



Test specification: Section 15.255(c)(2), Out of band radiated emissions below 40 GHz			
Test procedure: 47 CFR, Section 2.1053; ANSI C63.10, Section 9.13			
Test mode: Compliance		Verdict: PASS	
Date(s): 30-Apr-18 - 01-May-18			
Temperature: 24.2 °C	Relative Humidity: 48 %	Air Pressure: 1009 hPa	Power: -48 VDC
Remarks:			

7.3 Out of band radiated emissions below 40 GHz

7.3.1 General

This test was performed to measure field strength of fundamental and spurious emissions from the EUT. Specification test limits are given in Table 7.3.1.

Table 7.3.1 Radiated spurious emissions limits

Frequency, MHz	Field strength at 3 m, dB(μV/m)*		
	Peak	Quasi Peak	Average
0.009 – 0.090	148.5 – 128.5	NA	128.5 – 108.5**
0.090 – 0.110	NA	108.5 – 106.8**	NA
0.110 – 0.490	126.8 – 113.8	NA	106.8 – 93.8**
0.490 – 1.705	NA	73.8 – 63.0**	NA
1.705 – 30.0*		69.5	
30 – 88		40.0	
88 – 216		43.5	
216 – 960		46.0	
960 – 1000		54.0	
1000 – 40000	74.0	NA	54.0

*- The limit for 3 m test distance was calculated using the inverse square distance extrapolation factor as follows:

$$\text{Lim}_{S_2} = \text{Lim}_{S_1} + 40 \log (S_1/S_2),$$

where S_1 and S_2 – standard defined and test distance respectively in meters.

** - The limit decreases linearly with the logarithm of frequency.

Note: The above field strength limits applied from the lowest radio frequency generated in the device, without going below 9 kHz up to the tenth harmonic of the highest fundamental frequency but not exceeding 40 GHz for intentional radiators operated below 10 GHz and up to the fifth harmonic of the highest fundamental frequency but not exceeding 100 GHz for intentional radiators operated above 10 GHz.

Test specification: Section 15.255(c)(2), Out of band radiated emissions below 40 GHz			
Test procedure: 47 CFR, Section 2.1053; ANSI C63.10, Section 9.13			
Test mode:	Compliance	Verdict: PASS	
Date(s):	30-Apr-18 - 01-May-18		
Temperature: 24.2 °C	Relative Humidity: 48 %	Air Pressure: 1009 hPa	Power: -48 VDC
Remarks:			

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

7.3.2.1 The EUT was set up as shown in Figure 7.3.1, energized and the performance check was conducted.

7.3.2.2 The specified frequency range was investigated with antenna connected to spectrum analyzer/ EMI receiver. To find maximum radiation the turntable was rotated 360° and the measuring antenna was rotated around its vertical axis.

7.3.2.3 The worst test results (the lowest margins) were recorded in Table 7.3.2, Table 7.3.3 and shown in the associated plots.

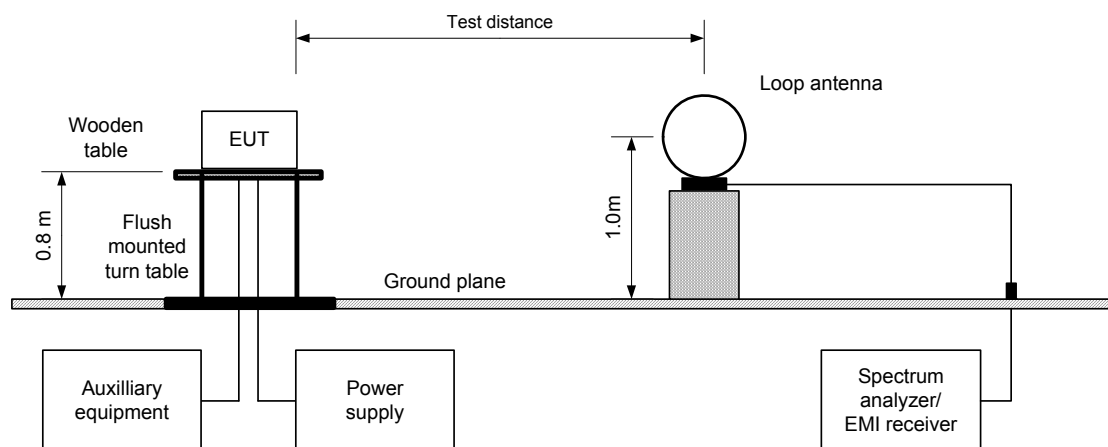
7.3.3 Test procedure for spurious emission field strength measurements above 30 MHz

7.3.3.1 The EUT was set up as shown in Figure 7.3.2, Figure 7.3.3, energized and the performance check was conducted.

7.3.3.2 The specified frequency range was investigated with antenna connected to spectrum analyzer/ EMI receiver. To find maximum radiation the turntable was rotated 360°, the measuring antenna height was changed from 1 to 4 m, its polarization was switched from vertical to horizontal.

7.3.3.3 The worst test results (the lowest margins) were recorded in Table 7.3.2, Table 7.3.3 and shown in the associated plots.

Figure 7.3.1 Setup for spurious emission field strength measurements below 30 MHz



Test specification: Section 15.255(c)(2), Out of band radiated emissions below 40 GHz			
Test procedure: 47 CFR, Section 2.1053; ANSI C63.10, Section 9.13			
Test mode: Compliance		Verdict: PASS	
Date(s): 30-Apr-18 - 01-May-18			
Temperature: 24.2 °C	Relative Humidity: 48 %	Air Pressure: 1009 hPa	Power: -48 VDC
Remarks:			

Figure 7.3.2 Setup for spurious emission field strength measurements in 30 – 1000 MHz

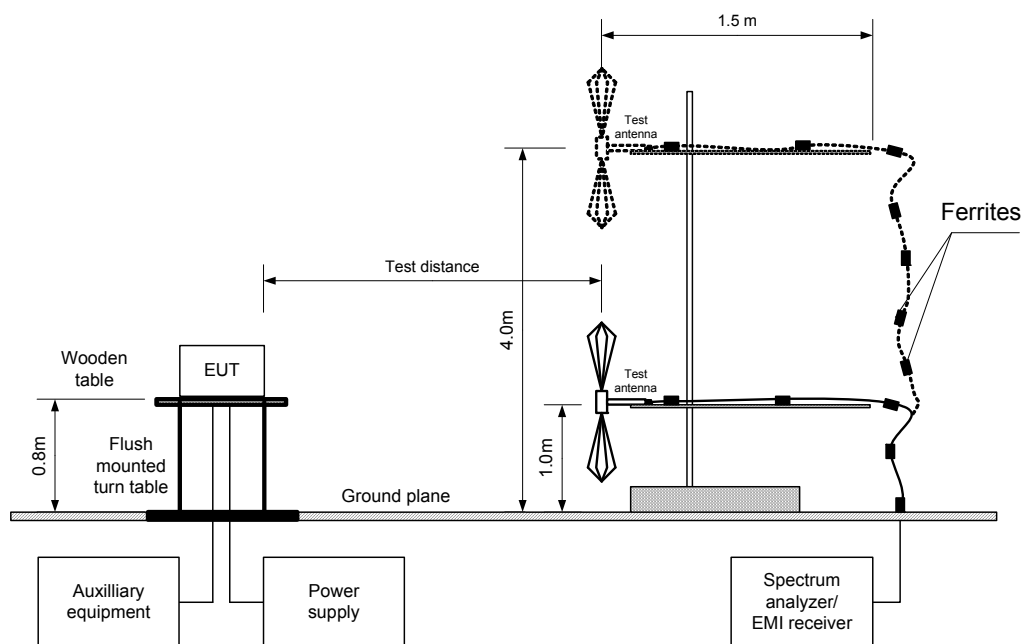
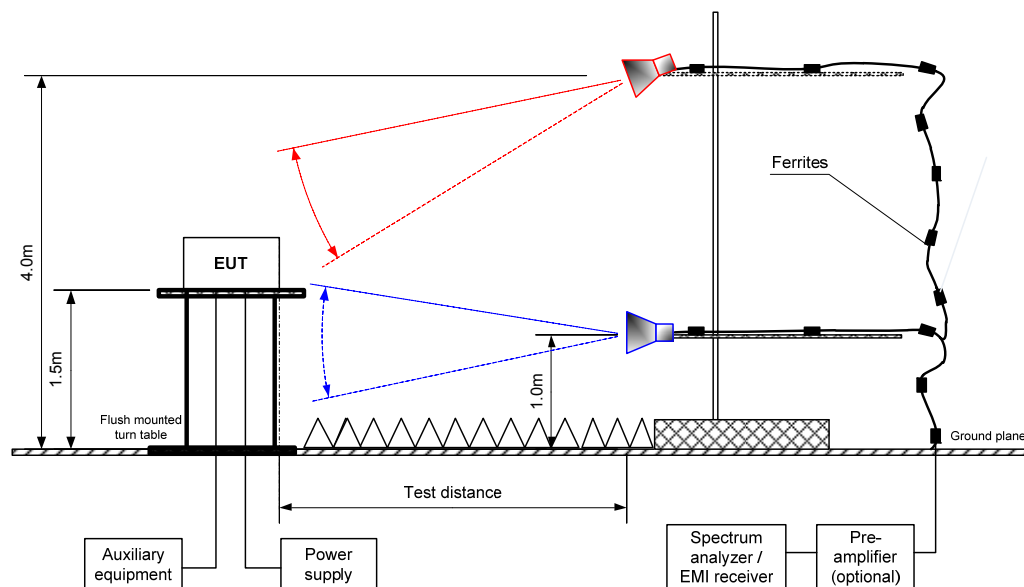


Figure 7.3.3 Setup for spurious emission field strength measurements above 1000 MHz





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Test specification: Section 15.255(c)(2), Out of band radiated emissions below 40 GHz			
Test procedure: 47 CFR, Section 2.1053; ANSI C63.10, Section 9.13			
Test mode: Compliance	Verdict: PASS		
Date(s): 30-Apr-18 - 01-May-18			
Temperature: 24.2 °C	Relative Humidity: 48 %	Air Pressure: 1009 hPa	Power: -48 VDC
Remarks:			

Table 7.3.2 Field strength of emissions below 1 GHz

TEST DISTANCE: 3 m
EUT POSITION: Typical (Vertical)
MODULATION: BPSK (2QAM)
MODULATING SIGNAL: PRBS
BIT RATE: 34.642 Mbps
TRANSMITTER OUTPUT POWER SETTINGS: Maximum
INVESTIGATED FREQUENCY RANGE: 0.009 – 1000 MHz
DETECTOR USED: Peak
RESOLUTION BANDWIDTH: 0.2 kHz (9 kHz – 150 kHz)
9.0 kHz (150 kHz – 30 MHz)
120 kHz (30 MHz – 1000 MHz)
VIDEO BANDWIDTH: ≥ Resolution bandwidth
TEST ANTENNA TYPE: Active loop (9 kHz – 30 MHz)
Biconilog (30 MHz – 1000 MHz)

Biconfig (50 MHz – 1000 MHz)

Frequency, MHz	Peak emission, dB(μV/m)	Quasi-peak			Antenna polarization	Antenna height, m	Turn-table position**, degrees	Verdict
		Measured emission, dB(μV/m)	Limit, dB(μV/m)	Margin, dB*				
Carrier frequency 57025 MHz								
33.971833	36.88	35.24	40.00	-3.12	Vert	1.02	-58	Pass
34.464833	34.75	33.11	40.00	-5.25	Vert	1.02	16	
53.934333	39.54	37.58	40.00	-0.46	Vert	1.04	161	
67.432833	29.23	26.96	40.00	-10.77	Vert	1.02	47	
138.347167	33.11	25.72	43.50	-15.39	Vert	1.02	114	
203.165500	29.18	32.18	43.50	-11.32	Hor	1.33	-171	
875.024333	36.65	33.74	46.00	-12.26	Hor	1.77	-155	
Carrier frequency 61500 MHz								
34.464833	35.82	34.13	40.00	-5.87	Vert	1.02	16	Pass
50.924000	39.48	38.14	40.00	-1.86	Vert	1.33	180	
52.938667	38.11	36.55	40.00	-3.45	Vert	1.35	-9	
138.347167	34.68	26.88	43.50	-16.62	Vert	1.02	114	
875.024333	36.88	33.86	46.00	-12.14	Hor	1.77	-155	
Carrier frequency 65975 MHz								
50.438000	36.34	34.67	40.00	-5.33	Vert	1.33	5	Pass
53.425667	40.03	38.56	40.00	-1.44	Vert	1.02	-167	
152.347167	33.21	29.96	40.00	-10.77	Vert	1.02	47	
875.024333	39.83	36.17	46.00	-9.83	Hor	1.77	-155	

*- Margin = Measured emission - specification limit.

** - EUT front panel refer to 0 degrees position of turntable.

Test specification: Section 15.255(c)(2), Out of band radiated emissions below 40 GHz			
Test procedure: 47 CFR, Section 2.1053; ANSI C63.10, Section 9.13			
Test mode: Compliance		Verdict: PASS	
Date(s): 30-Apr-18 - 01-May-18			
Temperature: 24.2 °C	Relative Humidity: 48 %	Air Pressure: 1009 hPa	Power: -48 VDC
Remarks:			

Table 7.3.3 Spurious emissions at frequencies above 1 GHz

TEST DISTANCE: 3 m
EUT POSITION: Typical (Vertical)
MODULATION: BPSK (2QAM)
MODULATING SIGNAL: PRBS
BIT RATE: 34.642 Mbps
TRANSMITTER OUTPUT POWER SETTINGS: Maximum
DUTY CYCLE: 100 %
INVESTIGATED FREQUENCY RANGE: 1000 -40000 MHz
DETECTOR USED: Peak
RESOLUTION BANDWIDTH: 1.0 MHz (above 1000 MHz)
VIDEO BANDWIDTH: ≥ Resolution bandwidth
TEST ANTENNA TYPE: Double ridged guide (above 1000 MHz)

Antenna			Azimuth, degrees*	Peak field strength			Average field strength			Verdict
Frequency, MHz	Pol.	Height, m		Measured, dB(μV/m)	Limit, dB(μV/m)	Margin, dB**	Measured, dB(μV/m)	Limit, dB(μV/m)	Margin, dB**	
Carrier frequency 57025 MHz										
1374.566667	Hor	1.00	-130	56.87	74.0	-17.13	51.67	54.0	-2.33	Pass
Carrier frequency 61500 MHz										
1375.254833	Hor	1.02	-120	57.25	74.0	-16.75	52.02	54.0	-1.98	Pass
Carrier frequency 65975 MHz										
1375.202667	Hor	1.04	-132	57.04	74.0	-16.96	52.78	54.0	-1.22	Pass

*- EUT front panel refers to 0 degrees position of turntable.

**- Margin = dB below (negative if above) specification limit.

Table 7.3.4 Restricted bands

MHz	MHz	MHz	MHz	MHz	GHz
0.09 - 0.11	8.37625 - 8.38675	73 - 74.6	399.9 - 410	2690 - 2900	10.6 - 12.7
0.495 - 0.505	8.41425 - 8.41475	74.8 - 75.2	608 - 614	3260 - 3267	13.25 - 13.4
2.1735 - 2.1905	12.29 - 12.293	108 - 121.94	960 - 1240	3332 - 3339	14.47 - 14.5
4.125 - 4.128	12.51975 - 12.52025	123 - 138	1300 - 1427	3345.8 - 3358	15.35 - 16.2
4.17725 - 4.17775	12.57675 - 12.57725	149.9 - 150.05	1435 - 1626.5	3600 - 4400	17.7 - 21.4
4.20725 - 4.20775	13.36 - 13.41	156.52475 - 156.52525	1645.5 - 1646.5	4500 - 5150	22.01 - 23.12
6.215 - 6.218	16.42 - 16.423	156.7 - 156.9	1660 - 1710	5350 - 5460	23.6 - 24
6.26775 - 6.26825	16.69475 - 16.69525	162.0125 - 167.17	1718.8 - 1722.2	7250 - 7750	31.2 - 31.8
6.31175 - 6.31225	16.80425 - 16.80475	167.72 - 173.2	2200 - 2300	8025 - 8500	36.43 - 36.5
8.291 - 8.294	25.5 - 25.67	240 - 285	2310 - 2390	9000 - 9200	Above 38.6
8.362 - 8.366	37.5 - 38.25	322 - 335.4	2483.5 - 2500	9300 - 9500	

Reference numbers of test equipment used

HL 0446	HL 0604	HL 3001	HL 3818	HL 3901	HL 4353	HL 4360	HL 4933
HL 4956	HL 5245						

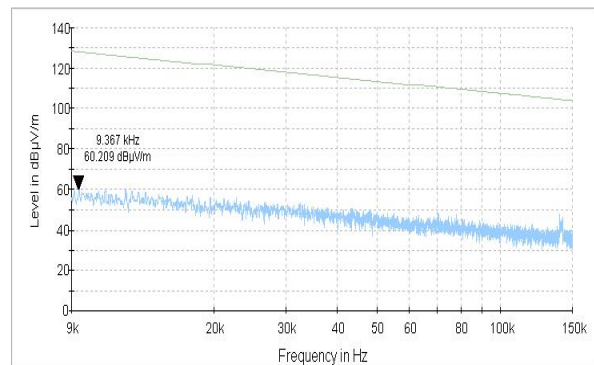
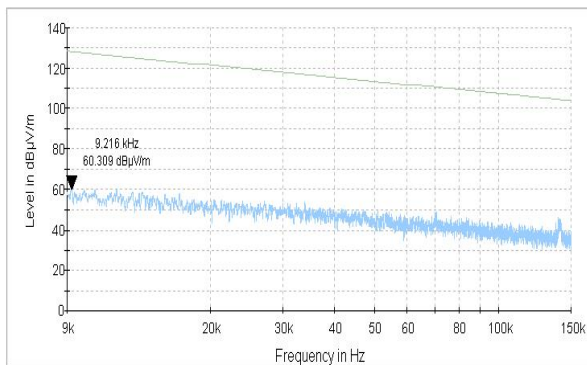
Full description is given in Appendix A.

Test specification: Section 15.255(c)(2), Out of band radiated emissions below 40 GHz			
Test procedure: 47 CFR, Section 2.1053; ANSI C63.10, Section 9.13			
Test mode: Compliance		Verdict: PASS	
Date(s): 30-Apr-18 - 01-May-18			
Temperature: 24.2 °C	Relative Humidity: 48 %	Air Pressure: 1009 hPa	Power: -48 VDC
Remarks:			

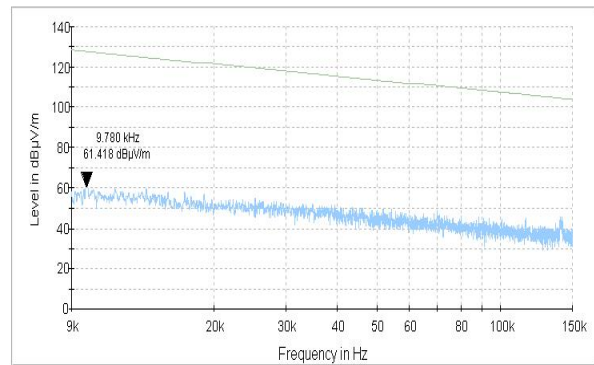
Plot 7.3.1 Radiated emission measurements from 9 to 150 kHz

TEST SITE:
TEST DISTANCE:
ANTENNA POLARIZATION:
EUT POSITION:
CARRIER FREQUENCY: Low 57025 MHz

Semi anechoic chamber
3 m
Vertical
Typical (Vertical)
CARRIER FREQUENCY: Mid 61500 MHz



CARRIER FREQUENCY: High 65975 MHz

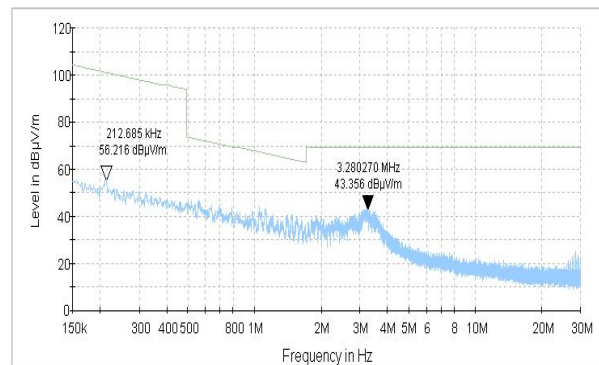
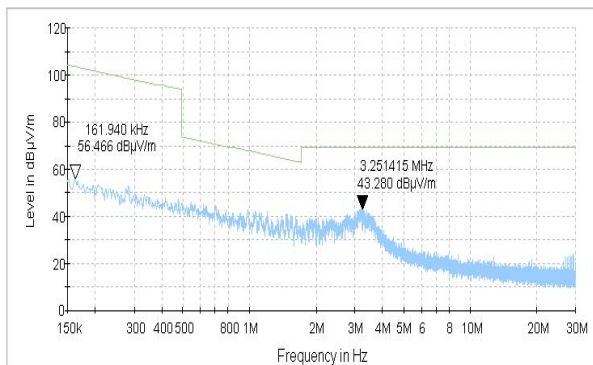


Test specification:		Section 15.255(c)(2), Out of band radiated emissions below 40 GHz	
Test procedure:		47 CFR, Section 2.1053; ANSI C63.10, Section 9.13	
Test mode:		Verdict: PASS	
Date(s):			
30-Apr-18 - 01-May-18			
Temperature: 24.2 °C	Relative Humidity: 48 %	Air Pressure: 1009 hPa	Power: -48 VDC
Remarks:			

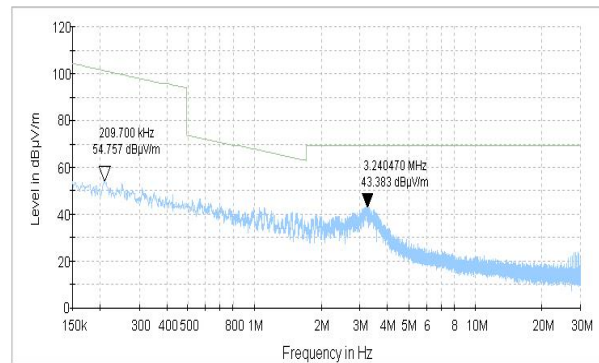
Plot 7.3.2 Radiated emission measurements from 0.15 to 30 MHz

TEST SITE:
TEST DISTANCE:
ANTENNA POLARIZATION:
EUT POSITION:
CARRIER FREQUENCY: Low 57025 MHz

Semi anechoic chamber
3 m
Vertical
Typical (Vertical)
CARRIER FREQUENCY: Mid 61500 MHz



CARRIER FREQUENCY: High 65975 MHz

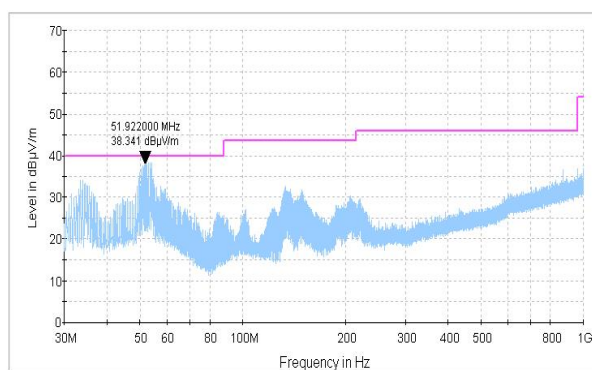
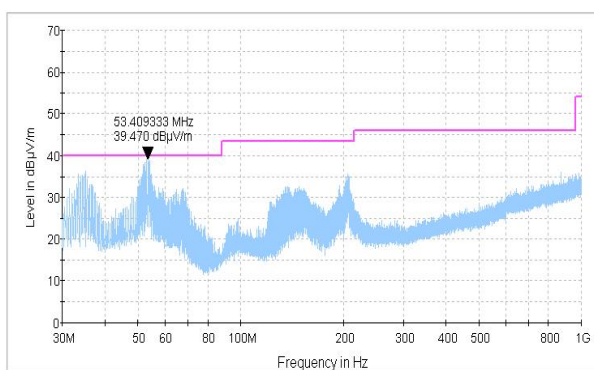


Test specification: Section 15.255(c)(2), Out of band radiated emissions below 40 GHz			
Test procedure: 47 CFR, Section 2.1053; ANSI C63.10, Section 9.13			
Test mode: Compliance		Verdict: PASS	
Date(s): 30-Apr-18 - 01-May-18			
Temperature: 24.2 °C	Relative Humidity: 48 %	Air Pressure: 1009 hPa	Power: -48 VDC
Remarks:			

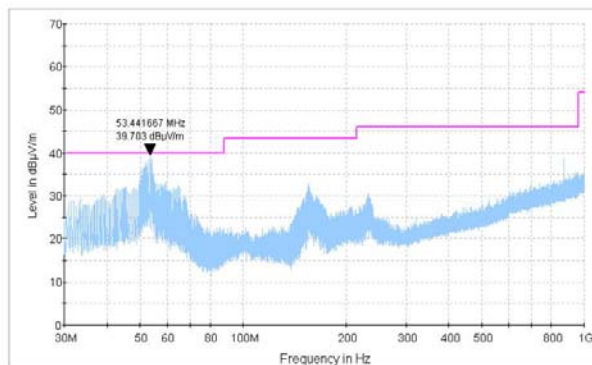
Plot 7.3.3 Radiated emission measurements from 30 to 1000 MHz

TEST SITE:
TEST DISTANCE:
ANTENNA POLARIZATION:
EUT POSITION:
CARRIER FREQUENCY: Low 57025 MHz

Semi anechoic chamber
3 m
Vertical
Typical (Vertical)
CARRIER FREQUENCY: Mid 61500 MHz



CARRIER FREQUENCY: High 65975 MHz





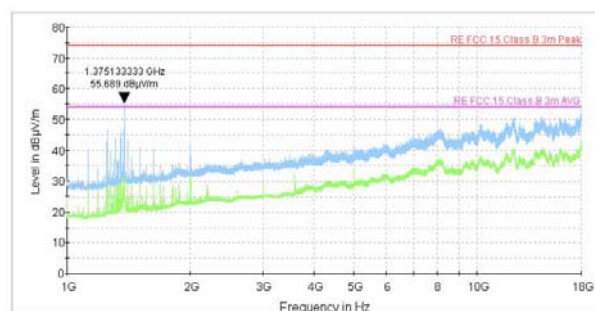
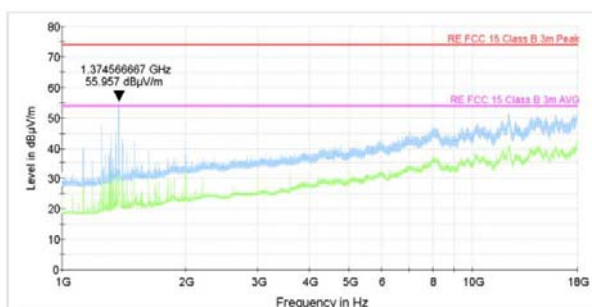
HERMON LABORATORIES

Test specification: Section 15.255(c)(2), Out of band radiated emissions below 40 GHz			
Test procedure: 47 CFR, Section 2.1053; ANSI C63.10, Section 9.13			
Test mode: Compliance		Verdict: PASS	
Date(s): 30-Apr-18 - 01-May-18			
Temperature: 24.2 °C	Relative Humidity: 48 %	Air Pressure: 1009 hPa	Power: -48 VDC
Remarks:			

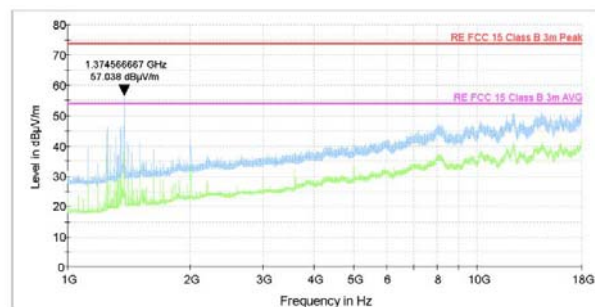
Plot 7.3.4 Radiated emission measurements from 1.0 to 18.0 MHz

TEST SITE:
TEST DISTANCE:
ANTENNA POLARIZATION:
EUT POSITION:
CARRIER FREQUENCY: Low 57025 MHz

Semi anechoic chamber
3 m
Vertical
Typical (Vertical)
CARRIER FREQUENCY: Mid 61500 MHz



CARRIER FREQUENCY: High 65975 MHz



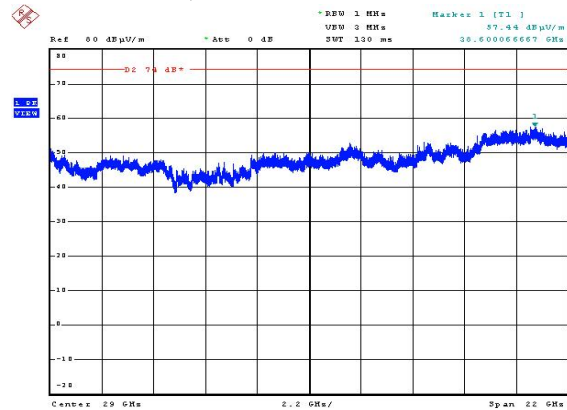
Test specification: Section 15.255(c)(2), Out of band radiated emissions below 40 GHz			
Test procedure: 47 CFR, Section 2.1053; ANSI C63.10, Section 9.13			
Test mode: Compliance		Verdict: PASS	
Date(s): 30-Apr-18 - 01-May-18			
Temperature: 24.2 °C	Relative Humidity: 48 %	Air Pressure: 1009 hPa	Power: -48 VDC
Remarks:			

Plot 7.3.5 Radiated emission measurements from 18.0 to 40.0 GHz

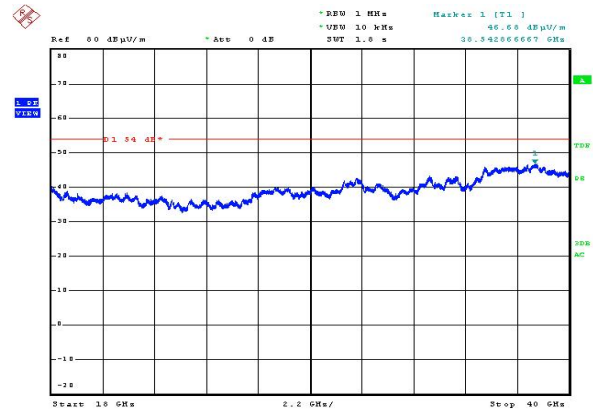
TEST SITE:
TEST DISTANCE:
ANTENNA POLARIZATION:
EUT POSITION:

Semi anechoic chamber
3 m
Vertical
Typical (Vertical)

CARRIER FREQUENCY: Low

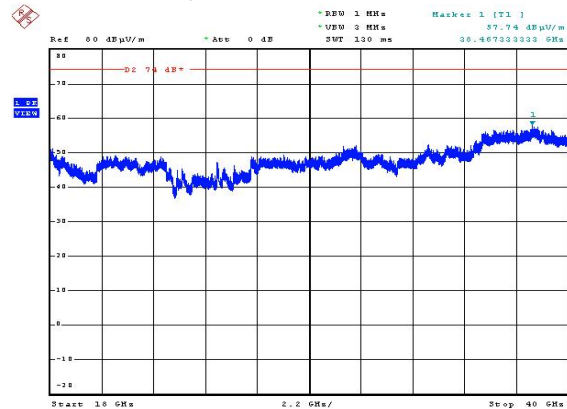


57025 MHz



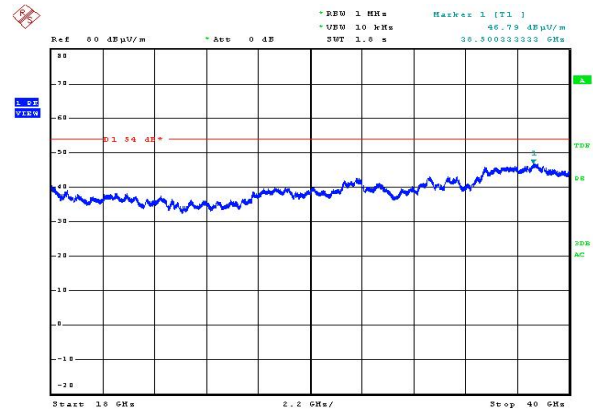
Date: 21.JUN.2018 05:45:21

CARRIER FREQUENCY: Mid



Date: 21.JUN.2018 05:52:05

61500 MHz



Date: 21.JUN.2018 06:11:20

Date: 21.JUN.2018 06:06:11

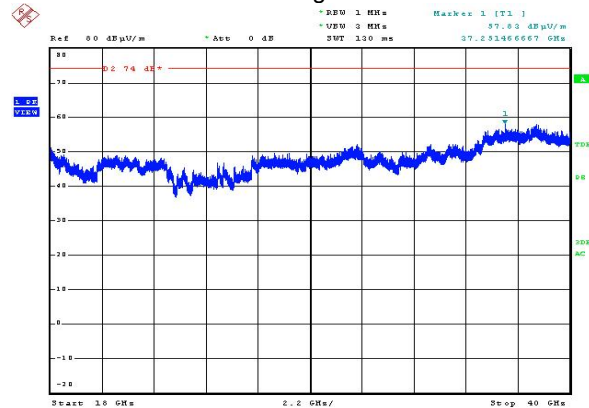
Test specification:		Section 15.255(c)(2), Out of band radiated emissions below 40 GHz	
Test procedure:		47 CFR, Section 2.1053; ANSI C63.10, Section 9.13	
Test mode:		Verdict: PASS	
Date(s):			
30-Apr-18 - 01-May-18			
Temperature: 24.2 °C	Relative Humidity: 48 %	Air Pressure: 1009 hPa	Power: -48 VDC
Remarks:			

Plot 7.3.6 Radiated emission measurements from 18.0 to 40.0 GHz

TEST SITE:
TEST DISTANCE:
ANTENNA POLARIZATION:
EUT POSITION:

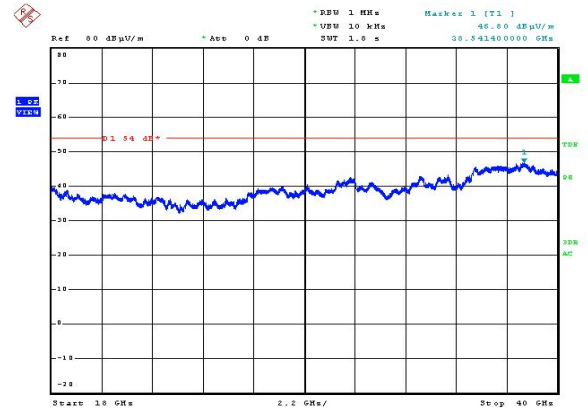
Semi anechoic chamber
3 m
Vertical
Typical (Vertical)

CARRIER FREQUENCY: High



Date: 21.JUN.2018 06:37:47

65975 MHz



Date: 21.JUN.2018 06:33:54



Test specification: Section 15.255(c)(3), Out of band radiated emissions above 40 GHz			
Test procedure: ANSI C63.10, Sections 9.9, 9.12			
Test mode: Compliance		Verdict: PASS	
Date(s): 25-Apr-18 - 16-Aug-18			
Temperature: 24.1 °C	Relative Humidity: 46 %	Air Pressure: 1011 hPa	Power: -48 VDC
Remarks:			

7.4 Out of band radiated emissions above 40 GHz up to 200 GHz

7.4.1 General

This test was performed to measure radiated spurious emissions from the EUT. Specification test limits are given in Table 7.4.1.

Table 7.4.1 Radiated spurious emission test limits

Frequency, GHz	Power density at 3 m distance pW/cm ²	Distance, m	Field strength dB(μV/m)*, peak	Field strength dB(μV/m)*, average
40 – 220	90.0	3.0	105.30	85.30
75 - 110	90.0	1.0	114.80**	94.80**
110 - 140	90.0	0.1	134.80**	114.8**
140 - 200	90.0	0.005	160.90**	140.90**

* - Field strength was calculated per equation (26) of ANSI C63.10-2013 section 9 as follows: $E = \sqrt{PD \times 377}$, where PD is the power density at the distance specified by the limit in W/m², E- field strength in V/m.

** - The limit for other test distance was calculated using the inverse distance extrapolation factor as follows:
 $\text{Lim}_{S_2} = \text{Lim}_{S_1} + 20 \log (S_1/S_2)$, where S₁ and S₂ – standard defined and test distance respectively in meters.

7.4.2 Test procedure for spurious emission field strength measurements

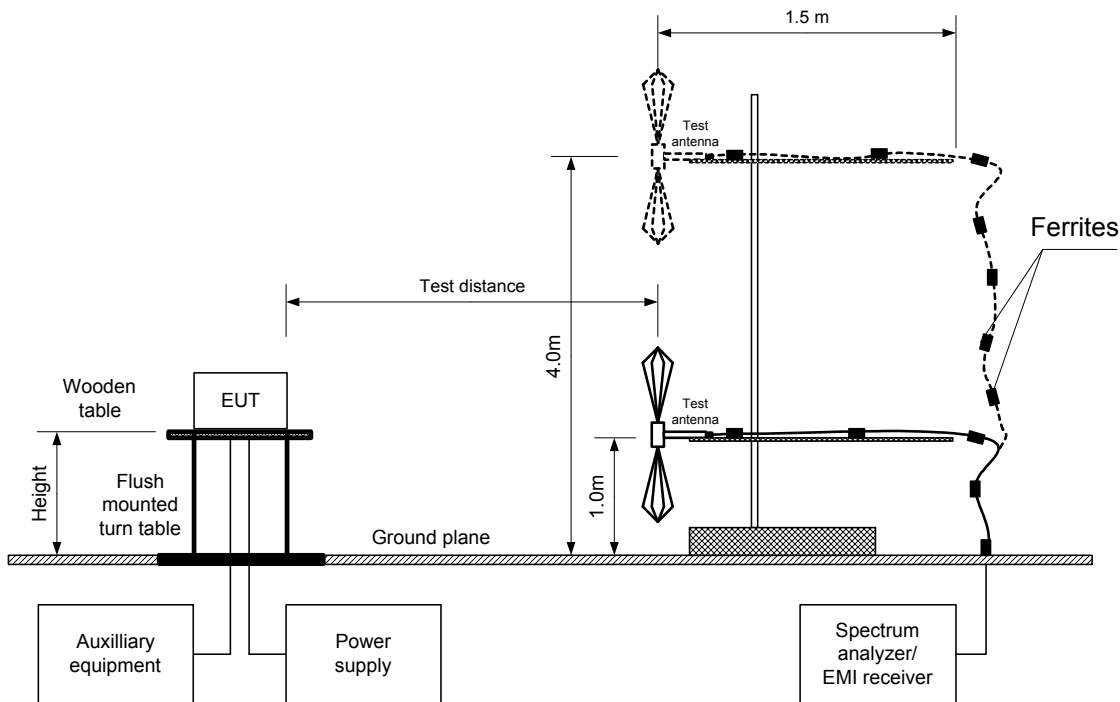
7.4.2.1 The EUT was set up as shown in Figure 7.4.1, energized and the performance check was conducted.

7.4.2.2 The specified frequency range was investigated with antenna connected to spectrum analyzer/ EMI receiver. To find maximum radiation the turntable was rotated 360°, the measuring antenna height was changed from 1 to 4 m, its polarization was switched from vertical to horizontal.

7.4.2.3 The test results are given in Table 7.4.2 and shown in the associated plots.

Remarks:

Figure 7.4.1 Radiated emissions above 40 GHz test set up





Test specification: Section 15.255(c)(3), Out of band radiated emissions above 40 GHz			
Test procedure: ANSI C63.10, Sections 9.9, 9.12			
Test mode: Compliance		Verdict: PASS	
Date(s): 25-Apr-18 - 16-Aug-18			
Temperature: 24.1 °C	Relative Humidity: 46 %	Air Pressure: 1011 hPa	Power: -48 VDC
Remarks:			

Table 7.4.2 Out of band radiated emissions test results

TEST DISTANCE: 0.005 - 3 m
 EUT POSITION: Typical (Vertical)
 MODULATION: BPSK
 CHANNEL BANDWIDTH: 50 MHz
 TRANSMITTER OUTPUT POWER: Maximum
 INVESTIGATED FREQUENCY RANGE: 40 – 200 GHz
 RESOLUTION BANDWIDTH: 1000 kHz
 VIDEO BANDWIDTH: ≥ Resolution bandwidth
 TEST ANTENNA TYPE: Standard Gain Horn 24dB (40-60 GHz)
 Standard Gain Horn 24dB (50-75 GHz)
 Standard Gain Horn 24dB (75-110 GHz)
 Standard Gain Horn 24dB (90-140 GHz)
 Standard Gain Horn 24dB (140-220 GHz)

Frequency, MHz	Antenna		Azimuth, degrees*	Peak field strength(VBW=3 MHz)			Average field strength(VBW=1 kHz)			Verdict
	Polariz.	Height, m		Measured, dB(μV/m)	Limit, dB(μV/m)	Margin, dB**	Measured, dB(μV/m)	Limit, dB(μV/m)	Margin, dB**	
Low carrier frequency										
No emissions were found										Pass
Mid carrier frequency										
No emissions were found										Pass
High carrier frequency										
No emissions were found										Pass

*- EUT front panel refer to 0 degrees position of turntable.

** - Margin = Measured emission - specification limit.

Reference numbers of test equipment used

HL 0747	HL 0748	HL 0770	HL 0771	HL 0772	HL 1295	HL 1299	HL 1300
HL 1303	HL 1304	HL 1306	HL 1312	HL 2909	HL 3235	HL 3290	HL 3291
HL 3294	HL 3297	HL 3305	HL 3329	HL 3433	HL 3434	HL 3455	HL 3901
HL 4023	HL 5376	HL 5380					

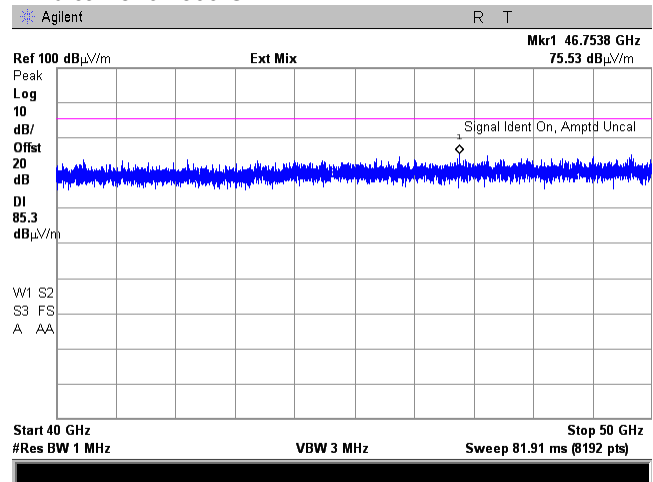
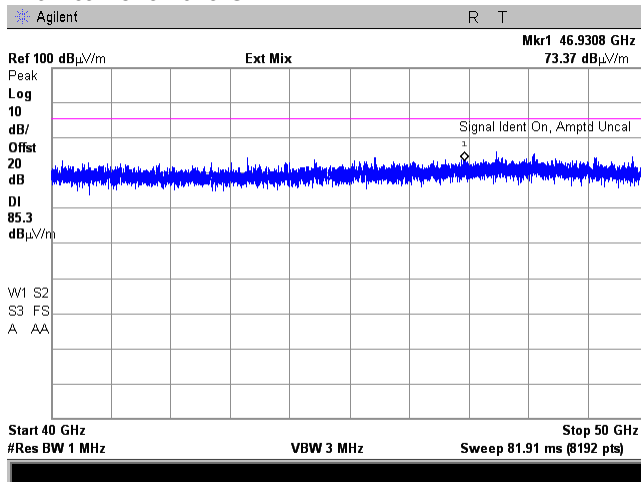
Full description is given in Appendix A.

Test specification: Section 15.255(c)(3), Out of band radiated emissions above 40 GHz			
Test procedure: ANSI C63.10, Sections 9.9, 9.12			
Test mode: Compliance		Verdict: PASS	
Date(s): 25-Apr-18 - 16-Aug-18			
Temperature: 24.1 °C	Relative Humidity: 46 %	Air Pressure: 1011 hPa	Power: -48 VDC
Remarks:			

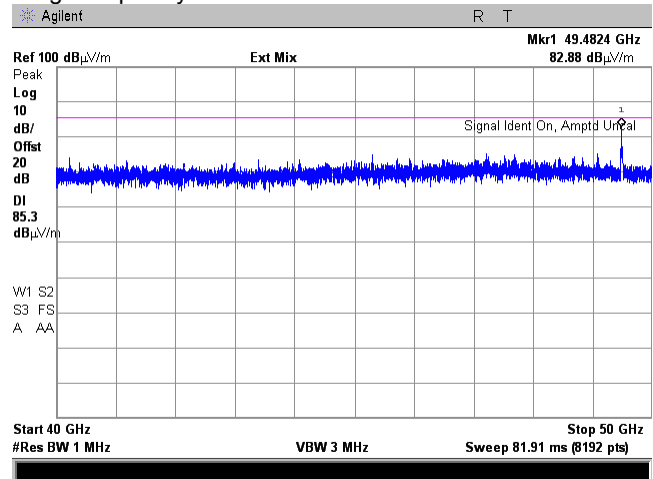
Plot 7.4.1 Spurious emission measurements in 40 – 50 GHz range

TEST SITE:
TEST DISTANCE:
ANTENNA POLARIZATION:
DETECTOR:
Low carrier 57.025 GHz

OATS
3 m
Vertical and Horizontal
Peak
Mid carrier 61.500 GHz



High frequency: 65.975 GHz

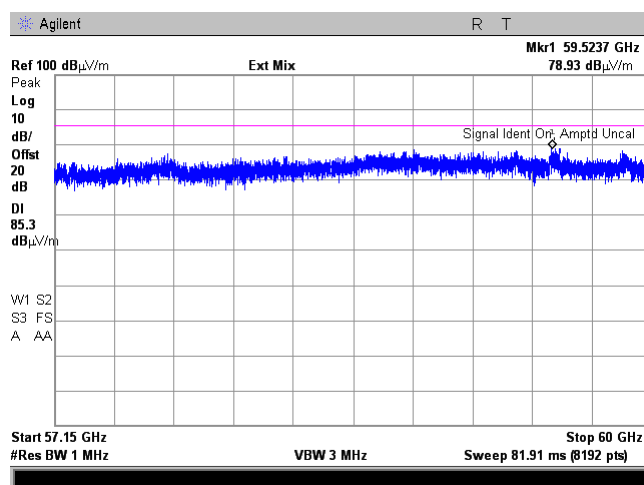
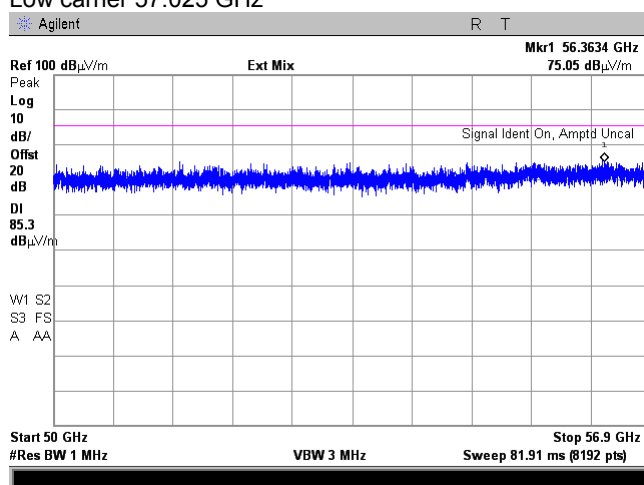


Test specification:		Section 15.255(c)(3), Out of band radiated emissions above 40 GHz	
Test procedure:		ANSI C63.10, Sections 9.9, 9.12	
Test mode:	Compliance	Verdict: PASS	
Date(s):	25-Apr-18 - 16-Aug-18		
Temperature: 24.1 °C	Relative Humidity: 46 %	Air Pressure: 1011 hPa	Power: -48 VDC
Remarks:			

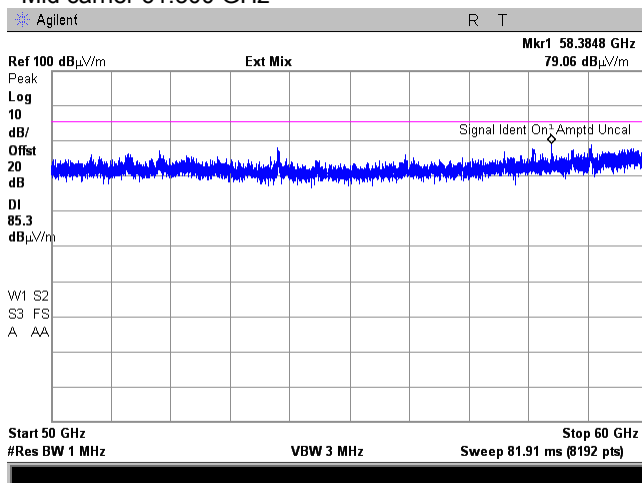
Plot 7.4.2 Spurious emission measurements in 50 – 60 GHz range

TEST SITE:
TEST DISTANCE:
ANTENNA POLARIZATION:
DETECTOR:
Low carrier 57.025 GHz

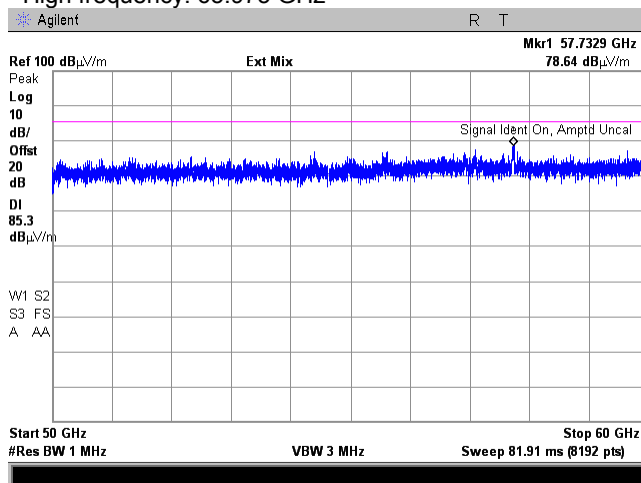
OATS
3 m
Vertical and Horizontal
Peak



Mid carrier 61.500 GHz



High frequency: 65.975 GHz

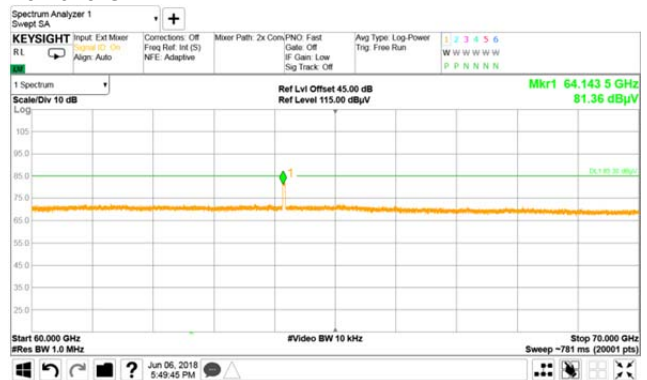
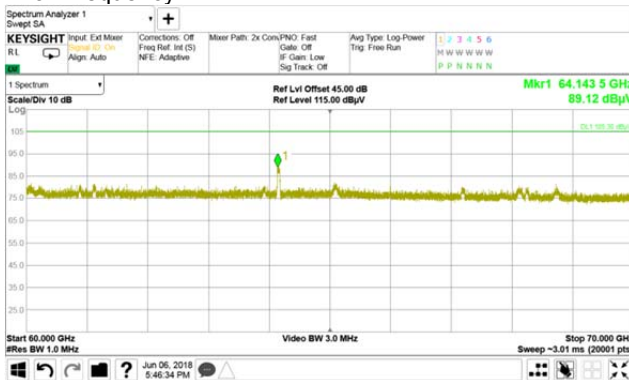


Test specification:		Section 15.255(c)(3), Out of band radiated emissions above 40 GHz	
Test procedure:		ANSI C63.10, Sections 9.9, 9.12	
Test mode:		Verdict: PASS	
Date(s):			
25-Apr-18 - 16-Aug-18			
Temperature: 24.1 °C	Relative Humidity: 46 %	Air Pressure: 1011 hPa	Power: -48 VDC
Remarks:			

Plot 7.4.3 Spurious emission measurements in 60 – 70 GHz range

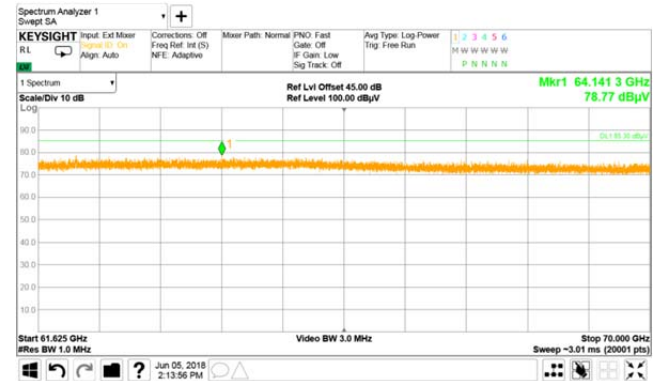
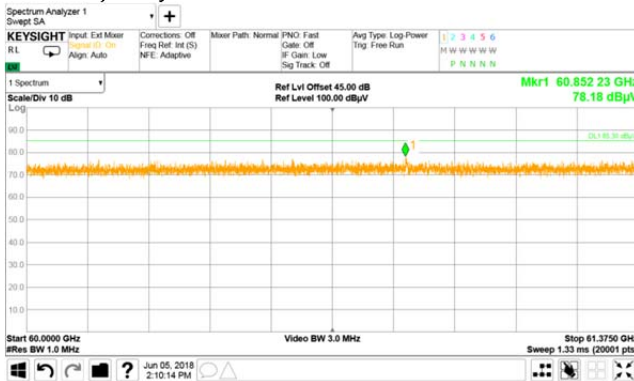
TEST SITE:
TEST DISTANCE:
ANTENNA POLARIZATION:
DETECTOR:
Low frequency:

OATS
3 m
Vertical and Horizontal
Peak
57.025 GHz



Mid frequency:

61.500 GHz



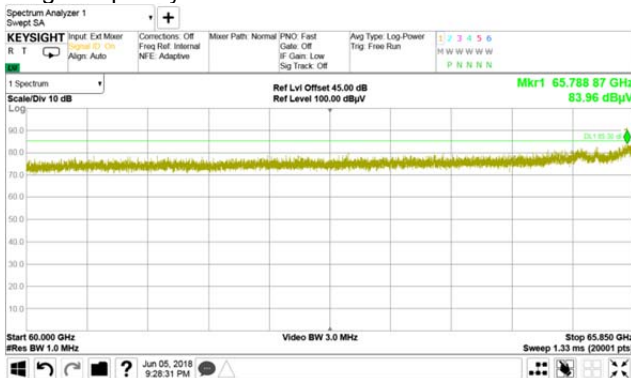
Test specification:		Section 15.255(c)(3), Out of band radiated emissions above 40 GHz	
Test procedure:		ANSI C63.10, Sections 9.9, 9.12	
Test mode:		Verdict: PASS	
Date(s):			
25-Apr-18 - 16-Aug-18			
Temperature: 24.1 °C	Relative Humidity: 46 %	Air Pressure: 1011 hPa	Power: -48 VDC
Remarks:			

Plot 7.4.4 Spurious emission measurements in 60 – 70 GHz range

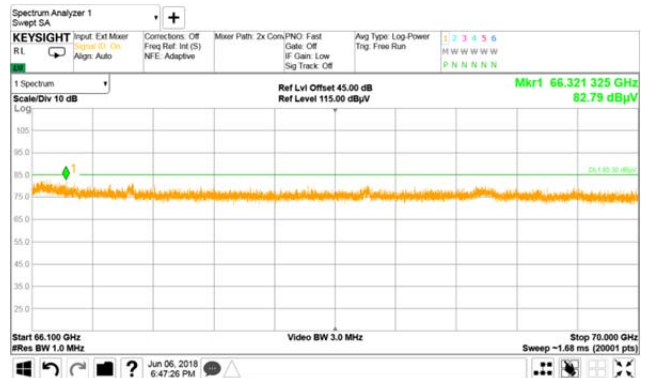
TEST SITE:
TEST DISTANCE:
ANTENNA POLARIZATION:
DETECTOR:

OATS
3 m
Vertical and Horizontal
Peak

High frequency:



65.975 GHz

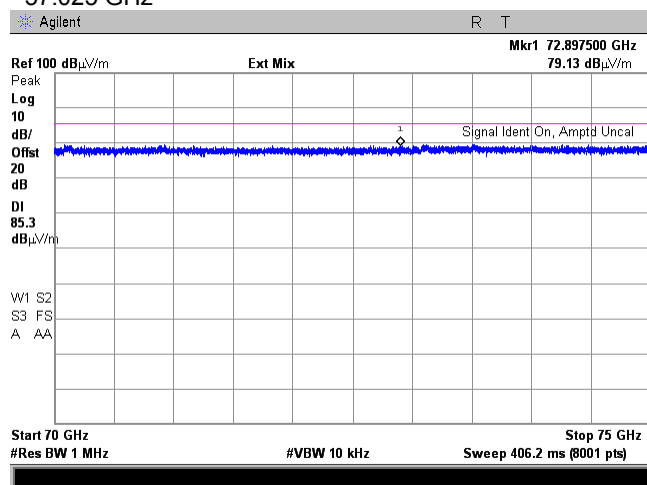
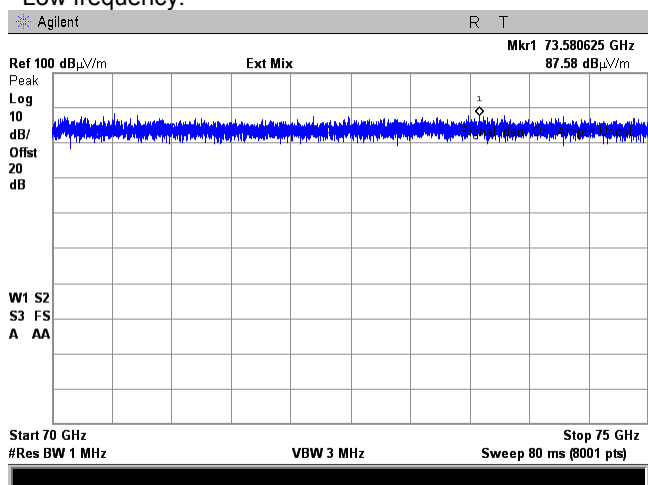


Test specification: Section 15.255(c)(3), Out of band radiated emissions above 40 GHz			
Test procedure: ANSI C63.10, Sections 9.9, 9.12			
Test mode: Compliance		Verdict: PASS	
Date(s): 25-Apr-18 - 16-Aug-18			
Temperature: 24.1 °C	Relative Humidity: 46 %	Air Pressure: 1011 hPa	Power: -48 VDC
Remarks:			

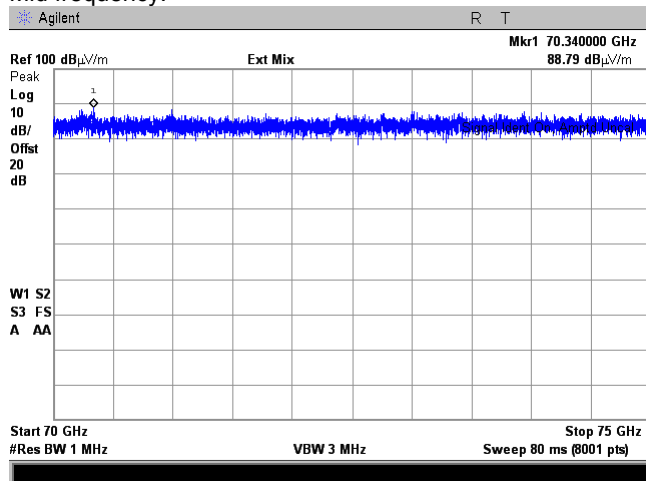
Plot 7.4.5 Spurious emission test results at low carrier frequency from 70 to 75 GHz

TEST SITE:
TEST DISTANCE:
ANTENNA POLARIZATION:
DETECTOR:
Low frequency:

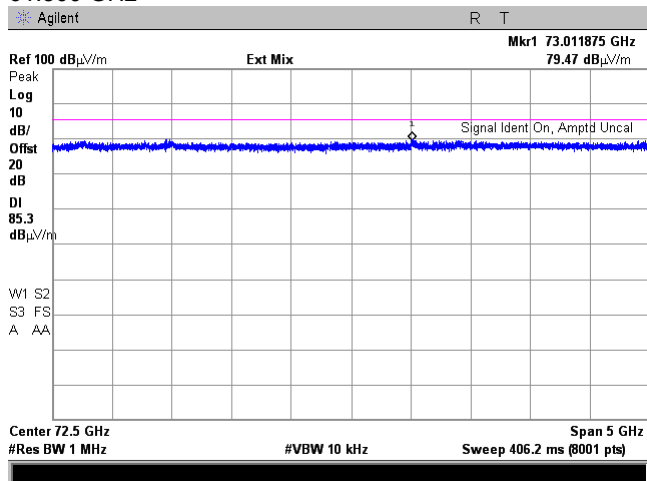
OATS
3 m
Vertical and Horizontal
Peak
57.025 GHz



Mid frequency:



61.500 GHz



Limit 105.3 dBuV/m was applied

Test specification: Section 15.255(c)(3), Out of band radiated emissions above 40 GHz			
Test procedure: ANSI C63.10, Sections 9.9, 9.12			
Test mode: Compliance		Verdict: PASS	
Date(s): 25-Apr-18 - 16-Aug-18			
Temperature: 24.1 °C	Relative Humidity: 46 %	Air Pressure: 1011 hPa	Power: -48 VDC
Remarks:			

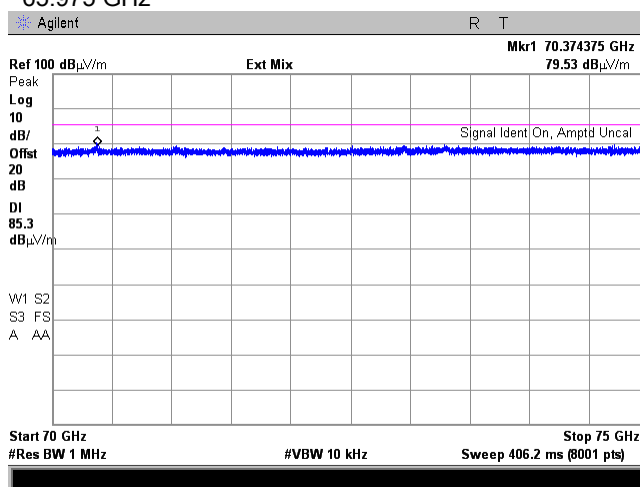
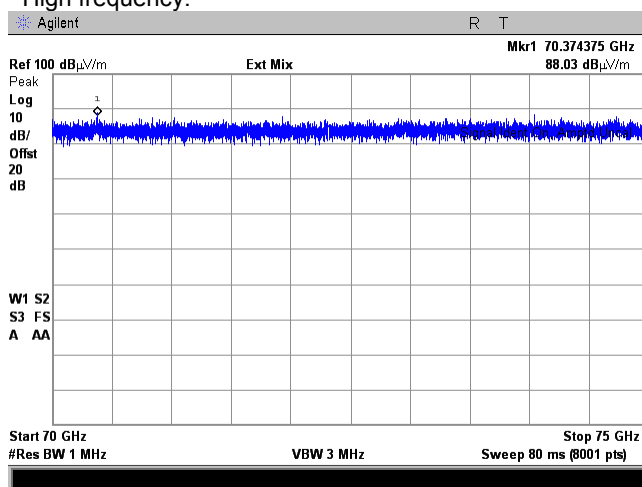
Plot 7.4.6 Spurious emission test results at low carrier frequency from 70 to 75 GHz

TEST SITE:
TEST DISTANCE:
ANTENNA POLARIZATION:
DETECTOR:

OATS
3 m
Vertical and Horizontal
Peak

High frequency:

65.975 GHz



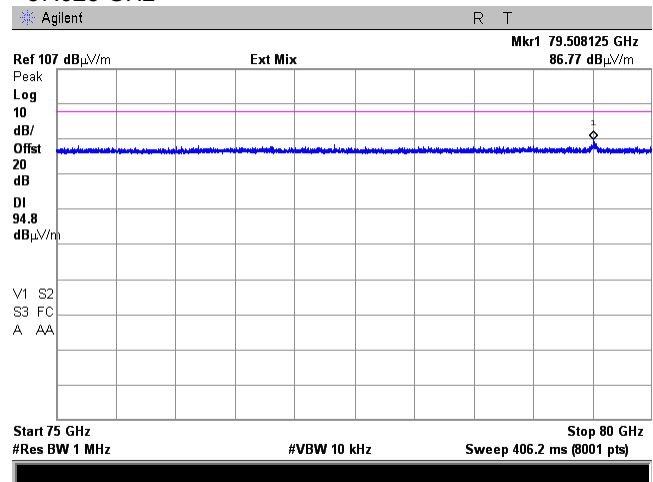
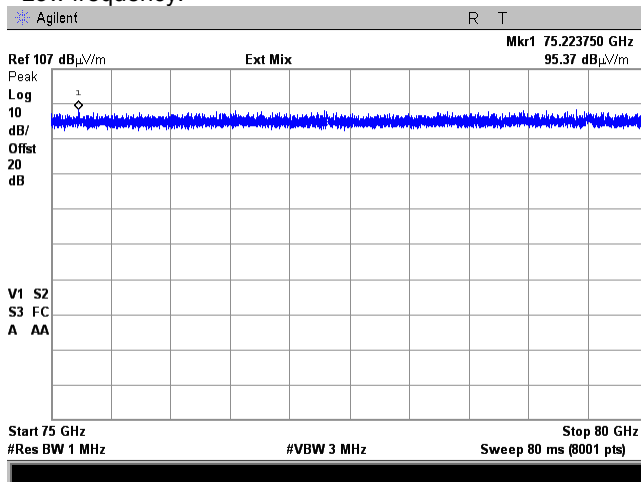
Limit 105.3 dBuV/m was applied

Test specification:		Section 15.255(c)(3), Out of band radiated emissions above 40 GHz	
Test procedure:		ANSI C63.10, Sections 9.9, 9.12	
Test mode:		Compliance	Verdict: PASS
Date(s):		25-Apr-18 - 16-Aug-18	
Temperature: 24.1 °C	Relative Humidity: 46 %	Air Pressure: 1011 hPa	Power: -48 VDC
Remarks:			

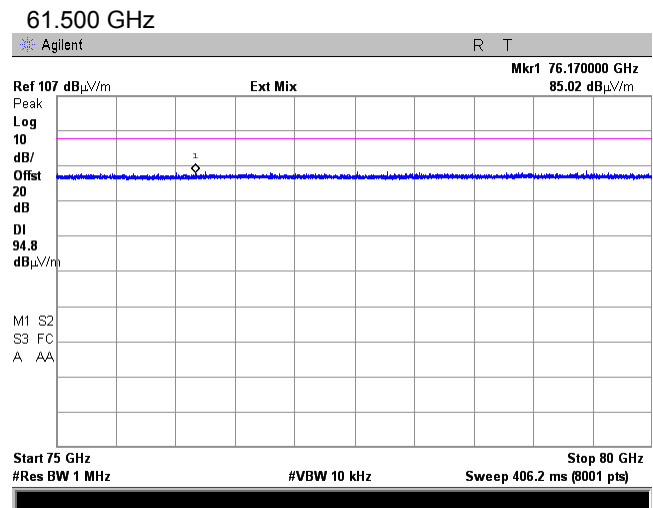
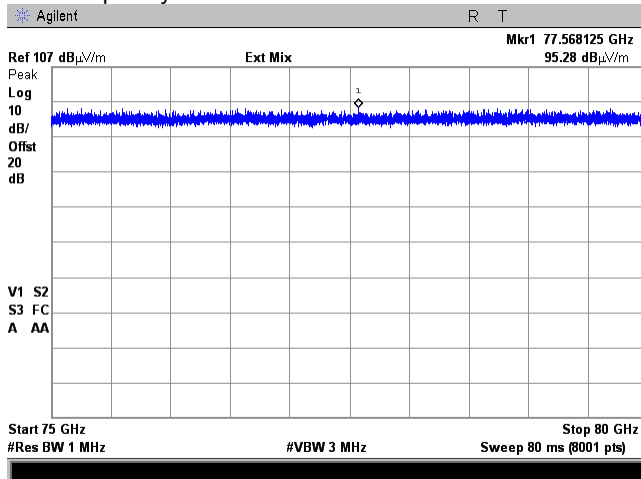
Plot 7.4.7 Spurious emission test results at low carrier frequency from 75 to 80 GHz

TEST SITE:
TEST DISTANCE:
ANTENNA POLARIZATION:
DETECTOR:
Low frequency:

OATS
1 m
Vertical and Horizontal
Peak
57.025 GHz



Mid frequency:



Limit 114.8 dB μ V/m was applied

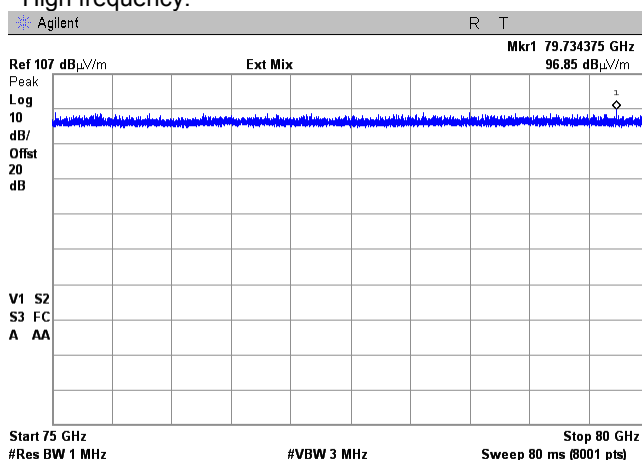
Test specification: Section 15.255(c)(3), Out of band radiated emissions above 40 GHz			
Test procedure: ANSI C63.10, Sections 9.9, 9.12			
Test mode: Compliance		Verdict: PASS	
Date(s): 25-Apr-18 - 16-Aug-18			
Temperature: 24.1 °C	Relative Humidity: 46 %	Air Pressure: 1011 hPa	Power: -48 VDC
Remarks:			

Plot 7.4.8 Spurious emission test results at low carrier frequency from 75 to 80 GHz

TEST SITE:
TEST DISTANCE:
ANTENNA POLARIZATION:
DETECTOR:

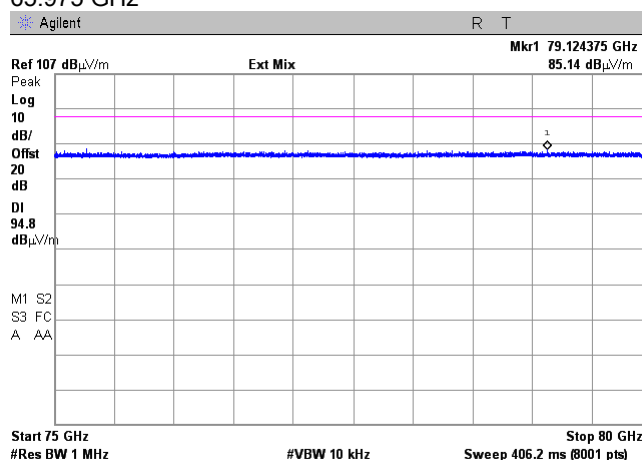
OATS
1 m
Vertical and Horizontal
Peak

High frequency:



Limit 114.8 dBuV/m was applied

65.975 GHz

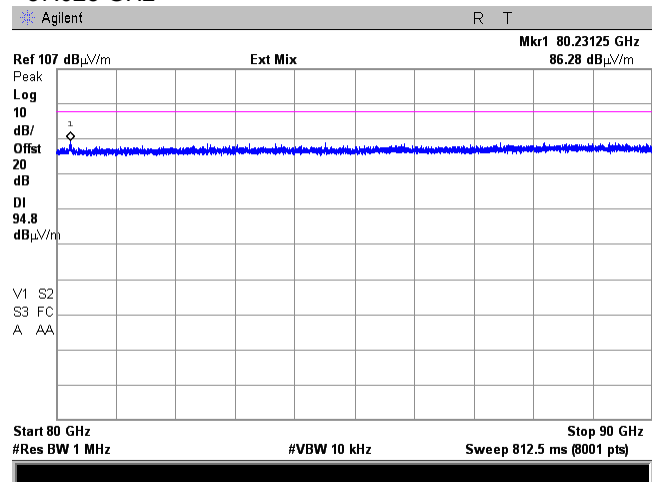
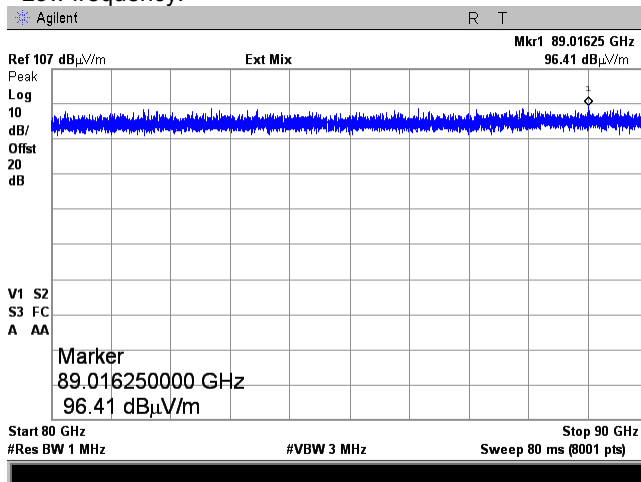


Test specification:		Section 15.255(c)(3), Out of band radiated emissions above 40 GHz	
Test procedure:		ANSI C63.10, Sections 9.9, 9.12	
Test mode:		Verdict: PASS	
Date(s):			
25-Apr-18 - 16-Aug-18			
Temperature: 24.1 °C	Relative Humidity: 46 %	Air Pressure: 1011 hPa	Power: -48 VDC
Remarks:			

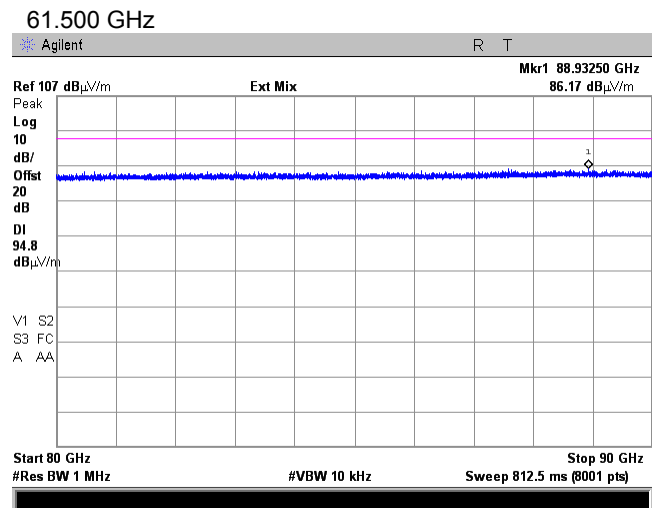
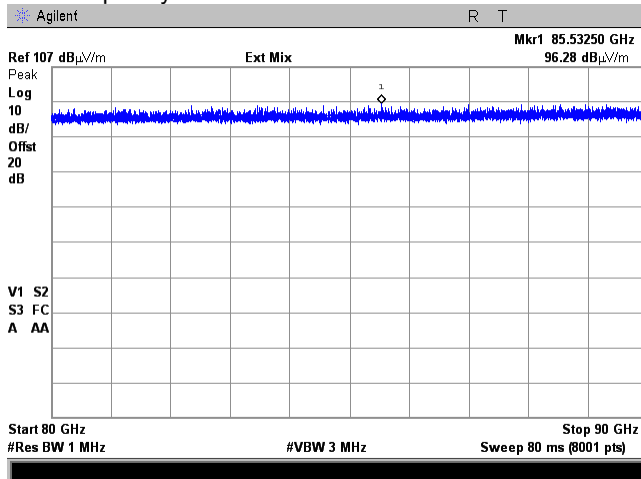
Plot 7.4.9 Spurious emission test results at low carrier frequency from 80 to 90 GHz

TEST SITE:
TEST DISTANCE:
ANTENNA POLARIZATION:
DETECTOR:
Low frequency:

OATS
1 m
Vertical and Horizontal
Peak
57.025 GHz



Mid frequency:



Limit 114.8 dB μ V/m was applied

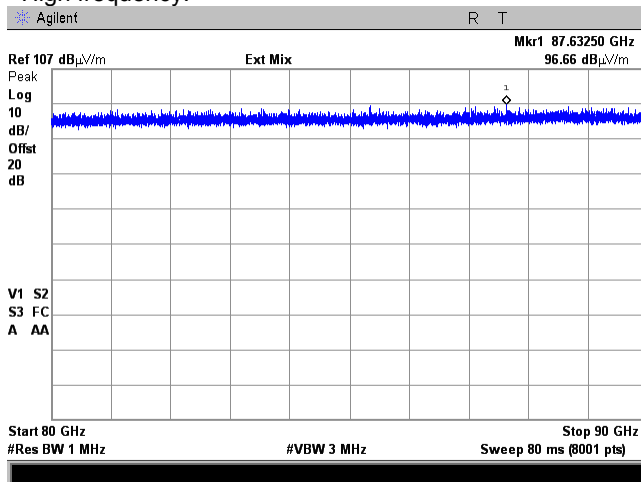
Test specification:		Section 15.255(c)(3), Out of band radiated emissions above 40 GHz	
Test procedure:		ANSI C63.10, Sections 9.9, 9.12	
Test mode:		Verdict: PASS	
Date(s):			
25-Apr-18 - 16-Aug-18			
Temperature: 24.1 °C	Relative Humidity: 46 %	Air Pressure: 1011 hPa	Power: -48 VDC
Remarks:			

Plot 7.4.10 Spurious emission test results at low carrier frequency from 80 to 90 GHz

TEST SITE:
TEST DISTANCE:
ANTENNA POLARIZATION:
DETECTOR:

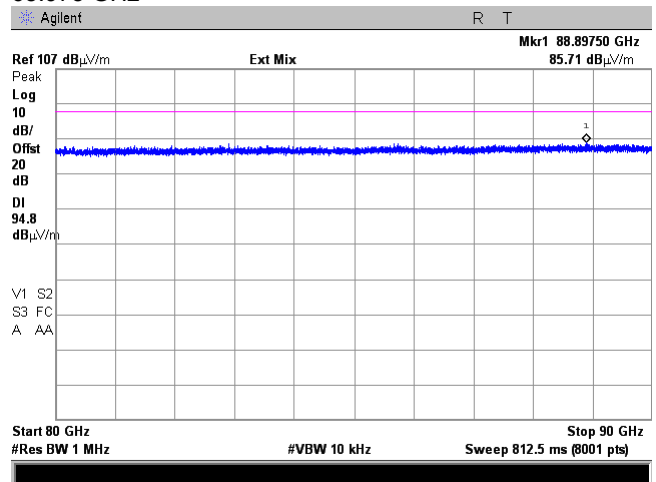
OATS
1 m
Vertical and Horizontal
Peak

High frequency:



Limit 114.8 dBuV/m was applied

65.975 GHz

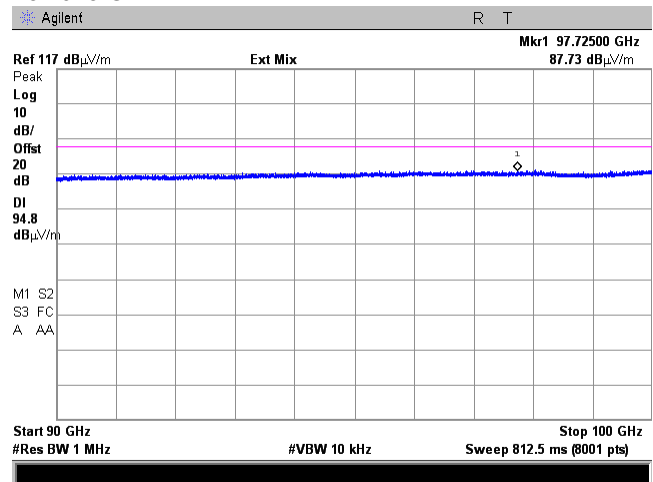
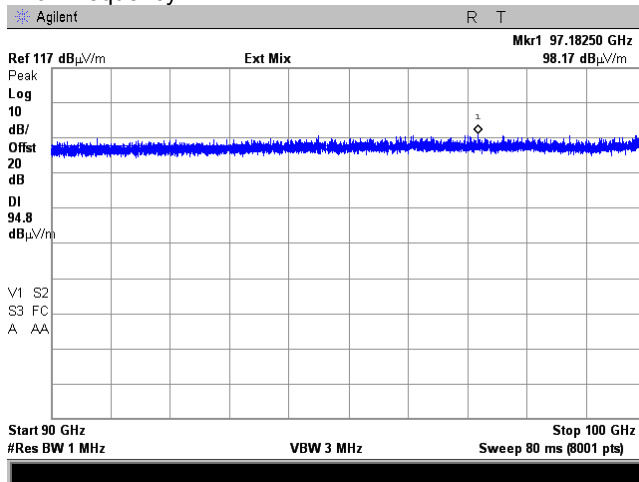


Test specification:		Section 15.255(c)(3), Out of band radiated emissions above 40 GHz	
Test procedure:		ANSI C63.10, Sections 9.9, 9.12	
Test mode:		Verdict: PASS	
Date(s):			
25-Apr-18 - 16-Aug-18			
Temperature: 24.1 °C	Relative Humidity: 46 %	Air Pressure: 1011 hPa	Power: -48 VDC
Remarks:			

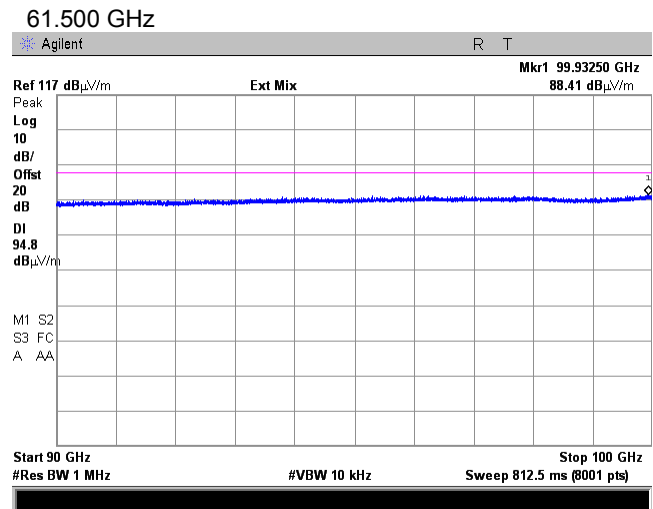
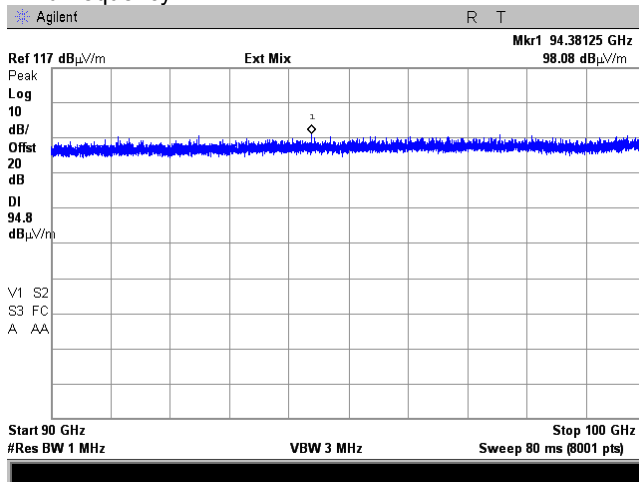
Plot 7.4.11 Spurious emission test results at low carrier frequency from 90 to 100 GHz

TEST SITE:
TEST DISTANCE:
ANTENNA POLARIZATION:
DETECTOR:
Low frequency:

OATS
1 m
Vertical and Horizontal
Peak
57.025 GHz



Mid frequency:



Limit 114.8 dB μ V/m was applied

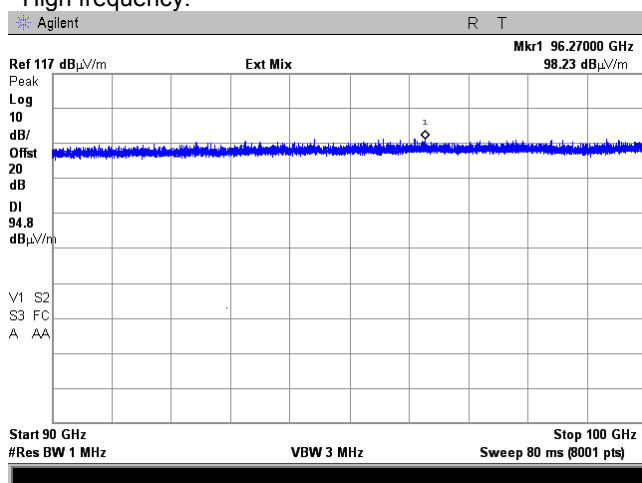
Test specification: Section 15.255(c)(3), Out of band radiated emissions above 40 GHz			
Test procedure: ANSI C63.10, Sections 9.9, 9.12			
Test mode: Compliance		Verdict: PASS	
Date(s): 25-Apr-18 - 16-Aug-18			
Temperature: 24.1 °C	Relative Humidity: 46 %	Air Pressure: 1011 hPa	Power: -48 VDC
Remarks:			

Plot 7.4.12 Spurious emission test results at low carrier frequency from 90 to 100 GHz

TEST SITE:
TEST DISTANCE:
ANTENNA POLARIZATION:
DETECTOR:

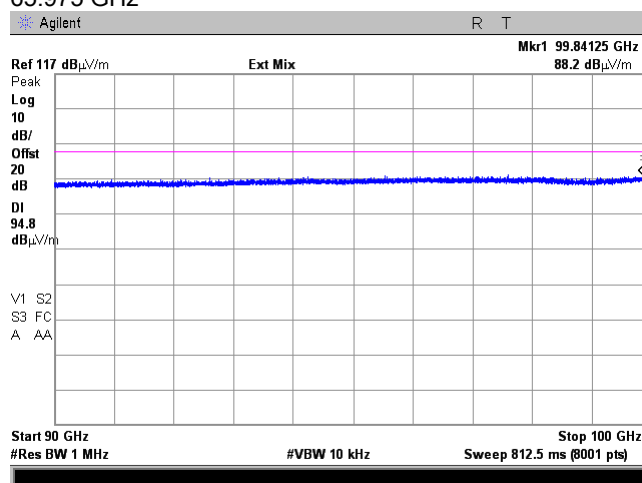
OATS
1 m
Vertical and Horizontal
Peak

High frequency:



Limit 114.8 dB μ V/m was applied

65.975 GHz

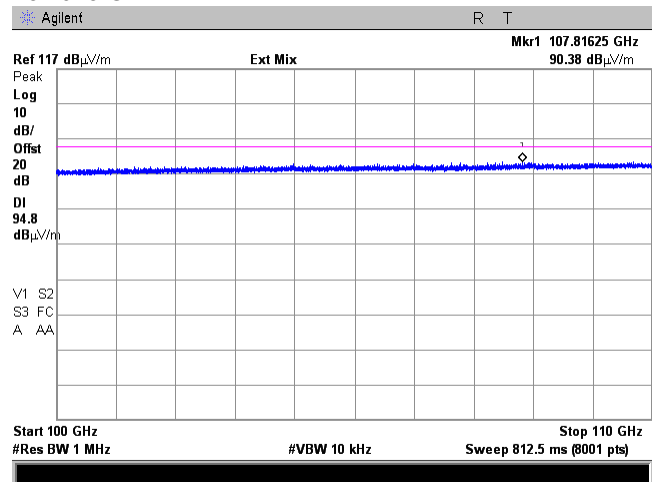
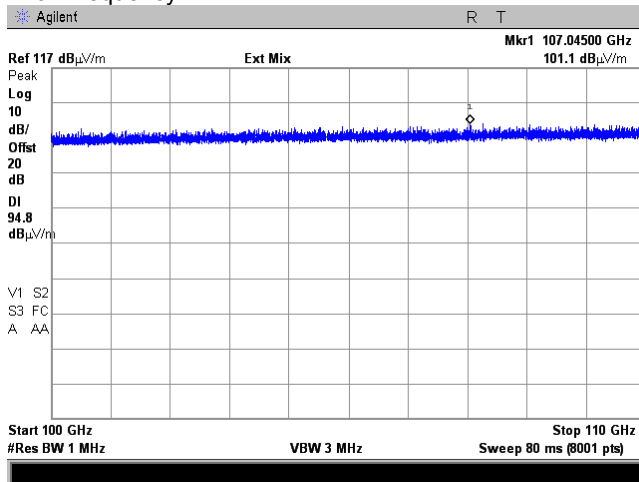


Test specification:		Section 15.255(c)(3), Out of band radiated emissions above 40 GHz	
Test procedure:		ANSI C63.10, Sections 9.9, 9.12	
Test mode:		Verdict: PASS	
Date(s):			
25-Apr-18 - 16-Aug-18			
Temperature: 24.1 °C	Relative Humidity: 46 %	Air Pressure: 1011 hPa	Power: -48 VDC
Remarks:			

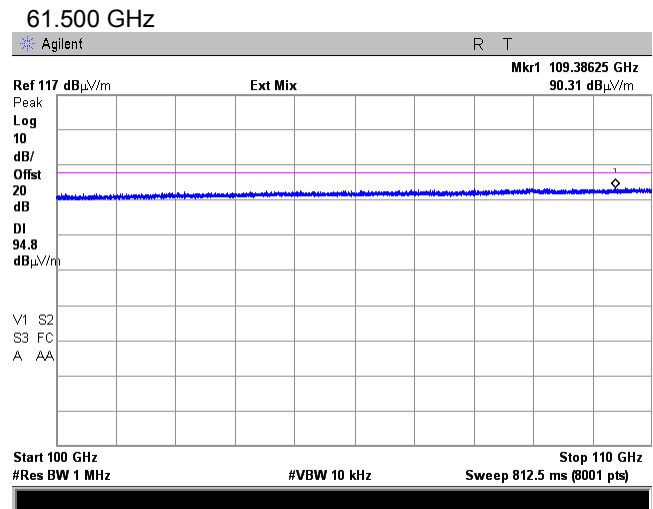
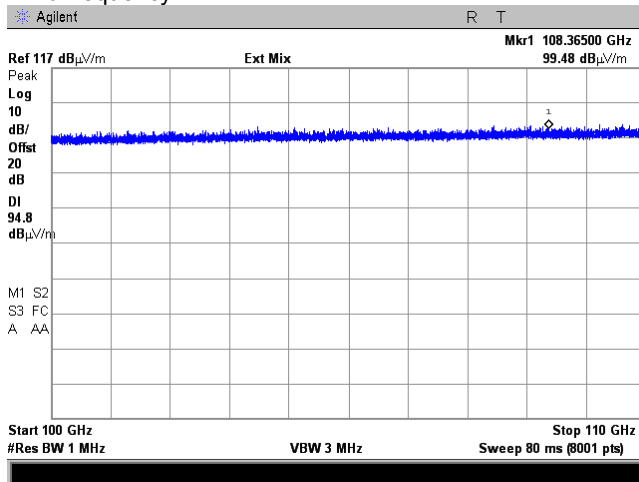
Plot 7.4.13 Spurious emission test results at low carrier frequency from 100 to 110 GHz

TEST SITE:
TEST DISTANCE:
ANTENNA POLARIZATION:
DETECTOR:
Low frequency:

OATS
1 m
Vertical and Horizontal
Peak
57.025 GHz



Mid frequency:



Limit 114.8 dBuV/m was applied

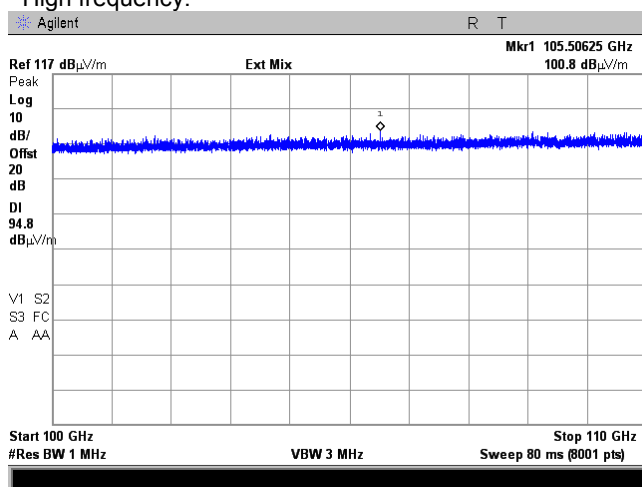
Test specification: Section 15.255(c)(3), Out of band radiated emissions above 40 GHz			
Test procedure: ANSI C63.10, Sections 9.9, 9.12			
Test mode: Compliance		Verdict: PASS	
Date(s): 25-Apr-18 - 16-Aug-18			
Temperature: 24.1 °C	Relative Humidity: 46 %	Air Pressure: 1011 hPa	Power: -48 VDC
Remarks:			

Plot 7.4.14 Spurious emission test results at low carrier frequency from 100 to 110 GHz

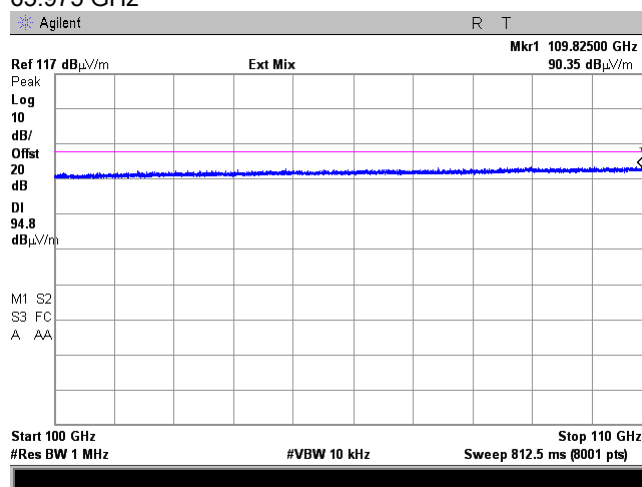
TEST SITE:
TEST DISTANCE:
ANTENNA POLARIZATION:
DETECTOR:

OATS
1 m
Vertical and Horizontal
Peak

High frequency:



65.975 GHz

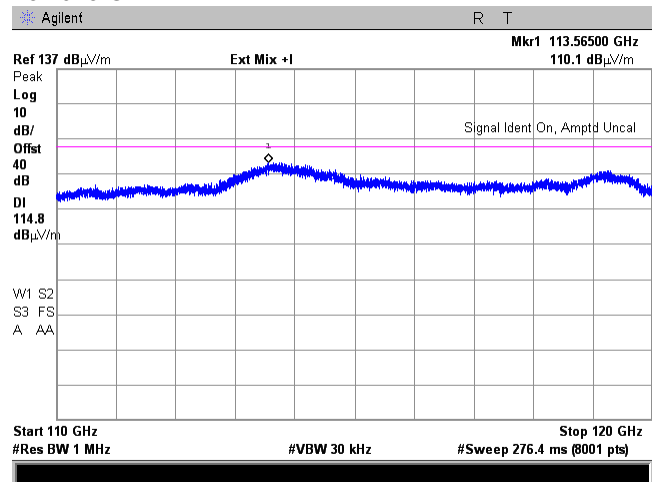
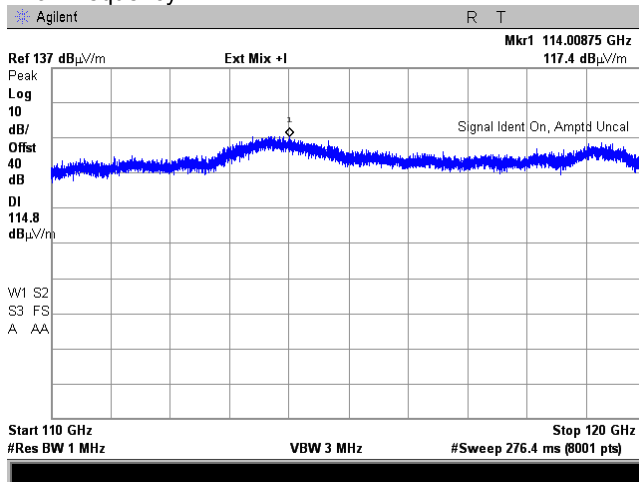


Test specification:		Section 15.255(c)(3), Out of band radiated emissions above 40 GHz	
Test procedure:		ANSI C63.10, Sections 9.9, 9.12	
Test mode:		Verdict: PASS	
Date(s):			
25-Apr-18 - 16-Aug-18			
Temperature: 24.1 °C	Relative Humidity: 46 %	Air Pressure: 1011 hPa	Power: -48 VDC
Remarks:			

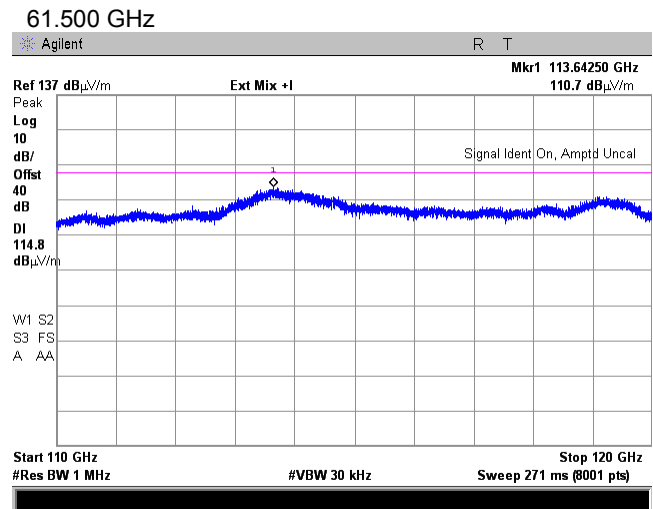
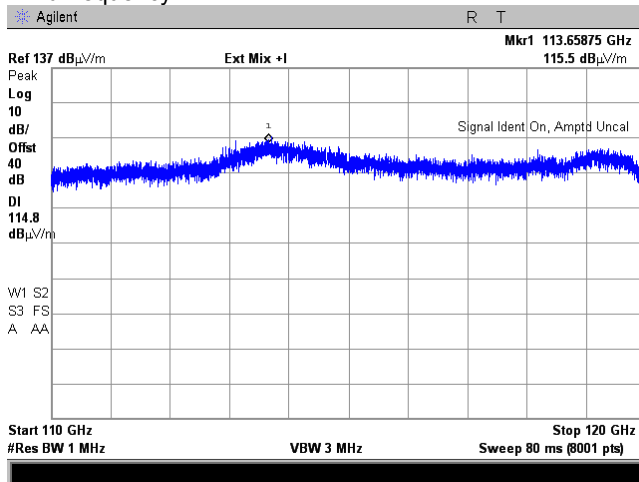
Plot 7.4.15 Spurious emission test results at low carrier frequency from 110 to 120 GHz

TEST SITE:
TEST DISTANCE:
ANTENNA POLARIZATION:
DETECTOR:
Low frequency:

OATS
0.1 m
Vertical and Horizontal
Peak
57.025 GHz



Mid frequency:



Limit 134.8 dBuV/m was applied

Test specification: Section 15.255(c)(3), Out of band radiated emissions above 40 GHz			
Test procedure: ANSI C63.10, Sections 9.9, 9.12			
Test mode: Compliance		Verdict: PASS	
Date(s): 25-Apr-18 - 16-Aug-18			
Temperature: 24.1 °C	Relative Humidity: 46 %	Air Pressure: 1011 hPa	Power: -48 VDC
Remarks:			

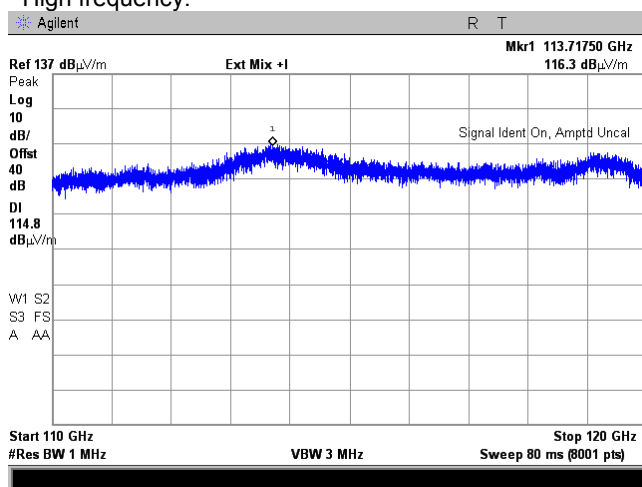
Plot 7.4.16 Spurious emission test results at low carrier frequency from 110 to 120 GHz

TEST SITE:
TEST DISTANCE:
ANTENNA POLARIZATION:
DETECTOR:

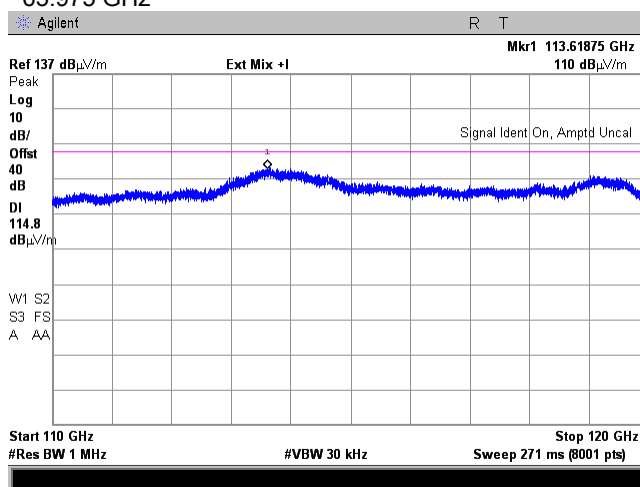
OATS
0.1 m
Vertical and Horizontal
Peak

High frequency:

65.975 GHz



Limit 134.8 dBuV/m was applied

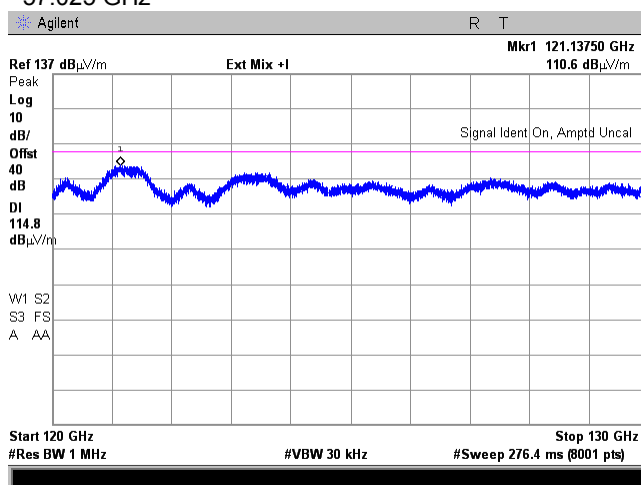
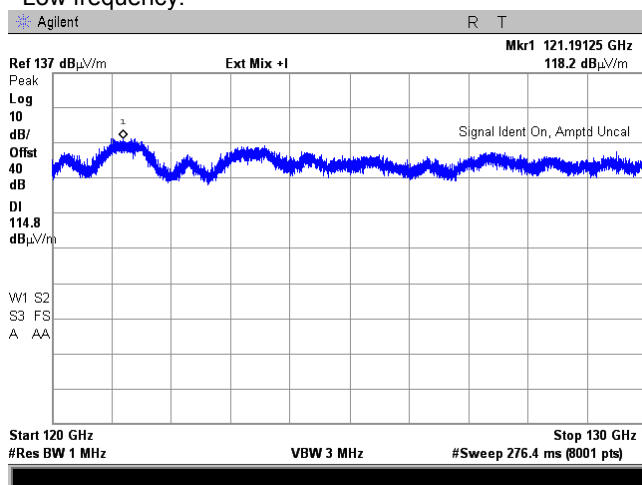


Test specification: Section 15.255(c)(3), Out of band radiated emissions above 40 GHz			
Test procedure: ANSI C63.10, Sections 9.9, 9.12			
Test mode: Compliance		Verdict: PASS	
Date(s): 25-Apr-18 - 16-Aug-18			
Temperature: 24.1 °C	Relative Humidity: 46 %	Air Pressure: 1011 hPa	Power: -48 VDC
Remarks:			

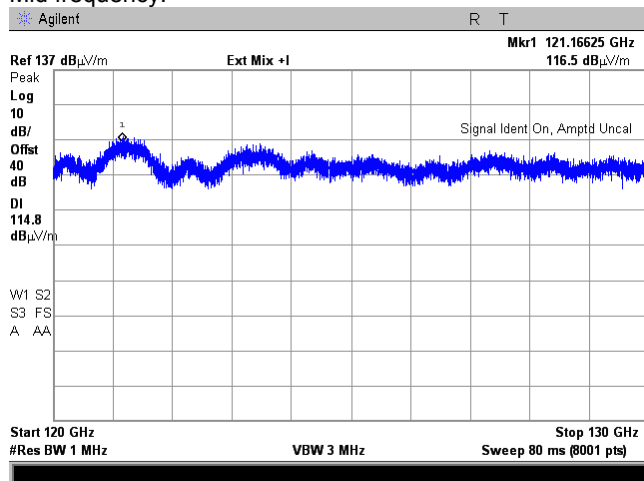
Plot 7.4.17 Spurious emission test results at low carrier frequency from 120 to 130 GHz

TEST SITE:
TEST DISTANCE:
ANTENNA POLARIZATION:
DETECTOR:
Low frequency:

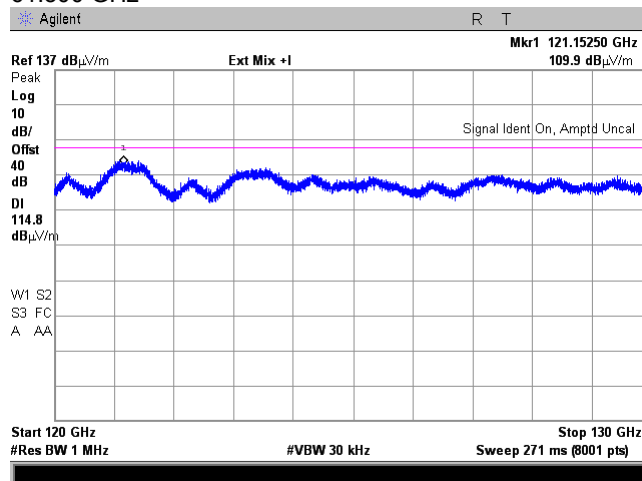
OATS
0.1 m
Vertical and Horizontal
Peak
57.025 GHz



Mid frequency:



61.500 GHz



Limit 134.8 dB μ V/m was applied

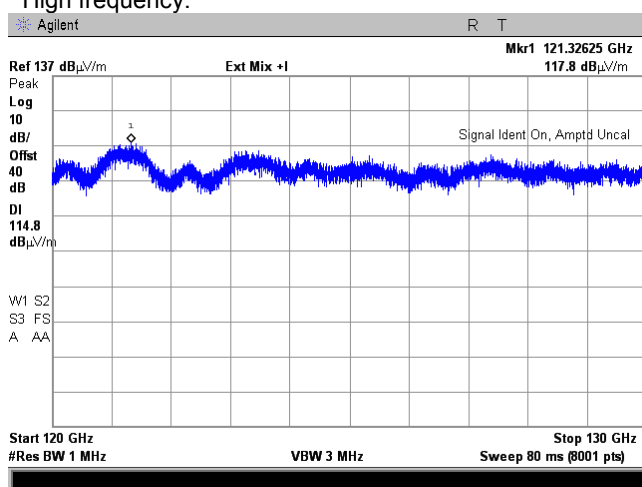
Test specification: Section 15.255(c)(3), Out of band radiated emissions above 40 GHz			
Test procedure: ANSI C63.10, Sections 9.9, 9.12			
Test mode: Compliance		Verdict: PASS	
Date(s): 25-Apr-18 - 16-Aug-18			
Temperature: 24.1 °C	Relative Humidity: 46 %	Air Pressure: 1011 hPa	Power: -48 VDC
Remarks:			

Plot 7.4.18 Spurious emission test results at low carrier frequency from 120 to 130 GHz

TEST SITE:
TEST DISTANCE:
ANTENNA POLARIZATION:
DETECTOR:

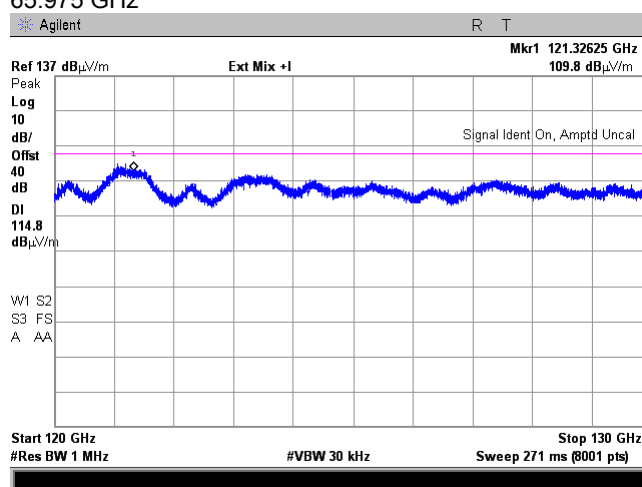
OATS
0.1 m
Vertical and Horizontal
Peak

High frequency:



Limit 134.8 dBuV/m was applied

65.975 GHz

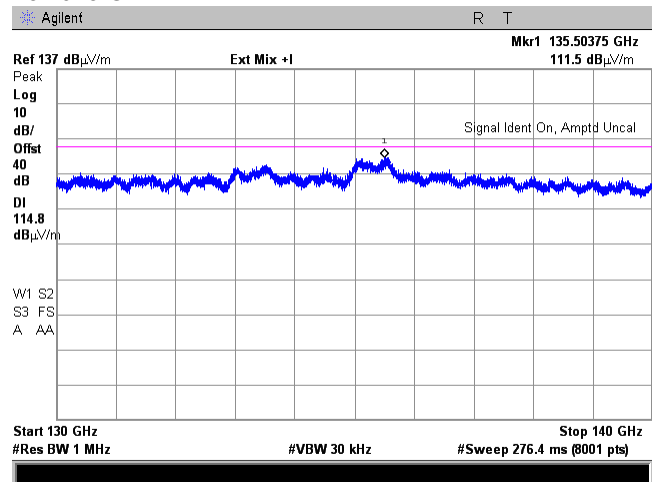
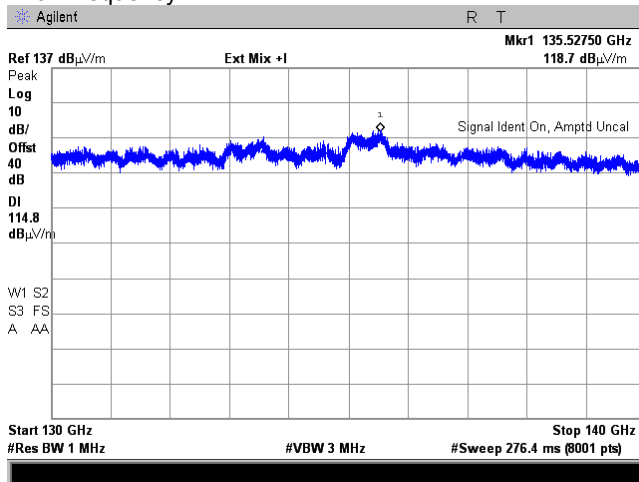


Test specification: Section 15.255(c)(3), Out of band radiated emissions above 40 GHz			
Test procedure: ANSI C63.10, Sections 9.9, 9.12			
Test mode: Compliance		Verdict: PASS	
Date(s): 25-Apr-18 - 16-Aug-18			
Temperature: 24.1 °C	Relative Humidity: 46 %	Air Pressure: 1011 hPa	Power: -48 VDC
Remarks:			

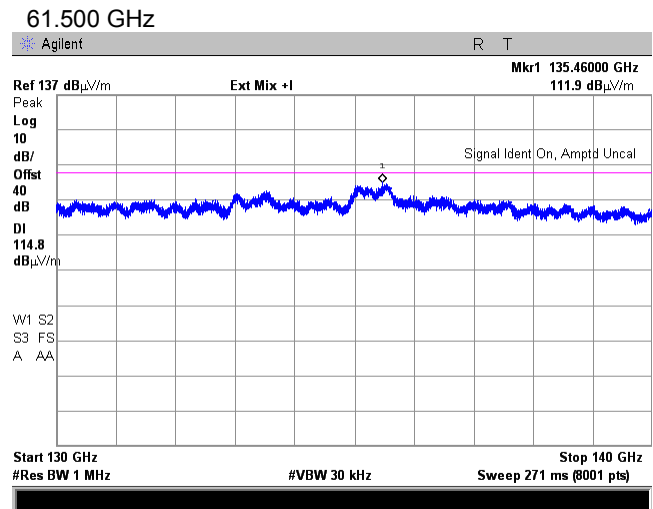
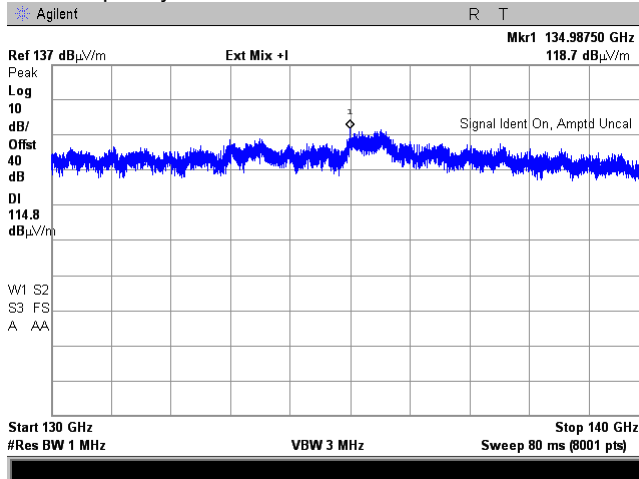
Plot 7.4.19 Spurious emission test results at low carrier frequency from 130 to 140 GHz

TEST SITE:
TEST DISTANCE:
ANTENNA POLARIZATION:
DETECTOR:
Low frequency:

OATS
0.1 m
Vertical and Horizontal
Peak
57.025 GHz



Mid frequency:



Limit 134.8 dB μ V/m was applied

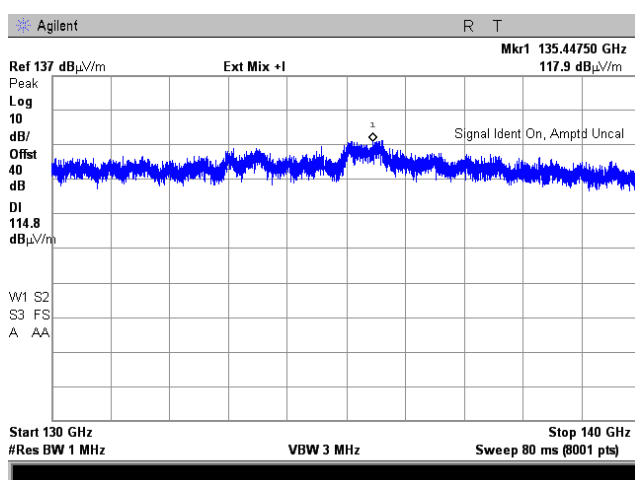
Test specification: Section 15.255(c)(3), Out of band radiated emissions above 40 GHz			
Test procedure: ANSI C63.10, Sections 9.9, 9.12			
Test mode: Compliance		Verdict: PASS	
Date(s): 25-Apr-18 - 16-Aug-18			
Temperature: 24.1 °C	Relative Humidity: 46 %	Air Pressure: 1011 hPa	Power: -48 VDC
Remarks:			

Plot 7.4.20 Spurious emission test results at low carrier frequency from 130 to 140 GHz

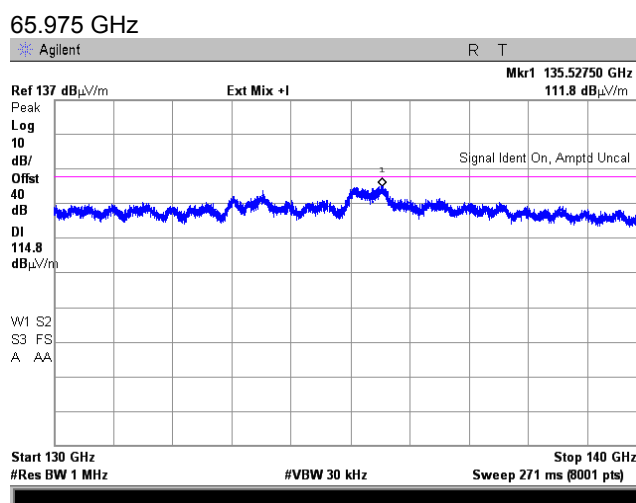
TEST SITE:
TEST DISTANCE:
ANTENNA POLARIZATION:
DETECTOR:

OATS
0.1 m
Vertical and Horizontal
Peak

High frequency:



Limit 134.8 dBuV/m was applied

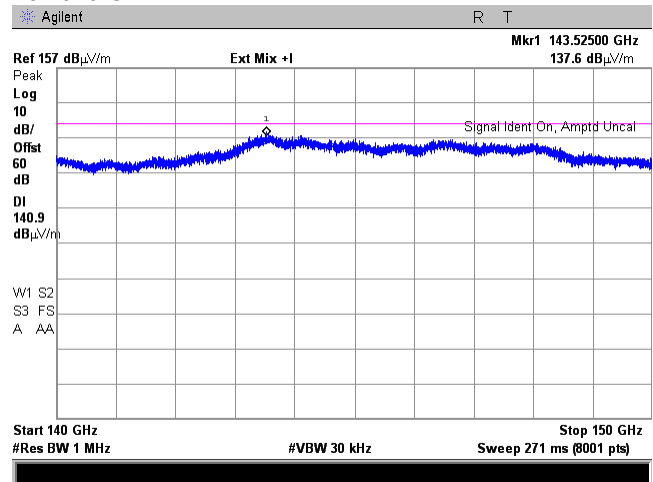
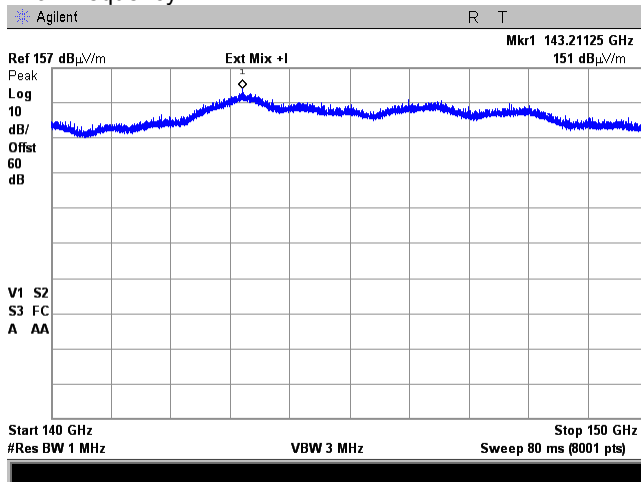


Test specification:		Section 15.255(c)(3), Out of band radiated emissions above 40 GHz	
Test procedure:		ANSI C63.10, Sections 9.9, 9.12	
Test mode:		Verdict: PASS	
Date(s):			
25-Apr-18 - 16-Aug-18			
Temperature: 24.1 °C	Relative Humidity: 46 %	Air Pressure: 1011 hPa	Power: -48 VDC
Remarks:			

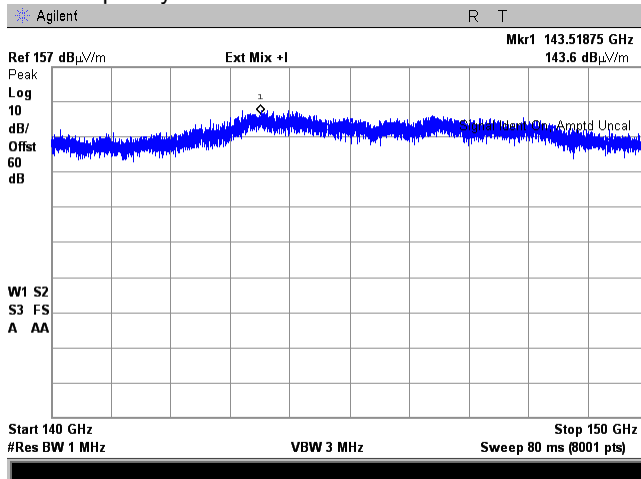
Plot 7.4.21 Spurious emission test results at low carrier frequency from 140 to 150 GHz

TEST SITE:
TEST DISTANCE:
ANTENNA POLARIZATION:
DETECTOR:
Low frequency:

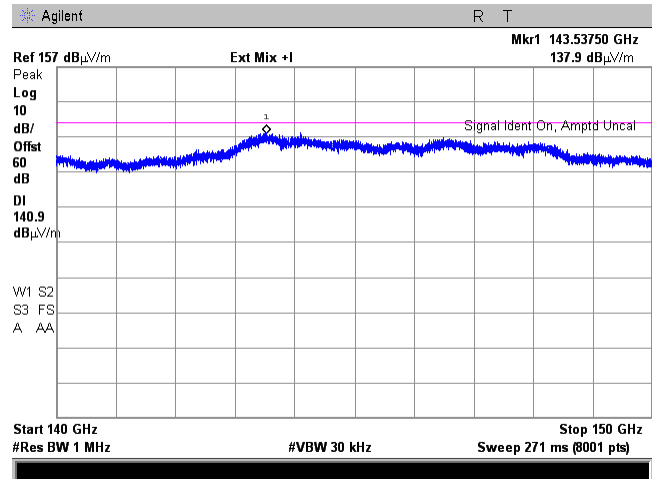
OATS
0.005 m
Vertical and Horizontal
Peak
57.025 GHz



Mid frequency:



61.500 GHz



Limit 160.9 dB μ V/m was applied

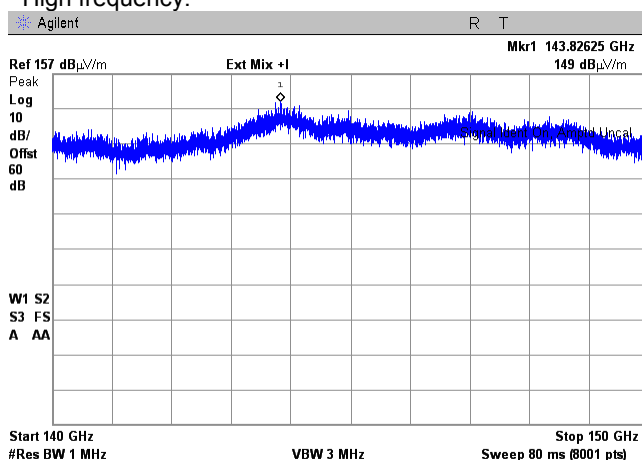
Test specification: Section 15.255(c)(3), Out of band radiated emissions above 40 GHz			
Test procedure: ANSI C63.10, Sections 9.9, 9.12			
Test mode: Compliance		Verdict: PASS	
Date(s): 25-Apr-18 - 16-Aug-18			
Temperature: 24.1 °C	Relative Humidity: 46 %	Air Pressure: 1011 hPa	Power: -48 VDC
Remarks:			

Plot 7.4.22 Spurious emission test results at low carrier frequency from 140 to 150 GHz

TEST SITE:
TEST DISTANCE:
ANTENNA POLARIZATION:
DETECTOR:

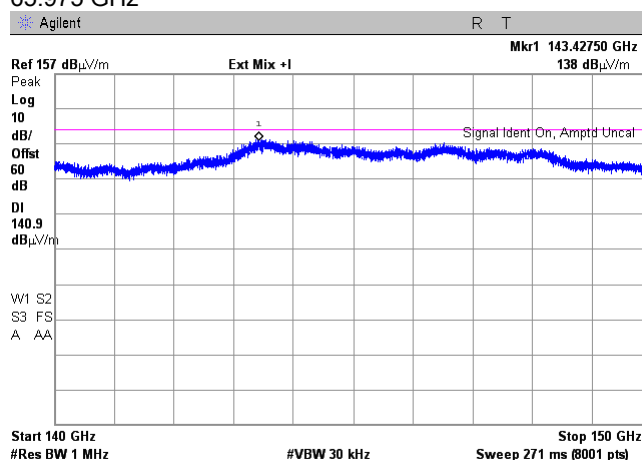
OATS
0.005 m
Vertical and Horizontal
Peak

High frequency:



Limit 160.9 dBuV/m was applied

65.975 GHz

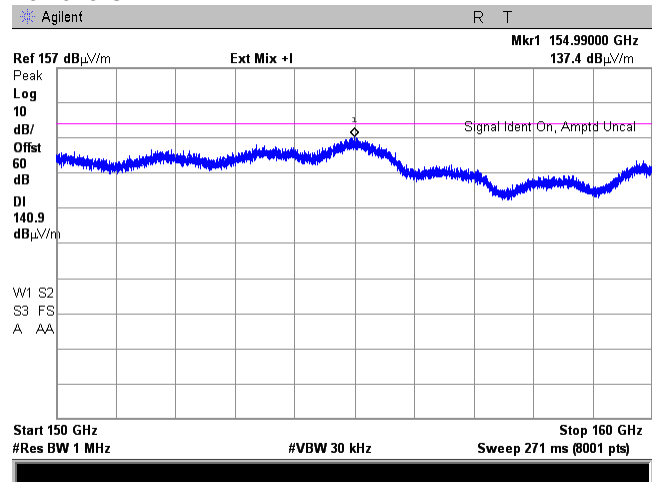
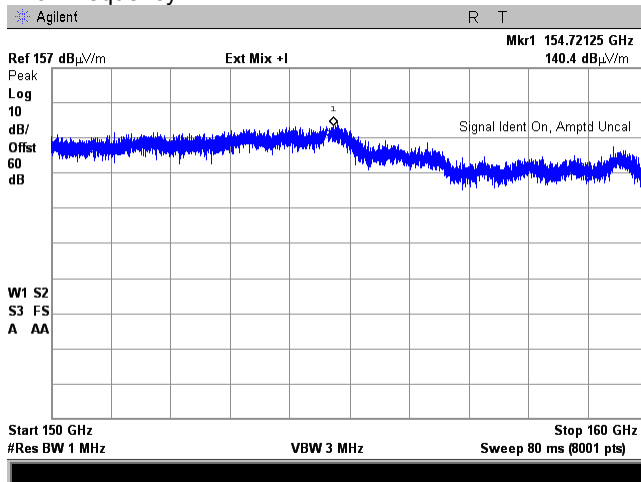


Test specification:		Section 15.255(c)(3), Out of band radiated emissions above 40 GHz	
Test procedure:		ANSI C63.10, Sections 9.9, 9.12	
Test mode:		Verdict: PASS	
Date(s):			
25-Apr-18 - 16-Aug-18			
Temperature: 24.1 °C	Relative Humidity: 46 %	Air Pressure: 1011 hPa	Power: -48 VDC
Remarks:			

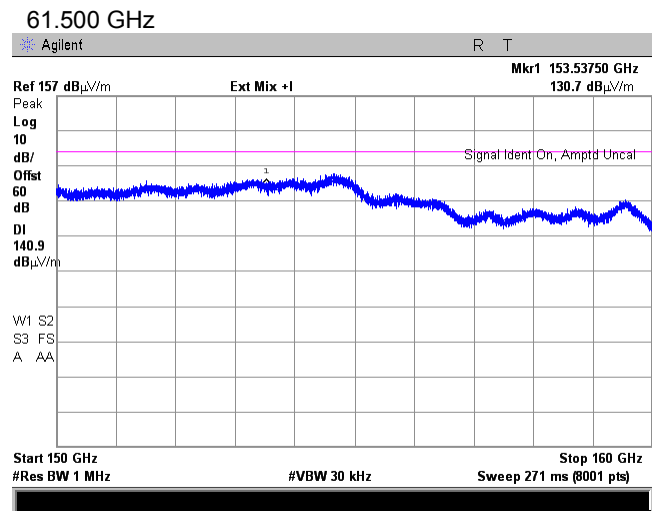
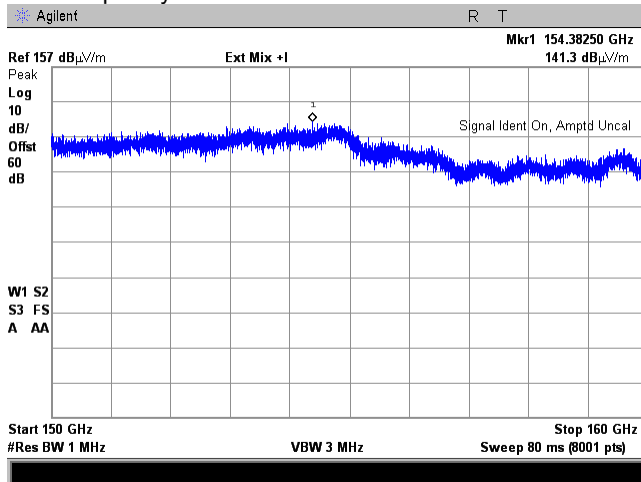
Plot 7.4.23 Spurious emission test results at low carrier frequency from 150 to 160 GHz

TEST SITE:
TEST DISTANCE:
ANTENNA POLARIZATION:
DETECTOR:
Low frequency:

OATS
0.005 m
Vertical and Horizontal
Peak
57.025 GHz



Mid frequency:



Limit 160.9 dB μ V/m was applied

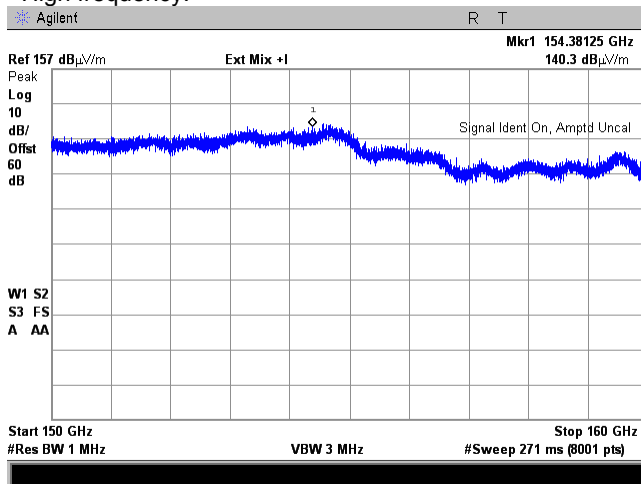
Test specification:		Section 15.255(c)(3), Out of band radiated emissions above 40 GHz	
Test procedure:		ANSI C63.10, Sections 9.9, 9.12	
Test mode:		Verdict: PASS	
Date(s):			
25-Apr-18 - 16-Aug-18			
Temperature: 24.1 °C	Relative Humidity: 46 %	Air Pressure: 1011 hPa	Power: -48 VDC
Remarks:			

Plot 7.4.24 Spurious emission test results at low carrier frequency from 150 to 160 GHz

TEST SITE:
TEST DISTANCE:
ANTENNA POLARIZATION:
DETECTOR:

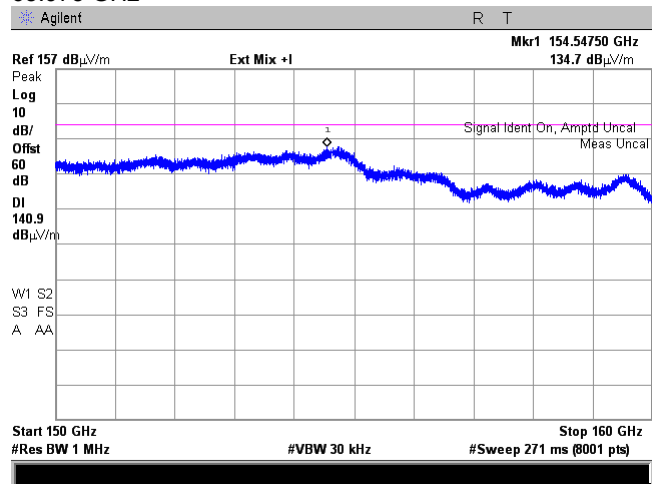
OATS
0.005 m
Vertical and Horizontal
Peak

High frequency:



Limit 160.9 dB μ V/m was applied

65.975 GHz

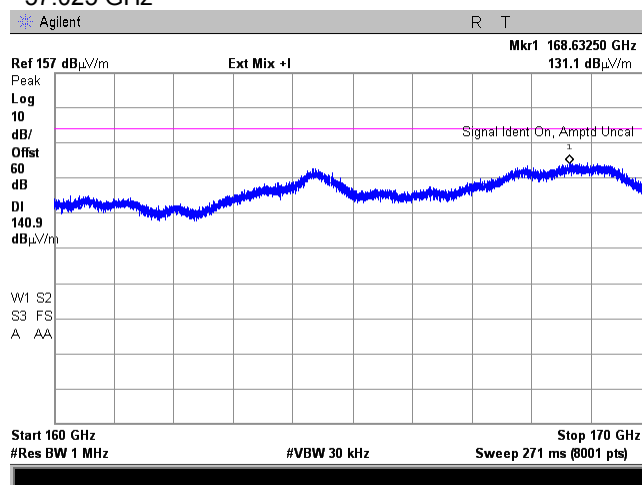
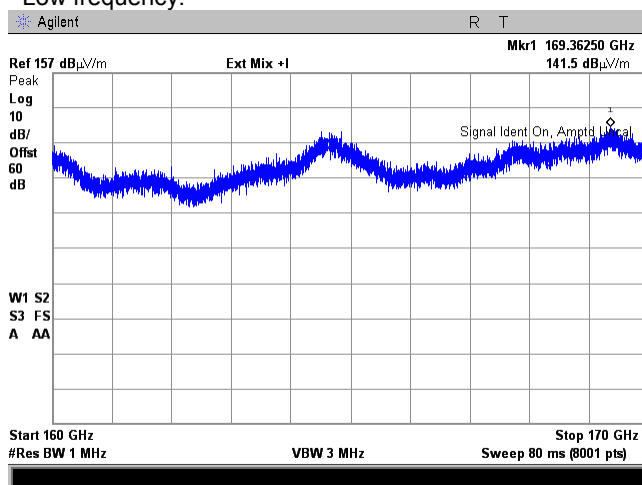


Test specification:		Section 15.255(c)(3), Out of band radiated emissions above 40 GHz	
Test procedure:		ANSI C63.10, Sections 9.9, 9.12	
Test mode:		Verdict: PASS	
Date(s):			
25-Apr-18 - 16-Aug-18			
Temperature: 24.1 °C	Relative Humidity: 46 %	Air Pressure: 1011 hPa	Power: -48 VDC
Remarks:			

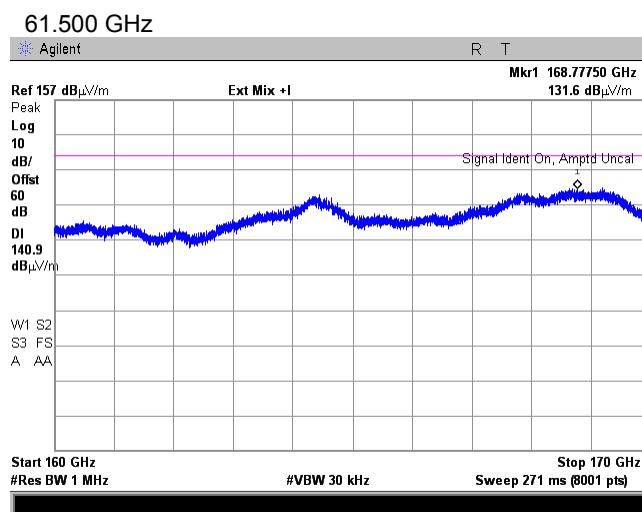
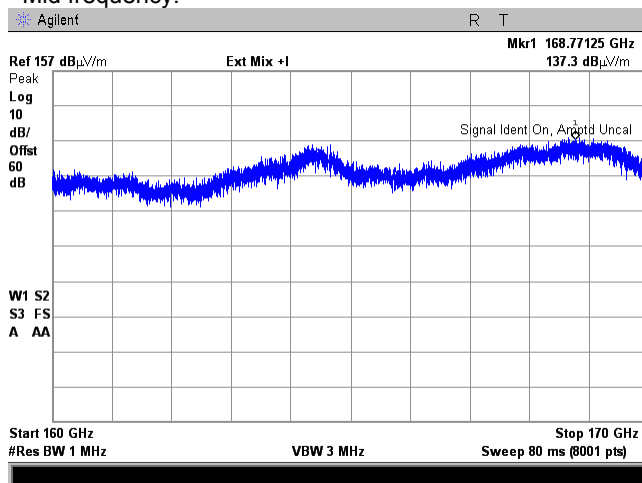
Plot 7.4.25 Spurious emission test results at low carrier frequency from 160 to 170 GHz

TEST SITE:
TEST DISTANCE:
ANTENNA POLARIZATION:
DETECTOR:
Low frequency:

OATS
0.005 m
Vertical and Horizontal
Peak
57.025 GHz



Mid frequency:



Limit 160.9 dB μ V/m was applied

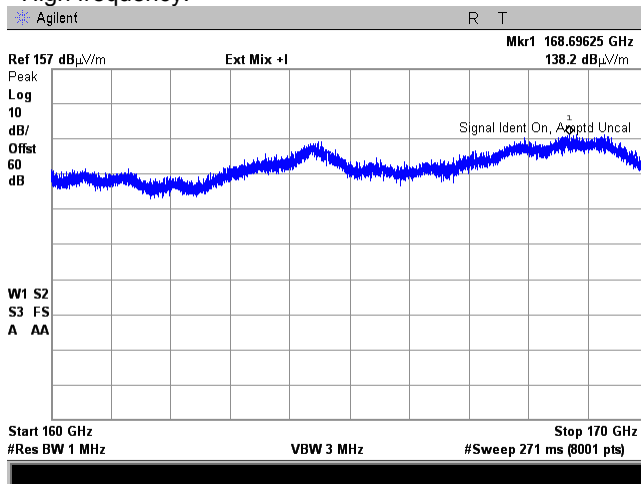
Test specification:		Section 15.255(c)(3), Out of band radiated emissions above 40 GHz	
Test procedure:		ANSI C63.10, Sections 9.9, 9.12	
Test mode:		Compliance	Verdict: PASS
Date(s):		25-Apr-18 - 16-Aug-18	
Temperature: 24.1 °C	Relative Humidity: 46 %	Air Pressure: 1011 hPa	Power: -48 VDC
Remarks:			

Plot 7.4.26 Spurious emission test results at low carrier frequency from 160 to 170 GHz

TEST SITE:
TEST DISTANCE:
ANTENNA POLARIZATION:
DETECTOR:

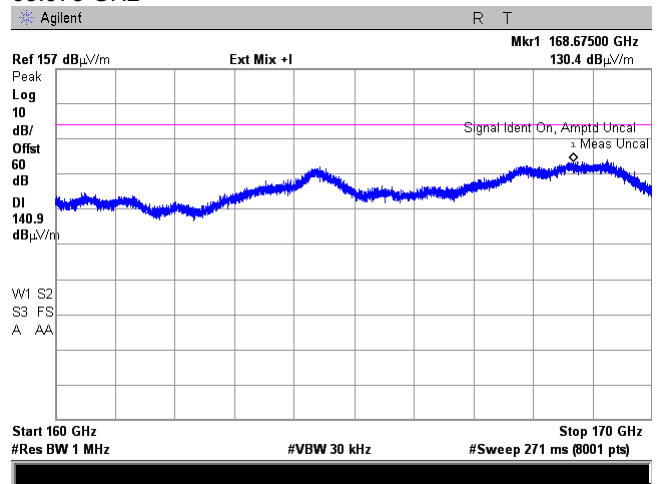
OATS
0.005 m
Vertical and Horizontal
Peak

High frequency:



Limit 160.9 dBuV/m was applied

65.975 GHz

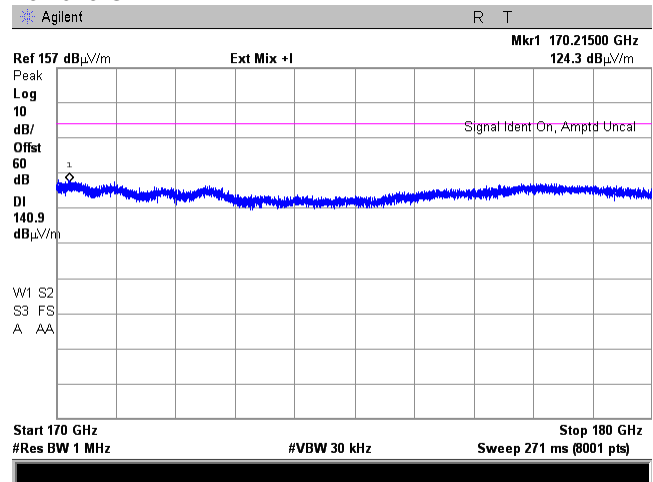
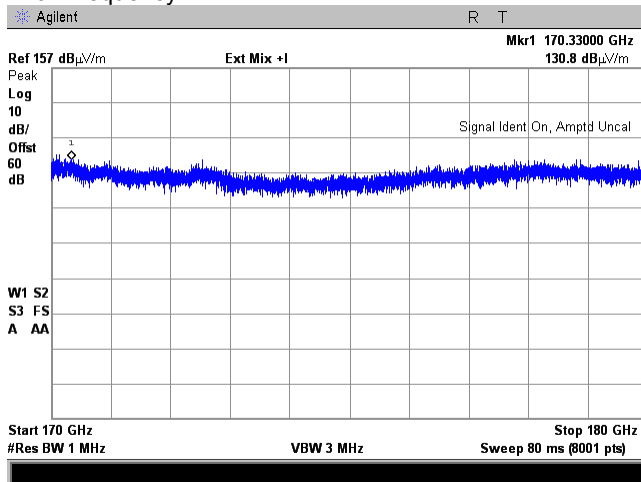


Test specification:		Section 15.255(c)(3), Out of band radiated emissions above 40 GHz	
Test procedure:		ANSI C63.10, Sections 9.9, 9.12	
Test mode:		Compliance	Verdict: PASS
Date(s):		25-Apr-18 - 16-Aug-18	
Temperature: 24.1 °C	Relative Humidity: 46 %	Air Pressure: 1011 hPa	Power: -48 VDC
Remarks:			

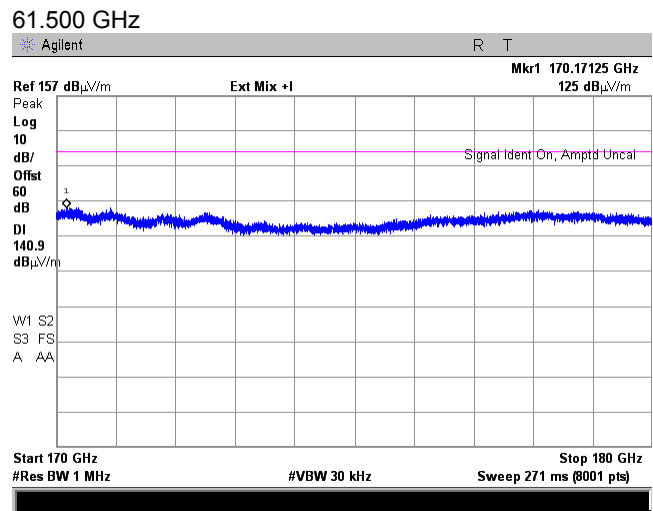
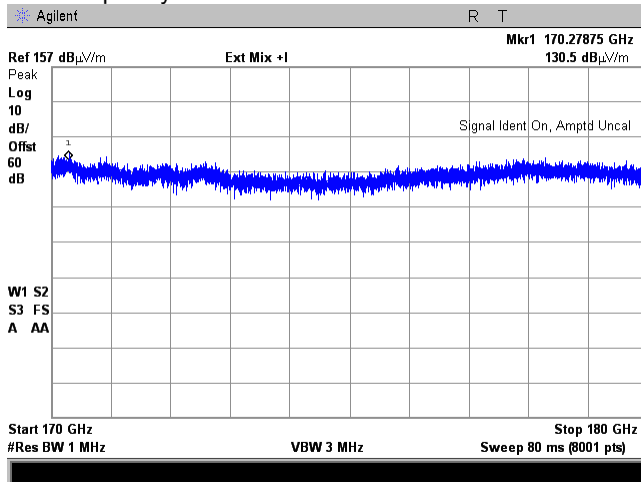
Plot 7.4.27 Spurious emission test results at low carrier frequency from 170 to 180 GHz

TEST SITE:
TEST DISTANCE:
ANTENNA POLARIZATION:
DETECTOR:
Low frequency:

OATS
0.005 m
Vertical and Horizontal
Peak
57.025 GHz



Mid frequency:



Limit 160.9 dB μ V/m was applied

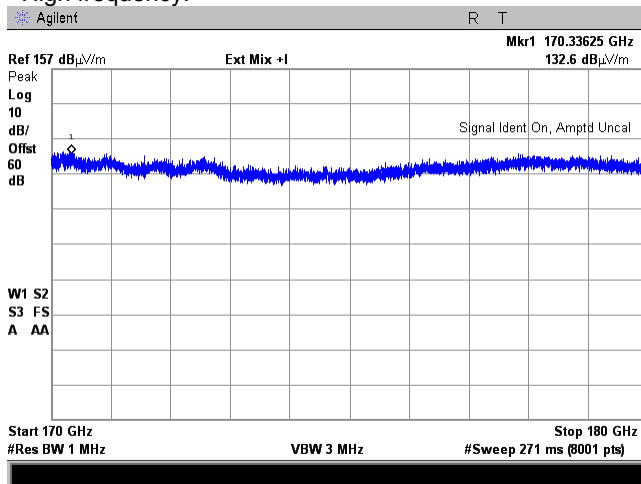
Test specification:		Section 15.255(c)(3), Out of band radiated emissions above 40 GHz	
Test procedure:		ANSI C63.10, Sections 9.9, 9.12	
Test mode:		Verdict: PASS	
Date(s):			
25-Apr-18 - 16-Aug-18			
Temperature: 24.1 °C	Relative Humidity: 46 %	Air Pressure: 1011 hPa	Power: -48 VDC
Remarks:			

Plot 7.4.28 Spurious emission test results at low carrier frequency from 170 to 180 GHz

TEST SITE:
TEST DISTANCE:
ANTENNA POLARIZATION:
DETECTOR:

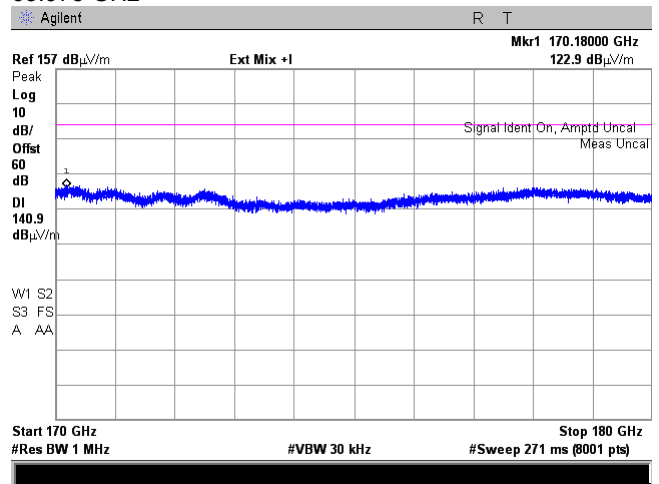
OATS
0.005 m
Vertical and Horizontal
Peak

High frequency:



Limit 160.9 dBuV/m was applied

65.975 GHz

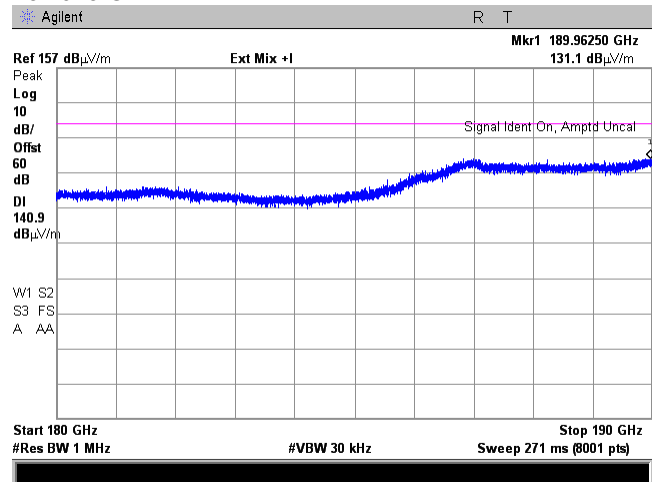
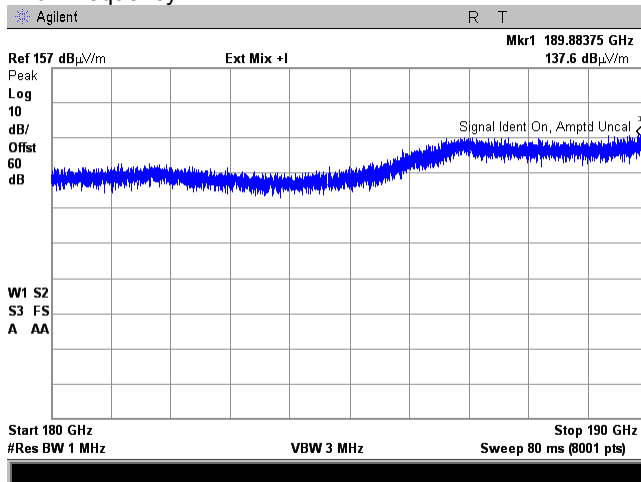


Test specification:		Section 15.255(c)(3), Out of band radiated emissions above 40 GHz	
Test procedure:		ANSI C63.10, Sections 9.9, 9.12	
Test mode:		Verdict: PASS	
Date(s):			
25-Apr-18 - 16-Aug-18			
Temperature: 24.1 °C	Relative Humidity: 46 %	Air Pressure: 1011 hPa	Power: -48 VDC
Remarks:			

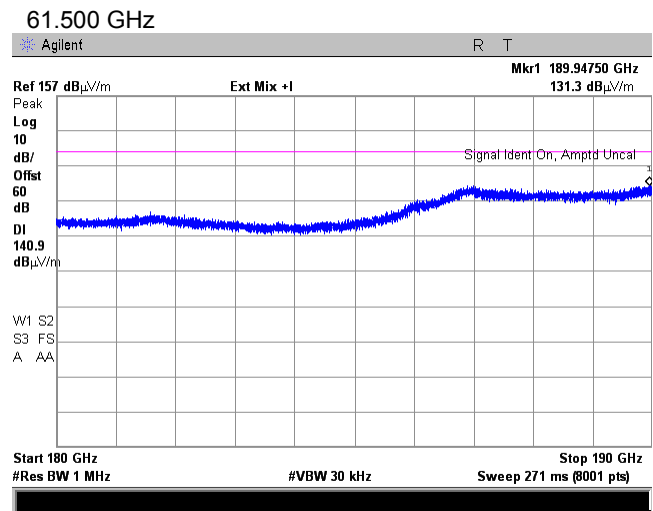
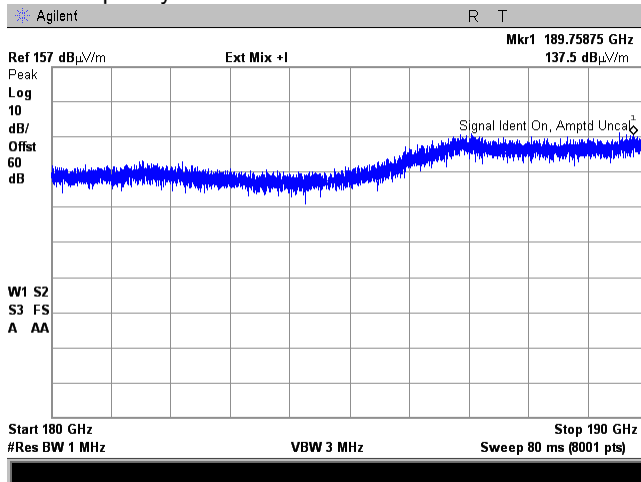
Plot 7.4.29 Spurious emission test results at low carrier frequency from 180 to 190 GHz

TEST SITE:
TEST DISTANCE:
ANTENNA POLARIZATION:
DETECTOR:
Low frequency:

OATS
0.005 m
Vertical and Horizontal
Peak
57.025 GHz



Mid frequency:



Limit 160.9 dBuV/m was applied

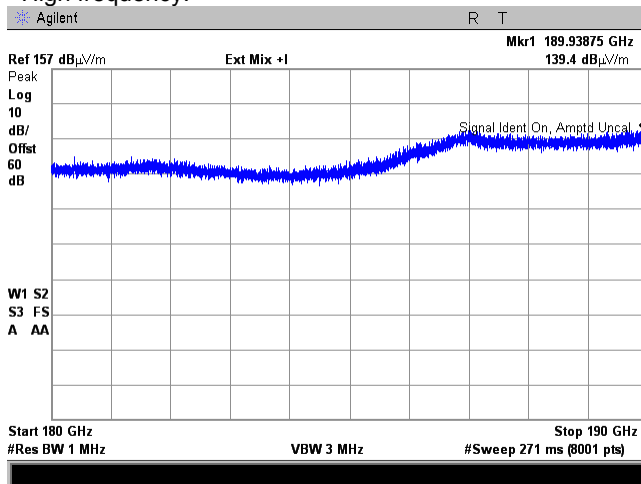
Test specification:		Section 15.255(c)(3), Out of band radiated emissions above 40 GHz	
Test procedure:		ANSI C63.10, Sections 9.9, 9.12	
Test mode:		Verdict: PASS	
Date(s):			
25-Apr-18 - 16-Aug-18			
Temperature: 24.1 °C	Relative Humidity: 46 %	Air Pressure: 1011 hPa	Power: -48 VDC
Remarks:			

Plot 7.4.30 Spurious emission test results at low carrier frequency from 180 to 190 GHz

TEST SITE:
TEST DISTANCE:
ANTENNA POLARIZATION:
DETECTOR:

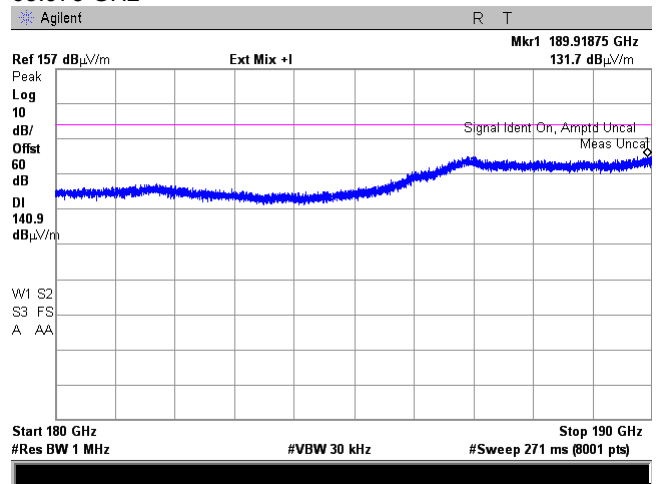
OATS
0.005 m
Vertical and Horizontal
Peak

High frequency:



Limit 160.9 dBuV/m was applied

65.975 GHz

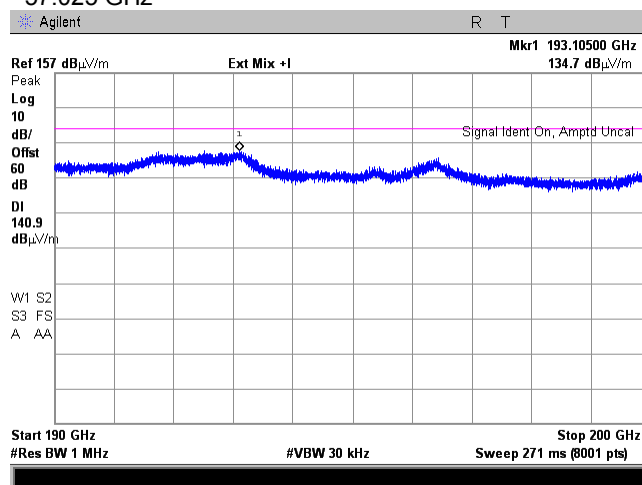
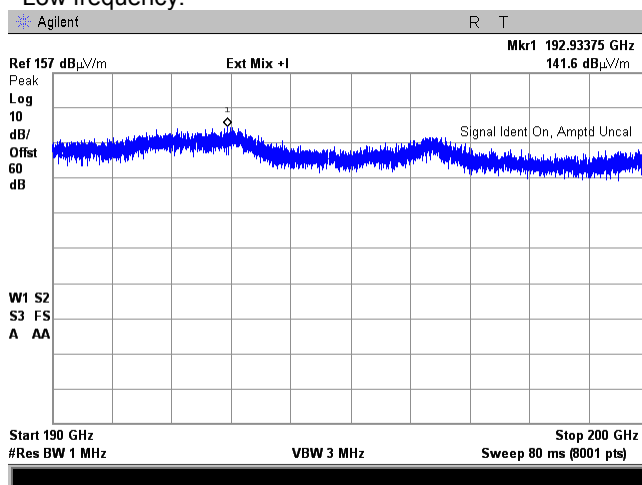


Test specification:		Section 15.255(c)(3), Out of band radiated emissions above 40 GHz	
Test procedure:		ANSI C63.10, Sections 9.9, 9.12	
Test mode:		Compliance	Verdict: PASS
Date(s):		25-Apr-18 - 16-Aug-18	
Temperature: 24.1 °C	Relative Humidity: 46 %	Air Pressure: 1011 hPa	Power: -48 VDC
Remarks:			

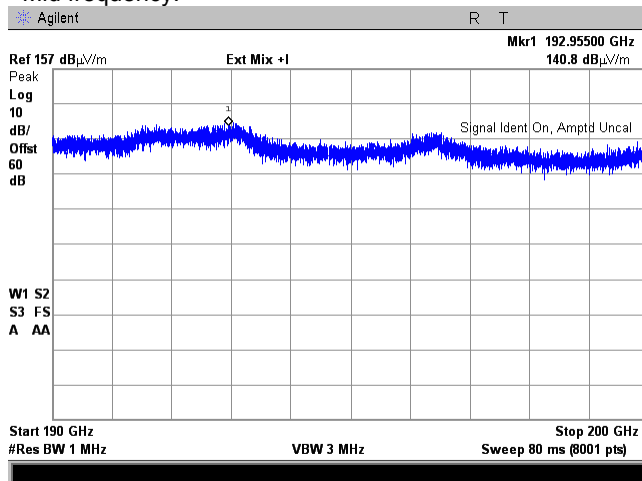
Plot 7.4.31 Spurious emission test results at low carrier frequency from 190 to 200 GHz

TEST SITE:
TEST DISTANCE:
ANTENNA POLARIZATION:
DETECTOR:
Low frequency:

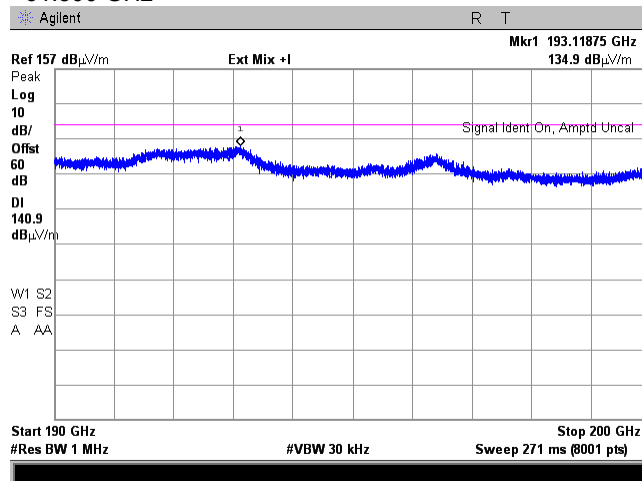
OATS
0.005 m
Vertical and Horizontal
Peak
57.025 GHz



Mid frequency:



61.500 GHz



Limit 160.9 dB μ V/m was applied

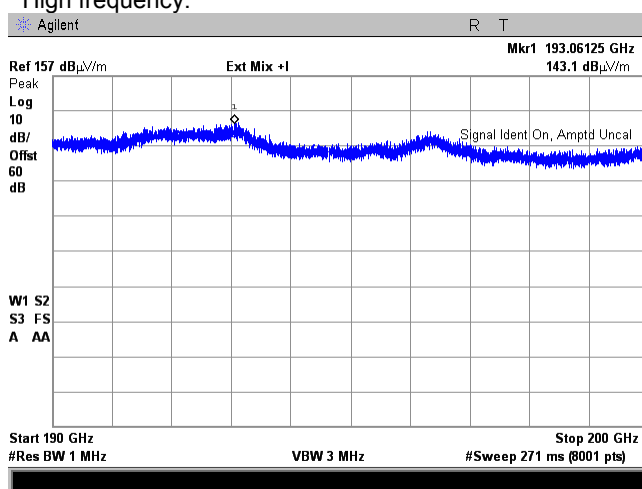
Test specification: Section 15.255(c)(3), Out of band radiated emissions above 40 GHz			
Test procedure: ANSI C63.10, Sections 9.9, 9.12			
Test mode: Compliance		Verdict: PASS	
Date(s): 25-Apr-18 - 16-Aug-18			
Temperature: 24.1 °C	Relative Humidity: 46 %	Air Pressure: 1011 hPa	Power: -48 VDC
Remarks:			

Plot 7.4.32 Spurious emission test results at low carrier frequency from 190 to 200 GHz

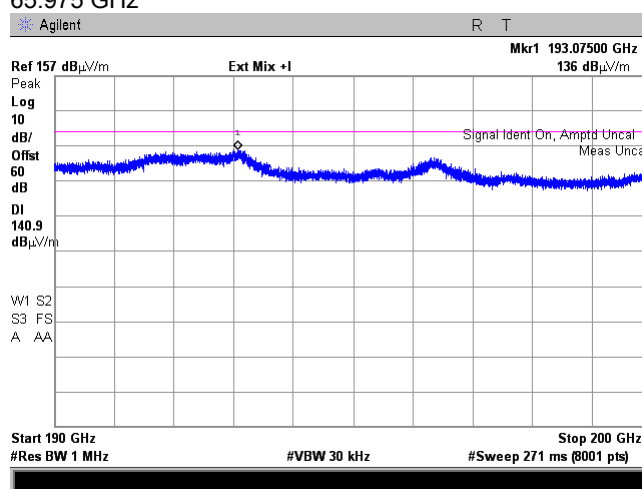
TEST SITE:
TEST DISTANCE:
ANTENNA POLARIZATION:
DETECTOR:

OATS
0.005 m
Vertical and Horizontal
Peak

High frequency:



65.975 GHz



Test specification: Section 15.255(e), Frequency tolerance			
Test procedure: 47 CFR, Section 2.1055; ANSI C63.10, Section 9.14			
Test mode: Compliance		Verdict: PASS	
Date(s): 27-May-18 - 29-May-18			
Temperature: 24.3 °C	Relative Humidity: 46 %	Air Pressure: 1009 hPa	Power: -48 VDC
Remarks:			

7.5 Frequency stability test

7.5.1 General

This test was performed to measure frequency stability of transmitter RF carrier. Specification test limits are given in Table 7.5.1.

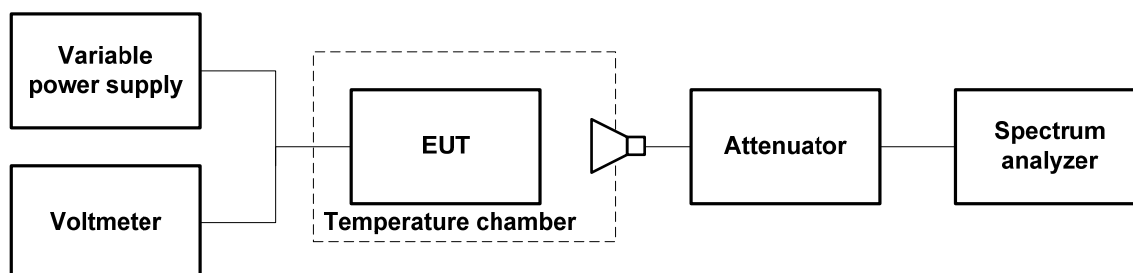
Table 7.5.1 Frequency stability limits

Assigned frequency, MHz	Maximum allowed frequency displacement
57025	NA
61500	
65975	

7.5.2 Test procedure

- 7.5.2.1 The EUT was set up as shown in Figure 7.5.1, energized and its proper operation was checked.
- 7.5.2.2 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.
- 7.5.2.3 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.
- 7.5.2.4 The above procedure was repeated at 0°C and at the lowest test temperature.
- 7.5.2.5 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.
- 7.5.2.6 Frequency displacement was calculated and compared with the limit as provided in Table 7.5.2.

Figure 7.5.1 Frequency stability test setup



Test specification: Section 15.255(e), Frequency tolerance			
Test procedure: 47 CFR, Section 2.1055; ANSI C63.10, Section 9.14			
Test mode: Compliance		Verdict: PASS	
Date(s): 27-May-18 - 29-May-18			
Temperature: 24.3 °C	Relative Humidity: 46 %	Air Pressure: 1009 hPa	Power: -48 VDC
Remarks:			

Table 7.5.2 Frequency stability test results

OPERATING FREQUENCY: 57000 – 66000 MHz
 NOMINAL POWER VOLTAGE: -48 V output of AC/DC adapter
 TEMPERATURE STABILIZATION PERIOD: 20 min
 POWER DURING TEMPERATURE TRANSITION: Off
 SPECTRUM ANALYZER MODE: Counter
 RESOLUTION BANDWIDTH: 1 kHz
 VIDEO BANDWIDTH: 1 kHz
 MODULATION: Unmodulated

T, °C	Voltage, V	Frequency, MHz							Max frequency drift, Hz	
		Start up	1 st min	2 nd min	3 rd min	4 th min	5 th min	10 th min	Posit	Negative
Low frequency 57025 MHz										
-30	nominal	57025.007687	57025.007720	57025.007624	57025.007621	57025.007710	57025.007644	57025.007703	27651	0
-20	nominal	57024.970412	NA	NA	NA	NA	NA	57024.973361	0	-9657
-10	nominal	57024.958511	NA	NA	NA	NA	NA	57024.958575	0	-21558
0	nominal	57024.967012	57024.967065	57024.967109	57024.967111	57024.967127	57024.967131	57024.967088	0	-13057
10	nominal	57024.974678	NA	NA	NA	NA	NA	57024.974648	0	-5421
20	15%	57024.980086	NA	NA	NA	NA	NA	57024.979967	17	-102
20	nominal	57024.980034	NA	NA	NA	NA	NA	57024.980069	0	-35
20	-15%	57024.980025	NA	NA	NA	NA	NA	57024.980024	0	-45
30	nominal	57024.979051	57024.979019	57024.979048	57024.979053	57024.979064	57024.979070	57024.979044	0	-1050
40	nominal	57024.970106	NA	NA	NA	NA	NA	57024.969513	0	-10556
50	nominal	57024.959777	NA	NA	NA	NA	NA	57024.956758	0	-23311
Mid frequency 61500 MHz										
-30	nominal	61500.008325	61500.008381	61500.008303	61500.008362	61500.008326	61500.008300	61500.008329	29826	0
-20	nominal	61499.971391	NA	NA	NA	NA	NA	61499.972054	0	-7164
-10	nominal	61499.955142	NA	NA	NA	NA	NA	61499.955229	0	-23413
0	nominal	61499.964500	61499.964522	61499.964489	61499.964770	61499.964496	61499.964502	61499.964533	0	-14066
10	nominal	61499.972821	NA	NA	NA	NA	NA	61499.972711	0	-5844
20	15%	61499.978504	NA	NA	NA	NA	NA	61499.978553	0	-51
20	nominal	61499.978469	NA	NA	NA	NA	NA	61499.978555	0	-86
20	-15%	61499.978493	NA	NA	NA	NA	NA	61499.978518	0	-62
30	nominal	61499.977492	61499.977408	61499.977462	61499.977430	61499.977418	61499.977416	61499.977400	0	-1155
40	nominal	61499.967076	NA	NA	NA	NA	NA	61499.967976	0	-11479
50	nominal	61499.956612	NA	NA	NA	NA	NA	61499.956578	0	-21977
High frequency 65975 MHz										
-30	nominal	65975.006688	65975.006858	65975.006888	65975.007053	65975.007155	65975.007252	65975.007552	30577	0
-20	nominal	65974.970009	NA	NA	NA	NA	NA	65974.970157	0	-6966
-10	nominal	65974.951626	NA	NA	NA	NA	NA	65974.951887	0	-25349
0	nominal	65974.961925	65974.961860	65974.961911	65974.961894	65974.961926	65974.961898	65974.961968	0	-15115
10	nominal	65974.971975	NA	NA	NA	NA	NA	65974.971014	0	-5961
20	15%	65974.976999	NA	NA	NA	NA	NA	65974.977005	30	0
20	nominal	65974.976966	NA	NA	NA	NA	NA	65974.977021	46	-9
20	-15%	65974.976991	NA	NA	NA	NA	NA	65974.976975	16	0
30	nominal	65974.976395	65974.976126	65974.976092	65974.975967	65974.975904	65974.975898	65974.975853	0	-1122
40	nominal	65974.964594	NA	NA	NA	NA	NA	65974.964622	0	-12381
50	nominal	65974.953757	NA	NA	NA	NA	NA	65974.953457	0	-23518

* - Reference frequency

Reference numbers of test equipment used

HL 2909	HL 3290	HL 3433	HL 3305		
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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
0446	Antenna, Loop, Active, 10 kHz - 30 MHz	EMCO	6502	2857	11-Feb-18	11-Feb-19
0604	Antenna BiconiLog Log-Periodic/T Bow-TIE, 26 - 2000 MHz	EMCO	3141	9611-1011	03-Jun-18	03-Jun-19
0747	Mixer, Millimeter Wave Harmonic 90 - 140 GHz	Oleson Microwave Labs	M08HW	F80429-1	03-Mar-17	03-Mar-20
0748	Mixer Millimeter Wave Harmonic 60 - 90 GHz	Oleson Microwave Labs	M12 HW	E 804 29-1	13-Apr-17	13-Apr-20
0770	Antenna Standard Gain Horn, 40-60 GHz WR-19, U-band, 24 dB mid-band gain	Quinstar Technology	QWH-1900-AA	118	05-Jul-18	05-Jul-19
0771	Antenna Standard Gain Horn, 60-90 GHz, WR-12, 24 dB mid-band gain	Quinstar Technology	QWH-1200-AA	111	05-Jul-18	05-Jul-19
0772	Antenna Standard Gain Horn, 75-110 GHz, WR-10, 24 dB mid-band gain	Quinstar Technology	QWH-0800-AA	110	05-Jul-18	05-Jul-19
1295	Adapter 35WR28Kf, 26.5-40 GHz	Wiltron	35WR28K F	1295	24-Sep-18	24-Sep-21
1299	Transition waveguide ET28S -19R	Custom Microwave	ET28S - 19R	1299	13-Aug-18	13-Aug-21
1300	Transition waveguide ET28S -19R	Custom Microwave	ET28S - 19R	1300	13-Aug-18	13-Aug-21
1303	Transition waveguide ET28S -12R	Custom Microwave	ET28S - 12R	S0951	14-Aug-18	14-Aug-21
1304	Transition waveguide ET28S - 8R	Custom Microwave	ET28S - 8R	1304	13-Aug-18	13-Aug-21
1306	Transition waveguide ET28S - 5R	Custom Microwave	ET28S - 5R	1306	13-Aug-18	13-Aug-21
1312	Mixer Millimeter Wave Harmonic 140-220 GHz	Oleson Microwave Labs	M05HWD	G91112-1	03-Mar-17	03-Mar-20
2909	Spectrum analyzer, ESA-E, 100 Hz to 26.5 GHz	Agilent Technologies	E4407B	MY414447 62	27-Mar-18	27-Mar-19
3001	EMC Analyzer, 9 kHz to 3 GHz	Agilent Technologies	E7402A	US394401 80	09-Oct-17	09-Oct-18
3235	Harmonic mixer 40 to 60 GHz	Agilent Technologies	11970U	MY300301 82	16-Aug-16	16-Aug-19
3290	Attenuator, direct reading, 40 to 60 GHz, 0.4 W	Quinstar Technology	QAD-U00000	10381008	10-Dec-17	10-Dec-18
3291	Attenuator, direct reading, 60 to 90 GHz, 0.2 W	Quinstar Technology	QAD-E00000	10381009	10-Dec-17	10-Dec-18
3294	Tapered transition, WR-28, UG-599 to WR-15, UG-385 (26.5-40 GHz to 50-75 GHz)	Quinstar Technology	QWP-AV0000	10381004	14-Aug-18	14-Aug-21
3297	Tapered , WR-28, UG-599 to WR-10, UG-387 (26.5-40 GHz to 75-100 GHz)	Quinstar Technology	QWP-AW0000	10381007	13-Aug-18	13-Aug-21



HL No	Description	Manufacturer	Model	Ser. No.	Last Cal./ Check	Due Cal./ Check
3305	Harmonic mixer 50 to 75 GHz	Agilent Technologies	11970V	MY30030149	16-Aug-16	16-Aug-19
3329	Antenna Standard Gain Horn, 140-220 GHz, WR-5, 24 dB mid-band gain	Quinstar Technology	NA	NA	14- Aug-18	14- Aug-19
3433	Test Cable , DC-18 GHz, 1.5 m, SMA - SMA	Mini-Circuits	CBL-5FT-SMSM+	25679	28-Mar-18	28-Mar-19
3434	Test Cable , DC-18 GHz, 1.5 m, SMA - SMA	Mini-Circuits	CBL-5FT-SMSM+	25683	28-Mar-18	28-Mar-19
3901	Microwave Cable Assembly, 40.0 GHz, 3.5 m, SMA/SMA	Huber-Suhner	SUCOFLE X 102A	1225/2A	07-Feb-18	07-Feb-19
3903	Microwave Cable Assembly, 40.0 GHz, 1.5 m, SMA/SMA	Huber-Suhner	SUCOFLE X 102A	1226/2A	07-Feb-18	07-Feb-19
4023	Diplexer for use OML mixers with Agilent spectrum analyzer	Oleson Microwave Labs	DPL.26	NA	10-Dec-17	10-Dec-18
4360	EMI Test Receiver, 20 Hz to 40 GHz.	Rohde & Schwarz	ESU40	100322	26-Dec-17	26-Dec-18
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
5245	RF cable, 18 GHz, 3 m, N-type	Huber-Suhner	ST18A/Nm/Nm/3000	602211/18A	01-Aug-18	01-Aug-19
5360	Broadband detector, 55 to 90 GHz	Pacific Millimeter Products, Inc	ED	200	17-May-18	17-May-19
5369	Digital storage oscilloscope, 350 MHz	Keysight Technologies	DSOX3034T	MY58032630	31-May-18	31-May-19
5376	EXA Signal Analyzer, 10 Hz - 32 GHz	Keysight Technologies	N9010B	MY57470404	16-Mar-18	16-Mar-19
5380	Waveguide Harmonic Mixer 55-90GHz	Keysight Technologies	M1971E	MY56130239	01-Jun-18	01-Jun-19

9 APPENDIX B Measurement uncertainties

Expanded uncertainty at 95% confidence in Hermon Labs EMC measurements

Test description	Expanded uncertainty
Conducted emissions with LISN	9 kHz to 150 kHz: ± 3.9 dB 150 kHz to 30 MHz: ± 3.8 dB
Radiated emissions at 10 m measuring distance Horizontal polarization Vertical polarization	Biconilog antenna: ± 5.0 dB Biconical antenna: ± 5.0 dB Log periodic antenna: ± 5.1 dB Double ridged horn antenna: ± 5.3 dB Biconilog antenna: ± 5.5 dB Biconical antenna: ± 5.5 dB Log periodic antenna: ± 5.6 dB Double ridged horn antenna: ± 5.8 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
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

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

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).

Address: P.O. Box 23, Binyamina 3055001, Israel.
Telephone: +972 4628 8001
Fax: +972 4628 8277
e-mail: mail@hermonlabs.com
website: www.hermonlabs.com

Person for contact: Mr. Michael Nikishin, EMC&Radio group manager

11 APPENDIX D Specification references

47CFR part 15: 2017	Radio Frequency Devices
47CFR part 1: 2017	Practice and procedure
47CFR part 2: 2017	Frequency allocations and radio treaty matters; general rules and regulations
ANSI C63.10: 2013	American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices
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(μ V) to convert it into field strength in dB(μ V/m).

Antenna factor
Standard gain horn antenna
Quinstar Technology
Model QWH
Ser.No.112, HL 0768, 0769, 0770, 0771, 0772

Frequency min, GHz	Frequency max, GHz	Antenna factor, dB(1/m)
18.000	26.500	32.01
26.500	40.000	35.48
40.000	60.000	39.03
60.000	90.000	42.55
90.000	140.000	46.23
140.000	220.000	50.11

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

Antenna factor
Biconilog antenna EMCO Model 3141
Ser.No.1011, HL 0604

Frequency, MHz	Antenna factor, dB(1/m)	Frequency, MHz	Antenna factor, dB(1/m)	Frequency, MHz	Antenna factor, dB(1/m)
26	7.8	580	20.6	1320	27.8
28	7.8	600	21.3	1340	28.3
30	7.8	620	21.5	1360	28.2
40	7.2	640	21.2	1380	27.9
60	7.1	660	21.4	1400	27.9
70	8.5	680	21.9	1420	27.9
80	9.4	700	22.2	1440	27.8
90	9.8	720	22.2	1460	27.8
100	9.7	740	22.1	1480	28.0
110	9.3	760	22.3	1500	28.5
120	8.8	780	22.6	1520	28.9
130	8.7	800	22.7	1540	29.6
140	9.2	820	22.9	1560	29.8
150	9.8	840	23.1	1580	29.6
160	10.2	860	23.4	1600	29.5
170	10.4	880	23.8	1620	29.3
180	10.4	900	24.1	1640	29.2
190	10.3	920	24.1	1660	29.4
200	10.6	940	24.0	1680	29.6
220	11.6	960	24.1	1700	29.8
240	12.4	980	24.5	1720	30.3
260	12.8	1000	24.9	1740	30.8
280	13.7	1020	25.0	1760	31.1
300	14.7	1040	25.2	1780	31.0
320	15.2	1060	25.4	1800	30.9
340	15.4	1080	25.6	1820	30.7
360	16.1	1100	25.7	1840	30.6
380	16.4	1120	26.0	1860	30.6
400	16.6	1140	26.4	1880	30.6
420	16.7	1160	27.0	1900	30.6
440	17.0	1180	27.0	1920	30.7
460	17.7	1200	26.7	1940	30.9
480	18.1	1220	26.5	1960	31.2
500	18.5	1240	26.5	1980	31.6
520	19.1	1260	26.5	2000	32.0
540	19.5	1280	26.6		
560	19.8	1300	27.0		

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

Antenna factor
Active Horn Antenna,
Com-Power Corporation, model: AHA-118, s/n 701046, HL 4933

Frequency, MHz	Measured antenna factor (with preamplifier), dB/m
1000	-16.1
1500	-15.1
2000	-10.9
2500	-11.9
3000	-11.1
3500	-10.6
4000	-8.6
4500	-8.3
5000	-5.9
5500	-5.7
6000	-3.3
6500	-4.0
7000	-2.2
7500	-1.7
8000	1.1
8500	-0.8
9000	-1.5
9500	-0.2

Frequency, MHz	Measured antenna factor (with preamplifier), dB/m
10000	1.8
10500	1.0
11000	0.3
11500	-0.5
12000	3.1
12500	1.4
13000	-0.3
13500	-0.4
14000	2.5
14500	2.2
15000	1.9
15500	0.5
16000	2.1
16500	1.2
17000	0.6
17500	3.1
18000	4.2

The antenna factor shall be added to receiver reading in dB μ V to obtain field strength in dB μ V/m.

Antenna factor
Active Horn Antenna,
Com-Power Corporation, model: AHA-840, s/n 105004, HL 4956

Frequency, MHz	Measured antenna factor (with preamplifier), dB/m
18000	2.5
18500	0.5
19000	-1.0
19500	-2.4
20000	-2.5
20500	-2.2
21000	-2.0
21500	-2.7
22000	-3.7
22500	-3.8
23000	-3.7
23500	-5.0
24000	-4.5
24500	-5.0
25000	-4.7
25500	-4.4
26000	-4.3
26500	-5.6
27000	-4.3
27500	-4.9
28000	-5.2
28500	-4.4

Frequency, MHz	Measured antenna factor (with preamplifier), dB/m
29000	-2.7
29500	-2.6
30000	-1.4
30500	-1.5
31000	-1.0
31500	-2.6
32000	-3.3
32500	-3.3
33000	-5.1
33500	-5.2
34000	-1.5
34500	-5.4
35000	-3.3
35500	-4.2
36000	-2.8
36500	-2.6
37000	-1.0
38000	1.8
38500	2.8
39000	1.3
39500	1.3
40000	0.3

The antenna factor shall be added to receiver reading in dB μ V to obtain field strength in dB μ V/m.

Cable loss
Test Cable, Mini-Circuits, CBL-5FT-SMSM+, SMA-SMA, 18 GHz, 1.5 m, S/N 25679
Mini-Circuits, HL 3433

Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB
10.0	0.06	9000	2.01
100	0.17	9500	2.06
500	0.41	10000	2.05
1000	0.58	10500	2.18
1500	0.72	11000	2.26
2000	0.86	11500	2.28
2500	0.96	12000	2.43
3000	1.04	12500	2.53
3500	1.13	13000	2.52
4000	1.23	13500	2.56
4500	1.31	14000	2.60
5000	1.41	14500	2.59
5500	1.49	15000	2.67
6000	1.55	15500	2.76
6500	1.63	16000	2.86
7000	1.71	16500	2.91
7500	1.78	17000	2.95
8000	1.86	17500	3.02
8500	1.92	18000	3.07

Cable loss
Test Cable, Mini-Circuits, CBL-5FT-SMSM+, SMA-SMA, 18 GHz, 1.5 m, S/N 25683
Mini-Circuits, HL 3434

Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB
10.0	0.06	9000	1.96
100	0.16	9500	2.01
500	0.40	10000	2.01
1000	0.57	10500	2.14
1500	0.72	11000	2.21
2000	0.85	11500	2.24
2500	0.95	12000	2.36
3000	1.03	12500	2.47
3500	1.11	13000	2.46
4000	1.21	13500	2.50
4500	1.29	14000	2.53
5000	1.39	14500	2.53
5500	1.46	15000	2.62
6000	1.52	15500	2.70
6500	1.60	16000	2.80
7000	1.68	16500	2.86
7500	1.75	17000	2.88
8000	1.83	17500	2.94
8500	1.88	18000	3.00

Cable loss
Microwave Cable Assembly, Huber-Suhner, 40 GHz, 3.5 m, SMA-SMA, S/N 1225/2A
HL 3901

Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB
10	0.09	9500	4.29	21000	6.67
100	0.41	10000	4.40	22000	6.92
500	0.93	10500	4.52	23000	7.00
1000	1.33	11000	4.64	24000	7.18
1500	1.63	11500	4.76	25000	7.29
2000	1.90	12000	4.87	26000	7.55
2500	2.12	12500	4.99	27000	7.70
3000	2.33	13000	5.11	28000	7.88
3500	2.50	13500	5.20	29000	8.02
4000	2.67	14000	5.31	30000	8.15
4500	2.82	14500	5.42	31000	8.35
5000	2.99	15000	5.51	32000	8.40
5500	3.16	15500	5.58	33000	8.62
6000	3.32	16000	5.68	34000	8.73
6500	3.51	16500	5.78	35000	8.78
7000	3.65	17000	5.91	36000	8.94
7500	3.79	17500	5.99	37000	9.21
8000	3.92	18000	6.07	38000	9.37
8500	4.04	19000	6.36	39000	9.45
9000	4.18	20000	6.49	40000	9.52

Cable loss
Microwave Cable Assembly, Huber-Suhner, 40 GHz, 1.5 m, SMA-SMA, S/N 1226/2A
HL 3903

Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB
10	-0.02	9500	1.84	21000	2.98
100	0.15	10000	1.86	22000	3.07
500	0.38	10500	1.93	23000	3.13
1000	0.56	11000	1.99	24000	3.21
1500	0.69	11500	2.04	25000	3.26
2000	0.82	12000	2.10	26000	3.48
2500	0.90	12500	2.15	27000	3.44
3000	0.98	13000	2.21	28000	3.53
3500	1.06	13500	2.25	29000	3.59
4000	1.11	14000	2.29	30000	3.66
4500	1.17	14500	2.34	31000	3.70
5000	1.24	15000	2.36	32000	3.79
5500	1.32	15500	2.40	33000	3.88
6000	1.40	16000	2.45	34000	3.94
6500	1.50	16500	2.48	35000	3.91
7000	1.56	17000	2.56	36000	4.05
7500	1.62	17500	2.58	37000	4.22
8000	1.68	18000	2.60	38000	4.25
8500	1.74	19000	2.84	39000	4.27
9000	1.78	20000	2.88	40000	4.33

Cable loss
RF Cable, Huber-Suhner, 18 GHz, 3 m, N- type,
ST18A/Nm/Nm/3000, S/N 602211/18A
HL 5245

Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB
0.1	0.01	5500	1.76
50	0.16	6000	1.85
100	0.23	6500	1.93
200	0.32	7000	2.02
300	0.39	7500	2.11
400	0.45	8000	2.19
500	0.51	8500	2.26
600	0.56	9000	2.30
700	0.60	9500	2.33
800	0.65	10000	2.37
900	0.68	10500	10500
1000	0.72	11000	11000
1100	0.76	11500	11500
1200	0.80	12000	12000
1300	0.83	12500	12500
1400	0.86	13000	13000
1500	0.89	13500	13500
1600	0.92	14000	14000
1700	0.95	14500	14500
1800	0.98	15000	15000
1900	1.01	15500	15500
2000	1.03	16000	16000
2500	1.16	16500	16500
3000	1.27	17000	17000
3500	1.38	17500	17500
4000	1.48	18000	18000
4500	1.58		
5000	1.67		

13 APPENDIX F Abbreviations and acronyms

A	ampere
AC	alternating current
A/m	ampere per meter
AM	amplitude modulation
AVRG	average (detector)
BB	broad band
cm	centimeter
dB	decibel
dBm	decibel referred to one milliwatt
dB(μ V)	decibel referred to one microvolt
dB(μ V/m)	decibel referred to one microvolt per meter
dB(μ A)	decibel referred to one microampere
dB Ω	decibel referred to one Ohm
DC	direct current
EIRP	equivalent isotropically radiated power
ERP	effective radiated power
EUT	equipment under test
F	frequency
GHz	gigahertz
GND	ground
H	height
HL	Hermon laboratories
Hz	hertz
ITE	information technology equipment
k	kilo
kHz	kilohertz
LISN	line impedance stabilization network
LO	local oscillator
m	meter
MHz	megahertz
min	minute
mm	millimeter
ms	millisecond
μ s	microsecond
NA	not applicable
NB	narrow band
NT	not tested
OATS	open area test site
Ω	Ohm
QP	quasi-peak
PM	pulse modulation
PS	power supply
RE	radiated emission
RF	radio frequency
rms	root mean square
Rx	receive
s	second
T	temperature
Tx	transmit
V	volt
VA	volt-ampere

END OF DOCUMENT