

FCC TEST REPORT

REPORT NO.: RF930730L03

MODEL NO.: ME-101

OEM MODEL NO.: MAX H-01

RECEIVED: Jul. 15, 2004

TESTED: Aug. 31 ~ Sep. 02, 2004

APPLICANT: ADD-ON TECHNOLOGY CO., LTD.

ADDRESS: 1F, No.11, Lane 206, Da-An Road, Sec.1,
Taipei, Taiwan, R.O.C.

ISSUED BY: Advance Data Technology Corporation

LAB ADDRESS: 47 14th Ling, Chia Pau Tsuen, Lin Kou Hsiang
244, Taipei Hsien, Taiwan, R.O.C.

TEST LOCATION: No. 19, Hwa Ya 2nd Rd., Wen Hwa Tsuen,
Kwei Shan Hsiang, Taoyuan Hsien 333,
Taiwan, R.O.C.

This test report consists of 75 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, A2LA or any government agencies. The test results in the report only apply to the tested sample.



0528
ILAC MRA



No. 2177-01

TABLE OF CONTENTS

1	CERTIFICATION	4
2	SUMMARY OF TEST RESULTS	5
2.1	MEASUREMENT UNCERTAINTY	6
3	GENERAL INFORMATION.....	7
3.0	GENERAL DESCRIPTION OF EUT	7
3.1	DESCRIPTION OF TEST MODES.....	8
3.2	GENERAL DESCRIPTION OF APPLIED STANDARDS	9
3.3	DESCRIPTION OF SUPPORT UNITS	9
3.4	CONFIGURATION OF SYSTEM UNDER TEST	10
4	TEST PROCEDURES AND RESULTS	11
4.1	CONDUCTED EMISSION MEASUREMENT	11
4.1.1	LIMITS OF CONDUCTED EMISSION MEASUREMENT.....	11
4.1.2	TEST INSTRUMENTS.....	11
4.1.3	TEST PROCEDURES	12
4.1.4	DEVIATION FROM TEST STANDARD	12
4.1.5	TEST SETUP.....	12
4.1.6	EUT OPERATING CONDITIONS	13
4.1.7	TEST RESULTS	14
4.2	NUMBER OF HOPPING FREQUENCY USED	18
4.2.1	LIMIT OF HOPPING FREQUENCY USED	18
4.2.2	TEST INSTRUMENTS.....	18
4.2.3	TEST PROCEDURES	19
4.2.4	DEVIATION FROM TEST STANDARD	19
4.2.5	TEST SETUP.....	20
4.2.6	TEST RESULTS	20
4.3	DWELL TIME ON EACH CHANNEL	23
4.3.1	LIMIT OF DWELL TIME USED.....	23
4.3.2	TEST INSTRUMENTS.....	23
4.3.3	TEST PROCEDURES	24
4.3.4	DEVIATION FROM TEST STANDARD	24
4.3.5	TEST SETUP.....	24
4.3.6	TEST RESULTS	25
4.4	CHANNEL BANDWIDTH.....	32
4.4.1	LIMITS OF CHANNEL BANDWIDTH	32
4.4.2	TEST INSTRUMENTS.....	32
4.4.3	TEST PROCEDURE.....	33
4.4.4	DEVIATION FROM TEST STANDARD	33
4.4.5	TEST SETUP.....	33
4.4.6	EUT OPERATING CONDITION	33
4.4.7	TEST RESULTS	34
4.5	HOPPING CHANNEL SEPARATION	38
4.5.1	LIMIT OF HOPPING CHANNEL SEPARATION	38

4.5.2	TEST INSTRUMENTS.....	38
4.5.3	TEST PROCEDURES	39
4.5.4	DEVIATION FROM TEST STANDARD	39
4.5.5	TEST SETUP.....	39
4.5.6	TEST RESULTS	40
4.6	MAXIMUM PEAK OUTPUT POWER	44
4.6.1	LIMITS OF MAXIMUM PEAK OUTPUT POWER MEASUREMENT	44
4.6.2	INSTRUMENTS.....	44
4.6.3	TEST PROCEDURES	45
4.6.4	DEVIATION FROM TEST STANDARD	45
4.6.5	TEST SETUP.....	46
4.6.6	EUT OPERATING CONDITION	46
4.6.7	TEST RESULTS	47
4.7	RADIATED EMISSION MEASUREMENT	51
4.7.1	LIMITS OF RADIATED EMISSION MEASUREMENT	51
4.7.2	TEST INSTRUMENTS.....	52
4.7.3	TEST PROCEDURES	53
4.7.4	DEVIATION FROM TEST STANDARD	53
4.7.5	TEST SETUP.....	54
4.7.6	TEST RESULTS	55
4.8	BAND EDGES MEASUREMENT	62
4.8.1	LIMITS OF BAND EDGES MEASUREMENT.....	62
4.8.2	TEST INSTRUMENTS	62
4.8.3	TEST PROCEDURE.....	62
4.8.4	DEVIATION FROM TEST STANDARD	62
4.8.5	EUT OPERATING CONDITION	63
4.8.6	TEST RESULTS	63
4.9	ANTENNA REQUIREMENT	68
4.9.1	STANDARD APPLICABLE	68
4.9.2	ANTENNA CONNECTED CONSTRUCTION	68
5	PHOTOGRAPHS OF THE TEST CONFIGURATION.....	69
6	INFORMATION ON THE TESTING LABORATORIES	75

1 CERTIFICATION

PRODUCT : Bluetooth Headset
MODEL NO. : ME-101 (for Brand name: MobileEar)
OEM MODEL NO.: MAX H-01 (for Brand name: maxfield)
APPLICANT : ADD-ON TECHNOLOGY CO., LTD.
TESTED DATE: Aug. 31 ~ Sep. 02, 2004
TEST ITEM : Engineering Sample
STANDARDS : FCC Part 15, Subpart C (Section 15.247),
ANSI C63.4-2001

The above equipment (Model: ME-101) has 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 : Windy Chou , **DATE:** Sep. 09, 2004
(Windy Chou)

TECHNICAL

ACCEPTANCE : Gary Chang , **DATE:** Sep. 09, 2004
Responsible for RF (Gary Chang)

APPROVED BY : Cody Chang , **DATE:** Sep. 09, 2004
(Cody Chang,
Deputy 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 -18.67dB at 0.232 MHz
15.247(a)(1)(I)-(ii)	Number of Hopping Frequency Used Spec.: At least 15 channels	PASS	Meet the requirement of limit
15.247(a)(1)(ii)	Dwell Time on Each Channel Spec. : Max. 0.4 second within 31.6 second	PASS	Meet the requirement of limit
15.247(a)(1)(I)-(ii)	Hopping Channel Separation Spec. : Min. 25 kHz or 20 dB bandwidth, which ever is greater	PASS	Meet the requirement of limit
15.247(a)(2)	Spectrum Bandwidth of a Frequency Hopping Sequence Spread Spectrum System Spec.: Max. 1 MHz	PASS	Meet the requirement of limit
15.247(b)	Maximum Peak Output Power Spec.: max. 30dBm	PASS	Meet the requirement of limit
15.247(c)	Transmitter Radiated Emissions Spec.: Table 15.209	PASS	Meet the requirement of limit Minimum passing margin is -2.38dB at 35.83MHz
15.247(c)	Band Edge Measurement	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

3.0 GENERAL DESCRIPTION OF EUT

PRODUCT	Bluetooth Headset
MODEL NO.	ME-101 (for Brand name: MobileEar)
OEM MODEL NO.	MAX H-01 (for Brand name: maxfield)
POWER SUPPLY	4.2Vdc from battery 5.0Vdc from AC Adapter 5.0Vdc from host equipment
MODULATION TYPE	FHSS
MODULATION TECHNOLOGY	GFSK
FREQUENCY RANGE	2402MHz ~ 2480MHz
NUMBER OF CHANNEL	79
OUTPUT POWER	2.77dBm
ANTENNA TYPE	Printed Antenna with -2.53dBi Antenna gain
DATA CABLE	USB 50cm unshielded cable
I/O PORTS	USB
ASSOCIATED DEVICES	NA

NOTE:

1. Bluetooth technology is used for the EUT.
2. The models as below are identical to each other except for their model no. and brand name due to marketing requirement.

Brand	Model
MobileEar	ME-101
maxfield	MAX H-01

3. The EUT was tested with the following adapters:

BRAND :	Pro-technology
MODEL :	MKD-350500150
INPUT :	120Vac, 60Hz, 55mA
OUTPUT :	5Vdc, 150mA

4. The above EUT information was declared by manufacturer and for more detailed features description, please refer to the manufacturer's specifications or User's Manual.

3.1 DESCRIPTION OF TEST MODES

Seventy-nine channels are provided to this EUT.

Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)	Channel	Freq. (MHz)
0	2402	20	2422	40	2442	60	2462
1	2403	21	2423	41	2443	61	2463
2	2404	22	2424	42	2444	62	2464
3	2405	23	2425	43	2445	63	2465
4	2406	24	2426	44	2446	64	2466
5	2407	25	2427	45	2447	65	2467
6	2408	26	2428	46	2448	66	2468
7	2409	27	2429	47	2449	67	2469
8	2410	28	2430	48	2450	68	2470
9	2411	29	2431	49	2451	69	2471
10	2412	30	2431	50	2452	70	2472
11	2413	31	2433	51	2453	71	2473
12	2414	32	2434	52	2454	72	2474
13	2415	33	2435	53	2455	73	2475
14	2416	34	2436	54	2456	74	2476
15	2417	35	2437	55	2457	75	2477
16	2418	36	2438	56	2458	76	2478
17	2419	37	2439	57	2459	77	2479
18	2420	38	2440	58	2460	78	2480
19	2421	39	2441	59	2461		

NOTE:

1. Below 1 GHz, the channel 0, 39, and 78 were pre-tested in chamber. The channel 78, worst case one, was chosen for final test.
2. Above 1 GHz, the channel 0, 39, and 78 were tested individually.
3. For Conducted Emission Measurement and Radiated Emission Measurement, there are several test modes presented in following section. Please refer to the table as below:

Test Item	Description	Test Mode
Conducted Emission	Powered by AC Adapter (charger mode)	A
	Powered by USB Cable (charger mode)	B
Radiated Emission Below 1GHz	Powered by AC Adapter (charger mode)	A
	Powered by USB Cable (charger mode)	B
	Powered by Car Charger (charger mode)	C
	Powered by batteries (Tx & Rx Mode)	D

3.2 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a Bluetooth Headset. 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 : 2001

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

3.3 DESCRIPTION OF SUPPORT UNITS

For Test Mode A

NA

For Test Mode B

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	NOTEBOOK COMPUTER	DELL	PP05L	12130898320	E2K24CLNS
2	PRINTER	EPSON	LQ-300+	DCGY054147	FCC DoC Approved
3	MODEM	ACEEX	1414V/3	0401008269	IFAXDM1414

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
3	1.2 m braid shielded w/o core.

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

For Test Mode C

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	DC POWER SUPPLY // TF-6306A	Topward	TF-6306A	727263	NA

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	NA

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

For Test Mode D

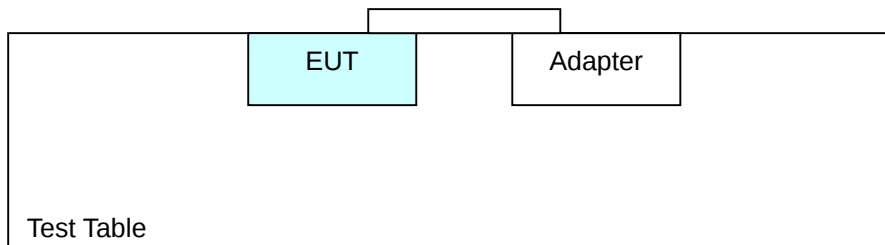
NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	NOTEBOOK COMPUTER	DELL	PP05L	12130898320	E2K24CLNS
2	PRINTER	EPSON	LQ-300+	DCGY054147	FCC DoC Approved

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

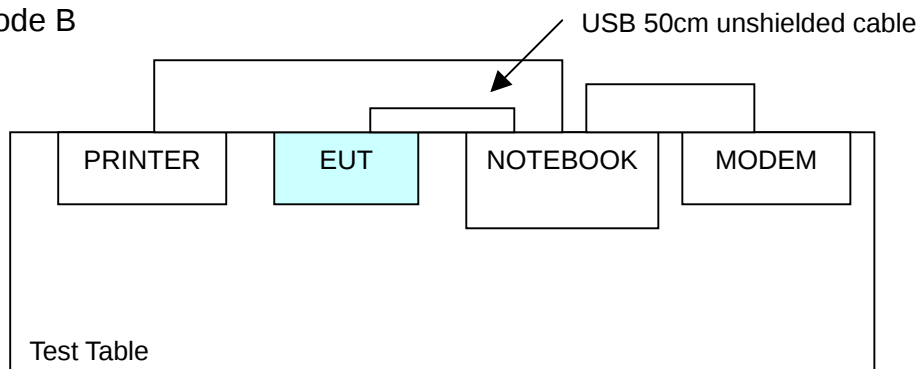
NOTE: All power cords of the above support units are non shielded (1.8m).

3.4 CONFIGURATION OF SYSTEM UNDER TEST

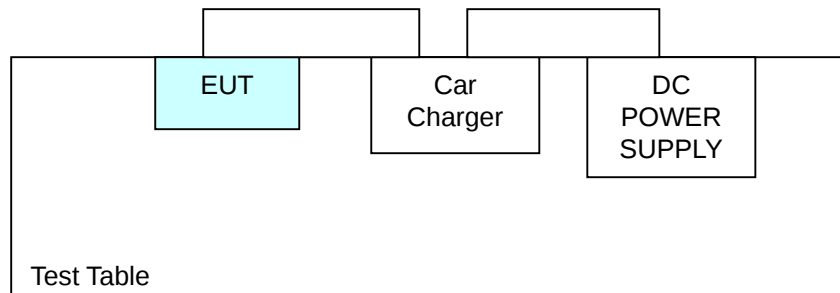
For Test Mode A



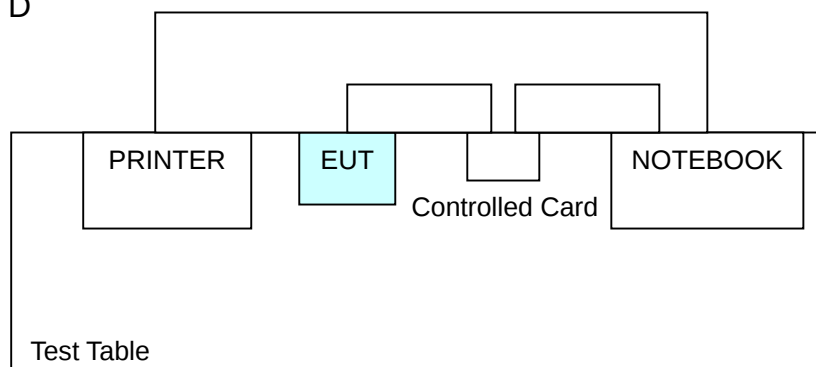
For Test Mode B



For Test Mode C



For Test Mode D



4 TEST PROCEDURES AND RESULTS

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

Notes:

1. The lower limit shall apply at the transition frequencies.
2. 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.

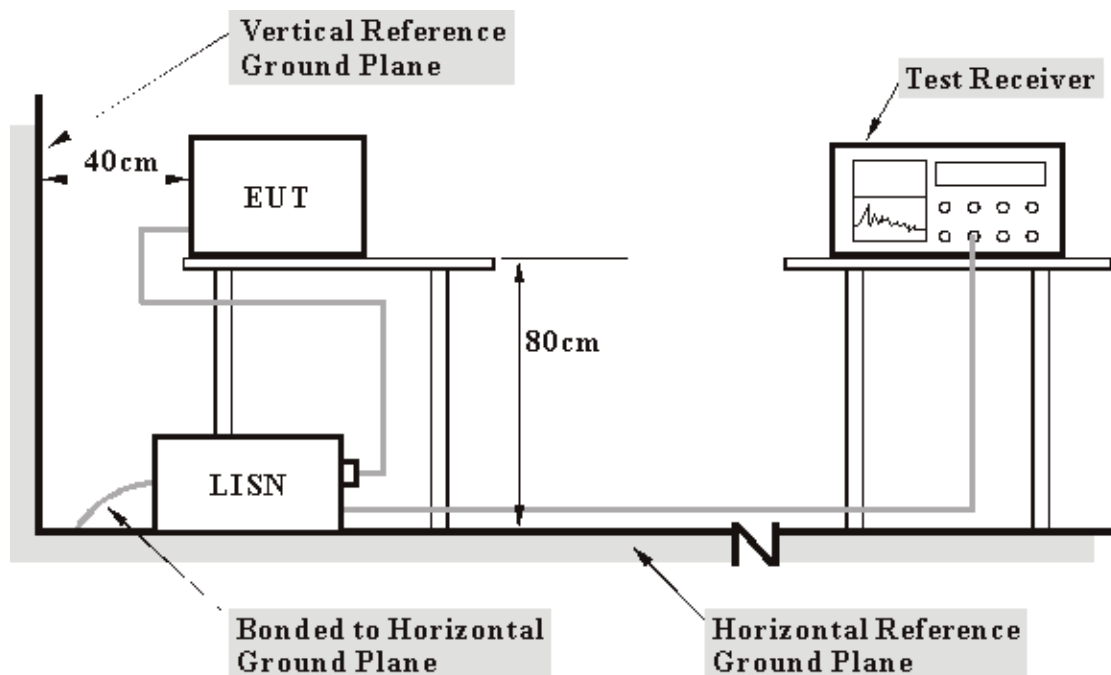
4.1.3 TEST PROCEDURES

- 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.
- Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
- 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:**
- Support units were connected to second LISN.
 - 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

For Test Mode A

- a. Place the EUT on the test table.
- b. The EUT was connected to the adapter and it was charge condition.

For Test Mode B

- a. Connect EUT into the Notebook system via USB placed on a testing table.
- b. The EUT was powered 5Vdc from the Notebook via USB and it was charge condition.
- c. The computer system sent "H" messages to its screen.
- d. The computer system sent "H" messages to modem.
- e. The computer system sent "H" messages to printer, and the printer printed them on paper.
- f. Steps c ~ e were repeated.

For Test Mode C

- a. Place the EUT on the test table.
- b. The EUT was connected to Car charger and powered 5Vdc from the DC power supply (12Vdc). The EUT was charge condition.

For Test Mode D

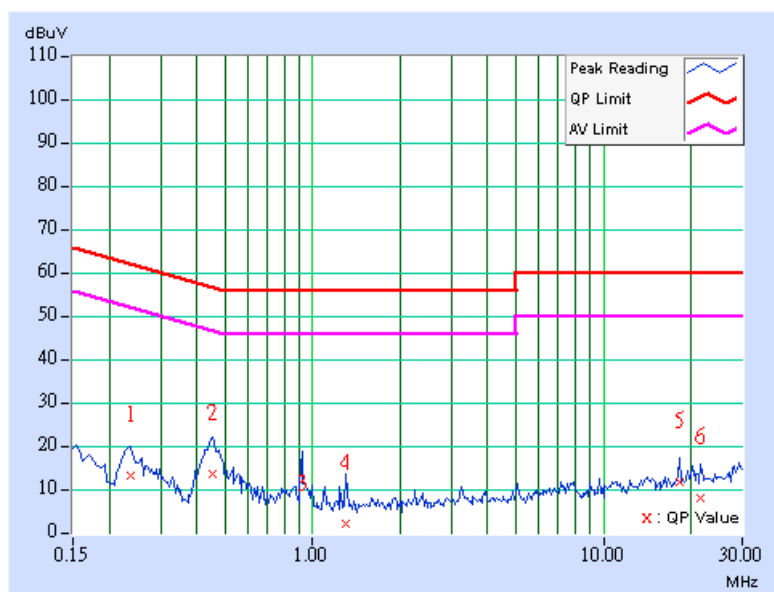
- a. Connected the EUT to the Notebook system via the controlled card placed on a testing table.
- b. The Notebook system ran a test program (provided by manufacturer) to enable EUT under transmission/receiving condition continuously at specific channel frequency.
- c. Batteries powered the EUT.
- d. The computer system sent "H" messages to its screen.
- e. The computer system sent "H" messages to printer, and the printer printed them on paper.
- f. Steps d ~ e were repeated.

4.1.7 TEST RESULTS

EUT	Bluetooth Headset	MODEL	ME-101
TEST MODE	A	6dB BANDWIDTH	9 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	PHASE	Line (L)
ENVIRONMENTAL CONDITIONS	25 deg. C, 65%RH, 991 hPa	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	0.236	0.10	12.41	-	12.51	-	62.24	52.24	-49.73	-
2	0.451	0.13	12.79	-	12.92	-	56.86	46.86	-43.95	-
3	0.920	0.23	-3.42	-	-3.19	-	56.00	46.00	-59.19	-
4	1.305	0.25	1.16	-	1.41	-	56.00	46.00	-54.59	-
5	18.367	0.85	10.76	-	11.61	-	60.00	50.00	-48.39	-
6	21.660	1.00	7.12	-	8.12	-	60.00	50.00	-51.88	-

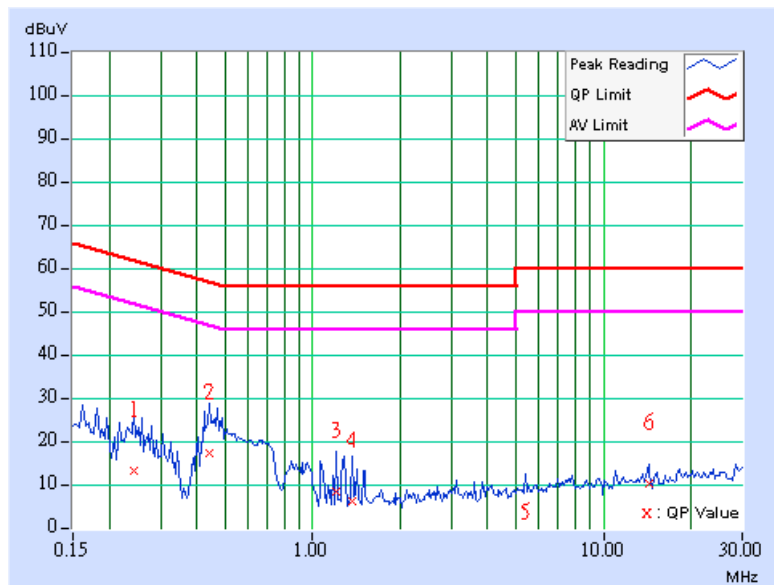
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value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



EUT	Bluetooth Headset	MODEL	ME-101
TEST MODE	A	6dB BANDWIDTH	9 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	PHASE	Neutral (N)
ENVIRONMENTAL CONDITIONS	25 deg. C, 65%RH, 991 hPa	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	0.244	0.10	12.82	-	12.92	-	61.97	51.97	-49.04	-
2	0.443	0.12	16.71	-	16.83	-	57.01	47.01	-40.17	-
3	1.211	0.24	8.02	-	8.26	-	56.00	46.00	-47.74	-
4	1.363	0.24	5.76	-	6.00	-	56.00	46.00	-50.00	-
5	5.402	0.36	-10.93	-	-10.57	-	60.00	50.00	-70.57	-
6	14.273	0.55	9.68	-	10.23	-	60.00	50.00	-49.77	-

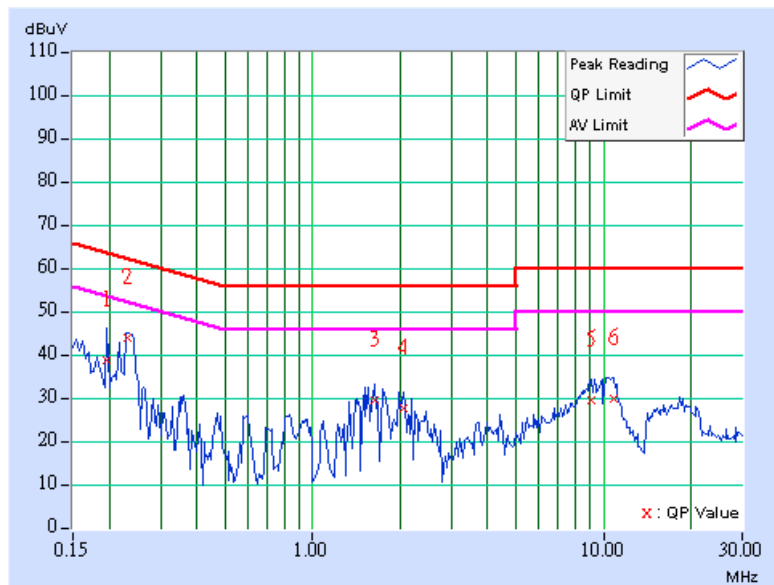
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value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



EUT	Bluetooth Headset	MODEL	ME-101
TEST MODE	B	6dB BANDWIDTH	9 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	PHASE	Line (L)
ENVIRONMENTAL CONDITIONS	25 deg. C, 65%RH, 991 hPa	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	0.197	0.10	38.28	-	38.38	-	63.74	53.74	-25.36	-
2	0.232	0.10	43.60	-	43.70	-	62.38	52.38	-18.67	-
3	1.630	0.26	29.07	-	29.33	-	56.00	46.00	-26.67	-
4	2.047	0.26	27.10	-	27.36	-	56.00	46.00	-28.64	-
5	9.105	0.50	29.13	-	29.63	-	60.00	50.00	-30.37	-
6	10.816	0.56	29.31	-	29.87	-	60.00	50.00	-30.13	-

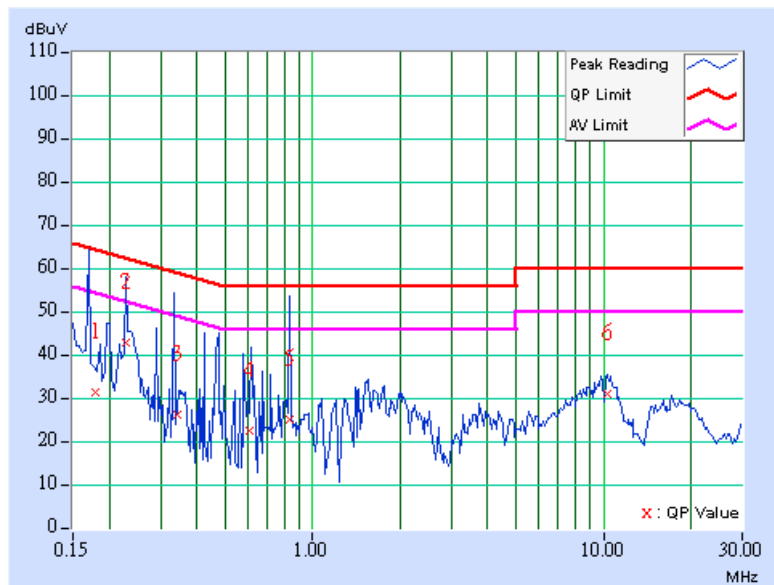
- REMARKS:**
1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
 2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
 3. The emission levels of other frequencies were very low against the limit.
 4. Margin value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



EUT	Bluetooth Headset	MODEL	ME-101
TEST MODE	B	6dB BANDWIDTH	9 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	PHASE	Neutral (N)
ENVIRONMENTAL CONDITIONS	25 deg. C, 65%RH, 991 hPa	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	0.179	0.10	31.09	-	31.19	-	64.55	54.55	-33.36	-
2	0.228	0.10	42.39	-	42.49	-	62.52	52.52	-20.03	-
3	0.343	0.11	25.79	-	25.90	-	59.14	49.14	-33.24	-
4	0.606	0.15	22.14	-	22.29	-	56.00	46.00	-33.71	-
5	0.830	0.20	24.86	-	25.06	-	56.00	46.00	-30.94	-
6	10.320	0.49	30.66	-	31.15	-	60.00	50.00	-28.85	-

- 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 NUMBER OF HOPPING FREQUENCY USED

4.2.1 LIMIT OF HOPPING FREQUENCY USED

At least 15 hopping frequencies, and should be equally spaced.

4.2.2 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.

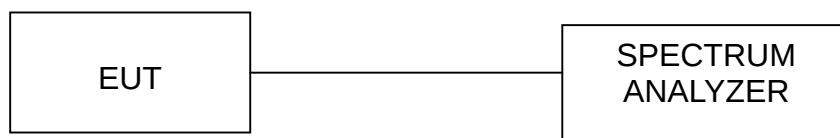
4.2.3 TEST PROCEDURES

1. Check the calibration of the measuring instrument (SA) using either an internal calibrator or a known signal from an external generator.
2. Turn on the EUT and connect its antenna terminal to measurement via a low loss cable. Then set it to any one measured frequency within its operating range and make sure the instrument is operated in its linear range.
3. Set the SA on MaxHold Mode, and then keep the EUT in hopping mode. Record all the signals from each channel until each one has been recorded.
4. Set the SA on View mode and then plot the result on SA screen.
5. Repeat above procedures until all frequencies measured were complete.

4.2.4 DEVIATION FROM TEST STANDARD

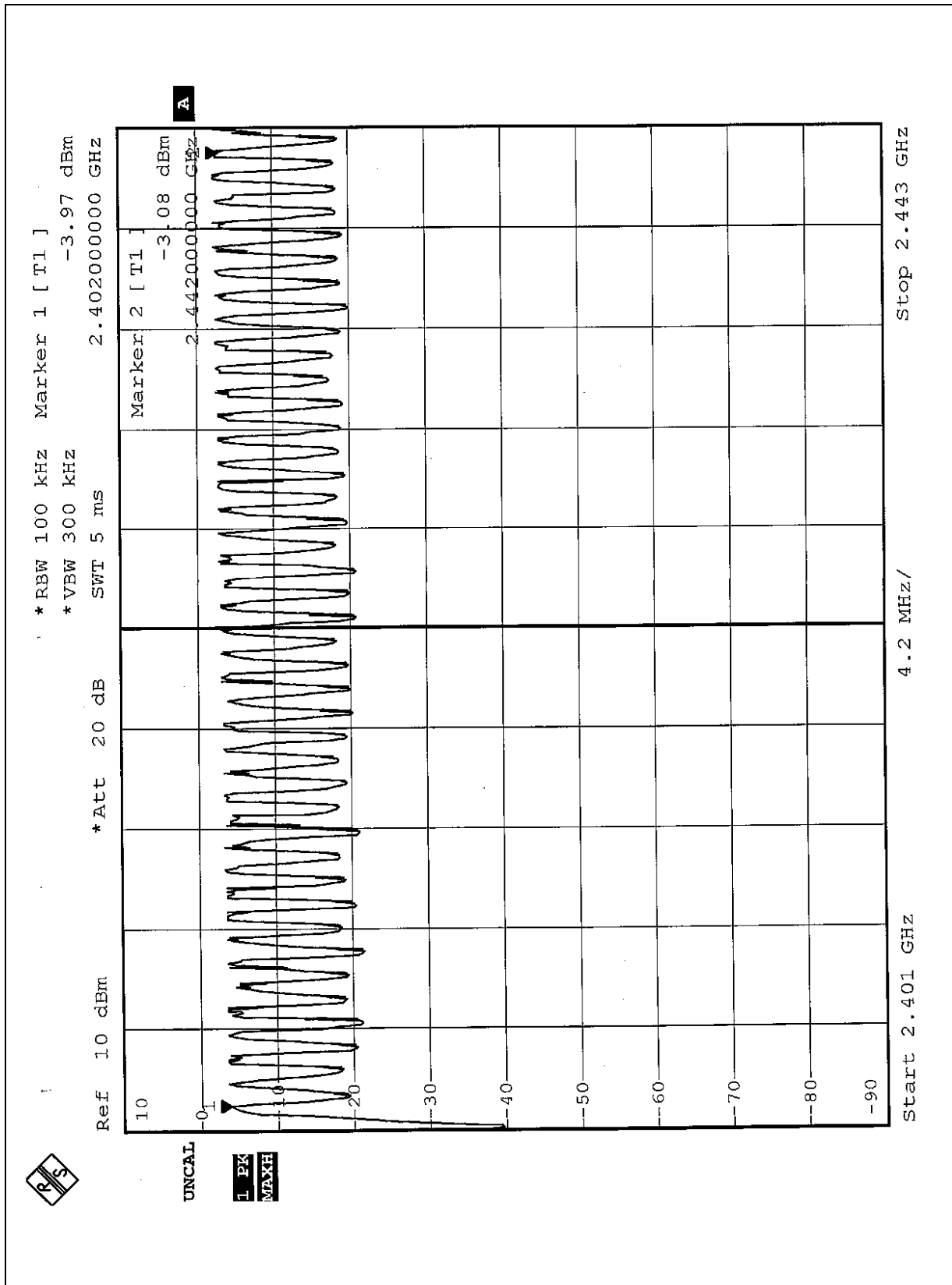
No deviation

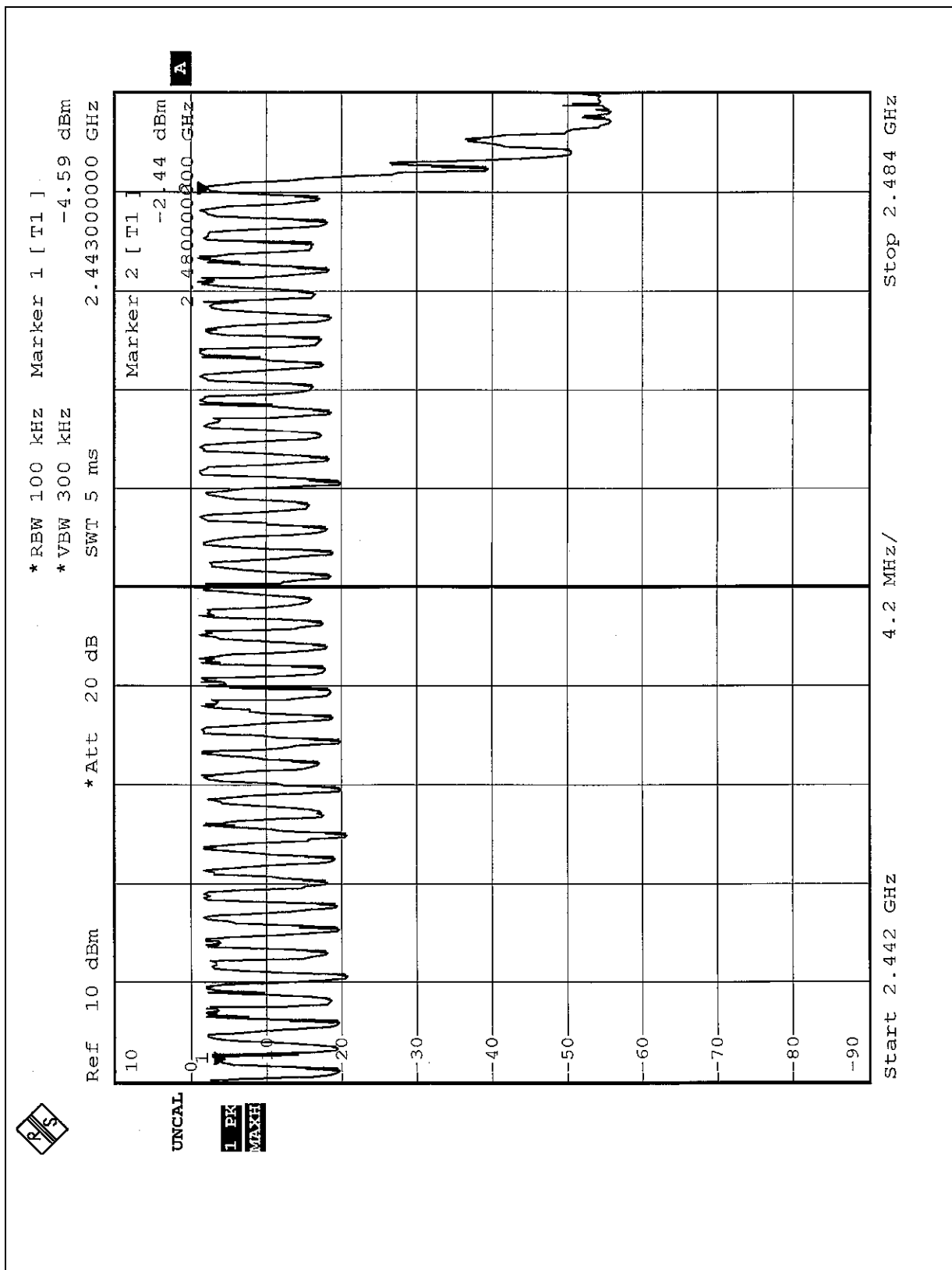
4.2.5 TEST SETUP



4.2.6 TEST RESULTS

There are 79 hopping frequencies in the hopping mode. Please refer to next two pages for the test result. On the plots, it shows that the hopping frequencies are equally spaced.





4.3 DWELL TIME ON EACH CHANNEL

4.3.1 LIMIT OF DWELL TIME USED

For FHSS, the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 31.6 second period. For hybrid systems, the average time of occupancy on any frequency should not exceed 0.4 seconds within a time period in seconds equal to the number of hopping frequencies employed multiplied by 0.4.

4.3.2 TEST INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
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.

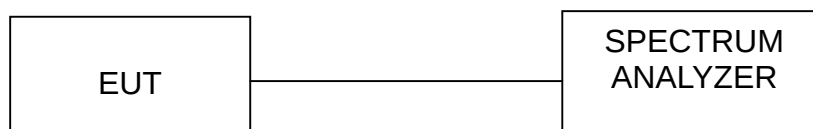
4.3.3 TEST PROCEDURES

1. Check the calibration of the measuring instrument (SA) using either an internal calibrator or a known signal from an external generator.
2. Turn on the EUT and connect its antenna terminal to measurement via a low loss cable. Then set it to any one measured frequency within its operating range and make sure the instrument is operated in its linear range.
3. Adjust the center frequency of SA on any frequency be measured and set SA to zero span mode. And then, set RBW and VBW of spectrum analyzer to proper value.
4. Measure the time duration of one transmission on the measured frequency. And then plot the result with time difference of this time duration.
5. Repeat above procedures until all frequencies measured were complete.

4.3.4 DEVIATION FROM TEST STANDARD

No deviation

4.3.5 TEST SETUP

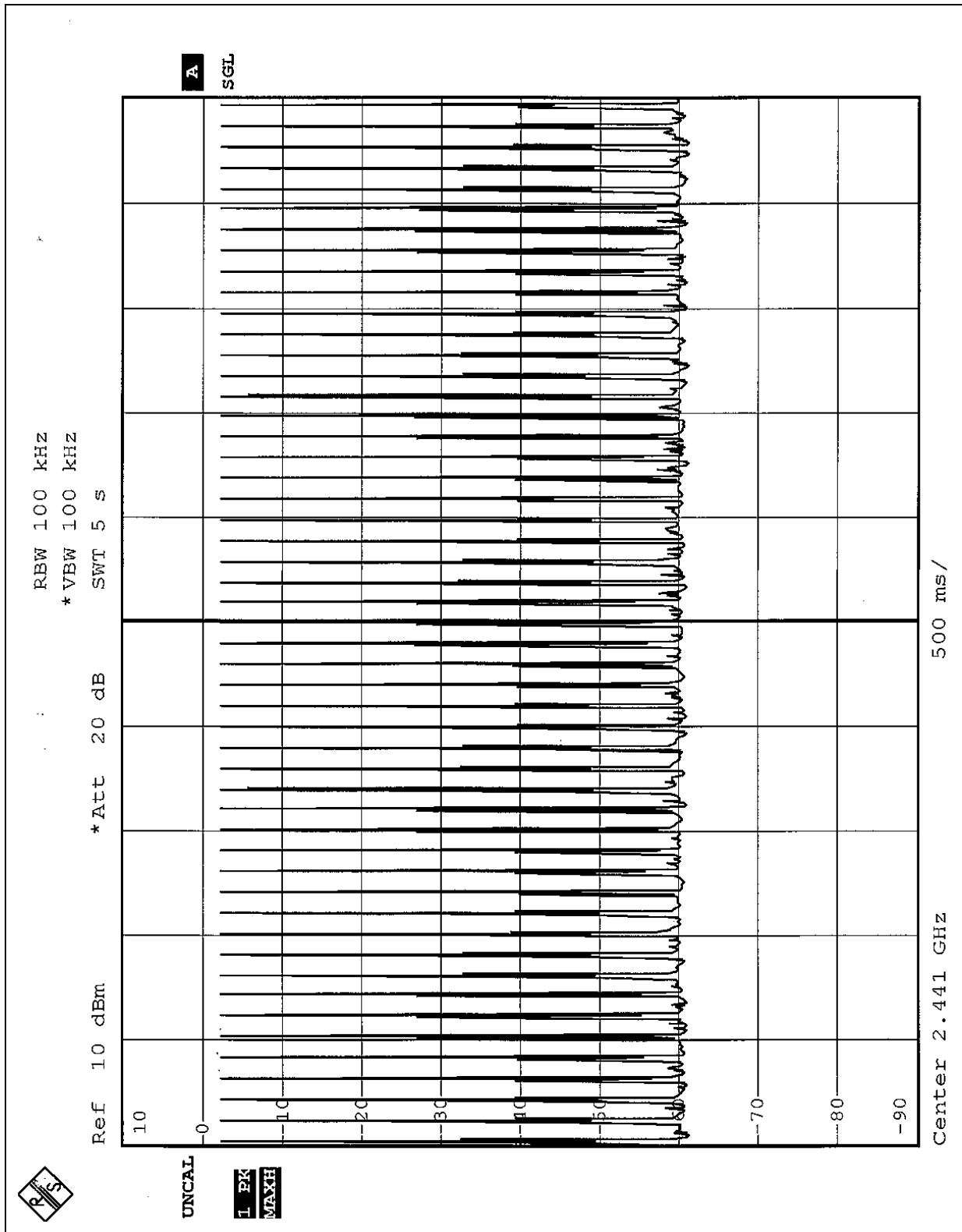


4.3.6 TEST RESULTS

Mode	Number of transmission in a 31.6 (79Hopping*0.4)	Length of transmission time (msec)	Result (msec)	Limit (msec)
DH1	51 (times / 5 sec) *6.32=322.32 times	0.481	155.03	400
DH3	25 (times / 5 sec) *6.32=158.00 times	1.721	271.92	400
DH5	17 (times / 5 sec) *6.32=107.44 times	2.997	322.00	400

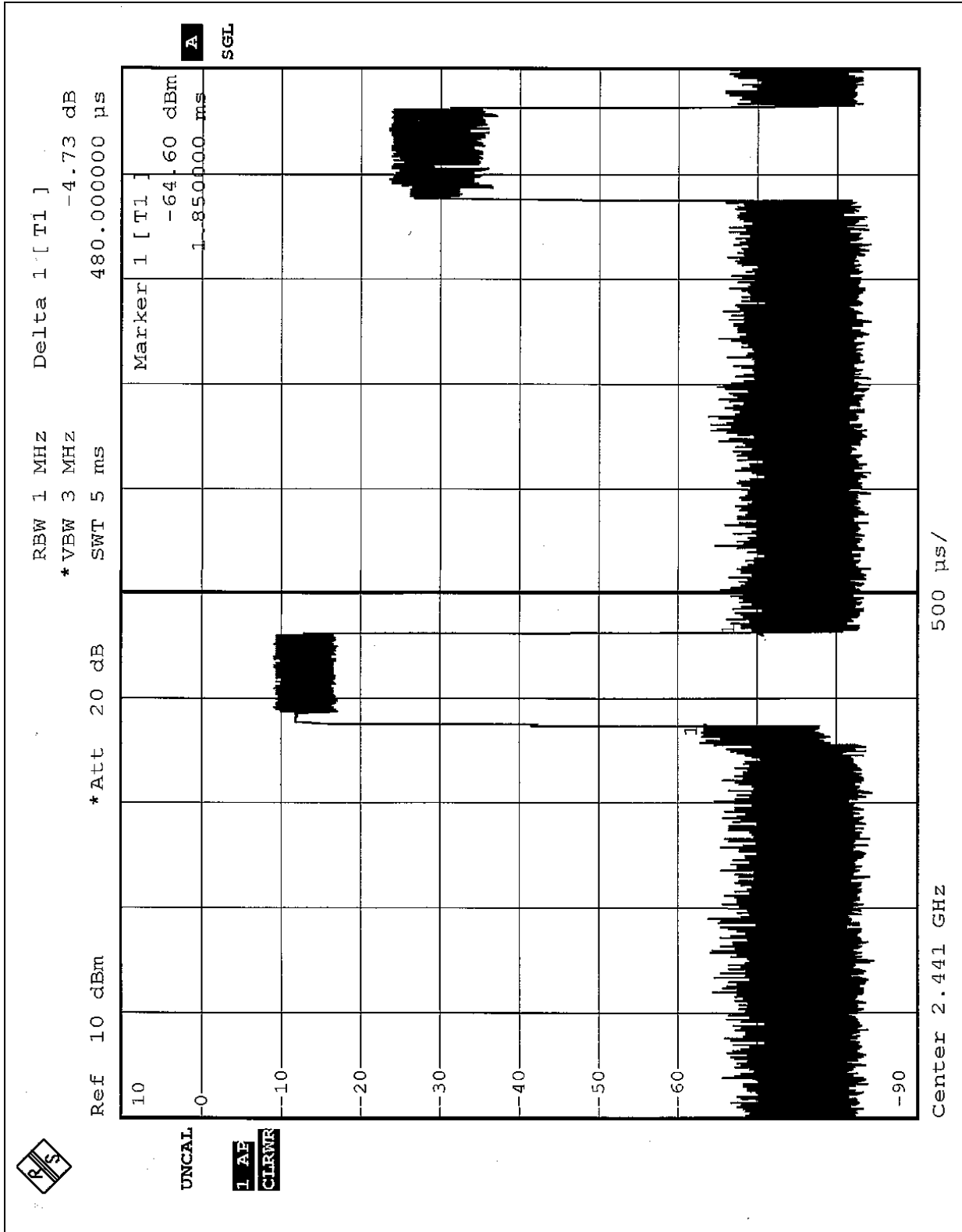
Test plots of the transmitting time slot are shown on next six pages.

DH1

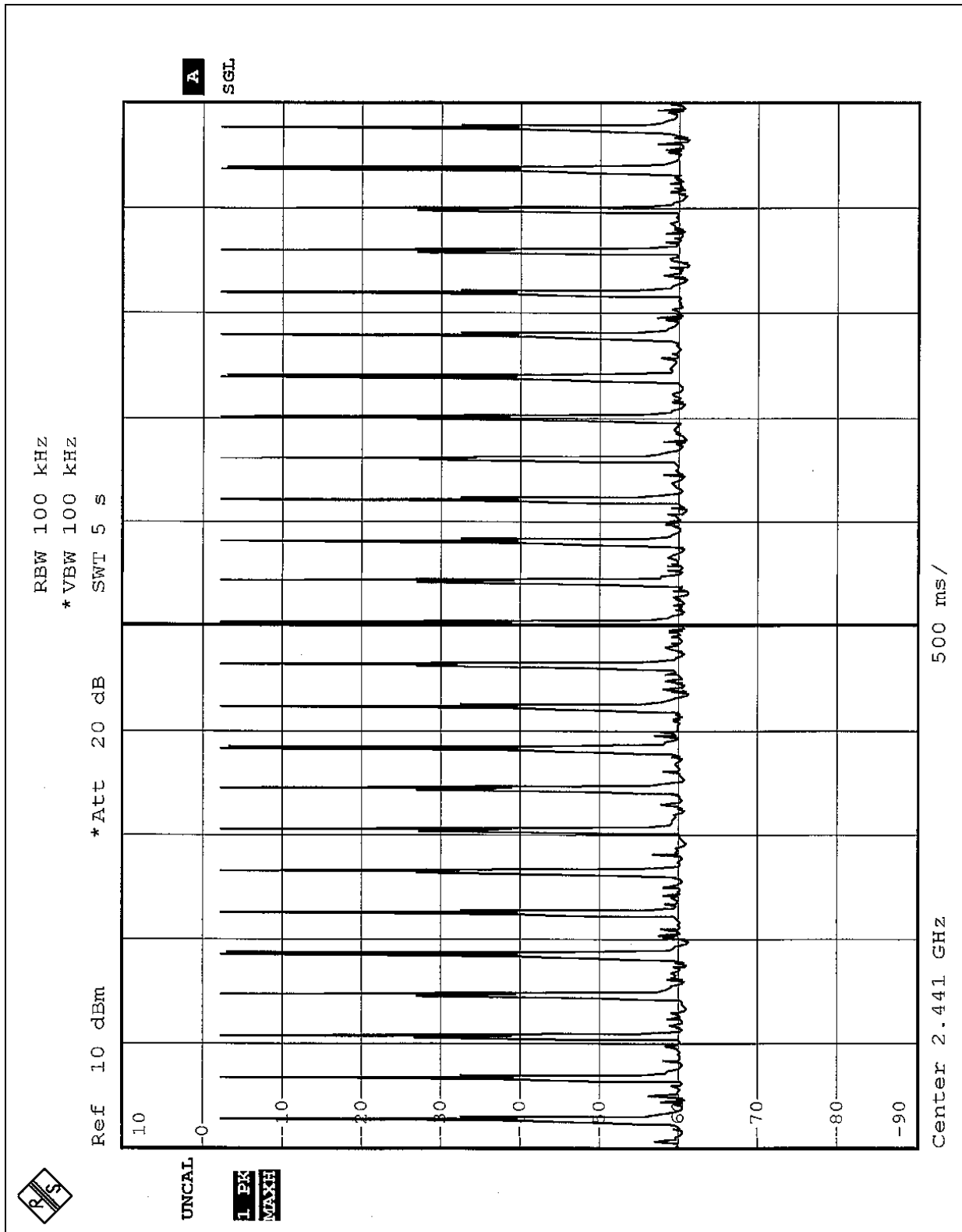




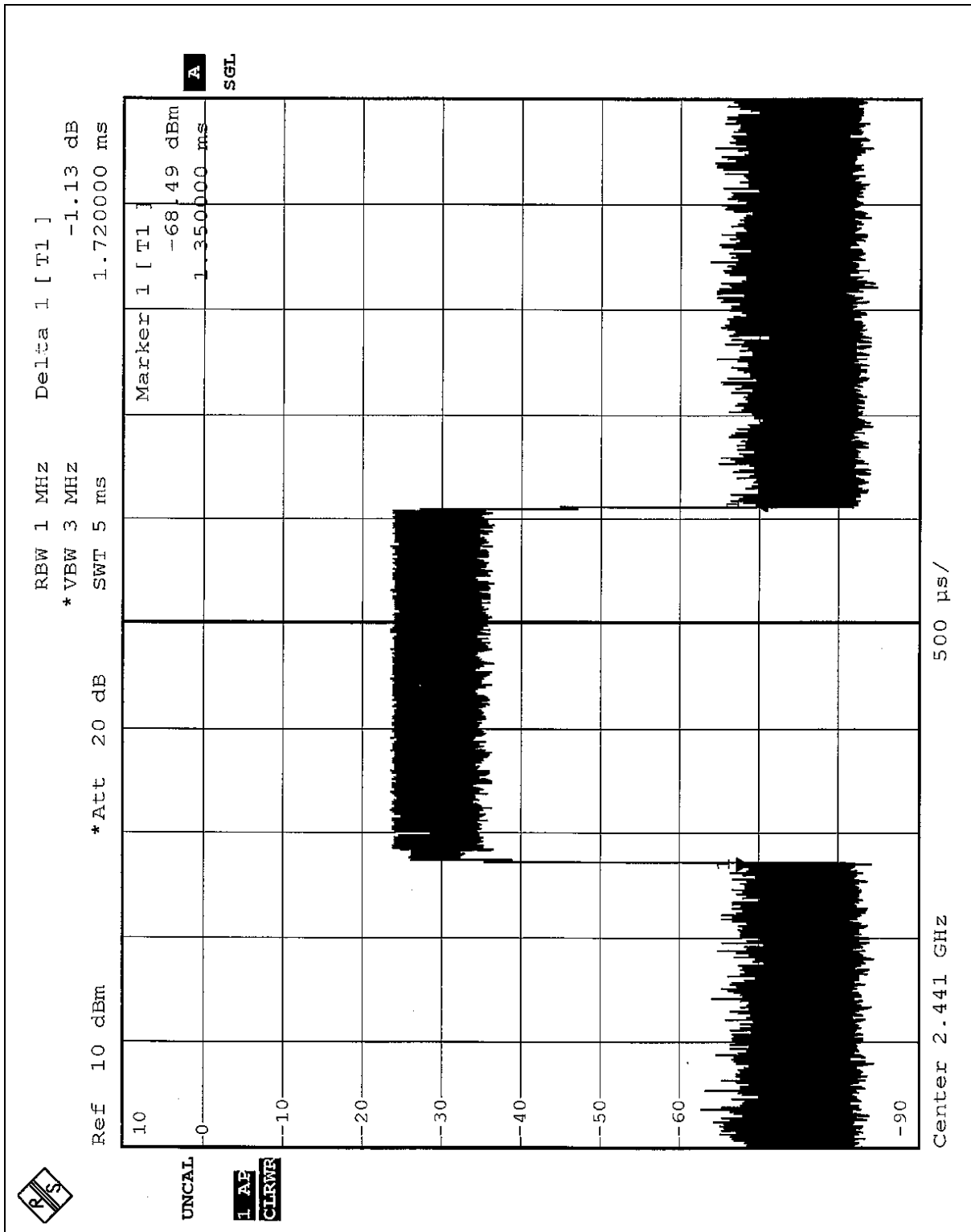
DH1



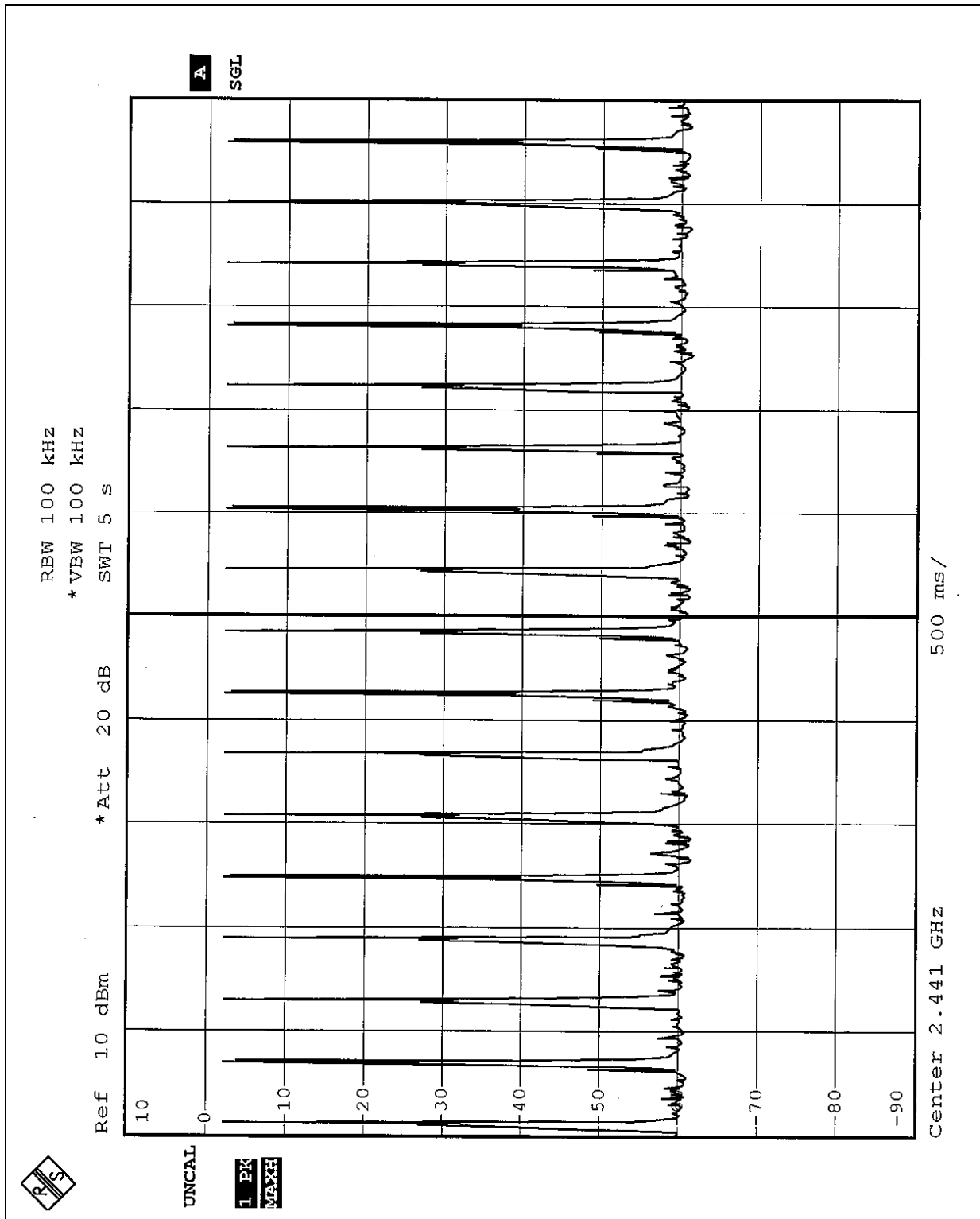
DH3



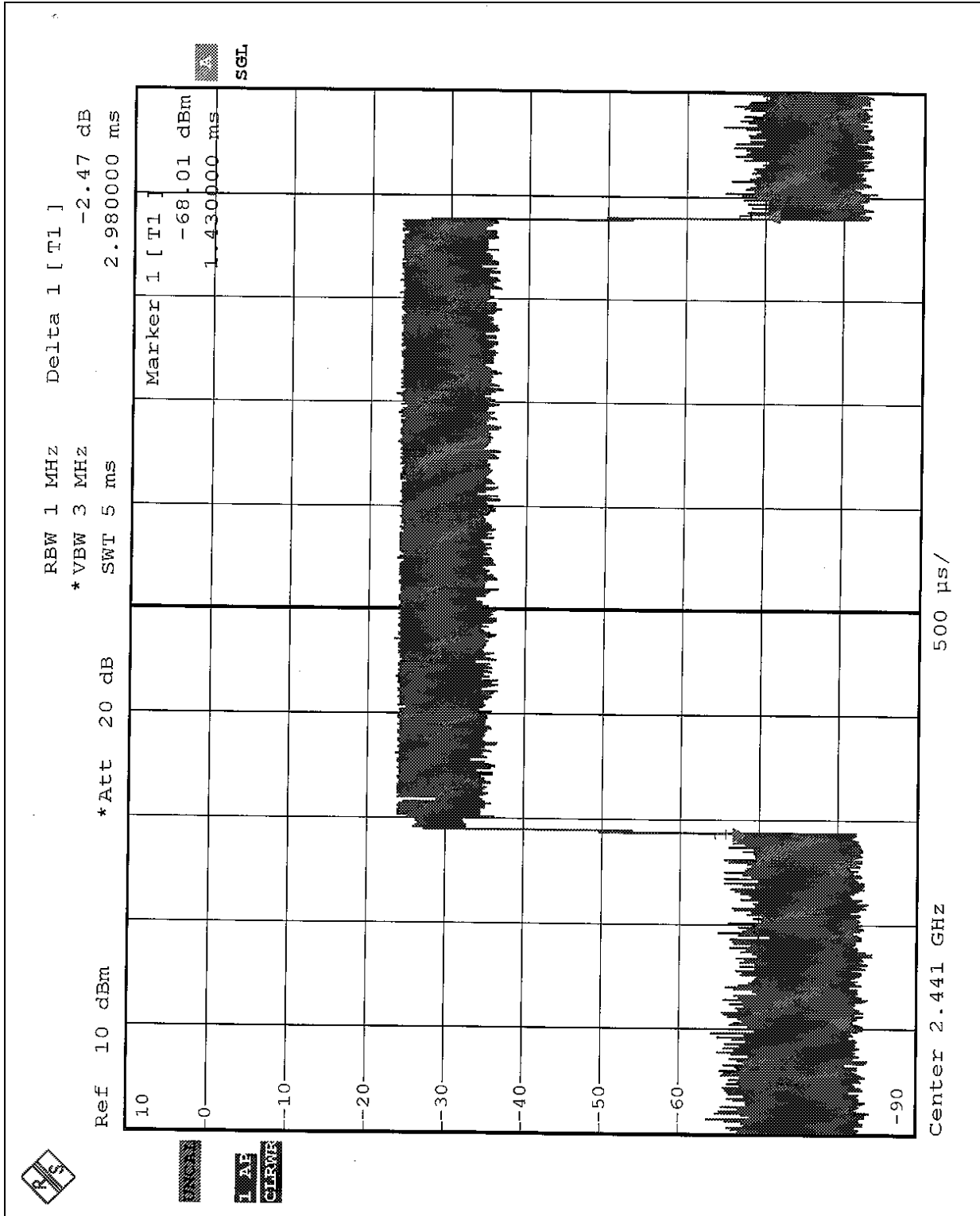
DH3



DH5



DH5



4.4 CHANNEL BANDWIDTH

4.4.1 LIMITS OF CHANNEL BANDWIDTH

For frequency hopping system operating in the 2400-2483.5 MHz and 5725-5850 MHz bands, the maximum 20dB bandwidth of the hopping channel is 1 MHz.

4.4.2 TEST INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
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.

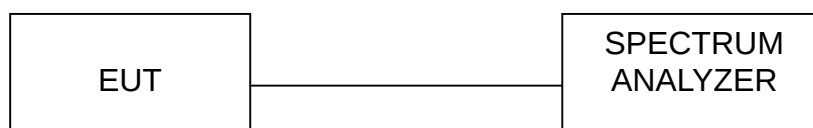
4.4.3 TEST PROCEDURE

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.
3. Measure the frequency difference of two frequencies that were attenuated 20dB from the reference level. Record the frequency difference as the emission bandwidth.
4. Repeat above procedures until all frequencies measured were complete.

4.4.4 DEVIATION FROM TEST STANDARD

No deviation

4.4.5 TEST SETUP



4.4.6 EUT OPERATING CONDITION

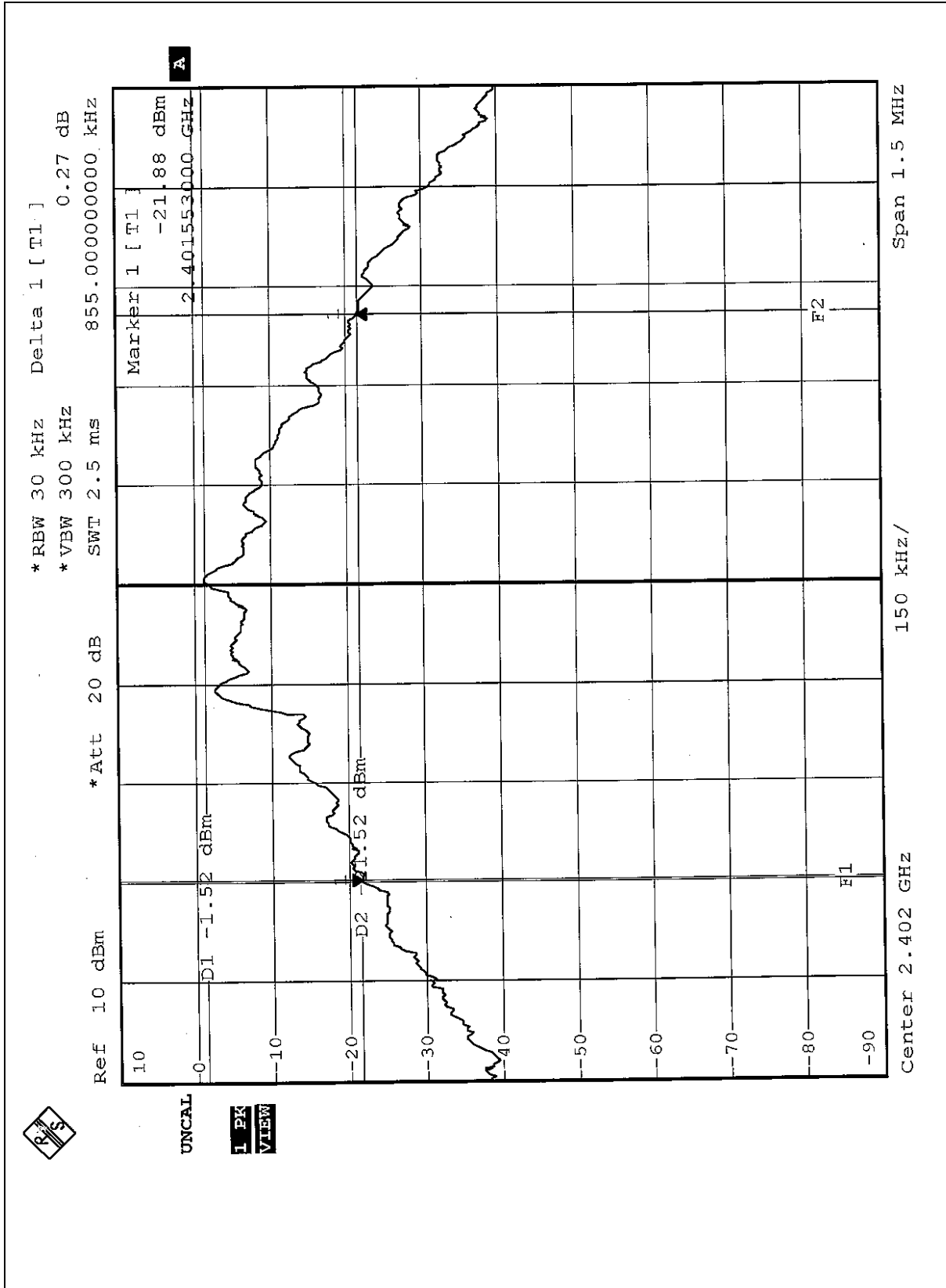
The software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel frequencies individually.

4.4.7 TEST RESULTS

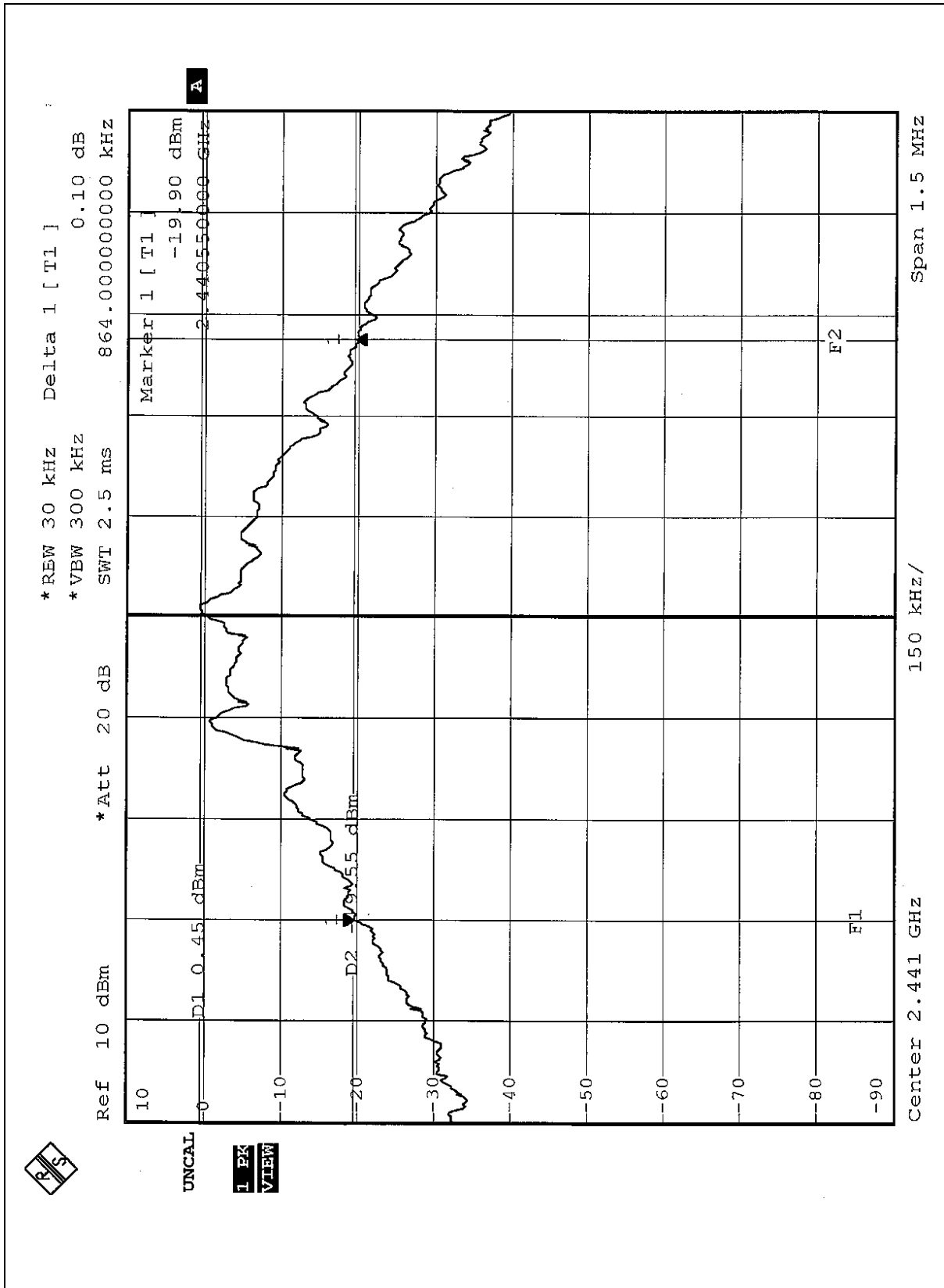
EUT	Bluetooth Headset	MODEL	ME-101
ENVIRONMENTAL CONDITIONS	24deg. C, 65%RH, 991 hPa	INPUT POWER (SYSTEM)	120Vac, 60 Hz
TESTED BY: Jamison Chan			

CHANNEL	CHANNEL FREQUENCY (MHz)	20dB BANDWIDTH (kHz)	MAXIMUM LIMIT (MHz)	PASS/FAIL
0	2402	855	1	PASS
39	2441	864	1	PASS
78	2480	855	1	PASS

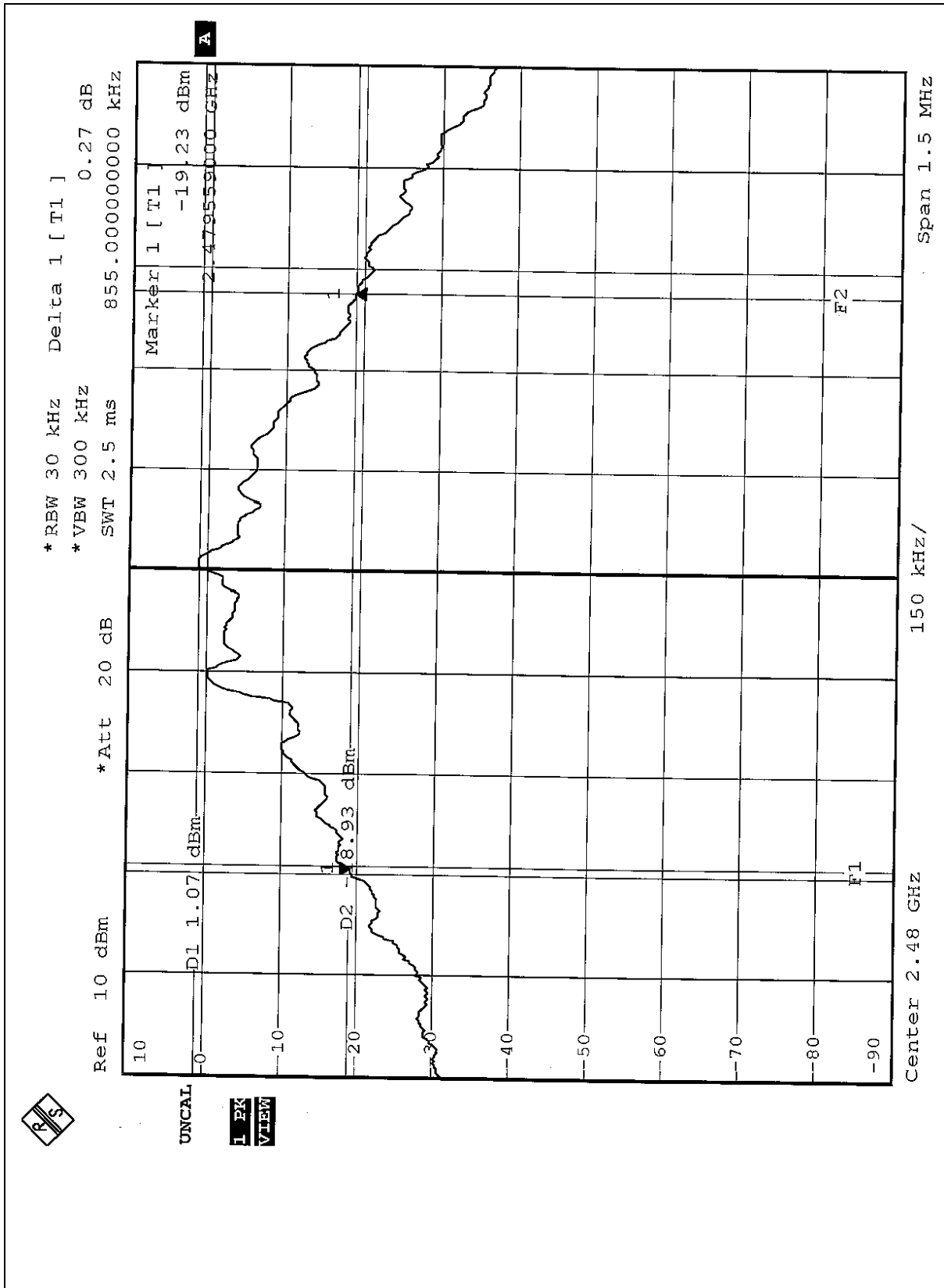
Channel 0



Channel 39



Channel 78



4.5 HOPPING CHANNEL SEPARATION

4.5.1 LIMIT OF HOPPING CHANNEL SEPARATION

At least 25kHz or 20dB bandwidth (whichever is greater).

4.5.2 TEST INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
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.

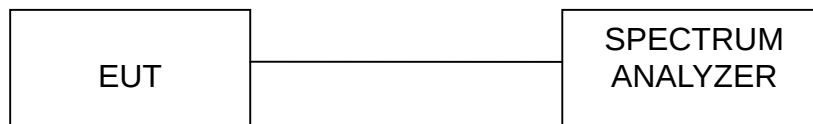
4.5.3 TEST PROCEDURES

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range.
3. By using the MaxHold function record the separation of two adjacent channels.
4. Measure the frequency difference of these two adjacent channels by SA MARK function. And then plot the result on SA screen.
5. Repeat above procedures until all frequencies measured were complete.

4.5.4 DEVIATION FROM TEST STANDARD

No deviation

4.5.5 TEST SETUP



4.5.6 TEST RESULTS

EUT	Bluetooth Headset	MODEL	ME-101
ENVIRONMENTAL CONDITIONS	24deg. C, 65%RH, 991 hPa	INPUT POWER (SYSTEM)	120Vac, 60 Hz
TESTED BY: Jamison Chan			

Channel	Frequency (MHz)	Adjacent Channel Separation	Minimum Limit (kHz)	Pass / Fail
0	2402	1.000MHz	855	PASS
39	2441	1.005MHz	864	PASS
78	2480	1.005MHz	855	PASS

The minimum limit is 20dB bandwidth. Test results please refer to next three pages.

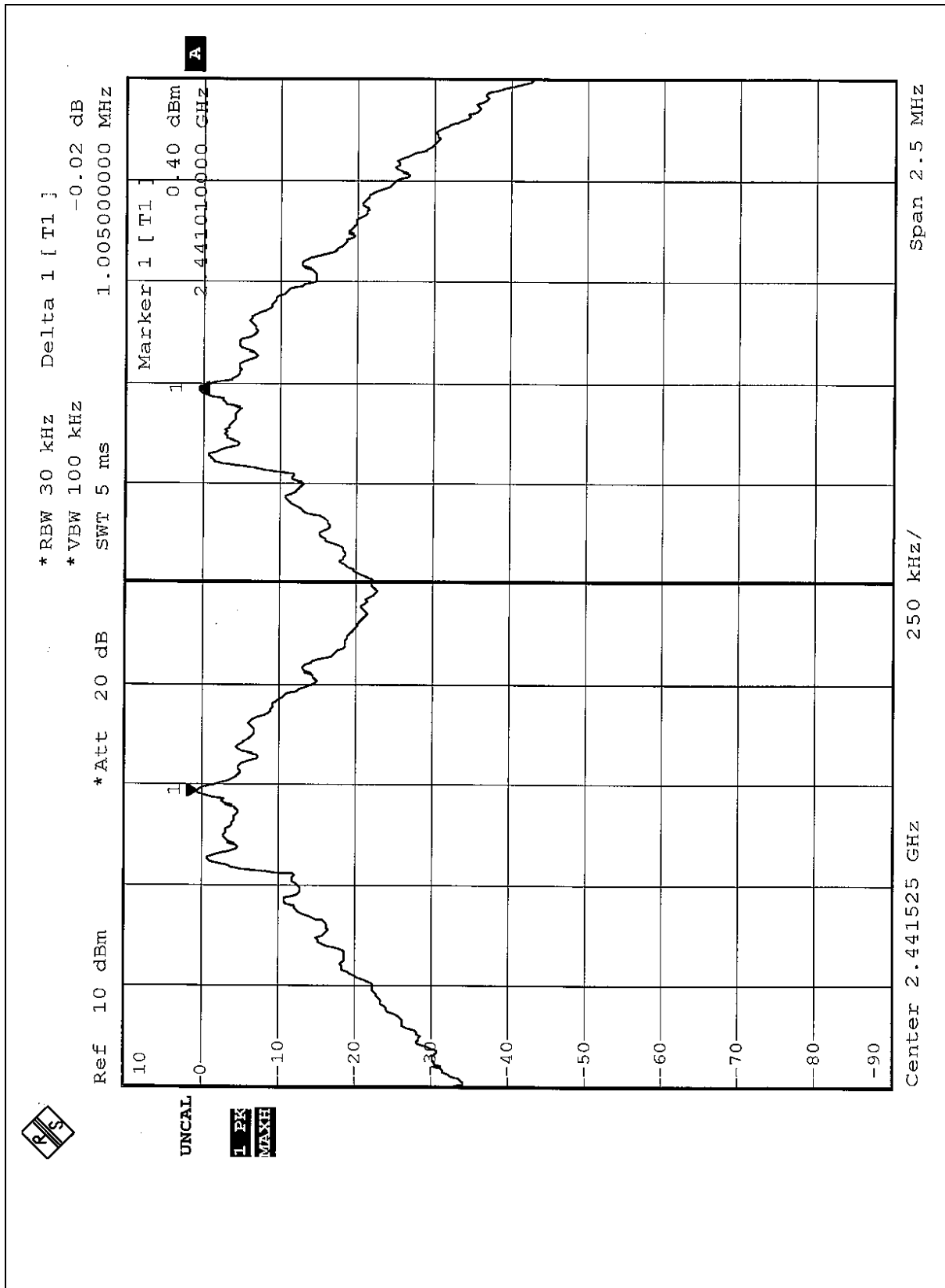
*REW 30 kHz Delta 1 [T1]
 *VBW 100 kHz -0.07 dB
 *Att 20 dB 1.000000000 MHz
 SWT 5 ms

Ref 10 dBm
 10
 0
 -10
 -20
 -30
 -40
 -50
 -60
 -70
 -80
 -90

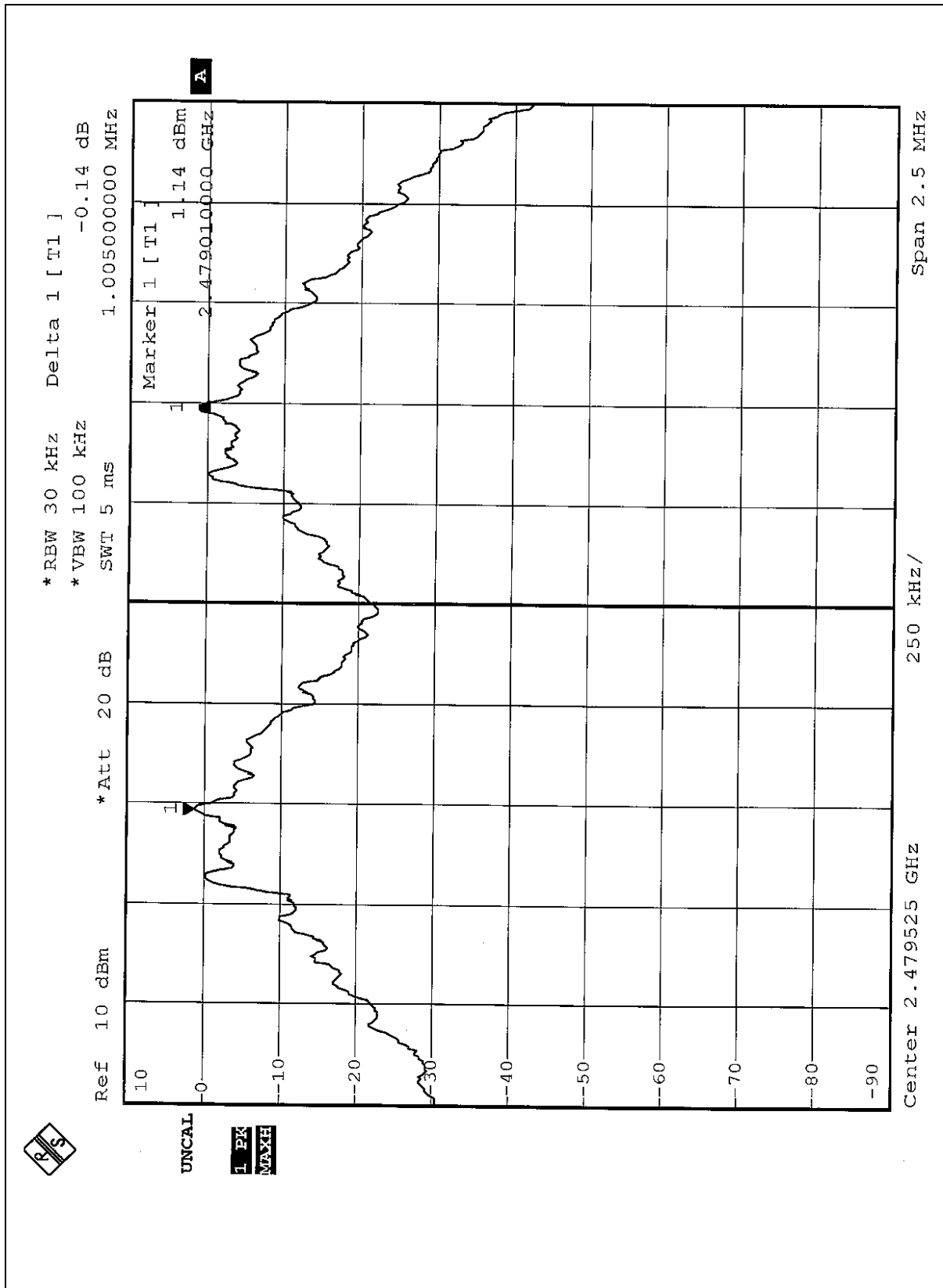
1
 1
 Marker 1 [T1]
 -6.03 dBm
 2.402010000 GHz

250 kHz/
 Center 2.402625 GHz
 Span 2.5 MHz

Channel 39



Channel 78



4.6 MAXIMUM PEAK OUTPUT POWER

4.6.1 LIMITS OF MAXIMUM PEAK OUTPUT POWER MEASUREMENT

The Maximum Peak Output Power Measurement is 30dBm.

4.6.2 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.

4.6.3 TEST PROCEDURES

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.
3. The center frequency of the spectrum analyzer is set to the fundamental frequency and using 3 MHz RBW and 3 MHz VBW.
4. Measure the frequency difference of two frequencies that were attenuated 20dB from the reference level. Record the frequency difference as the emission bandwidth.
5. Repeat above procedures until all frequencies measured were complete.

4.6.4 DEVIATION FROM TEST STANDARD

No deviation

4.6.5 TEST SETUP



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

4.6.6 EUT OPERATING CONDITION

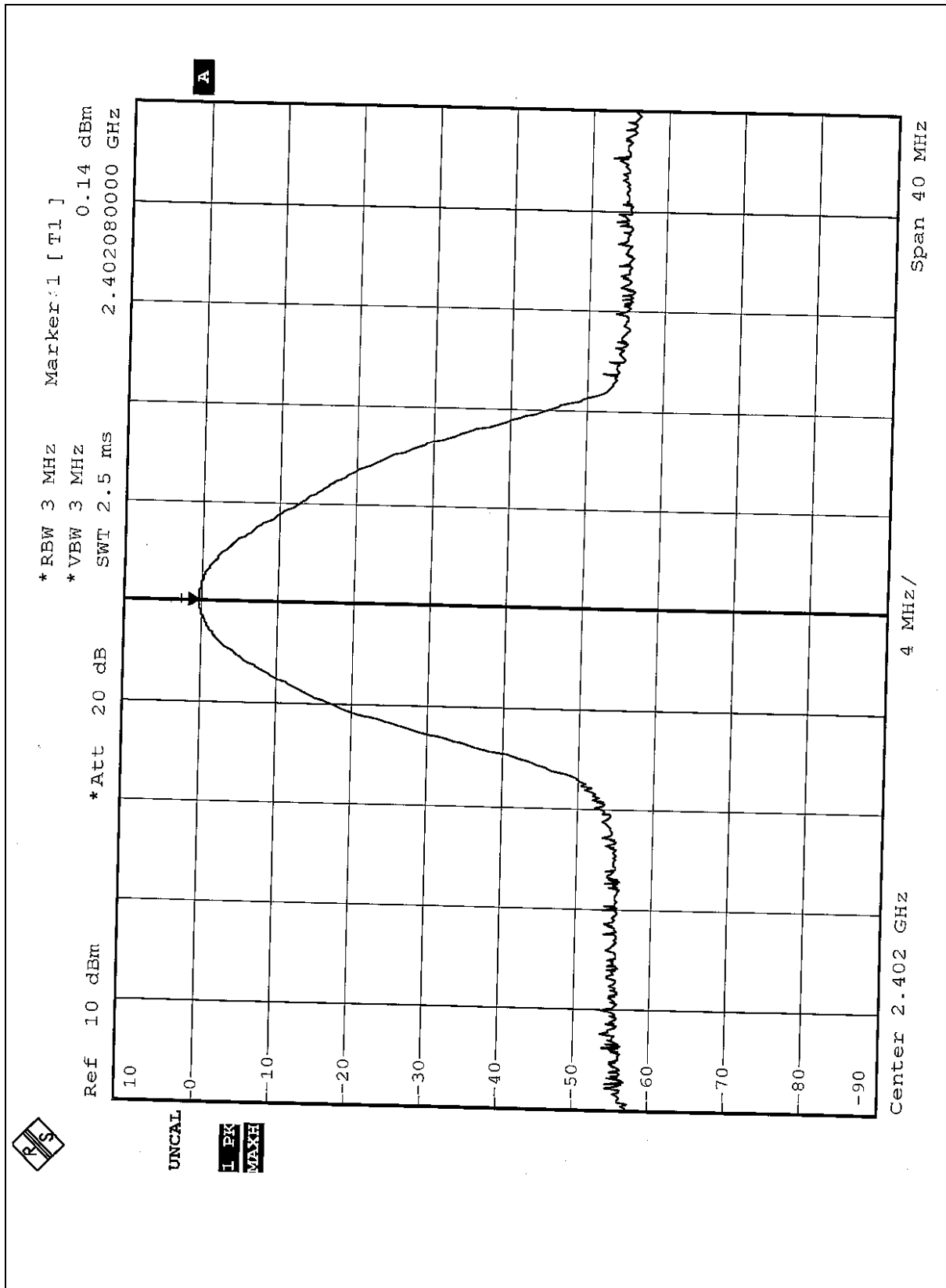
The software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel frequencies individually.

4.6.7 TEST RESULTS

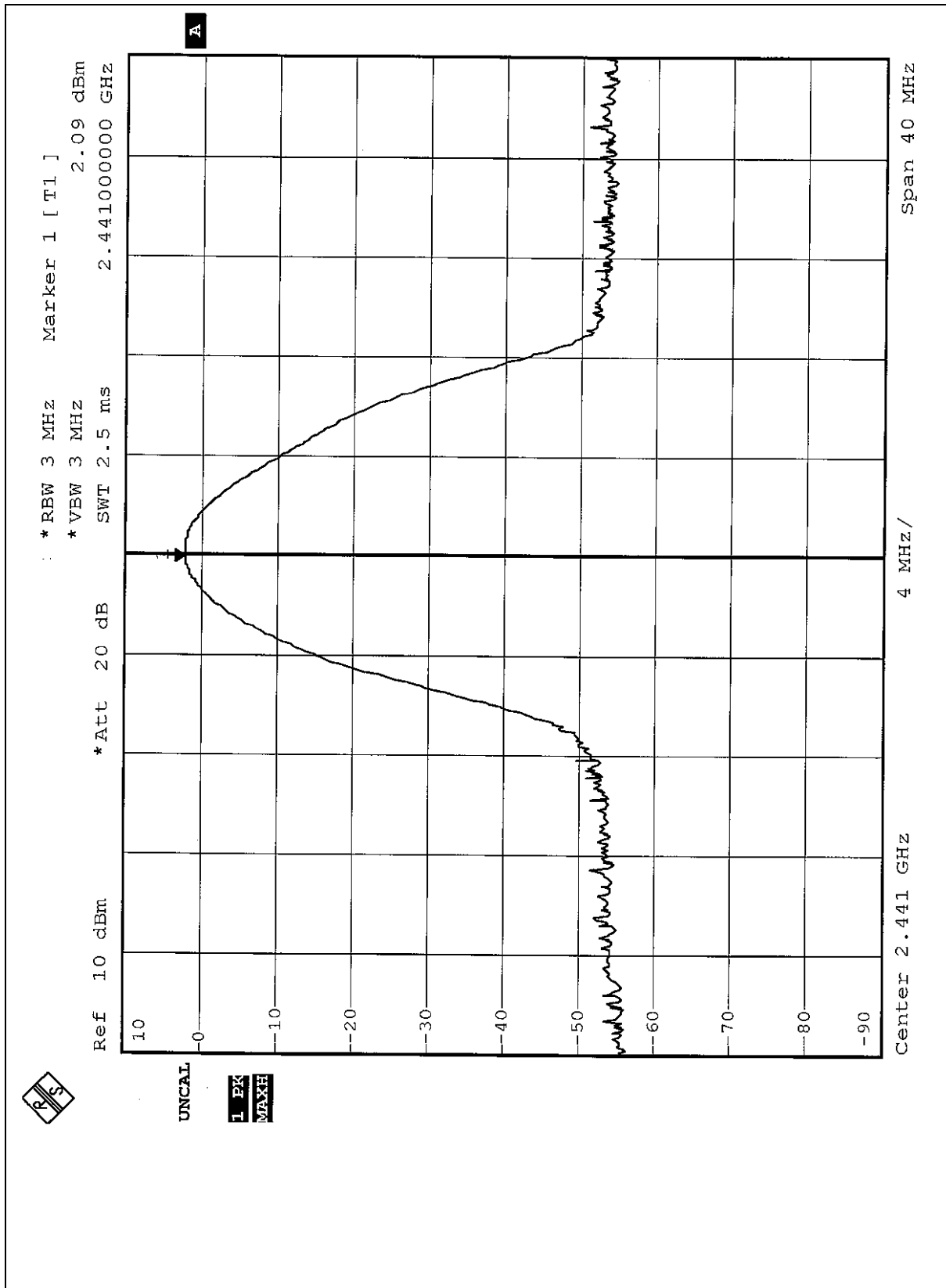
EUT	Bluetooth Headset	MODEL	ME-101
ENVIRONMENTAL CONDITIONS	24deg. C, 65%RH, 991 hPa	INPUT POWER (SYSTEM)	120Vac, 60 Hz
TESTED BY: Jamison Chan			

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (dBm)	PASS/FAIL
0	2402	0.14	30	PASS
39	2441	2.09	30	PASS
78	2480	2.77	30	PASS

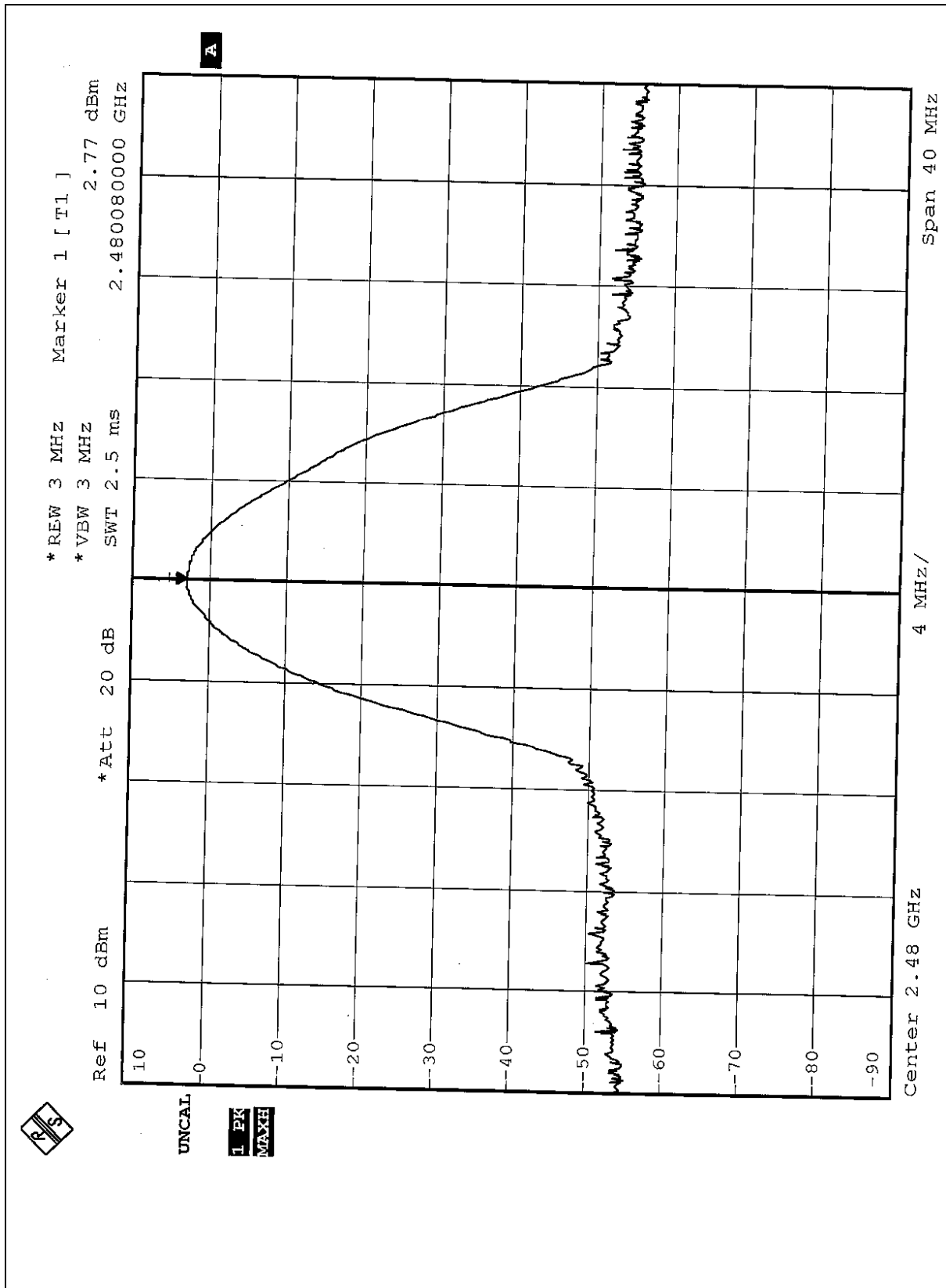
Channel 0



Channel 39



Channel 78



4.7 RADIATED EMISSION MEASUREMENT

4.7.1 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

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.

4.7.2 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_V5.14	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.

4.7.3 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 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 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.

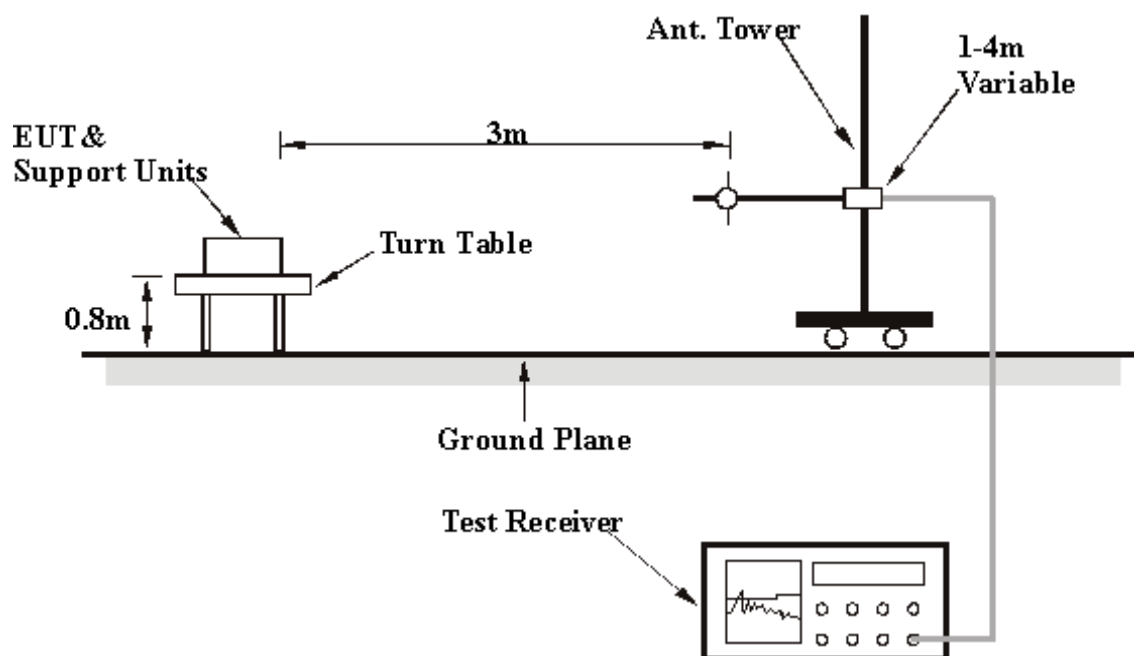
NOTE:

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.

4.7.4 DEVIATION FROM TEST STANDARD

No deviation

4.7.5 TEST SETUP



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

4.7.6 TEST RESULTS

EUT	Bluetooth Headset	MODEL	ME-101
CHANNEL	78	FREQUENCY RANGE	Below 1GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	25 deg. C, 65 % RH, 991hPa	TEST MODE	A
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	59.16	21.40 QP	40.00	-18.60	1.75 H	82	7.61	13.79
2	113.59	18.58 QP	43.50	-24.92	1.50 H	238	6.21	12.37
3	127.19	19.28 QP	43.50	-24.22	1.75 H	274	5.75	13.53
4	142.75	21.99 QP	43.50	-21.51	2.00 H	94	7.51	14.48
5	228.28	20.23 QP	46.00	-25.77	1.50 H	310	7.89	12.35
6	286.59	23.37 QP	46.00	-22.63	1.00 H	244	9.07	14.29
7	751.18	25.11 QP	46.00	-20.89	1.75 H	169	1.57	23.54
8	815.33	25.03 QP	46.00	-20.97	2.50 H	34	1.09	23.93
9	860.04	25.29 QP	46.00	-20.71	2.50 H	289	0.91	24.37
10	904.75	38.19 QP	46.00	-7.81	1.00 H	229	13.02	25.16
11	957.23	26.51 QP	46.00	-19.49	2.00 H	64	0.85	25.66

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	59.16	33.13 QP	40.00	-6.87	1.00 V	7	19.34	13.79
2	96.09	22.92 QP	43.50	-20.58	2.00 V	115	12.25	10.68
3	129.14	30.95 QP	43.50	-12.55	1.00 V	298	17.28	13.67
4	142.75	28.36 QP	43.50	-15.14	1.00 V	316	13.88	14.48
5	228.28	24.23 QP	46.00	-21.77	2.00 V	127	11.88	12.35
6	329.36	22.49 QP	46.00	-23.51	1.50 V	346	7.31	15.18
7	856.15	25.47 QP	46.00	-20.53	1.50 V	178	1.16	24.30
8	906.69	25.76 QP	46.00	-20.24	2.00 V	67	0.58	25.18
9	943.63	25.95 QP	46.00	-20.05	2.00 V	94	0.38	25.57

- REMARKS:**
1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB/m)
 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	Bluetooth Headset	MODEL	ME-101
CHANNEL	78	FREQUENCY RANGE	Below 1GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	25 deg. C, 65 % RH, 991hPa	TEST MODE	B
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	98.04	29.00 QP	43.50	-14.50	2.00 H	190	18.17	10.83
2	129.14	32.69 QP	43.50	-10.81	1.75 H	355	19.03	13.67
3	164.13	36.24 QP	43.50	-7.26	1.75 H	49	21.75	14.49
4	199.12	29.21 QP	43.50	-14.29	1.50 H	118	17.75	11.46
5	307.98	30.68 QP	46.00	-15.32	1.00 H	133	16.00	14.68
6	344.91	34.72 QP	46.00	-11.28	1.00 H	142	19.18	15.53
7	370.18	33.28 QP	46.00	-12.72	1.00 H	148	17.19	16.09
8	395.45	31.90 QP	46.00	-14.10	1.00 H	157	15.25	16.65
9	533.47	26.68 QP	46.00	-19.32	1.75 H	208	7.31	19.37
10	599.56	29.48 QP	46.00	-16.52	1.50 H	226	8.49	21.00

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	66.93	30.59 QP	40.00	-9.41	1.00 V	235	17.66	12.93
2	84.43	30.58 QP	40.00	-9.42	1.25 V	334	20.51	10.07
3	127.19	32.75 QP	43.50	-10.75	1.00 V	184	19.22	13.53
4	158.30	29.32 QP	43.50	-14.18	2.00 V	298	14.47	14.85
5	199.12	25.96 QP	43.50	-17.54	1.75 V	145	14.50	11.46
6	228.28	24.78 QP	46.00	-21.22	2.00 V	298	12.43	12.35
7	733.69	29.28 QP	46.00	-16.72	1.25 V	97	6.15	23.13
8	863.93	29.99 QP	46.00	-16.01	1.25 V	115	5.55	24.45

- REMARKS:**
1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB/m)
 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	Bluetooth Headset	MODEL	ME-101
CHANNEL	78	FREQUENCY RANGE	Below 1GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	25 deg. C, 65 % RH, 991hPa	TEST MODE	C
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	35.83	25.53 QP	40.00	-14.47	1.50 H	307	10.96	14.57
2	84.43	17.54 QP	40.00	-22.46	1.50 H	193	7.47	10.07
3	113.59	17.20 QP	43.50	-26.30	1.00 H	358	4.82	12.37
4	142.75	20.36 QP	43.50	-23.14	1.75 H	34	5.88	14.48
5	171.90	18.27 QP	43.50	-25.23	1.25 H	211	4.53	13.74
6	228.28	19.69 QP	46.00	-26.31	1.25 H	127	7.34	12.35
7	286.59	22.77 QP	46.00	-23.23	1.00 H	163	8.47	14.29
8	329.36	20.08 QP	46.00	-25.92	1.00 H	250	4.91	15.18
9	825.05	24.14 QP	46.00	-21.86	1.25 H	16	0.14	24.01
10	856.15	24.54 QP	46.00	-21.46	1.25 H	313	0.24	24.30
11	891.14	24.97 QP	46.00	-21.03	1.25 H	46	0.02	24.95
12	922.24	25.50 QP	46.00	-20.50	1.00 H	253	0.15	25.35
13	953.35	24.51 QP	46.00	-21.49	1.50 H	175	-1.14	25.65

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	35.83	37.62 QP	40.00	-2.38	1.00 V	97	23.05	14.57
2	45.55	28.33 QP	40.00	-11.67	1.00 V	91	13.09	15.23
3	66.93	30.94 QP	40.00	-9.06	1.00 V	22	18.02	12.93
4	84.43	27.39 QP	40.00	-12.61	1.50 V	157	17.32	10.07
5	113.59	25.22 QP	43.50	-18.28	1.00 V	244	12.85	12.37
6	127.19	30.76 QP	43.50	-12.74	1.50 V	268	17.23	13.53
7	142.75	26.23 QP	43.50	-17.27	1.25 V	16	11.75	14.48
8	228.28	23.28 QP	46.00	-22.72	2.00 V	88	10.94	12.35
9	286.59	23.72 QP	46.00	-22.28	1.50 V	160	9.43	14.29
10	329.36	22.30 QP	46.00	-23.70	1.25 V	193	7.12	15.18
11	758.96	24.90 QP	46.00	-21.10	1.25 V	187	1.32	23.58
12	803.67	25.27 QP	46.00	-20.73	1.25 V	151	1.42	23.85
13	889.20	25.47 QP	46.00	-20.53	1.75 V	328	0.56	24.91
14	939.74	25.86 QP	46.00	-20.14	1.25 V	223	0.33	25.53

REMARKS:

1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB/m)
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	Bluetooth Headset	MODEL	ME-101
CHANNEL	78	FREQUENCY RANGE	Below 1GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	25 deg. C, 65 % RH, 991hPa	TEST MODE	D
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	31.94	22.13 QP	40.00	-17.87	1.00 H	232	8.20	13.93
2	57.21	19.89 QP	40.00	-20.11	1.50 H	253	5.90	13.99
3	80.54	20.25 QP	40.00	-19.75	1.50 H	34	10.27	9.98
4	107.76	14.84 QP	43.50	-28.66	1.50 H	352	3.07	11.77
5	142.75	17.39 QP	43.50	-26.11	2.00 H	103	2.90	14.48
6	160.24	18.04 QP	43.50	-25.46	1.50 H	157	3.18	14.87
7	199.12	16.84 QP	43.50	-26.66	2.00 H	175	5.38	11.46
8	228.28	20.32 QP	46.00	-25.68	1.50 H	226	7.97	12.35
9	257.43	16.76 QP	46.00	-29.24	1.00 H	181	3.43	13.33
10	286.59	17.03 QP	46.00	-28.97	2.50 H	10	2.74	14.29
11	329.36	18.33 QP	46.00	-27.67	1.00 H	259	3.15	15.18
12	735.63	24.14 QP	46.00	-21.86	2.00 H	328	0.96	23.18
13	854.21	24.99 QP	46.00	-21.01	1.50 H	328	0.72	24.27
14	895.03	25.50 QP	46.00	-20.50	2.00 H	256	0.48	25.02
15	951.40	25.69 QP	46.00	-20.31	1.50 H	124	0.05	25.64

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	33.89	20.63 QP	40.00	-19.37	1.00 V	226	6.38	14.25
2	55.27	30.77 QP	40.00	-9.23	1.00 V	1	16.59	14.18
3	76.65	36.28 QP	40.00	-3.72	1.00 V	10	25.44	10.84
4	92.20	31.43 QP	43.50	-12.07	1.50 V	253	21.06	10.37
5	111.64	28.91 QP	43.50	-14.59	1.00 V	262	16.74	12.17
6	156.35	25.01 QP	43.50	-18.49	1.00 V	289	10.21	14.80
7	228.28	24.47 QP	46.00	-21.53	2.00 V	208	12.12	12.35
8	243.83	20.41 QP	46.00	-25.59	2.00 V	13	7.28	13.13
9	257.43	18.69 QP	46.00	-27.31	2.00 V	154	5.36	13.33
10	286.59	23.15 QP	46.00	-22.85	1.50 V	172	8.85	14.29
11	329.36	22.09 QP	46.00	-23.91	1.50 V	235	6.91	15.18
12	457.66	21.99 QP	46.00	-24.01	1.00 V	88	3.82	18.17
13	741.46	24.41 QP	46.00	-21.59	1.50 V	196	1.09	23.32
14	914.47	25.38 QP	46.00	-20.62	1.50 V	49	0.12	25.26
15	957.23	25.29 QP	46.00	-20.71	1.50 V	70	-0.38	25.66

- REMARKS:**
1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB/m)
 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	Bluetooth Headset	MODEL	ME-101
CHANNEL	Channel 0	FREQUENCY RANGE	1 ~25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25 deg. C, 65 % 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	1200.00	49.18 PK	74.00	-24.82	1.22 H	238	22.17	27.01
2	*2402.00	95.45 PK			1.33 H	148	63.61	31.84
2	*2402.00	65.45 AV			1.33 H	148	33.61	31.84
3	4804.00	64.15 PK	74.00	-9.85	1.00 H	154	26.11	38.04
3	4804.00	34.15 AV	54.00	-19.85	1.00 H	154	-3.89	38.04

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	1200.00	52.08 PK	74.00	-21.92	1.00 V	9	25.07	27.01
2	*2402.00	96.17 PK			1.00 V	154	64.33	31.84
2	*2402.00	66.17 AV			1.00 V	154	34.33	31.84
3	4804.00	67.14 PK	74.00	-6.86	1.00 V	146	29.10	38.04
3	4804.00	37.14 AV	54.00	-16.86	1.00 V	146	-0.90	38.04

- 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
 6. The DH5 packet was the worse case duty cycle for a transmit dwell time on a channel, based upon bluetooth theory the transmitter is on 0.625*5 per 247 ms per channel. Therefore, the duty cycle be equal to: $20\log(3.125/100) = -30\text{dB}$
 7. Average value = peak reading $-20\log(\text{duty cycle})$

EUT	Bluetooth Headset	MODEL	ME-101
CHANNEL	Channel 39	FREQUENCY RANGE	1 ~25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25 deg. C, 65 % 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	1221.00	43.34 PK	74.00	-30.66	1.20 H	237	16.26	27.08
2	*2441.00	99.86 PK			1.39 H	287	67.90	31.96
2	*2441.00	69.86 AV			1.39 H	287	37.90	31.96
3	4882.00	59.27 PK	74.00	-14.73	1.89 H	85	20.96	38.31
3	4882.00	29.27 AV	54.00	-24.73	1.89 H	85	-9.04	38.31

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	1221.00	40.81 PK	74.00	-33.19	1.32 V	170	13.73	27.08
2	*2441.00	99.39 PK			1.00 V	156	67.43	31.96
2	*2441.00	69.39 AV			1.00 V	156	37.43	31.96
3	4882.00	59.89 PK	74.00	-14.11	1.38 V	315	21.58	38.31
3	4882.00	29.89 AV	54.00	-24.11	1.38 V	315	-8.42	38.31

- 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
 6. The DH5 packet was the worse case duty cycle for a transmit dwell time on a channel, based upon bluetooth theory the transmitter is on 0.625*5 per 247 ms per channel. Therefore, the duty cycle be equal to: $20\log(3.125/100) = -30\text{dB}$
 7. Average value = peak reading $-20\log(\text{duty cycle})$

EUT	Bluetooth Headset	MODEL	ME-101
CHANNEL	Channel 78	FREQUENCY RANGE	1 ~25GHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25 deg. C, 65 % 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	1240.00	44.17 PK	74.00	-29.83	1.16 H	236	17.02	27.15
2	*2480.00	100.70 PK			1.31 H	307	68.62	32.08
2	*2480.00	70.70 AV			1.31 H	307	38.62	32.08
3	4960.00	59.27 PK	74.00	-14.73	1.04 H	340	20.60	38.66
3	4960.00	29.27 AV	54.00	-24.73	1.04 H	340	-9.39	38.66

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	1240.00	41.31 PK	74.00	-32.69	1.00 V	196	14.16	27.15
2	*2480.00	99.40 PK			1.00 V	154	67.32	32.08
2	*2480.00	69.40 AV			1.00 V	154	37.32	32.08
3	4960.00	60.48 PK	74.00	-13.52	1.00 V	337	21.81	38.66
3	4960.00	30.48 AV	54.00	-23.52	1.00 V	337	-8.18	38.66

- 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
 6. The DH5 packet was the worse case duty cycle for a transmit dwell time on a channel, based upon bluetooth theory the transmitter is on 0.625*5 per 247 ms per channel. Therefore, the duty cycle be equal to: $20\log(3.125/100) = -30\text{dB}$
 7. Average value = peak reading $-20\log(\text{duty cycle})$

4.8 BAND EDGES MEASUREMENT

4.8.1 LIMITS OF BAND EDGES MEASUREMENT

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

4.8.2 TEST INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
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.

4.8.3 TEST PROCEDURE

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

4.8.4 DEVIATION FROM TEST STANDARD

No deviation

4.8.5 EUT OPERATING CONDITION

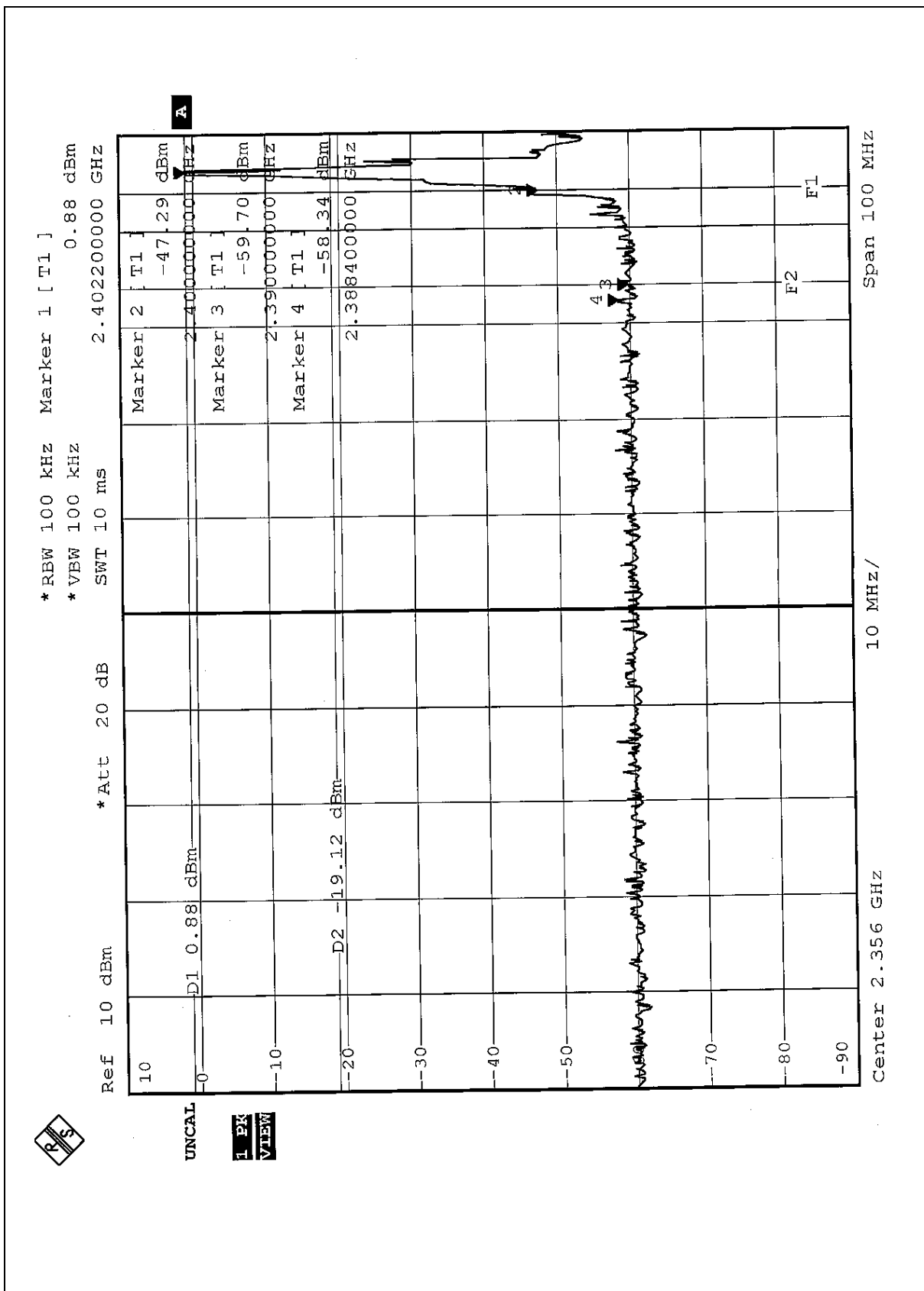
The software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel frequencies individually.

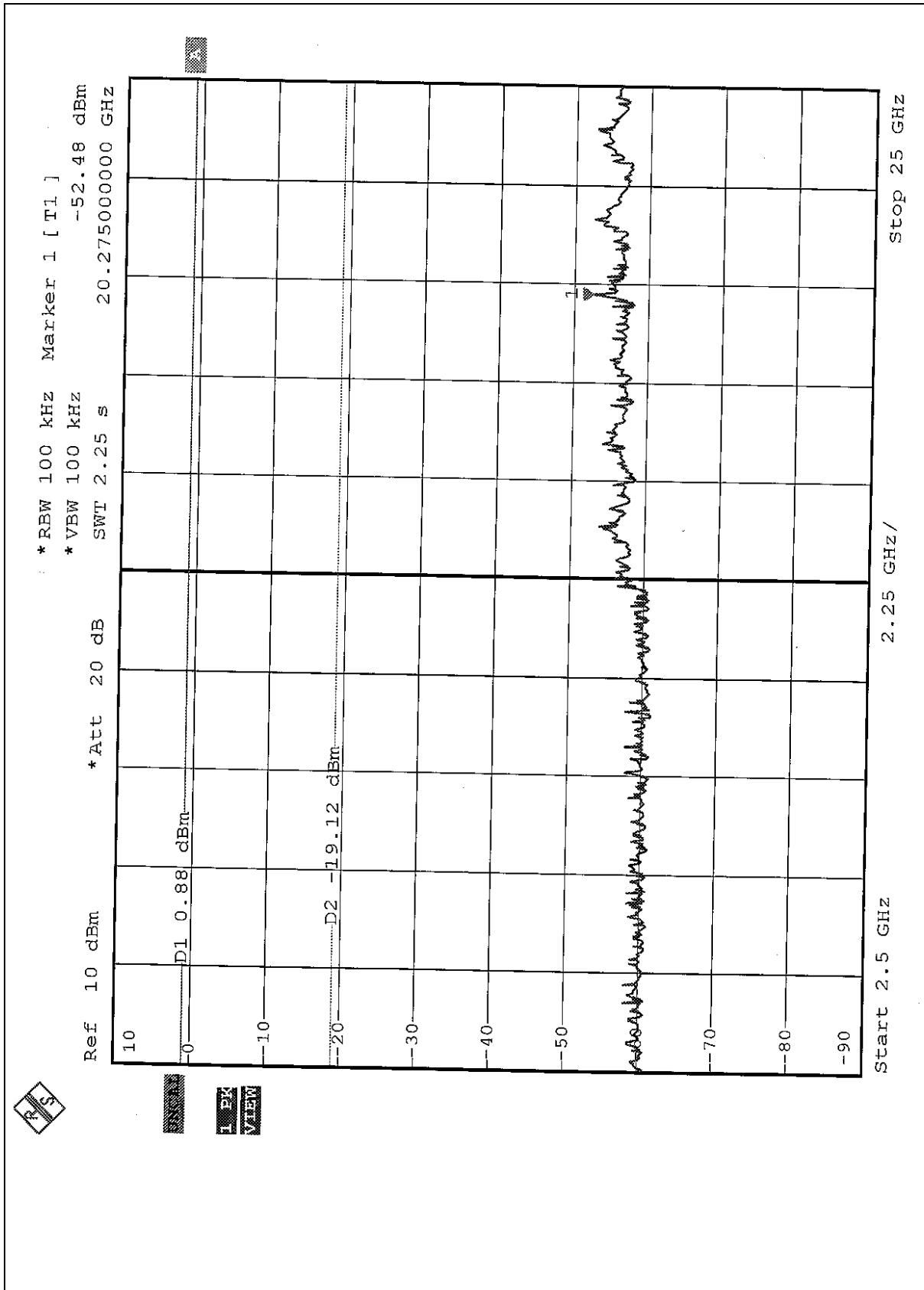
4.8.6 TEST RESULTS

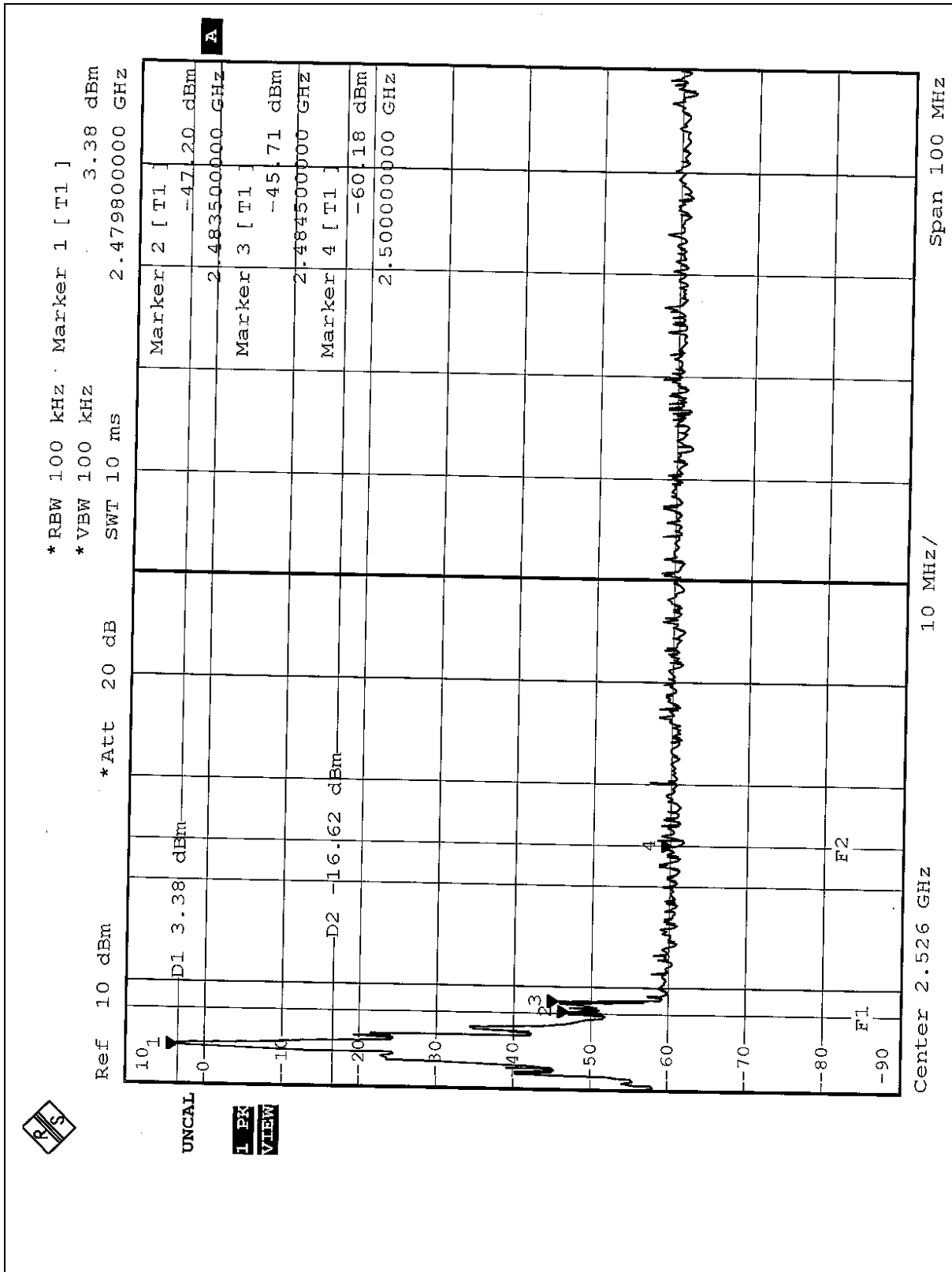
The spectrum plots are attached on the following 4 pages. D2 line indicates the highest level, D1 line indicates the 20dB offset below D2. It shows compliance with the requirement in part 15.247(C).

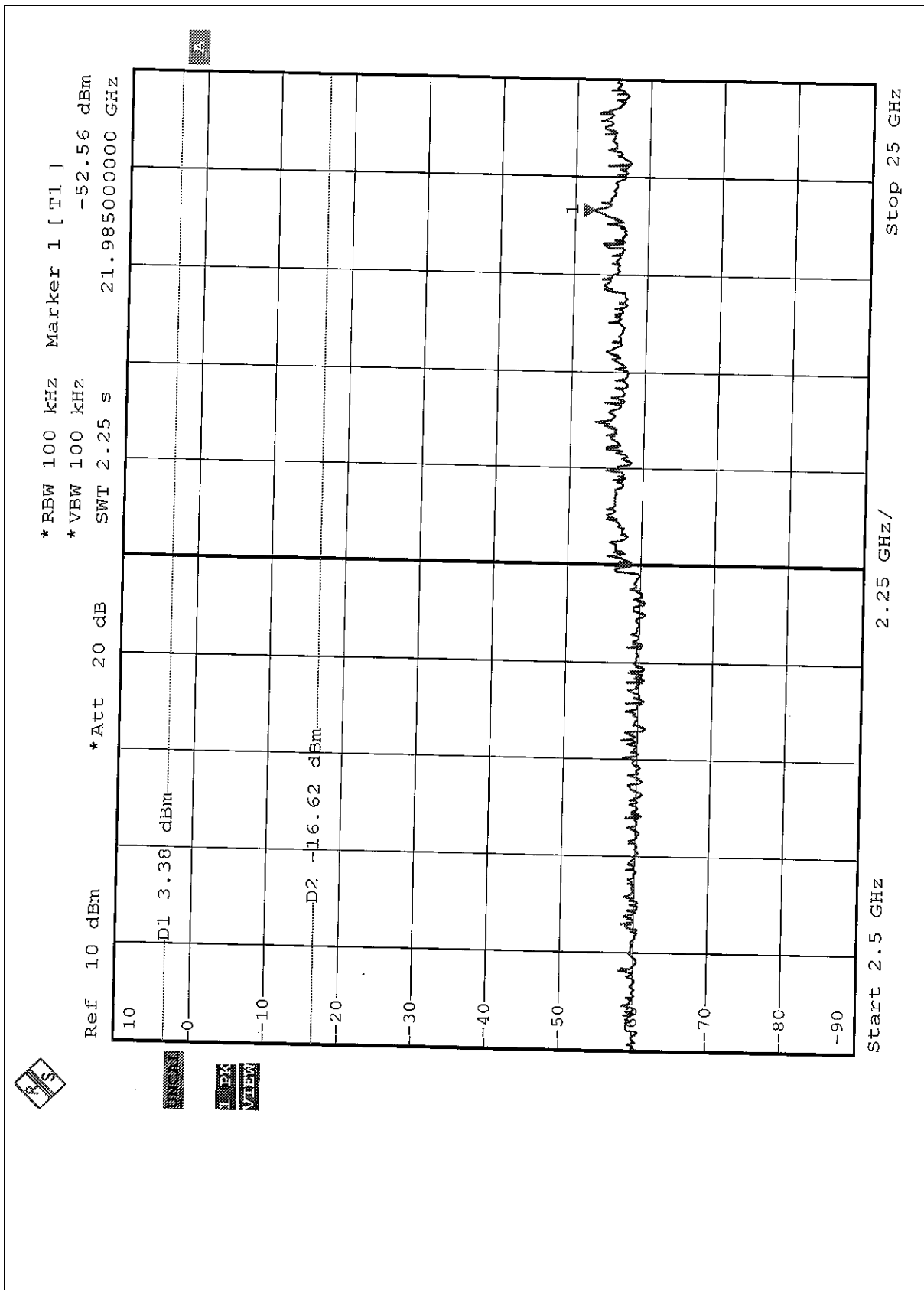
NOTE1: The band edge emission plot on the following 1 ~ 2 page shows 59.22dB delta between carrier maximum power and local maximum emission in restrict band (2.3884GHz). The emission of carrier strength list in the test result of channel 0 at the item 4.7.9 is 66.17dBuV/m, so the maximum field strength in restrict band is $66.17 - 59.22 = 6.95$ dBuV/m which is under 54 dBuV/m limit.

NOTE2: The band edge emission plot on the following 3 ~ 4 page shows 49.09dB delta between carrier maximum power and local maximum emission in restrict band (2.4845GHz). The emission of carrier strength list in the test result of channel 78 at the item 4.7.9 is 70.70dBuV/m, so the maximum field strength in restrict band is $70.70 - 49.09 = 20.80$ dBuV/m which is under 54 dBuV/m limit.











4.9 ANTENNA REQUIREMENT

4.9.1 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 6 dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

4.9.2 ANTENNA CONNECTED CONSTRUCTION

The antenna used in this product is Printed Antenna without antenna connector. The maximum Gain of this antenna is only –2.53dBi.

5 PHOTOGRAPHS OF THE TEST CONFIGURATION

CONDUCTED EMISSION TEST (For Test Mode A)



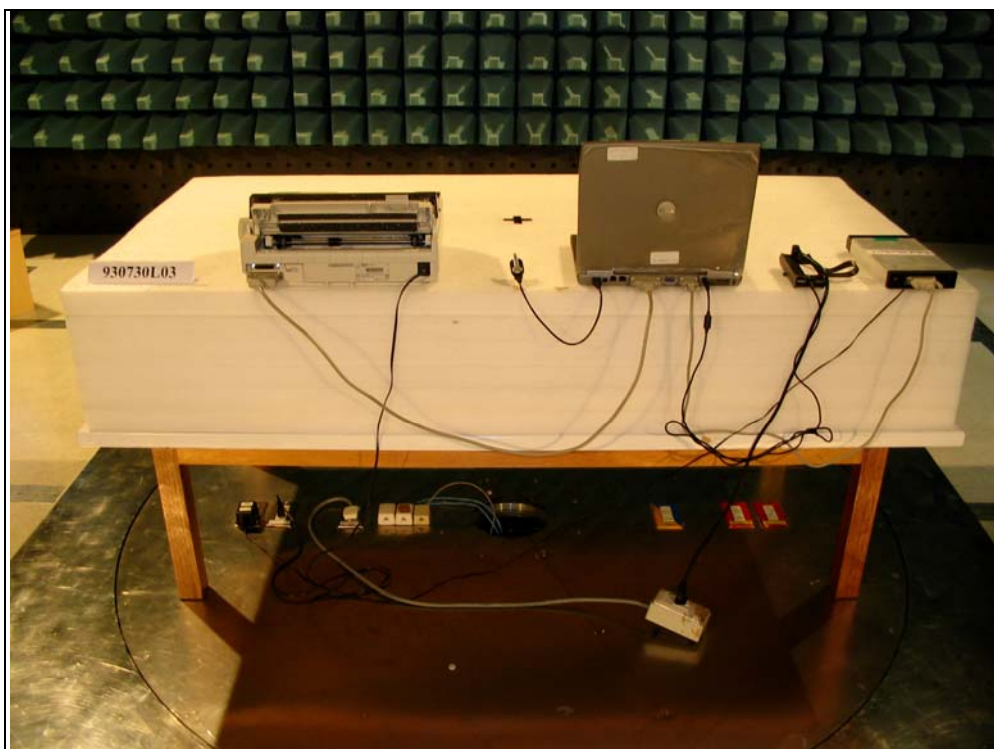
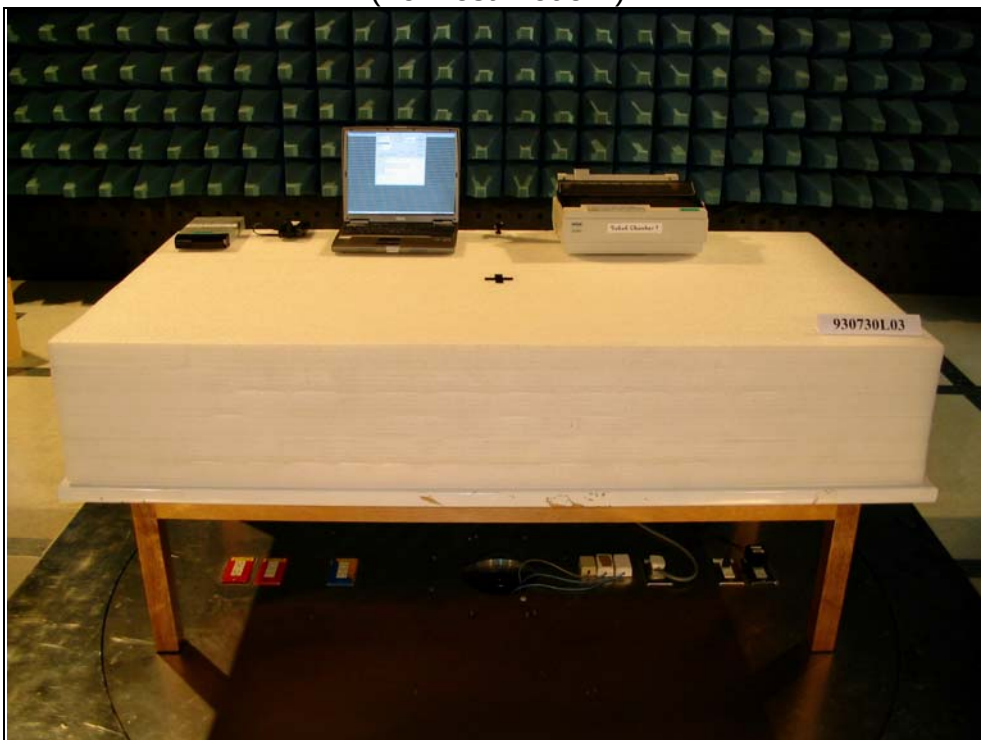
(For Test Mode B)



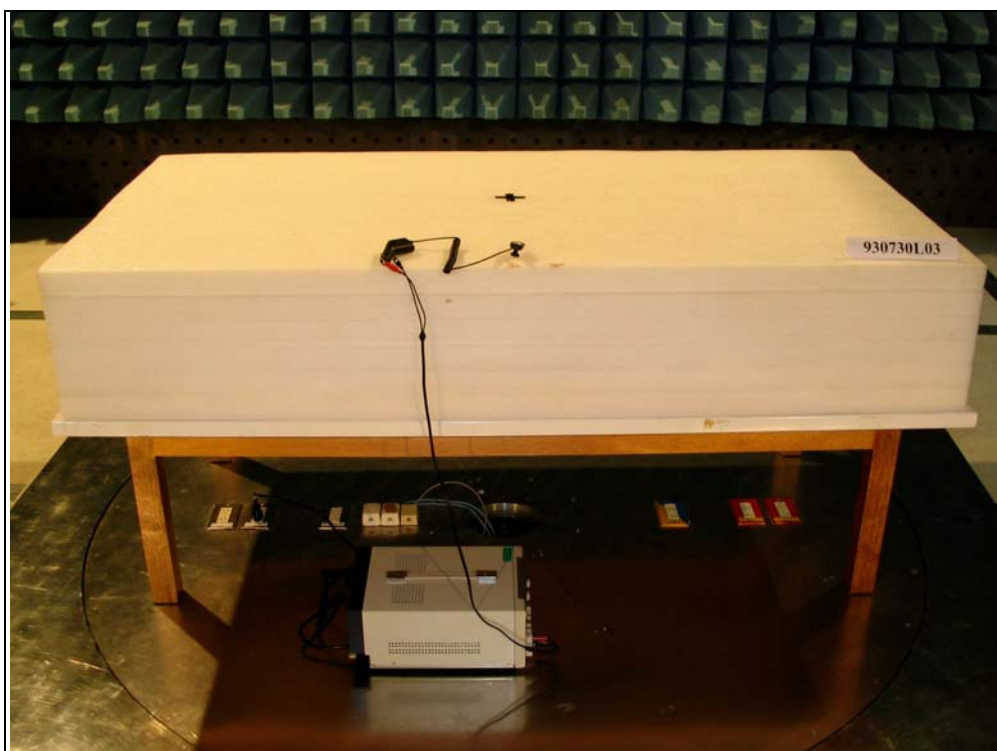
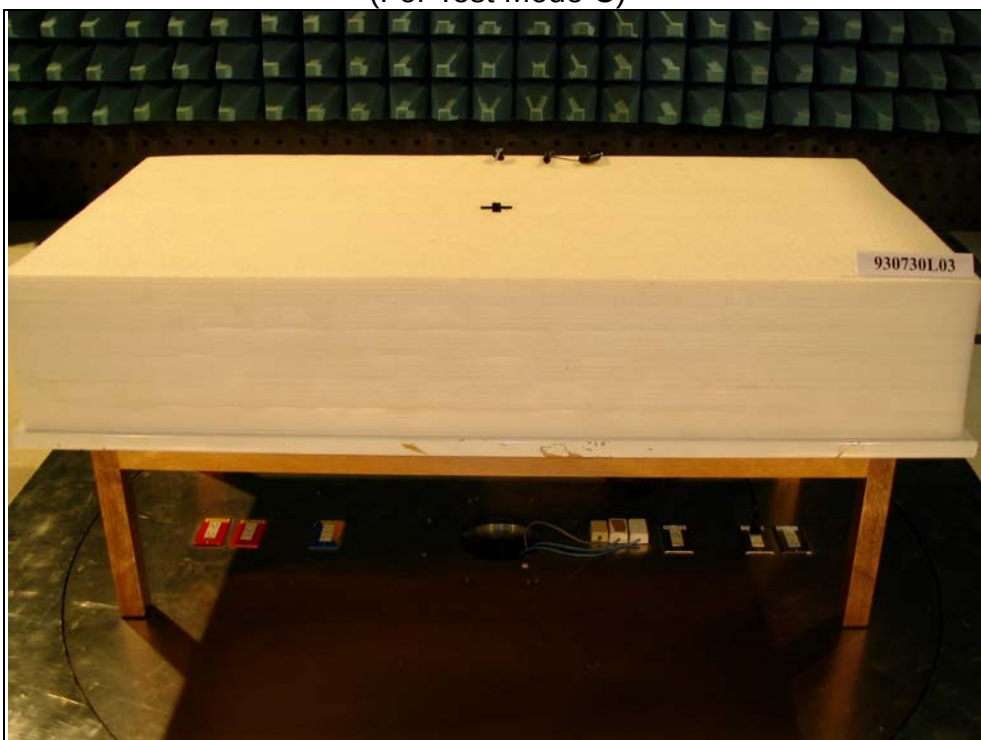
RADIATED EMISSION TEST
(For Test Mode A)



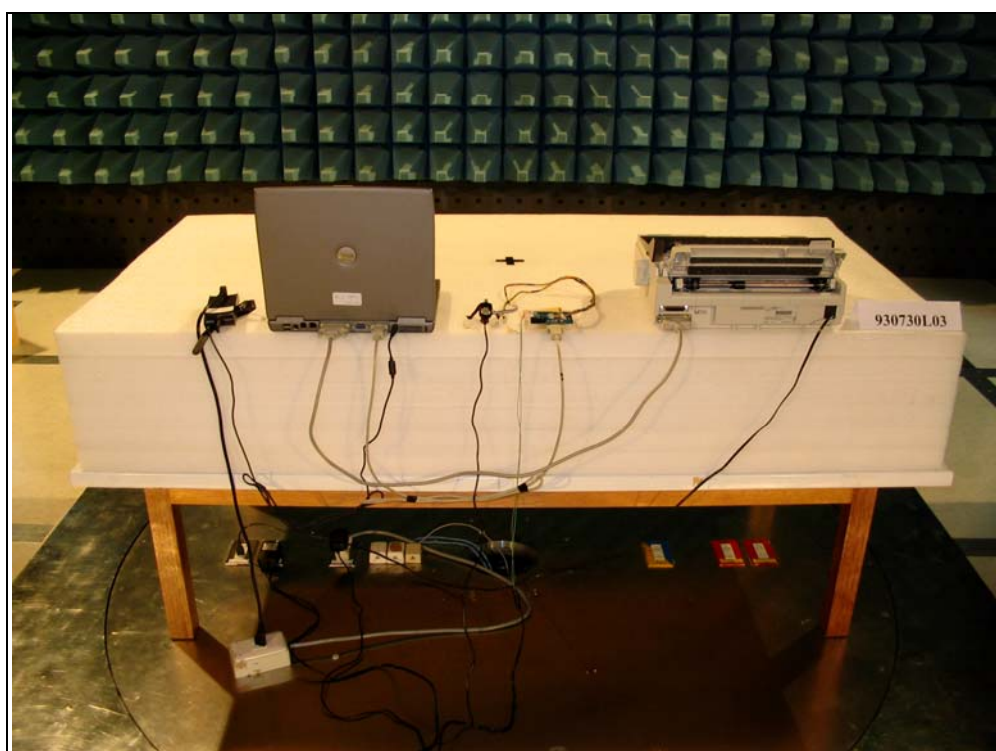
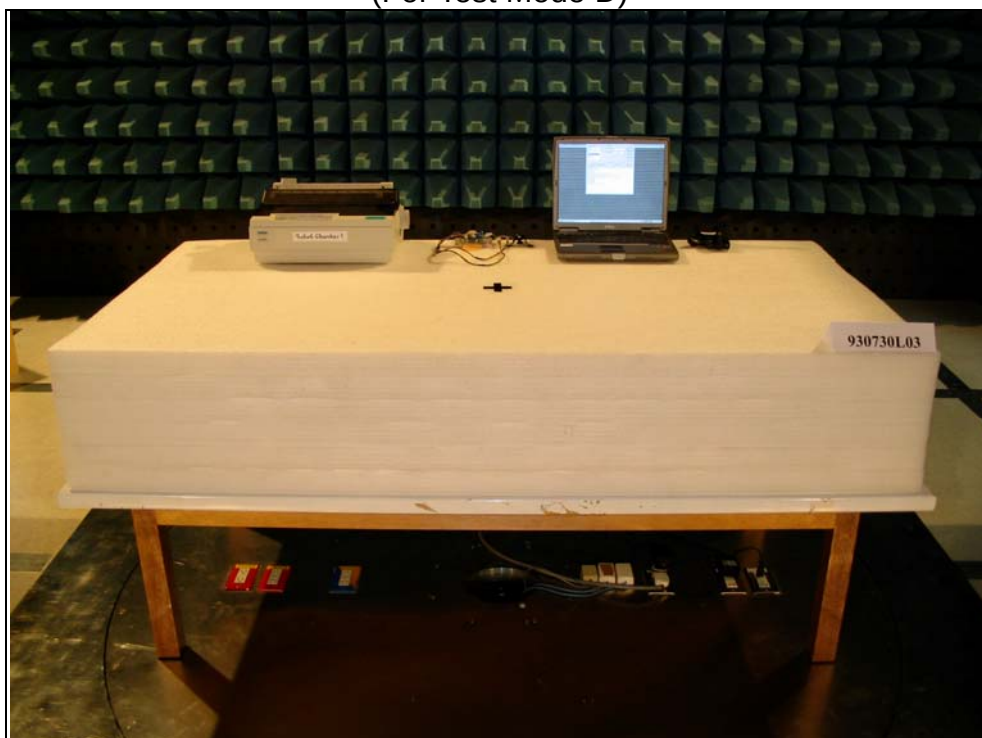
(For Test Mode B)



(For Test Mode C)



(For Test Mode D)



6 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, A2LA
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

Hwa Ya EMC/RF/Safety/Telecom Lab:

Tel: 886-3-3183232

Fax: 886-3-3185050

Linko RF 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.

Report Format Version 1.5