



ELECTRICAL TESTING
0839.01

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TEST REPORT

**ACCORDING TO: FCC 47 CFR PART 15 subpart C, section 15.249 and subpart B;
RSS-210 issue 8 Annex 2, ICES-003 Issue 5:2012**

FOR:

**Israel Weapon Industries (IWI) Ltd.
Light weapons inventory control
and maintenance tool**

Model: eLog

FCC ID:2AG7D810

This report is in conformity with ISO/ IEC 17025. The "A2LA Accredited" symbol endorsement applies only to the tests and calibrations that are listed in the scope of Hermon Laboratories accreditation. The test results relate only to the items tested. This test report shall not be reproduced in any form except in full with the written approval of Hermon Laboratories Ltd.

Table of contents

1	Applicant information.....	3
2	Equipment under test attributes	3
3	Manufacturer information	3
4	Test details.....	3
5	Tests summary.....	4
6	EUT description.....	5
6.1	General information.....	5
6.2	Test configuration.....	5
6.3	Changes made in EUT	5
6.4	Transmitter characteristics	6
7	Transmitter tests according to 47CFR part 15 subpart C and RSS-210 requirements.....	7
7.1	Field strength of emissions.....	7
7.2	Occupied bandwidth test.....	20
7.3	Band edge emission.....	24
7.4	Antenna requirements	28
8	Unintentional emission tests.....	29
8.1	Radiated emission measurements	29
9	APPENDIX A Test equipment and ancillaries used for tests.....	36
10	APPENDIX B Measurement uncertainties.....	37
11	APPENDIX C Test laboratory description	38
12	APPENDIX D Specification references	38
13	APPENDIX E Test equipment correction factors.....	39
14	APPENDIX F Abbreviations and acronyms.....	44



1 Applicant information

Client name: Israel Weapon Industries (IWI) Ltd.
Address: 64 Bialik avenue, P.O.Box 63, Ramat Hasharon 4710001, Israel
Telephone: +972 3760 6195
Fax: +972 3760 6001
E-mail: avirams@iwi.net
Contact name: Mr. Aviram Sobol

2 Equipment under test attributes

Product name: Light weapons inventory control and maintenance tool
Product type: Transceiver
Model(s): eLog
Serial number: 4315.0003
Hardware version: 2.1
Software release: 2.1
Receipt date 20-Dec-15

3 Manufacturer information

Manufacturer name: Israel Weapon Industries (IWI) Ltd.
Address: 64 Bialik avenue, P.O.Box 63, Ramat Hasharon 4710001, Israel
Telephone: +972 3760 6195
Fax: +972 3760 6001
E-Mail: avirams@iwi.net
Contact name: Mr. Aviram Sobol

4 Test details

Project ID: 27623
Location: Hermon Laboratories Ltd. Harakevet Industrial Zone, Binyamina 30500, Israel
Test started: 20-Dec-15
Test completed: 29-Dec-15
Test specification(s): FCC 47 CFR Part 15, subpart C, §15.249; subpart B §15.109;
RSS-210 issue 8, RSS-Gen issue 4, ICES-003 issue 5

5 Tests summary

Test	Status
Transmitter characteristics	
Section 15.249(a)(d) / RSS-210, section A2.9, Field strength of emissions	Pass
Section 15.215(c) / RSS-Gen, section 6.6, Occupied bandwidth	Pass
Section 15.249(d) / RSS-210, section A2.9, Band edge emissions	Pass
Section 15.207(a) / RSS-Gen, section 8.8, Conducted emission	Not required
Section 15.203 / RSS-Gen, section 8.3, Antenna requirement	Pass
Unintentional emissions	
Section 15.107 / ICES-003, Section 6.1 class B, Conducted emission at AC power port	Not required
Section 15.109 / RSS-Gen, section 7.1.2, ICES-003, Section 6.2 class B, Radiated emission	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	December 29, 2015	
Reviewed by:	Mrs. M. Cherniavsky, certification engineer	January 24, 2016	
Approved by:	Mr. M. Nikishin, EMC and Radio group manager	February 22, 2016	

6 EUT description

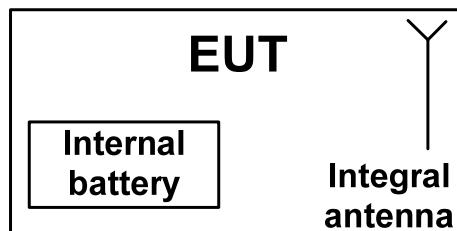
6.1 General information

The EUT, model name eLog (Electronic LOG), is an innovative computer based, light weapons inventory control and maintenance tool for field armorer level.

The eLog enables real preventive maintenance for small arms weapons, based on real counting of shot, and a database of life expectancy of each component in the weapon.

The EUT is a small PCB in the plastic case containing transceiver operating in the 902-928 MHz range and stand-alone coin battery.

6.2 Test configuration



6.3 Changes made in EUT

No changes were implemented in the EUT during the testing.

6.4 Transmitter characteristics

Type of equipment							
<input checked="" type="checkbox"/> V	Stand-alone (Equipment with or without its own control provisions)						
	Combined equipment (Equipment where the radio part is fully integrated within another type of equipment)						
	Plug-in card (Equipment intended for a variety of host systems)						
Assigned frequency range		902-908 MHz					
Operating frequency		916 MHz					
Maximum field strength of carrier at 3 m distance		83.6 dB μ V/m					
Is transmitter output power variable?		V	No				
				continuous variable			
			Yes	stepped variable with stepsize	dB		
				minimum RF power	dBm		
				maximum RF power	dBm		
Antenna connection							
unique coupling	standard connector		V	Integral	with temporary RF connector		
			<input checked="" type="checkbox"/>		without temporary RF connector		
Antenna/s technical characteristics							
Type	Manufacturer		Model number		Gain		
Integral	IWI Ltd.		Printed		NA		
Transmitter aggregate data rate/s		50 kbps					
Type of modulation		FSK					
Modulating test signal (baseband)		PRBS					
Transmitter power source							
V	Battery	Nominal rated voltage	3.0 V	Battery type	Renata CR2032 MFR		
	DC	Nominal rated voltage					
	AC mains	Nominal rated voltage		Frequency	Hz		



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Test specification:	FCC Part 15, Section 15.249(a)(d)/RSS-210, section A2.9, Field strength of emissions		
Test procedure:	ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict: PASS	
Date(s):	20-Dec-15 - 23-Dec-15	Temperature: 22 °C	Air Pressure: 1010 hPa
Remarks:	Relative Humidity: 55 % Power Supply: Battery		

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 in Table 7.1.1, Table 7.1.2 and Table 7.1.3.

Table 7.1.1 Radiated fundamental emission limits

Fundamental frequency, MHz	Field strength at 3 m, dB(µV/m)		
	Peak	Average	Quasi-Peak
902 – 928	NA	NA	94

Table 7.1.2 Harmonics limits

Fundamental frequency, MHz	Field strength at 3 m, dB(µV/m)	
	Peak	Average
902 – 928	74.0	54.0

Table 7.1.3 Radiated spurious emissions limits (other than harmonics)

Frequency, MHz	Field strength at 3 m, dB(µV/m)*			
	Peak	Quasi Peak	Average	Attenuation below carrier
0.009 – 0.090	148.5 – 128.5	NA	128.5 – 108.5**	50 dBc (whichever is the less stringent)
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		73.8 – 63.0**		
1.705 – 30.0*		69.5		
30 – 88	NA	40.0	NA	
88 – 216		43.5		
216 – 960		46.0		
960 - 1000		54.0		
Above 1000	74.0	NA	54.0	

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

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

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

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

Note: The above 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 but not exceeding 40 GHz for intentional radiators operated below 10 GHz and up to the fifth harmonic of the highest fundamental frequency but not exceeding 100 GHz for intentional radiators operated above 10 GHz.



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Test specification:	FCC Part 15, Section 15.249(a)(d)/RSS-210, section A2.9, Field strength of emissions		
Test procedure:	ANSI C63.4, Section 13.1.4		
Test mode:	Compliance		
Date(s):	20-Dec-15 - 23-Dec-15	Verdict:	PASS
Temperature: 22 °C	Air Pressure: 1010 hPa	Relative Humidity: 55 %	Power Supply: Battery
Remarks:			

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

- 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 antenna connected to spectrum analyzer/ EMI receiver. To find maximum radiation the turntable was rotated 360° and the measuring antenna was rotated around its vertical axis.
- 7.1.2.3 The worst test results (the lowest margins) were recorded in the associated tables 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°, 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 the associated tables and shown in the associated plots

Test specification:	FCC Part 15, Section 15.249(a)(d)/RSS-210, section A2.9, Field strength of emissions		
Test procedure:	ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict: PASS	
Date(s):	20-Dec-15 - 23-Dec-15		
Temperature: 22 °C	Air Pressure: 1010 hPa	Relative Humidity: 55 %	Power Supply: Battery
Remarks:			

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

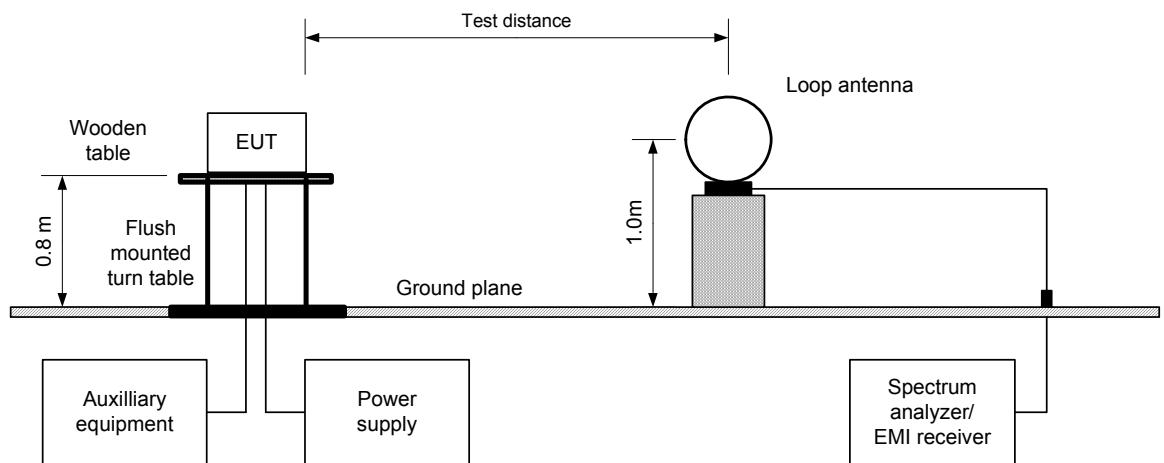
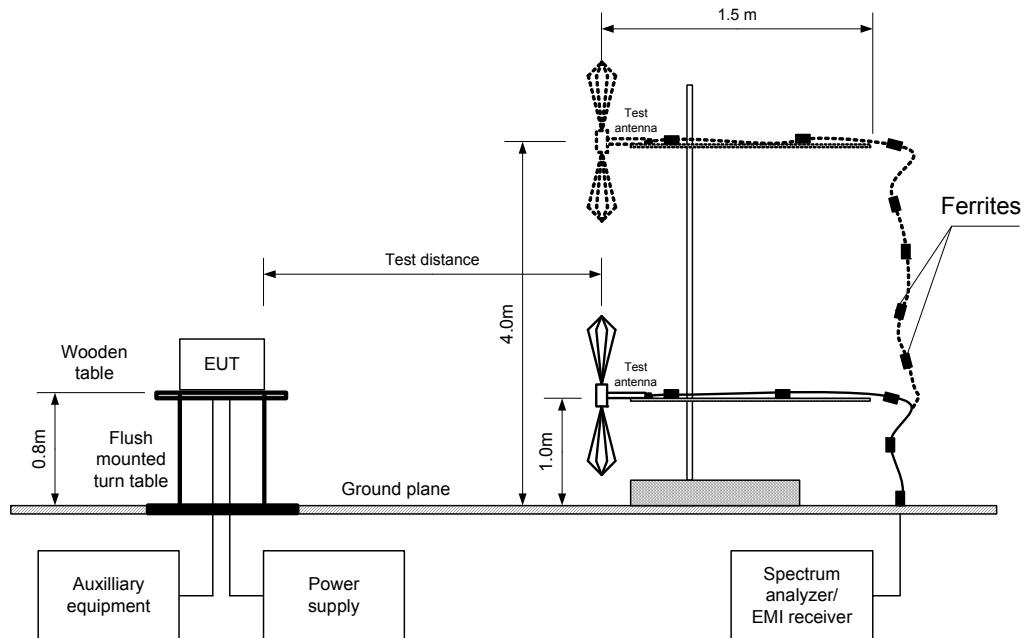


Figure 7.1.2 Setup for spurious emission field strength measurements above 30 MHz





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Test specification:	FCC Part 15, Section 15.249(a)(d)/RSS-210, section A2.9, Field strength of emissions		
Test procedure:	ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict: PASS	
Date(s):	20-Dec-15 - 23-Dec-15	Temperature: 22 °C	Air Pressure: 1010 hPa
Remarks:	Relative Humidity: 55 % Power Supply: Battery		

Table 7.1.4 Field strength of fundamental emission and spurious emissions

TEST DISTANCE:	3 m
EUT POSITION:	Vertical & Horizontal
MODULATION:	FSK
TRANSMITTER OUTPUT POWER SETTINGS:	Maximum
INVESTIGATED FREQUENCY RANGE:	0.009 –9200 MHz
DETECTOR USED:	Peak
RESOLUTION BANDWIDTH:	1.0 kHz (9 kHz – 150 kHz) 9.0 kHz (150 kHz – 30 MHz) 120 kHz (30 MHz – 1000 MHz) 1.0 MHz (above 1000 MHz)
VIDEO BANDWIDTH:	≥ Resolution bandwidth
TEST ANTENNA TYPE:	Active loop (9 kHz – 30 MHz) Biconilog (30 MHz – 1000 MHz) Double ridged guide (above 1000 MHz)

Fundamental emission

Frequency, MHz	Antenna		Azimuth, degrees*	Peak emission, dB(µV/m)	Quasi-peak			Verdict
	Pol.	Height, m			Measured emission, dB(µV/m)	Limit, dB(µV/m)	Margin, dB**	
915.645	Vertical	1.1	60	84.57	83.6	94	-10.4	Pass

Spurious emissions

F, MHz	Antenna		Azimuth, degrees*	Peak field strength			Avr factor, dB	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**	
1831.5	Vertical	1.3	90	49.28	74	-24.72	-26	23.28	54	-30.72	Pass
2746.9	Horizontal	1.4	10	50.52	74	-23.48	-26	24.52	54	-29.48	
3662.6	Vertical	1.2	65	50.72	74	-23.48	-26	24.72	54	-29.28	
4578.3	Vertical	1.2	70	51.49	74	-22.51	-26	25.49	54	-28.51	
5494.3	Vertical	1.2	70	50.76	74	-23.24	-26	24.76	54	-29.24	

*- EUT front panel refers to 0 degrees position of turntable.

**- Margin, dB =Measured (calculated) value, dB(µV/m)-Limit, dB(µV/m).

Table 7.1.5 Average factor calculation

Transmission pulse		Transmission burst		Transmission train duration, ms	Average factor, dB
Duration, ms	Period, ms	Duration, ms	Period, ms		
5	125	NA	NA	NA	-26

*- Average factor was calculated as follows

$$\text{Average factor} = 20 \times \log_{10} \left(\frac{\text{Pulse duration}}{\text{Pulse period}} \times \frac{\text{Burst duration}}{\text{Train duration}} \times \text{Number of bursts within pulse train} \right)$$

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

Reference numbers of test equipment used

HL 0446	HL 0521	HL 0604	HL 1984	HL 4353	HL 4722	HL 4916	HL 4932
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Full description is given in Appendix A.



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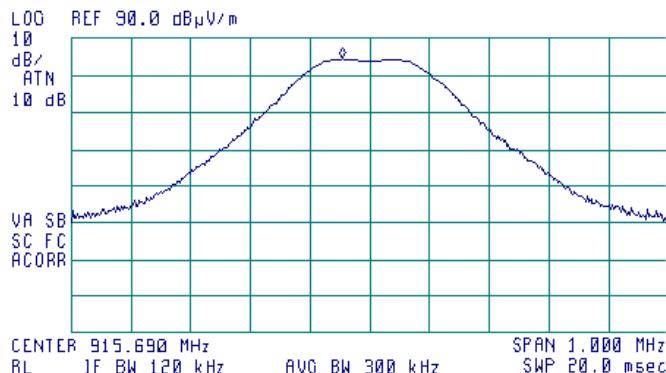
Test specification:	FCC Part 15, Section 15.249(a)(d)/RSS-210, section A2.9, Field strength of emissions		
Test procedure:	ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date(s):	20-Dec-15 - 23-Dec-15		
Temperature: 22 °C	Air Pressure: 1010 hPa	Relative Humidity: 55 %	Power Supply: 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: Horizontal



ACTV DET: PEAK
MEAS DET: PEAK OP AVG
MKR 915.645 MHz
84.57 dB μ V/m

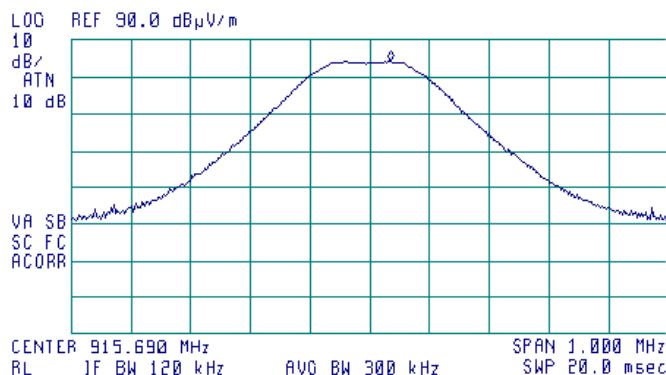


Plot 7.1.2 Radiated emission measurements at the fundamental frequency

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



ACTV DET: PEAK
MEAS DET: PEAK OP AVG
MKR 915.725 MHz
84.33 dB μ V/m



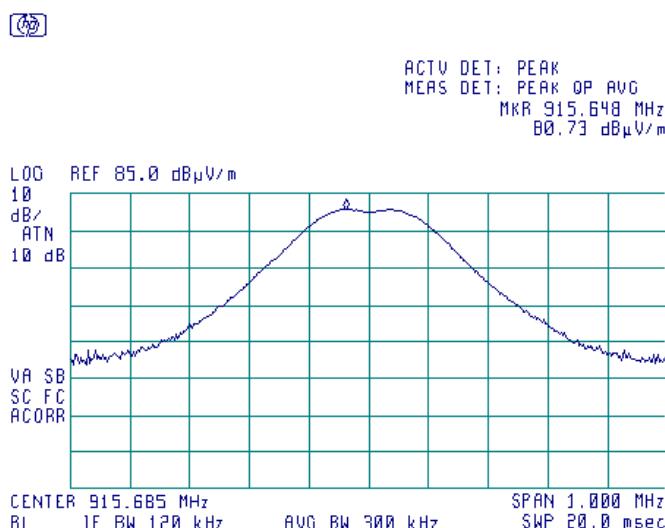


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Test specification:	FCC Part 15, Section 15.249(a)(d)/RSS-210, section A2.9, Field strength of emissions		
Test procedure:	ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date(s):	20-Dec-15 - 23-Dec-15		
Temperature: 22 °C	Air Pressure: 1010 hPa	Relative Humidity: 55 %	Power Supply: Battery
Remarks:			

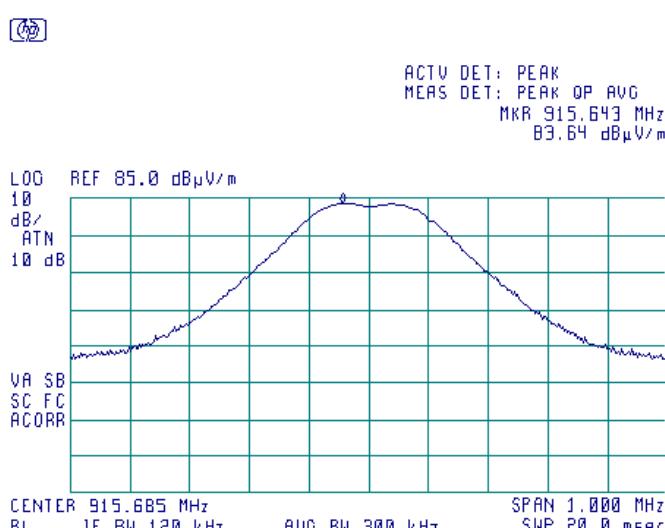
Plot 7.1.3 Radiated emission measurements at the fundamental frequency

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



Plot 7.1.4 Radiated emission measurements at the fundamental frequency

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





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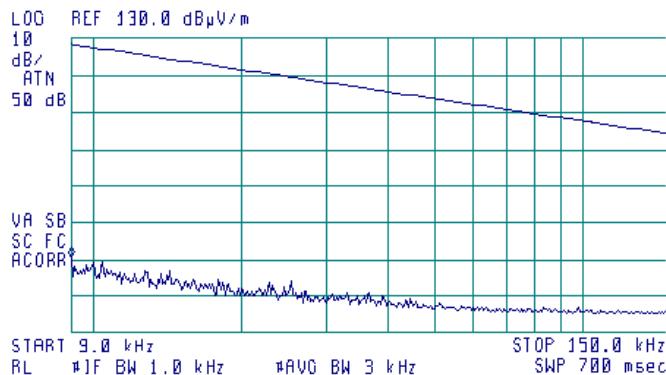
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Test procedure:	ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date(s):	20-Dec-15 - 23-Dec-15		
Temperature: 22 °C	Air Pressure: 1010 hPa	Relative Humidity: 55 %	Power Supply: Battery
Remarks:			

Plot 7.1.5 Radiated emission measurements from 9 to 150 kHz

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



ACTV DET: PEAK
MEAS DET: PEAK OP AVG
MKR 9.0 kHz
70.54 dB μ V/m

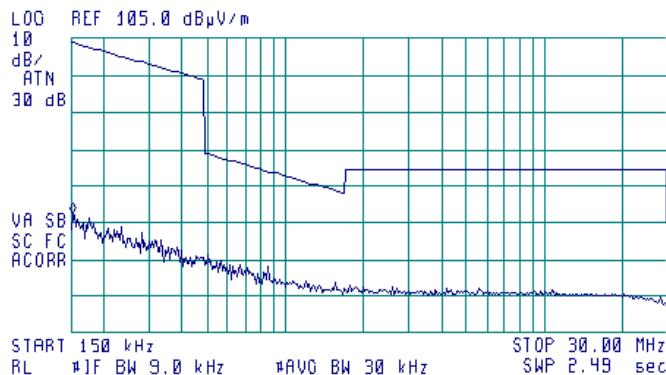


Plot 7.1.6 Radiated emission measurements from 0.15 to 30 MHz

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



ACTV DET: PEAK
MEAS DET: PEAK OP AVG
MKR 150 kHz
57.60 dB μ V/m





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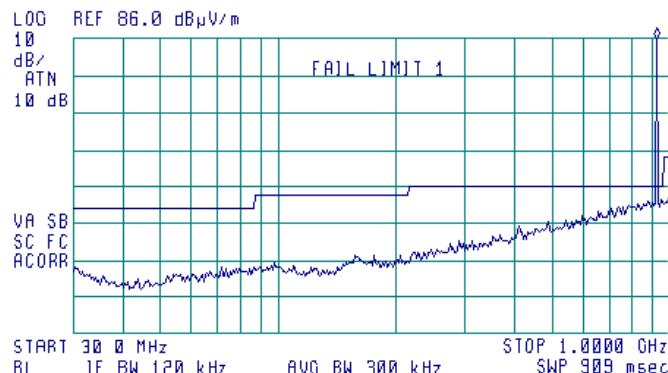
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Test procedure:	ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict: PASS	
Date(s):	20-Dec-15 - 23-Dec-15		
Temperature: 22 °C	Air Pressure: 1010 hPa	Relative Humidity: 55 %	Power Supply: Battery
Remarks:			

Plot 7.1.7 Radiated emission measurements from 30 to 1000 MHz

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



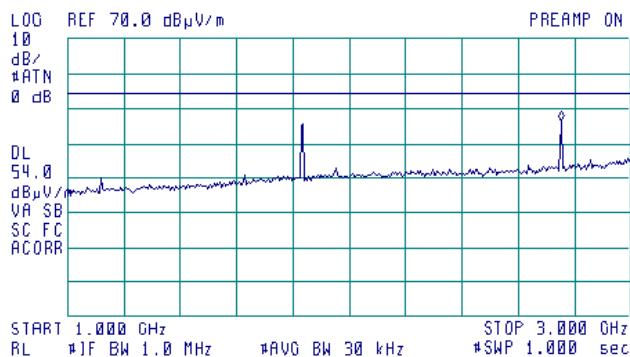
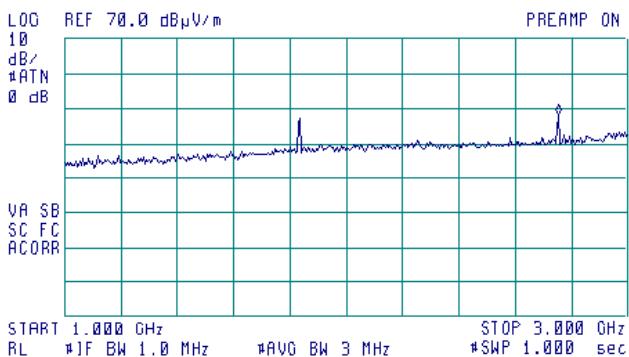
ACTV DET: PEAK
 MEAS DET: PEAK OP AVG
 MKR 914.2 MHz
 86.10 dB μ V/m

**Plot 7.1.8 Radiated emission measurements from 1.0 to 3 GHz**

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



ACTV DET: PEAK
 MEAS DET: PEAK OP AVG
 MKR 2.751 GHz
 48.93 dB μ V/m



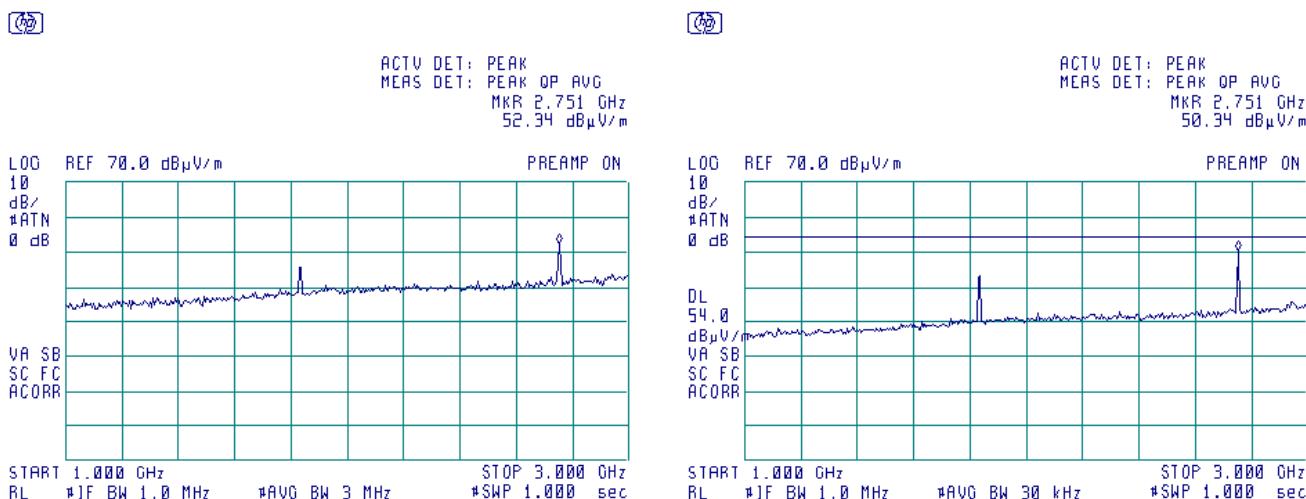


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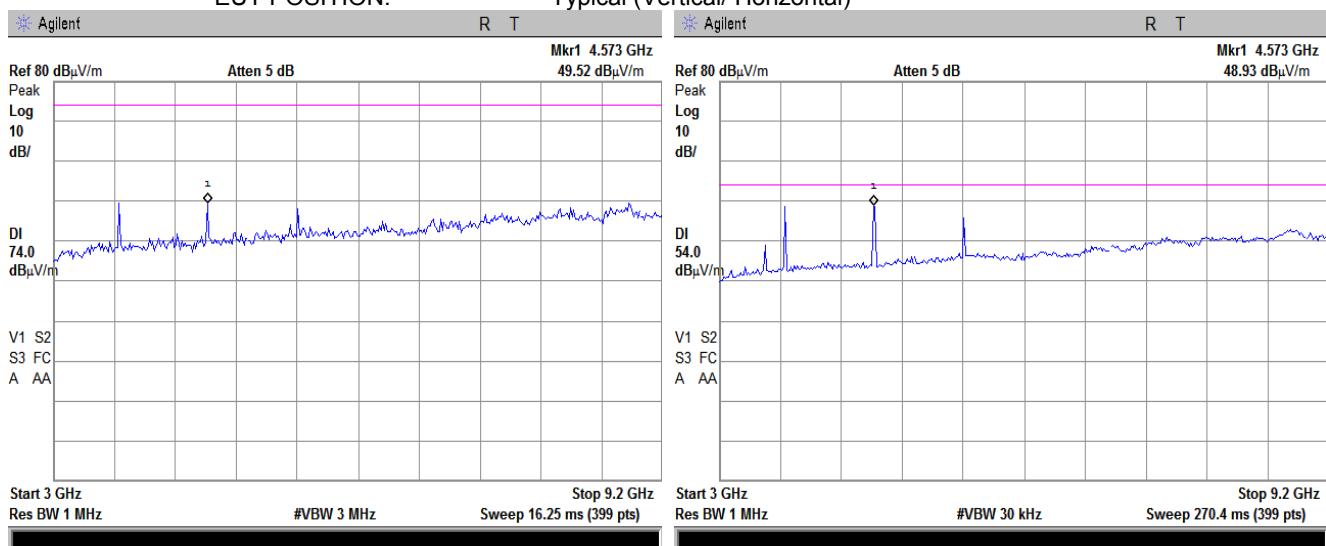
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Test procedure:	ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict: PASS	
Date(s):	20-Dec-15 - 23-Dec-15		
Temperature: 22 °C	Air Pressure: 1010 hPa	Relative Humidity: 55 %	Power Supply: Battery
Remarks:			

Plot 7.1.9 Radiated emission measurements from 1 to 3.0 GHz

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

**Plot 7.1.10 Radiated emission measurements from 3.0 to 9.2 GHz**

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



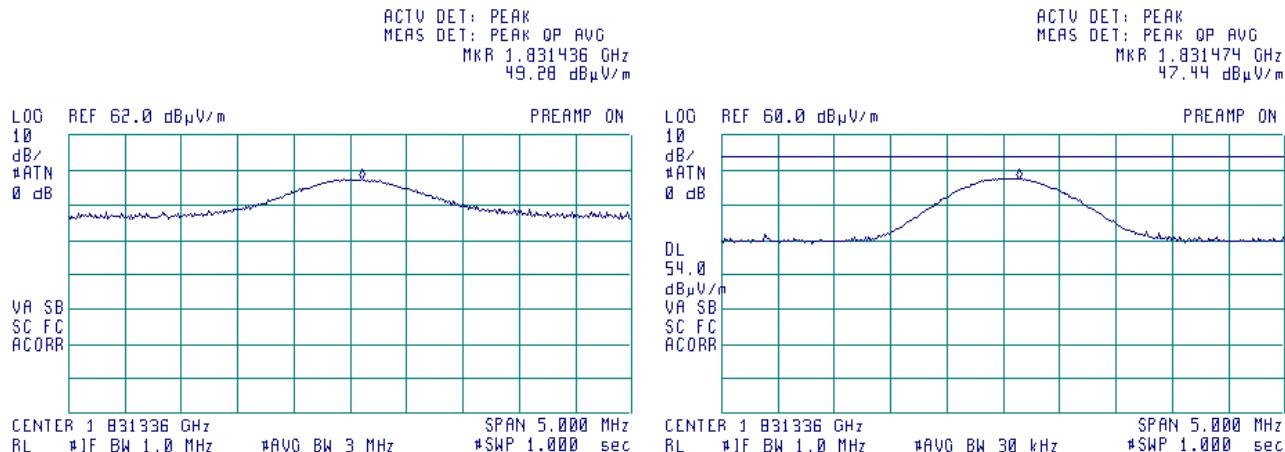


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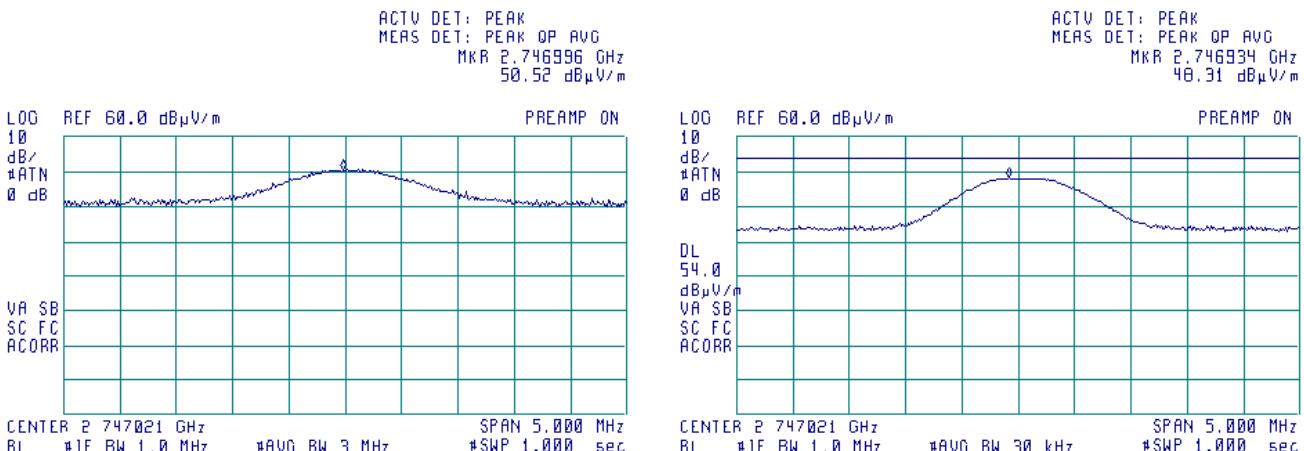
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Test procedure:	ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict: PASS	
Date(s):	20-Dec-15 - 23-Dec-15		
Temperature: 22 °C	Air Pressure: 1010 hPa	Relative Humidity: 55 %	Power Supply: Battery
Remarks:			

Plot 7.1.11 Radiated emission measurements at the second harmonic frequency

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

**Plot 7.1.12 Radiated emission measurements at the third harmonic frequency**

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



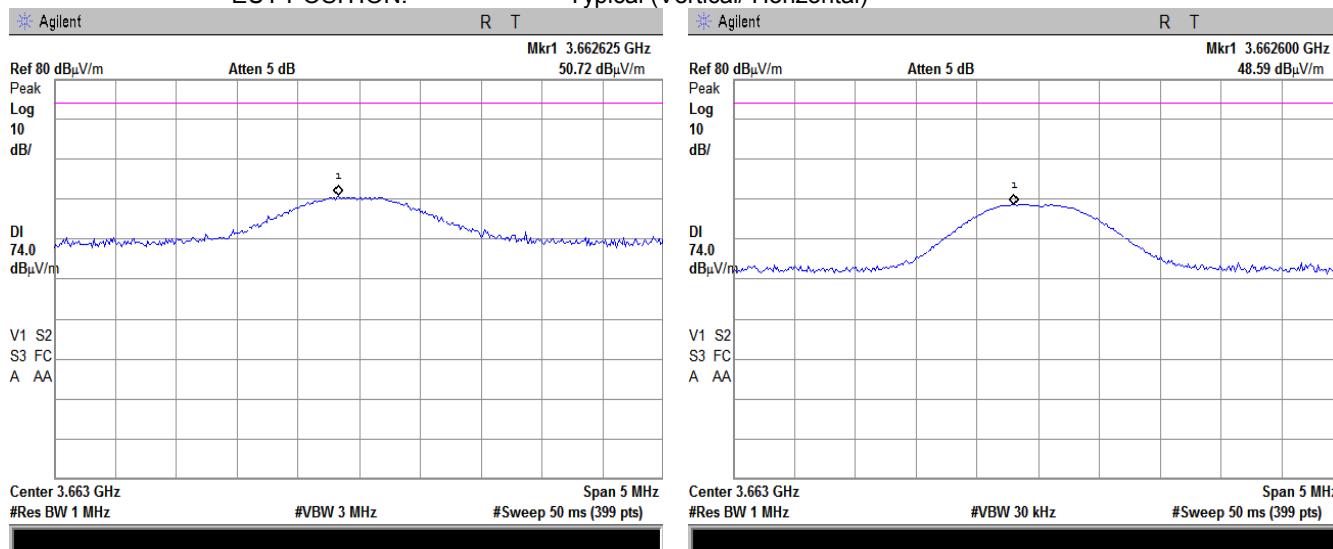


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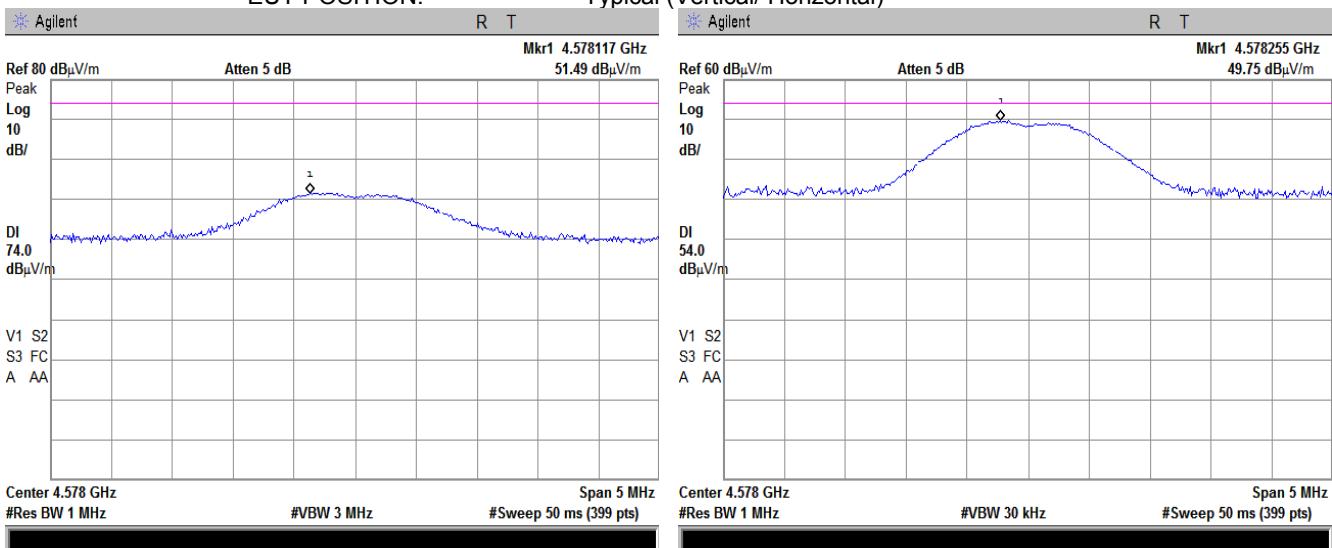
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Test procedure:	ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict: PASS	
Date(s):	20-Dec-15 - 23-Dec-15		
Temperature: 22 °C	Air Pressure: 1010 hPa	Relative Humidity: 55 %	Power Supply: Battery
Remarks:			

Plot 7.1.13 Radiated emission measurements at the 4 harmonic frequency

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

**Plot 7.1.14 Radiated emission measurements at the 5 harmonic frequency**

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



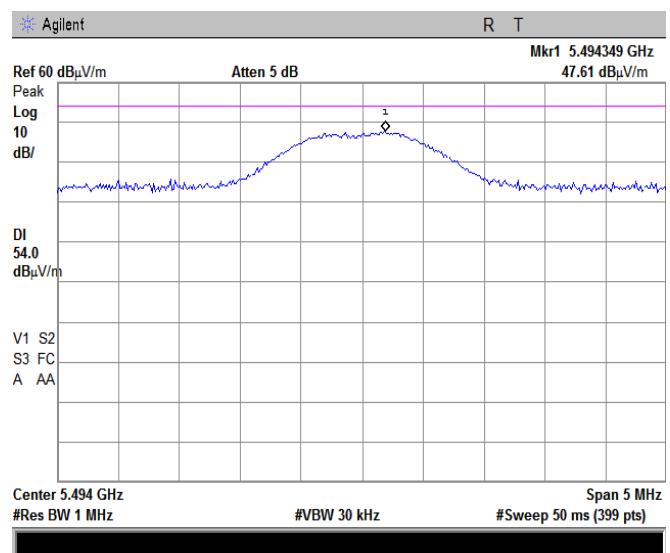
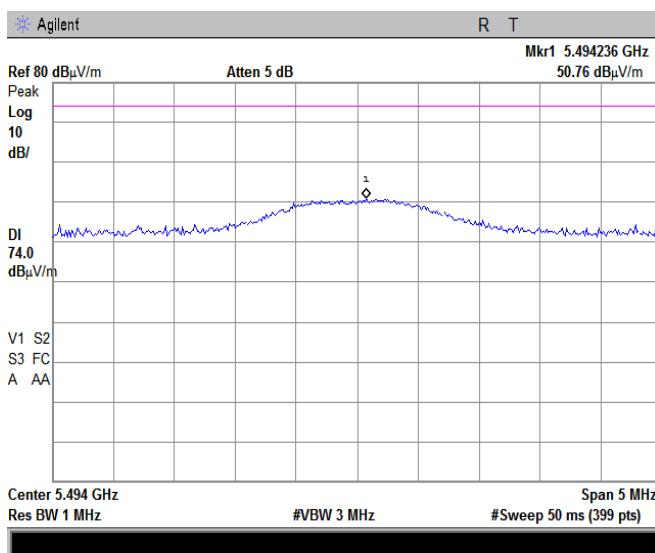


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Test specification:	FCC Part 15, Section 15.249(a)(d)/RSS-210, section A2.9, Field strength of emissions		
Test procedure:	ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date(s):	20-Dec-15 - 23-Dec-15		
Temperature: 22 °C	Air Pressure: 1010 hPa	Relative Humidity: 55 %	Power Supply: Battery
Remarks:			

Plot 7.1.15 Radiated emission measurements at the 6 harmonic frequency

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

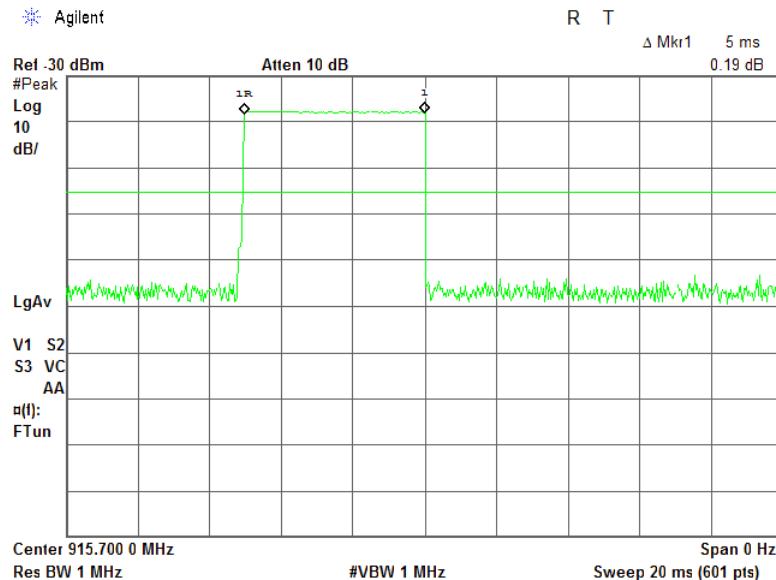




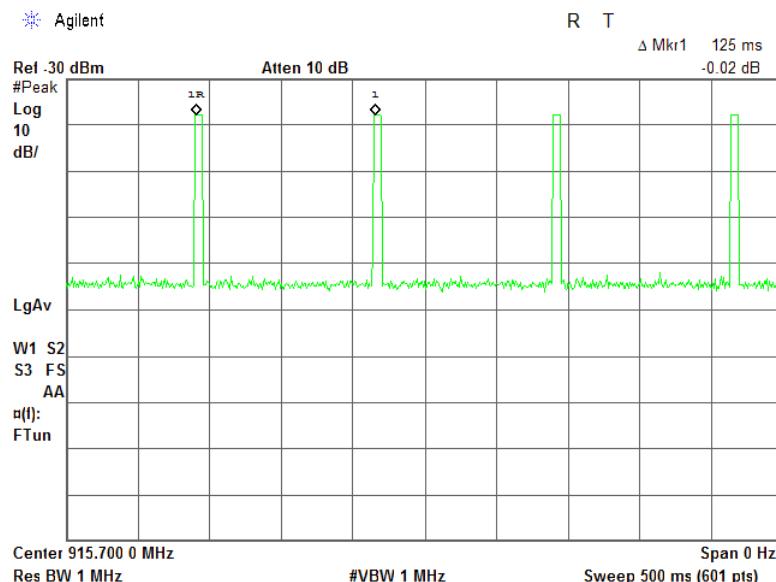
HERMON LABORATORIES

Test specification:	FCC Part 15, Section 15.249(a)(d)/RSS-210, section A2.9, Field strength of emissions		
Test procedure:	ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict: PASS	
Date(s):	20-Dec-15 - 23-Dec-15		
Temperature: 22 °C	Air Pressure: 1010 hPa	Relative Humidity: 55 %	Power Supply: Battery
Remarks:			

Plot 7.1.16 Transmission pulse duration



Plot 7.1.17 Transmission pulse period





HERMON LABORATORIES

Test specification:	FCC Part 15, Section 15.215(c) / RSS-Gen, section 6.6, Occupied bandwidth		
Test procedure:	ANSI C63.4, Section 13.1.7		
Test mode:	Compliance	Verdict:	PASS
Date(s):	23-Dec-15		
Temperature: 23 °C	Air Pressure: 1018 hPa	Relative Humidity: 44 %	Power Supply: Battery
Remarks:			

7.2 Occupied bandwidth test

7.2.1 General

This test was performed to verify that the 20 dB bandwidth of the emissions was contained within the standard specified frequency band according to FCC §15.215 requirements. Specification test limits are given in Table 7.2.1.

Table 7.2.1 Occupied bandwidth limits

Assigned frequency, MHz	Modulation envelope reference points*, dBc
902 - 928	20.0

*- Modulation envelope reference points provided in terms of attenuation below modulated carrier.

7.2.2 Test procedure

- 7.2.2.1 The EUT was set up as shown in Figure 7.2.1, energized and its proper operation was checked.
- 7.2.2.2 The spectrum analyzer sweep time and bandwidth were set to capture all major modulation sidebands of emission and sweep time was set sufficiently slow to ensure peak measurements. Spectrum analyzer was set in peak hold mode and time sufficient for trace stabilization was allowed.
- 7.2.2.3 The peak of emission was measured. The transmitter occupied bandwidth was measured with spectrum analyzer as frequency delta between reference points on modulation envelope and provided in Table 7.2.2 and associated plot.
- 7.2.2.4 Modulation bandwidth was calculated by adding of the negative frequency drift to the lower measured frequency and the positive frequency drift to the higher measured frequency. The obtained modulation bandwidth was verified to be within the allowed frequency range.

Figure 7.2.1 Occupied bandwidth test setup





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Test specification:	FCC Part 15, Section 15.215(c) / RSS-Gen, section 6.6, Occupied bandwidth		
Test procedure:	ANSI C63.4, Section 13.1.7		
Test mode:	Compliance	Verdict: PASS	
Date(s):	23-Dec-15		
Temperature: 23 °C	Air Pressure: 1018 hPa	Relative Humidity: 44 %	Power Supply: Battery
Remarks:			

Table 7.2.2 Occupied bandwidth test results

ASSIGNED FREQUENCY BAND 902-928 MHz
DETECTOR USED: Peak hold
RESOLUTION BANDWIDTH: 10
VIDEO BANDWIDTH: 30 kHz
MODULATION ENVELOPE REFERENCE POINTS: 20 dBc
MODULATION: FSK

Band edge	Cross point frequency, MHz	Frequency drift, kHz		Modulation band edge, MHz	Assigned band edge, MHz	Verdict
		Negative	Positive			
Low	915.5980	NA	NA	915.5980	902	Pass
High	915.7764	NA	NA	915.7764	928	Pass

Reference numbers of test equipment used

HL 3818							
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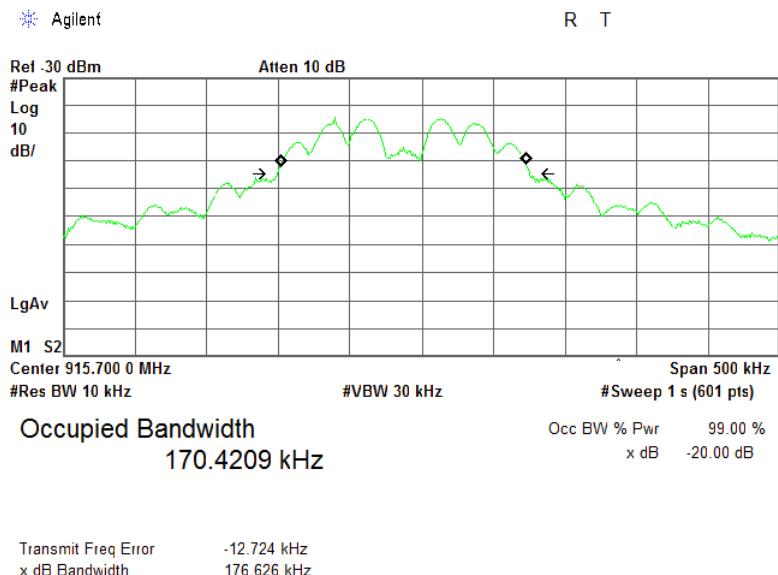
Full description is given in Appendix A.



HERMON LABORATORIES

Test specification:	FCC Part 15, Section 15.215(c) / RSS-Gen, section 6.6, Occupied bandwidth		
Test procedure:	ANSI C63.4, Section 13.1.7		
Test mode:	Compliance	Verdict:	PASS
Date(s):	23-Dec-15		
Temperature: 23 °C	Air Pressure: 1018 hPa	Relative Humidity: 44 %	Power Supply: Battery
Remarks:			

Plot 7.2.1 Occupied bandwidth test result

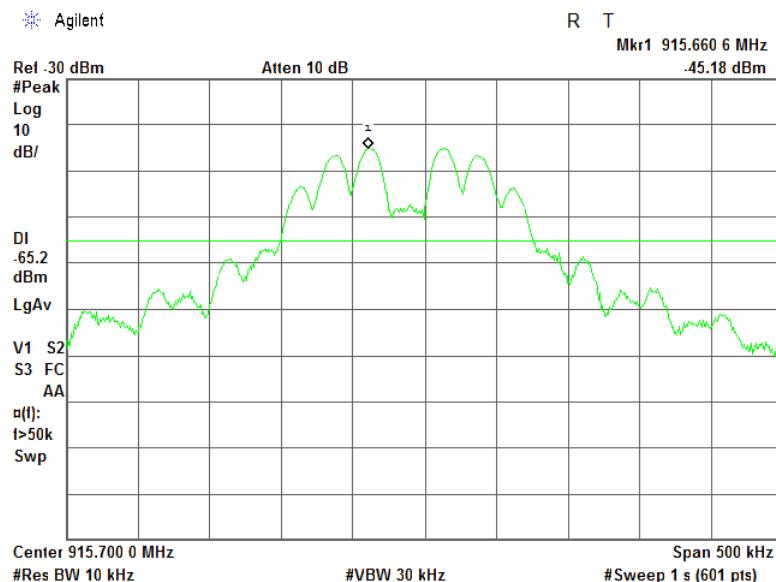




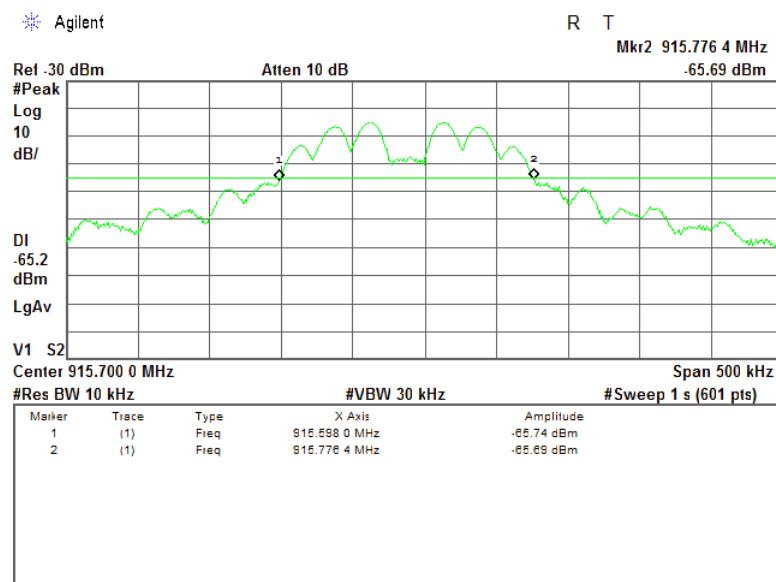
HERMON LABORATORIES

Test specification:	FCC Part 15, Section 15.215(c) / RSS-Gen, section 6.6, Occupied bandwidth		
Test procedure:	ANSI C63.4, Section 13.1.7		
Test mode:	Compliance	Verdict:	PASS
Date(s):	23-Dec-15		
Temperature: 23 °C	Air Pressure: 1018 hPa	Relative Humidity: 44 %	Power Supply: Battery
Remarks:			

Plot 7.2.2 Occupied bandwidth test result



Plot 7.2.3 Low and high band edge frequencies





HERMON LABORATORIES

Test specification:	FCC Part 15, Section 15.249(d)/RSS-210, section A2.9, Band edge emissions		
Test procedure:	ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date(s):	20-Dec-15		
Temperature: 23 °C	Air Pressure: 1015 hPa	Relative Humidity: 55 %	Power Supply: Battery
Remarks:			

7.3 Band edge emission

7.3.1 General

This test was performed to verify the EUT band edge emission including all associated side bands was attenuated at least 50 dB below the unmodulated carrier level or below the general spurious emission limit. Specification test limits are given in Table 7.3.1.

Table 7.3.1 Band edge emission limits

Frequency band, MHz	Field strength limit at 3 m, dBμV/m		Attenuation below carrier, dBc
	Peak	QP	
902.000 - 928.000	NA	46.0	50

7.3.2 Test procedure

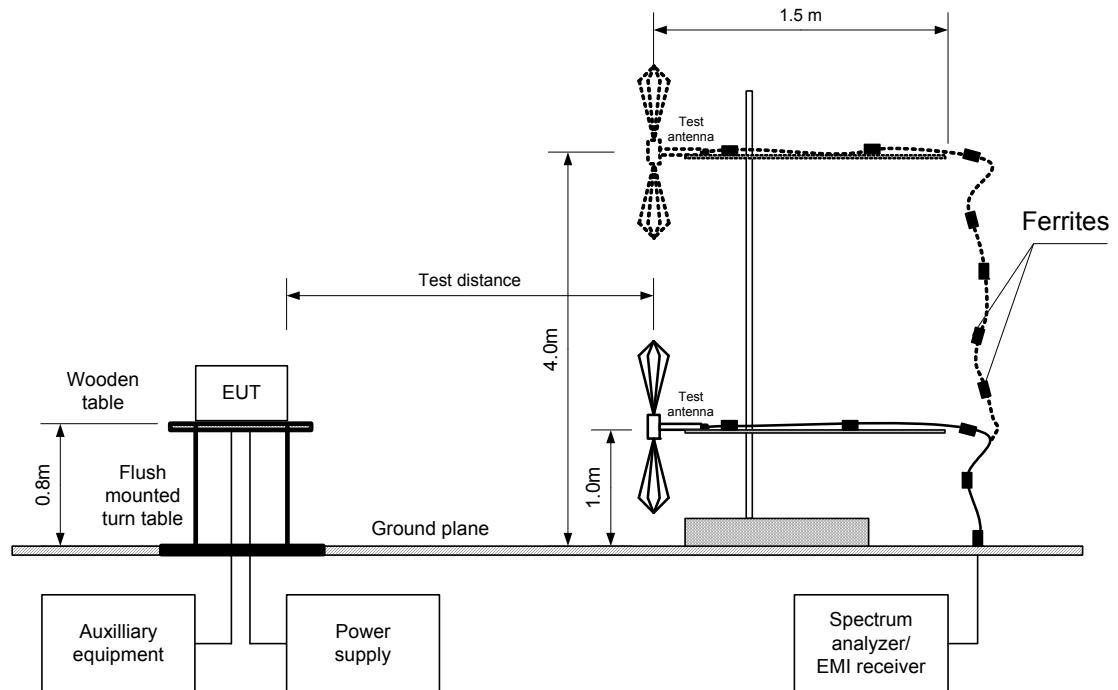
- 7.3.2.1 The EUT was set up as shown in Figure 7.3.1, energized and the performance check was conducted.
- 7.3.2.2 The spectrum analyzer frequency span was set to capture all major modulation sidebands of emission and sweep time was set sufficiently slow to ensure peak measurements. Spectrum analyzer was set in peak hold mode and time sufficient for trace stabilization was allowed.
- 7.3.2.3 The frequency of modulation envelope points beyond which power level drops below the band edge emission limit was measured.
- 7.3.2.4 The test results were recorded in Table 7.3.2 and shown in the associated plots.



HERMON LABORATORIES

Test specification:	FCC Part 15, Section 15.249(d)/RSS-210, section A2.9, Band edge emissions		
Test procedure:	ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date(s):	20-Dec-15		
Temperature: 23 °C	Air Pressure: 1015 hPa	Relative Humidity: 55 %	Power Supply: Battery
Remarks:			

Figure 7.3.1 Band edge emission measurement set up





HERMON LABORATORIES

Test specification:	FCC Part 15, Section 15.249(d)/RSS-210, section A2.9, Band edge emissions		
Test procedure:	ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict: PASS	
Date(s):	20-Dec-15		
Temperature: 23 °C	Air Pressure: 1015 hPa	Relative Humidity: 55 %	Power Supply: Battery
Remarks:			

Table 7.3.2 Band edge emission test results

OPERATING FREQUENCY RANGE: 902-928 MHz
DETECTOR USED: Peak hold
RESOLUTION BANDWIDTH: 120 kHz
VIDEO BANDWIDTH: 300 kHz
MODULATION: FSK
BIT RATE: 50 kbps
TRANSMITTER OUTPUT POWER SETTINGS: Maximum

Modulation envelope		Measured peak emission, dB μ V/m	Measured QP emission, dB μ V/m	QP limit, dB μ V/m	Margin, dB *	Verdict
Edge	Frequency, MHz					
Low	902	30.61	NA	46	-15.39	Pass
High	928	28.65	NA	46	-17.35	Pass

* - Margin = measured value - limit

Reference numbers of test equipment used

HL 0521	HL 0604	HL 4353					
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Full description is given in Appendix A.

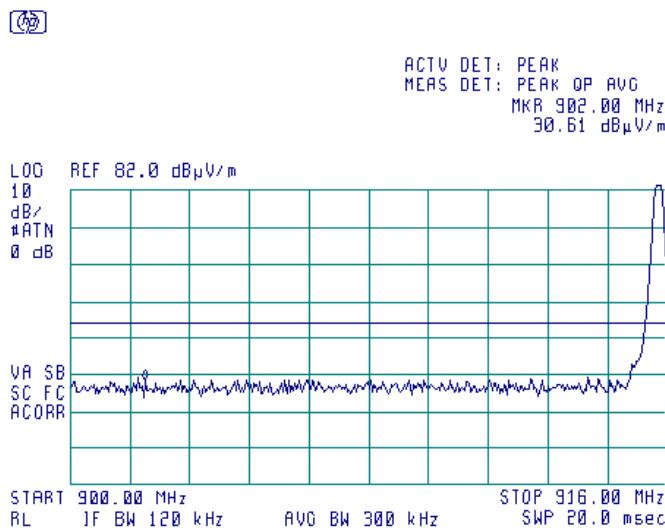


HERMON LABORATORIES

Test specification:	FCC Part 15, Section 15.249(d)/RSS-210, section A2.9, Band edge emissions		
Test procedure:	ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date(s):	20-Dec-15		
Temperature: 23 °C	Air Pressure: 1015 hPa	Relative Humidity: 55 %	Power Supply: Battery
Remarks:			

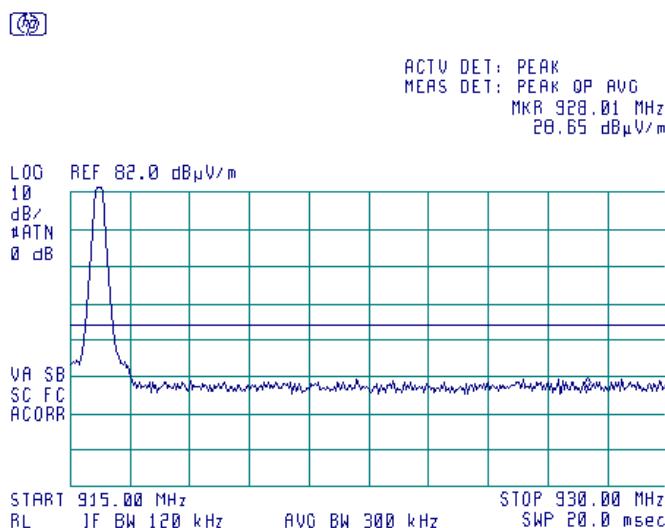
Plot 7.3.1 Low band edge emission test result

TEST SITE: Semi Anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
EUT POSITION: Horizontal



Plot 7.3.2 High band edge emission test result

TEST SITE: Semi Anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
EUT POSITION: Horizontal





HERMON LABORATORIES

Test specification:	FCC Part 15, Section 15.203 / RSS-Gen, Section 8.3 Antenna requirement		
Test procedure:	Visual inspection / supplier declaration		
Test mode:	Compliance	Verdict:	PASS
Date(s):	29-Dec-15		
Temperature: 23 °C	Air Pressure: 1016 hPa	Relative Humidity: 55 %	Power Supply: Battery
Remarks:			

7.4 Antenna requirements

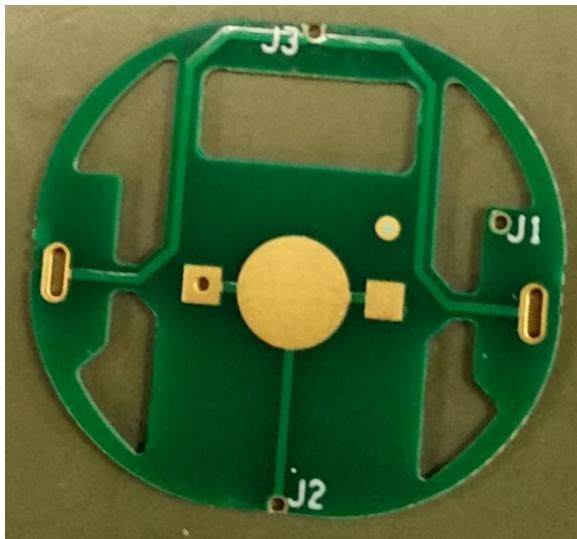
The EUT was verified for compliance with antenna requirements. A transmitter shall be designed to ensure that no antenna other than that furnished by the responsible party will be used with the device. It may be either permanently attached or employs a unique antenna connector for every antenna proposed 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 7.4.1.

Table 7.4.1 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 7.4.1 Antenna assembly





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Test specification:	FCC Part 15, Section 109 / RSS-Gen, Section 7.1.2 / ICES-003, Section 6.2, Class B, Radiated emission		
Test procedure:	ANSI C63.4, Sections 11.9 and 12.2		
Test mode:	Compliance	Verdict: PASS	
Date(s):	20-Dec-15	Temperature: 23 °C	Air Pressure: 1015 hPa
Remarks:	Relative Humidity: 55 % Power Supply: Battery		

8 Unintentional emission tests

8.1 Radiated emission measurements

8.1.1 General

This test was performed to measure radiated emissions from the EUT enclosure. Specification test limits are given in Table 8.1.1, Table 8.1.2.

Table 8.1.1 Radiated emission test limits according to FCC Part 15, Section 109 and ICES-003, Section 6.2

Frequency, MHz	Class B limit, dB(µV/m)		Class A limit, dB(µV/m)	
	10 m distance	3 m distance	10 m distance	3 m distance
30 - 88	29.5*	40.0	39.0	49.5*
88 - 216	33.0*	43.5	43.5	54.0*
216 - 960	35.5*	46.0	46.4	56.9*
Above 960	43.5*	54.0	49.5	60.0*

* The limit for test distance other than specified was calculated using the inverse linear distance extrapolation factor as follows: $Lim_{S2} = Lim_{S1} + 20 \log (S_1/S_2)$, where S_1 and S_2 – standard defined and test distance respectively in meters.

Table 8.1.2 Radiated emission limits according to RSS-Gen, Section 7.1.2

Frequency, MHz	Field strength limit at 3 m test distance, dB(µV/m)
30 - 88	40.0
88 - 216	43.5
216 - 960	46.0
960 - 5 th harmonic**	54.0

** - harmonic of the highest frequency the EUT generates, uses, operates or tunes to.

8.1.2 Test procedure for measurements

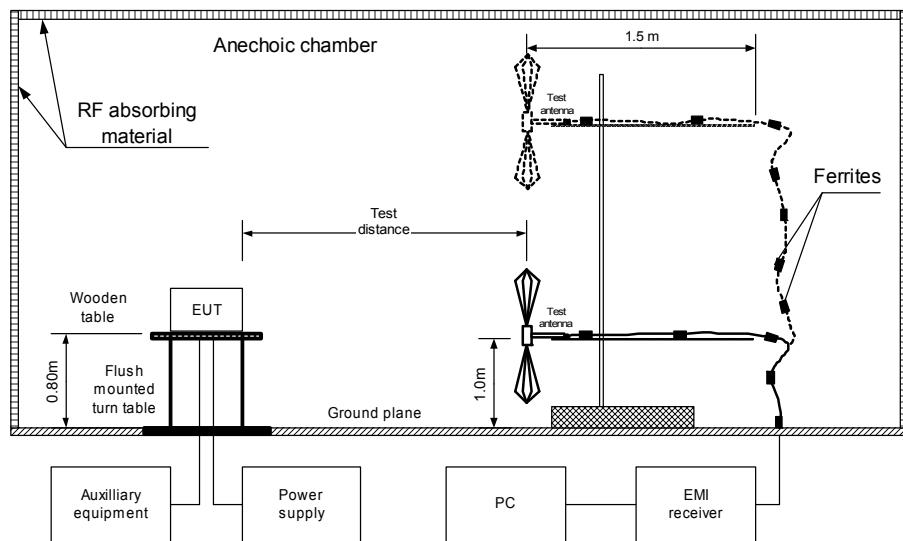
- 8.1.2.1 The EUT was set up as shown in Figure 8.1.1 and associated photograph/s, energized and the performance check was conducted.
- 8.1.2.2 The specified frequency range was investigated with biconilog antenna connected to EMI receiver. To find maximum radiation the turntable was rotated 360°, the measuring antenna height was changed from 1 to 4 m, its polarization was switched from vertical to horizontal and the EUT cables position was varied.
- 8.1.2.3 The worst test results (the lowest margins) were recorded in Table 8.1.3 and shown in the associated plots.



HERMON LABORATORIES

Test specification:	FCC Part 15, Section 109 / RSS-Gen, Section 7.1.2 / ICES-003, Section 6.2, Class B, Radiated emission		
Test procedure:	ANSI C63.4, Sections 11.9 and 12.2		
Test mode:	Compliance	Verdict:	PASS
Date(s):	20-Dec-15		
Temperature: 23 °C	Air Pressure: 1015 hPa	Relative Humidity: 55 %	Power Supply: Battery
Remarks:			

Figure 8.1.1 Setup for radiated emission measurements in anechoic chamber, table-top equipment

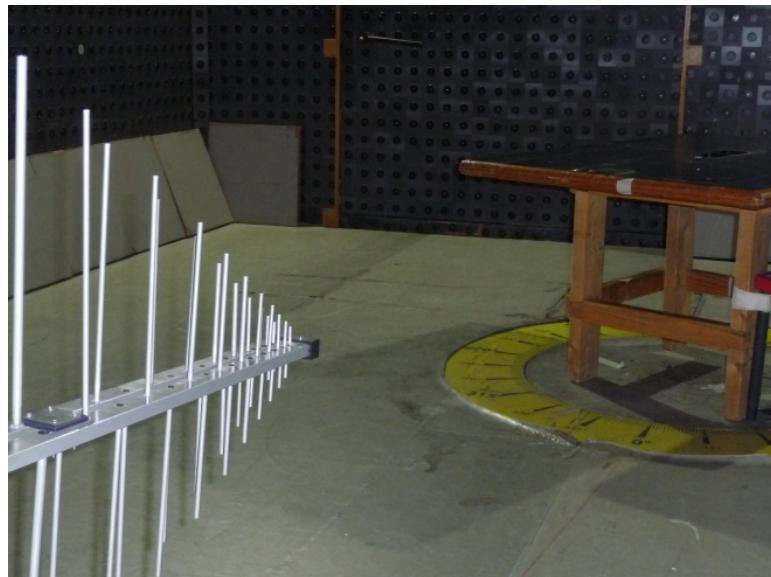




HERMON LABORATORIES

Test specification:	FCC Part 15, Section 109 / RSS-Gen, Section 7.1.2 / ICES-003, Section 6.2, Class B, Radiated emission		
Test procedure:	ANSI C63.4, Sections 11.9 and 12.2		
Test mode:	Compliance	Verdict:	PASS
Date(s):	20-Dec-15		
Temperature: 23 °C	Air Pressure: 1015 hPa	Relative Humidity: 55 %	Power Supply: Battery
Remarks:			

Photograph 8.1.1 Setup for radiated emission measurements in 30-1000 MHz



Photograph 8.1.2 Setup for radiated emission measurements, EUT in horizontal position





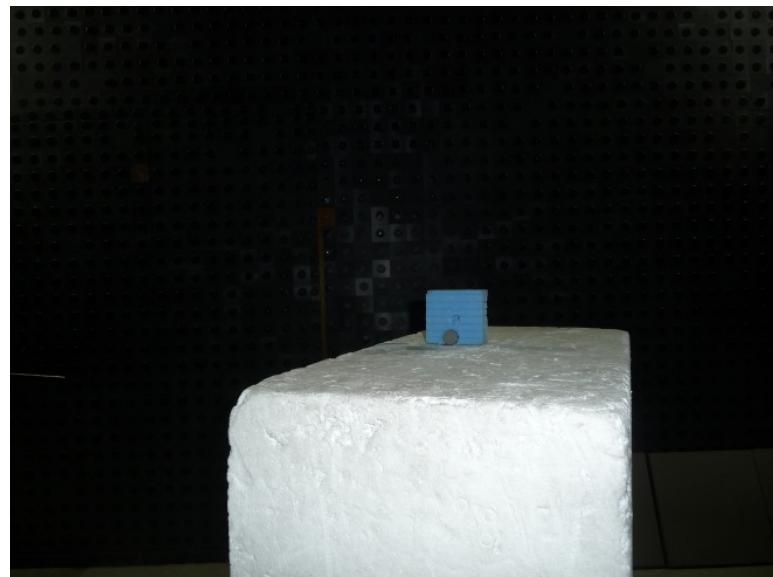
HERMON LABORATORIES

Test specification:	FCC Part 15, Section 109 / RSS-Gen, Section 7.1.2 / ICES-003, Section 6.2, Class B, Radiated emission		
Test procedure:	ANSI C63.4, Sections 11.9 and 12.2		
Test mode:	Compliance	Verdict:	PASS
Date(s):	20-Dec-15		
Temperature: 23 °C	Air Pressure: 1015 hPa	Relative Humidity: 55 %	Power Supply: Battery
Remarks:			

Photograph 8.1.3 Setup for radiated emission measurements above 1000 MHz



Photograph 8.1.4 Setup for radiated emission measurements above 1000 MHz, EUT in vertical position





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Test specification:	FCC Part 15, Section 109 / RSS-Gen, Section 7.1.2 / ICES-003, Section 6.2, Class B, Radiated emission		
Test procedure:	ANSI C63.4, Sections 11.9 and 12.2		
Test mode:	Compliance	Verdict: PASS	
Date(s):	20-Dec-15		
Temperature: 23 °C	Air Pressure: 1015 hPa	Relative Humidity: 55 %	Power Supply: Battery
Remarks:			

Table 8.1.3 Radiated emission test results

EUT SET UP:

TABLE-TOP

LIMIT:

Class B

EUT OPERATING MODE:

Receive / Stand-by

TEST SITE:

SEMI ANECHOIC CHAMBER

TEST DISTANCE:

3 m

DETECTORS USED:

PEAK / QUASI-PEAK

FREQUENCY RANGE:

30 MHz – 1000 MHz

RESOLUTION BANDWIDTH:

120 kHz

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 signals were found								Pass

TEST SITE:

SEMI ANECHOIC CHAMBER

TEST DISTANCE:

3 m

DETECTORS USED:

PEAK / AVERAGE

FREQUENCY RANGE:

1000 MHz – 5000 MHz

RESOLUTION BANDWIDTH:

1000 kHz

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

*- Margin = Measured emission - specification limit.

**- EUT front panel refer to 0 degrees position of turntable.

Reference numbers of test equipment used

HL 0521	HL 0604	HL 1984	HL 4353	HL 4722				
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Full description is given in Appendix A.



HERMON LABORATORIES

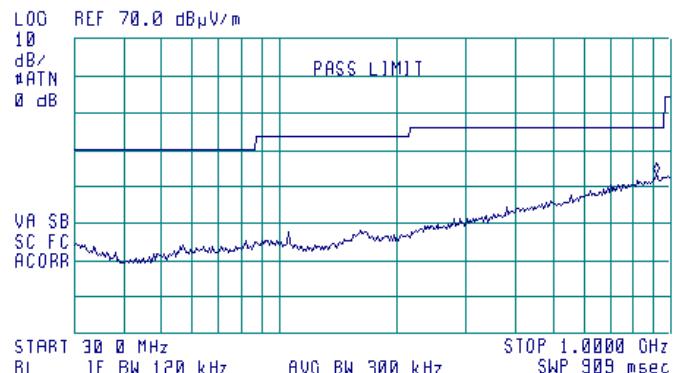
Test specification:	FCC Part 15, Section 109 / RSS-Gen, Section 7.1.2 / ICES-003, Section 6.2, Class B, Radiated emission		
Test procedure:	ANSI C63.4, Sections 11.9 and 12.2		
Test mode:	Compliance	Verdict: PASS	
Date(s):	20-Dec-15		
Temperature: 23 °C	Air Pressure: 1015 hPa	Relative Humidity: 55 %	Power Supply: Battery
Remarks:			

Plot 8.1.1 Radiated emission measurements in 30 - 1000 MHz range, vertical & horizontal antenna polarization

TEST SITE: Semi anechoic chamber
 LIMIT: B
 TEST DISTANCE: 3 m
 EUT OPERATING MODE: Receive



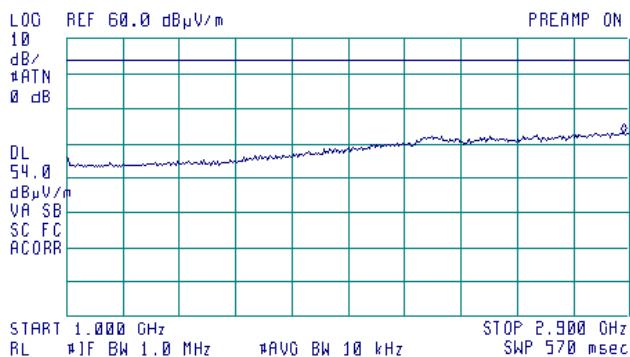
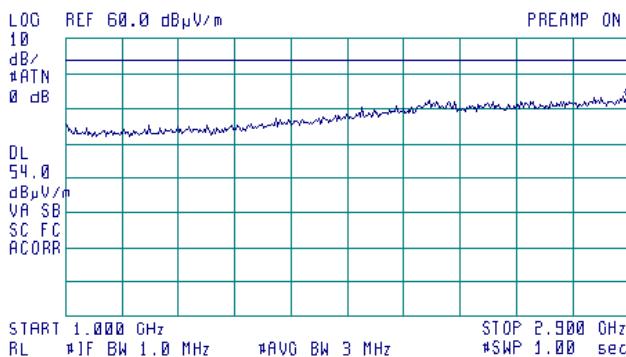
ACTV DET: PEAK
 MEAS DET: PEAK OP AVG
 MKR 904.7 MHz
 33.39 dB μ V/m

**Plot 8.1.2 Radiated emission measurements in 1- 2.9 GHz range, vertical & horizontal antenna polarization**

TEST SITE: Semi anechoic chamber
 LIMIT: Class B
 TEST DISTANCE: 3 m
 EUT OPERATING MODE: Receive / Stand-by



ACTV DET: PEAK
 MEAS DET: PEAK OP AVG
 MKR 2.895 GHz
 43.45 dB μ V/m



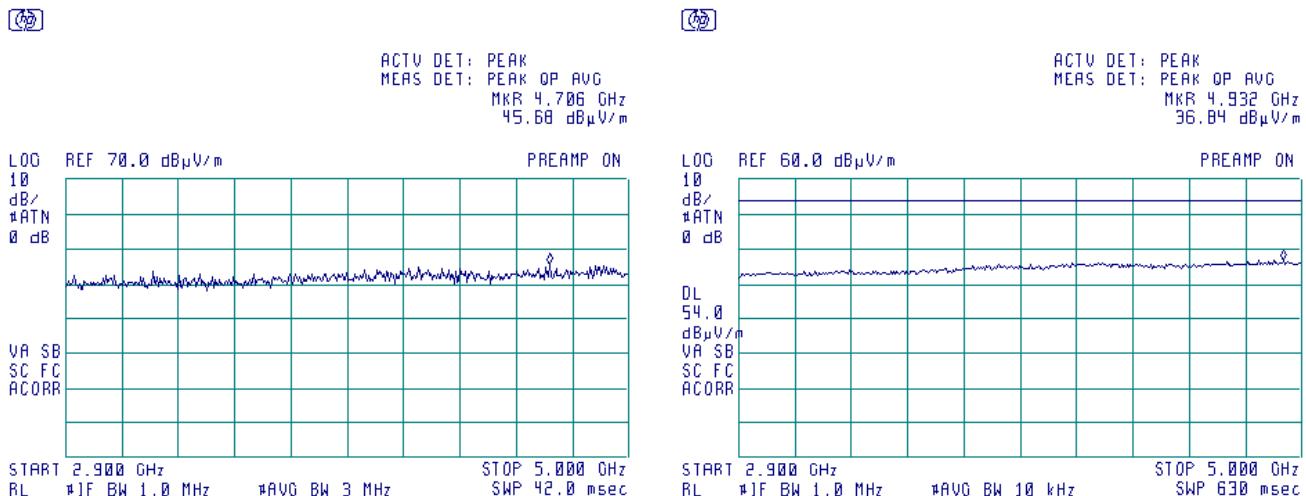


HERMON LABORATORIES

Test specification:	FCC Part 15, Section 109 / RSS-Gen, Section 7.1.2 / ICES-003, Section 6.2, Class B, Radiated emission		
Test procedure:	ANSI C63.4, Sections 11.9 and 12.2		
Test mode:	Compliance	Verdict: PASS	
Date(s):	20-Dec-15		
Temperature: 23 °C	Air Pressure: 1015 hPa	Relative Humidity: 55 %	Power Supply: Battery
Remarks:			

Plot 8.1.3 Radiated emission measurements in 2.9 - 5 GHz range, vertical & horizontal antenna polarization

TEST SITE: Semi anechoic chamber
 LIMIT: Class B
 TEST DISTANCE: 3 m
 EUT OPERATING MODE: Receive / Stand-by





HERMON LABORATORIES

9 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	13-Jan-15	13-Jan-16
0521	EMI Receiver (Spectrum Analyzer) with RF filter section 9 kHz-6.5 GHz	Hewlett Packard	8546A	3617A 00319, 3448A002 53	27-Oct-15	27-Oct-16
0604	Antenna BiconiLog Log-Periodic/T Bow-TIE, 26 - 2000 MHz	EMCO	3141	9611-1011	15-May-15	15-May-16
1984	Antenna, Double-Ridged Waveguide Horn, 1 to 18 GHz, 300 W	EMC Test Systems	3115	9911-5964	17-Apr-15	17-Apr-16
3818	PSA Series Spectrum Analyzer, 3 Hz- 44 GHz	Agilent Technologies	E4446A	MY482502 88	29-Apr-15	29-Apr-16
4353	Low Loss Armored Test Cable, DC - 18 GHz, 6.2 m, N type-M/N type-M	MegaPhase	NC29-N1N1-244	12025101 003	15-Mar-15	15-Mar-16
4722	Low Loss Armored Test Cable, DC - 18 GHz, 6.2 m, N type-M/N type-M	MegaPhase	NC29-N1N1-244	51228701 001	30-Dec-15	30-Dec-16
4916	High Pass Filter, 50 Ohm, 3150 to 6500 MHz, SMA-FM / SMA-M	Mini-Circuits	VHF-2700+	NA	01-Oct-15	01-Oct-17
4932	Microwave preamplifier, 500 MHz to 18 GHz, 40 dB Gain	Com-Power Corporation	PAM-118A	551029	19-Nov-15	19-Nov-16



HERMON LABORATORIES

10 APPENDIX B Measurement uncertainties

Expanded uncertainty at 95% confidence in Hermon Labs EMC measurements

Test description	Expanded uncertainty
Radiated emissions at 3 m measuring distance Horizontal polarization	Biconilog antenna: ± 5.3 dB Biconical antenna: ± 5.0 dB Log periodic antenna: ± 5.3 dB Double ridged horn antenna: ± 5.3 dB
Vertical polarization	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.



HERMON LABORATORIES

11 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), certified by VCCI, Japan (the registration numbers are R-808 for OATS, R-1082 for anechoic chamber, C-845 for conducted emissions site), 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 IL1001.

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e-mail: mail@hermonlabs.com
website: www.hermonlabs.com

Person for contact: Mr. Alex Usoskin, CEO.

12 APPENDIX D Specification references

FCC 47CFR part 15: 2014	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: 2009	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 4: 2014	General Requirements and Information for the Certification of Radiocommunication Equipment
ICES-003 issue 5:2012	Information Technology Equipment (ITE) – Limits and methods of measurement



HERMON LABORATORIES

13 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(μ V) to convert it into field intensity in dB(μ V/m).



HERMON LABORATORIES

**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(μ V) to convert it into field strength in dB(μ V/m).



HERMON LABORATORIES

Antenna factor
Double-ridged wave guide horn antenna
Model 3115, S/N 9911-5964, HL1984

Frequency, MHz	Antenna factor, dB(1/m)
1000.0	24.7
1500.0	25.7
2000.0	27.6
2500.0	28.9
3000.0	31.2
3500.0	32.0
4000.0	32.5
4500.0	32.7
5000.0	33.6
5500.0	35.1
6000.0	35.4
6500.0	34.9
7000.0	36.1
7500.0	37.8
8000.0	38.0
8500.0	38.1
9000.0	39.1
9500.0	38.3
10000.0	38.6
10500.0	38.2
11000.0	38.7
11500.0	39.5
12000.0	40.0
12500.0	40.4
13000.0	40.5
13500.0	41.1
14000.0	41.6
14500.0	41.7
15000.0	38.7
15500.0	38.2
16000.0	38.8
16500.0	40.5
17000.0	42.5
17500.0	45.9
18000.0	49.4

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



HERMON LABORATORIES

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		



HERMON LABORATORIES

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		



HERMON LABORATORIES

14 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