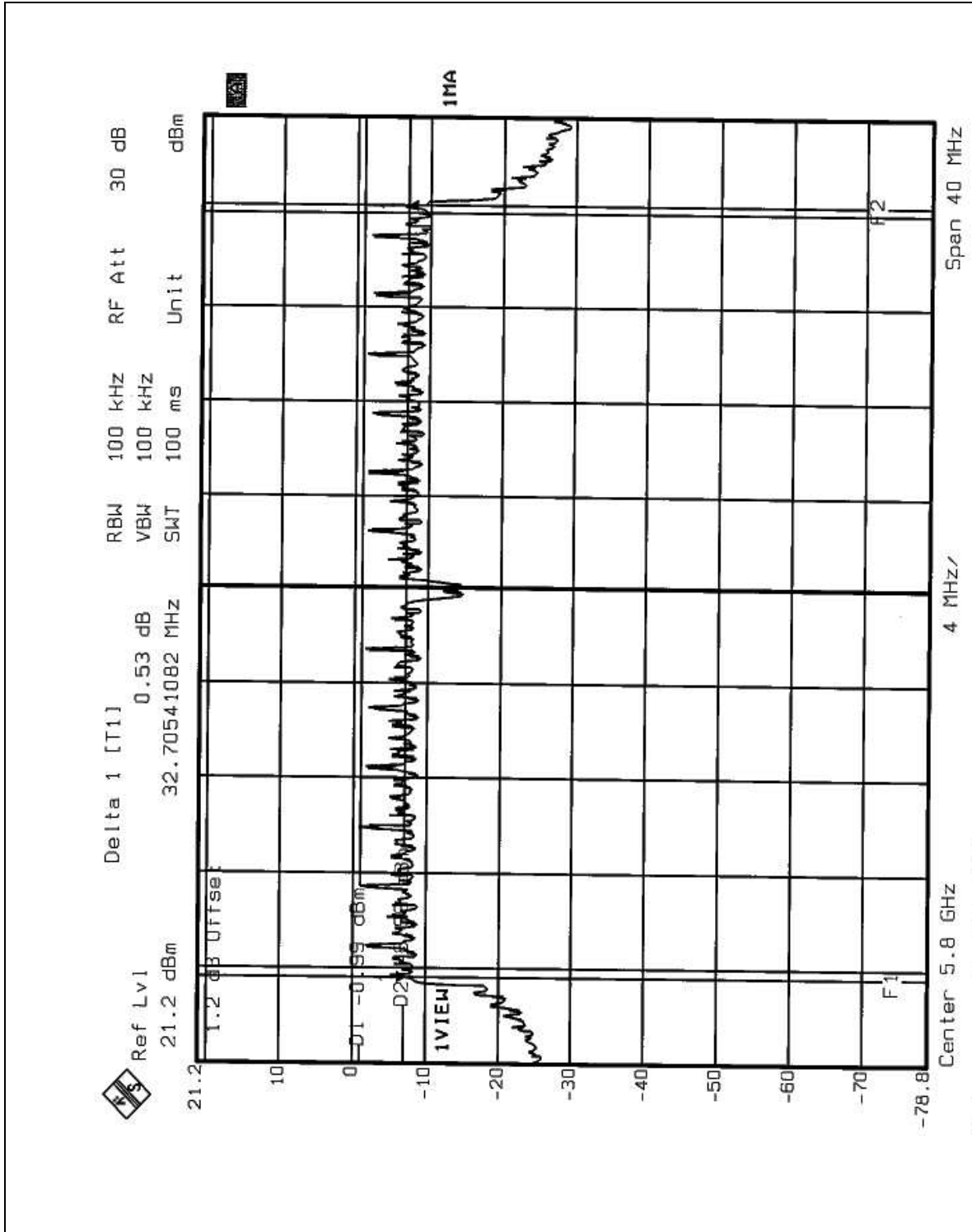


CHANNEL 4





CHANNEL 5





## 4.9 MAXIMUM PEAK OUTPUT POWER

### 4.9.1 LIMITS OF MAXIMUM PEAK OUTPUT POWER MEASUREMENT

The Maximum Peak Output Power Measurement is 30dBm.

### 4.9.2 INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
PEAK POWER SENSOR	E9327A	US40440722	Jul. 30, 2003
POWER METER	E4416A	GB41291118	Jul. 30, 2003

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

#### 4.9.3 TEST PROCEDURES

The transmitter output was connected to the peak power meter.

#### 4.9.4 DEVIATION FROM TEST STANDARD

No deviation

#### 4.9.5 TEST SETUP



#### 4.9.6 EUT OPERATING CONDITIONS

Same as Item 4.8.6.



## 4.9.7 TEST RESULTS

<b>EUT</b>	Wireless LAN and Mini PCI	<b>MODEL</b>	A13QBF
<b>MODE</b>	Normal	<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz
<b>ENVIRONMENTAL CONDITIONS</b>	25deg. C, 65%RH, 1005 hPa	<b>TESTED BY</b>	Ansen Lei

<b>CHANNEL</b>	<b>CHANNEL FREQUENCY (MHz)</b>	<b>PEAK POWER OUTPUT (dBm)</b>	<b>PEAK POWER LIMIT (dBm)</b>	<b>PASS/FAIL</b>
9	5745	18.96	30	PASS
11	5785	20.87	30	PASS
13	5825	20.42	30	PASS

<b>EUT</b>	Wireless LAN and Mini PCI	<b>MODEL</b>	A13QBF
<b>MODE</b>	Turbo	<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz
<b>ENVIRONMENTAL CONDITIONS</b>	25deg. C, 65%RH, 1005 hPa	<b>TESTED BY</b>	Ansen Lei

<b>CHANNEL</b>	<b>CHANNEL FREQUENCY (MHz)</b>	<b>PEAK POWER OUTPUT (dBm)</b>	<b>PEAK POWER LIMIT (dBm)</b>	<b>PASS/FAIL</b>
4	5760	16.32	30	PASS
5	5800	16.78	30	PASS



## 4.10 POWER SPECTRAL DENSITY MEASUREMENT

### 4.10.1 LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT

The Maximum of Power Spectral Density Measurement is 8dBm.

### 4.10.2 TEST INSTRUMENTS

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

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

#### 4.10.3 TEST PROCEDURE

The transmitter output was connected to the spectrum analyzer through an attenuator, the bandwidth of the fundamental frequency was measured with the spectrum analyzer using 3 kHz RBW and 30 kHz VBW, set sweep time = span/3 kHz. The power spectral density was measured and recorded.

The sweep time is allowed to be longer than span/3 kHz for a full response of the mixer in the spectrum analyzer.

#### 4.10.4 DEVIATION FROM TEST STANDARD

No deviation

#### 4.10.5 TEST SETUP



#### 4.10.6 EUT OPERATING CONDITION

Same as Item 4.8.6



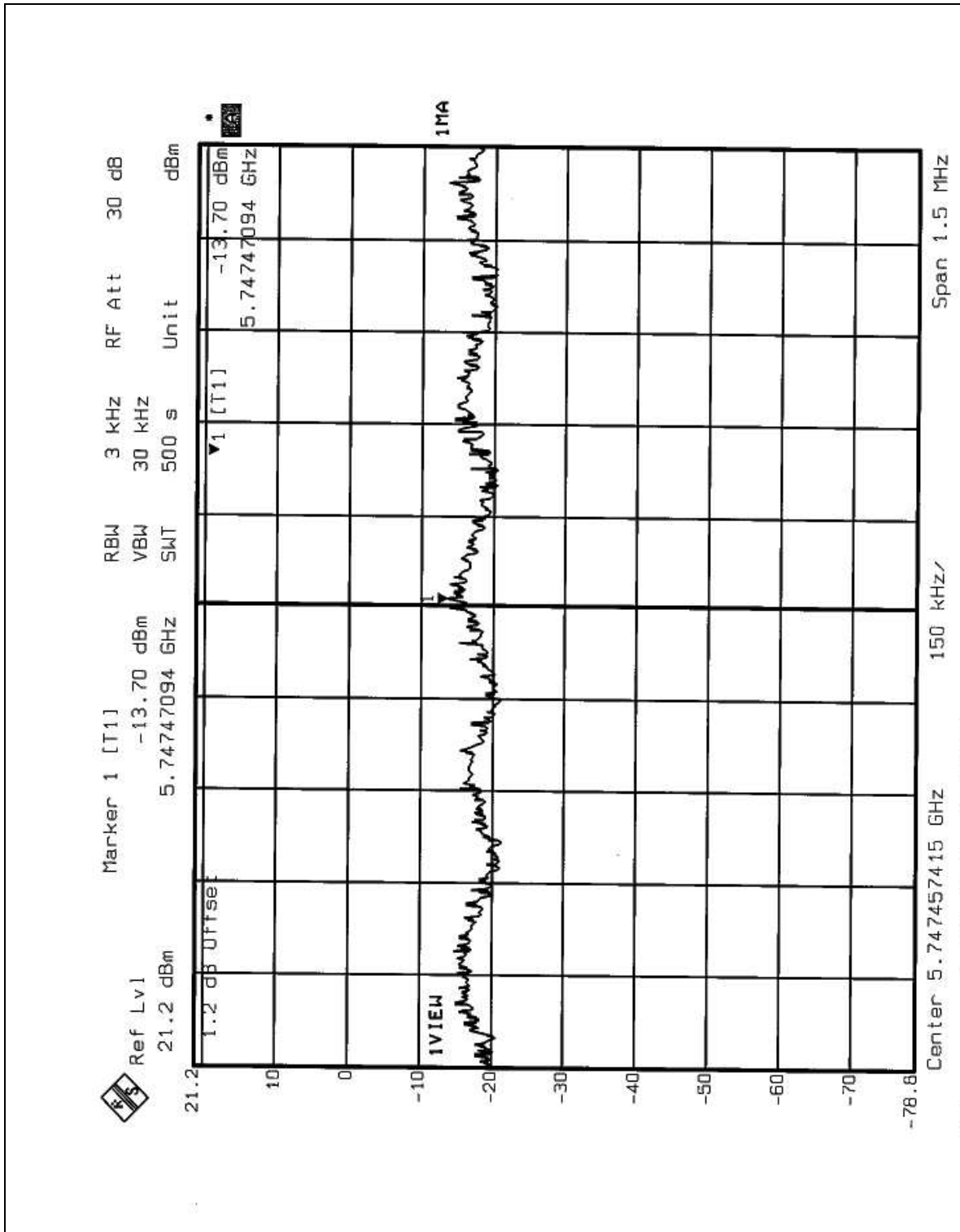
## 4.10.7 TEST RESULTS

<b>EUT</b>	Wireless LAN and Mini PCI	<b>MODEL</b>	A13QBF
<b>MODE</b>	Normal	<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz
<b>ENVIRONMENTAL CONDITIONS</b>	25deg. C, 65%RH, 1005 hPa	<b>TESTED BY</b>	Ansen Lei

<b>CHANNEL</b>	<b>CHANNEL FREQUENCY (MHz )</b>	<b>RF POWER LEVEL IN 3 kHz BW (dBm)</b>	<b>MAXIMUM LIMIT (dBm)</b>	<b>PASS/FAIL</b>
9	5745	-13.70	8	PASS
11	5785	-12.34	8	PASS
13	5825	-13.30	8	PASS



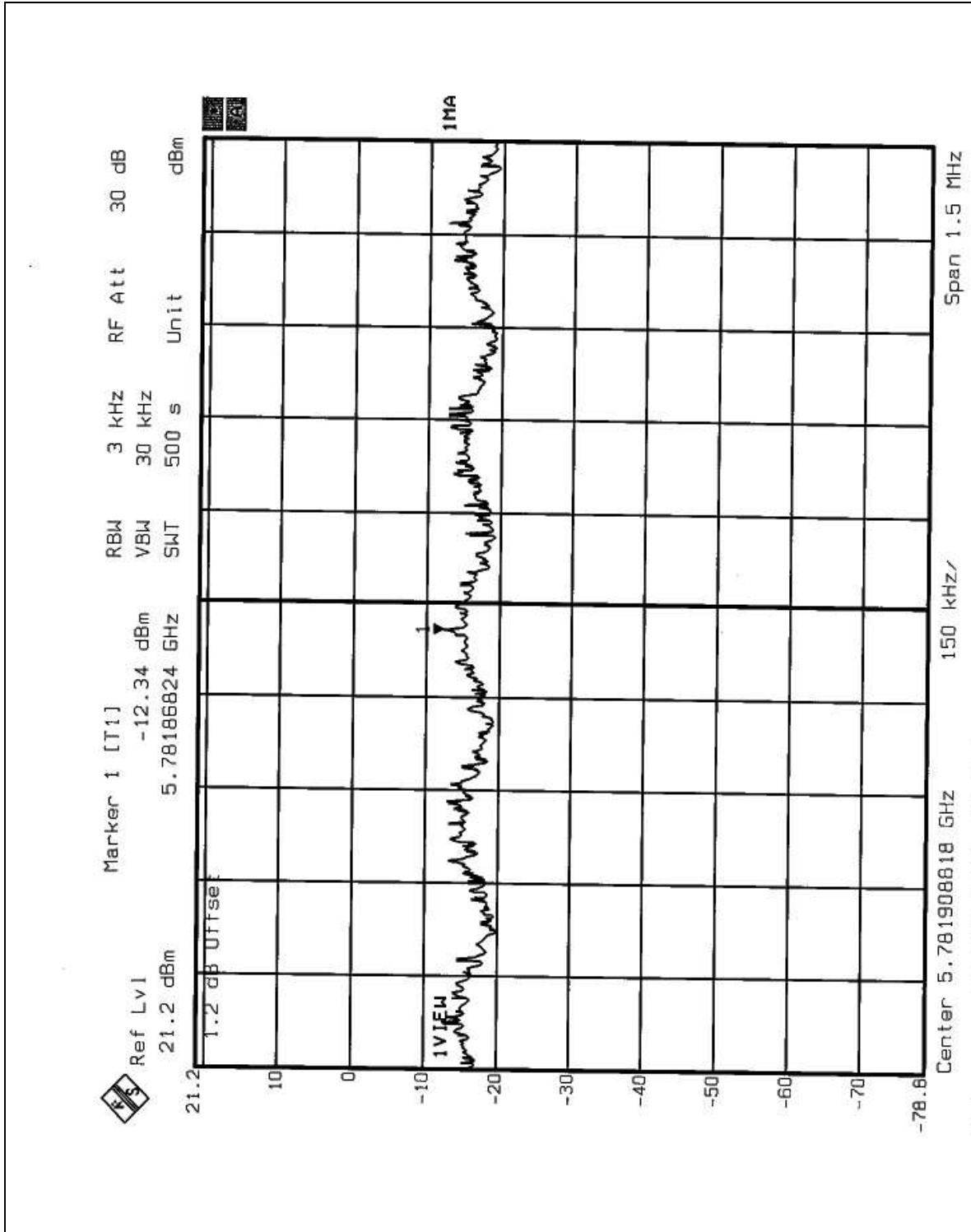
CHANNEL 9





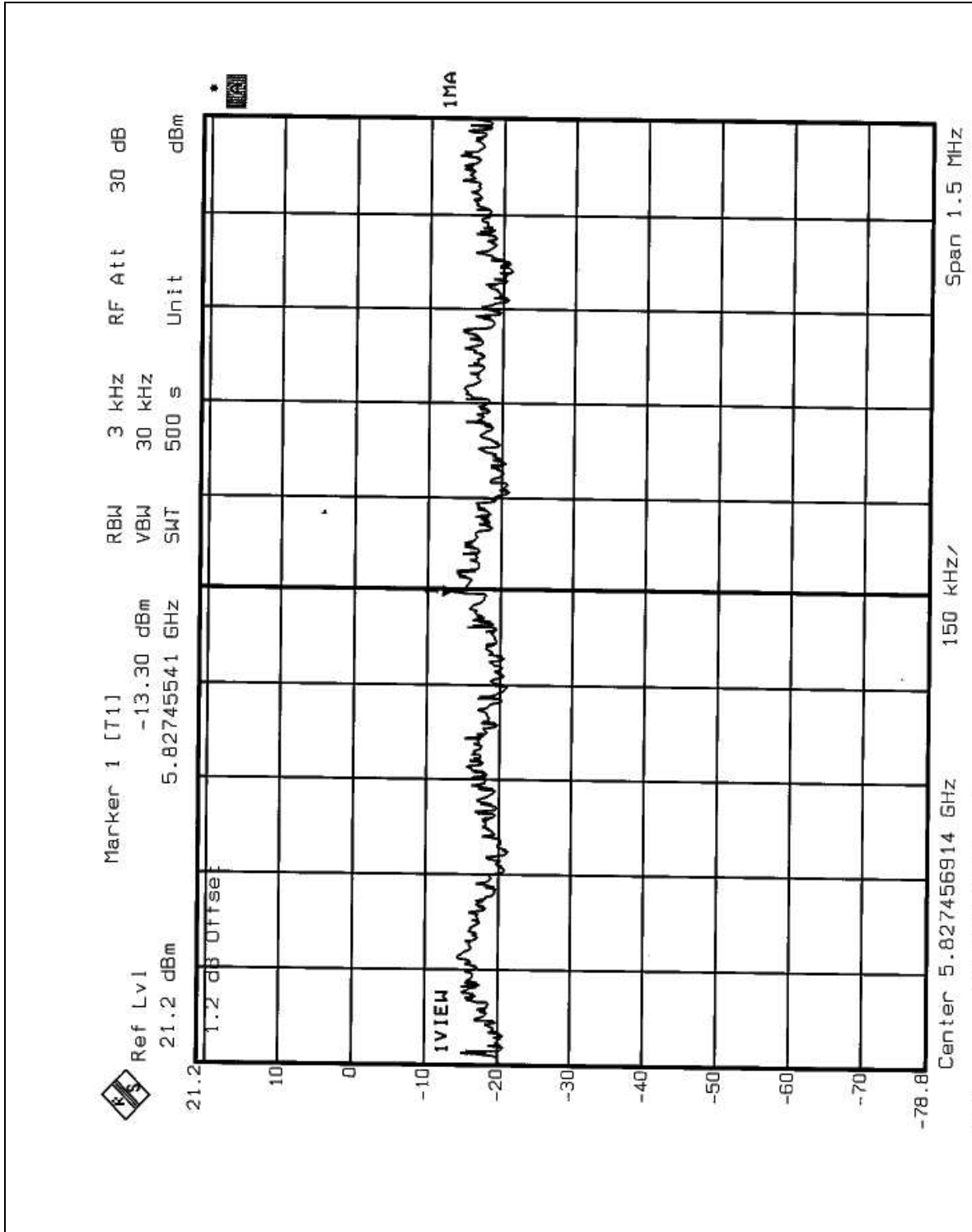


CHANNEL 11





CHANNEL 13



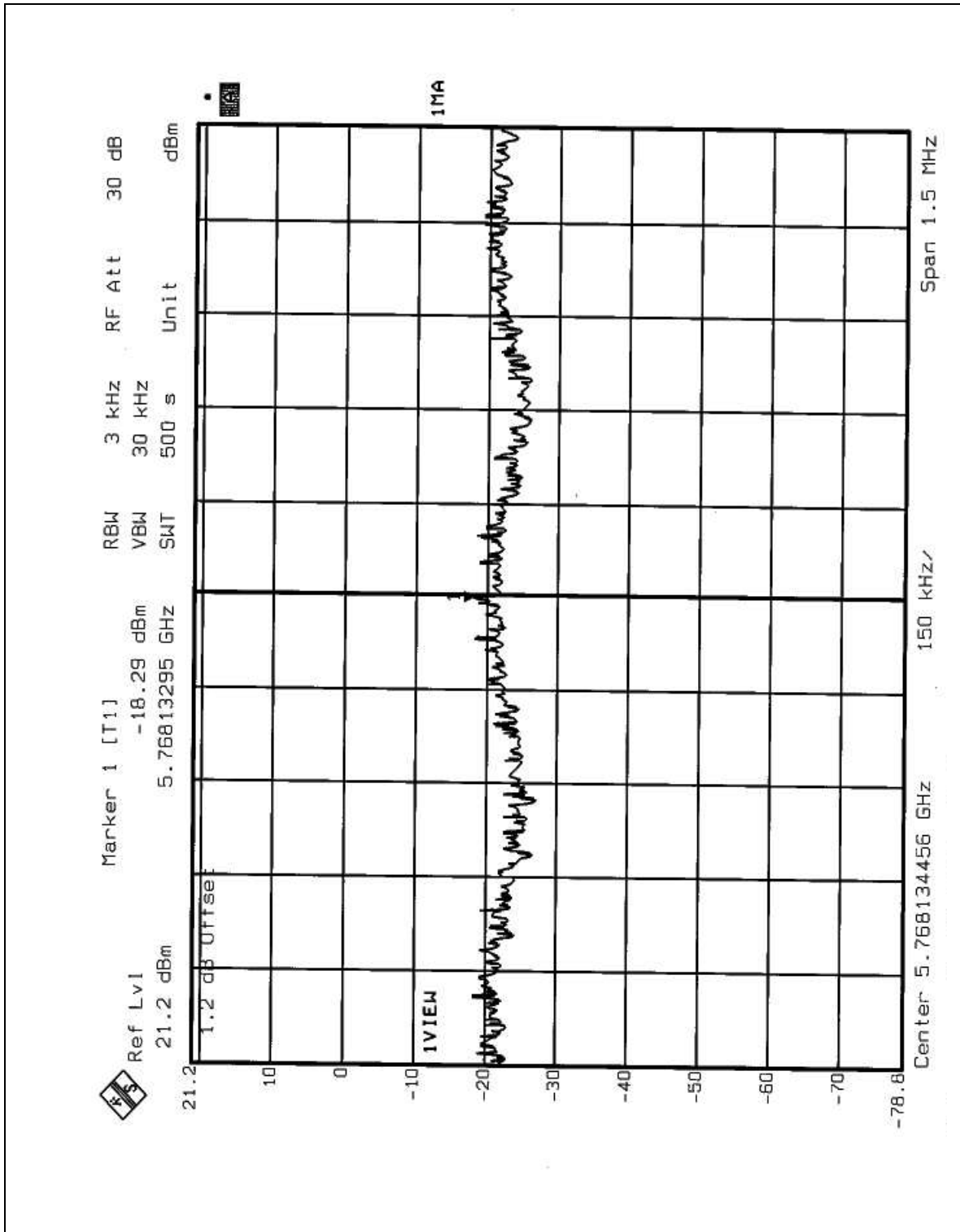


<b>EUT</b>	Wireless LAN and Mini PCI	<b>MODEL</b>	A13QBF
<b>MODE</b>	Turbo	<b>INPUT POWER (SYSTEM)</b>	120Vac, 60 Hz
<b>ENVIRONMENTAL CONDITIONS</b>	25deg. C, 65%RH, 1005 hPa	<b>TESTED BY</b>	Ansen Lei

<b>CHANNEL</b>	<b>CHANNEL FREQUENCY (MHz )</b>	<b>RF POWER LEVEL IN 3 kHz BW (dBm)</b>	<b>MAXIMUM LIMIT (dBm)</b>	<b>PASS/FAIL</b>
4	5760	-18.29	8	PASS
5	5800	-16.91	8	PASS

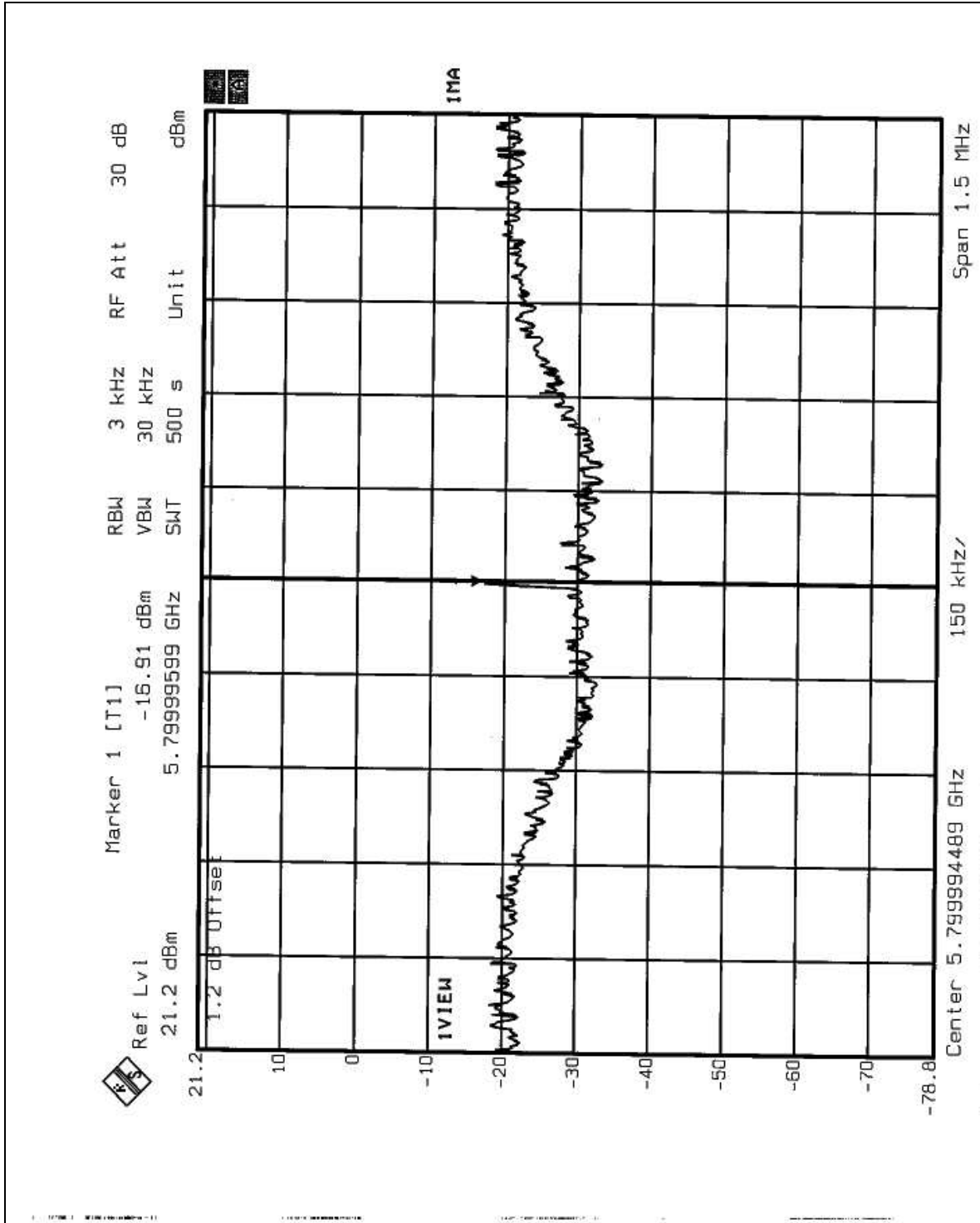


CHANNEL 4





CHANNEL 5





## 4.11 BAND EDGES MEASUREMENT

### 4.11.1 LIMITS OF BAND EDGES MEASUREMENT

Below -20dB of the highest emission level of operating band (in 100KHz Resolution Bandwidth).

### 4.11.2 TEST INSTRUMENTS

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

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

### 4.11.3 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 100 kHz with suitable frequency span including 100 kHz bandwidth from band edge. The band edges was measured and recorded.

### 4.11.4 DEVIATION FROM TEST STANDARD

No deviation



#### 4.11.5 EUT OPERATING CONDITION

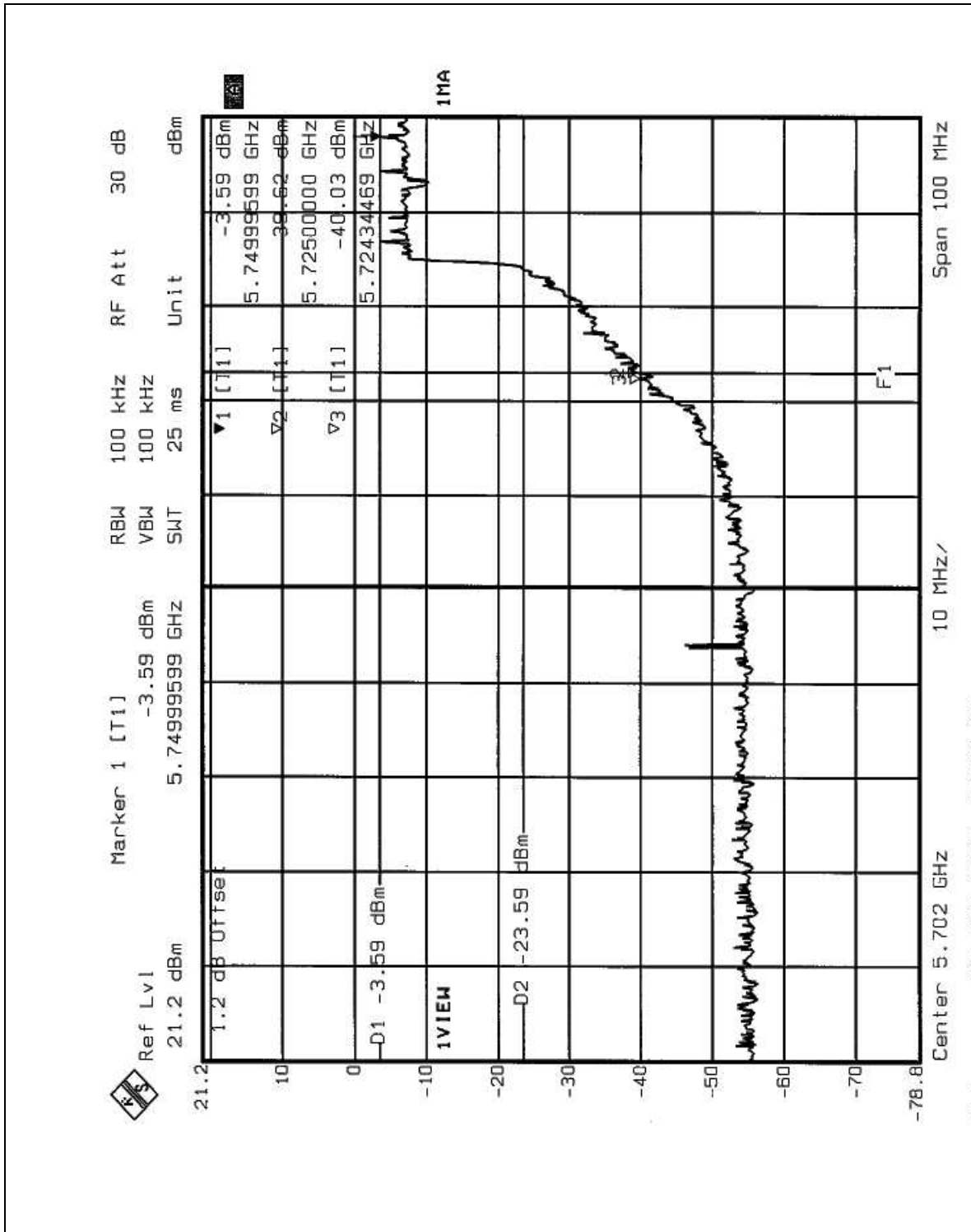
Same as Item 4.8.6

#### 4.11.6 TEST RESULTS

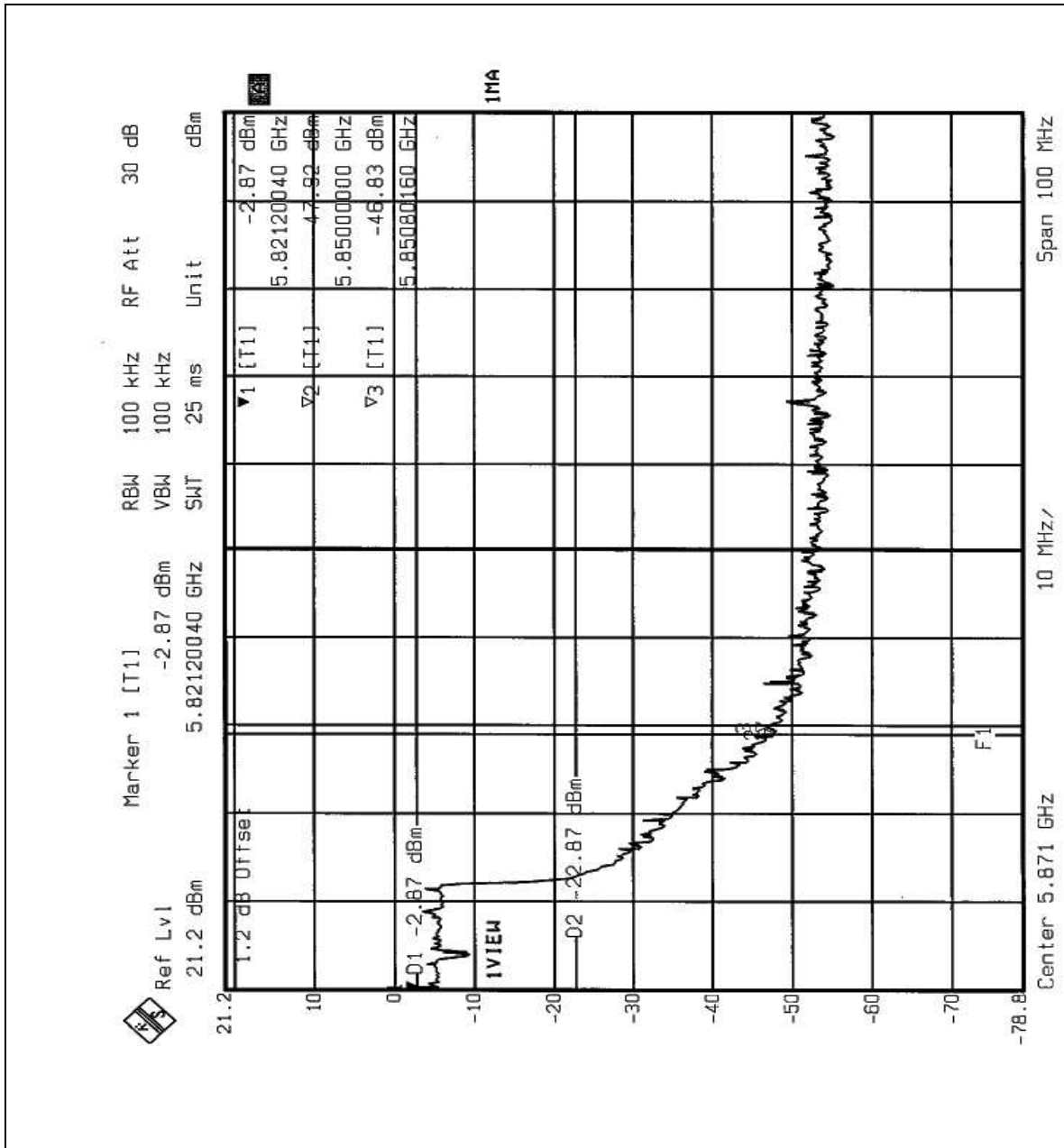
The spectrum plots are attached on the following pages. D2 line indicates the highest level, D1 line indicates the 20dB offset below D2. It shows compliance with the requirement in part 15.247(C).



Normal Mode

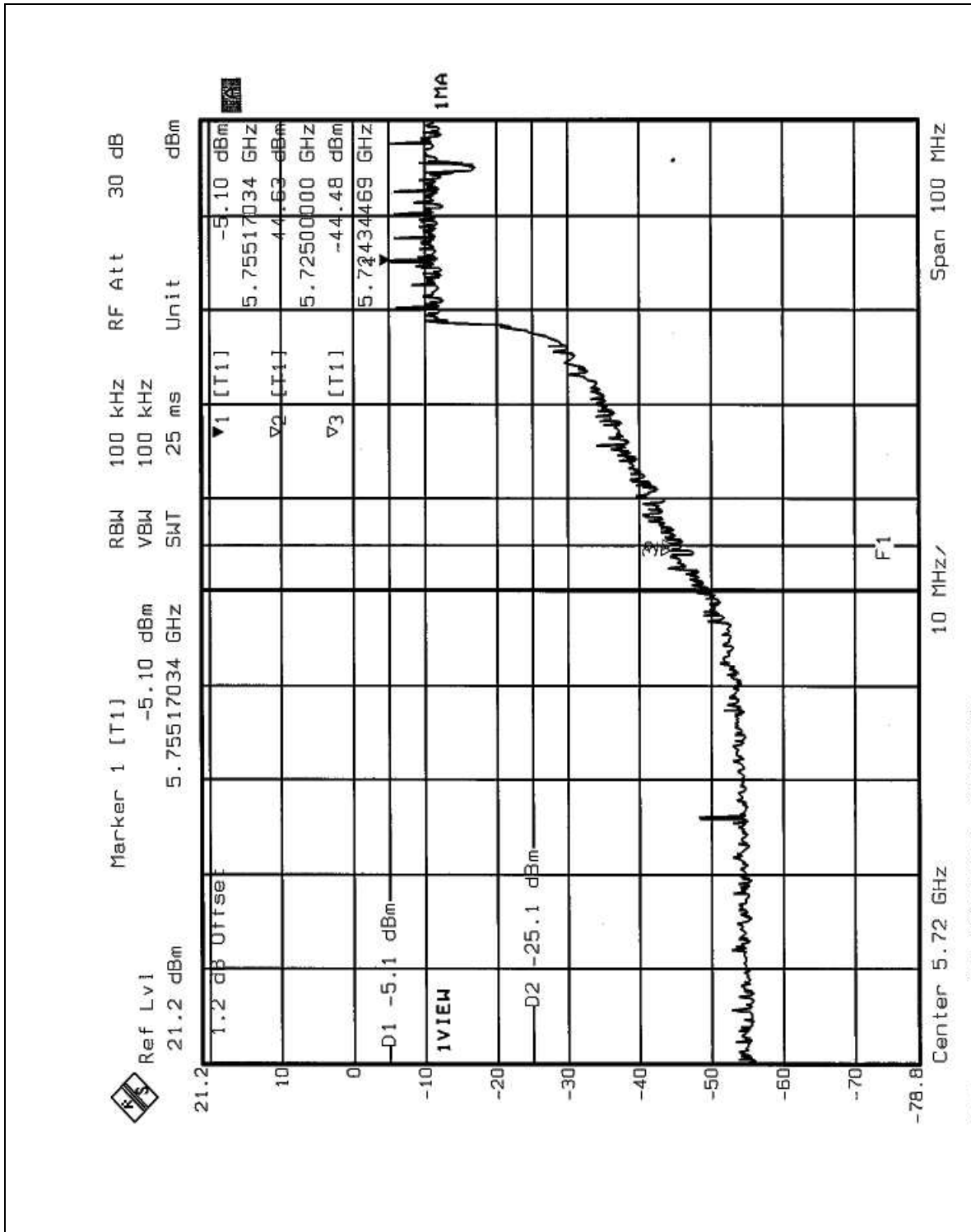


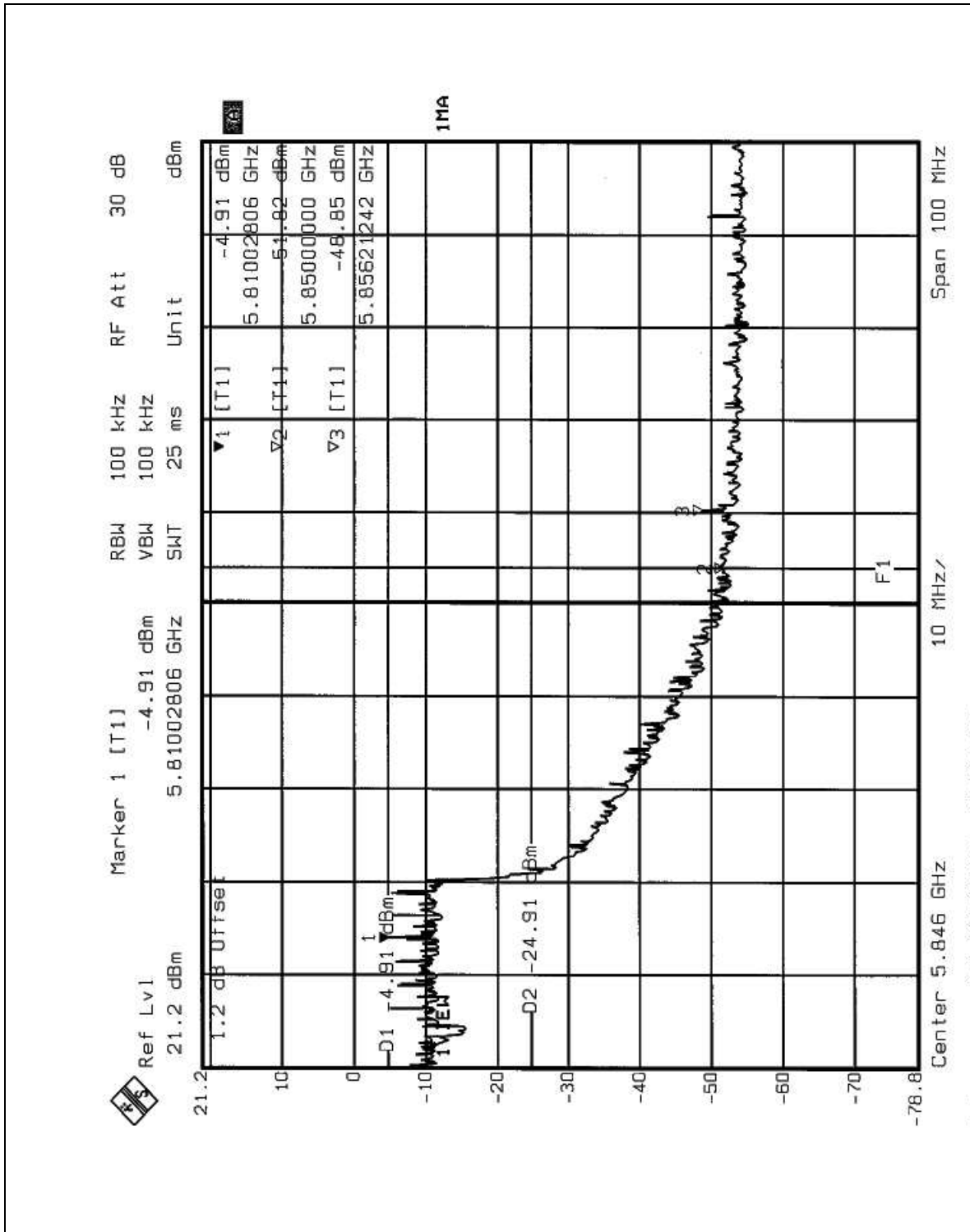






Turbo Mode







## **4.12 ANTENNA REQUIREMENT**

### **4.12.1 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.

### **4.12.2 ANTENNA CONNECTED CONSTRUCTION**

The antenna used in this product is Omni Directional antenna with MMCX connector. The maximum Gain of the antenna is 6dBi

## 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 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

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**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.