# Spider Tracks Limited

**REVISED TEST REPORT FOR**

## Spider 8

**Tested To The Following Standard(s)/Specification(s):**
**RTCA/DO-160F (2007)**

**Sections:**
**15, 21.4 and 21.5**

**Report No.: 97584-3A**

**Date of issue: September 19, 2017**

**CKC Laboratories, Inc.**

**We strive to create long-term, trust based relationships by providing sound, adaptive, customer first testing services. We embrace each of our customers' unique EMC challenges, not as an interruption to set processes, but rather as the reason we are in business.**

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# ADMINISTRATIVE INFORMATION

## Test Report Information

| **REPORT PREPARED FOR:** | **REPORT PREPARED BY:** |
|---|---|
| Spider Tracks Limited<br>203/150 Karangahape Rd.<br>Auckland 1010<br>New Zealand | Joyce Walker<br>CKC Laboratories, Inc.<br>5046 Sierra Pines Drive<br>Mariposa, CA 95338 |
| Representative: Luke McCarthy | Project Number: 97584 |
| **DATE OF EQUIPMENT RECEIPT:** | October 06, 2015 |
| **DATE(S) OF TESTING:** | October 06 - 07, 2015 |

**SCOPE :** To demonstrate testing of the Spider 7, Spider 7 Internal Antenna meets the requirements for RTCA/DO-160F.

**Revision A:** To change the UUT name from Spider 7, Spider 7 Internal Antenna to Spider 8 and update the representive's name. See Appendix A for manufacturer's declaration statement.

**APPLICABLE DOCUMENTS:**

- RTCA/DO-160F (December 6, 2007) Environmental Conditions and Test Procedures for Airborne Equipment.

## Report Authorization

The test data contained in this report documents the observed testing parameters pertaining to and are relevant for only the sample equipment tested in the agreed upon operational mode(s) and configuration(s) as identified herein. Compliance assessment remains the client's responsibility. This report may not be used to claim product endorsement by A2LA or any government agencies. This test report has been authorized for release under quality control from CKC Laboratories, Inc.

/ S / Steve Behm
***Steve Behm***
***Director of Quality Assurance & Engineering Services***
***CKC Laboratories, Inc.***

# Test Facility Information

Our laboratories are configured to effectively test a wide variety of product types. CKC utilizes first class test equipment, anechoic chambers, data acquisition and information services to create accurate, repeatable and affordable test results.

TEST LOCATION(S):
CKC Laboratories, Inc.
22116 23rd Drive S.E., Suite A
Bothell, WA 98021-4413

**Bothell - Semi-Anechoic Military/Aerospace EMC Chamber descriptions:**

CKC Laboratories, Inc. operates three solid wall semi-anechoic chambers and one fully-anechoic chamber at their Bothell, Washington facility located in the Canyon Park business park. These chambers have attached solid wall ante-rooms for placement of support equipment and assisting in reducing ambient RF Emissions and RF leakage during RF susceptibility testing. The largest chamber does not have a solid wall ante-room.

Testing for this project was performed in the fully-anechoic C1 chamber. The dimensions of fully-anechoic chambers used for all Military/Aerospace EMC testing are as follows:
CP-C1: Chamber is 30'w x 16'd x 11'h

The shielded enclosures are designed to attenuate radio frequency noise over 100 dB up to 1GHz, and over 70 dB up to 40GHz.

The walls and ceiling of the semi-anechoic chambers have been treated with RF absorbing ferrite tiles and 1 foot RF absorbing cones in order to achieve uniform RF absorption from 10MHz to 40GHz. The minimum absorption performance at normal incidence exceeds the requirements of DO-160F Section 20 paragraph 20.3.b.(5) and table 20-3 as shown below:

| | | | |
|---|---|---|---|
| 10MHz | ≥9dB | 425MHz | ≥38dB |
| 80MHz | ≥17dB | 1GHz | ≥25dB |
| 250MHz | ≥27dB | 40GH | ≥30dB |

All input power to the room is filtered at its point of entry. The filters provide 100dB of insertion loss over the frequency range of 10kHz to 40GHz.

## Ground Plane descriptions:

The ground plane used for all EMC testing is bonded to a wooden test bench. The dimensions are as follows:
CP-C1: 12’ long x 3.5’ deep x 0.025” thick copper bonded to bench surface.

The ground planes are bonded to the shielded enclosure wall at a minimum of once every 20 inches using copper bonding straps 12” in length x 4” in width exceeding the 5:1 length to width ratio requirements of DO-160F Section 20 para 20.3.a.(1).

## Software Versions

**CKC EMITest Emissions: 5.02.00**
**CKC Immunity: 5.02.00**
**NEXIO BAT-EMC: 3.10.0.14**

# UNIT UNDER TEST (UUT) DESCRIPTION

The following UUT was tested by CKC Laboratories: **Spider 7**

Since the time of testing the manufacturer has chosen to use the following UUT name in its place. **Spider 8**
See Appendix A for manufacturer's declaration statement.

The Spider 8 contains the PCB Board listed below.

### UNIT UNDER TEST

**Spider 8**
Manuf: Spider Tracks Limited
Model: Spider 8 Internal Antenna
Serial: 2015BETA33

**PCB Board**
Manuf: Spider Tracks Limited
Model: V3.5
Serial: N/A

### PERIPHERAL DEVICES

The UUT was not tested with peripheral devices.

## Mode / Configuration

| Mode/Configuration Definitions | |
|---|---|
| **Mode/Configuration** | **Definition/Description** |
| 1 | Transmitting location data via Iridium. Bluetooth low energy transmitter is operational |
| | |

# SUMMARY OF RESULTS

## Standard / Specification: RTCA/DO-160F

| Test Description | Results | Category | Outcome |
|---|---|---|---|
| 15 - Magnetic Effect | A deflection of 1° was not observed on any of the surfaces tested, which meets the requirements for Category Z. The surfaces of the UUT tested were as follows: front, back, top, bottom left side and right sides. | **Z** | **PASS** |
| | | | |
| 21.4 - Conducted Emission of Radio Frequency Energy | The UUT exhibited no emissions exceeding the limit from 150kHz to 152MHz on the 28VDC Power Line and the Return line. | **M** | **PASS** |
| | | | |
| 21.5 - Radiated Emission of Radio Frequency Energy | The UUT exhibited no emissions exceeding the limit from 100MHz to 6GHz in horizontal and vertical antenna polarizations. | **M** | **PASS** |
| | | | |

## Bonding Resistance Measurements

**Bonding Resistance Measurements:**
UUT was isolated 5cm above the EMI Ground Plane, therefore no Bonding Resistance Measurements were required.

# RTCA/DO-160F

## Section 15 – Magnetic Effect Category Z

| Test Equipment | | | | | |
|---|---|---|---|---|---|
| **Asset** | **Description** | **Manufacturer** | **Model** | **Cal Date** | **Cal Due** |
| 02566 | Compass, 1 Degree | Weems & Plath | None | 06/10/15 | 06/10/17 |
| 03273 | Gaussmeter | FW Bell | 6010 | 12/13/13 | 12/13/15 |
| P06220 | Zero Gauss Chamber | FW Bell | YA-112 | 02/26/14 | 02/26/16 |
| 03442 | Probe | Meggitt | MOW61-2506-05 | 12/13/13 | 12/13/15 |

**Test Procedure**

With the UUT and its cabling oriented along a magnetic west to east axis, the 1° degree resolution magnetic compass was placed 3.0 meters from the UUT. The UUT was turned ON and a reference reading was made. The UUT was moved from east to west towards the compass until a 1° needle deflection was observed or the compass and/or UUT to compass gap was 0 cm.

The UUT was rotated so that its left side faced the compass. The UUT was returned to the 3-meter distance and the test was repeated. Testing was also repeated with the back and right sides of the UUT facing the compass. Then, the UUT was laid down so the top was facing the compass and testing was repeated. The UUT was rotated so the bottom was facing the compass and the test was repeated.

A deflection of 1° was not observed on any of the surfaces tested, meeting the requirements for **Category Z.** DO-160G Section 15 is based on a Horizontal Intensity of 14.4 A/m ±10%.

**Horizontal Intensity of the test site is:** 15.6A/m.

$$Dc = \frac{14.4}{\text{Horizontal Component of Ambient Field Strength}}$$

| Test Results | | |
|---|---|---|
| **Mode/Config #** | **Surface** | **Measurement m** |
| 1 | Front surface | Never reached 1° deflection |
| 1 | Right surface | Never reached 1° deflection |
| 1 | Back surface | Never reached 1° deflection |
| 1 | Left surface | Never reached 1° deflection |
| 1 | Top surface | Never reached 1° deflection |
| 1 | Bottom surface | Never reached 1° deflection |

**Section 15 Magnetic Effect Test Setup Photos**


Section 15 - Gauss Meter Reading


Section 15 - Magnetic Effects, View 1


Section 15 - Magnetic Effects, View 2


Section 15 - Magnetic Effects, View 3


Section 15 - Magnetic Effects, View 4

Section 15 - Magnetic Effects, View 5

Section 15 - Magnetic Effects, View 6

# Section 21.4 – Conducted Emission of Radio Frequency Energy Category M

## Test Equipment

**See data sheets for Test Equipment**

**Test Procedure**

With the UUT on the ground plane and all the cables under test on 5 cm standoffs, the power was routed to the UUT through Line Impedance Stabilization Networks (LISNs). The current probe was clamped around the test lead/cable 5cm from the UUT. A scan of the emissions was made from 150kHz to 152MHz. Testing was repeated as necessary for the modes/configurations and/or leads/cables tested in the table below.

## Test Results

| Mode/Config # | Lead/Cable Tested | Seq # | Results | Cat |
|---|---|---|---|---|
| 1 | +28Vdc | 7 | Pass | M |
| 1 | Return | 8 | Pass | M |

**Section 21.4 Conducted RF Emissions Test Setup Photos**


Section 21.4 - 28VDC Input Power Lead


Section 21.4 - Return Lead

## Section 21.4 Test Data

| | | | |
|---|---|---|---|
| Test Location: | CKC Laboratories, Inc. • 22116 23rd Dr SE, Suite A • Bothell, WA 98021 • (425) 402-1717 | | |
| Customer: | **Spider Tracks Limited** | | |
| Specification: | **RTCA/DO-160F Section 21.4, Category M, Power Lines** | | |
| Work Order #: | **97584** | Date: | 10/6/2015 |
| Test Type: | **Conducted Emissions** | Time: | 12:28:55 PM |
| Tested By: | Steven Pittsford | Sequence#: | 7 |
| Software: | EMITest 5.02.00 | | 28VDC |

***Equipment Tested:***

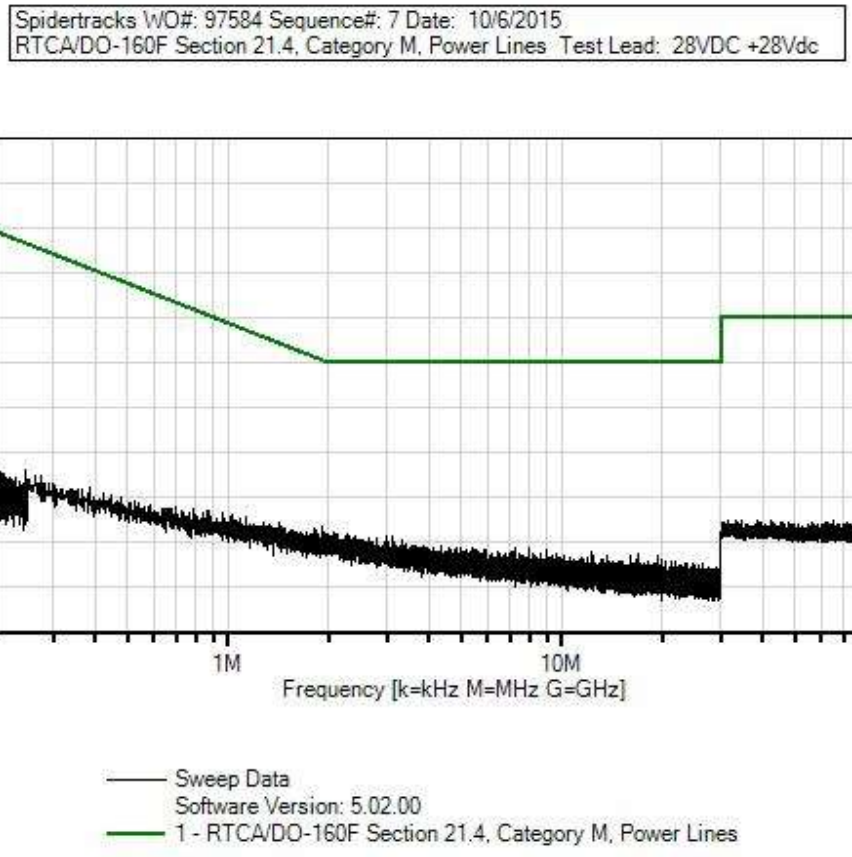
| Device | Manufacturer | Model # | S/N |
|---|---|---|---|
| Spider 7 | Spider Tracks Limited | Spider 7 Internal Antenna | 2015BETA33 |
| Spider 7 contains PCB board | Spider Tracks Limited | V3.5 | N/A |

***Support Equipment:***

| Device | Manufacturer | Model # | S/N |
|---|---|---|---|

***Test Conditions / Notes:***

Frequency: 150k-152MHz




***Test Equipment:***

| ID | Asset #/Serial # | Description | Model | Calibration Date | Cal Due Date |
|---|---|---|---|---|---|
| T1 | ANP05333 | Cable | Heliax | 8/27/2015 | 8/27/2017 |
| T2 | ANP05960 | Cable | Heliax 1/4 | 9/11/2015 | 9/11/2017 |
| T3 | AN02814 | Current Probe | F-51 | 2/25/2014 | 2/25/2016 |
| | AN03438 | 5uH LISN-Amplitude (dB) | 9117-5-TS-50-N | 10/30/2013 | 10/30/2015 |
| | AN03439 | 5uH LISN-Amplitude (dB) | 9117-5-TS-50-N | 10/30/2013 | 10/30/2015 |
| | AN00582 | Feed Through Capacitor | 6512-106R | 3/21/2014 | 3/21/2016 |
| | ANP06031 | Feed Through Capacitor | 6512-106R | 3/21/2014 | 3/21/2016 |
| | AN02870 | Spectrum Analyzer | E4440A | 1/6/2014 | 1/6/2016 |

***Measurement Data:*** Reading listed by margin. Test Lead: +28Vdc

| # | Freq MHz | Rdng dBµV | T1 dB | T2 dB | T3 dB | dB | Dist Table | Corr dBµA | Spec dBµA | Margin dB | Polar Ant |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1.905M | -4.9 | +0.1 | +0.0 | -11.8 | | +0.0 | -16.6 | 20.6 | -37.2 | +28Vd |
| 2 | 30.000M | 0.2 | +0.3 | +0.1 | -18.0 | | +0.0 | -17.4 | 20.0 | -37.4 | +28Vd |
| 3 | 1.950M | -5.6 | +0.1 | +0.0 | -11.9 | | +0.0 | -17.4 | 20.3 | -37.7 | +28Vd |
| 4 | 2.061M | -5.8 | +0.1 | +0.0 | -12.1 | | +0.0 | -17.8 | 20.0 | -37.8 | +28Vd |
| 5 | 1.994M | -6.1 | +0.1 | +0.0 | -12.0 | | +0.0 | -18.0 | 20.0 | -38.0 | +28Vd |
| 6 | 2.282M | -5.6 | +0.1 | +0.0 | -12.6 | | +0.0 | -18.1 | 20.0 | -38.1 | +28Vd |
| 7 | 2.116M | -6.1 | +0.1 | +0.0 | -12.2 | | +0.0 | -18.2 | 20.0 | -38.2 | +28Vd |
| 8 | 2.415M | -5.6 | +0.1 | +0.0 | -12.8 | | +0.0 | -18.3 | 20.0 | -38.3 | +28Vd |
| 9 | 1.803M | -5.5 | +0.1 | +0.0 | -11.6 | | +0.0 | -17.0 | 21.3 | -38.3 | +28Vd |
| 10 | 1.840M | -5.6 | +0.1 | +0.0 | -11.7 | | +0.0 | -17.2 | 21.1 | -38.3 | +28Vd |
| 11 | 2.011M | -6.6 | +0.1 | +0.0 | -12.0 | | +0.0 | -18.5 | 20.0 | -38.5 | +28Vd |
| 12 | 2.994M | -5.1 | +0.1 | +0.0 | -13.5 | | +0.0 | -18.5 | 20.0 | -38.5 | +28Vd |
| 13 | 2.310M | -6.1 | +0.1 | +0.0 | -12.6 | | +0.0 | -18.6 | 20.0 | -38.6 | +28Vd |
| 14 | 3.122M | -5.1 | +0.1 | +0.0 | -13.6 | | +0.0 | -18.6 | 20.0 | -38.6 | +28Vd |
| 15 | 2.238M | -6.3 | +0.1 | +0.0 | -12.5 | | +0.0 | -18.7 | 20.0 | -38.7 | +28Vd |

| | | | |
|---|---|---|---|
| Test Location: | CKC Laboratories, Inc. • 22116 23rd Dr SE, Suite A • Bothell, WA 98021 • (425) 402-1717 | | |
| Customer: | **Spider Tracks Limited** | | |
| Specification: | **RTCA/DO-160F Section 21.4, Category M, Power Lines** | | |
| Work Order #: | **97584** | Date: | 10/6/2015 |
| Test Type: | **Conducted Emissions** | Time: | 1:02:58 PM |
| Tested By: | Steven Pittsford | Sequence#: | 8 |
| Software: | EMITest 5.02.00 | | 28VDC |

***Equipment Tested:***

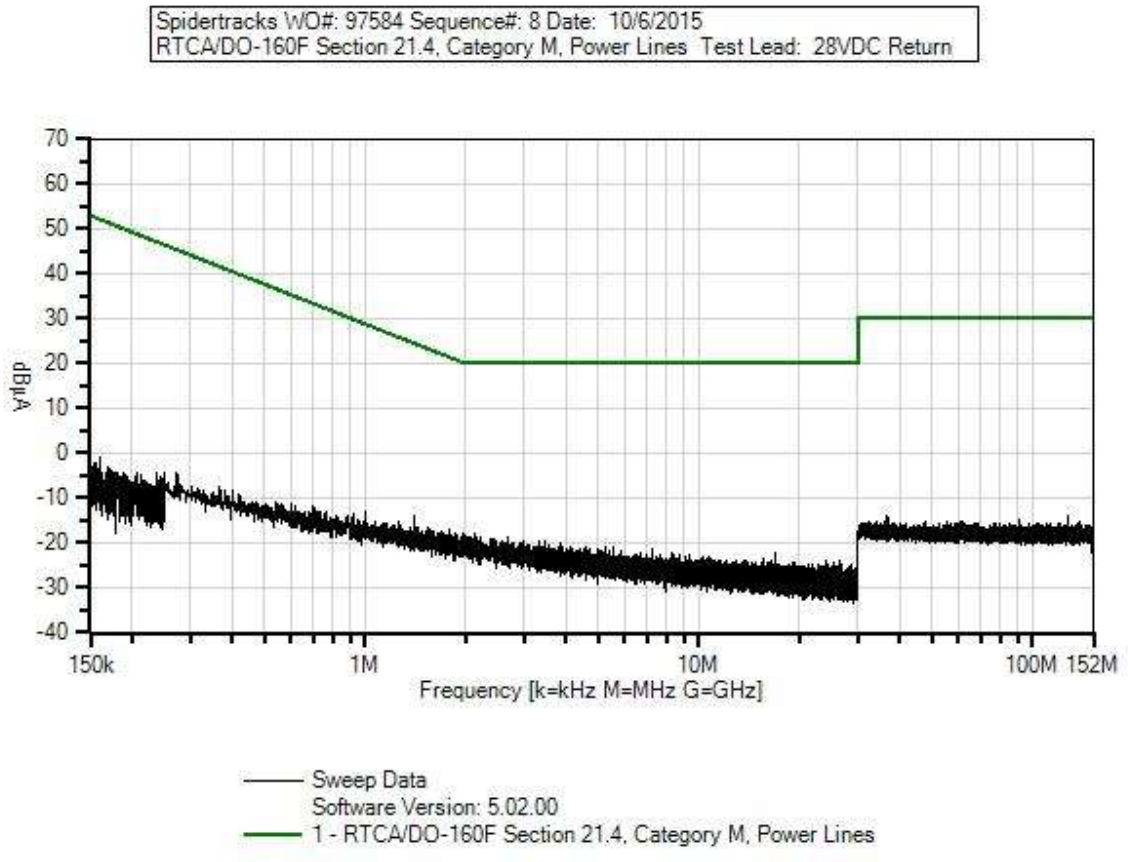
| Device | Manufacturer | Model # | S/N |
|---|---|---|---|
| Spider 7 | Spider Tracks Limited | Spider 7 Internal Antenna | 2015BETA33 |
| Spider 7 contains PCB board | Spider Tracks Limited | V3.5 | N/A |

***Support Equipment:***

| Device | Manufacturer | Model # | S/N |
|---|---|---|---|

***Test Conditions / Notes:***

Frequency: 150k-152MHz




***Test Equipment:***

| ID | Asset #/Serial # | Description | Model | Calibration Date | Cal Due Date |
|---|---|---|---|---|---|
| T1 | ANP05333 | Cable | Heliax | 8/27/2015 | 8/27/2017 |
| T2 | ANP05960 | Cable | Heliax 1/4 | 9/11/2015 | 9/11/2017 |
| T3 | AN02814 | Current Probe | F-51 | 2/25/2014 | 2/25/2016 |
| | AN03438 | 5uH LISN-Amplitude (dB) | 9117-5-TS-50-N | 10/30/2013 | 10/30/2015 |
| | AN03439 | 5uH LISN-Amplitude (dB) | 9117-5-TS-50-N | 10/30/2013 | 10/30/2015 |
| | AN00582 | Feed Through Capacitor | 6512-106R | 3/21/2014 | 3/21/2016 |
| | ANP06031 | Feed Through Capacitor | 6512-106R | 3/21/2014 | 3/21/2016 |
| | AN02870 | Spectrum Analyzer | E4440A | 1/6/2014 | 1/6/2016 |

***Measurement Data:*** Reading listed by margin. Test Lead: Return

| # | Freq MHz | Rdng dBµV | T1 dB | T2 dB | T3 dB | dB | Dist Table | Corr dBµA | Spec dBµA | Margin dB | Polar Ant |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 30.000M | 0.5 | +0.3 | +0.1 | -18.0 | | +0.0 | -17.1 | 20.0 | -37.1 | Retur |
| 2 | 2.138M | -5.3 | +0.1 | +0.0 | -12.3 | | +0.0 | -17.5 | 20.0 | -37.5 | Retur |
| 3 | 1.975M | -5.9 | +0.1 | +0.0 | -12.0 | | +0.0 | -17.8 | 20.2 | -38.0 | Retur |
| 4 | 1.407M | -3.3 | +0.1 | +0.0 | -10.6 | | +0.0 | -13.8 | 24.5 | -38.3 | Retur |
| 5 | 1.784M | -5.3 | +0.1 | +0.0 | -11.6 | | +0.0 | -16.8 | 21.5 | -38.3 | Retur |
| 6 | 2.221M | -6.1 | +0.1 | +0.0 | -12.4 | | +0.0 | -18.4 | 20.0 | -38.4 | Retur |
| 7 | 2.025M | -6.5 | +0.1 | +0.0 | -12.1 | | +0.0 | -18.5 | 20.0 | -38.5 | Retur |
| 8 | 1.873M | -6.1 | +0.1 | +0.0 | -11.7 | | +0.0 | -17.7 | 20.8 | -38.5 | Retur |
| 9 | 1.859M | -6.0 | +0.1 | +0.0 | -11.7 | | +0.0 | -17.6 | 20.9 | -38.5 | Retur |
| 10 | 2.081M | -6.5 | +0.1 | +0.0 | -12.2 | | +0.0 | -18.6 | 20.0 | -38.6 | Retur |
| 11 | 2.663M | -5.6 | +0.1 | +0.0 | -13.1 | | +0.0 | -18.6 | 20.0 | -38.6 | Retur |
| 12 | 2.036M | -6.7 | +0.1 | +0.0 | -12.1 | | +0.0 | -18.7 | 20.0 | -38.7 | Retur |
| 13 | 2.160M | -6.6 | +0.1 | +0.0 | -12.3 | | +0.0 | -18.8 | 20.0 | -38.8 | Retur |
| 14 | 1.938M | -6.7 | +0.1 | +0.0 | -11.9 | | +0.0 | -18.5 | 20.4 | -38.9 | Retur |
| 15 | 2.381M | -6.3 | +0.1 | +0.0 | -12.8 | | +0.0 | -19.0 | 20.0 | -39.0 | Retur |

# Section 21.5 – Radiated Emission of Radio Frequency Energy Category M

| Deviates from Standard / Customer Test Procedure |
|---|
| No |
| **Justification of UUT's worst case orientation**<br>*(If all UUT apertures are not exposed to the receive antenna, justification must be documented in the test report.)*<br>**All UUT apertures are exposed to the receive antenna.** |

## Test Equipment

**See data sheets for Test Equipment**

**Test Procedure**

The UUT was powered up. The measurement antenna was placed 1 meter in front of the UUT, at a centered height of 0.3m above the EMI Ground Plane and was connected into the measurement system. The EMITest™ software automatically scanned across the frequency ranges in both horizontal and vertical antenna polarizations. Antennas were changed as necessary to complete the entire range as shown in the Results Table below. Scans were repeated for each conf/mode as listed below.

**Antenna Positions**

| Freq Range | Antenna Position # | Description (Include Distances) |
|---|---|---|
| 100-6000MHz | 1 | Centered on the UUT 1 meter away |
| | | |

**Test Results**

| Mode / Config # | Frequency Range | Polarity | Antenna Position | Seq # | Results | Cat |
|---|---|---|---|---|---|---|
| 1 | 100-200MHz | Horizontal | 1 | 1 | Pass | M |
| 1 | 100-200MHz | Vertical | 1 | 2 | Pass | M |
| 1 | 200-1000MHz | Horizontal | 1 | 3 | Pass | M |
| 1 | 200-1000MHz | Vertical | 1 | 4 | Pass | M |
| 1 | 1-6GHz | Horizontal | 1 | 5 | Pass | M |
| 1 | 1-6GHz | Vertical | 1 | 6 | Pass | M |

**Section 21.5 Radiated RF Emissions Test Setup Photos**

Section 21.5 - Bicon Antenna, 100 - 200MHz, Horizontal Polarization

Section 21.5 - Bicon Antenna, 100 - 200MHz, Vertical Polarization


Section 21.5 - Log Antenna, 200MHz - 1GHz, Horizontal Polarization


Section 21.5 - Log Antenna, 200MHz - 1GHz, Vertical Polarization


Section 21.5 - HF Horn Antenna, 1 - 6GHz, Horizontal Polarization


Section 21.5 - HF Horn Antenna, 1 - 6GHz, Vertical Polarization

## Section 21.5 Test Data Sheets

| | | | |
|---|---|---|---|
| Test Location: | CKC Laboratories, Inc. • 22116 23rd Dr SE, Suite A • Bothell, WA 98021 • (425) 402-1717 | | |
| Customer: | **Spider Tracks Limited** | | |
| Specification: | **RTCA/DO-160F Section 21.5, Category M** | | |
| Work Order #: | **97584** | Date: | 10/6/2015 |
| Test Type: | **Radiated Scan** | Time: | 9:35:15 AM |
| Tested By: | Steven Pittsford | Sequence#: | 1 |
| Software: | EMITest 5.02.00 | | |

***Equipment Tested:***

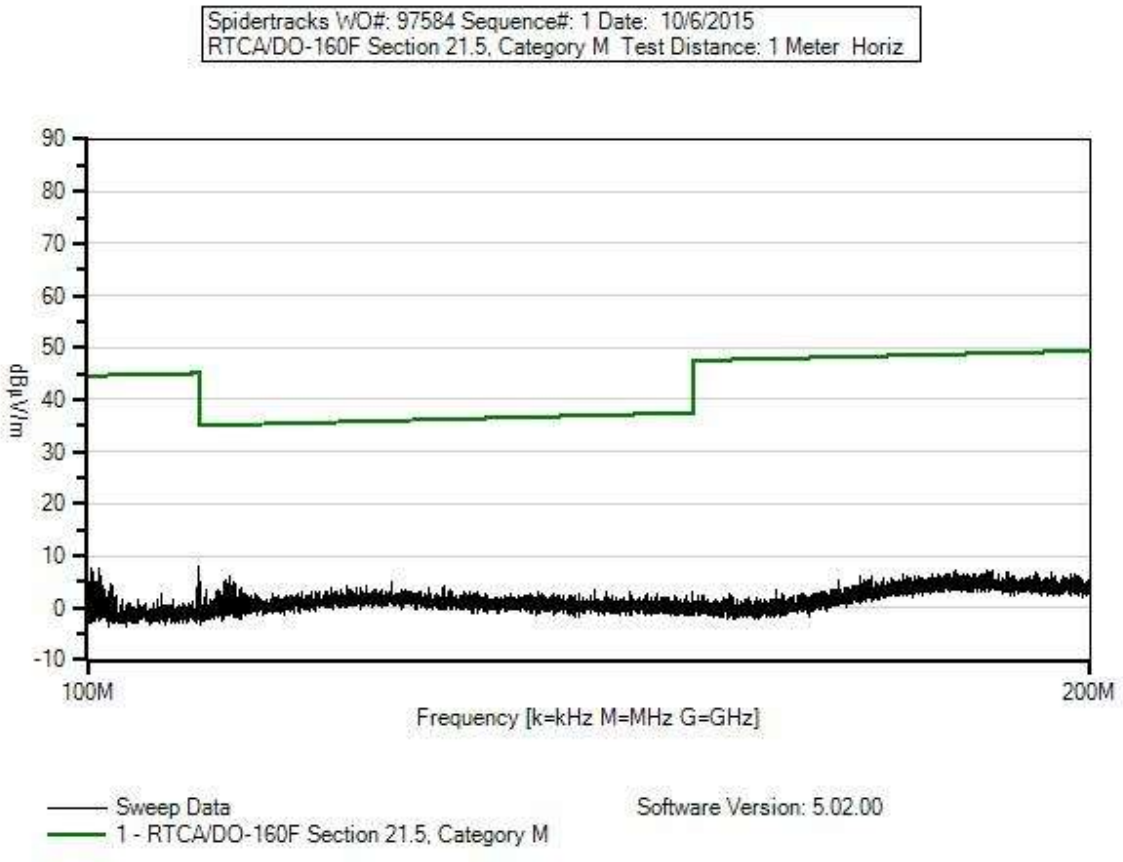
| Device | Manufacturer | Model # | S/N |
|---|---|---|---|
| Spider 7 | Spider Tracks Limited | Spider 7 Internal Antenna | 2015BETA33 |
| Spider 7 contains PCB board | Spider Tracks Limited | V3.5 | N/A |

***Support Equipment:***

| Device | Manufacturer | Model # | S/N |
|---|---|---|---|

***Test Conditions / Notes:***

Frequency: 100-200MHz




***Test Equipment:***

| ID | Asset #/Serial # | Description | Model | Calibration Date | Cal Due Date |
|---|---|---|---|---|---|
| | AN03438 | 5uH LISN-Amplitude (dB) | 9117-5-TS-50-N | 10/30/2013 | 10/30/2015 |
| | AN03439 | 5uH LISN-Amplitude (dB) | 9117-5-TS-50-N | 10/30/2013 | 10/30/2015 |
| | AN00582 | Feed Through Capacitor | 6512-106R | 3/21/2014 | 3/21/2016 |
| | ANP06031 | Feed Through Capacitor | 6512-106R | 3/21/2014 | 3/21/2016 |
| T1 | AN02308 | Preamp | 8447D | 3/26/2014 | 3/26/2016 |
| T2 | AN00206 | Bicon Antenna-ARP958 Calibration (Extrapolated) | SAS-200/540 | 5/27/2015 | 5/27/2017 |
| T3 | ANP05333 | Cable | Heliax | 8/27/2015 | 8/27/2017 |
| T4 | ANP05373 | Cable | RG-214 | 8/28/2014 | 8/28/2016 |
| T5 | ANP05960 | Cable | Heliax 1/4 | 9/11/2015 | 9/11/2017 |
| | AN02870 | Spectrum Analyzer | E4440A | 1/6/2014 | 1/6/2016 |

***Measurement Data:*** Reading listed by margin. Test Distance: 1 Meter

| # | Freq | Rdng | T1<br>T5 | T2 | T3 | T4 | Dist | Corr | Spec | Margin | Polar |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBµV | dB | dB | dB | dB | Table | dBµV/m | dBµV/m | dB | Ant |
| 1 | 108.008M | 22.6 | -27.8<br>+0.3 | +12.5 | +0.5 | +0.0 | +0.0 | 8.1 | 35.0 | -26.9 | Horiz |
| 2 | 110.390M | 20.4 | -27.8<br>+0.3 | +12.9 | +0.5 | +0.0 | +0.0 | 6.3 | 35.2 | -28.9 | Horiz |
| 3 | 110.020M | 19.7 | -27.8<br>+0.3 | +12.8 | +0.5 | +0.0 | +0.0 | 5.5 | 35.1 | -29.6 | Horiz |
| 4 | 108.188M | 19.8 | -27.8<br>+0.3 | +12.5 | +0.5 | +0.0 | +0.0 | 5.3 | 35.0 | -29.7 | Horiz |
| 5 | 110.581M | 19.4 | -27.8<br>+0.3 | +12.9 | +0.5 | +0.0 | +0.0 | 5.3 | 35.2 | -29.9 | Horiz |
| 6 | 109.840M | 19.3 | -27.8<br>+0.3 | +12.8 | +0.5 | +0.0 | +0.0 | 5.1 | 35.1 | -30.0 | Horiz |
| 7 | 110.771M | 18.8 | -27.8<br>+0.3 | +13.0 | +0.5 | +0.0 | +0.0 | 4.8 | 35.2 | -30.4 | Horiz |
| 8 | 110.210M | 18.6 | -27.8<br>+0.3 | +12.9 | +0.5 | +0.0 | +0.0 | 4.5 | 35.1 | -30.6 | Horiz |
| 9 | 123.353M | 17.3 | -27.7<br>+0.3 | +14.7 | +0.6 | +0.0 | +0.0 | 5.2 | 36.0 | -30.8 | Horiz |
| 10 | 111.311M | 17.8 | -27.8<br>+0.3 | +13.1 | +0.5 | +0.0 | +0.0 | 3.9 | 35.2 | -31.3 | Horiz |
| 11 | 108.559M | 18.0 | -27.8<br>+0.3 | +12.6 | +0.5 | +0.0 | +0.0 | 3.6 | 35.0 | -31.4 | Horiz |
| 12 | 109.479M | 18.0 | -27.8<br>+0.3 | +12.7 | +0.5 | +0.0 | +0.0 | 3.7 | 35.1 | -31.4 | Horiz |
| 13 | 119.690M | 16.8 | -27.7<br>+0.3 | +14.5 | +0.5 | +0.0 | +0.0 | 4.4 | 35.8 | -31.4 | Horiz |
| 14 | 111.131M | 17.6 | -27.8<br>+0.3 | +13.1 | +0.5 | +0.0 | +0.0 | 3.7 | 35.2 | -31.5 | Horiz |
| 15 | 121.321M | 16.7 | -27.7<br>+0.3 | +14.6 | +0.5 | +0.0 | +0.0 | 4.4 | 35.9 | -31.5 | Horiz |

| | | | |
|---|---|---|---|
| Test Location: | CKC Laboratories, Inc. • 22116 23rd Dr SE, Suite A • Bothell, WA 98021 • (425) 402-1717 | | |
| Customer: | **Spider Tracks Limited** | | |
| Specification: | **RTCA/DO-160F Section 21.5, Category M** | | |
| Work Order #: | **97584** | Date: | 10/6/2015 |
| Test Type: | **Radiated Scan** | Time: | 9:49:20 AM |
| Tested By: | Steven Pittsford | Sequence#: | 2 |
| Software: | EMITest 5.02.00 | | |

***Equipment Tested:***

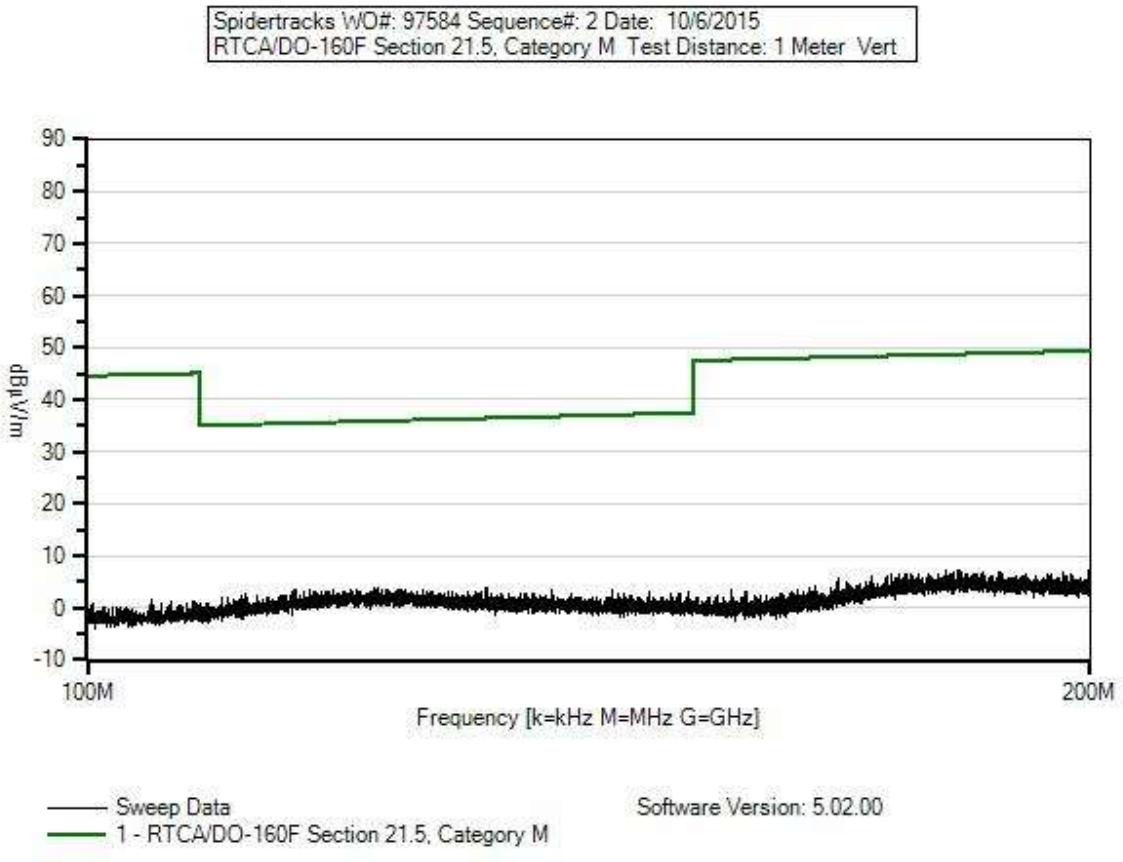
| Device | Manufacturer | Model # | S/N |
|---|---|---|---|
| Spider 7 | Spider Tracks Limited | Spider 7 Internal Antenna | 2015BETA33 |
| Spider 7 contains PCB board | Spider Tracks Limited | V3.5 | N/A |

***Support Equipment:***

| Device | Manufacturer | Model # | S/N |
|---|---|---|---|

***Test Conditions / Notes:***

Frequency: 100-200MHz




***Test Equipment:***

| ID | Asset #/Serial # | Description | Model | Calibration Date | Cal Due Date |
|---|---|---|---|---|---|
| | AN03438 | 5uH LISN-Amplitude (dB) | 9117-5-TS-50-N | 10/30/2013 | 10/30/2015 |
| | AN03439 | 5uH LISN-Amplitude (dB) | 9117-5-TS-50-N | 10/30/2013 | 10/30/2015 |
| | AN00582 | Feed Through Capacitor | 6512-106R | 3/21/2014 | 3/21/2016 |
| | ANP06031 | Feed Through Capacitor | 6512-106R | 3/21/2014 | 3/21/2016 |
| T1 | AN02308 | Preamp | 8447D | 3/26/2014 | 3/26/2016 |
| T2 | AN00206 | Bicon Antenna-ARP958 Calibration (Extrapolated) | SAS-200/540 | 5/27/2015 | 5/27/2017 |
| T3 | ANP05333 | Cable | Heliax | 8/27/2015 | 8/27/2017 |
| T4 | ANP05373 | Cable | RG-214 | 8/28/2014 | 8/28/2016 |
| T5 | ANP05960 | Cable | Heliax 1/4 | 9/11/2015 | 9/11/2017 |
| | AN02870 | Spectrum Analyzer | E4440A | 1/6/2014 | 1/6/2016 |

***Measurement Data:*** Reading listed by margin. Test Distance: 1 Meter

| # | Freq | Rdng | T1<br>T5 | T2 | T3 | T4 | Dist | Corr | Spec | Margin | Polar |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBµV | dB | dB | dB | dB | Table | dBµV/m | dBµV/m | dB | Ant |
| 1 | 115.485M | 16.5 | -27.7<br>+0.3 | +13.9 | +0.5 | +0.0 | +0.0 | 3.5 | 35.5 | -32.0 | Vert |
| 2 | 115.355M | 16.5 | -27.7<br>+0.3 | +13.9 | +0.5 | +0.0 | +0.0 | 3.5 | 35.5 | -32.0 | Vert |
| 3 | 122.182M | 16.1 | -27.7<br>+0.3 | +14.7 | +0.5 | +0.0 | +0.0 | 3.9 | 35.9 | -32.0 | Vert |
| 4 | 121.912M | 16.2 | -27.7<br>+0.3 | +14.6 | +0.5 | +0.0 | +0.0 | 3.9 | 35.9 | -32.0 | Vert |
| 5 | 115.255M | 16.4 | -27.7<br>+0.3 | +13.9 | +0.5 | +0.0 | +0.0 | 3.4 | 35.5 | -32.1 | Vert |
| 6 | 116.677M | 16.3 | -27.7<br>+0.3 | +14.1 | +0.5 | +0.0 | +0.0 | 3.5 | 35.6 | -32.1 | Vert |
| 7 | 120.531M | 16.0 | -27.7<br>+0.3 | +14.6 | +0.5 | +0.0 | +0.0 | 3.7 | 35.8 | -32.1 | Vert |
| 8 | 122.593M | 15.8 | -27.7<br>+0.3 | +14.7 | +0.5 | +0.0 | +0.0 | 3.6 | 35.9 | -32.3 | Vert |
| 9 | 116.136M | 16.1 | -27.7<br>+0.3 | +14.0 | +0.5 | +0.0 | +0.0 | 3.2 | 35.5 | -32.3 | Vert |
| 10 | 111.501M | 16.8 | -27.8<br>+0.3 | +13.1 | +0.5 | +0.0 | +0.0 | 2.9 | 35.2 | -32.3 | Vert |
| 11 | 116.937M | 16.1 | -27.7<br>+0.3 | +14.1 | +0.5 | +0.0 | +0.0 | 3.3 | 35.6 | -32.3 | Vert |
| 12 | 120.010M | 15.8 | -27.7<br>+0.3 | +14.6 | +0.5 | +0.0 | +0.0 | 3.5 | 35.8 | -32.3 | Vert |
| 13 | 118.508M | 15.9 | -27.7<br>+0.3 | +14.4 | +0.5 | +0.0 | +0.0 | 3.4 | 35.7 | -32.3 | Vert |
| 14 | 123.063M | 15.8 | -27.7<br>+0.3 | +14.7 | +0.5 | +0.0 | +0.0 | 3.6 | 36.0 | -32.4 | Vert |
| 15 | 124.304M | 15.7 | -27.7<br>+0.3 | +14.7 | +0.6 | +0.0 | +0.0 | 3.6 | 36.0 | -32.4 | Vert |

| | | | |
|---|---|---|---|
| Test Location: | CKC Laboratories, Inc. • 22116 23rd Dr SE, Suite A • Bothell, WA 98021 • (425) 402-1717 | | |
| Customer: | **Spider Tracks Limited** | | |
| Specification: | **RTCA/DO-160F Section 21.5, Category M** | | |
| Work Order #: | **97584** | Date: | 10/6/2015 |
| Test Type: | **Radiated Scan** | Time: | 9:58:48 AM |
| Tested By: | Steven Pittsford | Sequence#: | 3 |
| Software: | EMITest 5.02.00 | | |

***Equipment Tested:***

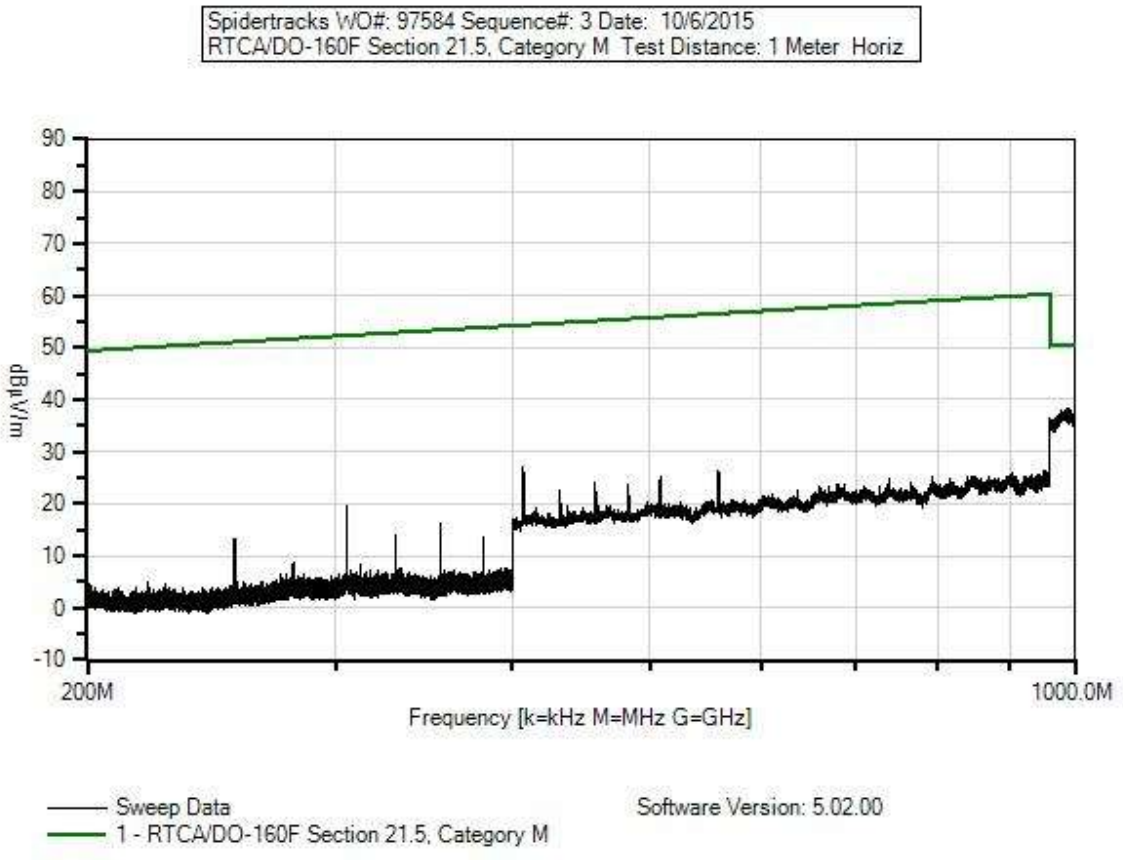
| Device | Manufacturer | Model # | S/N |
|---|---|---|---|
| Spider 7 | Spider Tracks Limited | Spider 7 Internal Antenna | 2015BETA33 |
| Spider 7 contains PCB board | Spider Tracks Limited | V3.5 | N/A |

***Support Equipment:***

| Device | Manufacturer | Model # | S/N |
|---|---|---|---|

***Test Conditions / Notes:***

Frequency: 200-1000MHz




***Test Equipment:***

| ID | Asset #/Serial # | Description | Model | Calibration Date | Cal Due Date |
|---|---|---|---|---|---|
| | AN03438 | 5uH LISN-Amplitude (dB) | 9117-5-TS-50-N | 10/30/2013 | 10/30/2015 |
| | AN03439 | 5uH LISN-Amplitude (dB) | 9117-5-TS-50-N | 10/30/2013 | 10/30/2015 |
| | AN00582 | Feed Through Capacitor | 6512-106R | 3/21/2014 | 3/21/2016 |
| | ANP06031 | Feed Through Capacitor | 6512-106R | 3/21/2014 | 3/21/2016 |
| T1 | AN02308 | Preamp | 8447D | 3/26/2014 | 3/26/2016 |
| T2 | ANP05333 | Cable | Heliax | 8/27/2015 | 8/27/2017 |
| T3 | ANP05373 | Cable | RG-214 | 8/28/2014 | 8/28/2016 |
| T4 | ANP05960 | Cable | Heliax 1/4 | 9/11/2015 | 9/11/2017 |
| | AN02870 | Spectrum Analyzer | E4440A | 1/6/2014 | 1/6/2016 |
| T5 | AN00147 | Log Periodic Antenna-ARP-958 | 3146 | 3/11/2014 | 3/11/2016 |

***Measurement Data:*** Reading listed by margin. Test Distance: 1 Meter

| # | Freq | Rdng | T1<br>T5 | T2 | T3 | T4 | Dist | Corr | Spec | Margin | Polar |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBµV | dB | dB | dB | dB | Table | dBµV/m | dBµV/m | dB | Ant |
| 1 | 988.960M | 38.0 | -27.1<br>+24.8 | +1.7 | +0.2 | +0.9 | +0.0 | 38.5 | 50.5 | -12.0 | Horiz |
| 2 | 982.880M | 37.9 | -27.2<br>+24.7 | +1.7 | +0.2 | +0.9 | +0.0 | 38.2 | 50.5 | -12.3 | Horiz |
| 3 | 983.160M | 37.7 | -27.2<br>+24.7 | +1.7 | +0.2 | +0.9 | +0.0 | 38.0 | 50.5 | -12.5 | Horiz |
| 4 | 978.160M | 37.5 | -27.2<br>+24.7 | +1.7 | +0.2 | +0.9 | +0.0 | 37.8 | 50.4 | -12.6 | Horiz |
| 5 | 977.840M | 37.5 | -27.2<br>+24.7 | +1.7 | +0.2 | +0.9 | +0.0 | 37.8 | 50.4 | -12.6 | Horiz |
| 6 | 989.280M | 37.4 | -27.1<br>+24.8 | +1.7 | +0.2 | +0.9 | +0.0 | 37.9 | 50.5 | -12.6 | Horiz |
| 7 | 979.400M | 37.5 | -27.2<br>+24.7 | +1.7 | +0.2 | +0.9 | +0.0 | 37.8 | 50.4 | -12.6 | Horiz |
| 8 | 993.280M | 37.2 | -27.1<br>+24.9 | +1.7 | +0.2 | +0.9 | +0.0 | 37.8 | 50.5 | -12.7 | Horiz |
| 9 | 980.080M | 37.4 | -27.2<br>+24.7 | +1.7 | +0.2 | +0.9 | +0.0 | 37.7 | 50.4 | -12.7 | Horiz |
| 10 | 981.560M | 37.4 | -27.2<br>+24.7 | +1.7 | +0.2 | +0.9 | +0.0 | 37.7 | 50.5 | -12.8 | Horiz |
| 11 | 987.520M | 37.2 | -27.1<br>+24.8 | +1.7 | +0.2 | +0.9 | +0.0 | 37.7 | 50.5 | -12.8 | Horiz |
| 12 | 983.680M | 37.3 | -27.2<br>+24.7 | +1.7 | +0.2 | +0.9 | +0.0 | 37.6 | 50.5 | -12.9 | Horiz |
| 13 | 960.160M | 37.2 | -27.3<br>+24.0 | +1.7 | +0.2 | +0.8 | +0.0 | 36.6 | 50.3 | -13.7 | Horiz |
| 14 | 960.800M | 37.1 | -27.3<br>+24.0 | +1.7 | +0.2 | +0.8 | +0.0 | 36.5 | 50.3 | -13.8 | Horiz |
| 15 | 969.320M | 36.4 | -27.2<br>+24.4 | +1.7 | +0.2 | +0.9 | +0.0 | 36.4 | 50.4 | -14.0 | Horiz |

| | | | |
|---|---|---|---|
| Test Location: | CKC Laboratories, Inc. • 22116 23rd Dr SE, Suite A • Bothell, WA 98021 • (425) 402-1717 | | |
| Customer: | **Spider Tracks Limited** | | |
| Specification: | **RTCA/DO-160F Section 21.5, Category M** | | |
| Work Order #: | **97584** | Date: | 10/6/2015 |
| Test Type: | **Radiated Scan** | Time: | 10:16:04 AM |
| Tested By: | Steven Pittsford | Sequence#: | 4 |
| Software: | EMITest 5.02.00 | | |

***Equipment Tested:***

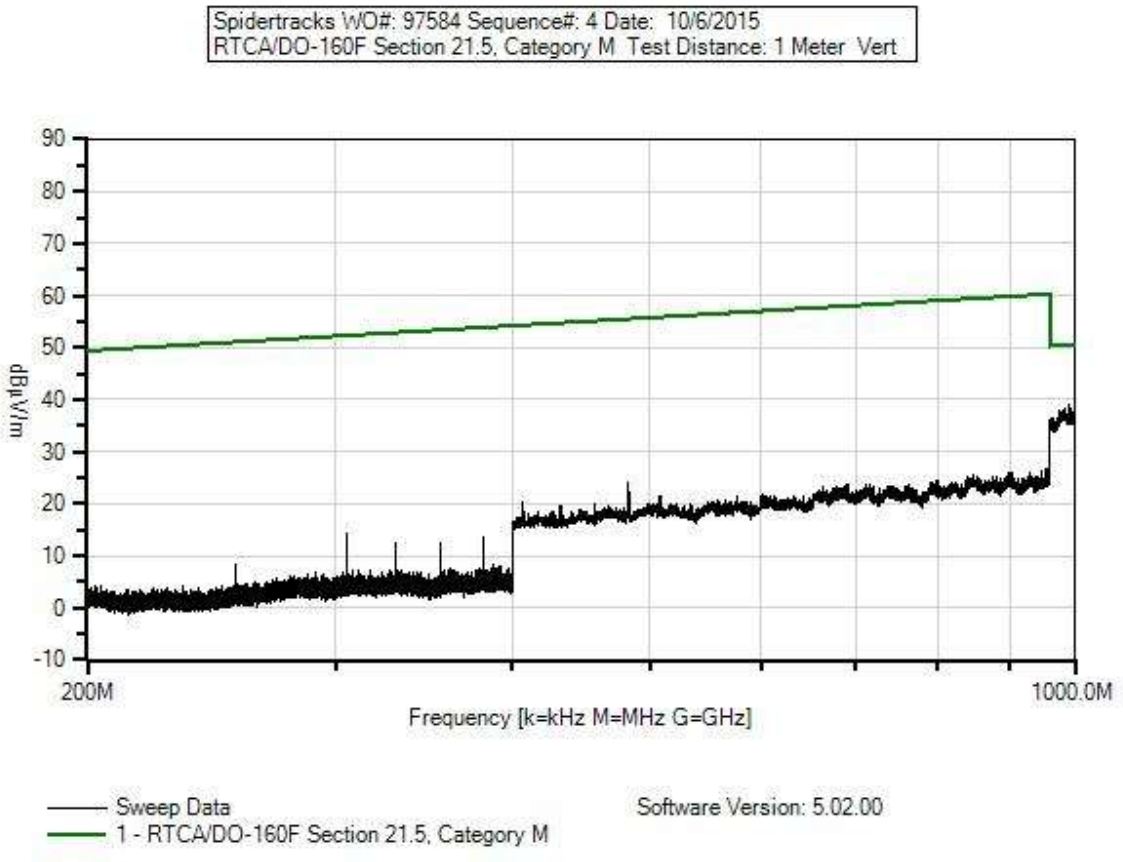
| Device | Manufacturer | Model # | S/N |
|---|---|---|---|
| Spider 7 | Spider Tracks Limited | Spider 7 Internal Antenna | 2015BETA33 |
| Spider 7 contains PCB board | Spider Tracks Limited | V3.5 | N/A |

***Support Equipment:***

| Device | Manufacturer | Model # | S/N |
|---|---|---|---|

***Test Conditions / Notes:***

Frequency: 200-1000MHz




***Test Equipment:***

| ID | Asset #/Serial # | Description | Model | Calibration Date | Cal Due Date |
|---|---|---|---|---|---|
| | AN03438 | 5uH LISN-Amplitude (dB) | 9117-5-TS-50-N | 10/30/2013 | 10/30/2015 |
| | AN03439 | 5uH LISN-Amplitude (dB) | 9117-5-TS-50-N | 10/30/2013 | 10/30/2015 |
| | AN00582 | Feed Through Capacitor | 6512-106R | 3/21/2014 | 3/21/2016 |
| | ANP06031 | Feed Through Capacitor | 6512-106R | 3/21/2014 | 3/21/2016 |
| T1 | AN02308 | Preamp | 8447D | 3/26/2014 | 3/26/2016 |
| T2 | ANP05333 | Cable | Heliax | 8/27/2015 | 8/27/2017 |
| T3 | ANP05373 | Cable | RG-214 | 8/28/2014 | 8/28/2016 |
| T4 | ANP05960 | Cable | Heliax 1/4 | 9/11/2015 | 9/11/2017 |
| | AN02870 | Spectrum Analyzer | E4440A | 1/6/2014 | 1/6/2016 |
| T5 | AN00147 | Log Periodic Antenna-ARP-958 | 3146 | 3/11/2014 | 3/11/2016 |

***Measurement Data:*** Reading listed by margin. Test Distance: 1 Meter

| # | Freq | Rdng | T1<br>T5 | T2 | T3 | T4 | Dist | Corr | Spec | Margin | Polar |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | MHz | dBµV | dB | dB | dB | dB | Table | dBµV/m | dBµV/m | dB | Ant |
| 1 | 989.360M | 38.7 | -27.1<br>+24.8 | +1.7 | +0.2 | +0.9 | +0.0 | 39.2 | 50.5 | -11.3 | Vert |
| 2 | 982.960M | 38.0 | -27.2<br>+24.7 | +1.7 | +0.2 | +0.9 | +0.0 | 38.3 | 50.5 | -12.2 | Vert |
| 3 | 993.880M | 37.8 | -27.1<br>+24.9 | +1.7 | +0.2 | +0.9 | +0.0 | 38.4 | 50.6 | -12.2 | Vert |
| 4 | 974.960M | 37.6 | -27.2<br>+24.6 | +1.7 | +0.2 | +0.9 | +0.0 | 37.8 | 50.4 | -12.6 | Vert |
| 5 | 997.960M | 37.1 | -27.1<br>+25.0 | +1.7 | +0.2 | +0.9 | +0.0 | 37.8 | 50.6 | -12.8 | Vert |
| 6 | 976.160M | 37.2 | -27.2<br>+24.6 | +1.7 | +0.2 | +0.9 | +0.0 | 37.4 | 50.4 | -13.0 | Vert |
| 7 | 998.960M | 36.8 | -27.1<br>+25.0 | +1.7 | +0.2 | +0.9 | +0.0 | 37.5 | 50.6 | -13.1 | Vert |
| 8 | 974.080M | 37.0 | -27.2<br>+24.6 | +1.7 | +0.2 | +0.9 | +0.0 | 37.2 | 50.4 | -13.2 | Vert |
| 9 | 483.283M | 31.9 | -28.1<br>+18.7 | +1.1 | +0.1 | +0.6 | +0.0 | 24.3 | 55.5 | -31.2 | Vert |
| 10 | 954.943M | 27.6 | -27.3<br>+23.8 | +1.7 | +0.2 | +0.8 | +0.0 | 26.8 | 60.3 | -33.5 | Vert |
| 11 | 896.596M | 27.6 | -27.4<br>+23.4 | +1.6 | +0.2 | +0.8 | +0.0 | 26.2 | 59.8 | -33.6 | Vert |
| 12 | 407.007M | 29.2 | -27.7<br>+17.4 | +1.0 | +0.1 | +0.5 | +0.0 | 20.5 | 54.3 | -33.8 | Vert |
| 13 | 848.648M | 27.4 | -27.5<br>+23.2 | +1.6 | +0.1 | +0.8 | +0.0 | 25.6 | 59.4 | -33.8 | Vert |
| 14 | 928.108M | 27.4 | -27.3<br>+23.5 | +1.6 | +0.2 | +0.8 | +0.0 | 26.2 | 60.1 | -33.9 | Vert |
| 15 | 947.089M | 27.2 | -27.3<br>+23.6 | +1.7 | +0.2 | +0.8 | +0.0 | 26.2 | 60.2 | -34.0 | Vert |

| | | | |
|---|---|---|---|
| Test Location: | CKC Laboratories, Inc. • 22116 23rd Dr SE, Suite A • Bothell, WA 98021 • (425) 402-1717 | | |
| Customer: | **Spider Tracks Limited** | | |
| Specification: | **RTCA/DO-160F Section 21.5, Category M** | | |
| Work Order #: | **97584** | Date: | 10/6/2015 |
| Test Type: | **Radiated Scan** | Time: | 10:51:21 AM |
| Tested By: | Steven Pittsford | Sequence#: | 5 |
| Software: | EMITest 5.02.00 | | |

***Equipment Tested:***

| Device | Manufacturer | Model # | S/N |
|---|---|---|---|
| Spider 7 | Spider Tracks Limited | Spider 7 Internal Antenna | 2015BETA33 |
| Spider 7 contains PCB board | Spider Tracks Limited | V3.5 | N/A |

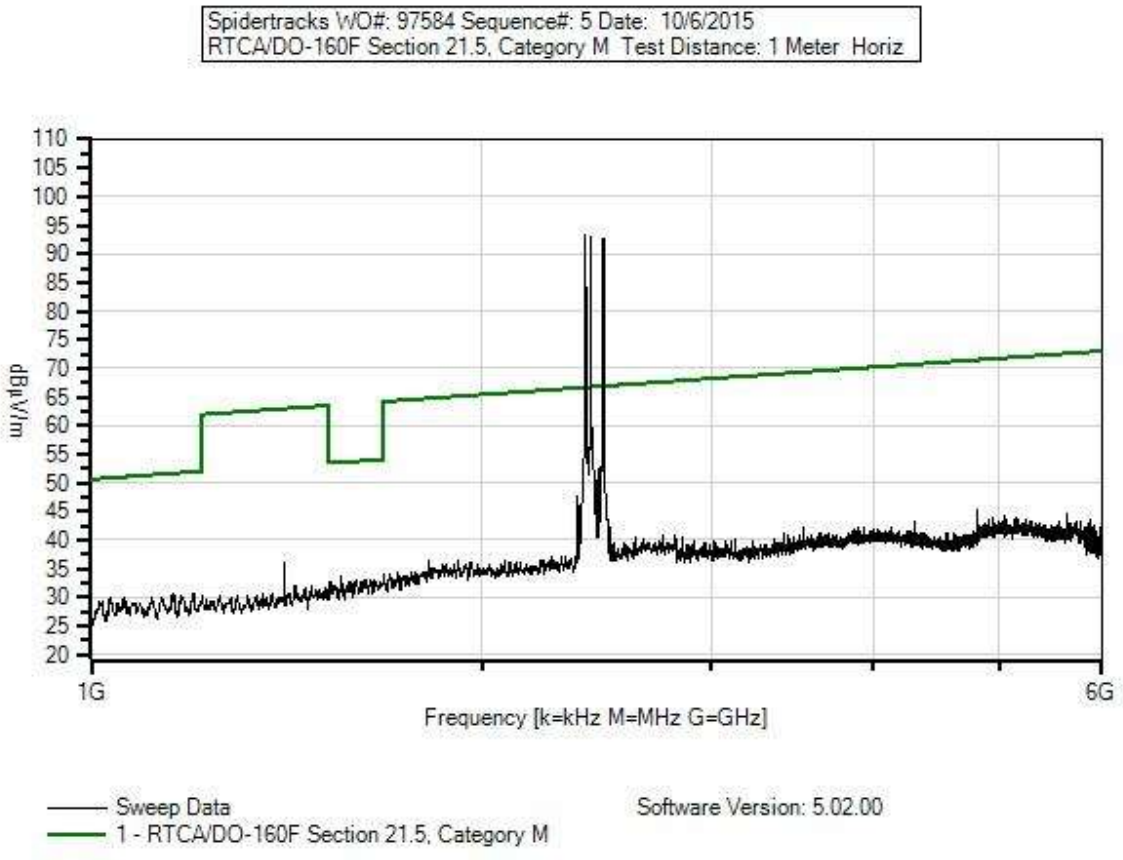
***Support Equipment:***

| Device | Manufacturer | Model # | S/N |
|---|---|---|---|

***Test Conditions / Notes:***

Frequency: 1-6GHz

EUT contains a Bluetooth Low Energy transmitter. Transmitting at 2402, 2426 and 2480MHz these frequencies are ignored.




***Test Equipment:***

| ID | Asset #/Serial # | Description | Model | Calibration Date | Cal Due Date |
|---|---|---|---|---|---|
| | AN03438 | 5uH LISN-Amplitude (dB) | 9117-5-TS-50-N | 10/30/2013 | 10/30/2015 |
| | AN03439 | 5uH LISN-Amplitude (dB) | 9117-5-TS-50-N | 10/30/2013 | 10/30/2015 |
| | AN00582 | Feed Through Capacitor | 6512-106R | 3/21/2014 | 3/21/2016 |
| | ANP06031 | Feed Through Capacitor | 6512-106R | 3/21/2014 | 3/21/2016 |
| T1 | ANP05333 | Cable | Heliax | 8/27/2015 | 8/27/2017 |
| T2 | ANP05960 | Cable | Heliax 1/4 | 9/11/2015 | 9/11/2017 |
| | AN02870 | Spectrum Analyzer | E4440A | 1/6/2014 | 1/6/2016 |
| T3 | AN03540 | Preamp | 83017A | 4/30/2015 | 4/30/2017 |
| T4 | AN02374 | Horn Antenna-ARP958 Calibration | RGA-60 | 8/12/2015 | 8/12/2017 |

***Measurement Data:*** Reading listed by margin. Test Distance: 1 Meter

| # | Freq MHz | Rdng dBµV | T1 dB | T2 dB | T3 dB | T4 dB | Dist Table | Corr dBµV/m | Spec dBµV/m | Margin dB | Polar Ant |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2402.706M | 94.3 | +2.7 | +1.5 | -34.6 | +29.7 | +0.0 | 93.6 | 66.7 | +26.9 | Horiz |
| | Ambient | | | | | | | | Fundamental BLE | | |
| 2 | 2425.729M | 93.7 | +2.7 | +1.6 | -34.6 | +29.7 | +0.0 | 93.1 | 66.7 | +26.4 | Horiz |
| | Ambient | | | | | | | | Fundamental BLE | | |
| 3 | 2479.783M | 93.1 | +2.7 | +1.6 | -34.5 | +29.8 | +0.0 | 92.7 | 66.9 | +25.8 | Horiz |
| | Ambient | | | | | | | | Fundamental BLE | | |
| 4 | 2408.712M | 59.3 | +2.7 | +1.5 | -34.6 | +29.7 | +0.0 | 58.6 | 66.7 | -8.1 | Horiz |
| 5 | 2432.736M | 57.8 | +2.7 | +1.6 | -34.6 | +29.7 | +0.0 | 57.2 | 66.8 | -9.6 | Horiz |
| 6 | 2457.761M | 52.8 | +2.7 | +1.6 | -34.5 | +29.8 | +0.0 | 52.4 | 66.8 | -14.4 | Horiz |
| 7 | 2448.752M | 50.7 | +2.7 | +1.6 | -34.5 | +29.8 | +0.0 | 50.3 | 66.8 | -16.5 | Horiz |
| 8 | 2369.673M | 48.6 | +2.7 | +1.5 | -34.6 | +29.6 | +0.0 | 47.8 | 66.6 | -18.8 | Horiz |
| 9 | 1555.642M | 40.1 | +2.1 | +1.2 | -35.5 | +26.0 | +0.0 | 33.9 | 53.6 | -19.7 | Horiz |
| 10 | 1599.767M | 39.0 | +2.1 | +1.2 | -35.4 | +26.2 | +0.0 | 33.1 | 53.7 | -20.6 | Horiz |
| 11 | 1623.463M | 39.0 | +2.1 | +1.2 | -35.4 | +26.3 | +0.0 | 33.2 | 53.8 | -20.6 | Horiz |
| 12 | 1527.860M | 39.0 | +2.1 | +1.2 | -35.5 | +26.0 | +0.0 | 32.8 | 53.5 | -20.7 | Horiz |
| 13 | 1156.887M | 39.9 | +1.9 | +0.9 | -36.8 | +24.9 | +0.0 | 30.8 | 51.6 | -20.8 | Horiz |
| 14 | 1035.136M | 40.2 | +1.7 | +0.9 | -37.4 | +24.5 | +0.0 | 29.9 | 50.8 | -20.9 | Horiz |
| 15 | 1615.292M | 38.6 | +2.1 | +1.2 | -35.4 | +26.3 | +0.0 | 32.8 | 53.8 | -21.0 | Horiz |

| | | | |
|---|---|---|---|
| Test Location: | CKC Laboratories, Inc. • 22116 23rd Dr SE, Suite A • Bothell, WA 98021 • (425) 402-1717 | | |
| Customer: | **Spider Tracks Limited** | | |
| Specification: | **RTCA/DO-160F Section 21.5, Category M** | | |
| Work Order #: | **97584** | Date: | 10/6/2015 |
| Test Type: | **Radiated Scan** | Time: | 11:10:00 AM |
| Tested By: | Steven Pittsford | Sequence#: | 6 |
| Software: | EMITest 5.02.00 | | |

***Equipment Tested:***

| Device | Manufacturer | Model # | S/N |
|---|---|---|---|
| Spider 7 | Spider Tracks Limited | Spider 7 Internal Antenna | 2015BETA33 |
| Spider 7 contains PCB board | Spider Tracks Limited | V3.5 | N/A |

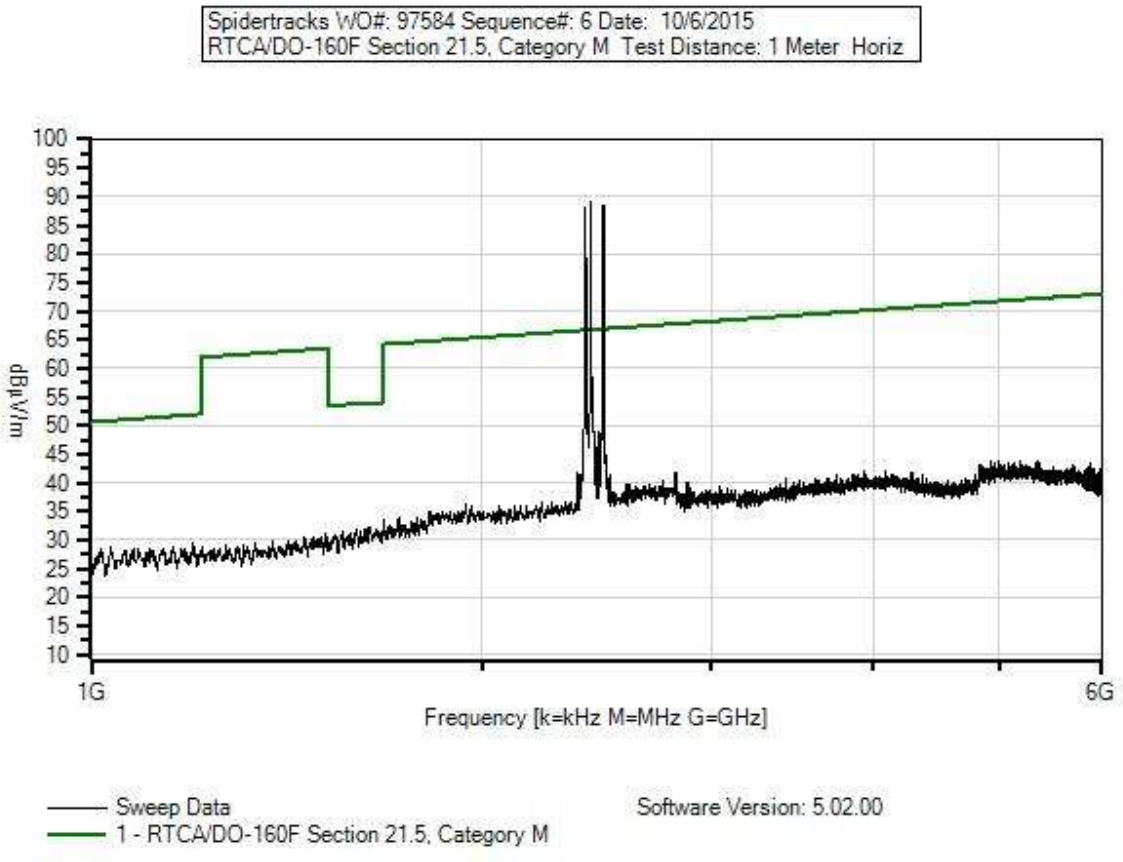
***Support Equipment:***

| Device | Manufacturer | Model # | S/N |
|---|---|---|---|

***Test Conditions / Notes:***

Frequency: 1-6GHz

EUT contains a Bluetooth Low Energy transmitter. Transmitting at 2402, 2426 and 2480MHz these frequencies are ignored.




***Test Equipment:***

| ID | Asset #/Serial # | Description | Model | Calibration Date | Cal Due Date |
|---|---|---|---|---|---|
| | AN03438 | 5uH LISN-Amplitude (dB) | 9117-5-TS-50-N | 10/30/2013 | 10/30/2015 |
| | AN03439 | 5uH LISN-Amplitude (dB) | 9117-5-TS-50-N | 10/30/2013 | 10/30/2015 |
| | AN00582 | Feed Through Capacitor | 6512-106R | 3/21/2014 | 3/21/2016 |
| | ANP06031 | Feed Through Capacitor | 6512-106R | 3/21/2014 | 3/21/2016 |
| T1 | ANP05333 | Cable | Heliax | 8/27/2015 | 8/27/2017 |
| T2 | ANP05960 | Cable | Heliax 1/4 | 9/11/2015 | 9/11/2017 |
| | AN02870 | Spectrum Analyzer | E4440A | 1/6/2014 | 1/6/2016 |
| T3 | AN03540 | Preamp | 83017A | 4/30/2015 | 4/30/2017 |
| T4 | AN02374 | Horn Antenna-ARP958 Calibration | RGA-60 | 8/12/2015 | 8/12/2017 |

***Measurement Data:*** Reading listed by margin. Test Distance: 1 Meter

| # | Freq MHz | Rdng dBµV | T1 dB | T2 dB | T3 dB | T4 dB | Dist Table | Corr dBµV/m | Spec dBµV/m | Margin dB | Polar Ant |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 2425.729M | 89.9 | +2.7 | +1.6 | -34.6 | +29.7 | +0.0 | 89.3 | 66.7 | +22.6 | Horiz |
| | Ambient | | | | | | | | Fundamental BLE | | |
| 2 | 2479.783M | 89.1 | +2.7 | +1.6 | -34.5 | +29.8 | +0.0 | 88.7 | 66.9 | +21.8 | Horiz |
| | Ambient | | | | | | | | Fundamental BLE | | |
| 3 | 2402.706M | 88.8 | +2.7 | +1.5 | -34.6 | +29.7 | +0.0 | 88.1 | 66.7 | +21.4 | Horiz |
| | Ambient | | | | | | | | Fundamental BLE | | |
| 4 | 2407.711M | 54.0 | +2.7 | +1.5 | -34.6 | +29.7 | +0.0 | 53.3 | 66.7 | -13.4 | Horiz |
| 5 | 2432.736M | 54.0 | +2.7 | +1.6 | -34.6 | +29.7 | +0.0 | 53.4 | 66.8 | -13.4 | Horiz |
| 6 | 2457.761M | 49.4 | +2.7 | +1.6 | -34.5 | +29.8 | +0.0 | 49.0 | 66.8 | -17.8 | Horiz |
| 7 | 2448.752M | 46.5 | +2.7 | +1.6 | -34.5 | +29.8 | +0.0 | 46.1 | 66.8 | -20.7 | Horiz |
| 8 | 1637.354M | 38.1 | +2.1 | +1.2 | -35.3 | +26.4 | +0.0 | 32.5 | 53.9 | -21.4 | Horiz |
| 9 | 1599.767M | 37.8 | +2.1 | +1.2 | -35.4 | +26.2 | +0.0 | 31.9 | 53.7 | -21.8 | Horiz |
| 10 | 1625.914M | 37.6 | +2.1 | +1.2 | -35.3 | +26.4 | +0.0 | 32.0 | 53.8 | -21.8 | Horiz |
| 11 | 1035.953M | 39.2 | +1.7 | +0.9 | -37.4 | +24.5 | +0.0 | 28.9 | 50.8 | -21.9 | Horiz |
| 12 | 1018.794M | 39.1 | +1.7 | +0.9 | -37.5 | +24.5 | +0.0 | 28.7 | 50.7 | -22.0 | Horiz |
| 13 | 1562.179M | 37.8 | +2.1 | +1.2 | -35.5 | +26.0 | +0.0 | 31.6 | 53.6 | -22.0 | Horiz |
| 14 | 1612.023M | 37.5 | +2.1 | +1.2 | -35.4 | +26.3 | +0.0 | 31.7 | 53.8 | -22.1 | Horiz |
| 15 | 1583.424M | 37.3 | +2.1 | +1.2 | -35.4 | +26.1 | +0.0 | 31.3 | 53.7 | -22.4 | Horiz |

# TEST LOG

| Date | Name | Time | Event |
|---|---|---|---|
| 10/6/15 | S. Pittsford | 0800 | Setup for **21.5 Radiated emissions** |
| | | 0930 | 01 Radiated emissions<br>100-200MHz<br>Horz<br>Pass |
| | | | 02 Radiated emissions<br>100-200MHz<br>Vert<br>Pass |
| | | 0956 | 03 Radiated emissions<br>200-1000MHz<br>Horz<br>Pass |
| | | | 04 Radiated emissions<br>200-1000MHz<br>Vert<br>Pass |
| | | 1032 | 05 Radiated emissions<br>1-6GHz<br>Horz<br>Pass |
| | | | 06 Radiated emissions<br>1-6GHz<br>Vert<br>Pass |
| | | | |
| | | | Setup for **21.4 Conducted emissions** |
| | | 1234 | 07 Conducted emissions<br>150k-152MHz<br>+28Vdc<br>Pass |
| | | | 08 Conducted emissions<br>150k-152MHz<br>Return<br>Pass |
| | | 1300 | **Setup for voltage spikes** |
| | | | |
| 10/7/15 | S. Pittsford | 0812 | **Setup magnetic effect** |
| | | | **Ambient mag field = 15.6A/m**<br>Never reached 1° deflection on any side |
| | | 0900 | **Paperwork** |

# APPENDX A
# MANUFACTURER'S DECLARATION

22 August 2017

**DO-160G Section 17 and 15 - Spider 8**

Dear Sir / Madam,

This letter details the reason for changing the name of the Spider 7 tested by CKC Laboratories as per reports 97584-4 and 97584-3and confirms that the Spider 8 (MPN: 6000S8) has no physical changes.

The Spider 7 with GPIO connection was the hardware originally tested, and was not sold due to postponement of developing and releasing supporting software and firmware for the GPIO connection. A replacement product without GPIO connection was marketed prior to August 2017. From October 2017 Spider Tracks Limited will market and sell the Spider 8, the version of hardware originally tested. To reduce market confusion Spider Tracks Limited has decided to brand this version of hardware the Spider 8.

Spider Tracks Limited confirms that the only difference between the Spider 7, the original hardware tested, and the Spider 8 is in the number on the Spider and the number on the keypad. There are no physical changes to the hardware.

Regards

Date: August 29, 2017 Luke McCarthy
Operations Manager
Spider Tracks Limited

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