FCC TEST REPORT

REPORT NO.: RF920617H03
MODEL NO.: MDCBTSC
RECEIVED: Jun. 17, 2003
TESTED: Jun. 24 to 30, 2003

APPLICANT: BILLIONTON SYSTEMS INC

ADDRESS: No.21, Sui-Lih Rd., Hsin-Chu, 300, Taiwan

ISSUED BY: Advance Data Technology Corporation

LAB LOCATION: No. 81-1, Lu Liao Keng, 9 Ling, Wu Lung Tsuen, Chiung Lin Hsiang, Hsin Chu Hsien, Taiwan, R.O.C.

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Lab Code: 200376-0

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1 CERTIFICATION

PRODUCT : Bluetooth\Modem Combo Card

BRAND NAME : Billionton

MODEL NO. : MDCBTSC

APPLICANT : BILLIONTON SYSTEMS INC

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 Jun. 24 to 30, 2003. 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: Amanda Chu , **DATE:** *Jul. 01, 2003*

(Amanda Chu)

APPROVED BY: _____ , **DATE:** *Jul. 01, 2003*

(Eric Lin, Manager)

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	PASS	Meet the requirement of limit Minimum passing margin is –13.13dBuV at 0.558 MHz
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 –7.5dBuV at 660.00 MHz
15.247(c)	Band Edge Measurement	PASS	Meet the requirement of limit

3 GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

PRODUCT	Bluetooth\Modem Combo Card
MODEL NO.	MDCBTSC
POWER SUPPLY	3-3.6VDC from host equipment
MODULATION TYPE	FHSS (GFSK)
FREQUENCY RANGE	2402MHz ~ 2480MHz
NUMBER OF CHANNEL	79
OUTPUT POWER	2.48dBm
ANTENNA TYPE	Inverted F Antenna
DATA CABLE	NA
I/O PORTS	NA
ASSOCIATED DEVICES	NA

NOTE:

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

3.2 DESCRIPTION OF TEST MODES

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\Modem Combo Card. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

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

All tests 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 47 CFR Part 15, Subpart B, Class B (DoC). The test report has been issued separately.

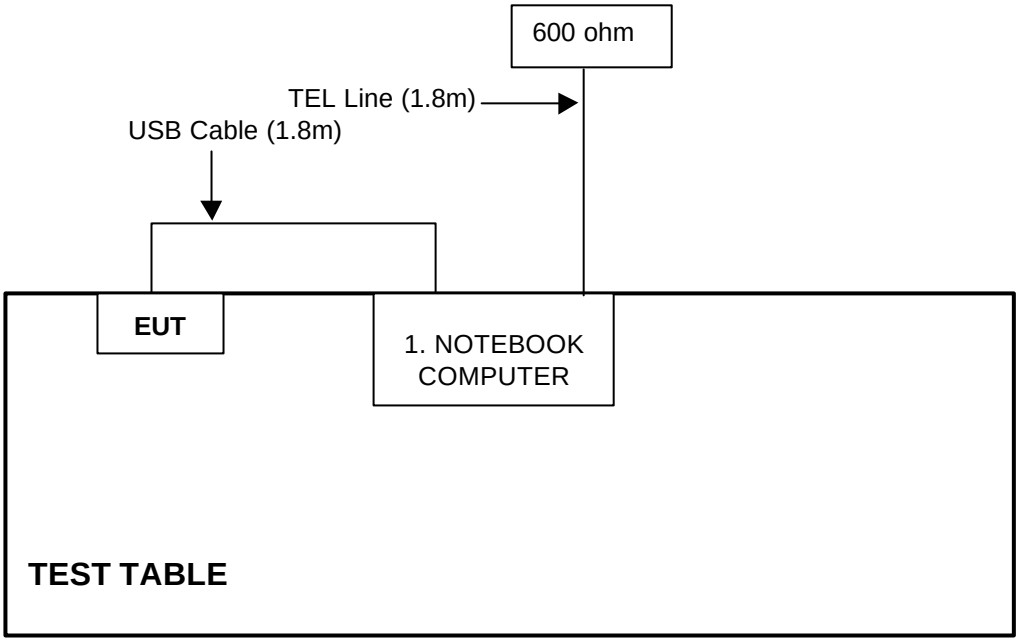
3.4 DESCRIPTION OF SUPPORT UNITS

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

No.	Product	Brand	Model No.	Serial No.	FCC ID
1	NOTEBOOK COMPUTER	CLEVO	M3	NA	NA

No.	Signal cable description
1	NA

Note: 1. All power cords of the above support units are unshielded (1.8m).



NOTE: 1. Please refer to the photos of test configuration in Item 5 also.

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	847124/029	Nov. 17, 2003
ROHDE & SCHWARZ LISN (for EUT)	ESHS-Z5	848773/004	Nov. 13, 2003
KYORITSU LISN (for peripheral)	KNW-407	8/1395/12	Jul. 23, 2003
RF Cable (JETBAO)	RG233/U	Cable_CA_01	Jul. 03, 2003
Terminator(for KYORITSU)	50	3	Apr. 11, 2004
Software	Cond-V2e	NA	NA

NOTE: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in ADT Shielded Room No. A.
3. The VCCI Con A Registration No. is C-817.

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.

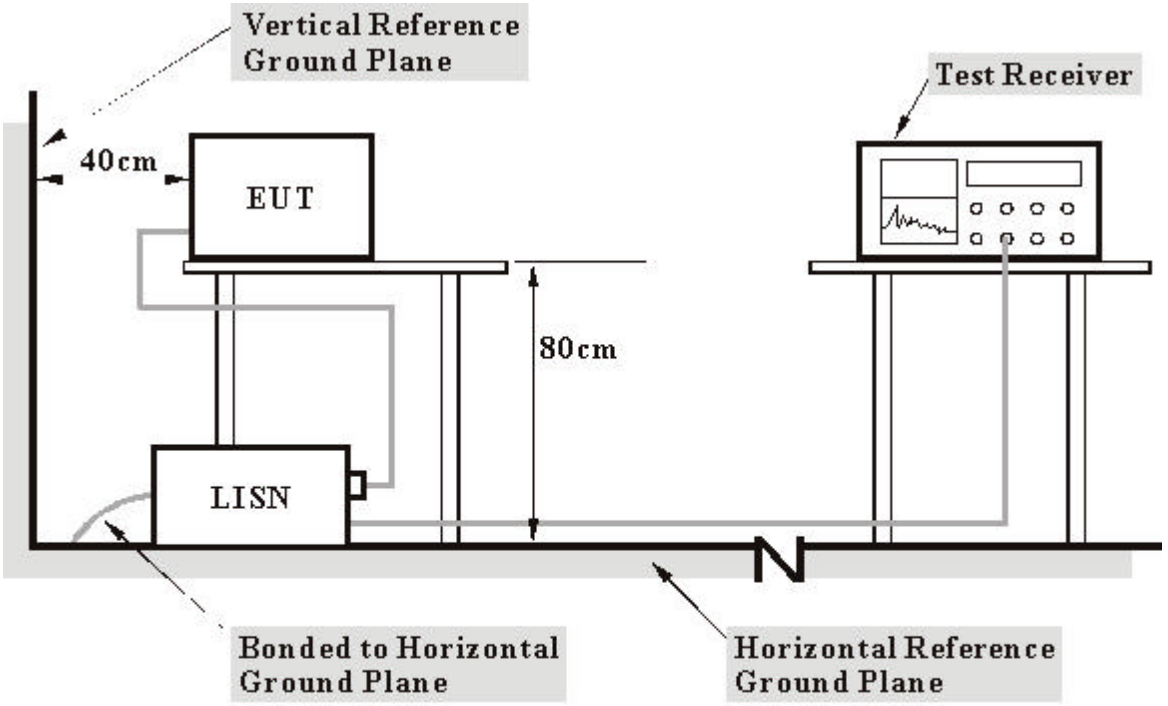
b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.

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 EUT OPERATING CONDITIONS

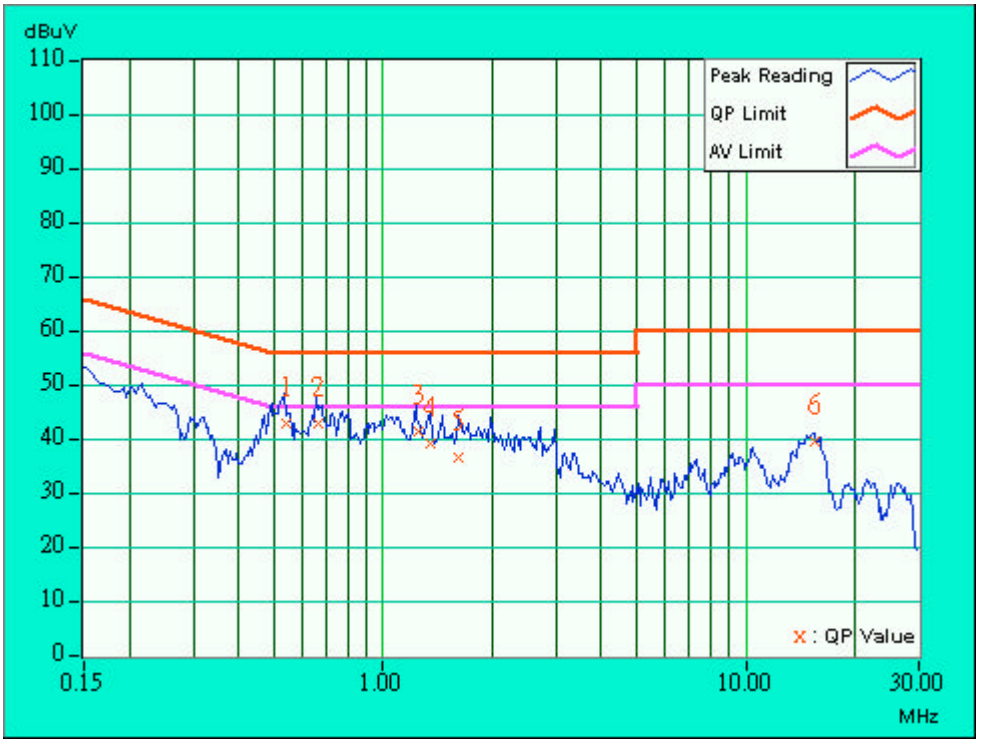
a. Connected the EUT to support unit 1 (Notebook Computer) and placed on a testing table.
b. The Notebook Computer ran a test program (provided by manufacturer) to enable EUT under transmission condition continuously at specific channel frequency.

4.1.7 TEST RESULTS

EUT	Bluetooth\Modem Combo Card	**MODEL**	MDCBTSC
MODE	Channel 0	**6dB BANDWIDTH**	9 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**PHASE**	Line (L)
ENVIRONMENTAL CONDITIONS	23 deg. C, 65%RH, 988 hPa	**TESTED BY**	Eric Lee

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.538	0.10	42.31	-	42.41	-	56.00	46.00	-13.59	-
2	0.660	0.10	42.02	-	42.12	-	56.00	46.00	-13.88	-
3	1.249	0.10	40.48	-	40.58	-	56.00	46.00	-15.42	-
4	1.357	0.10	38.37	-	38.47	-	56.00	46.00	-17.53	-
5	1.620	0.10	35.86	-	35.96	-	56.00	46.00	-20.04	-
6	15.484	0.82	38.74	-	39.56	-	60.00	50.00	-20.44	-

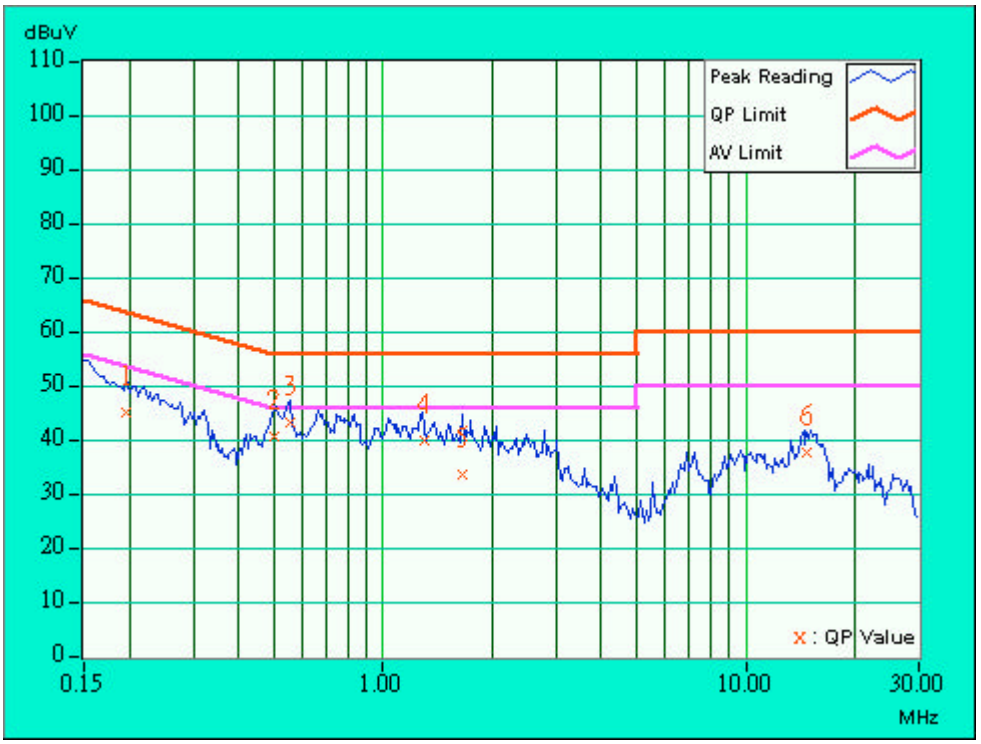
NOTES: (1) "*": Undetectable
(2) Q.P. and AV. are abbreviations of quasi-peak and average.
(3) "-": The Quasi-peak reading value also meets an average limit, thus measurement with the average detector is unnecessary.
(4) The emission levels of other frequencies were very low against the limit.
(5) Correction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



EUT	Bluetooth\Modem Combo Card	**MODEL**	MDCBTSC
MODE	Channel 0	**6dB BANDWIDTH**	9 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**PHASE**	Neutral (N)
ENVIRONMENTAL CONDITIONS	23 deg. C, 65%RH, 988 hPa	**TESTED BY**	Eric Lee

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.197	0.10	44.71	-	44.81	-	63.74	53.74	-18.93	-
2	0.503	0.10	40.17	-	40.27	-	56.00	46.00	-15.73	-
3	**0.558**	**0.10**	**42.77**	**-**	**42.87**	**-**	**56.00**	**46.00**	**-13.13**	**-**
4	1.296	0.10	39.56	-	39.66	-	56.00	46.00	-16.34	-
5	1.658	0.10	33.09	-	33.19	-	56.00	46.00	-22.81	-
6	14.701	0.59	37.16	-	37.75	-	60.00	50.00	-22.25	-

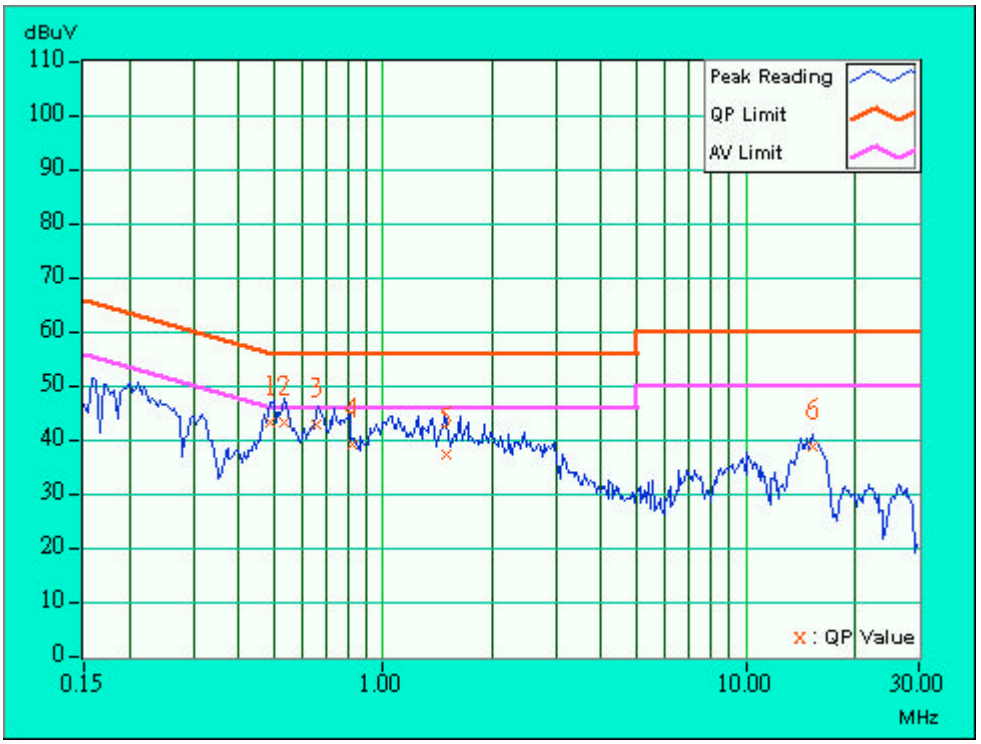
NOTES: (1) "*": Undetectable
(2) Q.P. and AV. are abbreviations of quasi-peak and average.
(3) "-": The Quasi-peak reading value also meets an average limit, thus measurement with the average detector is unnecessary.
(4) The emission levels of other frequencies were very low against the limit.
(5) Correction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



EUT	Bluetooth\Modem Combo Card	**MODEL**	MDCBTSC
MODE	Channel 39	**6dB BANDWIDTH**	9 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**PHASE**	Line (L)
ENVIRONMENTAL CONDITIONS	23 deg. C, 65%RH, 988 hPa	**TESTED BY**	Eric Lee

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.491	0.10	42.60	-	42.70	-	56.16	46.16	-13.46	-
2	0.532	0.10	42.67	-	42.77	-	56.00	46.00	-13.23	-
3	0.659	0.10	42.14	-	42.24	-	56.00	46.00	-13.76	-
4	0.821	0.10	38.53	-	38.63	-	56.00	46.00	-17.37	-
5	1.502	0.10	36.71	-	36.81	-	56.00	46.00	-19.19	-
6	15.227	0.81	38.14	-	38.95	-	60.00	50.00	-21.05	-

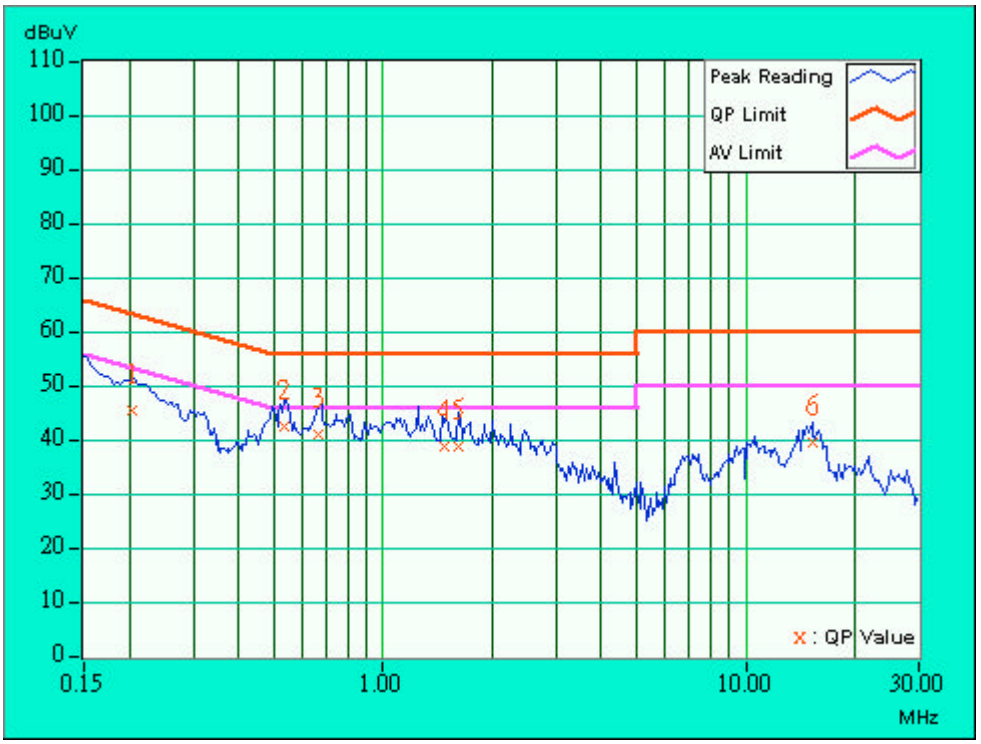
NOTES: (1) "*": Undetectable
(2) Q.P. and AV. are abbreviations of quasi-peak and average.
(3) "-": The Quasi-peak reading value also meets an average limit, thus measurement with the average detector is unnecessary.
(4) The emission levels of other frequencies were very low against the limit.
(5) Correction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



EUT	Bluetooth\Modem Combo Card	**MODEL**	MDCBTSC
MODE	Channel 39	**6dB BANDWIDTH**	9 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**PHASE**	Neutral (N)
ENVIRONMENTAL CONDITIONS	23 deg. C, 65%RH, 988 hPa	**TESTED BY**	Eric Lee

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.205	0.10	44.81	-	44.91	-	63.42	53.42	-18.51	-
2	0.537	0.10	42.14	-	42.24	-	56.00	46.00	-13.76	-
3	0.662	0.10	40.41	-	40.51	-	56.00	46.00	-15.49	-
4	1.483	0.10	38.32	-	38.42	-	56.00	46.00	-17.58	-
5	1.623	0.10	38.28	-	38.38	-	56.00	46.00	-17.62	-
6	15.230	0.60	39.15	-	39.75	-	60.00	50.00	-20.25	-

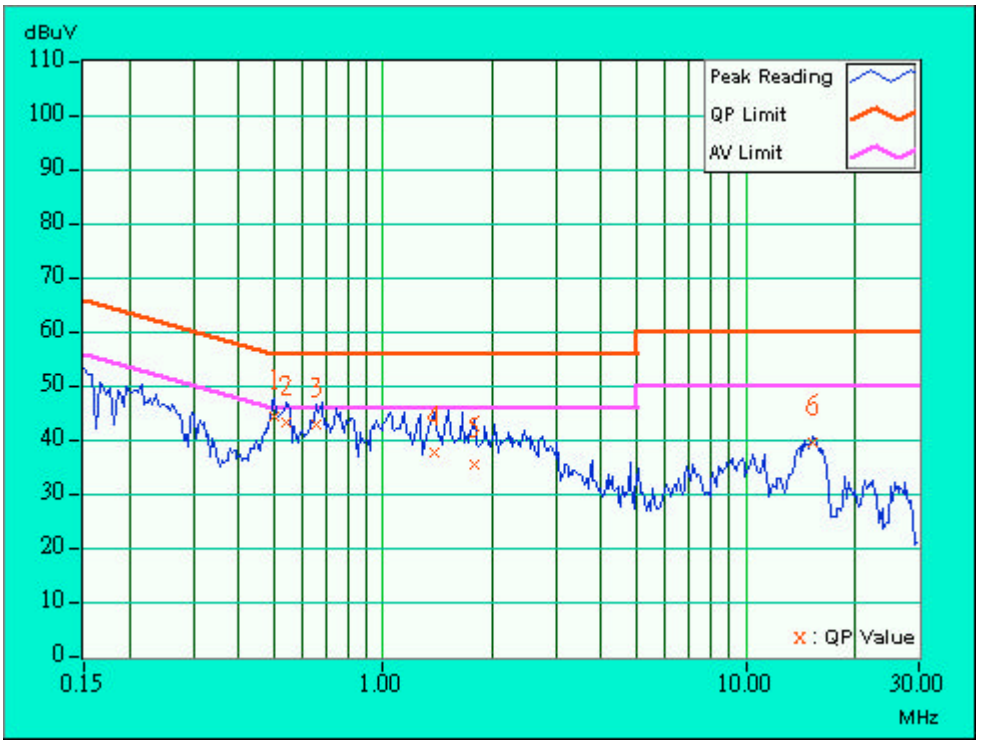
NOTES: (1) "*": Undetectable
(2) Q.P. and AV. are abbreviations of quasi-peak and average.
(3) "-": The Quasi-peak reading value also meets an average limit, thus measurement with the average detector is unnecessary.
(4) The emission levels of other frequencies were very low against the limit.
(5) Correction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



EUT	Bluetooth\Modem Combo Card	**MODEL**	MDCBTSC
MODE	Channel 78	**6dB BANDWIDTH**	9 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**PHASE**	Line (L)
ENVIRONMENTAL CONDITIONS	23 deg. C, 65%RH, 988 hPa	**TESTED BY**	Eric Lee

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.502	0.10	43.45	-	43.55	-	56.00	46.00	-12.45	-
2	0.545	0.10	42.37	-	42.47	-	56.00	46.00	-13.53	-
3	0.659	0.10	42.24	-	42.34	-	56.00	46.00	-13.66	-
4	1.384	0.10	37.03	-	37.13	-	56.00	46.00	-18.87	-
5	1.779	0.10	34.86	-	34.96	-	56.00	46.00	-21.04	-
6	15.360	0.81	38.70	-	39.51	-	60.00	50.00	-20.49	-

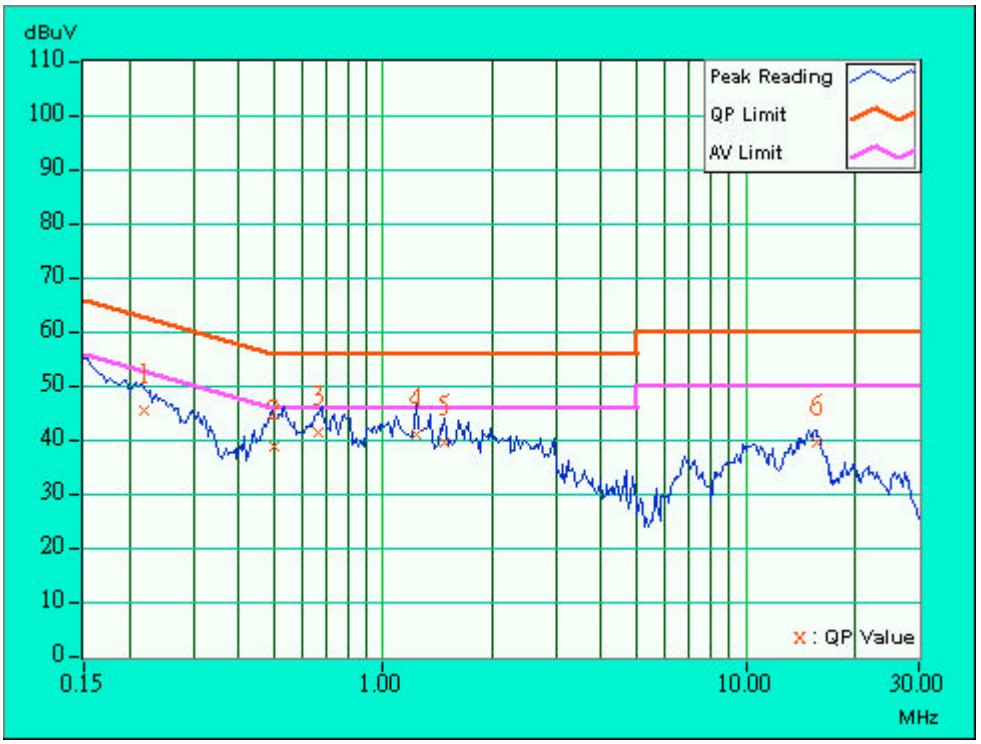
NOTES: (1) "*": Undetectable
(2) Q.P. and AV. are abbreviations of quasi-peak and average.
(3) "-": The Quasi-peak reading value also meets an average limit, thus measurement with the average detector is unnecessary.
(4) The emission levels of other frequencies were very low against the limit.
(5) Correction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



EUT	Bluetooth\Modem Combo Card	**MODEL**	MDCBTSC
MODE	Channel 78	**6dB BANDWIDTH**	9 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	**PHASE**	Neurral (N)
ENVIRONMENTAL CONDITIONS	23 deg. C, 65%RH, 988 hPa	**TESTED BY**	Eric Lee

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value [dB (uV)]		Emission Level [dB (uV)]		Limit [dB (uV)]		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.219	0.10	44.97	-	45.07	-	62.86	52.86	-17.79	-
2	0.500	0.10	38.32	-	38.42	-	56.00	46.00	-17.58	-
3	0.660	0.10	40.69	-	40.79	-	56.00	46.00	-15.21	-
4	1.235	0.10	40.49	-	40.59	-	56.00	46.00	-15.41	-
5	1.486	0.10	38.88	-	38.98	-	56.00	46.00	-17.02	-
6	15.617	0.61	39.03	-	39.64	-	60.00	50.00	-20.36	-

NOTES: (1) "*": Undetectable
(2) Q.P. and AV. are abbreviations of quasi-peak and average.
(3) "-": The Quasi-peak reading value also meets an average limit, thus measurement with the average detector is unnecessary.
(4) The emission levels of other frequencies were very low against the limit.
(5) Correction Factor = Insertion loss + Cable loss
(6) Margin value = Emission level - Limit 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
R&S SPECTRUM ANALYZER	FSP	1093.4495.30	Dec. 19, 2003

NOTE:

1. The measurement uncertainty is less than +/- 2.6dB, which is calculated as per the NAMAS document NIS81.
2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

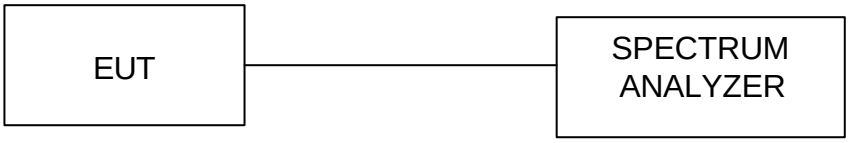
4.2.3 TEST PROCEDURES

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

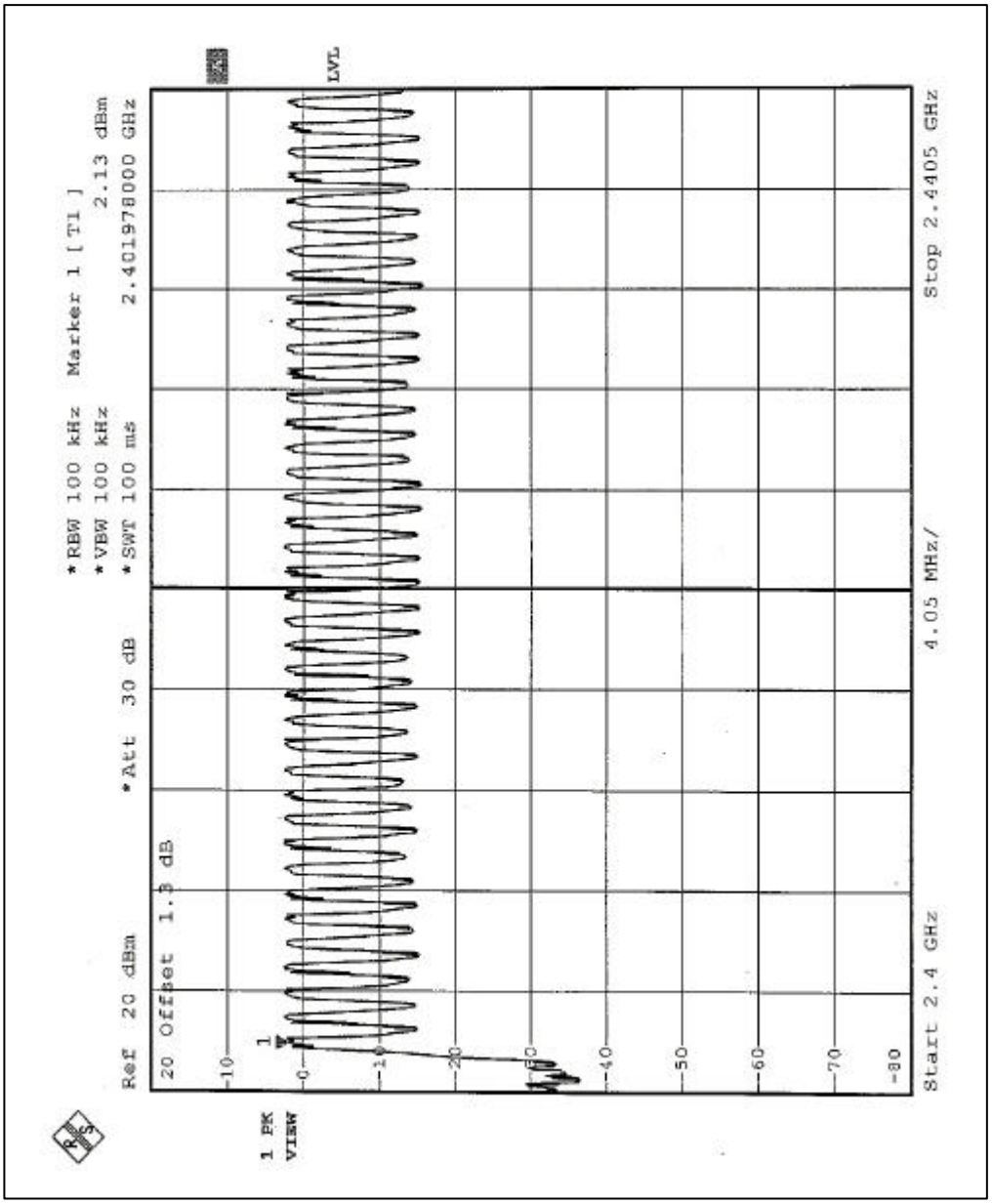
No deviation

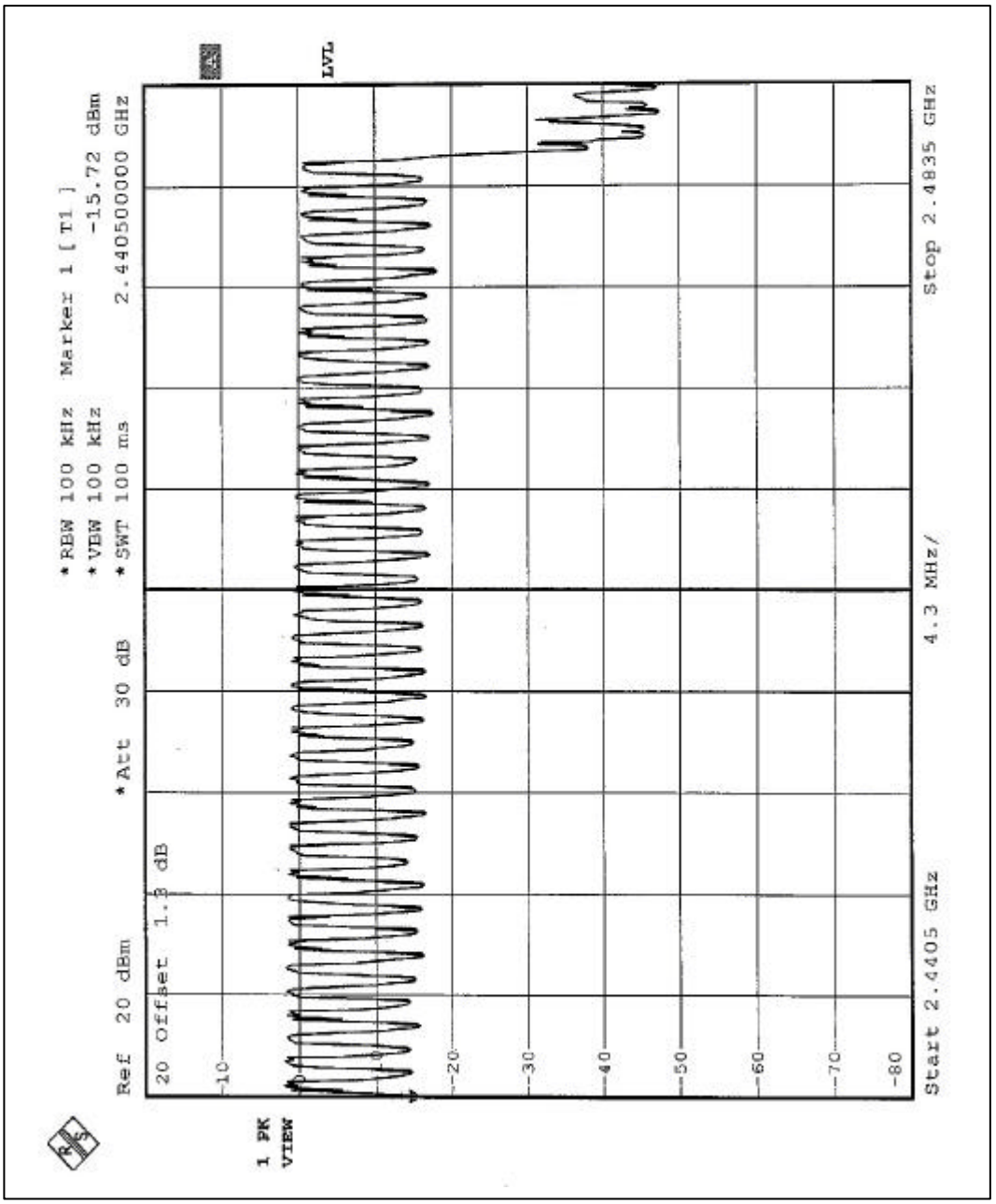
4.2.5 TEST SETUP



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 20 dBm
Att 30 dB
RBW 100 kHz
VBW 100 kHz
SWT 100 ms
Marker 1 [T1]
2.13 dBm
2.401978000 GHz
20 Offset 1.3 dB
1 PK
VIEW
LVL
Start 2.4 GHz
4.05 MHz/
Stop 2.4405 GHz


Ref 20 dBm
20 Offset 1.8 dB
* Att 30 dB
* RBW 100 kHz
* VBW 100 kHz
* SWT 100 ms
Marker 1 [T1]
-15.72 dBm
2.440500000 GHz
1 PK
VIEW
LVL
-10
-20
-30
-40
-50
-60
-70
-80
Start 2.4405 GHz
4.3 MHz/
Stop 2.4835 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 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
R&S SPECTRUM ANALYZER	FSP	1093.4495.30	Dec. 19, 2003

NOTE:

1. The measurement uncertainty is less than +/- 2.6dB, which is calculated as per the NAMAS document NIS81.
2. 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

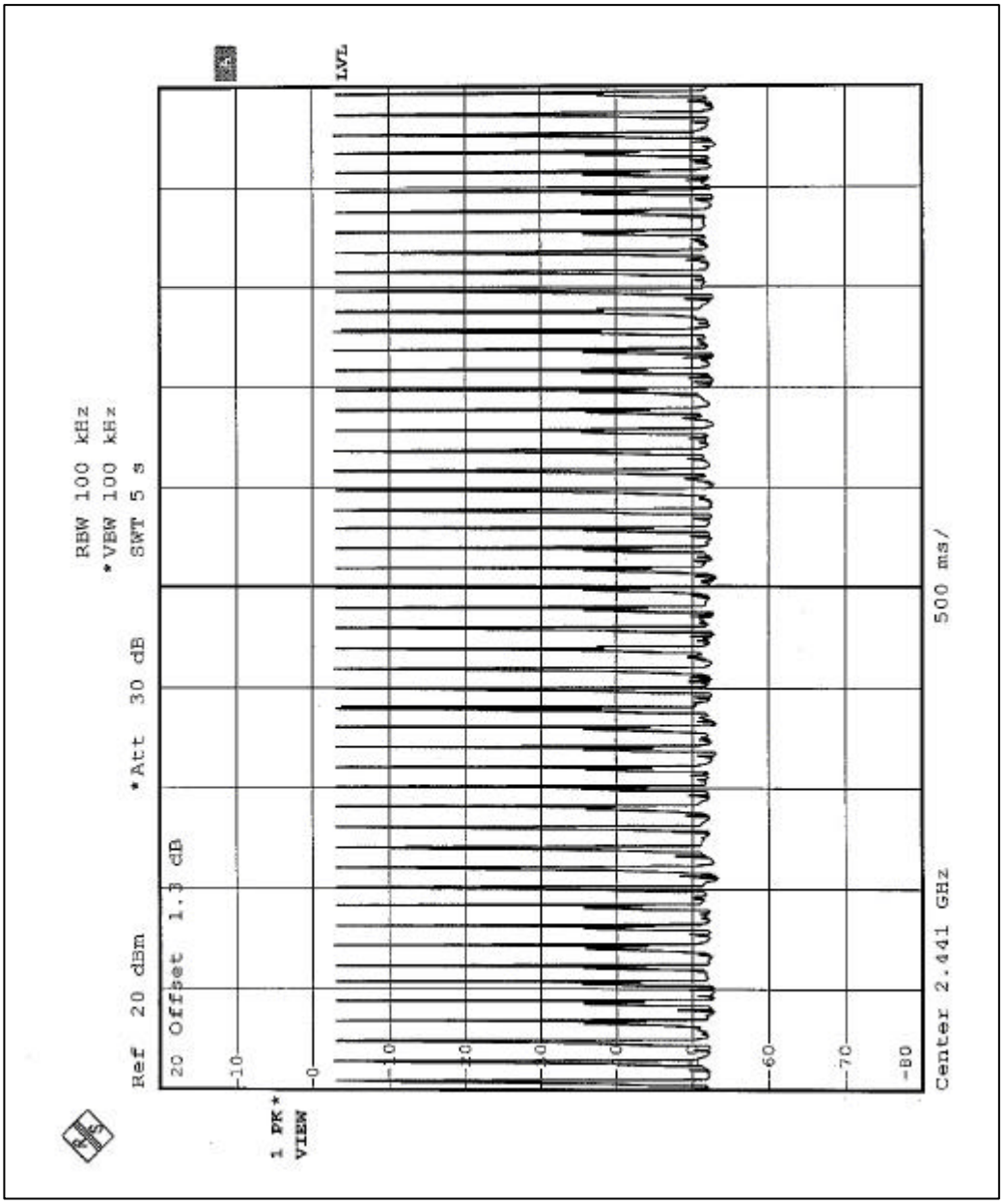
4.3.5 TEST SETUP

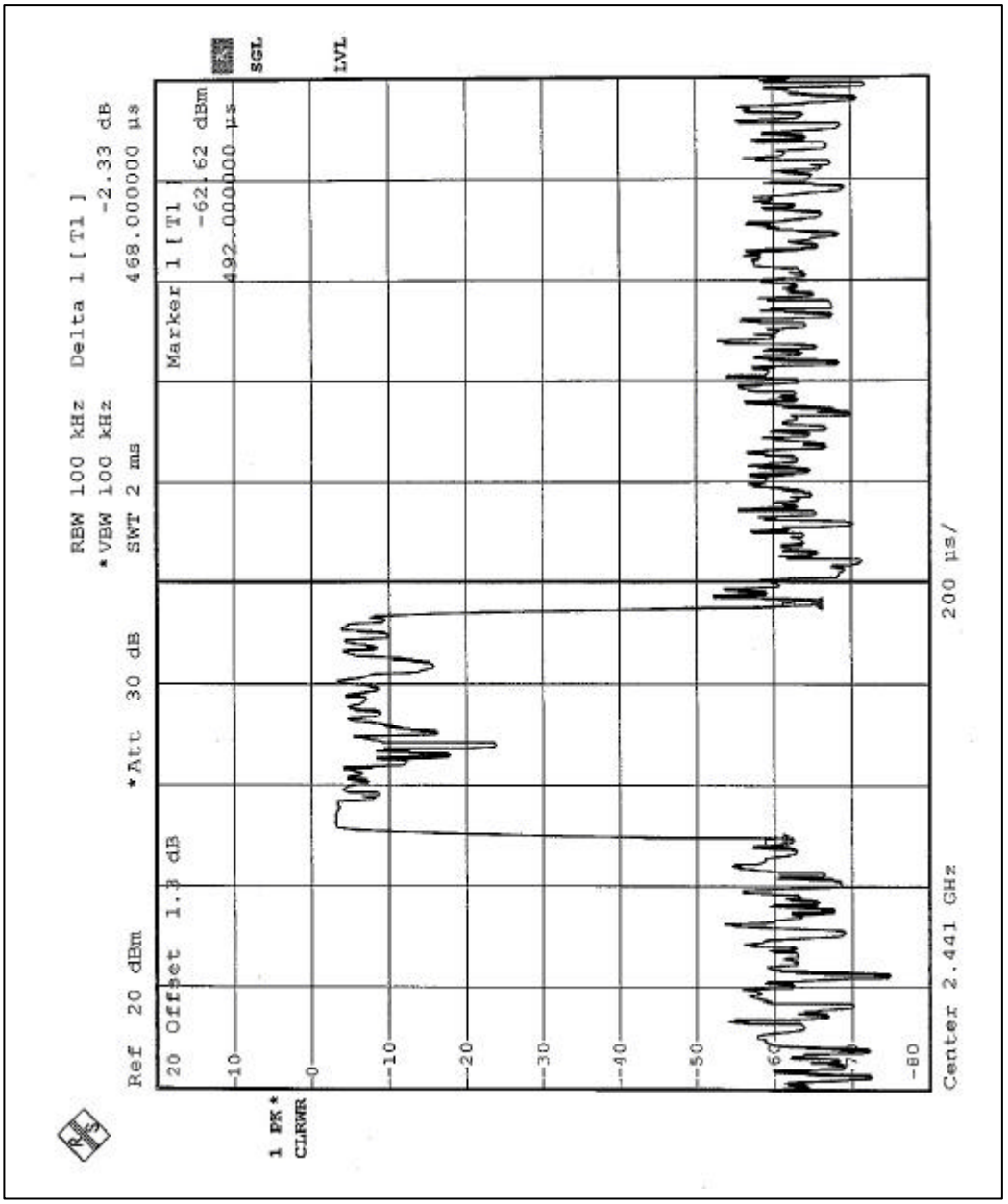
4.3.6 TEST RESULTS

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	0.468	150.85	400
DH3	26 times / 5 sec *6.32=164.32 times	1.77	290.85	400
DH5	17 times / 5 sec *6.32=107.44 times	3.16	339.51	400

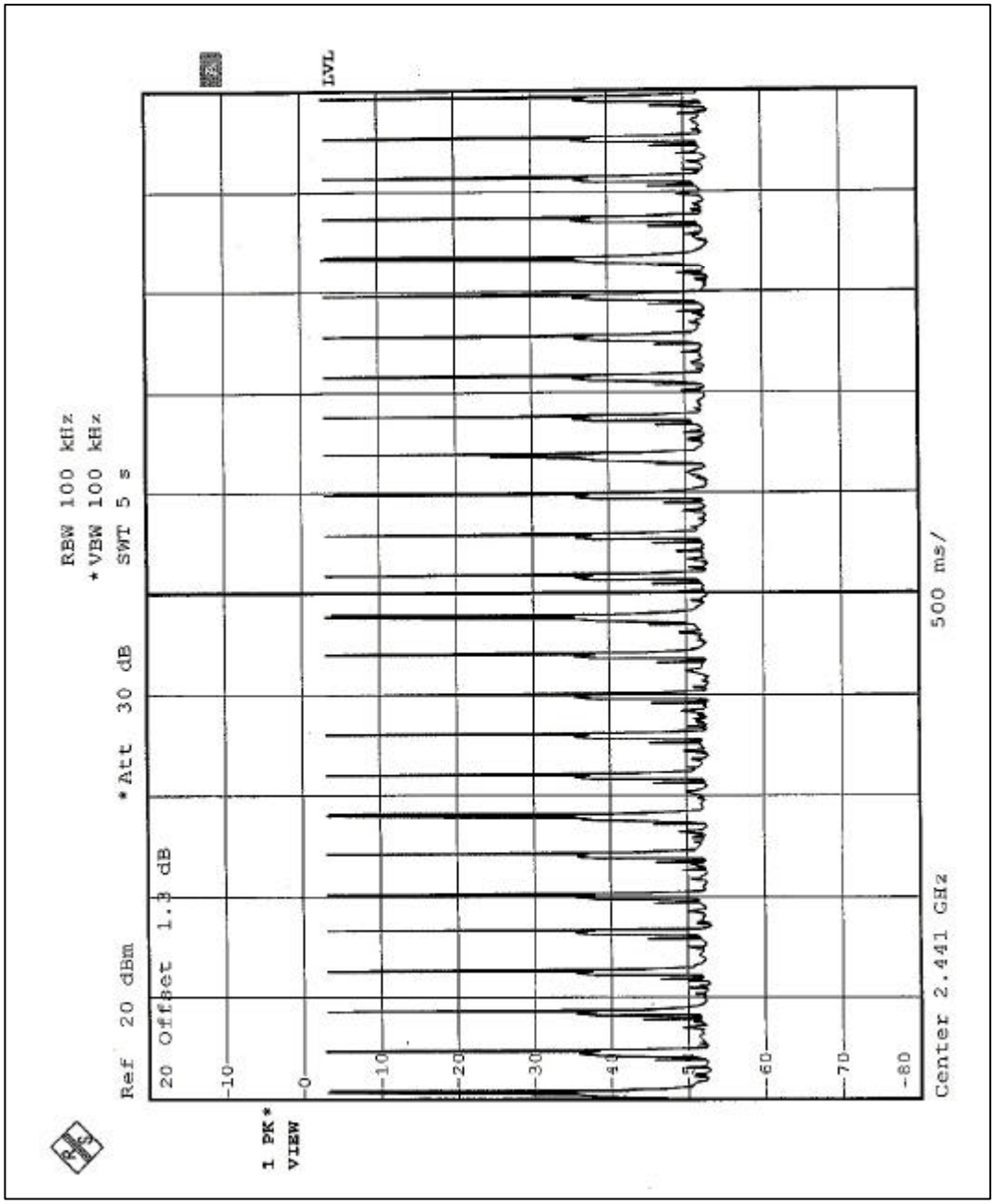
Test plots of the transmitting time slot are shown on next six pages.

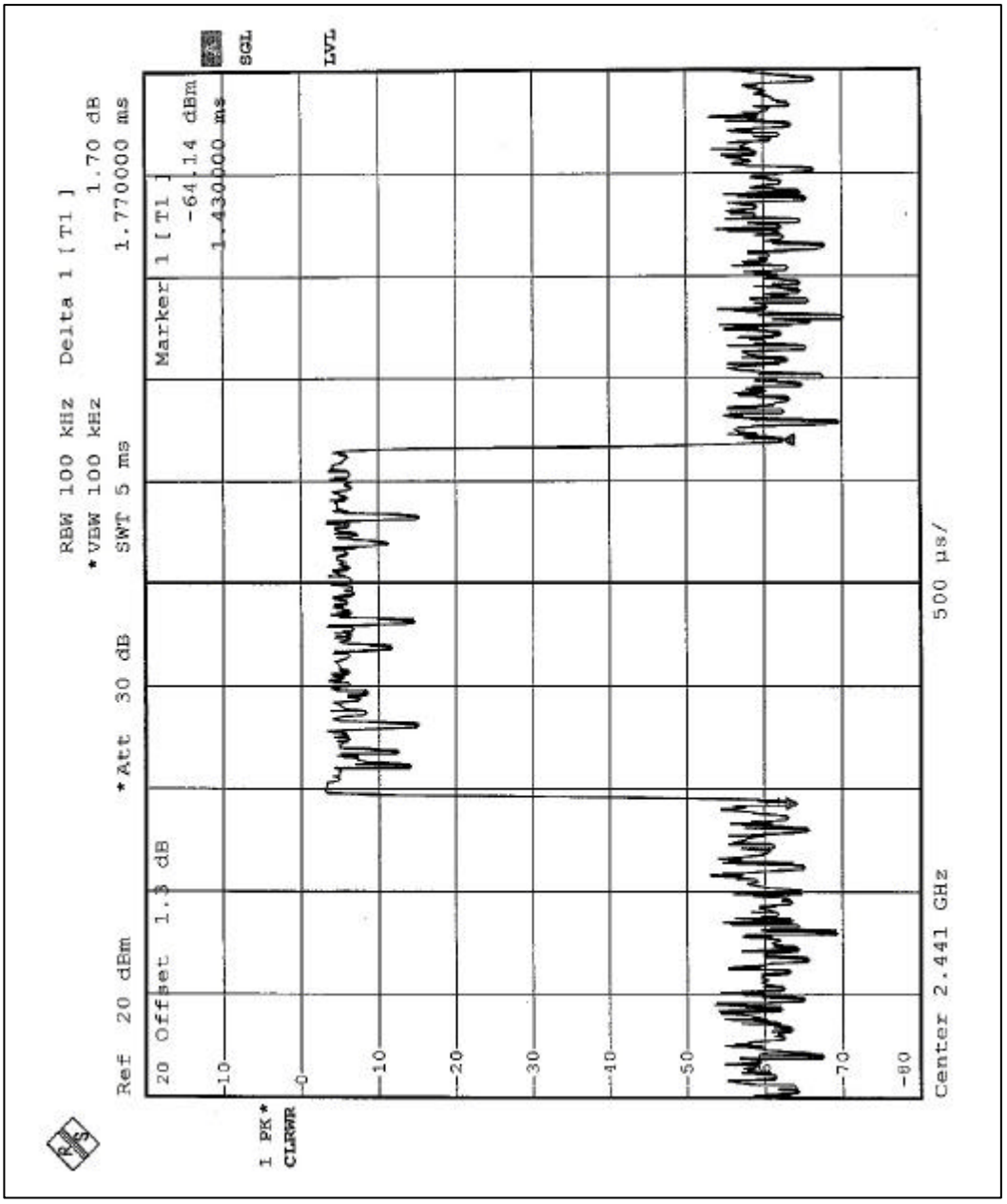
DH1


Ref 20 dBm
20 Offset 1.3 dB
*Att 30 dB
RBW 100 kHz
*VBW 100 kHz
SWT 5 s
1 PK*
VIEW
LVL
-10
-0
-10
-20
-30
-40
-50
-60
-70
-80
Center 2.441 GHz
500 ms/

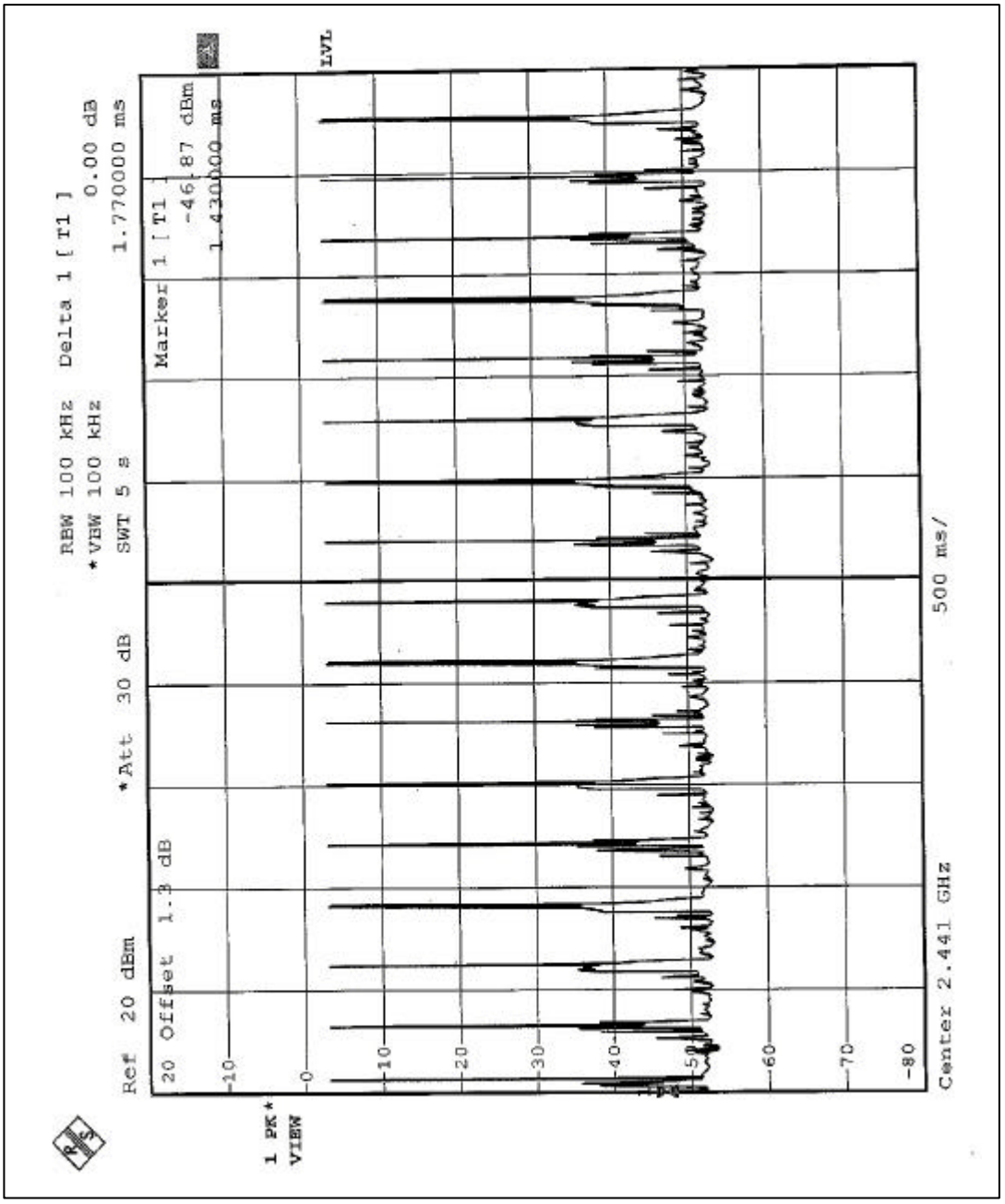

Ref 20 dBm
20 Offset 1.3 dB
*Att 30 dB
RBW 100 kHz
*VBW 100 kHz
SWT 2 ms
Delta 1 [T1]
-2.33 dB
468.000000 µs
Marker 1 [T1]
-62.62 dBm
492.000000 µs
1 PK*
CLRWR
SGL
LVL
Center 2.441 GHz
200 µs/

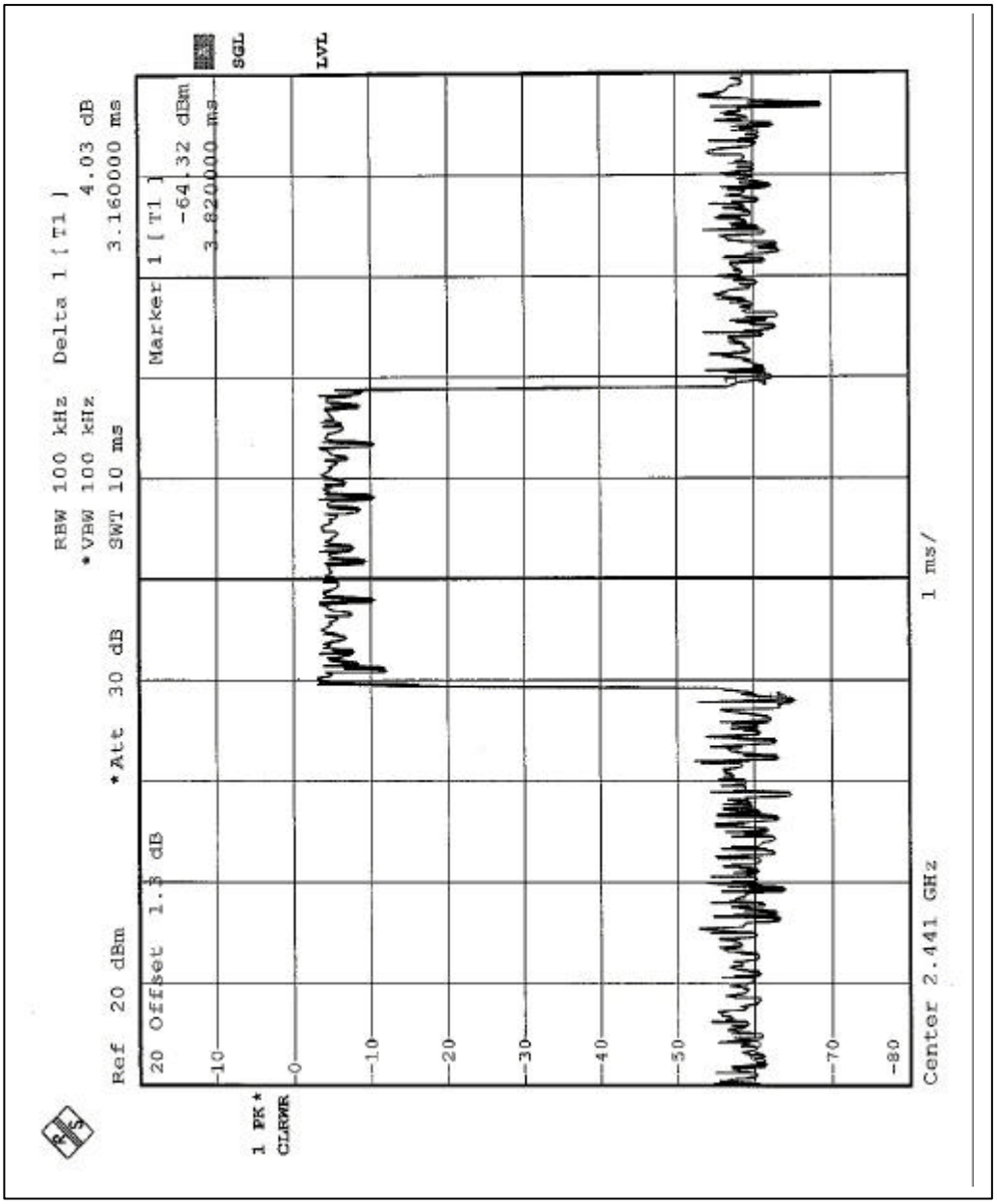
DH3


Ref 20 dBm
20 Offset 1.3 dB
*Att 30 dB
RBW 100 kHz
*VBW 100 kHz
SWT 5 s
1 PK*
VIEW
LVL
-10
0
-10
-20
-30
-40
-50
-60
-70
-80
Center 2.441 GHz
500 ms/


Ref 20 dBm
20 Offset 1.3 dB
*Att 30 dB
RBW 100 kHz
*VBW 100 kHz
SWT 5 ms
Delta 1 [T1]
1.70 dB
1.770000 ms
Marker 1 [T1]
-64.14 dBm
1.430000 ms
1 PK*
CLRWR
SGL
LVL
Center 2.441 GHz
500 µs/

DH5


Ref 20 dBm
Offset 1.3 dB
*Att 30 dB
RBW 100 kHz
*VBW 100 kHz
SWT 5 s
Delta 1 [T1]
0.00 dB
1.770000 ms
Marker 1 [T1]
-46.87 dBm
1.430000 ms
LVL
1 PK*
VIEW
Center 2.441 GHz
500 ms/


Ref 20 dBm
20 Offset 1.3 dB
*Att 30 dB
RBW 100 kHz
*VBW 100 kHz
SWT 10 ms
Delta 1 [T1]
4.03 dB
3.160000 ms
Marker 1 [T1]
-64.32 dBm
3.820000 ms
1 PK*
CLRWR
SGL
LVL
Center 2.441 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
R&S SPECTRUM ANALYZER	FSP	1093.4495.30	Dec. 19, 2003

NOTE:

1. The measurement uncertainty is less than +/- 2.6dB, which is calculated as per the NAMAS document NIS81.
2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

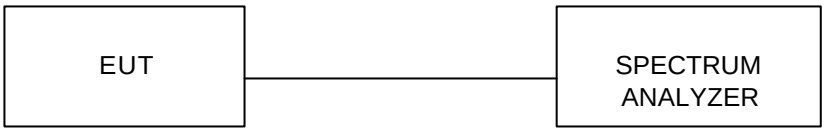
4.4.3 TEST PROCEDURE

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



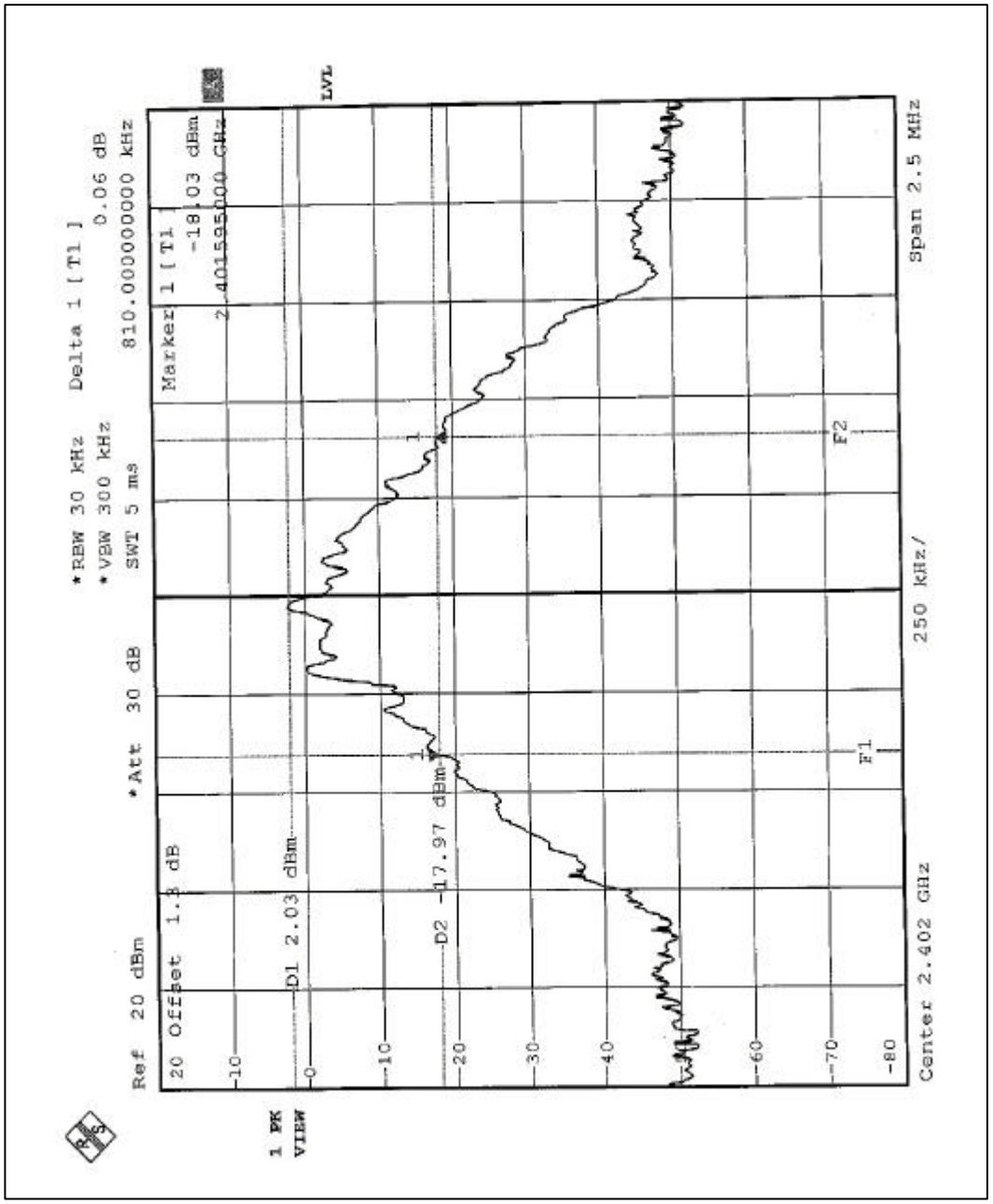
4.4.6 EUT OPERATING CONDITION

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

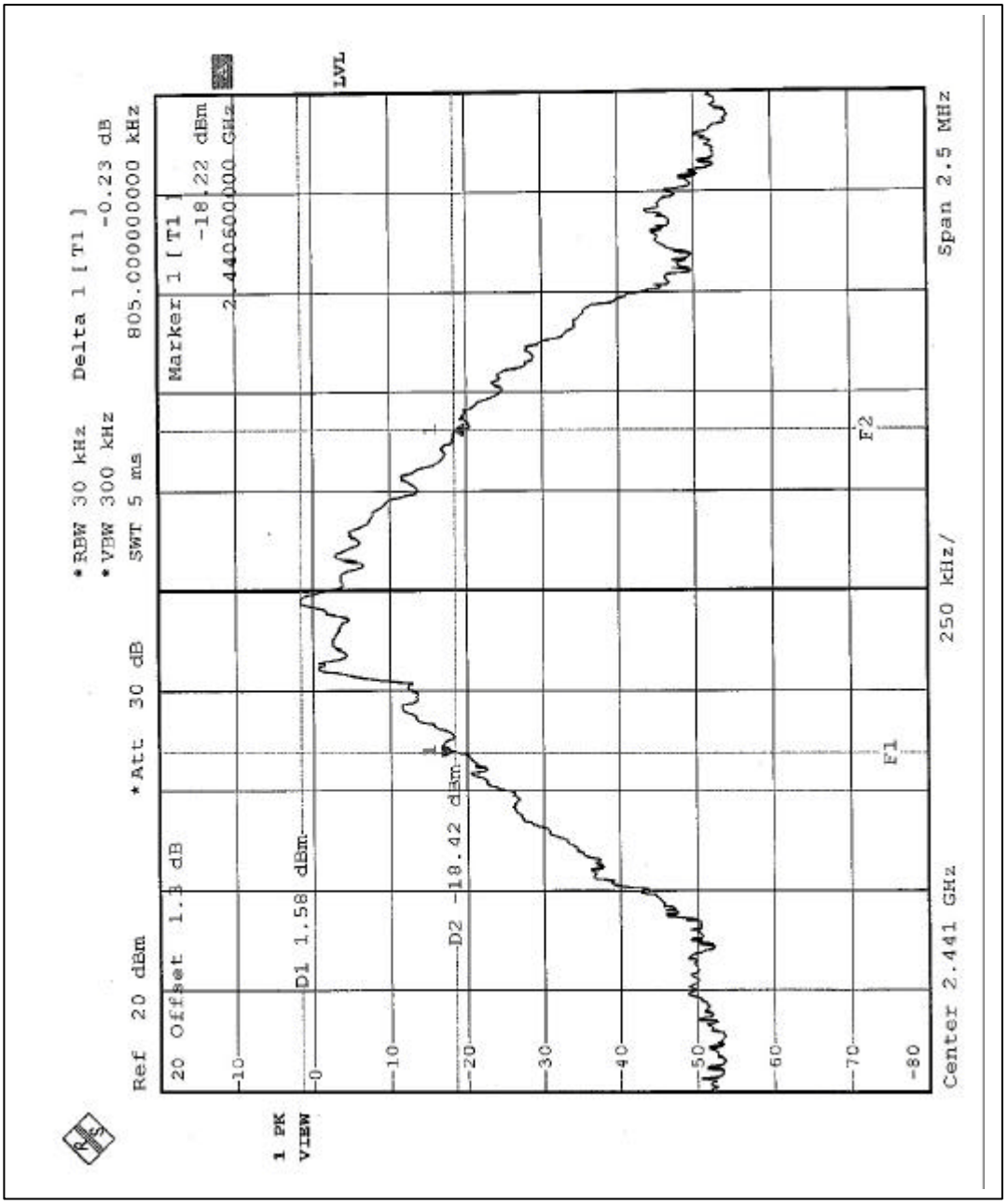
4.4.7 TEST RESULTS

CHANNEL	CHANNEL FREQUENCY (MHz)	20dB BANDWIDTH (kHz)	MAXIMUM LIMIT (MHz)	PASS/FAIL
0	2402	810	1	PASS
39	2441	805	1	PASS
78	2480	815	1	PASS

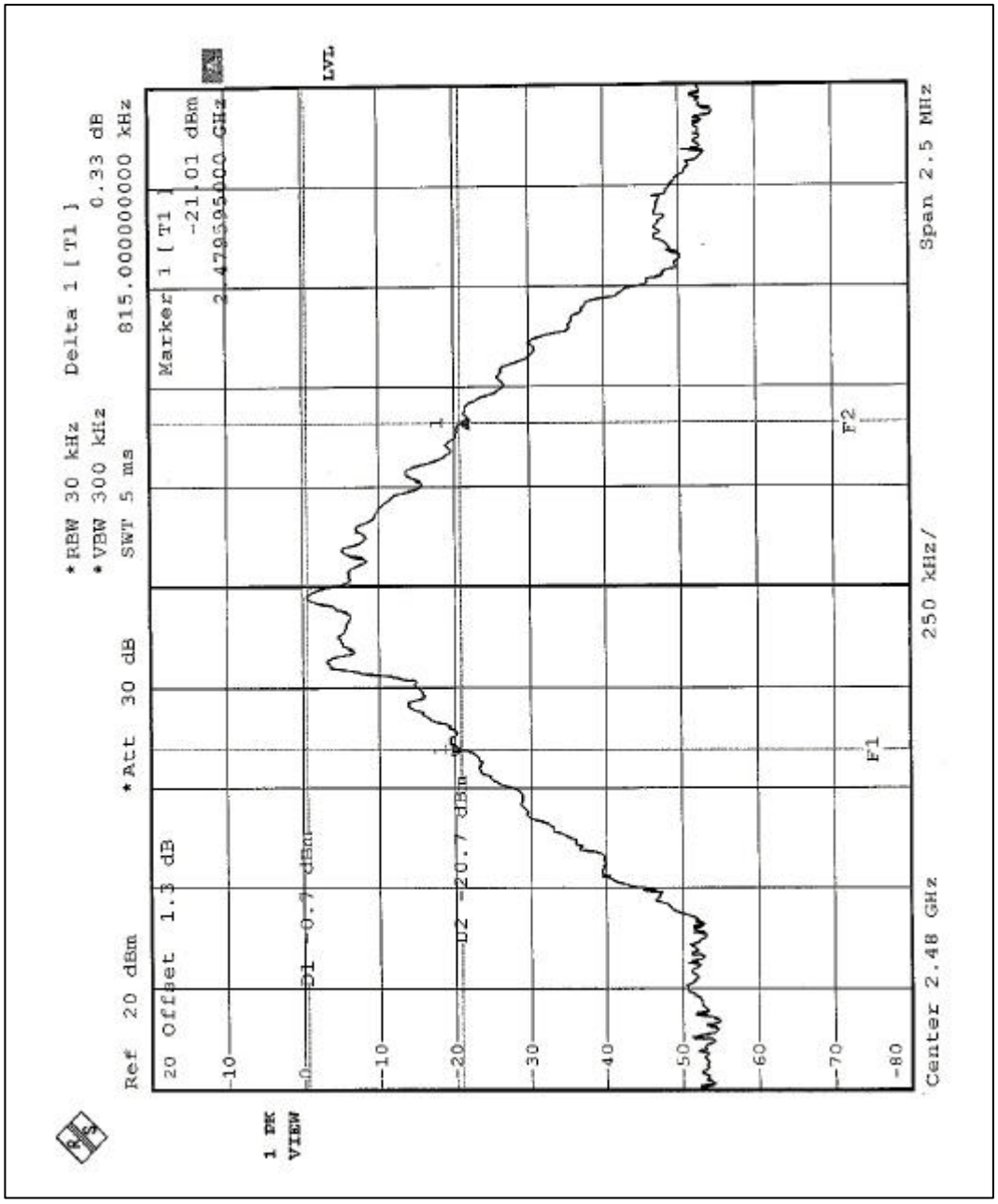
Channel 0


Ref 20 dBm
20 Offset 1.5 dB
*Att 30 dB
*RBW 30 kHz
*VBW 300 kHz
SWT 5 ms
Delta 1 [T1]
0.06 dB
810.00000000 kHz
Marker 1 [T1]
-18.03 dBm
2.401595000 GHz
D1 2.03 dBm
D2 -17.97 dBm
F1
F2
1 PK
VIEW
LVL
Center 2.402 GHz
250 kHz/
Span 2.5 MHz

Channel 39


Ref 20 dBm
20 Offset 1.3 dB
D1 1.58 dBm
D2 -18.42 dBm
*Att 30 dB
SWT 5 ms
*RBW 30 kHz
*VBW 300 kHz
Delta 1 [T1]
-0.23 dB
805.000000000 kHz
Marker 1 [T1]
-18.22 dBm
2.440600000 GHz
1 PK
VIEW
LVL
F1
F2
Center 2.441 GHz
250 kHz/
Span 2.5 MHz

Channel 78


Ref 20 dBm
Att 30 dB
RBW 30 kHz
VBW 300 kHz
SWT 5 ms
Delta 1 [T1]
0.33 dB
815.000000000 kHz
Marker 1 [T1]
-21.01 dBm
2.479305000 GHz
20 Offset 1.3 dB
D1 -0.7 dBm
D2 -20.7 dBm
1 PK
VIEW
LVL
F1
F2
Center 2.48 GHz
250 kHz/
Span 2.5 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
R&S SPECTRUM ANALYZER	FSP	1093.4495.30	Dec. 19, 2003

NOTE:

1. The measurement uncertainty is less than +/- 2.6dB, which is calculated as per the NAMAS document NIS81.
2. 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	1.005MHz	810	PASS
39	2441	1.0MHz	805	PASS
78	2480	1.005MHz	815	PASS

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