



FCC 47 CFR PART 15 SUBPART C

TEST REPORT

For

Icon7 S300 Wireless Laser Mouse

Model: MS04

Trade Name: iCON7

Issued to

PRIMAX Electronics Ltd

No.669, Ruey Kuang Road, Neihsu 114, Taipei, Taiwan. R.O.C.

Issued by

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1. TEST RESULT CERTIFICATION

Applicant: PRIMAX Electronics Ltd
No.669, Ruey Kuang Road, Neihu 114, Taipei, Taiwan. R.O.C.

Equipment Under Test: Icon7 S300 Wireless Laser Mouse

Trade Name: iCON7

Model: MS04

Date of Test: September 22-25, 2008

| APPLICABLE STANDARDS | |
|------------------------------|-------------------------|
| STANDARD | TEST RESULT |
| FCC 47 CFR Part 15 Subpart C | No non-compliance noted |

We hereby certify that:

The above equipment was tested by Compliance Certification Services (Shenzhen) Inc.. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.4:2003 and the energy emitted by the sample tested as described in this report is in compliance with the requirements of FCC Rules Part 15.227.

The test results of this report relate only to the tested sample identified in this report.

Approved by:

Clinton Kao
Manager
Compliance Certification Service Inc.

Reviewed by:

Vincent Yao
Assistant manager
Compliance Certification Service Inc.



2. EUT DESCRIPTION

| | |
|-----------------------------|-----------------------------------|
| Product | Icon7 S300 Wireless Laser Mouse |
| Trade Name | iCON7 |
| Model Number | MS04 |
| Model Difference | N/A |
| Power Supply | TX: DC1.5V powered by the battery |
| Frequency Range | 27.045 MHz |
| Modulation Technique | FSK |

Remark: This submittal(s) (test report) is intended for FCC ID: EMJMMS04 filing to comply with Section 15.227 of the FCC Part 15, Subpart C Rules.



3. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.4:2003 and FCC CFR 47 2.1046, 2.1047, 2.1049, 2.1051, 2.1053, 2.1055, 2.1057, and 15.227.

3.1 EUT CONFIGURATION

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner that intends to maximize its emission characteristics in a continuous normal application.

3.2 EUT EXERCISE

The EUT was operated in the engineering mode to fix the TX frequency that was for the purpose of the measurements.

3.3 GENERAL TEST PROCEDURES

Conducted Emissions

The EUT is placed on the turntable, which is 0.8 m above ground plane. According to the requirements in Section 13.1.4.1 of ANSI C63.4. Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-peak and average detector modes.

Radiated Emissions

The EUT is placed on a turn table, which is 0.8 m above ground plane. The turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna, which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the maximum emissions, exploratory radiated emission measurements were made according to the requirements in Section 13.1.4.1 of ANSI C63.4.

3.4 FCC PART 15.205 RESTRICTED BANDS OF OPERATIONS

- (a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

| MHz | MHz | MHz | GHz |
|----------------------------|---------------------|-----------------|------------------|
| 0.090 - 0.110 | 16.42 - 16.423 | 399.9 - 410 | 4.5 - 5.15 |
| ¹ 0.495 - 0.505 | 16.69475 - 16.69525 | 608 - 614 | 5.35 - 5.46 |
| 2.1735 - 2.1905 | 16.80425 - 16.80475 | 960 - 1240 | 7.25 - 7.75 |
| 4.125 - 4.128 | 25.5 - 25.67 | 1300 - 1427 | 8.025 - 8.5 |
| 4.17725 - 4.17775 | 37.5 - 38.25 | 1435 - 1626.5 | 9.0 - 9.2 |
| 4.20725 - 4.20775 | 73 - 74.6 | 1645.5 - 1646.5 | 9.3 - 9.5 |
| 6.215 - 6.218 | 74.8 - 75.2 | 1660 - 1710 | 10.6 - 12.7 |
| 6.26775 - 6.26825 | 108 - 121.94 | 1718.8 - 1722.2 | 13.25 - 13.4 |
| 6.31175 - 6.31225 | 123 - 138 | 2200 - 2300 | 14.47 - 14.5 |
| 8.291 - 8.294 | 149.9 - 150.05 | 2310 - 2390 | 15.35 - 16.2 |
| 8.362 - 8.366 | 156.52475 - | 2483.5 - 2500 | 17.7 - 21.4 |
| 8.37625 - 8.38675 | 156.52525 | 2655 - 2900 | 22.01 - 23.12 |
| 8.41425 - 8.41475 | 156.7 - 156.9 | 3260 - 3267 | 23.6 - 24.0 |
| 12.29 - 12.293 | 162.0125 - 167.17 | 3332 - 3339 | 31.2 - 31.8 |
| 12.51975 - 12.52025 | 167.72 - 173.2 | 3345.8 - 3358 | 36.43 - 36.5 |
| 12.57675 - 12.57725 | 240 - 285 | 3600 - 4400 | (²) |
| 13.36 - 13.41 | 322 - 335.4 | | |

¹ Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

² Above 38.6

- (b) Except as provided in paragraphs (d) and (e), the field strength of emissions appearing within these frequency bands shall not exceed the limits shown in Section 15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in Section 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.

3.5 DESCRIPTION OF TEST MODES

The EUT has been tested under engineering test mode condition and the EUT staying in continuous transmitting mode.



4. INSTRUMENT CALIBRATION

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipment, which is traceable to recognized national standards.



5. FACILITIES AND ACCREDITATIONS

5.1 FACILITIES

All measurement facilities used to collect the measurement data are located at

No. 5, Jinao industrial park, No.35 Jukeng Road, Dashuikeng Village, Guanlan Town, Baoan District, Shenzhen, China

The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 and CISPR Publication 22.

5.2 EQUIPMENT

Radiated emissions are measured with one or more of the following types of linearly polarized antennas: tuned dipole, biconical, log periodic, loop antenna, bi-log, and/or ridged waveguide, horn. Spectrum analyzers with preselectors and quasi-peak detectors are used to perform radiated measurements.

Conducted emissions are measured with Line Impedance Stabilization Networks and EMI Test Receivers.

Calibrated wideband preamplifiers, coaxial cables, and coaxial attenuators are also used for making measurements.

All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."

5.3 LABORATORY ACCREDITATIONS AND LISTING

Our laboratories are accredited and approved by the following accreditation body according to ISO/IEC 17025.

| | |
|---------------|------------|
| Taiwan | TAF |
|---------------|------------|

The measuring facility of laboratories has been authorized or registered by the following approval agencies.

| | |
|---------------|------------------------|
| USA | FCC |
| Japan | VCCI |
| Canada | INDUSTRY CANADA |
| Taiwan | BSMI |

Copies of granted accreditation certificates are available for downloading from our web site, <http://www.ccsemc.com.tw>



6. SETUP OF EQUIPMENT UNDER TEST

6.1 SETUP CONFIGURATION OF EUT

See test photographs attached in Appendix 1 for the actual connections between EUT and support equipment.

6.2 SUPPORT EQUIPMENT

| Device Type | Brand | Model | FCC ID | Series No. | Data Cable | Power Cord |
|-------------|-------|-------|--------|------------|------------|------------|
| N/A | | | | | | |

Remark:

- 1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.*
- 2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.*



7. FCC PART 15.227 REQUIREMENTS

7.1 26 DB BANDWIDTH

LIMIT

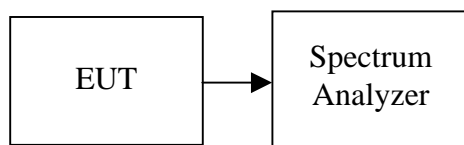
N/A

MEASUREMENT EQUIPMENT USED

| Name of Equipment | Manufacturer | Model | Serial Number | Calibration Due |
|-------------------|--------------|--------|---------------|-----------------|
| Spectrum Analyzer | Agilent | E4446A | US44300399 | 02/24/2009 |
| Spectrum Analyzer | R&S | FSP30 | 1093.4495.30 | 07/22/2009 |

Remark: Each piece of equipment is scheduled for calibration once a year.

Test Configuration



TEST PROCEDURE

1. Place the EUT on the table and set it in the transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
3. Set the spectrum analyzer as RBW=10kHz, VBW = RBW, Span = 500KHz, Sweep = auto.
4. Mark the peak frequency and 26dB (upper and lower) frequency.
5. Repeat until all the rest channels are investigated.

TEST RESULTS

No non-compliance noted



Test Plot

Agilent 10:06:17 Sep 24, 2008

R T

▲ Mkr1 32.4 kHz
0.69 dB

Ref 80 dBμV

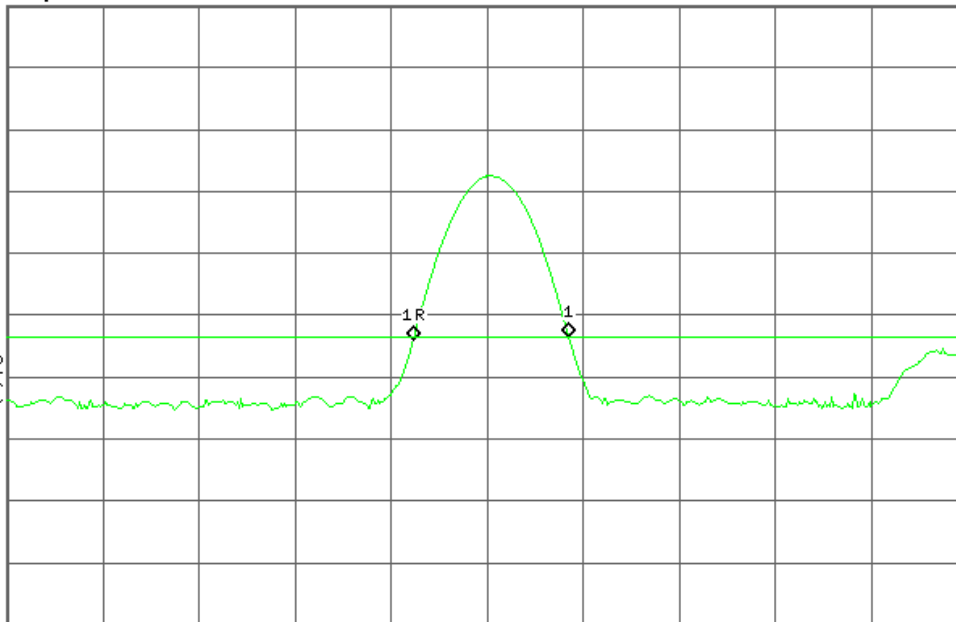
#Atten 0 dB

#Peak
Log
10
dB/

DI
26.5
dBμV
LgAv

M1 S2
S3 FC

£(f):
f>50k
Swp



Center 27.0471 MHz

Span 200 kHz

#Res BW 10 kHz

VBW 10 kHz

Sweep 2.44 ms (601 pts)



7.2 RADIATED EMISSIONS

LIMIT

The field strength of any emission within this band shall not exceed 10,000 microvolts/meter at 3 meters. The emission limit in this paragraph is based on measurement instrumentation employing an average detector. The provisions in Section 15.35 for limiting peak emissions apply.

The field strength of any emissions which appear outside of this band shall not exceed the general radiated emission limits in Section 15.209.

1. Except as provided elsewhere in this Subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

| Frequency (MHz) | Field Strength (mV/m) | Measurement Distance (m) |
|-----------------|-----------------------|--------------------------|
| 30-88 | 100* | 3 |
| 88-216 | 150* | 3 |
| 216-960 | 200* | 3 |
| Above 960 | 500 | 3 |

Remark: Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g., Sections 15.231 and 15.241.

2. In the above emission table, the tighter limit applies at the band edges.

| Frequency (Hz) | Field Strength ($\mu\text{V/m}$ at 3-meter) | Field Strength (dB $\mu\text{V/m}$ at 3-meter) |
|----------------|--|--|
| 30-88 | 100 | 40 |
| 88-216 | 150 | 43.5 |
| 216-960 | 200 | 46 |
| Above 960 | 500 | 54 |

3. Except as provided elsewhere in this Subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

| Frequency (Hz) | Field Strength ($\mu\text{V/m}$ at meter) | Measurement Distance (meter) |
|----------------|--|------------------------------|
| 0.009 – 0.490 | 2400 / F (kHz) | 300 |
| 0.490 – 1.705 | 24000 / F (kHz) | 30 |
| 1.705 – 30.0 | 30 | 30 |
| 30 - 88 | 100** | 3 |
| 88-216 | 150** | 3 |
| 216-960 | 200** | 3 |
| Above 960 | 500 | 3 |

** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g., Sections 15.231 and 15.241.

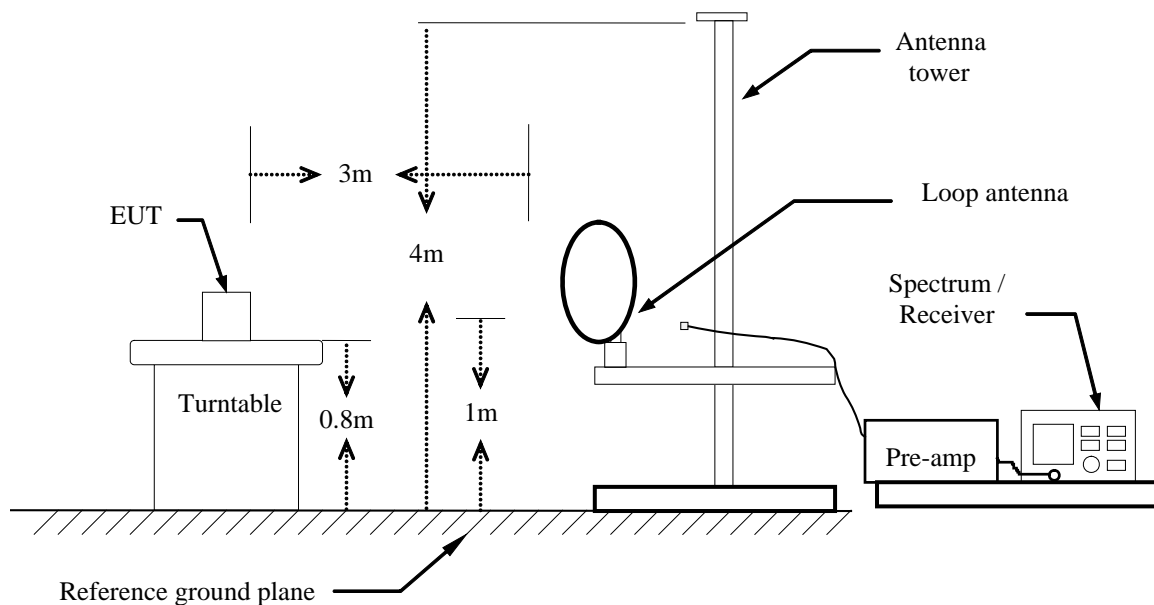
MEASUREMENT EQUIPMENT USED

| 966 RF CHAMBER 2 | | | | |
|-----------------------|--------------|------------|------------------------------|-----------------|
| Name of Equipment | Manufacturer | Model | Serial Number | Calibration Due |
| PSA Spectrum Analyzer | Agilent | E4446A | US44300399 | 02/24/2009 |
| EMI Test Receiver | R&S | ESCI | 1166.5950 03 | 01/13/2009 |
| Pre-Amplifier | MITEQ | N/A | AFS42-00102650-4 2-10P-42 | 02/14/2009 |
| Bilog Antenna | SCHWAZBECK | CBL6143 | 5082 | 06/09/2009 |
| Turn Table | EMCO | 2081-1.21 | N/A | N.C.R |
| Antenna Tower | CT | N/A | N/A | N.C.R |
| Controller | CT | N/A | N/A | N.C.R |
| RF Comm. Test set | HP | 8920B | US36142090 | N.C.R |
| Site NSA | C&C | N/A | N/A | 06/09/2009 |
| Horn Antenna | TRC | N/A | N/A | 03/04/2009 |
| Loop Antenna | ARA | PLA-1030/B | 1029 | 02/24/2009 |

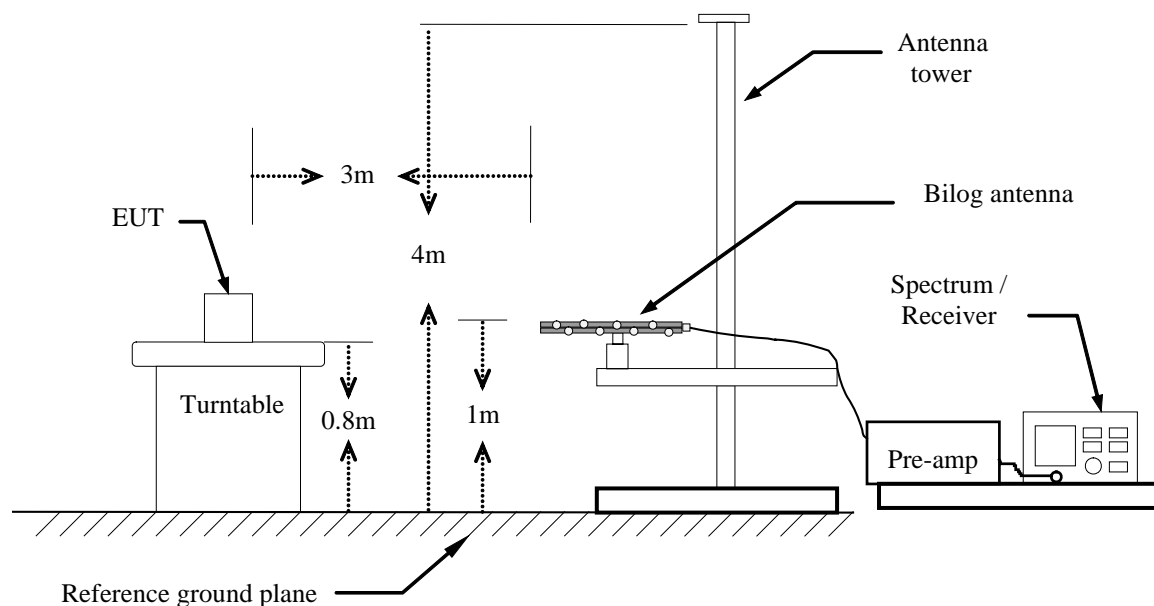
Remark: Each piece of equipment is scheduled for calibration once a year.

Test Configuration

Below 30MHz



Below 1 GHz



TEST PROCEDURE

1. The EUT is placed on a turntable, which is 0.8m above ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Repeat above procedures until the measurements for all frequencies are complete.

TEST RESULTS

Below 1 GHz

| | | | |
|------------------------|---------|-------------------|--------------------|
| Operation Mode: | TX | Test Date: | September 25, 2008 |
| Temperature: | 25°C | Tested by: | Breeze |
| Humidity: | 55 % RH | Polarity: | Ver. / Hor. |

| Freq. (MHz) | Ant.Pol. H/V | Detector Mode (PK/QP/AVG) | Reading (dBuV) | Factor (dB) | Actual FS (dBuV/m) | Limit 3m (dBuV/m) | Safe Margin (dB) |
|----------------|-----------------|---------------------------------|-------------------|----------------|-----------------------|----------------------|---------------------|
| 27.045 | V | Peak | 48.79 | 5.15 | 53.94 | 80.00 | -26.06 |
| 53.807 | V | Peak | 39.78 | -19.36 | 20.42 | 40.00 | -19.58 |
| 63.006 | V | Peak | 44.39 | -19.81 | 24.58 | 40.00 | -15.42 |
| 94.929 | V | Peak | 48.40 | -20.30 | 28.10 | 43.50 | -15.40 |
| 118.196 | V | Peak | 52.07 | -19.64 | 32.43 | 43.50 | -11.07 |
| 308.416 | V | Peak | 42.48 | -14.12 | 28.36 | 46.00 | -17.64 |
| 350.501 | V | Peak | 33.66 | -13.32 | 20.34 | 46.00 | -25.66 |
| 27.045 | H | Peak | 51.23 | 5.15 | 56.38 | 80.00 | -23.62 |
| 53.807 | H | Peak | 40.53 | -19.36 | 21.17 | 40.00 | -18.83 |
| 93.847 | H | Peak | 45.82 | -20.32 | 25.50 | 43.50 | -18.00 |
| 99.799 | H | Peak | 36.31 | -20.35 | 15.96 | 43.50 | -27.54 |
| 109.539 | H | Peak | 39.29 | -19.98 | 19.31 | 43.50 | -24.19 |
| 118.196 | H | Peak | 52.53 | -19.64 | 32.89 | 43.50 | -10.61 |
| 189.078 | H | Peak | 35.82 | -17.97 | 17.85 | 43.50 | -25.65 |

Remark:

1. *Measuring frequencies from 30 MHz to the 1GHz.*
2. *Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak detector mode.*
3. *Data of measurement within this frequency range shown “ --- ” in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.*
4. *The IF bandwidth of SPA between 30MHz to 1GHz was 100kHz.*



7.3 POWERLINE CONDUCTED EMISSIONS

LIMIT

For an intentional radiator which is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed 250 microvolts (The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz). The limits at specific frequency range is listed as follows:

| Frequency Range (MHz) | Limits (dB μ V) | |
|-----------------------|---------------------|----------|
| | Quasi-peak | Average |
| 0.15 to 0.50 | 66 to 56 | 56 to 46 |
| 0.50 to 5 | 56 | 46 |
| 5 to 30 | 60 | 50 |

Compliance with this provision shall be based on the measurement of the radio frequency voltage between each power line (LINE and NEUTRAL) and ground at the power terminals.

MEASUREMENT EQUIPMENT USED

| Conducted Emission Test Site G | | | | |
|--------------------------------|---------------|--------|---------------|-----------------|
| Name of Equipment | Manufacturer | Model | Serial Number | Calibration Due |
| EMI TEST RECEIVER | ROHDE&SCHWARZ | ESCI | 100088 | 02/24/2009 |
| LISN | EMCO | 3825/2 | 1371 | 02/24/2009 |
| LISN | EMCO | 3825/2 | 8901-1459 | 02/24/2009 |

Remark: Each piece of equipment is scheduled for calibration once a year.

Test Procedure

1. The EUT was placed on a table, which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. Repeat above procedures until all frequency measured were complete.

TEST RESULTS

Not applicable.

(Since the EUT is battery-powered)