Test specification:	**Section 96.41(e), Emission mask**		
Test procedure:	Section 96.41(e)(3)		
Test mode:	Compliance	**Verdict:**	PASS
Date(s):	28-Oct-18 - 01-Nov-18		
Temperature: 24.2 ºC	**Relative Humidity:** 49 %	**Air Pressure:** 1010 hPa	**Power:** 48 VDC
Remarks:			

Table 7.4.3 Emission outside the fundamental test results (continued)

ASSIGNED FREQUENCY RANGE: 3550.0 –3700.0 MHz
DETECTOR USED: Average (gated)
VIDEO BANDWIDTH: ≥ Resolution bandwidth
EBW: 20 MHz
NUMBER OF CHAINS: 2
ANTENNA PORT: #1

Frequency MHz	Band edge	SA reading over 1 chain, dBm	Total band edge*, dBm	RBW, kHz	Integration BW, kHz	Limit, dBm	Verdict
64 QAM							
Low frequency 3560.0 MHz							
3550.00	Low	-27.10	-24.10	100	NA	-13.0	Pass
3540.00	Low	-43.72	-40.72	100	1000	-25.0	
3570.00	High	-28.57	-25.57	100	NA	-13.0	
3580.00	High	-39.47	-36.47	100	1000	-25.0	
Mid frequency 3625.0 MHz							
3615.00	Low	-27.91	-24.91	100	NA	-13.0	Pass
3605.00	Low	-43.37	-40.37	100	1000	-25.0	
3635.00	High	-26.05	-23.05	100	NA	-13.0	
3645.00	High	-43.42	40.42	100	1000	-25.0	
High frequency 3690.0 MHz							
3680.00	Low	-27.29	-24.29	100	NA	-13.0	Pass
3670.00	Low	-42.84	-39.84	100	1000	-25.0	
3700.00	High	-29.97	-26.97	100	NA	-13.0	
3710.00	High	-45.34	-42.34	100	1000	-25.0	

* - Total band edge = SA reading + 10*log(N) = SA reading +3 dB

Reference numbers of test equipment used

HL 3301	HL 3302	HL 3818	HL 3868	HL 3903	

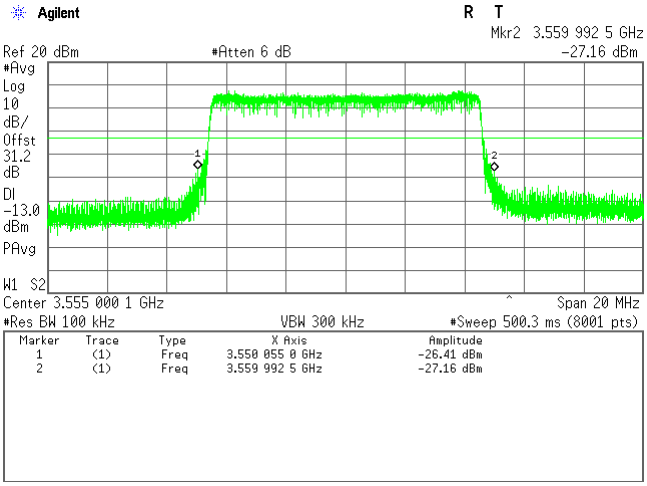
Full description is given in Appendix A.

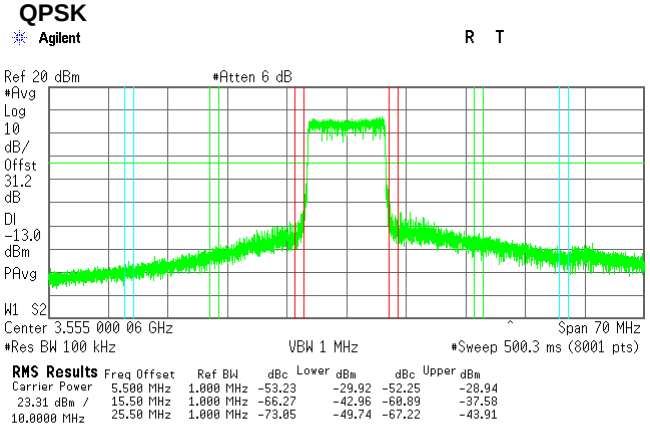
Test specification:	Section 96.41(e), Emission mask		
Test procedure:	Section 96.41(e)(3)		
Test mode:	Compliance	Verdict:	PASS
Date(s):	28-Oct-18 - 01-Nov-18		
Temperature: 24.2 ºC	Relative Humidity: 49 %	Air Pressure: 1010 hPa	Power: 48 VDC
Remarks:			

Plot 7.4.1 Emission outside the fundamental test results at low carrier frequency

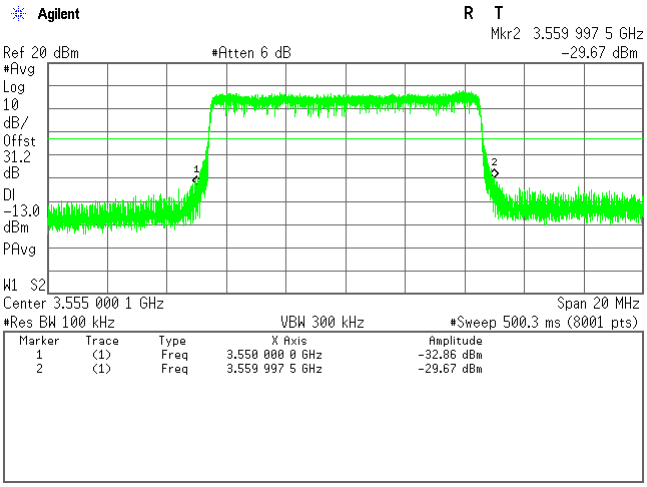
MODULATION: QPSK
CHANNEL SPACING: 10 MHz
ANTENNA CHAIN: 1

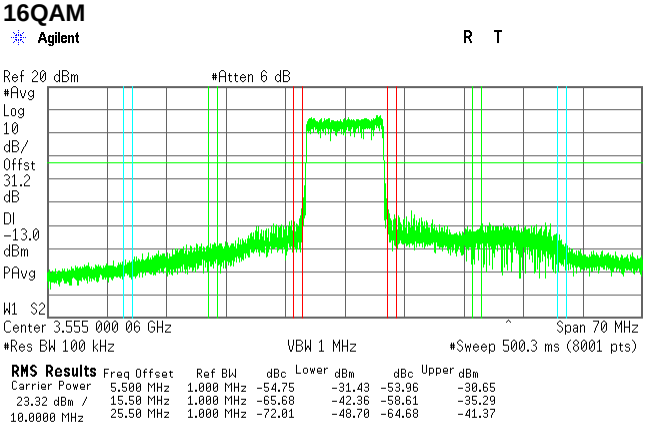
Modulation: **QPSK**





Modulation: **16QAM**



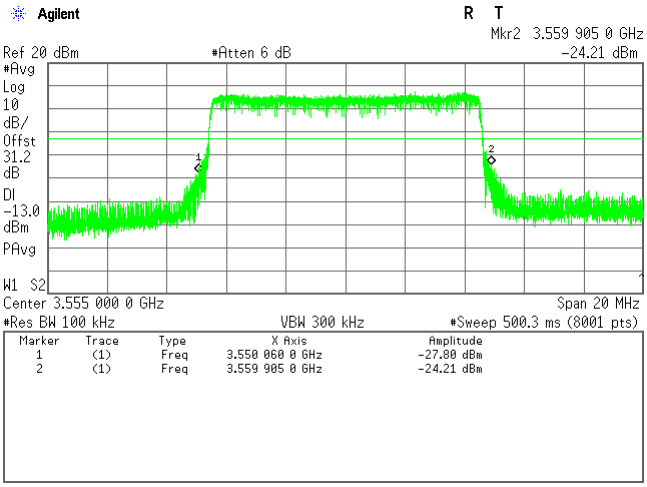


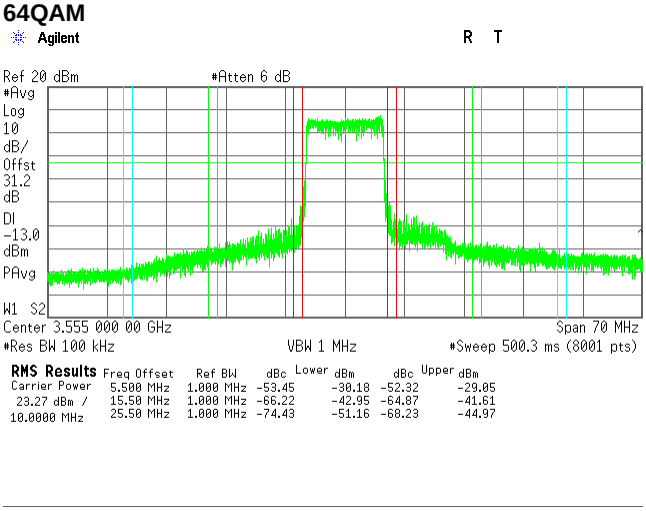
Test specification:	Section 96.41(e), Emission mask		
Test procedure:	Section 96.41(e)(3)		
Test mode:	Compliance	Verdict:	PASS
Date(s):	28-Oct-18 - 01-Nov-18		
Temperature: 24.2 ºC	Relative Humidity: 49 %	Air Pressure: 1010 hPa	Power: 48 VDC
Remarks:			

Plot 7.4.2 Emission outside the fundamental test results at low carrier frequency

MODULATION: QPSK
CHANNEL SPACING: 10 MHz
ANTENNA CHAIN: 1

Modulation: **64QAM**

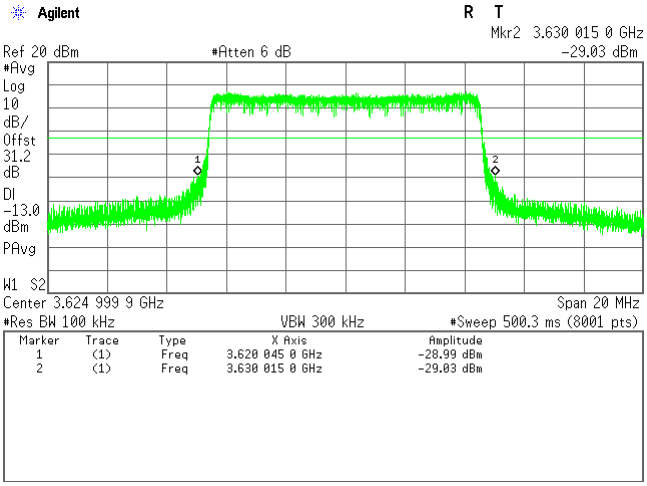


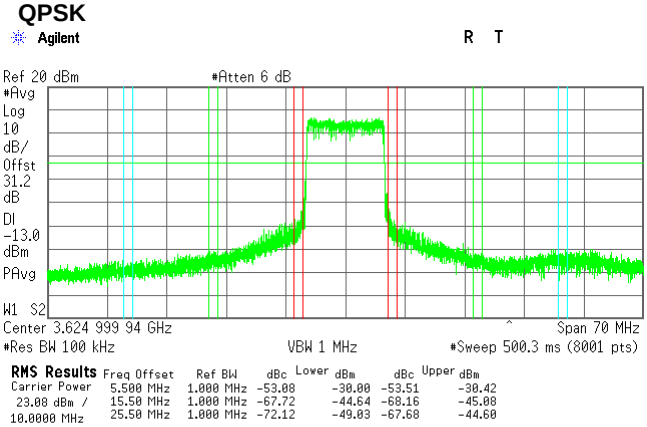


Test specification:	Section 96.41(e), Emission mask		
Test procedure:	Section 96.41(e)(3)		
Test mode:	Compliance	Verdict:	PASS
Date(s):	28-Oct-18 - 01-Nov-18		
Temperature: 24.2 ºC	Relative Humidity: 49 %	Air Pressure: 1010 hPa	Power: 48 VDC
Remarks:			

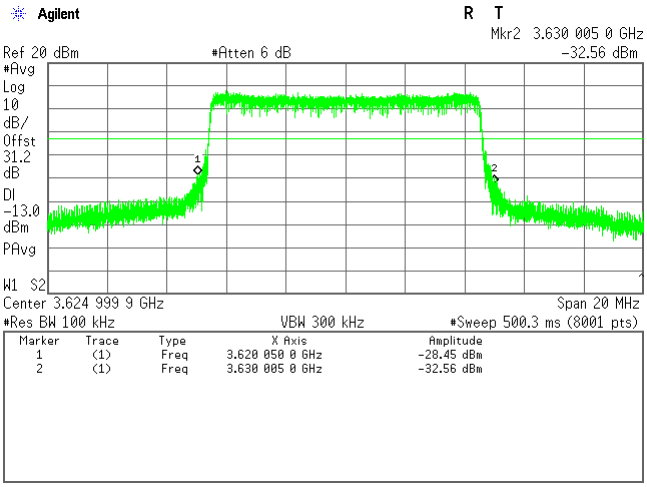
Plot 7.4.3 Emission outside the fundamental test results at mid carrier frequency

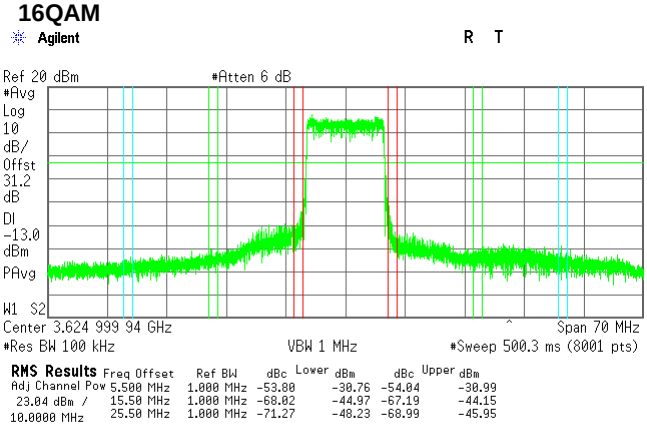
MODULATION: QPSK
CHANNEL SPACING: 10 MHz
ANTENNA CHAIN: 1
Modulation: **QPSK**





Modulation: **16QAM**



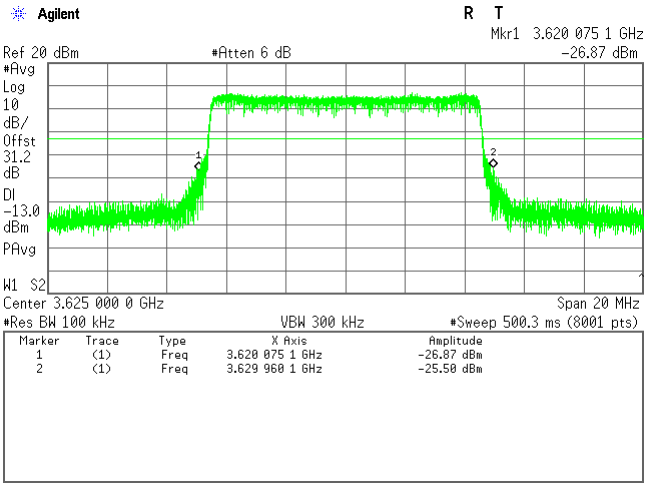


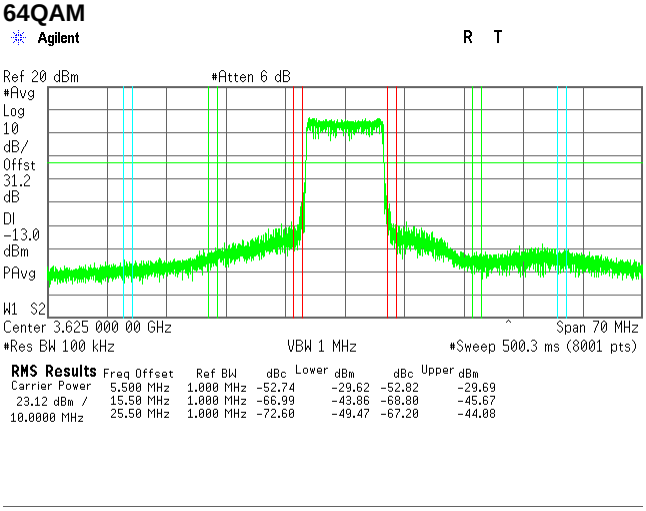
Test specification:	Section 96.41(e), Emission mask		
Test procedure:	Section 96.41(e)(3)		
Test mode:	Compliance	Verdict:	PASS
Date(s):	28-Oct-18 - 01-Nov-18		
Temperature: 24.2 ºC	Relative Humidity: 49 %	Air Pressure: 1010 hPa	Power: 48 VDC
Remarks:			

Plot 7.4.4 Emission outside the fundamental test results at mid carrier frequency

MODULATION: QPSK
CHANNEL SPACING: 10 MHz
ANTENNA CHAIN: 1

Modulation: **64QAM**



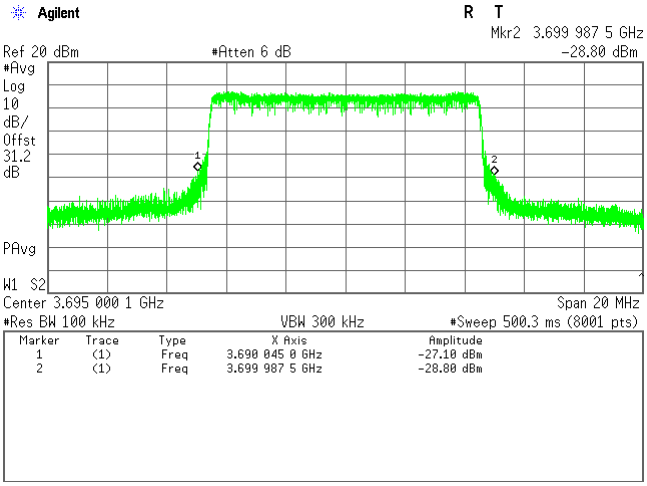


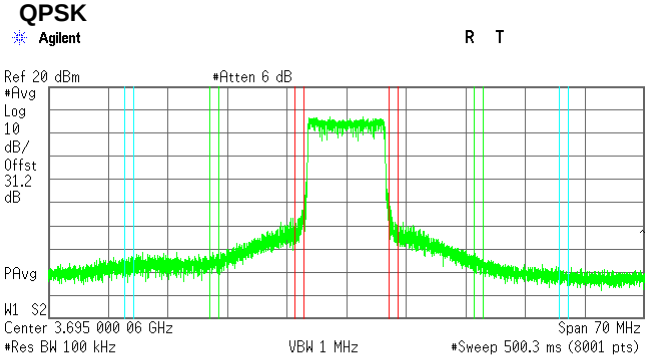
Test specification:	Section 96.41(e), Emission mask		
Test procedure:	Section 96.41(e)(3)		
Test mode:	Compliance	Verdict:	PASS
Date(s):	28-Oct-18 - 01-Nov-18		
Temperature: 24.2 ºC	Relative Humidity: 49 %	Air Pressure: 1010 hPa	Power: 48 VDC
Remarks:			

Plot 7.4.5 Emission outside the fundamental test results at high carrier frequency

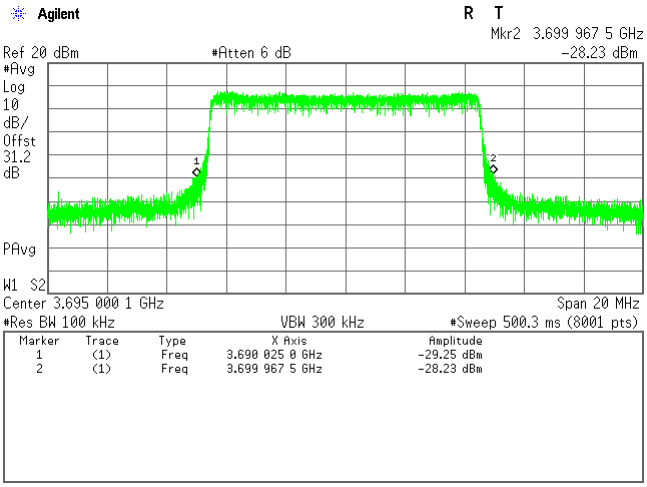
MODULATION: QPSK
CHANNEL SPACING: 10 MHz
ANTENNA CHAIN: 1

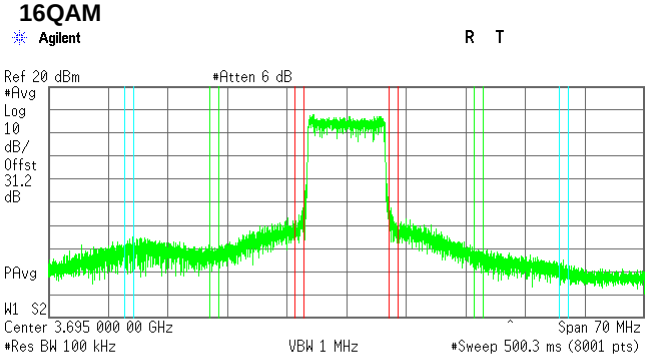
Modulation: QPSK





Modulation: 16QAM



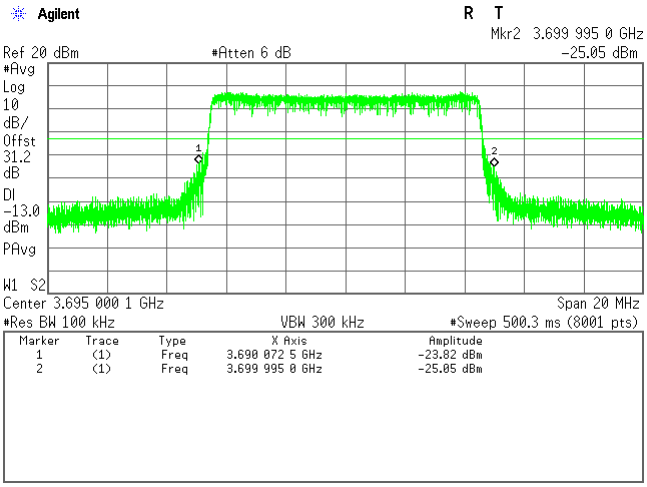


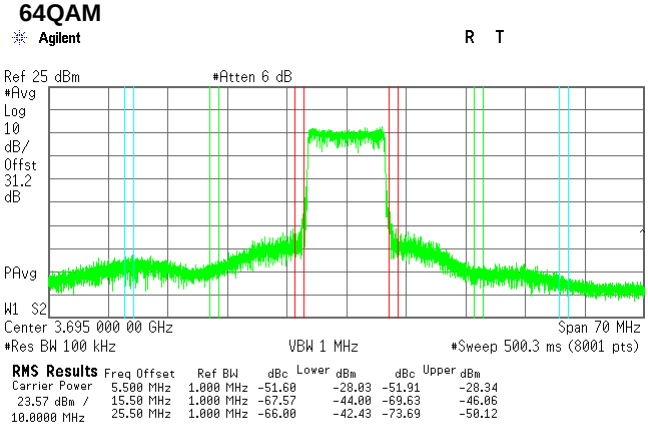
Test specification:	Section 96.41(e), Emission mask		
Test procedure:	Section 96.41(e)(3)		
Test mode:	Compliance	Verdict:	PASS
Date(s):	28-Oct-18 - 01-Nov-18		
Temperature: 24.2 ºC	Relative Humidity: 49 %	Air Pressure: 1010 hPa	Power: 48 VDC
Remarks:			

Plot 7.4.6 Emission outside the fundamental test results at high carrier frequency

MODULATION: QPSK
CHANNEL SPACING: 10 MHz
ANTENNA CHAIN: 1

Modulation: **64QAM**

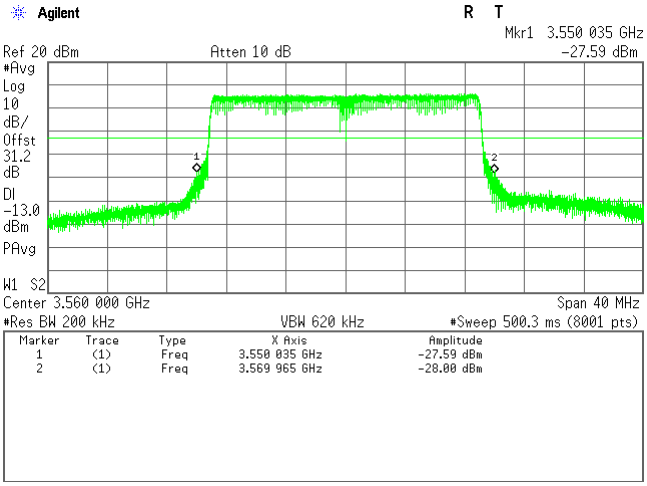


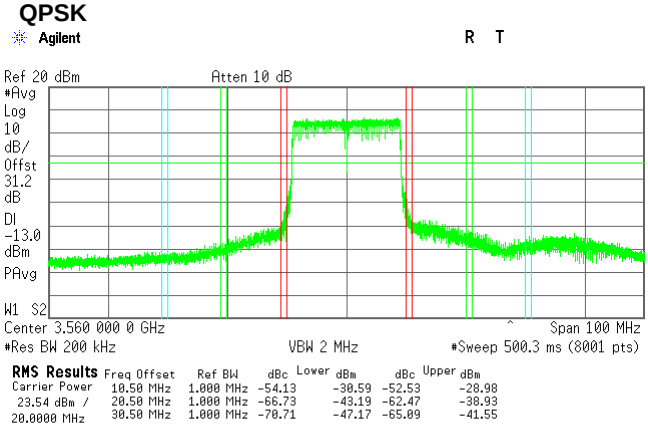


Test specification:	Section 96.41(e), Emission mask		
Test procedure:	Section 96.41(e)(3)		
Test mode:	Compliance	Verdict:	PASS
Date(s):	28-Oct-18 - 01-Nov-18		
Temperature: 24.2 ºC	Relative Humidity: 49 %	Air Pressure: 1010 hPa	Power: 48 VDC
Remarks:			

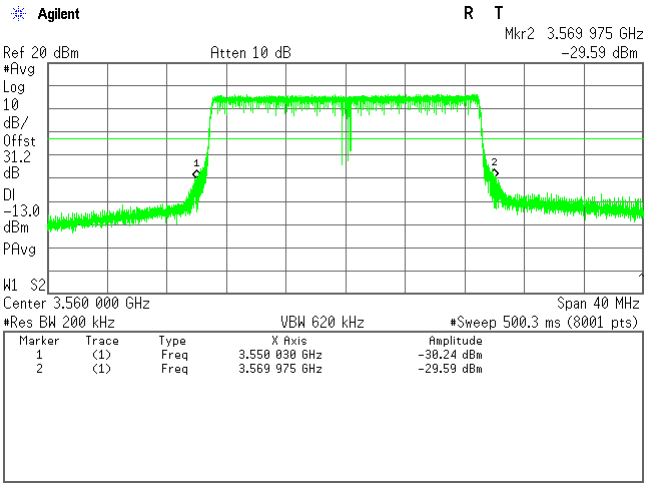
Plot 7.4.7 Emission outside the fundamental test results at low carrier frequency

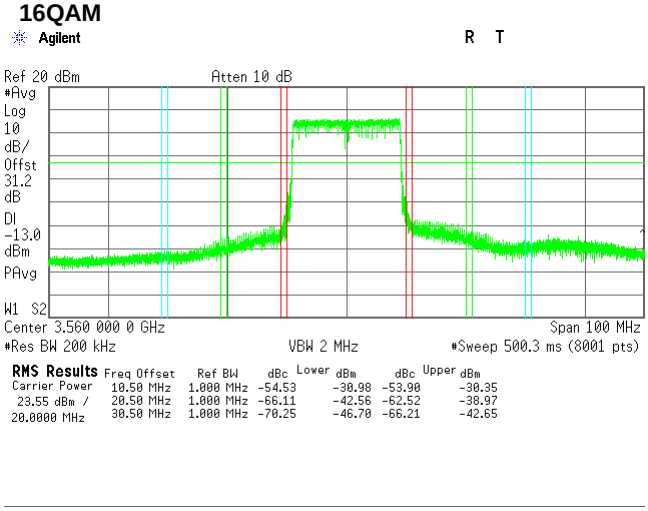
MODULATION: QPSK
CHANNEL SPACING: 20 MHz
ANTENNA CHAIN: 1
Modulation: **QPSK**





Modulation: **16QAM**



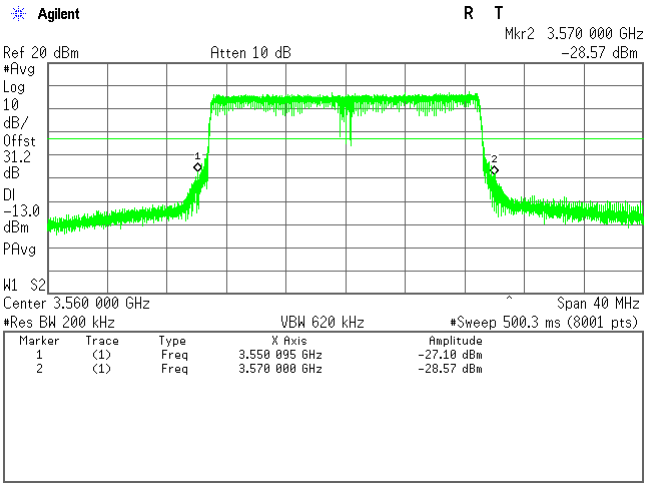


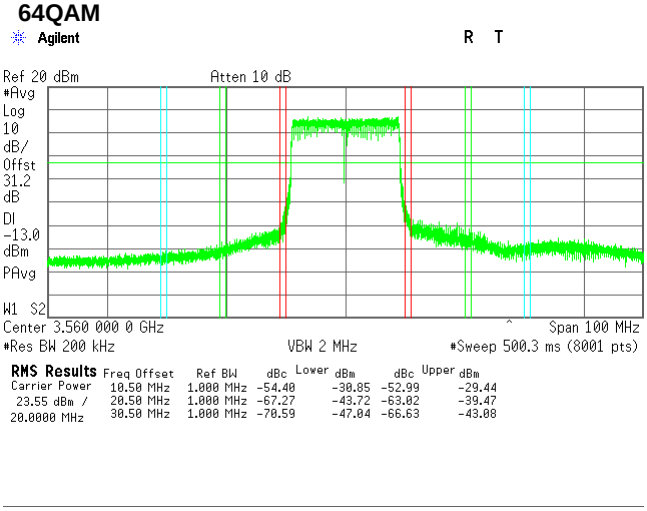
Test specification:	Section 96.41(e), Emission mask		
Test procedure:	Section 96.41(e)(3)		
Test mode:	Compliance	Verdict:	PASS
Date(s):	28-Oct-18 - 01-Nov-18		
Temperature: 24.2 ºC	Relative Humidity: 49 %	Air Pressure: 1010 hPa	Power: 48 VDC
Remarks:			

Plot 7.4.8 Emission outside the fundamental test results at low carrier frequency

MODULATION: QPSK
CHANNEL SPACING: 20 MHz
ANTENNA CHAIN: 1

Modulation: **64QAM**



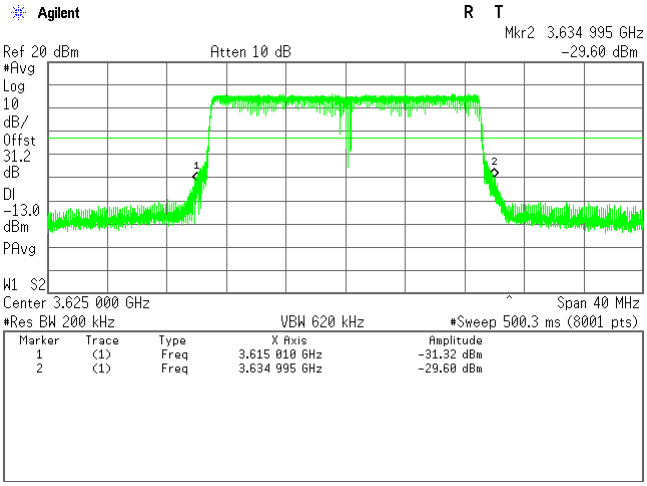


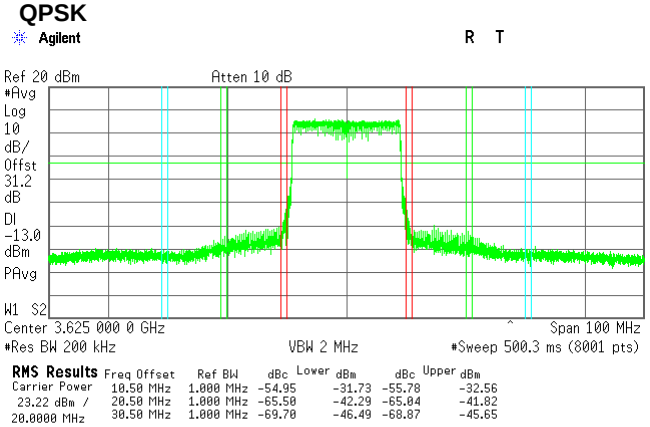
Test specification:	Section 96.41(e), Emission mask		
Test procedure:	Section 96.41(e)(3)		
Test mode:	Compliance	Verdict:	PASS
Date(s):	28-Oct-18 - 01-Nov-18		
Temperature: 24.2 ºC	Relative Humidity: 49 %	Air Pressure: 1010 hPa	Power: 48 VDC
Remarks:			

Plot 7.4.9 Emission outside the fundamental test results at mid carrier frequency

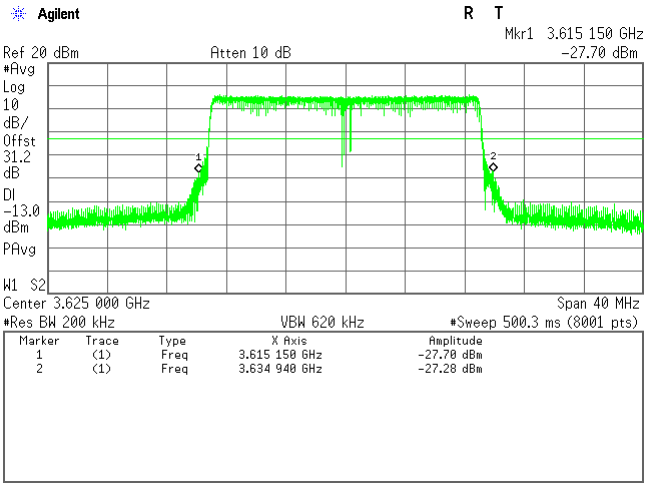
MODULATION: QPSK
CHANNEL SPACING: 20 MHz
ANTENNA CHAIN: 1

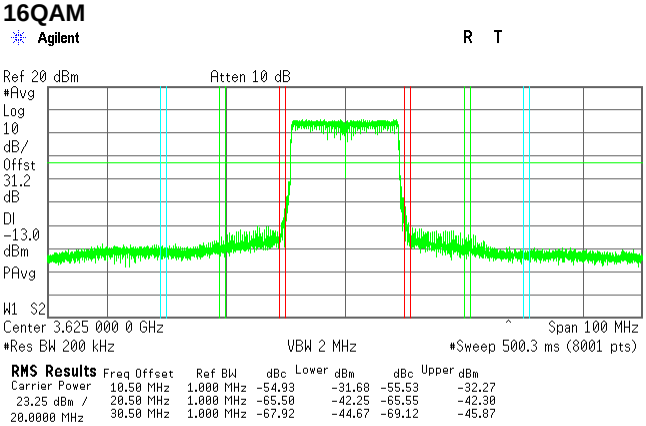
Modulation: **QPSK**





Modulation: **16QAM**



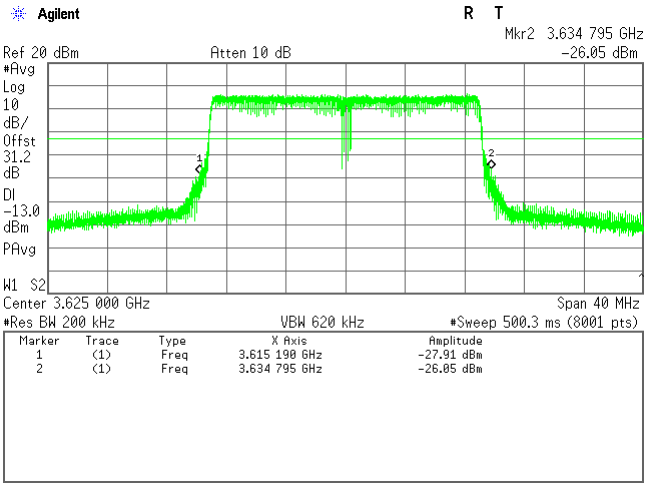


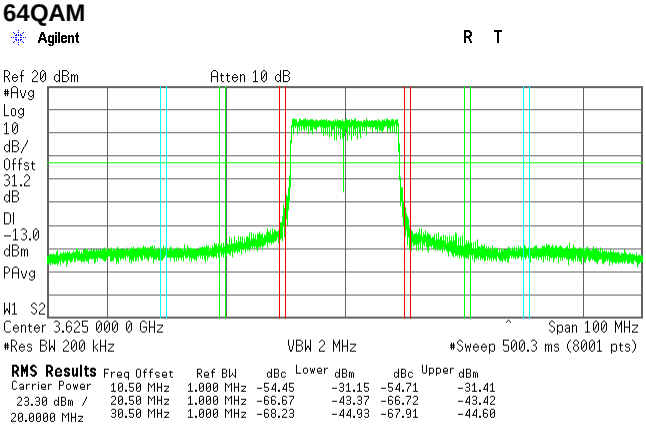
Test specification:	**Section 96.41(e), Emission mask**		
Test procedure:	Section 96.41(e)(3)		
Test mode:	Compliance	**Verdict:**	PASS
Date(s):	28-Oct-18 - 01-Nov-18		
Temperature: 24.2 ºC	**Relative Humidity:** 49 %	**Air Pressure:** 1010 hPa	**Power:** 48 VDC
Remarks:			

Plot 7.4.10 Emission outside the fundamental test results at mid carrier frequency

MODULATION: QPSK
CHANNEL SPACING: 20 MHz
ANTENNA CHAIN: 1

Modulation: **64QAM**



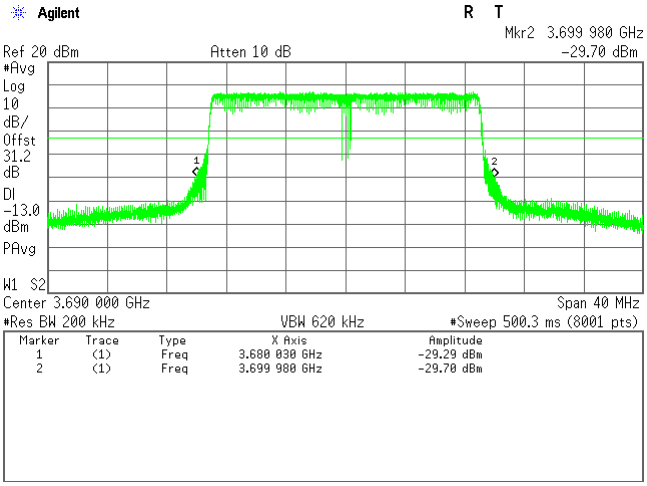


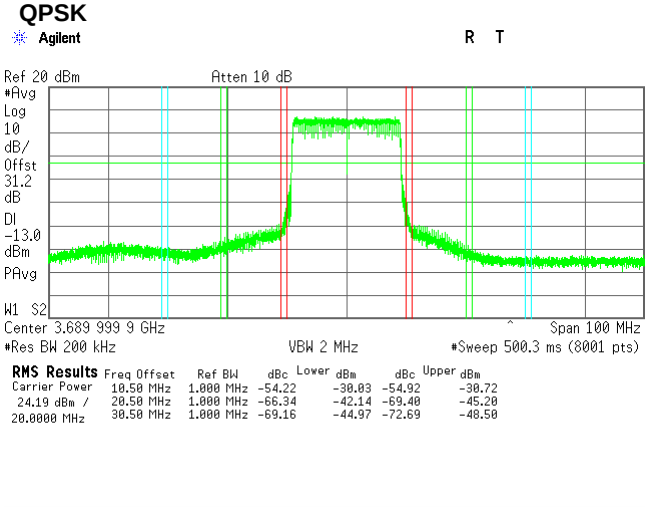
Test specification:	Section 96.41(e), Emission mask		
Test procedure:	Section 96.41(e)(3)		
Test mode:	Compliance	Verdict:	PASS
Date(s):	28-Oct-18 - 01-Nov-18		
Temperature: 24.2 ºC	Relative Humidity: 49 %	Air Pressure: 1010 hPa	Power: 48 VDC
Remarks:			

Plot 7.4.11 Emission outside the fundamental test results at high carrier frequency

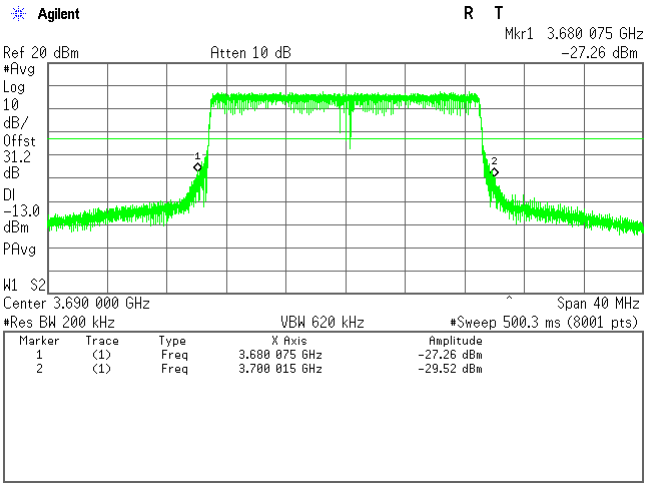
MODULATION: QPSK
CHANNEL SPACING: 20 MHz
ANTENNA CHAIN: 1

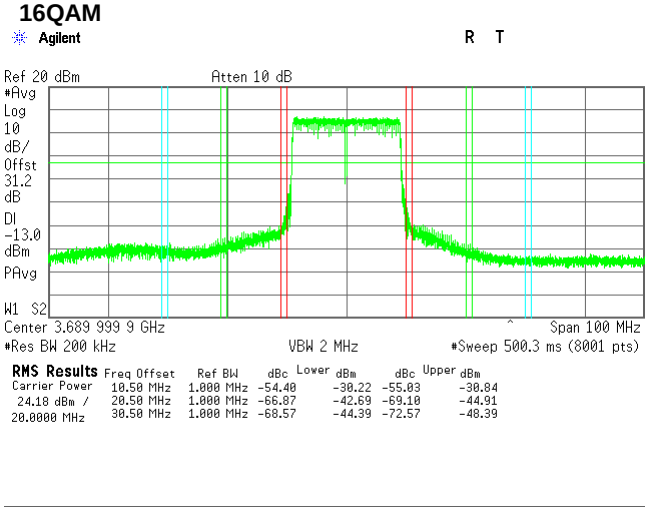
Modulation: QPSK





Modulation: 16QAM



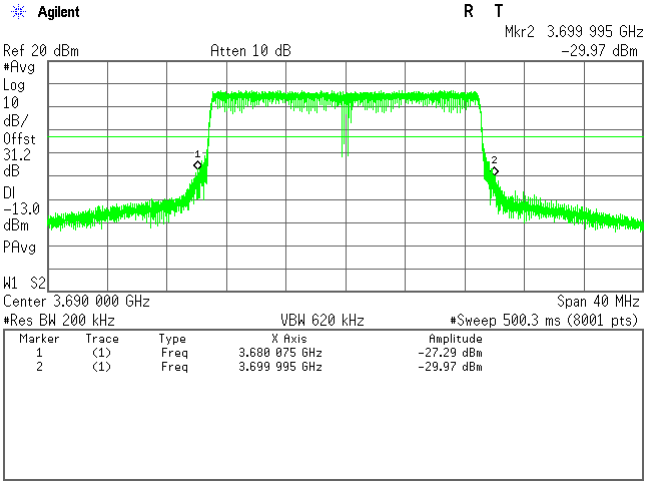


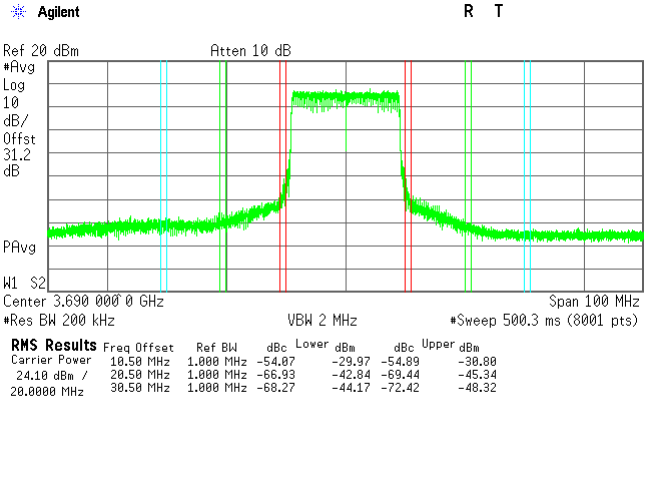
Test specification:	Section 96.41(e), Emission mask		
Test procedure:	Section 96.41(e)(3)		
Test mode:	Compliance	Verdict:	PASS
Date(s):	28-Oct-18 - 01-Nov-18		
Temperature: 24.2 ºC	Relative Humidity: 49 %	Air Pressure: 1010 hPa	Power: 48 VDC
Remarks:			

Plot 7.4.12 Emission outside the fundamental test results at high carrier frequency

MODULATION: QPSK
CHANNEL SPACING: 20 MHz
ANTENNA CHAIN: 1

Modulation: **64QAM**





Test specification:	Section 96.41(e)(2), Radiated spurious emissions		
Test procedure:	Section 96.41(e)(3)		
Test mode:	Compliance	Verdict:	PASS
Date(s):	26-Sep-18		
Temperature: 24 ºC	Relative Humidity: 52 %	Air Pressure: 1011 hPa	Power: 48 VDC
Remarks:			

7.5 Radiated spurious emission measurements

7.5.1 General

This test was performed to measure radiated spurious emissions from the EUT. Specification test limits are given in Table 7.5.1.

Table 7.5.1 Radiated spurious emission test limits

Frequency, MHz	EIRP of spurious, dBm	Equivalent field strength limit @ 3m, dB(μV/m)***
0.09 – below 3530.0	-40.0	55.2
3720.0 – 10th harmonic*	-40.0	55.2

*** - Equivalent field strength limit was calculated from maximum allowed ERP of spurious as follows: E=sqrt(30×P×1.64)/r, where P is ERP in Watts, 1.64 is numeric gain of ideal dipole and r is antenna to EUT distance in meters

7.5.2 Test procedure for spurious emission field strength measurements in 9 kHz to 30 MHz band

7.5.2.1 The EUT was set up as shown in Figure 7.5.1, energized and the performance check was conducted.

7.5.2.2 The specified frequency range was investigated with antenna connected to spectrum analyzer. To find maximum radiation the turntable was rotated 360^0 and the measuring antenna was rotated around its vertical axis.

7.5.2.3 The worst test results (the lowest margins) were recorded in Table 7.5.2 and shown in the associated plots.

7.5.3 Test procedure for spurious emission field strength measurements above 30 MHz

7.5.3.1 The EUT was set up as shown in Figure 7.5.2, energized and the performance check was conducted.

7.5.3.2 The specified frequency range was investigated with antenna connected to spectrum analyzer. To find maximum radiation the turntable was rotated 360^0 and the measuring antenna height was swept from 1 to 4 m in both, vertical and horizontal, polarizations.

7.5.3.3 The worst test results (the lowest margins) were recorded in Table 7.5.2 and shown in the associated plots.

7.5.4 Test procedure for substitution EIRP measurements of spurious

7.5.4.1 The test equipment was set up as shown in Figure 7.5.3 and energized.

7.5.4.2 RF signal generator was set to the frequency of investigated spurious emission and the RF output level was preliminary adjusted to produce the same field strength as it was measured from the EUT.

7.5.4.3 The test antenna height was swept from 1 to 4 m to find maximum emission from substitution antenna and RF signal generator output was fine adjusted to produce the same field strength as it was measured from the EUT.

7.5.4.4 The above procedure was performed in both, horizontal and vertical, polarizations of the test and substitution antennas.

7.5.4.5 The EIRP of spurious emissions was calculated as a sum of signal generator output power in dBm and antenna gain in dBi reduced by cable loss in dB.

7.5.4.6 The above procedure was repeated at the rest of investigated frequencies.

7.5.4.7 The worst test results (the lowest margins) were recorded in Table 7.5.3 and shown in the associated plots.

Test specification:	Section 96.41(e)(2), Radiated spurious emissions		
Test procedure:	Section 96.41(e)(3)		
Test mode:	Compliance	Verdict:	PASS
Date(s):	26-Sep-18		
Temperature: 24 ºC	Relative Humidity: 52 %	Air Pressure: 1011 hPa	Power: 48 VDC
Remarks:			

Figure 7.5.1 Setup for spurious emission field strength measurements in 9 kHz to 30 MHz band

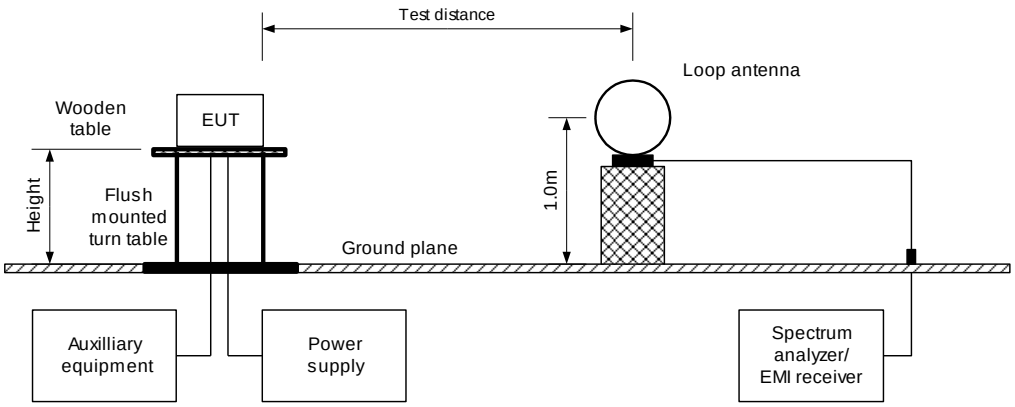
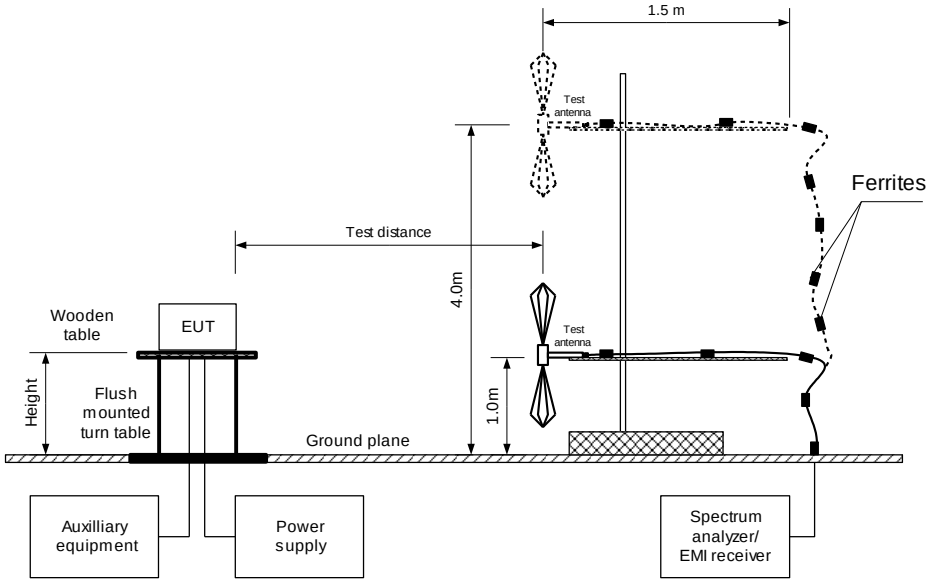
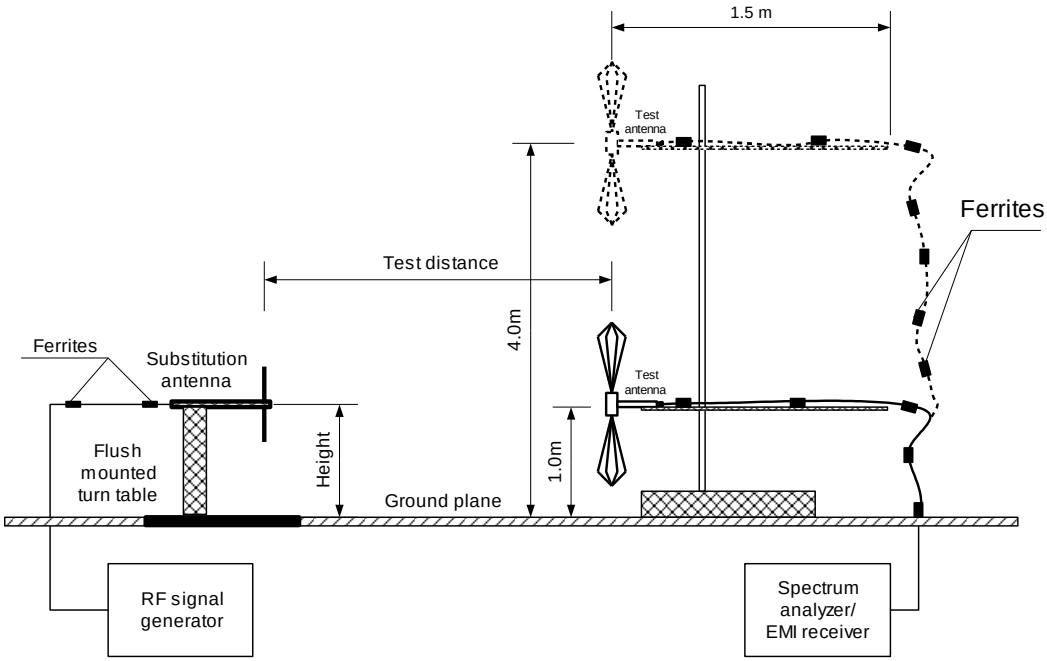


Figure 7.5.2 Setup for spurious emission field strength measurements above 30 MHz



Test specification:	Section 96.41(e)(2), Radiated spurious emissions		
Test procedure:	Section 96.41(e)(3)		
Test mode:	Compliance	Verdict:	PASS
Date(s):	26-Sep-18		
Temperature: 24 ºC	Relative Humidity: 52 %	Air Pressure: 1011 hPa	Power: 48 VDC
Remarks:			

Figure 7.5.3 Setup for substitution EIRP measurements of spurious



Test specification:	**Section 96.41(e)(2), Radiated spurious emissions**		
Test procedure:	Section 96.41(e)(3)		
Test mode:	Compliance	**Verdict:**	PASS
Date(s):	26-Sep-18		
Temperature: 24 ºC	**Relative Humidity:** 52 %	**Air Pressure:** 1011 hPa	**Power:** 48 VDC
Remarks:			

Table 7.5.2 Spurious emission field strength test results

ASSIGNED FREQUENCY RANGE: 3550 - 3700 MHz
TEST DISTANCE: 3 m
TEST SITE: Semi anechoic chamber
INVESTIGATED FREQUENCY RANGE: 0.009 – 37000 MHz
DETECTOR USED: Peak
VIDEO BANDWIDTH: > Resolution bandwidth
TEST ANTENNA TYPE: Active loop (9 kHz – 30 MHz)
Biconilog (30 MHz – 1000 MHz)
Double ridged guide (above 1000 MHz)
MODULATION: QPSK
MODULATING SIGNAL: PRBS
TRANSMITTER OUTPUT POWER SETTINGS: Maximum

Frequency, MHz	Field strength, dB(μV/m)	Limit, dB(μV/m)	Margin, dB*	RBW, kHz	Antenna polarization	Antenna height, m	Turn-table position**, degrees
113.084	43.32	55.2	-11.88	100	Vertical	104	38
127.536	51.04	55.2	-4.16	100	Vertical	100	109
140.511	46.82	55.2	-8.38	100	Vertical	102	55
168.888	41.95	55.2	-13.25	100	Vertical	102	180
325.013	41.08	55.2	-14.12	100	Vertical	176	-171
374.982	41.06	55.2	-14.14	100	Vertical	143	143

*****- Margin = Field strength of spurious – calculated field strength limit.
******- EUT front panel refers to 0 degrees position of turntable.

Table 7.5.3 Substitution EIRP of spurious test results

ASSIGNED FREQUENCY RANGE: 3550 - 3700 MHz
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
DETECTOR USED: Peak
VIDEO BANDWIDTH: > Resolution bandwidth
SUBSTITUTION ANTENNA TYPE: Tunable dipole (30 MHz – 1000 MHz)

Frequency, MHz	Field strength, dB(μV/m)	RBW, kHz	Antenna polarization	RF generator output, dBm	Ant gain, dBi	Cable loss, dB	EIRP, dBm	Limit, dBm/MHz	Margin, dB*	Verdict
113.084	43.32	100	Vertical	-52.81	0.85	0.6	-52.56	-40.0	-12.56	Pass
127.536	51.04	100	Vertical	-46.50	0.75	0.6	-46.35	-40.0	-6.35	Pass
140.511	46.82	100	Vertical	-49.19	0.55	0.7	-49.34	-40.0	-9.34	Pass
168.888	41.95	100	Vertical	-52.45	0.05	0.7	-53.10	-40.0	-13.10	Pass
325.013	41.08	100	Vertical	-55.25	1.65	1.1	-54.70	-40.0	-14.70	Pass
374.982	41.06	100	Vertical	-54.78	1.55	1.1	-54.33	-40.0	-14.33	Pass

*****- Margin = EIRP – specification limit.

Reference numbers of test equipment used

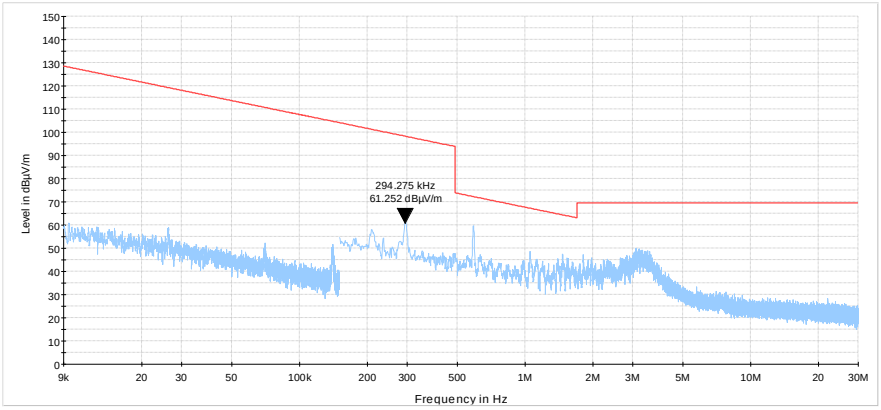
HL 0030	HL 0446	HL 0614	HL 0661	HL 3903	HL 4278	HL 4360	HL 4933
HL 4956	HL 5111	HL 5288	HL 5405				

Full description is given in Appendix A.

Test specification:	Section 96.41(e)(2), Radiated spurious emissions		
Test procedure:	Section 96.41(e)(3)		
Test mode:	Compliance	Verdict:	PASS
Date(s):	26-Sep-18		
Temperature: 24 ºC	Relative Humidity: 52 %	Air Pressure: 1011 hPa	Power: 48 VDC
Remarks:			

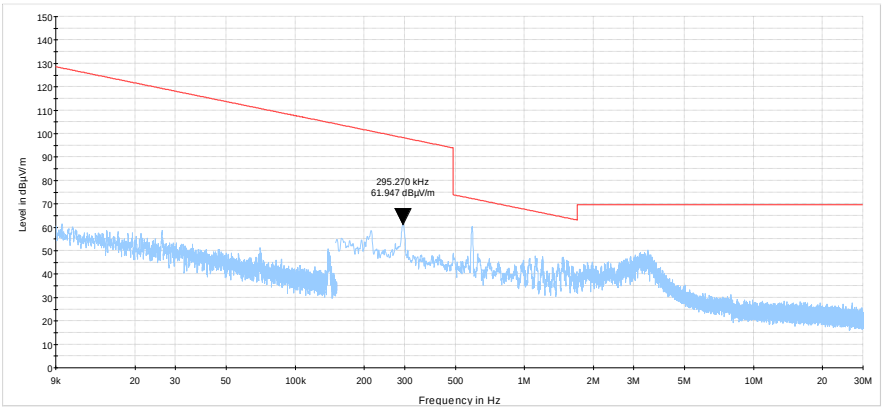
Plot 7.5.1 Radiated emission measurements in 9 kHz - 30 MHz range

TEST SITE: Semi anechoic chamber
CARRIER FREQUENCY: Low
TEST DISTANCE: 3 m



Plot 7.5.2 Radiated emission measurements in 9 kHz - 30 MHz range

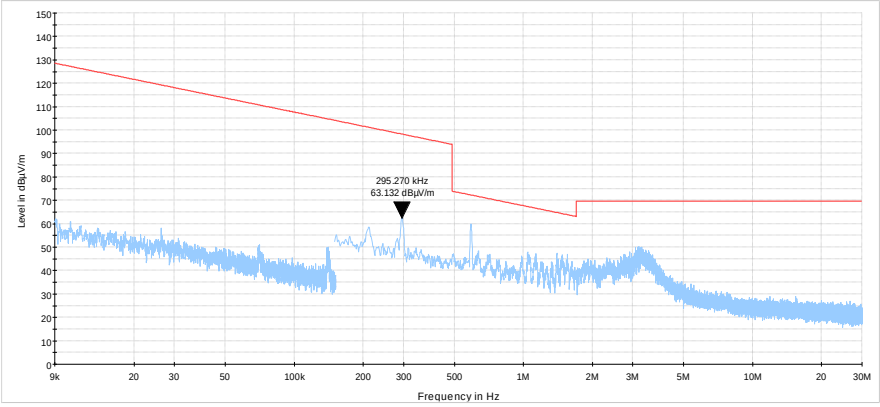
TEST SITE: Semi anechoic chamber
CARRIER FREQUENCY: Mid
TEST DISTANCE: 3 m



Test specification:	Section 96.41(e)(2), Radiated spurious emissions		
Test procedure:	Section 96.41(e)(3)		
Test mode:	Compliance	Verdict:	PASS
Date(s):	26-Sep-18		
Temperature: 24 ºC	Relative Humidity: 52 %	Air Pressure: 1011 hPa	Power: 48 VDC
Remarks:			

Plot 7.5.3 Radiated emission measurements in 9 kHz - 30 MHz range

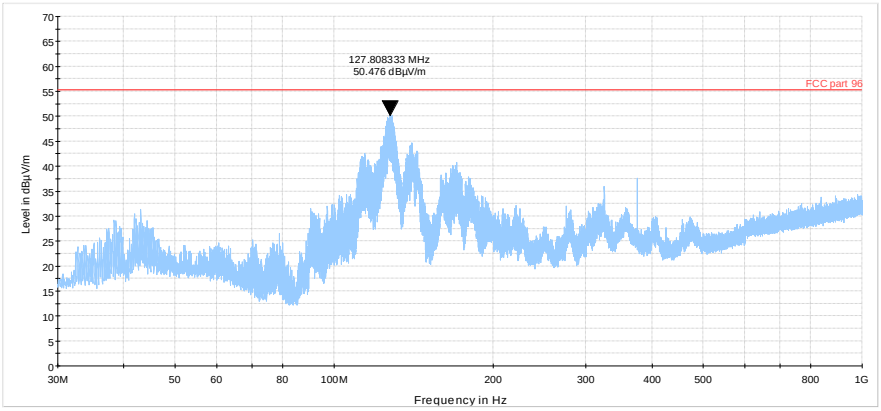
TEST SITE: Semi anechoic chamber
CARRIER FREQUENCY: High
TEST DISTANCE: 3 m



Test specification:	Section 96.41(e)(2), Radiated spurious emissions		
Test procedure:	Section 96.41(e)(3)		
Test mode:	Compliance	Verdict:	PASS
Date(s):	26-Sep-18		
Temperature: 24 ºC	Relative Humidity: 52 %	Air Pressure: 1011 hPa	Power: 48 VDC
Remarks:			

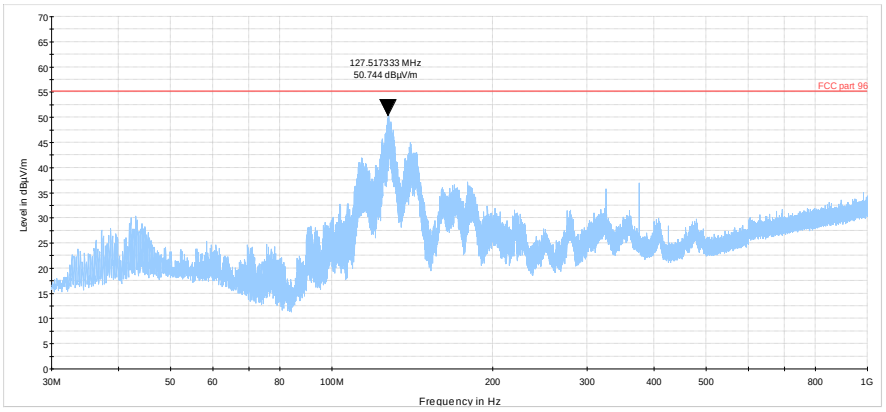
Plot 7.5.4 Radiated emission measurements in 30 - 1000 MHz range

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



Plot 7.5.5 Radiated emission measurements in 30 - 1000 MHz range

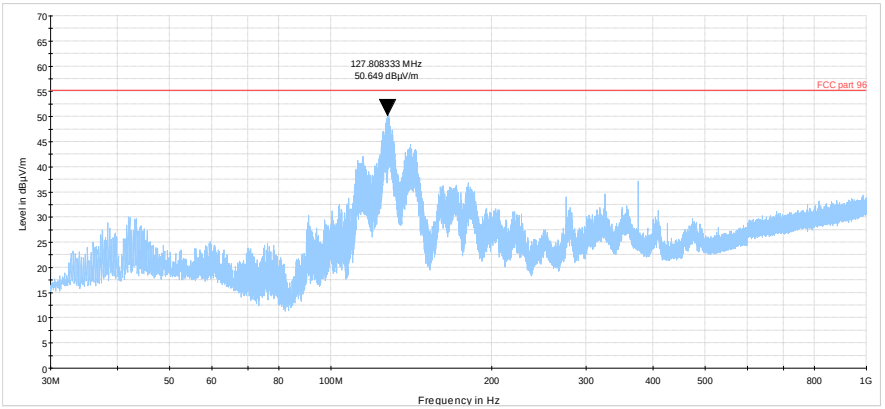
TEST SITE:	Semi anechoic chamber
CARRIER FREQUENCY:	Mid
ANTENNA POLARIZATION:	Vertical and Horizontal
TEST DISTANCE:	3 m



Test specification:	Section 96.41(e)(2), Radiated spurious emissions		
Test procedure:	Section 96.41(e)(3)		
Test mode:	Compliance	Verdict:	PASS
Date(s):	26-Sep-18		
Temperature: 24 ºC	Relative Humidity: 52 %	Air Pressure: 1011 hPa	Power: 48 VDC
Remarks:			

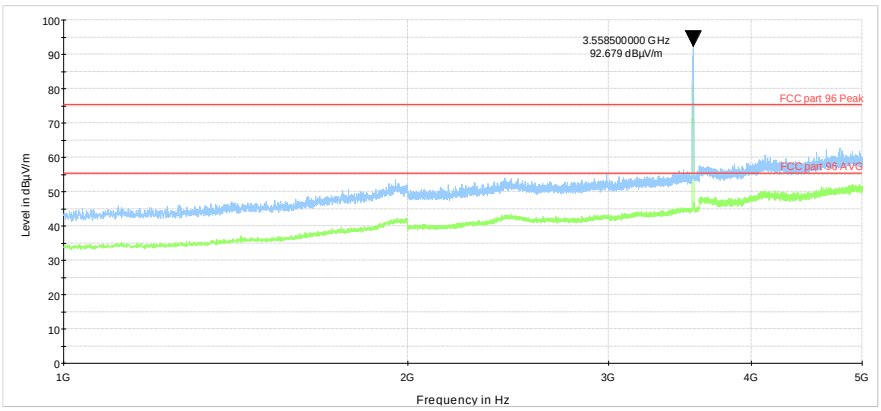
Plot 7.5.6 Radiated emission measurements in 30 - 1000 MHz range

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



Plot 7.5.7 Radiated emission measurements in 1000 – 5000 MHz range

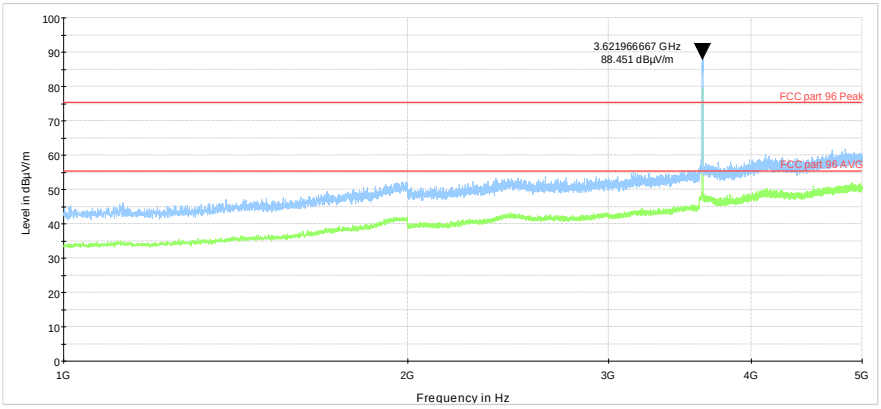
TEST SITE:	Semi anechoic chamber
CARRIER FREQUENCY:	Low
ANTENNA POLARIZATION:	Vertical and Horizontal
TEST DISTANCE:	3 m



Test specification:	Section 96.41(e)(2), Radiated spurious emissions		
Test procedure:	Section 96.41(e)(3)		
Test mode:	Compliance	Verdict:	PASS
Date(s):	26-Sep-18		
Temperature: 24 ºC	Relative Humidity: 52 %	Air Pressure: 1011 hPa	Power: 48 VDC
Remarks:			

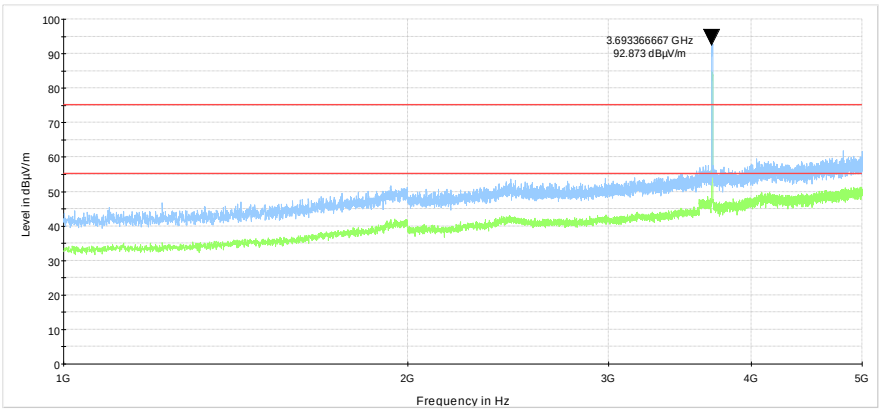
Plot 7.5.8 Radiated emission measurements in 1000 – 5000 MHz range

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



Plot 7.5.9 Radiated emission measurements in 1000 – 5000 MHz range

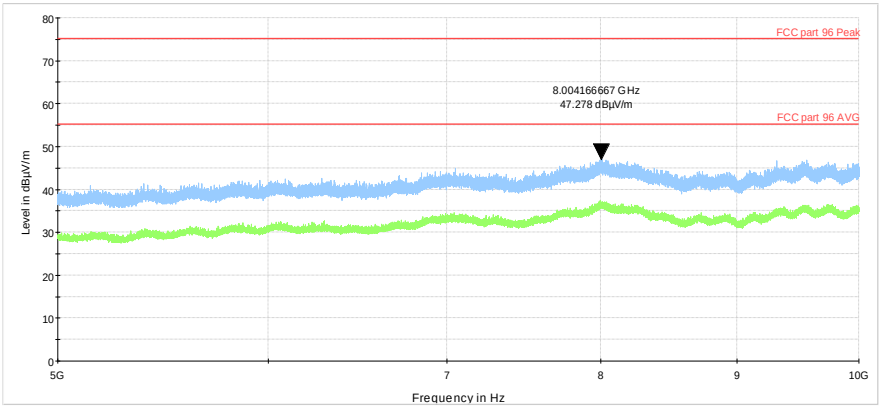
TEST SITE:	Semi anechoic chamber
CARRIER FREQUENCY:	High
ANTENNA POLARIZATION:	Vertical and Horizontal
TEST DISTANCE:	3 m



Test specification:	Section 96.41(e)(2), Radiated spurious emissions		
Test procedure:	Section 96.41(e)(3)		
Test mode:	Compliance	Verdict:	PASS
Date(s):	26-Sep-18		
Temperature: 24 ºC	Relative Humidity: 52 %	Air Pressure: 1011 hPa	Power: 48 VDC
Remarks:			

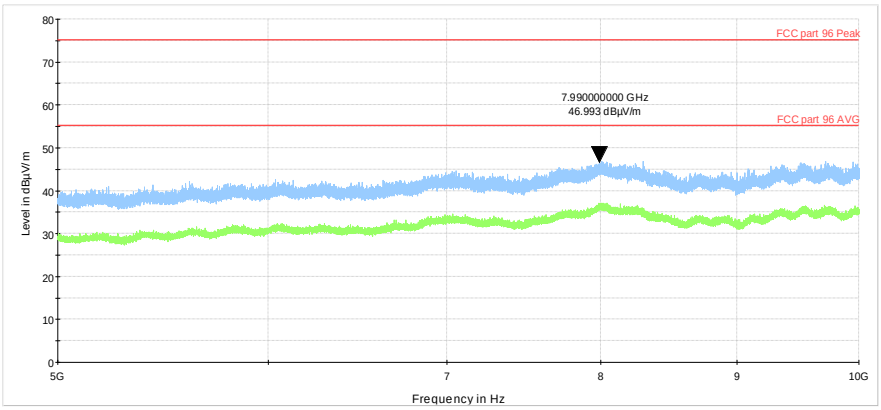
Plot 7.5.10 Radiated emission measurements in 5000 – 10000 MHz range

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



Plot 7.5.11 Radiated emission measurements in 5000 – 10000 MHz range

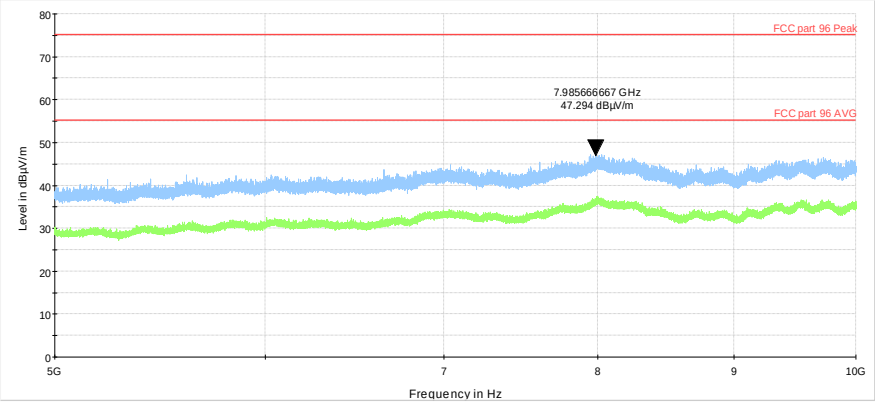
TEST SITE:	Semi anechoic chamber
CARRIER FREQUENCY:	Mid
ANTENNA POLARIZATION:	Vertical and Horizontal
TEST DISTANCE:	3 m



Test specification:	Section 96.41(e)(2), Radiated spurious emissions		
Test procedure:	Section 96.41(e)(3)		
Test mode:	Compliance	Verdict:	PASS
Date(s):	26-Sep-18		
Temperature: 24 ºC	Relative Humidity: 52 %	Air Pressure: 1011 hPa	Power: 48 VDC
Remarks:			

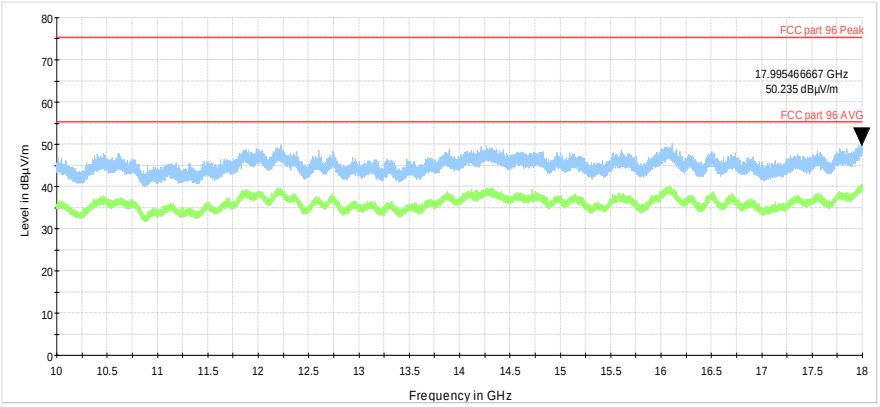
Plot 7.5.12 Radiated emission measurements in 5000 – 10000 MHz range

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



Plot 7.5.13 Radiated emission measurements in 10000 – 18000 MHz range

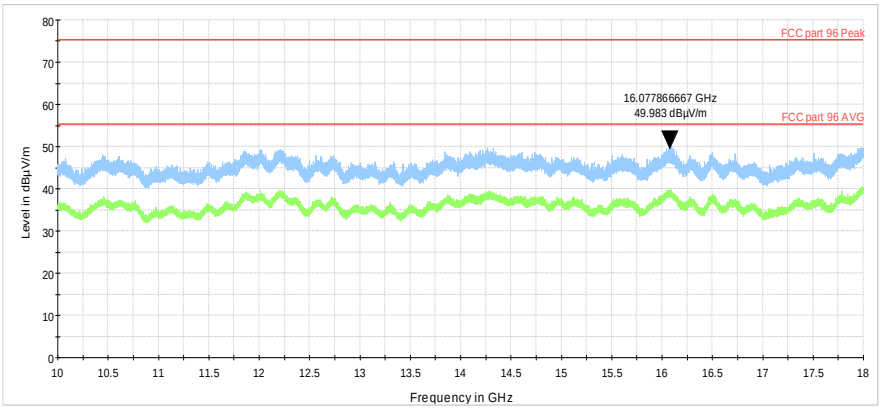
TEST SITE:	Semi anechoic chamber
CARRIER FREQUENCY:	Low
ANTENNA POLARIZATION:	Vertical and Horizontal
TEST DISTANCE:	3 m



Test specification:	Section 96.41(e)(2), Radiated spurious emissions		
Test procedure:	Section 96.41(e)(3)		
Test mode:	Compliance	Verdict:	PASS
Date(s):	26-Sep-18		
Temperature: 24 ºC	Relative Humidity: 52 %	Air Pressure: 1011 hPa	Power: 48 VDC
Remarks:			

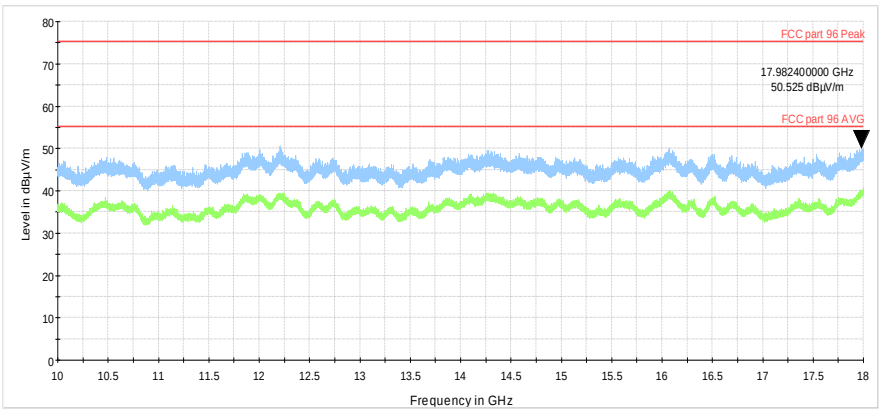
Plot 7.5.14 Radiated emission measurements in 10000 – 18000 MHz range

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



Plot 7.5.15 Radiated emission measurements in 10000 – 18000 MHz range

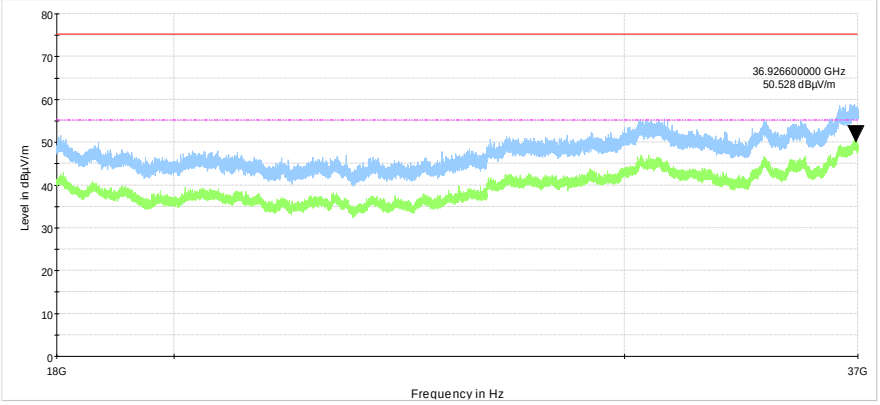
TEST SITE:	Semi anechoic chamber
CARRIER FREQUENCY:	High
ANTENNA POLARIZATION:	Vertical and Horizontal
TEST DISTANCE:	3 m



Test specification:	Section 96.41(e)(2), Radiated spurious emissions		
Test procedure:	Section 96.41(e)(3)		
Test mode:	Compliance	Verdict:	PASS
Date(s):	26-Sep-18		
Temperature: 24 ºC	Relative Humidity: 52 %	Air Pressure: 1011 hPa	Power: 48 VDC
Remarks:			

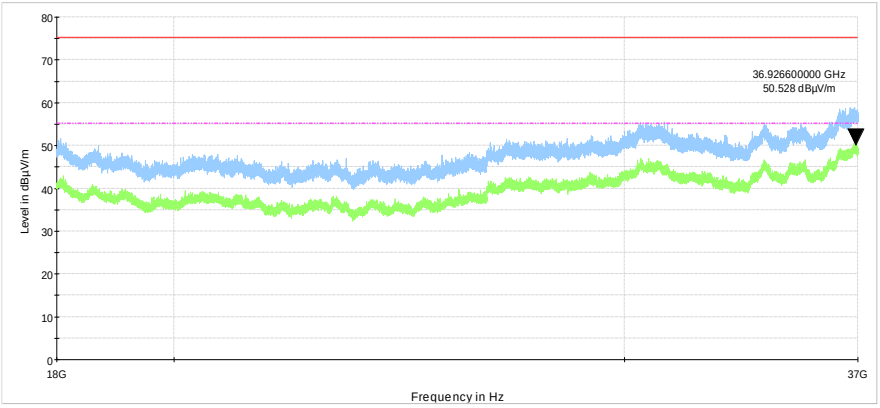
Plot 7.5.16 Radiated emission measurements in 18000 – 37000 MHz range

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



Plot 7.5.17 Radiated emission measurements in 18000 – 37000 MHz range

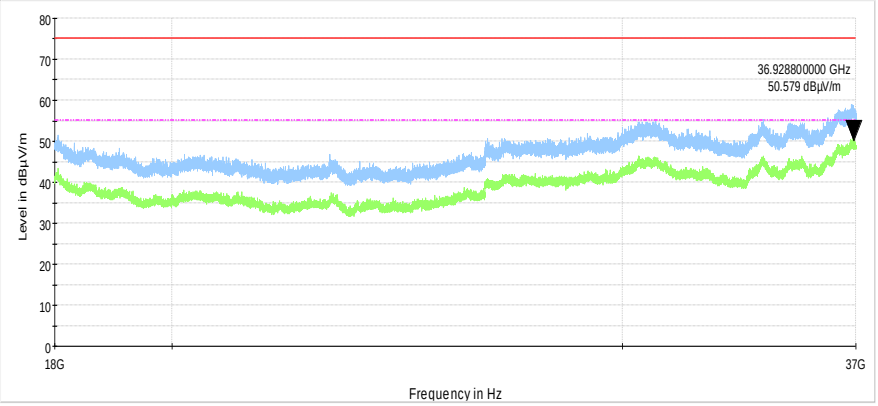
TEST SITE:	Semi anechoic chamber
CARRIER FREQUENCY:	Mid
ANTENNA POLARIZATION:	Vertical and Horizontal
TEST DISTANCE:	3 m



Test specification:	Section 96.41(e)(2), Radiated spurious emissions		
Test procedure:	Section 96.41(e)(3)		
Test mode:	Compliance	Verdict:	PASS
Date(s):	26-Sep-18		
Temperature: 24 ºC	Relative Humidity: 52 %	Air Pressure: 1011 hPa	Power: 48 VDC
Remarks:			

Plot 7.5.18 Radiated emission measurements in 18000 – 37000 MHz range

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



Test specification:	Section 96.41(e)(3), Conducted spurious emissions		
Test procedure:	Section 96.41(e)(3)		
Test mode:	Compliance	Verdict:	PASS
Date(s):	29-Oct-18 - 31-Oct-18		
Temperature: 24.1 ºC	Relative Humidity: 49 %	Air Pressure: 1011 hPa	Power: 48 VDC
Remarks:			

7.6 Spurious emissions at RF antenna connector test

7.6.1 General

This test was performed to measure spurious emissions at RF antenna connector. Specification test limits are given in Table 7.6.1.

Table 7.6.1 Spurious emission limits

Frequency, MHz	Conducted power of spurious, dBm/MHz
0.10 – below 3530.0	-40.0
3720.0 – 10th harmonic*	-40.0

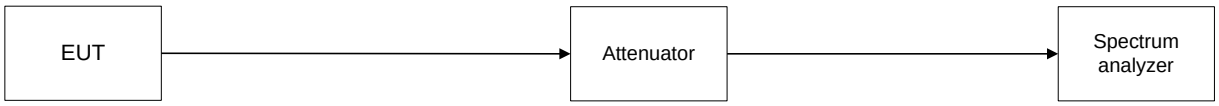
7.6.2 Test procedure

7.6.2.1 The EUT was set up as shown in Figure 7.6.1, energized and its proper operation was checked.

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

7.6.2.3 The spurious emission was measured with spectrum analyzer as provided in Table 7.6.2 and associated plots.

Figure 7.6.1 Spurious emission test setup



Test specification:	**Section 96.41(e)(3), Conducted spurious emissions**		
Test procedure:	Section 96.41(e)(3)		
Test mode:	Compliance	**Verdict:**	PASS
Date(s):	29-Oct-18 - 31-Oct-18		
Temperature: 24.1 ºC	**Relative Humidity:** 49 %	**Air Pressure:** 1011 hPa	**Power:** 48 VDC
Remarks:			

Table 7.6.2 Spurious emission test results

ASSIGNED FREQUENCY RANGE: 3550 - 3700 MHz
INVESTIGATED FREQUENCY RANGE: 0.009 – 37000 MHz
DETECTOR USED: Peak
VIDEO BANDWIDTH: ≥ Resolution bandwidth
MODULATION: QPSK
MODULATING SIGNAL: PRBS
CHANNEL SPACING: 10 MHz
TRANSMITTER OUTPUT POWER SETTINGS: Maximum

Frequency, MHz	SA reading, dBm	Attenuator, dB	Cable loss, dB	RBW, kHz	Spurious emission, dBm	Attenuation below carrier, dBc	Limit, dBc	Margin, dB*	Verdict
Low carrier frequency 3555 MHz									
No emissions were found									Pass
Mid carrier frequency 3625 MHz									
No emissions were found									Pass
High carrier frequency 3695 MHz									
No emissions were found									Pass

*****- Margin = Spurious emission – specification limit.

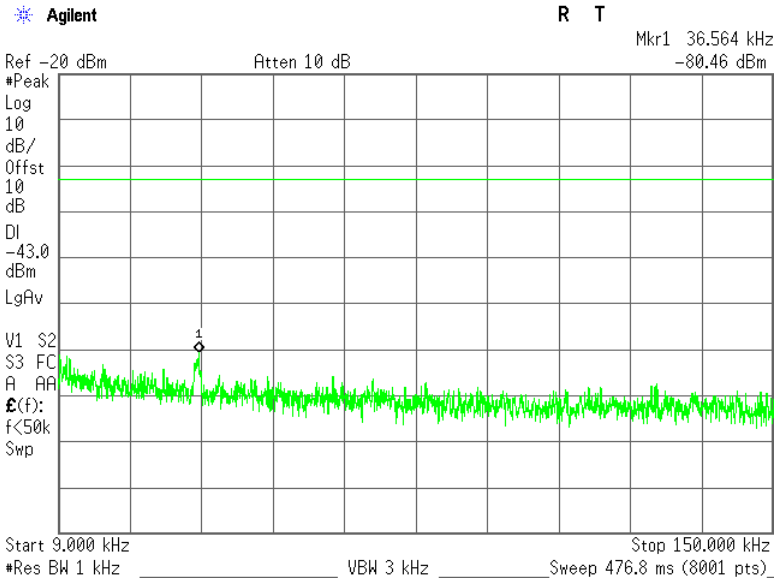
Reference numbers of test equipment used

HL 3818	HL 3903	HL 4771	HL 3868	HL 3301	HL 3302

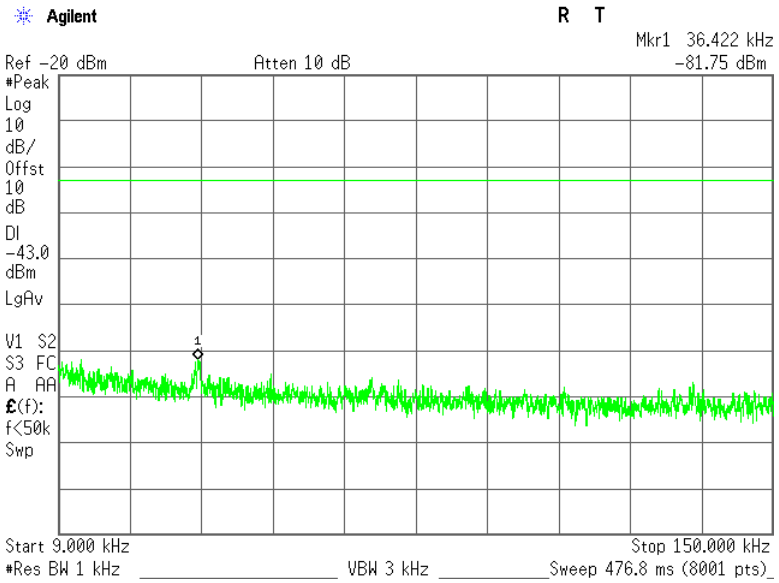
Full description is given in Appendix A.

Test specification:	Section 96.41(e)(3), Conducted spurious emissions		
Test procedure:	Section 96.41(e)(3)		
Test mode:	Compliance	Verdict:	PASS
Date(s):	29-Oct-18 - 31-Oct-18		
Temperature: 24.1 ºC	Relative Humidity: 49 %	Air Pressure: 1011 hPa	Power: 48 VDC
Remarks:			

Plot 7.6.1 Spurious emission measurements in 9 - 150 kHz range at low carrier frequency

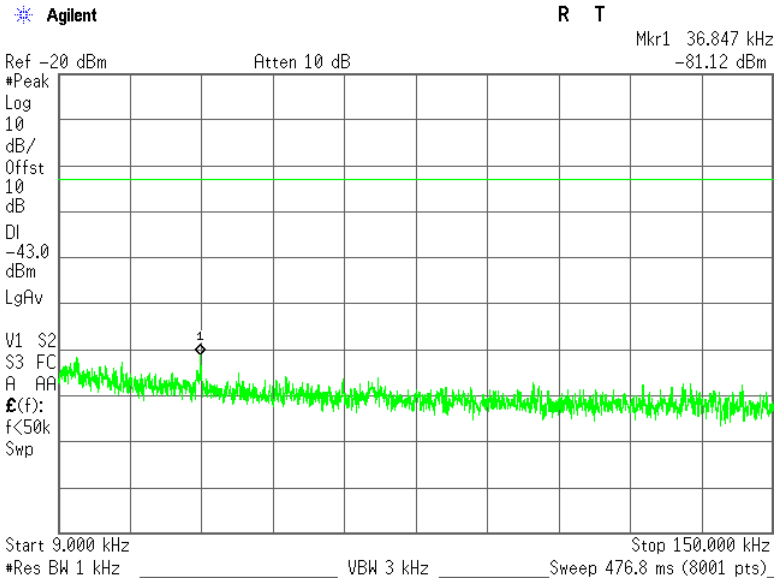


Plot 7.6.2 Spurious emission measurements in 9 - 150 kHz range at mid carrier frequency

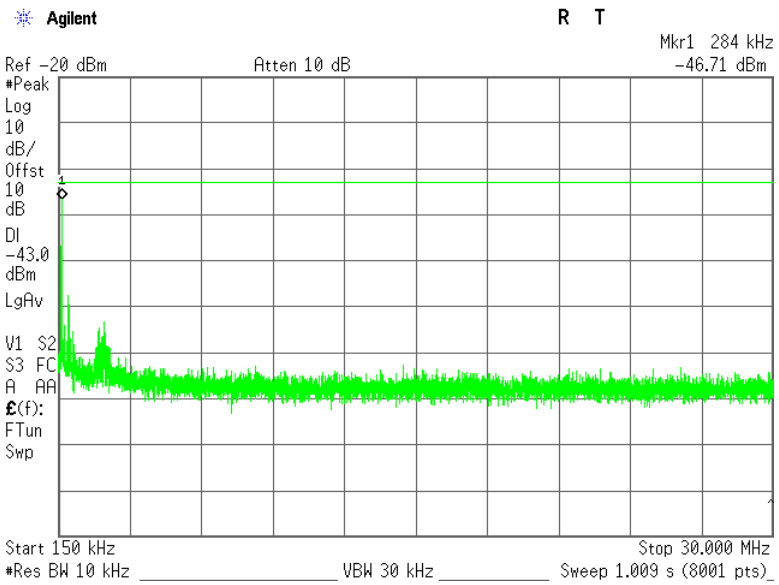


Test specification:	Section 96.41(e)(3), Conducted spurious emissions		
Test procedure:	Section 96.41(e)(3)		
Test mode:	Compliance	Verdict:	PASS
Date(s):	29-Oct-18 - 31-Oct-18		
Temperature: 24.1 ºC	Relative Humidity: 49 %	Air Pressure: 1011 hPa	Power: 48 VDC
Remarks:			

Plot 7.6.3 Spurious emission measurements in 9 - 150 kHz range at high carrier frequency

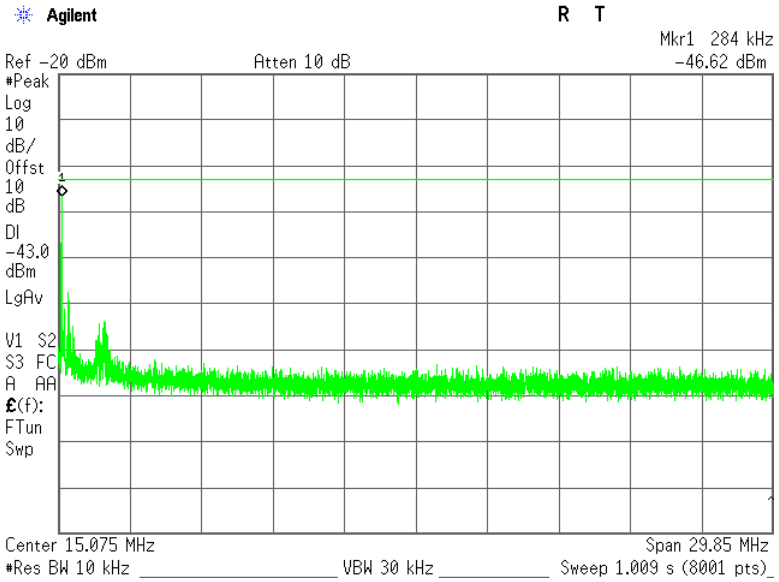


Plot 7.6.4 Spurious emission measurements in 0.15 - 30.0 MHz range at low carrier frequency

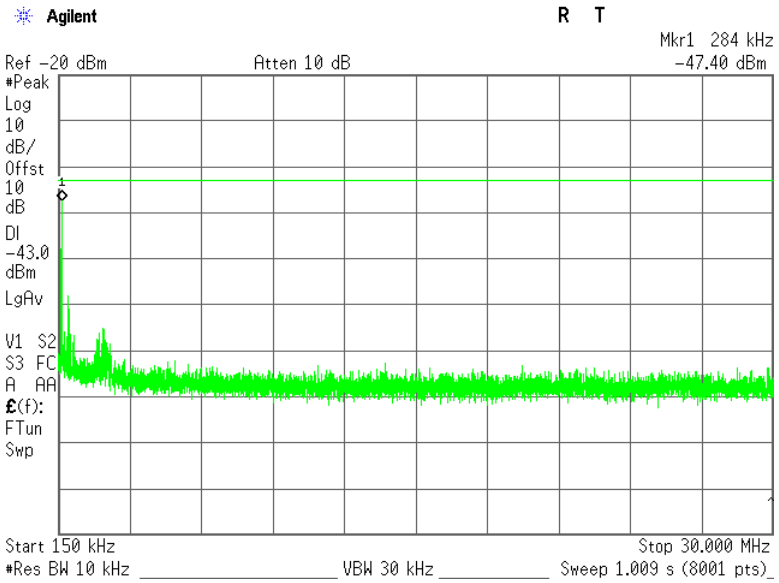


Test specification:	Section 96.41(e)(3), Conducted spurious emissions		
Test procedure:	Section 96.41(e)(3)		
Test mode:	Compliance	Verdict:	PASS
Date(s):	29-Oct-18 - 31-Oct-18		
Temperature: 24.1 ºC	Relative Humidity: 49 %	Air Pressure: 1011 hPa	Power: 48 VDC
Remarks:			

Plot 7.6.5 Spurious emission measurements in 0.15 - 30.0 MHz range at mid carrier frequency

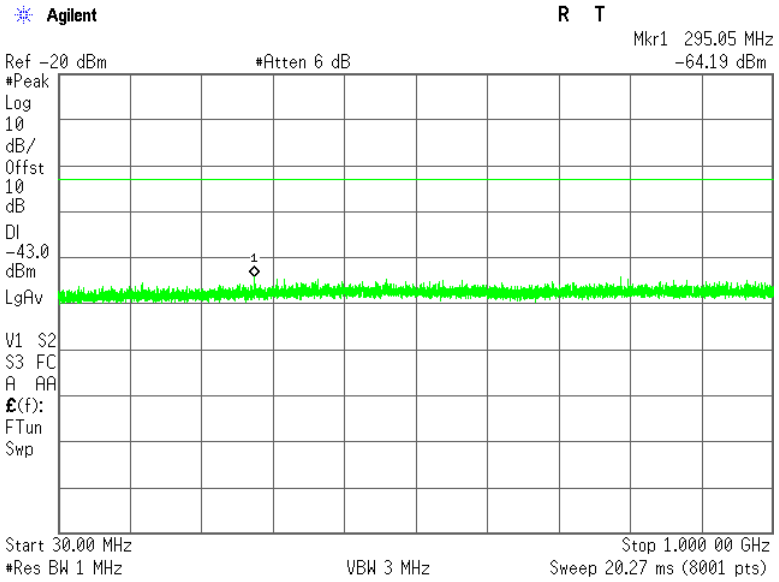


Plot 7.6.6 Spurious emission measurements in 0.15 – 30.0 MHz range at high carrier frequency

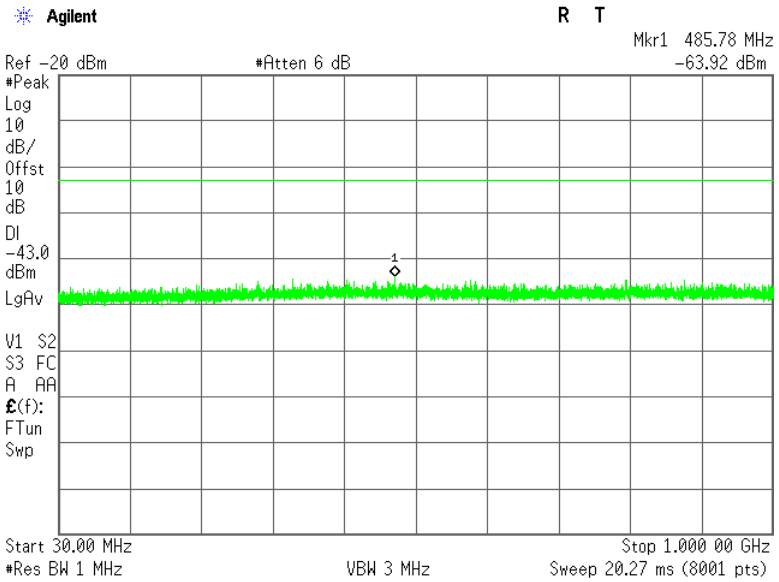


Test specification:	Section 96.41(e)(3), Conducted spurious emissions		
Test procedure:	Section 96.41(e)(3)		
Test mode:	Compliance	Verdict:	PASS
Date(s):	29-Oct-18 - 31-Oct-18		
Temperature: 24.1 ºC	Relative Humidity: 49 %	Air Pressure: 1011 hPa	Power: 48 VDC
Remarks:			

Plot 7.6.7 Spurious emission measurements in 30.0 - 1000 MHz range at low carrier frequency

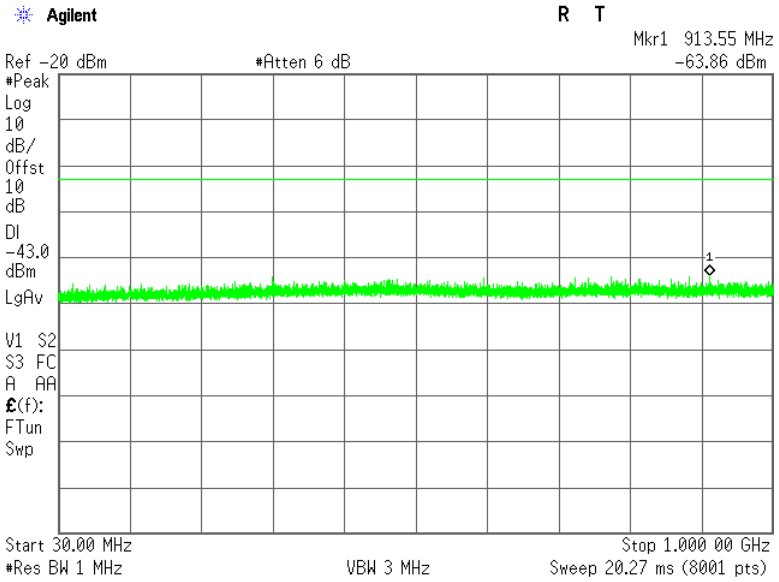


Plot 7.6.8 Spurious emission measurements in 30.0 - 1000 MHz range at mid carrier frequency

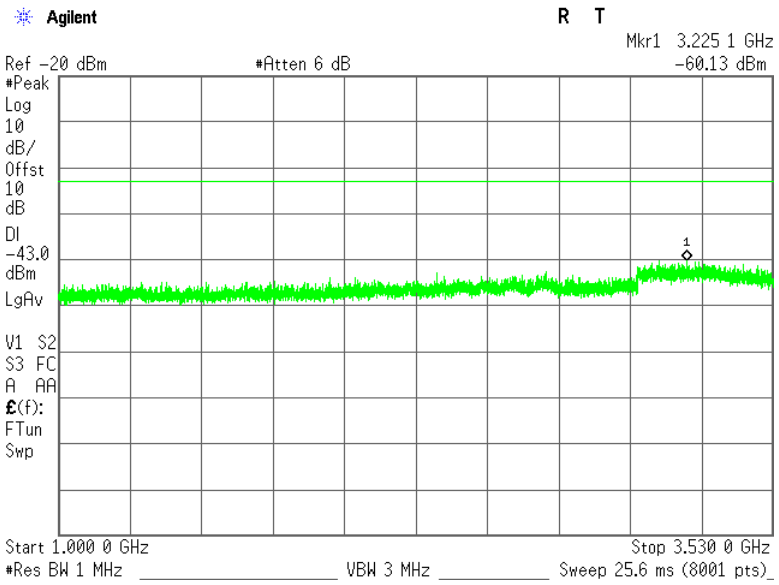


Test specification:	Section 96.41(e)(3), Conducted spurious emissions		
Test procedure:	Section 96.41(e)(3)		
Test mode:	Compliance	Verdict:	PASS
Date(s):	29-Oct-18 - 31-Oct-18		
Temperature: 24.1 ºC	Relative Humidity: 49 %	Air Pressure: 1011 hPa	Power: 48 VDC
Remarks:			

Plot 7.6.9 Spurious emission measurements in 30.0 - 1000 MHz range at high carrier frequency

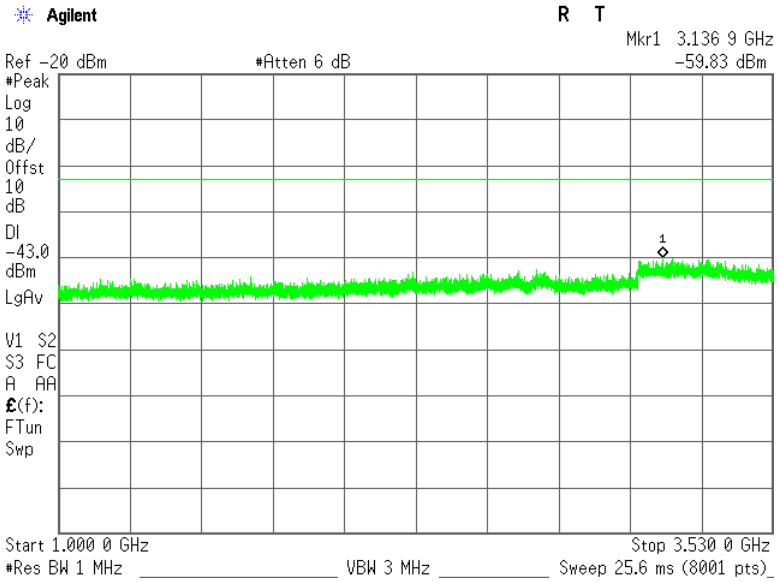


Plot 7.6.10 Spurious emission measurements in 1000 - 3530 MHz range at low carrier frequency

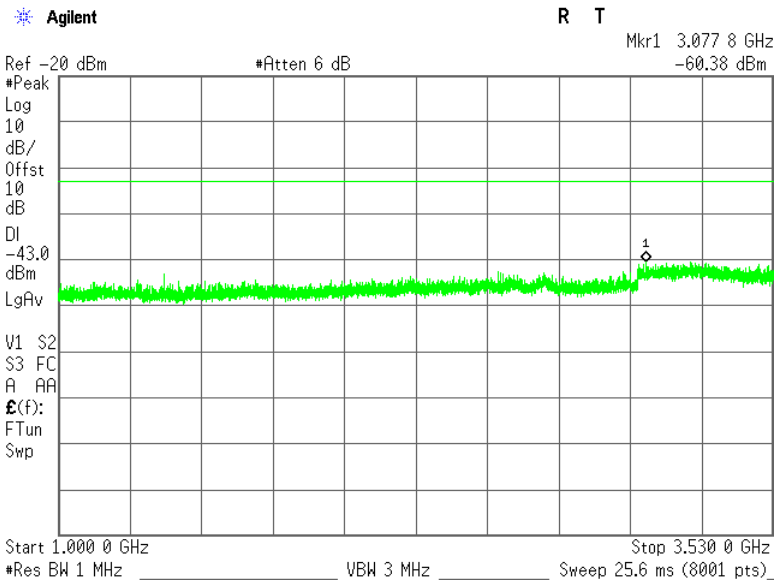


Test specification:	Section 96.41(e)(3), Conducted spurious emissions		
Test procedure:	Section 96.41(e)(3)		
Test mode:	Compliance	Verdict:	PASS
Date(s):	29-Oct-18 - 31-Oct-18		
Temperature: 24.1 ºC	Relative Humidity: 49 %	Air Pressure: 1011 hPa	Power: 48 VDC
Remarks:			

Plot 7.6.11 Spurious emission measurements in 1000 - 3530 MHz at mid carrier frequency

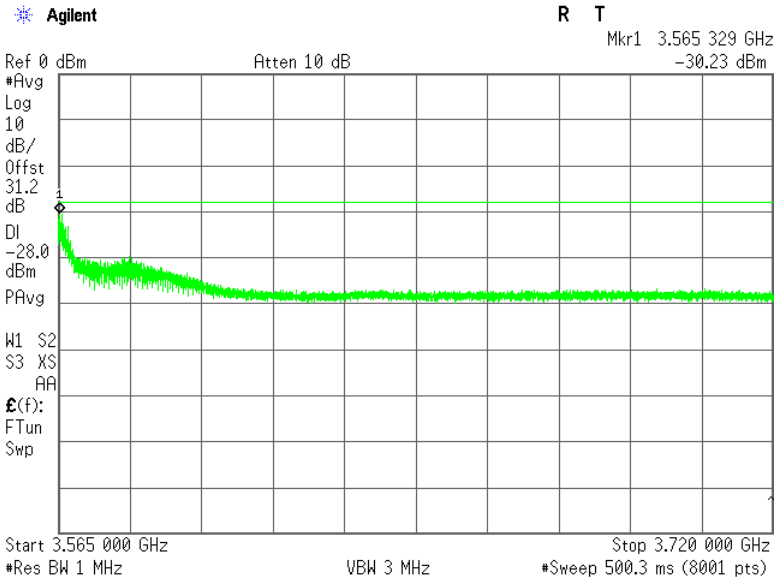


Plot 7.6.12 Spurious emission measurements in 1000 - 3530 MHz at high carrier frequency

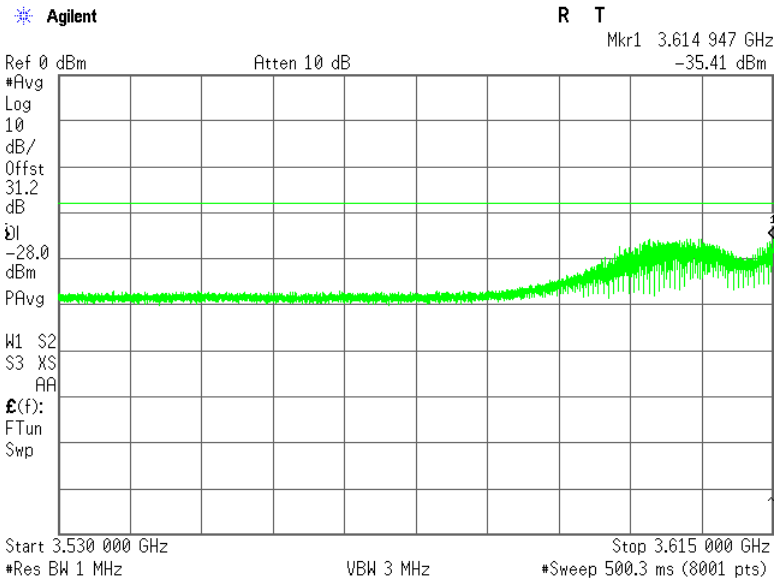


Test specification:	Section 96.41(e)(3), Conducted spurious emissions		
Test procedure:	Section 96.41(e)(3)		
Test mode:	Compliance	Verdict:	PASS
Date(s):	29-Oct-18 - 31-Oct-18		
Temperature: 24.1 ºC	Relative Humidity: 49 %	Air Pressure: 1011 hPa	Power: 48 VDC
Remarks:			

Plot 7.6.13 Spurious emission measurements in 3565 - 3720 MHz range at low carrier frequency

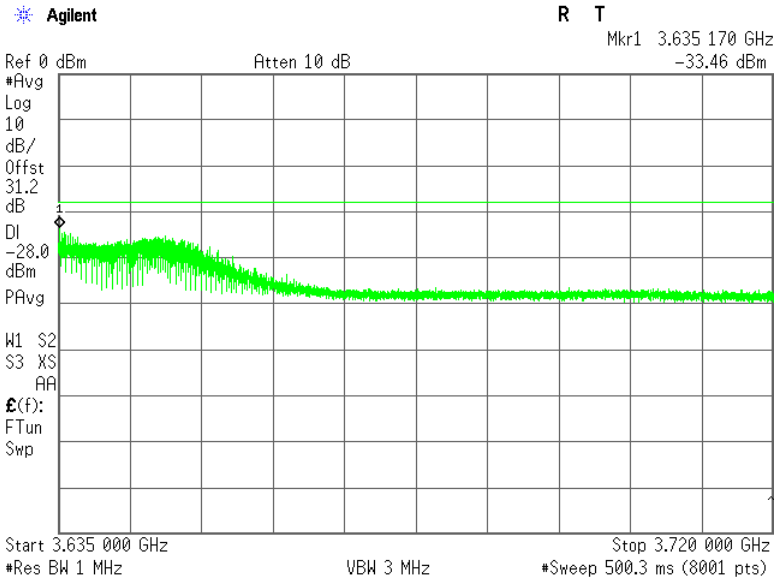


Plot 7.6.14 Spurious emission measurements in 3530 - 3615 MHz range at mid carrier frequency

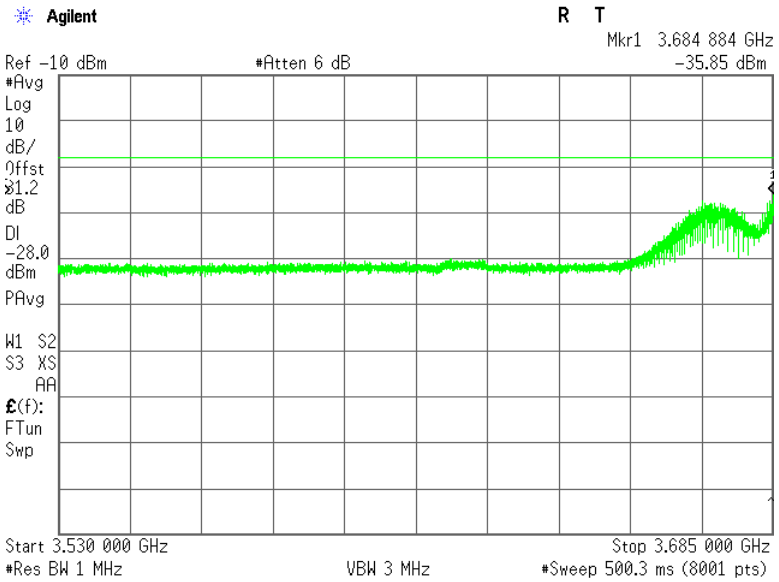


Test specification:	Section 96.41(e)(3), Conducted spurious emissions		
Test procedure:	Section 96.41(e)(3)		
Test mode:	Compliance	Verdict:	PASS
Date(s):	29-Oct-18 - 31-Oct-18		
Temperature: 24.1 ºC	Relative Humidity: 49 %	Air Pressure: 1011 hPa	Power: 48 VDC
Remarks:			

Plot 7.6.15 Spurious emission measurements in 3635 - 3700 MHz at mid carrier frequency

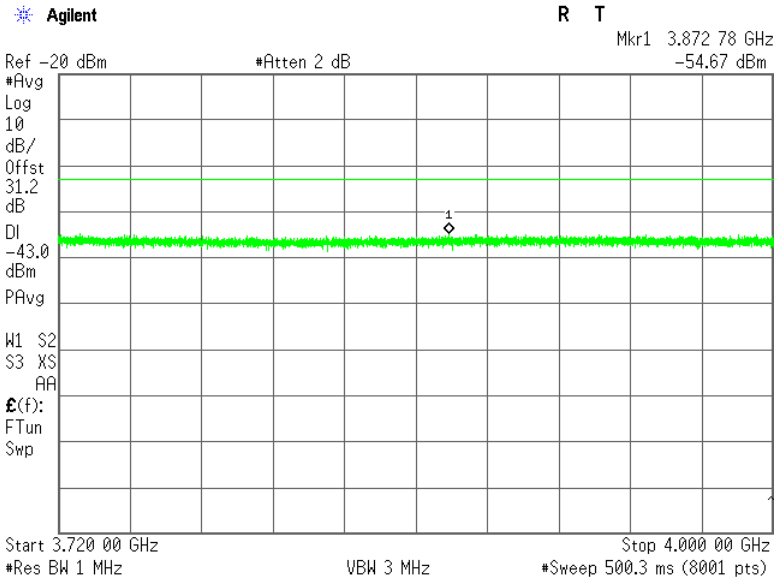


Plot 7.6.16 Spurious emission measurements in 3530 - 3685 MHz range at high carrier frequency

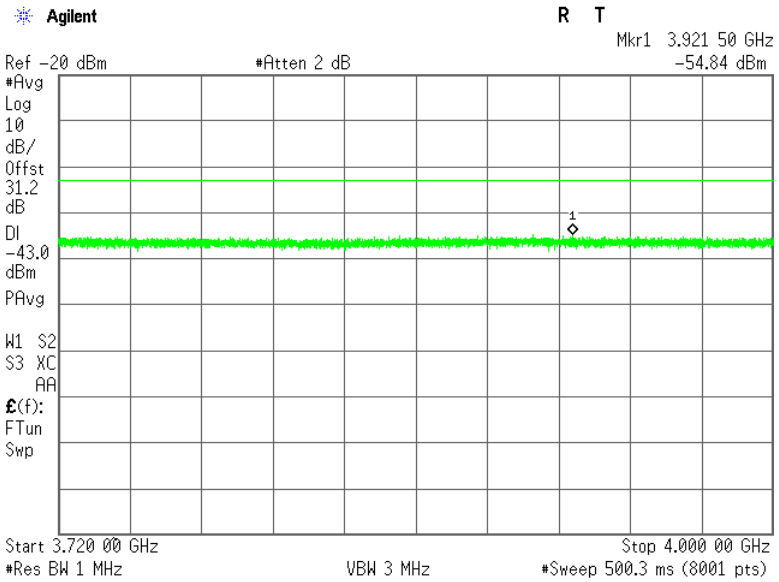


Test specification:	Section 96.41(e)(3), Conducted spurious emissions		
Test procedure:	Section 96.41(e)(3)		
Test mode:	Compliance	Verdict:	PASS
Date(s):	29-Oct-18 - 31-Oct-18		
Temperature: 24.1 ºC	Relative Humidity: 49 %	Air Pressure: 1011 hPa	Power: 48 VDC
Remarks:			

Plot 7.6.17 Spurious emission measurements in 3720 - 4000 MHz range at low carrier frequency

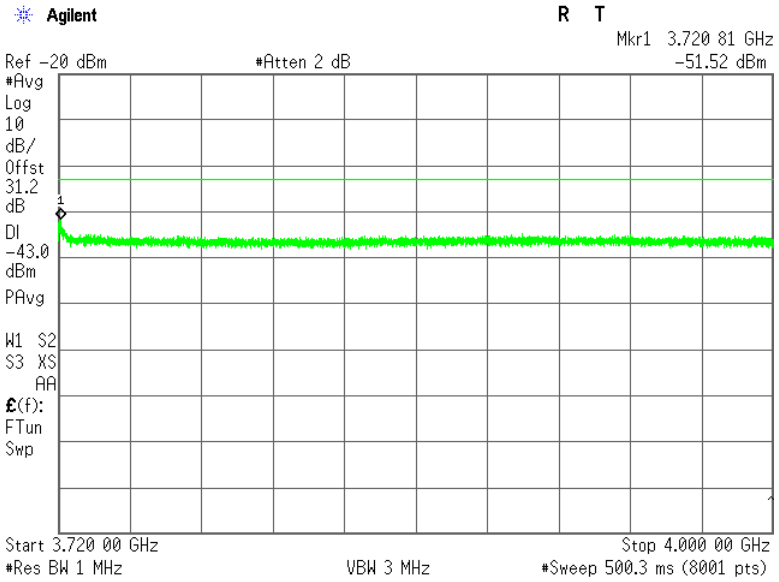


Plot 7.6.18 Spurious emission measurements in 3720 - 4000 MHz at mid carrier frequency



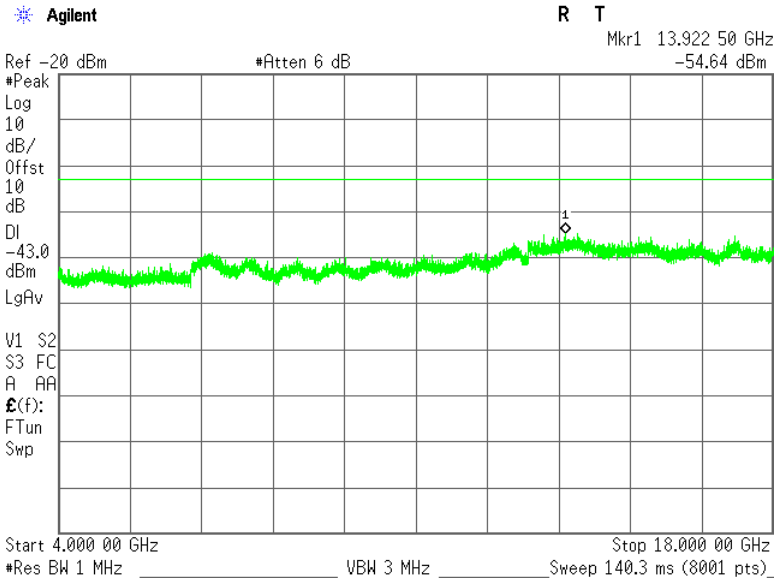
Test specification:	Section 96.41(e)(3), Conducted spurious emissions		
Test procedure:	Section 96.41(e)(3)		
Test mode:	Compliance	Verdict:	PASS
Date(s):	29-Oct-18 - 31-Oct-18		
Temperature: 24.1 ºC	Relative Humidity: 49 %	Air Pressure: 1011 hPa	Power: 48 VDC
Remarks:			

Plot 7.6.19 Spurious emission measurements in 3720 - 4000 MHz at high carrier frequency

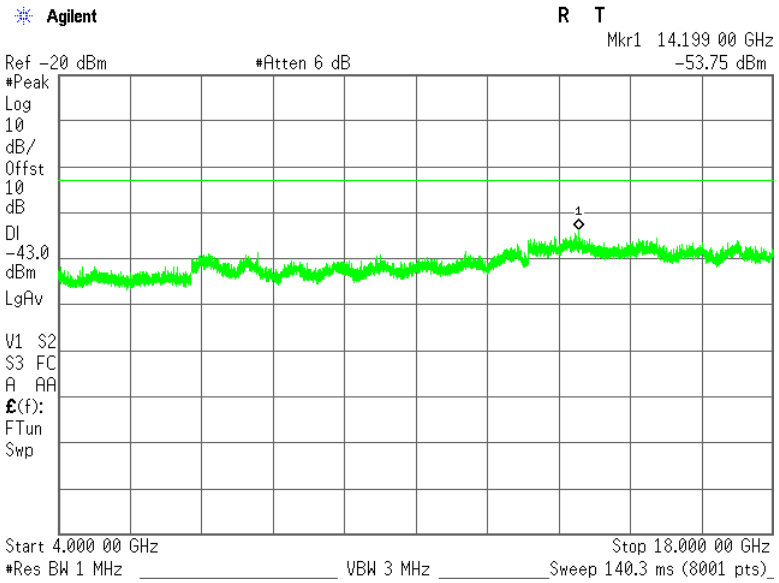


Test specification:	Section 96.41(e)(3), Conducted spurious emissions		
Test procedure:	Section 96.41(e)(3)		
Test mode:	Compliance	Verdict:	PASS
Date(s):	29-Oct-18 - 31-Oct-18		
Temperature: 24.1 ºC	Relative Humidity: 49 %	Air Pressure: 1011 hPa	Power: 48 VDC
Remarks:			

Plot 7.6.20 Spurious emission measurements in 4000 - 18000 MHz range at low carrier frequency

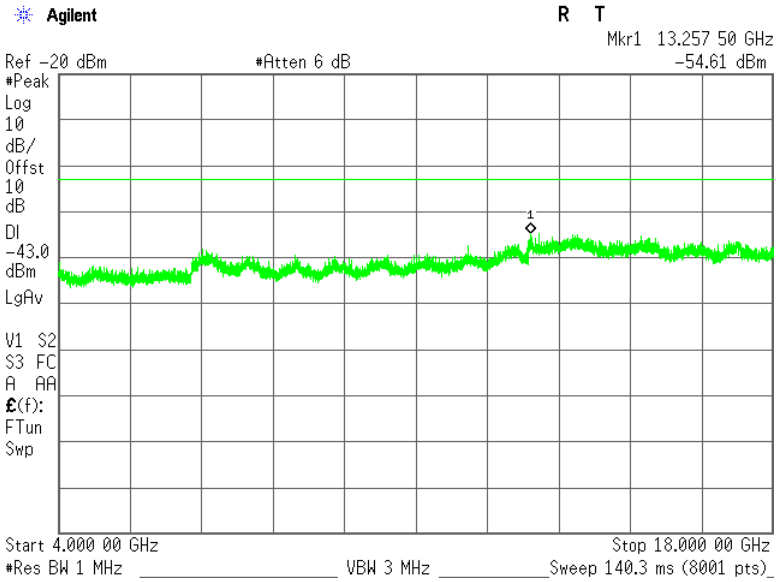


Plot 7.6.21 Spurious emission measurements in 4000 - 18000 MHz at mid carrier frequency

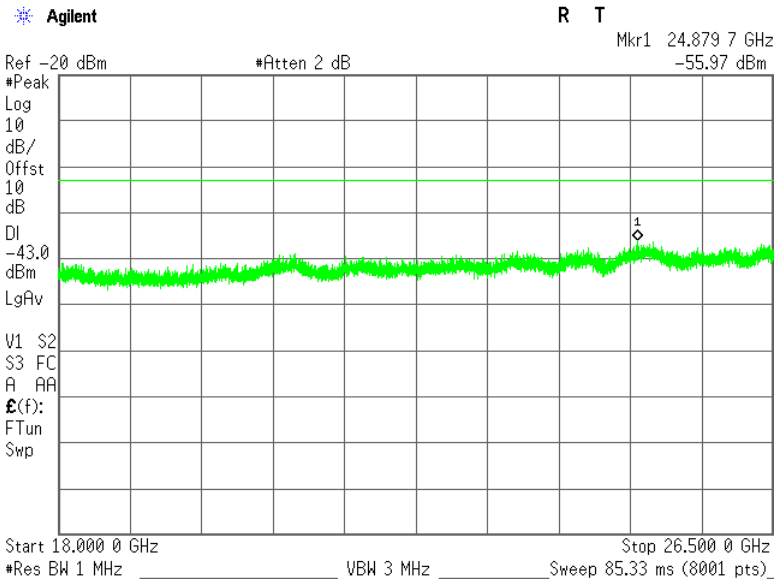


Test specification:	Section 96.41(e)(3), Conducted spurious emissions		
Test procedure:	Section 96.41(e)(3)		
Test mode:	Compliance	Verdict:	PASS
Date(s):	29-Oct-18 - 31-Oct-18		
Temperature: 24.1 ºC	Relative Humidity: 49 %	Air Pressure: 1011 hPa	Power: 48 VDC
Remarks:			

Plot 7.6.22 Spurious emission measurements in 4000 - 18000 MHz at high carrier frequency

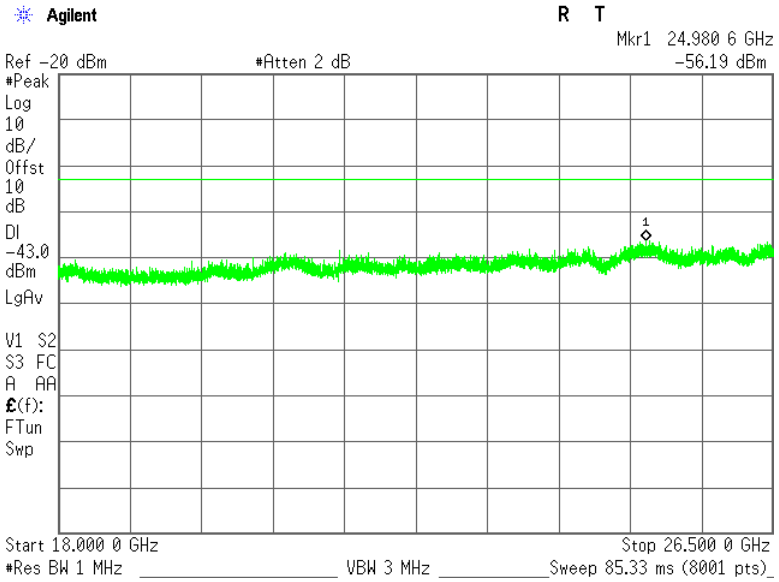


Plot 7.6.23 Spurious emission measurements in 18000 - 26500 MHz range at low carrier frequency

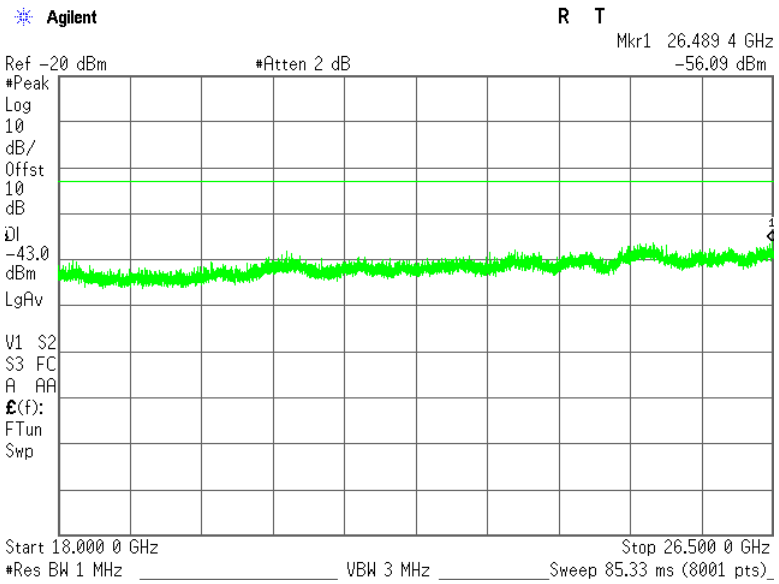


Test specification:	Section 96.41(e)(3), Conducted spurious emissions		
Test procedure:	Section 96.41(e)(3)		
Test mode:	Compliance	Verdict:	PASS
Date(s):	29-Oct-18 - 31-Oct-18		
Temperature: 24.1 ºC	Relative Humidity: 49 %	Air Pressure: 1011 hPa	Power: 48 VDC
Remarks:			

Plot 7.6.24 Spurious emission measurements in 18000 - 26500 MHz at mid carrier frequency

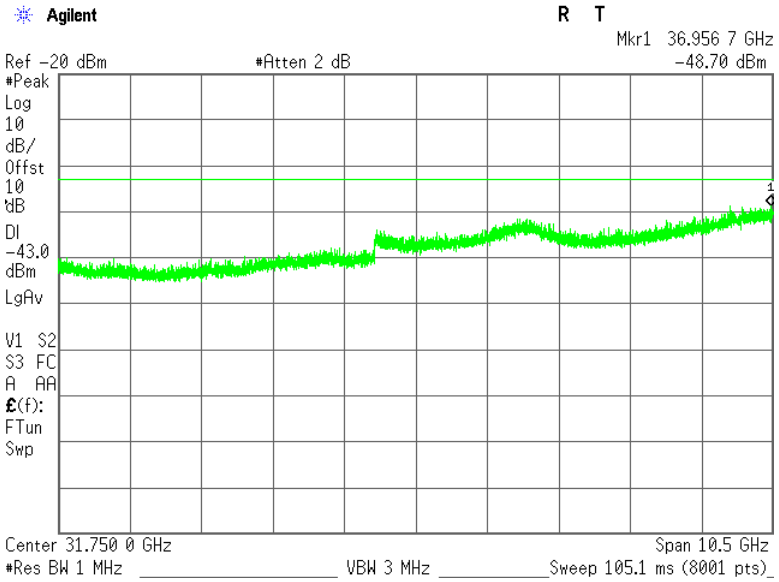


Plot 7.6.25 Spurious emission measurements in 18000 - 26500 MHz at high carrier frequency

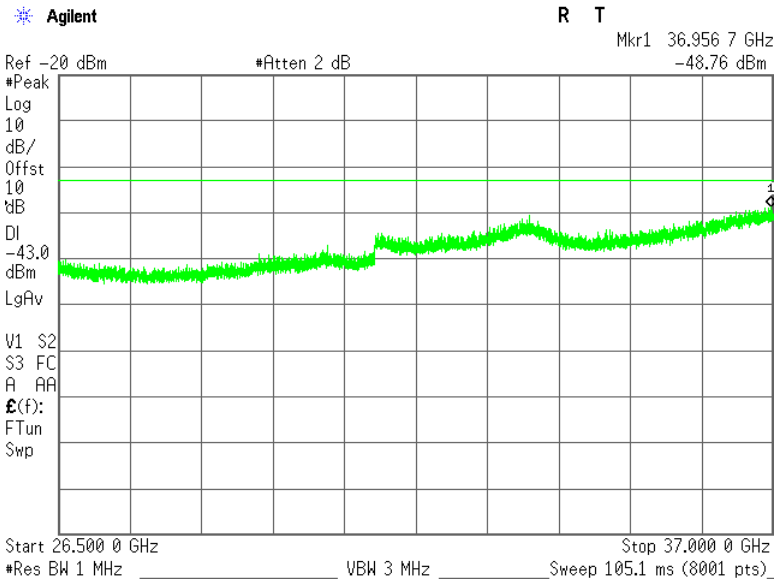


Test specification:	Section 96.41(e)(3), Conducted spurious emissions		
Test procedure:	Section 96.41(e)(3)		
Test mode:	Compliance	Verdict:	PASS
Date(s):	29-Oct-18 - 31-Oct-18		
Temperature: 24.1 ºC	Relative Humidity: 49 %	Air Pressure: 1011 hPa	Power: 48 VDC
Remarks:			

Plot 7.6.26 Spurious emission measurements in 26500 - 37000 MHz range at low carrier frequency

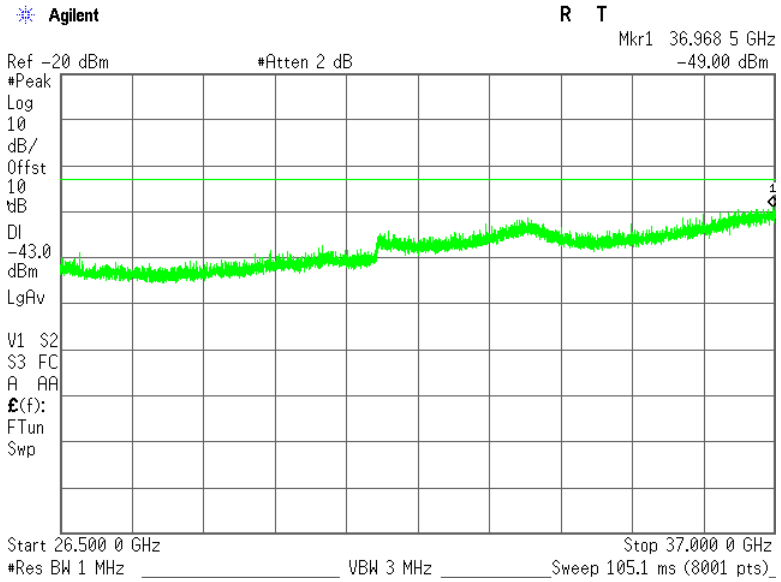


Plot 7.6.27 Spurious emission measurements in 26500 - 37000 MHz at mid carrier frequency



Test specification:	Section 96.41(e)(3), Conducted spurious emissions		
Test procedure:	Section 96.41(e)(3)		
Test mode:	Compliance	Verdict:	PASS
Date(s):	29-Oct-18 - 31-Oct-18		
Temperature: 24.1 ºC	Relative Humidity: 49 %	Air Pressure: 1011 hPa	Power: 48 VDC
Remarks:			

Plot 7.6.28 Spurious emission measurements in 26500 - 37000 MHz at high carrier frequency



Test specification:	Section 2.1055, Frequency stability		
Test procedure:	47 CFR, Section 2.1055		
Test mode:	Compliance	Verdict:	PASS
Date(s):	31-Oct-18 - 01-Nov-18		
Temperature: 24.2 ºC	Relative Humidity: 48 %	Air Pressure: 1011 hPa	Power: 48 VDC
Remarks:			

7.7 Frequency stability test

7.7.1 General

This test was performed to measure frequency stability of transmitter RF carrier. Specification test limits are given in Table 7.7.1.

Table 7.7.1 Frequency stability limits

Assigned frequency, MHz	Maximum allowed frequency displacement	
	ppm	Hz
3555.0		
3625.0		
3695.0		

7.7.2 Test procedure

7.7.2.1 The EUT was set up as shown in Figure 7.7.1, energized and its proper operation was checked.

7.7.2.2 The EUT power was turned off. Temperature within test chamber was set to +30˚C and a period of time sufficient to stabilize all of the oscillator circuit components was allowed.

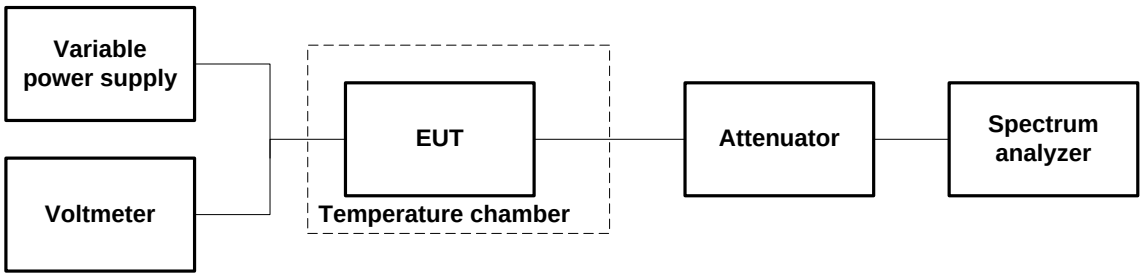
7.7.2.3 The EUT was powered on and carrier frequency was measured at start up moment and then every minute until frequency had been stabilized or 10 minutes elapsed whichever reached the last. The EUT was powered off.

7.7.2.4 The above procedure was repeated at 0˚C and at the lowest test temperature.

7.7.2.5 The EUT was powered on and carrier frequency was measured at start up moment and at the end of stabilization period at the rest of test temperatures and voltages. The EUT was powered off.

7.7.2.6 Frequency displacement was calculated and compared with the limit as provided in Table 7.7.2.

Figure 7.7.1 Frequency stability test setup



Test specification:	**Section 2.1055, Frequency stability**		
Test procedure:	47 CFR, Section 2.1055		
Test mode:	Compliance	**Verdict:**	PASS
Date(s):	31-Oct-18 - 01-Nov-18		
Temperature: 24.2 ºC	**Relative Humidity:** 48 %	**Air Pressure:** 1011 hPa	**Power:** 48 VDC
Remarks:			

Table 7.7.2 Frequency stability test results

OPERATING FREQUENCY: 3550 – 3700 MHz
NOMINAL POWER VOLTAGE: 56 VDC
TEMPERATURE STABILIZATION PERIOD: 20 min
POWER DURING TEMPERATURE TRANSITION: Off
SPECTRUM ANALYZER MODE: Counter
RESOLUTION BANDWIDTH: 1 kHz
VIDEO BANDWIDTH: 3 kHz
MODULATION: Unmodulated

T, ºC	Voltage, V	Frequency, MHz							Max frequency drift, Hz		Verdict
		Start up	1st min	2nd min	3rd min	4th min	5th min	10th min	Positive	Negative	
Low frequency 3555.0 MHz											
-30	nominal	3555.000001	3554.999992	3554.999997	3554.999982	3554.999988	3554.999986	3554.999989	8	-11	Comply
-20	nominal	3554.999992	NA	NA	NA	NA	NA	3554.999997	4	-1	Comply
-10	nominal	3554.999997	NA	NA	NA	NA	NA	3554.999983	4	-10	Comply
0	nominal	3554.999984	3554.999991	3554.999995	3555.000001	3554.999997	3554.999976	3554.999991	8	-17	Comply
10	nominal	3554.999997	NA	NA	NA	NA	NA	3554.999994	4	0	Comply
20	+15%	3554.999989	NA	NA	NA	NA	NA	3554.999991	0	-4	Comply
20	nominal	3554.999995	NA	NA	NA	NA	NA	3554.999993	2	0	Comply
20	-15%	3554.999993	NA	NA	NA	NA	NA	3554.999994	1	0	Comply
30	nominal	3554.999985	3554.999986	3554.999999	3555.000001	3554.999987	3554.999985	3554.999984	8	-9	Comply
40	nominal	3554.999988	NA	NA	NA	NA	NA	3554.999995	2	-5	Comply
50	nominal	3554.999984	NA	NA	NA	NA	NA	3554.999992	0	-9	Comply
Mid frequency 3625.0 MHz											
-30	nominal	3624.999982	3625.000002	3624.999986	3624.999983	3624.999986	3624.999994	3624.999986	13	-7	Comply
-20	nominal	3624.999992	NA	NA	NA	NA	NA	3625.000021	32	0	Comply
-10	nominal	3624.999993	NA	NA	NA	NA	NA	3625.000001	12	0	Comply
0	nominal	3624.999993	3624.999998	3624.999997	3624.999991	3624.999988	3625.000005	3624.999994	16	-1	Comply
10	nominal	3624.999993	NA	NA	NA	NA	NA	3624.999989	4	0	Comply
20	+15%	3624.999999	NA	NA	NA	NA	NA	3624.999992	10	0	Comply
20	nominal	3624.999997	NA	NA	NA	NA	NA	3624.999989	8	0	Comply
20	-15%	3624.999994	NA	NA	NA	NA	NA	3624.999993	5	0	Comply
30	nominal	3624.999983	3625.000005	3625.000003	3624.999992	3625.000005	3624.999985	3624.999984	16	-6	Comply
40	nominal	3624.999993	NA	NA	NA	NA	NA	3624.999996	7	0	Comply
50	nominal	3624.999988	NA	NA	NA	NA	NA	3624.999989	0	-1	Comply
High frequency 3695.0 MHz											
-30	nominal	3694.999994	3695.000002	3694.999987	3695.000008	3694.999999	3694.999997	3694.999991	17	-4	Comply
-20	nominal	3695.000012	NA	NA	NA	NA	NA	3695.000022	31	0	Comply
-10	nominal	3695.000002	NA	NA	NA	NA	NA	3694.999997	11	0	Comply
0	nominal	3695.000001	3694.999983	3695.000003	3695.000006	3695.000007	3695.000006	3694.999988	16	-8	Comply
10	nominal	3694.999984	NA	NA	NA	NA	NA	3694.999995	4	-7	Comply
20	+15%	3694.999995	NA	NA	NA	NA	NA	3694.999988	4	-3	Comply
20	nominal	3694.999996	NA	NA	NA	NA	NA	3694.999991	5	0	Comply
20	-15%	3695.000004	NA	NA	NA	NA	NA	3694.999989	13	-2	Comply
30	nominal	3695.000006	3695.000007	3695.000007	3695.000004	3694.999989	3695.000008	3695.000006	17	-2	Comply
40	nominal	3695.000001	NA	NA	NA	NA	NA	3695.000002	11	0	Comply
50	nominal	3694.999996	NA	NA	NA	NA	NA	3694.999995	5	0	Comply

* - Reference frequency

Reference numbers of test equipment used

HL 0493	HL 2171	HL 3901	HL 4164	HL 4355			

Full description is given in Appendix A.

8 APPENDIX A Test equipment and ancillaries used for tests

HL No	Description	Manufacturer	Model	Ser. No.	Last Cal./ Check	Due Cal./ Check
0030	Antenna, Dipole, Tunable, 30 - 200 MHz	Electro-Metrics	TDA-25/30	261	08-Feb-18	08-Feb-19
0446	Antenna, Loop, Active, 10 kHz - 30 MHz	EMCO	6502	2857	11-Feb-18	11-Feb-19
0493	Temperature Chamber -45…175 deg C	Thermotron	S-1.2 Mini-Max	14016	11-Jun-18	11-Jun-19
0614	Antenna, Dipole, Tunable, 200 - 500 MHz	Electro-Metrics	TDS-30-1	334	08-Feb-18	08-Feb-19
0661	Generator Swept Signal, 10 MHz to 40 GHz, + 10 dBm	Hewlett Packard	83640B	3614A00266	11-Jul-18	11-Jul-19
2171	Multimeter	Fluke	177	79960418	19-Jul-17	19-Jul-19
3301	Power Meter, P-series, 50 MHz to 40 GHz	Agilent Technologies	N1911A	MY45101057	02-May-18	02-May-19
3302	Power sensor, P-Series, 50 MHz to 40 GHz, -35/30 to 20 dBm	Agilent Technologies	N1922A	MY45240586	02-May-18	02-May-19
3787	Precision Fixed Attenuator, 50 Ohm, 5 W, 10 dB, DC to 18 GHz	Mini-Circuits	BW-S10W5+	NA	10-Dec-18	10-Dec-19
3818	PSA Series Spectrum Analyzer, 3 Hz- 44 GHz	Agilent Technologies	E4446A	MY48250288	28-May-18	28-May-19
3868	Directional coupler, 2 GHz to 8 GHz, 10 dB, SMA Female	Narda	4203-10	06978	21-May-18	21-May-20
3901	Microwave Cable Assembly, 40.0 GHz, 3.5 m, SMA/SMA	Huber-Suhner	SUCOFLEX 102A	1225/2A	07-Feb-18	07-Feb-19
3903	Microwave Cable Assembly, 40.0 GHz, 1.5 m, SMA/SMA	Huber-Suhner	SUCOFLEX 102A	1226/2A	07-Feb-18	07-Feb-19
4164	DC Power Supply, 60V, 5A	Standig	605D	NA	05-Nov-18	05-Nov-19
4278	Test Cable , DC-18 GHz, 4.6 m, N/M - N/M	Mini-Circuits	APC-15FT-NMNM+	0755A	01-Aug-18	01-Aug-19
4355	Signal and Spectrum Analyzer, 9 kHz to 7 GHz	Rohde & Schwarz	FSV 7	101630	28-Jun-18	28-Sep-19
4360	EMI Test Receiver, 20 Hz to 40 GHz.	Rohde & Schwarz	ESU40	100322	26-Dec-17	26-Dec-18
4771	Tape-measure, 5m/16FT	FISCO	Tri-Matic	NA	03-Oct-18	03-Oct-19
4933	Active Horn Antenna, 1 GHz to 18 GHz	Com-Power Corporation	AHA-118	701046	04-Jan-18	04-Jan-19
4956	Active horn antenna, 18 to 40 GHz	Com-Power Corporation	AHA-840	105004	11-Jan-18	11-Jan-19
5111	RF cable, 40 GHz, 5.5 m, K-type	Huber-Suhner	SF102EA/11SK/11SK/5500MM	502493/2EA	09-Apr-18	09-Apr-19
5288	Trilog Antenna, 25 MHz - 8 GHz, 100W	Frankonia	ALX-8000E	00809	21-Jan-18	21-Jan-19
5405	RF cable, 18 GHz, N-N, 6 m	Huber-Suhner	SF118/11N(x2)	500023/118	01-Aug-18	01-Aug-19

9 APPENDIX B Measurement uncertainties

Expanded uncertainty at 95% confidence in Hermon Labs EMC measurements

Test description	Expanded uncertainty
Transmitter tests	
Carrier power conducted at antenna connector	± 1.7 dB
Carrier power radiated (substitution method)	± 4.5 dB
Occupied bandwidth	±8%
Conducted emissions at RF antenna connector	9 kHz to 2.9 GHz: ± 2.6 dB 2.9 GHz to 6.46 GHz: ± 3.5 dB 6.46 GHz to 13.2 GHz: ± 4.3 dB 13.2 GHz to 22.0 GHz: ± 5.0 dB 22.0 GHz to 26.8 GHz: ± 5.5 dB 26.8 GHz to 40.0 GHz: ± 4.8 dB
Spurious emissions radiated 30 MHz – 40 GHz (substitution method)	± 4.5 dB
Frequency error	30 – 300 MHz: ± 50.5 Hz (1.68 ppm) 300 – 1000 MHz: ± 168 Hz (0.56 ppm)
Transient frequency behaviour	187 Hz ± 13.9 %
Duty cycle, timing (Tx ON / OFF) and average factor measurements	± 1.0 %
Unintentional radiator tests	
Conducted emissions with LISN	9 kHz to 150 kHz: ± 3.9 dB 150 kHz to 30 MHz: ± 3.8 dB
Radiated emissions at 3 m measuring distance Horizontal polarization Vertical polarization	 Biconilog antenna: ± 5.3 dB Biconical antenna: ± 5.0 dB Log periodic antenna: ± 5.3 dB Double ridged horn antenna: ± 5.3 dB Biconilog antenna: ± 6.0 dB Biconical antenna: ± 5.7 dB Log periodic antenna: ± 6.0 dB Double ridged horn antenna: ± 6.0 dB

Hermon Laboratories is accredited by A2LA for calibration according to present requirements of ISO/IEC 17025 and NCSL Z540-1. The accreditation is granted to perform calibration of parameters that are listed in the Scope of Hermon Laboratories Accreditation.

Hermon Laboratories calibrates its reference and transfer standards by calibration laboratories accredited to ISO/IEC 17025 by a mutually recognized Accreditation Body or by a recognized national metrology institute. All reference and transfer standards used in the calibration system are traceable to national or international standards.

In-house calibration of all test and measurement equipment is performed on a regular basis according to Hermon Laboratories calibration procedures, manufacturer calibration/verification procedures or procedures defined in the relevant standards. The Hermon Laboratories test and measurement equipment is calibrated within the tolerances specified by the manufacturers and/or by the relevant standards.

10 APPENDIX C Test facility description

T Tests were performed at Hermon Laboratories Ltd., which is a fully independent, private, EMC, Radio, Safety, Environmental and Telecommunication testing facility.
Hermon Laboratories is recognized and accredited by the Federal Communications Commission (USA) for 1, 2, 15, 18 parts of Code of Federal Regulations 47 (CFR 47), Test Firm Registration Number is 927748, Designation Number is IL1001; registered by Industry Canada for electromagnetic emissions, file number IC 2186A-1 for OATS, certified by VCCI, Japan (the registration numbers are R-10808 for OATS, R-1082 for anechoic chamber, G-10869 for RE measurements above 1 GHz, C-10845 for conducted emissions site and T-11606 for conducted emissions at telecommunication ports).
The laboratory is accredited by American Association for Laboratory Accreditation (USA) according to ISO/IEC 17025 for electromagnetic compatibility, product safety, telecommunications testing, environmental simulation and calibration (for exact scope please refer to Certificate No. 839.01, 839.03 and 839.04).

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11 APPENDIX D Specification references

FCC 47CFR part 96: 2017	Citizens Broaband Radio Service
FCC 47CFR part 1: 2017	Practice and procedure
FCC 47CFR part 2: 2017	Frequency allocations and radio treaty matters; general rules and regulations
ANSI C63.2: 1996	American National Standard for Instrumentation-Electromagnetic Noise and Field Strength, 10 kHz to 40 GHz-Specifications.
ANSI C63.4: 2014	American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz.

12 APPENDIX E Test equipment correction factors

Antenna factor
Active loop antenna
Model 6502, S/N 2857, HL 0446

Frequency, MHz	Magnetic antenna factor, dB	Electric antenna factor, dB
0.009	-32.8	18.7
0.010	-33.8	17.7
0.020	-38.3	13.2
0.050	-41.1	10.4
0.075	-41.3	10.2
0.100	-41.6	9.9
0.150	-41.7	9.8
0.250	-41.6	9.9
0.500	-41.8	9.8
0.750	-41.9	9.7
1.000	-41.4	10.1
2.000	-41.5	10.0
3.000	-41.4	10.2
4.000	-41.4	10.1
5.000	-41.5	10.1
10.000	-41.9	9.6
15.000	-41.9	9.6
20.000	-42.2	9.3
25.000	-42.8	8.7
30.000	-44.0	7.5

Antenna factor in dB(1/m) is to be added to receiver meter reading in dB(μV) to convert it into field strength in dB(μV/m).