

TEST REPORT

ACCORDING TO: FCC 47CFR part 15 subpart C §15.247 (DTS), subpart B, Class B,
RSS-247 Issue 4:2025, RSS-Gen Issue 5, ICES-003 Issue 7:2020

FOR:

ARAD TECHNOLOGIES

Digital water meter

Models:

AT98-7-23-17-S-5-N, AT98-7-2-11-S-5-N,

AT98-7-2-25-S-5-N, AT98-7-22-5-P-5-N

AT98-7-21-5-P-5-N, AT98-7-1-13-P-5-N

AT98-7-22-5-OM-5-N, AT98-7-21-5-OM-5-N

AT98-7-1-13-OM-5-N, AT98-7-2-21-S-5-N,

AT98-7-23-11-S-5-N, AT98-7-23-16-S-5-N

FCC ID: 2A7AA-SON2ENCODR

IC: 28664- SON2ENCODR

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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: Digital water meter
Product type: Transceiver
AT98-7-23-17-S-5-N
AT98-7-2-11-S-5-N
AT98-7-2-25-S-5-N
AT98-7-22-5-P-5-N
AT98-7-21-5-P-5-N
Model(s): AT98-7-1-13-P-5-N
AT98-7-22-5-OM-5-N
AT98-7-21-5-OM-5-N
AT98-7-1-13-OM-5-N
AT98-7-2-21-S-5-N
AT98-7-23-11-S-5-N
AT98-7-23-16-S-5-N
Serial number: 80E12687F48C
Hardware version: 00E
Software release: 98.1.7.5
Receipt date 18-Sep-25

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: 57006
Location: Hermon Laboratories Ltd. 66 HaTachana str., P.O. Box 23, Binyamina 3055001, Israel
Test started: 11-Jun-25
Test completed: 14-Apr-26
Test specification(s): FCC 47CFR part 15 subpart C §15.247 (DTS), subpart B, Class B, RSS-247 Issue 4:2025, RSS-Gen Issue 5, ICES-003 Issue 7:2020

5 Tests summary

Test	Status
Transmitter characteristics	
FCC Section 15.247(a)2 / RSS-247 section 5.2(1), 6 dB bandwidth	Pass
FCC Section 15.247(b)3/ RSS-247 section 5.4(4), Peak output power	Pass*
FCC Section 15.247(d) / RSS-247 section 5.5, Radiated spurious emissions	Pass
FCC Section 15.247(d)/ RSS-247 section 5.5, Emissions at band edges	Pass
FCC Section 15.247(e) / RSS-247 section 5.2(2), Peak power density	Pass
FCC section 15.203 / RSS-Gen section 6.8, Antenna requirement	Pass
Unintentional emissions	
FCC Part 15, Section 107 / ICES-003, Section 6.1 class B, Conducted emission at AC power port	Not required
FCC Part 15, Section 109 / RSS-Gen, Section 7.3 / ICES-003, Section 6.2 class B, Radiated emission	Pass

* According to manufacturer's declaration provided in Appendix G the possible variants of the AT98-7-23-17-S-5-N, AT98-7-2-11-S-5-N, AT98-7-2-25-S-5-N, AT98-7-22-5-P-5-N, AT98-7-21-5-P-5-N, AT98-7-1-13-P-5-N, AT98-7-22-5-OM-5-N, AT98-7-21-5-OM-5-N, AT98-7-1-13-OM-5-N, AT98-7-2-21-S-5-N, AT98-7-23-11-S-5-N and AT98-7-23-16-S-5-N, fully identical and the only difference is a material that the pipe is made of and diameter and length of the pipe. Therefore, only the relevant test was performed for all models. All other tests were performed only for models delivering the worst ERP. The re-issue of the Test Report is to support Application for Class II permissive changes certification. The change under this application is to add additional model variants AT98-7-2-21-S-5-N, AT98-7-23-11-S-5-N and AT98-7-23-16-S-5-N.

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, EMC & Radio	11-Jun-25 – 14-Apr-26	
Reviewed by:	Mrs. S. Peysahov Sheynin, certification specialist, EMC & Radio	12-May-26	
Approved by:	Mr. M. Nikishin, group leader, EMC & Radio	21-Jun-26	

6 EUT description

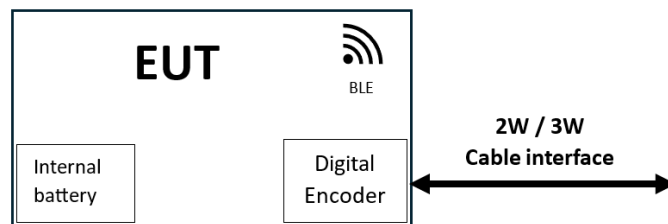
Note: The following data in this clause is provided by the customer and represents his sole responsibility

6.1 General information

The AT98-7 Encoder water meter is a battery-operated meter designed for automated water meter reading. The AT98-7 Encoder provides optional online data of all kinds (water consumption, temperature, Alerts, Tampering, back flow ...) It uses 3W Sensus protocol Via data output cable ready for AMI Transceiver for sending water consumption data to the utility.

The AT98-7 Encoder Integrate Bluetooth Low energy for field maintenance.

6.2 EUT Test configuration



6.3 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		2402-2480 MHz			
Maximum rated output power		Peak output power 3.82 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
				V	with temporary RF connector without temporary RF connector
Antenna/s technical characteristics					
Type		Manufacturer		Model number	
Internal		Inhouse design		N/A	
				Gain	
				2.5 dBi	
Transmitter aggregate data rate/s				1 Mbps	
Type of modulation				GFSK	
Modulating test signal (baseband)					
Transmitter power source					
V	Battery	Nominal rated voltage	3.7 VDC	Battery type	Lithium Inorganic battery
	DC	Nominal rated voltage			
	AC mains	Nominal rated voltage		Frequency	Hz



Test specification: Section 15.247(a)2 / RSS-247 section 5.2(1), 6 dB bandwidth			
Test procedure: ANSI C63.10 section 11.8.1			
Test mode: Compliance		Verdict: PASS	
Date(s): 15-Jun-25			
Temperature: 27 °C	Relative Humidity: 51 %	Air Pressure: 1012 hPa	Power: 3.7 VDC
Remarks:			

7 Transmitter tests according to 47CFR part 15 subpart C and RSS-247 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 6 dB bandwidth limits

Assigned frequency, MHz	Modulation envelope reference points*, dBc	Minimum bandwidth, kHz
902.0 – 928.0	6.0	500.0
2400.0 – 2483.5		
5725.0 – 5850.0		

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

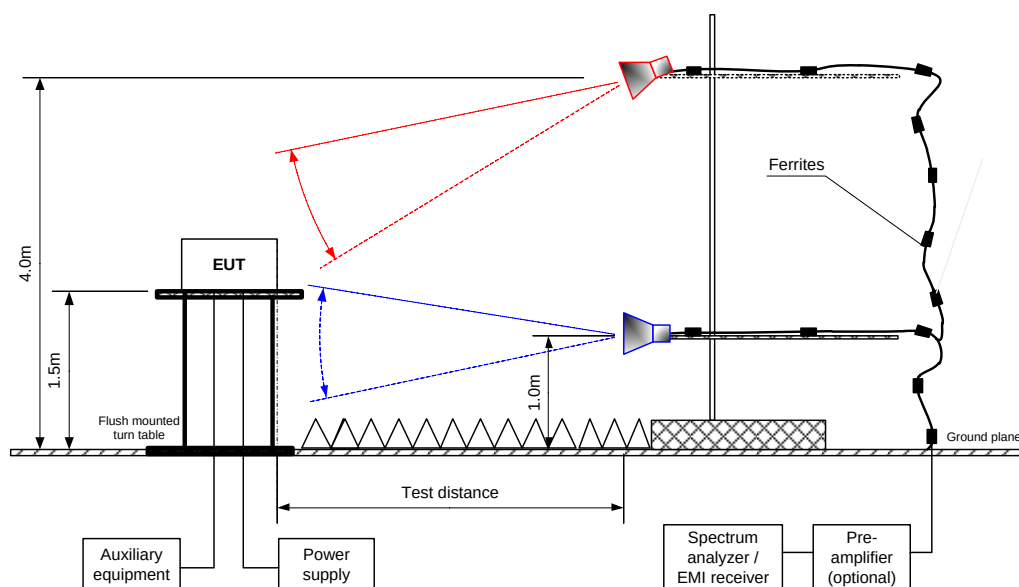
7.1.2 Test procedure

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.

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 7.1.2 and associated plot.

Figure 7.1.1 6 dB bandwidth test setup





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Test specification: Section 15.247(a)2 / RSS-247 section 5.2(1), 6 dB bandwidth			
Test procedure: ANSI C63.10 section 11.8.1			
Test mode: Compliance		Verdict: PASS	
Date(s): 15-Jun-25			
Temperature: 27 °C	Relative Humidity: 51 %	Air Pressure: 1012 hPa	Power: 3.7 VDC
Remarks:			

Table 7.1.2 6 and 99% dB bandwidth test results

ASSIGNED FREQUENCY BAND: 2400-2483.5 MHz
DETECTOR USED: Peak
SWEEP TIME: Auto
RESOLUTION BANDWIDTH: 100 kHz
VIDEO BANDWIDTH: 300 kHz
MODULATION ENVELOPE REFERENCE POINTS: 6.0 dBc
MODULATION: GFSK
BIT RATE: 1 Mbps

Carrier frequency, MHz	99% bandwidth, kHz	6 dB bandwidth, kHz	Limit, kHz	Margin, kHz	Verdict
2402	1164.4	617.4	500	117.4	Pass
2440	1164.4	611.4	500	111.4	Pass
2480	1084.4	611.4	500	111.4	Pass

Reference numbers of test equipment used

HL 7585	HL 4114	HL 3903	HL 5902					
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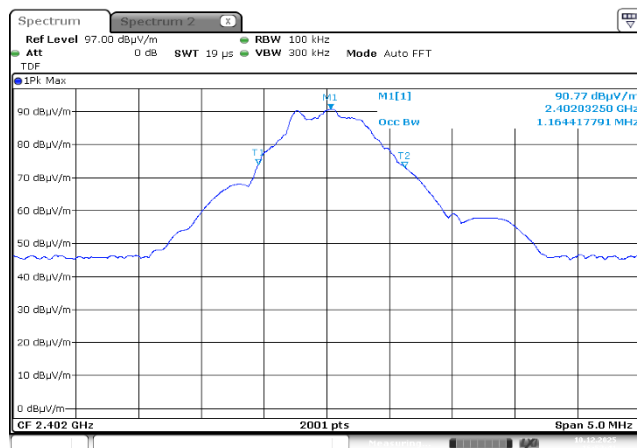
Full description is given in Appendix A.



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Test specification: Section 15.247(a)2 / RSS-247 section 5.2(1), 6 dB bandwidth			
Test procedure: ANSI C63.10 section 11.8.1			
Test mode: Compliance		Verdict: PASS	
Date(s): 15-Jun-25			
Temperature: 27 °C	Relative Humidity: 51 %	Air Pressure: 1012 hPa	Power: 3.7 VDC
Remarks:			

Plot 7.1.1 6 dB bandwidth test result at low frequency



Date: 10 DEC 2025 16:53:41



09:56:36 AM 06/15/2025

Plot 7.1.2 6 dB bandwidth test result at mid frequency



Date: 10 DEC 2025 16:56:12



10:14:54 AM 06/15/2025



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Test specification: Section 15.247(a)2 / RSS-247 section 5.2(1), 6 dB bandwidth			
Test procedure: ANSI C63.10 section 11.8.1			
Test mode: Compliance		Verdict: PASS	
Date(s): 15-Jun-25			
Temperature: 27 °C	Relative Humidity: 51 %	Air Pressure: 1012 hPa	Power: 3.7 VDC
Remarks:			

Plot 7.1.3 6 dB bandwidth test result at high frequency





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): 18-Jun-25			
Temperature: 24 °C	Relative Humidity: 42 %	Air Pressure: 1015 hPa	Power: 3.7 VDC
Remarks:			

7.2 Peak output power at AT98-7-23-17-S-5-N, AT98-7-2-11-S-5-N, AT98-7-2-25-S-5-N

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: $E = \sqrt{30 \times P \times G} / r$, 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° 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:

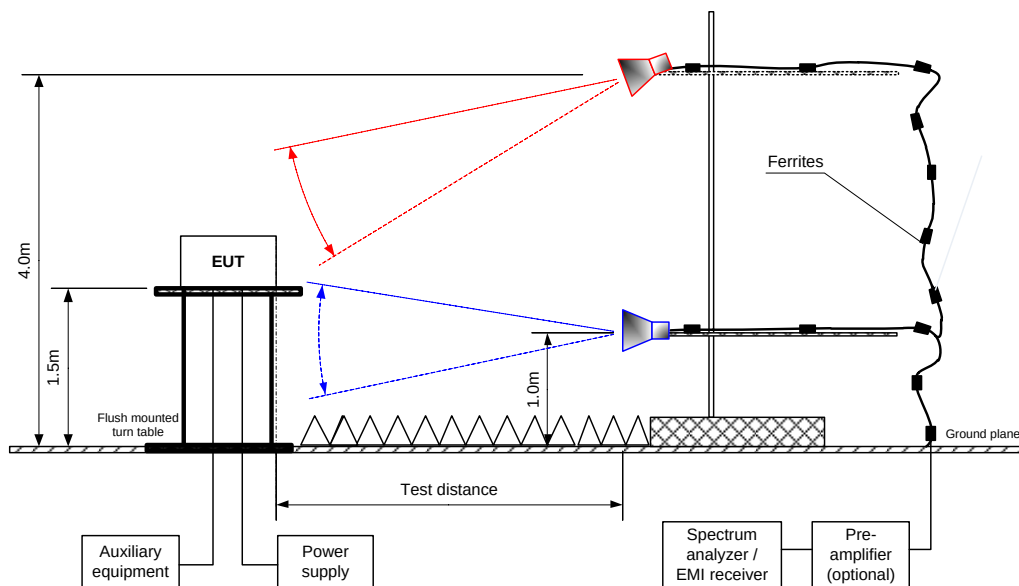
$$\text{Peak output power in dBm} = \text{Field strength in dB}(\mu\text{V/m}) - \text{Transmitter antenna gain in dBi} - 95.2 \text{ dB}$$

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



Test specification: Section 15.247(b), 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): 18-Jun-25			
Temperature: 24 °C	Relative Humidity: 42 %	Air Pressure: 1015 hPa	Power: 3.7 VDC
Remarks:			

Figure 7.2.1 Setup for carrier field strength measurements





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): 18-Jun-25			
Temperature: 24 °C	Relative Humidity: 42 %	Air Pressure: 1015 hPa	Power: 3.7 VDC
Remarks:			

Table 7.2.2 Peak output power test results

ASSIGNED FREQUENCY: 2400 – 2483.5 MHz
 TEST DISTANCE: 3 m
 TEST SITE: Semi anechoic chamber
 EUT HEIGHT: 1.5 m
 DETECTOR USED: Peak
 TEST ANTENNA TYPE: Double ridged guide (above 1000 MHz)
 MODULATION: GFSK
 BIT RATE: 1 Mbps
 TRANSMITTER OUTPUT POWER SETTINGS: Maximum
 DETECTOR USED: Peak
 RESOLUTION BANDWIDTH: 3 MHz
 VIDEO BANDWIDTH: 10 MHz

MODEL

AT98-7-23-17-S-5-N

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
2402	100.15	H	1.95	25	2.5	2.45	30	-27.55	Pass
2440	100.60	H	1.95	25	2.5	2.90	30	-27.10	Pass
2480	100.70	H	1.90	25	2.5	3.00	30	-27.00	Pass

MODEL

AT98-7-2-11-S-5-N (WC)

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
2402	100.98	H	2.5	30	2.5	3.28	30	-26.72	Pass
2440	101.50	H	1.9	30	2.5	3.80	30	-26.20	Pass
2480	101.52	H	2.7	27	2.5	3.82	30	-26.18	Pass

MODEL

AT98-7-2-25-S-5-N

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
2402	99.77	H	2.70	10	2.5	2.07	30	-27.93	Pass
2440	98.96	H	2.68	10	2.5	1.26	30	-28.74	Pass
2480	100.33	H	2.70	20	2.5	2.63	30	-27.37	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.

Reference numbers of test equipment used

HL 3903	HL 4474	HL 5902	HL 7585				
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Full description is given in Appendix A.

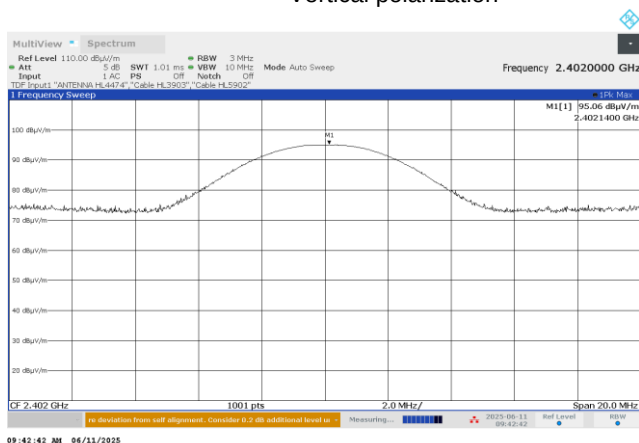


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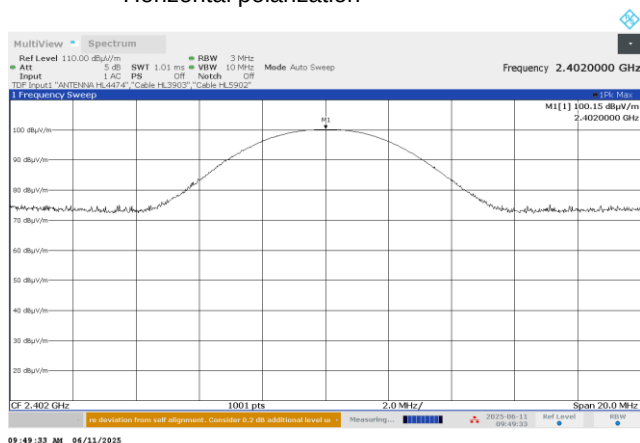
Test specification: Section 15.247(b), RSS-247 section 5.4(1), Peak output power			
Test procedure: ANSI C63.10, section 7.8.5			
Test mode: Compliance		Verdict: PASS	
Date(s): 18-Jun-25			
Temperature: 24 °C	Relative Humidity: 42 %	Air Pressure: 1015 hPa	Power: 3.7 VDC
Remarks:			

Plot 7.2.1 Field strength of carrier at low frequency at AT98-7-23-17-S-5-N

Vertical polarization

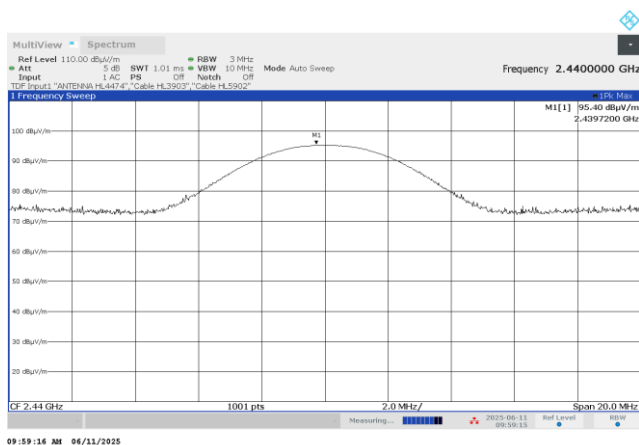


Horizontal polarization

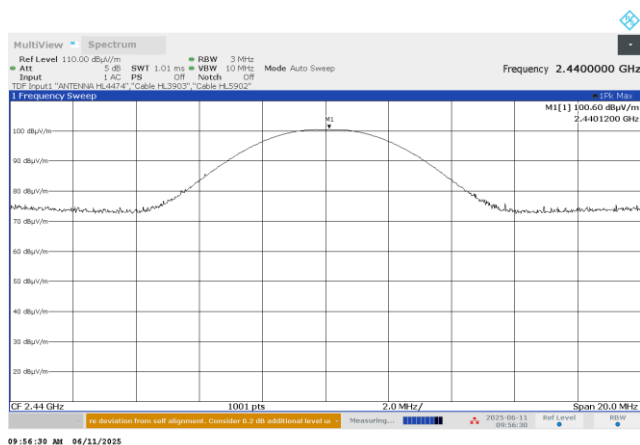


Plot 7.2.2 Field strength of carrier at mid frequency at AT98-7-23-17-S-5-N

Vertical polarization



Horizontal polarization



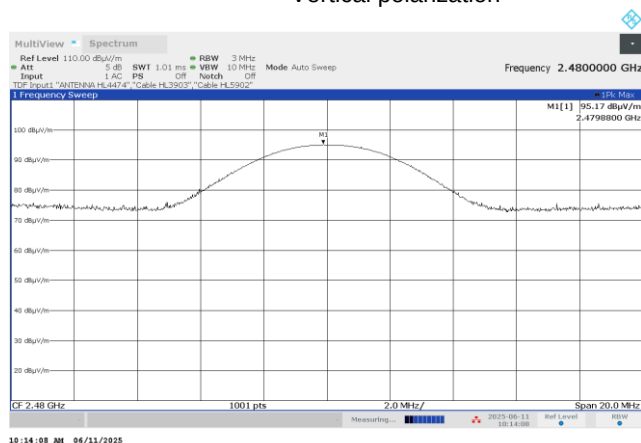


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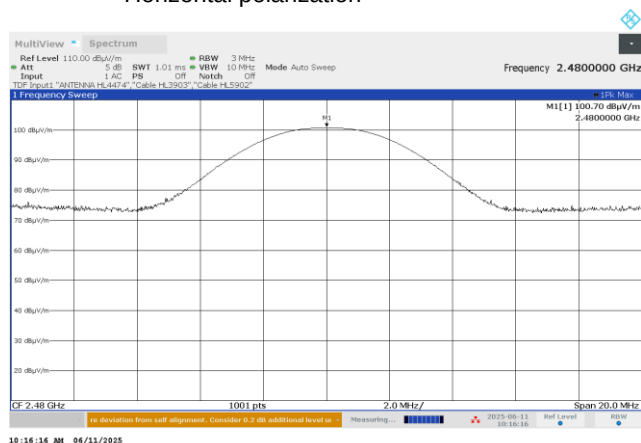
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Test procedure: ANSI C63.10, section 7.8.5			
Test mode: Compliance		Verdict: PASS	
Date(s): 18-Jun-25			
Temperature: 24 °C	Relative Humidity: 42 %	Air Pressure: 1015 hPa	Power: 3.7 VDC
Remarks:			

Plot 7.2.3 Field strength of carrier at high frequency at AT98-7-23-17-S-5-N

Vertical polarization



Horizontal polarization



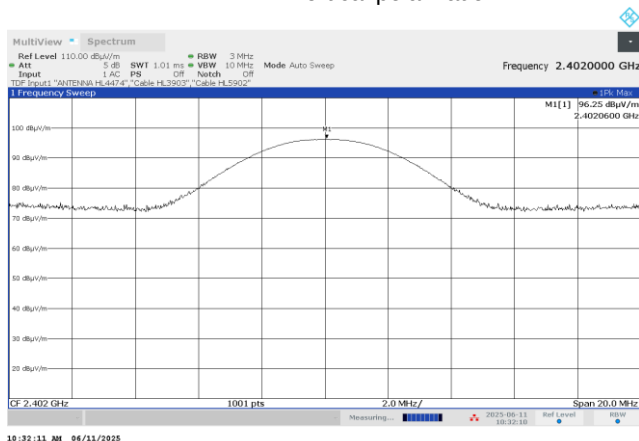


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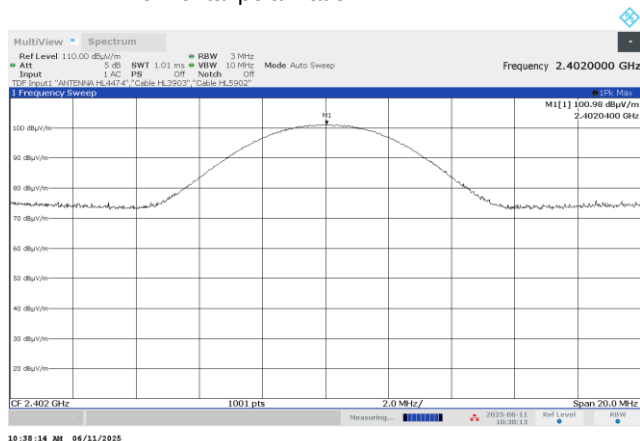
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Test procedure: ANSI C63.10, section 7.8.5			
Test mode: Compliance		Verdict: PASS	
Date(s): 18-Jun-25			
Temperature: 24 °C	Relative Humidity: 42 %	Air Pressure: 1015 hPa	Power: 3.7 VDC
Remarks:			

Plot 7.2.4 Field strength of carrier at low frequency at AT98-7-2-11-S-5-N

Vertical polarization

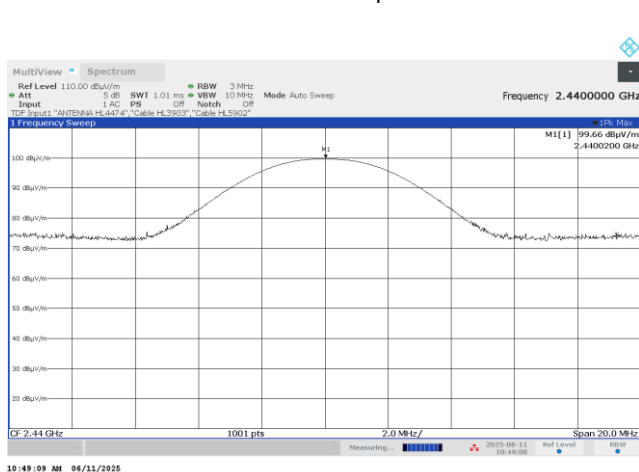


Horizontal polarization

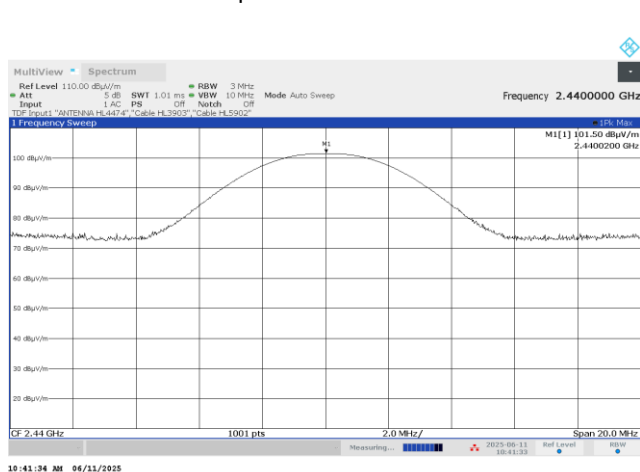


Plot 7.2.5 Field strength of carrier at mid frequency at AT98-7-2-11-S-5-N

Vertical polarization



Horizontal polarization



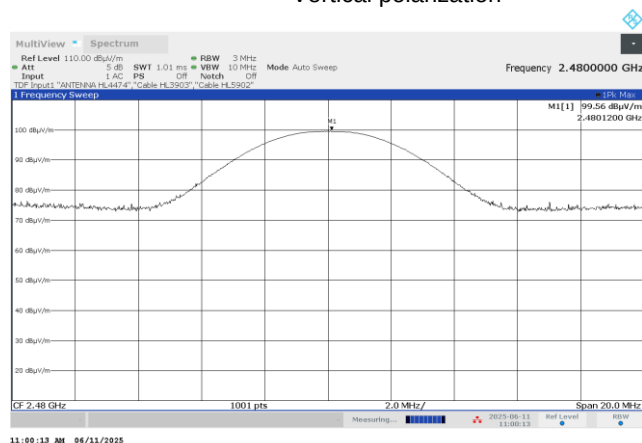


HERMON LABORATORIES

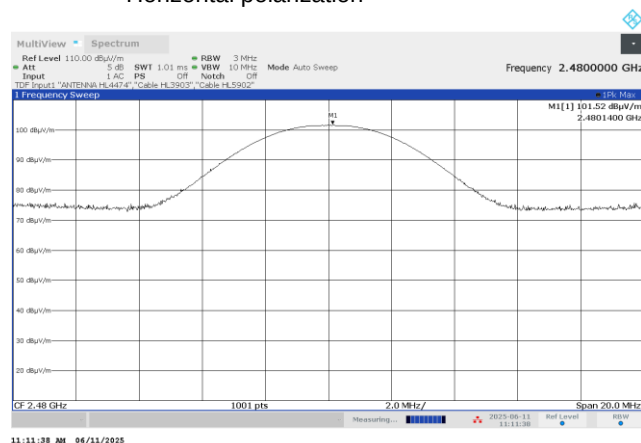
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Test procedure: ANSI C63.10, section 7.8.5			
Test mode: Compliance		Verdict: PASS	
Date(s): 18-Jun-25			
Temperature: 24 °C	Relative Humidity: 42 %	Air Pressure: 1015 hPa	Power: 3.7 VDC
Remarks:			

Plot 7.2.6 Field strength of carrier at high frequency at AT98-7-2-11-S-5-N

Vertical polarization



Horizontal polarization



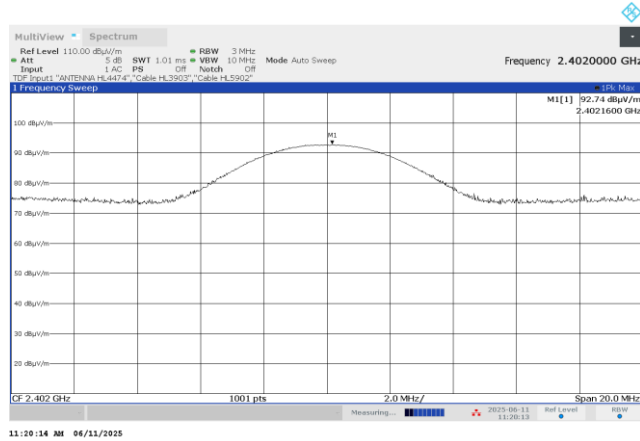


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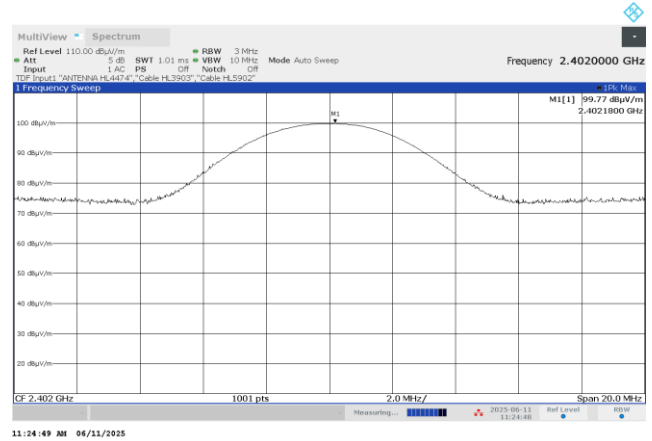
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Test procedure:		ANSI C63.10, section 7.8.5	
Test mode:		Verdict: PASS	
Date(s):			
18-Jun-25			
Temperature: 24 °C	Relative Humidity: 42 %	Air Pressure: 1015 hPa	Power: 3.7 VDC
Remarks:			

Plot 7.2.7 Field strength of carrier at low frequency at AT98-7-2-25-S-5-N

Vertical polarization

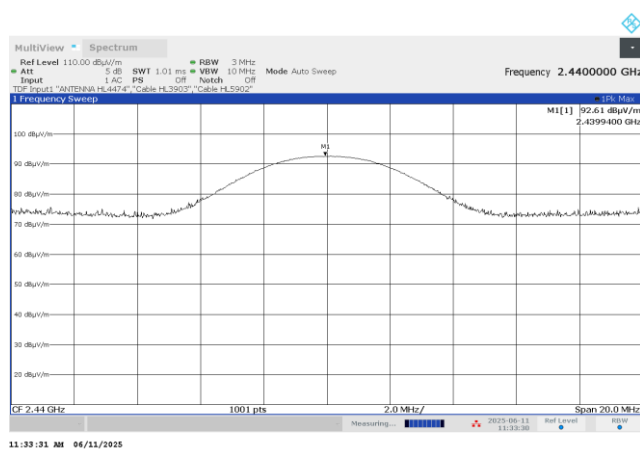


Horizontal polarization

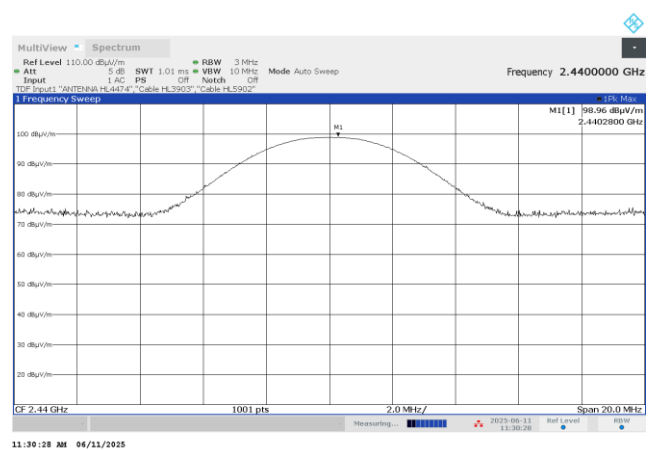


Plot 7.2.8 Field strength of carrier at mid frequency at AT98-7-2-25-S-5-N

Vertical polarization



Horizontal polarization





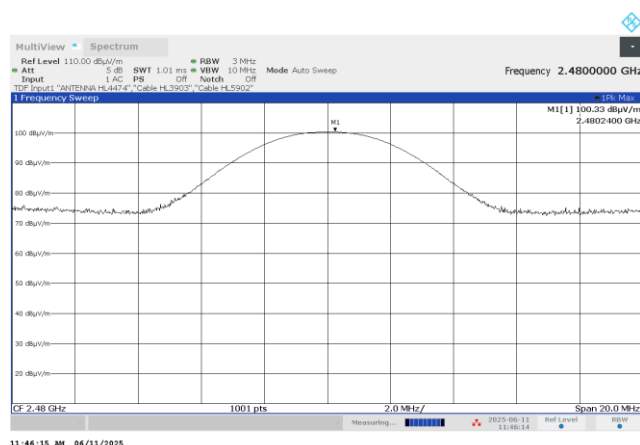
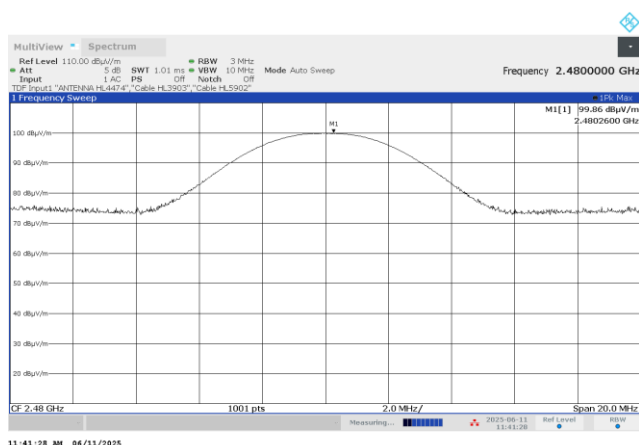
HERMON LABORATORIES

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): 18-Jun-25			
Temperature: 24 °C	Relative Humidity: 42 %	Air Pressure: 1015 hPa	Power: 3.7 VDC
Remarks:			

Plot 7.2.9 Field strength of carrier at high frequency at AT98-7-2-25-S-5-N

Vertical polarization

Horizontal polarization





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): 17-Dec-25			
Temperature: 24 °C	Relative Humidity: 42 %	Air Pressure: 1015 hPa	Power: 3.7 VDC
Remarks:			

7.3 Peak output power at AT98-7-22-5-P-5-N, AT98-7-21-5-P-5-N, AT98-7-1-13-P-5-N, AT98-7-22-5-OM-5-N, AT98-7-21-5-OM-5-N, AT98-7-1-13-OM-5-N

7.3.1 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 7.3.1 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: $E = \sqrt{(30 \times P \times G)/r}$, where P is peak output power in Watts, r is antenna to EUT distance in meters and G is transmitter antenna gain in dBi.

7.3.2 Test procedure

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

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

7.3.2.3 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° and the measuring antenna height was swept in both vertical and horizontal polarizations.

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

7.3.2.5 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:

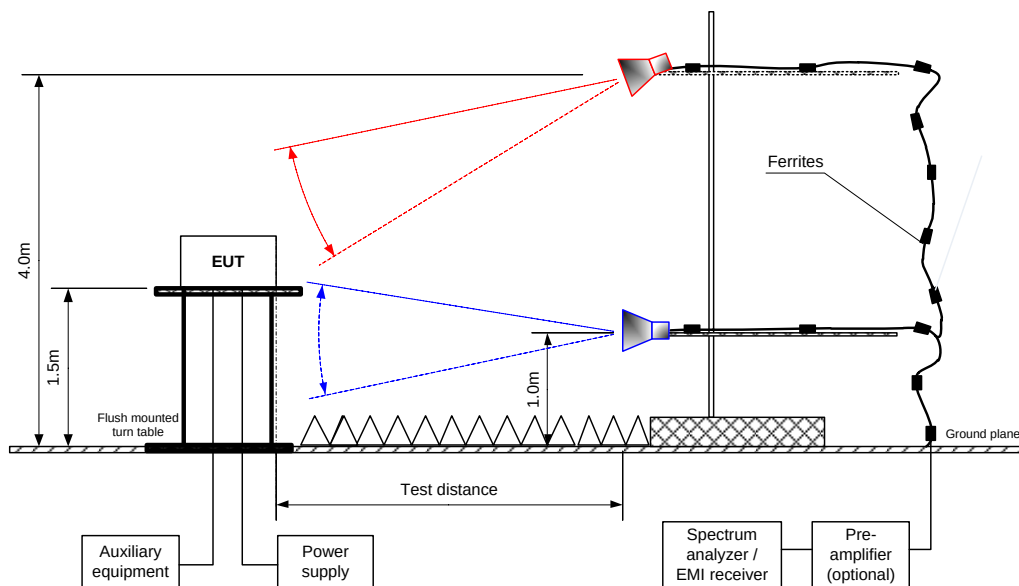
$$\text{Peak output power in dBm} = \text{Field strength in dB}(\mu\text{V/m}) - \text{Transmitter antenna gain in dBi} - 95.2 \text{ dB}$$

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



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): 17-Dec-25			
Temperature: 24 °C	Relative Humidity: 42 %	Air Pressure: 1015 hPa	Power: 3.7 VDC
Remarks:			

Figure 7.3.1 Setup for carrier field strength measurements





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): 17-Dec-25			
Temperature: 24 °C	Relative Humidity: 42 %	Air Pressure: 1015 hPa	Power: 3.7 VDC
Remarks:			

Table 7.3.2 Peak output power test results

ASSIGNED FREQUENCY: 2400 – 2483.5 MHz
 TEST DISTANCE: 3 m
 TEST SITE: Semi anechoic chamber
 EUT HEIGHT: 1.5 m
 DETECTOR USED: Peak
 TEST ANTENNA TYPE: Double ridged guide (above 1000 MHz)
 MODULATION: GFSK
 BIT RATE: 1 Mbps
 RESOLUTION BANDWIDTH: 3 MHz
 VIDEO BANDWIDTH: 10 MHz

MODEL

AT98-7-1-13-P-5-N

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
2402	99.32	H	1.6	0	2.5	1.62	30	-28.38	Pass
2440	99.45	H	1.6	17	2.5	1.75	30	-28.25	Pass
2480	99.05	H	1.6	13	2.5	1.35	30	-28.65	Pass

MODEL

AT98-7-1-13-OM-5-N

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
2402	99.87	H	2.0	30	2.5	2.17	30	-27.83	Pass
2440	99.93	H	1.9	30	2.5	2.23	30	-27.77	Pass
2480	98.61	H	2.2	27	2.5	0.91	30	-29.09	Pass

MODEL

AT98-7-21-5-P-5-N

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
2402	99.16	H	2.1	68	2.5	1.46	30	-28.54	Pass
2440	98.82	H	1.9	-59	2.5	1.12	30	-28.88	Pass
2480	98.22	H	2.0	113	2.5	0.52	30	-29.48	Pass

MODEL

AT98-7-21-5-OM-5-N

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
2402	99.51	H	2.1	-60	2.5	1.81	30	-28.19	Pass
2440	99.68	H	2.0	-59	2.5	1.98	30	-28.02	Pass
2480	99.61	H	2.0	-90	2.5	1.91	30	-28.09	Pass



HERMON LABORATORIES

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): 17-Dec-25			
Temperature: 24 °C	Relative Humidity: 42 %	Air Pressure: 1015 hPa	Power: 3.7 VDC
Remarks:			

Table 7.3.3 Peak output power test results (continuation)

MODEL

AT98-7-22-5-P-5-N

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
2402	99.25	H	2.3	70	2.5	1.55	30	-28.45	Pass
2440	99.04	H	2.2	21	2.5	1.34	30	-28.76	Pass
2480	98.86	H	2.2	-70	2.5	1.16	30	-28.84	Pass

MODEL

AT98-7-22-5-OM-5-N (WC)

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
2402	100.20	H	2.1	-80	2.5	2.50	30	-27.50	Pass
2440	100.12	H	2.2	-42	2.5	1.81	30	-28.19	Pass
2480	99.81	H	2.0	-90	2.5	2.11	30	-27.89	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.

Reference numbers of test equipment used

HL 3903	HL 4933	HL 5902	HL 7585				
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Full description is given in Appendix A.

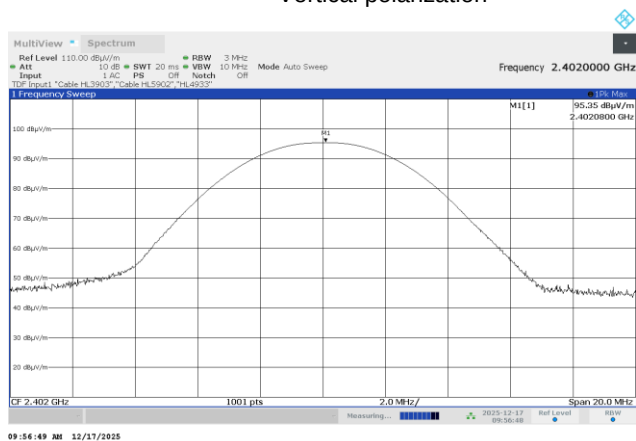


HERMON LABORATORIES

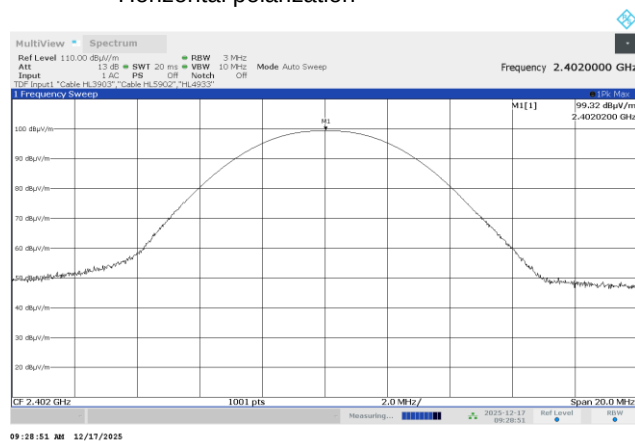
Test specification: Section 15.247(b), RSS-247 section 5.4(1), Peak output power			
Test procedure: ANSI C63.10, section 7.8.5			
Test mode: Compliance		Verdict: PASS	
Date(s): 17-Dec-25			
Temperature: 24 °C	Relative Humidity: 42 %	Air Pressure: 1015 hPa	Power: 3.7 VDC
Remarks:			

Plot 7.3.1 Field strength of carrier at low frequency at AT98-1-13-P-5-N

Vertical polarization

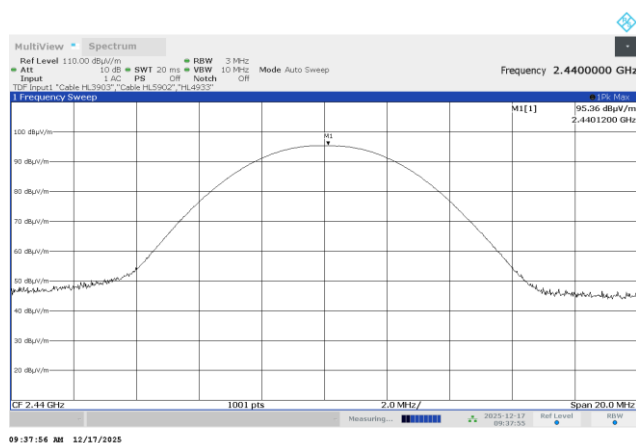


Horizontal polarization

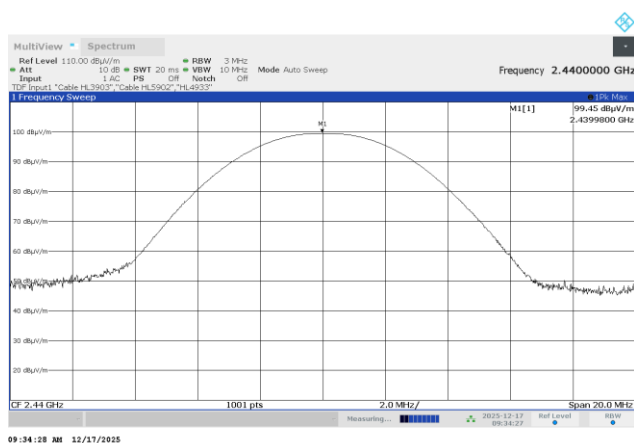


Plot 7.3.2 Field strength of carrier at mid frequency at AT98-1-13-P-5-N

Vertical polarization



Horizontal polarization



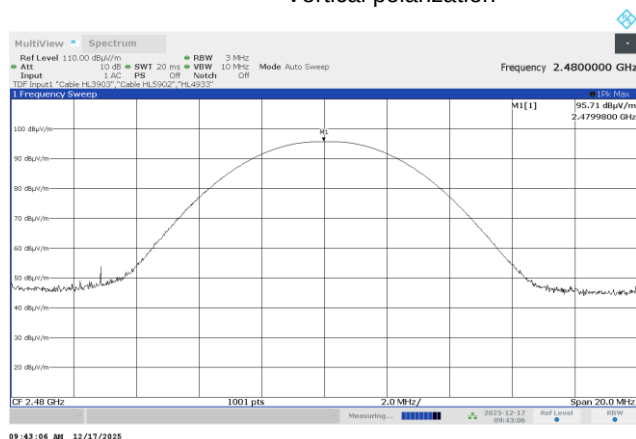


HERMON LABORATORIES

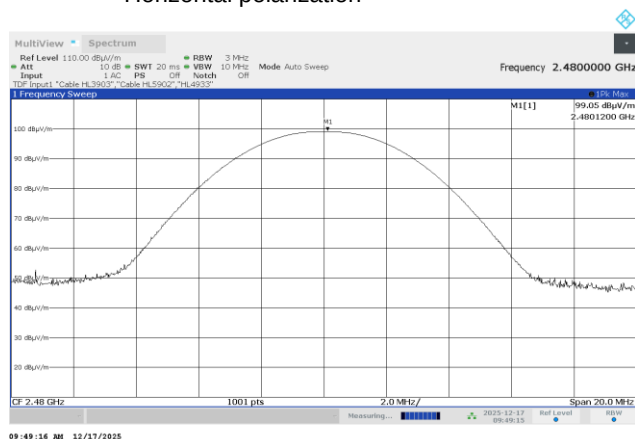
Test specification: Section 15.247(b), RSS-247 section 5.4(1), Peak output power			
Test procedure: ANSI C63.10, section 7.8.5			
Test mode: Compliance		Verdict: PASS	
Date(s): 17-Dec-25			
Temperature: 24 °C	Relative Humidity: 42 %	Air Pressure: 1015 hPa	Power: 3.7 VDC
Remarks:			

Plot 7.3.3 Field strength of carrier at high frequency at AT98-1-13-P-5-N

Vertical polarization



Horizontal polarization



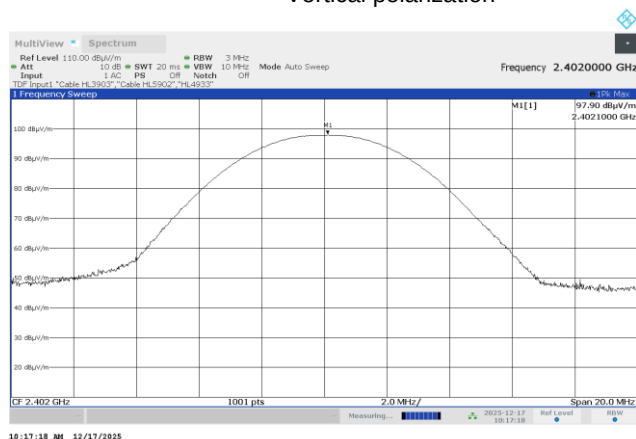


HERMON LABORATORIES

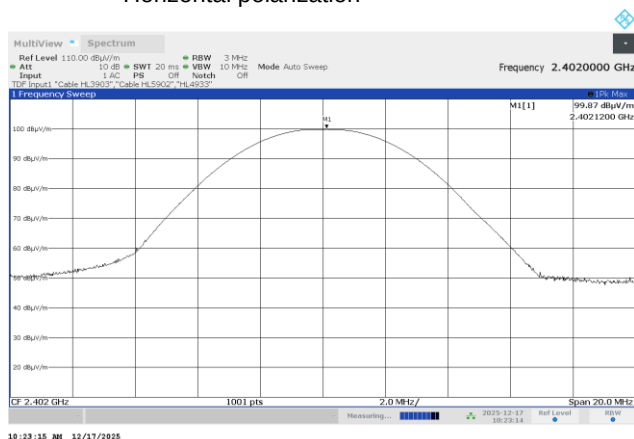
Test specification: Section 15.247(b), RSS-247 section 5.4(1), Peak output power			
Test procedure: ANSI C63.10, section 7.8.5			
Test mode: Compliance		Verdict: PASS	
Date(s): 17-Dec-25			
Temperature: 24 °C	Relative Humidity: 42 %	Air Pressure: 1015 hPa	Power: 3.7 VDC
Remarks:			

Plot 7.3.4 Field strength of carrier at low frequency AT98-1-13-OM-5-N

Vertical polarization

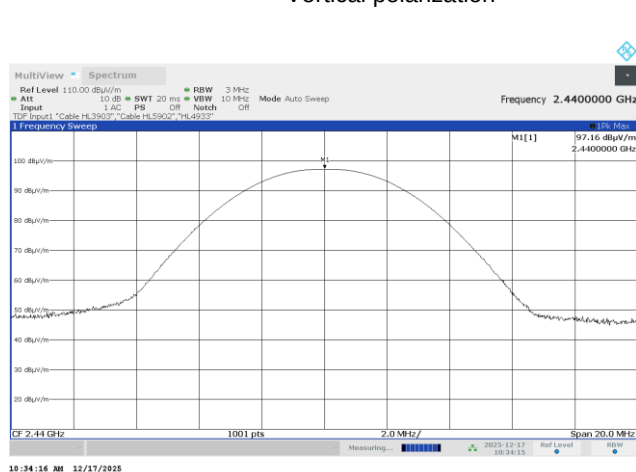


Horizontal polarization

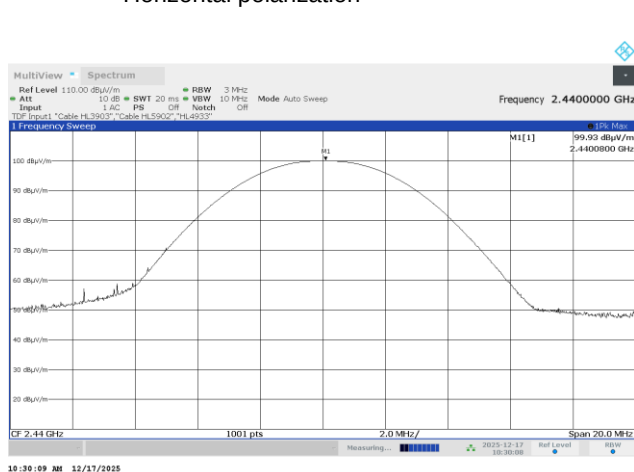


Plot 7.3.5 Field strength of carrier at mid frequency at AT98-1-13-OM-5-N

Vertical polarization



Horizontal polarization



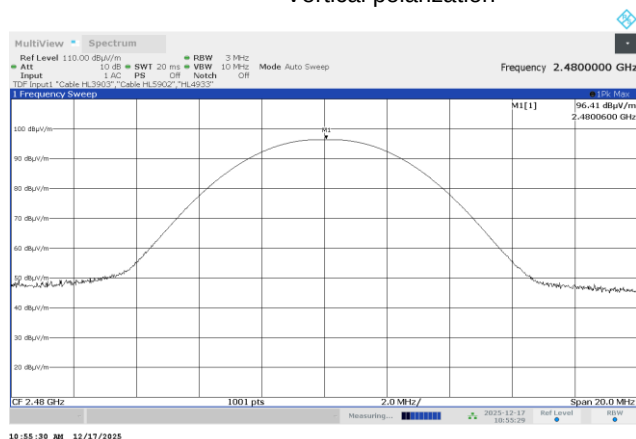


HERMON LABORATORIES

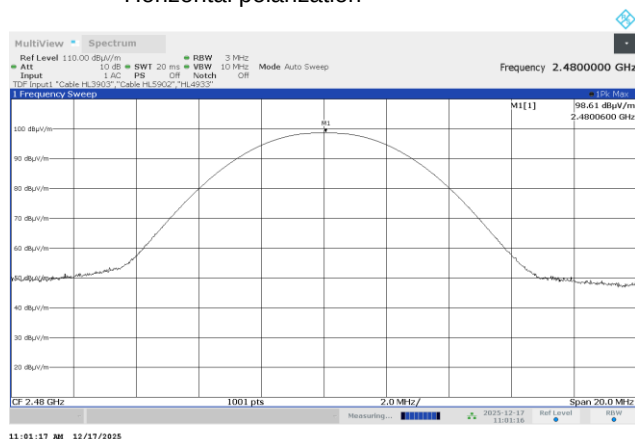
Test specification: Section 15.247(b), RSS-247 section 5.4(1), Peak output power			
Test procedure: ANSI C63.10, section 7.8.5			
Test mode: Compliance		Verdict: PASS	
Date(s): 17-Dec-25			
Temperature: 24 °C	Relative Humidity: 42 %	Air Pressure: 1015 hPa	Power: 3.7 VDC
Remarks:			

Plot 7.3.6 Field strength of carrier at high frequency at AT98-1-13-OM-5-N

Vertical polarization



Horizontal polarization



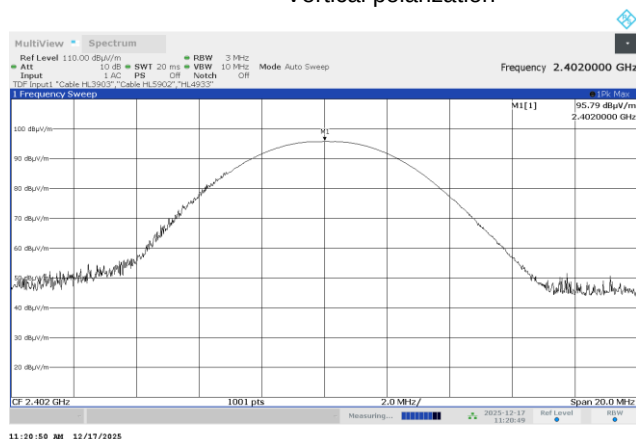


HERMON LABORATORIES

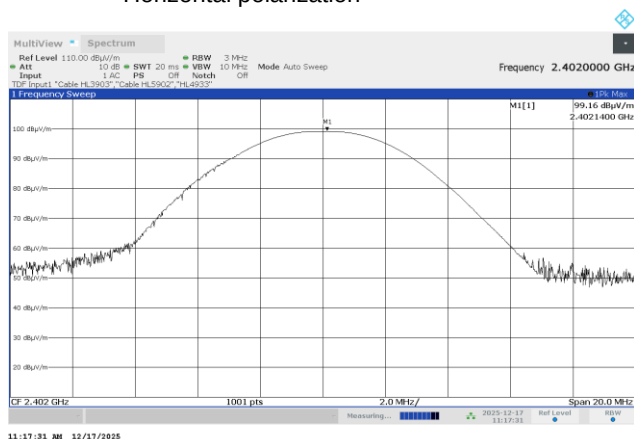
Test specification: Section 15.247(b), RSS-247 section 5.4(1), Peak output power			
Test procedure: ANSI C63.10, section 7.8.5			
Test mode: Compliance		Verdict: PASS	
Date(s): 17-Dec-25			
Temperature: 24 °C	Relative Humidity: 42 %	Air Pressure: 1015 hPa	Power: 3.7 VDC
Remarks:			

Plot 7.3.7 Field strength of carrier at low frequency at AT98-7-21-5-P-5-N

Vertical polarization

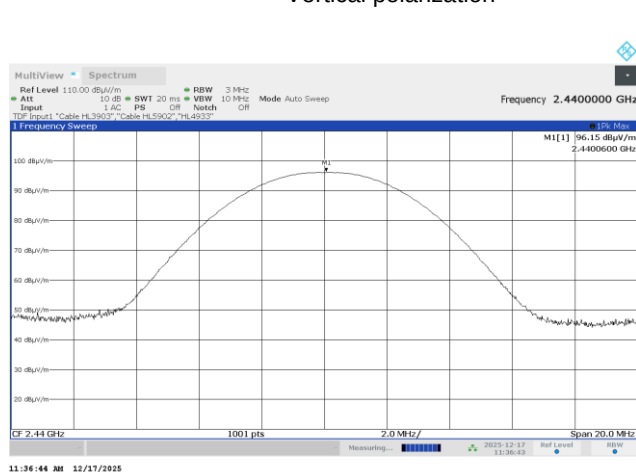


Horizontal polarization

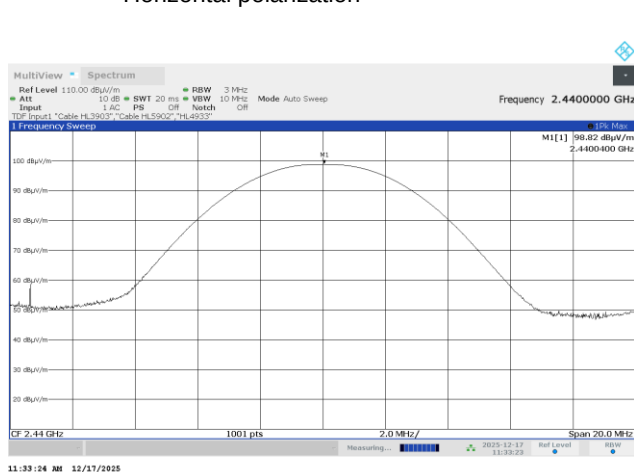


Plot 7.3.8 Field strength of carrier at mid frequency at AT98-7-21-5-P-5-N

Vertical polarization



Horizontal polarization





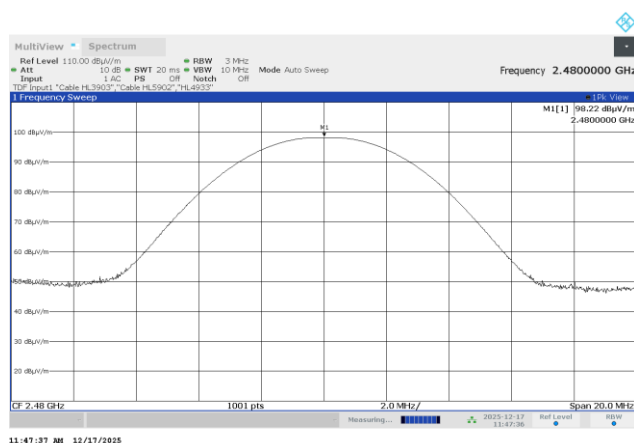
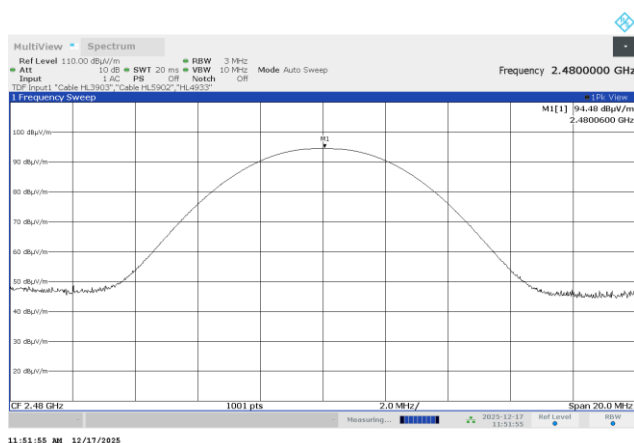
HERMON LABORATORIES

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): 17-Dec-25			
Temperature: 24 °C	Relative Humidity: 42 %	Air Pressure: 1015 hPa	Power: 3.7 VDC
Remarks:			

Plot 7.3.9 Field strength of carrier at high frequency at AT98-7-21-5-P-5-N

Vertical polarization

Horizontal polarization



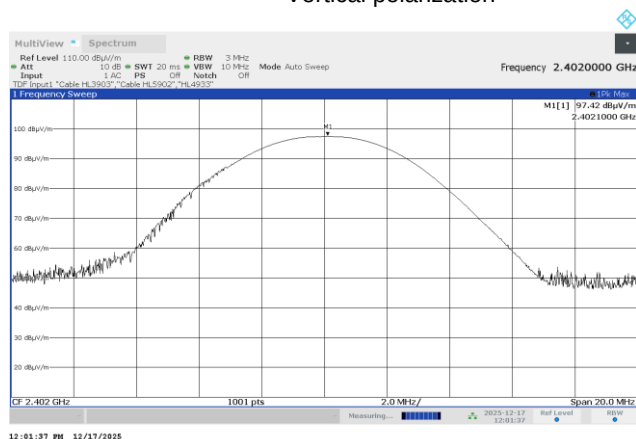


HERMON LABORATORIES

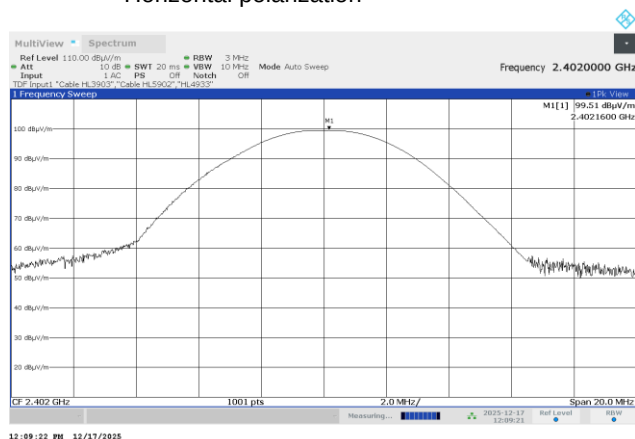
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Test procedure: ANSI C63.10, section 7.8.5			
Test mode: Compliance		Verdict: PASS	
Date(s): 17-Dec-25			
Temperature: 24 °C	Relative Humidity: 42 %	Air Pressure: 1015 hPa	Power: 3.7 VDC
Remarks:			

Plot 7.3.10 Field strength of carrier at low frequency at AT98-7-21-5-OM-5-N

Vertical polarization

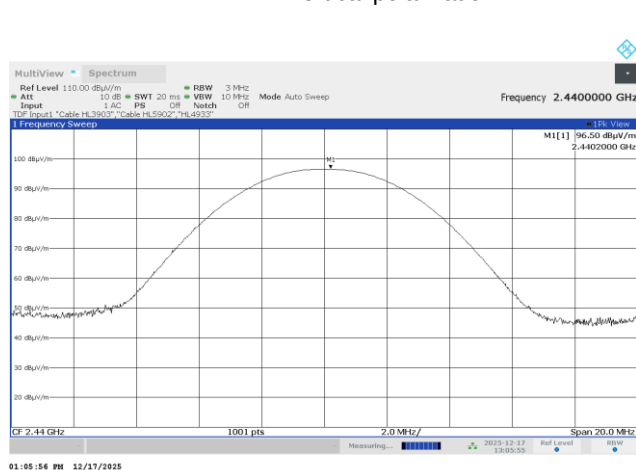


Horizontal polarization

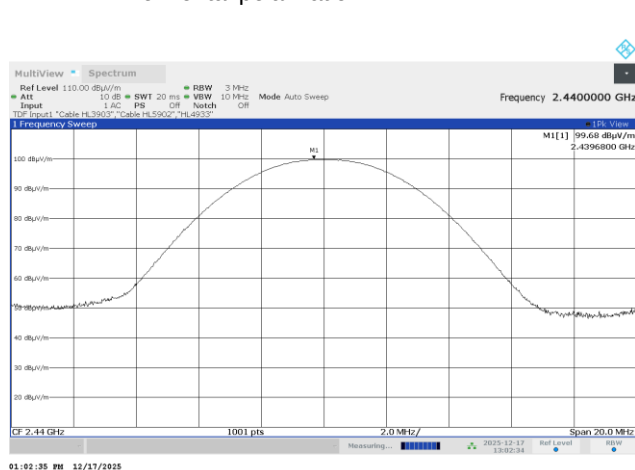


Plot 7.3.11 Field strength of carrier at mid frequency at AT98-7-21-5-OM-5-N

Vertical polarization



Horizontal polarization





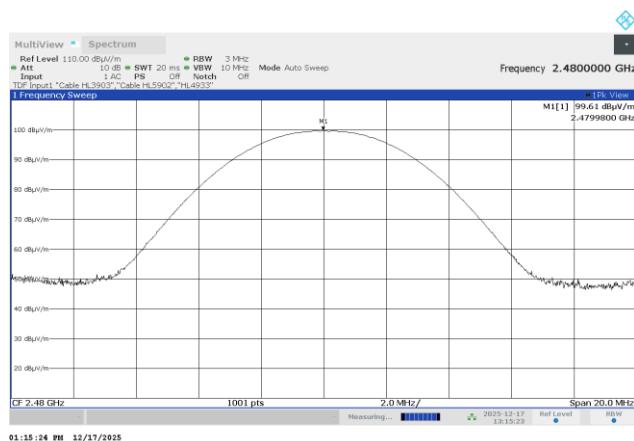
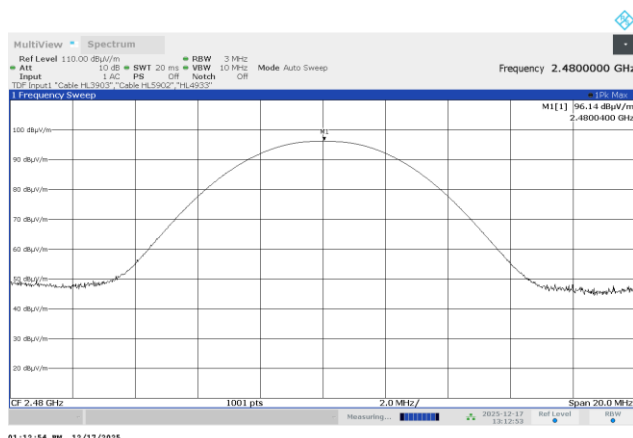
HERMON LABORATORIES

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): 17-Dec-25			
Temperature: 24 °C	Relative Humidity: 42 %	Air Pressure: 1015 hPa	Power: 3.7 VDC
Remarks:			

Plot 7.3.12 Field strength of carrier at high frequency at AT98-7-21-5-OM-5-N

Vertical polarization

Horizontal polarization



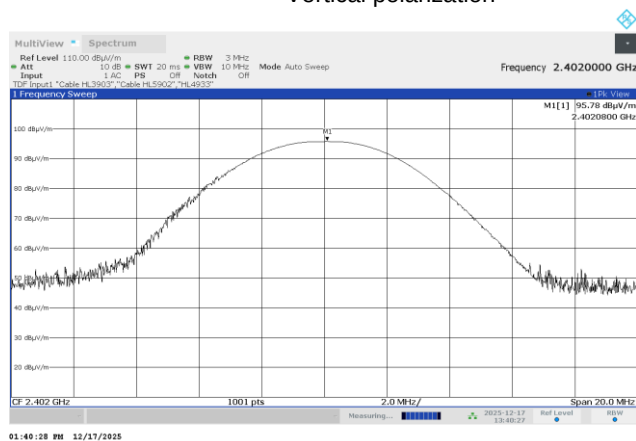


HERMON LABORATORIES

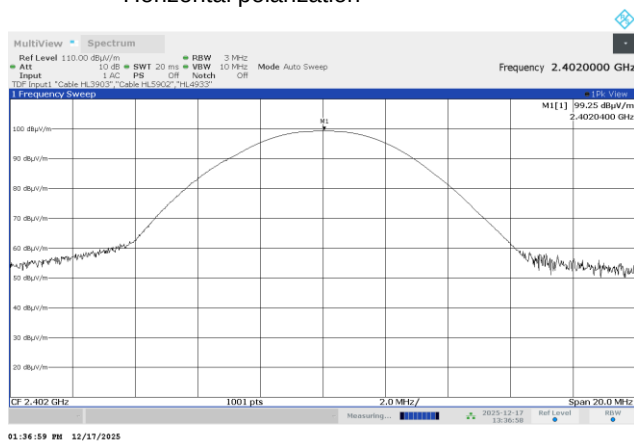
Test specification: Section 15.247(b), RSS-247 section 5.4(1), Peak output power			
Test procedure: ANSI C63.10, section 7.8.5			
Test mode: Compliance		Verdict: PASS	
Date(s): 17-Dec-25			
Temperature: 24 °C	Relative Humidity: 42 %	Air Pressure: 1015 hPa	Power: 3.7 VDC
Remarks:			

Plot 7.3.13 Field strength of carrier at low frequency at AT98-7-22-5-P-5-N

Vertical polarization

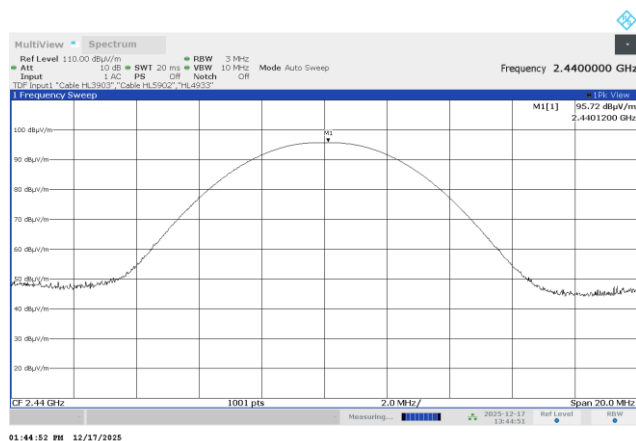


Horizontal polarization

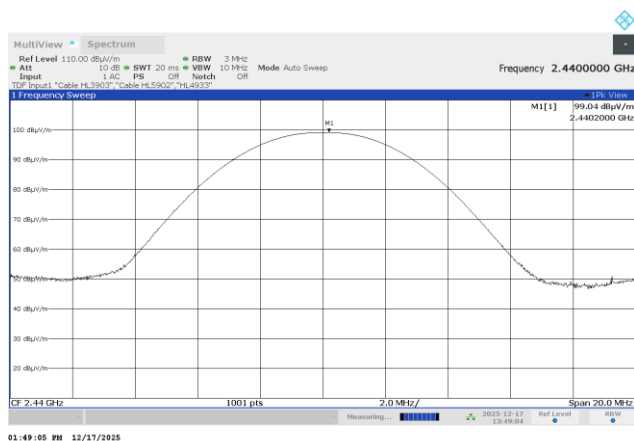


Plot 7.3.14 Field strength of carrier at mid frequency at AT98-7-22-5-P-5-N

Vertical polarization



Horizontal polarization





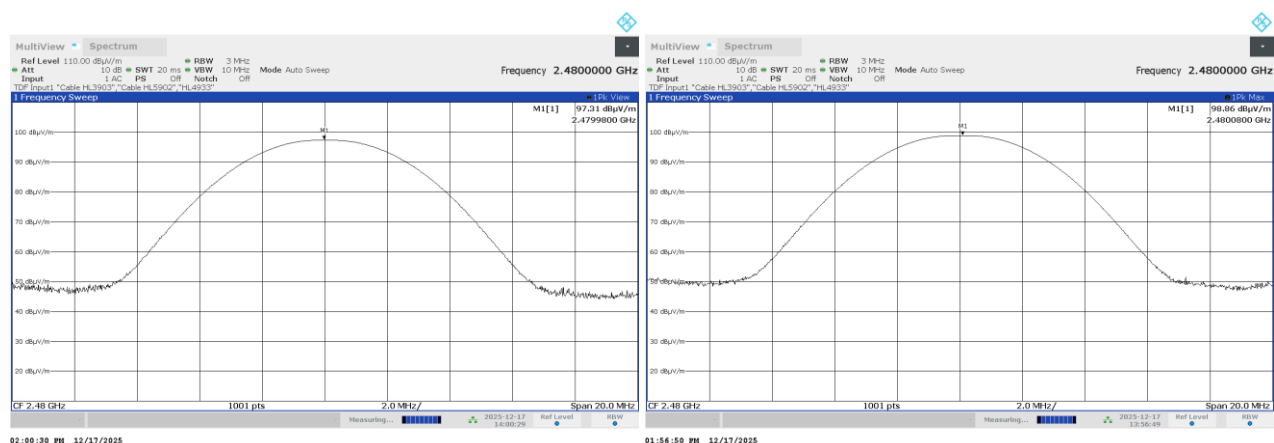
HERMON LABORATORIES

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): 17-Dec-25			
Temperature: 24 °C	Relative Humidity: 42 %	Air Pressure: 1015 hPa	Power: 3.7 VDC
Remarks:			

Plot 7.3.15 Field strength of carrier at high frequency at AT98-7-22-5-P-5-N

Vertical polarization

Horizontal polarization



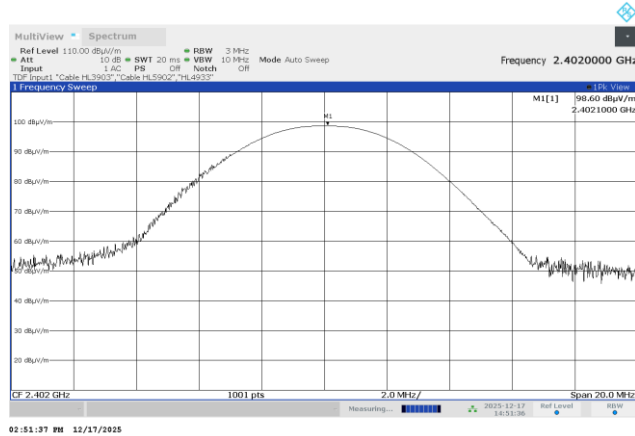


HERMON LABORATORIES

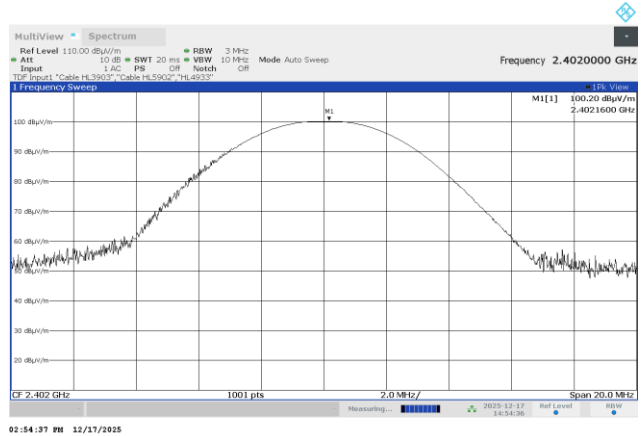
Test specification: Section 15.247(b), RSS-247 section 5.4(1), Peak output power			
Test procedure: ANSI C63.10, section 7.8.5			
Test mode: Compliance		Verdict: PASS	
Date(s): 17-Dec-25			
Temperature: 24 °C	Relative Humidity: 42 %	Air Pressure: 1015 hPa	Power: 3.7 VDC
Remarks:			

Plot 7.3.16 Field strength of carrier at low frequency at AT98-7-22-5-OM-5-N

Vertical polarization

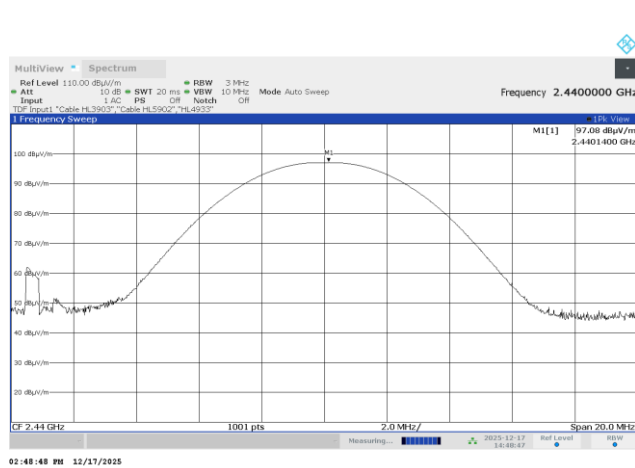


Horizontal polarization

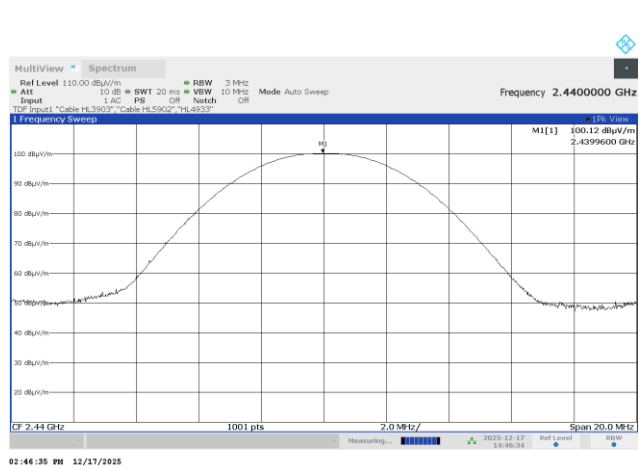


Plot 7.3.17 Field strength of carrier at mid frequency at AT98-7-22-5-OM-5-N

Vertical polarization



Horizontal polarization





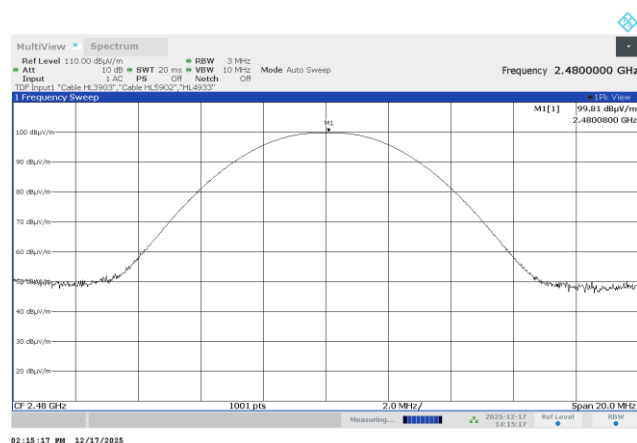
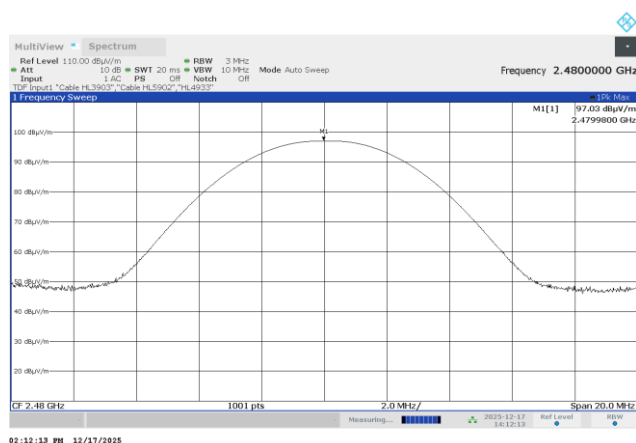
HERMON LABORATORIES

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): 17-Dec-25			
Temperature: 24 °C	Relative Humidity: 42 %	Air Pressure: 1015 hPa	Power: 3.7 VDC
Remarks:			

Plot 7.3.18 Field strength of carrier at high frequency at AT98-7-22-5-OM-5-N

Vertical polarization

Horizontal polarization





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): 06-Apr-26			
Temperature: 24 °C	Relative Humidity: 42 %	Air Pressure: 1015 hPa	Power: 3.7 VDC
Remarks:			

7.4 Peak output power at AT98-7-2-21-S-5-N, AT98-7-23-11-S-5-N, AT98-7-23-16-S-5-N

7.4.1 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 7.4.1 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: $E = \sqrt{30 \times P \times G} / r$, where P is peak output power in Watts, r is antenna to EUT distance in meters and G is transmitter antenna gain in dBi.

7.4.2 Test procedure

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

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

7.4.2.3 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° and the measuring antenna height was swept in both vertical and horizontal polarizations.

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

7.4.2.5 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:

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

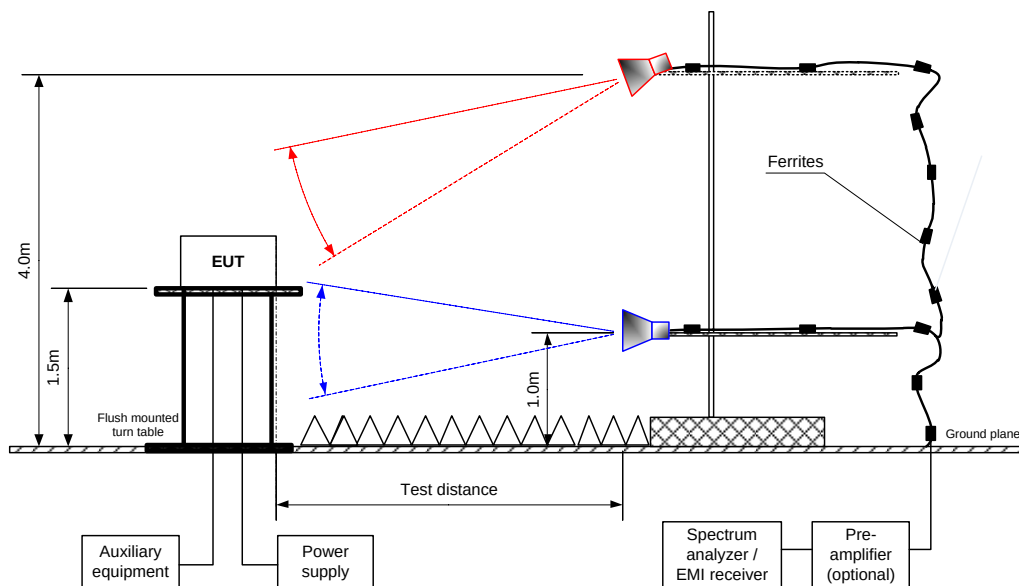
7.4.2.6 The worst test results (the lowest margins) were recorded in Table 7.2.2.



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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): 06-Apr-26			
Temperature: 24 °C	Relative Humidity: 42 %	Air Pressure: 1015 hPa	Power: 3.7 VDC
Remarks:			

Figure 7.4.1 Setup for carrier field strength measurements





HERMON LABORATORIES

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): 06-Apr-26			
Temperature: 24 °C	Relative Humidity: 42 %	Air Pressure: 1015 hPa	Power: 3.7 VDC
Remarks:			

Table 7.4.2 Peak output power test results

ASSIGNED FREQUENCY: 2400 – 2483.5 MHz
 TEST DISTANCE: 3 m
 TEST SITE: Semi anechoic chamber
 EUT HEIGHT: 1.5 m
 DETECTOR USED: Peak
 TEST ANTENNA TYPE: Double ridged guide (above 1000 MHz)
 MODULATION: GFSK
 BIT RATE: 1 Mbps
 RESOLUTION BANDWIDTH: 3 MHz
 VIDEO BANDWIDTH: 10 MHz

MODEL

AT98-7-2-21-S-5-N

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
2402	97.34	Horizontal	1.97	25	2.5	-0.36	30	-30.36	Pass
2440	97.70	Horizontal	1.92	30	2.5	0.00	30	-30.00	Pass
2480	98.54	Horizontal	1.97	15	2.5	0.84	30	-29.16	Pass

MODEL

AT98-7-23-11-S-5-N (WC)

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
2402	100.85	Horizontal	2.01	19	2.5	3.15	30	-26.85	Pass
2440	100.86	Horizontal	1.93	14	2.5	3.16	30	-26.84	Pass
2480	100.02	Horizontal	1.95	18	2.5	2.32	30	-27.68	Pass

MODEL

AT98-7-23-16-S-5-N

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
2402	98.27	Horizontal	1.98	22	2.5	0.57	30	-29.43	Pass
2440	99.01	Horizontal	2.00	18	2.5	1.31	30	-28.69	Pass
2480	99.53	Horizontal	1.94	25	2.5	1.83	30	-28.17	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.

Reference numbers of test equipment used

HL 3903	HL 4933	HL 5902	HL 7585				
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Full description is given in Appendix A.

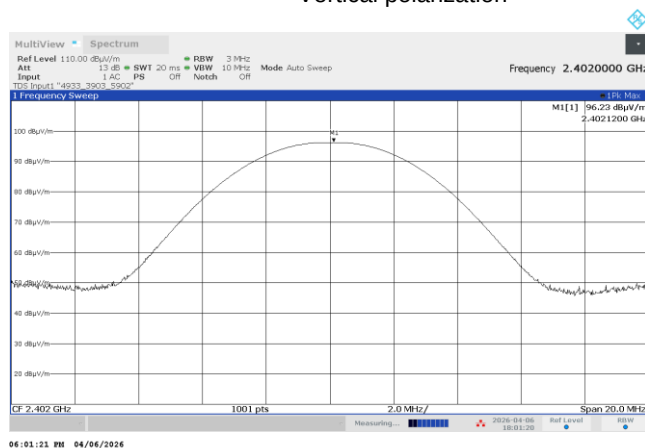


HERMON LABORATORIES

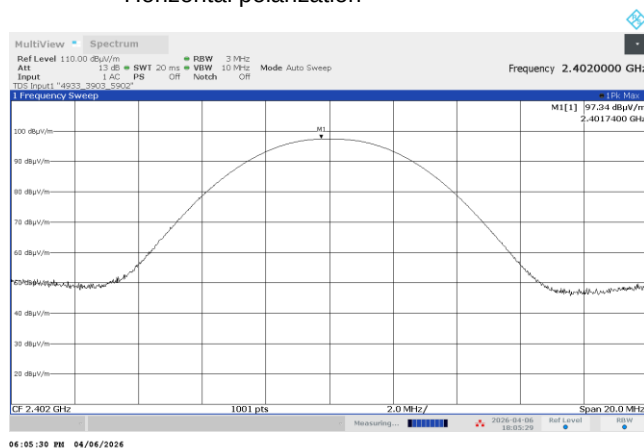
Test specification: Section 15.247(b), RSS-247 section 5.4(1), Peak output power			
Test procedure: ANSI C63.10, section 7.8.5			
Test mode: Compliance		Verdict: PASS	
Date(s): 06-Apr-26			
Temperature: 24 °C	Relative Humidity: 42 %	Air Pressure: 1015 hPa	Power: 3.7 VDC
Remarks:			

Plot 7.4.1 Field strength of carrier at low frequency at AT98-7-2-21-S-5-N

Vertical polarization

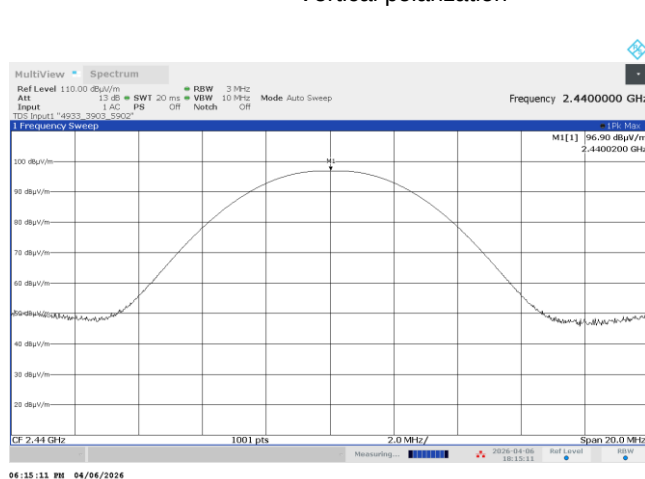


Horizontal polarization



Plot 7.4.2 Field strength of carrier at mid frequency at AT98-7-2-21-S-5-N

Vertical polarization



Horizontal polarization

