FCC TEST REPORT

REPORT NO.: RF931019A10

MODEL NO.: HSTNC-001W

RECEIVED: Sep. 10, 2004

TESTED: Sep. 10 ~ Nov. 3, 2004

ISSUED: Nov. 16, 2004

APPLICANT: Chicony Electronics Co., Ltd.

ADDRESS: No. 25, Wu-Gong 6th Rd., Wu Ku Industrial Park, Taipei Hsien, Taiwan, R.O.C.

ISSUED BY: Advance Data Technology Corporation

LAB LOCATION: 47 14th Lin, Chiapau Tsun, Linko, Taipei, Taiwan, R.O.C.

TEST LOCATION : No. 47, 14th Ling, Chia Pau Tsuen, Lin Kou Hsiang 244, Taipei Hsien, Taiwan, R.O.C.

0528
ILAC MRA

No. 2177-01

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1 CERTIFICATION

PRODUCT:	Bluetooth adaptor
BRAND NAME:	hp
MODEL NO:	HSTNC-001W
APPLICANT:	Chicony Electronics Co., Ltd.
TESTED:	Sep. 10 ~ Nov. 3, 2004
TEST ITEM:	ENGINEERING SAMPLE
STANDARDS:	FCC Part 15, Subpart C (Section 15.247) FCC Part 15, Subpart B, Class B CISPR 22: 1997, Class B ANSI C63.4-2003

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

PREPARED BY : Annie Chang (Annie Chang) , **DATE:** Nov. 16, 2004

TECHNICAL ACCEPTANCE Responsible for EMI : Arthur Lin (Arthur Lin) , **DATE:** Nov. 16, 2004

APPROVED BY : Gary Chang for (Cody Chang, Deputy Manager) , **DATE:** Nov. 16, 2004

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	NA	DC power not applicable
15.247(a)(1)(I)-(ii)	Number of Hopping Frequency Used Spec.:At least 79 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, whichever is greater.	PASS	Meet the requirement of limit
15.247(a)(2)	Spectrum Bandwidth of a Frequency Hopping Sequence Spread Spectrum System Spec.: NA	--	--
15.247(b)	Maximum Peak Output Power Spec.: max. 30dBm	PASS	Meet the requirement of limit
15.247(d)	Transmitter Radiated Emissions Spec.: Table 15.209	PASS	Meet the requirement of limit Minimum passing margin is –1.94 dB at 4804.00MHz
15.247(d)	Band Edge Measurement	PASS	Meet the requirement of limit

APPLIED STANDARD: FCC Part 15, Subpart B			
Standard	**Test Type**	**Result**	**Remarks**
FCC Part 15, Subpart B, Class B	Conducted Test	PASS	Meets Class B Limit Minimum passing margin is –20.01 dB at 0.186 MHz
CISPR 22: 1997, Class B	Radiated Test	PASS	Meets Class B Limit Minimum passing margin is –6.30 dB at 48.02 MHz

Note: The limit for radiated test for 30-1000 MHz was performed according to CISPR 22: 1997, which was specified in FCC PART 15 Subpart B 15.109(g). Also the limits of ICES-003: 2004 is the same.

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	2.45dB
Radiated emissions	30MHz ~ 1GHz	3.86 dB
	1GHz ~ 18GHz	2.20 dB
	18GHz ~ 40GHz	1.88 dB

3 GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

PRODUCT	Bluetooth adaptor
MODEL NO.	HSTNC-001W
POWER SUPPLY	3Vdc from battery
MODULATION TYPE	GFSK
MODULATION TECHNOLOGY	FHSS
FREQUENCY RANGE	2402MHz ~ 2480MHz
NUMBER OF CHANNEL	79
OUTPUT POWER	1.89mW
ANTENNA TYPE	Strip Antenna
ANTENNA GAIN	-1.31 dBi
DATA CABLE	45cm data cable (RJ45 type) 1.9m data cable (USB type for charging function)
I/O PORTS	USB port
ASSOCIATED DEVICES	NA

NOTE:

1. The EUT is a Bluetooth adaptor which can connected to a keyboard for wireless transmission and also can connect to PC with a data cable for charging function.

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

3.2 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		

1. Software used to control the EUT for staying in continuous transmitting and receiving mode is programmed. Channel 0, 39 and 78 are chosen for testing to fulfill the requirement of frequency spectrum usage in each country.
2. 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.
3. Above 1 GHz, the channel 0, 39, and 78 were tested individually.
4. For Conducted & Radiated tests, the EUT was test under the following modes:

FOR CONDUCTED TEST		
TEST MODE	**EUT FUNCTION**	**STANDARD**
1	Charging function	**FCC Part 15, Subpart B**
FOR RADIATED TEST		
TEST MODE	**EUT FUNCTION**	**STANDARD**
1	Transmission function	**FCC Part 15, Subpart C**
2	Receive function	**FCC Part 15, Subpart B**
3	Charging function	**FCC Part 15, Subpart B**

3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS

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

FCC Part 15, Subpart C. (15.247)

FCC Part 15, Subpart B, Class B

CISPR 22: 1997, Class B

ANSI C63.4 : 2003

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

3.4 DESCRIPTION OF SUPPORT UNITS

FCC Part 15, Subpart C:

The EUT has been tested as an independent.

FCC Part 15, Subpart B:

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.

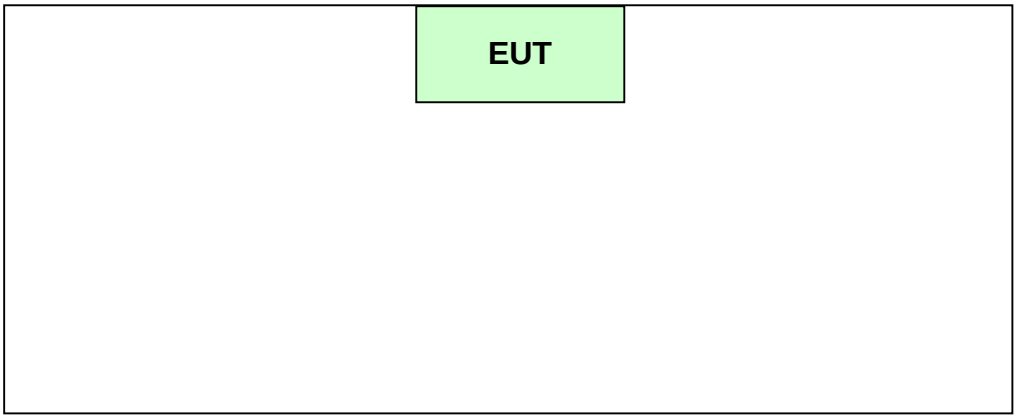
NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	PERSONAL COMPUTER	LEO	Persica 8620G	1A36I98A000202	FCC DoC Approved
2	MONITOR	ADI	CM100	240058T00100018	FCC DoC Approved
3	PRINTER	EPSON	LQ-300+	DCGY046777	FCC DoC Approved
4	MODEM	ACEEX	1414	980020516	IFAXDM1414
5	PS/2 MOUSE	BTC	M851	M4-010359	E5XMSM860
6	BLUETOOTH DONGLE	LEVEL ONE	MDU-0005USB	03111500120	PANBT0230
7	USB KEYBOARD	HP	KU-0412	N/A	FCC DoC Approved

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	N/A
2	1.8 m braid shielded wire, terminated with VGA connector via metallic frame, w. 2 cores.
3	1.2m braid shielded wire, terminated with DB25 and Centronics connector via metallic frame, w/o core
4	1.2 m braid shielded wire, terminated with DB25 and DB9 connector via metallic frame, w/o core.
5	1.5 m Non shielded wire, terminated with PS/2 connector via drain wire, w/o core.
6	N/A
7	1.9m data cable (optional)

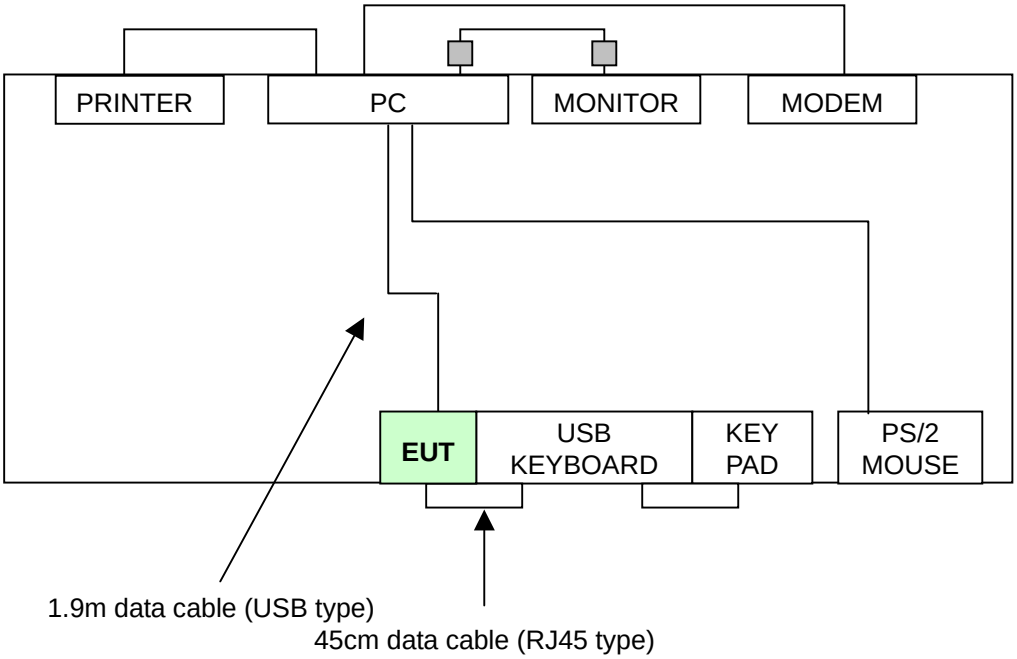
NOTE: All power cords of the above support units are non-shielded (1.8m).

3.5 CONFIGURATION OF SYSTEM UNDER TEST

FCC Part 15, Subpart C:



FCC Part 15, Subpart B:



4 EMISSION TEST

4.1 CONDUCTED EMISSION MEASUREMENT

4.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

FREQUENCY (MHz)	Class A (dBuV)		Class B (dBuV)	
	Quasi-peak	Average	Quasi-peak	Average
0.15 - 0.5	79	66	66 - 56	56 - 46
0.50 - 5.0	73	60	56	46
5.0 - 30.0	73	60	60	50

NOTES: (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	ESHS 30	828765/002	July 4, 2005
ROHDE & SCHWARZ Artificial Mains Network (for EUT)	ESH3-Z5	835239/001	Mar. 31, 2005
LISN With Adapter (for EUT)	AD10	C09Ada-001	Mar. 31, 2005
ROHDE & SCHWARZ Artificial Mains Network (for peripherals)	ESH3-Z5	835239/002	Apr. 18, 2005
ROHDE & SCHWARZ 4-wire ISN	ENY41	935154/007	Apr. 20, 2005
ROHDE & SCHWARZ 2-wire ISN	ENY22	833823/026	Apr. 20, 2005
Software	ADT_Cond_V7.3.1	NA	NA
Software	ADT_ISN_V7.3.1	NA	NA
RF cable (JYEBAO)	5D-FB	Cable-C09.01	May 9, 2005
SUHNER Terminator (For ROHDE & SCHWARZ LISN)	65BNC-5001	E1-010789	May 17, 2005

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. 9.

4. The VCCI Site Registration No. C-1312.

4.1.3 TEST PROCEDURE

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.

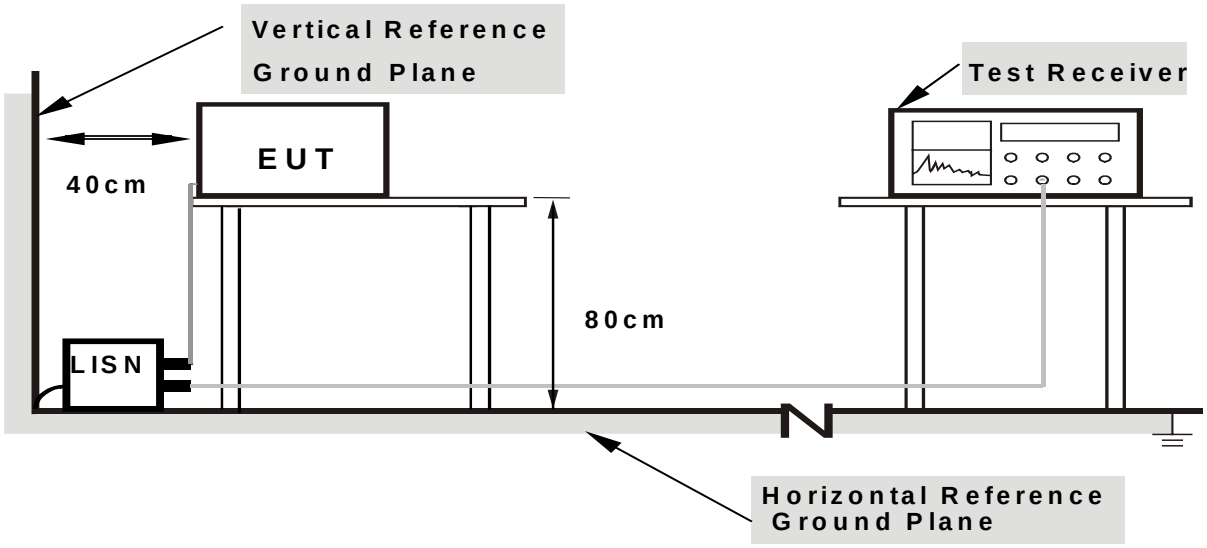
b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.

c. The frequency range from 150 kHz to 30 MHz was searched. Emission levels under (Limit - 20dB) was not recorded.

4.1.4 DEVIATION FROM TEST STANDARD

No deviation

4.1.5 TEST SETUP



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

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

4.1.6 EUT OPERATING CONDITIONS

FCC Part 15, Subpart C:

The PC system ran a test program (provided by manufacturer) to enable EUT under transmission/receiving condition continuously at specific channel frequency.

FCC Part 15, Subpart B:

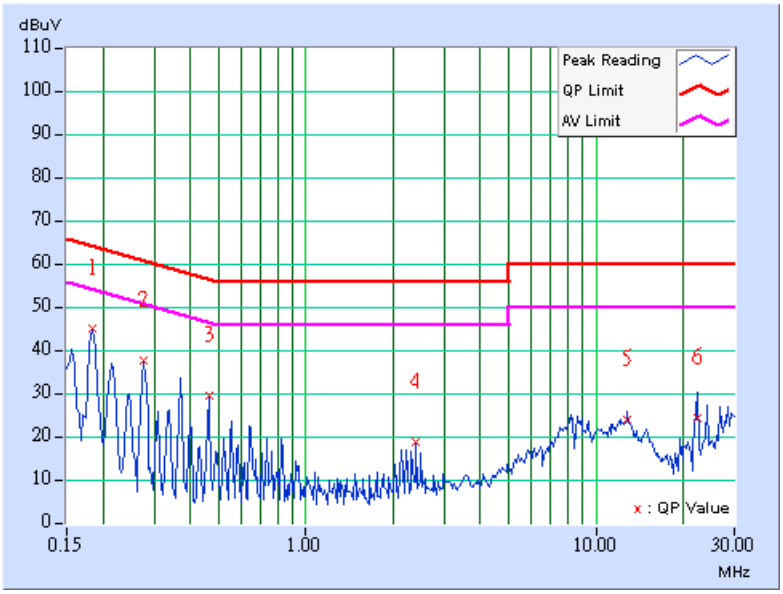
a. Turned on the power of all equipment.
b. PC ran a test program to enable all functions.
c. PC read and wrote messages from FDD and HDD.
d. EUT sent messages to PC.
e. PC sent "H" messages to monitor and monitor displayed "H" patterns on screen.
f. PC sent "H" messages to modem.
g. PC sent "H" messages to printer and printed it out.
h. Repeated steps c-g.

4.1.7 TEST RESULTS

EUT	Bluetooth adaptor	MODEL	HSTNC-001W
TEST MODE	1	6dB BANDWIDTH	9 kHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	PHASE	Line (L)
ENVIRONMENTAL CONDITIONS	20deg. C, 60% RH, 1043hPa	TESTED BY: Chad Lee	

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	0.183	0.20	43.80	-	44.00	-	64.35	54.35	-20.35	-
2	0.276	0.20	36.63	-	36.83	-	60.94	50.94	-24.11	-
3	0.462	0.20	28.46	-	28.66	-	56.66	46.66	-28.00	-
4	2.401	0.22	17.63	-	17.85	-	56.00	46.00	-38.15	-
5	12.837	0.83	22.72	-	23.55	-	60.00	50.00	-36.45	-
6	22.417	1.24	23.02	-	24.26	-	60.00	50.00	-35.74	-

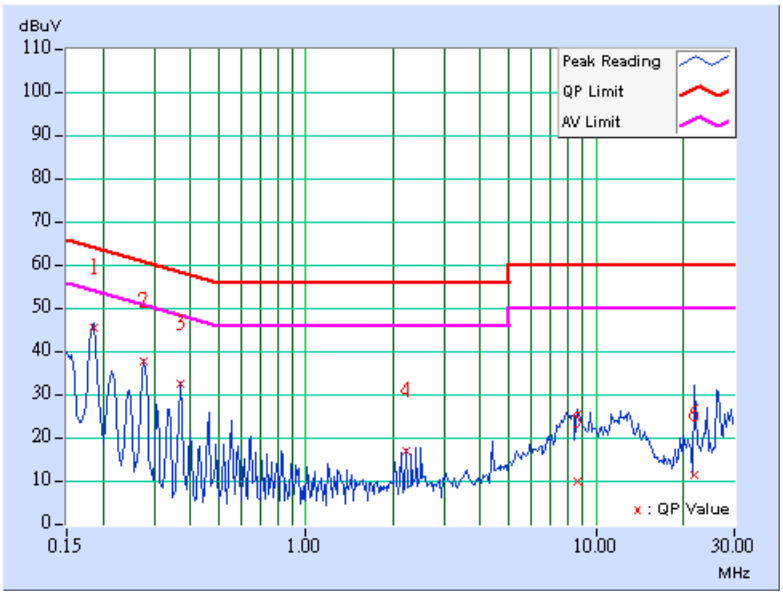
REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission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



EUT	Bluetooth adaptor	**MODEL**	HSTNC-001W
TEST MODE	1	**6dB BANDWIDTH**	9 kHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	**PHASE**	Neutral (N)
ENVIRONMENTAL CONDITIONS	20deg. C, 60% RH, 1043hPa	**TESTED BY**: Chad Lee	

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	**0.186**	**0.20**	**44.00**	**-**	**44.20**	**-**	**64.21**	**54.21**	**-20.01**	**-**
2	0.276	0.20	36.49	-	36.69	-	60.94	50.94	-24.25	-
3	0.370	0.20	31.19	-	31.39	-	58.51	48.51	-27.12	-
4	2.215	0.30	15.48	-	15.78	-	56.00	46.00	-40.22	-
5	8.691	0.61	8.75	-	9.36	-	60.00	50.00	-50.64	-
6	21.870	1.37	10.18	-	11.55	-	60.00	50.00	-48.45	-

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
SIGNAL GENERATOR / Agilent	E8257C	MY43320668	Dec 31, 2004

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

4.2.3 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.

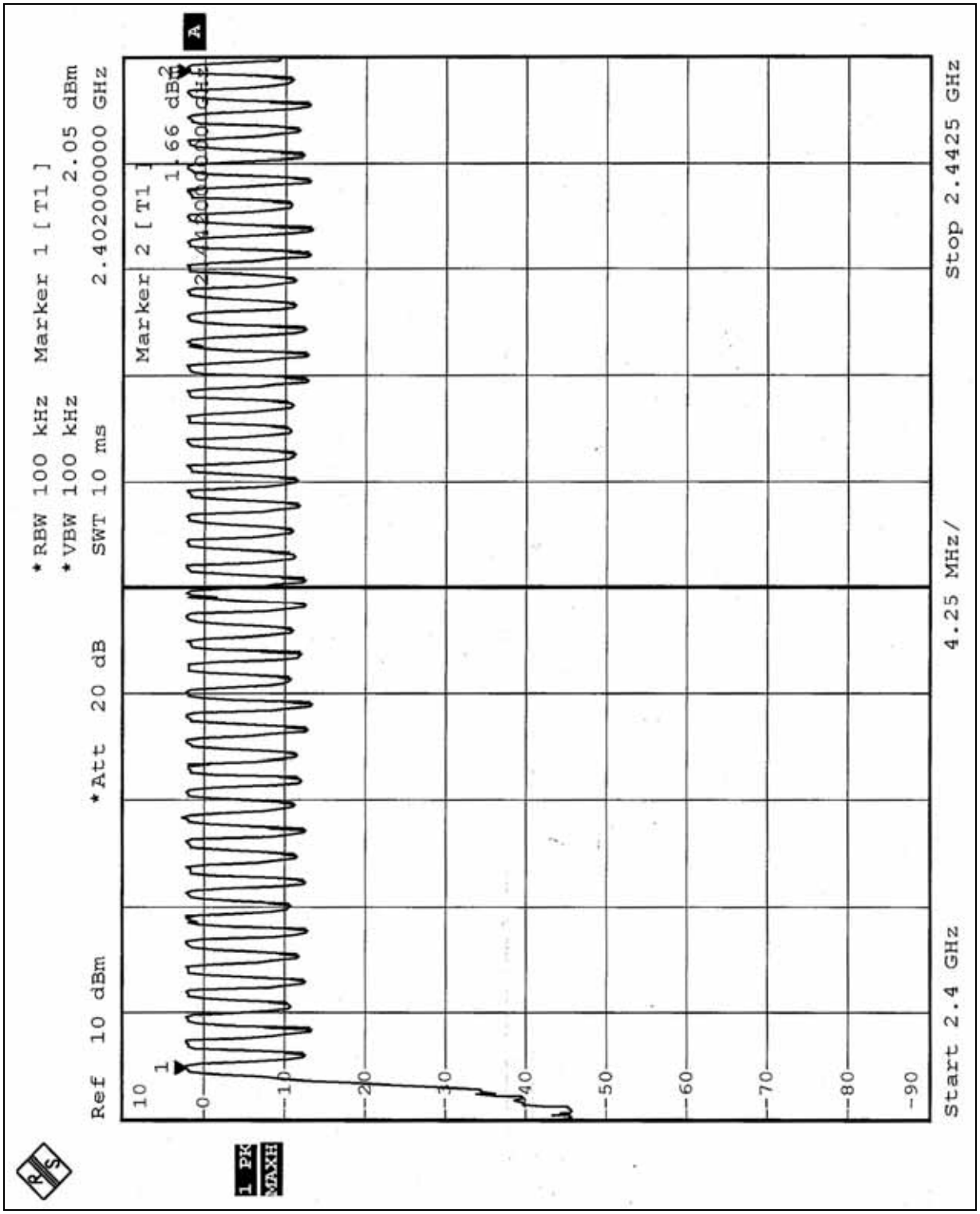
4.2.4 DEVIATION FROM TEST STANDARD

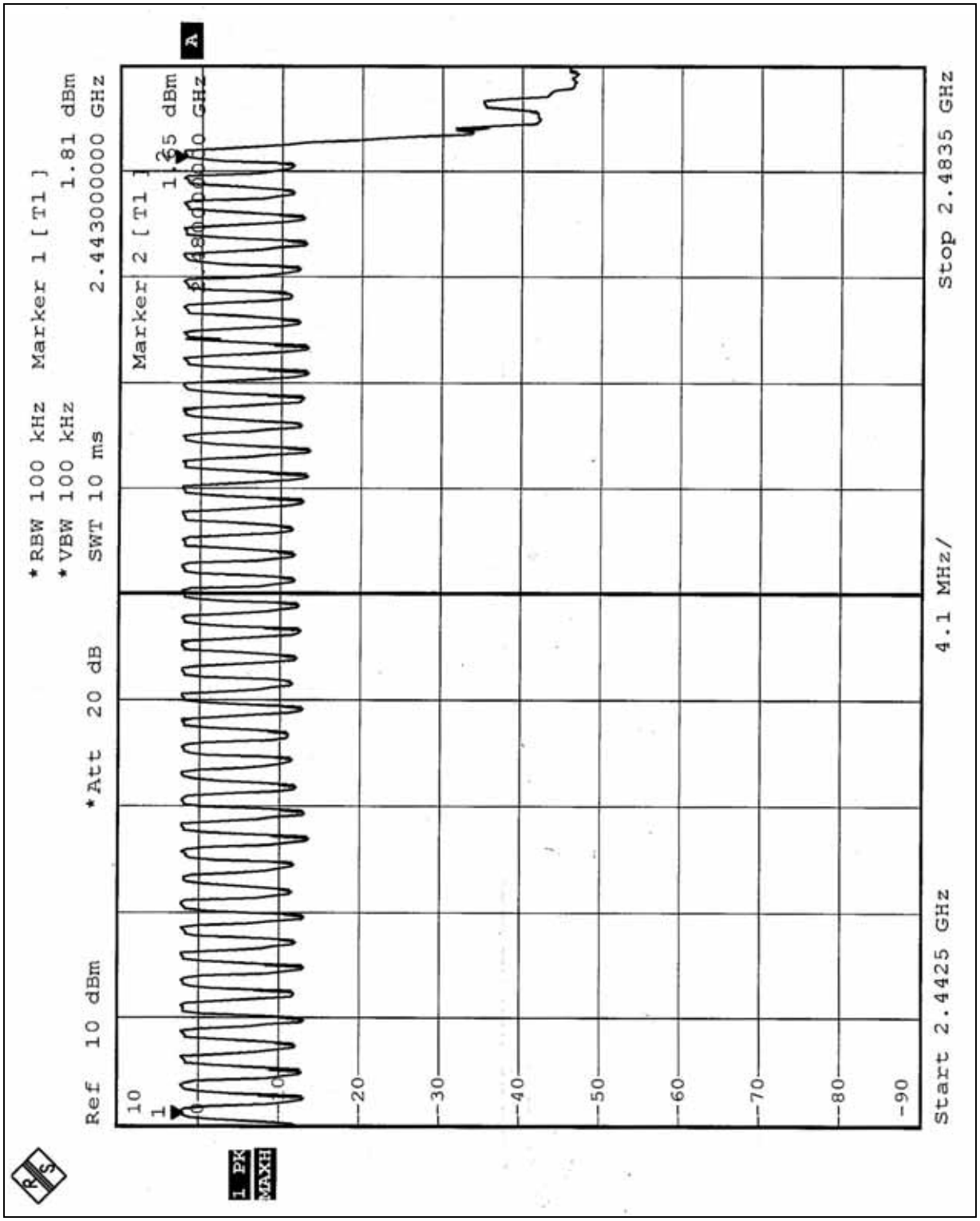
No deviation

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.


RBW 100 kHz
VBW 100 kHz
SWT 10 ms
Marker 1 [T1]
2.05 dBm
2.40200000 GHz
Marker 2 [T1]
1.66 dBm
2.48000000 GHz
Ref 10 dBm
Att 20 dB
Start 2.4 GHz
4.25 MHz/
Stop 2.4425 GHz
1 PK
MAXH


Ref 10 dBm
*Att 20 dB
*VBW 100 kHz
SWT 10 ms
*RBW 100 kHz
Marker 1 [T1]
1.81 dBm
2.443000000 GHz
Marker 2 [T1]
1.65 dBm
2.483500000 GHz
Start 2.4425 GHz
4.1 MHz/
Stop 2.4835 GHz
1 PK
MAXH
A

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
SIGNAL GENERATOR / Agilent	E8257C	MY43320668	Dec 31, 2004

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

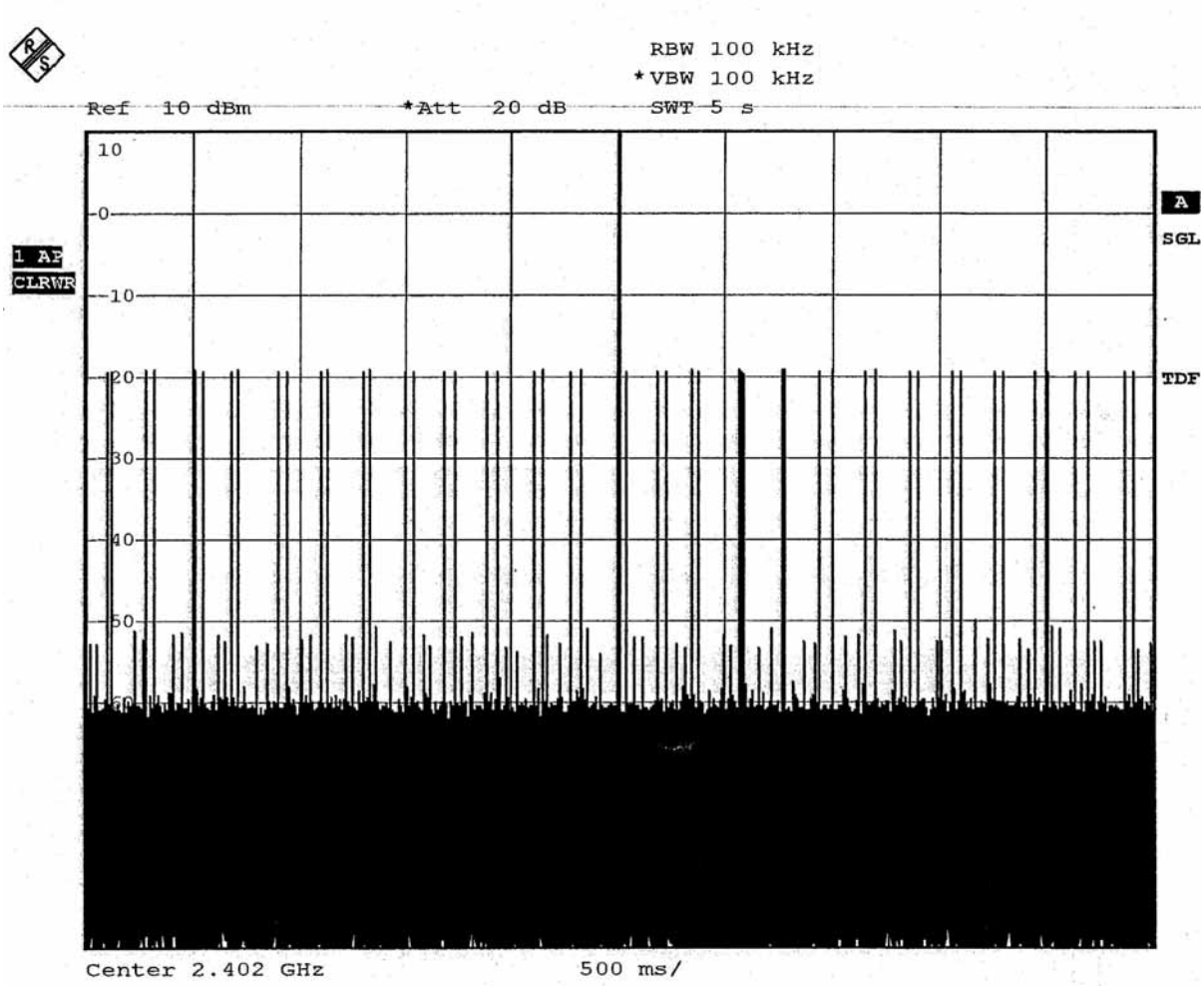
4.3.5 TEST SETUP

4.3.6 TEST RESULTS

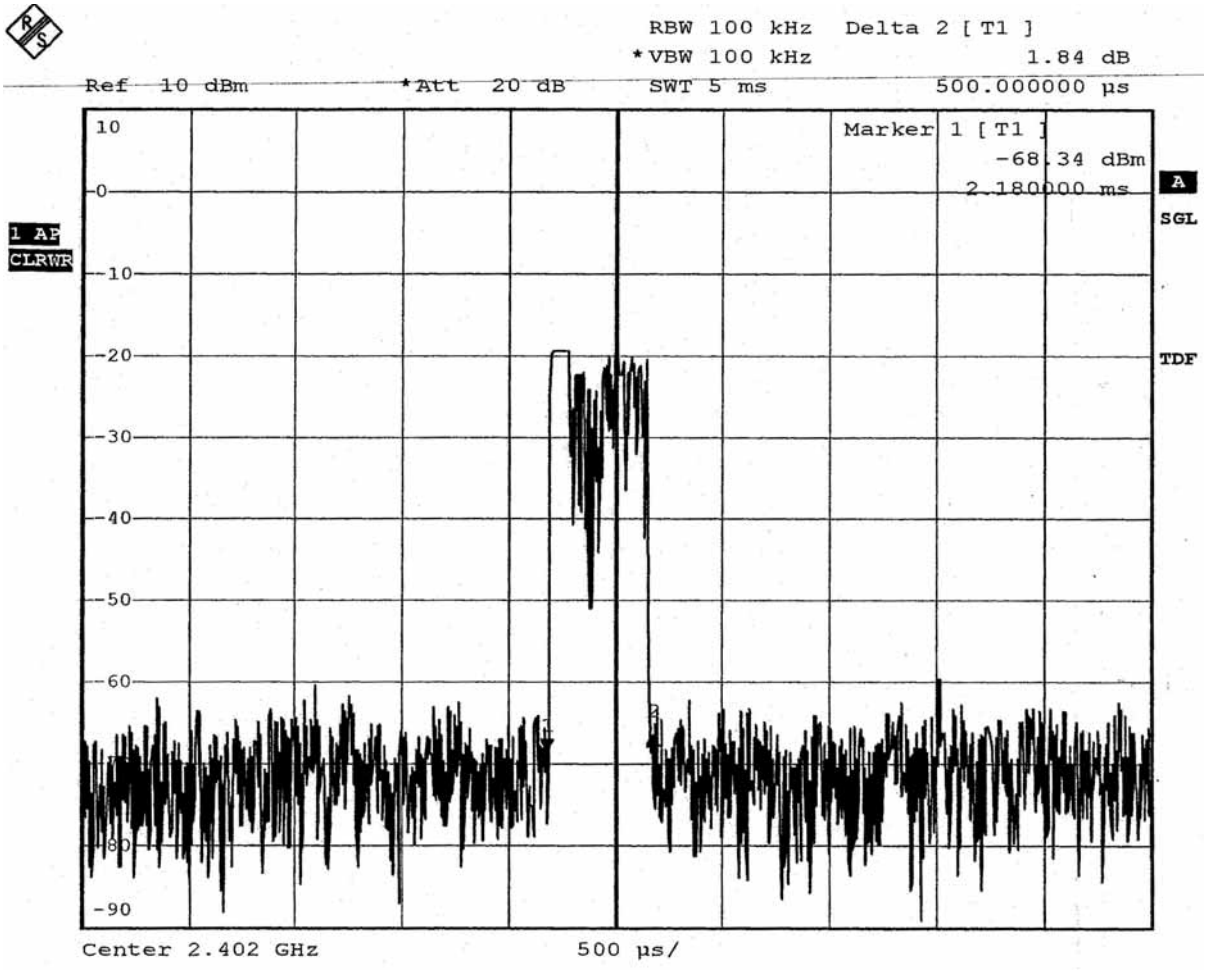
Mode	Number of transmission in a 31.6 (79Hopping*0.4)	Length of transmission time (msec)	Result (msec)	Limit (msec)
DH1	47 (times / 5 sec) *6.32=297.04 times	0.5	148.52	400
DH3	25 (times / 5 sec) *6.32=158 times	1.77	279.66	400

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

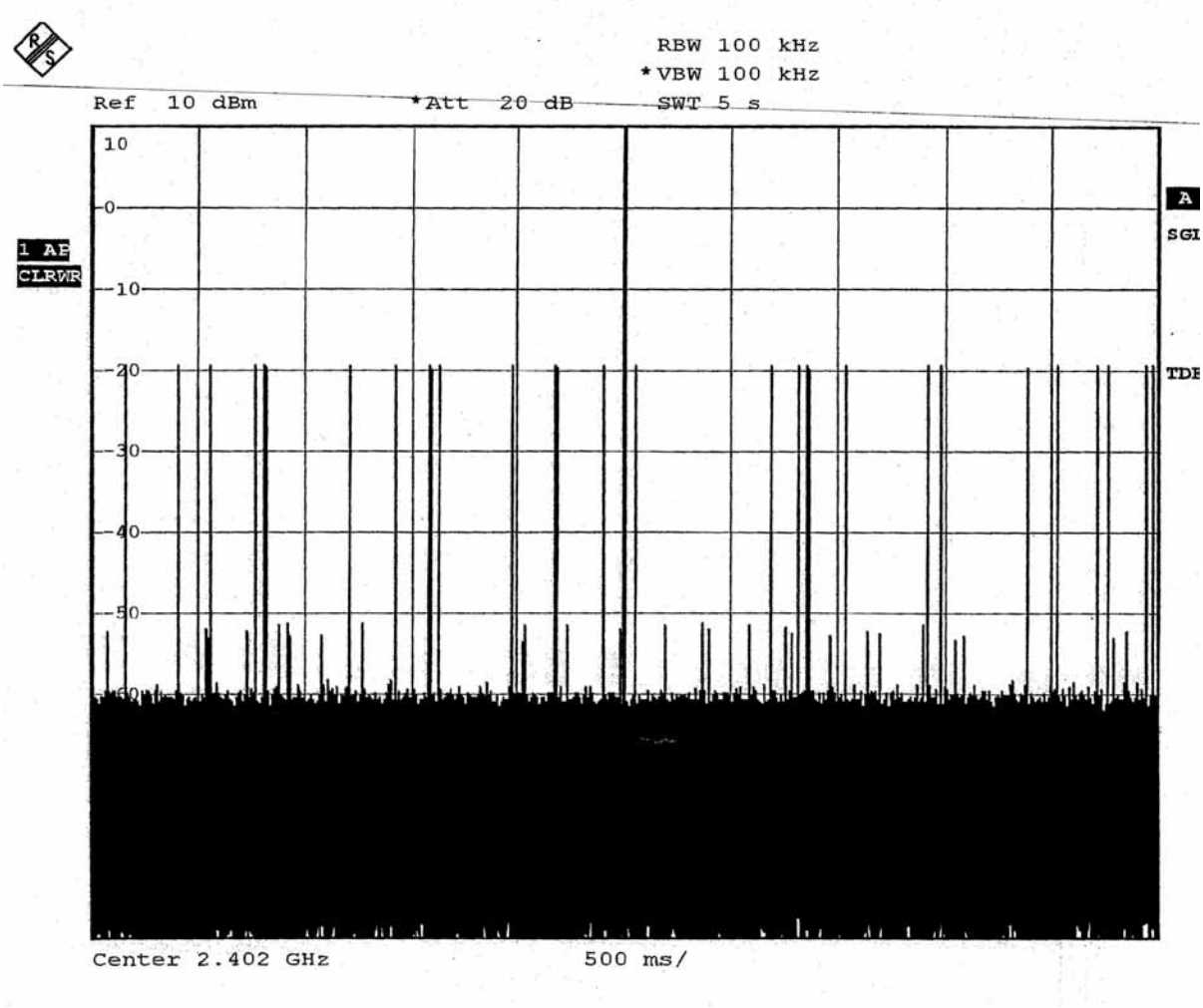
DH1


RBW 100 kHz
*VBW 100 kHz
Ref 10 dBm
*Att 20 dB
SWT 5 s
10
0
-10
-20
-30
-40
-50
-60
1 AP
CLRWR
A
SGL
TDF
Center 2.402 GHz
500 ms/

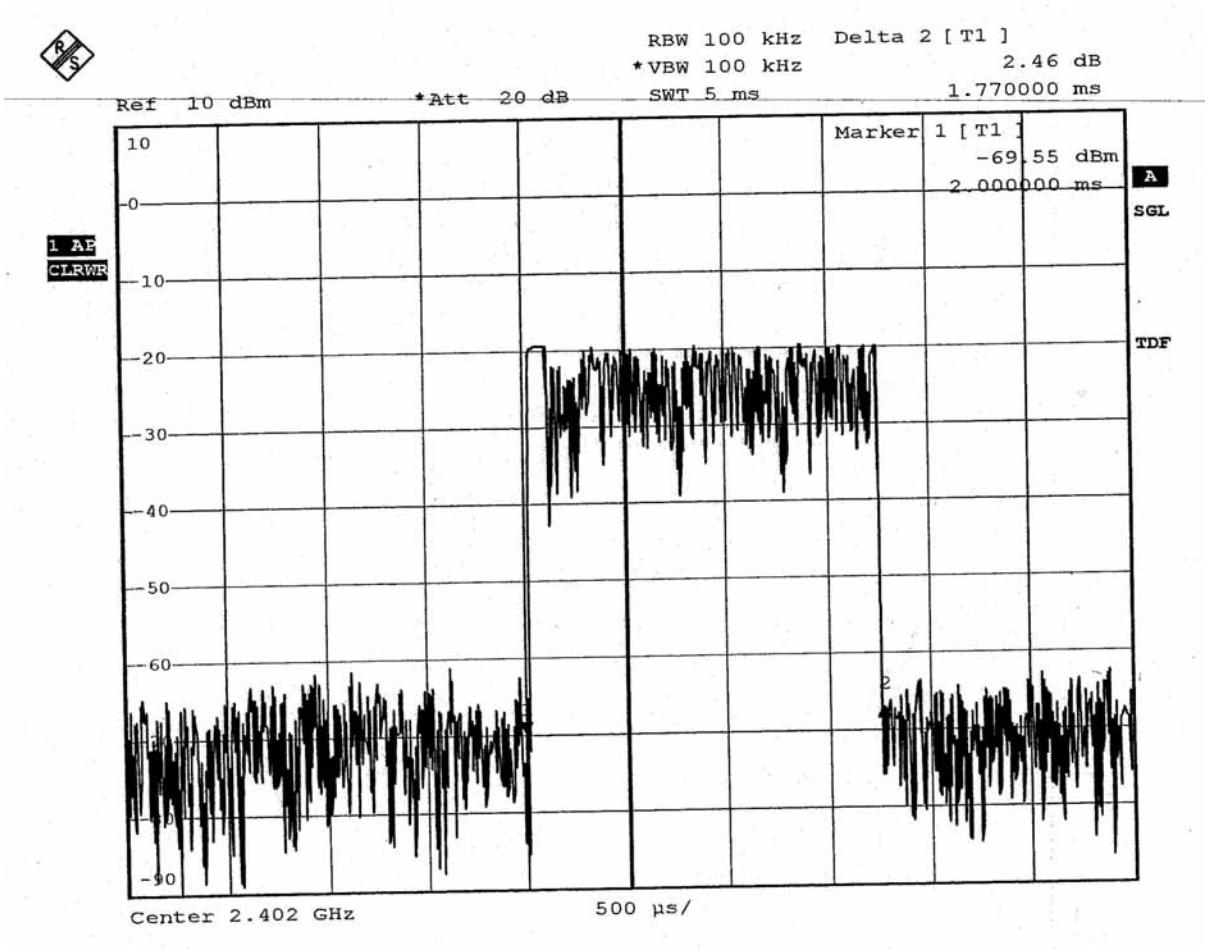
DH1


RBW 100 kHz
*VBW 100 kHz
SWT 5 ms
Delta 2 [T1]
1.84 dB
500.000000 µs
Ref 10 dBm
*Att 20 dB
Marker 1 [T1]
-68.34 dBm
2.180000 ms
1 AP
CLRWR
A
SGL
TDF
10
0
-10
-20
-30
-40
-50
-60
-80
-90
Center 2.402 GHz
500 µs/

DH3


RBW 100 kHz
*VBW 100 kHz
Ref 10 dBm
*Att 20 dB
SWT 5 s
10
0
-10
-20
-30
-40
-50
1 AE
CLRWR
A
SGI
TDF
Center 2.402 GHz
500 ms/

DH3


RBW 100 kHz
*VBW 100 kHz
SWT 5 ms
Delta 2 [T1]
2.46 dB
1.770000 ms
Ref 10 dBm
*Att 20 dB
Marker 1 [T1]
-69.55 dBm
2.000000 ms
1 AP
CLRWR
A
SGL
TDF
10
0
-10
-20
-30
-40
-50
-60
-90
Center 2.402 GHz
500 µs/

4.4 CHANNEL BANDWIDTH

4.4.1 LIMITS OF CHANNEL BANDWIDTH

NA

4.4.2 TEST INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
SIGNAL GENERATOR / Agilent	E8257C	MY43320668	Dec 31, 2004

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

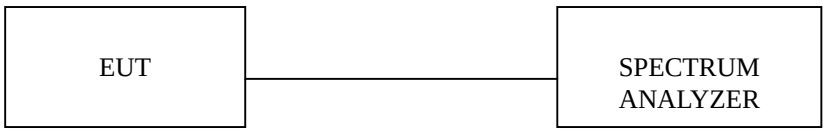
4.4.3 TEST PROCEDURE

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



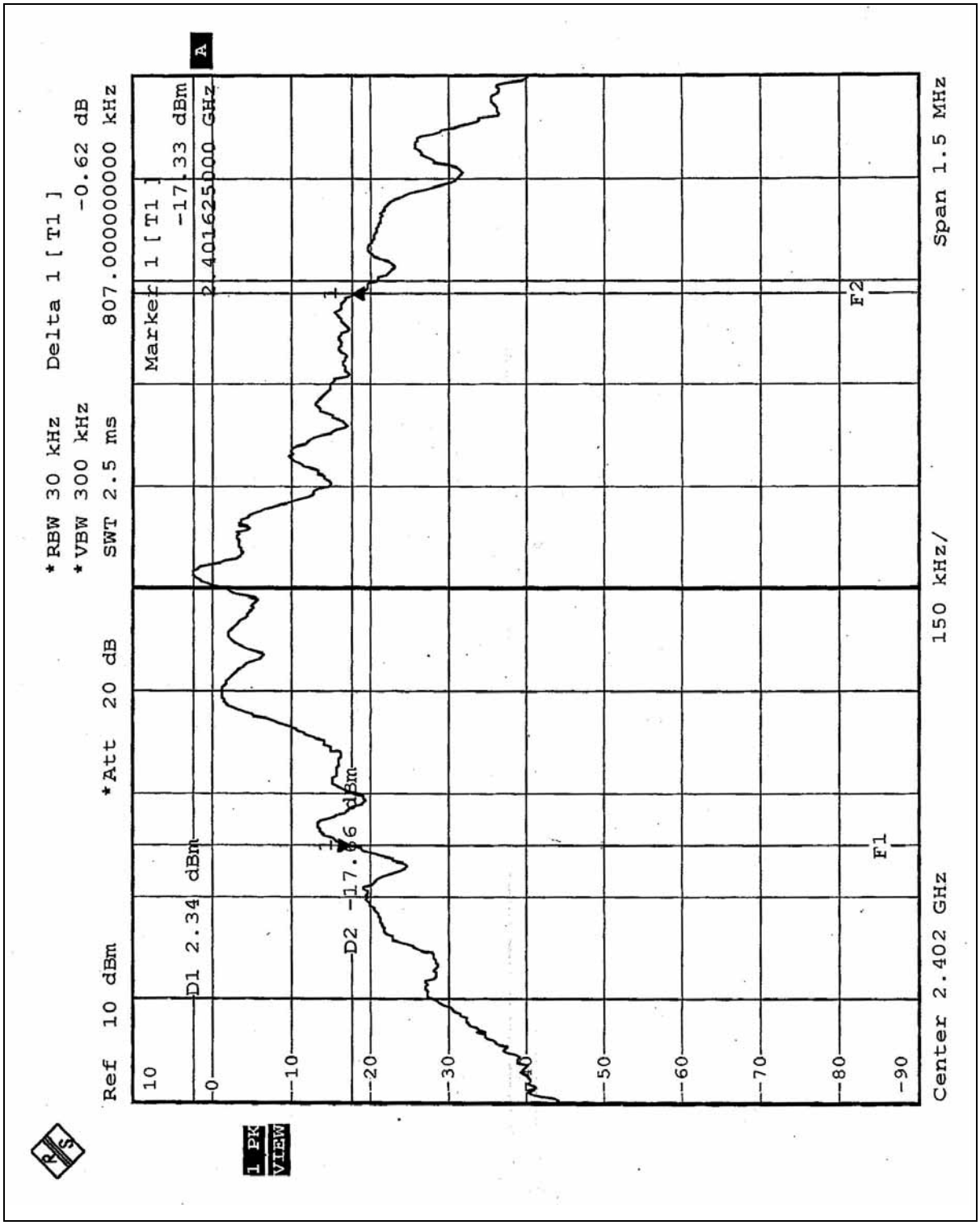
4.4.6 EUT OPERATING CONDITION

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

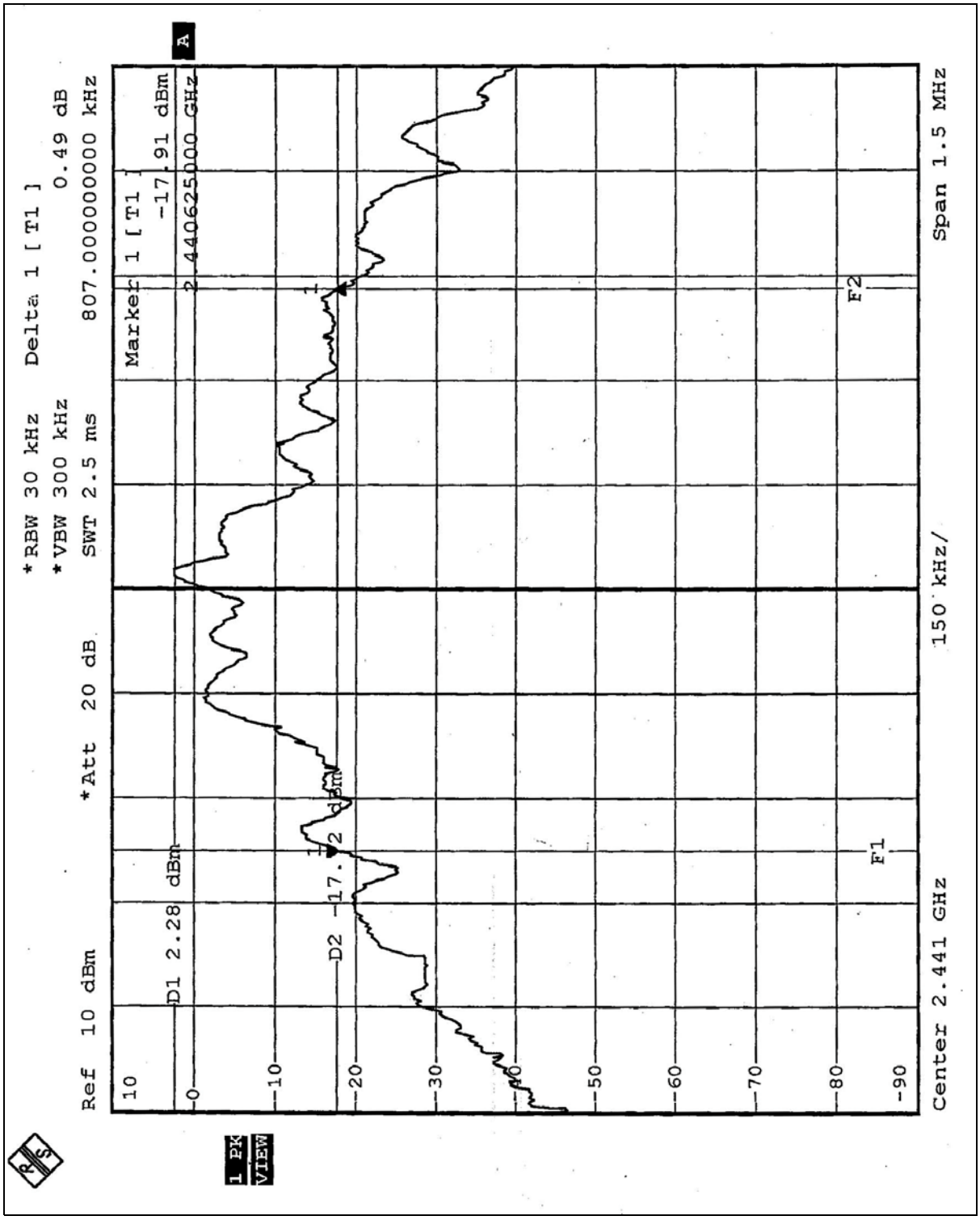
4.4.7 TEST RESULTS

CHANNEL	CHANNEL FREQUENCY (MHz)	20dB BANDWIDTH (MHz)
0	2402	0.807
39	2441	0.807
78	2480	0.807

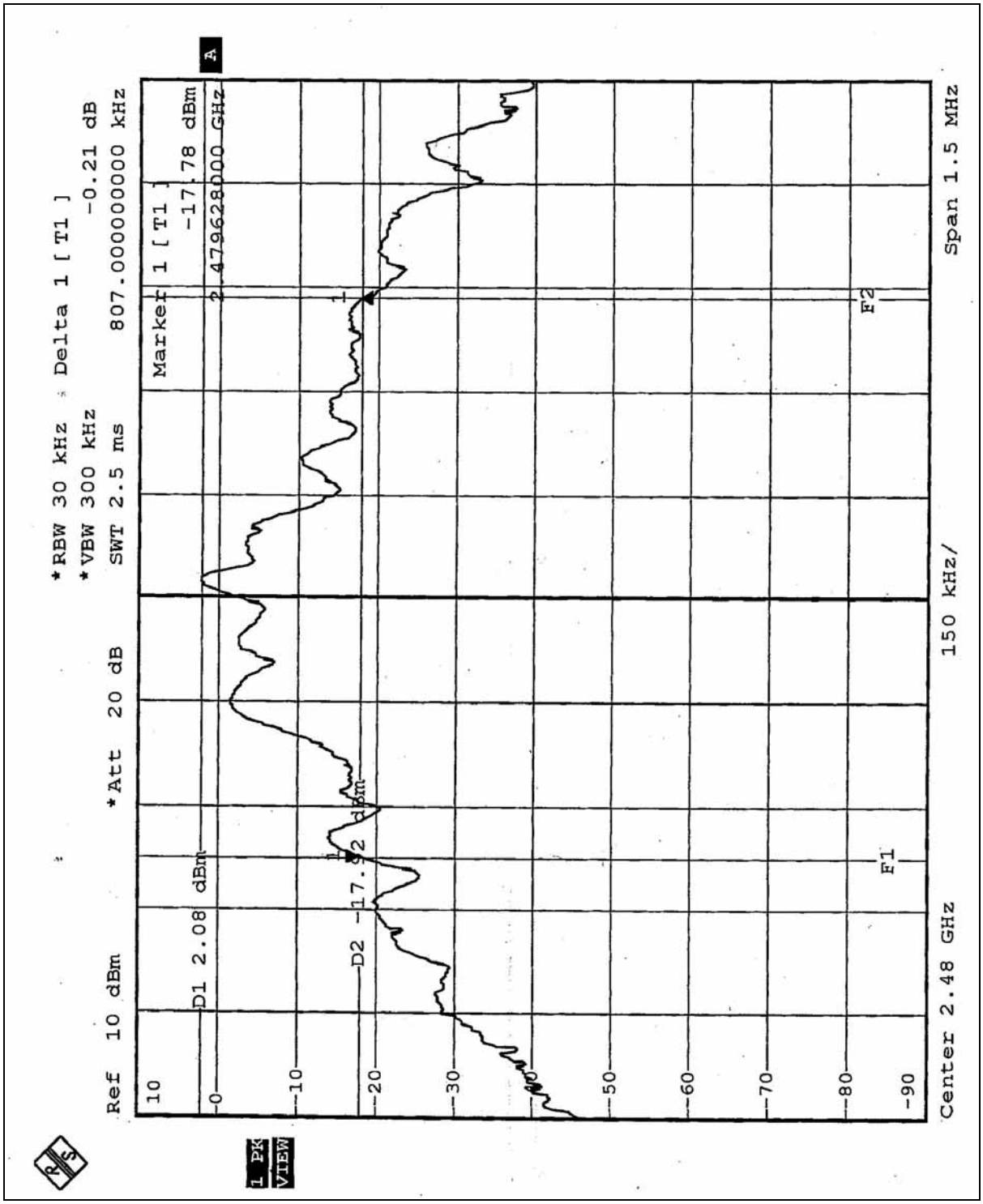
Channel 0


Ref 10 dBm
*Att 20 dB
SWT 2.5 ms
*VBW 300 kHz
*RBW 30 kHz
Delta 1 [T1]
-0.62 dB
807.000000000 kHz
Marker 1 [T1]
-17.33 dBm
2.401625000 GHz
D1 2.34 dBm
D2 -17.96 dBm
F1
F2
Center 2.402 GHz
150 kHz/
Span 1.5 MHz
1 PK VIEW

Channel 39


Ref 10 dBm
*Att 20 dB
*RBW 30 kHz
*VBW 300 kHz
SWT 2.5 ms
Delta 1 [T1]
0.49 dB
807.000000000 kHz
Marker 1 [T1]
-17.91 dBm
2.440625000 GHz
D1 2.28 dBm
D2 -17.42 dBm
F1
F2
Center 2.441 GHz
150 kHz/
Span 1.5 MHz
1 PK VIEW

Channel 78


*RBW 30 kHz
*VBW 300 kHz
SWT 2.5 ms
Delta 1 [T1]
-0.21 dB
807.000000000 kHz
Marker 1 [T1]
-17.78 dBm
2.479628000 GHz
Ref 10 dBm
*Att 20 dB
D1 2.08 dBm
D2 -17.92 dBm
Center 2.48 GHz
150 kHz/
Span 1.5 MHz
F1
F2
1 PK
VIEW

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
SIGNAL GENERATOR / Agilent	E8257C	MY43320668	Dec 31, 2004

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

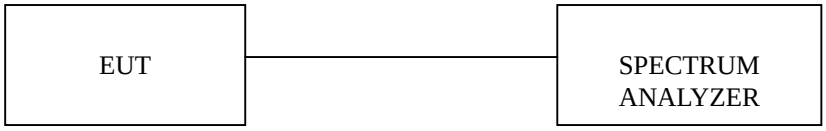
4.5.3 TEST PROCEDURES

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

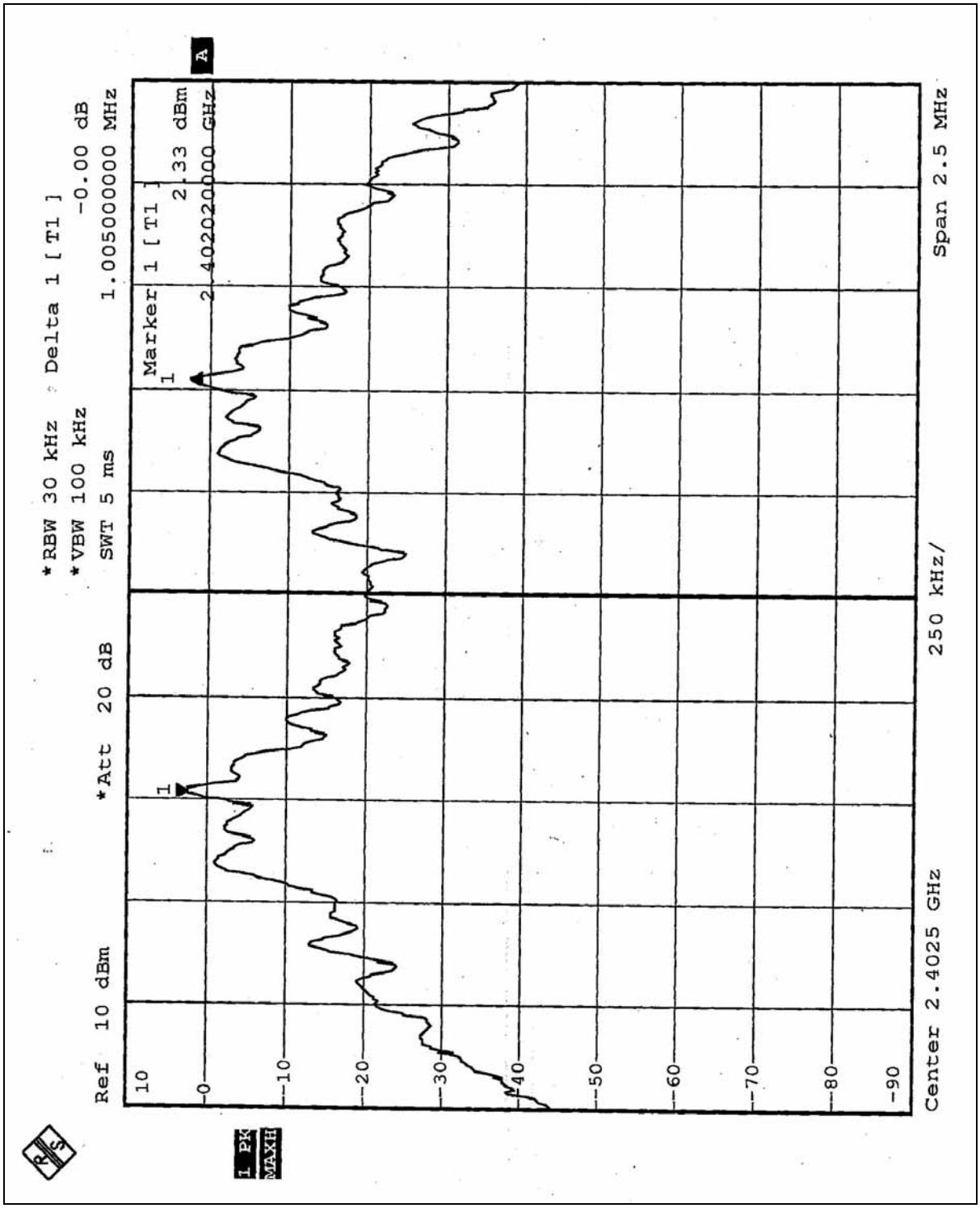


4.5.6 TEST RESULTS

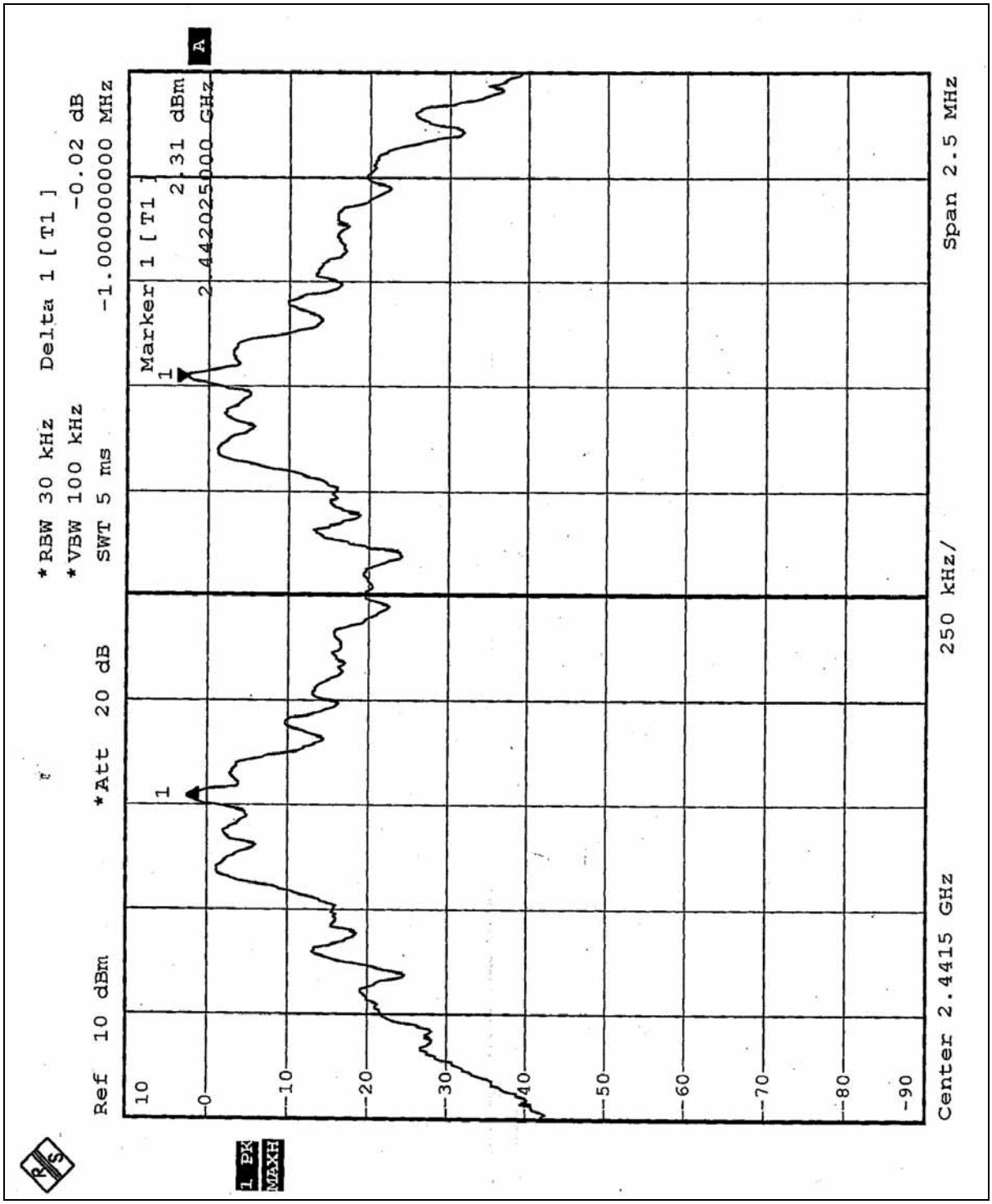
Channel	Frequency (MHz)	Adjacent Channel Separation	Minimum Limit (MHz)	Pass / Fail
0	2402	1.005 MHz	0.807	PASS
39	2441	1.000 MHz	0.807	PASS
78	2480	1.005 MHz	0.807	PASS

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

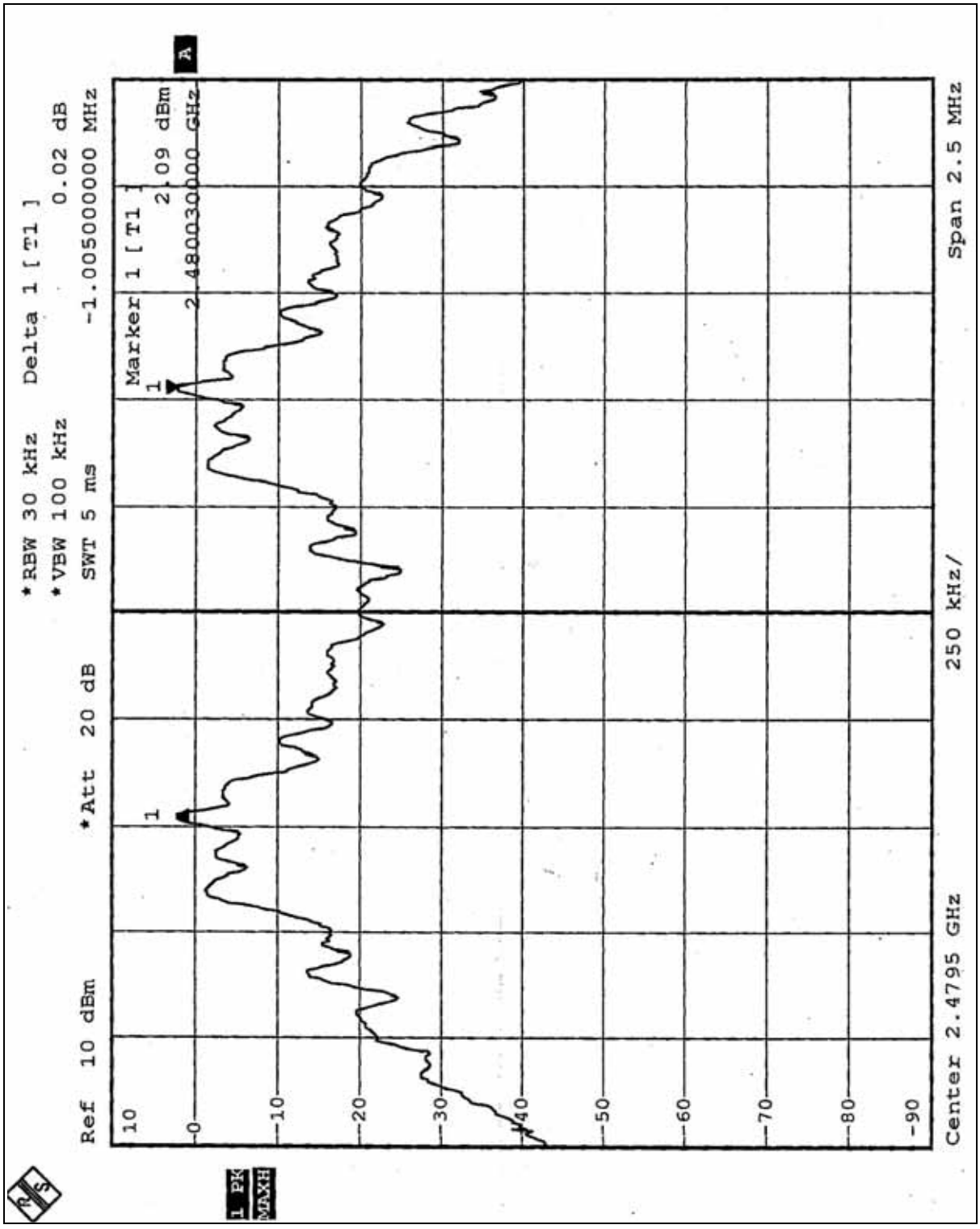
Channel 0


Ref 10 dBm
*Att 20 dB
*RBW 30 kHz
*VBW 100 kHz
SWT 5 ms
Delta 1 [T1]
-0.00 dB
1.005000000 MHz
Marker 1 [T1]
2.33 dBm
2.402020000 GHz
Center 2.4025 GHz
250 kHz/
Span 2.5 MHz
1 PK MAXH

Channel 39


A
*RBW 30 kHz
*VBW 100 kHz
SWT 5 ms
Delta 1 [T1]
-0.02 dB
-1.000000000 MHz
Marker 1 [T1]
2.31 dBm
2.442025000 GHz
Ref 10 dBm
*Att 20 dB
Center 2.4415 GHz
250 kHz/
Span 2.5 MHz
1 PK
MAXH

Channel 78


Ref 10 dBm
*Att 20 dB
*RBW 30 kHz
*VBW 100 kHz
SWT 5 ms
Delta 1 [T1]
0.02 dB
-1.005000000 MHz
Marker 1 [T1]
2.09 dBm
2.480300000 GHz
Center 2.4795 GHz
250 kHz/
Span 2.5 MHz
1 PK MAXH

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 TEST INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
SIGNAL GENERATOR / Agilent	E8257C	MY43320668	Dec 31, 2004

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

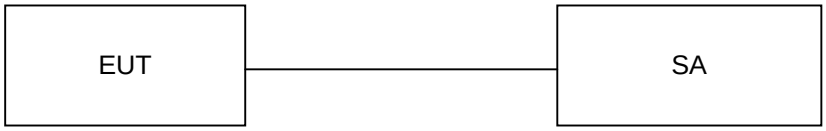
4.6.3 TEST PROCEDURES

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

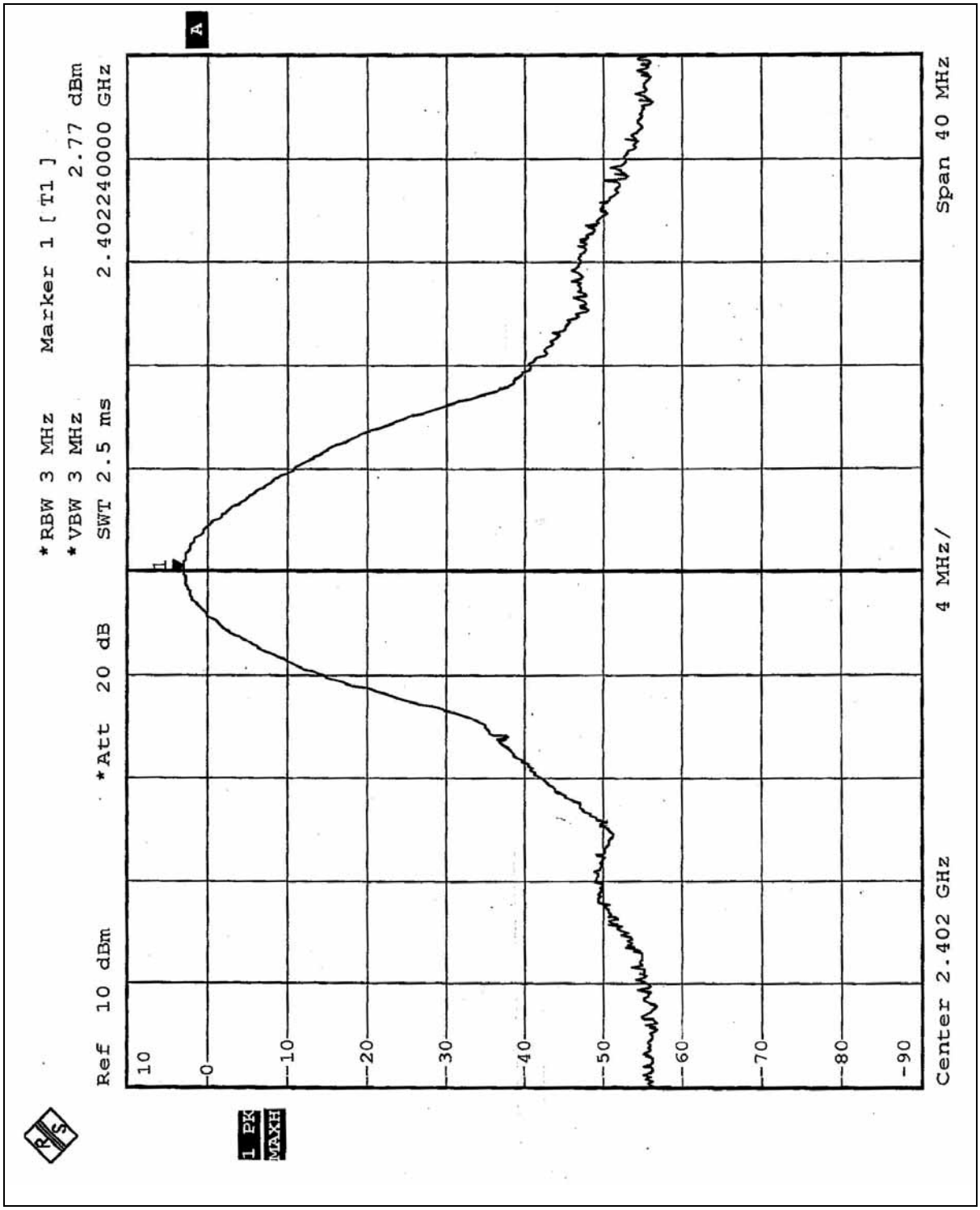
The software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel frequencies individually.

4.6.7 TEST RESULTS

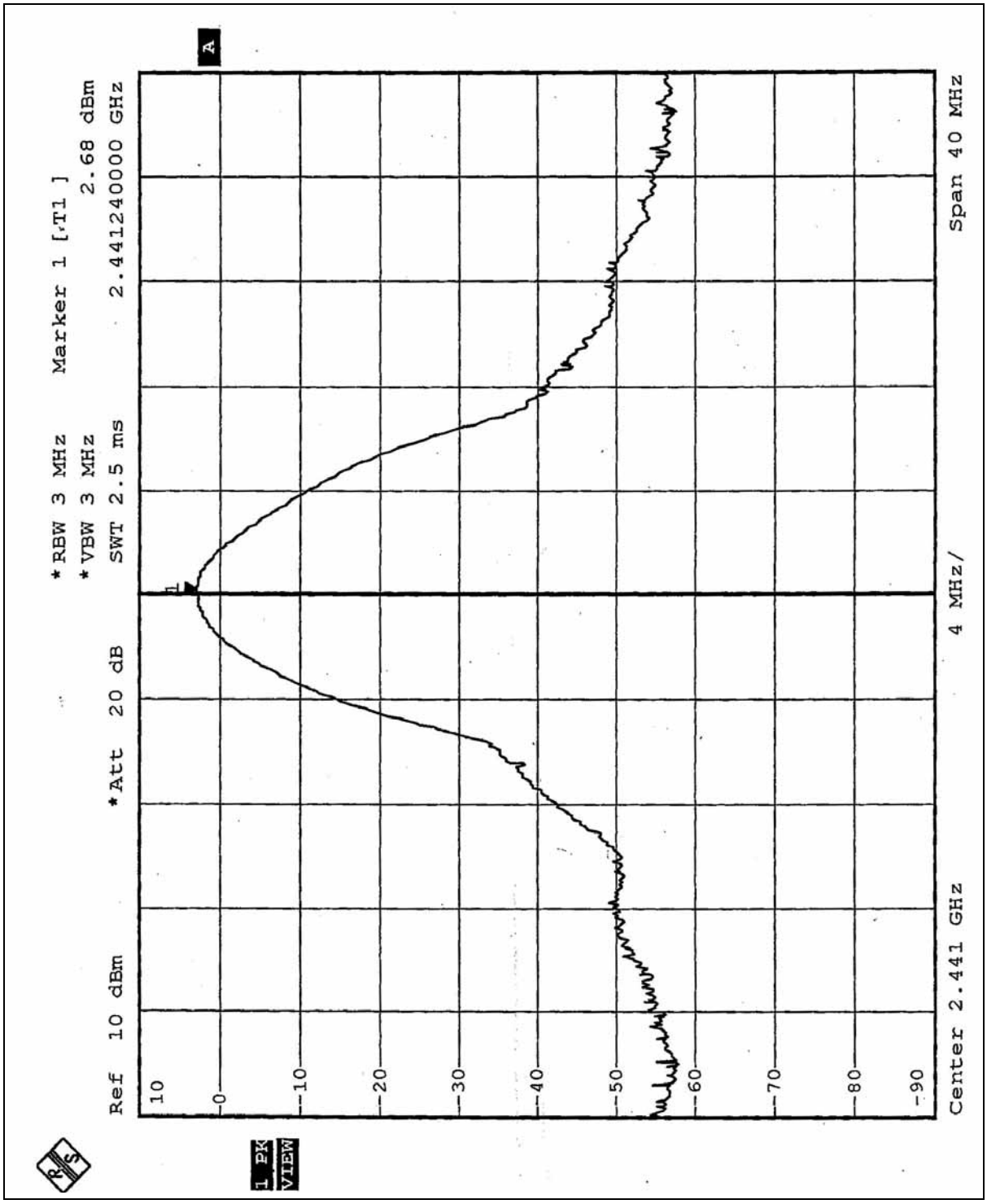
Output Power to Antenna:

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (mW)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (dBm)	PASS/FAIL
0	2402	1.89	2.77	30	PASS
39	2441	1.85	2.68	30	PASS
78	2480	1.79	2.53	30	PASS

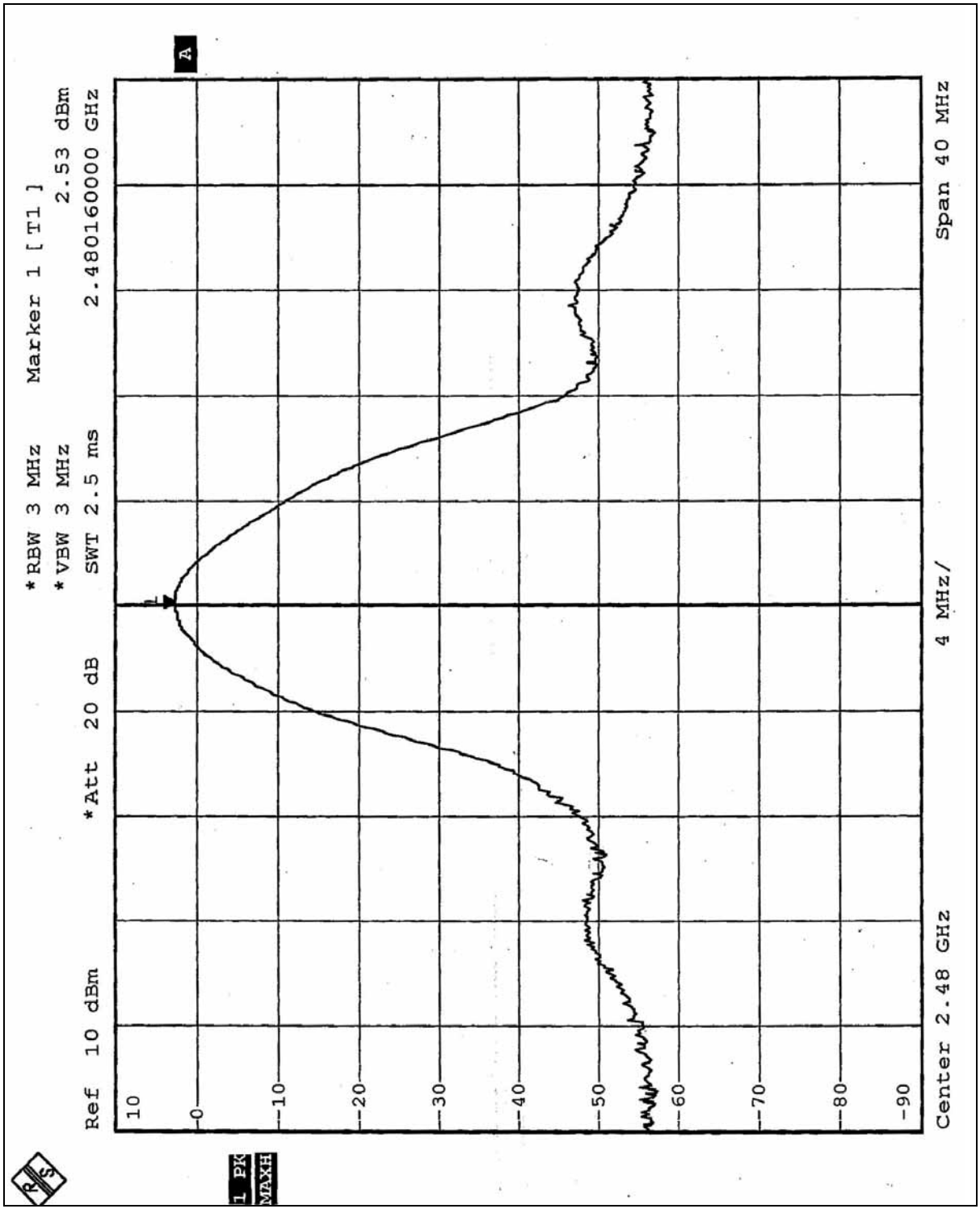
Channel 0


A
*RBW 3 MHz
*VBW 3 MHz
SWT 2.5 ms
Marker 1 [T1]
2.77 dBm
2.402240000 GHz
Ref 10 dBm
*Att 20 dB
Span 40 MHz
4 MHz/
Center 2.402 GHz
1 PK
MAXH

Channel 39


A
Marker 1 [rT1]
2.68 dBm
2.441240000 GHz
*RBW 3 MHz
*VBW 3 MHz
SWT 2.5 ms
*Att 20 dB
Ref 10 dBm
10
0
-10
-20
-30
-40
-50
-60
-70
-80
-90
Span 40 MHz
4 MHz/
Center 2.441 GHz
1 PK
VIEW

Channel 78


A
*RBW 3 MHz
*VBW 3 MHz
SWT 2.5 ms
Marker 1 [T1]
2.53 dBm
2.480160000 GHz
Ref 10 dBm
*Att 20 dB
Span 40 MHz
4 MHz/
Center 2.48 GHz
1 PK
MAXH

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

FOR MODE 1 & 2:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
* HP Preamplifier	8447D	2432A03504	Jun. 3, 2005
***** HP Preamplifier	8449B	3008A01924	Sep. 19, 2005
***** HP Preamplifier	8449B	3008A01638	Sep. 30, 2005
SCHWARZBECK Tunable Dipole Antenna	VHA 9103	NA	Oct. 29, 2005
SCHWARZBECK Tunable Dipole Antenna	UHA 9105	977	
* ROHDE & SCHWARZ TEST RECEIVER	ESI7	836697/012	Nov. 05, 2005
Schwarzbeck Antenna	VULB9168	137	Feb. 27, 2005
***** EMCO Horn Antenna	3115	6714	Oct. 28, 2005
***** EMCO Horn Antenna	3115	9312-4192	Feb. 28, 2005
ADT. Turn Table	TT100	0306	NA
ADT. Tower	AT100	0306	NA
Software	ADT_Radiated_V6	NA	NA
TIMES RF cable	LL142	CABLE-CH6-01	Apr. 16, 2005

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.
5. The Industry Canada Reference No. IC 3789-6.

FOR MODE 3:

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
* HP Spectrum Analyzer	8591E	3308A01367	Mar 16, 2005
HP Preamplifier	8447F	3113A05767	Sep. 15, 2005
* HP Preamplifier	8449B	3008A01924	Sep. 19, 2005
* HP Preamplifier	8449B	3008A01638	Sep. 30, 2005
* ROHDE & SCHWARZ TEST RECEIVER	ESVS10	846285/012	Aug. 11, 2005
SCHWARZBECK Tunable Dipole Antenna	VHA 9103	NA	Oct. 29, 2005
SCHWARZBECK Tunable Dipole Antenna	UHA 9105	977	
* ROHDE & SCHWARZ TEST RECEIVER	ESMI	839013/007 839379/002	Feb. 12, 2005
*CHASE BILOG Antenna	CBL6112A	2331	Oct. 13, 2005
* EMCO Horn Antenna	3115	6714	Oct. 28, 2005
* EMCO Horn Antenna	3115	9312-4192	Feb. 28, 2005
* ADT. Turn Table	TT100	0308	NA
* ADT. Tower	AT100	0308	NA
* Software	ADT_Radiated_V5.14	NA	NA
* ANRITSU RF Switches	MP59B	M32159	Oct. 10, 2005
* TIMES RF cable	LMR-600	CABLE-ST8-01	Oct. 10, 2005

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 Open Site No. 8.
5. The VCCI Site Registration No. R-877.

4.7.3 TEST PROCEDURE

a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter chamber room / 10 meter open site area. The table was rotated 360 degrees to determine the position of the highest radiation.

b. The EUT was set 3 meters / 10 meter 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.

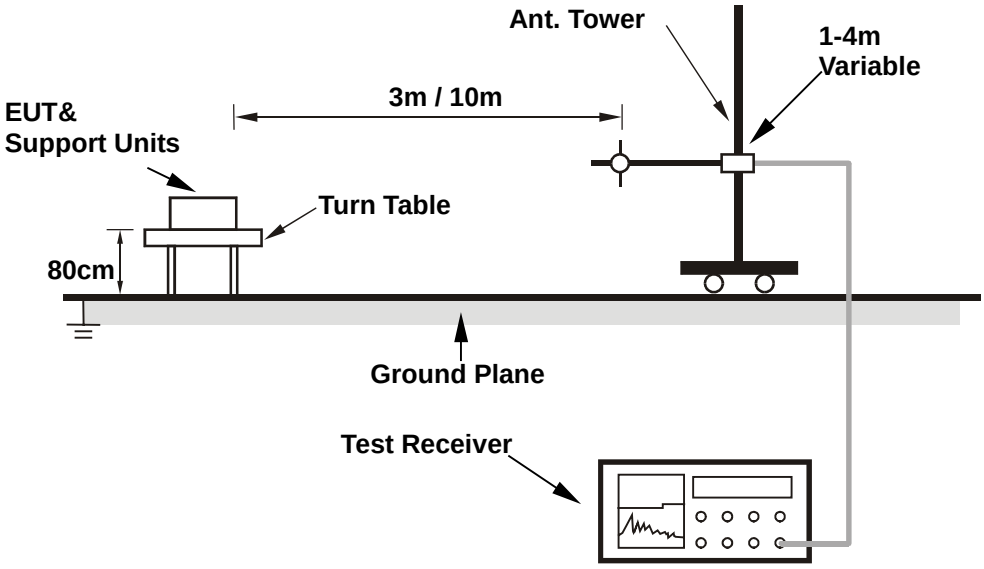
NOTE:

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.

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 (1)

EUT	Bluetooth adaptor	**MODEL**	HSTNC-001W
MODE	Channel 78	**FREQUENCY RANGE**	Below 1000MHz
INPUT POWER	3.0V from Battery	**DETECTOR FUNCTION**	Quasi-Peak
ENVIRONMENTAL CONDITIONS	25 deg. C, 70% RH, 991 hPa	**TEST MODE**	1
		TESTED BY: Jamison Chan	

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	701.46	25.33 QP	46.00	-20.67	2.50 H	112	2.08	23.25
2	749.96	26.37 QP	46.00	-19.63	2.50 H	4	1.60	24.77
3	784.44	26.81 QP	46.00	-19.19	1.25 H	196	1.98	24.83
4	834.02	26.91 QP	46.00	-19.09	3.00 H	82	1.55	25.36
5	895.46	27.77 QP	46.00	-18.23	3.00 H	298	2.06	25.72
6	931.02	28.06 QP	46.00	-17.94	1.00 H	172	1.75	26.31

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	64.49	21.05 QP	40.00	-18.95	1.00 V	52	8.81	12.23
2	157.18	27.92 QP	43.50	-15.58	1.00 V	22	15.08	12.84
3	721.93	27.52 QP	46.00	-18.48	1.00 V	202	3.63	23.89
4	769.36	27.37 QP	46.00	-18.63	1.00 V	190	2.56	24.80
5	857.73	27.16 QP	46.00	-18.84	2.00 V	106	1.55	25.61
6	959.04	27.54 QP	46.00	-18.46	2.00 V	40	0.89	26.65

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 adaptor	**MODEL**	HSTNC-001W
MODE	Channel 0	**FREQUENCY RANGE**	1 ~ 25GHz
INPUT POWER	3.0V from Battery	**DETECTOR FUNCTION**	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25 deg. C, 70% RH, 991 hPa	**TEST MODE**	1
		TESTED BY: Jamison Chan	

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	2378.00	36.72 PK	74.00	-37.28	1.77 H	155	5.62	31.10
2	2390.00	32.59 PK	74.00	-41.41	1.77 H	155	1.44	31.15
3	*2402.00	90.59 PK			1.77 H	155	59.40	31.19
3	*2402.00	56.05 AV			1.77 H	155	58.73	31.19
4	4804.00	54.23 PK	74.00	-19.77	1.78 H	306	17.47	36.76
4	4804.00	49.77 AV	54.00	-4.23	1.78 H	306	13.01	36.76

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	2378.00	39.36 PK	74.00	-34.64	1.05 V	314	5.59	33.77
2	2390.00	35.23 PK	74.00	-38.77	1.05 V	314	1.41	33.82
3	*2402.00	93.23 PK			1.05 V	314	59.37	33.86
3	*2402.00	58.69 AV			1.05 V	314	58.62	33.86
4	4804.00	55.02 PK	74.00	-18.98	1.20 V	162	14.60	40.42
4	**4804.00**	**51.09 AV**	**54.00**	**-2.91**	**1.20 V**	**162**	**10.67**	**40.42**
5	9608.00	57.39 PK	74.00	-16.61	1.37 V	189	4.92	52.47
5	9608.00	46.90 AV	54.00	-7.10	1.37 V	189	-5.57	52.47

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.
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*3 per ms per channel. Therefore the duty cycle be equal to: 20log(1.875/100)= -34.54dB
7. Average value = peak reading –20log(duty cycle)

EUT	Bluetooth adaptor	**MODEL**	HSTNC-001W
MODE	Channel 39	**FREQUENCY RANGE**	1 ~ 25GHz
INPUT POWER	3.0V from Battery	**DETECTOR FUNCTION**	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25 deg. C, 70% RH, 991 hPa	**TEST MODE**	1
		TESTED BY: Jamison Chan	

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	*2441.00	88.92 PK			1.02 H	185	57.63	31.29
1	*2441.00	54.38 AV			1.02 H	185	56.92	31.29
2	4882.00	51.42 PK	74.00	-22.58	1.00 H	340	14.76	36.66
2	4882.00	46.67 AV	54.00	-7.33	1.00 H	340	10.01	36.66

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	*2441.00	90.30 PK			1.01 V	179	56.34	33.96
1	*2441.00	55.76 AV			1.01 V	179	55.87	33.96
2	4882.00	49.98 PK	74.00	-24.02	1.02 V	177	9.51	40.47

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.
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*3 per ms per channel. Therefore the duty cycle be equal to: 20log(1.875/100)= -34.54dB
7. Average value = peak reading –20log(duty cycle)

EUT	Bluetooth adaptor	MODEL	HSTNC-001W
MODE	Channel 78	FREQUENCY RANGE	1 ~ 25GHz
INPUT POWER	3.0V from Battery	DETECTOR FUNCTION	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25 deg. C, 70% RH, 991 hPa	TEST MODE	1
		TESTED BY: Jamison Chan	

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	*2480.00	87.07 PK			1.78 H	152	55.69	31.38
1	*2480.00	52.53 AV			1.78 H	152	55.07	31.38
2	2483.50	46.71 PK	74.00	-27.29	1.78 H	152	15.32	31.39
3	4960.00	49.68 PK	74.00	-24.32	1.00 H	342	13.11	36.57

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	*2480.00	88.97 PK			1.00 V	177	54.92	34.05
1	*2480.00	54.43 AV			1.00 V	177	54.39	34.05
2	2483.50	48.61 PK	74.00	-25.39	1.00 V	177	14.55	34.06
3	4960.00	51.47 PK	74.00	-22.53	1.00 V	169	10.86	40.61
3	4960.00	46.32 AV	54.00	-7.68	1.00 V	169	5.71	40.61

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.
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*3 per ms per channel. Therefore the duty cycle be equal to: 20log(1.875/100)= -34.54dB
7. Average value = peak reading –20log(duty cycle)

4.7.7 TEST RESULTS (2)

EUT	Bluetooth adaptor	**MODEL NO.**	HSTNC-001W
		FREQUENCY RANGE	Below 1000MHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	**DETECTOR FUNCTION & BANDWIDTH**	Quasi-Peak
ENVIRONMENTAL CONDITIONS	25 deg. C, 70% RH, 991 hPa	**TEST MODE**	2
		TESTED BY: Jamison Chan	

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	113.59	38.65 QP	43.50	-4.85	2.50 H	85	27.89	10.76
2	154.41	35.33 QP	43.50	-8.17	1.50 H	124	22.46	12.87
3	191.34	36.67 QP	43.50	-6.83	2.00 H	97	25.17	11.50
4	597.62	37.97 QP	46.00	-8.03	2.50 H	157	15.89	22.09
5	731.74	35.17 QP	46.00	-10.83	1.00 H	343	10.97	24.20
6	768.68	35.38 QP	46.00	-10.62	1.00 H	166	10.58	24.80

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 adaptor	**MODEL NO.**	HSTNC-001W
		FREQUENCY RANGE	Below 1000MHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	**DETECTOR FUNCTION & BANDWIDTH**	Quasi-Peak
ENVIRONMENTAL CONDITIONS	25 deg. C, 70% RH, 991 hPa	**TEST MODE**	2
		TESTED BY: Jamison Chan	

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	119.42	31.14 QP	43.50	-12.36	1.25 V	138	19.58	11.56
2	154.41	25.01 QP	43.50	-18.49	1.00 V	96	12.13	12.87
3	467.37	29.53 QP	46.00	-16.47	1.00 V	78	10.50	19.03
4	500.42	27.10 QP	46.00	-18.90	1.00 V	175	7.16	19.94
5	601.50	27.74 QP	46.00	-18.26	1.25 V	75	5.58	22.15
6	667.60	28.12 QP	46.00	-17.88	1.00 V	225	5.55	22.57

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 adaptor	**MODEL NO.**	HSTNC-001W
MODE	Channel 0	**FREQUENCY RANGE**	1 ~ 25 GHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	**DETECTOR FUNCTION & BANDWIDTH**	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25 deg. C, 70% RH, 991 hPa	**TEST MODE**	2
		TESTED BY: Jamison Chan	

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	1645.00	41.05 PK	74.00	-32.95	1.00 H	334	10.36	30.69

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	1645.00	41.19 PK	74.00	-32.81	1.38 V	148	10.50	30.69

NOTE: 1. Emission level = Raw value + Correction Factor
2. Correction Factor = Ant. Factor + Cable loss
3. Margin value = Emission level - Limit value
4. The other emission levels were very low against the limit.

EUT	Bluetooth adaptor	**MODEL NO.**	HSTNC-001W
MODE	Channel 39	**FREQUENCY RANGE**	1 ~ 25 GHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	**DETECTOR FUNCTION & BANDWIDTH**	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25 deg. C, 70% RH, 991 hPa	**TEST MODE**	2
		TESTED BY: Jamison Chan	

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	1645.00	40.96 PK	74.00	-33.04	1.45 H	147	10.27	30.69

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	1645.00	41.67 PK	74.00	-32.33	1.43 V	144	10.98	30.69

NOTE: 1. Emission level = Raw value + Correction Factor
2. Correction Factor = Ant. Factor + Cable loss
3. Margin value = Emission level - Limit value
4. The other emission levels were very low against the limit.

EUT	Bluetooth adaptor	**MODEL NO.**	HSTNC-001W
MODE	Channel 78	**FREQUENCY RANGE**	1 ~ 25 GHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	**DETECTOR FUNCTION & BANDWIDTH**	Peak (PK) Average (AV)
ENVIRONMENTAL CONDITIONS	25 deg. C, 70% RH, 991 hPa	**TEST MODE**	2
		TESTED BY: Jamison Chan	

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	1645.00	40.29 PK	74.00	-33.71	1.46 H	150	9.60	30.69

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	1645.00	41.03 PK	74.00	-32.97	1.45 V	151	10.34	30.69

NOTE: 1. Emission level = Raw value + Correction Factor
2. Correction Factor = Ant. Factor + Cable loss
3. Margin value = Emission level - Limit value
4. The other emission levels were very low against the limit.

4.7.8 TEST RESULTS (3)

EUT	Bluetooth adaptor	**MODEL NO.**	HSTNC-001W
		FREQUENCY RANGE	Below 1000MHz
INPUT POWER (SYSTEM)	120Vac, 60Hz	**DETECTOR FUNCTION & BANDWIDTH**	Quasi-Peak
ENVIRONMENTAL CONDITIONS	25 deg. C, 70% RH, 991 hPa	**TEST MODE**	3
		TESTED BY: Jamison Chan	

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 10 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	48.71	22.70 QP	30.00	-7.30	4.00 H	99	10.44	12.26
2	112.20	21.54 QP	30.00	-8.46	4.00 H	318	8.89	12.65
3	136.06	22.60 QP	30.00	-7.40	4.00 H	241	10.29	12.31
4	169.41	17.11 QP	30.00	-12.89	4.00 H	268	5.97	11.14
5	216.50	22.60 QP	30.00	-7.40	4.00 H	225	10.22	12.38
6	240.38	26.68 QP	37.00	-10.32	4.00 H	304	12.64	14.04
7	336.46	27.42 QP	37.00	-9.58	3.19 H	227	9.48	17.94

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 10 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	48.02	23.70 QP	30.00	-6.30	1.00 V	40	11.42	12.28
2	112.83	19.18 QP	30.00	-10.82	1.00 V	21	6.50	12.68
3	137.30	23.36 QP	30.00	-6.64	1.00 V	304	11.11	12.25
4	169.90	19.12 QP	30.00	-10.88	1.00 V	240	7.99	11.13
5	216.63	19.62 QP	30.00	-10.38	1.00 V	117	7.23	12.39
6	624.00	26.02 QP	37.00	-10.98	3.00 V	276	1.09	24.93

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.

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 RB).

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

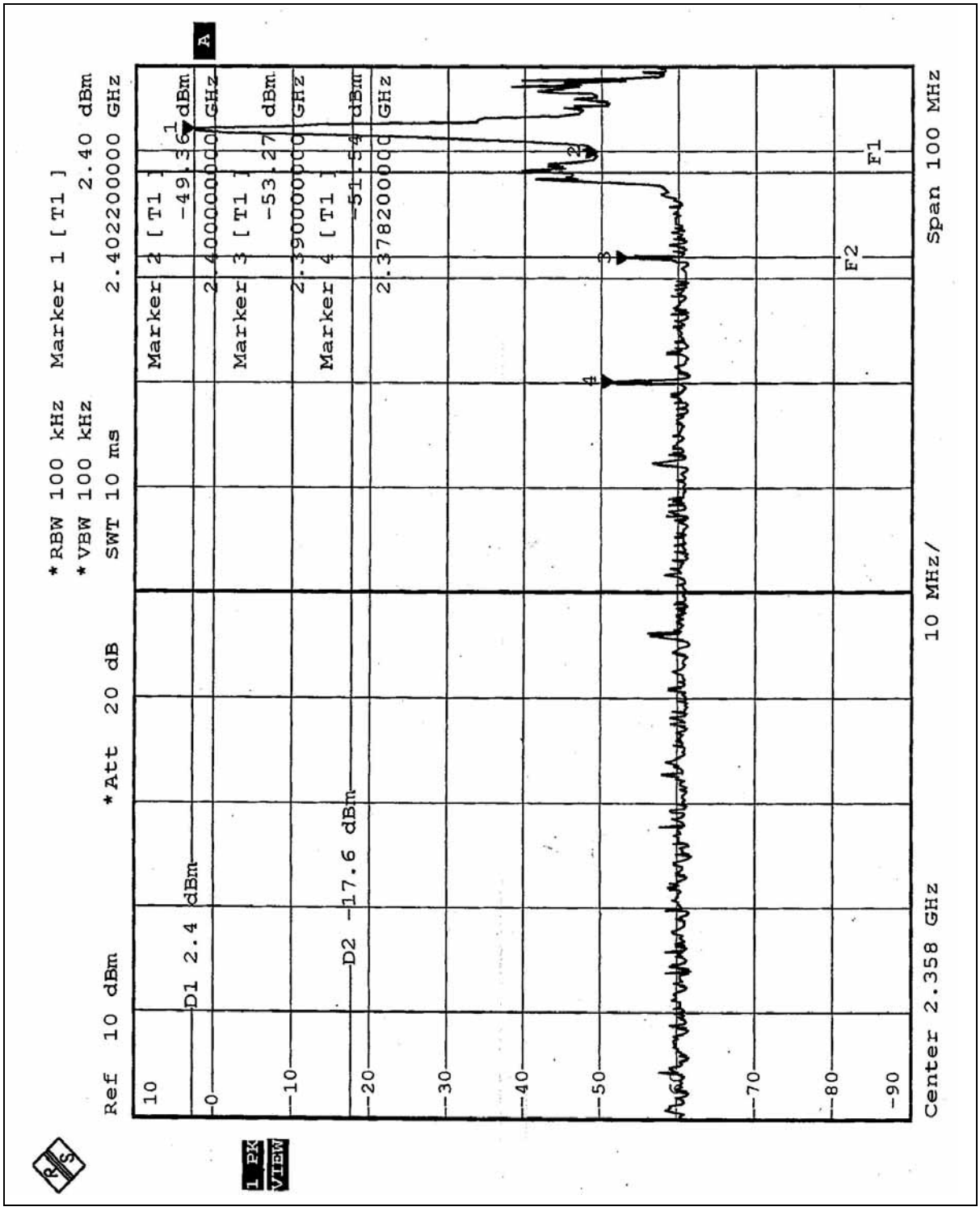
The software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel frequencies individually.

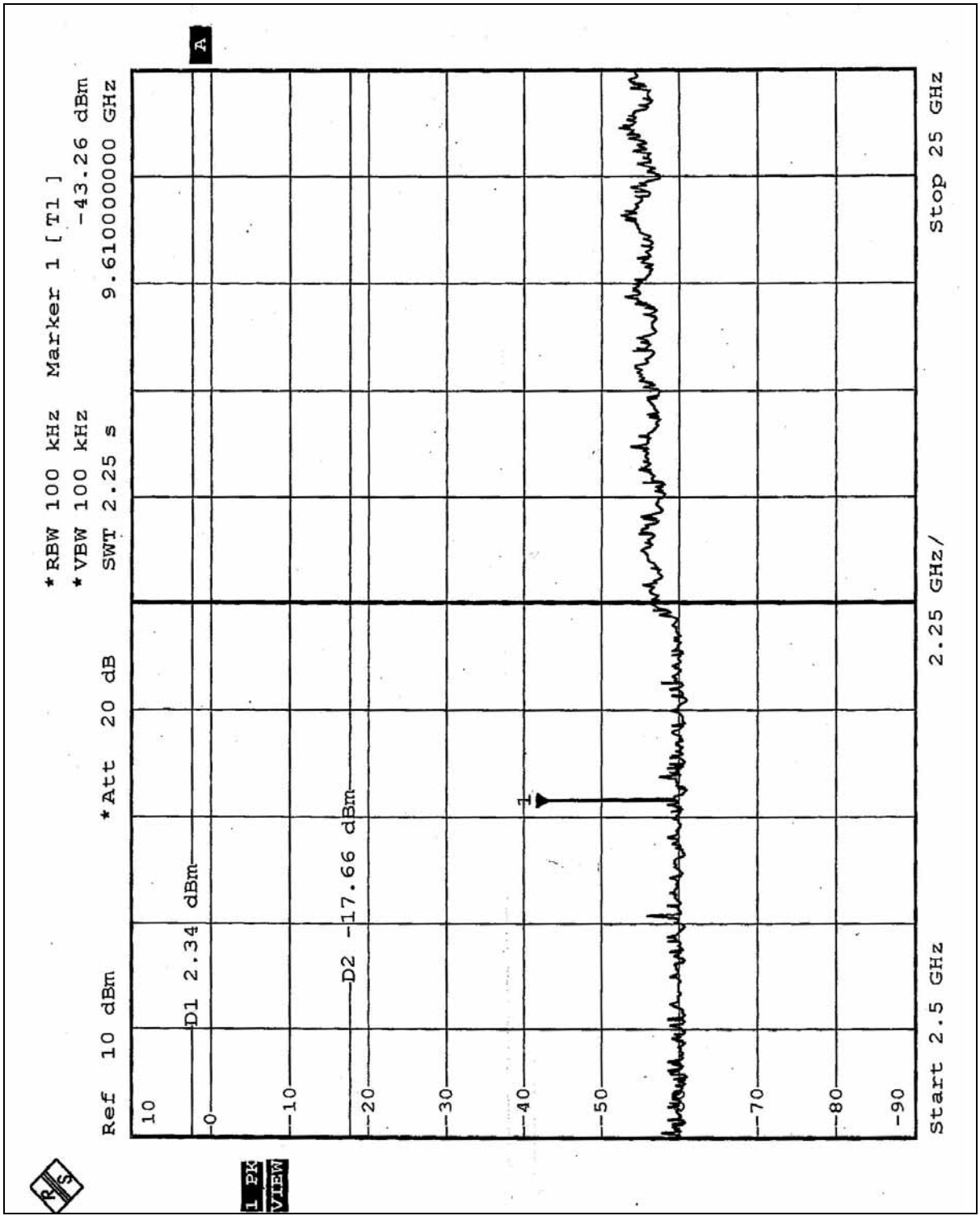
4.8.6 TEST RESULTS

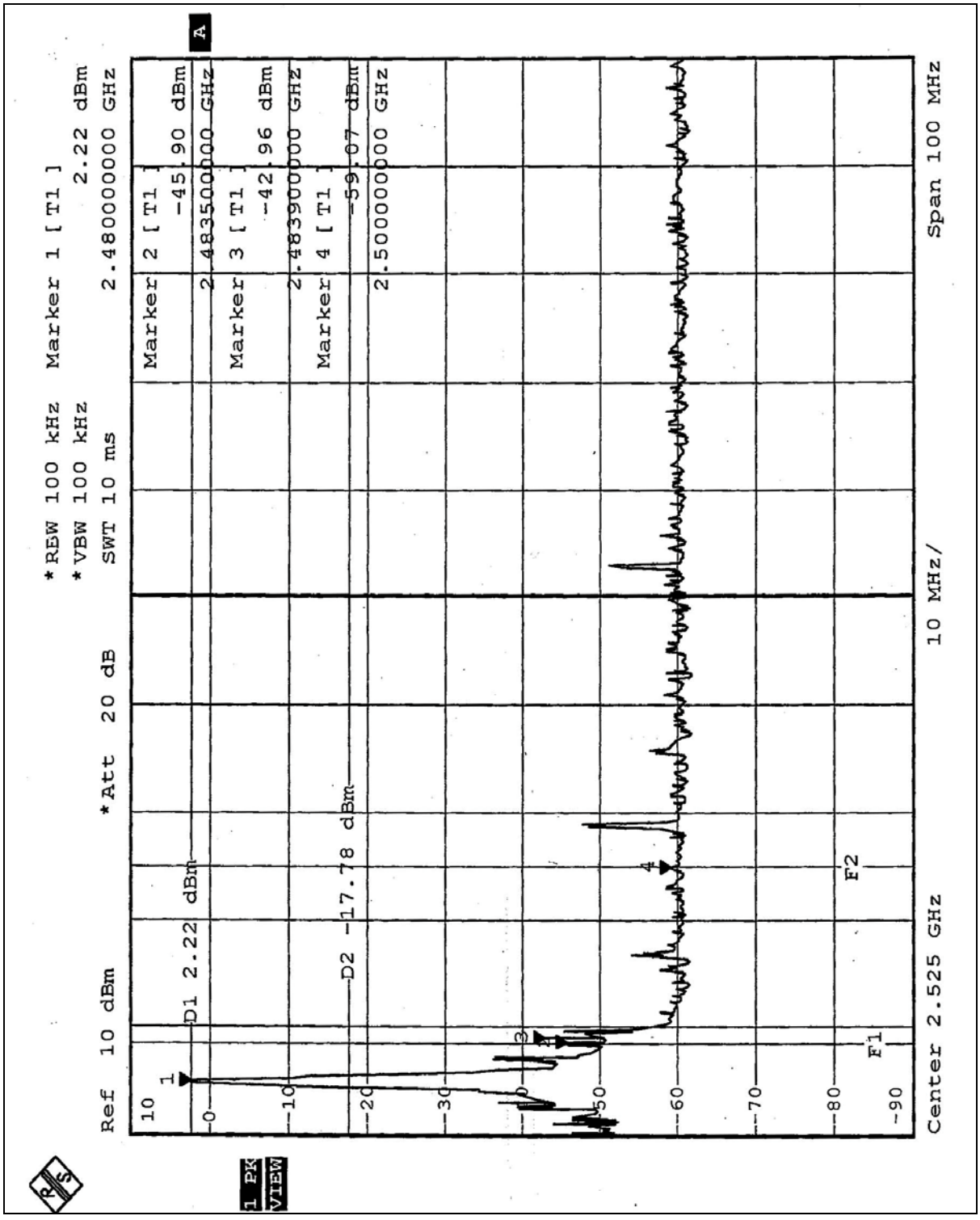
The spectrum plots are attached on the following 2 pages. D2 line indicates the highest level, D1 line indicates the 20dB offset below D2. It shows compliance with the requirement in part 15.247(C).

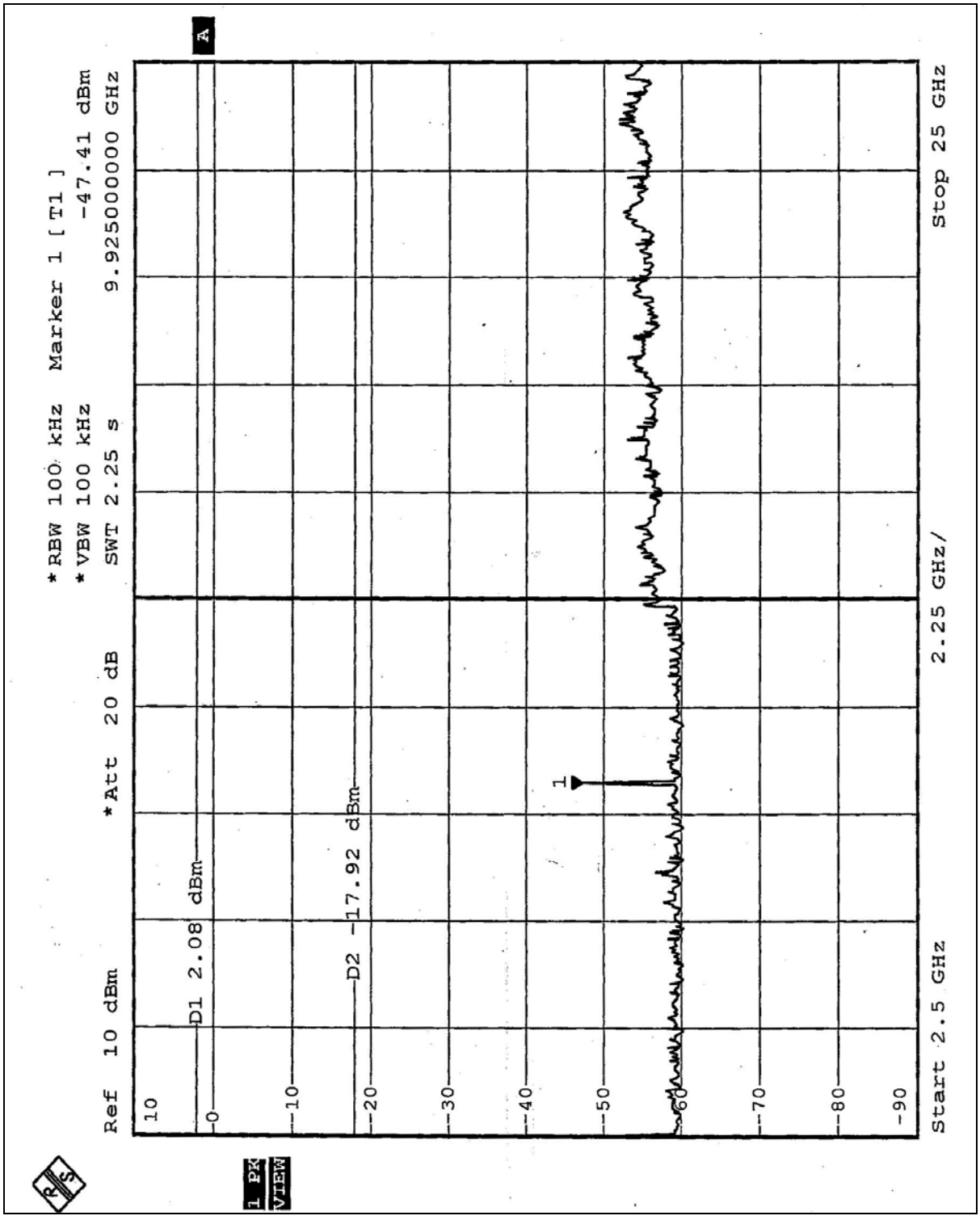
NOTE: The band edge emission plot on the following 1~2 page shows 53.94dB delta between carrier maximum power and local maximum emission in restrict band (2.3782GHz). The emission of carrier strength list in the test result of channel 0 at the item 4.7.6 is 58.69dBuV/m, so the maximum field strength in restrict band is 58.69-53.94=4.75dBuV/m which is under 54 dBuV/m limit.

NOTE: The band edge emission plot on the following 3~4 page shows 45.18dB delta between carrier maximum power and local maximum emission in restrict band (2.4839GHz). The emission of carrier strength list in the test result of channel 78 at the item 4.7.6 is 54.43dBuV/m, so the maximum field strength in restrict band is 54.43-45.18=9.25dBuV/m which is under 54 dBuV/m limit.


*RBW 100 kHz
*VBW 100 kHz
SWT 10 ms
Marker 1 [T1]
2.40 dBm
2.402200000 GHz
Ref 10 dBm
*Att 20 dB
D1 2.4 dBm
D2 -17.6 dBm
Marker 2 [T1]
-49.36 dBm
2.400000000 GHz
Marker 3 [T1]
-53.27 dBm
2.390000000 GHz
Marker 4 [T1]
-51.54 dBm
2.378200000 GHz
Center 2.358 GHz
10 MHz/
Span 100 MHz
1 PK
VIEW


A
*RBW 100 kHz
*VBW 100 kHz
SWT 2.25 s
Marker 1 [T1]
-43.26 dBm
9.610000000 GHz
Ref 10 dBm
*Att 20 dB
D1 2.34 dBm
D2 -17.66 dBm
1 PK VIEW
Start 2.5 GHz
2.25 GHz/
Stop 25 GHz


*RBW 100 kHz
*VBW 100 kHz
SWT 10 ms
Marker 1 [T1]
2.22 dBm
2.480000000 GHz
Marker 2 [T1]
-45.90 dBm
2.483500000 GHz
Marker 3 [T1]
-42.96 dBm
2.483900000 GHz
Marker 4 [T1]
-59.07 dBm
2.500000000 GHz
Ref 10 dBm
*Att 20 dB
D1 2.22 dBm
D2 -17.78 dBm
Center 2.525 GHz
10 MHz/
Span 100 MHz
F1
F2
1 PK VIEW


A
*RBW 100 kHz
*VBW 100 kHz
SWT 2.25 s
Marker 1 [T1]
-47.41 dBm
9.925000000 GHz
Ref 10 dBm
*Att 20 dB
D1 2.08 dBm
D2 -17.92 dBm
1
1 PK VIEW
Start 2.5 GHz
2.25 GHz/
Stop 25 GHz

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 Strip Antenna without antenna connector. The maximum Gain of this antenna is only –1.31dBi.

5 PHOTOGRAPHS OF THE TEST CONFIGURATION

CONDUCTED EMISSION TEST

RADIATED EMISSION TEST (Mode 1)

RADIATED EMISSION TEST (Mode 2)

RADIATED EMISSION TEST (Mode 3)

6 APPENDIX - 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:

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Fax: 886-2-26052943

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