



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 |
|----------------------------|-----------|------------|------------------|
| PEAK POWER SENSOR | E9327A | US40440722 | July 30, 2003 |
| POWER METER | E4416A | GB41291118 | July 30, 2003 |

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



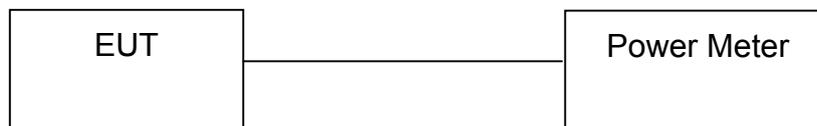
5.4.3 TEST PROCEDURE

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=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.



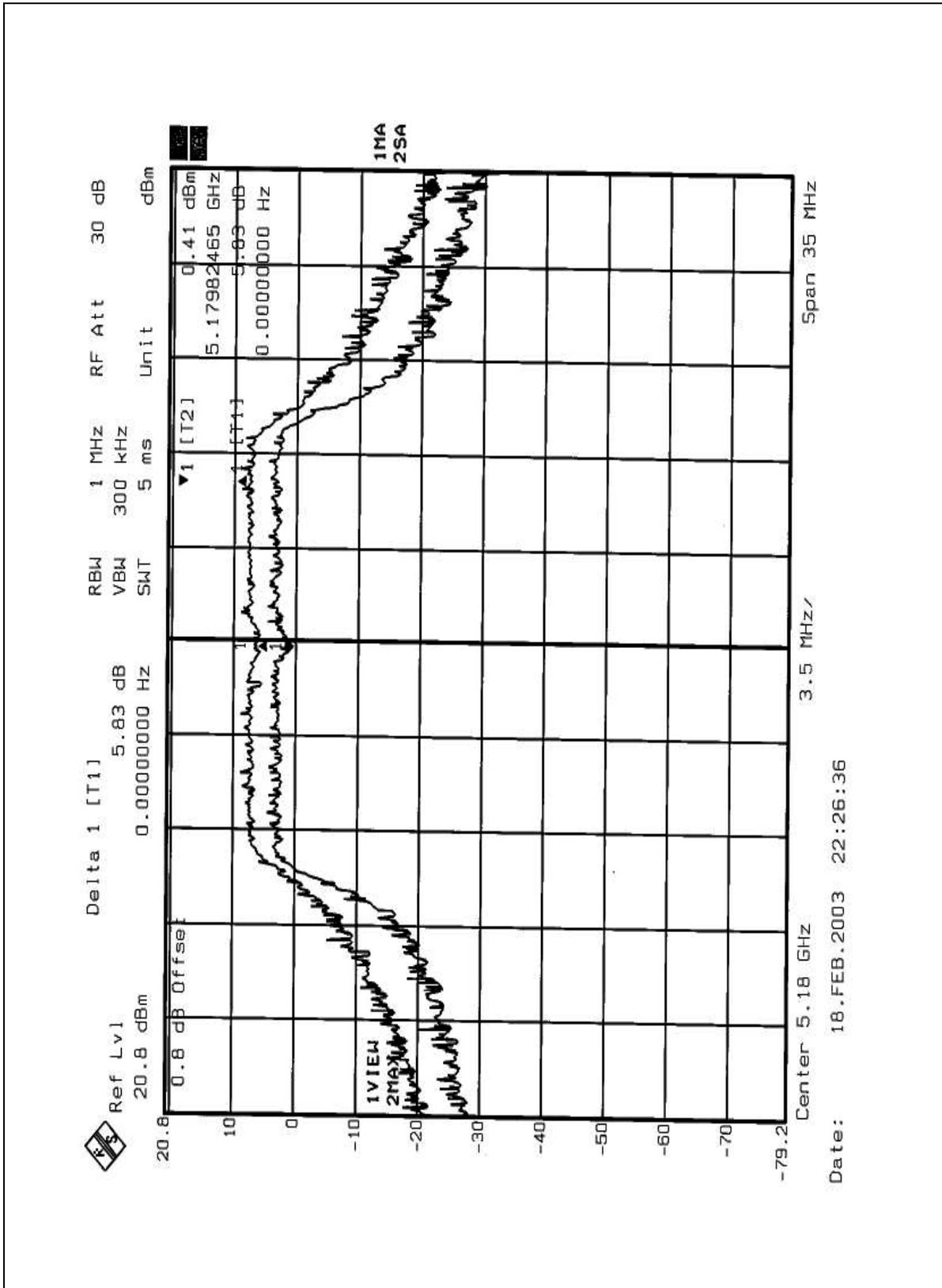
5.4.7 TEST RESULTS

| | | | |
|-------------------------------------|-----------------------------------|---------------------------------|---------------|
| EUT | IEEE 802.11a+b/g WLAN Mini PCI | MODEL | GL2554MP-0A0 |
| ENVIRONMENTAL CONDITIONS | 24deg. C, 65%RH, 1005hPa | INPUT POWER (SYSTEM) | 120Vac, 60 Hz |
| TESTED BY | Ansen Lei | | |

| CHANNEL | CHANNEL FREQUENCY (MHz) | PEAK POWER EXCURSION (dB) | PEAK to AVERAGE EXCURSION LIMIT (dB) | PASS/FAIL |
|----------------|--|--|---|------------------|
| 1 | 5180 | 5.83 | 13 | PASS |
| 4 | 5240 | 4.91 | 13 | PASS |
| 5 | 5260 | 8.23 | 13 | PASS |
| 8 | 5320 | 4.89 | 13 | PASS |
| 9 | 5745 | 5.78 | 13 | PASS |
| 12 | 5805 | 5.26 | 13 | PASS |

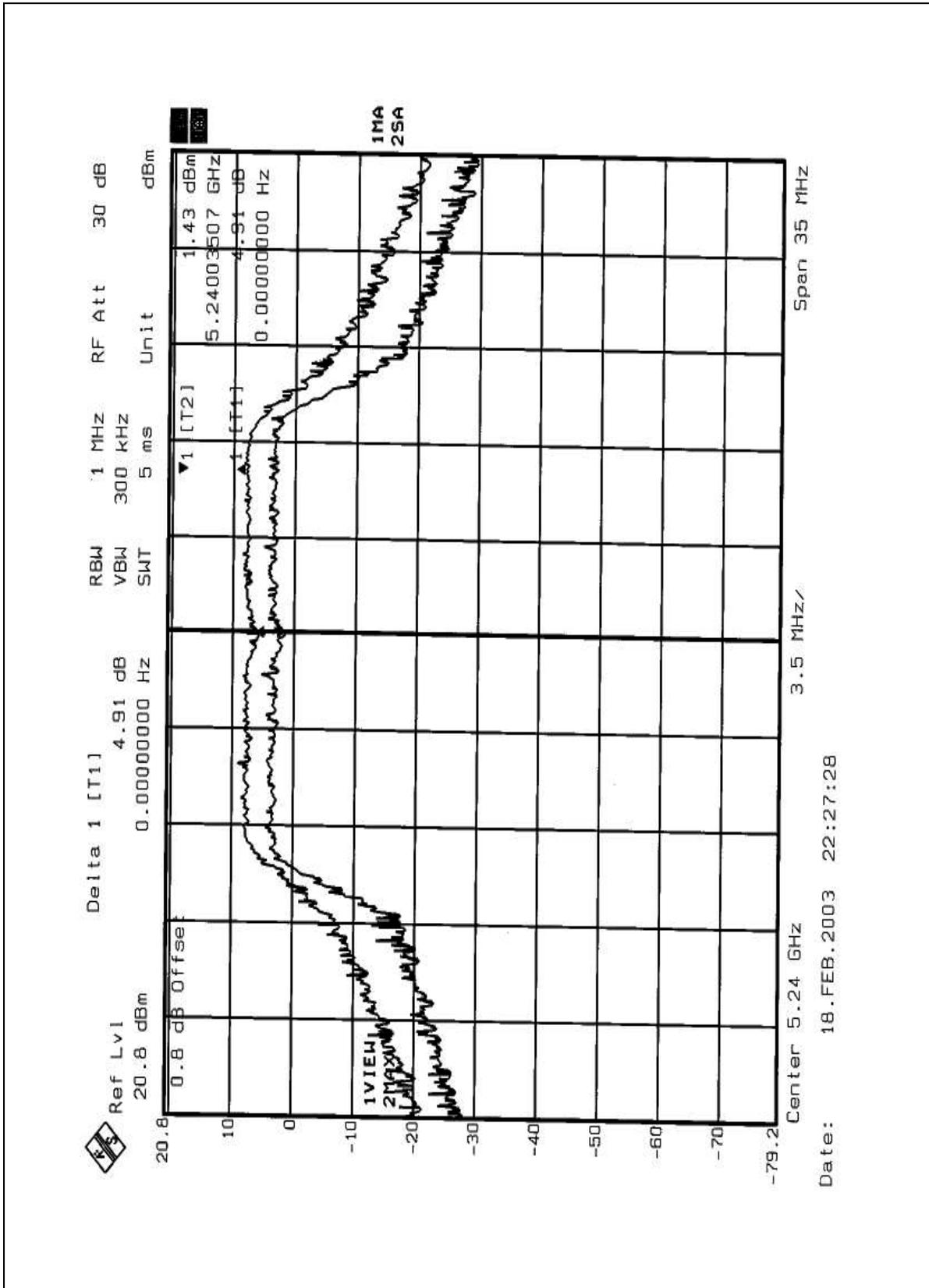


CHANNEL 1



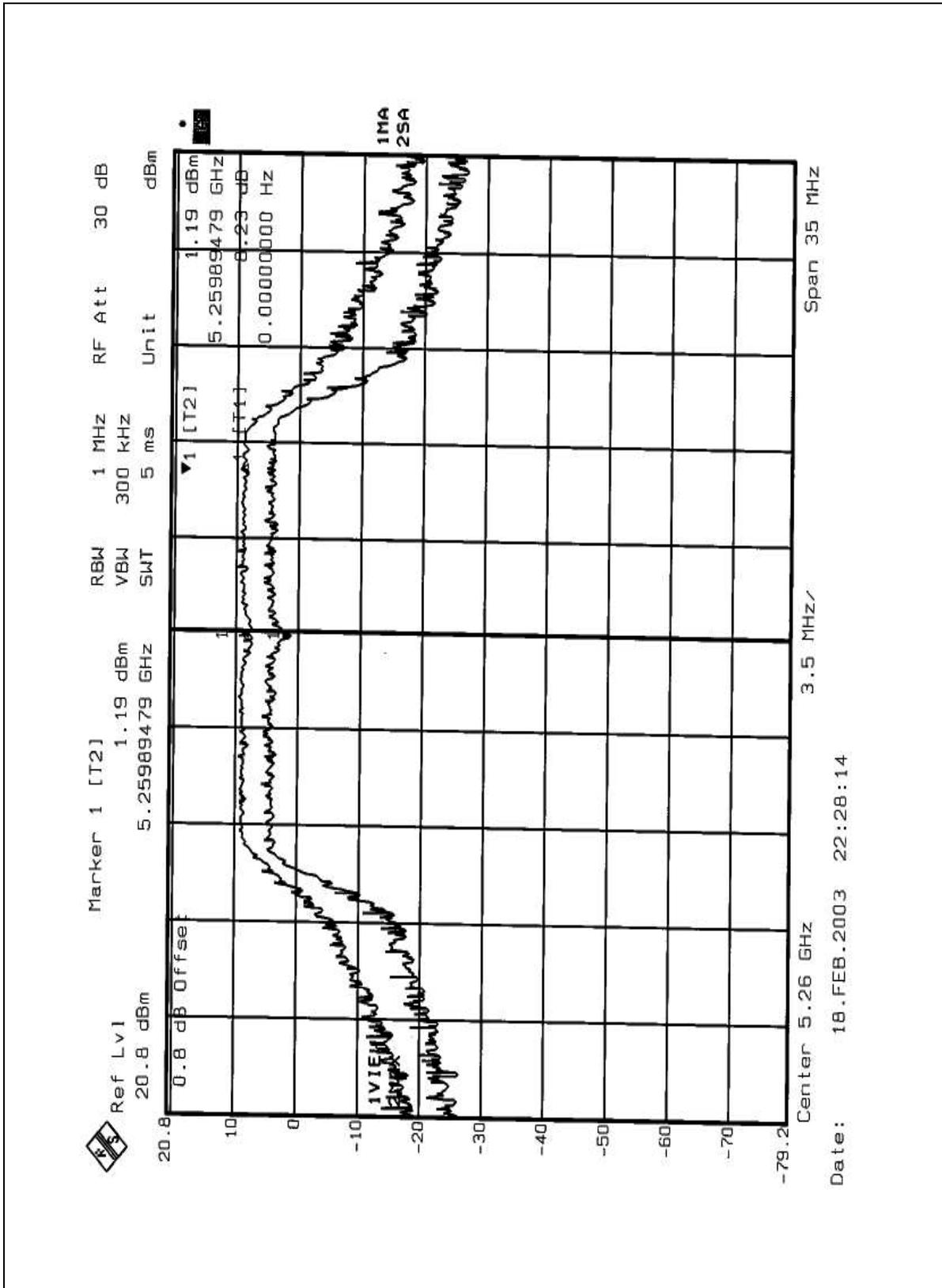


CHANNEL 4



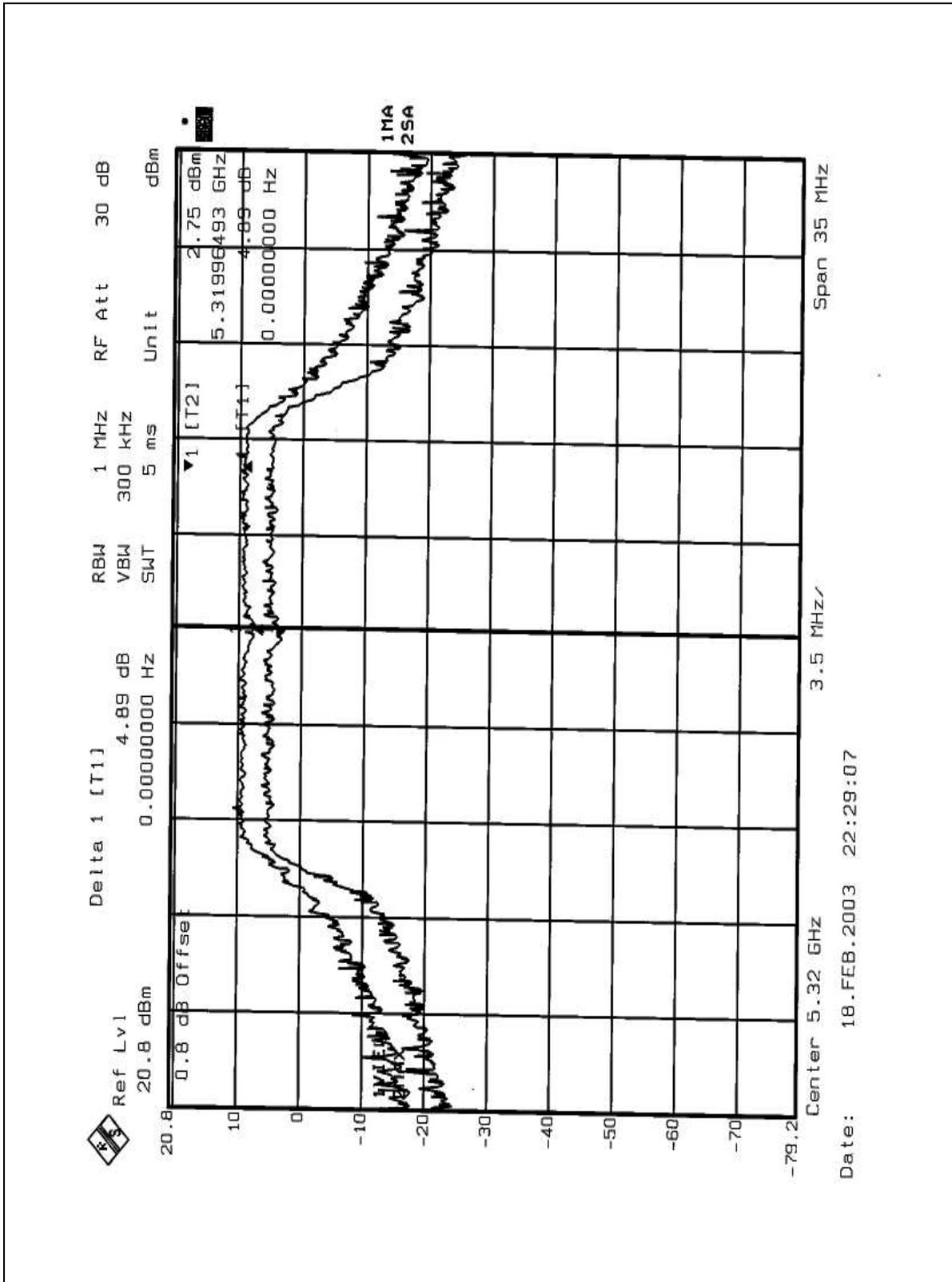


CHANNEL 5



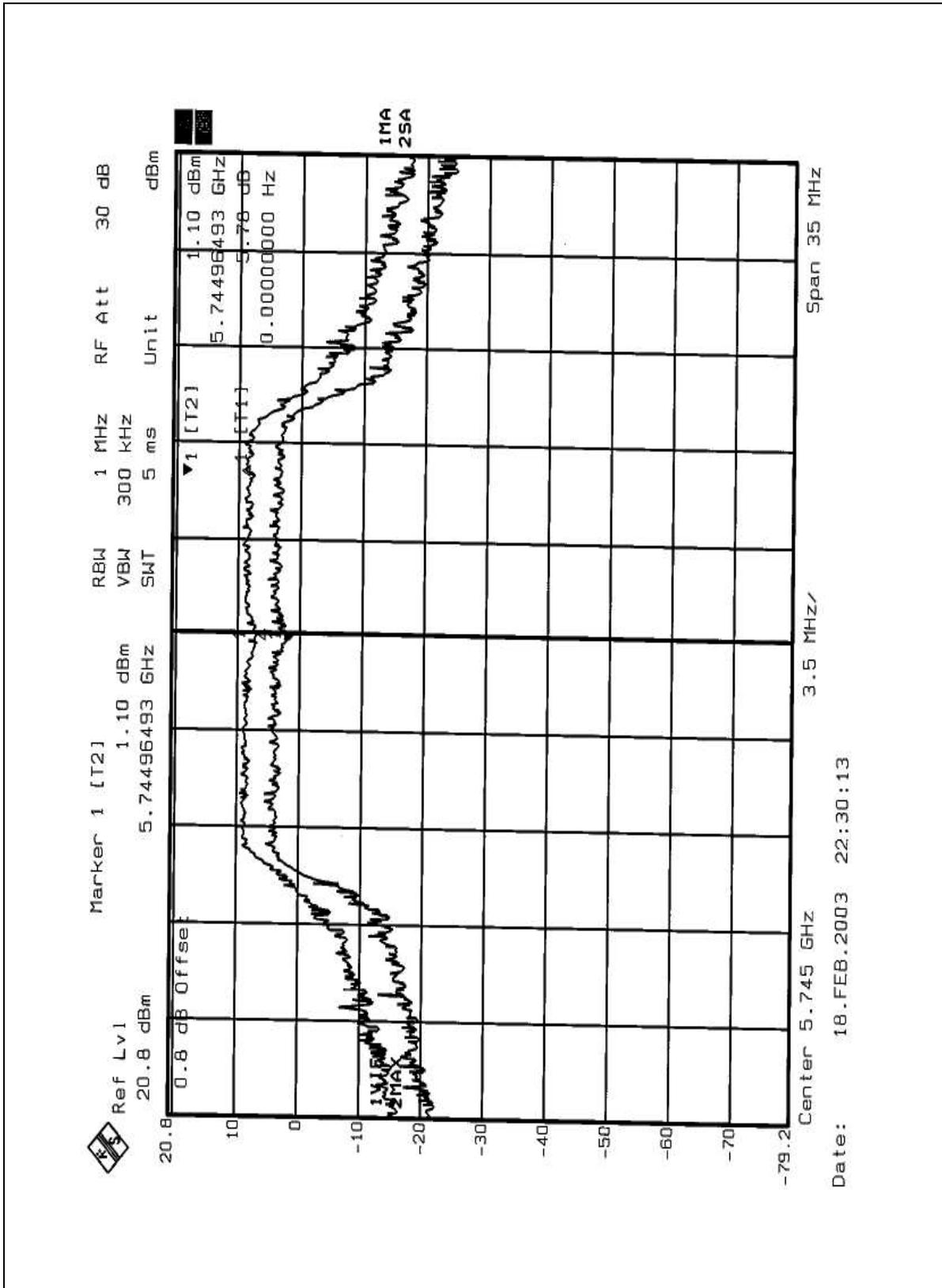


CHANNEL 8



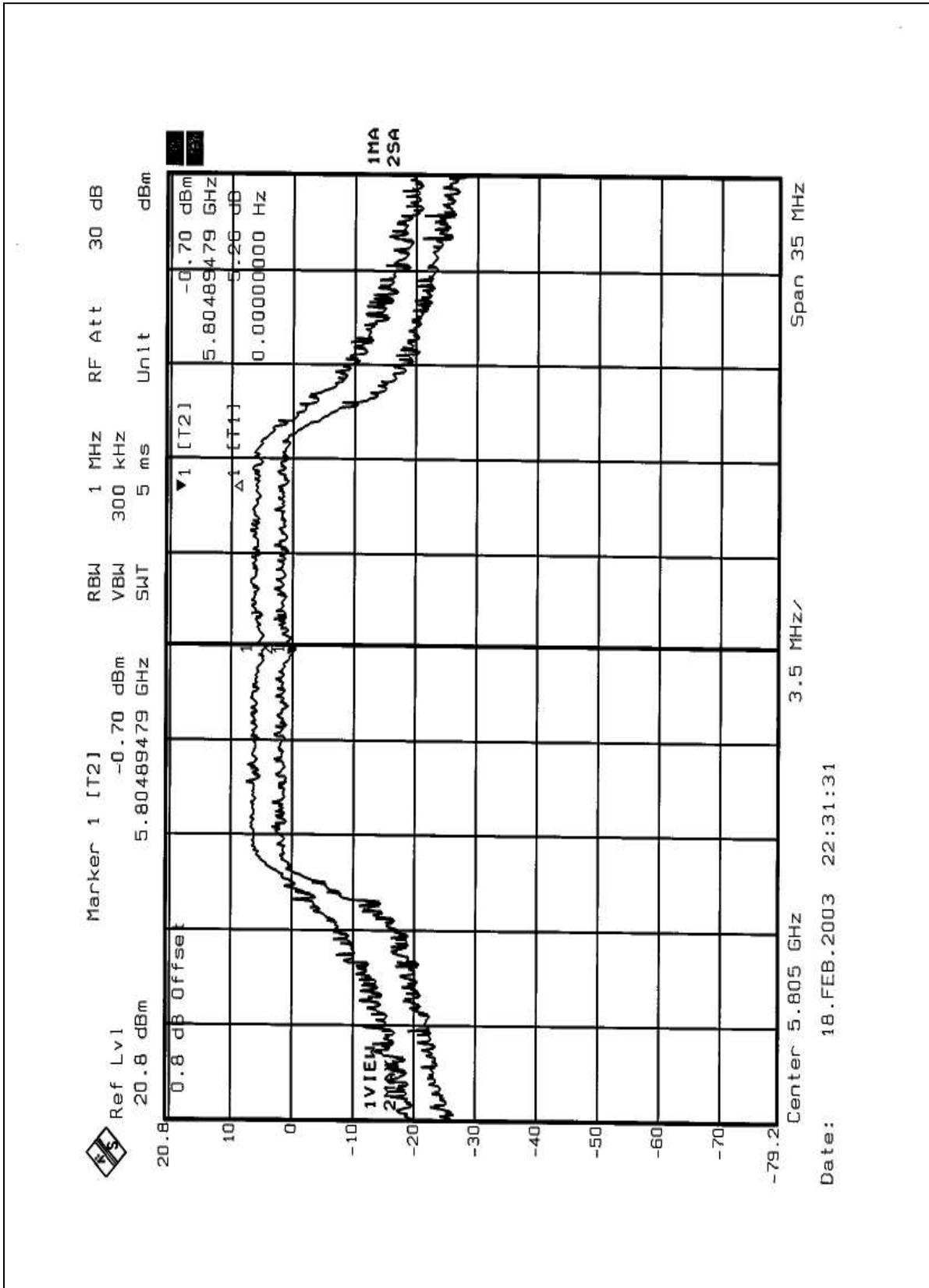


CHANNEL 9





CHANNEL 12





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 | 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



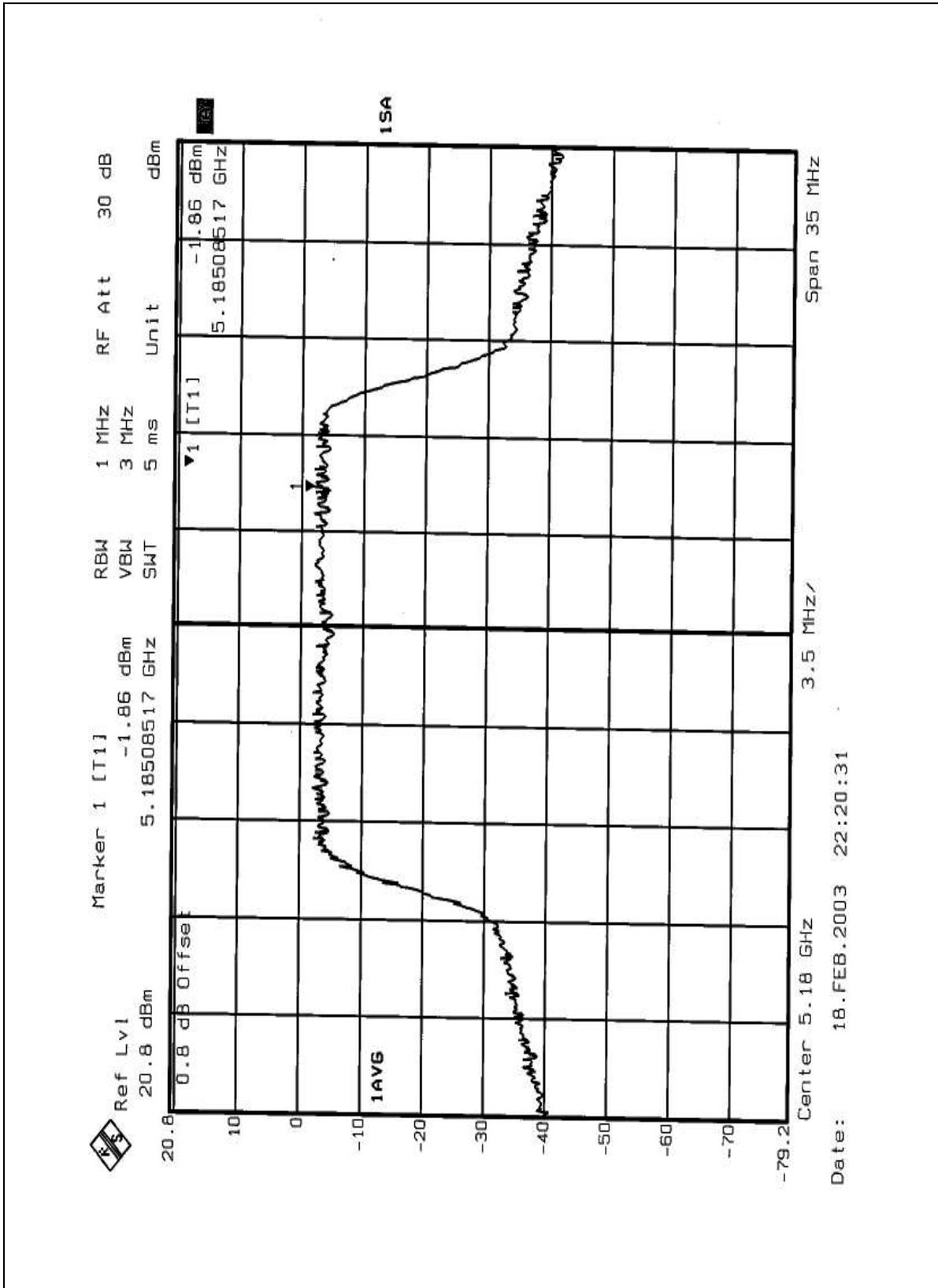
5.5.7 TEST RESULTS

| | | | |
|-------------------------------------|-----------------------------------|---------------------------------|---------------|
| EUT | IEEE 802.11a+b/g WLAN Mini PCI | MODEL | GL2554MP-0A0 |
| ENVIRONMENTAL CONDITIONS | 24deg. C, 65%RH, 1005hPa | INPUT POWER (SYSTEM) | 120Vac, 60 Hz |
| TESTED BY | Ansen Lei | | |

| CHANNEL | CHANNEL FREQUENCY (MHz) | RF POWER LEVEL IN 1MHz BW (dBm) | MAXIMUM LIMIT (dBm) | PASS/FAIL |
|----------------|---|--|------------------------------------|------------------|
| 1 | 5180 | -1.86 | 4 | PASS |
| 4 | 5240 | -1.73 | 4 | PASS |
| 5 | 5260 | -0.36 | 11 | PASS |
| 8 | 5320 | 0.21 | 11 | PASS |
| 9 | 5745 | -1.79 | 17 | PASS |
| 12 | 5805 | -2.89 | 17 | PASS |

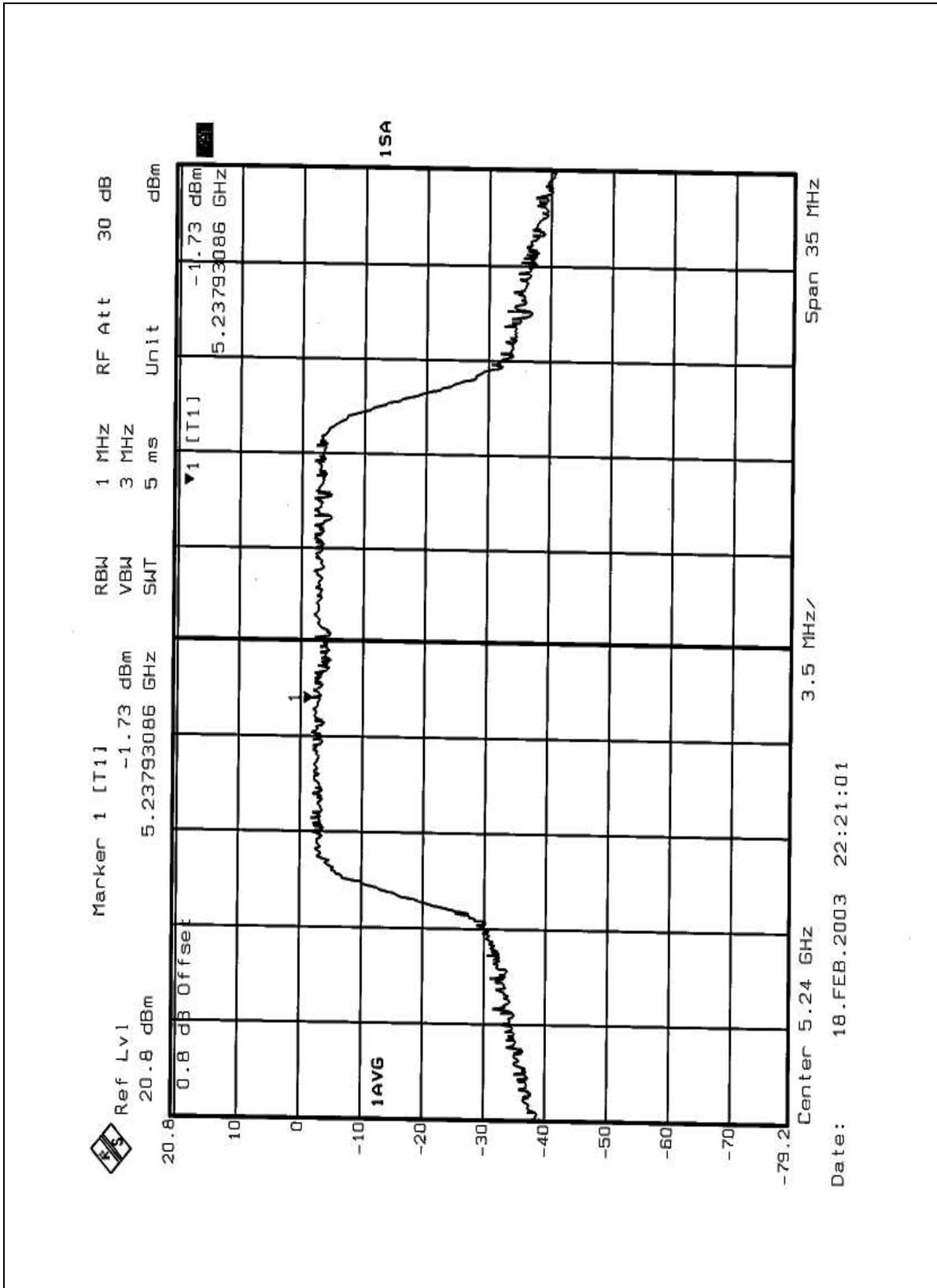


CHANNEL 1



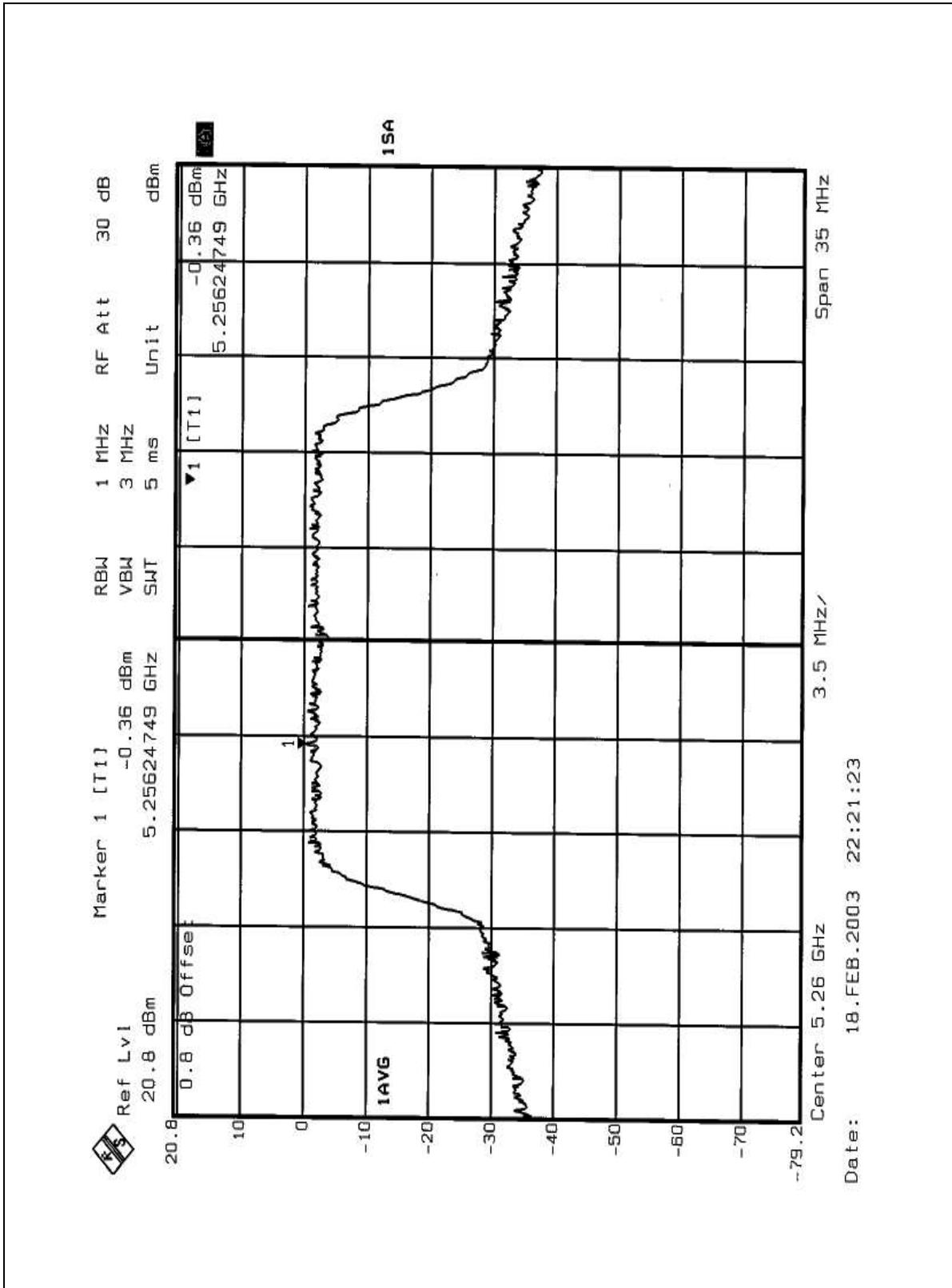


CHANNEL 4



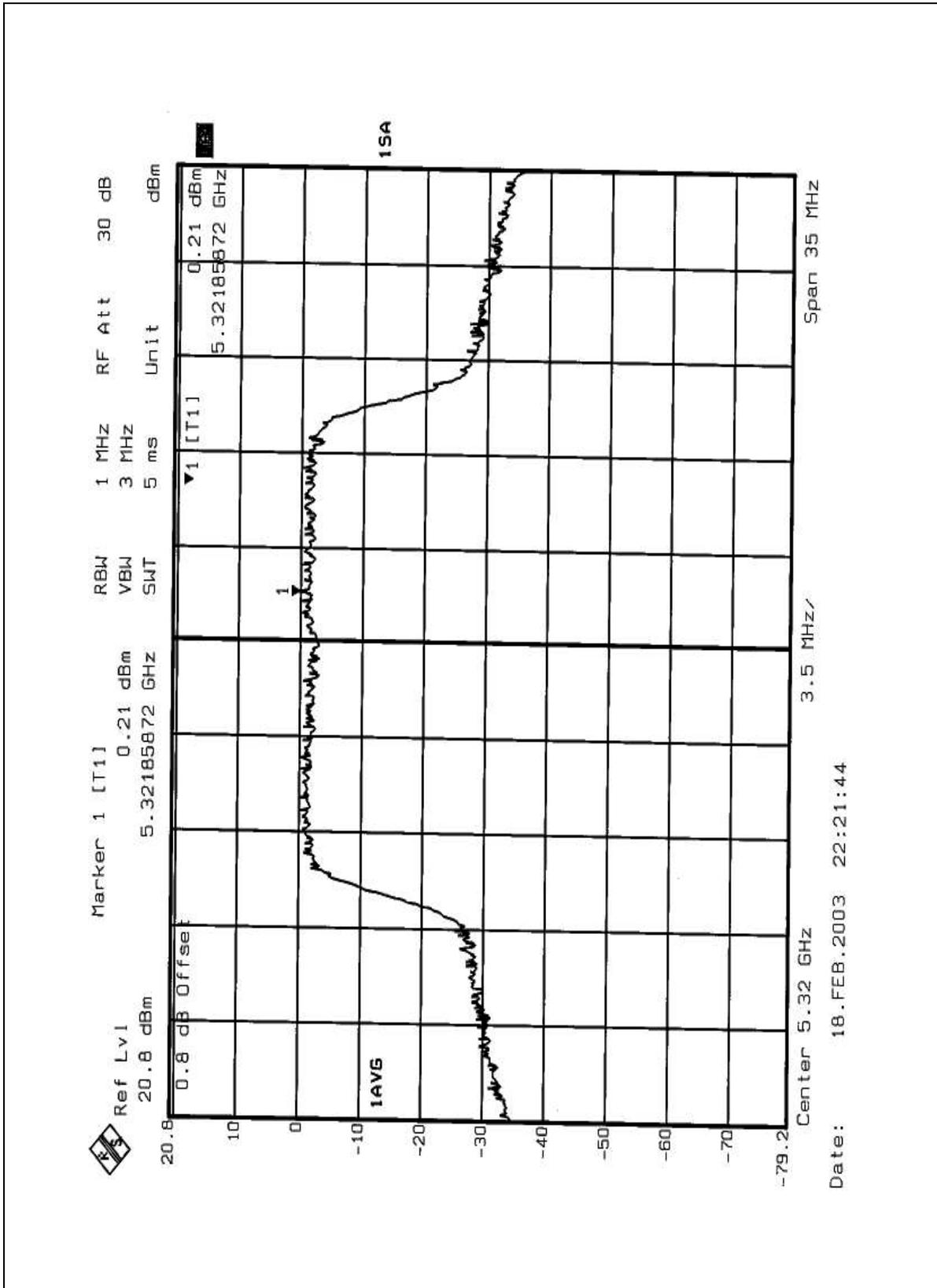


CHANNEL 5



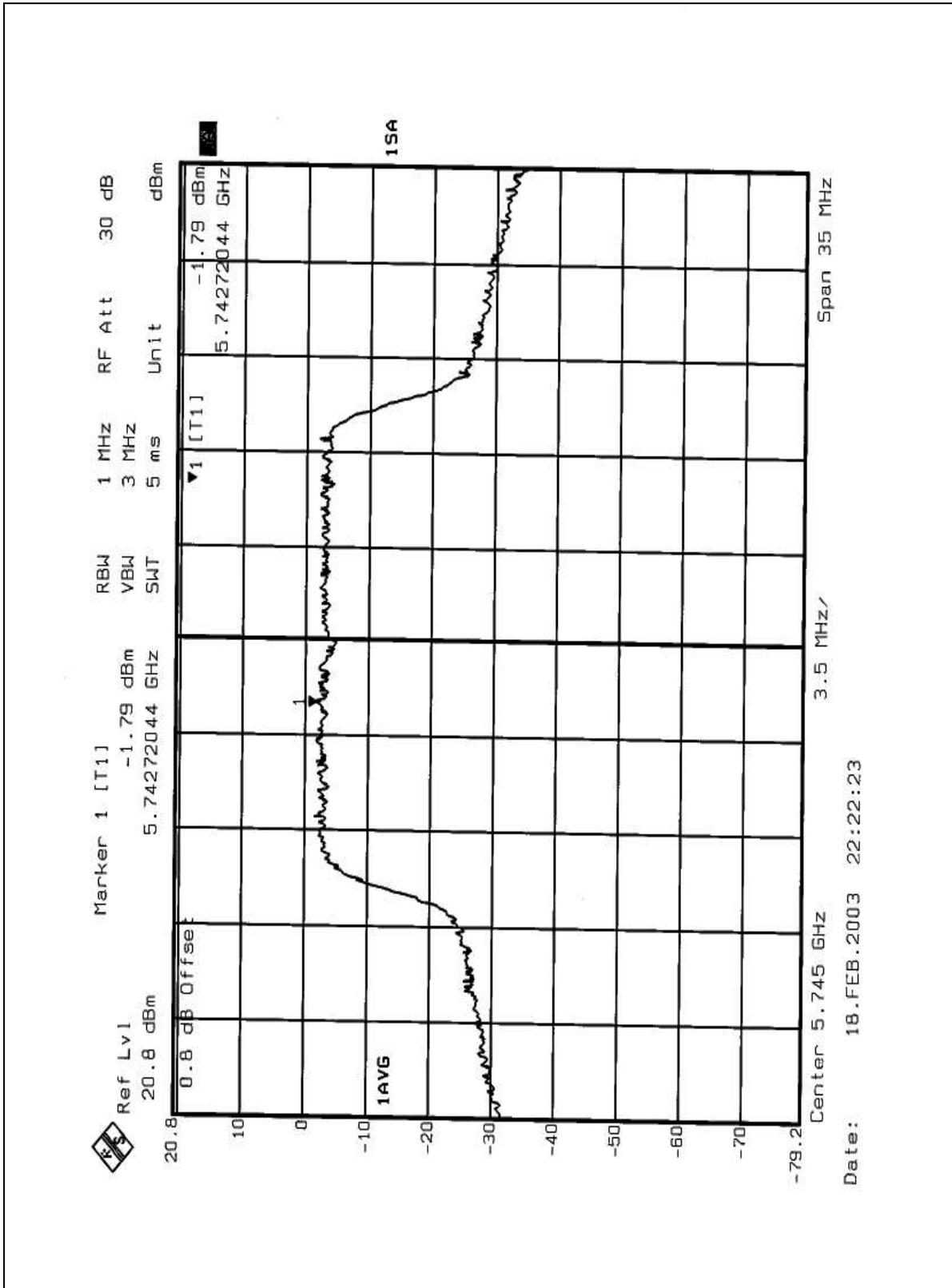


CHANNEL 8



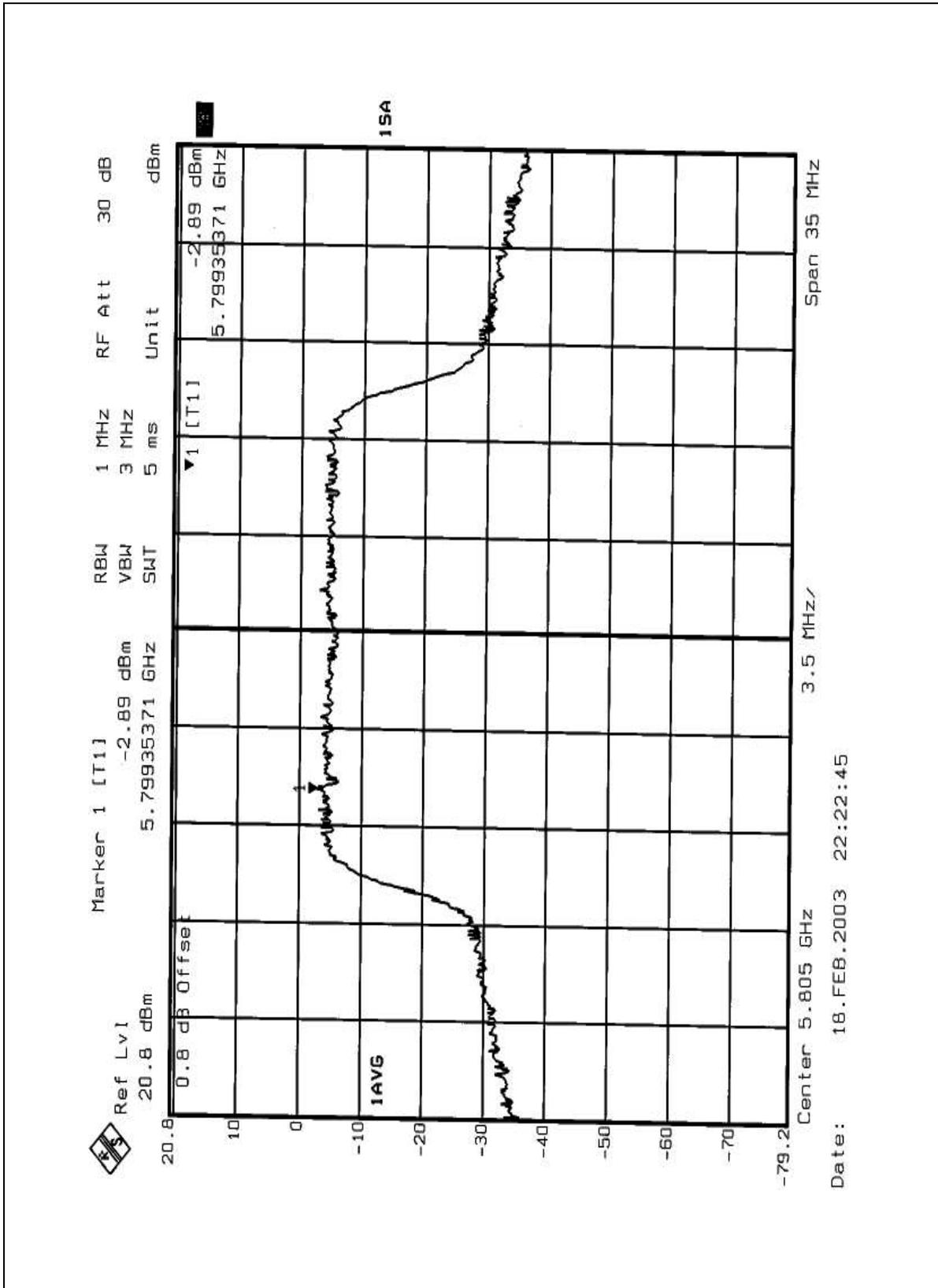


CHANNEL 9





CHANNEL 12





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 | 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.

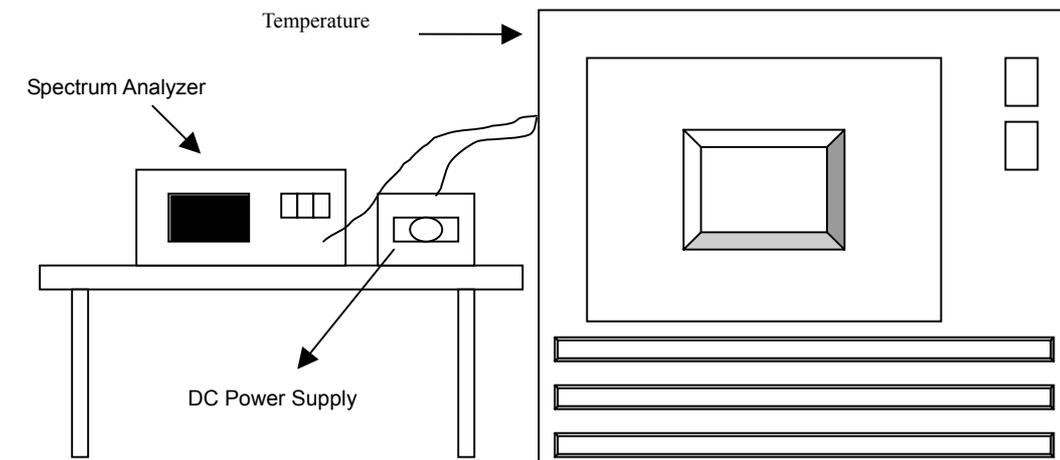
5.6.3 TEST PROCEDURE

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: 5180MHz | | | | Limit : ± 0.02% | |
|------------|--------------------|------------------------------|------------|-----------|------------|-----------------|------------|
| Temp. (°C) | Power supply (VDC) | 2 minute | | 5 minute | | 10 minute | |
| | | (MHz) | (%) | (MHz) | (%) | (MHz) | (%) |
| 50 | 126.5 | 5319.9202 | -0.0015000 | 5319.9206 | -0.0014925 | 5319.9205 | -0.0014944 |
| | 110.0 | 5319.9202 | -0.0015000 | 5319.9208 | -0.0014887 | 5319.9205 | -0.0014944 |
| | 93.5 | 5319.9204 | -0.0014962 | 5319.9207 | -0.0014906 | 5319.9207 | -0.0014906 |
| 40 | 126.5 | 5319.9132 | -0.0016316 | 5319.9135 | -0.0016259 | 5319.9135 | -0.0016259 |
| | 110.0 | 5319.9132 | -0.0016316 | 5319.9133 | -0.0016297 | 5319.9137 | -0.0016222 |
| | 93.5 | 5319.9133 | -0.0016297 | 5319.9133 | -0.0016297 | 5319.9136 | -0.0016241 |
| 30 | 126.5 | 5319.9123 | -0.0016485 | 5319.9120 | -0.0016541 | 5319.9129 | -0.0016372 |
| | 110.0 | 5319.9123 | -0.0016485 | 5319.9121 | -0.0016523 | 5319.9127 | -0.0016410 |
| | 93.5 | 5319.9125 | -0.0016447 | 5319.9121 | -0.0016523 | 5319.9126 | -0.0016429 |
| 20 | 126.5 | 5319.9111 | -0.0016711 | 5319.9115 | -0.0016635 | 5319.9112 | -0.0016692 |
| | 110.0 | 5319.9110 | -0.0016729 | 5319.9115 | -0.0016635 | 5319.9112 | -0.0016692 |
| | 93.5 | 5319.9110 | -0.0016729 | 5319.9117 | -0.0016598 | 5319.9113 | -0.0016673 |
| 10 | 126.5 | 5319.9156 | -0.0015865 | 5319.9162 | -0.0015752 | 5319.9165 | -0.0015695 |
| | 110.0 | 5319.9157 | -0.0015846 | 5319.9162 | -0.0015752 | 5319.9165 | -0.0015695 |
| | 93.5 | 5319.9157 | -0.0015846 | 5319.9163 | -0.0015733 | 5319.9168 | -0.0015639 |
| 0 | 126.5 | 5319.9174 | -0.0015526 | 5319.9121 | -0.0016523 | 5319.9133 | -0.0016297 |
| | 110.0 | 5319.9125 | -0.0016447 | 5319.9122 | -0.0016504 | 5319.9132 | -0.0016316 |
| | 93.5 | 5319.9128 | -0.0016391 | 5319.9122 | -0.0016504 | 5319.9135 | -0.0016259 |
| -10 | 126.5 | 5319.9126 | -0.0016429 | 5319.9127 | -0.0016410 | 5319.9133 | -0.0016297 |
| | 110.0 | 5319.9126 | -0.0016429 | 5319.9128 | -0.0016391 | 5319.9130 | -0.0016353 |
| | 93.5 | 5319.9128 | -0.0016391 | 5319.9128 | -0.0016391 | 5319.9131 | -0.0016335 |
| -20 | 126.5 | 5319.9155 | -0.0015883 | 5319.9154 | -0.0015902 | 5319.9152 | -0.0015940 |
| | 110.0 | 5319.9155 | -0.0015883 | 5319.9153 | -0.0015921 | 5319.9150 | -0.0015977 |
| | 93.5 | 5319.9157 | -0.0015846 | 5319.9156 | -0.0015865 | 5319.9151 | -0.0015959 |
| -30 | 126.5 | 5319.9195 | -0.0015132 | 5319.9197 | -0.0015094 | 5319.9195 | -0.0015132 |
| | 110.0 | 5319.9195 | -0.0015132 | 5319.9197 | -0.0015094 | 5319.9193 | -0.0015169 |
| | 93.5 | 5319.9197 | -0.0015094 | 5319.9196 | -0.0015113 | 5319.9193 | -0.0015169 |



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 loss 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

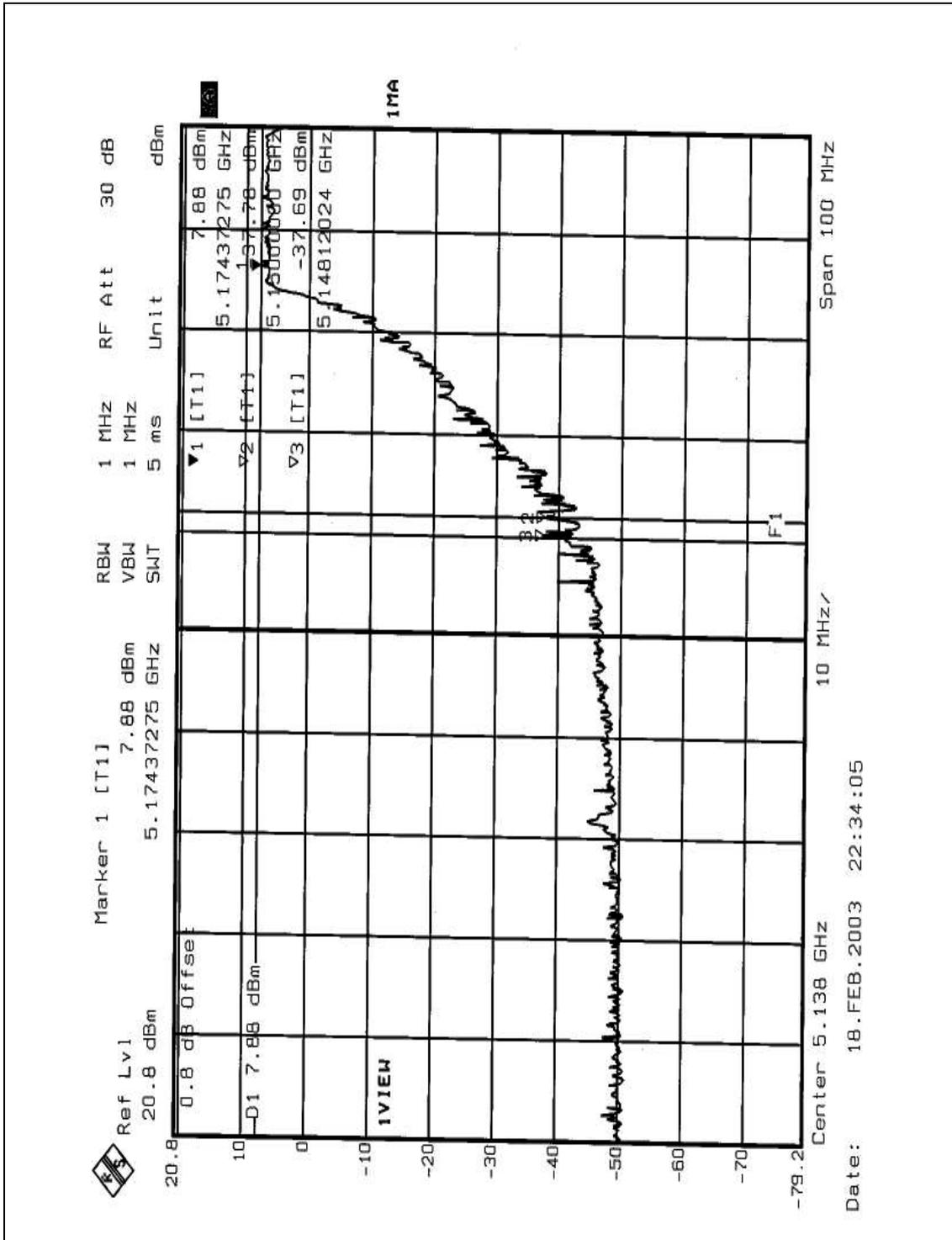
For signals in the restricted bands above and below the 5.15 to 5.35GHz allocated band a measurement was made of the amplitude of the spurious emissions with respect to the intentional signals. The relative amplitude, in dBc, was applied to the average and peak field strength of the intentional signal made on the OATS to calculate the field strength of the unintentional signals.

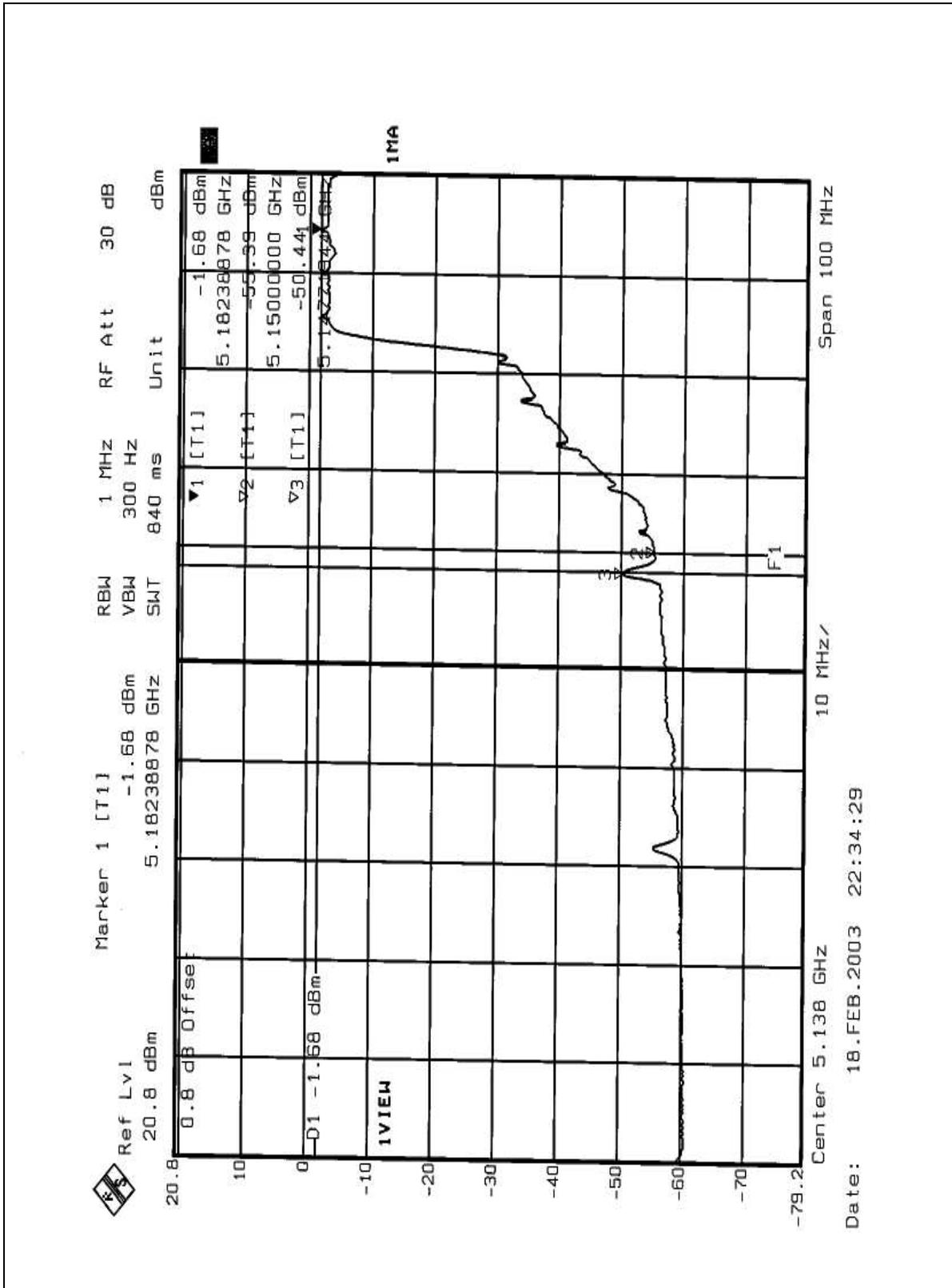
The spectrum plots (Peak RBW=VBW=1MHz; Average RBW=1MHz, VBW=300Hz) are attached on the following 8 pages.



Channel 1 (5180 MHz)

The band edge emission plot on the following 2 pages shows 45.57dBc (Peak) / 48.76 dBc (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 is 93.1dBuV/m, so the maximum field strength in restrict band is $93.1 - 48.76 = 44.34$ dBuV/m which is under 54dBuV/m limit.

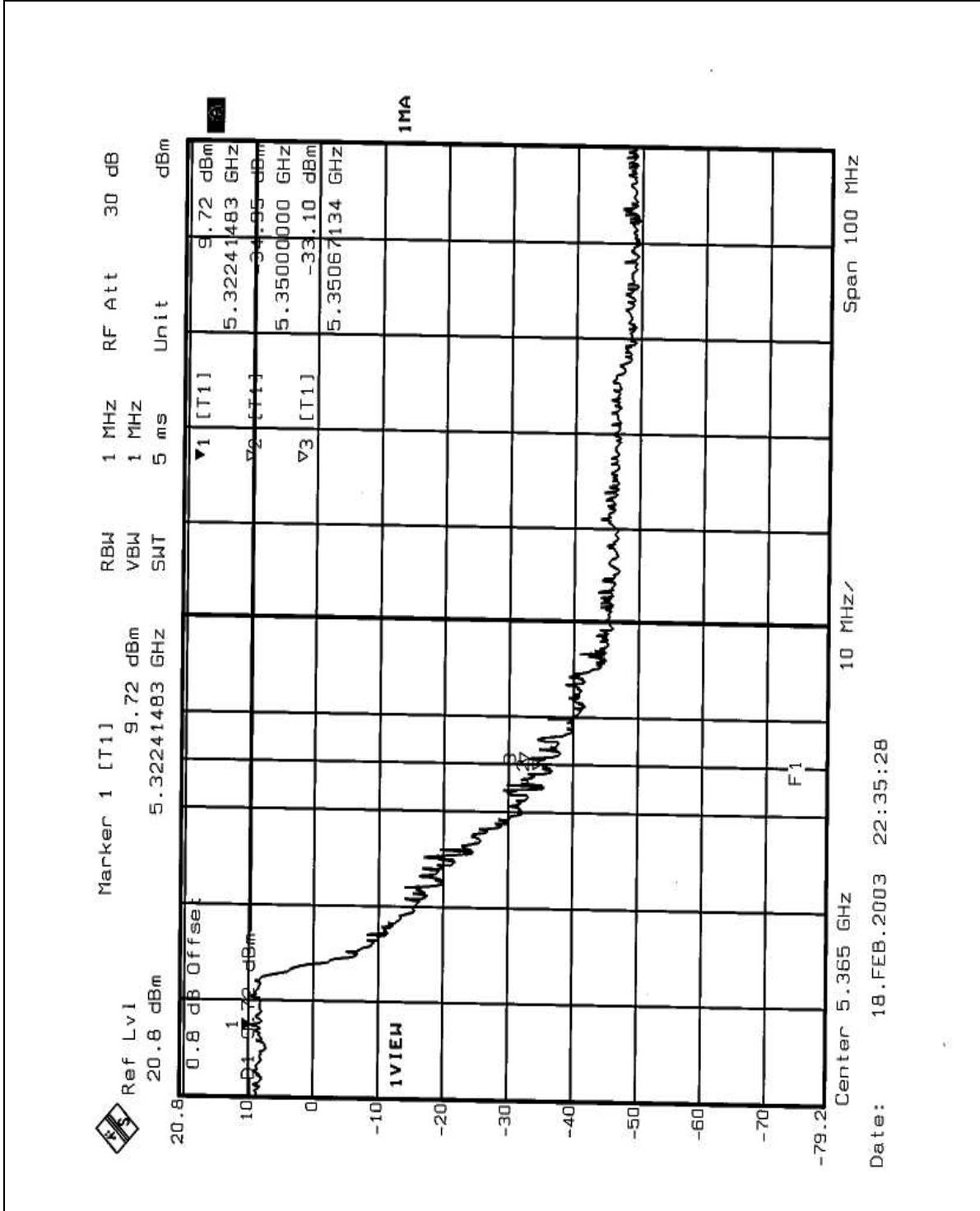


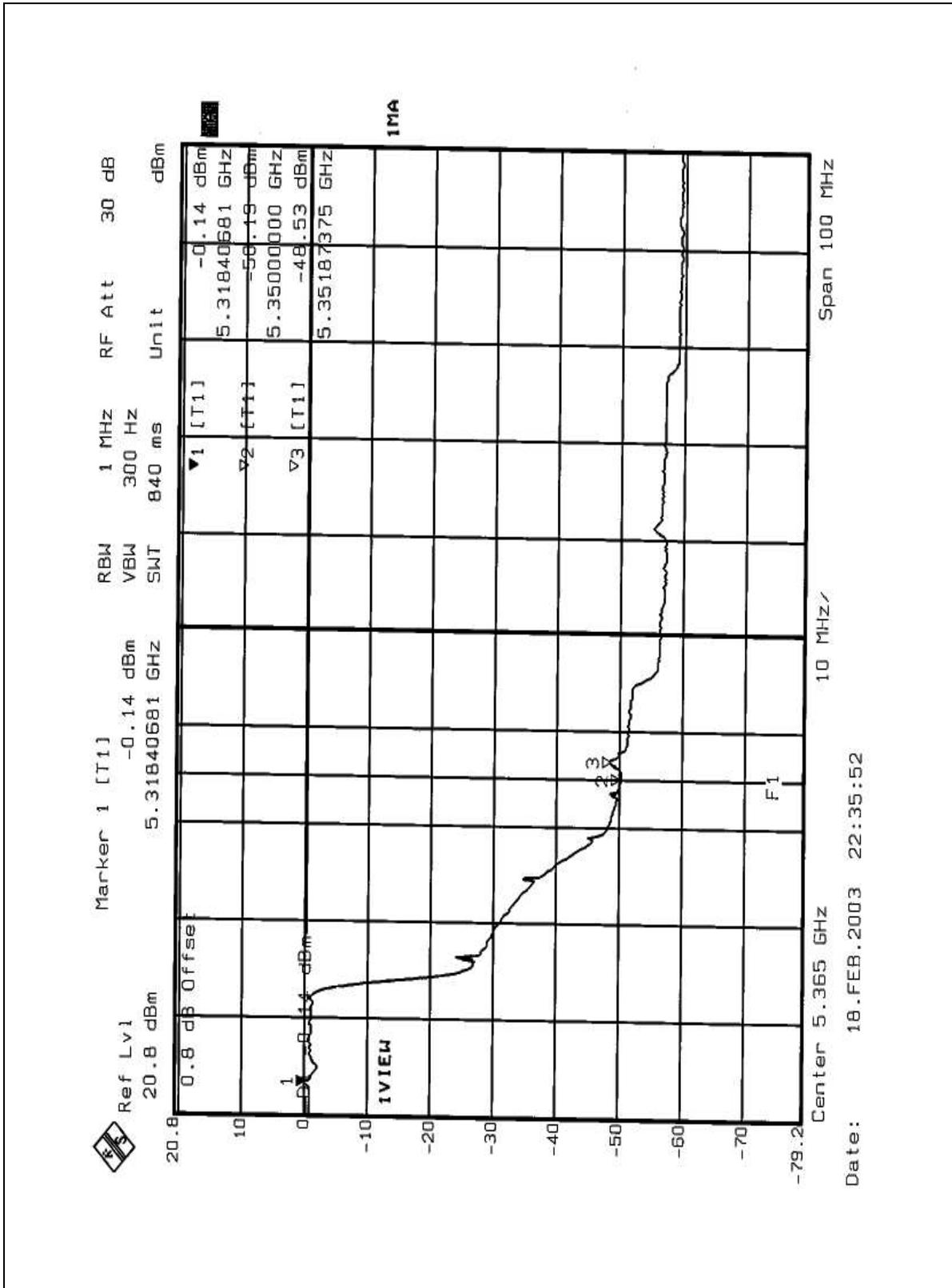




Channel 8 (5320 MHz)

The band edge emission plot on the following 2 pages shows 42.82dBc (Peak) / 48.39dBc (Average) between carrier maximum power and local maximum emission in restrict band. The emission of carrier strength list in the test result of channel 8 is 94.9dBuV/m, so the maximum field strength in restrict band is 94.9-48.39=46.51dBuV/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 without connector. The maximum Gain of the antenna is 2dBi.

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.

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Fax: 886-35-935342

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