

# FCC TEST REPORT

**REPORT NO.:** RF940103L05

**MODEL NO.:** BT510

**RECEIVED:** Jan. 03, 2005

**TESTED:** Jan. 04 ~ Jan. 06, 2005

**ISSUED:** Jan. 10, 2005

**APPLICANT:** KYE SYSTEMS CORP.

**ADDRESS:** NO. 492, SEC.5, CHUNG HSIN RD., SAN  
CHUNG, TAIPEI HSIEN, 241, TAIWAN,  
R.O.C.

**ISSUED BY:** Advance Data Technology Corporation

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

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

This test report consists of 65 pages in total. It may be duplicated completely for legal use with the approval of the applicant. It should not be reproduced except in full, without the written approval of our laboratory. The client should not use it to claim product endorsement by CNLA, A2LA or any government agency. The test results in the report only apply to the tested sample.





## TABLE OF CONTENTS

1	CERTIFICATION .....	4
2	SUMMARY OF TEST RESULTS .....	5
2.1	MEASUREMENT UNCERTAINTY .....	5
3	GENERAL INFORMATION .....	6
3.1	GENERAL DESCRIPTION OF EUT .....	6
3.2	DESCRIPTION OF TEST MODES .....	7
3.3	GENERAL DESCRIPTION OF APPLIED STANDARDS .....	8
3.4	DESCRIPTION OF SUPPORT UNITS .....	8
3.5	CONFIGURATION OF SYSTEM UNDER TEST .....	9
4	TEST PROCEDURES AND RESULTS .....	10
4.1	CONDUCTED EMISSION MEASUREMENT .....	10
4.1.1	LIMITS OF CONDUCTED EMISSION MEASUREMENT .....	10
4.1.2	TEST INSTRUMENTS .....	10
4.1.3	TEST PROCEDURES .....	11
4.1.4	DEVIATION FROM TEST STANDARD .....	11
4.1.5	TEST SETUP .....	12
4.1.6	EUT OPERATING CONDITIONS .....	12
4.1.7	TEST RESULTS .....	14
4.2	NUMBER OF HOPPING FREQUENCY USED .....	20
4.2.1	LIMIT OF HOPPING FREQUENCY USED .....	20
4.2.2	TEST INSTRUMENTS .....	20
4.2.3	TEST PROCEDURES .....	21
4.2.4	DEVIATION FROM TEST STANDARD .....	21
4.2.5	TEST SETUP .....	22
4.2.6	TEST RESULTS .....	22
4.3	DWELL TIME ON EACH CHANNEL .....	24
4.3.1	LIMIT OF DWELL TIME USED .....	24
4.3.2	TEST INSTRUMENTS .....	24
4.3.3	TEST PROCEDURES .....	25
4.3.4	DEVIATION FROM TEST STANDARD .....	25
4.3.5	TEST SETUP .....	25
4.3.6	TEST RESULTS .....	26
4.4	CHANNEL BANDWIDTH .....	30
4.4.1	LIMITS OF CHANNEL BANDWIDTH .....	30
4.4.2	TEST INSTRUMENTS .....	30
4.4.3	TEST PROCEDURE .....	31
4.4.4	DEVIATION FROM TEST STANDARD .....	31
4.4.5	TEST SETUP .....	31



4.4.6	EUT OPERATING CONDITION .....	31
4.4.7	TEST RESULTS .....	32
4.5	HOPPING CHANNEL SEPARATION .....	35
4.5.1	LIMIT OF HOPPING CHANNEL SEPARATION .....	35
4.5.2	TEST INSTRUMENTS.....	35
4.5.3	TEST PROCEDURES .....	36
4.5.4	DEVIATION FROM TEST STANDARD .....	36
4.5.5	TEST SETUP.....	36
4.5.6	TEST RESULTS .....	37
4.6	MAXIMUM PEAK OUTPUT POWER .....	40
4.6.1	LIMITS OF MAXIMUM PEAK OUTPUT POWER MEASUREMENT .....	40
4.6.2	INSTRUMENTS.....	40
4.6.3	TEST PROCEDURES .....	41
4.6.4	DEVIATION FROM TEST STANDARD .....	41
4.6.5	TEST SETUP.....	42
4.6.6	EUT OPERATING CONDITION .....	42
4.6.7	TEST RESULTS .....	43
4.7	RADIATED EMISSION MEASUREMENT .....	46
4.7.1	LIMITS OF RADIATED EMISSION MEASUREMENT .....	46
4.7.2	TEST INSTRUMENTS.....	47
4.7.3	TEST PROCEDURES .....	48
4.7.4	DEVIATION FROM TEST STANDARD .....	48
4.7.5	TEST SETUP.....	49
4.7.6	TEST RESULTS .....	50
4.8	BAND EDGES MEASUREMENT .....	57
4.8.1	LIMITS OF BAND EDGES MEASUREMENT.....	57
4.8.2	TEST INSTRUMENTS.....	57
4.8.3	TEST PROCEDURE.....	57
4.8.4	DEVIATION FROM TEST STANDARD .....	57
4.8.5	EUT OPERATING CONDITION .....	58
4.8.6	TEST RESULTS .....	58
4.9	ANTENNA REQUIREMENT .....	61
4.9.1	STANDARD APPLICABLE .....	61
4.9.2	ANTENNA CONNECTED CONSTRUCTION.....	61
5	PHOTOGRAPHS OF THE TEST CONFIGURATION.....	62
6	INFORMATION ON THE TESTING LABORATORIES .....	65



## 1 CERTIFICATION

**PRODUCT :** Bluetooth Mini Mouse  
**BRAND NAME :** KYE  
**OEM BRAND NAME :** Bluetake  
**MODEL NO. :** BT510  
**APPLICANT :** KYE SYSTEMS CORP.  
**TESTED :** Jan. 04 ~ Jan. 06, 2005  
**TEST ITEM :** ENGINEERING SAMPLE  
**STANDARDS :** FCC Part 15, Subpart C (Section 15.247)  
ANSI C63.4-2003

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

**PREPARED BY :** Candice Chen, **DATE:** Jan. 10, 2005  
( Candice Chen )

**TECHNICAL**  
**ACCEPTANCE :** Gary Chang, **DATE:** Jan. 10, 2005  
Responsible for RF ( Gary Chang )

**APPROVED BY :** Cody Chang, **DATE:** Jan. 10, 2005  
( Cody Chang / Deputy Manager )

## 2 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

<b>APPLIED STANDARD: FCC Part 15, Subpart C</b>			
<b>Standard Section</b>	<b>Test Type and Limit</b>	<b>Result</b>	<b>REMARK</b>
15.207	AC Power Conducted Emission	PASS	Meet the requirement of limit Minimum passing margin is -17.04 dB at 0.201 MHz
15.247(a)(1) (iii)	Number of Hopping Frequency Used Spec.: At least 15 channels	PASS	Meet the requirement of limit
15.247(a)(1) (iii)	Dwell Time on Each Channel Spec. : Max. 0.4 second within 31.6 second	PASS	Meet the requirement of limit
15.247(a)(1)	Hopping Channel Separation Spec. : Min. 25 kHz or 20 dB bandwidth, whichever is greater	PASS	Meet the requirement of limit
15.247(a)(1)	Spectrum Bandwidth of a Frequency Hopping Sequence Spread Spectrum System	NA	NA
15.247(b)	Maximum Peak Output Power Spec.: max. 30dBm	PASS	Meet the requirement of limit
15.247(d)	Transmitter Radiated Emissions Spec.: Table 15.209	PASS	Meet the requirement of limit Minimum passing margin is -1.16 dB at 47.79 MHz
15.247(d)	Band Edge Measurement	PASS	Meet the requirement of limit

### 2.1 MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4:

<b>MEASUREMENT</b>	<b>FREQUENCY</b>	<b>UNCERTAINTY</b>
Conducted emissions	9kHz~30MHz	2.44 dB
Radiated emissions	30MHz ~ 200MHz	3.73 dB
	200MHz ~1000MHz	3.74 dB
	1GHz ~ 18GHz	2.20 dB
	18GHz ~ 40GHz	1.88 dB

### 3 GENERAL INFORMATION

#### 3.1 GENERAL DESCRIPTION OF EUT

<b>PRODUCT</b>	Bluetooth Mini Mouse
<b>MODEL NO.</b>	BT510
<b>POWER SUPPLY</b>	3 Vdc from batteries 5 Vdc from host equipment
<b>MODULATION TYPE</b>	GFSK
<b>MODULATION TECHNOLOGY</b>	FHSS
<b>FREQUENCY RANGE</b>	2402 MHz ~ 2480 MHz
<b>NUMBER OF CHANNEL</b>	79
<b>OUTPUT POWER</b>	0.920mW
<b>ANTENNA TYPE</b>	Printed antenna with -4.38 dBi gain
<b>DATA CABLE</b>	1.5 m shielded USB cable without core
<b>I/O PORTS</b>	USB Port

**NOTE:**

1. There are two brands provided to this EUT and identical to each other except for their brand due to marketing requirement.

<b>Brand</b>	<b>Model</b>
KYE	BT510
Bluetake	BT510

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

### 3.2 DESCRIPTION OF TEST MODES

79 channels are provided to this EUT.

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

**NOTE:**

1. The EUT is a Bluetooth mouse, which is powered by 3Vdc from batteries or 5Vdc from host equipment via a USB cable, therefore, there are two test modes presented in the report on below table.

Test Mode	Description
A	Power from batteries
B	Power from host equipment via USB cable

2. For radiated test below 1 GHz, channel 0, 39 and 78 have been pre-tested. Channel 78, the worst case, was chosen for the final test.
3. For radiated test above 1 GHz, channel 0, 39 and 78 were tested individually.
4. For radiated test above 1GHz, we have pre-tested both mode A and B in the smi-anechoic chamber, and found of the Mode B was the worst case. So chosen as the representative and in this report.

### 3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS

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

**FCC Part 15, Subpart C. (15.247)**

**ANSI C63.4-2003**

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

### 3.4 DESCRIPTION OF SUPPORT UNITS

NO.	PRODUCT	BRAND	MODEL NO.	SERIAL NO.	FCC ID
1	NOTEBOOK COMPUTER	DELL	PP05L	16484462992	E2K24CLNS
2	PRINTER	EPSON	LQ-300+	DCGY054147	FCC DoC Approved

NO.	SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS
1	NA
2	1.2 m shielded cable without core

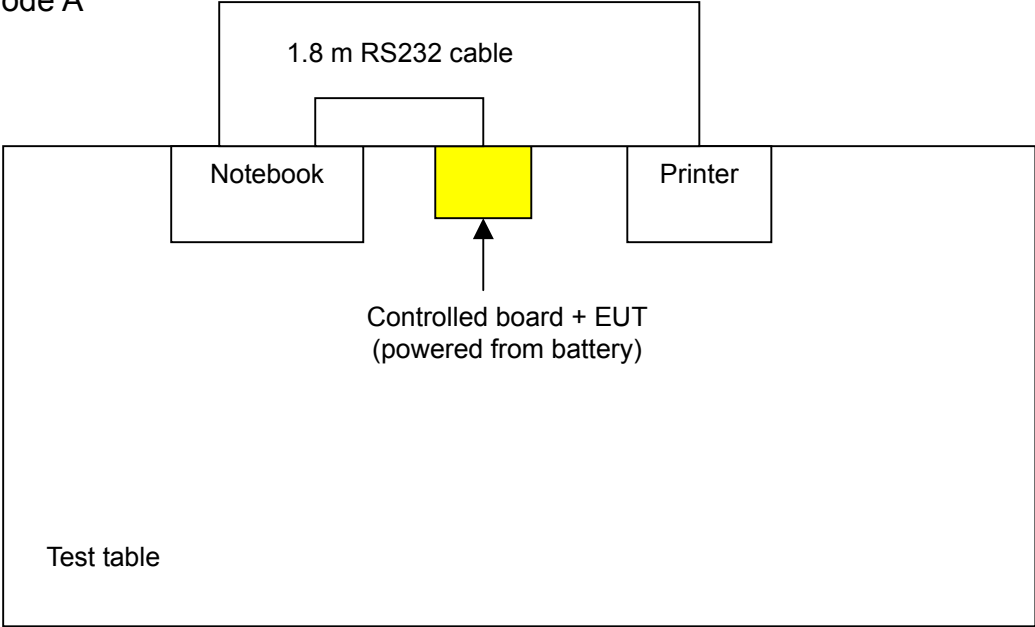
**NOTE:** All power cords of the above support units are non shielded (1.8m).



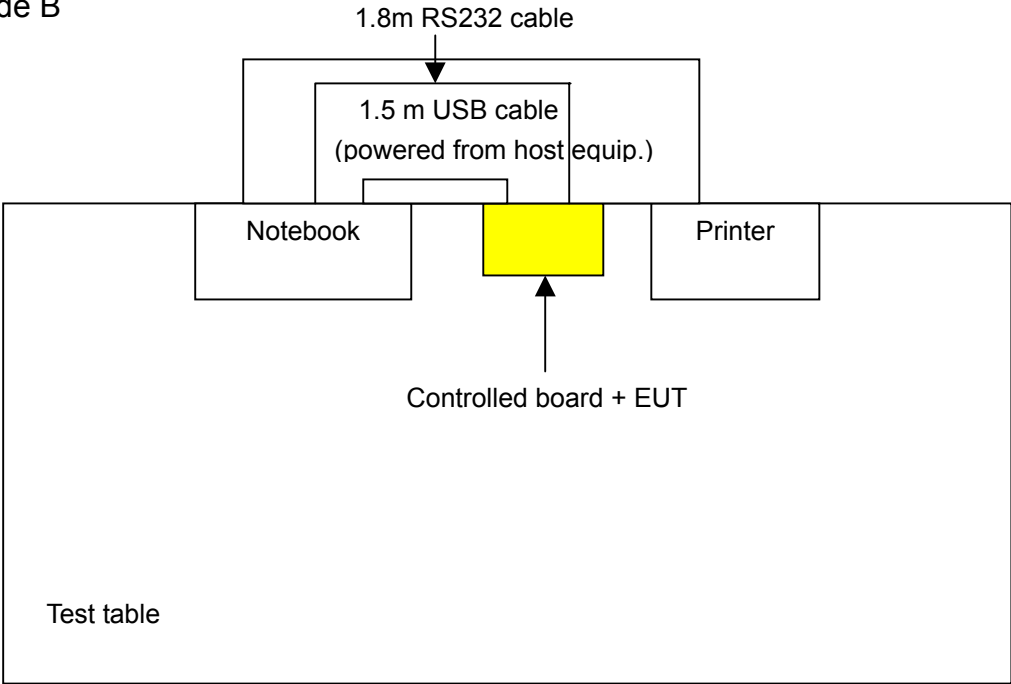


### 3.5 CONFIGURATION OF SYSTEM UNDER TEST

#### Test Mode A



#### Test Mode B



## 4 TEST PROCEDURES AND RESULTS

### 4.1 CONDUCTED EMISSION MEASUREMENT

#### 4.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

FREQUENCY OF EMISSION (MHz)	CONDUCTED LIMIT (dB $\mu$ V)	
	Quasi-peak	Average
0.15-0.5	66 to 56	56 to 46
0.5-5	56	46
5-30	60	50

**NOTE:**

1. The lower limit shall apply at the transition frequencies.
2. All emanations from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

#### 4.1.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
Test Receiver ROHDE & SCHWARZ	ESCS30	100291	Nov. 16, 2005
RF signal cable Woken	5D-FB	Cable-HYC01-01	Mar. 02, 2005
LISN ROHDE & SCHWARZ	ESH3-Z5	100312	Mar. 03, 2005
LISN ROHDE & SCHWARZ	ESH2-Z5	100104	Mar. 02, 2005
Software ADT	ADT_Cond_V3	NA	NA

- NOTE:**
1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
  2. The test was performed in HwaYa Shielded Room 1.
  3. The VCCI Site Registration No. is C-2040.

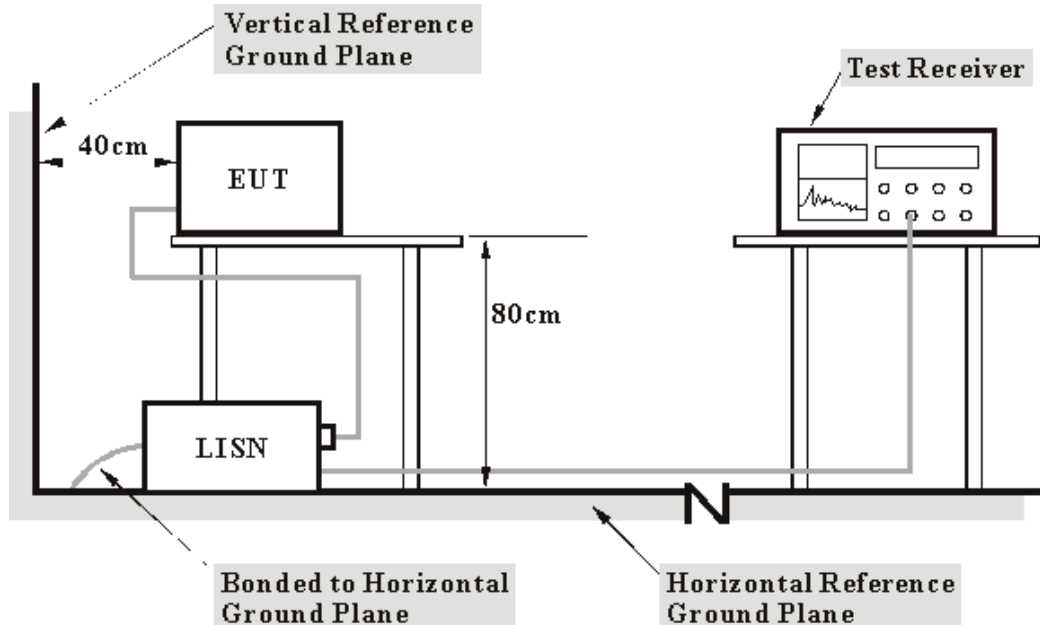
#### 4.1.3 TEST PROCEDURES

- 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 150kHz to 30MHz was searched. Emission levels under Limit - 20dB was not recorded.

#### 4.1.4 DEVIATION FROM TEST STANDARD

No deviation.

#### 4.1.5 TEST SETUP



- Note:**
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

##### Mode 1:

- a. The EUT connected to notebook through a controlled.
- b. The notebook system ran a test program (provided by manufacturer) via RJ232 cable, and to enable EUT under transmission/receiving condition continuously at specific channel frequency.
- c. The notebook system sent "H" messages to printer, and the printer printed them on paper.
- d. Step c was repeated.



**Mode 2:**

- a. The EUT connected to notebook through a controlled.
- b. The notebook system ran a test program (provided by manufacturer) via RS232 cable to enable EUT under transmission/receiving condition continuously at specific channel frequency.
- c. The notebook system sent "H" messages to its screen.
- d. The notebook system sent "H" messages to modem.
- e. The notebook system sent "H" messages to printer, and the printer printed them on paper.
- f. Steps c ~ e were repeated.

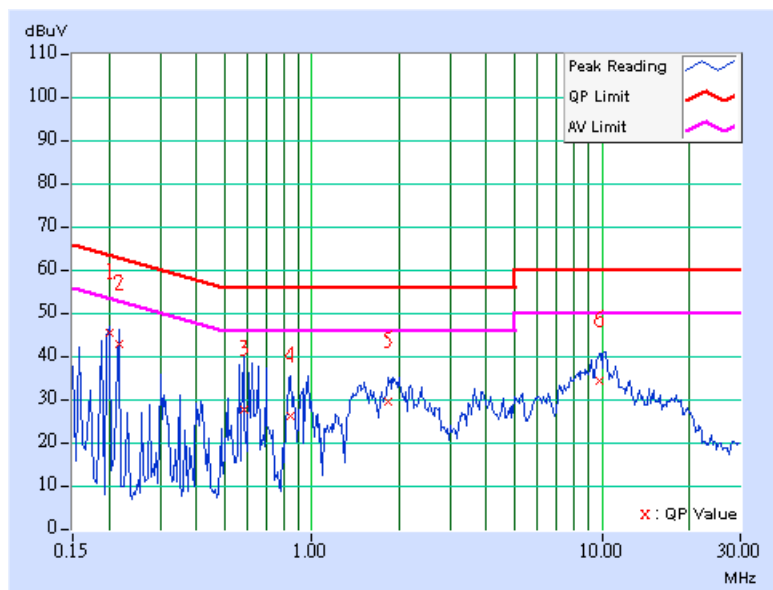


4.1.7 TEST RESULTS

<b>EUT</b>	Bluetooth Mini Mouse	<b>MODEL</b>	BT510
<b>CHANNEL</b>	0	<b>6dB BANDWIDTH</b>	9 kHz
<b>INPUT POWER (SYSTEM)</b>	120 Vac, 60 Hz	<b>PHASE</b>	Line (L)
<b>ENVIRONMENTAL CONDITIONS</b>	24 deg. C, 64%RH, 991 hPa	<b>TESTED BY</b>	Leo Hung

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.201	0.12	45.16	-	45.28	-	63.58	53.58	-18.30	-
2	0.216	0.12	42.51	-	42.63	-	62.96	52.96	-20.33	-
3	0.584	0.13	27.47	-	27.60	-	56.00	46.00	-28.40	-
4	0.849	0.14	26.18	-	26.32	-	56.00	46.00	-29.68	-
5	1.832	0.16	29.45	-	29.61	-	56.00	46.00	-26.39	-
6	9.762	0.30	33.96	-	34.26	-	60.00	50.00	-25.74	-

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

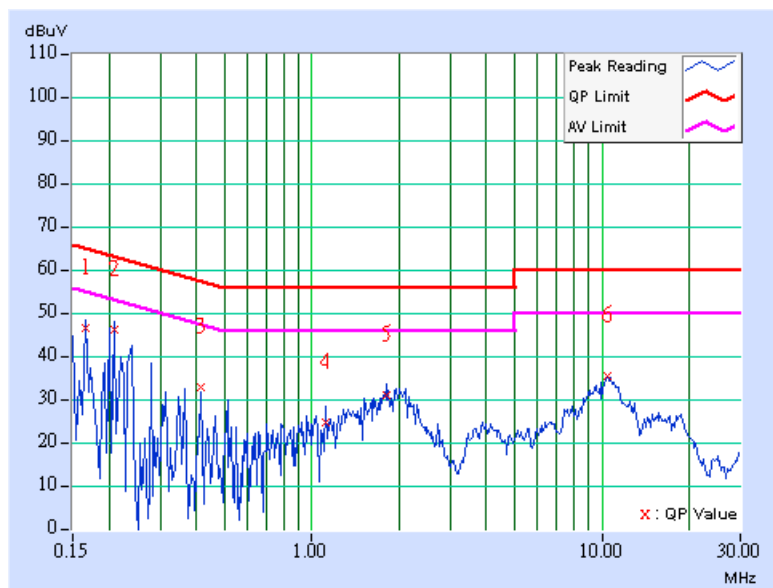




<b>EUT</b>	Bluetooth Mini Mouse	<b>MODEL</b>	BT510
<b>CHANNEL</b>	0	<b>6dB BANDWIDTH</b>	9 kHz
<b>INPUT POWER (SYSTEM)</b>	120 Vac, 60 Hz	<b>PHASE</b>	Neutral (N)
<b>ENVIRONMENTAL CONDITIONS</b>	24 deg. C, 64%RH, 991 hPa	<b>TESTED BY</b>	Leo Hung

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	0.166	0.10	46.27	-	46.37	-	65.18	55.18	-18.80
2	0.209	0.11	46.08	-	46.19	-	63.26	53.26	-17.07	-
3	0.416	0.12	32.60	-	32.72	-	57.54	47.54	-24.82	-
4	1.117	0.15	24.36	-	24.51	-	56.00	46.00	-31.49	-
5	1.816	0.16	30.76	-	30.92	-	56.00	46.00	-25.08	-
6	10.430	0.31	35.16	-	35.47	-	60.00	50.00	-24.53	-

- 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.

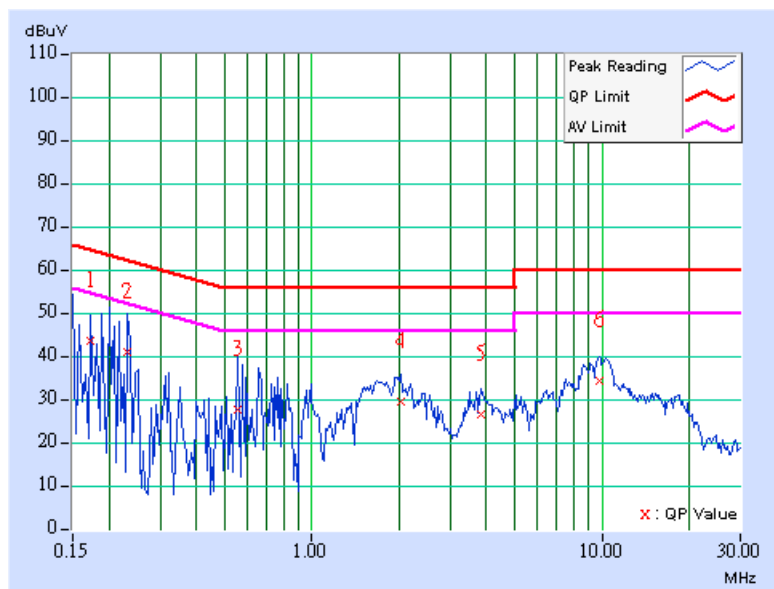




<b>EUT</b>	Bluetooth Mini Mouse	<b>MODEL</b>	BT510
<b>CHANNEL</b>	39	<b>6dB BANDWIDTH</b>	9 kHz
<b>INPUT POWER (SYSTEM)</b>	120 Vac, 60 Hz	<b>PHASE</b>	Line (L)
<b>ENVIRONMENTAL CONDITIONS</b>	24 deg. C, 64%RH, 991 hPa	<b>TESTED BY</b>	Leo Hung

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.173	0.11	43.51	-	43.62	-	64.79	54.79	-21.17	-
2	0.232	0.12	40.84	-	40.96	-	62.38	52.38	-21.42	-
3	0.556	0.13	27.47	-	27.60	-	56.00	46.00	-28.40	-
4	2.020	0.16	29.34	-	29.50	-	56.00	46.00	-26.50	-
5	3.852	0.20	26.29	-	26.49	-	56.00	46.00	-29.51	-
6	9.781	0.30	34.18	-	34.48	-	60.00	50.00	-25.52	-

- 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.



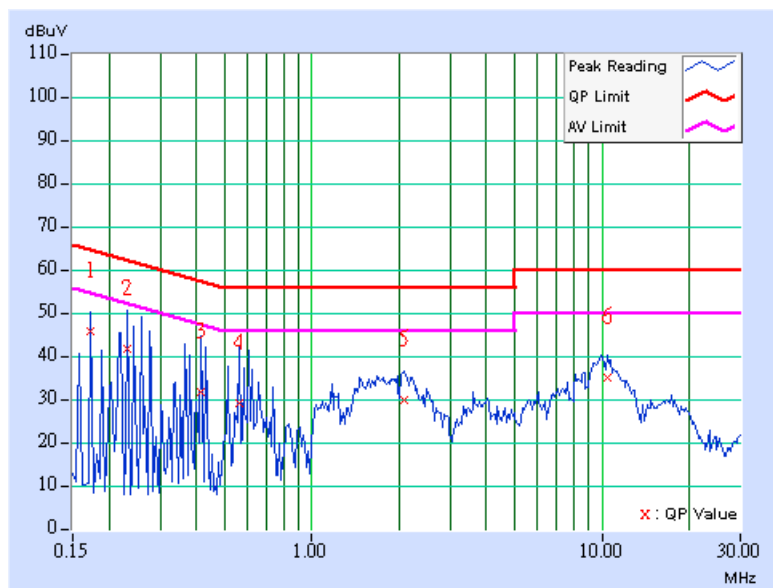




<b>EUT</b>	Bluetooth Mini Mouse	<b>MODEL</b>	BT510
<b>CHANNEL</b>	39	<b>6dB BANDWIDTH</b>	9 kHz
<b>INPUT POWER (SYSTEM)</b>	120 Vac, 60 Hz	<b>PHASE</b>	Neutral (N)
<b>ENVIRONMENTAL CONDITIONS</b>	24 deg. C, 64%RH, 991 hPa	<b>TESTED BY</b>	Leo Hung

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	0.173	0.10	45.51	-	45.61	-	64.79	54.79	-19.18
2	0.232	0.11	41.64	-	41.75	-	62.38	52.38	-20.63	-
3	0.416	0.12	31.72	-	31.84	-	57.54	47.54	-25.70	-
4	0.564	0.12	28.94	-	29.06	-	56.00	46.00	-26.94	-
5	2.078	0.16	29.80	-	29.96	-	56.00	46.00	-26.04	-
6	10.508	0.32	34.79	-	35.11	-	60.00	50.00	-24.89	-

- 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.

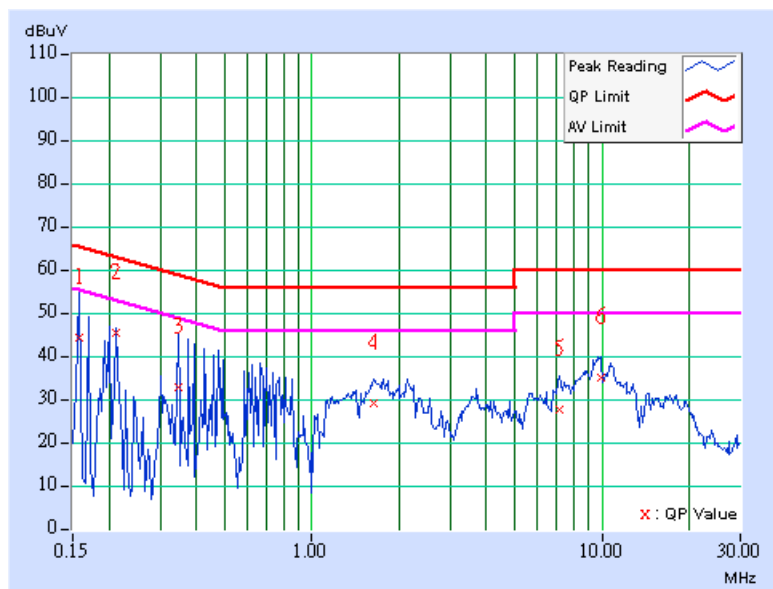




<b>EUT</b>	Bluetooth Mini Mouse	<b>MODEL</b>	BT510
<b>CHANNEL</b>	78	<b>6dB BANDWIDTH</b>	9 kHz
<b>INPUT POWER (SYSTEM)</b>	120 Vac, 60 Hz	<b>PHASE</b>	Line (L)
<b>ENVIRONMENTAL CONDITIONS</b>	24 deg. C, 64%RH, 991 hPa	<b>TESTED BY</b>	Leo Hung

No	Freq. [MHz]	Corr. Factor (dB)	Reading Value		Emission Level		Limit		Margin	
			[dB (uV)]		[dB (uV)]		[dB (uV)]		(dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.158	0.11	43.98	-	44.09	-	65.58	55.58	-21.49	-
2	0.213	0.12	45.22	-	45.34	-	63.11	53.11	-17.77	-
3	0.345	0.12	32.50	-	32.62	-	59.07	49.07	-26.45	-
4	1.641	0.16	28.92	-	29.08	-	56.00	46.00	-26.92	-
5	7.148	0.30	27.53	-	27.83	-	60.00	50.00	-32.17	-
6	9.965	0.30	34.94	-	35.24	-	60.00	50.00	-24.76	-

- 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.

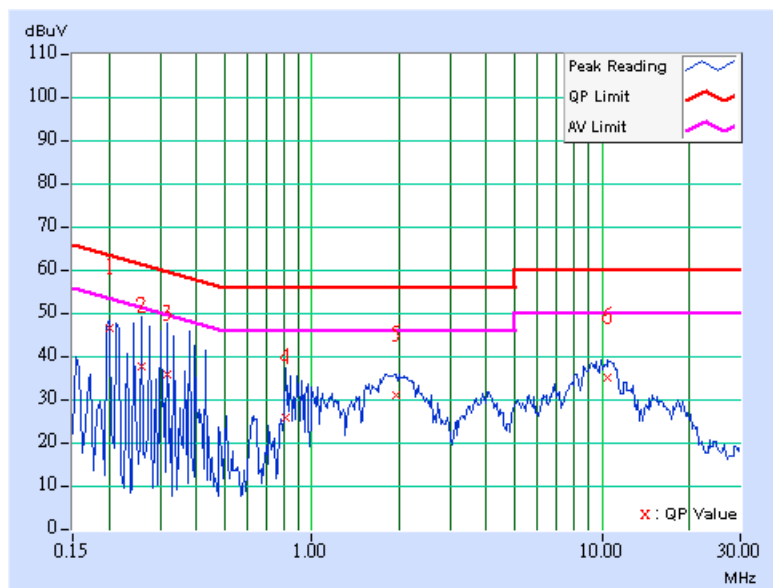




<b>EUT</b>	Bluetooth Mini Mouse	<b>MODEL</b>	BT510
<b>CHANNEL</b>	78	<b>6dB BANDWIDTH</b>	9 kHz
<b>INPUT POWER (SYSTEM)</b>	120 Vac, 60 Hz	<b>PHASE</b>	Neutral (N)
<b>ENVIRONMENTAL CONDITIONS</b>	24 deg. C, 64%RH, 991 hPa	<b>TESTED BY</b>	Leo Hung

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	0.201	0.11	46.43	-	46.54	-	63.58	53.58	-17.04
2	0.259	0.11	37.58	-	37.69	-	61.45	51.45	-23.76	-
3	0.318	0.11	35.44	-	35.55	-	59.76	49.76	-24.21	-
4	0.810	0.13	25.69	-	25.82	-	56.00	46.00	-30.18	-
5	1.953	0.16	30.88	-	31.04	-	56.00	46.00	-24.96	-
6	10.496	0.32	34.81	-	35.13	-	60.00	50.00	-24.87	-

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



## 4.2 NUMBER OF HOPPING FREQUENCY USED

### 4.2.1 LIMIT OF HOPPING FREQUENCY USED

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

### 4.2.2 TEST INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
SPECTRUM ANALYZER	FSEK30	100049	Aug. 12, 2005

**NOTE:**

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

#### 4.2.3 TEST PROCEDURES

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

#### 4.2.4 DEVIATION FROM TEST STANDARD

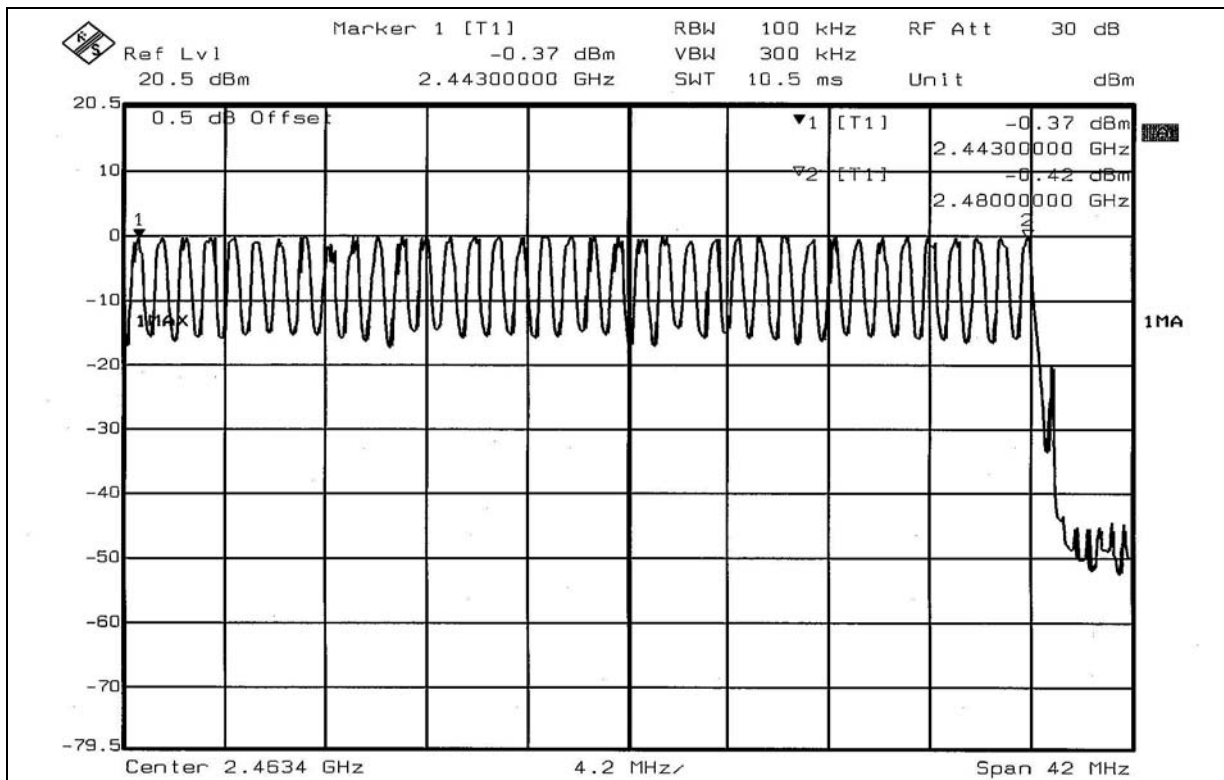
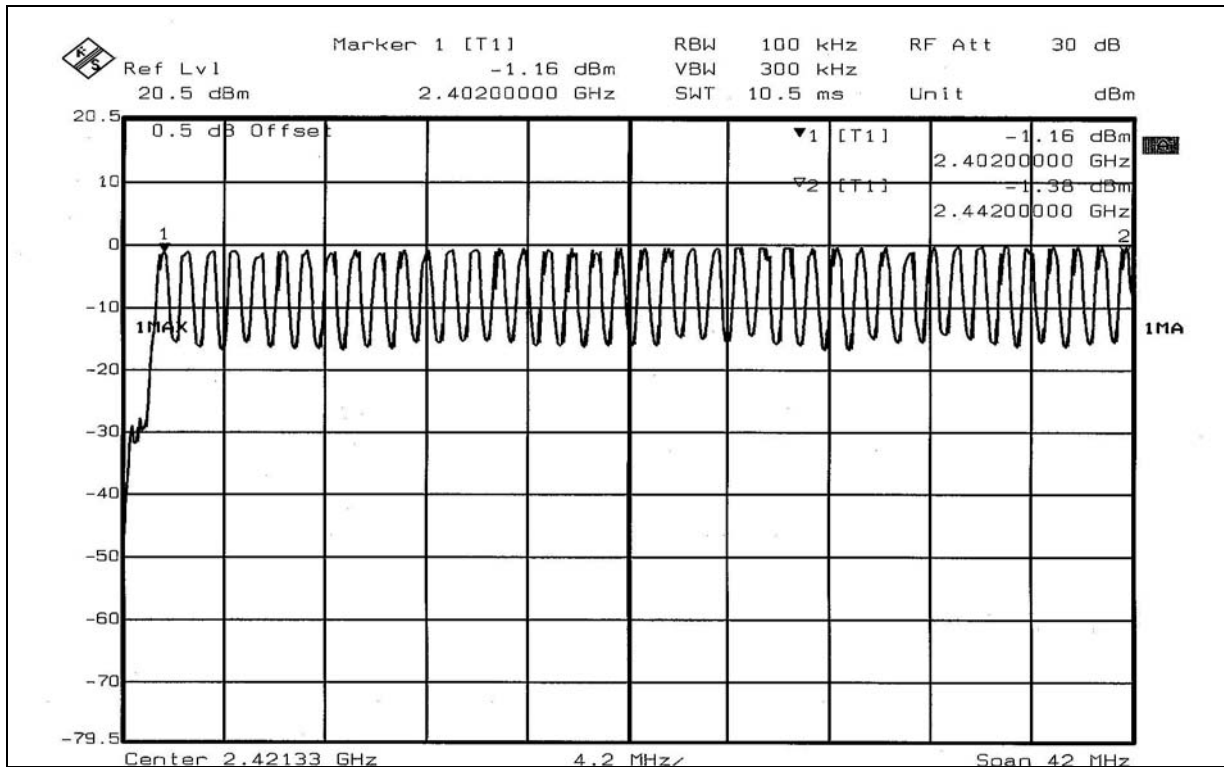
No deviation.

#### 4.2.5 TEST SETUP



#### 4.2.6 TEST RESULTS

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



### 4.3 DWELL TIME ON EACH CHANNEL

#### 4.3.1 LIMIT OF DWELL TIME USED

The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed.

#### 4.3.2 TEST INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
SPECTRUM ANALYZER	FSEK30	100049	Aug. 12, 2005

**NOTES:**

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



#### 4.3.3 TEST PROCEDURES

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

#### 4.3.4 DEVIATION FROM TEST STANDARD

No deviation.

#### 4.3.5 TEST SETUP



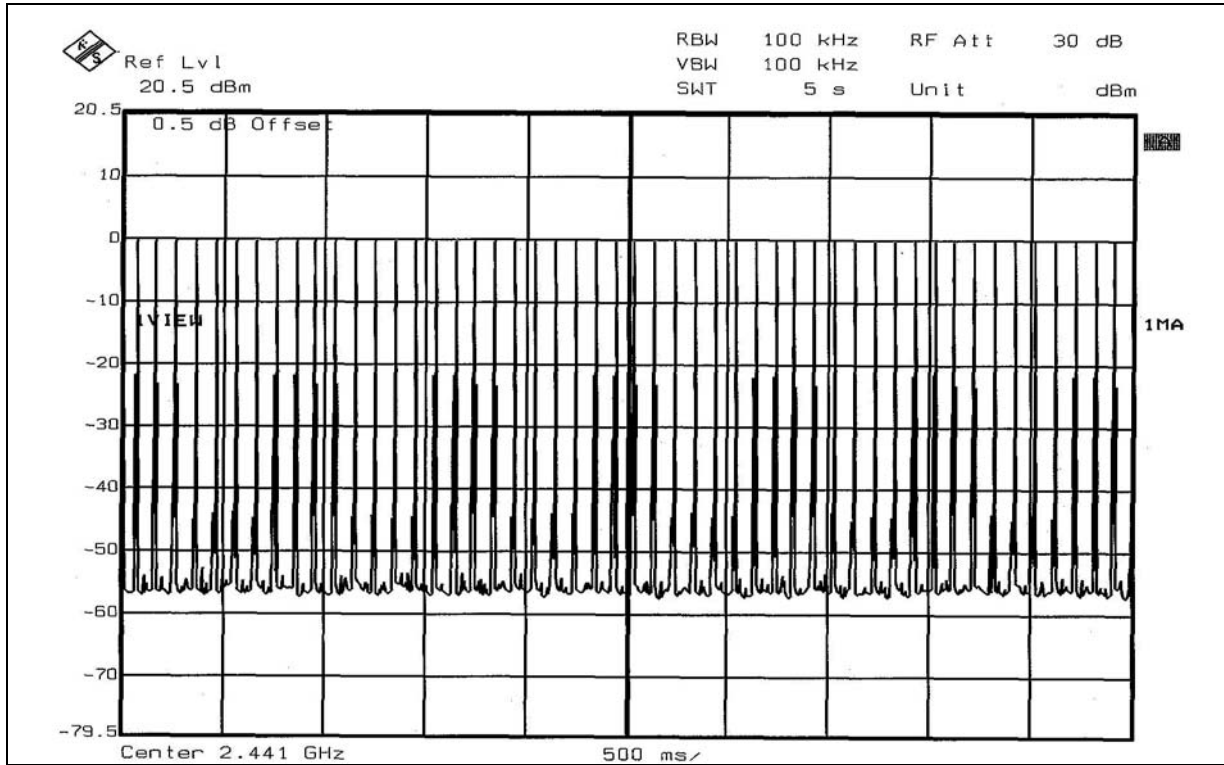
## 4.3.6 TEST RESULTS

Mode	Number of transmission in a 31.6 (79Hopping*0.4)	Length of transmission time (msec)	Result (msec)	Limit (msec)
DH1	50 (times / 5 sec) *6.32=316.00 times	1.232	389.312	400
DH3	31 (times / 5 sec) *6.32=195.92 times	1.749	194.171	400
DH5	17 (times / 5 sec) *6.32=132.72 times	2.992	397.098	400

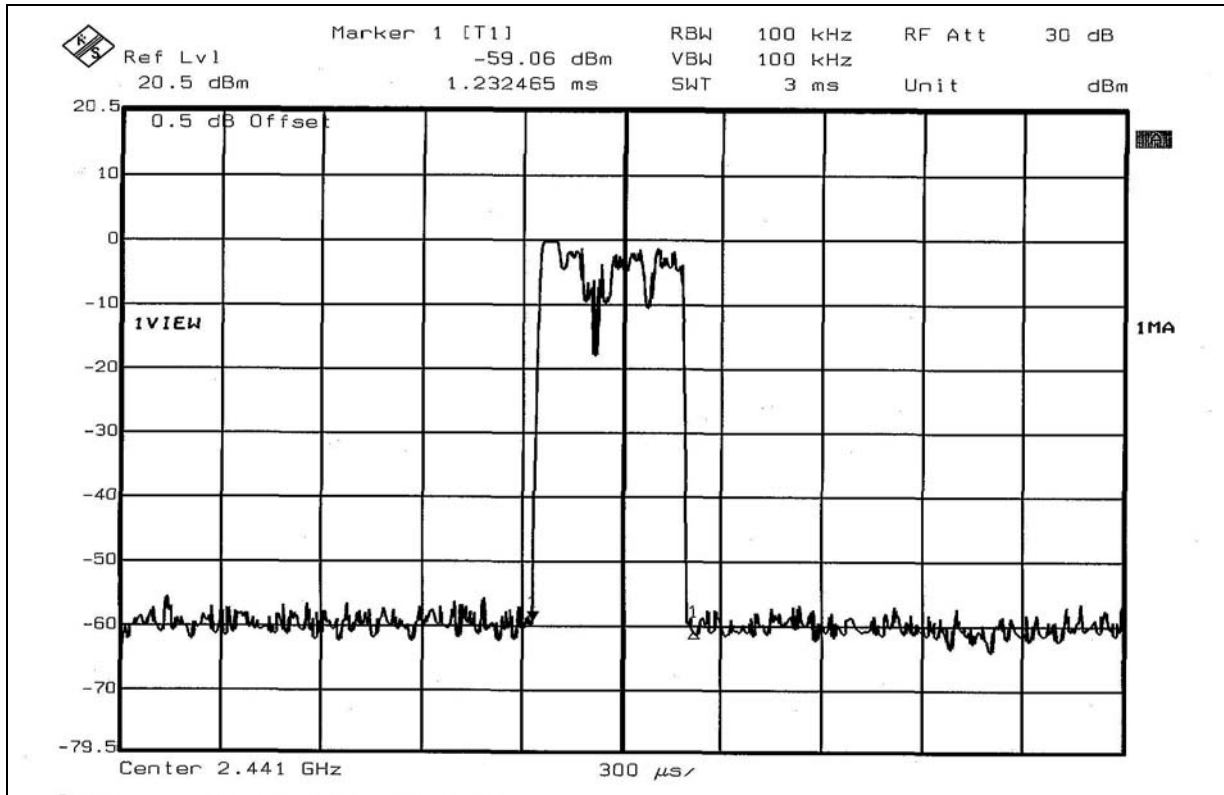
Test plots of the transmitting time slot are shown on next 3 pages.



DH1

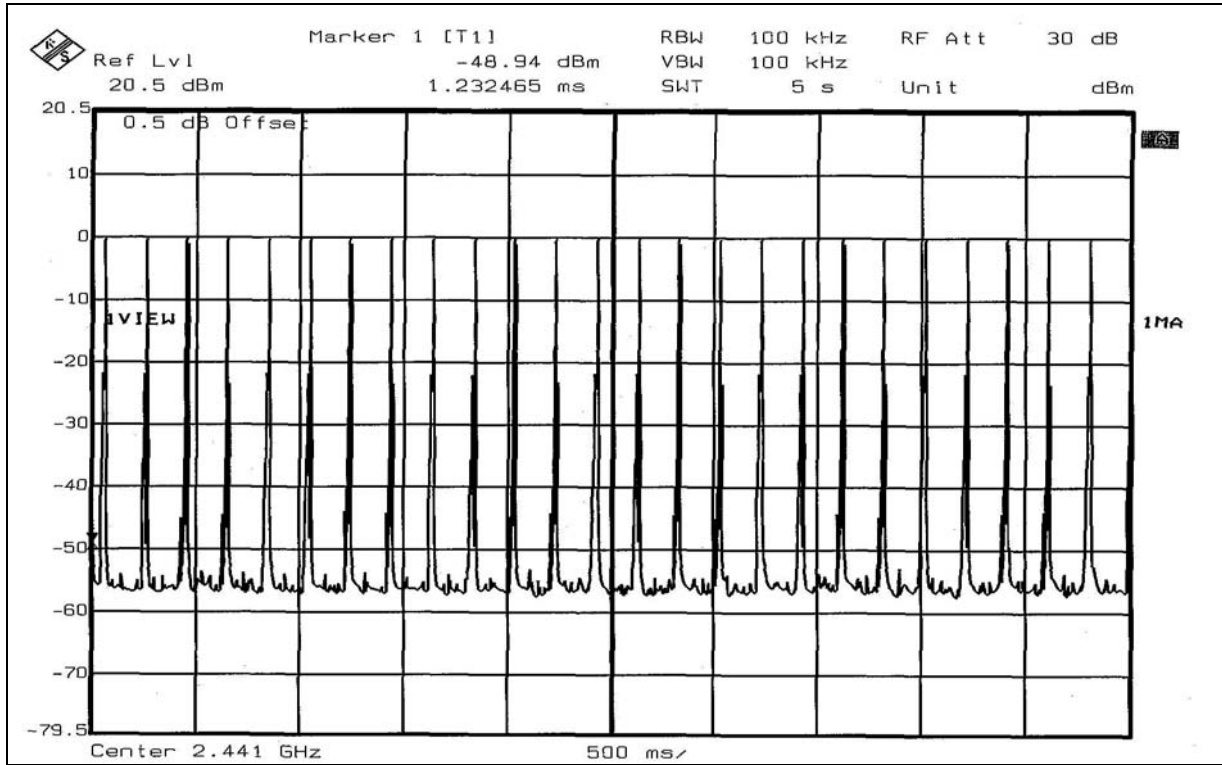


DH1

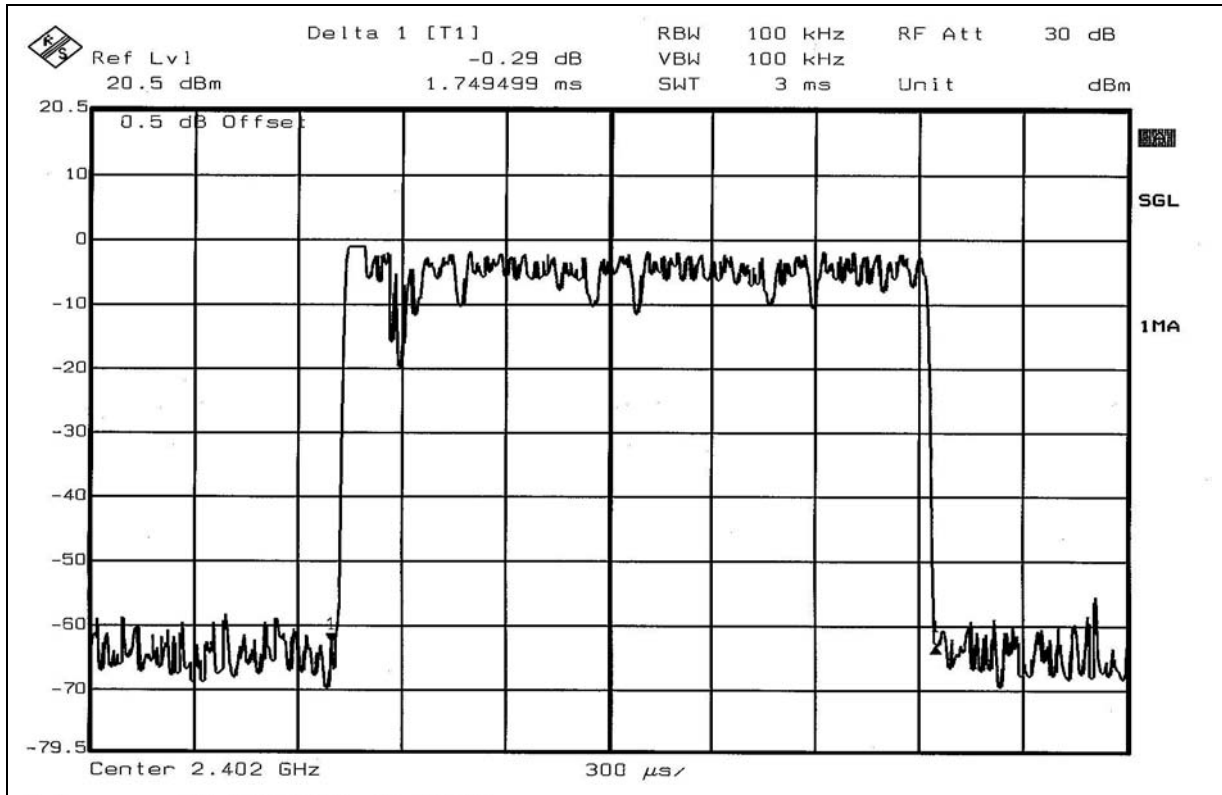




DH3

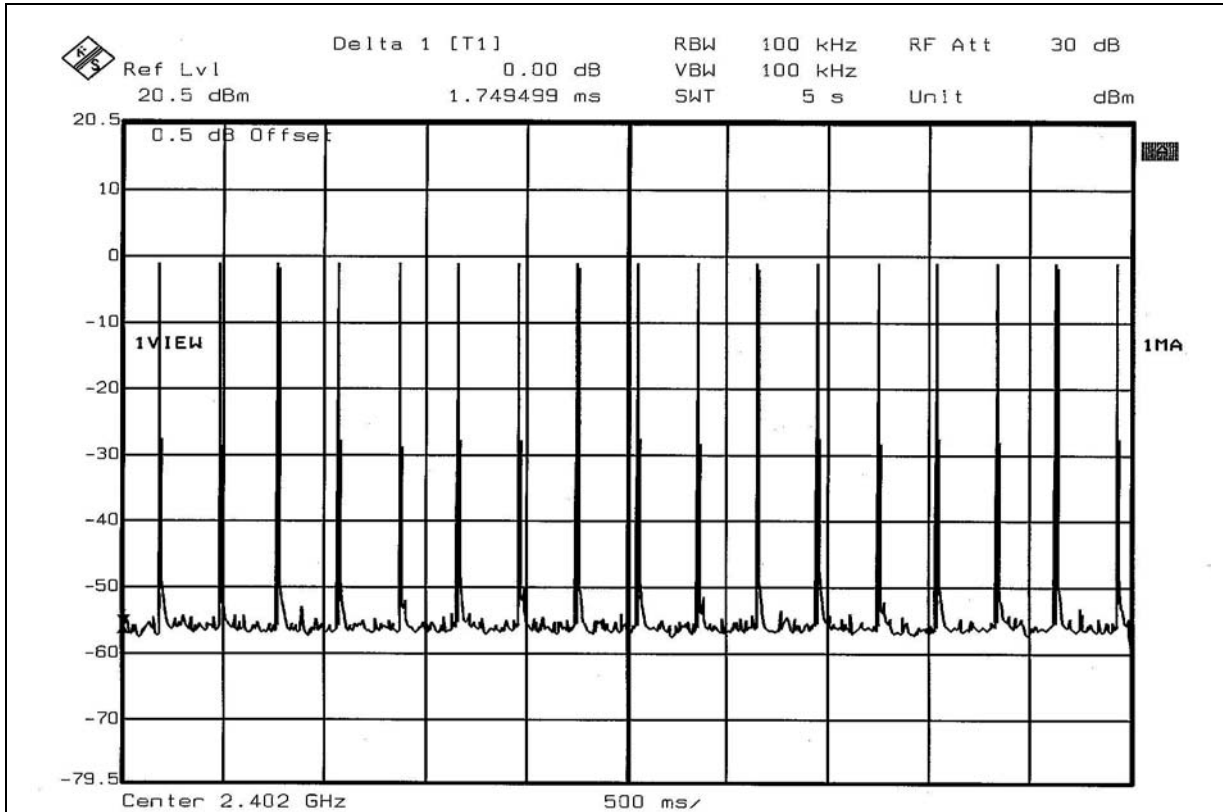


DH3

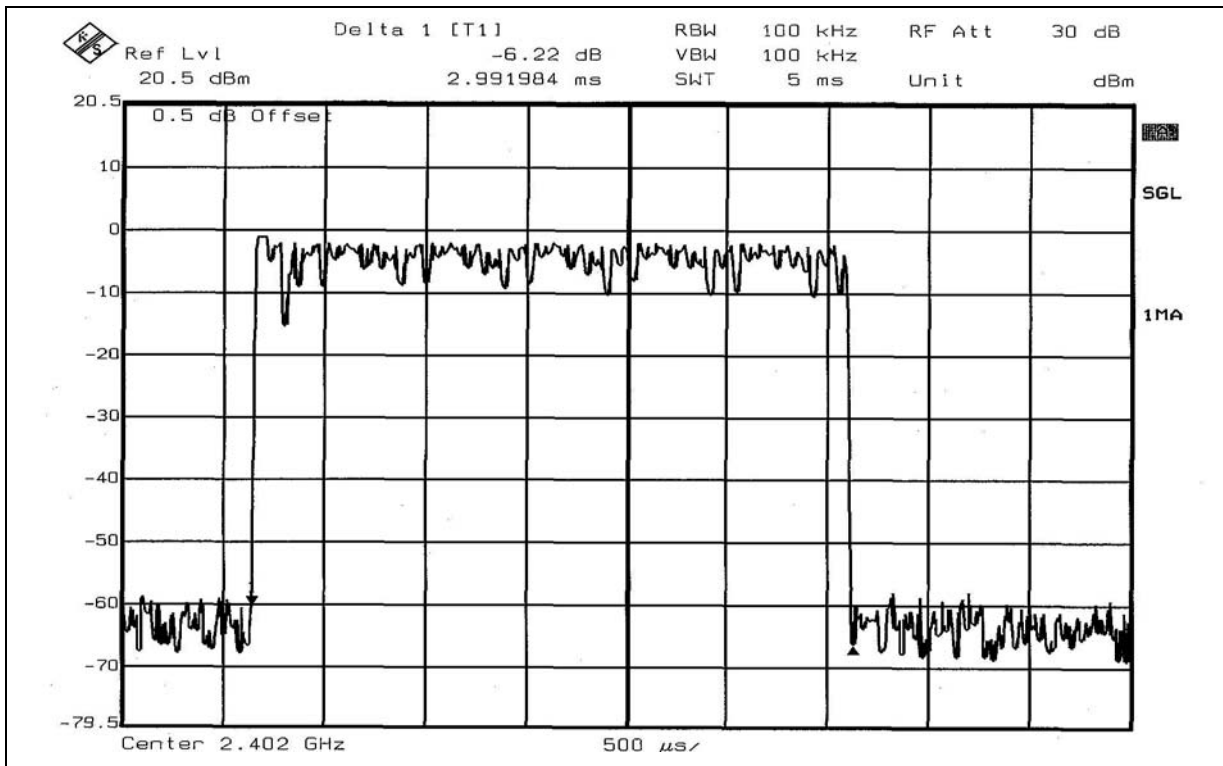




DH5



DH5



#### 4.4 CHANNEL BANDWIDTH

##### 4.4.1 LIMITS OF CHANNEL BANDWIDTH

NA

##### 4.4.2 TEST INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
SPECTRUM ANALYZER	FSEK30	100049	Aug. 12, 2005

**NOTE:**

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

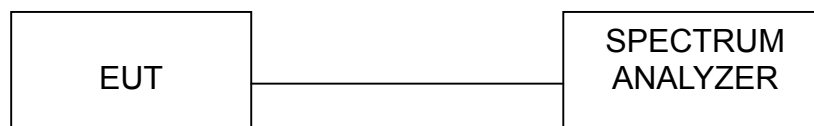
#### 4.4.3 TEST PROCEDURE

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

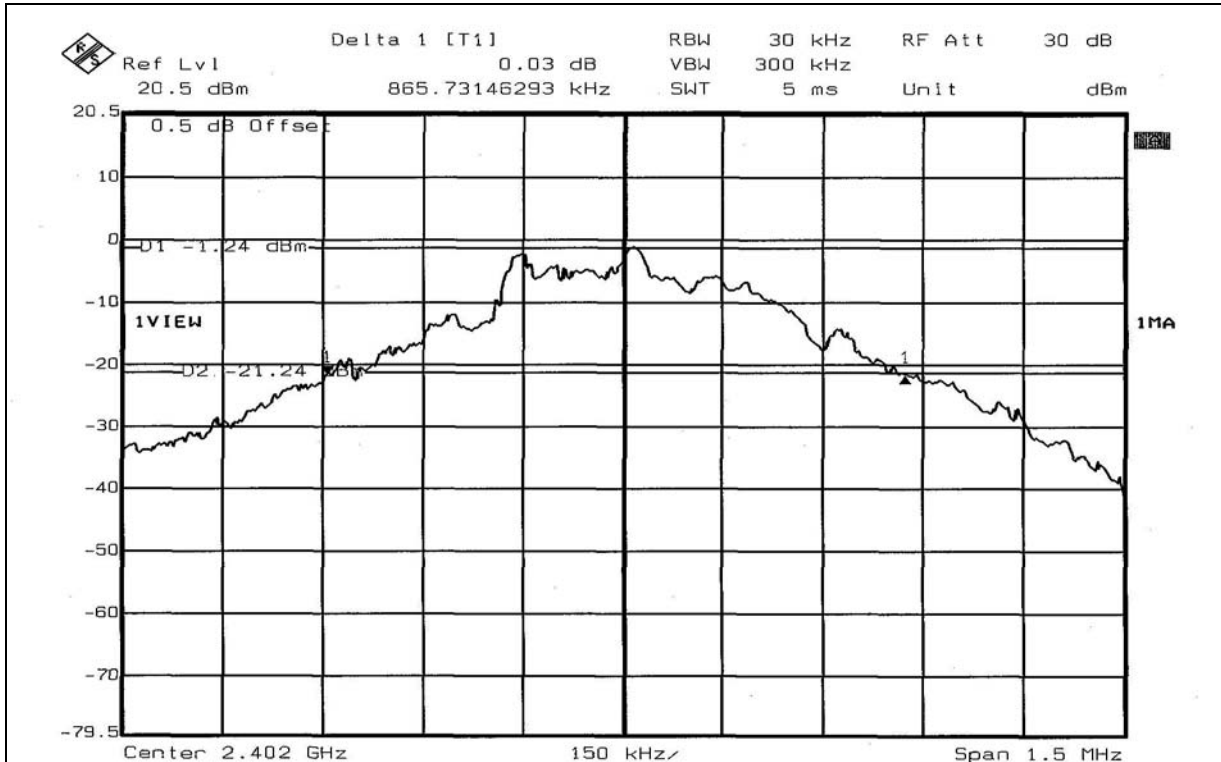
<b>EUT</b>	Bluetooth Mini Mouse	<b>MODEL</b>	BT510
<b>ENVIRONMENTAL CONDITIONS</b>	23 deg. C, 69% RH, 991 hPa	<b>INPUT POWER (SYSTEM)</b>	120 Vac, 60 Hz
<b>TESTED BY</b>	Leo Hung		

<b>CHANNEL</b>	<b>CHANNEL FREQUENCY (MHz)</b>	<b>20dB BANDWIDTH (MHz)</b>	<b>MAXIMUM LIMIT (MHz)</b>
0	2402	0.866	NA
39	2441	0.866	NA
78	2480	0.866	NA

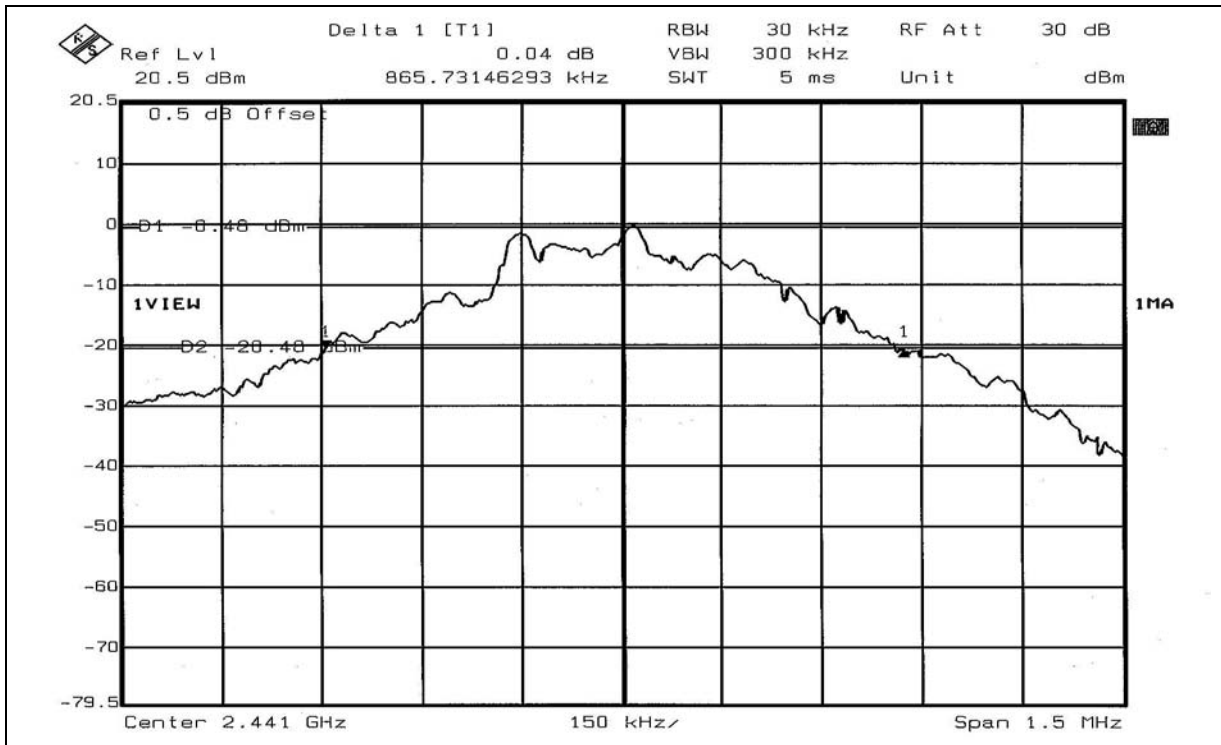




### Channel 0

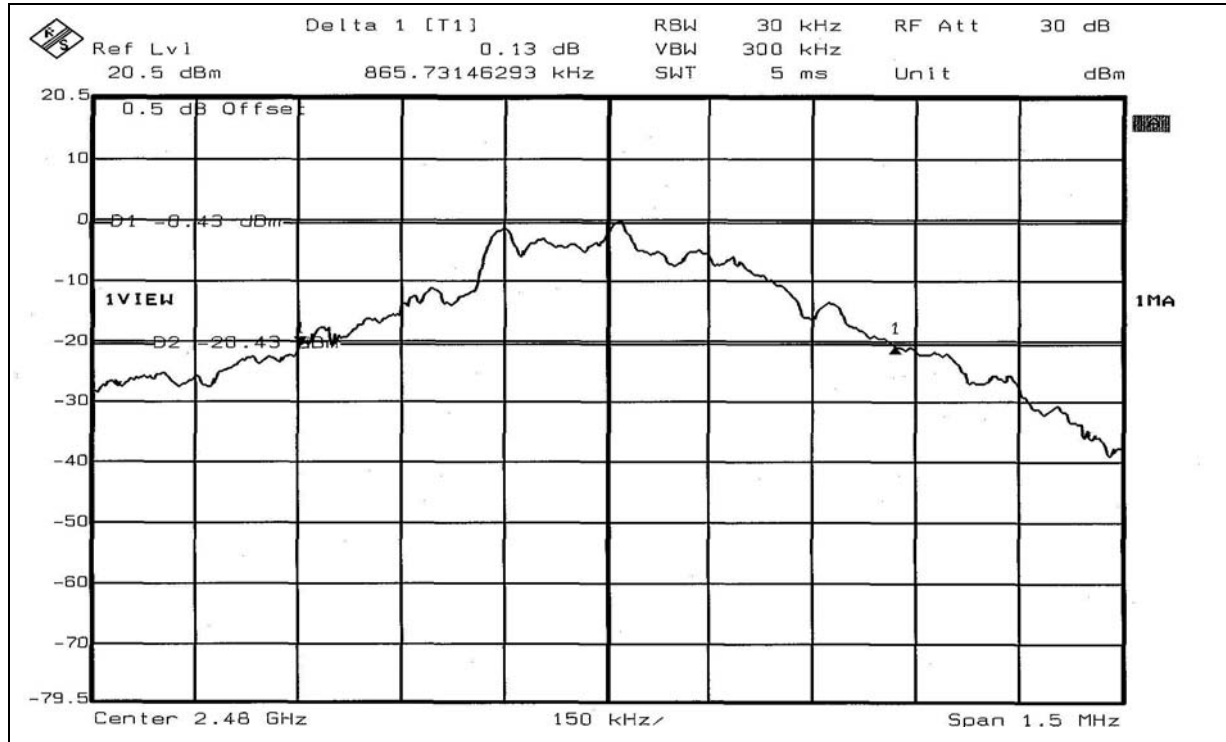


### Channel 39





Channel 78



## 4.5 HOPPING CHANNEL SEPARATION

### 4.5.1 LIMIT OF HOPPING CHANNEL SEPARATION

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

### 4.5.2 TEST INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
SPECTRUM ANALYZER	FSEK30	100049	Aug. 12, 2005

#### NOTES:

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

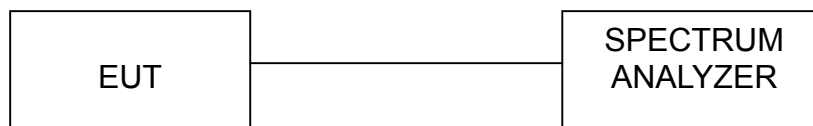
#### 4.5.3 TEST PROCEDURES

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

#### 4.5.4 DEVIATION FROM TEST STANDARD

No deviation

#### 4.5.5 TEST SETUP



## 4.5.6 TEST RESULTS

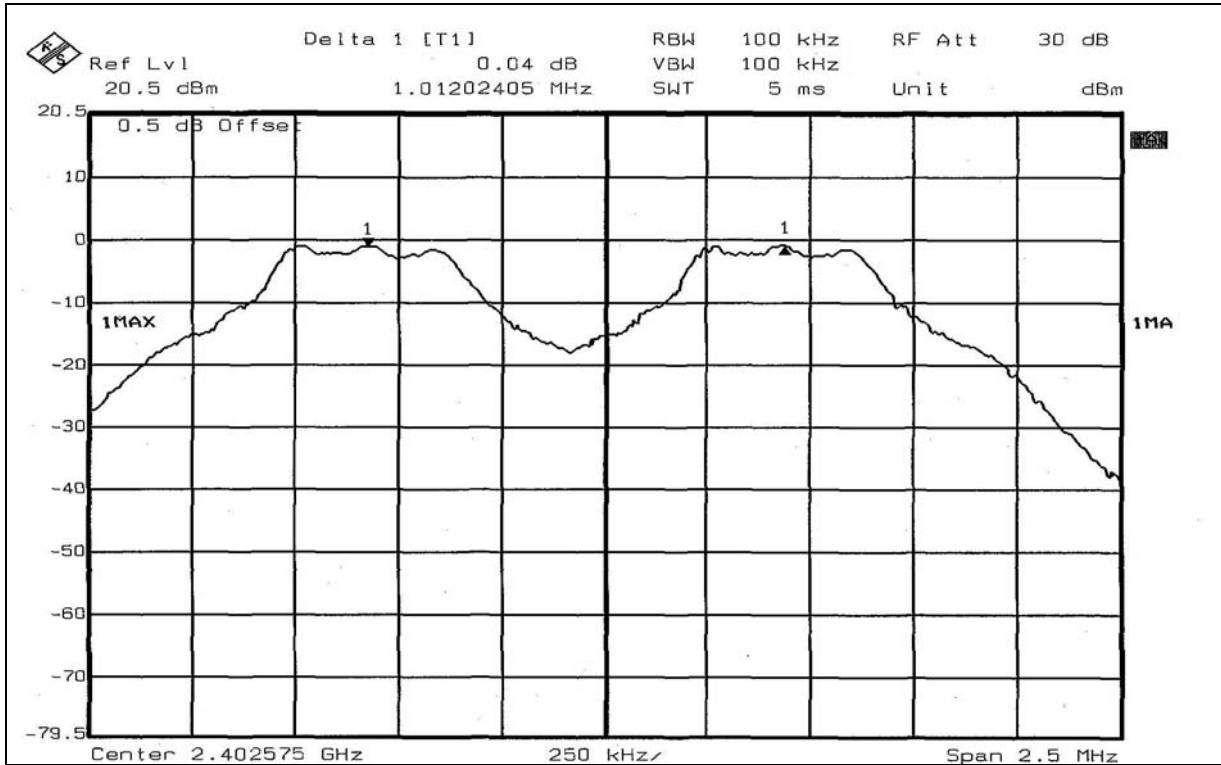
<b>EUT</b>	Bluetooth Mini Mouse	<b>MODEL</b>	BT510
<b>ENVIRONMENTAL CONDITIONS</b>	23 deg. C, 69% RH, 991 hPa	<b>INPUT POWER (SYSTEM)</b>	120 Vac, 60 Hz
<b>TESTED BY</b>	Leo Hung		

<b>Channel</b>	<b>Frequency (MHz)</b>	<b>Adjacent Channel Separation</b>	<b>Minimum Limit (MHz)</b>	<b>Pass / Fail</b>
0	2402	1.012MHz	0.866	PASS
39	2441	1.012MHz	0.866	PASS
78	2480	1.012MHz	0.866	PASS

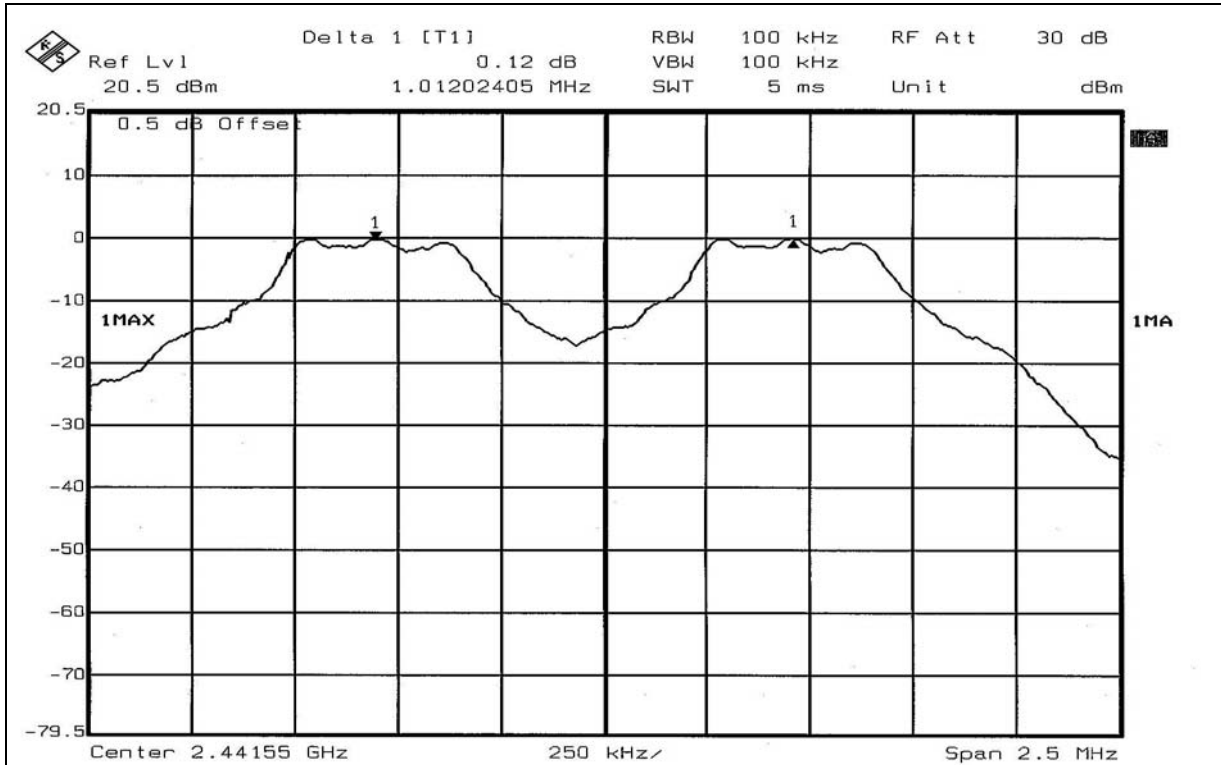
The minimum limit is 20dB bandwidth. Test results please refer to next two pages.



### Channel 0

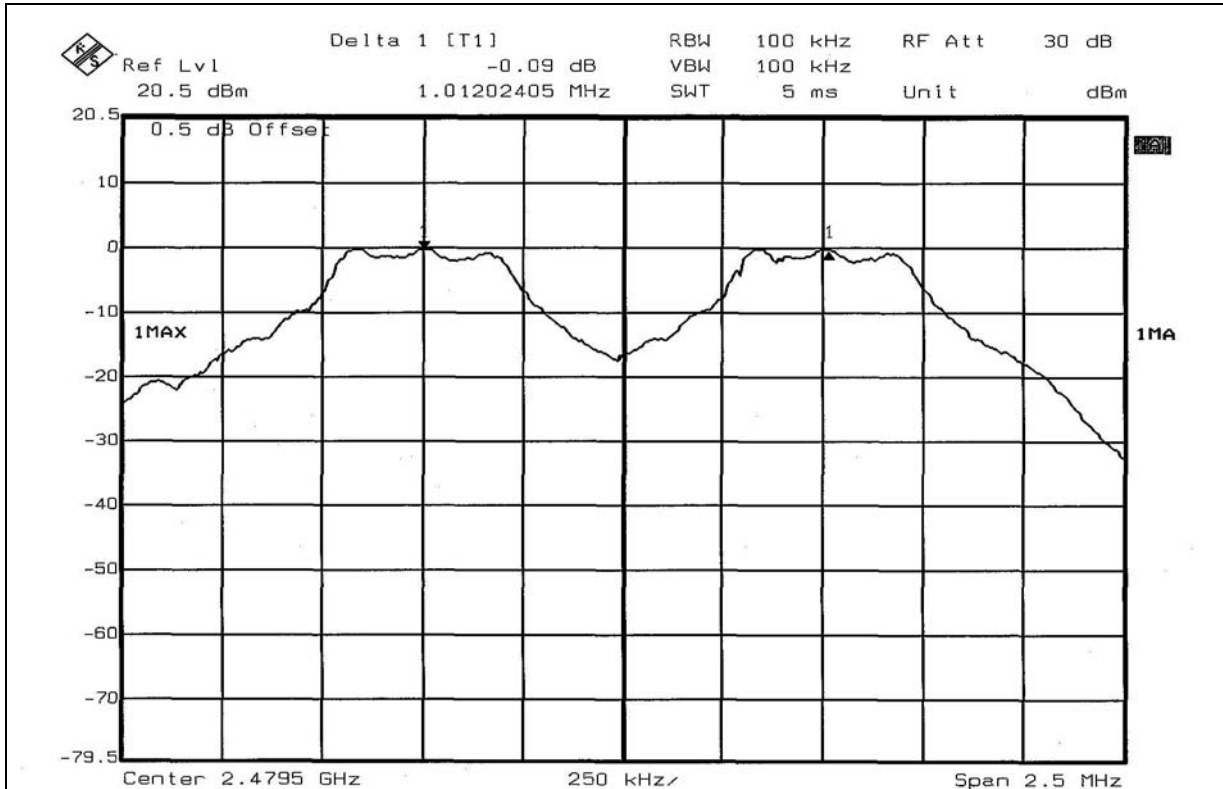


### Channel 39





Channel 78



#### 4.6 MAXIMUM PEAK OUTPUT POWER

##### 4.6.1 LIMITS OF MAXIMUM PEAK OUTPUT POWER MEASUREMENT

The Maximum Peak Output Power Measurement is 30dBm.

##### 4.6.2 INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
SPECTRUM ANALYSEER	FSEK30	100049	Aug. 12, 2005

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



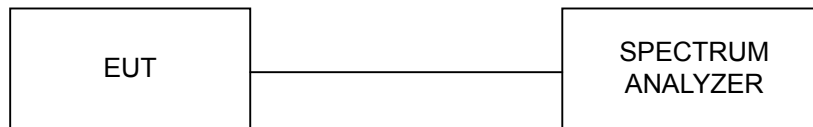
#### 4.6.3 TEST PROCEDURES

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

#### 4.6.4 DEVIATION FROM TEST STANDARD

No deviation

#### 4.6.5 TEST SETUP



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

#### 4.6.6 EUT OPERATING CONDITION

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

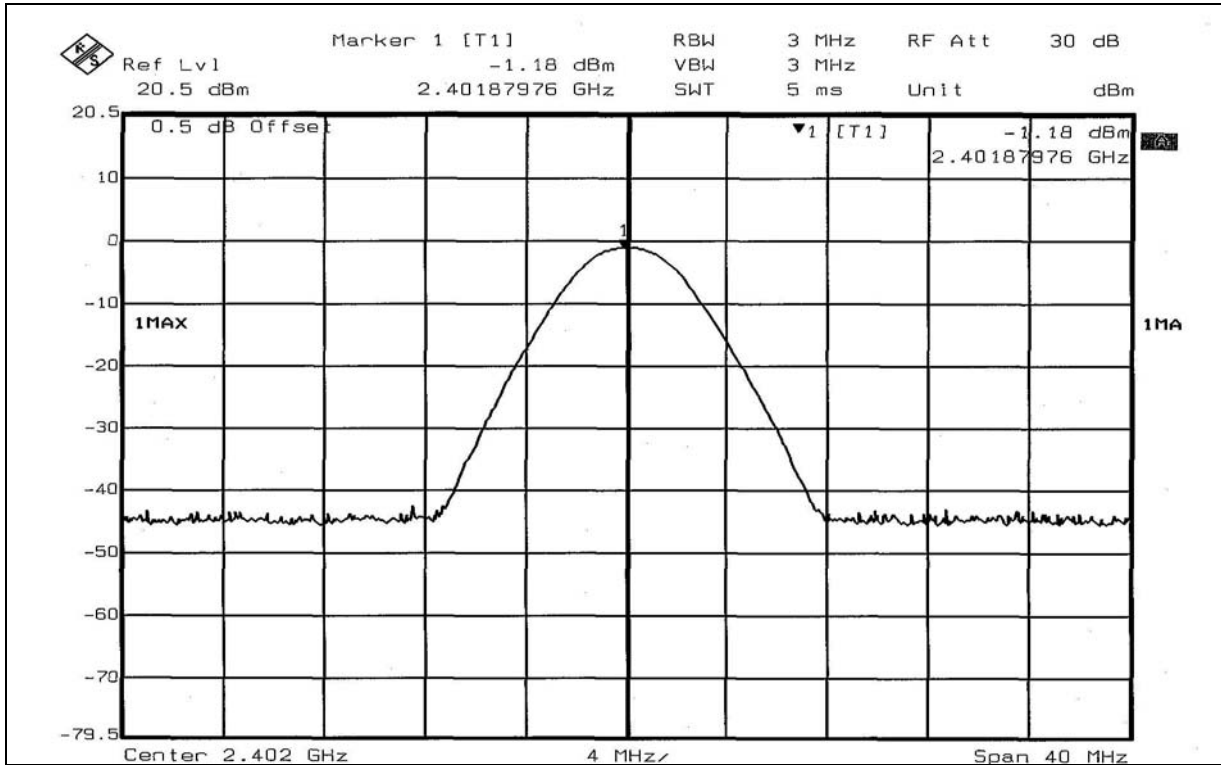
## 4.6.7 TEST RESULTS

<b>EUT</b>	Bluetooth Mini Mouse	<b>MODEL</b>	BT510
<b>ENVIRONMENTAL CONDITIONS</b>	23 deg. C, 69% RH, 991 hPa	<b>INPUT POWER (SYSTEM)</b>	120 Vac, 60 Hz
<b>TESTED BY</b>	Leo Hung		

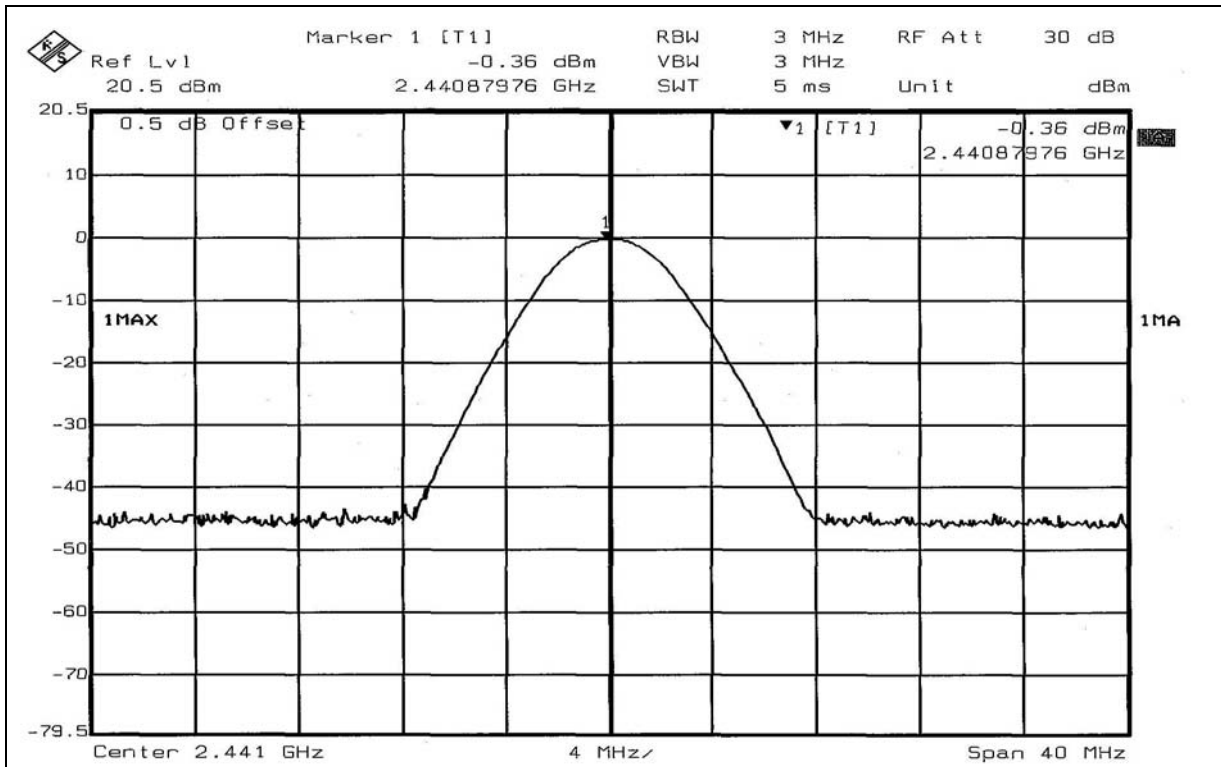
<b>CHANNEL</b>	<b>CHANNEL FREQUENCY (MHz)</b>	<b>PEAK POWER OUTPUT (mW)</b>	<b>PEAK POWER OUTPUT (dBm)</b>	<b>PEAK POWER LIMIT (dBm)</b>	<b>PASS/FAIL</b>
0	2402	0.762	-1.18	30	PASS
39	2441	0.920	-0.36	30	PASS
78	2480	0.920	-0.36	30	PASS



Channel 0

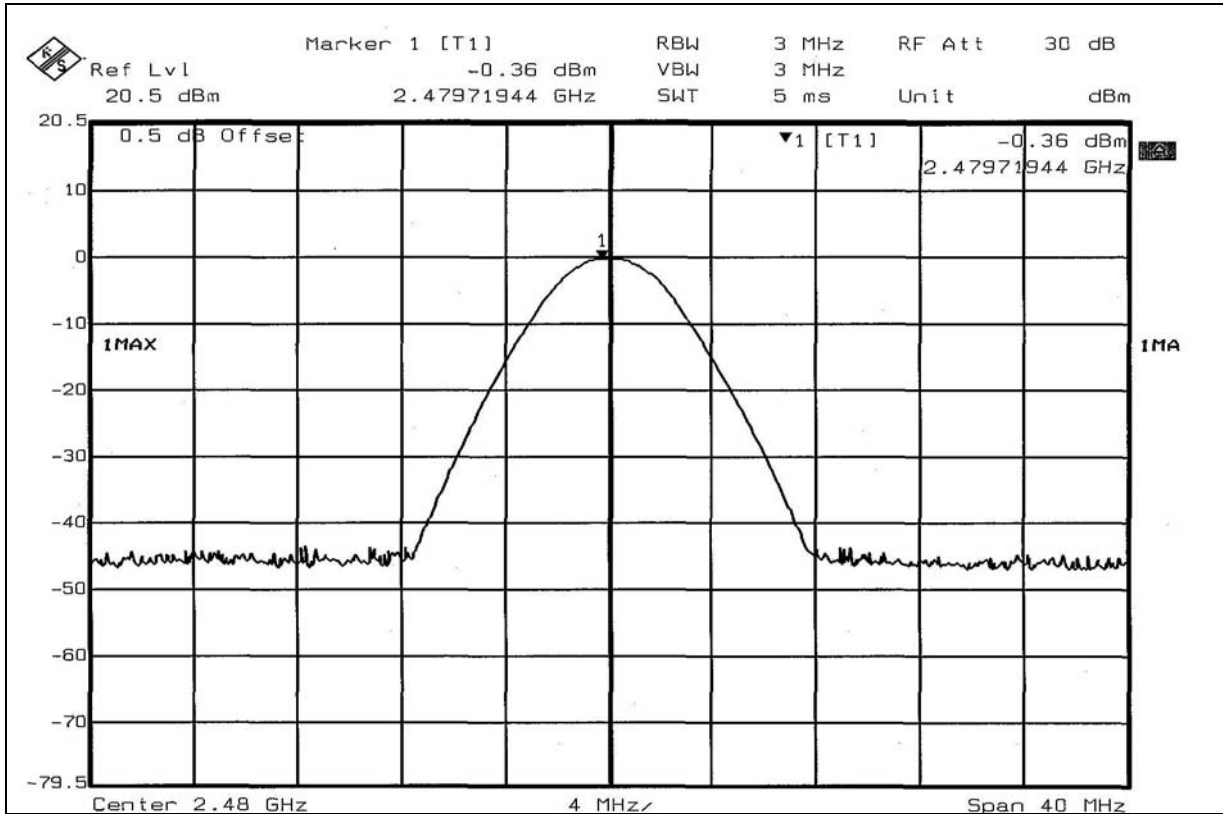


Channel 39





### Channel 78



## 4.7 RADIATED EMISSION MEASUREMENT

### 4.7.1 LIMITS OF RADIATED EMISSION MEASUREMENT

Emissions radiated outside of the specified bands, shall be according to the general radiated limits in 15.209 as following:

Frequencies (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

**NOTE:** The limit for radiated test was performed according to CISPR 22: 1997, which was specified in FCC PART 15B 15.109(g). Also the limits of ICES-003: 2004 and CISPR 22: 1997 are same.

## 4.7.2 TEST INSTRUMENTS

DESCRIPTION & MANUFACTURER	MODEL NO.	SERIAL NO.	CALIBRATED UNTIL
Test Receiver ROHDE & SCHWARZ	ESIB7	100188	Dec. 19, 2005
Spectrum Analyzer ROHDE & SCHWARZ	FSP40	100039	Nov. 21, 2005
BILOG Antenna SCHWARZBECK	VULB9168	9168-157	Feb. 03, 2005
HORN Antenna SCHWARZBECK	BBHA 9120 D	9120D-407	Feb. 03, 2005
HORN Antenna SCHWARZBECK	BBHA 9170	BBHA 9170241	Feb. 23, 2005
Preamplifier Agilent	8449B	3008A01961	Nov. 09, 2005
Preamplifier Agilent	8447D	2944A10629	Nov. 09, 2005
RF signal cable HUBER+SUHNER	SUCOFLEX 104	218182/4	Mar. 04, 2005
RF signal cable HUBER+SUHNER	SUCOFLEX 104	218194/4	Mar. 04, 2005
Software ADT.	ADT_Radiated_V5.14	NA	NA
Antenna Tower ADT.	AT100	AT93021702	NA
Turn Table ADT.	TT100.	TT93021702	NA
Controller ADT.	SC100.	SC93021702	NA

- NOTE:**
1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
  2. The test was performed in HwaYa Chamber 1.
  3. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
  4. The IC Site Registration No. is IC4924-2.



#### 4.7.3 TEST PROCEDURES

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meters semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The antenna is a broadband antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. If the emission level of the EUT in peak mode was 10 dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10 dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

**NOTE:**

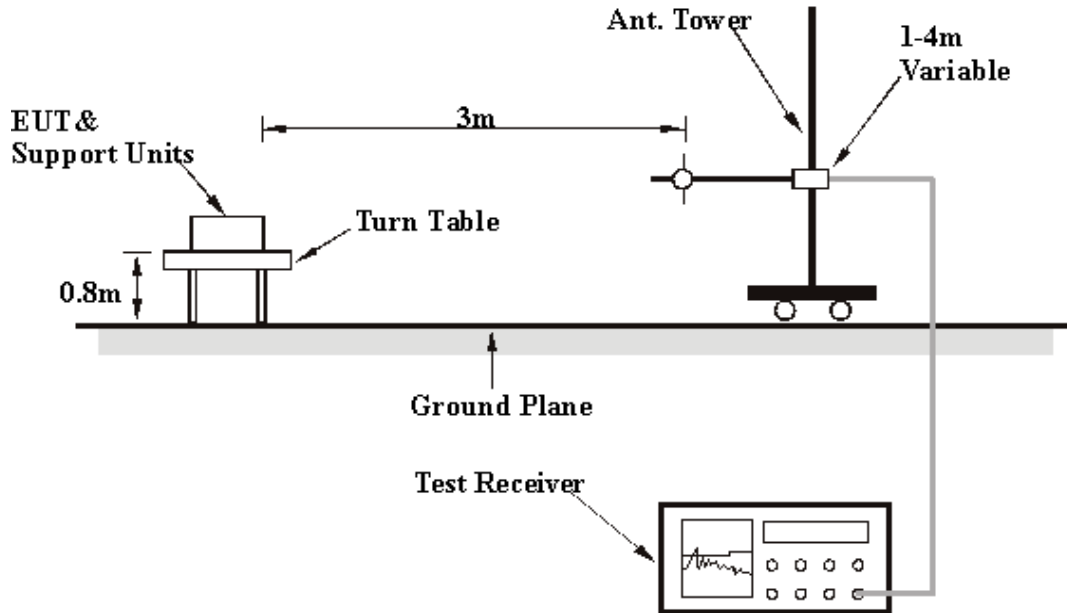
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Peak detection (PK) and Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1 MHz for Peak detection at frequency above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

#### 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

<b>EUT</b>	Bluetooth Mini Mouse	<b>MODEL</b>	BT510
<b>CHANNEL</b>	78	<b>FREQUENCY RANGE</b>	Below 1 GHz
<b>INPUT POWER (SYSTEM)</b>	120 Vac, 60 Hz	<b>DETECTOR FUNCTION</b>	Quasi-Peak
<b>ENVIRONMENTAL CONDITIONS</b>	21 deg. C, 58% RH, 991 hPa	<b>TEST MODE</b>	A
<b>TESTED BY</b>	Match Tsui		

ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	47.49	26.54 QP	40.00	-13.46	2.00 H	319	11.53	15.02
2	117.47	36.39 QP	43.50	-7.11	1.50 H	49	23.61	12.78
3	154.41	34.57 QP	43.50	-8.93	2.00 H	73	19.84	14.73
4	232.16	30.03 QP	46.00	-15.97	1.00 H	25	17.43	12.60
5	249.66	34.11 QP	46.00	-11.89	1.00 H	82	20.88	13.23
6	329.36	28.08 QP	46.00	-17.92	1.00 H	265	12.87	15.20
7	401.28	25.62 QP	46.00	-20.38	2.00 H	136	8.78	16.84
8	455.71	33.19 QP	46.00	-12.81	2.00 H	223	14.99	18.21
9	510.14	29.04 QP	46.00	-16.96	1.50 H	52	10.09	18.95
10	599.56	29.86 QP	46.00	-16.14	1.50 H	331	8.76	21.10
11	733.69	28.14 QP	46.00	-17.86	1.00 H	154	4.95	23.19
12	801.72	32.22 QP	46.00	-13.78	1.50 H	91	8.35	23.87
13	865.87	28.11 QP	46.00	-17.89	1.50 H	127	3.50	24.60

- REMARKS:**
1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB/m)
  2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
  3. The other emission levels were very low against the limit.
  4. Margin value = Emission level – Limit value.

<b>EUT</b>	Bluetooth Mini Mouse	<b>MODEL</b>	BT510
<b>CHANNEL</b>	78	<b>FREQUENCY RANGE</b>	Below 1 GHz
<b>INPUT POWER (SYSTEM)</b>	120 Vac, 60 Hz	<b>DETECTOR FUNCTION</b>	Quasi-Peak
<b>ENVIRONMENTAL CONDITIONS</b>	21 deg. C, 58% RH, 991 hPa	<b>TEST MODE</b>	A
<b>TESTED BY</b>	Match Tsui		

### ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	47.49	38.84 QP	40.00	-1.16	1.00 V	142	23.82	15.02
2	70.82	29.35 QP	40.00	-10.65	1.00 V	19	16.98	12.37
3	115.53	29.42 QP	43.50	-14.08	1.00 V	289	16.84	12.58
4	154.41	26.80 QP	43.50	-16.70	1.00 V	301	12.07	14.73
5	249.66	34.89 QP	46.00	-11.11	1.50 V	4	21.66	13.23
6	344.91	26.91 QP	46.00	-19.09	1.00 V	340	11.35	15.56
7	401.28	26.64 QP	46.00	-19.36	1.50 V	340	9.79	16.84
8	455.71	30.57 QP	46.00	-15.43	1.00 V	313	12.36	18.21
9	566.51	26.94 QP	46.00	-19.06	1.00 V	103	6.73	20.21
10	630.66	26.60 QP	46.00	-19.40	1.00 V	352	5.08	21.52
11	733.69	25.98 QP	46.00	-20.02	1.00 V	76	2.78	23.19
12	801.72	28.92 QP	46.00	-17.08	1.50 V	43	5.05	23.87
13	935.85	28.61 QP	46.00	-17.39	1.00 V	58	2.95	25.66

- REMARKS:**
1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB/m)
  2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
  3. The other emission levels were very low against the limit.
  4. Margin value = Emission level – Limit value.

<b>EUT</b>	Bluetooth Mini Mouse	<b>MODEL</b>	BT510
<b>CHANNEL</b>	78	<b>FREQUENCY RANGE</b>	Below 1 GHz
<b>INPUT POWER (SYSTEM)</b>	120 Vac, 60 Hz	<b>DETECTOR FUNCTION</b>	Quasi-Peak
<b>ENVIRONMENTAL CONDITIONS</b>	21 deg. C, 58% RH, 991 hPa	<b>TEST MODE</b>	<b>B</b>
<b>TESTED BY</b>	Match Tsui		

#### ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	47.49	25.63 QP	40.00	-14.37	2.00 H	13	10.62	15.02
2	117.47	38.23 QP	43.50	-5.27	1.50 H	76	25.45	12.78
3	160.24	30.06 QP	43.50	-13.44	1.50 H	70	15.22	14.84
4	214.67	27.10 QP	43.50	-16.40	1.50 H	223	15.38	11.72
5	249.66	33.25 QP	46.00	-12.75	1.00 H	217	20.02	13.23
6	331.30	27.05 QP	46.00	-18.95	1.00 H	43	11.80	15.25
7	455.71	26.82 QP	46.00	-19.18	1.50 H	325	8.61	18.21
8	599.56	28.02 QP	46.00	-17.98	1.50 H	106	6.92	21.10
9	733.69	27.61 QP	46.00	-18.39	1.00 H	145	4.41	23.19
10	801.72	29.31 QP	46.00	-16.69	1.00 H	112	5.44	23.87
11	865.87	27.52 QP	46.00	-18.48	1.50 H	118	2.92	24.60
12	978.62	27.65 QP	54.00	-26.35	1.50 H	217	1.75	25.91

- REMARKS:**
1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB/m)
  2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
  3. The other emission levels were very low against the limit.
  4. Margin value = Emission level – Limit value.

<b>EUT</b>	Bluetooth Mini Mouse	<b>MODEL</b>	BT510
<b>CHANNEL</b>	78	<b>FREQUENCY RANGE</b>	Below 1 GHz
<b>INPUT POWER (SYSTEM)</b>	120 Vac, 60 Hz	<b>DETECTOR FUNCTION</b>	Quasi-Peak
<b>ENVIRONMENTAL CONDITIONS</b>	21 deg. C, 58% RH, 991 hPa	<b>TEST MODE</b>	<b>B</b>
<b>TESTED BY</b>	Match Tsui		

#### ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	47.49	37.13 QP	40.00	-2.87	1.00 V	157	22.11	15.02
2	117.47	29.25 QP	43.50	-14.25	1.50 V	262	16.47	12.78
3	142.75	28.22 QP	43.50	-15.28	1.00 V	313	13.76	14.46
4	160.24	26.96 QP	43.50	-16.54	1.50 V	358	12.12	14.84
5	249.66	35.44 QP	46.00	-10.56	2.00 V	10	22.21	13.23
6	329.36	25.86 QP	46.00	-20.14	1.50 V	325	10.66	15.20
7	401.28	27.17 QP	46.00	-18.83	1.50 V	313	10.33	16.84
8	455.71	28.90 QP	46.00	-17.10	1.00 V	343	10.69	18.21
9	510.14	27.11 QP	46.00	-18.89	1.00 V	322	8.16	18.95
10	605.39	27.52 QP	46.00	-18.48	1.50 V	358	6.34	21.18
11	733.69	26.87 QP	46.00	-19.13	1.00 V	85	3.67	23.19
12	801.72	26.89 QP	46.00	-19.11	1.50 V	145	3.02	23.87
13	933.91	27.49 QP	46.00	-18.51	1.00 V	58	1.86	25.64

- REMARKS:**
1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB/m)
  2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
  3. The other emission levels were very low against the limit.
  4. Margin value = Emission level – Limit value.



<b>EUT</b>	Bluetooth Mini Mouse	<b>MODEL</b>	BT510
<b>CHANNEL</b>	0	<b>FREQUENCY RANGE</b>	1 ~ 25 GHz
<b>INPUT POWER (SYSTEM)</b>	120 Vac, 60 Hz	<b>DETECTOR FUNCTION</b>	Peak(PK) Average (AV)
<b>ENVIRONMENTAL CONDITIONS</b>	21 deg. C, 62 % RH, 991 hPa	<b>TESTED BY</b>	Match Tsui

<b>ANTENNA POLARITY &amp; TEST DISTANCE: HORIZONTAL AT 3 M</b>								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1201.00	46.25 PK	74.00	-27.75	1.23 H	62	18.91	27.34
1	1201.00	16.25 AV	54.00	-37.75	1.23 H	62	-11.09	27.34
2	*2402.00	96.38 PK			1.09 H	211	65.54	30.84
2	*2402.00	66.38 AV			1.09 H	211	35.54	30.84
3	4804.00	48.12 PK	74.00	-25.88	1.01 H	126	11.74	36.38
3	4804.00	18.12 AV	54.00	-35.88	1.01 H	126	-18.26	36.38

<b>ANTENNA POLARITY &amp; TEST DISTANCE: VERTICAL AT 3 M</b>								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1201.00	39.76 PK	74.00	-34.24	1.30 V	355	12.42	27.34
1	1201.00	9.76 AV	54.00	-44.24	1.30 V	355	-17.58	27.34
2	*2402.00	94.69 PK			1.22 V	360	63.85	30.84
2	*2402.00	64.69 AV			1.22 V	360	33.85	30.84
3	4804.00	49.30 PK	74.00	-24.70	1.09 V	1	12.92	36.38
3	4804.00	19.30 AV	54.00	-34.70	1.09 V	1	-17.08	36.38

- REMARKS:**
1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB/m)
  2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
  3. The other emission levels were very low against the limit.
  4. Margin value = Emission level – Limit value.
  5. “ \* “ : Fundamental frequency
  6. The DH5 packet was the worse case duty cycle for a transmit dwell time on a channel, based upon bluetooth theory the transmitter is on 0.625\*5 per 247 ms per channel. Therefore, the duty cycle be equal to:  $20\log(3.125/100) = -30$  dB
  7. Average value = peak reading  $-20\log(\text{duty cycle})$

<b>EUT</b>	Bluetooth Mini Mouse	<b>MODEL</b>	BT510
<b>CHANNEL</b>	39	<b>FREQUENCY RANGE</b>	1 ~ 25 GHz
<b>INPUT POWER (SYSTEM)</b>	120 Vac, 60 Hz	<b>DETECTOR FUNCTION</b>	Peak(PK) Average (AV)
<b>ENVIRONMENTAL CONDITIONS</b>	21 deg. C, 62 % RH, 991 hPa	<b>TESTED BY</b>	Match Tsui

#### ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1221.00	45.53 PK	74.00	-28.47	1.09 H	229	18.09	27.44
1	1221.00	15.53 AV	54.00	-38.47	1.09 H	229	-11.91	27.44
2	*2441.00	97.64 PK			1.07 H	208	66.64	31.00
2	*2441.00	67.64 AV			1.07 H	208	36.64	31.00
3	4882.00	46.93 PK	74.00	-27.07	1.00 H	117	10.30	36.63
3	4882.00	16.93 AV	54.00	-37.07	1.00 H	117	-19.70	36.63

#### ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M

No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1221.00	41.60 PK	74.00	-32.40	1.30 V	135	14.16	27.44
1	1221.00	11.60 AV	54.00	-42.40	1.30 V	135	-15.84	27.44
2	*2441.00	93.92 PK			1.00 V	257	62.92	31.00
2	*2441.00	63.92 AV			1.00 V	257	32.92	31.00
3	4882.00	45.64 PK	74.00	-28.36	1.07 V	192	9.01	36.63
3	4882.00	15.64 AV	54.00	-38.36	1.07 V	192	-20.99	36.63

- REMARKS:**
1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB/m)
  2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
  3. The other emission levels were very low against the limit.
  4. Margin value = Emission level – Limit value.
  5. “ \* “ : Fundamental frequency
  6. The DH5 packet was the worse case duty cycle for a transmit dwell time on a channel, based upon bluetooth theory the transmitter is on 0.625\*5 per 247 ms per channel. Therefore, the duty cycle be equal to:  $20\log(3.125/100) = -30$  dB
  7. Average value = peak reading  $-20\log(\text{duty cycle})$



<b>EUT</b>	Bluetooth Mini Mouse	<b>MODEL</b>	BT510
<b>CHANNEL</b>	78	<b>FREQUENCY RANGE</b>	1 ~ 25 GHz
<b>INPUT POWER (SYSTEM)</b>	120 Vac, 60 Hz	<b>DETECTOR FUNCTION</b>	Peak(PK) Average (AV)
<b>ENVIRONMENTAL CONDITIONS</b>	21 deg. C, 62 % RH, 991 hPa	<b>TESTED BY</b>	Match Tsui

<b>ANTENNA POLARITY &amp; TEST DISTANCE: HORIZONTAL AT 3 M</b>								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1240.00	44.58 PK	74.00	-29.42	1.15 H	234	17.04	27.54
1	1240.00	15.58 AV	54.00	-39.42	1.15 H	234	-11.96	27.54
2	*2480.00	98.16 PK			1.07 H	211	67.00	31.16
2	*2480.00	68.16 AV			1.07 H	211	37.00	31.16
3	4960.00	46.97 PK	74.00	-27.03	1.12 H	121	10.00	36.97
3	4960.00	16.97 AV	54.00	-37.03	1.12 H	121	-20.00	36.97

<b>ANTENNA POLARITY &amp; TEST DISTANCE: VERTICAL AT 3 M</b>								
No.	Freq. (MHz)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (m)	Table Angle (Degree)	Raw Value (dBuV)	Correction Factor (dB/m)
1	1240.00	39.58 PK	74.00	-34.42	1.24 V	331	12.04	27.54
1	1240.00	9.58 AV	54.00	-44.42	1.24 V	331	-17.96	27.54
2	*2480.00	93.76 PK			1.19 V	335	62.60	31.16
2	*2480.00	63.76 AV			1.19 V	335	32.60	31.16
3	4960.00	47.93 PK	74.00	-26.07	1.03 V	1	10.96	36.97
3	4960.00	17.93 AV	54.00	-36.07	1.03 V	1	-19.04	36.97

- REMARKS:**
1. Emission level(dBuV/m)=Raw Value(dBuV) + Correction Factor(dB/m)
  2. Correction Factor(dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
  3. The other emission levels were very low against the limit.
  4. Margin value = Emission level – Limit value.
  5. “ \* “ : Fundamental frequency
  6. The DH5 packet was the worse case duty cycle for a transmit dwell time on a channel, based upon bluetooth theory the transmitter is on 0.625\*5 per 247 ms per channel. Therefore, the duty cycle be equal to:  $20\log(3.125/100) = -30$  dB
  7. Average value = peak reading  $-20\log(\text{duty cycle})$



## 4.8 BAND EDGES MEASUREMENT

### 4.8.1 LIMITS OF BAND EDGES MEASUREMENT

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

### 4.8.2 TEST INSTRUMENTS

Description & Manufacturer	Model No.	Serial No.	Calibrated Until
SPECTRUM ANALYZER	FSEK30	100049	Aug. 12, 2005

#### NOTES:

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

### 4.8.3 TEST PROCEDURE

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

### 4.8.4 DEVIATION FROM TEST STANDARD

No deviation.

#### 4.8.5 EUT OPERATING CONDITION

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

#### 4.8.6 TEST RESULTS

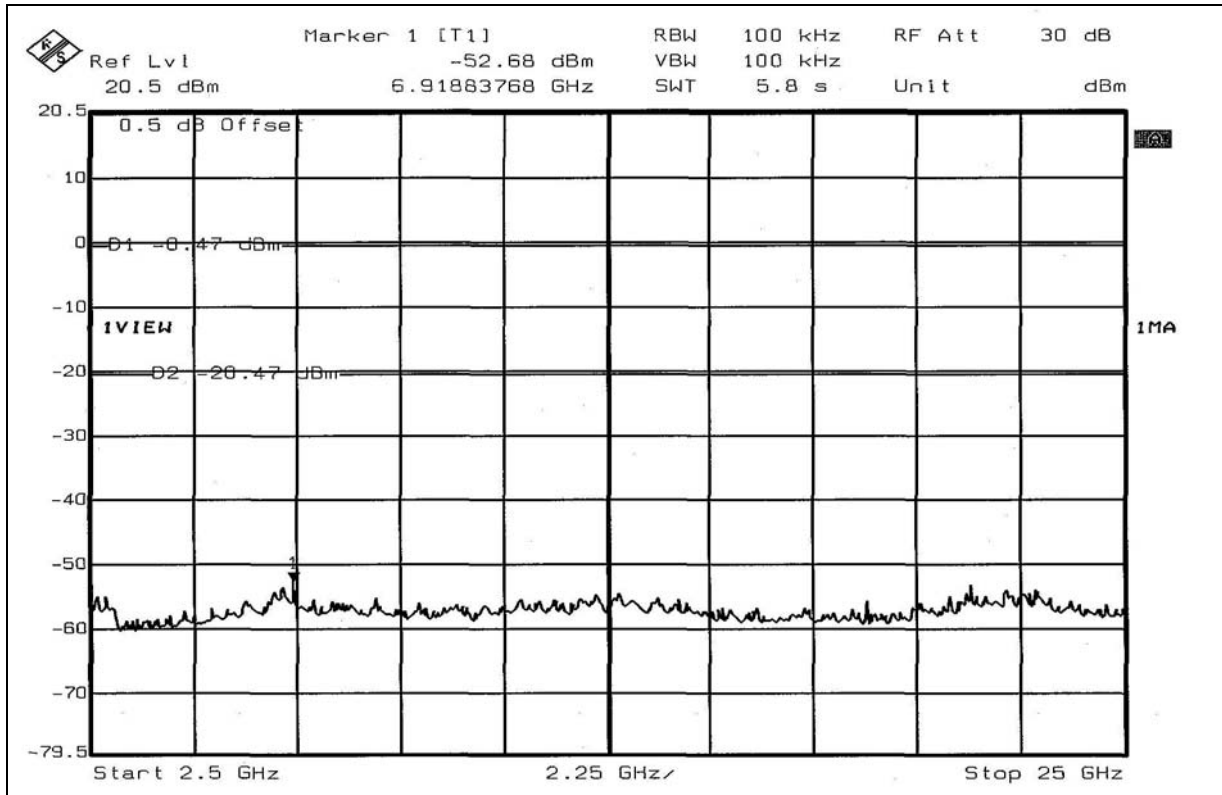
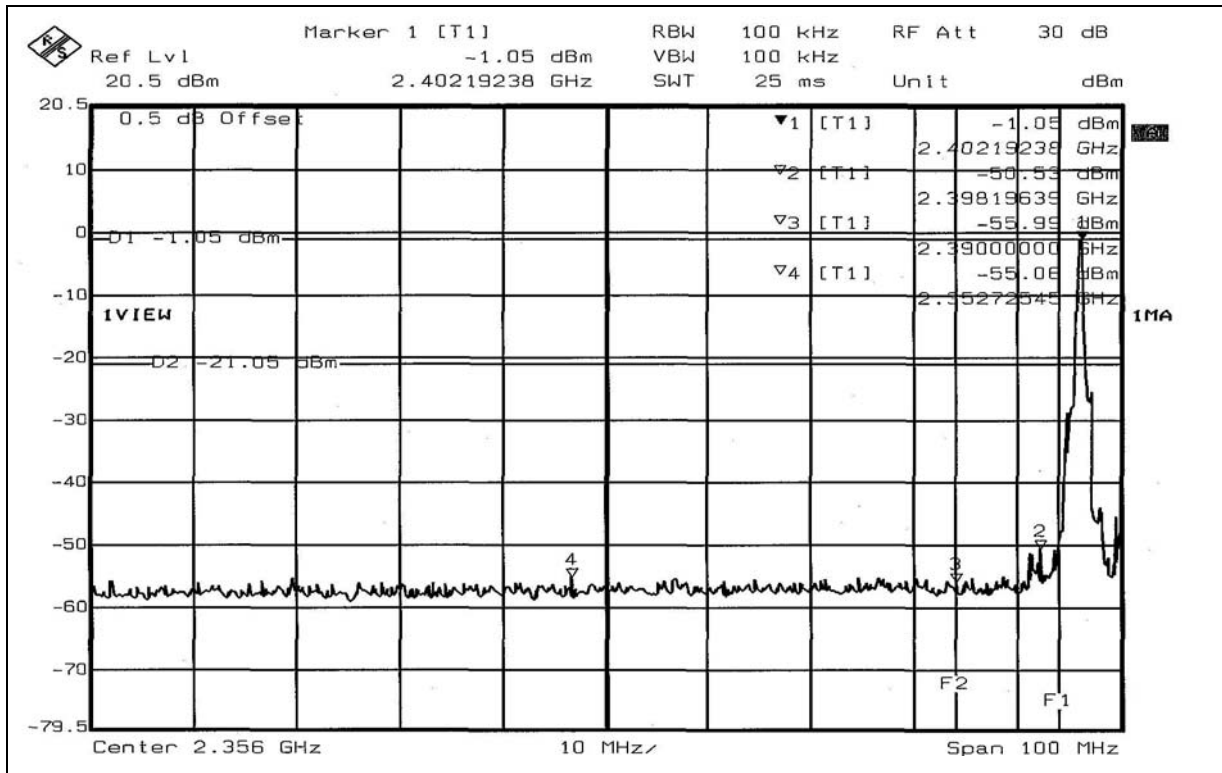
The spectrum plots are attached on the following 4 images. D2 line indicates the highest level, D1 line indicates the 20dB offset below D2. It shows compliance with the requirement in part 15.247(d).

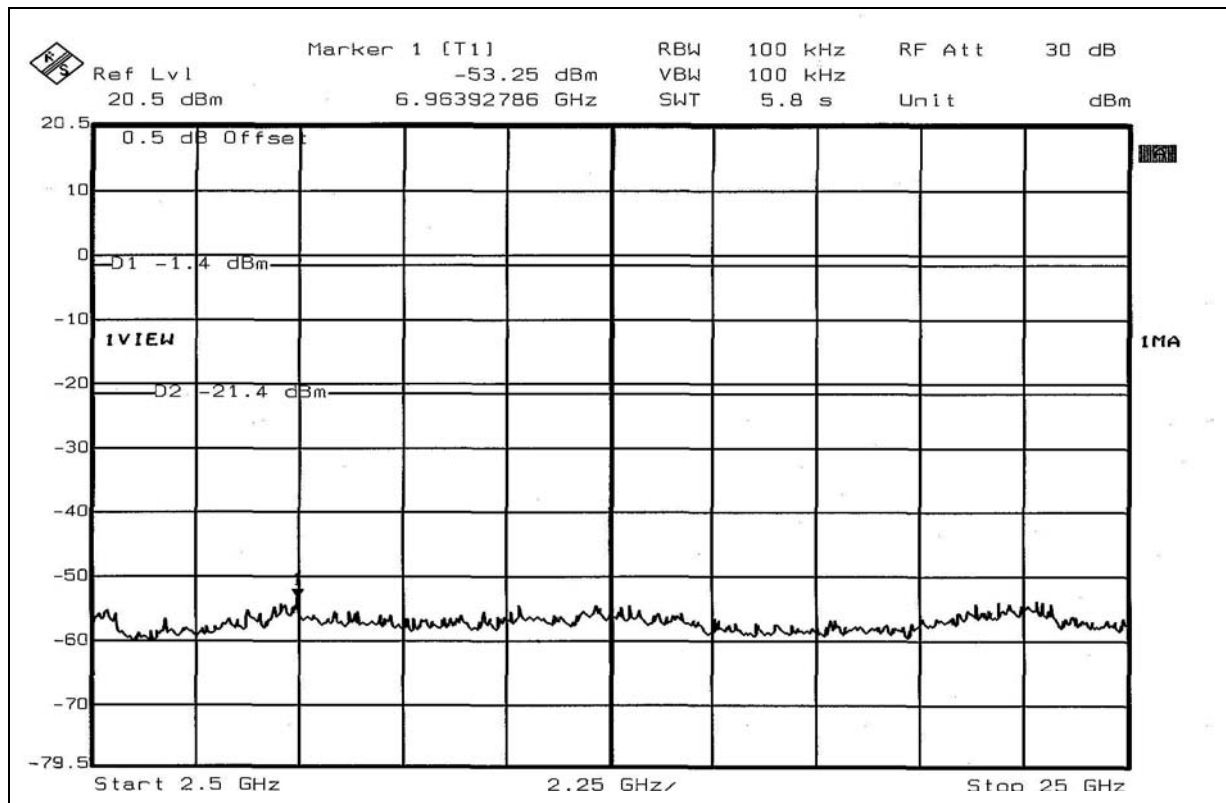
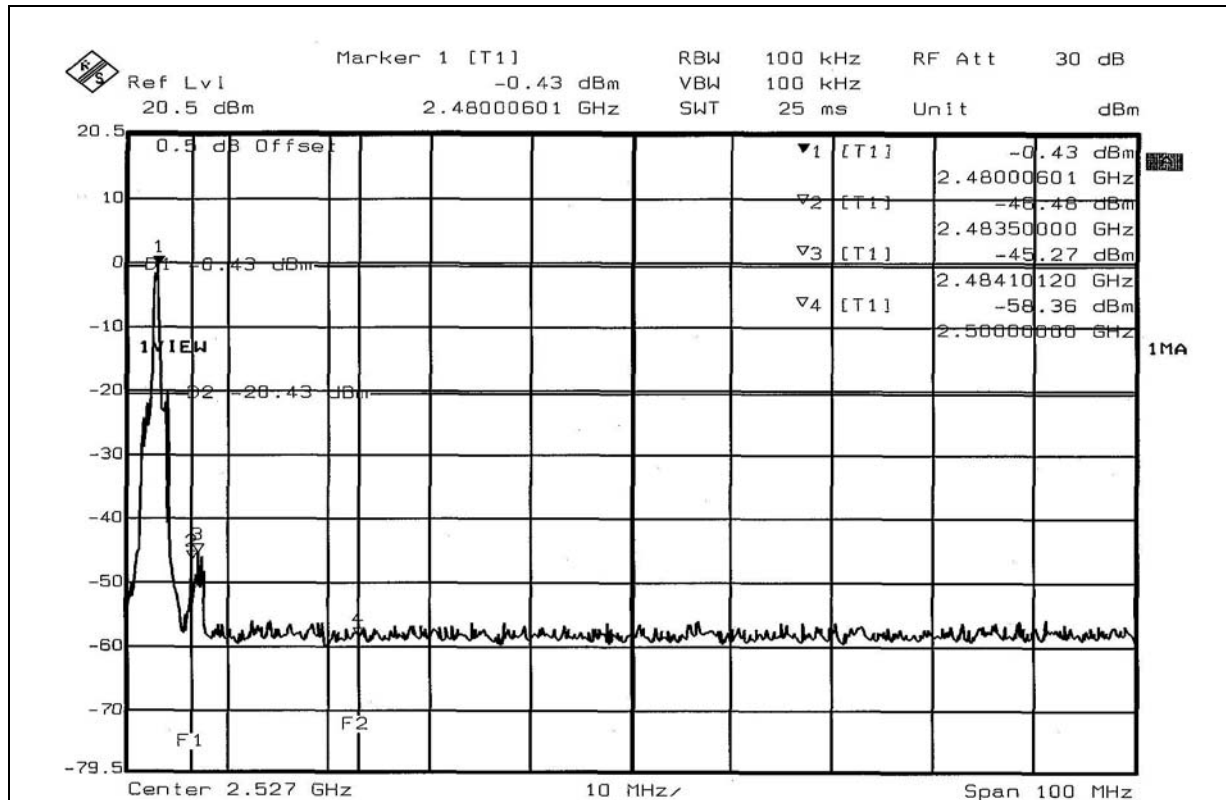
**NOTE1:** The band edge emission plot on page 58 shows 54.03dB between carrier maximum power and local maximum emission in restrict band (2.3527GHz). The emission of carrier strength list in the test result of channel 0 at the item 4.7.6 is 96.38dBuV/m (Peak), so the maximum field strength in restrict band is  $96.38 - 54.03 = 42.35$  dBuV/m which is under 74 dBuV/m limit.

The band edge emission plot on page 58 shows 54.03dB between carrier maximum power and local maximum emission in restrict band (2.3527GHz). The emission of carrier strength list in the test result of channel 0 at the item 4.7.6 is 66.38dBuV/m (Average), so the maximum field strength in restrict band is  $66.38 - 54.03 = 12.35$  dBuV/m which is under 54 dBuV/m limit.

**NOTE2:** The band edge emission plot on page 59 shows 44.84dB between carrier maximum power and local maximum emission in restrict band (2.4841GHz). The emission of carrier strength list in the test result of channel 78 at the item 4.7.6 is 98.16dBuV/m (Peak), so the maximum field strength in restrict band is  $98.16 - 44.84 = 53.32$  dBuV/m which is under 74 dBuV/m limit.

The band edge emission plot on page 59 shows 44.84dB between carrier maximum power and local maximum emission in restrict band (2.4841GHz). The emission of carrier strength list in the test result of channel 78 at the item 4.7.6 is 68.16dBuV/m (Average), so the maximum field strength in restrict band is  $68.16 - 44.84 = 23.32$  dBuV/m which is under 54 dBuV/m limit.







## **4.9 ANTENNA REQUIREMENT**

### **4.9.1 STANDARD APPLICABLE**

For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

And according to FCC 47 CFR Section 15.247 (b), if transmitting antennas of directional gain greater than 6 dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

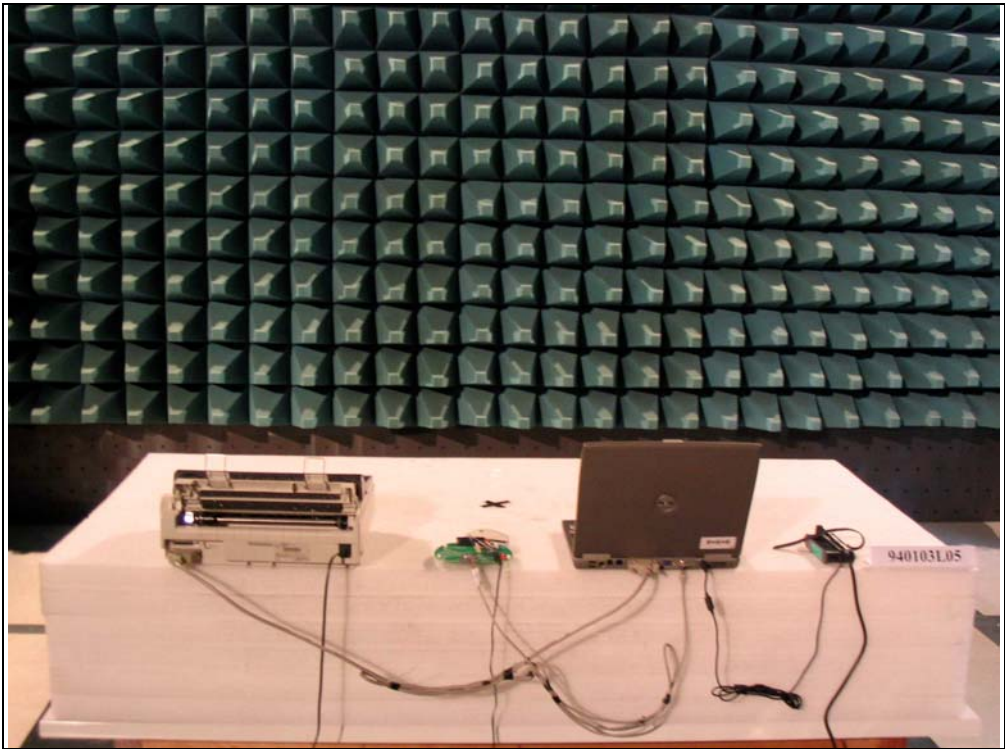
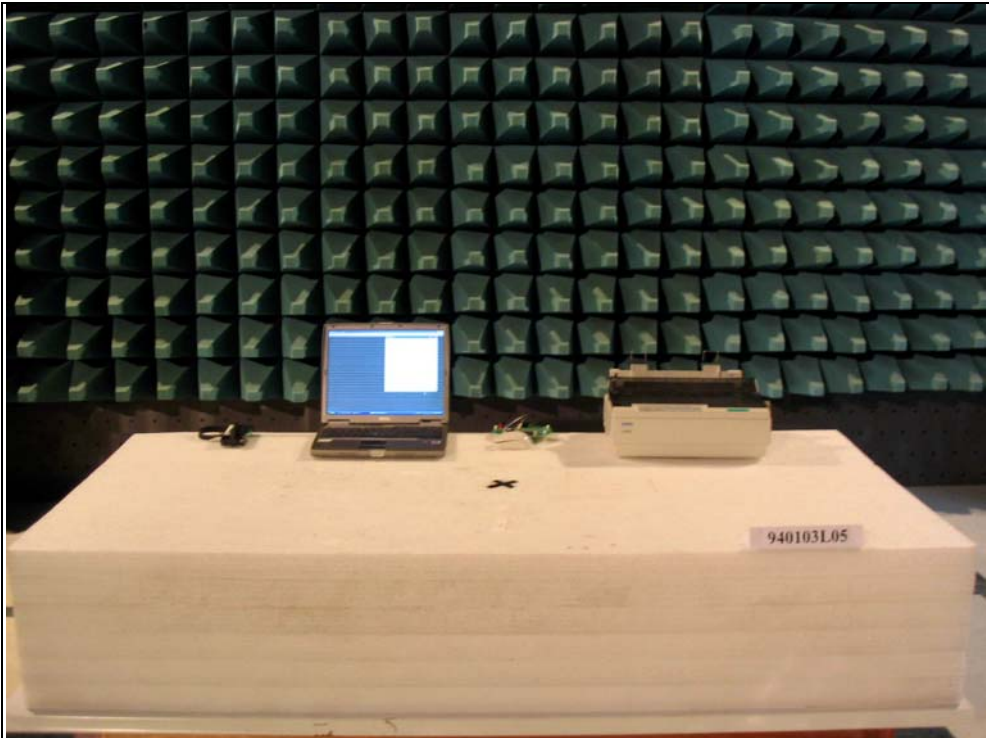
### **4.9.2 ANTENNA CONNECTED CONSTRUCTION**

The antenna used in this product is printed antenna without antenna connector. The maximum gain of this antenna is  $-4.38$  dBi.

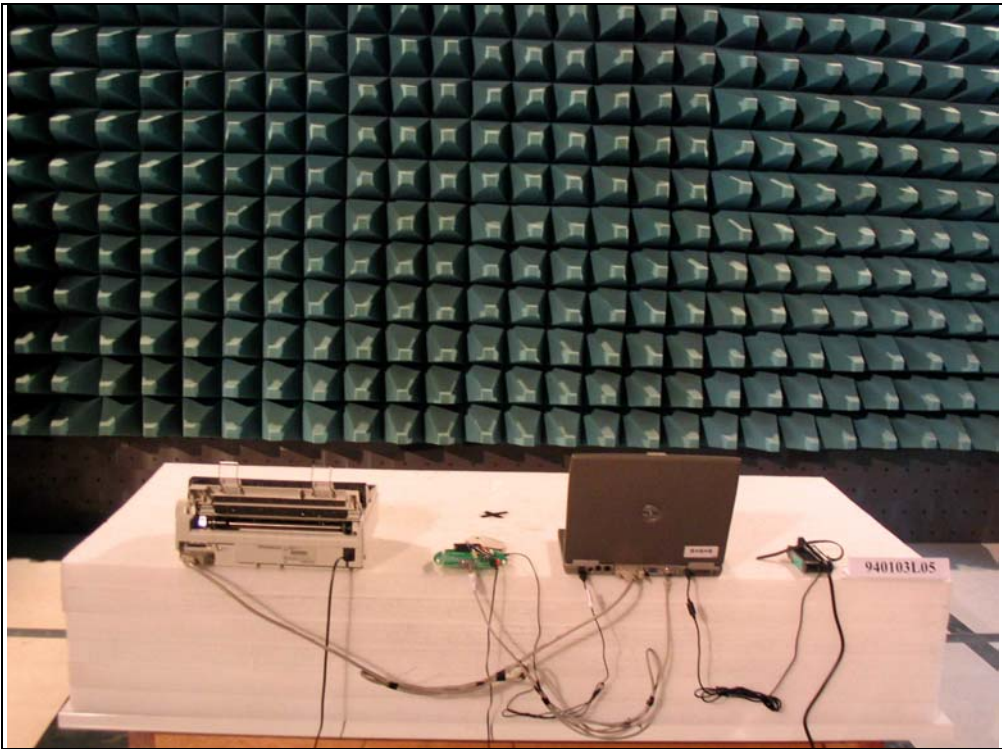
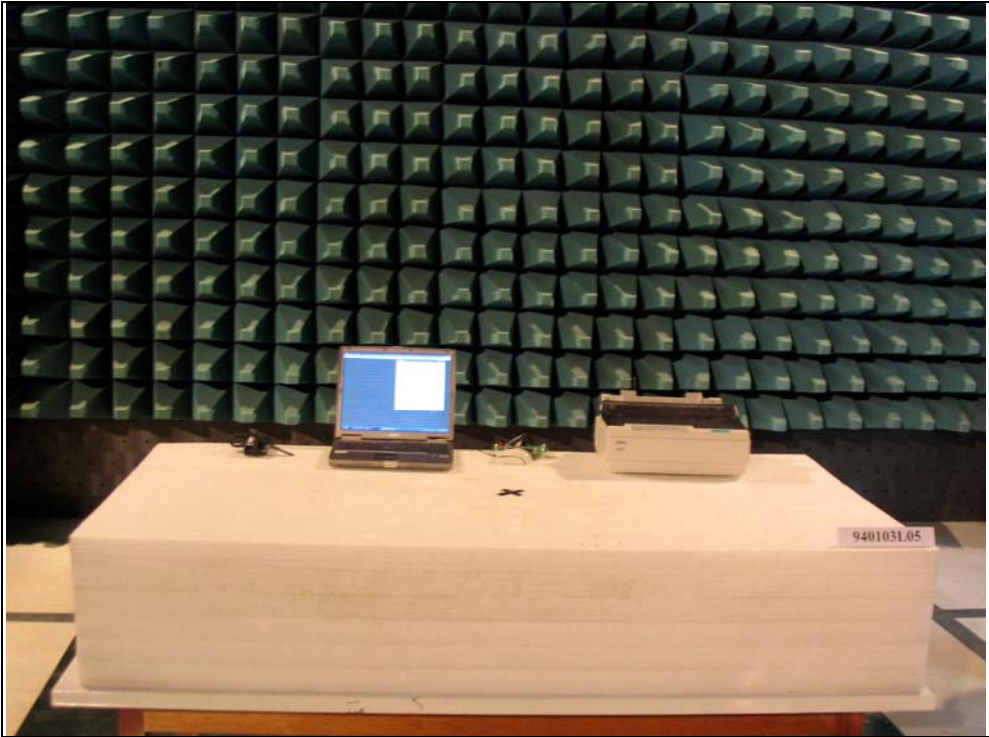
### 5 PHOTOGRAPHS OF THE TEST CONFIGURATION CONDUCTED EMISSION TEST



RADIATED EMISSION TEST  
Test Mode A



Test Mode B







## 6 INFORMATION ON THE TESTING LABORATORIES

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

<b>USA</b>	FCC, NVLAP, UL, A2LA
<b>Germany</b>	TUV Rheinland
<b>Japan</b>	VCCI
<b>Norway</b>	NEMKO
<b>Canada</b>	INDUSTRY CANADA , CSA
<b>R.O.C.</b>	CNLA, BSMI, DGT
<b>Netherlands</b>	Telefication
<b>Singapore</b>	PSB , GOST-ASIA(MOU)
<b>Russia</b>	CERTIS(MOU)

Copies of accreditation certificates of our laboratories obtained from approval agencies can be downloaded from our web site: [www.adt.com.tw/index.5/phtml](http://www.adt.com.tw/index.5/phtml).  
If you have any comments, please feel free to contact us at the following:

**Linko EMC/RF Lab:**

Tel: 886-2-26052180  
Fax: 886-2-26052943

**Hsin Chu EMC/RF Lab:**

Tel: 886-3-5935343  
Fax: 886-3-5935342

**Hwa Ya EMC/RF/Safety/Telecom Lab:**

Tel: 886-3-3183232  
Fax: 886-3-3185050

**Linko RF Lab.**

Tel: 886-3-3270910  
Fax: 886-3-3270892

**Web Site:** [www.adt.com.tw](http://www.adt.com.tw)

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