

ftech Corporation

No. 16, Nan-ke 9th Rd., Science-based Industrial Park, Tainan 741, Taiwan, R.O.C.,
TEL: 886-6-600-8999 FAX: 886-6-505-0826

Federal Communications Commission
Authorization and Evaluation Division

Confidentiality Request

FCC ID: SBUFGPSBT04

Pursuant to Sections 0.457 and 0.459 of the Commission's Rules, the Applicant hereby requests confidential treatment of information accompanying this Application as outlined below:

- Schematics
- Block Diagram

The above materials contain trade secrets and proprietary information not customarily released to the public. The public disclosure of these matters might be harmful to the Applicant and provide unjustified benefits to its competitors.

The Applicant understands that pursuant to Rule 0.457, disclosure of this Application and all accompanying documentation will not be made before the date of the Grant for this application.

Sincerely yours,



Phil Lin / R&D Engineer
E-mail: phil@f-tech.com.tw

RFI / EMI TEST REPORT

APPLICANT : **ftech Corporation**

E U T Type : **Bluetooth GPS Receiver**

MODEL NO. : **BT1.5**

FCC ID : **SBUFGPSBT04**

REGULATION : **CFR 47 , Part 15 Subpart C , Class B**

TEST SITE : **PEP Testing Laboratory**

TEST ENGINEER : **JASON KUNG**

TEST DATE : **FEB. 24, 2006**

ISSUED DATE : **MAR. 16, 2006**

REPORT NO. : **E950091**

PEP Testing Laboratory

12-3Fl, No. 27-1, Lane 169, Kang-Ning St., Hsi-Chih,
Taipei Hsien, Taiwan, R. O. C.
TEL: 886-2-26922097 FAX: 886-2-26956236

FCC ID : SBUFGPSBT04

REPORT NO. : E950091

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 - 2003 .

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

APPLICANT : **ftech Corporation**
PRODUCT : **Bluetooth GPS Receiver**
FCC ID : **SBUFGPSBT04**
MODEL : **BT1.5**

M. Y. Tsui

M. Y. TSUI / President

PEP Testing Laboratory

12-3FL., NO. 27-1, Lane 169, Kang-Ning St.,
Hsi-Chi, Taipei Hsien, Taiwan, R. O. C.
TEL : 886-2-6922097 FAX : 886-2-6956236

TABLE OF CONTENTS

I.	GENERAL INFORMATION	5
1.1	Description of EUT	
1.2	Supporting Devices for EUT testing	
1.3	EUT Test Setup Configuration	
1.4	Channels Verification (15.205)	
II.	§15.207 POWER LINE CONDUCTED EMISSION TEST	10
2.1	Testing Description	
2.2	Software Using	
2.3	Test Result	
2.4	Conducted Emission Test Photo	
III.	§15.247(a)(1): HOPPINGCHANNEL FREQUENCY SEPARATION	14
3.1	Test Procedure	
3.2	Test result of Frequency Separation	
3.3	Spectrum Plot Data	
IV.	§15.247(a)(1) : 20dB BANDWIDTH	15
4.1	Test Procedure	
4.2	Test Result of Bandwidth	
4.3	Spectrum Plot Data	
V.	§15.247(a) (1): TIME OF OCCUPANCY(DWELL TIME)	22
5.1	Test Procedure	
5.2	Test Result of Dwell Time	
5.3	Spectrum Plot Data	
VI	§15.247(b) : THE MAXIMUM PEAK OUTPUT POWER (≤ 1WATT)	24
6.1	Testing Description	
6.2	Software Using	
6.3	Test Result of Fundamental Emissions	
VII.	§15.247(b)(4) MAXIMUM PERMISSIBLE EXPOSURE (MPE)	32
7.1	MPE distance calculation	
7.2	Device operating configurations exposure conditions	
7.3	Maximum Permissible Exposure (MPE)	

PEP Testing Laboratory

12-3Fl, No. 27-1, Lane 169, Kang-Ning St., Hsi-Chih,

Taipei Hsien, Taiwan, R. O. C.

TEL: 886-2-26922097 FAX: 886-2-26956236

FCC ID : SBUFGPSBT04

REPORT NO. : E950091

VIII. §15.247(c) : SPURIOUS RADIATED EMISSIONS	34
8.1 Out side band below 1GHz	
8.2 Out side band above 1GHz	
8.2 Spurious Radiate Emission Testing Photos	
IX. §15.247(c) : BAND-EDGES COMPLIANCE	39
X. §15.247(d) : PEAK POWER SPECTRAL DENSITY	43
10.1 Test Procedure	
10.2 Test result of Peak Power Spectral Density	
10.3 Spectrum Plot Data	
XI. LIST OF TEST INSTRUMENTS	50
XII. EUT PHOTOS	51

I . General Information

The equipment under test (EUT) is Bluetooth GPS Receiver, FCC ID: SBUFGPSBT04, model BT1.5. 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 5V 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	:	SBUFGPSBT04
EUT Model No.	:	BT1.5
Frequency Range	:	2.402~2.480 GHz
Support Channel	:	79 channels
Modulation	:	Frequency Hopping Spread Spectrum (FHSS) Built in Active Antenna
Antenna Type	:	Comply with FCC Part 15, Section 15.203;
Power Supply	:	DC 3.7V Li-on Battery
Power Cord	:	N/A

1.2 Supporting Devices for EUT testing

Adaptor

Manufacturer : ADAPTER TECH.

Model Number : STD-0501

Input : AC 100-240V

Output : DC 5V 1A

Notebook PC

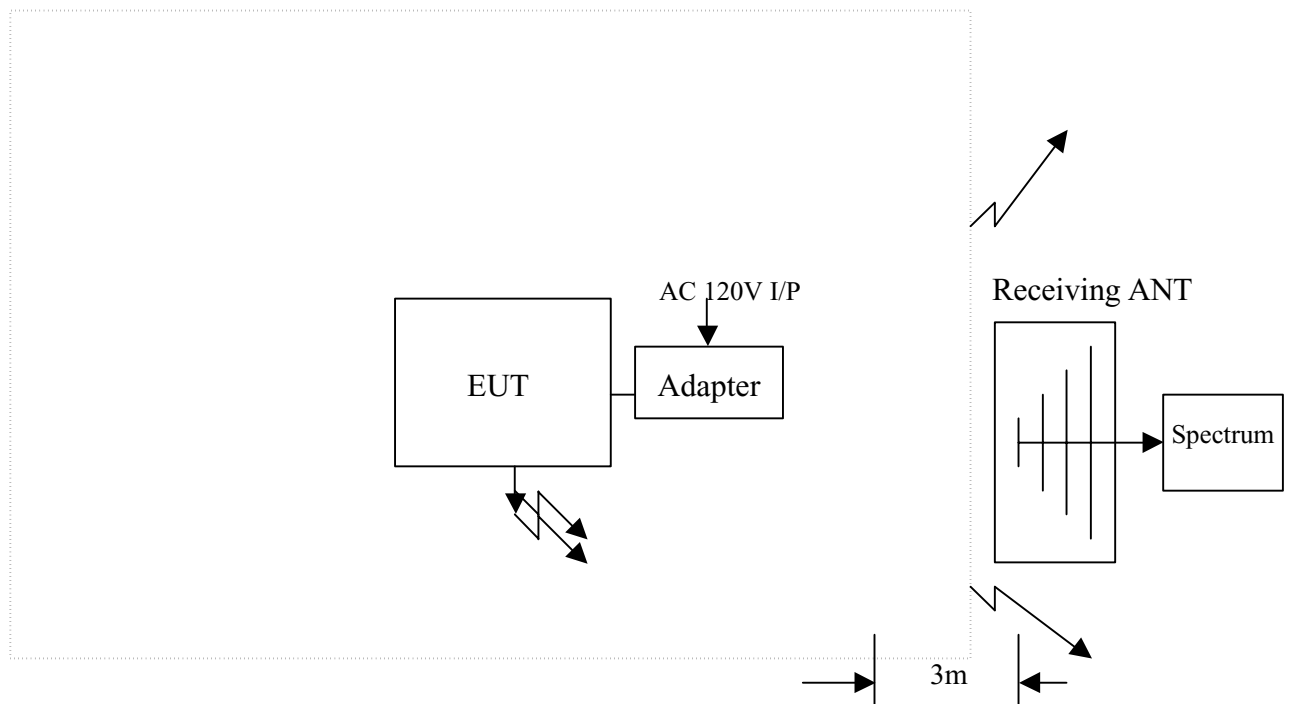
Manufacturer : GIGABYTE

Model Number : N601

1.3 EUT Test Setup Configuration

- (A)Test Procedure: As required by ANSI C63.4 (2003)
- (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 : BT1.5

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 :

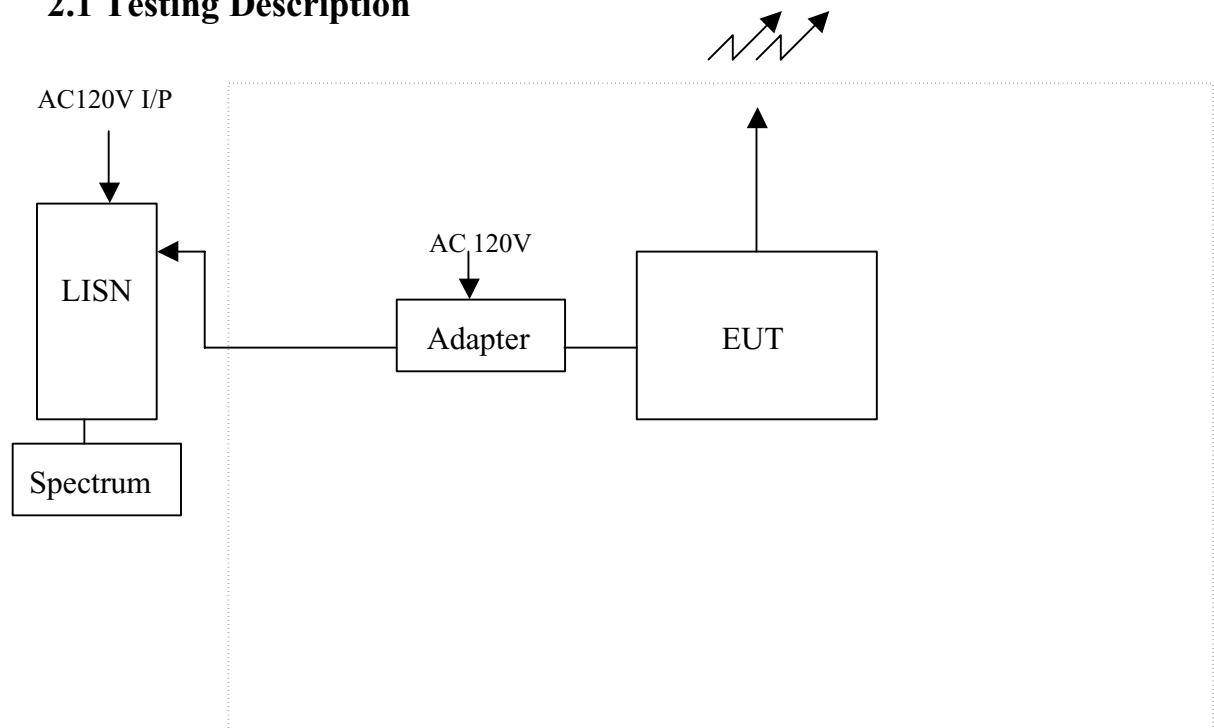
2.4 GHz --- 2.4835 GHz ☒ Yes ☐ No

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

PEP Testing Laboratory

12-3Fl, No. 27-1, Lane 169, Kang-Ning St., Hsi-Chih,
Taipei Hsien, Taiwan, R. O. C.
TEL: 886-2-26922097 FAX: 886-2-26956236

FCC ID : SBUFGPSBT04

REPORT NO. : E950091

2.3 Test Result

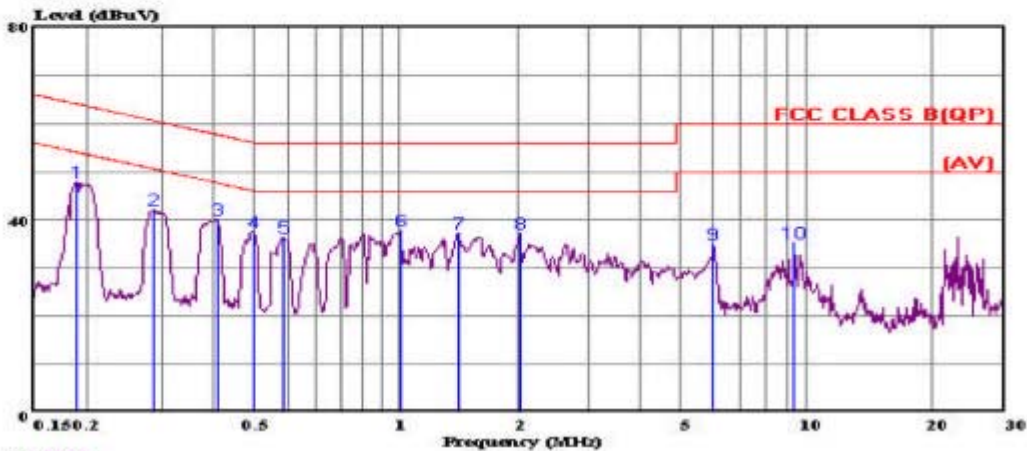
EUT Model No. BT1.5 (LINE)

Detector : Peak Value



暉鑫科技股份有限公司
PEP Testing Laboratory

Data#: 1825 File#: FCC CLASS B(QP).EMI Date: 2006-02-24 Time: 16:58:35



Trace: 1824
Site : Shih-Chi : Conduction No.1(Long)
Condition: FCC CLASS B(QP) LISN.L(16A) LINE
eut : E950091
power : AC 120V 60Hz
memo : Peak Value
: Final Test

Page: 1

	Freq	Level	Over	Limit	Read	Probe	Cable	
	MHz	dBuV	Limit	Line	Level	Factor	Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.190	47.92	-16.10	64.02	47.72	0.10	0.10	
2	0.286	42.04	-18.59	60.63	41.81	0.10	0.13	
3	0.408	40.23	-17.45	57.68	40.03	0.10	0.10	
4	0.497	37.70	-18.35	56.05	37.40	0.10	0.20	
5	0.585	36.28	-19.72	56.00	36.06	0.10	0.12	
6	1.106	37.97	-18.03	56.00	37.67	0.10	0.20	
7	1.519	37.36	-18.64	56.00	37.06	0.10	0.20	
8	2.133	37.34	-18.66	56.00	37.04	0.10	0.20	
9	6.089	35.01	-24.99	60.00	34.61	0.19	0.21	
10	9.502	35.30	-24.70	60.00	34.71	0.29	0.30	

PEP Testing Laboratory

12-3Fl, No. 27-1, Lane 169, Kang-Ning St., Hsi-Chih,
Taipei Hsien, Taiwan, R. O. C.
TEL: 886-2-26922097 FAX: 886-2-26956236

FCC ID : SBUFGPSBT04

REPORT NO. : E950091

EUT Model No.: BT1.5 (NEUTRAL)

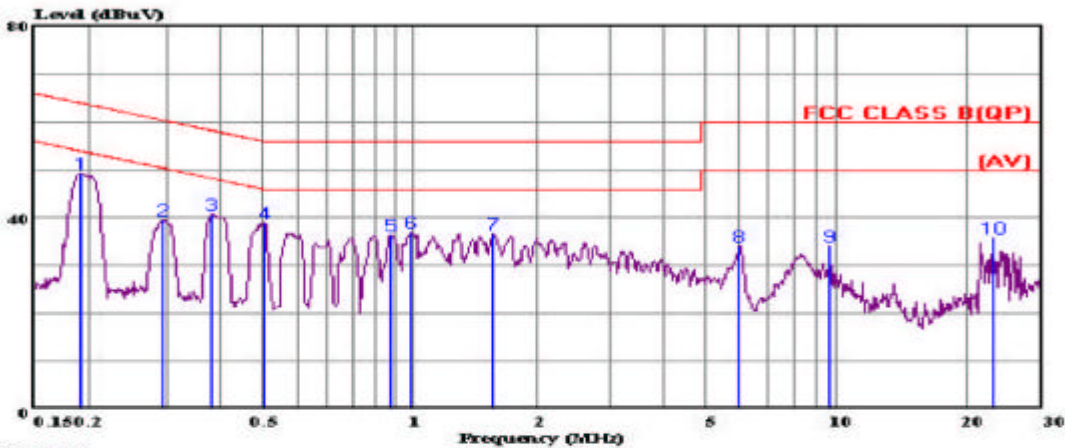
Detector : Peak Value



緯鑫科技股份有限公司
PEP Testing Laboratory

Data#: 1830 File#: FCC CLASS B(QP).EMI

Date: 2006-02-24 Time: 17:00:15



Trace: 1829
Site : Shih-Chi : Conduction No.1(Long)
Condition: FCC CLASS B(QP) LISN.N(16A) NEUTRAL
eut : E950091
power : AC 120V 60Hz
memo : Peak Value
 : Final Test

Page: 1

	Freq	Level	Over	Limit	Read	Probe	Cable	
	MHz	dBuV	Limit	Line	Level	Factor	Loss	Remark
			dB	dBuV	dBuV	dB	dB	
1	0.192	49.27	-14.66	63.93	49.07	0.10	0.10	
2	0.294	39.57	-20.84	60.41	39.36	0.10	0.11	
3	0.381	40.78	-17.47	58.25	40.58	0.10	0.10	
4	0.502	39.03	-16.97	56.00	38.73	0.10	0.20	
5	0.979	36.30	-19.70	56.00	36.00	0.10	0.20	
6	1.082	37.00	-19.00	56.00	36.70	0.10	0.20	
7	1.680	36.79	-19.21	56.00	36.49	0.10	0.20	
8	6.089	34.23	-25.77	60.00	33.83	0.19	0.21	
9	9.861	34.05	-25.95	60.00	33.45	0.30	0.30	
10	23.140	35.89	-24.11	60.00	34.93	0.56	0.40	

2.4 Conducted Emission Test Photo

EUT Model No. BT1.5

< FRONT VIEW >



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

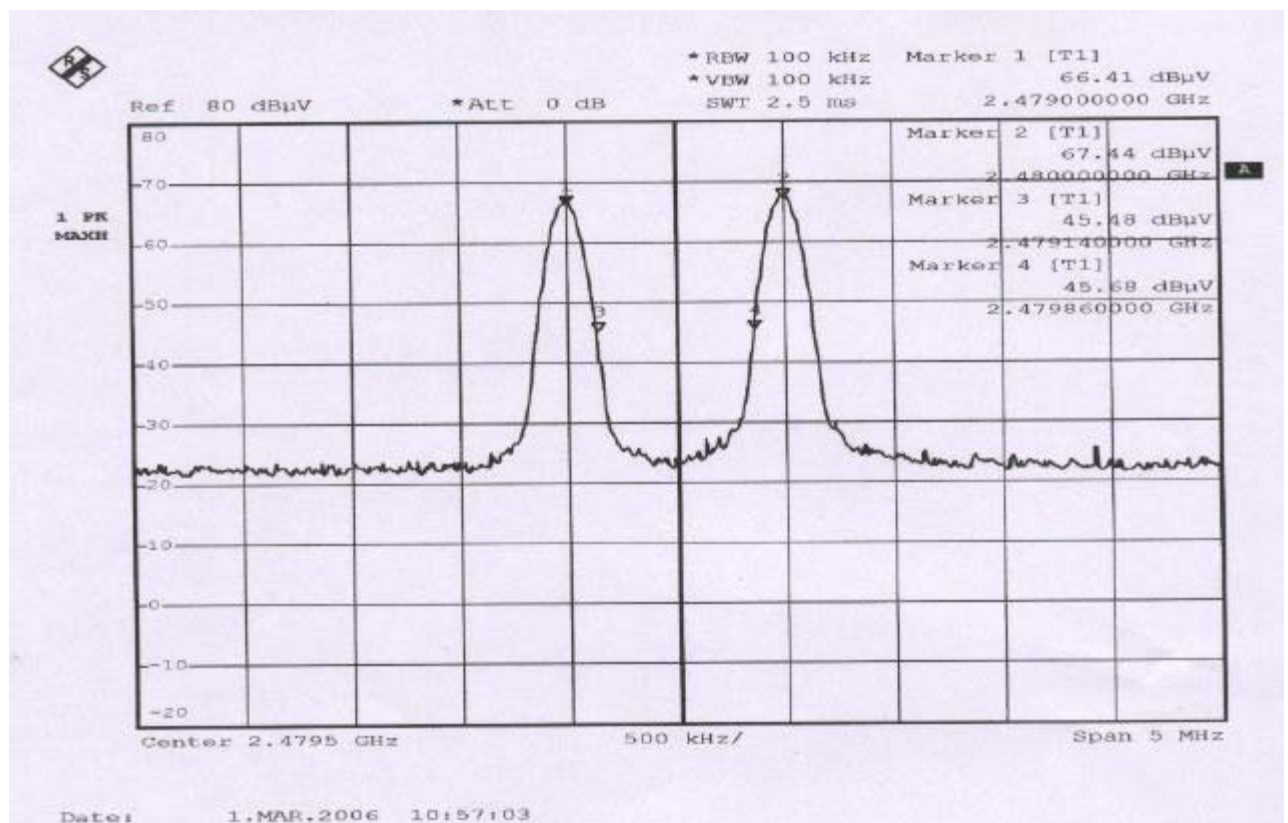
3.1 Test Procedure

- (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	1000	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. BT1.5

Channel	Antenna Polarity	Bandwidth (KHz)	Limit (KHz)	Pass/Fail
LOW	H	35	1000	Pass
	V	34	1000	Pass
MID	H	31	1000	Pass
	V	35	1000	Pass
HIGH	H	35	1000	Pass
	V	34	1000	Pass

PEP Testing Laboratory

12-3Fl, No. 27-1, Lane 169, Kang-Ning St., Hsi-Chih,
Taipei Hsien, Taiwan, R. O. C.

TEL: 886-2-26922097 FAX: 886-2-26956236

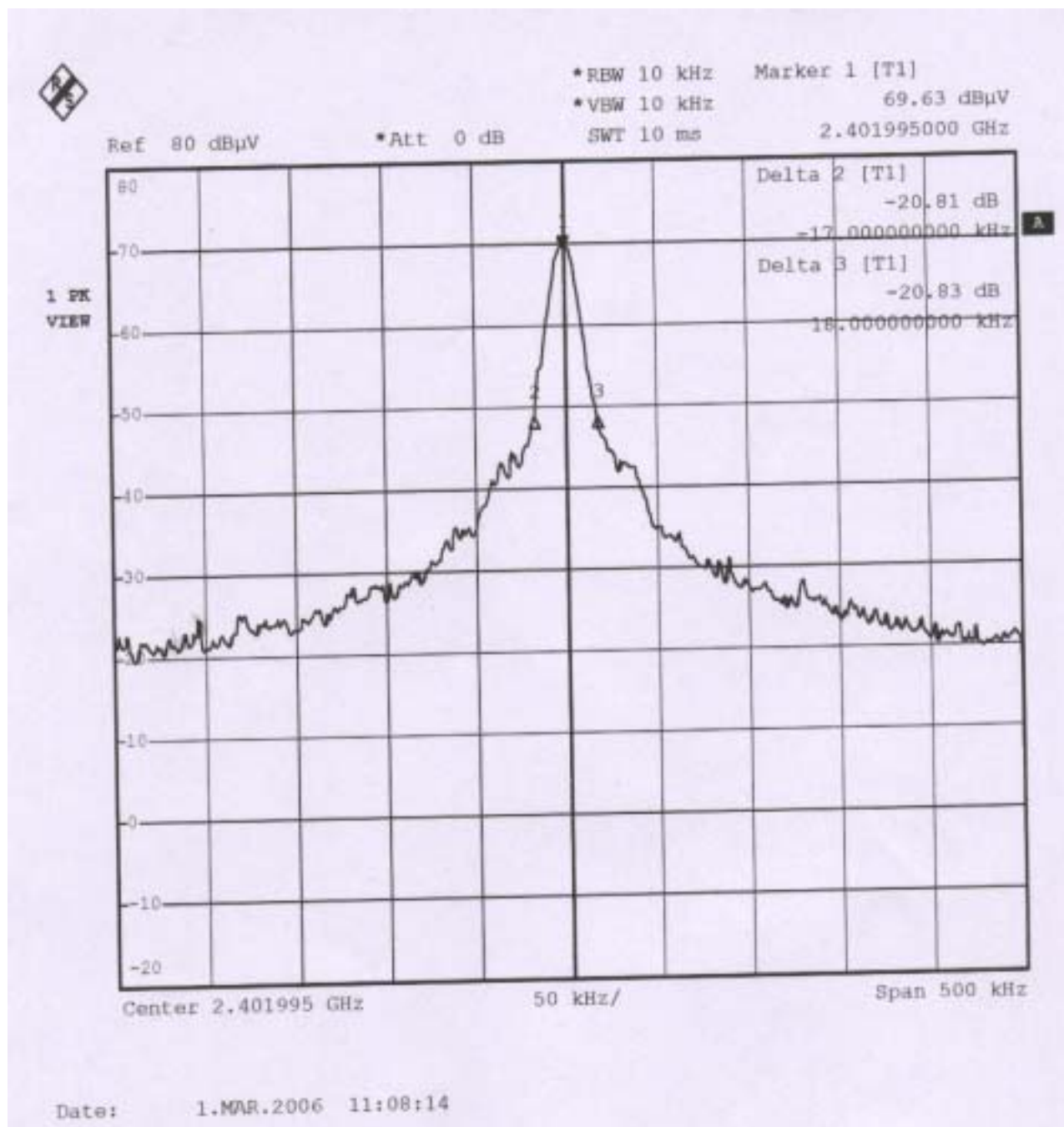
FCC ID : SBUFGPSBT04

REPORT NO. : E950091

4.3 Spectrum Plot Data

Channel : CH LOW

Polarity : Horizontal



PEP Testing Laboratory

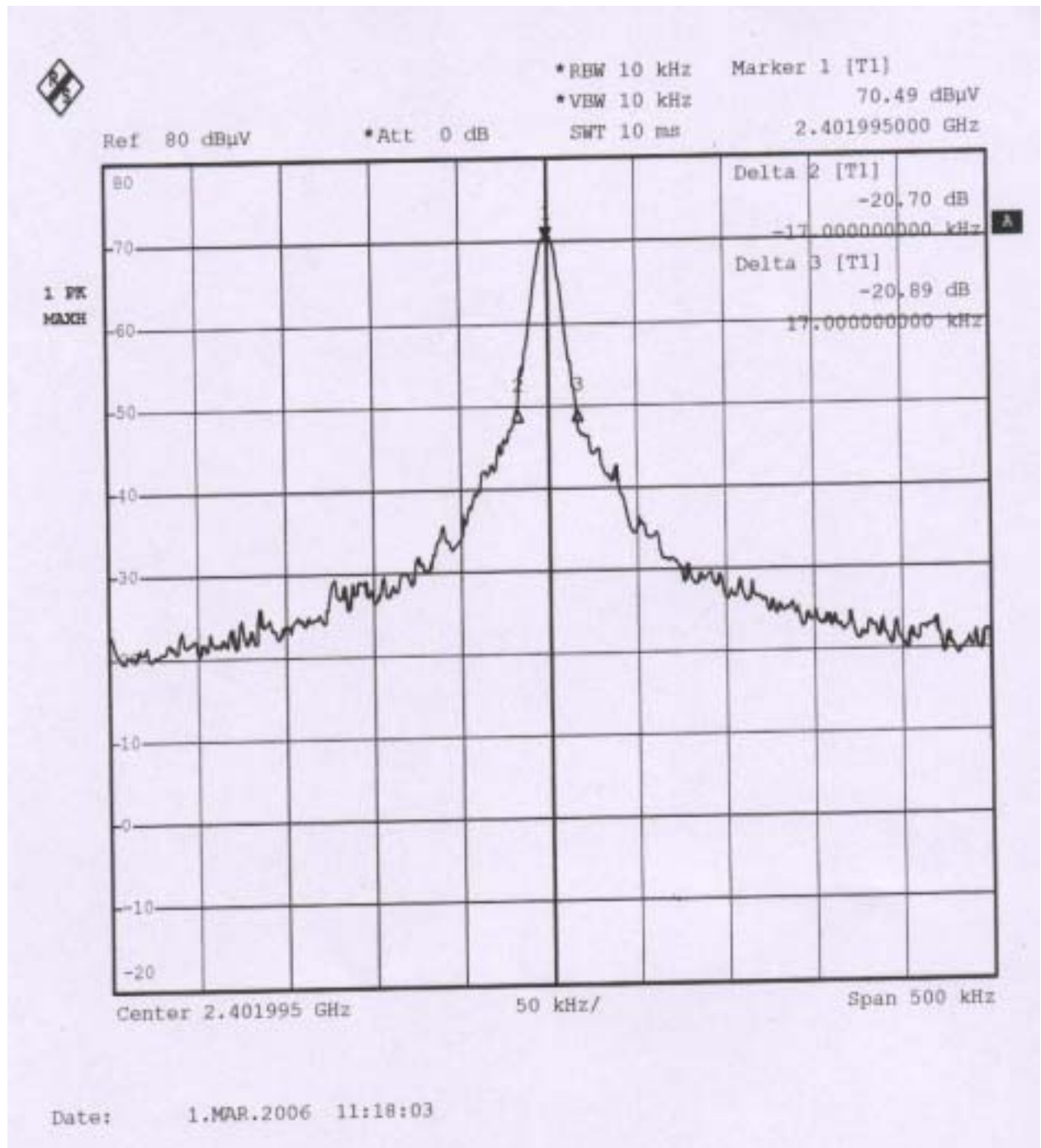
12-3Fl, No. 27-1, Lane 169, Kang-Ning St., Hsi-Chih,
Taipei Hsien, Taiwan, R. O. C.
TEL: 886-2-26922097 FAX: 886-2-26956236

FCC ID : SBUFGPSBT04

REPORT NO. : E950091

Channel : CH LOW

Polarity : Vertical



PEP Testing Laboratory

12-3Fl, No. 27-1, Lane 169, Kang-Ning St., Hsi-Chih,
Taipei Hsien, Taiwan, R. O. C.

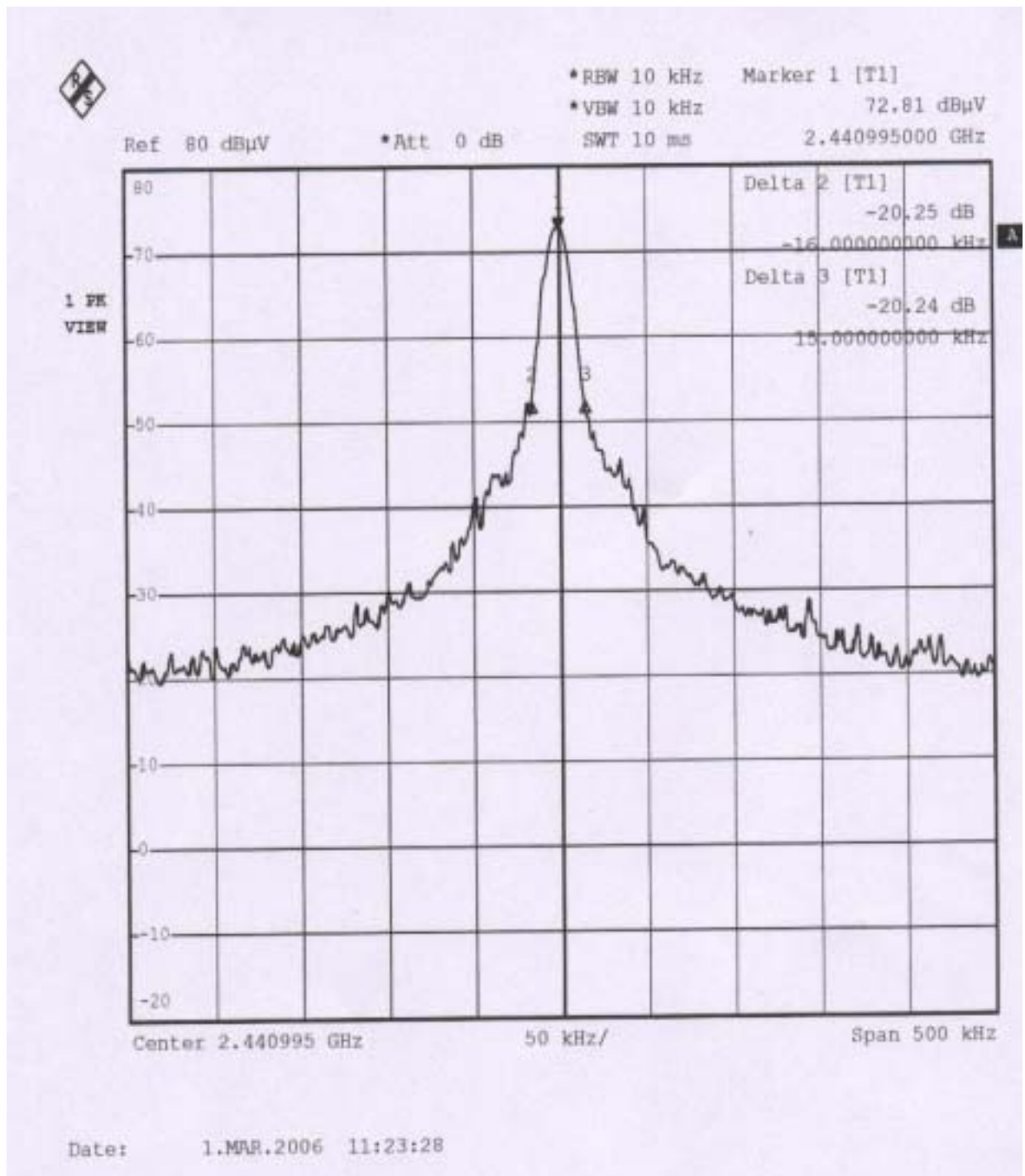
TEL: 886-2-26922097 FAX: 886-2-26956236

FCC ID : SBUFGPSBT04

REPORT NO. : E950091

Channel : CH MID

Polarity : Horizontal



PEP Testing Laboratory

12-3Fl, No. 27-1, Lane 169, Kang-Ning St., Hsi-Chih,

Taipei Hsien, Taiwan, R. O. C.

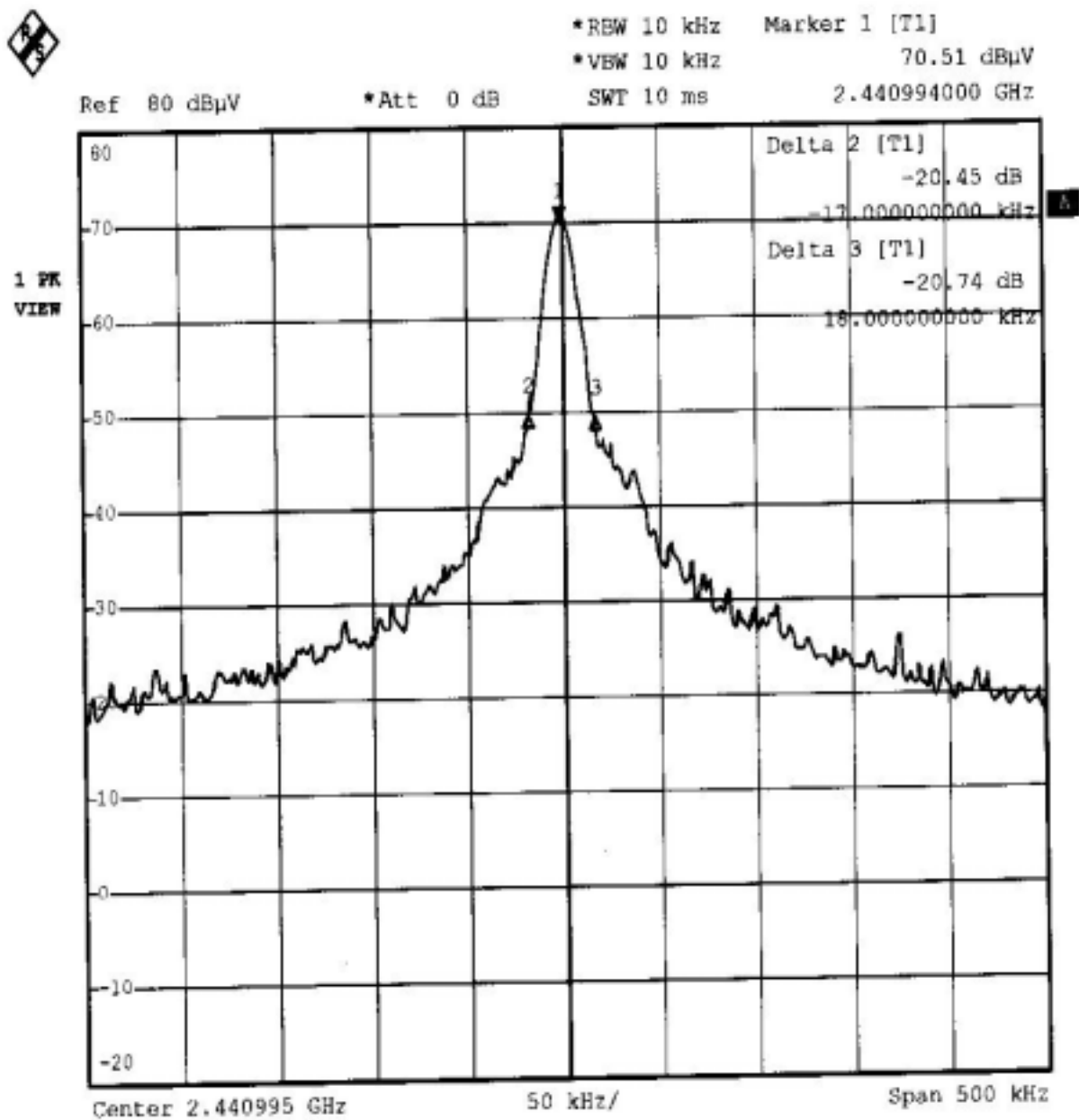
TEL: 886-2-26922097 FAX: 886-2-26956236

FCC ID : SBUFGPSBT04

REPORT NO. : E950091

Channel : CH MID

Polarity : Vertical



Date: 1.MAR.2006 11:20:51

PEP Testing Laboratory

12-3Fl, No. 27-1, Lane 169, Kang-Ning St., Hsi-Chih,

Taipei Hsien, Taiwan, R. O. C.

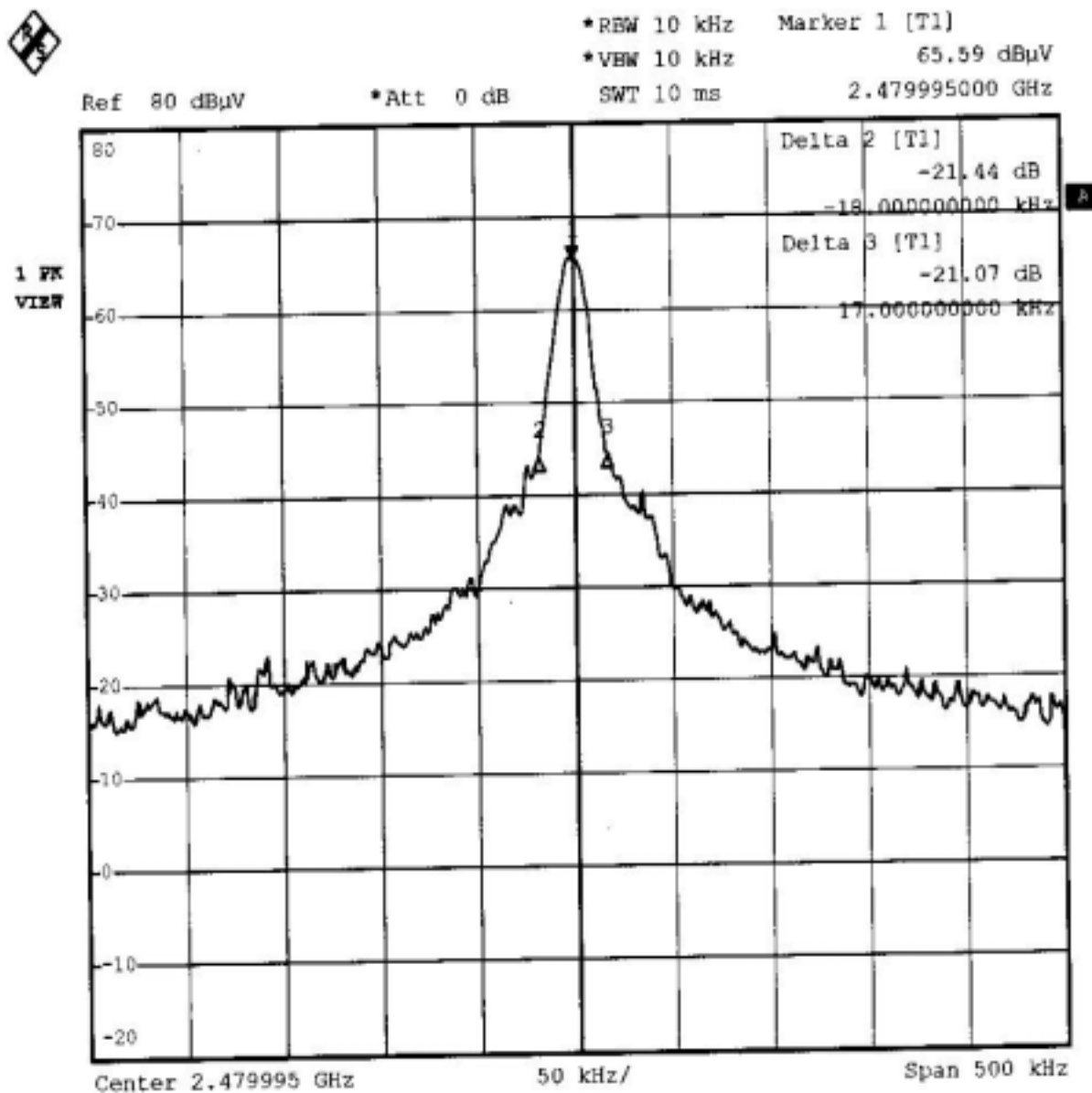
TEL: 886-2-26922097 FAX: 886-2-26956236

FCC ID : SBUFGPSBT04

REPORT NO. : E950091

Channel : CH HIGH

Polarity : Horizontal



Date: 1.MAR.2006 11:29:28

PEP Testing Laboratory

12-3Fl, No. 27-1, Lane 169, Kang-Ning St., Hsi-Chih,

Taipei Hsien, Taiwan, R. O. C.

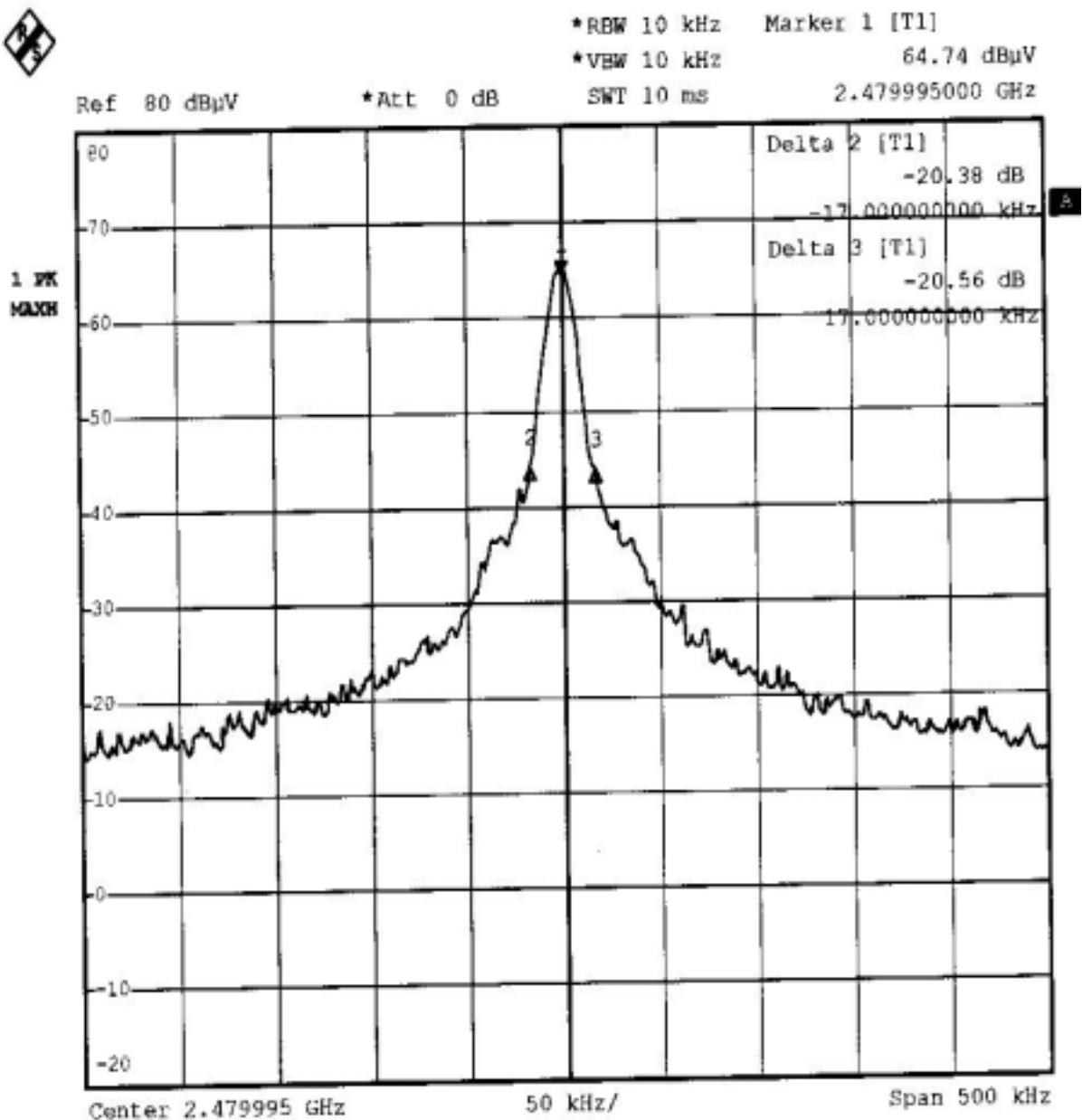
TEL: 886-2-26922097 FAX: 886-2-26956236

FCC ID : SBUFGPSBT04

REPORT NO. : E950091

Channel : CH HIGH

Polarity : Vertical



Date: 1.MAR.2006 11:31:18

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= $0.42 \times 80 = 33.6\text{ms} < 0.4\text{s}$

PEP Testing Laboratory

12-3Fl, No. 27-1, Lane 169, Kang-Ning St., Hsi-Chih,

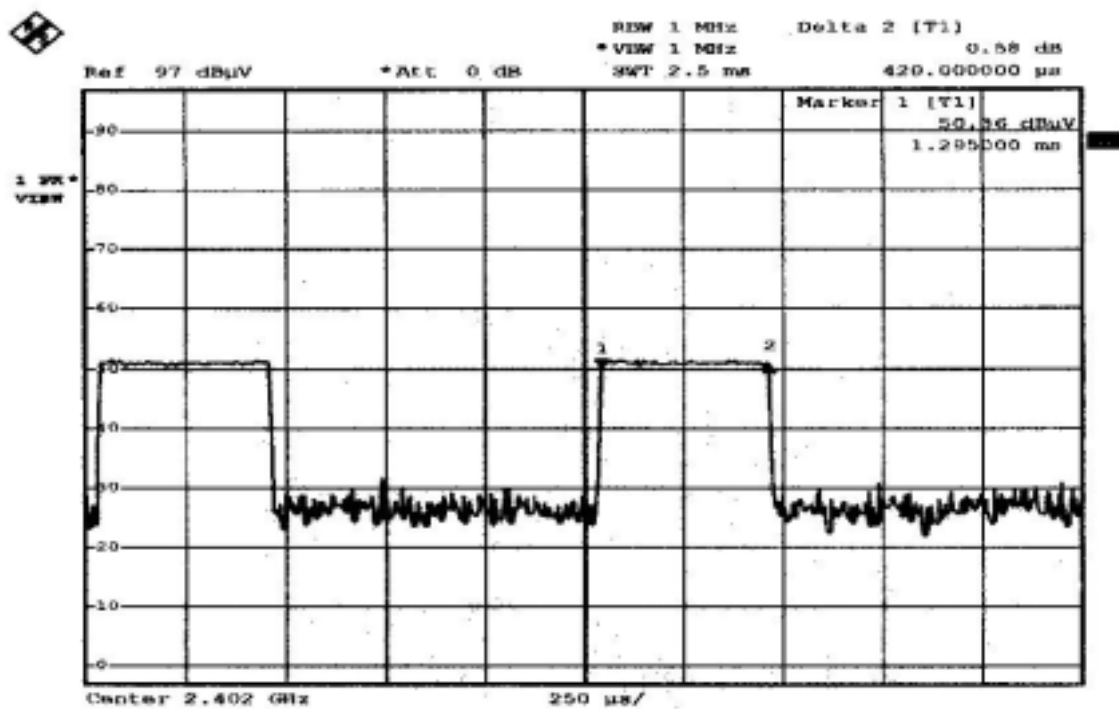
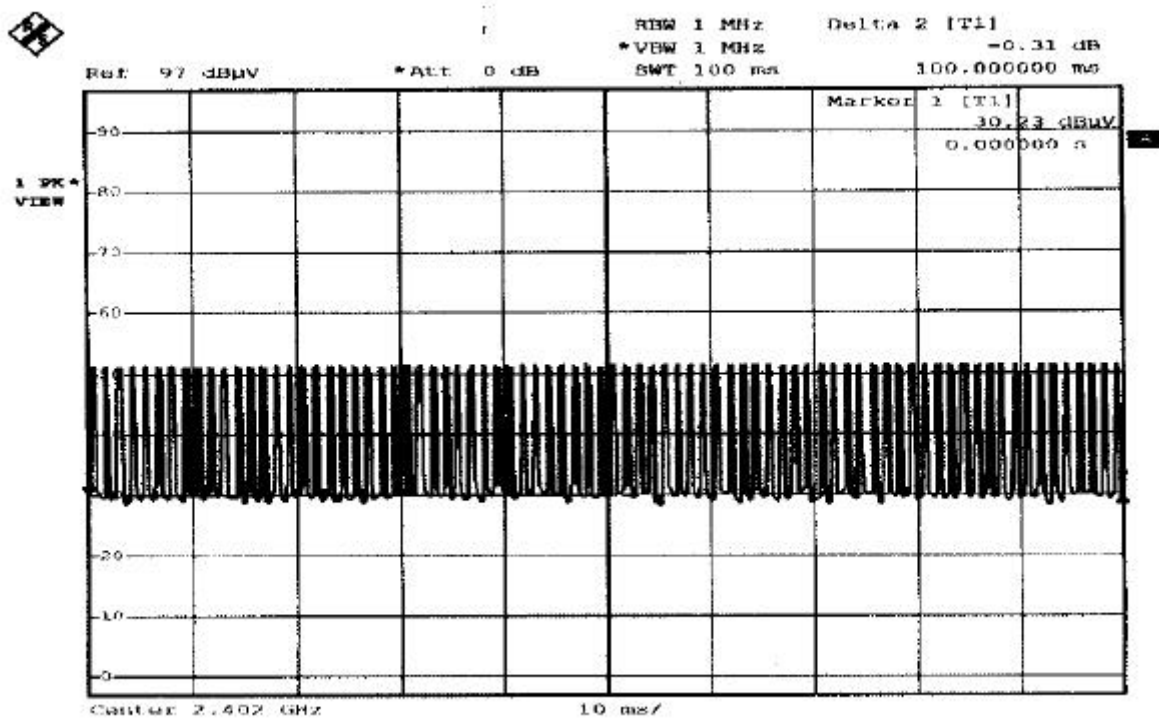
Taipei Hsien, Taiwan, R. O. C.

TEL: 886-2-26922097 FAX: 886-2-26956236

FCC ID : SBUFGPSBT04

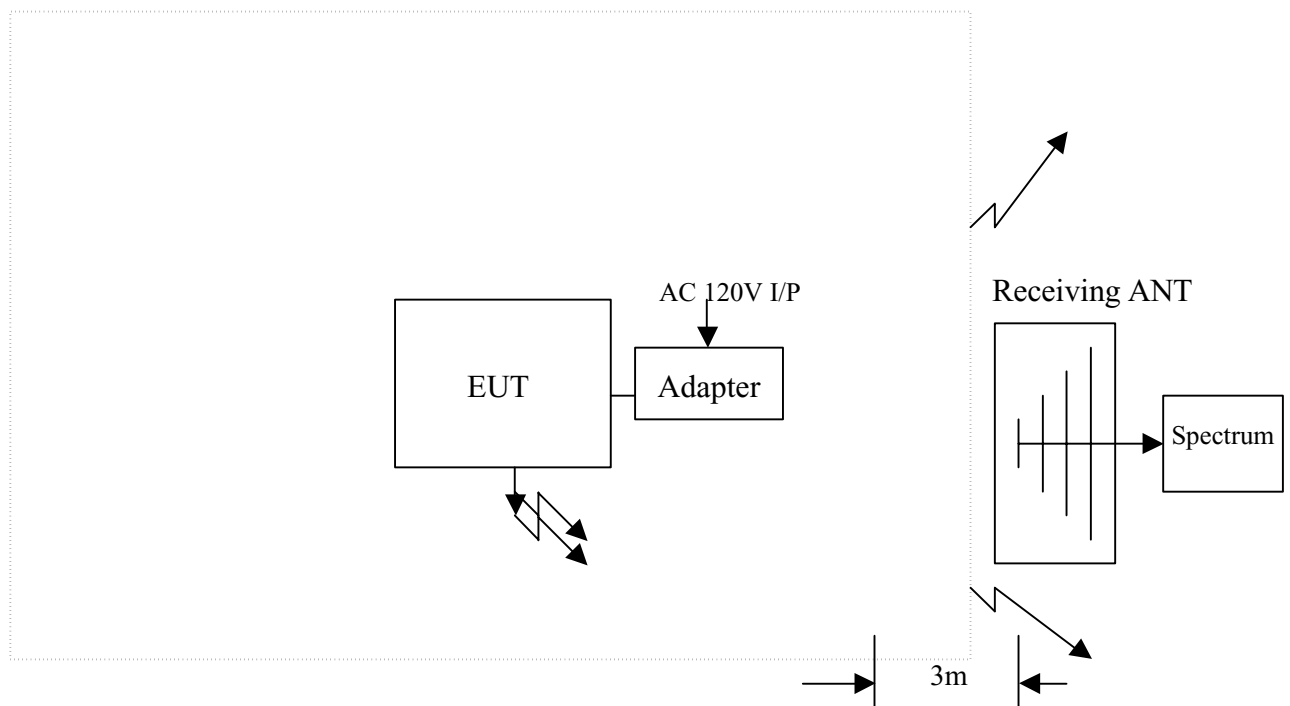
REPORT NO. : E950091

5.3 Spectrum Plot Data



VI. §15.247(b) : The maximum peak output power ($\leq 1\text{watt}$)

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. BT1.5

Channel	Frequency (MHz)	Antenna Polarity (H/V)	Level (dBuV/m)	E.I.R.P. (W)
LOW	2402.04	H	67.72	1.77×10^{-6}
	2401.98	V	68.46	2.10×10^{-6}
MID	2441.04	H	67.43	1.66×10^{-6}
	2441.04	V	65.39	1.04×10^{-6}
HIGH	2479.98	H	62.23	0.50×10^{-6}
	2480.04	V	62.04	0.48×10^{-6}

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)

$P = \text{E.I.R.P.}$

4. Example :

If Level = 120 dBuV/m

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

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

PEP Testing Laboratory

12-3Fl, No. 27-1, Lane 169, Kang-Ning St., Hsi-Chih,
Taipei Hsien, Taiwan, R. O. C.
TEL: 886-2-26922097 FAX: 886-2-26956236

FCC ID : SBUFGPSBT04

REPORT NO. : E950091

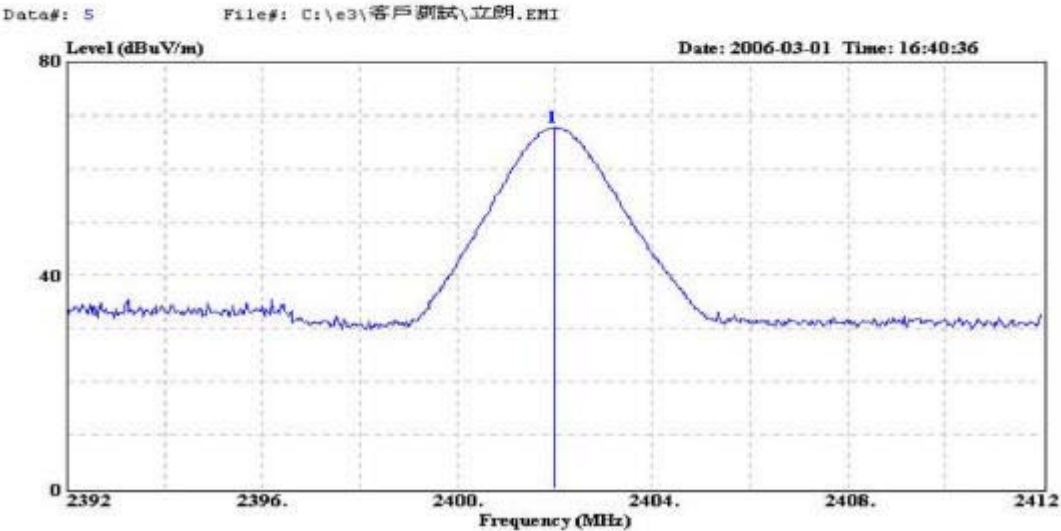
EUT Model No. BT1.5

Channel : CH LOW

Polarity : Horizontal



緯鑫科技股份有限公司
PEP Testing Laboratory



Site : chamber no3 (Joe)
Condition : 3m HORN ANTENNA H.3 HORIZONTAL
EUT : E950091
Power : AC 120V 60Hz
Memo : TX ON
: LOW

	Freq	Level	Over	Limit	Read	Probe	Cable	Preamp	
	MHz	dBuV/m	Limit	Line	Level	Factor	Loss	Factor	Remark
			dB	dBuV/m	dBuV	dB	dB	dB	
1	2401.980	67.72	-----	-----	69.83	26.48	4.08	34.67	

PEP Testing Laboratory

12-3Fl, No. 27-1, Lane 169, Kang-Ning St., Hsi-Chih,
Taipei Hsien, Taiwan, R. O. C.
TEL: 886-2-26922097 FAX: 886-2-26956236

FCC ID : SBUFGPSBT04

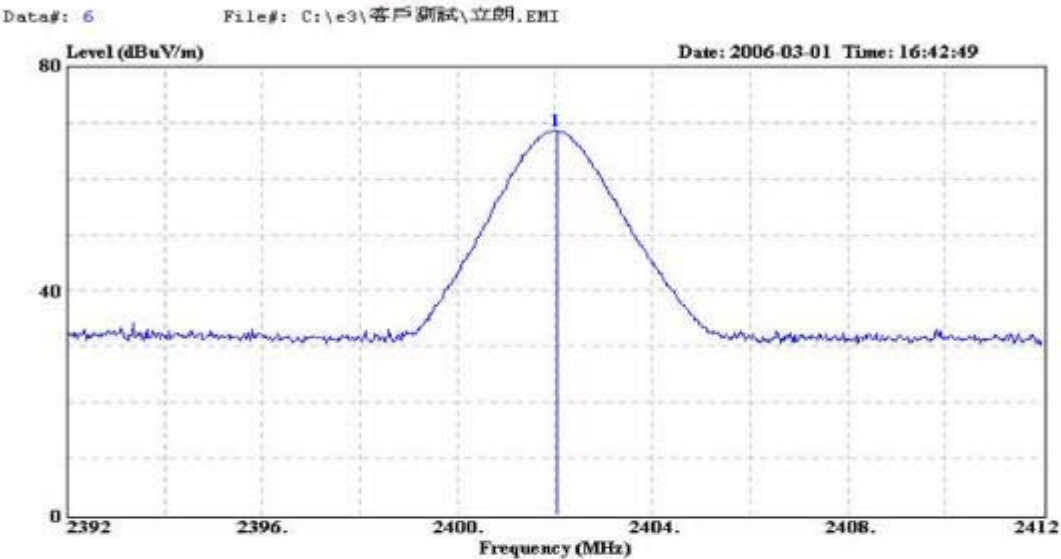
REPORT NO. : E950091

Channel : CH LOW

Polarity : Vertical



緯鑫科技股份有限公司
PEP Testing Laboratory



Site : chamber no3 (Joe)
Condition : 3m HORN ANTENNA V.3 VERTICAL
EUT : E950091
Power : AC 120V 60Hz
Memo : TX ON
: LOW

1	Freq	Level	Over	Limit	Read	Probe	Cable	Preamp	Remark
	MHz	dBuV/m	Limit	Line	Level	Factor	Loss	Factor	
			dB	dBuV/m	dBuV	dB	dB	dB	
1	2402.040	68.46	-----	-----	70.57	28.48	4.08	34.67	

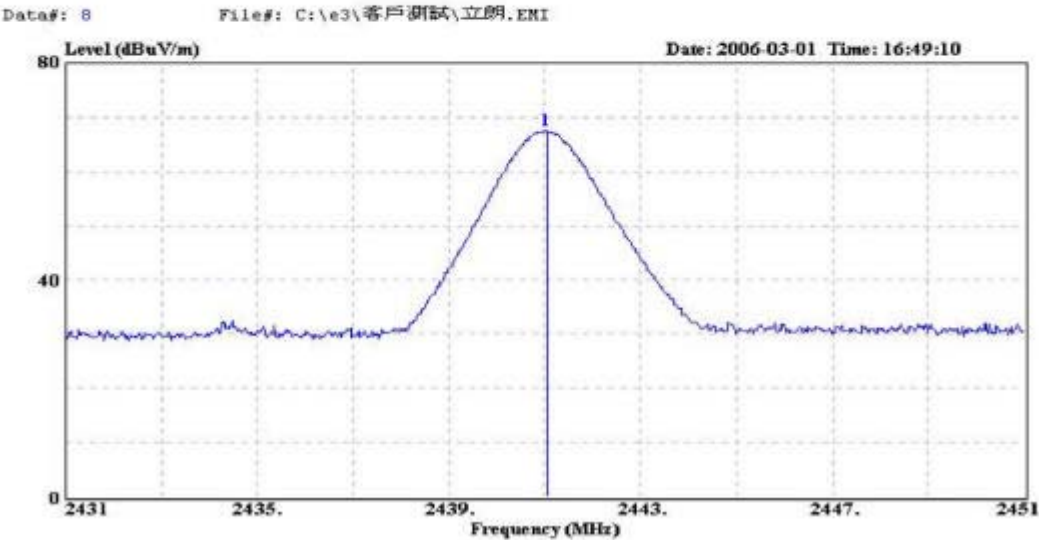
PEP Testing Laboratory

12-3Fl, No. 27-1, Lane 169, Kang-Ning St., Hsi-Chih,
Taipei Hsien, Taiwan, R. O. C.
TEL: 886-2-26922097 FAX: 886-2-26956236

FCC ID : SBUFGPSBT04

REPORT NO. : E950091

Channel : CH MID
Polarity : Horizontal



Site	: chamber no3 (Joe)							
Condition	: 3m HORN ANTENNA H.3 HORIZONTAL							
EUT	: E950091							
Power	: AC 120V 60Hz							
Memo	: TX ON							
	: MID							
	Freq	Level	Over	Limit	Read	Probe	Cable	Preamp
	MHz	dBuV/m	Limit	Line	Level	Factor	Loss	Factor
			dB	dBuV/m	dBuV	dB	dB	dB
1	2441.040	67.43	-----	-----	69.44	28.53	4.14	34.68

PEP Testing Laboratory

12-3Fl, No. 27-1, Lane 169, Kang-Ning St., Hsi-Chih,
Taipei Hsien, Taiwan, R. O. C.
TEL: 886-2-26922097 FAX: 886-2-26956236

FCC ID : SBUFGPSBT04

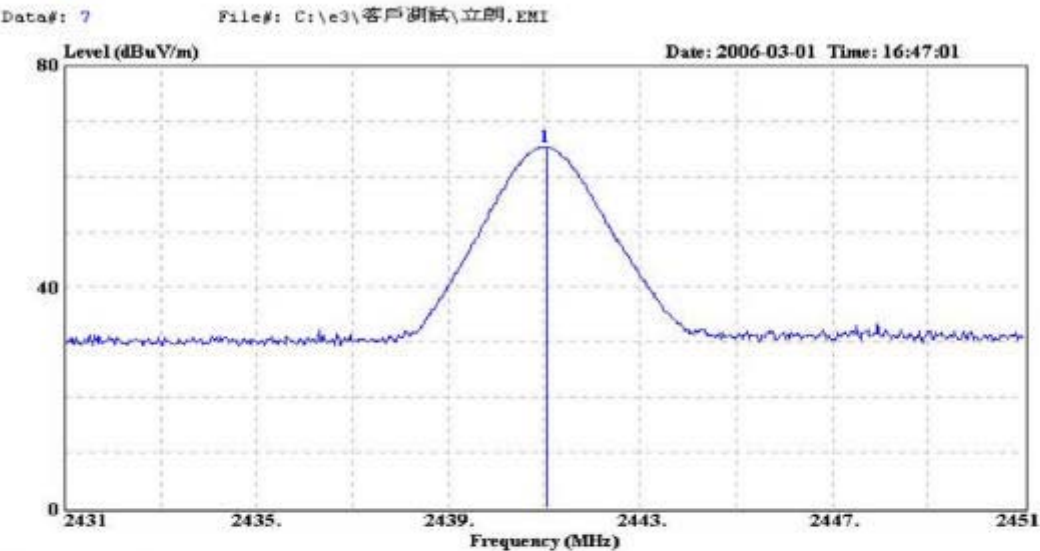
REPORT NO. : E950091

Channel : CH MID

Polarity : Vertical



緯鑫科技股份有限公司
PEP Testing Laboratory



Site : chamber no3 (Joe)
Condition : 3m HORN ANTENNA V.3 VERTICAL
EUT : E950091
Power : AC 120V 60Hz
Memo : TX ON
: MID

Freq	Level	Over Limit		Read Level	Probe Factor	Cable Preamp		Remark
		Limit	Line			Loss Factor	dB	
MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB	
1 2441.040	65.39	-----	-----	67.40	28.53	4.14	34.68	

PEP Testing Laboratory

12-3Fl, No. 27-1, Lane 169, Kang-Ning St., Hsi-Chih,
Taipei Hsien, Taiwan, R. O. C.
TEL: 886-2-26922097 FAX: 886-2-26956236

FCC ID : SBUFGPSBT04

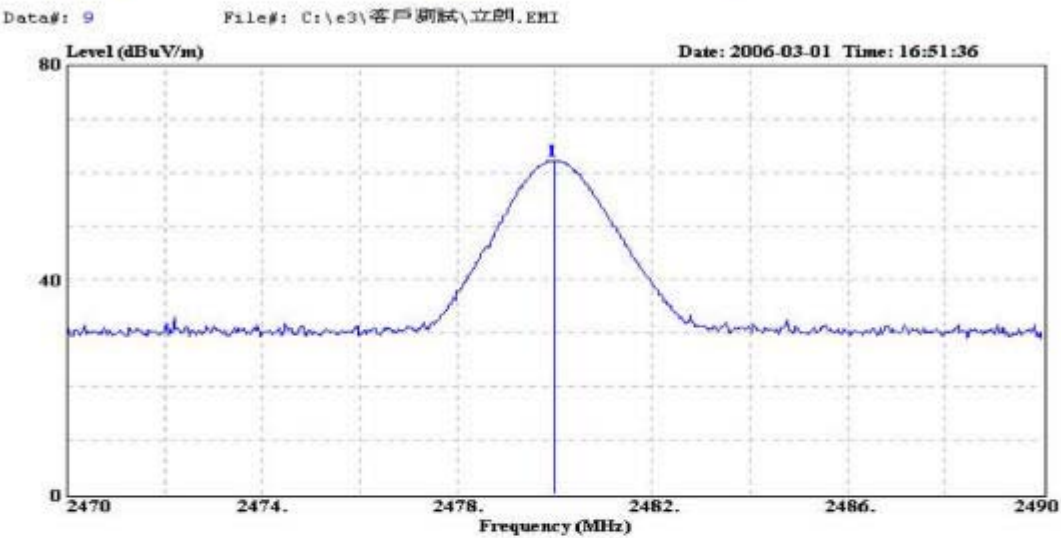
REPORT NO. : E950091

Channel : CH HIGH

Polarity : Horizontal



緯鑫科技股份有限公司
PEP Testing Laboratory



Site : chamber no3 (Joe)
Condition : 3m HORN ANTENNA H.3 HORIZONTAL
EUT : E950091
Power : AC 120V 60Hz
Memo : TX ON
: HIGH

Freq	Level	Over	Limit	Read	Probe	Cable	Preamp	Remark
		Limit	Line					
MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB	
1 2479.980	62.23	-----	-----	64.17	28.59	4.17	34.70	

PEP Testing Laboratory

12-3Fl, No. 27-1, Lane 169, Kang-Ning St., Hsi-Chih,
Taipei Hsien, Taiwan, R. O. C.
TEL: 886-2-26922097 FAX: 886-2-26956236

FCC ID : SBUFGPSBT04

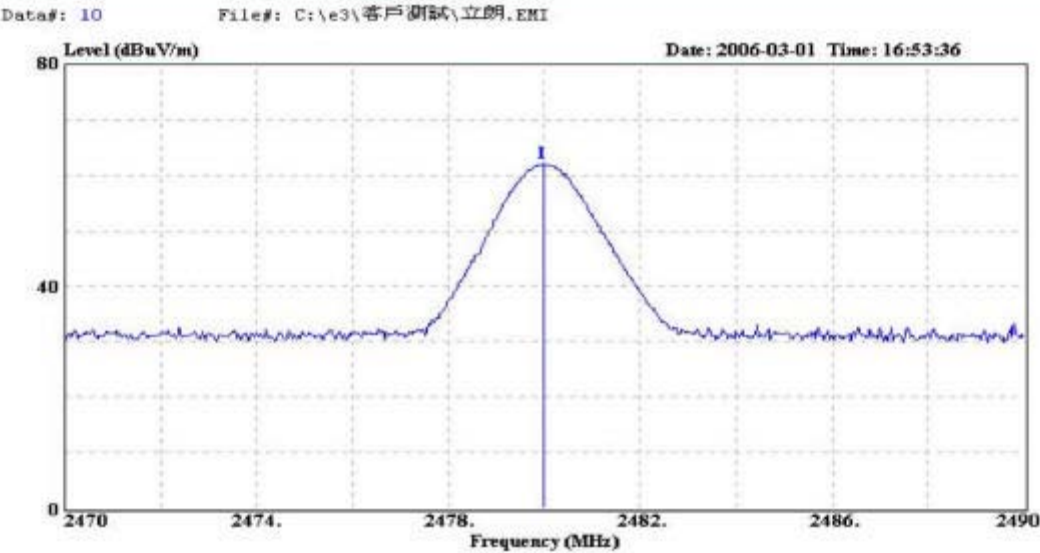
REPORT NO. : E950091

Channel : CH HIGH

Polarity : Vertical



緯鑫科技股份有限公司
PEP Testing Laboratory



Site : chamber no3 (Joe)
Condition : 3m HORN ANTENNA V.3 VERTICAL
EUT : E950091
Power : AC 120V 60Hz
Memo : TX ON
: HIGH

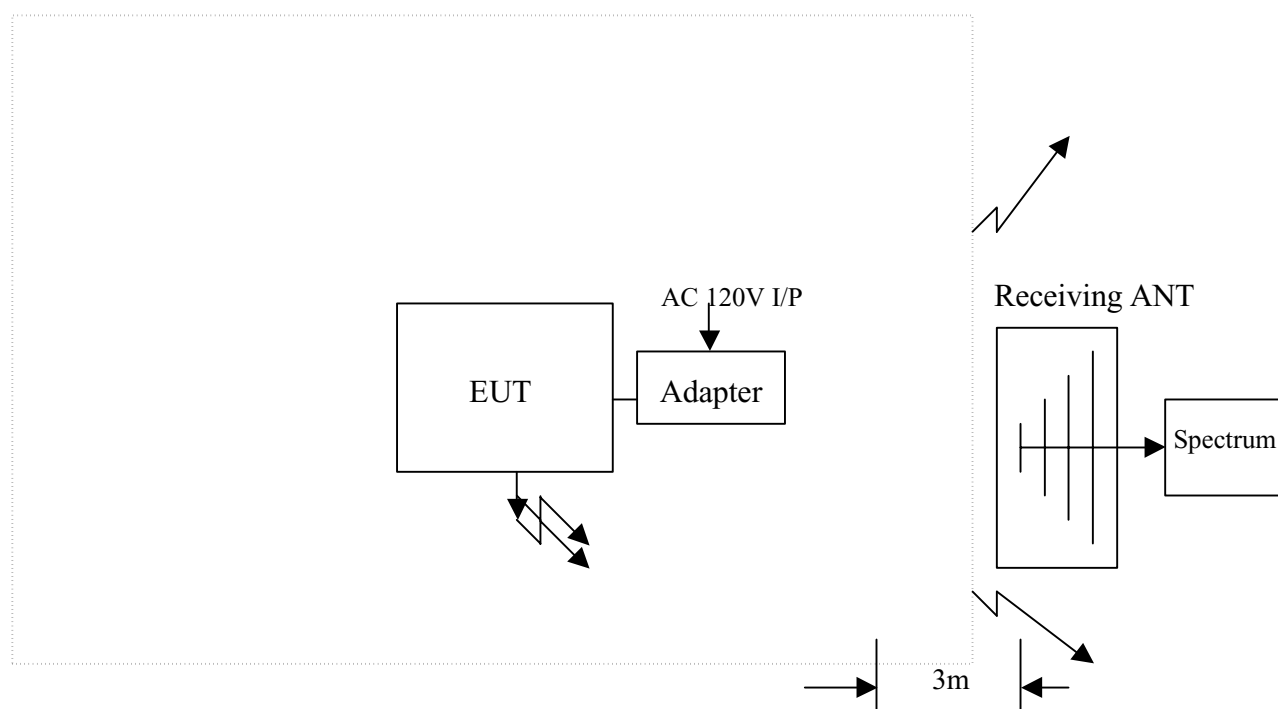
	Freq	Level	Over	Limit	Read	Probe	Cable	Preamp	
			Limit	Line					
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB	Remark
1	2479.960	62.04	-----	-----	63.98	28.59	4.17	34.70	

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

7.1 MPE distance calculation

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

7.2 Device operating configurations exposure conditions



7.3 Maximum Permissible Exposure (MPE)**EUT Model No. BT1.5**

Channel	Frequency (MHz)	A.P. (H/V)	Level (dBuV/m)	Power density at 20cm (m W / cm ²)
LOW	2402.04	H	67.72	7.89×10^{-9}
	2401.98	V	68.46	9.35×10^{-9}
MID	2441.04	H	67.43	7.38×10^{-9}
	2441.04	V	65.39	4.61×10^{-9}
HIGH	2479.98	H	62.33	2.28×10^{-9}
	2480.04	V	62.04	2.13×10^{-9}

Note :

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

where $E (V) = \text{Level} (V)$ $d (m) = \text{distance} = 20 \text{ cm}$ $G = 1$ (the gain of the transmitting antenna over isotropic antenna) $P = \text{E.I.R.P.}$

6. Example :

If Level = 120 dBuV/m

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

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

VIII. §15.247(c) : Spurious Radiated Emissions**8.1 Out side band below 1GHz****Test Results :**

Model No. : BT1.5
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)
134.290	19.89	-23.61	43.50
172.395	24.47	-19.03	43.50
210.147	22.36	-21.14	43.50
285.487	27.90	-18.10	46.00
374.990	31.66	-14.34	46.00
400.194	25.85	-20.15	46.00

Antenna polarization : VERTICAL ; **Test distance** : 3 m ;

Freq. (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)
134.326	19.97	-23.53	43.50
165.922	24.04	-19.46	43.50
236.130	24.60	-21.40	46.00
285.512	27.96	-18.04	46.00
500.993	27.07	-18.93	46.00
710.304	27.11	-18.89	46.00

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

PEP Testing Laboratory

12-3Fl, No. 27-1, Lane 169, Kang-Ning St., Hsi-Chih,
Taipei Hsien, Taiwan, R. O. C.
TEL: 886-2-26922097 FAX: 886-2-26956236

FCC ID : SBUFGPSBT04

REPORT NO. : E950091

8.2 Out side band above 1GHz

Test Results :

Model No. : BT1.5

Frequency range : above 1GHz

Temperature : 26° C

Channel : LOW

Detector : Peak / Average Value

Humidity : 54 %

Antenna polarization : HORIZONTAL ; Test distance : 3 m ;

Freq. (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Remark
4803.980	52.21	-21.79	74	PK
-----	-----	-----	-----	-----
7206.060	50.05	-23.95	74	PK
-----	-----	-----	-----	-----

Antenna polarization : VERTICAL ; Test distance : 3 m ;

Freq. (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Remark
4804.060	52.32	-21.68	74	PK
-----	-----	-----	-----	-----
7205.980	50.02	-23.98	74	PK
-----	-----	-----	-----	-----

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

PEP Testing Laboratory

12-3Fl, No. 27-1, Lane 169, Kang-Ning St., Hsi-Chih,
Taipei Hsien, Taiwan, R. O. C.
TEL: 886-2-26922097 FAX: 886-2-26956236

FCC ID : SBUFGPSBT04

REPORT NO. : E950091

Model No. : BT1.5

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)	Remark
4881.910	49.06	-24.94	74	PK
-----	-----	-----	-----	-----
7323.030	46.92	-27.08	74	PK
-----	-----	-----	-----	-----

Antenna polarization : VERTICAL ; Test distance : 3 m ;

Freq. (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Remark
4881.980	49.95	-24.05	74	PK
-----	-----	-----	-----	-----
7323.020	46.68	-27.32	74	PK
-----	-----	-----	-----	-----

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

PEP Testing Laboratory

12-3Fl, No. 27-1, Lane 169, Kang-Ning St., Hsi-Chih,
Taipei Hsien, Taiwan, R. O. C.
TEL: 886-2-26922097 FAX: 886-2-26956236

FCC ID : SBUFGPSBT04

REPORT NO. : E950091

Model No. : BT1.5

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)	Remark
4959.980	55.74	-18.26	74	PK
4959.990	52.79	-1.21	54	AV
7439.830	49.18	-24.82	74	PK
-----	-----	-----	-----	-----

Antenna polarization : VERTICAL ; Test distance : 3 m ;

Freq. (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Remark
4960.060	57.67	-16.33	74	PK
4959.990	53.63	-0.37	54	AV
7440.230	47.60	-26.40	74	PK
-----	-----	-----	-----	-----

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. BT1.5

< FRONT VIEW >



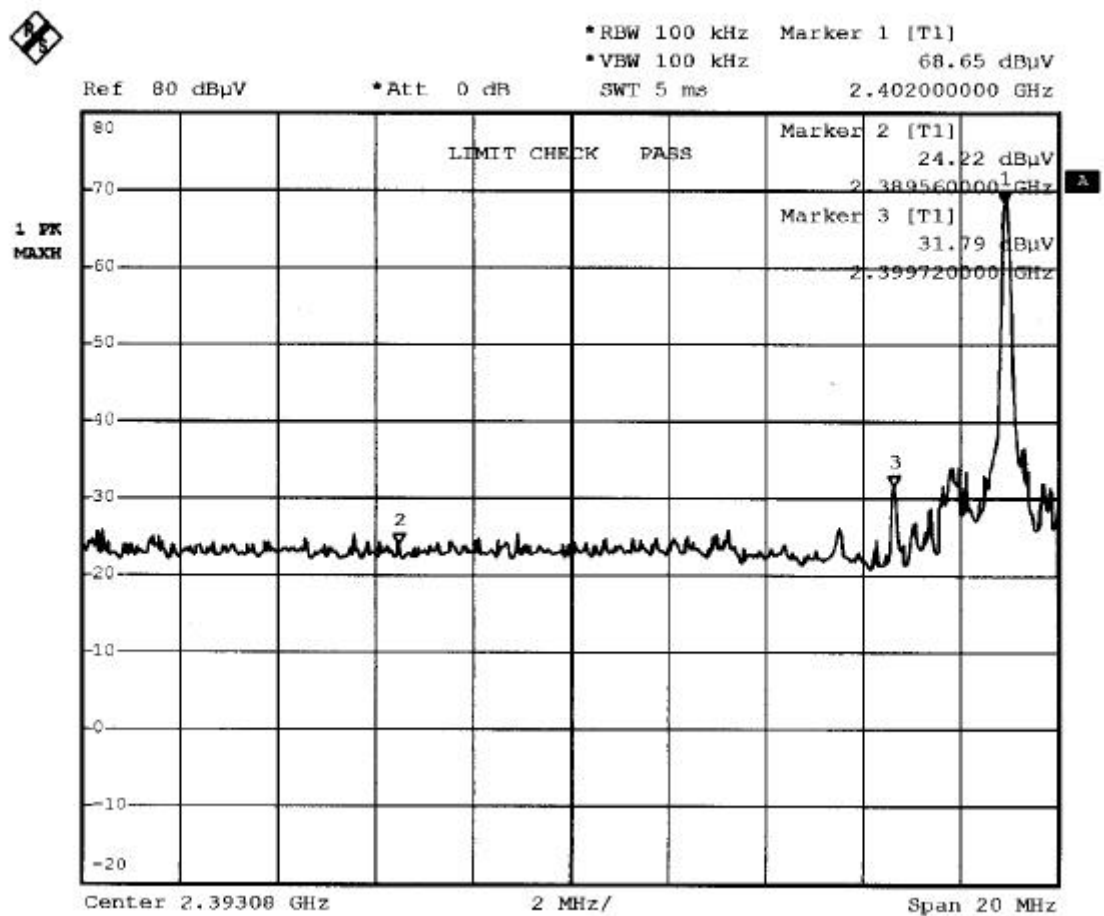
< REAR VIEW >



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 :

68.65dBuV/m-24.22 dBuV/m =44.43dBuV/m

67.72 dBuV/m-44.43 dBuV/m=23.29 dBuV/m

*23.29dBuV/m<Average Limit (54dBuV/m)

PEP Testing Laboratory

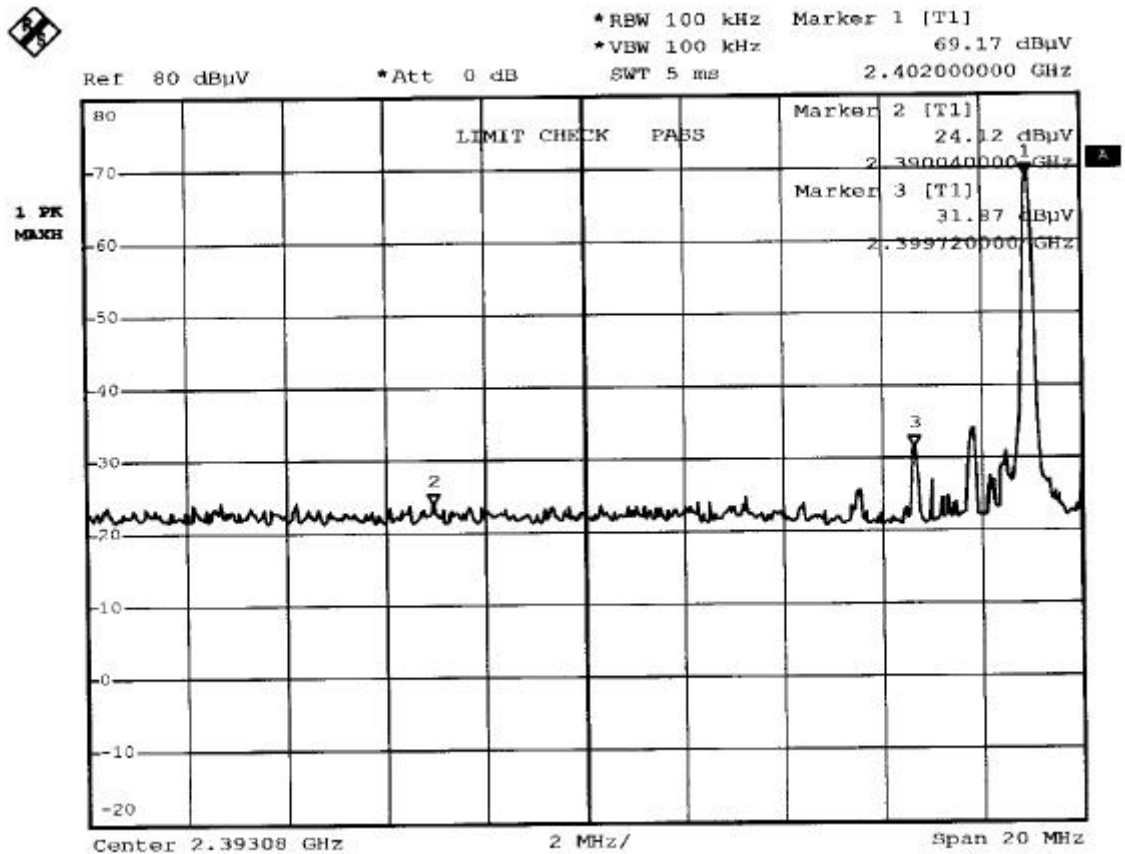
12-3Fl, No. 27-1, Lane 169, Kang-Ning St., Hsi-Chih,
Taipei Hsien, Taiwan, R. O. C.
TEL: 886-2-26922097 FAX: 886-2-26956236

FCC ID : SBUFGPSBT04

REPORT NO. : E950091

Channel : CH LOW

Polarity : Vertical



Test method : Public Notice DA 00-705

Detect : Peak Value

Marker-Delta method :

$69.17\text{dB}\mu\text{V}/\text{m} - 24.12\text{dB}\mu\text{V}/\text{m} = 45.05\text{dB}\mu\text{V}/\text{m}$

$68.46\text{dB}\mu\text{V}/\text{m} - 45.05\text{dB}\mu\text{V}/\text{m} = 23.41\text{dB}\mu\text{V}/\text{m}$

$*23.41\text{dB}\mu\text{V}/\text{m} < \text{Average Limit (54dB}\mu\text{V}/\text{m)}$

PEP Testing Laboratory

12-3Fl, No. 27-1, Lane 169, Kang-Ning St., Hsi-Chih,

Taipei Hsien, Taiwan, R. O. C.

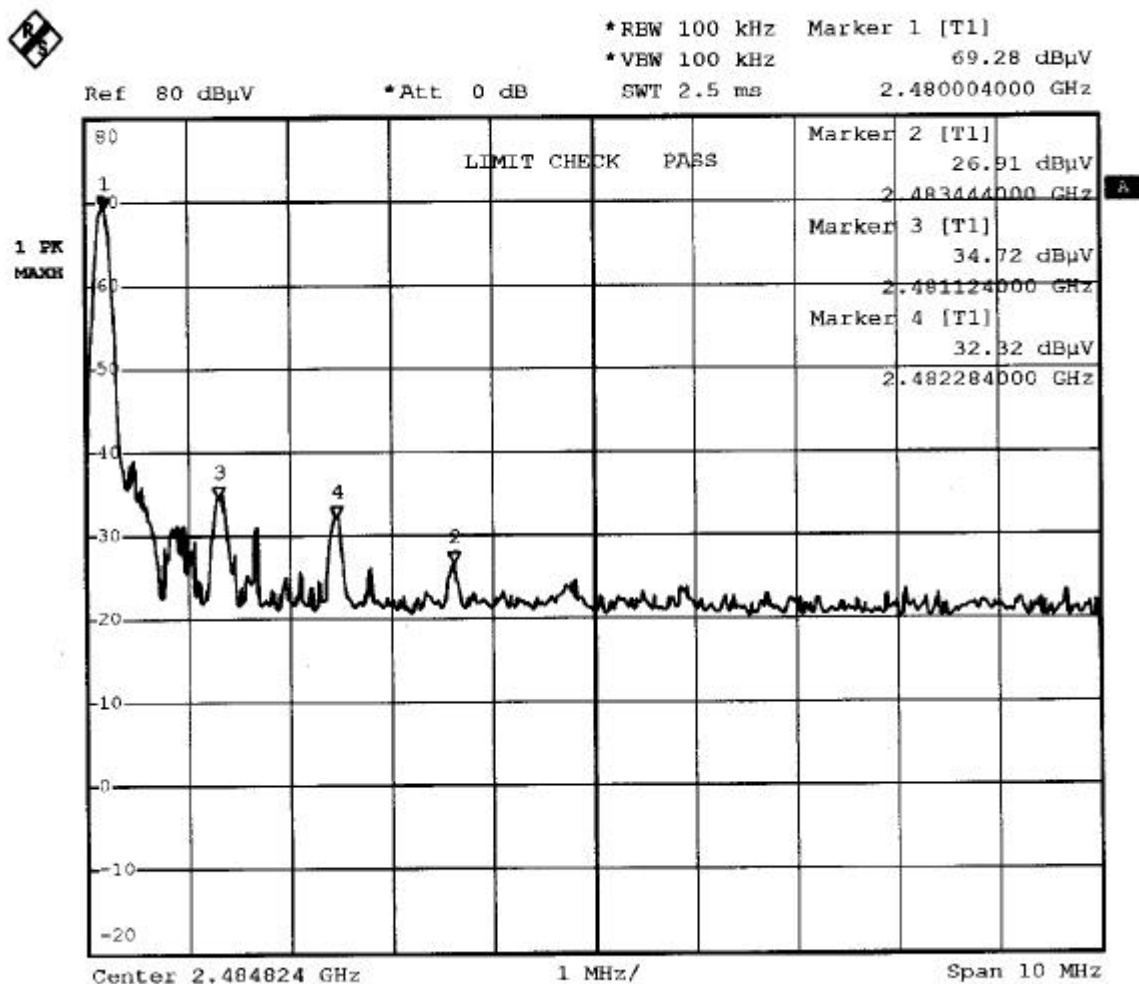
TEL: 886-2-26922097 FAX: 886-2-26956236

FCC ID : SBUFGPSBT04

REPORT NO. : E950091

Channel : CH HIGH

Polarity : Horizontal



Channel : CH HIGH

Polarity : Horizontal

Test method : Public Notice DA 00-705

Detect : Peak Value

Marker-Delta method :

$69.28\text{dBuV/m} - 26.91\text{ dBuV/m} = 42.37\text{dBuV/m}$

$62.23\text{dBuV/m} - 42.37\text{dBuV/m} = 19.86\text{ dBuV/m}$

$*19.86\text{dBuV/m} < \text{Average Limit (54dBuV/m)}$

PEP Testing Laboratory

12-3Fl, No. 27-1, Lane 169, Kang-Ning St., Hsi-Chih,

Taipei Hsien, Taiwan, R. O. C.

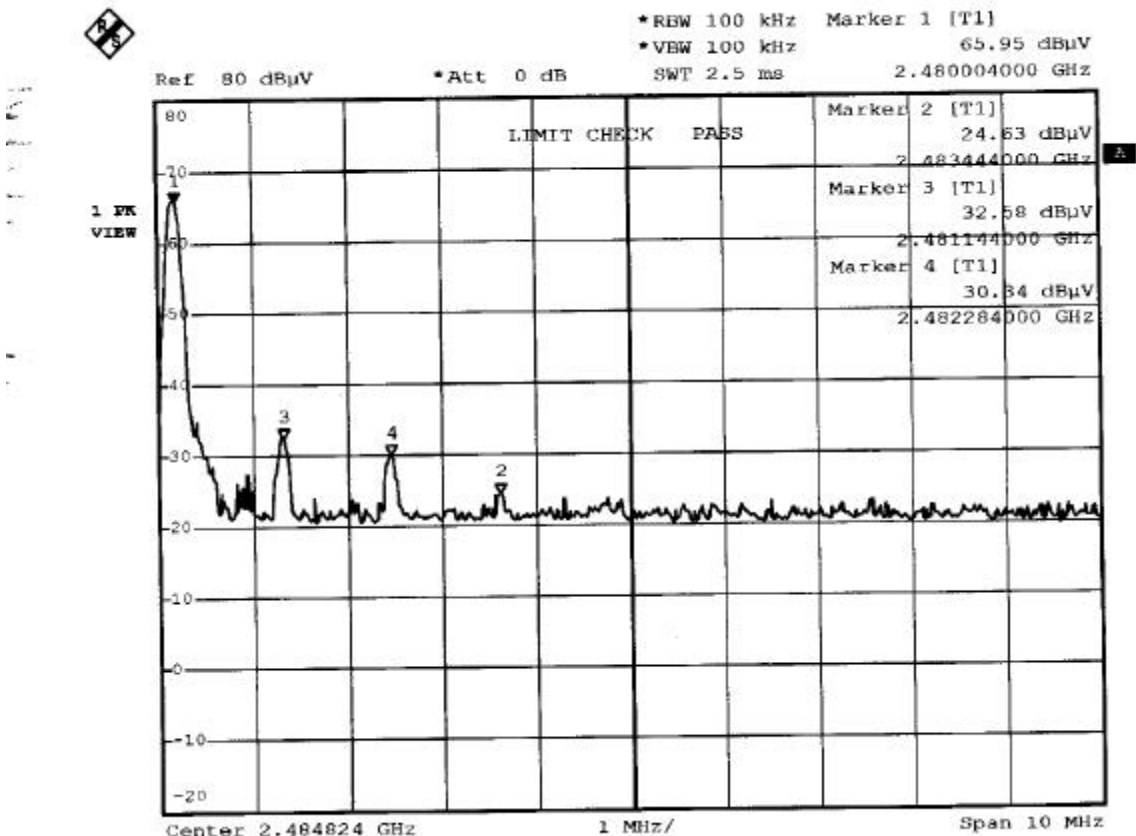
TEL: 886-2-26922097 FAX: 886-2-26956236

FCC ID : SBUFGPSBT04

REPORT NO. : E950091

Channel : CH HIGH

Polarity : Vertical



Test method : Public Notice DA 00-705

Detect : Peak Value

Marker-Delta method :

$65.95\text{dBuV/m} - 24.63\text{ dBuV/m} = 41.32\text{dBuV/m}$

$62.04\text{ dBuV/m} - 41.32\text{ dBuV/m} = 20.72\text{ dBuV/m}$

$*20.72\text{dBuV/m} < \text{Average Limit (54dBuV/m)}$

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 , Sweptime: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	2401.980	-24.95	8	Pass
MID	2440.980	-26.64	8	Pass
HIGH	2479.980	-27.25	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

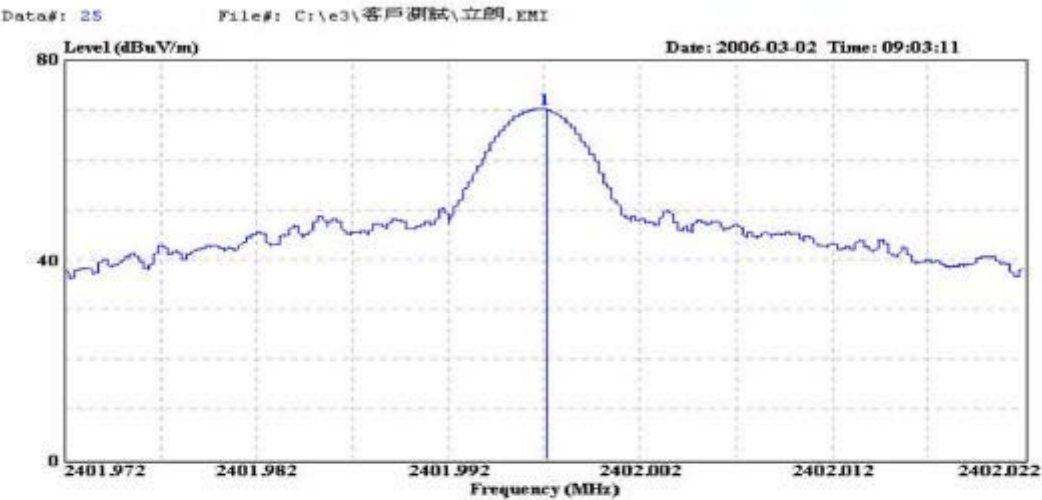
$$10^{(120/20)} \times 10^{-6} = 1 \text{ V}$$

$$E.R.P. = (1 \times 3)^2 / 30 = 300 \text{ mW} = 10 \text{ Log } (300\text{mW}/1\text{mW}) \\ = 24.77\text{dBm}$$

10.3 Spectrum Plot Data

Channel : CH LOW

Polarity : Horizontal



Site : chamber no3 (Joe)
Condition : 3m HORN ANTENNA H.3 HORIZONTAL
EUT : E950091
Power : AC 120V 60Hz
Memo : Peak Power Spectral Density
: TX ON
: LOW

	Freq	Level	Over	Limit	Read	Probe	Cable	Preamp	
	MHz	dBuV/m	Limit	Line	Level	Factor	Loss	Factor	Remark
			dB	dBuV/m	dBuV	dB	dB	dB	
1	2401.997	70.31	-----	-----	72.43	28.46	4.08	34.66	

PEP Testing Laboratory

12-3Fl, No. 27-1, Lane 169, Kang-Ning St., Hsi-Chih,
Taipei Hsien, Taiwan, R. O. C.
TEL: 886-2-26922097 FAX: 886-2-26956236

FCC ID : SBUFGPSBT04

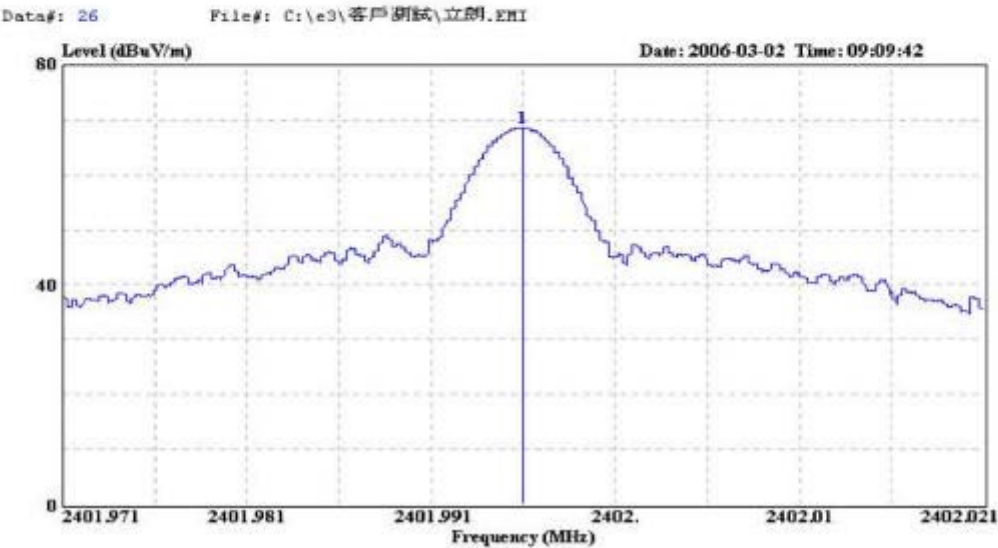
REPORT NO. : E950091

Channel : CH LOW

Polarity : Vertical



緯鑫科技股份有限公司
PEP Testing Laboratory



Site : chamber no3 (Joe)
Condition : 3m HORN ANTENNA V.3 VERTICAL
EUT : E950091
Power : AC 120V 60Hz
Memo : Peak Power Spectral Density
: TX ON
: LOW

Freq	Level	Over	Limit	Read	Probe	Cable		Preamp	Remark
		Limit	Line			Loss	Factor		
MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB	dB	
1 2401.996	68.62	-----	-----	70.74	28.46	4.08	34.66		

PEP Testing Laboratory

12-3Fl, No. 27-1, Lane 169, Kang-Ning St., Hsi-Chih,
Taipei Hsien, Taiwan, R. O. C.
TEL: 886-2-26922097 FAX: 886-2-26956236

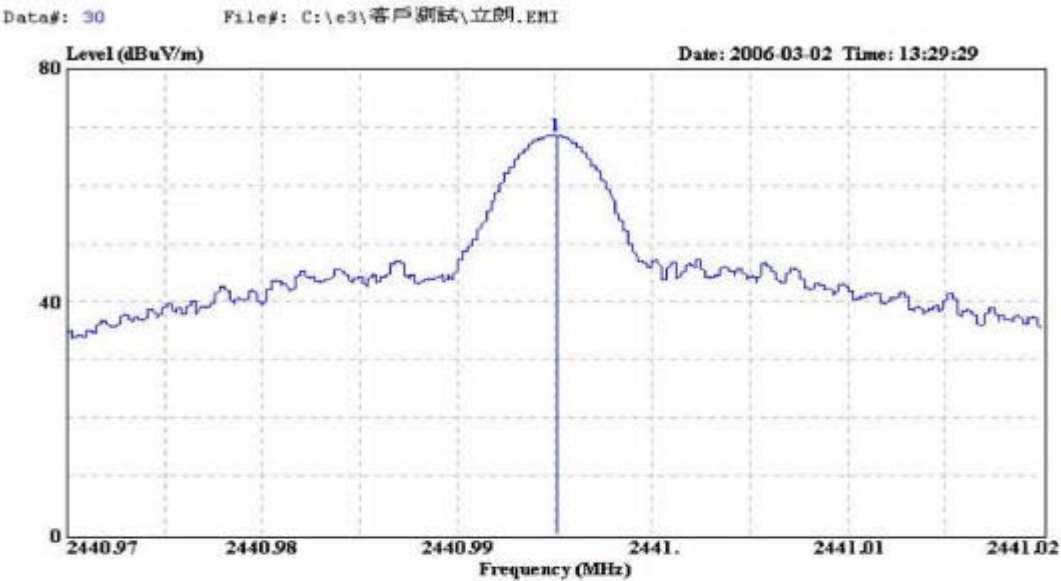
FCC ID : SBUFGPSBT04

REPORT NO. : E950091

Channel : CH MID
Polarity : Horizontal



緯鑫科技股份有限公司
PEP Testing Laboratory



Site : chamber no3 (Joe)
Condition : 3m HORN ANTENNA H.3 HORIZONTAL
EUT : E950091
Power : AC 120V 60Hz
Memo : Peak Power Spectral Density
: TX ON
: MID

Freq	Level	Over	Limit	Read	Probe	Cable	Preamp	Remark
		Limit	Line					
MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB	
1 2440.995	68.59	-----	-----	70.60	28.53	4.14	34.68	

PEP Testing Laboratory

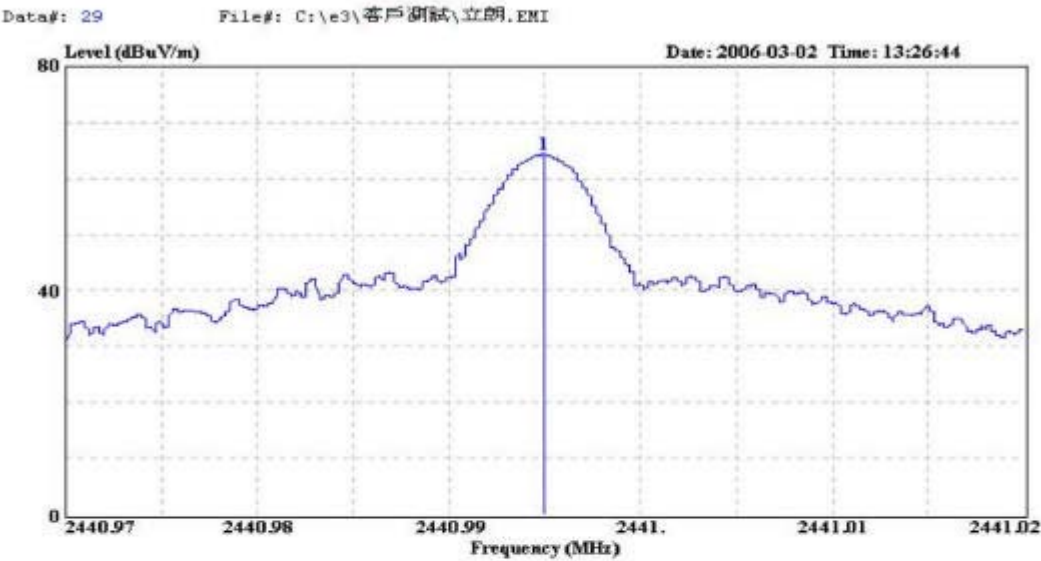
12-3Fl, No. 27-1, Lane 169, Kang-Ning St., Hsi-Chih,
Taipei Hsien, Taiwan, R. O. C.
TEL: 886-2-26922097 FAX: 886-2-26956236

FCC ID : SBUFGPSBT04

REPORT NO. : E950091

Channel : CH MID

Polarity : Vertical



Site : chamber no3 (Joe)
Condition : 3m HORN ANTENNA V.3 VERTICAL
EUT : E950091
Power : AC 120V 60Hz
Memo : Peak Power Spectral Density
: TX ON
: MID

Freq	Level	Over	Limit	Read	Probe	Cable	Preamp	Remark
		Limit	Line					
MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB	
1 2440.995	64.26	-----	-----	66.27	28.53	4.14	34.68	

PEP Testing Laboratory

12-3Fl, No. 27-1, Lane 169, Kang-Ning St., Hsi-Chih,
Taipei Hsien, Taiwan, R. O. C.
TEL: 886-2-26922097 FAX: 886-2-26956236

FCC ID : SBUFGPSBT04

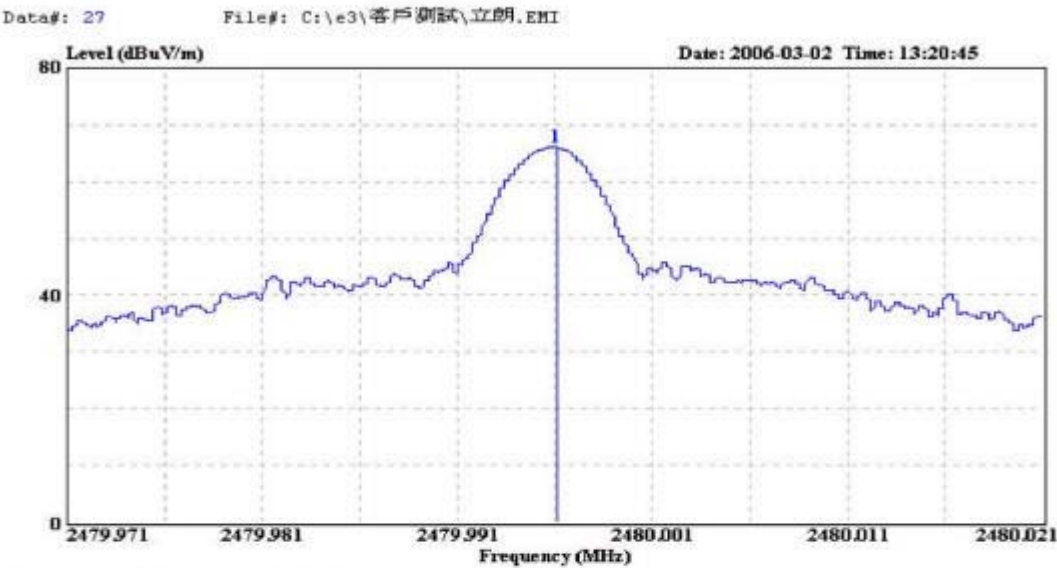
REPORT NO. : E950091

Channel : CH HIGH

Polarity : Horizontal



緯鑫科技股份有限公司
PEP Testing Laboratory



Site : chamber no3 (Joe)
Condition : 3m HORN ANTENNA H.3 HORIZONTAL
EUT : E950091
Power : AC 120V 60Hz
Memo : Peak Power Spectral Density
: TX ON
: HIGH

	Freq	Level	Over	Limit	Read	Probe	Cable	Preamp	
	MHz	dBuV/m	Limit	Line	Level	Factor	Loss	Factor	Remark
			dB	dBuV/m	dBuV	dB	dB	dB	
1	2479.996	66.03	-----	-----	67.97	28.58	4.17	34.69	

PEP Testing Laboratory

12-3Fl, No. 27-1, Lane 169, Kang-Ning St., Hsi-Chih,
Taipei Hsien, Taiwan, R. O. C.
TEL: 886-2-26922097 FAX: 886-2-26956236

FCC ID : SBUFGPSBT04

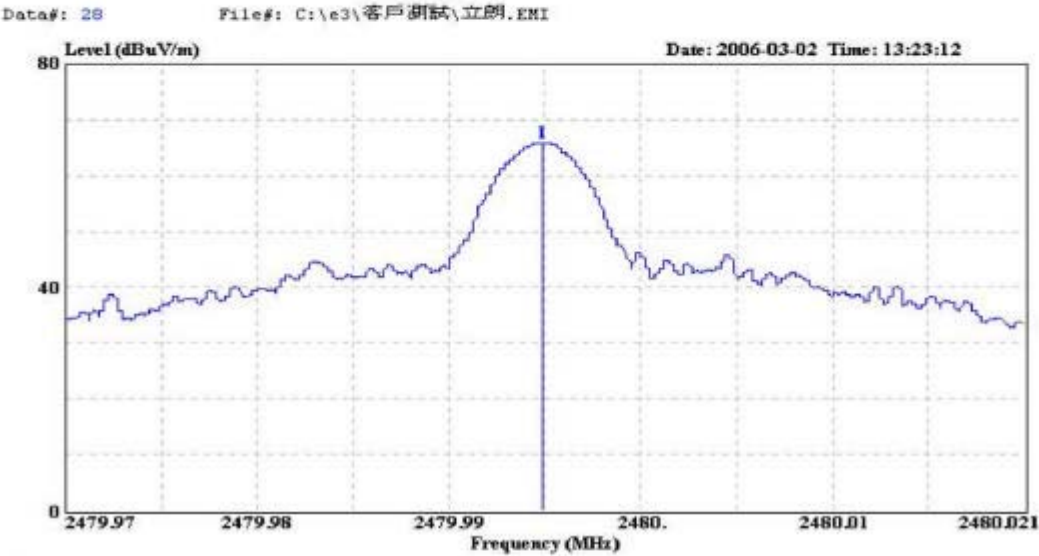
REPORT NO. : E950091

Channel : CH HIGH

Polarity : Vertical



緯鑫科技股份有限公司
PEP Testing Laboratory



Site : chamber no3 (Joe)
Condition : 3m HORN ANTENNA V.3 VERTICAL
EUT : E950091
Power : AC 120V 60Hz
Memo : Peak Power Spectral Density
: TX ON
: HIGH

Freq	Level	Over Limit		Read Level	Probe Factor	Cable Preamp		Remark
		Limit	Line			Loss Factor	dB	
MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB	
1 2479.995	65.88	-----	-----	67.82	28.58	4.17	34.69	

PEP Testing Laboratory

12-3Fl, No. 27-1, Lane 169, Kang-Ning St., Hsi-Chih,

Taipei Hsien, Taiwan, R. O. C.

TEL: 886-2-26922097 FAX: 886-2-26956236

FCC ID : SBUFGPSBT04

REPORT NO. : E950091

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, 2006	1Year
	Rolf Heine LISN	NNB-4/63TL	98008	May 01, 2006	1Year
	R & S LISN	ESH3-Z5	844982/039	Aug. 06, 2006	1Year
	Spectrum Analyzer	R3261A	91720076	June 08, 2006	1Year
	RF Cable	Rg400	N/A	May 12, 2006	1Year
	Schaffner ISN	T411	N/A	June 29, 2006	1Year
Radiation (OP No.1)	R & S Receiver	ESVS30	863342/012	Apr. 23, 2006	1Year
	Schaffner Pre-amplifier	CPA9232	1028	May 20, 2006	1Year
	COM-Power Horn Ant.	AH-118 (1GHz~18GHz)	10095	May 21, 2007	2Year
	Schwarzbeck Precision Dipole Ant	VHAP (30MHz~1GHz)	970 + 971 953 + 954	June 26, 2006	3Year
	R &S Signal Generator	SMY01	841104/037	Apr. 29, 2007	2Year
	RF Cable	No. 1	N/A	May 11, 2006	1Year
	EMCO Antenna	3142B (26MHz~2GHz)	9904-1370	Aug. 24, 2006	1Year
Chamber (No. 3)	Spectrum Analyzer	FSP 30	100157	Aug. 30, 2006	1Year
	Pre-Amplifier	CPA-9232	1027	Feb. 24, 2006	1Year
	Antenna	VULB9160	3074	July 24, 2006	1Year
	Signal Generator	SMY02	829846/0358	Jane 29, 2007	2Year
	RF Cable	NO.3	N/A	Feb. 19, 2006	1Year
	HORN ANTENNA	AH-118	10095	May 13, 2006	1Year

XII. EUT Photos

EUT Model No. BT1.5



PEP Testing Laboratory

12-3Fl, No. 27-1, Lane 169, Kang-Ning St., Hsi-Chih,
Taipei Hsien, Taiwan, R. O. C.
TEL: 886-2-26922097 FAX: 886-2-26956236

FCC ID : SBUFGPSBT04

REPORT NO. : E950091



12-3Fl, No. 27-1, Lane 169, Kang-Ning St., Hsi-Chih,
Taipei Hsien, Taiwan, R. O. C.
TEL: 886-2-26922097 FAX: 886-2-26956236

REPORT NO. : E950091



PEP Testing Laboratory

12-3Fl, No. 27-1, Lane 169, Kang-Ning St., Hsi-Chih,
Taipei Hsien, Taiwan, R. O. C.

TEL: 886-2-26922097 FAX: 886-2-26956236

FCC ID : SBUFGPSBT04

REPORT NO. : E950091



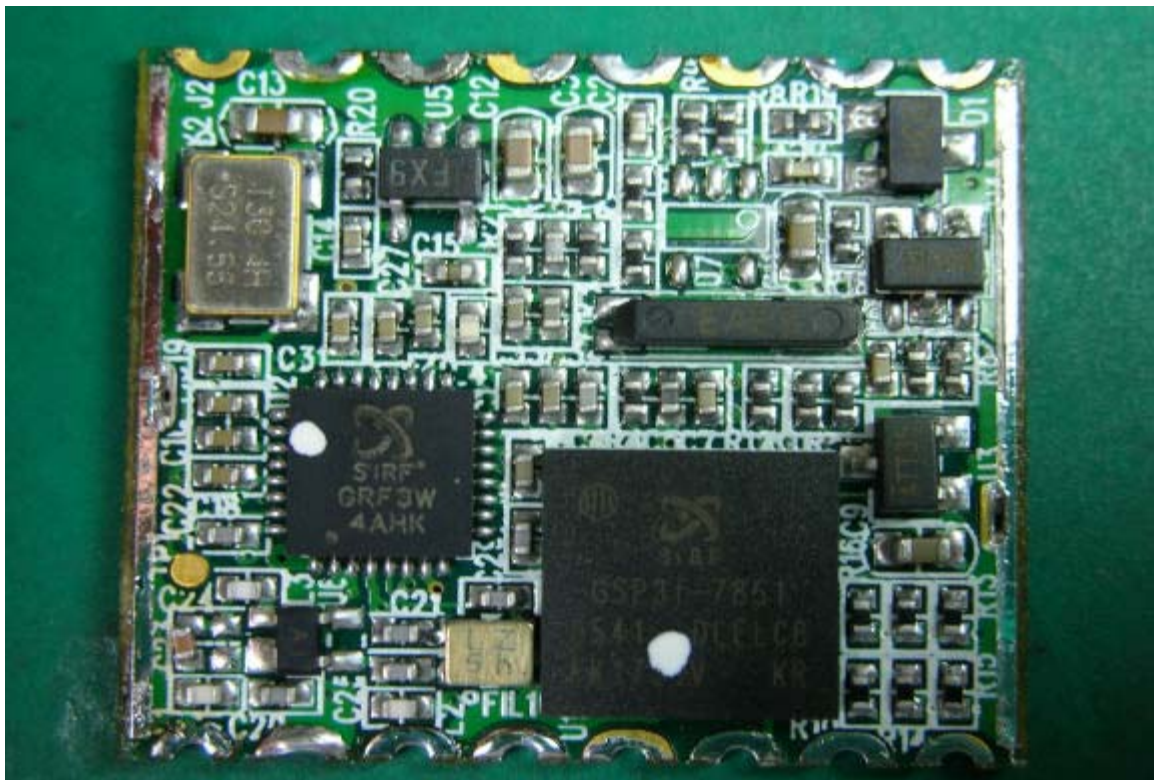
PEP Testing Laboratory

12-3Fl, No. 27-1, Lane 169, Kang-Ning St., Hsi-Chih,
Taipei Hsien, Taiwan, R. O. C.

TEL: 886-2-26922097 FAX: 886-2-26956236

FCC ID : SBUFGPSBT04

REPORT NO. : E950091



PEP Testing Laboratory

12-3Fl, No. 27-1, Lane 169, Kang-Ning St., Hsi-Chih,
Taipei Hsien, Taiwan, R. O. C.

TEL: 886-2-26922097 FAX: 886-2-26956236

FCC ID : SBUFGPSBT04

REPORT NO. : E950091



