HERMON LABORATORIES

ELECTRICAL TESTING
0839.01

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TEST REPORT

ACCORDING TO: FCC 47CFR part 15 subpart C § 15.209 and RSS-210 issue 8 section 2.5.1

FOR:

LogiTag Systems Ltd.
Gate Exciter GPRS
Model:LTG2-11
Door Management Unit GPRS
Model:LTG2-11-PRF
Base Station
Model:LTG2-01
Central Management Unit
Model:LTG2-01-PRF
Gate Locator
Model:LTG2-02
Door Management Unit
Model:LTG2-02-PRF
4 Channel Exciter
Model:LTG2-03
Multi Location Unit
Model:LTG2-03-PRF
FCC ID:Z97LTG2-01

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1 Applicant information

Client name:	LogiTag Systems Ltd.
Address:	1st Floor, Building 9, 29 Yad Harutzim street, Poleg Industrial Zone, P.O.B. 8249, Netanya 4250473, Israel
Telephone:	+972 9835 4848
Fax:	+972 9865 6262
E-mail:	golank@Logi-tag.com
Contact name:	Mr. Golan Kormian

2 Equipment under test attributes

Product name:	Gate Exciter GPRS
Model(s):	LTG2-11
Serial number:	1
Hardware version:	C01
Software release:	V2.04
Receipt date	31-Jul-14

3 Manufacturer information

Manufacturer name:	LogiTag Systems Ltd.
Address:	1st Floor, Building 9, 29 Yad Harutzim street, Poleg Industrial Zone, P.O.B. 8249, Netanya 4250473, Israel
Telephone:	+972 9835 4848
Fax:	+972 9865 6262
E-Mail:	golank@Logi-tag.com
Contact name:	Mr. Golan Kormian

4 Test details

Project ID:	25985
Location:	Hermon Laboratories Ltd. Harakevet Industrial Zone, Binyamina 30500, Israel
Test started:	31-Jul-14
Test completed:	03-Sep-14
Test specification(s):	FCC 47CFR part 15, subpart C, §15.209; RSS-210 issue 8 section 2.5.1, RSS-Gen issue 3 Table 6

5 Tests summary

Test	Status
Transmitter characteristics	
Section 15.209 / RSS-210, Tables 2, 3, Field strength of emissions	Pass
Section 15.207(a) / RSS-Gen, Section 7.2.2, Conducted emission	Pass
Section 15.203 / RSS-Gen, Section 7.1.4, Antenna requirements	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:	Mrs. E. Pitt, test engineer	September 4, 2014	
Reviewed by:	Mrs. M. Cherniavsky, certification engineer	September 14, 2014	
Approved by:	Mr. M. Nikishin, EMC and Radio group manager	October 29, 2014	

6 EUT description

6.1 General information

The EUT, Gate Exciter GPRS, model number LTG2-11, functionalizes as a combination of Base Station and Gate Locator. It can be the management unit and also direct operation and control of RFID tags.
The device can manage the subunits – gate locators. It carries out the following functionalities:

- **Management unit** –the data that is received on the gate locators is transferred to the unit with an indication on which unit sends the data.
  The unit is able to send configuration info the gate locators via 916 MHz
- **Transferring data** – the unit receives over the UHF band. the messages transmitted by the tags to the gate locator and then to the Gate Exciter GPRS. It can send them a response (to acknowledge the reception); send data to a main server, trigger local hardware through dry-contact interfaces or start a continuous communication session with the tag.
- Generate RF-Zones using an internal 125 kHz transmitter. Each of the unit's channels carries a unique number as an identifier to the location/area where the RF-Zone operates. The device has four LF antenna ports, only one works at a time (two Ceiling and two Door antennas were connected during the tests).
- Operates logical rules: based on events (tag detection, sensor detection, location decision, etc.) that the units detects it activates actions (I/O, parameter update, etc.)
- Function as a repeater to tag's transmissions, relaying it toward the Base-Station unit.

The EUT has the following features/ports:

a) Rx from tag at 433 MHz (UHF1)
b) Tx to tag at 433 MHz (UHF2);
c) Tx/Rx with a tag at 433 MHz (UHF3);
d) Tx/Rx with a one channel exciter in 902-928 MHz (UHF4).

The Gate Exciter GPRS can connect the customer computer/management system via Ethernet, GPRS or WIFI.

The EUT includes the approved by FCC module FCC ID:RI7HE910 manufactured by Telit Communications S.p.A and approved WiFi module FCC ID:TFB-TIWI1-01 manufactured by LS Research, LLC.

The manufacturer's declaration of identity provided in Appendix G of the test report describes the similarity and differences between the models. The model LTG2-11 was tested as the most complex version.
The present test report involves the test results for certification of 125 kHz transmitters as a part of a composite application for certification.

6.2 EUT modules and sub-assemblies

Description	Manufacturer	Model or P/N	Hardware rev.	Serial number
Gate Exciter GPRS	LogiTag Systems	LTG2-11	C01	1
Atenna LF Door	LogiTag Systems	LANT-01	NA	1402-010
Atenna LF Door	LogiTag Systems	LANT-01	NA	1402-011
Atenna LF Cieling	LogiTag Systems	LANT-02 PRF	NA	1401056
Atenna LF Cieling	LogiTag Systems	LANT-02-PRF	NA	1401078
Antenna GPRS	Any	Typical	NA	NA

6.3 Ports and lines

Port type	Port description	Connected from	Connected to	Qty.	Cable type	Cable length
Power	DC power	EUT	24V DC power supply	1	Unshielded	1.6 m**
Control	USB2*	EUT	PC	1	Shielded	2 m*
Control	USB1	EUT	Not used	1	NA	NA
Telecom	Ethernet	EUT	Ethernet switch	1	S-FTP	10 m
Control	RS485*	EUT	Open circuit	1	FTP	1 m*
Control	Extension (1, 5, 6)	EUT	LEDs (1;2)	1	FTP	2 m**
Control	Input (7, GND)	EUT	Switch On/Off	2	FTP	2 m**
Control	Input (8)	EUT	Open circuit	1	FTP	2 m**
Control	Input (3, 4; GND)	EUT	Open circuit	3	FTP	1 m**
Control	Input (5, 6; GND)	EUT	Open circuit	3	FTP	1 m**
Control	Input (1, 2, GND)	EUT	Open circuit	1	FTP	1 m**
Control	Relay (R2...R8)	EUT	Open circuit	7	FTP	1 m**
Control	Relay (R1)	EUT	LED 3	1	FTP	2 m**
Control	Outputs (2...8)	EUT	Open circuit	7	FTP	2 m**
Control	Output (1)	EUT	LED 3	1	FTP	2 m**
Signal	LF Antenna	EUT	LF Antenna	4	FTP	2 m**
Signal	GPRS	EUT	GPRS Antenna	1	Coax	3 m**
Signal	Antenna (UHF1...UHF4)	EUT	UHF Antenna	4	NA	NA
Signal	Antenna (Wi-Fi)	EUT	Not used	1	NA	NA

* For maintenance only.
** May be longer than 3 m.

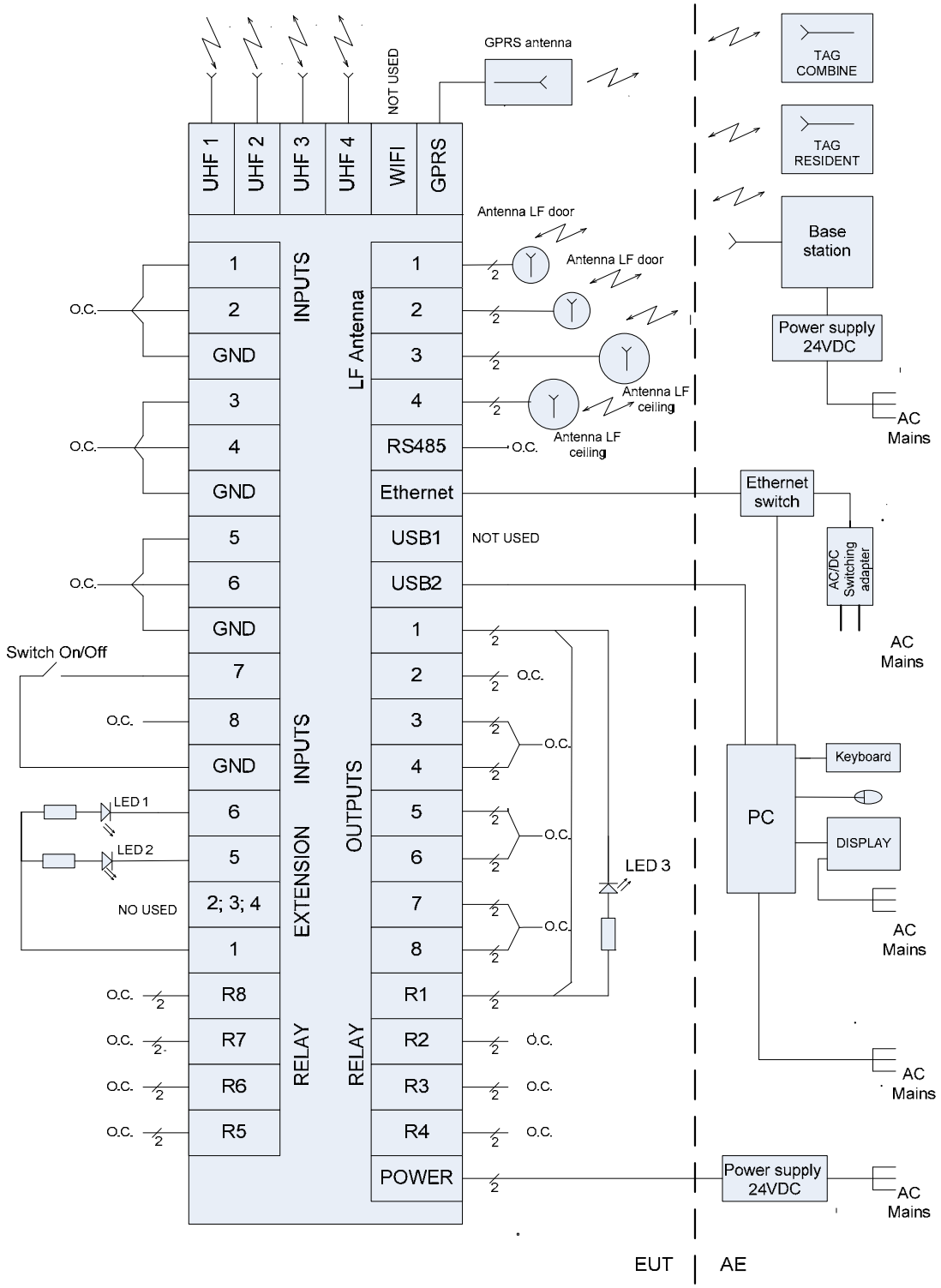
6.4 Support and test equipment

Description	Manufacturer	Model number	Serial number
Base station	LogiTag	LTG2-02	LTG02-1401-003
Power supply 24VDC for Base station	MW Meanwell	GS60A24-P1J	EB27859018
Ethernet Switch	Edimax	ES-3305 P	NA
AC adapter for Ethernet switch	ADVICE	KSAFC120010	NA
PC	Any	Any	Any
AC adapter 24VDC for Gate exciter GPRS	Edacpower Elec.	EA10721B-240	00340
Monitor	SENSE	M989C	1301185SE0754
Keyboard	E-ASER	NA	NA
Mouse	HP	NA	BR1 12257
TAG1	LogiTag	LT comb_TAG	NA
TAG2	LogiTag	LT-RESI_TAG	NA

6.5 Changes made in the EUT

No changes were implemented in the EUT during testing.

6.6 Test configuration



Test specification:	Section 15.209 / / RSS-Gen section 7.2.5, Field strength of emissions		
Test procedure:	ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date(s):	31-Jul-14 - 03-Aug-14		
Temperature: 25 ºC	Air Pressure: 1005 hPa	Relative Humidity: 42 %	Power Supply: 24 VDC
Remarks:			

7 Transmitter tests according to 47CFR part 15 subpart C and RSS-210 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)	
	Peak	Average
125	125.69	105.69

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 / / RSS-Gen section 7.2.5, Field strength of emissions		
Test procedure:	ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date(s):	31-Jul-14 - 03-Aug-14		
Temperature: 25 ºC	Air Pressure: 1005 hPa	Relative Humidity: 42 %	Power Supply: 24 VDC
Remarks:			

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

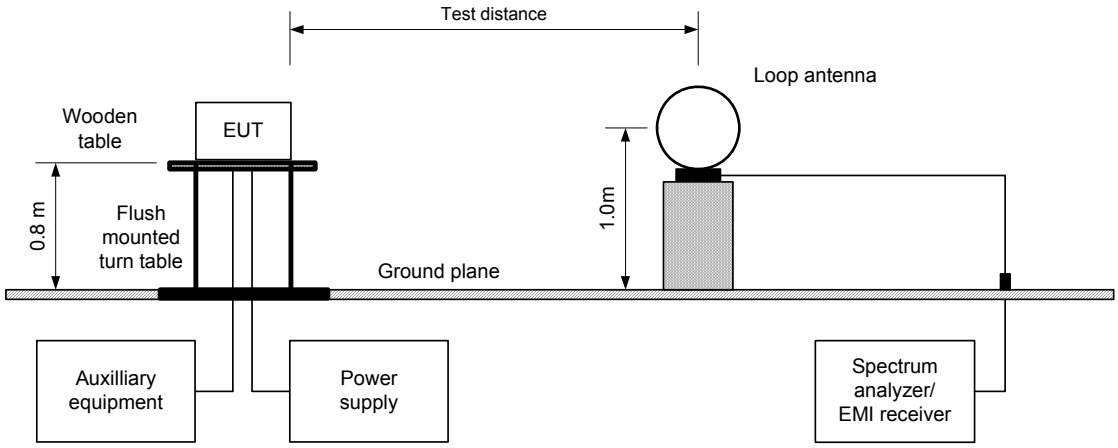
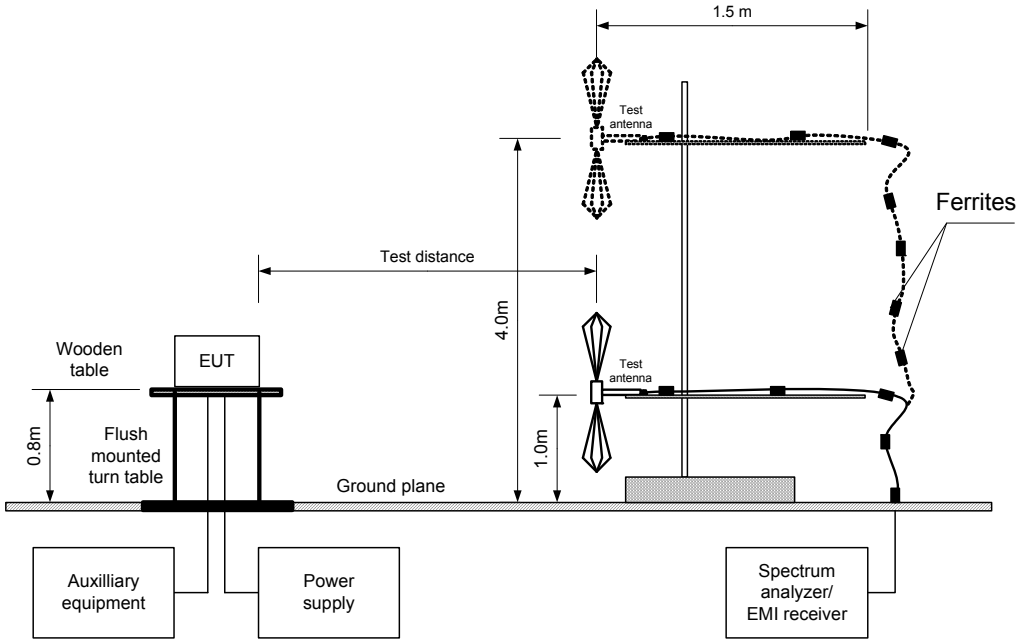


Figure 7.1.2 Setup for spurious emission field strength measurements above 30 MHz



Test specification:	**Section 15.209 / / RSS-Gen section 7.2.5, Field strength of emissions**		
Test procedure:	ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	**Verdict:**	PASS
Date(s):	31-Jul-14 - 03-Aug-14		
Temperature: 25 ºC	**Air Pressure:** 1005 hPa	**Relative Humidity:** 42 %	**Power Supply:** 24 VDC
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
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)

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)	Calculated, dB(μV/m)	Limit, dB(μV/m)	Margin, dB**	
125.066	Vertical	1.0	112	108.1	125.69	-17.59	108.1	105.59	105.69	-0.1	Pass

*****- EUT front panel refers to 0 degrees position of turntable.
******- Margin (dB) = Calculated result - specification limit.
******- Calculated result (dBuV/m) = Measured result + Average factor (dB).

Table 7.1.4 Average factor calculation

Transmission pulse		Transmission burst		Transmission train duration, ms	Average factor, dB
Duration, ms	Period, ms	Duration, ms	Period, ms		
74.9	214	NA	NA	NA	-2.51

*- 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 15.209 / / RSS-Gen section 7.2.5, Field strength of emissions**		
Test procedure:	ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	**Verdict:**	PASS
Date(s):	31-Jul-14 - 03-Aug-14		
Temperature: 25 ºC	**Air Pressure:** 1005 hPa	**Relative Humidity:** 42 %	**Power Supply:** 24 VDC
Remarks:			

Table 7.1.5 Field strength of spurious emissions

TEST DISTANCE: 3 m
TEST SITE: Semi anechoic chamber
EUT POSITION: Typical (Vertical)
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***				
128.63	39.4	35.6	43.5	-7.9	Vertical	1.1	120	Pass
167.99	38.1	36.2	43.5	-7.3	Vertical	1.1	120	
192.00	37.8	35.3	43.5	-8.2	Vertical	1.0	10	
288.00	39.4	38.0	46.0	-8.0	Vertical	1.0	295	
499.98	41.3	40.2	46.0	-5.8	Vertical	1.0	300	

Reference numbers of test equipment used

HL 0446	HL 0521	HL 0604	HL 2780	HL 3001	HL 4276	HL 4278	HL 4353
HL 4722							

Full description is given in Appendix A.

Test specification:	**Section 15.209 / / RSS-Gen section 7.2.5, Field strength of emissions**		
Test procedure:	ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	**Verdict:**	PASS
Date(s):	31-Jul-14 - 03-Aug-14		
Temperature: 25 ºC	**Air Pressure:** 1005 hPa	**Relative Humidity:** 42 %	**Power Supply:** 24 VDC
Remarks:			

Table 7.1.6 Restricted bands according to FCC 15, Section 205

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	12.290 - 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	16.420 - 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	

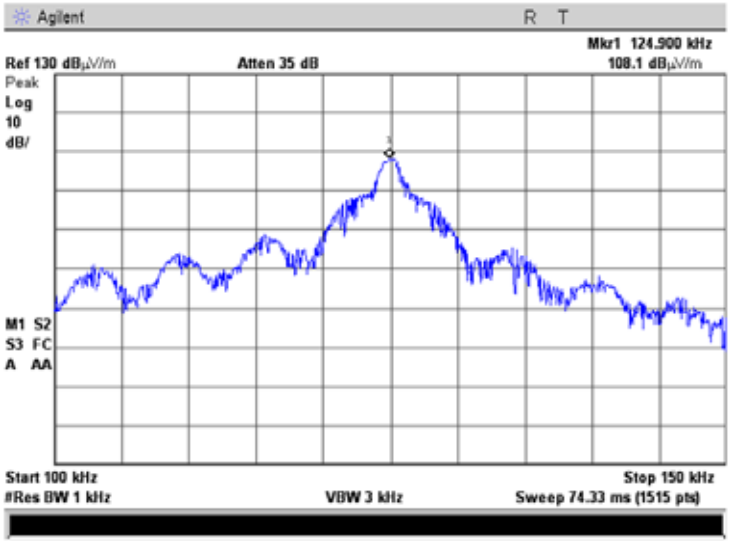
Table 7.1.7 Restricted bands according to RSS-Gen, Table 3

MHz	MHz	MHz	MHz	MHz	GHz
0.09 - 0.11	8.291 - 8.294	16.80425 - 16.80475	399.9 - 410	3260 - 3267	10.6 - 12.7
2.1735 - 2.190	8.362 - 8.366	25.5 - 25.67	608 - 614	3332 - 3339	13.25 - 13.4
3.020 - 3.026	8.37625 - 8.38675	37.5 - 38.25	960 - 1427	3345.8 - 3358	14.47 - 14.5
4.125 - 4.128	8.41425 - 8.41475	73 - 74.6	1435 - 1626.5	3500 - 4400	15.35 - 16.2
4.17725 - 4.17775	12.290 - 12.293	74.8 - 75.2	1645.5 - 1646.5	4500 - 5150	17.7 - 21.4
4.20725 - 4.20775	12.51975 - 12.52025	108 - 138	1660 - 1710	5350 – 5460	22.01 - 23.12
5.677 - 5.683	12.57675 - 12.57725	156.52475 - 156.52525	1718.8 - 1722.2	7250 - 7750	23.6 – 24.0
6.215 - 6.218	13.36 - 13.41	156.7 - 156.9	2200 - 2300	8025 - 8500	31.2 - 31.8
6.26775 - 6.26825	16.42 - 16.423	240 - 285	2310 - 2390	9000 - 9200	36.43 - 36.5
6.31175 - 6.31225	16.69475 - 16.69525	322 - 335.4	2655 - 2900	9300 - 9500	Above 38.6

Test specification:	Section 15.209 / / RSS-Gen section 7.2.5, Field strength of emissions		
Test procedure:	ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date(s):	31-Jul-14 - 03-Aug-14		
Temperature: 25 ºC	Air Pressure: 1005 hPa	Relative Humidity: 42 %	Power Supply: 24 VDC
Remarks:			

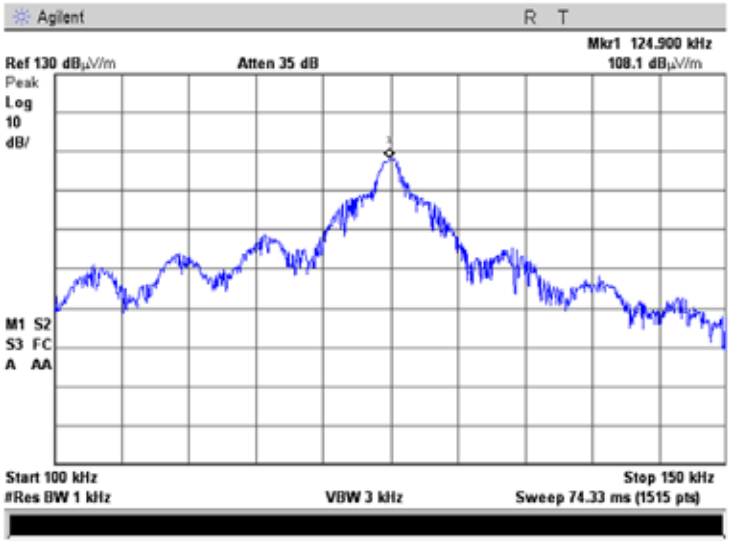
Plot 7.1.1 Radiated emission measurements at the fundamental frequency

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



Plot 7.1.2 Radiated emission measurements at the fundamental frequency

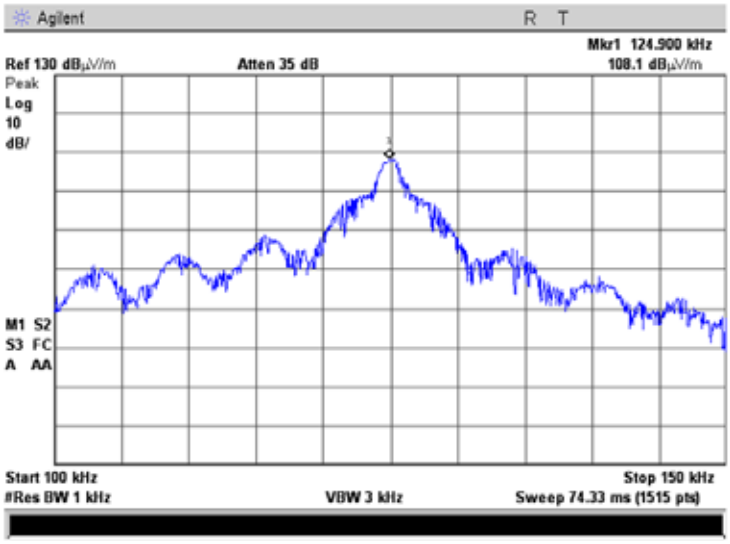
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical
VOLTAGE: 115%Unom



Test specification:	Section 15.209 / / RSS-Gen section 7.2.5, Field strength of emissions		
Test procedure:	ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date(s):	31-Jul-14 - 03-Aug-14		
Temperature: 25 ºC	Air Pressure: 1005 hPa	Relative Humidity: 42 %	Power Supply: 24 VDC
Remarks:			

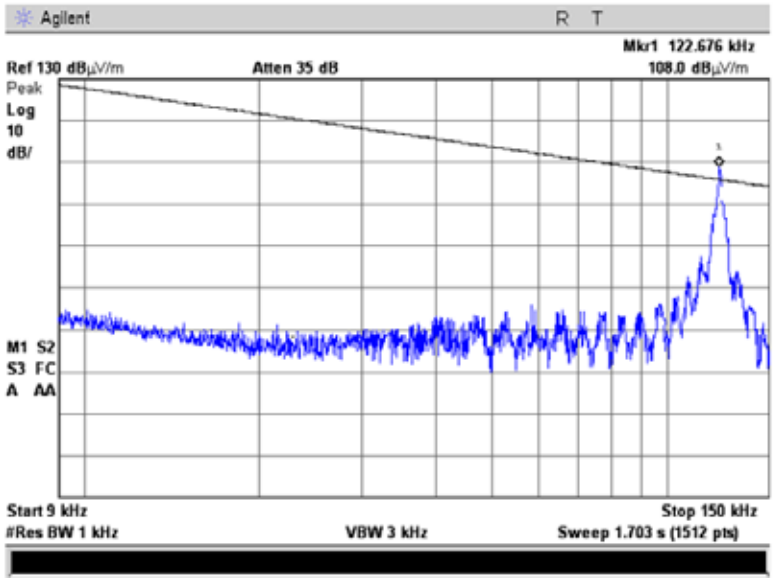
Plot 7.1.3 Radiated emission measurements at the fundamental frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical
VOLTAGE: 85%Unom



Plot 7.1.4 Radiated emission measurements from 9 to 150 kHz

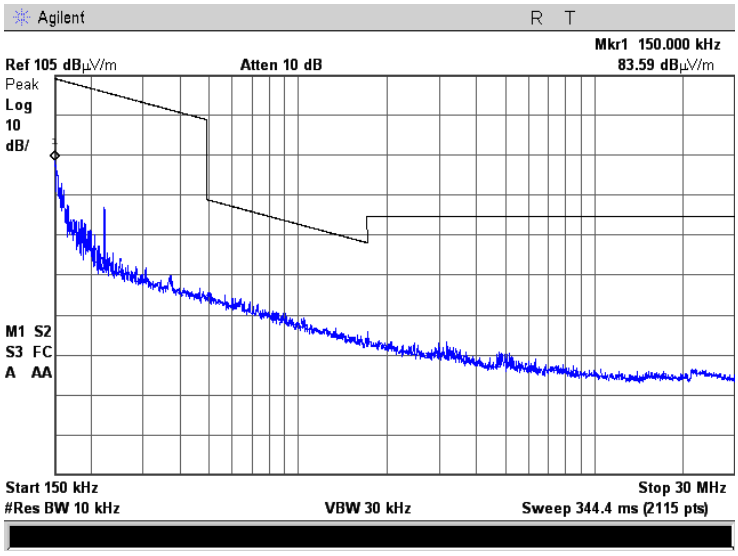
TEST SITE: Anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical



Test specification:	Section 15.209 / / RSS-Gen section 7.2.5, Field strength of emissions		
Test procedure:	ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date(s):	31-Jul-14 - 03-Aug-14		
Temperature: 25 ºC	Air Pressure: 1005 hPa	Relative Humidity: 42 %	Power Supply: 24 VDC
Remarks:			

Plot 7.1.5 Radiated emission measurements from 0.15 to 30 MHz

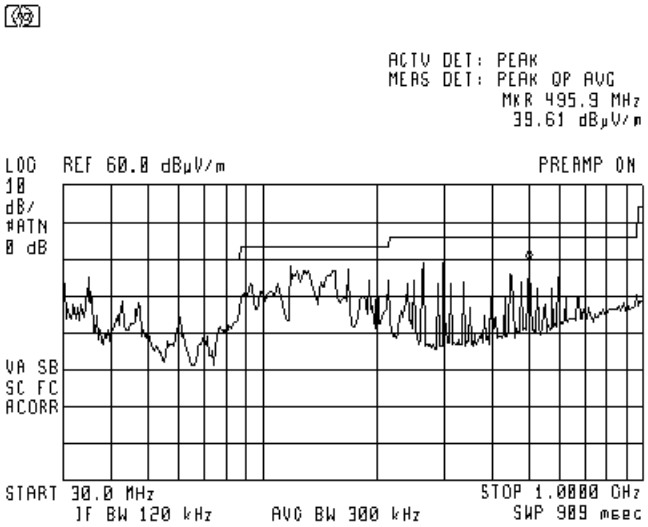
TEST SITE: Anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical



Test specification:	**Section 15.209 / / RSS-Gen section 7.2.5, Field strength of emissions**		
Test procedure:	ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	**Verdict:**	PASS
Date(s):	31-Jul-14 - 03-Aug-14		
Temperature: 25 ºC	**Air Pressure:** 1005 hPa	**Relative Humidity:** 42 %	**Power Supply:** 24 VDC
Remarks:			

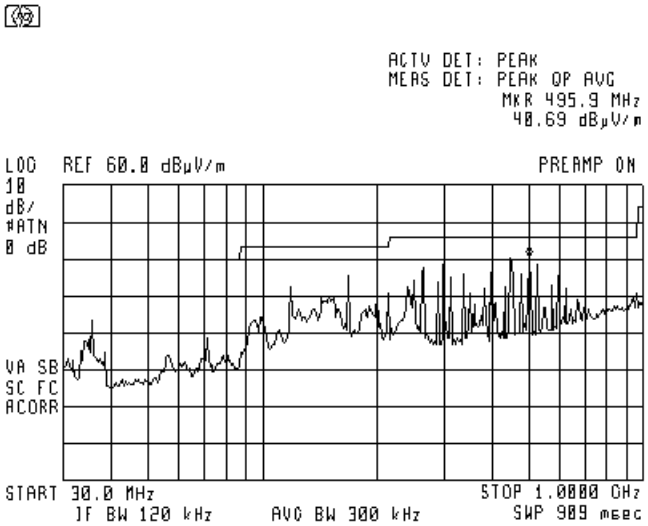
Plot 7.1.6 Radiated emission measurements from 30 to 1000 MHz

TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical



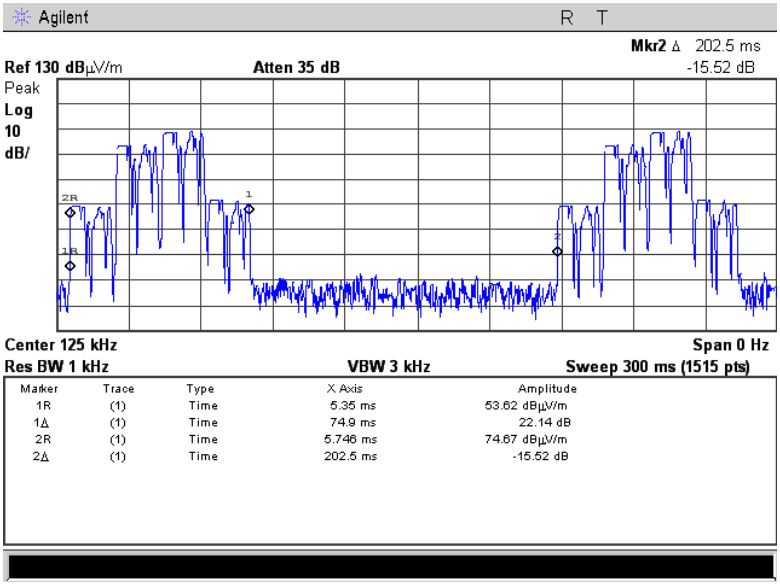
Plot 7.1.7 Radiated emission measurements from 30 to 1000 MHz

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

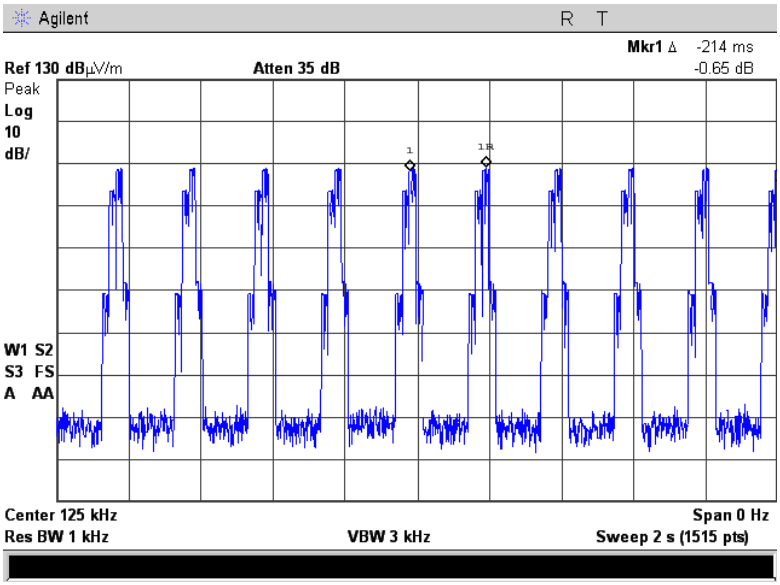


Test specification:	Section 15.209 / / RSS-Gen section 7.2.5, Field strength of emissions		
Test procedure:	ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date(s):	31-Jul-14 - 03-Aug-14		
Temperature: 25 ºC	Air Pressure: 1005 hPa	Relative Humidity: 42 %	Power Supply: 24 VDC
Remarks:			

Plot 7.1.8 Transmission pulse duration and period



Plot 7.1.9 Transmission burst period



Test specification:	Section 15.207(a) / RSS-Gen, Section 7.2.4, Conducted emission		
Test procedure:	ANSI C63.4, Section 13.1.3		
Test mode:	Compliance	Verdict:	PASS
Date(s):	20-Aug-14		
Temperature: 24 ºC	Air Pressure: 1010 hPa	Relative Humidity: 47 %	Power Supply: 24 VDC
Remarks:			

7.2 Conducted emissions

7.2.1 General

This test was performed to measure common mode conducted emissions at the mains power port. Specification test limits are given in Table 7.2.1.

Table 7.2.1 Limits for conducted emissions

Frequency, MHz	Class B limit, dB(μV)	
	QP	AVRG
0.15 - 0.5	66 - 56*	56 - 46*
0.5 - 5.0	56	46
5.0 - 30	60	50

* The limit decreases linearly with the logarithm of frequency.

7.2.2 Test procedure

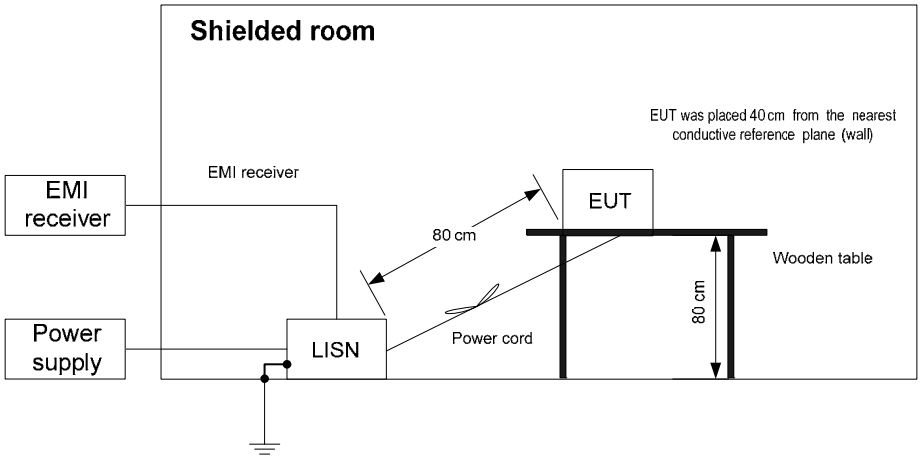
7.2.2.1 The EUT was set up as shown in Figure 7.2.1 and associated photographs, energized and the performance check was conducted.

7.2.2.2 The measurements were performed at power terminals with the LISN, connected to a spectrum analyzer in the frequency range referred to in Table 7.2.2. Unused coaxial connector of the LISN was terminated with 50 Ohm. Quasi-peak and average detectors were used throughout the testing.

7.2.2.3 The position of the device cables was varied to determine maximum emission level.

7.2.2.4 The worst test results (the lowest margins) were recorded in Table 7.2.2 and shown in the associated plots.

Figure 7.2.1 Setup for conducted emission measurements, table-top equipment



Test specification:	**Section 15.207(a) / RSS-Gen, Section 7.2.4, Conducted emission**		
Test procedure:	ANSI C63.4, Section 13.1.3		
Test mode:	Compliance	**Verdict:**	PASS
Date(s):	20-Aug-14		
Temperature: 24 ºC	**Air Pressure:** 1010 hPa	**Relative Humidity:** 47 %	**Power Supply:** 24 VDC
Remarks:			

Table 7.2.2 Conducted emission test results

LINE: AC mains
EUT OPERATING MODE: Transmit
EUT SET UP: TABLE-TOP
TEST SITE: SHIELDED ROOM
DETECTORS USED: PEAK / QUASI-PEAK / AVERAGE
FREQUENCY RANGE: 150 kHz - 30 MHz
RESOLUTION BANDWIDTH: 9 kHz

Frequency, MHz	Peak emission, dB(µV)	Quasi-peak			Average			Line ID	Verdict
		Measured emission, dB(µV)	Limit, dB(µV)	Margin, dB*	Measured emission, dB(µV)	Limit, dB(µV)	Margin, dB*		
0.165475	57.59	51.63	65.25	-13.62	33.10	55.25	-22.15	L1	Pass
0.192075	51.58	44.99	63.96	-18.97	31.00	53.96	-22.96		
0.469183	43.53	41.15	56.58	-15.43	30.18	46.58	-16.40		
0.880465	39.05	31.78	56.00	-24.22	19.65	46.00	-26.35		
1.700000	38.52	32.12	56.00	-23.88	17.70	46.00	-28.30		
4.500000	34.29	25.86	56.00	-30.14	13.39	46.00	-32.61		
0.171715	54.35	47.68	64.94	-17.26	23.71	54.94	-31.23	L2	Pass
0.191405	51.55	44.94	63.98	-19.04	25.56	53.98	-28.42		
0.472115	42.98	40.28	56.52	-16.24	28.95	46.52	-17.57		
1.014460	33.25	26.19	56.00	-29.81	12.95	46.00	-33.05		
10.549113	36.40	29.36	60.00	-30.64	17.08	50.00	-32.92		
12.662558	36.70	27.23	60.00	-32.77	15.79	50.00	-34.21		

*****- Margin = Measured emission - specification limit.

Reference numbers of test equipment used

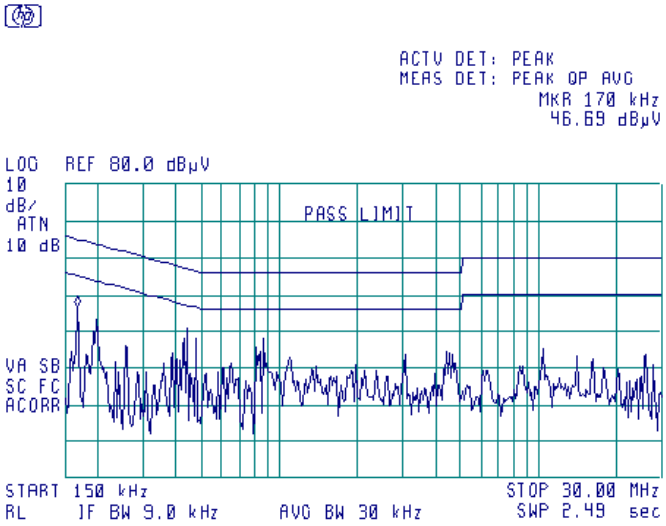
HL 0787	HL 1513	HL 2888	HL 3612				

Full description is given in Appendix A.

Test specification:	Section 15.207(a) / RSS-Gen, Section 7.2.4, Conducted emission		
Test procedure:	ANSI C63.4, Section 13.1.3		
Test mode:	Compliance	Verdict:	PASS
Date(s):	20-Aug-14		
Temperature: 24 ºC	Air Pressure: 1010 hPa	Relative Humidity: 47 %	Power Supply: 24 VDC
Remarks:			

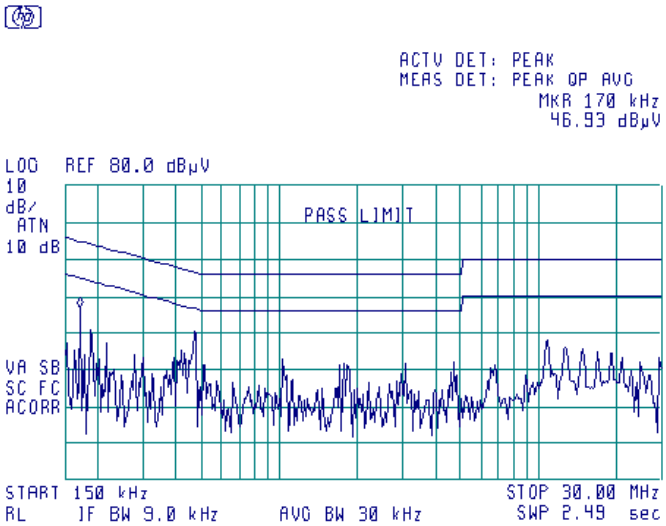
Plot 7.2.1 Conducted emission measurements

LINE: L1
EUT OPERATING MODE: Transmit
LIMIT: QUASI-PEAK, AVERAGE
DETECTOR: PEAK



Plot 7.2.2 Conducted emission measurements

LINE: L2
EUT OPERATING MODE: Transmit
LIMIT: QUASI-PEAK, AVERAGE
DETECTOR: PEAK



Test specification:	Section 15.203 / RSS-Gen, Section 7.1.2, Antenna requirements		
Test procedure:	Visual inspection/supplier declaration		
Test mode:	Compliance	Verdict:	PASS
Date(s):	03-Sep-14		
Temperature: 24 ºC	Air Pressure: 1007 hPa	Relative Humidity: 44 %	Power Supply: 24 VDC
Remarks:			

7.3 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 7.3.1.

Table 7.3.1 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 7.3.1 Antenna assembly

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	21-Jan-14	21-Jan-15
0521	EMI Receiver (Spectrum Analyzer) with RF filter section 9 kHz-6.5 GHz	Hewlett Packard	8546A	3617A 00319, 3448A00253	28-Oct-13	28-Oct-14
0604	Antenna BiconiLog Log-Periodic/T Bow-TIE, 26 - 2000 MHz	EMCO	3141	9611-1011	22-May-14	22-May-15
0787	Transient Limiter 9 kHz-200 MHz	Hewlett Packard	11947A	3107A01877	13-Oct-13	13-Oct-14
1513	Cable RF, 8 m, BNC/BNC	Belden	M17/167 MIL-C-17	1513	05-Nov-13	05-Nov-14
2780	EMC analyzer, 100 Hz to 26.5 GHz	Agilent Technologies	E7405A	MY45102462	02-Sep-14	02-Sep-15
2888	LISN Two-line V-Network 50 Ohm / 50 uH + 5 Ohm, 16A, MIL STD 461E, CISPR 16-1	Rolf Heine	NNB-2/16Z	02/10018	24-Mar-14	24-Mar-15
3001	EMC Analyzer, 9 kHz to 3 GHz	Agilent Technologies	E7402A	US39440180	20-Feb-14	20-Mar-15
3612	Cable RF, 17.5 m, N type-N type	Teldor	RG-214/U	NA	05-Dec-13	05-Dec-14
4276	Test Cable , DC-18 GHz, 3.05 m, N/M - N/M	Mini-Circuits	APC-10FT-NMNM+	0747A	27-Nov-13	27-Nov-14
4278	Test Cable , DC-18 GHz, 4.6 m, N/M - N/M	Mini-Circuits	APC-15FT-NMNM+	0755A	27-Nov-13	27-Nov-14
4353	Low Loss Armored Test Cable, DC - 18 GHz, 6.2 m, N type-M/N type-M	MegaPhase	NC29-N1N1-244	12025101003	16-Mar-14	16-Mar-15
4722	Low Loss Armored Test Cable, DC - 18 GHz, 6.2 m, N type-M/N type-M	MegaPhase	NC29-N1N1-244	51228701001	26-Aug-14	26-Aug-15

9 APPENDIX B Measurement uncertainties

Expanded uncertainty at 95% confidence in Hermon Labs EMC measurements

Test description	Expanded uncertainty
Conducted emissions with LISN	9 kHz to 150 kHz: ± 3.9 dB 150 kHz to 30 MHz: ± 3.8 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
Conducted emissions at RF antenna connector	9 kHz to 2.9 GHz: ± 2.6 dB 2.9 GHz to 6.46 GHz: ± 3.5 dB 6.46 GHz to 13.2 GHz: ± 4.3 dB 13.2 GHz to 22.0 GHz: ± 5.0 dB 22.0 GHz to 26.8 GHz: ± 5.5 dB 26.8 GHz to 40.0 GHz: ± 4.8 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 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 C Specification references

FCC 47CFR part 15: 2013	Radio Frequency Devices
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
RSS-210 Issue 8: 2010	Low Power Licence- Exempt Radiocommunication Devices
RSS-Gen Issue 3: 2010	General Requirements and Information for the Certification of Radiocommunication Equipment
ICES-003 issue 5:2012	Information Technology Equipment (ITE) – Limits and methods of measurement

12 APPENDIX D 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).

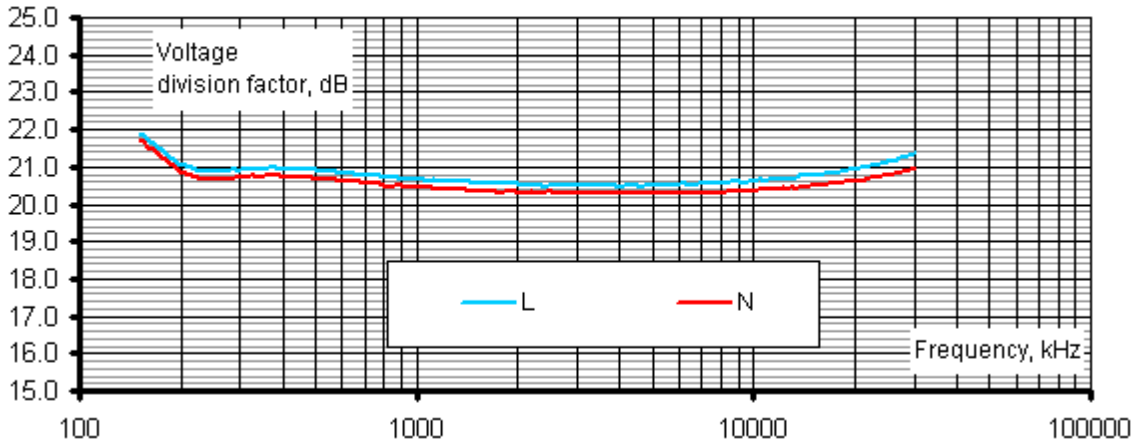
Antenna factor
Biconilog antenna EMCO Model 3141
Ser.No.1011, HL 0604

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).

Correction factor
Line impedance stabilization network
Model NNB-2/16Z, Rolf Heine, HL 2888

Frequency, kHz	Correction factor, dB	
	L	N
150	21.92	21.74
170	21.52	21.36
200	21.06	20.85
250	20.88	20.68
300	20.92	20.70
350	20.96	20.77
400	20.96	20.74
500	20.92	20.69
600	20.85	20.63
700	20.78	20.58
800	20.73	20.52
900	20.68	20.50
1000	20.67	20.45
1200	20.61	20.43
1500	20.56	20.33
2000	20.54	20.32
2500	20.51	20.33
3000	20.53	20.29
4000	20.46	20.30
5000	20.53	20.33
7000	20.54	20.32
10000	20.62	20.36
15000	20.78	20.49
20000	20.94	20.63
30000	21.37	20.95



Cable loss
Cable coaxial, RG-214/U, N type-N type, 17 m
Teldor, HL 3612

Frequency, MHz	Cable loss, dB
0.1	0.05
0.5	0.07
1	0.10
3	0.22
5	0.29
10	0.39
30	0.68
50	0.90
100	1.27
150	1.58
200	1.80
250	2.12
300	2.36
350	2.60
400	2.82
450	2.99
500	3.23
550	3.40
600	3.56
650	3.71
700	3.90
750	4.04
800	4.23
850	4.39
900	4.55
950	4.65
1000	4.79

Cable loss
Test cable, Mini-Circuits, S/N 0747A, 18 GHz, 3.05 m, N/M - N/M
APC-10FT-NMNM+, HL 4276

Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB
10	0.11	4500	2.81	9300	4.30	14100	5.59
30	0.19	4600	2.85	9400	4.33	14200	5.61
50	0.25	4700	2.88	9500	4.36	14300	5.63
100	0.36	4800	2.92	9600	4.39	14400	5.66
150	0.44	4900	2.95	9700	4.42	14500	5.68
200	0.52	5000	3.00	9800	4.46	14600	5.70
300	0.64	5100	3.03	9900	4.49	14700	5.72
400	0.75	5200	3.08	10000	4.53	14800	5.75
500	0.84	5300	3.11	10100	4.56	14900	5.77
600	0.93	5400	3.13	10200	4.60	15000	5.80
700	1.01	5500	3.16	10300	4.64	15100	5.82
800	1.08	5600	3.20	10400	4.66	15200	5.85
900	1.15	5700	3.22	10500	4.68	15300	5.88
1000	1.22	5800	3.26	10600	4.70	15400	5.91
1100	1.28	5900	3.30	10700	4.73	15500	5.93
1200	1.34	6000	3.34	10800	4.75	15600	5.97
1300	1.40	6100	3.39	10900	4.77	15700	5.99
1400	1.46	6200	3.42	11000	4.80	15800	6.02
1500	1.51	6300	3.47	11100	4.83	15900	6.07
1600	1.57	6400	3.50	11200	4.86	16000	6.08
1700	1.62	6500	3.52	11300	4.88	16100	6.11
1800	1.68	6600	3.55	11400	4.90	16200	6.12
1900	1.72	6700	3.58	11500	4.92	16300	6.14
2000	1.77	6800	3.60	11600	4.94	16400	6.17
2100	1.82	6900	3.62	11700	4.96	16500	6.19
2200	1.87	7000	3.64	11800	4.98	16600	6.21
2300	1.92	7100	3.66	11900	5.01	16700	6.22
2400	1.96	7200	3.68	12000	5.03	16800	6.24
2500	2.01	7300	3.71	12100	5.06	16900	6.26
2600	2.05	7400	3.74	12200	5.09	17000	6.28
2700	2.10	7500	3.78	12300	5.12	17100	6.31
2800	2.14	7600	3.81	12400	5.15	17200	6.33
2900	2.18	7700	3.84	12500	5.17	17300	6.36
3000	2.23	7800	3.87	12600	5.20	17400	6.39
3100	2.27	7900	3.90	12700	5.22	17500	6.42
3200	2.31	8000	3.93	12800	5.25	17600	6.45
3300	2.35	8100	3.96	12900	5.28	17700	6.48
3400	2.39	8200	4.00	13000	5.32	17800	6.50
3500	2.42	8300	4.03	13100	5.35	17900	6.52
3600	2.46	8400	4.06	13200	5.38	18000	6.55
3700	2.50	8500	4.08	13300	5.40		
3800	2.54	8600	4.11	13400	5.42		
3900	2.58	8700	4.13	13500	5.44		
4000	2.61	8800	4.16	13600	5.46		
4100	2.65	8900	4.18	13700	5.48		
4200	2.69	9000	4.21	13800	5.51		
4300	2.73	9100	4.24	13900	5.53		
4400	2.77	9200	4.27	14000	5.56		

Cable loss
Test cable, Mini-Circuits, S/N 0755A, 18 GHz, 4.6 m, N/M - N/M
APC-15FT-NMNM+, HL 4278

Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB
10	0.24	4900	4.19	10000	6.47	15100	8.33
30	0.26	5000	4.25	10100	6.50	15200	8.35
50	0.34	5100	4.29	10200	6.52	15300	8.37
100	0.50	5200	4.32	10300	6.57	15400	8.40
200	0.72	5300	4.38	10400	6.59	15500	8.42
300	0.90	5400	4.41	10500	6.61	15600	8.46
400	1.06	5500	4.46	10600	6.64	15700	8.50
500	1.20	5600	4.51	10700	6.64	15800	8.52
600	1.32	5700	4.56	10800	6.65	15900	8.56
700	1.44	5800	4.59	10900	6.68	16000	8.61
800	1.54	5900	4.64	11000	6.68	16100	8.64
900	1.64	6000	4.69	11100	6.69	16200	8.66
1000	1.74	6100	4.72	11200	6.70	16300	8.70
1100	1.83	6200	4.77	11300	6.74	16400	8.73
1200	1.92	6300	4.80	11400	6.78	16500	8.74
1300	2.01	6400	4.83	11500	6.81	16600	8.75
1400	2.09	6500	4.89	11600	6.84	16700	8.78
1500	2.18	6600	4.90	11700	6.87	16800	8.79
1600	2.25	6700	4.95	11800	6.92	16900	8.81
1700	2.33	6800	5.01	11900	6.98	17000	8.85
1800	2.39	6900	4.99	12000	7.02	17100	8.90
1900	2.47	7000	5.04	12100	7.08	17200	8.95
2000	2.53	7100	5.11	12200	7.15	17300	8.99
2100	2.60	7200	5.14	12300	7.20	17400	9.03
2200	2.67	7300	5.21	12400	7.26	17500	9.07
2300	2.73	7400	5.29	12500	7.31	17600	9.11
2400	2.80	7500	5.33	12600	7.36	17700	9.15
2500	2.87	7600	5.38	12700	7.41	17800	9.19
2600	2.93	7700	5.46	12800	7.46	17900	9.24
2700	3.00	7800	5.52	12900	7.51	18000	9.28
2800	3.06	7900	5.58	13000	7.55		
2900	3.12	8000	5.64	13100	7.59		
3000	3.18	8100	5.69	13200	7.65		
3100	3.24	8200	5.75	13300	7.69		
3200	3.30	8300	5.80	13400	7.72		
3300	3.35	8400	5.84	13500	7.78		
3400	3.42	8500	5.90	13600	7.82		
3500	3.46	8600	5.97	13700	7.86		
3600	3.52	8700	5.99	13800	7.91		
3700	3.57	8800	6.04	13900	7.96		
3800	3.61	8900	6.10	14000	8.01		
3900	3.67	9000	6.13	14100	8.06		
4000	3.71	9100	6.17	14200	8.10		
4100	3.77	9200	6.23	14300	8.13		
4200	3.83	9300	6.27	14400	8.16		
4300	3.89	9400	6.30	14500	8.19		
4400	3.94	9500	6.35	14600	8.21		
4500	4.00	9600	6.37	14700	8.23		
4600	4.05	9700	6.40	14800	8.26		
4700	4.10	9800	6.44	14900	8.28		
4800	4.16	9900	6.45	15000	8.30		

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		

Cable loss
Low Loss Armored Test Cable, MegaPhase, 18 GHz, 6.2 m, N type-M/N type-M, NC29-N1N1-244, S/N 51228701 001
HL 4722

Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB
50	0.22	9000	2.93
100	0.30	9500	3.06
300	0.52	10000	3.16
500	0.66	10500	3.20
1000	0.93	11000	3.34
1500	1.15	11500	3.39
2000	1.33	12000	3.48
2500	1.49	12500	3.55
3000	1.64	13000	3.66
3500	1.77	13500	3.75
4000	1.90	14000	3.76
4500	2.03	14500	3.87
5000	2.17	15000	3.98
5500	2.30	15500	4.01
6000	2.39	16000	4.14
6500	2.51	16500	4.15
7000	2.59	17000	4.32
7500	2.67	17500	4.36
8000	2.76	18000	4.38
8500	2.84		

13 APPENDIX E 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

14 APPENDIX F Manufacturer's declaration of identity

Gate Exciter GPRS - Declaration of identity:

We declare that the Gate Exciter GPRS is identical to the following products, with less hardware functions:

Hardware function	GATE EXCITER GPRS (tested device)	BASE STATION (identical)	GATE LOCATOR (identical)	4 Channel Exciter (identical)
GENERAL USE RELAY	8	4	8	8
DIGITAL INPUTS	8	4	8	8
GENERAL USE OUTPUT	8	4	8	8
GPRS	includes	includes	none	none
LF antenna port	4	None (software disable)	4	4
UHF1	Rx	software disable	Rx	Rx
UHF2	Tx	software disable	Tx	Tx
UHF3	Rx\Tx with tamper tag	Rx\Tx with tamper tag	Rx\Tx with tamper tag	Rx\Tx with tamper tag
UHF4	communication with Base station	communication with exciters	communication with Base station	communication with Base station
WIFI	Includes	Includes	Includes	Does not include
UHF4 function description	start at Rx mode, when receiving transmission from Base station, then transmit at DC OF 50% Tx-----Rx	continuous transmission at DC of 50%: Tx---- Rx	start at Rx mode, when receiving transmission from Base station, then transmit at DC OF 50% Tx-----Rx	start at Rx mode, when receiving transmission from Base station, then transmit at DC OF 50% Tx-----Rx
SOM module	Includes	includes	includes	Does not include
Ethernet	Includes	Includes	Includes	Includes
RS485	Includes	Includes	Includes	Includes

We declare that the following products are identical, only difference is Lexan and cover shape:

Model name and p/n	Identical to model name and p/n
Base Station LTG2-01	Central Management Unit LTG2-01-PRF
Gate Locator LTG2-02	Door Management Unit LTG2-02-PRF
4 Channel Reader LTG2-03	Multi Location Unit LTG2-03-PRF
Gate Exciter GPRS LTG2-11	Door Management Unit GPRS LTG2-11-PRF

END OF DOCUMENT