

TEST RESULT SUMMARY

FCC Part 15 Subpart C Section 15.207

FCC Part 15 Subpart C Section 15.209

IC RSS-210 Issue 7

IC RSS-Gen Issue 2

| | |
|-------------------------|---|
| MANUFACTURER'S NAME | Datacard Group 11111 Bren Road West Minnetonka MN 55343 |
| PRODUCT NAME | SD200 |
| MODEL NUMBER(S) TESTED | PX10 |
| SERIAL NUMBER(S) TESTED | A00061 |
| PRODUCT DESCRIPTION | Card Printer with 13.56 MHz RFID reader |
| TEST REPORT NUMBER | WC1004952.1 Rev A |
| TEST DATE(S) | 15 March, 28 April and 28 May 2010 |

TÜV SÜD America Inc, as an independent testing laboratory, declares that the equipment tested as specified above conforms to the applicable EMC requirements of FCC Part 15 Subpart C Sections 15.207 "Conducted Limits" and 15.209 "Radiated emission limits; general requirements" and IC RSS-210 Issue 7 "Low-power Licence-exempt Radiocommunication Devices (All Frequency Bands): Category I Equipment" and IC RSS-Gen "General Requirements and Information for the Certification of Radiocommunication Equipment".

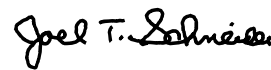
It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical characteristics. Any modifications necessary for compliance made during testing on the above mentioned date(s) must be implemented in all production units for compliance to be maintained.

Date: 10 August 2010

Location: Taylors Falls MN
USA



Greg S Jakubowski
Senior EMC Technician



Joel T Schneider
Senior EMC Engineer

Not Transferable



America

EMC TEST REPORT

Test Report No. WC1004952.1 Rev A Date of issue: 10 August 2010

Product Name SD200

Model(s) Tested PX10

Serial No(s) Tested A00061

Product Description Card Printer with 13.56 MHz RFID reader

Manufacturer Datacard Group
11111 Bren Road West
Minnetonka MN 55343

Test Result **Positive** **Negative**

TÜV SÜD America Inc reports apply only to the specific samples tested under stated test conditions. It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical components. TÜV SÜD America Inc shall have no liability for any deductions, inferences or generalizations drawn by the client or others from TÜV SÜD America Inc issued reports.

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TÜV SÜD America Inc and its professional staff hold government and professional organization certifications and are members of AAMI, ACIL, AEA, ANSI, IEEE, NARTE, and VCCI.

REVISION RECORD

| REVISION | TOTAL NUMBER OF PAGES | DATE | DESCRIPTION |
|----------|-----------------------|----------------|--|
| | 32 | 19 July 2010 | Initial Release |
| A | | 10 August 2010 | Revisions Include: <ul style="list-style-type: none">▪ Added rbw for below 30 MHz readings |
| | | | |





America

DIRECTORY

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EMC TEST REGULATIONS:

The tests were performed according to the following regulations:

FCC Part 15 Subpart C Section 15.207 Paragraph (a)

FCC Part 15 Subpart C Section 15.209 Paragraphs (a), (c), (f)

IC RSS-210 Issue 7 Section 2.6

IC RSS-Gen Issue 2 Sections 4.6.1, 7.2.2

ENVIRONMENTAL CONDITIONS IN THE LAB

| | <u>Actual</u> |
|----------------------|---------------|
| Temperature: | : 18-21°C |
| Atmospheric pressure | : 98-98.4kPa |
| Relative Humidity | : 24-80% |

POWER SUPPLY UTILIZED

Power supply system : 220 V / 60 Hz

TEST EQUIPMENT

All measurement instrumentation is traceable to the National Institute of Standards and Technology and is calibrated according to internal procedure.

SIGN EXPLANATIONS

- not applicable
- applicable

General field strength limits 0.009 – 30 MHz

FCC 15.209(a), FCC 15.209(c), IC RSS-210 2.6

Test summary

The requirements are: - MET - NOT MET

Testing was performed in accordance with the test procedure of ANSI C63.4 2003, clause 8.2.2

Maximum field strength of the fundamental is 27 dB μ V/m* or 22.4 μ V/m at 30 meters at 13.56 MHz

Minimum margin of compliance of the fundamental is 2.5 dB

Minimum margin of compliance of the spurious emissions is 55.5 dB at 27.12 MHz

No unwanted emissions exceed the level of the fundamental

*Extrapolated levels using a 40 dB/decade falloff as indicated by the measurements.

Test location

- Wild River Lab Large Test Site (Open Area Test Site)

- Wild River Lab Small Test Site (Open Area Test Site)

Test distance

- 3 meters

- 10 meters

Test equipment

| TUV ID | Model | Manufacturer | Description | Serial | Cal Due |
|-----------|---------|-----------------|--------------|------------|-----------|
| WRLE02517 | HFH2-Z2 | Polarad | Loop Antenna | 879285/036 | 01-Jul-10 |
| WRLE02534 | ESHS-20 | Rohde & Schwarz | EMI Receiver | 837055/003 | 29-Mar-11 |

Test limit

| Frequency (MHz) | Field strength (μ V/m) | Measurement distance (m) |
|-----------------|-----------------------------|--------------------------|
| 0.009-0.490 | 2400/F(kHz) | 300 |
| 0.490 - 1.705 | 24000/F(kHz) | 30 |
| 1.705 - 30 | 30 | 30 |

Test Data

The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9–90 kHz, 110–490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.

When average radiated emission measurements are specified in this part, including average emission measurements below 1000 MHz, there also is a limit on the peak level of the radio frequency emissions. Unless otherwise specified, e.g., see §§ 15.250, 15.252, 15.255, and 15.509–15.519, the limit on peak radio frequency emissions is 20 dB above the maximum permitted average emission limit applicable to the equipment under test.

Test Data,

| Frequency (MHz) | Detector | 1 m dB μ V/m | 3 m dB μ V/m | 10 m dB μ V/m | 30 m dB μ V/m | 300 m dB μ V/m | Final Level uV/m | Limit uV/m |
|-----------------|----------|------------------|------------------|-------------------|-------------------|--------------------|------------------|------------|
| 13.56 | QP | 89.3 | 67 | 48.5 | 27* | n/a | 22.4 | 30 |
| 27.12 | QP | 34 | nf | nf | -26* | n/a | 0.05 | 30 |
| 0.1522 | Peak | 68.8 | nf | nf | nf | -31.2* | 0.0275 | 15.7-av |
| 0.3045 | Peak | 63.5 | nf | nf | nf | -36.5* | 0.015 | 7.88-av |
| 0.4567 | Peak | 56.4 | nf | nf | nf | -43.6* | 0.0066 | 5.25-av |

* Extrapolated value using 40 dB per decade fall off

nf = noise floor

RBW for peak readings is 10 kHz.

Radiated Emissions 30 - 1000 MHz

FCC 15.209(c), FCC 15.209(f), IC RSS-210 2.6

Test summary

The requirements are: - MET - NOT MET

Testing was performed in accordance with the test procedure of ANSI C63.4 2003, clause 8.3

Maximum Tx related spurious emission below 135.6 MHz is 35.96 dB μ V/m at 3 meters at 81.383 MHz

Minimum margin of compliance is 4.04 dB

Maximum spurious emission of incorporated digital device is 52.78 dB μ V/m at 3 meters at 198.001 MHz

Minimum margin of compliance is 0.72 dB

Test location

- Wild River Lab Large Test Site (Open Area Test Site)

- Wild River Lab Small Test Site (Open Area Test Site)

Test distance

- 3 meters

- 10 meters

Test Equipment

| TUV ID | Model | Manufacturer | Description | Serial | Cal Due |
|-----------|-----------|-----------------|---------------------------|------------|------------------|
| WRLE03204 | EM-6917B | Electro-Metrics | Biconicalog Periodic | 102 | 22-Mar-11 |
| WRLE10617 | ZHL-1042J | Mini-Circuits | Preamplifier 30 MHz-5 GHz | QA0746004 | Code B 25-Sep-10 |
| WRLE02681 | 85650A | Hewlett-Packard | Quasi-Peak Adapter | 2430A00562 | 12-May-11 |
| NBLE03196 | 8566B | Hewlett-Packard | Spectrum Analyzer | 2240A01856 | 21-Jul-10 |
| NBLE03195 | 85662A | Hewlett-Packard | Analyzer Display | 2648A13518 | 21-Jul-10 |

Cal Code B = Calibration verification performed internally.

Test limits

Transmitter

| Frequency (MHz) | Field strength (μ V/m) | Field strength (dB μ V/m) | Measurement distance (m) |
|-----------------|-----------------------------|-------------------------------|--------------------------|
| 30 - 88 | 100 | 40 | 3 |
| 88 - 135.6 | 150 | 43.5 | 3 |

Incorporated digital device

| Frequency (MHz) | Field strength (μ V/m) | Field strength (dB μ V/m) | Measurement distance (m) |
|-----------------|-----------------------------|-------------------------------|--------------------------|
| 30 - 88 | 90 | 39 | 10 |
| 88 - 216 | 150 | 43.5 | 10 |
| 216 - 960 | 210 | 46.4 | 10 |
| Above 960 | 300 | 49.5 | 10 |

Test data

See following pages

Measurement summary for limit1: FCC-B <1GHz 3m (Qp)

| FREQ | LEVEL (dBuV) | CABLE / ANT / PREAMP / ATTEN (dB) | FINAL (dBuV / m) | POL / HGT / AZ (m)(DEG) | DELTA1 FCC-B <1GHz 3m |
|-------------|--------------|-----------------------------------|------------------|-------------------------|-----------------------|
| 81.383 MHz | 56.54 Qp | 1.41 / 7.65 / 29.65 / 0.0 | 35.96 | V / 1.00 / 40 | -4.04 |
| 108.503 MHz | 55.53 Qp | 1.61 / 8.51 / 29.7 / 0.0 | 35.95 | V / 1.00 / 250 | -7.55 |
| 131.981 MHz | 55.1 Qp | 1.78 / 7.8 / 29.53 / 0.0 | 35.14 | H / 3.00 / 270 | -8.36 |
| 119.934 MHz | 52.55 Qp | 1.69 / 8.58 / 29.62 / 0.0 | 33.2 | H / 3.00 / 270 | -10.3 |
| 122.057 MHz | 52.05 Qp | 1.71 / 8.44 / 29.61 / 0.0 | 32.59 | H / 3.00 / 270 | -10.91 |
| 126.564 MHz | 52.05 Qp | 1.74 / 8.15 / 29.57 / 0.0 | 32.36 | H / 3.00 / 90 | -11.14 |
| 106.057 MHz | 51.95 Qp | 1.6 / 8.36 / 29.62 / 0.0 | 32.29 | V / 1.00 / 90 | -11.21 |
| 83.078 MHz | 49.5 Qp | 1.43 / 7.39 / 29.65 / 0.0 | 28.67 | V / 1.00 / 0 | -11.33 |
| 67.819 MHz | 46.99 Qp | 1.29 / 9.73 / 29.61 / 0.0 | 28.4 | V / 1.00 / 165 | -11.6 |
| 82.777 MHz | 49.1 Qp | 1.42 / 7.44 / 29.65 / 0.0 | 28.32 | V / 1.00 / 90 | -11.68 |
| 79.809 MHz | 48.45 Qp | 1.4 / 7.9 / 29.64 / 0.0 | 28.1 | V / 1.00 / 0 | -11.9 |
| 121.818 MHz | 50.3 Qp | 1.7 / 8.46 / 29.61 / 0.0 | 30.85 | V / 1.00 / 270 | -12.65 |
| 124.992 MHz | 49.7 Qp | 1.73 / 8.25 / 29.59 / 0.0 | 30.09 | H / 3.00 / 90 | -13.41 |
| 63.519 MHz | 44.4 Qp | 1.25 / 10.39 / 29.6 / 0.0 | 26.44 | V / 1.00 / 0 | -13.56 |
| 31.32 MHz | 35.5 Qp | 0.88 / 19.75 / 29.91 / 0.0 | 26.22 | V / 1.00 / 0 | -13.78 |
| 47.797 MHz | 40.35 Qp | 1.08 / 13.86 / 29.67 / 0.0 | 25.62 | V / 1.00 / 0 | -14.38 |
| 84.672 MHz | 46.0 Qp | 1.44 / 7.15 / 29.65 / 0.0 | 24.94 | V / 1.00 / 180 | -15.06 |
| 44.01 MHz | 38.55 Qp | 1.02 / 15.05 / 29.69 / 0.0 | 24.93 | V / 1.00 / 0 | -15.07 |
| 95.768 MHz | 48.6 Qp | 1.53 / 7.75 / 29.68 / 0.0 | 28.19 | V / 1.00 / 0 | -15.31 |
| 91.706 MHz | 48.35 Qp | 1.5 / 7.5 / 29.67 / 0.0 | 27.68 | V / 1.00 / 0 | -15.82 |
| 73.658 MHz | 43.6 Qp | 1.34 / 8.84 / 29.63 / 0.0 | 24.15 | V / 1.00 / 0 | -15.85 |
| 108.792 MHz | 46.8 Qp | 1.62 / 8.53 / 29.66 / 0.0 | 27.28 | V / 1.00 / 90 | -16.22 |
| 34.92 MHz | 34.4 Qp | 0.92 / 18.23 / 29.8 / 0.0 | 23.76 | V / 1.00 / 90 | -16.24 |
| 57.427 MHz | 40.2 Qp | 1.21 / 11.33 / 29.62 / 0.0 | 23.12 | V / 1.00 / 0 | -16.88 |
| 81.192 MHz | 43.05 Qp | 1.41 / 7.68 / 29.64 / 0.0 | 22.5 | H / 3.00 / 0 | -17.5 |
| 54.367 MHz | 38.9 Qp | 1.17 / 11.89 / 29.63 / 0.0 | 22.33 | V / 1.00 / 0 | -17.67 |
| 54.156 MHz | 38.55 Qp | 1.17 / 11.95 / 29.63 / 0.0 | 22.04 | V / 1.00 / 90 | -17.96 |
| 67.716 MHz | 38.3 Qp | 1.29 / 9.75 / 29.61 / 0.0 | 19.72 | V / 1.00 / 180 | -20.28 |
| 135.599 MHz | 43.15 Qp | 1.8 / 7.68 / 29.51 / 0.0 | 23.12 | V / 1.00 / 270 | -20.38 |
| 40.668 MHz | 30.25 Qp | 0.98 / 16.22 / 29.61 / 0.0 | 17.83 | V / 1.00 / 90 | -22.17 |

Transmitter related

Measurement summary for limit2: FCC-A <1GHz 3m (Qp)

| FREQ | LEVEL (dBuV) | CABLE / ANT / PREAMP / ATTEN (dB) | FINAL (dBuV / m) | POL / HGT / AZ (m)(DEG) | DELTA2 FCC-A <1GHz 3m |
|-------------|--------------|-----------------------------------|------------------|-------------------------|-----------------------|
| 198.001 MHz | 69.74 Qp | 2.23 / 10.31 / 29.5 / 0.0 | 52.78 | H / 2.50 / 95 | -0.72 |
| 527.995 MHz | 57.45 Qp | 4.05 / 18.28 / 29.45 / 0.0 | 50.34 | V / 1.00 / 220 | -6.06 |
| 65.978 MHz | 60.6 Qp | 1.27 / 10.02 / 29.61 / 0.0 | 42.28 | V / 1.00 / 200 | -6.82 |
| 560.99 MHz | 55.54 Qp | 4.17 / 18.28 / 29.46 / 0.0 | 48.54 | V / 1.20 / 340 | -7.86 |
| 791.987 MHz | 48.05 Qp | 5.21 / 21.23 / 29.45 / 0.0 | 45.04 | V / 1.00 / 90 | -11.36 |
| 230.997 MHz | 59.4 Qp | 2.43 / 11.07 / 29.41 / 0.0 | 43.48 | V / 1.00 / 90 | -12.92 |
| 495.0 MHz | 50.25 Qp | 3.94 / 17.41 / 29.35 / 0.0 | 42.25 | V / 1.00 / 180 | -14.15 |
| 334.634 MHz | 54.7 Qp | 3.06 / 13.87 / 29.4 / 0.0 | 42.23 | V / 1.00 / 180 | -14.17 |
| 339.008 MHz | 54.15 Qp | 3.08 / 14.22 / 29.43 / 0.0 | 42.03 | V / 1.00 / 180 | -14.37 |
| 626.991 MHz | 48.1 Qp | 4.44 / 19.01 / 29.57 / 0.0 | 41.98 | V / 1.00 / 315 | -14.42 |
| 659.985 MHz | 47.3 Qp | 4.6 / 19.3 / 29.44 / 0.0 | 41.75 | V / 1.00 / 90 | -14.65 |
| 334.179 MHz | 54.15 Qp | 3.06 / 13.83 / 29.4 / 0.0 | 41.64 | V / 1.00 / 180 | -14.76 |
| 462.0 MHz | 49.75 Qp | 3.75 / 16.68 / 29.4 / 0.0 | 40.78 | V / 1.00 / 180 | -15.62 |
| 974.989 MHz | 43.9 Qp | 5.87 / 22.68 / 29.21 / 0.0 | 43.24 | V / 1.00 / 180 | -16.26 |
| 824.999 MHz | 41.75 Qp | 5.33 / 21.67 / 29.47 / 0.0 | 39.28 | V / 1.00 / 0 | -17.12 |
| 296.991 MHz | 53.15 Qp | 2.88 / 12.39 / 29.37 / 0.0 | 39.05 | V / 1.00 / 90 | -17.35 |
| 999.992 MHz | 42.45 Qp | 5.96 / 22.81 / 29.28 / 0.0 | 41.94 | V / 1.00 / 180 | -17.56 |
| 758.998 MHz | 42.55 Qp | 5.06 / 20.65 / 29.45 / 0.0 | 38.81 | V / 1.00 / 180 | -17.59 |
| 450.0 MHz | 48.35 Qp | 3.68 / 16.2 / 29.48 / 0.0 | 38.75 | V / 1.00 / 270 | -17.65 |
| 220.015 MHz | 55.15 Qp | 2.36 / 10.66 / 29.43 / 0.0 | 38.74 | V / 1.00 / 315 | -17.66 |
| 162.727 MHz | 54.5 Qp | 2.02 / 8.54 / 29.57 / 0.0 | 35.49 | H / 3.00 / 90 | -18.01 |
| 263.998 MHz | 52.95 Qp | 2.62 / 12.29 / 29.5 / 0.0 | 38.36 | V / 1.00 / 90 | -18.04 |
| 249.989 MHz | 53.4 Qp | 2.54 / 11.77 / 29.46 / 0.0 | 38.25 | V / 1.00 / 90 | -18.15 |
| 176.292 MHz | 53.45 Qp | 2.12 / 9.32 / 29.58 / 0.0 | 35.32 | V / 1.00 / 180 | -18.18 |
| 131.981 MHz | 55.1 Qp | 1.78 / 7.8 / 29.53 / 0.0 | 35.14 | H / 3.00 / 270 | -18.36 |
| 274.996 MHz | 51.8 Qp | 2.68 / 12.7 / 29.46 / 0.0 | 37.72 | V / 1.00 / 90 | -18.68 |
| 299.99 MHz | 51.4 Qp | 2.91 / 12.56 / 29.36 / 0.0 | 37.5 | H / 3.00 / 180 | -18.9 |
| 329.996 MHz | 50.05 Qp | 3.04 / 13.5 / 29.38 / 0.0 | 37.21 | V / 1.00 / 180 | -19.19 |
| 362.992 MHz | 48.2 Qp | 3.18 / 15.06 / 29.46 / 0.0 | 36.98 | V / 1.00 / 315 | -19.42 |
| 396.005 MHz | 46.95 Qp | 3.31 / 15.85 / 29.34 / 0.0 | 36.77 | V / 1.00 / 180 | -19.63 |
| 692.986 MHz | 42.05 Qp | 4.75 / 19.32 / 29.51 / 0.0 | 36.61 | V / 1.00 / 315 | -19.79 |
| 165.931 MHz | 44.3 Qp | 2.05 / 8.73 / 29.58 / 0.0 | 25.5 | V / 1.00 / 0 | -28.0 |
| 474.992 MHz | 36.55 Qp | 3.84 / 17.2 / 29.32 / 0.0 | 28.27 | H / 3.00 / 0 | -28.13 |
| 161.301 MHz | 44.2 Qp | 2.01 / 8.46 / 29.57 / 0.0 | 25.11 | V / 1.00 / 315 | -28.39 |
| 699.989 MHz | 32.45 Qp | 4.79 / 19.6 / 29.55 / 0.0 | 27.29 | V / 1.00 / 90 | -29.11 |
| 383.99 MHz | 38.05 Qp | 3.26 / 15.26 / 29.39 / 0.0 | 27.18 | V / 1.00 / 0 | -29.22 |
| 144.0 MHz | 41.95 Qp | 1.86 / 8.77 / 29.51 / 0.0 | 23.08 | V / 1.00 / 0 | -30.42 |
| 420.384 MHz | 34.95 Qp | 3.49 / 16.46 / 29.37 / 0.0 | 25.53 | V / 1.00 / 0 | -30.87 |
| 471.451 MHz | 32.3 Qp | 3.81 / 17.06 / 29.34 / 0.0 | 23.83 | V / 1.00 / 0 | -32.57 |
| 542.443 MHz | 31.3 Qp | 4.1 / 17.82 / 29.49 / 0.0 | 23.74 | V / 1.00 / 0 | -32.66 |

Incorporated digital device

Occupied bandwidth

RSS-Gen 4.6.1

Test summary

The requirements are: - MET - NOT MET

Test was performed in accordance with the article "The Measurement of Occupied Bandwidth" by Industry Canada's certification bureau.

Occupied bandwidth = 24 Hz

Test location

- Wild River Lab Large Test Site (Open Area Test Site)

- Wild River Lab Small Test Site (Open Area Test Site)

Test equipment

| TUV ID | Model Number | Manufacturer | Description | Serial Number | Cal Due |
|-----------|--------------|--------------|-------------------|---------------|-----------|
| WRLE02517 | HFH2-Z2 | Polorad | Loop Antenna | 879285/036 | 01-Jul-10 |
| WRLE03371 | E4440A | Agilent | Spectrum Analyzer | MY43362222 | 11-Aug-10 |

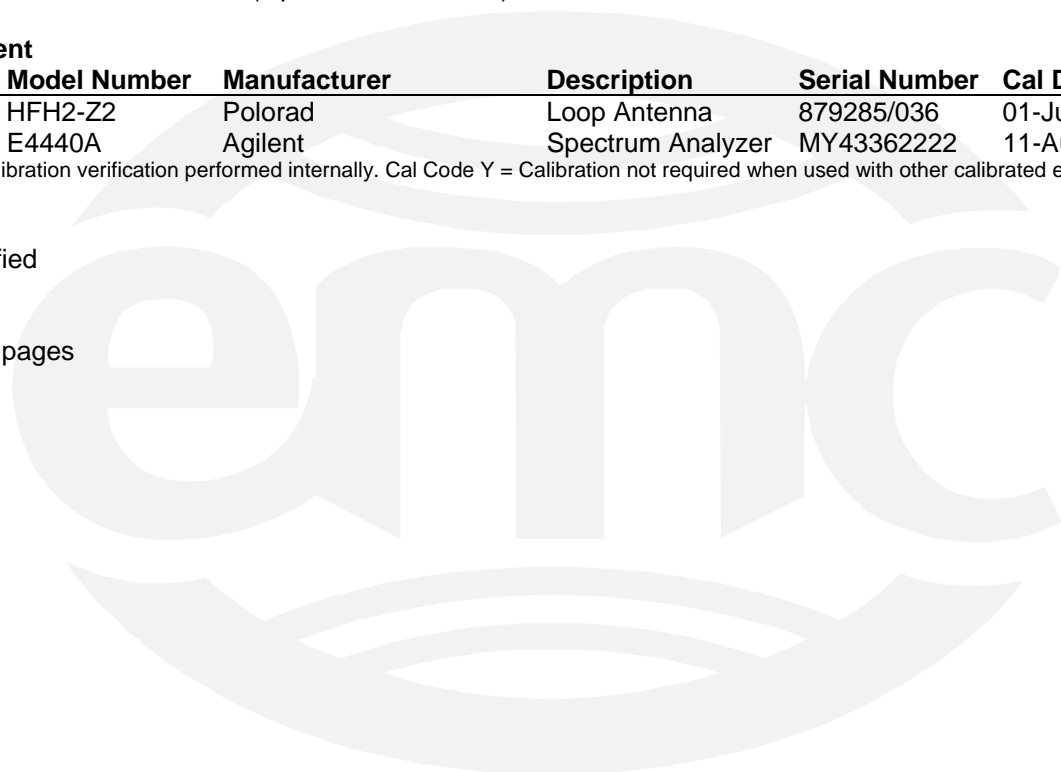
Cal Code B = Calibration verification performed internally. Cal Code Y = Calibration not required when used with other calibrated equipment.

Test limit

No limit specified

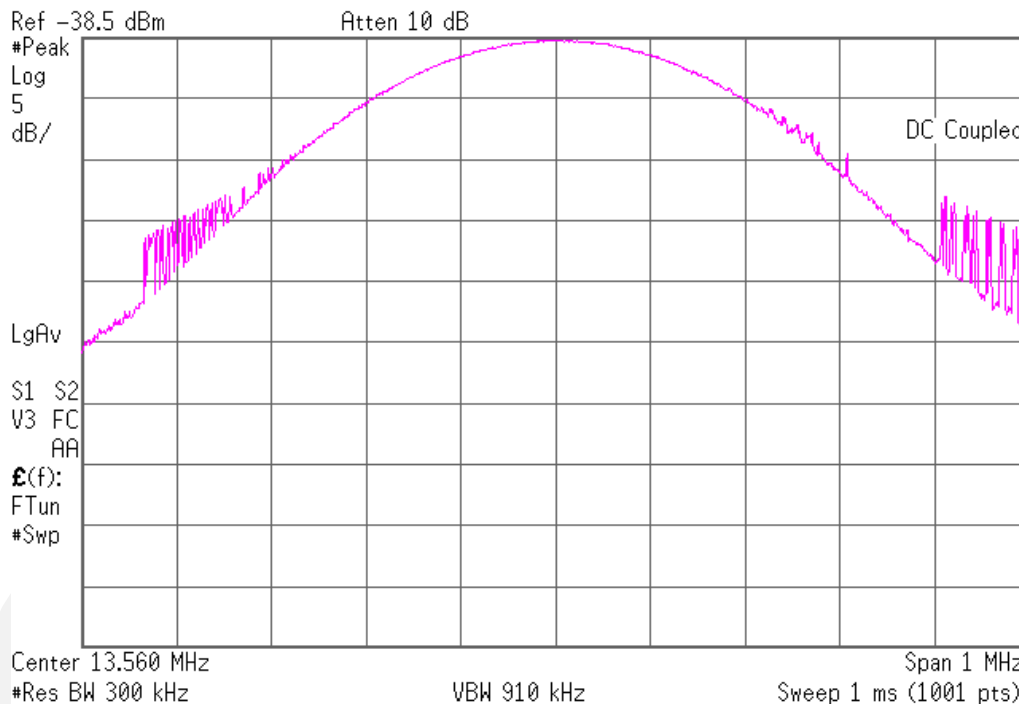
Test data

See following pages



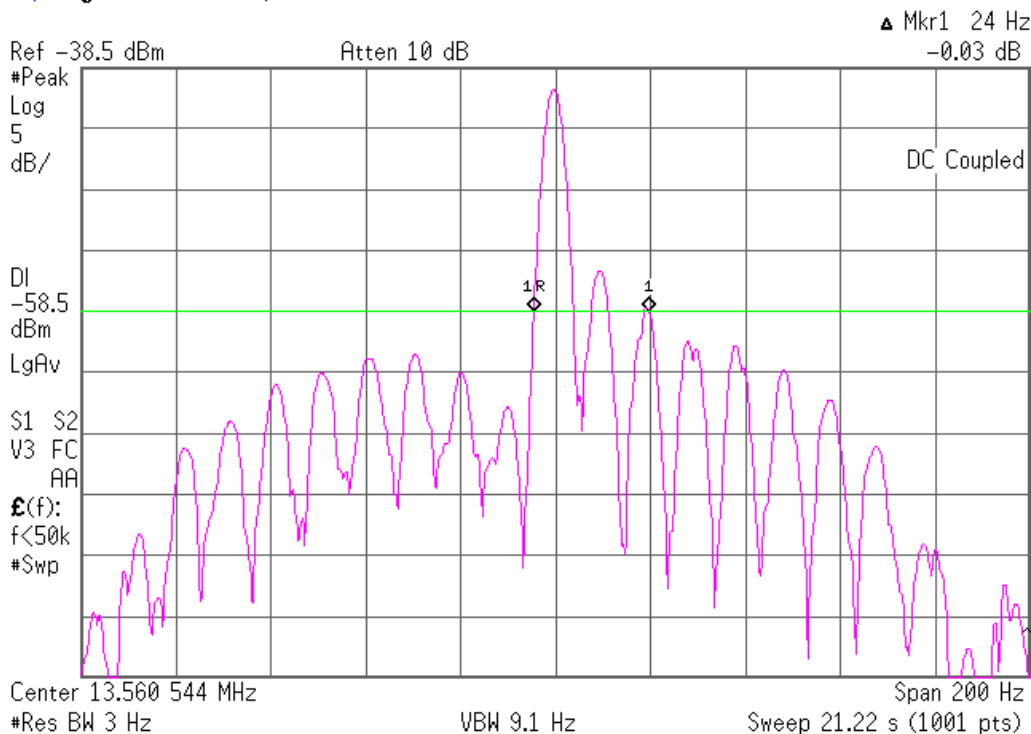
99% Occupied bandwidth
1 of 2, Wide RBW, set reference level

Agilent 11:33:05 Apr 28, 2010



2 of 2, minimal RBW, towards 1% of 20 dB BW

Agilent 11:38:25 Apr 28, 2010



Conducted Emissions - AC Power Lines

FCC 15.207(a), IC RSS-Gen 7.2.2

Test summary

The requirements are: - MET - NOT MET

Testing was performed in accordance with the test procedure of ANSI C63.4 2003, clause 7.2

Minimum margin of compliance is 7.81 dB at 1.37 MHz – quasi-peak

Minimum margin of compliance is 2.71 dB at 1.37 MHz – average – average measurements made with 10 kHz rbw.

Test location

- Wild River Lab Large Test Site (Open Area Test Site)

- Wild River Lab Small Test Site (Open Area Test Site)

Test equipment used:

| TUV ID | Model | Manufacturer | Description | Serial | Cal Due |
|-----------|---------|--------------------------|------------------|------------|------------------|
| WRLE02416 | 3825/2 | Electro-Mechanics (EMCO) | 50 Ω LISN | 8812-1437 | Code B 06-Jan-11 |
| WRLE02534 | ESHS-20 | Rohde & Schwarz | EMI Receiver | 837055/003 | 29-Mar-11 |

Cal Code B = Calibration verification performed internally. Cal Code Y = Calibration not required when used with other calibrated equipment.

Test limits for intentional radiator, dB μ V

| Frequency (MHz) | Quasi Peak | Average |
|-----------------|------------|----------|
| 0.15 - 0.5 | 66 - 56* | 56 - 46* |
| 0.5 - 5 | 56 | 46 |
| 5 - 30 | 60 | 50 |

*Decreases with the logarithm of the frequency

Test limits for incorporated Class A digital device, dB μ V

| Frequency (MHz) | Quasi Peak | Average |
|-----------------|------------|---------|
| 0.15 - 0.5 | 79 | 66 |
| 0.5 - 30 | 73 | 60 |

Test data

See following pages

*Not related to transmitter - related to incorporated digital device -

Measurement summary for limit2: FCC 15.107 Class A AV (Av)

| FREQ | LEVEL (dBuV) | CABLE / ANT / PREAMP / ATTEN (dB) | FINAL (dBuV) | EUT Lead | DELTA2 FCC 15.107 AV |
|-----------|--------------|-----------------------------------|--------------|----------|----------------------|
| 1.245 MHz | 46.11 Av | 0.57 / 0.0 / 0.0 / 0.0 | 46.68 | L1 | -13.32* |

Measurement summary for limit2: FCC 15.207 AV (Av)

| FREQ | LEVEL (dBuV) | CABLE / ANT / PREAMP / ATTEN (dB) | FINAL (dBuV) | EUT Lead | DELTA2 FCC 15.207 AV |
|-----------|--------------|-----------------------------------|--------------|----------|----------------------|
| 1.37 MHz | 42.69 Av | 0.6 / 0.0 / 0.0 / 0.0 | 43.29 | L1 | -2.71 |
| 590.0 kHz | 40.41 Av | 0.4 / 0.1 / 0.0 / 0.0 | 40.91 | N | -5.09 |
| 460.0 kHz | 39.25 Av | 0.36 / 0.1 / 0.0 / 0.0 | 39.71 | N | -6.99 |
| 2.555 MHz | 36.92 Av | 0.87 / 0.0 / 0.0 / 0.0 | 37.79 | N | -8.21 |
| 1.11 MHz | 36.5 Av | 0.54 / 0.03 / 0.0 / 0.0 | 37.07 | L1 | -8.94 |
| 915.0 kHz | 35.51 Av | 0.49 / 0.1 / 0.0 / 0.0 | 36.09 | L1 | -9.91 |
| 260.0 kHz | 40.94 Av | 0.29 / 0.1 / 0.0 / 0.0 | 41.33 | N | -10.1 |
| 23.13 MHz | 34.39 Av | 2.77 / 0.55 / 0.0 / 0.0 | 37.72 | N | -12.28 |
| 390.0 kHz | 34.71 Av | 0.34 / 0.1 / 0.0 / 0.0 | 35.15 | N | -12.92 |
| 1.705 MHz | 32.11 Av | 0.71 / 0.0 / 0.0 / 0.0 | 32.82 | N | -13.18 |
| 3.075 MHz | 30.73 Av | 0.95 / 0.0 / 0.0 / 0.0 | 31.68 | L1 | -14.32 |
| 1.555 MHz | 30.65 Av | 0.66 / 0.0 / 0.0 / 0.0 | 31.31 | N | -14.69 |
| 16.23 MHz | 32.25 Av | 2.36 / 0.26 / 0.0 / 0.0 | 34.88 | L1 | -15.12 |
| 195.0 kHz | 37.0 Av | 0.25 / 0.18 / 0.0 / 0.0 | 37.43 | N | -16.39 |
| 4.445 MHz | 28.04 Av | 1.2 / 0.0 / 0.0 / 0.0 | 29.24 | L1 | -16.76 |
| 10.79 MHz | 31.14 Av | 1.89 / 0.21 / 0.0 / 0.0 | 33.24 | L1 | -16.76 |
| 515.0 kHz | 28.53 Av | 0.37 / 0.1 / 0.0 / 0.0 | 29.0 | L1 | -17.0 |
| 1.045 MHz | 26.43 Av | 0.52 / 0.05 / 0.0 / 0.0 | 27.0 | N | -19.0 |
| 10.06 MHz | 28.85 Av | 1.84 / 0.2 / 0.0 / 0.0 | 30.89 | L1 | -19.11 |
| 2.295 MHz | 25.95 Av | 0.83 / 0.0 / 0.0 / 0.0 | 26.78 | N | -19.22 |

Measurement summary for limit1: FCC 15.207 QP (Qp)

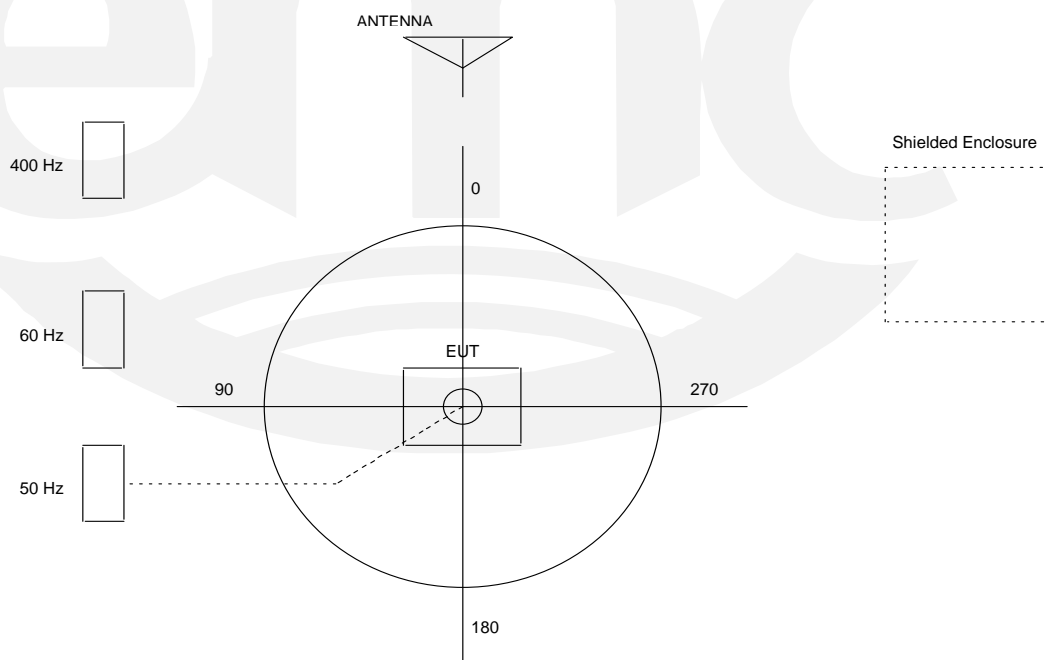
| FREQ | LEVEL (dBuV) | CABLE / ANT / PREAMP / ATTEN (dB) | FINAL (dBuV) | EUT Lead | DELTA1 FCC 15.207 QP |
|-----------|--------------|-----------------------------------|--------------|----------|----------------------|
| 1.37 MHz | 47.59 Qp | 0.6 / 0.0 / 0.0 / 0.0 | 48.19 | N | -7.81 |
| 1.705 MHz | 45.95 Qp | 0.71 / 0.0 / 0.0 / 0.0 | 46.66 | N | -9.34 |
| 1.11 MHz | 43.91 Qp | 0.54 / 0.03 / 0.0 / 0.0 | 44.48 | N | -11.53 |
| 2.555 MHz | 42.87 Qp | 0.87 / 0.0 / 0.0 / 0.0 | 43.74 | N | -12.26 |
| 590.0 kHz | 42.23 Qp | 0.4 / 0.1 / 0.0 / 0.0 | 42.73 | N | -13.27 |
| 1.045 MHz | 41.65 Qp | 0.52 / 0.05 / 0.0 / 0.0 | 42.22 | N | -13.78 |
| 460.0 kHz | 42.43 Qp | 0.36 / 0.1 / 0.0 / 0.0 | 42.89 | N | -13.81 |
| 2.22 MHz | 40.81 Qp | 0.82 / 0.0 / 0.0 / 0.0 | 41.63 | N | -14.37 |
| 715.0 kHz | 40.07 Qp | 0.43 / 0.1 / 0.0 / 0.0 | 40.6 | N | -15.4 |
| 2.295 MHz | 39.39 Qp | 0.83 / 0.0 / 0.0 / 0.0 | 40.22 | N | -15.78 |
| 2.875 MHz | 38.87 Qp | 0.92 / 0.0 / 0.0 / 0.0 | 39.79 | N | -16.21 |
| 915.0 kHz | 38.69 Qp | 0.49 / 0.1 / 0.0 / 0.0 | 39.27 | N | -16.73 |
| 5.37 MHz | 41.79 Qp | 1.33 / 0.0 / 0.0 / 0.0 | 43.12 | N | -16.88 |
| 195.0 kHz | 45.89 Qp | 0.25 / 0.18 / 0.0 / 0.0 | 46.32 | N | -17.5 |
| 490.0 kHz | 38.13 Qp | 0.37 / 0.1 / 0.0 / 0.0 | 38.6 | N | -17.57 |
| 1.44 MHz | 37.59 Qp | 0.62 / 0.0 / 0.0 / 0.0 | 38.21 | N | -17.79 |
| 325.0 kHz | 40.81 Qp | 0.31 / 0.1 / 0.0 / 0.0 | 41.22 | N | -18.35 |
| 4.445 MHz | 35.75 Qp | 1.2 / 0.0 / 0.0 / 0.0 | 36.95 | L1 | -19.05 |
| 260.0 kHz | 41.67 Qp | 0.29 / 0.1 / 0.0 / 0.0 | 42.06 | L1 | -19.37 |
| 390.0 kHz | 37.71 Qp | 0.34 / 0.1 / 0.0 / 0.0 | 38.15 | N | -19.92 |

TEST SETUP FOR EMISSIONS TESTING

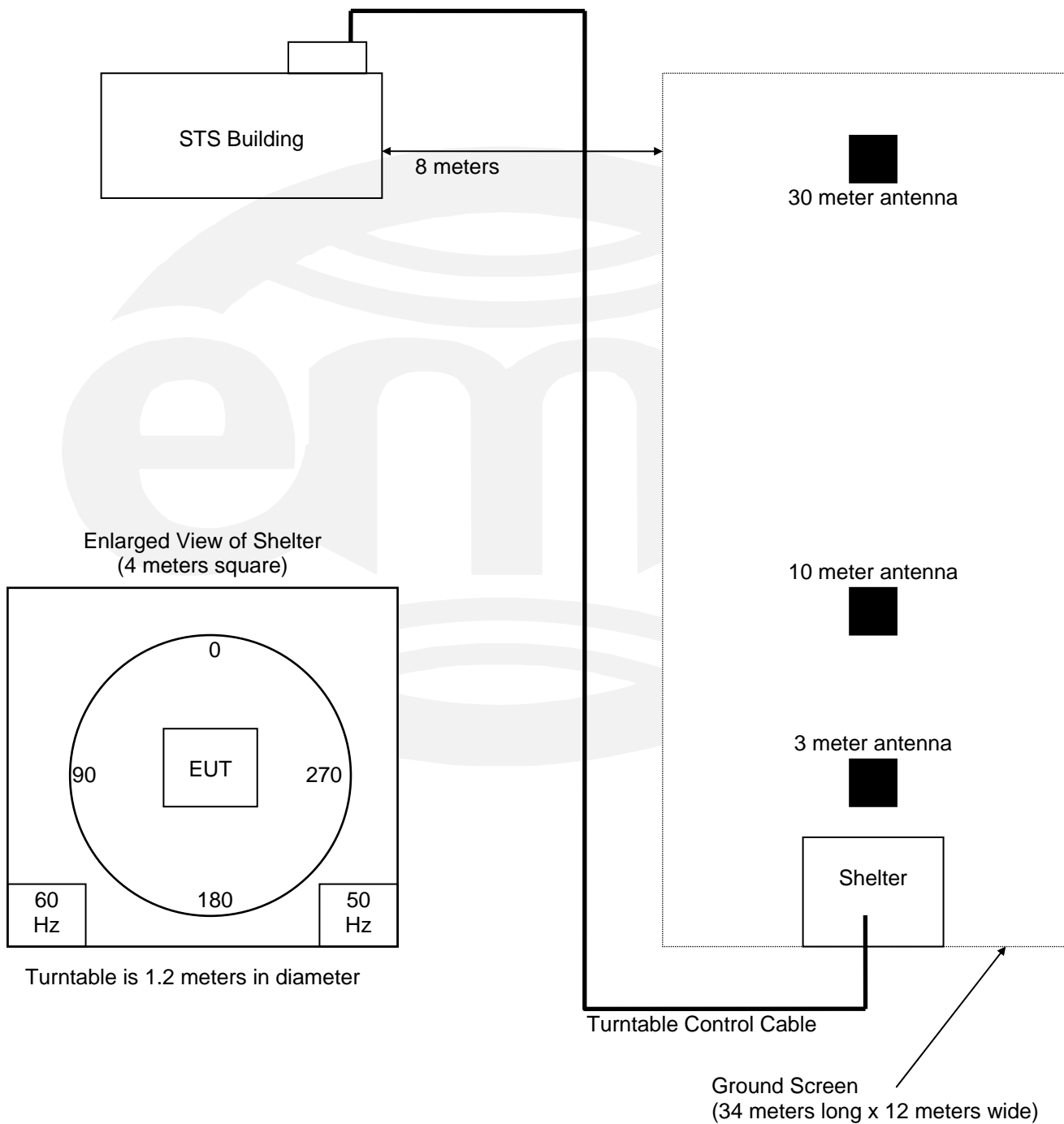
WILD RIVER LAB Large Test Site

Notes:

1. Items shown in dotted lines are located on the floor below the test area. It is 5 meters vertically from the ground floor to the test area.
2. 50 Hz, 60 Hz, and 400 Hz are power panels for alternating current.
3. The antenna may be positioned horizontally 3, 10 or 30 meters from the center of the turntable.
4. The circle is a 6.7 meter diameter turntable.
5. A ground plane is in the plane of this sheet.
6. The test sample is shown in the azimuthal position representing zero degrees.



TEST SETUP FOR EMISSIONS TESTING
 WILD RIVER LAB
 Small Test Site (STS)



Test-setup photo(s):
General Field Strength Limits 0.009 – 30 MHz

Removed for FCC and IC application



Test-setup photo(s):
Radiated Emissions 30 - 1000 MHz

Removed for FCC and IC application



Test-setup photo(s):
Radiated Emissions 30 - 1000 MHz

Removed for FCC and IC application



Test-setup photo(s):

Conducted Emissions, AC lines, 150 kHz - 30 MHz

Removed for FCC and IC application



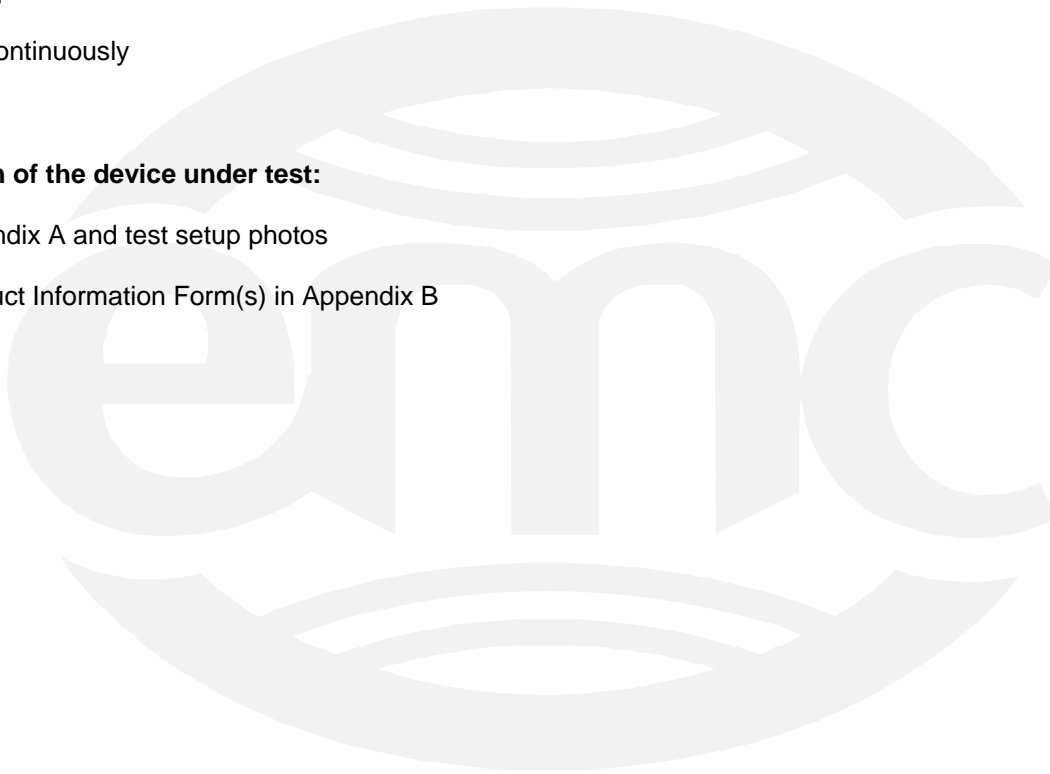
Equipment Under Test (EUT) Test Operation Mode:

The device under test was operated under the following conditions during immunity testing :

- Standby
- Test program (H - Pattern)
- Test program (color bar)
- Test program (customer specific)
- Practice operation
- RFID on continuously

Configuration of the device under test:

- See Appendix A and test setup photos
- See Product Information Form(s) in Appendix B



DEVIATIONS FROM STANDARD:

None.

GENERAL REMARKS:

Testing was also performed under Test Report Numbers WC1002988 & WC1001930.

Modifications required to pass:

- None
- As indicated on the data sheet(s)

Test Specification Deviations: Additions to or Exclusions from:

- None
- As indicated in the Test Plan

SUMMARY:

The requirements according to the technical regulations are

- met and the device under test does fulfill the general approval requirements.
- **not** met and the device under test does **not** fulfill the general approval requirements..

EUT Received Date: 15 March 2010
Condition of EUT: Normal
Testing Start Date: 15 March 2010
Testing End Date: 28 May 2010

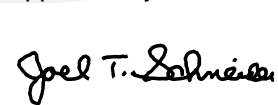
TÜV SÜD AMERICA INC

Tested by:



Greg S Jakubowski
Senior EMC Technician

Approved by:



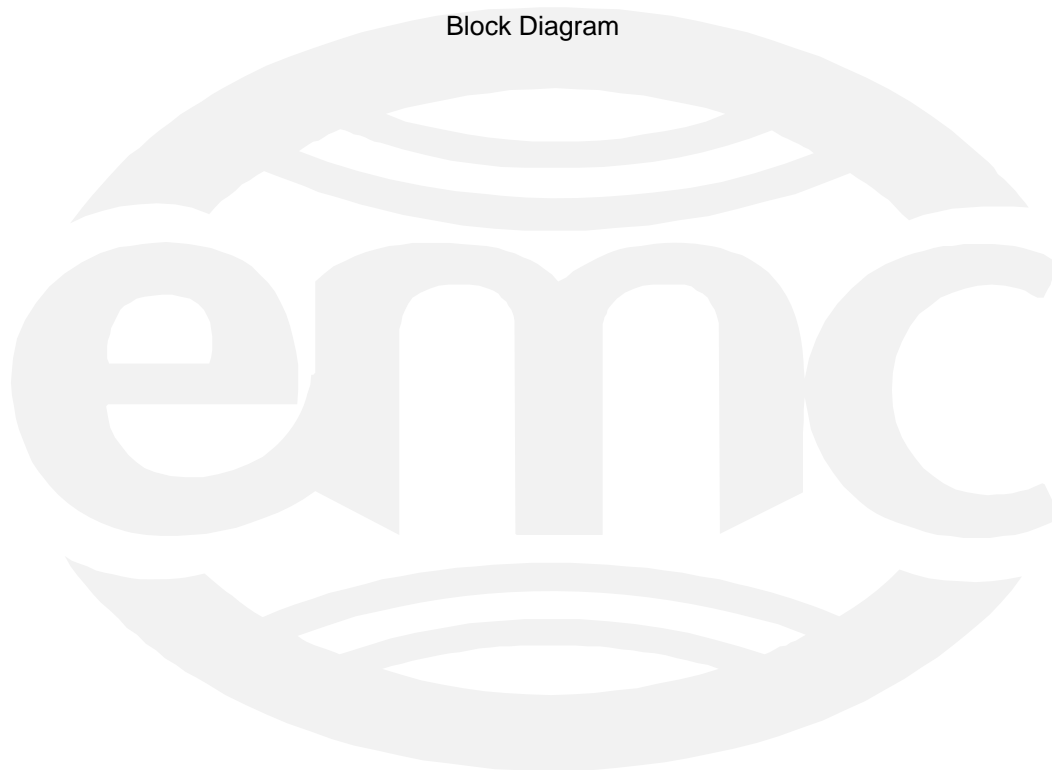
Joel T Schneider
Senior EMC Engineer

Appendix A

EMC Test Plan / Constructional Data Form

and

Block Diagram





EMC Test Plan and Constructional Data Form

PLEASE COMPLETE THIS DOCUMENT IN FULL, ENTERING N/A IF THE FIELD IS NOT APPLICABLE. IF TESTING RESULTS IN MODIFICATIONS TO THE EQUIPMENT, PLEASE SUBMIT A REVISED TP/CDF INDICATING THOSE MODIFICATIONS.
NOTE: This information will be input into your test report as shown below. Press the F1 key at any time to get HELP for the current field selected.

Company: Datacard Group
 Address: 11111 Bren Road West
Minnetonka, MN 55343
 Contact: Steve Fitzsimmons Position: Electrical Engineer
 Phone: 952 988 1838 Fax: 952 988 2658
 E-mail Address: steve_fitzsimmons@datacard.com

General Equipment Description -- NOTE: This information will be input into your test report as shown below.

EUT Description Card Printer
 EUT Name SD200
 Model No.: PX10 Serial No.: A00061
 Product Options: Magstripe, input hopper
 Configurations to be tested: Printing one sided Color cards

Equipment Modification (If applicable, indicate modifications since EUT was last tested. If modifications are made during this testing, submit revised TP/CDF after testing is complete.)

Modifications since last test: Testing rev D of control board 572523-002. This new revision has the thermal printhead signal routed away from the RFID I.C. to reduce emissions.
 Modifications made during test: _____

Test Objective(s): Please indicate the tests to be performed, entering the applicable standard(s) where noted.

- | | |
|--|--|
| <input checked="" type="checkbox"/> EMC Directive 2004/108/EC (EMC) Std: <u>EN55022:1998</u> | <input checked="" type="checkbox"/> FCC: Class <input checked="" type="checkbox"/> A <input type="checkbox"/> B Part _____ |
| <input type="checkbox"/> Machinery Directive 89/392/EEC (EMC) Std: _____ | <input checked="" type="checkbox"/> VCCI: Class <input checked="" type="checkbox"/> A <input type="checkbox"/> B |
| <input type="checkbox"/> Medical Device Directive 93/42/EEC (EMC) Std: _____ | <input type="checkbox"/> BSMI: Class <input type="checkbox"/> A <input type="checkbox"/> B (Separate Report) |
| <input type="checkbox"/> Vehicle Directive: <input type="checkbox"/> 2001/3/EC (EMC) <input type="checkbox"/> 2004/104/EC (EMC) <input type="checkbox"/> Other Vehicle Std: _____ | <input checked="" type="checkbox"/> Canada: Class <input checked="" type="checkbox"/> A <input type="checkbox"/> B |
| <input type="checkbox"/> FDA Reviewers Guidance for Premarket Notification Submissions (EMC) | <input checked="" type="checkbox"/> Australia: Class <input checked="" type="checkbox"/> A <input type="checkbox"/> B |
| | <input checked="" type="checkbox"/> Other: <u>RTTE Directive EN301 489-3: 2000 Korea KN series standards for ITE</u> |



EMC Test Plan and Constructional Data Form

| EUT Interface Ports and Cables | | | | | | | | | | | | | | |
|--------------------------------|--------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-----|-------------------------------------|-------------------------------------|-----------------|----------------|------------------------|---------------------------|-----------|-------------------------------------|--------------------------|
| Type | Analog | Digital | During Test | | Qty | Shielding | | Termination | Connector Type | Port Termination | Length tested (in meters) | Removable | Permanent | |
| | | | Active | Passive | | Yes | No | | | | | | | Type |
| EXAMPLE: RS232 | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | 2 | <input checked="" type="checkbox"/> | <input type="checkbox"/> | Foil over braid | Coaxial | Metallized 9-pin D-Sub | Characteristic Impedance | 6 | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| USB | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input checked="" type="checkbox"/> | 1 | <input checked="" type="checkbox"/> | <input type="checkbox"/> | foil | na | typeA-B | USB 2.0 | 2 | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| Ethernet | <input type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | 1 | <input type="checkbox"/> | <input checked="" type="checkbox"/> | 10/100baseT | na | RJ45 | magnetics | NA | <input checked="" type="checkbox"/> | <input type="checkbox"/> |
| | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | | <input type="checkbox"/> | <input type="checkbox"/> | | | | | | <input type="checkbox"/> | <input type="checkbox"/> |
| | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | | <input type="checkbox"/> | <input type="checkbox"/> | | | | | | <input type="checkbox"/> | <input type="checkbox"/> |
| | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | | <input type="checkbox"/> | <input type="checkbox"/> | | | | | | <input type="checkbox"/> | <input type="checkbox"/> |
| | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | | <input type="checkbox"/> | <input type="checkbox"/> | | | | | | <input type="checkbox"/> | <input type="checkbox"/> |
| | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | | <input type="checkbox"/> | <input type="checkbox"/> | | | | | | <input type="checkbox"/> | <input type="checkbox"/> |
| | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | | <input type="checkbox"/> | <input type="checkbox"/> | | | | | | <input type="checkbox"/> | <input type="checkbox"/> |
| | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | | <input type="checkbox"/> | <input type="checkbox"/> | | | | | | <input type="checkbox"/> | <input type="checkbox"/> |
| | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | | <input type="checkbox"/> | <input type="checkbox"/> | | | | | | <input type="checkbox"/> | <input type="checkbox"/> |
| | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | | <input type="checkbox"/> | <input type="checkbox"/> | | | | | | <input type="checkbox"/> | <input type="checkbox"/> |



EMC Test Plan and Constructional Data Form

EUT Software.

Revision Level: D1.0.13.0

Description: DVT firmware

Equipment Under Test (EUT) Operating Modes to be Tested -- list the operating modes to be used during test. It is recommended the equipment be tested while operating in a typical operation mode. FCC testing of personal computers and/or peripherals requires that a simple program generate a complete line of upper case H's. Provide a general description of all software, firmware, and PLD algorithms used in the equipment. List all code modules as described above, with the revision level used during testing. Consult with your TÜV Product Service Representative if additional assistance is required.

1. Continuous printing of single side Color cards

- 2.

- 3.

Equipment Under Test (EUT) System Components -- List and describe all components which are part of the EUT. For FCC & Taiwan testing a minimum configuration is required. (ie. Mouse, Printer, Monitor, External Disk Drive, Motherboard, etc)

| Description | Model # | Serial # | FCC ID # |
|-------------|---------|----------|----------|
| | | | |



EMC Test Plan and Constructional Data Form

Support Equipment -- List and describe all support equipment which is not part of the EUT. (i.e. peripherals, simulators, etc)
This information is required for FCC & Taiwan testing.

| Description | Model # | Serial # | FCC ID # |
|-------------|----------------|-------------|--------------|
| Desktop PC | SSE2500MT64 | SFST0072121 | E186194 |
| Keyboard | EO3601QUS201-C | J014405380 | E139948JZ |
| Monitor | VCDTS21378-2M | E783732785 | GSS15015 |
| Mouse | ECM-S3902 | 1487209 | EW4ECM-S3902 |

Oscillator Frequencies

| Manufacturer | Frequency | Derived Frequency | Component # / Location | Description of Use |
|--------------|-----------|-------------------|--------------------------|--|
| | 33Mhz | | Y3, print control board | Oscillator for system clock generation |
| | 13.56Mhz | | Y1, print control board | RFID communication clock |
| | | 22Mhz | U24, print control board | TPH logic control |
| | 25Mhz | | Y4, print control board | Ethernet clock |
| | 48MHz | | Y2, print control board | USB clock |
| | | | | |

Power Supply

| Manufacturer | Model # | Serial # | Type |
|--------------|-----------|----------|---|
| Cincon | TRG70A240 | | <input checked="" type="checkbox"/> Switched-mode: (Frequency) _____ <input type="checkbox"/> Linear <input type="checkbox"/> Other: _____ |
| | | | <input type="checkbox"/> Switched-mode: (Frequency) _____ <input type="checkbox"/> Linear <input type="checkbox"/> Other: _____ |

Power Line Filters

| Manufacturer | Model # | Location in EUT |
|--------------|---------|-----------------|
| | | |
| | | |



EMC Test Plan and Constructional Data Form

| Critical EMI Components (Capacitors, ferrites, etc.) | | | | |
|---|---------------------|------------------------|------------|-------------------------------|
| <i>Description</i> | <i>Manufacturer</i> | <i>Part # or Value</i> | <i>Qty</i> | <i>Component # / Location</i> |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

EMC Critical Detail -- Describe other EMC Design details used to reduce high frequency noise.

PLEASE ENTER NAMES BELOW (INSERT ELECTRONIC SIGNATURE IF POSSIBLE)

Authorization (Signature Required if a Third Party Certification is checked on pg 1)

Customer authorization to perform tests according to this test plan.

Date

Mark Forster

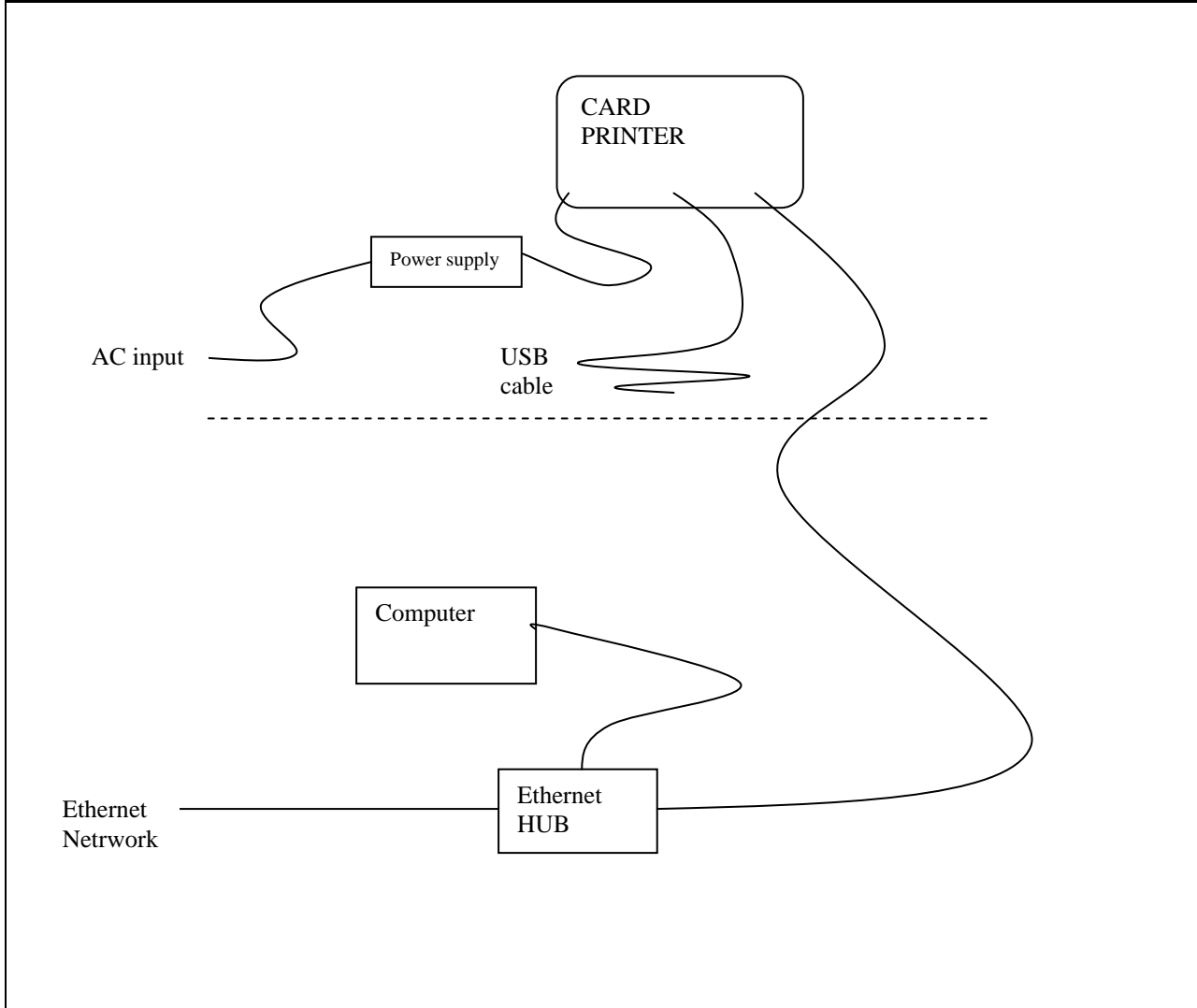
5/28/10

Test Plan/CDF Prepared By (please print)

Date

EMC Block Diagram Form

System Configuration Block Diagram -- Provide a line drawing identifying the EUT, simulators, support equipment, I/O cables, power cables, and any other pertinent components to be used during testing. Use a dashed line to separate the equipment in the testing field versus equipment outside testing field.



Authorization Signatures

Customer authorization to perform tests according to this test plan.

Steve Fitzsimmons

Test Plan/CDF Prepared By (please print)

Date

3/18/10

Date

Appendix B

Measurement Protocol



MEASUREMENT PROTOCOL

GENERAL INFORMATION

Test Methodology

Emissions testing is performed according to the procedures in ANSI C63.4-2003 & the article “The Measurement of Occupied Bandwidth” by Industry Canada’s certification bureau

Measurement Uncertainty

The test system for conducted emissions is defined as the LISN, tuned receiver or spectrum analyzer, and coaxial cable. The test system has a measurement uncertainty of ± 1.8 dB. The test system for radiated emissions is defined as the antenna, the pre-amplifier, the spectrum analyzer and the coaxial cable. The test system has a measurement uncertainty of ± 4.8 dB. The equipment comprising the test systems is calibrated on an annual basis.

Justification

The Equipment Under Test (EUT) is configured in a typical user arrangement in accordance with the manufacturer's instructions. A cable is connected to each available port and either terminated with a peripheral into its characteristic impedance or left unterminated. When appropriate, the cables are manually manipulated with respect to each other to obtain maximum emissions from the unit.

Conducted Emissions

The final level, in $\text{dB}\mu\text{V}$, equals the EMI receiver level plus the cable loss and LISN factor.

Radiated Emissions

The final level, in $\text{dB}\mu\text{V}/\text{m}$, equals the reading from the spectrum analyzer (Level $\text{dB}\mu\text{V}$), adding the antenna correction factor and cable loss factor (Factor dB) to it, and subtracting the preamp gain (and duty cycle correction factor, if applicable). This result then has the limit subtracted from it to provide the Delta, which gives the tabular data as shown in the data sheets in Attachment A.

Example:

| FREQ (MHz) | LEVEL ($\text{dB}\mu\text{V}$) | CABLE/ANT/PREAMP (dB) | FINAL ($\text{dB}\mu\text{V}/\text{m}$) | POL/HGT/AZ (m) (deg) | DELTA1 |
|---------------|-------------------------------------|--------------------------|--|-------------------------|--------|
| 60.80 | 42.5Qp + | 1.2 + 10.9 - 25.5 = | 29.1 | V 1.0 0.0 | -10.9 |

Test Equipment

All measurement instrumentation is traceable to the National Institute of Standards and Technology and is calibrated according to internal procedure.

DETAILS OF TEST PROCEDURES

Conducted Emissions

Conducted emissions on the 50 Hz and/or 60 Hz power interface of the EUT are measured in the frequency range of 150 kHz to 30 MHz. The measurements are performed using a receiver, which has CISPR characteristic bandwidth and quasi-peak detection, and a Line Impedance Stabilization Network (LISN), with 50 Ω /50 μ H (CISPR 16) characteristics. Table top equipment is placed on a non-conducting table 80 centimeters above the floor and is positioned 40 centimeters from the vertical ground plane (wall) of the screen room. In some cases, a pre-scan using a spectrum analyzer is initially performed on the units comprising the system under test to locate the highest emissions.

Radiated Emissions

Radiated emissions in the frequency range of 10 kHz to 30 MHz, including the fundamental transmit signal, are measured using a receiver capable of quasi-peak and average measurements and a magnetic loop antenna. The transmitter is rotated through 3 orthogonal axes in order to determine the maximum emission levels. If the signal cannot be measured at the specified limit distance, measurements are recorded at multiple distances nearer to the device and the final level mathematically extrapolated. Radiated emissions from the EUT are measured in the frequency range of 30 to 1000 MHz using a spectrum analyzer and appropriate broadband linearly polarized antennas. Measurements between 30 MHz and 1000 MHz are made with 120 kHz/6 dB bandwidth and quasi-peak detection and measurements above 1000 MHz are made with a 1 MHz/6 dB bandwidth and peak detection. Floor standing equipment is placed directly on the turntable/ground plane. Interface cables that are closer than 40 centimeters to the ground plane are bundled in the center in a serpentine fashion so they are at least 40 centimeters from the ground plane. Cables to simulators/testers (if used in this test) are routed through the center of the table and to a screen room located outside the test area. The antenna is positioned 3, 10 or 30 meters horizontally from the EUT. To locate maximum emissions from the test sample the antenna is varied in height from 1 to 4 meters, measurement scans are made with both horizontal and vertical antenna polarizations and the EUT are rotated 360 degrees.