

**DATE: 19 December 2010**

**I.T.L. (PRODUCT TESTING) LTD.**  
**FCC Radio Test Report**  
**for**  
**Haldor Advanced Technologies Ltd.**

**Equipment under test:**  
**Mount Antenna and MR101 Reader**  
**SPD**

Written by: *E. Ever*  
E. Ever, Documentation

Approved by: *E. Ever*  
E. Ever, Test Engineer

Approved by: *I. Raz*  
I. Raz, EMC Laboratory Manager

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This report relates only to items tested.

**Measurement/Technical Report for**  
**Haldor Advanced Technologies Ltd.**  
**Mount Antenna and MR101 Reader**

**SPD**

**FCC ID: X4V-SPD**

This report concerns:

Original Grant:

Class I change:

Class II change: X

Equipment type: Part 15 Low Power Communication Device Transmitter

47CFR15 Section 15.225

Measurement procedure used is ANSI C63.4-2003.

Application for Certification

prepared by:

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# 1. General Information

## 1.1 Administrative Information

Manufacturer: Haldor Advanced Technologies Ltd.

Manufacturer's Address: 2 Habanay St.,  
Hod Hasharon, 45319  
Israel  
Tel: +972-9-788-5867  
Fax: +972-9-788-5861

Manufacturer's Representative: Ofer Bogomoletz  
Morr Avissara

Equipment Under Test (E.U.T): Mount Antenna and MR101 Reader

Equipment Model No.: SPD

Equipment Serial No.: Not Designated

Date of Receipt of E.U.T: 19/07/2010

Start of Test: 19/07/2010

End of Test: 19/07/2010

Test Laboratory Location: I.T.L (Product Testing) Ltd.  
Kfar Bin Nun,  
ISRAEL 99780

Test Specifications: FCC Part 15 Subpart C

## **1.2 List of Accreditations**

The EMC laboratory of I.T.L. is accredited by the following bodies:

1. The American Association for Laboratory Accreditation (A2LA) (U.S.A.), Certificate No. 1152.01.
2. The Federal Communications Commission (FCC) (U.S.A.), Registration No. 90715.
3. The Israel Ministry of the Environment (Israel), Registration No. 1104/01.
4. The Voluntary Control Council for Interference by Information Technology Equipment (VCCI) (Japan), Registration Numbers: C-1350, R-1285.
5. Industry Canada (Canada), File No. IC 4025.
6. TUV Product Services, England, ASLLAS No. 97201.

I.T.L. Product Testing Ltd. is accredited by the American Association for Laboratory Accreditation (A2LA) and the results shown in this test report have been determined in accordance with I.T.L.'s terms of accreditation unless stated otherwise in the report.

### **1.3 Product Description**

The new sub-system of ORLocate is the ORLocate SPD.

The sub-system comprise of several modules as follows:

1. PC Desktop
2. HF Loop Antenna with integrated HF RFID reader (ISO 15693 – 13.56MHz)

We are required to conduct FCC tests to be able to install the sub-system in Hospitals in US.

The integrated RFID reader is provided from FEIG Electronics and was tested and certified under FCC requirements to be used in US.

### **1.4 Test Methodology**

Both conducted and radiated testing were performed according to the procedures in ANSI C63.4: 2003. Radiated testing was performed at an antenna to EUT distance of 3 meters.

### **1.5 Test Facility**

The radiated emissions tests were performed at I.T.L.'s testing facility at Kfar Bin-Nun, Israel. This site is a FCC listed test laboratory (FCC Registration No. 90715, date of listing September 3, 2009). I.T.L.'s EMC Laboratory is also accredited by A2LA, certificate No. 1152.01.

### **1.6 Measurement Uncertainty**

Conducted Emission

The uncertainty for this test is  $\pm 2$  dB.

Radiated Emission

The Open Site complies with the  $\pm 4$  dB Normalized Site Attenuation requirements of ANSI C63.4-2003. In accordance with Paragraph 5.4.6.1 of this standard, this tolerance includes instrumentation calibration errors, measurement technique errors, and errors due to site anomalies.

## 2. System Test Configuration

### 2.1 Justification

The E.U.T. is a radio device with FCC ID approval from the original manufacturer. Haldor Advanced Technologies has applied for an FCC ID change in order to submit a C2PC.

In order to use this device with an antenna manufactured by Haldor Advanced Technologies and a new housing also manufactured by Haldor Advanced Technologies, a C2PC is being submitted.

### 2.2 Special Accessories

No special accessories were needed in order to achieve compliance.

### 2.3 Equipment Modifications

No modifications were needed in order to achieve compliance

### 2.4 Configuration of Tested System

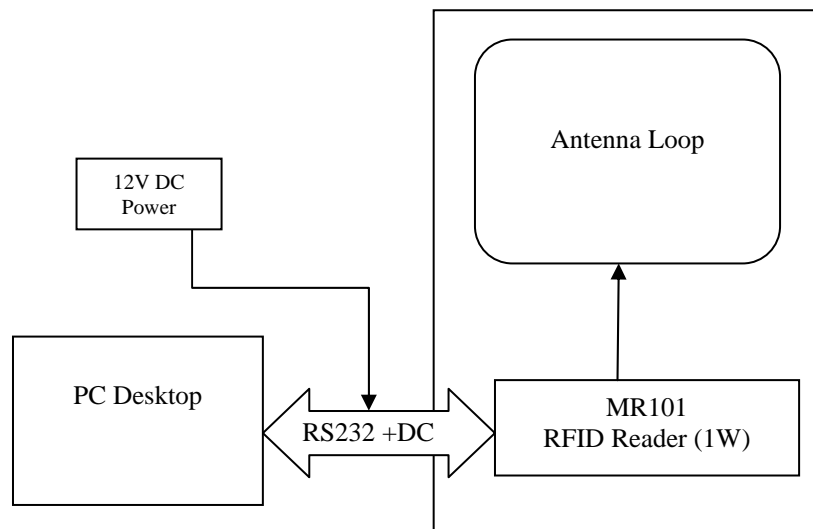


Figure 1. Configuration of Tested System

### 3. Test Set-up Photos



Figure 2. Radiated Emission



Figure 3. Conducted Emissions Power Lines

## 4. Conducted Emission Data

### 4.1 Test Specification

F.C.C., Part 15, Subpart C

### 4.2 Test Procedure

The E.U.T operation mode and test set-up are as described in Section 3.1. In order to minimize background noise interference, the conducted emission testing was performed inside a shielded room, with the E.U.T placed on an 0.8 meter high wooden table, 0.4 meter from the room's vertical wall.

The E.U.T was powered from 115 V AC / 60 Hz via a 50 Ohm / 50  $\mu$ Hn Line Impedance Stabilization Network (LISN) on the phase and neutral lines. The LISN's were grounded to the shielded room ground plane (floor), and were kept at least 0.8 meters from the nearest boundary of the E.U.T

The center of the E.U.T AC cable was folded back and forth, in order to form a bundle less than 0.40 meters and a total cable length of 1 meter.

The emission voltages at the LISN's outputs were measured using a computerized receiver, complying with CISPR 16 requirements. The specification limits are loaded to the receiver via a 3.5" floppy disk and are displayed on the receiver's spectrum display.

A frequency scan between 0.15 and 30 MHz was performed at 9 kHz I.F. band width, and using peak detection.

The spectral components having the highest level on each line were measured using a quasi-peak and average detector.

### 4.3 Measured Data

JUDGEMENT: Passed by 11.6 dB

The margin between the emission levels and the specification limit is, in the worst case, 11.6 dB for the phase line at 0.67 MHz and 15.5 dB at 0.34 MHz for the neutral line.

The EUT met the F.C.C. Part 15, Subpart C specification requirements.

The details of the highest emissions are given in *Figure 4* to *Figure 7*.

TEST PERSONNEL:

Tester Signature: *E. Ever*

Date: 10/08/10

Typed/Printed Name: E. Ever

## Conducted Emission

E.U.T Description Mount Antenna and MR101  
Reader

Type SPD

Serial Number: Not Designated

Specification: F.C.C., Part 15, Subpart C

Lead: Phase

Detectors: Peak, Quasi-peak, Average

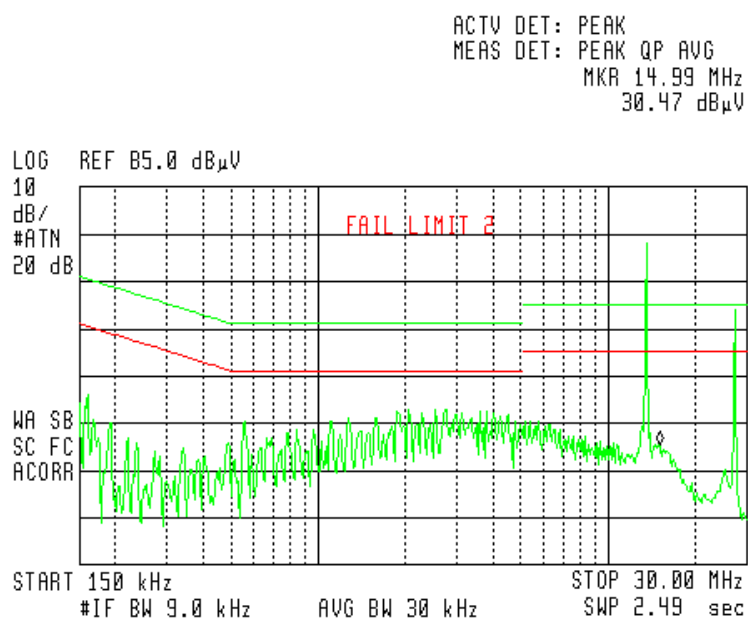
| Signal<br>Number | Frequency<br>(MHz) | Peak<br>(dBuV) | QP<br>(dBuV) | QP Delta<br>L 1 (dB) | Avg<br>(dBuV) | Av Delta<br>L 2 (dB) | Corr<br>(dB) |
|------------------|--------------------|----------------|--------------|----------------------|---------------|----------------------|--------------|
| 1                | 0.163048           | 40.5           | 35.1         | -30.2                | 22.4          | -33.0                | 0.4          |
| 2                | 0.560898           | 36.3           | 33.7         | -22.3                | 27.7          | -18.3                | 0.4          |
| 3                | 1.863549           | 37.5           | 33.7         | -22.3                | 25.4          | -20.6                | 0.4          |
| 4                | 3.946264           | 38.0           | 34.3         | -21.7                | 25.7          | -20.3                | 0.4          |
| 5                | 5.765443           | 35.0           | 31.3         | -28.7                | 22.4          | -27.6                | 0.4          |
| 6                | 10.149943          | 30.7           | 26.4         | -33.6                | 16.9          | -33.1                | 0.4          |

**Figure 4. Detectors: Peak, Quasi-peak, AVERAGE .**

*Note: QP Delta/Av Delta refers to the test results obtained minus specified requirement; thus a positive number indicates failure, and a negative result indicates that the product passes the test.*

## Conducted Emission

E.U.T Description    Mount Antenna and MR101  
                               Reader  
 Type                    SPD  
 Serial Number:        Not Designated  
  
 Specification:        F.C.C., Part 15, Subpart C  
 Lead:                   Phase  
 Detectors:            Peak, Quasi-peak, Average



**Figure 5. Detectors: Peak, Quasi-peak, Average**

Note: Fail indication on the spectral plot results from peak detector level reading above the limit. This indication is for information only and it should not be interpreted as a test failure.

## Conducted Emission

E.U.T Description    Mount Antenna and MR101  
Reader  
Type                    SPD  
Serial Number:        Not Designated

Specification:        F.C.C., Part 15, Subpart C  
Lead:                   Neutral  
Detectors:            Peak, Quasi-peak, Average

| Signal<br>Number | Frequency<br>(MHz) | Peak<br>(dBuV) | QP<br>(dBuV) | QP Delta<br>L 1 (dB) | Avg<br>(dBuV) | Av Delta<br>L 2 (dB) | Corr<br>(dB) |
|------------------|--------------------|----------------|--------------|----------------------|---------------|----------------------|--------------|
| 1                | 0.163043           | 36.1           | 30.3         | -35.1                | 15.9          | -39.5                | 0.4          |
| 2                | 0.560893           | 32.6           | 29.3         | -26.7                | 25.5          | -20.5                | 0.4          |
| 3                | 1.863547           | 33.8           | 28.6         | -27.4                | 22.4          | -23.6                | 0.4          |
| 4                | 3.946264           | 34.5           | 28.8         | -27.2                | 22.8          | -23.2                | 0.4          |
| 5                | 5.765443           | 32.4           | 26.2         | -33.8                | 20.1          | -29.9                | 0.4          |
| 6                | 10.149943          | 28.9           | 22.3         | -37.7                | 14.8          | -35.2                | 0.4          |

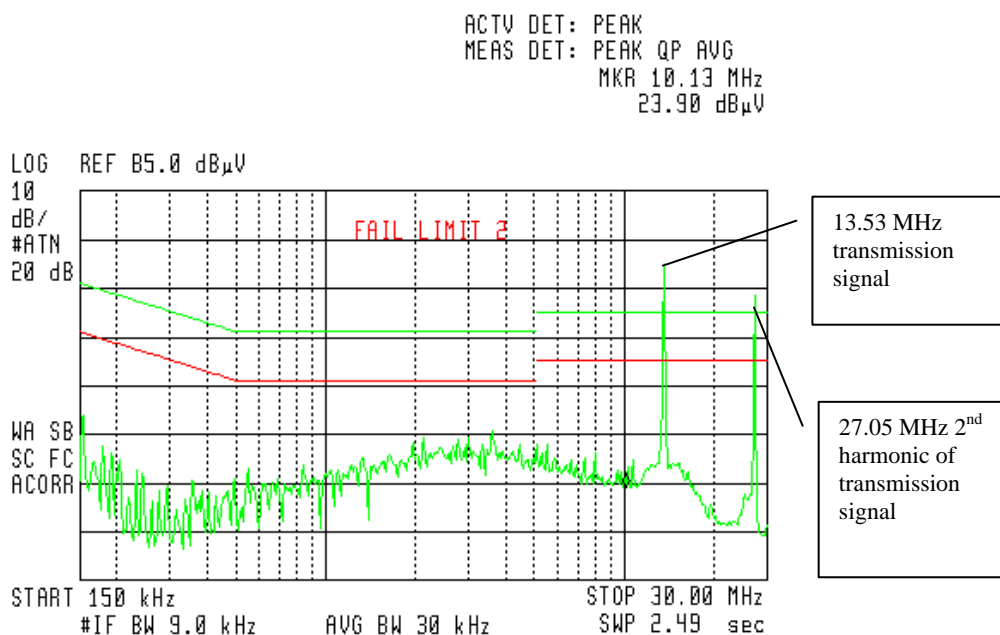
**Figure 6. Detectors: Peak, Quasi-peak, AVERAGE**

*Note: QP Delta/Av Delta refers to the test results obtained minus specified requirement; thus a positive number indicates failure, and a negative result indicates that the product passes the test.*

## Conducted Emission

E.U.T Description Mount Antenna and MR101  
Reader  
Type SPD  
Serial Number: Not Designated

Specification: F.C.C., Part 15, Subpart C  
Lead: Neutral  
Detectors: Peak, Quasi-peak, Average



**Figure 7 Conducted Emission: NEUTRAL**  
**Detectors: Peak, Quasi-peak, Average**

Note: Fail indication on the spectral plot results from peak detector level reading above the limit. This indication is for information only and it should not be interpreted as a test failure.

#### 4.4 Test Instrumentation Used, Conducted Measurement

| Instrument        | Manufacturer | Model         | Serial No. | Last Calibration Date | Period |
|-------------------|--------------|---------------|------------|-----------------------|--------|
| LISN              | Fischer      | FCC-LISN-2A   | 127        | March 3, 2010         | 1 Year |
| LISN              | Fischer      | FCC-LISN-2A   | 128        | March 3, 2010         | 1 Year |
| EMI Receiver      | HP           | 85422E        | 3906A00276 | November 30, 2010     | 1 Year |
| RF Filter Section | HP           | 85420E        | 3705A00248 | November 30, 2010     | 1 Year |
| Printer           | HP           | LaserJet 2200 | JPKG19982  | N/A                   | N/A    |

## 5. Field Strength of Fundamental

### 5.1 Test Specification

F.C.C., Part 15, Subpart C, Section 15.225(a)

### 5.2 Test Procedure

The E.U.T. operation mode and test set-up are as described in Section 3.

The E.U.T. was placed on a non-conductive table, 0.8 meters above the O.A.T.S. ground plane.

The EMI receiver was set to the E.U.T. Fundamental Frequency (13.56 MHz) and Peak Detection.

The distance between the E.U.T. and test antenna was 3 meters.

The turntable and antenna were adjusted for maximum level reading on the EMI receiver. The loop antenna was rotated on its vertical axis. The antenna height (center of loop) was 1 meter.

The average result is:

Peak Level(dB $\mu$ V/m) + E.U.T. Duty Cycle Factor, in 100msec time window (dB)

### 5.3 Measured Data

JUDGEMENT: Passed by 42.3 dB

The EUT met the FCC Part 15, Subpart C, Section 15.225(a) specification requirements.

The details of the highest emissions are given in Figure 8.

TEST PERSONNEL:

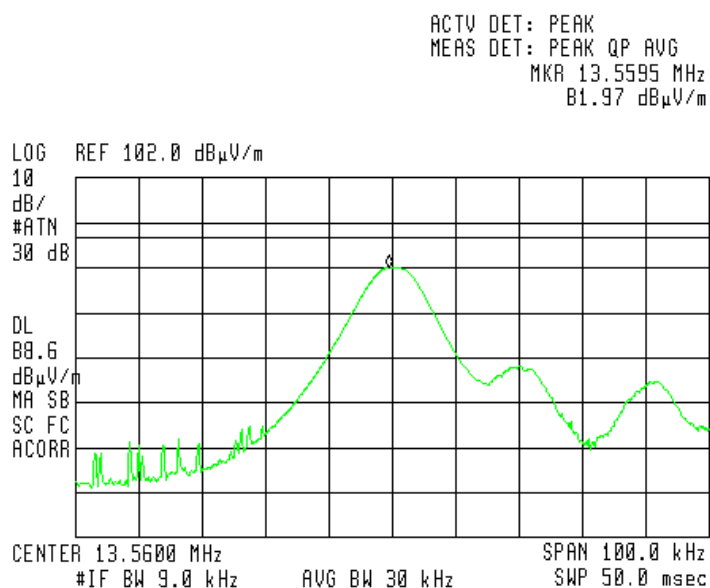
Tester Signature: Chav Ever

Date: 10/08/10

Typed/Printed Name: E. Ever

## Field Strength of Fundamental

E.U.T Description Mount Antenna and MR101  
Reader  
Model Number SPD  
Serial Number: Not Designated



**Figure 8. Field Strength of Fundamental  
Detector: Peak**

Active Antenna

$$L_{im30m} = 15848.00 \mu V/m$$

$$L_{im3m} = 40 \text{ dB}\mu V/m + 84.0 \text{ dB}\mu V/m = 124.0 \text{ dB}\mu V/m$$

$$\text{Margin} = L_{im3m} - \text{Result}$$

$$\text{Margin} = 124.0 \text{ dB}\mu V/m - 81.97 \text{ dB}\mu V/m$$

$$\text{Margin} = -42.03 \text{ dB}$$

#### 5.4 Test Instrumentation Used, Field Strength of Fundamental

| Instrument                  | Manufacturer | Model      | Serial Number | Calibration       | Period |
|-----------------------------|--------------|------------|---------------|-------------------|--------|
| EMI Receiver                | HP           | 85422E     | 3411A00102    | November 30, 2010 | 1 year |
| EMI Receiver Filter Section | HP           | 85420E     | 3427A00103    | November 30, 2010 | 1 year |
| Active Loop Antenna         | EMCO         | 6502       | 3506-2950     | October 19, 2010  | 1 year |
| Antenna Mast                | ARA          | AAM-4A     | 1001          | N/A               | N/A    |
| Turntable                   | ARA          | ART-1001/4 | 1001          | N/A               | N/A    |
| Mast & Table Controller     | ARA          | ACU-2/5    | 1001          | N/A               | N/A    |

## 6. Radiated Emission, 9 kHz – 30 MHz

### 6.1 Test Specification

9 kHz-30 MHz, FCC, Part 15, Subpart C, Section 209

### 6.2 Test Procedure

The E.U.T. operation mode and test set-up are as described in Section 3.

A preliminary measurement to characterize the E.U.T was performed inside the shielded room at a distance of 3 meters, using peak detection mode and broadband antennas. The preliminary measurements produced a list of the highest emissions. The E.U.T was then transferred to the open site, and placed on a remote-controlled turntable. The E.U.T was placed on a non-metallic table, 0.8 meters above the ground. The configuration tested is shown in Figure 3.1.

The frequency range 9 kHz-30 MHz was scanned.

The emissions were measured using a computerized EMI receiver complying to CISPR 16 requirements. The specification limits and applicable correction factors are loaded to the receiver via a 3.5" floppy disk.

In the frequency range 9 kHz-30MHz, the loop antenna was rotated on its vertical axis. The antenna height (center of loop) was 1 meter at a distance of 3 meters.

The E.U.T. was operated at the frequency of 13.56 MHz. This frequency was measured using a peak detector.

### 6.3 Measured Data

JUDGEMENT: Passed by 54.1 dB

The EUT met the requirements of the F.C.C. Part 15, Subpart C, Section 209 specification.

The margin between the emission level and the specification limit is 32.2 dB in the worst case at the frequency of 27.12 MHz.

See details in *Figure 9*.

TEST PERSONNEL:

Tester Signature: Chan Ever

Date: 17.03.10

Typed/Printed Name: E. Ever

## Radiated Emission, 9 kHz-30 MHz

E.U.T Description    Mount Antenna and MR101 Reader  
Type                      SPD  
Serial Number:        Not Designated

Specification: FCC Part 15, Subpart C, Section 209

Antenna: 3 meters distance                      Frequency range: 9 kHz to 30 MHz  
Detectors: Peak, Average

| Frequency<br>(MHz) | Peak<br>Reading<br>(dBμV/m) | Peak<br>Specification<br>(dBμV/m) | Margin<br>(dB) |
|--------------------|-----------------------------|-----------------------------------|----------------|
| 27.12              | 37.3                        | 69.5                              | 32.2           |

**Figure 9. Radiated Emission. Detectors: Peak, Quasi-peak**

*Note: Margin refers to the test results obtained minus specified requirement; thus a positive number indicates failure, and a negative result indicates that the product passes the test.*

$$L_{im30m} = 30 \mu V/m$$

$$L_{im3m} = 40 \text{ dB}\mu V/m + 29.5 \text{ dB}\mu V/m = 69.5 \text{ dB}\mu V/m$$

#### 6.4 Test Instrumentation Used, Radiated Measurements

| Instrument              | Manufacturer | Model         | Serial Number | Calibration       | Period |
|-------------------------|--------------|---------------|---------------|-------------------|--------|
| EMI Receiver            | HP           | 85422E        | 3906A00276    | November 30, 2010 | 1 year |
| RF Section              | HP           | 85420E        | 3705A00248    | November 30, 2010 | 1 year |
| Active Loop Antenna     | EMCO         | 6502          | 9506-2950     | October 19, 2010  | 1 year |
| Antenna Mast            | ARA          | AAM-4A        | 1001          | N/A               | N/A    |
| Turntable               | ARA          | ART-1001/4    | 1001          | N/A               | N/A    |
| Mast & Table Controller | ARA          | ACU-2/5       | 1001          | N/A               | N/A    |
| Printer                 | HP           | LaserJet 2200 | JPKGC19982    | N/A               | N/A    |

#### 6.5 Field Strength Calculation

The field strength is calculated directly by the EMI Receiver software, and a "Correction Factors" data disk, using the following equation:

$$FS = RA + AF + CF$$

FS: Field Strength [dB $\mu$ V/m]

RA: Receiver Amplitude [dB $\mu$ V]

AF: Receiving Antenna Correction Factor [dB/m]

CF: Cable Attenuation Factor [dB]

Example: FS = 30.7 dB $\mu$ V (RA) + 14.0 dB (AF) + 0.9 dB (CF) = 45.6 dB $\mu$ V

No external pre-amplifiers are used.

## **7. Radiated Emission 30 – 1000 MHz**

### **7.1 Test Specification**

30 MHz-1000 MHz, F.C.C., Part 15, Subpart C

### **7.2 Test Procedure**

The E.U.T. operation mode and test set-up are as described in Section 3.

See Section 3.1 Justification of the System Test Configuration concerning the E.U.T. orientation for this test.

A preliminary measurement to characterize the E.U.T was performed inside the shielded room at a distance of 3 meters, using peak detection mode and broadband antennas. The preliminary measurements produced a list of the highest emissions. The E.U.T was then transferred to the open site, and placed on a remote-controlled turntable.

The frequency range 30 MHz-1000 MHz was scanned, and the list of the highest emissions was verified and updated accordingly.

The levels of the emissions within the frequency ranges of the restricted bands (Section 15.205 of FCC Part 15) were compared to the limits of the table in Section 15.209 (a), General Requirements.

The emissions were measured using a computerized EMI receiver complying to CISPR 16 requirements. The specification limits and applicable correction factors are loaded to the receiver via a 3.5" floppy disk.

In the frequency range 30-1000 MHz, the readings were maximized by adjusting the antenna height between 1-4 meters, the turntable azimuth between 0-360°, and the antenna polarization.

Verification of the E.U.T emissions was based on the following methods:

- Turning the E.U.T on and off.

- Using a frequency span less than 10 MHz.

- Observation of the signal level during turntable rotation. Background noise is not affected by the rotation of the E.U.T.

### 7.3 Test Data

JUDGEMENT: Passed by 3.1 dB

The EUT met the requirements of the F.C.C. Part 15, Subpart C, specification.

The margin between the emission level and the specification limit was 3.1 dB in the worst case at the frequency of 108.50 MHz, vertical polarization.

The details of the highest emissions are given in *Figure 10*.

TEST PERSONNEL:

Tester Signature: E. Ever

Date: 10/08/10

Typed/Printed Name: E. Ever

## Radiated Emission

E.U.T Description    Mount Antenna and MR101 Reader  
Type                      SPD  
Serial Number:        Not Designated

Specification: FCC Part 15, Subpart C

Antenna Polarization: Horizontal

Frequency range: 30 MHz to 1000 MHz

Antenna: 3 meters distance

Detectors: Peak, Quasi-peak

| Frequency<br>(MHz) | Antenna<br>(H/V) | Peak<br>Reading<br>(dB $\mu$ V/m) | Quasi-peak<br>Reading<br>(dB $\mu$ V/m) | Peak<br>Specification<br>(dB $\mu$ V/m) | Margin<br>(dB) |
|--------------------|------------------|-----------------------------------|-----------------------------------------|-----------------------------------------|----------------|
| 40.68              | H                | 19.6                              | 13.8                                    | 40.0                                    | -26.2          |
| 54.24              | H                | 27.1                              | 25.0                                    | 40.0                                    | -15.0          |
| 67.80              | H                | 28.8                              | 27.0                                    | 43.5                                    | -16.5          |
| 81.32              | H                | 23.7                              | 20.5                                    | 43.5                                    | -23.0          |
| 108.48             | H                | 38.7                              | 37.8                                    | 43.5                                    | -5.7           |
| 122.00             | H                | 26.4                              | 22.9                                    | 40.0                                    | -17.1          |
| 40.68              | V                | 25.2                              | 21.7                                    | 40.0                                    | -18.3          |
| 54.24              | V                | 37.7                              | 36.6                                    | 43.5                                    | -6.9           |
| 67.80              | V                | 37.0                              | 32.9                                    | 43.5                                    | -10.6          |
| 81.36              | V                | 27.6                              | 25.6                                    | 43.5                                    | -17.9          |
| 108.50             | V                | 41.1                              | 40.4                                    | 43.5                                    | -3.1           |
| 217.00             | V                | 34.8                              | 32.9                                    | 43.5                                    | -10.6          |
| 244.10             | V                | 40.3                              | 38.6                                    | 46.5                                    | -7.9           |

**Figure 10. Radiated Emission. Antenna Polarization: VERTICAL/HORIZONTAL.  
Detectors: Peak, Quasi-peak**

#### 7.4 Test Instrumentation Used, Radiated Measurements

| Instrument              | Manufacturer | Model         | Serial Number | Calibration       | Period |
|-------------------------|--------------|---------------|---------------|-------------------|--------|
| EMI Receiver            | HP           | 85422E        | 3906A00276    | November 30, 2010 | 1 year |
| RF Section              | HP           | 85420E        | 3705A00248    | November 30, 2010 | 1 year |
| Antenna Bioconical      | ARA          | BCD 235/B     | 1041          | August 03, 2009   | 1 year |
| Antenna Log Periodic    | ARA          | LPD-2010/A    | 1038          | March 24, 2010    | 1 year |
| Antenna Mast            | ARA          | AAM-4A        | 1001          | N/A               | N/A    |
| Turntable               | ARA          | ART-1001/4    | 1001          | N/A               | N/A    |
| Mast & Table Controller | ARA          | ACU-2/5       | 1001          | N/A               | N/A    |
| Printer                 | HP           | LaserJet 2200 | JPKGC19982    | N/A               | N/A    |

#### 7.5 Field Strength Calculation

The field strength is calculated directly by the EMI Receiver software, and a "Correction Factors" data disk, using the following equation:

$$[\text{dB}\mu\text{V/m}] \text{ FS} = \text{RA} + \text{AF} + \text{CF}$$

FS: Field Strength [dB $\mu$ V/m]  
 RA: Receiver Amplitude [dB $\mu$ V]  
 AF: Receiving Antenna Correction Factor [dB/m]  
 CF: Cable Attenuation Factor [dB]

Example: FS = 30.7 dB $\mu$ V (RA) + 14.0 dB (AF) + 0.9 dB (CF) = 45.6 dB $\mu$ V

No external pre-amplifiers are used.

## 8. APPENDIX A - CORRECTION FACTORS

### 8.1 Correction factors for CABLE from EMI receiver to test antenna at 3 meter range.

| FREQUENCY<br>(MHz) | CORRECTION<br>FACTOR<br>(dB) | FREQUENCY<br>(MHz) | CORRECTION<br>FACTOR<br>(dB) |
|--------------------|------------------------------|--------------------|------------------------------|
| 10.0               | 0.3                          | 1200.0             | 7.3                          |
| 20.0               | 0.6                          | 1400.0             | 7.8                          |
| 30.0               | 0.8                          | 1600.0             | 8.4                          |
| 40.0               | 0.9                          | 1800.0             | 9.1                          |
| 50.0               | 1.1                          | 2000.0             | 9.9                          |
| 60.0               | 1.2                          | 2300.0             | 11.2                         |
| 70.0               | 1.3                          | 2600.0             | 12.2                         |
| 80.0               | 1.4                          | 2900.0             | 13.0                         |
| 90.0               | 1.6                          |                    |                              |
| 100.0              | 1.7                          |                    |                              |
| 150.0              | 2.0                          |                    |                              |
| 200.0              | 2.3                          |                    |                              |
| 250.0              | 2.7                          |                    |                              |
| 300.0              | 3.1                          |                    |                              |
| 350.0              | 3.4                          |                    |                              |
| 400.0              | 3.7                          |                    |                              |
| 450.0              | 4.0                          |                    |                              |
| 500.0              | 4.3                          |                    |                              |
| 600.0              | 4.7                          |                    |                              |
| 700.0              | 5.3                          |                    |                              |
| 800.0              | 5.9                          |                    |                              |
| 900.0              | 6.3                          |                    |                              |
| 1000.0             | 6.7                          |                    |                              |

#### NOTES:

1. The cable type is RG-214.
2. The overall length of the cable is 27 meters.
3. The above data is located in file 27MO3MO.CBL on the disk marked "Radiated Emission Tests EMI Receiver".

**8.2      Correction factors for      CABLE**  
**from EMI receiver**  
**to test antenna**  
**at 3 meter range.**

| FREQUENCY | CORRECTION |
|-----------|------------|
| (GHz)     | FACTOR     |
| 1.0       | 1.2        |
| 2.0       | 1.6        |
| 3.0       | 2.0        |
| 4.0       | 2.4        |
| 5.0       | 3.0        |
| 6.0       | 3.4        |
| 7.0       | 3.8        |
| 8.0       | 4.2        |
| 9.0       | 4.6        |
| 10.0      | 5.0        |
| 12.0      | 5.8        |

*NOTES:*

- 1. The cable type is RG-8.*
- 2. The overall length of the cable is 10 meters.*

### 8.3 Correction factors for LOG PERIODIC ANTENNA

**Type LPD 2010/A  
at 3 and 10 meter ranges.**

**Distance of 3 meters**

| <b>FREQUENCY</b><br>(MHz) | <b>AFE</b><br>(dB/m) |
|---------------------------|----------------------|
| 200.0                     | 9.1                  |
| 250.0                     | 10.2                 |
| 300.0                     | 12.5                 |
| 400.0                     | 15.4                 |
| 500.0                     | 16.1                 |
| 600.0                     | 19.2                 |
| 700.0                     | 19.4                 |
| 800.0                     | 19.9                 |
| 900.0                     | 21.2                 |
| 1000.0                    | 23.5                 |

**Distance of 10 meters**

| <b>FREQUENCY</b><br>(MHz) | <b>AFE</b><br>(dB/m) |
|---------------------------|----------------------|
| 200.0                     | 9.0                  |
| 250.0                     | 10.1                 |
| 300.0                     | 11.8                 |
| 400.0                     | 15.3                 |
| 500.0                     | 15.6                 |
| 600.0                     | 18.7                 |
| 700.0                     | 19.1                 |
| 800.0                     | 20.2                 |
| 900.0                     | 21.1                 |
| 1000.0                    | 23.2                 |

**NOTES:**

1. Antenna serial number is 1038.
2. The above lists are located in file number 38M30.ANT for a 3 meter range, and file number 38M100.ANT for a 10 meter range.
3. The files mentioned above are located on the disk marked "Radiated Emission Test EMI Receiver".

**8.4 Correction factors for BICONICAL ANTENNA**  
**Type BCD-235/B,**  
**at 3 meter range**

| <b>FREQUENCY</b><br>(MHz) | <b>AFE</b><br>(dB/m) |
|---------------------------|----------------------|
| 20.0                      | 19.4                 |
| 30.0                      | 14.8                 |
| 40.0                      | 11.9                 |
| 50.0                      | 10.2                 |
| 60.0                      | 9.1                  |
| 70.0                      | 8.5                  |
| 80.0                      | 8.9                  |
| 90.0                      | 9.6                  |
| 100.0                     | 10.3                 |
| 110.0                     | 11.0                 |
| 120.0                     | 11.5                 |
| 130.0                     | 11.7                 |
| 140.0                     | 12.1                 |
| 150.0                     | 12.6                 |
| 160.0                     | 12.8                 |
| 170.0                     | 13.0                 |
| 180.0                     | 13.5                 |
| 190.0                     | 14.0                 |
| 200.0                     | 14.8                 |
| 210.0                     | 15.3                 |
| 220.0                     | 15.8                 |
| 230.0                     | 16.2                 |
| 240.0                     | 16.6                 |
| 250.0                     | 17.6                 |
| 260.0                     | 18.2                 |
| 270.0                     | 18.4                 |
| 280.0                     | 18.7                 |
| 290.0                     | 19.2                 |
| 300.0                     | 19.9                 |
| 310                       | 20.7                 |
| 320                       | 21.9                 |
| 330                       | 23.4                 |
| 340                       | 25.1                 |
| 350                       | 27.0                 |

**NOTES:**

1. Antenna serial number is 1041.
2. The above list is located in file 19BC10M1.ANT on the disk marked "Radiated Emissions Tests EMI Receiver".

## 8.5 Correction factors for ACTIVE LOOP ANTENNA

**Model 6502**

**S/N 9506-2950**

| FREQUENCY | Magnetic<br>Antenna<br>Factor | Electric<br>Antenna<br>Factor |
|-----------|-------------------------------|-------------------------------|
| (MHz)     | (dB)                          | (dB)                          |
| .009      | -35.1                         | 16.4                          |
| .010      | -35.7                         | 15.8                          |
| .020      | -38.5                         | 13.0                          |
| .050      | -39.6                         | 11.9                          |
| .075      | -39.8                         | 11.8                          |
| .100      | -40.0                         | 11.6                          |
| .150      | -40.0                         | 11.5                          |
| .250      | -40.0                         | 11.6                          |
| .500      | -40.0                         | 11.5                          |
| .750      | -40.1                         | 11.5                          |
| 1.000     | -39.9                         | 11.7                          |
| 2.000     | -39.5                         | 12.0                          |
| 3.000     | -39.4                         | 12.1                          |
| 4.000     | -39.7                         | 11.9                          |
| 5.000     | -39.7                         | 11.8                          |
| 10.000    | 40.2                          | 11.3                          |
| 15.000    | -40.7                         | 10.8                          |
| 20.000    | -40.5                         | 11.0                          |
| 25.000    | -41.3                         | 10.2                          |
| 30.000    | 42.3                          | 9.2                           |