HERMON LABORATORIES

ELECTRICAL TESTING
0839.01

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TEST REPORT

ACCORDING TO: FCC 47CFR part 15 subpart C § 15.247 (DTS), RSS-247 issue 2, RSS-Gen issue 5

FOR:

Essence Smartcare Ltd.

Emergency Pendant

Model: ES902MPRS-WL

FCC ID: 2ARFP-ES902MPRS

IC: 24417-ES902MPRS

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1 Applicant information

Client name:	Essence Smartcare Ltd.
Address:	12 Abba Eban avenue, Ackerstein Tower Bldg. D, P.O.Box 2073, Herzliya 4612001, Israel
Telephone:	+972 732 447 735
Fax:	+972 9772 9962
E-mail:	israelgo@essence-grp.com
Contact name:	Mr. Israel Gottesman

2 Equipment under test attributes

Product name:	Emergency Pendant
Product type:	Transceiver
Model(s):	ES902MPRS-WL
Serial number:	1623095800001533
Hardware version:	3.I
Software release:	1.3
Receipt date	23-Jun-23

3 Manufacturer information

Manufacturer name:	Essence Smartcare Ltd.
Address:	12 Abba Eban avenue, Ackerstein Tower Bldg. D, P.O.Box 2073, Herzliya 4612001, Israel
Telephone:	+972 732 447 735
Fax:	+972 9772 9962
E-Mail:	israelgo@essence-grp.com
Contact name:	Mr. Israel Gottesman

4 Test details

Project ID:	50382
Location:	Hermon Laboratories Ltd. P.O. Box 23, Binyamina 3055001, Israel
Test started:	23-Jul-23
Test completed:	17-Jan-24
Test specification(s):	FCC 47CFR part 15 subpart C § 15.247 (DTS); RSS-247 issue 2, RSS-Gen issue 5

5 Tests summary

Test	Status
Transmitter characteristics	
FCC section 15.247(a)2 / RSS-247 section 5.2(a), 6 dB and 99% bandwidth	Pass
FCC section 15.247(b)3/ RSS-247 section 5.4(d), Peak output power	Pass
FCC section 15.247(d/ RSS-247 section 5.5), Band edge emissions	Pass
FCC section 15.247(e) / RSS-247 section 5.2(b), Peak power density	Pass
FCC section 15.203 / RSS-Gen section 6.8, Antenna requirement	Pass
FCC section 15.207(a) / RSS-Gen section 8.8, Conducted emission	Not required

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. M. Evsuk, certification specialist, EMC & Radio Mrs. E. Pitt, certification specialist, EMC & Radio	23-Jul-23 – 17-Jan-24	 
Reviewed by:	Mrs. S. Peysahov Sheynin, certification specialist, EMC & Radio	22-Jan-24	
Approved by:	Mr. M. Nikishin, group leader, EMC & Radio	25-Jan-24	

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 EUT, Mobile Personal Emergency Response System (mPRS2) is a small emergency device that a person can put in his pocket while travelling outside home.

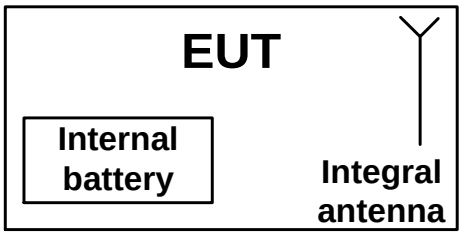
When emergency happened (feeling bad, fall detection) the LTE module will send a message to the monitoring center/family member with the person location (by using the Wi-Fi as receiver to locate positioning). The LTE module approved by FCC and IC, FCC ID: YXG-ES900BG77, IC:11061A-ES900BG77.

The system includes a pendant and a charging cradle.

The EUT in charging mode is receiving power wirelessly from a WPT source (charging cradle).

This test report represents test results for 2.4 GHz WiFi radio of the pendant.

6.2 Test configuration



6.3 Changes made in EUT

No changes were implemented in the EUT during the testing.

6.4 Transmitter characteristics

Type of equipment							
V	Stand-alone (Equipment with or without its own control provisions)						
	Combined equipment (Equipment where the radio part is fully integrated within another type of equipment)						
	Plug-in card (Equipment intended for a variety of host systems)						
Assigned frequency range	2400 -2483.5 MHz						
Operating frequencies	2412-2462 MHz						
Maximum rated output power	Peak output power @ CCK 19.37 dBm						
	Peak output power @ BPSK 21.40 dBm						
	Peak output power @ 64-QAM 20.34 dBm						
Is transmitter output power variable?	**V**	No					
		Yes		continuous variable			
				stepped variable with stepsize	dB		
				minimum RF power	dBm		
				maximum RF power	dBm		
Antenna connection							
unique coupling	standard connector		**V**	Integral	with temporary RF connector		
					V	without temporary RF connector	
Antenna/s technical characteristics							
Type	Manufacturer		Model number		Gain		
Integral	Essence		Printed		Typical peak gain: -2 dBi		
Transmitter aggregate data rate/s	1 / 11 / 6 / 54 / 6.5 / 65 Mbps						
Type of modulation	CCK / BPSK / 64-QAM						
Modulating test signal (baseband)							
Transmitter power source							
V	Battery	**Nominal rated voltage**	4.37 VDC	Battery type	Lithium Rechargeable		
	DC	**Nominal rated voltage**					
	AC mains	**Nominal rated voltage**		Frequency			

Test specification:	Section 15.247(a)2 / RSS-247 section 5.2(a), 6 dB and 99% bandwidth		
Test procedure:	ANSI C63.10 section 11.8.1		
Test mode:	Compliance	Verdict:	PASS
Date(s):	23-Jul-23		
Temperature: 25 ºC	Relative Humidity: 45 %	Air Pressure: 1010 hPa	Power: 4.37 VDC
Remarks:			

7 Transmitter tests according to 47CFR part 15 subpart C requirements

7.1 Minimum 6 dB and 99% bandwidth

7.1.1 General

This test was performed to measure 6 dB bandwidth of the EUT carrier frequency. Specification test limits are given in Table 7.1.1.

Table 7.1.1 20 dB bandwidth limits

Assigned frequency, MHz	Modulation envelope reference points*, dBc	Minimum bandwidth, MHz
2400.0 – 2483.5	6.0	500.0

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

Table 7.1.2 The 99% bandwidth limits

Assigned frequency, MHz	Modulation envelope reference points	Limit, MHz
2400.0 – 2483.5	99%	NA

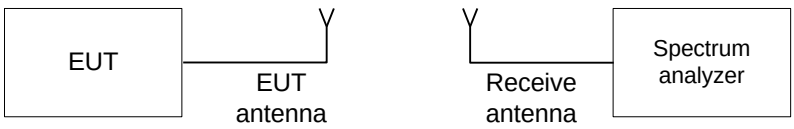
7.1.2 Test procedure

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.

7.1.2.3 The transmitter minimum 6 dB bandwidth was measured with spectrum analyzer as frequency delta between reference points on modulation envelope and provided in Table 7.1.3 and associated plot.

Figure 7.1.1 20 dB bandwidth test setup



Test specification:	**Section 15.247(a)2 / RSS-247 section 5.2(a), 6 dB and 99% bandwidth**		
Test procedure:	ANSI C63.10 section 11.8.1		
Test mode:	Compliance	**Verdict:**	PASS
Date(s):	23-Jul-23		
Temperature: 25 ºC	**Relative Humidity:** 45 %	**Air Pressure:** 1010 hPa	**Power:** 4.37 VDC
Remarks:			

Table 7.1.3 The 6 dB bandwidth test results

ASSIGNED FREQUENCY BAND: 2400.0 – 2483.5 MHz
DETECTOR USED: Peak
RESOLUTION BANDWIDTH: 300 kHz
VIDEO BANDWIDTH: 1000 kHz
CHANNEL BANDWIDTH: 20 MHz
MODULATION/BITRATE: CCK /1 Mbps

Carrier frequency, MHz	6 dB bandwidth, kHz	Limit, kHz	Margin, kHz	Verdict
2412.0	9200	500.0	-9150	Pass
2437.0	10009	500.0	-9509	Pass
2462.0	9645	500.0	-9145	Pass

CHANNEL BANDWIDTH: 20 MHz
MODULATION/BITRATE: CCK /11 Mbps

Carrier frequency, MHz	6 dB bandwidth, kHz	Limit, kHz	Margin, kHz	Verdict
2412.0	9394	500.0	-8894	Pass
2437.0	9365	500.0	-8865	Pass
2462.0	9402	500.0	-8902	Pass

CHANNEL BANDWIDTH: 20 MHz
MODULATION/BITRATE: BPSK /6 Mbps

Carrier frequency, MHz	6 dB bandwidth, kHz	Limit, kHz	Margin, kHz	Verdict
2412.0	16300	500.0	-15800	Pass
2437.0	16450	500.0	-15950	Pass
2462.0	16360	500.0	-15860	Pass

CHANNEL BANDWIDTH: 20 MHz
MODULATION/BITRATE: 64-QAM /54 Mbps

Carrier frequency, MHz	6 dB bandwidth, kHz	Limit, kHz	Margin, kHz	Verdict
2412.0	16490	500.0	-15990	Pass
2437.0	16060	500.0	-15560	Pass
2462.0	16610	500.0	-16110	Pass

CHANNEL BANDWIDTH: 20 MHz
MODULATION/BITRATE: BPSK /6.5 Mbps

Carrier frequency, MHz	6 dB bandwidth, kHz	Limit, kHz	Margin, kHz	Verdict
2412.0	17280	500.0	-16780	Pass
2437.0	17640	500.0	-17140	Pass
2462.0	17620	500.0	-17120	Pass

CHANNEL BANDWIDTH: 20 MHz
MODULATION/BITRATE: 64-QAM /65 Mbps

Carrier frequency, MHz	6 dB bandwidth, kHz	Limit, kHz	Margin, kHz	Verdict
2412.0	17670	500.0	-17170	Pass
2437.0	17730	500.0	-17230	Pass
2462.0	17710	500.0	-17210	Pass

Test specification:	**Section 15.247(a)2 / RSS-247 section 5.2(a), 6 dB and 99% bandwidth**		
Test procedure:	ANSI C63.10 section 11.8.1		
Test mode:	Compliance	**Verdict:**	PASS
Date(s):	23-Jul-23		
Temperature: 25 ºC	**Relative Humidity:** 45 %	**Air Pressure:** 1010 hPa	**Power:** 4.37 VDC
Remarks:			

Table 7.1.4 The 6 dB bandwidth test results (continuation)

ASSIGNED FREQUENCY BAND: 2400.0 – 2483.5 MHz
DETECTOR USED: Peak
RESOLUTION BANDWIDTH: 300 kHz
VIDEO BANDWIDTH: 1000 kHz
CHANNEL BANDWIDTH: 40 MHz
MODULATION/BITRATE: BPSK /6.5 Mbps

Carrier frequency, MHz	6 dB bandwidth, kHz	Limit, kHz	Margin, kHz	Verdict
2422.0	27510	500.0	-27010	Pass
2442.0	32850	500.0	-32350	Pass
2452.0	32230	500.0	-31730	Pass

CHANNEL BANDWIDTH: 40 MHz
MODULATION/BITRATE: 64-QAM /65 Mbps

Carrier frequency, MHz	6 dB bandwidth, kHz	Limit, kHz	Margin, kHz	Verdict
2422.0	26390	500.0	-25890	Pass
2442.0	32180	500.0	-31680	Pass
2452.0	32240	500.0	-31740	Pass

Test specification:	**Section 15.247(a)2 / RSS-247 section 5.2(a), 6 dB and 99% bandwidth**		
Test procedure:	ANSI C63.10 section 11.8.1		
Test mode:	Compliance	**Verdict:**	PASS
Date(s):	23-Jul-23		
Temperature: 25 ºC	**Relative Humidity:** 45 %	**Air Pressure:** 1010 hPa	**Power:** 4.37 VDC
Remarks:			

Table 7.1.5 The 99% bandwidth test results

ASSIGNED FREQUENCY BAND: 2400.0 – 2483.5 MHz
DETECTOR USED: Peak
RESOLUTION BANDWIDTH: 300 kHz
VIDEO BANDWIDTH: 1000 kHz
CHANNEL BANDWIDTH: 20 MHz
MODULATION/BITRATE: CCK /1 Mbps

Carrier frequency, MHz	99% bandwidth, kHz	Limit, kHz	Margin, kHz	Verdict
2412.0	13049	500.0	-12549	Pass
2437.0	13113	500.0	-12613	Pass
2462.0	13041	500.0	-12541	Pass

CHANNEL BANDWIDTH: 20 MHz
MODULATION/BITRATE: CCK /11 Mbps

Carrier frequency, MHz	99% bandwidth, kHz	Limit, kHz	Margin, kHz	Verdict
2412.0	12922	500.0	-12422	Pass
2437.0	13028	500.0	-12528	Pass
2462.0	12950	500.0	-12450	Pass

CHANNEL BANDWIDTH: 20 MHz
MODULATION/BITRATE: BPSK /6 Mbps

Carrier frequency, MHz	99% bandwidth, kHz	Limit, kHz	Margin, kHz	Verdict
2412.0	17001	500.0	-16501	Pass
2437.0	17225	500.0	-16725	Pass
2462.0	17309	500.0	-16809	Pass

CHANNEL BANDWIDTH: 20 MHz
MODULATION/BITRATE: 64-QAM /54 Mbps

Carrier frequency, MHz	99% bandwidth, kHz	Limit, kHz	Margin, kHz	Verdict
2412.0	16677	500.0	-16177	Pass
2437.0	16815	500.0	-16315	Pass
2462.0	16829	500.0	-16329	Pass

CHANNEL BANDWIDTH: 20 MHz
MODULATION/BITRATE: BPSK /6.5 Mbps

Carrier frequency, MHz	99% bandwidth, kHz	Limit, kHz	Margin, kHz	Verdict
2412.0	17876	500.0	-17376	Pass
2437.0	18134	500.0	-17634	Pass
2462.0	18039	500.0	-17539	Pass

CHANNEL BANDWIDTH: 20 MHz
MODULATION/BITRATE: 64-QAM /65 Mbps

Carrier frequency, MHz	99% bandwidth, kHz	Limit, kHz	Margin, kHz	Verdict
2412.0	17778	500.0	-17278	Pass
2437.0	17870	500.0	-17370	Pass
2462.0	17808	500.0	-17308	Pass

Test specification:	**Section 15.247(a)2 / RSS-247 section 5.2(a), 6 dB and 99% bandwidth**		
Test procedure:	ANSI C63.10 section 11.8.1		
Test mode:	Compliance	**Verdict:**	PASS
Date(s):	23-Jul-23		
Temperature: 25 ºC	**Relative Humidity:** 45 %	**Air Pressure:** 1010 hPa	**Power:** 4.37 VDC
Remarks:			

Table 7.1.6 The 6 dB bandwidth test results (continuation)

ASSIGNED FREQUENCY BAND: 2400.0 – 2483.5 MHz
DETECTOR USED: Peak
RESOLUTION BANDWIDTH: 300 kHz
VIDEO BANDWIDTH: 1000 kHz
CHANNEL BANDWIDTH: 40 MHz
MODULATION/BITRATE: BPSK /6.5 Mbps

Carrier frequency, MHz	6 dB bandwidth, kHz	Limit, kHz	Margin, kHz	Verdict
2422.0	33783	500.0	-33283	Pass
2442.0	34810	500.0	-34310	Pass
2452.0	34647	500.0	-34147	Pass

CHANNEL BANDWIDTH: 40 MHz
MODULATION/BITRATE: 64-QAM /65 Mbps

Carrier frequency, MHz	6 dB bandwidth, kHz	Limit, kHz	Margin, kHz	Verdict
2422.0	34133	500.0	-33633	Pass
2442.0	34784	500.0	-34284	Pass
2452.0	34366	500.0	-33866	Pass

Reference numbers of test equipment used

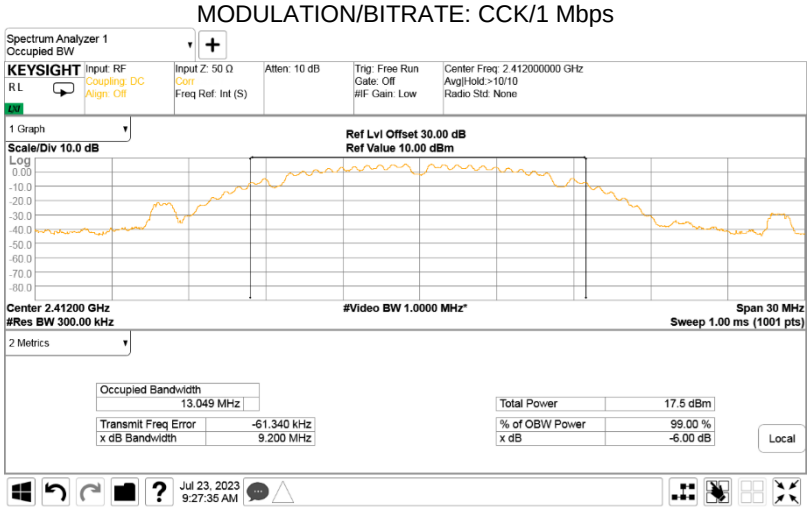
HL 3521	HL 4135	HL 5376	HL 5644	HL 7546				

Full description is given in Appendix A.

Test specification:	Section 15.247(a)2 / RSS-247 section 5.2(a), 6 dB and 99% bandwidth		
Test procedure:	ANSI C63.10 section 11.8.1		
Test mode:	Compliance	Verdict:	PASS
Date(s):	23-Jul-23		
Temperature: 25 ºC	Relative Humidity: 45 %	Air Pressure: 1010 hPa	Power: 4.37 VDC
Remarks:			

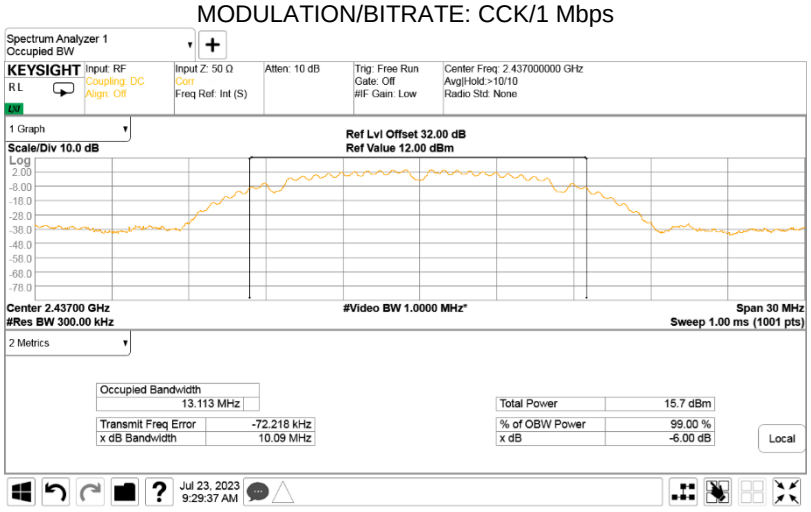
Plot 7.1.1 6 dB and 99% bandwidth test result at low frequency

MODULATION/BITRATE: CCK/1 Mbps



Plot 7.1.2 6 dB and 99% bandwidth test result at mid frequency

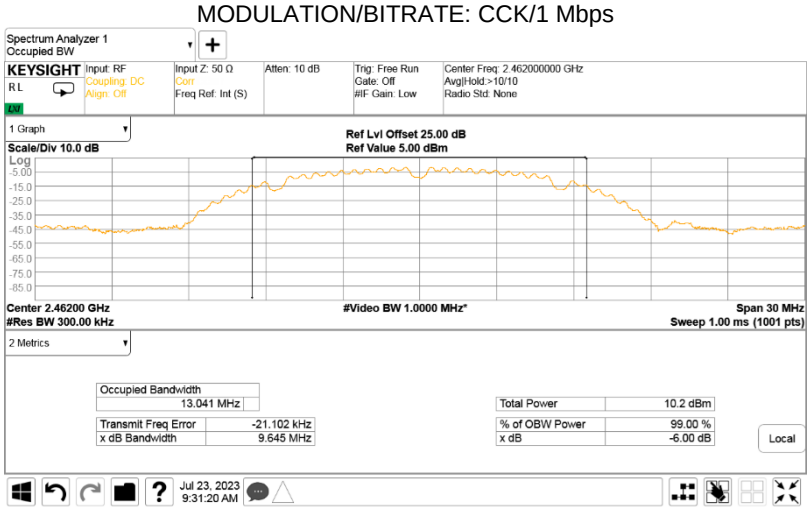
MODULATION/BITRATE: CCK/1 Mbps



Test specification:	Section 15.247(a)2 / RSS-247 section 5.2(a), 6 dB and 99% bandwidth		
Test procedure:	ANSI C63.10 section 11.8.1		
Test mode:	Compliance	Verdict:	PASS
Date(s):	23-Jul-23		
Temperature: 25 ºC	Relative Humidity: 45 %	Air Pressure: 1010 hPa	Power: 4.37 VDC
Remarks:			

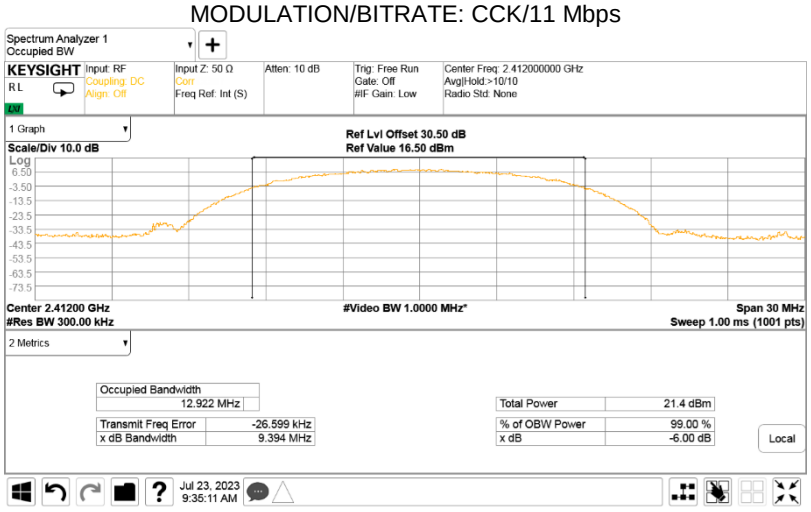
Plot 7.1.3 6 dB and 99% bandwidth test result at high frequency

MODULATION/BITRATE: CCK/1 Mbps



Plot 7.1.4 6 dB and 99% bandwidth test result at low frequency

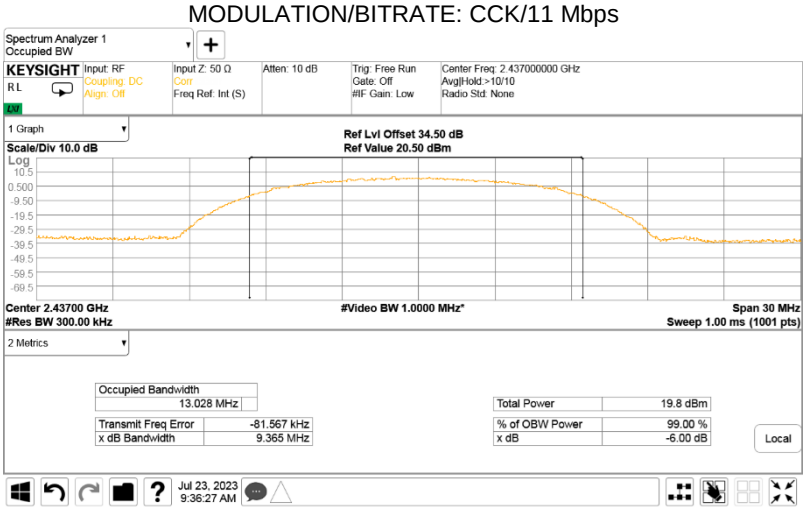
MODULATION/BITRATE: CCK/11 Mbps



Test specification:	Section 15.247(a)2 / RSS-247 section 5.2(a), 6 dB and 99% bandwidth		
Test procedure:	ANSI C63.10 section 11.8.1		
Test mode:	Compliance	Verdict:	PASS
Date(s):	23-Jul-23		
Temperature: 25 ºC	Relative Humidity: 45 %	Air Pressure: 1010 hPa	Power: 4.37 VDC
Remarks:			

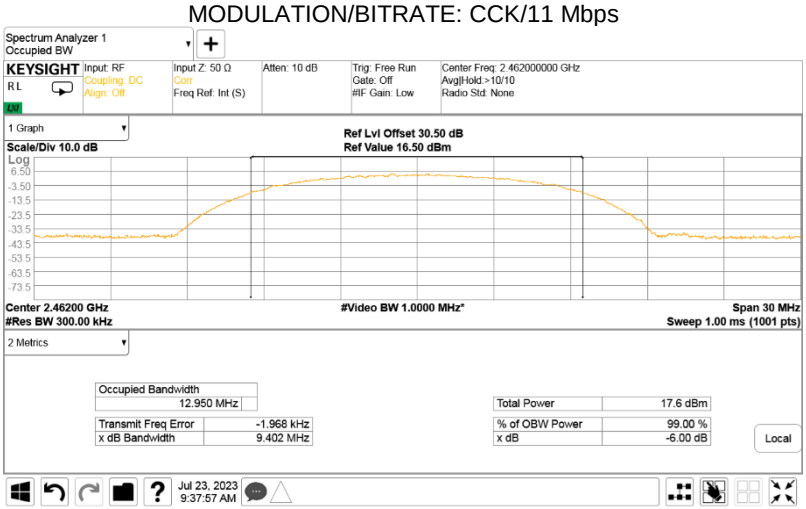
Plot 7.1.5 6 dB and 99% bandwidth test result at mid frequency

MODULATION/BITRATE: CCK/11 Mbps



Plot 7.1.6 6 dB and 99% bandwidth test result at high frequency

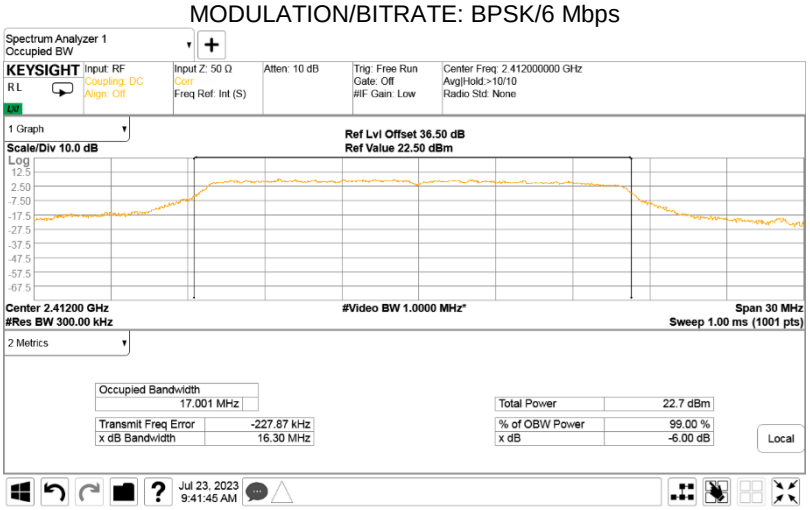
MODULATION/BITRATE: CCK/11 Mbps



Test specification:	Section 15.247(a)2 / RSS-247 section 5.2(a), 6 dB and 99% bandwidth		
Test procedure:	ANSI C63.10 section 11.8.1		
Test mode:	Compliance	Verdict:	PASS
Date(s):	23-Jul-23		
Temperature: 25 ºC	Relative Humidity: 45 %	Air Pressure: 1010 hPa	Power: 4.37 VDC
Remarks:			

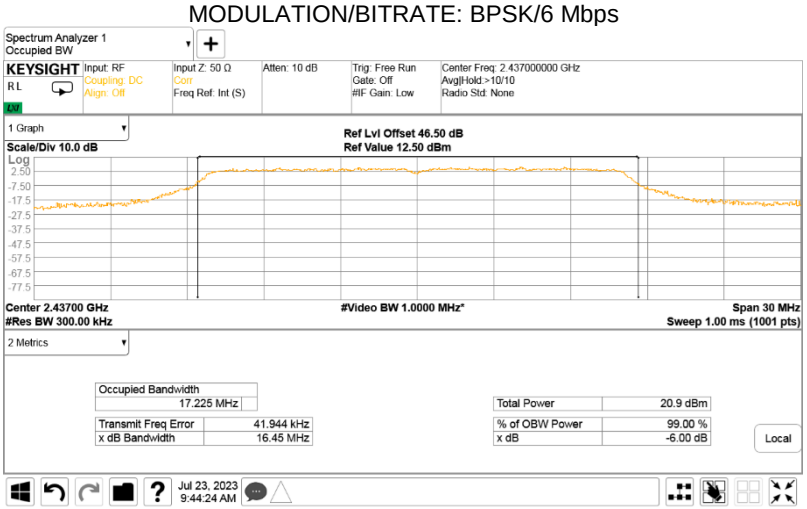
Plot 7.1.7 6 dB and 99% bandwidth test result at low frequency

MODULATION/BITRATE: BPSK/6 Mbps



Plot 7.1.8 6 dB and 99% bandwidth test result at mid frequency

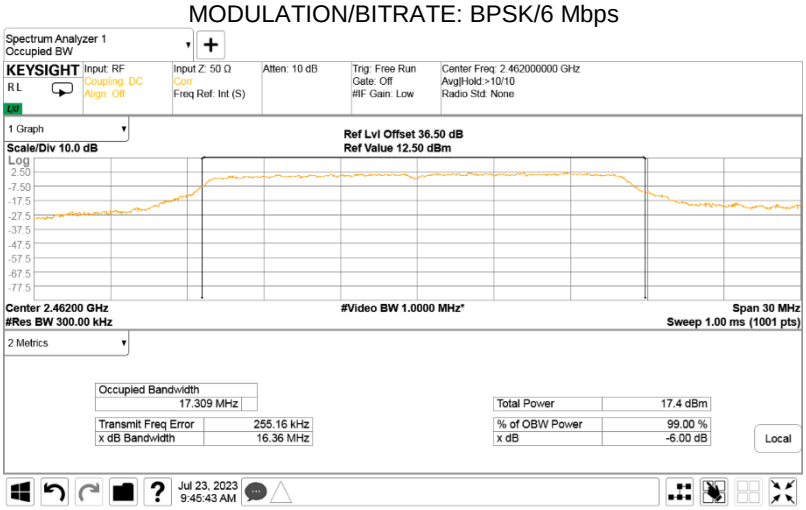
MODULATION/BITRATE: BPSK/6 Mbps



Test specification:	Section 15.247(a)2 / RSS-247 section 5.2(a), 6 dB and 99% bandwidth		
Test procedure:	ANSI C63.10 section 11.8.1		
Test mode:	Compliance	Verdict:	PASS
Date(s):	23-Jul-23		
Temperature: 25 ºC	Relative Humidity: 45 %	Air Pressure: 1010 hPa	Power: 4.37 VDC
Remarks:			

Plot 7.1.9 6 dB and 99% bandwidth test result at high frequency

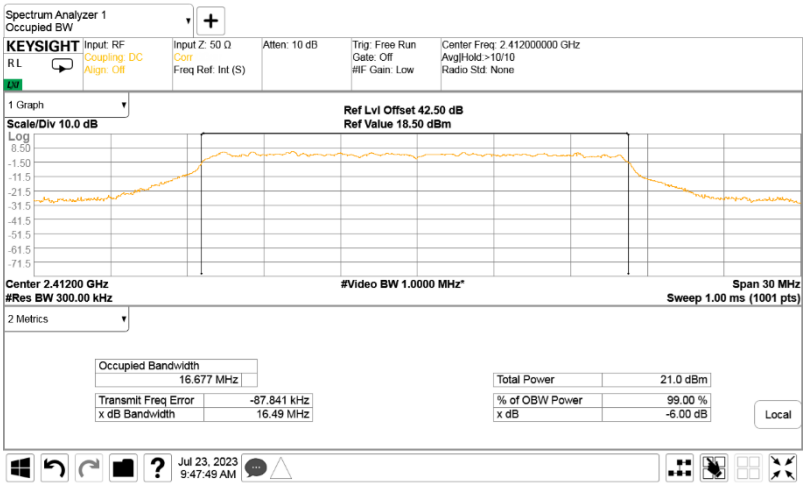
MODULATION/BITRATE: BPSK/6 Mbps



Test specification:	Section 15.247(a)2 / RSS-247 section 5.2(a), 6 dB and 99% bandwidth		
Test procedure:	ANSI C63.10 section 11.8.1		
Test mode:	Compliance	Verdict:	PASS
Date(s):	23-Jul-23		
Temperature: 25 ºC	Relative Humidity: 45 %	Air Pressure: 1010 hPa	Power: 4.37 VDC
Remarks:			

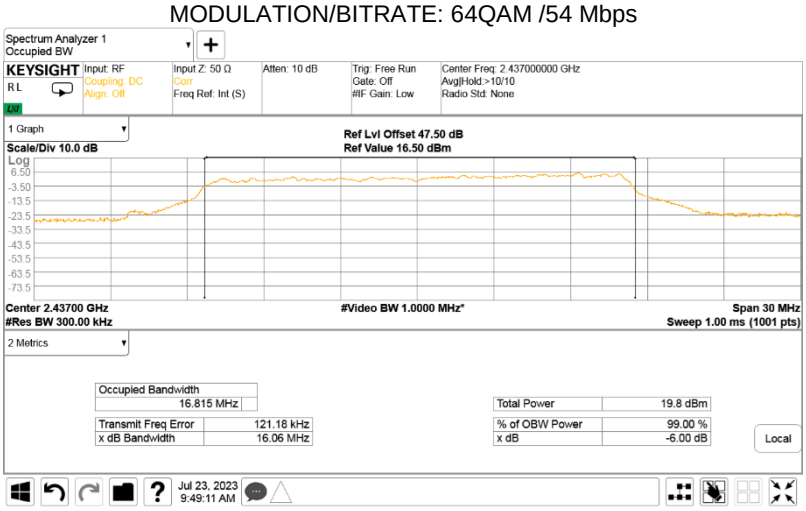
Plot 7.1.10 6 dB and 99% bandwidth test result at low frequency

MODULATION/BITRATE: 64QAM/54 Mbps



Plot 7.1.11 6 dB and 99% bandwidth test result at mid frequency

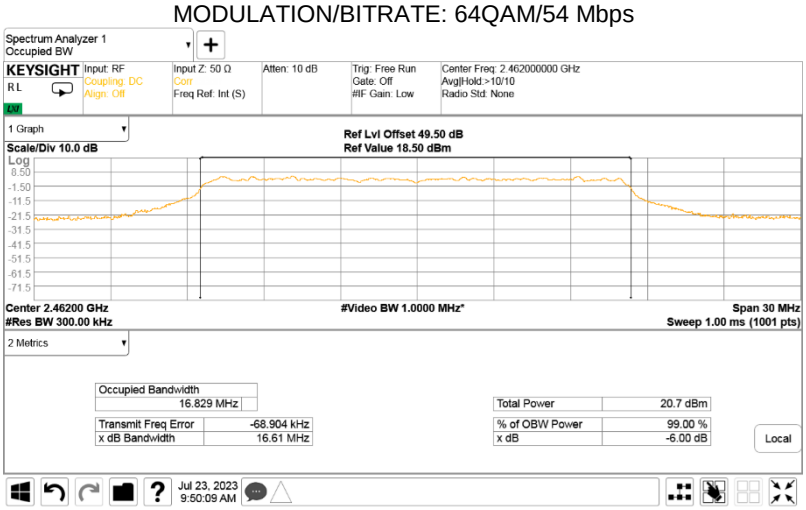
MODULATION/BITRATE: 64QAM /54 Mbps



Test specification:	Section 15.247(a)2 / RSS-247 section 5.2(a), 6 dB and 99% bandwidth		
Test procedure:	ANSI C63.10 section 11.8.1		
Test mode:	Compliance	Verdict:	PASS
Date(s):	23-Jul-23		
Temperature: 25 ºC	Relative Humidity: 45 %	Air Pressure: 1010 hPa	Power: 4.37 VDC
Remarks:			

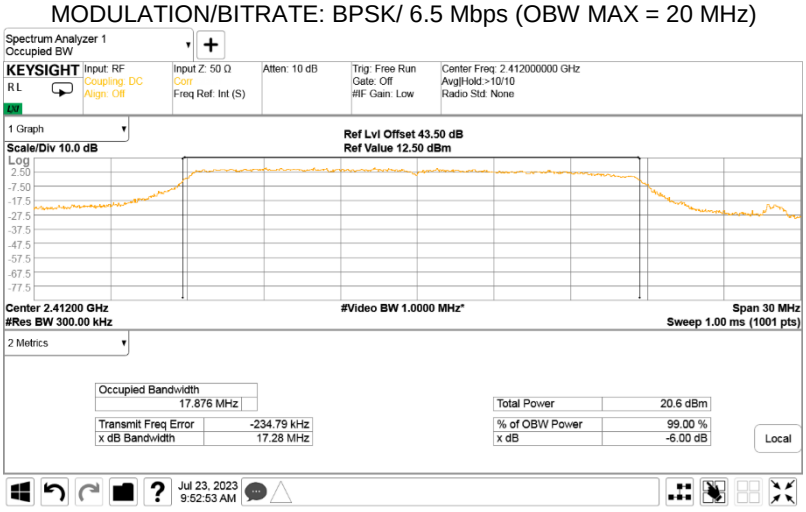
Plot 7.1.12 6 dB and 99% bandwidth test result at high frequency

MODULATION/BITRATE: 64QAM/54 Mbps



Plot 7.1.13 6 dB and 99% bandwidth test result at low frequency

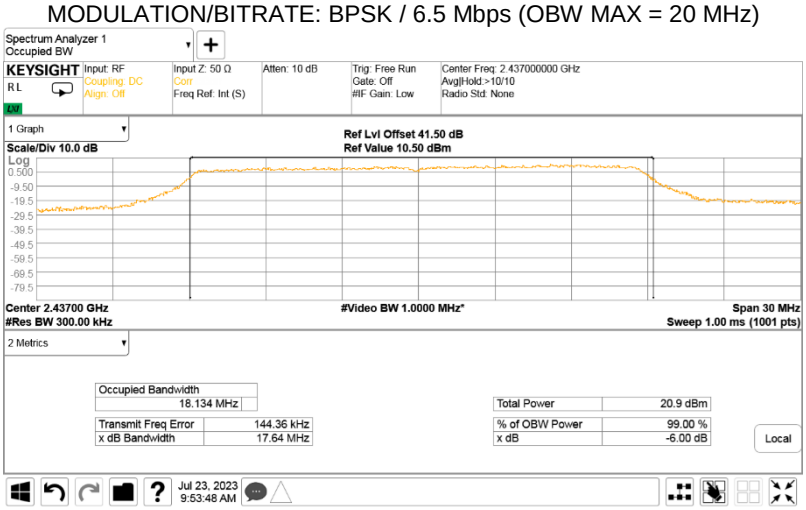
MODULATION/BITRATE: BPSK/ 6.5 Mbps (OBW MAX = 20 MHz)



Test specification:	Section 15.247(a)2 / RSS-247 section 5.2(a), 6 dB and 99% bandwidth		
Test procedure:	ANSI C63.10 section 11.8.1		
Test mode:	Compliance	Verdict:	PASS
Date(s):	23-Jul-23		
Temperature: 25 ºC	Relative Humidity: 45 %	Air Pressure: 1010 hPa	Power: 4.37 VDC
Remarks:			

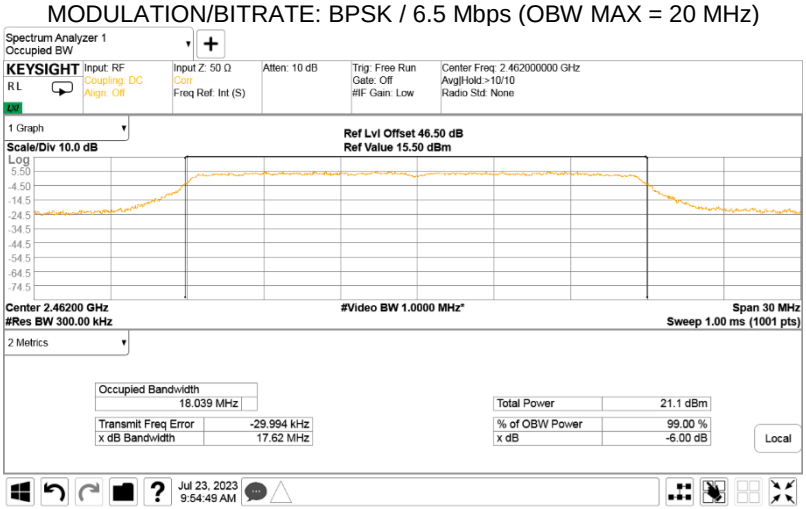
Plot 7.1.14 6 dB and 99% bandwidth test result at mid frequency

MODULATION/BITRATE: BPSK / 6.5 Mbps (OBW MAX = 20 MHz)



Plot 7.1.15 6 dB and 99% bandwidth test result at high frequency

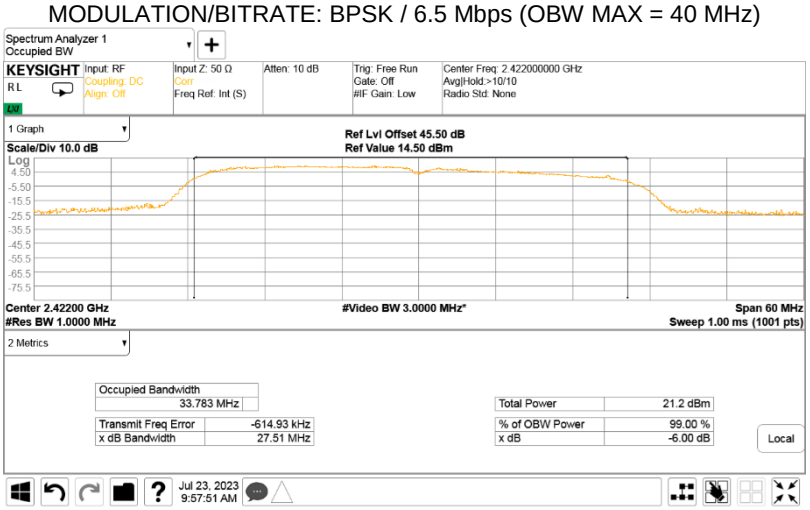
MODULATION/BITRATE: BPSK / 6.5 Mbps (OBW MAX = 20 MHz)



Test specification:	Section 15.247(a)2 / RSS-247 section 5.2(a), 6 dB and 99% bandwidth		
Test procedure:	ANSI C63.10 section 11.8.1		
Test mode:	Compliance	Verdict:	PASS
Date(s):	23-Jul-23		
Temperature: 25 ºC	Relative Humidity: 45 %	Air Pressure: 1010 hPa	Power: 4.37 VDC
Remarks:			

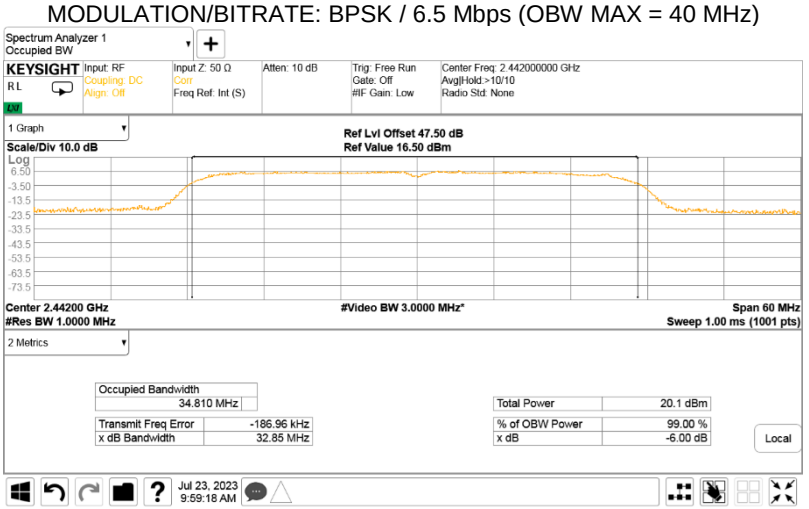
Plot 7.1.16 6 dB and 99% bandwidth test result at low frequency

MODULATION/BITRATE: BPSK / 6.5 Mbps (OBW MAX = 40 MHz)



Plot 7.1.17 6 dB and 99% bandwidth test result at mid frequency

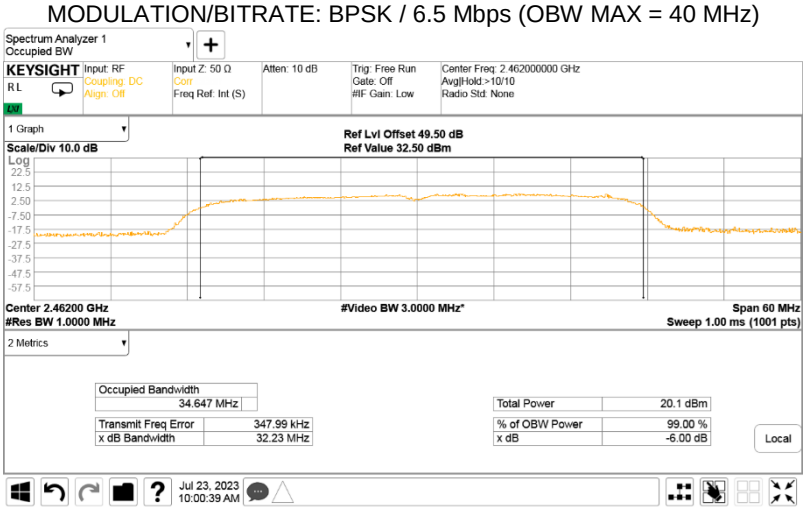
MODULATION/BITRATE: BPSK / 6.5 Mbps (OBW MAX = 40 MHz)



Test specification:	Section 15.247(a)2 / RSS-247 section 5.2(a), 6 dB and 99% bandwidth		
Test procedure:	ANSI C63.10 section 11.8.1		
Test mode:	Compliance	Verdict:	PASS
Date(s):	23-Jul-23		
Temperature: 25 ºC	Relative Humidity: 45 %	Air Pressure: 1010 hPa	Power: 4.37 VDC
Remarks:			

Plot 7.1.18 6 dB and 99% bandwidth test result at high frequency

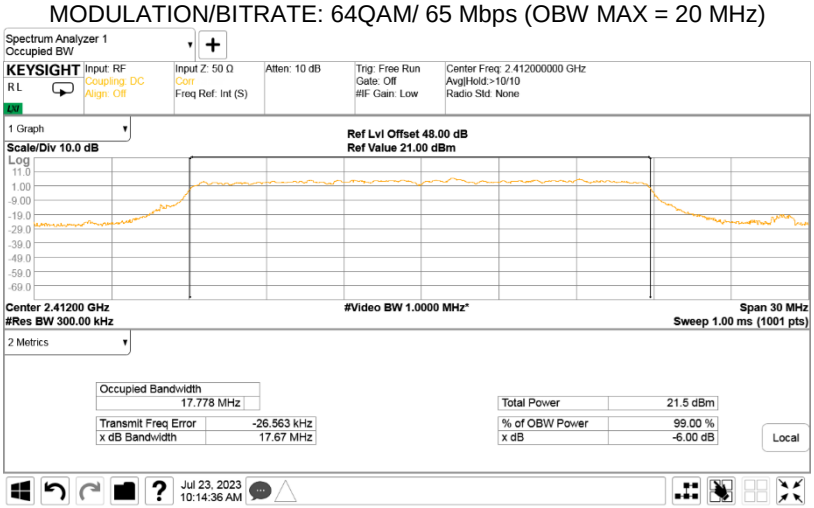
MODULATION/BITRATE: BPSK / 6.5 Mbps (OBW MAX = 40 MHz)



Test specification:	Section 15.247(a)2 / RSS-247 section 5.2(a), 6 dB and 99% bandwidth		
Test procedure:	ANSI C63.10 section 11.8.1		
Test mode:	Compliance	Verdict:	PASS
Date(s):	23-Jul-23		
Temperature: 25 ºC	Relative Humidity: 45 %	Air Pressure: 1010 hPa	Power: 4.37 VDC
Remarks:			

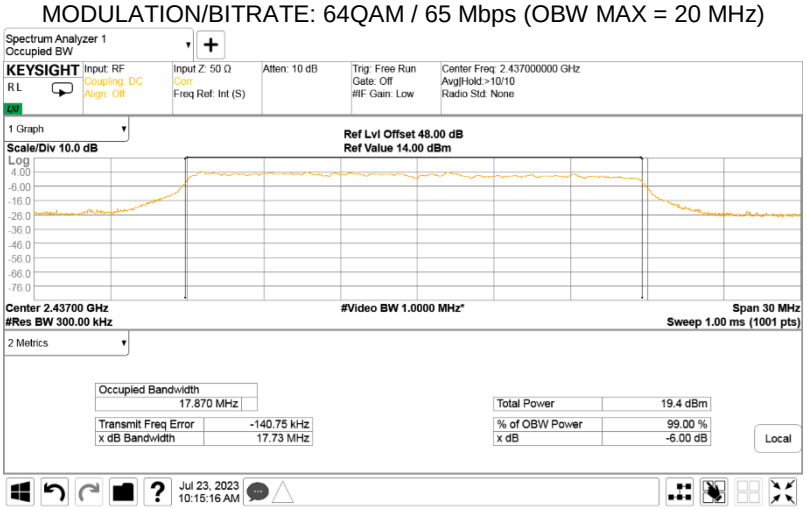
Plot 7.1.19 6 dB and 99% bandwidth test result at low frequency

MODULATION/BITRATE: 64QAM/ 65 Mbps (OBW MAX = 20 MHz)



Plot 7.1.20 6 dB and 99% bandwidth test result at mid frequency

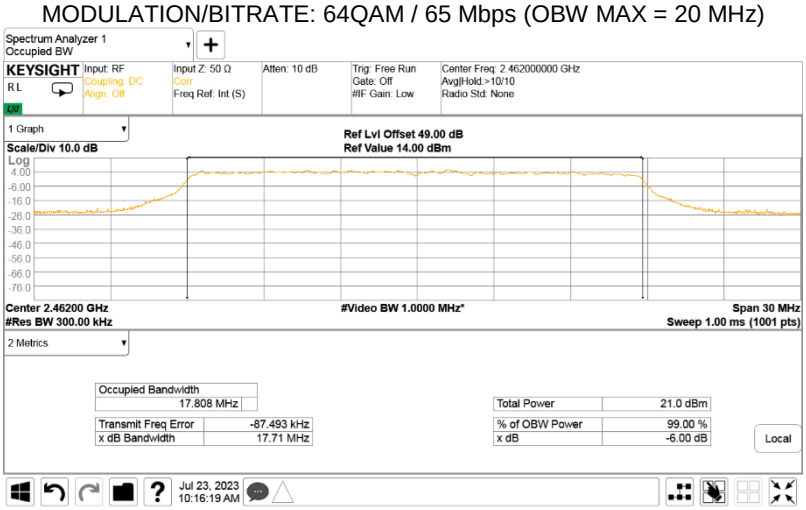
MODULATION/BITRATE: 64QAM / 65 Mbps (OBW MAX = 20 MHz)



Test specification:	Section 15.247(a)2 / RSS-247 section 5.2(a), 6 dB and 99% bandwidth		
Test procedure:	ANSI C63.10 section 11.8.1		
Test mode:	Compliance	Verdict:	PASS
Date(s):	23-Jul-23		
Temperature: 25 ºC	Relative Humidity: 45 %	Air Pressure: 1010 hPa	Power: 4.37 VDC
Remarks:			

Plot 7.1.21 6 dB and 99% bandwidth test result at high frequency

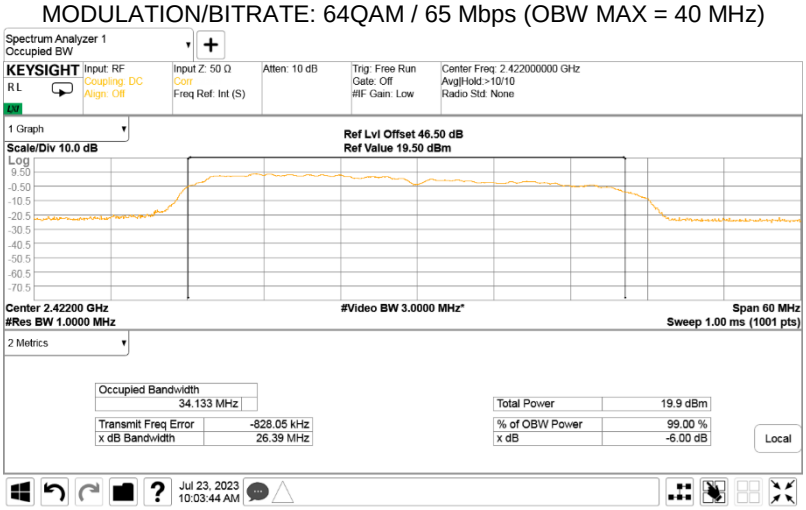
MODULATION/BITRATE: 64QAM / 65 Mbps (OBW MAX = 20 MHz)



Test specification:	Section 15.247(a)2 / RSS-247 section 5.2(a), 6 dB and 99% bandwidth		
Test procedure:	ANSI C63.10 section 11.8.1		
Test mode:	Compliance	Verdict:	PASS
Date(s):	23-Jul-23		
Temperature: 25 ºC	Relative Humidity: 45 %	Air Pressure: 1010 hPa	Power: 4.37 VDC
Remarks:			

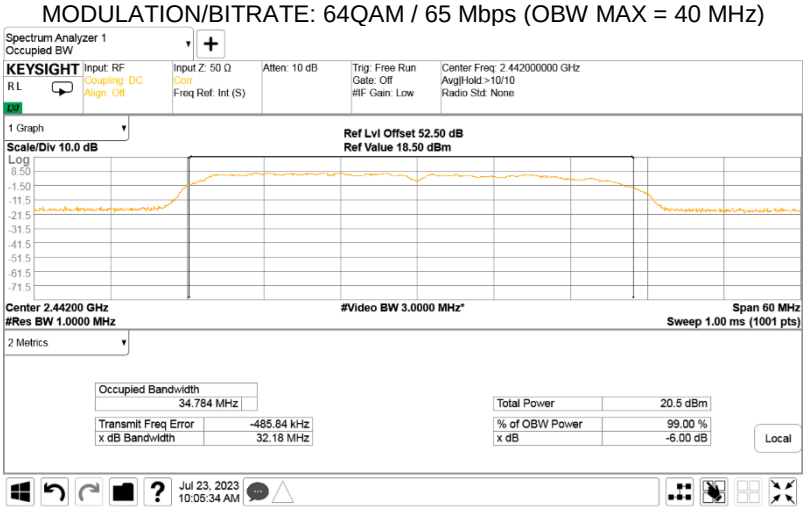
Plot 7.1.22 6 dB and 99% bandwidth test result at low frequency

MODULATION/BITRATE: 64QAM / 65 Mbps (OBW MAX = 40 MHz)



Plot 7.1.23 6 dB and 99% bandwidth test result at mid frequency

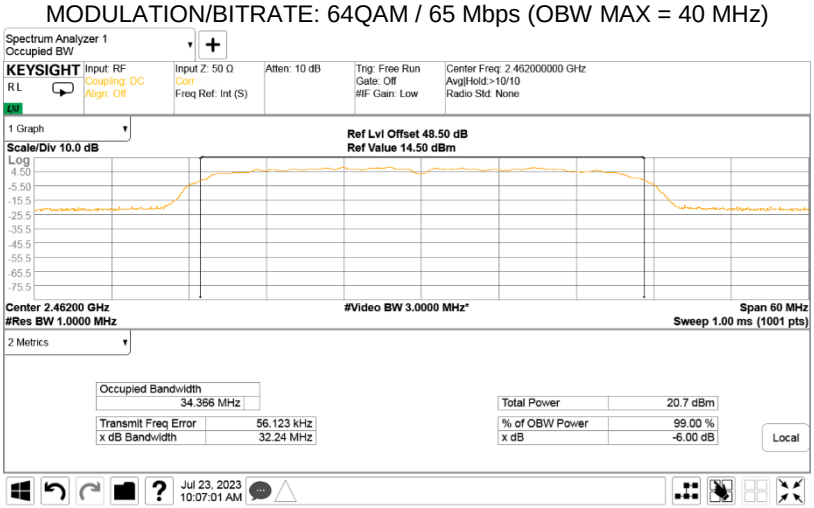
MODULATION/BITRATE: 64QAM / 65 Mbps (OBW MAX = 40 MHz)



Test specification:	Section 15.247(a)2 / RSS-247 section 5.2(a), 6 dB and 99% bandwidth		
Test procedure:	ANSI C63.10 section 11.8.1		
Test mode:	Compliance	Verdict:	PASS
Date(s):	23-Jul-23		
Temperature: 25 ºC	Relative Humidity: 45 %	Air Pressure: 1010 hPa	Power: 4.37 VDC
Remarks:			

Plot 7.1.24 6 dB and 99% bandwidth test result at high frequency

MODULATION/BITRATE: 64QAM / 65 Mbps (OBW MAX = 40 MHz)



Test specification:	Section 15.247(b)3/ RSS-247 section 5.4(d), Maximum output power		
Test procedure:	ANSI C63.10 section 11.9.2.2.4		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-24		
Temperature: 25 ºC	Relative Humidity: 45 %	Air Pressure: 1010 hPa	Power: 4.37 VDC
Remarks:			

7.2 Peak output power

7.2.1 General

This test was performed to measure the maximum peak output power radiated by transmitter. Specification test limits are given in Table 7.2.1.

Table 7.2.1 Peak output power limits

Assigned frequency range, MHz	Maximum antenna gain, dBi	Peak output power*		Equivalent field strength limit @ 3m, dB(μV/m)**
		W	dBm	
902.0 – 928.0	6.0	1.0	30.0	131.2
2400.0 – 2483.5				
5725.0 – 5850.0				

*- 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.

**- 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.

7.2.2 Test procedure

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

7.2.2.2 The EUT was adjusted to produce maximum available to end user RF output power.

7.2.2.3 The resolution bandwidth of spectrum analyzer was set wider than 6 dB bandwidth of the EUT and the field strength of the EUT carrier frequency was measured with antenna connected to spectrum analyzer/ EMI receiver. To find maximum radiation the turntable was rotated 360^0 and the measuring antenna height was swept in both vertical and horizontal polarizations.

7.2.2.4 The maximum field strength of the EUT carrier frequency was measured as provided in Table 7.2.2 and associated plots.

7.2.2.5 The maximum peak output power was calculated from the field strength of carrier as follows:

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

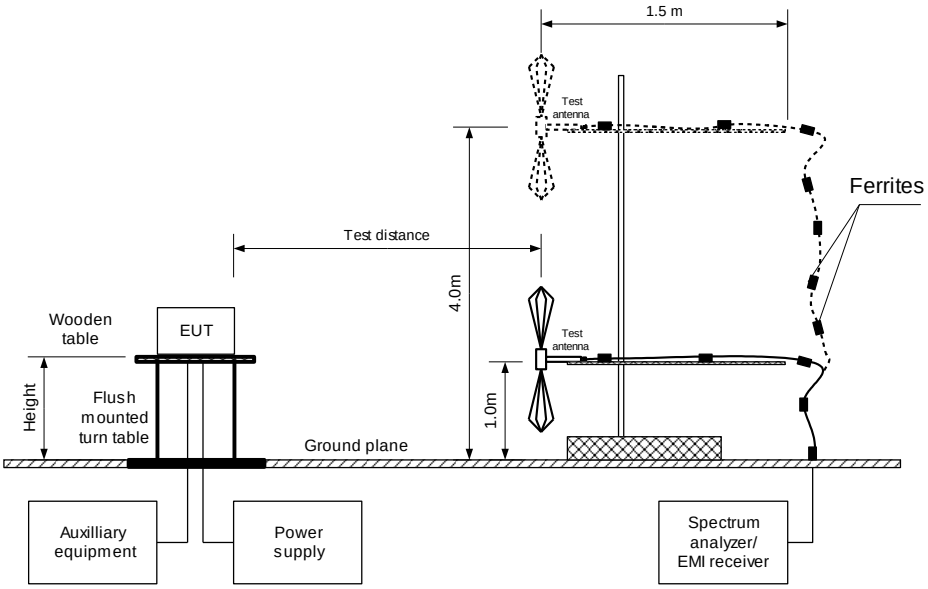
where P is the peak output power in W, E is the field strength in V/m, d is the test distance and G is the transmitter numeric antenna gain over an isotropic radiator.
The above equation was converted in logarithmic units for 3 m test distance:

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

7.2.2.6 The worst test results (the lowest margins) were recorded in Table 7.2.2.

Test specification:	Section 15.247(b)3/ RSS-247 section 5.4(d), Maximum output power		
Test procedure:	ANSI C63.10 section 11.9.2.2.4		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-24		
Temperature: 25 ºC	Relative Humidity: 45 %	Air Pressure: 1010 hPa	Power: 4.37 VDC
Remarks:			

Figure 7.2.1 Setup for carrier field strength measurements



Test specification:	Section 15.247(b)3/ RSS-247 section 5.4(d), Maximum output power		
Test procedure:	ANSI C63.10 section 11.9.2.2.4		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-24		
Temperature: 25 ºC	Relative Humidity: 45 %	Air Pressure: 1010 hPa	Power: 4.37 VDC
Remarks:			

Table 7.2.2 Peak output power test results

ASSIGNED FREQUENCY: 2400.0 – 2483.5MHz
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)
Double ridged guide (above 1000 MHz)
TRANSMITTER OUTPUT POWER SETTINGS: Maximum
DETECTOR USED: Peak
RESOLUTION BANDWIDTH: 1MHz
VIDEO BANDWIDTH: 3MHz
CHANNEL BANDWIDTH: 20 MHz
MODULATION/BITRATE: CCK /1 Mbps

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
2412	108.71	H	1.5	-40	-2	15.51	30	-14.49	Pass
2437	111.28	H	1.5	-40	-2	18.08	30	-11.92	Pass
2462	112.56	H	1.5	-40	-2	19.36	30	-10.64	Pass

CHANNEL BANDWIDTH: 20 MHz
MODULATION/BITRATE: CCK /11 Mbps

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
2412	109.81	H	1.5	-40	-2	16.61	30	-13.39	Pass
2437	111.28	H	1.5	-40	-2	18.08	30	-11.92	Pass
2462	112.57	H	1.5	-40	-2	19.37	30	-10.63	Pass

CHANNEL BANDWIDTH: 20 MHz
MODULATION/BITRATE: BPSK /6 Mbps

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
2412	112.95	H	1.5	-135	-2	19.75	30	-10.25	Pass
2437	114.01	H	1.5	-135	-2	20.81	30	-9.19	Pass
2462	114.60	H	1.5	-135	-2	21.40	30	-8.6	Pass

CHANNEL BANDWIDTH: 20 MHz
MODULATION/BITRATE: 64QAM /54 Mbps

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
2412	111.33	H	1.5	-135	-2	18.13	30	-11.87	Pass
2437	112.00	H	1.5	-135	-2	18.8	30	-11.2	Pass
2462	113.54	H	1.5	-135	-2	20.34	30	-9.66	Pass

CHANNEL BANDWIDTH: 20 MHz
MODULATION/BITRATE: BPSK /6.5 Mbps

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
2412	112.41	H	1.5	-135	-2	19.21	30	-10.79	Pass
2437	111.78	H	1.5	-135	-2	18.58	30	-11.42	Pass
2462	114.26	H	1.5	-135	-2	21.06	30	-8.94	Pass

Test specification:	Section 15.247(b)3/ RSS-247 section 5.4(d), Maximum output power		
Test procedure:	ANSI C63.10 section 11.9.2.2.4		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-24		
Temperature: 25 ºC	Relative Humidity: 45 %	Air Pressure: 1010 hPa	Power: 4.37 VDC
Remarks:			

Table 7.2.3 Peak output power test results (continuation)

ASSIGNED FREQUENCY: 2400.0 – 2483.5MHz
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)
Double ridged guide (above 1000 MHz)
TRANSMITTER OUTPUT POWER SETTINGS: Maximum
DETECTOR USED: Peak
RESOLUTION BANDWIDTH: 1MHz
VIDEO BANDWIDTH: 3MHz

CHANNEL BANDWIDTH: 20 MHz
MODULATION/BITRATE: 64QAM /65 Mbps

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
2412	111.67	Horizontal	1.5	-135	-2	18.47	30	-11.53	Pass
2437	112.78	Horizontal	1.5	-135	-2	18.94	30	-11.06	Pass
2462	113.41	Horizontal	1.5	-135	-2	20.21	30	-9.79	Pass

CHANNEL BANDWIDTH: 40 MHz
MODULATION/BITRATE: BPSK /6.5 Mbps

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
2422	113.12	Horizontal	1.5	-135	-2	19.89	30	-10.11	Pass
2442	113.89	Horizontal	1.5	-135	-2	20.66	30	-9.34	Pass
2462	113.25	Horizontal	1.5	-135	-2	20.02	30	-9.98	Pass

CHANNEL BANDWIDTH: 40 MHz
MODULATION/BITRATE: 64QAM /65 Mbps

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
2422	112.08	Horizontal	1.5	-135	-2	18.85	30	-11.15	Pass
2442	112.55	Horizontal	1.5	-135	-2	19.32	30	-10.68	Pass
2462	113.29	Horizontal	1.5	-135	-2	20.06	30	-9.94	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(µV/m) - Transmitter antenna gain in dBi – 95.2 dB*
***- Margin = Peak output power – specification limit.
Note: Maximum peak output power was obtained at Unom (115%Unom, 85%Unom) input power voltage.

Reference numbers of test equipment used

HL 3903	HL 4933	HL 5624	HL 5902	HL 7585			

Full description is given in Appendix A.

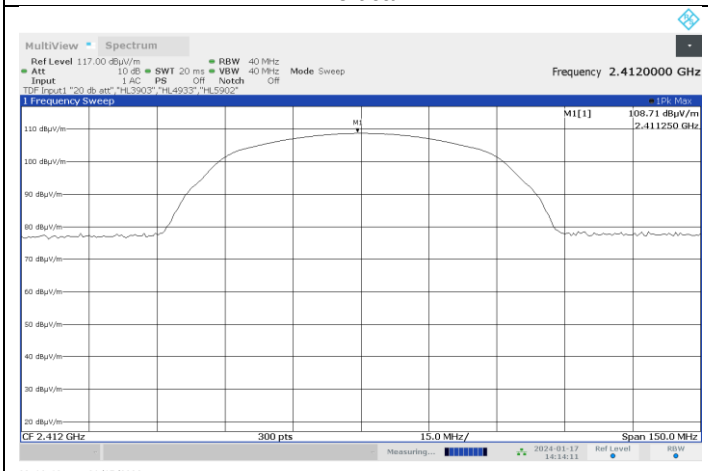
Test specification:	Section 15.247(b)3/ RSS-247 section 5.4(d), Maximum output power		
Test procedure:	ANSI C63.10 section 11.9.2.2.4		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-24		
Temperature: 25 ºC	Relative Humidity: 45 %	Air Pressure: 1010 hPa	Power: 4.37 VDC
Remarks:			

Plot 7.2.1 Field strength of carrier at low frequency

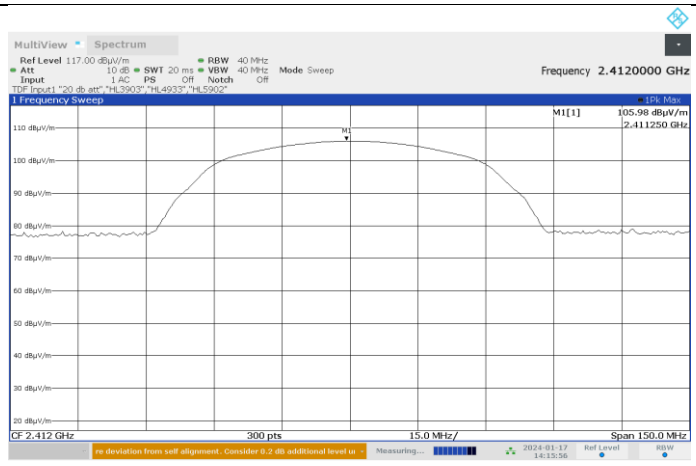
CHANNEL BANDWIDTH: 20 MHz
MODULATION / BITRATE: CCK / 1 Mbps

Position X

Vertical

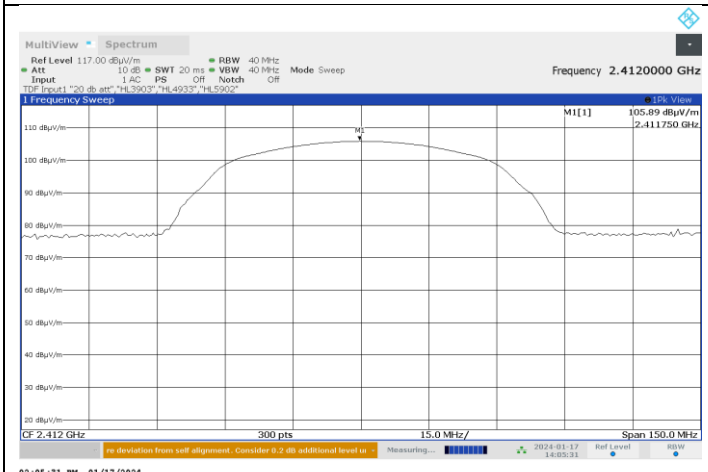


Horizontal

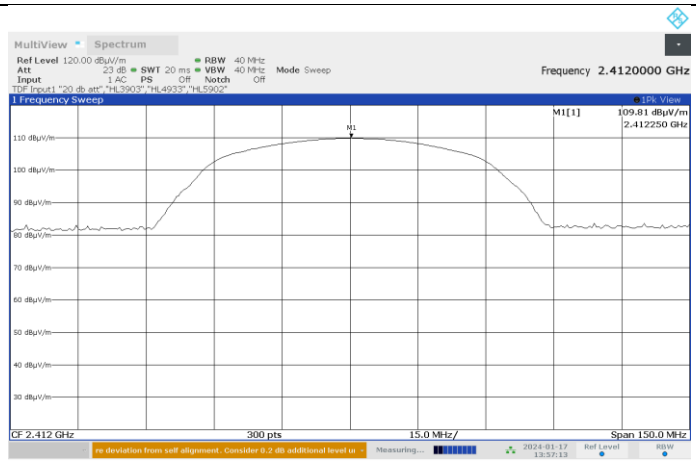


Position Y

Vertical



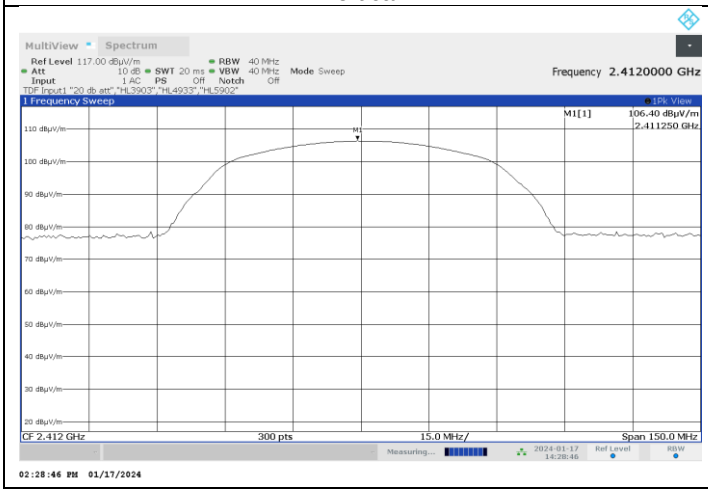
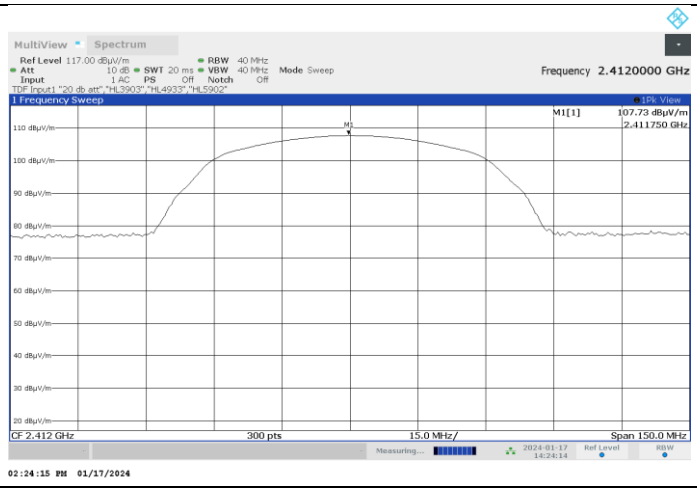
Horizontal



Test specification:	Section 15.247(b)3/ RSS-247 section 5.4(d), Maximum output power		
Test procedure:	ANSI C63.10 section 11.9.2.2.4		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-24		
Temperature: 25 ºC	Relative Humidity: 45 %	Air Pressure: 1010 hPa	Power: 4.37 VDC
Remarks:			

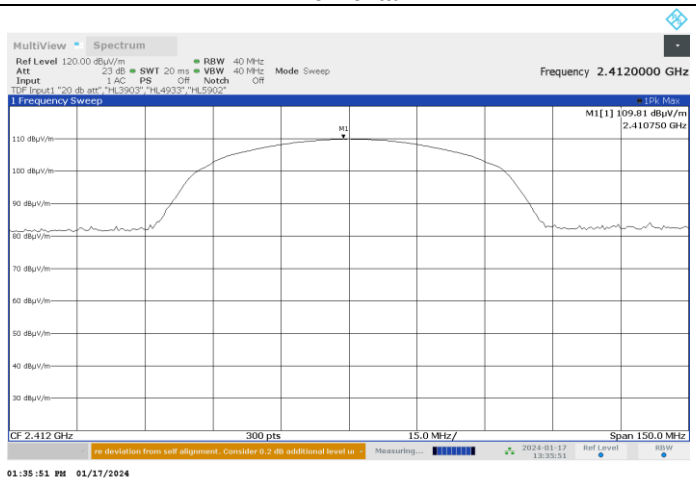
Plot 7.2.2 Field strength of carrier at low frequency

CHANNEL BANDWIDTH: 20 MHz
MODULATION / BITRATE: CCK / 1 Mbps

Position Z	
Vertical	Horizontal
	

Plot 7.2.3 Field strength of carrier at low frequency

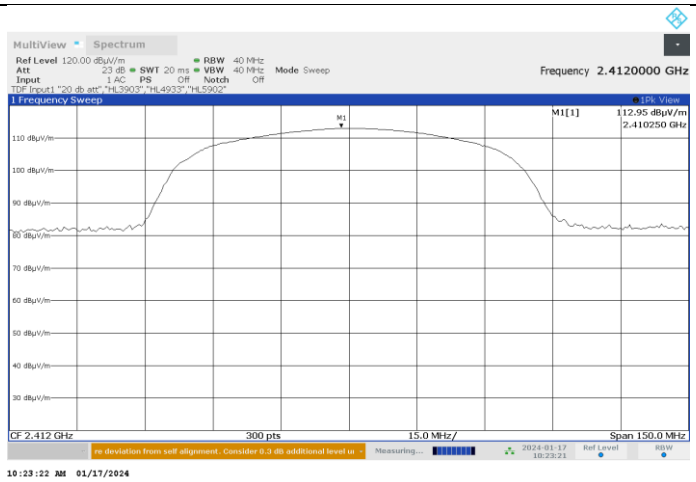
CHANNEL BANDWIDTH: 20 MHz
MODULATION / BITRATE: CCK / 11Mbps

Position Y (worst case)
Horizontal


Test specification:	Section 15.247(b)3/ RSS-247 section 5.4(d), Maximum output power		
Test procedure:	ANSI C63.10 section 11.9.2.2.4		
Test mode:	Compliance	Verdict:	PASS
Date(s):	17-Jan-24		
Temperature: 25 ºC	Relative Humidity: 45 %	Air Pressure: 1010 hPa	Power: 4.37 VDC
Remarks:			

Plot 7.2.4 Field strength of carrier at low frequency

CHANNEL BANDWIDTH: 20 MHz
MODULATION / BITRATE: BPSK / 6 Mbps

Position Y (worst case)
Horizontal


CHANNEL BANDWIDTH: 20 MHz
MODULATION / BITRATE: 64QAM / 54 Mbps

Position Y (worst case)
Horizontal