HERMON LABORATORIES

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 6:2016

FOR:

Power Sense Wireless Ltd.
Personal Tag
Model: Tag 4.0/Tag 3.0
FCC ID:2AEXTTAGS3V04V0
IC:21825- TAG3V04V0

Report ID: PSWRAD_FCC.28484.docx
Date of Issue: 13-Sep-16

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1 Applicant information

Client name:	Power Sense Wireless Ltd.
Address:	129/67 Hazon Ish street, Ramat-Gan 5237008, Israel
Telephone:	+972 52 845 1005
Fax:	+972 3677 1454
E-mail:	yaniv@power-tags.com
Contact name:	Mr. Yaniv Reibenbach

2 Equipment under test attributes

Product name:	Personal Tag
Product type:	Transmitter
Model(s):	Tag 4.0/Tag 3.0
Serial number:	10001
Hardware version:	4V2
Software release:	FW_V4.2
Receipt date	14-Jun-16

3 Manufacturer information

Manufacturer name:	Power Sense Wireless Ltd.
Address:	129/67 Hazon Ish street, Ramat-Gan 5237008, Israel
Telephone:	+972 52 845 1005
Fax:	+972 3677 1454
E-Mail:	yaniv@power-tags.com
Contact name:	Mr. Yaniv Reibenbach

4 Test details

Project ID:	28484
Location:	Hermon Laboratories Ltd. Harakevet Industrial Zone, Binyamina 30500, Israel
Test started:	14-Jun-16
Test completed:	16-Jun-16
Test specification(s):	FCC 15.249
Test suite:	FCC 47 CFR Part 15, subpart C, §15.249; subpart B §15.109; RSS-210 issue 8, RSS-Gen issue 4, ICES-003: 2016 Issue 6

5 Tests summary

Test	Status
Transmitter characteristics	
Section 15.249(a)(d) / RSS-210, section A2.9, Field strength of emissions	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
Section 15.215(c) / RSS-Gen, section 6.6, Occupied bandwidth	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.

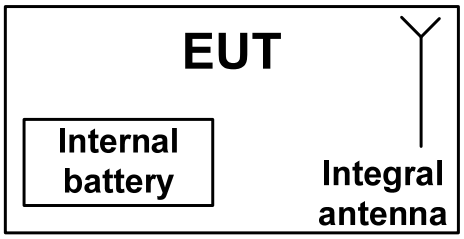
	Name and Title	Date	Signature
Tested by:	Mrs.E. Pitt, test engineer	June 16, 2016	
Reviewed by:	Mrs. M. Cherniavsky, certification engineer	July 25, 2016	
Approved by:	Mr. M. Nikishin, EMC and Radio group manager	September 13, 2016	

6 EUT description

6.1 General information

The EUT, PowerTag is battery fed unit, comprising a low power transmitter operating in 911.2-920.8 MHz band. The Tags are used to locate people or assets in a facility while they are attached or worn by the person/asset.

6.2 Test configuration



6.3 Changes made in EUT

No changes were performed in the EUT.

6.4 Transmitter characteristics

Type of equipment							
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	902-928 MHz
Operating frequency range	911.2-920.8 MHz
RF channel spacing	200 kHz
Maximum field strength of carrier at 3 m distance	80.46 dBµV/m (peak)

Is transmitter output power variable?	**V**	No			
		Yes		continuous variable	
				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
				V without temporary RF connector

Antenna/s technical characteristics			
Type	Manufacturer	Model number	Gain
Integral	Power Sense Wireless Ltd.	Printed	-0.7 dBi

Transmitter aggregate data rate/s	100 kbps
Type of modulation	4FSK
Modulating test signal (baseband)	PRBS

Transmitter power source					
V	Battery	**Nominal rated voltage**	3V	Battery type	Lithium Ion
	DC	**Nominal rated voltage**			
	AC mains	**Nominal rated voltage**		Frequency	Hz

Test specification:	Section 15.249(a)(d)/RSS-210, section A2.9, Field strength of emissions		
Test procedure:	ANSI C63.10 sections 6.5, 6.6		
Test mode:	Compliance	Verdict:	PASS
Date(s):	15-Jun-16		
Temperature: 23 ºC	Relative Humidity: 55 %	Air Pressure: 1009 hPa	Power: Battery
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 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	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		
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:

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

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

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

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.

Test specification:	Section 15.249(a)(d)/RSS-210, section A2.9, Field strength of emissions		
Test procedure:	ANSI C63.10 sections 6.5, 6.6		
Test mode:	Compliance	Verdict:	PASS
Date(s):	15-Jun-16		
Temperature: 23 ºC	Relative Humidity: 55 %	Air Pressure: 1009 hPa	Power: 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 measurements were performed in three EUT orthogonal positions.

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

7.1.2.4 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

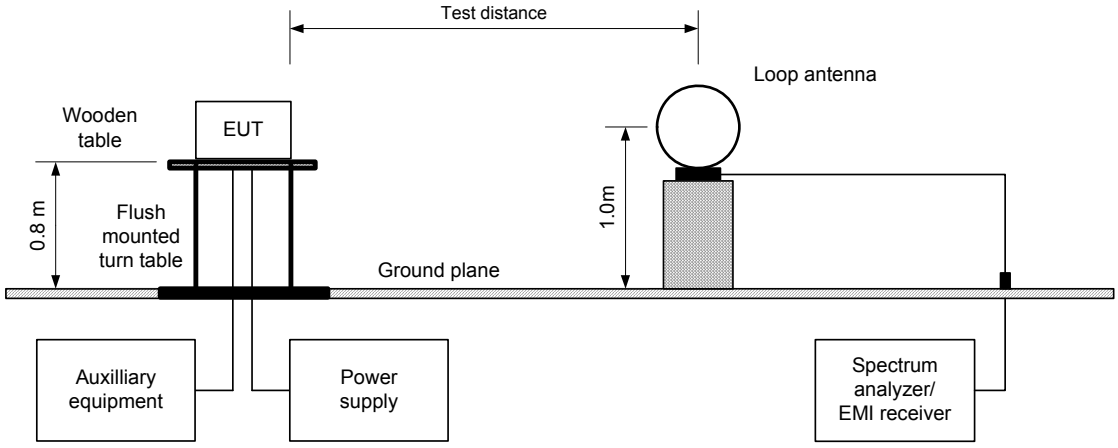
7.1.3.1 The EUT was set up as shown in Figure 7.1.2, energized and the performance check was conducted.

7.1.3.2 The measurements were performed in three EUT orthogonal positions.

7.1.3.3 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.

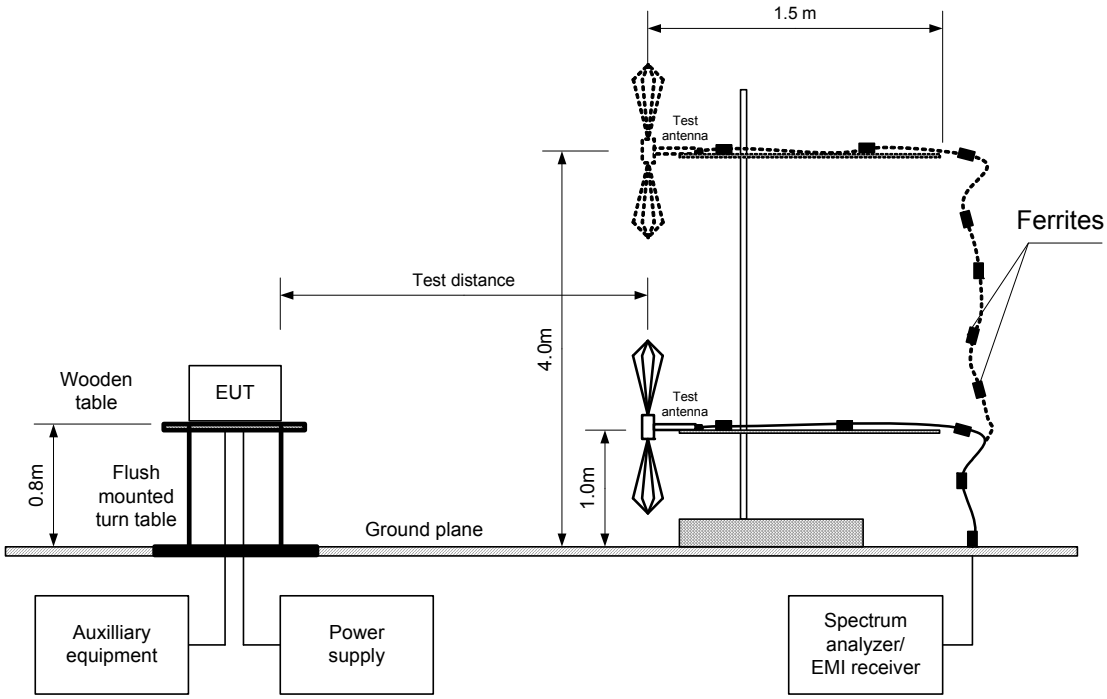
7.1.3.4 The worst test results (the lowest margins) were recorded in the associated tables and shown in the associated plots

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



Test specification:	Section 15.249(a)(d)/RSS-210, section A2.9, Field strength of emissions		
Test procedure:	ANSI C63.10 sections 6.5, 6.6		
Test mode:	Compliance	Verdict:	PASS
Date(s):	15-Jun-16		
Temperature: 23 ºC	Relative Humidity: 55 %	Air Pressure: 1009 hPa	Power: Battery
Remarks:			

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



Test specification:	Section 15.249(a)(d)/RSS-210, section A2.9, Field strength of emissions		
Test procedure:	ANSI C63.10 sections 6.5, 6.6		
Test mode:	Compliance	Verdict:	PASS
Date(s):	15-Jun-16		
Temperature: 23 ºC	Relative Humidity: 55 %	Air Pressure: 1009 hPa	Power: Battery
Remarks:			

Table 7.1.4 Field strength of fundamental emission and spurious emissions

TEST DISTANCE:	3 m
EUT POSITION:	3 orthogonal X / Y / Z
MODULATION:	4FSK
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**	
911.2	Vert.	1.2	70	79.01	NA	94	-14.99	Pass
920.8	Horiz.	1.3	0	80.46	NA	94	-13.54	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**		Calculation, dB(μV/m)	Limit, dB(μV/m)	Margin, dB**	
1822.46	Hor.	1.5	0	46.66	74	-27.34	-32.2	14.46	54	-39.54	Pass
1841.62	Hor.	1.5	0	45.39	74	-28.61	-32.2	13.19	54	-40.81	
3645.00	Hor.	1.5	0	40.92	74	-33.08	-32.2	8.72	54	-45.28	
3683.09	Hor.	1.5	0	37.62	74	-36.38	-32.2	5.42	54	-48.58	
5467.34	Hor.	1.5	0	47.25	74	-26.75	-32.2	15.05	54	-38.95	
5524.98	Hor.	1.5	0	45.62	74	-28.38	-32.2	13.42	54	-40.58	

*- 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		
2.45	760	NA	NA	NA	-32.2

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

Reference numbers of test equipment used

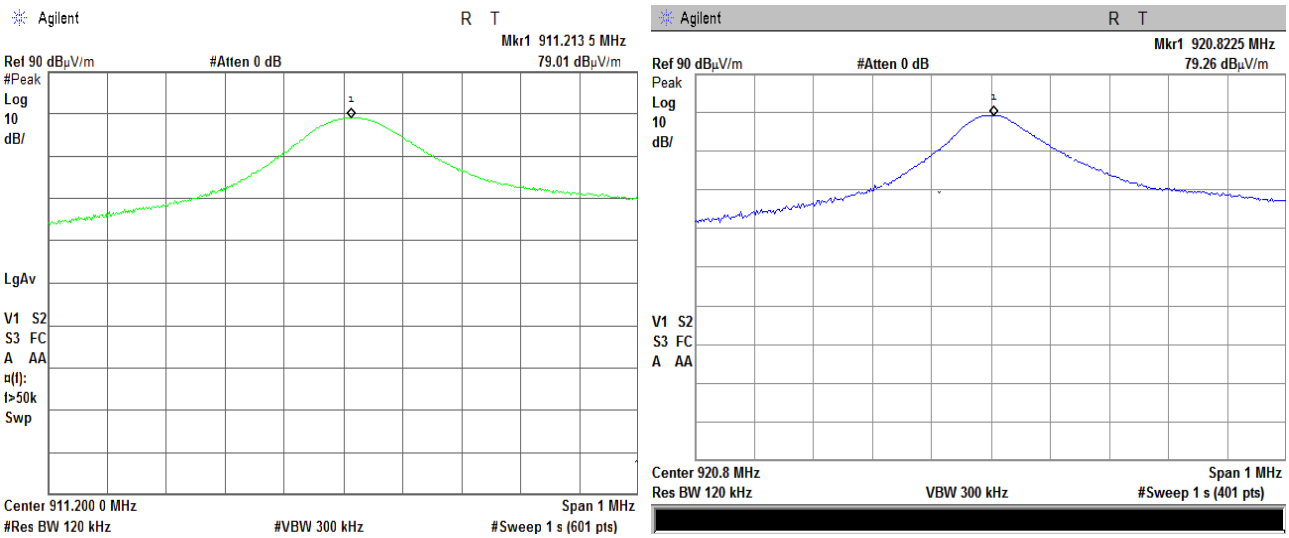
HL 0446	HL 0604	HL 2780	HL 4278	HL 4339	HL 4353	HL 4933	

Full description is given in Appendix A.

Test specification:	Section 15.249(a)(d)/RSS-210, section A2.9, Field strength of emissions		
Test procedure:	ANSI C63.10 sections 6.5, 6.6		
Test mode:	Compliance	Verdict:	PASS
Date(s):	15-Jun-16		
Temperature: 23 ºC	Relative Humidity: 55 %	Air Pressure: 1009 hPa	Power: Battery
Remarks:			

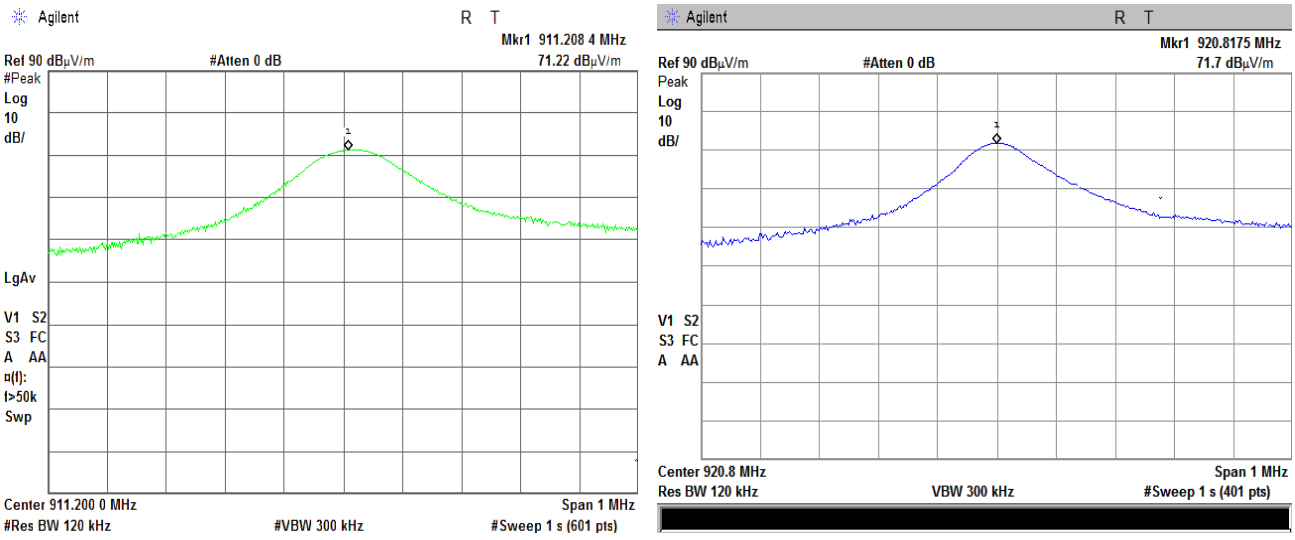
Plot 7.1.1 Radiated emission measurements at the fundamental frequency

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



Plot 7.1.2 Radiated emission measurements at the fundamental frequency

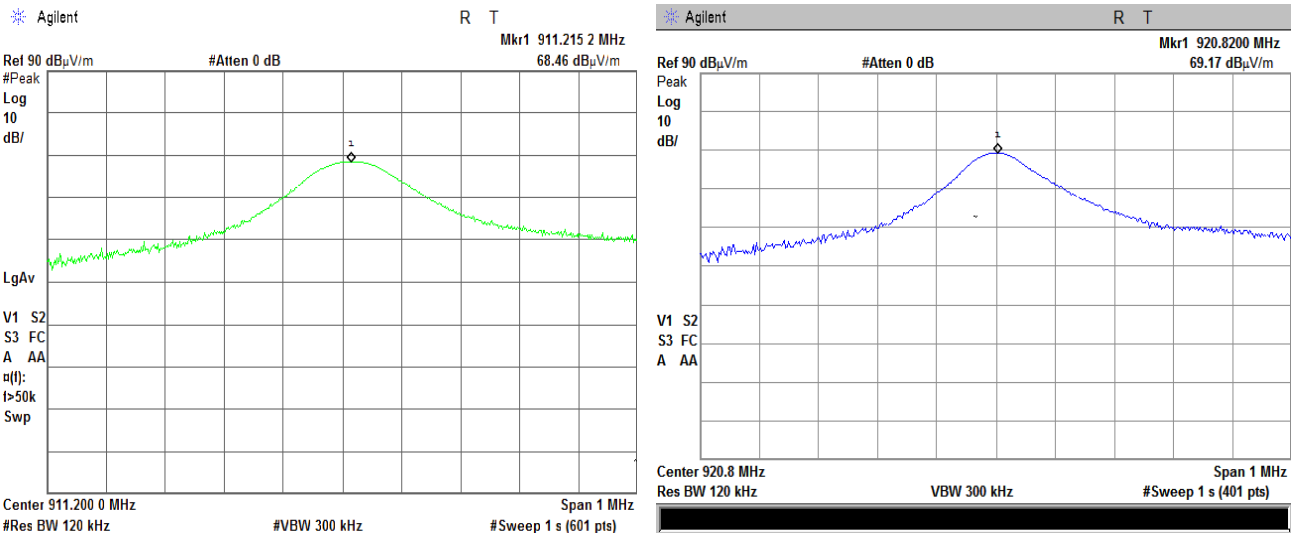
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical
EUT POSITION: Y-axis



Test specification:	Section 15.249(a)(d)/RSS-210, section A2.9, Field strength of emissions		
Test procedure:	ANSI C63.10 sections 6.5, 6.6		
Test mode:	Compliance	Verdict:	PASS
Date(s):	15-Jun-16		
Temperature: 23 ºC	Relative Humidity: 55 %	Air Pressure: 1009 hPa	Power: Battery
Remarks:			

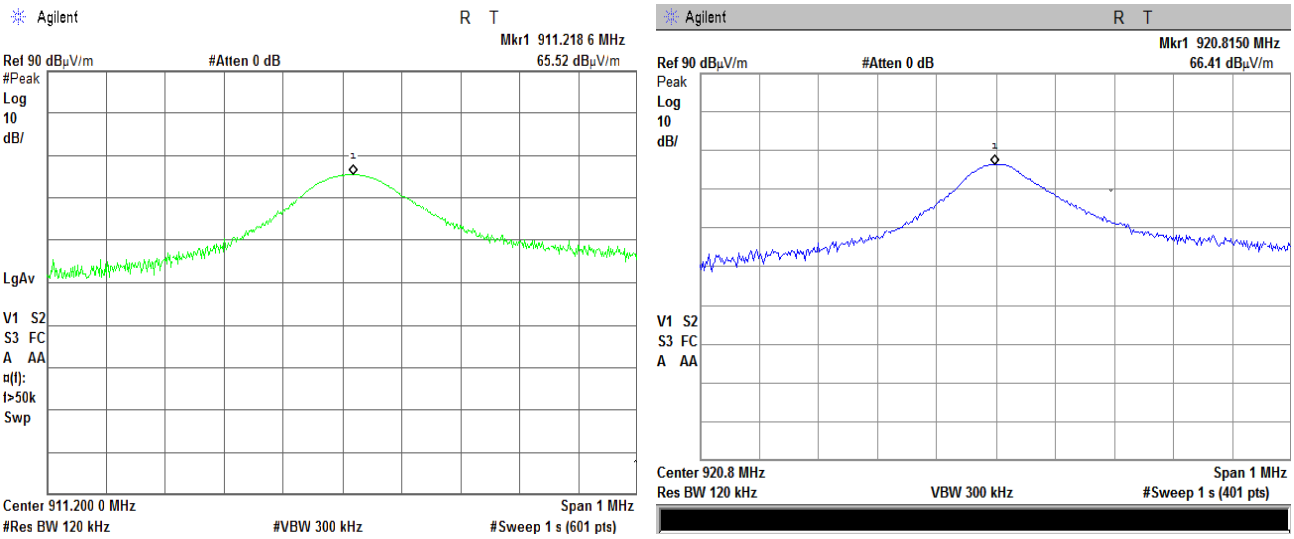
Plot 7.1.3 Radiated emission measurements at the fundamental frequency

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



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: X-axis

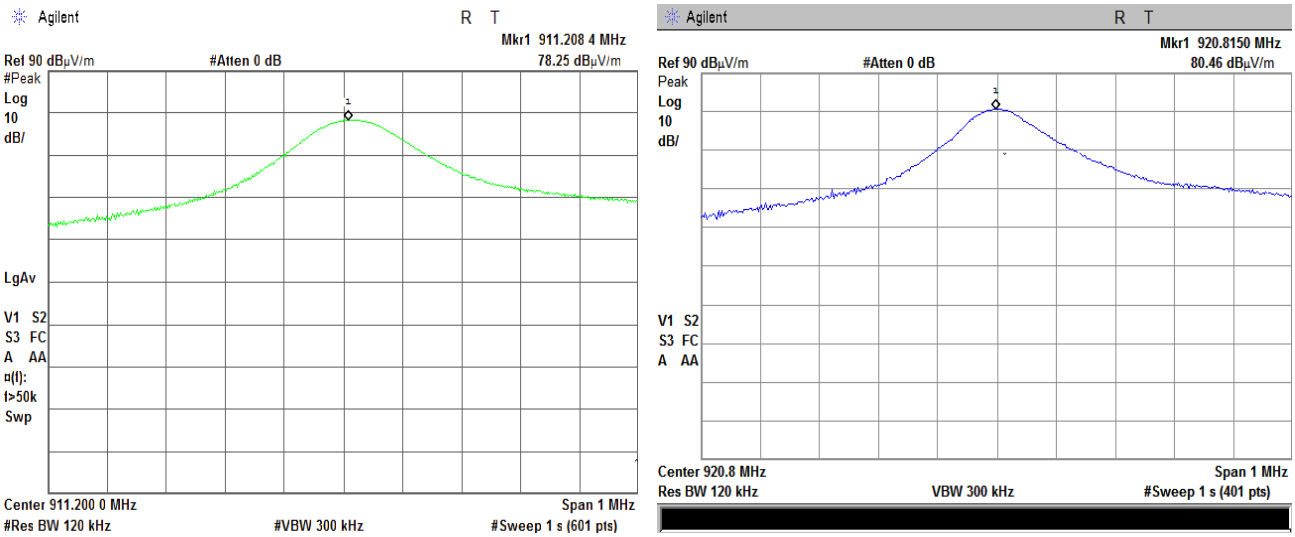


X

Test specification:	Section 15.249(a)(d)/RSS-210, section A2.9, Field strength of emissions		
Test procedure:	ANSI C63.10 sections 6.5, 6.6		
Test mode:	Compliance	Verdict:	PASS
Date(s):	15-Jun-16		
Temperature: 23 ºC	Relative Humidity: 55 %	Air Pressure: 1009 hPa	Power: Battery
Remarks:			

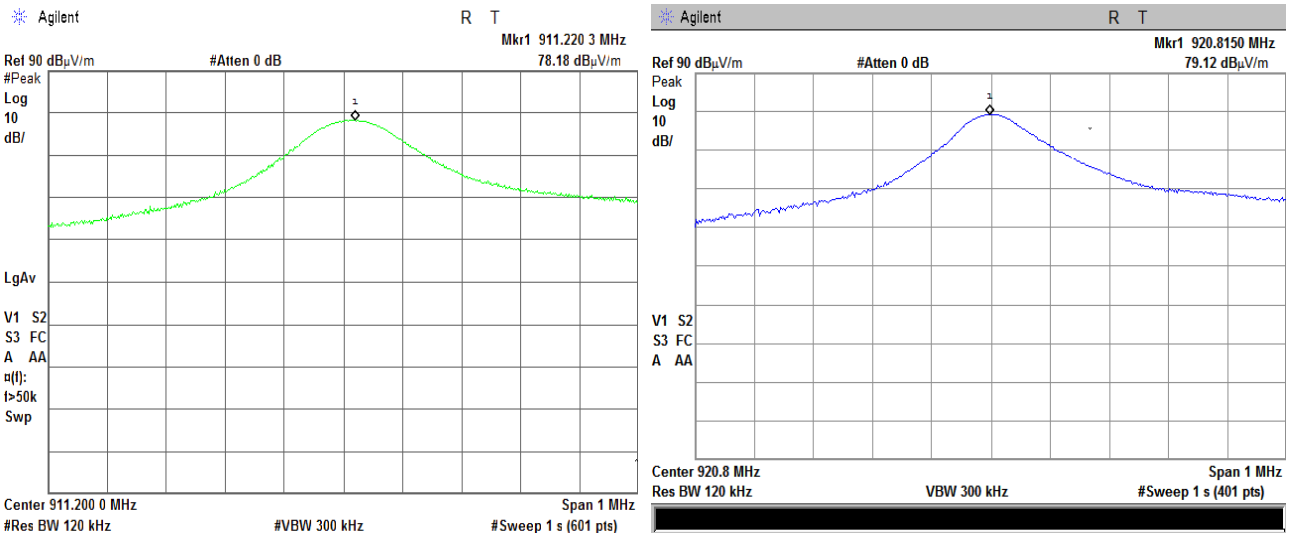
Plot 7.1.5 Radiated emission measurements at the fundamental frequency

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



Plot 7.1.6 Radiated emission measurements at the fundamental frequency

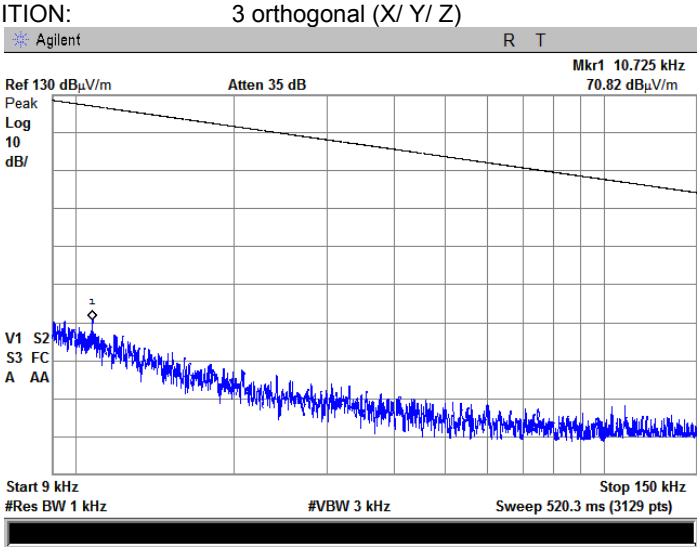
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Horizontal
EUT POSITION: Z-axis



Test specification:	Section 15.249(a)(d)/RSS-210, section A2.9, Field strength of emissions		
Test procedure:	ANSI C63.10 sections 6.5, 6.6		
Test mode:	Compliance	Verdict:	PASS
Date(s):	15-Jun-16		
Temperature: 23 ºC	Relative Humidity: 55 %	Air Pressure: 1009 hPa	Power: Battery
Remarks:			

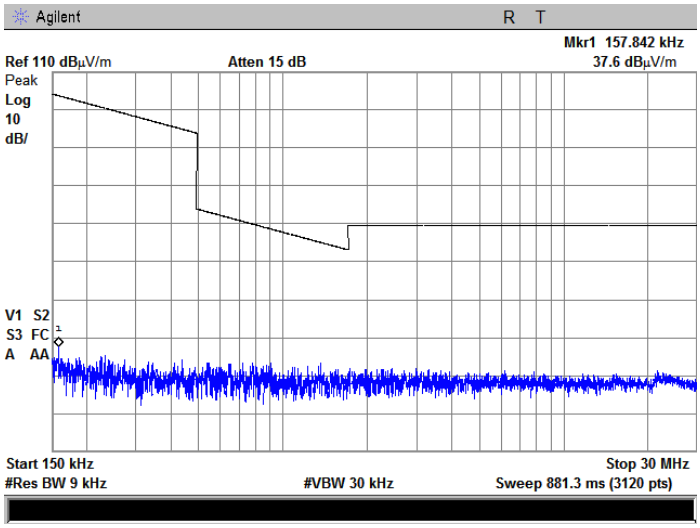
Plot 7.1.7 Radiated emission measurements from 9 to 150 kHz at low and high frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
EUT POSITION: 3 orthogonal (X/ Y/ Z)



Plot 7.1.8 Radiated emission measurements from 0.15 to 30 MHz at low and high frequency

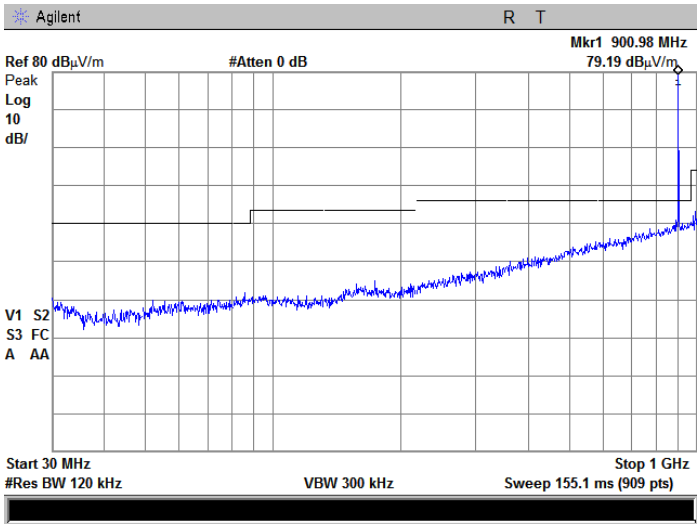
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
EUT POSITION: 3 orthogonal (X/ Y/ Z)



Test specification:	Section 15.249(a)(d)/RSS-210, section A2.9, Field strength of emissions		
Test procedure:	ANSI C63.10 sections 6.5, 6.6		
Test mode:	Compliance	Verdict:	PASS
Date(s):	15-Jun-16		
Temperature: 23 ºC	Relative Humidity: 55 %	Air Pressure: 1009 hPa	Power: Battery
Remarks:			

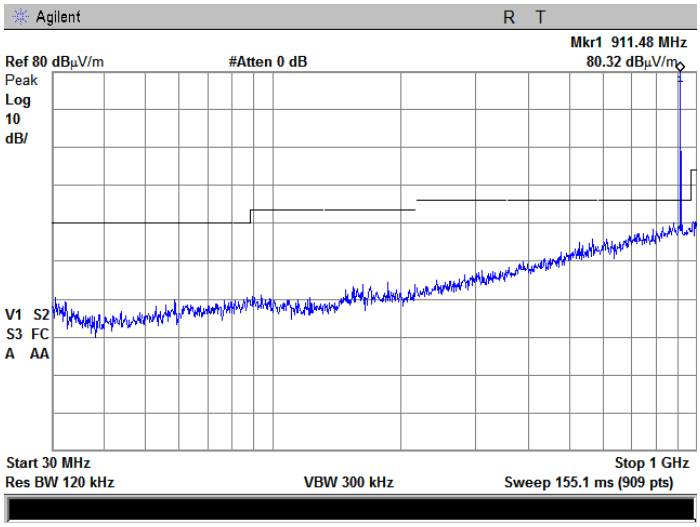
Plot 7.1.9 Radiated emission measurements from 30 to 1000 MHz at low frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
EUT POSITION: 3 orthogonal (X/ Y/ Z)



Plot 7.1.10 Radiated emission measurements from 30 to 1000 MHz at high frequency

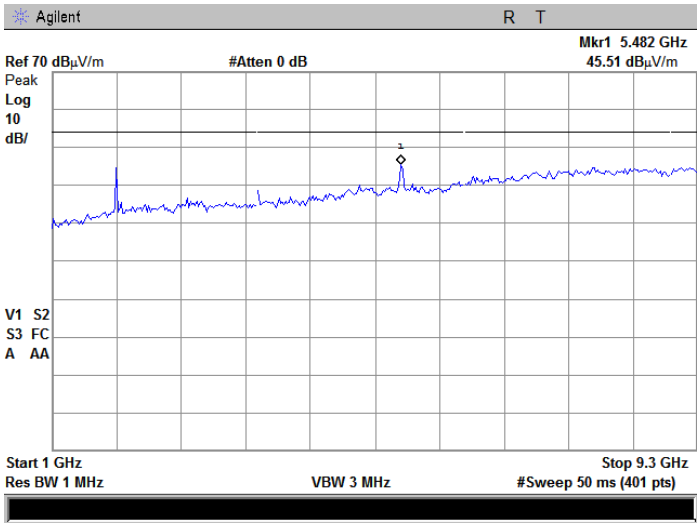
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
EUT POSITION: 3 orthogonal (X/ Y/ Z)



Test specification:	Section 15.249(a)(d)/RSS-210, section A2.9, Field strength of emissions		
Test procedure:	ANSI C63.10 sections 6.5, 6.6		
Test mode:	Compliance	Verdict:	PASS
Date(s):	15-Jun-16		
Temperature: 23 ºC	Relative Humidity: 55 %	Air Pressure: 1009 hPa	Power: Battery
Remarks:			

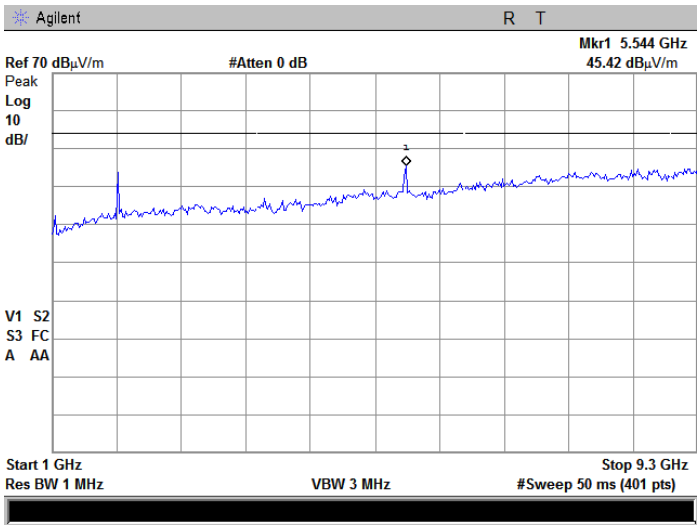
Plot 7.1.11 Radiated emission measurements from 1.0 to 9.2 GHz at low frequency

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



Plot 7.1.12 Radiated emission measurements from 1.0 to 9.2 GHz at high frequency

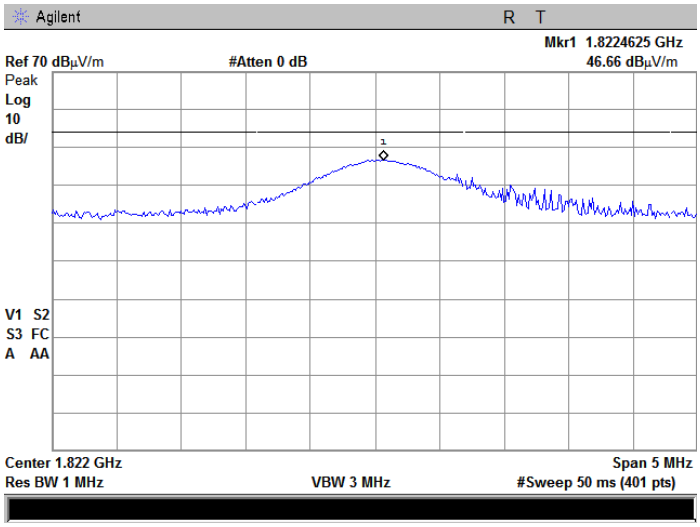
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



Test specification:	Section 15.249(a)(d)/RSS-210, section A2.9, Field strength of emissions		
Test procedure:	ANSI C63.10 sections 6.5, 6.6		
Test mode:	Compliance	Verdict:	PASS
Date(s):	15-Jun-16		
Temperature: 23 ºC	Relative Humidity: 55 %	Air Pressure: 1009 hPa	Power: Battery
Remarks:			

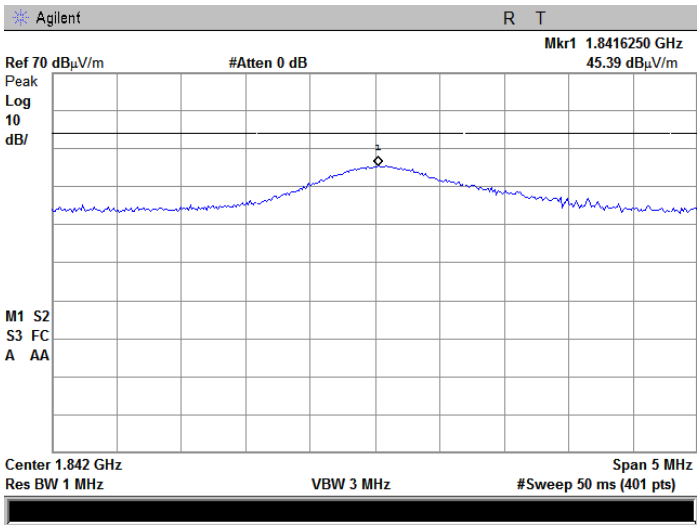
Plot 7.1.13 Radiated emission measurements at the second harmonic frequency of low frequency

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



Plot 7.1.14 Radiated emission measurements at the second harmonic frequency of high frequency

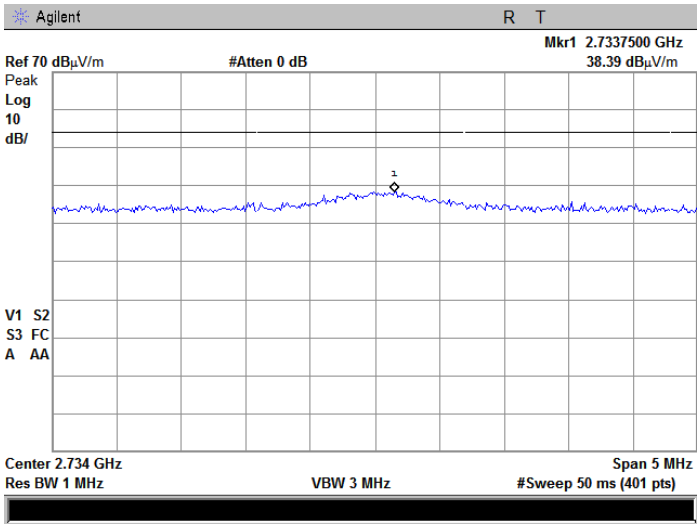
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical & Horizontal



Test specification:	Section 15.249(a)(d)/RSS-210, section A2.9, Field strength of emissions		
Test procedure:	ANSI C63.10 sections 6.5, 6.6		
Test mode:	Compliance	Verdict:	PASS
Date(s):	15-Jun-16		
Temperature: 23 ºC	Relative Humidity: 55 %	Air Pressure: 1009 hPa	Power: Battery
Remarks:			

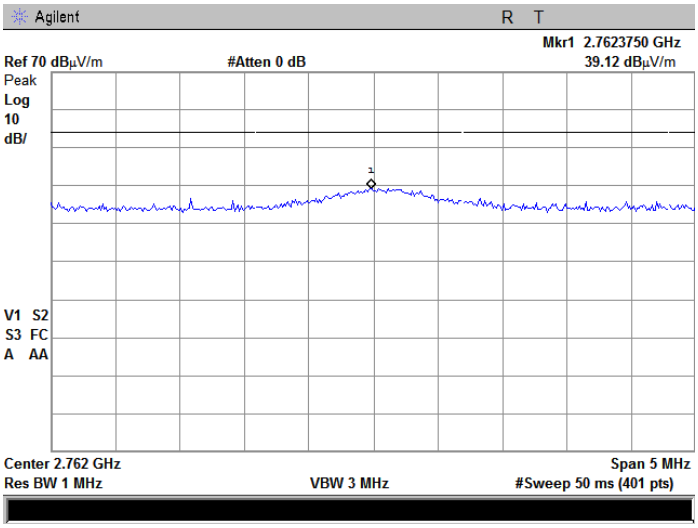
Plot 7.1.15 Radiated emission measurements at the third harmonic frequency of low frequency

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



Plot 7.1.16 Radiated emission measurements at the third harmonic frequency of high frequency

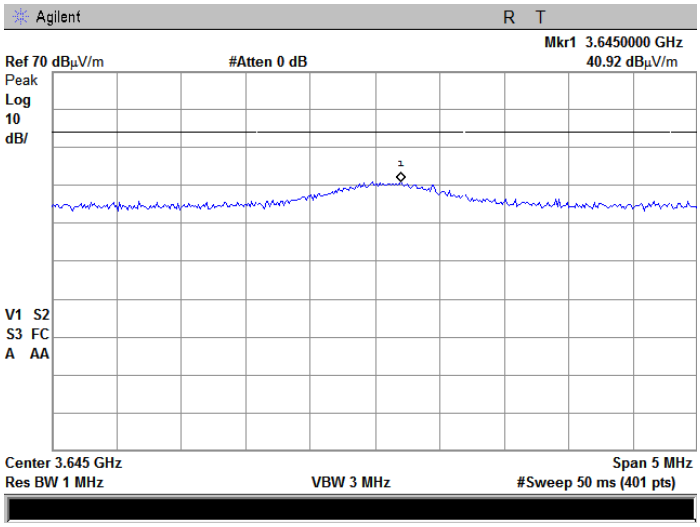
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical &Horizontal



Test specification:	Section 15.249(a)(d)/RSS-210, section A2.9, Field strength of emissions		
Test procedure:	ANSI C63.10 sections 6.5, 6.6		
Test mode:	Compliance	Verdict:	PASS
Date(s):	15-Jun-16		
Temperature: 23 ºC	Relative Humidity: 55 %	Air Pressure: 1009 hPa	Power: Battery
Remarks:			

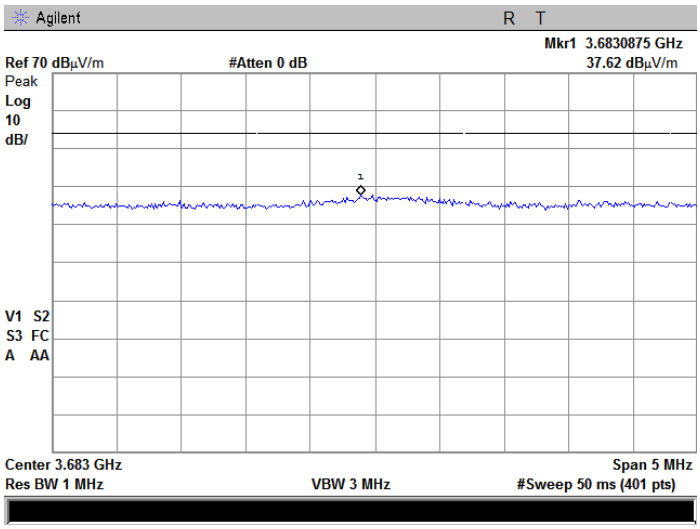
Plot 7.1.17 Radiated emission measurements at the fourth harmonic frequency of low frequency

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



Plot 7.1.18 Radiated emission measurements at the fourth harmonic frequency of high frequency

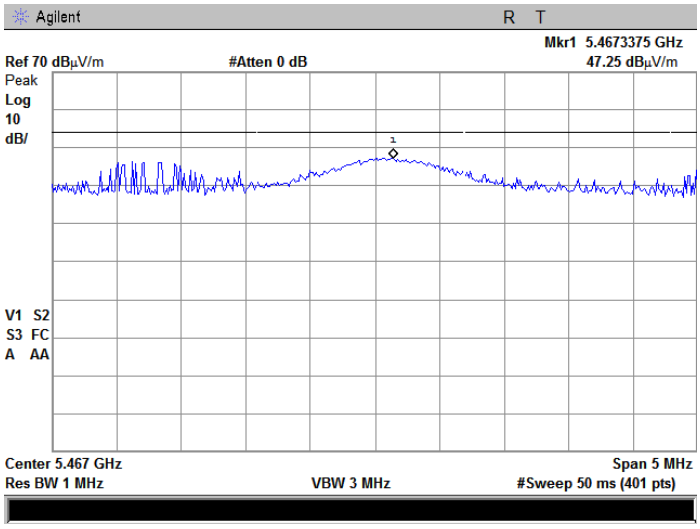
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical& Horizontal



Test specification:	Section 15.249(a)(d)/RSS-210, section A2.9, Field strength of emissions		
Test procedure:	ANSI C63.10 sections 6.5, 6.6		
Test mode:	Compliance	Verdict:	PASS
Date(s):	15-Jun-16		
Temperature: 23 ºC	Relative Humidity: 55 %	Air Pressure: 1009 hPa	Power: Battery
Remarks:			

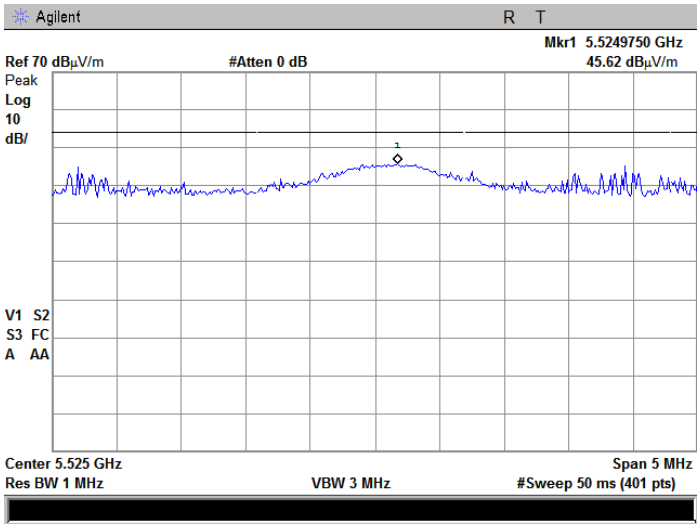
Plot 7.1.19 Radiated emission measurements at the fifth harmonic frequency of low frequency

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



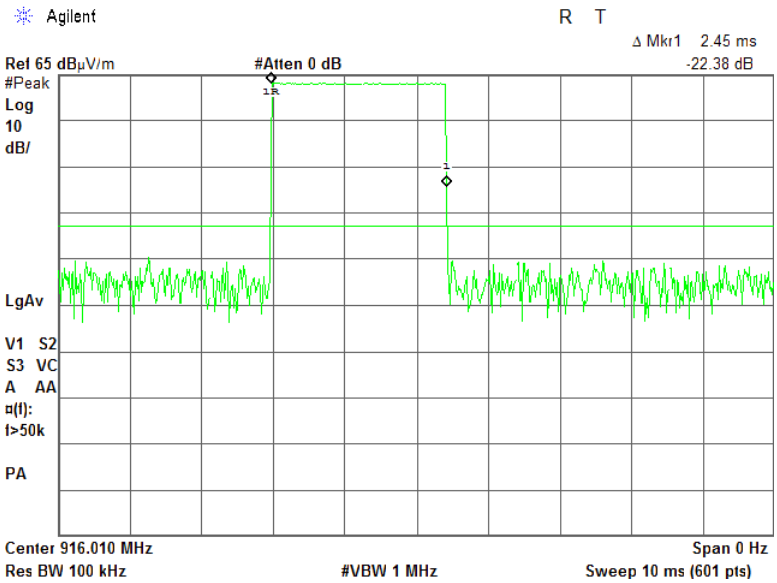
Plot 7.1.20 Radiated emission measurements at the fifth harmonic frequency of high frequency

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

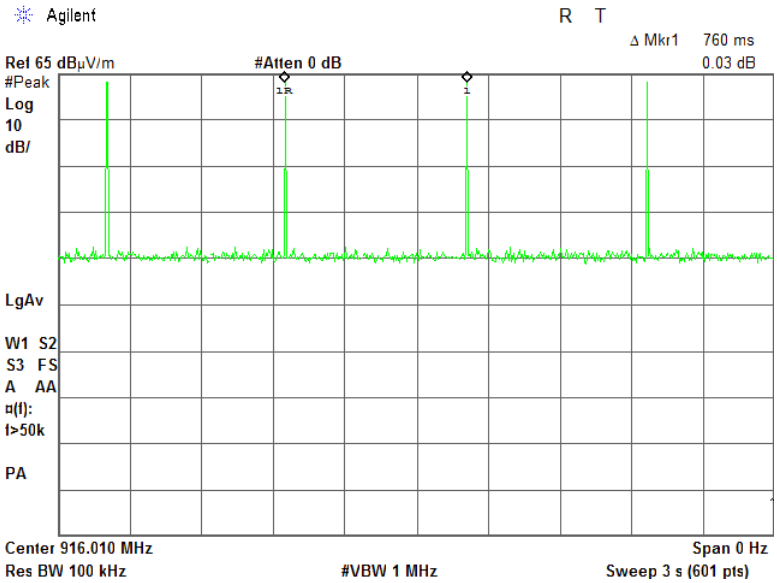


Test specification:	Section 15.249(a)(d)/RSS-210, section A2.9, Field strength of emissions		
Test procedure:	ANSI C63.10 sections 6.5, 6.6		
Test mode:	Compliance	Verdict:	PASS
Date(s):	15-Jun-16		
Temperature: 23 ºC	Relative Humidity: 55 %	Air Pressure: 1009 hPa	Power: Battery
Remarks:			

Plot 7.1.21 Transmission pulse duration



Plot 7.1.22 Transmission pulse period



Test specification:	Section 15.215(c)/ RSS-Gen, section 6.6, Occupied bandwidth		
Test procedure:	ANSI C63.10 section 6.9.2		
Test mode:	Compliance	Verdict:	PASS
Date(s):	16-Jun-16		
Temperature: 23 ºC	Relative Humidity: 55 %	Air Pressure: 1009 hPa	Power: 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
2400 – 2483.5	
5725 – 5875	
24000 – 24250	

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

7.2.2 Test procedure

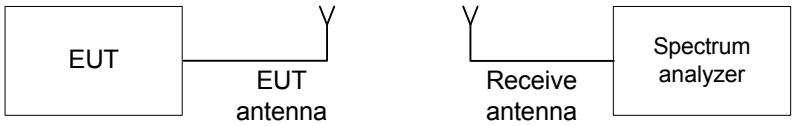
7.2.2.1 The EUT was set up as shown in Figure 7.2.1, energized and its proper operation was checked.

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



Test specification:	Section 15.215(c)/ RSS-Gen, section 6.6, Occupied bandwidth		
Test procedure:	ANSI C63.10 section 6.9.2		
Test mode:	Compliance	Verdict:	PASS
Date(s):	16-Jun-16		
Temperature: 23 ºC	Relative Humidity: 55 %	Air Pressure: 1009 hPa	Power: Battery
Remarks:			

Table 7.2.2 Occupied bandwidth test results

ASSIGNED FREQUENCY BAND 902-928 MHz
DETECTOR USED: Peak hold
RESOLUTION BANDWIDTH: 3 kHz
VIDEO BANDWIDTH: 10 kHz
MODULATION ENVELOPE REFERENCE POINTS: 20 dBc
MODULATION: 4FSK

Band edge	Cross point frequency, MHz	OBW, kHz		Assigned band edge, MHz	Verdict
		20 dBc	99%		
Low	911.1895	53.125	51.2395	902	Pass
High	920.8440	53.102	51.0180	928	Pass

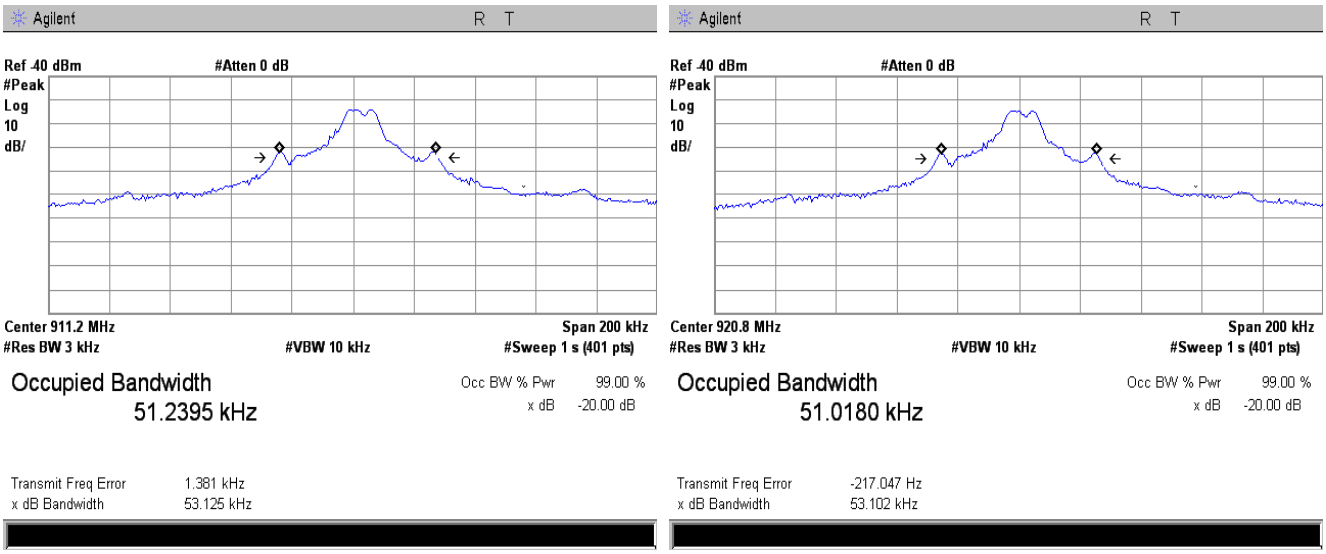
Reference numbers of test equipment used

HL 2909								

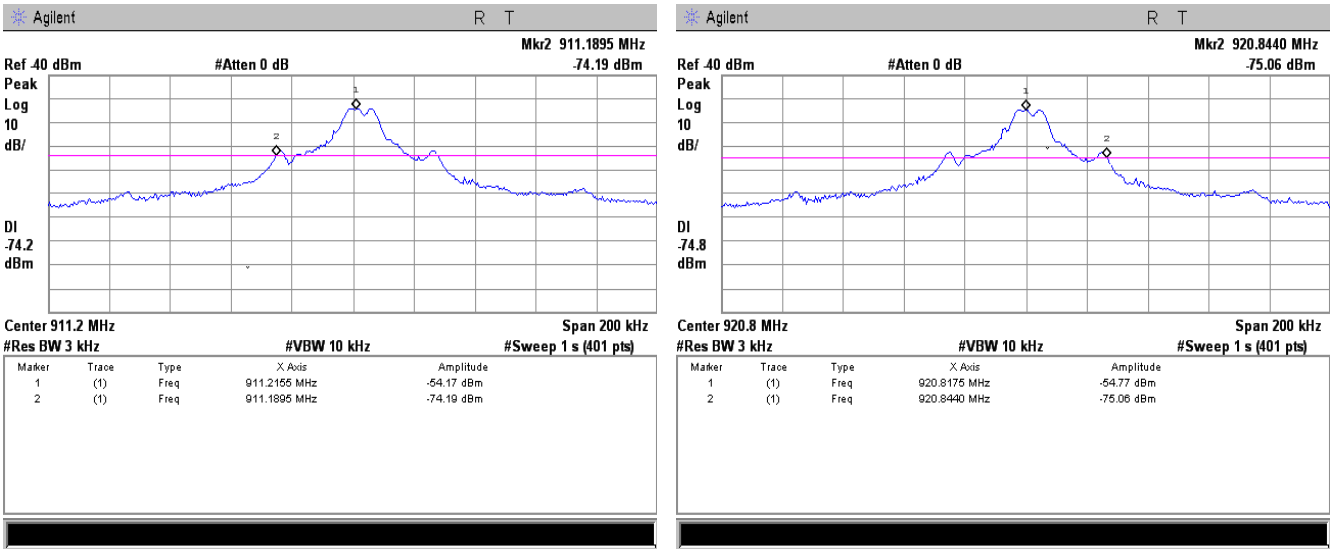
Full description is given in Appendix A.

Test specification:	Section 15.215(c)/ RSS-Gen, section 6.6, Occupied bandwidth		
Test procedure:	ANSI C63.10 section 6.9.2		
Test mode:	Compliance	Verdict:	PASS
Date(s):	16-Jun-16		
Temperature: 23 ºC	Relative Humidity: 55 %	Air Pressure: 1009 hPa	Power: Battery
Remarks:			

Plot 7.2.1 Occupied bandwidth test result



Plot 7.2.2 Cross point frequencies, low and high band edges



Test specification:	Section 15.249(d)/RSS-210, section A2.9, Band edge emissions		
Test procedure:	ANSI C63.10 section 6.10		
Test mode:	Compliance	Verdict:	PASS
Date(s):	15-Jun-16		
Temperature: 23 ºC	Relative Humidity: 55 %	Air Pressure: 1009 hPa	Power: 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.

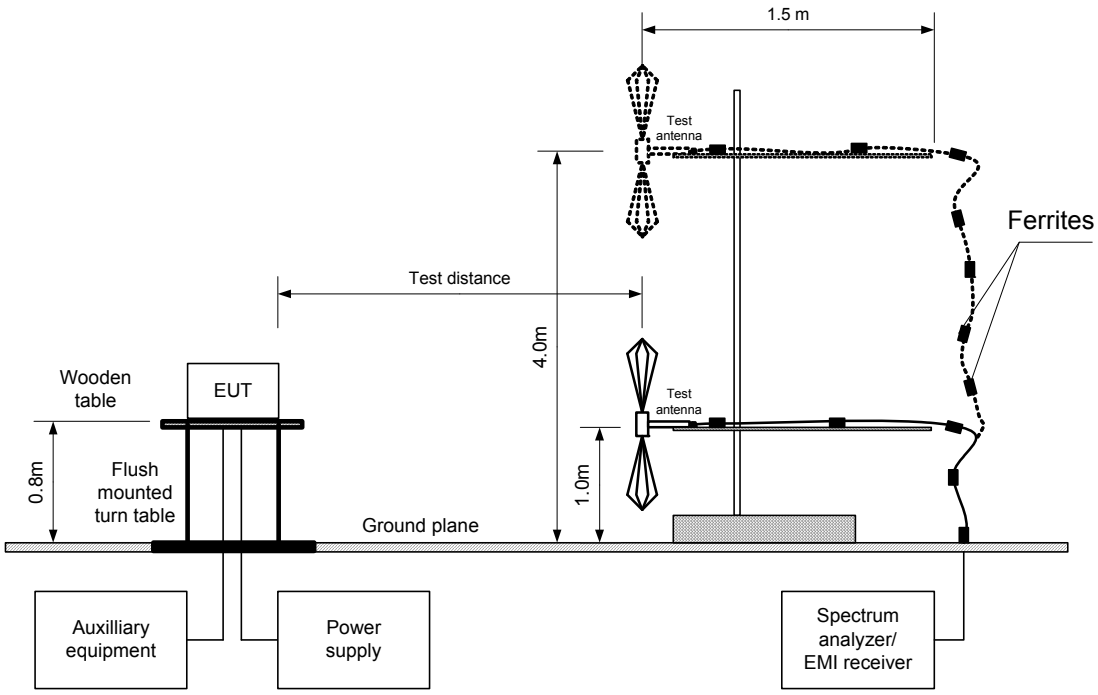
7.3.2.2 The spectrum analyzer frequency span was set to capture all major modulation sidebands of emission and sweep time was set sufficiently slow to ensure peak measurements. Spectrum analyzer was set in peak hold mode and time sufficient for trace stabilization was allowed.

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.

Test specification:	Section 15.249(d)/RSS-210, section A2.9, Band edge emissions		
Test procedure:	ANSI C63.10 section 6.10		
Test mode:	Compliance	Verdict:	PASS
Date(s):	15-Jun-16		
Temperature: 23 ºC	Relative Humidity: 55 %	Air Pressure: 1009 hPa	Power: Battery
Remarks:			

Figure 7.3.1 Band edge emission measurement set up



Test specification:	Section 15.249(d)/RSS-210, section A2.9, Band edge emissions		
Test procedure:	ANSI C63.10 section 6.10		
Test mode:	Compliance	Verdict:	PASS
Date(s):	15-Jun-16		
Temperature: 23 ºC	Relative Humidity: 55 %	Air Pressure: 1009 hPa	Power: 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: 4FSK
TRANSMITTER OUTPUT POWER SETTINGS: Maximum

Modulation envelope		Measured peak emission, dBµV/m	Measured QP emission, dBµV/m	QP limit, dBµV/m	Margin, dB *	Verdict
Edge	Frequency, MHz					
Low	902	38.72	NA	46	-7.28	Pass
High	928	38.72	NA	46	-7.28	Pass

* - Margin = measured value– limit

Reference numbers of test equipment used

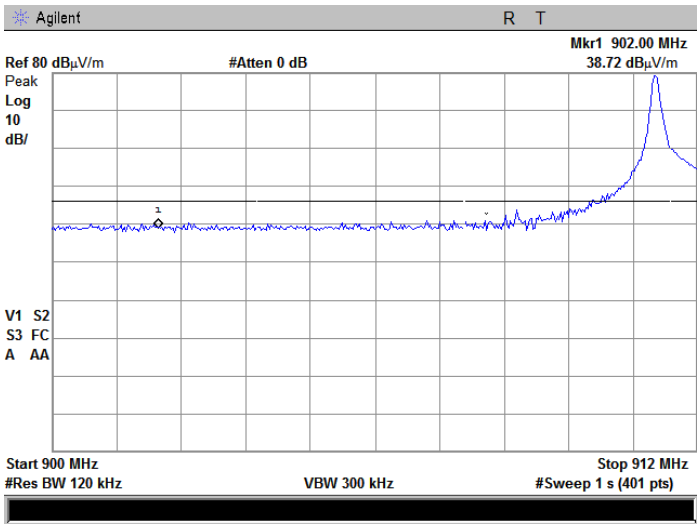
HL 0604	HL 2780	HL 4278	HL 4353				

Full description is given in Appendix A.

Test specification:	Section 15.249(d)/RSS-210, section A2.9, Band edge emissions		
Test procedure:	ANSI C63.10 section 6.10		
Test mode:	Compliance	Verdict:	PASS
Date(s):	15-Jun-16		
Temperature: 23 ºC	Relative Humidity: 55 %	Air Pressure: 1009 hPa	Power: Battery
Remarks:			

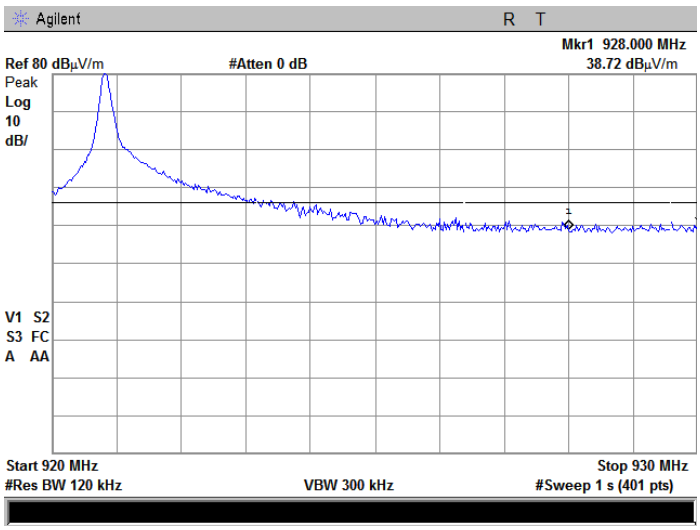
Plot 7.3.1 Low band edge emission test result

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



Plot 7.3.2 High band edge emission test result

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



Test specification:	Section 15.203, RSS-Gen, Section 8.3, Antenna requirement		
Test procedure:	Visual inspection / supplier declaration		
Test mode:	Compliance	Verdict:	PASS
Date(s):	15-Jun-16		
Temperature: 23 ºC	Relative Humidity: 55 %	Air Pressure: 1009 hPa	Power: Battery
Remarks:			

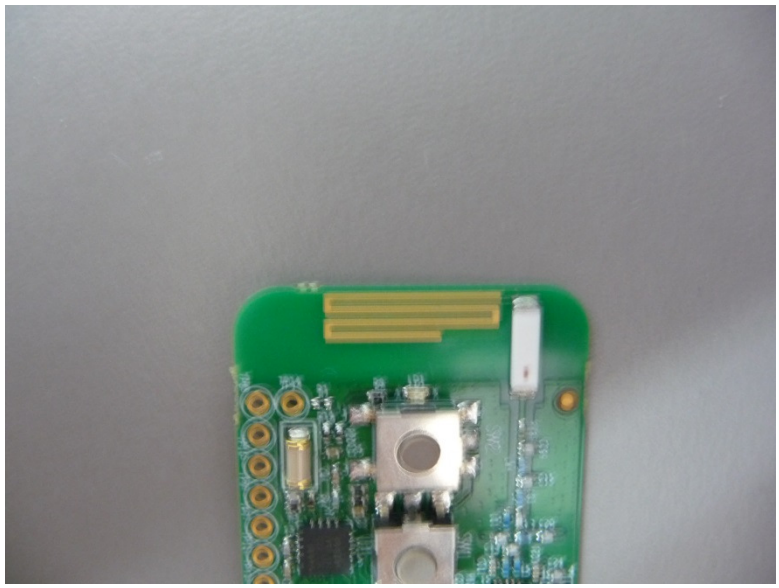
7.4 Antenna requirements

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



Test specification:	Section 15.109/ ICES-003, Section 6.2, Radiated emission		
Test procedure:	ANSI C63.4, Sections 11.6 and 12.1.4		
Test mode:	Compliance	Verdict:	PASS
Date(s):	15-Jun-16		
Temperature: 23 ºC	Relative Humidity: 55 %	Air Pressure: 1009 hPa	Power: Battery
Remarks:			

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 8.1.1 Radiated emission test limits

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.

8.1.2 Test procedure

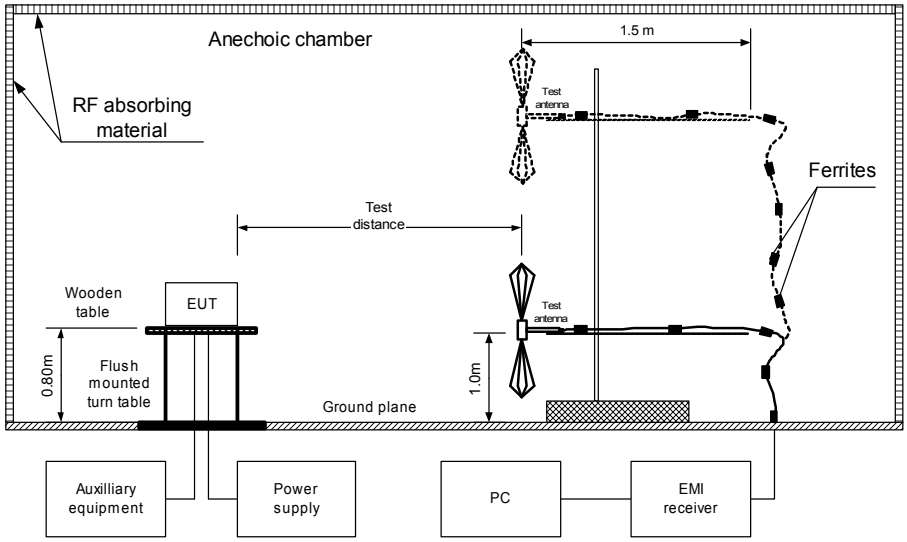
8.1.2.1 The EUT was set up as shown in Figure 8.1.1 and associated photograph/s, energized and the performance check was conducted.

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 360^0, 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 8.1.2 and shown in the associated plots.

Test specification:	Section 15.109/ ICES-003, Section 6.2, Radiated emission		
Test procedure:	ANSI C63.4, Sections 11.6 and 12.1.4		
Test mode:	Compliance	Verdict:	PASS
Date(s):	15-Jun-16		
Temperature: 23 ºC	Relative Humidity: 55 %	Air Pressure: 1009 hPa	Power: Battery
Remarks:			

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



Test specification:	**Section 15.109/ ICES-003, Section 6.2, Radiated emission**		
Test procedure:	ANSI C63.4, Sections 11.6 and 12.1.4		
Test mode:	Compliance	**Verdict:**	PASS
Date(s):	15-Jun-16		
Temperature: 23 ºC	**Relative Humidity:** 55 %	**Air Pressure:** 1009 hPa	**Power:** Battery
Remarks:			

Table 8.1.2 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

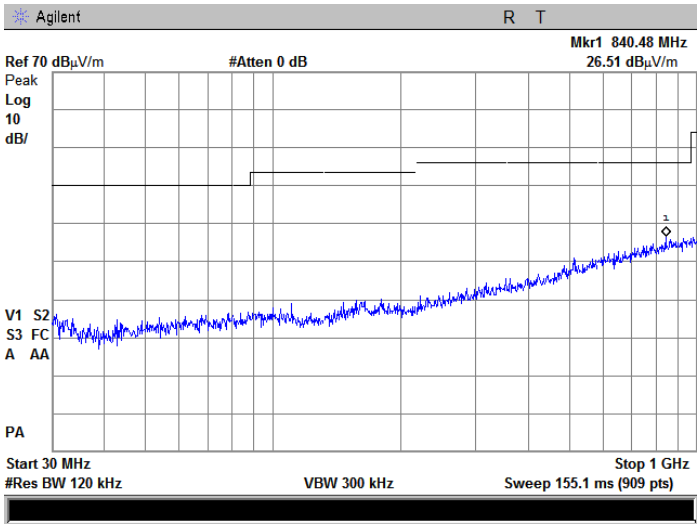
HL 0604	HL 2780	HL 4278	HL 4353	HL 4933			

Full description is given in Appendix A.

Test specification:	Section 15.109/ ICES-003, Section 6.2, Radiated emission		
Test procedure:	ANSI C63.4, Sections 11.6 and 12.1.4		
Test mode:	Compliance	Verdict:	PASS
Date(s):	15-Jun-16		
Temperature: 23 ºC	Relative Humidity: 55 %	Air Pressure: 1009 hPa	Power: Battery
Remarks:			

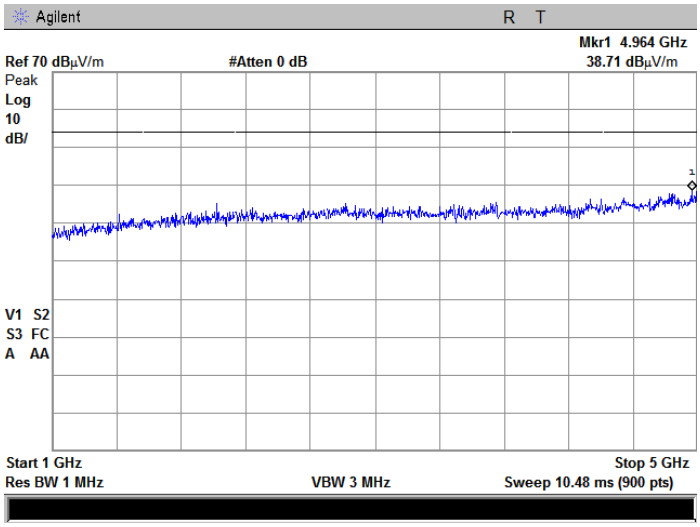
Plot 8.1.1 Radiated emission measurements in 30 - 1000 MHz range, vertical antenna polarization

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



Plot 8.1.2 Radiated emission measurements above 1000 MHz

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



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	18-Jan-16	18-Jan-17
0604	Antenna BiconiLog Log-Periodic/T Bow-TIE, 26 - 2000 MHz	EMCO	3141	9611-1011	10-May-16	10-May-17
2780	EMC analyzer, 100 Hz to 26.5 GHz	Agilent Technologies	E7405A	MY45102462	08-Sep-15	08-Sep-16
2909	Spectrum analyzer, ESA-E, 100 Hz to 26.5 GHz	Agilent Technologies	E4407B	MY41444762	21-Feb-16	21-Feb-17
3818	PSA Series Spectrum Analyzer, 3 Hz- 44 GHz	Agilent Technologies	E4446A	MY48250288	03-May-16	03-May-17
4278	Test Cable , DC-18 GHz, 4.6 m, N/M - N/M	Mini-Circuits	APC-15FT-NMNM+	0755A	22-Nov-15	22-Nov-16
4339	High pass Filter, 50 Ohm, 1000 to 18000 MHz, SMA-FM / SMA-M	Micro-Tronics	HPM50115-02	001	08-May-16	08-May-17
4353	Low Loss Armored Test Cable, DC - 18 GHz, 6.2 m, N type-M/N type-M	MegaPhase	NC29-N1N1-244	12025101003	15-Mar-16	15-Mar-17
4933	Active Horn Antenna, 1 GHz to 18 GHz	Com-Power Corporation	AHA-118	701046	04-Sep-15	04-Sep-16

10 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 10 m measuring distance Horizontal polarization Vertical polarization	 Biconilog antenna: ± 5.0 dB Biconical antenna: ± 5.0 dB Log periodic antenna: ± 5.1 dB Double ridged horn antenna: ± 5.3 dB Biconilog antenna: ± 5.5 dB Biconical antenna: ± 5.5 dB Log periodic antenna: ± 5.6 dB Double ridged horn antenna: ± 5.8 dB
Radiated emissions at 3 m measuring distance Horizontal polarization Vertical polarization	 Biconilog antenna: ± 5.3 dB Biconical antenna: ± 5.0 dB Log periodic antenna: ± 5.3 dB Double ridged horn antenna: ± 5.3 dB Biconilog antenna: ± 6.0 dB Biconical antenna: ± 5.7 dB Log periodic antenna: ± 6.0 dB Double ridged horn antenna: ± 6.0 dB
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.

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). 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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Person for contact: Mr. Alex Usoskin, CEO.

12 APPENDIX D Specification references

47CFR part 15: 2015	Radio Frequency Devices.
ANSI C63.10: 2013	American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices
ANSI C63.2: 1996	American National Standard for Instrumentation-Electromagnetic Noise and Field Strength, 10 kHz to 40 GHz-Specifications.
ANSI C63.4: 2014	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
ICES-003: 2016, Issue 6	Information Technology Equipment (Including Digital Apparatus) – Limits and methods of measurement

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(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).

Antenna factor, HL 4933

COM-POWER CORPORATION

Active Horn Antenna Factor Calibration

1 GHz to 18 GHz

Equipment:	**ACTIVE HORN ANTENNA**
Model:	**AHA-118**
Serial Number:	**701046**
Calibration Distance:	**3 Meter**
Polarization:	**Horizontal**
Calibration Date:	**11/12/2014**

Frequency (GHz)	*Preamplifier Gain (dB)*	*Antenna Factor with pre-amp (dB/m)*	*Frequency (GHz)*	*Preamplifier Gain (dB)*	*Antenna Factor with pre-amp (dB/m)*
1	40.96	-16.47	10	40.94	-1.97
1.5	41.21	-14.53	10.5	40.63	-1.06
2	41.44	-13.30	11	40.74	-1.50
2.5	41.71	-12.87	11.5	40.65	-0.52
3	41.96	-12.26	12	40.76	-0.15
3.5	42.14	-11.77	12.5	41.03	-0.85
4	42.13	-10.91	13	41.37	-0.81
4.5	41.79	-9.41	13.5	41.18	0.05
5	41.44	-7.54	14	40.98	0.36
5.5	40.91	-6.47	14.5	40.81	1.26
6	40.69	-5.48	15	40.65	0.25
6.5	40.64	-5.53	15.5	40.93	-1.05
7	40.76	-4.12	16	41.31	-1.44
7.5	40.94	-3.12	16.5	40.96	-0.80
8	40.68	-1.69	17	40.64	-0.02
8.5	40.08	-1.71	17.5	40.57	1.81
9	40.41	-1.86	18	40.08	3.63
9.5	41.21	-2.73			

Calibration according to ARP 958

Antenna Factor to be added to receiver reading:

Meter Reading (dBuV) + Antenna Factor (dB/m) = Corrected Reading (dBuV/m)

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		

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