



FCC ID: F2QRFLIBRAP5U

Issued on Dec. 16, 2004

Report No.: F483132

# FCC TEST REPORT

**CATEGORY** : Portable

**PRODUCT NAME** : WIRELESS PRESENTER MOUSE

**FCC ID.** : F2QRFLIBRAP5U

**FILING TYPE** : Certification

**BRAND NAME** : IONE

**MODEL NAME** : Libra-P5

**APPLICANT** : Itron Technology Inc.

9F, #75, Sec. 1, Hsin Tai Wu Rd., Hsichih, Taipei Hsien,  
Taiwan, R.O.C.

**MANUFACTURER** : Qumax Elec.(Dongguan) CO., LTD.

Sec. B, Hopewell Industrial City, Sima, Changping Town,  
Dongguan City, Guangdong Province, Post Code: 523570,  
P.R.C.

**ISSUED BY** : SPORTON INTERNATIONAL INC.

6F, No. 106, Sec. 1, Hsin Tai Wu Rd., His Chih, Taipei Hsien,  
Taiwan, R.O.C.

## Statements:

The test result in this report refers exclusively to the presented test model / sample.

Without written approval of SPORTON International Inc., the test report shall not be reproduced except in full.

Certificate or Test Report could not be used by the applicant to claim the product endorsement by CNLA, NVLAP or any agency of U.S. government.

The test equipment used to perform the test are calibrated and traceable to NML/ROC or NIST/USA.

  
Dr. Alan Lane  
Vice General Manager  
SPORTON International Inc.

NVLAP®

Lab Code: 200079-0

***SPORTON International Inc.***

TEL : 886-2-2696-2468

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## HISTORY OF THIS TEST REPORT

Original Report Issue Date: Dec. 16, 2004

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No additional attachment.

Additional attachment were issued as following record:



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## CERTIFICATE OF COMPLIANCE

with

### 47 CFR FCC Part 15 Subpart C ( Section 15.249 )

**PRODUCT NAME** : WIRELESS PRESENTER MOUSE

**BRAND NAME** : IONE

**MODEL NAME** : Libra-P5

**APPLICANT** : Itron Technology Inc.

9F, #75, Sec. 1, Hsin Tai Wu Rd., Hsichih, Taipei Hsien,  
Taiwan, R.O.C.

**MANUFACTURER** : Qumax Elec.(Dongguan) CO., LTD.

Sec. B, Hopewell Industrial City, Sima, Changping Town,  
Dongguan City, Guangdong Province, Post Code: 523570,  
P.R.C.

#### I HEREBY CERTIFY THAT:

The measurements shown in this test report were made in accordance with the procedures given in ANSI C63.4 - 2003 and all test are performed according to 47 CFR FCC Part 15. Testing was carried out on Nov. 30, 2004 at SPORTON International Inc. LAB.

A handwritten signature in blue ink, appearing to read 'Alan Lane'.

**Dr. Alan Lane**

Vice General Manager

SPORTON International Inc.



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## 1. General Description of Equipment under Test

### 1.1. Applicant

**Itron Technology Inc.**

9F, #75, Sec. 1, Hsin Tai Wu Rd., Hsichih, Taipei Hsien, Taiwan, R.O.C.

### 1.2. Manufacturer

**Qumax Elec.(Dongguan) CO., LTD.**

Sec. B, Hopewell Industrial City, Sima, Changping Town, Dongguan City, Guangdong Province, Pose Code: 523570, P.R.C.

### 1.3. Basic Description of Equipment under Test

This product is a wireless presenter. This product is used to wirelessly control the present material in the computer. The transmitter part is battery powered, the receiver part is powered by USB part. Please refer to "Features of Equipment under Test".

### 1.4. Features of Equipment under Test

Items	Description
Type of Modulation	FSK
Number of Channels	8
Frequency Band	2402MHz ~ 2465MHz
Carrier Frequency	See section 1.5 for details
Antenna Type	Printed Antenna
Testing Duty Cycle	100.00%
Power Rating (DC/AC, Voltage)	3 VDC from battery
Temperature Range (Operating)	0 ~ 55 °C

### 1.5. Table for Carrier Frequencies

Channel	Frequency	Channel	Frequency
01	2402 MHz	05	2438 MHz
02	2411 MHz	06	2447 MHz
03	2420 MHz	07	2456 MHz
04	2429 MHz	08	2465 MHz



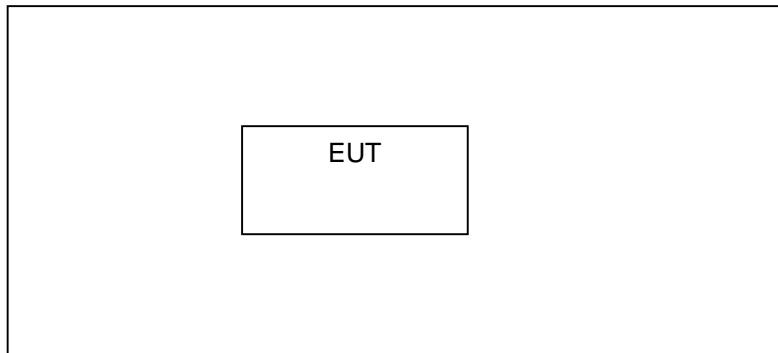
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## 2. Test Configuration of the Equipment under Test

### 2.1. Connection Diagram of Test System



### 2.2. The Test Mode Description

1. Spurious emission below 1GHz is independent of channel selection, so only channel 08 was tested.
2. AC conduction emission is independent of channel selection, so only channel 08 was tested.
3. Because of the EUT is hand-held device, the following modes were tested:
  - Mode 1: X axis
  - Mode 2: Y axis
  - Mode 3: Z axis

### 2.3. Description of Test Supporting Units

Support unit	Brand	Model No.	Serial No.	FCC ID	Data cable (m)
Notebook	DELL	PP01L	SP0030	Doc	-
Printer	EPSON	STYLUS COLOR 680	SP0046	Doc	1.35
Modem	ACEEX	DM141	SP0049	Doc	1.15



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### 3. General Information of Test

#### 3.1. Test Facility

**Test Site Location** : No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiag, Tao Yuan Hsien, Taiwan, R.O.C.  
: TEL 886-3-327-3456  
: FAX 886-3-318-0055

**Test Site No** : 03CH01-HY / TH01-HY

#### 3.2. Test Conditions

Normal Voltage : 3.0 VDC  
Extreme Voltages : NA  
Normal Temperature : 20°C  
Extreme Temperature : 0 °C and 55 °C

#### 3.3. Standards for Methods of Measurement

Here is the list of the standards followed in this test report.

**ANSI C63.4-2003**

**47 CFR Part 15 Subpart C ( Section 15.249 )**

#### 3.4. DoC Statement

This EUT is also classified as a device of computer peripheral Class B which DoC has to be followed. It has been verified according to the rule of 47 CFR part 15 Subpart B, and found that all the requirements has been fulfilled.

#### 3.5. Frequency Range Investigated

Radiated emission test: from 30 MHz to 10th carrier harmonic

#### 3.6. Test Distance

The test distance of radiated emission (30MHz~1GHz) test from antenna to EUT is 3 M.

The test distance of radiated emission (1GHz~10th carrier harmonic) test from antenna to EUT is 3 M.

#### 3.7. Test Software

During testing, Channel & Power Controlling Software: This was provided by the manufacturer and is able to let the test engineer select the operating channel as well as the RF output power. The parameters for channel selection is trying to offer the test engineer the ability to fix the operating channel for testing, both normal data and continuously transmitting modes are allowed, and that for RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product.



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## 4. List of Measurements

### 4.1. Summary of the Test Results

Applied Standard: 47 CFR Part 15 and Part 2			
Paragraph	FCC Rule	Description of Test	Result
5.1	15.249	Maximum Carrier Field Strength	Pass
5.2	15.207	AC Power Line Conducted Emission	Pass
5.3	15.209/15.249	Spurious Radiated Emission	Pass
5.4	15.203	Antenna Requirement	Pass

## 5. Test Result

### 5.1. Test of Maximum Carrier Field Strength

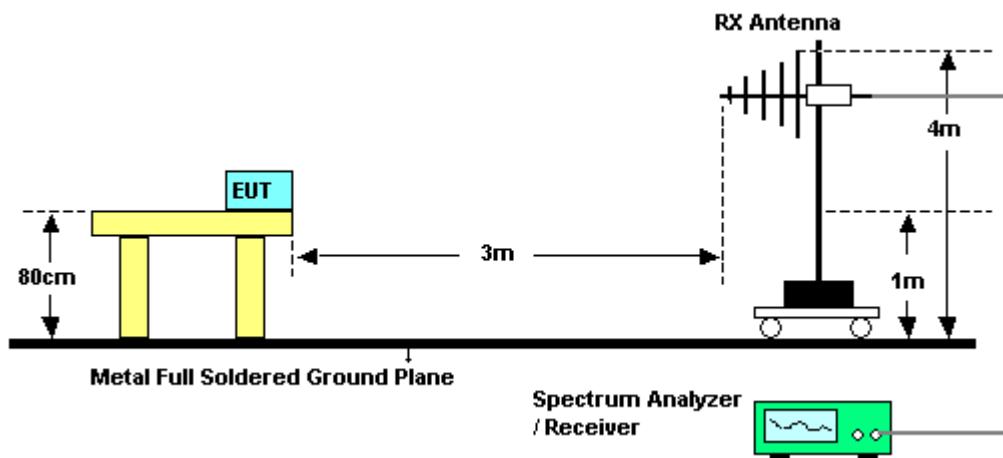
#### 5.1.1. Measuring Instruments

Item 6~17 of the table is on section 6.

#### 5.1.2. Test Procedures

1. Configure the EUT according to ANSI C63.4.
2. The turn table was rotated by 360 degrees to determine the position of the highest radiation.
3. The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emission field strength of both horizontal and vertical polarization.
4. For carrier field strength emission, the antenna tower was scan (from 1 M to 4 M) and then the turn table was rotated (from 0 degree to 360 degrees) to find the maximum reading.
5. For carrier field strength emission, use 1MHz VBW and RBW for peak reading. Then 1MHz RBW and 10Hz VBW for average reading in spectrum analyzer.

#### 5.1.3. Test Setup Layout





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#### 5.1.4. Test Result

- Maximum axis: X
- Temperature: 26°C
- Relative Humidity: 64%
- Duty Cycle of the Equipment During the Test: 100.00%
- Test Engineer: Ted Chou

Channel No.	Frequency ( MHz )	Level ( dBuV/m )	Over Limit ( dB )	Limit Line ( dBuV/m )	Read Level ( dBuV/m )	Detector
01	2402 MHz	53.53	-40.47	94.00	23.50	Average
01	2402 MHz	83.05	-30.95	114.00	53.01	Peak
05	2438 MHz	52.74	-41.26	94.00	22.60	Average
05	2438 MHz	79.83	-34.17	114.00	49.68	Peak
08	2465 MHz	54.18	-39.82	94.00	23.97	Average
08	2465 MHz	84.66	-29.34	114.00	54.42	Peak

Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level.



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## **5.2. Test of AC Power Line Conducted Emission**

The EUT is battery powered, so it is not required to test the item.

### 5.3. Test of Spurious Radiated Emission

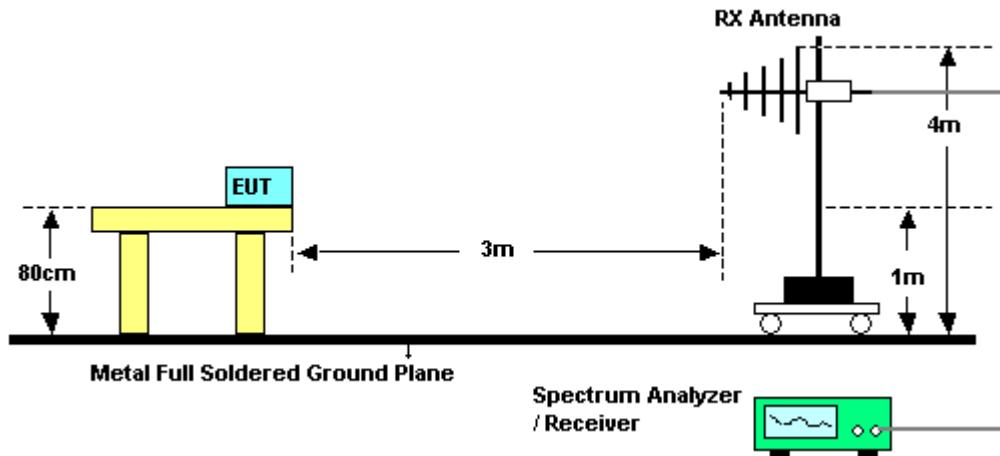
#### 5.3.1. Measuring Instruments

Please reference item 6~17 in chapter 6 for the instruments used for testing.

#### 5.3.2. Test Procedures

1. Configure the EUT according to ANSI C63.4.
2. The EUT was placed on the top of the turn table 0.8 meter above ground.
3. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turn table.
4. Power on the EUT and all the supporting units.
5. The turn table was rotated by 360 degrees to determine the position of the highest radiation.
6. The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emission field strength of both horizontal and vertical polarization.
7. For each suspected emission, the antenna tower was scan (from 1 M to 4 M) and then the turn table was rotated (from 0 degree to 360 degrees) to find the maximum reading.
8. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.
9. For emission above 1GHz, use 1MHz VBW and RBW for peak reading. Then 1MHz RBW and 10Hz VBW for average reading in spectrum analyzer.
10. If the emission level of the EUT in peak mode was 3 dB lower than the average limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method for below 1GHz and average method for above the 1GHz. the reported.
11. For testing above 1GHz, the emission level of the EUT in peak mode was 20dB higher than average limit (that means the emission level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.

#### 5.3.3. Test Setup Layout





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### 5.3.4. Test Results for CH 08 / 2465 MHz ( for emission below 1GHz)

- Test Mode: Mode 1
- Temperature: 26°C
- Relative Humidity: 64%
- Duty Cycle of the Equipment During the Test: 100.00%
- Test Engineer: Ted Chou

#### (A) Polarization: Horizontal

Freq	Level	Over Limit		Read Level	Probe Factor	Cable Loss		Preamp Factor	Remark	Ant Pos	Table Pos
		Line	Limit			dBuV	dB				
MHz	dBuV/m	dB	dBuV/m								
1	73.350	7.00	-33.00	40.00	23.81	9.70	1.44	27.95	Peak	---	---
2	99.700	9.52	-33.98	43.50	26.66	8.98	1.78	27.90	Peak	---	---
3	145.430	11.05	-32.45	43.50	24.48	12.22	2.16	27.81	Peak	---	---
1	237.600	19.99	-26.01	46.00	31.50	13.26	2.78	27.55	Peak	---	---
2	409.600	26.12	-19.88	46.00	33.75	16.72	3.53	27.88	Peak	---	---
3	675.200	26.46	-19.54	46.00	29.95	20.63	4.60	28.72	Peak	---	---

#### (B) Polarization: Vertical

Freq	Level	Over Limit		Read Level	Probe Factor	Cable Loss		Preamp Factor	Remark	Ant Pos	Table Pos
		Line	Limit			dBuV	dB				
MHz	dBuV/m	dB	dBuV/m								
1	32.380	12.01	-27.99	40.00	26.58	12.49	0.98	28.04	Peak	---	---
2	46.830	10.57	-29.43	40.00	25.40	12.02	1.16	28.01	Peak	---	---
3	62.980	13.25	-26.75	40.00	29.60	10.29	1.33	27.97	Peak	---	---
1	208.800	16.23	-27.27	43.50	25.79	15.50	2.60	27.66	Peak	---	---
2	423.200	21.24	-24.76	46.00	29.05	16.61	3.58	28.00	Peak	---	---
3	823.200	33.36	-12.64	46.00	35.05	21.85	5.14	28.68	Peak	120	185

Note:

Emission level (dBuV/m) = 20 log Emission level (uV/m)

Corrected Reading: Probe Factor + Cable Loss + Read Level - Preamp Factor = Level



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### 5.3.5. Test Results for CH 01 / 2402 MHz ( for emission above 1GHz)

- Test Mode: Mode 1
- Temperature: 26°C
- Relative Humidity: 64%
- Duty Cycle of the Equipment During the Test: 100.00%
- Test Engineer: Ted Chou

#### (A) Polarization: Horizontal

Freq	Level	Over	Limit	Read	Probe	Cable	Preamp	Remark	Ant	Table
		Limit	Line	Level	Factor	Loss	Factor			Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB	cm	deg
1	2724.000	54.86	-19.14	74.00	63.15	29.25	1.96	39.50	Peak	---
2	2724.000	22.99	-31.01	54.00	31.28	29.25	1.96	39.50	Average	---
3	4808.000	66.47	-7.53	74.00	71.25	32.96	2.40	40.14	Peak	---
4	4808.000	38.91	-15.09	54.00	43.69	32.96	2.40	40.14	Average	---
5	7208.000	59.81	-14.19	74.00	60.80	35.77	2.72	39.48	Peak	---
6	7208.000	40.40	-13.60	54.00	41.39	35.77	2.72	39.48	Average	---

#### (B) Polarization: Vertical

Freq	Level	Over	Limit	Read	Probe	Cable	Preamp	Remark	Ant	Table
		Limit	Line	Level	Factor	Loss	Factor			Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB	cm	deg
1	2724.000	51.82	-22.18	74.00	60.11	29.25	1.96	39.50	Peak	---
2	2724.000	21.86	-32.14	54.00	30.15	29.25	1.96	39.50	Average	---
3	4808.000	65.12	-8.88	74.00	69.90	32.96	2.40	40.14	Peak	---
4	4808.000	38.53	-15.47	54.00	43.31	32.96	2.40	40.14	Average	---
5	7208.000	63.76	-10.24	74.00	64.75	35.77	2.72	39.48	Peak	---
6	7208.000	42.48	-11.52	54.00	43.47	35.77	2.72	39.48	Average	---

Note:

Emission level (dBuV/m) = 20 log Emission level (uV/m)

Corrected Reading: Probe Factor + Cable Loss + Read Level - Preamp Factor = Level



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### 5.3.6. Test Results for CH 05 / 2438 MHz ( for emission above 1GHz)

- Test Mode: Mode 1
- Temperature: 26°C
- Relative Humidity: 64%
- Duty Cycle of the Equipment During the Test: 100.00%
- Test Engineer: Ted Chou

#### (A) Polarization: Horizontal

Freq	Level	Over Limit		Read Line	Probe Factor	Cable Preamp			Ant Remark	Table Pos	Table Pos
		MHz	dBuV/m	dB	dBuV/m	dB	dB	dB			
1	2724.000	55.29	-18.71	74.00	63.58	29.25	1.96	39.50	Peak	---	---
2	2724.000	26.71	-27.29	54.00	35.00	29.25	1.96	39.50	Average	---	---
3	4880.000	38.53	-15.47	54.00	43.05	33.11	2.51	40.14	Average	---	---
4	4880.000	62.98	-11.02	74.00	67.50	33.11	2.51	40.14	Peak	---	---
5	7322.000	39.04	-14.96	54.00	39.16	36.03	3.30	39.45	Average	---	---
6	7322.000	59.66	-14.34	74.00	59.78	36.03	3.30	39.45	Peak	---	---

#### (B) Polarization: Vertical

Freq	Level	Over Limit		Read Line	Probe Factor	Cable Preamp			Ant Remark	Table Pos	Table Pos
		MHz	dBuV/m	dB	dBuV/m	dB	dB	dB			
1	2336.000	54.02	-19.98	74.00	63.75	28.16	1.72	39.61	Peak	---	---
2	2336.000	25.69	-28.31	54.00	35.42	28.16	1.72	39.61	Average	---	---
3	4876.840	38.38	-15.62	54.00	42.90	33.11	2.51	40.14	Average	---	---
4	4876.840	64.86	-9.14	74.00	69.38	33.11	2.51	40.14	Peak	---	---
5	7316.000	40.73	-13.27	54.00	40.85	36.03	3.30	39.45	Average	---	---
6	7316.000	58.15	-15.85	74.00	58.27	36.03	3.30	39.45	Peak	---	---

Note:

Emission level (dBuV/m) = 20 log Emission level (uV/m)

Corrected Reading: Probe Factor + Cable Loss + Read Level - Preamp Factor = Level



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### 5.3.7. Test Results for CH 08 / 2465 MHz ( for emission above 1GHz)

- Test Mode: Mode 1
- Temperature: 26°C
- Relative Humidity: 64%
- Duty Cycle of the Equipment During the Test: 100.00%
- Test Engineer: Ted Chou

#### (A) Polarization: Horizontal

Freq	Level	Over Limit	Limit	Read Line	Probe Factor	Cable Preamp			Ant Pos	Table Pos
						dB	dBuV/m	dB		
1	2724.000	53.19	-20.81	74.00	63.18	29.25	1.96	41.20	Peak	---
2	4932.000	60.56	-13.44	74.00	67.37	33.21	2.47	42.49	Peak	---
3	4932.000	35.16	-18.84	54.00	41.97	33.21	2.47	42.49	Average	---
4	7400.000	58.38	-15.62	74.00	61.72	36.34	2.84	42.52	Peak	---
5	7400.000	37.39	-16.61	54.00	40.73	36.34	2.84	42.52	Average	---

#### (B) Polarization: Vertical

Freq	Level	Over Limit	Limit	Read Line	Probe Factor	Cable Preamp			Ant Pos	Table Pos
						dB	dBuV/m	dB		
1	2724.000	54.17	-19.83	74.00	64.16	29.25	1.96	41.20	Peak	---
2	2724.000	21.26	-32.74	54.00	31.25	29.25	1.96	41.20	Average	---
3	4932.000	58.91	-15.09	74.00	65.72	33.21	2.47	42.49	Peak	---
4	4932.000	36.89	-17.11	54.00	43.70	33.21	2.47	42.49	Average	---
5	7400.000	38.84	-15.16	54.00	42.18	36.34	2.84	42.52	Average	---
6	7400.000	58.35	-15.65	74.00	61.69	36.34	2.84	42.52	Peak	---

Note:

Emission level (dBuV/m) = 20 log Emission level (uV/m)

Corrected Reading: Probe Factor + Cable Loss + Read Level - Preamp Factor = Level



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### 5.3.8. Test Results for CH 08 / 2465 MHz ( for emission below 1GHz)

- Test Mode: Mode 2
- Temperature: 26°C
- Relative Humidity: 64%
- Duty Cycle of the Equipment During the Test: 100.00%
- Test Engineer: Ted Chou

#### (A) Polarization: Horizontal

Freq	Level	Over Limit	Limit Line	Read Probe			Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
				dB	dBuV/m	dBuV					
MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB	dB	cm	deg	
1	99.700	9.37	-34.13	43.50	26.51	8.98	1.78	27.90	Peak	125	181
2	141.860	10.60	-32.90	43.50	23.88	12.46	2.08	27.82	Peak	---	---
3	175.350	14.39	-29.11	43.50	25.55	14.20	2.39	27.75	Peak	---	---
1	413.600	25.39	-20.61	46.00	33.08	16.69	3.54	27.92	Peak	---	---
2	668.800	26.34	-19.66	46.00	29.82	20.61	4.64	28.73	Peak	---	---
3	788.000	26.61	-19.39	46.00	28.62	21.75	5.03	28.79	Peak	---	---

#### (B) Polarization: Vertical

Freq	Level	Over Limit	Limit Line	Read Probe			Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
				dB	dBuV/m	dBuV					
MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB	dB	cm	deg	
1	62.300	14.67	-25.33	40.00	30.98	10.34	1.32	27.97	Peak	---	---
2	78.790	21.56	-18.44	40.00	38.43	9.54	1.53	27.94	Peak	---	---
3	88.140	15.67	-27.83	43.50	33.31	8.68	1.60	27.92	Peak	---	---
1	288.000	15.29	-30.71	46.00	26.14	13.46	3.04	27.35	Peak	---	---
2	419.200	21.77	-24.23	46.00	29.54	16.64	3.56	27.97	Peak	---	---
3	823.200	25.20	-20.80	46.00	26.89	21.85	5.14	28.68	Peak	---	---

Note:

Emission level (dBuV/m) = 20 log Emission level (uV/m)

Corrected Reading: Probe Factor + Cable Loss + Read Level - Preamp Factor = Level



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### 5.3.9. Test Results for CH 01 / 2402 MHz ( for emission above 1GHz)

- Test Mode: Mode 2
- Temperature: 26°C
- Relative Humidity: 64%
- Duty Cycle of the Equipment During the Test: 100.00%
- Test Engineer: Ted Chou

#### (A) Polarization: Horizontal

Freq	Level	Over	Limit	Read	Probe	Cable	Preamp	Remark	Ant	Table
		MHz	dBuV/m	dB	dBuV/m	dBuV	dB		Pos	Pos
1	2724.000	54.97	-19.03	74.00	63.26	29.25	1.96	39.50 Peak	---	---
2	2724.000	24.58	-29.42	54.00	32.87	29.25	1.96	39.50 Average	---	---
3	4808.000	68.84	-5.16	74.00	73.62	32.96	2.40	40.14 Peak	---	---
4	4808.000	39.38	-14.62	54.00	44.16	32.96	2.40	40.14 Average	---	---
5	7211.380	67.93	-6.07	74.00	68.92	35.77	2.72	39.48 Peak	---	---
6	7211.380	42.65	-11.35	54.00	43.64	35.77	2.72	39.48 Average	---	---

#### (B) Polarization: Vertical

Freq	Level	Over	Limit	Read	Probe	Cable	Preamp	Remark	Ant	Table
		MHz	dBuV/m	dB	dBuV/m	dBuV	dB		Pos	Pos
1	2724.000	51.39	-22.61	74.00	59.68	29.25	1.96	39.50 Peak	---	---
2	4808.000	67.50	-6.50	74.00	72.28	32.96	2.40	40.14 Peak	---	---
3	4808.000	39.18	-14.82	54.00	43.96	32.96	2.40	40.14 Average	---	---
4	7208.000	70.42	-3.58	74.00	71.41	35.77	2.72	39.48 Peak	---	---
5	7208.000	41.97	-12.03	54.00	42.96	35.77	2.72	39.48 Average	---	---

Note:

Emission level (dBuV/m) = 20 log Emission level (uV/m)

Corrected Reading: Probe Factor + Cable Loss + Read Level - Preamp Factor = Level



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### 5.3.10. Test Results for CH 05 / 2438 MHz ( for emission above 1GHz)

- Test Mode: Mode 2
- Temperature: 26°C
- Relative Humidity: 64%
- Duty Cycle of the Equipment During the Test: 100.00%
- Test Engineer: Ted Chou

#### (A) **Polarization: Horizontal**

Freq	Level	Over	Limit	Read	Probe	Cable	Preamp	Remark	Ant	Table	Pos
		Limit	Line	Level	Factor	Loss	Factor				
MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB				
1	2724.000	54.09	-19.91	74.00	62.38	29.25	1.96	39.50 Peak	---	---	---
2	2724.000	30.39	-23.61	54.00	38.68	29.25	1.96	39.50 Average	---	---	---
3	4880.000	58.81	-15.19	74.00	63.33	33.11	2.51	40.14 Peak	---	---	---
4	4880.000	35.35	-18.65	54.00	39.87	33.11	2.51	40.14 Average	---	---	---
5	7322.000	58.51	-15.49	74.00	58.63	36.03	3.30	39.45 Peak	---	---	---
6	7322.000	35.03	-18.97	54.00	35.15	36.03	3.30	39.45 Average	---	---	---

#### (B) **Polarization: Vertical**

Freq	Level	Over	Limit	Read	Probe	Cable	Preamp	Remark	Ant	Table	Pos
		Limit	Line	Level	Factor	Loss	Factor				
MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB				
1	2724.000	47.07	-26.93	74.00	55.36	29.25	1.96	39.50 Peak	---	---	---
2	4880.000	57.03	-16.97	74.00	61.55	33.11	2.51	40.14 Peak	---	---	---
3	4880.000	36.16	-17.84	54.00	40.68	33.11	2.51	40.14 Average	---	---	---
4	7322.000	55.34	-18.66	74.00	55.46	36.03	3.30	39.45 Peak	---	---	---
5	7322.000	32.56	-21.44	54.00	32.68	36.03	3.30	39.45 Average	---	---	---

Note:

Emission level (dBuV/m) = 20 log Emission level (uV/m)

Corrected Reading: Probe Factor + Cable Loss + Read Level - Preamp Factor = Level



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### 5.3.11. Test Results for CH 08 / 2465 MHz ( for emission above 1GHz)

- Test Mode: Mode 2
- Temperature: 26°C
- Relative Humidity: 64%
- Duty Cycle of the Equipment During the Test: 100.00%
- Test Engineer: Ted Chou

#### (A) Polarization: Horizontal

	Freq	Over Level	Limit	Read Line	Probe Level	Cable Factor	Preamp Loss	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB	cm	deg
1	2724.000	56.18	-17.82	74.00	64.47	29.25	1.96	39.50 Peak	---	---
2	2724.000	25.25	-28.75	54.00	33.54	29.25	1.96	39.50 Average	---	---
3	4932.000	72.20	-1.80	74.00	76.67	33.21	2.47	40.15 Peak	---	---
4	4932.000	39.88	-14.12	54.00	44.35	33.21	2.47	40.15 Average	---	---
5	7400.000	68.01	-5.99	74.00	68.25	36.34	2.84	39.42 Peak	---	---
6	7400.000	41.67	-12.33	54.00	41.91	36.34	2.84	39.42 Average	---	---

#### (B) Polarization: Vertical

	Freq	Over Level	Limit	Read Line	Probe Level	Cable Factor	Preamp Loss	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB	cm	deg
1	2724.000	46.89	-27.11	74.00	55.18	29.25	1.96	39.50 Peak	---	---
2	4932.000	67.53	-6.47	74.00	72.00	33.21	2.47	40.15 Peak	---	---
3	4932.000	38.87	-15.13	54.00	43.34	33.21	2.47	40.15 Average	---	---
4	7400.000	64.69	-9.31	74.00	64.93	36.34	2.84	39.42 Peak	---	---
5	7400.000	41.03	-12.97	54.00	41.27	36.34	2.84	39.42 Average	---	---

Note:

Emission level (dBuV/m) = 20 log Emission level (uV/m)

Corrected Reading: Probe Factor + Cable Loss + Read Level - Preamp Factor = Level



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### 5.3.12. Test Results for CH 08 / 2465 MHz ( for emission below 1GHz)

- Test Mode: Mode 3
- Temperature: 26°C
- Relative Humidity: 64%
- Duty Cycle of the Equipment During the Test: 100.00%
- Test Engineer: Ted Chou

#### (A) Polarization: Horizontal

Freq	Level	Over Limit		Read Line	Probe Factor	Cable Preamp		Remark	Ant Pos	Table Pos
		MHz	dBuV/m	dB	dBuV/m	dB	dB			
1	156.820	26.59	-16.91	43.50	39.72	12.38	2.28	27.79 Peak	---	---
2	165.830	28.62	-14.88	43.50	40.83	13.23	2.33	27.77 Peak	---	---
3	182.830	22.38	-21.12	43.50	33.25	14.42	2.44	27.73 Peak	---	---
1	314.400	20.97	-25.03	46.00	30.94	14.24	3.16	27.37 Peak	---	---
2	400.000	24.47	-21.53	46.00	32.00	16.80	3.47	27.80 Peak	---	---
3	675.200	27.03	-18.97	46.00	30.52	20.63	4.60	28.72 Peak	---	---

#### (B) Polarization: Vertical

Freq	Level	Over Limit		Read Line	Probe Factor	Cable Preamp		Remark	Ant Pos	Table Pos
		MHz	dBuV/m	dB	dBuV/m	dB	dB			
1	32.380	14.42	-25.58	40.00	28.99	12.49	0.98	28.04 Peak	---	---
2	67.910	25.82	-14.18	40.00	42.44	9.95	1.39	27.96 Peak	118	177
3	73.180	17.19	-22.81	40.00	33.99	9.71	1.44	27.95 Peak	---	---
1	416.800	22.06	-23.94	46.00	29.80	16.66	3.55	27.95 Peak	---	---
2	656.000	23.47	-22.53	46.00	27.02	20.57	4.62	28.74 Peak	---	---
3	823.200	29.87	-16.13	46.00	31.56	21.85	5.14	28.68 Peak	---	---

Note:

Emission level (dBuV/m) = 20 log Emission level (uV/m)

Corrected Reading: Probe Factor + Cable Loss + Read Level - Preamp Factor = Level



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### 5.3.13. Test Results for CH 01 / 2402 MHz ( for emission above 1GHz)

- Test Mode: Mode 3
- Temperature: 26°C
- Relative Humidity: 64%
- Duty Cycle of the Equipment During the Test: 100.00%
- Test Engineer: Ted Chou

#### (A) Polarization: Horizontal

Freq	Level	Over Limit		Read Line	Probe Factor	Cable Preamp		Remark	Ant Pos	Table Pos
		MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB	deg
1	2724.000	53.93	-20.07	74.00	62.22	29.25	1.96	39.50	Peak	---
2	4808.000	65.33	-8.67	74.00	70.11	32.96	2.40	40.14	Peak	---
3	4808.000	39.07	-14.93	54.00	43.85	32.96	2.40	40.14	Average	---
4	7208.000	67.67	-6.33	74.00	68.66	35.77	2.72	39.48	Peak	---
5	7208.000	41.56	-12.44	54.00	42.55	35.77	2.72	39.48	Average	---

#### (B) Polarization: Vertical

Freq	Level	Over Limit		Read Line	Probe Factor	Cable Preamp		Remark	Ant Pos	Table Pos
		MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB	deg
1	2724.000	50.85	-23.15	74.00	59.14	29.25	1.96	39.50	Peak	---
2	4808.000	66.15	-7.85	74.00	70.93	32.96	2.40	40.14	Peak	---
3	4808.000	39.06	-14.94	54.00	43.84	32.96	2.40	40.14	Average	---
4	7211.500	62.22	-11.78	74.00	63.21	35.77	2.72	39.48	Peak	---
5	7211.500	43.18	-10.82	54.00	44.17	35.77	2.72	39.48	Average	---

Note:

Emission level (dBuV/m) = 20 log Emission level (uV/m)

Corrected Reading: Probe Factor + Cable Loss + Read Level - Preamp Factor = Level



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### 5.3.14. Test Results for CH 05 / 2438 MHz ( for emission above 1GHz)

- Test Mode: Mode 3
- Temperature: 26°C
- Relative Humidity: 64%
- Duty Cycle of the Equipment During the Test: 100.00%
- Test Engineer: Ted Chou

#### (A) Polarization: Horizontal

Freq	Level	Over	Limit	Read	Probe	Cable	Preamp	Remark	Ant	Table
		Limit	Line	Level	Factor	Loss	Factor		Pos	Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB	cm	deg
1	2724.000	54.58	-19.42	74.00	62.87	29.25	1.96	39.50 Peak	---	---
2	2724.000	26.90	-27.10	54.00	35.19	29.25	1.96	39.50 Average	---	---
3	4880.000	62.55	-11.45	74.00	67.07	33.11	2.51	40.14 Peak	---	---
4	4880.000	40.46	-13.54	54.00	44.98	33.11	2.51	40.14 Average	---	---
5	7322.000	54.36	-19.64	74.00	54.48	36.03	3.30	39.45 Peak	---	---
6	7322.000	31.16	-22.84	54.00	31.28	36.03	3.30	39.45 Average	---	---

#### (B) Polarization: Vertical

Freq	Level	Over	Limit	Read	Probe	Cable	Preamp	Remark	Ant	Table
		Limit	Line	Level	Factor	Loss	Factor		Pos	Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB	cm	deg
1	2724.000	52.82	-21.18	74.00	61.11	29.25	1.96	39.50 Peak	---	---
2	4880.000	69.91	-4.09	74.00	74.43	33.11	2.51	40.14 Peak	---	---
3	4880.000	38.67	-15.33	54.00	43.19	33.11	2.51	40.14 Average	---	---
4	7316.000	66.02	-7.98	74.00	66.14	36.03	3.30	39.45 Peak	---	---
5	7316.000	42.96	-11.04	54.00	43.08	36.03	3.30	39.45 Average	---	---

Note:

Emission level (dBuV/m) = 20 log Emission level (uV/m)

Corrected Reading: Probe Factor + Cable Loss + Read Level - Preamp Factor = Level



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### 5.3.15. Test Results for CH 08 / 2465 MHz ( for emission above 1GHz)

- Test Mode: Mode 3
- Temperature: 26°C
- Relative Humidity: 64%
- Duty Cycle of the Equipment During the Test: 100.00%
- Test Engineer: Ted Chou

#### (A) Polarization: Horizontal

	Freq	Over Level	Limit	Read Line	Probe Level	Cable Factor	Preamp Loss	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB	cm	deg
1	2724.000	52.51	-21.49	74.00	60.80	29.25	1.96	39.50 Peak	---	---
2	4932.000	37.26	-16.74	54.00	41.73	33.21	2.47	40.15 Average	---	---
3	4932.000	60.95	-13.05	74.00	65.42	33.21	2.47	40.15 Peak	---	---
4	7400.000	60.24	-13.76	74.00	60.48	36.34	2.84	39.42 Peak	---	---
5	7400.000	38.50	-15.50	54.00	38.74	36.34	2.84	39.42 Average	---	---

#### (B) Polarization: Vertical

	Freq	Over Level	Limit	Read Line	Probe Level	Cable Factor	Preamp Loss	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB	dB	dB	cm	deg
1	2724.000	56.48	-17.52	74.00	64.77	29.25	1.96	39.50 Peak	---	---
2	2724.000	26.70	-27.30	54.00	34.99	29.25	1.96	39.50 Average	---	---
3	4935.000	39.42	-14.58	54.00	43.89	33.21	2.47	40.15 Average	---	---
4	4935.000	67.76	-6.24	74.00	72.23	33.21	2.47	40.15 Peak	---	---
5	7400.000	40.48	-13.52	54.00	40.72	36.34	2.84	39.42 Average	---	---
6	7400.000	62.38	-11.62	74.00	62.62	36.34	2.84	39.42 Peak	---	---

Note:

Emission level (dBuV/m) = 20 log Emission level (uV/m)

Corrected Reading: Probe Factor + Cable Loss + Read Level - Preamp Factor = Level



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#### 5.3.16. Photographs of Radiated Emission Test Configuration

FRONT VIEW



REAR VIEW





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#### **5.4. Antenna Requirements**

##### **5.4.1. Standard Applicable**

47 CFR Part15 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.

##### **5.4.2. Antenna Connected Construction**

There is no antenna connector for printed antenna.



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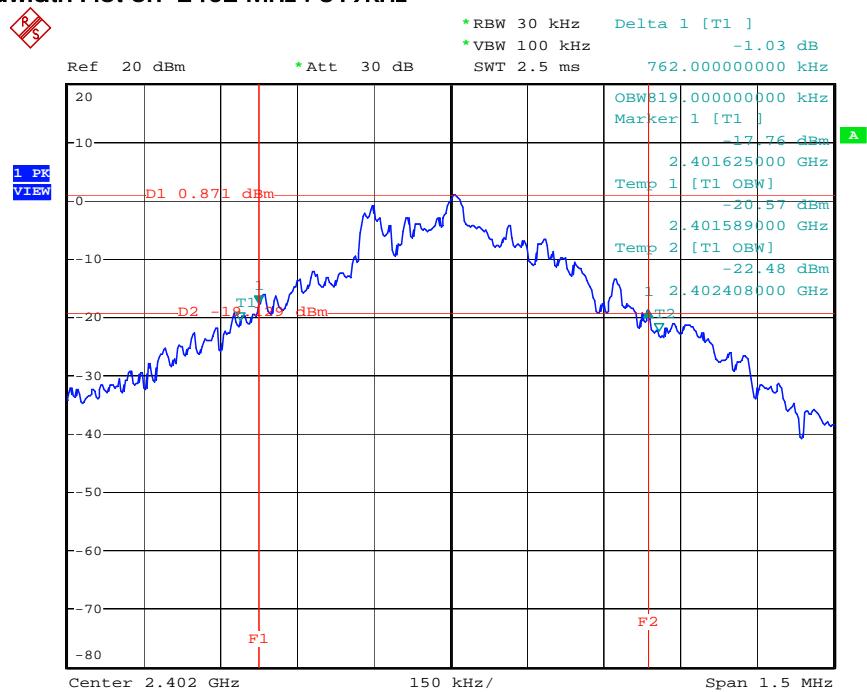
## 6. List of Measuring Equipments Used

Items	Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
1	EMC Receiver	R&S	ESCS 30	100174	9 KHz – 2.75 GHz	Feb. 16, 2004	Conduction (CO04-HY)
2	LISN	MessTec	NNB-2/16Z	2001/004	9 KHz – 30 MHz	Jun. 09, 2004	Conduction (CO04-HY)
3	LISN (Support Unit)	MessTec	NNB-2/16Z	99041	9 KHz – 30 MHz	Apr. 27, 2004	Conduction (CO04-HY)
4	EMI Filter	LINDGREN	LRE-2030	2651	< 450 Hz	N/A	Conduction (CO04-HY)
5	RF Cable-CON	UTIFLEX	3102-26886-4	CB044	9KHz~30MHz	Apr. 21, 2004	Conduction (CO04-HY)
6	3m Semi Anechoic Chamber	SIDT FRANKONIA	SAC-3M	03CH03-HY	30MHz~1GHz 3m	Jun. 21, 2004	Radiation (03CH03-HY)
7	Spectrum analyzer	R&S	FSP40	100004	9KHZ~40GHz	Aug. 31, 2004	Radiation (03CH03-HY)
8	Amplifier	HP	8447D	2944A09072	100KHz – 1.3GHz	Nov. 04, 2004	Radiation (03CH03-HY)
9	Biconical Antenna	SCHWARZBECK	VHBB 9124	301	30MHz –200MHz	Jul. 28, 2004	Radiation (03CH03-HY)
10	Log Antenna	SCHWARZBECK	VUSLP 9111	221	200MHz -1GHz	Jul. 28, 2004	Radiation (03CH03-HY)
11	RF Cable-R03m	Jye Bao	RG142	CB021	30MHz~1GHz	Dec. 02, 2004	Radiation (03CH03-HY)
12	Amplifier	MITEQ	AFS44	849984	100MHz~26.5GHz	Mar. 26, 2004	Radiation (03CH03-HY)
13	Horn Antenna	EMCO	3115	6741	1GHz – 18GHz	Apr. 07, 2004	Radiation (03CH03-HY)
14	Turn Table	HD	DS 420	420/650/00	0 ~ 360 degree	N/A	Radiation (03CH03-HY)
15	Antenna Mast	HD	MA 240	240/560/00	1 m - 4 m	N/A	Radiation (03CH03-HY)
16	Horn Antenna	Schwarzbeck	BBHA9170	154	18GHz~40GHz	Jun. 09, 2004	Radiation (03CH03-HY)
17	RF Cable-HIGH	Jye Bao	RG142	CB030-HIGH	1GHz~29.5GHz	Dec. 04, 2004	Radiation (03CH03-HY)

Calibration Interval of instruments listed above is one year.

## Appendix B

Occupied Bandwidth Plot on 2402 MHz : 819KHz



### Low Band Edge Plot on 2402 MHz

