



Engineering Solutions & Electromagnetic Compatibility Services

FCC 15.231 Test Data

for

Model: RE353

433.92 MHz Outdoor PIR

(RTL barcode: 20558)

for

Resolution Engineering

Report #: 2012102

Test Engineer: Jon Wilson

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These tests are accredited and meet the requirements of ISO/IEC 17025 as verified by ANSI-ASQ National Accreditation Board/ACLASS. Refer to certificate and scope of accreditation AT-1445.

Description of testing presented in this test report

The data and limits presented in this report are for peak emissions limiting per 15.231(b)(2) which references 15.35(b), and peak limiting for restricted bands per 15.209(e) which again references 15.35(b)(2), as procured by Resolution Engineering. No average data is presented in this report. Data is also presented for spurious, non-harmonic radiated emissions per 15.209.

Radiated Emissions Test Data – FCC Limits / 3m Distance

| Emission Frequency (MHz) | Test Detector | Antenna Polarity (H/V) | Analyzer Reading (dBuV) | Site Correction Factor (dB/m) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Pass/Fail |
|---------------------------------|----------------------|-------------------------------|--------------------------------|--------------------------------------|--------------------------------|-----------------------|--------------------|------------------|
| 216.968 | Qp | V | 40.1 | -21.7 | 18.4 | 46.0 | -27.6 | Pass |
| 325.445 | Qp | V | 39.1 | -14.6 | 24.5 | 46.0 | -21.5 | Pass |
| 420.355 | Qp | V | 33.0 | 4.9 | 37.9 | 46.0 | -8.1 | Pass |
| 433.950* | Peak | H | 65.2 | 30.5 | 95.7 | 100.8 | -5.1 | Pass |
| 454.744 | Qp | V | 33.1 | 2.1 | 35.2 | 46.0 | -10.8 | Pass |
| 542.563 | Qp | V | 35.9 | -5.1 | 30.8 | 46.0 | -15.2 | Pass |
| 651.274 | Qp | H | 35.1 | -6.9 | 28.2 | 46.0 | -17.8 | Pass |
| 867.833 | Peak | V | 46.7 | -3.2 | 43.5 | 80.8 | -37.3 | Pass |
| 1301.773 | Peak | H | 49.8 | 3.4 | 53.2 | 74.0 | -20.8 | Pass |
| 1735.693 | Peak | V | 41.6 | 7.8 | 49.4 | 80.8 | -31.4 | Pass |
| 2169.605 | Peak | H | 60.7 | -14.3 | 46.4 | 80.8 | -34.4 | Pass |
| 2603.525 | Peak | V | 70.4 | -14.7 | 55.7 | 80.8 | -25.1 | Pass |
| 3037.445 | Peak | H | 67.0 | -14.2 | 52.8 | 80.8 | -28.0 | Pass |
| 3471.365 | Peak | V | 76.2 | -13.3 | 62.9 | 80.8 | -17.9 | Pass |
| 3905.285 | Peak | H | 52.0 | -13.5 | 38.5 | 74.0 | -35.5 | Pass |
| 4339.205 | Peak | V | 58.0 | -7.6 | 50.4 | 74.0 | -23.6 | Pass |

* *fundamental*

Test Procedure

Radiated fundamental and spurious emissions were tested at three meters. The EUT was tested in the three orthogonal planes with the receive antenna in both polarities. The emissions were maximized per ANSI C63.4:2003 8.3.1.2; that is, the measurement antenna height was varied between 1 and 4 m, and the EUT was rotated through 360° on a rotating turntable until the maximum emissions were found. Both horizontal and vertical measurement antenna polarizations were used. A resolution bandwidth of 100 kHz was used for frequencies less than 1000 MHz, and a resolution bandwidth of 1 MHz was used for frequencies greater than or equal to 1000 MHz. The video bandwidth was set to a value at least three times greater than the resolution bandwidth.


EUT Disposition

The EUT was adapted to continuously transmit for testing purposes.

Radiated Emissions Test Equipment – 2012 testing

| Part | Manufacturer | Model | Serial Number | RTL Bar Code | Calibration Due Date |
|---|-------------------------------|---------------------------|---------------|--------------|----------------------|
| Amplifier (20 MHz-2 GHz) | Rhein Tech Laboratories, Inc. | PR-1040 | 900905 | 900905 | 4/10/12 |
| Spectrum Analyzer (100 Hz-22 GHz) | Hewlett Packard | HP-8566B | 3138A07771 | 900930 | 9/13/12 |
| Bilog Periodic Antenna (25 MHz-2 GHz) | Schaffner Chase | CBL6112 | 2099 | 900791 | 12/12/12 |
| EMI Receiver RF Section (9 KHz-6.5 GHz) | Hewlett Packard | 85462A | 3325A00159 | 900913 | 6/8/12 |
| RF Filter Section (100 KHz-6.5 GHz) | Hewlett Packard | 85460A | 3330A00107 | 900914 | 6/8/12 |
| Amplifier (1 GHz-26.0 GHz) | Rhein Tech Laboratories, Inc. | PR-1042 | N/A | 901364 | 7/14/12 |
| Horn Antenna (2.0-4.0 GHz) | EMCO | 3161-02 | 9804-1044 | 900772 | 6/13/12 |
| Horn Antenna (4.0-8.0 GHz) | EMCO | 3161-03 | 9508-1020 | 900321 | 6/13/12 |
| Emissions Testing Software | Rhein Tech Laboratories, Inc. | Automated Emission Tester | Rev. 14.0.2 | N/A | N/A |

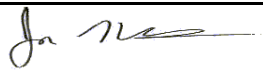
Test Personnel:

| | | |
|---------------|---|---------------|
| Jon Wilson |  | March 26 2012 |
| Test Engineer | Signature | Date of Test |

Radiated Emissions Test Equipment – 2013 testing

| Part | Manufacturer | Model | Serial Number | RTL Bar Code | Calibration Due Date |
|---|-------------------------------|---------------------------|---------------|--------------|----------------------|
| Amplifier (20 MHz-2 GHz) | Rhein Tech Laboratories, Inc. | PR-1040 | 900905 | 900905 | 8/20/2013 |
| Bilog Periodic Antenna (25 MHz-2 GHz) | Schaffner Chase | CBL6112 | 2099 | 900791 | 2/2/2014 |
| EMI Receiver RF Section (9 kHz-6.5 GHz) | Hewlett Packard | 85462A | 3325A00159 | 900913 | 9/20/2013 |
| RF Filter Section (100 kHz-6.5 GHz) | Hewlett Packard | 85460A | 3330A00107 | 900914 | 9/20/2013 |
| Spectrum Analyzer | Rohde & Schwarz | FSU | 1166.1660.50 | 901581 | 6/4/2013 |
| Amplifier (1 GHz–26.0 GHz) | Rhein Tech Laboratories, Inc. | PR-1042 | N/A | 901364 | 9/28/2013 |
| Horn Antenna (2.0-4.0 GHz) | EMCO | 3161-02 | 9804-1044 | 900772 | 4/20/2015 |
| Horn Antenna (4.0-8.2 GHz) | EMCO | 3161-03 | 9508-1020 | 900321 | 4/20/2015 |
| Emissions Testing Software | Rhein Tech Laboratories, Inc. | Automated Emission Tester | Rev. 14.0.2 | N/A | N/A |

Test Personnel:

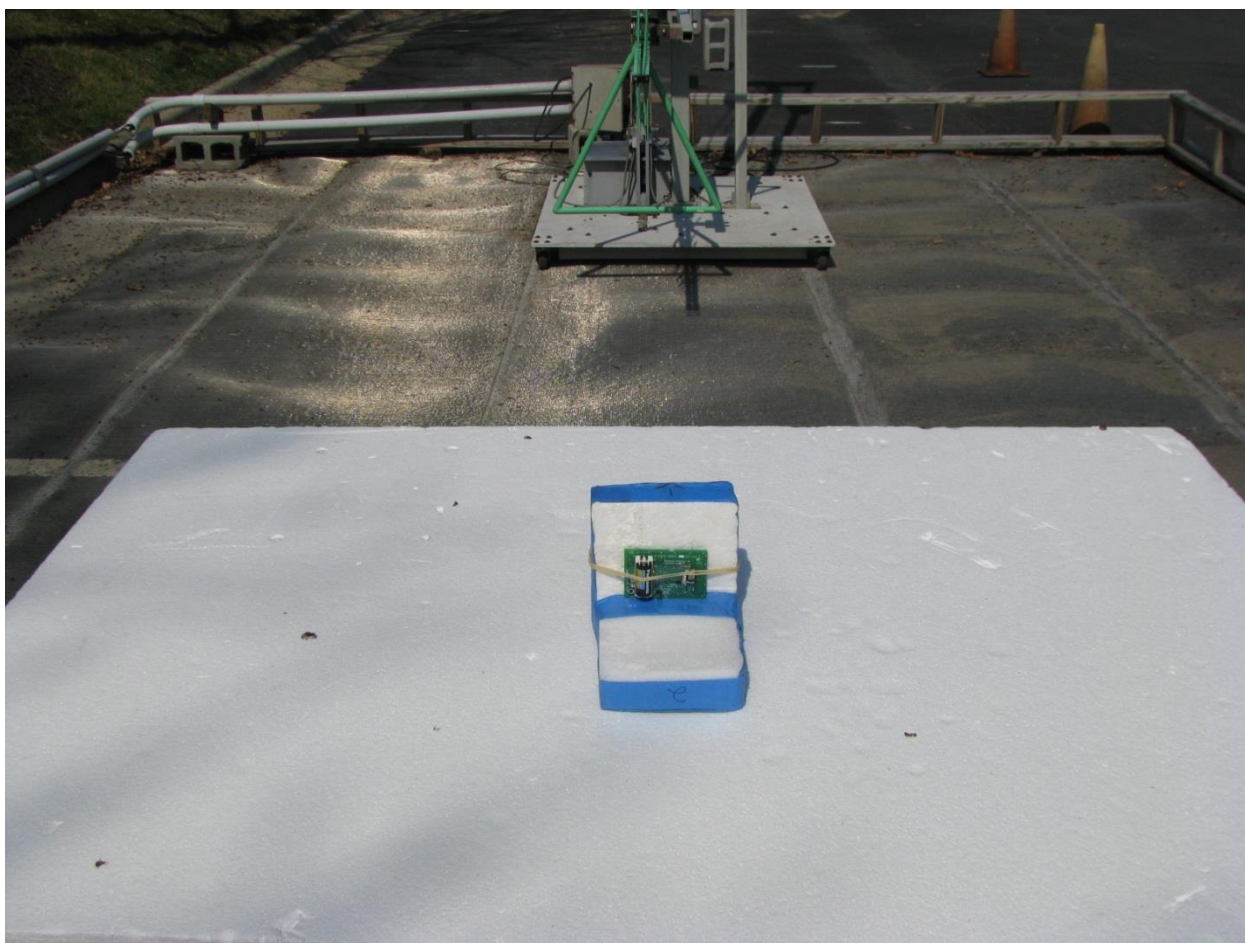
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|---------------|---|---------------|
| Jon Wilson |  | April 4, 2013 |
| Test Engineer | Signature | Date of Test |

FCC/IC Cross Reference

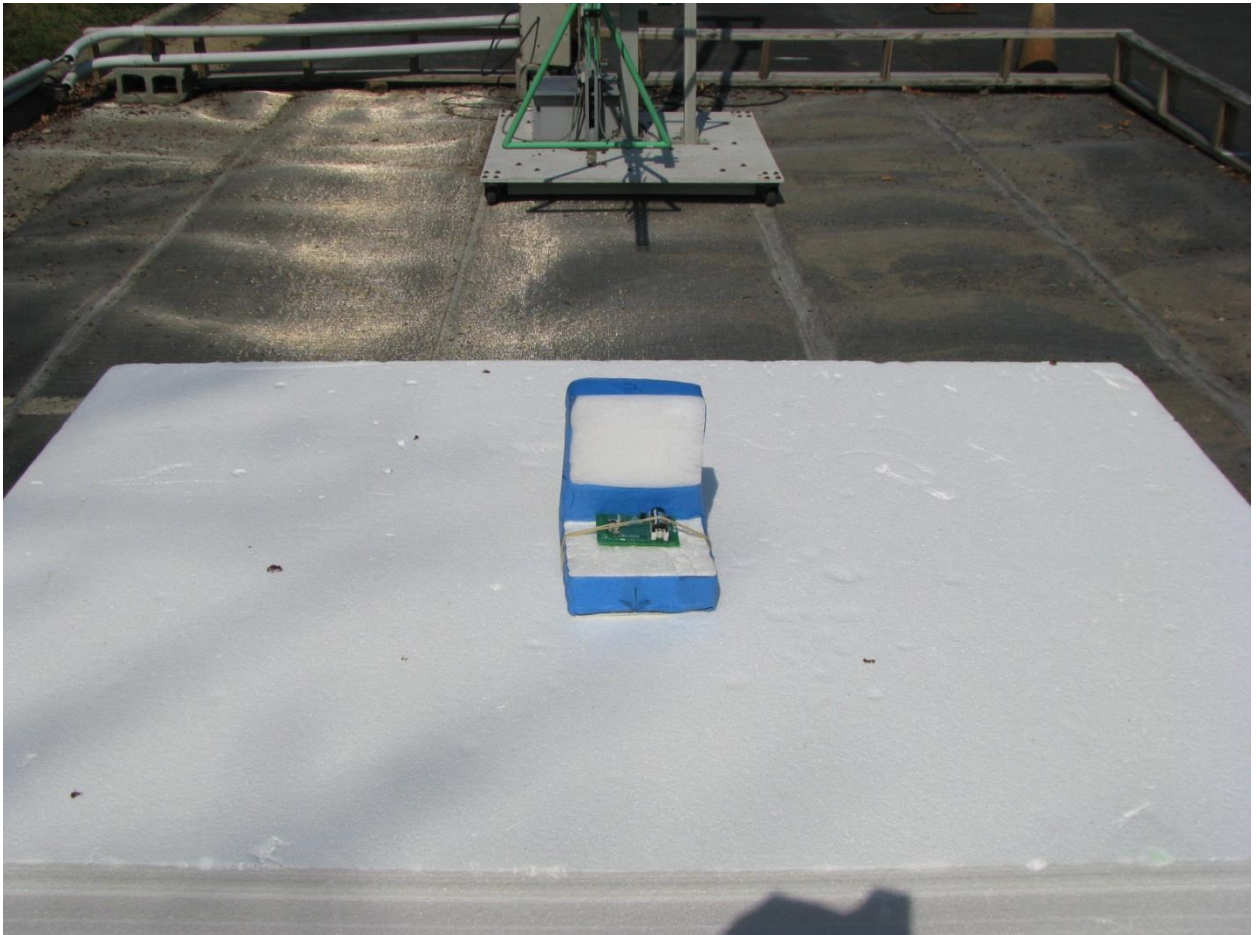
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|------------------|-----------------------|
| FCC 15.231(b)(2) | RSS-210 Issue 8 A1.1 |
| FCC 15.35(b) | RSS-Gen Issue 3 7.2.3 |
| FCC 15.205 | RSS-Gen Issue 3 7.2.2 |
| FCC 15.209 | RSS-Gen Issue 3 7.2.5 |

Test Configuration Photographs

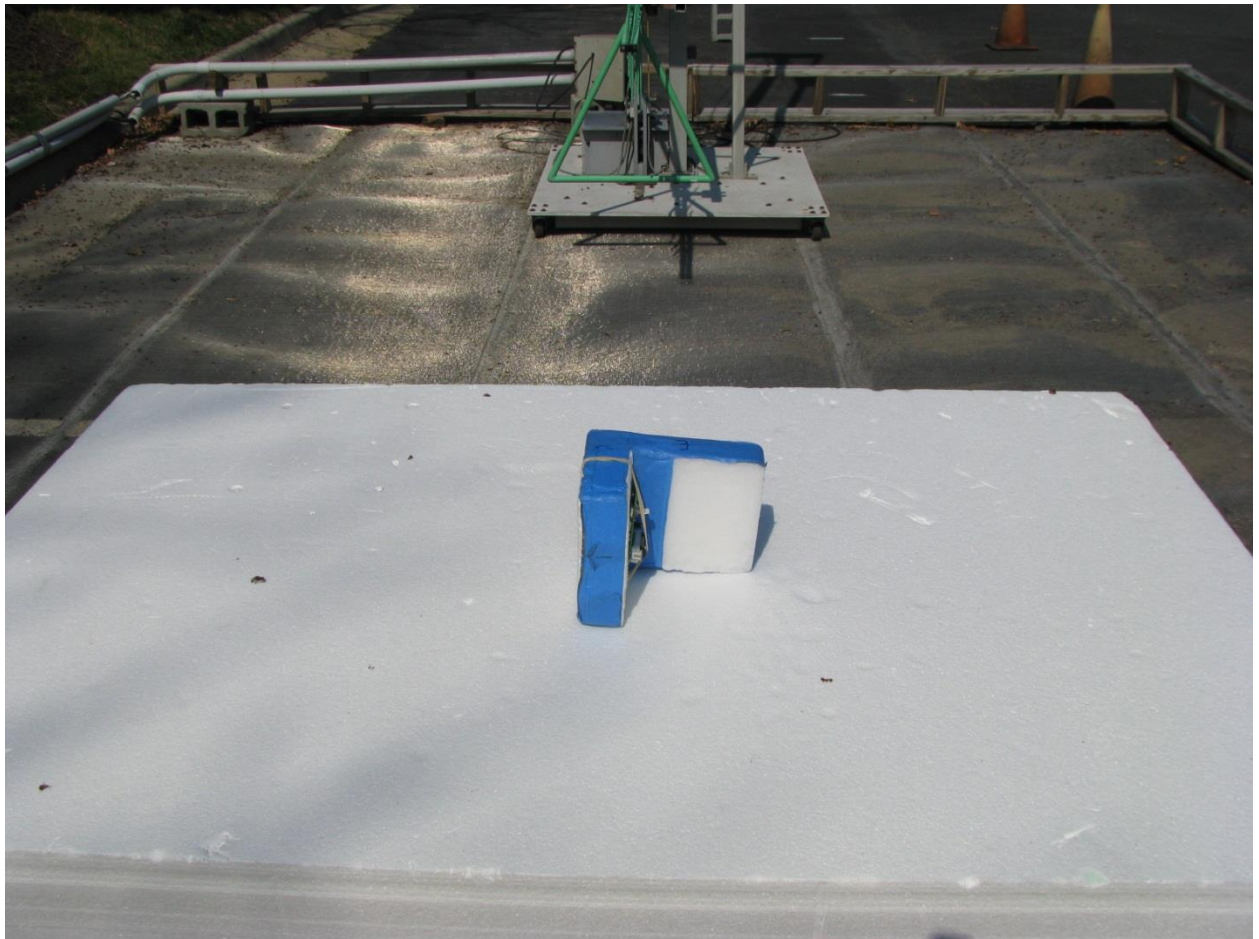
X-Axis



Y-Axis



Z-Axis



EUT Photograph

