



Hermon Laboratories Ltd. 66 HaTachana str., 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), RSS-247 Issue 3:2023, RSS-Gen Issue 5

FOR:

ARAD TECHNOLOGIES Allegro Cellular Models: PIT Unit X PIT_Unit X FCC ID: 2A7AA-CM2R1PIT4G IC: 28664-CM2R1PIT4G

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1 Applicant information

Client name:	ARAD TECHNOLOGIES
Address:	POB 537, HaMada 4, Yokneam Ind. Zone, Yokneam Ilit 20692, Israel
Telephone:	04-9935222, Ext: 271
Fax:	04-9935227
E-mail:	viorel.negreanu@aradtec.com
Contact name:	Mr. Vily Negreanu

2 Equipment under test attributes

Product name:	Allegro Cellular
Product type:	Transceiver
Model(s):	PIT Unit X*
Serial number:	80E12696A18F
Hardware version:	PCB00266 (1)
Software release:	74.1.12
Receipt date	23-May-24

*According to manufacturer's declaration provided in Appendix G the PIT Unix X is a Super Set product that is fully identical to PIT_Unix X, some components were added/replaced because they are required for the functionality of their specific application. This component does not change the radio functions. Therefore, only the model PIT Unix X was tested.

3 Manufacturer information

Manufacturer name:	ARAD TECHNOLOGIES
Address:	POB 537, HaMada 4, Yokneam Ind. Zone, Yokneam Ilit 20692, Israel
Telephone:	04-9935222, Ext: 271
Fax:	04-9935227
E-Mail:	viorel.negreanu@aradtec.com
Contact name:	Mr. Vily Negreanu

4 Test details

Project ID:	54470
Location:	Hermon Laboratories Ltd. 66 HaTachana str., P.O. Box 23, Binyamina 3055001, Israel
Test started:	27-Jun-24
Test completed:	11-Jul-24
Test specification(s):	FCC 47CFR part 15 subpart C §15.247 (FHSS),
	RSS-247 Issue 3:2023, RSS-Gen Issue 5



Tests summary 5

Test	Status
Transmitter characteristics	
Section 15.247(a)1 / RSS-247 section 5.1(c), 20 dB bandwidth	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(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 frequencies	Pass
Section 15.247(a)1 / RSS-247 section 5.1(c), Average time of occupancy	Pass
Section 15.247(i)5 / RSS-102 section 2.5, RF exposure	Pass, the exhibit to the application of certification is provided
Section 15.247(d) / RSS-247 section 5.5, Emissions at band edges	Pass
Section 15.207(a) / RSS-Gen section 8.8, Conducted emission	Not required
Section 15.203 / RSS-Gen section 8.3, Antenna requirements	Pass

This is to request a Class II Permissive Change for FCC ID: 2A7AA-CM2R1PIT4G, original granted on 23/08/2024. The change filed under this application is:

1. To add additional Hybrid Spread spectrum technique for LoRa wireless technology via embedded software.

Except outlined above, Certified product remain identical to original one.

This test report supersedes the previously issued test report identified by Doc ID: ARARAD_FCC.54470_LoRa_Rev2

Testing was completed against all relevant requirements of the test standard. However, 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, EMC & Radio	27-Jun-24 – 11-Jul-24	BH
Reviewed by:	Mrs. S. Peysahov Sheynin, certification specialist, EMC & Radio	20-Jul-24	
Approved by:	Mr. M. Nikishin, group leader, EMC & Radio	09-Oct-24	54 b



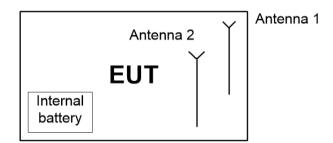
6 EUT description

Note: The following data in this clause is provided by the customer and represents his sole responsibility

6.1 General information

The Allegro cellular PIT booster Module is a battery-operated radio module designed for automated water meter reading. The Allegro cellular is capable of reading water consumption data from residential and commercial water meters equipped with an Encoder or Solid-State Register. It uses CAT-M cellular / LoRaWAN radio for relaying water consumption data to the utility. And Bluetooth short range wireless technology for unit parameters configuration and maintenance interface.

6.2 Test configuration





6.3 Transmitter characteristics

Type o	of equipment												
Х	Stand-alone	Equipme	ent with or wit	hout its	own co	ontrol p	provisions	3)					
	Combined equipment (Equipment where the radio part is fully integrated within another type of equipment)												
	Plug-in card (Equipme	ent intended f	or a vari	ety of h	host sy	/stems)						
Intend	ed use		Condition of	of use									
Х	fixed		Always at a	ays at a distance more than 2 m from all people									
	mobile		Always at a										
	portable		May operate	e at a dis	tance	closer	than 20 d	cm to human	body				
Assign	ned frequency	ranges		902 -	- 928 N	ИНz							
Operat	ting frequencie	es		902.3	3 – 914	1.9 MH	z						
				At tra	Insmitte	er 50 🛙	Ω RF out	out connecto	r		dBm	1	
Maxim	um rated outp	ut powe	r	Peak	output	t powe	er				27.94	4 dBm	
				Х	No								
				-		Γ		continuous	variah	le			
le tran	smitter output	nower w	ariable?			F				with stepsize		dB	
15 11 411		power v			Yes	Ŀ			lable	with stepsize		dBm	
								RF power					
							maximum	n RF power				dBm	
Antenr	na connection												
	unique coupli	na	et	andard o	onnec	tor	х	integral		with temporary RF	conn	ector	
	unique coupi	ng	51	anuaru (Х	X without temporary RF connector				
Antenr	na/s technical	characte	eristics										
Туре			Manufa	acturer			Model	number		Gain			
Intergra	ated		Inhous	e desigr	۱		N/A			0dBi			
Transr	nitter aggrega	te data r	ate/s			980b	nns						
						5470							
Type o	of modulation					Chirp	Spread	Spectrum CS	SS				
	ating test sign	al (basel	band)			LoRa		•					
	nitter power s		,										
Х	Battery		ninal rated vo	oltage		3.6 V	DC	Battery t	ype	Lithium Inorgan	ic batt	tery	
	DC		ninal rated vo									-	
	AC mains	Nom	ninal rated vo	oltage				Frequen	су				
Comm	on power sou	rce for tr	ransmitter ar	nd recei	ver			Х	y	es		no	
					Х	Fr	requency	hopping (FH	ISS)				
Spread spectrum technique used						U	smission sys	tem (I	DTS)				
							ybrid						
Spread	d spectrum pa			tters tes	sted pe	er FCC	C 15.247	only					
			er of hops		64								
FHSS Bandwidth per hop					144.36 kHz								
FHSS			ation of hops		200 k								



Test specification: Section 15.247(a)1, RSS-247 section 5.1(3), 20 dB bandwidth							
Test procedure:	ANSI C63.10, section 7.8.7						
Test mode:	Compliance	Verdict: PASS					
Date(s):	27-Jun-24	verdict:	PASS				
Temperature: 23 °C	Relative Humidity: 58 %	Air Pressure: 1012 hPa	Power: 3.6 VDC				
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	

* - 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.
- 7.1.2.4 The test was repeated for each data rate and each modulation format.

Figure 7.1.1 The 20 dB bandwidth test setup





Test specification: Section 15.247(a)1, RSS-247 section 5.1(3), 20 dB bandwidth								
Test procedure: ANSI C63.10, section 7.8.7								
Test mode:	Compliance	Verdict: PASS						
Date(s):	27-Jun-24	verdict:	PASS					
Temperature: 23 °C	Relative Humidity: 58 %	Air Pressure: 1012 hPa	Power: 3.6 VDC					
Remarks:								

Table 7.1.2 The 20 dB bandwidth test results

ASSIGNED FREQUEN DETECTOR USED: SWEEP TIME: VIDEO BANDWIDTH: FREQUENCY HOPPIN			902- Peak Auto ≥ RB' Disat	W				
Carrier frequency, MHz	Type of modulation	Data rate, bps	99% OBW kHz	20 dB bandwidth, kHz	Limit, kHz	Margin, kHz	Verdict	
Low frequency								
902.3	LoRa	980	126.05	143.86	250	-106.14	Pass	
902.3	LORA	5470	127.24	137.86	250	-112.14	Pass	
Mid frequency								
000.7	LaDa	980	126.28	144.36	250	-105.64	Pass	
908.7 LoRa		5470	127.20	138.86	250	-111.14	Pass	
High frequency								
914.9	LoRa	980	126.02	143.86	250	-106.14	Pass	
914.9	LUKA	5470	127.08	137.86	250	-112.14	Pass	

Reference numbers of test equipment used

HL 5288	HL 5902	HL 3903				
		•		•	•	

Full description is given in Appendix A.



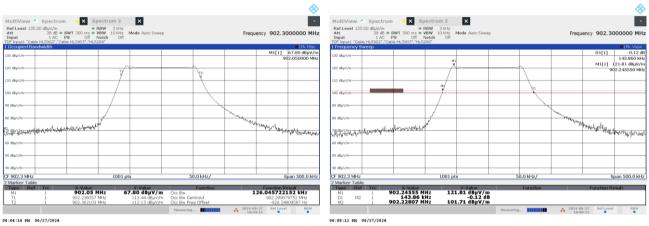
Test specification:	Section 15.247(a)1, RSS-2	247 section 5.1(3), 20 dB bar	ndwidth
Test procedure:	ANSI C63.10, section 7.8.7		
Test mode:	Compliance	Verdict:	PASS
Date(s):	27-Jun-24	verdict:	PASS
Temperature: 23 °C	Relative Humidity: 58 %	Air Pressure: 1012 hPa	Power: 3.6 VDC
Remarks:			·

Plot 7.1.1 20 dB bandwidth test result at low frequency

BIT RATE 980 bps

99%OBW

20 dB OBW

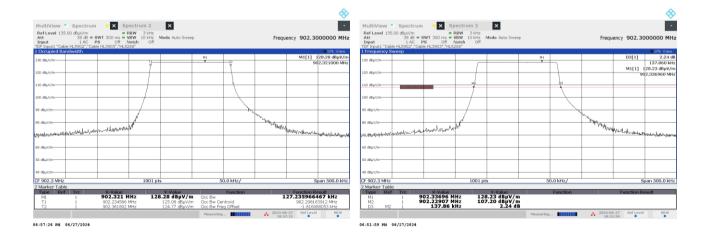


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BIT RATE 5470 bps

99%OBW

20 dB OBW

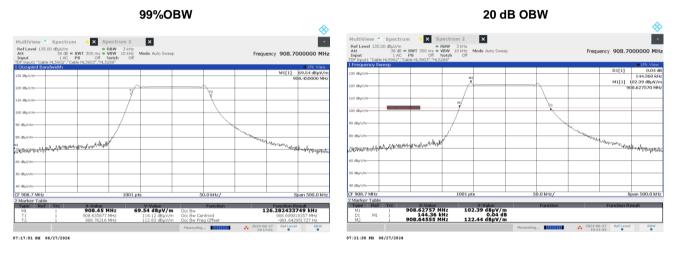




Test specification:	Section 15.247(a)1, RSS-2	247 section 5.1(3), 20 dB bar	ndwidth
Test procedure:	ANSI C63.10, section 7.8.7		
Test mode:	Compliance	Verdict:	PASS
Date(s):	27-Jun-24	verdict:	PASS
Temperature: 23 °C	Relative Humidity: 58 %	Air Pressure: 1012 hPa	Power: 3.6 VDC
Remarks:	•		

Plot 7.1.2 The 20 dB bandwidth test result at mid frequency

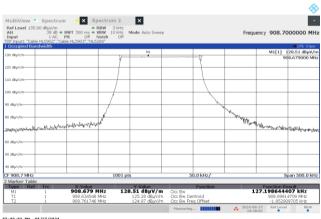
BIT RATE 980 bps

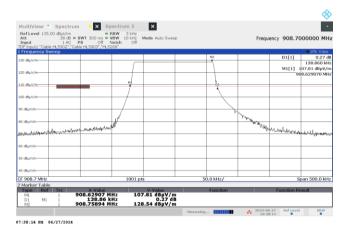


BIT RATE 5470 bps









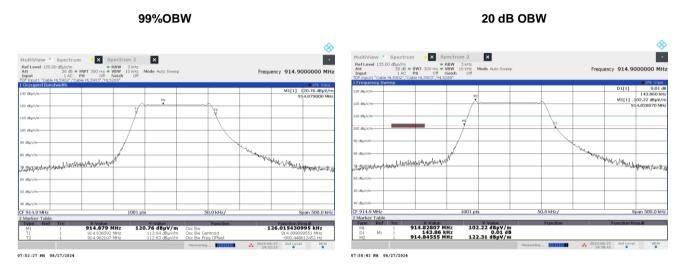
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Test specification:	Section 15.247(a)1, RSS-2	247 section 5.1(3), 20 dB bar	ndwidth
Test procedure:	ANSI C63.10, section 7.8.7		
Test mode:	Compliance	Verdict:	PASS
Date(s):	27-Jun-24	verdict:	PASS
Temperature: 23 °C	Relative Humidity: 58 %	Air Pressure: 1012 hPa	Power: 3.6 VDC
Remarks:	-		

Plot 7.1.3 The 20 dB bandwidth test result at high frequency

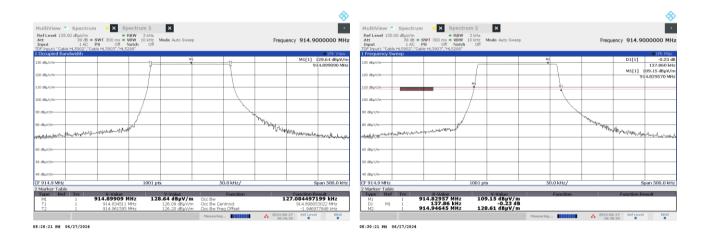
BIT RATE 980 bps



BIT RATE 5470 bps



20 dB OBW





Test specification:	Section 15.247(a)1, RSS-2	247 section 5.1(2), Frequenc	y separation
Test procedure:	ANSI C63.10, section 7.8.2		
Test mode:	Compliance	Verdict:	PASS
Date(s):	01-Jul-24	verdict.	PA33
Temperature: 25 °C	Relative Humidity: 47 %	Air Pressure: 1003 hPa	Power: 3.6 VDC
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 Carrier frequency separation limits

Assigned frequency range,	Carrier freque	ncy 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





Test specification:	Section 15.247(a)1, RSS-	247 section 5.1(2), Frequenc	y separation
Test procedure:	ANSI C63.10, section 7.8.2		
Test mode:	Compliance	Verdict:	PASS
Date(s):	01-Jul-24	verdict:	PASS
Temperature: 25 °C	Relative Humidity: 47 %	Air Pressure: 1003 hPa	Power: 3.6 VDC
Remarks:			

Table 7.2.2 Carrier frequency separation test results

ASSIGNED FREQUENCY: MODULATION: DETECTOR USED: RESOLUTION BANDWIDTH: VIDEO BANDWIDTH: FREQUENCY HOPPING:	902.0 – 928.0 MHz LoRa Peak ≥ 1% of the span ≥ RBW Enabled		
BIT RATE: 20 dB BANDWIDTH:	980 bps 144.36 kHz		
Carrier frequency separation, kHz	Limit, kHz	Margin, kHz*	Verdict
200	444.00	55.04	Deee
200	144.36	-55.64	Pass
BIT RATE: 20 dB BANDWIDTH:	5470 bps 138.86 kHz	-55.64	Pass
BIT RATE:	5470 bps	-55.64 Margin, kHz*	Verdict

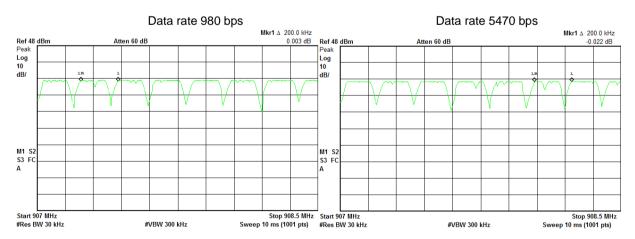
* - Margin = Carrier frequency separation – specification limit.

Reference numbers of test equipment used

	ĺ	HL 2780	HL 3434	HL 4136	HL 7546	HL 5622			
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Full description is given in Appendix A.







Test specification:	Section 15.247(a)1, RSS-24	7 section 5.1(3), Number o	f hopping frequencies
Test procedure:	ANSI C63.10, section 7.8.3		
Test mode:	Compliance	Verdict:	PASS
Date(s):	01-Jul-24	verdict:	PASS
Temperature: 25 °C	Relative Humidity: 47 %	Air Pressure: 1003 hPa	Power: 3.6 VDC
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
----------------------------	------------------------

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 associated plots.

Figure 7.3.1 Hopping frequencies test setup





Test specification:	Section 15.247(a)1, RSS-2	247 section 5.1(3), Number o	of hopping frequencies
Test procedure:	ANSI C63.10, section 7.8.3		
Test mode:	Compliance	Verdict:	PASS
Date(s):	01-Jul-24	verdict:	PASS
Temperature: 25 °C	Relative Humidity: 47 %	Air Pressure: 1003 hPa	Power: 3.6 VDC
Remarks:	-		

Table 7.3.2 Hopping frequencies test results

ASSIGNED FREQUENCY: MODULATION: DETECTOR USED: FREQUENCY HOPPING:

LoRa Peak Enabled

902.0 - 928.0 MHz

IT RATE: 980 bps			
Number of hopping frequencies	Minimum number of hopping frequencies	Margin*	Verdict
64	50	14	Pass

BIT RATE: 5470 bps			
Number of hopping frequencies	Minimum number of hopping frequencies	Margin*	Verdict
64	50	14	Pass

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

Reference numbers of test equipment used

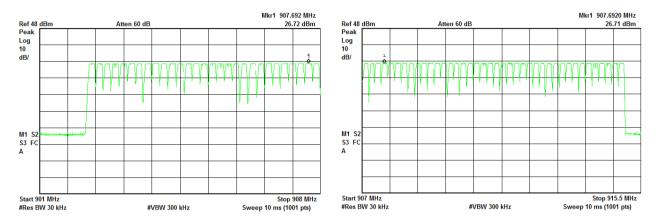
HL 2780	HL 4136	HL 3434	HL 7546	HL 5622		

Full description is given in Appendix A.

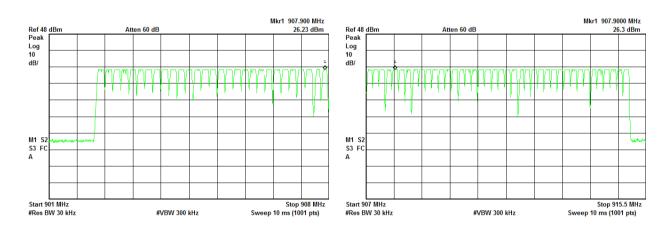


Test specification:	on: Section 15.247(a)1, RSS-247 section 5.1(3), Number of hopping frequencies			
Test procedure:	ANSI C63.10, section 7.8.3			
Test mode:	Compliance	Verdict: PASS		
Date(s):	01-Jul-24	verdict:	PA33	
Temperature: 25 °C	Relative Humidity: 47 %	Air Pressure: 1003 hPa	Power: 3.6 VDC	
Remarks:				











Test specification:	pecification: Section 15.247(a)1, RSS-247 section 5.1(3), Average time of occupancy			
Test procedure:	ANSI C63.10, section 7.8.4			
Test mode:	Compliance	Verdict: PASS		
Date(s):	01-Jul-24	verdict.	FA33	
Temperature: 25 °C	Relative Humidity: 47 %	Air Pressure: 1003 hPa	Power: 3.6 VDC	
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.

Table 7.4.1 Average time of occupancy limits

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 associated plots.

Figure 7.4.1 Average time of occupancy test setup





Test specification:	Section 15.247(a)1, RSS-247 section 5.1(3), Average time of occupancy			
Test procedure:	ANSI C63.10, section 7.8.4			
Test mode:	Compliance	Vardiate	PASS	
Date(s):	01-Jul-24	Verdict:	PASS	
Temperature: 25 °C	Relative Humidity: 47 %	Air Pressure: 1003 hPa	Power: 3.6 VDC	
Remarks:	-			

Table 7.4.2 Average time of occupancy test results

ASSIGNED FREC MODULATION: DETECTOR USEI NUMBER OF HOF INVESTIGATED F FREQUENCY HO	D: PPING FREQUENCI PERIOD:	ES:	902.0 – 92 LoRa Peak 64 21 s Enabled	28.0 MHz			
Carrier frequency, MHz	Single transmission duration, s	Number of transmissions within investigated period	Average time of occupancy*, s	Bit rate, bps	Limit, s	Margin, s**	Verdict
908.7	0.3715	1	0.37	980	0.4	-0.03	Pass
914.9	0.3715	1	0.37	5470	0.4	-0.03	Pass

* - Average time of occupancy = (Single transmission duration × Investigated period) / (Single transmission period × number of hopping channels).

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

Reference numbers of test equipment used

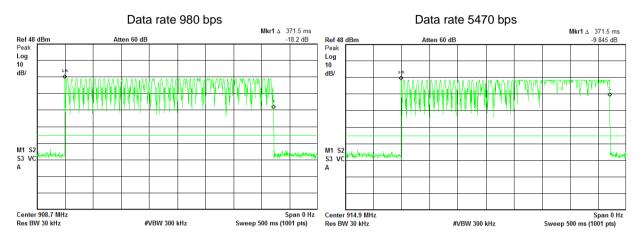
HL 2780 HL 4136 HL 7546 HL 5622	

Full description is given in Appendix A.

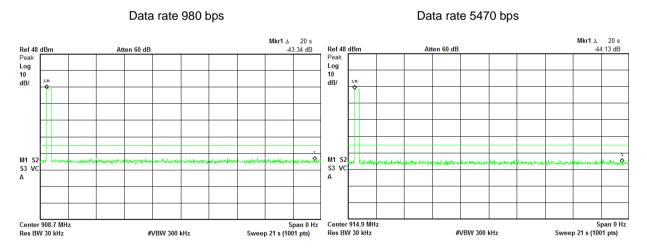


Test specification:	Section 15.247(a)1, RSS-247 section 5.1(3), Average time of occupancy			
Test procedure:	ANSI C63.10, section 7.8.4			
Test mode:	Compliance	Verdict:	PASS	
Date(s):	01-Jul-24	verdict:	PASS	
Temperature: 25 °C	Relative Humidity: 47 %	Air Pressure: 1003 hPa	Power: 3.6 VDC	
Remarks:	· · · ·			









Test specification: Section 15.247(b), RSS-247 section 5.4(1), Peak output power				
Test procedure:	ANSI C63.10, section 7.8.5			
Test mode:	Compliance	Verdict:	PASS	
Date(s):	04-Jul-24	verdict.	FA33	
Temperature: 24 °C	Relative Humidity: 58 %	Air Pressure: 1012 hPa	Power: 3.6 VDC	
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
	· oun	ouput	p • · · • ·	

Assigned	Peak outp	Peak output power* Equivalent field strength limit		Maximum
frequency range, MHz	W	dBm	@ 3m, dB(μV/m)*	antenna gain, dBi
002.0 028.0	0.25 (<50 hopping channels)	24.0(<50 hopping channels)	125.2 (<50 hopping channels)	
902.0 – 928.0 1.0 (≥50 hopping channe		30.0 (≥50 hopping channels)	131.2 (≥50 hopping channels)	
2400.0 - 2483.5	0.125 (<75 hopping channels)	21.0(<75 hopping channels)	122.2 (<75 hopping channels)	6.0*
2400.0 - 2403.5	1.0 (≥75 hopping channels)	30.0 (≥75 hopping channels)	131.2 (≥75 hopping channels)	
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^o 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:

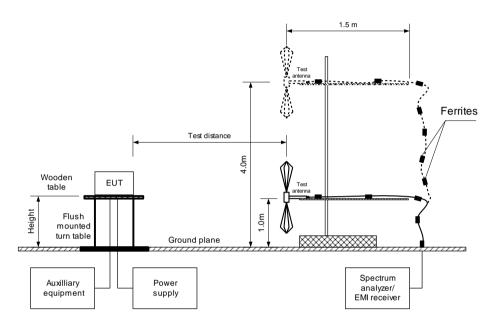
Peak output power in dBm = Field strength in dB(μ V/m) - Transmitter antenna gain in dBi – 95.2 dB

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(1), Peak output power				
Test procedure:	ANSI C63.10, section 7.8.5				
Test mode:	Compliance	Verdict:	PASS		
Date(s):	04-Jul-24	verdict.	PA35		
Temperature: 24 °C	Relative Humidity: 58 %	Air Pressure: 1012 hPa	Power: 3.6 VDC		
Remarks:					

Figure 7.5.1 Setup for carrier field strength measurements





Test specification:	pecification: Section 15.247(b), RSS-247 section 5.4(1), Peak output power				
Test procedure:	ANSI C63.10, section 7.8.5				
Test mode:	Compliance	Verdict:	PASS		
Date(s):	04-Jul-24	verdict:	PASS		
Temperature: 24 °C	Relative Humidity: 58 %	Air Pressure: 1012 hPa	Power: 3.6 VDC		
Remarks:	• •				

Table 7.5.2 Peak output power test results

TEST SITE:Semi anechoic chamberEUT HEIGHT:0.8 mDETECTOR USED:PeakTEST ANTENNA TYPE:Biconilog (30 MHz - 100MODULATION:LoRaDETECTOR USED:PeakEUT 20 dB BANDWIDTH:144.36 kHzRESOLUTION BANDWIDTH:300 kHzVIDEO BANDWIDTH:1 MHzFREQUENCY HOPPING:DisabledNUMBER OF FREQUENCY HOPPING CHANNELS:64	000 MHz)
NUMBER OF FREQUENCY HOPPING CHANNELS: 64	

BIT RATE				980 bp	DS				
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
902.3	122.16	Vertical	1.0	-38	0	26.96	30	-3.04	Pass
908.7	123.10	Vertical	1.0	-30	0	27.90	30	-2.10	Pass
914.9	123.12	Vertical	1.0	-32	0	27.92	30	-2.08	Pass
BIT RATE				5470 b	ps				
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
902.3	122.86	Vertical	1.0	-39	0	27.66	30	-2.34	Pass
908.7	123.05	Vertical	1.0	-30	0	27.85	30	-2.15	Pass
914.9	123.14	Vertical	1.0	-37	0	27.94	30	-2.06	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*(μ V/m) - *Transmitter antenna gain in dBi* – 95.2 *dB* *- Margin = Peak output power – specification limit.

Reference numbers of test equipment used

	HL 5288	HL 5902	HL 3903			
_						

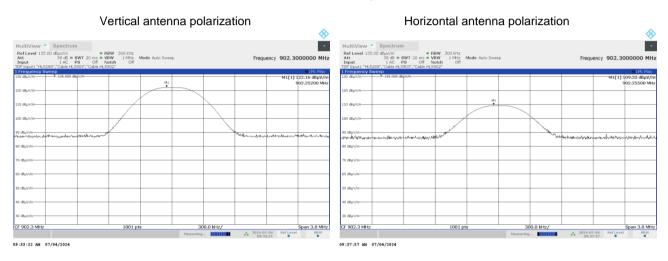
Full description is given in Appendix A.



Test specification:	Section 15.247(b), RSS-247 section 5.4(1), Peak output power				
Test procedure:	ANSI C63.10, section 7.8.5				
Test mode:	Compliance	Verdict:	PASS		
Date(s):	04-Jul-24	verdict:	PASS		
Temperature: 24 °C	Relative Humidity: 58 %	Air Pressure: 1012 hPa	Power: 3.6 VDC		
Remarks:					

Plot 7.5.1 Field strength of carrier at low frequency

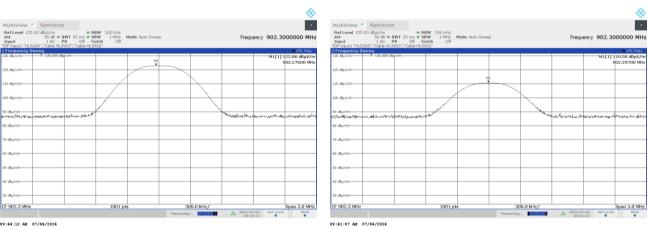
Data rate 980 bps



Data rate 5470 bps

Vertical antenna polarization

Horizontal antenna polarization



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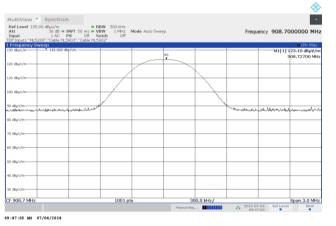
Test specification:	Section 15.247(b), RSS-247 section 5.4(1), Peak output power				
Test procedure:	ANSI C63.10, section 7.8.5				
Test mode:	Compliance	Verdict:	PASS		
Date(s):	04-Jul-24	verdict.	FA33		
Temperature: 24 °C	Relative Humidity: 58 %	Air Pressure: 1012 hPa	Power: 3.6 VDC		
Remarks:					

Plot 7.5.2 Field strength of carrier at mid frequency

Data rate 980 bps

Vertical antenna polarization

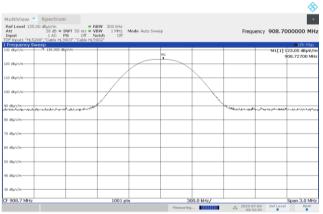
Horizontal antenna polarization



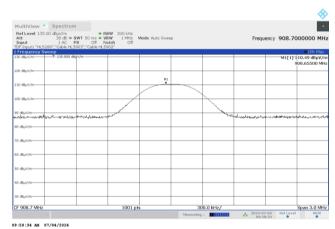
fultiView Spect								
Ref Level 135.00 dBµV/m Att 38 dB db Input 1 AC OF Input1 "HL5288", "Cable	 SWT 50 ms = VI PS Off N 	otch Off	Mode Auto Swee	p		Frequ	ency 908.7	000000 MI
Frequency Sweep	HL5905, Cable HL55	102						e 1Pk Mai
30 dBµN/m 7-135-00	ið dðýV/m						M1[1]	110.55 dBµV/
								908.69100 M
20 dBuV/m								
			м					
0 dBuV/m								
10 00p1/m								
		· /						
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) d8µV/m								
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r daga vym								
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908.7 MHz	1	1001 pt	5	30	00.0 kHz/			Span 3.0 M
						. 2024-07	-04 Ref Leve	

Data rate 5470 bps

Vertical antenna polarization



Horizontal antenna polarization



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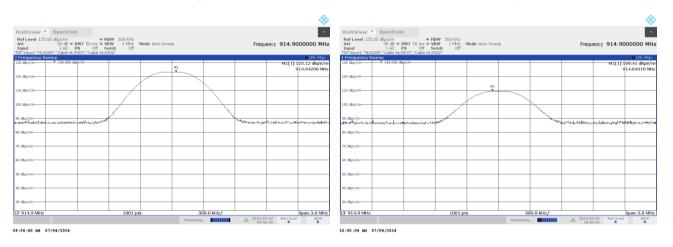
Test specification:	Section 15.247(b), RSS-247 section 5.4(1), Peak output power				
Test procedure:	ANSI C63.10, section 7.8.5				
Test mode:	Compliance	Verdict:	PASS		
Date(s):	04-Jul-24	verdict:	PASS		
Temperature: 24 °C	Relative Humidity: 58 %	Air Pressure: 1012 hPa	Power: 3.6 VDC		
Remarks:	-				

Plot 7.5.3 Field strength of carrier at high frequency

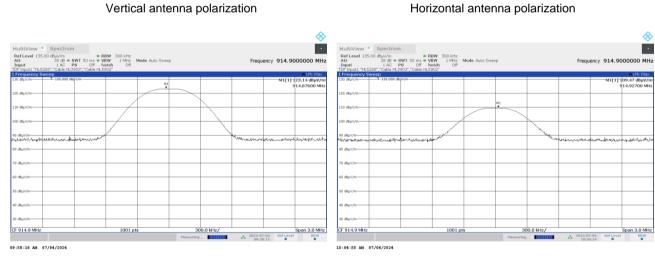
Data rate 980 bps

Vertical antenna polarization

Horizontal antenna polarization



Data rate 5470 bps



Horizontal antenna polarization

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):	08-Jul-24 - 11-Jul-24	verdict:	PA33	
Temperature: 24 °C	Relative Humidity: 58 %	Air Pressure: 1012 hPa	Power: 3.6 VDC	
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)***	Attenuation of field strength of spurious versus carrier outside restricted			
r requeriey, minz	Prequency, MH2 Peak Quasi Peak Average					
0.009 - 0.090	148.5 – 128.5	NA	128.5 - 108.5**			
0.090 – 0.110	NA	108.5 – 106.8**	NA			
0.110 - 0.490	126.8 – 113.8	NA	106.8 - 93.8**			
0.490 – 1.705		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	NA NA			
216 - 960		46.0				
960 - 1000		54.0				
1000 – 10 th 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^o 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 1.1.3, 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^o, 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	Verdict:	PASS					
Date(s):	08-Jul-24 - 11-Jul-24	verdict:	PA33					
Temperature: 24 °C	Relative Humidity: 58 %	Air Pressure: 1012 hPa	Power: 3.6 VDC					
Remarks:	-	·						

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

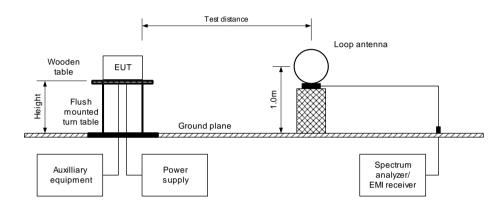
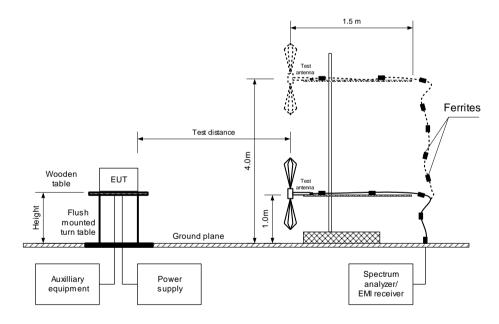


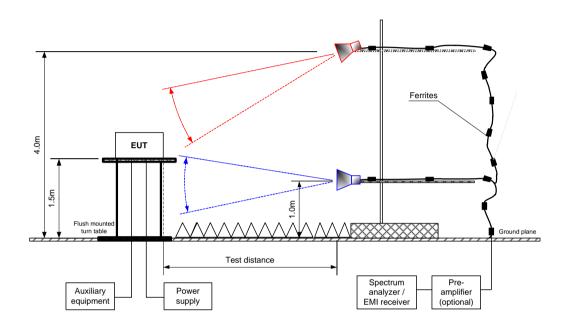
Figure 7.6.2 Setup for spurious emission field strength measurements from 30 to 1000 MHz





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):	08-Jul-24 - 11-Jul-24	verdict:	PA35					
Temperature: 24 °C	Relative Humidity: 58 %	Air Pressure: 1012 hPa	Power: 3.6 VDC					
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 spurious emissions							
Test procedure:	ANSI C63.10, sections 6.5, 6.6							
Test mode:	Compliance	Verdict:	PASS					
Date(s):	08-Jul-24 - 11-Jul-24	verdict:	PASS					
Temperature: 24 °C	Relative Humidity: 58 %	Air Pressure: 1012 hPa	Power: 3.6 VDC					
Remarks:	•							

Table 7.6.2 Field strength of spurious emissions below 1 GHz within restricted bands

INVESTIGA TEST DISTA MODULATIO RESOLUTIO VIDEO BAN TEST ANTE	GNED FREQUENCY: STIGATED FREQUENCY RANGE: DISTANCE: ULATION: DLUTION BANDWIDTH: O BANDWIDTH: ANTENNA TYPE: QUENCY HOPPING:				MHz 000 MHz 9 kHz – 150 kł 150 kHz – 30 l (30 MHz – 100 tion bandwidth op (9 kHz – 30 (30 MHz – 10	MHz) 00 MHz) MHz)		
INEQUEINC	Peak		asi-peak	Disabled			Turn-table	
Frequency, MHz	emission, dB(μV/m)	$\begin{array}{c c} \hline & & & & \\ \hline & & & & \\ \hline \\ \hline$					position**,	Verdict
Low, mid, h	Low, mid, high carrier frequency							
	No spurious emissions were found							Pass

*- Margin = Measured emission - specification limit.

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

Table 7.6.3 Field strength of emissions outside restricted bands

ASSIGNED FREQUENCY: INVESTIGATED FREQUENCY RANGE: TEST DISTANCE: MODULATION: DETECTOR USED: TEST ANTENNA TYPE: 902-928 MHz 0.009 - 9500 MHz 3 m LoRa Peak Active loop (9 kHz – 30 MHz) Biconilog (30 MHz – 1000 MHz) Double ridged guide (above 1000 MHz) Disabled

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**	Verdict		
Low carrier	Low carrier frequency										
1804.6	61.89	Horizontal	1.5	-41	122.86	60.97	20.0	40.97	Pass		
7218.4	51.71	Vertical	1.5	-19	122.00	71.15	20.0	51.15	Pass		
Mid carrier f	requency										
1817.4	62.93	Horizontal	1.5	-40	400.40	60.17	20.0	40.17	Pass		
6360.9	47.96	Vertical	1.5	67	123.10	75.14	20.0	55.14	Pass		
High carrier	High carrier frequency										
1829.8	62.23	Horizontal	1.5	-36	123.14	60.91	20.0	40.91	Pass		

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

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



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):	08-Jul-24 - 11-Jul-24	verdict:	PA33					
Temperature: 24 °C	Relative Humidity: 58 %	Air Pressure: 1012 hPa	Power: 3.6 VDC					
Remarks:								

Table 7.6.4 Field strength of spurious emissions above 1 GHz within restricted bands

INVESTIG/ TEST DIST MODULAT DETECTO RESOLUTI TEST ANT	SIGNED FREQUENCY: 902-928 MHz ESTIGATED FREQUENCY RANGE: 1000 - 9500 MHz ST DISTANCE: 3 m DULATION: LoRa ECTOR USED: Peak SOLUTION BANDWIDTH: 1000 kHz TANTENNA TYPE: Double ridged guide GUENCY HOPPING: Disabled										
Fraguanau	Antenr		Arimouth	Peak	field stren	gth	A	Average field	strength		
Frequency, MHz	Polarization	Height, m	Azimuth, degrees**	Measured, dB(μV/m)	Limit, dB(µV/m)	Margin, dB***	Measured, dB(µV/m)	Calculated, dB(µV/m)	Limit, dB(µV/m)	Margin, dB***	Verdict
Low carrie	r frequency										
2706.9	Vertical	1.3	-170	48.34	74	-25.66	45.57	NA	54	-8.43	Pass
8120.7	Vertical	1.5	-24	58.30	74	-15.7	53.45	NA	54	-0.55	1 033
Mid carrier	frequency										
2726.1	Vertical	1.5	180	47.26	74	-26.74	47.26	NA	54	-6.74	
4543.5	Vertical	1.5	100	44.48	74	-29.52	44.48	NA	54	-9.52	Pass
7269.6	Vertical	1.5	-17	50.70	74	-23.30	44.13	NA	54	-9.87	F 855
8178.3	Horizontal	1.5	0	54.82	74	-19.18	47.54	NA	54	-6.46	
High carrie	High carrier frequency										
2744.7	Vertical	1.5	180	47.16	74	-26.84	47.16	NA	54	-6.84	
7319.2	Vertical	1.5	-48	50.12	74	-23.88	42.62	NA	54	-11.38	Pass
8234.1	Horizontal	1.5	-20	57.43	74	-16.57	52.21	NA	54	-1.79	

*- 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 7.6.5 Average factor calculation

Transmis	Transmission pulse		Transmission burst Transmission train Avera		Average factor,		
Duration, ms	Period, ms	Duration, ms	Period, ms	duration, ms	dB		
NA	NA	NA	NA	NA	NA		
*- Average factor was calculated as follows for pulse train shorter than 100 ms: $Average \ factor = 20 \times \log_{10} \left(\frac{Pulse \ duration}{Pulse \ period} \times \frac{Burst \ duration}{Train \ duration} \times Number \ of \ bursts \ within \ pulse \ train \ duration} \right)$							
for pulse train	longer than 100 ms:	Average factor = $20 \times \log_{10}$	$\frac{Pulse\ duration}{Pulse\ period} \times \frac{Burst\ duration}{100}$	$\frac{duration}{duration} \times Number of bursts$	within 100 ms		



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):	08-Jul-24 - 11-Jul-24	verdict:	PASS				
Temperature: 24 °C	Relative Humidity: 58 %	Air Pressure: 1012 hPa	Power: 3.6 VDC				
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

Reference numbers of test equipment used

HL 446 HL 5288 HL 4933 HL 3903 HL 5902 HL 7585 HL 4339 HL

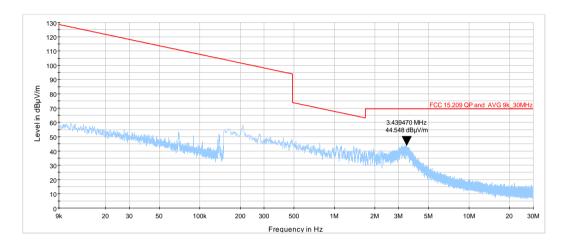
Full description is given in Appendix A.



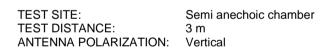
Test specification:	Section 15.247(d), RSS-247 section 5.5, Radiated spurious emissions					
Test procedure:	ANSI C63.10, sections 6.5, 6.6					
Test mode:	Compliance	Verdict:	PASS			
Date(s):	08-Jul-24 - 11-Jul-24	verdict:	PA33			
Temperature: 24 °C	Relative Humidity: 58 %	Air Pressure: 1012 hPa	Power: 3.6 VDC			
Remarks:						

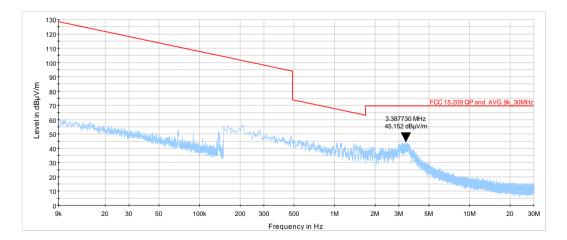
Plot 7.6.1 Radiated emission measurements from 9 kHz to 30 MHz at the low carrier frequency

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



Plot 7.6.2 Radiated emission measurements from 9 kHz to 30 MHz at the mid carrier frequency



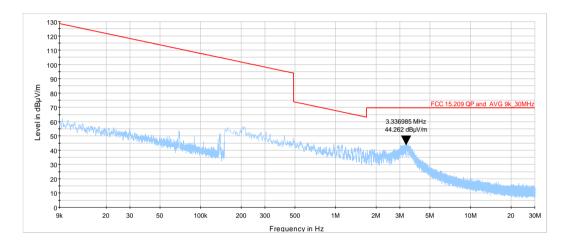




Test specification:	Section 15.247(d), RSS-247 section 5.5, Radiated spurious emissions					
Test procedure:	ANSI C63.10, sections 6.5, 6.6					
Test mode:	Compliance	Verdict:	PASS			
Date(s):	08-Jul-24 - 11-Jul-24	verdict:	PASS			
Temperature: 24 °C	Relative Humidity: 58 %	Air Pressure: 1012 hPa	Power: 3.6 VDC			
Remarks:						

Plot 7.6.3 Radiated emission measurements from 9 kHz to 30 MHz at the high carrier frequency

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



Plot 7.6.4 Radiated emission measurements from 30 to 1000 MHz at the low carrier frequency

TEST SITE:Semi anechoic chamberTEST DISTANCE:3 mANTENNA POLARIZATION:Vertical and Horizontal					•
MultiView Spectrum RefLevel 90.00 db = \$WT 1 = VBW Att 0 db = \$WT 1 = VBW Input 10C PS 0n Noth TDP input "Cable H_590", "4528" 7884", "400", "4528", "458", "45	300 kHz Mode Auto Si Off	weep	Frequ	ency 515.00	
1 Frequency Sweep				M1[1] 1	0 1Pk View 21.53 dBµV/m 902.3080 MHz
80 dBj.v/m-					
70 dBµV/m					
60 dBµV/m					
50 dBµV/m-					
FCC PART IS E FIELD 3M QP+AV CLASS B		and the start in a set in a set in the	فالمعدقان وإرحافا المرتفاه يقتصه	the literate of the state	Destification (and a Properties of the set
	Index stands and a standard st	and phylociae a finding and a second	present of the property of the		
10 dbµv/m-					
0 dBµV/m					
30.0 MHz	30001 pts	97.0 M			1.0 GHz
11:28:11 AM 07/04/2024		- Measuring	2024-0 11:2	7-04 Ref Level 8:10 •	RBW



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):	08-Jul-24 - 11-Jul-24	verdict:	PA33			
Temperature: 24 °C	Relative Humidity: 58 %	Air Pressure: 1012 hPa	Power: 3.6 VDC			
Remarks:						

Plot 7.6.5 Radiated emission measurements from 30 to 1000 MHz at the mid carrier frequency

TEST DI	TEST SITE:Semi anechoic chamberTEST DISTANCE:3 mANTENNA POLARIZATION:Vertical and Horizontal						~			
	Ref Level 90 Att Input TDF Input1 "Cab	0 dB • S 1 DC P le HL5902","Cabl	● RBW WT 1 s ● VBW S On Notch	Off	Mode Auto Si	veep		Frequ	ency 515.0	000000 MHz
	1 Frequency S	weep							M1[1]	121.96 dBµV/m
	80 dBuV/m-									908.7100 MHz
	70 dBµV/m									
	60 dBµV/m									
	bu ubpv/m)
	S0 dBµV/m									
	CC DADT IS S FIE	LD 3M QP+AV CLAS							nt is to shift an	A handlender of the late
	- 40-dB(DV)m	LD SH OF WE COU			un und	اللفضغ وخلاطهم والم	ر الغار المربط المراجع مراجع المربط المراجع المربط المربط المراجع المربط المربط المربط المربط المربط المربط الم	المراجعة من المراجعة المراجعة . وماريط من من المراجعة .	lagentin martaly financia	
	30 dBµV/m-		Last, Internette	and the second district		a deres a de se la seguera.	1	1.9100		
	eo asialar da	Ling Statistics	and the spectropy and	and a subsection.	****					
	10 d8µV/m									
	0 d8µV/m									
	30.0 MHz			30001 p	ts	9	7.0 MHz/			1.0 GHz
						Measuring		2024-0	7-04 Ref Leve 0:58 •	I RBW
	11:30:59 AM	07/04/2024								

Plot 7.6.6 Radiated emission measurements from 30 to 1000 MHz at the high carrier frequency

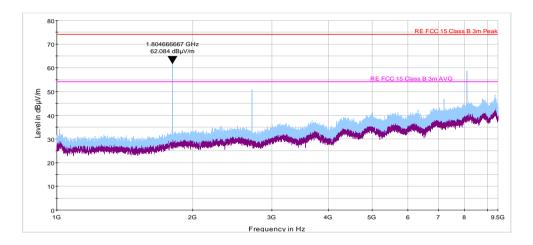
TEST SITE TEST DIST ANTENNA	TANCE:	ATION:	3 m			hambe			ŵ
		RBW (6d SWT 1 s • VBW PS On Notch		Mode Auto Swe	sep		Freque	ency 515.0 0	000000 MHz
	requency sweep						i.	41[1]	122.03 dBµV/m
80	dBµV/m								914.9500 MHz
	dBuV/m-								
10	d8µv/m								
60	d8µV/m								
50	dBuV/m-								
									A
FCC	BART 15 E FIELD 3M QP+AV CI	ASS B			ففيران ر	ومقاول ورونغان	فأطرن بالمراجع	Antipia Lincia di Antipia di Antipia di Antipia di Anti	A STREET, STRE
30	dBµV/m	14	فألغ والمراجد	فأرف المحتجد ووردائه	The second s	Lindo and the state of the stat	WHAT THE REAL PROPERTY OF	dan	
	فالدين المتحد الأ	والماغ الفاستعامات عدارهمان	adart for a	Sold Street Street	of.				
40	dog of the part of the second	of the party of the second							
10	-γ d8µ∿/m								
0.0	18µ/V/m								
30	D.0 MHz		30001 pts		97	.0 MHz/			1.0 GHz
	e.						2024-07	-04 Ref Level	
11:	32:34 AM 07/04/2024						.1:32		



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):	08-Jul-24 - 11-Jul-24	verdict:	PASS			
Temperature: 24 °C	Relative Humidity: 58 %	Air Pressure: 1012 hPa	Power: 3.6 VDC			
Remarks:						

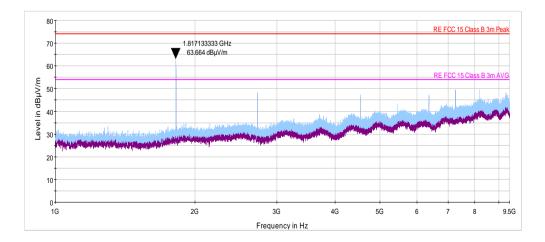
Plot 7.6.7 Radiated emission measurements from 1000 to 9500 MHz at the low carrier frequency

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



Plot 7.6.8 Radiated emission measurements from 1000 to 9500 MHz at the mid carrier frequency

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

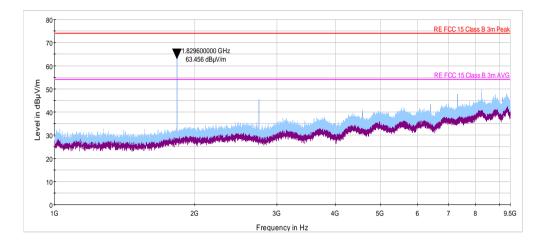




Test specification:	Section 15.247(d), RSS-247 section 5.5, Radiated spurious emissions					
Test procedure:	ANSI C63.10, sections 6.5, 6.6					
Test mode:	Compliance	Verdict:	PASS			
Date(s):	08-Jul-24 - 11-Jul-24	verdict:	PASS			
Temperature: 24 °C	Relative Humidity: 58 %	Air Pressure: 1012 hPa	Power: 3.6 VDC			
Remarks:	-					

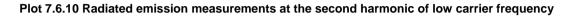
Plot 7.6.9 Radiated emission measurements from 1000 to 9500 MHz at the high carrier frequency

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





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):	08-Jul-24 - 11-Jul-24	verdict:	PA33			
Temperature: 24 °C	Relative Humidity: 58 %	Air Pressure: 1012 hPa Power: 3.6 VDC				
Remarks:						



TEST SITE			Semi a 3 m	anech	ioic ch	ambe	er		
	MultiView Spectrum Ref Level 80.00 dBµV/m Att 0 dB = S Input 1 AC P TDF Input 1'HL4933", "Cable HL5 1 Frequency Sweep	RBW WT 500 ms VBW S On Notch		ode Auto Swee	P		Fre	equency 1.8	• 046000 GHz
	70 dBuV/m							M1[1]	61.89 dBµV/m .80454010 GHz
	60 dBµV/m			M1					
	50 d8µV/m					\searrow			
	40 d8µV/m minimashighturana Kurishimunitiinys 30 d8µV/m	Answer at					Market and a start of	Mariana	
	20 d8µV/m								
	10 dBµV/m								
	0 d8µV/m -10 d8µV/m								
	CF 1.8046 GHz		1001 pts		500.0 k	457			Span 5.0 MHz
	GF 110040 GHZ		1001 pts	e.	Measuring		* 2024-03	-DB Ref Leve	
	03:44:50 PM 07/08/2024						13.4		

Plot 7.6.11 Radiated emission measurements at the second harmonic of mid carrier frequency

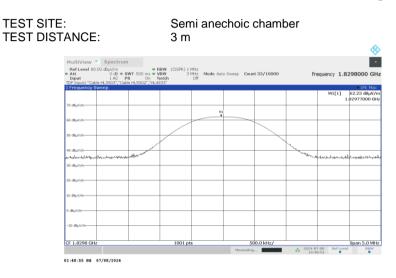
486-96-5-66-56-56-56-56-56-56-56-56-56-56-56-	all all and and and and all all all all all all all all all al			- Andrews	honorado	and the second
40 d8µV/m				 \sim		
50 d8µV/m						
and reality has						
60 d8uV/m			M1 T			
70 d8µV/m						1.81747490
I Frequency Sweep					M1[1]	62.93 d 1.817474

TEST SITE: TEST DISTANCE: Semi anechoic chamber 3 m



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):	08-Jul-24 - 11-Jul-24	veraici.	FA33			
Temperature: 24 °C	Relative Humidity: 58 %	Air Pressure: 1012 hPa	Power: 3.6 VDC			
Remarks:						

Plot 7.6.12 Radiated emission measurements at the second harmonic of high carrier frequency



Plot 7.6.13 Radiated emission measurements at the 3 harmonic of low carrier frequency

