FCC TEST REPORT

REPORT NO.: RF910611R01D
MODEL NO.: F8T020
RECEIVED: NA
TESTED: June 13 ~ June 24, 2002
November 17, 2003 (for testing parts of conduction and dwell time)

APPLICANT: Belkin Corporation

ADDRESS: 501 West Walnut Street, Compton, CA 90220-5221, U.S.A.

ISSUED BY: Advance Data Technology Corporation

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

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Lab Code: 200102-0

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1 CERTIFICATION

PRODUCT :	Bluetooth PDA & PC Combo Card
BRAND :	BELKIN
MODEL NO. :	F8T020
TEST ITEM:	Engineering Sample
APPLICANT :	Belkin Corporation
STANDARDS :	47 CFR Part 15, Subpart C (Section 15.247), ANSI C63.4-1992

We, **Advance Data Technology Corporation**, hereby certify that one sample of the designation has been tested in our facility from June 13 ~ June 24, 2002 and November 17, 2003 (for testing parts of conduction and dwell time). The test record, data evaluation and Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions herein specified.

PREPARED BY: Rennie Wang, **DATE:** November 17, 2003

APPROVED BY: Ellis Wu, Manager, **DATE:** November 17, 2003

2 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

APPLIED STANDARD: 47 CFR Part 15, Subpart C			
Standard Section	**Test Type and Limit**	**Result**	**REMARK**
15.207	AC Power Conducted Emission Limit: 48dBuV	PASS	Meet the requirement of limit Minimum passing margin is –12.66dB at 0.17MHz
15.247(a)(1)(I)-(ii)	Number of Hopping Frequency Used Spec.:At least 75 channels	PASS	Meet the requirement of limit
15.247(a)(1)(ii)	Dwell Time on Each Channel Spec. : Max. 0.4 second within 30 second	PASS	Meet the requirement of limit
15.247(a)(1)(I)-(ii)	Hopping Channel Separation Spec. : Min. 25 kHz or 20 dB bandwidth	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 –9.00dB at 4882.00MHz
15.247(c)	Band Edge Measurement	PASS	Meet the requirement of limit

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

3 GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

PRODUCT	Bluetooth PDA & PC Combo Card
MODEL NO.	F8T020
POWER SUPPLY	3.3VDC from host equipment
MODULATION TYPE	FHSS
MODULATION TECHNOLOGY	GFSK
FREQUENCY RANGE	2402MHz ~ 2480MHz
NUMBER OF CHANNEL	79
OUTPUT POWER	1.52dBm
ANTENNA TYPE	Printed Antenna with 0dBi antenna gain
DATA CABLE	NA
I/O PORTS	NA
ASSOCIATED DEVICES	NA

NOTE:

1. This report is issued as a duplicate report to the original report with No. RF910611R01. And the model in this report is identical to the original application model.
2. For more detailed features description, please refer to the manufacturer's specifications or 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		

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

3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS

The EUT is a Bluetooth PDA & PC Combo Card. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

FCC 47 CFR Part 15, Subpart C. (15.247)
ANSI C63.4 : 1992

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

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

3.4 DESCRIPTION OF SUPPORT UNITS

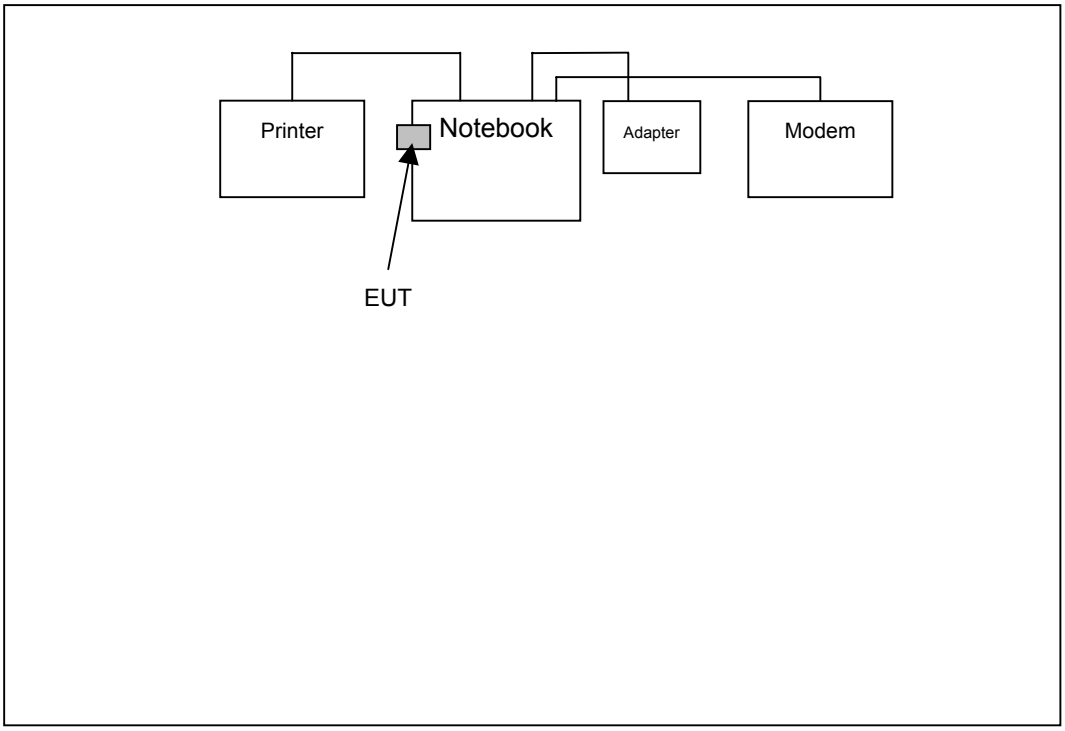
The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	NOTEBOOK	DELL	PP01L	TW-09C748-12800-19O-B220	FCC DoC APPROVED
2	PRINTER	EPSON	LQ-300+	DCGY017096	FCC DoC APPROVED
3	MODEM	ACEEX	1414	980020503	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 wire, terminated with DB25 and DB9 connector via metallic frame, w/o core.

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

3.5 CONFIGURATION OF SYSTEM UNDER TEST



4 TEST PROCEDURES AND RESULTS

4.1 CONDUCTED EMISSION MEASUREMENT

4.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

FREQUENCY OF EMISSION (MHz)	CONDUCTED LIMIT (dBμV)	
	Quasi-peak	Average
0.15-0.5	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
ROHDE & SCHWARZ Test Receiver	ESCS 30	838251/021	Jan. 20, 2004
ROHDE & SCHWARZ Artificial Mains Network (for EUT)	ESH3-Z5	100218	Dec. 18, 2003
ROHDE & SCHWARZ Artificial Mains Network (for peripherals)	ESH3-Z5	100219	Dec. 18, 2003
ROHDE & SCHWARZ Artificial Mains Network (for peripherals)	ESH3-Z5	100220	Dec. 18, 2003
*OHDE & SCHWARZ 4-wire ISN	ENY41	837032/016	Nov. 29 2003
*OHDE & SCHWARZ 2-wire ISN	ENY22	837497/016	Nov. 29 2003
Software	Cond-V2M3	NA	NA
RF cable (JYEBAO)	5D-FB	Cable-C10.01	May 01, 2004
SUHNER Terminator (For ROHDE & SCHWARZ LISN)	65BNC-5001	E1-010770	Mar. 24, 2004
SUHNER Terminator (For ROHDE & SCHWARZ LISN)	65BNC-5001	E1-010773	Apr. 06, 2004

NOTE:
1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. "*": These equipment are used for conducted telecom port test only (if tested).
3. The test was performed in ADT Shielded Room No. 10.
4. The VCCI Site Registration No. is C-1312.

4.1.3 TEST PROCEDURES

a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.

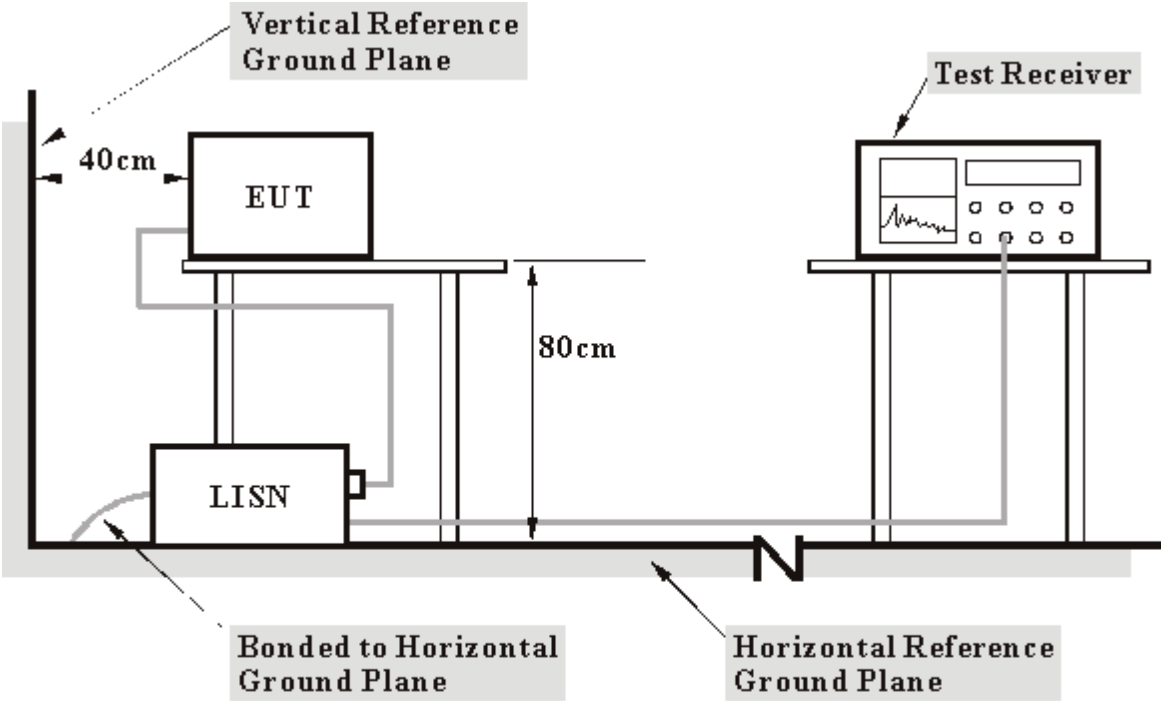
b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.

c. The frequency range from 150 kHz to 30 MHz was searched. Emission levels over 10dB under the prescribed limits could not be reported

4.1.4 DEVIATION FROM TEST STANDARD

No deviation

4.1.5 TEST SETUP



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

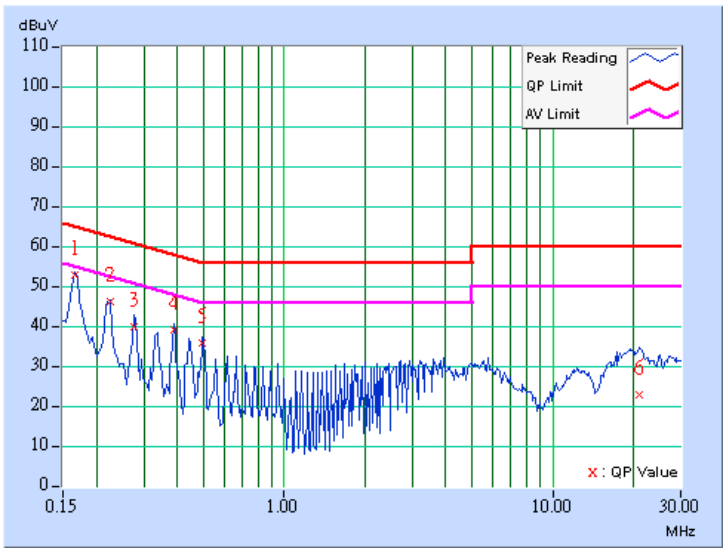
For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

4.1.6 TEST RESULTS

EUT	Bluetooth PDA & PC Combo Card	**MODEL**	F8T020
CHANNEL	0	**6dB BANDWIDTH**	9 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**PHASE**	Line (L)
ENVIRONMENTAL CONDITIONS	20 deg. C, 70%RH, 991 hPa	**TESTED BY**: Steven Lu	

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	0.166	0.06	52.24	-	52.30	-	65.18	55.18	-12.88	-
2	0.224	0.06	45.76	-	45.82	-	62.66	52.66	-16.84	-
3	0.275	0.06	39.27	-	39.33	-	60.97	50.97	-21.64	-
4	0.388	0.06	38.75	-	38.81	-	58.10	48.10	-19.29	-
5	0.498	0.08	35.41	-	35.49	-	56.04	46.04	-20.55	-
6	20.996	0.69	22.35	-	23.04	-	60.00	50.00	-36.96	-

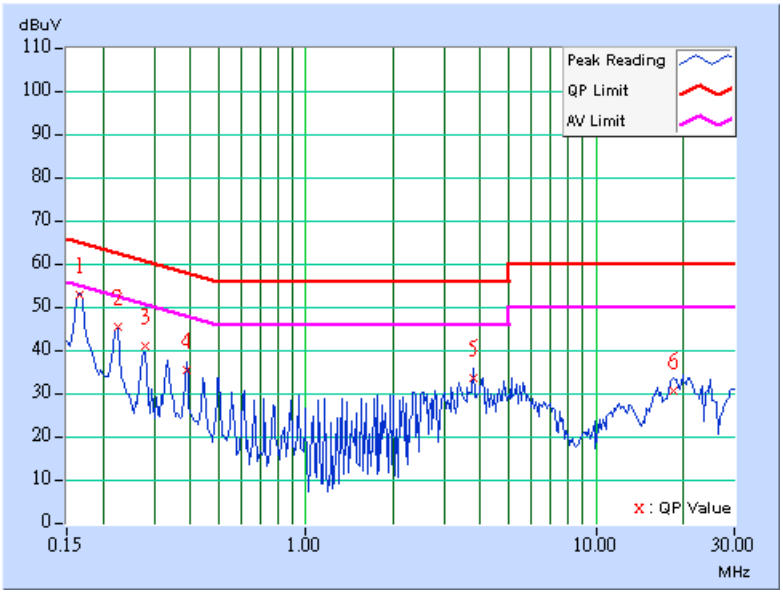
REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission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



EUT	Bluetooth PDA & PC Combo Card	**MODEL**	F8T020
MODE	Channel 0	**6dB BANDWIDTH**	9 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**PHASE**	Neutral (N)
ENVIRONMENTAL CONDITIONS	20 deg. C, 70%RH, 991 hPa	**TESTED BY**: Steven Lu	

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	**0.166**	**0.05**	**52.47**	**-**	**52.52**	**-**	**65.18**	**55.18**	**-12.66**	**-**
2	0.224	0.05	45.18	-	45.23	-	62.66	52.66	-17.43	-
3	0.279	0.05	40.63	-	40.68	-	60.85	50.85	-20.17	-
4	0.388	0.05	35.07	-	35.12	-	58.10	48.10	-22.98	-
5	3.773	0.20	33.33	-	33.53	-	56.00	46.00	-22.47	-
6	18.484	0.50	30.17	-	30.67	-	60.00	50.00	-29.33	-

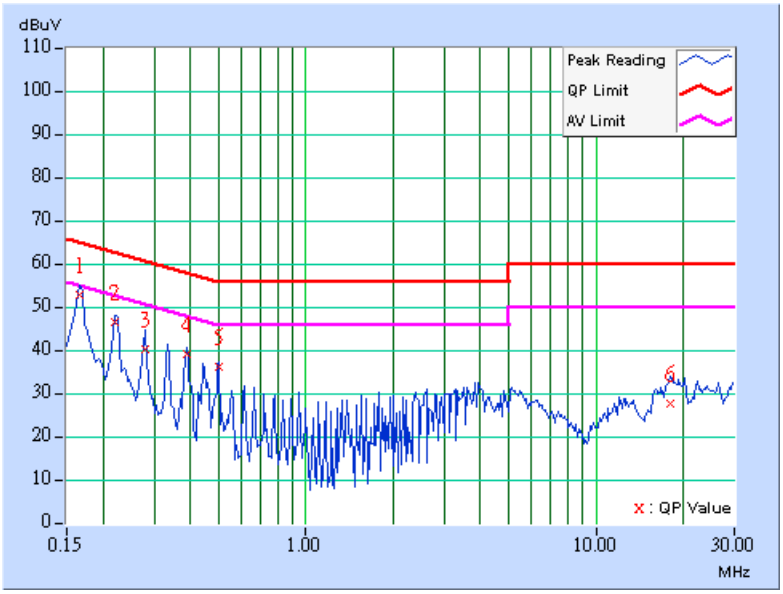
REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission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



EUT	Bluetooth PDA & PC Combo Card	**MODEL**	F8T020
MODE	Channel 39	**6dB BANDWIDTH**	9 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**PHASE**	Line (L)
ENVIRONMENTAL CONDITIONS	20 deg. C, 70%RH, 991 hPa	**TESTED BY**: Steven Lu	

No	Freq.	Corr. Factor	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
	[MHz]	(dB)	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.166	0.06	52.32	-	52.38	-	65.18	55.18	-12.80	-
2	0.220	0.06	46.15	-	46.21	-	62.81	52.81	-16.60	-
3	0.279	0.06	39.87	-	39.93	-	60.85	50.85	-20.92	-
4	0.388	0.06	38.75	-	38.81	-	58.10	48.10	-19.29	-
5	0.502	0.08	35.56	-	35.64	-	56.00	46.00	-20.36	-
6	18.105	0.61	27.23	-	27.84	-	60.00	50.00	-32.16	-

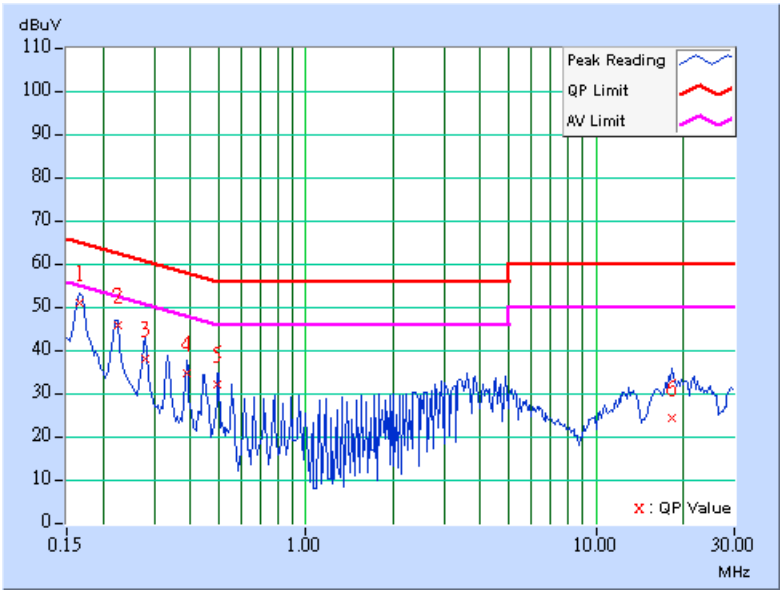
REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission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



EUT	Bluetooth PDA & PC Combo Card	**MODEL**	F8T020
MODE	Channel 39	**6dB BANDWIDTH**	9 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**PHASE**	Neutral (N)
ENVIRONMENTAL CONDITIONS	20 deg. C, 70%RH, 991 hPa	**TESTED BY**: Steven Lu	

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	0.166	0.05	50.57	-	50.62	-	65.18	55.18	-14.56	-
2	0.224	0.05	45.33	-	45.38	-	62.66	52.66	-17.28	-
3	0.279	0.05	37.61	-	37.66	-	60.85	50.85	-23.19	-
4	0.388	0.05	34.31	-	34.36	-	58.10	48.10	-23.74	-
5	0.498	0.07	31.78	-	31.85	-	56.04	46.04	-24.19	-
6	18.258	0.50	23.99	-	24.49	-	60.00	50.00	-35.51	-

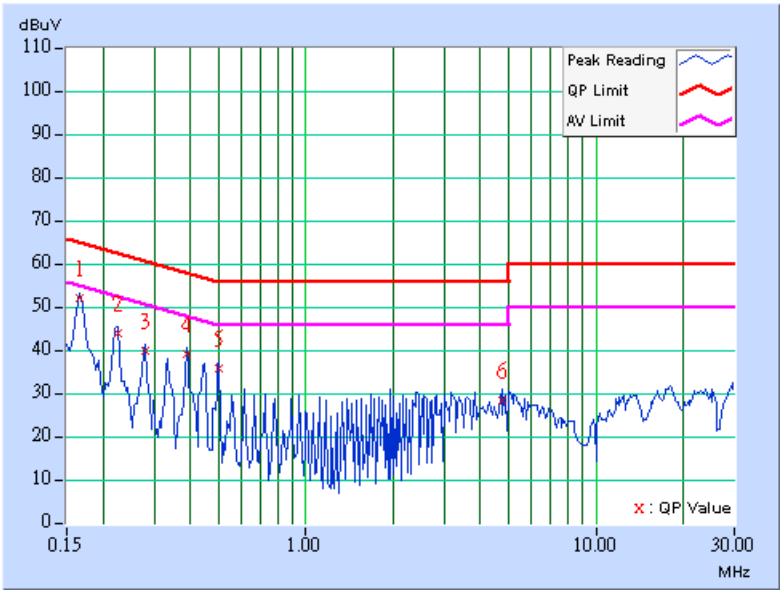
REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission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



EUT	Bluetooth PDA & PC Combo Card	**MODEL**	F8T020
MODE	Channel 78	**6dB BANDWIDTH**	9 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**PHASE**	Line (L)
ENVIRONMENTAL CONDITIONS	20 deg. C, 70%RH, 991 hPa	**TESTED BY**: Steven Lu	

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	0.166	0.06	51.86	-	51.92	-	65.18	55.18	-13.26	-
2	0.224	0.06	43.93	-	43.99	-	62.66	52.66	-18.67	-
3	0.279	0.06	39.73	-	39.79	-	60.85	50.85	-21.06	-
4	0.388	0.06	39.01	-	39.07	-	58.10	48.10	-19.03	-
5	0.502	0.08	35.84	-	35.92	-	56.00	46.00	-20.08	-
6	4.727	0.25	28.39	-	28.64	-	56.00	46.00	-27.36	-

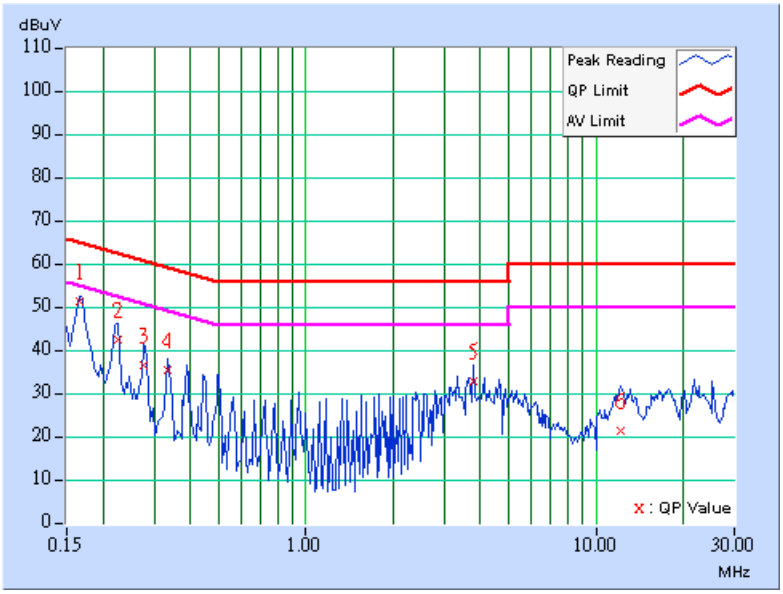
REMARKS: 1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. "-": The Quasi-peak reading value also meets average limit and measurement with the average detector is unnecessary.
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission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



EUT	Bluetooth PDA & PC Combo Card	**MODEL**	F8T020
MODE	Channel 78	**6dB BANDWIDTH**	9 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**PHASE**	Netural (N)
ENVIRONMENTAL CONDITIONS	20 deg. C, 70%RH, 991 hPa	**TESTED BY**: Steven Lu	

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	0.166	0.05	51.12	-	51.17	-	65.18	55.18	-14.01	-
2	0.224	0.05	42.22	-	42.27	-	62.66	52.66	-20.39	-
3	0.275	0.05	36.16	-	36.21	-	60.97	50.97	-24.76	-
4	0.334	0.05	35.07	-	35.12	-	59.36	49.36	-24.24	-
5	3.781	0.20	32.65	-	32.85	-	56.00	46.00	-23.15	-
6	12.234	0.43	21.17	-	21.60	-	60.00	50.00	-38.40	-

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 75 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, 2004

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

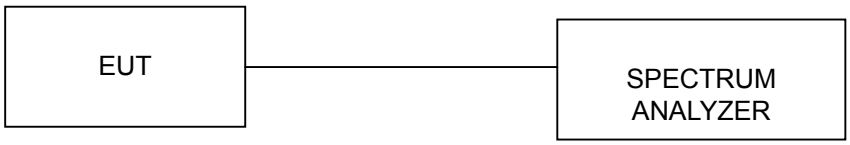
4.2.3 TEST PROCEDURES

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

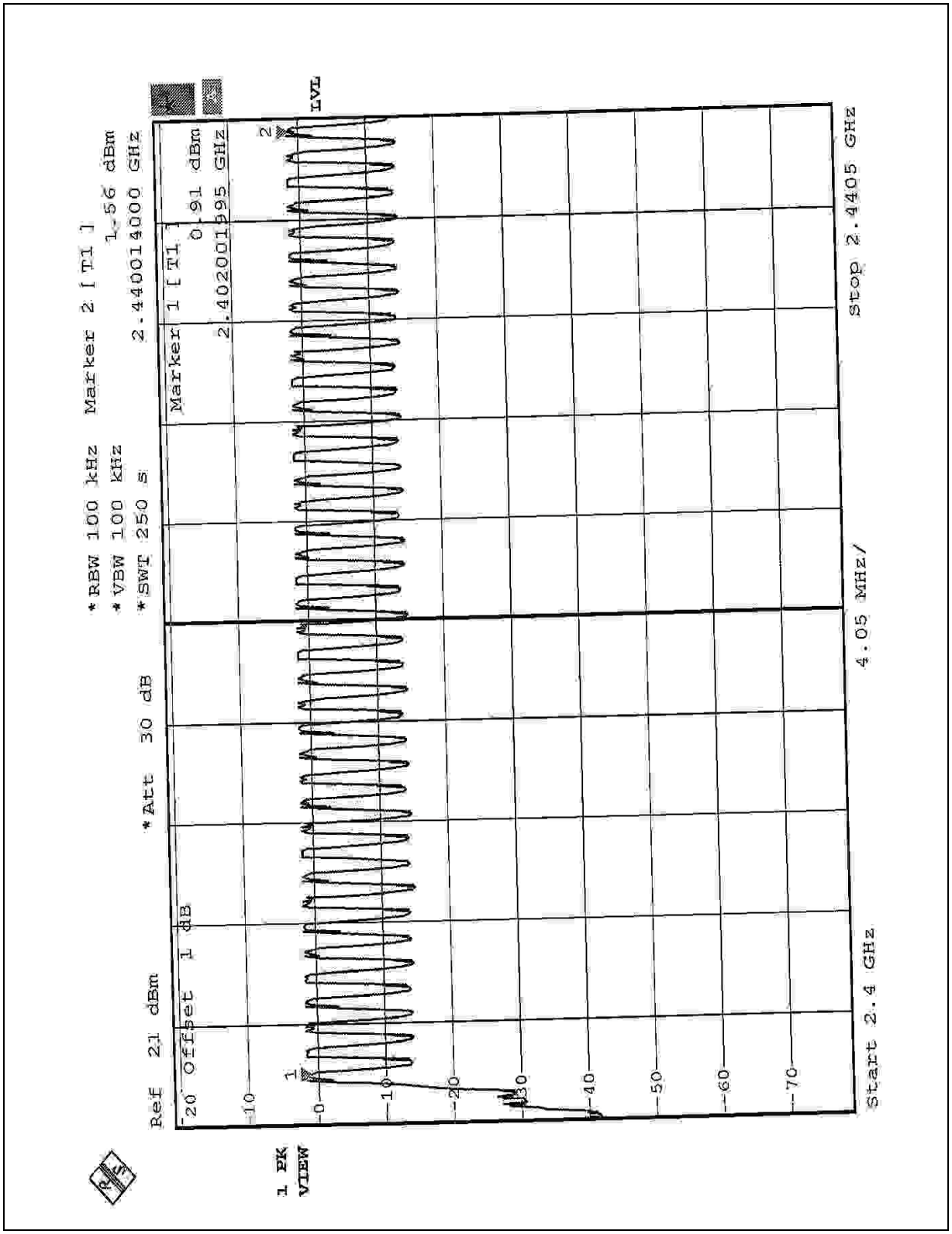
No deviation

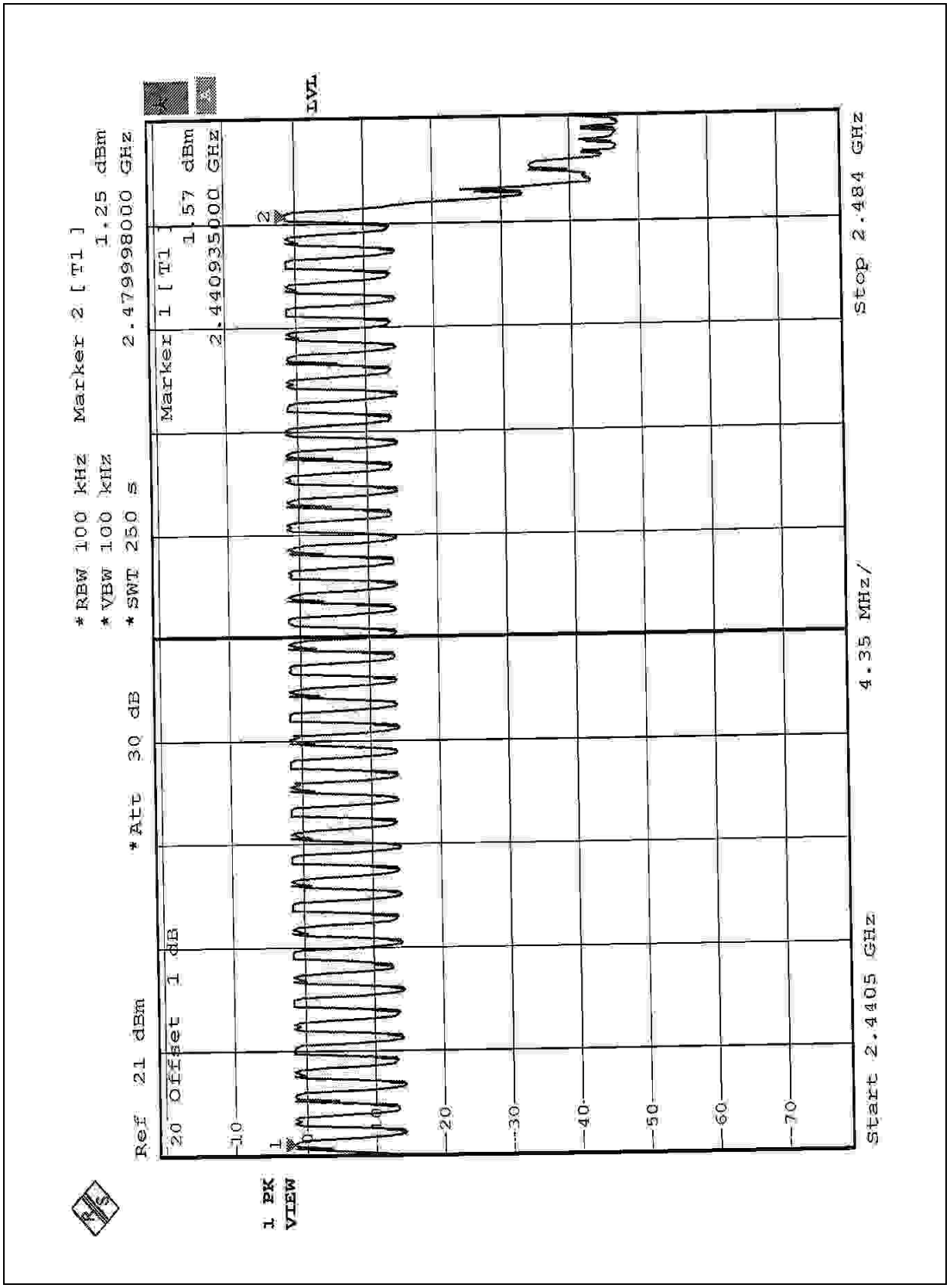
4.2.5 TEST SETUP



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.


Ref 21 dBm
Att 30 dB
RBW 100 kHz
VBW 100 kHz
SWT 250 s
Marker 2 [T1]
1.56 dBm
2.440014000 GHz
Marker 1 [T1]
0.91 dBm
2.402001995 GHz
Offset 1 dB
1 PK
VIEW
Start 2.4 GHz
4.05 MHz/
Stop 2.4405 GHz


Ref 21 dBm
Offset 1 dB
*Att 30 dB
*RBW 100 kHz
*VBW 100 kHz
*SWT 250 s
Marker 2 [T1]
1.25 dBm
2.479998000 GHz
Marker 1 [T1]
1.57 dBm
2.440935000 GHz
1 PK
VIEW
LVL
Start 2.4405 GHz
4.35 MHz/
Stop 2.484 GHz

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 30 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, 2004

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

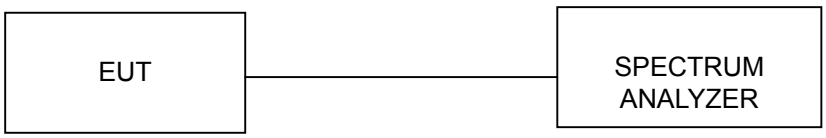
4.3.3 TEST PROCEDURES

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

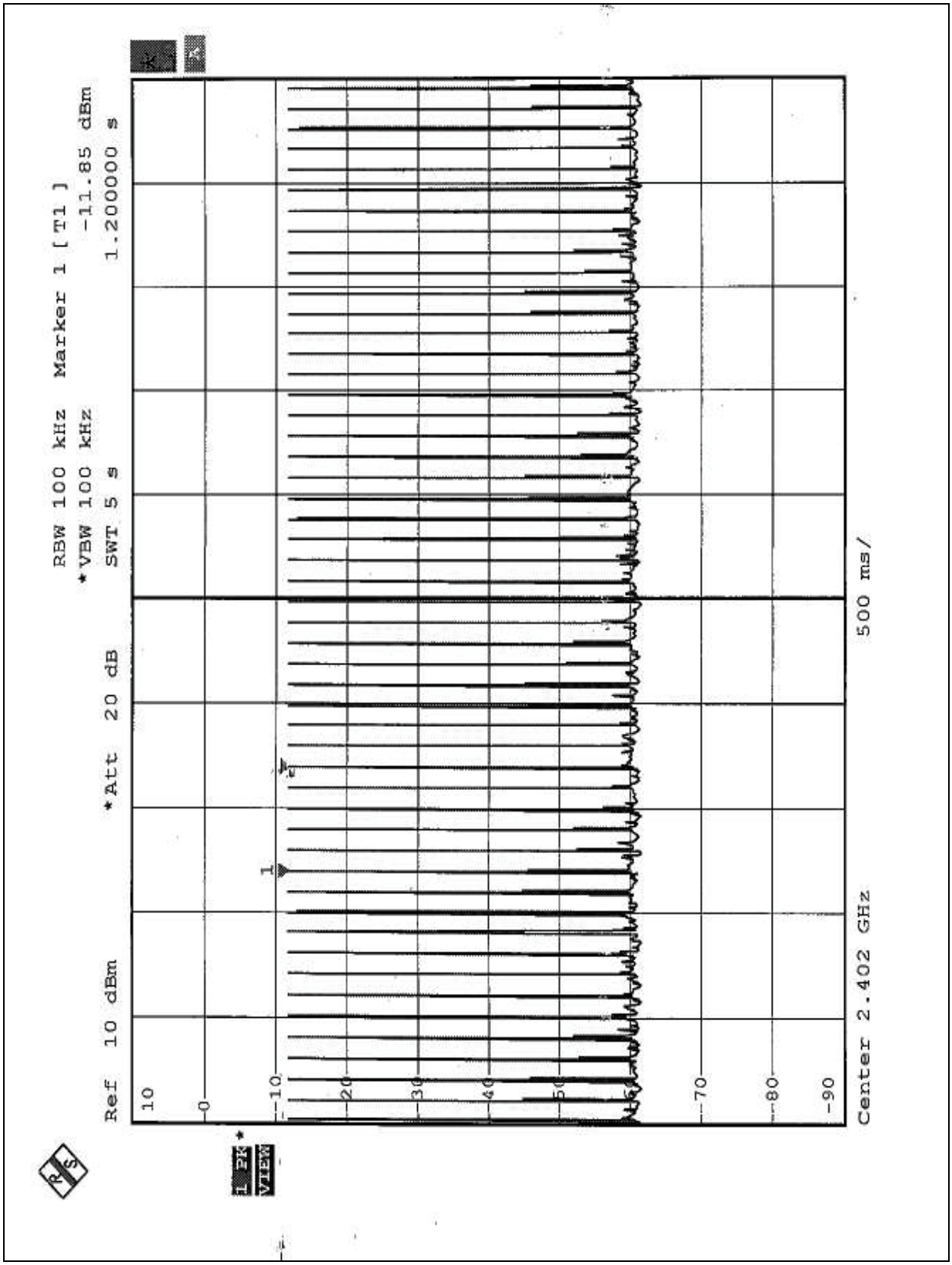


4.3.6 TEST RESULTS

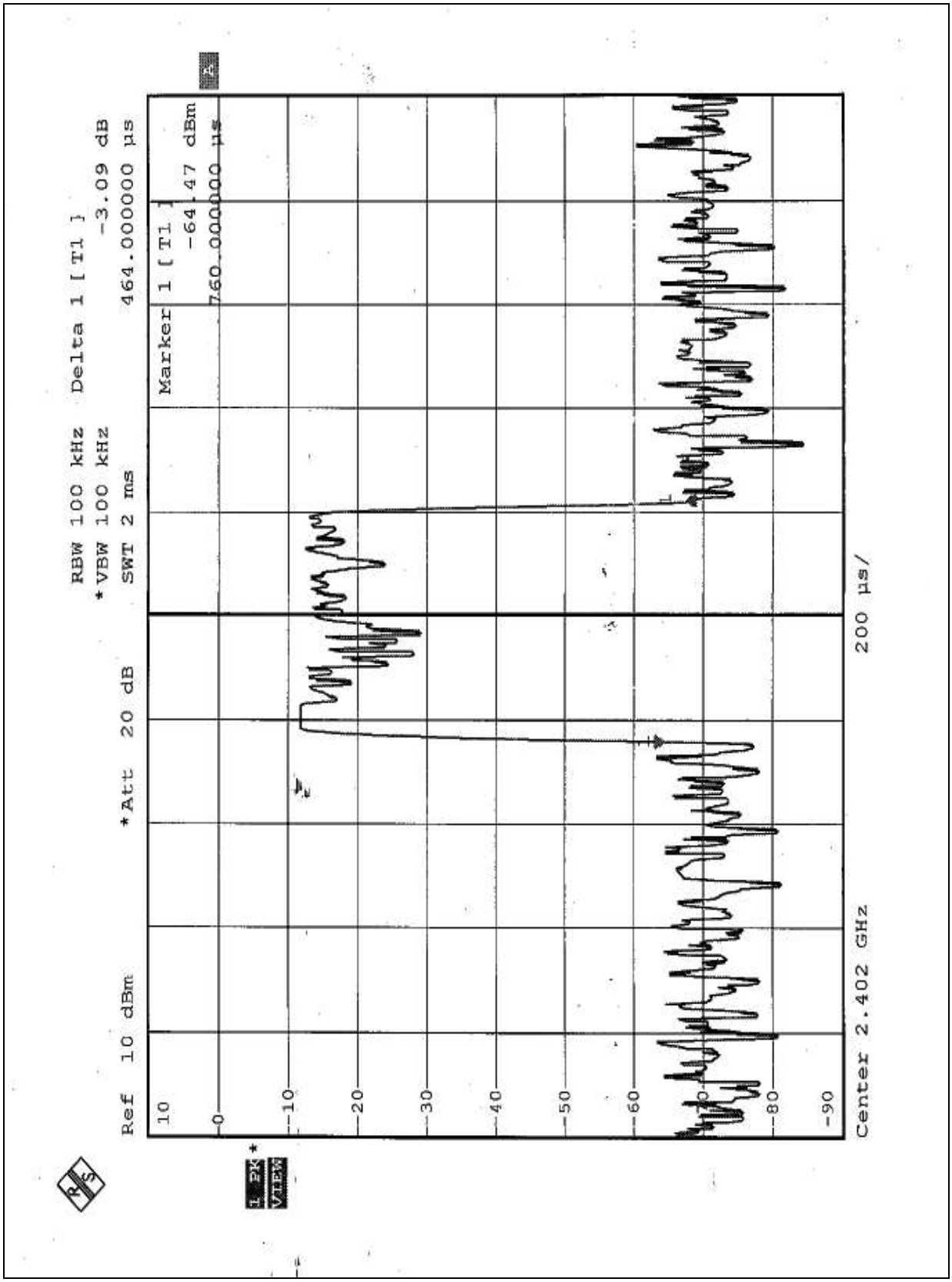
Mode	Number of transmission in a 31.6 (79Hopping*0.4)	Length of transmission time (msec)	Result (msec)	Limit (msec)
DH1	51 times / 5 sec *6.32=322.32 times	0.464	149.56	400
DH3	25 times / 5 sec *6.32=158.00 times	1.760	278.08	400
DH5	17 times / 5 sec *6.32=107.44 times	3.020	324.47	400

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

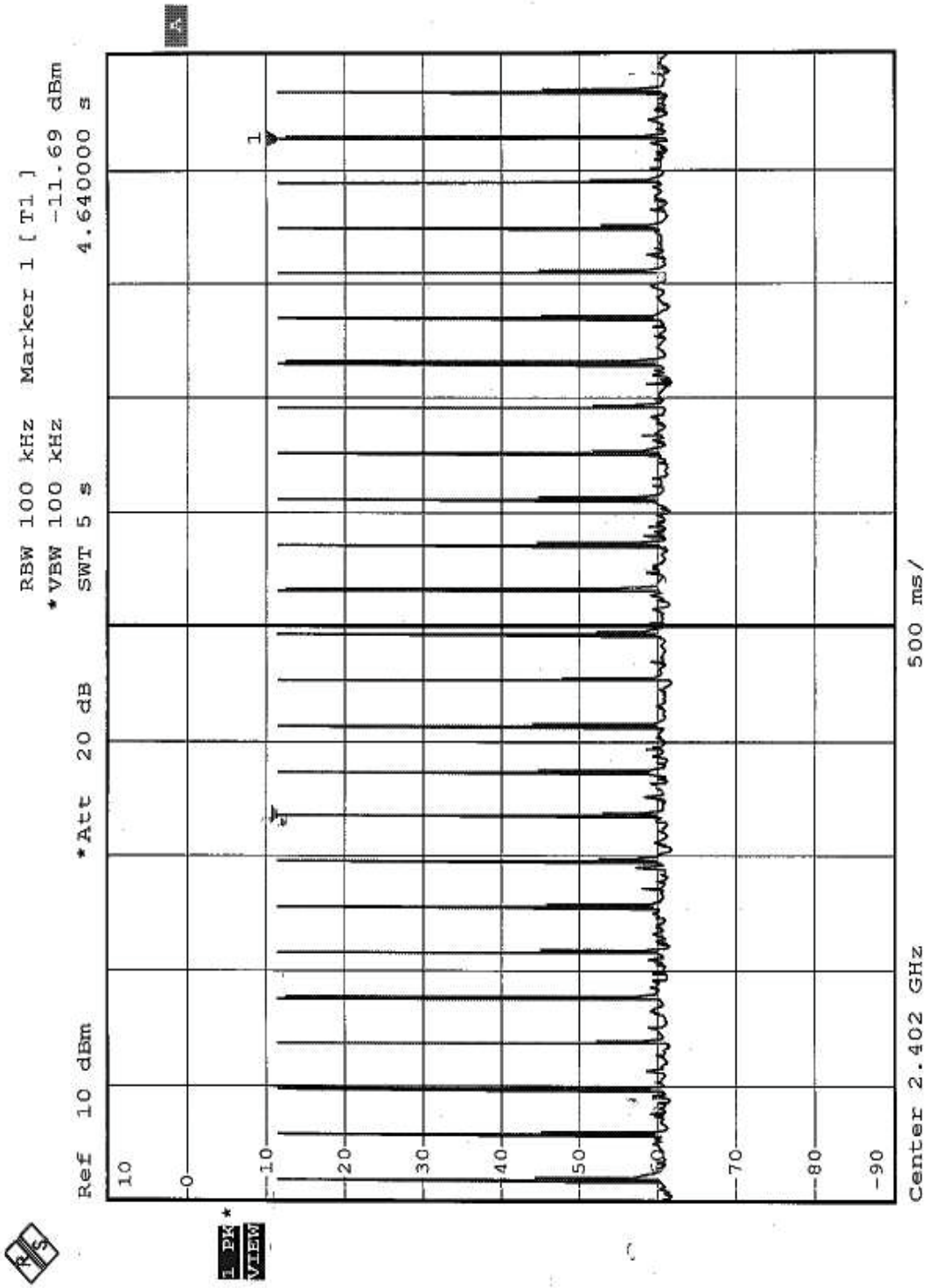
DH1


Ref 10 dBm
*Att 20 dB
RBW 100 kHz
*VBW 100 kHz
SWT 5 s
Marker 1 [T1]
-11.85 dBm
1.200000 s
1 PK
VIEW
Center 2.402 GHz
500 ms/

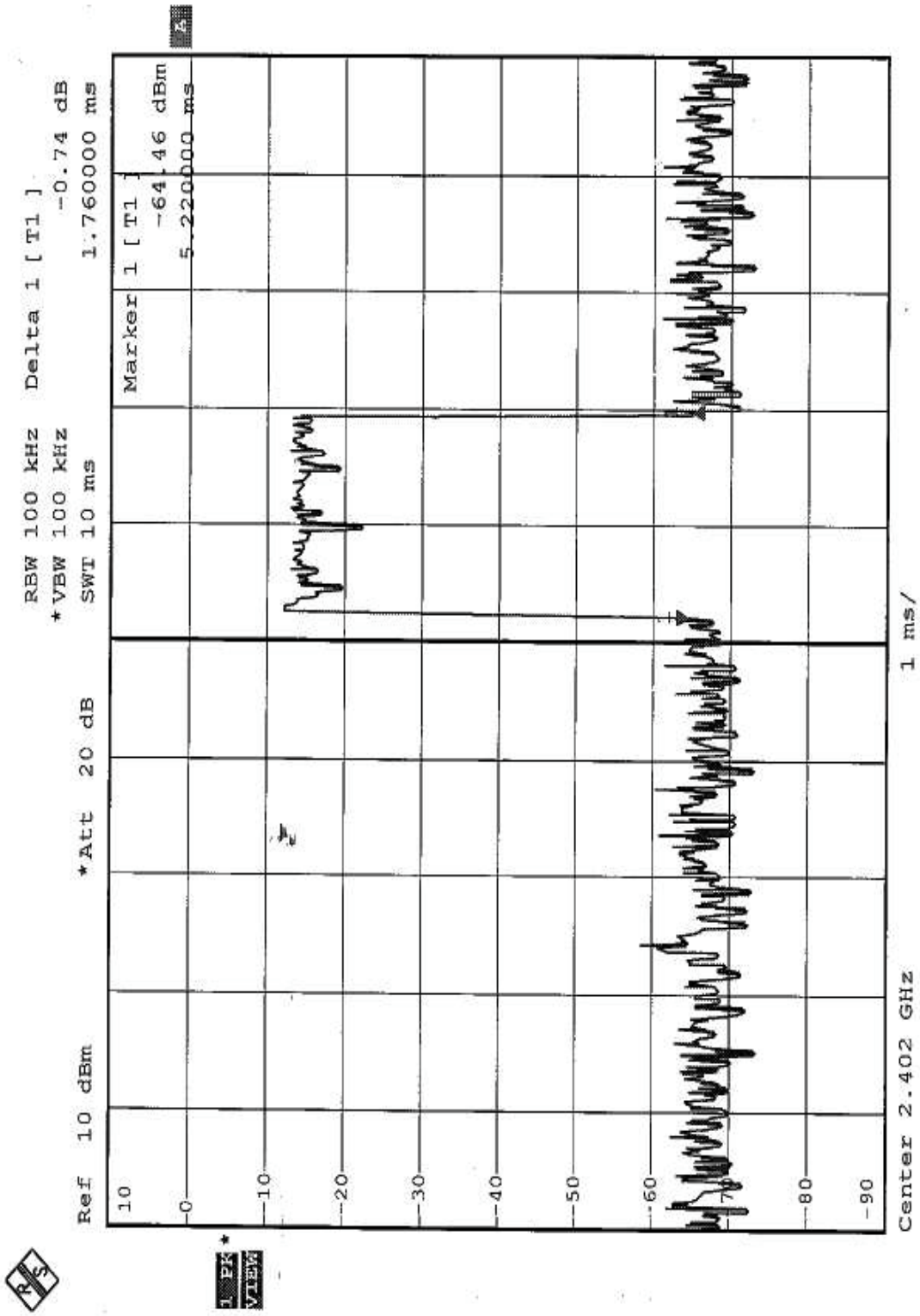
DH1


Ref 10 dBm
*Att 20 dB
RBW 100 kHz
*VBW 100 kHz
SWT 2 ms
Delta 1 [T1]
-3.09 dB
464.000000 µs
Marker 1 [T1]
-64.47 dBm
760.000000 µs
1 PK
VIEW
Center 2.402 GHz
200 µs/

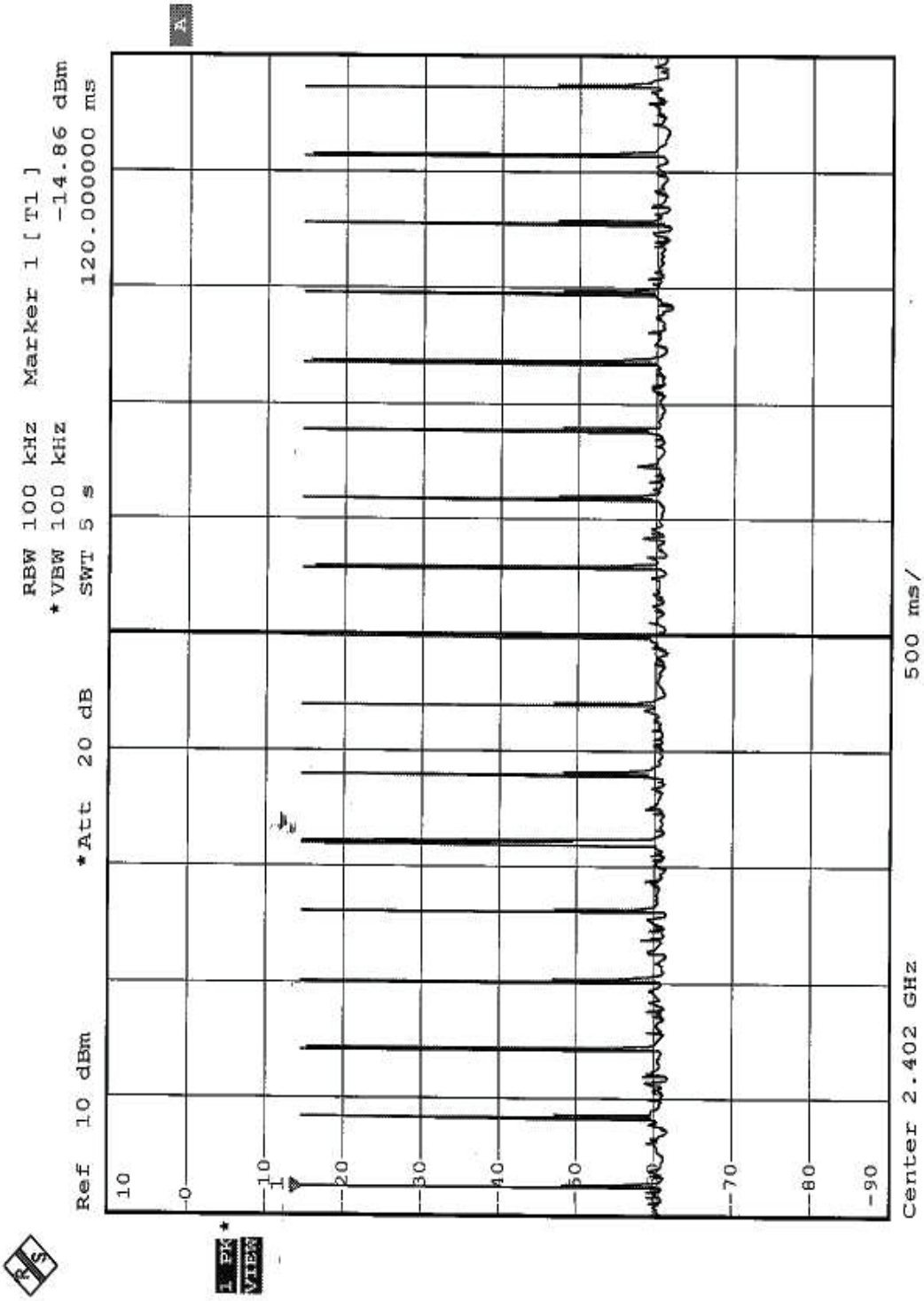
DH3


Ref 10 dBm
*Att 20 dB
RBW 100 kHz
*VBW 100 kHz
SWT 5 s
Marker 1 [T1]
-11.69 dBm
4.640000 s
1 PK
VIEW
Center 2.402 GHz
500 ms/

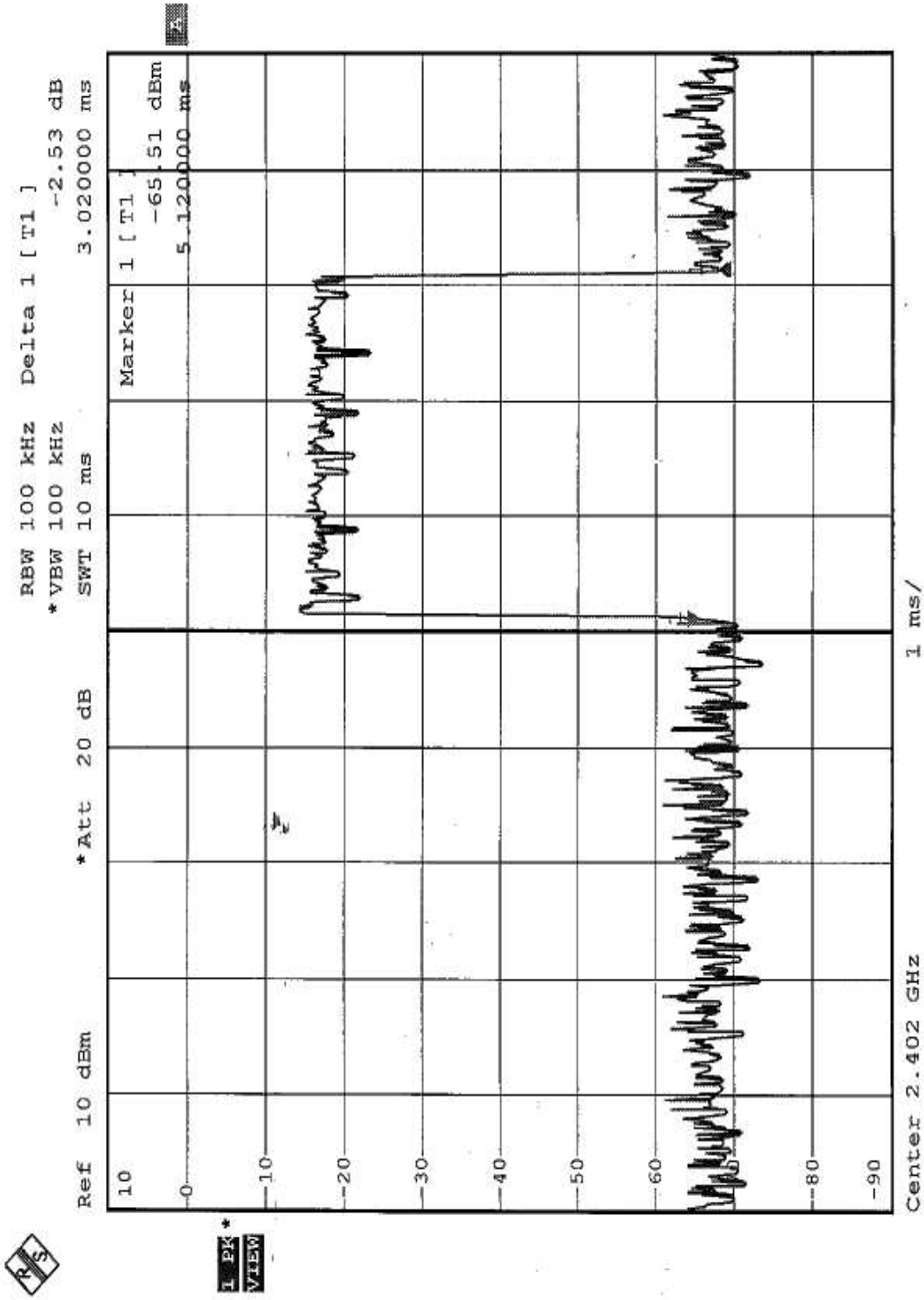
DH3


Ref 10 dBm
*Att 20 dB
RBW 100 kHz
*VBW 100 kHz
SWT 10 ms
Delta 1 [T1]
-0.74 dB
1.760000 ms
Marker 1 [T1]
-64.46 dBm
5.220000 ms
1 PK
VIEW
Center 2.402 GHz
1 ms/

DH5


Ref 10 dBm
*Att 20 dB
RBW 100 kHz
*VBW 100 kHz
SWT 5 s
Marker 1 [T1]
-14.86 dBm
120.000000 ms
Center 2.402 GHz
500 ms/

DH5


Ref 10 dBm
*Att 20 dB
RBW 100 kHz
*VBW 100 kHz
SWT 10 ms
Delta 1 [T1] -2.53 dB
3.020000 ms
Marker 1 [T1]
-65.51 dBm
5.120000 ms
1 PK
VIEW
Center 2.402 GHz
1 ms/

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 20 dB 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, 2004

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

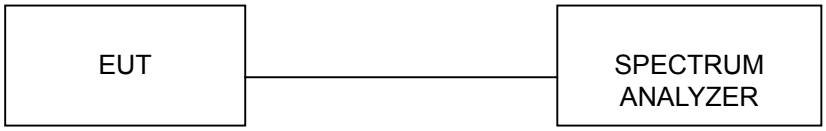
4.4.3 TEST PROCEDURE

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



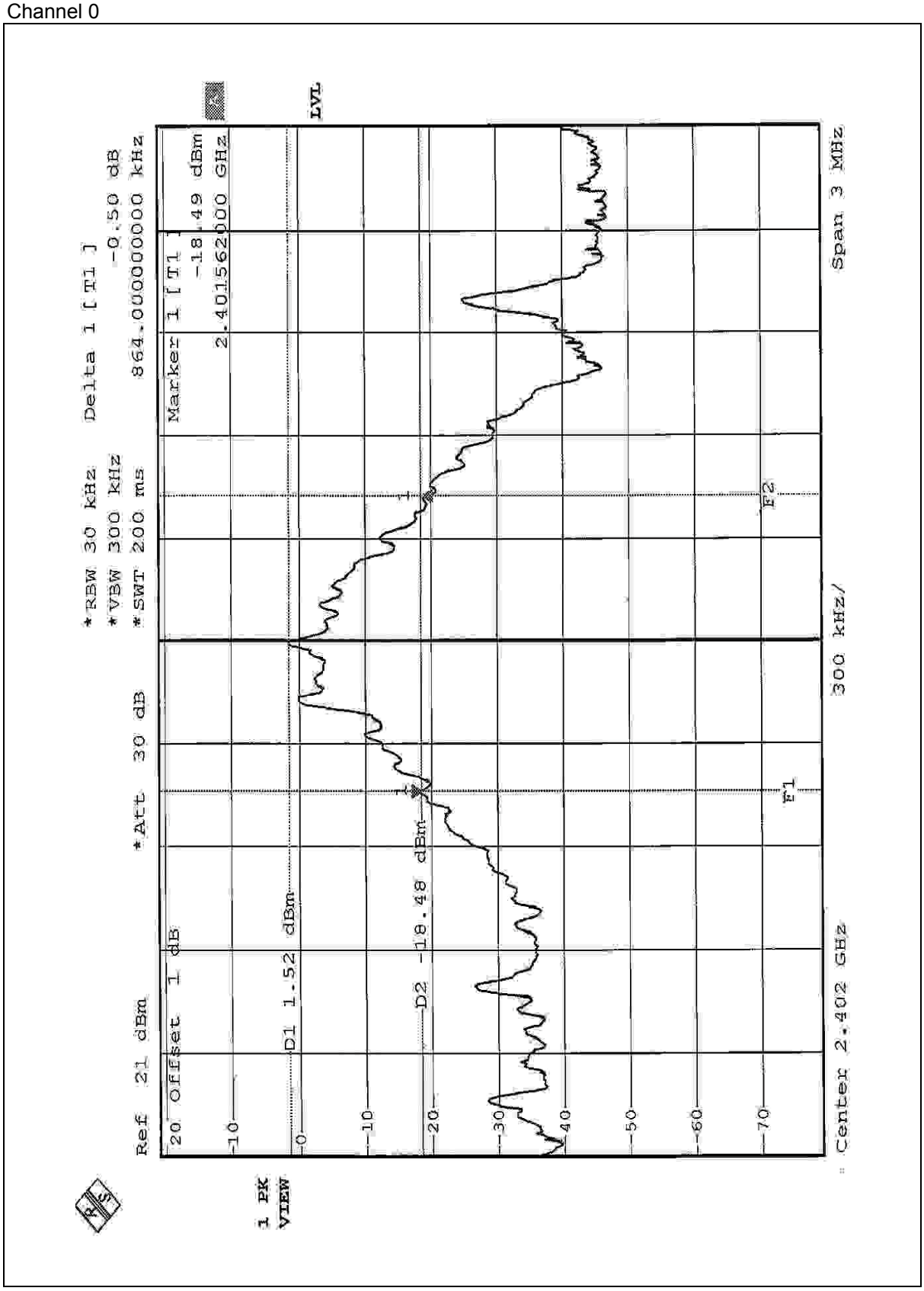
4.4.6 EUT OPERATING CONDITION

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

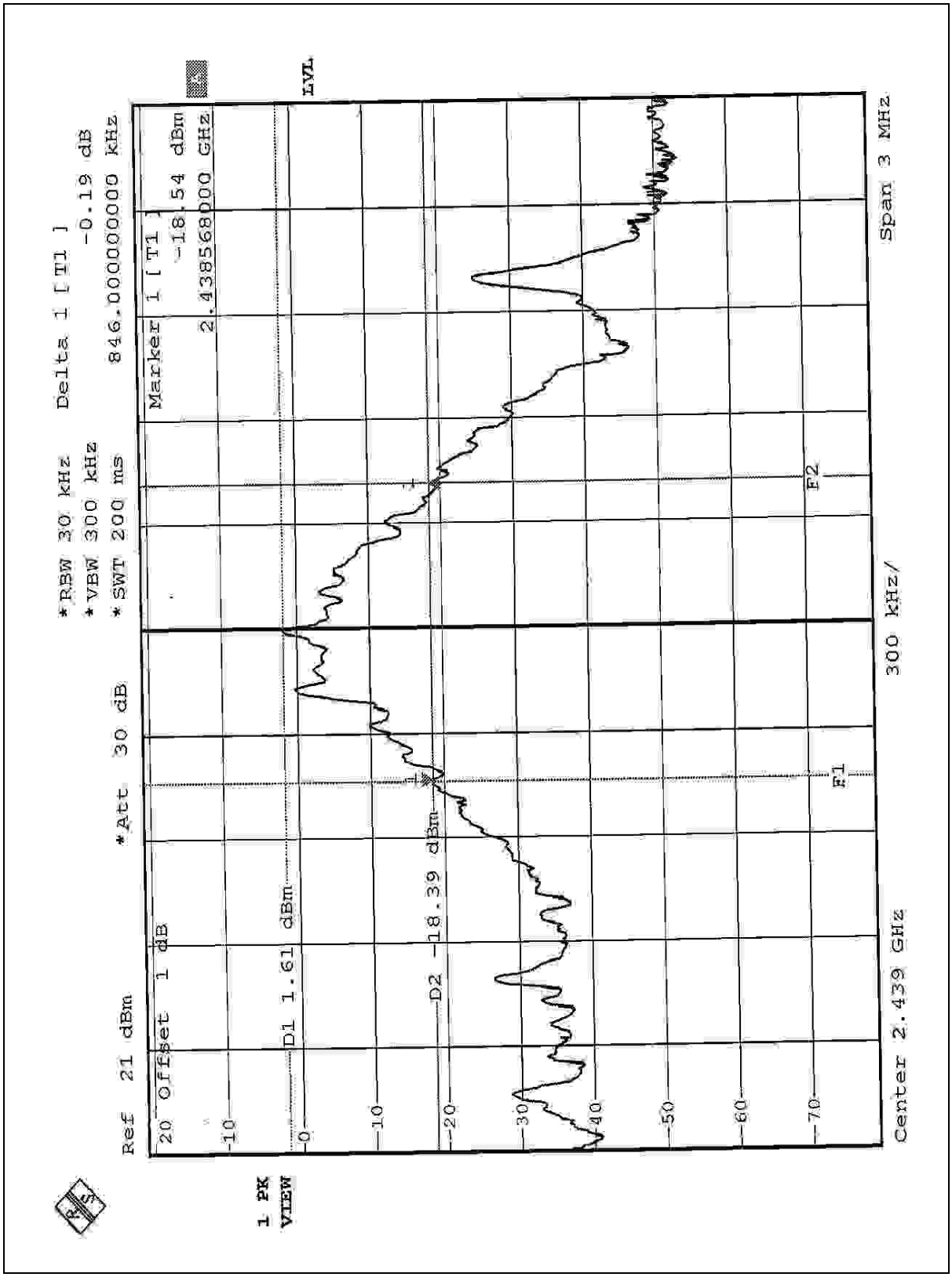
4.4.7 TEST RESULTS

CHANNEL	CHANNEL FREQUENCY (MHz)	20 dB BANDWIDTH (kHz)	MAXIMUM LIMIT (MHz)	PASS/FAIL
0	2402	864.00	1	PASS
39	2441	846.00	1	PASS
78	2480	864.00	1	PASS

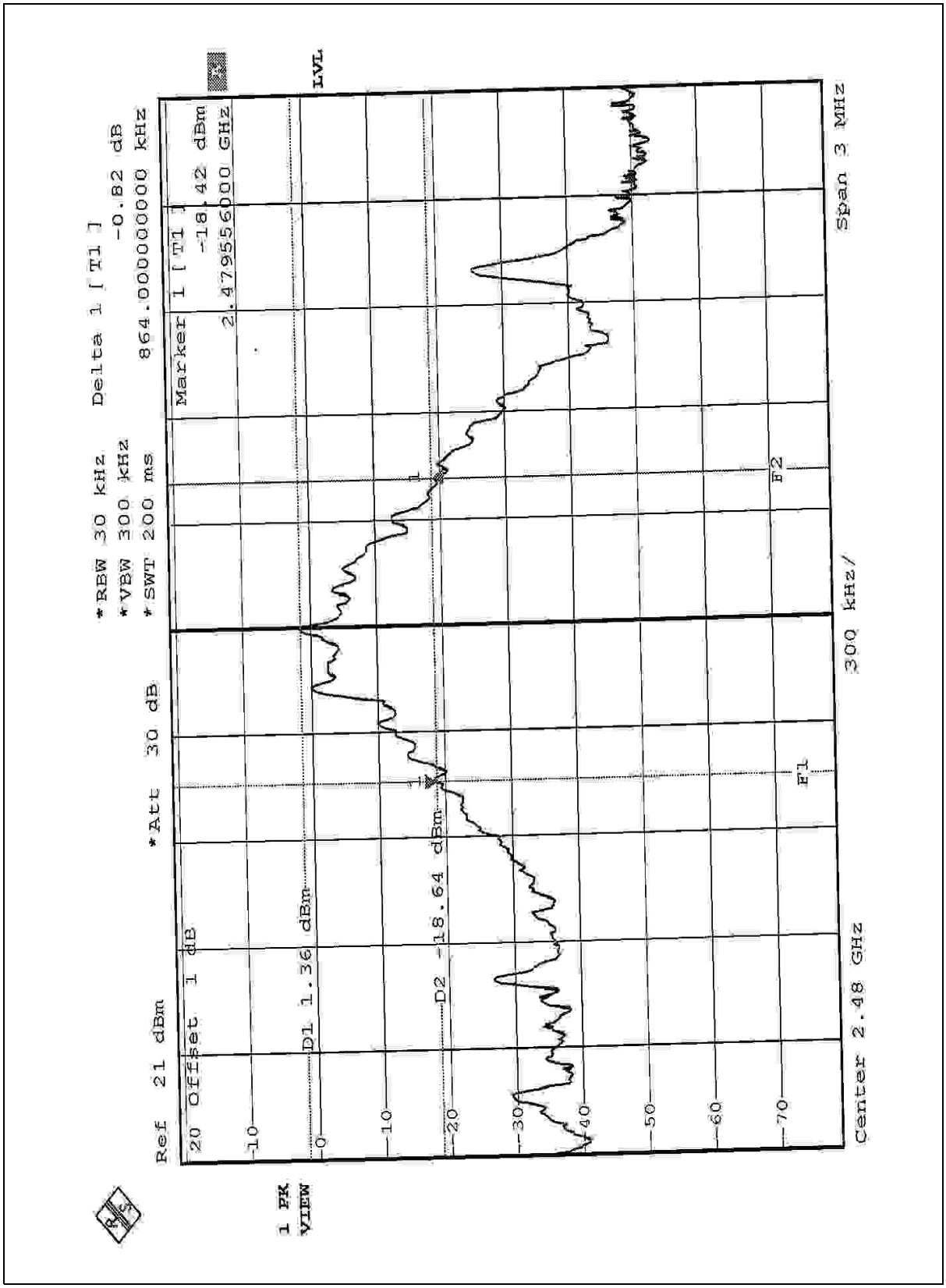
Channel 0


Ref 21 dBm
20 Offset 1 dB
*Att 30 dB
*RBW 30 kHz
*VBW 300 kHz
*SWT 200 ms
Delta 1 [T1]
-0.50 dB
864.00000000 kHz
Marker 1 [T1]
-18.49 dBm
2.401562000 GHz
D1 1.52 dBm
D2 -18.48 dBm
F1
F2
LVL
1 PK
VIEW
Center 2.402 GHz
300 kHz/
Span 3 MHz

Channel 39


Ref 21 dBm
Offset 1 dB
*Att 30 dB
*RBW 30 kHz
*VBW 300 kHz
*SWT 200 ms
Delta 1 [T1]
-0.19 dB
846.00000000 kHz
Marker 1 [T1]
-18.54 dBm
2.438568000 GHz
D1 1.61 dBm
D2 -18.39 dBm
LVL
1 PK
VIEW
Center 2.439 GHz
300 kHz/
Span 3 MHz
F1
F2

Channel 78


Ref 21 dBm
Att 30 dB
RBW 30 kHz
VBW 300 kHz
SWT 200 ms
Delta 1 [T1]
-0.82 dB
864.00000000 kHz
Marker 1 [T1]
-18.42 dBm
2.47955000 GHz
Offset 1 dB
D1 1.36 dBm
D2 -18.64 dBm
LVL
1 PK
VIEW
Center 2.48 GHz
300 kHz/
Span 3 MHz

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, 2004

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

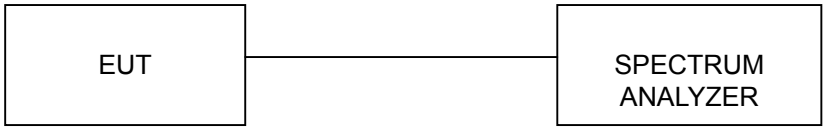
4.5.3 TEST PROCEDURES

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

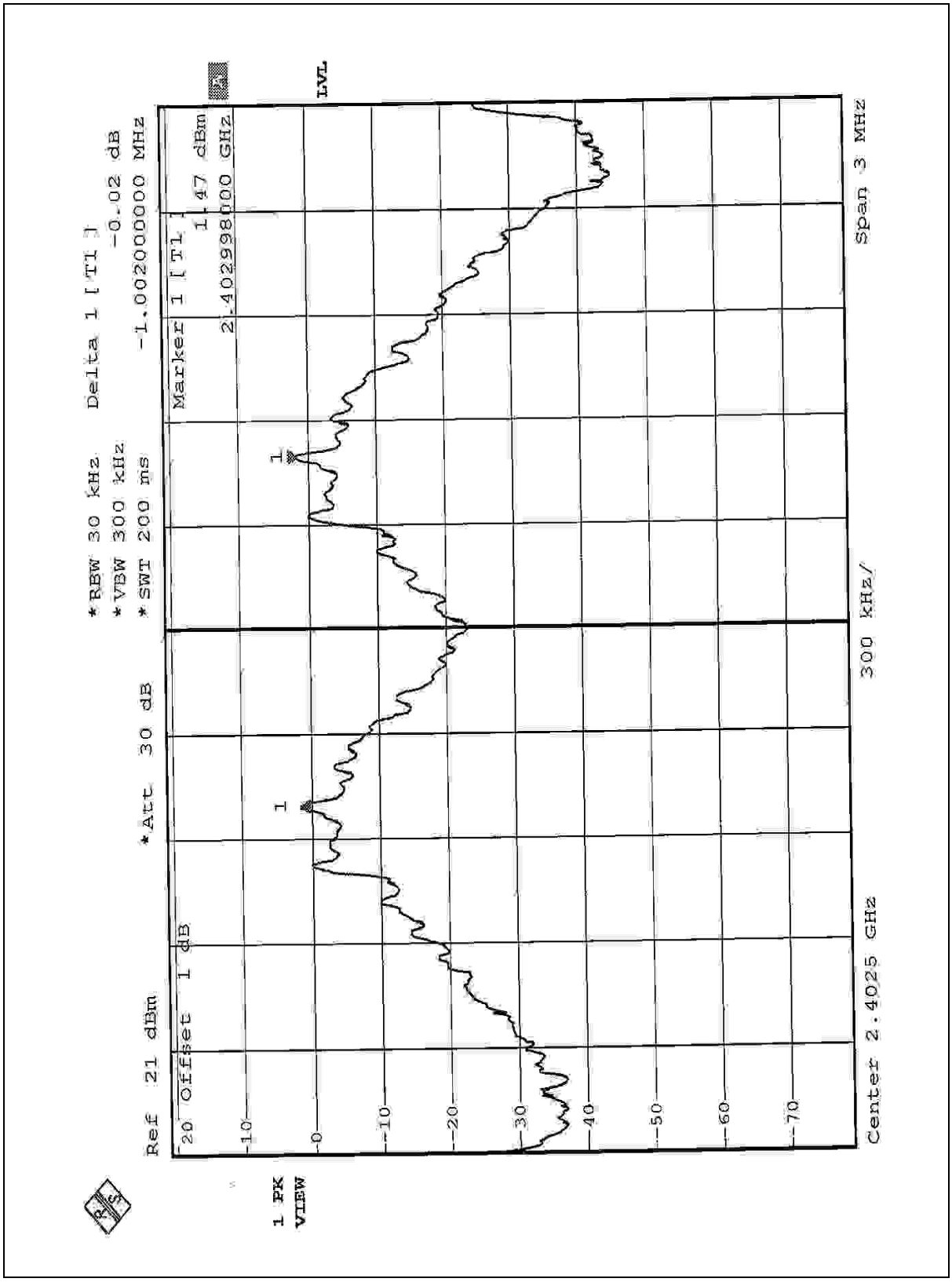


4.5.6 TEST RESULTS

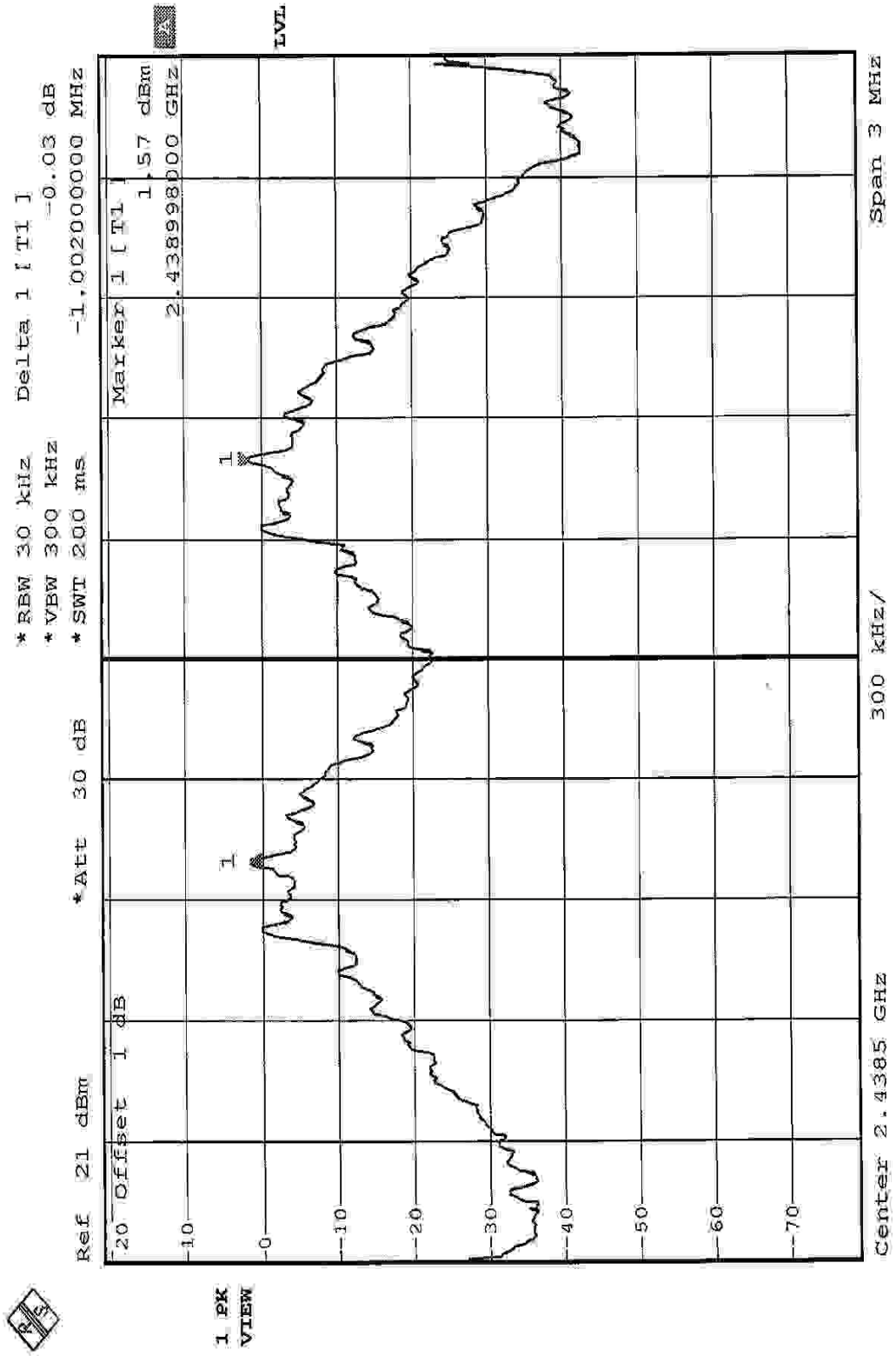
Channel	Frequency (MHz)	Adjacent Channel Separation	Minimum Limit (kHz)	Pass / Fail
0	2402	1MHz	864.00	PASS
39	2441	1MHz	846.00	PASS
78	2480	1MHz	864.00	PASS

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

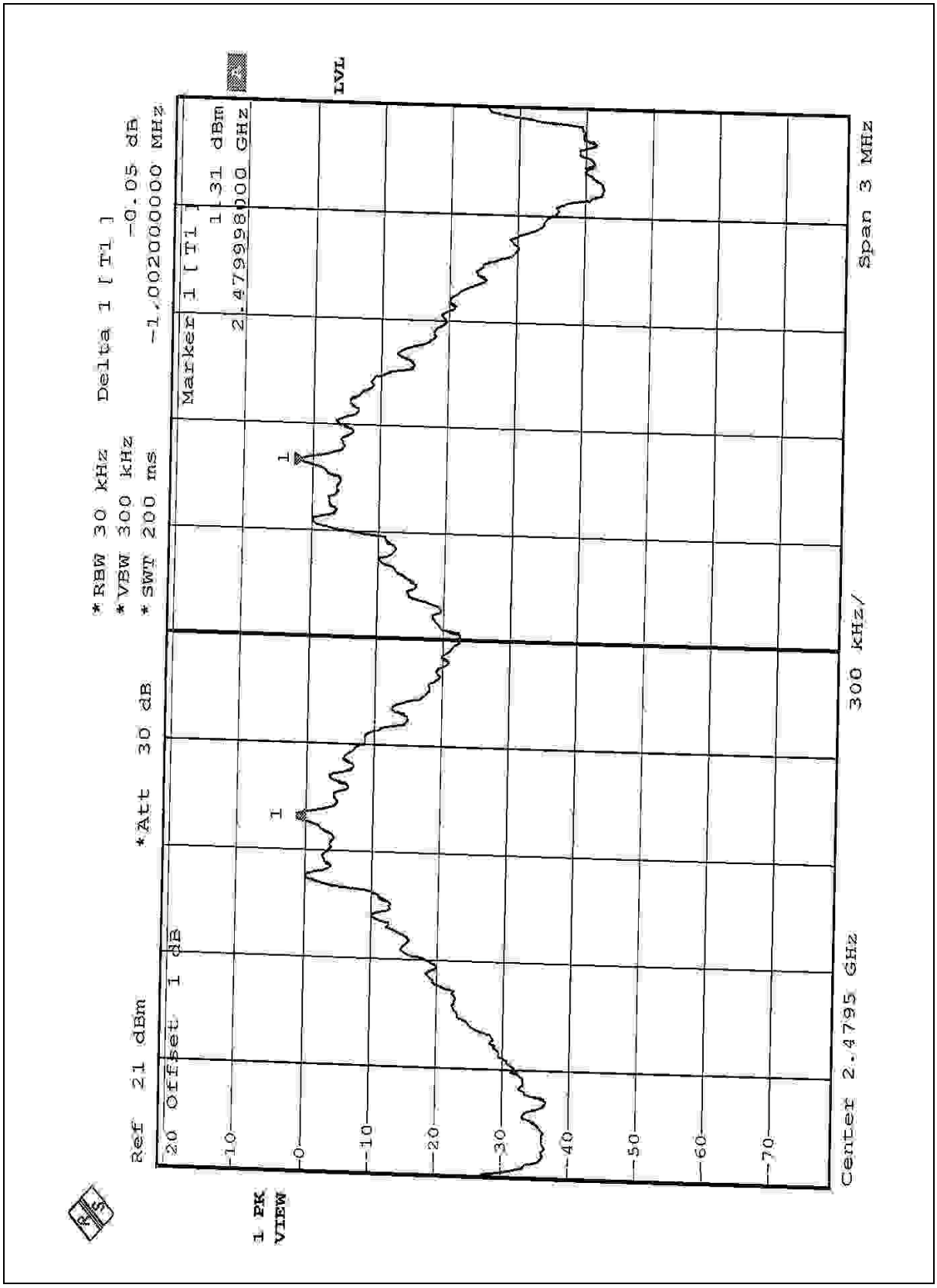
Channel 0


Ref 21 dBm
Offset 1 dB
*Att 30 dB
*RBW 30 kHz
*VBW 300 kHz
*SWT 200 ms
Delta 1 [T1]
-0.02 dB
-1.00200000 MHz
Marker 1 [T1]
1.47 dBm
2.402998000 GHz
LVL
1 PK
VIEW
Center 2.4025 GHz
300 kHz/
Span 3 MHz

Channel 39


Ref 21 dBm
Offset 1 dB
*Att 30 dB
* RBW 30 kHz
* VBW 300 kHz
* SWT 200 ms
Delta 1 [T1]
-0.03 dB
-1.002000000 MHz
Marker 1 [T1]
1.57 dBm
2.438998000 GHz
LVL
1 PK
VIEW
Center 2.4385 GHz
300 kHz/
Span 3 MHz

Channel 78


Ref 21 dBm
Offset 1 dB
*Att 30 dB
*RBW 30 kHz
*VBW 300 kHz
*SWT 200 ms
Delta 1 [T1]
-0.05 dB
-1.00200000 MHz
Marker 1 [T1]
1.31 dBm
2.47998000 GHz
LVL
1 PK
VIEW
Center 2.4795 GHz
300 kHz/
Span 3 MHz

4.6 MAXIMUM PEAK OUTPUT POWER

4.6.1 LIMITS OF MAXIMUM PEAK OUTPUT POWER MEASUREMENT

The Limit of 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, 2004

NOTES:

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

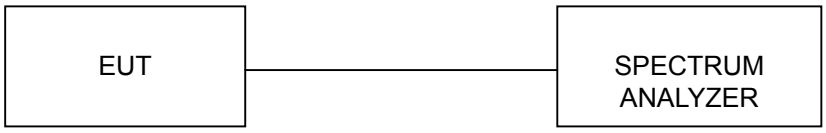
4.6.3 TEST PROCEDURES

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 2 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

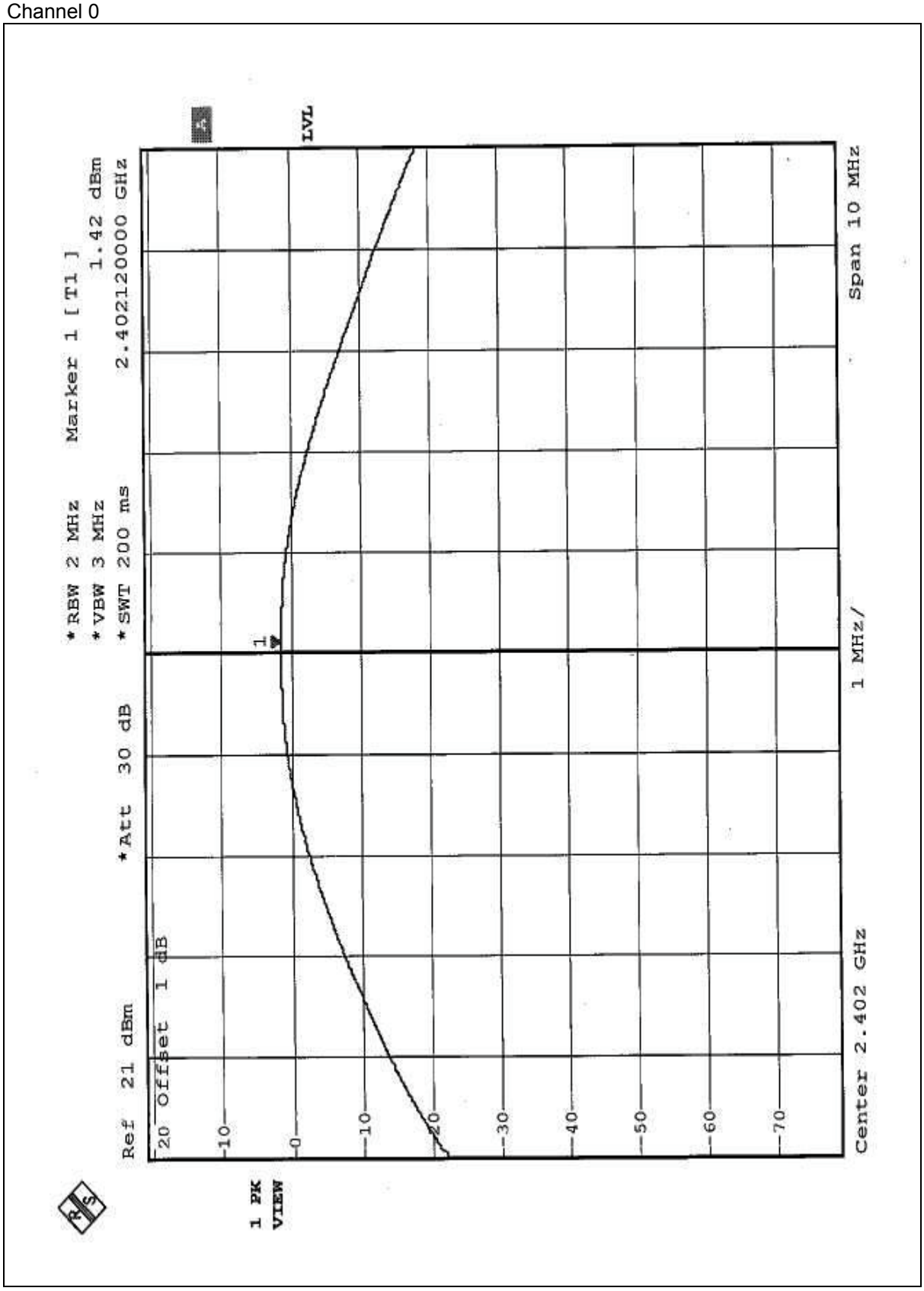
The software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel frequencies individually.

4.6.7 TEST RESULTS

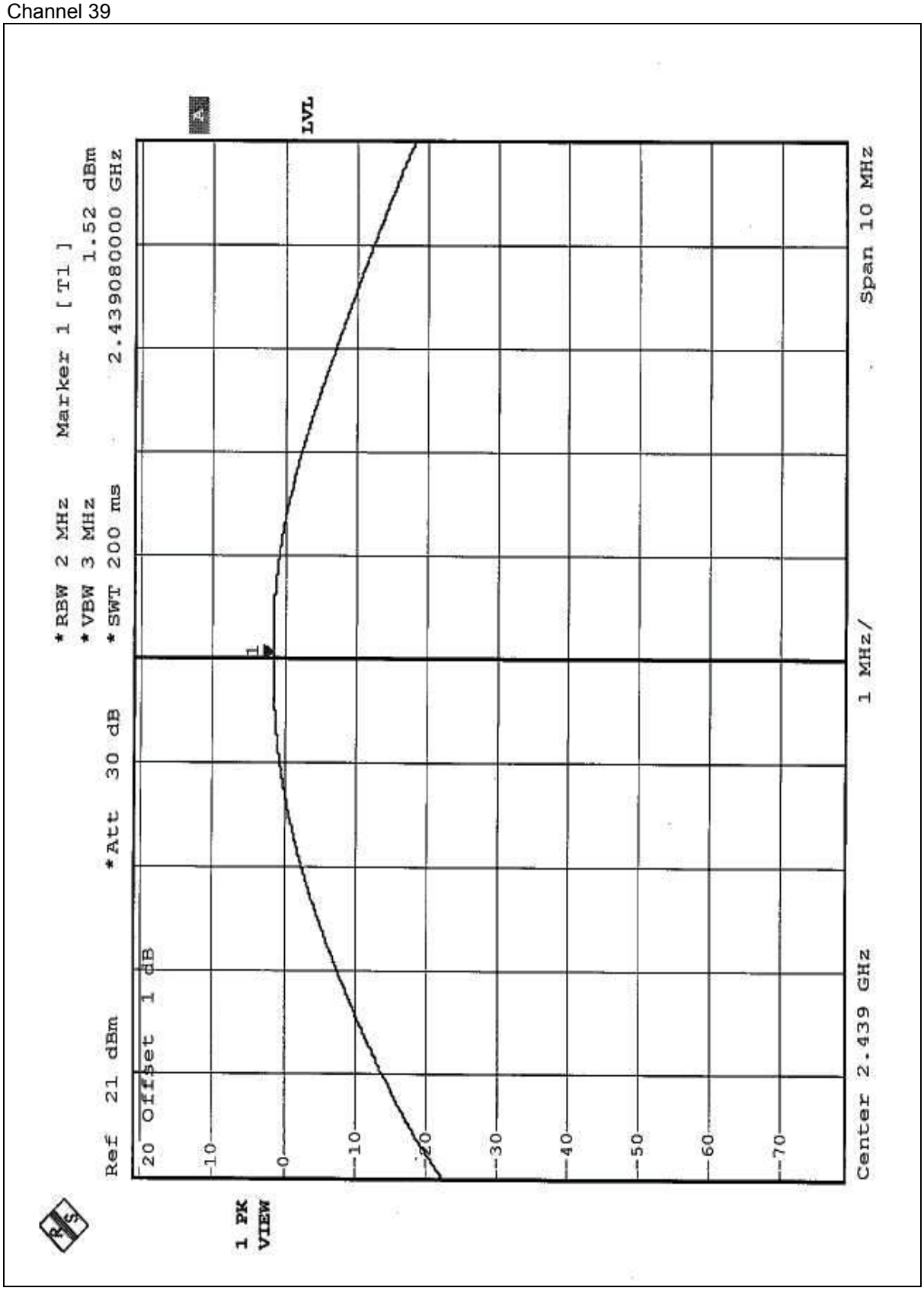
Output Power Into Antenna:

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (dBm)	PASS/FAIL
0	2402	1.42	30	PASS
39	2441	1.52	30	PASS
78	2480	1.21	30	PASS

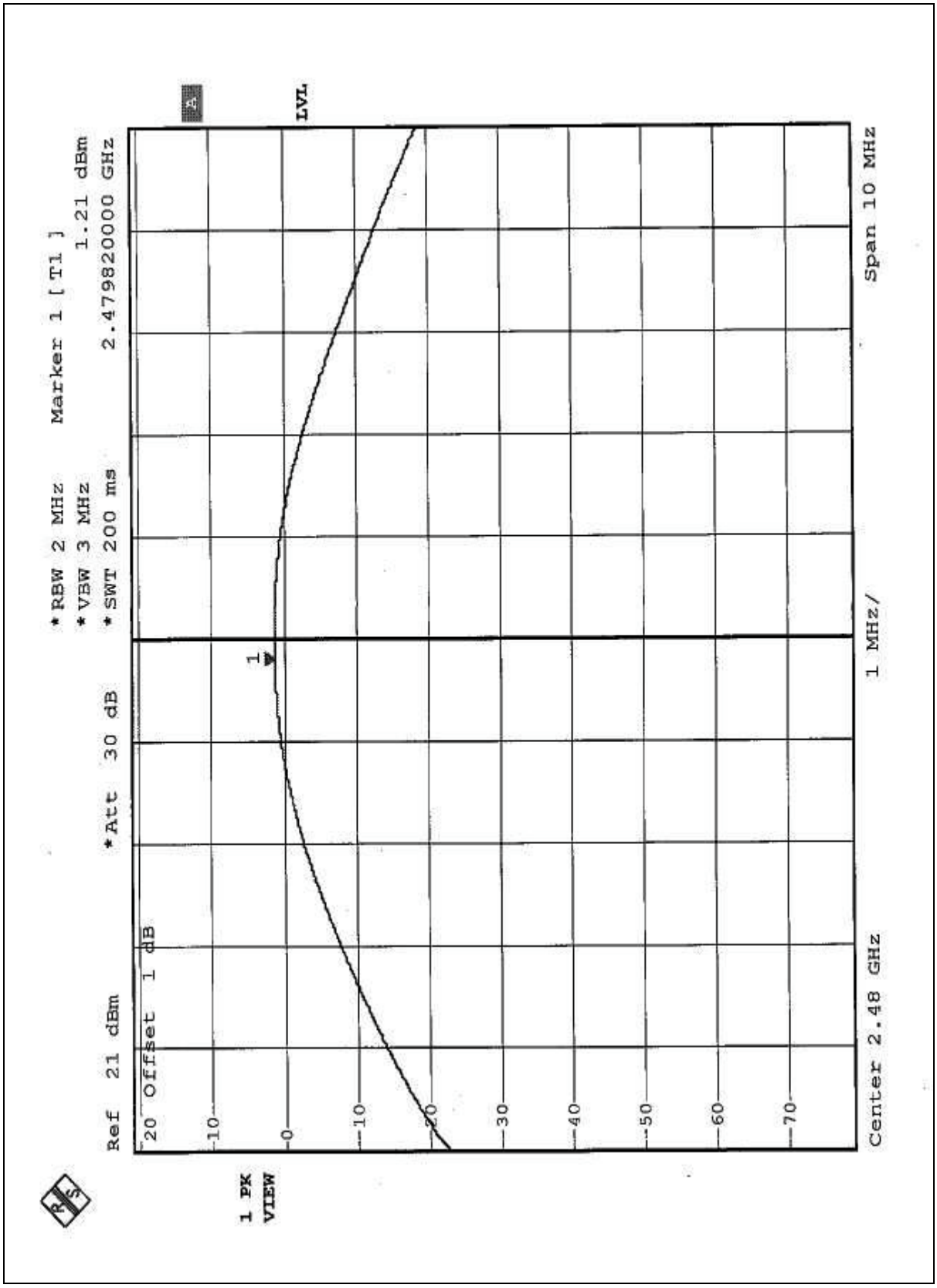
Channel 0


Ref 21 dBm
*Att 30 dB
20 Offset 1 dB
*RBW 2 MHz
*VBW 3 MHz
*SWT 200 ms
Marker 1 [T1]
1.42 dBm
2.402120000 GHz
1 PK
VIEW
LVL
Center 2.402 GHz
1 MHz/
Span 10 MHz

Channel 39


Ref 21 dBm
*Att 30 dB
Offset 1 dB
*RBW 2 MHz
*VBW 3 MHz
*SWT 200 ms
Marker 1 [T1]
1.52 dBm
2.439080000 GHz
1 PK
VIEW
A
LVL
Center 2.439 GHz
1 MHz/
Span 10 MHz

Channel 78


Ref 21 dBm
Offset 1 dB
*Att 30 dB
*RBW 2 MHz
*VBW 3 MHz
*SWT 200 ms
Marker 1 [T1]
1.21 dBm
2.479820000 GHz
1 PK
VIEW
LVL
Center 2.48 GHz
1 MHz/
Span 10 MHz

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

NOTE:

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

4.7.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
* HP Spectrum Analyzer	8590L	3544A01176	Jun. 10, 2004
* HP Preamplifier	8447D	2944A08485	May 01, 2004
HP Preamplifier	8449B	3008A01201	Dec. 01, 2003
* HP Preamplifier	8449B	3008A01292	Aug. 13, 2004
ROHDE & SCHWARZ TEST RECEIVER	ESI7	838496/016	Feb. 23, 2004
* ROHDE & SCHWARZ TEST RECEIVER	ESMI	839013/007 839379/002	Feb. 13, 2004
SCHAFFNER Tunable Dipole Antenna SCHWARZBECK Tunable Dipole Antenna	VHBA 9123 UHA 9105	459 977	Nov. 22, 2003
* CHASE BILOG Antenna	CBL6112A	2221	July 26, 2004
* SCHWARZBECK Horn Antenna	BBHA9120-D1	D130	Jun. 30, 2004
* EMCO Turn Table	1060	1115	NA
* CHANCE Tower	CM-AT40	CM-A010	NA
* Software	ADT_Radiated_V5.14	NA	NA
* ANRITSU RF Switches	MP59B	M35046	Jan. 05, 2004
* TIMES RF cable	LMR-600	CABLE-ST5-01	Jan. 05, 2004

NOTE: 1.The calibration interval of the above test instruments is 12 months. And the calibrations are traceable to NML/ROC and NIST/USA.

2. "*" = These equipment are used for the final measurement.
3. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
4. The test was performed in ADT Open Site No. 5.
5. The VCCI Site Registration No. is R-1039.

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 10 meter open area test site. The table was rotated 360 degrees to determine the position of the highest radiation.

b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

c. The antenna is a broadband antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

f. If the emission level of the EUT in peak mode was 10 dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10 dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

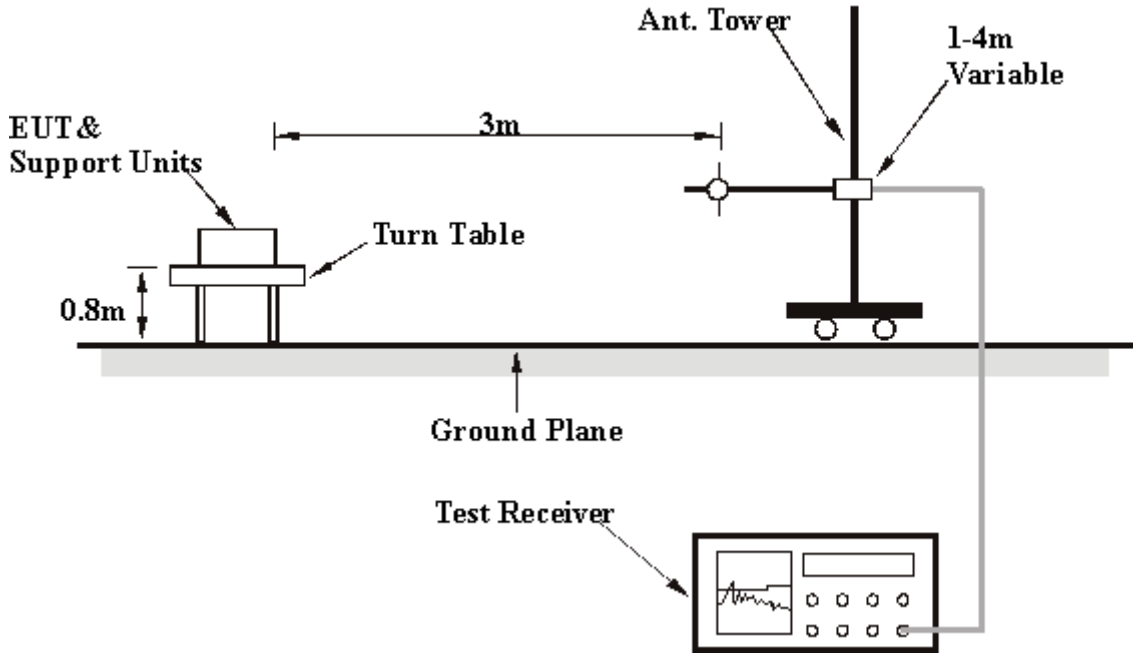
NOTE:

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

4.7.4 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 PDA & PC Combo Card	**MODEL**	F8T020
MODE	Channel 78	**FREQUENCY RANGE**	Below 1000 MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**DETECTOR FUNCTION**	Quasi-Peak
ENVIRONMENTAL CONDITIONS	30 deg. C, 70%RH, 991 hPa	**TESTED BY**: Bunny Yao	

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M											
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB/m)
1	80.00	18.9 QP	40.00	-21.10	1.05H	355	10.45	7.33	1.12	0.00	-8.45
2	112.00	14.3 QP	43.50	-29.20	1.24H	284	1.93	11.18	1.19	0.00	-12.37
3	144.00	22.5 QP	43.50	-21.00	1.77H	12	10.64	10.58	1.28	0.00	-11.86
4	240.00	25.1 QP	46.00	-20.90	1.40H	224	12.02	11.41	1.67	0.00	-13.08
5	288.00	22.3 QP	46.00	-23.70	1.44H	137	7.58	12.88	1.83	0.00	-14.73
6	300.00	30.0 QP	46.00	-16.00	1.56H	94	14.94	13.18	1.88	0.00	-15.07
7	336.00	23.7 QP	46.00	-22.30	1.45H	182	7.73	13.92	2.05	0.00	-15.98
8	384.00	18.7 QP	46.00	-27.30	1.36H	144	1.05	15.50	2.15	0.00	-17.66
9	432.00	24.0 QP	46.00	-22.00	1.08H	11	5.44	16.28	2.28	0.00	-18.57
10	457.00	30.6 QP	46.00	-15.40	1.02H	13	11.75	16.49	2.36	0.00	-18.86
11	528.00	20.9 QP	46.00	-25.10	1.03H	96	0.66	17.62	2.62	0.00	-20.25
12	720.00	26.3 QP	46.00	-19.70	1.41H	7	3.34	19.68	3.28	0.00	-22.96

NOTE:

1. Emission level = Raw value - Correction Factor
2. Correction Factor = Pre-Amp. 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 PDA & PC Combo Card	**MODEL**	F8T020
MODE	Channel 78	**FREQUENCY RANGE**	30-1000 MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**DETECTOR FUNCTION**	Quasi-Peak
ENVIRONMENTAL CONDITIONS	30 deg. C, 70%RH, 991 hPa	**TESTED BY**: Bunny Yao	

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M											
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB/m)
1	80.00	20.4 QP	40.00	-19.60	1.24V	57	11.95	7.33	1.12	0.00	-8.45
2	112.00	23.6 QP	43.50	-19.90	1.05V	74	11.23	11.18	1.19	0.00	-12.37
3	128.00	21.1 QP	43.50	-22.40	1.06V	168	8.50	11.37	1.23	0.00	-12.60
4	144.00	20.6 QP	43.50	-22.90	1.14V	297	8.74	10.58	1.28	0.00	-11.86
5	240.00	24.3 QP	46.00	-21.70	1.75V	15	11.22	11.41	1.67	0.00	-13.08
6	288.00	20.3 QP	46.00	-25.70	1.67V	283	5.58	12.88	1.83	0.00	-14.72
7	336.00	21.2 QP	46.00	-24.80	1.64V	130	5.23	13.92	2.05	0.00	-15.97
8	384.00	19.9 QP	46.00	-26.10	1.34V	106	2.25	15.50	2.15	0.00	-17.65
9	432.00	22.5 QP	46.00	-23.50	1.60V	356	3.94	16.28	2.28	0.00	-18.56
10	528.00	23.5 QP	46.00	-22.50	1.20V	134	3.26	17.62	2.62	0.00	-20.24
11	720.00	23.0 QP	46.00	-23.00	1.14V	17	0.04	19.68	3.28	0.00	-22.96

NOTE:

1. Emission level = Raw value - Correction Factor
2. Correction Factor = Pre-Amp. 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 PDA & PC Combo Card	**MODEL**	F8T020
MODE	Channel 0	**FREQUENCY RANGE**	Above 1000 MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**DETECTOR FUNCTION**	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	30 deg. C, 70%RH, 991 hPa	**TESTED BY**: Bunny Yao	

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M											
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB/m)
1	*2402.00	90.2 PK			1.31H	92	58.02	27.11	5.10	0.00	-32.21
2	*2402.00	74.5 AV			1.31H	92	42.27	27.11	5.10	0.00	-32.21
3	4804.00	44.9 AV	54.00	-9.10	1.09H	64	40.88	31.43	7.23	34.63	-4.02
4	4804.00	54.9 PK	74.00	-19.10	1.09H	64	50.89	31.43	7.23	34.63	-4.02.

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M											
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB/m)
1	*2402.00	88.8 PK			1.04V	312	56.56	27.11	5.10	0.00	-32.21
2	*2402.00	73.9 AV			1.04V	312	41.73	27.11	5.10	0.00	-32.21
3	4804.00	44.6 AV	54.00	-9.40	1.29V	54	40.60	31.43	7.23	34.63	-4.02
4	4804.00	54.2 PK	74.00	-19.80	1.29V	54	50.20	31.43	7.23	34.63	-4.02.

NOTE:

1. Emission level = Raw value - Correction Factor
2. Correction Factor = Pre-Amp. Factor - Ant. Factor - Cable loss
3. Margin value = Emission level - Limit value
4. " * " : Fundamental frequency
5. The other emission levels were very low against the limit.

EUT	Bluetooth PDA & PC Combo Card	**MODEL**	F8T020
MODE	Channel 39	**FREQUENCY RANGE**	Above 1000 MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**DETECTOR FUNCTION**	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	30 deg. C, 70%RH, 991 hPa	**TESTED BY**: Bunny Yao	

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M											
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB/m)
1	*2441.00	93.2 PK			1.35H	91	60.99	27.11	5.10	0.00	-32.21
2	*2441.00	77.2 AV			1.35H	91	45.00	27.11	5.10	0.00	-32.21
3	4882.00	43.9 AV	54.00	-10.10	1.34H	48	39.80	31.47	7.21	34.63	-4.05
4	4882.00	53.2 PK	74.00	-20.80	1.34H	48	49.10	31.47	7.21	34.63	-4.05

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M											
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB/m)
1	*2441.00	90.5 PK			1.08V	102	58.11	27.33	5.08	0.00	-32.40
2	*2441.00	74.7 AV			1.08V	102	42.30	27.33	5.08	0.00	-32.40
3	**4882.00**	**45.0 AV**	**54.00**	**-9.00**	**1.76V**	**52**	**40.98**	**31.47**	**7.21**	**34.63**	**-4.05**
4	4882.00	55.2 PK	74.00	-18.80	1.76V	52	51.13	31.47	7.21	34.63	-4.05

NOTE:

1. Emission level = Raw value - Correction Factor
2. Correction Factor = Pre-Amp. Factor - Ant. Factor - Cable loss
3. Margin value = Emission level - Limit value
4. " * " : Fundamental frequency
5. The other emission levels were very low against the limit.

EUT	Bluetooth PDA & PC Combo Card	**MODEL**	F8T020
MODE	Channel 78	**FREQUENCY RANGE**	Above 1000 MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**DETECTOR FUNCTION**	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	30 deg. C, 70%RH, 991 hPa	**TESTED BY**: Bunny Yao	

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M											
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB/m)
1	*2480.00	89.1 PK			1.26H	27	56.52	27.54	5.06	0.00	-32.59
2	*2480.00	74.2 AV			1.30H	27	41.65	27.54	5.06	0.00	-32.59
3	4960.00	42.1 AV	54.00	-11.90	1.46H	54	37.90	31.55	7.26	34.61	-4.21
4	4960.00	52.1 PK	74.00	-21.90	1.46H	54	47.85	31.55	7.26	34.61	-4.21

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M											
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (DbuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB/m)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB/m)
1	*2480.00	89.7 PK			1.07V	97	57.10	27.54	5.06	0.00	-32.59
2	*2480.00	74.9 AV			1.07V	97	42.30	27.54	5.06	0.00	-32.59
3	4960.00	44.6 AV	54.00	-9.40	1.23V	93	40.44	31.55	7.26	34.61	-4.21
4	4960.00	54.8 PK	74.00	-19.2	1.23V	93	50.60	31.55	7.26	34.61	-4.21.

NOTE:

1. Emission level = Raw value - Correction Factor
2. Correction Factor = Pre-Amp. Factor - Ant. Factor - Cable loss
3. Margin value = Emission level - Limit value
4. " * " : Fundamental frequency
5. The other emission levels were very low against the limit.

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, 2004

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

4.8.3 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 kHz 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

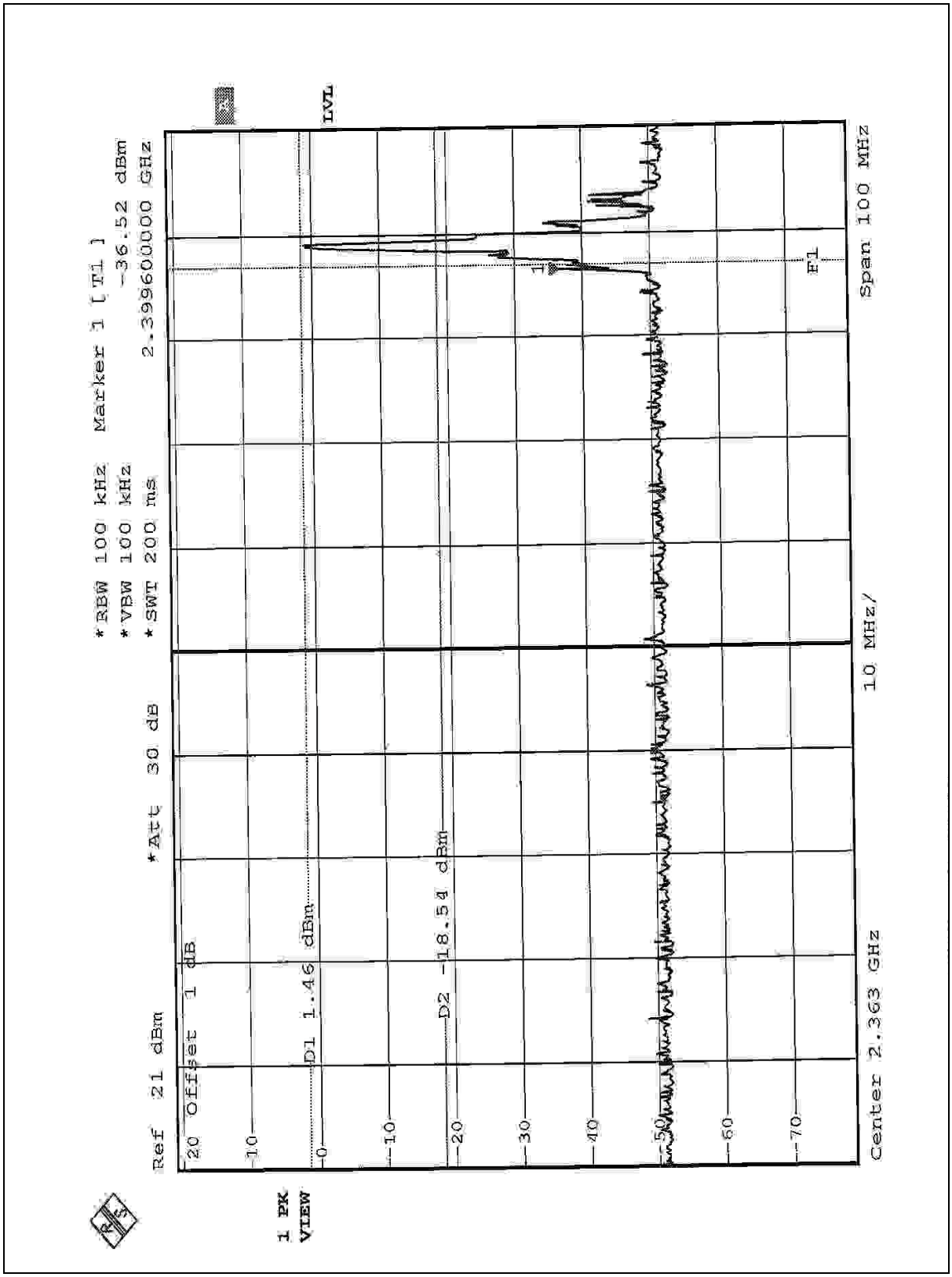
The software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel frequencies individually.

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).

NOTE1: The band edge emission plot on the following first page shows 49.46dB delta between carrier maximum power and local maximum emission in restrict band (2.3900GHz). The emission of carrier strength list in the test result of channel 0 at the item 4.7.6 is 74.50dBuV/m, so the maximum field strength in restrict band is 74.5-49.46=25.04 dBuV/m which is under 54 dBuV/m limit.

NOTE2: The band edge emission plot on the following second page shows 43.30dB delta between carrier maximum power and local maximum emission in restrict band (2.4840GHz). The emission of carrier strength list in the test result of channel 78 at the item 4.7.6 is 74.90dBuV/m, so the maximum field strength in restrict band is 74.90-43.30=31.60 dBuV/m which is under 54 dBuV/m limit.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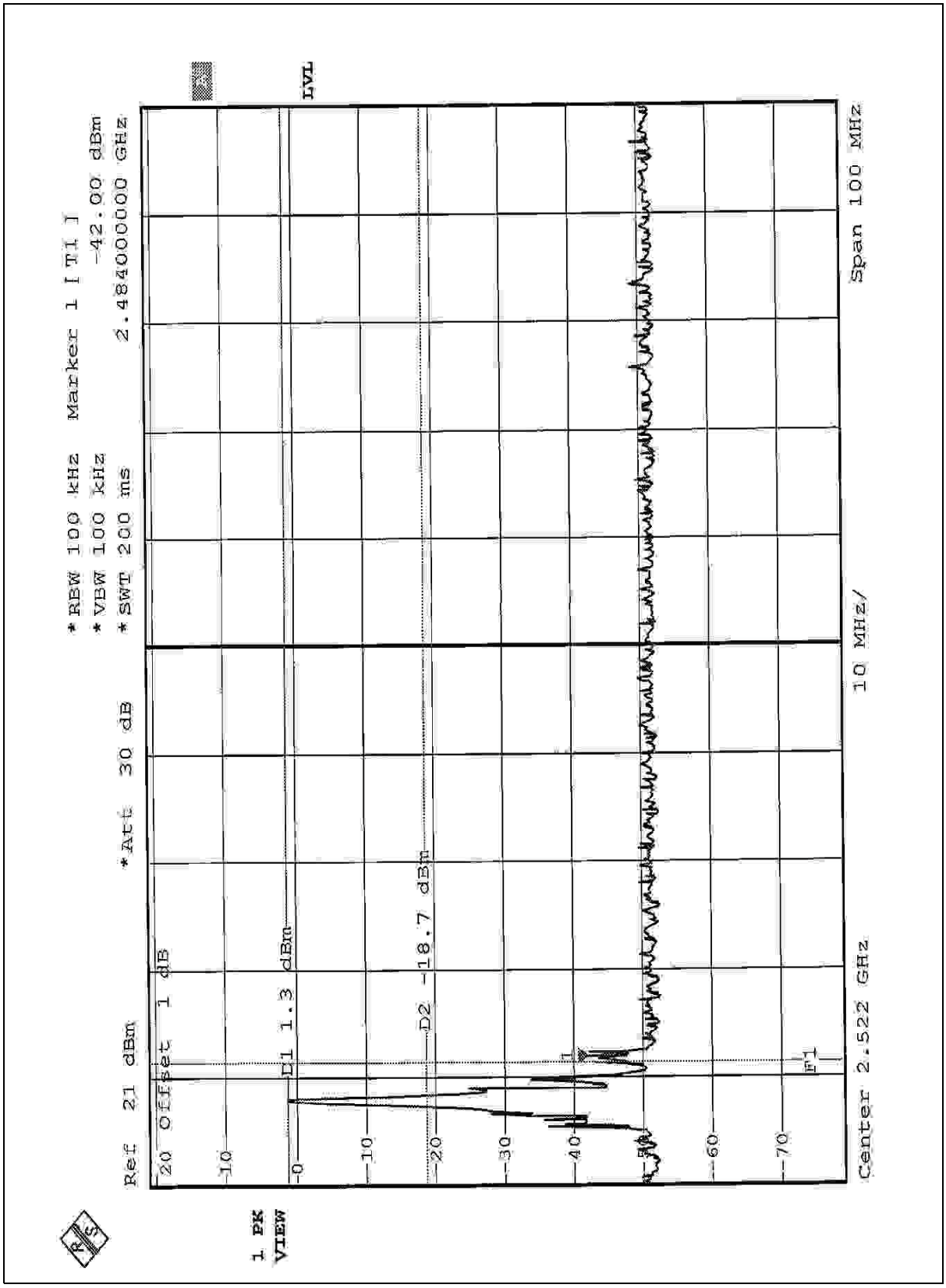
Att 30 dB
RBW 100 kHz
VBW 100 kHz
SWT 200 ms
Marker 1 [T1]
-36.52 dBm
2.399600000 GHz
Offset 1 dB
D1 1.46 dBm
D2 -18.54 dBm
LVL
1 PK
VIEW
Center 2.363 GHz
10 MHz/
Span 100 MHz


Ref 21 dBm
*Att 30 dB
* RBW 100 kHz
* VBW 100 kHz
* SWT 200 ms
Marker 1 [T1]
-42.00 dBm
2.484000000 GHz
20 Offset 1 dB
D1 1.3 dBm
D2 -18.7 dBm
LVL
1 PK
VIEW
Center 2.522 GHz
10 MHz/
Span 100 MHz

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.

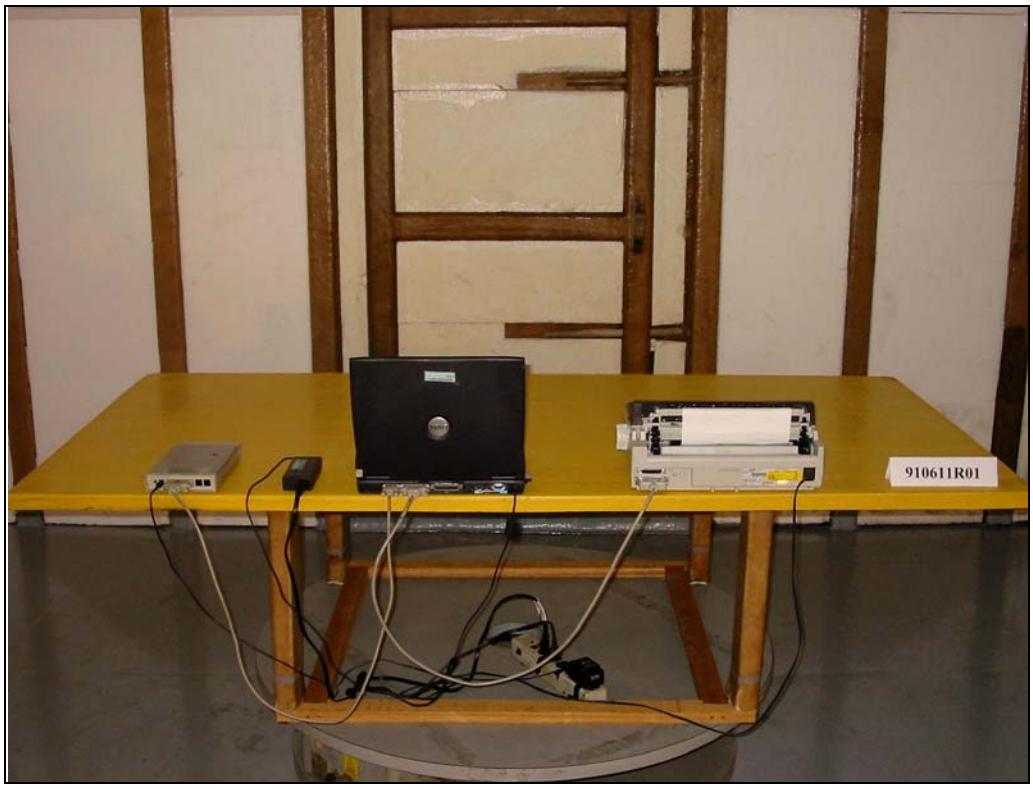
4.9.2 ANTENNA CONNECTED CONSTRUCTION

The antenna used in this product is Printed Antenna without antenna connector. The maximum Gain of this antenna is only 0dBi.

5 PHOTOGRAPHS OF THE TEST CONFIGURATION

CONDUCTED EMISSION TEST

RADIATED EMISSION TEST



6 INFORMATION ON THE TESTING LABORATORIES

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

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

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

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

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