



FCC TEST REPORT

REPORT NO.: RF930728L05

MODEL NO.: WGU624

RECEIVED: July 28, 2004

TESTED: July 29 ~ Aug. 09, 2004

APPLICANT: NETGEAR, INC.

ADDRESS: 4500 GREAT AMERICA PARKWAY, SANTA CLARA, CA95054 U.S.A.

ISSUED BY: Advance Data Technology Corporation

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ILAC MRA



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1. CERTIFICATION

PRODUCT: Double 108 Mbps Wireless Firewall Router
BRAND NAME: NETGEAR
MODEL NO.: WGU624
APPLICANT: NETGEAR, INC.
TEST ITEM: Engineering Sample
TESTED: July 29 ~ Aug. 09, 2004
STANDARDS: FCC Part 15, Subpart C (Section 15.247),
Subpart E (Section 15.407), ANSI C63.4-2001

The above equipment have been tested by **Advance Data Technology Corporation**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions specified in this report.

PREPARED BY : Wendy Liao , **DATE:** Aug. 11, 2004
(Wendy Liao)

TECHNICAL
ACCEPTANCE : Gary Chang , **DATE:** Aug. 11, 2004
Responsible for RF (Gary Chang)

APPROVED BY : Cody Chang , **DATE:** Aug. 11, 2004
(Cody Chang, Supervisor)



2. SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC Part 15, Subpart C (Section 15.247)			
Standard Section	Test Type and Limit	Result	Remark
15.207	AC Power Conducted Emission	PASS	Meet the requirement of limit. Minimum passing margin is -10.86dB at 3.125MHz
15.247(a)(2)	Spectrum Bandwidth of a Direct Sequence Spread Spectrum System Limit: min. 500kHz	PASS	Meet the requirement of limit.
15.247(b)	Maximum Peak Output Power Limit: max. 30dBm	PASS	Meet the requirement of limit.
15.247(c)	Radiated Emissions Limit: Table 15.209	PASS	Meet the requirement of limit. Minimum passing margin is -1.40dB at 2390.00MHz
15.247(d)	Power Spectral Density Limit: max. 8dBm	PASS	Meet the requirement of limit.
15.247(c)	Band Edge Measurement Limit: 20dB less than the peak value of fundamental frequency	PASS	Meet the requirement of limit.



For Freq. 5.15 ~ 5.35GHz:

APPLIED STANDARD: FCC Part 15, Subpart E (Section 15.407)			
Standard Section	Test Type	Result	Remark
15.407(b)(5)	AC Power Conducted Emission	PASS	Meet the requirement of limit. Minimum passing margin is -10.34dB at 3.301MHz
15.407(b/1/2/3) (b)(5)	Electric Field Strength Spurious Emissions, 30MHz ~ 40000MHz	PASS	Meet the requirement of limit. Minimum passing margin is -1.06dB at 5150.00MHz
15.407(a/1/2/3)	Peak Transmit Power	PASS	Meet the requirement of limit.
15.407(a)(6)	Peak Power Excursion	PASS	Meet the requirement of limit.
15.407(a/1/2/3)	Peak Power Spectral Density	PASS	Meet the requirement of limit.
15.407(g)	Frequency Stability	PASS	Meet the requirement of limit.



For Freq. 5.725 ~ 5.850GHz :

APPLIED STANDARD: FCC Part 15, Subpart C (Section 15.247)			
Standard Section	Test Type and Limit	Result	Remark
15.207	AC Power Conducted Emission	PASS	Meet the requirement of limit. Minimum passing margin is -1.96dB at 3.4922MHz
15.247(a)(2)	Spectrum Bandwidth of a Direct Sequence Spread Spectrum System Limit: min. 500kHz	PASS	Meet the requirement of limit.
15.247(b)	Maximum Peak Output Power Limit: max. 30dBm	PASS	Meet the requirement of limit.
15.247(c)	Radiated Emissions Limit: Table 15.209	PASS	Meet the requirement of limit. Minimum passing margin is -1.54dB at 11600.00MHz
15.247(d)	Power Spectral Density Limit: max. 8dBm	PASS	Meet the requirement of limit.
15.247(c)	Band Edge Measurement Limit: 20dB less than the peak value of fundamental frequency	PASS	Meet the requirement of limit.



2.1 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4:

Measurement	Frequency	Uncertainty
Conducted emissions	9k~30MHz	2.44 dB
Radiated emissions	30MHz ~ 200MHz	3.73 dB
	200MHz ~1000MHz	3.74 dB
	1GHz ~ 18GHz	2.20 dB
	18GHz ~ 40GHz	1.88 dB



3. GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

EUT	Double 108 Mbps Wireless Firewall Router
MODEL NO.	WGU624
POWER SUPPLY	5.0Vdc from host equipment
MODULATION TYPE	DBPSK, DQPSK, CCK, 16QAM, 64QAM
MODULATION TECHNOLOGY	DSSS, OFDM
TRANSFER RATE	802.11b: 11/5.5/2/1Mbps 802.11g: 54/48/36/24/18/12/9/6Mbps 802.11a: 54/48/36/24/18/12/9/6Mbps (Turbo mode: up to 108Mbps *see Note 3)
FREQUENCY RANGE	802.11b & 802.11g: 2412 ~ 2462MHz 802.11a: 5.15 ~ 5.35GHz and 5.725 ~ 5.850GHz
NUMBER OF CHANNEL	802.11b & 802.11g: 11 for Normal mode / 1 for Turbo mode 802.11a: 13 for Normal mode / 5 for Turbo mode
CHANNEL SPACING	802.11b & 802.11g: 5MHz 802.11a: 20MHz for Normal mode / 40MHz for Turbo mode
OUTPUT POWER	802.11b: 18.00dBm 802.11g: 18.00dBm 802.11a: 13.19dBm
DATA CABLE	NA
ANTENNA TYPE	Dipole antenna with 3.0dBi gain for 5GHz band Dipole antenna with 2.0dBi gain for 2.4GHz band Printed antenna with 2.0dBi gain for 5GHz band Printed antenna with 0.7dBi gain for 2.4GHz band
I/O PORTS	NA
ASSOCIATED DEVICES	NA

NOTE:

1. The EUT was powered by the following adapter :

BRAND:	Netgear
MODEL :	MT18-3050280-A1
INPUT :	100-120Vac, 50/60Hz, 0.6A
OUTPUT :	5Vdc, 2.8A

2. The EUT operates in both the 5.0GHz and 2.4GHz Bands and compatibility with 802.11a and 802.11b, 802.11g technology.
3. This EUT is capable of providing data rates of up to 108Mbps in Turbo Mode depending upon reception quality.
4. The above EUT information was declared by the manufacturer and for more detailed features description, please refer to the manufacturer's specifications or User's Manual.



3.2 DESCRIPTION OF TEST MODES

802.11b and 802.11g: Eleven channels are provided to this EUT.

Channel	Frequency	Channel	Frequency
1	2412 MHz	7	2442 MHz
2	2417 MHz	8	2447 MHz
3	2422 MHz	9	2452 MHz
4	2427 MHz	10	2457 MHz
5	2432 MHz	11	2462 MHz
6	2437 MHz		

NOTE:

1. Below 1GHz, the channel 1, 6, and 11 were pre-tested in chamber. The channel 11, worst case one, was chosen for final test.
2. Above 1GHz, the channel 1, 6, and 11 were tested individually.
3. From our experience and technical viewpoint, we have chosen data rates, 11Mbps with CCK technique and 6Mbps with OFDM technique, as the worst cases for the test among other data rates.

One channel is provided to this EUT for Turbo Mode.

Channel	Frequency
6	2437 MHz

NOTE: One turbo mode at frequency 2437MHz.

For 802.11a: Thirteen channels are provided to this EUT for Normal mode.

Channel	Frequency	Channel	Frequency
1	5180 MHz	8	5320 MHz
2	5200 MHz	9	5745 MHz
3	5220 MHz	10	5765 MHz
4	5240 MHz	11	5785 MHz
5	5260 MHz	12	5805 MHz
6	5280 MHz	13	5825 MHz
7	5300 MHz		

Five channels are provided to this EUT for Turbo Mode.

Channel	Frequency	Channel	Frequency
1	5210 MHz	4	5760 MHz
2	5250 MHz	5	5800 MHz
3	5290 MHz		

NOTE:

1. The EUT was tested in both normal mode (channel bandwidth of approximately 30MHz) and turbo mode (channel bandwidth of approximately 60MHz).
2. "Normal Mode" allows data rates of up to 54Mbps. The device was, therefore, tested in Normal mode at the data rate that produced the highest output power for normal mode (6Mbps).
3. "Turbo Mode" allows data rates of up to 108Mbps. At data rates higher than 12Mbps the PA gain is reduced to improve signal fidelity. The device was, therefore, tested in turbo mode at the data rate that produced the highest output power for turbo mode (12Mbps).
4. Channel 1, 4, 5, 8, 9, 11, 12 and 13 are the closest frequencies to the band edge, were chosen for final test of Normal Mode.
5. Channel 1~5 were chosen for final test of Turbo mode.



3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a Double 108 Mbps Wireless Firewall Router. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

**FCC Part 15, Subpart C. (15.247),
Subpart E (15.407). ANSI C63.4 : 2001**

All test items have been performed and recorded as per the above standards.

NOTE: The EUT is also considered as a kind of computer peripheral, because the connection to computer is necessary for typical use. It has been verified to comply with the requirements of FCC Part 15, Subpart B, Class B (DoC). The test report has been issued separately.



3.4 DESCRIPTION OF SUPPORT UNITS

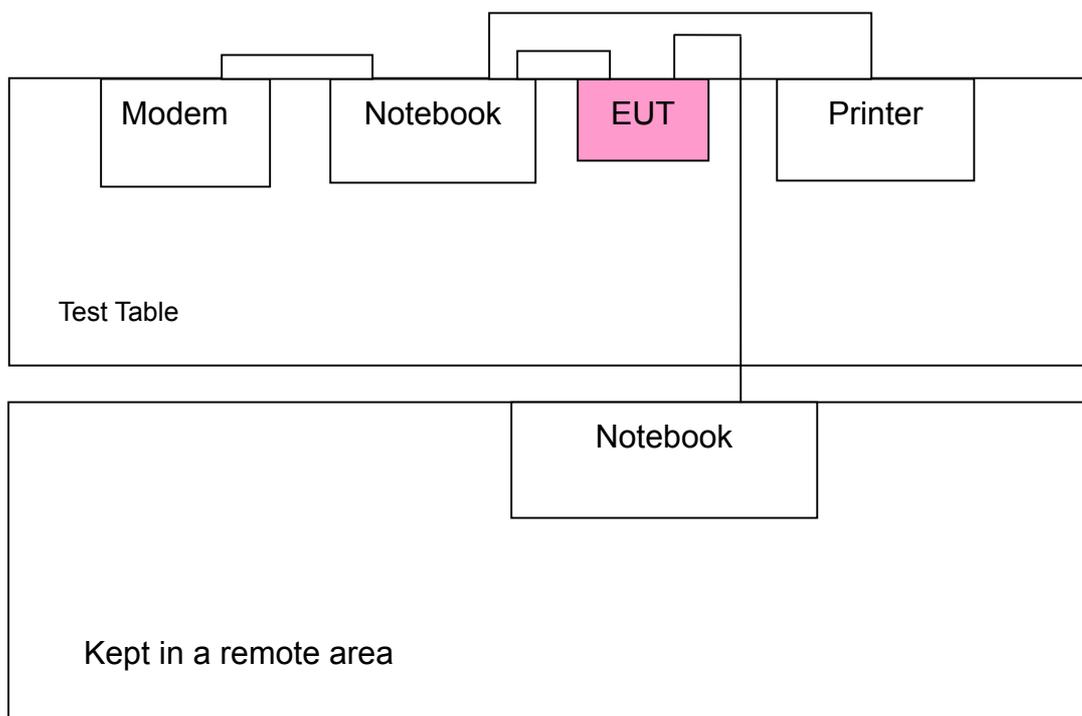
The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	NOTEBOOK COMPUTER	DELL	PP05L	25191592336	E2K24CLNS
2	NOTEBOOK COMPUTER	DELL	PP05L	12130898320	E2K24CLNS
3	PRINTER	EPSON	LQ-300+	DCGY047265	FCC DoC Approved
4	MODEM	ACEEX	1414V/3	0401008248	IFAXDM1414

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	NA
2	NA
3	1.2m shielded without core
4	1.2m shielded without core

- NOTE:** 1. All power cords of the above support units are non shielded (1.8m).
 2. Item 2 acted as a communication partner to transfer data.

3.5 CONFIGURATION OF SYSTEM UNDER TEST





4. TEST TYPES AND RESULTS (FOR PART 802.11b & 802.11g)

4.1 CONDUCTED EMISSION MEASUREMENT

4.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

FREQUENCY OF EMISSION (MHz)	CONDUCTED LIMIT (dB μ V)	
	Quasi-peak	Average
0.15-0.5	66 to 56	56 to 46
0.5-5	56	46
5-30	60	50

- NOTE:**
1. The lower limit shall apply at the transition frequencies.
 2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50 MHz.
 3. All emanations from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

4.1.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
Test Receiver ROHDE & SCHWARZ	ESCS30	100288	Dec. 11, 2004
RF signal cable Woken	5D-FB	Cable-HyC02-01	Mar. 07, 2005
LISN ROHDE & SCHWARZ	ESH2-Z5	100100	Mar. 10, 2005
LISN ROHDE & SCHWARZ	ESH3-Z5	100311	Mar. 04, 2005
Software ADT	ADT_Cond_V3	NA	NA

- NOTE:**
1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
 2. The test was performed in HwaYa Shielded Room 2.
 3. The VCCI Site Registration No. is C-2047.



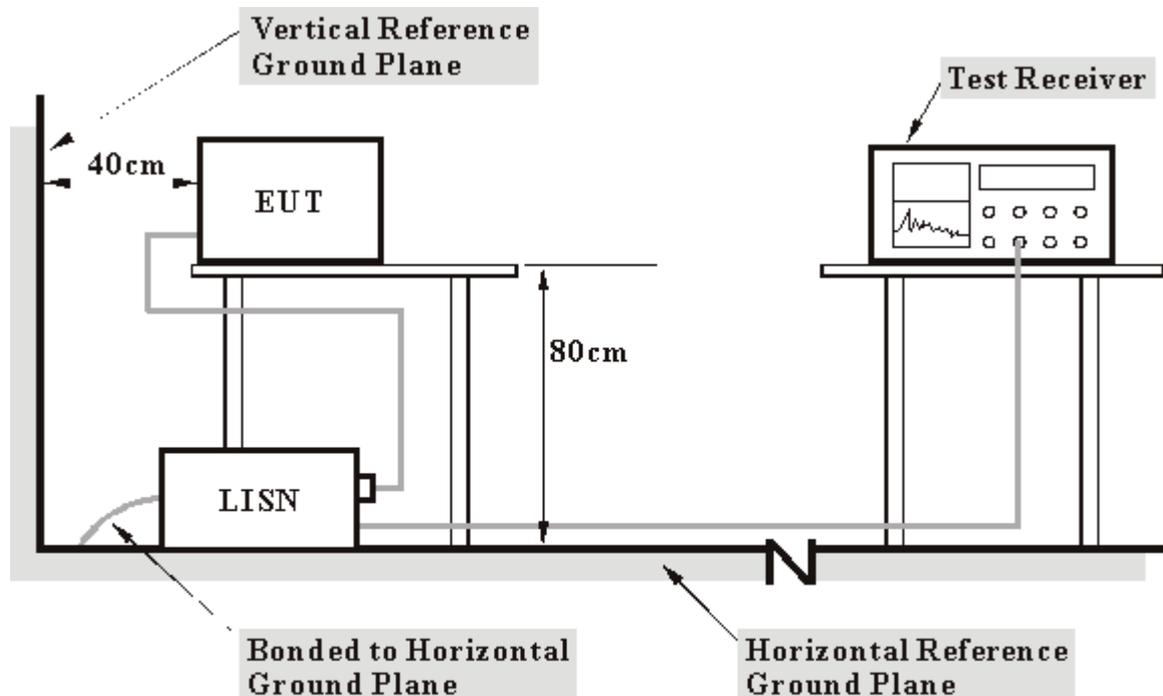
4.1.3 TEST PROCEDURES

- a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.
- b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
- c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

4.1.4 DEVIATION FROM TEST STANDARD

No deviation

4.1.5 TEST SETUP



- Note:**
1. Support units were connected to second LISN.
 2. Both of LISNs (AMN) 80 cm from EUT and at the least 80 cm from other units and other metal planes support units.

For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

4.1.6 EUT OPERATING CONDITIONS

- a. Connected the EUT to a notebook system placed on a testing table.
- b. The notebook system ran a test program (provided by manufacturer) to enable EUT under transmission/receiving condition continuously at specific channel frequency.
- c. The notebook system sent "H" messages to its screen.
- d. The notebook system sent "H" messages to modem.
- e. The notebook system sent "H" messages to printer, and the printer prints them on paper.
- f. Steps c-e are repeated.

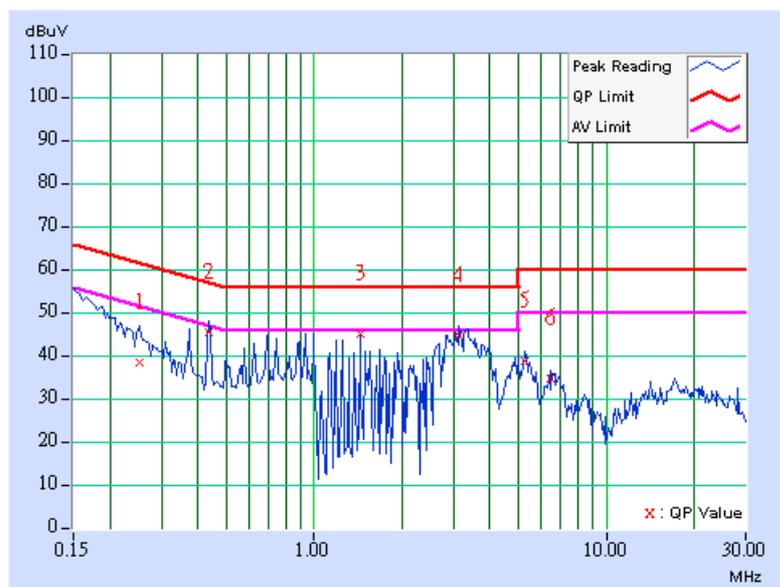


4.1.7 TEST RESULTS

EUT	Double 108 Mbps Wireless Firewall Router	MODEL	WGU624
MODE	Channel 1	6dB BANDWIDTH	9 kHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	PHASE	Line (L)
ENVIRONMENTAL CONDITIONS	24deg. C, 64%RH, 991hPa	TESTED BY	Rush Kao

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
	1	0.252	0.10	37.93	-	38.03	-	61.71	51.71	-23.67
2	0.435	0.12	45.21	-	45.33	-	57.15	47.15	-11.82	-
3	1.438	0.25	44.61	-	44.86	-	56.00	46.00	-11.14	-
4	3.125	0.29	44.39	-	44.68	-	56.00	46.00	-11.32	-
5	5.242	0.37	38.54	-	38.91	-	60.00	50.00	-21.09	-
6	6.426	0.42	34.41	-	34.83	-	60.00	50.00	-25.17	-

- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value = Emission level - Limit value
 5. Correction factor = Insertion loss + Cable loss
 6. Emission Level = Correction Factor + Reading Value.

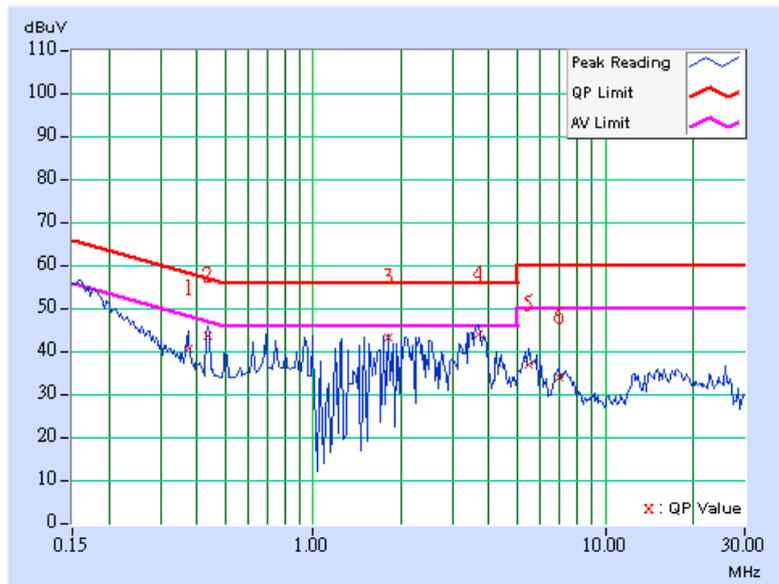




EUT	Double 108 Mbps Wireless Firewall Router	MODEL	WGU624
MODE	Channel 1	6dB BANDWIDTH	9 kHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	PHASE	Neutral (N)
ENVIRONMENTAL CONDITIONS	24deg. C, 64%RH, 991hPa	TESTED BY	Rush Kao

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
			1	0.373	0.11	40.39	-	40.50	-	58.44
2	0.435	0.12	43.15	-	43.27	-	57.15	47.15	-13.88	-
3	1.805	0.25	42.83	-	43.08	-	56.00	46.00	-12.92	-
4	3.676	0.29	43.74	-	44.03	-	56.00	46.00	-11.97	-
5	5.500	0.37	36.67	-	37.04	-	60.00	50.00	-22.96	-
6	6.977	0.42	33.80	-	34.22	-	60.00	50.00	-25.78	-

- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value = Emission level - Limit value
 5. Correction factor = Insertion loss + Cable loss
 6. Emission Level = Correction Factor + Reading Value.

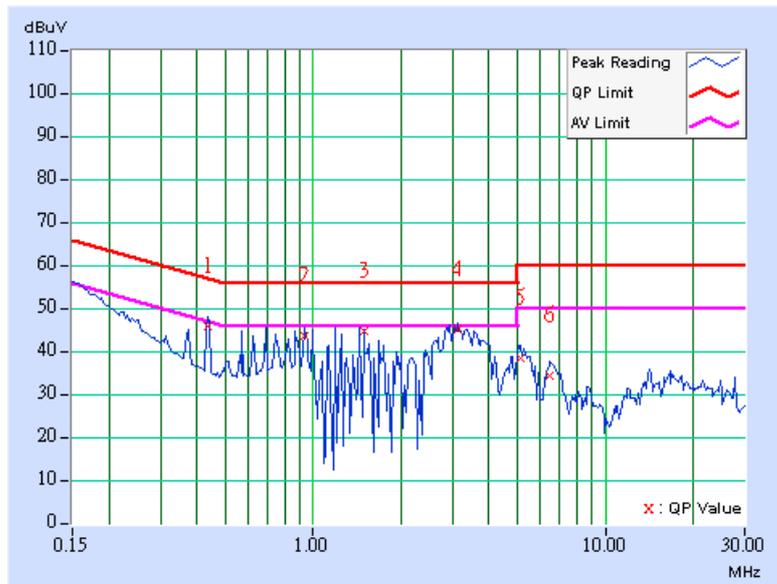




EUT	Double 108 Mbps Wireless Firewall Router	MODEL	WGU624
MODE	Channel 6	6dB BANDWIDTH	9 kHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	PHASE	Line (L)
ENVIRONMENTAL CONDITIONS	24deg. C, 64%RH, 991hPa	TESTED BY	Rush Kao

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
			1	0.435	0.12	45.40	-	45.52	-	57.15
2	0.935	0.23	43.13	-	43.36	-	56.00	46.00	-12.64	-
3	1.496	0.25	44.33	-	44.58	-	56.00	46.00	-11.42	-
4	3.125	0.29	44.85	-	45.14	-	56.00	46.00	-10.86	-
5	5.109	0.36	38.21	-	38.57	-	60.00	50.00	-21.43	-
6	6.477	0.42	34.12	-	34.54	-	60.00	50.00	-25.46	-

- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value = Emission level - Limit value
 5. Correction factor = Insertion loss + Cable loss
 6. Emission Level = Correction Factor + Reading Value.

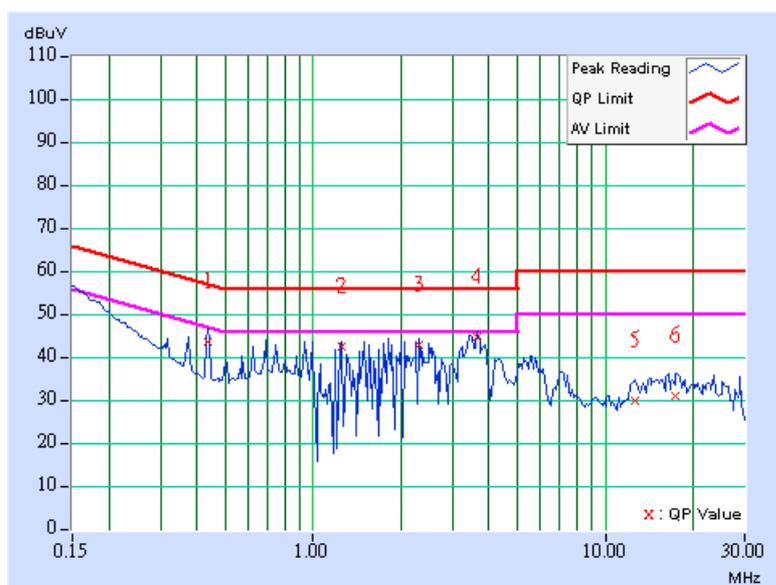




EUT	Double 108 Mbps Wireless Firewall Router	MODEL	WGU624
MODE	Channel 6	6dB BANDWIDTH	9 kHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	PHASE	Neutral (N)
ENVIRONMENTAL CONDITIONS	24deg. C, 64%RH, 991hPa	TESTED BY	Rush Kao

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
			1	0.435	0.12	43.07	-	43.19	-	57.15
2	1.250	0.24	42.11	-	42.35	-	56.00	46.00	-13.65	-
3	2.307	0.26	42.54	-	42.80	-	56.00	46.00	-13.20	-
4	3.629	0.29	44.07	-	44.36	-	56.00	46.00	-11.64	-
5	12.672	0.53	29.28	-	29.81	-	60.00	50.00	-30.19	-
6	17.473	0.60	30.69	-	31.29	-	60.00	50.00	-28.71	-

- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value = Emission level - Limit value
 5. Correction factor = Insertion loss + Cable loss
 6. Emission Level = Correction Factor + Reading Value.

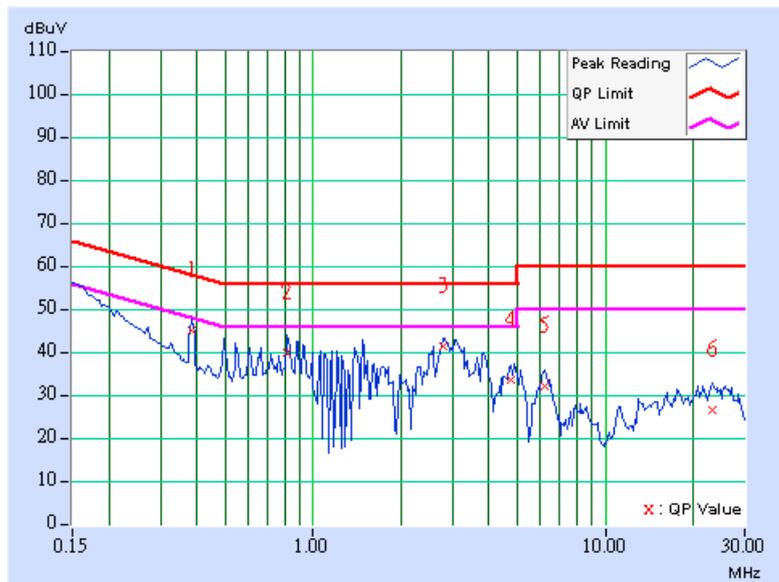




EUT	Double 108 Mbps Wireless Firewall Router	MODEL	WGU624
MODE	Channel 11	6dB BANDWIDTH	9 kHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	PHASE	Line (L)
ENVIRONMENTAL CONDITIONS	24deg. C, 64%RH, 991hPa	TESTED BY	Rush Kao

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
			1	0.384	0.11	43.96	-	44.07	-	58.18
2	0.818	0.21	39.00	-	39.21	-	56.00	46.00	-16.79	-
3	2.801	0.28	40.39	-	40.67	-	56.00	46.00	-15.33	-
4	4.742	0.35	32.67	-	33.02	-	56.00	46.00	-22.98	-
5	6.230	0.41	31.03	-	31.44	-	60.00	50.00	-28.56	-
6	23.199	1.07	25.51	-	26.58	-	60.00	50.00	-33.42	-

- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value = Emission level - Limit value
 5. Correction factor = Insertion loss + Cable loss
 6. Emission Level = Correction Factor + Reading Value.

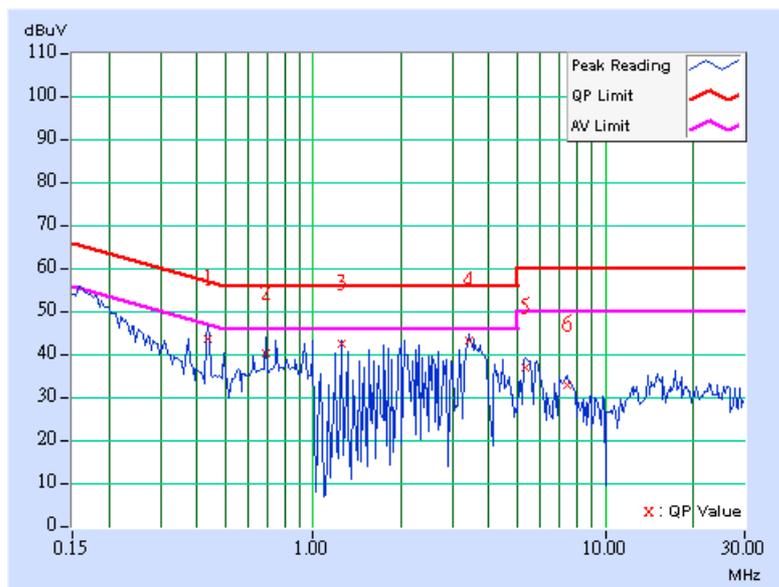




EUT	Double 108 Mbps Wireless Firewall Router	MODEL	WGU624
MODE	Channel 11	6dB BANDWIDTH	9 kHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	PHASE	Neutral (N)
ENVIRONMENTAL CONDITIONS	23deg. C, 65%RH, 991hPa	TESTED BY	Rush Kao

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
			1	0.438	0.12	43.33	-	43.45	-	57.11
2	0.688	0.17	39.78	-	39.95	-	56.00	46.00	-16.05	-
3	1.249	0.24	42.02	-	42.26	-	56.00	46.00	-13.74	-
4	3.430	0.29	42.83	-	43.12	-	56.00	46.00	-12.88	-
5	5.316	0.36	36.57	-	36.93	-	60.00	50.00	-23.07	-
6	7.375	0.43	32.55	-	32.98	-	60.00	50.00	-27.02	-

- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value = Emission level - Limit value
 5. Correction factor = Insertion loss + Cable loss
 6. Emission Level = Correction Factor + Reading Value.





4.2 RADIATED EMISSION MEASUREMENT

4.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT

Emissions radiated outside of the specified bands, shall be according to the general radiated limits in 15.209 as following:

Frequencies (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

NOTE:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. As shown in 15.35(b), for frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.



4.2.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
Test Receiver ROHDE & SCHWARZ	ESIB7	100188	Jan. 13, 2005
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100039	Dec. 15, 2004
BILOG Antenna SCHWARZBECK	VULB9168	9168-157	Feb. 03, 2005
HORN Antenna SCHWARZBECK	BBHA 9120 D	9120D-407	Feb. 03, 2005
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA 9170241	Feb. 23, 2005
Preamplifier Agilent	8449B	3008A01961	Jan. 22, 2005
Preamplifier Agilent	8447D	2944A10629	Jan. 14, 2005
RF signal cable HUBER+SUHNER	SUCOFLEX 104	218182/4	Mar. 04, 2005
RF signal cable HUBER+SUHNER	SUCOFLEX 104	218194/4	Mar. 04, 2005
Software ADT.	ADT_Radiated_V5.1 4	NA	NA
Antenna Tower ADT.	AT100	AT93021702	NA
Turn Table ADT.	TT100.	TT93021702	NA
Controller ADT.	SC100.	SC93021702	NA

- NOTE:** 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in HwaYa Chamber 1.
3. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
4. The IC Site Registration No. is IC4924-2.



4.2.3 TEST PROCEDURES

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi- anechoic. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The antenna is a broadband antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. If the emission level of the EUT in peak mode was 10 dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10 dB margin would be re-tested one by one using the quasi-peak method or average method as specified and then reported in Data sheet peak mode and QP mode.

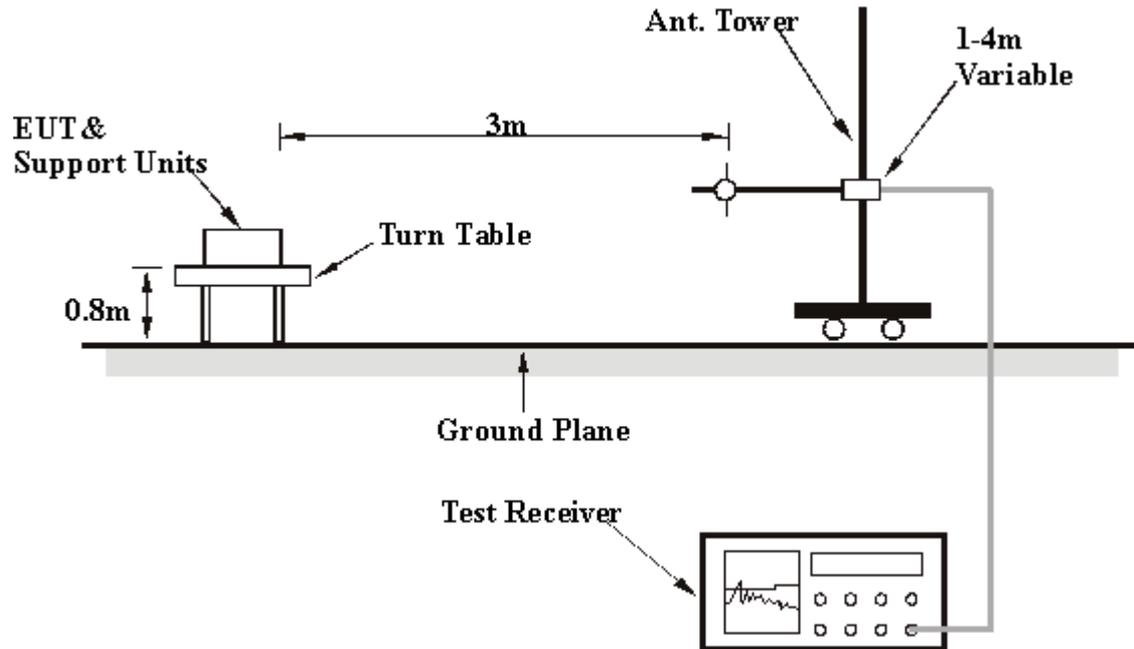
NOTE:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection at frequency below 1GHz.
2. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1 MHz for Peak detection (PK) at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 10 Hz for Average detection (AV) at frequency above 1GHz.

4.2.4 DEVIATION FROM TEST STANDARD

No deviation

4.2.5 TEST SETUP



For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

4.2.6 EUT OPERATING CONDITIONS

Same as 4.1.6



4.2.7 TEST RESULTS

EUT	Double 108 Mbps Wireless Firewall Router	MODEL	WGU624
CHANNEL	Channel 11	FREQUENCY RANGE	Below 1000MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	26deg. C, 62%RH, 991hPa	TESTED BY	Rush Kao

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	109.70	34.97 QP	43.50	-8.53	1.50 H	262	23.11	11.86
2	199.12	35.83 QP	43.50	-7.67	1.50 H	43	24.49	11.34
3	249.66	44.48 QP	46.00	-1.52	1.00 H	307	31.38	13.11
4	329.36	40.10 QP	46.00	-5.90	1.00 H	316	25.03	15.06
5	399.34	35.72 QP	46.00	-10.28	1.00 H	142	19.00	16.71
6	449.88	32.17 QP	46.00	-13.83	1.50 H	55	14.17	18.00
7	550.96	36.65 QP	46.00	-9.35	1.50 H	112	17.16	19.49
8	599.56	35.39 QP	46.00	-10.61	1.50 H	25	14.57	20.82

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	55.87	38.35 QP	40.00	-1.65	1.05 V	97	24.33	14.02
2	109.70	37.59 QP	43.50	-5.91	1.00 V	256	25.74	11.86
3	249.66	42.53 QP	46.00	-3.47	1.00 V	340	29.43	13.11
4	300.20	37.13 QP	46.00	-8.87	1.50 V	94	22.72	14.41
5	329.36	35.67 QP	46.00	-10.33	1.50 V	85	20.61	15.06
6	550.96	38.82 QP	46.00	-7.18	1.00 V	262	19.34	19.49
7	770.62	39.79 QP	46.00	-6.21	1.50 V	265	16.46	23.33
8	881.42	39.62 QP	46.00	-6.38	1.25 V	232	15.15	24.48

- REMARKS:**
1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB)
 2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level – Limit value



EUT	Double 108 Mbps Wireless Firewall Router	MODEL	WGU624
CHANNEL	Channel 1	MODE	CCK
INPUT POWER (SYSTEM)	120Vac, 60 Hz	FREQUENCY RANGE	1 ~ 25GHz
ENVIRONMENTAL CONDITIONS	26deg. C, 62%RH, 991hPa	DETECTOR FUNCTION	Peak(PK) Average (AV)
TESTED BY	Match Tsui		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1100.00	42.40 PK	74.00	-31.60	1.00 H	308	15.70	26.70
1	1100.00	36.55 AV	54.00	-17.45	1.00 H	308	9.85	26.70
2	2320.00	54.04 PK	74.00	-19.96	1.00 H	279	22.46	31.58
2	2320.00	42.62 AV	54.00	-11.38	1.00 H	279	11.04	31.58
3	2390.00	53.96 PK	74.00	-20.04	1.00 H	6	22.16	31.80
3	2390.00	45.61 AV	54.00	-8.39	1.00 H	6	13.81	31.80
4	*2412.00	110.93 PK			1.00 H	6	79.06	31.87
4	*2412.00	102.58 AV			1.00 H	6	70.71	31.87
5	4824.00	52.25 PK	74.00	-21.75	1.00 H	6	14.14	38.11
6	7236.00	57.59 PK	74.00	-16.41	1.00 H	223	14.54	43.05
6	7236.00	46.13 AV	54.00	-7.87	1.00 H	223	3.08	43.05

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1100.00	46.03 PK	74.00	-27.97	1.00 V	227	19.33	26.70
1	1100.00	41.50 AV	54.00	-12.50	1.00 V	227	14.80	26.70
2	2320.00	64.17 PK	74.00	-9.83	1.10 V	8	32.59	31.58
2	2320.00	52.49 AV	54.00	-1.51	1.10 V	8	20.91	31.58
3	2390.00	57.80 PK	74.00	-16.20	1.16 V	26	26.00	31.80
3	2390.00	49.35 AV	54.00	-4.65	1.16 V	26	17.55	31.80
4	*2412.00	114.77 PK			1.16 V	26	82.90	31.87
4	*2412.00	106.32 AV			1.16 V	26	74.45	31.87
5	4824.00	52.14 PK	74.00	-21.86	1.10 V	357	14.03	38.11
6	7236.00	59.22 PK	74.00	-14.78	1.10 V	180	16.17	43.05
6	7236.00	48.86 AV	54.00	-5.14	1.10 V	180	5.81	43.05

- REMARKS:**
1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB)
 2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level – Limit value.
 5. The limit value is defined as per 15.247
 6. “ * ” : Fundamental frequency



EUT	Double 108 Mbps Wireless Firewall Router	MODEL	WGU624
CHANNEL	Channel 6	FREQUENCY RANGE	1 ~ 25GHz
ENVIRONMENTAL CONDITIONS	26deg. C, 62%RH, 991hPa	DETECTOR FUNCTION	Peak(PK) Average (AV)
INPUT POWER (SYSTEM)	120Vac, 60 Hz	MODE	CCK
TESTED BY	Match Tsui		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1000.00	46.69 PK	74.00	-27.31	1.03 H	287	20.35	26.34
1	1000.00	40.45 AV	54.00	-13.55	1.03 H	287	14.11	26.34
2	2320.00	53.76 PK	74.00	-20.24	1.18 H	259	22.18	31.58
2	2320.00	38.90 AV	54.00	-15.10	1.18 H	259	7.32	31.58
3	*2437.00	106.63 PK			1.03 H	7	74.68	31.95
3	*2437.00	97.79 AV			1.03 H	7	65.84	31.95
4	7311.00	55.53 PK	74.00	-18.47	1.03 H	351	12.56	42.97
4	7311.00	43.08 AV	54.00	-10.92	1.03 H	351	0.11	42.97

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1000.00	46.63 PK	74.00	-27.37	1.24 V	355	20.29	26.34
1	1000.00	39.79 AV	54.00	-14.21	1.24 V	355	13.45	26.34
2	2320.00	63.33 PK	74.00	-10.67	1.20 V	33	31.75	31.58
2	2320.00	47.53 AV	54.00	-6.47	1.20 V	33	15.95	31.58
3	*2437.00	114.77 PK			1.06 V	313	82.82	31.95
3	*2437.00	106.03 AV			1.06 V	313	74.08	31.95
4	7311.00	61.36 PK	74.00	-12.64	1.33 V	335	18.39	42.97
4	7311.00	51.22 AV	54.00	-2.78	1.33 V	335	8.25	42.97

- REMARKS:**
1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB)
 2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level – Limit value.
 5. The limit value is defined as per 15.247
 6. " * " : Fundamental frequency



EUT	Double 108 Mbps Wireless Firewall Router	MODEL	WGU624
CHANNEL	Channel 11	FREQUENCY RANGE	1 ~ 25GHz
ENVIRONMENTAL CONDITIONS	26deg. C, 62%RH, 991hPa	MODE	CCK
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak(PK) Average (AV)
TESTED BY	Match Tsui		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1100.00	41.65 PK	74.00	-32.35	1.39 H	220	14.95	26.70
1	1100.00	34.52 AV	54.00	-19.48	1.39 H	220	7.82	26.70
2	2320.00	52.15 PK	74.00	-21.85	1.39 H	75	20.57	31.58
2	2320.00	40.02 AV	54.00	-13.98	1.39 H	75	8.44	31.58
3	*2462.00	106.51 PK			1.19 H	352	74.49	32.02
3	*2462.00	98.17 AV			1.19 H	352	66.15	32.02
4	2483.50	48.37 PK	74.00	-25.63	1.19 H	352	16.28	32.09
4	2483.50	40.03 AV	54.00	-13.97	1.19 H	352	7.94	32.09
5	7386.00	56.56 PK	74.00	-17.44	1.41 H	62	14.02	42.55
5	7386.00	44.95 AV	54.00	-9.05	1.41 H	62	2.41	42.55

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1100.00	44.95 PK	74.00	-29.05	1.23 V	125	18.25	26.70
1	1100.00	40.53 AV	54.00	-13.47	1.23 V	125	13.83	26.70
2	2320.00	64.18 PK	74.00	-9.82	1.40 V	282	32.60	31.58
2	2320.00	52.01 AV	54.00	-1.99	1.40 V	282	20.43	31.58
3	*2462.00	116.33 PK			1.02 V	335	84.31	32.02
3	*2462.00	107.39 AV			1.02 V	335	75.37	32.02
4	2483.50	57.90 PK	74.00	-16.10	1.02 V	335	25.81	32.09
4	2483.50	49.25 AV	54.00	-4.75	1.02 V	335	17.16	32.09
5	7386.00	62.59 PK	74.00	-11.41	1.04 V	340	20.05	42.55
5	7386.00	51.79 AV	54.00	-2.21	1.04 V	340	9.25	42.55
6	9848.00	48.08 PK	74.00	-25.92	1.25 V	341	12.75	35.33
6	9848.00	40.03 AV	54.00	-13.97	1.25 V	341	4.70	35.33

- REMARKS:**
1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB)
 2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level – Limit value.
 5. The limit value is defined as per 15.247
 6. " * " : Fundamental frequency

**Normal mode**

EUT	Double 108 Mbps Wireless Firewall Router	MODEL	WGU624
CHANNEL	Channel 1	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 60%RH, 991hPa	MODE	OFDM
TESTED BY	Match Tsui		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1000.00	47.07 PK	74.00	-26.93	1.15 H	287	20.73	26.34
1	1000.00	40.88 AV	54.00	-13.12	1.15 H	287	14.54	26.34
2	2320.00	50.11 PK	74.00	-23.89	1.14 H	121	18.53	31.58
2	2320.00	38.17 AV	54.00	-15.83	1.14 H	121	6.59	31.58
3	2390.00	52.24 PK	74.00	-21.76	1.00 H	354	20.44	31.80
3	2390.00	41.86 AV	54.00	-12.14	1.00 H	354	10.06	31.80
4	*2412.00	101.26 PK			1.00 H	354	69.39	31.87
4	*2412.00	90.88 AV			1.00 H	354	59.01	31.87
5	7236.00	54.70 PK	74.00	-19.30	1.14 H	278	11.65	43.05

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1100.00	45.79 PK	74.00	-28.21	1.18 V	125	19.09	26.70
1	1100.00	40.86 AV	54.00	-13.14	1.18 V	125	14.16	26.70
2	2320.00	59.52 PK	74.00	-14.48	1.13 V	268	27.94	31.58
2	2320.00	48.11 AV	54.00	-5.89	1.13 V	268	16.53	31.58
3	2390.00	62.15 PK	74.00	-11.85	1.04 V	1	30.35	31.80
3	2390.00	52.10 AV	54.00	-1.90	1.04 V	1	20.30	31.80
4	*2412.00	111.17 PK			1.04 V	1	79.30	31.87
4	*2412.00	101.12 AV			1.04 V	1	69.25	31.87
5	7236.00	58.28 PK	74.00	-15.72	1.29 V	182	15.23	43.05
5	7236.00	43.13 AV	54.00	-10.87	1.29 V	182	0.08	43.05

- REMARKS:**
1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB)
 2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level – Limit value.
 5. The limit value is defined as per 15.247
 6. “ * “ : Fundamental frequency



EUT	Double 108 Mbps Wireless Firewall Router	MODEL	WGU624
CHANNEL	Channel 6	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 60%RH, 991hPa	MODE	OFDM
TESTED BY	Match Tsui		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1000.00	46.51 PK	74.00	-27.49	1.00 H	290	20.17	26.34
1	1000.00	40.33 AV	54.00	-13.67	1.00 H	290	13.99	26.34
2	2320.00	54.41 PK	74.00	-19.59	1.00 H	278	22.83	31.58
2	2320.00	41.98 AV	54.00	-12.02	1.00 H	278	10.40	31.58
3	*2437.00	103.00 PK			1.18 H	350	71.05	31.95
3	*2437.00	92.72 AV			1.18 H	350	60.77	31.95
4	7311.00	58.17 PK	74.00	-15.83	1.17 H	212	15.20	42.97

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1000.00	46.03 PK	74.00	-27.97	1.28 V	358	19.69	26.34
1	1000.00	39.89 AV	54.00	-14.11	1.28 V	358	13.55	26.34
2	2320.00	62.33 PK	74.00	-11.67	1.32 V	323	30.75	31.58
2	2320.00	50.84 AV	54.00	-3.16	1.32 V	323	19.26	31.58
3	*2437.00	114.45 PK			1.33 V	10	82.50	31.95
3	*2437.00	103.87 AV			1.33 V	10	71.92	31.95
4	7311.00	65.24 PK	74.00	-8.76	1.34 V	333	22.27	42.97

- REMARKS:**
1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB)
 2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level – Limit value.
 5. The limit value is defined as per 15.247
 6. “ * “ : Fundamental frequency



EUT	Double 108 Mbps Wireless Firewall Router	MODEL	WGU624
CHANNEL	Channel 11	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 60%RH, 991hPa	MODE	OFDM
TESTED BY	Match Tsui		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1000.00	46.49 PK	74.00	-27.51	1.15 H	288	20.15	26.34
1	1000.00	40.15 AV	54.00	-13.85	1.15 H	288	13.81	26.34
2	2320.00	53.85 PK	74.00	-20.15	1.18 H	257	22.27	31.58
2	2320.00	41.99 AV	54.00	-12.01	1.18 H	257	10.41	31.58
3	2462.00	102.32 PK	74.00	28.32	1.36 H	228	70.30	32.02
3	*2462.00	91.50 AV			1.36 H	228	59.48	32.02
4	*2483.50	50.71 PK			1.36 H	228	18.62	32.09
4	2483.50	39.89 AV	54.00	-14.11	1.36 H	228	7.80	32.09
5	7386.00	55.10 PK	74.00	-18.90	1.38 H	98	12.56	42.55

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1000.00	45.38 PK	74.00	-28.62	1.00 V	298	19.04	26.34
1	1000.00	37.77 AV	54.00	-16.23	1.00 V	298	11.43	26.34
2	2320.00	62.51 PK	74.00	-11.49	1.00 V	226	30.93	31.58
2	2320.00	51.19 AV	54.00	-2.83	1.00 V	226	19.59	31.58
3	*2462.00	113.23 PK			1.01 V	343	81.21	32.02
3	*2462.00	102.97 AV			1.01 V	343	70.95	32.02
4	2483.50	61.62 PK	74.00	-12.38	1.01 V	343	29.53	32.09
4	2483.50	51.36 AV	54.00	-2.64	1.01 V	343	19.27	32.09
5	7386.00	59.55 PK	74.00	-14.45	1.21 V	277	17.01	42.55
5	7386.00	43.57 AV	54.00	-10.43	1.21 V	277	1.03	42.55

- REMARKS:**
1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB)
 2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level – Limit value.
 5. The limit value is defined as per 15.247
 6. " * " : Fundamental frequency

**Turbo mode**

EUT	Double 108 Mbps Wireless Firewall Router	MODEL	WGU624
CHANNEL	Channel 6	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 55%RH, 991hPa	MODE	OFDM
TESTED BY	Match Tsui		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1100.00	43.37 PK	74.00	-30.63	1.00 H	155	15.51	27.86
1	1100.00	36.70 AV	54.00	-17.30	1.00 H	155	8.84	27.86
2	2320.00	52.64 PK	74.00	-21.36	1.00 H	67	19.91	32.73
2	2320.00	40.90 AV	54.00	-13.10	1.00 H	67	8.17	32.73
3	2390.00	51.72 PK	74.00	-22.28	1.04 H	9	18.87	32.85
3	2390.00	41.84 AV	54.00	-12.16	1.04 H	9	8.99	32.85
4	*2437.00	100.79 PK			1.04 H	9	67.72	33.07
4	*2437.00	90.91 AV			1.04 H	9	57.84	33.07
5	2483.50	47.26 PK	74.00	-26.74	1.04 H	9	13.94	33.32
6	7311.00	54.88 PK	74.00	-19.12	1.04 H	305	10.26	44.63

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1100.00	46.53 PK	74.00	-27.47	1.00 V	243	18.67	27.86
1	1100.00	42.39 AV	54.00	-11.61	1.00 V	243	14.53	27.86
2	2320.00	61.17 PK	74.00	-12.83	1.00 V	74	28.44	32.73
2	2320.00	48.84 AV	54.00	-5.16	1.00 V	74	16.11	32.73
3	2390.00	62.39 PK	74.00	-11.61	1.06 V	15	29.54	32.85
3	2390.00	52.60 AV	54.00	-1.40	1.06 V	15	19.75	32.85
4	*2437.00	111.46 PK			1.06 V	15	78.39	33.07
4	*2437.00	101.67 AV			1.06 V	15	68.60	33.07
5	2483.50	57.93 PK	74.00	-16.07	1.06 V	15	24.61	33.32
5	2483.50	48.14 AV	54.00	-5.86	1.06 V	15	14.82	33.32
6	7311.00	60.86 PK	74.00	-13.14	1.04 V	281	16.24	44.63
6	7311.00	46.81 AV	54.00	-7.19	1.04 V	281	2.19	44.63

- REMARKS:**
1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB)
 2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level – Limit value.
 5. The limit value is defined as per 15.247
 6. “ * “ : Fundamental frequency



4.3 6dB BANDWIDTH MEASUREMENT

4.3.1 LIMITS OF 6dB BANDWIDTH MEASUREMENT

The minimum of 6dB Bandwidth Measurement is 0.5 MHz.

4.3.2 TEST INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
SPECTRUM ANALYZER	FSEK 30	100049	Aug. 12, 2005

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

4.3.3 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.

4.3.4 DEVIATION FROM TEST STANDARD

No deviation

4.3.5 TEST SETUP



4.3.6 EUT OPERATING CONDITIONS

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



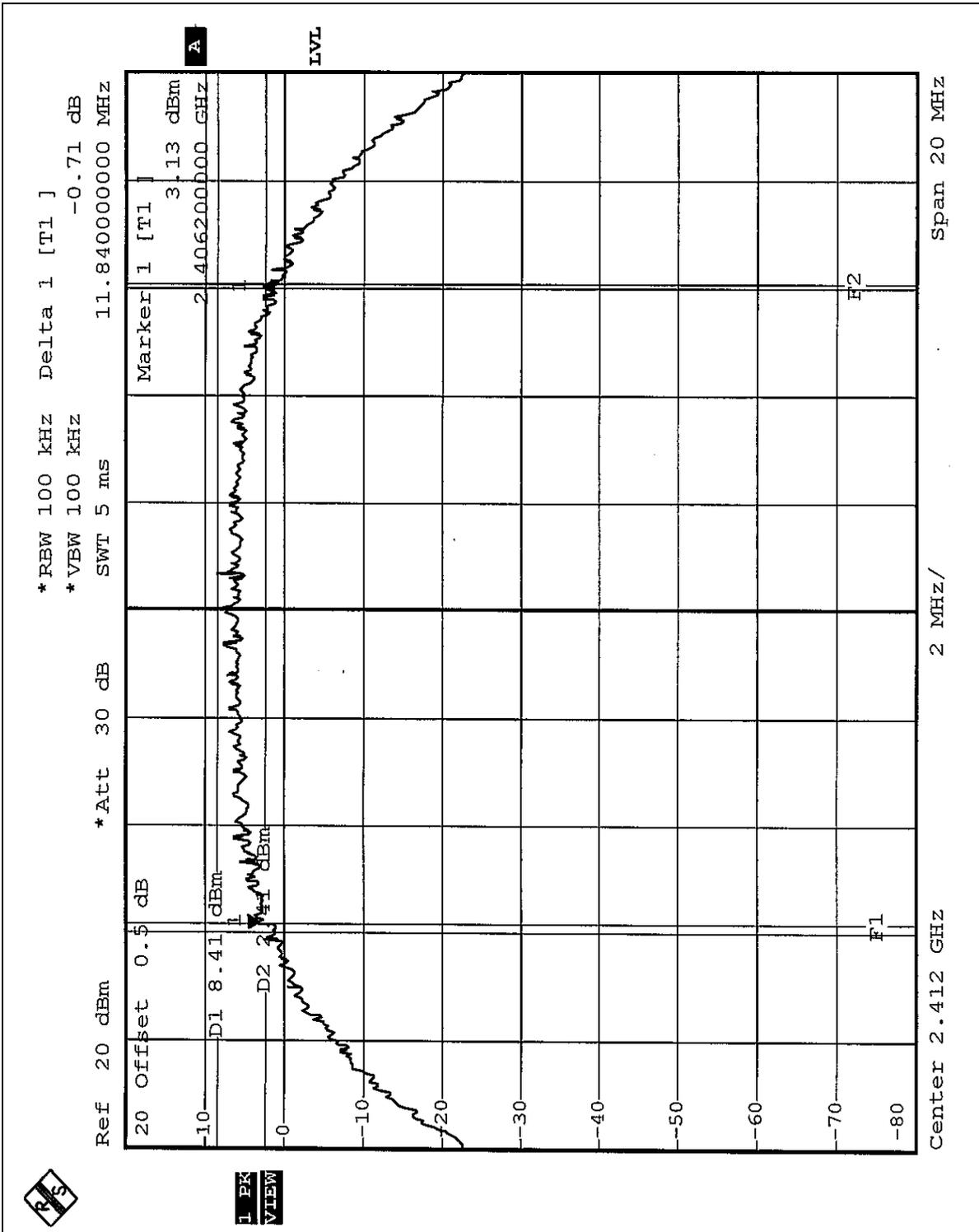
4.3.7 TEST RESULTS

EUT	Double 108 Mbps Wireless Firewall Router	MODEL	WGU624
MODE	CCK	INPUT POWER (SYSTEM)	120Vac, 60 Hz
ENVIRONMENTAL CONDITIONS	24deg. C, 65%RH, 991hPa	TESTED BY	Steven Lu

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS/FAIL
1	2412	11.84	0.5	PASS
6	2437	11.72	0.5	PASS
11	2462	11.68	0.5	PASS

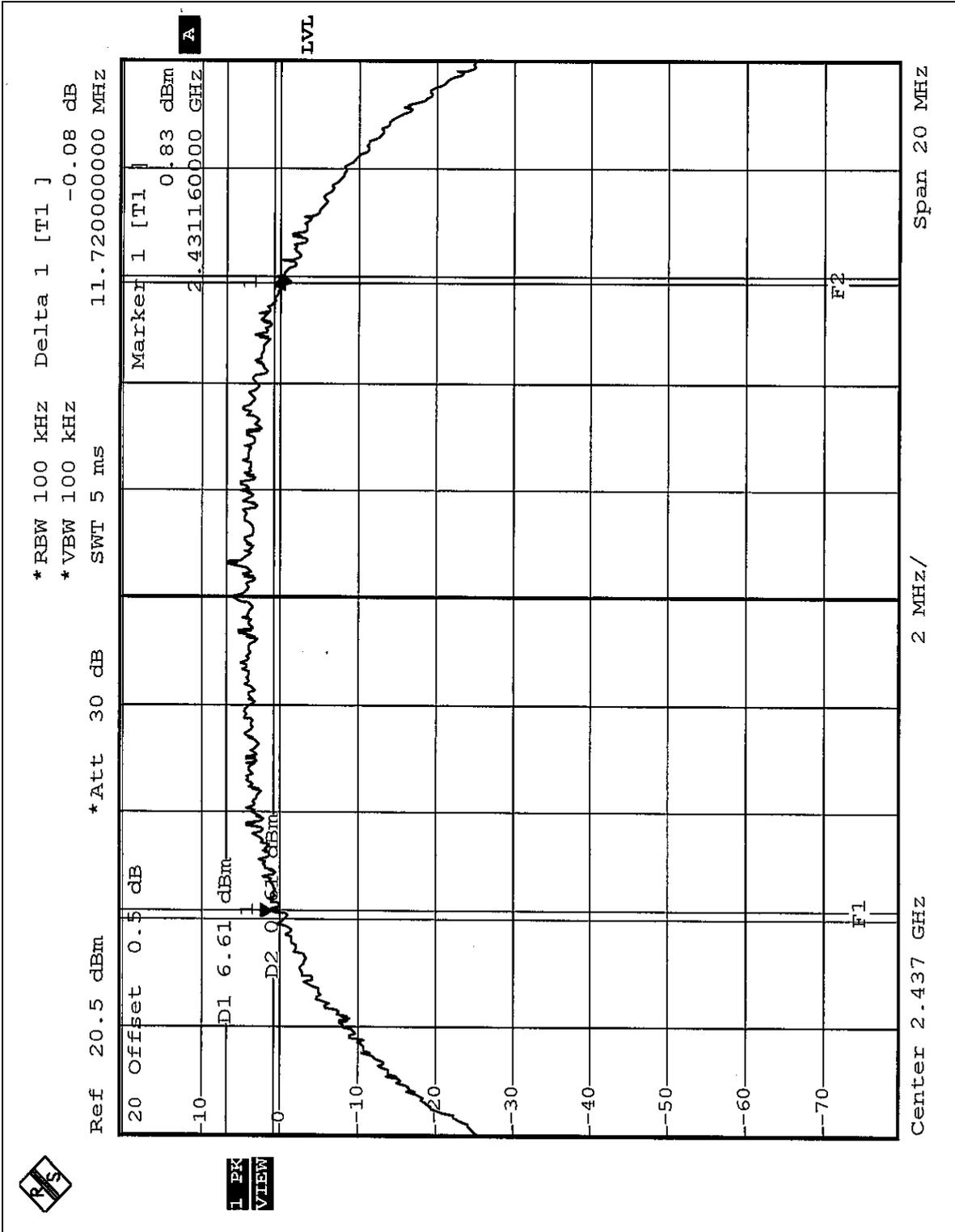


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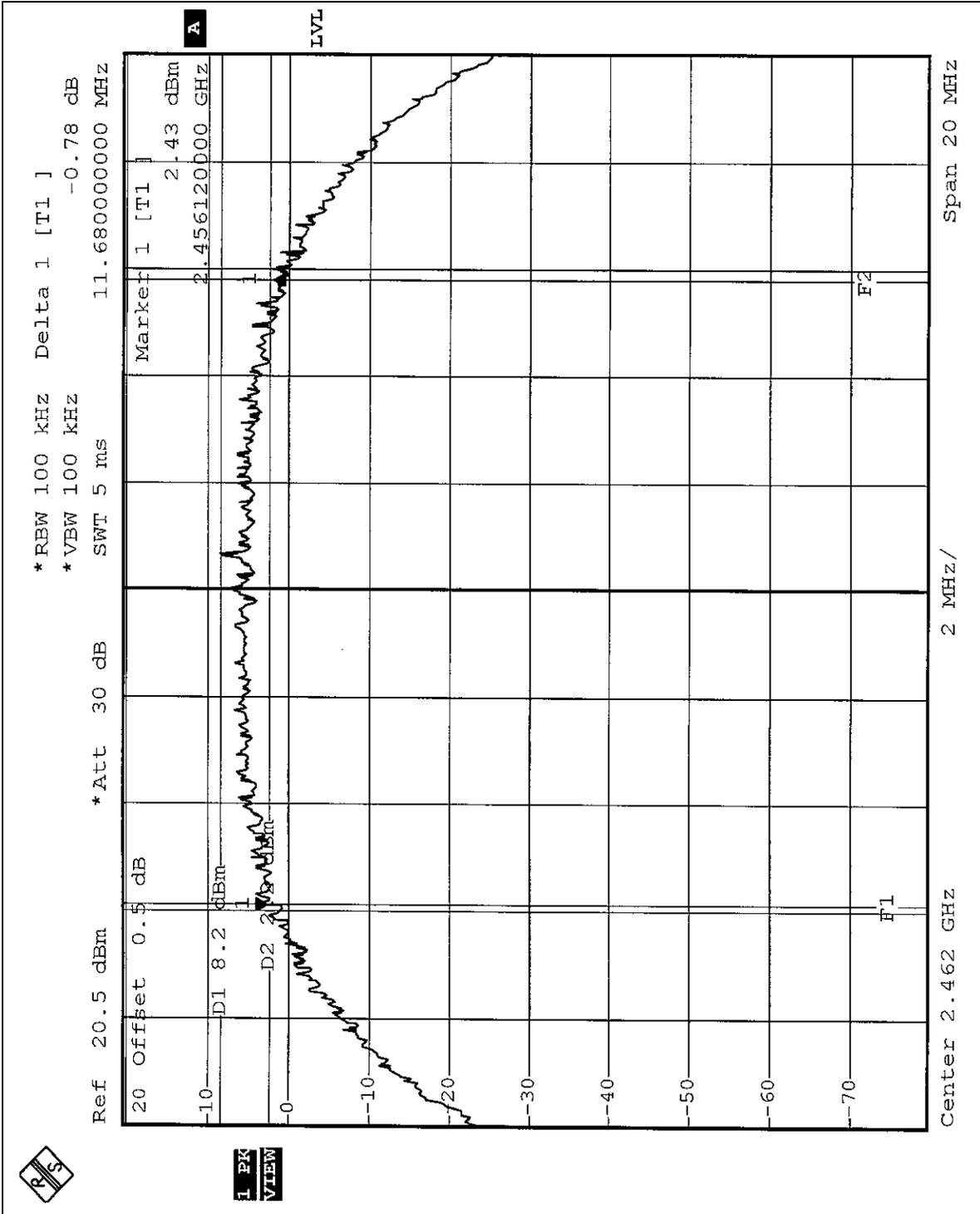


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CH11



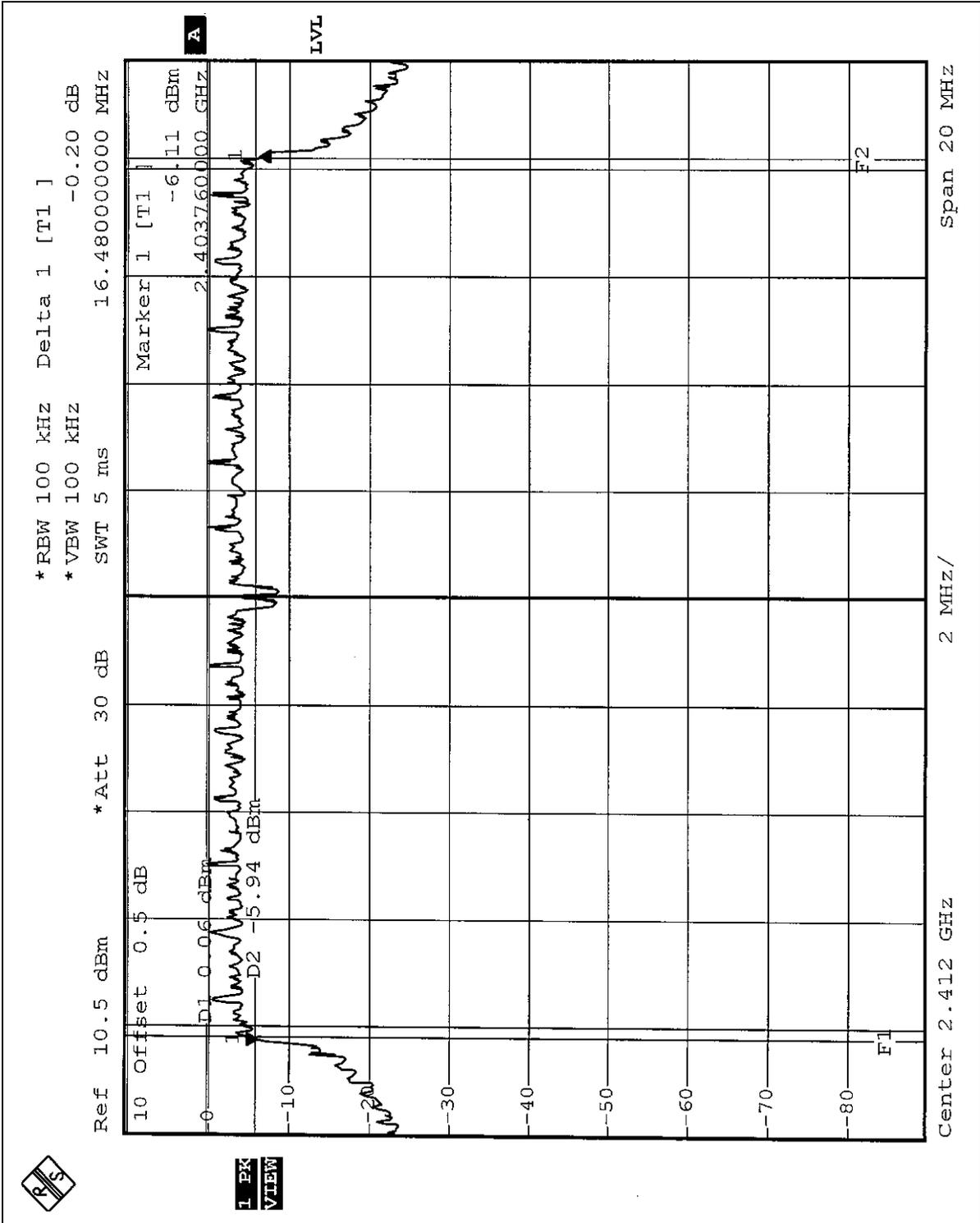
**Normal mode**

EUT	Double 108 Mbps Wireless Firewall Router	MODEL	WGU624
MODE	OFDM	INPUT POWER (SYSTEM)	120Vac, 60 Hz
ENVIRONMENTAL CONDITIONS	24deg. C, 65%RH, 991hPa	TESTED BY	Steven Lu

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS/FAIL
1	2412	16.48	0.5	PASS
6	2437	16.44	0.5	PASS
11	2462	16.40	0.5	PASS

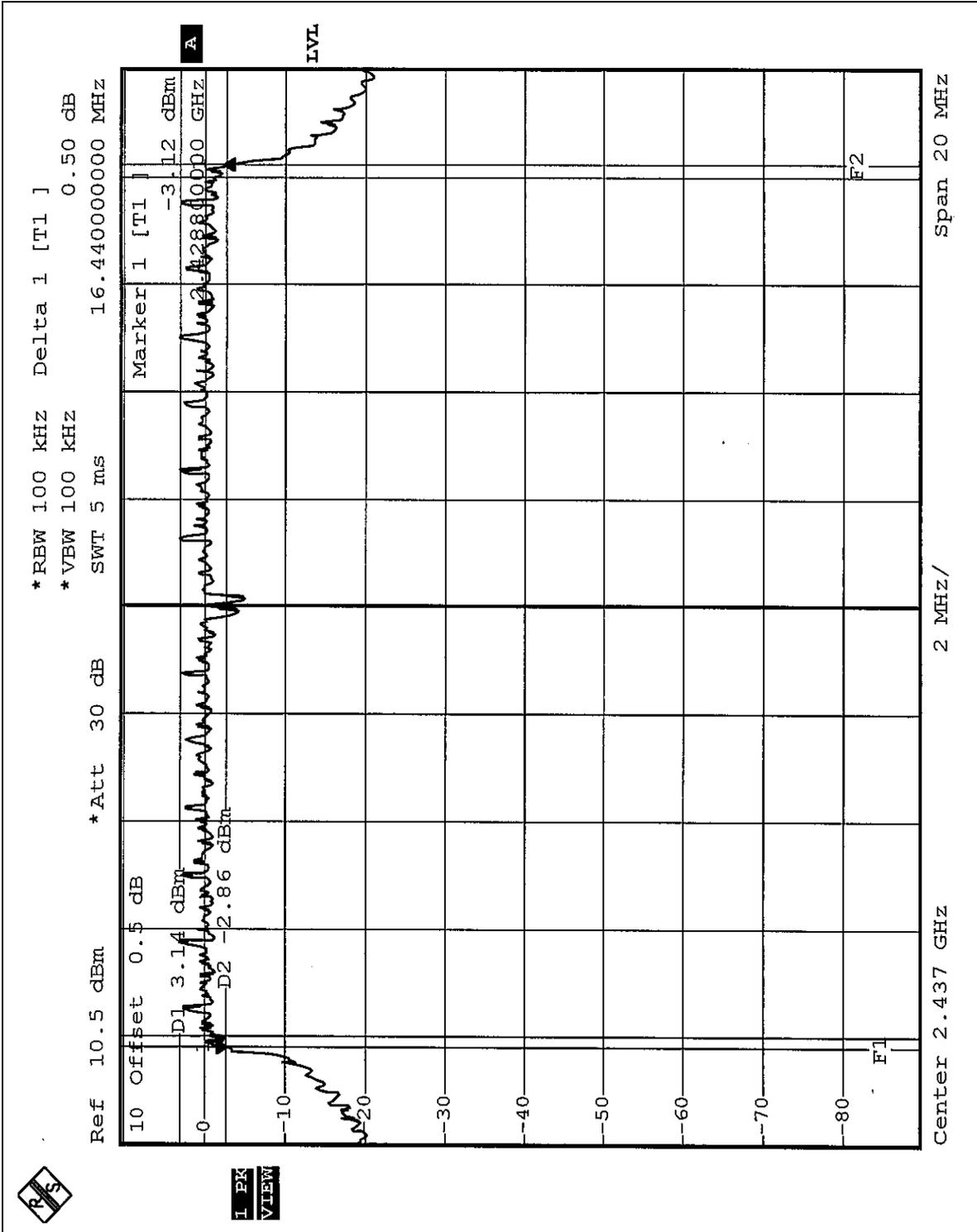


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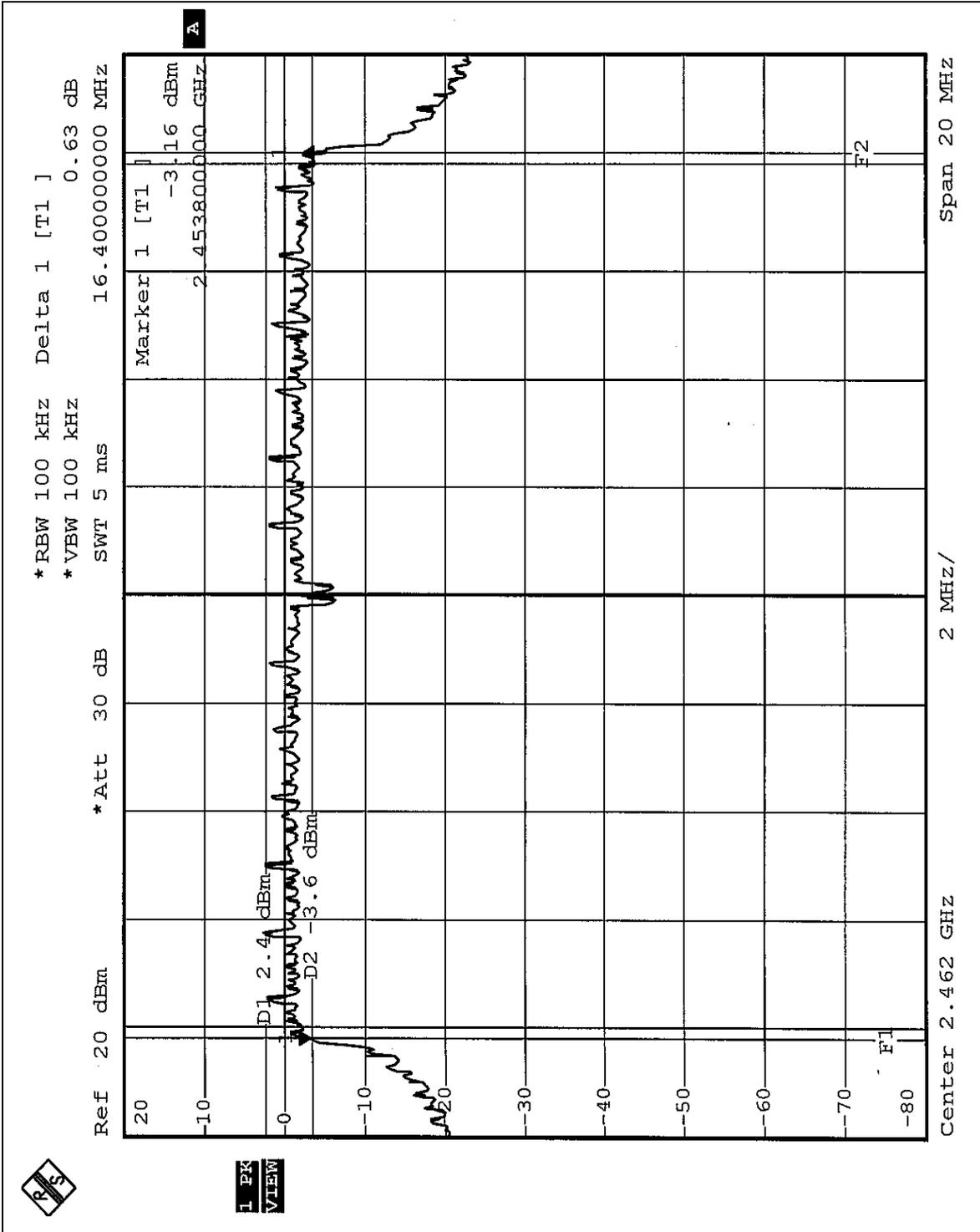


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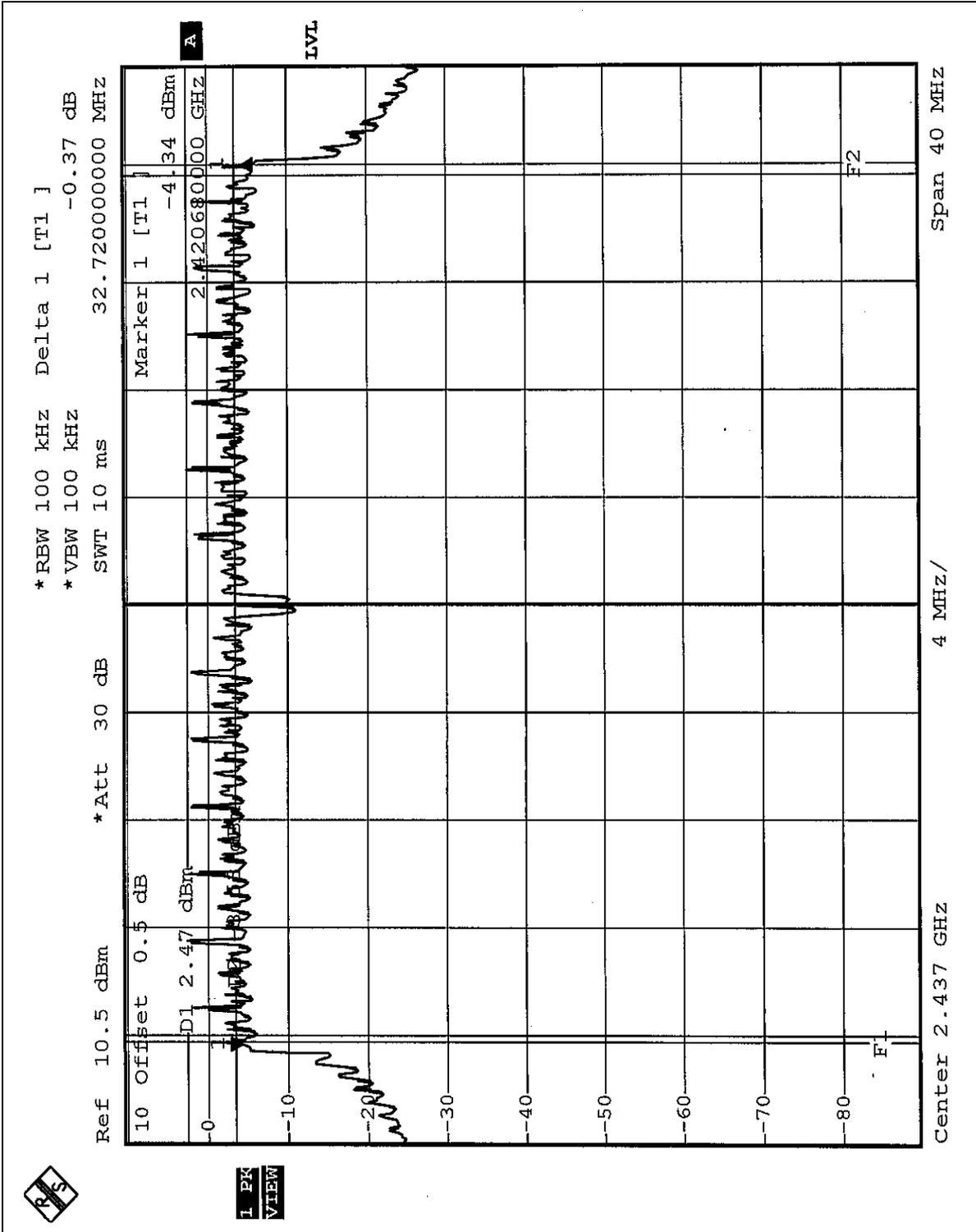
Turbo mode

EUT	Double 108 Mbps Wireless Firewall Router	MODEL	WGU624
MODE	OFDM	INPUT POWER (SYSTEM)	120Vac, 60 Hz
ENVIRONMENTAL CONDITIONS	24deg. C, 65%RH, 991hPa	TESTED BY	Steven Lu

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS/FAIL
6	2437	32.72	0.5	PASS



CH6



L PK VIEW



4.4 MAXIMUM PEAK OUTPUT POWER

4.4.1 LIMITS OF MAXIMUM PEAK OUTPUT POWER MEASUREMENT

The Maximum Peak Output Power Measurement is 30dBm.

4.4.2 INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
R&S SPECTRUM ANALYZER	FSEK30	100049	Aug. 12, 2005
AGILENT SIGNAL GENERATOR	E8257C	MY43320668	Dec. 31, 2004
TEKTRONIX OSCILLOSCOPE	TDS 1012	C019167	Feb. 01, 2005
NARDA DETECTOR	4503A	FSCM99899	NA

NOTE:

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



4.4.1 TEST PROCEDURES

1. A detector was used on the output port of the EUT. An oscilloscope was used to read the response of the detector.
2. Replaced the EUT by the signal generator . The center frequency of the S.G was adjusted to the center frequency of the measured channel.
3. Adjusted the power to have the same reading on oscilloscope. Record the power level.

4.4.2 DEVIATION FROM TEST STANDARD

No deviation

4.4.3 TEST SETUP



4.4.4 EUT OPERATING CONDITIONS

Same as Item 4.3.6



4.4.3 TEST RESULTS

EUT	Double 108 Mbps Wireless Firewall Router	MODEL	WGU624
INPUT POWER (SYSTEM)	120Vac, 60Hz	ENVIRONMENTAL CONDITIONS	24deg.C, 65%RH, 991hPa
MODE	CCK	TESTED BY	Steven Lu

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (dBm)	PASS/FAIL
1	2412	18.00	30	PASS
6	2437	17.00	30	PASS
11	2462	18.00	30	PASS

Normal mode

EUT	Double 108 Mbps Wireless Firewall Router	MODEL	WGU624
INPUT POWER (SYSTEM)	120Vac, 60Hz	ENVIRONMENTAL CONDITIONS	24deg.C, 65%RH, 991hPa
MODE	OFDM	TESTED BY	Steven Lu

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (dBm)	PASS/FAIL
1	2412	15.00	30	PASS
6	2437	18.00	30	PASS
11	2462	18.00	30	PASS

Turbo mode

EUT	Double 108 Mbps Wireless Firewall Router	MODEL	WGU624
INPUT POWER (SYSTEM)	120Vac, 60Hz	ENVIRONMENTAL CONDITIONS	24deg.C, 65%RH, 991hPa
MODE	OFDM	TESTED BY	Steven Lu

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (dBm)	PASS/FAIL
6	2437	17.04	30	PASS



4.5 POWER SPECTRAL DENSITY MEASUREMENT

4.5.1 LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT

The Maximum of Power Spectral Density Measurement is 8dBm.

4.5.2 TEST INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
R&S SPECTRUM ANALYZER	FSEK30	100049	Aug. 12, 2005

NOTE:

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

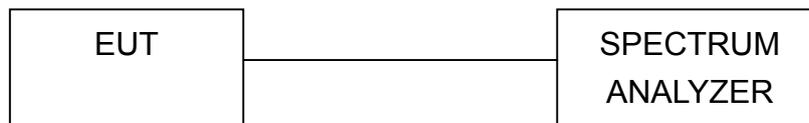
4.5.3 TEST PROCEDURE

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 3kHz RBW and 30kHz VBW, set sweep time = span/3kHz. The power spectral density was measured and recorded. The sweep time is allowed to be longer than span/3kHz for a full response of the mixer in the spectrum analyzer.

4.5.4 DEVIATION FROM TEST STANDARD

No deviation

4.5.5 TEST SETUP



4.5.6 EUT OPERATING CONDITION

Same as Item 4.3.6



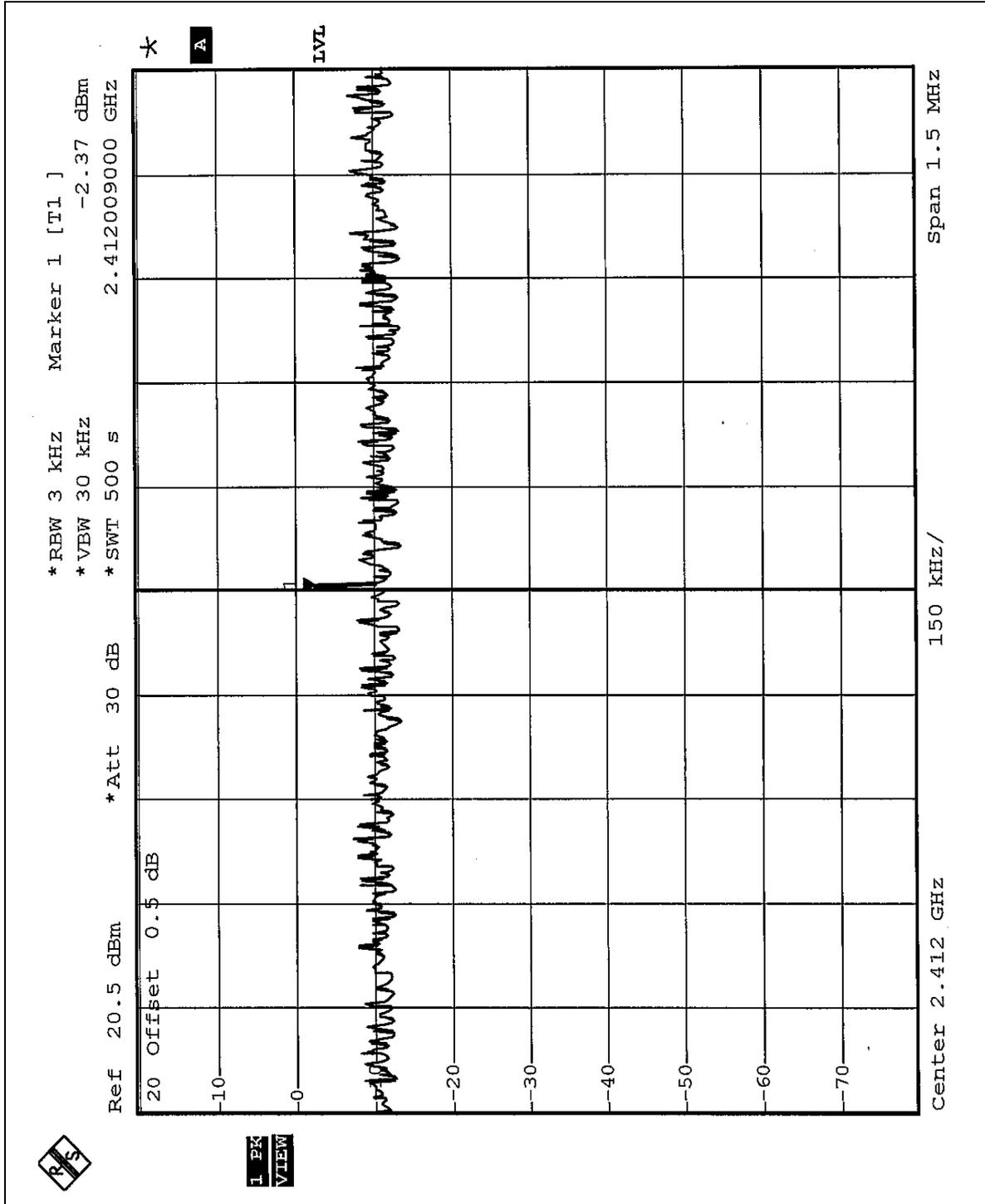
4.5.7 TEST RESULTS

EUT	Double 108 Mbps Wireless Firewall Router	MODEL	WGU624
INPUT POWER (SYSTEM)	120Vac, 60Hz	ENVIRONMENTAL CONDITIONS	24deg.C, 65%RH, 991hPa
MODE	CCK	TESTED BY	Steven Lu

CHANNEL	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3kHz BW (dBm)	MAXIMUM LIMIT (dBm)	PASS/FAIL
1	2412	-2.37	8	PASS
6	2437	-3.95	8	PASS
11	2462	-2.61	8	PASS

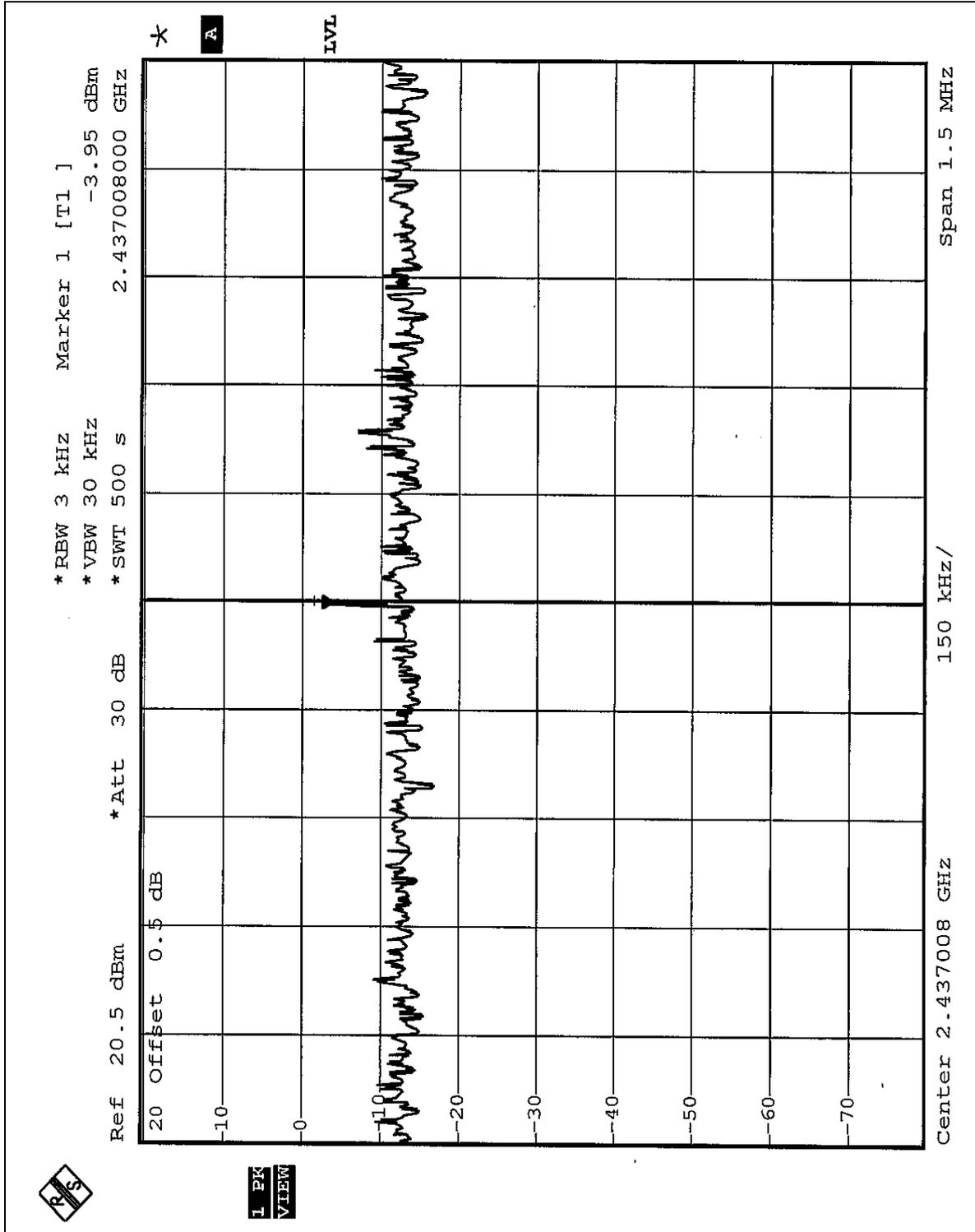


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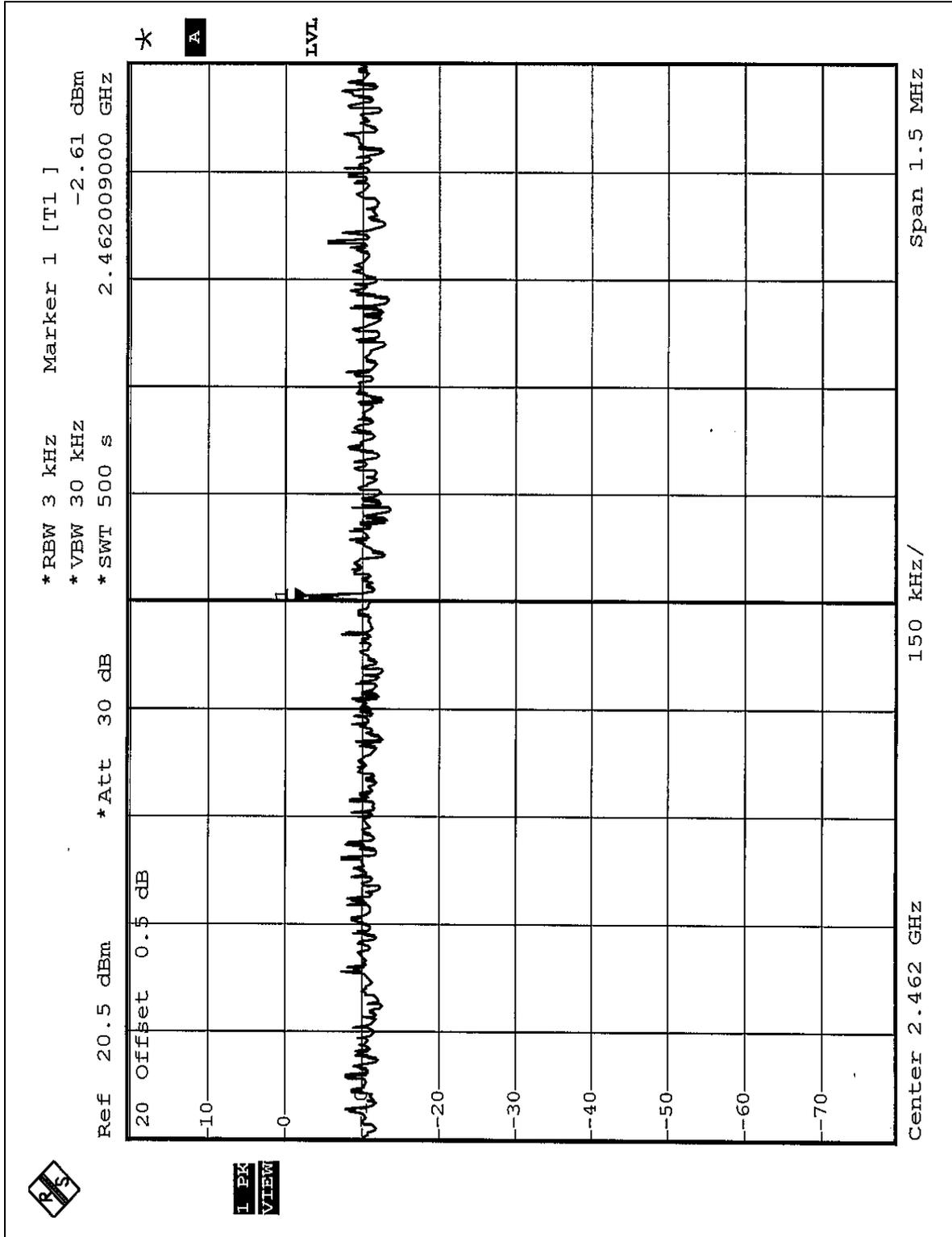


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CH11



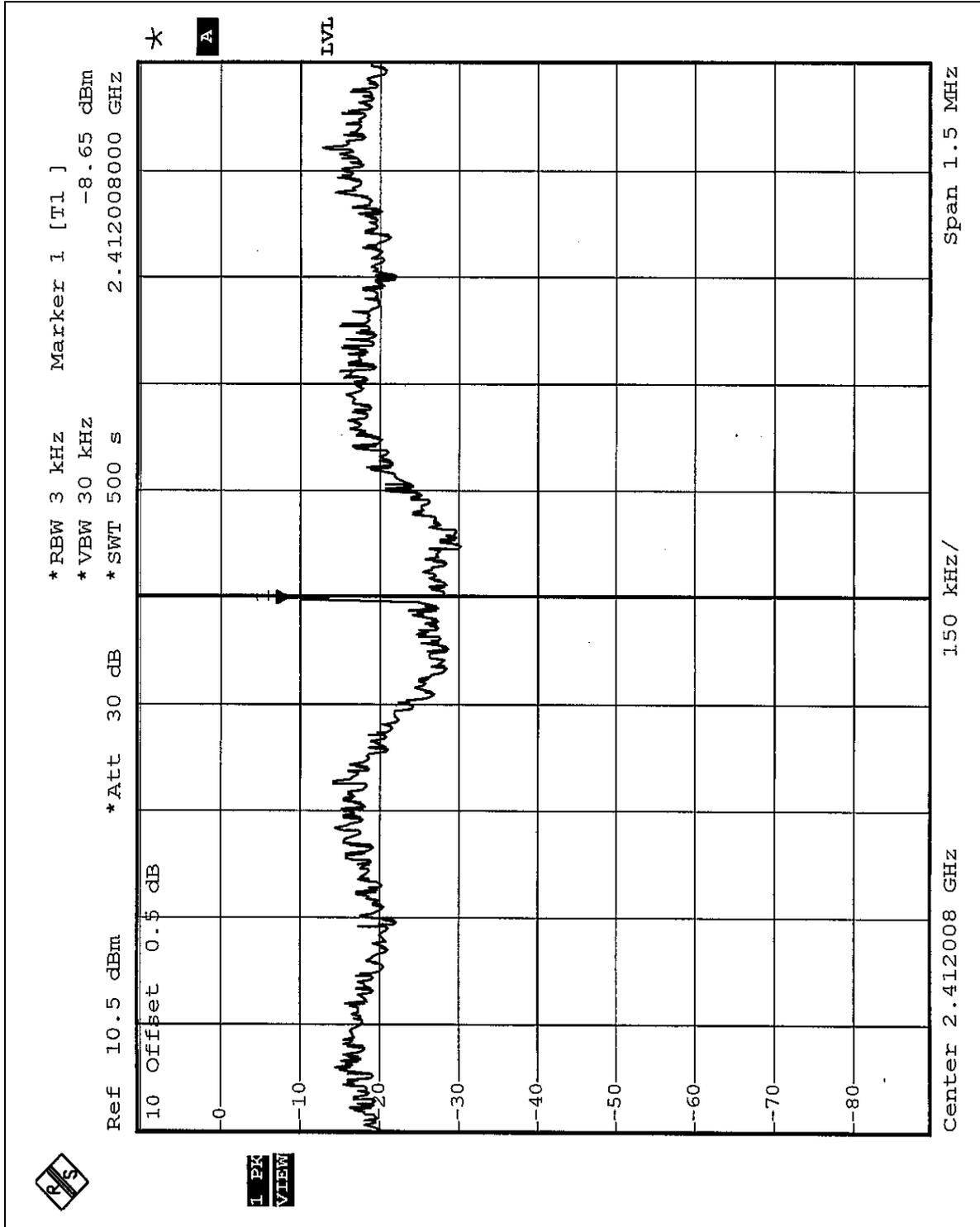
**Normal mode**

EUT	Double 108 Mbps Wireless Firewall Router	MODEL	WGU624
INPUT POWER (SYSTEM)	120Vac, 60Hz	ENVIRONMENTAL CONDITIONS	24deg.C, 65%RH, 991hPa
MODE	OFDM	TESTED BY	Steven Lu

CHANNEL	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3kHz BW (dBm)	MAXIMUM LIMIT (dBm)	PASS/FAIL
1	2412	-8.65	8	PASS
6	2437	-5.04	8	PASS
11	2462	-6.32	8	PASS

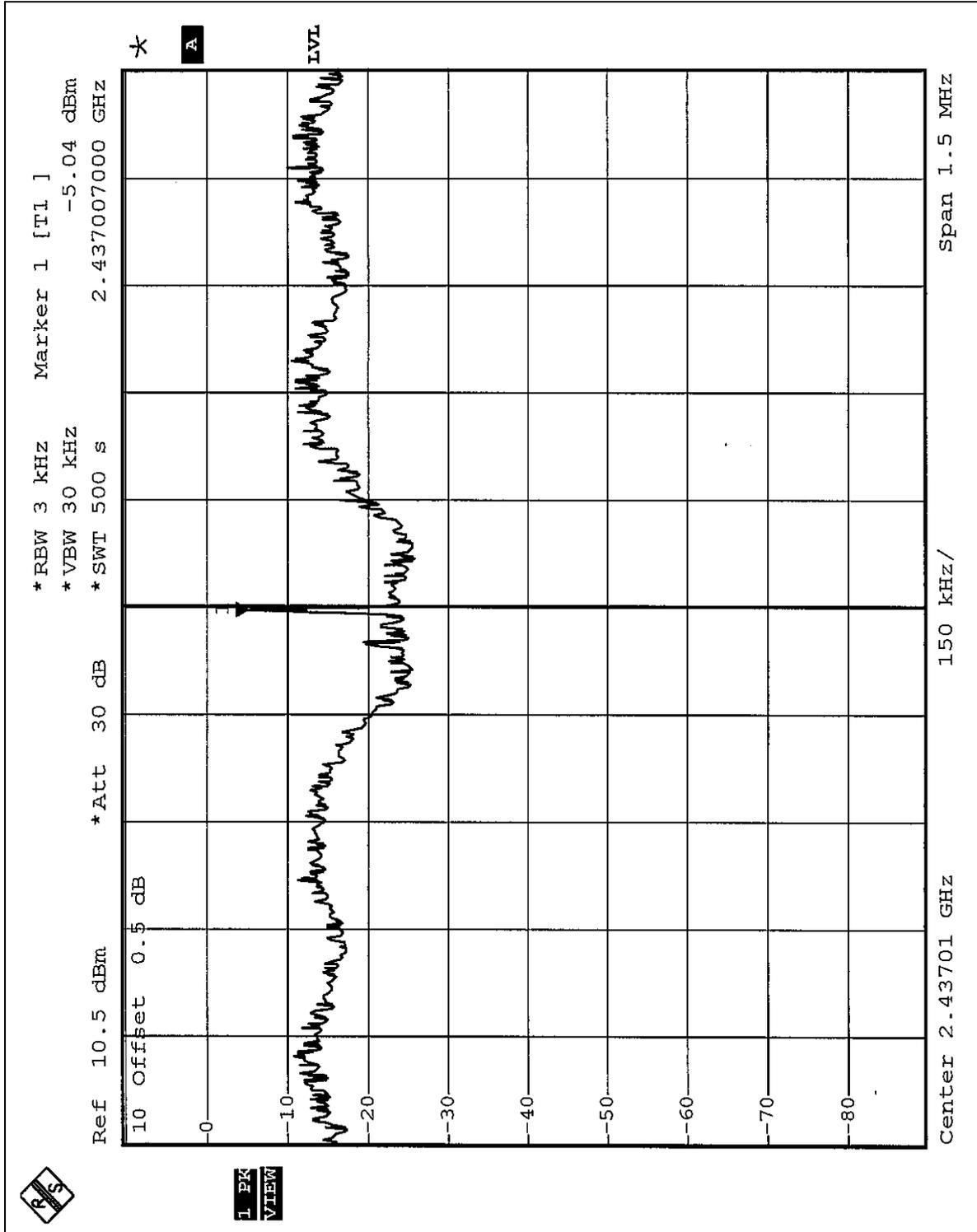


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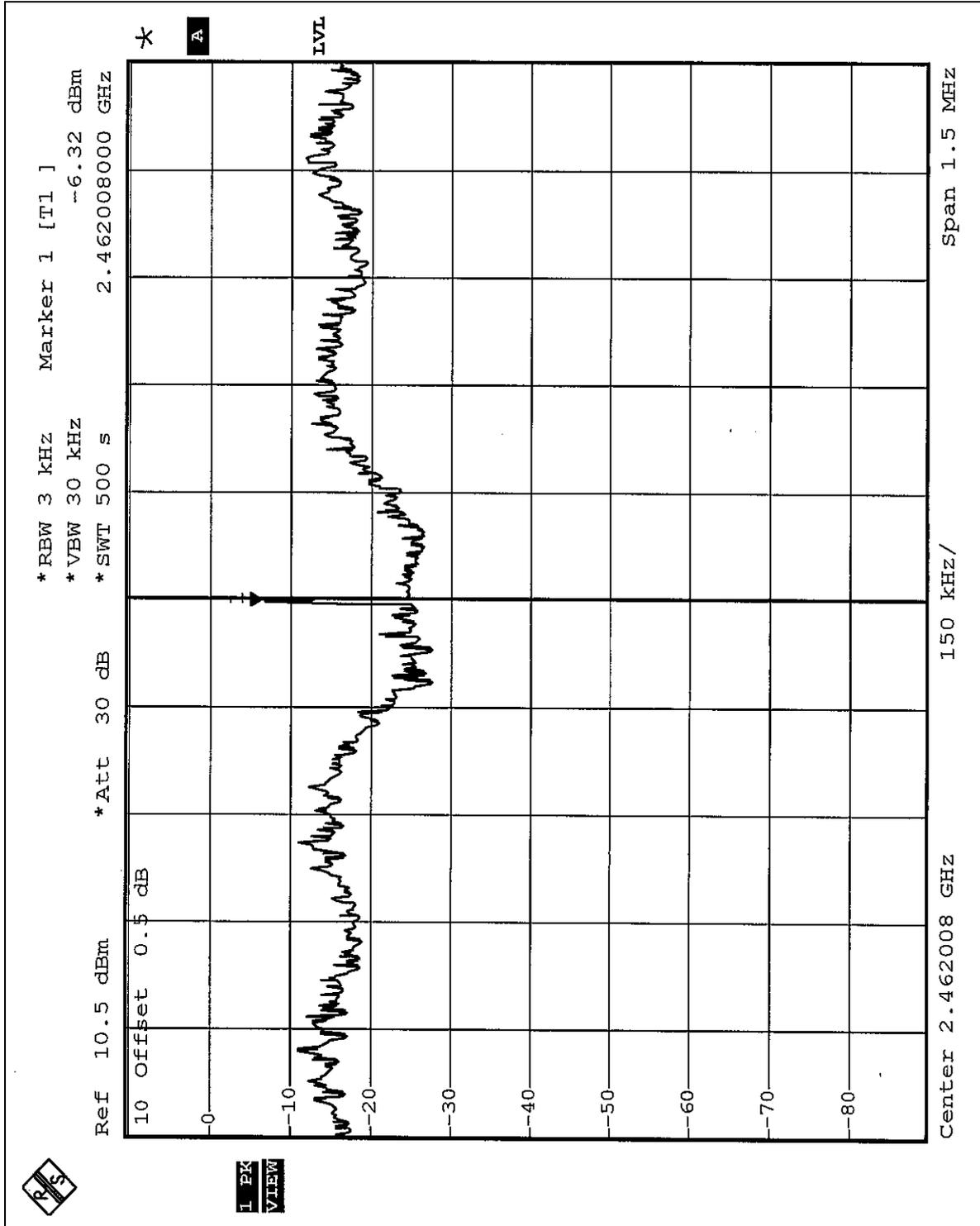


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CH11



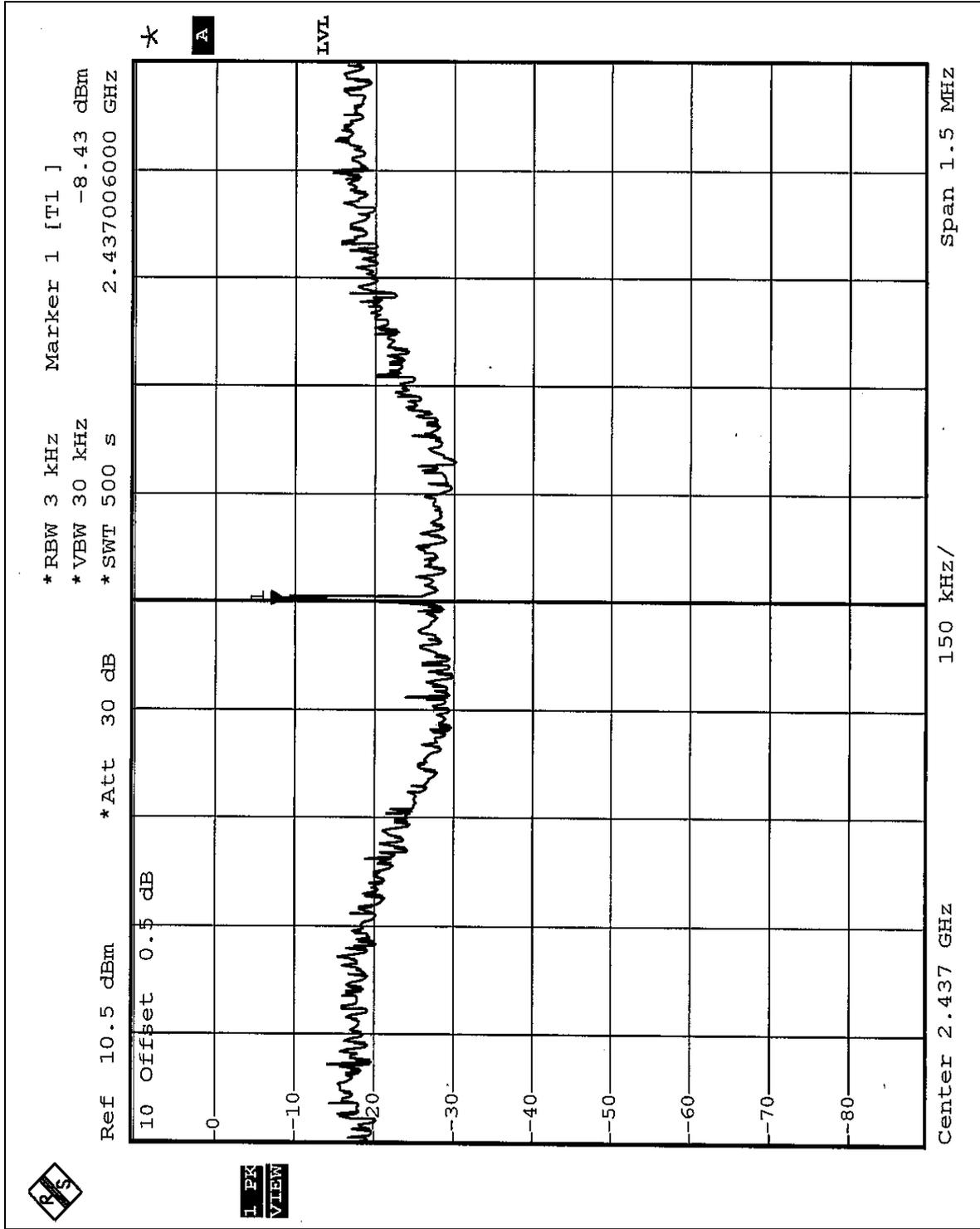
**Turbo mode**

EUT	Double 108 Mbps Wireless Firewall Router	MODEL	WGU624
INPUT POWER (SYSTEM)	120Vac, 60Hz	ENVIRONMENTAL CONDITIONS	24deg.C, 65%RH, 991hPa
MODE	OFDM	TESTED BY	Steven Lu

CHANNEL	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3kHz BW (dBm)	MAXIMUM LIMIT (dBm)	PASS/FAIL
6	2437	-8.43	8	PASS



CH6





4.6 BAND EDGES MEASUREMENT

4.6.1 LIMITS OF BAND EDGES MEASUREMENT

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

4.6.2 TEST INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
R&S SPECTRUM ANALYZER	FSEK30	100049	Aug. 12, 2005

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

The transmitter output was connected to the spectrum analyzer via a low lose cable. Set both RBW and VBW of spectrum analyzer to 1MHz and 10Hz with suitable frequency span including 100 MHz bandwidth from band edge. The band edges was measured and recorded.

4.6.4 DEVIATION FROM TEST STANDARD

No deviation

4.6.5 EUT OPERATING CONDITION

Same as Item 4.3.6



4.6.6 TEST RESULTS

The spectrum plots are attached on the following 12 pages. D2 line indicates the highest level, and D1 line indicates the 20dB offset below D2. It shows compliance with the requirement in part 15.247(C).

NOTE 1: The band edge emission plot of CCK technique on page 65 show 56.66dB delta between carrier maximum power and local maximum emission in restrict band (2.3868GHz). The emission of carrier strength list in the test result of channel 1 at the item 4.2.7 is 106.32dBuV/m, so the maximum field strength in restrict band is $106.32 - 56.66 = 49.66$ dBuV/m which is under 54dBuV/m limit.

NOTE 2: The band edge emission plot of CCK technique on page 67 show 57.70dB delta between carrier maximum power and local maximum emission in restrict band (2.4871GHz). The emission of carrier strength list in the test result of channel 11 at the item 4.2.7 is 107.37dBuV/m, so the maximum field strength in restrict band is $107.39 - 57.70 = 49.69$ dBuV/m which is under 54dBuV/m limit.

NOTE 3: The band edge emission plot of OFDM technique with Normal mode on page 69 show 48.44dB delta between carrier maximum power and local maximum emission in restrict band (2.3900GHz). The emission of carrier strength list in the test result of channel 1 at the item 4.2.7 is 101.12dBuV/m, so the maximum field strength in restrict band is $101.12 - 48.44 = 52.68$ dBuV/m which is under 54dBuV/m limit.

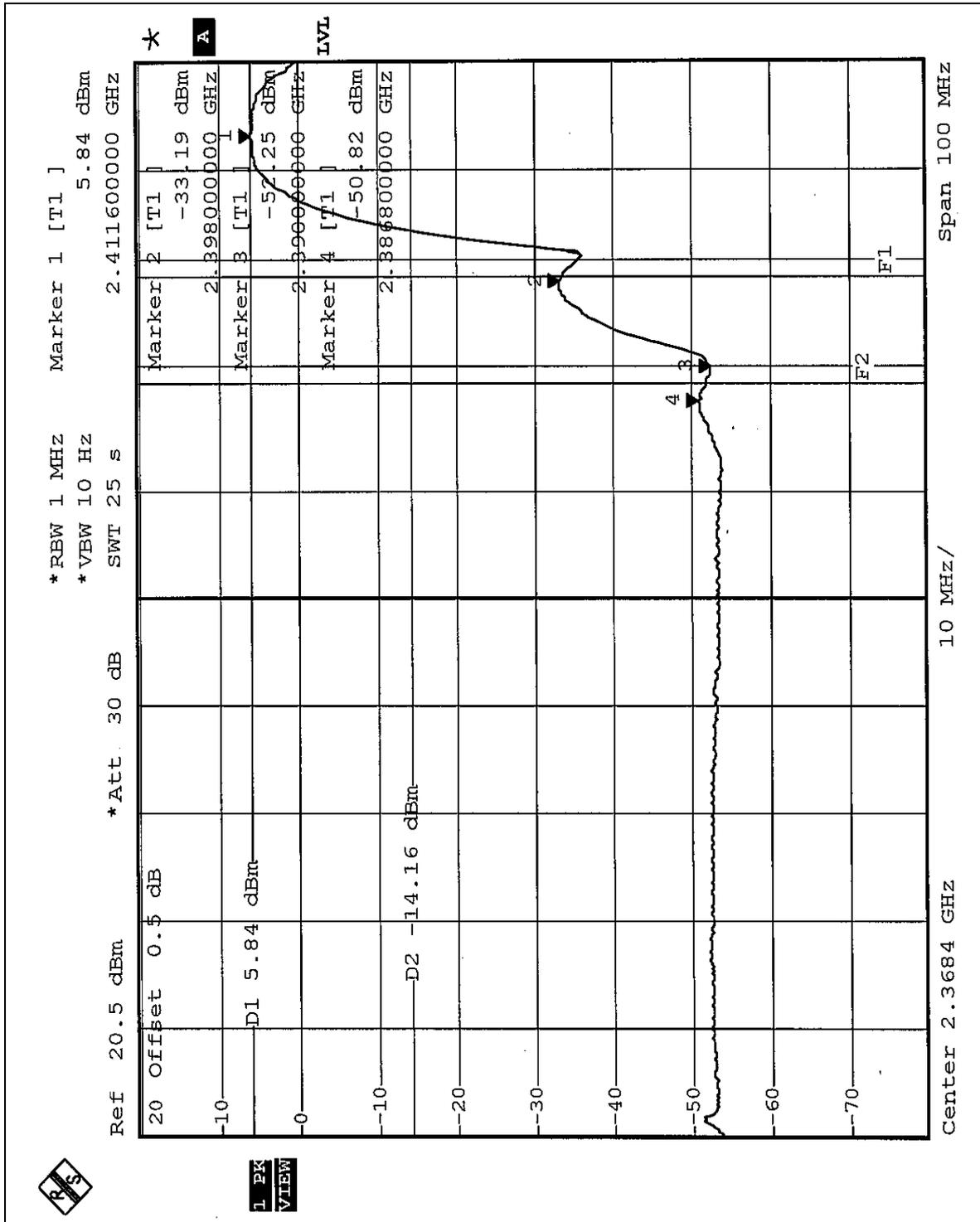
NOTE 4: The band edge emission plot of OFDM technique with Normal mode on page 71 show 50.30dB delta between carrier maximum power and local maximum emission in restrict band (2.4835GHz). The emission of carrier strength list in the test result of channel 11 at the item 4.2.7 is 102.97dBuV/m, so the maximum field strength in restrict band is $102.97 - 50.30 = 52.67$ dBuV/m which is under 54dBuV/m limit.

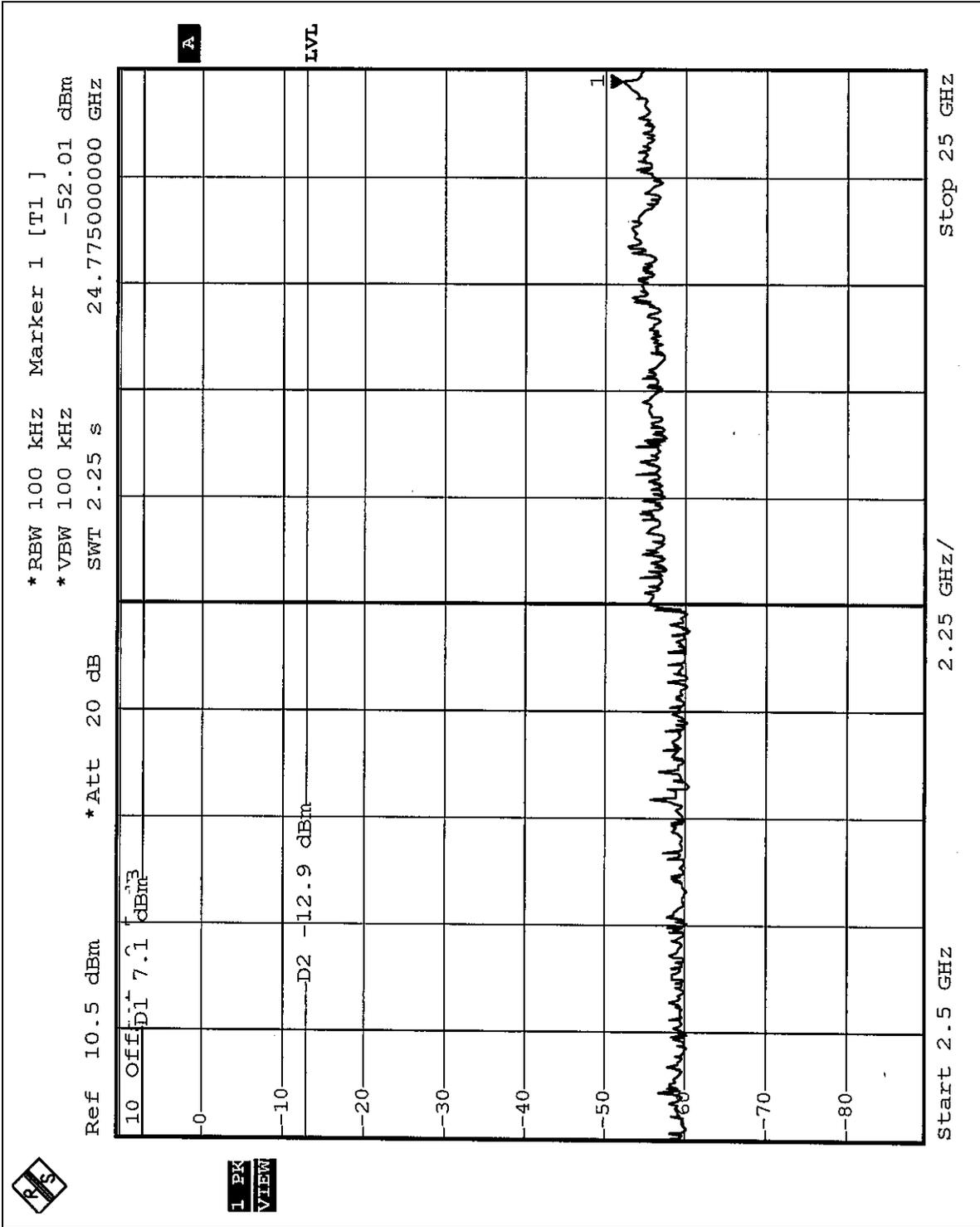
NOTE 5: The band edge emission plot of OFDM technique with Turbo mode on page 73 shows 48.97dB delta between carrier maximum power and local maximum emission in restrict band (2.3200GHz). The emission of carrier strength list in the test result of channel 6 at the item 4.2.7 is 101.67dBuV/m, so the maximum field strength in restrict band is $101.67 - 48.97 = 52.70$ dBuV/m which is under 54dBuV/m limit.

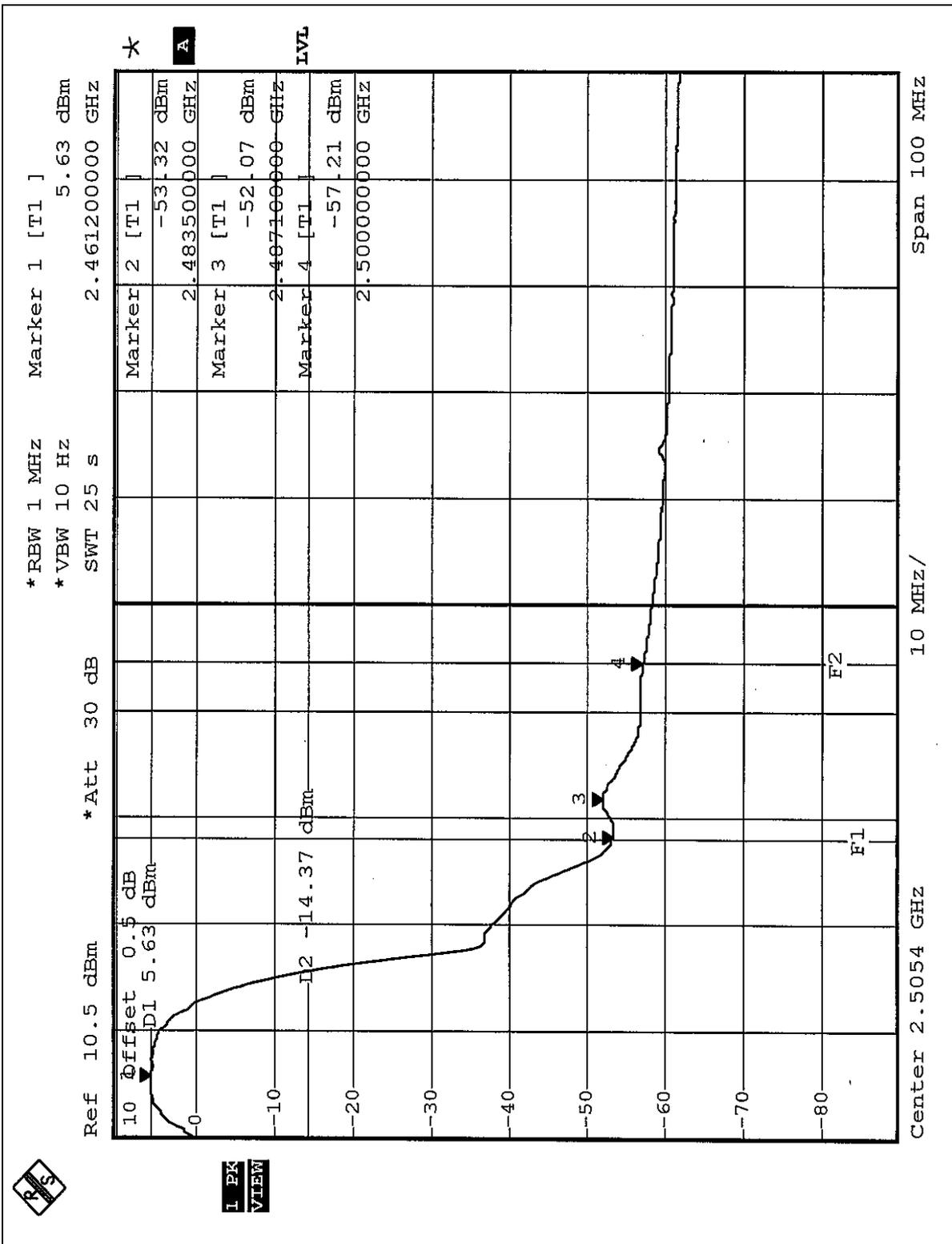
NOTE 6: The band edge emission plot of OFDM technique with Turbo mode on page 75 shows 53.10dB delta between carrier maximum power and local maximum emission in restrict band (2.4835GHz). The emission of carrier strength list in the test result of channel 6 at the item 4.2.7 is 101.67dBuV/m, so the maximum field strength in restrict band is $101.67 - 53.10 = 48.57$ dBuV/m which is under 54dBuV/m limit.

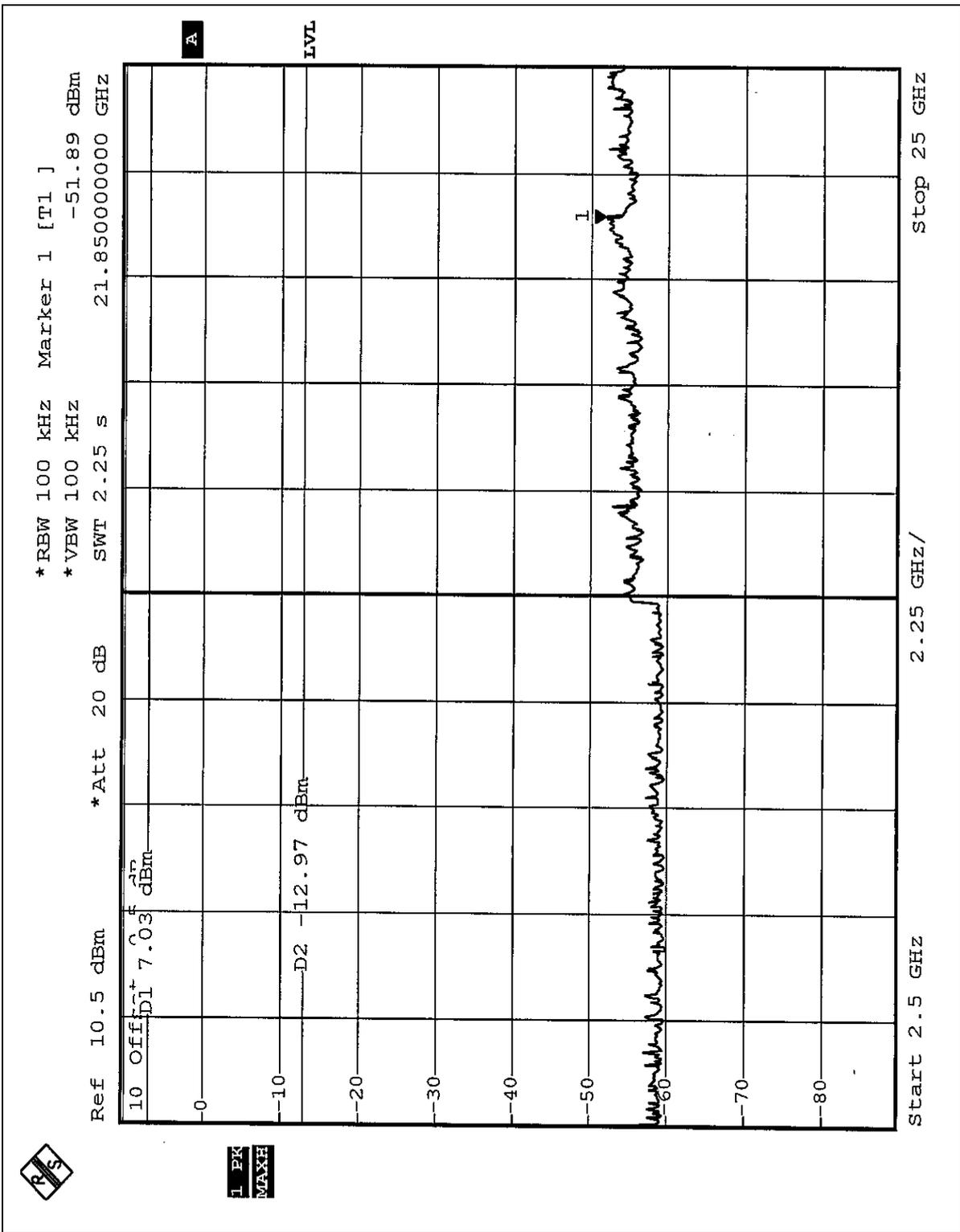


CCK mode:



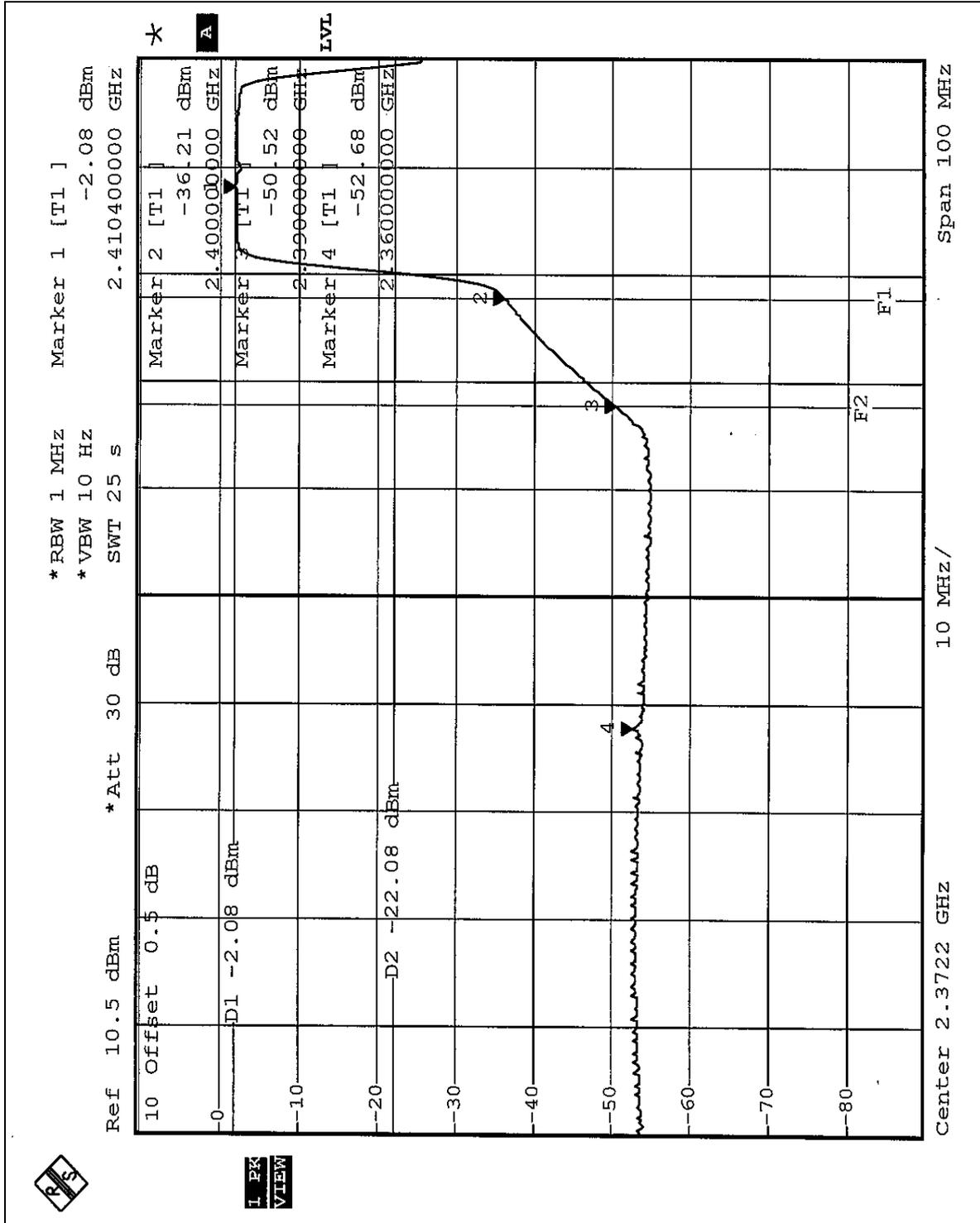


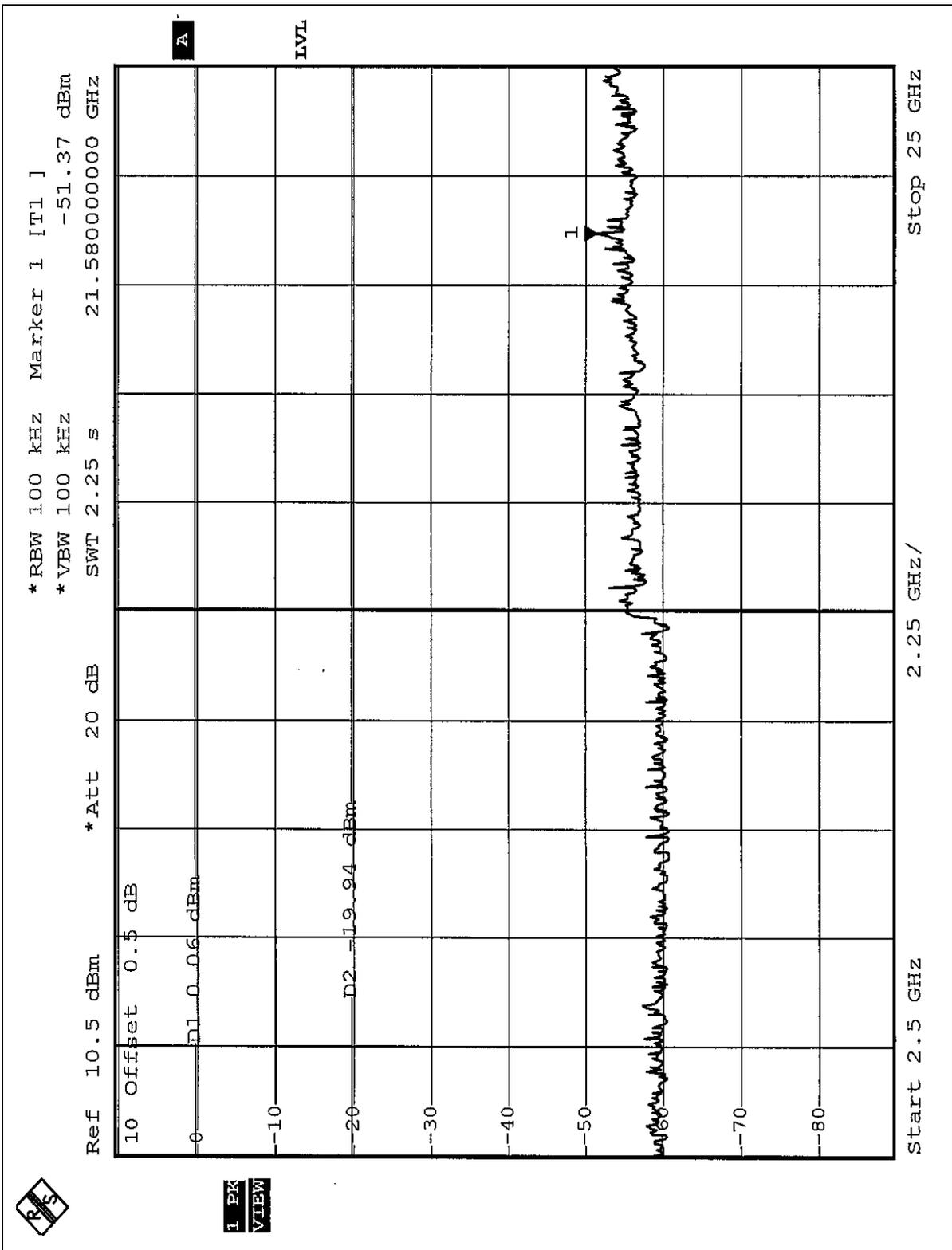


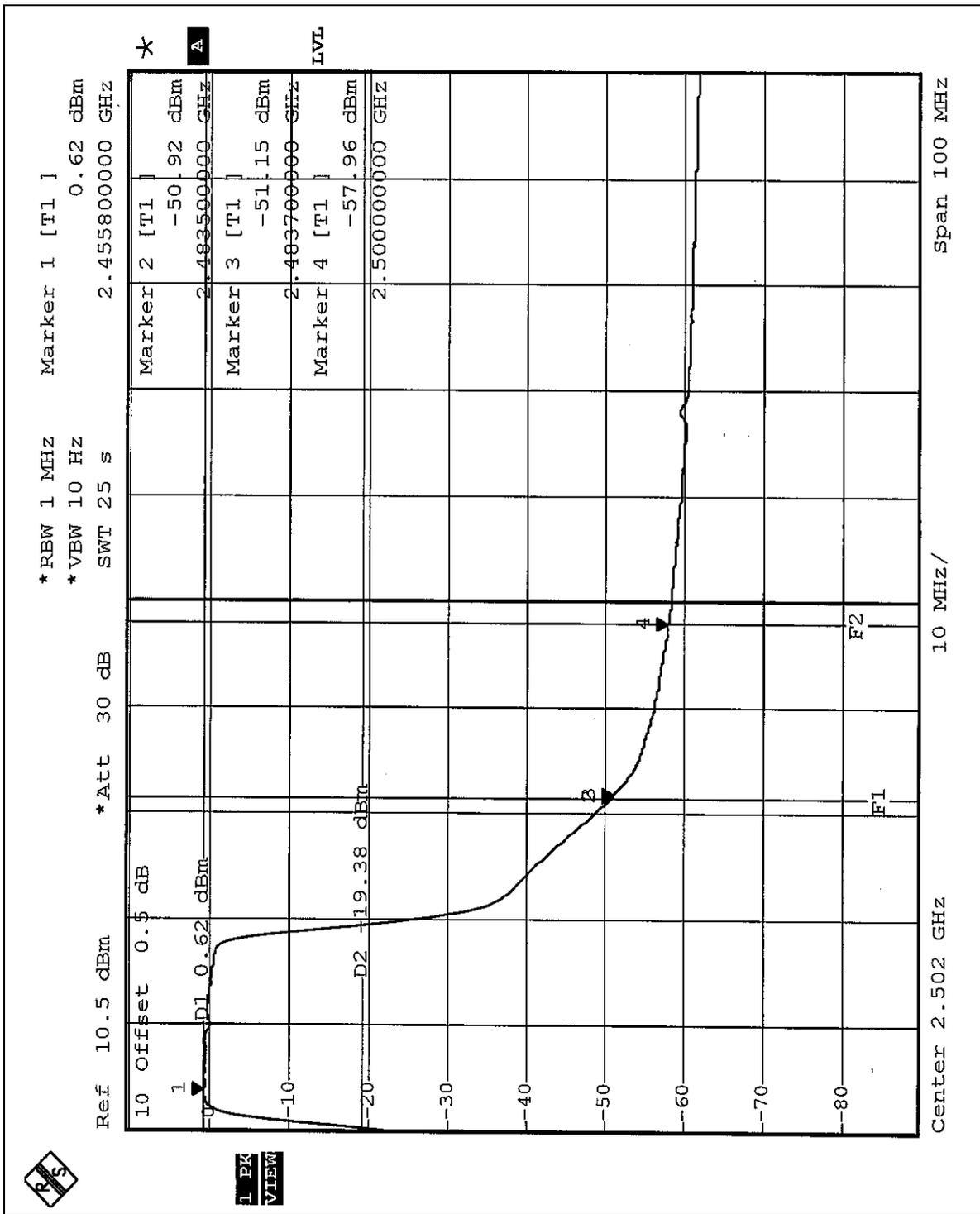


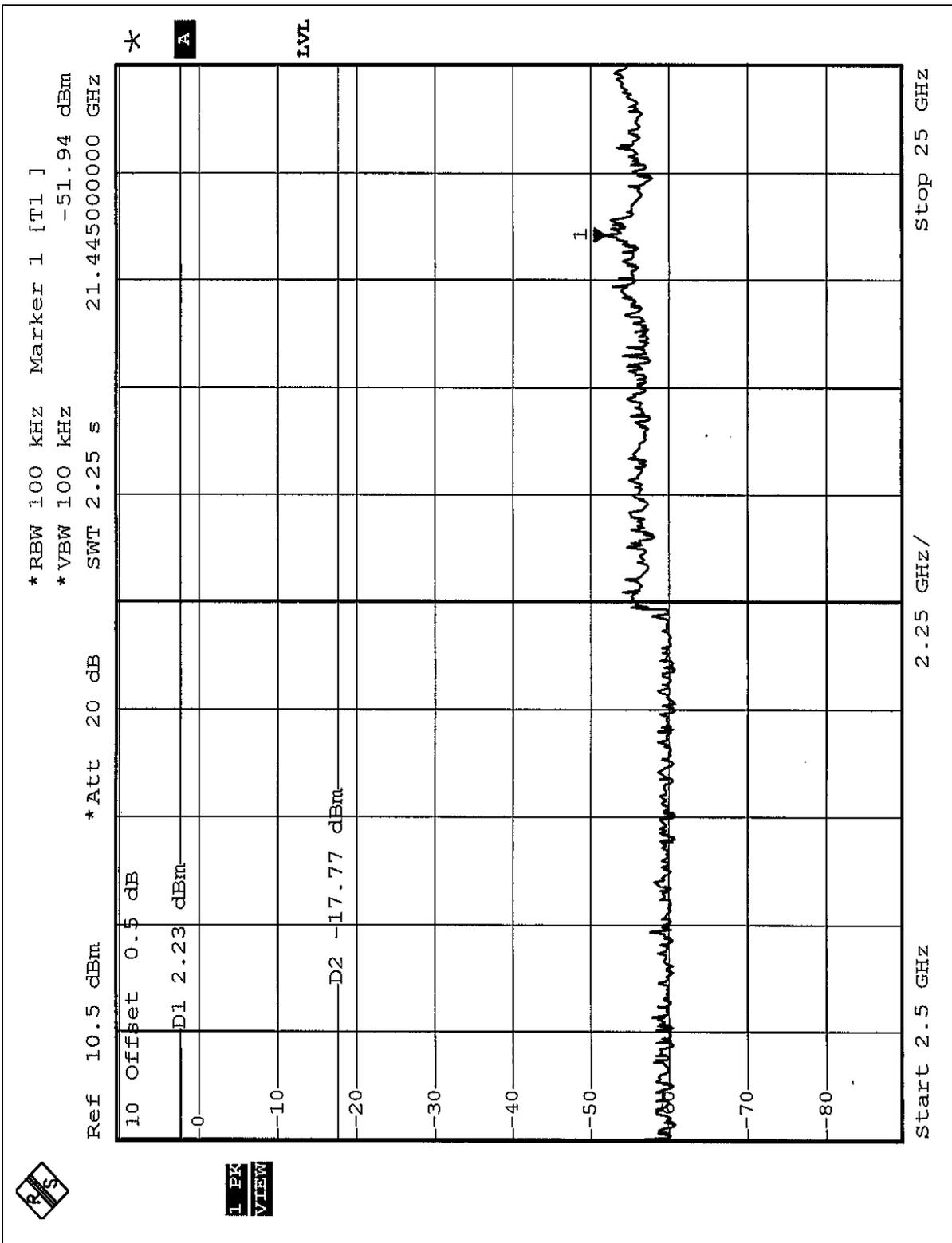


OFDM mode:



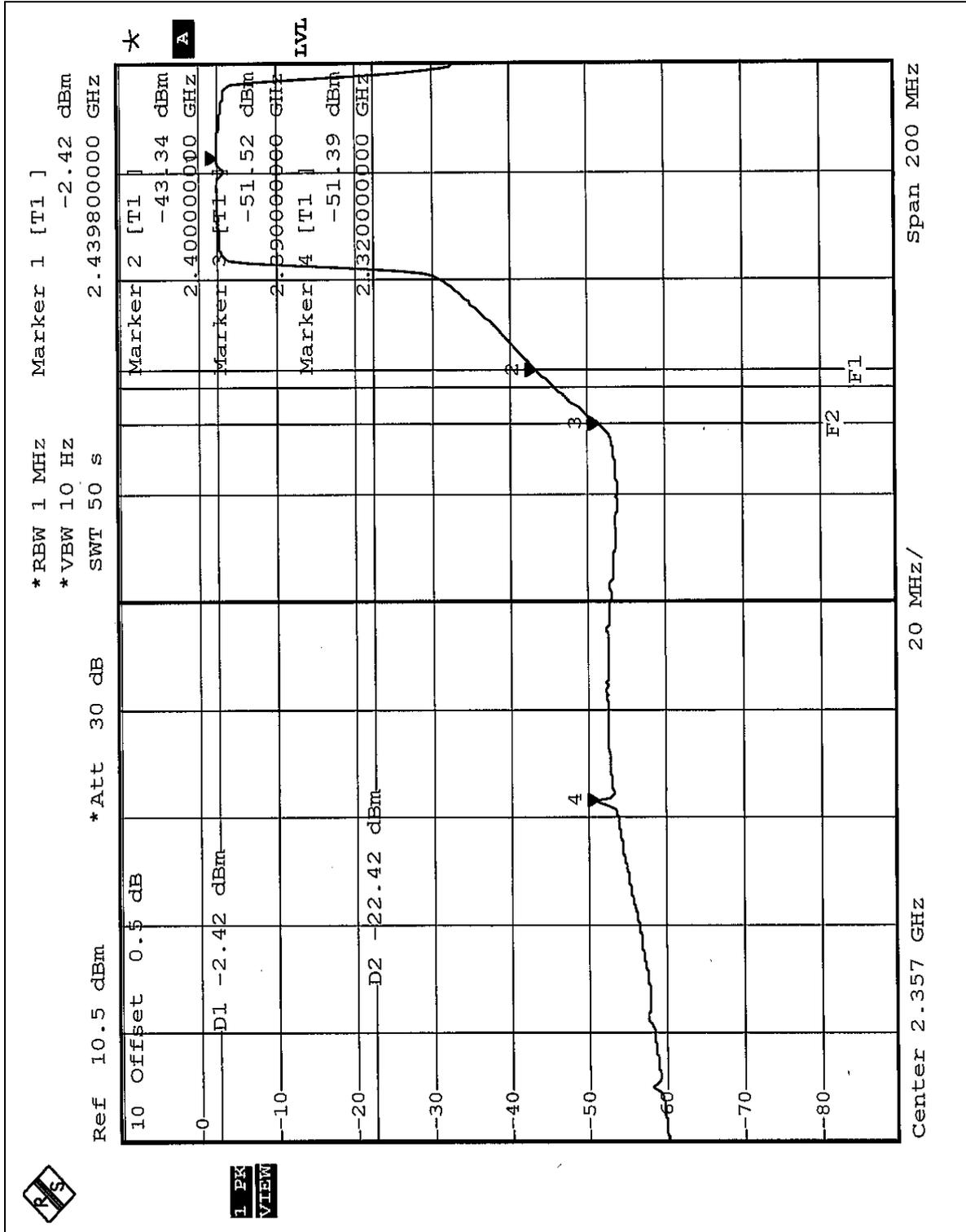


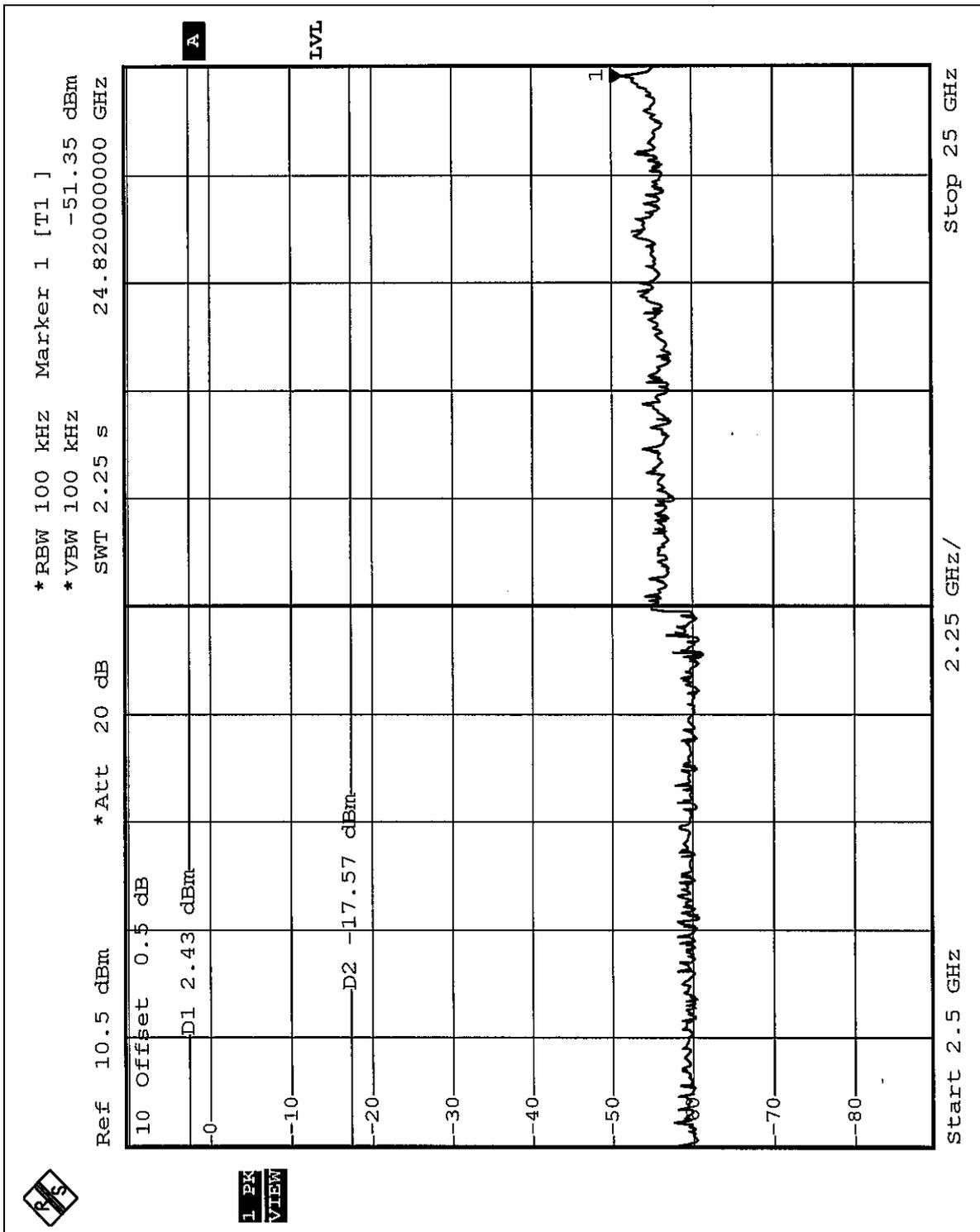


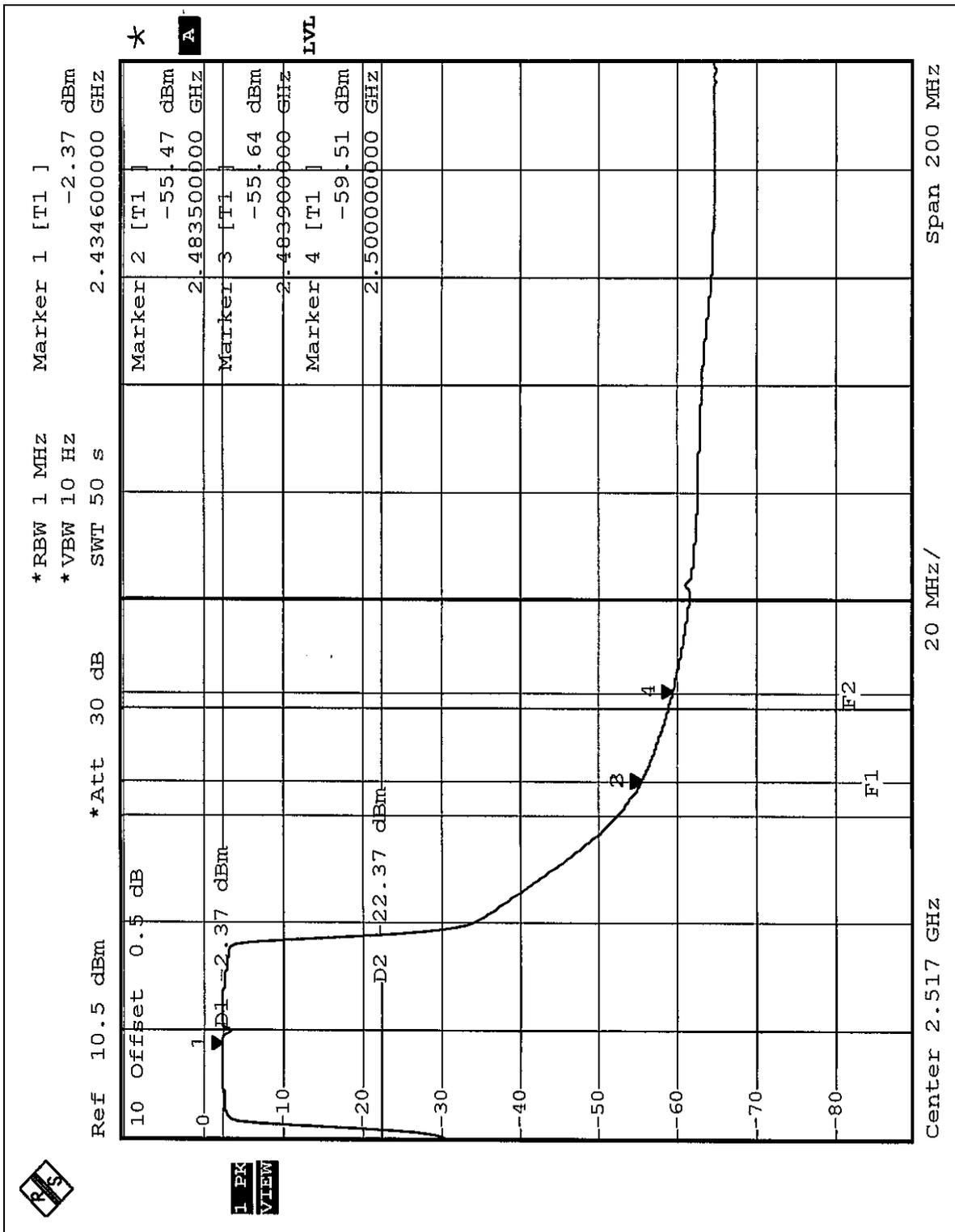


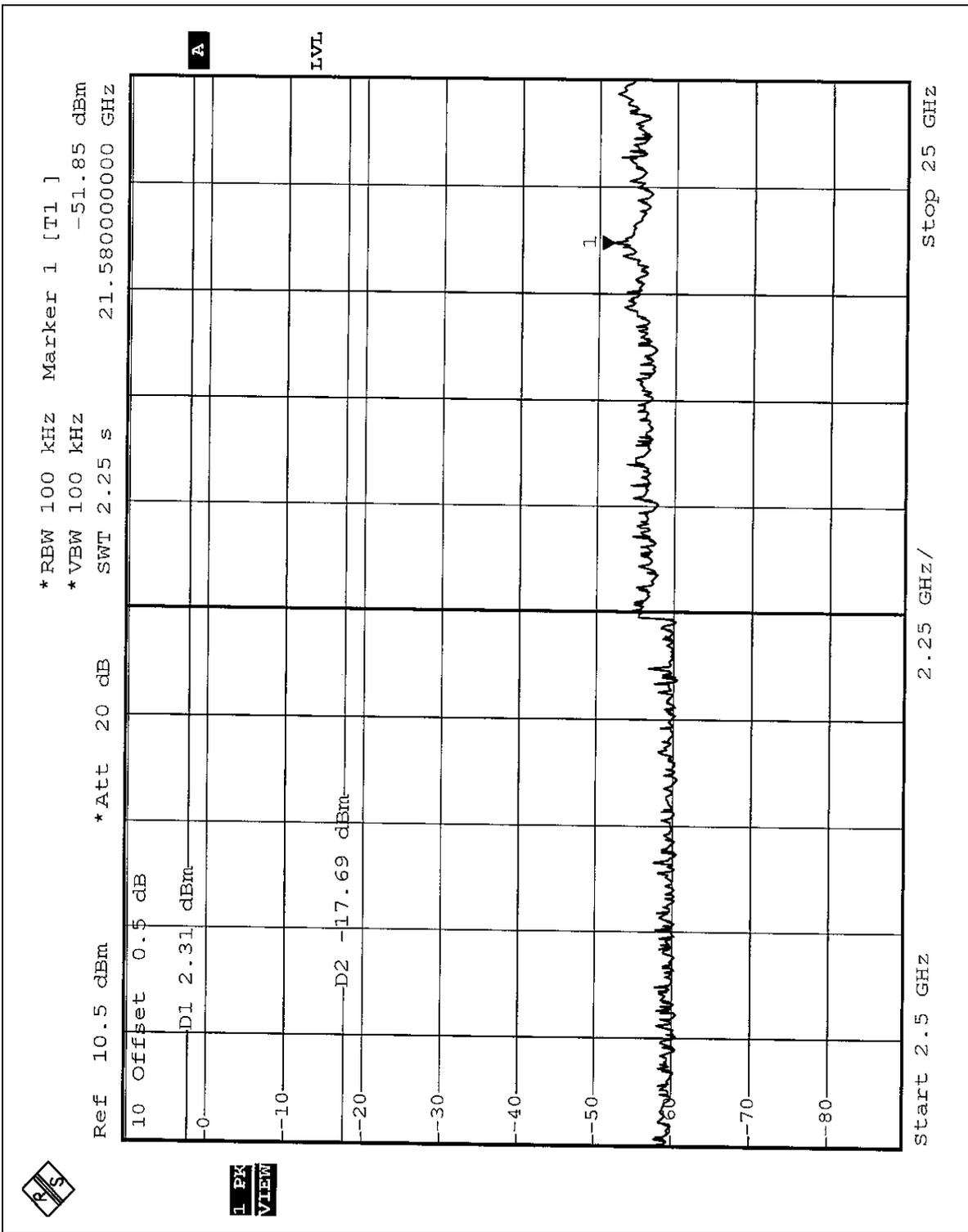


OFDM Turbo mode:











4.7 ANTENNA REQUIREMENT

4.7.1 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 15.247 (b), 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.

4.7.2 ANTENNA CONNECTED CONSTRUCTION

The antenna used in this product is Dipole and Printed antenna with UFL connector. The maximum Gain of the antenna is 2dBi.



5. TEST TYPES AND RESULTS (FOR PART 802.11a)

5.1 CONDUCTED EMISSION MEASUREMENT

5.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

FREQUENCY OF EMISSION (MHz)	CONDUCTED LIMIT (dB μ V)	
	Quasi-peak	Average
0.15-0.5	66 to 56	56 to 46
0.5-5	56	46
5-30	60	50

- NOTE:**
1. The lower limit shall apply at the transition frequencies.
 2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50 MHz.
 3. All emanations from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

5.1.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
Test Receiver ROHDE & SCHWARZ	ESCS30	100288	Dec. 11, 2004
RF signal cable Woken	5D-FB	Cable-HyC02-01	Mar. 07, 2005
LISN ROHDE & SCHWARZ	ESH2-Z5	100100	Mar. 10, 2005
LISN ROHDE & SCHWARZ	ESH3-Z5	100311	Mar. 04, 2005
Software ADT	ADT_Cond_V3	NA	NA

- NOTE:**
1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
 2. The test was performed in HwaYa Shielded Room 2.
 3. The VCCI Site Registration No. is C-2047.



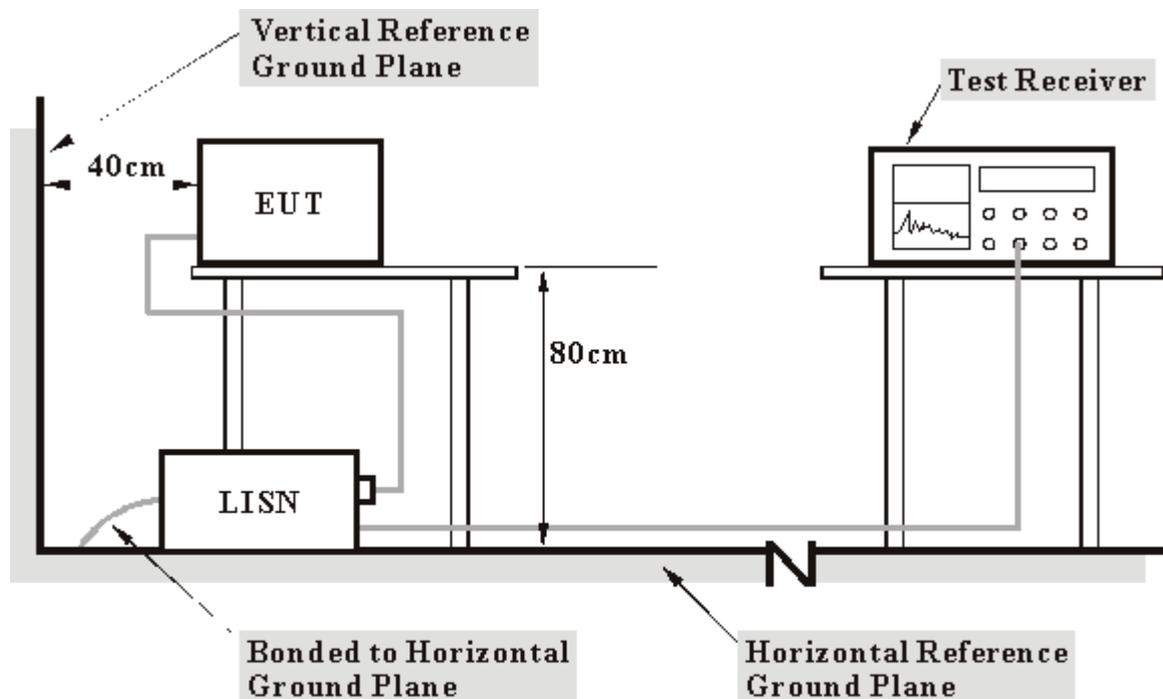
5.1.3 TEST PROCEDURES

- a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.
- b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
- c. The frequency range from 150kHz to 30MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

5.1.4 DEVIATION FROM TEST STANDARD

No deviation

5.1.5 TEST SETUP



- Note:**
1. Support units were connected to second LISN.
 2. Both of LISNs (AMN) 80 cm from EUT and at the least 80 cm from other units and other metal planes support units.

For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

5.1.6 EUT OPERATING CONDITIONS

Same as 4.1.6

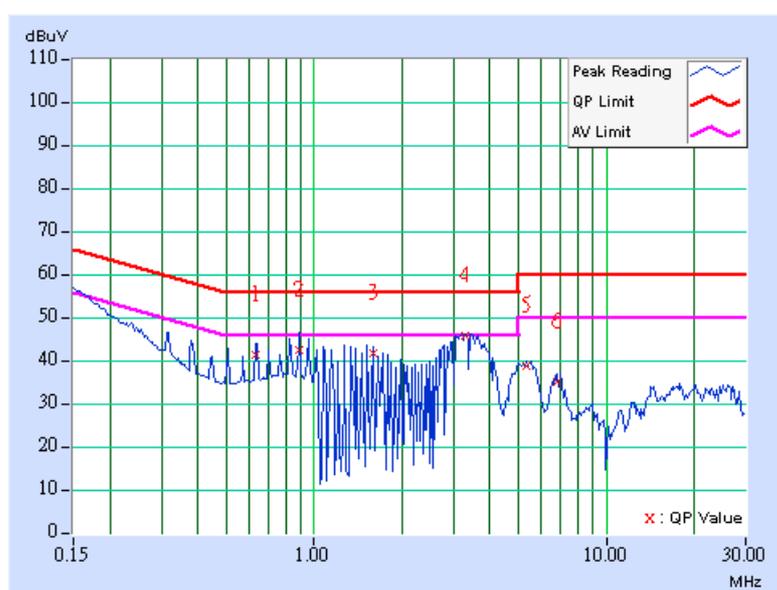


5.1.7 TEST RESULTS

EUT	Double 108 Mbps Wireless Firewall Router	MODEL	WGU624
INPUT POWER (SYSTEM)	120Vac, 60 Hz	6dB BANDWIDTH	9 kHz
ENVIRONMENTAL CONDITIONS	24deg. C, 64%RH, 991hPa	PHASE	Line (L)
TESTED BY	Rush Kao		

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
			1	0.634	0.17	40.96	-	41.13	-	56.00
2	0.888	0.22	41.98	-	42.20	-	56.00	46.00	-13.80	-
3	1.586	0.26	41.50	-	41.76	-	56.00	46.00	-14.24	-
4	3.301	0.29	45.37	-	45.66	-	56.00	46.00	-10.34	-
5	5.336	0.37	38.62	-	38.99	-	60.00	50.00	-21.01	-
6	6.796	0.43	34.89	-	35.32	-	60.00	50.00	-24.68	-

- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value = Emission level - Limit value
 5. Correction factor = Insertion loss + Cable loss
 6. Emission Level = Correction Factor + Reading Value.

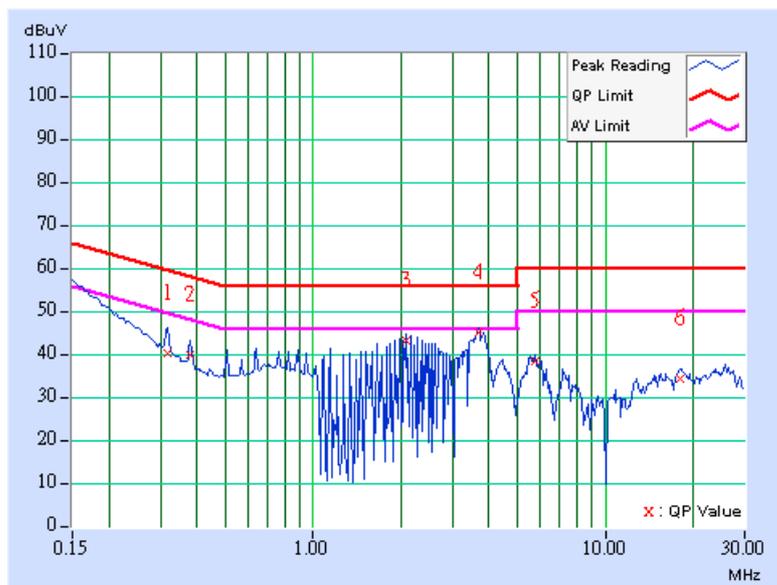




EUT	Double 108 Mbps Wireless Firewall Router	MODEL	WGU624
INPUT POWER (SYSTEM)	120Vac, 60 Hz	PHASE	Neutral (N)
ENVIRONMENTAL CONDITIONS	26deg. C, 62%RH, 991hPa	6dB BANDWIDTH	9 kHz
TESTED BY	Rush Kao		

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.318	0.11	39.73	-	39.84	-	59.76	49.76	-19.92	-
2	0.380	0.11	39.27	-	39.38	-	58.27	48.27	-18.89	-
3	2.094	0.25	42.90	-	43.15	-	56.00	46.00	-12.85	-
4	3.684	0.29	44.45	-	44.74	-	56.00	46.00	-11.26	-
5	5.777	0.38	37.97	-	38.35	-	60.00	50.00	-21.65	-
6	17.965	0.61	33.88	-	34.49	-	60.00	50.00	-25.51	-

- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value = Emission level - Limit value
 5. Correction factor = Insertion loss + Cable loss
 6. Emission Level = Correction Factor + Reading Value.





5.2 RADIATED EMISSION MEASUREMENT

5.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT

Emissions radiated outside of the specified bands, shall be according to the general radiated limits in 15.209 as following:

Frequencies (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

NOTE:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. As shown in 15.35(b), for frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.



5.2.2 LIMITS OF UNWANTED EMISSION OUT OF THE RESTRICTED BANDS

Frequencies (MHz)	EIRP Limit (dBm)	Equivalent Field Strength at 3m (dB μ V/m) *note 3
5150~5250	-27	68.3
5250~5350	-27	68.3
5725~5825	-27 *note 1	68.3
	-17 *note 2	78.3

NOTE:

1. For frequencies 10MHz or greater above or below the band edge.
2. All emissions within the frequency range from the band edge to 10MHz above or below the band edge.
3. The following formula is used to convert the equipment isotropic radiated power (eirp) to field strength

$$E = \frac{1000000\sqrt{30P}}{3} \mu\text{V/m, where P is the eirp (Watts)}$$



5.2.3 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
Test Receiver ROHDE & SCHWARZ	ESIB7	100188	Jan. 13, 2005
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100039	Dec. 15, 2004
BILOG Antenna SCHWARZBECK	VULB9168	9168-157	Feb. 03, 2005
HORN Antenna SCHWARZBECK	BBHA 9120 D	9120D-407	Feb. 03, 2005
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA 9170241	Feb. 23, 2005
Preamplifier Agilent	8449B	3008A01961	Jan. 22, 2005
Preamplifier Agilent	8447D	2944A10629	Jan. 14, 2005
RF signal cable HUBER+SUHNER	SUCOFLEX 104	218182/4	Mar. 04, 2005
RF signal cable HUBER+SUHNER	SUCOFLEX 104	218194/4	Mar. 04, 2005
Software ADT.	ADT_Radiated_V5.14	NA	NA
Antenna Tower ADT.	AT100	AT93021702	NA
Turn Table ADT.	TT100.	TT93021702	NA
Controller ADT.	SC100.	SC93021702	NA

- NOTE:** 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in HwaYa Chamber 1.
3. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
4. The IC Site Registration No. is IC4924-2.



5.2.4 TEST PROCEDURES

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The antenna is a broadband antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

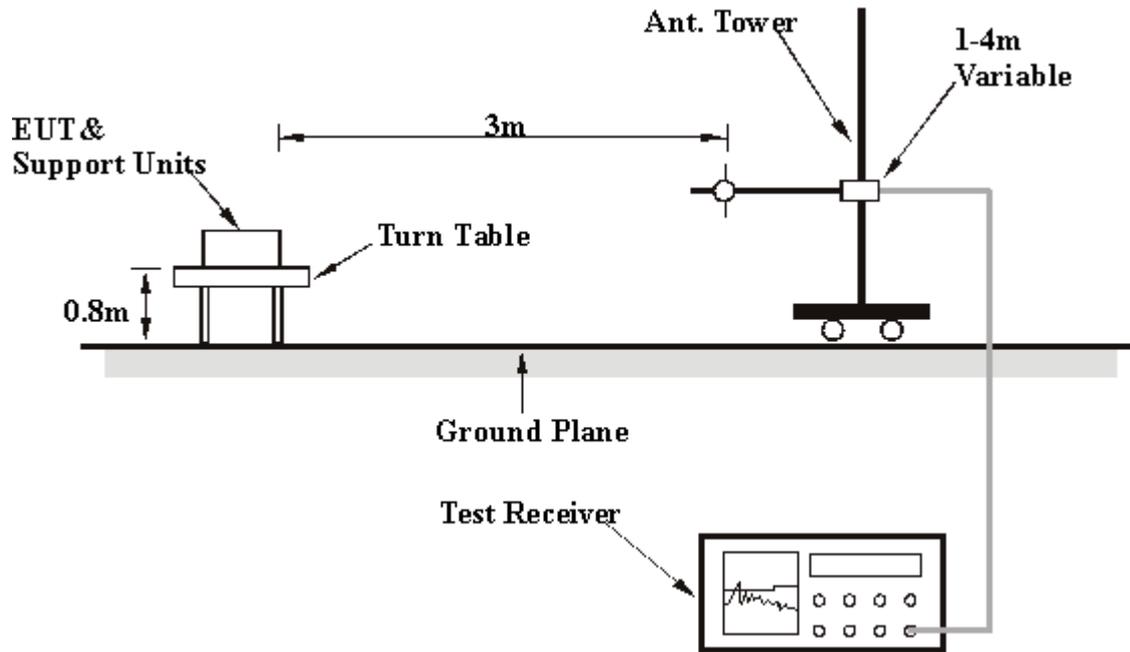
NOTE:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Peak detection (PK) and Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1 MHz for Peak detection at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 10 Hz for Average detection (AV) at frequency above 1GHz.

5.2.5 DEVIATION FROM TEST STANDARD

No deviation

5.2.6 TEST SETUP



For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

5.2.7 EUT OPERATING CONDITIONS

Same as 4.1.6



5.2.8 TEST RESULTS

EUT	Double 108 Mbps Wireless Firewall Router	MODEL	WGU624
CHANNEL	Channel 11	FREQUENCY RANGE	Below 1000MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	26deg. C, 62%RH, 991hPa	TESTED BY	Rush Kao

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	109.70	34.97 QP	43.50	-8.53	1.50 H	262	23.11	11.86
2	199.12	35.83 QP	43.50	-7.67	1.50 H	43	24.49	11.34
3	249.66	44.48 QP	46.00	-1.52	1.00 H	307	31.38	13.11
4	329.36	40.10 QP	46.00	-5.90	1.00 H	316	25.03	15.06
5	399.34	35.72 QP	46.00	-10.28	1.00 H	142	19.00	16.71
6	449.88	32.17 QP	46.00	-13.83	1.50 H	55	14.17	18.00
7	550.96	36.65 QP	46.00	-9.35	1.50 H	112	17.16	19.49
8	599.56	35.39 QP	46.00	-10.61	1.50 H	25	14.57	20.82

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	55.87	38.35 QP	40.00	-1.65	1.05 V	97	24.33	14.02
2	109.70	37.59 QP	43.50	-5.91	1.00 V	256	25.74	11.86
3	249.66	42.53 QP	46.00	-3.47	1.00 V	340	29.43	13.11
4	300.20	37.13 QP	46.00	-8.87	1.50 V	94	22.72	14.41
5	329.36	35.67 QP	46.00	-10.33	1.50 V	85	20.61	15.06
6	550.96	38.82 QP	46.00	-7.18	1.00 V	262	19.34	19.49
7	770.62	39.79 QP	46.00	-6.21	1.50 V	265	16.46	23.33
8	881.42	39.62 QP	46.00	-6.38	1.25 V	232	15.15	24.48

- REMARKS:**
1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB)
 2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
 3. The other emission levels were very low against the limit.
 4. Margin value = Emission level – Limit value



EUT	Double 108 Mbps Wireless Firewall Router	MODEL	WGU624
MODE	Normal Mode	CHANNEL	1
FREQUENCY RANGE	1 ~ 40 GHz	DETECTOR FUNCTION	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 55%RH, 991hPa	INPUT POWER (SYSTEM)	120Vac, 60Hz
TESTED BY	Match Tsui		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB)
1	#1100.00	43.54 PK	74.00	-30.46	1.10 H	341	15.68	27.86
1	#1100.00	35.72 AV	54.00	-18.28	1.10 H	341	7.86	27.86
2	3453.00	47.10 PK	68.30	-21.20	1.13 H	17	9.81	37.29
3	#5150.00	50.30 PK	74.00	-23.70	1.07 H	279	9.65	40.65
4	*5180.00	100.61 PK			1.07 H	279	59.88	40.73
4	*5180.00	89.90 AV			1.07 H	279	49.17	40.73
5	10360.00	58.45 PK	68.30	-9.85	1.03 H	195	10.16	48.29
6	#15540.00	63.75 PK	74.00	-10.25	1.09 H	282	12.85	50.90
6	#15540.00	51.56 AV	54.00	-2.44	1.09 H	282	0.66	50.90

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB)
1	#1100.00	47.27 PK	74.00	-26.73	1.00 V	234	19.41	27.86
1	#1100.00	41.86 AV	54.00	-12.14	1.00 V	234	14.00	27.86
2	3453.00	55.18 PK	68.30	-13.12	1.10 V	119	17.89	37.29
3	#5150.00	62.95 PK	74.00	-11.05	1.24 V	337	22.30	40.65
3	#5150.00	51.28 AV	54.00	-2.72	1.24 V	337	10.63	40.65
4	*5180.00	113.26 PK			1.24 V	337	72.53	40.73
4	*5180.00	101.59 AV			1.24 V	337	60.86	40.73
5	10360.00	65.79 PK	68.30	-2.51	1.23 V	360	17.50	48.29
6	#15540.00	63.02 PK	74.00	-10.98	1.00 V	196	12.12	50.90
6	#15540.00	51.25 AV	54.00	-2.75	1.00 V	196	0.35	50.90

NOTE:

1. Emission level = Raw value + Correction Factor
2. Correction Factor = Ant. Factor + Cable loss
3. Margin value = Emission level - Limit value
4. The other emission levels were very low against the limit.
5. "*" : Fundamental frequency
6. "#" The radiated frequency falling in the restricted band.



EUT	Double 108 Mbps Wireless Firewall Router	MODEL	WGU624
MODE	Normal Mode	CHANNEL	4
FREQUENCY RANGE	1 ~ 40 GHz	DETECTOR FUNCTION	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 55%RH, 991hPa	INPUT POWER (SYSTEM)	120Vac, 60Hz
TESTED BY	Match Tsui		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB)
1	#1100.00	43.45 PK	74.00	-30.55	1.10 H	336	15.59	27.86
1	#1100.00	36.12 AV	54.00	-17.88	1.10 H	336	8.26	27.86
2	#1320.00	43.74 PK	74.00	-30.26	1.04 H	304	14.98	28.76
2	#1320.00	35.24 AV	54.00	-18.76	1.04 H	304	6.48	28.76
3	3493.52	50.66 PK	68.30	-17.64	1.00 H	343	13.30	37.37
4	*5240.00	102.95 PK			1.50 H	97	62.11	40.84
4	*5240.00	93.09 AV			1.50 H	97	52.25	40.84
5	10480.00	58.67 PK	68.30	-9.63	1.07 H	97	10.91	47.76

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB)
1	#1100.00	45.11 PK	74.00	-28.89	1.11 V	128	17.25	27.86
1	#1100.00	39.18 AV	54.00	-14.82	1.11 V	128	11.32	27.86
2	#1320.00	43.52 PK	74.00	-30.48	1.02 V	126	14.76	28.76
2	#1320.00	36.64 AV	54.00	-17.36	1.02 V	126	7.88	28.76
3	3493.52	53.62 PK	68.30	-14.68	1.08 V	125	16.26	37.37
4	*5240.00	113.03 PK			1.25 V	306	72.19	40.84
4	*5240.00	102.82 AV			1.25 V	306	61.98	40.84
5	10480.00	62.93 PK	68.30	-5.37	1.32 V	352	15.17	47.76

NOTE:

1. Emission level = Raw value + Correction Factor
2. Correction Factor = Ant. Factor + Cable loss
3. Margin value = Emission level - Limit value
4. The other emission levels were very low against the limit.
5. "*" : Fundamental frequency
6. "#"The radiated frequency falling in the restricted band.



EUT	Double 108 Mbps Wireless Firewall Router	MODEL	WGU624
MODE	Normal Mode	CHANNEL	5
FREQUENCY RANGE	1 ~ 40 GHz	DETECTOR FUNCTION	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 55%RH, 991hPa	INPUT POWER (SYSTEM)	120Vac, 60Hz
TESTED BY	Match Tsui		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#1100.00	41.84 PK	74.00	-32.16	1.23 H	331	13.98	27.86
1	#1100.00	36.82 AV	54.00	-17.18	1.23 H	331	8.96	27.86
2	#1320.00	42.96 PK	74.00	-31.04	1.05 H	301	14.20	28.76
2	#1320.00	37.72 AV	54.00	-12.11	1.05 H	301	8.96	28.76
3	3506.80	50.68 PK	68.30	-17.62	1.20 H	336	13.28	37.40
4	*5260.00	102.08 PK			1.22 H	313	61.21	40.87
4	*5260.00	92.50 AV			1.22 H	313	51.63	40.87
5	10520.00	58.12 PK	68.30	-10.18	1.42 H	225	10.53	47.59

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#1100.00	46.54 PK	74.00	-27.46	1.50 V	310	18.68	27.86
1	#1100.00	42.82 AV	54.00	-11.18	1.50 V	310	14.96	27.86
2	#1320.00	42.85 PK	74.00	-31.15	1.35 V	66	14.09	28.76
2	#1320.00	34.83 AV	54.00	-19.17	1.35 V	66	14.09	28.76
3	3506.80	54.04 PK	68.30	-14.26	1.10 V	300	16.64	37.40
4	*5260.00	115.37 PK			1.02 V	304	74.50	40.87
4	*5260.00	105.14 AV			1.02 V	304	64.27	40.87
5	10520.00	62.66 PK	68.30	-5.64	1.20 V	357	15.07	47.59

NOTE:

1. Emission level = Raw value + Correction Factor
2. Correction Factor = Ant. Factor + Cable loss
3. Margin value = Emission level - Limit value
4. The other emission levels were very low against the limit.
5. "*" : Fundamental frequency
6. "#" The radiated frequency falling in the restricted band.



EUT	Double 108 Mbps Wireless Firewall Router	MODEL	WGU624
MODE	Normal Mode	CHANNEL	8
FREQUENCY RANGE	1 ~ 40 GHz	DETECTOR FUNCTION	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25deg. C, 55%RH, 991hPa	INPUT POWER (SYSTEM)	120Vac, 60Hz
TESTED BY	Match Tsui		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB)
1	#1100.00	42.39 PK	74.00	-31.61	1.06 H	324	14.53	27.86
1	#1100.00	33.03 AV	54.00	-20.97	1.06 H	324	5.17	27.86
2	3547.00	51.99 PK	68.30	-16.31	1.10 H	15	14.45	37.55
3	*5320.00	101.17 PK			1.00 H	214	60.24	40.93
3	*5320.00	90.19 AV			1.00 H	214	49.26	40.93
4	#5350.00	48.50 PK	74.00	-25.50	1.00 H	214	7.57	40.93
5	#10640.00	58.26 PK	74.00	-15.74	1.00 H	160	10.57	47.69
5	#10640.00	46.07 AV	54.00	-7.93	1.00 H	160	-1.62	47.69
6	#15960.00	63.30 PK	74.00	-10.70	1.00 H	214	11.49	51.81

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB)
1	#1100.00	46.64 PK	74.00	-27.36	1.24 V	134	18.78	27.86
1	#1100.00	41.49 AV	54.00	-12.51	1.24 V	134	13.63	27.86
2	3547.00	54.46 PK	68.30	-13.84	1.07 V	130	16.92	37.55
3	*5320.00	113.05 PK			1.04 V	293	72.12	40.93
3	*5320.00	102.36 AV			1.04 V	293	61.43	40.93
4	#5350.00	60.41 PK	74.00	-13.59	1.04 V	293	19.48	40.93
4	#5350.00	49.72 AV	54.00	-4.28	1.04 V	293	8.79	40.93
5	#10640.00	62.38 PK	74.00	-11.62	1.03 V	330	14.69	47.69
5	#10640.00	48.48 AV	54.00	-5.52	1.03 V	330	0.79	47.69
6	#15960.00	64.15 PK	74.00	-9.85	1.11 V	158	12.34	51.81

NOTE:

1. Emission level = Raw value + Correction Factor
2. Correction Factor = Ant. Factor + Cable loss
3. Margin value = Emission level - Limit value
4. The other emission levels were very low against the limit.
5. "*" : Fundamental frequency
6. "#"The radiated frequency falling in the restricted band.



EUT	Double 108 Mbps Wireless Firewall Router	MODEL	WGU624
MODE	Normal Mode	CHANNEL	9
FREQUENCY RANGE	1 ~ 40 GHz	DETECTOR FUNCTION	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	26deg. C, 62%RH, 991hPa	INPUT POWER (SYSTEM)	120Vac, 60Hz
TESTED BY	Steven Lu		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#1100.00	44.32 PK	74.00	-29.68	1.25 H	127	16.46	27.86
1	#1100.00	39.35 AV	54.00	-14.65	1.25 H	127	11.49	27.86
2	#1320.00	43.68 PK	74.00	-30.32	1.25 H	157	14.92	28.76
2	#1320.00	36.68 AV	54.00	-17.32	1.25 H	157	7.92	28.76
3	#3830.16	51.96 PK	74.00	-22.04	1.33 H	157	13.61	38.35
3	#3830.16	42.35 AV	54.00	-11.65	1.33 H	157	4.00	38.35
4	*5745.00	109.13 PK			1.14 H	17	67.38	41.75
4	*5745.00	98.97 AV			1.14 H	17	57.22	41.75
5	#11490.00	58.63 PK	74.00	-15.37	1.35 H	152	9.12	49.51
5	#11490.00	47.85 AV	54.00	-6.15	1.35 H	152	-1.66	49.51

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#1100.00	48.72 PK	74.00	-25.28	1.33 V	214	20.86	27.86
1	#1100.00	44.22 AV	54.00	-9.78	1.33 V	214	16.36	27.86
2	#1320.00	47.32 PK	74.00	-26.68	1.00 V	122	18.56	28.76
2	#1320.00	36.86 AV	54.00	-17.14	1.00 V	122	8.10	28.76
3	#3830.16	53.63 PK	74.00	-20.37	1.00 V	146	15.27	38.35
3	#3830.16	47.83 AV	54.00	-6.17	1.00 V	146	9.47	38.35
4	*5745.00	114.79 PK			1.15 V	288	73.04	41.75
4	*5745.00	104.92 AV			1.15 V	288	63.17	41.75
5	#11490.00	63.35 PK	74.00	-10.65	1.25 V	33	13.84	49.51
5	#11490.00	50.68 AV	54.00	-3.32	1.25 V	33	1.17	49.51

NOTE:

1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB).
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. “ * “ : Fundamental frequency.
6. “#”The radiated frequency falling in the restricted band.
7. The limit value is defined as per 15.247



EUT	Double 108 Mbps Wireless Firewall Router	MODEL	WGU624
MODE	Normal Mode	CHANNEL	11
FREQUENCY RANGE	1 ~ 40 GHz	DETECTOR FUNCTION	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	26deg. C, 62%RH, 991hPa	INPUT POWER (SYSTEM)	120Vac, 60Hz
TESTED BY	Steven Lu		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#1100.00	43.05 PK	74.00	-30.95	1.12 H	307	15.19	27.86
1	#1100.00	35.31 AV	54.00	-18.69	1.12 H	307	7.45	27.86
2	#3858.00	51.59 PK	74.00	-22.41	1.02 H	61	13.26	38.33
2	#3858.00	39.07 AV	54.00	-14.93	1.02 H	61	0.74	38.33
3	*5785.00	102.84 PK			1.03 H	320	60.92	41.92
3	*5785.00	92.24 AV			1.03 H	320	50.32	41.92
4	#11570.00	61.23 PK	74.00	-12.77	1.03 H	150	11.01	50.22
4	#11570.00	48.03 AV	54.00	-5.97	1.03 H	150	-2.19	50.22

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#1100.00	45.68 PK	74.00	-28.32	1.21 V	133	17.82	27.86
1	#1100.00	40.49 AV	54.00	-13.51	1.21 V	133	12.63	27.86
2	#3858.00	52.94 PK	74.00	-21.06	1.03 V	360	14.61	38.33
2	#3858.00	45.61 AV	54.00	-8.39	1.03 V	360	7.28	38.33
3	*5785.00	116.51 PK		42.51	1.00 V	311	74.59	41.92
3	*5785.00	104.94 AV		50.94	1.00 V	311	63.02	41.92
4	#11570.00	63.38 PK	74.00	-10.62	1.11 V	277	13.16	50.22
4	#11570.00	49.70 AV	54.00	-4.30	1.11 V	277	-0.52	50.22

NOTE:

1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB).
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. “ * ” : Fundamental frequency.
6. “#” The radiated frequency falling in the restricted band.
7. The limit value is defined as per 15.247



EUT	Double 108 Mbps Wireless Firewall Router	MODEL	WGU624
MODE	Normal Mode	CHANNEL	13
FREQUENCY RANGE	1 ~ 40 GHz	DETECTOR FUNCTION	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	26deg. C, 62%RH, 991hPa	INPUT POWER (SYSTEM)	120Vac, 60Hz
TESTED BY	Steven Lu		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#1100.00	43.34 PK	74.00	-30.66	1.00 H	143	15.48	27.86
1	#1100.00	36.42 AV	54.00	-17.58	1.00 H	143	8.56	27.86
2	#3883.00	51.67 PK	74.00	-22.33	1.05 H	321	13.36	38.31
2	#3883.00	41.51 AV	54.00	-12.49	1.05 H	321	3.20	38.31
3	*5825.00	101.90 PK			1.01 H	319	59.93	41.97
3	*5825.00	91.51 AV			1.01 H	319	49.54	41.97
4	#11645.00	53.18 PK	74.00	-20.82	1.10 H	260	2.97	50.21
4	#11645.00	42.74 AV	54.00	-11.26	1.10 H	260	-7.47	50.21

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	#1100.00	47.43 PK	74.00	-26.57	1.06 V	64	19.57	27.86
1	#1100.00	40.47 AV	54.00	-13.53	1.06 V	64	12.61	27.86
2	#3883.00	52.64 PK	74.00	-21.36	1.04 V	313	14.33	38.31
2	#3883.00	42.58 AV	54.00	-11.42	1.04 V	313	4.27	38.31
3	*5825.00	113.91 PK			1.24 V	10	71.94	41.97
3	*5825.00	103.35 AV			1.24 V	10	61.38	41.97
4	#11645.00	63.77 PK	74.00	-10.23	1.12 V	273	13.56	50.21
4	#11645.00	49.49 AV	54.00	-4.51	1.12 V	273	-0.72	50.21

NOTE:

1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB).
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. “ * “ : Fundamental frequency.
6. “#”The radiated frequency falling in the restricted band.
- 7.The limit value is defined as per 15.247



EUT	Double 108 Mbps Wireless Firewall Router	MODEL	WGU624
MODE	Turbo Mode	CHANNEL	1
FREQUENCY RANGE	1 ~ 40 GHz	DETECTOR FUNCTION	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	26deg. C, 62%RH, 991hPa	INPUT POWER (SYSTEM)	120Vac, 60Hz
TESTED BY	Steven Lu		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB)
1	#1100.00	43.15 PK	74.00	-30.85	1.47 H	147	15.29	27.86
1	#1100.00	38.53 AV	54.00	-15.47	1.47 H	147	10.67	27.86
2	#1320.00	43.75 PK	74.00	-30.25	1.25 H	157	14.99	28.76
2	#1320.00	36.65 AV	54.00	-17.35	1.25 H	157	7.89	28.76
3	3473.48	50.94 PK	68.30	-17.36	1.22 H	95	13.61	37.33
4	#5150.00	52.01 PK	74.00	-21.99	1.16 H	17	11.36	40.65
4	#5150.00	41.56 AV	54.00	-12.44	1.16 H	17	0.91	40.65
5	*5210.00	100.63 PK			1.16 H	17	59.83	40.80
5	*5210.00	90.18 AV			1.16 H	17	49.38	40.80
6	10420.00	58.65 PK	68.30	-9.65	1.38 H	168	10.45	48.21

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB)
1	#1100.00	47.64 PK	74.00	-26.36	1.00 V	311	19.78	27.86
1	#1100.00	44.11 AV	54.00	-9.89	1.00 V	311	16.25	27.86
2	#1320.00	46.49 PK	74.00	-27.51	1.00 V	120	17.73	28.76
2	#1320.00	35.63 AV	54.00	-18.37	1.00 V	120	6.87	28.76
3	3473.48	54.52 PK	68.30	-13.78	1.07 V	113	17.19	37.33
4	#5150.00	62.25 PK	74.00	-11.75	1.00 V	342	21.60	40.65
4	#5150.00	52.94 AV	54.00	-1.06	1.00 V	342	12.29	40.65
5	*5210.00	110.87 PK			1.00 V	342	70.07	40.80
5	*5210.00	101.56 AV			1.00 V	342	60.76	40.80
6	10420.00	62.44 PK	68.30	-5.86	1.34 V	4	14.24	48.21

NOTE:

1. Emission level = Raw value+ Correction Factor
2. Correction Factor = Ant. Factor + Cable loss
3. Margin value = Emission level - Limit value
4. The other emission levels were very low against the limit.
5. "*" : Fundamental frequency
6. "#" The radiated frequency falling in the restricted band.



EUT	Double 108 Mbps Wireless Firewall Router	MODEL	WGU624
MODE	Turbo Mode	CHANNEL	2
FREQUENCY RANGE	1 ~ 40 GHz	DETECTOR FUNCTION	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	26deg. C, 62%RH, 991hPa	INPUT POWER (SYSTEM)	120Vac, 60Hz
TESTED BY	Steven Lu		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB)
1	#1100.00	44.25 PK	74.00	-29.75	1.58 H	28	16.39	27.86
1	#1100.00	38.76 AV	54.00	-15.24	1.58 H	28	10.90	27.86
2	#1320.00	44.56 PK	74.00	-29.44	1.24 H	274	15.80	28.76
2	#1320.00	34.68 AV	54.00	-19.32	1.24 H	274	5.92	28.76
3	3500.00	50.94 PK	68.30	-17.36	1.14 H	28	13.56	37.38
4	*5250.00	101.65 PK			1.20 H	32	60.80	40.85
4	*5250.00	91.68 AV			1.20 H	32	50.83	40.85
5	10500.00	58.15 PK	68.30	-10.15	1.25 H	274	10.54	47.61

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB)
1	#1100.00	46.10 PK	74.00	-27.90	1.60 V	334	18.24	27.86
1	#1100.00	39.82 AV	54.00	-14.18	1.60 V	334	11.96	27.86
2	#1320.00	47.63 PK	74.00	-26.37	1.00 V	122	18.87	28.76
2	#1320.00	36.35 AV	54.00	-17.65	1.00 V	122	13.86	28.76
3	3500.00	55.63 PK	68.30	-12.67	1.07 V	114	18.25	37.38
4	*5250.00	112.44 PK			1.01 V	305	71.58	40.85
4	*5250.00	102.03 AV			1.01 V	305	61.18	40.85
5	10500.00	61.48 PK	68.30	-6.82	1.33 V	0	13.87	47.61

NOTE:

1. Emission level = Raw value + Correction Factor
2. Correction Factor = Ant. Factor + Cable loss
3. Margin value = Emission level - Limit value
4. The other emission levels were very low against the limit.
5. “#”The radiated frequency falling in the restricted band.



EUT	Double 108 Mbps Wireless Firewall Router	MODEL	WGU624
MODE	Turbo Mode	CHANNEL	3
FREQUENCY RANGE	1 ~ 40 GHz	DETECTOR FUNCTION	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	26deg. C, 62%RH, 991hPa	INPUT POWER (SYSTEM)	120Vac, 60Hz
TESTED BY	Steven Lu		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB)
1	#1100.00	43.56 PK	74.00	-30.44	1.47 H	150	15.70	27.86
1	#1100.00	39.14 AV	54.00	-14.86	1.47 H	150	11.28	27.86
2	#1320.00	44.02 PK	74.00	-29.98	1.25 H	22	15.26	28.76
2	#1320.00	36.89 AV	54.00	-17.11	1.25 H	22	8.13	28.76
3	3526.82	51.22 PK	68.30	-17.08	1.14 H	96	13.75	37.47
4	*5290.00	100.46 PK			1.25 H	13	59.55	40.91
4	*5290.00	90.54 AV			1.25 H	13	49.63	40.91
5	#5350.00	45.48 PK	74.00	-28.52	1.25 H	13	4.55	40.93
6	10580.00	58.66 PK	68.30	-9.64	1.35 H	168	11.11	47.55

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB)
1	#1100.00	49.18 PK	74.00	-24.82	1.00 V	327	21.32	27.86
1	#1100.00	44.18 AV	54.00	-9.82	1.00 V	327	16.32	27.86
2	#1320.00	42.30 PK	74.00	-31.70	1.24 V	306	13.54	28.76
2	#1320.00	33.27 AV	54.00	-20.73	1.24 V	306	4.51	28.76
3	3526.82	53.88 PK	68.30	-14.42	1.08 V	293	16.41	37.47
4	*5290.00	111.41 PK			1.14 V	303	70.50	40.91
4	*5290.00	101.91 AV			1.14 V	303	61.00	40.91
5	#5350.00	56.43 PK	74.00	-17.57	1.14 V	303	15.50	40.93
5	#5350.00	46.93 AV	54.00	-7.07	1.14 V	303	6.00	40.93
6	10580.00	61.59 PK	68.30	-6.71	1.60 V	114	14.04	47.55

NOTE:

1. Emission level = Raw value + Correction Factor
2. Correction Factor = Ant. Factor + Cable loss
3. Margin value = Emission level - Limit value
4. The other emission levels were very low against the limit.
5. "*" : Fundamental frequency
6. "#" The radiated frequency falling in the restricted band.



EUT	Double 108 Mbps Wireless Firewall Router	MODEL	WGU624
MODE	Turbo Mode	CHANNEL	4
FREQUENCY RANGE	1 ~40 GHz	DETECTOR FUNCTION	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	26deg. C, 62%RH, 991hPa	INPUT POWER (SYSTEM)	120Vac, 60Hz
TESTED BY	Steven Lu		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB)
1	#1100.00	43.32 PK	74.00	-30.68	1.23 H	124	15.46	27.86
1	#1100.00	38.56 AV	54.00	-15.44	1.23 H	124	10.70	27.86
2	#1320.00	43.54 PK	74.00	-30.46	1.20 H	241	14.78	28.76
2	#1320.00	37.52 AV	54.00	-16.48	1.20 H	241	8.76	28.76
3	#3840.16	50.21 PK	74.00	-23.79	1.22 H	74	11.86	38.35
4	*5760.00	109.03 PK			1.16 H	10	67.22	41.81
4	*5760.00	98.56 AV			1.16 H	10	56.75	41.81
5	#11520.00	58.63 PK	74.00	-15.37	1.20 H	135	8.86	49.77

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB)
1	#1100.00	46.54 PK	74.00	-27.46	1.03 V	244	18.68	27.86
1	#1100.00	42.64 AV	54.00	-11.36	1.03 V	244	14.78	27.86
2	#1320.00	46.52 PK	74.00	-27.48	1.11 V	200	17.76	28.76
2	#1320.00	35.68 AV	54.00	-18.32	1.11 V	200	6.92	28.76
3	#3840.16	52.43 PK	74.00	-21.57	1.20 V	14	14.09	38.35
3	#3840.16	46.92 AV	54.00	-7.08	1.20 V	14	8.58	38.35
4	*5760.00	113.44 PK			1.03 V	299	71.63	41.81
4	*5760.00	103.52 AV			1.03 V	299	61.71	41.81
5	#11520.00	64.53 PK	74.00	-9.47	1.14 V	2	14.75	49.77
5	#11520.00	52.25 AV	54.00	-1.75	1.14 V	2	2.47	49.77

NOTE:

1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB).
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. “ * “ : Fundamental frequency.
6. “#”The radiated frequency falling in the restricted band.
7. The limit value is defined as per 15.247



EUT	Double 108 Mbps Wireless Firewall Router	MODEL	WGU624
MODE	Turbo Mode	CHANNEL	5
FREQUENCY RANGE	1 ~ 40 GHz	DETECTOR FUNCTION	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	26deg. C, 62%RH, 991hPa	INPUT POWER (SYSTEM)	120Vac, 60Hz
TESTED BY	Steven Lu		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB)
1	#1100.00	43.63 PK	74.00	-30.37	1.50 H	224	15.77	27.86
1	#1100.00	38.96 AV	54.00	-15.04	1.50 H	224	11.10	27.86
2	#1320.00	44.20 PK	74.00	-29.80	1.24 H	236	15.44	28.76
2	#1320.00	37.52 AV	54.00	-16.48	1.24 H	236	8.76	28.76
3	#3867.00	50.98 PK	74.00	-23.02	1.10 H	24	12.66	38.32
3	#3867.00	41.63 AV	54.00	-12.37	1.10 H	24	3.31	38.32
4	*5800.00	103.50 PK			1.64 H	230	61.52	41.98
4	*5800.00	93.13 AV			1.64 H	230	51.15	41.98
5	#11600.00	59.63 PK	74.00	-14.37	1.22 H	143	9.14	50.49

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB)
1	#1100.00	46.54 PK	74.00	-27.46	1.20 V	155	18.68	27.86
1	#1100.00	41.82 AV	54.00	-12.18	1.20 V	155	13.96	27.86
2	#1320.00	46.21 PK	74.00	-27.79	1.00 V	102	17.45	28.76
2	#1320.00	36.52 AV	54.00	-17.48	1.00 V	102	7.76	28.76
3	#3867.00	55.32 PK	74.00	-18.68	1.08 V	110	17.00	38.32
3	#3867.00	51.00 AV	54.00	-3.00	1.08 V	110	12.68	38.32
4	*5800.00	113.83 PK			1.06 V	287	71.85	41.98
4	*5800.00	104.61 AV			1.06 V	287	62.63	41.98
5	#11600.00	65.14 PK	74.00	-8.86	1.08 V	29	14.65	50.49
5	#11600.00	52.46 AV	54.00	-1.54	1.08 V	29	1.97	50.49

NOTE:

1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB).
2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB).
3. The other emission levels were very low against the limit.
4. Margin value = Emission level – Limit value.
5. “ * “ : Fundamental frequency.
6. “#”The radiated frequency falling in the restricted band.
7. The limit value is defined as per 15.247



FOR FREQUENCY 5.15~5.35GHz

5.3 PEAK TRANSMIT POWER MEASUREMENT

5.3.1 LIMITS OF PEAK TRANSMIT POWER MEASUREMENT

Frequency Band	Limit
5.15 – 5.25GHz	The lesser of 50mW (17dBm) or 4dBm + 10logB
5.25 – 5.35GHz	The lesser of 250mW (24dBm) or 11dBm + 10logB
5.725 – 5.825GHz	The lesser of 1W (30dBm) or 17dBm + 10logB

NOTE: Where B is the 26dB emission bandwidth in MHz.

5.3.2 TEST INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
R&S SPECTRUM ANALYZER	FSEK30	100049	Aug. 12, 2005

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



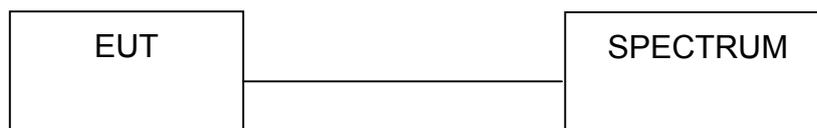
5.3.3 TEST PROCEDURE

1. The transmitter output was connected to the spectrum analyzer.
2. Set span to encompass the entire emission bandwidth of the signal.
3. Set RBW to 1MHz, VBW to 300kHz.
4. Using the spectrum analyzer's channel power measurement function to measure the output power.

5.3.4 DEVIATION FROM TEST STANDARD

No deviation

5.3.5 TEST SETUP



5.3.6 EUT OPERATING CONDITIONS

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



5.3.7 TEST RESULTS

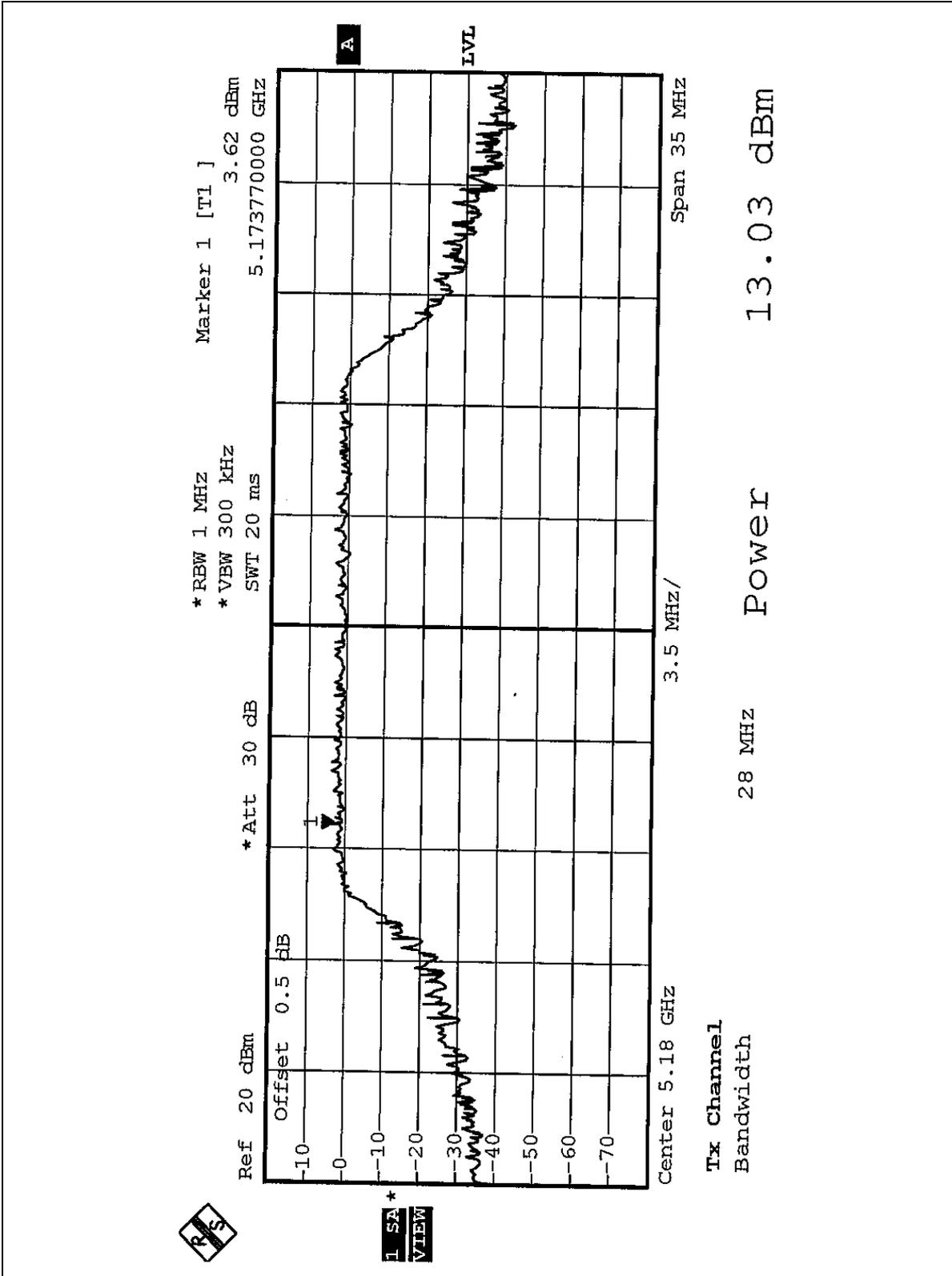
EUT	Double 108 Mbps Wireless Firewall Router	MODEL	WGU624
MODE	Normal	INPUT POWER (SYSTEM)	120Vac, 60 Hz
ENVIRONMENTAL CONDITIONS	24deg. C, 65%RH, 991hPa	TESTED BY	Steven Lu

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (dBm)	26dBc Occupied Bandwidth (MHz)	PASS/FAIL
1	5180	13.03	17.00	24.92	PASS
4	5240	13.09	17.00	25.69	PASS
5	5260	13.03	24.00	25.13	PASS
8	5320	13.16	24.00	26.53	PASS

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

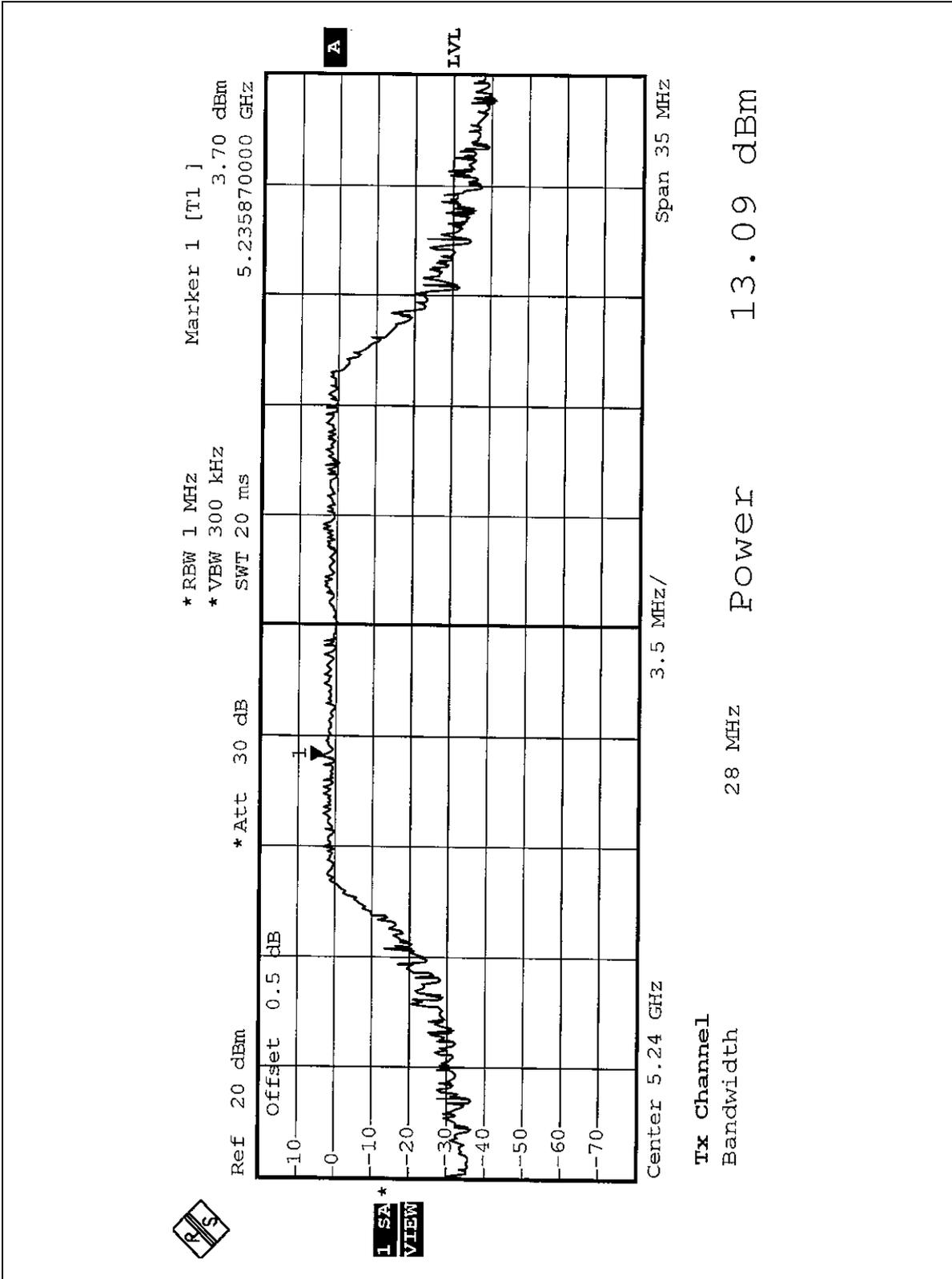


Peak Power Output:
CH1



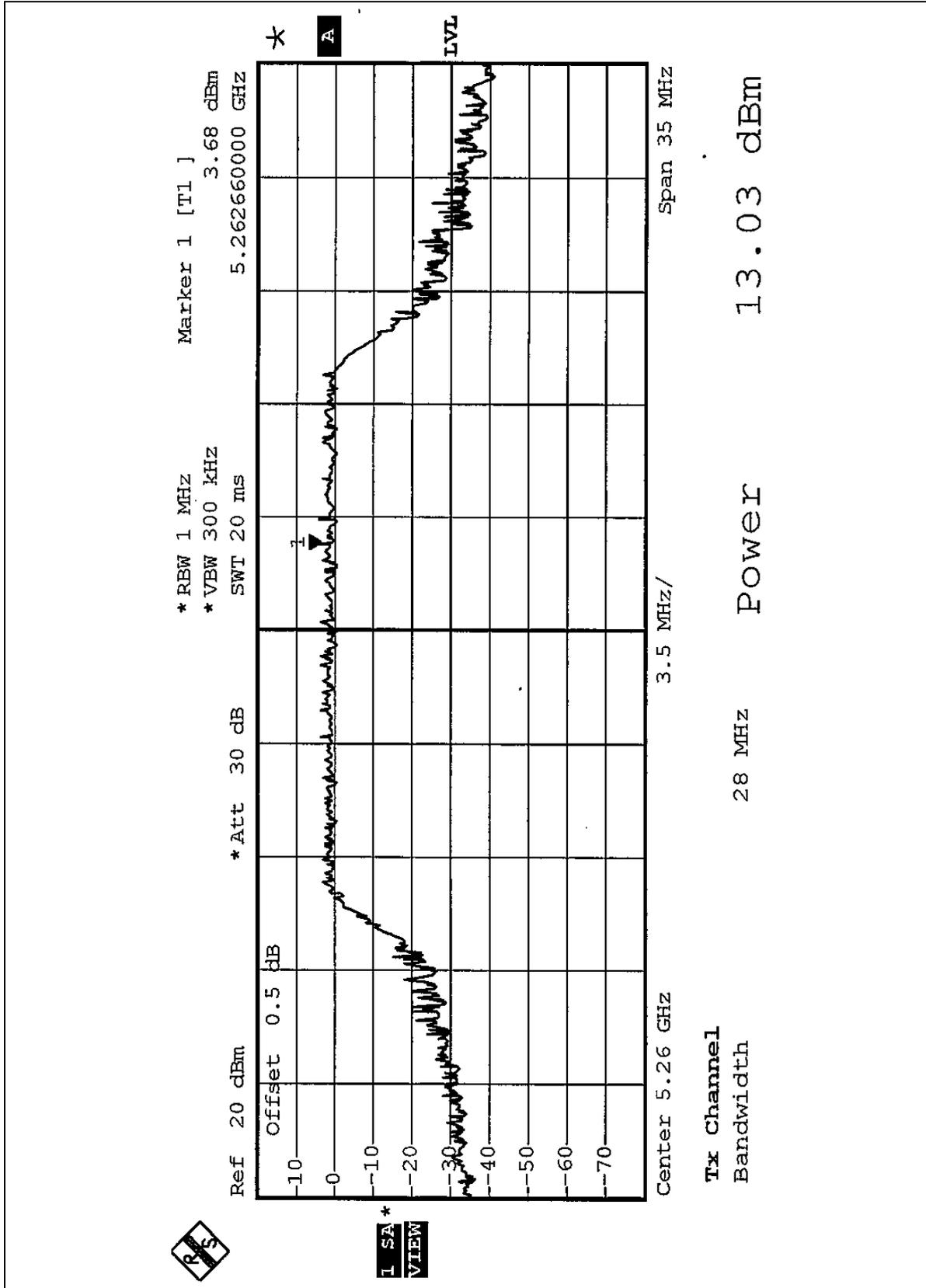


CH4



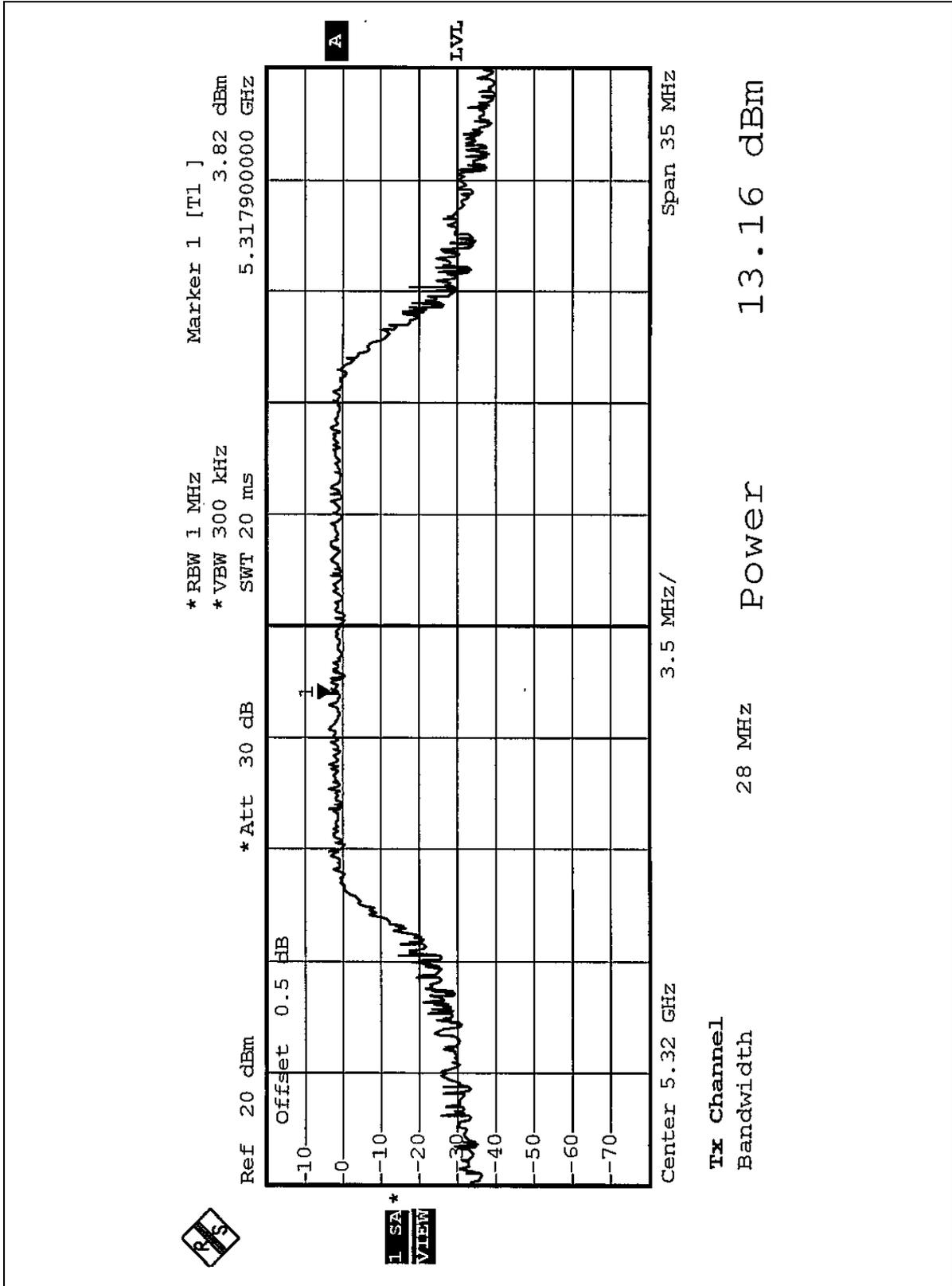


CH5



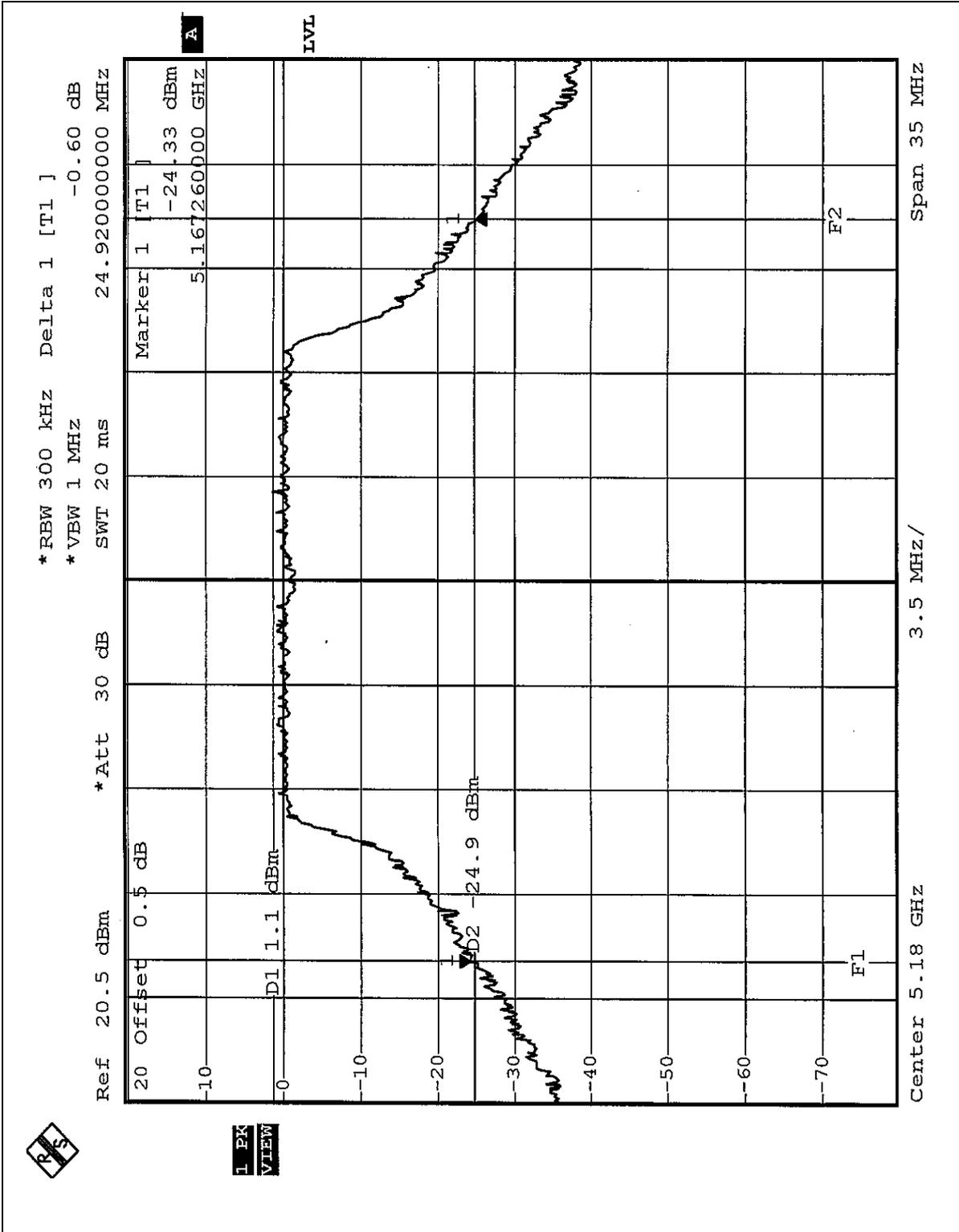


CH8



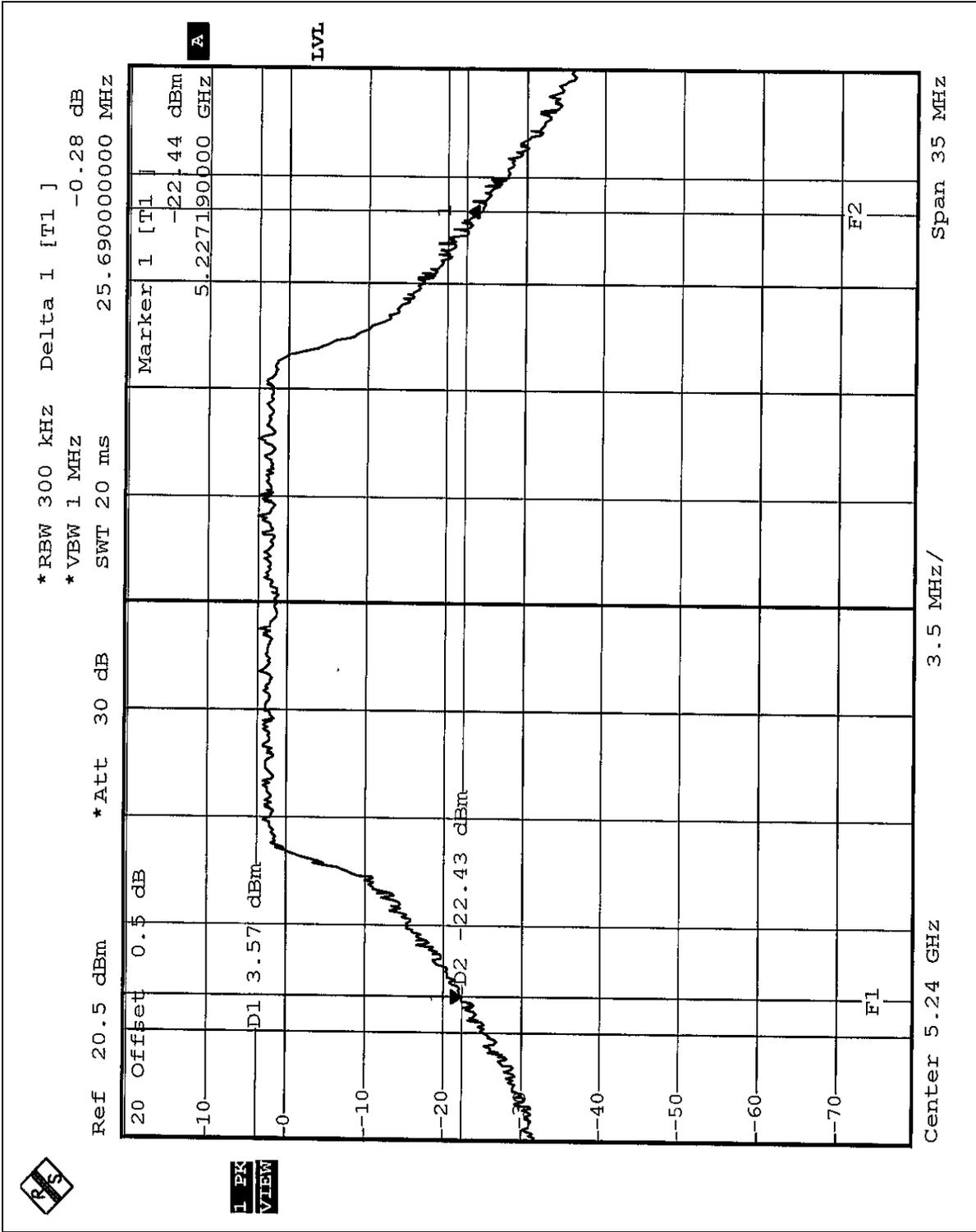


26dB Occupied Bandwidth:
CH1



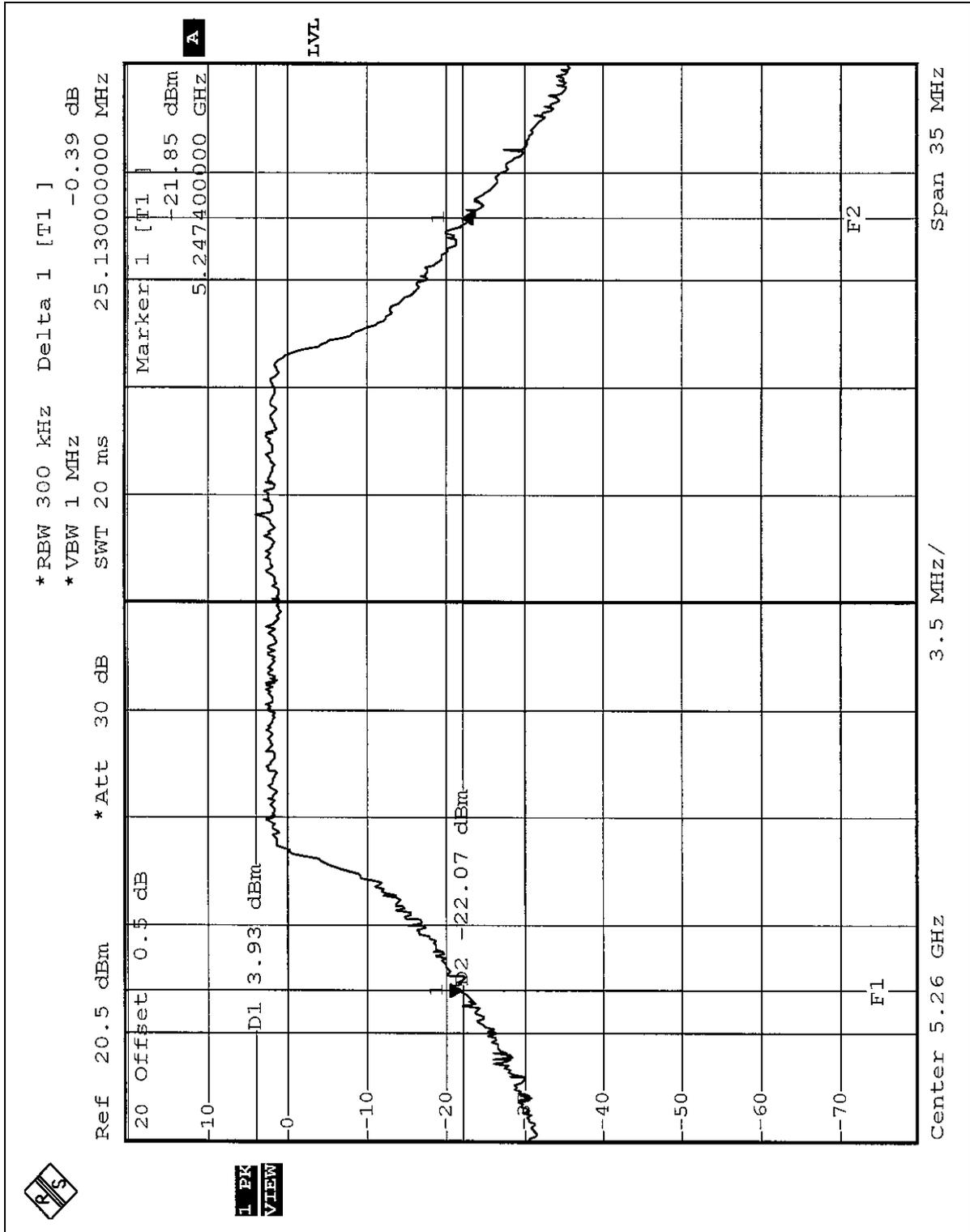


CH4



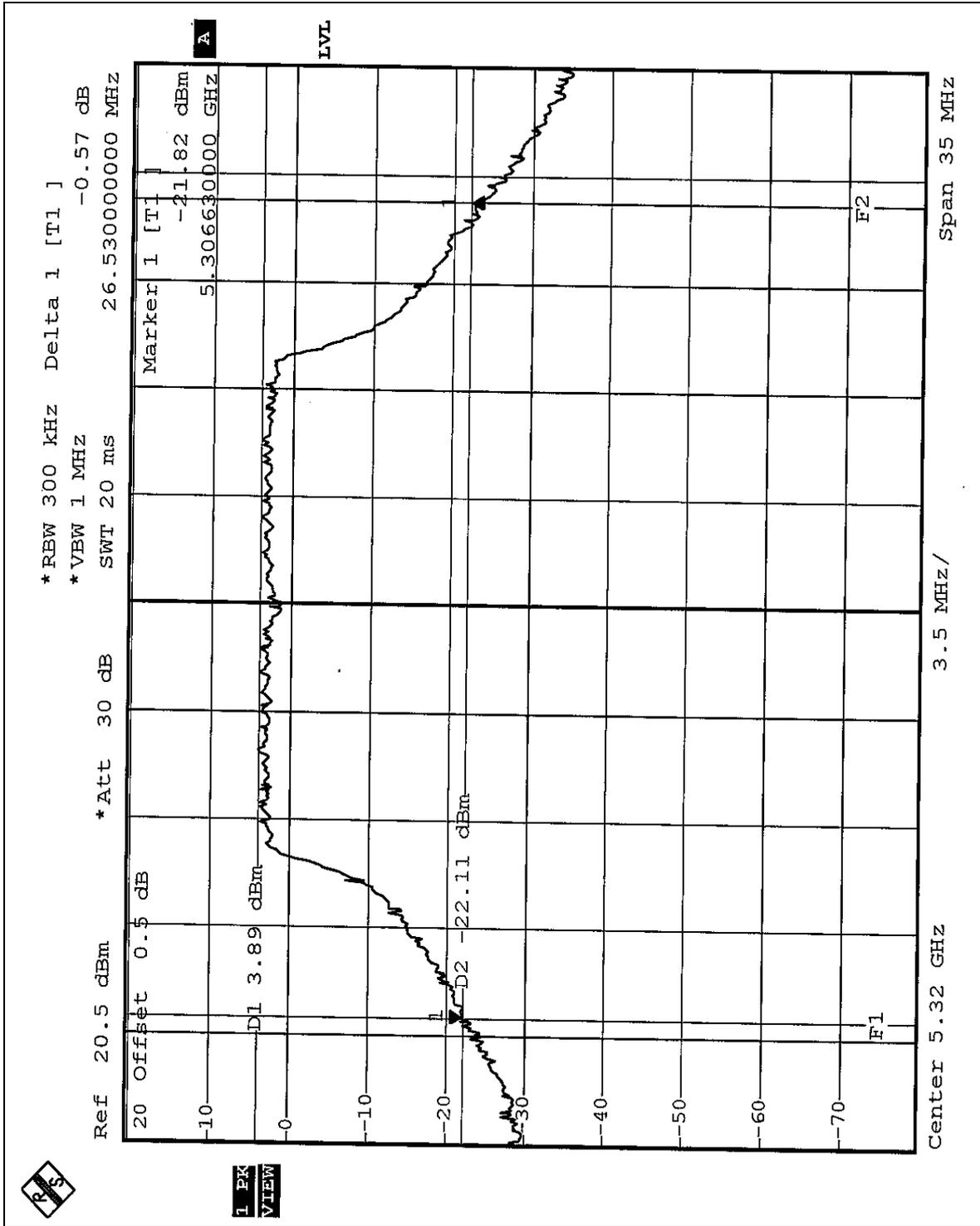


CH5





CH8





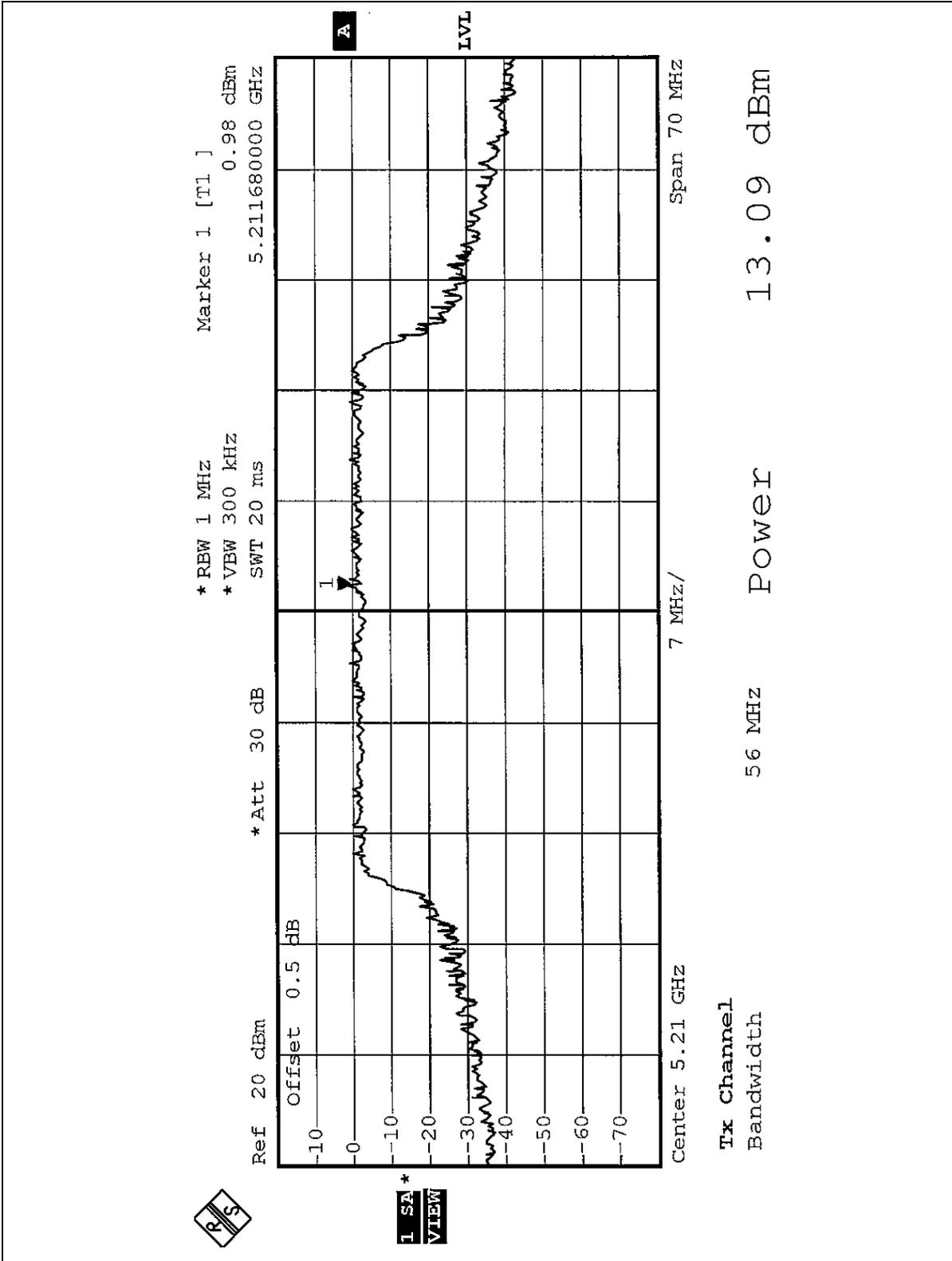
EUT	Double 108 Mbps Wireless Firewall Router	MODEL	WGU624
MODE	Turbo	INPUT POWER (SYSTEM)	120Vac, 60 Hz
ENVIRONMENTAL CONDITIONS	24deg. C, 65%RH, 991hPa	TESTED BY	Steven Lu

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (dBm)	26dBc Occupied Bandwidth (MHz)	PASS/FAIL
1	5210	13.09	17.00	49.08	PASS
2	5250	13.13	17.00	49.20	PASS
3	5290	13.19	24.00	49.08	PASS

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

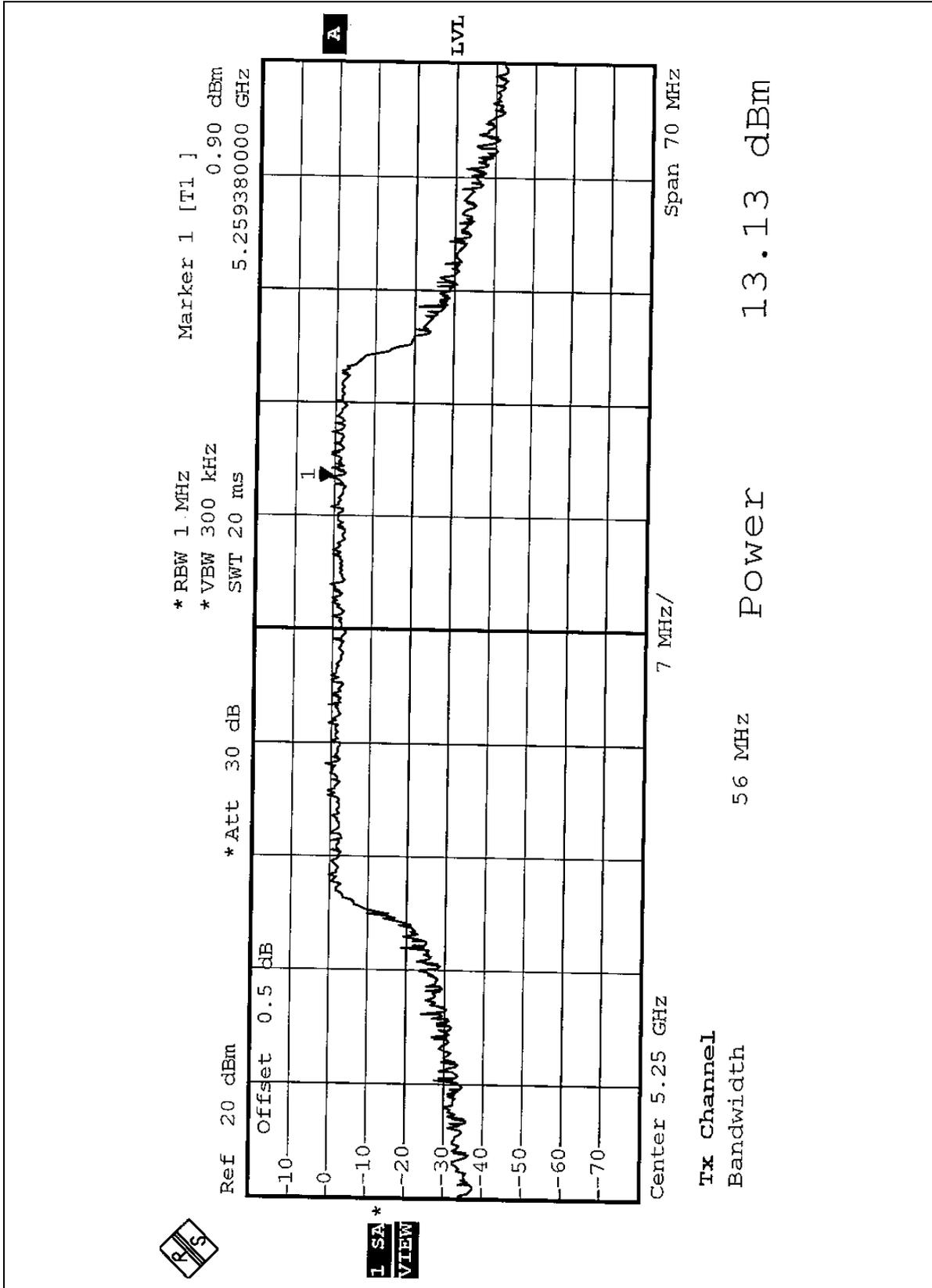


Peak Power Output:
CH1



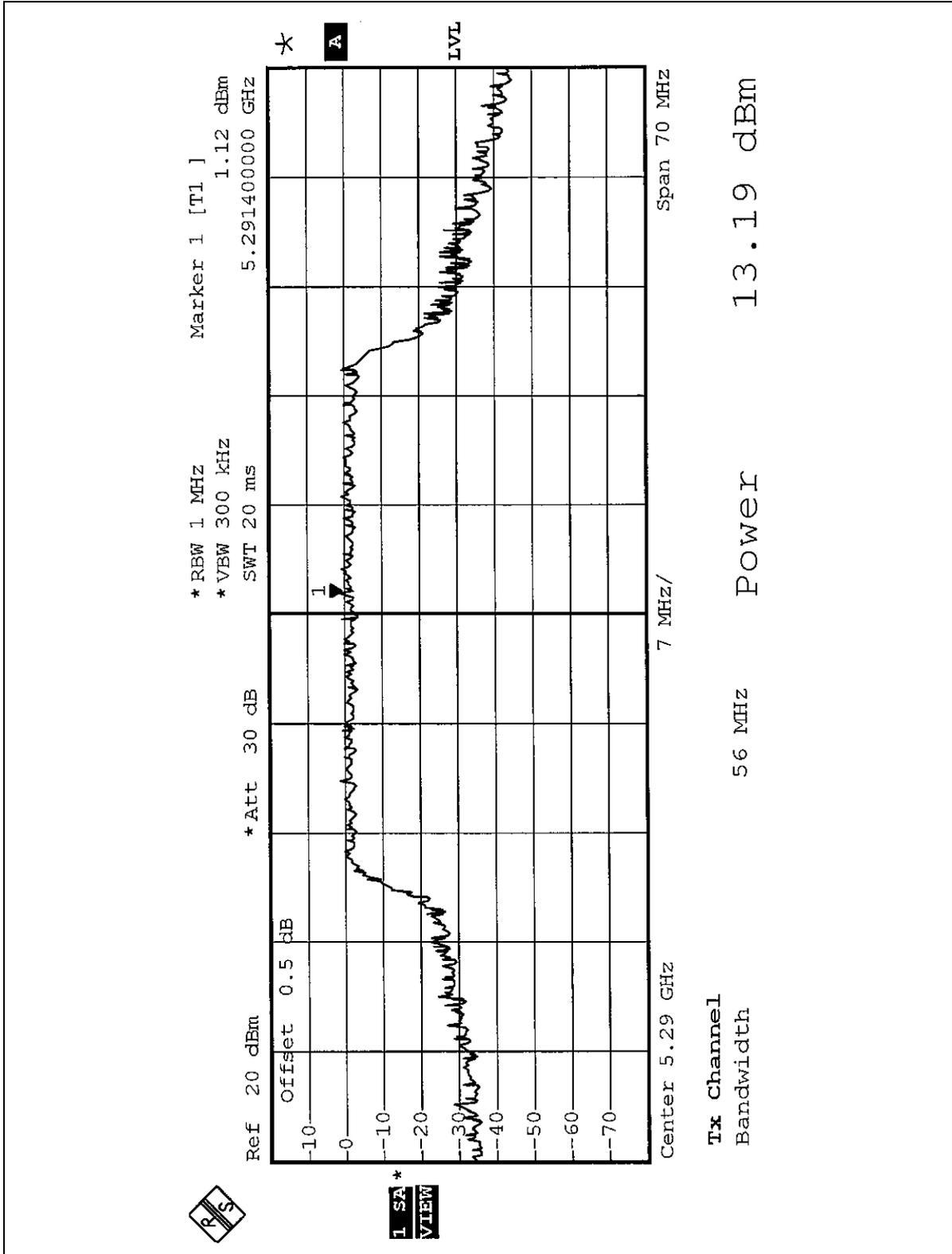


CH2



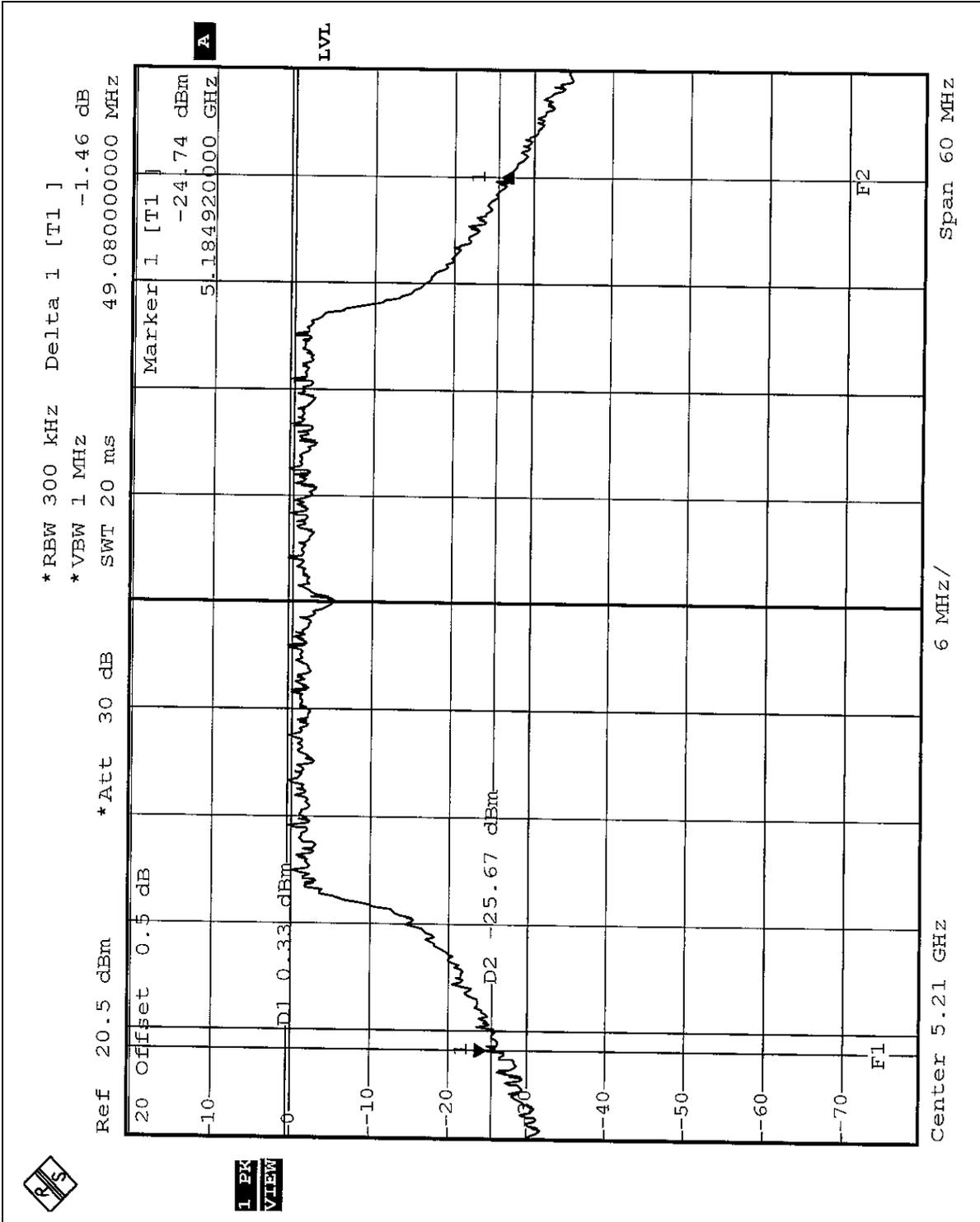


CH3



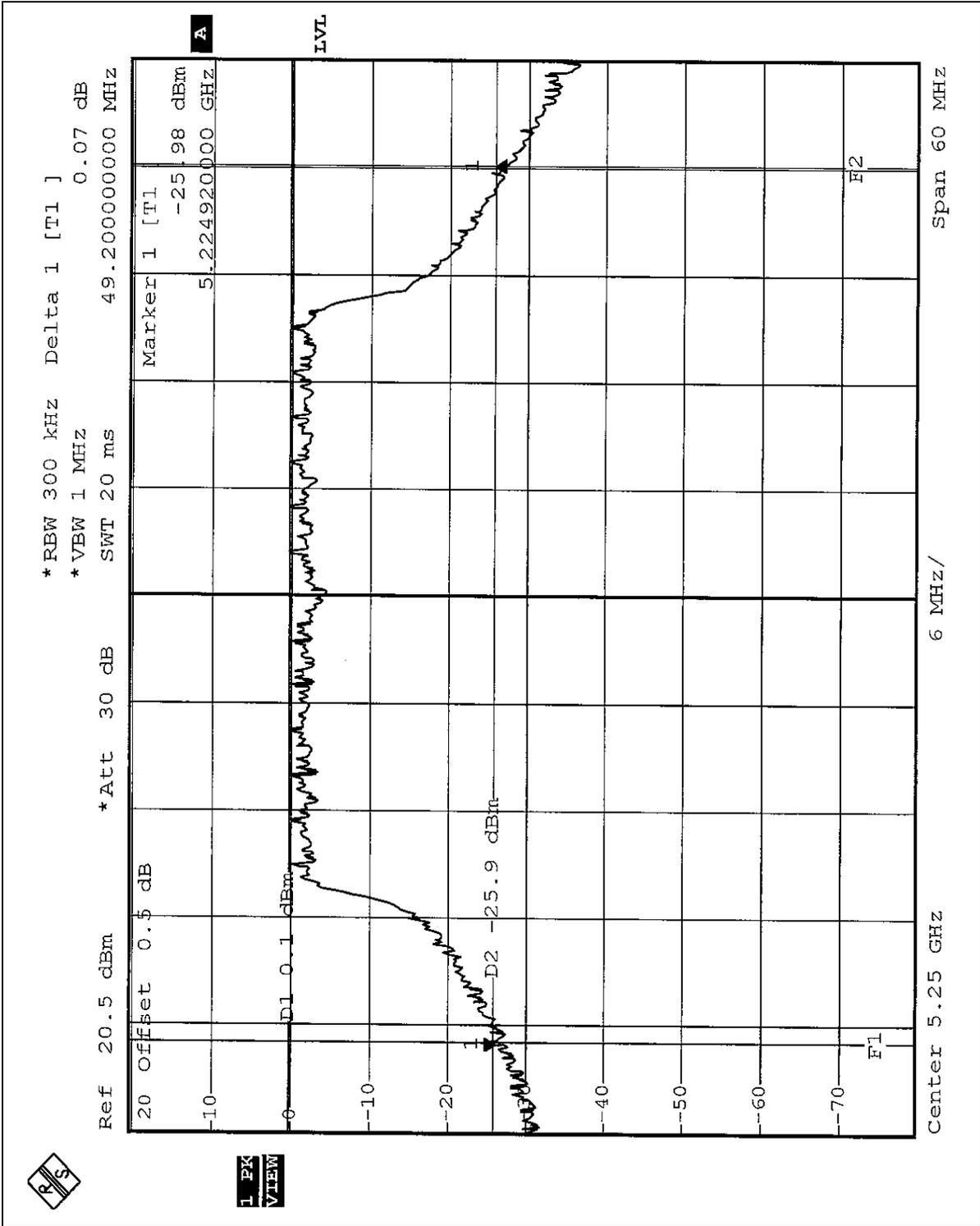


26dB Occupied Bandwidth:
CH1



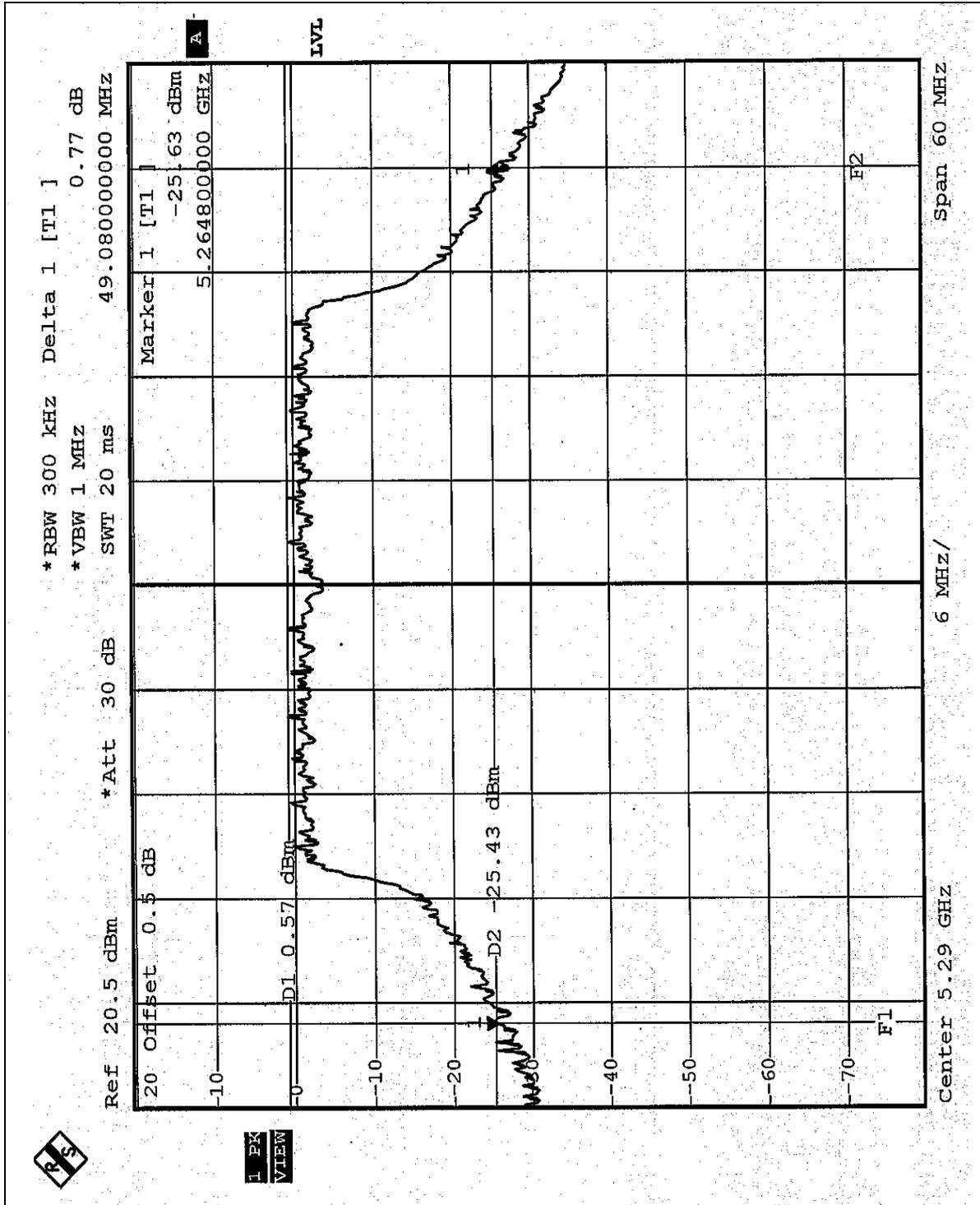


CH2





CH3





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	Aug. 12, 2005

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



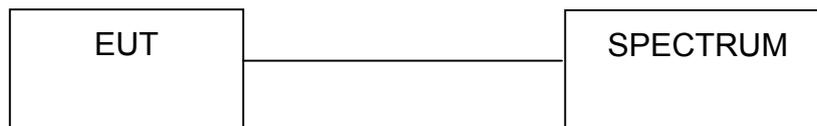
5.4.3 TEST PROCEDURE

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.



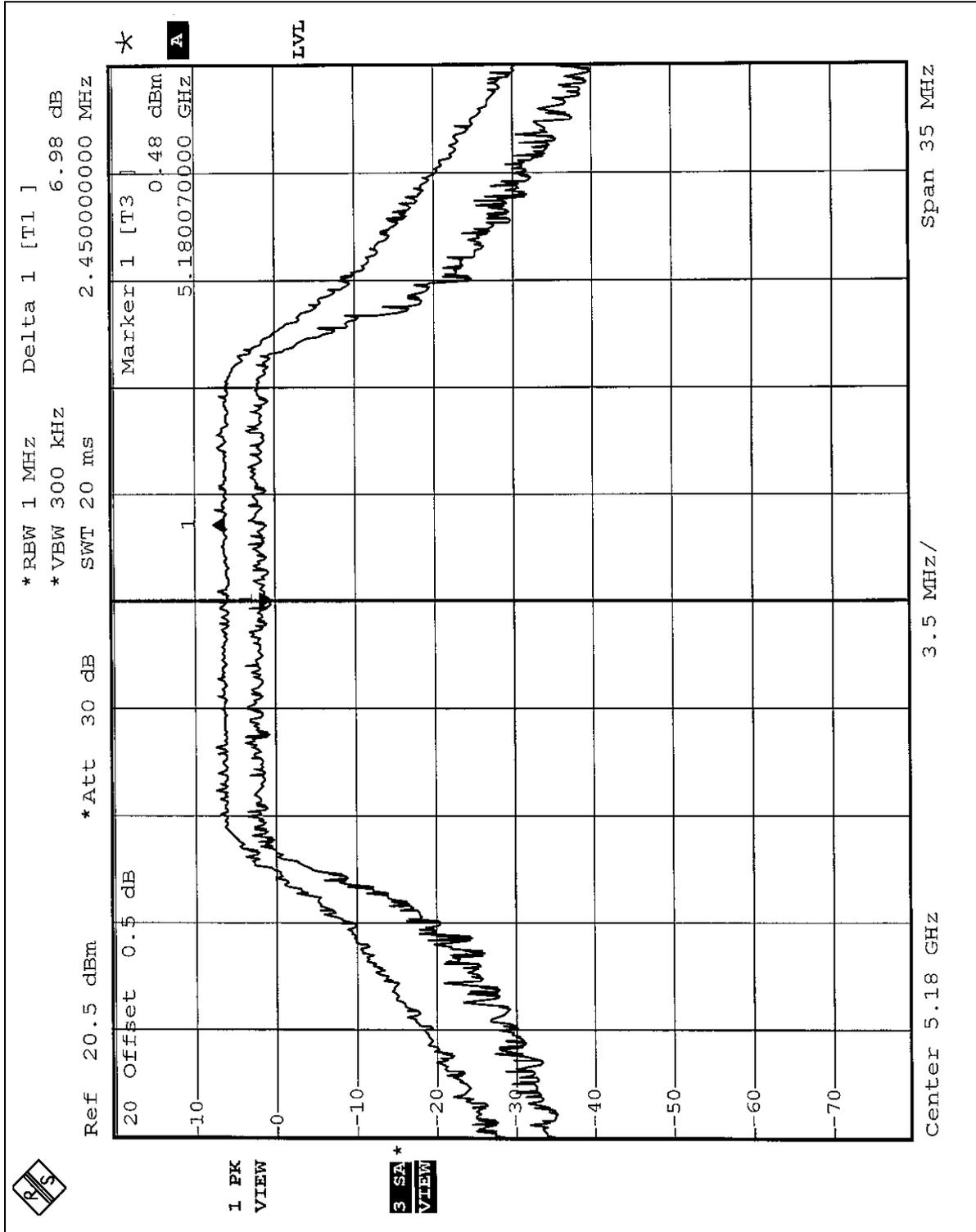
5.4.7 TEST RESULTS

EUT	Double 108 Mbps Wireless Firewall Router	MODEL	WGU624
MODE	Normal	INPUT POWER (SYSTEM)	120Vac, 60 Hz
ENVIRONMENTAL CONDITIONS	24deg. C, 65%RH, 991hPa	TESTED BY	Steven Lu

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER EXCURSION (dB)	PEAK to AVERAGE EXCURSION LIMIT (dB)	PASS/FAIL
1	5180	6.98	13	PASS
4	5240	7.50	13	PASS
5	5260	7.25	13	PASS
8	5320	6.35	13	PASS

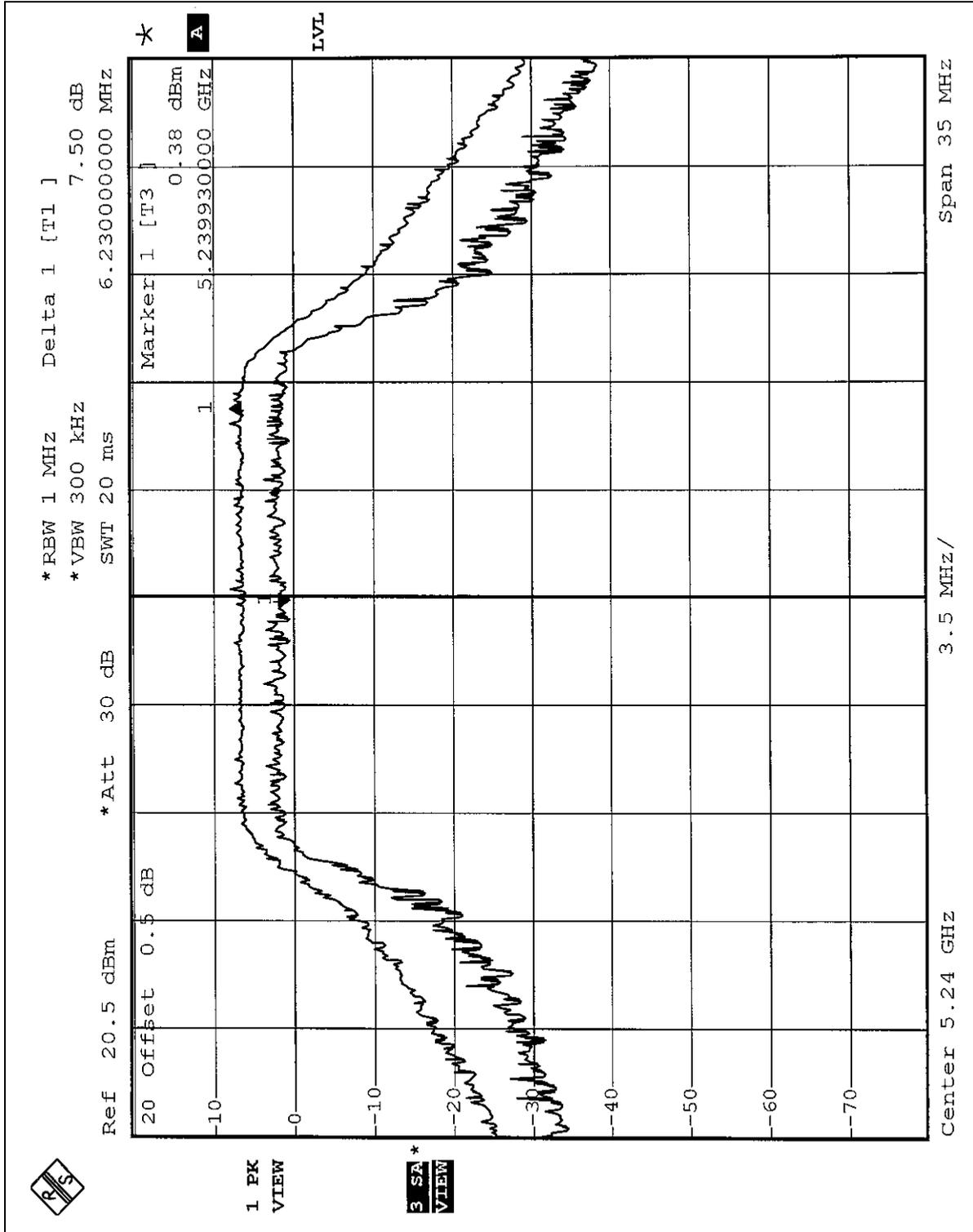


CH1



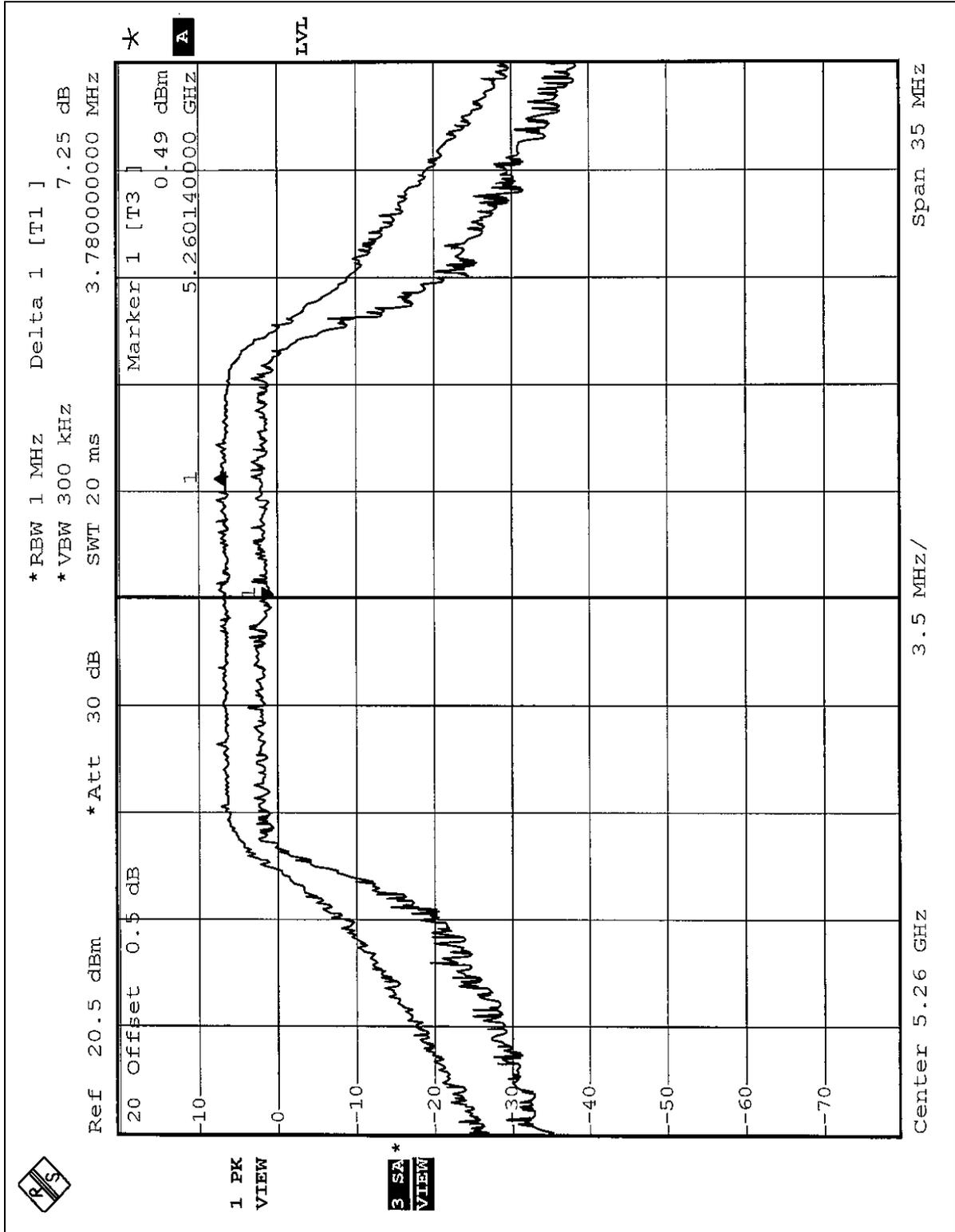


CH4



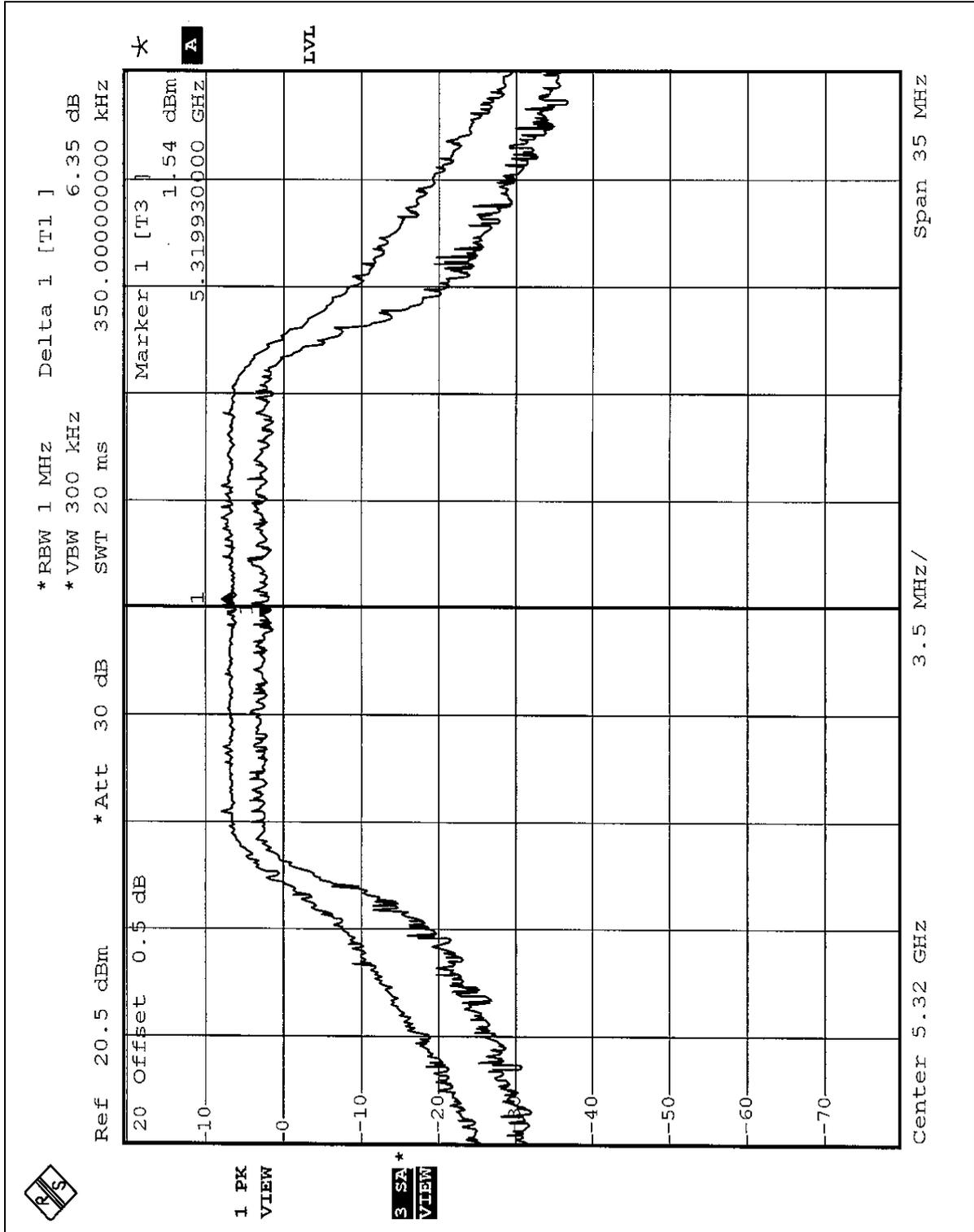


CH5





CH8



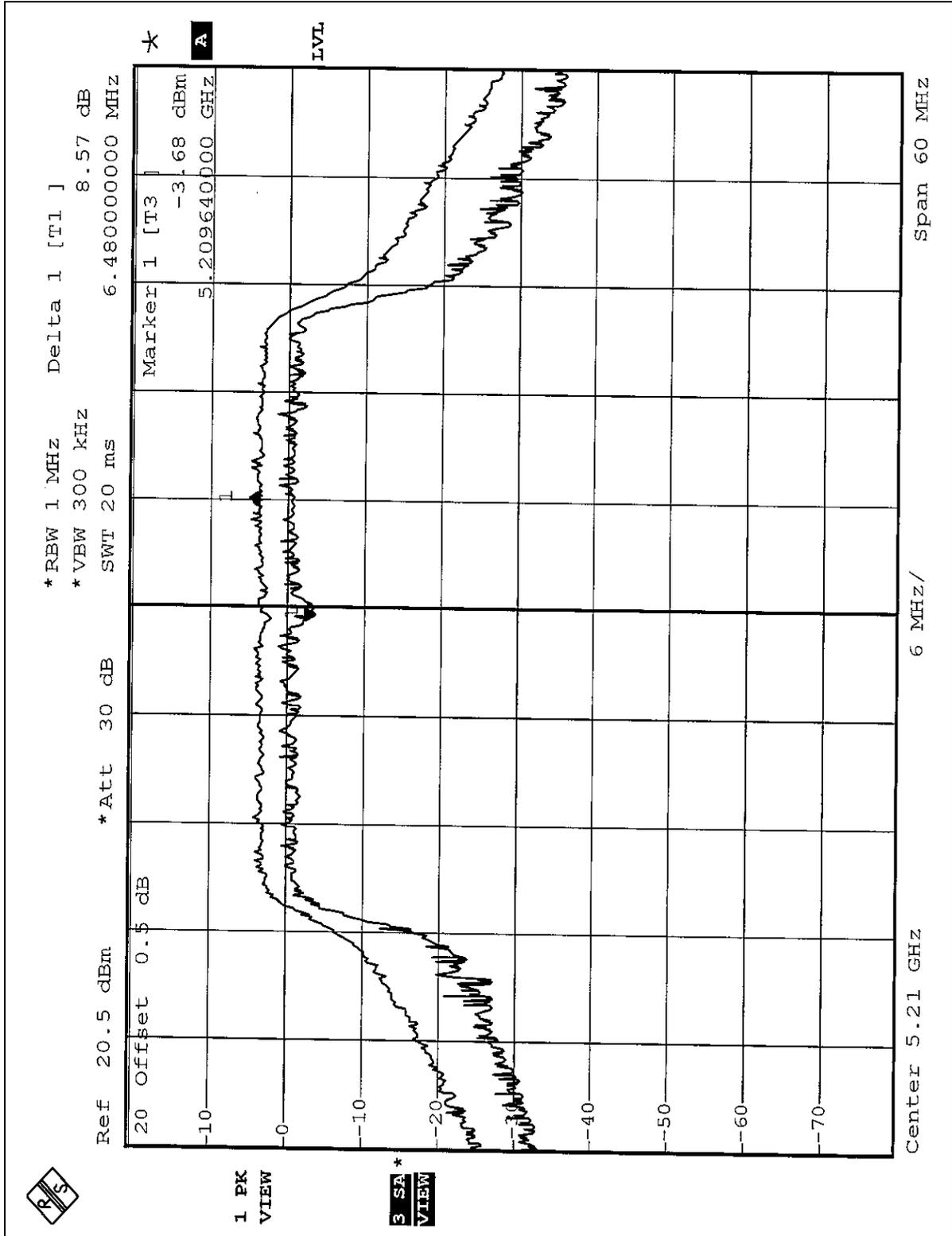


EUT	Double 108 Mbps Wireless Firewall Router	MODEL	WGU624
MODE	Turbo	INPUT POWER (SYSTEM)	120Vac, 60 Hz
ENVIRONMENTAL CONDITIONS	24deg. C, 65%RH, 991hPa	TESTED BY	Steven Lu

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER EXCURSION (dB)	PEAK to AVERAGE EXCURSION LIMIT (dB)	PASS/FAIL
1	5210	8.57	13	PASS
2	5250	7.08	13	PASS
3	5290	8.98	13	PASS

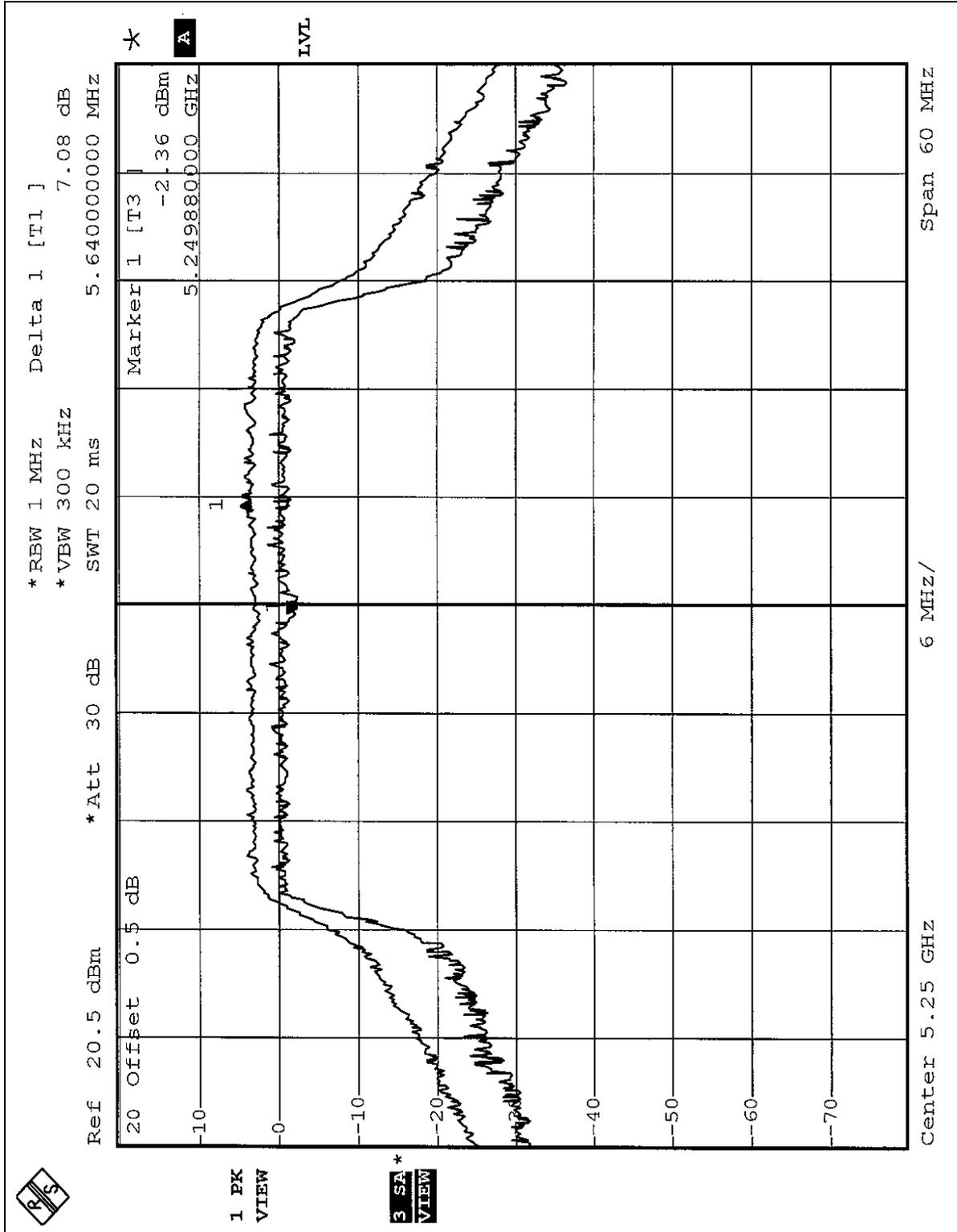


CH1



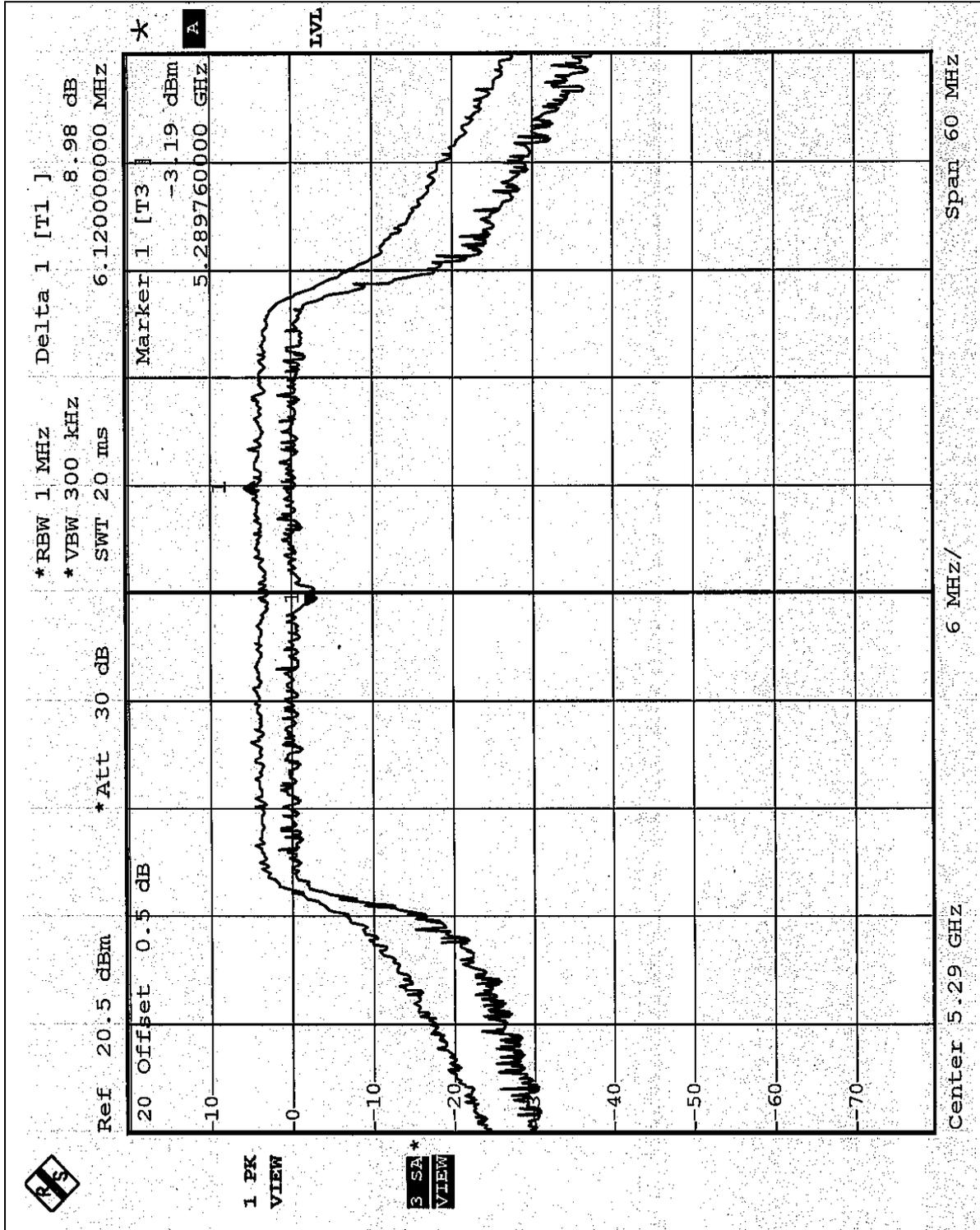


CH2





CH3





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	Aug. 12, 2005

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



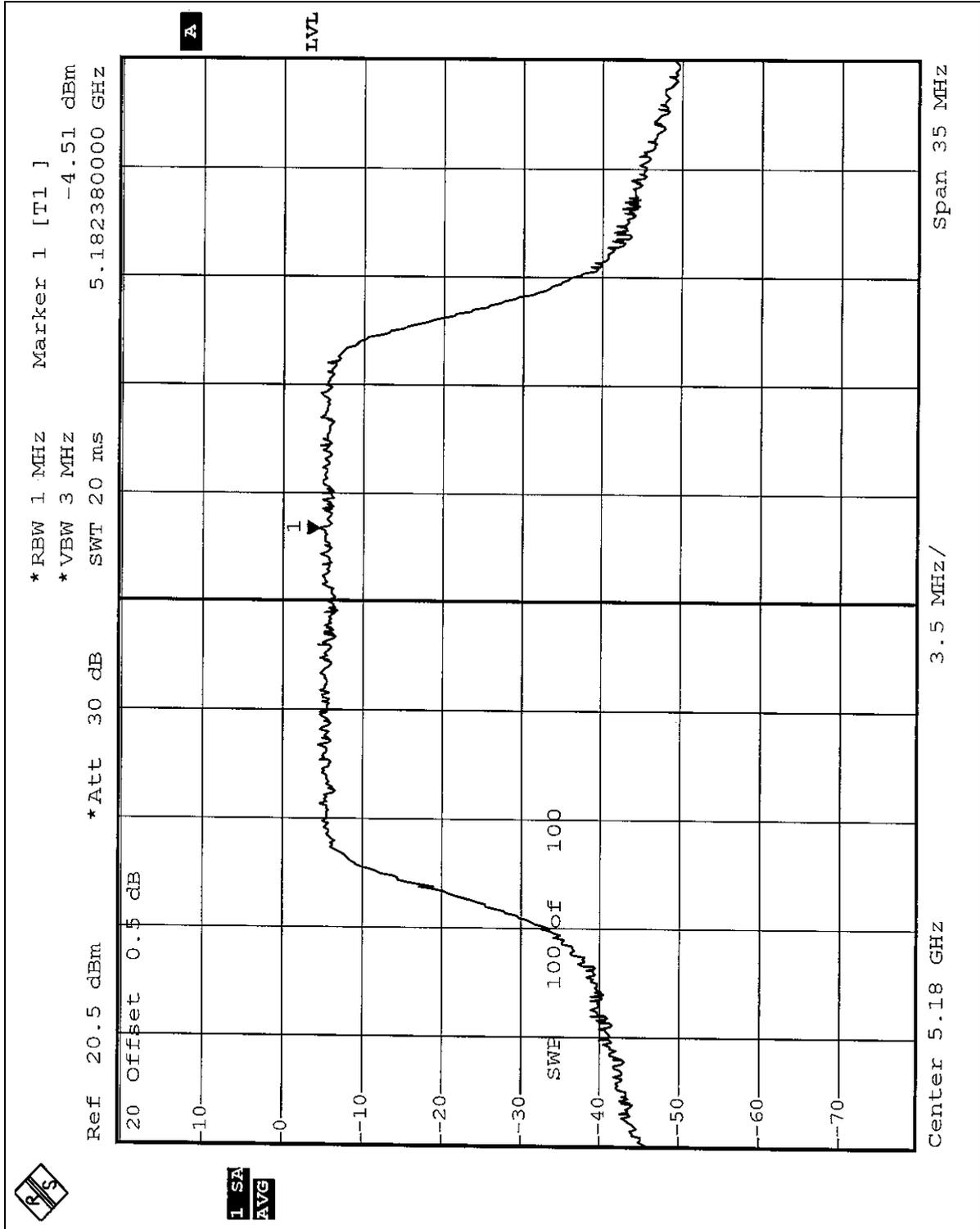
5.5.7 TEST RESULTS

EUT	Double 108 Mbps Wireless Firewall Router	MODEL	WGU624
MODE	Normal	INPUT POWER (SYSTEM)	120Vac, 60 Hz
ENVIRONMENTAL CONDITIONS	24deg. C, 65%RH, 991hPa	TESTED BY	Steven Lu

CHANNEL	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 1MHz BW (dBm)	MAXIMUM LIMIT (dBm)	PASS/FAIL
1	5180	-4.51	4	PASS
4	5240	-1.95	4	PASS
5	5260	-2.19	11	PASS
8	5320	-1.72	11	PASS

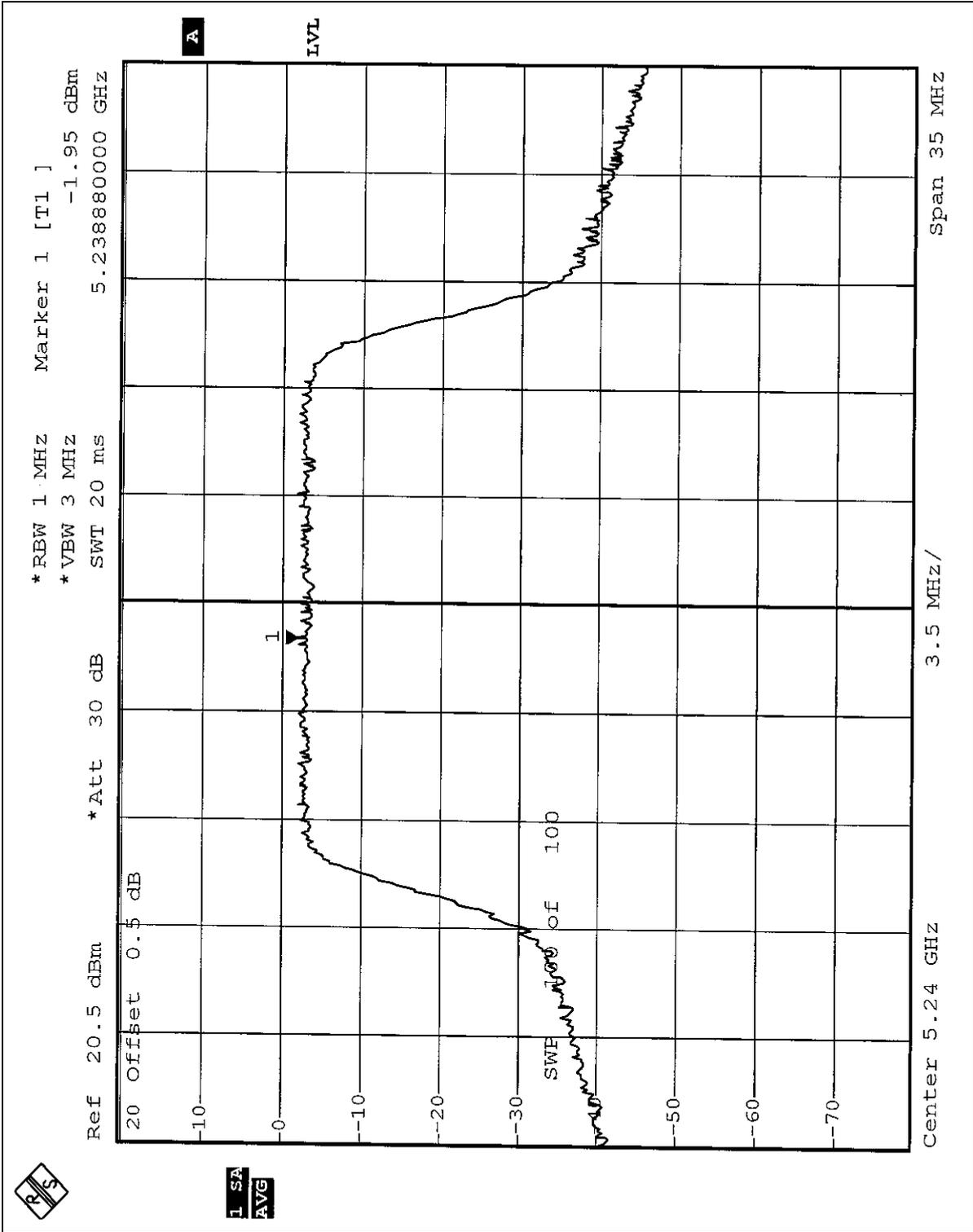


CH1



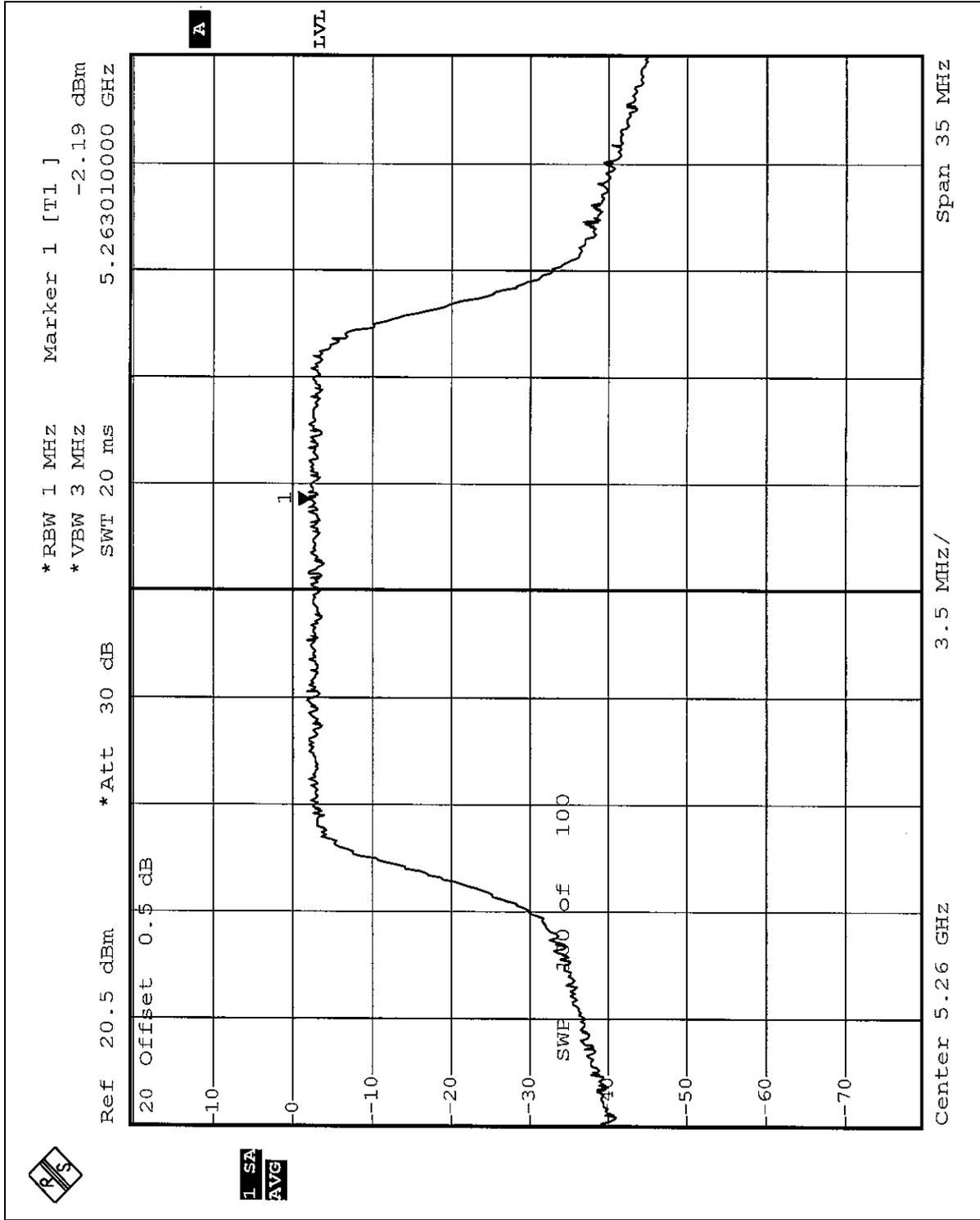


CH4



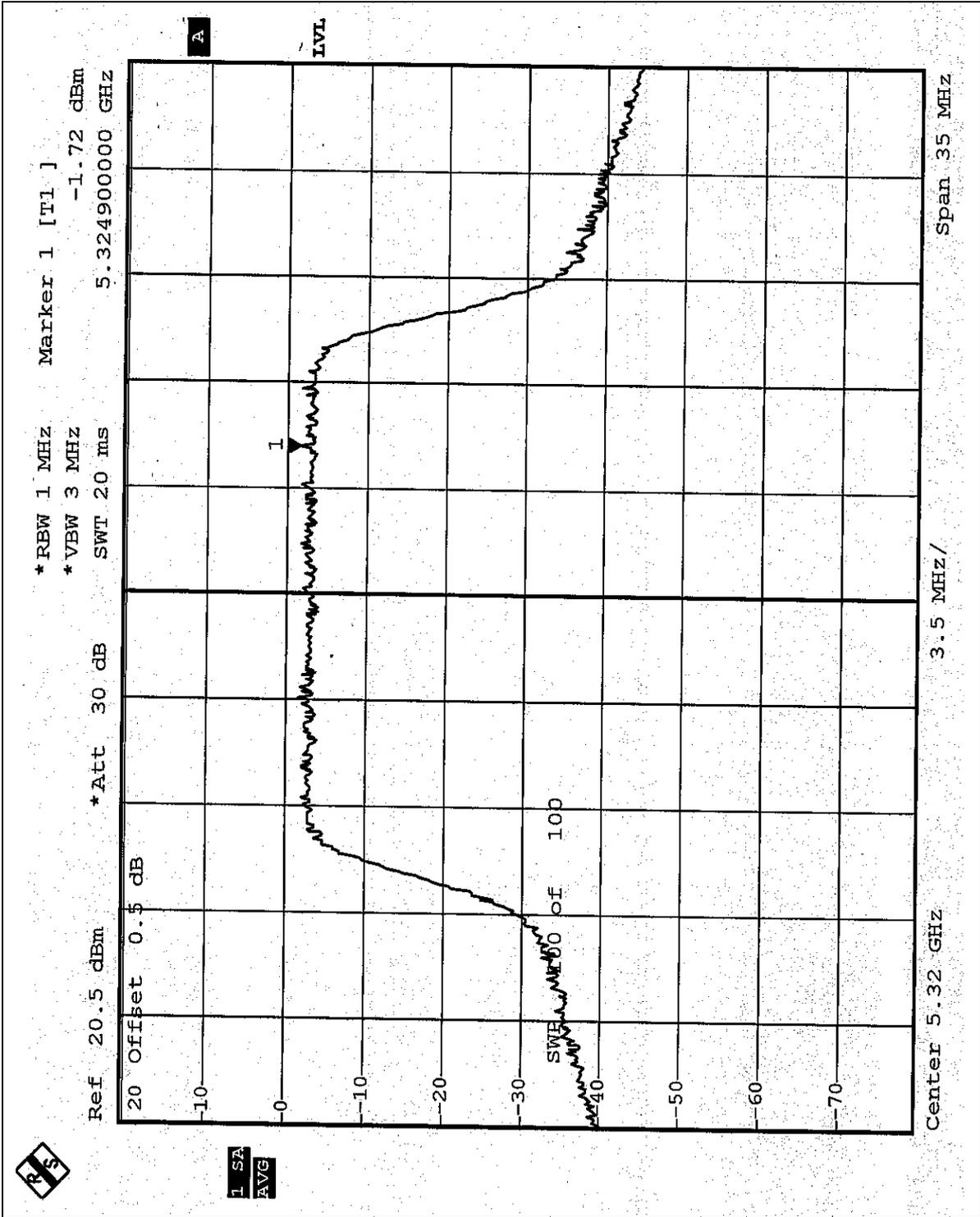


CH5





CH8



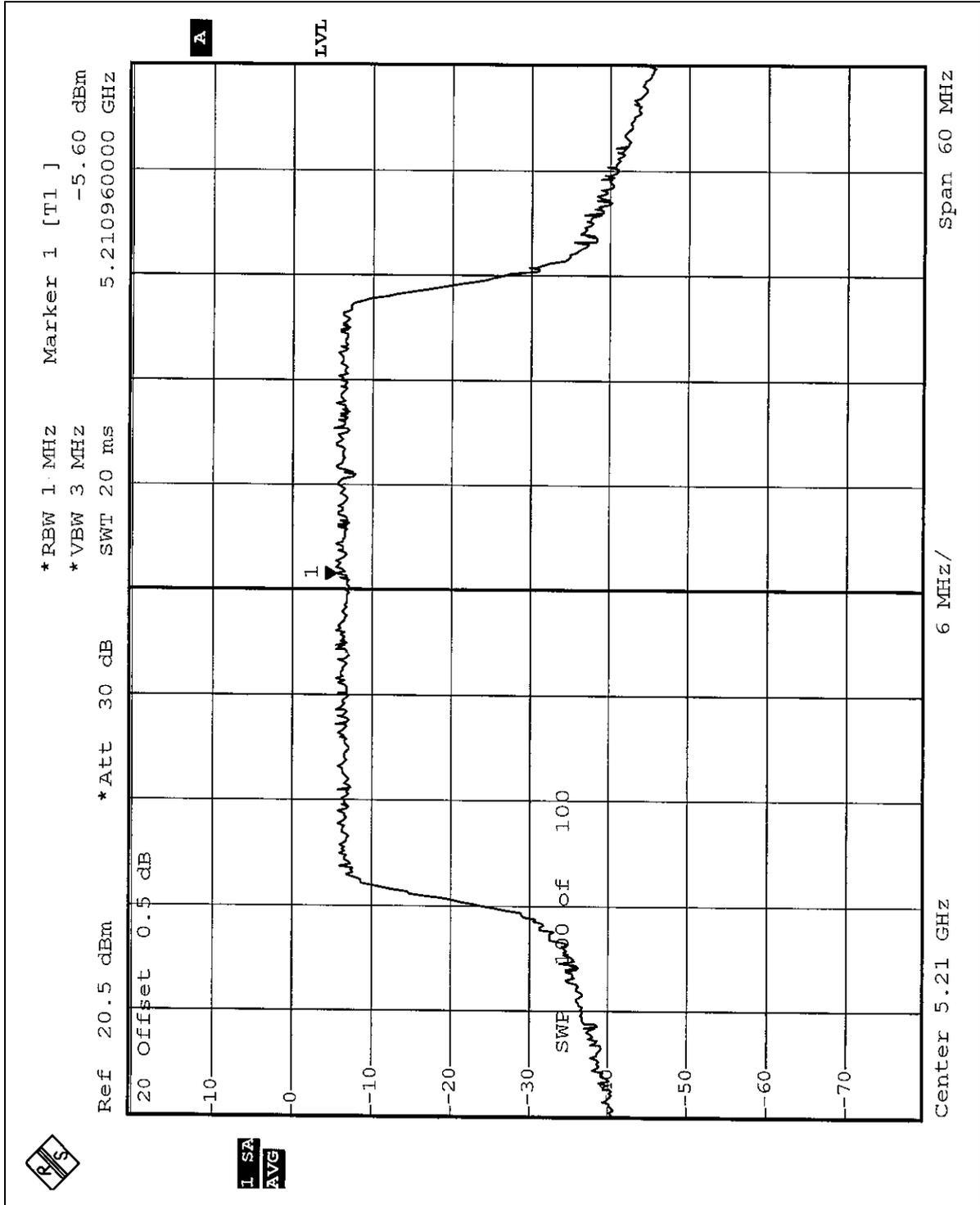


EUT	Double 108 Mbps Wireless Firewall Router	MODEL	WGU624
MODE	Turbo	INPUT POWER (SYSTEM)	120Vac, 60 Hz
ENVIRONMENTAL CONDITIONS	24deg. C, 65%RH, 991hPa	TESTED BY	Steven Lu

CHANNEL	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 1 MHz BW (dBm)	MAXIMUM LIMIT (dBm)	PASS/FAIL
1	5210	-5.60	4	PASS
2	5250	-5.14	4	PASS
3	5290	-4.99	11	PASS

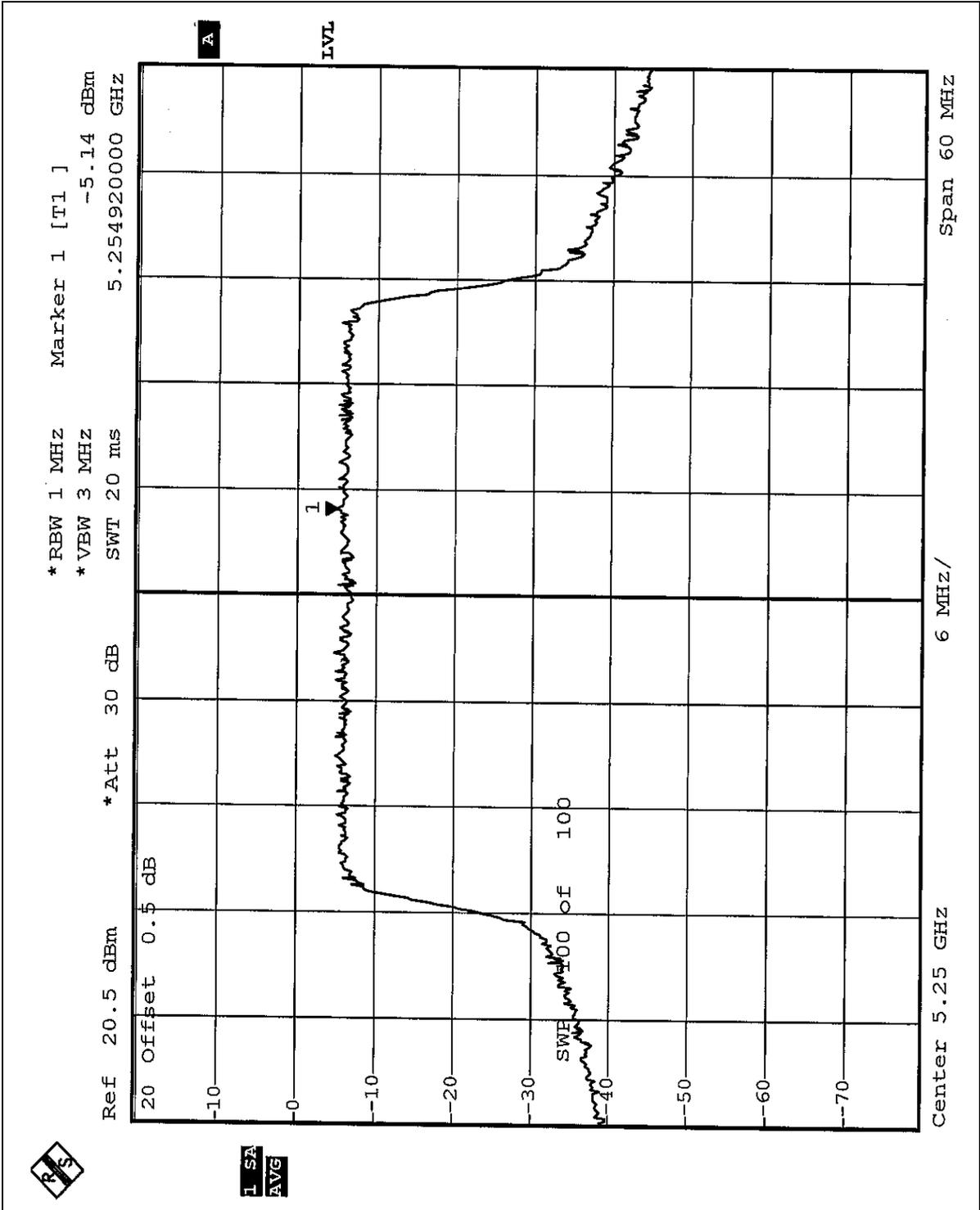


CH1



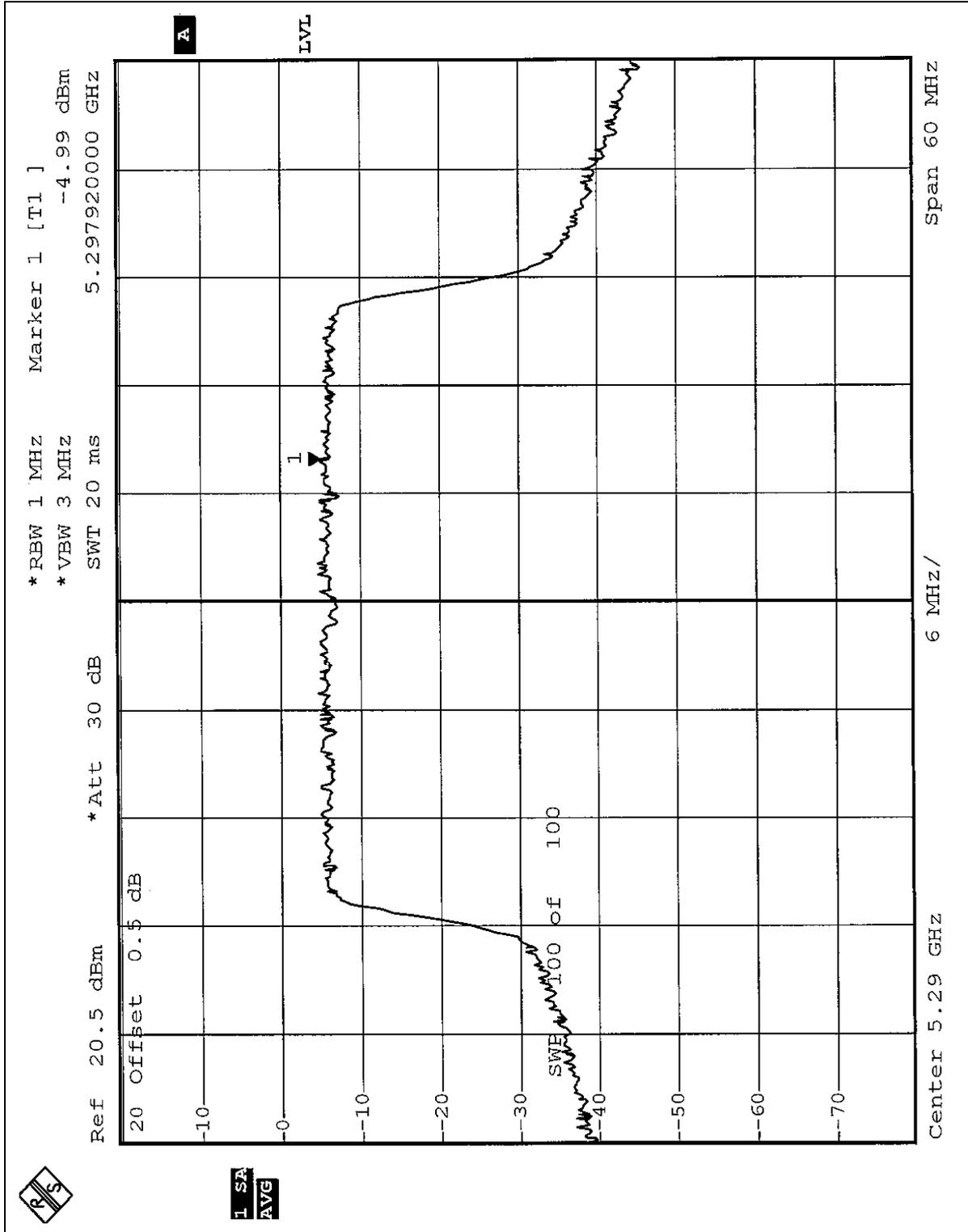


CH2





CH3





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	Feb. 09, 2005
WIT STANDARD TEMPERATURE AND HUMIDITY CHAMBER	TH-4S-C	W981030	July 18, 2005

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

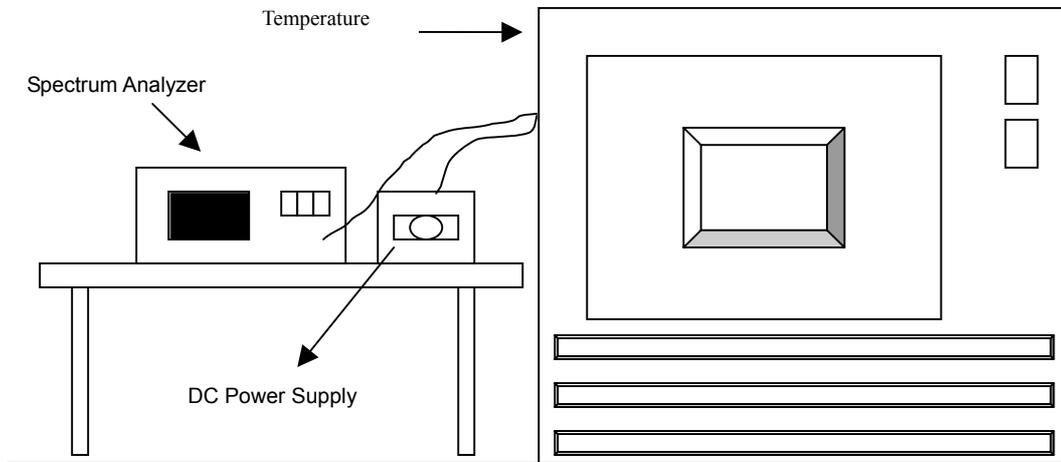
5.6.3 TEST PROCEDURE

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 : $\pm 0.01\%$	
Temp. (°C)	Power supply (VDC)	2 minute		5 minute		10 minute	
		(MHz)	(%)	(MHz)	(%)	(MHz)	(%)
50	93.5	5320.0110	0.0002068	5320.0114	0.0002143	5320.0114	0.0002143
	110.0	5320.0108	0.0002030	5320.0112	0.0002105	5320.0114	0.0002143
	126.5	5320.0106	0.0001992	5320.0112	0.0002105	5320.0114	0.0002143
40	93.5	5320.0076	0.0001429	5320.0076	0.0001429	5320.0076	0.0001429
	110.0	5320.0076	0.0001429	5320.0076	0.0001429	5320.0076	0.0001429
	126.5	5320.0076	0.0001429	5320.0076	0.0001429	5320.0076	0.0001429
30	93.5	5320.0116	0.0002180	5320.0116	0.0002180	5320.0116	0.0002180
	110.0	5320.0116	0.0002180	5320.0116	0.0002180	5320.0116	0.0002180
	126.5	5320.0116	0.0002180	5320.0116	0.0002180	5320.0116	0.0002180
20	93.5	5320.0152	0.0002857	5320.0140	0.0002632	5320.0140	0.0002632
	110.0	5320.0152	0.0002857	5320.0140	0.0002857	5320.0140	0.0002632
	126.5	5320.0152	0.0002857	5320.0152	0.0003571	5320.0140	0.0002632
10	93.5	5320.0186	0.0003496	5320.0190	0.0003571	5320.0194	0.0003647
	110.0	5320.0186	0.0003496	5320.0190	0.0003496	5320.0194	0.0003647
	126.5	5320.0182	0.0003421	5320.0186	0.0005865	5320.0194	0.0003647
0	93.5	5320.0312	0.0005865	5320.0312	0.0005865	5320.0322	0.0006053
	110.0	5320.0310	0.0005827	5320.0312	0.0005865	5320.0322	0.0006053
	126.5	5320.0310	0.0005827	5320.0312	0.0008534	5320.0322	0.0006053
-10	93.5	5320.0446	0.0008383	5320.0454	0.0008459	5320.0458	0.0008609
	110.0	5320.0446	0.0008383	5320.0450	0.0008459	5320.0454	0.0008534
	126.5	5320.0446	0.0008383	5320.0450	0.0010414	5320.0454	0.0008534
-20	93.5	5320.0554	0.0010414	5320.0554	0.0010414	5320.0054	0.0001015
	110.0	5320.0554	0.0010414	5320.0554	0.0010414	5320.0054	0.0001015
	126.5	5320.0550	0.0010338	5320.0554	0.0007406	5320.0054	0.0001015
-30	93.5	5320.0394	0.0007406	5320.0394	0.0007406	5320.0390	0.0007331
	110.0	5320.0394	0.0007406	5320.0394	0.0007406	5320.0394	0.0007406
	126.5	5320.0394	0.0007406	5320.0394	0.0007406	5320.0390	0.0007331



5.7 BAND EDGES MEASUREMENT

5.7.1 TEST INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
SPECTRUM ANALYZER	FSEK30	100049	Aug. 12, 2005

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 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.

**Normal Mode:**

Channel 1 (5180MHz)

The band edge emission plot on the pages 146 ~ 147 shows 44.24dBc (Peak) / 51.22Bc (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 101.59dBuV/m, so the maximum field strength in restrict band is $101.59-51.22=50.37$ dBuV/m which is under 54dBuV/m limit.

Channel 8 (5320MHz)

The band edge emission plot on the pages 149~ 150 shows 48.41dBc (Peak) / 52.86dBc (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 102.36dBuV/m, so the maximum field strength in restrict band is $102.36-52.86=49.50$ dBuV/m which is under 54dBuV/m limit.

Turbo Mode:

Channel 1 (5210MHz)

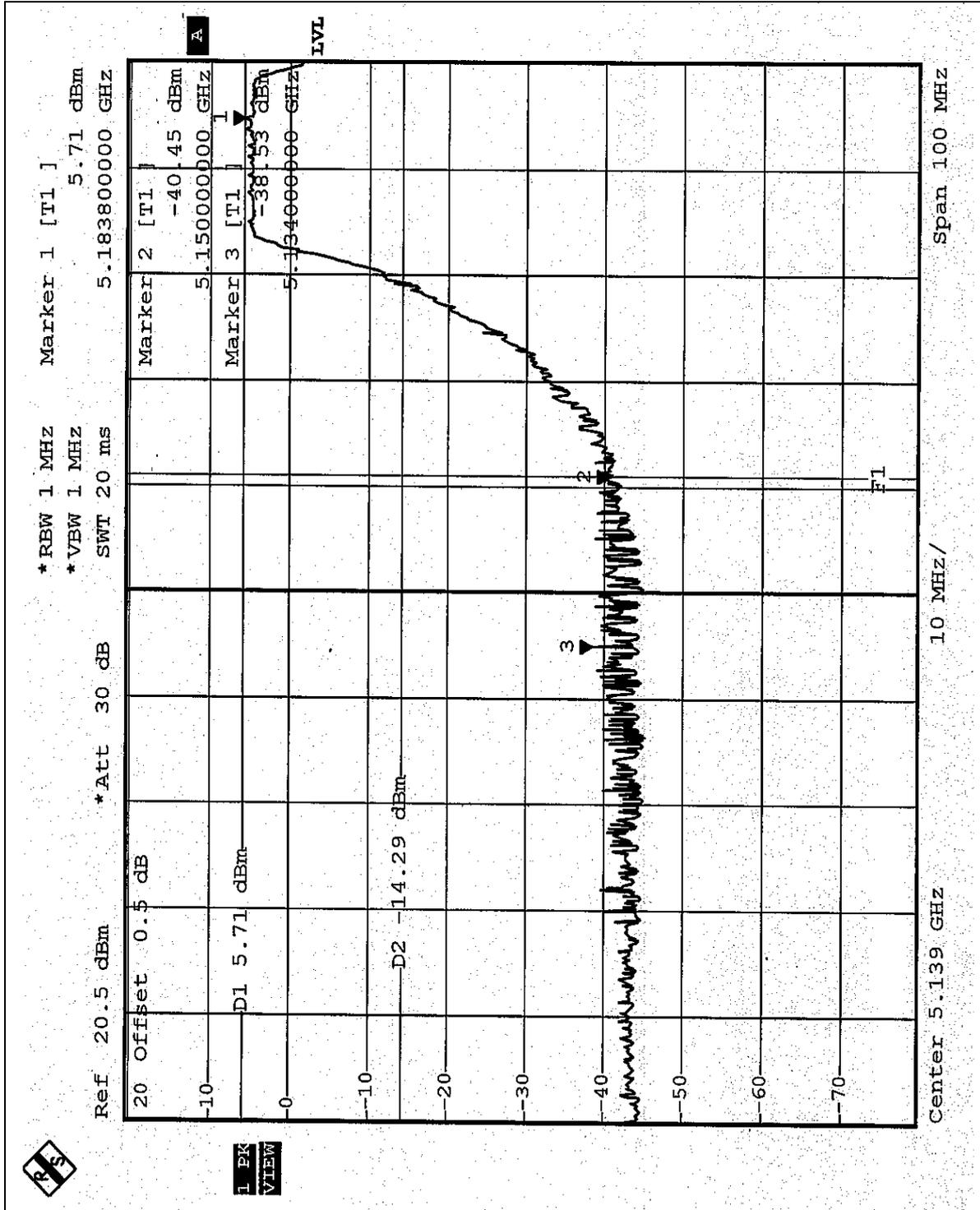
The band edge emission plot on the pages 152 ~153 shows 43.23dBc (Peak) / 49.36dBc (Average) between carrier maximum power and local maximum emission in restrict band. The emission of carrier strength list in the test result of channel 1 is 101.56dBuV/m, so the maximum field strength in restrict band is $101.56-49.36=52.20$ dBuV/m which is under 54dBuV/m limit.

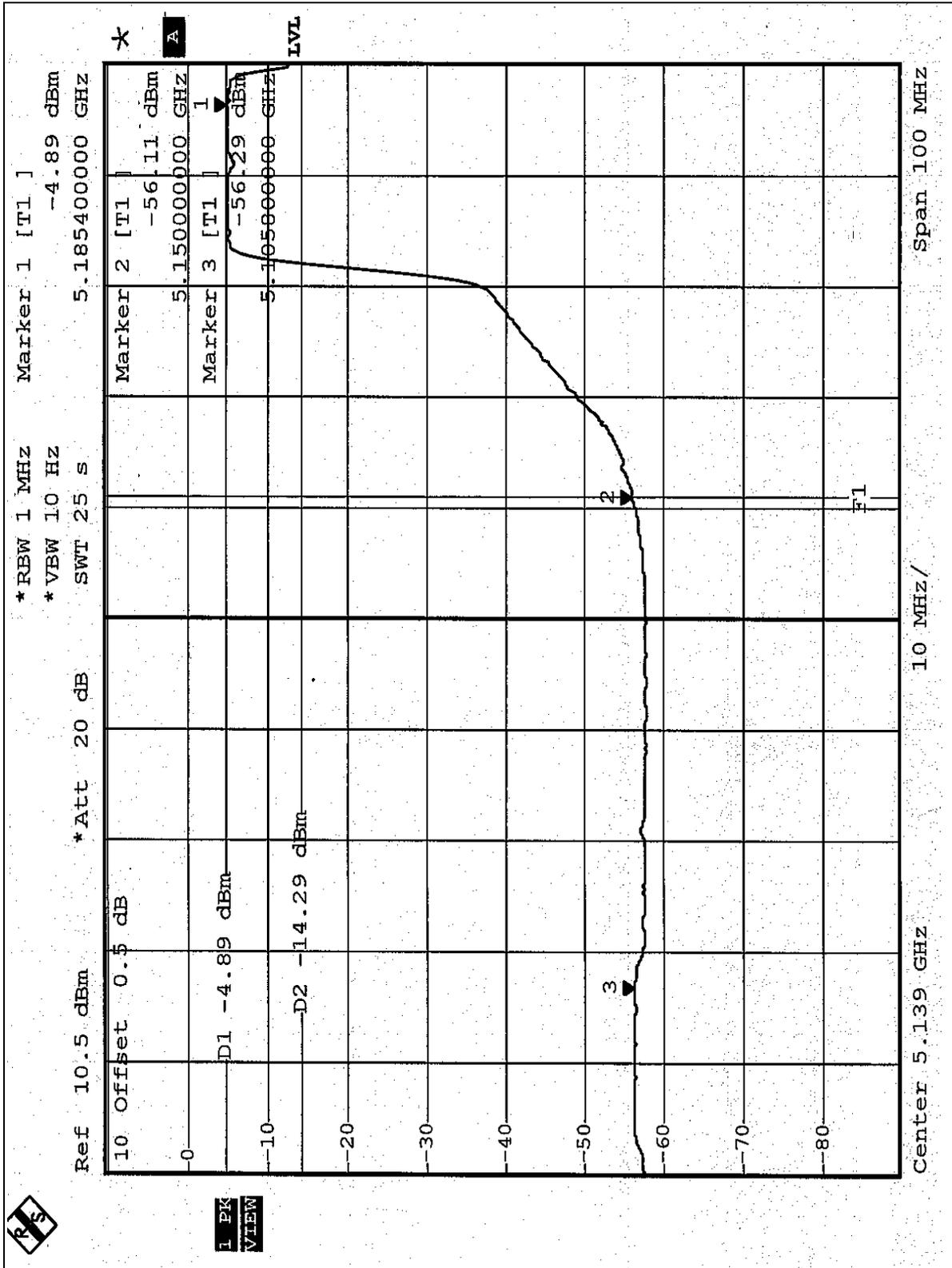
Channel 3 (5290MHz)

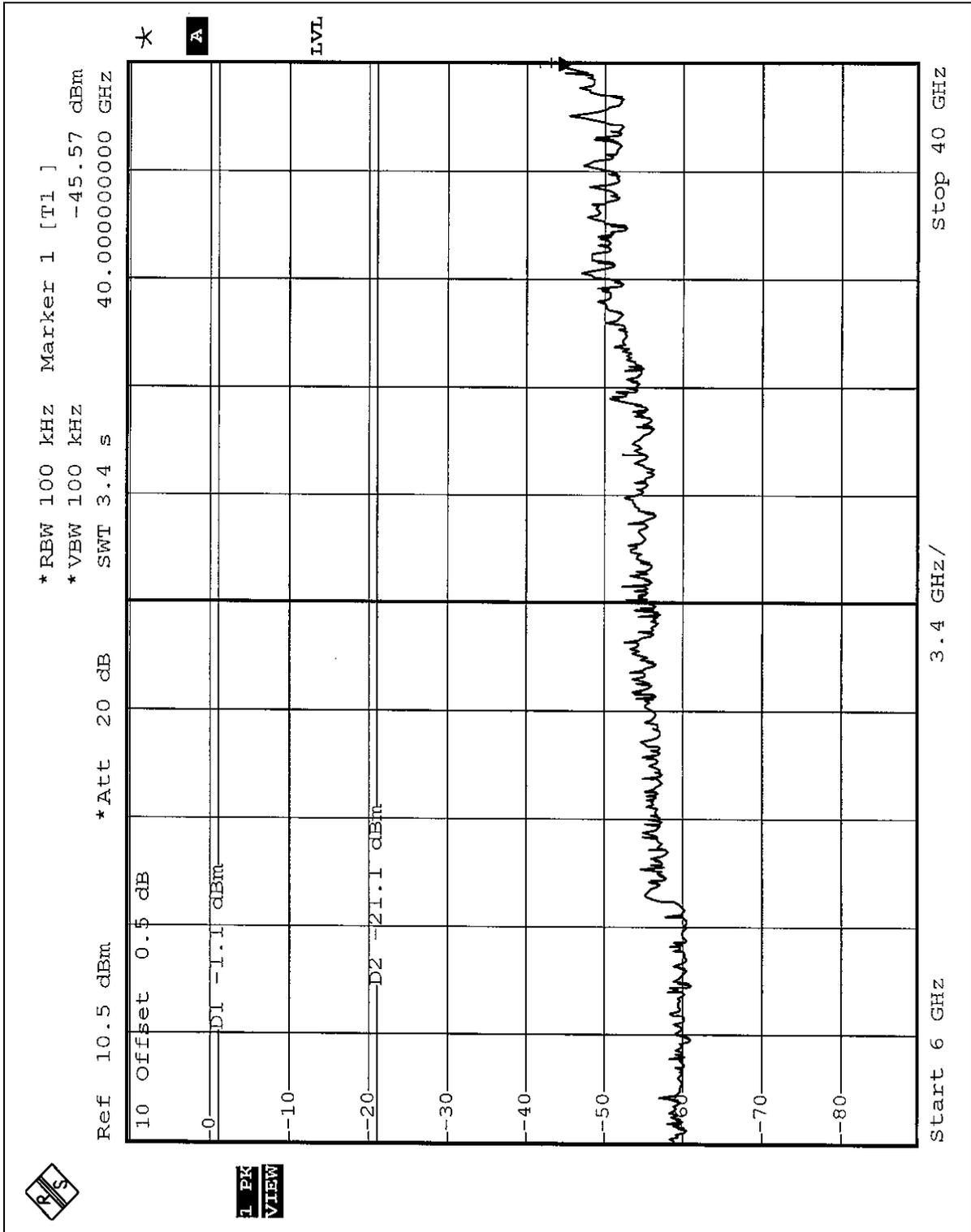
The band edge emission plot on the pages 155~166 shows 48.36dBc (Peak) / 52.06dBc (Average) between carrier maximum power and local maximum emission in restrict band. The emission of carrier strength list in the test result of channel 3 is 101.91dBuV/m, so the maximum field strength in restrict band is $101.91-52.06=49.85$ dBuV/m which is under 54dBuV/m limit.



Normal Mode (CH1)

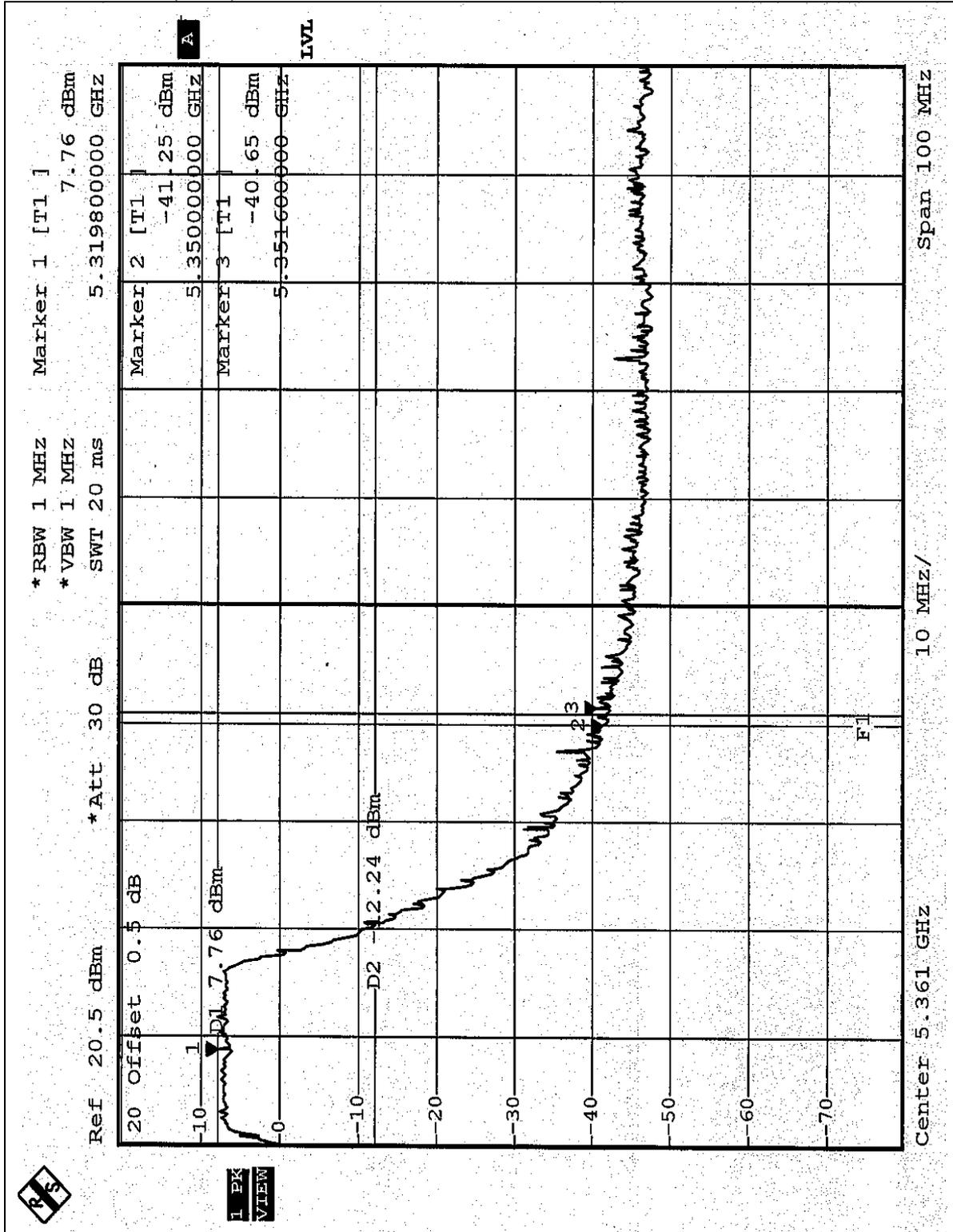


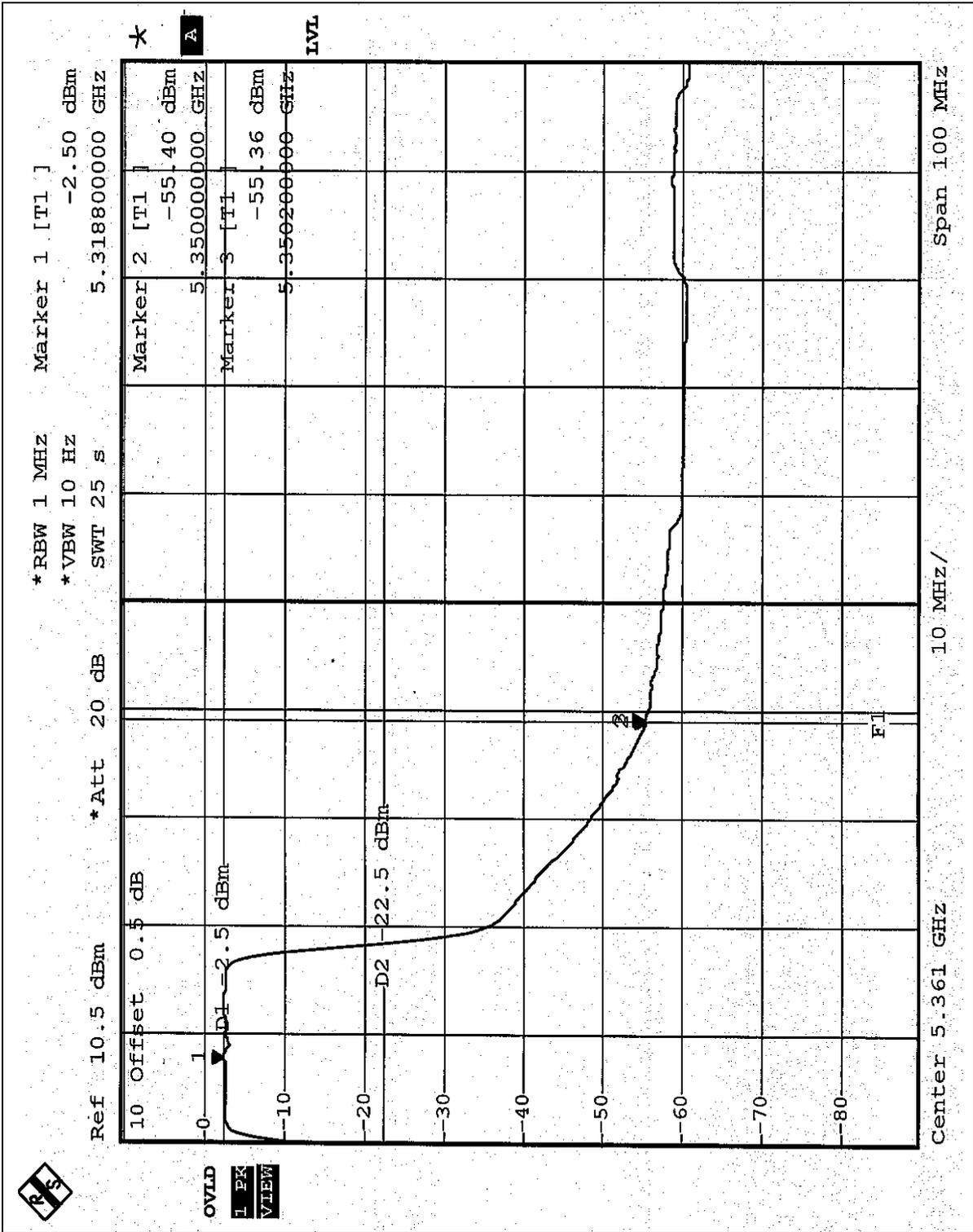


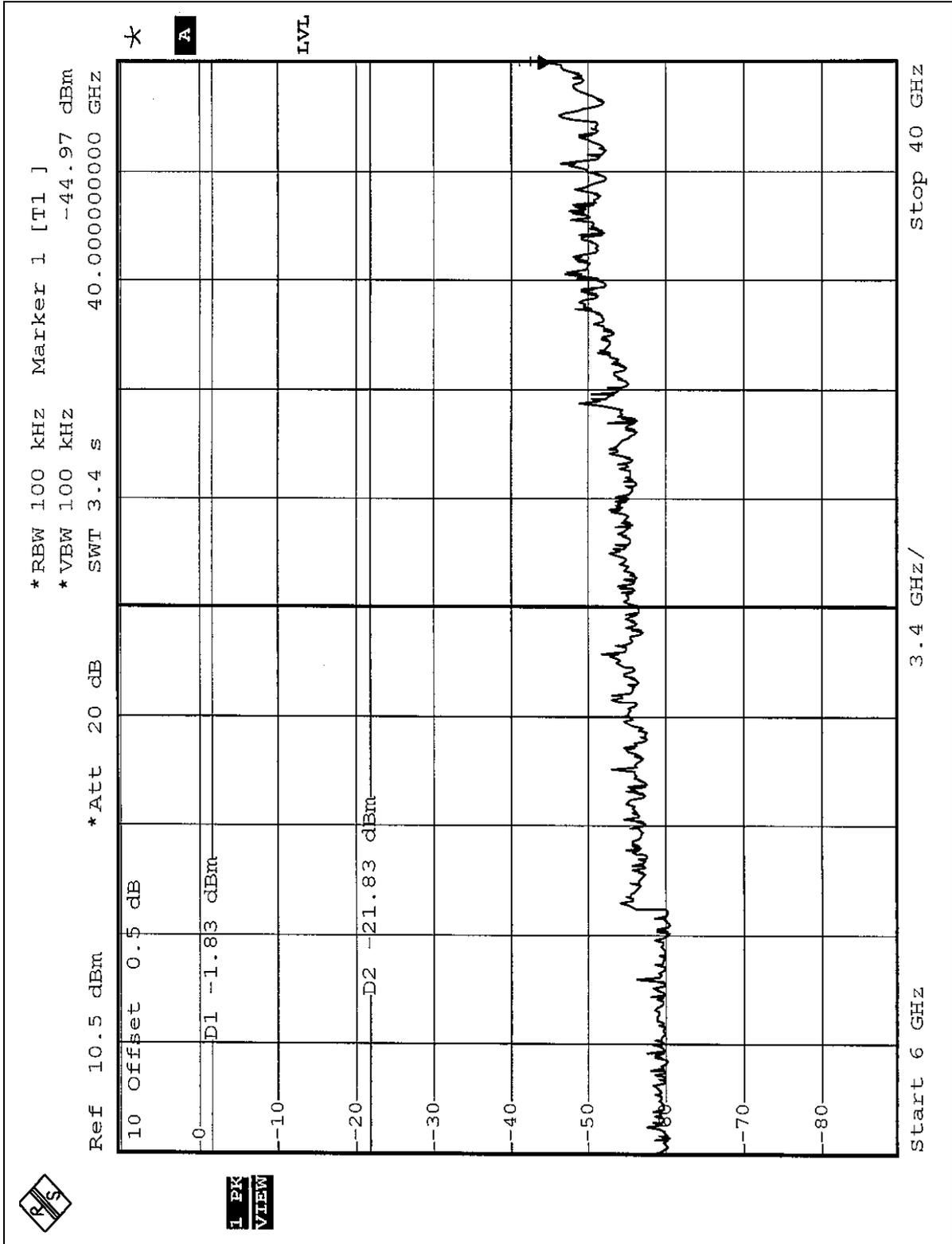




Normal Mode (CH8)

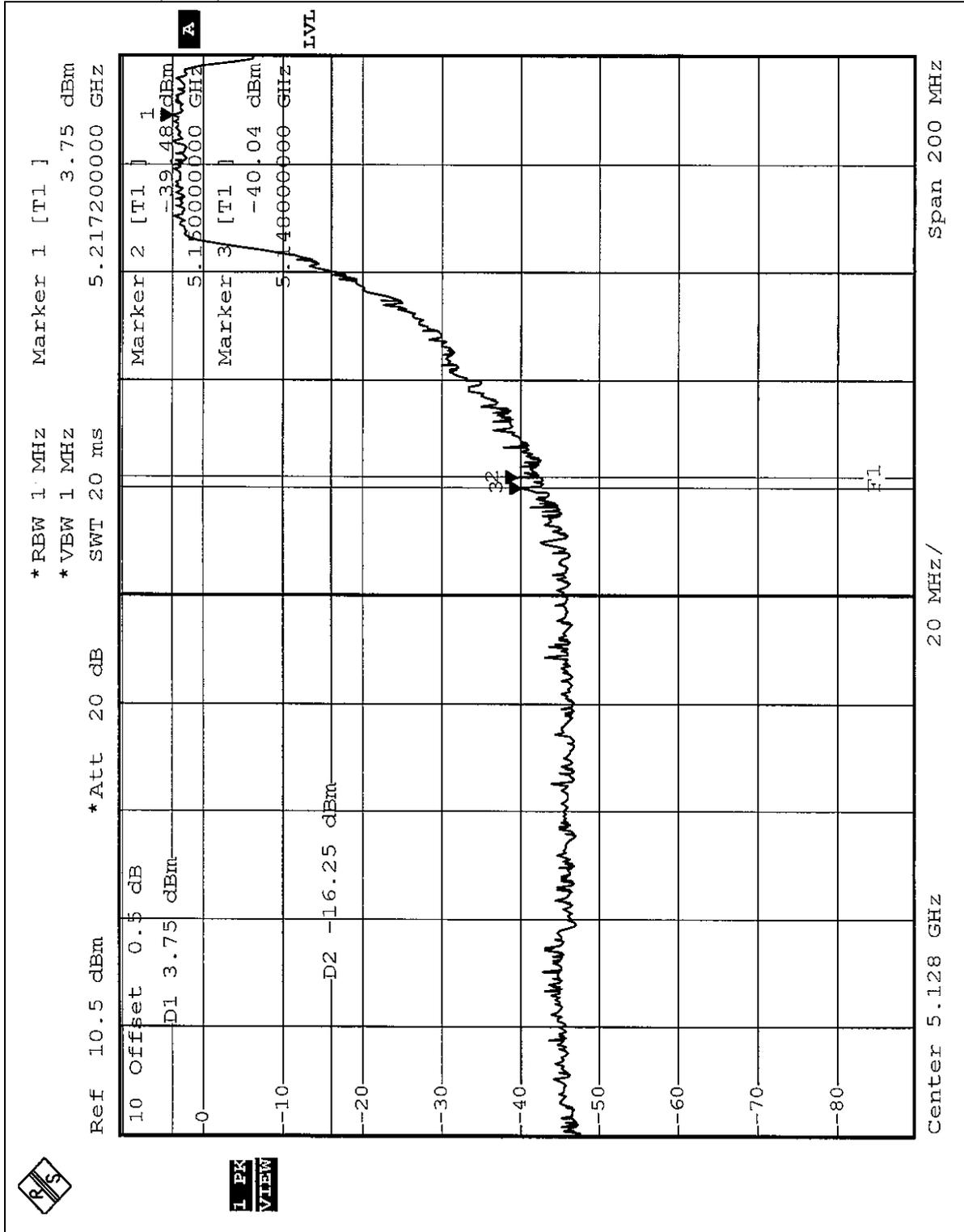


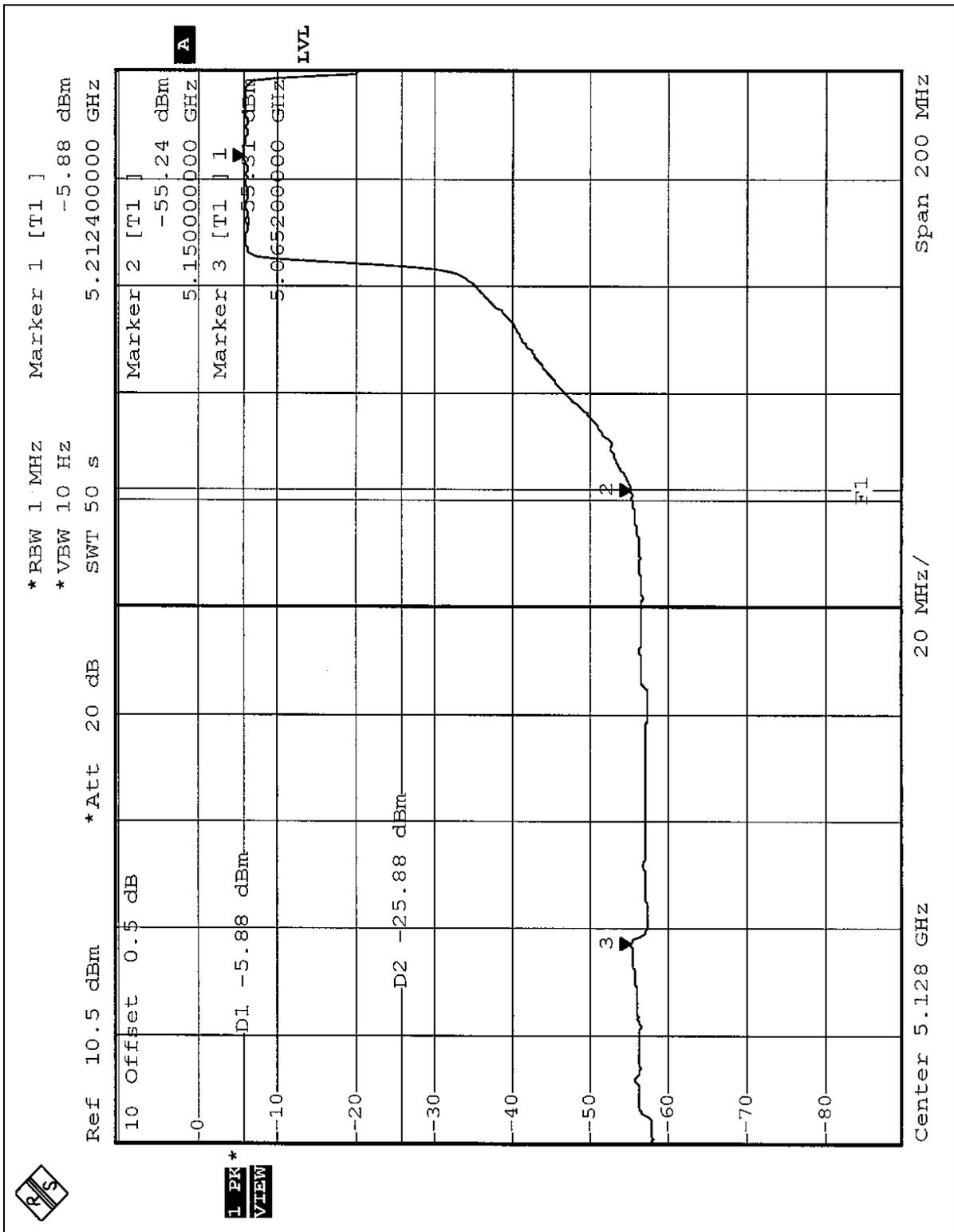


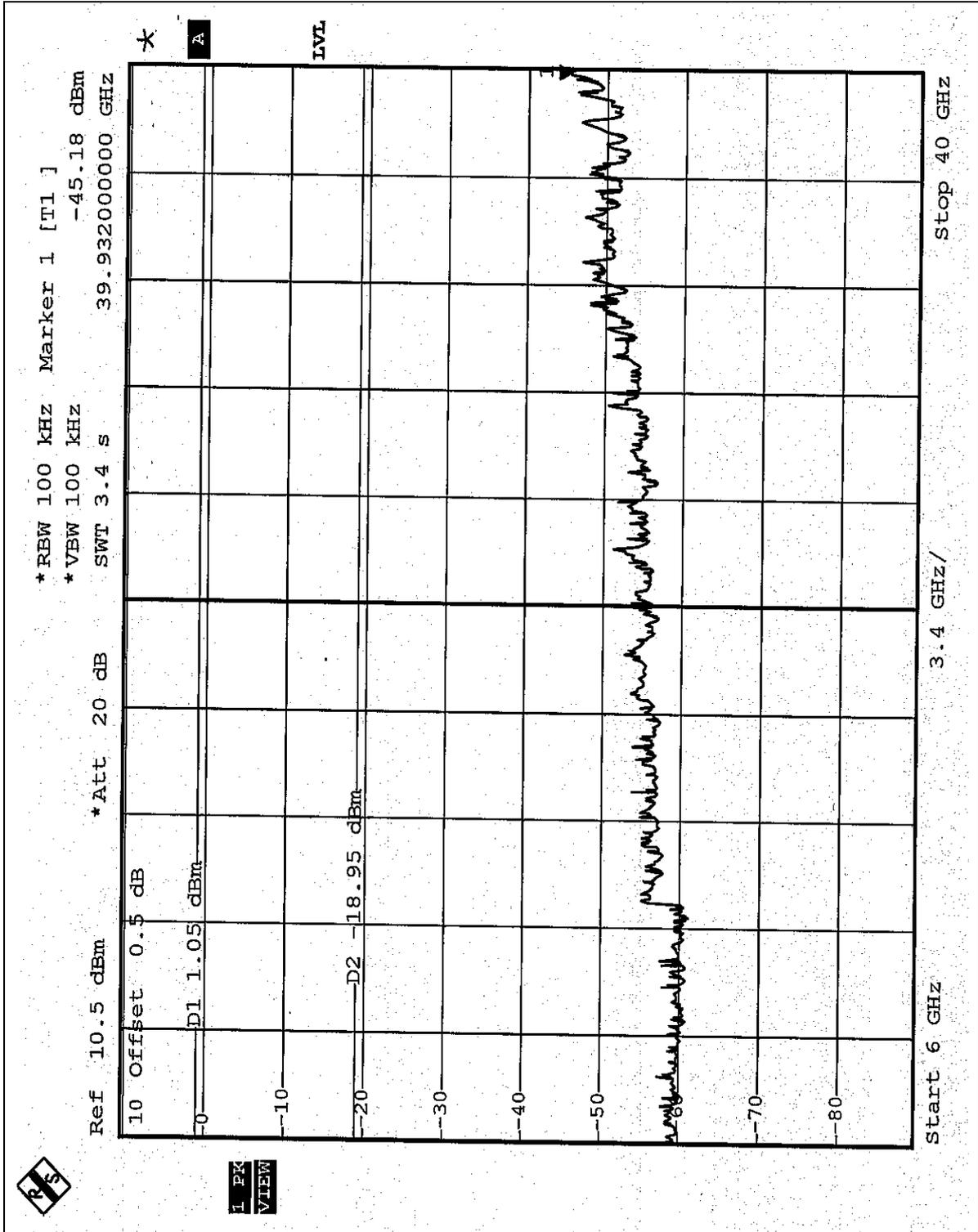




Turbo Mode (CH1)

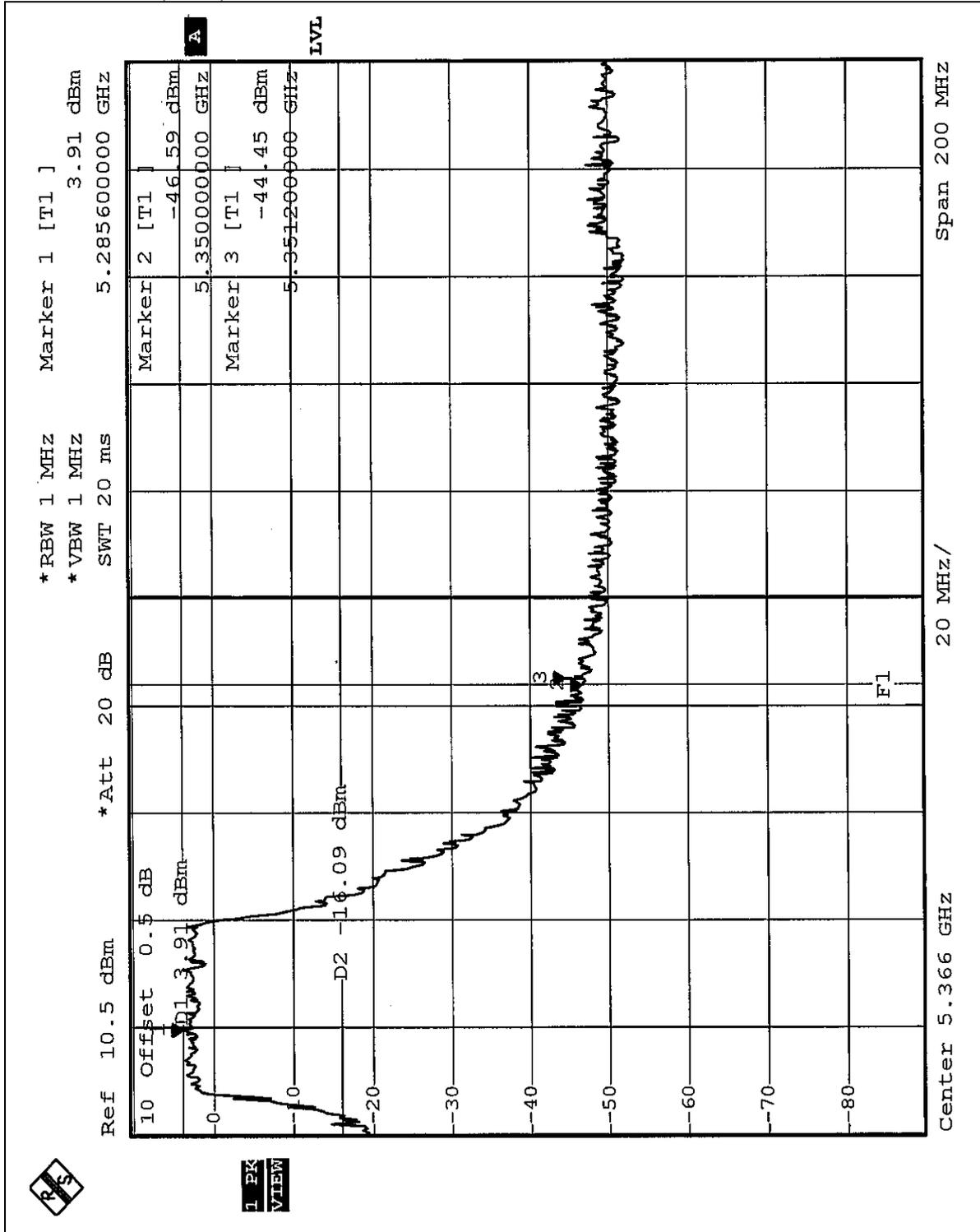


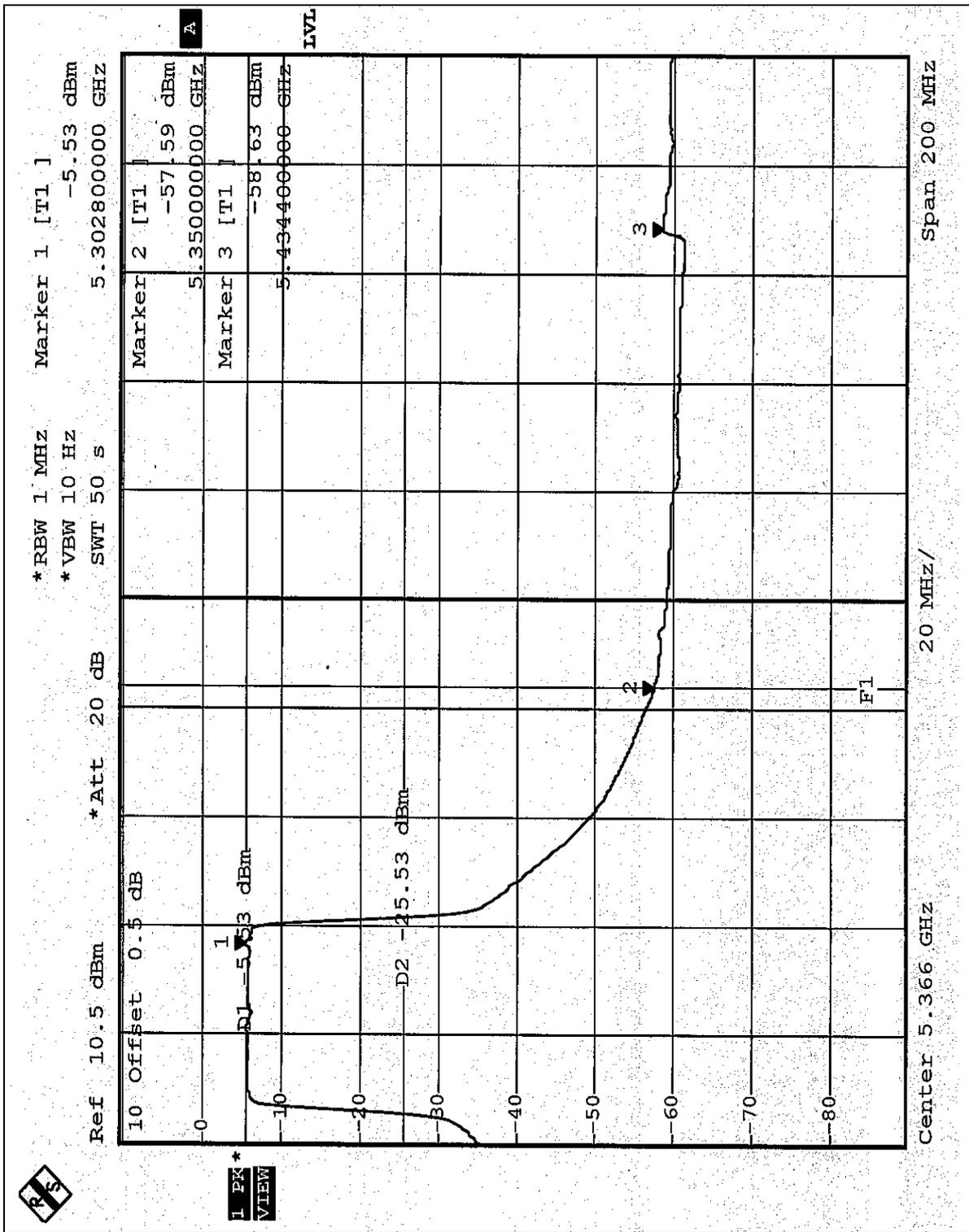


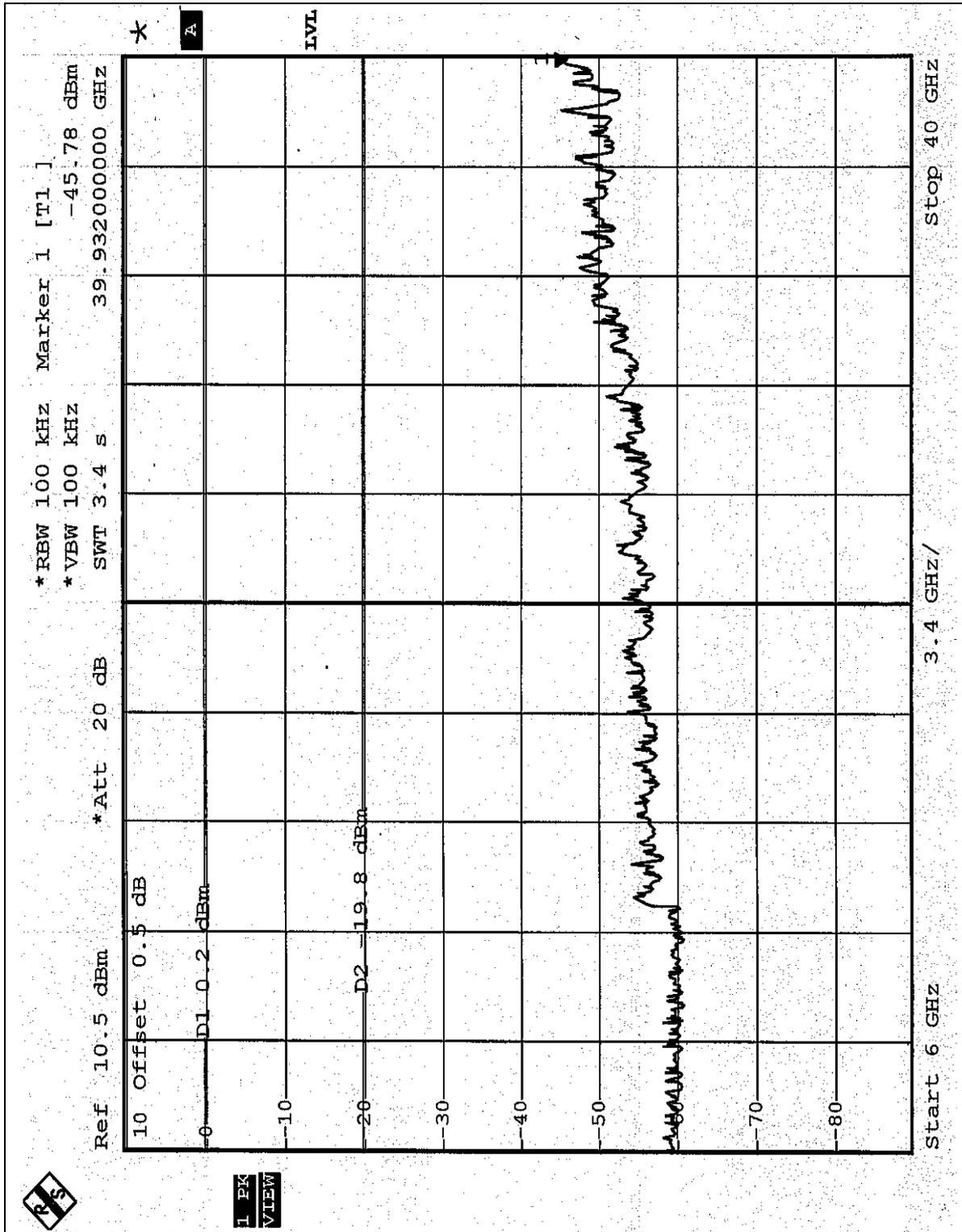




Turbo Mode (CH3)









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 and Printed antenna with UFL antenna connector. The maximum Gain of the antenna is 3.0dBi.

**FOR FREQUENCY 5.725~5.850GHz****5.9 6dB BANDWIDTH MEASUREMENT****5.9.1 LIMITS OF 6dB BANDWIDTH MEASUREMENT**

The minimum of 6dB Bandwidth Measurement is 0.5 MHz.

5.9.2 TEST INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
R&S SPECTRUM ANALYZER	FSEK30	100049	Aug. 12, 2005

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

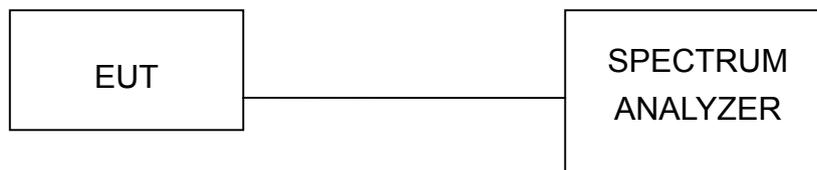
5.9.3 TEST PROCEDURE

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.

5.9.4 DEVIATION FROM TEST STANDARD

No deviation

5.9.5 TEST SETUP



5.9.6 EUT OPERATING CONDITIONS

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



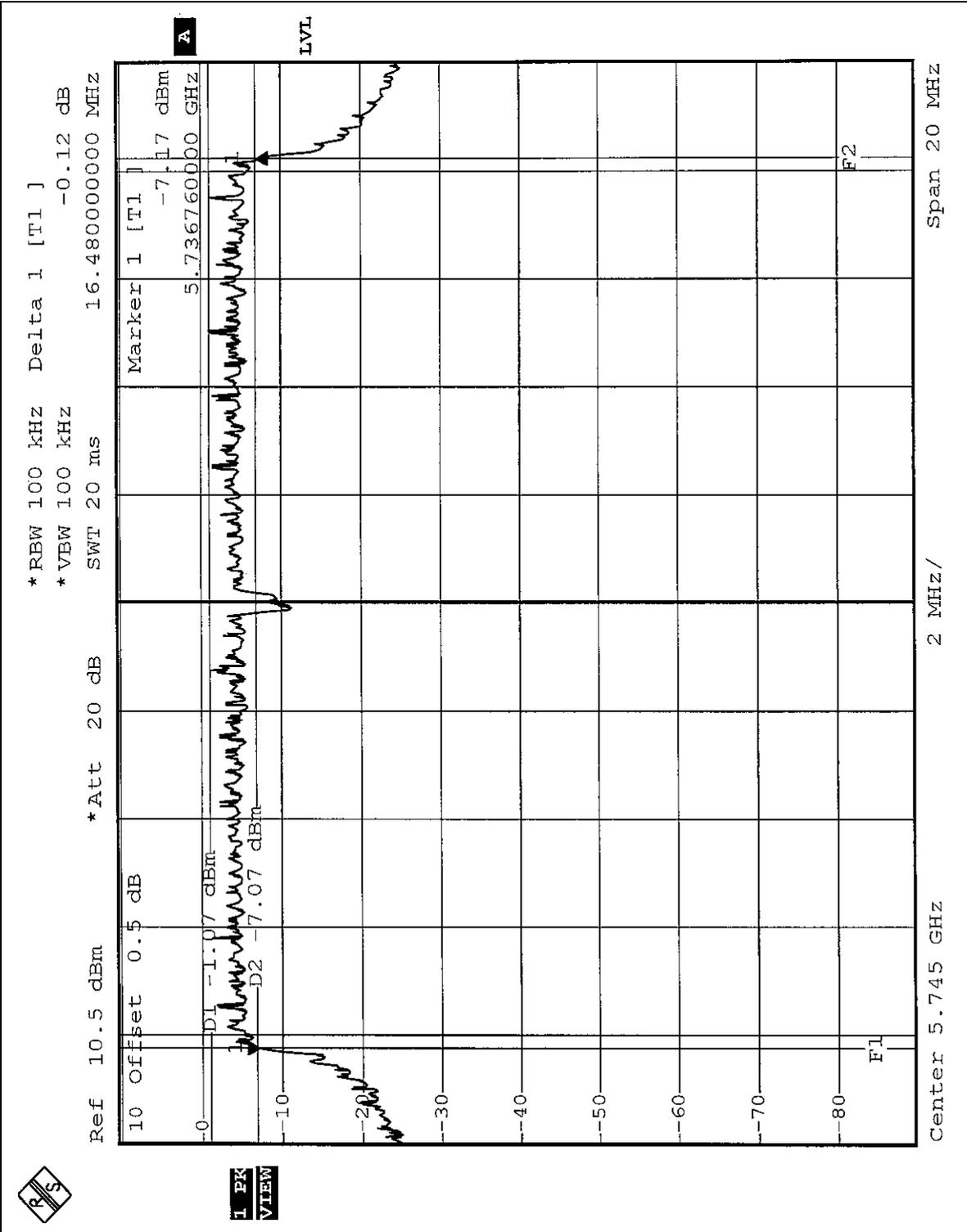
5.9.7 TEST RESULTS

EUT	Double 108 Mbps Wireless Firewall Router	MODEL	WGU624
MODE	Normal	INPUT POWER (SYSTEM)	120Vac, 60 Hz
ENVIRONMENTAL CONDITIONS	24deg. C, 65%RH, 991 hPa	TESTED BY	Steven Lu

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS/FAIL
9	5745	16.48	0.5	PASS
11	5785	16.44	0.5	PASS
13	5825	16.44	0.5	PASS

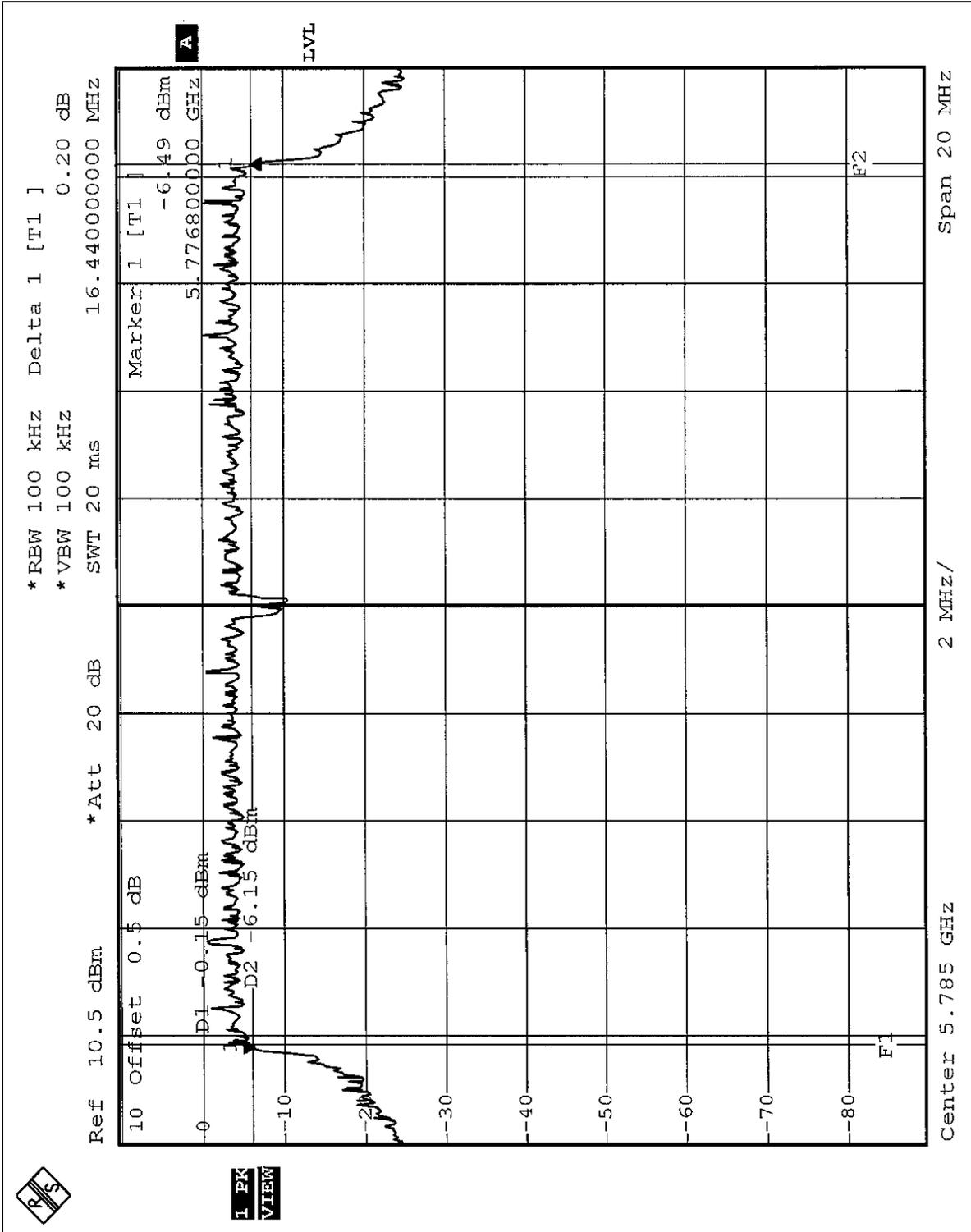


CH9



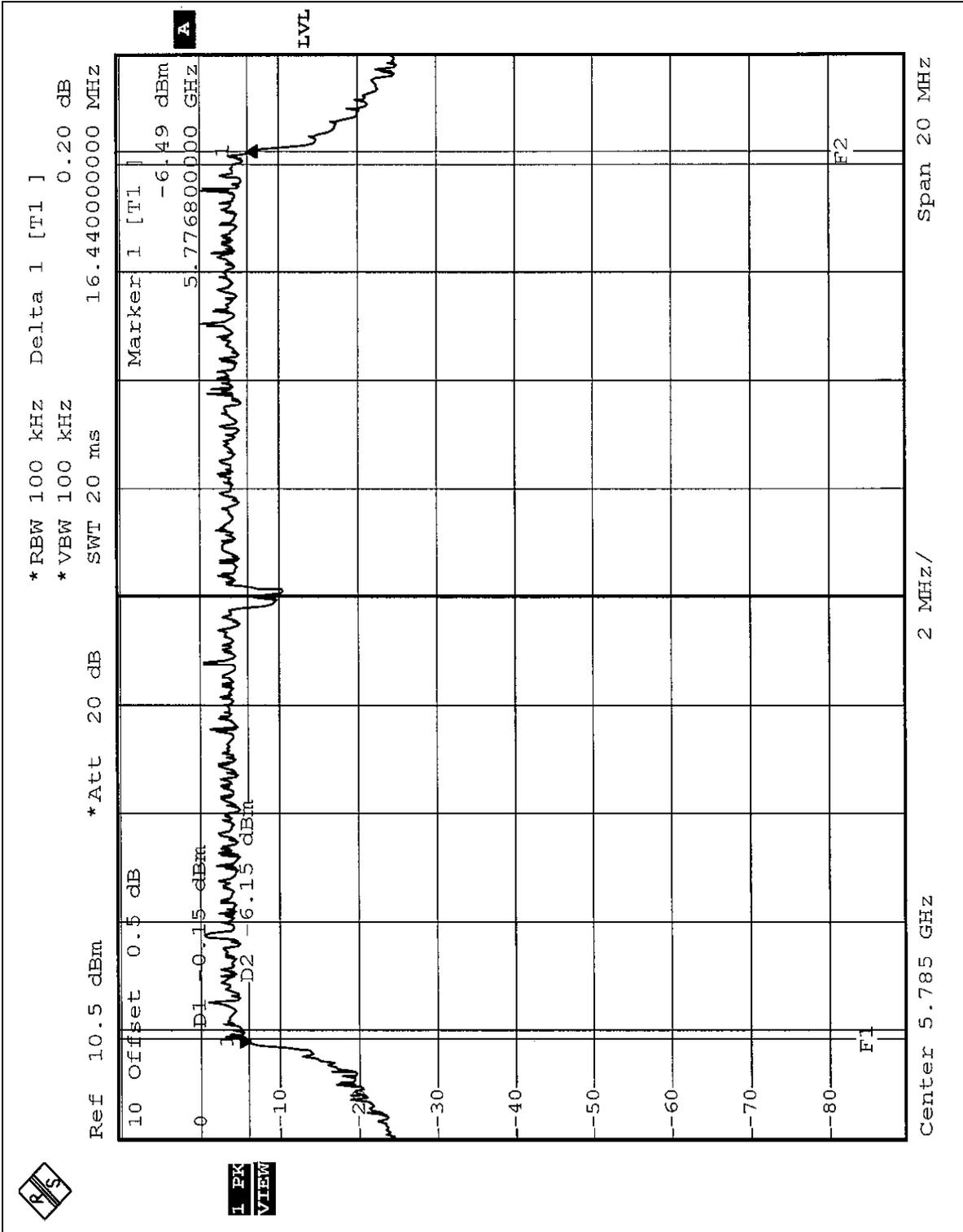


CH11





CH13



1 PK VIEW

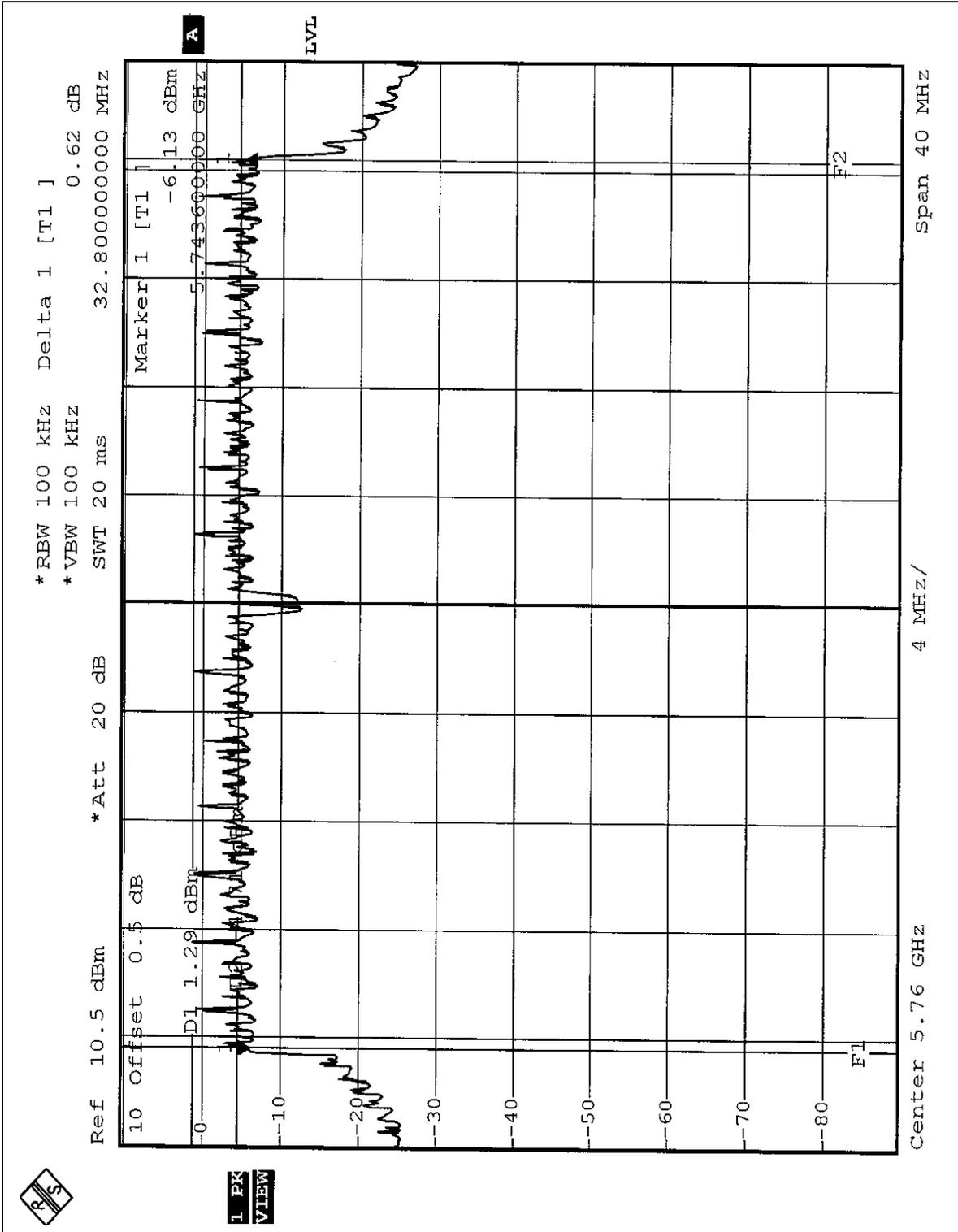


EUT	Double 108 Mbps Wireless Firewall Router	MODEL	WGU624
MODE	Turbo	INPUT POWER (SYSTEM)	120Vac, 60 Hz
ENVIRONMENTAL CONDITIONS	24deg. C, 65%RH, 991 hPa	TESTED BY	Steven Lu

CHANNEL	CHANNEL FREQUENCY (MHz)	6dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS/FAIL
4	5760	32.80	0.5	PASS
5	5800	32.72	0.5	PASS

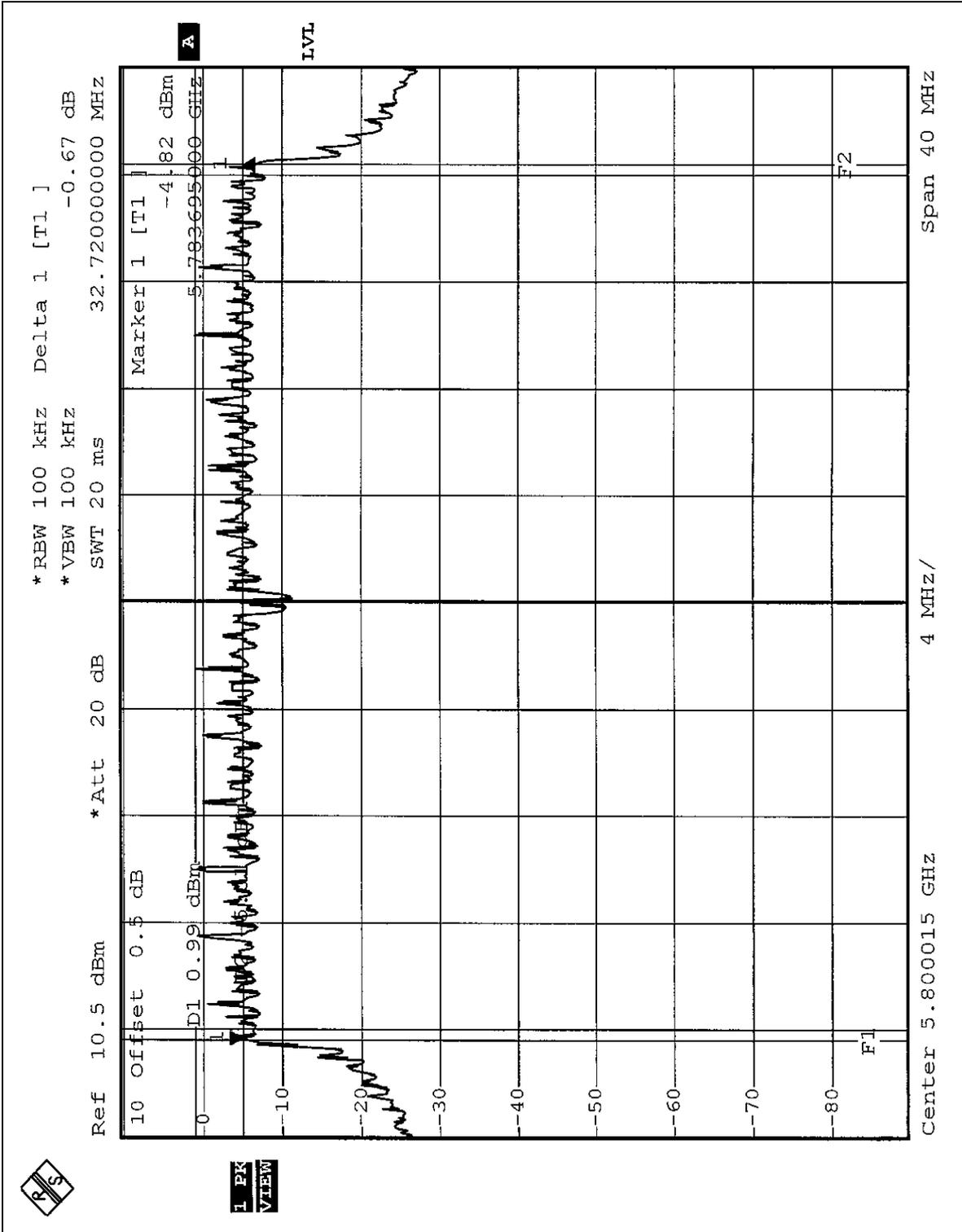


CH4





CH5





5.10 MAXIMUM PEAK OUTPUT POWER

5.10.1 LIMITS OF MAXIMUM PEAK OUTPUT POWER MEASUREMENT

The Maximum Peak Output Power Measurement is 30dBm.

5.10.2 INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
R&S SPECTRUM ANALYZER	FSEK30	100049	Aug. 12, 2005
AGILENT SIGNAL GENERATOR	E8257C	MY43320668	Dec. 31, 2004
TEKTRONIX OSCILLOSCOPE	TDS 1012	C019167	Feb. 01, 2005
NARDA DETECTOR	4503A	FSCM99899	NA

NOTE:

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



5.10.3 TEST PROCEDURES

1. A detector was used on the output port of the EUT. An oscilloscope was used to read the response of the detector.
2. Replaced the EUT by the signal generator . The center frequency of the S.G was adjusted to the center frequency of the measured channel.
3. Adjusted the power to have the same reading on oscilloscope. Record the power level.

5.10.4 DEVIATION FROM TEST STANDARD

No deviation

5.10.5 TEST SETUP



5.10.6 EUT OPERATING CONDITIONS

Same as Item 5.9.6



5.10.7 TEST RESULTS

EUT	Double 108 Mbps Wireless Firewall Router	MODEL	WGU624
MODE	Normal	INPUT POWER (SYSTEM)	120Vac, 60 Hz
ENVIRONMENTAL CONDITIONS	24deg. C, 65%RH, 991 hPa	TESTED BY	Steven Lu

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (dBm)	PASS/FAIL
9	5745	13.00	30	PASS
11	5785	13.00	30	PASS
13	5825	13.00	30	PASS

EUT	Double 108 Mbps Wireless Firewall Router	MODEL	WGU624
MODE	Turbo	INPUT POWER (SYSTEM)	120Vac, 60 Hz
ENVIRONMENTAL CONDITIONS	24deg. C, 65%RH, 991 hPa	TESTED BY	Steven Lu

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (dBm)	PASS/FAIL
4	5760	13.00	30	PASS
5	5800	13.00	30	PASS



5.11 POWER SPECTRAL DENSITY MEASUREMENT

5.11.1 LIMITS OF POWER SPECTRAL DENSITY MEASUREMENT

The Maximum of Power Spectral Density Measurement is 8dBm.

5.11.2 TEST INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
R&S SPECTRUM ANALYZER	FSEK30	100049	Aug. 12, 2005

NOTES:

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

5.11.3 TEST PROCEDURE

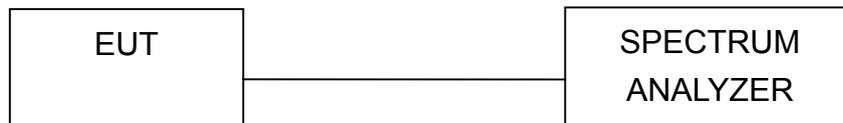
The transmitter output was connected to the spectrum analyzer through an attenuator, the bandwidth of the fundamental frequency was measured with the spectrum analyzer using 3 kHz RBW and 30 kHz VBW, set sweep time = span/3 kHz. The power spectral density was measured and recorded.

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

5.11.4 DEVIATION FROM TEST STANDARD

No deviation

5.11.5 TEST SETUP



5.11.6 EUT OPERATING CONDITION

Same as Item 5.9.6



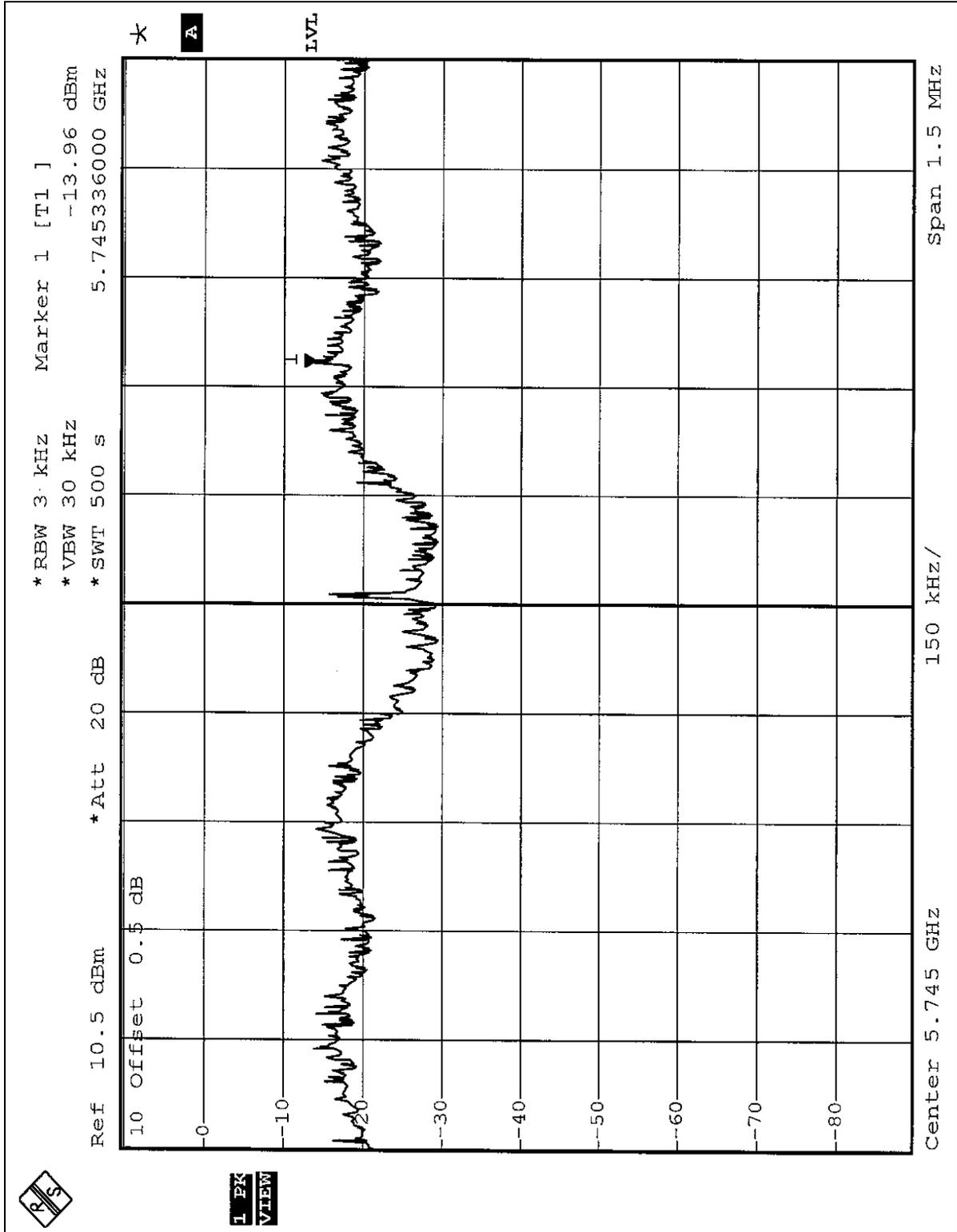
5.11.7 TEST RESULTS

EUT	Double 108 Mbps Wireless Firewall Router	MODEL	WGU624
MODE	Normal	INPUT POWER (SYSTEM)	120Vac, 60 Hz
ENVIRONMENTAL CONDITIONS	24deg. C, 65%RH, 991 hPa	TESTED BY	Steven Lu

CHANNEL	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3 kHz BW (dBm)	MAXIMUM LIMIT (dBm)	PASS/FAIL
9	5745	-13.96	8	PASS
11	5785	-13.12	8	PASS
13	5825	-13.21	8	PASS

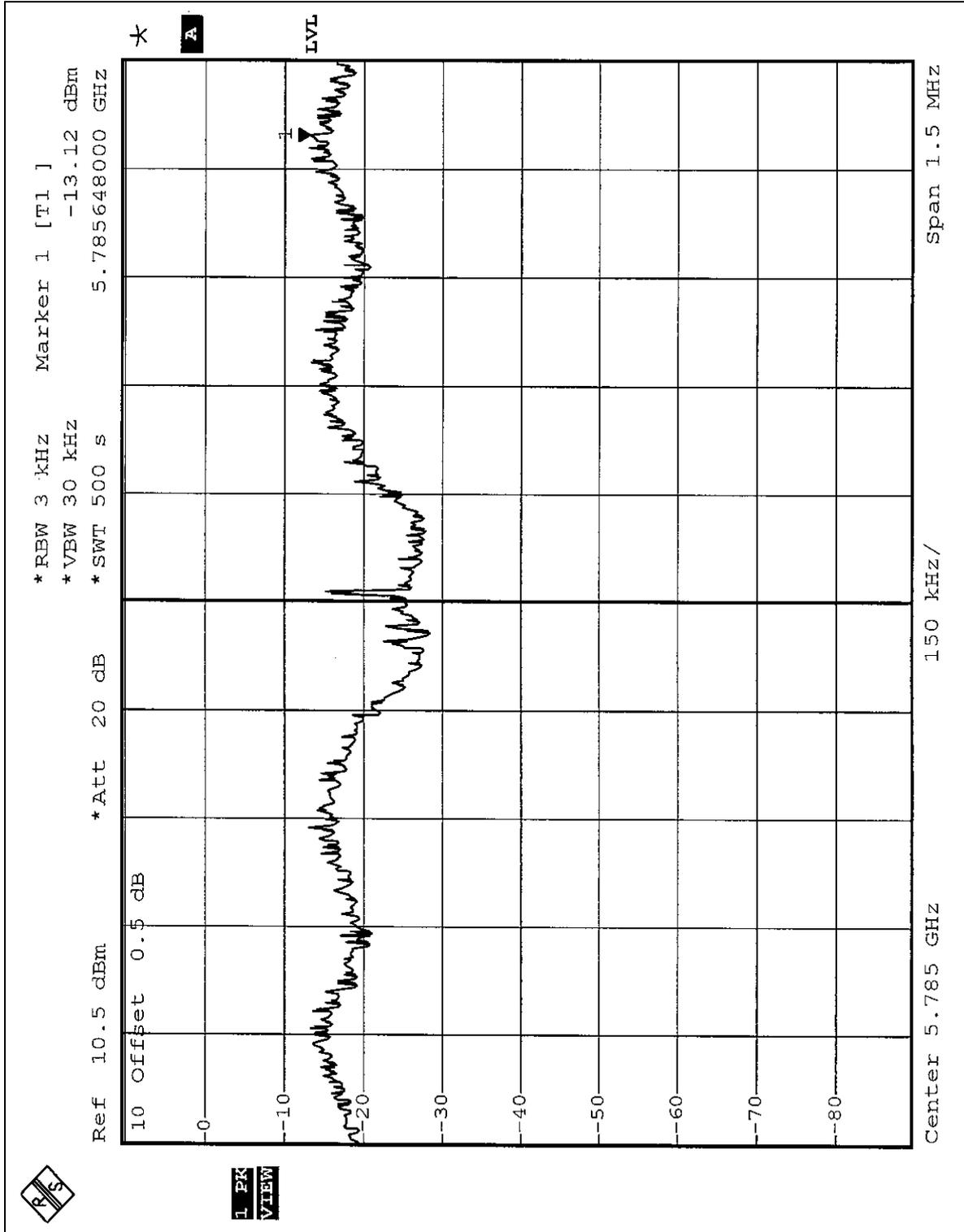


CH9



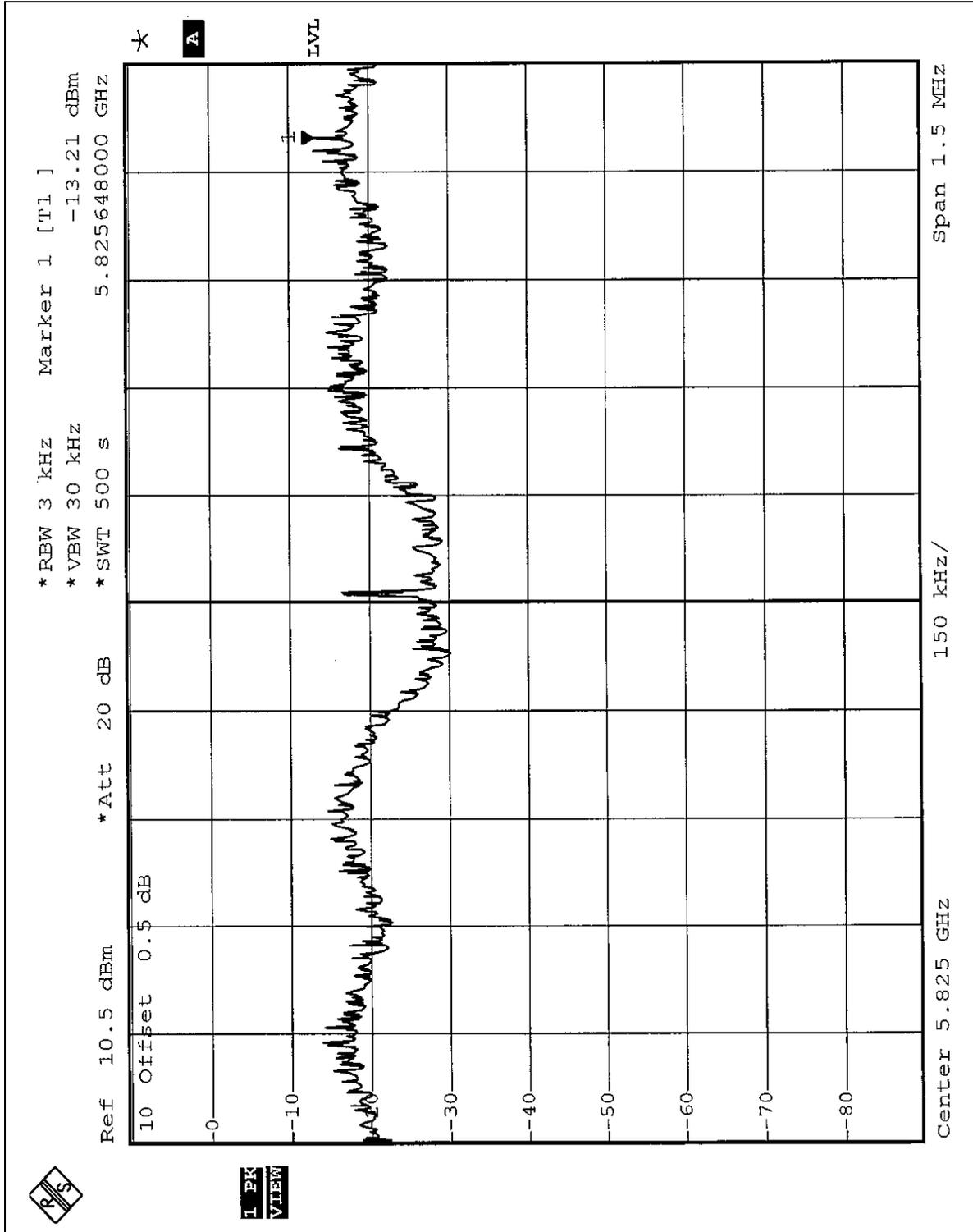


CH11





CH13



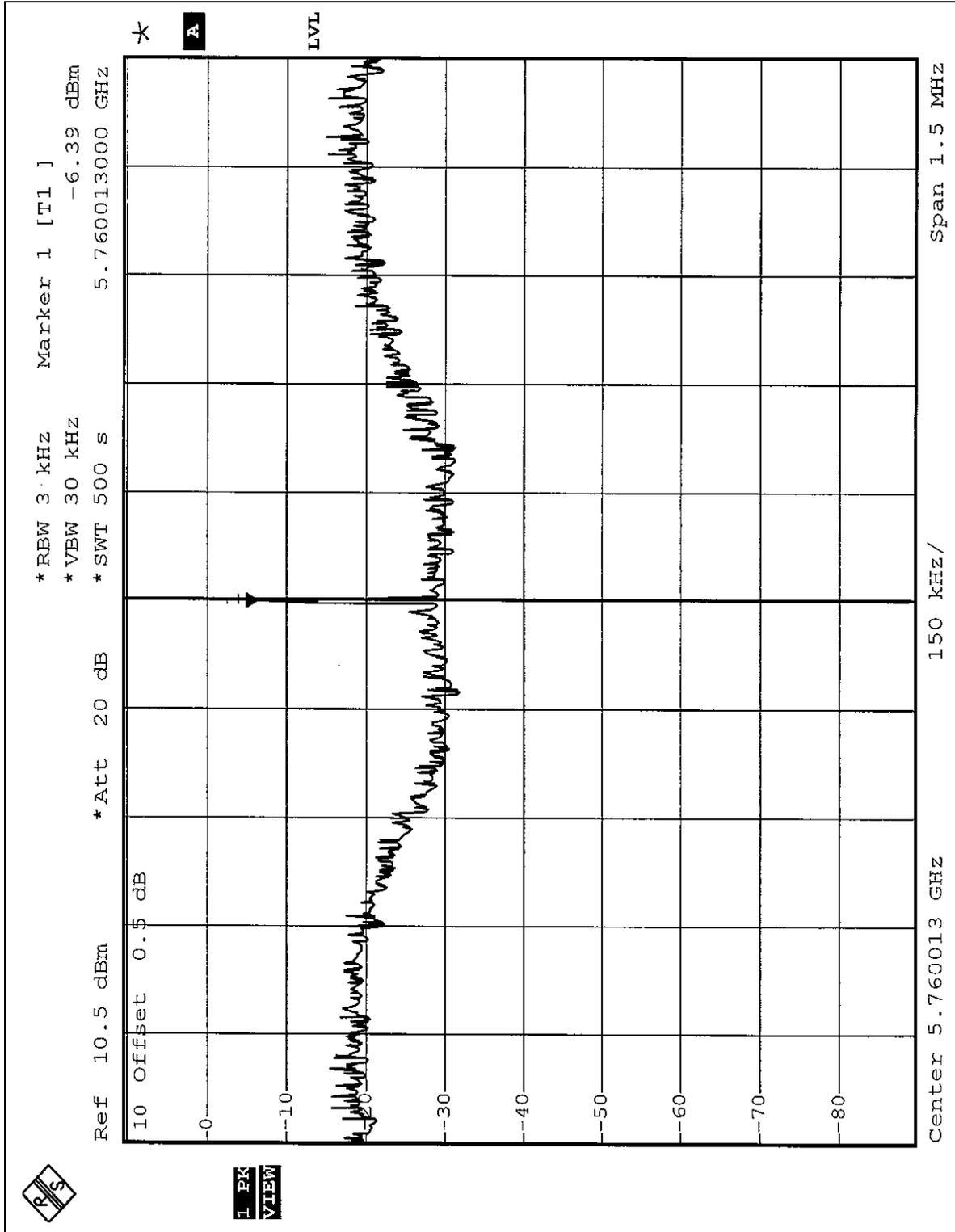


EUT	Double 108 Mbps Wireless Firewall Router	MODEL	WGU624
MODE	Turbo	INPUT POWER (SYSTEM)	120Vac, 60 Hz
ENVIRONMENTAL CONDITIONS	24deg. C, 65%RH, 991 hPa	TESTED BY	Steven Lu

CHANNEL	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3 kHz BW (dBm)	MAXIMUM LIMIT (dBm)	PASS/FAIL
4	5760	-6.39	8	PASS
5	5800	-7.58	8	PASS

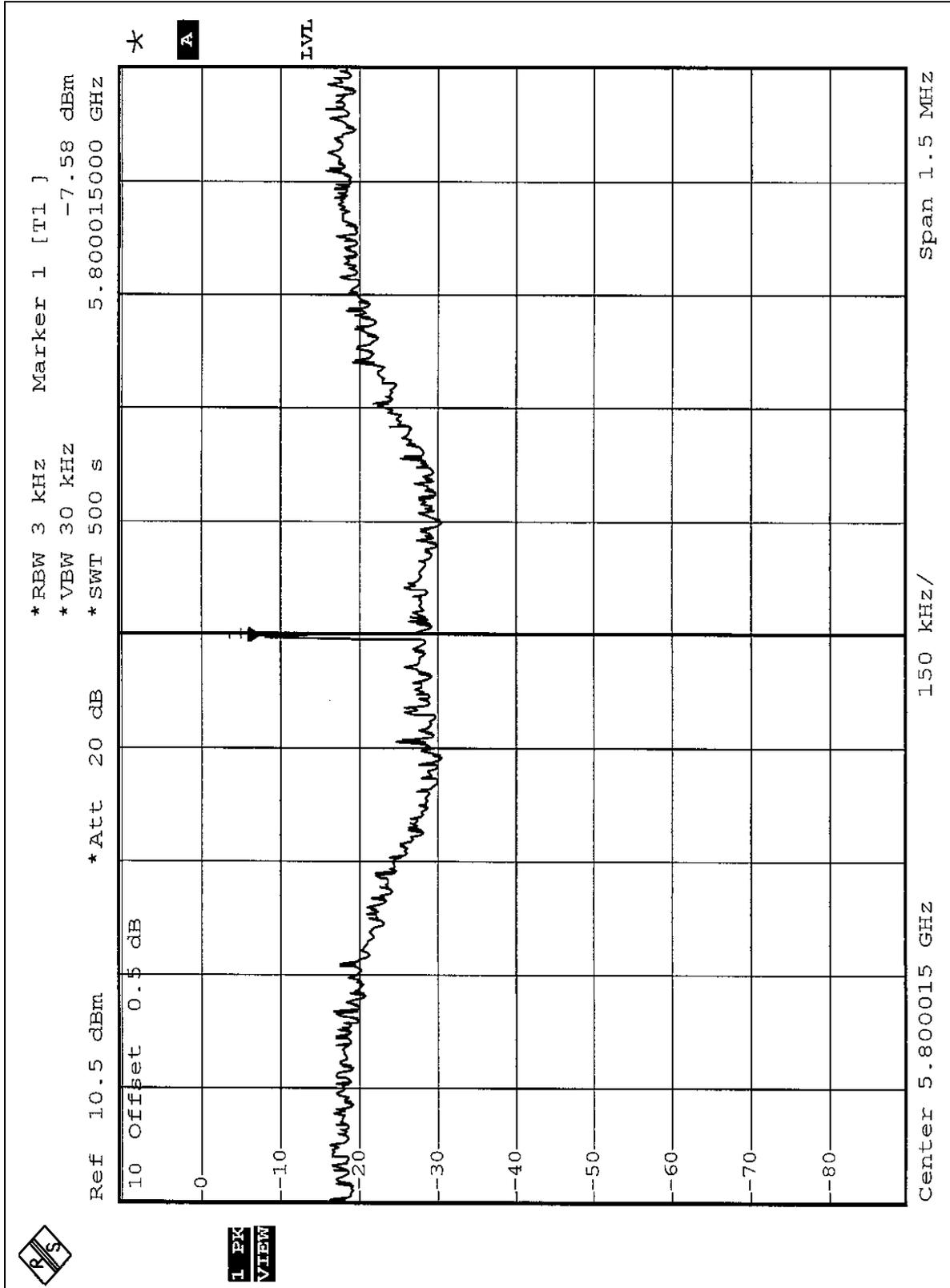


CH4





CH5





5.12 BAND EDGES MEASUREMENT

5.12.1 LIMITS OF BAND EDGES MEASUREMENT

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

5.12.2 TEST INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
R&S SPECTRUM ANALYZER	FSEK30	100049	Aug. 12, 2005

NOTES:

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

5.12.3 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 100 kHz with suitable frequency span including 100 MHz bandwidth from band edge. The band edges was measured and recorded.

5.12.4 DEVIATION FROM TEST STANDARD

No deviation



5.12.5 EUT OPERATING CONDITION

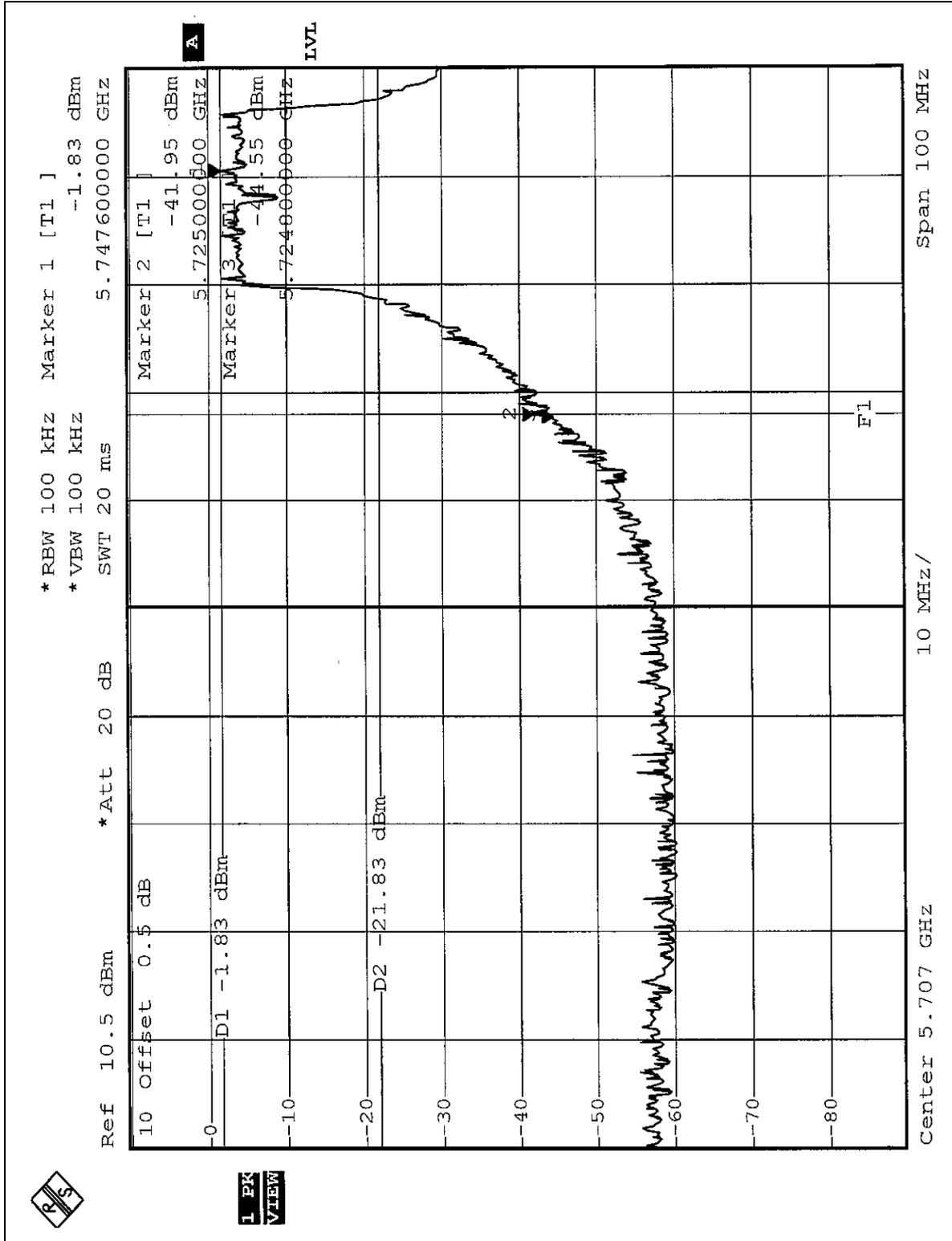
Same as Item 5.9.6

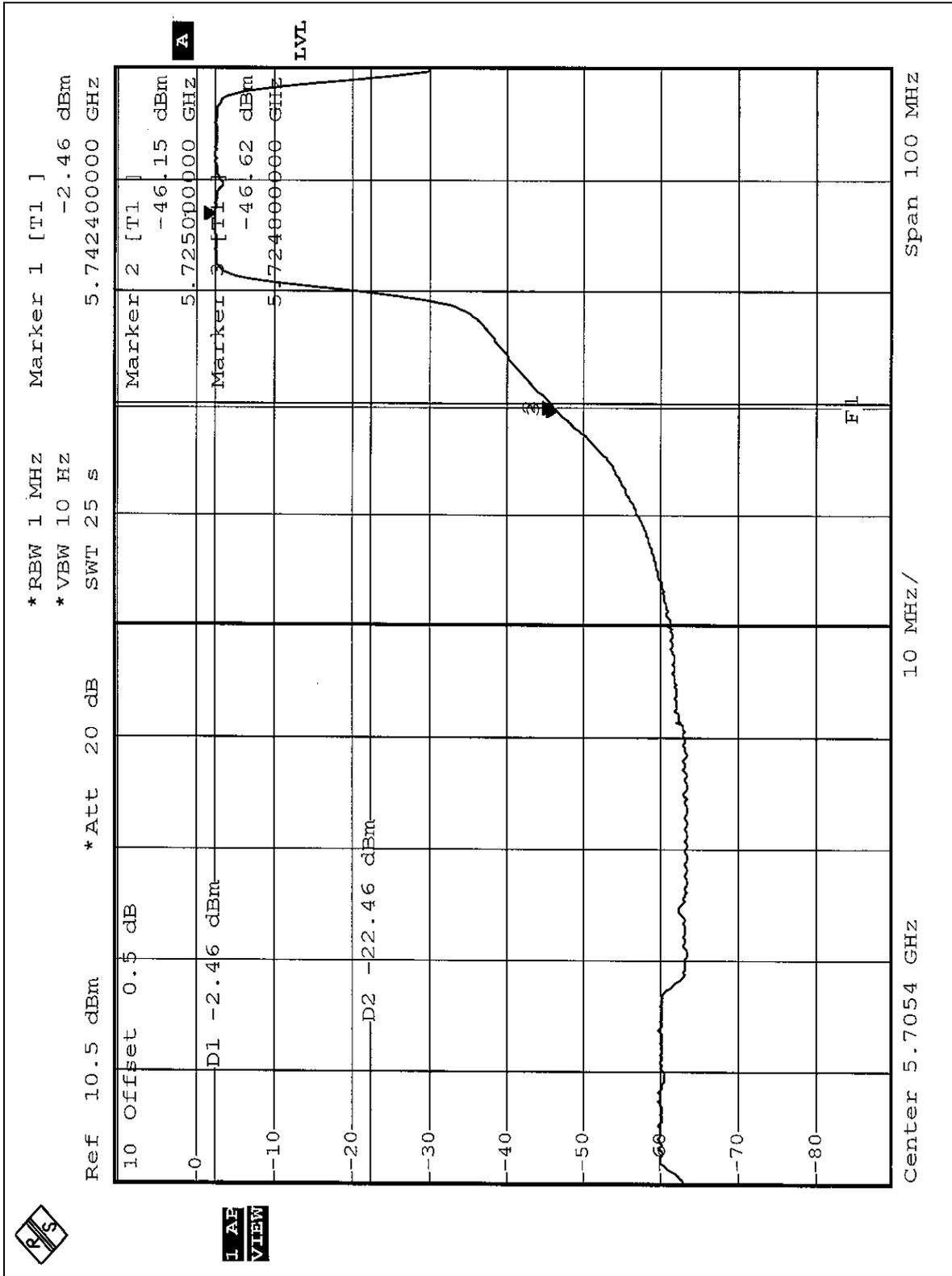
5.12.6 TEST RESULTS

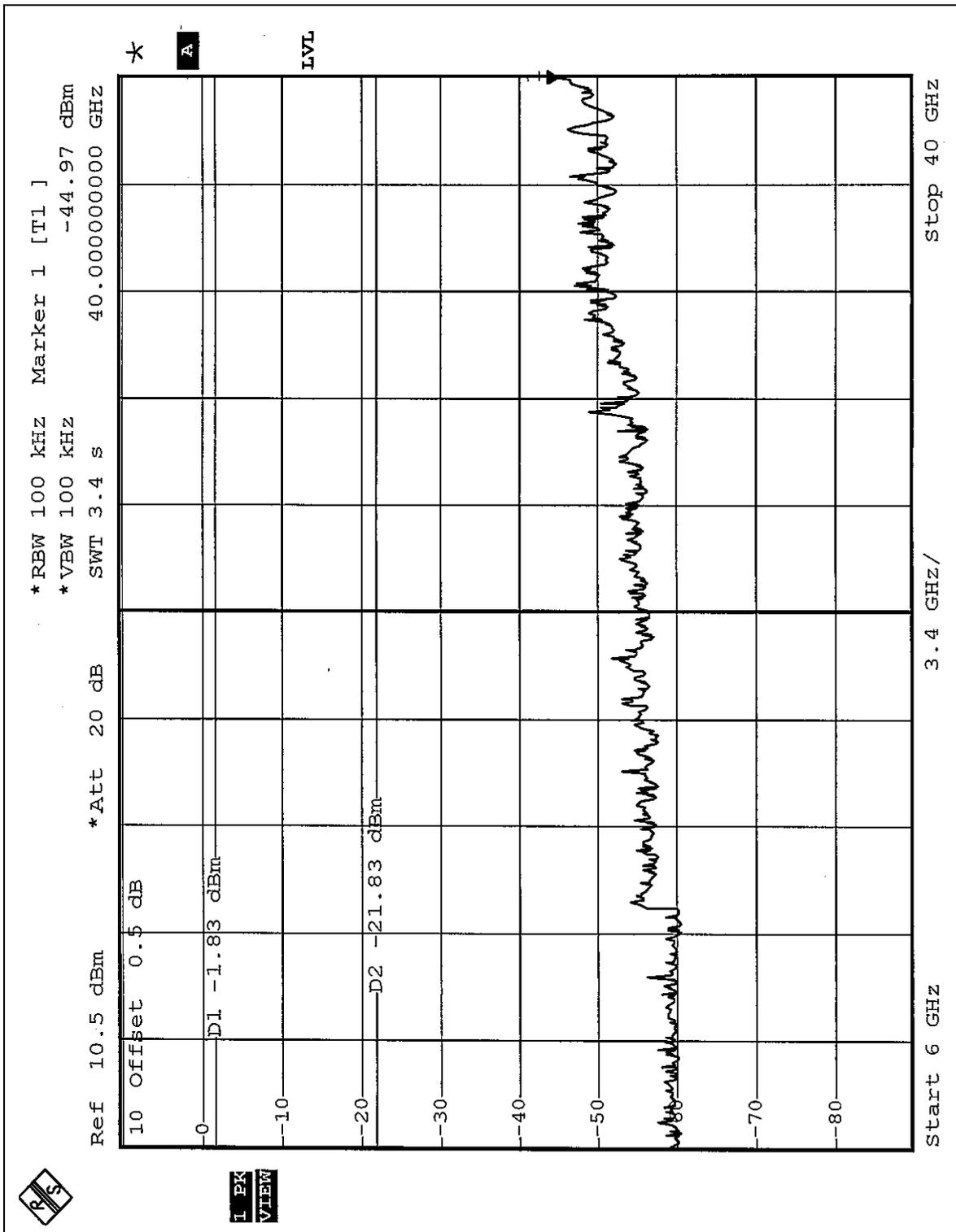
The spectrum plots are attached on the following pages. D2 line indicates the highest level, D1 line indicates the 20dB offset below D2. It shows compliance with the requirement in part 15.247(C).

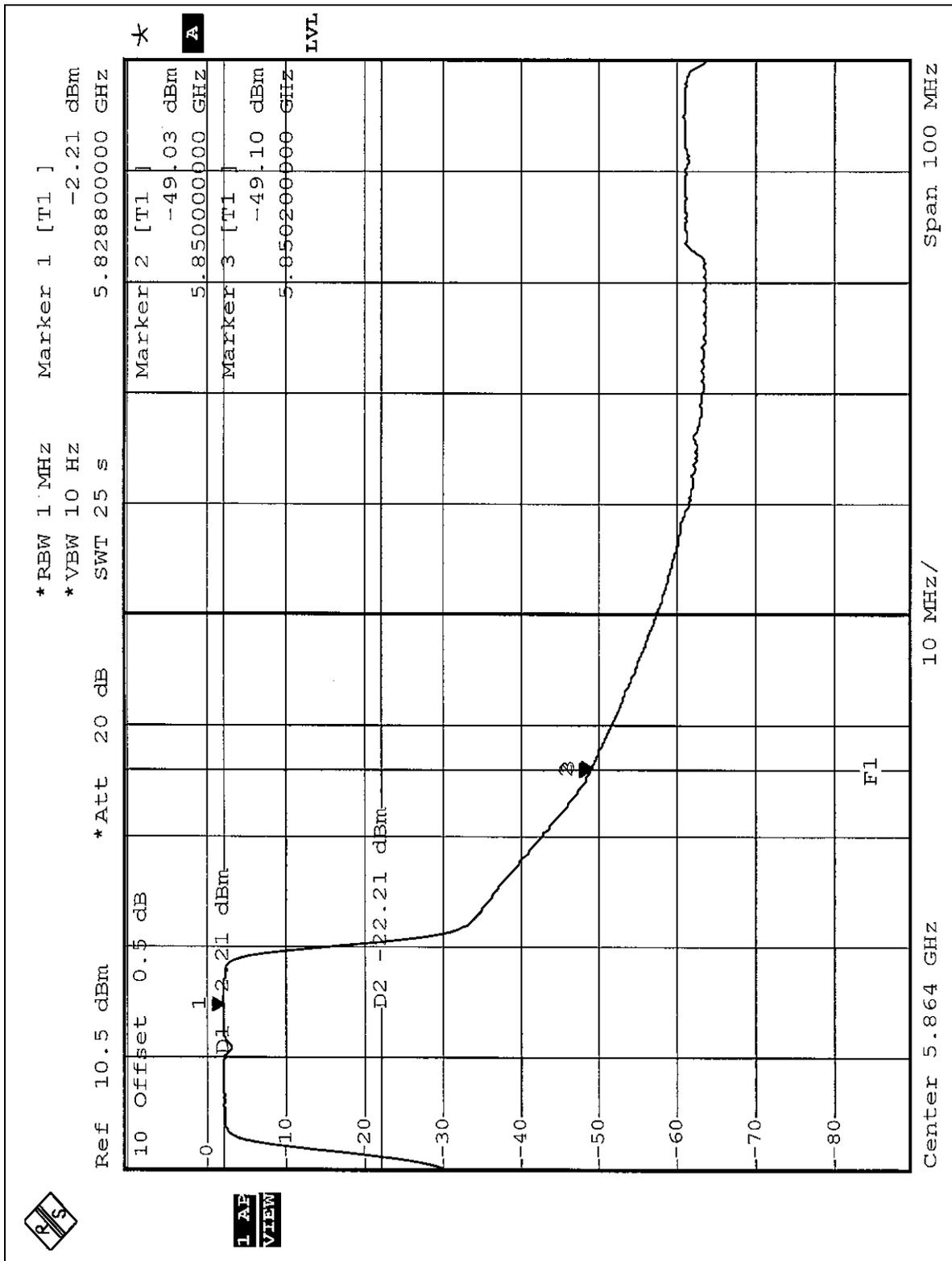


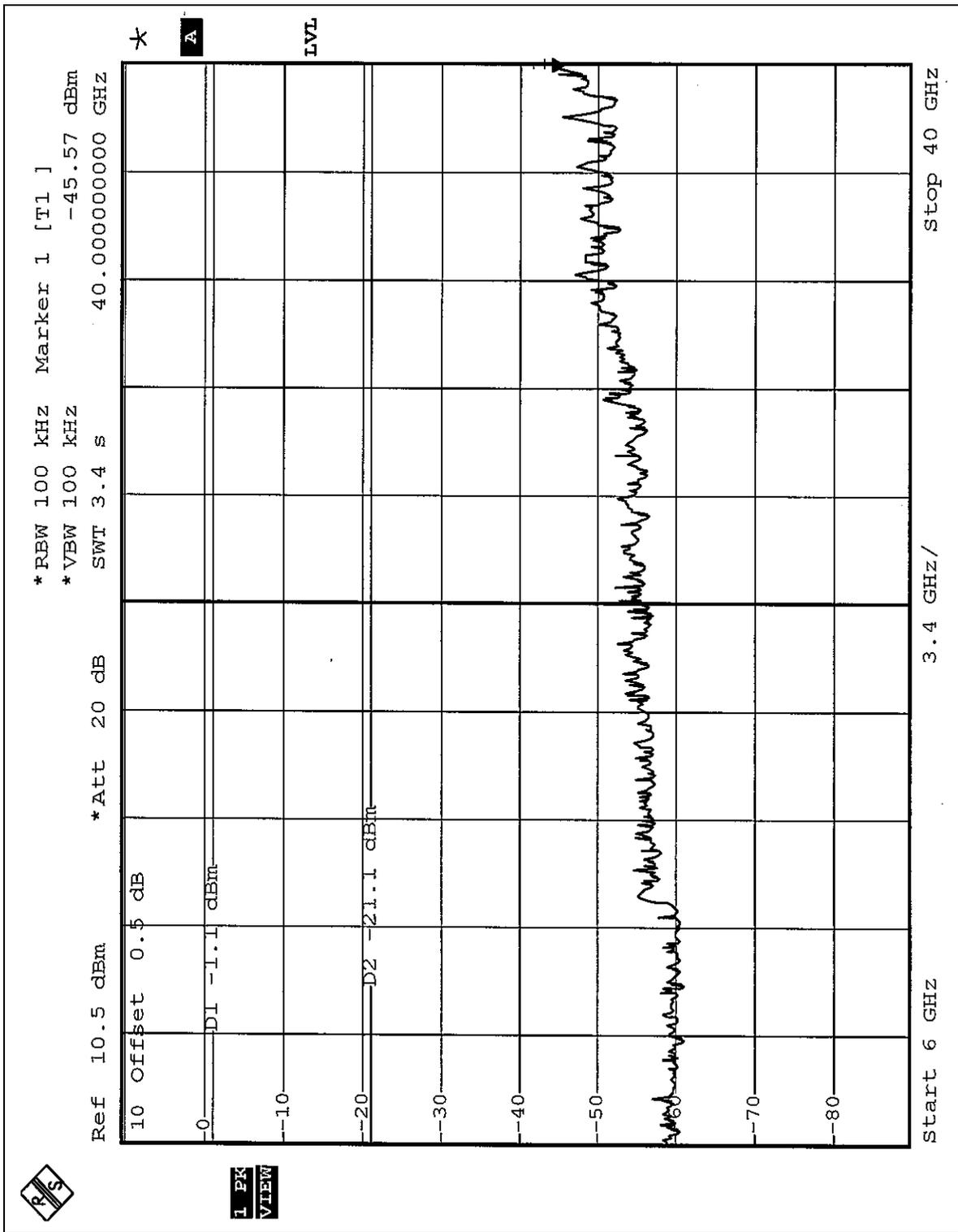
Normal Mode





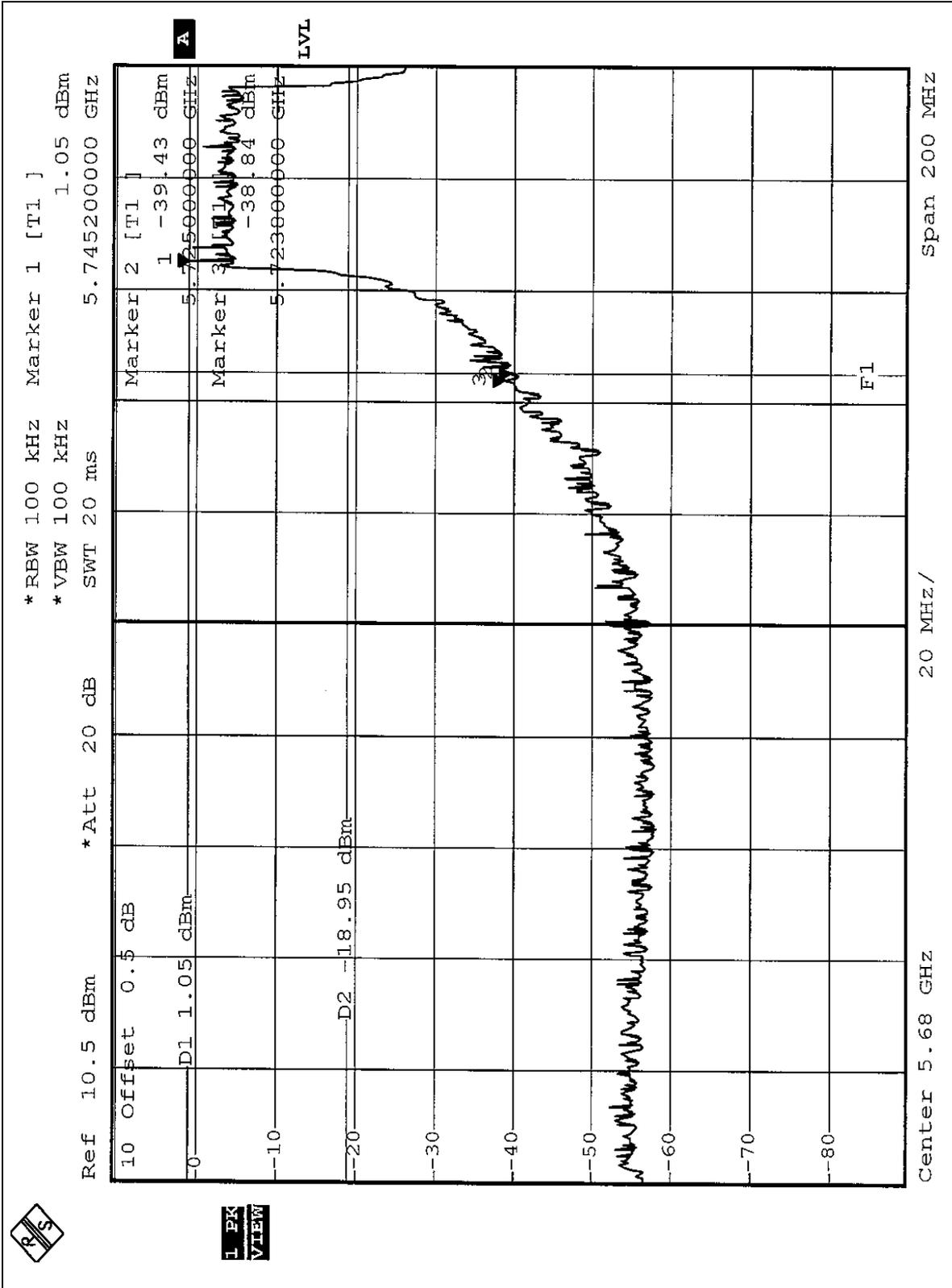


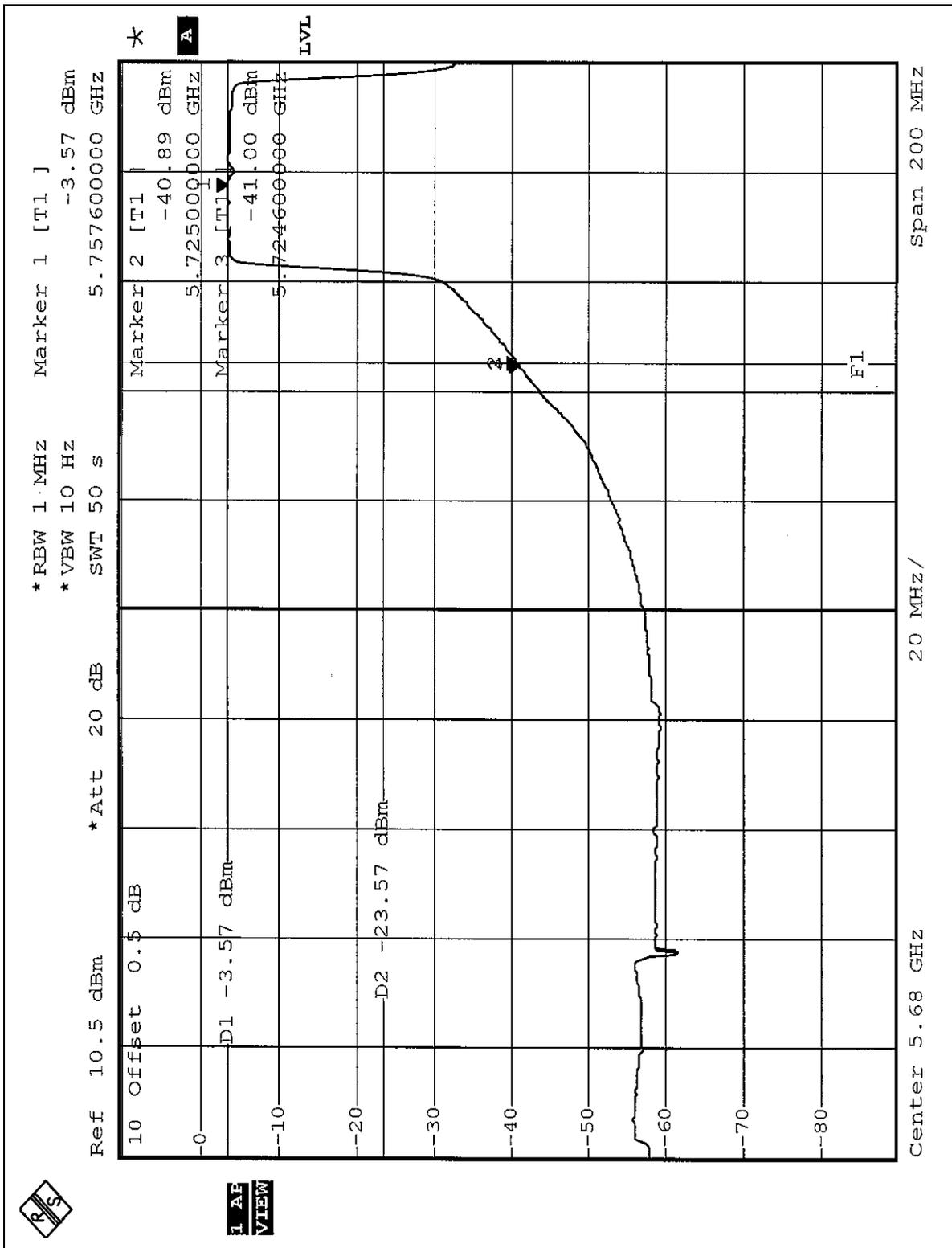


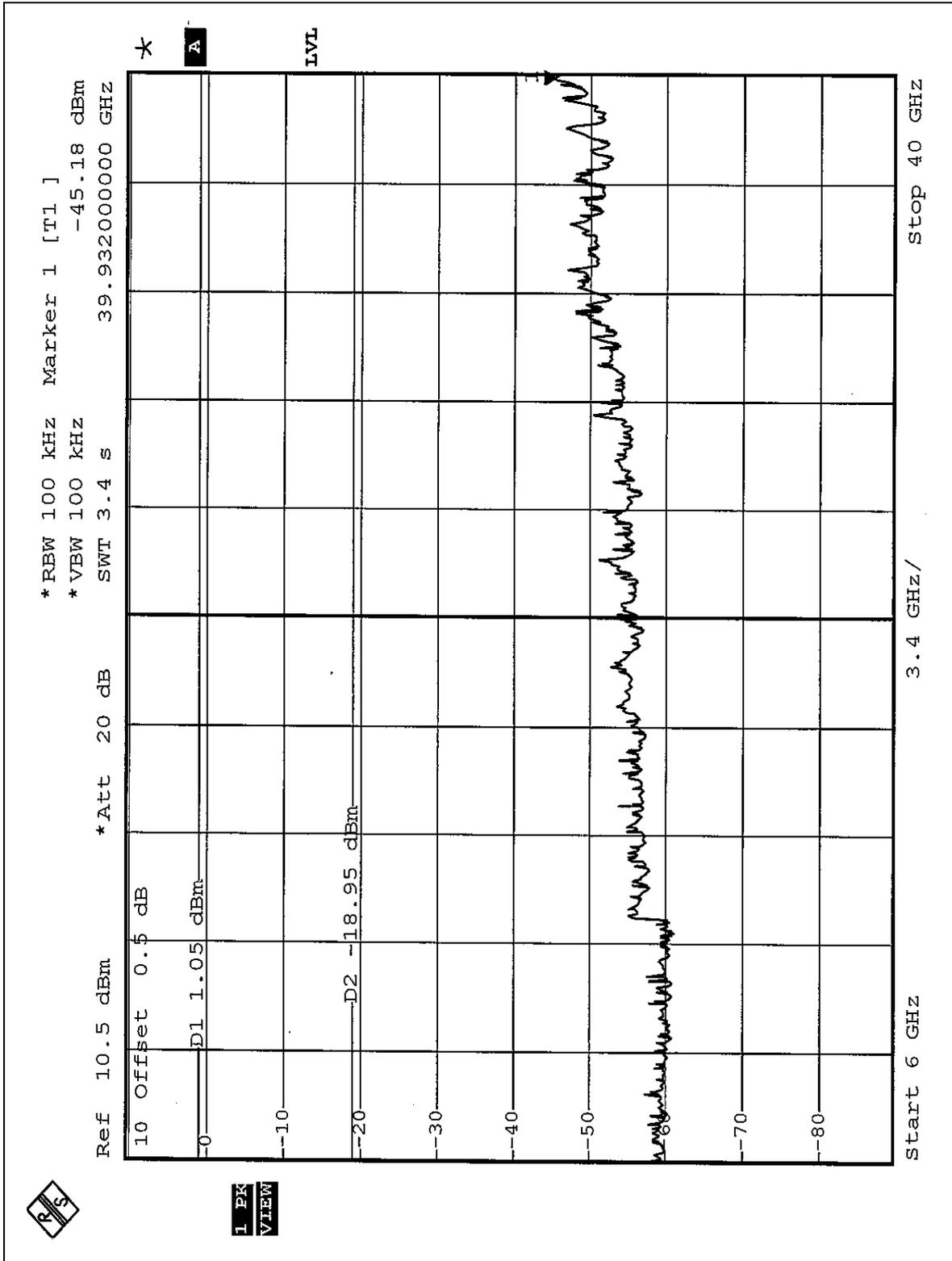


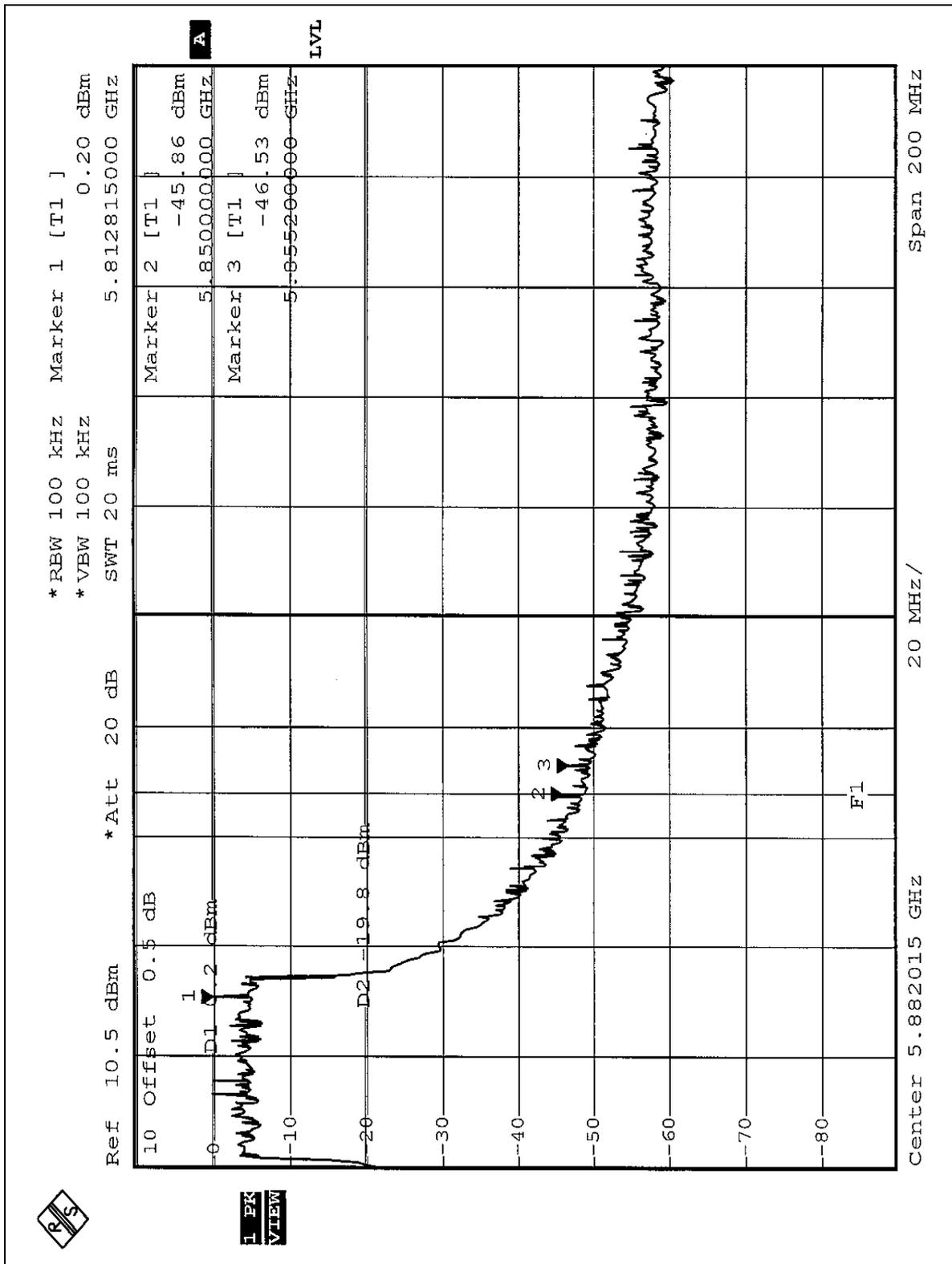


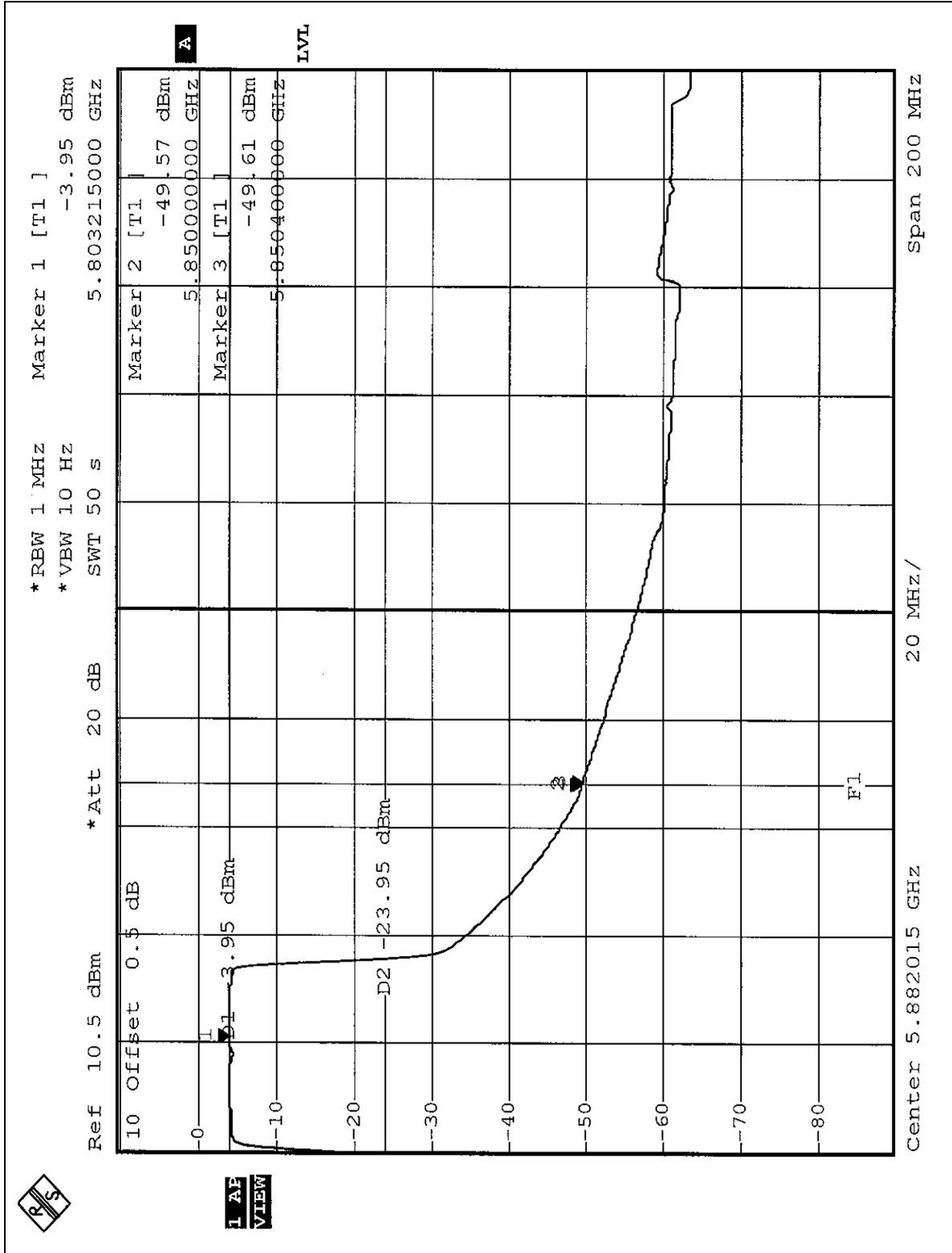
Turbo Mode

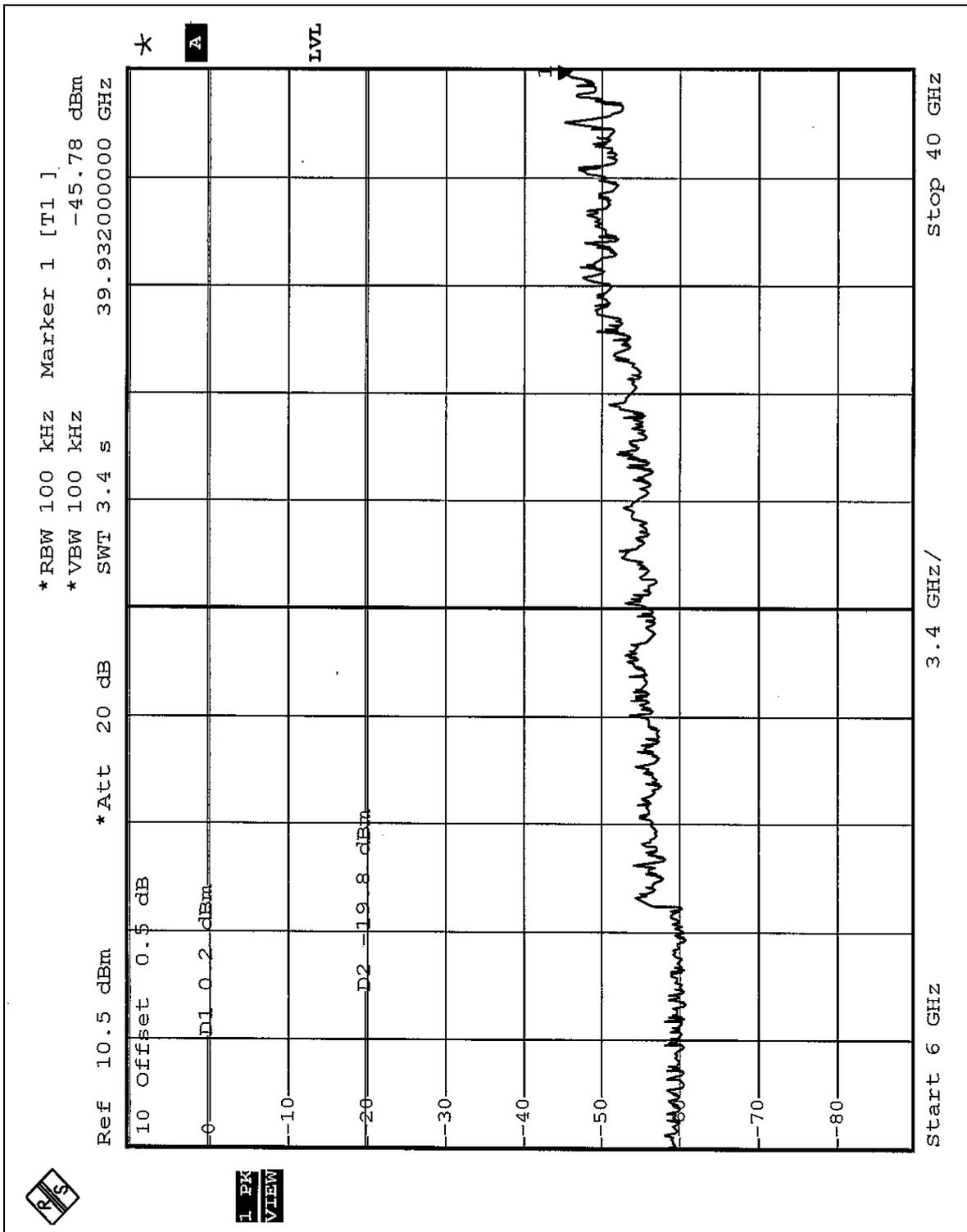














5.13 ANTENNA REQUIREMENT

5.13.1 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 15.247(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.

5.13.2 ANTENNA CONNECTED CONSTRUCTION

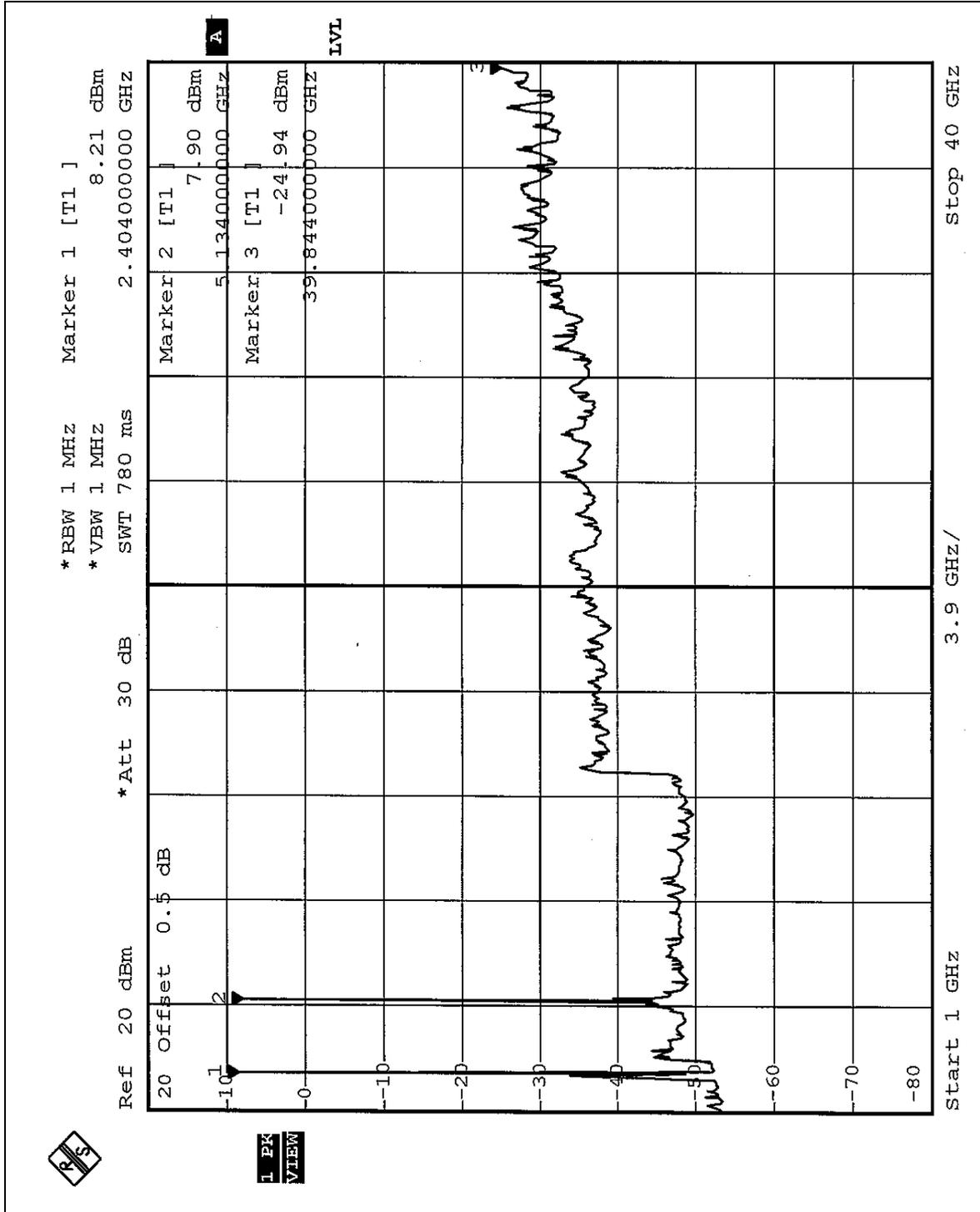
The antenna used in this product is Dipole antenna and Printed antenna with ULF antenna connector. The maximum Gain of the antenna is 3.0dBi.

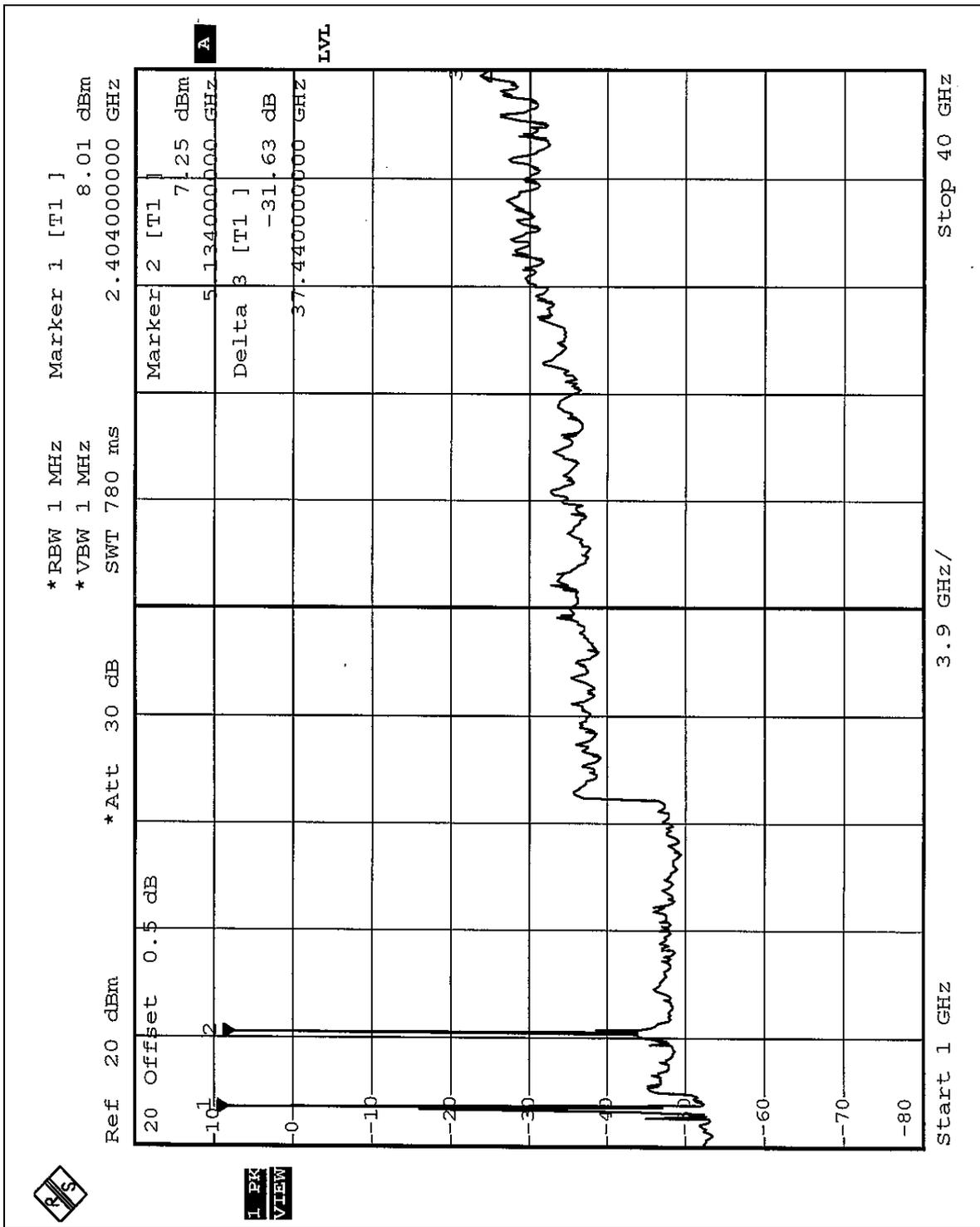


6. APPENDIX : SIMULTANEOUS TRANSMISSION

Normal Mode

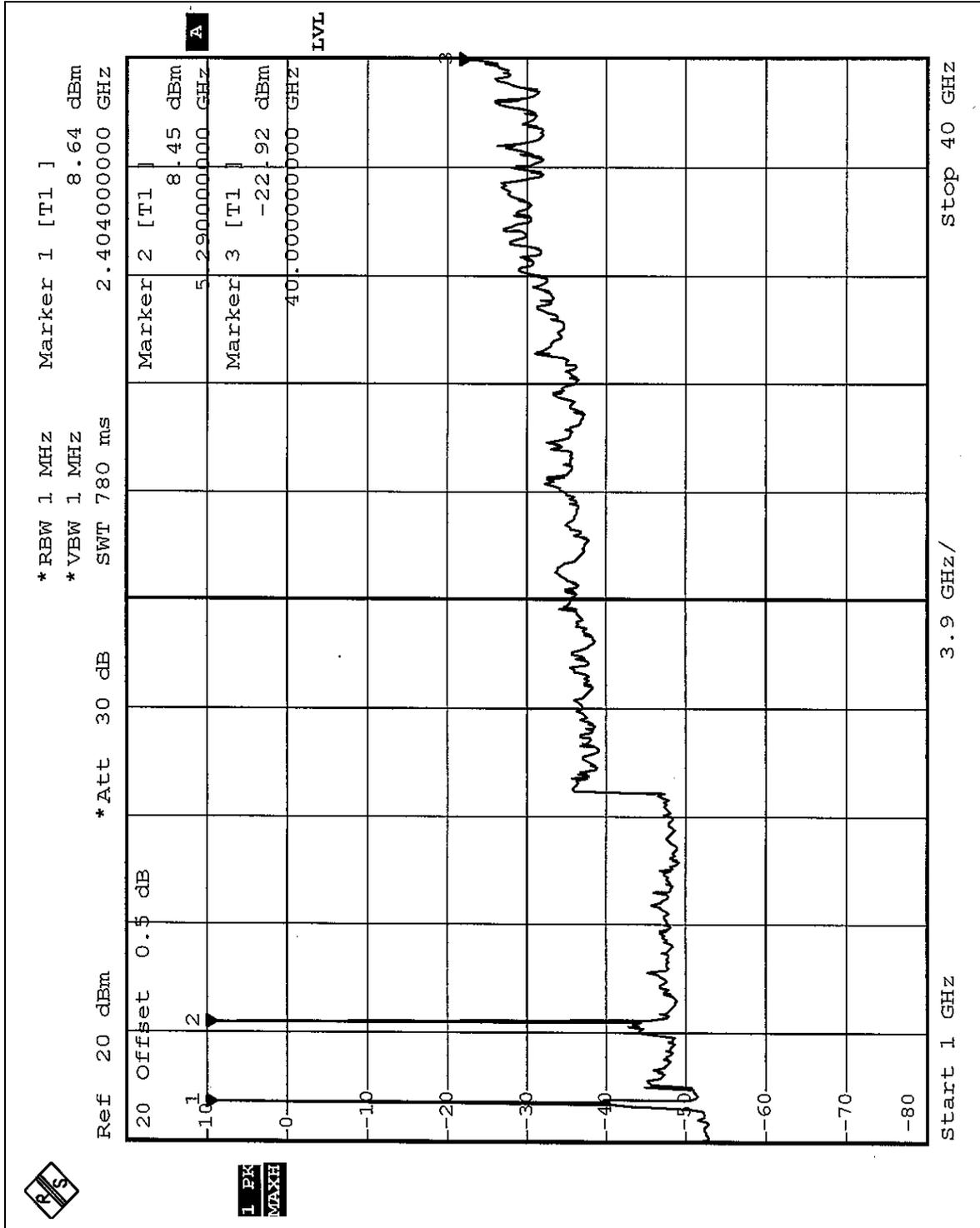
CH 1

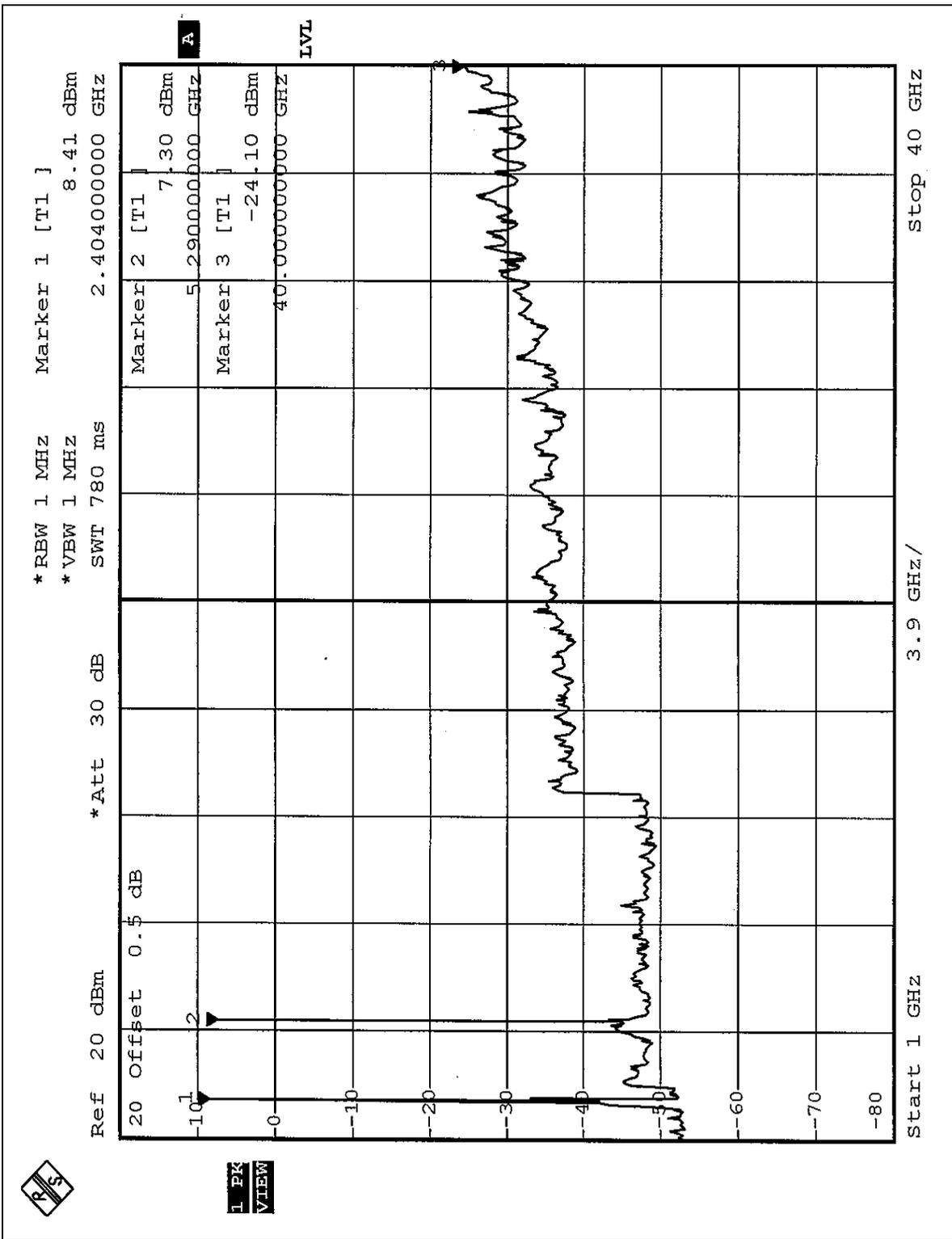






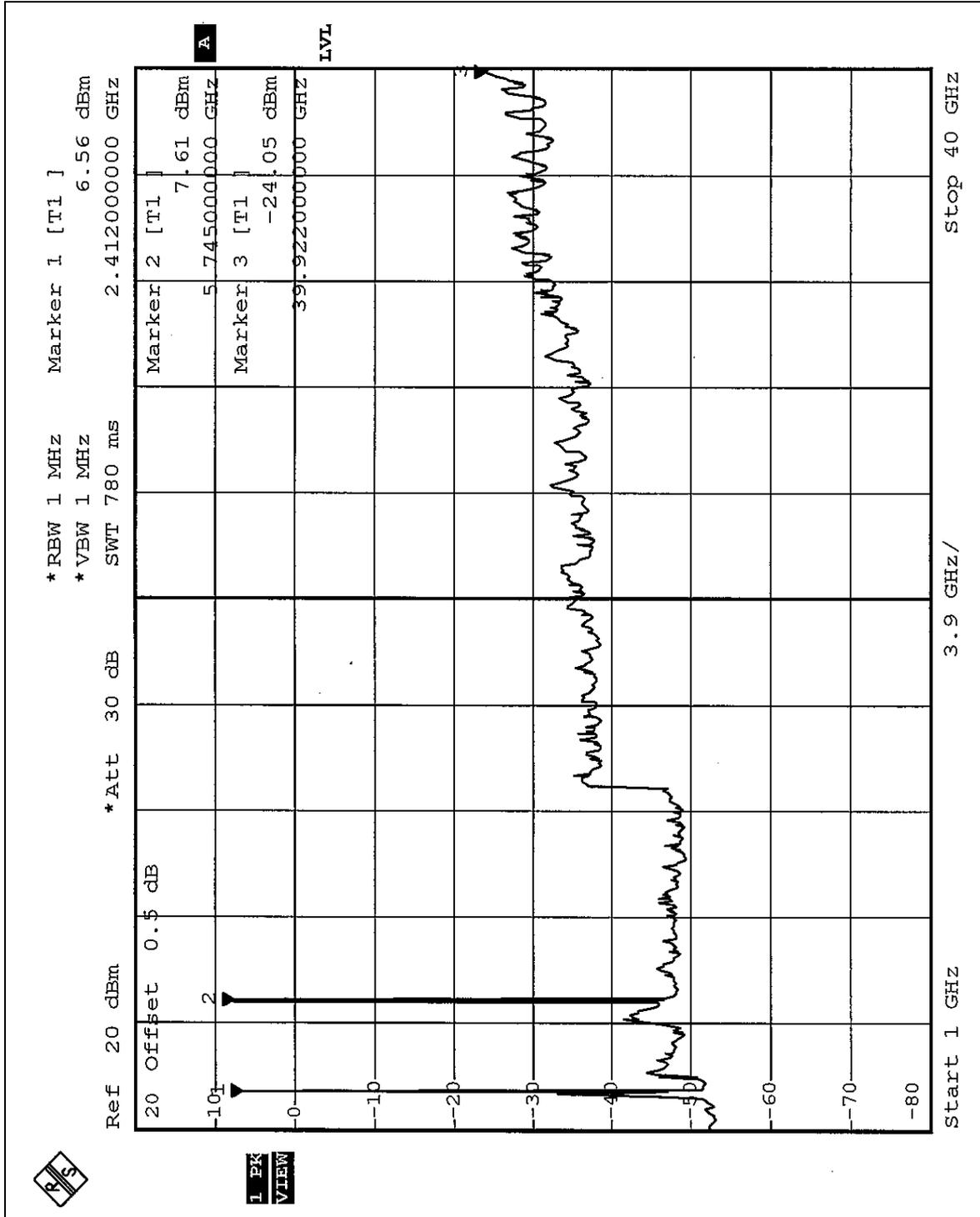
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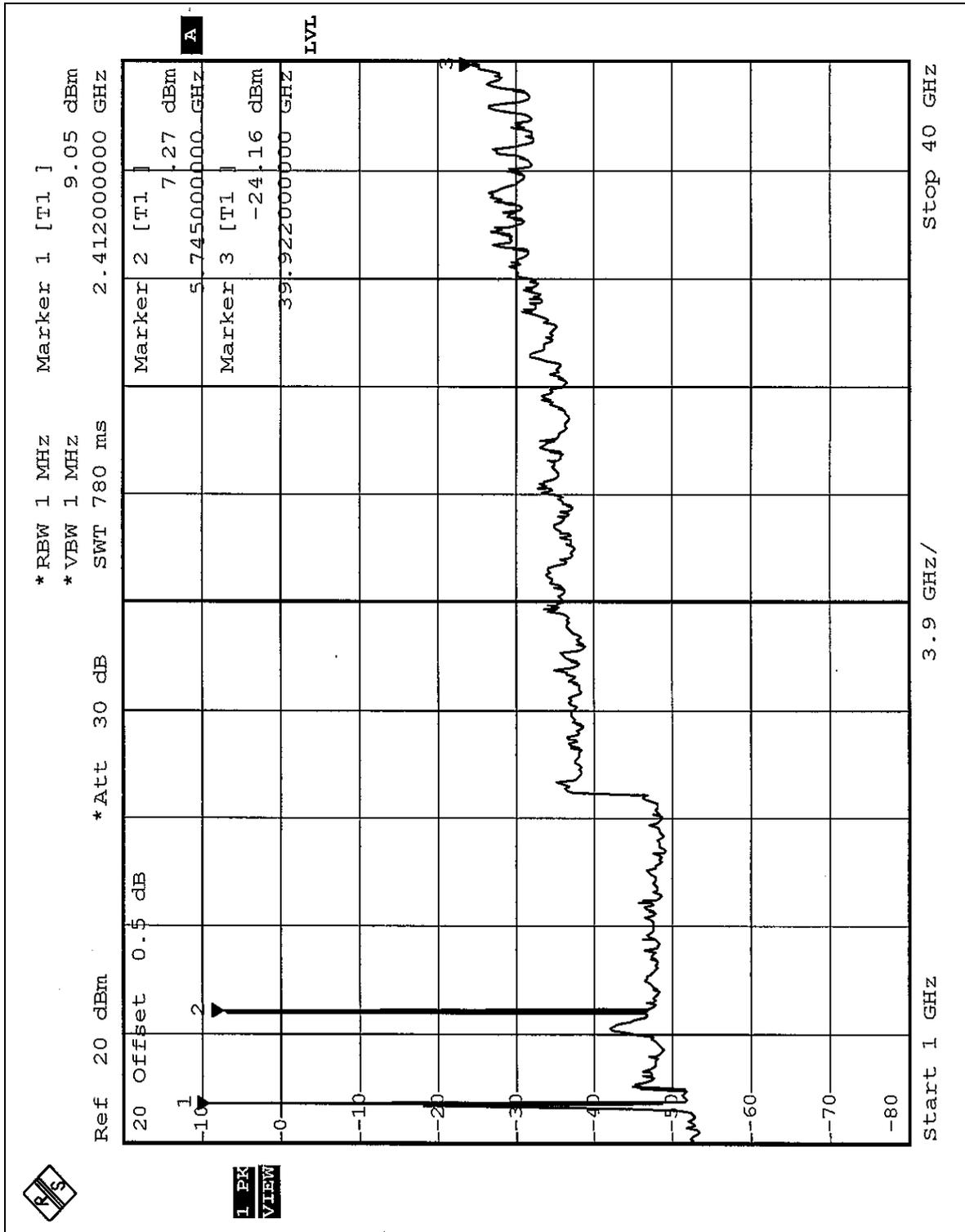






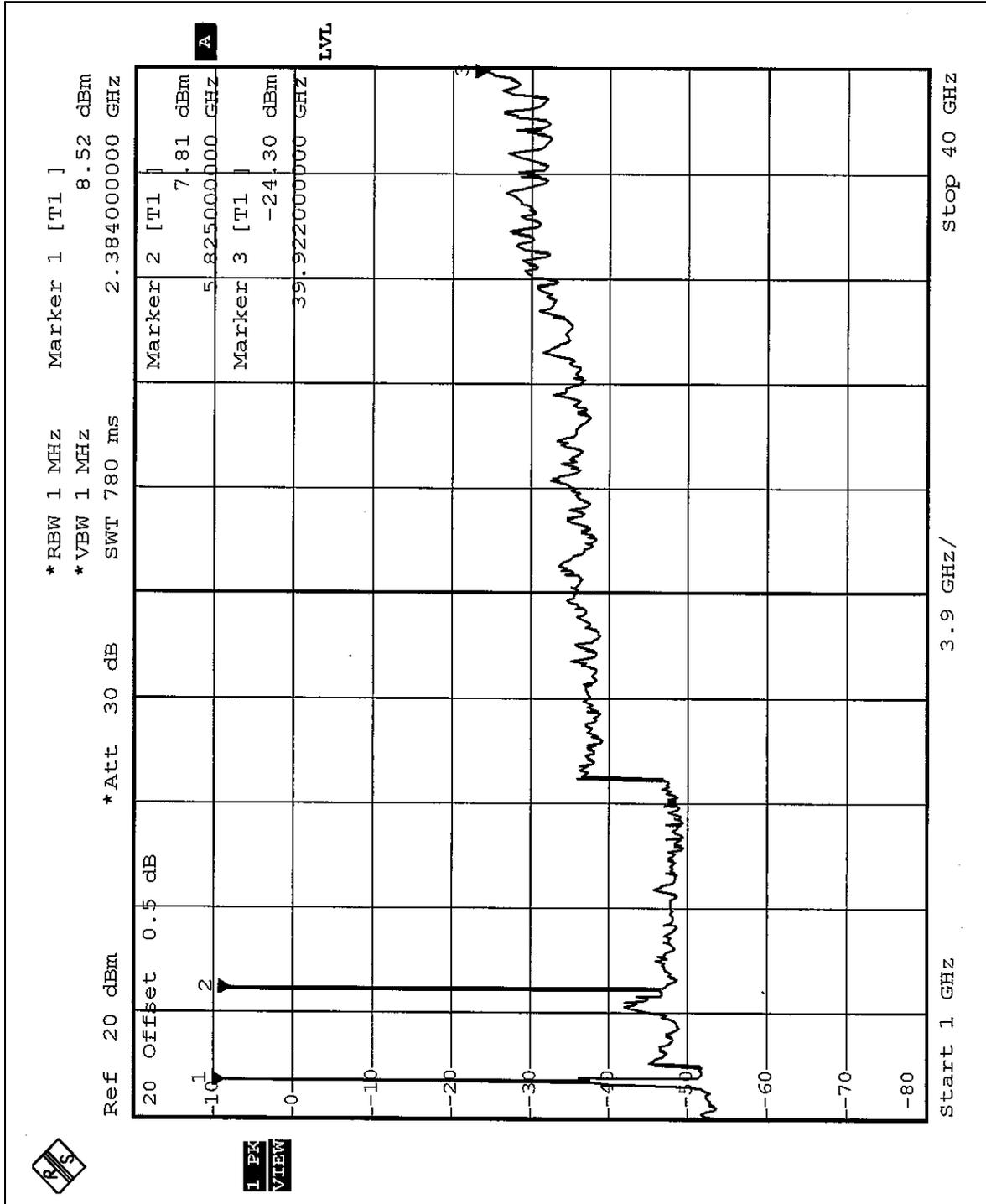
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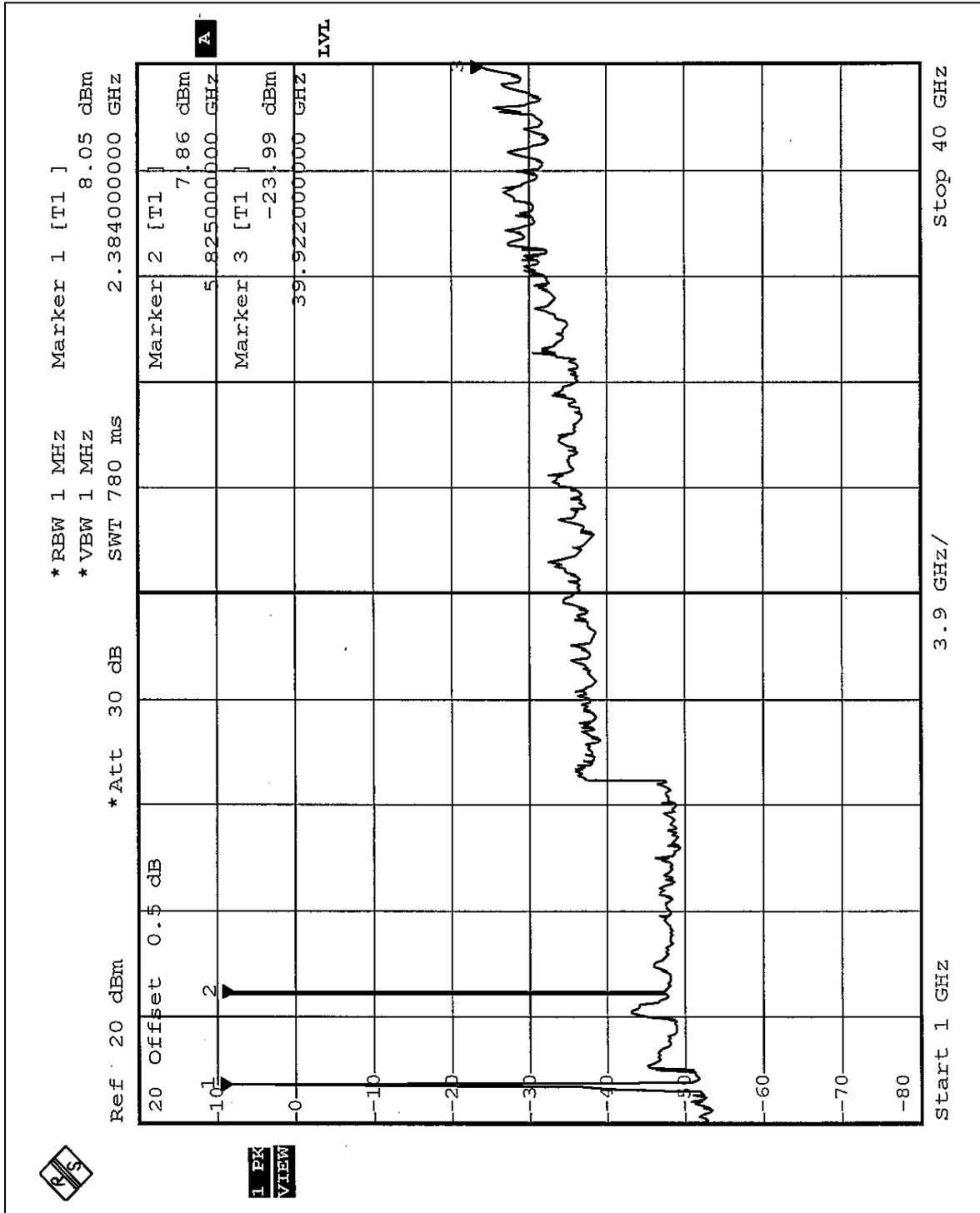






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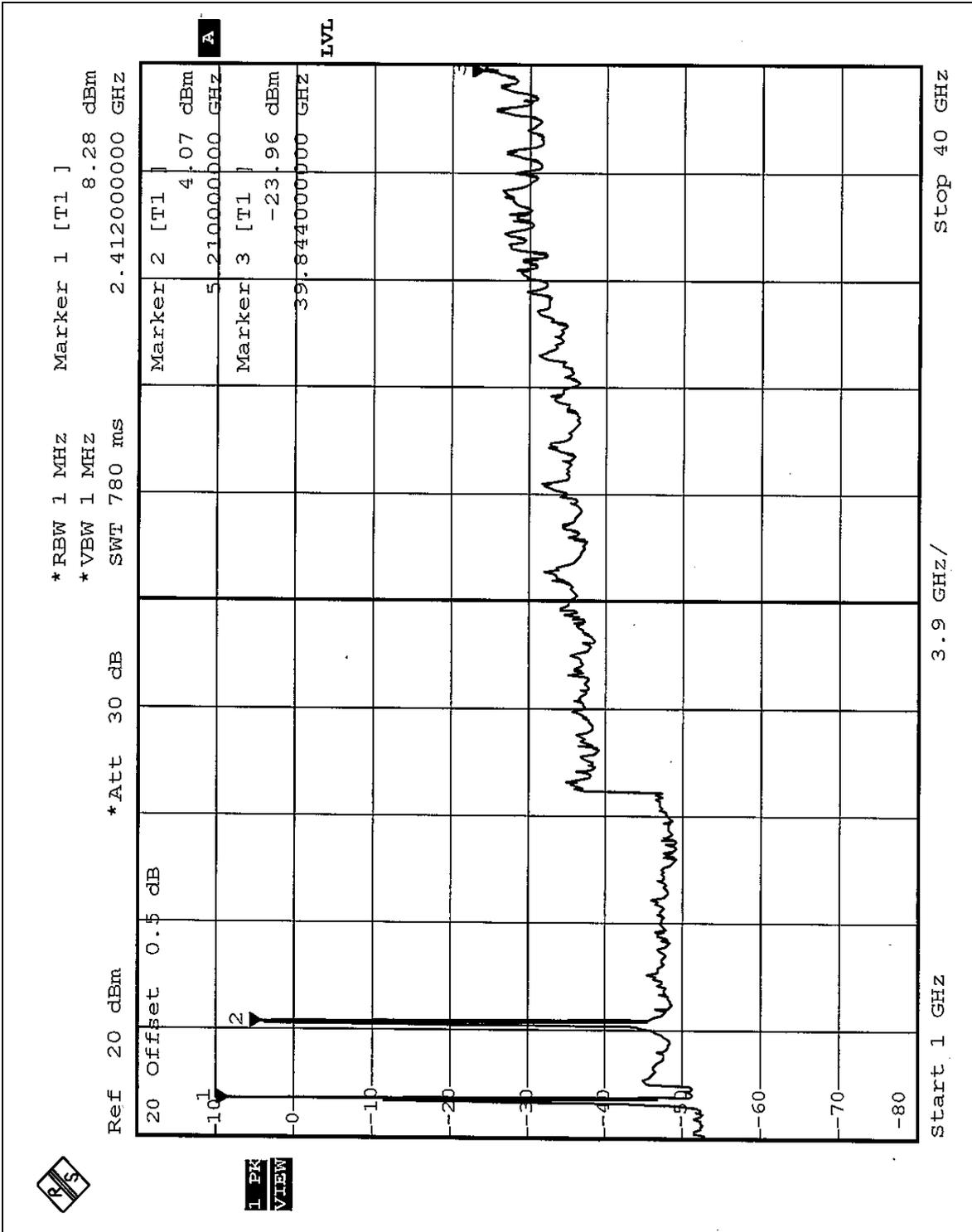


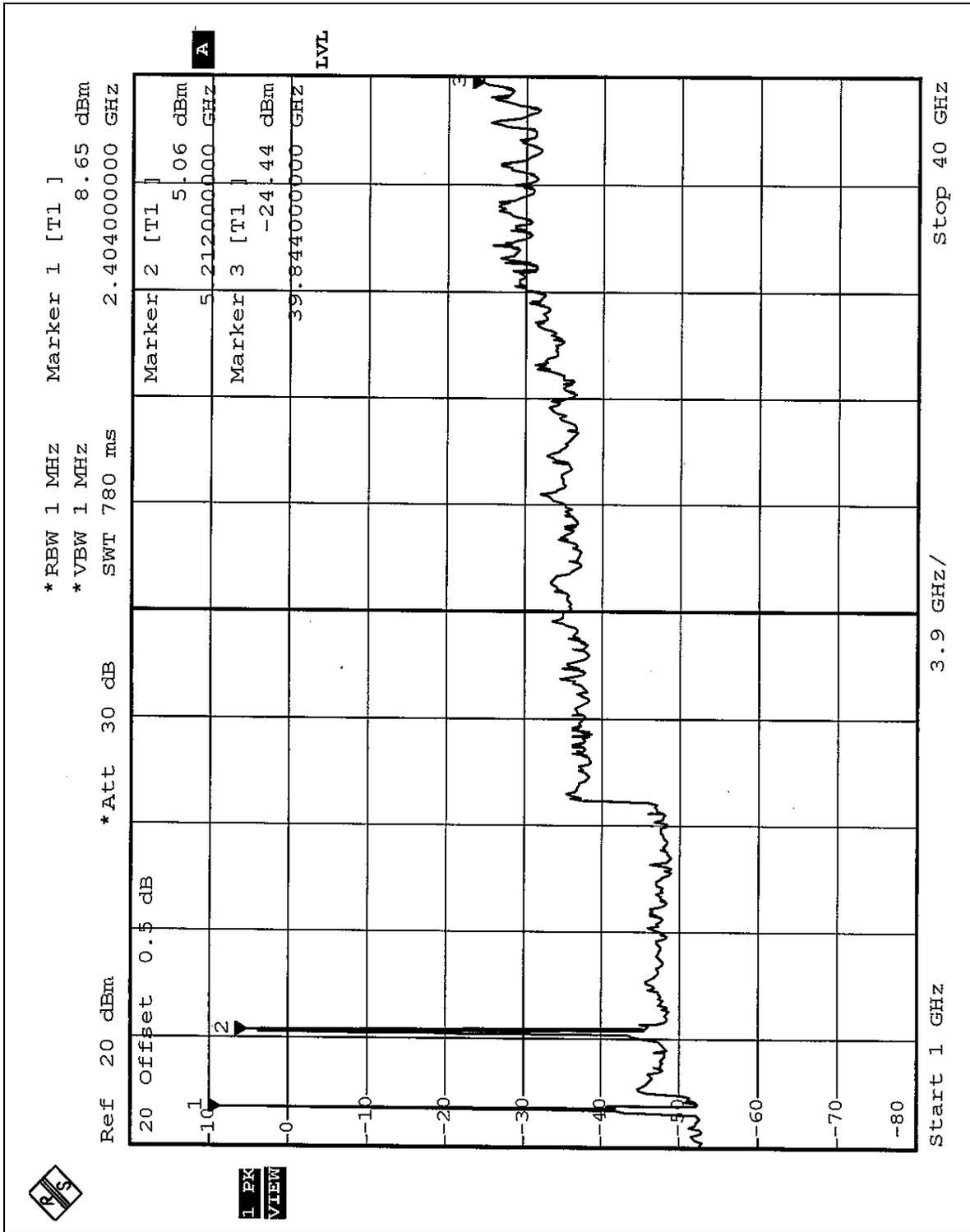




Turbo Mode

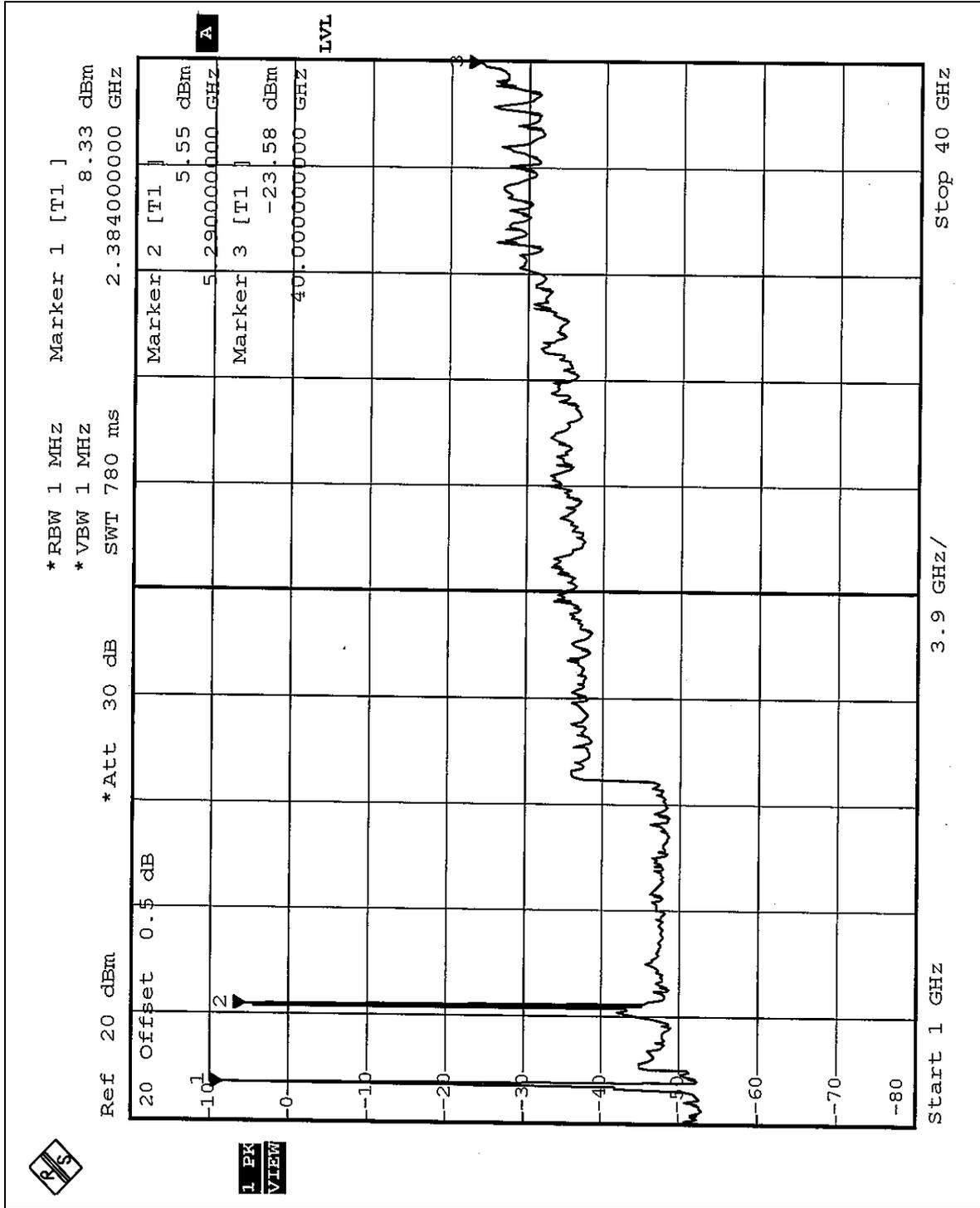
CH 1

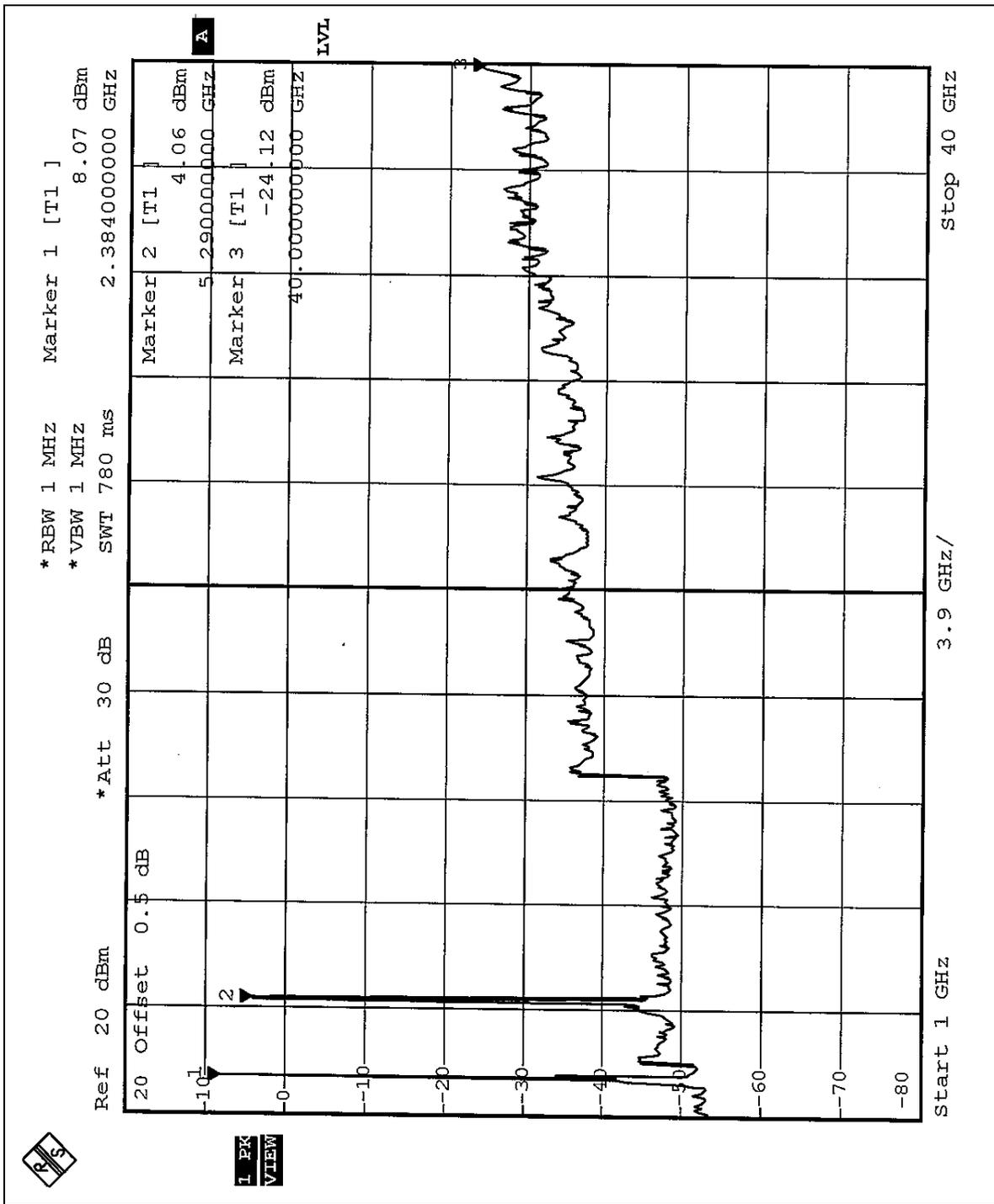


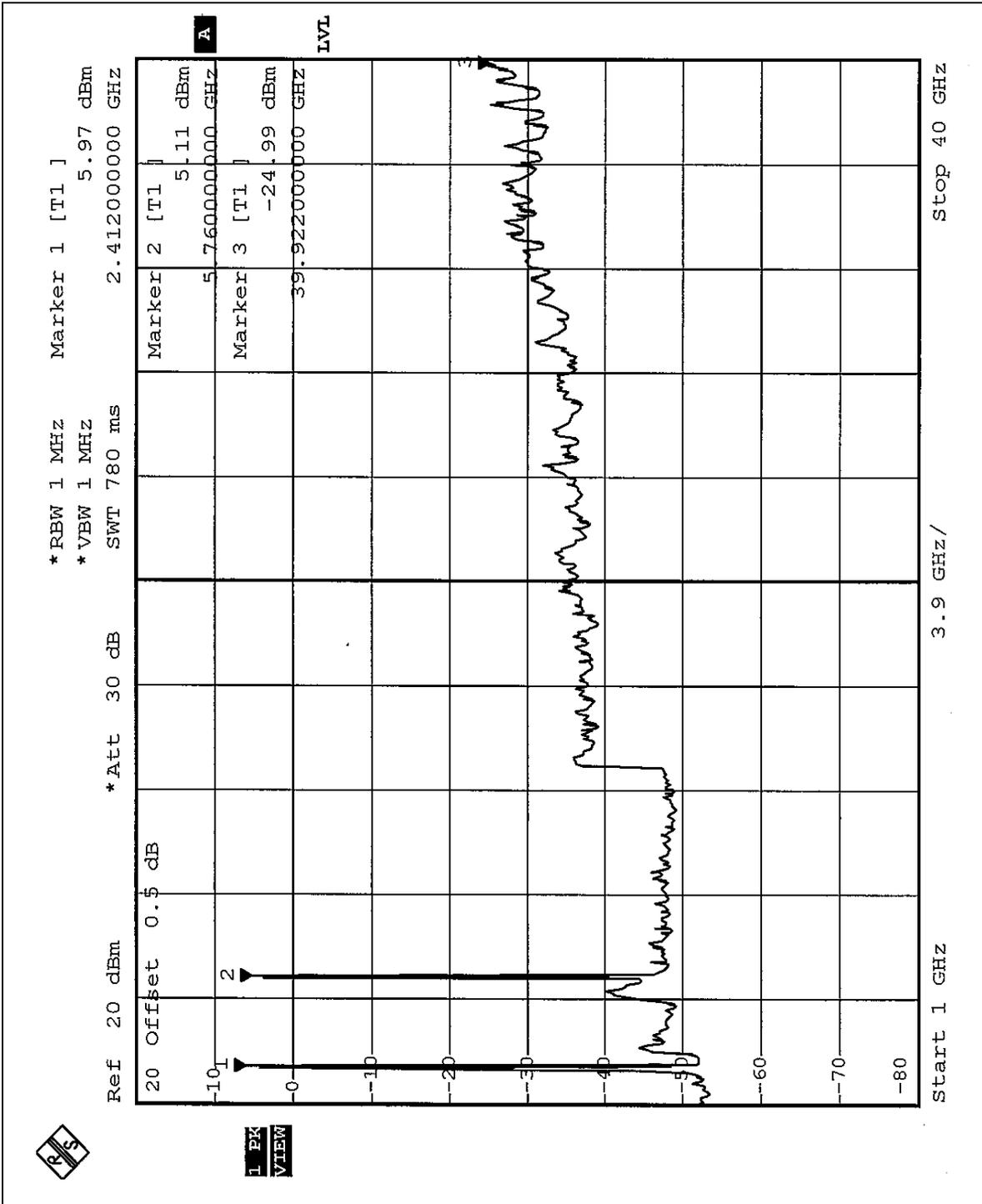




CH 3

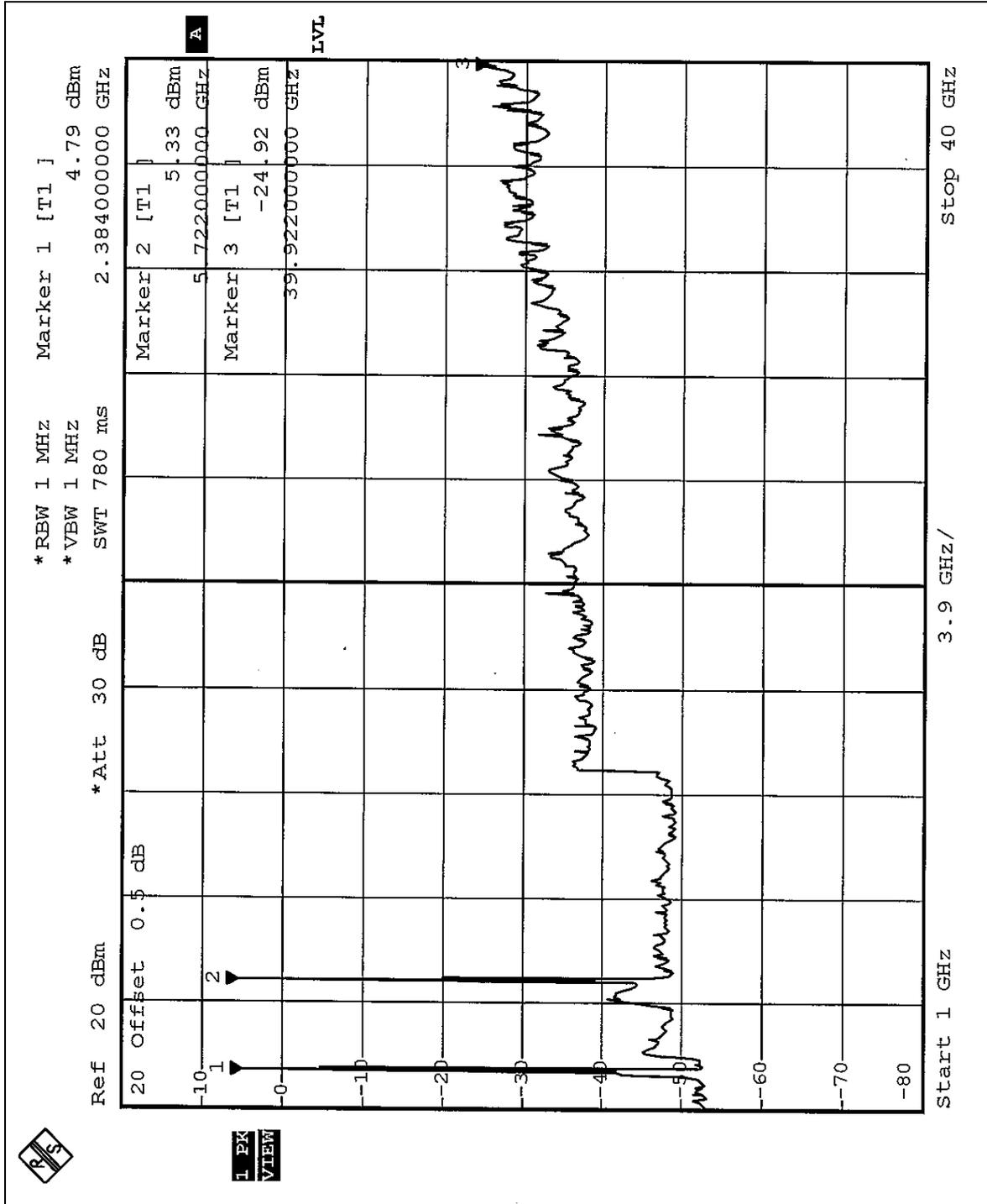


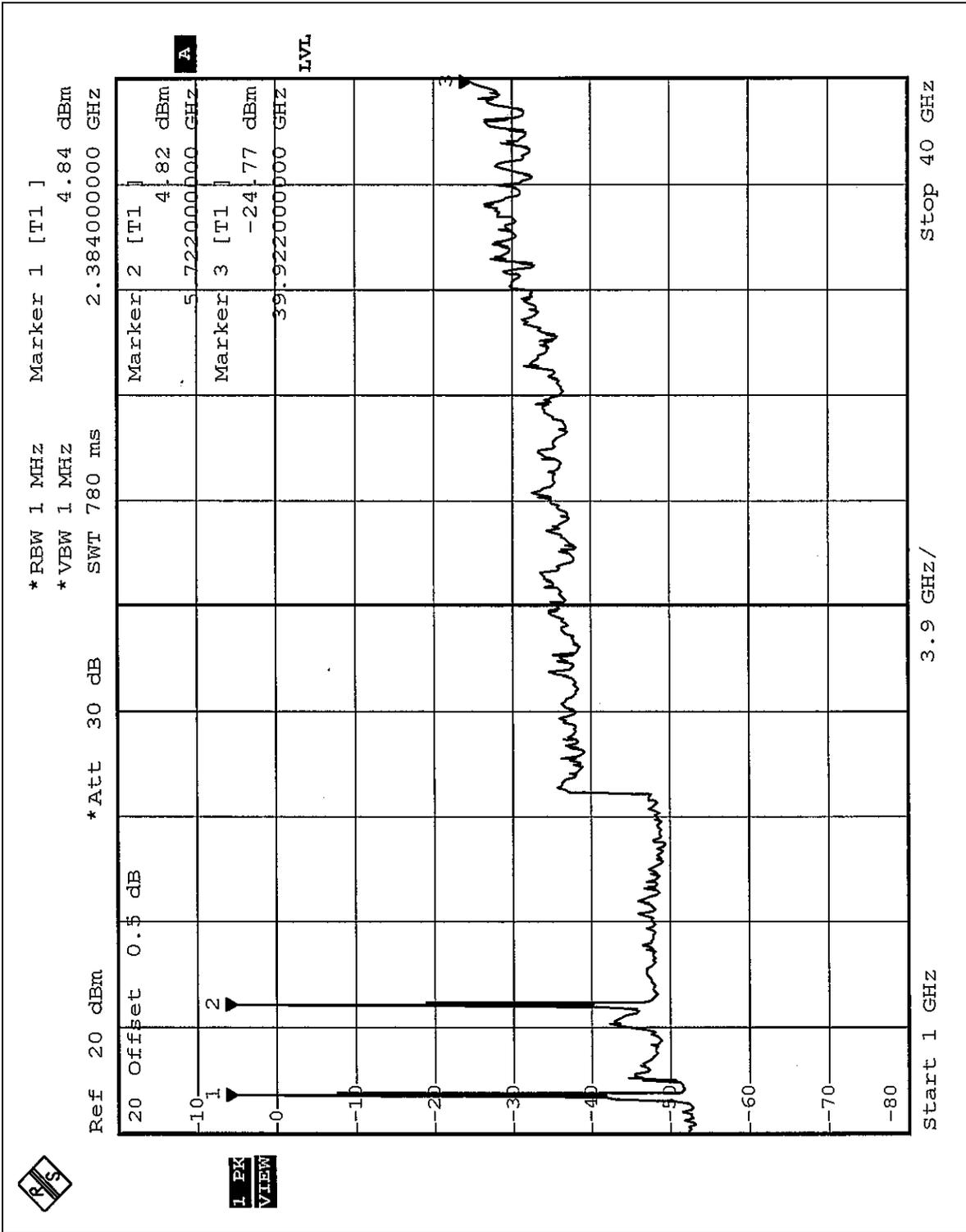






CH 5



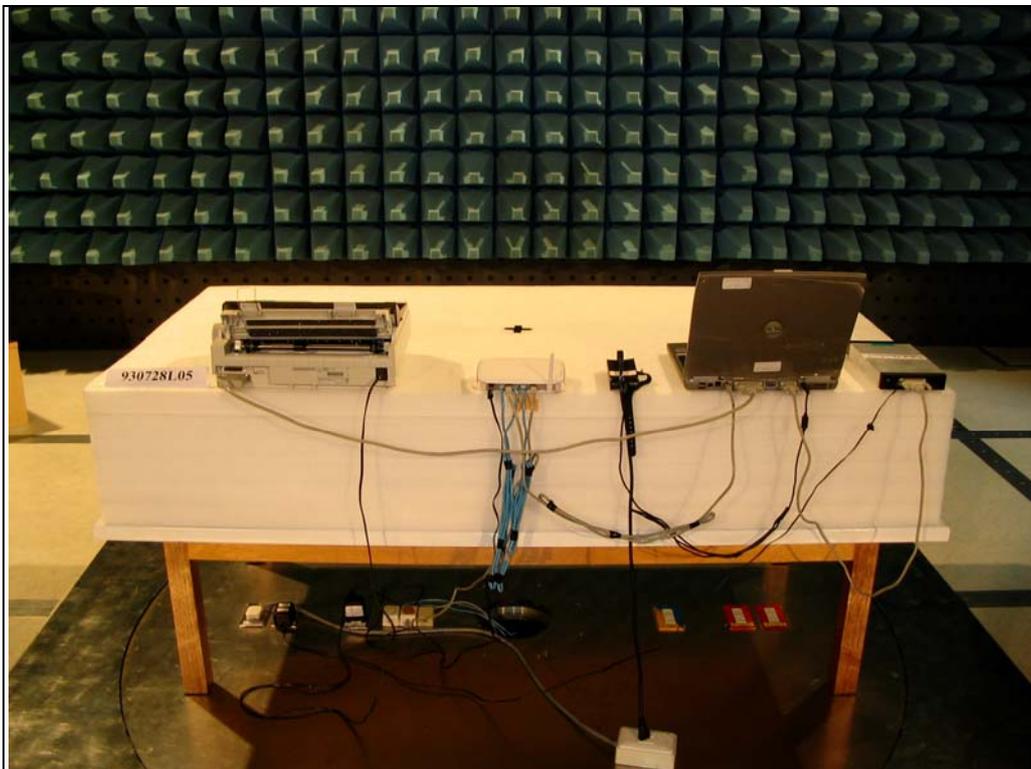
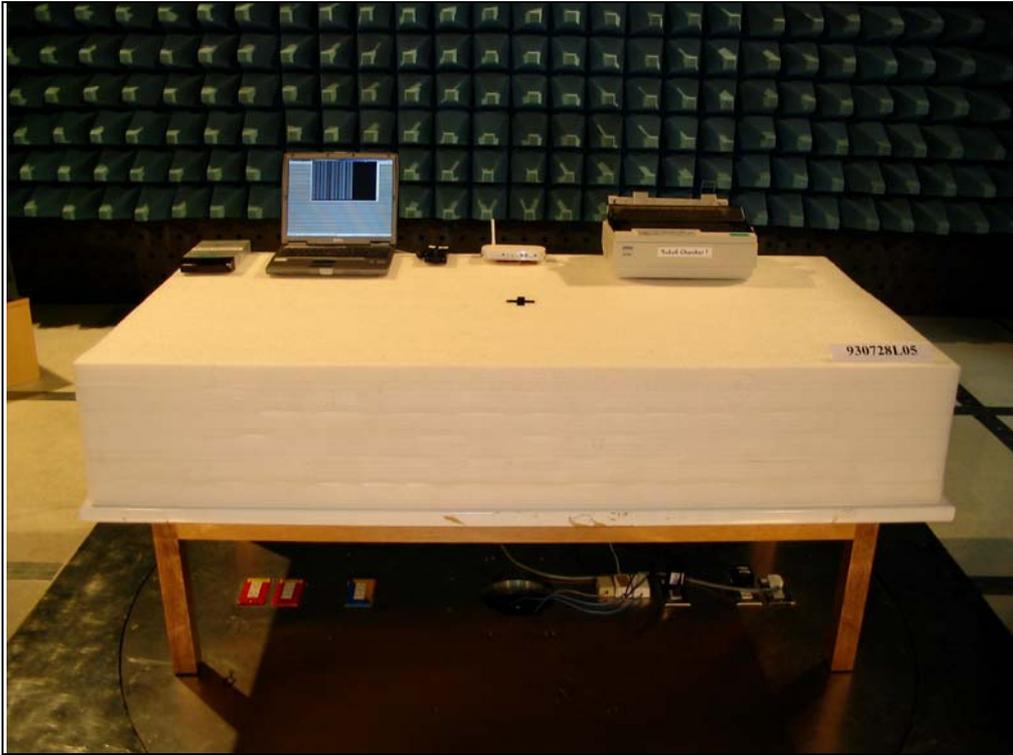


7. PHOTOGRAPHS OF THE TEST CONFIGURATION

CONDUCTED EMISSION TEST



RADIATED EMISSION TEST





8. 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, Guide 25 or EN 45001:

USA	FCC, NVLAP, UL
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

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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

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