HERMON LABORATORIES

ELECTRICAL TESTING
0839.01

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TEST REPORT

ACCORDING TO: FCC 47CFR part 15 subpart C § 15.209 and 15.247 (spurious emissions)

FOR:

The Stanley Works Israel Ltd.

Access Control System with Bluetooth module

Model: ACS 321000

FCC ID:RLBACS321000

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1 Applicant information

Client name:	The Stanley Works Israel Ltd.
Address:	19 Hamelacha street, New Industrial Zone, Rosh Ha'ayin 48091, Israel
Telephone:	+972 3902 0200
Fax:	+972 3902 0222
E-mail:	Irit.Teerosh@sbdinc.com
Contact name:	Mrs. Irit Teerosh

2 Equipment under test attributes

Product name:	Access control system with Bluetooth (BT)
Model(s):	ACS 321000
Serial number:	00-00-00-00-6C
Hardware version:	B1.01
Software release:	B1.06
Receipt date	1/28/2013

3 Manufacturer information

Manufacturer name:	The Stanley Works Israel Ltd.
Address:	19 Hamelacha street, New Industrial Zone, Rosh Ha'ayin 48091, Israel
Telephone:	+972 3902 0200
Fax:	+972 3902 0222
E-Mail:	Irit.Teerosh@sbdinc.com
Contact name:	Mrs. Irit Teerosh

4 Test details

Project ID:	24132
Location:	Hermon Laboratories Ltd. Harakevet Industrial Zone, Binyamina 30500, Israel
Test started:	1/28/2013
Test completed:	1/29/2013
Test specification(s):	FCC 47CFR part 15, subpart C, §15.209, §15.247 (spurious emissions)

5 Tests summary

Test	Status
Transmitter characteristics	
Section 15.209, Field strength of emissions	Pass
Section 15.207(a), Conducted emission	Not required
Section 15.203, Antenna requirements	Pass
Section 15.247(d), Radiated spurious emissions	Pass

Testing was completed against all relevant requirements of the test standard. The results obtained indicate that the product under test complies in full with the requirements tested.
The test results relate only to the items tested. Pass/ fail decision was based on nominal values.

	Name and Title	Date	Signature
Tested by:	Mr. S.Samokha, test engineer	January 29, 2013	
Reviewed by:	Mrs. M. Cherniavsky, certification engineer	February 17, 2013	
Approved by:	Mr. M. Nikishin, EMC and Radio group leader	February 20, 2013	

6 EUT description

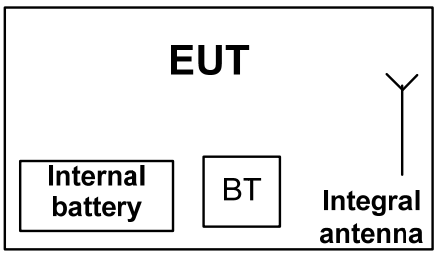
6.1 General information

The EUT, Access Control System with Bluetooth, is a smart padlock for preventing unauthorized access of strangers and workers to storage facilities and containers at job sites. The EUT contains a RFID transmitter operating at 125 kHz and includes a Bluetooth transmitter module FCC ID:T9JRN41-1. The EUT is powered from 6V internal batteries pack.

6.2 Operating frequencies

Source	Frequency, MHz		
Clock	0.032768	16	24
RFID	0.125		
Bluetooth	2402 - 2480		

6.3 Test configuration



6.4 Changes made in EUT

No changes were implemented in the EUT during testing.

Test specification:	Section 15.209, Field strength of emissions		
Test procedure:	ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date(s):	1/28/2013		
Temperature: 22.3 ºC	Air Pressure: 1011 hPa	Relative Humidity: 52 %	Power Supply: Battery
Remarks:			

7 Transmitter tests according to 47CFR part 15 subpart C requirements

7.1 Field strength of emissions

7.1.1 General

This test was performed to measure field strength of fundamental and spurious emissions from the EUT. Specification test limits are given Table 7.1.1 and Table 7.1.2.

Table 7.1.1 Radiated fundamental emission limits

Fundamental frequency, kHz	Field strength at 3 m, dB(μV/m)
	Average
125.675	105.6

Table 7.1.2 Radiated spurious emissions limits

Frequency, MHz	Field strength at 3 m, dB(μV/m)		
	Within restricted bands		
	Peak	Quasi Peak	Average
0.009 – 0.090	148.5 – 128.5	NA	128.5 – 108.5**
0.090 – 0.110	NA	108.5 – 106.8**	NA
0.110 – 0.490	126.8 – 113.8	NA	106.8 – 93.8**
0.490 – 1.705	NA	73.8 – 63.0**	NA
1.705 – 30.0*		69.5	
30 – 88		40.0	
88 – 216		43.5	
216 – 960		46.0	
960 - 1000		54.0	
1000 – 10th harmonic	74.0	NA	54.0

*- The limit for 3 m test distance was calculated using the inverse square distance extrapolation factor as follows:

$$Lim_{S2} = Lim_{S1} + 40 \log (S_1/S_2),$$

where S_1 and S_2 – standard defined and test distance respectively in meters.

**- The limit decreases linearly with the logarithm of frequency.

7.1.2 Test procedure for fundamental and spurious emission field strength measurements in 9 kHz to 30 MHz

7.1.2.1 The EUT was set up as shown in Figure 7.1.1, energized and the performance check was conducted.

7.1.2.2 The specified frequency range was investigated with a loop antenna connected to spectrum analyzer/ EMI receiver. To find maximum radiation the turntable was rotated 360^0, the measuring antenna was rotated around its vertical axis. The measuring antenna polarization was switched from vertical to horizontal.

7.1.2.3 The worst test results (the lowest margins) were recorded in Table 7.1.3 and shown in the associated plots.

7.1.3 Test procedure for spurious emission field strength measurements above 30 MHz

7.1.3.1 The EUT was set up as shown in Figure 7.1.2, energized and the performance check was conducted.

7.1.3.2 The specified frequency range was investigated with antenna connected to spectrum analyzer/ EMI receiver. To find maximum radiation the turntable was rotated 360^0, the measuring antenna height was changed from 1 to 4 m, its polarization was switched from vertical to horizontal.

7.1.3.3 The worst test results (the lowest margins) were recorded in Table 7.1.4 and shown in the associated plots.

Test specification:	**Section 15.209, Field strength of emissions**		
Test procedure:	ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	**Verdict:**	PASS
Date(s):	1/28/2013		
Temperature: 22.3 ºC	**Air Pressure:** 1011 hPa	**Relative Humidity:** 52 %	**Power Supply:** Battery
Remarks:			

Figure 7.1.1 Setup for spurious emission field strength measurements below 30 MHz

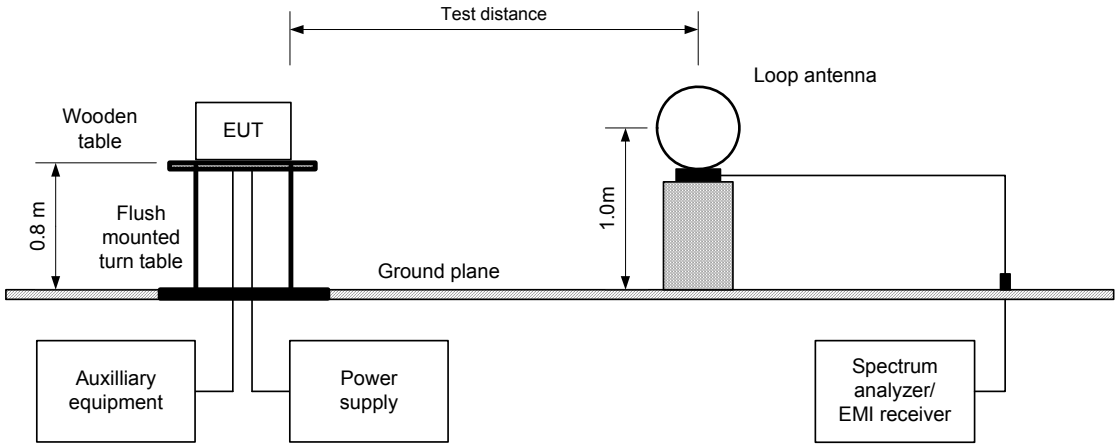
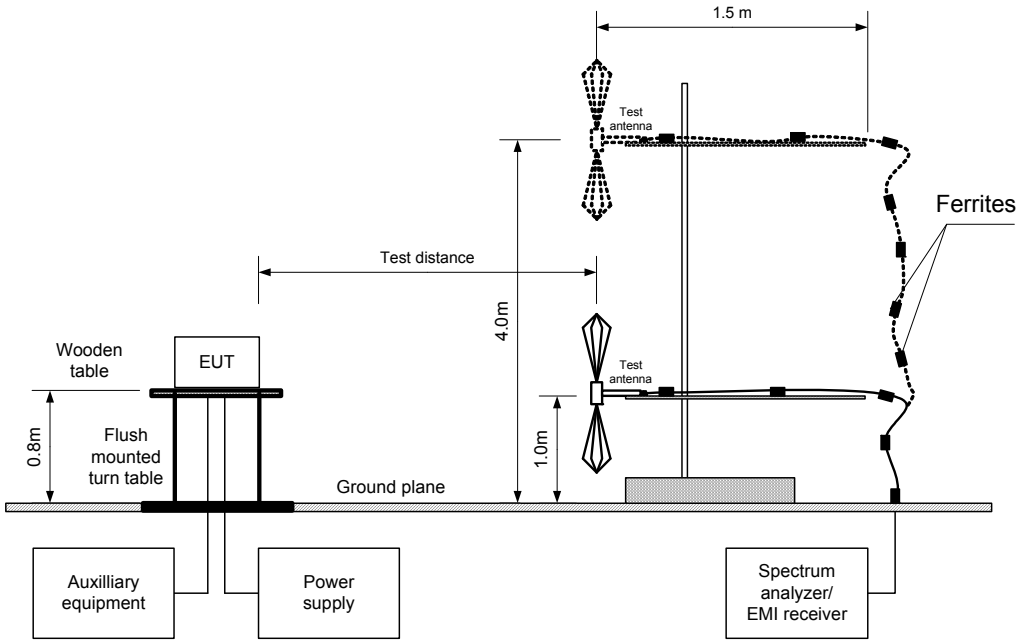


Figure 7.1.2 Setup for spurious emission field strength measurements above 30 MHz



Test specification:	**Section 15.209, Field strength of emissions**		
Test procedure:	ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	**Verdict:**	PASS
Date(s):	1/28/2013		
Temperature: 22.3 ºC	**Air Pressure:** 1011 hPa	**Relative Humidity:** 52 %	**Power Supply:** Battery
Remarks:			

Table 7.1.3 Field strength of fundamental emission

TEST DISTANCE: 3 m
TEST SITE: Anechoic chamber
EUT POSITION: Typical (Vertical)
TRANSMITTER OUTPUT POWER SETTINGS: Maximum
DETECTOR USED: Peak
RESOLUTION BANDWIDTH: 1 kHz (9 kHz – 150 kHz)
9.0 kHz (150 kHz – 30 MHz)
120 kHz (30 MHz – 1000 MHz)
VIDEO BANDWIDTH: ≥ Resolution bandwidth
TEST ANTENNA TYPE: Active loop (9 kHz – 30 MHz)

F, kHz	Antenna		Azimuth, degrees*	Peak field strength			Average field strength			Verdict
	Pol.	Height, m		Measured, dB(μV/m)	Limit, dB(μV/m)	Margin, dB**	Measured, dB(μV/m)	Limit, dB(μV/m)	Margin, dB**	
125.675	Vert	1.0	197	50.26	125.6	-75.34	50.26	105.6	-55.34	Pass

***- EUT front panel refers to 0 degrees position of turntable.
****- Margin (dB) = measured result - specification limit.

Reference numbers of test equipment used

HL 0446	HL 0521	HL 4352	HL 4353				

Full description is given in Appendix A.

Test specification:	**Section 15.209, Field strength of emissions**		
Test procedure:	ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	**Verdict:**	PASS
Date(s):	1/28/2013		
Temperature: 22.3 ºC	**Air Pressure:** 1011 hPa	**Relative Humidity:** 52 %	**Power Supply:** Battery
Remarks:			

Table 7.1.4 Field strength of spurious emissions

TEST DISTANCE: 3 m
TEST SITE: Anechoic chamber
EUT POSITION: Typical (Vertical)
TRANSMITTER OUTPUT POWER SETTINGS: Maximum
INVESTIGATED FREQUENCY RANGE: 0.009 – 1000 MHz
DETECTOR USED: Peak
RESOLUTION BANDWIDTH: 1 kHz (9 kHz – 150 kHz)
9.0 kHz (150 kHz – 30 MHz)
120 kHz (30 MHz – 1000 MHz)
VIDEO BANDWIDTH: ≥ Resolution bandwidth
TEST ANTENNA TYPE: Active loop (9 kHz – 30 MHz)
Biconilog (30 MHz – 1000 MHz)

Frequency, MHz	Peak emission, dB(μV/m)	Quasi-peak			Antenna polarization	Antenna height, m	Turn-table position**, degrees	Verdict
		Measured emission, dB(μV/m)	Limit, dB(μV/m)	Margin, dB*				
No emissions were found								Pass

*- Margin = Measured emission - specification limit.
**- EUT front panel refer to 0 degrees position of turntable.

Table 7.1.5 Restricted bands

MHz	MHz	MHz	MHz	MHz	GHz
0.09 - 0.11	8.37625 - 8.38675	73 - 74.6	399.9 - 410	2690 - 2900	10.6 - 12.7
0.495 - 0.505	8.41425 - 8.41475	74.8 - 75.2	608 - 614	3260 - 3267	13.25 - 13.4
2.1735 - 2.1905	12.29 - 12.293	108 - 121.94	960 - 1240	3332 - 3339	14.47 - 14.5
4.125 - 4.128	12.51975 - 12.52025	123 - 138	1300 - 1427	3345.8 - 3358	15.35 - 16.2
4.17725 - 4.17775	12.57675 - 12.57725	149.9 - 150.05	1435 - 1626.5	3600 - 4400	17.7 - 21.4
4.20725 - 4.20775	13.36 - 13.41	156.52475 - 156.52525	1645.5 - 1646.5	4500 - 5150	22.01 - 23.12
6.215 - 6.218	16.42 - 16.423	156.7 - 156.9	1660 - 1710	5350 – 5460	23.6 - 24
6.26775 - 6.26825	16.69475 - 16.69525	162.0125 - 167.17	1718.8 - 1722.2	7250 - 7750	31.2 - 31.8
6.31175 - 6.31225	16.80425 - 16.80475	167.72 - 173.2	2200 - 2300	8025 – 8500	36.43 - 36.5
8.291 - 8.294	25.5 - 25.67	240 - 285	2310 - 2390	9000 - 9200	Above 38.6
8.362 - 8.366	37.5 - 38.25	322 - 335.4	2483.5 - 2500	9300 - 9500	

Reference numbers of test equipment used

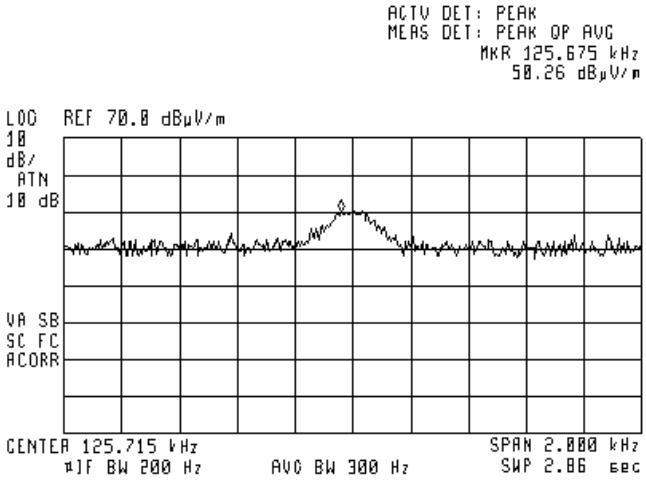
HL 0446	HL 0521	HL 0604	HL 4352	HL 4353			

Full description is given in Appendix A.

Test specification:	**Section 15.209, Field strength of emissions**		
Test procedure:	ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	**Verdict:**	PASS
Date(s):	1/28/2013		
Temperature: 22.3 ºC	**Air Pressure:** 1011 hPa	**Relative Humidity:** 52 %	**Power Supply:** Battery
Remarks:			

Plot 7.1.1 Radiated emission measurements at the fundamental frequency

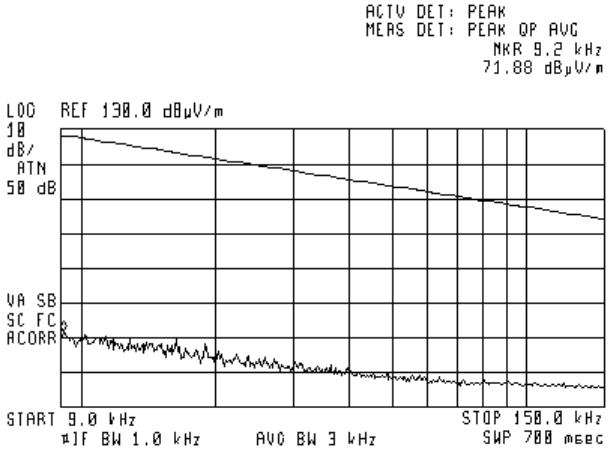
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical
EUT POSITION: Typical (Vertical)



Test specification:	Section 15.209, Field strength of emissions		
Test procedure:	ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date(s):	1/28/2013		
Temperature: 22.3 ºC	Air Pressure: 1011 hPa	Relative Humidity: 52 %	Power Supply: Battery
Remarks:			

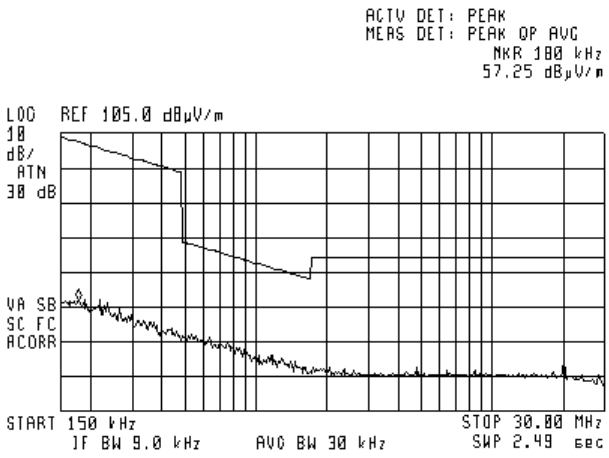
Plot 7.1.2 Radiated emission measurements from 9 to 150 kHz

TEST SITE: Anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical
EUT POSITION: Typical (Vertical)



Plot 7.1.3 Radiated emission measurements from 0.15 to 30 MHz

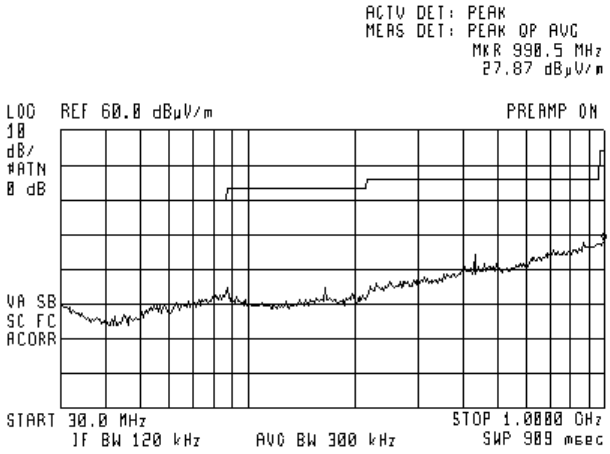
TEST SITE: Anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical
EUT POSITION: Typical (Vertical)



Test specification:	**Section 15.209, Field strength of emissions**		
Test procedure:	ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	**Verdict:**	PASS
Date(s):	1/28/2013		
Temperature: 22.3 ºC	**Air Pressure:** 1011 hPa	**Relative Humidity:** 52 %	**Power Supply:** Battery
Remarks:			

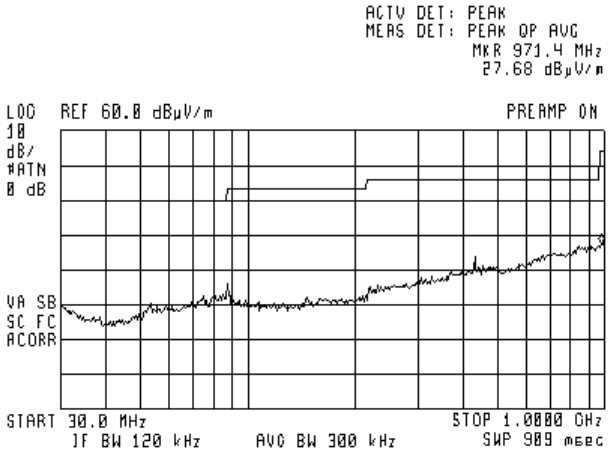
Plot 7.1.4 Radiated emission measurements from 30 to 1000 MHz

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical
EUT POSITION: Typical (Vertical)



Plot 7.1.5 Radiated emission measurements from 30 to 1000 MHz

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Horizontal
EUT POSITION: Typical (Vertical)



Test specification:	Section 15.203, Antenna requirements		
Test procedure:	Visual inspection/supplier declaration		
Test mode:	Compliance	Verdict:	PASS
Date(s):	1/28/2013		
Temperature: 22.3 ºC	Air Pressure: 1011 hPa	Relative Humidity: 52 %	Power Supply: Battery
Remarks:			

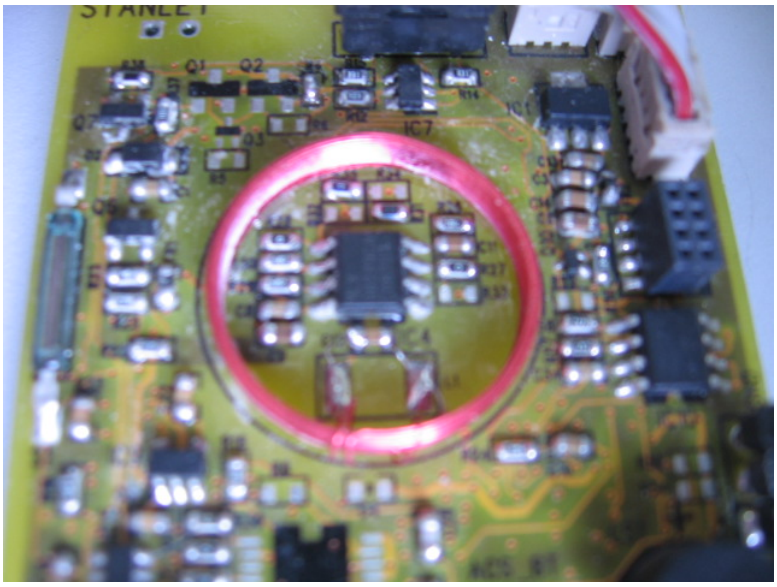
7.2 Antenna requirements

The EUT was verified for compliance with antenna requirements. A transmitter shall be designed to ensure that no antenna other than that furnished by the responsible party will be used with the device. It may be either permanently attached or employs a unique antenna connector for every antenna proposed for use with the EUT. This requirement does not apply to professionally installed transmitters.
The rationale for compliance with the above requirements was either visual inspection results or supplier declaration. The summary of results is provided in Table 7.2.1.

Table 7.2.1 Antenna requirements

Requirement	Rationale	Verdict
The transmitter antenna is permanently attached	Visual inspection	Comply
The transmitter employs a unique antenna connector	NA	
The transmitter requires professional installation	NA	

Photograph 7.2.1 Antenna assembly



Test specification:	Section 15.247(d), Radiated spurious emissions		
Test procedure:	Public notice DA 00-705/ 47 CFR, Section 15.247(d) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date(s):	1/29/2013		
Temperature: 22.3 ºC	Air Pressure: 1013 hPa	Relative Humidity: 53 %	Power Supply: Battery
Remarks: Co-location of BT and RFID transmitters			

7.3 Field strength of spurious emissions at simultaneous operation of BT and RFID transmitters

7.3.1 General

This test was performed to measure field strength of spurious emissions from the EUT. Specification test limits are given in Table 7.3.1.

Table 7.3.1 Radiated spurious emissions limits

Frequency, MHz	Field strength at 3 m within restricted bands, dB(μV/m)***			Attenuation of field strength of spurious versus carrier outside restricted bands, dBc***
	Peak	Quasi Peak	Average	
0.009 – 0.090	148.5 – 128.5	NA	128.5 – 108.5**	20.0
0.090 – 0.110	NA	108.5 – 106.8**	NA	
0.110 – 0.490	126.8 – 113.8	NA	106.8 – 93.8**	
0.490 – 1.705	NA	73.8 – 63.0**	NA	
1.705 – 30.0*		69.5		
30 – 88		40.0		
88 – 216		43.5		
216 – 960		46.0		
960 - 1000		54.0		
1000 – 10th harmonic	74.0	NA	54.0	

*- The limit for 3 m test distance was calculated using the inverse square distance extrapolation factor as follows:

$$Lim_{S2} = Lim_{S1} + 40 \log (S_1/S_2),$$

where S_1 and S_2 – standard defined and test distance respectively in meters.

**- The limit decreases linearly with the logarithm of frequency.

*** - The field strength limits applied from the lowest radio frequency generated in the device, without going below 9 kHz up to the tenth harmonic of the highest fundamental frequency.

7.3.2 Test procedure for spurious emission field strength measurements in 9 kHz to 30 MHz band

7.3.2.1 The EUT was set up as shown in Figure 7.3.1, energized and the performance check was conducted.

7.3.2.2 The specified frequency range was investigated with antenna connected to spectrum analyzer/ EMI receiver. To find maximum radiation the turntable was rotated 360^0 and the measuring antenna was rotated around its vertical axis.

7.3.2.3 The worst test results (the lowest margins) were recorded and shown in the associated plots.

7.3.3 Test procedure for spurious emission field strength measurements above 30 MHz

7.3.3.1 The EUT was set up as shown in Figure 7.3.2, energized and the performance check was conducted.

7.3.3.2 The specified frequency range was investigated with antenna connected to spectrum analyzer/ EMI receiver. To find maximum radiation the turntable was rotated 360^0, the measuring antenna height was changed from 1 to 4 m, its polarization was switched from vertical to horizontal.

7.3.3.3 The worst test results (the lowest margins) were recorded and shown in the associated plots.

Test specification:	**Section 15.247(d), Radiated spurious emissions**		
Test procedure:	Public notice DA 00-705/ 47 CFR, Section 15.247(d) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	**Verdict:**	PASS
Date(s):	1/29/2013		
Temperature: 22.3 ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 53 %	**Power Supply:** Battery
Remarks: Co-location of BT and RFID transmitters			

Figure 7.3.1 Setup for spurious emission field strength measurements below 30 MHz

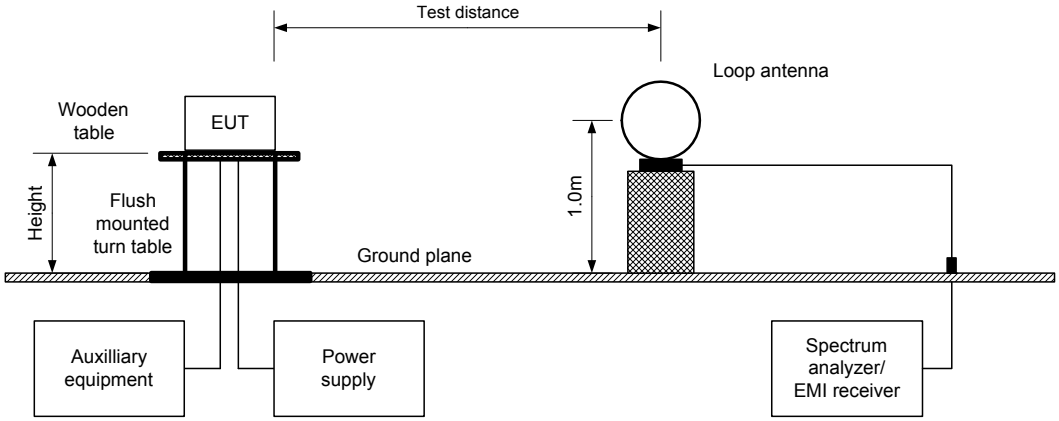
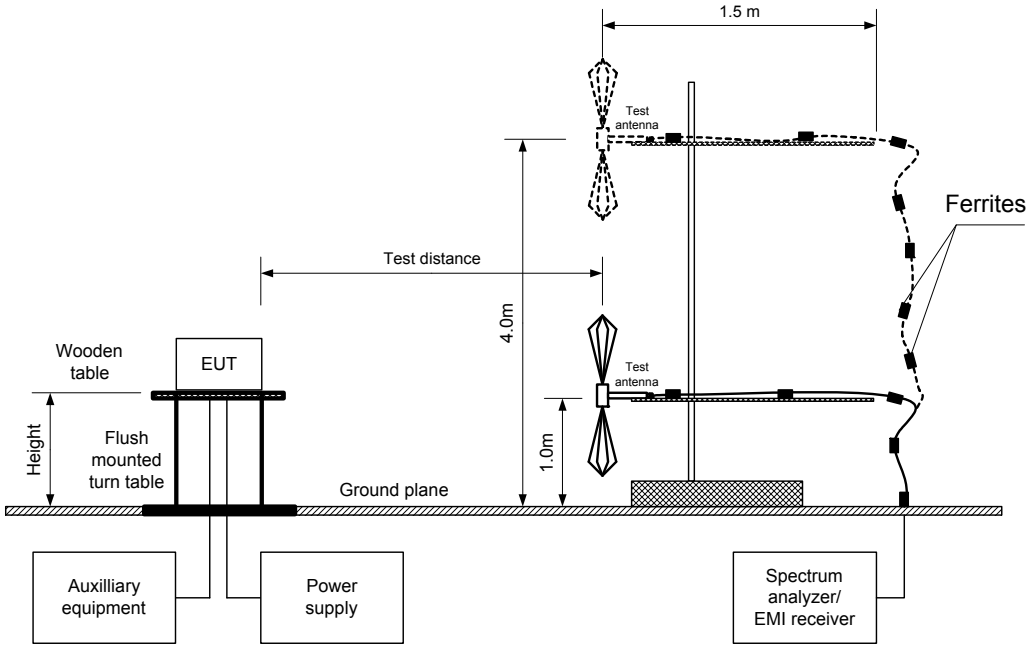


Figure 7.3.2 Setup for spurious emission field strength measurements above 30 MHz



Test specification:	**Section 15.247(d), Radiated spurious emissions**		
Test procedure:	Public notice DA 00-705/ 47 CFR, Section 15.247(d) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	**Verdict:**	PASS
Date(s):	1/29/2013		
Temperature: 22.3 ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 53 %	**Power Supply:** Battery
Remarks: Co-location of BT and RFID transmitters			

Table 7.3.2 Field strength of emissions outside restricted bands

ASSIGNED FREQUENCY RANGE:	0.119 – 0.135 MHz; 2400 – 2483.5 MHz
INVESTIGATED FREQUENCY RANGE:	0.009 - 25000 MHz
TEST DISTANCE:	3 m
MODULATION:	FHSS
TRANSMITTER OUTPUT POWER SETTINGS:	Maximum
DETECTOR USED:	Peak
RESOLUTION BANDWIDTH:	100 kHz
VIDEO BANDWIDTH:	300 kHz
TEST ANTENNA TYPE:	Active loop (9 kHz – 30 MHz) Biconical (30 MHz – 200 MHz) Log periodic (200 MHz – 1000 MHz) Biconilog (30 MHz – 1000 MHz) Double ridged guide (above 1000 MHz)
FREQUENCY HOPPING:	Enabled

Frequency, MHz	Field strength of spurious, dB(μV/m)	Antenna polarization	Antenna height, m	Azimuth, degrees*	Field strength of carrier, dB(μV/m)	Attenuation below carrier, dBc	Limit, dBc	Margin, dB**	Verdict
9760.03	51.17	Vertical	1.1	32	88.94	37.77	20	17.77	Pass

*****- EUT front panel refers to 0 degrees position of turntable.
******- Margin = Attenuation below carrier – specification limit.

Test specification:	Section 15.247(d), Radiated spurious emissions		
Test procedure:	Public notice DA 00-705/ 47 CFR, Section 15.247(d) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date(s):	1/29/2013		
Temperature: 22.3 ºC	Air Pressure: 1013 hPa	Relative Humidity: 53 %	Power Supply: Battery
Remarks: Co-location of BT and RFID transmitters			

Table 7.3.3 Field strength of spurious emissions above 1 GHz within restricted bands

INVESTIGATED FREQUENCY RANGE:	1000 - 25000 MHz
TEST DISTANCE:	3 m
DETECTOR USED:	Peak
RESOLUTION BANDWIDTH:	1000 kHz
TEST ANTENNA TYPE:	Double ridged guide
FREQUENCY HOPPING:	Enabled
ASSIGNED FREQUENCY:	0.119 – 0.135 MHz
MODULATION:	ASK
BIT RATE:	2 kbps
ASSIGNED FREQUENCY:	2400 – 2483.5 MHz
MODULATION:	FSK
BIT RATE:	1.0 Mbps

Frequency, MHz	Antenna		Azimuth, degrees*	Peak field strength(VBW=3 MHz)			Average field strength(VBW=10 Hz)				Verdict
	Polarization	Height, m		Measured, dB(μV/m)	Limit, dB(μV/m)	Margin, dB**	Measured, dB(μV/m)	Calculated, dB(μV/m)	Limit, dB(μV/m)	Margin, dB***	
4881.950	Ver	1.1	220	56.56	74	-17.44	54.10	21.01	54.0	-32.99	Pass
12204.90	Hor	1.1	128	56.84	74	-17.16	50.92	17.83	54.0	-36.17	
14640.00	Hor.	1.1	337	59.85	74	-14.15	55.06	21.97	54.0	-32.03	

*****- EUT front panel refers to 0 degrees position of turntable.
******- Margin = Measured field strength - specification limit.
***- Margin = Calculated field strength - specification limit,
where Calculated field strength = Measured field strength + average factor.

Table 7.3.4 Average factor calculation

Transmission pulse		Transmission burst		Transmission train duration, ms	Average factor, dB
Duration, ms	Period, ms	Duration, ms	Period, ms		
0.725	32.74	NA	NA	NA	-33.09

*- Average factor was calculated as follows

for pulse train shorter than 100 ms: $$Average\ factor = 20 \times \log_{10}\left(\frac{Pulse\ duration}{Pulse\ period} \times \frac{Burst\ duration}{Train\ duration} \times Number\ of\ bursts\ within\ pulse\ train\right)$$

for pulse train longer than 100 ms: $$Average\ factor = 20 \times \log_{10}\left(\frac{Pulse\ duration}{Pulse\ period} \times \frac{Burst\ duration}{100\,ms} \times Number\ of\ bursts\ within\ 100\,ms\right)$$

Test specification:	**Section 15.247(d), Radiated spurious emissions**		
Test procedure:	Public notice DA 00-705/ 47 CFR, Section 15.247(d) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	**Verdict:**	PASS
Date(s):	1/29/2013		
Temperature: 22.3 ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 53 %	**Power Supply:** Battery
Remarks: Co-location of BT and RFID transmitters			

Table 7.3.5 Field strength of spurious emissions below 1 GHz within restricted bands

ASSIGNED FREQUENCY:	0.119 – 0.135 MHz; 2400 – 2483.5 MHz
INVESTIGATED FREQUENCY RANGE:	0.009 – 1000 MHz
TEST DISTANCE:	3 m
MODULATION:	FSK
BIT RATE:	1.0 Mbps
DUTY CYCLE:	Normal
TRANSMITTER OUTPUT POWER SETTINGS:	Maximum
RESOLUTION BANDWIDTH:	0.2 kHz (9 kHz – 150 kHz) 9.0 kHz (150 kHz – 30 MHz) 120 kHz (30 MHz – 1000 MHz)
VIDEO BANDWIDTH:	> Resolution bandwidth
TEST ANTENNA TYPE:	Active loop (9 kHz – 30 MHz) Biconilog (30 MHz – 1000 MHz)
FREQUENCY HOPPING:	Enabled

Frequency, MHz	Peak emission, dB(μV/m)	Quasi-peak			Antenna polarization	Antenna height, m	Turn-table position**, degrees	Verdict
		Measured emission, dB(μV/m)	Limit, dB(μV/m)	Margin, dB*				
No emissions were found								Pass

*****- Margin = Measured emission - specification limit.
******- EUT front panel refer to 0 degrees position of turntable.

Table 7.3.6 Restricted bands

MHz	MHz	MHz	MHz	MHz	GHz
0.09 - 0.11	8.37625 - 8.38675	73 - 74.6	399.9 - 410	2690 - 2900	10.6 - 12.7
0.495 - 0.505	8.41425 - 8.41475	74.8 - 75.2	608 - 614	3260 - 3267	13.25 - 13.4
2.1735 - 2.1905	12.29 - 12.293	108 - 121.94	960 - 1240	3332 - 3339	14.47 - 14.5
4.125 - 4.128	12.51975 - 12.52025	123 - 138	1300 - 1427	3345.8 - 3358	15.35 - 16.2
4.17725 - 4.17775	12.57675 - 12.57725	149.9 - 150.05	1435 - 1626.5	3600 - 4400	17.7 - 21.4
4.20725 - 4.20775	13.36 - 13.41	156.52475 - 156.52525	1645.5 - 1646.5	4500 - 5150	22.01 - 23.12
6.215 - 6.218	16.42 - 16.423	156.7 - 156.9	1660 - 1710	5350 – 5460	23.6 - 24
6.26775 - 6.26825	16.69475 - 16.69525	162.0125 - 167.17	1718.8 - 1722.2	7250 - 7750	31.2 - 31.8
6.31175 - 6.31225	16.80425 - 16.80475	167.72 - 173.2	2200 - 2300	8025 – 8500	36.43 - 36.5
8.291 - 8.294	25.5 - 25.67	240 - 285	2310 - 2390	9000 - 9200	Above 38.6
8.362 - 8.366	37.5 - 38.25	322 - 335.4	2483.5 - 2500	9300 - 9500	

Reference numbers of test equipment used

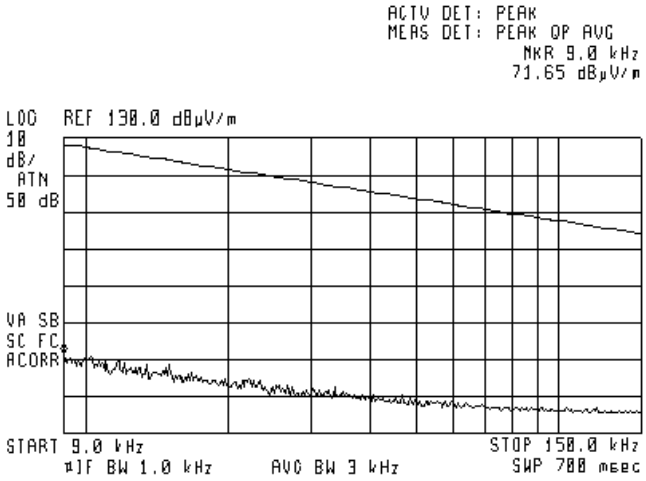
HL 0446	HL 0521	HL 0604	HL 0768	HL 2909	HL 3533	HL 3535	HL 3818
HL 3901	HL 4114	HL 4295	HL 4351	HL 4352	HL 4353		

Full description is given in Appendix A.

Test specification:	**Section 15.247(d), Radiated spurious emissions**		
Test procedure:	Public notice DA 00-705/ 47 CFR, Section 15.247(d) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	**Verdict:**	PASS
Date(s):	1/29/2013		
Temperature: 22.3 ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 53 %	**Power Supply:** Battery
Remarks: Co-location of BT and RFID transmitters			

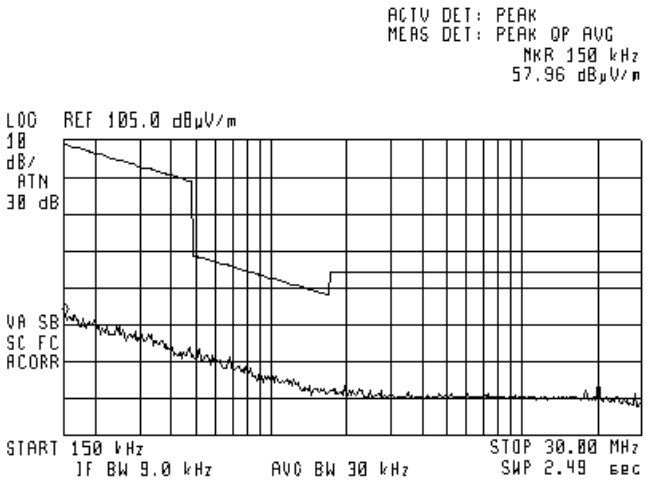
Plot 7.3.1 Radiated emission measurements from 9 to 150 kHz

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical
MODULATION TECHNIQUEC: FHSS



Plot 7.3.2 Radiated emission measurements from 0.15 to 30 MHz

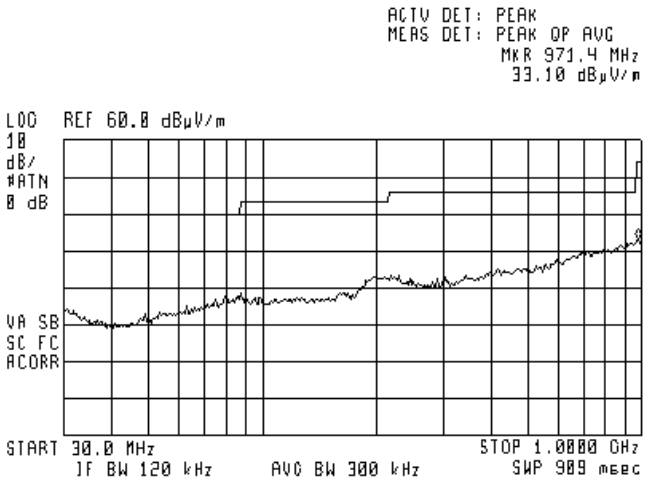
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical



Test specification:	**Section 15.247(d), Radiated spurious emissions**		
Test procedure:	Public notice DA 00-705/ 47 CFR, Section 15.247(d) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	**Verdict:**	PASS
Date(s):	1/29/2013		
Temperature: 22.3 ºC	**Air Pressure:** 1013 hPa	**Relative Humidity:** 53 %	**Power Supply:** Battery
Remarks: Co-location of BT and RFID transmitters			

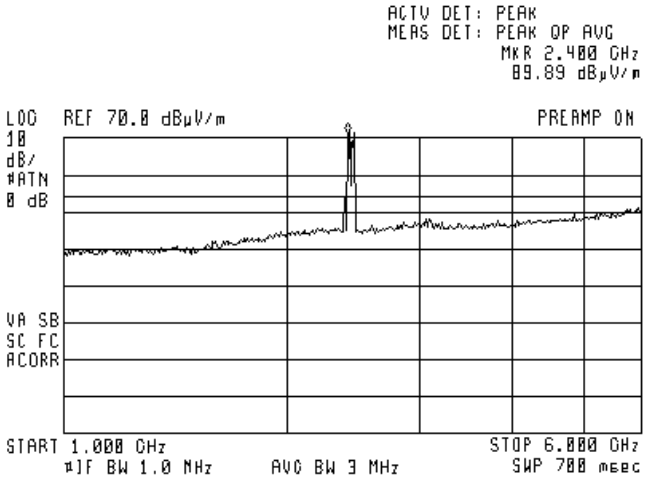
Plot 7.3.3 Radiated emission measurements from 30 to 1000 MHz

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Plot 7.3.4 Radiated emission measurements from 1000 to 6000 MHz

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal

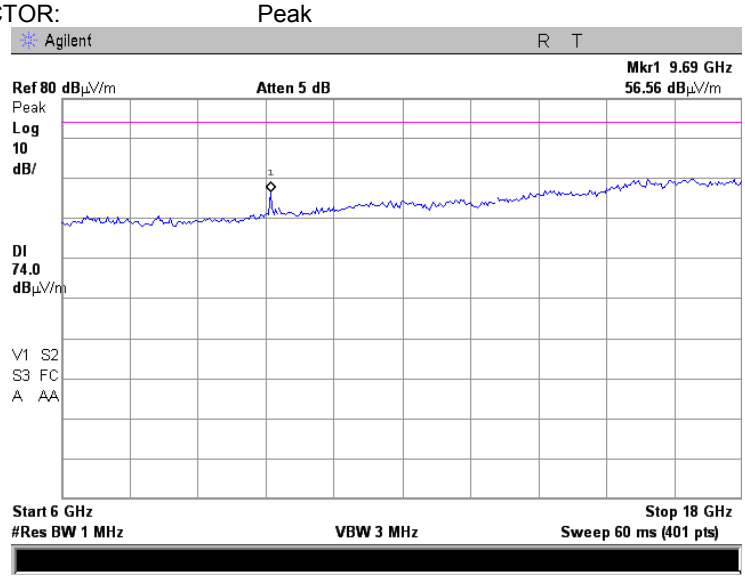


NOTE: 2400 – 2483.5 MHz – carrier frequencies of Bluetooth module

Test specification:	Section 15.247(d), Radiated spurious emissions		
Test procedure:	Public notice DA 00-705/ 47 CFR, Section 15.247(d) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date(s):	1/29/2013		
Temperature: 22.3 ºC	Air Pressure: 1013 hPa	Relative Humidity: 53 %	Power Supply: Battery
Remarks: Co-location of BT and RFID transmitters			

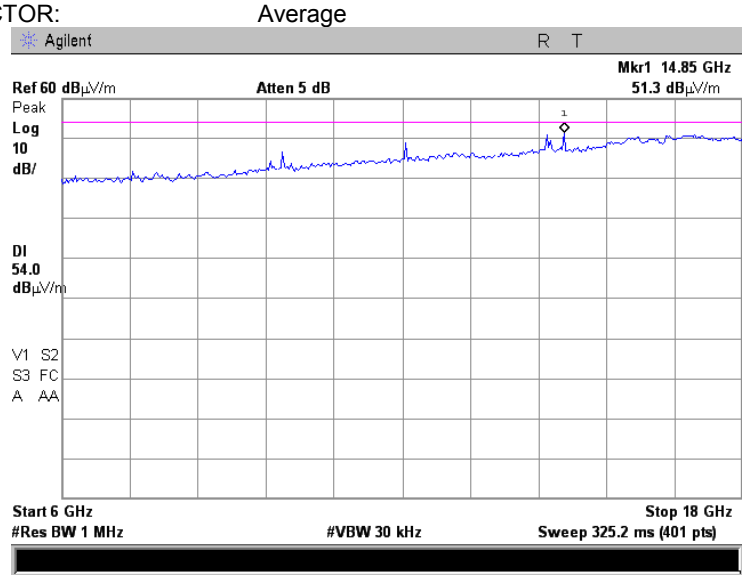
Plot 7.3.5 Radiated emission measurements from 6000 to 18000 MHz

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
DETECTOR: Peak



Plot 7.3.6 Radiated emission measurements from 6000 to 18000 MHz

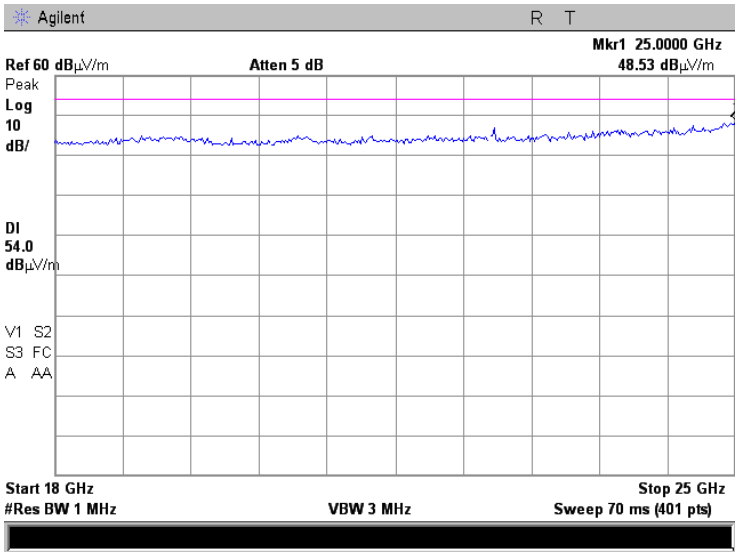
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
DETECTOR: Average



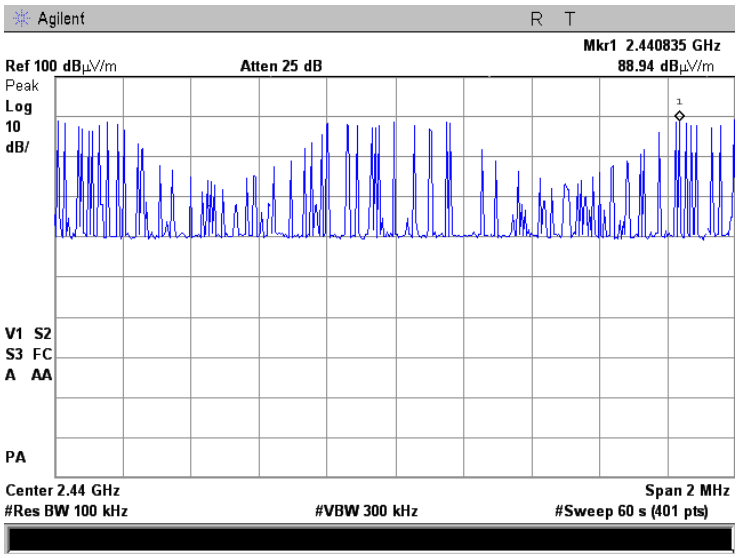
Test specification:	Section 15.247(d), Radiated spurious emissions		
Test procedure:	Public notice DA 00-705/ 47 CFR, Section 15.247(d) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date(s):	1/29/2013		
Temperature: 22.3 ºC	Air Pressure: 1013 hPa	Relative Humidity: 53 %	Power Supply: Battery
Remarks: Co-location of BT and RFID transmitters			

Plot 7.3.7 Radiated emission measurements from 18000 to 25000 MHz

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



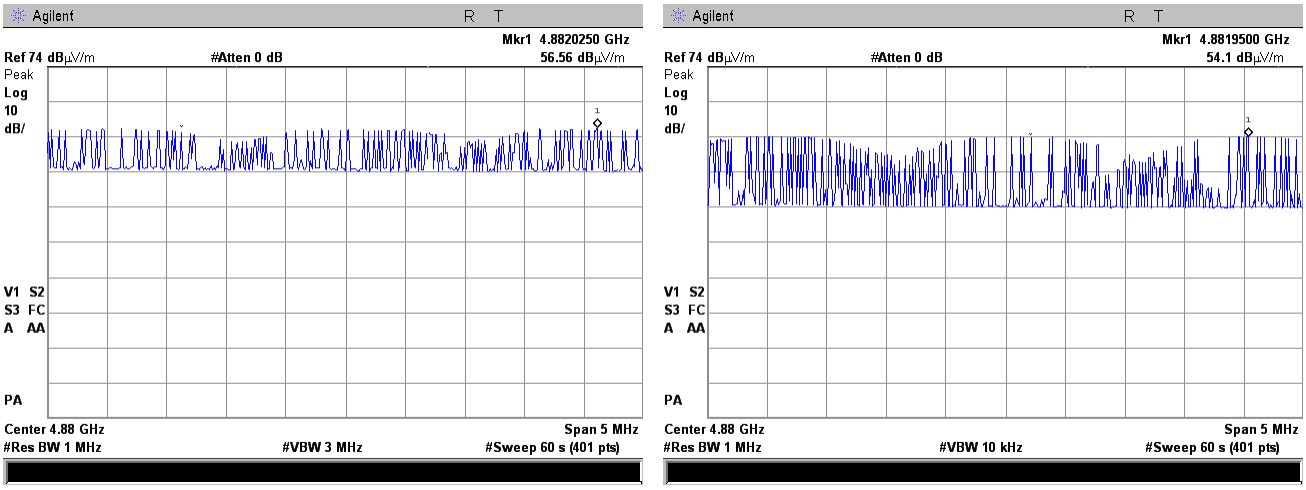
Plot 7.3.8 Radiated emission measurements at the carrier



Test specification:	Section 15.247(d), Radiated spurious emissions		
Test procedure:	Public notice DA 00-705/ 47 CFR, Section 15.247(d) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date(s):	1/29/2013		
Temperature: 22.3 ºC	Air Pressure: 1013 hPa	Relative Humidity: 53 %	Power Supply: Battery
Remarks: Co-location of BT and RFID transmitters			

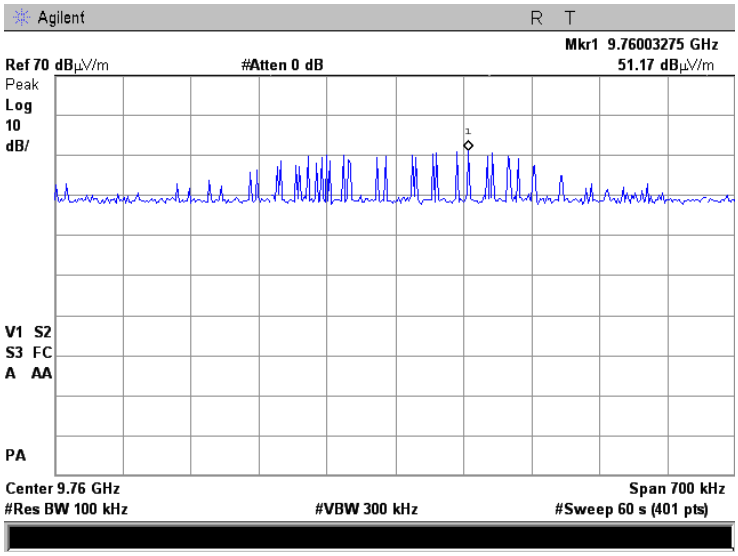
Plot 7.3.9 Radiated emission measurements at the 2 harmonic

TEST SITE:	Semi anechoic chamber
TEST DISTANCE:	3 m
ANTENNA POLARIZATION	Vertical & Horizontal
DETECTOR: Peak	Average



Plot 7.3.10 Radiated emission measurements at the 4 harmonic

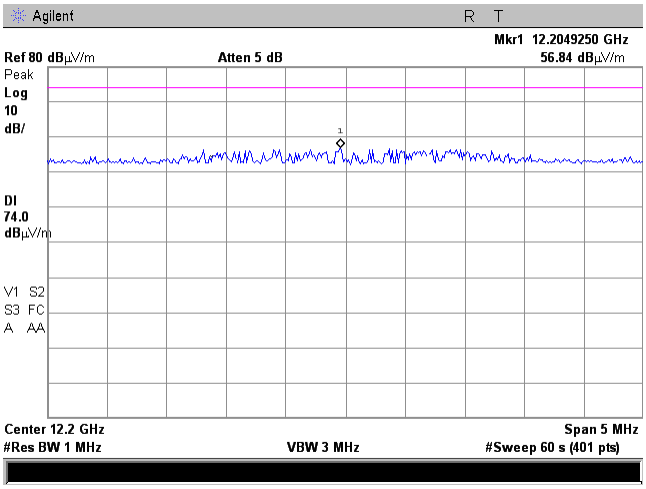
TEST SITE:	Semi anechoic chamber
TEST DISTANCE:	3 m
ANTENNA POLARIZATION	Vertical & Horizontal

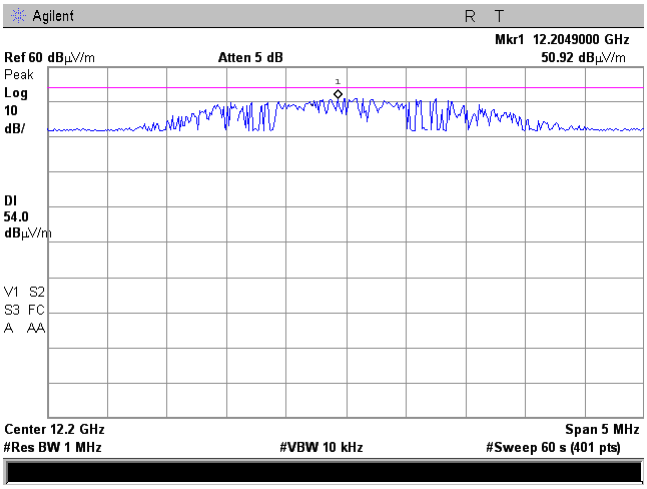


Test specification:	Section 15.247(d), Radiated spurious emissions		
Test procedure:	Public notice DA 00-705/ 47 CFR, Section 15.247(d) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date(s):	1/29/2013		
Temperature: 22.3 ºC	Air Pressure: 1013 hPa	Relative Humidity: 53 %	Power Supply: Battery
Remarks: Co-location of BT and RFID transmitters			

Plot 7.3.11 Radiated emission measurements at the 5 harmonic

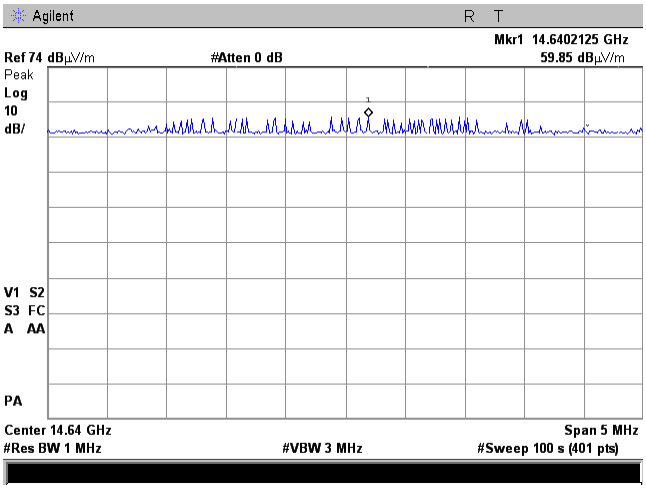
TEST SITE:	Semi anechoic chamber
TEST DISTANCE:	3 m
ANTENNA POLARIZATION: Vertical	Vertical & Horizontal
DETECTOR: Peak	Average

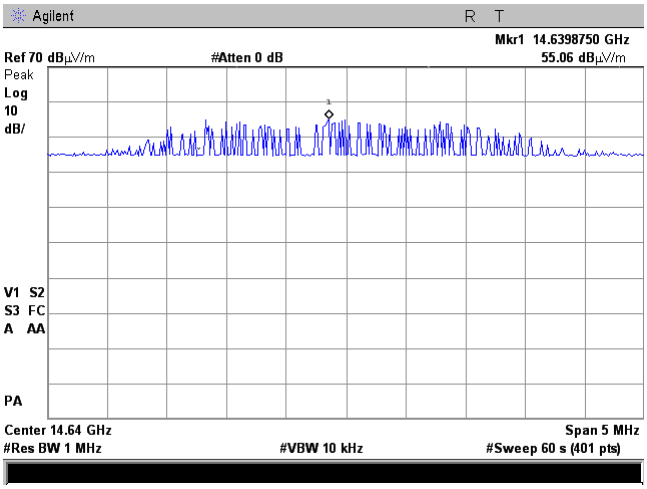




Plot 7.3.12 Radiated emission measurements at the 6 harmonic

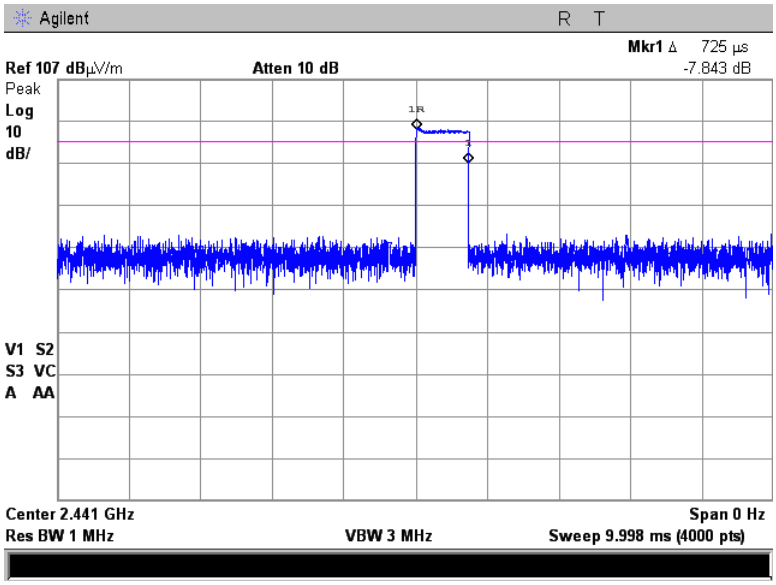
TEST SITE:	Semi anechoic chamber
TEST DISTANCE:	3 m
ANTENNA POLARIZATION: Vertical	Vertical & Horizontal
DETECTOR: Peak	Average



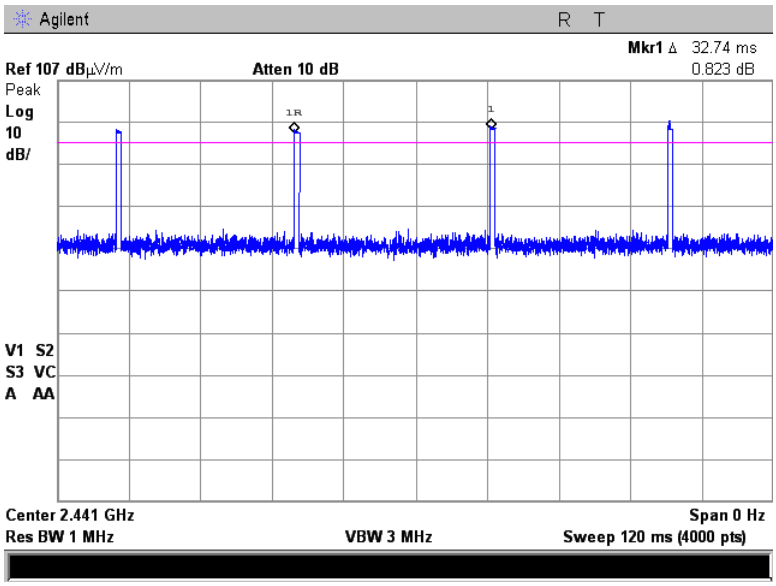


Test specification:	Section 15.247(d), Radiated spurious emissions		
Test procedure:	Public notice DA 00-705/ 47 CFR, Section 15.247(d) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date(s):	1/29/2013		
Temperature: 22.3 ºC	Air Pressure: 1013 hPa	Relative Humidity: 53 %	Power Supply: Battery
Remarks: Co-location of BT and RFID transmitters			

Plot 7.3.13 Transmission pulse duration



Plot 7.3.14 Transmission pulse period



8 APPENDIX A Test equipment and ancillaries used for tests

HL No	Description	Manufacturer	Model	Ser. No.	Last Cal./ Check	Due Cal./ Check
0446	Antenna, Loop, Active, 10 kHz - 30 MHz	EMCO	6502	2857	03-Jul-12	03-Jul-13
0521	EMI Receiver (Spectrum Analyzer) with RF filter section 9 kHz-6.5 GHz	Hewlett Packard	8546A	3617A 00319, 3448A00253	24-Sep-12	24-Sep-13
0604	Antenna BiconiLog Log-Periodic/T Bow-TIE, 26 - 2000 MHz	EMCO	3141	9611-1011	20-May-12	20-May-14
0768	Antenna Standard Gain Horn, 18-26.5 GHz, WR-42, 25 dB gain	Quinstar Technology	QWH-4200-BA	110	03-Feb-12	03-Feb-15
2909	Spectrum analyzer, ESA-E, 100 Hz to 26.5 GHz	Agilent Technologies	E4407B	MY41444762	20-Dec-12	20-Dec-13
3533	Amplifier, low noise, 6 to 18 GHz	Quinstar Technology	QLJ-06184040-J0	11159001001	25-Dec-12	25-Dec-13
3535	Amplifier, low noise, 18 to 40 GHz	Quinstar Technology	QLJ-18404537-J0	11159003001	10-Jul-12	10-Jul-13
3818	PSA Series Spectrum Analyzer, 3 Hz- 44 GHz	Agilent Technologies	E4446A	MY48250288	16-Feb-13	16-Feb-14
3901	Microwave Cable Assembly, 40.0 GHz, 3.5 m, SMA/SMA	Huber-Suhner	SUCOFLEX 102A	1225/2A	06-Feb-13	06-Feb-14
4114	Antenna, Double-Ridged Waveguide Horn, 1-18 GHz	ETS Lindgren	3117	00123515	07-Dec-12	07-Dec-13
4295	Microwave Cable Assembly, 18.0 GHz, 3.4 m, SMA/SMA	Huber-Suhner	Sucoflex P103	NA	04-Dec-12	04-Dec-13
4351	Low Loss Armored Test Cable, DC - 18 GHz, 6.2 m, N type-M/N type-M	MegaPhase	NC29-N1N1-244	12025101001	06-Jun-12	06-Mar-13
4352	Low Loss Armored Test Cable, DC - 18 GHz, 6.2 m, N type-M/N type-M	MegaPhase	NC29-N1N1-244	12025101002	06-Jun-12	06-Mar-13
4353	Low Loss Armored Test Cable, DC - 18 GHz, 6.2 m, N type-M/N type-M	MegaPhase	NC29-N1N1-244	12025101003	06-Jun-12	06-Mar-13

9 APPENDIX B Measurement uncertainties

Expanded uncertainty at 95% confidence in Hermon Labs EMC measurements

Test description	Expanded uncertainty
Radiated emissions at 10 m measuring distance Horizontal polarization Vertical polarization	 Biconilog antenna: ± 5.0 dB Biconical antenna: ± 5.0 dB Log periodic antenna: ± 5.1 dB Double ridged horn antenna: ± 5.3 dB Biconilog antenna: ± 5.5 dB Biconical antenna: ± 5.5 dB Log periodic antenna: ± 5.6 dB Double ridged horn antenna: ± 5.8 dB
Radiated emissions at 3 m measuring distance Horizontal polarization Vertical polarization	 Biconilog antenna: ± 5.3 dB Biconical antenna: ± 5.0 dB Log periodic antenna: ± 5.3 dB Double ridged horn antenna: ± 5.3 dB Biconilog antenna: ± 6.0 dB Biconical antenna: ± 5.7 dB Log periodic antenna: ± 6.0 dB Double ridged horn antenna: ± 6.0 dB
Duty cycle, timing (Tx ON / OFF) and average factor measurements	± 1.0 %
Occupied bandwidth	± 8.0 %

Hermon Laboratories is accredited by A2LA for calibration according to present requirements of ISO/IEC 17025 and NCSL Z540-1. The accreditation is granted to perform calibration of parameters that are listed in the Scope of Hermon Laboratories Accreditation.
Hermon Laboratories calibrates its reference and transfer standards by calibration laboratories accredited to ISO/IEC 17025 by a mutually recognized Accreditation Body or by a recognized national metrology institute. All reference and transfer standards used in the calibration system are traceable to national or international standards.
In-house calibration of all test and measurement equipment is performed on a regular basis according to Hermon Laboratories calibration procedures, manufacturer calibration/verification procedures or procedures defined in the relevant standards. The Hermon Laboratories test and measurement equipment is calibrated within the tolerances specified by the manufacturers and/or by the relevant standards.

10 APPENDIX C Test laboratory description

Tests were performed at Hermon Laboratories Ltd., which is a fully independent, private, EMC, safety, environmental and telecommunication testing facility.
Hermon Laboratories is listed by the Federal Communications Commission (USA) for all parts of Code of Federal Regulations 47 (CFR 47), Registration Numbers 90624 for OATS and 90623 for the anechoic chamber; by Industry Canada for electromagnetic emissions (file numbers IC 2186A-1 for OATS, IC 2186A-2 for anechoic chamber, IC 2186A-3 for full-anechoic chamber for RE measurements above 1 GHz), certified by VCCI, Japan (the registration numbers are R-808 for OATS, R-1082 for anechoic chamber, G-27 for full-anechoic chamber for RE measurements above 1 GHz, C-845 for conducted emissions site, T-1606 for conducted emissions at telecommunication ports), has a status of a Telefication - Listed Testing Laboratory, Certificate No. L138/00. The laboratory is accredited by American Association for Laboratory Accreditation (USA) according to ISO/IEC 17025 for electromagnetic compatibility, product safety, telecommunications testing and environmental simulation (for exact scope please refer to Certificate No. 839.01). The FCC Designation Number is US1003.

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Person for contact: Mr. Alex Usoskin, CEO.

11 APPENDIX D Specification references

FCC 47CFR part 15: 2012	Radio Frequency Devices.
Public notice DA 00- 705: 2000	Filing and measurement guidelines for frequency hopping spread spectrum systems.
ANSI C63.2: 1996	American National Standard for Instrumentation-Electromagnetic Noise and Field Strength, 10 kHz to 40 GHz-Specifications.
ANSI C63.4: 2003	American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz.

12 APPENDIX E Test equipment correction factors

Antenna factor
Active loop antenna
Model 6502, S/N 2857, HL 0446

Frequency, MHz	Magnetic antenna factor, dB	Electric antenna factor, dB
0.009	-32.8	18.7
0.010	-33.8	17.7
0.020	-38.3	13.2
0.050	-41.1	10.4
0.075	-41.3	10.2
0.100	-41.6	9.9
0.150	-41.7	9.8
0.250	-41.6	9.9
0.500	-41.8	9.8
0.750	-41.9	9.7
1.000	-41.4	10.1
2.000	-41.5	10.0
3.000	-41.4	10.2
4.000	-41.4	10.1
5.000	-41.5	10.1
10.000	-41.9	9.6
15.000	-41.9	9.6
20.000	-42.2	9.3
25.000	-42.8	8.7
30.000	-44.0	7.5

Antenna factor in dB(1/m) is to be added to receiver meter reading in dB(μV) to convert it into field intensity in dB(μV/m).

Antenna factor
Standard gain horn antenna
Quinstar Technology
Model QWH
Ser.No.110, HL 0768

Frequency min, GHz	Frequency max, GHz	Antenna factor, dB(1/m)
18.000	26.500	32.01
26.500	40.000	35.48

Antenna factor in dB(1/m) is to be added to receiver meter reading in dB(μV) to convert it into field strength in dB(μV/m).

Antenna factor
Biconilog antenna EMCO Model 3141
Ser.No.1011, HL 0604

Frequency, MHz	Antenna factor, dB(1/m)	Frequency, MHz	Antenna factor, dB(1/m)	Frequency, MHz	Antenna factor, dB(1/m)
26	7.8	580	20.6	1320	27.8
28	7.8	600	21.3	1340	28.3
30	7.8	620	21.5	1360	28.2
40	7.2	640	21.2	1380	27.9
60	7.1	660	21.4	1400	27.9
70	8.5	680	21.9	1420	27.9
80	9.4	700	22.2	1440	27.8
90	9.8	720	22.2	1460	27.8
100	9.7	740	22.1	1480	28.0
110	9.3	760	22.3	1500	28.5
120	8.8	780	22.6	1520	28.9
130	8.7	800	22.7	1540	29.6
140	9.2	820	22.9	1560	29.8
150	9.8	840	23.1	1580	29.6
160	10.2	860	23.4	1600	29.5
170	10.4	880	23.8	1620	29.3
180	10.4	900	24.1	1640	29.2
190	10.3	920	24.1	1660	29.4
200	10.6	940	24.0	1680	29.6
220	11.6	960	24.1	1700	29.8
240	12.4	980	24.5	1720	30.3
260	12.8	1000	24.9	1740	30.8
280	13.7	1020	25.0	1760	31.1
300	14.7	1040	25.2	1780	31.0
320	15.2	1060	25.4	1800	30.9
340	15.4	1080	25.6	1820	30.7
360	16.1	1100	25.7	1840	30.6
380	16.4	1120	26.0	1860	30.6
400	16.6	1140	26.4	1880	30.6
420	16.7	1160	27.0	1900	30.6
440	17.0	1180	27.0	1920	30.7
460	17.7	1200	26.7	1940	30.9
480	18.1	1220	26.5	1960	31.2
500	18.5	1240	26.5	1980	31.6
520	19.1	1260	26.5	2000	32.0
540	19.5	1280	26.6		
560	19.8	1300	27.0		

Antenna factor in dB(1/m) is to be added to receiver meter reading in dB(μV) to convert it into field strength in dB(μV/m).

Antenna factor
Double-ridged waveguide horn antenna
ETS Lindgren, Model 3117, serial number: 00123515, HL 4114

Frequency, MHz	Antenna factor, dB/m		
	Measured	Manufacturer	Deviation
1000	28.0	28.4	-0.4
1500	28.0	27.4	0.6
2000	31.2	30.9	0.3
2500	32.5	33.4	-0.9
3000	32.9	32.6	0.3
3500	32.7	32.8	-0.1
4000	33.1	33.4	-0.3
4500	33.8	33.9	-0.1
5000	33.8	34.1	-0.3
5500	34.4	34.5	-0.1
6000	35.0	35.2	-0.2
6500	35.4	35.5	-0.1
7000	35.7	35.7	0.0
7500	35.9	35.7	0.2
8000	35.8	35.8	0.0
8500	35.9	35.8	0.1
9000	36.3	36.2	0.1
9500	36.6	36.6	0.0
10000	37.1	37.1	0.0
10500	37.6	37.5	0.1
11000	37.9	37.7	0.2
11500	38.5	38.1	0.4
12000	39.2	38.7	0.5
12500	39.0	38.9	0.1
13000	39.1	39.1	0.0
13500	38.9	38.8	0.1
14000	39.0	38.8	0.2
14500	39.6	39.9	-0.3
15000	39.9	39.7	0.2
15500	39.9	40.1	-0.2
16000	40.7	40.8	-0.1
16500	41.3	41.8	-0.5
17000	42.5	42.1	0.4
17500	41.3	41.2	0.1
18000	41.4	40.9	0.5

Antenna factor is to be added to receiver meter reading in dB(μV) to convert to field strength in dB(μV/meter)

Cable loss
Microwave Cable Assembly, Huber-Suhner, 40 GHz, 3.5 m, SMA-SMA, S/N 1225/2A
HL 3901

Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB
10	0.09	9500	4.29	21000	6.67
100	0.41	10000	4.40	22000	6.92
500	0.93	10500	4.52	23000	7.00
1000	1.33	11000	4.64	24000	7.18
1500	1.63	11500	4.76	25000	7.29
2000	1.90	12000	4.87	26000	7.55
2500	2.12	12500	4.99	27000	7.70
3000	2.33	13000	5.11	28000	7.88
3500	2.50	13500	5.20	29000	8.02
4000	2.67	14000	5.31	30000	8.15
4500	2.82	14500	5.42	31000	8.35
5000	2.99	15000	5.51	32000	8.40
5500	3.16	15500	5.58	33000	8.62
6000	3.32	16000	5.68	34000	8.73
6500	3.51	16500	5.78	35000	8.78
7000	3.65	17000	5.91	36000	8.94
7500	3.79	17500	5.99	37000	9.21
8000	3.92	18000	6.07	38000	9.37
8500	4.04	19000	6.36	39000	9.45
9000	4.18	20000	6.49	40000	9.52

Cable loss
Microwave Cable Assembly, 18.0 GHz, 3.4 m, SMA/SMA, Huber-Suhner, S/N 4295, Sucoflex P103, HL 4295

Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB
10	0.11	5000	2.09	10200	2.97	15400	3.63
30	0.18	5100	2.12	10300	3.01	15500	3.65
50	0.23	5200	2.13	10400	3.00	15600	3.63
100	0.31	5300	2.16	10500	3.05	15700	3.64
200	0.38	5400	2.19	10600	3.09	15800	3.64
300	0.43	5500	2.21	10700	3.05	15900	3.66
400	0.52	5600	2.21	10800	3.09	16000	3.71
500	0.60	5700	2.24	10900	3.10	16100	3.67
600	0.67	5800	2.24	11000	3.08	16200	3.71
700	0.72	5900	2.25	11100	3.11	16300	3.70
800	0.78	6000	2.27	11200	3.12	16400	3.71
900	0.83	6100	2.25	11300	3.12	16500	3.72
1000	0.89	6200	2.29	11400	3.20	16600	3.84
1100	0.94	6300	2.34	11500	3.16	16700	3.78
1200	0.98	6400	2.37	11600	3.16	16800	3.85
1300	1.03	6500	2.33	11700	3.20	16900	3.88
1400	1.06	6600	2.34	11800	3.19	17000	3.85
1500	1.11	6700	2.39	11900	3.21	17100	3.88
1600	1.14	6800	2.46	12000	3.28	17200	3.92
1700	1.19	6900	2.45	12100	3.23	17300	3.90
1800	1.22	7000	2.44	12200	3.26	17400	4.00
1900	1.26	7100	2.43	12300	3.30	17500	4.02
2000	1.30	7200	2.44	12400	3.25	17600	4.00
2100	1.34	7300	2.51	12500	3.26	17700	3.96
2200	1.37	7400	2.54	12600	3.30	17800	4.01
2300	1.40	7500	2.49	12700	3.26	17900	4.02
2400	1.44	7600	2.52	12800	3.34	18000	4.08
2500	1.47	7700	2.59	12900	3.37		
2600	1.50	7800	2.57	13000	3.30		
2700	1.55	7900	2.55	13100	3.35		
2800	1.58	8000	2.57	13200	3.31		
2900	1.60	8100	2.58	13300	3.33		
3000	1.63	8200	2.64	13400	3.42		
3100	1.64	8300	2.70	13500	3.43		
3200	1.67	8400	2.65	13600	3.40		
3300	1.69	8500	2.66	13700	3.47		
3400	1.73	8600	2.68	13800	3.45		
3500	1.74	8700	2.70	13900	3.43		
3600	1.76	8800	2.74	14000	3.52		
3700	1.79	8900	2.74	14100	3.51		
3800	1.82	9000	2.76	14200	3.54		
3900	1.85	9100	2.82	14300	3.55		
4000	1.87	9200	2.79	14400	3.52		
4100	1.90	9300	2.82	14500	3.52		
4200	1.92	9400	2.83	14600	3.56		
4300	1.93	9500	2.83	14700	3.55		
4400	1.94	9600	2.86	14800	3.55		
4500	1.97	9700	2.93	14900	3.59		
4600	1.99	9800	2.89	15000	3.56		
4700	2.01	9900	2.91	15100	3.59		
4800	2.02	10000	2.94	15200	3.59		
4900	2.04	10100	2.94	15300	3.59		

Cable loss
Low Loss Armored Test Cable, MegaPhase, 18 GHz, 6.2 m, N type-M/N type-M,
NC29-N1N1-244S/N 12025101 001,
HL 4351

Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB
50	0.21	9000	2.86
100	0.28	9500	2.96
300	0.49	10000	3.05
500	0.63	10500	3.12
1000	0.90	11000	3.18
1500	1.10	11500	3.24
2000	1.29	12000	3.30
2500	1.44	12500	3.37
3000	1.58	13000	3.45
3500	1.71	13500	3.53
4000	1.84	14000	3.58
4500	1.95	14500	3.66
5000	2.05	15000	3.73
5500	2.17	15500	3.79
6000	2.29	16000	3.87
6500	2.39	16500	3.94
7000	2.47	17000	3.98
7500	2.56	17500	4.07
8000	2.70	18000	4.14
8500	2.77		

Cable loss
Low Loss Armored Test Cable, MegaPhase, 18 GHz, 6.2 m, N type-M/N type-M,
NC29-N1N1-244S/N 12025101 002,
HL 4352

Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB
50	0.20	9000	2.81
100	0.28	9500	2.89
300	0.49	10000	3.00
500	0.63	10500	3.07
1000	0.90	11000	3.15
1500	1.10	11500	3.23
2000	1.28	12000	3.30
2500	1.44	12500	3.38
3000	1.57	13000	3.47
3500	1.71	13500	3.55
4000	1.85	14000	3.61
4500	1.95	14500	3.68
5000	2.05	15000	3.76
5500	2.14	15500	3.86
6000	2.27	16000	3.92
6500	2.38	16500	3.97
7000	2.47	17000	4.03
7500	2.58	17500	4.10
8000	2.65	18000	4.18
8500	2.74		

Cable loss
Low Loss Armored Test Cable, MegaPhase, 18 GHz, 6.2 m, N type-M/N type-M,
NC29-N1N1-244S/N 12025101 003,
HL 4353

Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB
50	0.20	9000	2.71
100	0.27	9500	2.81
300	0.47	10000	2.90
500	0.61	10500	2.97
1000	0.87	11000	3.06
1500	1.07	11500	3.13
2000	1.24	12000	3.20
2500	1.39	12500	3.26
3000	1.53	13000	3.34
3500	1.65	13500	3.39
4000	1.77	14000	3.47
4500	1.89	14500	3.54
5000	1.99	15000	3.62
5500	2.07	15500	3.69
6000	2.20	16000	3.76
6500	2.30	16500	3.83
7000	2.39	17000	3.86
7500	2.51	17500	3.94
8000	2.58	18000	4.02
8500	2.65		

13 APPENDIX F Abbreviations and acronyms

A	ampere
AC	alternating current
A/m	ampere per meter
AVRG	average (detector)
cm	centimeter
dB	decibel
dBm	decibel referred to one milliwatt
dB(μV)	decibel referred to one microvolt
dB(μV/m)	decibel referred to one microvolt per meter
dB(μA)	decibel referred to one microampere
DC	direct current
EIRP	equivalent isotropically radiated power
ERP	effective radiated power
EUT	equipment under test
F	frequency
GHz	gigahertz
GND	ground
H	height
HL	Hermon laboratories
Hz	hertz
k	kilo
kHz	kilohertz
LO	local oscillator
m	meter
MHz	megahertz
min	minute
mm	millimeter
ms	millisecond
μs	microsecond
NA	not applicable
OATS	open area test site
Ω	Ohm
PS	power supply
ppm	part per million (10^{-6})
QP	quasi-peak
RE	radiated emission
RF	radio frequency
rms	root mean square
Rx	receive
s	second
T	temperature
Tx	transmit
V	volt

END OF DOCUMENT