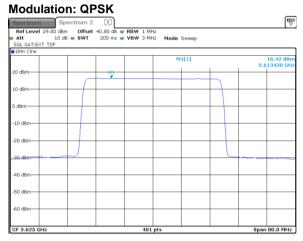


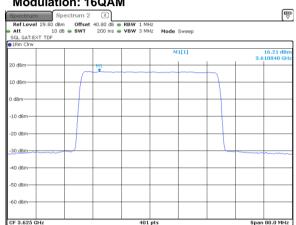
Test specification:	Section 96.41(b), Maximum EIRP and maximum power spectral density			
Test procedure:	Section 96.41(e)(3)			
Test mode:	Compliance	Verdict: PASS		
Date(s):	25-Jul-21 – 30-Aug-21	verdict:	PASS	
Temperature: 24 °C	Relative Humidity: 55 %	Air Pressure: 1011 hPa	Power: 48 VAC	
Remarks:				

Plot 7.1.30 Peak spectral power density at mid frequency

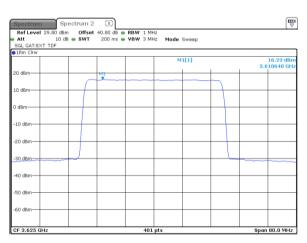


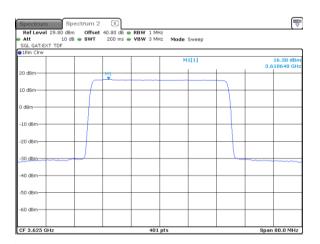
40 MHz

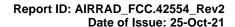
Modulation: 16QAM



Modulation: 64QAM



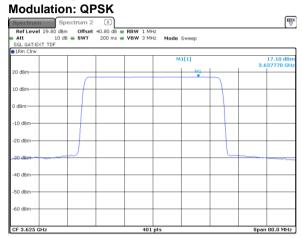






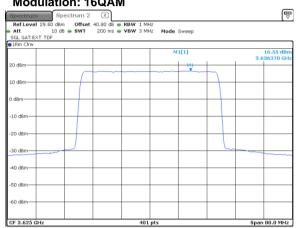
Test specification:	Section 96.41(b), Maximum EIRP and maximum power spectral density			
Test procedure:	Section 96.41(e)(3)			
Test mode:	Compliance	Verdict: PASS		
Date(s):	25-Jul-21 – 30-Aug-21	verdict:	PASS	
Temperature: 24 °C	Relative Humidity: 55 %	Air Pressure: 1011 hPa	Power: 48 VAC	
Remarks:				

Plot 7.1.31 Peak spectral power density at mid frequency

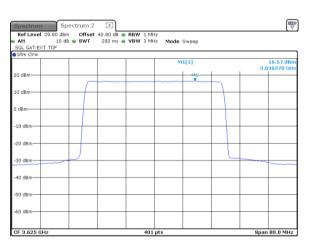


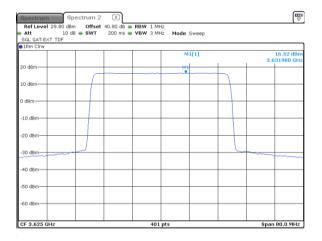
40 MHz

Modulation: 16QAM



Modulation: 64QAM



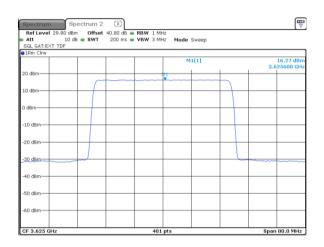


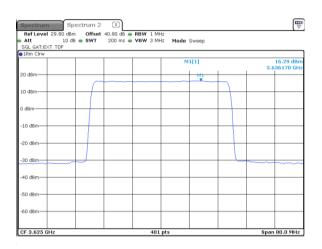


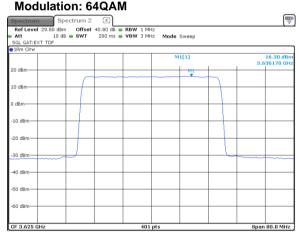
Test specification:	Section 96.41(b), Maximum EIRP and maximum power spectral density				
Test procedure:	Section 96.41(e)(3)				
Test mode:	Compliance	Vardiet	DACC		
Date(s):	25-Jul-21 – 30-Aug-21	Verdict: PASS			
Temperature: 24 °C	Relative Humidity: 55 %	Air Pressure: 1011 hPa	Power: 48 VAC		
Remarks:					

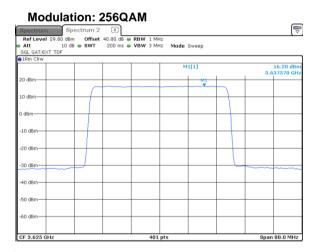
Plot 7.1.32 Peak spectral power density at mid frequency

Modulation: QPSK Modulation: 16QAM











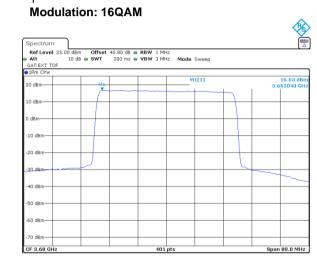
Test specification:	Section 96.41(b), Maximum EIRP and maximum power spectral density				
Test procedure:	Section 96.41(e)(3)				
Test mode:	Compliance	Vardiet: DACC			
Date(s):	25-Jul-21 – 30-Aug-21	Verdict: PASS			
Temperature: 24 °C	Relative Humidity: 55 %	Air Pressure: 1011 hPa	Power: 48 VAC		
Remarks:					

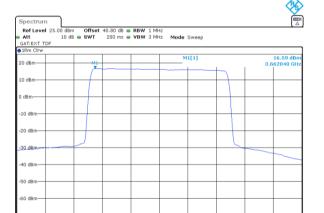
Plot 7.1.33 Peak spectral power density at high frequency

40 MHz

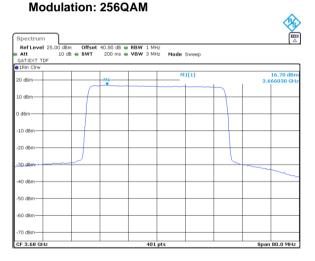
CHANNEL SPACING: ANTENNA CHAIN: **Modulation: QPSK**







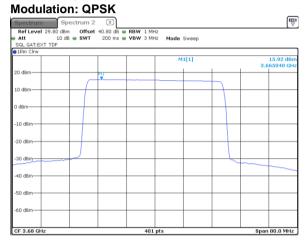
CF 3.68 GHz





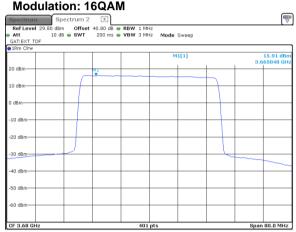
Test specification:	Section 96.41(b), Maximum EIRP and maximum power spectral density			
Test procedure:	Section 96.41(e)(3)			
Test mode:	Compliance	Verdict: PASS		
Date(s):	25-Jul-21 – 30-Aug-21	verdict:	PASS	
Temperature: 24 °C	Relative Humidity: 55 %	Air Pressure: 1011 hPa	Power: 48 VAC	
Remarks:				

Plot 7.1.34 Peak spectral power density at high frequency

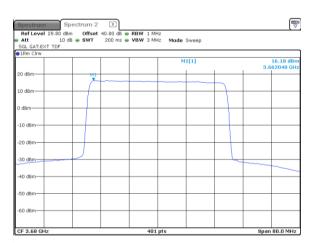


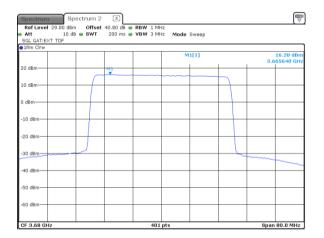
40 MHz

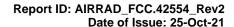
Modulation: 16QAM



Modulation: 64QAM



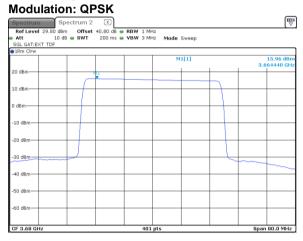






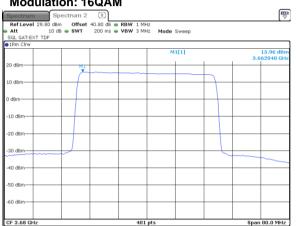
Test specification:	Section 96.41(b), Maximum EIRP and maximum power spectral density			
Test procedure:	Section 96.41(e)(3)			
Test mode:	Compliance	Verdict: PASS		
Date(s):	25-Jul-21 – 30-Aug-21	verdict:	PASS	
Temperature: 24 °C	Relative Humidity: 55 %	Air Pressure: 1011 hPa	Power: 48 VAC	
Remarks:				

Plot 7.1.35 Peak spectral power density at high frequency

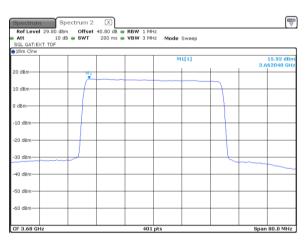


40 MHz

Modulation: 16QAM



Modulation: 64QAM

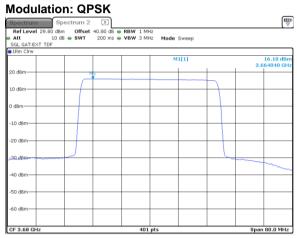






Test specification:	Section 96.41(b), Maximum EIRP and maximum power spectral density				
Test procedure:	Section 96.41(e)(3)				
Test mode:	Compliance	Vardiet. DACC			
Date(s):	25-Jul-21 – 30-Aug-21	Verdict: PASS			
Temperature: 24 °C	Relative Humidity: 55 %	Air Pressure: 1011 hPa	Power: 48 VAC		
Remarks:					

Plot 7.1.36 Peak spectral power density at high frequency



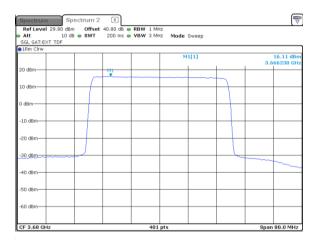
40 MHz





Modulation: 64QAM







Test specification:	Section 96.41(g), Peak-to- average power ratio			
Test procedure:	Section 96.41(g)			
Test mode:	Compliance	Verdict: PASS		
Date(s):	25-Jul-21 – 30-Aug-21	verdict.	PASS	
Temperature: 24.3. °C	Relative Humidity: 48 %	Air Pressure: 1010 hPa	Power: 48 VAC	
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.

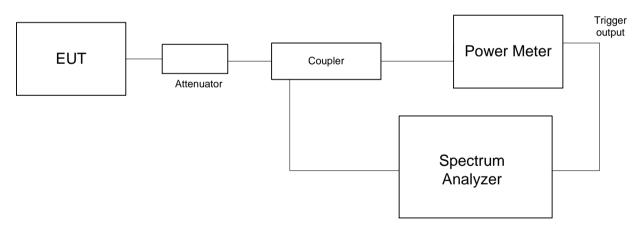
Table 7.2.1 Peak-to-average power ratio limits

Assigned frequency range MHz	Peak to average power ratio limit		
Assigned frequency range, MHz	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 Table 7.2.2 and the associated 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):	25-Jul-21 – 30-Aug-21	verdict.	PASS	
Temperature: 24.3. °C	Relative Humidity: 48 %	Air Pressure: 1010 hPa	Power: 48 VAC	
Remarks:				

Table 7.2.2 Peak-to-average power ratio test results

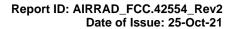
OPERATING FREQUENCY RANGE: **DETECTOR USED:**

3550 - 3700 MHz Peak/Average

MODULATING SIGNAL:

PRBS

TRANSMITTER OUTPL	JT POWER SETTINGS:		Maximum	
Carrier frequency, MHz	Peak to average ratio, dB	Limit, dBm	Margin, dB	Verdict
Channel spacing 10 M	lHz			
Modulation QPSK				
3555.0	8.84	13.0	-4.16	Pass
3625.0	8.90	13.0	-4.10	Pass
3695.0	8.78	13.0	-4.22	Pass
Modulation 16QAM				
3555.0	8.49	13.0	-4.51	Pass
3625.0	8.55	13.0	-4.45	Pass
3695.0	8.49	13.0	-4.51	Pass
Modulation 64QAM				
3555.0	8.52	13.0	-4.48	Pass
3625.0	8.52	13.0	-4.48	Pass
3695.0	8.49	13.0	-4.51	Pass
Modulation 256QAM				
3555.0	8.52	13.0	-4.48	Pass
3625.0	8.52	13.0	-4.48	Pass
3695.0	8.43	13.0	-4.57	Pass





Test specification:	Section 96.41(g), Peak-to- average power ratio				
Test procedure:	Section 96.41(g)				
Test mode:	Compliance	Vordict	PASS		
Date(s):	25-Jul-21 – 30-Aug-21	Verdict: PASS			
Temperature: 24.3. °C	Relative Humidity: 48 %	Air Pressure: 1010 hPa	Power: 48 VAC		
Remarks:					

Channel spacing 20 MH	Z			
Modulation QPSK				
3560.0	8.72	13.0	-4.28	Pass
3625.0	8.67	13.0	-4.33	Pass
3690.0	8.67	13.0	-4.33	Pass
Modulation 16QAM				
3560.0	8.38	13.0	-4.62	Pass
3625.0	8.35	13.0	-4.65	Pass
3690.0	8.41	13.0	-4.59	Pass
Modulation 64QAM				
3560.0	8.29	13.0	-4.71	Pass
3625.0	8.35	13.0	-4.65	Pass
3690.0	8.41	13.0	-4.59	Pass
Modulation 256QAM				
3560.0	8.35	13.0	-4.65	Pass
3625.0	8.55	13.0	-4.45	Pass
3690.0	8.46	13.0	-4.54	Pass
Channel spacing 40 MHz	Z			
Modulation QPSK				
3570.0	9.54	13.0	-3.46	Pass
3625.0	9.57	13.0	-3.43	Pass
3680.0	9.58	13.0	-3.42	Pass
Modulation 16QAM				
3570.0	9.38	13.0	-3.62	Pass
3625.0	9.38	13.0	-3.62	Pass
3680.0	9.39	13.0	-3.61	Pass
Modulation 64QAM				
3570.0	9.54	13.0	-3.46	Pass
3625.0	9.36	13.0	-3.64	Pass
3680.0	9.39	13.0	-3.61	Pass
Modulation 256QAM			•	
3570.0	9.37	13.0	-3.63	Pass
3625.0	9.37	13.0	-3.63	Pass
3680.0	9.37	13.0	-3.63	Pass

Reference numbers of test equipment used

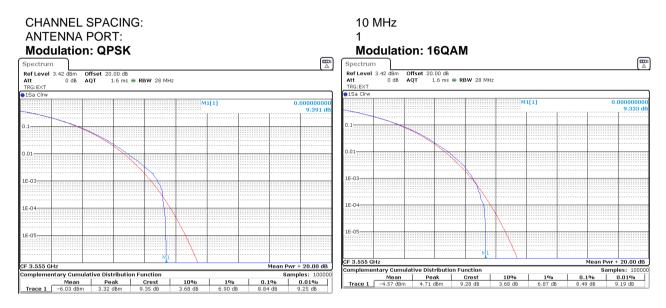
HL 3301	HL 3302	HL 4366	HL 5409		

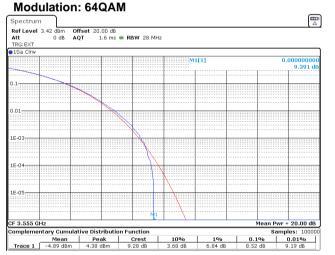
Full description is given in Appendix A.

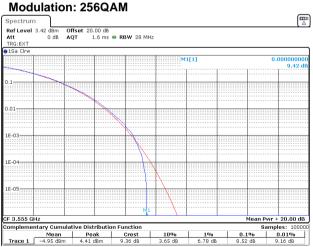


Test specification:	Section 96.41(g), Peak-to- average power ratio		
Test procedure:	Section 96.41(g)		
Test mode:	Compliance	Verdict:	PASS
Date(s):	25-Jul-21 – 30-Aug-21	verdict.	PASS
Temperature: 24.3. °C	Relative Humidity: 48 %	Air Pressure: 1010 hPa	Power: 48 VAC
Remarks:			

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



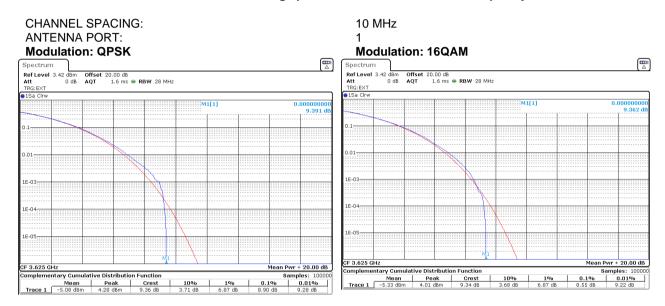


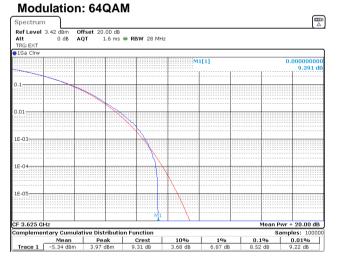


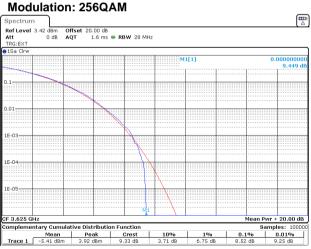


Test specification:	Section 96.41(g), Peak-to- average power ratio			
Test procedure:	Section 96.41(g)			
Test mode:	Compliance	Verdict:	PASS	
Date(s):	25-Jul-21 – 30-Aug-21	verdict.	PASS	
Temperature: 24.3. °C	Relative Humidity: 48 %	Air Pressure: 1010 hPa	Power: 48 VAC	
Remarks:				

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



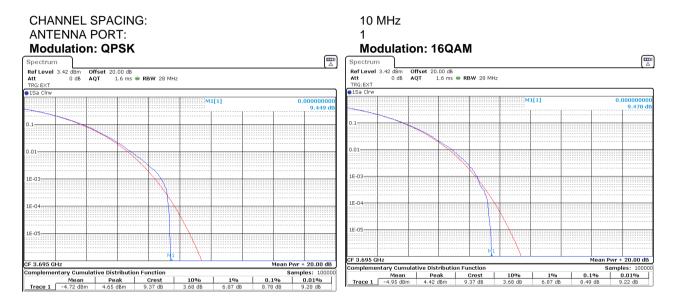


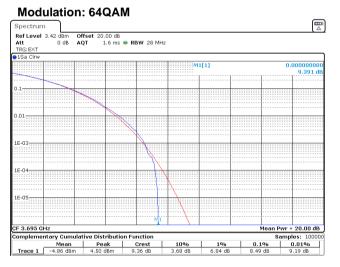


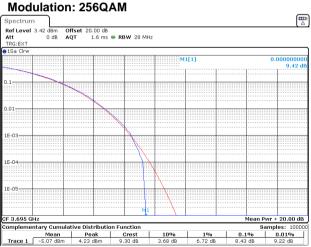


Test specification:	Section 96.41(g), Peak-to- average power ratio		
Test procedure:	Section 96.41(g)		
Test mode:	Compliance	Verdict:	PASS
Date(s):	25-Jul-21 – 30-Aug-21	verdict.	PASS
Temperature: 24.3. °C	Relative Humidity: 48 %	Air Pressure: 1010 hPa	Power: 48 VAC
Remarks:			

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



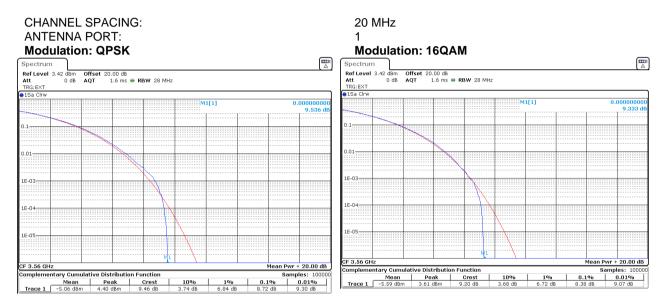


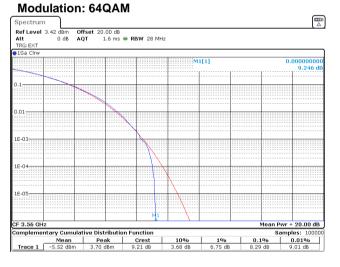


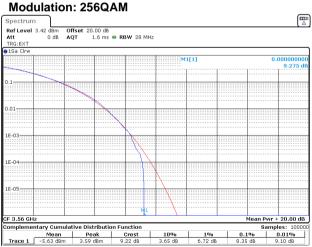


Test specification:	Section 96.41(g), Peak-to- average power ratio		
Test procedure:	Section 96.41(g)		
Test mode:	Compliance	Verdict:	PASS
Date(s):	25-Jul-21 – 30-Aug-21	verdict.	PASS
Temperature: 24.3. °C	Relative Humidity: 48 %	Air Pressure: 1010 hPa	Power: 48 VAC
Remarks:			

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



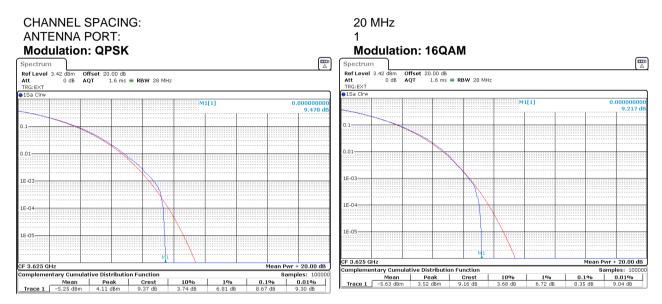


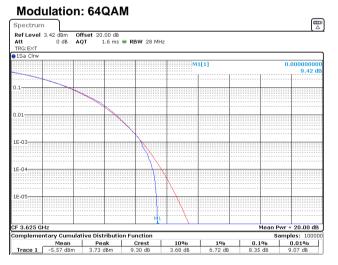


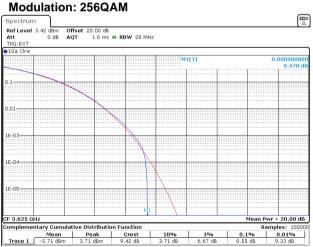


Test specification:	Section 96.41(g), Peak-to- average power ratio			
Test procedure:	Section 96.41(g)			
Test mode:	Compliance	Verdict:	PASS	
Date(s):	25-Jul-21 – 30-Aug-21	verdict.	PASS	
Temperature: 24.3. °C	Relative Humidity: 48 %	Air Pressure: 1010 hPa	Power: 48 VAC	
Remarks:				

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



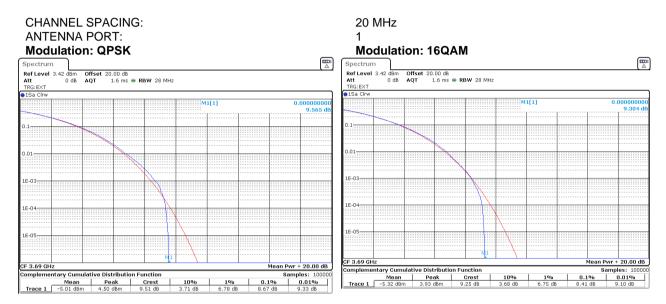


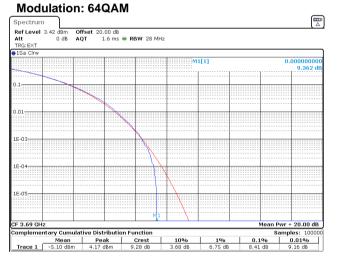


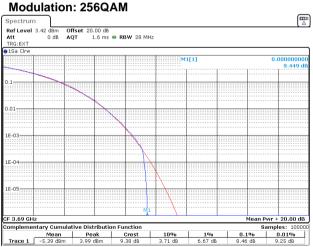


Test specification:	Section 96.41(g), Peak-to- average power ratio		
Test procedure:	Section 96.41(g)		
Test mode:	Compliance	Verdict:	PASS
Date(s):	25-Jul-21 – 30-Aug-21	verdict.	PASS
Temperature: 24.3. °C	Relative Humidity: 48 %	Air Pressure: 1010 hPa	Power: 48 VAC
Remarks:			

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







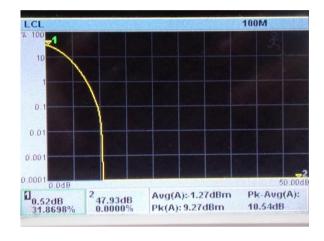


Test specification:	Section 96.41(g), Peak-to- average power ratio		
Test procedure:	Section 96.41(g)		
Test mode:	Compliance	Verdict:	PASS
Date(s):	25-Jul-21 – 30-Aug-21	verdict.	PASS
Temperature: 24.3. °C	Relative Humidity: 48 %	Air Pressure: 1010 hPa	Power: 48 VAC
Remarks:	-		

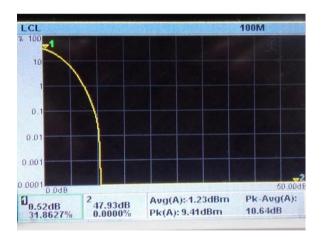
Plot 7.2.7 Peak-to-average power ratio test results at low frequency

CHANNEL SPACING: ANTENNA PORT: Modulation: QPSK

A 10% 4.19dB 1% 7.59dB 0.1% 9.54dB 0.01% 10.25dB 0.001% 10.40dB 0.0001% 10.48dB 40 MHz 1



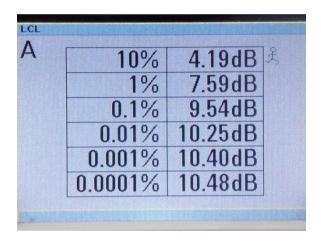
	10%	4.23dB
	1%	7.55dB
	0.1%	9.38dB
	0.01%	10.23dB
	0.001%	10.38dB
0	.0001%	10.47dB

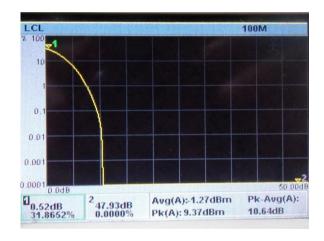




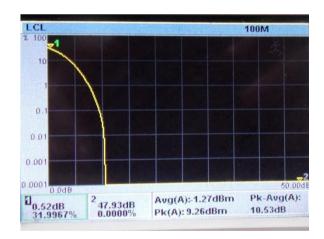
Test specification:	Section 96.41(g), Peak-to- average power ratio			
Test procedure:	Section 96.41(g)			
Test mode:	Compliance	Verdict:	PASS	
Date(s):	25-Jul-21 – 30-Aug-21	verdict.	PASS	
Temperature: 24.3. °C	Relative Humidity: 48 %	Air Pressure: 1010 hPa	Power: 48 VAC	
Remarks:				

Modulation: 64QAM





10%	4.22dB
1%	7.57dB
0.1%	9.37dB
0.01%	10.24dB
0.001%	10.44dB
0.0001%	10.48dB



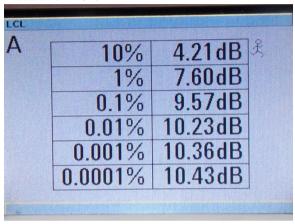


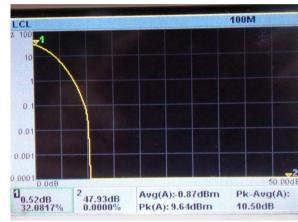
Test specification:	cation: Section 96.41(g), Peak-to- average power ratio			
Test procedure:	Section 96.41(g)			
Test mode:	Compliance	Verdict:	PASS	
Date(s):	25-Jul-21 – 30-Aug-21	verdict.	PASS	
Temperature: 24.3. °C	Relative Humidity: 48 %	Air Pressure: 1010 hPa	Power: 48 VAC	
Remarks:				

Plot 7.2.8 Peak-to-average power ratio test results at mid frequency

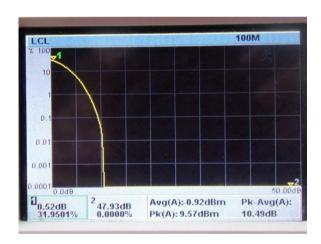
CHANNEL SPACING: ANTENNA PORT:

40 MHz 1 **Modulation: QPSK**





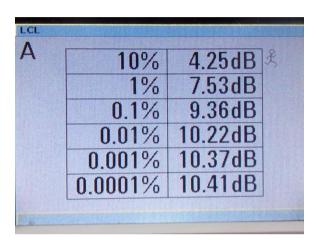
10	1%	4.2	5dB
1	%	7.5	2dB
0.1	%	9.3	8dB
0.01	%	10.2	4dB
0.001	%	10.3	6dB
0.0001	%	10.4	3dB

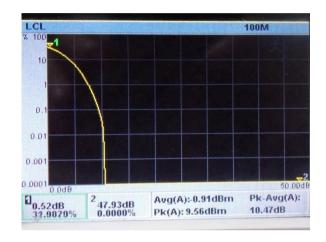




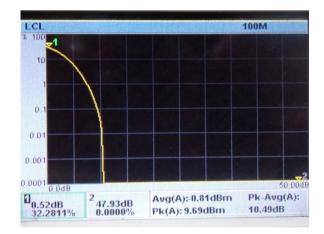
Test specification:	ion: Section 96.41(g), Peak-to- average power ratio			
Test procedure:	Section 96.41(g)			
Test mode:	Compliance	Verdict:	PASS	
Date(s):	25-Jul-21 – 30-Aug-21	verdict.	PASS	
Temperature: 24.3. °C	Relative Humidity: 48 %	Air Pressure: 1010 hPa	Power: 48 VAC	
Remarks:	-			

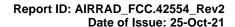
Modulation: 64QAM





10%	4.22dB
1%	7.54dB
0.1%	9.37dB
0.01%	10.20dB
0.001%	10.34dB
0.0001%	10.43dB





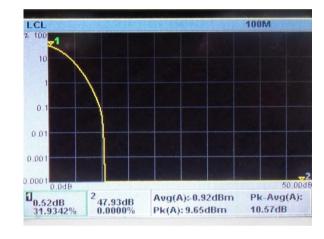


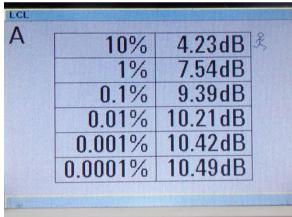
Test specification:	ion: Section 96.41(g), Peak-to- average power ratio			
Test procedure:	Section 96.41(g)			
Test mode:	Compliance	Verdict:	PASS	
Date(s):	25-Jul-21 – 30-Aug-21	verdict.	PASS	
Temperature: 24.3. °C	Relative Humidity: 48 %	Air Pressure: 1010 hPa	Power: 48 VAC	
Remarks:	-			

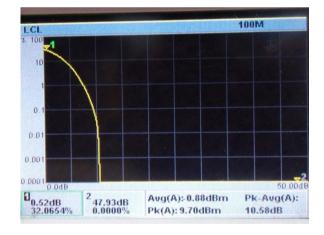
Plot 7.2.9 Peak-to-average power ratio test results at high frequency

CHANNEL SPACING: ANTENNA PORT: Modulation: QPSK

10% 4.21dB 1% 7.60dB 0.1% 9.58dB 0.01% 10.22dB 0.001% 10.41dB 0.0001% 10.49dB 40 MHz 1





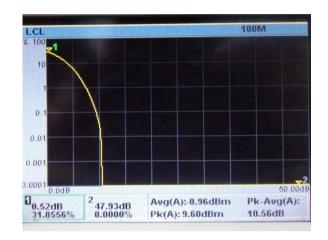




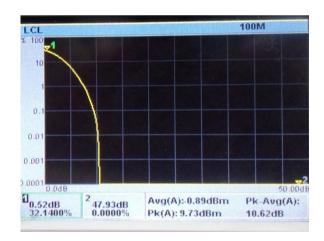
Test specification:	Section 96.41(g), Peak-to- average power ratio			
Test procedure:	Section 96.41(g)			
Test mode:	Compliance	Verdict: PASS		
Date(s):	25-Jul-21 – 30-Aug-21			
Temperature: 24.3. °C	Relative Humidity: 48 %	Air Pressure: 1010 hPa	Power: 48 VAC	
Remarks:				

Modulation: 64QAM

10%	4.22dB
1%	7.50dB
0.1%	9.39dB
0.01%	10.24dB
0.001%	10.45dB
0.0001%	10.50dB



10%	4.24dB
1%	7.56dB
0.1%	9.37dB
0.01%	10.17dB
0.001%	10.40dB
0.0001%	10.51dB





Test specification:	Section2.1049, Occupied bandwidth			
Test procedure:	47 CFR, Section 2.1049			
Test mode:	Compliance	Verdict:	PASS	
Date(s):	25-Jul-21 – 30-Aug-21	verdict:	PASS	
Temperature: 24 °C	Relative Humidity: 52 %	Air Pressure: 1012 hPa	Power: 48 VAC	
Remarks:	•			

7.3 Occupied bandwidth test

7.3.1 General

This test was performed to measure transmitter occupied bandwidth. Specification test limits are given in Table 7.3.1.

Table 7.3.1 Occupied bandwidth limits

Assigned frequency, MHz	Modulation envelope reference points*, %	Maximum allowed bandwidth, MHz
3550 - 3700	99	10 / 20 / 40 MHz

^{* -} Modulation envelope reference points are provided in terms of attenuation below the unmodulated carrier.

7.3.2 Test procedure

- 7.3.2.1 The EUT was set up as shown in Figure 7.3.1, energized and its proper operation was checked.
- 7.3.2.2 The EUT was set to transmit the unmodulated carrier and the reference peak power level was measured.
- **7.3.2.3** The EUT was set to transmit the normally modulated carrier.
- **7.3.2.4** The transmitter occupied bandwidth was measured with spectrum analyzer as a frequency delta between the reference points on modulation envelope and provided in Table 7.3.2 and the associated plots.

Figure 7.3.1 Occupied bandwidth test setup





Test specification:	Section2.1049, Occupied bandwidth			
Test procedure:	47 CFR, Section 2.1049			
Test mode:	Compliance	Verdict: PASS		
Date(s):	25-Jul-21 – 30-Aug-21	verdict.	PASS	
Temperature: 24 °C	Relative Humidity: 52 %	Air Pressure: 1012 hPa	Power: 48 VAC	
Remarks:				

Table 7.3.2 Occupied bandwidth test results

DETECTOR USED: Peak hold

RESOLUTION BANDWIDTH: 1-5% of the OBW

VIDEO BANDWIDTH: > RBW
MODULATION ENVELOPE REFERENCE POINTS: 99%

Carrier frequency, MHz	Occupied bandwidth, MHz	Limit, MHz	Margin, MHz	Verdict
Channel spacing 10 MHz				
Modulation QPSK				
3555.0	8.6814	10.0	-1.3186	Pass
3625.0	8.6914	10.0	-1.3086	Pass
3695.0	8.6714	10.0	-1.3286	Pass
Modulation 16QAM				
3555.0	8.6914	10.0	-1.3086	Pass
3625.0	8.6739	10.0	-1.3261	Pass
3695.0	8.6739	10.0	-1.3261	Pass
Modulation 64QAM				
3555.0	8.6764	10.0	-1.3236	Pass
3625.0	8.6764	10.0	-1.3236	Pass
3680.0	8.6664	10.0	-1.3336	Pass
Modulation 256QAM				
3555.0	8.6364	10.0	-1.3636	Pass
3625.0	8.6289	10.0	-1.3711	Pass
3695.0	8.6289	10.0	-1.3711	Pass



Test specification:	Section2.1049, Occupied bandwidth				
Test procedure:	47 CFR, Section 2.1049				
Test mode:	Compliance	Verdict:	PASS		
Date(s):	25-Jul-21 – 30-Aug-21	verdict.	PASS		
Temperature: 24 °C	Relative Humidity: 52 %	Air Pressure: 1012 hPa	Power: 48 VAC		
Remarks:					

Modulation QPSK				
3560.0	18.1927	20.0	-1.8073	Pass
3625.0 18.2027		20.0	-1.7973	Pass
3690.0 18.1927		20.0	-1.8073	Pass
Modulation 16QAM	10.1021	20.0	1.0070	1 400
3560.0	18.1927	20.0	-1.8073	Pass
3625.0	18.2027	20.0	-1.7973	Pass
3690.0	18.1927	20.0	-1.8073	Pass
Modulation 64QAM	10.1021	20.0	1.0070	1 400
3560.0	18.2377	20.0	-1.7623	Pass
3625.0	18.2627	20.0	-1.7373	Pass
3690.0	18.2627	20.0	-1.7373	Pass
Modulation 256QAM				. 450
3560.0	18.1727	20.0	-1.8273	Pass
3625.0	18.1772	20.0	-1.8228	Pass
3690.0	18.2027	20.0	-1.7973	Pass
Channel spacing 40 MHz				
Modulation QPSK				
3570.0	37.7453	40.0	-2.2547	Pass
3625.0	37.7853	40.0	-2.2147	Pass
3680.0	37.7653	40.0	-2.2347	Pass
Modulation 16QAM			•	
3570.0	37.7353	40.0	-2.2647	Pass
3625.0	37.7953	40.0	-2.2047	Pass
3680.0	37.7753	40.0	-2.2247	Pass
Modulation 64QAM				•
3570.0	37.7453	40.0	-2.2547	Pass
3625.0 37.8053		40.0	-2.1947	Pass
3680.0 37.7753		40.0	-2.2247	Pass
Modulation 256QAM			-	-
3570.0	37.7453	40.0	-2.2547	Pass
3625.0	37.8053	40.0	-2.1947	Pass
3680.0	37.7653	40.0	-2.2347	Pass

Reference numbers of test equipment used

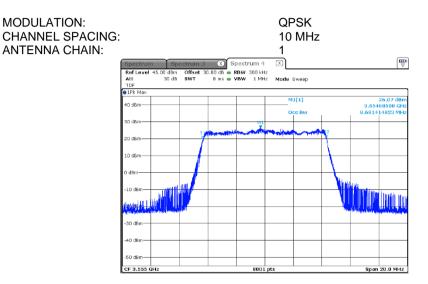
_	the state of the first state of the state of							
	HL 4355	HL 3901	HL 5608					

Full description is given in Appendix A.



Test specification:	Section2.1049, Occupied bandwidth				
Test procedure:	47 CFR, Section 2.1049				
Test mode:	Compliance	Verdict:	PASS		
Date(s):	25-Jul-21 – 30-Aug-21	verdict:	PASS		
Temperature: 24 °C	Relative Humidity: 52 %	Air Pressure: 1012 hPa	Power: 48 VAC		
Remarks:	•				

Plot 7.3.1 Occupied bandwidth test result at low frequency



Plot 7.3.2 Occupied bandwidth test result at low frequency

