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RFI / EMI TEST REPORT

APPLICANT	:	**WONDE PROUD TECHNOLOGY CO., LTD.**
E U T Type	:	**Bluetooth GPS Receiver**
MODEL NO.	:	**GPS BT-77**
FCC ID	:	**SRKWPBT77X**
REGULATION	:	CFR 47 , Part 15 Subpart C , **Class B**
TEST SITE	:	PEP Testing Laboratory
TEST ENGINEER	:	Barry Ma
TEST DATE	:	DEC. 07, 2004
ISSUED DATE	:	DEC. 15, 2004
REPORT NO.	:	E930751

VERIFICATION

WE HEREBY VERIFY THAT:

The EUT listed below has completed RFI testing by PEP Testing Laboratory and it does comply with the limitation of FCC Part 15, Section 15.247 limitations .

The tested configurations and the facility complies with the radiated and AC line conducted test site criteria in ANSI C63 . 4 - 2001 .

Any data in this RFI report is " **reference** " only .

APPLICANT : WONDE PROUD TECHNOLOGY CO., LTD.
PRODUCT : Bluetooth GPS Receiver
FCC ID : SRKWPBT77X
MODEL : GPS BT-77

M. Y. Tsui

M. Y. TSUI / President

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Ⅰ. General Information

The equipment under test (EUT) is Bluetooth GPS Receiver, FCC ID: SRKWPBT77X, model GPS BT-77. The EUT can be used to work for the applications such as car navigation purpose. The working frequency is 2.402GHz-2.480GHz. DC 3.7V from battery or DC 5.3V from AC-DC adaptor is required to operate EUT. For more detail specification about EUT, please refer to the user's manual.

Test method: According to the major function designed, the EUT placement on test table was arranged alone to proceed with test. The test was carried out on EUT operational condition of Tx-On mode: continuous transmission state. The worst-case test result of each test mode was recorded and provided in this report.

At the frequencies where the peak values of the emission exceeded the quasi-peak limit, the emissions were also measured with the quasi-peak detectors. The average detector also measured the emission either (A) quasi-peak values were under quasi-peak limit but exceeded average limit, or (B) peak values were under quasi-peak limit but exceeded average limit.

1.1 Description of EUT

EUT Type : Bluetooth GPS Receiver
FCC ID : SRKWPBT77X
EUT Model No. : GPS BT-77

Frequency Range : 2.402～2.480GHz
Support Channel : 79 channels
Modulation : QBSK
Antenna Type : Comply with FCC Part 15, Section 15.203;
Build-in PCB trace type, can't be removed by the user
Power Supply : 1) Manufacturer : DVE
Model No. : DSA-0051-05C FUS 53050F
Input : AC 100~240V, 0.2A
Output : DC 5.3V, 0.5A

Power Cord : N/A

1.2 Supporting Devices for EUT testing

1. Personal Computer (PC3)

CPU : Intel P4 Socket 478 1.6GHz
FCC ID： Declaration of Conformity(DoC)
Manufacturer： LEMEL
Model Number： LMIH1A2
Power Supply： Switching
Power Cord： Non-Shielded, Detachable, 1.8m
Data Cable： N/A

2. Keyboard (KBS1 PS/2)

FCC ID： E5XKB5121WTH0110
Manufacturer： BTC
Model Number： 5121W
Power Supply： +5Vdc from PS2 of PC
Power Cord： N/A
Data Cable： **1 >** Shielded , Non-detachable,1.6m
2 > Back Shell : Metal

3. Monitor (MON1 15”)

FCC ID： Declaration of Conformity(DoC)
Manufacturer： SAMSUNG
Model Number： 550S
Power Supply： Switching
Power Cord： Non-Shielded, Detachable, 1.8m
Data Cable： **1 >** Shielded , Non-detachable,1.2m
2 > Back Shell : Metal

4. Printer (PRN1)

FCC ID： B94C2642X
Manufacturer： Hewlett-Packard
Model Number： C2642E
Power Supply： Linear, 30Vdc O/P
Power Cable： Non-Shielded , Detachable,1.8m
Data Cable： **1 >** Shielded , Detachable,1.2m
2 > Back Shell : Metal

5. Modem (MOD1) × 2

FCC ID：IFAXDM1414
Manufacturer：ACEEX
Model Number：1414
Power Supply：Linear, 9Vac O/P
Power Cable：Non-Shielded , Detachable,1.7m
Data Cable：**1 >** Shielded , Detachable,1m
2 > Back Shell : Metal

6. Mouse (MOUS/1 PS/2)

FCC ID：DZL211106
Manufacturer：LOGITECH
Model Number：M-S43
Power Supply：+5Vdc from PS2 of PC
Power Cord：N/A
Data Cable：**1 >** Shielded , Non-detachable,1.8m
2 > Back Shell : Metal

1.3 EUT Test Setup Configuration

(A)Test Procedure: As required by ANSI C63.4 (2001)

(B)Channel Verification: In order to force selection of the typical channels for testing, Dungle was connected PC through USB interface and using the driver "CSR BlueSuite", under WinXP to force the channel selection by control PC, then set the EUT in high power and continuously transmitting mode for detecting the operating frequency, the test result for 79 channels is operating within 2.402～2.480GHz band.

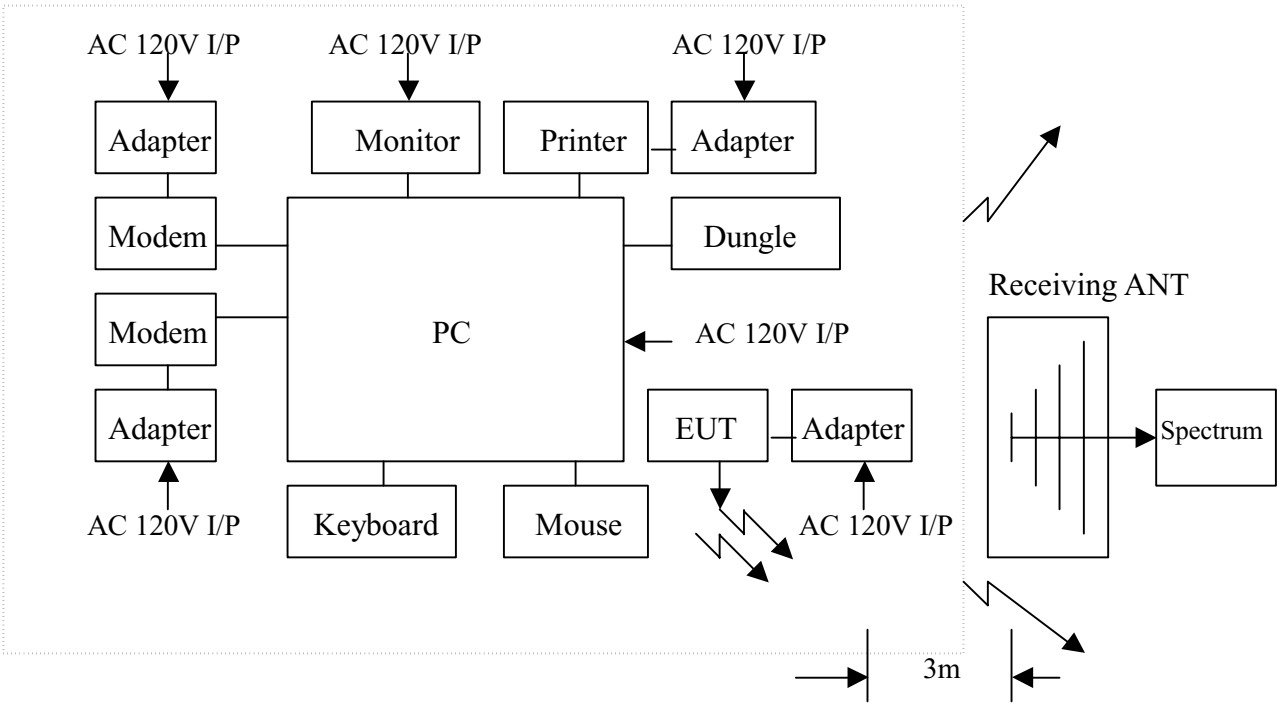
(C)Measurement Procedure: As required by FCC Part15, Section 15.31(m) measurements on intentional radiators or receiver should be performed at three frequencies for operating frequency over 10MHz, one near top, one near middle and one near bottom.

(D)Test Channel: Due to the support channels are 79 channels, the selected three frequencies for testing would be 2.402GHz near top for CH LOW, 2.441GHz near middle for CH MID and 2.480GHz near bottom for CH HIGH.

(E) At the frequencies where the peak values of the emission exceeded the quasi-peak limit, the emissions were also measured with the quasi-peak detectors. The average detector also measured the emission either (a) quasi-peak values were under quasi-peak limit but exceeded average limit, or (b) peak values were under quasi-peak limit but exceeded average limit.

(F)In this RFI test report, we provided the worst case conducted emission test data and radiated emission test data. The entire testing data was recorded and provided in this report.

1.4 Channels Verification



a. EUT Type：Bluetooth GPS Receiver

b. EUT Model：GPS BT-77

c. TX Channel No.：79

Channel 01: 2402 MHz	**Channel 28: 2429 MHz**	**Channel 55: 2456 MHz**
Channel 02: 2403 MHz	**Channel 29: 2430 MHz**	**Channel 56: 2457 MHz**
Channel 03: 2404 MHz	**Channel 30: 2431 MHz**	**Channel 57: 2458 MHz**
Channel 04: 2405 MHz	**Channel 31: 2432 MHz**	**Channel 58: 2459 MHz**
Channel 05: 2406 MHz	**Channel 32: 2433 MHz**	**Channel 59: 2460 MHz**
Channel 06: 2407 MHz	**Channel 33: 2434 MHz**	**Channel 60: 2461 MHz**
Channel 07: 2408 MHz	**Channel 34: 2435 MHz**	**Channel 61: 2462 MHz**
Channel 08: 2409 MHz	**Channel 35: 2436 MHz**	**Channel 62: 2463 MHz**
Channel 09: 2410 MHz	**Channel 36: 2437 MHz**	**Channel 63: 2464 MHz**
Channel 10: 2411 MHz	**Channel 37: 2438 MHz**	**Channel 64: 2465 MHz**
Channel 11: 2412 MHz	**Channel 38: 2439 MHz**	**Channel 65: 2466 MHz**
Channel 12: 2413 MHz	**Channel 39: 2440 MHz**	**Channel 66: 2467 MHz**
Channel 13: 2414 MHz	**Channel 40: 2441 MHz**	**Channel 67: 2468 MHz**
Channel 14: 2415 MHz	**Channel 41: 2442 MHz**	**Channel 68: 2469 MHz**
Channel 15: 2416 MHz	**Channel 42: 2443 MHz**	**Channel 69: 2470 MHz**
Channel 16: 2417 MHz	**Channel 43: 2444 MHz**	**Channel 70: 2471 MHz**
Channel 17: 2418 MHz	**Channel 44: 2445 MHz**	**Channel 71: 2472 MHz**
Channel 18: 2419 MHz	**Channel 45: 2446 MHz**	**Channel 72: 2473 MHz**
Channel 19: 2420 MHz	**Channel 46: 2447 MHz**	**Channel 73: 2474 MHz**
Channel 20: 2421 MHz	**Channel 47: 2448 MHz**	**Channel 74: 2475 MHz**
Channel 21: 2422 MHz	**Channel 48: 2449 MHz**	**Channel 75: 2476 MHz**
Channel 22: 2423 MHz	**Channel 49: 2450 MHz**	**Channel 76: 2477 MHz**
Channel 23: 2424 MHz	**Channel 50: 2451 MHz**	**Channel 77: 2478 MHz**
Channel 24: 2425 MHz	**Channel 51: 2452 MHz**	**Channel 78: 2479 MHz**
Channel 25: 2426 MHz	**Channel 52: 2453 MHz**	**Channel 79: 2480 MHz**
Channel 26: 2427 MHz	**Channel 53: 2454 MHz**	
Channel 27: 2428 MHz	**Channel 54: 2455 MHz**	

Frequency Range : 2.402 GHz to 2.480 GHz

Note :

1. All channels located in the frequency range as below :

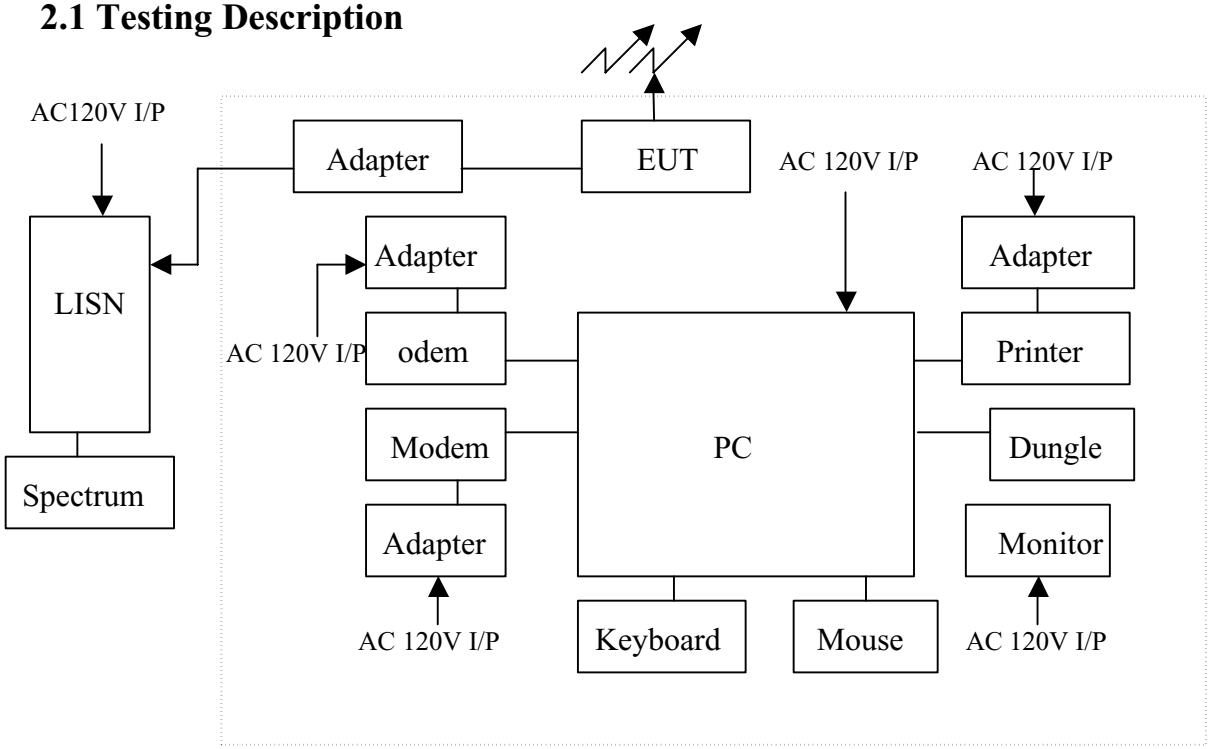
2.4 GHz --- 2.4835 GHz ☑ Yes ☐ No

Typical Channel for testing :

Channel	Channel Number	Frequency (GHz)
LOW	1	2.402
MID	40	2.441
HIGH	79	2.480

Ⅱ. 15.207 Power Line Conducted Emission Test

2.1 Testing Description



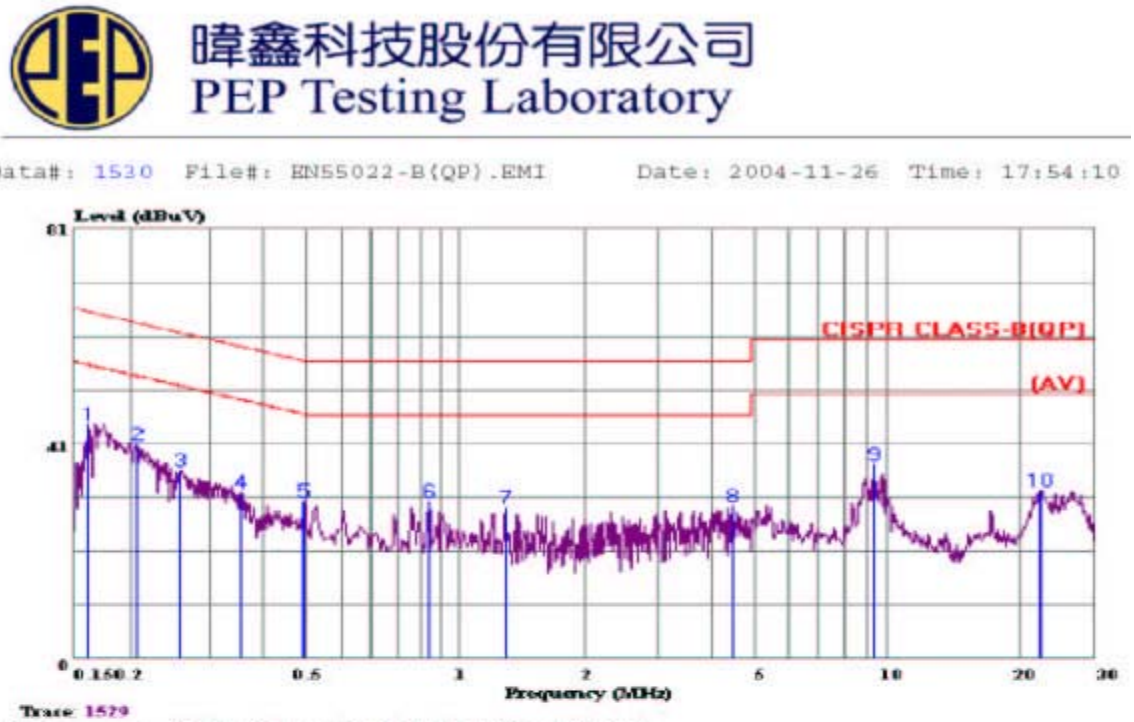
2.2 Software Using

The driver of "CSR BlueSuite" is used to select the support channel as mentioned on section 1.3 (b) listed above

2.3 Test Result

EUT Model No. GPS BT-77 (LINE)

Detector : Peak Value



Site : Shih-Chi : Conduction No.1(Gene)
Condition: CISPR CLASS-B(QP) LISN.L(16A) LINE
eut : E930751
power : AC 120V 60Hz
memo : Peak Value
: Final Test

Page: 1

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.161	44.27	-21.16	65.43	43.97	0.20	0.10	
2	0.207	40.41	-22.91	63.32	40.10	0.20	0.11	
3	0.260	35.54	-25.88	61.42	35.16	0.20	0.18	
4	0.354	31.22	-27.65	58.87	30.92	0.20	0.10	
5	0.494	29.75	-26.35	56.10	29.36	0.20	0.19	
6	0.948	29.51	-26.49	56.00	29.11	0.20	0.20	
7	1.396	28.34	-27.66	56.00	27.94	0.20	0.20	
8	4.574	28.73	-27.27	56.00	28.22	0.21	0.30	
9	9.502	36.55	-23.45	60.00	35.96	0.29	0.30	
10	22.298	31.59	-28.41	60.00	30.49	0.70	0.40	

EUT Model No.: GPS BT-77 (NEUTRAL)

Detector : Peak Value

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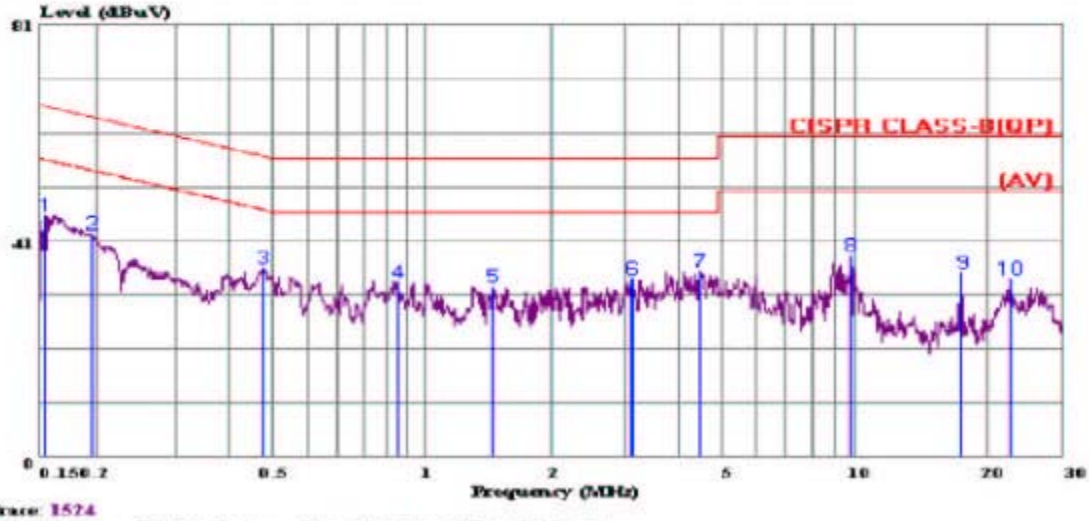
Data#: 1525 File#: EN55022-B(QP).EMI Date: 2004-11-26 Time: 17:52:27



Trace: 1574

Site : Shih-Chi : Conduction No.1(Gene)
Condition: CISPR CLASS-B(QP) LISN.N(16A) NEUTRAL
eut : E930751
power : AC 120V 60Hz
memo : Peak Value
: Final Test

Page: 1

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.154	45.40	-20.38	65.78	45.10	0.20	0.10	
2	0.197	41.83	-21.93	63.76	41.53	0.20	0.10	
3	0.474	35.32	-21.13	56.45	34.97	0.20	0.15	
4	0.958	32.83	-23.17	56.00	32.43	0.20	0.20	
5	1.560	32.06	-23.94	56.00	31.66	0.20	0.20	
6	3.190	33.24	-22.76	56.00	32.82	0.20	0.22	
7	4.574	34.73	-21.27	56.00	34.22	0.21	0.30	
8	9.966	37.76	-22.24	60.00	37.16	0.30	0.30	
9	17.661	34.57	-25.43	60.00	33.71	0.56	0.30	
10	22.655	33.53	-26.47	60.00	32.42	0.71	0.40	

2.4 Conducted Emission Test Photo

EUT Model No. GPS BT-77
< FRONT VIEW >

Ⅲ. §15.247(a)(1) : Hopping Channel Frequency Separation

3.1 Test Procedure

(1)The Hopping Channel Frequency Separation was measured in max hold analyzer mode with span wide enough to capture the peaks of two adjacent channels.

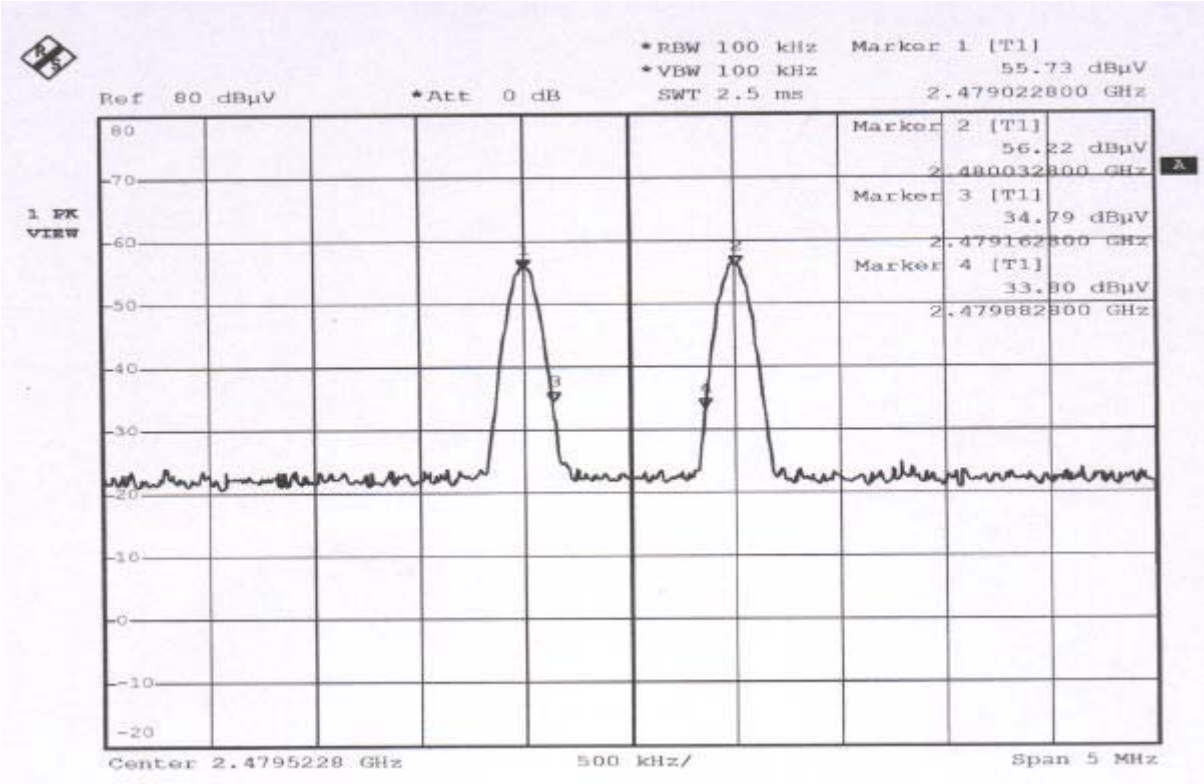
(2)Set the Spectrum as RBW=VBW=100KHz

(3) 3.3 Spectrum Plot Data show the Frequency Separation test results.

3.2 Test result of Frequency Separation

	Measured Separation (KHz)	Limit (KHz)	Pass/Fail
Channel Separation	**1010**	**25**	**Pass**
Separation at -20dB	**720**	**25**	**Pass**

3.3 Spectrum Plot Data



Ⅳ. §15.247(a)(1) : 20dB Bandwidth

4.1 Test Procedure

(1)The 20dB bandwidth was measured at the EUT antenna terminal in max hold analyzer mode with span wide enough to capture the hopping channel emissions.

(2)Set the Spectrum as RBW=VBW=10KHz

(3) 4.2 Spectrum Plot Data show the 20dB Bandwidth test results.

4.2 Test result of Bandwidth

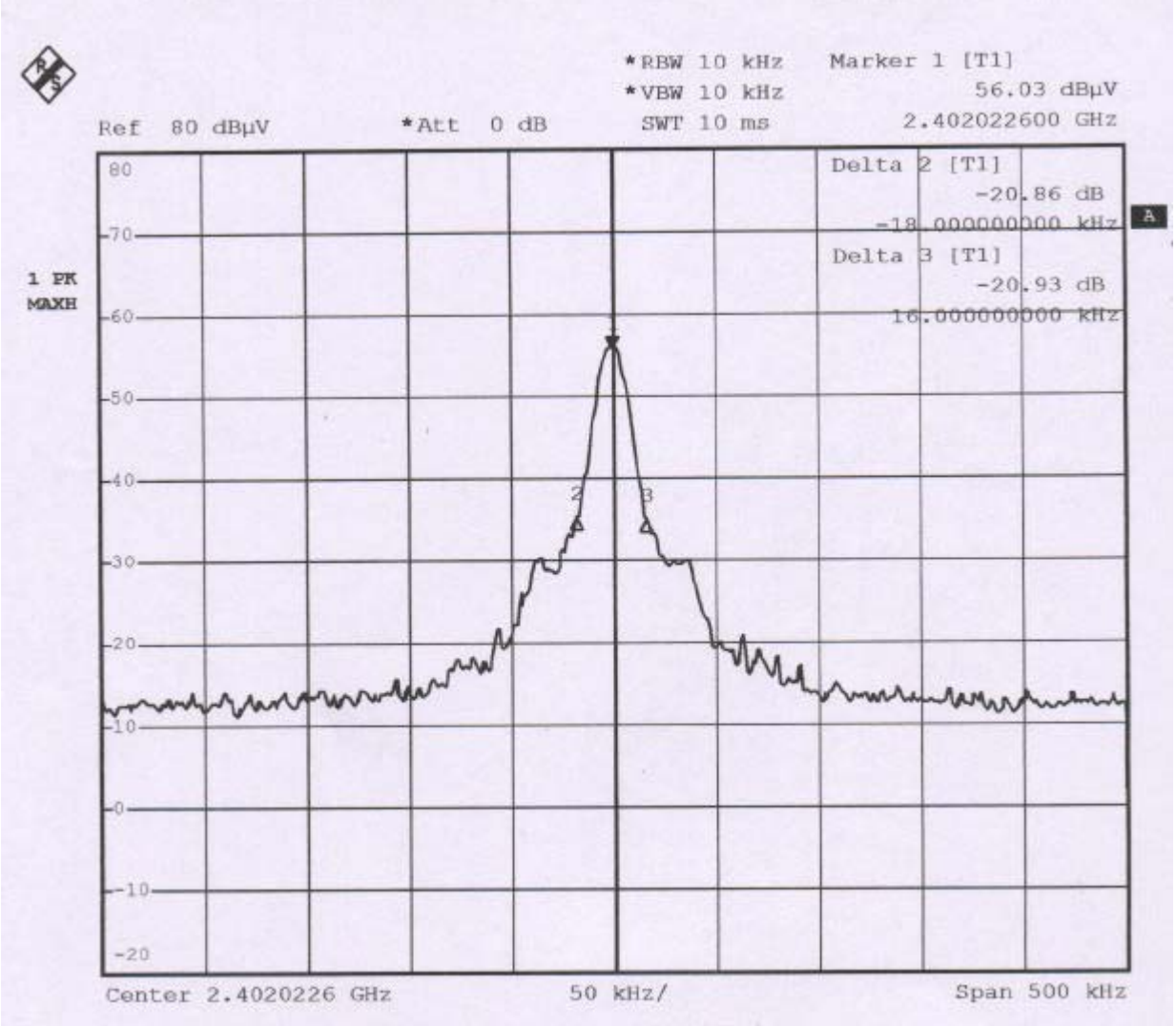
EUT Model No. GPS BT-77

Channel	Antenna Polarity	Bandwidth (KHz)	Limit (KHz)	Pass/Fail
LOW	H	34	1000	Pass
	V	35	1000	Pass
MID	H	36	1000	Pass
	V	35	1000	Pass
HIGH	H	36	1000	Pass
	V	36	1000	Pass

4.3 Spectrum Plot Data

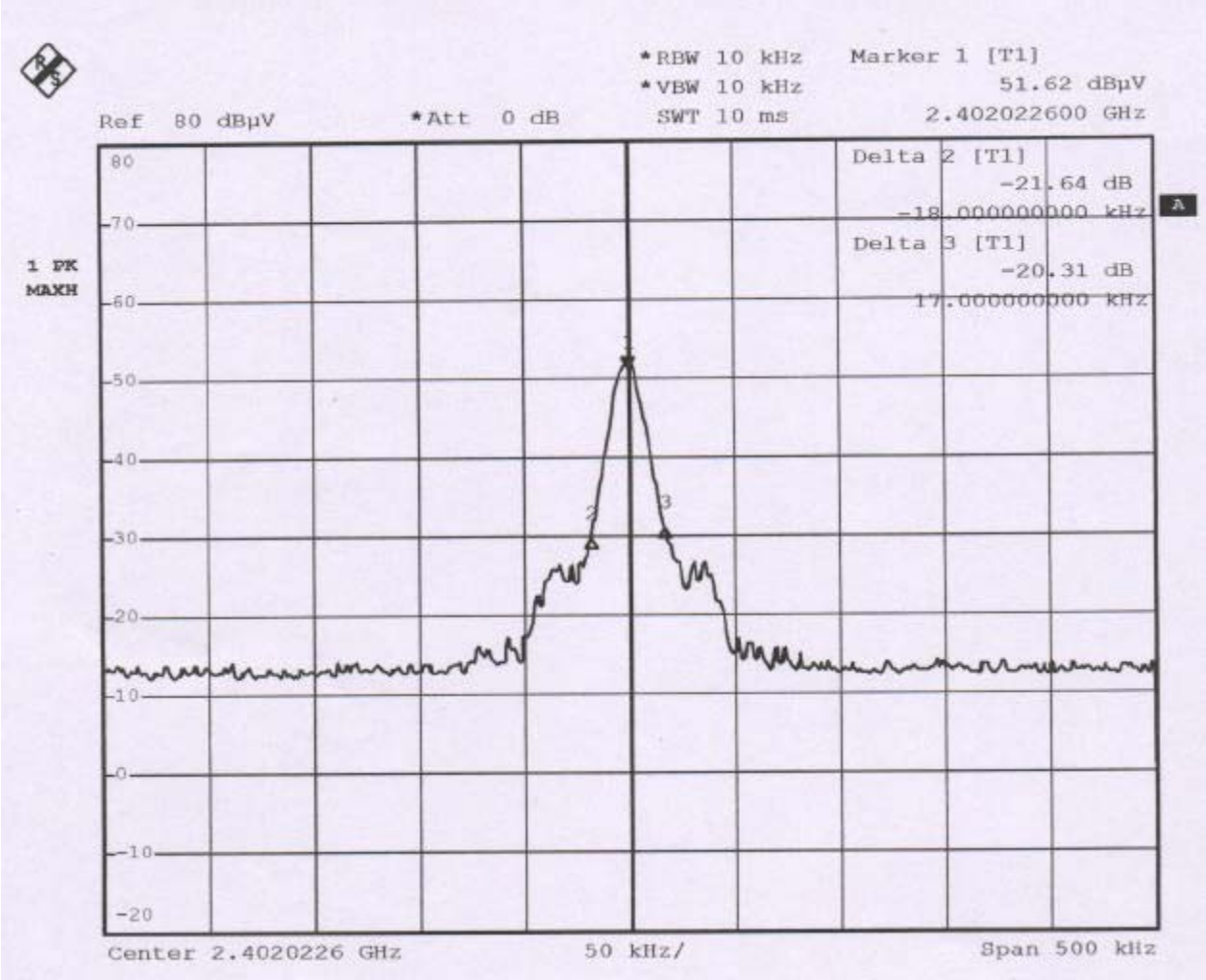
Channel : CH LOW

Polarity : Horizontal



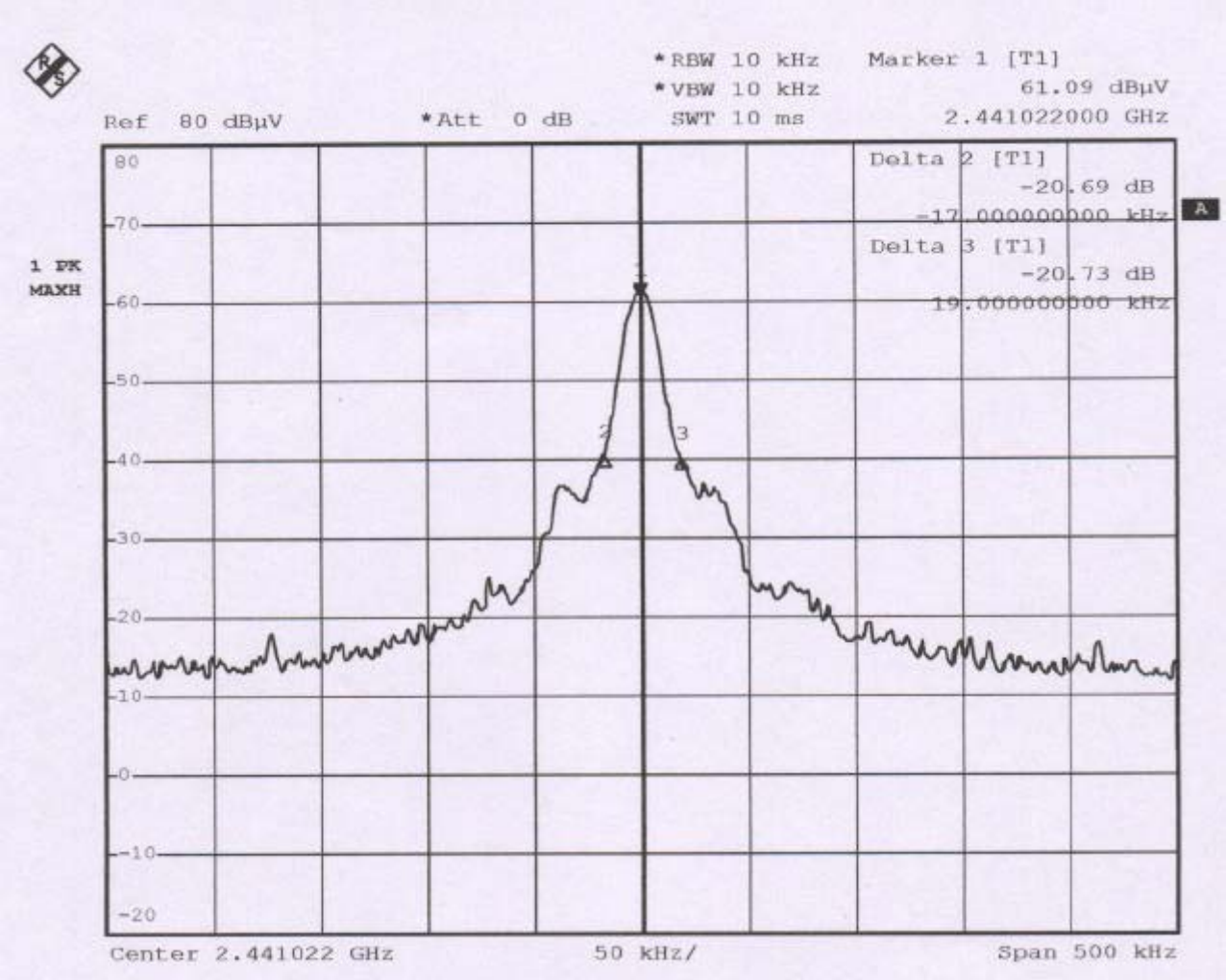
Channel : CH LOW

Polarity : Vertical



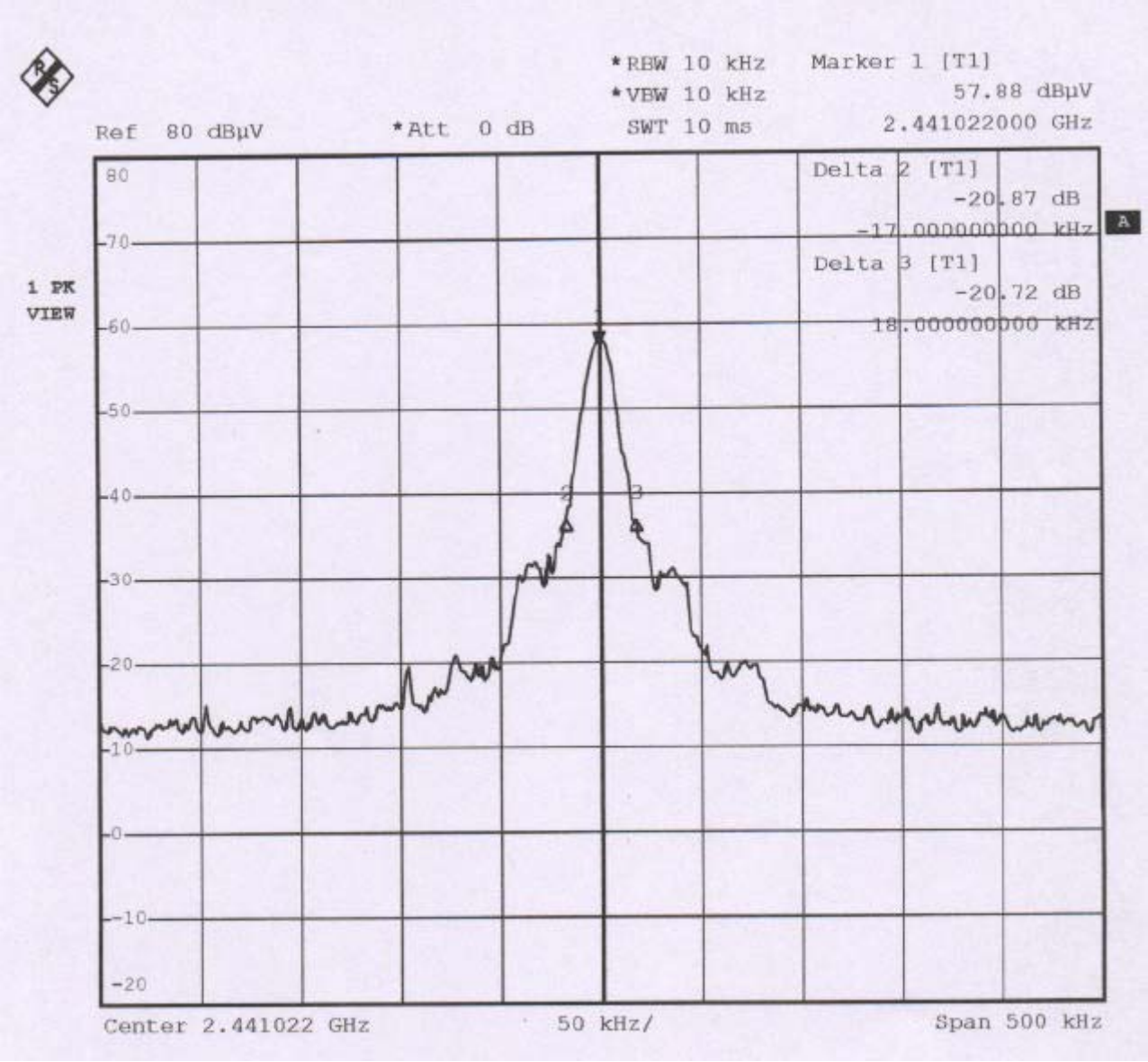
Channel : CH MID

Polarity : Horizontal



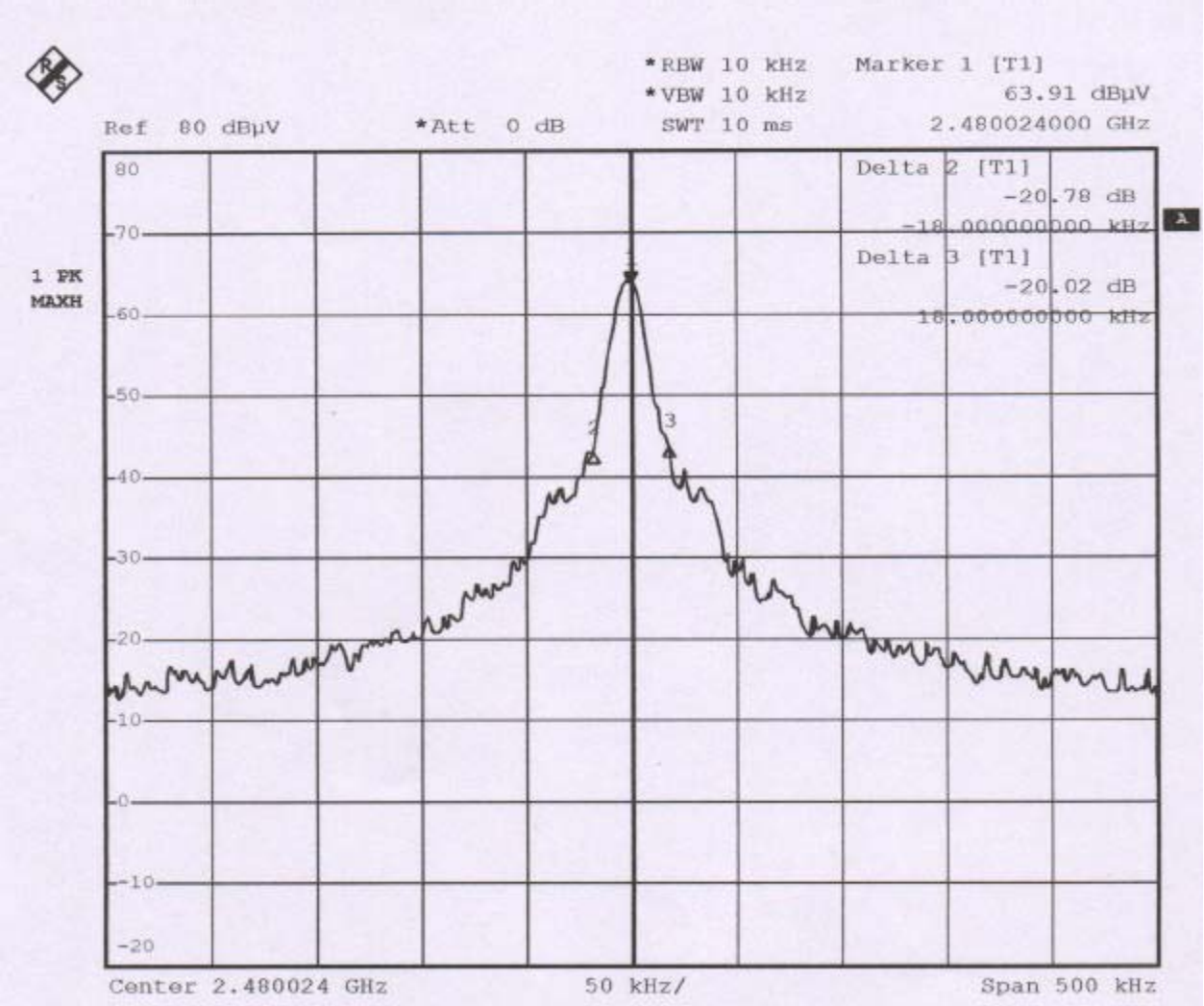
Channel : CH MID

Polarity : Vertical



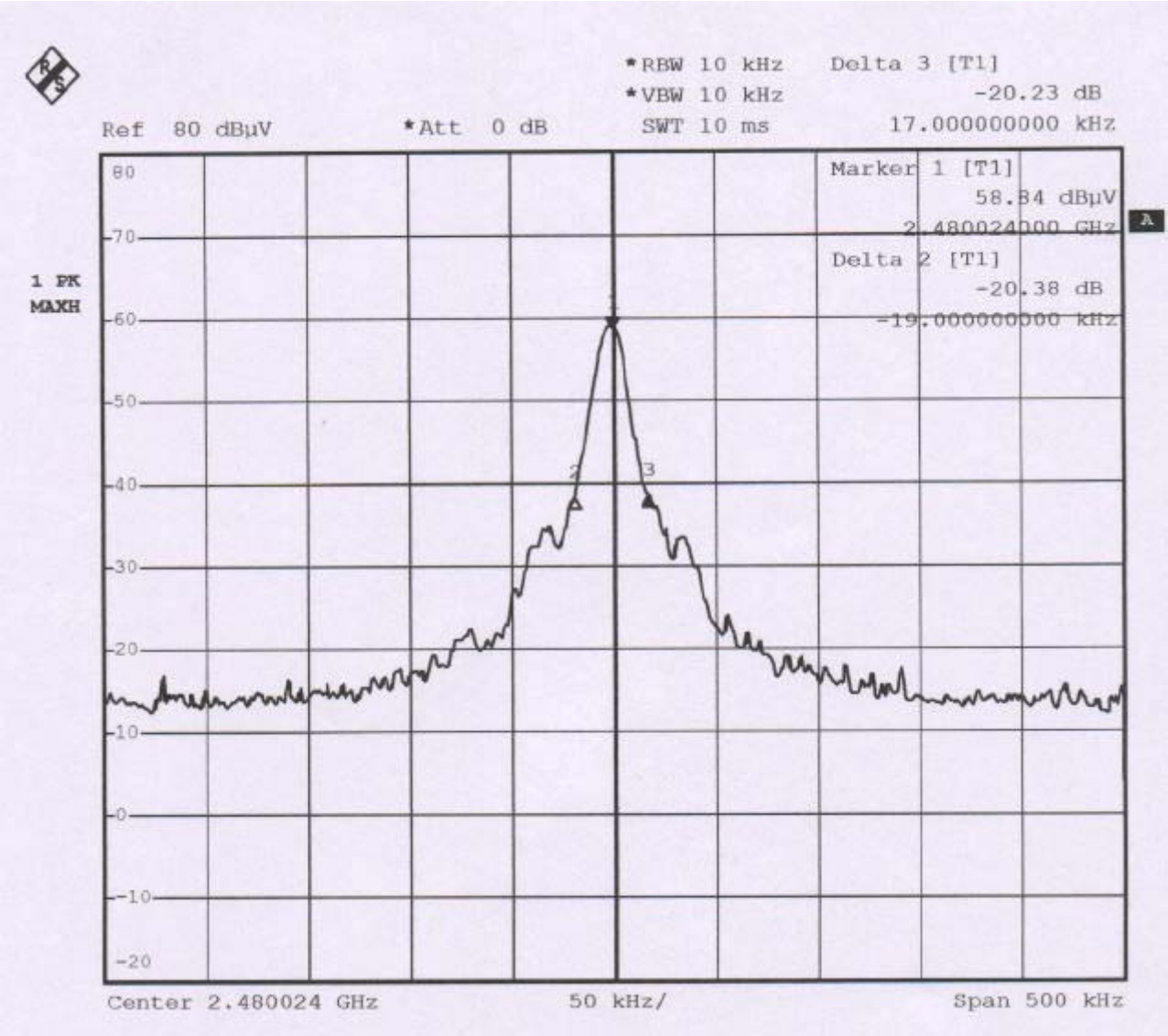
Channel : CH HIGH

Polarity : Horizontal



Channel : CH HIGH

Polarity : Vertical



Ⅴ. §15.247(a) (1): Time of Occupancy(Dwell Time)

5.1 Test Procedure

(1)The Time of Occupancy was measured in “max hold” analyzer mode with zero span and different sweep time to calculate the Time of Occupancy.

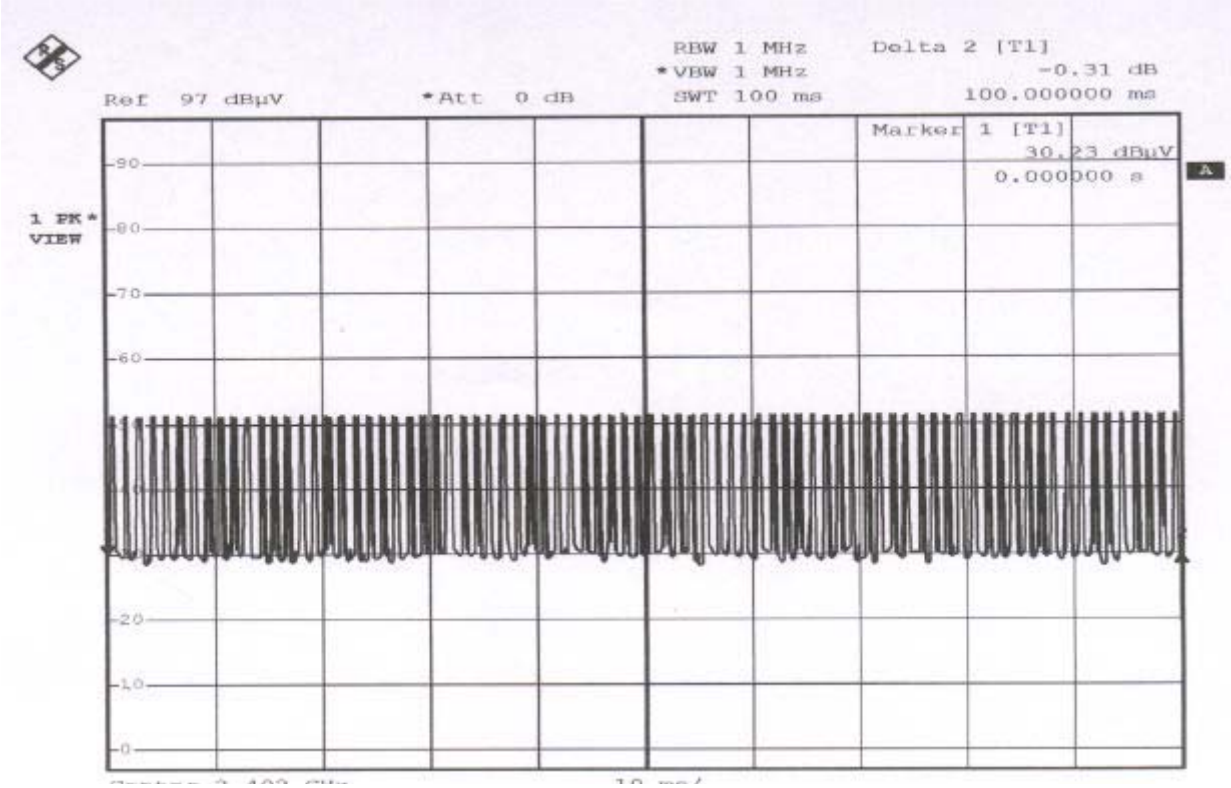
(2)Set the Spectrum as RBW=VBW=1MHz

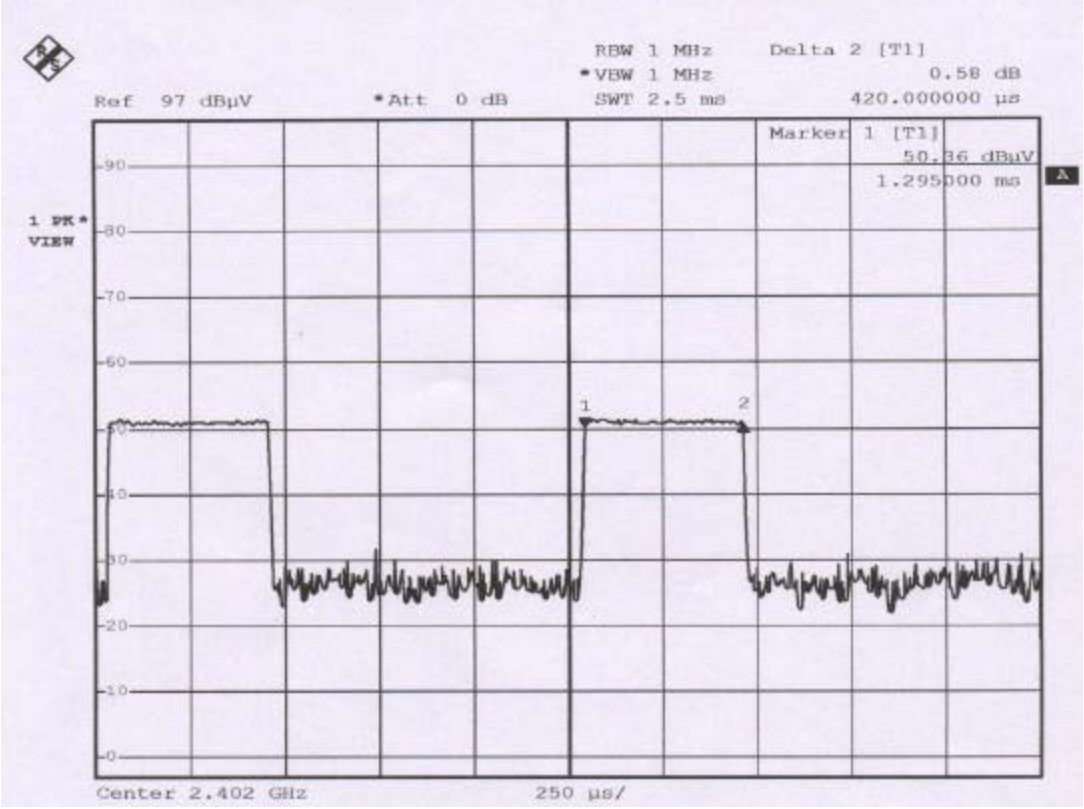
(3)5.3 Spectrum Plot Data show the Time of Occupancy test results.

5.2 Test Result of Dwell Time

Dwell Time= 0.42*80= 33.6ms < 0.4s

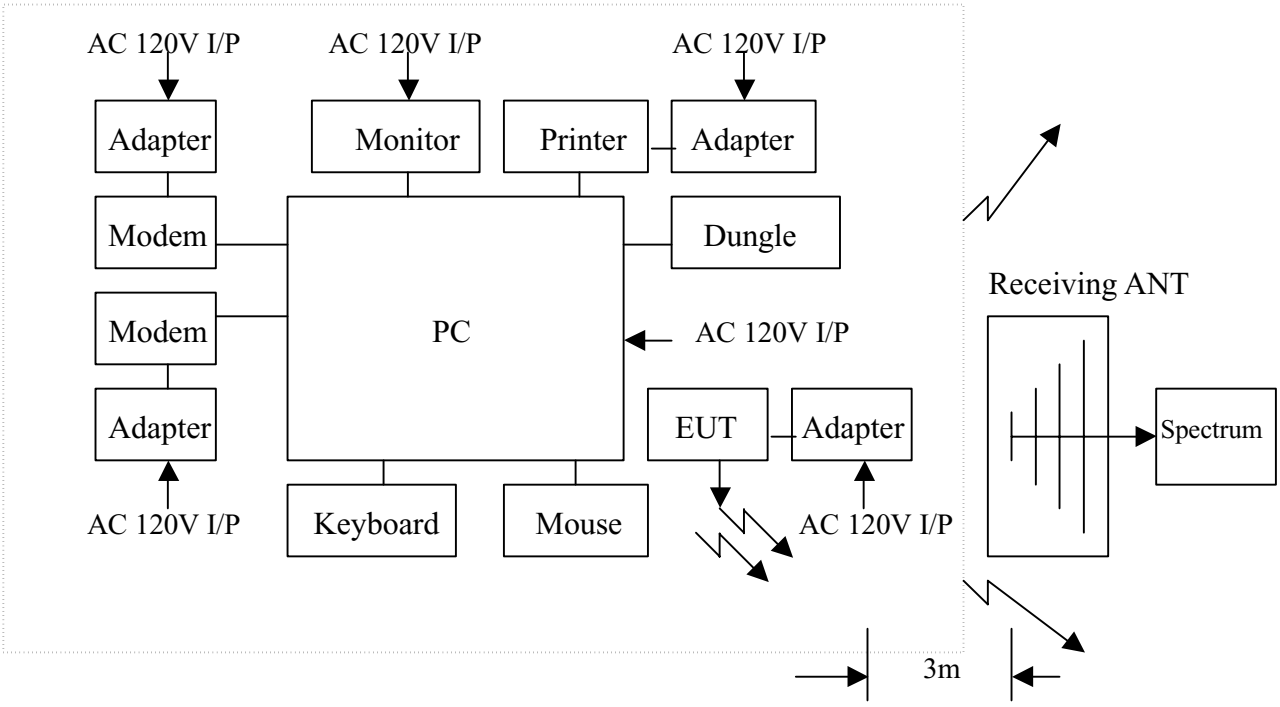
5.3 Spectrum Plot Data





Ⅵ. §15.247(b) : The maximum peak output power (≦ 1watt)

6.1 Testing Description



Three channels were tested : CH LOW, CH MID AND CH HIGH Measurements were taken by using both horizontal and vertical antenna polarization, and the antenna was raised and lowered from one to four meters to find the worst emission levels.

6.2 Software Using

The driver of "CSR BlueSuite" is used to select the support channel as mentioned on section 1.3 (b) listed above

6.3 Test Result of Fundamental Emissions

EUT Model No. GPS BT-77

Channel	Frequency (MHz)	Antenna Polarity (H/V)	Spectrum Read (dBuV/m)	C.F. (dB)	Level (dBuV/m)	E.I.R.P. (W)
LOW	2401.98	H	63.91	-2.11	61.80	$4.54*10^{-7}$
	2401.96	V	61.55	-2.11	59.44	$2.64*10^{-7}$
MID	2441.06	H	69.00	-2.01	66.99	$1.50*10^{-6}$
	2440.98	V	65.33	-2.01	63.32	$6.44*10^{-7}$
HIGH	2480.04	H	70.24	-1.94	68.30	$2.03*10^{-6}$
	2479.90	V	65.30	-1.94	63.36	$6.50*10^{-7}$

Note :

1. "C.F." means corrected factor = antenna factor + cable loss－Preamplifier Gain .
2. Level means emission amplitude = S.P. + C.F. + duty cycle factor
3. Conducted output power : $P = (E\ d)^2 / 30G$

   where E (V) = Level (V)

   d (m) = measurement distance = 3m

   G = 1 (the gain of the transmitting antenna over isotropic antenna)

   P = E.I.R.P.
4. Example :

   If Level = 120 dBuV/m

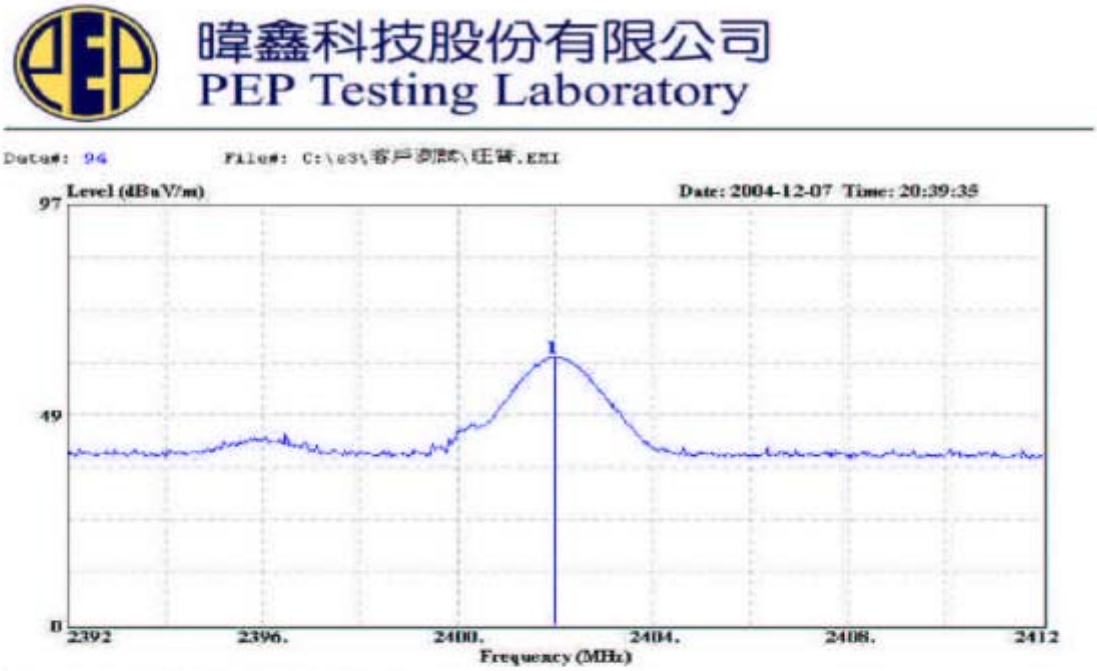
   $10^{(120/20)} \times 10^{-6} = 1$ V

   E.I.R.P. = $(1 \times 3)^2 / 30 = 300$ mW

EUT Model No. GPS BT-77

Channel : CH LOW

Polarity : Horizontal



Site : Shih-Chi : Chamber No.3
Condition : 3m HORN ANTENNA H.3 HORIZONTAL
EUT : E930751
Power : AC 120V 60Hz
Memo : TX ON
Memo : LOW
Channel :

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB	
1	2401.980	61.80	------	------	63.91	28.46	4.08	34.67	

-2-

Channel : CH LOW

Polarity : Vertical

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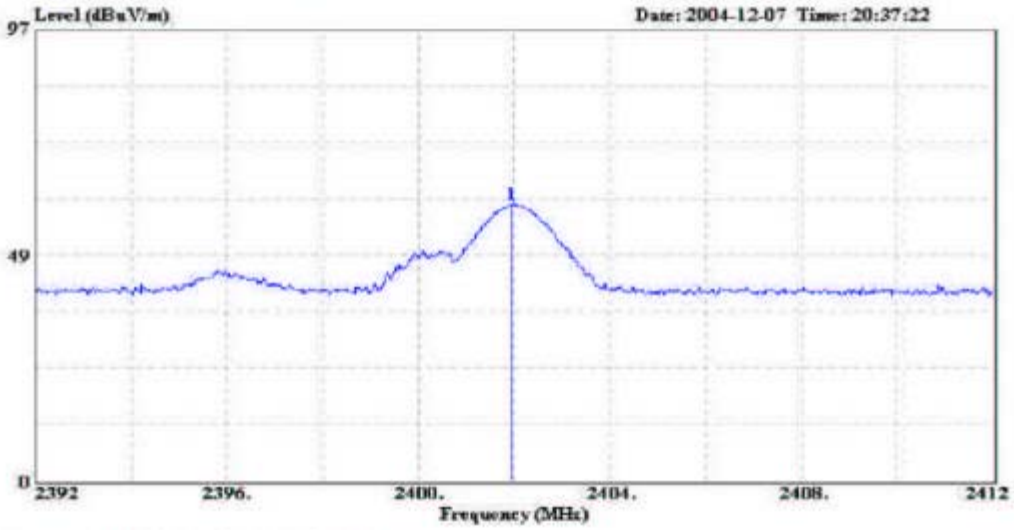
Data#: 93 File#: C:\e3\客戶測試\任著.EMI



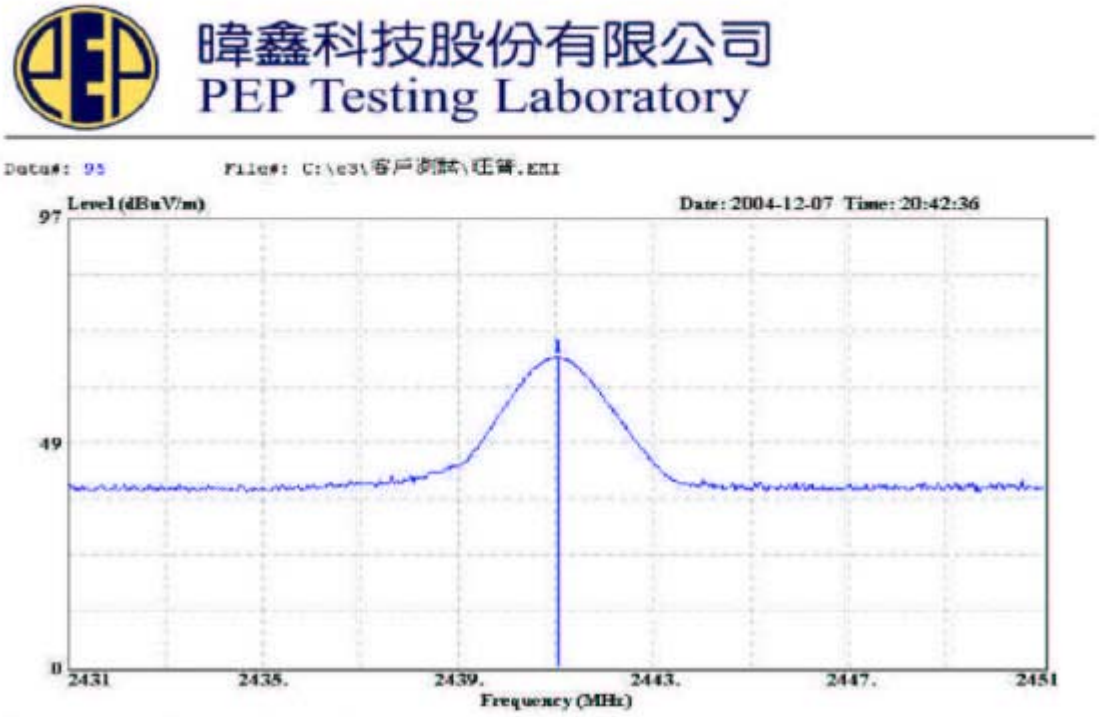
Site : Shih-Chi : Chamber No.3
Condition : 3m HORN ANTENNA V.3 VERTICAL
EUT : E930751
Power : AC 120V 60Hz
Memo : TX ON
Memo : 10V
Channel :

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB	
1	2401.960	59.44	------	------	61.55	28.48	4.08	34.67	

-1-

Channel : CH MID

Polarity : Horizontal



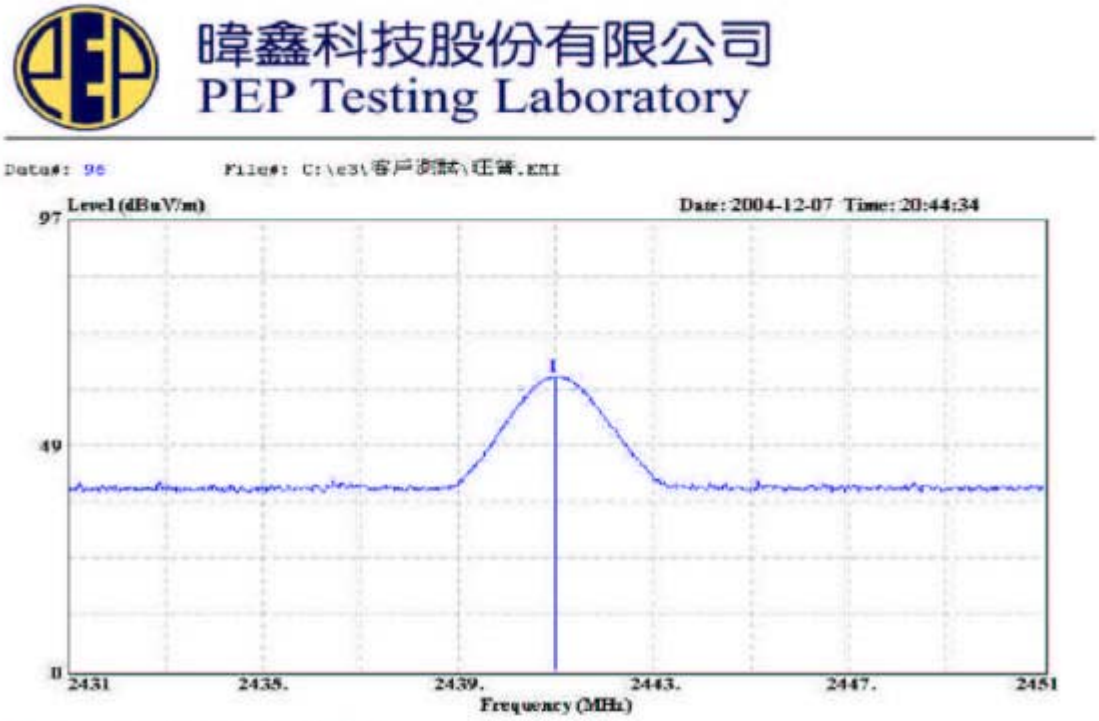
Site : Shih-Chi : Chamber No.3
Condition : 3m HORN ANTENNA H.3 HORIZONTAL
EUT : E930751
Power : AC 120V 60Hz
Memo : TX ON
Memo : MID
Channel :

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB	
1	2441.060	66.99	------	------	69.00	28.53	4.14	34.68	

-3-

Channel : CH MID

Polarity : Vertical



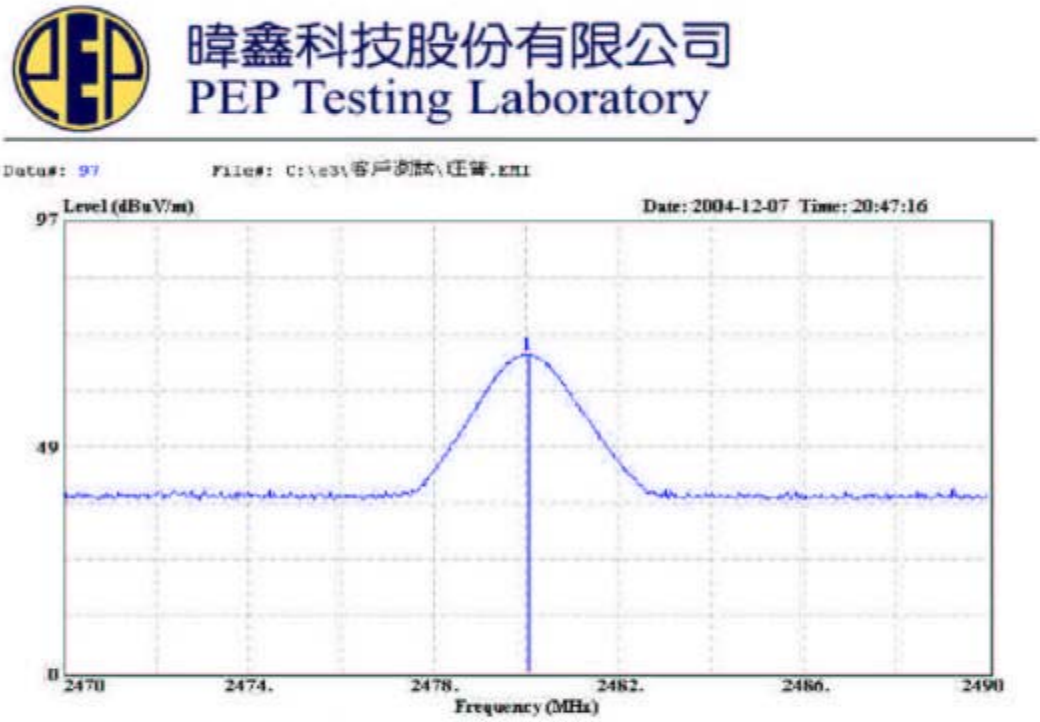
Site : Shih-Chi : Chamber No.3
Condition : 3m HORN ANTENNA V.3 VERTICAL
EUT : E930751
Power : AC 120V 60Hz
Memo : TX ON
Memo : MID
Channel :

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB	
1	2440.980	63.32	------	------	65.33	28.53	4.14	34.68	

-4-

Channel : CH HIGH

Polarity : Horizontal



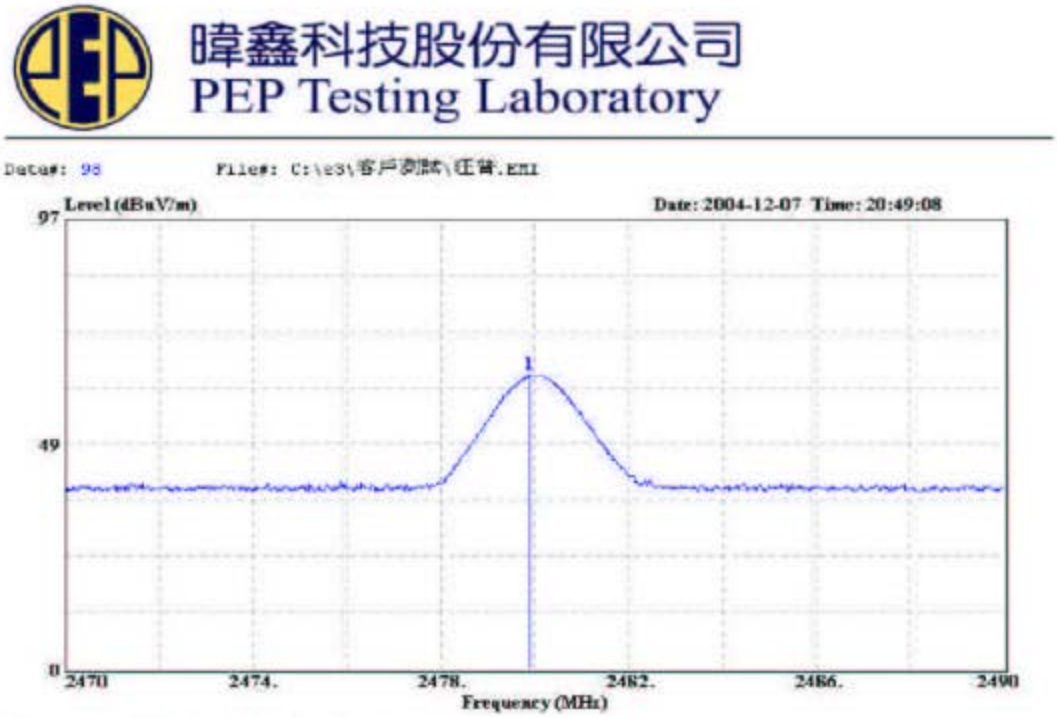
Site : Shih-Chi : Chamber No.3
Condition : 3m HORN ANTENNA H.3 HORIZONTAL
EUT : E930751
Power : AC 120V 60Hz
Memo : TX ON
Memo : HIGH
Channel :

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB	
1	2480.040	68.30	------	------	70.24	28.59	4.17	34.70	

-5-

Channel : CH HIGH

Polarity : Vertical



Site : Shih-Chi : Chamber No.3
Condition : 3m HORN ANTENNA V.3 VERTICAL
EUT : E930751
Power : AC 120V 60Hz
Memo : TX ON
Memo : HIGH
Channel :

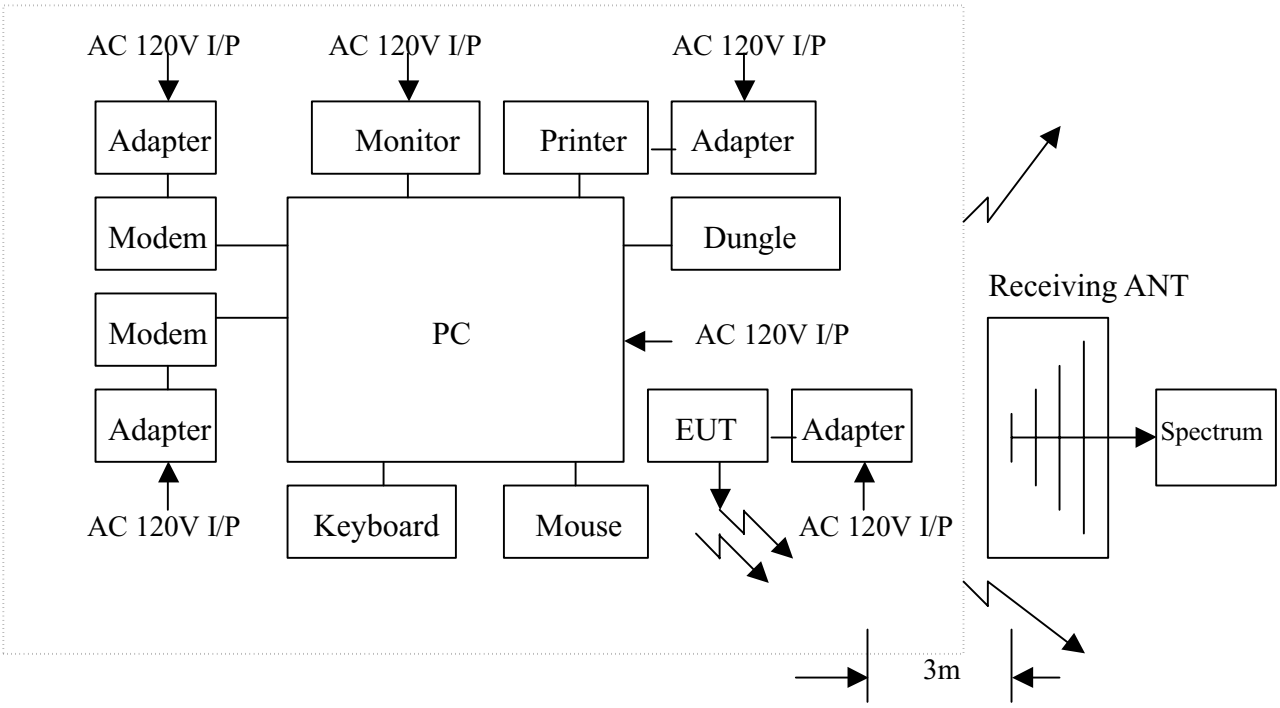
	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB	
1	2479.900	63.36	------	------	65.30	28.59	4.17	34.70	

Ⅶ. §15.247(b)(4) Maximum Permissible Exposure (MPE)

7.1 MPE distance calculation

$$d = \frac{\sqrt{30G\ EIRP}}{E}$$

7.2 Device operating configurations exposure conditions



7.3 Maximum Permissible Exposure (MPE)

EUT Model No. GPS BT-77

Channel	Frequency (MHz)	A.P. (H/V)	S.P. Read (dBuV/m)	C.F. (dB)	Level (dBuV/m)	Power density at 20cm (m W / cm^2)
LOW	2401.98	H	63.91	-2.11	61.80	$2.02*10^{-6}$
	2401.96	V	61.55	-2.11	59.44	$1.17*10^{-6}$
MID	2441.06	H	69.00	-2.01	66.99	$6.67*10^{-6}$
	2440.98	V	65.33	-2.01	63.32	$2.86*10^{-6}$
HIGH	2480.04	H	70.24	-1.94	68.30	$9.01*10^{-6}$
	2479.90	V	65.30	-1.94	63.36	$2.89*10^{-6}$

Note :

5. "A.P." means antenna polarity .
6. "S.P." Read means amplitude read by spectrum analyzer .
7. "C.F." means corrected factor = antenna factor + cable loss - Preamplifier Gain .
8. Level means emission amplitude = S.P. + C.F. + duty cycle factor
9. Conducted output power : $P = (E\ d)^2 / 30G$

where E (V) = Level (V)

d (m) = distance = 20 cm

G = 1 (the gain of the transmitting antenna over isotropic antenna)

P = E.I.R.P.

10. Example :

If Level = 120 dBuV/m

$10^{(120/20)} \times 10^{-6} = 1$ V

E.I.R.P. = $(1 \times 3)^2 / 30 = 300$ mW

Ⅷ. §15.247(c) : Spurious Radiated Emissions

8.1 Out side band below 1GHz

Test Results :

Model No. : GPS BT-77
Frequency range : 30MHz - 1GHz Detector : Quasi-Peak Value
Temperature : 26° C Humidity : 54 %

Antenna polarization : HORIZONTAL ; Test distance : 3 m ;

Freq. (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Probe Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Remark
103.98	29.74	-13.76	43.5	28.59	10.64	1.26	10.75	
200.10	27.89	-15.61	43.5	31.95	8.81	1.93	14.80	
255.45	27.20	-18.80	46.0	28.60	12.64	2.26	16.30	
500.20	39.01	-6.99	46.0	33.45	17.30	3.01	14.75	
638.10	39.67	-6.94	46.0	35.07	19.09	3.62	18.72	
825.00	36.67	-9.33	46.0	27.39	20.33	4.08	15.13	

Antenna polarization : VERTICAL ; Test distance : 3 m ;

Freq. (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Probe Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Remark
83.46	37.21	-2.79	40.0	37.95	7.63	1.13	9.50	
123.69	30.13	-13.37	43.5	27.92	11.36	1.44	10.59	
207.93	31.13	-12.37	43.5	29.37	7.77	1.99	8.00	
500.20	34.39	-11.61	46.0	29.20	17.30	3.01	15.12	
533.80	35.42	-10.58	46.0	32.50	18.21	3.14	18.43	
749.40	37.42	-8.58	46.0	29.99	19.90	3.91	16.38	
825.70	36.99	-9.01	46.0	27.74	20.33	4.08	15.16	

Note :

1. Level = Read Level + Probe Factor + Cable Loss – Preamp Factor
2. Over Limit = Level – Limit Line
3. All the other frequencies are under the limits more than 20dB

8.2 Out side band above 1GHz

Test Results :

Model No. : GPS BT-77
Frequency range : above 1GHz **Detector : Peak / Average Value**
Temperature : 26° C **Humidity : 54 %**
Channel : LOW

Antenna polarization : HORIZONTAL ; Test distance : 3 m ;

Freq. (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Probe Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Remark
4803	49.48	-24.52	74	44.87	32.79	5.93	34.11	PK
4803	42.14	-11.86	54	37.53	32.79	5.93	34.11	AV

Antenna polarization : VERTICAL ; Test distance : 3 m ;

Freq. (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Probe Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Remark
4803	44.72	-29.28	74	40.11	32.79	5.93	34.11	PK
4803	36.16	-17.84	54	31.55	32.79	5.93	34.11	AV

Note :

1. Level = Read Level + Probe Factor + Cable Loss – Preamp Factor
2. Over Limit = Level – Limit Line
3. All the other frequencies are under the limits more than 20dB

Model No. : GPS BT-77
Frequency range : above 1GHz **Detector : Peak / Average Value**
Temperature : 26° C **Humidity : 54 %**
Channel : MID

Antenna polarization : HORIZONTAL ; Test distance : 3 m ;

Freq. (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Probe Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Remark
4882	50.71	-23.29	74	45.71	33.10	5.96	34.06	PK
4882	40.97	-13.03	54	35.97	33.10	5.96	34.06	AV

Antenna polarization : VERTICAL ; Test distance : 3 m ;

Freq. (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Probe Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Remark
4882	46.53	-27.47	74	41.53	33.10	5.96	34.06	PK
4882	38.43	-15.57	54	33.43	33.10	5.96	34.06	AV

Note :
1. Level = Read Level + Probe Factor + Cable Loss – Preamp Factor
2. Over Limit = Level – Limit Line
3. All the other frequencies are under the limits more than 20dB

Model No. : GPS BT-77
Frequency range : above 1GHz **Detector : Peak / Average Value**
Temperature : 26° C **Humidity : 54 %**
Channel : HIGH

Antenna polarization : HORIZONTAL ; Test distance : 3 m ;

Freq. (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Probe Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Remark
4962	49.92	-24.08	74	44.55	33.40	5.99	34.02	PK
4962	41.19	-12.81	54	35.82	33.40	5.99	34.02	AV

Antenna polarization : VERTICAL ; Test distance : 3 m ;

Freq. (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Probe Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Remark
4962	45.89	-28.11	74	40.52	33.40	5.99	34.02	PK
4962	38.24	-15.76	54	32.87	33.40	5.99	34.02	AV

Note :
1. Level = Read Level + Probe Factor + Cable Loss – Preamp Factor
2. Over Limit = Level – Limit Line
3. All the other frequencies are under the limits more than 20dB

8.3 Spurious Radiate Emission Testing Photos

EUT Model No. GPS BT-77

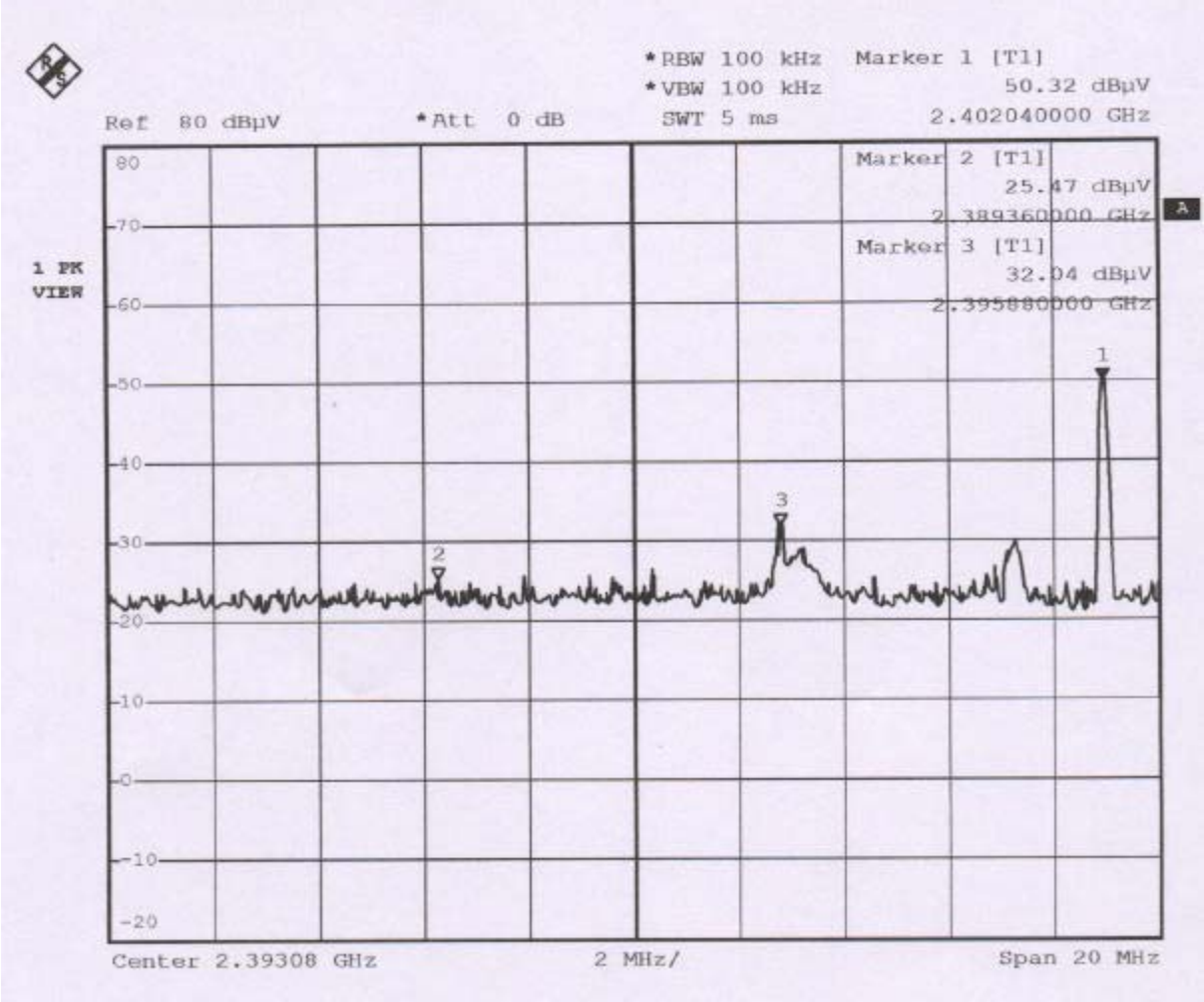
< FRONT VIEW >

< REAR VIEW >

Ⅸ. §15.247(c) : Band-edges Compliance

Channel : CH LOW

Polarity : Horizontal



Test method : Public Notice DA 00-705

Detect : Peak Value

Marker-Delta method :

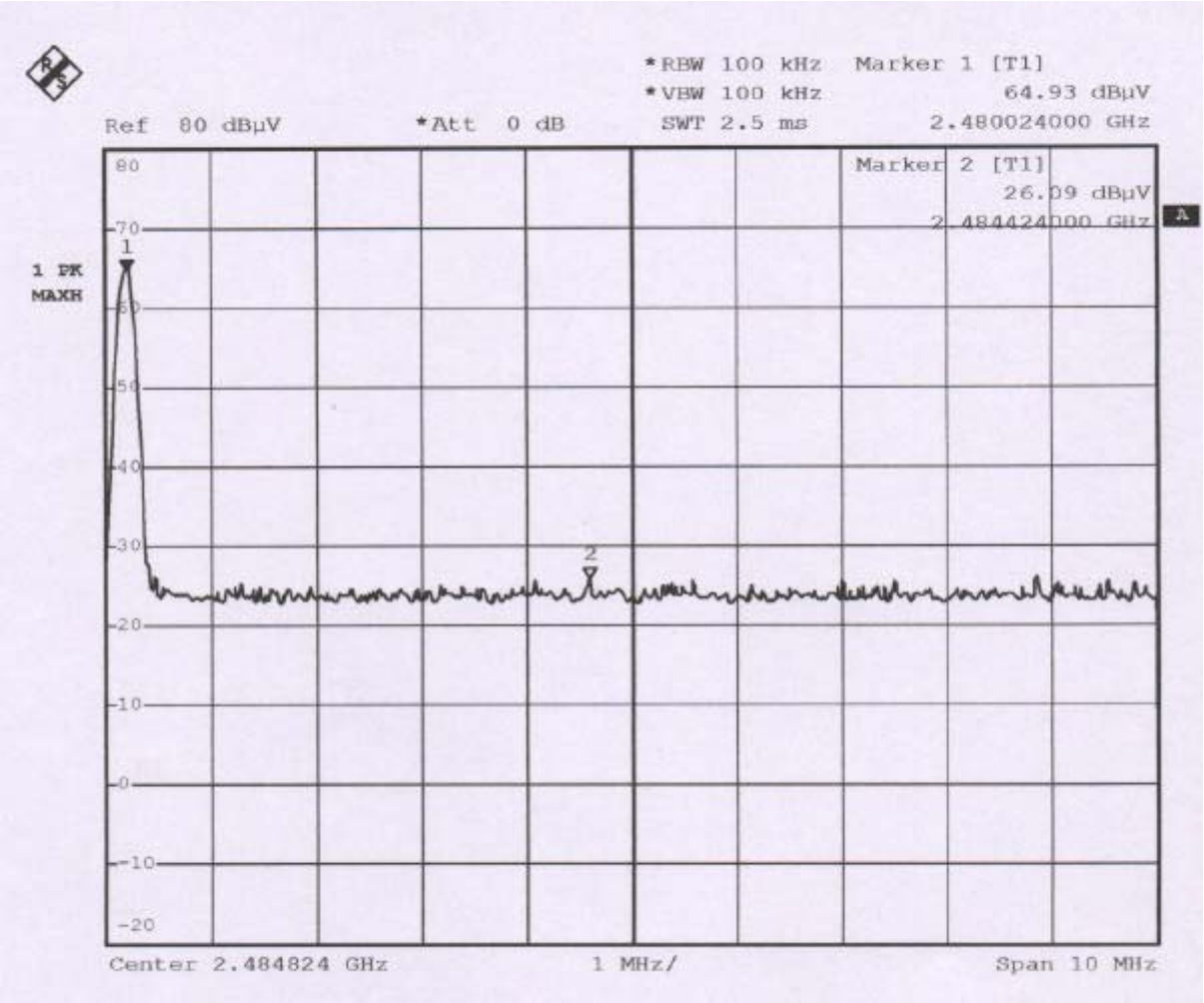
50.32dBuV/m-25.47 dBuV/m =24.85dBuV/m

61.80 dBuV/m-24.85 dBuV/m=36.95 dBuV/m

*36.95dBuV/m<Average Limit (54dBuV/m)

Channel : CH HIGH

Polarity : Horizontal



Test method : Public Notice DA 00-705

Detect : Peak Value

Marker-Delta method :

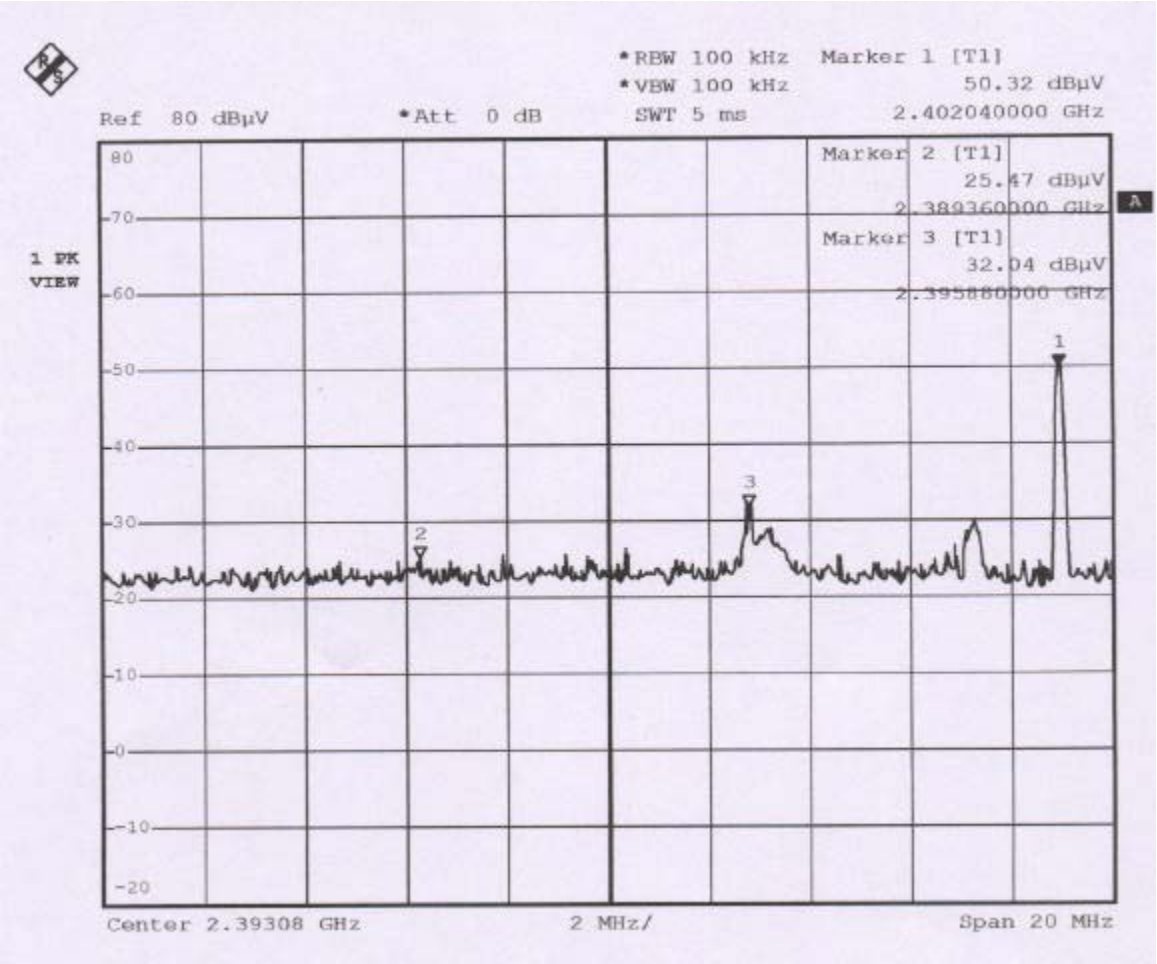
64.93dBuV/m-26.09 dBuV/m =38.84dBuV/m

68.30 dBuV/m-38.84 dBuV/m=29.46 dBuV/m

*29.46dBuV/m<Average Limit (54dBuV/m)

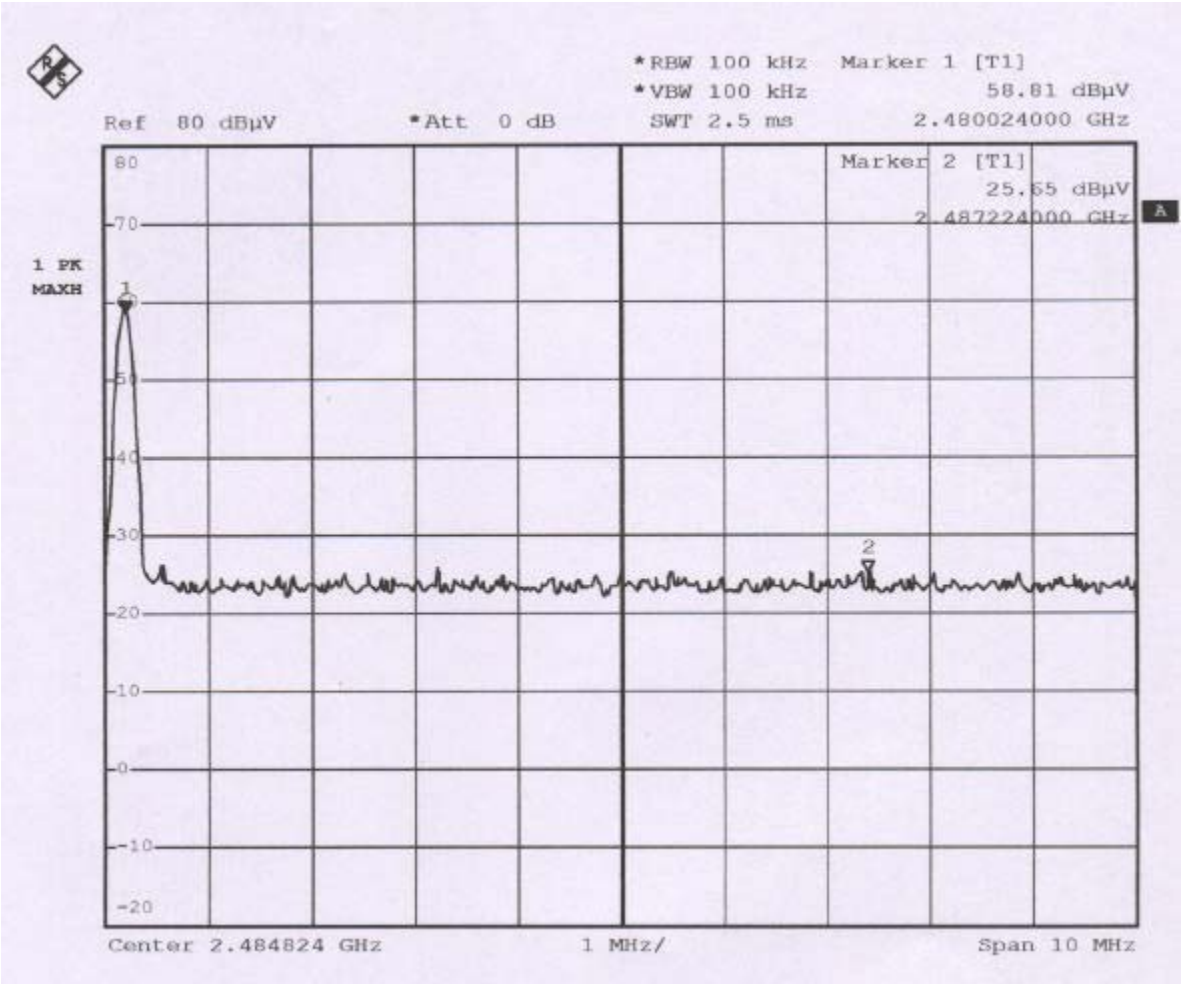
Channel : CH LOW

Polarity : Vertical



Channel : CH HIGH

Polarity : Vertical



X. §15.247(d) : Peak Power Spectral Density

10.1 Test Procedure

(1) The Peak Power Spectral Density was measured at the EUT antenna terminal in max hold analyzer mode with span wide enough to capture the hopping channel emissions.

(2)Set Spectrum as RBW=VBW=3KHz , Sweeptime:auto.

(3)10.3 Spectrum Plot Data show the Peak Power Spectral Density test results.

10.2 Test result of Peak Power Spectral Density

Channel	Frequency (MHz)	Level (dBm)	Limit (dBm)	Pass/Fail
LOW	2401.88	-37.15	8	Pass
MID	2441.01	-31.33	8	Pass
HIGH	2479.88	-29.55	8	Pass

Note:

1. "S.P. read" means spectrum analyzer read power density.
2. "C.F." means correct factor = antenna factor + cable loss – Preamplifier Gain.
3. "Level" means power spectral density.

   E.R.P. = $(E\ d)^2 / 30G$

   where E (V) = S.P. read + C.F.

   d (m) = measurement distance = 3m

   G = 1 (the gain of the transmitting antenna over isotropic antenna)

   Example :

   If Level = 120 dBuV/m

   $10^{(120/20)} \times 10^{-6} = 1$ V

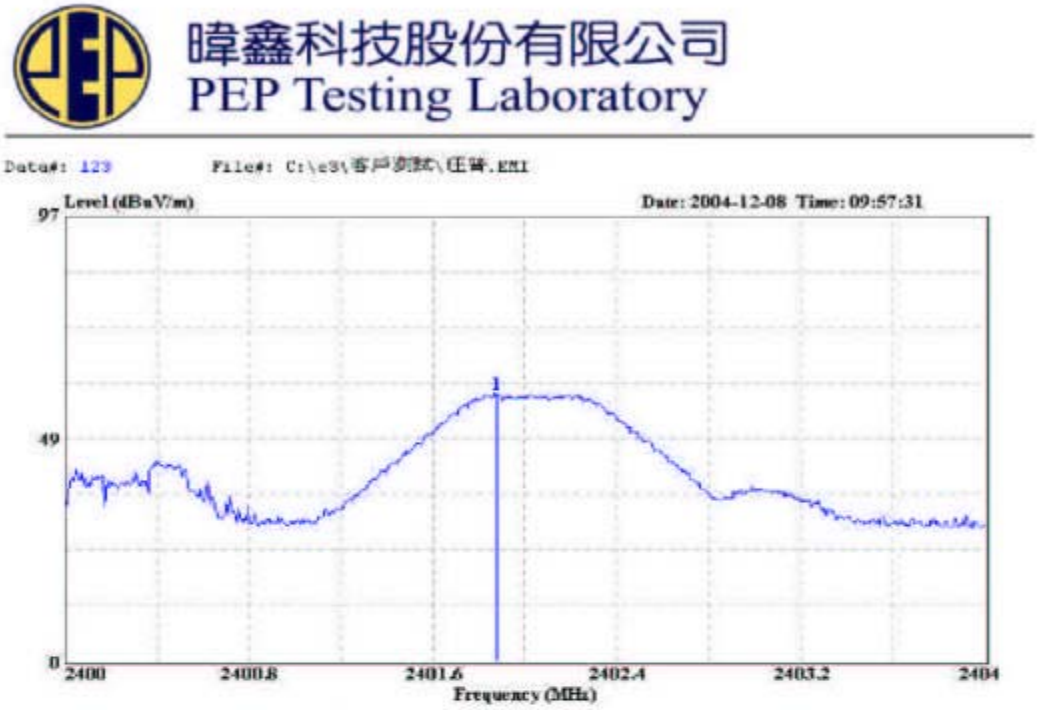
   E.R.P. = $(1 \times 3)^2 / 30$ = 300 mW = 10 Log (300mW/1mW)

   = 24.77dBm

10.3 Spectrum Plot Data

Channel : CH LOW

Polarity : Horizontal



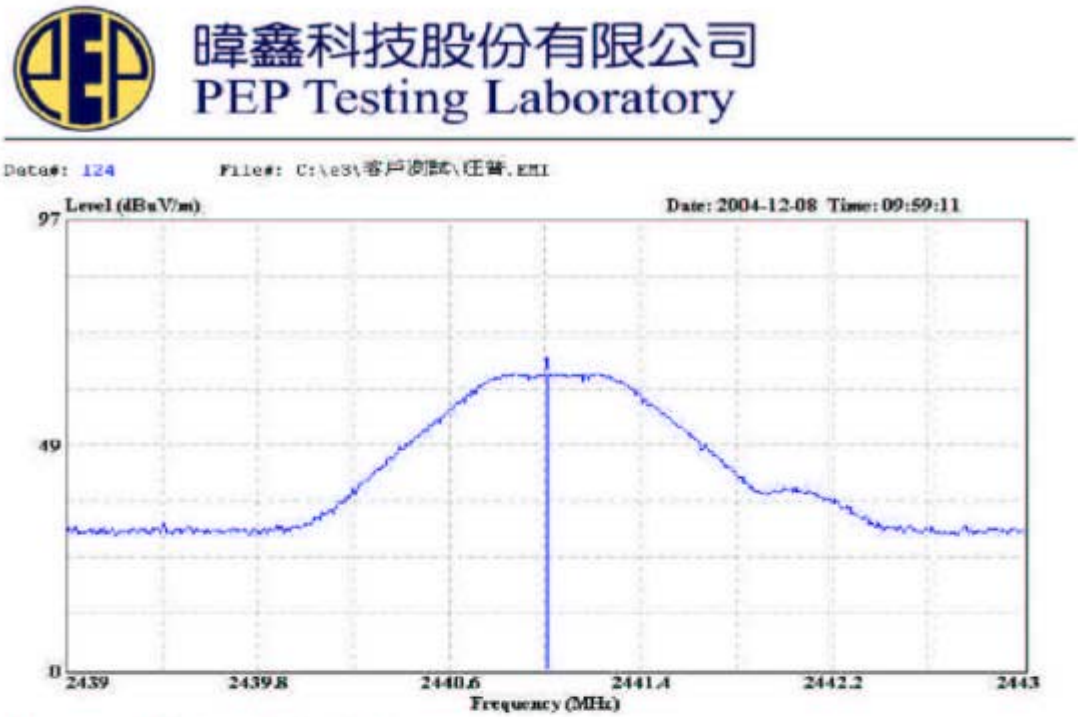
Site : Shih-Chi : Chamber No.3
Condition : 3m HORN ANTENNA H.3 HORIZONTAL
EUT : E930751
Power : AC 120V 60Hz
Memo : Peak Power Spectral Density
Memo : TX ON
Channel : LOW

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB	
1	2401.000	58.08	------	------	60.19	28.47	4.08	34.66	

- 1 -

Channel : CH MID

Polarity : Horizontal



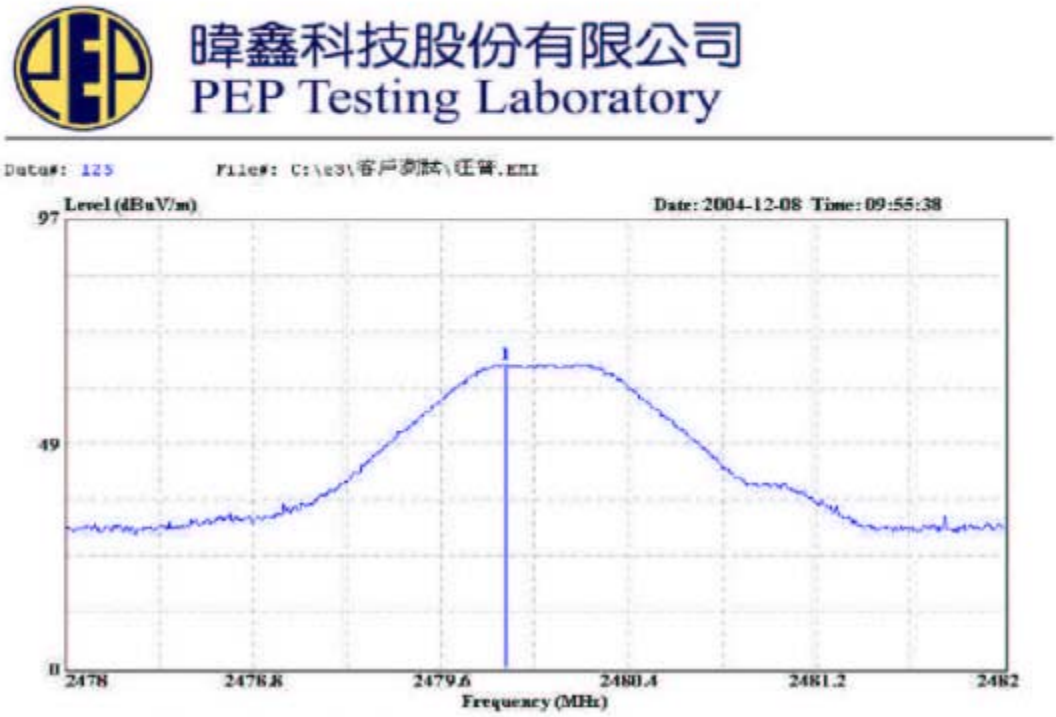
Site : Shih-Chi : Chamber No.3
Condition : 3m HORN ANTENNA H.3 HORIZONTAL
EUT : E930751
Power : AC 120V 60Hz
Memo : Peak Power Spectral Density
Memo : TX ON
Channel : MID

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB	
1	2441.010	63.90	------	------	65.91	28.53	4.14	34.68	

-2-

Channel : CH HIGH

Polarity : Horizontal



Site : Shih-Chi : Chamber No.3
Condition : 3m HORN ANTENNA H.3 HORIZONTAL
EUT : E930751
Power : AC 120V 60Hz
Memo : Peak Power Spectral Density
Memo : TX ON
Channel : HIGH

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Preamp Factor	Remark
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB	
1	2479.880	65.68	------	------	67.62	28.58	4.17	34.69	

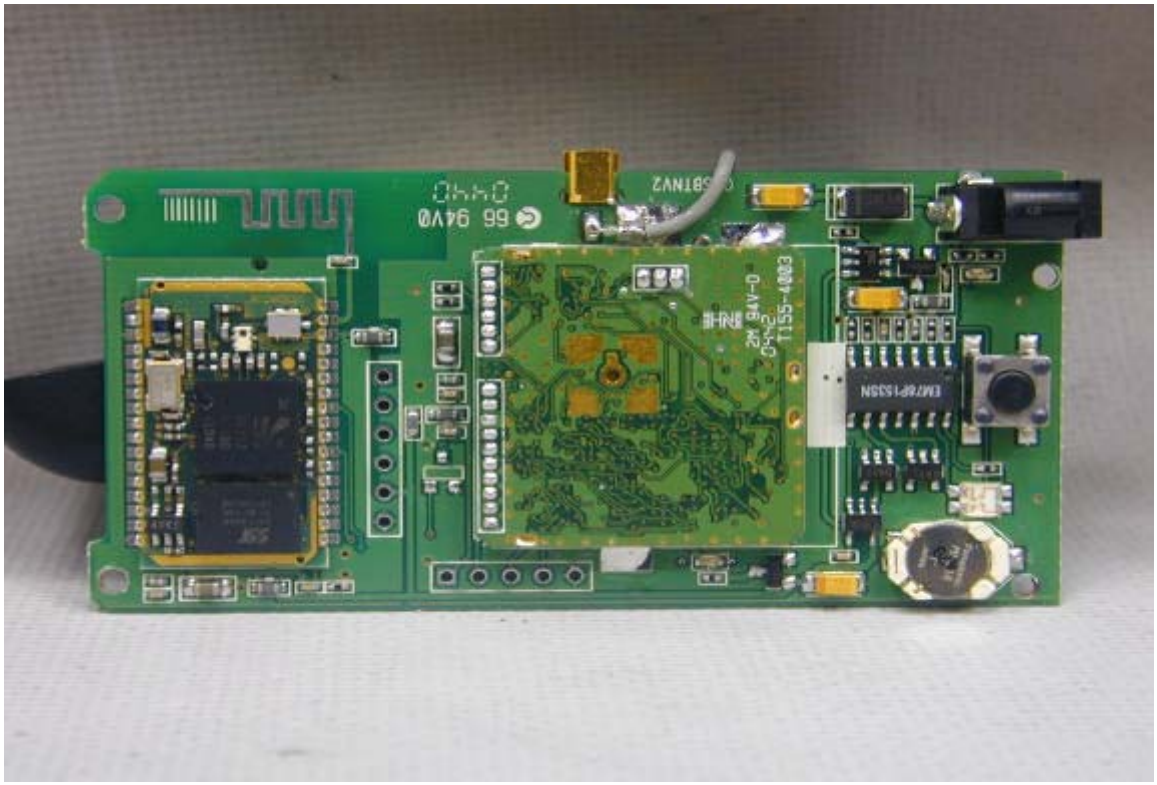
-3-

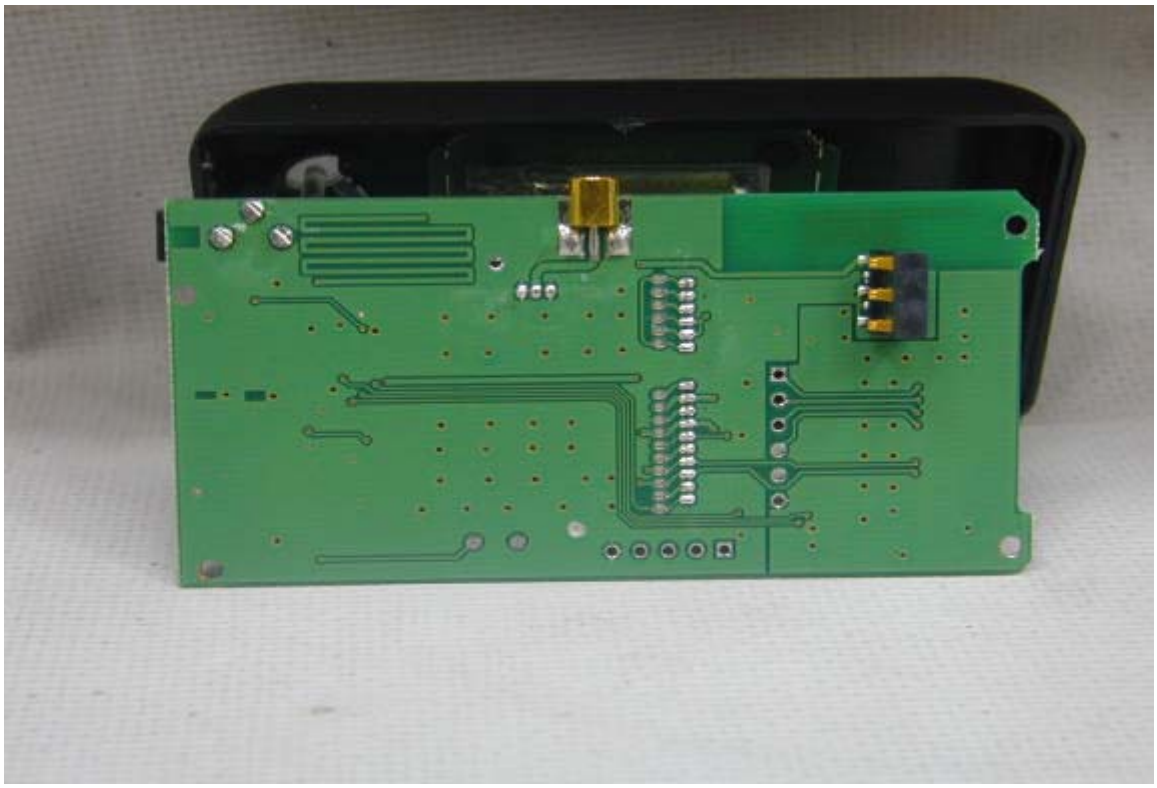
XI. List of Test Instruments

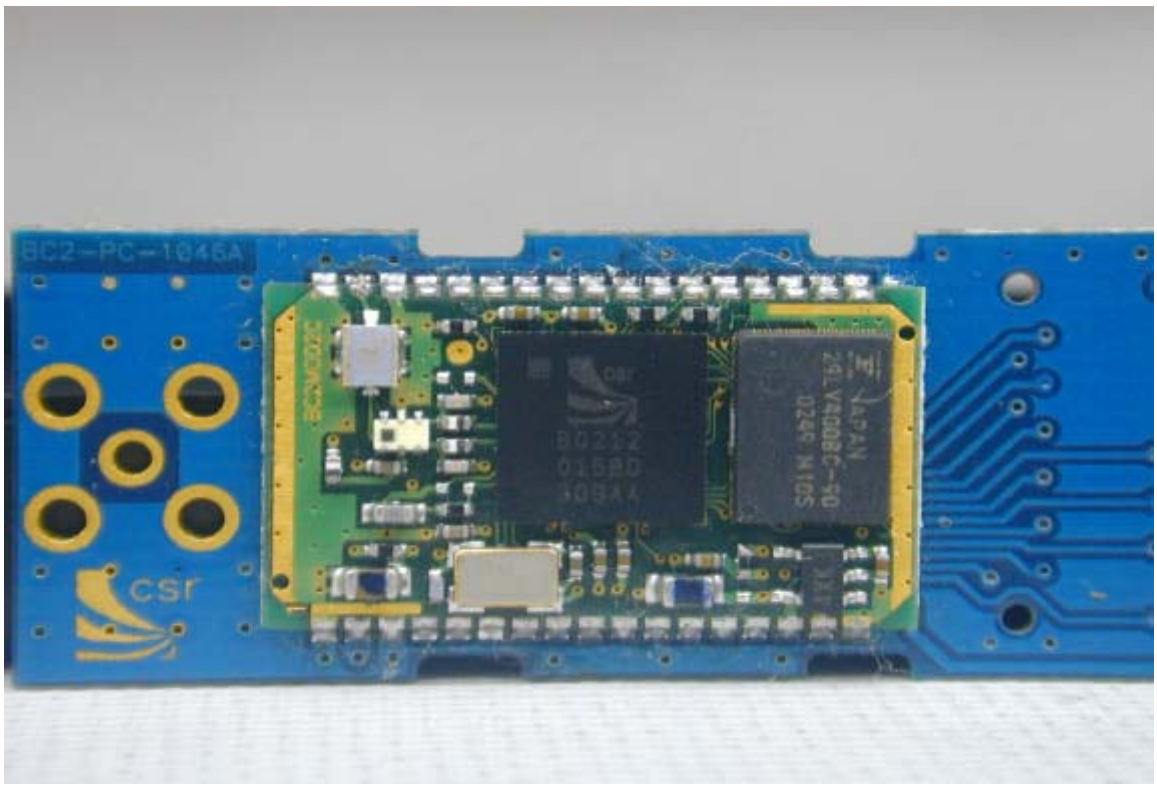
Test Mode	Instrument	Model No.	Serial No.	Next Cal. Date	Cal. Interval
Conduction (No.1)	R & S Receiver	ESHS10	830223/008	May 22, 2005	1Year
	Rolf Heine LISN	NNB-4/63TL	98008	May 01, 2005	1Year
	R & S LISN	ESH3-Z5	844982/039	Aug. 06, 2005	1Year
	Spectrum Analyzer	R3261A	91720076	June 08, 2005	1Year
	RF Cable	Rg400	N/A	May 12, 2005	1Year
	Schaffner ISN	T411	N/A	June 29, 2005	1Year
Radiation (OP No.3)	R & S Receiver	ESBI	845658/003	July 28, 2005	1Year
	Schaffner Pre-Amp.	CPA-9232	1012	Aug. 20, 2005	1Year
	SCJWARZBECL Antenna	VULB9161	D-69250	May 19, 2005	1Year
	COM-Power Horn Ant.	AH-118 (1GHz~18GHz)	10095	May 25, 2005	1Year
	RF Cable	No.2	N/A	Feb. 19, 2005	1Year
	SCHWARZBECK Precision Dipole Ant.	VHAP (30MHz~1GHz)	970+971 953+954	June 26, 2006	3Year
	R & S Signal Generator	SMY01	829846/038	Feb. 16, 2005	2Year
Chamber (No. 3)	Spectrum Analyzer	FSP 30	100157	Aug. 30, 2005	1Year
	Pre-Amplifier	CPA-9232	1027	Feb. 24, 2005	1Year
	Antenna	VULB9160	3074	July 24, 2004	1Year
	Signal Generator	SMY02	829846/0358	Jane 29, 2005	2Year
	RF Cable	NO.3	N/A	Feb. 19, 2005	1Year
	HORN ANTENNA	AH-118	10095	May 13, 2005	1Year

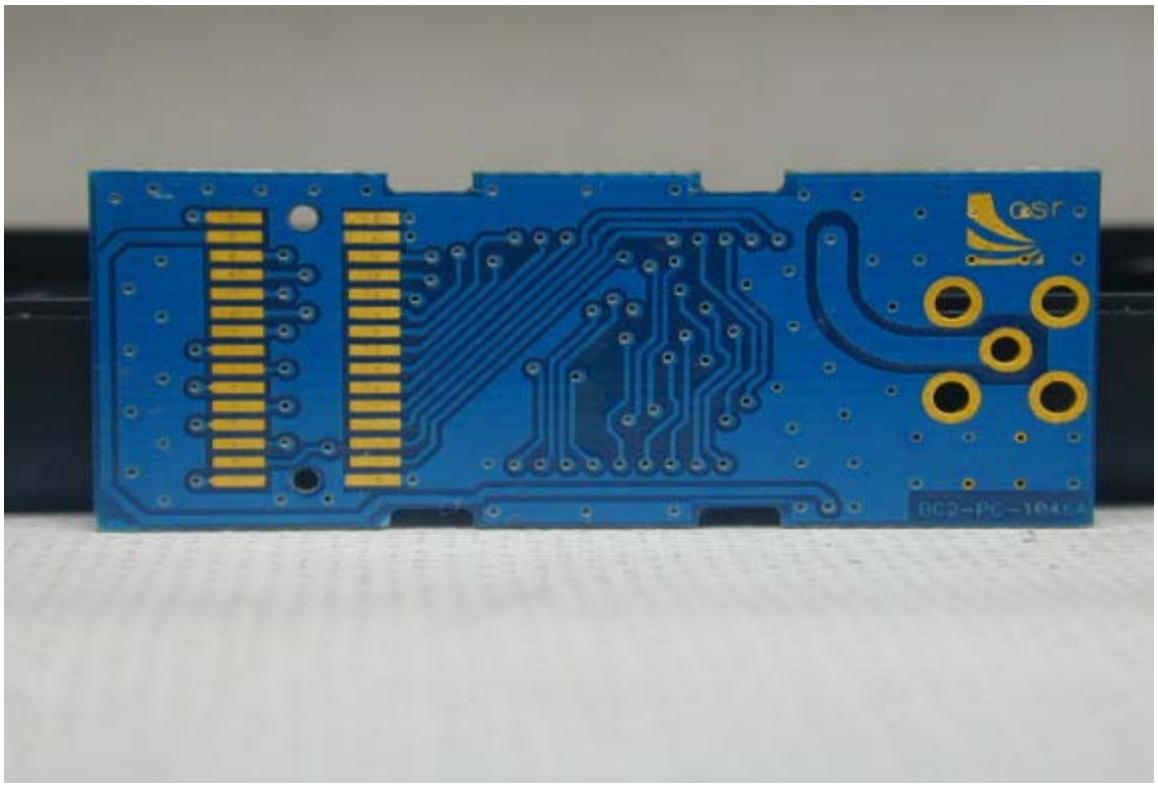
XII. EUT Photos

EUT Model No. GPS BT-77






BC2-PC-1046A
csr


asr