FCC TEST REPORT

REPORT NO.: RF921231R03
MODEL NO.: ZW9
RECEIVED: Dec. 31, 2003
TESTED: Jan. 1 ~ Jan. 13, 2004

APPLICANT: Quanta Computer Inc.

ADDRESS: 7F, 116, Hou Kang St., Shih Lin, Taipei, Taiwan, R.O.C.

ISSUED BY: Advance Data Technology Corporation

LAB LOCATION: 14-1, Lane 19, Wen Shan 3 Str., Kwei Shan, Taiwan, R. O. C

This test report consists of 71 pages in total. It may be duplicated completely for legal use with the approval of the applicant. It should not be reproduced except in full, without the written approval of our laboratory. The client should not use it to claim product endorsement by CNLA or any government agencies. The test results in the report only apply to the tested sample.

0528
ILAC MRA

Table of Contents

1 CERTIFICATION

PRODUCT :	NoteBook
MODEL NO. :	ZW9
BRAND :	Quanta
TEST ITEM:	R&D Sample
APPLICANT :	Quanta Computer Inc.
STANDARDS :	FCC Part 15, Subpart C (Section 15.247), ANSI C63.4-1992

We, **Advance Data Technology Corporation**, hereby certify that one sample of the designation has been tested in our facility from Jan. 01 to Jan. 13, 2004. The test record, data evaluation and Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions herein specified.

PREPARED BY: Stacy Hsueh. , **DATE:** January 14, 2004
Stacy Hsueh

APPROVED BY: Ellis Wu , **DATE:** January 14, 2004
Ellis Wu / Manager

2 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: FCC Part 15, Subpart C			
Standard Section	**Test Type and Limit**	**Result**	**REMARK**
15.207	AC Power Conducted Emission	PASS	Meet the requirement of limit Minimum passing margin is –5.79dB at 0.259MHz
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)	Transmitter Radiated Emissions Limit: Table 15.209	PASS	Meet the requirement of limit Minimum passing margin is –2.06dB at 2336.00MHz
15.247(d)	Power Spectral Density Limit: max. 8dBm	PASS	Meet the requirement of limit
15.247(c)	Band Edge Measurement Limit: 20 dB less than the peak value of fundamental frequency	PASS	Meet the requirement of limit

NOTE: The information of measurement uncertainty is available upon the customer's request.

3 GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

PRODUCT	NoteBook
MODEL NO.	ZW9
POWER SUPPLY	19Vdc from AC adapter
MODULATION TYPE	BPSK, QPSK, CCK,16QAM, 64QAM
RADIO TECHNOLOGY	DSSS, OFDM
TRANSFER RATE	1/2/5.5/6/9/11/12/18/24/36/48/54Mbps
FREQUENCY RANGE	2412MHz ~ 2462MHz
NUMBER OF CHANNEL	11
OUTPUT POWER	16.10dBm
ANTENNA TYPE	Monopole
ANTENNA GAIN	0.08dBi for Main antenna -0.79dBi for Auxiliary antenna
DATA CABLE	NA
I/O PORTS	NA
ASSOCIATED DEVICES	NA

NOTE:

1. The mini PCI card, which brand is Intel and the model name is WM3B2200BG, is specified to this EUT.
2. The EUT is powered by the following adapter:

BRAND :	LITEON
MODEL :	PA-1750-01
INPUT :	100-240Vac, 2.3A, 50-60Hz
OUTPUT :	19Vdc, 3.95A

3. For more detailed features description, please refer to the manufacturer's specifications or User's Manual.

3.2 DESCRIPTION OF TEST MODES

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 1 GHz, the channel 1, 6, and 11 were pre-tested in chamber. The channel 11, worst case one, was chosen for final test.
2. Above 1 GHz, the channel 1, 6, and 11 were tested individually.
3. Data rate 11Mbps, the worst case, was chosen for final test.
4. Diversity function was provided to this EUT. Monopole with 0.08dBi antenna gain, the worse case, was chosen for final test.
5. Transfer rate, 11Mbps with CCK technique and 6Mbps with OFDM technique, the worst cases, were chosen for final test.

3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a NoteBook. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

FCC Part 15, Subpart C. (15.247)
ANSI C63.4 : 1992

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

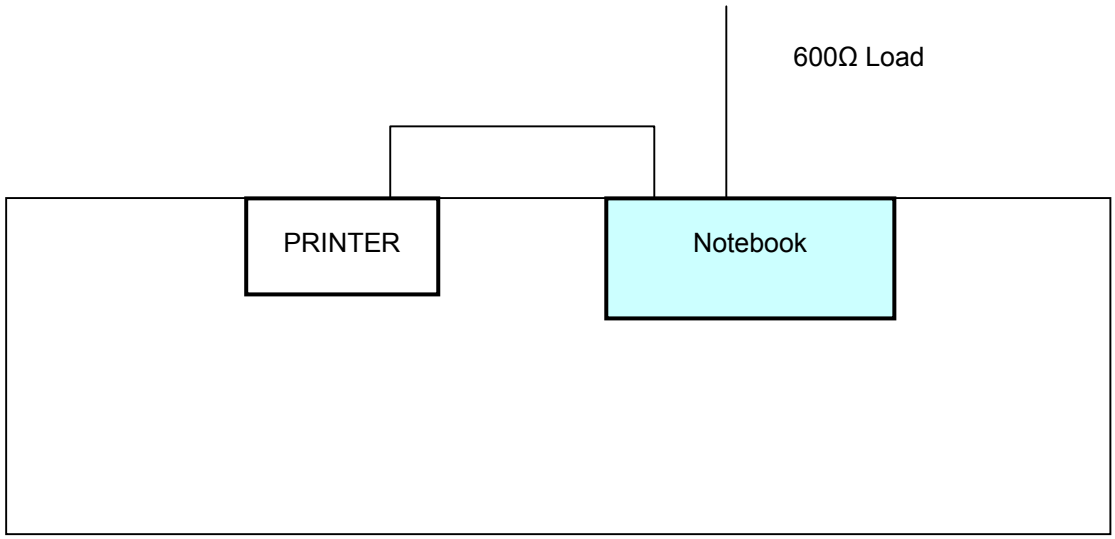
The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	600Ω Load	NA	NA	NA	NA
2	PRINTER	EPSON	EPSON	DCGY017058	FCC DoC Approved

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	NA
2	1.2m braid shielded wire, terminated with DB25 and Centronics connector via metallic frame, w/o core.

NOTE: All power cords of the above support units are non shielded (1.8m).

3.5 CONFIGURATION OF SYSTEM UNDER TEST



4 TEST TYPES AND RESULTS

4.1 CONDUCTED EMISSION MEASUREMENT

4.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

FREQUENCY OF EMISSION (MHz)	CONDUCTED LIMIT (dBμV)	
	Quasi-peak	Average
0.15-0.5 0.5-5 5-30	66 to 56 56 60	56 to 46 46 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
ROHDE & SCHWARZ Test Receiver	ESCS 30	838251/021	Jan. 19, 2005
ROHDE & SCHWARZ Artificial Mains Network (for EUT)	ESH3-Z5	100218	Dec. 09, 2004
ROHDE & SCHWARZ Artificial Mains Network (for peripherals)	ESH3-Z5	100219	Dec. 09, 2004
ROHDE & SCHWARZ Artificial Mains Network (for peripherals)	ESH3-Z5	100220	Dec. 09, 2004
*ROHDE & SCHWARZ 4-wire ISN	ENY41	837032/016	Nov. 19, 2004
*ROHDE & SCHWARZ 2-wire ISN	ENY22	837497/016	Nov. 19, 2004
Software	Cond-V2M3	NA	NA
RF cable (JYEBAO)	5D-FB	Cable-C10.01	May 01, 2004
SUHNER Terminator (For ROHDE & SCHWARZ LISN)	65BNC-5001	E1-010770	Mar. 24, 2004
SUHNER Terminator (For ROHDE & SCHWARZ LISN)	65BNC-5001	E1-010773	Apr. 06, 2004

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. "*": These equipment are used for conducted telecom port test only (if tested).
3. The test was performed in ADT Shielded Room No. 10.
4. The VCCI Site Registration No. is C-1312.

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.

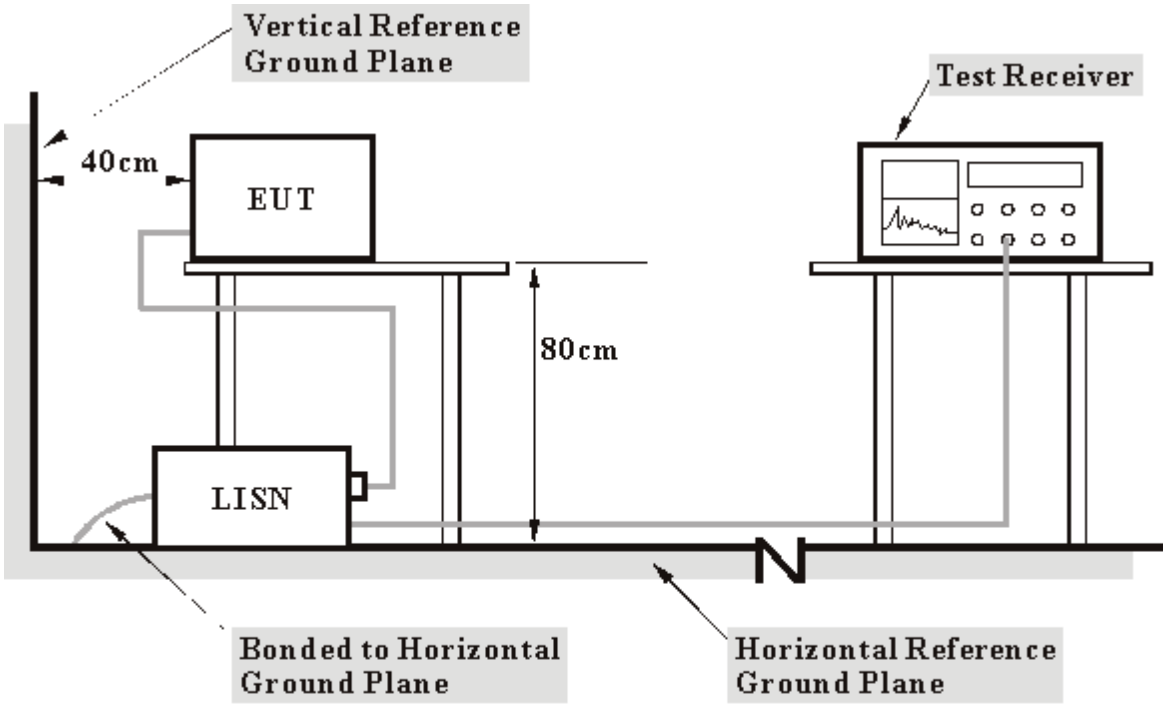
b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.

c. The frequency range from 150 kHz to 30 MHz was searched. Emission levels under 20dB under the prescribed limits could not be reported

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

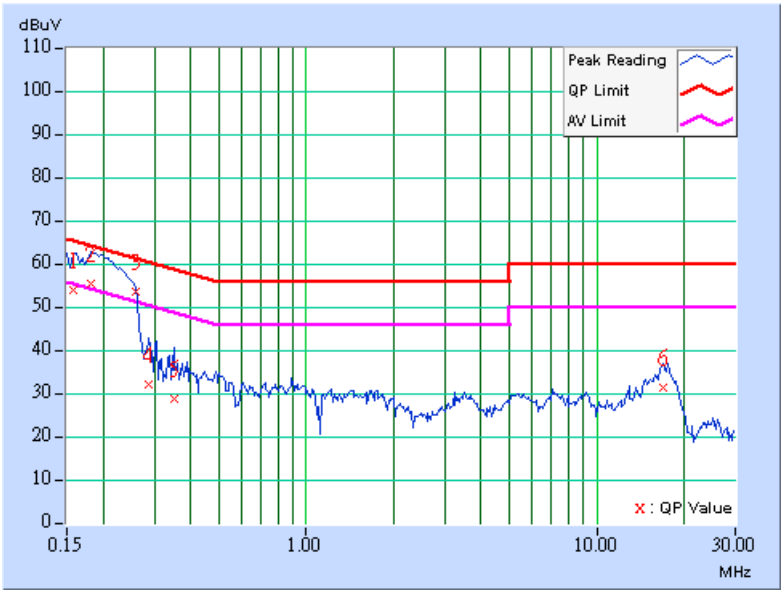
a. The notebook system ran a test program to enable EUT under transmission/receiving condition continuously at specific channel frequency.
b. The notebook system sent "H" messages on its screen.
c. The notebook system sent “H” messages to printer, and the printer prints them on paper.
d. Repeated items b to c.

4.1.7 TEST RESULTS

EUT	NoteBook	**MODEL**	ZW9
MODE	Channel 1	**6dB BANDWIDTH**	9 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**PHASE**	Line (L)
ENVIRONMENTAL CONDITIONS	20 deg. C, 65%RH, 991 hPa	**TESTED BY**: Jamison Chan	

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.158	0.10	53.37	-	53.47	-	65.58	55.58	-12.11	-
2	0.181	0.10	54.74	32.58	54.84	32.68	64.43	54.43	-9.59	-21.75
3	0.259	0.10	52.95	45.32	53.05	45.42	61.45	51.45	-8.40	-6.03
4	0.287	0.10	31.35	-	31.45	-	60.62	50.62	-29.17	-
5	0.349	0.10	28.09	-	28.19	-	58.98	48.98	-30.79	-
6	16.844	0.84	30.53	-	31.37	-	60.00	50.00	-28.63	-

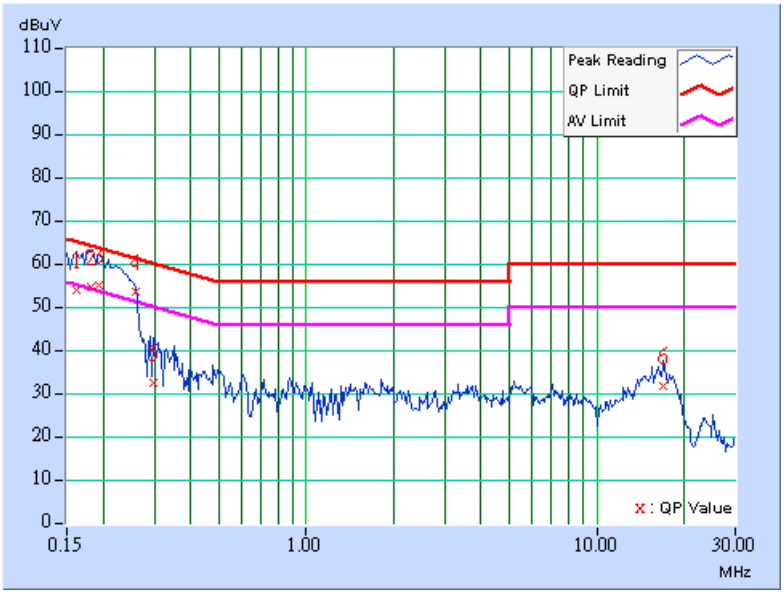
REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission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



EUT	NoteBook	**MODEL**	ZW9
MODE	Channel 1	**6dB BANDWIDTH**	9 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**PHASE**	Neutral (N)
ENVIRONMENTAL CONDITIONS	20 deg. C, 65%RH, 991 hPa	**TESTED BY**: Jamison Chan	

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.162	0.10	53.51	-	53.61	-	65.38	55.38	-11.77	-
2	0.181	0.10	54.05	-	54.15	-	64.43	54.43	-10.28	-
3	0.193	0.10	54.30	32.88	54.40	32.98	63.91	53.91	-9.51	-20.93
4	**0.259**	**0.10**	**53.11**	**45.56**	**53.21**	**45.66**	**61.45**	**51.45**	**-8.24**	**-5.79**
5	0.298	0.10	31.93	-	32.03	-	60.29	50.29	-28.26	-
6	17.039	0.74	31.02	-	31.76	-	60.00	50.00	-28.24	-

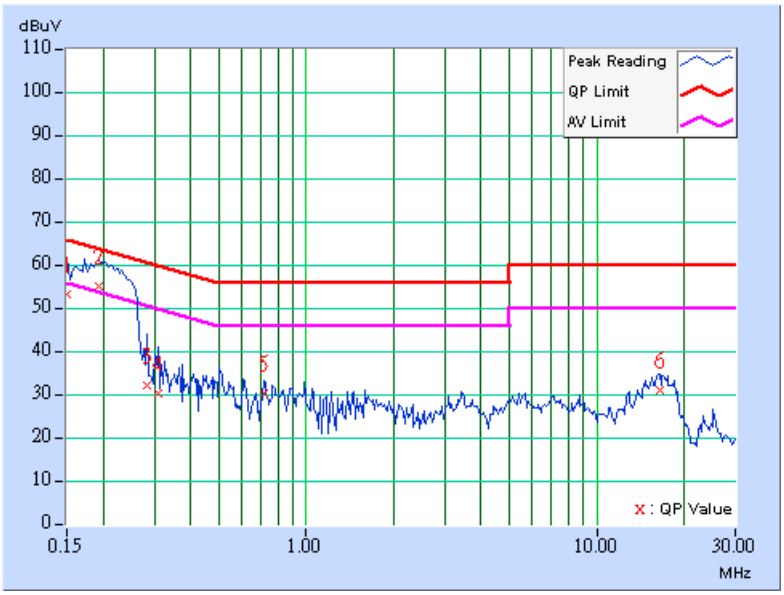
REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission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



EUT	NoteBook	**MODEL**	ZW9
MODE	Channel 6	**6dB BANDWIDTH**	9 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**PHASE**	Line (L)
ENVIRONMENTAL CONDITIONS	20 deg. C, 65%RH, 991 hPa	**TESTED BY**: Jamison Chan	

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.150	0.10	52.44	-	52.54	-	66.00	56.00	-13.46	-
2	0.193	0.10	54.31	32.98	54.41	33.08	63.91	53.91	-9.50	-20.83
3	0.283	0.10	31.55	-	31.65	-	60.73	50.73	-29.08	-
4	0.310	0.10	29.68	-	29.78	-	59.97	49.97	-30.19	-
5	0.713	0.15	29.57	-	29.72	-	56.00	46.00	-26.28	-
6	16.430	0.83	30.22	-	31.05	-	60.00	50.00	-28.95	-

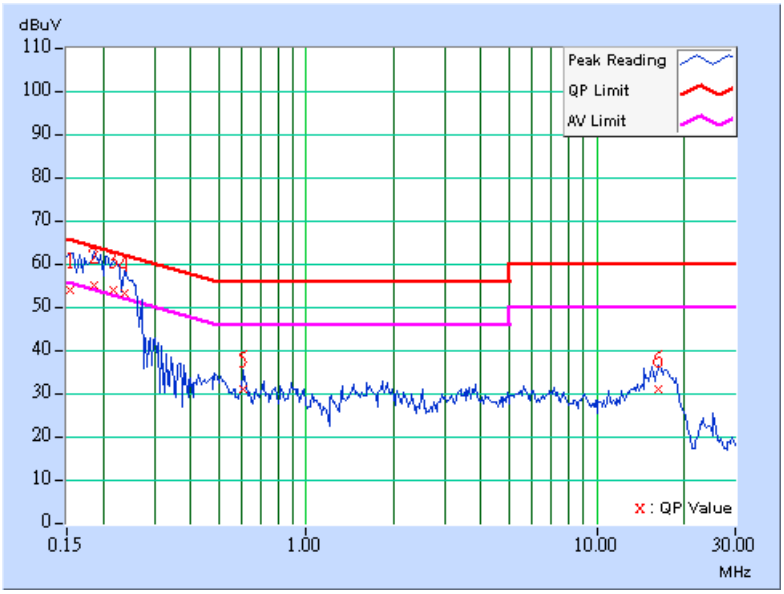
REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission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



EUT	NoteBook	**MODEL**	ZW9
MODE	Channel 6	**6dB BANDWIDTH**	9 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**PHASE**	Neutral (N)
ENVIRONMENTAL CONDITIONS	20 deg. C, 65%RH, 991 hPa	**TESTED BY**: Jamison Chan	

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.154	0.10	53.17	-	53.27	-	65.79	55.79	-12.52	-
2	0.185	0.10	54.44	32.83	54.54	32.93	64.25	54.25	-9.71	-21.32
3	0.216	0.10	53.20	32.93	53.30	33.03	62.96	52.96	-9.66	-19.93
4	0.236	0.10	52.56	32.30	52.66	32.40	62.24	52.24	-9.58	-19.84
5	0.607	0.13	30.45	-	30.58	-	56.00	46.00	-25.42	-
6	16.270	0.73	30.28	-	31.01	-	60.00	50.00	-28.99	-

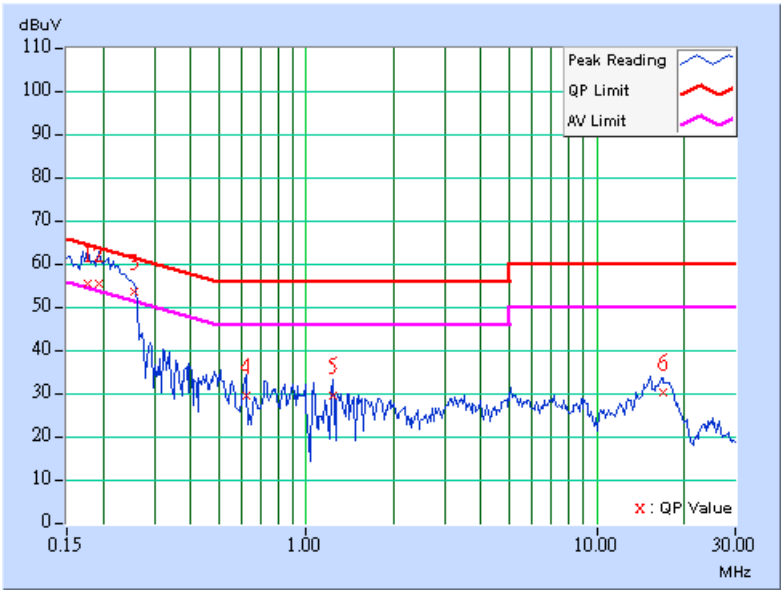
REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission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



EUT	NoteBook	MODEL	ZW9
MODE	Channel 11	6dB BANDWIDTH	9 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	PHASE	Line (L)
ENVIRONMENTAL CONDITIONS	20 deg. C, 65%RH, 991 hPa	TESTED BY: Jamison Chan	

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.177	0.10	54.78	32.58	54.88	32.68	64.61	54.61	-9.73	-21.93
2	0.193	0.10	54.54	33.09	54.64	33.19	63.91	53.91	-9.27	-20.72
3	0.255	0.10	52.69	43.96	52.79	44.06	61.58	51.58	-8.79	-7.52
4	0.619	0.14	28.86	-	29.00	-	56.00	46.00	-27.00	-
5	1.238	0.20	28.95	-	29.15	-	56.00	46.00	-26.85	-
6	16.836	0.84	29.35	-	30.19	-	60.00	50.00	-29.81	-

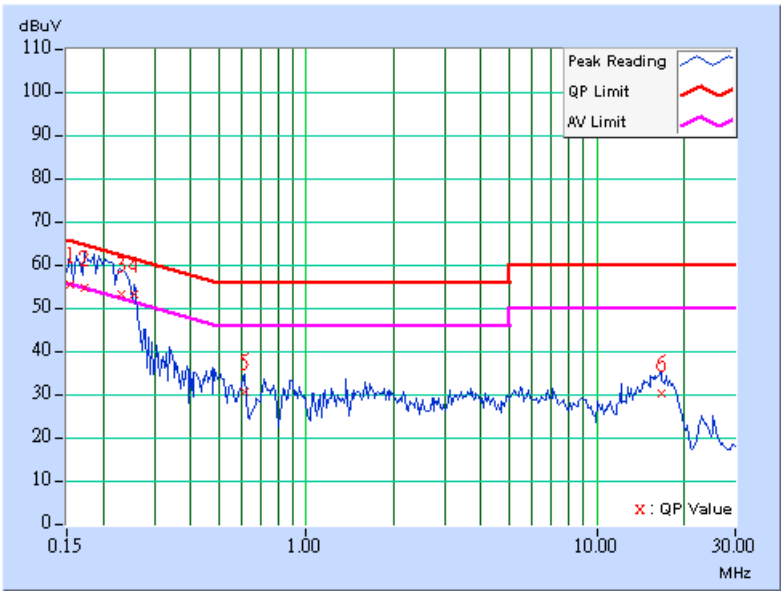
REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission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



EUT	NoteBook	**MODEL**	ZW9
MODE	Channel 11	**6dB BANDWIDTH**	9 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**PHASE**	Netural (N)
ENVIRONMENTAL CONDITIONS	20 deg. C, 65%RH, 991 hPa	**TESTED BY**: Jamison Chan	

No	Freq.	Corr. Factor	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.154	0.10	54.71	-	54.81	-	65.79	55.79	-10.98	-
2	0.173	0.10	54.25	-	54.35	-	64.79	54.79	-10.44	-
3	0.232	0.10	52.64	32.19	52.74	32.29	62.38	52.38	-9.64	-20.09
4	0.255	0.10	52.77	44.02	52.87	44.12	61.58	51.58	-8.71	-7.46
5	0.611	0.14	30.05	-	30.19	-	56.00	46.00	-25.81	-
6	16.703	0.73	29.72	-	30.45	-	60.00	50.00	-29.55	-

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
* HP Spectrum Analyzer	8593E	3911A07465	July 07, 2004
* HP Preamplifier	8447D	2432A03504	June 10, 2004
* HP Preamplifier	8449B	3008A01201	Dec. 11, 2004
SCHAFFNER Tunable Dipole Antenna SCHWARZBECK Tunable Dipole Antenna	VHBA 9123 UHA 9105	459 977	Jun. 26, 2004
* ROHDE & SCHWARZ TEST RECEIVER	ESMI	839013/007 839379/002	Feb. 13, 2004
*Schwarzbeck Antenna	VULB9168	137	Apr. 03, 2004
* SCHWARZBECK Horn Antenna	BBHA9120-D1	D130	June 30, 2004
*ADT. Turn Table	TT100	0306	NA
*ADT. Tower	AT100	0306	NA
*Software	ADT_Radiated_V5.14	NA	NA
*TIMES RF cable	LL142	CABLE-CH6-01	Apr. 30, 2004

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. "*" = These equipment are used for the final measurement.
3. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
4. The test was performed in ADT Chamber No. 6.

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 10 meter open area test site. 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 peak, quasi-peak or average method as specified and then reported in a data sheet.

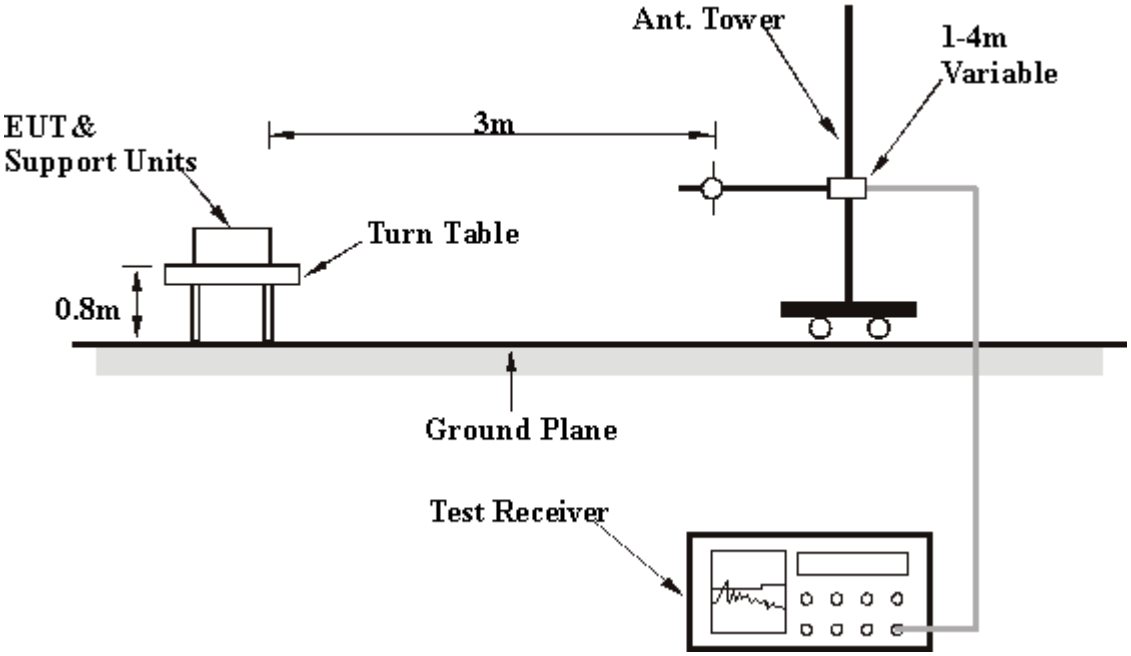
NOTE:

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.

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	NoteBook	**MODEL**	ZW9
MODE	Channel 11	**FREQUENCY RANGE**	Below 1000 MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**DETECTOR FUNCTION**	Quasi-Peak
ENVIRONMENTAL CONDITIONS	20 deg. C, 60 % RH, 991 hPa	**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	199.12	21.46 QP	43.50	-22.04	1.25 H	265	18.57	2.89
2	218.56	21.91 QP	46.00	-24.09	1.75 H	280	18.12	3.78
3	333.25	32.52 QP	46.00	-13.48	1.00 H	157	24.47	8.05
4	467.37	24.20 QP	46.00	-21.80	1.50 H	202	10.19	14.02
5	595.67	27.41 QP	46.00	-18.59	1.25 H	220	10.65	16.77
6	628.72	28.73 QP	46.00	-17.27	1.25 H	157	11.27	17.46
7	667.60	22.95 QP	46.00	-23.05	1.25 H	151	5.87	17.08
8	731.74	35.29 QP	46.00	-10.71	1.00 H	166	21.04	14.26
9	838.66	30.01 QP	46.00	-15.99	1.50 H	202	10.66	19.35

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	NoteBook	**MODEL**	ZW9
MODE	Channel 11	**FREQUENCY RANGE**	Below 1000 MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**DETECTOR FUNCTION**	Quasi-Peak
ENVIRONMENTAL CONDITIONS	20 deg. C, 60 % RH, 991 hPa	**TESTED BY**: Steven Lu	

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	47.49	19.47 QP	40.00	-20.53	1.25 V	244	8.78	10.69
2	199.12	22.71 QP	43.50	-20.79	2.50 V	166	15.19	7.52
3	218.56	26.08 QP	46.00	-19.92	1.25 V	181	16.37	9.71
4	333.25	27.58 QP	46.00	-18.42	1.75 V	109	19.68	7.90
5	381.84	18.61 QP	46.00	-27.39	1.00 V	157	10.18	8.43
6	465.43	22.05 QP	46.00	-23.95	1.50 V	289	11.00	11.05
7	515.97	22.49 QP	46.00	-23.51	1.75 V	346	8.66	13.83
8	599.56	26.30 QP	46.00	-19.70	1.75 V	97	9.32	16.98
9	628.72	28.22 QP	46.00	-17.78	1.50 V	181	11.19	17.02
10	731.74	32.48 QP	46.00	-13.52	2.50 V	52	14.94	17.55
11	838.66	30.57 QP	46.00	-15.43	1.25 V	304	10.16	20.42
12	865.87	28.25 QP	46.00	-17.75	1.25 V	112	7.84	20.40

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.

4.2.8 TEST RESULTS(FOR CCK)

EUT	NoteBook	**MODEL**	ZW9
MODE	Channel 1	**FREQUENCY RANGE**	1 ~25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**DETECTOR FUNCTION**	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	20 deg. C, 65 % RH, 991 hPa	**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	1480.00	39.75 PK	74.00	-34.25	1.16 H	287	11.23	28.51
1	1480.00	29.74 AV	54.00	-24.26	1.16 H	287	1.22	28.51
2	2092.36	44.74 PK	74.00	-29.26	1.22 H	176	13.66	31.08
2	2092.00	35.85 AV	54.00	-18.15	1.22 H	176	4.77	31.08
3	2312.00	54.78 PK	74.00	-19.22	2.16 H	249	23.40	31.38
3	2312.00	47.45 AV	54.00	-6.55	2.16 H	249	16.07	31.38
4	2390.00	48.36 PK	74.00	-25.64	2.16 H	249	16.88	31.48
4	2390.00	41.03 AV	54.00	-12.97	2.16 H	249	9.55	31.48
5	*2412.00	107.11 PK			2.16 H	249	75.60	31.51
5	*2412.00	99.78 AV			2.16 H	249	68.27	31.51
6	4824.00	47.64 PK	74.00	-26.36	1.22 H	216	9.79	37.86
6	4824.00	36.01 AV	54.00	-17.99	1.22 H	216	-1.84	37.86
7	6432.00	53.03 PK	74.00	-20.97	1.52 H	285	12.95	40.09
7	6432.00	40.92 AV	54.00	-13.08	1.52 H	285	0.84	40.09
8	9648.00	63.08 PK	87.11	-24.03	1.98 H	220	18.61	44.47
8	9648.00	56.18 AV	79.78	-23.60	1.98 H	220	11.71	44.47

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. " * " : Fundamental frequency

EUT	NoteBook	**MODEL**	ZW9
MODE	Channel 1	**FREQUENCY RANGE**	1 ~25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**DETECTOR FUNCTION**	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	20 deg. C, 65 % RH, 991 hPa	**TESTED BY**: Steven Lu	

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	1480.00	42.91 PK	74.00	-31.09	1.00 V	167	14.39	28.51
1	1480.00	35.09 AV	54.00	-18.91	1.00 V	167	6.57	28.51
2	2092.36	45.65 PK	74.00	-28.35	1.63 V	93	14.57	31.08
2	2092.36	38.33 AV	54.00	-15.67	1.63 V	93	7.25	31.08
3	2312.00	55.86 PK	74.00	-18.14	1.50 V	176	24.48	31.38
3	2312.00	47.78 AV	54.00	-6.22	1.50 V	176	16.40	31.38
4	2390.00	49.44 PK	74.00	-24.56	1.50 V	176	17.96	31.48
4	2390.00	41.36 AV	54.00	-12.64	1.50 V	176	9.88	31.48
5	*2412.00	108.19 PK			1.50 V	176	76.68	31.51
5	*2412.00	100.11 AV			1.50 V	176	68.60	31.51
6	4824.00	48.74 PK	74.00	-25.26	1.43 V	206	10.89	37.86
6	4824.00	37.46 AV	54.00	-16.54	1.43 V	206	-0.39	37.86
7	6432.00	52.09 PK	74.00	-21.91	1.50 V	256	12.01	40.09
7	6432.00	43.03 AV	54.00	-10.97	1.50 V	256	2.95	40.09
8	9648.00	64.05 PK	88.19	-24.14	1.11 V	130	19.58	44.47
8	9648.00	58.05 AV	80.11	-22.06	1.11 V	130	13.58	44.47

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. " * " : Fundamental frequency

EUT	NoteBook	MODEL	ZW9
MODE	Channel 6	FREQUENCY RANGE	1 ~25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	20 deg. C, 65 % RH, 991 hPa	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	1496.00	41.23 PK	74.00	-32.77	1.13 H	283	12.74	28.49
1	1496.00	31.30 AV	54.00	-22.70	1.13 H	283	2.81	28.49
2	2336.00	54.78 PK	74.00	-19.22	2.16 H	247	23.37	31.41
2	2336.00	46.92 AV	54.00	-7.08	2.16 H	247	15.51	31.41
3	*2437.00	107.39 PK			2.16 H	247	75.85	31.54
3	*2437.00	99.53 AV			2.16 H	247	67.99	31.54
4	4874.00	46.50 PK	74.00	-27.50	1.20 H	88	8.56	37.94
4	4874.00	34.52 AV	54.00	-19.48	1.20 H	88	-3.42	37.94
5	6498.66	50.43 PK	74.00	-23.57	1.43 H	98	10.42	40.02
5	6498.66	40.17 AV	54.00	-13.83	1.43 H	98	0.16	40.02
6	9748.00	64.67 PK	87.39	-22.72	1.27 H	153	19.85	44.82
6	9748.00	59.28 AV	79.53	-20.25	1.27 H	153	14.46	44.82

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	1496.00	43.07 PK	74.00	-30.93	1.12 V	177	14.58	28.49
1	1496.00	35.46 AV	54.00	-18.54	1.12 V	177	6.97	28.49
2	2336.00	56.03 PK	74.00	-17.97	1.54 V	180	24.62	31.41
2	2336.00	48.22 AV	54.00	-5.78	1.54 V	180	16.81	31.41
3	*2437.00	108.64 PK			1.54 V	180	77.10	31.54
3	*2437.00	100.81 AV			1.54 V	180	69.27	31.54
4	4874.00	47.35 PK	74.00	-26.65	1.24 V	180	9.41	37.94
4	4874.00	36.13 AV	54.00	-17.87	1.24 V	180	-1.81	37.94
5	6498.66	53.27 PK	74.00	-20.73	1.14 V	127	13.26	40.02
5	6498.66	47.43 AV	54.00	-6.57	1.14 V	127	7.42	40.02
6	9748.00	65.41 PK	88.64	-23.23	1.17 V	130	20.59	44.82
6	9748.00	59.85 AV	80.81	-20.96	1.17 V	130	15.03	44.82

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. " * " : Fundamental frequency

EUT	NoteBook	**MODEL**	ZW9
MODE	Channel 11	**FREQUENCY RANGE**	1 ~25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**DETECTOR FUNCTION**	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	20 deg. C, 65 % RH, 991 hPa	**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	1496.00	40.01 PK	74.00	-33.99	1.55 H	20	11.52	28.49
1	1496.00	28.73 AV	54.00	-25.27	1.55 H	20	0.24	28.49
2	2287.00	51.41 PK	74.00	-22.59	2.26 H	296	20.07	31.34
2	2287.00	42.54 AV	54.00	-11.46	2.26 H	296	11.20	31.34
3	2360.00	52.04 PK	74.00	-21.96	2.26 H	296	20.60	31.44
3	2360.00	43.17 AV	54.00	-10.83	2.26 H	296	11.73	31.44
4	*2462.00	107.02 PK			2.26 H	296	75.45	31.57
4	*2462.00	98.15 AV			2.26 H	296	66.58	31.57
5	2484.90	48.68 PK	74.00	-25.32	2.26 H	296	17.08	31.60
5	2484.90	39.81 AV	54.00	-14.19	2.26 H	296	8.21	31.60
6	4924.00	47.78 PK	74.00	-26.22	1.17 H	138	9.76	38.02
6	4924.00	35.72 AV	54.00	-18.28	1.17 H	138	-2.30	38.02
7	6565.32	51.20 PK	74.00	-22.80	1.06 H	146	11.15	40.05
7	6565.32	41.72 AV	54.00	-12.28	1.06 H	146	1.67	40.05
8	9848.00	67.89 PK	87.02	-19.13	1.33 H	144	22.86	45.03
8	9848.00	62.70 AV	78.15	-15.45	1.33 H	144	17.67	45.03

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. " * " : Fundamental frequency

EUT	NoteBook	**MODEL**	ZW9
MODE	Channel 11	**FREQUENCY RANGE**	1 ~25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**DETECTOR FUNCTION**	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	20 deg. C, 65 % RH, 991 hPa	**TESTED BY**: Steven Lu	

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	1496.00	42.78 PK	74.00	-31.22	1.11 V	181	14.29	28.49
1	1496.00	35.13 AV	54.00	-18.87	1.11 V	181	6.64	28.49
2	2287.00	51.89 PK	74.00	-22.11	1.50 V	268	20.55	31.34
2	2287.00	43.29 AV	54.00	-10.71	1.50 V	268	11.95	31.34
3	2360.00	52.42 PK	74.00	-21.58	1.50 V	268	20.98	31.44
3	2360.00	43.92 AV	54.00	-10.08	1.50 V	268	12.48	31.44
4	*2462.00	107.40 PK			1.50 V	268	75.83	31.57
4	*2462.00	98.90 AV			1.50 V	268	67.33	31.57
5	2484.90	49.06 PK	74.00	-24.94	1.50 V	268	17.46	31.60
5	2484.00	40.56 AV	54.00	-13.44	1.50 V	268	8.96	31.60
6	4924.00	48.58 PK	74.00	-25.42	1.12 V	210	10.56	38.02
7	6565.32	53.27 PK	74.00	-20.73	1.50 V	140	13.22	40.05
7	6565.32	47.70 AV	54.00	-6.30	1.50 V	140	7.65	40.05
8	9848.00	67.16 PK	87.04	-19.88	1.17 V	129	22.13	45.03
8	9848.00	61.84 AV	78.90	-17.06	1.17 V	129	16.81	45.03

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. " * " : Fundamental frequency

4.2.9 TEST RESULTS(FOR OFDM)

EUT	NoteBook	**MODEL**	ZW9
MODE	Channel 1	**FREQUENCY RANGE**	1 ~25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**DETECTOR FUNCTION**	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	20 deg. C, 65 % RH, 991 hPa	**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	1480.00	41.34 PK	74.00	-32.66	1.14 H	114	12.82	28.51
1	1480.00	32.73 AV	54.00	-21.27	1.14 H	114	4.21	28.51
2	2312.00	59.08 PK	74.00	-14.92	1.62 H	118	27.70	31.38
2	2312.00	49.47 AV	54.00	-4.53	1.62 H	118	18.09	31.38
3	2390.00	51.79 PK	74.00	-22.21	1.50 H	117	20.31	31.48
3	2390.00	41.83 AV	54.00	-12.17	1.50 H	117	10.35	31.48
4	*2412.00	101.02 PK			1.50 H	117	69.51	31.51
4	*2412.00	91.06 AV			1.50 H	117	59.55	31.51
5	2512.00	44.86 PK	74.00	-29.14	1.17 H	110	13.19	31.67
5	2512.00	34.24 AV	54.00	-19.76	1.17 H	110	2.57	31.67
6	6432.00	51.06 PK	74.00	-22.94	1.00 H	24	10.98	40.09
6	6432.00	41.61 AV	54.00	-12.39	1.00 H	24	1.53	40.09

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	1480.00	39.85 PK	74.00	-34.15	1.00 V	322	11.33	28.51
1	1480.00	30.04 AV	54.00	-23.96	1.00 V	322	1.52	28.51
2	2312.00	58.10 PK	74.00	-15.90	1.76 V	356	26.72	31.38
2	2312.00	48.49 AV	54.00	-5.51	1.76 V	356	17.11	31.38
3	2390.00	49.20 PK	74.00	-24.80	1.62 V	356	17.72	31.48
3	2390.00	39.67 AV	54.00	-14.33	1.62 V	356	8.19	31.48
4	*2412.00	98.43 PK			1.62 V	356	66.92	31.51
4	*2412.00	88.90 AV			1.62 V	356	57.39	31.51
5	2512.00	43.75 PK	74.00	-30.25	1.00 V	92	12.08	31.67
5	2512.00	33.48 AV	54.00	20.52	1.00 V	92	1.81	31.67
6	6432.00	53.09 PK	74.00	-20.91	1.00 V	80	13.01	40.09
6	6432.00	45.52 AV	54.00	-8.48	1.00 V	80	5.44	40.09

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. " * " : Fundamental frequency

EUT	NoteBook	**MODEL**	ZW9
MODE	Channel 6	**FREQUENCY RANGE**	1 ~25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**DETECTOR FUNCTION**	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	20 deg. C, 65 % RH, 991 hPa	**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	1480.00	40.13 PK	74.00	-33.87	1.07 H	287	11.61	28.51
1	1480.00	29.96 AV	54.00	-24.04	1.07 H	287	1.44	28.51
2	2233.00	54.16 PK	74.00	-19.84	1.54 H	296	22.89	31.27
2	2233.00	43.61 AV	54.00	-10.39	1.54 H	296	12.34	31.27
3	2336.00	62.49 PK	74.00	-11.51	1.54 H	296	31.08	31.41
3	**2336.00**	**51.94 AV**	**54.00**	**-2.06**	**1.54 H**	**296**	**20.53**	**31.41**
4	*2437.00	104.95 PK			1.54 H	296	73.41	31.54
4	*2437.00	94.40 AV			1.54 H	296	62.86	31.54
5	6498.00	40.81 PK	74.00	-33.19	1.18 H	89	0.80	40.02
5	6498.00	40.14 AV	54.00	-13.86	1.18 H	89	0.13	40.02

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	1480.00	43.63 PK	74.00	-30.37	1.06 V	169	15.11	28.51
1	1480.00	37.15 AV	54.00	-16.85	1.06 V	169	8.63	28.51
2	2233.00	49.52 PK	74.00	-24.48	1.06 V	260	18.25	31.27
2	2233.00	39.53 AV	54.00	-14.47	1.06 V	260	8.26	31.27
3	2336.00	57.58 PK	74.00	-16.42	1.06 V	260	26.17	31.41
3	2336.00	47.87 AV	54.00	-6.13	1.06 V	260	16.46	31.41
4	*2437.00	100.04 PK			1.06 V	260	68.50	31.54
4	*2437.00	90.32 AV			1.06 V	260	58.78	31.54
5	6498.00	53.63 PK	74.00	-20.37	1.00 V	72	13.62	40.02
5	6498.00	48.04 AV	54.00	-5.96	1.00 V	72	8.03	40.02

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. " * " : Fundamental frequency

EUT	NoteBook	**MODEL**	ZW9
MODE	Channel 11	**FREQUENCY RANGE**	1 ~25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**DETECTOR FUNCTION**	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	20 deg. C, 65 % RH, 991 hPa	**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	1480.00	39.96 PK	74.00	-34.04	1.62 H	35	11.44	28.51
1	1480.00	32.25 AV	54.00	-21.75	1.62 H	35	3.73	28.51
2	2257.00	57.17 PK	74.00	-16.83	1.47 H	118	25.87	31.30
2	2257.00	47.19 AV	54.00	-6.81	1.47 H	118	15.89	31.30
3	2288.00	60.58 PK	74.00	-13.42	1.47 H	118	29.24	31.34
3	2288.00	50.60 AV	54.00	-3.40	1.47 H	118	19.26	31.34
4	2360.00	60.15 PK	74.00	-13.85	1.47 H	118	28.71	31.44
4	2360.00	50.17 AV	54.00	-3.83	1.47 H	118	18.73	31.44
5	*2462.00	104.92 PK			1.47 H	118	73.35	31.57
5	*2462.00	94.94 AV			1.47 H	118	63.37	31.57
6	2483.50	61.49 PK	74.00	-12.51	1.47 H	118	29.89	31.60
6	2483.50	51.51 AV	54.00	-2.49	1.47 H	118	19.91	31.60
7	9848.00	61.59 PK	94.94	-33.35	1.57 H	320	16.56	45.03
7	9848.00	47.06 AV	74.94	-27.88	1.57 H	320	2.03	45.03

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. " * " : Fundamental frequency

EUT	NoteBook	**MODEL**	ZW9
MODE	Channel 11	**FREQUENCY RANGE**	1 ~25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**DETECTOR FUNCTION**	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	20 deg. C, 65 % RH, 991 hPa	**TESTED BY**: Steven Lu	

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	1480.00	40.60 PK	74.00	-33.40	1.26 V	264	12.08	28.51
1	1480.00	29.15 AV	54.00	-24.85	1.26 V	264	0.63	28.51
2	2257.00	55.98 PK	74.00	-18.02	1.58 V	360	24.68	31.30
2	2257.00	46.27 AV	54.00	-7.73	1.58 V	360	14.97	31.30
3	2288.00	59.39 PK	74.00	-14.61	1.58 V	360	28.05	31.34
3	2288.00	49.68 AV	54.00	-4.32	1.58 V	360	18.34	31.34
4	2360.00	58.96 PK	74.00	-15.04	1.58 V	360	27.52	31.44
4	2360.00	49.25 AV	54.00	-4.75	1.58 V	360	17.81	31.44
5	*2462.00	103.73 PK			1.58 V	360	72.16	31.57
5	*2462.00	94.02 AV			1.58 V	360	62.45	31.57
6	2483.50	60.30 PK	74.00	-13.70	1.58 V	360	28.70	31.60
6	2483.50	50.59 AV	54.00	-3.41	1.58 V	360	18.99	31.60
7	9848.00	57.13 PK	83.73	-26.60	1.26 V	0	12.10	45.03
7	9848.00	44.88 AV	74.02	-29.14	1.26 V	0	-0.15	45.03

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. " * " : 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	FSEK30	100049	August 12, 2004

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

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 100 kHz RBW and 100 kHz VBW. The 6 dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 6 dB.

4.3.4 DEVIATION FROM TEST STANDARD

No deviation

4.3.5 TEST SETUP

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

4.3.6 EUT OPERATING CONDITIONS

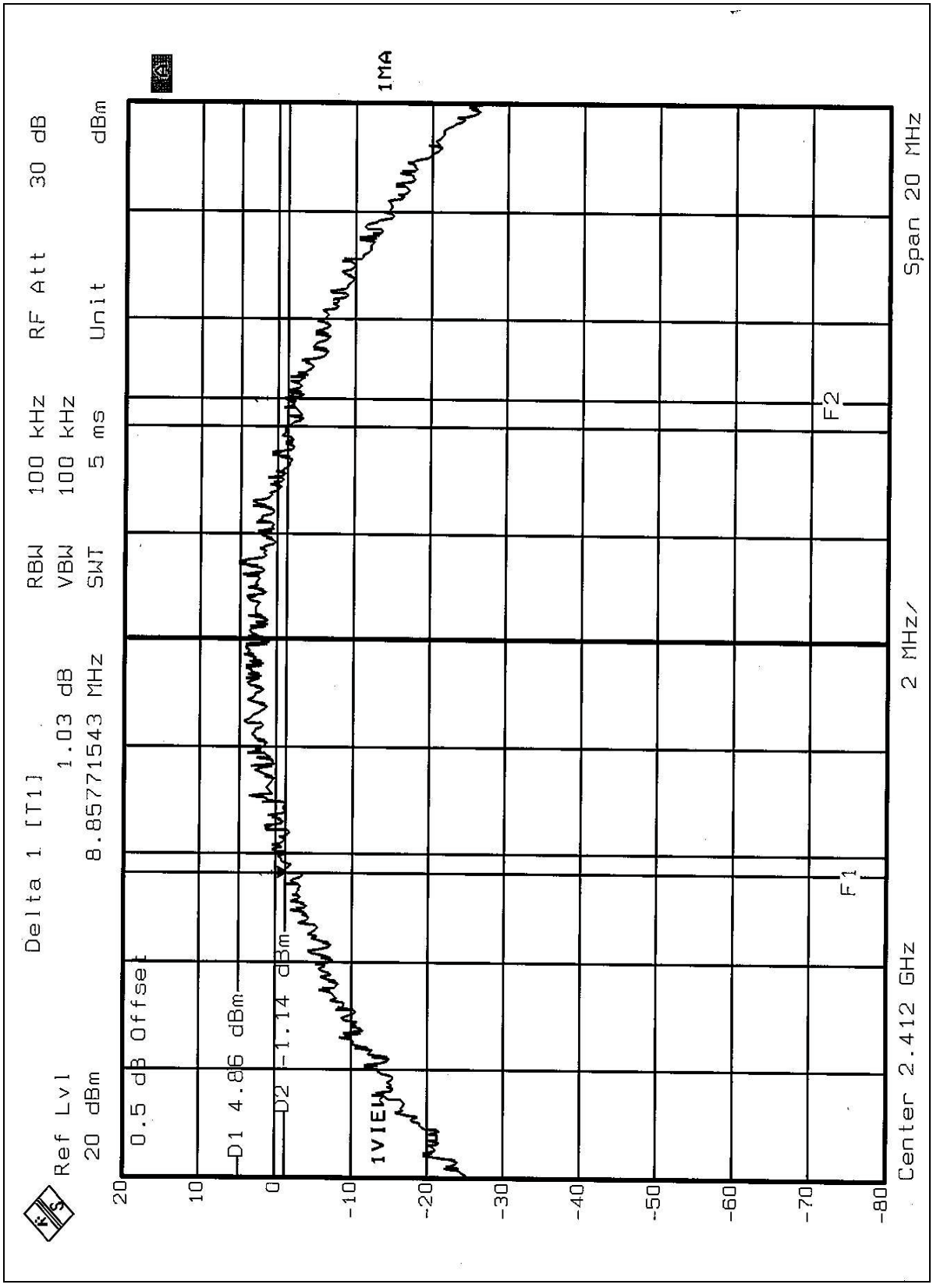
The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

4.3.7 TEST RESULTS

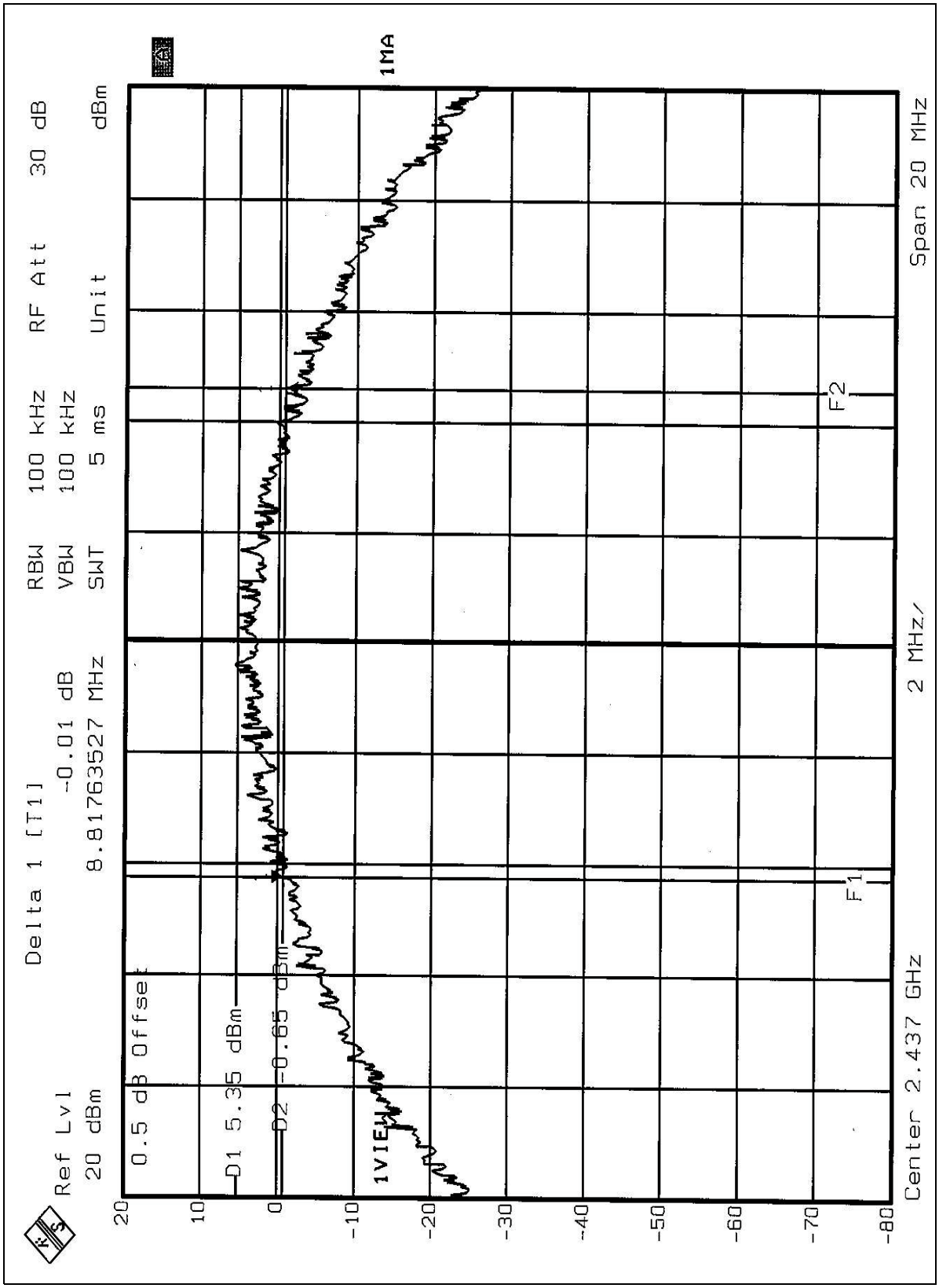
EUT	NoteBook	MODEL	ZW9
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	23 deg. C, 62%RH, 991 hPa
MODE	CCK	TESTED BY	Steven Lu

CHANNEL	CHANNEL FREQUENCY (MHz)	6 dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS/FAIL
1	2412	8.86	0.5	PASS
6	2437	8.82	0.5	PASS
11	2462	9.02	0.5	PASS

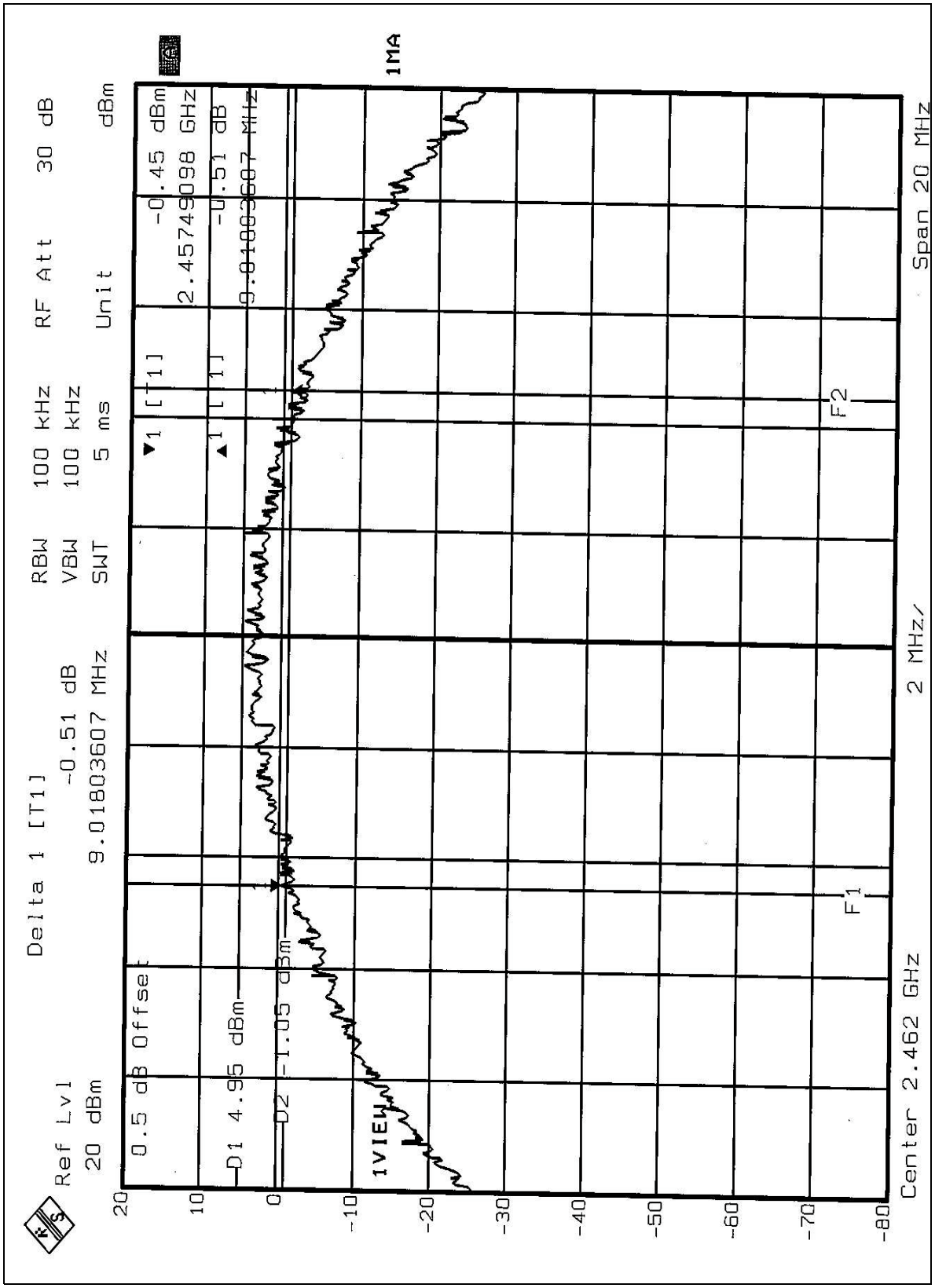
CH1


Delta 1 [T1]
1.03 dB
8.85771543 MHz
RBW 100 kHz
VBW 100 kHz
SWT 5 ms
RF Att 30 dB
Unit dBm
1MA
Ref Lvl
20 dBm
0.5 dB Offset
D1 4.86 dBm
D2 -1.14 dBm
1VIEW
F1
F2
Center 2.412 GHz
2 MHz/
Span 20 MHz
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80

CH6


Delta 1 [T1]
-0.01 dB
8.81763527 MHz
RBW 100 kHz
VBW 100 kHz
SWT 5 ms
RF Att 30 dB
Unit dBm
Ref Lvl
20 dBm
0.5 dB Offset
D1 5.35 dBm
D2 -0.65 dBm
1MA
1VIEW
F1
F2
Center 2.437 GHz
2 MHz/
Span 20 MHz

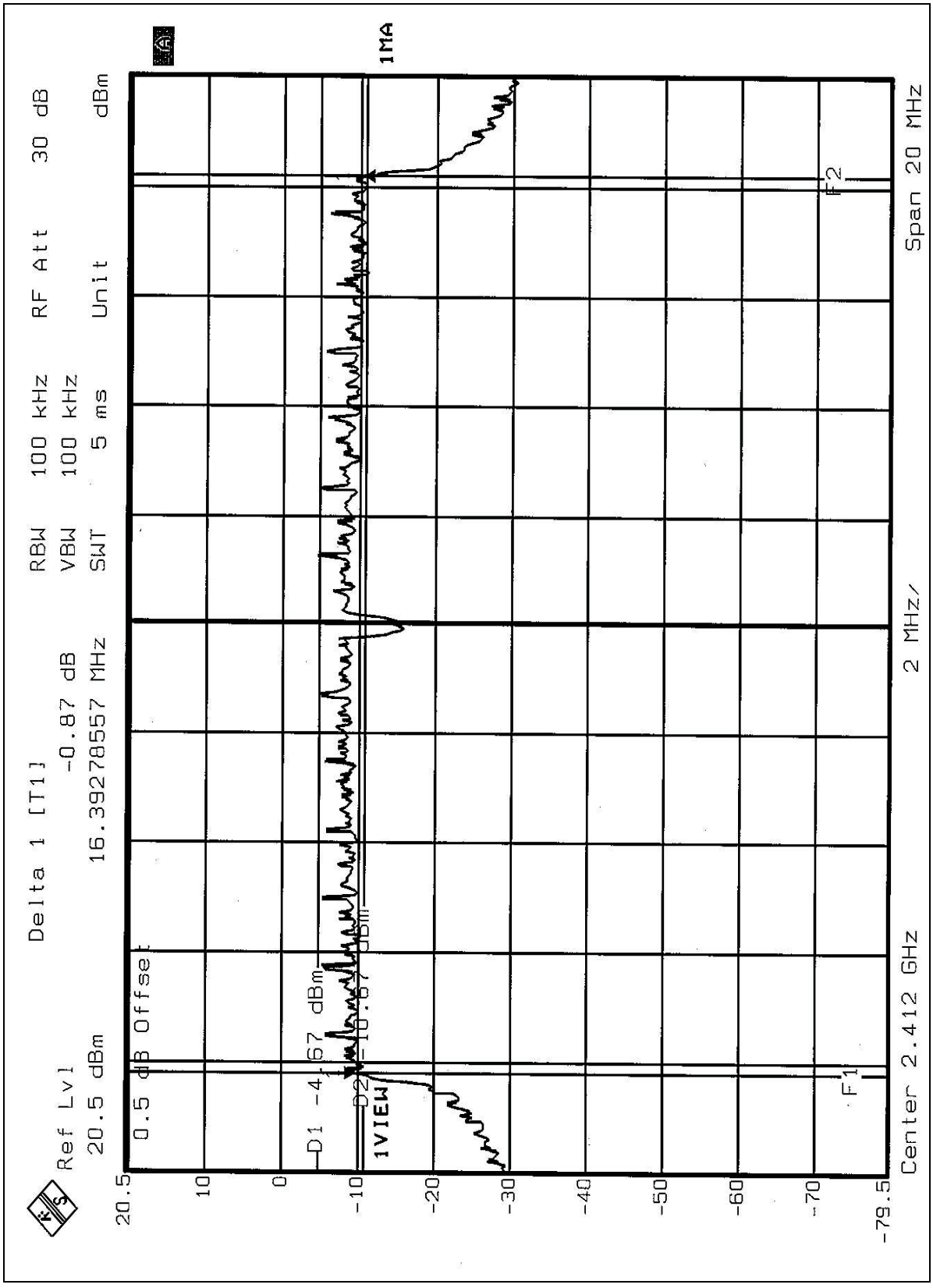
CH11


Delta 1 [T1]
-0.51 dB
9.01803607 MHz
RBW 100 kHz
VBW 100 kHz
SWT 5 ms
RF Att 30 dB
Unit dBm
Ref Lvl
20 dBm
0.5 dB Offset
D1 4.95 dBm
D2 -1.05 dBm
1MA
1VIEW
-0.45 dBm
2.45749098 GHz
-0.51 dB
9.01803607 MHz
F1
F2
Center 2.462 GHz
2 MHz/
Span 20 MHz

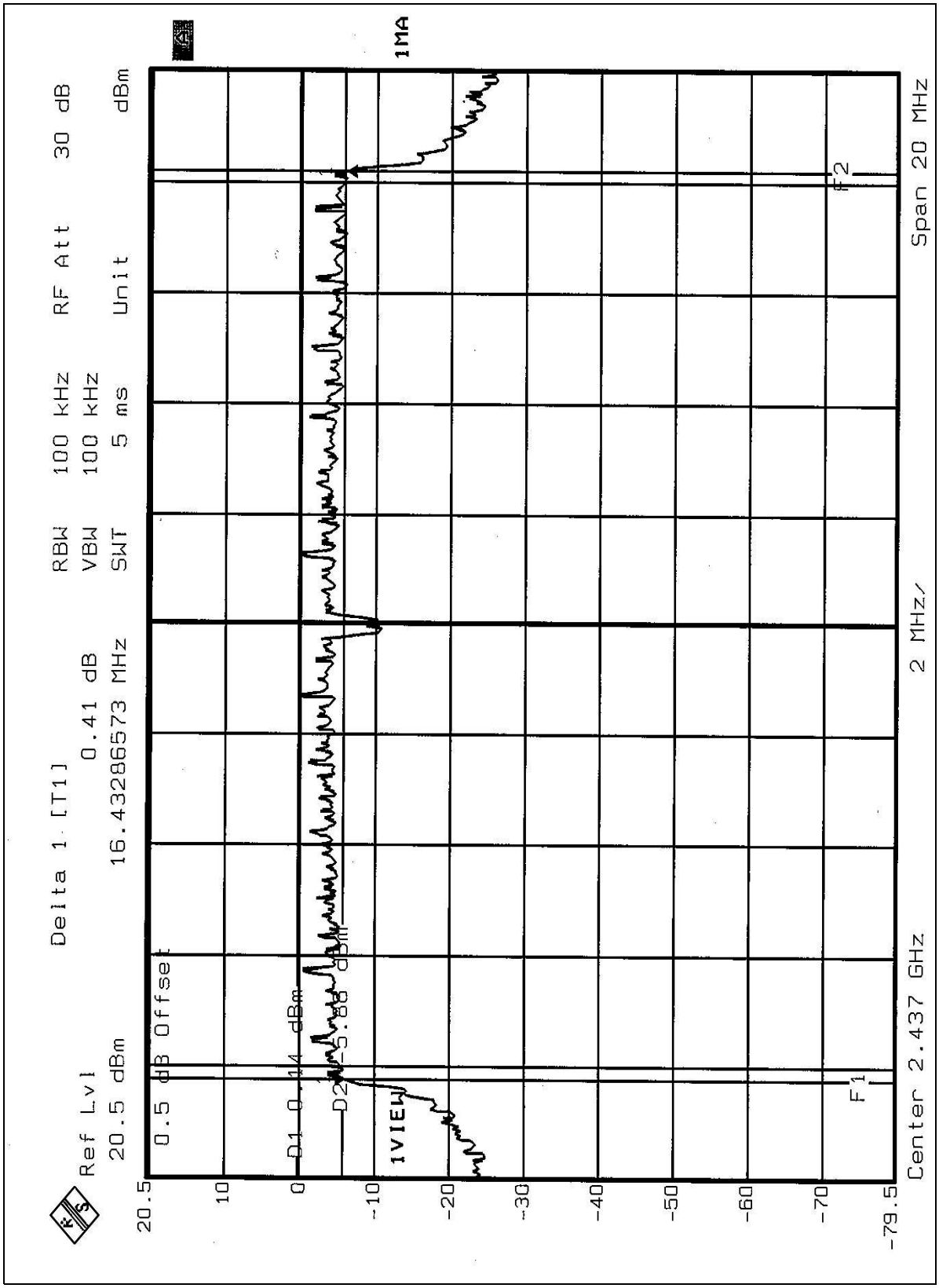
EUT	NoteBook	MODEL	ZW9
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	21 deg. C, 51%RH, 991 hPa
MODE	OFDM	TESTED BY	Steven Lu

CHANNEL	CHANNEL FREQUENCY (MHz)	6 dB BANDWIDTH (MHz)	MINIMUM LIMIT (MHz)	PASS/FAIL
1	2412	16.39	0.5	PASS
6	2437	16.43	0.5	PASS
11	2462	16.35	0.5	PASS

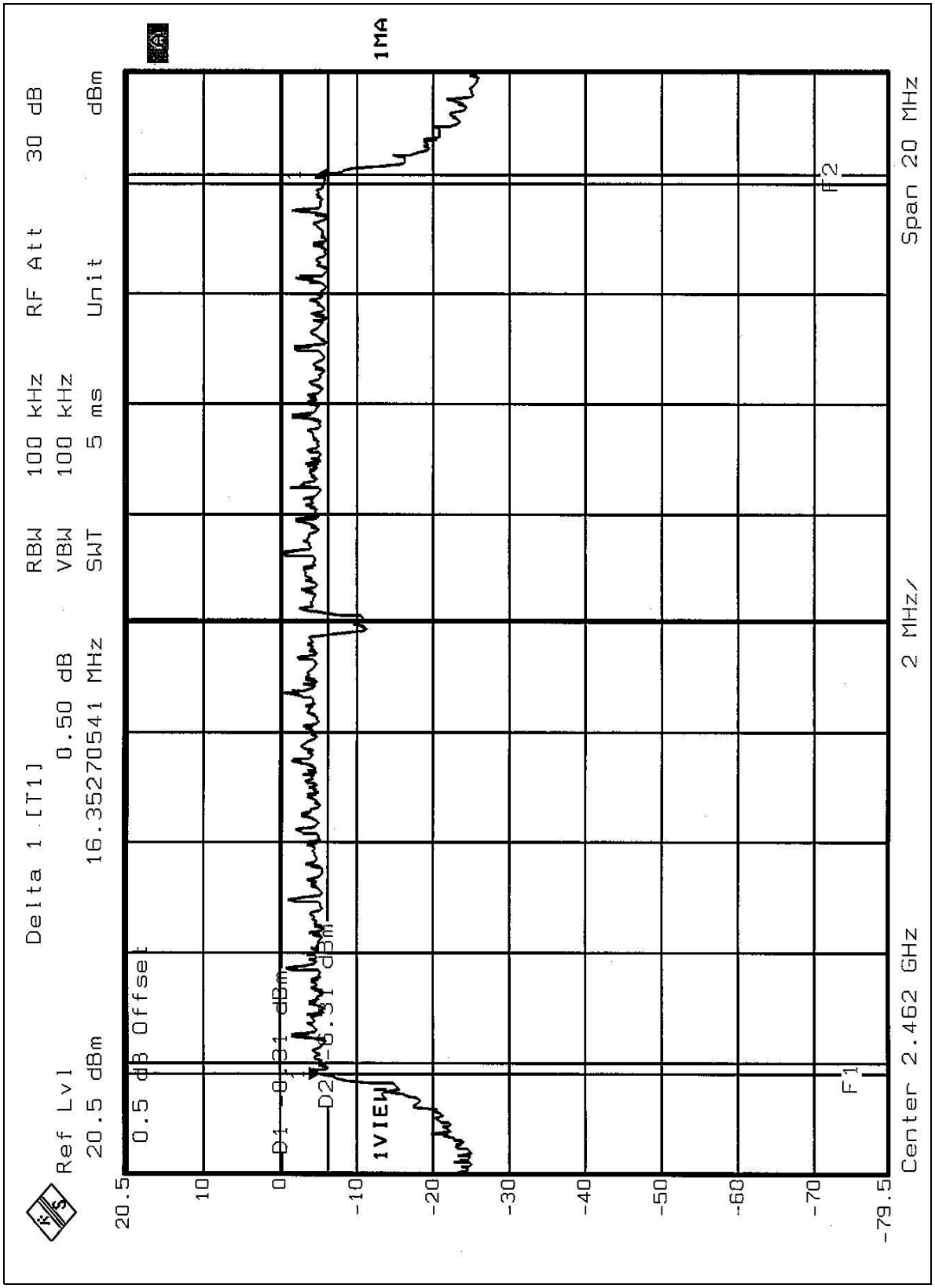
CH1


Delta 1 [T1]
-0.87 dB
16.39278557 MHz
RBW 100 kHz
VBW 100 kHz
SWT 5 ms
RF Att 30 dB
Unit dBm
Ref Lvl
20.5 dBm
0.5 dB Offset
D1 -4.67 dBm
D2 -10.87 dBm
1VIEW
1MA
F1
F2
Center 2.412 GHz
2 MHz/
Span 20 MHz
20.5
10
0
-10
-20
-30
-40
-50
-60
-70
-79.5

CH6


Ref Lvl
20.5 dBm
0.5 dB Offset
Delta 1 [T1]
0.41 dB
16.43286573 MHz
D1 0.14 dBm
D2 -5.88 dBm
RBW 100 kHz
VBW 100 kHz
SWT 5 ms
RF Att 30 dB
Unit dBm
1MA
1VIEW
F1
F2
Center 2.437 GHz
2 MHz/
Span 20 MHz
20.5
10
0
-10
-20
-30
-40
-50
-60
-70
-79.5

CH11


Delta 1 [T1]
0.50 dB
16.35270541 MHz
RBW 100 kHz
VBW 100 kHz
SWT 5 ms
RF Att 30 dB
Unit dBm
Ref Lvl
20.5 dBm
0.5 dB Offset
D1 -0.31 dBm
D2 -0.31 dBm
1VIEW
1MA
F1
F2
Center 2.462 GHz
2 MHz/
Span 20 MHz
20.5
10
0
-10
-20
-30
-40
-50
-60
-70
-79.5

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 TEST INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
R&S SPECTRUM ANALYZER	FSEK30	100049	August 12, 2004
R&S SIGNAL GENERATOR	SMP04	100011	May 28, 2004
TEKTRONIX OSCILLOSCOPE	TDS 220	B048470	Mar. 05, 2004
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.

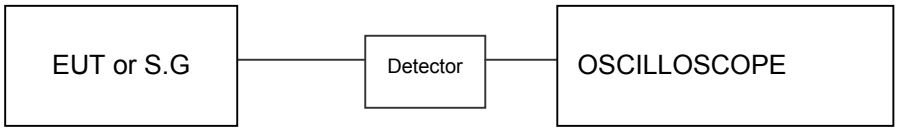
4.4.3 TEST PROCEDURES

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.

4.4.4 DEVIATION FROM TEST STANDARD

No deviation

4.4.5 TEST SETUP



4.4.6 EUT OPERATING CONDITIONS

Same as Item 4.3.6

4.4.7 TEST RESULTS

EUT	NoteBook	MODEL	ZW9
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	23 deg. C, 62%RH, 991 hPa
MODE	CCK	TESTED BY	Steven Lu

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (dBm)	PASS/FAIL
1	2412	16.00	30	PASS
6	2437	16.10	30	PASS
11	2462	16.00	30	PASS

EUT	NoteBook	MODEL	ZW9
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	21 deg. C, 52%RH, 991 hPa
MODE	OFDM	TESTED BY	Steven Lu

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (dBm)	PASS/FAIL
1	2412	10.50	30	PASS
6	2437	15.50	30	PASS
11	2462	15.50	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
SPECTRUM ANALYZER	FSEK30	100049	August 12, 2004

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

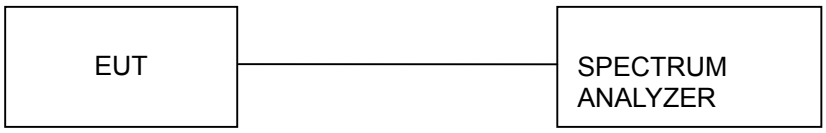
4.5.3 TEST PROCEDURE

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 3 kHz RBW and 30 kHz 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 CONDITIONS

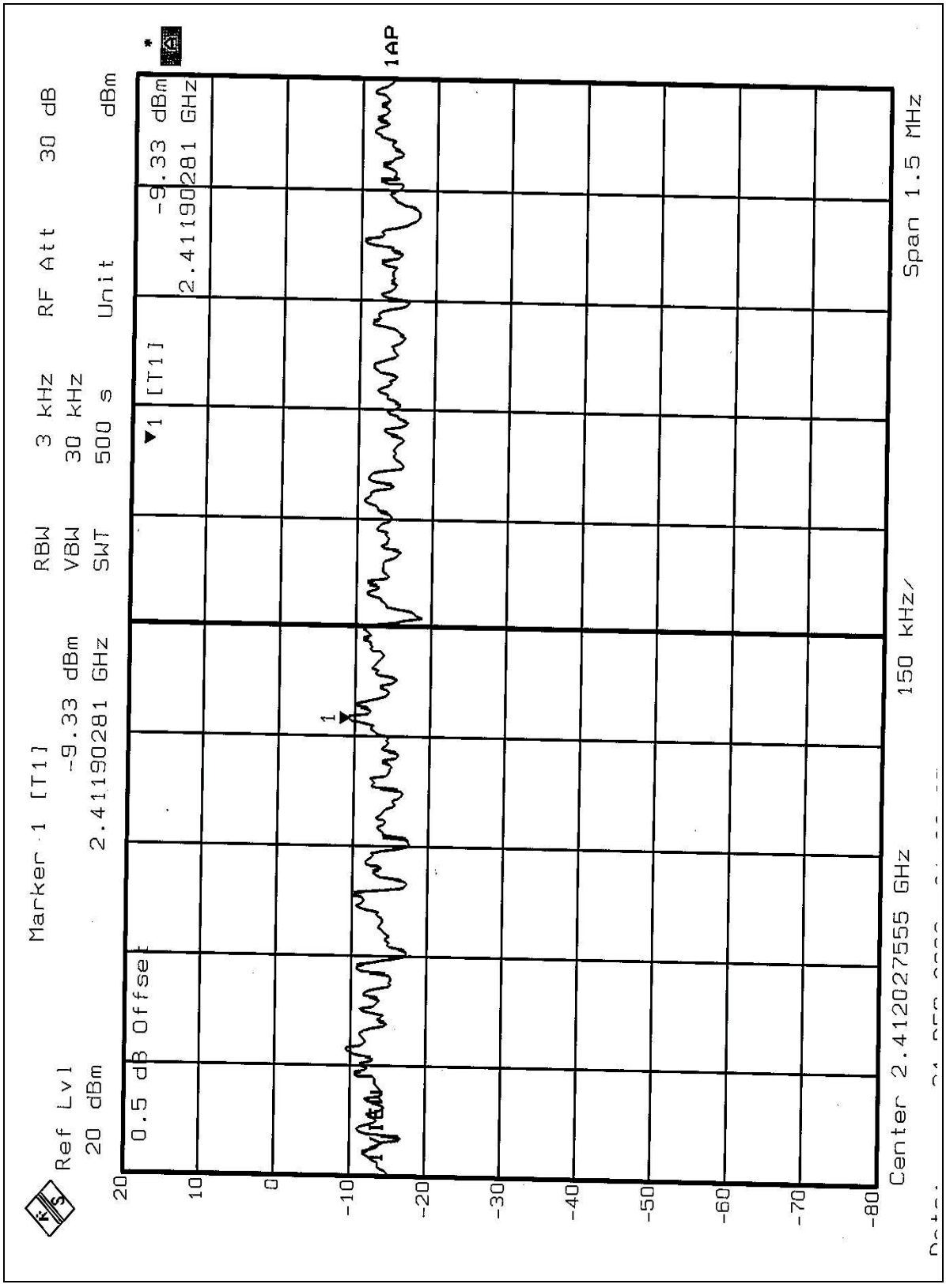
Same as 4.3.6

4.5.7 TEST RESULTS

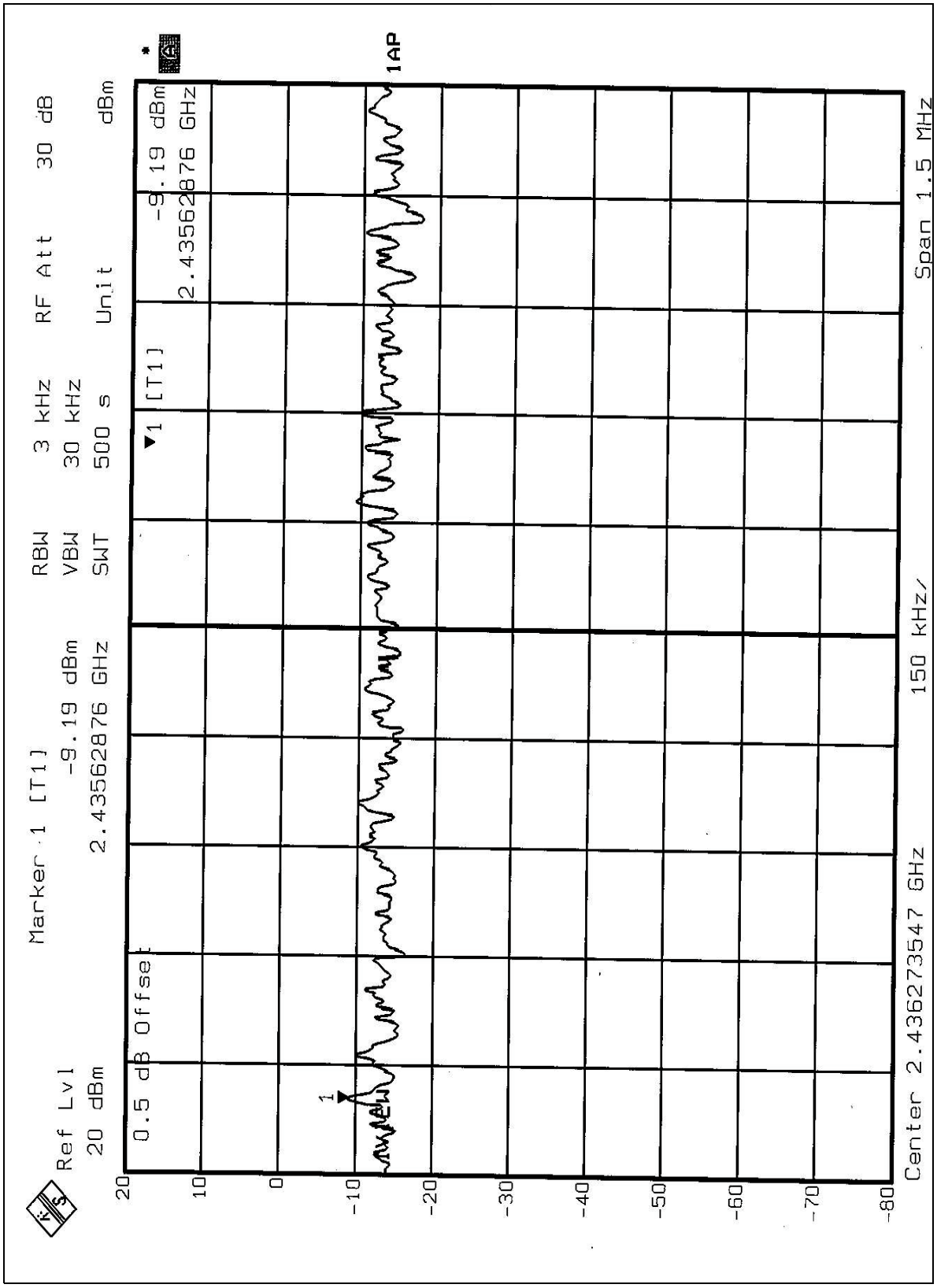
EUT	NoteBook	**MODEL**	ZW9
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**ENVIRONMENTAL CONDITIONS**	23 deg. C, 62%RH, 991 hPa
MODE	CCK	**TESTED BY**	Steven Lu

CHANNEL NUMBER	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3 KHz BW (dBm)	MAXIMUM LIMIT (dBm)	PASS/FAIL
1	2412	-9.33	8	PASS
6	2437	-9.19	8	PASS
11	2462	-9.34	8	PASS

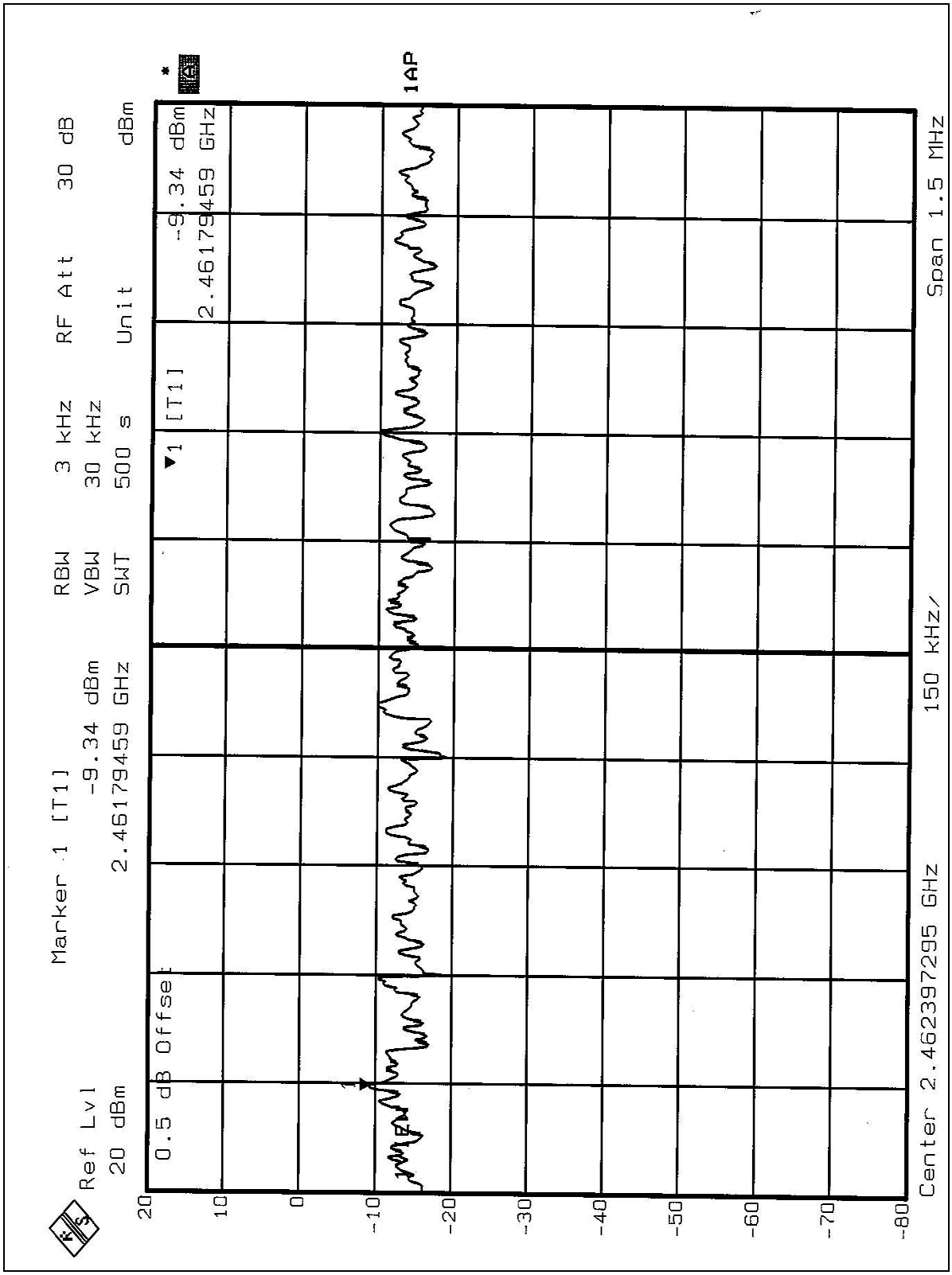
CH1


Ref Lvl
20 dBm
0.5 dB Offset
Marker 1 [T1]
-9.33 dBm
2.41190281 GHz
RBW 3 kHz
VBW 30 kHz
SWT 500 s
RF Att 30 dB
Unit dBm
1 [T1]
-9.33 dBm
2.41190281 GHz
1AP
Center 2.412027555 GHz
150 kHz/
Span 1.5 MHz
20
10
0
-10
-20
-30
-40
-50
-60
-70
-80

CH6


Ref Lvl
20 dBm
0.5 dB Offset
Marker 1 [T1]
-9.19 dBm
2.43562876 GHz
RBW 3 kHz
VBW 30 kHz
SWT 500 s
RF Att 30 dB
Unit dBm
1AP
1 [T1]
-9.19 dBm
2.43562876 GHz
Center 2.436273547 GHz
150 kHz/
Span 1.5 MHz

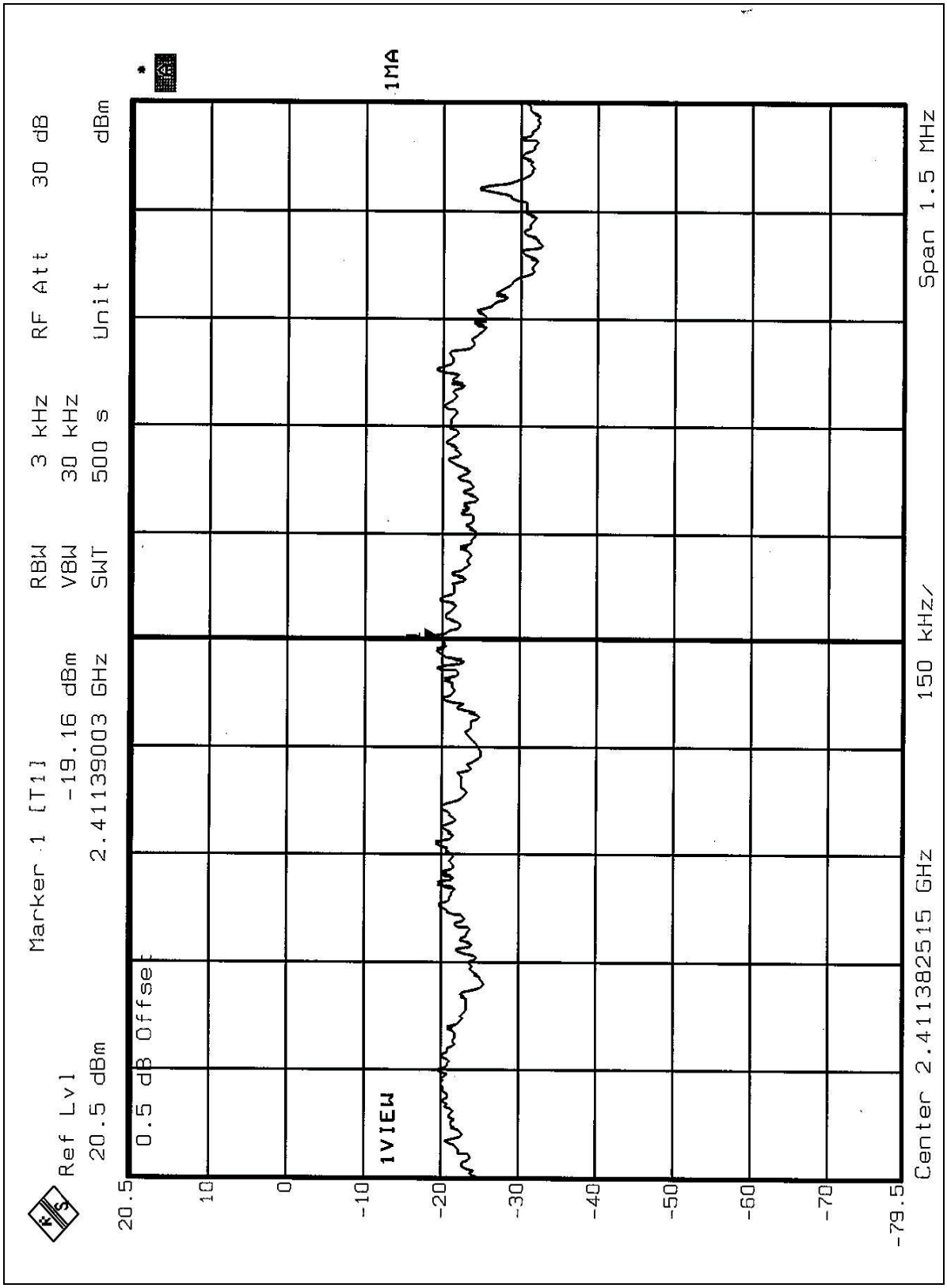
CH11


Ref Lvl
20 dBm
0.5 dB Offset
Marker 1 [T1]
-9.34 dBm
2.46179459 GHz
RBW 3 kHz
VBW 30 kHz
SWT 500 s
RF Att 30 dB
Unit dBm
1AP
Center 2.462397295 GHz
150 kHz/
Span 1.5 MHz

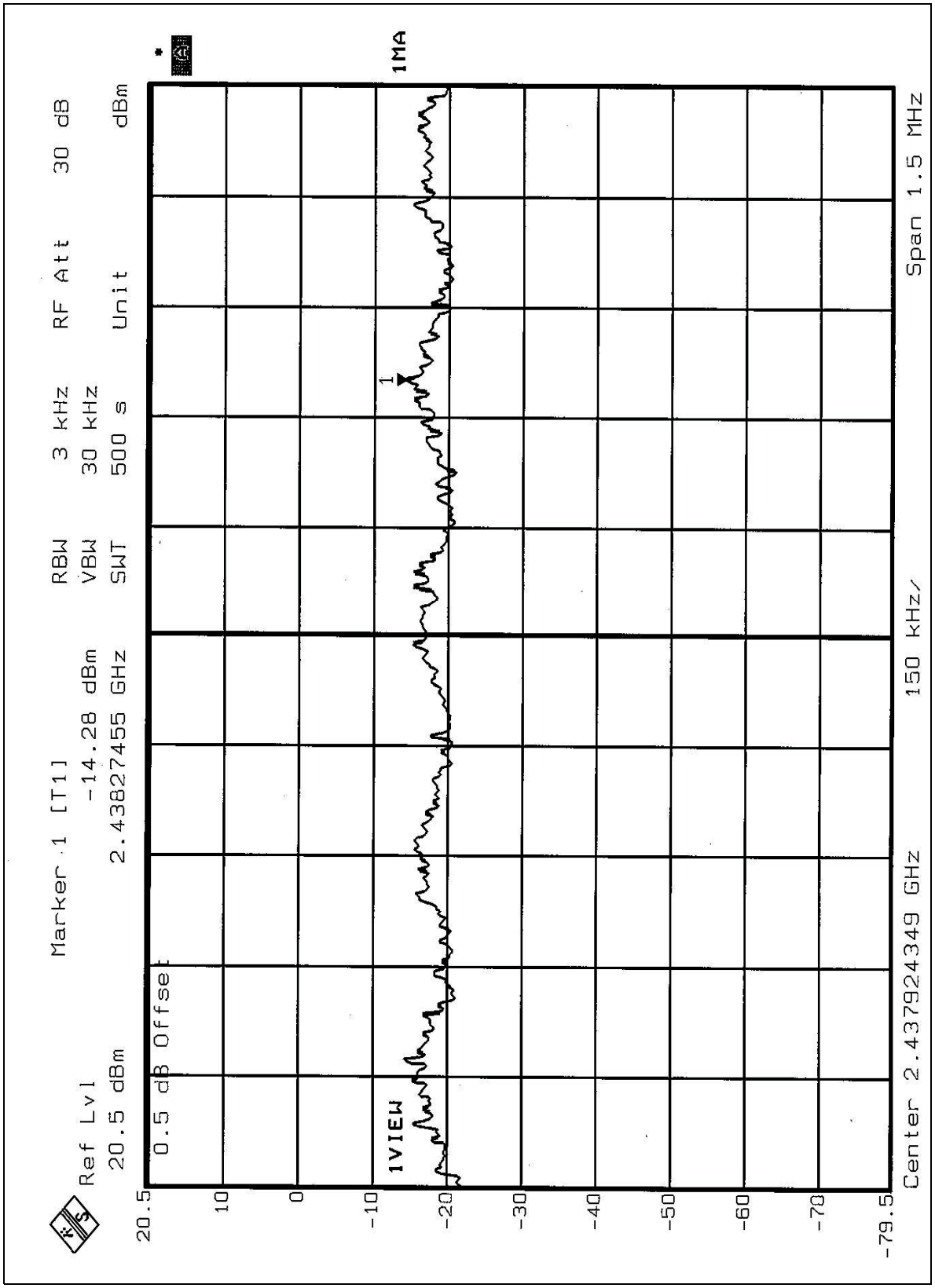
EUT	NoteBook	MODEL	ZW9
INPUT POWER (SYSTEM)	120Vac, 60 Hz	ENVIRONMENTAL CONDITIONS	21 deg. C, 52%RH, 991 hPa
MODE	OFDM	TESTED BY	Steven Lu

CHANNEL NUMBER	CHANNEL FREQUENCY (MHz)	RF POWER LEVEL IN 3 KHz BW (dBm)	MAXIMUM LIMIT (dBm)	PASS/FAIL
1	2412	-19.16	8	PASS
6	2437	-14.28	8	PASS
11	2462	-14.06	8	PASS

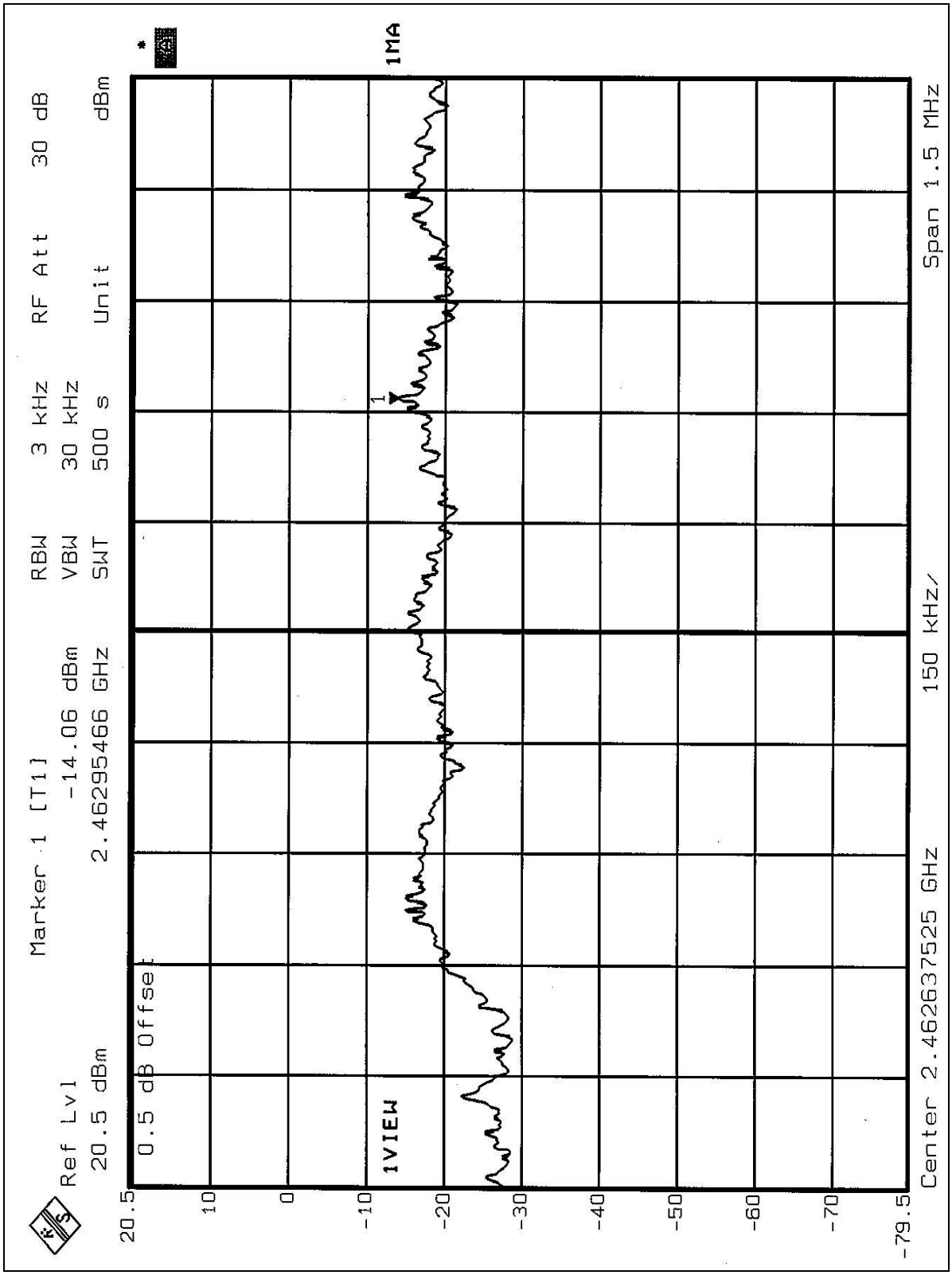
CH1


Ref Lvl
20.5 dBm
0.5 dB Offset
Marker 1 [T1]
-19.16 dBm
2.41139003 GHz
RBW 3 kHz
VBW 30 kHz
SWT 500 s
RF Att 30 dB
Unit dBm
1MA
1VIEW
Center 2.411382515 GHz
150 kHz/
Span 1.5 MHz
20.5
10
0
-10
-20
-30
-40
-50
-60
-70
-79.5

CH6


Marker 1 [T1]
-14.28 dBm
2.43827455 GHz
RBW 3 kHz
VBW 30 kHz
SWT 500 s
RF Att 30 dB
Unit dBm
Ref Lvl
20.5 dBm
0.5 dB Offset
1VIEW
1MA
Center 2.437924349 GHz
150 kHz/
Span 1.5 MHz
20.5
10
0
-10
-20
-30
-40
-50
-60
-70
-79.5

CH11


Ref Lvl
20.5 dBm
0.5 dB Offset
Marker 1 [T1]
-14.06 dBm
2.46295466 GHz
RBW 3 kHz
VBW 30 kHz
SWT 500 s
RF Att 30 dB
Unit dBm
1MA
1VIEW
Center 2.46637525 GHz
150 kHz/
Span 1.5 MHz
20.5
10
0
-10
-20
-30
-40
-50
-60
-70
-79.5

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
SPECTRUM ANALYZER	FSEK30	100049	August 12, 2004

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

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 and10Hz with suitable frequency span including 100MHz 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

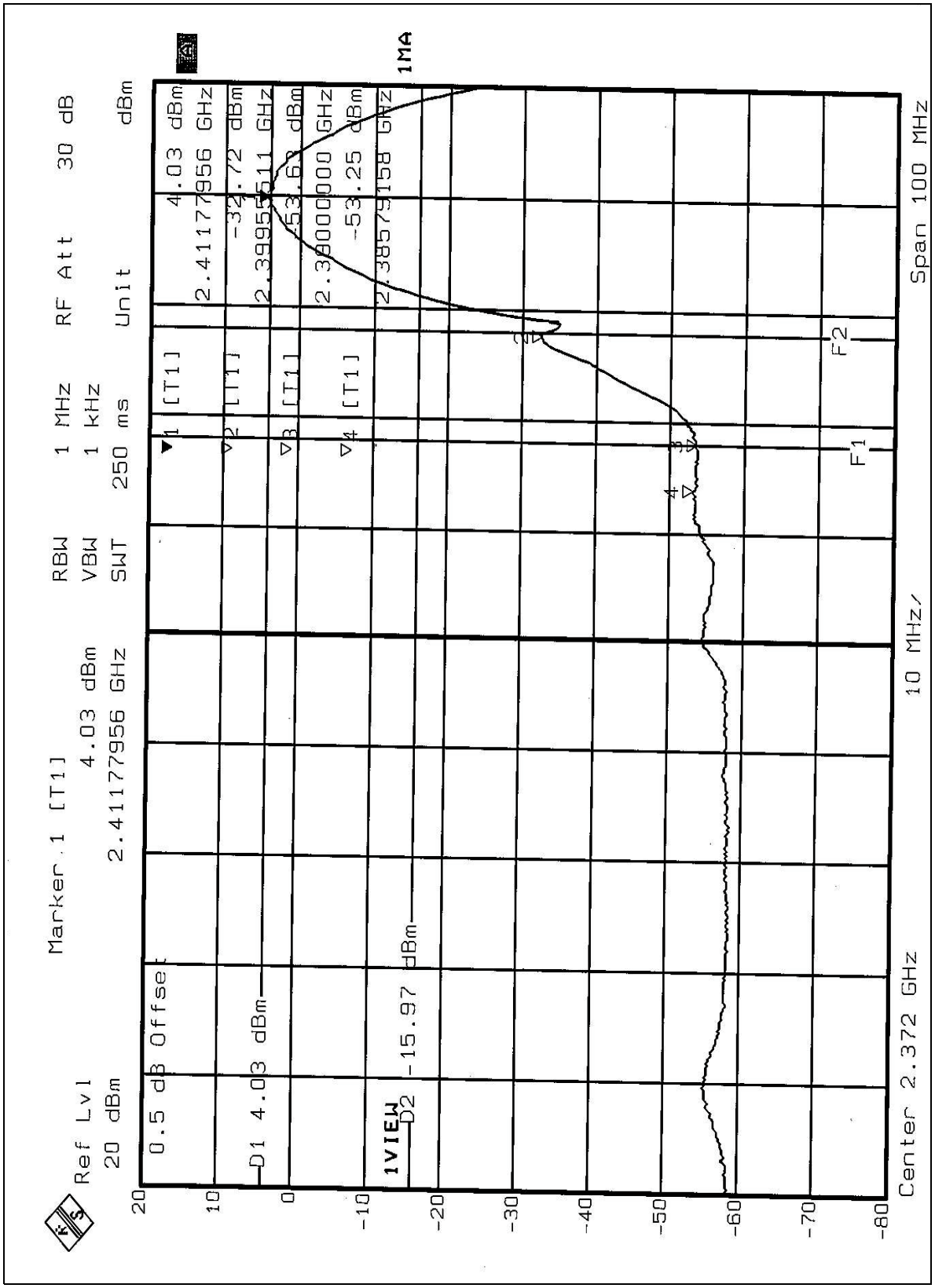
Same as Item 4.3.6

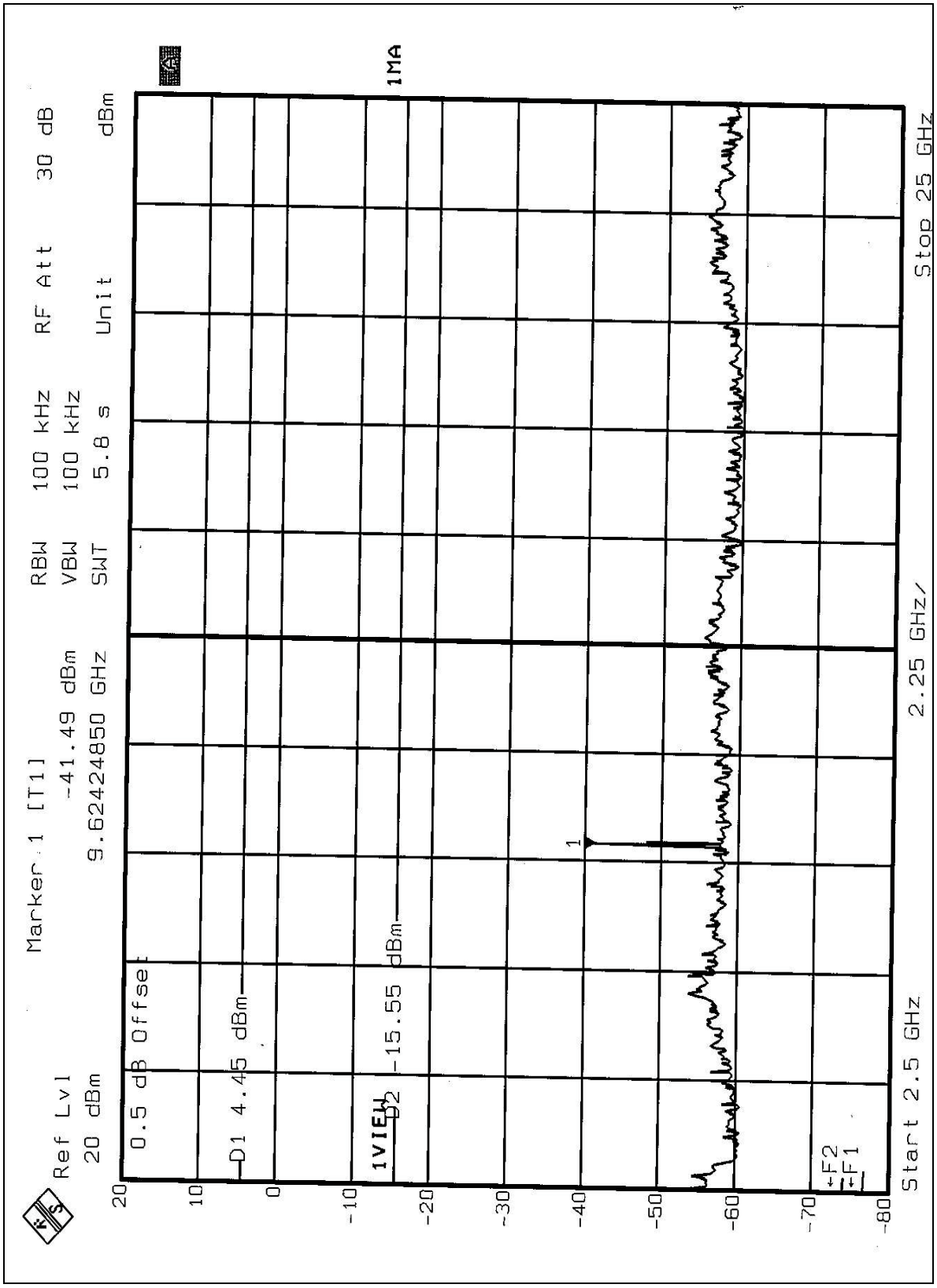
4.6.6 TEST RESULTS

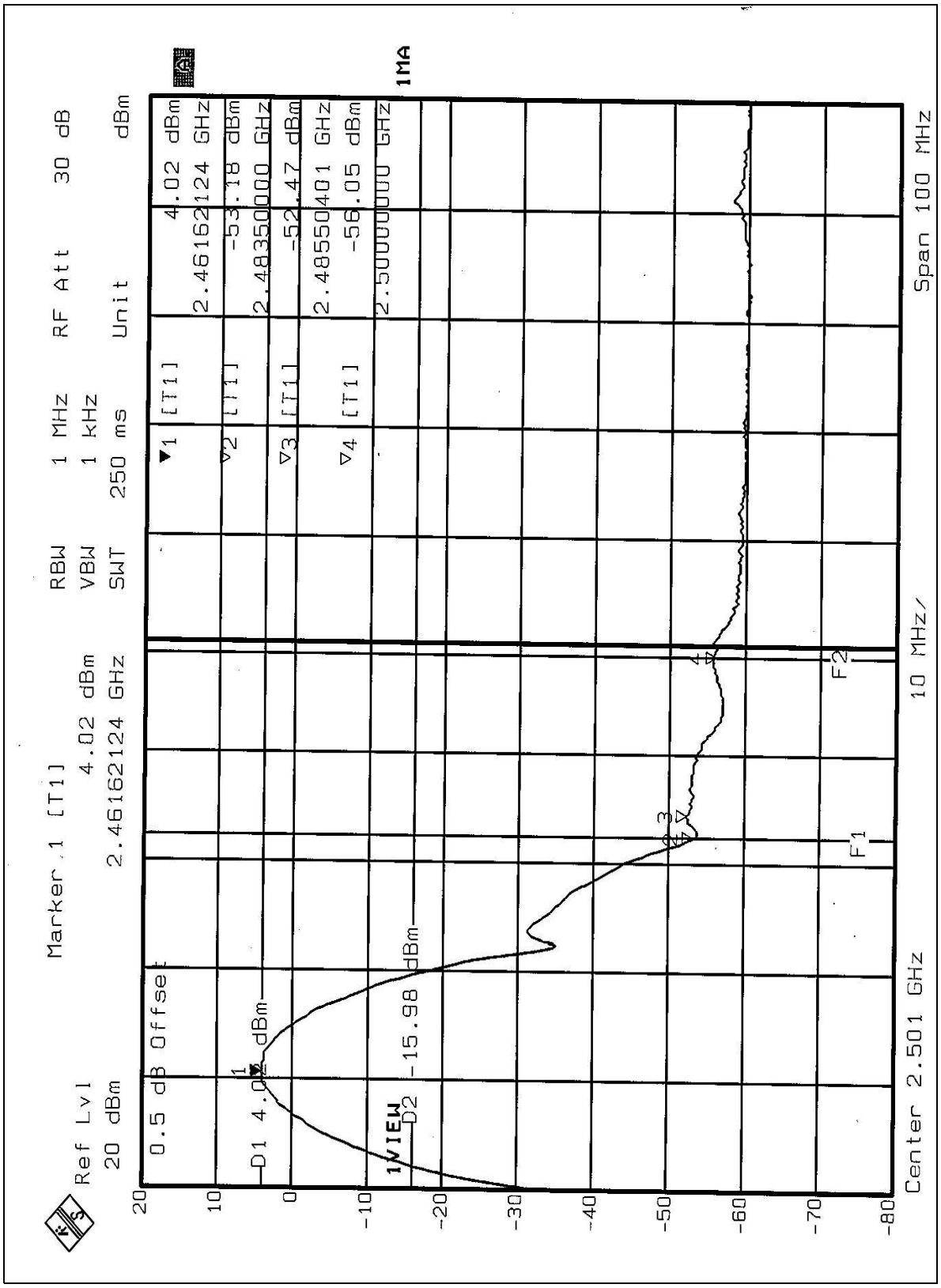
The spectrum plots are attached on the following 4 pages. D2 line indicates the highest level, D1 line indicates the 20dB offset below D2. It shows compliance with the requirement in part 15.247(C).

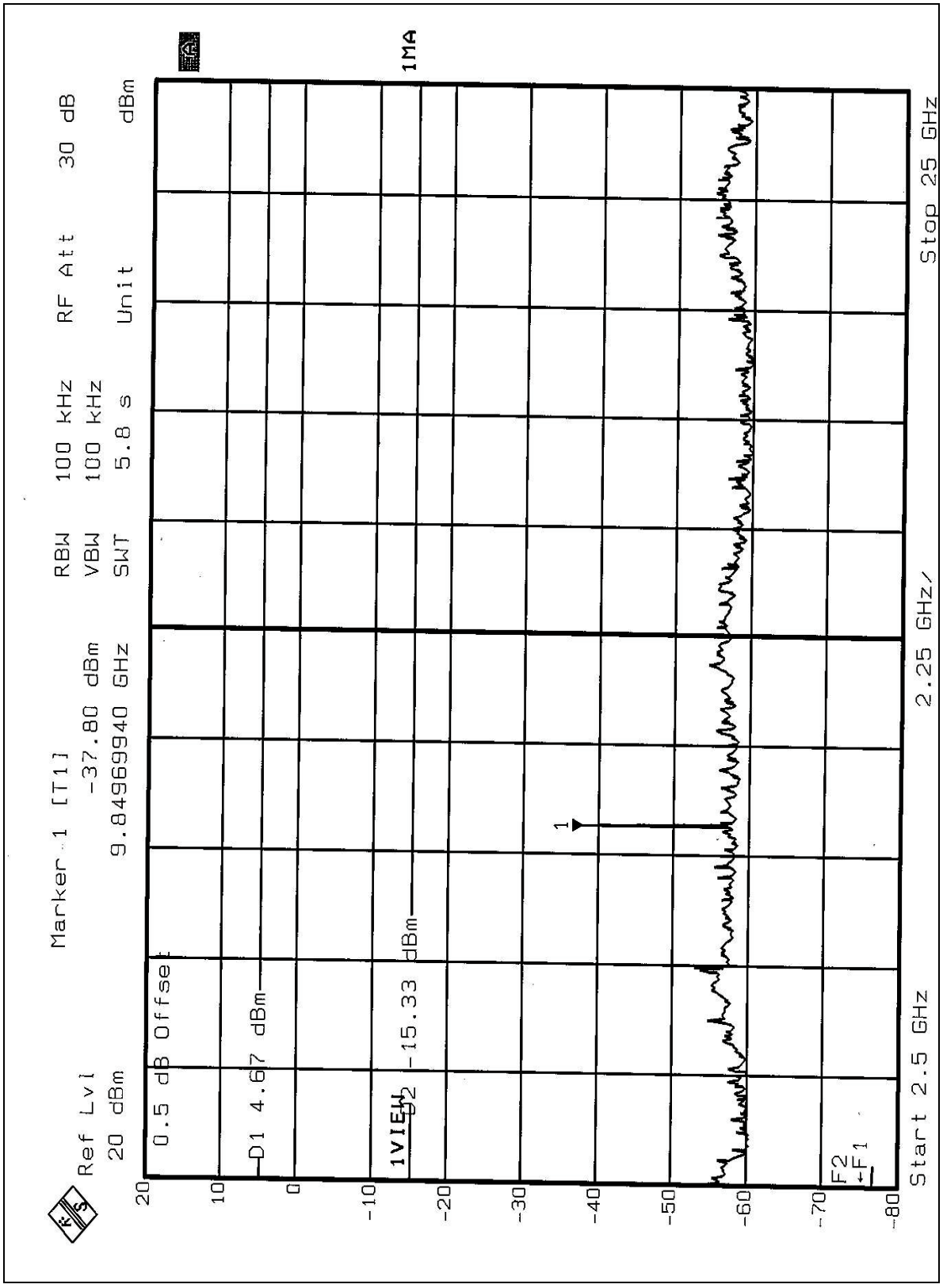
NOTE(FOR CCK):
The band edge emission plot on the following first page shows 57.28dB delta between carrier maximum power and local maximum emission in restrict band (2.3857GHz). The emission of carrier strength list in the test result of channel 1 at the item 4.2.8 (Page 25) is 100.11dBuV/m, so the maximum field strength in restrict band is 100.11-57.28=42.83dBuV/m which is under 54 dBuV/m limit.

The band edge emission plot on the following third page shows 56.49dB delta between carrier maximum power and local maximum emission in restrict band (2.4855GHz). The emission of carrier strength list in the test result of channel 11 at the item 4.2.8 (Page 29) is 98.90dBuV/m, so the maximum field strength in restrict band is 98.90-56.49=42.41dBuV/m which is under 54 dBuV/m limit.


Marker 1 [T1]
4.03 dBm
2.41177956 GHz
RBW 1 MHz
VBW 1 kHz
SWT 250 ms
RF Att 30 dB
Unit dBm
Ref Lvl
20 dBm
0.5 dB Offset
D1 4.03 dBm
1VIEW
D2 -15.97 dBm
1MA
1 [T1] 4.03 dBm 2.41177956 GHz
2 [T1] -32.72 dBm 2.39955511 GHz
3 [T1] -53.62 dBm 2.38000000 GHz
4 [T1] -53.25 dBm 2.38579158 GHz
F1
F2
Center 2.372 GHz
10 MHz/
Span 100 MHz

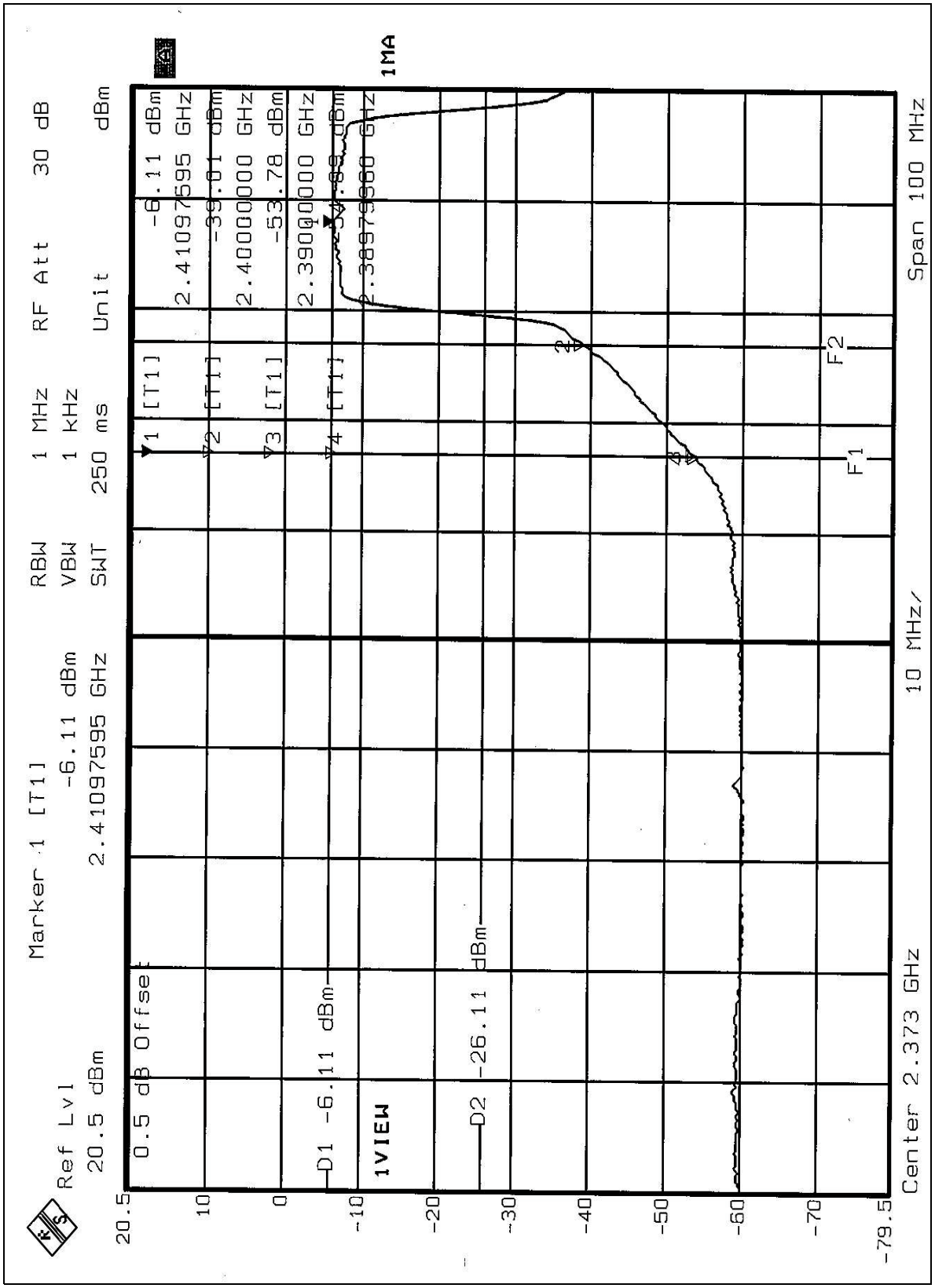

Ref Lvl
20 dBm
0.5 dB Offset
D1 4.45 dBm
1VIEW
D2 -15.55 dBm
Marker 1 [T1]
-41.49 dBm
9.62424850 GHz
RBW 100 kHz
VBW 100 kHz
SWT 5.8 s
RF Att 30 dB
Unit dBm
1MA
Start 2.5 GHz
2.25 GHz/
Stop 25 GHz
F1
F2

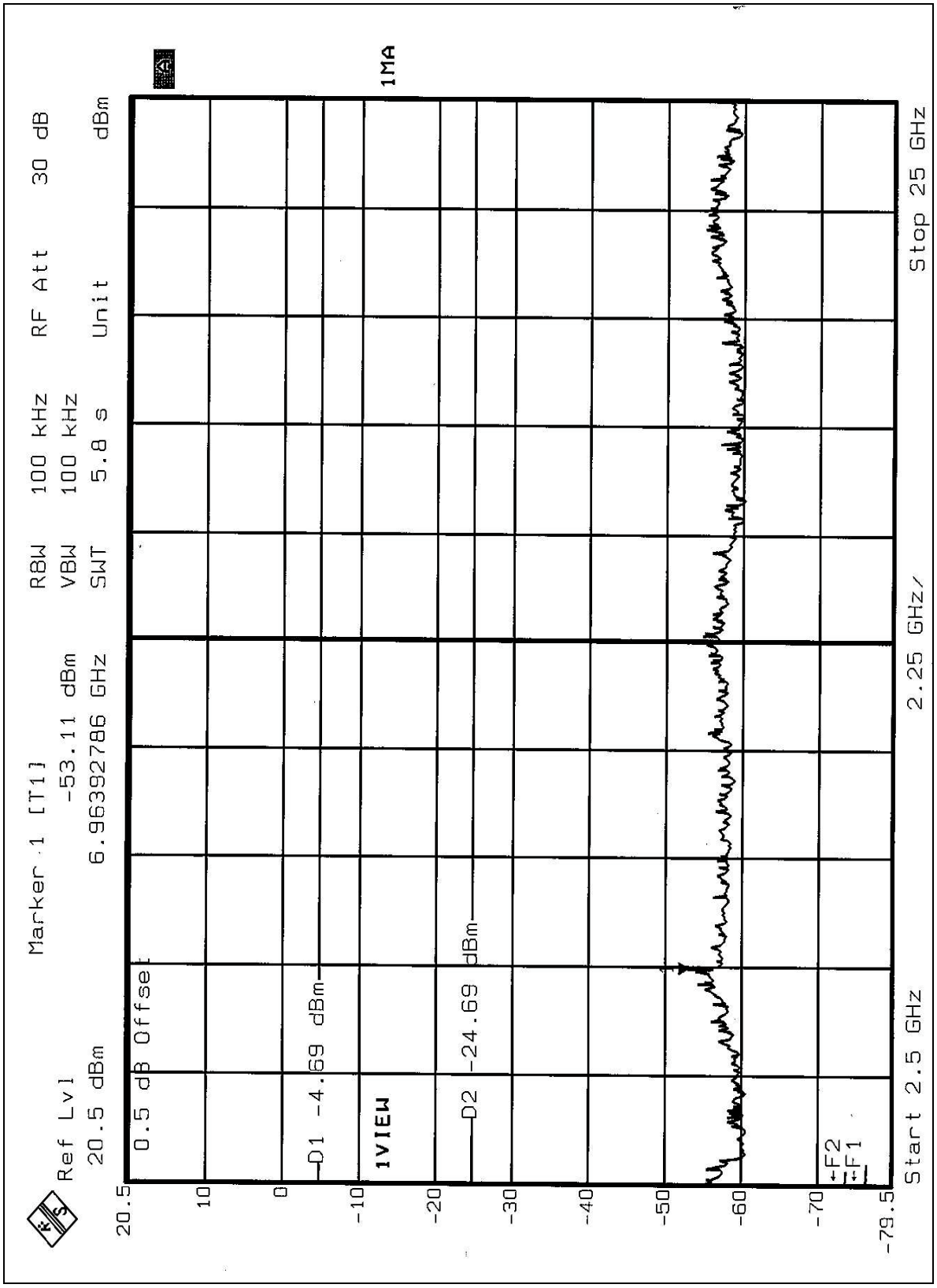

Ref Lvl
20 dBm
0.5 dB Offset
Marker 1 [T1]
4.02 dBm
2.46162124 GHz
RBW 1 MHz
VBW 1 kHz
SWT 250 ms
RF Att 30 dB
Unit dBm
1 [T1] 4.02 dBm 2.46162124 GHz
2 [T1] -53.18 dBm 2.48350000 GHz
3 [T1] -52.47 dBm 2.48550401 GHz
4 [T1] -56.05 dBm 2.50000000 GHz
1MA
VIEW
D1 4.02 dBm
D2 -15.98 dBm
F1
F2
Center 2.501 GHz
10 MHz/
Span 100 MHz

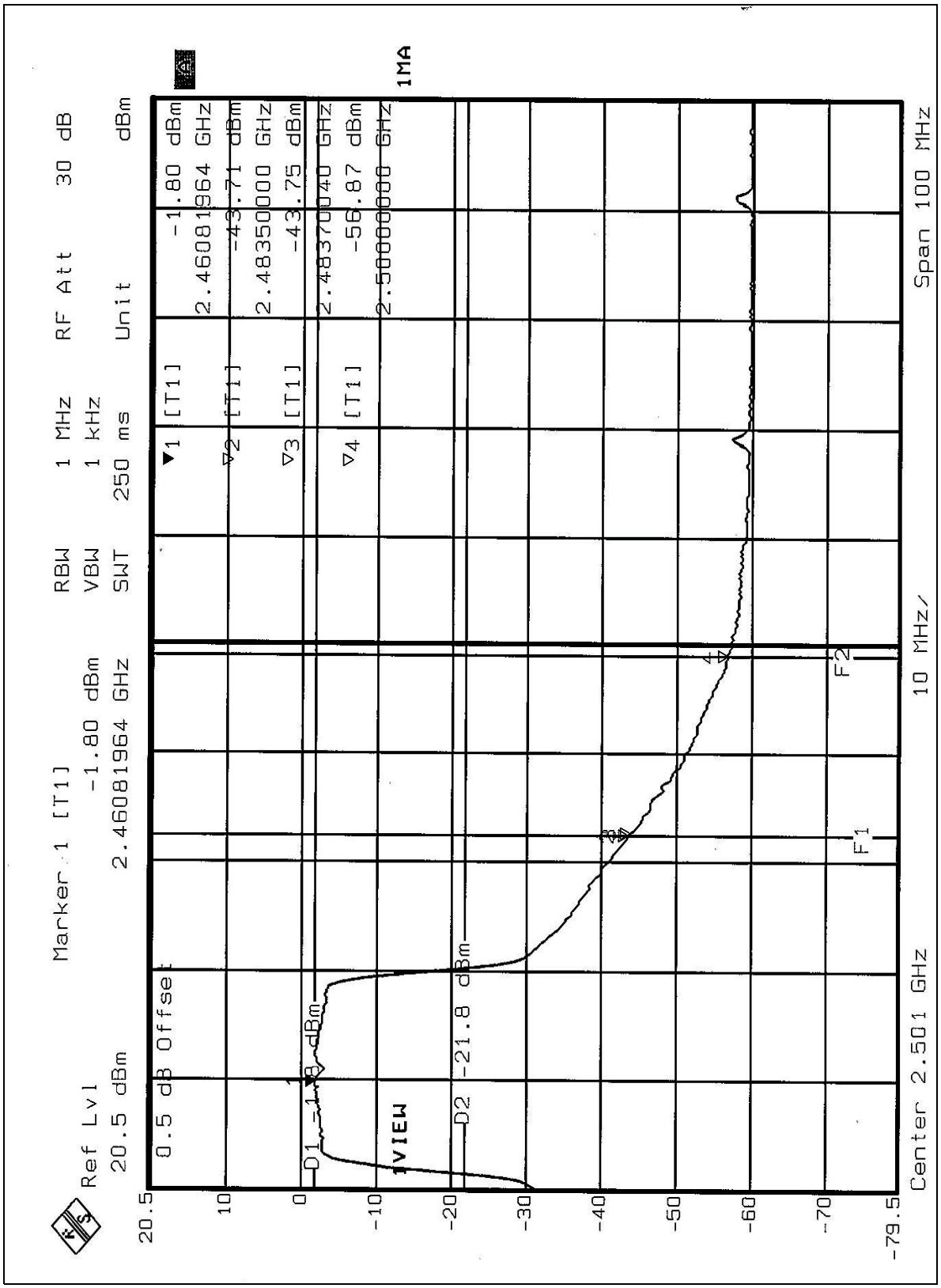

Marker 1 [T1]
-37.80 dBm
9.84969940 GHz
RBW 100 kHz
VBW 100 kHz
SWT 5.8 s
RF Att 30 dB
Unit dBm
Ref Lvl
20 dBm
0.5 dB Offset
D1 4.67 dBm
1VIEW -15.33 dBm
1MA
Start 2.5 GHz
2.25 GHz/
Stop 25 GHz
F2
F1

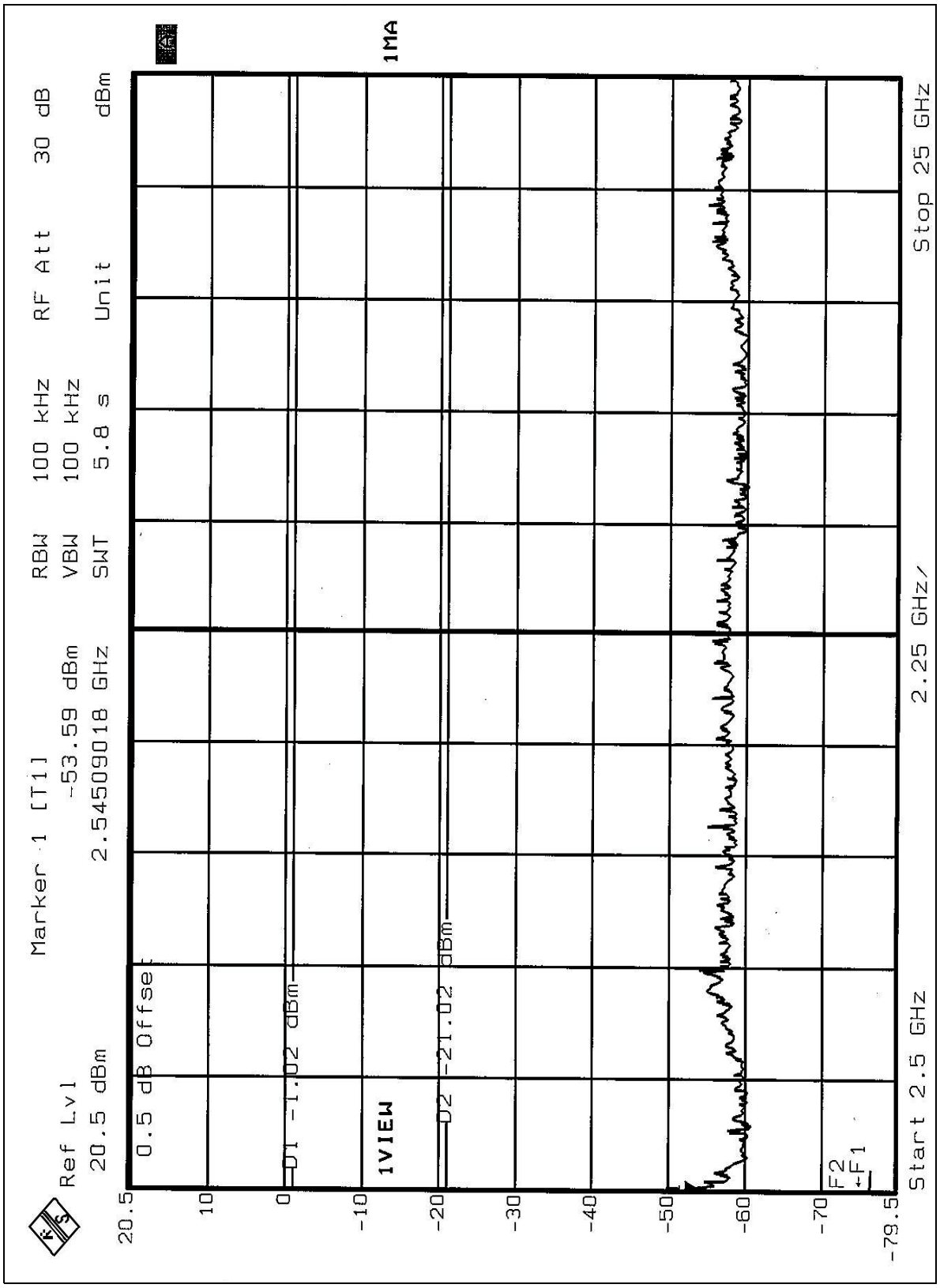
NOTE(FOR OFDM):
The band edge emission plot on the following first page shows 47.67dB delta between carrier maximum power and local maximum emission in restrict band (2.3900GHz). The emission of carrier strength list in the test result of channel 1 at the item 4.2.9 (Page 30) is 91.06dBuV/m, so the maximum field strength in restrict band is 91.06-47.67=43.39dBuV/m which is under 54 dBuV/m limit.

The band edge emission plot on the following third page shows 41.91dB 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 4.2.8 (Page 32) is 94.94dBuV/m, so the maximum field strength in restrict band is 94.94-41.91=53.03dBuV/m which is under 54 dBuV/m limit.


Marker 1 [T1]
-6.11 dBm
2.41097595 GHz
RBW 1 MHz
VBW 1 kHz
SWT 250 ms
RF Att 30 dB
Unit dBm
Ref Lvl
20.5 dBm
0.5 dB Offset
1 [T1] -6.11 dBm 2.41097595 GHz
2 [T1] -39.01 dBm 2.40000000 GHz
3 [T1] -53.78 dBm 2.39000000 GHz
4 [T1] -54.89 dBm 2.38979960 GHz
D1 -6.11 dBm
D2 -26.11 dBm
1VIEW
1MA
F1
F2
Center 2.373 GHz
10 MHz/
Span 100 MHz
20.5
10
0
-10
-20
-30
-40
-50
-60
-70
-79.5


Marker 1 [T1]
-53.11 dBm
6.96392786 GHz
RBW 100 kHz
VBW 100 kHz
SWT 5.8 s
RF Att 30 dB
Unit dBm
Ref Lvl
20.5 dBm
0.5 dB Offset
D1 -4.69 dBm
D2 -24.69 dBm
1VIEW
1MA
F2
F1
Start 2.5 GHz
2.25 GHz/
Stop 25 GHz
20.5
10
0
-10
-20
-30
-40
-50
-60
-70
-79.5


Ref Lvl
20.5 dBm
0.5 dB Offset
Marker 1 [T1]
-1.80 dBm
2.46081964 GHz
RBW 1 MHz
VBW 1 kHz
SWT 250 ms
RF Att 30 dB
Unit dBm
1MA
▼1 [T1] -1.80 dBm 2.46081964 GHz
▽2 [T1] -43.71 dBm 2.48350000 GHz
▽3 [T1] -43.75 dBm 2.48370040 GHz
▽4 [T1] -56.87 dBm 2.50000000 GHz
D1 -1.8 dBm
D2 -21.8 dBm
VIEW
F1
F2
Center 2.501 GHz
10 MHz/
Span 100 MHz
20.5
10
0
-10
-20
-30
-40
-50
-60
-70
-79.5


Ref Lvl
20.5 dBm
0.5 dB Offset
Marker 1 [T1]
-53.59 dBm
2.5450901 8 GHz
RBW 100 kHz
VBW 100 kHz
SWT 5.8 s
RF Att 30 dB
Unit dBm
1MA
D1 -1.02 dBm
D2 -21.02 dBm
1VIEW
F2
F1
Start 2.5 GHz
2.25 GHz/
Stop 25 GHz
20.5
10
0
-10
-20
-30
-40
-50
-60
-70
-79.5

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.

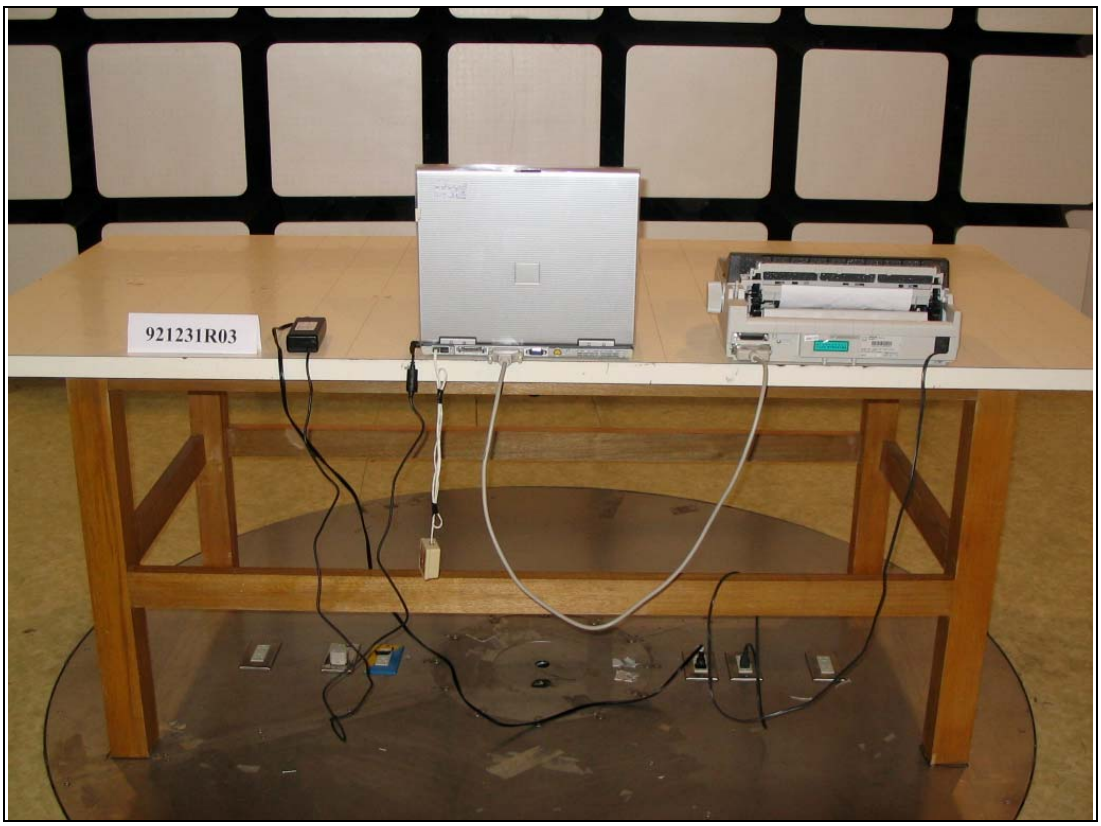
4.7.2 ANTENNA CONNECTED CONSTRUCTION

The antenna used in this product is Monopole with UFL antenna connector. And the maximum Gain of this antenna is 0.08dBi only.

5 PHOTOGRAPHS OF THE TEST CONFIGURATION

CONDUCTED EMISSION TEST

RADIATED EMISSION TEST



6 INFORMATION ON THE TESTING LABORATORIES

We, ADT Corp., were founded in 1988 to provide our best service in EMC and Safety consultation. Our laboratories are accredited and approved by the following approval agencies according to ISO/IEC 17025, Guide 25 or EN 45001:

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

Copies of accreditation certificates of our laboratories obtained from approval agencies can be downloaded from our web site: www.adt.com.tw/index.5/phtml.

If you have any comments, please feel free to contact us at the following:

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

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

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

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

Email: service@mail.adt.com.tw
Web Site: www.adt.com.tw

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