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DATE: 26 November 2013

I.T.L. (PRODUCT TESTING) LTD.

FCC Radio Test Report

for

Hi-G-Tek Ltd.

Equipment under test:

SPDS Seal

IGSPV40916/IGSBV40916*

916.5 MHz Transmitter

Written by: _____
R. Pinchuck, Documentation

Approved by: _____
A. Sharabi, Test Engineer

Approved by: _____
I. Raz, EMC Laboratory Manager

*See Customer's Declaration on page 5

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Measurement/Technical Report for

Hi-G-Tek Ltd.

Equipment under test:

SPDS Seal

FCC ID: OB6-IGSV40916

27 November 2013

This report concerns: Original Grant: X
Class I change:
Class II change:

Equipment type: Low Power Communication Device Transmitter

47CFR15 Section 15.249 (a-b)

Measurement procedure used is KDB 558074 D01 April 9, 2013 and ANSI C63.4-2003.

Application for Certification prepared by:

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Applicant for this device: (different from "prepared by")

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TABLE OF CONTENTS

1. GENERAL INFORMATION ---- 4
1.1 Administrative Information 4
1.2 Abbreviations and Symbols 6
1.3 List of Accreditations 7
1.4 Product Description 8
1.5 Test Methodology 8
1.6 Test Facility 8
1.7 Measurement Uncertainty 8

2. SYSTEM TEST CONFIGURATION ---- 9
2.1 Justification 9
2.2 EUT Exercise Software 9
2.3 Special Accessories 9
2.4 Equipment Modifications 9
2.5 Configuration of Tested System 9

3. RADIATED MEASUREMENT TEST SET-UP PHOTOS ----10

4. FIELD STRENGTH OF FUNDAMENTAL 916.5 MHZ TRANSMITTER ----12
4.1 Test Specification 12
4.2 Test Procedure 12
4.3 Measured Data 12
4.4 Test Instrumentation Used, Field Strength of Fundamental 16

5. RADIATED EMISSION, 9 KHZ – 30 MHZ, 916.5 MHZ TRANSMITTER ----17
5.1 Test Specification 17
5.2 Test Procedure 17
5.3 Measured Data 17
5.4 Test Instrumentation Used, Radiated Measurements 18
5.5 Field Strength Calculation 19

6. SPURIOUS RADIATED EMISSION 30 MHZ - 10000MHZ, 916.5 MHZ TRANSMITTER ----20
6.1 Test Specification 20
6.2 Measured Data 21
6.3 Test Instrumentation Used 24
6.4 Field Strength Calculation 25

7. 26 DB MINIMUM BANDWIDTH----26
7.1 Test procedure 26
7.2 Results table 27
7.3 Test Equipment Used. 28

8. ANTENNA GAIN/INFORMATION----29

9. AVERAGE FACTOR CALCULATION ----30
9.1 Test Equipment Used, Average Factor Calculation 31

10. R.F EXPOSURE/SAFETY----32

11. APPENDIX A - CORRECTION FACTORS ----33
11.1 Correction factors for CABLE 33
11.2 Correction factors for CABLE 34
11.3 Correction factors for CABLE 35
12.6 Correction factors for LOG PERIODIC ANTENNA 36
11.4 Correction factors for LOG PERIODIC ANTENNA 37
11.5 Correction factors for BICONICAL ANTENNA 38
11.6 Correction factors for Double-Ridged Waveguide Horn 39
11.7 Correction factors for Horn Antenna 40
11.8 Correction factors for ACTIVE LOOP ANTENNA 41

1. General Information

1.1 Administrative Information

Manufacturer:	Hi-G-Tek Ltd.
Manufacturer's Address:	16 Hacharoshet St. Or-Yehuda 60375 Israel Tel: +972-3-533-9359 Fax: +972-3-533-9225
Manufacturer's Representative:	Roni Cohen
Equipment Under Test (E.U.T):	SPDS Seal
Equipment Model No.:	IGSPV40916/IGSBV40916
Equipment Serial No.:	Not Designated
Date of Receipt of E.U.T:	21.08.2013
Start of Test:	21.08.2013
End of Test:	21.08.2013
Test Laboratory Location:	I.T.L (Product Testing) Ltd. Kfar Bin Nun, ISRAEL 99780
Test Specifications:	FCC Part 15, Subpart C, Section 15.249

Hi-G-Tek Wireless Monitoring Platform for Security & Management

November 13, 2013

DECLARATION

I HEREBY DECLARE THAT THE DIFFERENCES BETWEEN THE FOLLOWING PRODUCT(S):

SPDS Seal IG-SPV-40-916 and
SPDS Seal IG-SBV-40-916

ARE AS FOLLOWS:

SPDS Seal IG-SBV-40-916 – THE ADAPTER HAS 3 INPUTS AND INTERNAL REED SWITCH

SPDS Seal IG-SPV-40-916- THE ADAPTER HAS ONE INPUT, ONE OUTPUT AND INTERNAL REED SWITCH

Please relate to them all (from an EMC point of view) as the same product.

Thank you,
Signature: Hi-G-Tek Ltd. Wireless Monitoring Platform

Roni Cohen
HW Development Manager
Hi-G-Tek Ltd.

1.2 Abbreviations and Symbols

The following abbreviations and symbols are applicable to this test report:

A/m	ampere per meter
AC	alternating current
AM	amplitude modulation
ARA	Antenna Research Associates
Aux	auxiliary
Avg	average
CDN	coupling-decoupling network
cm	centimeter
dB	decibel
dBm	decibel referred to one milliwatt
dbµV	decibel referred to one microvolt
dbµV/m	decibel referred to one microvolt per meter
DC	direct current
EFT/B	electrical fast transient/burst
EMC	electromagnetic compatibility
ESD	electrostatic discharge
E.U.T.	equipment under test
GHz	gigahertz
HP	Hewlett Packard
Hz	Hertz
kHz	kilohertz
kV	kilovolt
LED	light emitting diode
LISN	line impedance stabilization network
m	meter
mHn	millihenry
MHz	megahertz
msec	millisecond
N/A	not applicable
per	period
QP	quasi-peak
PC	personal computer
RF	radio frequency
RE	radiated emission
sec	second
V	volt
V/m	volt per meter
VRMS	volts root mean square

1.3 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), IC File No.: 46405-4025; Site No. IC 4025B-1.

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.

1.4 Product Description

The SPDS Seal is a portable, reusable electronic seal that provides automatic processing and real-time monitoring of secured cargoes in transit and in storage. The SPDS Seal uses active RFID (Radio Frequency Identification) wireless monitoring technology and includes a transmitter/receiver unit, read/ write capability, real-time clock, memory and sensing circuitry for sealing verification. The SPDS Seal, together with mounting fixture, form the complete assembly used in most applications. The system detects any such attempt, sends an alert and records the event. In low frequency, short range mode, the SPDS Seal logs and communicates data through a handheld data terminal and can be inspected by a MicroReader. The data terminal writes the electronic manifest of the sealed cargo into the electronic seal's memory. The information can include the vehicle ID, container and invoice numbers, cargo descriptions, quantities and destinations. The high-frequency, long range mode provides full two-way, read/write data communication capabilities at a distance of 50m. The SPDS Seal transmits the information in reply to an interrogation by the AVL Reader.

1.5 Test Methodology

Radiated testing was performed according to the procedures in KDB 558074 D01 April 9, 2013 and ANSI C63.4: 2003. Radiated testing was performed at an antenna to EUT distance of 3 meters.

1.6 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.

1.7 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):

± 4.96 dB

2. System Test Configuration

2.1 Justification

Model IGSPV40916 differs from Model IGSBV40916 by additional digital components connected to the unit sensor
During testing the IGSPV40916 was tested as worst case.

2.2 EUT Exercise Software

No exercise software was used during testing.

2.3 Special Accessories

No special accessories were needed to achieve compliance.

2.4 Equipment Modifications

No special modifications were needed to achieve compliance.

2.5 Configuration of Tested System

The configuration of the tested system is described below.

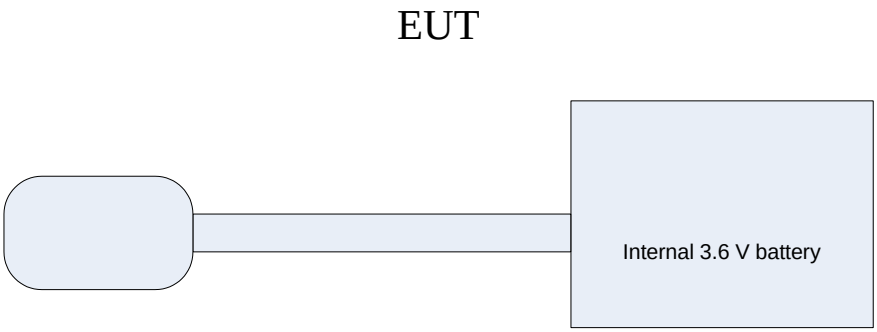

Figure 1. Configuration of Tested System

3. Radiated Measurement Test Set-up Photos

Figure 2. Radiated Emission Test

Figure 3. Radiated Emission Test

Figure 4. Radiated Emission Test

Figure 5. Radiated Emission Test

4. Field Strength of Fundamental 916.5 MHz Transmitter

4.1 Test Specification

F.C.C., Part 15, Subpart C, Section 15.249(a)

4.2 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 (916.0 MHz) and Peak Detection. The turntable and antenna mast were adjusted for maximum level reading on the EMI receiver. The measurement was performed for vertical and horizontal polarizations of the test antenna.

4.3 Measured Data

JUDGEMENT: Passed by 1.23 dB

The EUT met the FCC Part 15, Subpart C, Section 15.249(a) specification requirements.

The details of the highest emissions are given in *Figure 6*.

TEST PERSONNEL:

Tester Signature: _____ Date: 22.12.13

Typed/Printed Name: A. Sharabi

Field Strength of Fundamental

E.U.T Description	SPDS Seal
Model Number	IGSPV40916/IGSBV40916
Serial Number:	Not Designated

Specification: F.C.C., Part 15, Subpart C, Section 15.249(a)

Antenna Polarization: Horizontal/Vertical Test Distance: 3 meters

Frequency: 916.528 MHz Detectors: Peak

Freq. (MHz)	Pol. V/H	Peak Reading (*) (dBµV/m)	Specification (dBµV/m)	Margin (dB)
916.528	V	92.77	94.0	-1.23
916.528	H	88.58	94.0	-5.42

Figure 6. Field Strength of Fundamental. Antenna Polarization: HORIZONTAL/VERTICAL. Detector: 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.

* "Peak Amp." includes "Correction Factors.

"Correction Factors" = Antenna Correction Factor + Cable Loss.

Field Strength of Fundamental

E.U.T Description	SPDS Seal
Model Number	IGSPV40916/IGSBV40916
Serial Number:	Not Designated

Specification: F.C.C., Part 15, Subpart C, Section 15.249(a)

Antenna Polarization: Vertical
Frequency: 916.528 MHz

Test Distance: 3 meters
Detectors: Peak

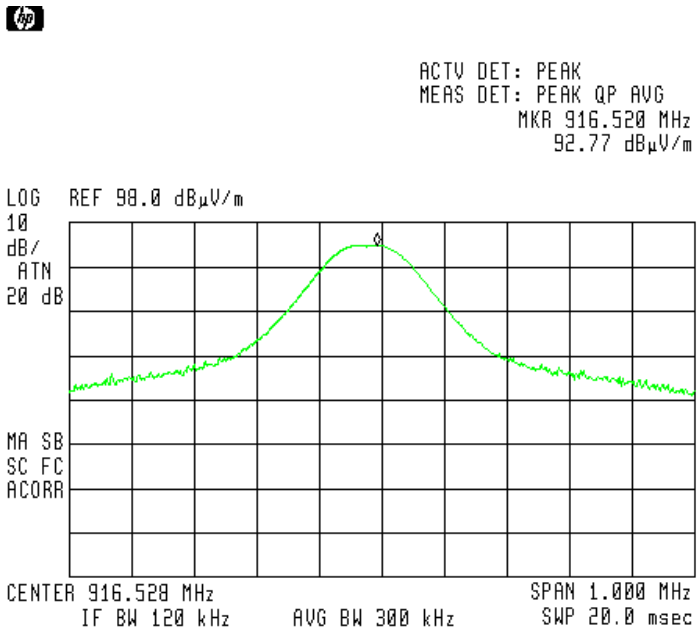

Figure 7. Field Strength of Fundamental. Antenna Polarization: VERTICAL. Detector: Peak

Field Strength of Fundamental

E.U.T Description	SPDS Seal
Model Number	IGSPV40916/IGSBV40916
Serial Number:	Not Designated

Specification: F.C.C., Part 15, Subpart C 15.249(a)

Antenna Polarization: Horizontal
Frequency: 916.528 MHz

Test Distance: 3 meters
Detector: Peak

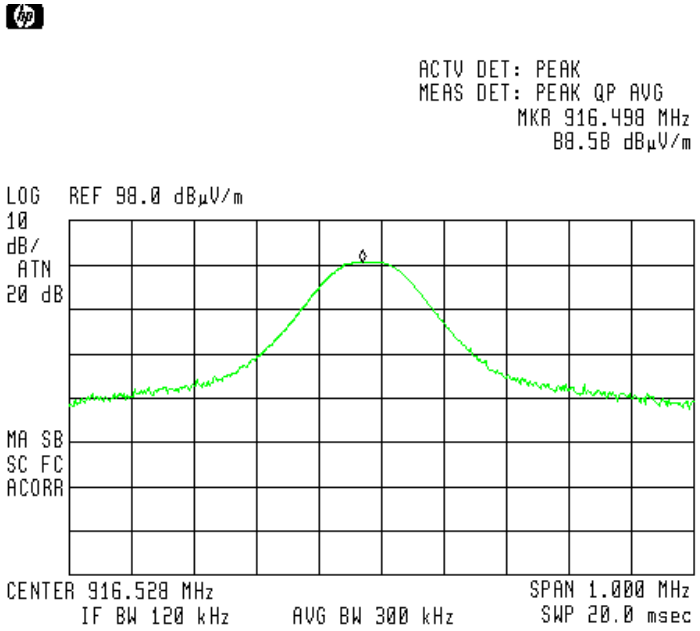

Figure 8. Field Strength of Fundamental. Antenna Polarization: HORIZONTAL. Detector: Peak

4.4 Test Instrumentation Used, Field Strength of Fundamental

Instrument	Manufacturer	Model	Serial Number	Calibration	Period
EMI Receiver	HP	85422E	3906A00276	February 26, 2013	1 year
RF Section	HP	85420E	3705A00248	February 26, 2013	1 year
Horn Antenna	ETS	3115	6142	March 14, 2012	2 Years
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

5. Radiated Emission, 9 kHz – 30 MHz, 916.5 MHz Transmitter

5.1 Test Specification

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

5.2 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 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 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 916.528 MHz. This frequency was measured using a peak detector.

5.3 Measured Data

JUDGEMENT: Passed

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 was at least 20 db below the specification level

TEST PERSONNEL:

Tester Signature: _____ Date: 22.12.13

Typed/Printed Name: A. Sharabi

5.4 Test Instrumentation Used, Radiated Measurements

Instrument	Manufacturer	Model	Serial Number	Calibration	Period
EMI Receiver	HP	85422E	3906A00276	February 26, 2013	1 year
RF Section	HP	85420E	3705A00248	February 26, 2013	1 year
Active Loop Antenna	EMCO	6502	9506-2950	November 4, 2012	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

5.5 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 dBµV (RA) + 14.0 dB (AF) + 0.9 dB (CF) = 45.6 dBµV

No external pre-amplifiers are used.

6. Spurious Radiated Emission 30 MHz - 10000MHz, 916.5 MHz Transmitter

6.1 Test Specification

F.C.C., Part 15, Subpart C, Section 15.249(b)

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 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 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.

In the frequency range 30 MHz – 2.9 GHz, 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.

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.)

6.2 Measured Data

JUDGEMENT: Passed

The margin between the emission level and the specification limit was 10.3 dB in the worst case at the frequency of 1833.0 MHz, vertical polarization.

The EUT met the requirements of the F.C.C. Part 15, Subpart C, Section 15.249 specification.

TEST PERSONNEL:

Tester Signature: _____ Date: 22.12.13

Typed/Printed Name: A. Sharabi

Radiated Emission

E.U.T Description	SPDS Seal
Type	IGSPV40916/IGSBV40916
Serial Number:	Not Designated

Specification: FCC, Part 15, Subpart C

Antenna Polarization: Horizontal/Vertical
Frequency range: 1.0 MHz to 10.0 GHz
Test Distance: 3 meters
Detector: Peak
Operation Frequency: 916.00 MHz

Freq. (MHz)	Polarity (H/V)	Peak Amp (dBµV/m)	Peak. Specification (dB µV/m)	Peak. Margin (dB)
1833.0	H	55.5*	74.0	-18.5
1833.0	V	63.7*	74.0	-10.3
2749.0	H	49.0*	74.0	-25.0
2749.0	V	47.7*	74.0	-26.3

Figure 9. Radiated Emission. Antenna Polarization: HORIZONTAL / VERTICAL. Detector: Peak

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 Amp" includes correction factor.

* "Correction Factor" = Antenna Factor + Cable Loss- Low Noise Amplifier Gain

Radiated Emission

E.U.T Description	SPDS Seal
Type	IGSPV40916/IGSBV40916
Serial Number:	Not Designated

Specification: FCC, Part 15, Subpart C

Antenna Polarization: Horizontal/Vertical
Frequency range: 30.0 MHz to 10.0 GHz
Test Distance: 3 meters
Detector: Average
Operation Frequency: 916.00 MHz

Freq. (MHz)	Polarity (H/V)	Average Factor (dB)	Average Amp (dBµV/m)	Average Specification (dB µV/m)	Peak. Margin (dB)
1833.0	H	-16.9	38.6	54.0	-15.4
1833.0	V	-16.9	46.8	54.0	-7.2
2749.0	H	-16.9	32.1	54.0	-21.9
2749.0	V	-16.9	30.8	54.0	-23.2

Figure 10. Radiated Emission. Antenna Polarization: HORIZONTAL / VERTICAL. Detector: Average

Notes:

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.

"Average Amp" includes correction factor.

* Correction Factor = Antenna Factor + Cable Loss- Low Noise Amplifier Gain

6.3 Test Instrumentation Used

Instrument	Manufacturer	Model	Serial No.	Last Calibration Date	Period
EMI Receiver	HP	85422E	3906A00276	February 26, 2013	1Year
RF Filter Section	HP	85420E	3705A00248	February 26, 2013	1Year
Antenna Biconical	EMCO	3104	2606	August 30, 2012	1Year
Antenna Log Periodic	ARA	LPD-2010/A	1038	April 2, 2013	1 Year
Antenna Log Periodic	A.H. Systems	SAS-200/511	253	April 2, 2013	1 Year
Double Ridged Waveguide Horn Antenna	EMCO	3115	29845	March 14, 2012	2 Years
Horn Antenna	ARA	SWH-28	1008	January 26, 20011	3 Years
Low Noise Amplifier	DBS MICROWAVE	LNA-DBS-0411N313	013	August 21, 2013	1 Year
Low Noise Amplifier	Sophia Wireless	LNA 28-B	232	August 28, 2012	1 Year
Spectrum Analyzer	HP	8592L	3826A01204	February 28, 2013	1 Year
Spectrum Analyzer	HP	8546E	3442A00275	February 28, 2013	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

6.4 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]

7.26 dB Minimum Bandwidth

7.1 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.

The E.U.T was tested at 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 1.*

The spectrum bandwidth of the E.U.T. at the point of 26 dB below maximum peak power was measured and recorded.

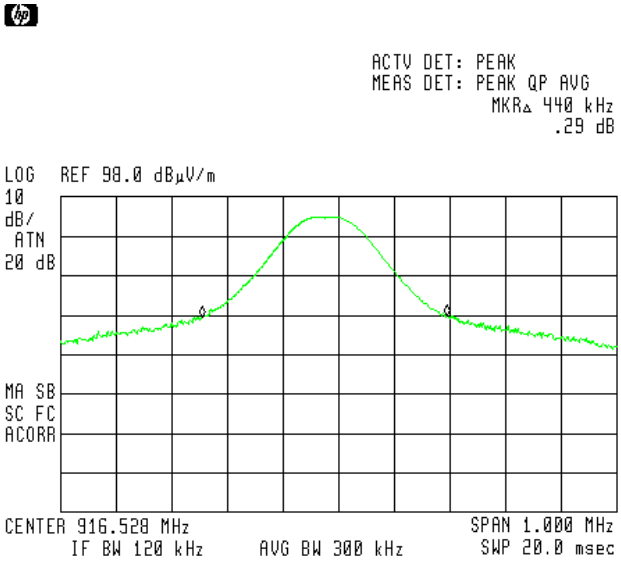

Figure 11 — 26 dB Minimum Bandwidth

7.2 Results table

E.U.T Description: SPDS Seal
Model No.: IGSPV40916/IGSBV40916
Serial Number: Not Designated
Specification: F.C.C. Part 15, Subpart C: (15.247-a2)

Operation Frequency (MHz)	Modulation Mbps	Reading (MHz)	Specification (MHz)
916.528	6	0.44	N/A

Figure 12 26 dB Minimum Bandwidth

JUDGEMENT: Passed

TEST PERSONNEL:

Tester Signature: _____ Date: 22.12.13

Typed/Printed Name: A. Sharabi

7.3 Test Equipment Used.

26 dB Minimum Bandwidth

Instrument	Manufacturer	Model	Serial No.	Last Calibration Date	Period
EMI Receiver	HP	85422E	3906A00276	February 26, 2013	1Year
RF Filter Section	HP	85420E	3705A00248	February 26, 2013	1Year
Antenna Biconical	EMCO	3104	2606	August 30, 2012	1Year
Antenna Log Periodic	ARA	LPD-2010/A	1038	April 2, 2013	1 Year
Horn Antenna	ETS	3115	29845	March 14, 2012	2 Years
Horn Antenna	ARA	SWH-28	1007	January 26, 2011	3 Years
Low Noise Amplifier	Narda	LNA-DBS-0411N313	013	August 21, 2013	1 Year
Low Noise Amplifier	Sophia Wireless	LNA 28-B	232	August 28, 2012	1 Year
Spectrum Analyzer	HP	8592L	3826A01204	February 28, 2013	1 Year
Spectrum Analyzer	HP	8564E	3442A00275	February 28, 2013	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

Figure 13 Test Equipment Used

8. Antenna Gain/Information

The antenna gain is 0 dBi/integral.

9. Average Factor Calculation

Burst duration within 100msec:

1. Burst duration = 14.25usec
2. Time between bursts > 1000msec
3. Pulse duration = N/A
4. pulse period = N/A

5. $$\text{Average Factor} = 20\log\left[\frac{\text{Pulse duration}}{\text{Pulse period}} \times \frac{\text{burst duration}}{100\text{msec}} \times \text{Num of burst within } 100\text{msec}\right]$$

$$\text{Average Factor} = 20\log\left[\frac{14.25}{100}\right] = -16.9dB$$

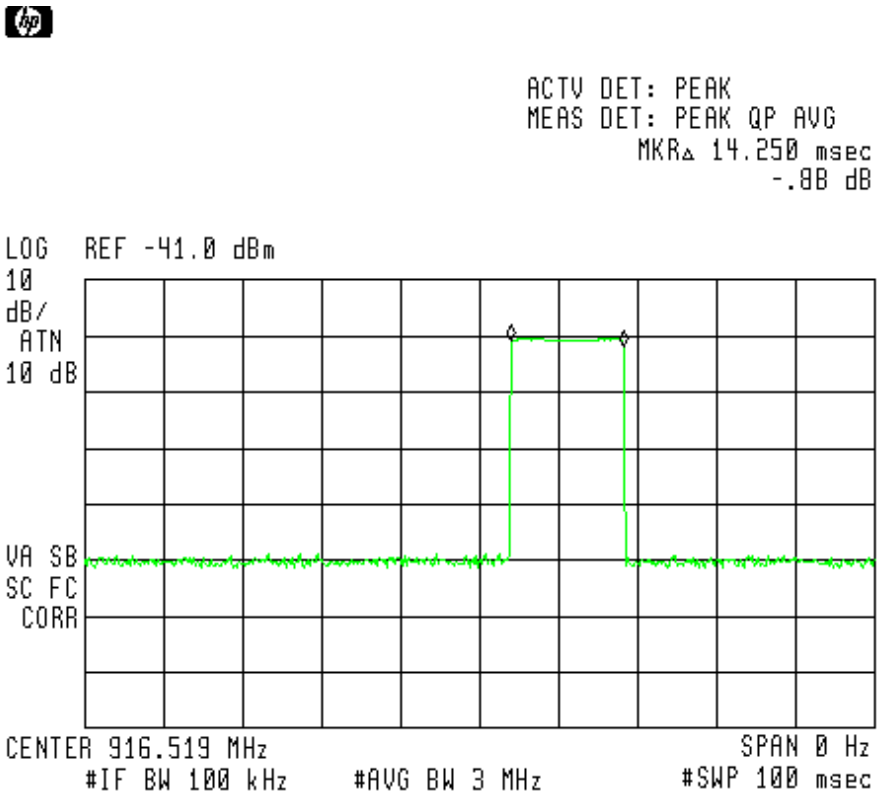

Figure 14. Duty Cycle

9.1 Test Equipment Used, Average Factor Calculation

Instrument	Manufacturer	Model	Serial No.	Last Calibration Date	Period
EMI Receiver	HP	85422E	3906A00276	February 26, 2013	1Year
RF Filter Section	HP	85420E	3705A00248	February 26, 2013	1Year
Antenna Biconical	EMCO	3104	2606	August 30, 2012	1Year
Antenna Log Periodic	ARA	LPD-2010/A	1038	April 2, 2013	1 Year
Horn Antenna	ETS	3115	29845	March 14, 2012	2 Years
Horn Antenna	ARA	SWH-28	1007	January 26, 2011	3 Years
Low Noise Amplifier	Narda	LNA-DBS-0411N313	013	August 21, 2012	1 Year
Low Noise Amplifier	Sophia Wireless	LNA 28-B	232	August 28, 2013	1 Year
Spectrum Analyzer	HP	8592L	3826A01204	February 28, 2013	1 Year
Spectrum Analyzer	HP	8564E	3442A00275	February 28, 2013	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

10. R.F Exposure/Safety

Typical use of the E.U.T. is a RFID wireless adaptor, installed on a refueling truck.
The typical distance between the E.U.T. and the user in the worst case application, is 20 cm.

Calculation of Maximum Permissible Exposure (MPE)
Based on Section 1.1310 Requirements

(a) FCC limits at 916.528 MHz is: $1\frac{mW}{cm^2}$

Using table 1 of Section 1.1310 limit for general population/uncontrolled exposures, the above level is an average over 30 minutes.

(b) The power density produced by the E.U.T. is

P_t- Transmitted Power 92.77 dBuV/m (Peak) =0.5 mW

$$S = \frac{P_t G_t}{4\pi R^2}$$

G_T- Antenna Gain, 0 dBi = 1 numeric

R- Distance from Transmitter using 20cm worst case

(c) The peak power density is:

$$S_{Avg} = \frac{0.5 \times 1}{4\pi (20)^2} = 9.9 \times 10^{-5} \frac{mW}{cm^2}$$

(d) This is below the FCC limit.

11. APPENDIX A - CORRECTION FACTORS

11.1 Correction factors for CABLE

from EMI receiver to test antenna at 3 meter range.

FREQUENCY (MHz)	CORRECTION FACTOR (dB)
10.0	0.3
20.0	0.6
30.0	0.8
40.0	0.9
50.0	1.1
60.0	1.2
70.0	1.3
80.0	1.4
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

FREQUENCY (MHz)	CORRECTION FACTOR (dB)
1200.0	7.3
1400.0	7.8
1600.0	8.4
1800.0	9.1
2000.0	9.9
2300.0	11.2
2600.0	12.2
2900.0	13.0

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".

11.2 Correction factors for CABLE

from EMI receiver to test antenna at 3 meter range.

FREQUENCY (GHz)	CORRECTION FACTOR (dB)
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.

11.3 Correction factors for CABLE from spectrum analyzer to test antenna above 2.9 GHz

FREQUENCY (GHz)	CORRECTION FACTOR (dB)	FREQUENCY (GHz)	CORRECTION FACTOR (dB)
1.0	1.9	14.0	9.1
2.0	2.7	15.0	9.5
3.0	3.5	16.0	9.9
4.0	4.2	17.0	10.2
5.0	4.9	18.0	10.4
6.0	5.5	19.0	10.7
7.0	6.0	20.0	10.9
8.0	6.5	21.0	11.2
9.0	7.0	22.0	11.6
10.0	7.5	23.0	11.9
11.0	7.9	24.0	12.3
12.0	8.3	25.0	12.6
13.0	8.7	26.0	13.0

NOTES:

1. The cable type is SUCOFLEX 104 E manufactured by SUHNER.

2. The cable is used for measurements above 2.9 GHz.

3. The overall length of the cable is 10 meters.

12.6 Correction factors for LOG PERIODIC ANTENNA

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

Distance of 3 meters

FREQUENCY (MHz)	AFE (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

FREQUENCY (MHz)	AFE (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 38M3O.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".*

11.4 Correction factors for LOG PERIODIC ANTENNA

Type SAS-200/511 at 3 meter range.

FREQUENCY (GHz)	ANTENNA FACTOR (dB)
1.0	24.9
1.5	27.8
2.0	29.9
2.5	31.2
3.0	32.8
3.5	33.6
4.0	34.3
4.5	35.2
5.0	36.2
5.5	36.7
6.0	37.2
6.5	38.1

FREQUENCY (GHz)	ANTENNA FACTOR (dB)
7.0	38.6
7.5	39.2
8.0	39.9
8.5	40.4
9.0	40.8
9.5	41.1
10.0	41.7
10.5	42.4
11.0	42.5
11.5	43.1
12.0	43.4
12.5	44.4
13.0	44.6

NOTES:

1. *Antenna serial number is 253.*
2. *The above lists are located in file number SAS3M0.ANT for a 3 meter range.*
3. *The files mentioned above are located on the disk marked "Antenna Factors".*

11.5 Correction factors for BICONICAL ANTENNA

Type BCD-235/B, at 3 meter range

FREQUENCY (MHz)	AFE (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".

11.6 Correction factors for Double-Ridged Waveguide Horn

Model: 3115, S/N 29845
at 3 meter range.

FREQUENCY (GHz)	ANTENNA FACTOR (dB 1/m)	ANTENNA Gain (dBi)	FREQUENCY (GHz)	ANTENNA FACTOR (dB 1/m)	ANTENNA Gain (dBi)
1.0	24.8	5.4	10.0	38.8	11.4
1.5	26.1	7.6	10.5	38.9	11.8
2.0	28.6	7.7	11.0	39.0	12.1
2.5	29.8	8.4	11.5	39.6	11.8
3.0	31.4	8.4	12.0	39.8	12.0
3.5	32.4	8.7	12.5	39.6	12.5
4.0	33.7	8.6	13.0	40.0	12.5
4.5	33.4	9.9	13.5	39.8	13.0
5.0	34.5	9.7	14.0	40.2	13.0
5.5	35.1	9.9	14.5	40.6	12.9
6.0	35.4	10.4	15.0	41.3	12.4
6.5	35.6	10.8	15.5	39.5	14.6
7.0	36.2	10.9	16.0	38.8	15.5
7.5	37.3	10.4	16.5	40.0	14.6
8.0	37.7	10.6	17.0	41.4	13.4
8.5	38.3	10.5	17.5	44.8	10.3
9.0	38.5	10.8	18.0	47.2	8.1
9.5	38.7	11.1			

11.7 Correction factors for Horn Antenna

Model: SWH-28
at 1 meter range.

FREQUENCY (GHz)	AFE (dB /m)	Gain (dB1)
18.0	40.3	16.1
19.0	40.3	16.3
20.0	40.3	16.1
21.0	40.3	16.3
22.0	40.4	16.8
23.0	40.5	16.4
24.0	40.5	16.6
25.0	40.5	16.7
26.0	40.6	16.4

11.8 Correction factors for ACTIVE LOOP ANTENNA

Model 6502
S/N 9506-2950

FREQUENCY	Magnetic Antenna Factor	Electric Antenna 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