



DATE: 24 August 2016

I.T.L. (PRODUCT TESTING) LTD. FCC/IC Radio Test Report

Kornit Digital Technologies Ltd.

Equipment under test:

RFID Bulk System for Kornit Printers

RFID Bulk System

Tested by:

N. Levi

Approved by:

D. Shidlowsky

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Measurement/Technical Report for

Kornit Digital Technologies Ltd.

RFID Bulk System for Kornit Printers

RFID Bulk System

FCC ID: 2AGY2RFIDBULKSYS

IC: 21026-RFIDBULKSYS

| This report concer | rns: Original Grant: X |
|--------------------|--|
| | Class I change: |
| | Class II change: |
| Equipment type: | FCC: Part 15 Low Power Communication Device Transmitter DXX IC: Low Power Transmitter General Field Limits (9 kHz-30 MHz) |
| Limits used: | FCC: 47CFR15 Section 15.225 IC: RSS 210, Issue 8: 2010 |

Measurement procedure used is ANSI C63.10: 2013.

| Application for Certification | Applicant for this device: |
|-------------------------------|---------------------------------|
| prepared by: | (different from "prepared by") |
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General Information 1.

1.1 Administrative Information

| Manufacturer: | Kornit Digital Technologies Ltd. |
|--------------------------------|---|
| Manufacturer's Address: | 12 Ha'amal, Rosh-Ha'Ayin 4809246, Israel Tel: +972-3-908-5800 Fax: +972-3-908-0280 |
| Manufacturer's Representative: | Dori Brudner |
| Equipment Under Test (E.U.T): | RFID Bulk System for Kornit Printers |
| Equipment Name: | RFID Bulk System |
| Equipment Serial No.: | Not Designated |
| HVIN: | 1.0 |
| Date of Receipt of E.U.T: | December 24, 2015 |
| Start of Test: | 1. December 24, 2015 2. August 24, 2016 (See Note below) |
| End of Test: | 1. January 12, 2016 2. August 24, 2016 (See Note below) |
| Test Laboratory Location: | I.T.L (Product Testing) Ltd. 1 Batsheva St., Lod ISRAEL 7120101 |
| Test Specifications: | FCC Part 15, Subpart C IC: RSS -210 Issue 8, RSS Gen- issue 4 |

Note: Occupied Bandwidth and Frequency Tolerance testing were performed on August 24, 2016.



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.), FCC Designation No. IL1005
- 3. The Israel Ministry of the Environment (Israel), Registration No. 1104/01.
- The Voluntary Control Council for Interference by Information Technology Equipment (VCCI) (Japan), Registration Numbers:. C-3006, R-2729, T-1877, G-245.
- 5. Industry Canada (Canada), IC File No.: 46405-4025; Sites No. IC 4025A-1, 4025A-2.

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.



2.1 Product Description

E.U.T. is a 13.56MHz RFID module intended to be used in several Kornit Printing Machine models.

2.2 Test Methodology

Radiated testing was performed according to the procedures in ANSI C63.10: 2013. Radiated testing was performed at an antenna to EUT distance of 3 meters.

2.3 Test Facility

Emissions tests were performed at I.T.L.'s testing facility in Lod, Israel. I.T.L.'s EMC Laboratory is accredited by A2LA, certificate No. 1152.01 and its FCC Designation Number is IL1005.

2.4 Measurement Uncertainty

Radiated Emission

Radiated Emission (CISPR 11, EN 55011, CISPR 22, EN 55022, ANSI C63.4) for open site 30-1000MHz:

Expanded Uncertainty (95% Confidence, K=2):

 $\pm 4.98 \text{ dB}$

3. System Test Configuration

3.1 Justification

Kornit Digital is applying for limited modular approval for its 13.56 MHz module.

Per FCC response on 04/07/2014 (Tracking Number 219279), the E.U.T. was tested as "stand alone" as would be the installation position in the following host printers: Paradigm, Avalanche, Avalanche 1000, Avalanche Hexa, Allegro, Vulcan, Storm and Breeze.

The EUT was connected to an AC/DC adapter to simulate the power it would receive from the actual printer the E.U.T. would be installed in.

3.2 EUT Exercise Software

No special exercise software was used.

3.3 Special Accessories

No special accessories were needed in order to achieve compliance.

3.4 Equipment Modifications

No modifications were needed in order to achieve compliance



3.5 Configuration of Tested System



Figure 1. Configuration of Tested System





4. Test Set-up Photos

Figure 2. Radiated Emission Test



Figure 3. Radiated Emission Test





Figure 4. Radiated Emissions Test



Figure 5. Frequency Tolerance Test





Figure 6. Field Strength of Fundamental Test

5. Field Strength of Fundamental

5.1 Test Specification

F.C.C., Part 15, Subpart C, Section 15.225(a) (b) (c) RSS-210 section 2.5, Annex 2 A2.6(a) (b) (c)

5.2 Test Procedure

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

The E.U.T. was placed on a non-conductive table, 0.8 meters above in the chamber.

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 1 meter.

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 Test Results

| Field Strength Reading | Limit Section 15.225(a) @1m | Margin A | Limit Section 15.225(b) @1m | Margin B | Limit Section 15.225(c) @1m | Margin C |
|------------------------------|--------------------------------------|-------------|--------------------------------------|-------------|--------------------------------------|-------------|
| dBuV/m | dBµV/m | dB | dBµV/m | dB | dBµV/m | dB |
| 84.08 | | | 110.50 | -26.42 | 100.50 | -16.42 |
| 87.83 | 144.0 | -56.17 | | | | |

Figure 7. Field Strength of Fundamental Test Results

| JUDGEMENT: | Passed by 56.17 dB (Section 15.225(a)) |
|------------|--|
| | Passed by 26.42 dB (Section 15.225(b)) |
| | Passed by16.42 dB (Section 15.225(c) |

The EUT met the FCC Part 15, Subpart C, Sections 15.225(a); (b); (c) and RSS-210 section 2.5, Annex 2 A2. 6(a) (b) (c) specification requirements.

The details of the highest emissions are given in Figure 8 to Figure 9.



Field Strength of Fundamental

E.U.T Description Model/Part Number Serial Number:

RFID Bulk System for Kornit Printers RFID Bulk System Not Designated



Date: 27.DEC.2015 16:05:28

Figure 8. Field Strength of Fundamental Mask Detector: Peak

Section 15.225 (b): $L_{im30m} = 334.00 \ \mu V/m = 50.50 \ dB\mu V/m$ Section 15.225 (b): $L_{im1m} = 60 + 50.50 \ dB\mu V/m = 110.50 \ dB\mu V/m$ Section 15.225 (c): $L_{im30m} = 106.00 \ \mu V/m = 40.50 \ dB\mu V/m$ Section 15.225 (c) $L_{im1m} = 60 + 40.50 \ dB\mu V/m = 100.50 \ dB\mu V/m$



Field Strength of Fundamental



Date: 27.DEC.2015 15:44:48

Figure 9. Field Strength of Fundamental Detector: Peak

Section 15.225 (a): $L_{im30m} = 15848.00 \ \mu V/m = 84.0 \ dB\mu V/m$ Section 15.225(a): $L_{im1m} = 60 + 84.0 \ dB\mu V/m = 144.0 \ dB\mu V/m$



5.4 Test Equipment Used, Field Strength of Fundamental

| Instrument | Manufacturer | Model | Serial No. | Last Calibration Date | Next Calibration Due |
|----------------------------|--------------------|--------|------------|--------------------------|-------------------------|
| EMI Test Receiver | Rohde & Schwarz | ESCI7 | 100724 | January 4, 2015 | January 4, 2016 |
| Loop Antenna | EMCO | 6502 | 2950 | November 5, 2015 | November 30, 2016 |
| Antenna Mast | ETS | 2070-2 | 9608-1497 | N/A | N/A |
| Turntable | ETS | 2087 | - | N/A | N/A |
| Mast & Table Controller | ETS/EMCO | 2090 | 9608-1456 | N/A | N/A |

Figure 10 Test Equipment Used



6. **Spurious Radiated Emission**, 9 kHz – 30 MHz

6.1 **Test Specification**

FCC, Part 15, Subpart C, Section 209 RSS-210 issue 8, section A2.6 (d)

6.2 **Test Procedure**

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

A preliminary measurement to characterize the E.U.T was performed inside the shielded room at a distance of 3 meters for the frequency range 30MHz and above, 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 chamber, 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 1*.

The frequency range 9 kHz-30 MHz was scanned.

The emissions were measured using a computerized EMI receiver complying with CISPR 16 requirements. The specification limits and applicable correction factors are pre-loaded to the receiver.

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 1 meters.

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

6.3 **Test Results**

JUDGEMENT: Passed by 29.2 dB

The EUT met the requirements of the F.C.C. Part 15, Subpart C, Section 209 and RSS-210 issue 8, section A2.6 (d) specification.



Radiated Emission 9 kHz – 30 MHz

E.U.T Description

Model/Part Number Serial Number: RFID Bulk System for Kornit Printers RFID Bulk System Not Designated

Specification: FCC, Part 15, Subpart C; RSS-210 issue 8, Section A2.6 (d)

Antenna Polarization: Vertical Test Distance: 3 meters Operation Frequency: 13.56 MHz Frequency range: 9 kHz - 30 MHz Detector: Peak

| Frequency | Peak | Specification | Margin |
|-----------|----------|---------------|--------|
| (MHz) | (dBµV/m) | $(dB\mu V/m)$ | (dB) |
| 26.20 | 40.3 | 69.5 | -29.2 |

Figure 11. Radiated Emission

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.

"Peak Reading" includes correction factor.

"Correction Factor" = Antenna Factor + Cable Loss



| Instrument | Manufacturer | Model | Serial No. | Last Calibration Date | Next Calibration Due |
|----------------------------|--------------------|--------|------------|--------------------------|-------------------------|
| EMI Test Receiver | Rohde & Schwarz | ESCI7 | 100724 | January 4, 2015 | January 4, 2016 |
| Loop Antenna | ЕМСО | 6502 | 9506-2950 | November 5, 2015 | November 30, 2016 |
| Antenna Mast | ETS | 2070-2 | 9608-1497 | N/A | N/A |
| Turntable | ETS | 2087 | - | N/A | N/A |
| Mast & Table Controller | ETS/EMCO | 2090 | 9608-1456 | N/A | N/A |

6.4 Test Equipment Used, Radiated Measurements 9kHz-30MHz

| Figure 1 | 12 | Test | Equipment | Used |
|----------|----|------|-----------|------|
|----------|----|------|-----------|------|

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 [dBµv/m] |
|-----|--|
| RA: | Receiver Amplitude [dBµv] |
| AF: | Receiving Antenna Correction Factor [dB/m] |
| CF: | Cable Attenuation Factor [dB] |

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

No external pre-amplifiers are used.



7. Spurious Radiated Emission 30 MHz – 1000 MHz

7.1 Test Specification

F.C.C., Part 15, Subpart C RSS-210 issue 8, Section A2.6 (d)

7.2 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 for measurements below 1GHz, 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 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 with 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 Results

JUDGEMENT:

Passed by 4.4 dB

The EUT met the requirements of the F.C.C. Part 15, Subpart C and RSS-210 issue 8, section A2.6 (d) specification.



Radiated Emission 30 MHz- 1000 MHz

E.U.T Description

Model/Part Number Serial Number: RFID Bulk System for Kornit Printers RFID Bulk System Not Designated

Specification: FCC, Part 15, Subpart C; RSS-210 issue 8, section A2.6 (d)

Antenna Polarization: Vertical/Horizontal Test Distance: 3 meters Operation Frequency: 13.56 MHz Frequency range: 30 MHz - 1000 MHz Detector: Quasi Peak

| Frequency (MHz) | Antenna Polarization | Q.Peak Reading (dBµV/m) | Specification (dBµV/m) | Margin (dB) |
|--------------------|-------------------------|-------------------------------|---------------------------|----------------|
| 298.2 | Н | 41.0 | 46.0 | -5.0 |
| 298.2 | V | 40.5 | 46.0 | -5.5 |
| 325.0 | Н | 38.1 | 46.0 | -7.9 |
| 325.0 | V | 41.1 | 46.0 | -4.9 |
| 455.3 | Н | 39.3 | 46.0 | -6.7 |
| 455.3 | V | 41.6 | 46.0 | -4.4 |

Figure 13. Radiated Emission

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.

"Peak Reading" includes correction factor.

"Correction Factor" = Antenna Factor + Cable Loss

| Instrument | Manufacturer | Model | Serial No. | Last Calibration Date | Next Calibration Due |
|----------------------------|--------------|--------|------------|--------------------------|-------------------------|
| EMI Receiver | HP | 8542E | 3906A00276 | March 11, 2015 | March 31, 2016 |
| RF Filter Section | HP | 85420E | 3705A00248 | March 19, 2015 | March 31, 2016 |
| Biconical Antenna | ЕМСО | 3104 | 2606 | December 31. 2015 | March 31, 2016 |
| Log Periodic Antenna | ЕМСО | 3146 | 9505-4081 | December 31. 2015 | March 31. 2016 |
| Antenna Mast | ETS | 2070-2 | 9608-1497 | N/A | N/A |
| Turntable | ETS | 2087 | - | N/A | N/A |
| Mast & Table Controller | ETS/EMCO | 2090 | 9608-1456 | N/A | N/A |

7.4 Test Equipment Used, Radiated Measurements 30MHz-1000MHz

Figure 14 Test Equipment Used

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:

 $[dB\mu v/m]$ FS = RA + AF + CF

| FS: | Field Strength [dBµv/m] |
|-----|--|
| RA: | Receiver Amplitude [dBµv] |
| AF: | Receiving Antenna Correction Factor [dB/m] |
| CF: | Cable Attenuation Factor [dB] |

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

No external pre-amplifiers are used.

8. Occupied Bandwidth

8.1 Test Specification

FCC, Part 2, Section 2.1049 RSS-GEN issue 4 11 2014, Section 6.6

8.2 Test Procedure

The transmitter unit was operated with normal modulation. The spectrum analyzer was set to 10 kHz resolution BW and center frequency of the transmitter fundamental. The spectrum bandwidth of the transmitter unit was measured and recorded. The BW was measured at 26dBc points.

The EUT was set up as shown in *Figure 1*, and its proper operation was checked. The transmitter occupied bandwidth was measured with the EMI receiver as frequency delta between reference points on the modulation envelope.

8.3 Test Limit

N/A

8.4 Test Results

| FREQUENCY | READING |
|-----------|---------|
| (MHz) | (kHz) |
| 13.56 | 167.7 |

Figure 15. Bandwidth Test Results

JUDGEMENT: Passed

See additional information in Figure 16.



Occupied Bandwidth

| E.U.T Description | RFID Bulk System for Kornit Printers |
|-------------------|---|
| Model Number | RFID Bulk System |
| Part Number: | Not Designated |



Date: 24.AUG.2016 11:57:04

Figure 16 26dB Bandwidth



| Instrument | Manufacturer | Model | Serial No. | Last Calibration Date | Next Calibration Due |
|----------------------------|--------------------|--------|------------|--------------------------|-------------------------|
| EMI Test Receiver | Rohde & Schwarz | FSL6 | 100194 | February 29, 2016 | March 1, 2017 |
| Loop Antenna | EMCO | 6502 | 2950 | November 5, 2015 | November 30, 2016 |
| Antenna Mast | ETS | 2070-2 | 9608-1497 | N/A | N/A |
| Turntable | ETS | 2087 | - | N/A | N/A |
| Mast & Table Controller | ETS/EMCO | 2090 | 9608-1456 | N/A | N/A |

8.5 Test Equipment Used; Occupied Bandwidth

| Figure 17 | Test | Equipment | Used |
|-------------|------|-----------|------|
| i iguio i i | | Equipmont | 0000 |



9. Frequency Tolerance

9.1 Test Specification

Part 15 Subpart C Section 15.225(e) RSS-210 issue 8, section A2.6 (d)

9.2 Test Procedure

The E.U.T operation mode and test setup are as described in Section 3.

The E.U.T. was placed in a test fixture enabling coupling from the E.U.T. to the spectrum analyzer.

The E.U.T. and test fixture were placed inside a temperature chamber. The E.U.T. was operated from 115 VAC at normal temperature (20°C).

The chamber temperature was set to +20°C and tested at 115VAC, 97.75VAC and 133.25VAC.

The spectrum analyzer was set to 1.0 kHz span and 3.0 kHz resolution B.W.

"Frequency Counter" was used for these measurements.

The carrier frequency measurement was repeated for:

115 VAC @ +50°C 115 VAC @ +40°C 115 VAC @ +30°C 115 VAC @ +20°C 115 VAC @ +10°C 115 VAC @ 0°C 115 VAC @ -10°C 115 VAC @ -20°C

The carrier frequency was measured and recorded after at least 10 minutes of exposing the E.U.T. to the temperature.

The configuration tested is shown in photograph, *Figure 5. Frequency Tolerance Test.*

9.3 Test Results

The E.U.T met the requirements of Part 15 Subpart C, Section 225(e) specification.

The frequency offset between the frequency measured under extreme conditions and the nominal carrier frequency measured under normal test conditions, is in the worst case, +0.67 kHz at -20 °C (spec: +/-1.356 kHz).

The details of the highest emissions are given in Figure 18.



Frequency Tolerance

| E.U.T Description | RFID Bulk System for Kornit Printers |
|-------------------|--------------------------------------|
| Model/Part Number | RFID Bulk System |
| Serial Number: | Not Designated |

Specification: FCC Part 15 Subpart C Section 15.225(e); RSS-210 Issue 8, Section A2.6 (d)

| Temperature | Voltage | Measured Carrier Frequency | Nominal Carrier Frequency | Δ | Limit | Verdict |
|-------------|---------|----------------------------------|------------------------------|--------|----------|-------------|
| (°C) | (VAC) | (MHz) | (MHz) | (kHz) | (kHz) | (Pass/Fail) |
| | 115.0 | 13.560601 | 13.560000 | +0.601 | +/-1.356 | Pass |
| +20.0 | 97.75 | 13.560602 | 13.560000 | +0.602 | +/-1.356 | Pass |
| | 132.25 | 13.560602 | 13.560000 | +0.602 | +/-1.356 | Pass |
| -20.0 | 115.0 | 13.560670 | 13.560000 | +0.670 | +/-1.356 | Pass |
| -10.0 | 115.0 | 13.560632 | 13.560000 | +0.632 | +/-1.356 | Pass |
| 0.0 | 115.0 | 13.560615 | 13.560000 | +0.615 | +/-1.356 | Pass |
| +10.0 | 115.0 | 13.560601 | 13.560000 | +0.601 | +/-1.356 | Pass |
| +20.0 | 115.0 | 13.560610 | 13.560000 | +0.610 | +/-1.356 | Pass |
| +30.0 | 115.0 | 13.560613 | 13.560000 | +0.613 | +/-1.356 | Pass |
| +40.0 | 115.0 | 13.560620 | 13.560000 | +0.620 | +/-1.356 | Pass |
| +50.0 | 115.0 | 13.560635 | 13.560000 | +0.635 | +/-1.356 | Pass |

Figure 18. Frequency Tolerance



9.4 Test Equipment Used, Frequency Tolerance

| Instrument | Manufacturer | Model | Serial Number | Last Calibration Date | Next Calibration Due |
|-------------------------|--------------------|-----------|---------------|--------------------------|-------------------------|
| Spectrum Analyzer | Rohde & Schwarz | FSL6 | 100194 | February 29, 2016 | March 1, 2017 |
| DMM | UNI-T | UT50B | 1080731928 | March 3, 2016 | March 3, 2017 |
| Thermal Chamber | Thermotron | SM-4S-SLE | 23028 | March 23, 2016 | March 23, 2017 |
| Variable Transformer | VOLTAC | SB-5 | - | N/A | N/A |

Figure 19 Test Equipment Used



10. APPENDIX A - CORRECTION FACTORS

10.1 Correction factors for CABLE RF

from EMI receiver to test antenna at 3 meter length

| Frequency | Cable Loss | Frequency | Cable Loss |
|-----------|---------------|-----------|---------------|
| (MHz) | (dB) | (MHz) | (dB) |
| 0.010 | 0.4 | 50.00 | 1.2 |
| 0.015 | 0.2 | 100.00 | 0.7 |
| 0.020 | 0.2 | 150.00 | 2.1 |
| 0.030 | 0.3 | 200.00 | 2.3 |
| 0.050 | 0.3 | 300.00 | 2.9 |
| 0.075 | 0.3 | 500.00 | 3.8 |
| 0.100 | 0.2 | 750.00 | 4.8 |
| 0.150 | 0.2 | 1000.00 | 5.4 |
| 0.200 | 0.3 | 1500.00 | 6.7 |
| 0.500 | 0.4 | 2000.00 | 9.0 |
| 1.00 | 0.4 | 2500.00 | 9.4 |
| 1.50 | 0.5 | 3000.00 | 9.9 |
| 2.00 | 0.5 | 3500.00 | 10.2 |
| 5.00 | 0.6 | 4000.00 | 11.2 |
| 10.00 | 0.8 | 4500.00 | 12.1 |
| 15.00 | 0.9 | 5000.00 | 13.1 |
| 20.00 | 0.8 | 5500.00 | 13.5 |
| | | 6000.00 | 14.5 |

NOTES:

- 1. The cable type is SPUMA400 RF-11N(X2) and 39m long
- 2. The cable is manufactured by Huber + Suhner



10.2 Correction factors for Log Periodic Antenna Model: 3146 Antenna serial number: 9505-4081 3 meter range

CALIBRATION DATA

| Frequency, MHz | Antenna factor, dB/m ¹⁾ |
|----------------|------------------------------------|
| 200 | 11.55 |
| 250 | 11.60 |
| 300 | 14.43 |
| 400 | 15.38 |
| 500 | 17.98 |
| 600 | 18.78 |
| 700 | 21.17 |
| 800 | 21.16 |
| 900 | 22.67 |
| 1000 | 24.09 |

¹⁾ The antenna factor shall be added to receiver reading in dBµV to obtain field strength in dBµV/m.



10.3 Correction factors for Biconical ANTENNA

Model: 3104 *Antenna serial number: 2606* 3 meter range

CALIBRATION DATA

| Frequency, MHz | Near free space antenna factor, dB/m | Geometry specific correction factor, dB | Free space antenna factor, dB/m ¹⁾ |
|----------------|---|--|--|
| 30 | 12.97 | 0.13 | 12.84 |
| 35 | 12.34 | 0.09 | 12.25 |
| 40 | 12.03 | 0.06 | 11.97 |
| 45 | 11.42 | 0.02 | 11.40 |
| 50 | 11.91 | 0.03 | 11.88 |
| 60 | 11.92 | 0.37 | 11.55 |
| 70 | 9.60 | 0.25 | 9.35 |
| 80 | 6.99 | -0.45 | 7.44 |
| 90 | 10.87 | -0.34 | 11.21 |
| 100 | 11.51 | -0.06 | 11.57 |
| 120 | 13.30 | 0.20 | 13.10 |
| 140 | 12.56 | -0.01 | 12.57 |
| 160 | 14.49 | -0.12 | 14.61 |
| 180 | 16.53 | 0.05 | 16.48 |
| 200 | 15.30 | 0.15 | 15.15 |

1) The antenna factor shall be added to receiver reading in dBµV to obtain field strength in dBµV/m.

10.4 Correction Factors for Active Loop Antenna Model 6502 S/N 9506-2950

| | Magnetic | Electric |
|-----------|----------|----------|
| FREQUENCY | Antenna | Antenna |
| | Factor | 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 |