PEP Testing Laboratory
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RFI / EMI TEST REPORT

APPLICANT : ATM ELECTRONIC CORP.

E U T Type : 802.11b wireless card

MODEL NO. : WL0401C

FCC ID : TWAWL0401C

REGULATION : CFR 47 , Part 15 Subpart C

TEST SITE : PEP Testing Laboratory

TEST ENGINEER : **JASON KUNG**

TEST DATE : OCT. 26, 2005

ISSUED DATE : DEC. 23, 2005

REPORT NO. : E930007

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 : ATM ELECTRONIC CORP.
PRODUCT : 802.11b wireless card
FCC ID : TWAWL0401C
MODEL : WL0401C

M. Y. TSUI / President

PEP Testing Laboratory
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Ⅰ. General Information

The EUT is 802.11b wireless card, Model ML0401, FCC ID: TWAWL0401C.The EUT that is compatible with USB interface is used to transfer files on wireless local area network. The operating fundamental frequency is 2.412~2.462GHz. We tested channel 1, channel 6 and channel 11 which is controlled by applicant's software: WLAN HW TOOL. DC 5V from PC power system is required to operate EUT. For more detail information about the EUT, please refer to the user's manual.

1.1 Description of EUT

EUT Type	**:**	**802.11b wireless card**
FCC ID	**:**	**TWAWL0401C**
EUT Model No.	**:**	**WL0401C**
Frequency Range	**:**	**2.412～2.462 GHz**
Support Channel	**:**	**1-11 channels**
Modulation	**:**	**DBPSK, DQPSK, CCK**
Antenna Type	**:**	**Comply with FCC Part 15, Section 15.203;**
Power Supply	**:**	**DC 5V ----- Form PC**
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. 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

3. 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

4. Modem (MOD1)

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

5. 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

6. Mouse (MOUS/1 PS/2)

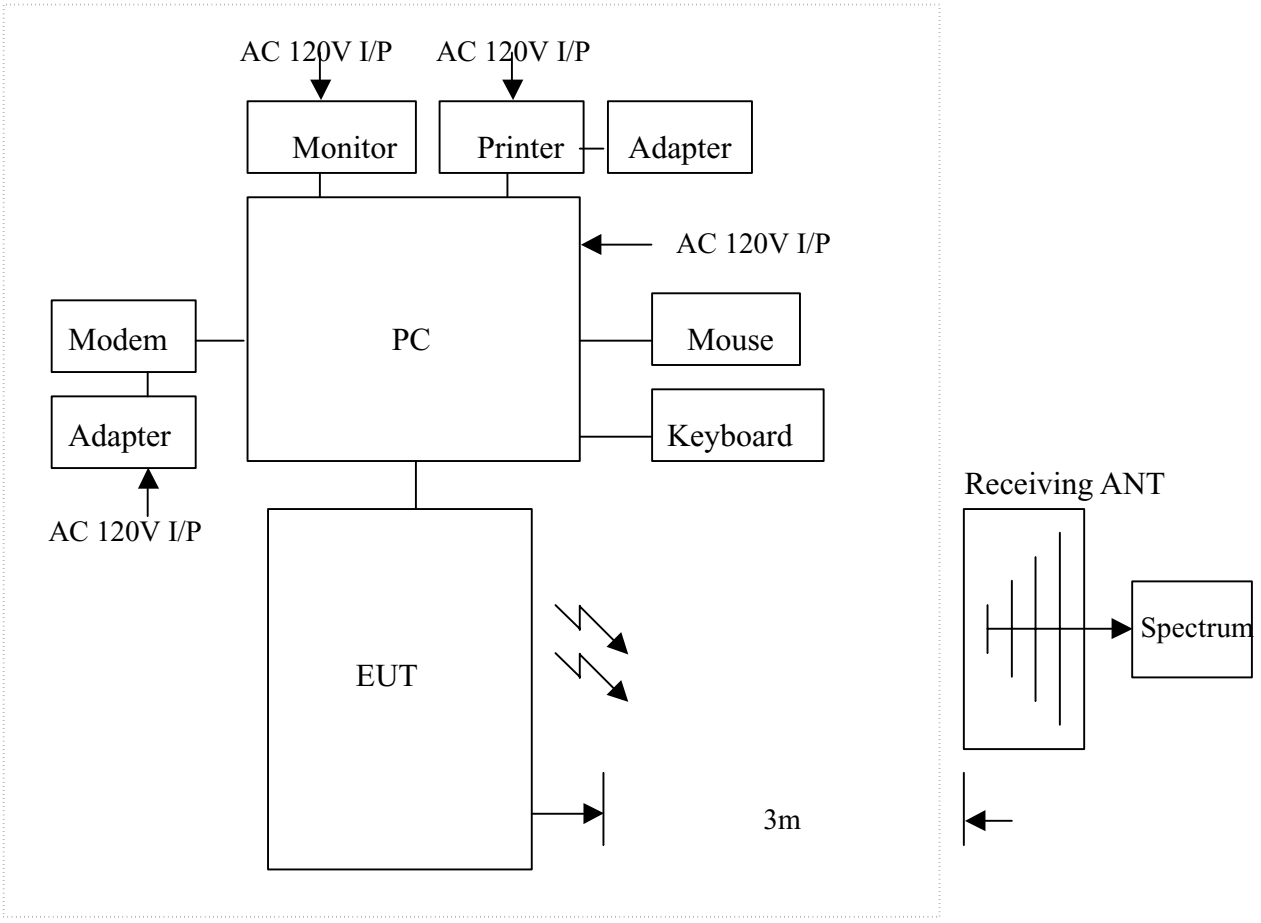
FCC ID：DZL211106
Manufacturer：LOGITECH
Model Number：M-S43
Power Supply：+5Vdc from PS2 of PC
Power Cord：N/A
Data Cable：**1 >** Shielded , Non-detachable,1.8m
2 > Back Shell : Metal

1.3 EUT Test Setup Configuration

(A) The EUT is 802.11b wireless card, Model ML0401, FCC ID: TWAWL0401C.The EUT that is compatible with USB interface is used to transfer files on wireless local area network. The operating fundamental frequency is 2.412~2.462GHz. We tested channel 1, channel 6 and channel 11 which is controlled by applicant's software: WLAN HW TOOL. DC 5V from PC power system is required to operate EUT. For more detail information about the EUT, please refer to the user's manual.

(B) Setup Method: According to the major function designed, the EUT was installed on PC USB port. All corresponding peripherals to PC I/O ports and EUT were set up to proceed with test. The test was respectively carried out on EUT operational condition of Tx on mode for channel 1, channel 6 and channel 11. The worst-case test result of each test mode was recorded and provided in this report.

1.4 Channels Verification



Frequency Range : 2.412 GHz to 2.462 GHz

Channel Number	Frequency (GHz)	Channel Number	Frequency (GHz)
1	2.412	11	2.462
2	2.417		
3	2.422		
4	2.427		
5	2.432		
6	2.437		
7	2.442		
8	2.447		
9	2.452		
10	2.457		

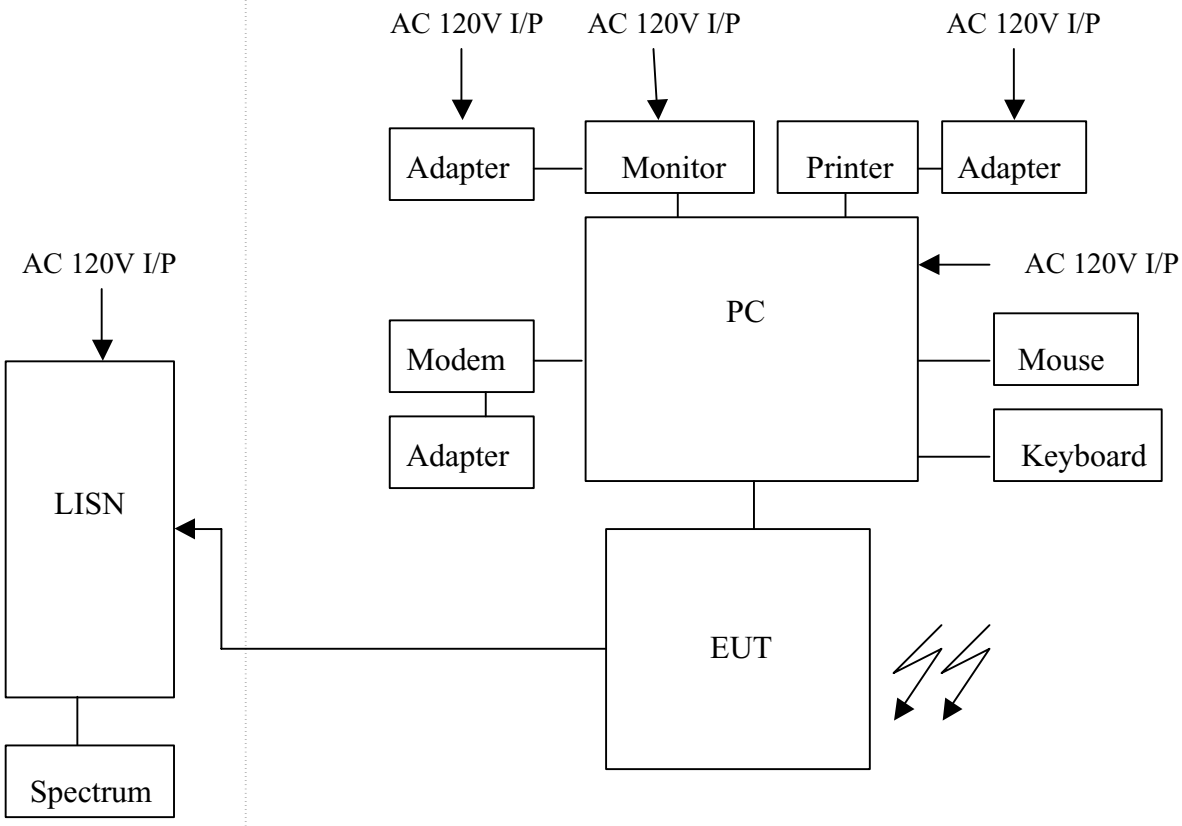
Note :

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)
Top	1	2.412
Middle	6	2.437
Bottom	11	2.462

Ⅱ. 15.207 Power Line Conducted Emission Test

2.1 Testing Description



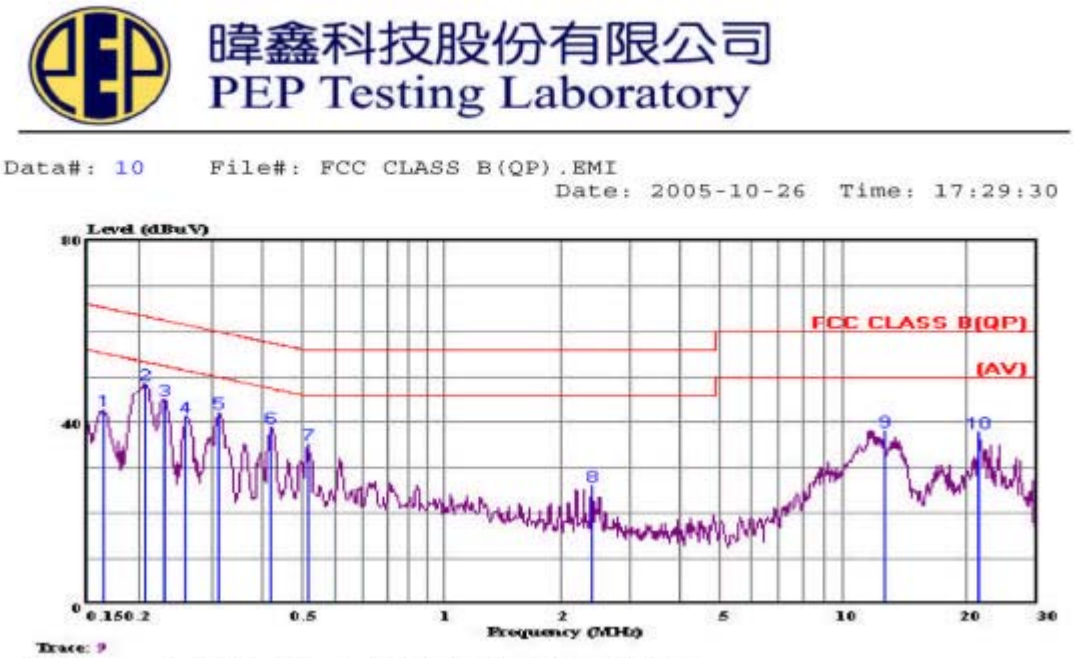
2.2 Software Using

The driver of "ZD1211.exe" is used to select the support channel as mentioned on section 1.3 (b) listed above.

2.3 Test Result

EUT Model No. WL0401C (LINE)

Detector : Peak Value



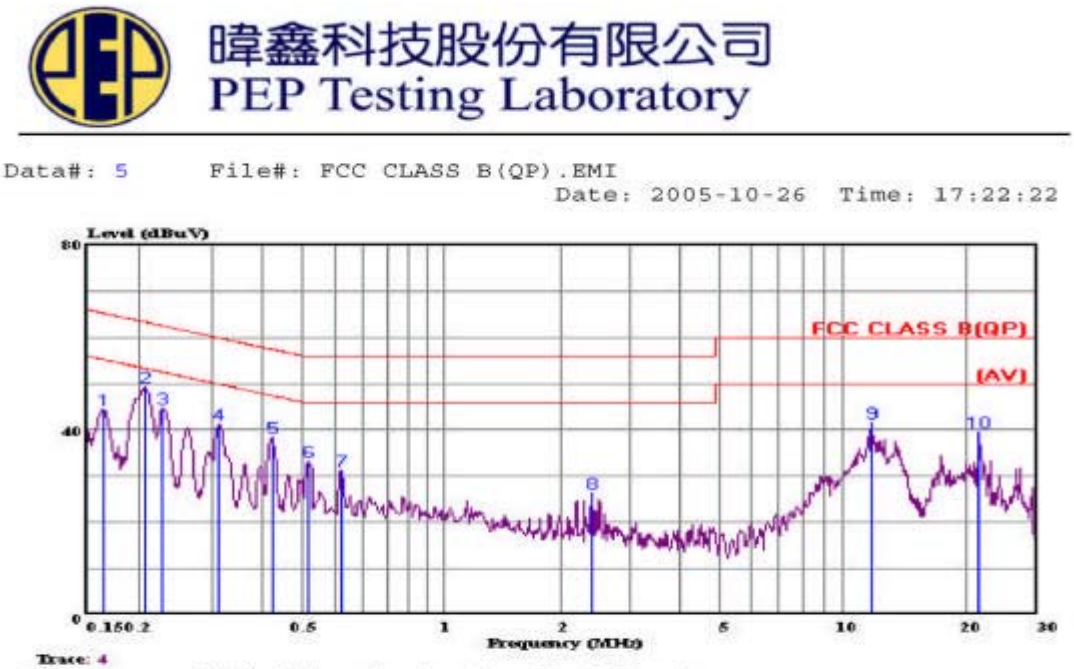
Site : Shih-Chi : Conduction No.1(Long)
Condition: FCC CLASS B(QP) LISN.L(16A) LINE
eut : E930007
power : AC 120V 60Hz
memo : Peak Value
: Final Test

Page:

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.165	42.68	-22.53	65.21	42.48	0.10	0.10	
2	0.207	48.39	-14.93	63.32	48.18	0.10	0.11	
3	0.230	45.12	-17.32	62.44	44.86	0.10	0.16	
4	0.260	41.23	-20.19	61.42	40.95	0.10	0.18	
5	0.313	42.29	-17.59	59.88	42.09	0.10	0.10	
6	0.419	38.91	-18.55	57.46	38.71	0.10	0.10	
7	0.513	35.35	-20.65	56.00	35.06	0.10	0.19	
8	2.513	25.95	-30.05	56.00	25.65	0.10	0.20	
9	12.784	38.27	-21.73	60.00	37.45	0.42	0.40	
10	21.715	37.74	-22.26	60.00	36.67	0.67	0.40	

EUT Model No.: WL0401C (NEUTRAL)

Detector : Peak Value



Site : Shih-Chi : Conduction No.1(Long)
Condition: FCC CLASS B(QP) LISN.N(16A) NEUTRAL
eut : E930007
power : AC 120V 60Hz
memo : Peak Value
: Final Test

Page:

	Freq	Level	Over Limit	Limit Line	Read Level	Probe Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.165	44.56	-20.65	65.21	44.36	0.10	0.10	
2	0.207	49.20	-14.12	63.32	48.99	0.10	0.11	
3	0.229	44.64	-17.84	62.48	44.38	0.10	0.16	
4	0.312	41.28	-18.65	59.93	41.08	0.10	0.10	
5	0.421	38.46	-18.96	57.42	38.26	0.10	0.10	
6	0.513	33.31	-22.69	56.00	33.02	0.10	0.19	
7	0.621	31.35	-24.65	56.00	31.15	0.10	0.10	
8	2.513	26.52	-29.48	56.00	26.22	0.10	0.20	
9	11.933	41.45	-18.55	60.00	40.72	0.34	0.39	
10	21.715	39.65	-20.35	60.00	38.71	0.54	0.40	

2.4 Conducted Emission Test Photo

EUT Model No. WL0401C

< FRONT VIEW >

Ⅲ. §15.247(a)(2) : -6dB bandwidth for Direct Sequence Systems

3.1 Test result of bandwidth

EUT Model No. WL0401C

MODE : CCK

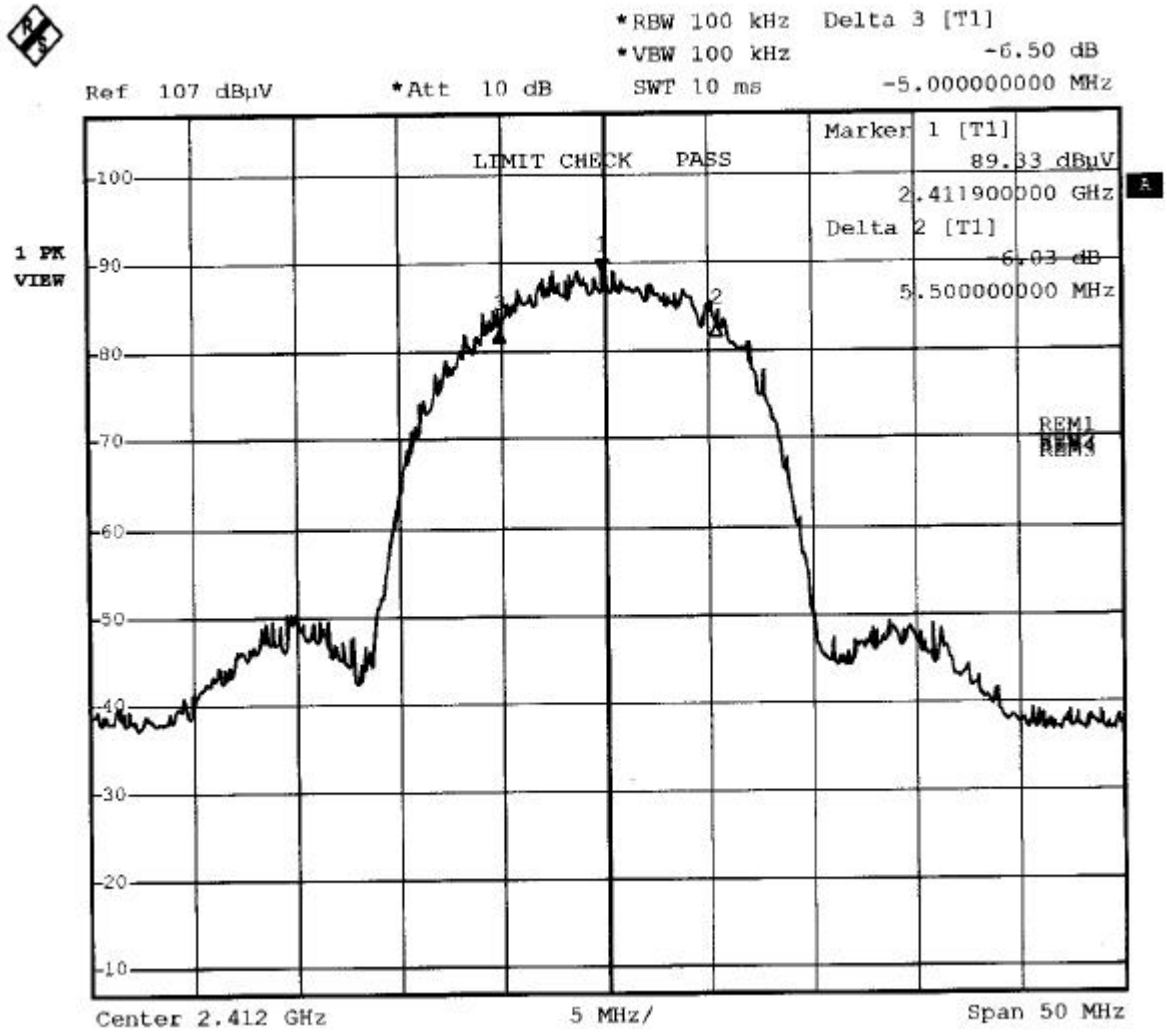
Channel	Channel Frequency （MHz）	-6dB Bandwidth （MHz）	Limit （MHz）	Pass/Fail
1	2412	10.5	＞0.5	Pass
6	2437	10.4	＞0.5	Pass
11	2462	10.6	＞0.5	Pass

3.2 Spectrum Plot Data

EUT Model No. WL0401C

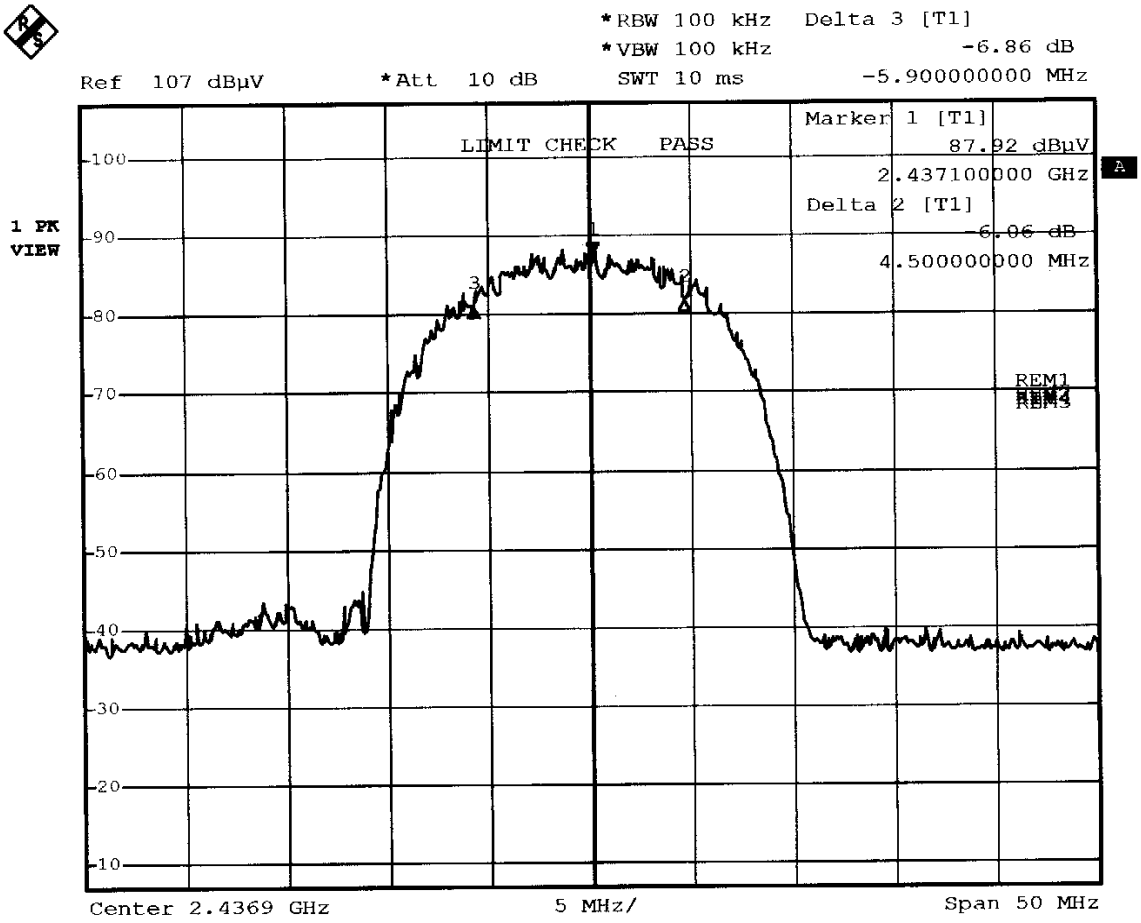
Channel : CH.1

Mode : CCK



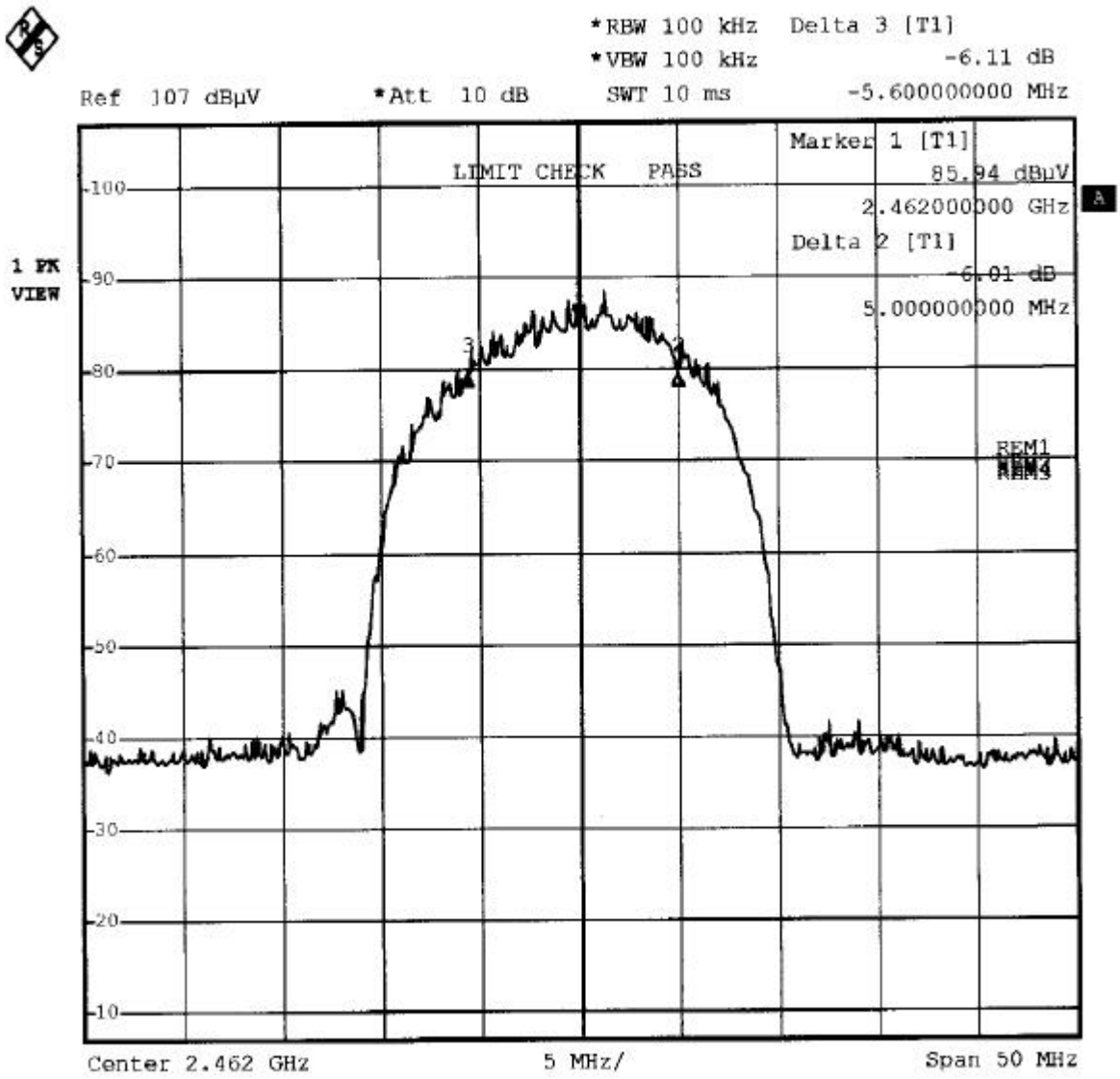
Channel : CH.6

Mode : CCK



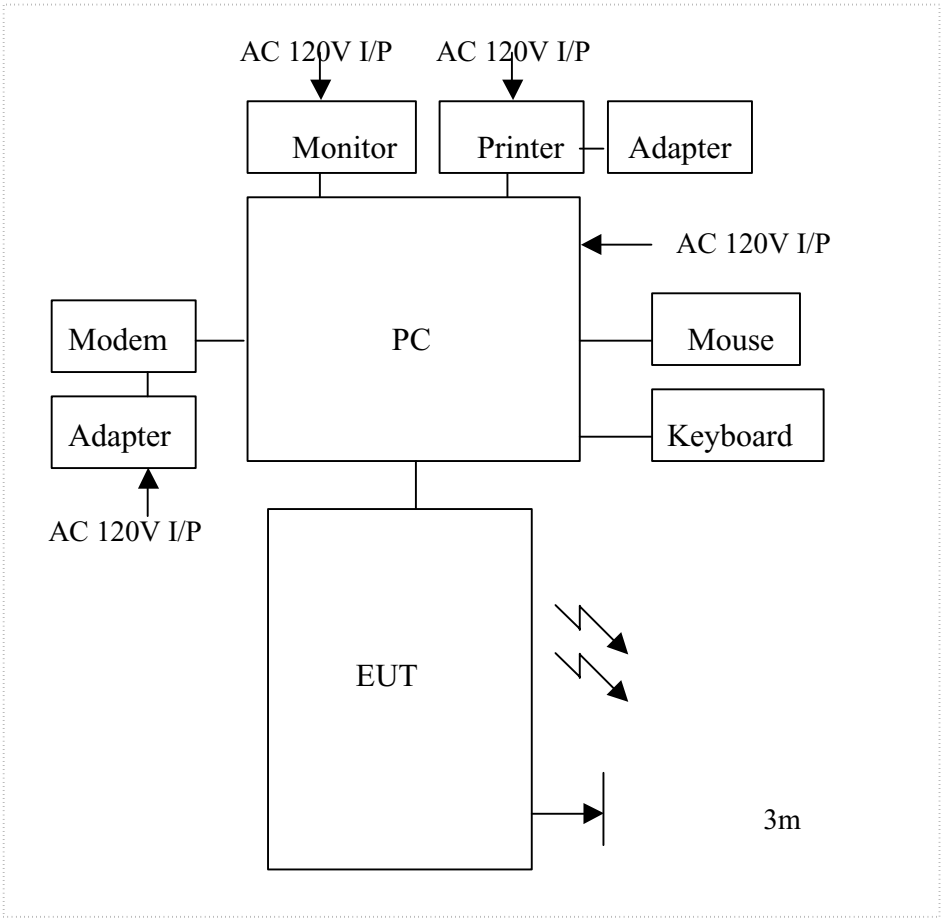
Channel : CH.11

Mode : CCK



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

4.1 Testing Description



Three channels were tested : CH01, CH06 AND CH11 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.

4.2 Software Using

The driver of "ZD1211.exe" is used to select the support channel as mentioned on section 1.3 (b) listed above.

4.3 Test Result of Fundamental Emissions

EUT Model No. WL0401C

Channel	Frequency (MHz)	Antenna Polarity (H/V)	Spectrum Read (dBuV/m)	C.F. (dB)	Level (dBuV/m)	E.I.R.P. (W)
1	2411.8	H	93.91	-2.07	91.84	0.458mW
	2411.9	V	96.42	-2.07	94.35	0.817mW
6	2436.0	H	93.37	-2.01	91.35	0.409mW
	2436.9	V	95.95	-2.01	93.94	0.743mW
11	2463.1	H	91.73	-1.95	89.78	0.285mW
	2463.4	V	95.12	-1.95	93.17	0.622mW

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. WL0401C

Channel : CH.1

Polarity : Horizontal

Mode : CCK

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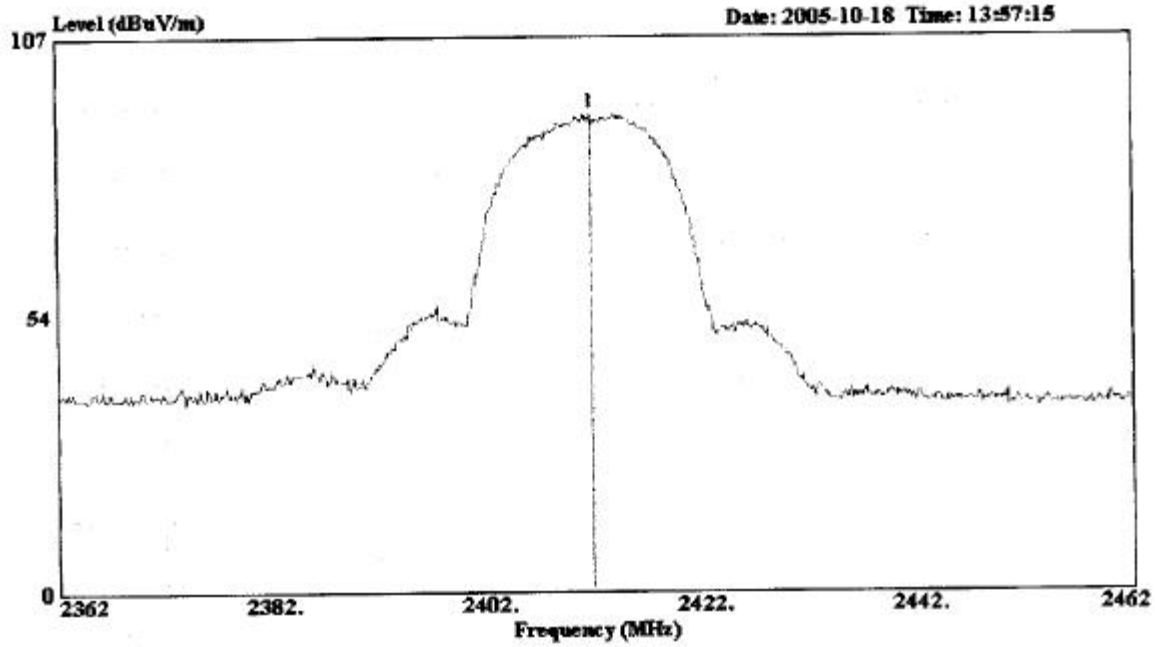
Data#: 1094 File#: C:\e3\客戶測試\聚興.EMI



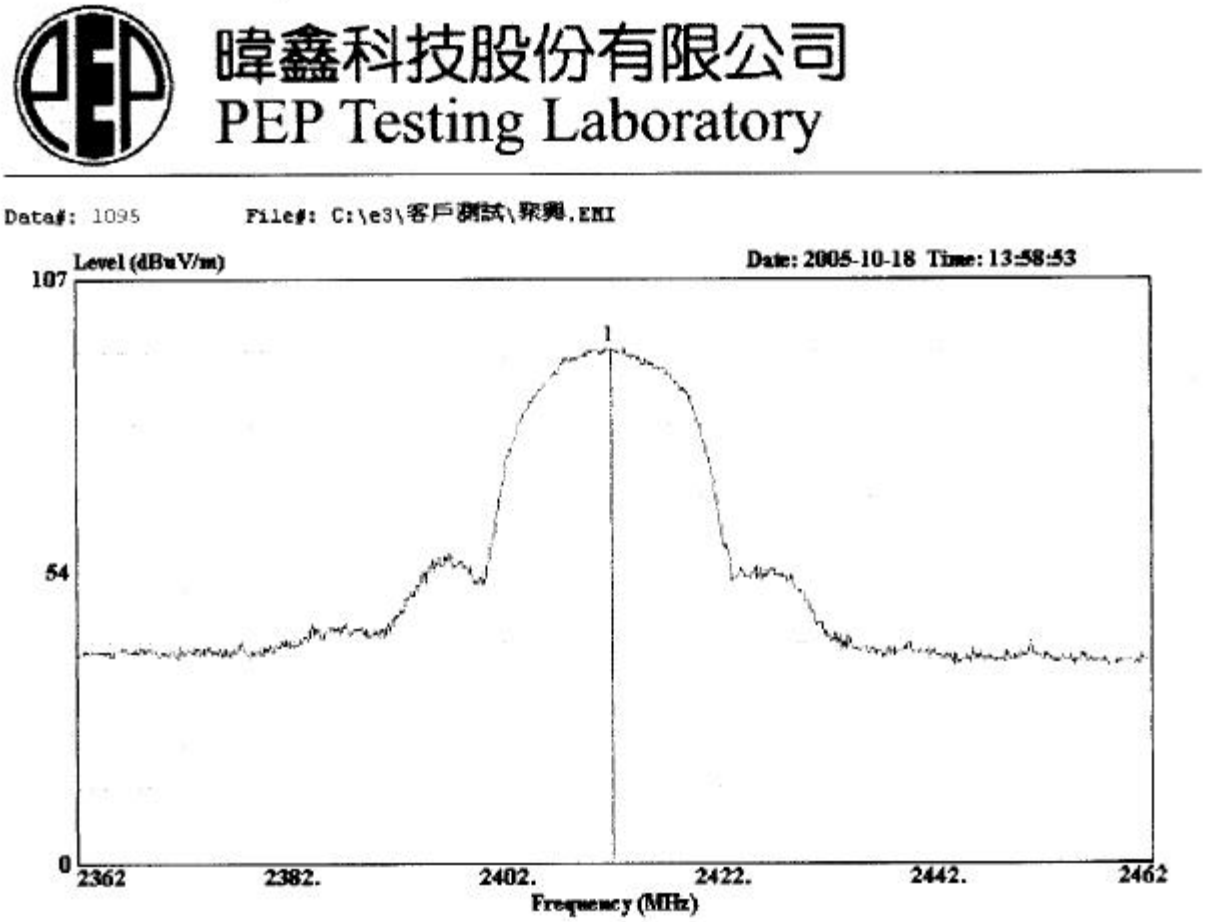
Site : chamber no3 (Joe)
Condition : 3m HORN ANTENNA H.3 HORIZONTAL
EUT : 2.4GHz Wireless lan
Power : AC 110V 60Hz
Memo : PRETEST
Memo : CH1:2.412 GHz
: TX ON
: The maximum peak output power
: TX POWER : 79

	Freq	Level	Over Limit	Limit Line	Read Level	Factor
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB
1	2411.800	91.84	------	------	93.91	-2.07

Channel : CH.1

Polarity : Vertical

Mode : CCK



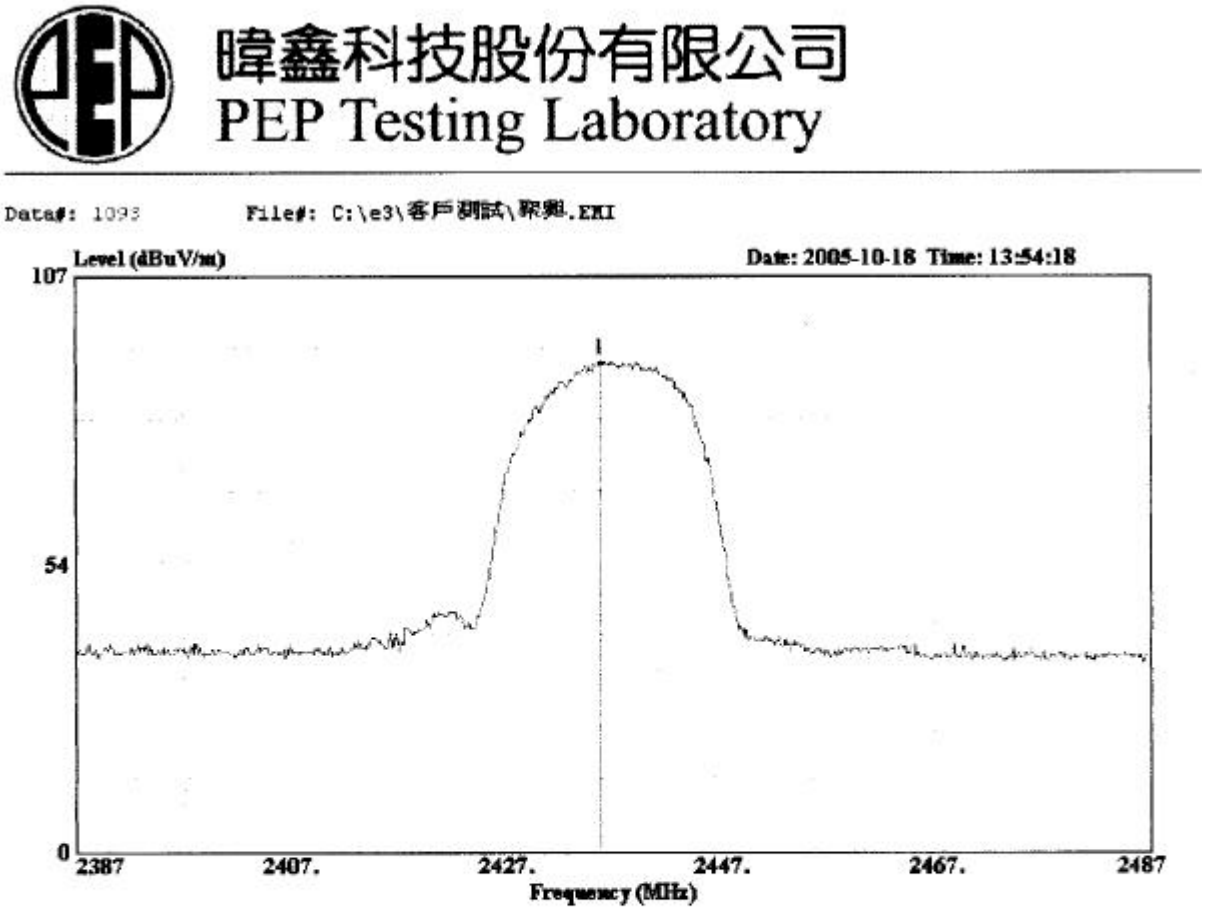

```
Site      : chamber  no3 (Joe)
Condition : 3m HORN ANTENNA V.3 VERTICAL
EUT       : 2.4GHz Wireless lan
Power     : AC 110V 60Hz
Memo      : PRETEST
Memo      : CH1:2.412 GHz
          : TX ON
          : The maximum peak output power
          : TX POWER : 79
                        Over  Limit   Read
          Freq  Level   Limit  Line  Level Factor
          ----  -----   -----  -----  ----- ------
           MHz dBuV/m     dB dBuV/m   dBuV     dB

  1   2411.900  94.35 ------ ------  96.42  -2.07
```

Channel : CH.6

Polarity : Horizontal

Mode : CCK



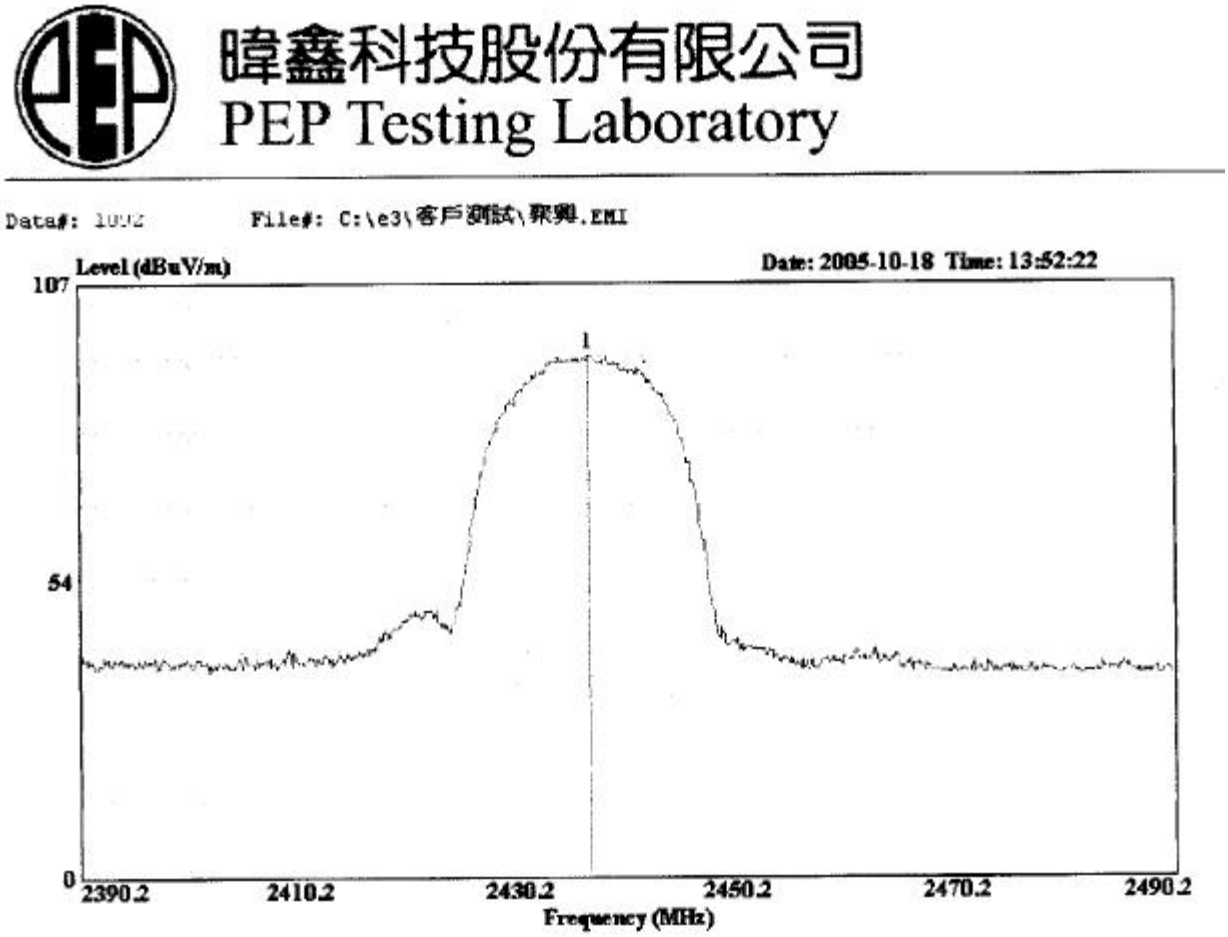

```
Site      : chamber  no3 (Joe)
Condition : 3m HORN ANTENNA H.3 HORIZONTAL
EUT       : 2.4GHz Wireless lan
Power     : AC 110V 60Hz
Memo      : PRETEST
Memo      : CH6:2.437 GHz
          : TX ON
          : The maximum peak output power
          : TX POWER : 79
                        Over  Limit   Read
          Freq  Level   Limit  Line  Level Factor
          ----------  -----  -----  -----  ------
            MHz dBuV/m    dB dBuV/m  dBuV    dB

  1   2436.000  91.35 ------ ------ 93.37 -2.02
```

Channel : CH.6

Polarity : Vertical

Mode : CCK



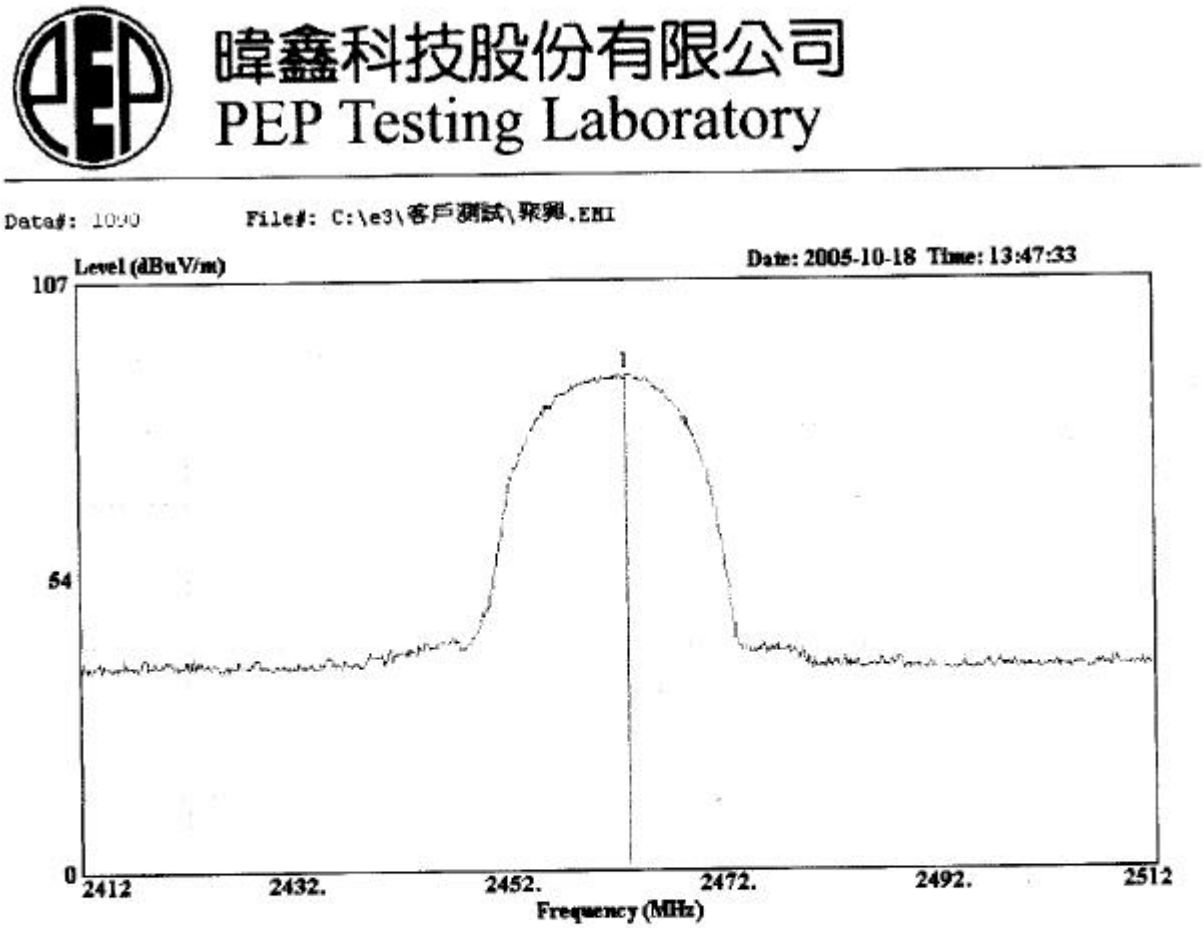

```
Site      : chamber  no3 (Joe)
Condition : 3m HORN ANTENNA V.3 VERTICAL
EUT       : 2.4GHz Wireless lan
Power     : AC 110V 60Hz
Memo      : PRETEST
Memo      : CH6:2.437 GHz
          : TX ON
          : The maximum peak output power
          : TX POWER : 79
                        Over  Limit   Read
          Freq  Level   Limit  Line  Level  Factor
          ---------  -------  -----  -----  ------
            MHz dBuV/m    dB dBuV/m   dBuV      dB

  1   2436.900  93.94 ------ ------  95.95   -2.01
```

Channel : CH.11

Polarity : Horizontal

Mode : CCK




```
Site      : chamber  no3 (Joe)
Condition : 3m HORN ANTENNA H.3 HORIZONTAL
EUT       : 2.4GHz Wireless lan
Power     : AC 110V 60Hz
Memo      : PRETEST
Memo      : CH11:2.462 GHz
          : TX ON
          : The maximum peak output power
          : TX POWER : 79
                       Over  Limit   Read
          Freq  Level  Limit  Line  Level Factor
          ----- ------ ------ ------ ------ ------
            MHz dBuV/m     dB dBuV/m   dBuV     dB

  1   2463.100  89.78 ------ ------  91.73  -1.95
```

Channel : CH.11

Polarity : Vertical

Mode : CCK

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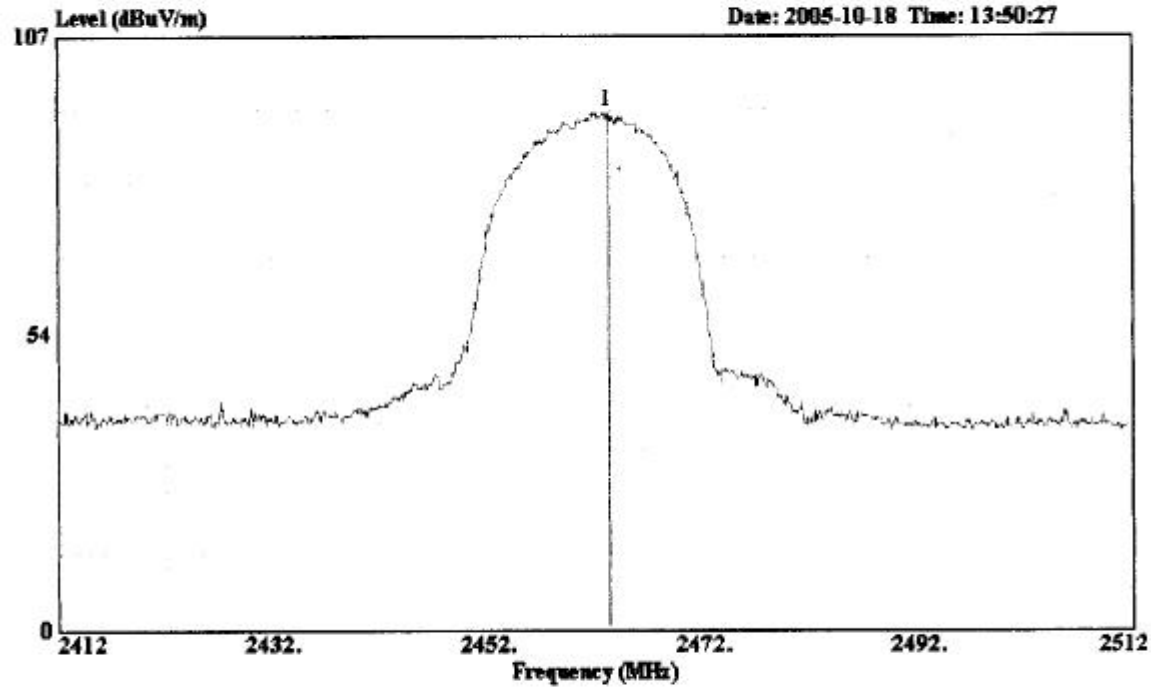
Data#: 1091 File#: C:\e3\客戶測試\聚鼎.EMI



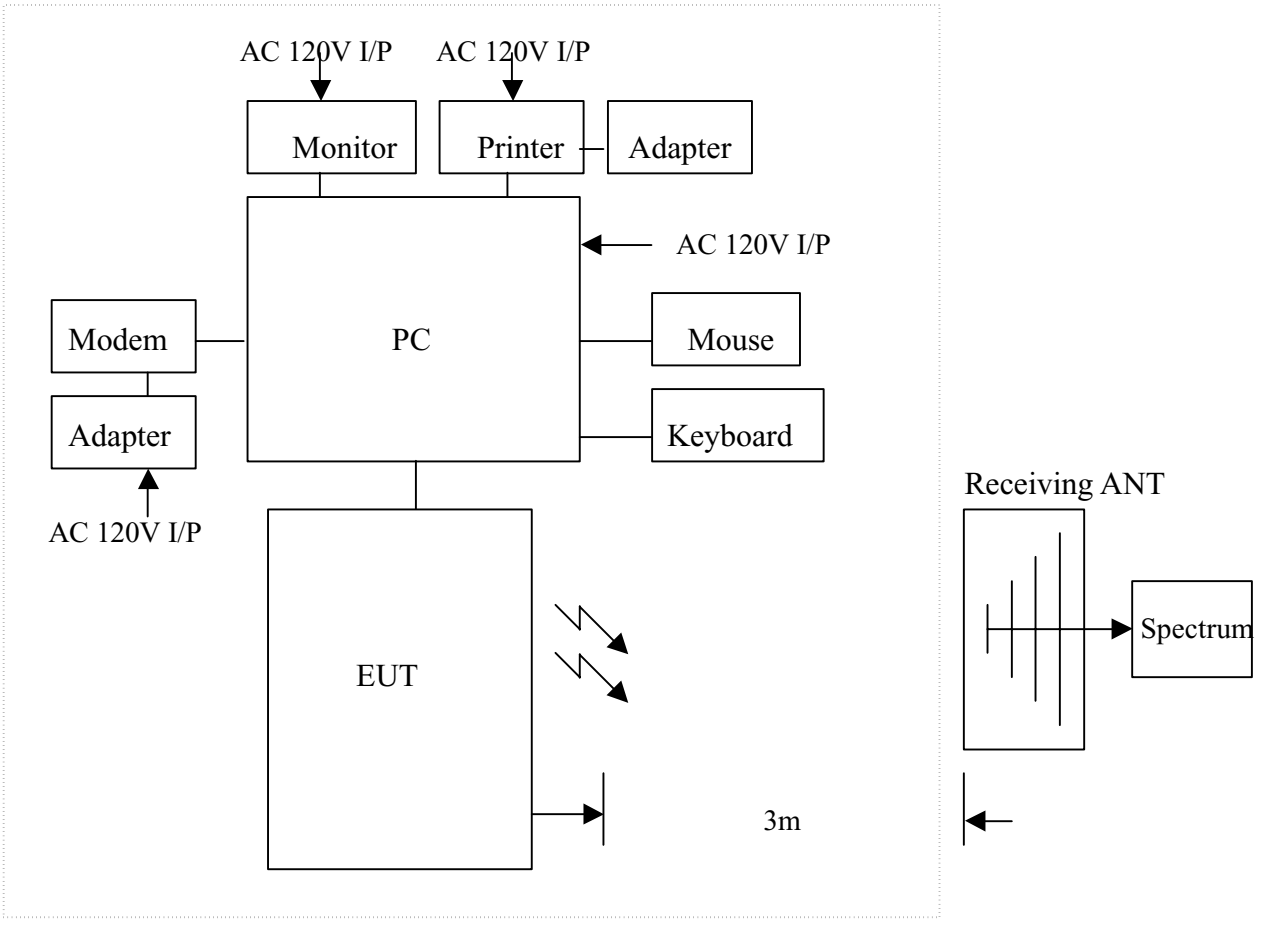

```
Site      : chamber  no3 (Joe)
Condition : 3m HORN ANTENNA V.3 VERTICAL
EUT       : 2.4GHz Wireless lan
Power     : AC 110V 60Hz
Memo      : PRETEST
Memo      : CH11:2.462 GHz
          : TX ON
          : The maximum peak output power
          : TX POWER : 79
                       Over  Limit   Read
          Freq  Level  Limit  Line  Level Factor
          ---------- ------ ------ ------ ------ ------
                 MHz dBuV/m     dB dBuV/m   dBuV     dB

  1   2463.400  93.17 ------ ------  95.12  -1.95
```

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

5.1 MPE distance calculation

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

5.2 Device operating configurations exposure conditions



5.3 Maximum Permissible Exposure (MPE)

EUT Model No. WL0401C

Channel	Frequency (MHz)	Antenna Polarity (H/V)	Spectrum Read (dBuV/m)	C.F. (dB)	Level (dBuV/m)	Power Density at 20cm (mW/cm^2)
1	2411.8	H	93.91	-2.07	91.84	$2.04*10^{-3}$
	2411.9	V	96.42	-2.07	94.35	$3.63*10^{-3}$
6	2436.0	H	93.37	-2.02	91.35	$1.82*10^{-3}$
	2436.9	V	95.95	-2.01	93.94	$3.30*10^{-3}$
11	2463.1	H	91.73	-1.95	89.78	$1.27*10^{-3}$
	2463.4	V	95.12	-1.95	93.17	$2.77*10^{-3}$

Note :

5. "C.F." means corrected factor = antenna factor + cable loss－Preamplifier Gain .
6. Level means emission amplitude = S.P. + C.F. + duty cycle factor
7. Conducted output power : $P = (E\ d)^2 / 30G$
   where E (V) = Level (V)
   d (m) = measurement distance = 0.2m
   G = 1 (the gain of the transmitting antenna over isotropic antenna)
   P = E.I.R.P.
8. 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

Ⅵ. §15.247(c) : Spurious Radiated Emissions

6.1 Out side band below 1GHz

Test Results:

Model No. : WL0401C
Frequency range : 30MHz - 1GHz Detector : Quasi-Peak Value
Temperature : 28° C Humidity : 52 %

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)	Remark
186.384	30.28	-13.22	43.50	36.39	- 6.11	
203.898	29.33	-14.17	43.50	36.39	- 7.06	
242.363	25.27	-20.73	46.00	32.33	- 7.06	
431.233	34.23	-11.77	46.00	35.68	- 1.45	
528.141	39.17	- 6.83	46.00	38.49	0.68	
747.080	41.23	- 4.77	46.00	35.97	5.26	

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)	Remark
35.343	33.78	- 6.22	40.00	42.41	- 8.63	
118.145	29.23	-14.27	43.50	36.40	- 7.17	
198.025	28.97	-14.53	43.50	35.94	- 6.97	
242.003	26.77	-19.23	46.00	33.87	- 7.10	
719.388	40.29	- 5.71	46.00	35.63	4.66	
824.843	38.64	- 7.36	46.00	32.04	6.60	

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

6.2 Out side band above 1GHz

Test Results:

Model No. : WL0401C
Frequency range : above 1GHz **Detector : Peak / Average Value**
Temperature : 28° C **Humidity : 52 %**
Channel : 1

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)	Remark
7237.10	50.68	-23.32	74	38.98	11.70	PK
7237.10	---	---	54	---	---	AV
9648.19	53.30	-20.70	74	38.41	14.89	PK
9648.19	---	---	54	---	---	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)	Remark
4824.10	49.67	-24.33	74	44.97	4.70	PK
4824.10	---	---	54	---	---	AV
7238.35	58.85	-15.15	74	47.15	11.70	PK
7238.35	48.77	- 5.23	54	37.07	11.70	AV
9648.19	55.23	-18.77	74	40.34	14.89	PK
9648.19	52.34	- 1.66	54	37.45	14.89	AV
12059.60	48.52	-25.48	74	33.02	15.50	PK
12059.60	---	---	54	---	---	AV

Note :

1. Level = Read Level + Probe Factor + Cable Loss – Preamp Factor
2. Over Limit = Level – Limit Line
3. Factor=Probe Factor + Cable Loss – Preamp Factor

Model No. : WL0401C
Frequency range : above 1GHz **Detector : Peak / Average Value**
Temperature : 28° C **Humidity : 52 %**
Channel : 6 **Mode**

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)	Remark
4874.60	43.25	-30.75	74	38.30	4.95	PK
4874.60	---	---	54	---	---	AV
7311.70	43.84	-30.16	74	32.20	11.64	PK
7311.70	---	---	54	---	---	AV
9737.10	41.14	-32.86	74	26.14	15.00	PK
9737.10	---	---	54	---	---	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)	Remark
4873.00	45.14	-28.86	74	40.20	4.94	PK
4873.00	---	---	54	---	---	AV
7308.70	52.42	-21.58	74	40.78	11.64	PK
7308.70	---	---	54	---	---	AV

Note :
1. Level = Read Level + Probe Factor + Cable Loss – Preamp Factor
2. Over Limit = Level – Limit Line
3. Factor=Probe Factor + Cable Loss – Preamp Factor

Model No. : WL0401C
Frequency range : above 1GHz **Detector : Peak / Average Value**
Temperature : 28° C **Humidity : 52 %**
Channel : 11 **Mode : CCK**

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)	Remark
7381.40	37.87	-36.13	74	26.28	11.59	PK
7381.40	---	---	54	---	---	AV

Antenna polarization : VERTICAL ; Test distance : 3 m ;

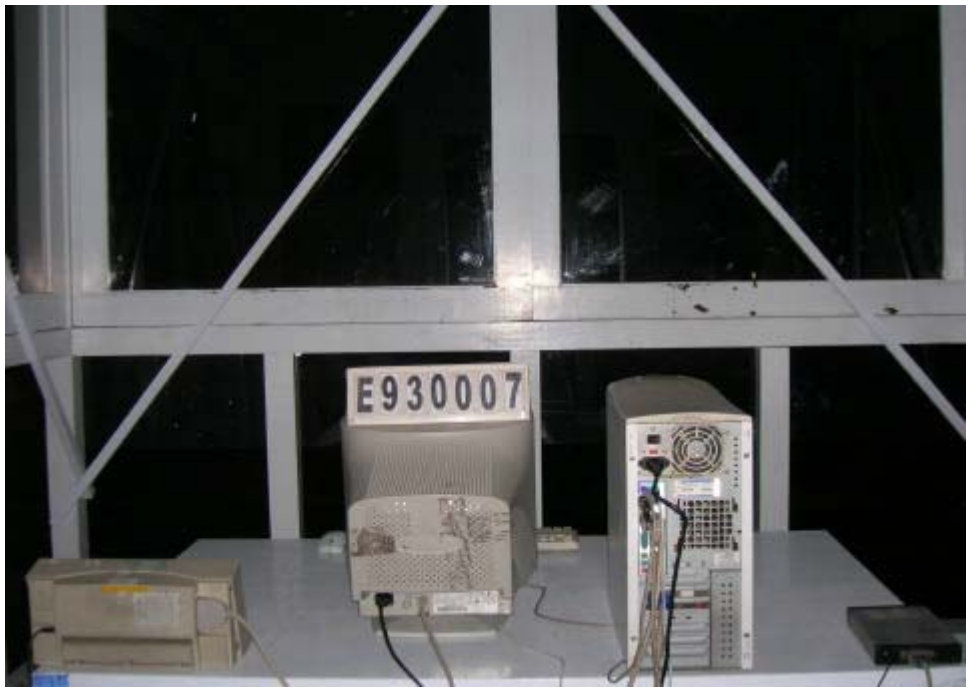
Freq. (MHz)	Level (dBuV/m)	Over Limit (dB)	Limit Line (dBuV/m)	Read Level (dBuV)	Probe Factor (dB/m)	Remark
4924.30	45.20	-28.80	74	40.01	5.19	PK
4924.30	---	---	54	---	---	AV
7382.30	42.53	-31.47	74	30.94	11.59	PK
7382.30	---	---	54	---	---	AV

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

6.3 Radiate Emission Testing Photos

< FRONT VIEW >

< REAR VIEW >



Ⅶ. §15.247(c) : Band-edges Compliance

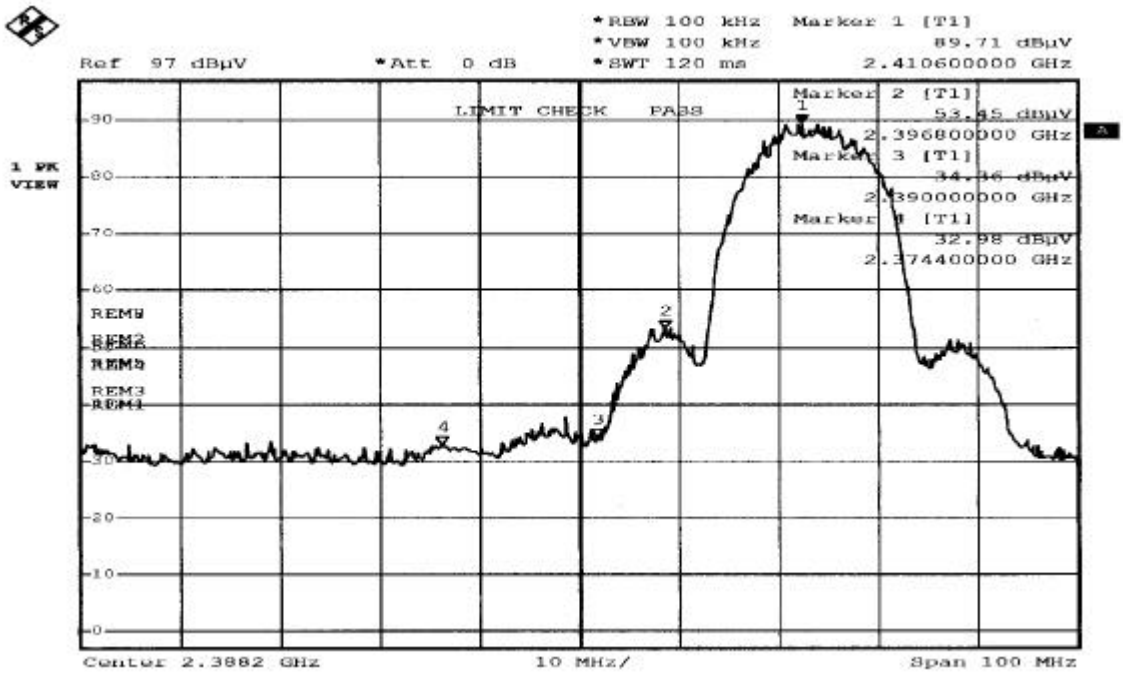
If any 100 kHz bandwidth outside these frequency bands, the radio frequency power that is produced by the modulation products of the spreading sequence, the information sequence and the carrier frequency shall be either at least 20 dB below that in any 100 kHz bandwidth within the band that contains the highest level of the desired power or shall not exceed the general levels specified §15.209(a)

7.1 Test Result of Band-edges Compliance

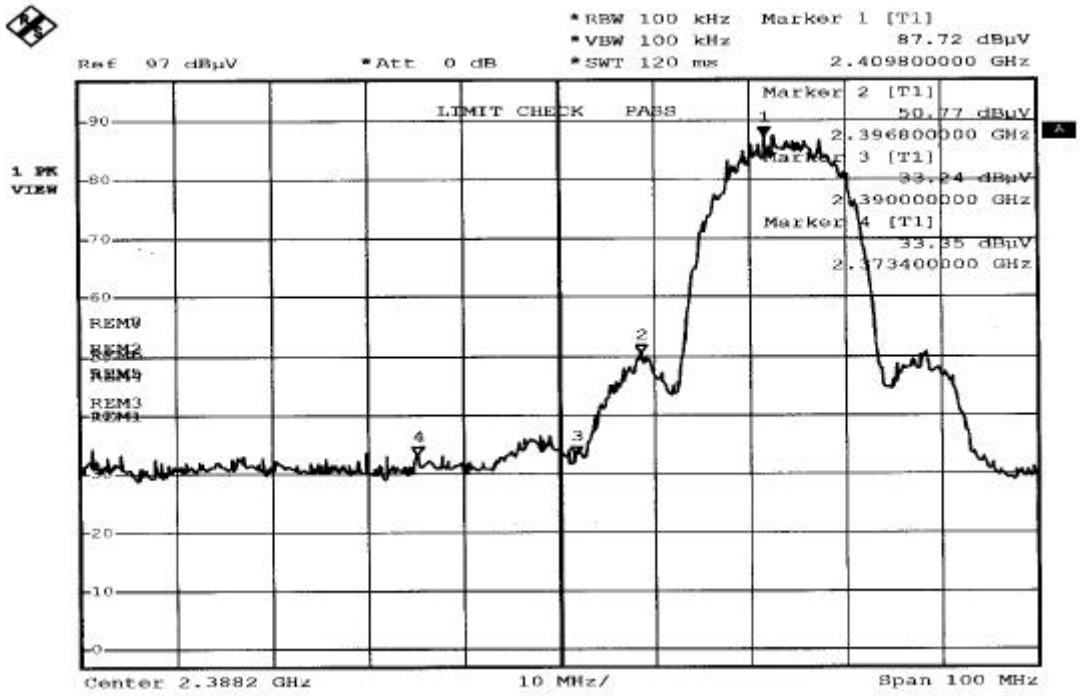
Frequency (MHz)	Polarity (H/V)	Level (dBuV/m)	Remark
2396.8	H	53.45	PK
2390.0	H	34.36	PK
2374.4	H	32.98	PK
2475.8	V	47.20	PK
2483.5	V	31.74	PK
2485.6	V	33.03	PK

Channel : CH.1

Polarity : Horizontal

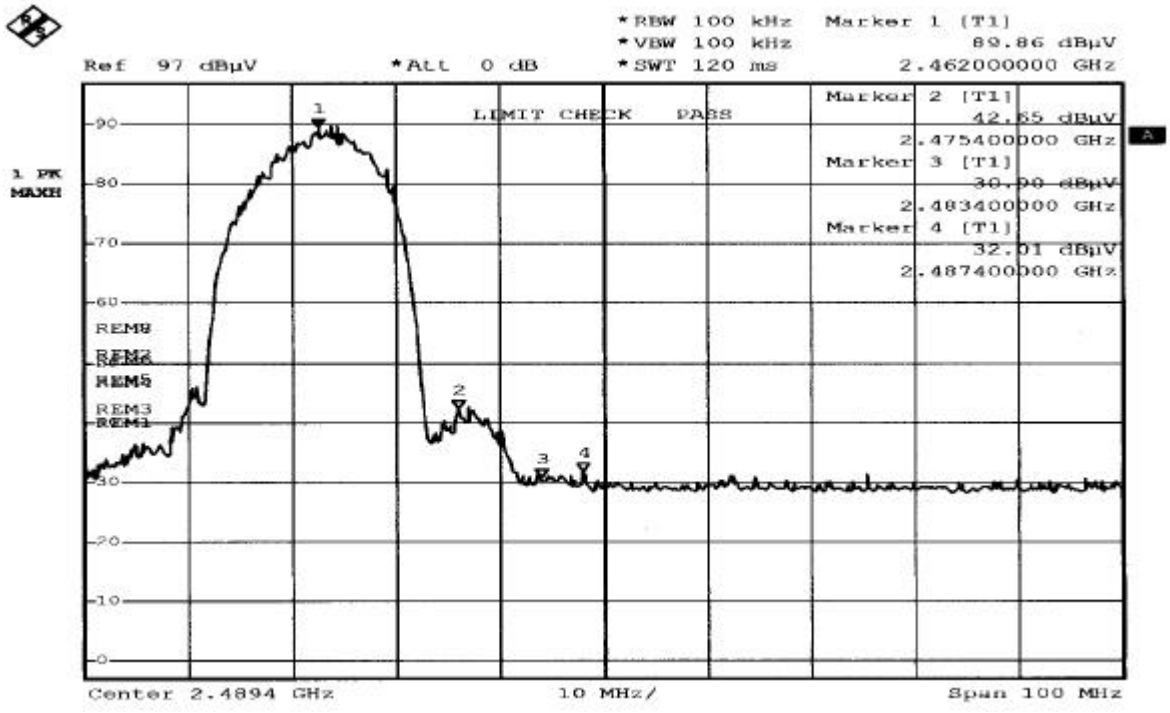


Polarity : Vertical

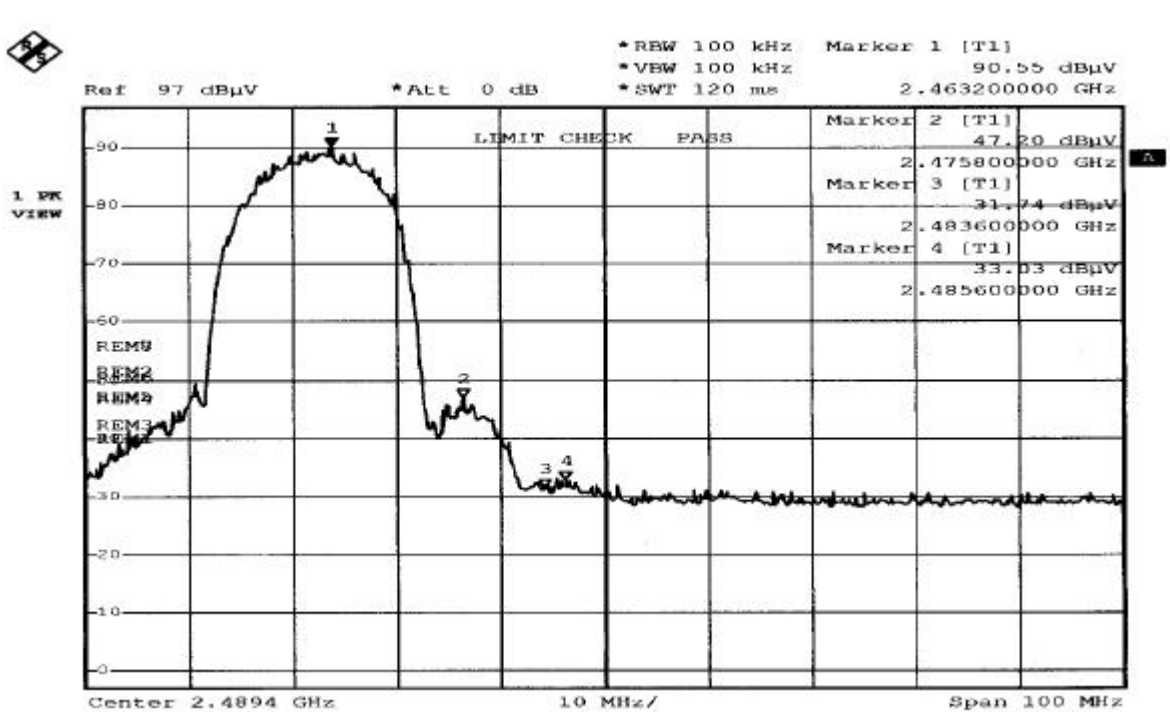


Channel : CH.11

Polarity : Horizontal



Polarity : Vertical



Ⅷ. §15.247(d) : Power Spectral Density

8.1 Test Result of Power Spectral Density

EUT Model No. WL0401C

RBW = 3KHz VBW = 30KHz Sweep time : Auto

Channel	Frequency (MHz)	Level (dBm)	Limit (dBm)	Pass/Fail
1	2412.6	-25.2	8	Pass
6	2435.3	-25.3	8	Pass
11	2460.3	-26.82	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

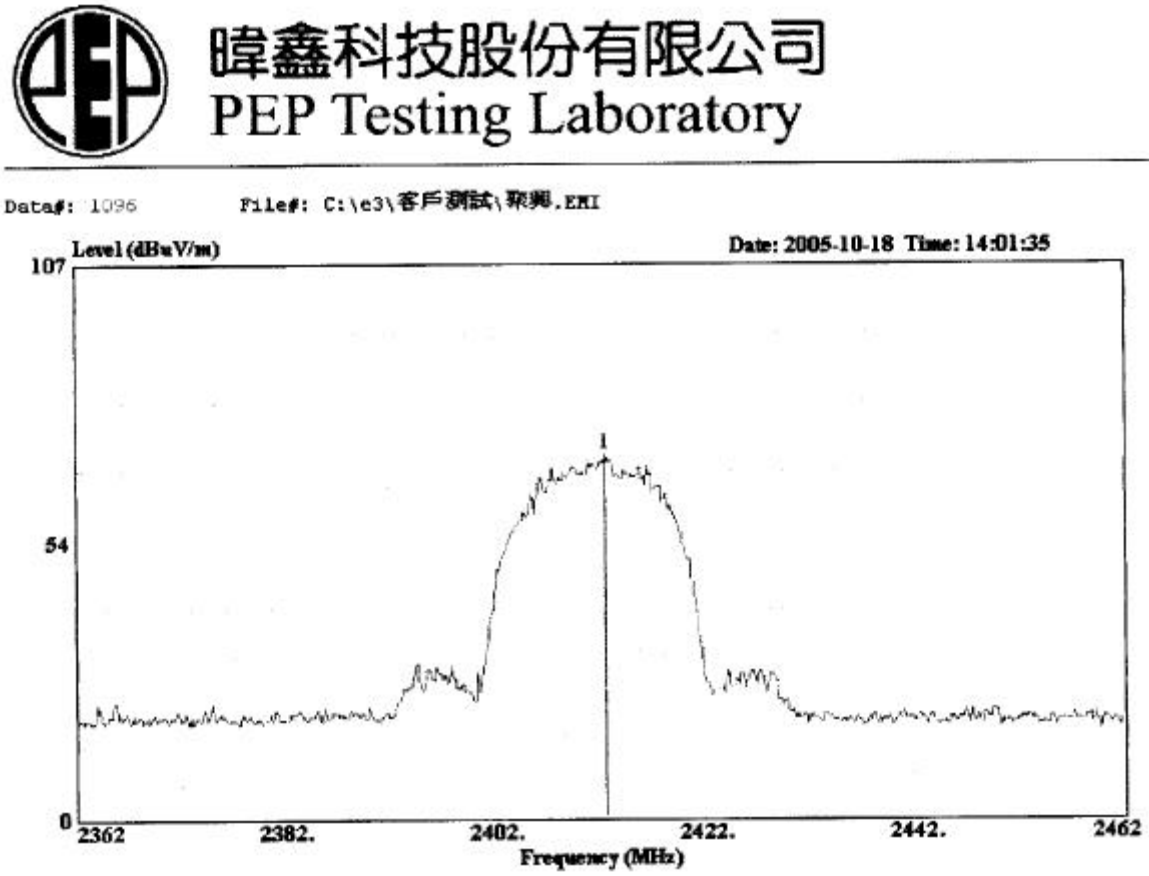
   $10^{(120/20)} \times 10^{-6} = 1$ V

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

8.2 Spectrum Plot Data

Channel : CH.1

Polarity : Vertical

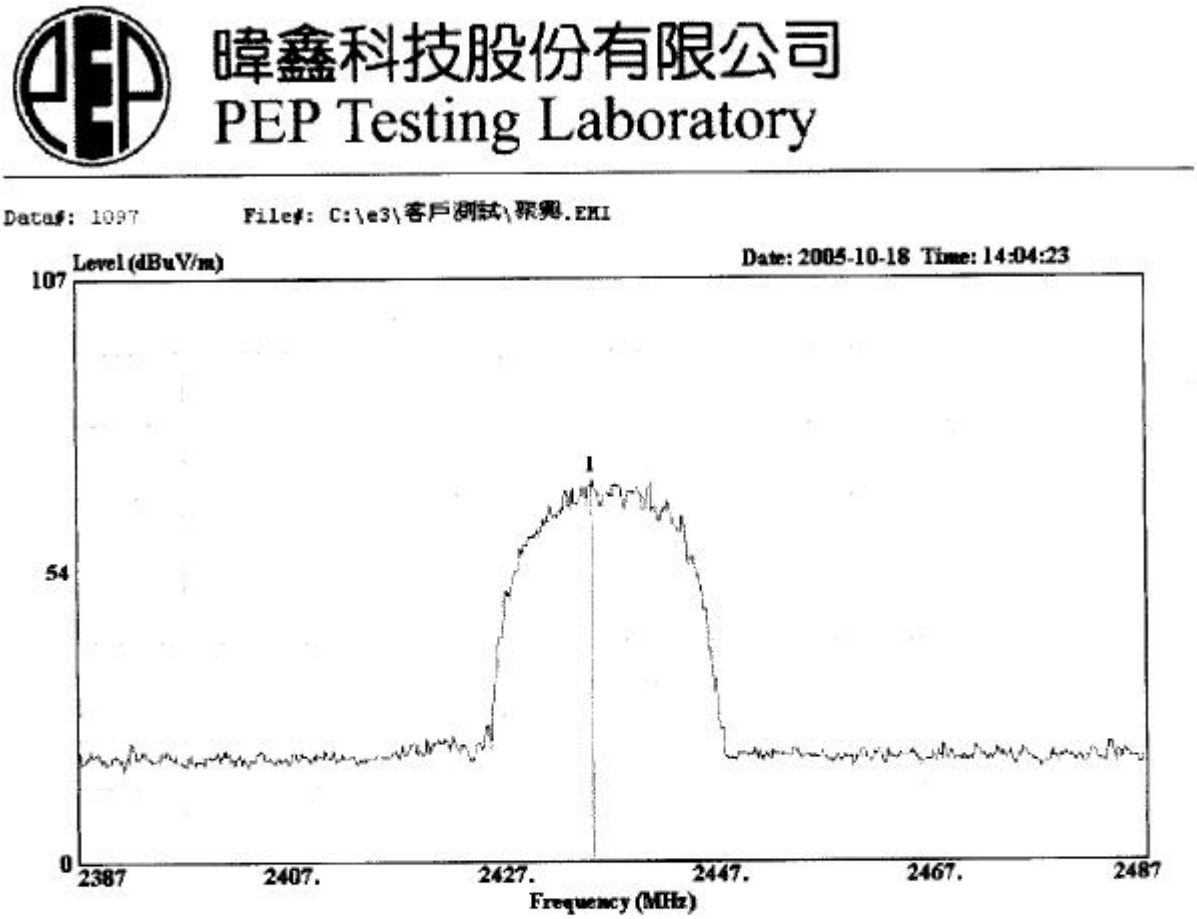


Site : chamber no3 (Joe)
Condition : 3m HORN ANTENNA V.3 VERTICAL
EUT : 2.4GHz Wireless lan
Power : AC 110V 60Hz
Memo : PRETEST
Memo : CH1
: TX ON
: The Peak Power Density
: TX POWER : 79

	Freq	Level	Over Limit	Limit Line	Read Level	Factor
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB
1	2412.600	70.02	------	------	72.09	-2.07

Channel : CH.6

Polarity : Vertical

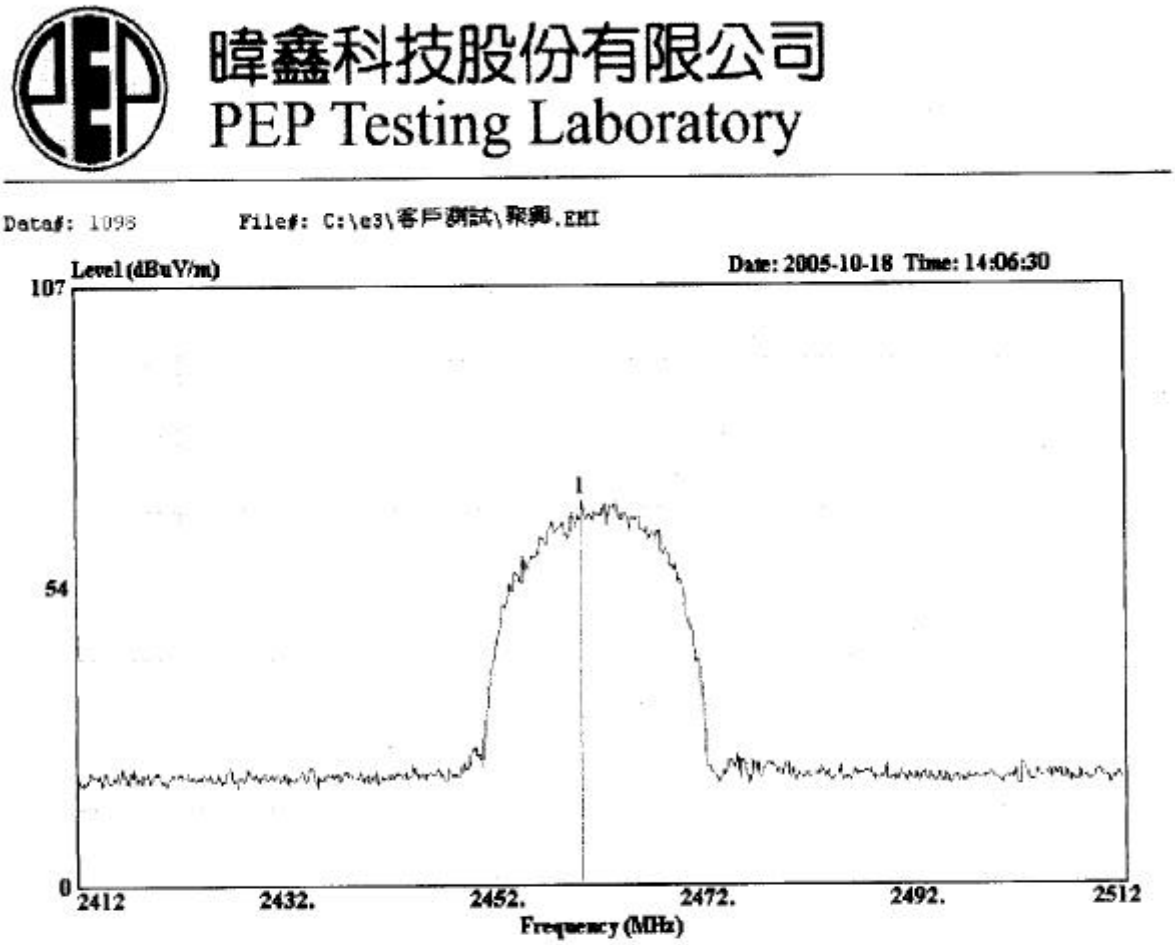


Site : chamber no3 (Joe)
Condition : 3m HORN ANTENNA V.3 VERTICAL
EUT : 2.4GHz Wireless lan
Power : AC 110V 60Hz
Memo : PRETEST
Memo : CH6
: TX ON
: The Peak Power Density
: TX POWER : 79

	Freq	Level	Over Limit	Limit Line	Read Level	Factor
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB
1	2435.300	69.95	------	------	71.97	-2.02

Channel : CH.11

Polarity : Vertical




```
Site      : chamber  no3 (Joe)
Condition : 3m HORN ANTENNA V.3 VERTICAL
EUT       : 2.4GHz Wireless lan
Power     : AC 110V 60Hz
Memo      : PRETEST
Memo      : CH11
          : TX ON
          : The Peak Power Density
          : TX POWER : 79
                        Over  Limit   Read
          Freq  Level   Limit  Line  Level Factor
          ---------- ------ ------ ------ ------
             MHz dBuV/m    dB dBuV/m  dBuV    dB

1   2460.300  68.40 ------ ------ 70.37 -1.97
```

Ⅸ. Antenna Requirement

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 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6dBi.

9.2 Antenna Connected Construction

The antenna used in this product is Dipole Antenna. The antenna connector type is IPEX. The maximum Gain of this antenna is 2dBi.

Ⅹ. 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

XI. EUT Photos

Model No. : WL0401C


E930007
Antenna is this side


ATM Electronic Corp.
WL0401C
FCC ID: TWAWL0401C