



MOBILE DEVICES BUSINESS

**PRODUCT SAFETY AND COMPLIANCE
EMC LABORATORY**

EMC TEST REPORT

Test Report Number – 24934-1JBP

Report Date – May 15, 2012

The test results contained herein relate only to the model(s) identified. It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical characteristics.

As the responsible EMC Engineer, I hereby declare that the equipment tested as specified in this report conforms to the requirements indicated.

Signature: 

Name: Albert J. Patapack

Title: EMC Engineer

Date: May 15, 2012

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UKAS Certificate Number: 2404

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Test Report Details

Tests Performed By: ADR Testing Service
Location Code: ADR LV
Motorola Mobility Inc
Product Safety and Compliance Group
600 North US Hwy 45
Libertyville, IL 60048
PH (847) 523-6167 Fax (847) 523-4538
FCC Registration Number: 316588
Industry Canada Number: 1090-1

Tests Requested By: Motorola Mobility Inc.
600 North US Hwy 45
Libertyville, IL 60048

Product Type: Cellular Phone

Signaling Capability: GSM 850/1900, WCDMA 850/1700/1900
HSDPA, HSUPA, EDGE, GPRS, 802.11a/b/g/n,
LTE Band 4/17, Bluetooth LE + EDR

FCC ID: IHDP56MB4

Serial Numbers: LDNB270027

Testing Complete Date: March 8, 2012

Applicable Standards

All tests and measurements indicated in this document were performed in accordance with the Code of Federal Regulations Title 47:

 X Part 15 Subpart B – Unintentional Radiators

Applicable Standards: ANSI 63.4 2003, RSS-210 Issue 8

Summary of Testing

| Test # | Test Name | Pass/Fail |
|--------|---|-----------|
| 1 | Field Strength of Spurious Emissions from Unintentional Radiators | Pass |
| 2 | AC Line Conducted Emissions | Pass |

| Test # | Test Name | Margin with respect to the Limit |
|--------|---|----------------------------------|
| 1 | Field Strength of Spurious Emissions from Unintentional Radiators | see results |
| 2 | AC Line Conducted Emissions | see results |

The margin with respect to the limit is the minimum margin for all modes and bands.

General and Special Conditions

This product utilizes an internal battery that is not removable. When applicable, EMC testing was performed with the internal battery fully charged.

All testing was done in an indoor controlled environment. The temperature and the relative humidity were maintained within the ANSI C63.4 2003 Standard requirements during the entire duration of testing.

Equipment and Cable Configurations

The EUT was tested in a configuration as specified by ANSI C63.4 2003 Standard requirements.

Equipment List

| Manufacturer | Equipment Type | Model No. | Serial Number | Calibration Due Date |
|-----------------|------------------------|-------------|---------------|----------------------|
| Rohde & Schwarz | Receiver | ESIB40 | 100226 | 3/30/2012 |
| A. H. Systems | DRG Horn Antenna | SAS 200/571 | 365 | 8/24/2012 |
| ETS | Log-Periodic Antenna | 3148 | 1188 | 12/12/2012 |
| ETS | Biconical Antenna | 3110B | 3369 | 12/14/2012 |
| Agilent | Microwave Preamplifier | 8449B | 3008A01442 | 9/22/2012 |
| Attenuator | Weinschel | AS-6 | 6675 | NCR |
| Attenuator | Weinschel | AS-6 | 6677 | NCR |
| ETS | LISN | 3810/2NM | 00023630 | 9/02/2012 |
| ETS | LISN | 3810/2NM | 2179 | 9/02/2012 |
| ETS | Loop Antenna | 6507 | 00049471 | 12/13/2012 |
| Rohde & Schwarz | Receiver | ESU40 | 100286 | 7/13/2012 |
| Hewlett Packard | Laptop Computer | 8440P | CND04111C8 | NA |
| Hewlett Packard | Monitor | HP2311X | CNT101X68Q | NA |
| Dell | Mouse | M-UVDEL1 | HCJ43516737 | NA |

Note that the microwave preamplifier is on a two-year calibration cycle. All other equipment is on a one-year calibration cycle. All testing was performed using equipment that was within calibration at the time that the test was performed. No equipment listed in the table above was used after the specified calibration due date. If, during the course of product testing, a piece of equipment went out of calibration and that piece of equipment was needed to complete product testing, a similar piece of calibrated equipment was substituted. If a substitution was made, that new piece of equipment would be listed in the above table along with the piece that was removed from service.

The HP 8440P Laptop Computer, HP Monitor and the Dell Mouse are labeled as DoC.

Measurement Procedures and Data

FIELD STRENGTH OF EMISSIONS FROM UNINTENTIONAL RADIATORS

Measurement Procedure

The equipment under test is placed inside the semi-anechoic chamber on a wooden table on the turntable center. Initially, for all radiated emissions, the antenna mast is varied from 1 to 4 meters and the turntable is rotated 360 degrees to obtain a maximum reading on the spectrum analyzer using the peak detector function. Below 1000MHz, the final radiated emissions are then measured using an EMI receiver employing a CISPR quasi-peak detector. The receiver used has an average detector function and an RMS detector function. The average detector function is used for final radiated emissions measurements above 1000MHz. Above 1000MHz, the EMI receiver VBW and RBW are both set to 1MHz. This is repeated for both horizontal and vertical polarizations of the receive antenna.

The field strength of each radiated emission is calculated by correcting the EMI receiver level for cable loss, amplifier gain and antenna correction factors.

$$\text{Field Strength (dBuV/m)} = \text{EMI Receiver Level (dBuV)} + \text{Cable Loss (dB)} - \text{Amplifier Gain (dB)} + \text{Antenna Correction Factor (1/m)}$$

Test Setup

The EUT and the host equipment were setup according to the procedures in ANSI C63.4-2003. The test is performed with the EUT connected to a laptop computer using a USB data cable. The USB data cable is 1 m in length. Two additional peripherals, a USB mouse and a VGA monitor, are also connected to the laptop computer through the appropriate port. The EUT was communicating with the laptop computer continuously.

Additional EUT information:

Processor Speed – Up to 1.5GHz

Xtal – 27MHz, 19.2MHz

TCXO – 48MHz

Memory Size – 1GB LPDDR2 SDRAM, 8GB eMMC

Video Resolution – 1280x720 (HD)

Video Clock – 230MHz

Refresh rate – 60Hz

Testing was conducted up to and including 8GHz.

Measurement Results

Radiated emissions were measured from 9 kHz to 30 MHz and all emissions were 20 dB below the limit.

Operating Mode – Rx Mode, Data Transfer Mode.

Notes: Worst Case emissions reported.

30 MHz – 1000 MHz

| Frequency MHz | Level dBµV/m | Measured dBµV | Transd dB | Cables dB | Limit dBµV/m | Margin dB | Height cm | Angle deg | Pol. |
|---------------|--------------|---------------|-----------|-----------|--------------|-----------|-----------|-----------|------|
| 33.28 | 34.93 | 15.18 | 12.7 | 7.0 | 40 | 5.1 | 100 | 110 | VERT |
| 37.56 | 33.48 | 14.61 | 11.8 | 7.1 | 40 | 6.5 | 101 | 126 | VERT |
| 62.08 | 27.25 | 10.38 | 9.5 | 7.4 | 40 | 12.7 | 150 | 14 | VERT |
| 114.56 | 31.18 | 12.14 | 11.1 | 7.9 | 43.5 | 12.3 | 123 | 19 | VERT |
| 141.00 | 31.21 | 11.34 | 11.8 | 8.1 | 43.5 | 12.3 | 101 | 38 | VERT |
| 214.48 | 31.52 | 12.42 | 10.6 | 8.5 | 43.5 | 12.0 | 99 | 146 | HORI |
| 232.32 | 35.16 | 14.86 | 11.7 | 8.6 | 46 | 10.8 | 150 | 146 | HORI |
| 281.36 | 24.06 | 2.00 | 13.2 | 8.9 | 46 | 21.9 | 211 | 184 | VERT |
| 285.12 | 24.08 | 2.07 | 13.1 | 8.9 | 46 | 21.9 | 218 | 187 | VERT |
| 351.60 | 35.90 | 11.8 | 14.8 | 9.3 | 46 | 10.1 | 102 | 7 | HORI |
| 357.16 | 36.95 | 13.06 | 14.6 | 9.3 | 46 | 9.0 | 98 | 11 | HORI |
| 427.84 | 23.16 | -2.58 | 16.0 | 9.7 | 46 | 22.8 | 213 | 359 | VERT |
| 951.48 | 34.01 | -1.43 | 23.9 | 11.6 | 46 | 12.0 | 145 | 297 | VERT |

Average Measurements Above 1 GHz

| Frequency MHz | Level dBμV/m | Measured dBμV | Transd dB | Gain dB | Limit dBμV/m | Margin dB | Height cm | Angle deg | Pol. |
|---------------|--------------|---------------|-----------|---------|--------------|-----------|-----------|-----------|------|
| 1261.1 | 32.23 | 34.29 | 24.5 | 26.5 | 54 | 21.8 | 211 | 179 | VERT |
| 1293.6 | 32.42 | 34.19 | 24.7 | 26.4 | 54 | 21.6 | 160 | 119 | HORI |
| 1633.0 | 33.92 | 34.06 | 25.5 | 25.6 | 54 | 20.1 | 100 | 148 | HORI |
| 1636.0 | 33.82 | 33.95 | 25.5 | 25.6 | 54 | 20.2 | 100 | 154 | HORI |
| 1645.1 | 33.66 | 33.73 | 25.5 | 25.6 | 54 | 20.3 | 101 | 146 | HORI |
| 1645.3 | 33.09 | 33.16 | 25.5 | 25.6 | 54 | 20.9 | 110 | 151 | HORI |
| 2400.1 | 49.04 | 44.00 | 29.1 | 24.0 | 54 | 5.0 | 100 | 174 | VERT |
| 3022.1 | 38.18 | 30.99 | 30.6 | 23.4 | 54 | 15.8 | 257 | 360 | HORI |
| 3182.4 | 39.62 | 30.94 | 31.8 | 23.1 | 54 | 14.4 | 314 | 42 | VERT |
| 3247.8 | 39.66 | 30.88 | 31.8 | 23.0 | 54 | 14.3 | 331 | 0 | VERT |
| 3317.7 | 38.89 | 30.45 | 31.3 | 22.9 | 54 | 15.1 | 139 | 159 | HORI |
| 3906.5 | 39.55 | 28.95 | 32.1 | 21.4 | 54 | 14.4 | 190 | 153 | VERT |
| 3923.7 | 39.65 | 28.95 | 32.1 | 21.4 | 54 | 14.4 | 213 | 326 | VERT |
| 3945.2 | 39.70 | 28.88 | 32.2 | 21.3 | 54 | 14.3 | 101 | 241 | VERT |
| 4525.6 | 41.15 | 28.49 | 33.0 | 20.4 | 54 | 12.9 | 300 | 201 | VERT |
| 4986.0 | 41.84 | 27.89 | 33.9 | 20.0 | 54 | 12.2 | 131 | 333 | VERT |
| 5769.5 | 41.77 | 27.17 | 33.9 | 19.3 | 54 | 12.2 | 100 | 360 | VERT |
| 5982.1 | 43.22 | 27.22 | 35.1 | 19.1 | 54 | 10.8 | 209 | 265 | VERT |
| 6314.5 | 43.60 | 27.37 | 35.1 | 18.8 | 54 | 10.4 | 242 | 156 | HORI |
| 6459.5 | 44.21 | 27.24 | 35.7 | 18.7 | 54 | 9.8 | 99 | 213 | VERT |
| 6539.2 | 44.09 | 26.73 | 36.1 | 18.7 | 54 | 9.9 | 358 | 347 | VERT |
| 6654.9 | 44.68 | 27.11 | 36.3 | 18.7 | 54 | 9.3 | 274 | 340 | VERT |
| 6725.6 | 44.83 | 27.18 | 36.3 | 18.7 | 54 | 9.2 | 400 | 128 | VERT |
| 6775.0 | 44.91 | 27.21 | 36.4 | 18.7 | 54 | 9.1 | 141 | 34 | HORI |
| 6873.2 | 44.56 | 26.67 | 36.6 | 18.7 | 54 | 9.4 | 400 | 202 | VERT |
| 6962.0 | 44.05 | 26.04 | 36.7 | 18.7 | 54 | 10 | 203 | 0 | HORI |
| 7182.7 | 45.57 | 26.60 | 37.4 | 18.4 | 54 | 8.4 | 400 | 155 | HORI |
| 7397.5 | 45.58 | 26.70 | 37.0 | 18.2 | 54 | 8.4 | 135 | 88 | HORI |
| 7668.4 | 45.25 | 26.07 | 37.0 | 17.8 | 54 | 8.8 | 323 | 57 | HORI |
| 7764.7 | 46.49 | 27.03 | 37.2 | 17.7 | 54 | 7.5 | 335 | 28 | HORI |
| 7817.0 | 47.02 | 27.41 | 37.3 | 17.7 | 54 | 7.0 | 328 | 114 | HORI |
| 7896.2 | 47.60 | 27.87 | 37.3 | 17.6 | 54 | 6.4 | 136 | 112 | HORI |
| 7941.3 | 47.75 | 27.97 | 37.3 | 17.5 | 54 | 6.2 | 100 | 26 | HORI |
| 7998.0 | 47.44 | 27.63 | 37.3 | 17.4 | 54 | 6.6 | 133 | 202 | VERT |

Peak Radiated Data for Emissions Above 1GHz

| Frequency MHz | Level dBμV/m | Measured dBμV | Transd dB | Gain dB | Height cm | Angle deg | Pol. | Limit dBμV/m | Result |
|---------------|--------------|---------------|-----------|---------|-----------|-----------|------|--------------|--------|
| 1261.1 | 53.99 | 56.05 | 24.5 | 26.5 | 211 | 179 | VERT | 74 | Pass |
| 1293.6 | 53.44 | 55.20 | 24.7 | 26.4 | 160 | 119 | HORI | 74 | Pass |
| 1633.0 | 56.70 | 56.84 | 25.5 | 25.6 | 100 | 148 | HORI | 74 | Pass |
| 1636.0 | 55.79 | 55.91 | 25.5 | 25.6 | 100 | 154 | HORI | 74 | Pass |
| 1645.1 | 57.32 | 57.39 | 25.5 | 25.6 | 101 | 146 | HORI | 74 | Pass |
| 1645.3 | 54.23 | 54.31 | 25.5 | 25.6 | 110 | 151 | HORI | 74 | Pass |
| 2400.1 | 54.86 | 49.82 | 29.1 | 24.0 | 100 | 174 | VERT | 74 | Pass |
| 3022.1 | 51.41 | 44.22 | 30.6 | 23.4 | 257 | 360 | HORI | 74 | Pass |
| 3182.4 | 52.64 | 43.97 | 31.8 | 23.1 | 314 | 42 | VERT | 74 | Pass |
| 3247.8 | 52.36 | 43.57 | 31.8 | 23.0 | 331 | 0 | VERT | 74 | Pass |
| 3317.7 | 52.28 | 43.84 | 31.3 | 22.9 | 139 | 159 | HORI | 74 | Pass |
| 3906.5 | 52.14 | 41.54 | 32.1 | 21.4 | 190 | 153 | VERT | 74 | Pass |
| 3923.7 | 52.73 | 42.03 | 32.1 | 21.4 | 213 | 326 | VERT | 74 | Pass |
| 3945.2 | 53.23 | 42.41 | 32.2 | 21.3 | 101 | 241 | VERT | 74 | Pass |
| 4525.6 | 54.32 | 41.66 | 33.0 | 20.4 | 300 | 201 | VERT | 74 | Pass |
| 4986.0 | 54.64 | 40.69 | 33.9 | 20.0 | 131 | 333 | VERT | 74 | Pass |
| 5769.5 | 54.33 | 39.73 | 33.9 | 19.3 | 100 | 360 | VERT | 74 | Pass |
| 5982.1 | 55.73 | 39.73 | 35.1 | 19.1 | 209 | 265 | VERT | 74 | Pass |
| 6314.5 | 56.67 | 40.44 | 35.1 | 18.8 | 242 | 156 | HORI | 74 | Pass |
| 6459.5 | 56.81 | 39.84 | 35.7 | 18.7 | 99 | 213 | VERT | 74 | Pass |
| 6539.2 | 56.64 | 39.28 | 36.1 | 18.7 | 358 | 347 | VERT | 74 | Pass |
| 6654.9 | 57.41 | 39.84 | 36.3 | 18.7 | 274 | 340 | VERT | 74 | Pass |
| 6725.6 | 58.10 | 40.44 | 36.3 | 18.7 | 400 | 128 | VERT | 74 | Pass |
| 6775.0 | 57.43 | 39.73 | 36.4 | 18.7 | 141 | 34 | HORI | 74 | Pass |
| 6873.2 | 57.63 | 39.73 | 36.6 | 18.7 | 400 | 202 | VERT | 74 | Pass |
| 6962.0 | 57.07 | 39.06 | 36.7 | 18.7 | 203 | 0 | HORI | 74 | Pass |
| 7182.7 | 58.35 | 39.39 | 37.4 | 18.4 | 400 | 155 | HORI | 74 | Pass |
| 7397.5 | 58.14 | 39.27 | 37.0 | 18.2 | 135 | 88 | HORI | 74 | Pass |
| 7668.4 | 57.92 | 38.75 | 37.0 | 17.8 | 323 | 57 | HORI | 74 | Pass |
| 7764.7 | 58.97 | 39.52 | 37.2 | 17.7 | 335 | 28 | HORI | 74 | Pass |
| 7817.0 | 59.76 | 40.15 | 37.3 | 17.7 | 328 | 114 | HORI | 74 | Pass |
| 7896.2 | 60.14 | 40.41 | 37.3 | 17.6 | 136 | 112 | HORI | 74 | Pass |
| 7941.3 | 60.45 | 40.67 | 37.3 | 17.5 | 100 | 26 | HORI | 74 | Pass |
| 7998.0 | 59.96 | 40.15 | 37.3 | 17.4 | 133 | 202 | VERT | 74 | Pass |

AC LINE CONDUCTED EMISSIONS

Measurement Procedure

Measured levels of ac power line conducted emission shall be the radio-noise voltage from the line probe or across the 50 Ω LISN port, where permitted, terminated into a 50 Ω noise meter, or where permitted or required, the radio-noise current on the power line sensed by a current probe.

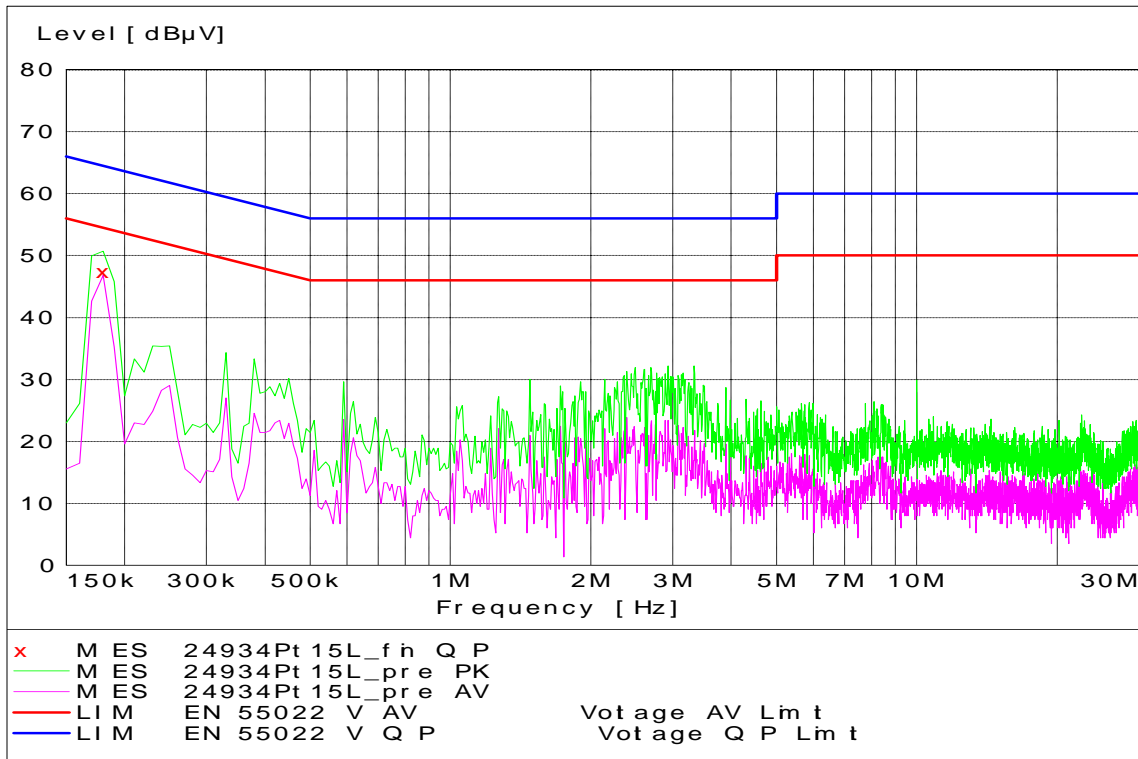
All radio-noise voltage and current measurements shall be made on each current-carrying conductor at the plug end of the EUT power cord or calibrated extension cord by the use of mating plugs and receptacles on the EUT and LISN. Equipment shall be tested with power cords that are normally supplied using a LISN, the 50 Ω measuring port is terminated by a 50 Ω radio-noise meter or a 50 Ω resistive load. All other ports are terminated in 50 Ω .

Detectors - Quasi Peak and Average Detector

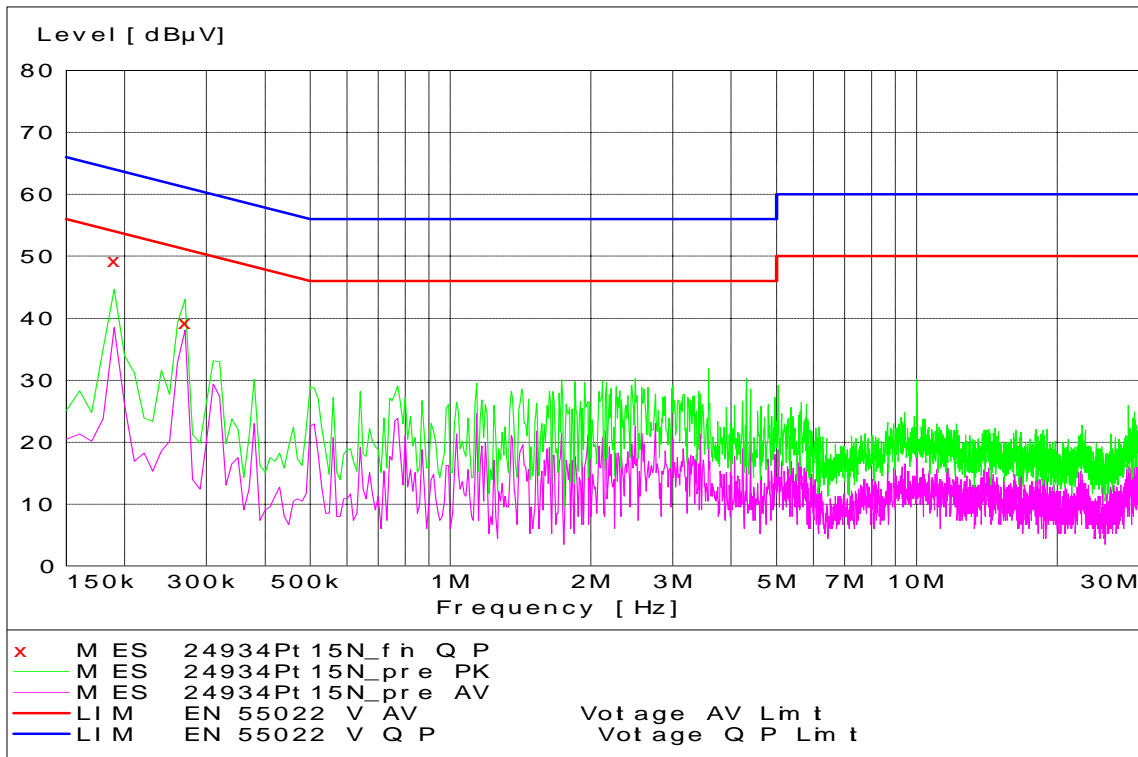
Test Setup

The EUT and the host equipment were setup according to the procedures in ANSI C63.4-2003. The test is performed with the EUT connected to a laptop computer using a USB data cable. The USB data cable is 1 m in length. The USB and the display ports of the computer were populated. The EUT was communicating with the laptop computer continuously.

Measurement Results



Tx Mode - Line Coupling



Tx Mode - Neutral Coupling

End of Test Report