



Hermon Laboratories Ltd. P.O. Box 23, Binyamina 3055001, Israel Tel. +972 4628 8001 Fax. +972 4628 8277 E-mail: mail@hermonlabs.com

# **TEST REPORT**

ACCORDING TO: FCC 47CFR part 15 subpart C § 15.247 (FHSS) and subpart B RSS-247 issue 2, RSS-Gen issue 4, ICES-003 Issue 6:2016

FOR:

Digital Security Controls Ltd. Supervised Wireless PowerG Smoke Detector Model: PG9936 FCC ID:F5317PG9936 IC:160A-PG9936

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.



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## **1** Applicant information

Client name:	Digital Security Controls Ltd.
Address:	3301 Langstaff Road, Concord, Ontario L4K 4L2, Canada
Telephone:	905-760-3000
Fax:	905-760-3020
E-mail:	dnita@dsc.com
Contact name:	Mr. Dan Nita

## 2 Equipment under test attributes

Product name:	Supervised Wireless PowerG Smoke Detector
Product type:	Transceiver
Model(s):	PG9936
Serial number:	0-500325
Hardware version:	90-208631
Software release:	JS-703284
Receipt date	17-Aug-17

## 3 Manufacturer information

Manufacturer name:	Visonic Ltd.
Address:	Habarzel street 24, Tel Aviv 69710, Israel
Telephone:	+972 3645 6832
Fax:	+972 3645 6788
E-Mail:	zurir@tycoint.com
Contact name:	Mr. Zuri Rubin

## 4 Test details

Project ID:	29963
Location:	Primary: Hermon Laboratories Ltd. P.O. Box 23, Binyamina 3055001, Israel Satellite: Hermon Laboratories Ltd. Hefetz-Haim 10, Tel Aviv 6744124, Israel
Test started:	09-Aug-17
Test completed:	29-Aug-17
Test specification(s):	FCC 47CFR part 15, subpart C, §15.247(FHSS) and subpart B;
	RSS-247 issue 2, RSS-Gen issue 4, ICES-003 issue 6:2016



## 5 Tests summary

Test	Status
Transmitter characteristics	
Section 15.247(a)1/ RSS-247 section 5.1(c), 20 dB bandwidth	Pass
Section 15.247(a)1/ RSS-247 section 5.1(b), Frequency separation	Pass
Section 15.247(a)1/ RSS-247 section 5.1(c), Number of hopping frequer	ncies Pass
Section 15.247(a)1/ RSS-247 section 5.1(c), Average time of occupancy	Pass
Section 15.247(b) / RSS-247 section 5.4(a), Peak output power	Pass
Section 15.247(d) / RSS-247 section 5.5, Radiated spurious emissions	Pass
Section 15.247(d) / RSS-247 section 5.5, Emissions at band edges	Pass
Section 15.247(i)5/ RSS-102 section 2.5, RF exposure	Pass, the exhibit to the application of certification is provided
Section 15.203/ RSS-Gen section 8.3, Antenna requirements	Pass
Section 15.207(a) / RSS-Gen section 8.8, Conducted emission	Not required
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 Mr. I. Zilberstein, test engineer	August 29, 2017	litte cont-
Reviewed by:	Mrs. M. Cherniavsky, certification engineer	September 11, 2017	Chur
Approved by:	Mr. S. Samokha, project manager	September 13, 2017	Ca



## 6 EUT description

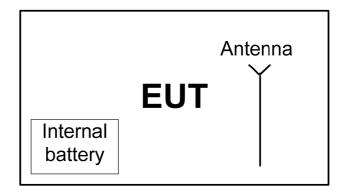
## 6.1 General information

The EUT is a Supervised Wireless PowerG Smoke Detector. The EUT is equipped with an integral antenna and is powered by 3 VDC internal battery.

## 6.2 Changes made in EUT

No changes were implemented in the EUT during the testing.

## 6.3 Test configuration





## 6.4 EUT test positions

Photograph 6.4.1 EUT in X-axis orthogonal position



Photograph 6.4.2 EUT in Y-axis orthogonal position





## 6.5 Transmitter characteristics

Type	of equipmer	nt											
X     Stand-alone (Equipment with or without its own control provisions)													
	Combined	ombined 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)											
Inten	ded use		Condition of	use									
	fixed		Always at a di	stance	more	than 2	m from a	l people					
Х	mobile			at a distance more than 20 cm from all people									
	portable		May operate a	at a dis	tance	closer	than 20 cr	n to human	body	1			
Assig	gned frequen	ncy ranges		902 -	928 N	ЛНz							
Opera	ating freque	ncies		912.7	50 – 9	19.106	6 MHz						
				At tra	nsmitt	er 50 🖸	2 RF outpu	it connecto	r			dBm	
Maxir	num rated o	utput powe	r			t powe					1	11.4 dBm	
				Х	No								
						T	(	continuous	varial	ole			
ls tra	nsmitter out	put power v	/ariable?		N-					with stepsiz	е	dB	
					Yes	r	ninimum F	RF power				dBm	
						r	maximum RF power			dBm			
Anter	nna connecti	ion											
							X			with tempo	rary RF o	connector	
	unique co	upling	star	ndard c	onnec	tor	х	integral	Х			RF connector	
Anter	nna/s technio	cal characte	eristics										
Туре			Manufac	turer			Model n	umber			Gain		
Integr	al		Ocean		H306097 -2 dBi								
Trans	smitter aggre	egate data r	ate/s			50 kb	ps						
	of modulatio					GFS	<						
Modu	lating test s	ignal (base	band)			PRBS	6						
Trans	smitter powe	r source	·										
Х	Battery		ninal rated vol	tage		3.0 V		Battery t	уре	3 AAA D	uracell P	rocell PC2400	
	DC	Nom	ninal rated vol	tage									
AC mains Nominal rated voltage				tage				Frequen	су				
Com	non power s	ource for tr	ansmitter and	l receiv	ver			Х	Ŋ	/es		no	
					Х			opping (FH					
Sprea	ad spectrum	technique	used					nission sys	stem (	DTS)			
	-					,	/brid	-					
Sprea			s for transmitt	ers tes		er FCC	; 15.247 o	nly					
FUIDO		Total number			50								
FHSS Bandwidth per hop Max. separation of hops					103.3 135 k								
iviar. Separation of hops					100 K	112							



Test specification: Section 15.247(a)1, RSS-247 section 5.1(c), 20 dB bandwidth								
Test procedure:	ANSI C63.10, section 7.8.7							
Test mode:	Compliance	Verdict: PASS						
Date(s):	27-Aug-17	verdict.	FA33					
Temperature: 23 °C	Relative Humidity: 55 %	Air Pressure: 1010 hPa	Power: Battery					
Remarks:								

# 7 Transmitter tests according to 47CFR part 15 subpart C and RSS-247 requirements

## 7.1 20 dB bandwidth

#### 7.1.1 General

This test was performed to measure the 20 dB bandwidth of the transmitter hopping channel. Specification test limits are given in Table 7.1.1.

#### Table 7.1.1 The 20 dB bandwidth limits

Assigned frequency, MHz	Maximum bandwidth, kHz	Modulation envelope reference points*, dBc
902.0 - 928.0	250	
2400.0 - 2483.5	NA	20
5725.0 - 5850.0	1000	
* Madulation annuales a safasas		

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

#### 7.1.2 Test procedure

- 7.1.2.1 The EUT was set up as shown in Figure 7.1.1, energized and its proper operation was checked.
- 7.1.2.2 The EUT was set to transmit modulated carrier at maximum data rate.
- **7.1.2.3** The transmitter bandwidth was measured with spectrum analyzer as frequency delta between reference points on modulation envelope and provided in Table 7.1.2 and associated plot.

#### Figure 7.1.1 The 20 dB bandwidth test setup





Test specification: Section 15.247(a)1, RSS-247 section 5.1(c), 20 dB bandwidth								
Test procedure:	ure: ANSI C63.10, section 7.8.7							
Test mode:	Compliance	Vardiate	PASS					
Date(s):	27-Aug-17	Verdict:	FA33					
Temperature: 23 °C	Relative Humidity: 55 %	Air Pressure: 1010 hPa	Power: Battery					
Remarks:								

#### Table 7.1.2 The 20 dB bandwidth test results

ASSIGNED FREQUEN DETECTOR USED: SWEEP TIME: VIDEO BANDWIDTH: MODULATION ENVEL FREQUENCY HOPPIN	OPE REFEREN	ICE POINTS:	Peak Auto ≥ RB	N dBc			
Carrier frequency, MHz	Type of modulation	Data rate, kbps	Symbol rate, Msymbols/s	20 dB bandwidth, kHz	Limit, kHz	Margin, kHz	Verdict
912.74				103.33	250	-146.67	Pass
915.85	GFSK	50	NA	101.59	250	-148.41	Pass
919.10				101.01	250	-148.99	Pass

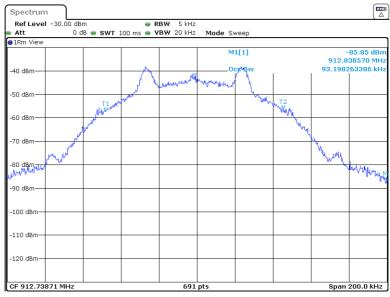
#### Reference numbers of test equipment used

HL 4355	HL 4135	HL			
Full descriptio	n is given in A	Appendix A.			



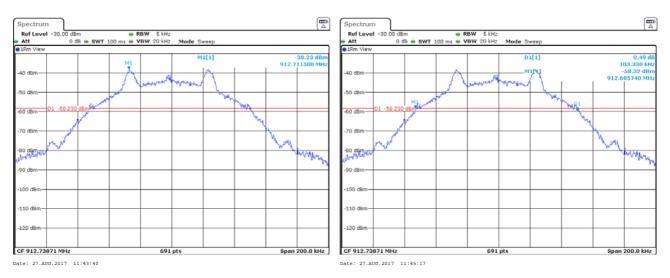
Test specification:	Section 15.247(a)1, RSS-247 section 5.1(c), 20 dB bandwidth				
Test procedure:	ANSI C63.10, section 7.8.7				
Test mode:	Compliance	Verdict: PASS			
Date(s):	27-Aug-17	verdict:	FA33		
Temperature: 23 °C	Relative Humidity: 55 %	Air Pressure: 1010 hPa	Power: Battery		
Remarks:					

#### Plot 7.1.1 The 99% bandwidth test result at low frequency



Date: 27.AUG.2017 11:42:01

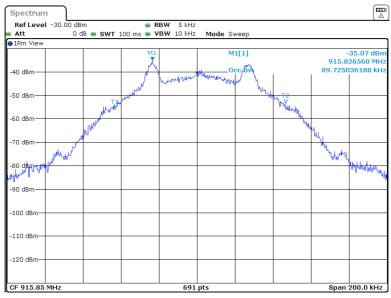
#### Plot 7.1.2 The 20 dB bandwidth test result at low frequency





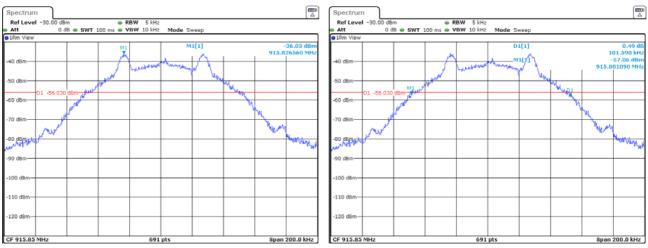
Test specification:	Section 15.247(a)1, RSS-247 section 5.1(c), 20 dB bandwidth				
Test procedure:	ANSI C63.10, section 7.8.7				
Test mode:	Compliance	Verdict: PASS			
Date(s):	27-Aug-17	verdict:	FA33		
Temperature: 23 °C	Relative Humidity: 55 %	Air Pressure: 1010 hPa	Power: Battery		
Remarks:					

#### Plot 7.1.3 The 99% bandwidth test result at mid frequency



Date: 27.AUG.2017 12:56:52

#### Plot 7.1.4 The 20 dB bandwidth test result at mid frequency



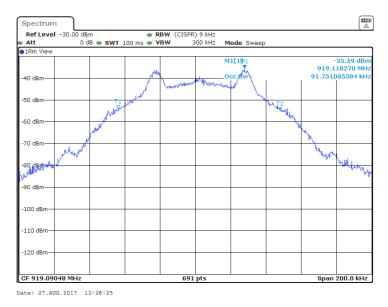
Date: 27.AUG.2017 12:52:57

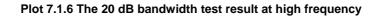
Date: 27.AUG.2017 12:54:37

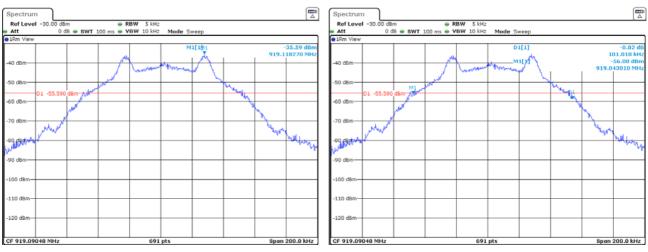


Test specification:	Section 15.247(a)1, RSS-247 section 5.1(c), 20 dB bandwidth				
Test procedure:	ANSI C63.10, section 7.8.7				
Test mode:	Compliance	Verdict: PASS			
Date(s):	27-Aug-17	verdict:	FA33		
Temperature: 23 °C	Relative Humidity: 55 %	Air Pressure: 1010 hPa	Power: Battery		
Remarks:					

#### Plot 7.1.5 The 99% bandwidth test result at high frequency







Date: 27.AUG.2017 12:45:38

Date: 27.AUG.2017 12:44:27



Test specification:	Section 15.247(a)1, RSS-247 section 5.1(b), Frequency separation				
Test procedure:	ANSI C63.10, section 7.8.2				
Test mode:	Compliance	Verdict:	PASS		
Date(s):	27-Aug-17	verdict:	FA33		
Temperature: 23 °C	Relative Humidity: 55 %	Air Pressure: 1010 hPa	Power: Battery		
Remarks:					

## 7.2 Carrier frequency separation

#### 7.2.1 General

This test was performed to measure frequency separation between the peaks of adjacent channels. Specification test limits are given in Table 7.2.1.

Table 7.2.1 Ca	arrier frequency	separation limits
----------------	------------------	-------------------

Assigned frequency range,	Carrier frequency separation			
MHz	Output power 30 dBm	Output power 21 dBm		
902.0 - 928.0	25 kHz or 20 dB bandwidth of the	25 kHz or two-thirds of the 20 dB		
2400.0 - 2483.5	hopping channel,	bandwidth of the hopping channel,		
5725.0 – 5850.0	whichever is greater	whichever is greater		

#### 7.2.2 Test procedure

**7.2.2.1** The EUT was set up as shown in Figure 7.2.1, energized with frequency hopping function enabled and its proper operation was checked.

- **7.2.2.2** The spectrum analyzer span was set to capture the carrier frequency and both of adjacent channels, the lower and the higher. The resolution bandwidth was set wider than 1 % of the frequency span.
- 7.2.2.3 The spectrum analyzer was set in max hold mode and allowed trace to stabilize.
- **7.2.2.4** The frequency separation between the peaks of adjacent channels was measured as provided in Table 7.2.2 and associated plots.

#### Figure 7.2.1 Carrier frequency separation test setup





31.7

Pass

Test specification:	Section 15.247(a)1, RSS-247 section 5.1(b), Frequency separation				
Test procedure:	ANSI C63.10, section 7.8.2				
Test mode:	Compliance	Verdict:	PASS		
Date(s):	27-Aug-17	verdict:	FA33		
Temperature: 23 °C	Relative Humidity: 55 %	Air Pressure: 1010 hPa	Power: Battery		
Remarks:					

#### Table 7.2.2 Carrier frequency separation test results

Carrier frequency separation, kHz	Limit, kHz	Margin*	Verdict
20 dB BANDWIDTH:	103.3 kHz		
FREQUENCY HOPPING:	Enabled		
VIDEO BANDWIDTH:	≥ RBW		
RESOLUTION BANDWIDTH:	≥ 1% of the span		
DETECTOR USED:	Peak		
BIT RATE:	50 kbps		
MODULATION:	GFSK		
ASSIGNED FREQUENCY:	902-928 MHz		

135

\* - Margin = Carrier frequency separation – specification limit.

#### Reference numbers of test equipment used

HL 4135	HL 4355				
			•	•	

103.3

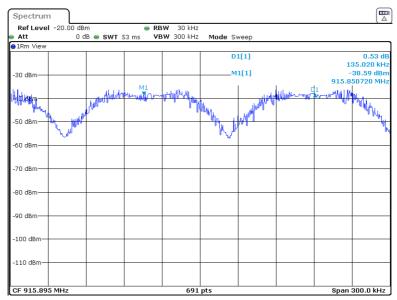
Full description is given in Appendix A.





Test specification:	Section 15.247(a)1, RSS-247 section 5.1(b), Frequency separation				
Test procedure:	ANSI C63.10, section 7.8.2				
Test mode:	Compliance	Verdiet. [			
Date(s):	27-Aug-17	- Verdict:	PASS		
Temperature: 23 °C	Relative Humidity: 55 %	Air Pressure: 1010 hPa	Power: Battery		
Remarks:			<b>j</b>		

#### Plot 7.2.1 Carrier frequency separation



Date: 27.AUG.2017 11:17:53



Test specification:	Section 15.247(a)1, RSS-247 section 5.1(c), Number of hopping frequencies				
Test procedure:	ANSI C63.10, section 7.8.3				
Test mode:	Compliance	Verdict:	PASS		
Date(s):	27-Aug-17	verdict:	FA33		
Temperature: 23 °C	Relative Humidity: 55 %	Air Pressure: 1010 hPa	Power: Battery		
Remarks:					

## 7.3 Number of hopping frequencies

#### 7.3.1 General

This test was performed to calculate the number of hopping frequencies used by the EUT. Specification test limits are given in Table 7.3.1.

Table 7.3.1 Minimum number of hopping frequencies	Table 7.3.1	Minimum	number	of ho	pping	frequencies
---	-------------	---------	--------	-------	-------	-------------

Assigned frequency range, MHz	Number of hopping frequencies
902.0 – 928.0	50 (if the 20 dB bandwidth is less than 250 kHz) 25 (if the 20 dB bandwidth is 250 kHz or greater)
2400.0 - 2483.5	15
5725.0 – 5850.0	75

#### 7.3.2 Test procedure

- **7.3.2.1** The EUT was set up as shown in Figure 7.3.1, energized with frequency hopping function enabled and its proper operation was checked.
- **7.3.2.2** Initially the spectrum analyzer span was set equal to frequency band of operation and the resolution bandwidth was set wider than 1 % of the frequency span. If the separate hopping channels were not clearly resolved the frequency band of operation was broken to sections and the resolution bandwidth was set wider than 1 % of the frequency span of each section.
- **7.3.2.3** The spectrum analyzer was set in max hold mode and allowed trace to stabilize.
- **7.3.2.4** The number of frequency hopping channels was calculated as provided in Table 7.3.2 and the associated plots.

#### Figure 7.3.1 Hopping frequencies test setup





Test specification:	Section 15.247(a)1, RSS-247 section 5.1(c), Number of hopping frequencies						
Test procedure:	ANSI C63.10, section 7.8.3						
Test mode:	Compliance	Verdict:	PASS				
Date(s):	27-Aug-17	verdict:	FA33				
Temperature: 23 °C	Relative Humidity: 55 %	Air Pressure: 1010 hPa	Power: Battery				
Remarks:			-				

#### Table 7.3.2 Hopping frequencies test results

ASSIGNED FREQUENCY: MODULATION: BIT RATE: DETECTOR USED: FREQUENCY HOPPING:	902-928 MHz GFSK 50 kbps Peak Enabled		
Number of hopping frequencies	Minimum number of hopping frequencies	Margin*	Verdict
50	50	0	Pass

\* - Margin = Number of hopping frequencies – Minimum number of hopping frequencies.

#### Reference numbers of test equipment used

HL 4135 HL 4355	

Full description is given in Appendix A.



Test specification:	Section 15.247(a)1, RSS-2	247 section 5.1(c), Number of	f hopping frequencies	
Test procedure:	ANSI C63.10, section 7.8.3			
Test mode:	Compliance	Verdict:	PASS	
Date(s):	27-Aug-17	verdict:	FA33	
Temperature: 23 °C	Relative Humidity: 55 %	Air Pressure: 1010 hPa	Power: Battery	
Remarks:			· · · · · ·	

#### Plot 7.3.1 Number of hopping frequencies

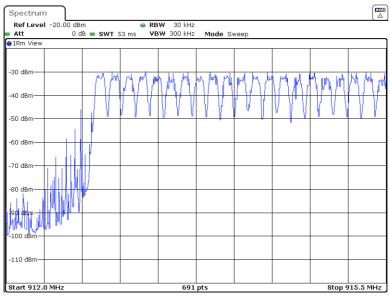
Spectrum Ref Level -	20.00.48m		- DDU	(CISPR)	100 kua					
Att		😑 SWT 53 ms			1 MHz	Mode	Sween			
●1Rm Max				-						
-40 dBm				<u>Villanda</u>	h paparangs	12.41)/~ 11.[1]	M2		919	33.10 dB 9.2550 MF 32.10 dB 2.8520 MF
-50 dBm									912	2.8520 MI
-60 dBm										
-70 dBm										
-80 dBm										
-90 dBm			J.							
-186 dBm							՝ Միս			·
-110 dBm										
-120 dBm						-				
Start 901.0 N Marker	1Hz			691	pts				Stop 9	929.0 MH
Type   Ref	Trc	X-value		r-value	Eun	ction	1	Fun	ction Result	
M1 M2	1	912.852 MH 919.255 MH	łz	-32.10 dB	m					

Date: 27.AUG.2017 08:43:06



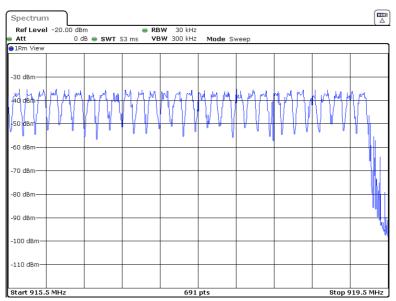
Test specification:	Section 15.247(a)1, RSS-2	247 section 5.1(c), Number of	f hopping frequencies	
Test procedure:	ANSI C63.10, section 7.8.3			
Test mode:	Compliance	Verdict:	PASS	
Date(s):	27-Aug-17	verdict:	FA33	
Temperature: 23 °C	Relative Humidity: 55 %	Air Pressure: 1010 hPa	Power: Battery	
Remarks:		· ·	· · · ·	

#### Plot 7.3.2 Number of hopping frequencies (21 channels)



Date: 27.AUG.2017 09:13:58

#### Plot 7.3.3 Number of hopping frequencies (29 channels)



Date: 27.AUG.2017 09:54:24



Test specification:	Section 15.247(a)1, RSS-247 section 5.1(c), Average time of occupancy						
Test procedure:	ANSI C63.10, section 7.8.4						
Test mode:	Compliance	Verdict: PASS					
Date(s):	28-Aug-17	- Verdict: PASS					
Temperature: 23 °C	Relative Humidity: 55 %	Air Pressure: 1012 hPa	Power: Battery				
Remarks:							

## 7.4 Average time of occupancy

#### 7.4.1 General

This test was performed to calculate the average time of occupancy (dwell time) on any frequency channel of the EUT. Specification test limits are given in Table 7.4.1.

Assigned frequency range, MHz	Maximum average time of occupancy, s	Investigated period, s	Number of hopping frequencies
902.0 - 928.0	0.4	20.0	≥ 50
902.0 - 928.0	0.4	10.0	< 50
2400.0 - 2483.5	0.4	0.4 × N	N (≥ 15)
5725.0 - 5850.0	0.4	30.0	≥ 75

#### 7.4.2 Test procedure

- **7.4.2.1** The EUT was set up as shown in Figure 7.4.1, energized with frequency hopping function enabled and its proper operation was checked.
- 7.4.2.2 The spectrum analyzer span was set to zero centered on a hopping channel.
- 7.4.2.3 The single transmission duration and period were measured with oscilloscope.
- **7.4.2.4** The average time of occupancy was calculated as the single transmission time multiplied by the investigated period and divided by the single transmission period.
- 7.4.2.5 The test was repeated at each data rate and modulation type as provided in Table 7.4.2 and the associated plots.

#### Figure 7.4.1 Average time of occupancy test setup





Test specification:	Section 15.247(a)1, RSS-247 section 5.1(c), Average time of occupancy						
Test procedure:	ANSI C63.10, section 7.8.4						
Test mode:	Compliance	Verdict:	PASS				
Date(s):	28-Aug-17	verdict:	PA33				
Temperature: 23 °C	Relative Humidity: 55 %	Air Pressure: 1012 hPa	Power: Battery				
Remarks:							

#### Table 7.4.2 Average time of occupancy test results

ASSIGNED FREQUENCY: MODULATION: DETECTOR USED: NUMBER OF HOPPING FREQUENCIES: INVESTIGATED PERIOD: FREQUENCY HOPPING:			902-928 N GFSK Peak 50 20 s Enabled	ЛНz				
Carrier frequency, Single transmission Number of pulses Aver			Average time of occupancy, ms		Symbol rate, Msymbol/s	Limit, s	Margin, s*	Verdict
912.75	4.75	1	4.75	50	NA	0.4	-0.39525	Pass

\* - Margin = Average time of occupancy – specification limit.

#### Reference numbers of test equipment used

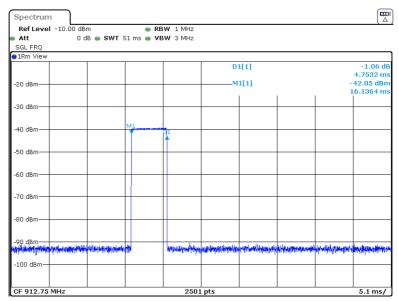
HL 4135	HL 4355			

Full description is given in Appendix A.



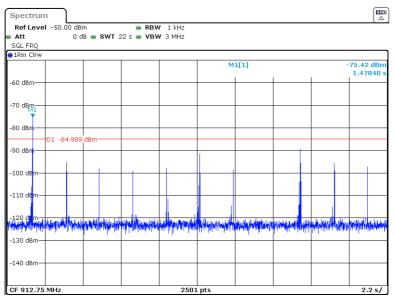
Test specification:	Section 15.247(a)1, RSS-247 section 5.1(c), Average time of occupancy					
Test procedure:	ANSI C63.10, section 7.8.4					
Test mode:	Compliance	Verdict:	PASS			
Date(s):	28-Aug-17	verdict:	PASS			
Temperature: 23 °C	Relative Humidity: 55 %	Air Pressure: 1012 hPa	Power: Battery			
Remarks:			· · · ·			

#### Plot 7.4.1 Single transmission duration



Date: 28.AUG.2017 08:40:35





Date: 28.AUG.2017 08:36:51



Test specification:	Section 15.247(b), RSS-247 section 5.4(a), Peak output power					
Test procedure:	ANSI C63.10, section 7.8.5					
Test mode:	Compliance	Verdict: PASS				
Date(s):	09-Aug-17	veraici.	FA33			
Temperature: 25.4 °C	Relative Humidity: 52 %	Air Pressure: 1008 hPa	Power: Battery			
Remarks:						

#### 7.5 Peak output power

#### 7.5.1 General

This test was performed to measure the maximum peak output power radiated by transmitter. Specification test limits are given in Table 7.5.1.

Table 7.5.1 Peak output power	limits
-------------------------------	--------

Assigned	Peak outp	out power*	Equivalent field strength limit	Maximum
frequency range, MHz	w	dBm	@ 3m, dB(μV/m)*	antenna gain, dBi
902.0 - 928.0	0.25 (<50 hopping channels) 1.0 (≥50 hopping channels)	24.0(<50 hopping channels) 30.0 (≥50 hopping channels)	125.2 (<50 hopping channels) 131.2 (≥50 hopping channels)	
2400.0 - 2483.5	0.125 (<75 hopping channels) 1.0 (≥75 hopping channels)	21.0(<75 hopping channels) 30.0 (≥75 hopping channels)	122.2 (<75 hopping channels) 131.2 (≥75 hopping channels)	6.0*
5725.0 - 5850.0	1.0	30.0	131.2	

\*- Equivalent field strength limit was calculated from the peak output power as follows: E=sqrt(30×P×G)/r, where P is peak output power in Watts, r is antenna to EUT distance in meters and G is transmitter antenna gain in dBi.

\*\*- The limit is provided in terms of conducted RF power at the antenna connector. If transmitting antennas of directional gain greater than 6 dBi are used, the peak output power limit shall be reduced below the stated value as follows:

- by 1 dB for every 3 dB that the directional gain of antenna exceeds 6 dBi for fixed point-to-point transmitters operate in 2400-2483.5 MHz band;

- without any corresponding reduction for fixed point-to-point transmitters operate in 5725-5850 MHz band; - by the amount in dB that the directional gain of antenna exceeds 6 dBi for the rest of transmitters.

#### 7.5.2 Test procedure

- **7.5.2.1** The EUT was set up as shown in Figure 7.5.1, energized and its proper operation was checked.
- 7.5.2.2 The EUT was adjusted to produce maximum available to end user RF output power.
- **7.5.2.3** The frequency span of spectrum analyzer was set approximately 5 times wider than 20 dB bandwidth of the EUT and the resolution bandwidth was set wider than 20 dB bandwidth of the EUT. To find maximum radiation the turntable was rotated 360<sup>0</sup> and the measuring antenna height was swept in both vertical and horizontal polarizations.
- **7.5.2.4** The maximum field strength of the EUT carrier frequency was measured as provided in Table 7.5.2 and associated plots.
- **7.5.2.5** The maximum peak output power was calculated from the field strength of carrier as follows:

 $P = (E \times d)^2 / (30 \times G),$ 

where P is the peak output power in W, E is the field strength in V/m, d is the test distance and G is the transmitter numeric antenna gain over an isotropic radiator.

The above equation was converted in logarithmic units for 3 m test distance:

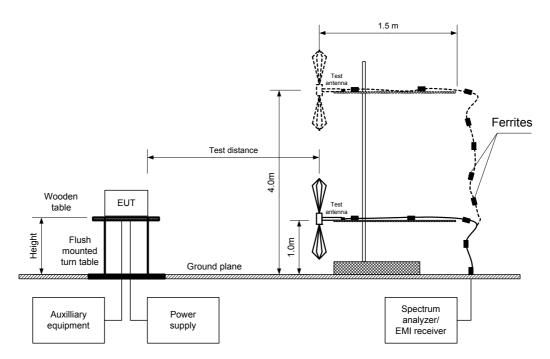
Peak output power in dBm = Field strength in dB( $\mu$ V/m) - Transmitter antenna gain in dBi – 95.2 dB

**7.5.2.6** The worst test results (the lowest margins) were recorded in Table 7.5.2.



Test specification:	Section 15.247(b), RSS-247 section 5.4(a), Peak output power					
Test procedure:	ANSI C63.10, section 7.8.5					
Test mode:	Compliance	Verdict:	PASS			
Date(s):	09-Aug-17	verdict:	FA33			
Temperature: 25.4 °C	Relative Humidity: 52 %	Air Pressure: 1008 hPa	Power: Battery			
Remarks:	·					

Figure 7.5.1 Setup for carrier field strength measurements



Test specification:	Section 15.247(b), RSS-247 section 5.4(a), Peak output power					
Test procedure:	ANSI C63.10, section 7.8.5					
Test mode:	Compliance	Verdict:	PASS			
Date(s):	09-Aug-17	verdict:	FA33			
Temperature: 25.4 °C	Relative Humidity: 52 %	Air Pressure: 1008 hPa	Power: Battery			
Remarks:						

#### Table 7.5.2 Peak output power test results

ASSIGNED FREQUENCY:	902-928 MHz
TEST DISTANCE:	3 m
TEST SITE:	Semi anechoic chamber
EUT HEIGHT:	0.8 m
DETECTOR USED:	Peak
TEST ANTENNA TYPE:	Biconilog (30 MHz – 1000 MHz)
MODULATION:	GFSK
BIT RATE:	50 kbps
TRANSMITTER OUTPUT POWER SETTINGS:	Maximum
DETECTOR USED:	Peak
RESOLUTION BANDWIDTH:	120 MHz

#### Retest after changes

Frequency, MHz	Field strength, dB(μV/m)	Antenna polarization	Antenna height, m	Azimuth, degrees*	EUT antenna gain, dBi	Peak output power, dBm**	Limit, dBm	Margin, dB***	Verdict
912.764	104.57	Н	1.0	360	-2.0	11.37	30.0	-15.63	Pass
915.837	104.14	V	1.4	360	-2.0	10.94	30.0	-16.04	Pass
919.072	104.25	V	1.1	0	-2.0	11.05	30.0	-15.95	Pass

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

\*\*- Peak output power was calculated from the field strength of carrier as follows:  $P = (E \times d)^2 / (30 \times G)$ , where P is the peak output power in W, E is the field strength in V/m, d is the test distance in meters and G is the transmitter numeric antenna gain over an isotropic radiator. The above equation was converted in logarithmic units for 3 m test distance: *Peak output power in dBm* = *Field strength in dB*( $\mu$ V/m) - *Transmitter antenna gain in dBi* – 95.2 *dB* \*\*\*- Margin = Peak output power – specification limit.

Note: Maximum peak output power was obtained in Y-axis orthogonal position.

#### Reference numbers of test equipment used

HL 4541	HL 4542	HL 4575	HL 4604	HL 5102	HL 5105		

Full description is given in Appendix A.



Test specification:	Section 15.247(b), RSS-247 section 5.4(a), Peak output power					
Test procedure:	ANSI C63.10, section 7.8.5					
Test mode:	Compliance	Verdict:	PASS			
Date(s):	09-Aug-17	verdict.	FA33			
Temperature: 25.4 °C	Relative Humidity: 52 %	Air Pressure: 1008 hPa	Power: Battery			
Remarks:						

#### Plot 7.5.1 Field strength of carrier at low frequency and Unom

	RF 50.0 A	C CORREC		SENSE:INT	AL	IGNAUTO		06:58:3	2 PM Aug 09, 20
ef Valu	e 120.00 dBµV	/m	NO: Wide 🖵		Run IB	Avg Type:	/oltage	T	TYPE MWWWW DET P P N N M
dB/div	Ref 120.00 dB	βµV/m					M	(r1 912.7) 102.457	61 5 MH ′dBµV/i
110									
100					<b>∮</b> <sup>1</sup>				
0.0									
0.0									
0.0								1 No.	
1.0 M	- CAR								Monan Dr
0.0									
0.0									
0.0									
	12.7500 MHz (CISPR) 120 kH	iz	#VB	W 300 kHz			Swe	Spar p 1.00 ms	n 500.0 k s (1001 p
G						STATUS			

Antenna polarization: Vertical EUT position: X-axis

#### Plot 7.5.2 Field strength of carrier at low frequency and Unom

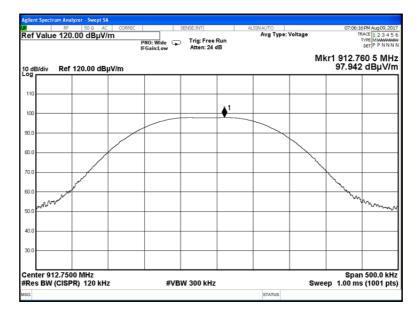
Antenna polarization:Horizontal EUT position: X-axis

ef Value 120.00 dB		PNO: Wide G	Trig: Free Atten: 24 of	Run	IGNAUTO Avg Type: \	oltage	TE	7PM Aug 09, 20 ACE 1 2 3 4 5 TYPE MWWWM DET P P N N N
dB/div Ref 120.00	dBµV/m					Mł	(r1 912.7 103.838	63 0 MH dBµV/r
110								
100				<b>♦</b> '				
		T						
0.0						$\overline{\}$		
0.0								
0.0							- North Contraction	
0.0 proved								Marin M
0.0								
0.0								
0.0								
enter 912.7500 MHz Res BW (CISPR) 120	kHz	#VB	W 300 kHz			Swee	Spar spar	n 500.0 kH s (1001 pt



Test specification:	Section 15.247(b), RSS-247 section 5.4(a), Peak output power						
Test procedure:	ANSI C63.10, section 7.8.5						
Test mode:	Compliance	Verdict: PASS					
Date(s):	09-Aug-17	verdict:	FA35				
Temperature: 25.4 °C	Relative Humidity: 52 %	Air Pressure: 1008 hPa	Power: Battery				
Remarks:							

#### Plot 7.5.3 Field strength of carrier at low frequency and Unom



Antenna polarization: Vertical EUT position: Y-axis

#### Plot 7.5.4 Field strength of carrier at low frequency and Unom

Antenna polarization:Horizontal EUT position: Y-axis

LXI	rum Analyzer - Swept S RF 50 Ω A4 e 120.00 dBμV	c   correc   /m P	NO: Wide	SENSE:INT	Run	IGNAUTO Avg Type: 1	/oltage	TF	3PM Aug 09, 2017 ACE 1 2 3 4 5 6 TYPE MWWWWW DET P P N N N N
10 dB/div	Ref 120.00 dB		Gain:Low	Atten: 24 o	18		M	(r1 912.7)	
110					1				
100					-				
80.0									
70.0								Marken .	
60.0 gran	and Ma							and a start	Mar Barriero
50.0									
30.0									
	2.7500 MHz							Spar	500.0 kH
	(CISPR) 120 kH	z	#VB	W 300 kHz		STATUS	Swee	ep 1.00 ms	(1001 pts



Test specification:	Section 15.247(b), RSS-247 section 5.4(a), Peak output power						
Test procedure:	ANSI C63.10, section 7.8.5						
Test mode:	Compliance	Verdict:	PASS				
Date(s):	09-Aug-17	verdict:	FA33				
Temperature: 25.4 °C	Relative Humidity: 52 %	Air Pressure: 1008 hPa	Power: Battery				
Remarks:							

#### Plot 7.5.5 Field strength of carrier at mid frequency and Unom



Antenna polarization: Vertical EUT position: X-axis

Plot 7.5.6 Field strength of carrier at mid frequency and Unom

1 Aug 09, 2 Avg Type: Voltage Center Freq 915.850000 MHz PNO: Wide Trig: Free Run IFGain:Low Atten: 24 dB DET P P N N N Mkr1 915.831 5 MHz 98.090 dBµV/m 10 dB/div Ref 120.00 dBµV/m 1 **≬**1 10 90. 80 70 h, 50. 40. 20 Center 915.8500 MHz #Res BW (CISPR) 120 kHz Span 500.0 kHz #VBW 300 kHz Sweep 1.00 ms (1001 pts) STATUS

Antenna polarization:Horizontal EUT position: X-axis



Test specification:	Section 15.247(b), RSS-247 section 5.4(a), Peak output power						
Test procedure:	ANSI C63.10, section 7.8.5						
Test mode:	Compliance	Verdict: PASS					
Date(s):	09-Aug-17	verdict:	FA35				
Temperature: 25.4 °C	Relative Humidity: 52 %	Air Pressure: 1008 hPa	Power: Battery				
Remarks:							

#### Plot 7.5.7 Field strength of carrier at mid frequency and Unom

gilent Spec	trum Ana RF	yzer - Swept SA 50 Q AC			SENSE:INT	A	LIGNAUTO		08:22:2	3PM Aug 09, 20
enter	Freq 9	15.850000	F	PNO: Wide 🖵 FGain:Low	Trig: Free l Atten: 24 d	Run IB	Avg Type:	Voltage	TF	DET P P N N N
0 dB/div	Ref	120.00 dBj						M	(r1 915.8) 97.035	27 0 MH dBµV/i
110										
100					1					
0.0						~ ~				
0.0			$\square$							
0.0		/	/							
0.0										
مهم 0.0	S. Contraction	ມີ								how
0.0										
0.0										
	15.850 V (CISP	0 MHz R) 120 kH;		#VB	W 300 kHz			Swe	Spar ep 1.00 ms	1 500.0 k 5 (1001 p
G	,						STATUS		•	

Antenna polarization: Vertical EUT position: Y-axis

#### Plot 7.5.8 Field strength of carrier at mid frequency and Unom

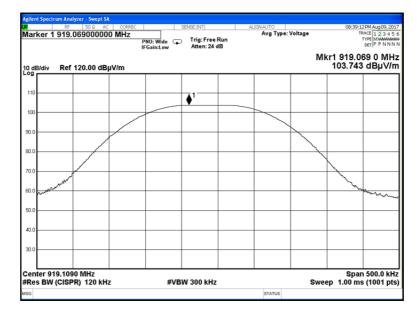
Antenna polarization:Horizontal EUT position: Y-axis

Agilent Spectrum Analyzer	- Swept SA 50 Q AC CORREC		SENSE:INT	ALIGNAUTO		00:42:2	5PM Aug 09, 201
RBW 120 kHz	SU Q AL   CURREL	PNO: Wide		ALIGNAUTO Avg T	ype: Voltage	TF	TYPE MWWWW DET P P N N N
0 dB/div Ref 120	).00 dBµV/m	IFGain:Low	witten. 24 ub		Μ	kr1 915.8 104.144	28 5 MH dBµV/i
110			<b>x</b> 1				
100			•				
90.0		1			$\rightarrow$		
80.0	-				`		
70.0	*						
50.0							n not not
40.0							
30.0							
Center 915.8500 M	14-					Spar	n 500.0 kł
Res BW (CISPR)		#VB	W 300 kHz	STATU		spar eep 1.00 ms	s (1001 pt



Test specification:	Section 15.247(b), RSS-247 section 5.4(a), Peak output power						
Test procedure:	ANSI C63.10, section 7.8.5						
Test mode:	Compliance	Verdict: PASS					
Date(s):	09-Aug-17	verdict:	FA33				
Temperature: 25.4 °C	Relative Humidity: 52 %	Air Pressure: 1008 hPa	Power: Battery				
Remarks:							

#### Plot 7.5.9 Field strength of carrier at high frequency and Unom



Antenna polarization: Vertical EUT position: X-axis

#### Plot 7.5.10 Field strength of carrier at high frequency and Unom

PM Aug 09, 21 Marker 1 919.069500000 MHz Avg Type: Voltage PNO: Wide Trig: Free Run IFGain:Low Atten: 24 dB DET P P N N N Mkr1 919.069 5 MHz 101.882 dBµV/m Ref 120.00 dBµV/m 10 dB/div 1 **∮**<sup>1</sup> 10 90. 80 70 60 50 40. Center 919.1090 MHz #Res BW (CISPR) 120 kHz

#VBW 300 kHz

STATUS

20

Antenna polarization:Horizontal EUT position: X-axis

Span 500.0 kHz

Sweep 1.00 ms (1001 pts)



Test specification:	Section 15.247(b), RSS-247 section 5.4(a), Peak output power						
Test procedure:	ANSI C63.10, section 7.8.5						
Test mode:	Compliance	Verdict: PASS					
Date(s):	09-Aug-17	verdict:	FA33				
Temperature: 25.4 °C	Relative Humidity: 52 %	Air Pressure: 1008 hPa	Power: Battery				
Remarks:							

#### Plot 7.5.11 Field strength of carrier at high frequency and Unom



Antenna polarization: Vertical EUT position: Y-axis

#### Plot 7.5.12 Field strength of carrier at high frequency and Unom

1 Aug 09, 2 Marker 1 919.072000000 MHz Avg Type: Voltage PNO: Wide Trig: Free Run IFGain:Low Atten: 24 dB DET P P N N N Mkr1 919.072 0 MHz 104.252 dBµV/m Ref 120.00 dBµV/m 10 dB/div 1 **♦**<sup>1</sup> 10 90. 80 70 60 how 50 40. 20 Center 919.1090 MHz #Res BW (CISPR) 120 kHz Span 500.0 kHz #VBW 300 kHz Sweep 1.00 ms (1001 pts) STATUS

Antenna polarization:Horizontal EUT position: Y-axis



Test specification:	Section 15.247(d), RSS-247	section 5.5, Radiated spur	ious emissions		
Test procedure:	ANSI C63.10, sections 6.5, 6.6				
Test mode:	Compliance	Verdict: PASS			
Date(s):	28-Aug-17	verdict:	FA33		
Temperature: 23 °C	Relative Humidity: 55 %	Air Pressure: 1012 hPa	Power: Battery		
Remarks:					

## 7.6 Field strength of spurious emissions

#### 7.6.1 General

This test was performed to measure field strength of spurious emissions from the EUT. Specification test limits are given in Table 7.6.1.

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

#### Table 7.6.1 Radiated spurious emissions limits

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

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

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

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

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

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

- 7.6.2.1 The EUT was set up as shown in Figure 7.6.1, energized and the performance check was conducted.
- **7.6.2.2** The specified frequency range was investigated with antenna connected to spectrum analyzer/ EMI receiver. To find maximum radiation the turntable was rotated 360<sup>0</sup> and the measuring antenna was rotated around its vertical axis.
- 7.6.2.3 The worst test results (the lowest margins) were recorded and shown in the associated plots.

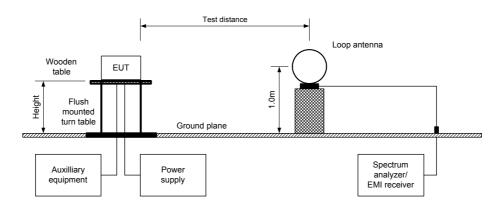
#### 7.6.3 Test procedure for spurious emission field strength measurements above 30 MHz

- 7.6.3.1 The EUT was set up as shown in Figure 7.6.2, Figure 7.6.3, energized and the performance check was conducted.
- **7.6.3.2** The specified frequency range was investigated with antenna connected to spectrum analyzer/ EMI receiver. To find maximum radiation the turntable was rotated 360<sup>0</sup>, the measuring antenna height was changed from 1 to 4 m, its polarization was switched from vertical to horizontal.
- 7.6.3.3 The worst test results (the lowest margins) were recorded and shown in the associated plots.

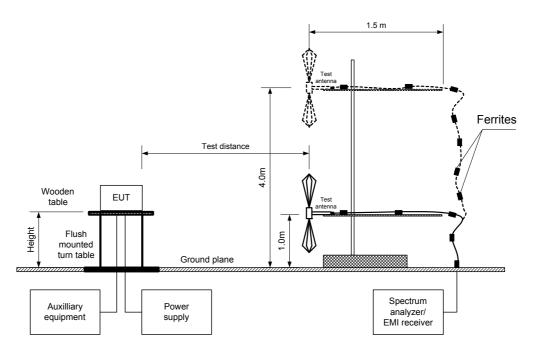


Test specification:	Section 15.247(d), RSS-247 section 5.5, Radiated spurious emissions						
Test procedure:	ANSI C63.10, sections 6.5, 6.6						
Test mode:	Compliance	Vardiate	PASS				
Date(s):	28-Aug-17	Verdict: PASS					
Temperature: 23 °C	Relative Humidity: 55 %	Air Pressure: 1012 hPa	Power: Battery				
Remarks:							

Figure 7.6.1 Setup for spurious emission field strength measurements below 30 MHz



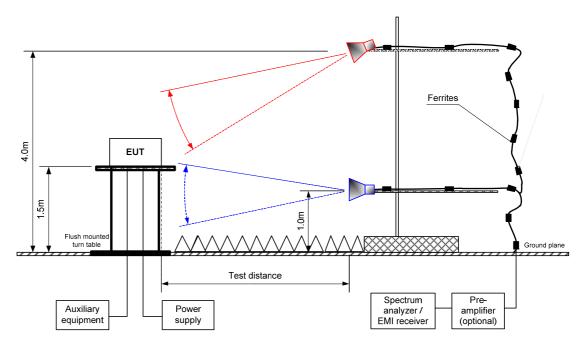






Test specification:	Section 15.247(d), RSS-24	7 section 5.5, Radiated spur	rious emissions
Test procedure:	ANSI C63.10, sections 6.5, 6.6		
Test mode:	Compliance	Verdict:	PASS
Date(s):	28-Aug-17	verdict:	FA00
Temperature: 23 °C	Relative Humidity: 55 %	Air Pressure: 1012 hPa	Power: Battery
Remarks:			-

Figure 7.6.3 Setup for spurious emission field strength measurements above1000 MHz





Test specification:	Section 15.247(d), RSS-247	section 5.5, Radiated spur	ious emissions
Test procedure:	ANSI C63.10, sections 6.5, 6.6		
Test mode:	Compliance	Vardiate	PASS
Date(s):	28-Aug-17	Verdict:	FA33
Temperature: 23 °C	Relative Humidity: 55 %	Air Pressure: 1012 hPa	Power: Battery
Remarks:			

#### Table 7.6.2 Field strength of emissions outside restricted bands

ASSIGNED FREQUENCY:	902-928 MHz
INVESTIGATED FREQUENCY RANGE:	0.009 -9500 MHz
TEST DISTANCE:	3 m
MODULATION:	GFSK
DUTY CYCLE:	100 %
TRANSMITTER OUTPUT POWER SETTINGS:	Maximum
DETECTOR USED:	Peak
RESOLUTION BANDWIDTH:	100 kHz
VIDEO BANDWIDTH:	300 kHz
TEST ANTENNA TYPE:	Active loop (9 kHz – 30 MHz) Biconilog (30 MHz – 1000 MHz) Double ridged quide (above 1000 MHz)

FREQUENC	REQUENCY HOPPING: Disabled									
Frequency, MHz	Field strength of spurious, dB(μV/m)	Antenna polarization	Antenna height, m	Azimuth, degrees*	Field strength of carrier, dB(µV/m)	Attenuation below carrier, dBc	Limit, dBc	Margin, dB**		
Low carrier	frequency									
1825.50	53.79	Horizontal	1.3	0.0	103.876	48.68	20.0	28.68		
5476.50	36.18	Horizontal	1.4	0.0	103.070	74.11	20.0	54.11		
Mid carrier	requency									
1831.70	55.61	Horizontal	1.7	0	104.291	48.68	20.0	28.68		
5495.10	30.18	Horizontal	1.4	0.0	104.291	74.11	20.0	54.11		
High carrier frequency										
1838.22	57.36	Horizontal	1.9	0	104.191	46.83	20.0	26.83		
5514.65	32.98	Horizontal	1.4	0.0	104.191	71.21	20.0	51.21		

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

Verdict

Pass

Pass

Pass



Test specification:	Section 15.247(d), RSS-24	7 section 5.5, Radiated spur	rious emissions
Test procedure:	ANSI C63.10, sections 6.5, 6.6		
Test mode:	Compliance	Verdict:	PASS
Date(s):	28-Aug-17	verdict:	FA33
Temperature: 23 °C	Relative Humidity: 55 %	Air Pressure: 1012 hPa	Power: Battery
Remarks:			

#### Table 7.6.3 Field strength of spurious emissions above 1 GHz within restricted bands

ASSIGNED FREQUENCY:					90	02-928 MH	lz				
INVESTIGATED FREQUENCY RANGE:					10	00 -9500	MHz				
TEST DIST	ANCE:				3	m					
MODULAT	ION:				G	FSK					
BIT RATE:					50	) kbps					
DUTY CYC	IF:					0 %					
TRANSMI		JT POW	/FR SETT	INGS:	M	aximum					
	DETECTOR USED:					Peak					
	RESOLUTION BANDWIDTH:					1000 kHz					
	TEST ANTENNA TYPE:					Double ridged guide					
	CY HOPPIN	-				sabled	su guide				
	FREQUEN					02-928 MH	17				
AGGIONEL										40.11-)	
Frequency,	Antenr		Azimuth.	Peak field s	<b>•</b> • •			ge field stre	<u> </u>		
MHz	Polarization	Height,	degrees*	Measured,		Margin,	,	Calculated,		Margin,	Verdict
	i olanzation	m	acgrees	dB(μV/m)	dB(μV/m)	dB**	dB(µV/m)	dB(μV/m)	dB(μV/m)	dB***	
Low carrier frequency											
2738.25	Vertical	1.7	0	57.11	74.0	-16.89	57.11	40.11	54.0	-13.89	
3651.00	Vertical	15	0	12 36	74.0	-31.64	12 36	25.36	54.0	-28.64	Pass

2738.25	Vertical	1.7	0	57.11	74.0	-16.89	57.11	40.11	54.0	-13.89	
3651.00	Vertical	1.5	0	42.36	74.0	-31.64	42.36	25.36	54.0	-28.64	Pass
4563.75	Vertical	1.5	0	45.65	74.0	-28.35	45.65	28.65	54.0	-25.35	
Mid carrier	frequency										
2747.55	Vertical	1.4	272	59.32	74.0	-14.68	59.32	42.32	54.0	-11.68	
3663.40	Vertical	1.5	0	45.07	74.0	-28.93	45.07	28.07	54.0	-25.93	Pass
4579.25	Vertical	1.5	0	48.57	74.0	-25.43	48.57	31.57	54.0	-22.43	
High carrie	r frequency										
2757.33	Vertical	1.7	0	56.46	74.0	-17.54	56.46	39.46	54.0	-14.54	
3676.44	Vertical	1.5	0	39.40	74.0	-34.6	39.40	22.40	54.0	-31.60	Pass
4595.55	Vertical	1.7	0	48.59	74.0	-25.41	48.59	31.59	54.0	-22.41	

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

\*\*- Margin = Measured field strength - specification limit.
 \*\*\*- Margin = Calculated field strength - specification limit,
 where Calculated field strength = Measured field strength + average factor.

#### Table 7.6.4 Average factor calculation

Transmis	sion pulse	Transmis	sion burst	Transmission train	Average factor,
Duration, ms	Period, ms	Duration, ms	Period, ms	duration, ms	dB
4.66	39.1	NA	NA	NA	-17
*- Average factor was	s calculated as follows	3			
for pulse tra	in longer than 100 ms	Average factor = $20 \times 10^{-10}$	$\int \frac{Pulse  duration}{Burs}$	$\frac{t  duration}{2} \times Number  of  burst$	ts within 100 ms
		Average julior $= 20 \times 10$	$\log_{10}\left(\frac{1 \text{ use an enter}}{Pulse \text{ period}} \times \frac{2 \text{ use}}{1}\right)$	00 ms	



Test specification:	Section 15.247(d), RSS-247	' section 5.5, Radiated spur	ious emissions
Test procedure:	ANSI C63.10, sections 6.5, 6.6		
Test mode:	Compliance	Verdict:	PASS
Date(s):	28-Aug-17	verdict:	FA33
Temperature: 23 °C	Relative Humidity: 55 %	Air Pressure: 1012 hPa	Power: Battery
Remarks:			

## Table 7.6.5 Field strength of spurious emissions below 1 GHz within restricted bands

ASSIGNED FREQUENCY:	902-928 MHz
INVESTIGATED FREQUENCY RANGE:	0.009 – 1000 MHz
TEST DISTANCE:	3 m
MODULATION:	GFSK
ASSIGNED FREQUENCY:	902-928 MHz
BIT RATE:	Mbps
DUTY CYCLE:	100 %
TRANSMITTER OUTPUT POWER SETTINGS:	Maximum
RESOLUTION BANDWIDTH:	0.2 kHz (9 kHz – 150 kHz)
	9.0 kHz (150 kHz – 30 MHz)
	120 kHz (30 MHz – 1000 MHz)
VIDEO BANDWIDTH:	> Resolution bandwidth
TEST ANTENNA TYPE:	Active loop (9 kHz – 30 MHz)
	Biconilog (30 MHz – 1000 MHz)
FREQUENCY HOPPING:	Disabled

Frequency	Peak	Qua	asi-peak		Antonno	Antenna	Turn-table	
Frequency, MHz	emission, dB(μV/m)	Measured emission, dB(μV/m)	Limit, dB(μV/m)	Margin, dB*	Antenna polarization	height, m	position**, degrees	Verdict
		٢	No signals wer	e found				Pass

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

#### Reference numbers of test equipment used

HL 1915	HL 3818	HL 4222	HL 4294	HL 4295	HL 4535	HL 4541	HL 4542
HL 4543	HL 4549	HL 4575	HL 4603	HL 4604	HL 4933	HL 5105	HL 5111

Full description is given in Appendix A.



Test specification:	Section 15.247(d), RSS-247	section 5.5, Radiated spur	ious emissions		
Test procedure:	ANSI C63.10, sections 6.5, 6.6				
Test mode:	Compliance	Verdict: PASS			
Date(s):	28-Aug-17	verdict:	FA33		
Temperature: 23 °C	Relative Humidity: 55 %	Air Pressure: 1012 hPa	Power: Battery		
Remarks:					

## Table 7.6.6 Restricted bands according to FCC section 15.205

MHz	MHz	MHz	MHz	MHz	GHz
0.09 - 0.11	8.37625 - 8.38675	73 - 74.6	399.9 - 410	2690 - 2900	10.6 - 12.7
0.495 - 0.505	8.41425 - 8.41475	74.8 - 75.2	608 - 614	3260 - 3267	13.25 - 13.4
2.1735 - 2.1905	12.29 - 12.293	108 - 121.94	960 - 1240	3332 - 3339	14.47 - 14.5
4.125 - 4.128	12.51975 - 12.52025	123 - 138	1300 - 1427	3345.8 - 3358	15.35 - 16.2
4.17725 - 4.17775	12.57675 - 12.57725	149.9 - 150.05	1435 - 1626.5	3600 - 4400	17.7 - 21.4
4.20725 - 4.20775	13.36 - 13.41	156.52475 - 156.52525	1645.5 - 1646.5	4500 - 5150	22.01 - 23.12
6.215 - 6.218	16.42 - 16.423	156.7 - 156.9	1660 - 1710	5350 - 5460	23.6 - 24
6.26775 - 6.26825	16.69475 - 16.69525	162.0125 - 167.17	1718.8 - 1722.2	7250 - 7750	31.2 - 31.8
6.31175 - 6.31225	16.80425 - 16.80475	167.72 - 173.2	2200 - 2300	8025 - 8500	36.43 - 36.5
8.291 - 8.294	25.5 - 25.67	240 - 285	2310 - 2390	9000 - 9200	Above 38.6
8.362 - 8.366	37.5 - 38.25	322 - 335.4	2483.5 - 2500	9300 - 9500	ADOVE 30.0

## Table 7.6.7 Restricted bands according to RSS-Gen

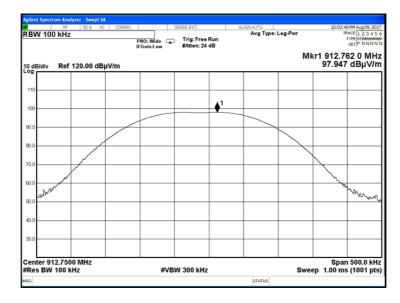
MHz	MHz	MHz	MHz	MHz	GHz
0.09 - 0.11	8.291 - 8.294	16.80425 - 16.80475	399.9 - 410	3260 - 3267	10.6 - 12.7
2.1735 - 2.1905	8.362 - 8.366	25.5 - 25.67	608 - 614	3332 - 3339	13.25 - 13.4
3.020 - 3.026	8.37625 - 8.38675	37.5 - 38.25	960 – 1427	3345.8 – 3358	14.47 – 14.5
4.125 – 4.128	8.41425 - 8.41475	73 - 74.6	1435 – 1626.5	3500 - 4400	15.35 – 16.2
4.17725 – 4.17775	12.29 – 12.293	74.8 - 75.2	1645.5 – 1646.5	4500 – 5150	17.7 – 21.4
4.20725 - 4.20775	12.51975 - 12.52025	108 – 138	1660 - 1710	5350 - 5460	22.01 – 23.12
5.677 - 5.683	12.57675 - 12.57725	156.52475 - 156.52525	1718.8 - 1722.2	7250 - 7750	23.6 - 24
6.215 - 6.218	13.36 – 13.41	156.7 - 156.9	2200 - 2300	8025 - 8500	31.2 - 31.8
6.26775 - 6.26825	16.42 - 16.423	240 - 285	2310 - 2390	9000 - 9200	36.43 - 36.5
6.31175 - 6.31225	16.69475 - 16.69525	322 - 335.4	2655 - 2900	9300 - 9500	Above 38.6



Test specification:	Section 15.247(d), RSS-247 section 5.5, Radiated spurious emissions						
Test procedure:	ANSI C63.10, sections 6.5, 6.6						
Test mode:	Compliance	Verdict:	PASS				
Date(s):	28-Aug-17	verdict:	FA33				
Temperature: 23 °C	Relative Humidity: 55 %	Air Pressure: 1012 hPa	Power: Battery				
Remarks:							

#### Plot 7.6.1 Radiated emission measurements at the low carrier frequency

TEST SITE:Semi anechoic chamberTEST DISTANCE:3 mANTENNA POLARIZATION:Vertical



## Plot 7.6.2 Radiated emission measurements at the low carrier frequency

TEST SITE:Semi anechoic chamberTEST DISTANCE:3 mANTENNA POLARIZATION:Horizontal

Agilent Spec		zer - Swept S								
<b>1</b> 20	RF	50 Ω A	C CORREC		SENSE:INT		ALIGNAUTO		10:01:4	6 PM Aug 09, 2017
RBW 10	00 kHz			PNO: Wide G	Trig: Free #Atten: 24		Avg Type:	-		TYPE MWWWWW DET P N N N N N
10 dB/div	Ref 1	20.00 dB	μV/m					IVI.		62 5 MHz 3 dBµV/m
110						L.1_				
100						<b>•</b> '				
90.0		/						$\overline{\}$		
80.0		/								
المطري 60.0	www.								- Wh	will work and
50.0										
40.0										
30.0										
	912.7500 V 100 kH			#VE	W 300 kHz			Swe	Spar ep 1.00 m	n 500.0 kHz s (1001 pts)
MSG							STATUS			



Test specification:	Section 15.247(d), RSS-247	Section 15.247(d), RSS-247 section 5.5, Radiated spurious emissions					
Test procedure:	ANSI C63.10, sections 6.5, 6.6						
Test mode:	Compliance	Verdict:	PASS				
Date(s):	28-Aug-17	verdict:	FA35				
Temperature: 23 °C	Relative Humidity: 55 %	Air Pressure: 1012 hPa	Power: Battery				
Remarks:							

#### Plot 7.6.3 Radiated emission measurements at the mid carrier frequency

TEST SITE:Semi anechoic chamberTEST DISTANCE:3 mANTENNA POLARIZATION:Vertical

Center Freq 915	50 Ω AC CORRE	~	SENSE:INT	ALIGNAUTO Avg Type: Log-Pv	NF TF	1 PM Aug 09, 20
		PNO: Wide FGain:Low	Trig: Free Run #Atten: 24 dB	• // •		DET P N N N
odB/div Ref 12	0.00 dBµV/m				Mkr1 915.8 97.623	28 0 MH dBµV/
110						
100			1			
90.0						
80.0					$\searrow$	
70.0						
50.0 × 20 <sup>000</sup>	/					~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
50.0 and Water						and the second
40.0						
0.0						
enter 915.8500 l Res BW 100 kHz		#VB	W 300 kHz		Spar Sweep 1.00 ms	500.0 kl

#### Plot 7.6.4 Radiated emission measurements at the mid carrier frequency

TEST SITE:Semi anecTEST DISTANCE:3 mANTENNA POLARIZATION:Horizontal

Semi anechoic chamber 3 m

arker 1 915.8	50 Ω AC 2950000	0 MHz	PNO: Wide G	Trig: Free Run #Atten: 24 dB	ALIGNAUTO Avg Type:	Log-Pwr	1	RACE 1 2 3 4 5 TYPE M WWWW DET P N N N N
0 dB/div Ref 1	20.00 dB	JV/m				M	lkr1 915.8 104.291	29 5 MH 1 dBµV/r
110				1				
100				•••				
0.0						$\searrow$		
0.0								
0.0	J.							
								and and a second s
0.0 ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~								. 0249
0.0								
0.0								
30.0								
enter 915.8500 Res BW 100 kH			#VE	W 300 kHz		Swe	Spa Spa	n 500.0 kH s (1001 pt



Test specification:	Section 15.247(d), RSS-247	Section 15.247(d), RSS-247 section 5.5, Radiated spurious emissions							
Test procedure:	ANSI C63.10, sections 6.5, 6.6								
Test mode:	Compliance	Verdict:	PASS						
Date(s):	28-Aug-17	verdict:	FA33						
Temperature: 23 °C	Relative Humidity: 55 %	Air Pressure: 1012 hPa	Power: Battery						
Remarks:									

#### Plot 7.6.5 Radiated emission measurements at the high carrier frequency

TEST SITE:Semi anechoic chamberTEST DISTANCE:3 mANTENNA POLARIZATION:Vertical

	RF 50 Ω A			SENSE:INT		ALIGNAUTO Avg Type:	an Dun		6PM Aug 09, 20: RACE 1 2 3 4 5
Marker 1	919.0685000		PNO: Wide G	Trig: Free #Atten: 24	Run dB	Avg Type:	Log-rwr		TYPE MWWWW DET P N N N N
10 dB/div	Ref 120.00 dE	BμV/m		1			M	kr1 919.0 98.147	68 5 MH ∕dBµV/ı
110									
100				<b>♦</b> <sup>1</sup>					
90.0									
80.0		$\square$					$\searrow$		
70.0								<u> </u>	
60.0	Nor of the second							- Von	
50.0									Marton No
40.0									
30.0									
Center 919 Res BW 1	9.1090 MHz 100 kHz		#VE	3W 300 kH	z		Swe	Spar spar sp 1.00 m	n 500.0 kH s (1001 pt

#### Plot 7.6.6 Radiated emission measurements at the high carrier frequency

TEST SITE:Semi anecTEST DISTANCE:3 mANTENNA POLARIZATION:Horizontal

Semi anechoic chamber 3 m

arker 1 919.06	50 Ω AC CO 9000000 MH		SENSE:INT Trig: Free Run #Atten: 24 dB	ALIGNAUTO Avg Type: Log-Pwr	1	06 PM Aug 09, 20 RACE 1 2 3 4 5 TYPE M WWWW DET P N N N N
dB/div Ref 12	20.00 dBµV/m				Mkr1 919.0 104.191	69 0 MH 1 dBµV/r
110			1			
100			••••			
0.0						
0.0						
0.0						
0.0					1	ana.
0.0						the way way
0.0						
0.0						
enter 919.1090 Res BW 100 kH		±1	BW 300 kHz	Sv	Spar veep 1.00 m	n 500.0 kH s (1001 pt



Test specification:	Section 15.247(d), RSS-247	section 5.5, Radiated spur	ious emissions
Test procedure:	ANSI C63.10, sections 6.5, 6.6		
Test mode:	Compliance	Verdict:	PASS
Date(s):	28-Aug-17	verdict:	FA33
Temperature: 23 °C	Relative Humidity: 55 %	Air Pressure: 1012 hPa	Power: Battery
Remarks:			

## Plot 7.6.7 Radiated emission measurements from 9 to 150 kHz at the low, mid and high carrier frequency

TEST SITE:Semi anechoic chamberTEST DISTANCE:3 mANTENNA POLARIZATION:Vertical

Marker 1 9.000000 kHz		SENSE:INT	ALIGNAUTO Avg Type: Voltag Avg Hold>100/10	10:37:13PM Aug 09, 20 TRACE 1 2 3 4 5 0 TYPE MWWWW
	PNO: Wide IFGain:Auto	#Atten: 40 dB	Avginola:>100/10	DET PNNN
10 dB/div Ref 129.99 dB	μV/m			Mkr1 9.000 kH 79.089 dBµV/ı
120				
110				
100				
100				
90.0				
80.0				
orth and the				
70.0 Marshing Marshing	Number .			Monto a superior of the states
60.0		and the showing the state of th	homore Manuter hitslowed as	Martine man and a second
50.0				
40.0				
Start 9.00 kHz Res BW (CISPR) 200 Hz	v	BW 1.5 kHz	Swee	Stop 150.00 kH p (FFT) ~16.2 ms (1001 pt
ASG	-		STATUS	P.(,

Plot 7.6.8 Radiated emission measurements from 0.15 to 30 MHz at the low, mid and high carrier frequency

TEST SITE:Semi anTEST DISTANCE:3 mANTENNA POLARIZATION:Vertical

Semi anechoic chamber 3 m

Agilent Spectrum Analyzer - Swept SA			Agilent Spectr	rum Analyzer - Swept SA					
RF 50 Ω 🛕 DC CORREC SENSE:INT	ALIGNAUTO	10:45:31 PM Aug 09, 2017	<b>U</b>	RF 50 Q Å DC		SENSE:INT	ALIGNAUTO		10:42:43 PM Aug 09, 2017
Stop Freq 30.000000 MHz	Avg Type: Voltage	TRACE 1 2 3 4 5 6 TYPE MWWWWW DET P NNNNN	Marker 1	155.700000 kH	z		Avg Type: V	oltage	TRACE 1 2 3 4 5 6 TYPE MUMMUM DET P N N N N N
PNO: East Trig: Free F	Run	TYPE MWWWWW			PNO: Wide 😱	Trig: Free Run			TYPE MWWWWW
IFGain:Low #Atten: 20 of	4B	DET PERMIT			IFGain:Low	#Atten: 20 dB			DETIP IN IN IN IN IN
		Mkr1 156 kHz						M	kr1 155.70 kHz
		60.381 dBµV/m						1411	0 501 JD://
10 dB/div Ref 110.00 dBµV/m	e	50.381 aBµv/m	10 dB/div	Ref 110.00 dBµ	V/m			6	60.521 dBµV/m
Log			Log						
									I
100									I
100			100						
									I
90.0			90.0						
30.5			30.0						
80.0			80.0						
70.0			70.0						
			L1						
			I ₽'				J   L		
60.0			60.0						
			The	Me.					I
			50.0	"YOU AND A					I
50.0			50.0		A set to				
				1 1	the state of the s				
40.0			40.0			and the second day	mounterration	and we have	
400 - 100 -			10.0		harden ha			a number of the order of the	were and have stated at
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30.0	a total a la tata a addition datte da Addia	all and the second states	30.0						
									I
20.0			20.0						
Start 150 kHz		Stop 30.00 MHz	Start 150	kHz					Stop 3.000 MHz
	Swoon	725 ms (1001 pts)		(CISPR) 9 kHz	#\/B	W 30 kHz		Swoon 6	
#Res BW (CISPR) 9 kHz #VBW 30 kHz	Sweep	725 ms (1001 pts)	#Res BW	(CIOPR) 9 KHZ	#VB	99 30 KHZ		oweep o	69.3 ms (1001 pts)
MSG	STATUS		MSG				STATUS		
MSG	STATUS		MSG				STATUS		



Test specification:	Section 15.247(d), RSS-247	section 5.5, Radiated spur	ious emissions
Test procedure:	ANSI C63.10, sections 6.5, 6.6		
Test mode:	Compliance	Verdict:	PASS
Date(s):	28-Aug-17	verdict:	FA35
Temperature: 23 °C	Relative Humidity: 55 %	Air Pressure: 1012 hPa	Power: Battery
Remarks:			

#### Plot 7.6.9 Radiated emission measurements from 30 to 1000 MHz at the low carrier frequency

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

l ?ef	Value 11	50 Ω 0.00 dBu	AC CORREC		SENSE:INT	AL.	IGNAUTO Avg Type: 1	/oltage	09:56:2: TF	3PM Aug 09, 20: RACE 1 2 3 4 5
	Fuide II	0.00 000		PNO: Fast Gain:Low	#Atten: 24		2.77			DET P P N N N
	B/div Re	f 110.00 d	BµV/m						Mkr1 91: 104.011	
og										<b>∮</b> 1
100										
90.0										
80.0										
70.0										
50.0										
50.0										
40.0										Anatron
30.0						and a manufacture of the second second	hadragenselaway	and the second	a Jean and the law over	
20.0	y,	Malin	J J J J J J J J J J J J J J J J J J J	every training of	-Andrew -					
	"Ynleigelen win	willer "								
	t 30.0 MH	z PR) 120 k	U-7	#\/P	W 300 kHz			Cur	Stop 1 eep 111 ms	.0000 GH
Re	5 DW (CI3	FR) 120 K	ΠZ	#10	W 300 KHZ		STATUS	31	eep minis	s (1001 pt

### Plot 7.6.10 Radiated emission measurements from 30 to 1000 MHz at the mid carrier frequency

TEST SITE: TEST DISTANCE: 3 m ANTENNA POLARIZATION: Vertical and Horizontal

Semi anechoic chamber

		nalyzer - Swept S								
<b>LXI</b>		RF 50 Ω A0			SENSE:INT	AL	IGNAUTO	6-14	09:49:41	PM Aug 09, 2017
Ref	Value 1	10.00 dBµV	1	PNO: Fast 🖵 Gain:Low	Trig: Free #Atten: 24		Avg Type: '	Voltage	т	ACE 123456 YPE MWWWWW DET P P N N N N
10 dE	B/div Re	ef 110.00 dB	μV/m						Mkr1 915 104.124	6.61 MHz dBµV/m
Ŭ										<b>∳</b> 1
100										
90.0										
80.0										
70.0										
60.0										
50.0										
40.0		ſ								
30.0					. 11.004	and the desided of the second s	mannestrationalises	here they have	surfacely and a second	A Antalana ana an
		have a figure a fictor of the	ant marganessing	have an interest						
20.0	henerows	works								
	t 30.0 MH				W 300 kHz	1	1			.0000 GHz
MSG	-						STATUS			



Test specification:	Section 15.247(d), RSS-247	Section 15.247(d), RSS-247 section 5.5, Radiated spurious emissions							
Test procedure:	ANSI C63.10, sections 6.5, 6.6								
Test mode:	Compliance	Verdict:	PASS						
Date(s):	28-Aug-17	verdict:	FA33						
Temperature: 23 °C	Relative Humidity: 55 %	Air Pressure: 1012 hPa	Power: Battery						
Remarks:									

## Plot 7.6.11 Radiated emission measurements from 30 to 1000 MHz at the high carrier frequency

TEST SITE:Semi anechoic chamberTEST DISTANCE:3 mANTENNA POLARIZATION:Vertical and Horizontal

npu	t Mech A	50 Ω Atten 24		PNO: Fast	Trig: Free R #Atten: 24 d	un	Avg Type:	Voltage	TR	PM Aug 09, 20 ACE 1 2 3 4 5 YPE MWWWW DET P P N N N
0 dE	3/div Re	f 110.00 d	dBµV/m						Mkr1 919 104.001	
100										<b>∳</b> 1
0.0										
0.0										
0.0										
0.0										
0.0										╞╴
0.0							فالم المعالية المراجع	will be with the st	Jahon we show	hand the second s
0.0	1		المعادية والمعادية المحالية	a providence	Wingt Lynaphing Black	*## <sub>2</sub> #\$4_#4_6 <sup>1</sup> ** <sup>0</sup> **#	A			
		_								
	t 30.0 MH	z PR) 120 I	kHz	#VB	W 300 kHz			SW	Stop 1 eep 111 ms	.0000 GH



Test specification:	Section 15.247(d), RSS-247	Section 15.247(d), RSS-247 section 5.5, Radiated spurious emissions							
Test procedure:	ANSI C63.10, sections 6.5, 6.6								
Test mode:	Compliance	Verdict:	PASS						
Date(s):	28-Aug-17	verdict:	FA33						
Temperature: 23 °C	Relative Humidity: 55 %	Air Pressure: 1012 hPa	Power: Battery						
Remarks:									

## Plot 7.6.12 Radiated emission measurements from 1000 to 9500 MHz at the low carrier frequency

TEST SITE: TEST DISTANCE: ANTENNA POLARIZATION:	Semi anechoic chamber 3 m : Vertical and Horizontal		
Aglient Spectrum Analyzer. Swept 53 1 10 dB/div. Ref. 90.00 dBµV/m	Agilent Spectrum Analyzer - Swep	AC CORPEC SEVEENT ALIGNAUTO PHO: Fast IFGeind.ow Atten: 6 dB	o <u>111113404.84.000.2077</u> Type: Voltage Tree Joint State or PP PNNN QEIP PNNN Mkr1 2.742 5 GHz 56.053 dBµV/m
500			
0.00	Stop 9.500 GHz Sweep 17.3 ms (1001 pts) wrsi		Stop 9.500 GHz Sweep 975 ms (1001 pts)

## Plot 7.6.13 Radiated emission measurements from 1000 to 9500 MHz at the mid carrier frequency

Aglient Spectrum Analyzer - Swept SA	TEST SITE TEST DIST ANTENNA	ANCE:	ZATION:	3 m	ii anecl	d H		ntal								
10 dB/div Ref 90.00 dBµV/m		ree Run	Avg Type: Voltage	Mkr1 2.7	8PM Aug 09, 2017 RACE 1 2 3 4 5 6 1 2 3 4 5 6 TYPE MANNA DET P P N N N N 51 0 GHz dBμV/m	<mark>и</mark> Mar		50 Q AG	CORREC 00 GHz	PNO: Fast 🕞 FGain:Low	SENSE:INT Trig: Free Atten: 6 db	Run	Avg Type:	Voltage	" Mkr1 2.7	51 0 GHz dBµV/m
60.0 70.0 50.0 40.0 30.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>1</b> 50.0 <b>11</b> 50.0 <b>1111111111111</b>		and a state of the	harisetan	-	Adving William	80.0 70.0 60.0 50.0 40.0			↓ <sup>1</sup>				مسمدلين	Learner		
0.00						30.0 20.0 10.0 0.00		anger menten part		Viene	and marked					
Start 1.000 GHz Res BW (CISPR) 1 MHz	#VBW 3.0 N	1Hz	Status	Stop veep 17.3 m	9.500 GHz s (1001 pts)		t 1.000 GHa s BW (CISP			#VB	W 10 kHz		STATUS	Sv	Stop veep 975 ms	9.500 GHz s (1001 pts)



Test specification:	Section 15.247(d), RSS-247	v section 5.5, Radiated spur	rious emissions
Test procedure:	ANSI C63.10, sections 6.5, 6.6		
Test mode:	Compliance	Verdict:	PASS
Date(s):	28-Aug-17	verdict:	FA33
Temperature: 23 °C	Relative Humidity: 55 %	Air Pressure: 1012 hPa	Power: Battery
Remarks:			

## Plot 7.6.14 Radiated emission measurements from 1000 to 9500 MHz at the high carrier frequency

TEST SITE: TEST DISTANCE: ANTENNA POLARIZATION: Vertical and Horizontal

Semi anechoic chamber 3 m

Agilen	t Spec		zer - Swept Si									Agiler	nt Spectrum An									
Mari	ker '	RF 1 1.841	5000000		PNO: Fast G	Trig: Free Atten: 6 d	Run	Avg Type:		T	HPM Aug 09, 2017 RACE 1 2 3 4 5 6 TYPE MUMANN N DET P P N N N N		eo BW 10	kHz	IF	'NO: Fast Gain:Low	SENSE:INT Trig: Free Atten: 6 d	Run	Avg Type	: Voltage	11:33:0	APM Aug 09, 2017 RACE 1 2 3 4 5 6 TYPE MWWWW DET P P N N N N
10 dE	3/div	Ref 9	0.00 dBµ	V/m						0kr1 1.8 57.136	41 5 GHz 3 dBµV/m	10 d Log	B/div Ref	90.00 dBj	ıV/m						Mkr1 1.8 57.015	41 5 GHz 6 dBµV/m
80.0												80.0										
70.0												70.0										
60.0 50.0		- †										60.0 50.0	·	<b>∲</b> '	-							
						Januar	man	<sup>يور</sup> يدهورلياسي		Hereitet-Anno-No	and an an an an	40.0									-	
30.0		www	ايرزيرسوياور وازير	A. Marken and	and a substance of the second							30.0				L	and summer	Julan				
20.0												20.0		J								
10.0												10.0										
0.00												0.00										
Res		00 GHz (CISPR)	1 MHz		#VB	W 3.0 MHz			Swee	stop p 17.3 m	9.500 GHz s (1001 pts)	Res	t 1.000 GH BW (CISP			#VE	W 10 kHz			Swe		9.500 GHz s (1001 pts)
MSG								STATUS				MSG							STATUS			



Test specification:	Section 15.247(d), RSS-24	7 section 5.5, Radiated spur	ious emissions
Test procedure:	ANSI C63.10, sections 6.5, 6.6		
Test mode:	Compliance	Verdict:	PASS
Date(s):	28-Aug-17	verdict:	PA33
Temperature: 23 °C	Relative Humidity: 55 %	Air Pressure: 1012 hPa	Power: Battery
Remarks:	-		· · · · ·

#### Plot 7.6.15 Radiated emission measurements at the second harmonic of low carrier frequency

TEST SITE:Semi anechoic chamberTEST DISTANCE:3 mANTENNA POLARIZATION:Vertical

PNO: Wide		-	Avg Type:	_og-Pwr	TI	RACE 1 2 3 4 5
IFGain:Low	Trig: Free F Atten: 6 dB	Run B				DET P P N N N
μV/m				M	(r1 1.825 52.665	524 GH dBµV/i
		<u>*</u> 1				
		<u> </u>				
			$\backslash$			
/						
and another all and a second			- X	····	La contra con	the same to a
#	VBW 300 kHz			Swee	Span sp 1.00 ms	1.000 Mł tg (1001) s
	#V/m			#VBW 300 kHz		µV/m 52.665

Plot 7.6.16 Radiated emission measurements at the second harmonic of low carrier frequency

TEST SITE:Semi anechoic chamberTEST DISTANCE:3 mANTENNA POLARIZATION:Horizontal

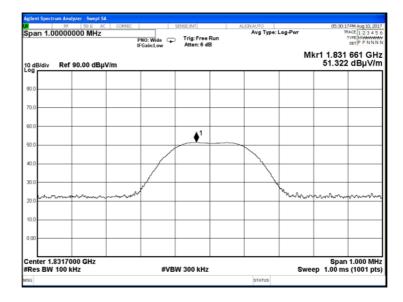
arker 1 1.8254360	Р	NO: Wide	SENSE:INT	Avg Type:	.og-Pwr	T	OPM Aug 10, 20 RACE 1 2 3 4 5 TYPE MWWWW DET P P N N N
0 dB/div Ref 90.00		Gain:Low	Atten: 6 dB		M	r1 1.825	
30.0							
70.0							
0.0			1	 			
0.0							
0.0		{		 $\overline{}$			
0.0	man			 - Ver	mm	m	mm
0.0							
.00							
enter 1.8255000 GH	2					Snan	1.000 MI
Res BW 100 kHz	12	#VB	W 300 kHz		Swee	ep 1.00 ms	s (1001 pt



Test specification:	Section 15.247(d), RSS-247	section 5.5, Radiated spur	ious emissions
Test procedure:	ANSI C63.10, sections 6.5, 6.6		
Test mode:	Compliance	Verdict:	PASS
Date(s):	28-Aug-17	verdict:	FA35
Temperature: 23 °C	Relative Humidity: 55 %	Air Pressure: 1012 hPa	Power: Battery
Remarks:			

#### Plot 7.6.17 Radiated emission measurements at the second harmonic of mid carrier frequency

TEST SITE:Semi anechoic chamberTEST DISTANCE:3 mANTENNA POLARIZATION:Vertical



#### Plot 7.6.18 Radiated emission measurements at the second harmonic of mid carrier frequency

TEST SITE:Semi anecTEST DISTANCE:3 mANTENNA POLARIZATION:Horizontal

Semi anechoic chamber 3 m

Agilent Spect	trum Analyzer - Swept SA RF 50 Ω AC			SENSE:INT	AL	IGNAUTO		05:28:0	0PM Aug 10, 201
Span 1.	00000000 MHz		PNO: Wide G		Run	Avg Type: I		19	ACE 12345 TYPE MWWWW DET P P N N N
10 dB/div	Ref 90.00 dBµ	V/m						55.614	dBµV/n
80.0									
70.0									
60.0					<b>1</b>				
50.0									
40.0			/						
30.0			/						
20.0	mmmmmm	www.wo					Jan Marson	mmanha	~~~~
10.0									
0.00									
	.8317000 GHz / 100 kHz		#VB	W 300 kHz			Swee	Span p 1.00 ms	1.000 MH (1001 pt
tSG						STATUS			



Test specification:	Section 15.247(d), RSS-247	section 5.5, Radiated spur	ious emissions
Test procedure:	ANSI C63.10, sections 6.5, 6.6		
Test mode:	Compliance	Verdict:	PASS
Date(s):	28-Aug-17	verdict:	FA35
Temperature: 23 °C	Relative Humidity: 55 %	Air Pressure: 1012 hPa	Power: Battery
Remarks:			

## Plot 7.6.19 Radiated emission measurements at the second harmonic of high carrier frequency

TEST SITE:Semi anechoic chamberTEST DISTANCE:3 mANTENNA POLARIZATION:Vertical

u Comt	tor Ero	RF 50 Ω q 1.838218	AC CORREC		SENSE:INT	AL	IGNAUTO Avg Type:	log-Pwr	05:40:0 TF	7 PM Aug 10, 20 RACE 1 2 3 4 5
, ern		iq 1.0302 id		PNO: Wide 🖵 FGain:Low	Trig: Free Atten: 6 dl	Run B				DET P P N N
0 dB	3/div	Ref 90.00 di	3μV/m		1			M	kr1 1.838 54.840	241 GH dBµV/i
80.0		_								
70.0		_								
60.0						1				
50.0						-				
40.0				$\swarrow$						
30.0							- V			
20.0	~~~~	mn	man					www	h	n. Mayor
10.0										
0.00										
	ter 1.83 s BW 10	82180 GHz			W 300 kHz			Swee	Span span	1.000 Mi
nes	1 1/10	00 1112		#10	999 300 KHZ			ower	ep 1.00 ms	(1001 pt

### Plot 7.6.20 Radiated emission measurements at the second harmonic of high carrier frequency

TEST SITE:Semi anecTEST DISTANCE:3 mANTENNA POLARIZATION:Horizontal

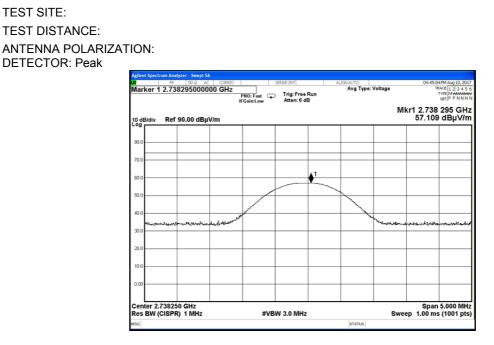
Semi anechoic chamber 3 m

Agilent Spectr	um Analyzer - Swept SA RF 50 Ω AC			SENSE:INT	AL	IGNAUTO		05:36:5	3PM Aug 10, 2017
Center F	req 1.83821800 Ref 90.00 dBµ	0 GHz	PNO: Wide G FGain:Low		Run	Avg Type:	-	r1 1.838	DET P P N N N
80.0									
70.0									
60.0	_				1				
50.0									
30.0		/							
	www.www.w	mar				her.	m	www.www	mhm
10.0									
0.00									
Center 1.3 #Res BW	8382180 GHz 100 kHz		#VB	W 300 kHz		STATUS	Swee	Span ep 1.00 ms	1.000 MH (1001 pts



Test specification:	Section 15.247(d), RSS-247	section 5.5, Radiated spur	ious emissions			
Test procedure:	ANSI C63.10, sections 6.5, 6.6					
Test mode:	Compliance	Verdict: PASS				
Date(s):	28-Aug-17	verdict:	FA33			
Temperature: 23 °C	Relative Humidity: 55 %	Air Pressure: 1012 hPa	Power: Battery			
Remarks:						

Plot 7.6.21 Radiated emission measurements at the third harmonic of low carrier frequency



Plot 7.6.22 Radiated emission measurements at the third harmonic of low carrier frequency

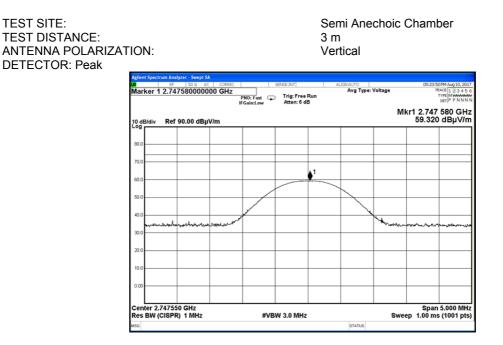
TEST SITE: TEST DISTANCE: ANTENNA POLARIZATION: DETECTOR: Peak

lari	ker 1 2.73	50 Q AC	00 GHz	PNO: Fast G	SENSE:INT Trig: Free F Atten: 6 dE	Run	Avg Type:	/oltage	TI	APM Aug 10, 201 RACE 1 2 3 4 5 TYPE MWWWWW DET P P N N N
0 de	i/div Ref	90.00 dBµ	V/m					M	(r1 2.738 55.076	110 GH: dBµV/n
80.0										
70.0										
50.0					<b>▲</b> 1					
50.0					-					
40.0							- h			
30.0	linderapeur	all works and	Wederwar					www.whe	ليسهد الإلام والم	himmo
20.0										
10.0										
0.00										
	er 2.73825 BW (CISPI			#VE	W 3.0 MHz			Swee		5.000 MH



Test specification:	Section 15.247(d), RSS-247	section 5.5, Radiated spur	ious emissions			
Test procedure:	ANSI C63.10, sections 6.5, 6.6					
Test mode:	Compliance	Verdict: PASS				
Date(s):	28-Aug-17	verdict:	FA33			
Temperature: 23 °C	Relative Humidity: 55 %	Air Pressure: 1012 hPa	Power: Battery			
Remarks:						

### Plot 7.6.23 Radiated emission measurements at the third harmonic of mid carrier frequency



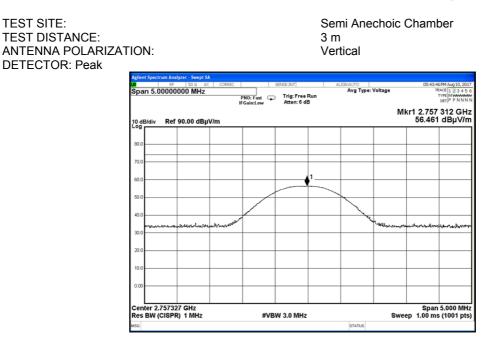
Plot 7.6.24 Radiated emission measurements at the third harmonic of mid carrier frequency

TION:					3 m			Chaml	ber
w Marker	RF 50 Ω A 1 2.7476250000	C CORREC	PNO: Fast	Trig: Free I	Run		-	" 1 xr1 2.747	
10 dB/div	Ref 90.00 dB	JV/m						36.326	авµv/m
80.0									
70.0									
60.0					<b>∮</b> 1				
50.0									
		ar en a canserar					Non-and and the second second	brandara and a start	hilpertensory
20.0									
10.0									
0.00									
Res BW			#VB	W 3.0 MHz		STATUS	Swe		5.000 MHz (1001 pts)
	04 Marker 10 dB/div 00 0 70.0 70.0 60.0 40.0 40.0 30.0 40.0 40.0 40.0 40.0 50.0 40.0 50.0 40.0 50.0 5	Aglent Spectrum Analyzer         Swept           IN         IN         SOO         A           Marker 1 2.7476250000         In         I	Agilent Spectrum Anslyrer . Swept SA B S G AC CORREC Marker 1 2,747625000000 GHz to dB/div Ref 90.00 dBµV/m Co 00 0 00 0 0 00 0 00 0 0	Aglient Spectrum Analyzer - Swept SA           Marker 1 2.747625000000 GHz           PN0: Fast           ID dB/div         Ref 90.00 dBµV/m           00         00           00         00           00         00           00         00           00         00           00         00           00         00           00         00           00         00           00         00         00           00         00         00         00           00         00         00         00         00           000         00         00         00         00         00           000	Aglent         Spectrum         Analyzer         Sweet SM           Warker 1 2.747625000000 GHz         FRO: Fast         FRO: Fast         Trig: Free           10 dB/div         Ref 90.00 dBµV/m         Trig: Free         FRO: Fast         Trig: Free           00         00         00         00         Trig: Free         Free           00         00         00         00         00         Free         Free           00         00         00         00         00         Free         Free         Free           00         00         00         00         00         Free         Free </td <td>Aplant Spectrum Analyzer Swept SA         Aplant Spectrum Analyzer Swept SA         Marker 1 2.7476625000000 GHz         10 dB/div         Ref 90.00 dBpt//m         10 dB/div         Ref 90.00 dBpt//m         10 dB/div         10 dB/div</td> <td>S m Horizontal Algorithm Spectrum Analyzer - Swept SA Book AC CORREC SPECENT ALGORATO Marker 1 2.747625000000 GBµV/m FGaintow Trig: Free Run Regaint Analyzer - Swept SA Avg Type: Regaint Analyzer -</td> <td>S m Horizontal Augusto Sector and Augusto Sector and Augusto Sector and Augusto Aug</td> <td>ATION: Horizontal</td>	Aplant Spectrum Analyzer Swept SA         Aplant Spectrum Analyzer Swept SA         Marker 1 2.7476625000000 GHz         10 dB/div         Ref 90.00 dBpt//m         10 dB/div         Ref 90.00 dBpt//m         10 dB/div         10 dB/div	S m Horizontal Algorithm Spectrum Analyzer - Swept SA Book AC CORREC SPECENT ALGORATO Marker 1 2.747625000000 GBµV/m FGaintow Trig: Free Run Regaint Analyzer - Swept SA Avg Type: Regaint Analyzer -	S m Horizontal Augusto Sector and Augusto Sector and Augusto Sector and Augusto Aug	ATION: Horizontal



Test specification:	Section 15.247(d), RSS-247	section 5.5, Radiated spur	ious emissions			
Test procedure:	ANSI C63.10, sections 6.5, 6.6					
Test mode:	Compliance	Verdict: PASS				
Date(s):	28-Aug-17	verdict:	FA33			
Temperature: 23 °C	Relative Humidity: 55 %	Air Pressure: 1012 hPa	Power: Battery			
Remarks:						

### Plot 7.6.25 Radiated emission measurements at the third harmonic of high carrier frequency

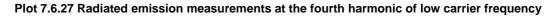


Plot 7.6.26 Radiated emission measurements at the third harmonic of high carrier frequency

TEST SITE: TEST DISTANCE: ANTENNA POLARIZAT DETECTOR: Peak	TION:	Semi Anechoic Chamber 3 m Horizontal
	Apilent Spectrum Analyzer - Swept SA	NT ALIGNAUTO 05:49:12 PM Aug 10, 2017
	PNO: East Trig	Avg Type: Voltage TRACE 123456 g: Free Run Type
	IFGain:Low Att	en: 6 dB Det [P P N N N Mkr1 2.757 222 GHz
	10 dB/div Ref 90.00 dBµV/m	56.381 dBµV/m
	80.0	
	70.0	
	60.0	<b>≜</b> 1 <sup> </sup>
	50.0	
	40.0 was and win of a provide of the second	Musical and a second a second a s
	30.0	And the second
	20.0	
	10.0	
	0.00	
	0.00	
	Center 2.757327 GHz	Span 5.000 MHz
	Res BW (CISPR) 1 MHz #VBW 3.0	0 MHz Sweep 1.00 ms (1001 pts)



Test specification:	Section 15.247(d), RSS-247	section 5.5, Radiated spur	ious emissions		
Test procedure:	ANSI C63.10, sections 6.5, 6.6				
Test mode:	Compliance	Verdict: PASS			
Date(s):	28-Aug-17	Verdict:	FA33		
Temperature: 23 °C	Relative Humidity: 55 %	Air Pressure: 1012 hPa	Power: Battery		
Remarks:					



TEST SITE:				OATS		
TEST DISTANCE:				3 m		
ANTENNA POLARIZA	TION:				Horizontal	
DETECTOR: Peak						
	Spectrum					
	TDF	m e R B e SWT 1 ms e V	BW 1 MHz BW 3 MHz Mode	Auto Sweep		
	• 1Pk View			M1[1]		36 dBµV/m 199280 GHz
	50 dBµV/m		M1			
		an marking the second date		where the state where	human	whenthelin
	30 dBµ/v/m					
	20 dBµ/V/m					
	10 dBµV/m					
	0 dBµV/m					
	-10 dBµV/m					
	-20 dBµV/m					
	-30 dBµV/m					
	CF 3.651 GHz		691 pts		Spa	n 5.0 MHz
	Date: 20.AUG.2017 12	:43:03				

## Plot 7.6.28 Radiated emission measurements at the fourth harmonic of mid carrier frequency

TEST SITE: TEST DISTANCE: ANTENNA POLARIZATION: DETECTOR: Peak OATS 3 m Vertical

Spectrum									
Ref Level 6 Att PA TDF		V/m ) dB 🛑 SWT		BW 1 MHz BW 3 MHz	Mode A	uto Sweep			
1Pk View									
					N	11[1]			07 dBµV/m 51580 CH₂
50 dBµV/m					M1				
40 dBuV/m			Judramenno			humberk			
40 dBy/V/m	ليتخبرون	مرور المستعمل ولاي					www.wearde	moundance	mintennes
30 d8µV/m-									
20 dBµV/m									
10 dBµV/m-									
0 dBµV/m									
-10 dBµV/m									
-20 dBµV/m-									
-30 dBµV/m—									
CF 3.6634 G	Hz			691	nts				n 5.0 MHz

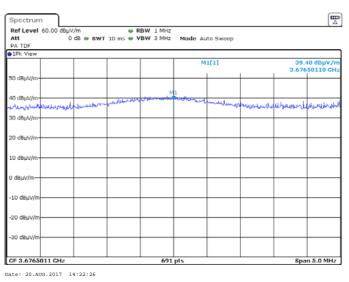
Date: 20.AUG.2017 13:27:51



Test specification:	Section 15.247(d), RSS-247	section 5.5, Radiated spur	ious emissions			
Test procedure:	ANSI C63.10, sections 6.5, 6.6					
Test mode:	Compliance	Verdict: PASS				
Date(s):	28-Aug-17	verdict:	FA33			
Temperature: 23 °C	Relative Humidity: 55 %	Air Pressure: 1012 hPa	Power: Battery			
Remarks:						

#### Plot 7.6.29 Radiated emission measurements at the fourth harmonic of high carrier frequency

TEST SITE: TEST DISTANCE: ANTENNA POLARIZATION: DETECTOR: Peak Semi Anechoic Chamber 3 m Vertical



#### Plot 7.6.30 Radiated emission measurements at the fifth harmonic of low carrier frequency

TEST SITE: TEST DISTANCE: ANTENNA POLARIZATION: DETECTOR: Peak OATS 3 m Vertical & Horizontal

Spectrum							
Ref Level         60.00         dBμV,           Att         0           TDF	/m e RE dB e SWT 1 ms e VE	W 1 MHz W 3 MHz	Mode Auto	o Sweep			
1Pk View							
			M	1[1]			5 dBµV/m 95980 GH₂
50 dBµV/m-			M1				
40 dByV/m	in a second water and the			mare the second	manyawery		
uthurtonetanation	area a				- Marticle	Andrew and	valubard
30 dBµV/m-							
20 dBµV/m-							
20 08µ0/m							
10 dBµV/m							
0 dBµV/m							
-10 dBuV/m							
-10 GBpV/m							
-20 dBµV/m							
-30 dBµV/m							
CF 4.56375 GHz		691 p	ots			Spa	n 5.0 MHz

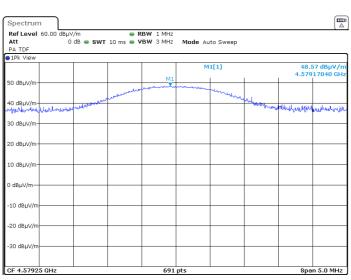
Date: 20.AUG.2017 12:51:10



Test specification:	Section 15.247(d), RSS-24	7 section 5.5, Radiated spur	rious emissions
Test procedure:	ANSI C63.10, sections 6.5, 6.6	i	
Test mode:	Compliance	Verdict:	PASS
Date(s):	28-Aug-17	verdict:	FA00
Temperature: 23 °C	Relative Humidity: 55 %	Air Pressure: 1012 hPa	Power: Battery
Remarks:			

#### Plot 7.6.31 Radiated emission measurements at the fifth harmonic of mid carrier frequency

TEST SITE: TEST DISTANCE: ANTENNA POLARIZATION: DETECTOR: Peak OATS 3 m Vertical & Horizontal



Date: 20.AUG.2017 13:18:49

#### Plot 7.6.32 Radiated emission measurements at the fifth harmonic of high carrier frequency

TEST SITE: TEST DISTANCE: ANTENNA POLARIZATION: DETECTOR: Peak Semi Anechoic Chamber 3 m Vertical

Spectrum					
Ref Level 60.00 Att PA TDF		<ul> <li>RBW 1 MHz</li> <li>10 ms</li> <li>VBW 3 MHz</li> </ul>	Mode Auto Sweep		
●1Pk View			M1[1]	10.00	
				48.59 df 4.595639	
50 dBµV/m			M1		
		where we want the second second	monor www.where	- and wedder and marked and a start	
40 dBµV/m	Lune & Merther Stat Comment		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	anthreaded and a set as in the	الم يقاله
				and a contraction	000-0500-
30 dBµV/m					
20 dBµV/m					
10 dBµV/m					
0 dBµV/m					
о аврулі					
-10 dBµV/m					
-20 dBµV/m					
-30 dBµV/m					
CF 4.595545 GH	2	691	pts	Span 5.0	) MHz

Date: 20.AUG.2017 14:27:55



Test specification:	Section 15.247(d), RSS-247 section 5.5, Radiated spurious emissions						
Test procedure:	ANSI C63.10, sections 6.5, 6.6						
Test mode:	Compliance	Verdict:	PASS				
Date(s):	28-Aug-17	verdict:	FA33				
Temperature: 23 °C	Relative Humidity: 55 %	Air Pressure: 1012 hPa	Power: Battery				
Remarks:							

#### Plot 7.6.33 Radiated emission measurements at the sixth harmonic of low carrier frequency

TEST SITE: TEST DISTANCE: ANTENNA POLARIZ/	ATION:			3 r	ATS n rtical & He	orizontal	
	Spectrum Ref Level 60.00 dBj Att PA TDF IPK Max		● RBW 1 10 ms ● VBW 3		Auto Sweep		
				м	1[1]		.18 dBµV/m
	50 dBµV/m					5.47	655210 GHz
	40 dBµV/m		, and the second second	an market and the second	MI		
	30 dBµV/m	All and all and a second of			- M	mulumen	Merca Buch
	20 dBµV/m						
	10 dBµV/m						
	0 dBµV/m						
	-10 dBµV/m						
	-20 dBµV/m						
	-30 dBµV/m						
	CF 5.476419 GHz			691 pts	1	Sp	an 1.0 MHz
	Date: 20.AUG.2017	13:11:03					

## Plot 7.6.34 Radiated emission measurements at the sixth harmonic of mid carrier frequency

TEST SITE: TEST DISTANCE: ANTENNA POLARIZAT	ION:			OATS 3 m Vertica	al & Horiz	ontal	
	PA TDF	'/m • dB • SWT 10 ms •	RBW 100 kHz VBW 300 kHz		weep		
	● 1Pk Max 50 dBµV/m			M1[1]			I dBµ∀/m 6210 GHz
	40 dBµV/m		an Subbley	Var war war war	M1 Avy Multin and		
	20 dbpv/m- 20 dbpv/m- 10 dbpv/m-	phyton			an a	- urgallykk-ak	ditur yodin huk
	0 dBµV/m						
	-20 dBµV/m						
	-30 dBµV/m CF 5.4951 GHz		691	ots		Span	1.0 MHz

Date: 20.AUG.2017 13:37:07



Test specification:	Section 15.247(d), RSS-247	section 5.5, Radiated spur	ious emissions
Test procedure:	ANSI C63.10, sections 6.5, 6.6		
Test mode:	Compliance	Verdict:	PASS
Date(s):	28-Aug-17	verdict.	FA33
Temperature: 23 °C	Relative Humidity: 55 %	Air Pressure: 1012 hPa	Power: Battery
Remarks:			

## Plot 7.6.35 Radiated emission measurements at the sixth harmonic of high carrier frequency

TEST SITE: TEST DISTANCE: ANTENNA POLARIZATION: Vertical

Semi Anechoic Chamber 3 m ANTENNA POLARIZATION: Horizontal

Ref Level 60.00	dBµV/m	-	RBW 100 kHz				
Att	0 dB 😑 SW	'T 10 ms 👄 '	VBW 300 kHz	Mode Auto	Sweep		
PA TDF 1Pk View							
DIPK VIEW		-		M1[1]		221	98 dBµV/m
				(inter)			40650 GHz
50 dBµV/m							
40 dBµV/m		_					
		M1					
30 dBuV/m		murching	Junitral	mound war	m		
30 dBµV/m	unperformante				mound	Hernerments	understand
20 dBµV/m							
20 000000							
10 dBµV/m							
10 UBµV/III							
0 dBµV/m							
-10 dBµV/m							
-20 dBµV/m			1				
-30 dBµV/m		-	1 1				-
	1	1	1		1		1

Date: 20.AUG.2017 14:40:35



Test specification: Section 15.247(d), RSS-247 section 5.5, Radiated spurious emissions					
Test procedure:	ANSI C63.10, sections 6.5, 6.6	3			
Test mode:	Compliance	bliance			
Date(s):	28-Aug-17	Verdict:	PASS		
Temperature: 23 °C	Relative Humidity: 55 %	Air Pressure: 1012 hPa	Power: Battery		
Remarks:			÷		

## Plot 7.6.36 Transmission pulse duration and period

Att TRG:E>		U (	B 👄 SWT 120	ms	VBW 3	MHz MHz						
a tol. O	KT TDF											
DIPK CI	rw											
-30 dBm					_		D:	2[1]				-1.15 d 9.04286 m
		4			M1 C	01	м	1[1]		2		9.04286 m -38.41 dBi
-40 dBm	1		+ +							<b></b>		9.12286 m
-50 dBm												
-Jo ubii	'											
-60 dBm	, <b></b>											
-70 dBr												
							البل في ال		والمراجب ال			
isunga an			a da ang dan panta baha Manang manang ang dalam ang da			and a state of the		dame a			alian di kanading Managina di kanading	
-90 dBm		di tan									1	
-90 0011	·											
-100 dB	m—				_							
-110 dB	m		+ +		-							
-120 dB	_											
-120 aB	m											
CF 912	.75 M	Hz				14001 p	ts					12.0 ms/
1arker												
Type M1	Ref	Trc 1	X-value 39.1228	6		alue 3.41 dBm	Func	tion		Fun	ction Resul	t
D1	M1	1	39.1228		-38	1.16 dB						
	1012	1	39.0428			-1.15 dB						

Date: 20.AUG.2017 09:05:10



Test specification:	Section 15.247(d), RSS-247 section 5.5, Emissions at band edges					
Test procedure:	ANSI C63.10, section 7.8.6					
Test mode:	Compliance	Verdict:	PASS			
Date(s):	27-Aug-17	verdict:	FA33			
Temperature: 23 °C	Relative Humidity: 55 %	Air Pressure: 1010 hPa	Power: Battery			
Remarks:						

## 7.7 Band edge radiated emissions

### 7.7.1 General

This test was performed to measure emissions, radiated from the EUT at the assigned frequency band edges. Specification test limits are given in Table 7.7.1.

#### Table 7.7.1 Band edge emission limits

Assigned frequency,	Attenuation below	Field strength at 3 m within restricted bands, $dB(\mu V)$				
MHz	carrier*, dBc	Peak	Average			
902.0 - 928.0						
2400.0 - 2483.5	20.0	74.0	54.0			
5725.0 - 5850.0						

\* - Band edge emission limit is provided in terms of attenuation below the peak of modulated carrier measured with the same resolution bandwidth.

### 7.7.2 Test procedure

- **7.7.2.1** The EUT was set up as shown in Figure 7.7.1, energized normally modulated at the maximum data rate with its hopping function disabled and its proper operation was checked.
- 7.7.2.2 The EUT was adjusted to produce maximum available to end user RF output power at the lowest carrier frequency.
- **7.7.2.3** The spectrum analyzer span was set to capture the carrier frequency and associated modulation products. The resolution bandwidth was set wider than 1 % of the frequency span.
- **7.7.2.4** The spectrum analyzer was set in max hold mode and allowed trace to stabilize. The highest emission level within the authorized band was measured.
- **7.7.2.5** The maximum band edge emission and modulation product outside of the band were measured as provided in Table 7.7.2 and associated plots and referenced to the highest emission level measured within the authorized band.
- **7.7.2.6** The above procedure was repeated with the EUT adjusted to produce maximum RF output power at the highest carrier frequency.
- **7.7.2.7** The above procedure was repeated with the frequency hopping function enabled.

#### Figure 7.7.1 Band edge emission test setup





Test specification: Section 15.247(d), RSS-247 section 5.5, Emissions at band edges							
Test procedure:	ANSI C63.10, section 7.8.6						
Test mode:	Compliance	Verdict:	PASS				
Date(s):	27-Aug-17	verdict:	FA33				
Temperature: 23 °C	Relative Humidity: 55 %	Air Pressure: 1010 hPa	Power: Battery				
Remarks:			-				

## Table 7.7.2 Band edge emission test results

DETECTOR US MODULATION: BIT RATE:	R OUTPUT POWER SE BANDWIDTH:	Peak GFSK 50 kbp TTTINGS: Maxim	is um of the span			
Frequency, MHz	Band edge emission, dBm	Emission at carrier, dBm	Attenuation below carrier, dBc	Limit, dBc	Margin, dB*	Verdict
Frequency hop	ping disabled					
912.750	-101.62	-37.58	64.04	20.0	44.04	Pass
919.109	-102.85	-32.42	70.43	20.0	50.43	Fass
Frequency hopping enabled						
912,750	-101.72	-37.56	64.16	20.0	44.16	Pass

\*- Margin = Attenuation below carrier – specification limit.

## Reference numbers of test equipment used

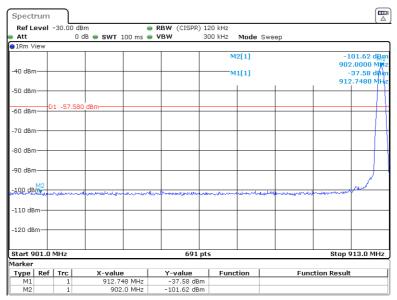
HL 4135	HL 4355						
•	-	-	-	-	-	-	-

Full description is given in Appendix A.



Test specification:	Section 15.247(d), RSS-247 section 5.5, Emissions at band edges				
Test procedure:	ANSI C63.10, section 7.8.6				
Test mode:	Compliance	Verdict:			
Date(s):	27-Aug-17	verdict:	PASS		
Temperature: 23 °C	Relative Humidity: 55 %	Air Pressure: 1010 hPa	Power: Battery		
Remarks:					

## Plot 7.7.1 The highest band edge emission at low carrier frequency with hopping function disabled



Date: 27.AUG.2017 12:10:47

## Plot 7.7.2 The highest band edge emission at high carrier frequency with hopping function disabled

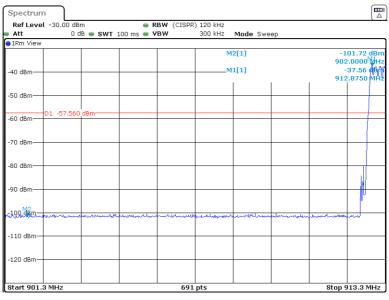
Att	6461	-30.00 dB			BW (CISPR)						
1Rm V		0 (	dB 👄 SWT 10	0 ms 😑 🕻	/BW	300 kHz	Mode	Sweep			
-	iew						2[1]			1	.02.85 dB
M1							2[1]				02.83 UE 3.0000 MI
40 dBn	י <b>−</b> ר		+ +			м	1[1]			_	32.42 dB
1										919	9.1090 M
-50 dBn		1 -52,420									
T		1 -52.420	J UBIII								
6 <mark>0 dBn</mark>	<u>ו</u> רי										
70 dBn	י—⊢							_			
			1 1								
-80 dBn	י—ר		+								
			1 1								
90 dBn	י—⊢-							-			
<u>ل</u>	M.										
100 dB	m +-	warmen and	how when when		Annality				11 Haran	N N	2
				code (transfer				rec. lean	infrance filters		
110 dB	-m		+ +								
120 dB	-m-										
Start 9	10.01	MU-2			691	nte				Stop (	 929.0 MH
larker	19.01	1112			091	prs				atup	729.0 111
Type	Ref	Trc	X-value	1	Y-value	Func	tion		Eun	ction Result	
M1		1	919.109	MHz	-32.42 dB				- T unit	stron result	
M2		1	928.0	MHz	-102.85 dB	m					

Date: 27.AUG.2017 12:20:58



Test specification:	Section 15.247(d), RSS-247 section 5.5, Emissions at band edges				
Test procedure:	ANSI C63.10, section 7.8.6				
Test mode:	Compliance	Vardiate	PASS		
Date(s):	27-Aug-17	Verdict:	PASS		
Temperature: 23 °C	Relative Humidity: 55 %	Air Pressure: 1010 hPa	Power: Battery		
Remarks:					

## Plot 7.7.3 The highest band edge emission at low carrier frequency with hopping function enabled



Date: 27.AUG.2017 13:15:34

### Plot 7.7.4 The highest band edge emission at high carrier frequency with hopping function enabled

Ref Level	-25.00 dBm	-	RBW (CISPR)				
🕨 Att	0 dB 👄	SWT 100 ms 🖷	VBW	300 kHz Mode	Sweep		
⊜1Rm View							
най увин			_	M2[1]			01.36 dB 1.0000 MI
ן ייידאיע				M1[1]			29.00 dB
							.2500 M
-40 d <mark>Bm</mark>							
							Í .
-50 d8m0	01 -49.000 dBm					-	
							Í .
-60 dBm							(
							Í .
-70 dBm							Í .
-70 ubiii							
I _ I							Í .
-80 dBm							
							Í .
-90 dBm							
- I W							Í .
-100 dBm						M	2
	W Webston	man and an and	miniliteration	when men when	herenation	Mar Mar Mar mar	humanson
110 10-							ĺ
-110 dBm							[
							ĺ
-120 dBm-							<b>—</b>

Date: 27.AUG.2017 13:50:58



Test specification:	Section 15.203, RSS-Gen, Section 7.1.4, Antenna requirements				
Test procedure:	Visual inspection				
Test mode:	Compliance	Verdict:	PASS		
Date(s):	27-Aug-17	verdict:	FA33		
Temperature: 23 °C	Relative Humidity: 55 %	Air Pressure: 1010 hPa	Power: Battery		
Remarks:					

## 7.8 Antenna requirements

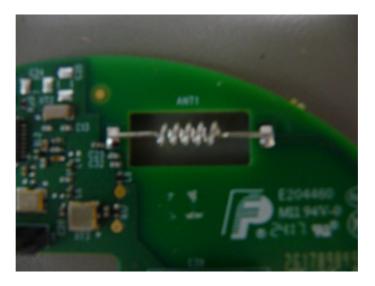
The EUT was verified for compliance with antenna requirements. A transmitter shall be designed to ensure that no antenna other than that furnished by the responsible party will be used with the device. It may be either permanently attached or employs a unique antenna connector for every antenna proposed 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 7.8.1.

## Table 7.8.1 Antenna requirements

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

## Photograph 7.8.1 Antenna assembly





Test specification:	Section 15.109, RSS-Gen, S	Section 7.1.2, ICES-003, Cla	ss B,Radiated emission
Test procedure:	ANSI C63.4, Section 12.2.5		
Test mode:	Compliance	Verdict:	PASS
Date(s):	29-Aug-17	verdict:	FA33
Temperature: 28 °C	Relative Humidity: 45 %	Air Pressure: 1006 hPa	Power: Battery
Remarks:			

## 8 Unintentional emissions

## 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

Frequency, Class B limit		mit, dB(μV/m) Class A limit, dB(μV/		it, dB(μV/m)
MHz	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:  $\lim_{S_2} = \lim_{S_1} + 20 \log (S_1/S_2)$ ,

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 <sup>th</sup> harmonic**	54.0

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

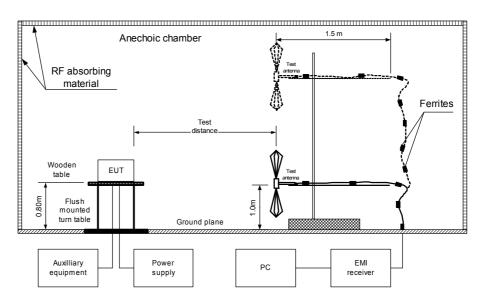
## 8.1.2 Test procedure

- **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<sup>0</sup>, 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.



Test specification:	Section 15.109, RSS-Gen, Section 7.1.2, ICES-003, Class B, Radiated emission				
Test procedure:	ANSI C63.4, Section 12.2.5				
Test mode:	Compliance	Verdict:	PASS		
Date(s):	29-Aug-17	verdict:	FA33		
Temperature: 28 °C	Relative Humidity: 45 %	Air Pressure: 1006 hPa	Power: Battery		
Remarks:					

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









Test specification:	Section 15.109, RSS-Gen,	, Section 7.1.2, ICES-003, Cla	ss B,Radiated emission
Test procedure:	ANSI C63.4, Section 12.2.5		
Test mode:	Compliance	Verdict:	PASS
Date(s):	29-Aug-17	verdict:	FA33
Temperature: 28 °C	Relative Humidity: 45 %	Air Pressure: 1006 hPa	Power: Battery
Remarks:	-		•

#### Table 8.1.3 Radiated emission test results

EUT SET UP: LIMIT: EUT OPERATING MODE: TEST SITE: TEST DISTANCE: DETECTORS USED: FREQUENCY RANGE: RESOLUTION BANDWIDTH:			Cla Rec SE 3 m PE 30	BLE-TOP ceive MI ANECHOIC ( N AK / QUASI-PE/ MHz – 1000 MH ) kHz	٨K			
Frequency, MHz	Peak emission, dB(μV/m)	Measured emission, dB(μV/m)	Quasi-peak Limit, dB(µV/m)	Margin, dB*	Antenna polarization	Antenna height, m	Turn-table position**, degrees	Verdict
No emissions were found					Pass			

TEST SITE: TEST DISTANCE: DETECTORS USED: FREQUENCY RANGE: RESOLUTION BANDWIDTH:				3 m PEA 1000	K / AVER	OIC CHAMBE AGE 000 MHz	R		
Frequency, MHz	Peak		Measured emission, dB(μV/m)			Antenna polarization	height	Turn-table position**, degrees	
No emissions were found					Pass				

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

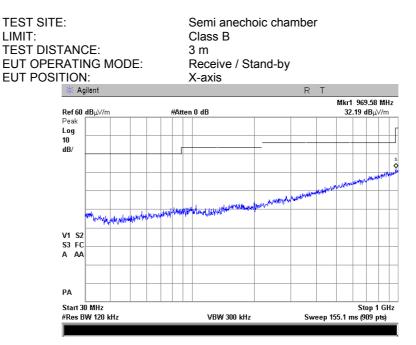
#### Reference numbers of test equipment used

HL 0604	HL 2909	HL 3615	HL 4277	HL 4353	HL 4933	

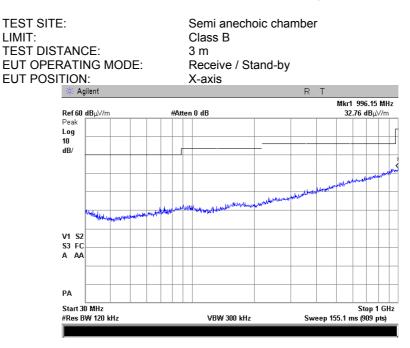
Full description is given in Appendix A.

Test specification:	Section 15.109, RSS-Gen,	Section 7.1.2, ICES-003, Cla	ss B,Radiated emission
Test procedure:	ANSI C63.4, Section 12.2.5		
Test mode:	Compliance	Verdict:	PASS
Date(s):	29-Aug-17	verdict:	FA33
Temperature: 28 °C	Relative Humidity: 45 %	Air Pressure: 1006 hPa	Power: Battery
Remarks:			

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



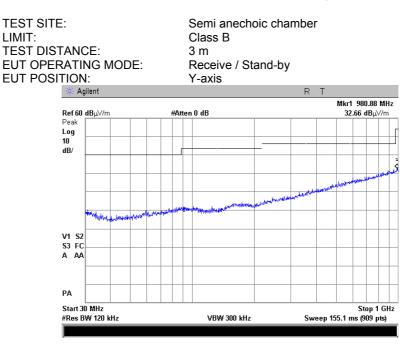
#### Plot 8.1.2 Radiated emission measurements in 30 - 1000 MHz range, horizontal antenna polarization



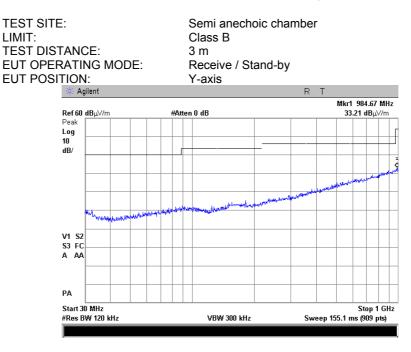


Test specification:	Section 15.109, RSS-Gen,	Section 7.1.2, ICES-003, Cla	ss B,Radiated emission
Test procedure:	ANSI C63.4, Section 12.2.5		
Test mode:	Compliance	Verdict:	PASS
Date(s):	29-Aug-17	verdict.	FA33
Temperature: 28 °C	Relative Humidity: 45 %	Air Pressure: 1006 hPa	Power: Battery
Remarks:			

#### Plot 8.1.3 Radiated emission measurements in 30 - 1000 MHz range, vertical antenna polarization



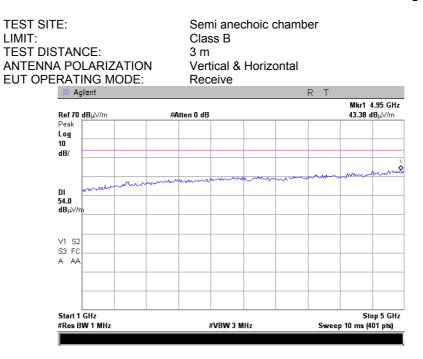
#### Plot 8.1.4 Radiated emission measurements in 30 - 1000 MHz range, horizontal antenna polarization





Test specification:	Section 15.109, RSS-Gen,	Section 7.1.2, ICES-003, Cla	ss B,Radiated emission
Test procedure:	ANSI C63.4, Section 12.2.5		
Test mode:	Compliance	Verdict: PASS	
Date(s):	29-Aug-17	Verdict:	FA33
Temperature: 28 °C	Relative Humidity: 45 %	Air Pressure: 1006 hPa	Power: Battery
Remarks:			

#### Plot 8.1.5 Radiated emission measurements in 1000-5000 MHz range





# 9 APPENDIX A Test equipment and ancillaries used for tests

HL No	Description	Manufacturer	Model	Ser. No.	Last Cal./ Check	Due Cal./ Check
0604	Antenna BiconiLog Log-Periodic/T Bow- TIE, 26 - 2000 MHz	EMCO	3141	9611-1011	12-May-17	12-May-18
1915	Antenna, Loop, Active Receiving, 1 kHz - 30 MHz	EMC Test Systems	6507	1457	19-Jan-17	19-Jan-18
2909	Spectrum analyzer, ESA-E, 100 Hz to 26.5 GHz	Agilent Technologies	E4407B	MY414447 62	09-Mar-17	09-Mar-18
3615	Cable RF, 6.5 m, N type-N type, DC-6 GHz	Suhner Switzerland	RG 214/U	NA	04-Jun-17	04-Jun-18
3818	PSA Series Spectrum Analyzer, 3 Hz- 44 GHz	Agilent Technologies	E4446A	MY482502 88	07-May-17	07-May-18
4135	Shield Box	TESCOM CO., LTD	TC-5916A	5916A000 136	06-Apr-17	06-Apr-18
4222	High Pass Filter, 50 Ohm, 3150 to 6500 MHz	Mini-Circuits	VHF- 2700+	NA	01-Oct-15	01-Oct-17
4277	Test Cable , DC-18 GHz, 3.05 m, N/M - N/M	Mini-Circuits	APC- 10FT- NMNM+	0748A	26-Sep-16	26-Sep-17
4294	Microwave Cable Assembly, 18.0 GHz, 3.4 m, SMA/SMA	Huber-Suhner	Sucoflex P103	NA	18-Dec-16	18-Dec-17
4295	Microwave Cable Assembly, 18.0 GHz, 3.4 m, SMA/SMA	Huber-Suhner	Sucoflex P103	NA	16-Oct-16	16-Oct-17
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-17	15-Mar-18
4355	Signal and Spectrum Analyzer, 9 kHz to 7 GHz	Rohde & Schwarz	FSV 7	191000086 881	20-Apr-17	20-Apr-18
4535	Microwave Cable Assembly, 6.5 GHz, 5.0 m, N/M type-N/M type	Suhner Switzerland	214-U	NA	04-Jun-17	04-Jun-18
4541	Microwave Cable Assembly, 4.0 GHz, 1.0 m, N/M type-N/M type	Suhner Switzerland	214-U	NA	25-Sep-16	25-Sep-17
4542	Amplifier, 9 kHz to 1 GHz, 32 dB gain	Sonoma Instrument	310	0002A056 39	15-Mar-17	15-Mar-18
4543	Broadband preamplifier, 0.5 to 18 GHz, 35 dB gain	Schwarzbeck mess- elektronik	BBV 9718	9718-134	15-Mar-17	15-Mar-18
4549	Cable RF, 6.8 m, N/N - type, up to 3 GHz	Suhner Switzerland	NA	07262	14-Mar-17	14-Mar-18
4575	EXA Signal Analyzer, 9 kHz - 26.5 GHz	Agilent Technologies	N9010A	MY480301 10	06-Apr-17	06-Apr-18
4603	Horn Antenna, 1 - 18 GHz	Schwarzbeck mess- elektronik	BBHA 9120 D	9120D-611	14-Oct-16	14-Oct-17
4604	Biconilog Antenna, 26 - 2000 MHz	EMCO	3142B	9909-1421	12-May-17	12-May-18
4933	Active Horn Antenna, 1 GHz to 18 GHz	Com-Power Corporation	AHA-118	701046	14-Oct-16	14-Oct-17
5102	RF cable, 18 GHz, 6 m, N-type	Huber-Suhner	SF106A/1 1N/11N/6 000MM	500848/6A	27-Jul-17	27-Jul-18
5105	RF cable, 18 GHz, 6 m, N-type	Huber-Suhner	SF106A/1 1N/11N/6 000MM	500851/6A	27-Jul-17	27-Jul-18
5111	RF cable, 40 GHz, 5.5 m, K-type	Huber-Suhner	SF102EA/ 11SK/11S K/5500M M	502493/2E A	27-Jul-17	27-Jul-18



## 10 APPENDIX B Measurement uncertainties

Test description	Expanded uncertainty
Conducted carrier power at RF antenna connector	Below 12.4 GHz: ± 1.7 dB
	12.4 GHz to 40 GHz: ± 2.3 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
Occupied bandwidth	± 8.0 %
Duty cycle, timing (Tx ON / OFF) and average factor measurements	± 1.0 %
Conducted emissions with LISN	9 kHz to 150 kHz: ± 3.9 dB
	150 kHz to 30 MHz: ± 3.8 dB
Radiated emissions at 3 m measuring distance	
Horizontal polarization	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

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, Radio, Safety, Environmental and Telecommunication testing facility.

Hermon Laboratories is recognized and accredited by the Federal Communications Commission (USA) for 1, 2, 15, 18 parts of Code of Federal Regulations 47 (CFR 47), Test Firm Registration Number is 927748, Designation Number is IL1001; registered by Industry Canada for electromagnetic emissions, file number IC 2186A-1 for OATS, certified by VCCI, Japan (the registration numbers are R-808 for OATS, R-1082 for anechoic chamber, G-869 for RE measurements above 1 GHz, C-845 for conducted emissions site and T-1606 for conducted emissions at telecommunication ports).

The laboratory is accredited by American Association for Laboratory Accreditation (USA) according to ISO/IEC 17025 for electromagnetic compatibility, product safety, telecommunications testing, environmental simulation and calibration (for exact scope please refer to Certificate No. 839.01, 839.03 and 839.04).

Address:	P.O. Box 23, Binyamina 3055001, Israel.
Telephone:	+972 4628 8001
Fax:	+972 4628 8277
e-mail:	mail@hermonlabs.com
website:	www.hermonlabs.com

Person for contact: Mr. Michael Nikishin, EMC&Radio group manager

## 12 APPENDIX D Specification references

FOO 470ED mont 45: 2040	Dedia Francisco Devices
FCC 47CFR part 15: 2016	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-247 Issue 2: 2017	Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSs) and Licence- Exempt Local Area Network (LE-LAN) Devices
RSS-Gen Issue 4: 2014	General Requirements for Compliance of Radio Apparatus
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 EMC Test Systems Model 6507, S/N 1457, HL 1915

Frequency, kHz	Measured antenna factor, dBS/m
10	-22.7
20	-27.6
50	-31.3
75	-31.8
100	-32.2
150	-32.3
250	-32.6
500	-32.8
750	-33.0
1000	-33.1
2000	-33.4
3000	-33.7
4000	-34.0
5000	-34.3
10000	-34.9
15000	-35.6
20000	-35.9
25000	-36.1
30000	-36.7

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

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



#### Antenna factor Horn antenna Schwarzbeck mess-elektronik, Model BBHA 9120 D, serial number: 9120D-611, HL 4603

Frequency, MHz	Measured antenna factor, dB/m
1000	25.2
1500	25.7
2000	26.1
2500	27.5
3000	28.3
3500	29.0
4000	30.0
4500	30.8
5000	31.9
5500	32.2
6000	33.1
6500	34.6
7000	35.9
7500	36.6
8000	37.2
8500	36.6
9000	36.9
9500	37.5
10000	38.4
10500	39.5
11000	40.3
11500	40.0
12000	39.2
12500	38.7
13000	39.6
13500	40.8
14000	41.6
14500	42.1
15000	41.2
15500	39.1
16000	38.5
16500	39.9
17000	41.0
17500	44.1
18000	55.6

The antenna factor shall be added to receiver reading in  $dB\mu V$  to obtain field strength in  $dB\mu V/m$ .



## Antenna factor Biconilog Antenna, 26 - 2000 MHz EMCO, Model 3142B, serial number: 9909-1421, HL 4604

Frequency, MHz	Measured, dB/m
30	17.9
35	14.8
40	12.1
45	10.0
50	8.7
60	8.1
70	7.3
80	6.6
90	7.6
100	7.9
120	7.0
140	7.7
160	9.6
180	10.0
200	10.2
250	12.7
300	13.4
400	16.7
500	18.2
600	20.2
700	22.0
800	22.7
900	24.1
1000	25.0

The antenna factor shall be added to receiver reading in  $dB\mu V$  to obtain field strength in  $dB\mu V/m$ 



Antenna factor, HL 4933

# COM-POWER CORPORATION

# **Active Horn Antenna Factor Calibration**

1 GHz to 18 GHz

Equipment:ACTIVE HORN ANTModel:ASerial Number:7Calibration Distance:3Polarization:HoriCalibration Date:11/1							
Frequency	Preamplifier Gain	Antenna Factor with pre-amp	Frequency	Preamplifier Gain	Antenna Factor with pre-amp		
(GHz)	(dB)	(dB/m)	(GHz)	(dB)	(dB/m)		
1	40.96	-16.47	10	40.94	-1.97		
1.5	41.21	-14-53	10.5	40.63	-1.06		
	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 Cable coaxial, RG-214/U, N type-N type, 6.5 m Suhner Switzerland, HL 3615

Frequency, MHz	Cable loss, dB						
10	0.13	1750	2.47	3550	4.10	5350	5.76
30	0.24	1800	2.53	3600	4.17	5400	5.84
50	0.31	1850	2.59	3650	4.21	5450	5.88
100	0.47	1900	2.61	3700	4.23	5500	5.90
150	0.58	1950	2.66	3750	4.33	5550	5.96
200	0.68	2000	2.74	3800	4.36	5600	6.02
250	0.77	2050	2.76	3850	4.38	5650	6.02
300	0.86	2100	2.80	3900	4.46	5700	6.09
350	0.94	2150	2.84	3950	4.52	5750	6.14
400	1.01	2200	2.89	4000	4.48	5800	6.15
450	1.08	2250	2.94	4050	4.52	5850	6.22
500	1.16	2300	2.98	4100	4.64	5900	6.29
550	1.21	2350	3.03	4150	4.62	5950	6.32
600	1.28	2400	3.07	4200	4.69	6000	6.39
650	1.35	2450	3.11	4250	4.75	6050	6.40
700	1.41	2500	3.15	4300	4.79	6100	6.48
750	1.48	2550	3.21	4350	4.83	6150	6.57
800	1.54	2600	3.25	4400	4.90	6200	6.62
850	1.58	2650	3.29	4450	4.95	6250	6.68
900	1.65	2700	3.33	4500	4.98	6300	6.74
950	1.67	2750	3.39	4550	5.04	6350	6.79
1000	1.74	2800	3.45	4600	5.08	6400	6.82
1050	1.79	2850	3.48	4650	5.12	6450	6.83
1100	1.84	2900	3.51	4700	5.15	6500	6.91
1150	1.91	2950	3.58	4750	5.22		
1200	1.94	3000	3.62	4800	5.26		
1250	1.99	3050	3.65	4850	5.29		
1300	2.06	3100	3.69	4900	5.33		
1350	2.11	3150	3.75	4950	5.36		
1400	2.16	3200	3.77	5000	5.38		
1450	2.21	3250	3.80	5050	5.46		
1500	2.25	3300	3.85	5100	5.49		
1550	2.30	3350	3.90	5150	5.56		
1600	2.35	3400	3.94	5200	5.58		
1650	2.38	3450	4.00	5250	5.64		
1700	2.42	3500	4.03	5300	5.69		



APC-10FT-NMNM+, HL 4277									
Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB		
10	0.12	4400	3.19	9000	4.82	13600	5.97		
30	0.21	4500	3.24	9100	4.87	13700	6.01		
50	0.28	4600	3.29	9200	4.90	13800	6.04		
100	0.40	4700	3.34	9300	4.96	13900	6.09		
200	0.59	4800	3.37	9400	4.99	14000	6.12		
300	0.73	4900	3.41	9500	5.03	14100	6.16		
400	0.86	5000	3.45	9600	5.07	14200	6.20		
500	0.97	5100	3.48	9700	5.11	14300	6.22		
600	1.07	5200	3.52	9800	5.13	14400	6.26		
700	1.15	5300	3.56	9900	5.15	14500	6.29		
800	1.23	5400	3.58	10000	5.17	14600	6.33		
900	1.31	5500	3.62	10100	5.19	14700	6.33		
1000	1.39	5600	3.65	10200	5.19	14800	6.35		
1100	1.46	5700	3.69	10300	5.21	14900	6.38		
1200	1.54	5800	3.72	10400	5.22	15000	6.38		
1300	1.60	5900	3.76	10500	5.22	15100	6.40		
1400	1.67	6000	3.80	10600	5.22	15200	6.42		
1500	1.74	6100	3.84	10700	5.25	15300	6.46		
1600	1.79	6200	3.89	10800	5.25	15400	6.51		
1700	1.86	6300	3.92	10900	5.26	15500	6.55		
1800	1.92	6400	3.96	11000	5.29	15600	6.56		
1900	1.98	6500	4.00	11100	5.30	15700	6.59		
2000	2.04	6600	4.04	11200	5.31	15800	6.60		
2100	2.09	6700	4.07	11300	5.35	15900	6.64		
2200	2.14	6800	4.11	11400	5.36	16000	6.65		
2300	2.20	6900	4.14	11500	5.39	16100	6.65		
2400	2.25	7000	4.17	11600	5.41	16200	6.67		
2500	2.31	7100	4.21	11700	5.45	16300	6.69		
2600	2.36	7200	4.23	11800	5.48	16400	6.71		
2700	2.42	7300	4.27	11900	5.51	16500	6.72		
2800	2.46	7400	4.30	12000	5.53	16600	6.73		
2900	2.51	7500	4.34	12100	5.56	16700	6.75		
3000	2.56	7600	4.37	12200	5.59	16800	6.80		
3100	2.60	7700	4.40	12300	5.61	16900	6.82		
3200	2.65	7800	4.44	12400	5.62	17000	6.85		
3300	2.70	7900	4.47	12500	5.65	17100	6.90		
3400	2.75	8000	4.49	12600	5.68	17200	6.96		
3500	2.80	8100	4.53	12700	5.71	17300	7.02		
3600	2.85	8200	4.57	12800	5.73	17400	7.07		
3700	2.90	8300	4.60	12900	5.76	17500	7.06		
3800	2.95	8400	4.63	13000	5.80	17600	7.06		
3900	2.98	8500	4.67	13100	5.83	17700	7.08		
4000	3.02	8600	4.69	13200	5.86	17800	7.09		
4100	3.07	8700	4.73	13300	5.88	17900	7.07		
4200	3.10	8800	4.76	13400	5.91	18000	7.08		
4300	3.14	8900	4.79	13500	5.94				

#### Cable loss Test cable, Mini-Circuits, S/N 0748A, 18 GHz, 3.05 m, N/M - N/M APC-10FT-NMNM+, HL 4277



	Cable			103, HL 4294			
Frequency, MHz	loss, dB	Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB
10	0.11	4900	2.09	10000	2.90	15100	3.61
30	0.17	5000	2.10	10100	2.92	15200	3.67
50	0.22	5100	2.14	10200	2.95	15300	3.63
100	0.30	5200	2.16	10300	2.96	15400	3.64
200	0.42	5300	2.17	10400	2.99	15500	3.68
300	0.51	5400	2.19	10500	2.99	15600	3.71
400	0.59	5500	2.19	10600	3.03	15700	3.74
500	0.66	5600	2.22	10700	3.03	15800	3.71
600	0.72	5700	2.24	10800	3.04	15900	3.74
700	0.77	5800	2.23	10900	3.05	16000	3.71
800	0.82	5900	2.26	11000	3.09	16100	3.73
900	0.88	6000	2.27	11100	3.07	16200	3.76
1000	0.93	6100	2.26	11200	3.08	16300	3.82
1100	0.98	6200	2.29	11300	3.11	16400	3.90
1200	1.02	6300	2.30	11400	3.12	16500	3.81
1300	1.06	6400	2.34	11500	3.11	16600	3.88
1400	1.10	6500	2.34	11600	3.15	16700	3.87
1500	1.14	6600	2.36	11700	3.16	16800	3.89
1600	1.19	6700	2.36	11800	3.18	16900	3.95
1700	1.23	6800	2.39	11900	3.19	17000	4.02
1800	1.27	6900	2.39	12000	3.23	17100	4.04
1900	1.30	7000	2.44	12100	3.25	17200	3.99
2000	1.35	7100	2.46	12200	3.22	17300	4.03
2100	1.38	7200	2.44	12300	3.25	17400	4.03
2200	1.42	7300	2.48	12400	3.25	17500	4.06
2300	1.45	7400	2.47	12500	3.28	17600	4.05
2400	1.48	7500	2.48	12600	3.27	17700	4.12
2500	1.51	7600	2.50	12700	3.27	17800	4.14
2600	1.55	7700	2.53	12800	3.30	17900	4.18
2700	1.59	7800	2.56	12900	3.30	18000	4.14
2800	1.62	7900	2.55	13000	3.27		
2900	1.65	8000	2.56	13100	3.32		
3000	1.66	8100	2.56	13200	3.32		
3100	1.69	8200	2.57	13300	3.32		
3200	1.71	8300	2.59	13400	3.35		
3300	1.74	8400	2.62	13500	3.38		
3400	1.76	8500	2.67	13600	3.39		
3500	1.78	8600	2.65	13700	3.42		
3600	1.80	8700	2.68	13800	3.47		
3700	1.85	8800	2.68	13900	3.45		
3800	1.88	8900	2.68	14000	3.49		
3900	1.90	9000	2.74	14100	3.50		
4000	1.91	9100	2.74	14200	3.55		
4100	1.93	9200	2.76	14300	3.59		
4200	1.96	9300	2.78	14400	3.58		
4300	1.97	9400	2.79	14500	3.56		
4400	1.99	9500	2.80	14600	3.57		
4500	2.02	9600	2.83	14700	3.57		
4600	2.02	9700	2.84	14800	3.57		
4700	2.04	9800	2.86	14900	3.64		
4800	2.05	9900	2.92	15000	3.64		

#### Cable loss Microwave Cable Assembly, 18.0 GHz, 3.4 m, SMA/SMA, Huber-Suhner, Sucoflex P103, HL 4294



			Cab	le loss				
	Aicrowave C	Cable Assembl	v, 18.0 GHz, 3	3.4 m, SMA/SN	/IA, Huber-S	Suhner, S/N 429	95.	
Sucoflex P103, HL 4295								

Frequency,	Cable						
MHz	loss, dB	Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB
10	0.11	5000	2.09	10200	2.97	15400	3.63
30	0.18	5100	2.12	10300	3.01	15500	3.65
50	0.23	5200	2.13	10400	3.00	15600	3.63
100	0.31	5300	2.16	10500	3.05	15700	3.64
200	0.38	5400	2.19	10600	3.09	15800	3.64
300	0.43	5500	2.21	10700	3.05	15900	3.66
400	0.52	5600	2.21	10800	3.09	16000	3.71
500	0.60	5700	2.24	10900	3.10	16100	3.67
600	0.67	5800	2.24	11000	3.08	16200	3.71
700	0.72	5900	2.25	11100	3.11	16300	3.70
800	0.78	6000	2.27	11200	3.12	16400	3.71
900	0.83	6100	2.25	11300	3.12	16500	3.72
1000	0.89	6200	2.29	11400	3.20	16600	3.84
1100	0.94	6300	2.34	11500	3.16	16700	3.78
1200	0.98	6400	2.37	11600	3.16	16800	3.85
1300	1.03	6500	2.33	11700	3.20	16900	3.88
1400	1.06	6600	2.34	11800	3.19	17000	3.85
1500	1.11	6700	2.39	11900	3.21	17100	3.88
1600	1.14	6800	2.46	12000	3.28	17200	3.92
1700	1.19	6900	2.45	12100	3.23	17300	3.90
1800	1.22	7000	2.44	12200	3.26	17400	4.00
1900	1.26	7100	2.43	12300	3.30	17500	4.02
2000	1.30	7200	2.44	12400	3.25	17600	4.00
2100	1.34	7300	2.51	12500	3.26	17700	3.96
2200	1.37	7400	2.54	12600	3.30	17800	4.01
2300	1.40	7500	2.49	12700	3.26	17900	4.02
2400	1.44	7600	2.52	12800	3.34	18000	4.08
2500	1.47	7700	2.59	12900	3.37		
2600	1.50	7800	2.57	13000	3.30		
2700	1.55	7900	2.55	13100	3.35		
2800	1.58	8000	2.57	13200	3.31		
2900	1.60	8100	2.58	13300	3.33		
3000	1.63	8200	2.64	13400	3.42		
3100	1.64	8300	2.70	13500	3.43		
3200	1.67	8400	2.65	13600	3.40		
3300	1.69	8500	2.66	13700	3.47		
3400	1.73	8600	2.68	13800	3.45		
3500	1.74	8700	2.70	13900	3.43	İ	İ
3600	1.76	8800	2.74	14000	3.52	1	
3700	1.79	8900	2.74	14100	3.51	İ	İ
3800	1.82	9000	2.76	14200	3.54		
3900	1.85	9100	2.82	14300	3.55		
4000	1.87	9200	2.79	14400	3.52		
4100	1.90	9300	2.82	14500	3.52		
4200	1.92	9400	2.83	14600	3.56		
4300	1.93	9500	2.83	14700	3.55		
4400	1.94	9600	2.86	14800	3.55		
4500	1.97	9700	2.93	14900	3.59		
4600	1.99	9800	2.89	15000	3.56		
4700	2.01	9900	2.91	15100	3.59		
4800	2.02	10000	2.94	15200	3.59		
4900	2.04	10100	2.94	15300	3.59	İ	İ



Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB
10	0.10	1700	1.79	4400	3.53
15	0.13	1800	1.86	4500	3.60
20	0.15	1900	1.93	4600	3.72
30	0.18	2000	2.00	4700	3.80
40	0.21	2100	2.06	4800	3.87
50	0.24	2200	2.13	4900	3.94
60	0.26	2300	2.19	5000	3.99
70	0.29	2400	2.25	5100	4.06
80	0.31	2500	2.32	5200	4.12
90	0.33	2600	2.38	5300	4.17
100	0.35	2700	2.45	5400	4.25
150	0.43	2800	2.51	5500	4.31
200	0.50	2900	2.57	5600	4.40
300	0.63	3000	2.64	5700	4.47
400	0.74	3100	2.73	5800	4.54
500	0.85	3200	2.79	5900	4.64
600	0.94	3300	2.86	6000	4.73
700	1.03	3400	2.91	6100	4.79
800	1.12	3500	2.97	6200	4.89
900	1.20	3600	3.02	6300	5.00
1000	1.28	3700	3.07	6400	5.06
1100	1.35	3800	3.14	6500	5.13
1200	1.43	3900	3.20		
1300	1.50	4000	3.25		
1400	1.58	4100	3.32		
1500	1.65	4200	3.38		
1600	1.72	4300	3.46		

## Cable loss Microwave Cable Assembly, 6.5 GHz, 5.0 m, N/M type-N/M type Suhner Switzerland, HL 4535



Cable loss	
Microwave Cable Assembly, 4.0 GHz, 1.0 m, N/M type-N/M ty	pe
Suhner Switzerland, HL 4541	

Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB
10	0.02	1700	0.45
15	0.03	1800	0.46
20	0.03	1900	0.48
30	0.04	2000	0.49
40	0.04	2100	0.52
50	0.05	2200	0.54
60	0.06	2300	0.55
70	0.06	2400	0.56
80	0.07	2500	0.58
90	0.07	2600	0.59
100	0.08	2700	0.61
150	0.10	2800	0.63
200	0.12	2900	0.64
300	0.15	3000	0.67
400	0.18	3100	0.70
500	0.20	3200	0.74
600	0.23	3300	0.77
700	0.25	3400	0.80
800	0.28	3500	0.82
900	0.30	3600	0.86
1000	0.31	3700	0.88
1100	0.33	3800	0.94
1200	0.35	3900	0.95
1300	0.37	4000	0.99
1400	0.39		
1500	0.41		
1600	0.43		



### Cable loss RF Cable, Huber-Suhner, 18 GHz, 6 m, N- type, SF106A/11N/11N/6000MM, S/N 500848/6A HL 5102

Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB
0.1	0.00	5500	2.43
50	0.23	6000	2.54
100	0.31	6500	2.65
200	0.44	7000	2.76
300	0.54	7500	2.87
400	0.62	8000	2.98
500	0.69	8500	3.06
600	0.76	9000	3.16
700	0.82	9500	3.27
800	0.87	10000	3.36
900	0.94	10500	3.45
1000	0.98	11000	3.55
1100	1.03	11500	3.63
1200	1.08	12000	3.72
1300	1.13	12500	3.82
1400	1.17	13000	3.90
1500	1.21	13500	3.99
1600	1.25	14000	4.06
1700	1.30	14500	4.15
1800	1.33	15000	4.24
1900	1.37	15500	4.30
2000	1.41	16000	4.37
2500	1.59	16500	4.45
3000	1.75	17000	4.53
3500	1.90	17500	4.62
4000	2.04	18000	4.67
4500	2.17		
5000	2.30		



### Cable loss RF Cable, Huber-Suhner, 18 GHz, 6 m, N- type, SF106A/11N/11N/6000MM, S/N 500851/6A HL 5105

Frequency,	Cable loss,	Frequency,	Cable loss,
MHz	dB	MHz	dB
0.1	0.01	5500	2.41
50	0.22	6000	2.53
100	0.31	6500	2.64
200	0.43	7000	2.75
300	0.53	7500	2.85
400	0.61	8000	2.96
500	0.68	8500	3.05
600	0.75	9000	3.15
700	0.81	9500	3.26
800	0.87	10000	3.34
900	0.93	10500	3.44
1000	0.98	11000	3.53
1100	1.03	11500	3.61
1200	1.07	12000	3.71
1300	1.12	12500	3.81
1400	1.16	13000	3.89
1500	1.21	13500	3.97
1600	1.25	14000	4.05
1700	1.28	14500	4.13
1800	1.32	15000	4.21
1900	1.37	15500	4.29
2000	1.40	16000	4.36
2500	1.58	16500	4.43
3000	1.74	17000	4.49
3500	1.89	17500	4.58
4000	2.03	18000	4.67
4500	2.17		
5000	2.29		



#### Cable loss RF Cable, Huber-Suhner, 40 GHz, 5.5 m, K type, SF102EA/11SK/11SK/5500MM, S/N 502493/2EA HL 5111

Frequency,	Cable loss,	Frequency,	Cable loss,
MHz	dB	MHz	dB
100	0.68	20500	10.17
200	0.97	21000	10.30
300	1.18	21500	10.43
500	1.52	22000	10.58
1000	2.14	22500	10.73
1500	2.62	23000	10.85
2000	3.03	23500	10.98
2500	3.39	24000	11.11
3000	3.72	24500	11.20
3500	4.03	25000	11.32
4000	4.32	25500	11.47
4500	4.59	26000	11.59
5000	4.84	26500	11.72
5500	5.09	27000	11.83
6000	5.32	27500	11.94
6500	5.55	28000	12.04
7000	5.77	28500	12.16
7500	5.99	29000	12.28
8000	6.19	29500	12.40
8500	6.40	30000	12.50
9000	6.60	30500	12.59
9500	6.79	31000	12.68
10000	6.98	31500	12.80
10500	7.16	32000	12.94
11000	7.34	32500	13.09
11500	7.51	33000	13.23
12000	7.68	33500	13.32
12500	7.84	34000	13.44
13000	8.00	34500	13.54
13500	8.15	35000	13.68
14000	8.31	35500	13.81
14500	8.46	36000	13.90
15000	8.62	36500	13.99
15500	8.76	37000	14.12
16000	8.91	37500	14.22
16500	9.06	38000	14.33
17000	9.21	38500	14.47
17500	9.35	39000	14.54
18000	9.49	39500	14.62
18500	9.62	40000	14.75
19000	9.76		
19500	9.90		
20000	10.05		



# 14 APPENDIX F Abbreviations and acronyms

А	ampere
AC	alternating current
A/m	ampere per meter
AM	amplitude modulation
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
Н	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
NB	narrow band
OATS	open area test site
Ω	Ohm
PM	pulse modulation
PS	power supply
ppm	part per million (10 <sup>-6</sup> )
QP	quasi-peak
RE	radiated emission
RF	radio frequency
rms	root mean square
Rx	receive
S T	second
T	temperature
Tx	transmit
V	volt
WB	wideband

# END OF DOCUMENT