

FCC TEST REPORT

REPORT NO.: RF900914R04

MODEL NO.: Celsius Mobile H

RECEIVED: Sept. 14, 2001

TESTED: Sept. 11 ~ Sept. 27, 2001

APPLICANT: QUANTA COMPUTER INC.

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

ISSUED BY: Advance Data Technology Corporation

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

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0528



Lab Code: 200102-0

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1 CERTIFICATION

PRODUCT : Notebook PC
BRAND NAME : Quanta
MODEL NO. : Celsius Mobile H
APPLICANT : QUANTA COMPUTER 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 Sept. 11, 2001 to Sept. 27, 2001, 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.

TESTED BY : Steven Lu , DATE: Oct 2, 2001
Steven Lu

CHECKED BY : Demi Chen , DATE: Oct. 2, 2001
Demi Chen

APPROVED BY : Alan Lane , DATE: Oct. 2, 2001
Dr. Alan Lane, 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
15.107	AC Power Conducted Emission Limit: 48dBuV	PASS	Meet the requirement of limit Minimum passing margin is -10.85 dBuV at 15.368 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 whichever is greater	PASS	Meet the requirement of limit
15.247(a)(2)	Spectrum Bandwidth of a Frequency Hopping Sequence Spread Spectrum System Spec.: Max. 1 MHz	PASS	Meet the requirement of limit
15.247(b)	Maximum Peak Output Power Spec.: max. 30dBm	PASS	Meet the requirement of limit
15.247(c)	Transmitter Radiated Emissions Spec.: Table 15.209	PASS	Meet the requirement of limit Minimum passing margin is -7.2 dBuV at 4804.20 MHz
15.247(c)	Band Edge Measurement	PASS	Meet the requirement of limit

3 GENERAL INFORMATION

3.1 GENERAL DESCRIPTION OF EUT

PRODUCT	Notebook PC
MODEL NO.	Celsius Mobile H
POWER SUPPLY	3.0VDC from battery for Keyboard 3.3VDC from Notebook
MODULATION TYPE	FHSS (GFSK)
FREQUENCY RANGE	2402MHz ~ 2480MHz
NUMBER OF CHANNEL	79
OUTPUT POWER	5.8dBm
ANTENNA TYPE	Micro Strip Antenna
DATA CABLE	NA
I/O PORTS	NA
ASSOCIATED DEVICES	NA

NOTE:

1. The EUT is a versatile and ergonomic notebook. Innovative technology and ergonomic design make this notebook the ideal user-friendly and reliable travel companion.
2. The EUT is designed to be detachable. Keyboard can be removed from the EUT.
3. 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.

NOTE: The EUT is a Notebook PC with detachable keyboard. Keyboard can be removed from the EUT. Bluetooth technology is used for both Keyboard and Notebook. The test results (A) is for Keyboard only and (B) is for host Notebook.

3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS

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

FCC CFR 47 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 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	MODEM	ACEEX	1414	980020503	IFAXDM1414
2	PRINTER	HP	2225C+	3123S97230	DSI6XU2225

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	1.2 m braid shielded wire, terminated with DB25 and DB9 connector via metallic frame, w/o core.
2	1.2m braid shielded wire, terminated with DB25 and Centronics connector via metallic frame, w/o core.

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

4 TEST PROCEDURES AND RESULTS

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
0.45 – 30	48	-	48	-

Notes:

1. The lower limit shall apply at the transition frequencies.
1. 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	ESHS30	828109/007	July 4, 2002
*ROHDE & SCHWARZ Artificial Mains Network (for EUT)	ESH3-Z5	839135/006	July 3, 2002
ROHDE & SCHWARZ 4-wire ISN	ENY41	837032/016	Nov. 28, 2001
ROHDE & SCHWARZ 2-wire ISN	ENY22	837497/016	Dec. 3, 2001
*EMCO-L.I.S.N. (for peripheral)	3825/2	9204-1964	July 3, 2002
*Software	Cond-V2J	NA	NA
*RF cable (JYEBAO)	RG-58A/U	Cable-C02.01	July 9, 2002
HP Terminator (For EMCO LISN)	11593A	E1-01-298	Feb. 20, 2002
HP Terminator (For EMCO LISN)	11593A	E1-01-299	Feb. 20, 2002
Shielded Room	Site 2	ADT-C02	NA
VCCI Site Registration No.	Site 2	C-240	NA

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.
3. "*" = These equipments are used for the final measurement.

- 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 450 kHz to 30 MHz was searched. Emission levels over 10dB under the prescribed limits could not be reported

The diagram illustrates a test setup for an Electromagnetic Interference (EMI) test. It features a **Vertical Reference Ground Plane** on the left, a **Horizontal Reference Ground Plane** at the bottom, and a **Bonded to Horizontal Ground Plane** connection point. A **EUT** (Equipment Under Test) is positioned on a stand, with a **LISN** (Line Impedance Stabilization Network) connected to its power source. The **Test Receiver** is also connected to the LISN. Dimensions are indicated: 40cm for the vertical distance from the ground plane to the EUT, and 80cm for the horizontal distance between the EUT and the Test Receiver.

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



4.1.5 TEST RESULTS(A)

This EUT is excused from investigation of conducted emission, for it is powered by battery only. According to paragraph 15.207(a), measurements to demonstrate compliance with the conducted limited are not required for devices which only employ battery power for operation and which do not operate from the AC power lines or contain provisions for operation while connected to the AC power lines.

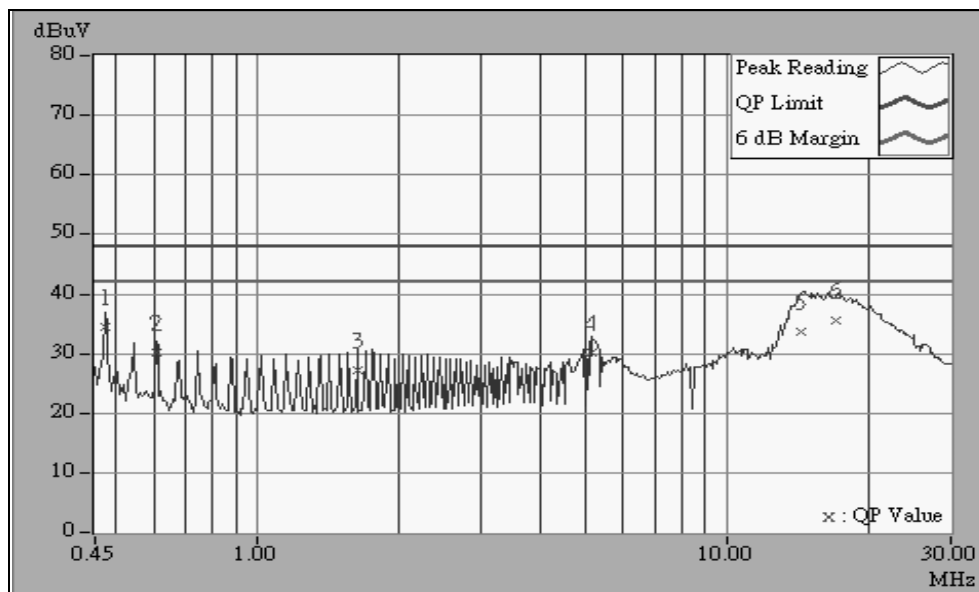
4.1.6 TEST RESULTS(B)

EUT	Notebook PC	MODEL	Celsius Mobile H
MODE	Channel 0	6dB BANDWIDTH	10 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	PHASE	Line (L)
ENVIRONMENTAL CONDITIONS	26 deg. C, 60%RH, 1005 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	0.474	0.10	34.60	-	34.70	-	48.00	-	-13.30	-
2	0.609	0.10	30.19	-	30.29	-	48.00	-	-17.71	-
3	1.626	0.10	27.29	-	27.39	-	48.00	-	-20.61	-
4	5.148	0.34	30.06	-	30.40	-	48.00	-	-17.60	-
5	14.428	0.77	33.63	-	34.40	-	48.00	-	-13.60	-
6	17.136	0.89	35.68	-	36.57	-	48.00	-	-11.43	-

NOTE:

1. QP. and AV. are abbreviations of quasi-peak and average individually.
2. "-": NA
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission level - Limit value
5. Emission Level = Reading Value + Correction Factor.

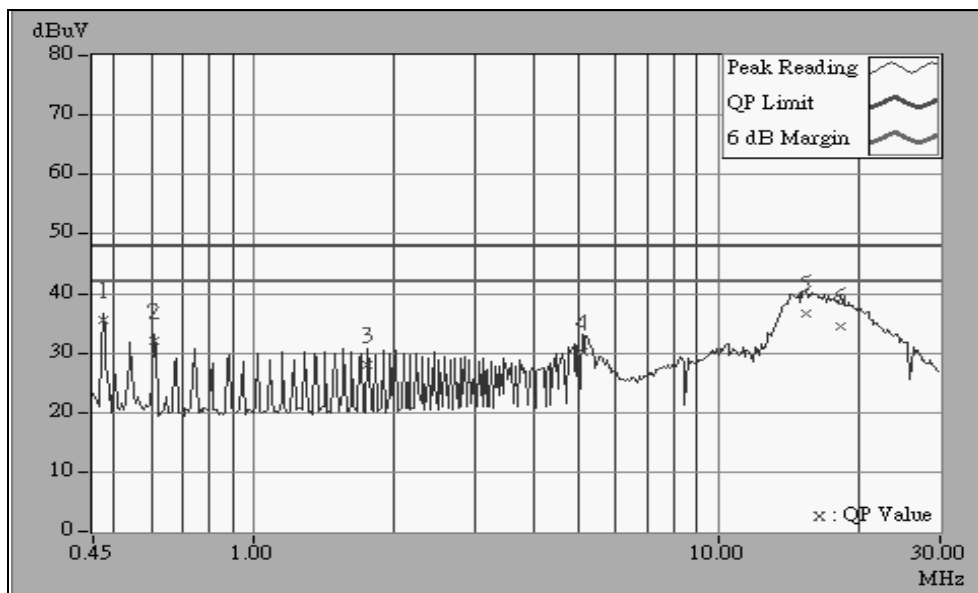


EUT	Notebook PC	MODEL	Celsius Mobile H
MODE	Channel 0	6dB BANDWIDTH	10 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	PHASE	Neutral (N)
ENVIRONMENTAL CONDITIONS	26 deg. C, 60%RH, 1005 hPa	TESTED BY: Steven Lu	

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	0.474	0.10	35.64	-	35.74	-	48.00	-	-12.26	-
2	0.609	0.10	32.04	-	32.14	-	48.00	-	-15.86	-
3	1.761	0.10	27.91	-	28.01	-	48.00	-	-19.99	-
4	5.078	0.32	30.20	-	30.52	-	48.00	-	-17.48	-
5	15.368	0.61	36.54	-	37.15	-	48.00	-	-10.85	-
6	18.347	0.73	34.47	-	35.20	-	48.00	-	-12.80	-

NOTE:

1. QP. and AV. are abbreviations of quasi-peak and average individually.
2. "-": NA
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission level - Limit value
5. Emission Level = Reading Value + Correction Factor.

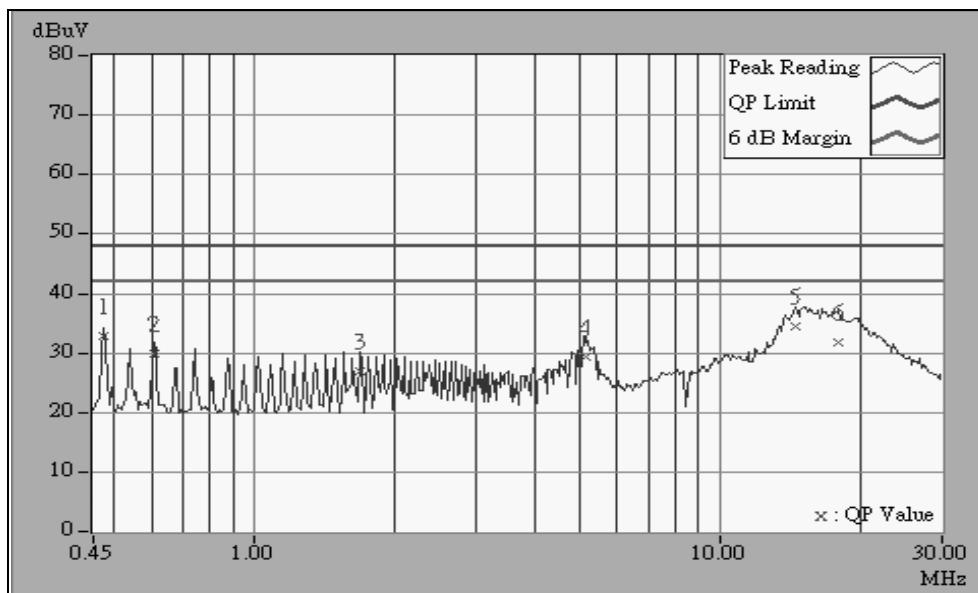


EUT	Notebook PC	MODEL	Celsius Mobile H
MODE	Channel 39	6dB BANDWIDTH	10 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	PHASE	Line (L)
ENVIRONMENTAL CONDITIONS	26 deg. C, 60%RH, 1005 hPa	TESTED BY: Steven Lu	

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	0.474	0.10	32.88	-	32.98	-	48.00	-	-15.02	-
2	0.609	0.10	29.77	-	29.87	-	48.00	-	-18.13	-
3	1.689	0.10	27.05	-	27.15	-	48.00	-	-20.85	-
4	5.141	0.34	29.42	-	29.76	-	48.00	-	-18.24	-
5	14.477	0.77	34.35	-	35.12	-	48.00	-	-12.88	-
6	17.996	0.92	31.78	-	32.70	-	48.00	-	-15.30	-

NOTE:

1. QP. and AV. are abbreviations of quasi-peak and average individually.
2. "-": NA
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission level - Limit value
5. Emission Level = Reading Value + Correction Factor.

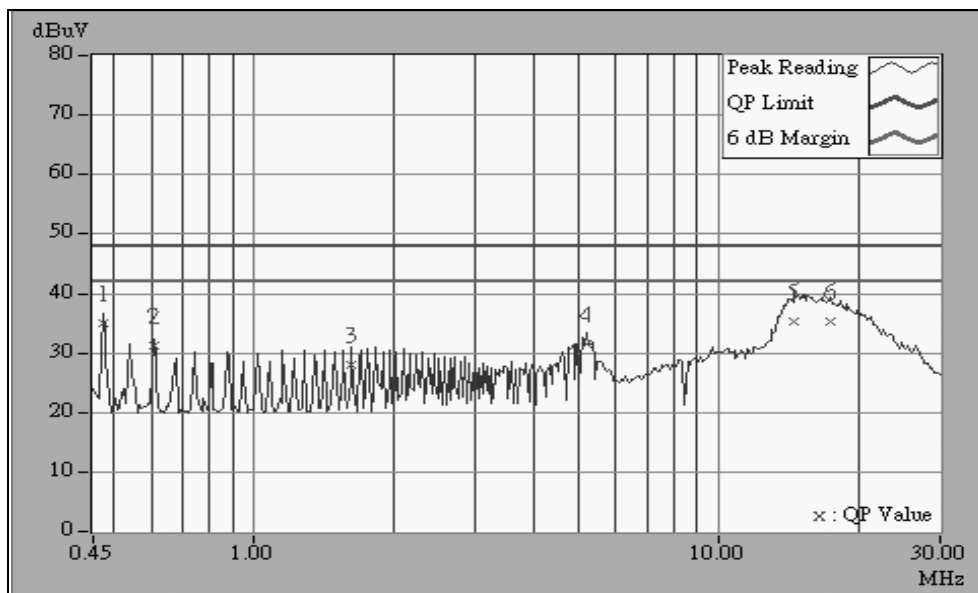


EUT	Notebook PC	MODEL	Celsius Mobile H
MODE	Channel 39	6dB BANDWIDTH	10 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	PHASE	Neutral (N)
ENVIRONMENTAL CONDITIONS	26 deg. C, 60%RH, 1005 hPa	TESTED BY: Steven Lu	

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	0.474	0.10	35.05	-	35.15	-	48.00	-	-12.85	-
2	0.609	0.10	31.26	-	31.36	-	48.00	-	-16.64	-
3	1.623	0.10	27.96	-	28.06	-	48.00	-	-19.94	-
4	5.210	0.32	31.42	-	31.74	-	48.00	-	-16.26	-
5	14.549	0.58	35.25	-	35.83	-	48.00	-	-12.17	-
6	17.456	0.70	35.42	-	36.12	-	48.00	-	-11.88	-

NOTE:

1. QP. and AV. are abbreviations of quasi-peak and average individually.
2. "-": NA
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission level - Limit value
5. Emission Level = Reading Value + Correction Factor.

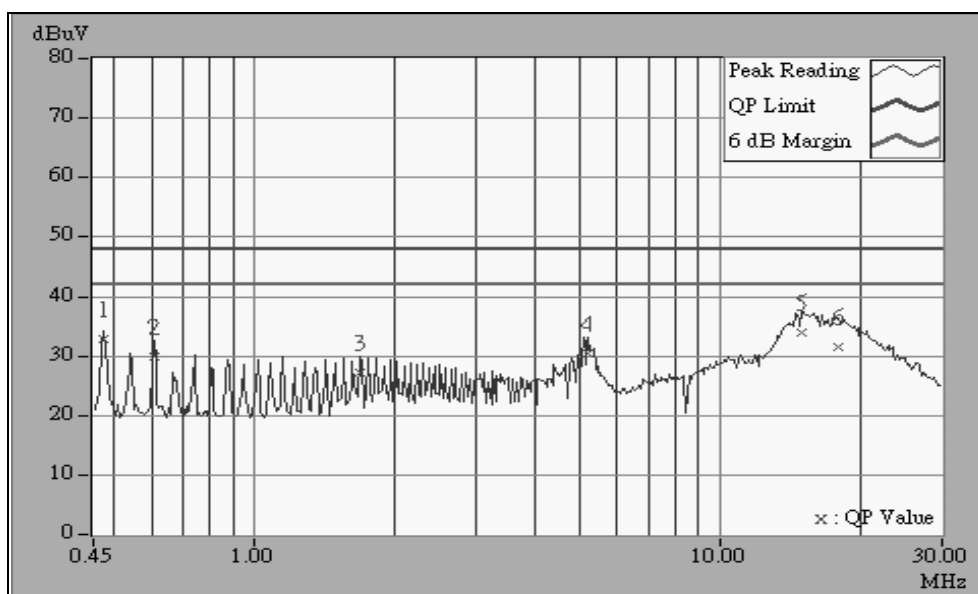


EUT	Notebook PC	MODEL	Celsius Mobile H
MODE	Channel 78	6dB BANDWIDTH	10 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	PHASE	Line (L)
ENVIRONMENTAL CONDITIONS	26 deg. C, 60%RH, 1005 hPa	TESTED BY: Steven Lu	

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	0.474	0.10	32.98	-	33.08	-	48.00	-	-14.92	-
2	0.609	0.10	29.89	-	29.99	-	48.00	-	-18.01	-
3	1.689	0.10	27.33	-	27.43	-	48.00	-	-20.57	-
4	5.207	0.34	30.56	-	30.90	-	48.00	-	-17.10	-
5	15.014	0.80	33.91	-	34.71	-	48.00	-	-13.29	-
6	17.993	0.92	31.58	-	32.50	-	48.00	-	-15.50	-

NOTE:

1. QP. and AV. are abbreviations of quasi-peak and average individually.
2. "-": NA
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission level - Limit value
5. Emission Level = Reading Value + Correction Factor.

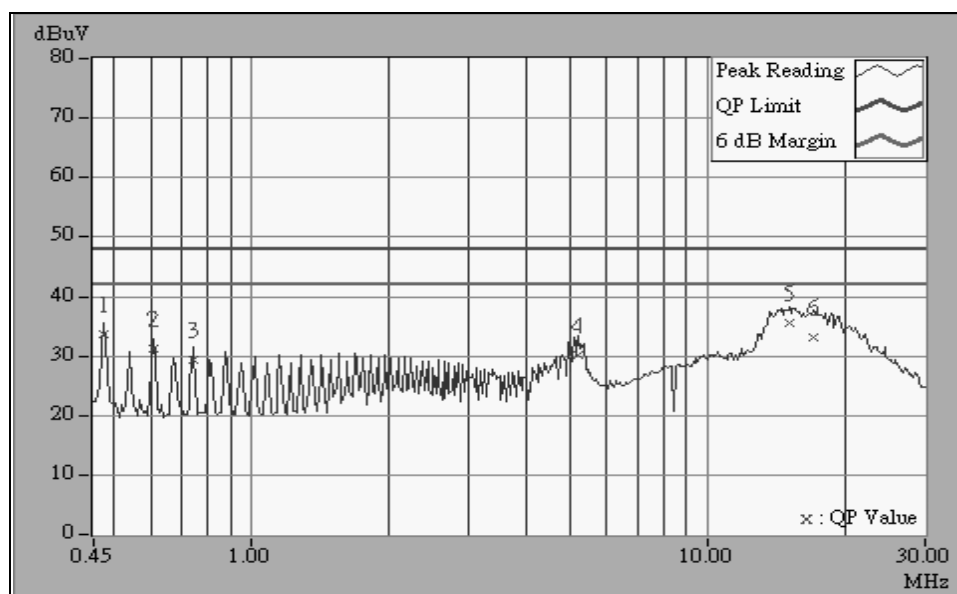


EUT	Notebook PC	MODEL	Celsius Mobile H
MODE	Channel 78	6dB BANDWIDTH	10 kHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	PHASE	Netural (N)
ENVIRONMENTAL CONDITIONS	26 deg. C, 60%RH, 1005 hPa	TESTED BY: Steven Lu	

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	0.475	0.10	33.76	-	33.86	-	48.00	-	-14.14	-
2	0.609	0.10	31.24	-	31.34	-	48.00	-	-16.66	-
3	0.744	0.10	29.26	-	29.36	-	48.00	-	-18.64	-
4	5.207	0.32	30.09	-	30.41	-	48.00	-	-17.59	-
5	15.146	0.61	35.44	-	36.05	-	48.00	-	-11.95	-
6	17.040	0.68	33.01	-	33.69	-	48.00	-	-14.31	-

NOTE:

1. QP. and AV. are abbreviations of quasi-peak and average individually.
2. "-": NA
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission level - Limit value
5. Emission Level = Reading Value + Correction Factor.



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
R&S SPECTRUM ANALYZER	FSEK30	100049	Jul. 16, 2002
HP ATTENUATOR	8496B	3247A18505	Cal. on use
HP PLOTTER	7475A	2641V27755	N/A

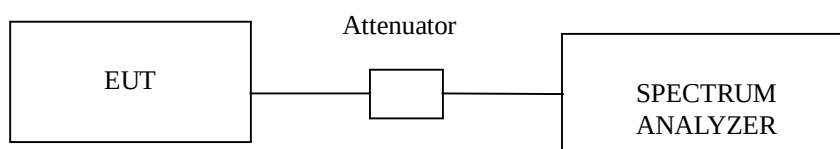
Notes:

- 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

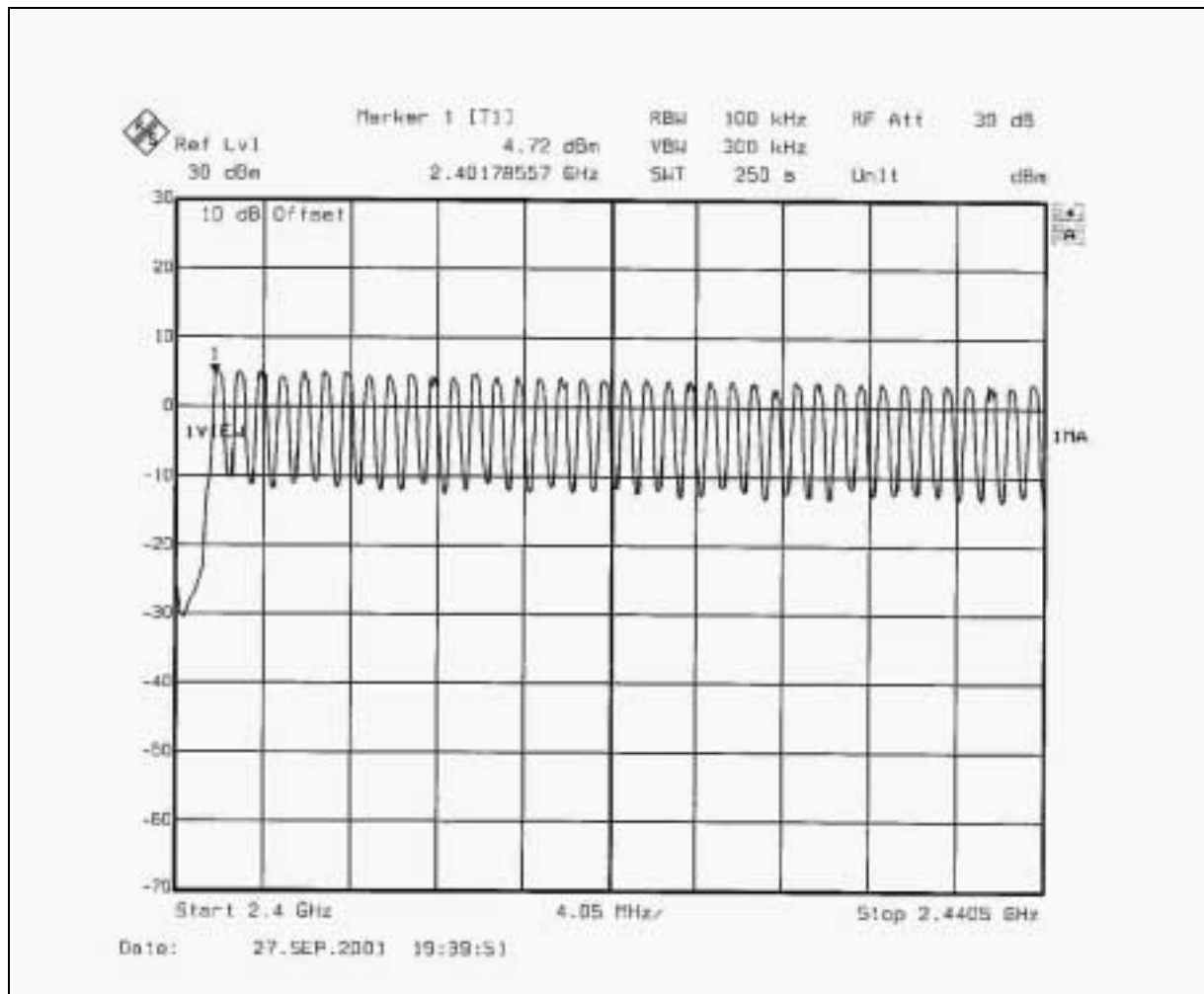
1. Check the calibration of the measuring instrument (SA) using either an internal calibrator or a known signal from an external generator.
2. Turn on the EUT and connect its antenna terminal to measurement via a low loss cable. Then set it to any one measured frequency within its operating range and 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.

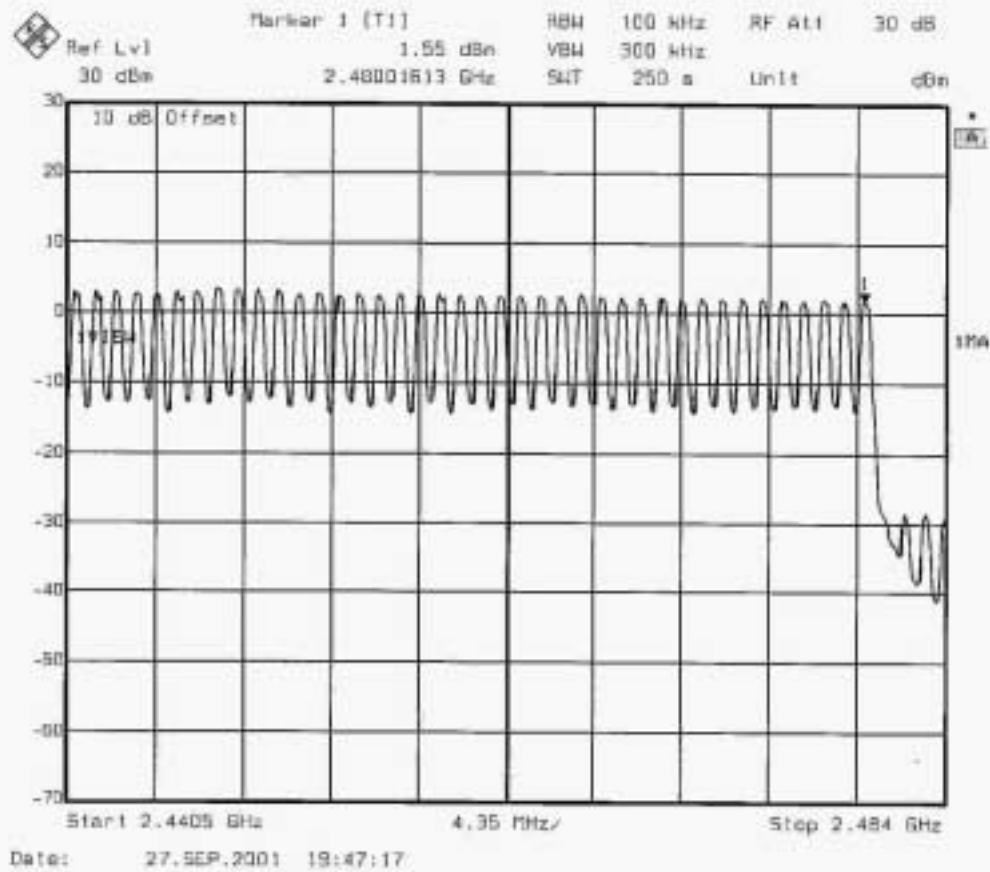
4.2.4 TEST SETUP



4.2.5 TEST RESULTS (A)

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

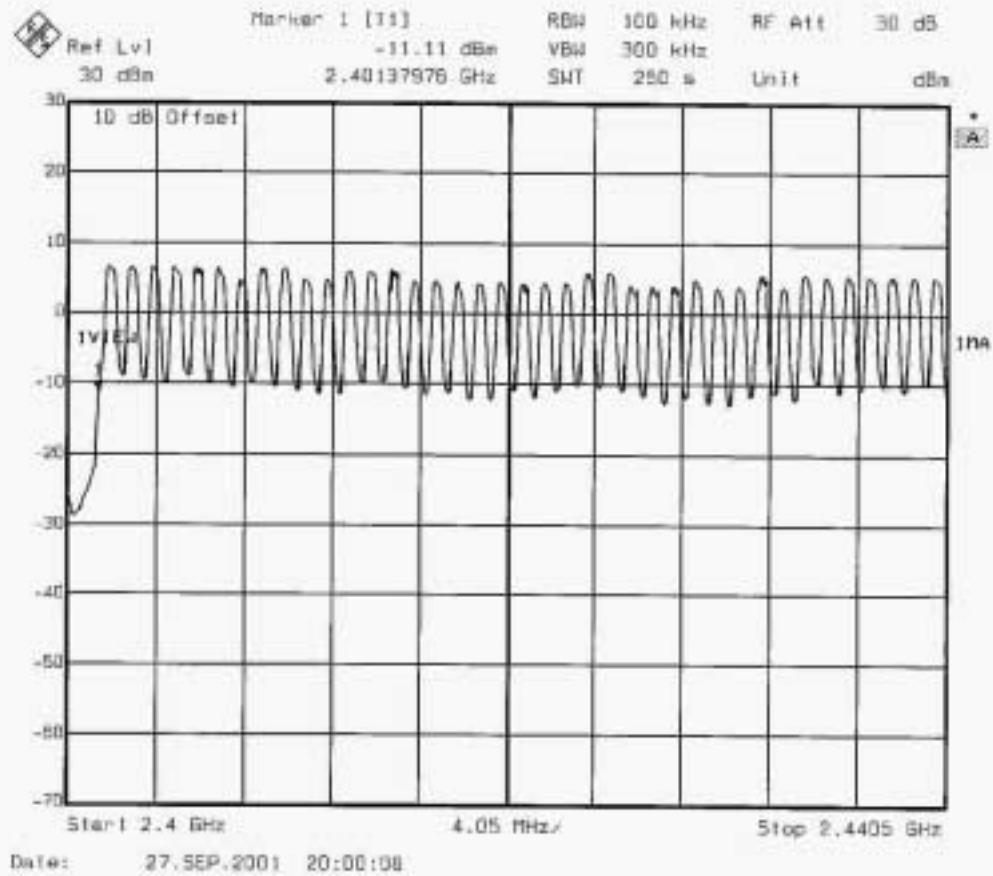


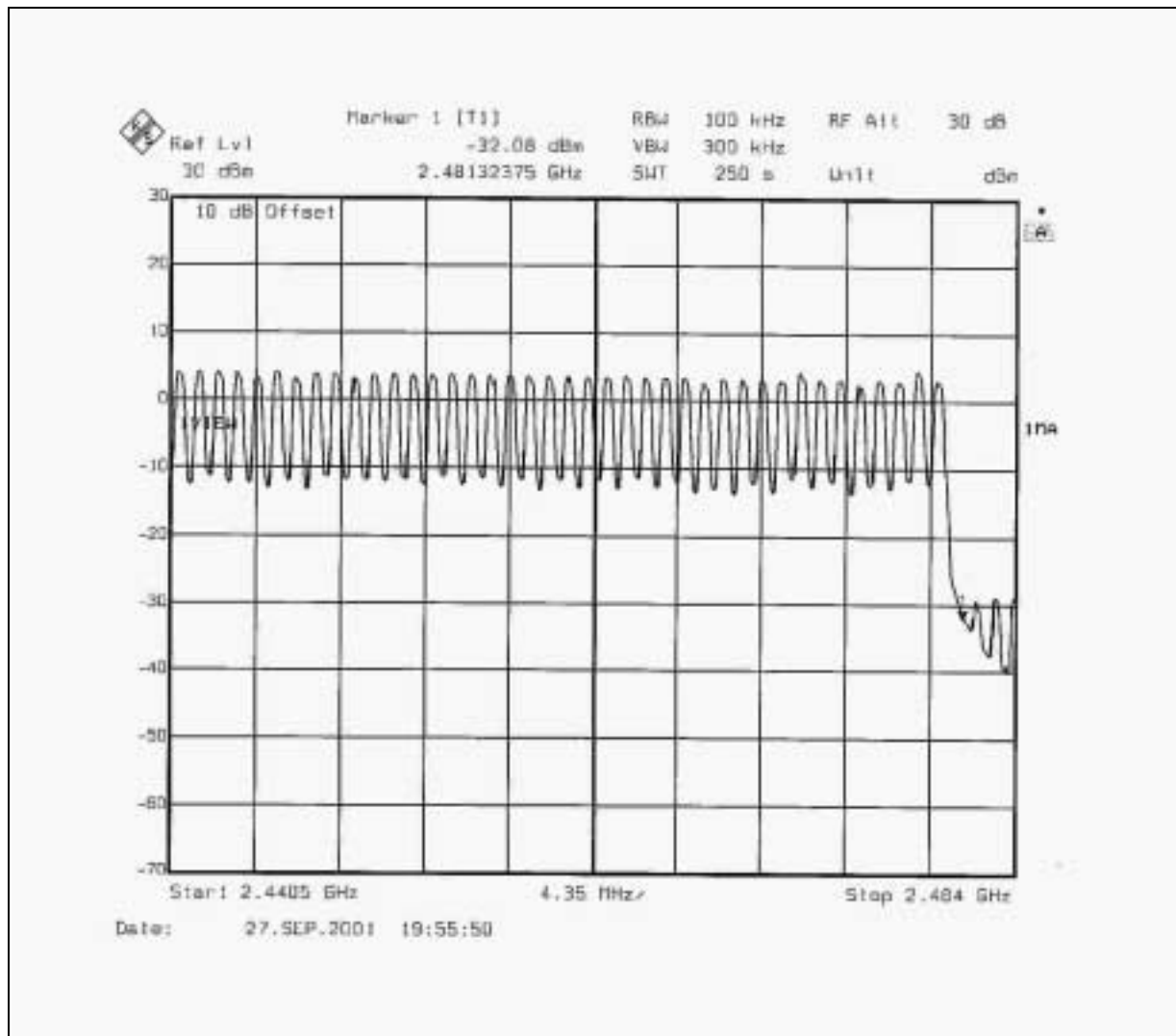




4.2.6 TEST RESULTS (B)

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





4.3 DWELL TIME ON EACH CHANNEL

4.3.1 LIMIT OF DWELL TIME USED

For FHSS, the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 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
R&S SPECTRUM ANALYZER	FSEK30	100049	Jul. 16, 2002
HP ATTENUATOR	8496B	3247A18505	Cal. on use
HP PLOTTER	7475A	2641V27755	N/A

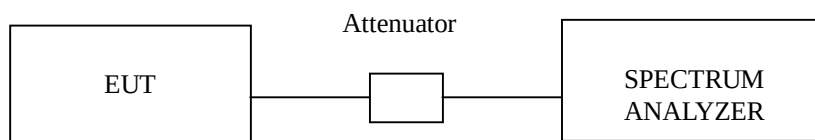
Notes:

- 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 TEST SETUP





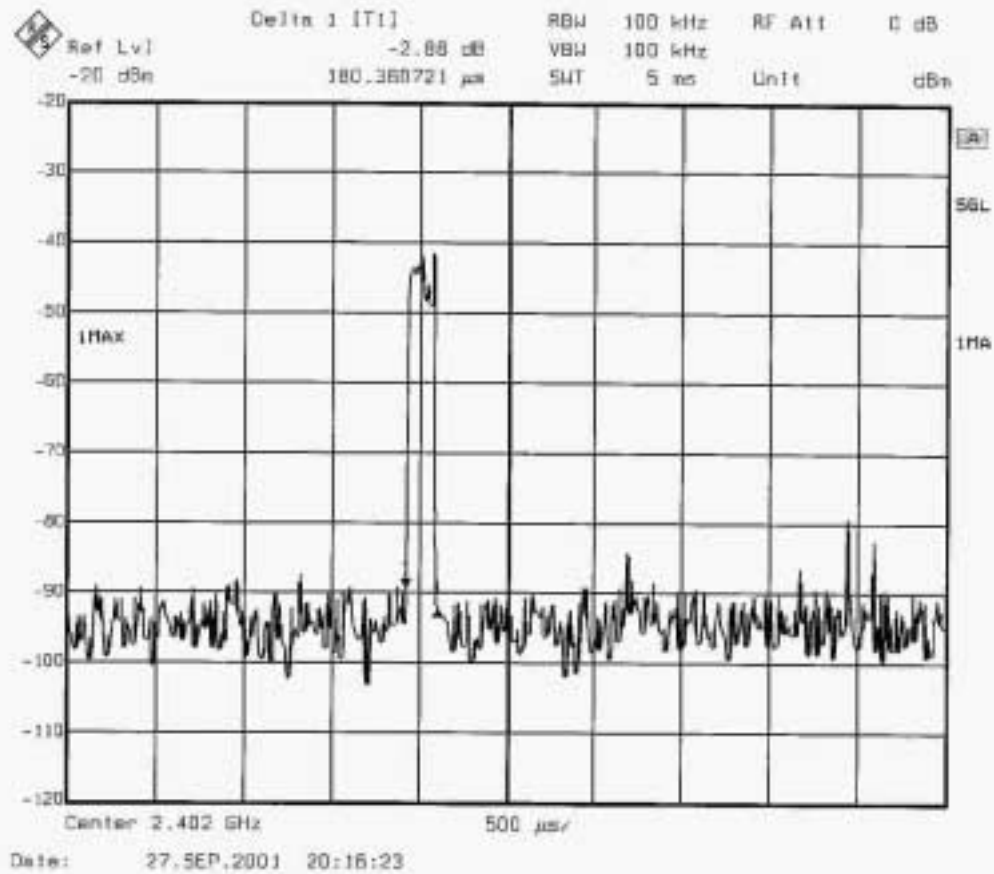
4.3.5 TEST RESULTS (A)

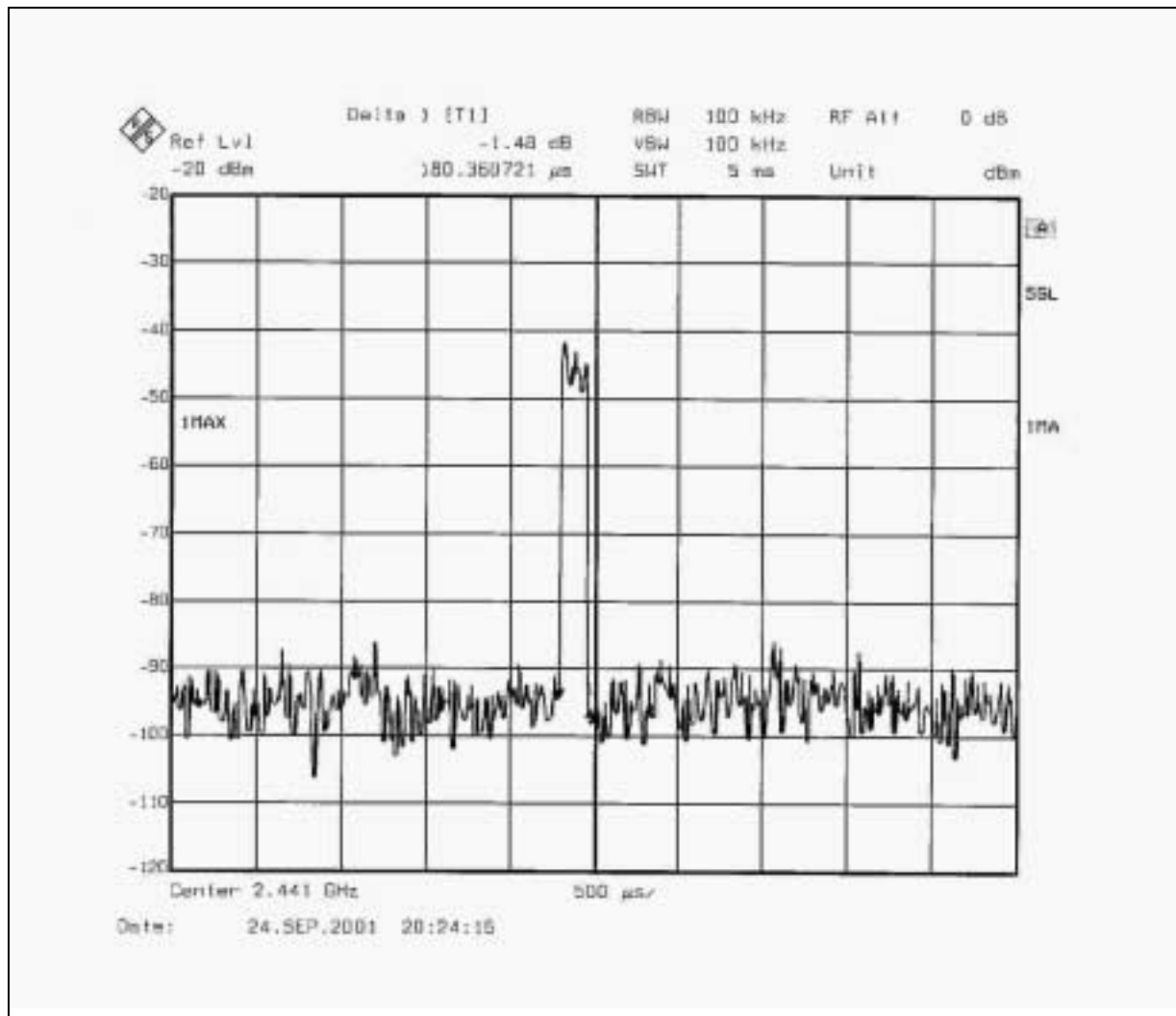
CHANNEL	DWELL TIME
0	109.6ms
39	109.6ms
78	109.6ms

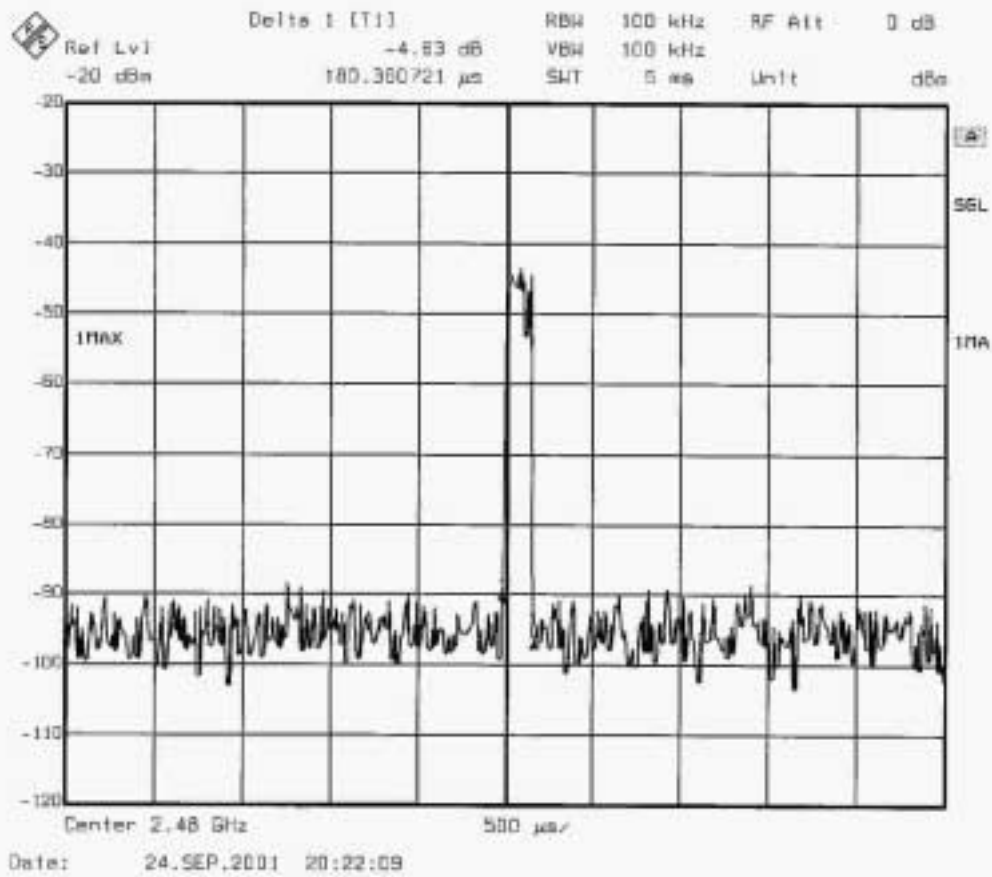
Note: This product is averagely hopped on 79 frequencies. The maximum hopping rate is 1600 hops/sec. The longest pulse duration is 180.36 μ sec.

So, the longest Dwell Time = $180.36\mu\text{sec} \times 30 \times 1600 \div 79 = 109.6\text{msec}$ which is smaller than 0.4sec.

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









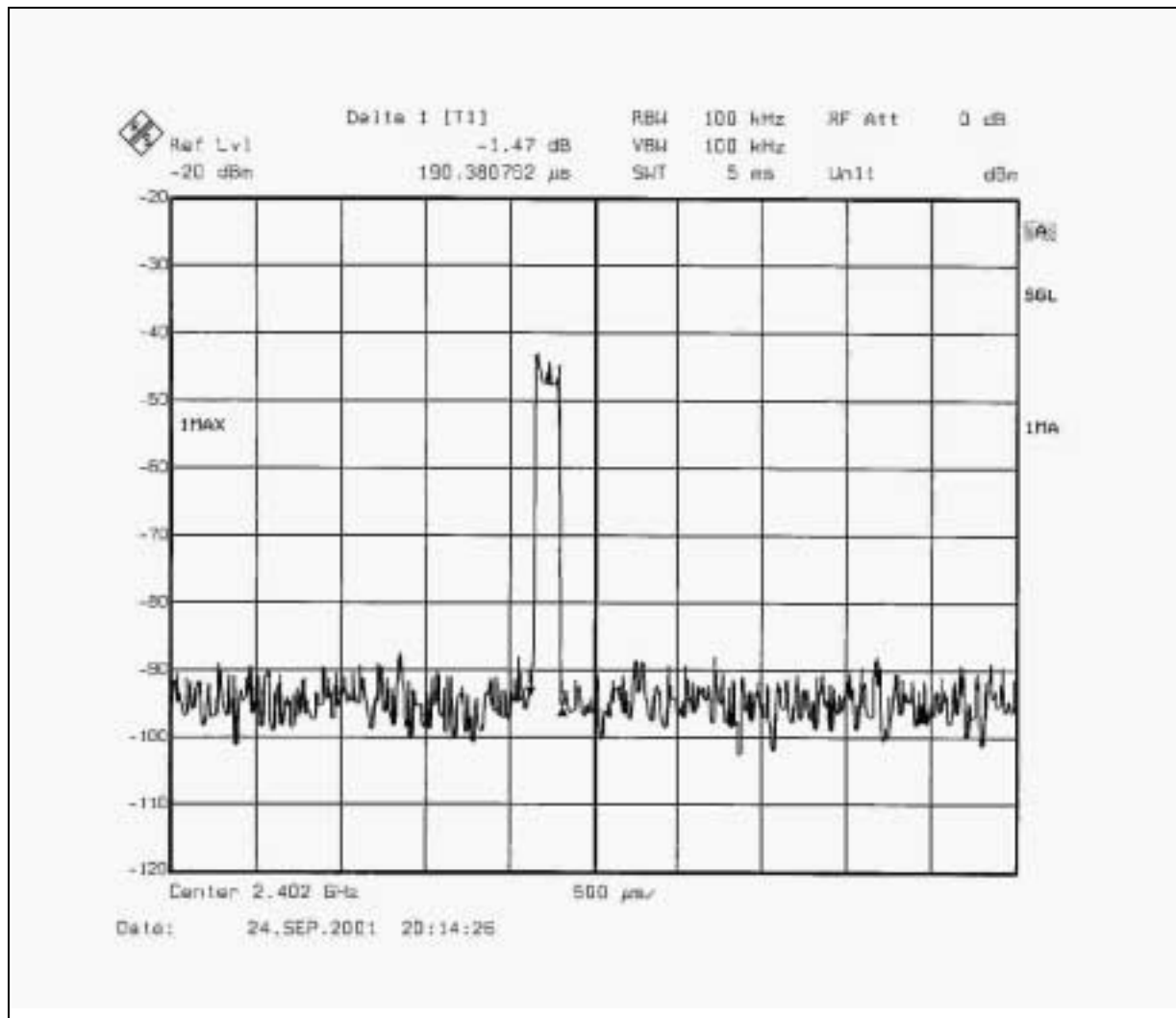
4.3.6 TEST RESULTS (B)

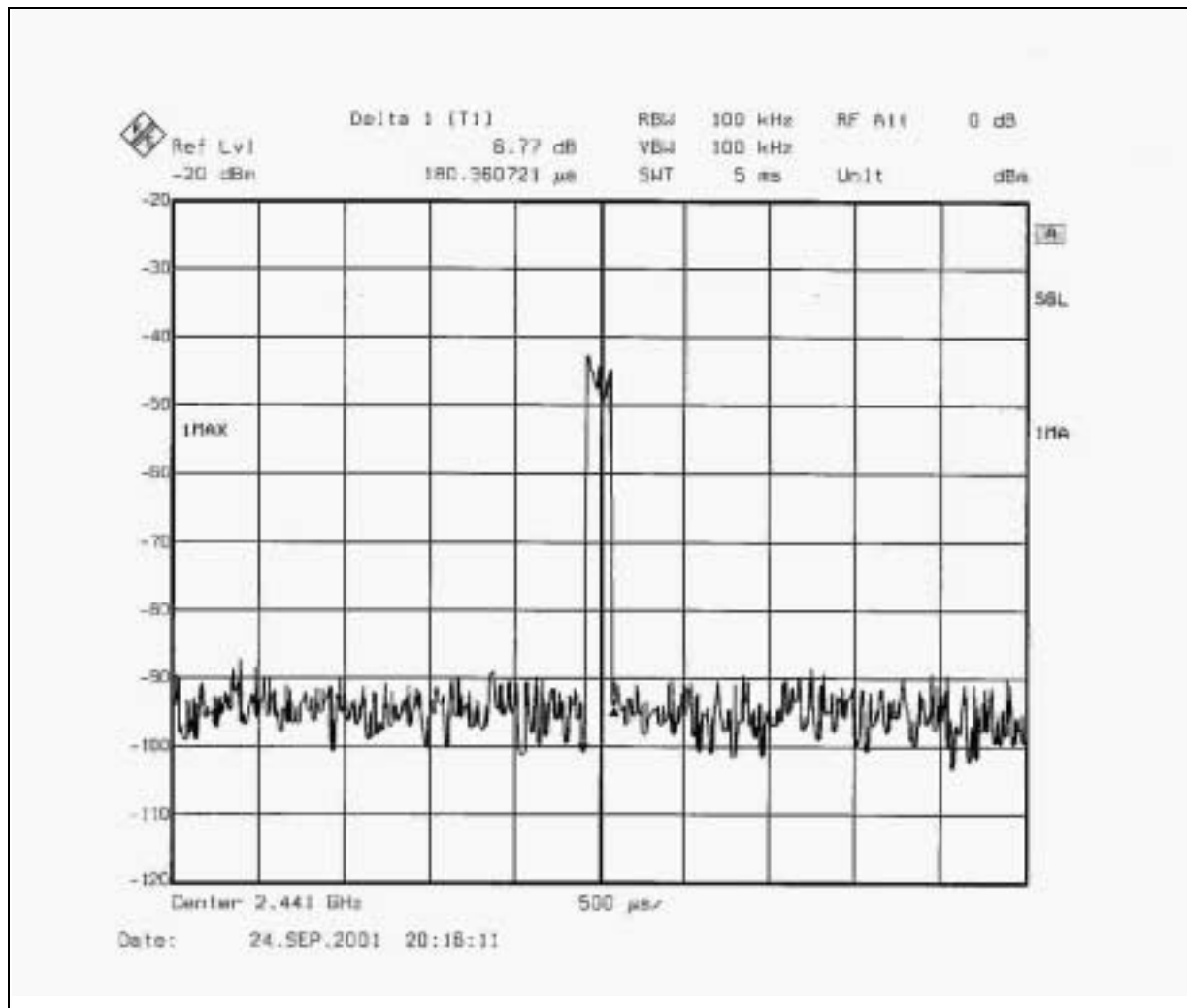
CHANNEL	DWELL TIME
0	115.7ms
39	109.6ms
78	109.6ms

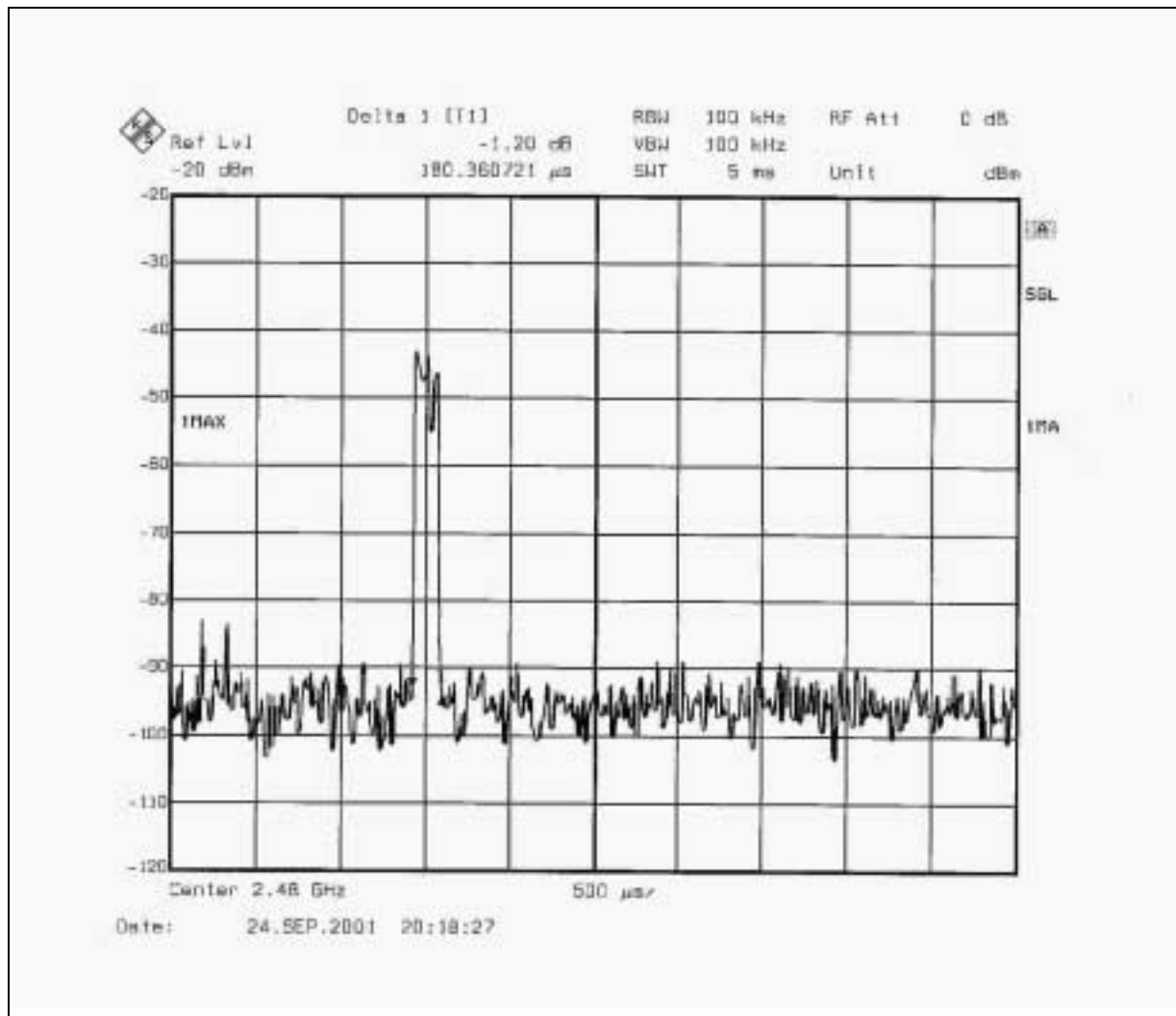
Note: This product is averagely hopped on 79 frequencies. The maximum hopping rate is 1600 hops/sec. The longest pulse duration is 190.38 μ sec.

So, the longest Dwell Time = $190.38\mu\text{sec} \times 30 \times 1600 \div 79 = 115.7\text{msec}$ which is smaller than 0.4sec.

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







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	FSEK30	100049	Jul. 16, 2002
HP ATTENUATOR	8496B	3247A18505	Cal. on use
HP PLOTTER	7475A	2641V27755	N/A

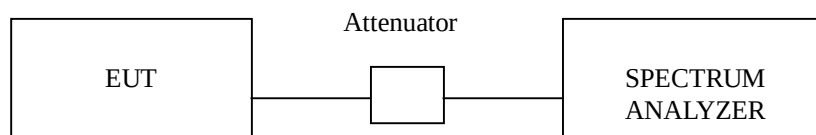
Notes:

- 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 TEST SETUP



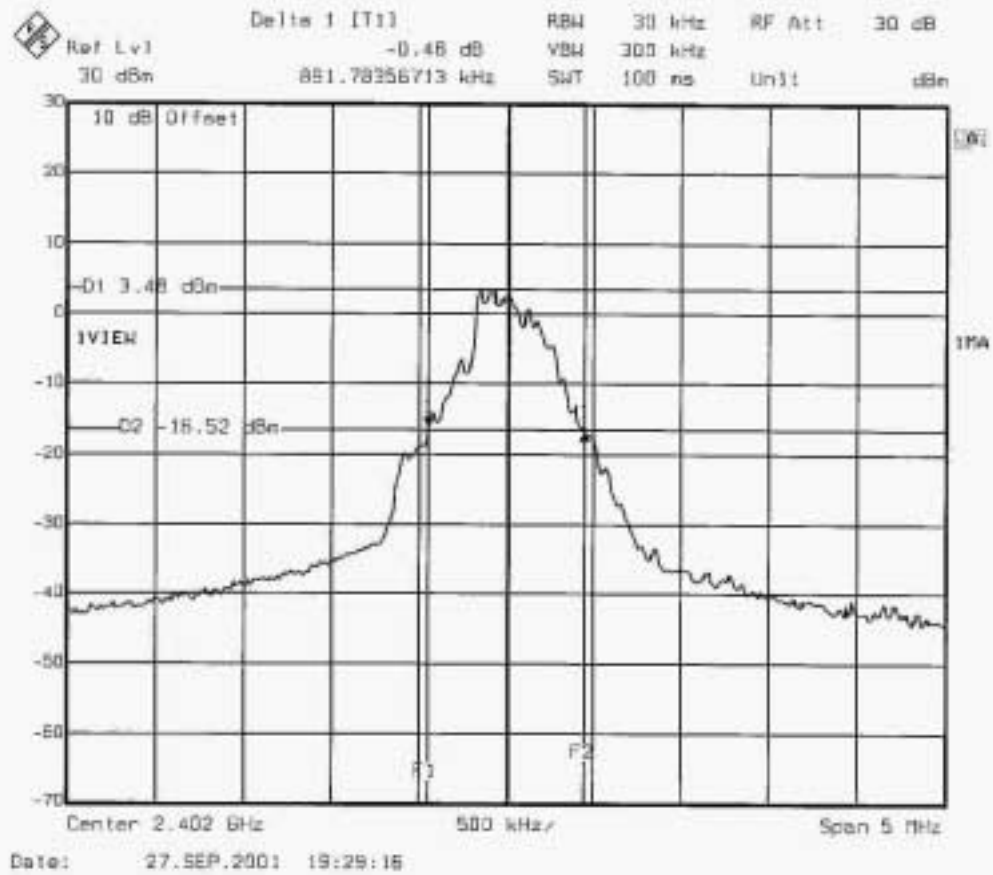
4.4.5 EUT OPERATING CONDITION

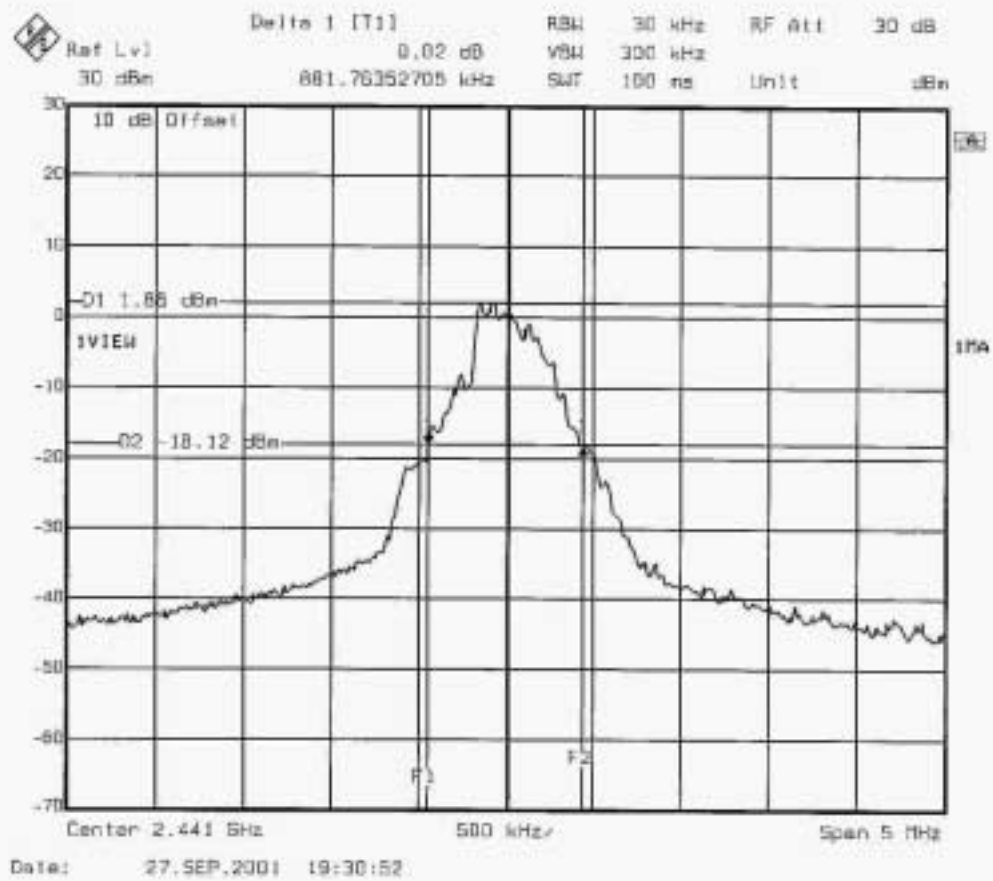
The software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel frequencies individually.

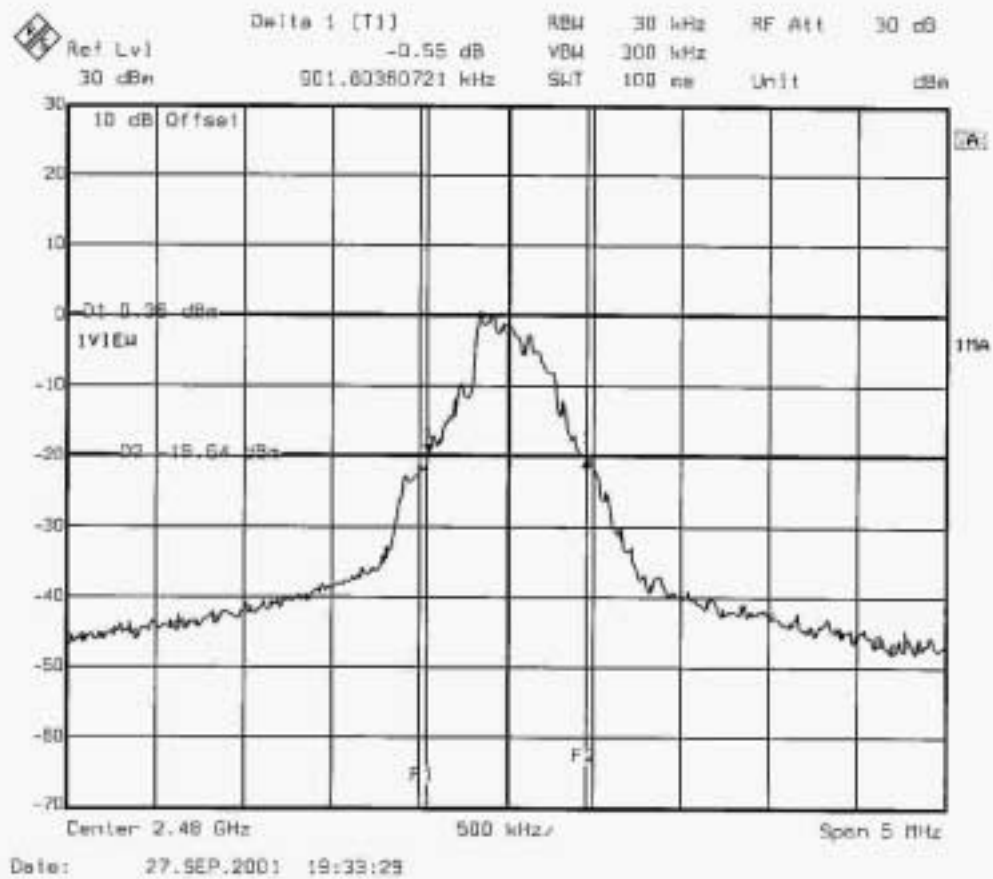
4.4.6 TEST RESULTS (A)

EUT	Notebook PC	Model	Celsius Mobile H
Environmental Conditions	26 deg. C, 60% RH	Tested By	Bruce Shiau

CHANNEL	CHANNEL FREQUENCY (MHz)	20 dB BANDWIDTH (kHz)	MAXIMUM LIMIT (MHz)	PASS/FAIL
0	2402	891.784	1	PASS
39	2441	881.764	1	PASS
78	2480	901.804	1	PASS





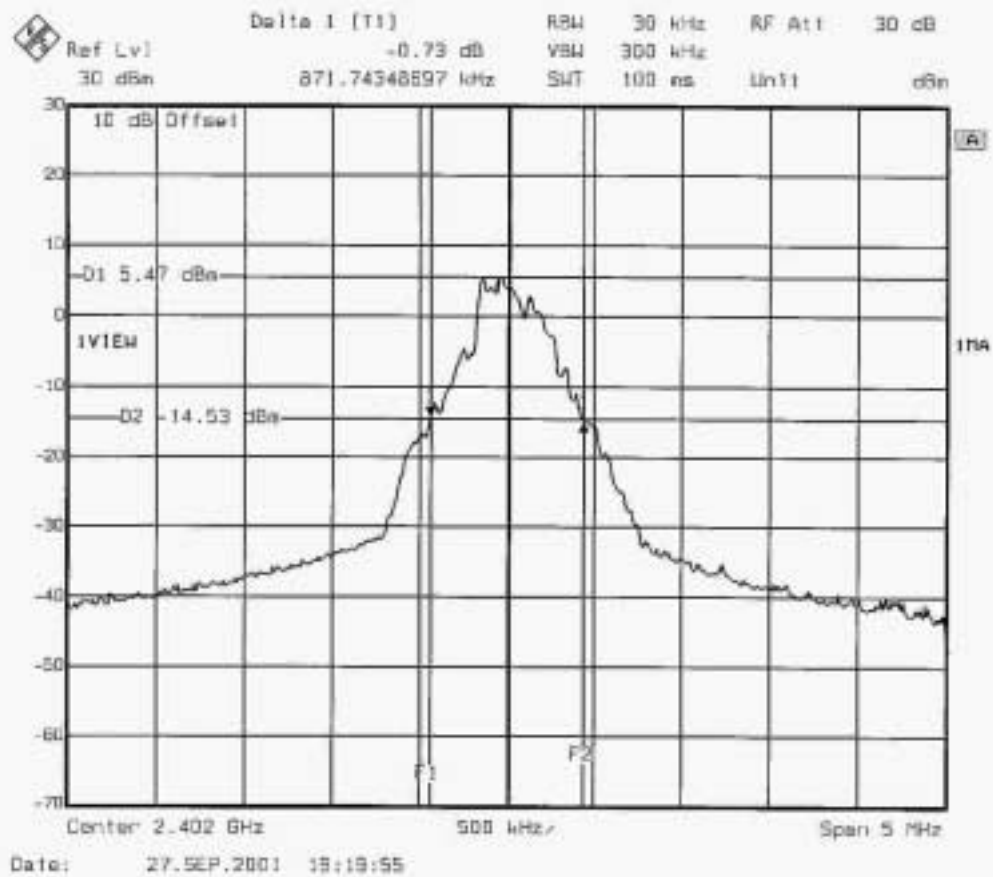


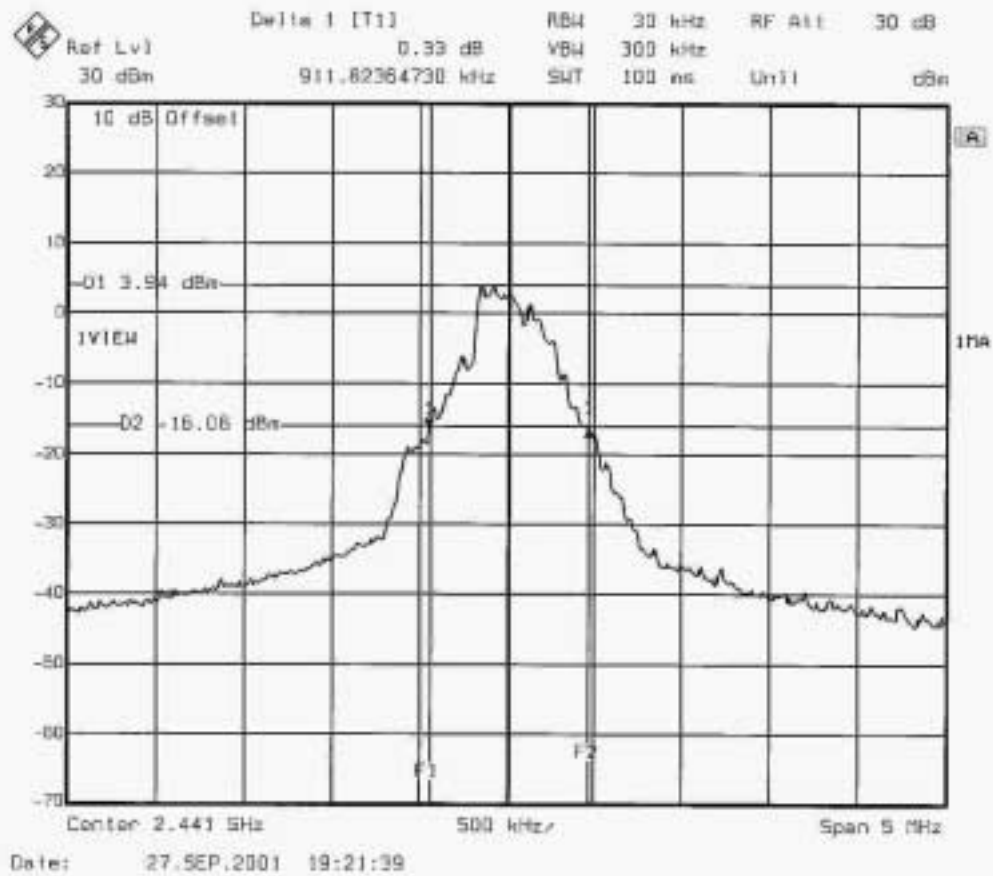


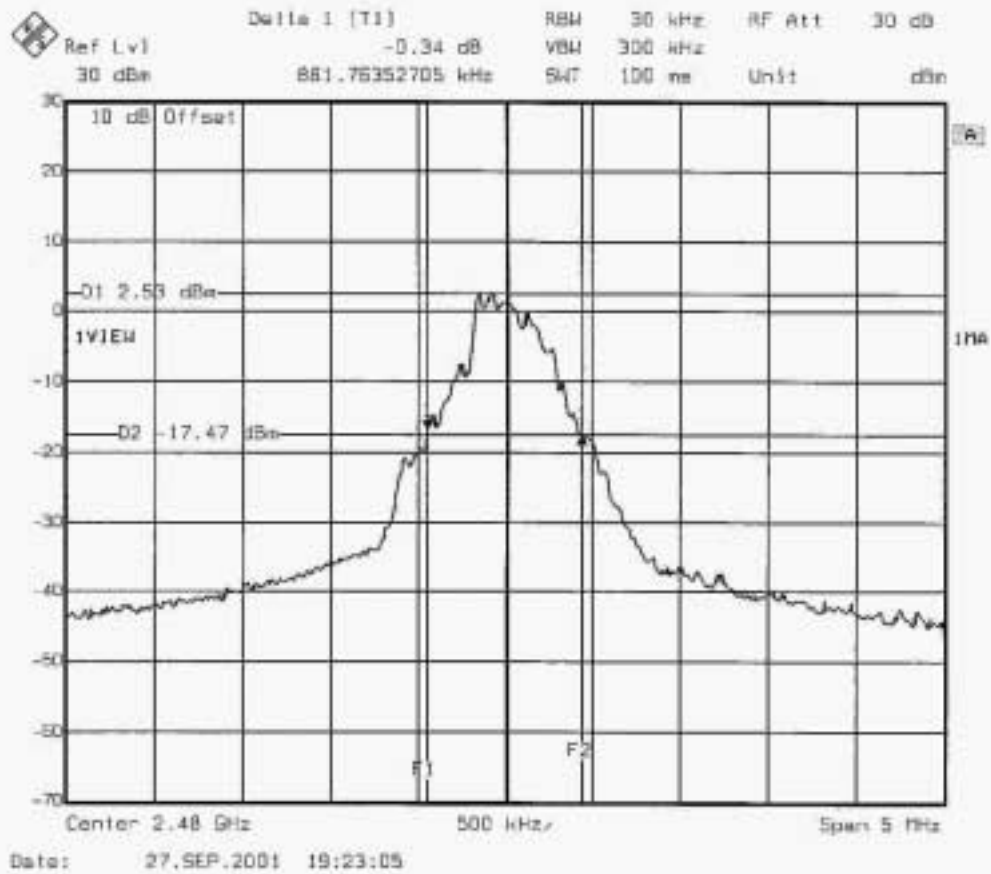
4.4.7 TEST RESULTS (B)

EUT	Notebook PC	Model	Celsius Mobile H
Environmental Conditions	26 deg. C, 60% RH	Tested By	Bruce Shiau

CHANNEL	CHANNEL FREQUENCY (MHz)	20 dB BANDWIDTH (kHz)	MAXIMUM LIMIT (MHz)	PASS/FAIL
0	2402	871.743	1	PASS
39	2441	911.824	1	PASS
78	2480	881.764	1	PASS







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	FSEK30	100049	Jul. 16, 2002
HP ATTENUATOR	8496B	3247A18505	Cal. on use
HP PLOTTER	7475A	2641V27755	N/A

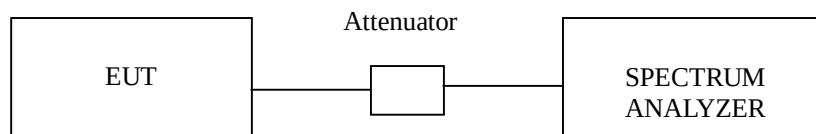
Notes:

- 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.

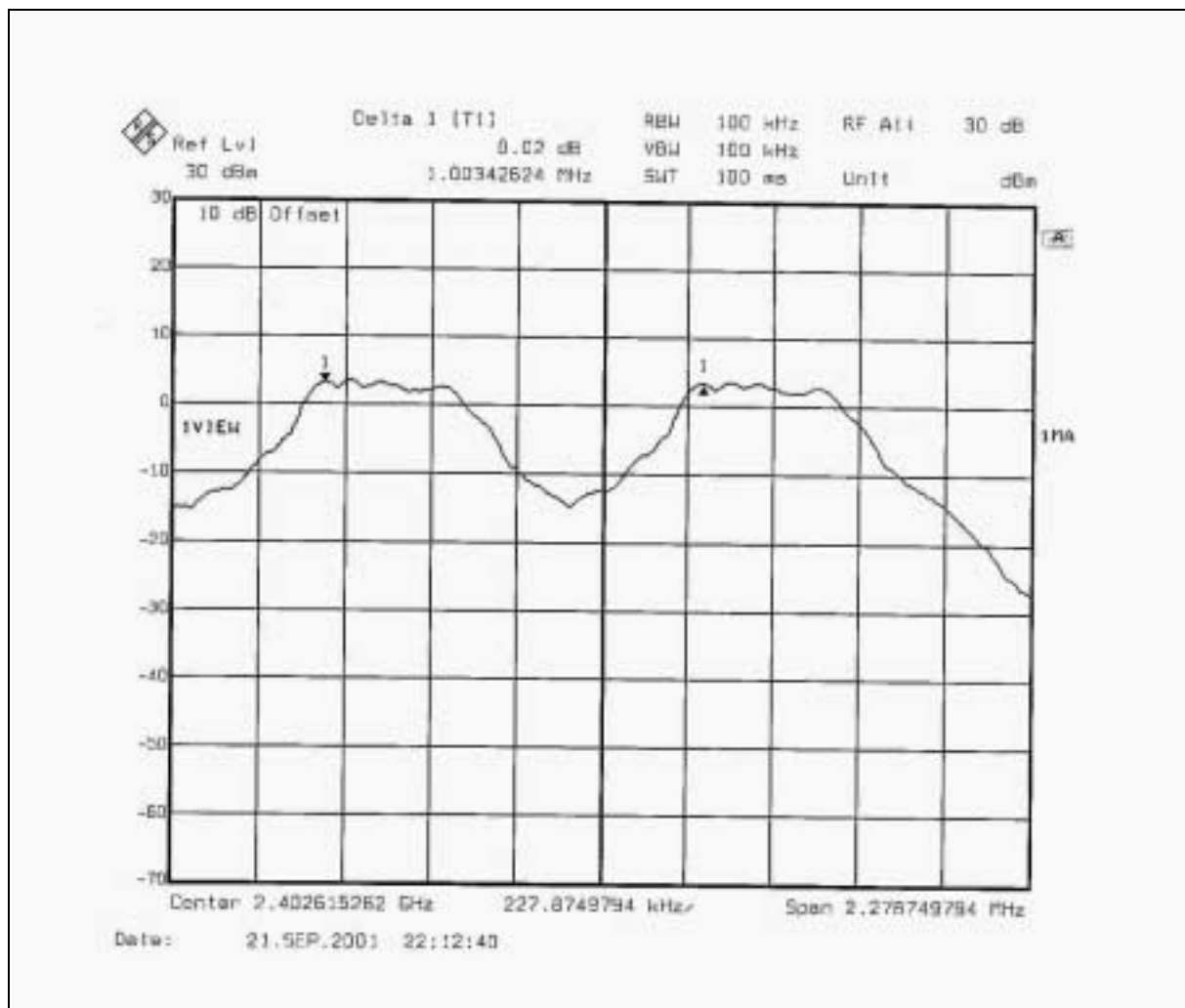
4.5.4 TEST SETUP

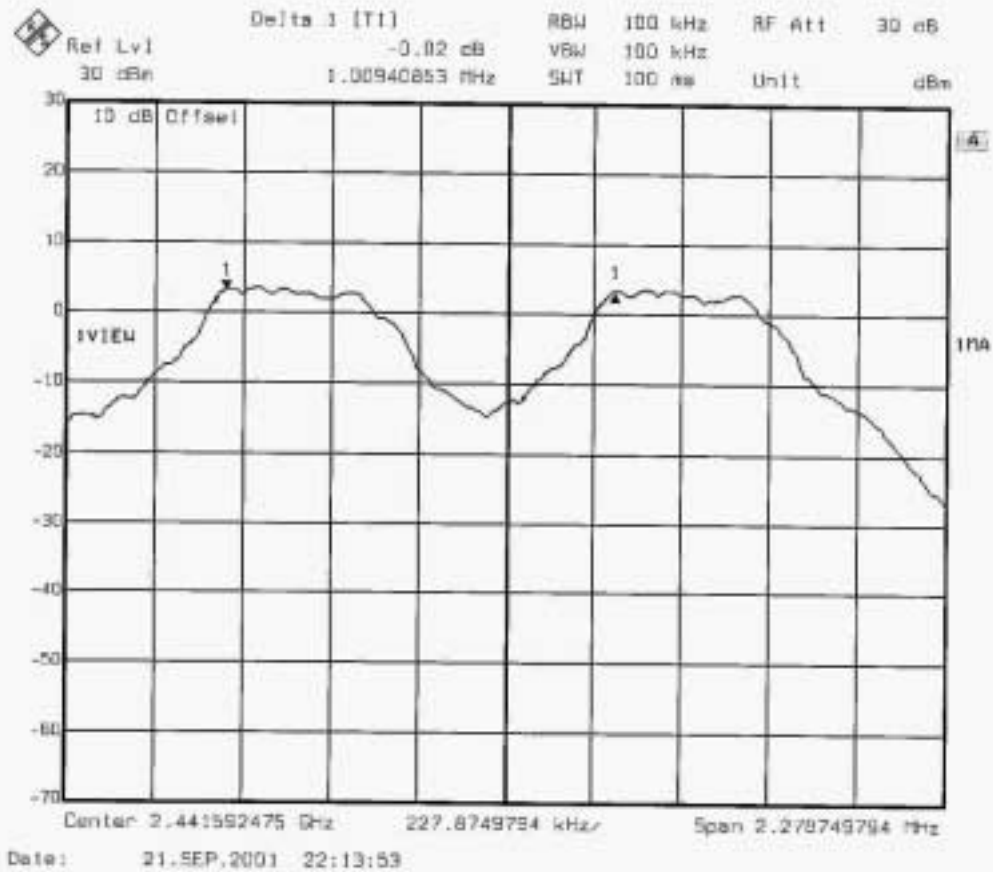


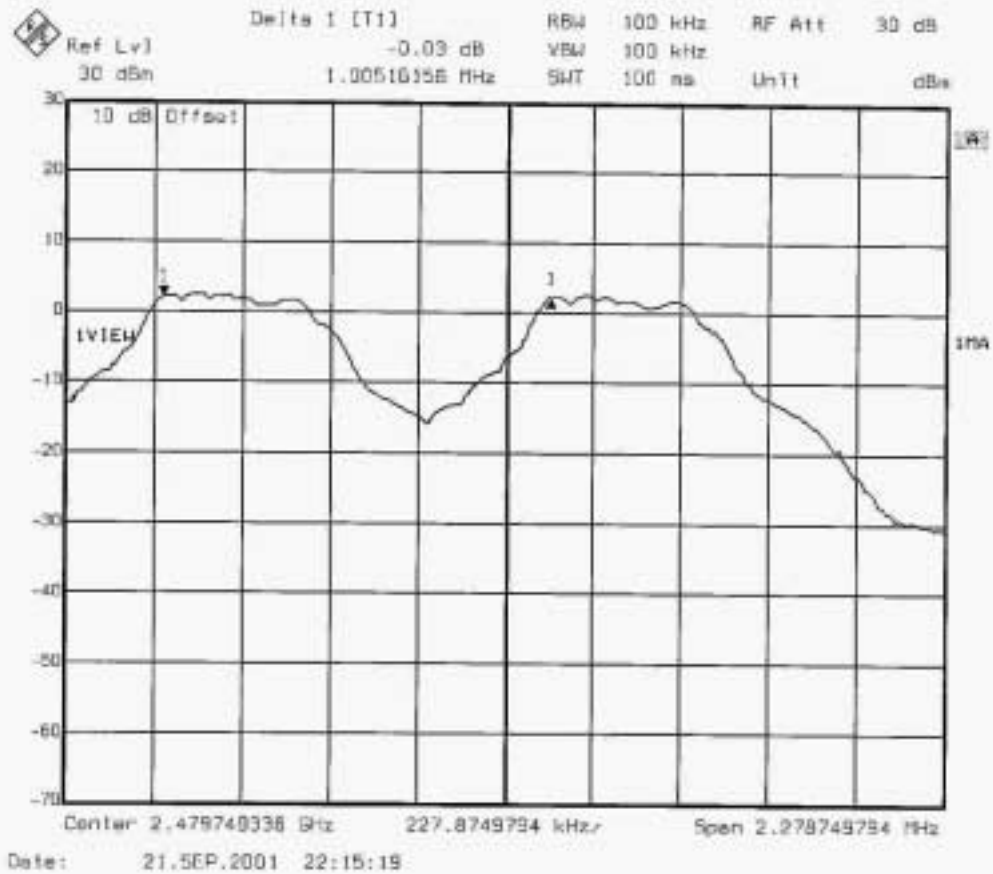
4.5.5 TEST RESULTS (A)

Channel	Frequency (MHz)	Adjacent Channel Separation	Minimum Limit (kHz)	Pass / Fail
0	2402	1MHz	891.78	pass
39	2441	1MHz	881.76	pass
78	2480	1MHz	901.80	pass

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





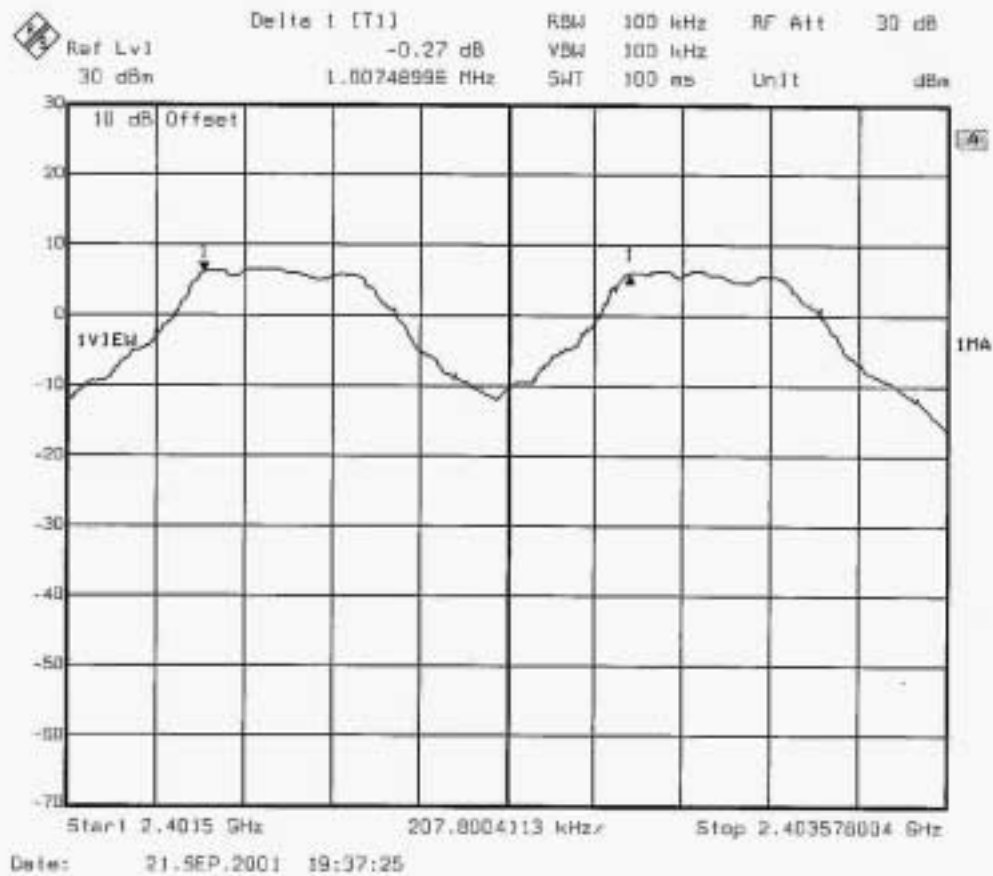


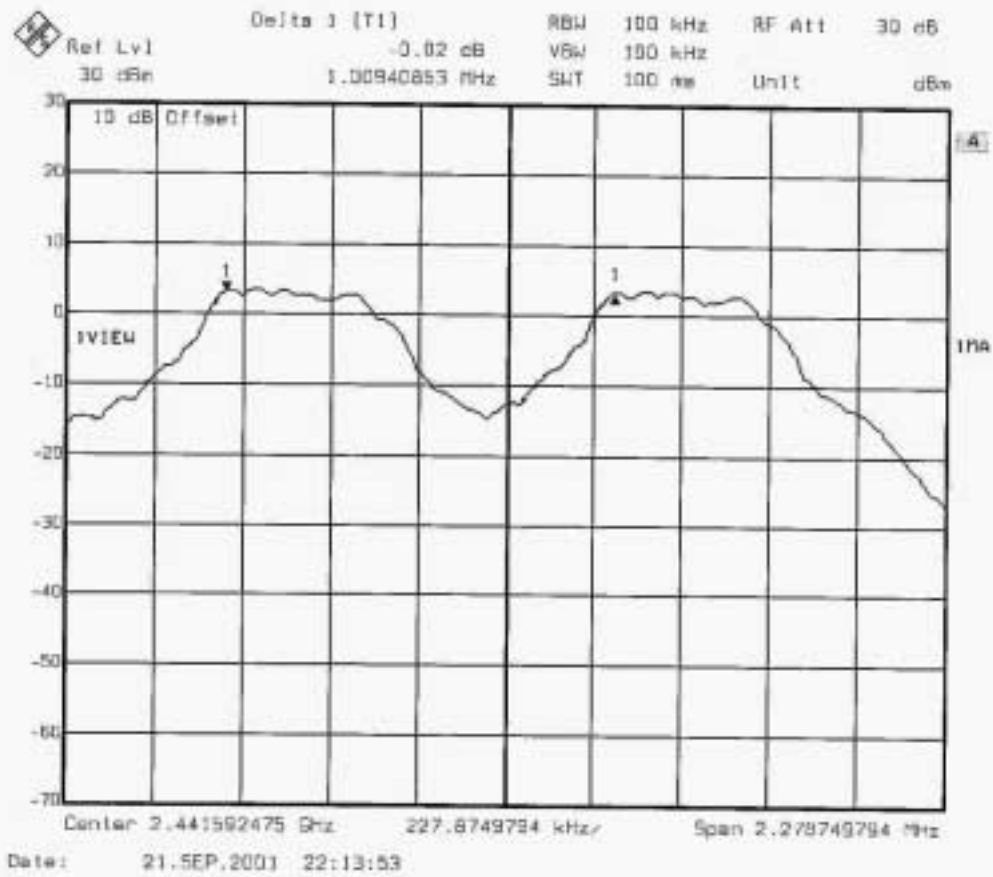


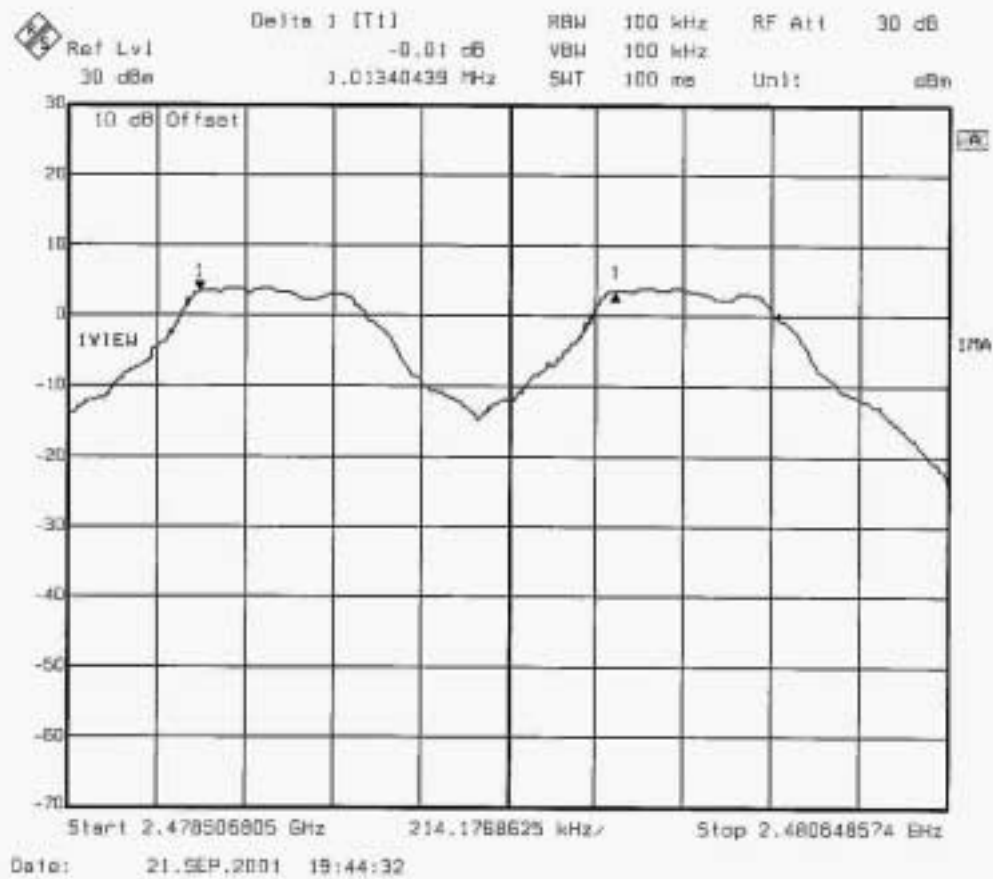
4.5.6 TEST RESULTS (B)

Channel	Frequency (MHz)	Adjacent Channel Separation	Minimum Limit (kHz)	Pass / Fail
0	2402	1MHz	871.74	pass
39	2441	1MHz	911.82	pass
78	2480	1MHz	881.76	pass

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







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
R&S SPECTRUM ANALYZER	FSEK30	100049	Jul. 16, 2002
HP ATTENUATOR	8496B	3247A18505	Cal. on use
HP PLOTTER	7475A	2641V27755	N/A

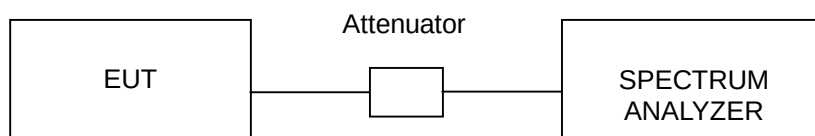
Notes:

- 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.

4.6.3 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 TEST SETUP



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

4.6.5 EUT OPERATING CONDITION

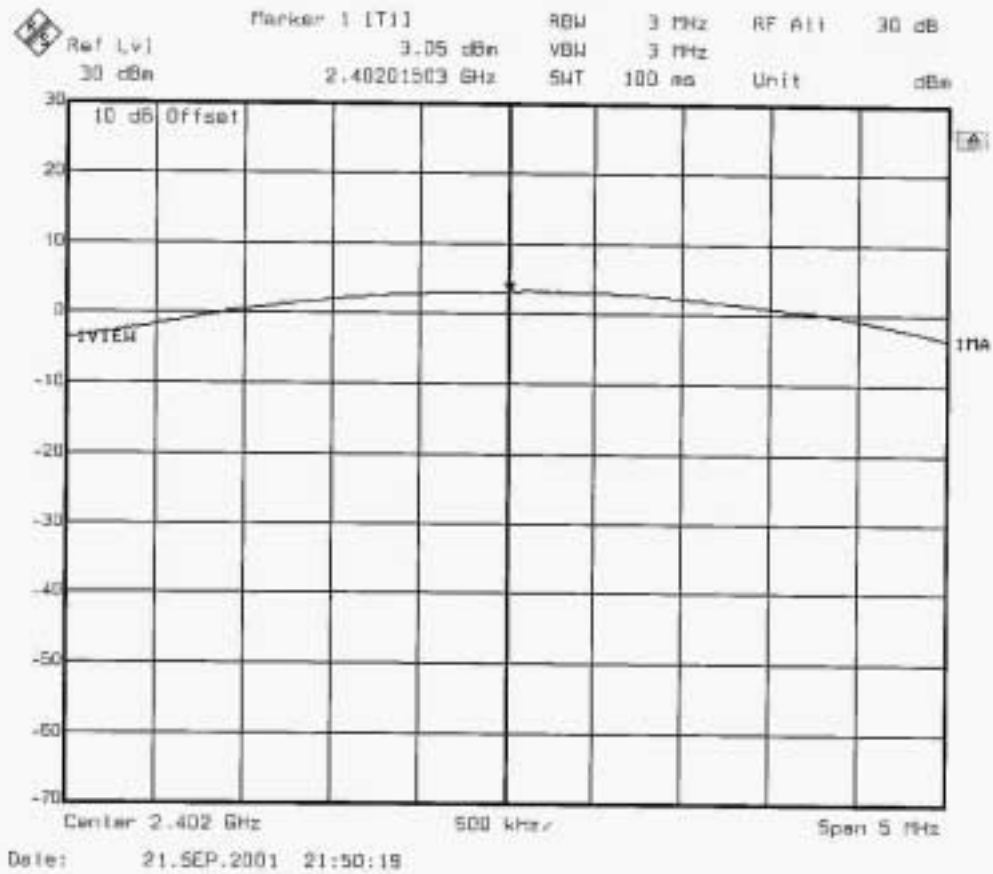
The software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel frequencies individually.

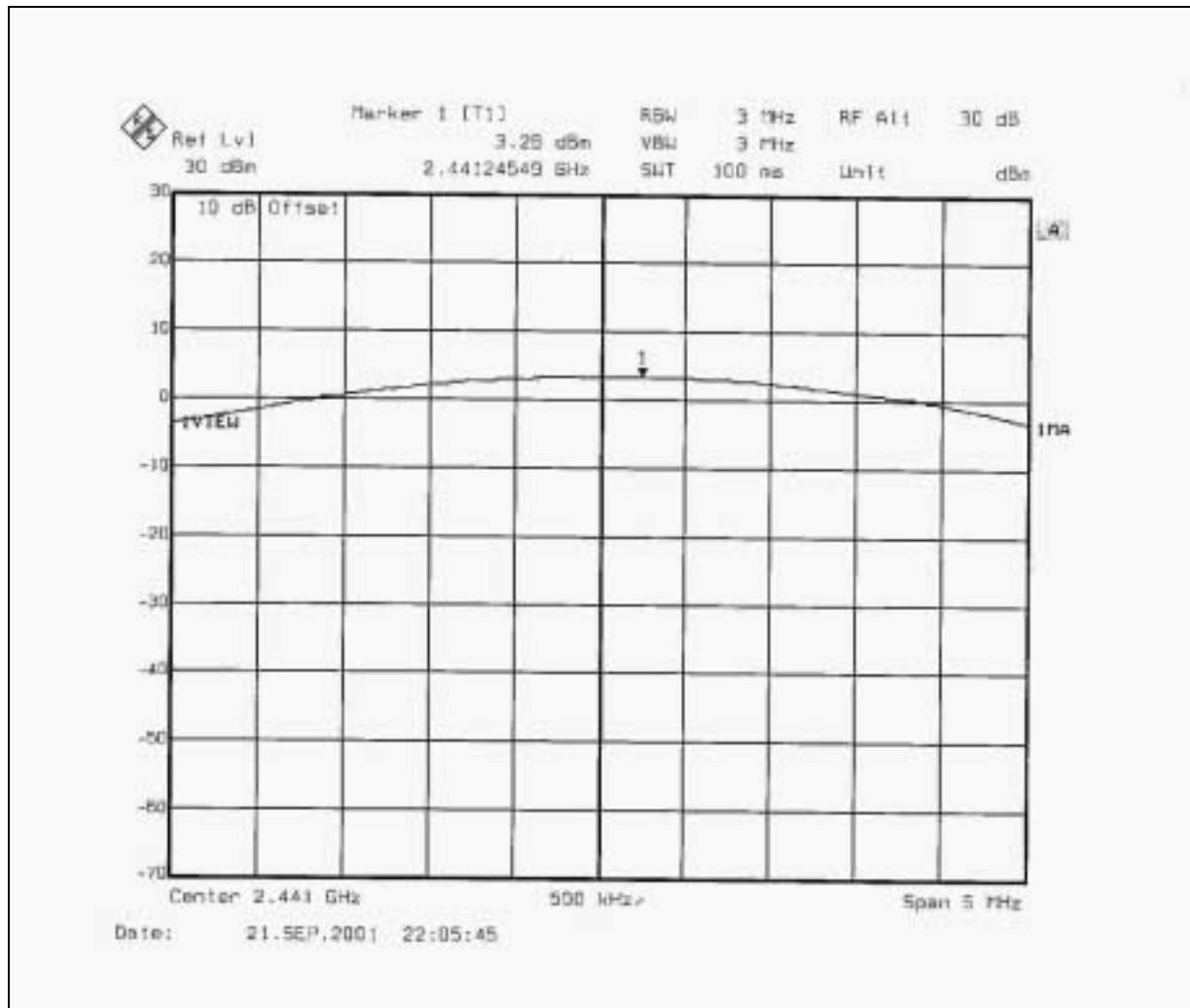
4.6.6 TEST RESULTS (A)

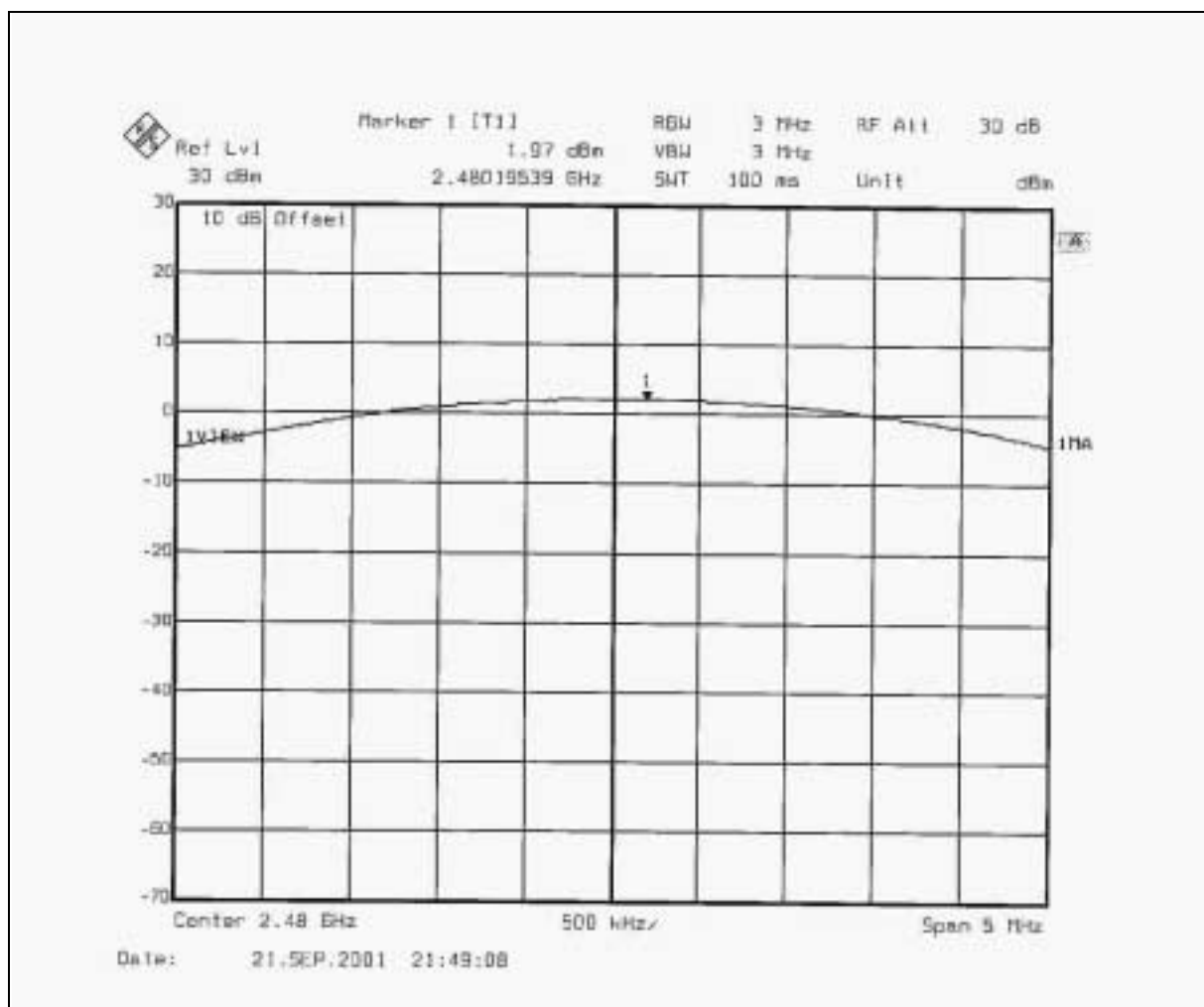
Output Power Into Antenna:

EUT	Notebook PC	Model	Celsius Mobile H
Environmental Conditions	26 deg. C, 70%RH	Tested By	Bruce Shiau

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (dBm)	PASS/FAIL
0	2402	3.05	30	PASS
39	2441	3.26	30	PASS
78	2480	1.97	30	PASS





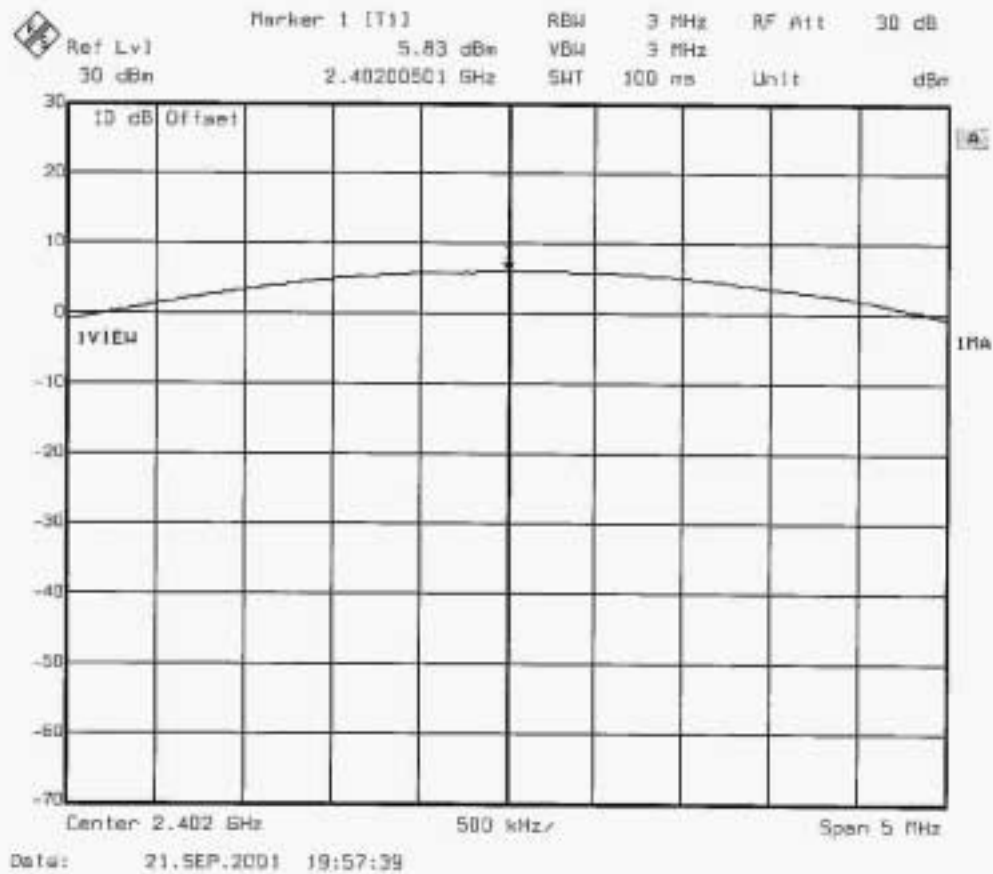


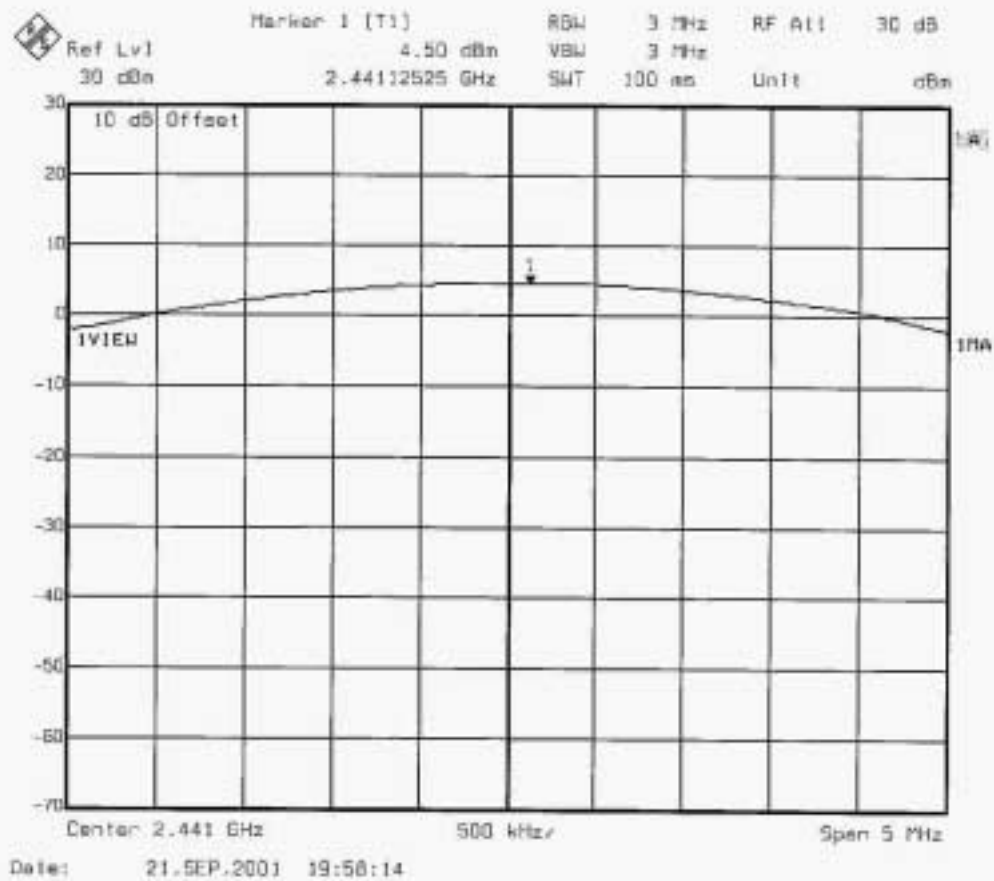
4.6.7 TEST RESULTS (B)

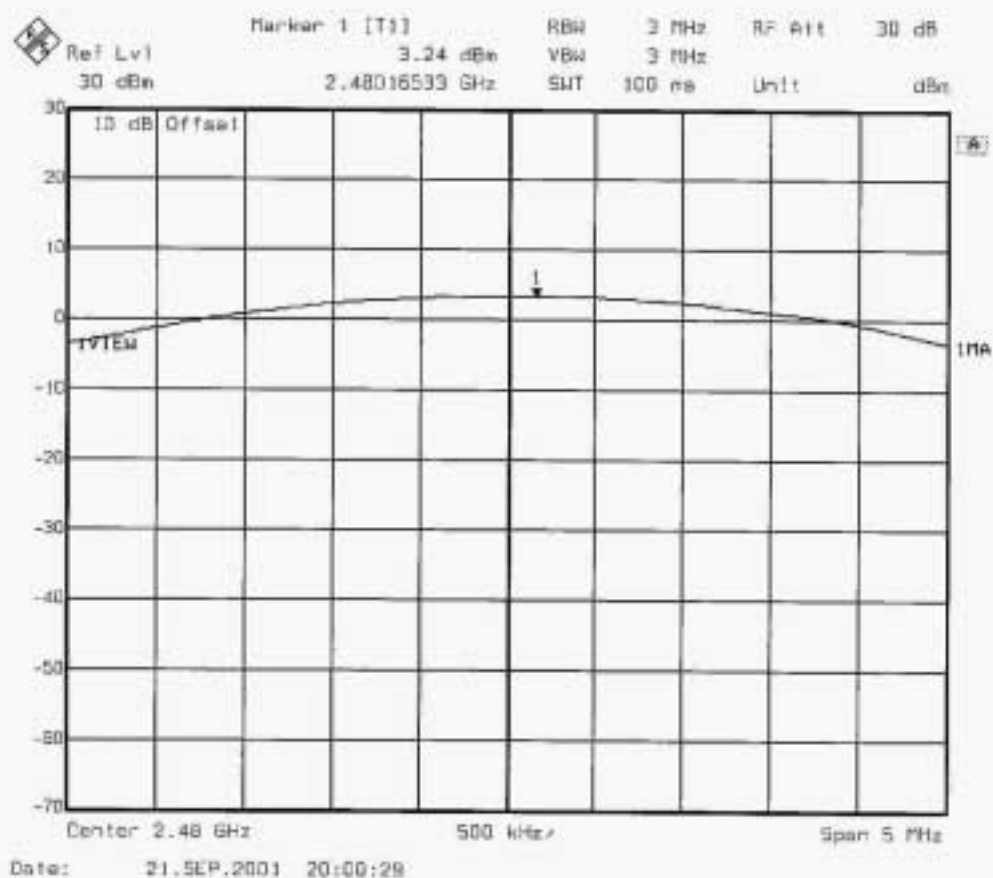
Output Power Into Antenna:

EUT	Notebook PC	Model	Celsius Mobile H
Environmental Conditions	26 deg. C, 70%RH	Tested By	Bruce Shiau

CHANNEL	CHANNEL FREQUENCY (MHz)	PEAK POWER OUTPUT (dBm)	PEAK POWER LIMIT (dBm)	PASS/FAIL
0	2402	5.83	30	PASS
39	2441	4.50	30	PASS
78	2480	3.24	30	PASS









4.7 RADIATED EMISSION MEASUREMENT

4.7.1 LIMITS OF RADIATED EMISSION MEASUREMENT

Field strength limits are at the distance of 3 meters, emissions radiated outside of the specified bands, shall be according to the general radiated limits in 15.209 as following:

Frequencies (MHz)	Field Strength of Fundamental	
	uV/m	dBuV/m
30-88	100	40.0
88-216	150	43.5
216-960	200	46.0
Above 960	500	54.0

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.

LIMIT OF RADIATED EMISSION OF FCCPART 15, SUBPART B FOR FREQUENCY ABOVE 1000 MHz

Frequencies (MHz)	Class A (at 10m)		Class B (at 3m)	
	uV/m	dBuV/m	uV/m	dBuV/m
Above 1000	300	49.5	500	54.0

Note:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. All emanation 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.

4.7.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
*HP Spectrum Analyzer	8590L	3544A01176	May 7, 2002
*HP Preamplifier	8447D	2944A08485	Nov. 3, 2001
*HP Preamplifier	8449B	3008A01201	Dec. 13, 2001
*HP Preamplifier	8449B	3008A01292	Aug. 21, 2002
*ROHDE & SCHWARZ TEST RECEIVER	ESMI	839013/007 839379/002	Jan. 25, 2002
SCHWARZBECK Tunable Dipole Antenna	VHA 9103 UHA 9105	E101051 E101055	Nov. 23, 2001
*CHASE BILOG Antenna	CBL6112A	2221	Aug. 2, 2002
*SCHWARZBECK Horn Antenna	BBHA9120-D1	D130	July 6, 2002
*EMCO Horn Antenna	3115	9312-4192	April 15, 2002
*EMCO Turn Table	1060	1115	NA
*SHOSHIN Tower	AP-4701	A6Y005	NA
*Software	AS61D4	NA	NA
*ANRITSU RF Switches	MP59B	M35046	Aug. 2, 2002
*TIMES RF cable	LMR-600	CABLE-ST5-01	Aug. 2, 2002
Antenna (Horn)	BBHA9120-D	D130	July 10, 2002
Open Field Test Site	Site 5	ADT-R05	July 28, 2002
VCCI Site Registration No.	Site 5	R-1039	NA
Site Registration No.	FCC: 90422 Canada IC: IC 3789 VCCI : R-1039		

NOTE:

1. The measurement uncertainty is less than +/- 3.0dB, 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.
3. "*" = These equipment are used for the final measurement.



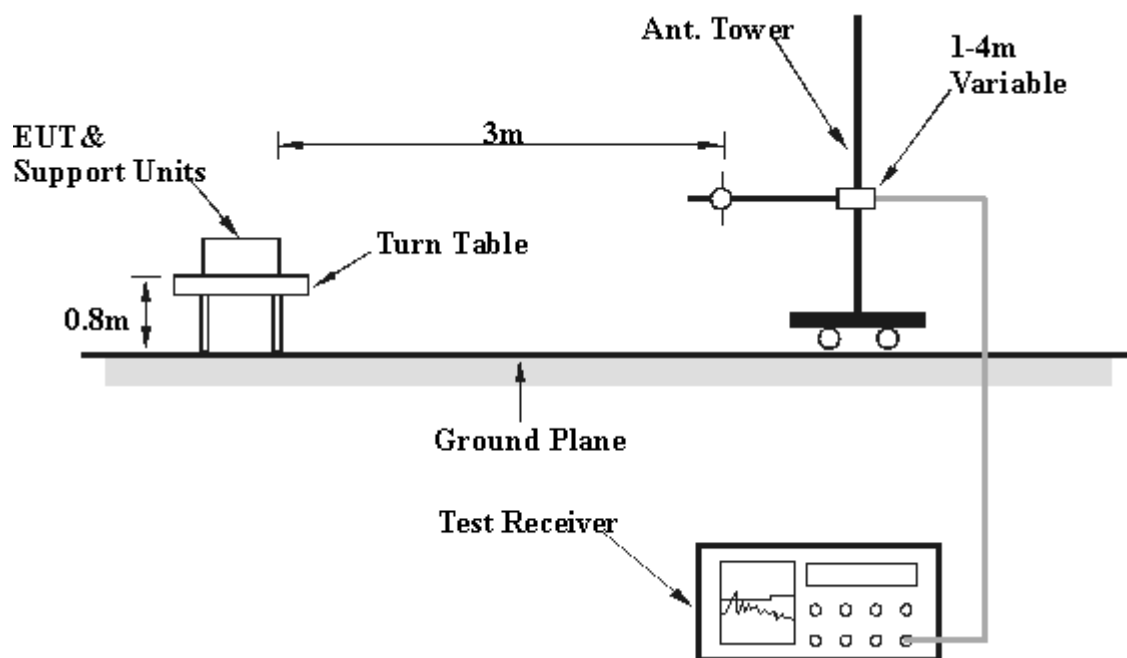
4.7.3 TEST PROCEDURES

- 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 300 Hz for Average detection (AV) at frequency above 1GHz.

4.7.4 TEST SETUP



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

4.7.5 TEST RESULTS

Digital Portion:

EUT	Notebook PC	MODEL	Celsius Mobile H
MODE	Channel 78	FREQUENCY RANGE	30-1000 MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Quasi-Peak
ENVIRONMENTAL CONDITIONS	26 deg. C, 60%RH, 1050 hPa	TESTED BY: Gary Chang	

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)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB)	
1	50.00	28.7 QP	40.00	-11.30	1.19H	132	18.20	9.78	0.71	0.00	-10.48	
2	132.70	29.9 QP	43.50	-13.60	1.36H	156	17.60	11.16	1.13	0.00	-12.29	
3	147.51	30.1 QP	43.50	-13.40	1.08H	221	18.50	10.44	1.19	0.00	-11.63	
4	220.80	29.3 QP	46.00	-16.70	1.33H	9	17.50	10.26	1.52	0.00	-11.80	
5	232.40	31.6 QP	46.00	-14.40	1.79H	93	19.20	10.84	1.57	0.00	-12.41	
6	298.20	33.5 QP	46.00	-12.50	1.15H	358	18.40	13.18	1.88	0.00	-15.06	
7	333.10	33.4 QP	46.00	-12.60	1.12H	346	17.50	13.87	1.99	0.00	-15.86	
8	366.38	32.7 QP	46.00	-13.30	1.13H	186	15.70	14.86	2.11	0.00	-16.96	
9	399.75	34.0 QP	46.00	-12.00	1.00H	47	15.70	16.05	2.23	0.00	-18.29	
10	430.65	32.8 QP	46.00	-13.20	1.12H	357	14.20	16.26	2.34	0.00	-18.61	
11	599.53	33.2 QP	46.00	-12.80	1.82H	2	11.80	18.61	2.83	0.00	-21.45	

NOTE:

1. Emission level = Raw value - Correction Factor
2. Correction Factor = Pre-Amp. Factor - Ant. Factor - Cable loss
(Pre-Amp. Factor = 0, when a Pre-Amplifier is not used for the test.)
3. Margin value = Emission level - Limit value
The other emission levels were very low against the limit.



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)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB)
1	62.00	26.3 QP	40.00	-13.70	1.00V	233	20.00	5.50	0.79	0.00	-6.30
2	132.96	32.7 QP	43.50	-10.80	1.00V	47	20.40	11.16	1.13	0.00	-12.29
3	148.50	31.0 QP	43.50	-12.50	1.28V	206	19.50	10.30	1.20	0.00	-11.51
4	216.55	32.3 QP	46.00	-13.70	1.00V	340	20.80	9.97	1.50	0.00	-11.47
5	270.00	32.6 QP	46.00	-13.40	1.75V	172	18.40	12.47	1.71	0.00	-14.18
6	299.83	33.5 QP	46.00	-12.50	2.19V	2	18.40	13.18	1.88	0.00	-15.06
7	333.21	33.1 QP	46.00	-12.90	1.81V	356	17.20	13.87	1.99	0.00	-15.86
8	366.48	32.7 QP	46.00	-13.30	1.78V	10	15.70	14.86	2.11	0.00	-16.97
9	398.30	33.1 QP	46.00	-12.90	1.60V	297	14.80	16.05	2.23	0.00	-18.28
10	432.02	36.0 QP	46.00	-10.00	1.44V	356	17.40	16.28	2.35	0.00	-18.63
11	486.10	38.7 QP	46.00	-7.30	2.45V	307	19.20	17.00	2.47	0.00	-19.48
12	701.94	37.9 QP	46.00	-8.10	1.49V	7	15.40	19.34	3.15	0.00	-22.49

NOTE:

4. Emission level = Raw value - Correction Factor
5. Correction Factor = Pre-Amp. Factor - Ant. Factor - Cable loss
(Pre-Amp. Factor = 0, when a Pre-Amplifier is not used for the test.)
6. Margin value = Emission level - Limit value
The other emission levels were very low against the limit.

4.7.6 TEST RESULTS (A)

RF Portion :

EUT	Notebook PC	MODEL	Celsius Mobile H
MODE	Channel 0	FREQUENCY RANGE	Above 1000 MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	26 deg. C, 60%RH, 1050 hPa	TESTED BY: Gary Chang	

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)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB)
1	*2402.00	94.9 PK	-	-	1.22H	99	64.25	27.08	3.60	0.00	-30.67
2	*2402.00	77.9 AV	-	-	1.22H	99	47.23	27.08	3.60	0.00	-30.67
3	4804.50	55.9 PK	74.00	-18.10	1.22H	189	19.30	31.40	5.19	0.00	-36.59
4	4804.50	42.8 AV	54.00	-11.20	1.22H	189	6.20	31.40	5.19	0.00	-36.59
5	7206.10	55.8 PK	54.00	-18.20	1.22H	154	13.40	36.02	6.36	0.00	-42.38
6	7206.10	44.3 AV	54.00	-9.70	1.22H	154	1.87	36.02	6.36	0.00	-42.39

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)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB)
1	*2402.00	93.9 PK	-	-	1.23V	274	63.25	27.08	3.60	0.00	-30.67
2	*2402.00	76.7 AV	-	-	1.23V	274	45.98	27.08	3.60	0.00	-30.67
3	4804.20	57.6 PK	74.00	-16.40	1.01V	247	20.96	31.40	5.19	0.00	-36.60
4	4804.20	46.8 AV	54.00	-7.20	1.01V	247	10.20	31.40	5.19	0.00	-36.59
5	7206.10	55.6 PK	74.00	-18.40	1.02V	64	13.25	36.02	6.36	0.00	-42.39
6	7206.10	44.4 AV	54.00	-9.60	1.02V	64	2.00	36.02	6.36	0.00	-42.38

NOTE:

1. Emission level = Raw value - Correction Factor
2. Correction Factor = Pre-Amp. Factor - Ant. Factor - Cable loss
(Pre-Amp. Factor = 0, when a Pre-Amplifier is not used for the test.)
3. Margin value = Emission level - Limit value
4. " * " : Fundamental frequency
5. The other emission levels were very low against the limit.

EUT	Notebook PC	MODEL	Celsius Mobile H
MODE	Channel 39	FREQUENCY RANGE	Above 1000 MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	26 deg. C, 60%RH, 1050 hPa	TESTED BY: Gary Chang	

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)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB)
1	*2441.00	94.2 PK	-	-	1.00H	133	63.25	27.30	3.64	0.00	-30.94
2	*2441.00	76.6 AV	-	-	1.00H	133	45.69	27.30	3.64	0.00	-30.94
3	4822.20	53.2 PK	74.00	-20.80	1.24H	247	16.52	31.43	5.21	0.00	-36.64
4	4822.20	38.2 AV	54.00	-15.80	1.24H	247	1.59	31.43	5.21	0.00	-36.64

ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Antenna Factor (dB)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB)
1	*2441.00	92.1 PK	-	-	1.10V	275	61.20	27.30	3.64	0.00	-30.94
2	*2441.00	75.6 AV	-	-	1.10V	275	44.70	27.30	3.64	0.00	-30.94
3	4821.40	53.5 PK	74.00	-20.50	1.09V	120	16.90	31.43	5.21	0.00	-36.64
4	4821.40	40.7 AV	54.00	-13.30	1.09V	120	4.10	31.43	5.21	0.00	-36.64

NOTE:

1. Emission level = Raw value - Correction Factor
2. Correction Factor = Pre-Amp. Factor - Ant. Factor - Cable loss
(Pre-Amp. Factor = 0, when a Pre-Amplifier is not used for the test.)
3. Margin value = Emission level - Limit value
4. " * " : Fundamental frequency
5. The other emission levels were very low against the limit.



EUT	Notebook PC	MODEL	Celsius Mobile H
MODE	Channel 78	FREQUENCY RANGE	Above 1000 MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	26 deg. C, 60%RH, 1050 hPa	TESTED BY: Gary Chang	

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)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB)
1	*2480.10	96.2 PK	-	-	1.00H	88	64.97	27.52	3.68	0.00	-31.20
2	*2480.10	77.9 AV	-	-	1.00H	88	46.70	27.52	3.68	0.00	-31.20
3	4960.10	54.6 PK	74.00	-19.40	1.00H	113	17.70	31.56	5.32	0.00	-36.88
4	4960.10	42.1 AV	54.00	-11.90	1.00H	113	5.21	31.56	5.32	0.00	-36.88

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)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB)
1	*2480.10	91.5 PK	-	-	1.30V	259	60.28	27.52	3.68	0.00	-31.20
2	*2480.10	75.0 AV	-	-	1.30V	259	43.77	27.52	3.68	0.00	-31.20
3	4960.10	54.7 PK	74.00	-19.30	1.19V	228	17.86	31.56	5.32	0.00	-36.88
4	4960.10	43.6 AV	54.00	-10.40	1.19V	228	6.70	31.56	5.32	0.00	-36.88

NOTE:

1. Emission level = Raw value - Correction Factor
2. Correction Factor = Pre-Amp. Factor - Ant. Factor - Cable loss
(Pre-Amp. Factor = 0, when a Pre-Amplifier is not used for the test.)
3. Margin value = Emission level - Limit value
4. " * " : Fundamental frequency
5. The other emission levels were very low against the limit.

4.7.7 TEST RESULTS (B)

RF Portion :

EUT	Notebook PC	MODEL	Celsius Mobile H
MODE	Channel 0	FREQUENCY RANGE	Above 1000 MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	26 deg. C, 60%RH, 1050 hPa	TESTED BY: Gary Chang	

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)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB)
1	*2401.10	103.1 PK	-	-	1.22H	336	72.40	27.08	3.60	0.00	-30.67
2	*2401.10	87.1 AV	-	-	1.22H	336	56.40	27.08	3.60	0.00	-30.67
3	4804.70	53.8 PK	74.00	-20.20	1.05H	261	17.20	31.40	5.19	0.00	-36.59
4	4804.70	42.8 AV	54.00	-11.20	1.05H	261	6.20	31.40	5.19	0.00	-36.59

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)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB)
1	*2401.90	105.3 PK	-	-	1.28V	204	74.63	27.08	3.60	0.00	-30.67
2	*2401.90	87.8 AV	-	-	1.28V	204	57.10	27.08	3.60	0.00	-30.67
3	4804.10	53.8 PK	54.00	-20.20	1.09V	241	17.19	31.40	5.19	0.00	-36.59
4	4804.10	40.4 AV	54.00	-13.60	1.09V	241	3.80	31.40	5.19	0.00	-36.59

NOTE:

1. Emission level = Raw value - Correction Factor
2. Correction Factor = Pre-Amp. Factor - Ant. Factor - Cable loss
(Pre-Amp. Factor = 0, when a Pre-Amplifier is not used for the test.)
3. Margin value = Emission level - Limit value
4. “ * ” : Fundamental frequency
5. The other emission levels were very low against the limit.



EUT	Notebook PC	MODEL	Celsius Mobile H
MODE	Channel 39	FREQUENCY RANGE	Above 1000 MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	26 deg. C, 60%RH, 1050 hPa	TESTED BY: Gary Chang	

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)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB)
1	*2441.10	102.6 PK	-	-	2.11H	328	71.69	27.30	3.64	0.00	-30.94
2	*2441.10	86.6 AV	-	-	2.11H	328	55.70	27.30	3.64	0.00	-30.94
3	4882.10	53.0 PK	74.00	-21.00	1.23H	295	16.20	31.49	5.26	0.00	-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)	Antenna Factor (dB)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB)
1	*2441.00	102.4 PK	-	-	1.85V	44	71.50	27.30	3.64	0.00	-30.94
2	*2441.00	86.6 AV	-	-	1.85V	44	55.70	27.30	3.64	0.00	-30.94
3	4882.10	52.2 PK	74.00	-21.80	1.16V	357	15.40	31.49	5.26	0.00	-36.76

NOTE:

1. Emission level = Raw value - Correction Factor
2. Correction Factor = Pre-Amp. Factor - Ant. Factor - Cable loss
(Pre-Amp. Factor = 0, when a Pre-Amplifier is not used for the test.)
3. Margin value = Emission level - Limit value
4. " * " : Fundamental frequency
5. The other emission levels were very low against the limit.



EUT	Notebook PC	MODEL	Celsius Mobile H
MODE	Channel 78	FREQUENCY RANGE	Above 1000 MHz
INPUT POWER (SYSTEM)	120Vac, 60 Hz	DETECTOR FUNCTION	Peak(PK) Average (AV)
ENVIRONMENTAL CONDITIONS	26 deg. C, 60%RH, 1050 hPa	TESTED BY: Gary Chang	

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)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB)
1	*2480.10	96.3 PK	-	-	1.30H	356	65.11	27.52	3.68	0.00	-31.20
2	*2480.10	84.8 AV	-	-	1.30H	356	53.63	27.52	3.68	0.00	-31.20
3	4960.00	52.3 PK	74.00	-21.70	2.04H	243	15.40	31.56	5.32	0.00	-36.88

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)	Cable Factor (dB)	Pre-Amp. Factor (dB)	Correction Factor (dB)
1	*2480.00	98.9 PK	-	-	2.03V	40	67.70	27.52	3.68	0.00	-31.20
2	*2480.00	48.7 AV	-	-	2.03V	40	17.46	27.52	3.68	0.00	-31.20
3	4960.10	52.1 PK	74.00	-21.90	1.32V	342	15.20	31.56	5.32	0.00	-36.88

NOTE:

1. Emission level = Raw value - Correction Factor
2. Correction Factor = Pre-Amp. Factor - Ant. Factor - Cable loss
(Pre-Amp. Factor = 0, when a Pre-Amplifier is not used for the test.)
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
R&S SPECTRUM ANALYZER	FSEK30	100049	Jul. 16, 2002
HP ATTENUATOR	8496B	3247A18505	Cal. on use
HP PLOTTER	7475A	2641V27755	N/A

Notes:

- 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.

4.8.3 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.

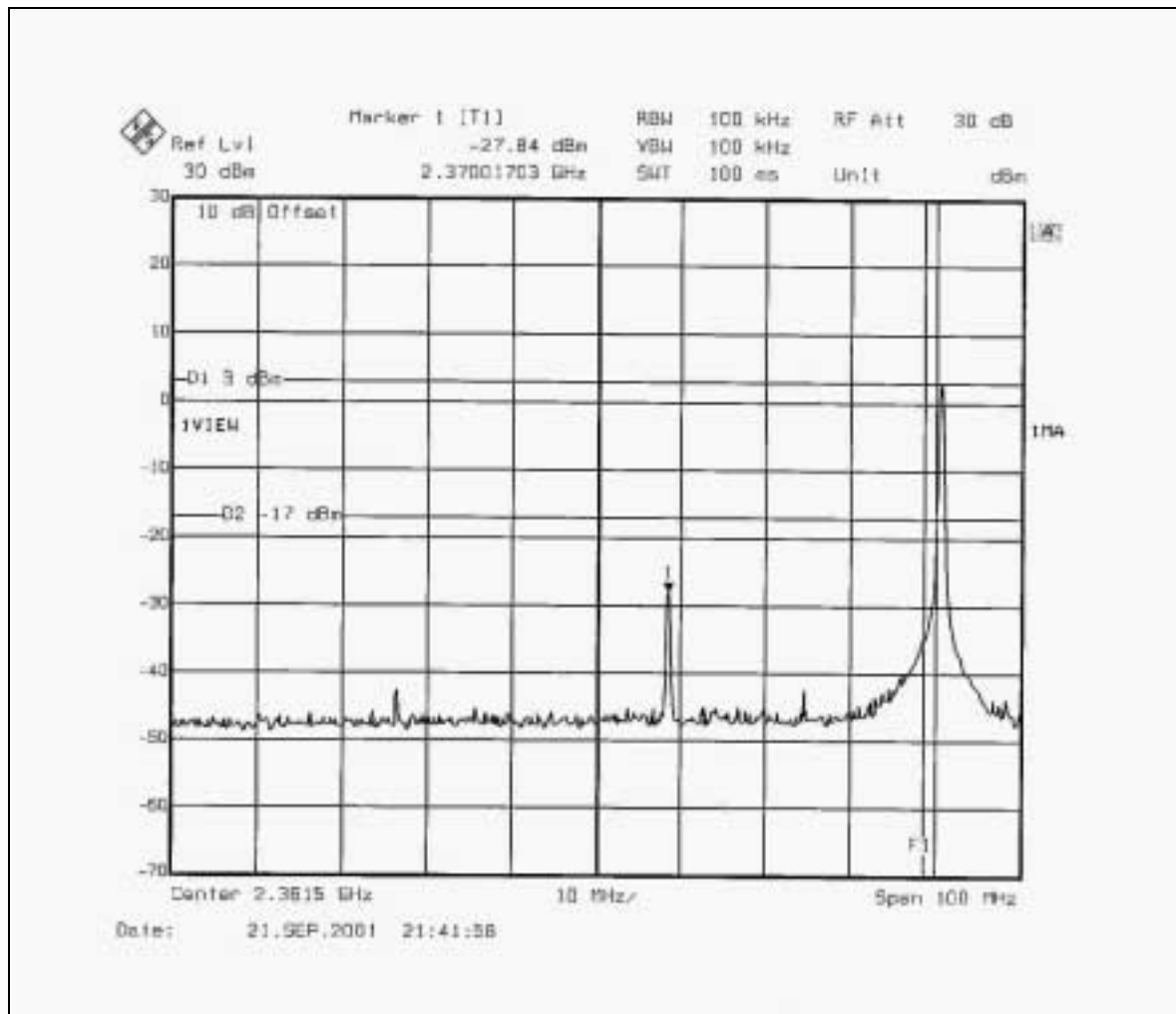


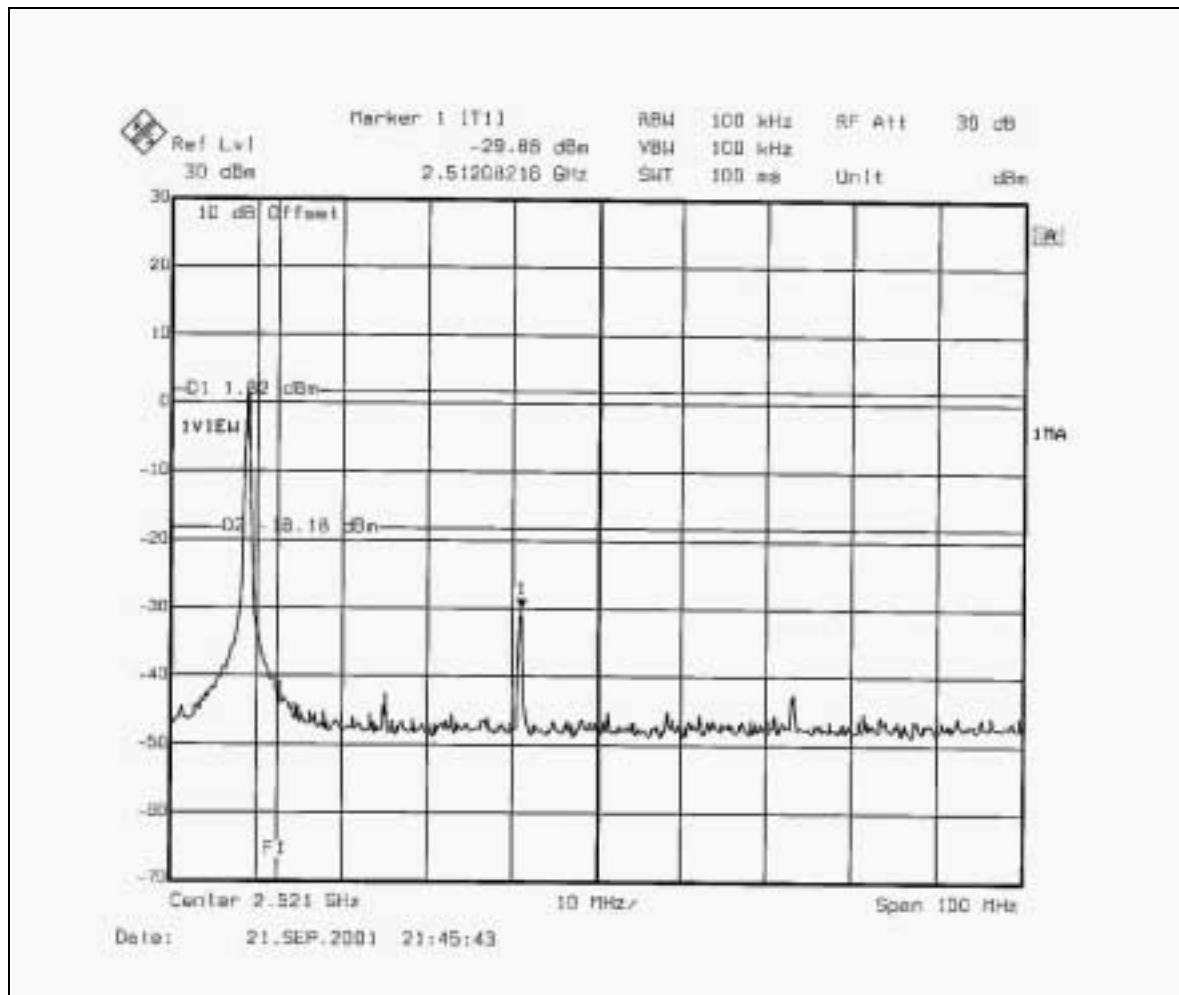
4.8.4 EUT OPERATING CONDITION

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

4.8.5 TEST RESULTS (A)

The spectrum plots are attached below. 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).

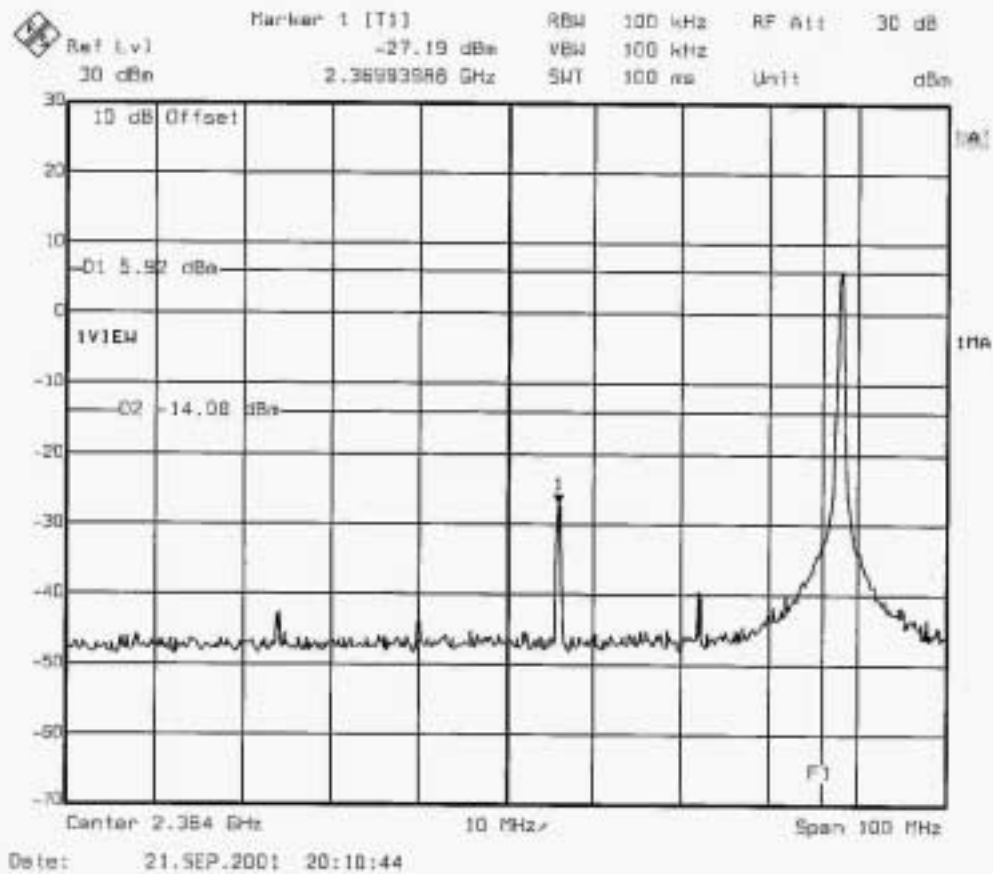


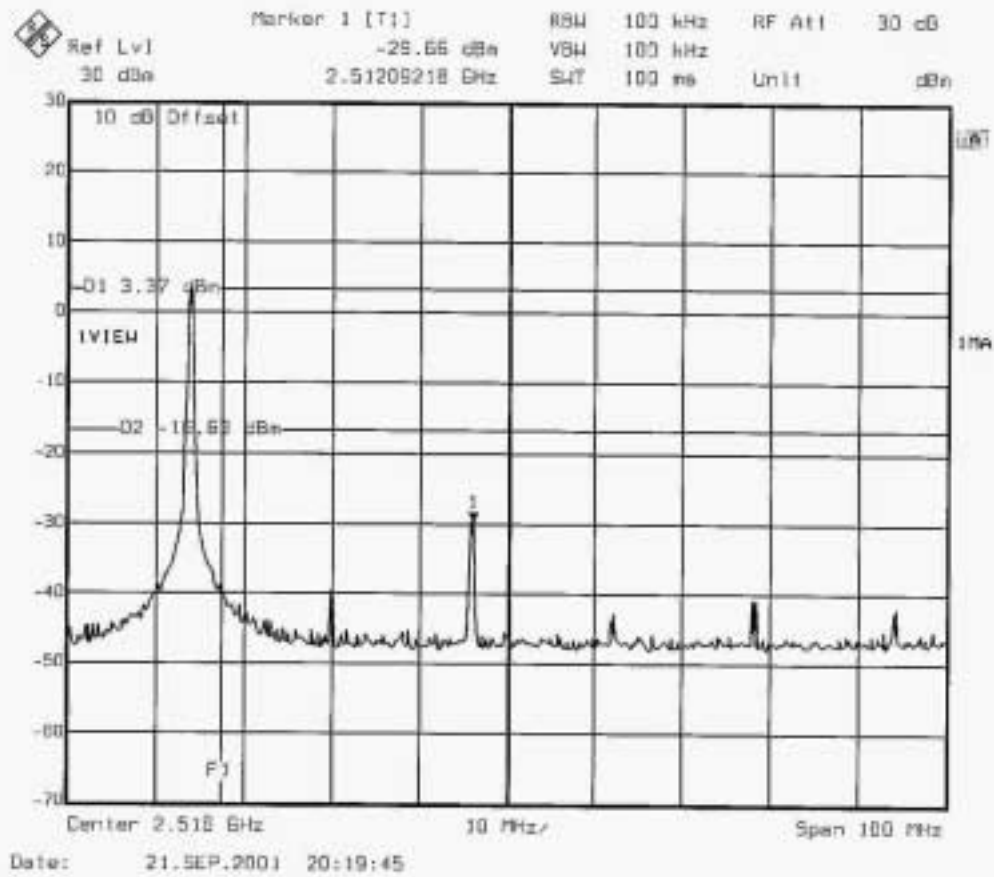




4.8.6 TEST RESULTS (B)

The spectrum plots are attached below. 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).







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 micro strip antenna. There is no 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.

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