

Test specification:		Section 96.41(g), Peak-to- average power ratio	
Test procedure:		Section 96.41(g)	
Test mode:		Verdict: PASS	
Date(s):			
14-Dec-21			
Temperature: 25 °C	Relative Humidity: 54 %	Air Pressure: 1011 hPa	Power: 48 VDC
Remarks:			

7.2 Peak-to-average power ratio (PAPR) test

7.2.1 General

This test was performed to measure the peak to average power ratio at RF antenna connector. Specification test limits are given in Table 7.2.1.

Table 7.2.1 Peak-to-average power ratio limits

Assigned frequency range, MHz	Peak to average power ratio limit	
	Probability, %	dB
3550.0 – 3700.0	0.1	13.0

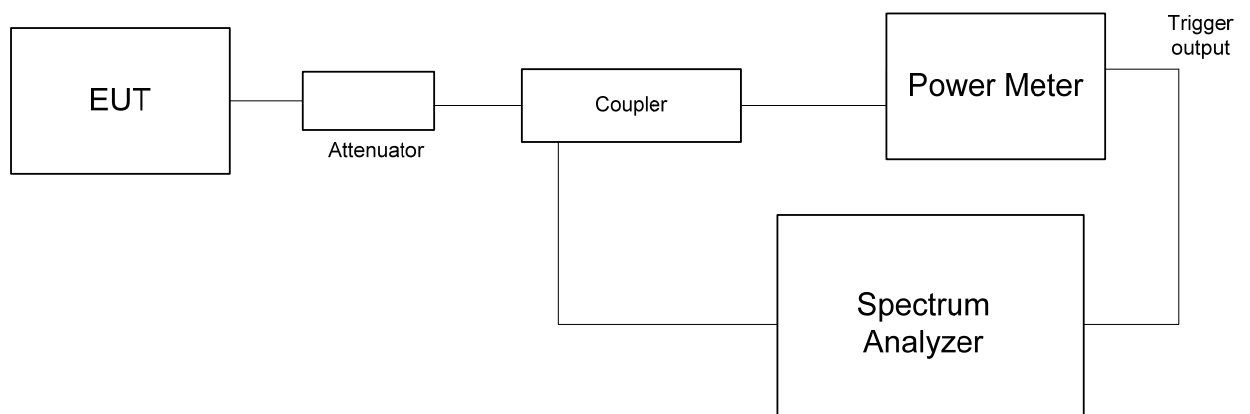
7.2.2 Test procedure

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 the end user RF output power.

7.2.2.3 The peak to average power ratio was measured with power meter as provided in the associated tables and plots.

Figure 7.2.1 Peak-to-average power ratio test setup





Test specification: Section 96.41(g), Peak-to- average power ratio			
Test procedure: Section 96.41(g)			
Test mode: Compliance		Verdict: PASS	
Date(s): 14-Dec-21			
Temperature: 25 °C	Relative Humidity: 54 %	Air Pressure: 1011 hPa	Power: 48 VDC
Remarks:			

Table 7.2.2 Peak-to-average power ratio test results

OPERATING FREQUENCY RANGE: 3550 – 3700 MHz
DETECTOR USED: Peak/Average
MODULATING SIGNAL: PRBS
TRANSMITTER OUTPUT POWER SETTINGS: Maximum

Carrier frequency, MHz	Peak to average ratio, dB	Limit, dBm	Margin, dB	Verdict
Channel spacing 10 MHz				
Modulation QPSK				
3555.0	8.43	13.0	-4.57	Pass
3625.0	8.35	13.0	-4.65	Pass
3695.0	8.46	13.0	-4.54	Pass
Modulation 16QAM				
3555.0	8.52	13.0	-4.48	Pass
3625.0	8.43	13.0	-4.57	Pass
3695.0	8.49	13.0	-4.51	Pass
Modulation 64QAM				
3555.0	8.46	13.0	-4.54	Pass
3625.0	8.46	13.0	-4.54	Pass
3695.0	8.49	13.0	-4.51	Pass
Modulation 256QAM				
3555.0	8.49	13.0	-4.51	Pass
3625.0	8.49	13.0	-4.51	Pass
3695.0	8.49	13.0	-4.51	Pass

Reference numbers of test equipment used

HL 3301	HL 3901	HL 4355				
---------	---------	---------	--	--	--	--

Full description is given in Appendix A.



Test specification:		Section 96.41(g), Peak-to- average power ratio	
Test procedure:		Section 96.41(g)	
Test mode:		Verdict: PASS	
Compliance			
Date(s):		14-Dec-21	
Temperature: 25 °C	Relative Humidity: 54 %	Air Pressure: 1011 hPa	Power: 48 VDC
Remarks:			

Table 7.2.3 Peak-to-average power ratio test results

OPERATING FREQUENCY RANGE: 3550 – 3700 MHz

DETECTOR USED: Peak/Average

TRANSMITTER OUTPUT POWER SETTINGS: Maximum

Carrier frequency, MHz	Peak to average ratio, dB	Limit, dBm	Margin, dB	Verdict
Channel spacing 30 MHz				
Modulation QPSK				
3565.0	9.47	13.0	-3.53	Pass
3625.0	9.46	13.0	-3.54	Pass
3685.0	9.50	13.0	-3.50	Pass
Modulation 16QAM				
3565.0	9.37	13.0	-3.63	Pass
3625.0	9.33	13.0	-3.67	Pass
3685.0	9.37	13.0	-3.63	Pass
Modulation 64QAM				
3565.0	9.40	13.0	-3.60	Pass
3625.0	9.35	13.0	-3.65	Pass
3685.0	9.35	13.0	-3.65	Pass
Modulation 256QAM				
3565.0	9.39	13.0	-3.61	Pass
3625.0	9.34	13.0	-3.66	Pass
3685.0	9.35	13.0	-3.65	Pass

Reference numbers of test equipment used

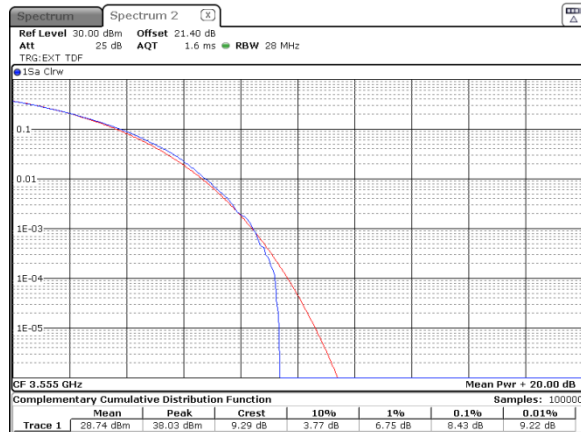
HL 3301	HL 3901	HL 4355					
---------	---------	---------	--	--	--	--	--

Full description is given in Appendix A.

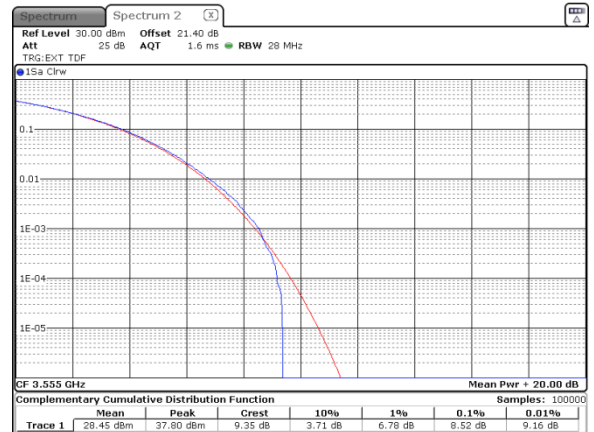
Test specification:		Section 96.41(g), Peak-to- average power ratio	
Test procedure:		Section 96.41(g)	
Test mode:		Verdict: PASS	
Date(s):			
14-Dec-21			
Temperature: 25 °C	Relative Humidity: 54 %	Air Pressure: 1011 hPa	Power: 48 VDC
Remarks:			

Plot 7.2.1 Peak-to-average power ratio test results at low frequency

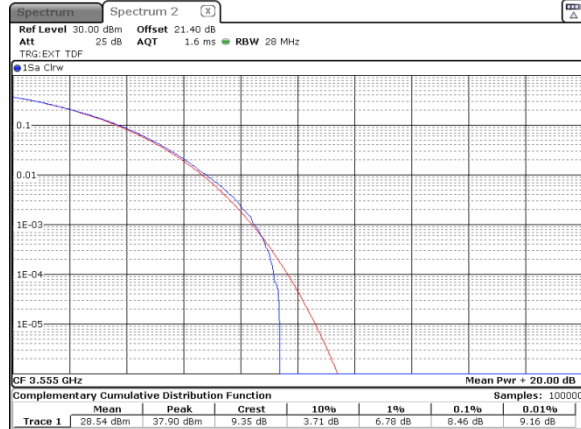
CHANNEL SPACING:
ANTENNA PORT:
Modulation: QPSK



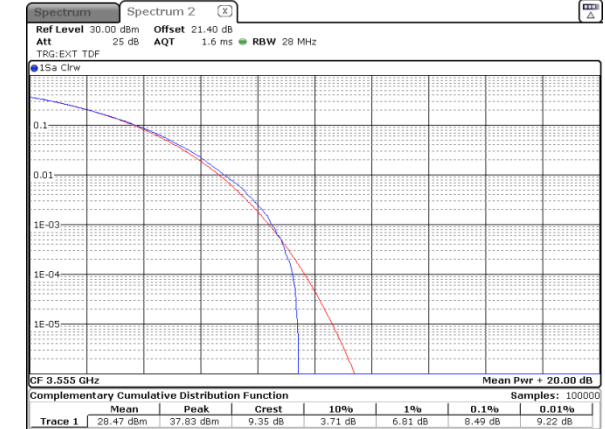
10 MHz
1
Modulation: 16QAM



Modulation: 64QAM



Modulation: 256QAM



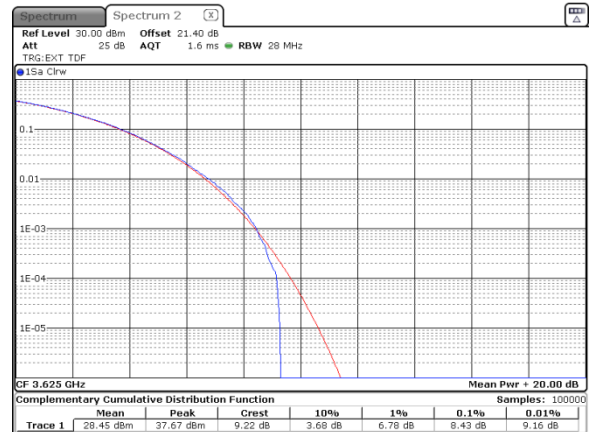
Test specification:		Section 96.41(g), Peak-to- average power ratio	
Test procedure:		Section 96.41(g)	
Test mode:		Verdict: PASS	
Date(s):			
14-Dec-21			
Temperature: 25 °C	Relative Humidity: 54 %	Air Pressure: 1011 hPa	Power: 48 VDC
Remarks:			

Plot 7.2.2 Peak-to-average power ratio test results at mid frequency

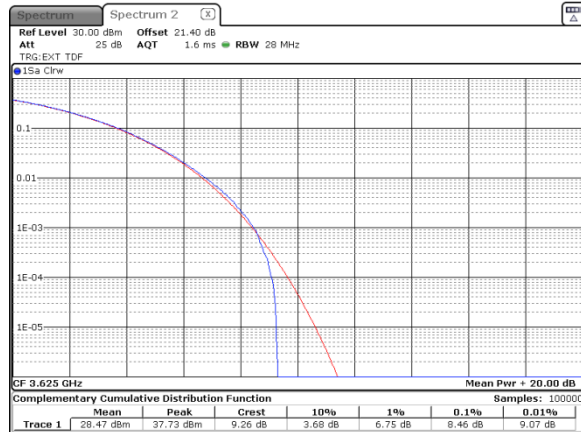
CHANNEL SPACING:
ANTENNA PORT:
Modulation: QPSK



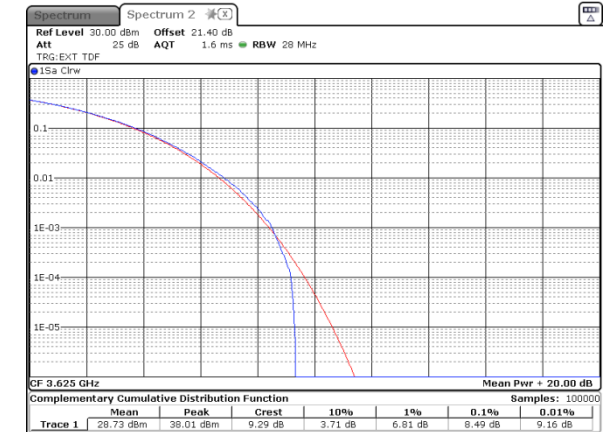
10 MHz
1
Modulation: 16QAM



Modulation: 64QAM



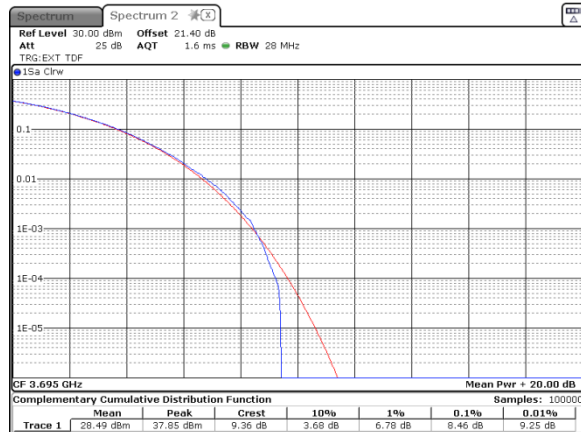
Modulation: 256QAM



Test specification:		Section 96.41(g), Peak-to- average power ratio	
Test procedure:		Section 96.41(g)	
Test mode:		Verdict: PASS	
Date(s):			
14-Dec-21			
Temperature: 25 °C	Relative Humidity: 54 %	Air Pressure: 1011 hPa	Power: 48 VDC
Remarks:			

Plot 7.2.3 Peak-to-average power ratio test results at high frequency

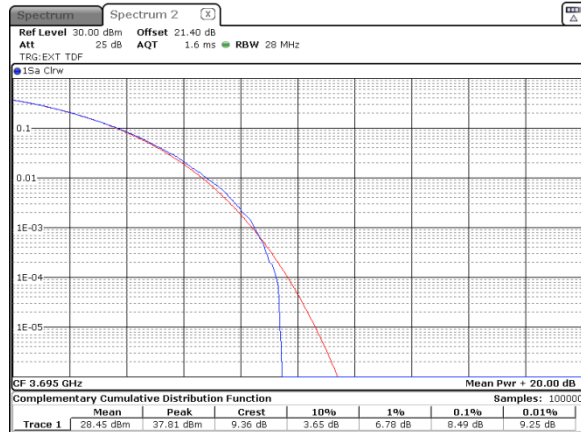
CHANNEL SPACING:
ANTENNA PORT:
Modulation: QPSK



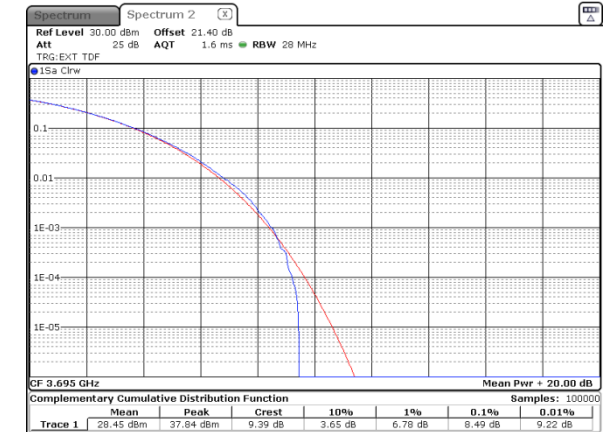
10 MHz
1
Modulation: 16QAM



Modulation: 64QAM



Modulation: 256QAM





HERMON LABORATORIES

Test specification: Section 96.41(g), Peak-to- average power ratio			
Test procedure: Section 96.41(g)			
Test mode: Compliance		Verdict: PASS	
Date(s): 14-Dec-21			
Temperature: 25 °C	Relative Humidity: 54 %	Air Pressure: 1011 hPa	Power: 48 VDC
Remarks:			

Plot 7.2.4 Peak-to-average power ratio test results at low frequency

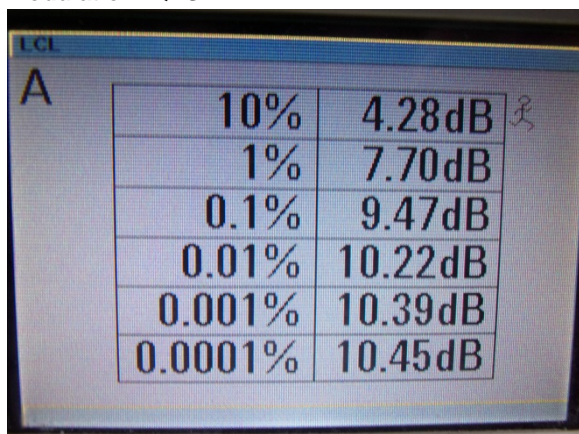
CHANNEL SPACING:

30 MHz

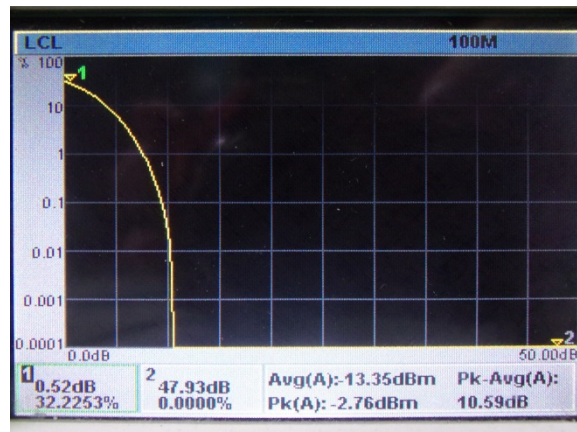
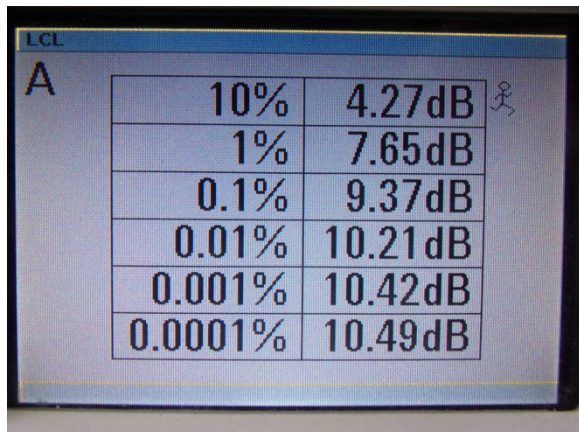
ANTENNA PORT:

1

Modulation: QPSK



Modulation: 16QAM



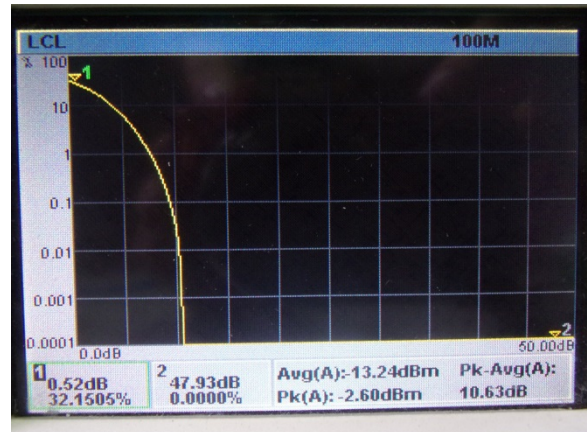


HERMON LABORATORIES

Test specification:		Section 96.41(g), Peak-to- average power ratio	
Test procedure:		Section 96.41(g)	
Test mode:		Verdict: PASS	
Date(s):			
14-Dec-21			
Temperature: 25 °C	Relative Humidity: 54 %	Air Pressure: 1011 hPa	Power: 48 VDC
Remarks:			

Modulation: 64QAM

LCL		
A		
10%	4.28dB	✍
1%	7.69dB	
0.1%	9.40dB	
0.01%	10.25dB	
0.001%	10.43dB	
0.0001%	10.50dB	



Modulation: 256QAM

LCL		
A		
10%	4.28dB	✍
1%	7.66dB	
0.1%	9.39dB	
0.01%	10.22dB	
0.001%	10.42dB	
0.0001%	10.49dB	





HERMON LABORATORIES

Test specification: Section 96.41(g), Peak-to- average power ratio			
Test procedure: Section 96.41(g)			
Test mode: Compliance		Verdict: PASS	
Date(s): 14-Dec-21			
Temperature: 25 °C	Relative Humidity: 54 %	Air Pressure: 1011 hPa	Power: 48 VDC
Remarks:			

Plot 7.2.5 Peak-to-average power ratio test results at mid frequency

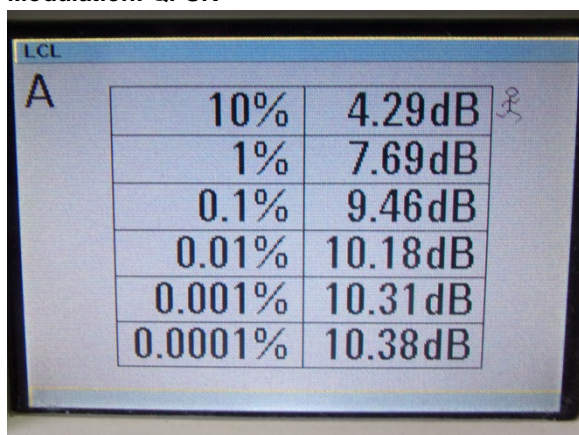
CHANNEL SPACING:

30 MHz

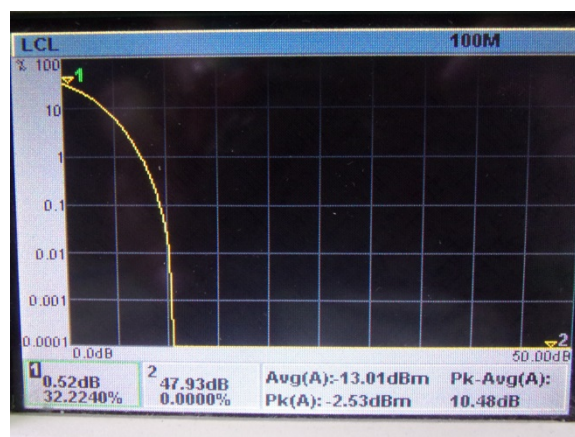
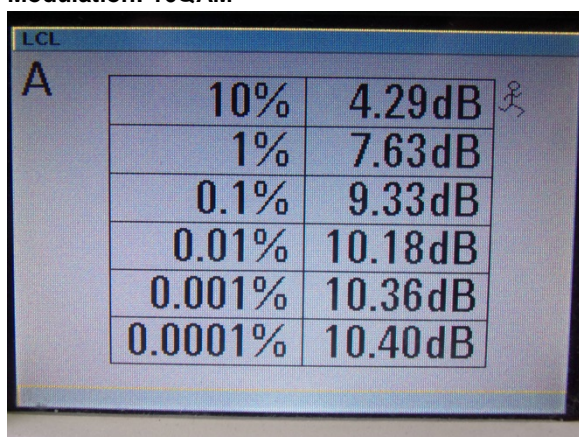
ANTENNA PORT:

1

Modulation: QPSK



Modulation: 16QAM



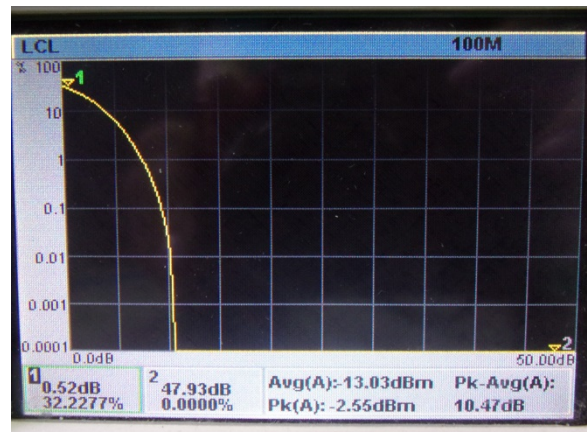


HERMON LABORATORIES

Test specification: Section 96.41(g), Peak-to- average power ratio			
Test procedure: Section 96.41(g)			
Test mode: Compliance		Verdict: PASS	
Date(s): 14-Dec-21			
Temperature: 25 °C	Relative Humidity: 54 %	Air Pressure: 1011 hPa	Power: 48 VDC
Remarks:			

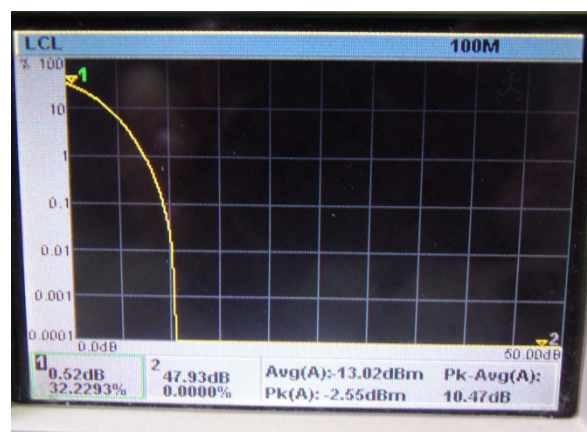
Modulation: 64QAM

LCL		
A		
10%	4.28dB	2
1%	7.63dB	
0.1%	9.35dB	
0.01%	10.19dB	
0.001%	10.35dB	
0.0001%	10.41dB	



Modulation: 256QAM

LCL		
A		
10%	4.29dB	2
1%	7.63dB	
0.1%	9.34dB	
0.01%	10.18dB	
0.001%	10.35dB	
0.0001%	10.41dB	





HERMON LABORATORIES

Test specification: Section 96.41(g), Peak-to- average power ratio			
Test procedure: Section 96.41(g)			
Test mode: Compliance		Verdict: PASS	
Date(s): 14-Dec-21			
Temperature: 25 °C	Relative Humidity: 54 %	Air Pressure: 1011 hPa	Power: 48 VDC
Remarks:			

Plot 7.2.6 Peak-to-average power ratio test results at high frequency

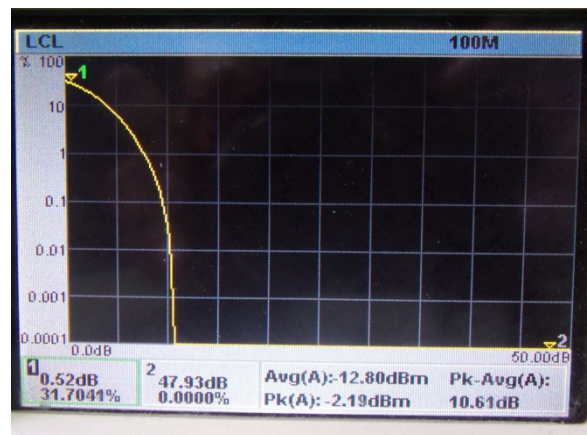
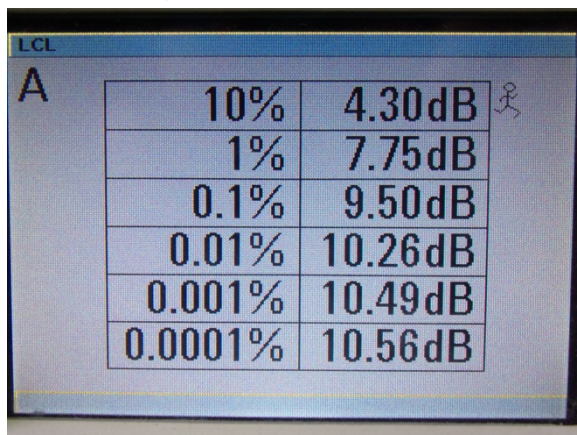
CHANNEL SPACING:

30 MHz

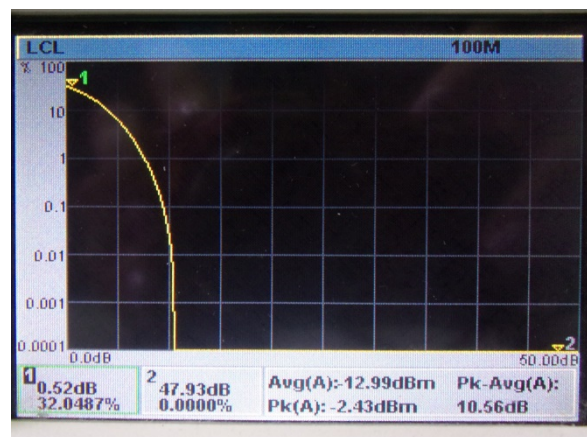
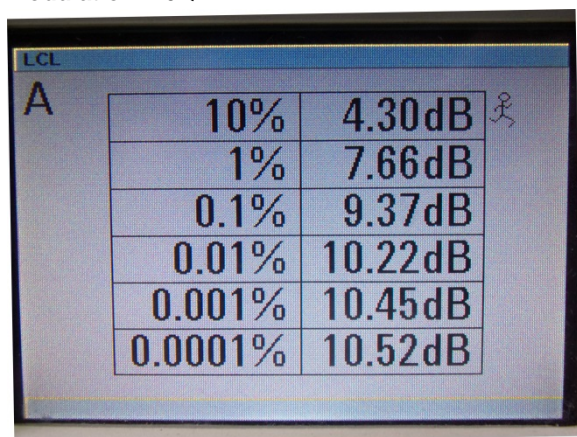
ANTENNA PORT:

1

Modulation: QPSK



Modulation: 16QAM



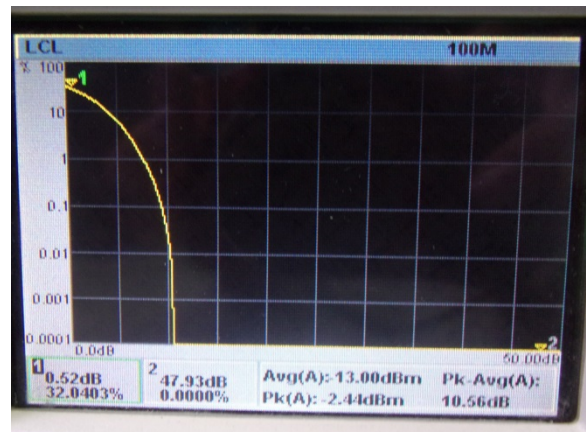


HERMON LABORATORIES

Test specification: Section 96.41(g), Peak-to- average power ratio			
Test procedure: Section 96.41(g)			
Test mode: Compliance		Verdict: PASS	
Date(s): 14-Dec-21			
Temperature: 25 °C	Relative Humidity: 54 %	Air Pressure: 1011 hPa	Power: 48 VDC
Remarks:			

Modulation: 64QAM

A	
10%	4.29dB
1%	7.65dB
0.1%	9.35dB
0.01%	10.22dB
0.001%	10.44dB
0.0001%	10.51dB



Modulation: 256QAM

A	
10%	4.29dB
1%	7.65dB
0.1%	9.35dB
0.01%	10.21dB
0.001%	10.45dB
0.0001%	10.50dB

