Test specification:	Section 27.53, Spurious emissions at RF antenna connector		
Test procedure:	47 CFR, Sections 2.1051, 27.53; TIA/EIA-603-E, Section 2.2.13		
Test mode:	Compliance	Verdict:	PASS
Date(s):	02-Jun-19		
Temperature: 24 ºC	Relative Humidity: 51 %	Air Pressure: 1004 hPa	Power: 120 VAC
Remarks:			

7.4 Spurious emissions at RF antenna connector test

7.4.1 General

This test was performed to measure spurious emissions at RF antenna connector. Specification test limits are given in Table 7.4.1.

Table 7.4.1 Spurious emission limits

Frequency, MHz	Attenuation below carrier, dBc	Spurious emissions, dBm
Base and fixed user stations		
0.009 – 10th harmonic	**43+10logP(W)****	**-13.0**
Mobile stations		
0.009 – 10th harmonic*	55+10logP(W)**	-25.0

* - spurious emission limits do not apply to the channel edge emission investigated in course of band edge emission testing
** - P is transmitter output power in watts

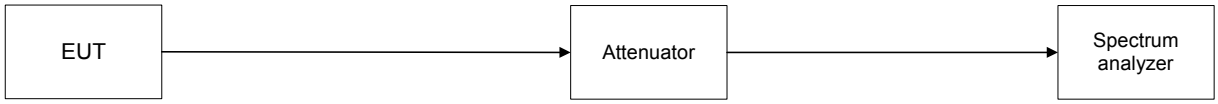
7.4.2 Test procedure

7.4.2.1 The EUT was set up as shown in Figure 7.4.1, energized and its proper operation was checked.

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

7.4.2.3 The spurious emission was measured with spectrum analyzer as provided in Table 7.4.2 and the associated plots.

Figure 7.4.1 Spurious emission test setup, single output



Test specification:	Section 27.53, Spurious emissions at RF antenna connector		
Test procedure:	47 CFR, Sections 2.1051, 27.53; TIA/EIA-603-E, Section 2.2.13		
Test mode:	Compliance	Verdict:	PASS
Date(s):	02-Jun-19		
Temperature: 24 ºC	Relative Humidity: 51 %	Air Pressure: 1004 hPa	Power: 120 VAC
Remarks:			

Table 7.4.2 Spurious emission test results

ASSIGNED FREQUENCY RANGE: 2496-2690 MHz
INVESTIGATED FREQUENCY RANGE: 0.009 – 26900 MHz
DETECTOR USED: Peak
VIDEO BANDWIDTH: ≥ Resolution bandwidth
MODULATION: 64QAM
MODULATING SIGNAL: PRBS
TRANSMITTER OUTPUT POWER SETTINGS: Maximum
ANTENNA PORT: #1

Frequency, MHz	SA reading, dBm	Attenuation, dB	Cable loss, dB	RBW, kHz	Spurious emission, dBm	Limit, dBm	Margin, dB*	Verdict
Low carrier frequency								
5002.05	-52.3	included	included	1000	-50.75	-13	-37.75	Pass
7506.35	-49.99	included	included	1000	-48.44	-13	-35.44	Pass
Mid carrier frequency								
5001.87	-49.78	included	included	1000	-48.23	-13	-35.23	Pass
7503.83	-46.46	included	included	1000	-44.91	-13	-31.91	Pass
High carrier frequency								
5370	-43.77	included	included	1000	-42.22	-13	-29.22	Pass
8054.35	-48.49	included	included	1000	-46.94	-13	-33.94	Pass

ANTENNA PORT: #2

Frequency, MHz	SA reading, dBm	Attenuation, dB	Cable loss, dB	RBW, kHz	Spurious emission*, dBm	Limit, dBm	Margin, dB**	Verdict
Low carrier frequency								
5001.675	-50.06	included	included	1000	-48.51	-13	-35.51	Pass
7503.725	-49.37	included	included	1000	-47.82	-13	-34.82	Pass
Mid carrier frequency								
5248.112	-50.89	included	included	1000	-49.34	-13	-36.34	Pass
7871.211	-42.98	included	included	1000	-41.43	-13	-28.43	Pass
High carrier frequency								
5370.000	-48.4	included	included	1000	-46.85	-13	-33.85	Pass
8054.250	-44.32	included	included	1000	-42.77	-13	-29.77	Pass

* - Spurious emission, dBm = SA reading, dBm + duty cycle factor
duty cycle factor = [10 log (1/duty cycle)] = 1.55
duty cycle = 0.7
**- Margin = Spurious emission – specification limit.

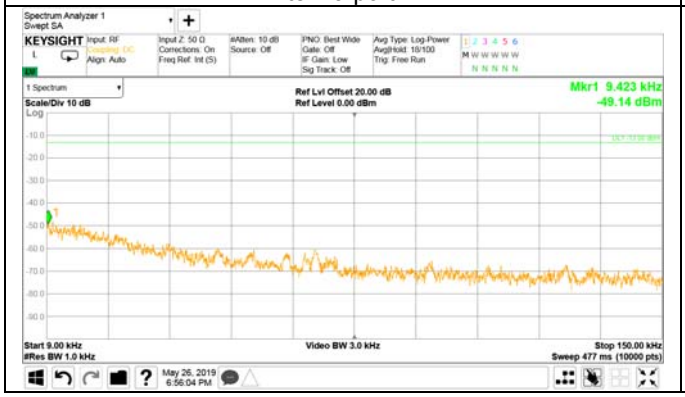
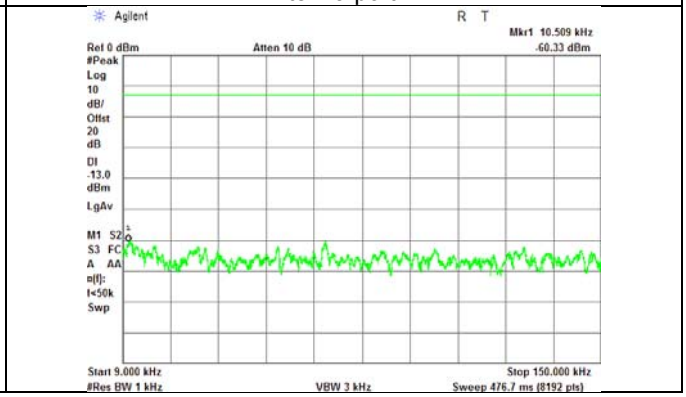
Reference numbers of test equipment used

HL 3301	HL 3302	HL 3433	HL 3787	HL 3818	HL 4068	HL 4366	

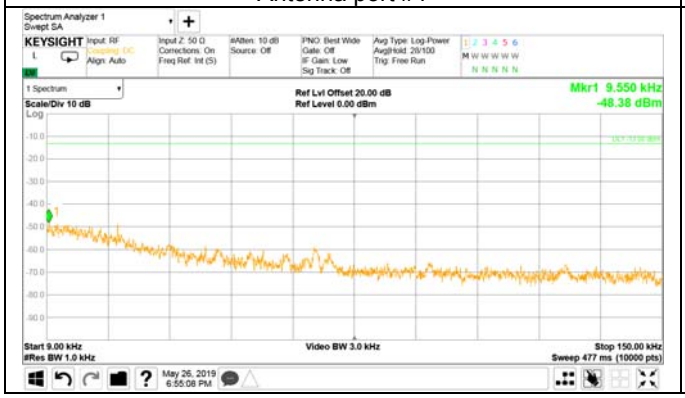
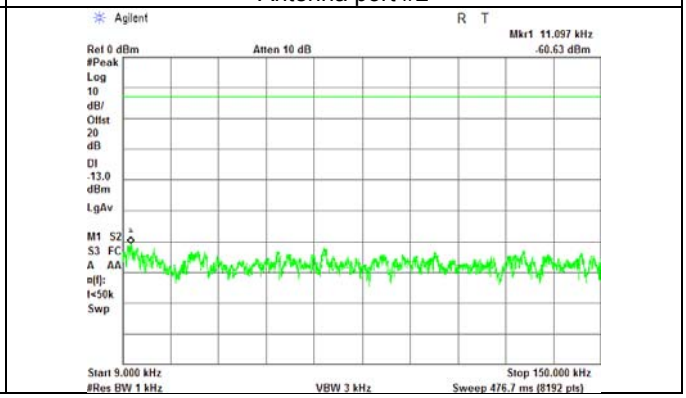
Full description is given in Appendix A.

Test specification:	Section 27.53, Spurious emissions at RF antenna connector		
Test procedure:	47 CFR, Sections 2.1051, 27.53; TIA/EIA-603-E, Section 2.2.13		
Test mode:	Compliance	Verdict:	PASS
Date(s):	02-Jun-19		
Temperature: 24 ºC	Relative Humidity: 51 %	Air Pressure: 1004 hPa	Power: 120 VAC
Remarks:			

Plot 7.4.1 Spurious emission measurements in 9 - 150 kHz range at low carrier frequency

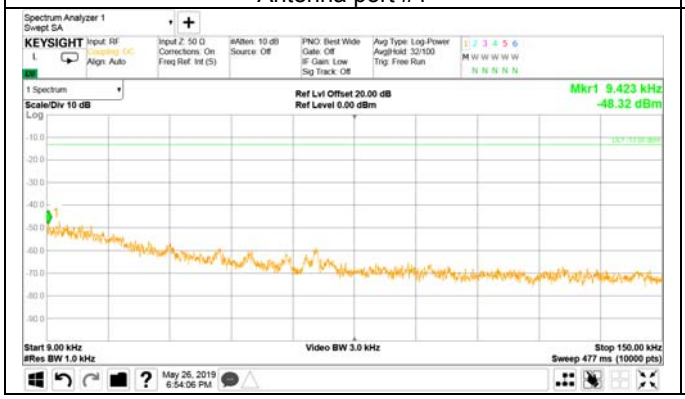
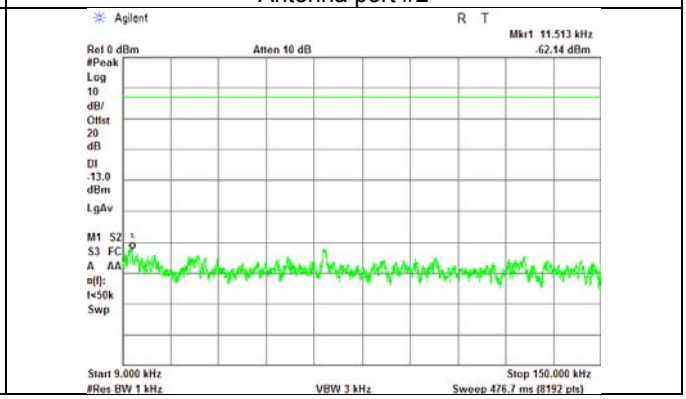
Antenna port #1	Antenna port #2
	

Plot 7.4.2 Spurious emission measurements in 9 - 150 kHz range at mid carrier frequency

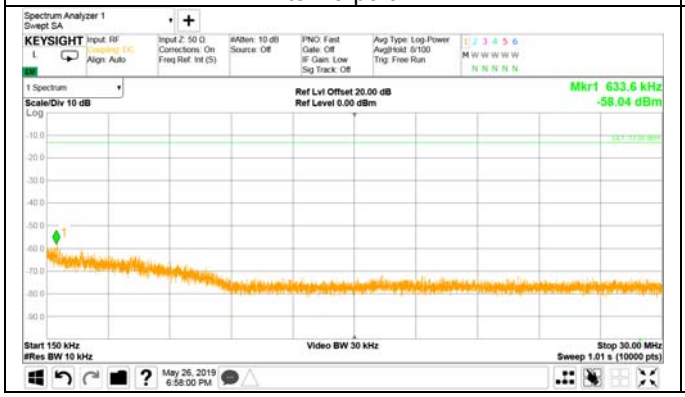
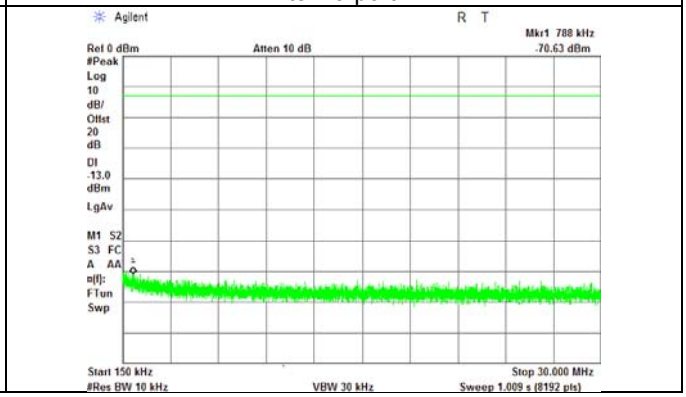
Antenna port #1	Antenna port #2
	

Test specification:	Section 27.53, Spurious emissions at RF antenna connector		
Test procedure:	47 CFR, Sections 2.1051, 27.53; TIA/EIA-603-E, Section 2.2.13		
Test mode:	Compliance	Verdict:	PASS
Date(s):	02-Jun-19		
Temperature: 24 ºC	Relative Humidity: 51 %	Air Pressure: 1004 hPa	Power: 120 VAC
Remarks:			

Plot 7.4.3 Spurious emission measurements in 9 - 150 kHz range at high carrier frequency

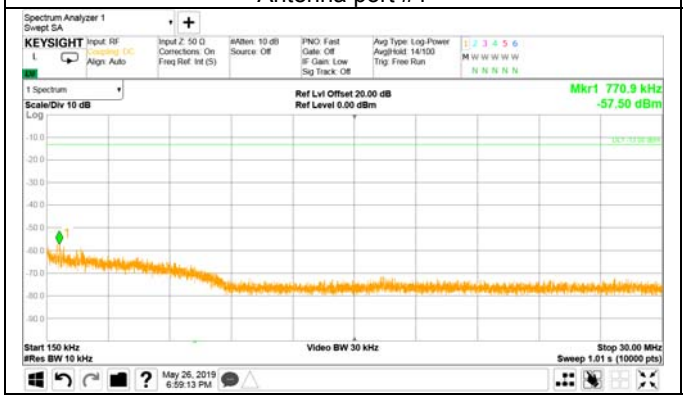
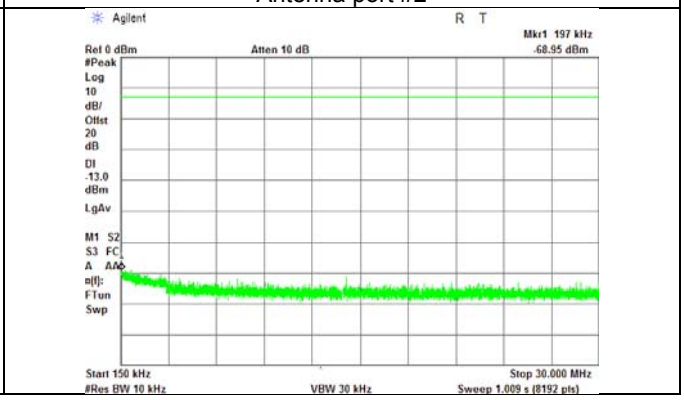
Antenna port #1	Antenna port #2
	

Plot 7.4.4 Spurious emission measurements in 0.15 - 30.0 MHz range at low carrier frequency

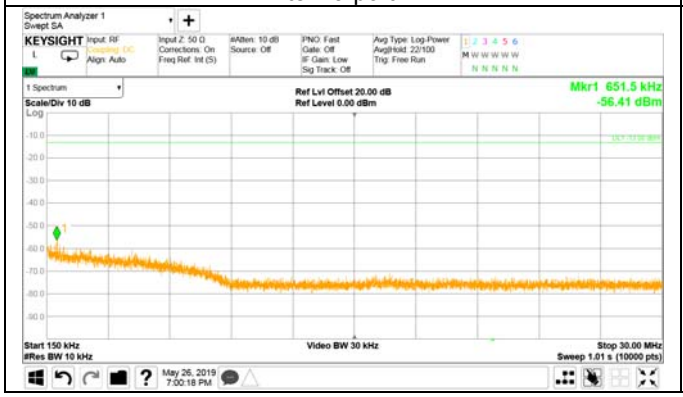
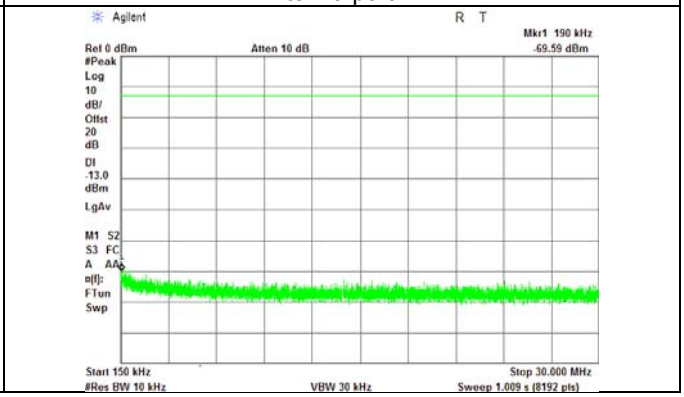
Antenna port #1	Antenna port #2
	

Test specification:	Section 27.53, Spurious emissions at RF antenna connector		
Test procedure:	47 CFR, Sections 2.1051, 27.53; TIA/EIA-603-E, Section 2.2.13		
Test mode:	Compliance	Verdict:	PASS
Date(s):	02-Jun-19		
Temperature: 24 ºC	Relative Humidity: 51 %	Air Pressure: 1004 hPa	Power: 120 VAC
Remarks:			

Plot 7.4.5 Spurious emission measurements in 0.15 - 30.0 MHz range at mid carrier frequency

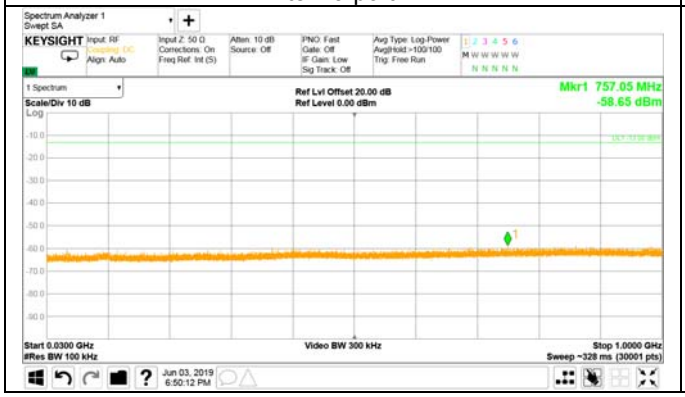
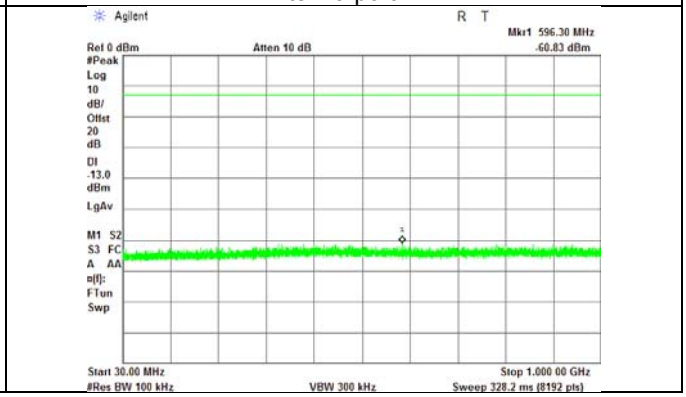
Antenna port #1	Antenna port #2
	

Plot 7.4.6 Spurious emission measurements in 0.15 - 30.0 MHz range at high carrier frequency

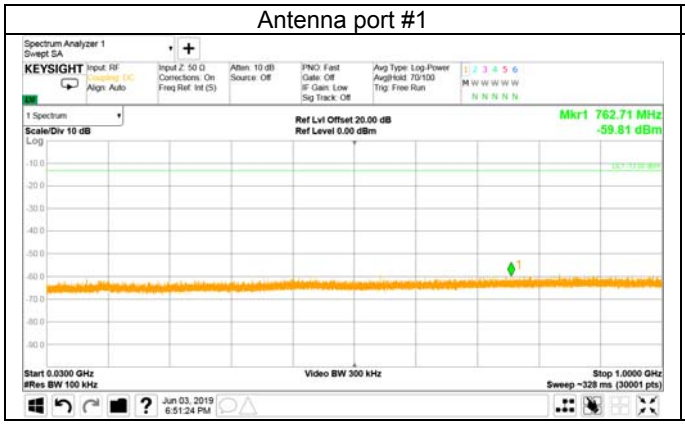
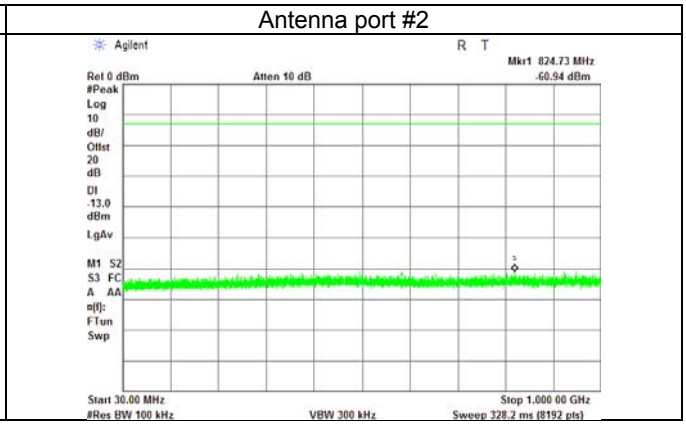
Antenna port #1	Antenna port #2
	

Test specification:	Section 27.53, Spurious emissions at RF antenna connector		
Test procedure:	47 CFR, Sections 2.1051, 27.53; TIA/EIA-603-E, Section 2.2.13		
Test mode:	Compliance	Verdict:	PASS
Date(s):	02-Jun-19		
Temperature: 24 ºC	Relative Humidity: 51 %	Air Pressure: 1004 hPa	Power: 120 VAC
Remarks:			

Plot 7.4.7 Spurious emission measurements in 30 - 1000 MHz range at low carrier frequency

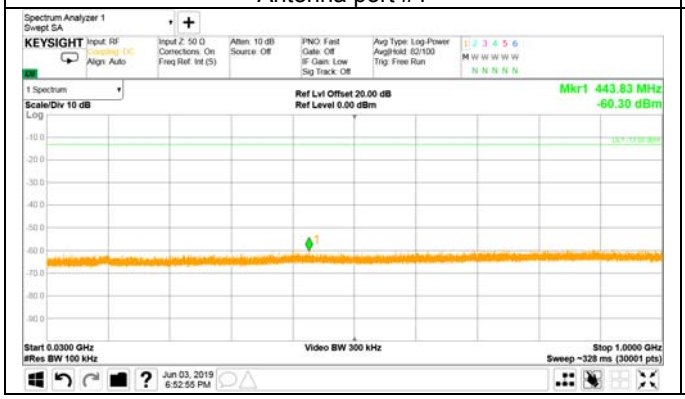
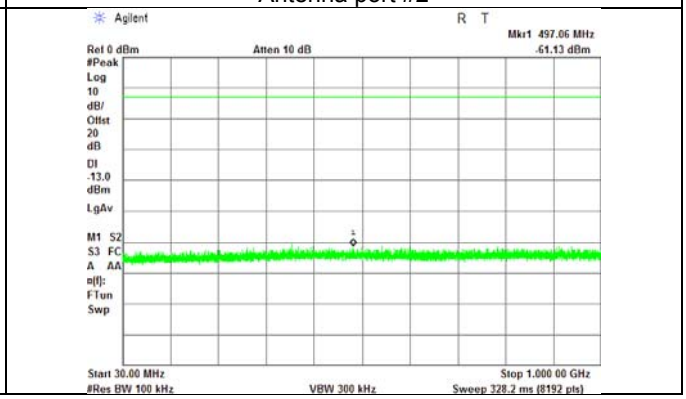
Antenna port #1	Antenna port #2
	

Plot 7.4.8 Spurious emission measurements in 30 - 1000 MHz range at mid carrier frequency

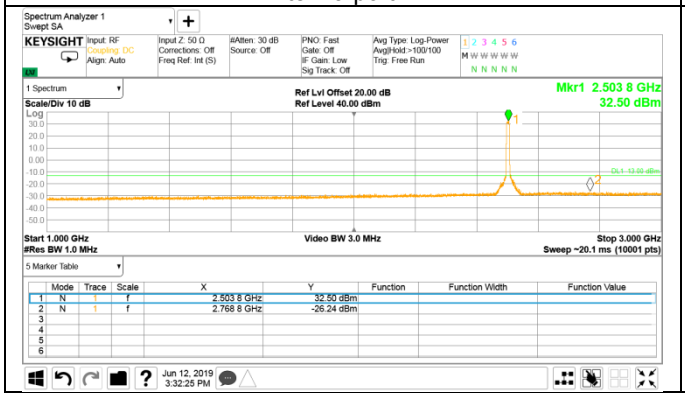
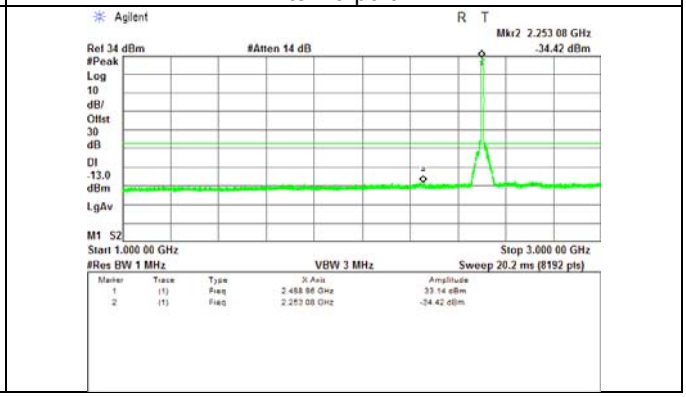
Antenna port #1	Antenna port #2
	

Test specification:	Section 27.53, Spurious emissions at RF antenna connector		
Test procedure:	47 CFR, Sections 2.1051, 27.53; TIA/EIA-603-E, Section 2.2.13		
Test mode:	Compliance	Verdict:	PASS
Date(s):	02-Jun-19		
Temperature: 24 ºC	Relative Humidity: 51 %	Air Pressure: 1004 hPa	Power: 120 VAC
Remarks:			

Plot 7.4.9 Spurious emission measurements in 30 - 1000 MHz range at high carrier frequency

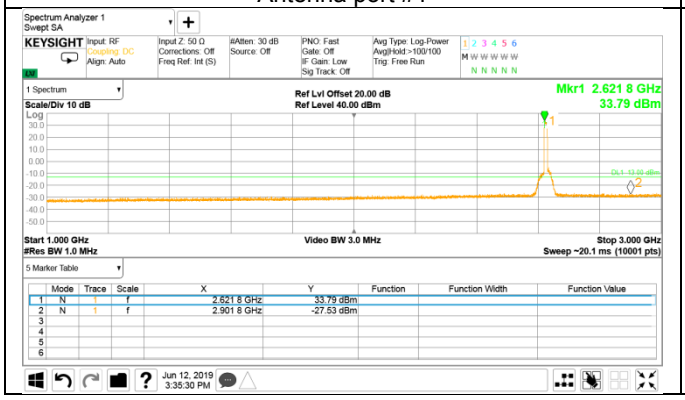
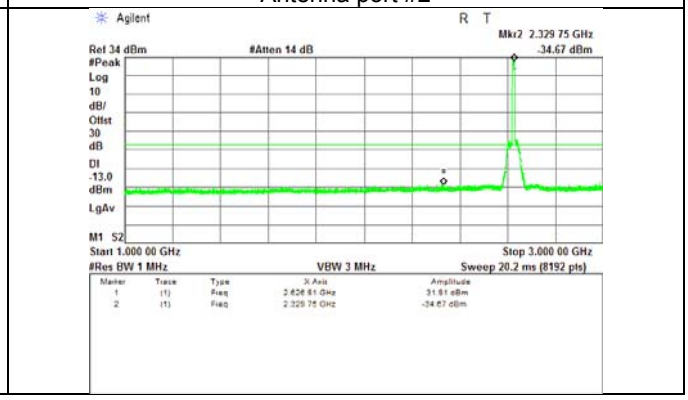
Antenna port #1	Antenna port #2
	

Plot 7.4.10 Spurious emission measurements in 1000 - 3000 MHz range at low carrier frequency

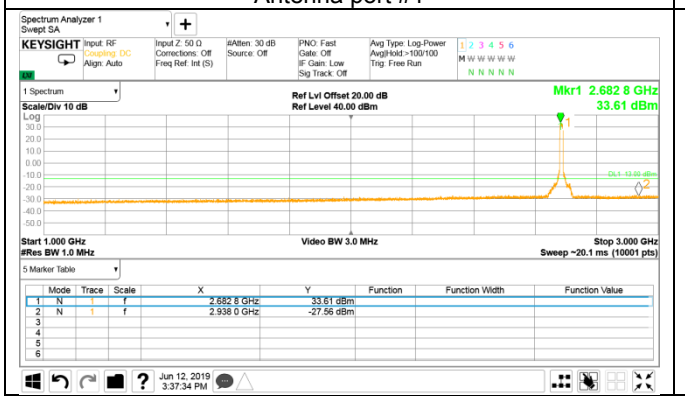
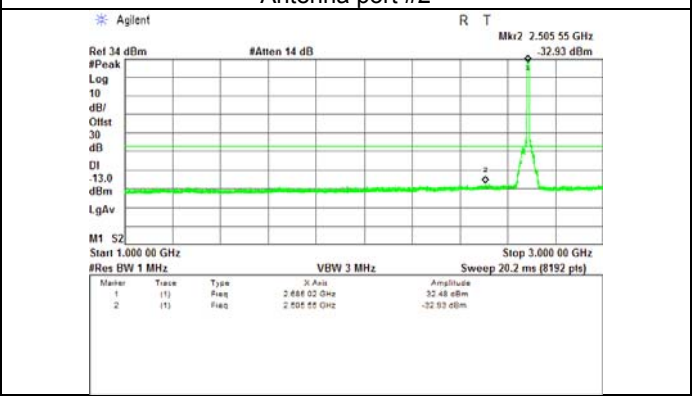
Antenna port #1	Antenna port #2
	

Test specification:	Section 27.53, Spurious emissions at RF antenna connector		
Test procedure:	47 CFR, Sections 2.1051, 27.53; TIA/EIA-603-E, Section 2.2.13		
Test mode:	Compliance	Verdict:	PASS
Date(s):	02-Jun-19		
Temperature: 24 ºC	Relative Humidity: 51 %	Air Pressure: 1004 hPa	Power: 120 VAC
Remarks:			

Plot 7.4.11 Spurious emission measurements in 1000 - 3000 MHz range at mid carrier frequency

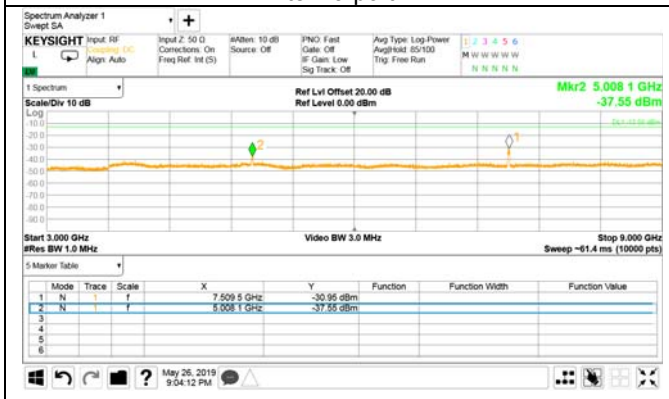
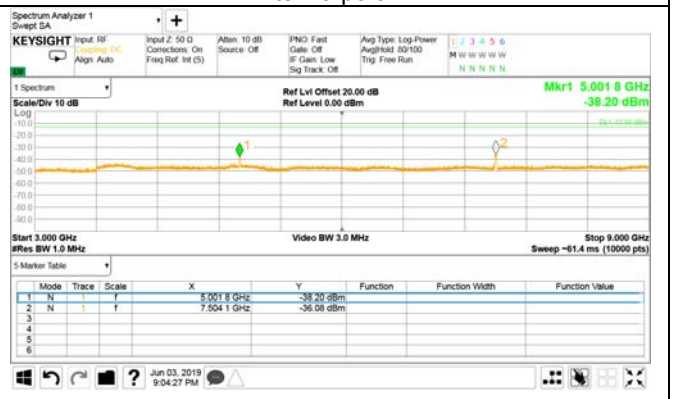
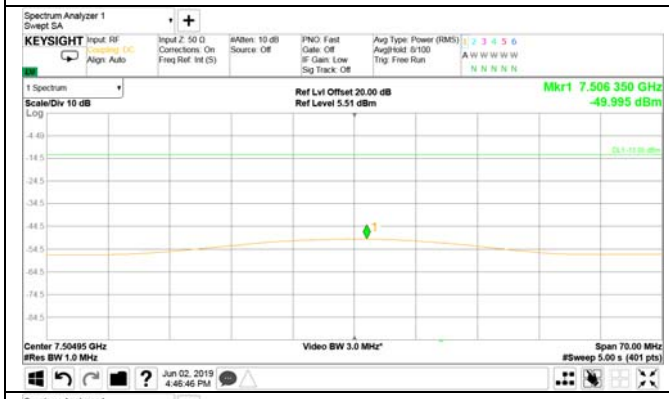
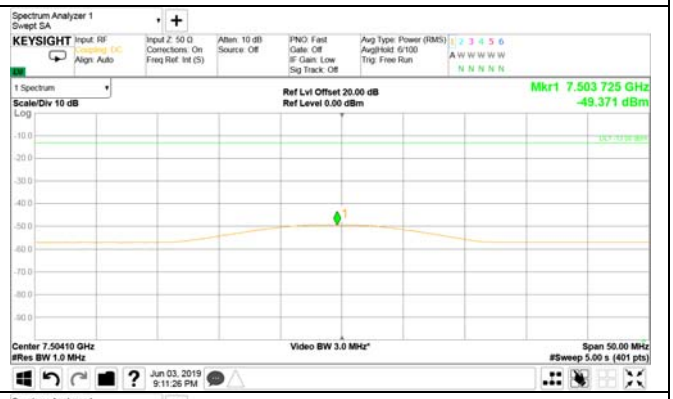
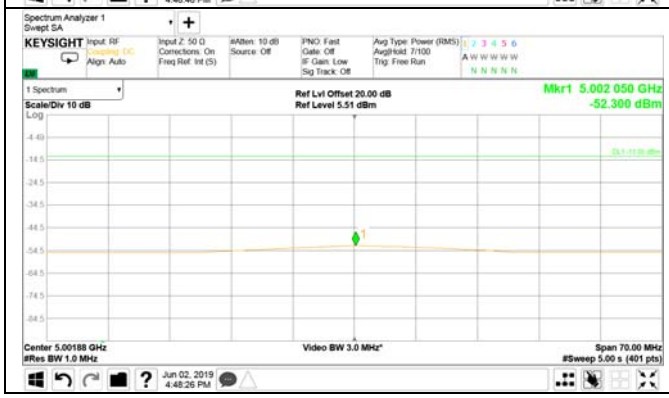
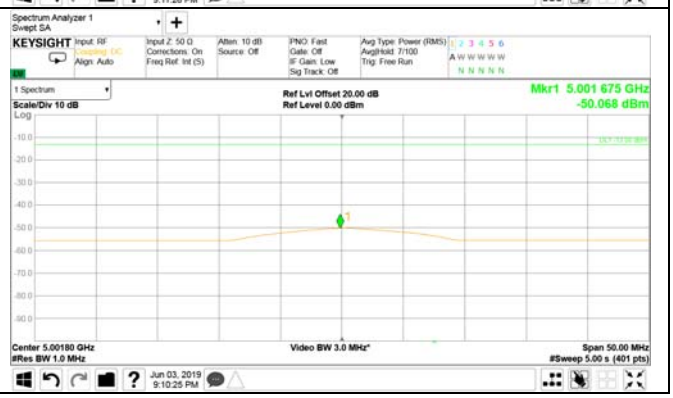
Antenna port #1	Antenna port #2
	

Plot 7.4.12 Spurious emission measurements in 1000 - 3000 MHz range at high carrier frequency

Antenna port #1	Antenna port #2
	

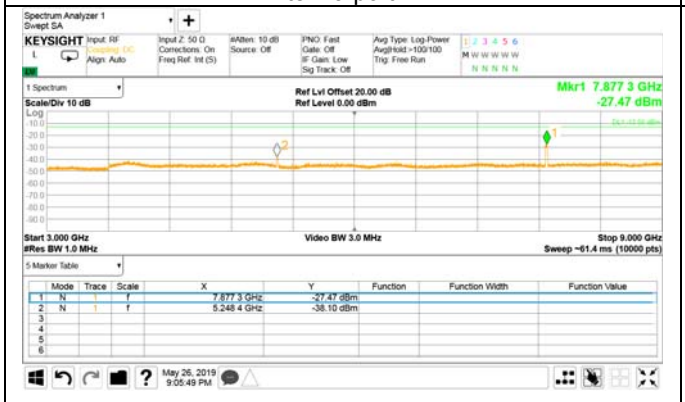
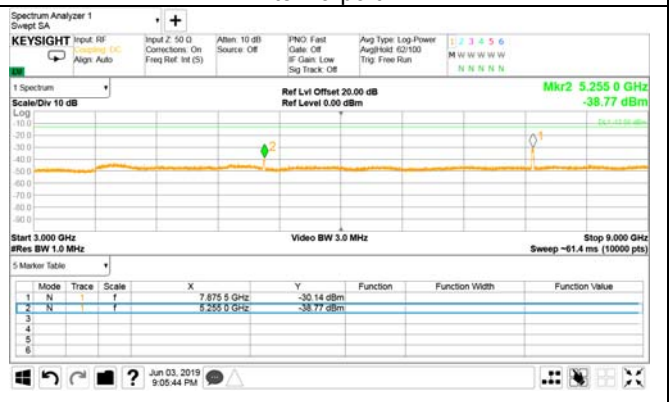
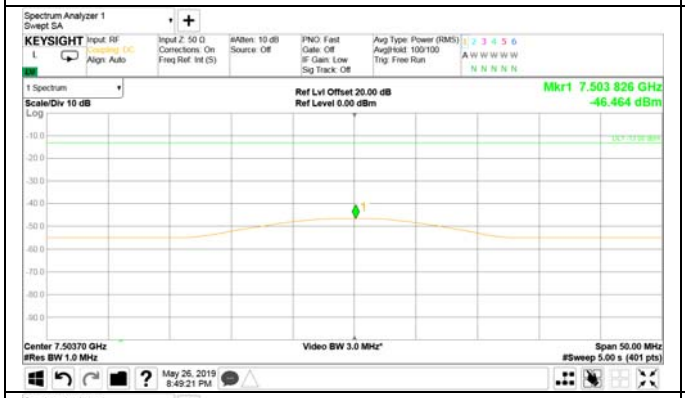
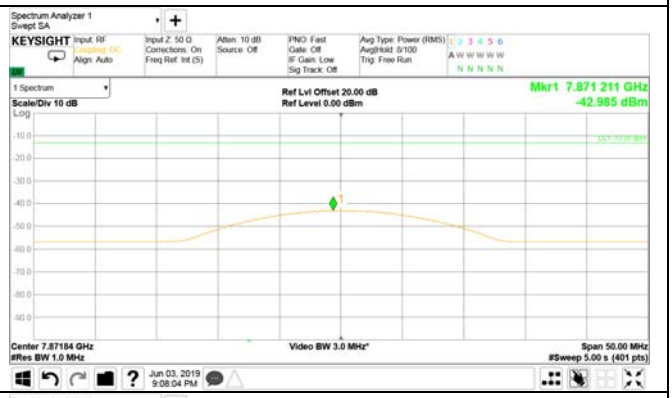
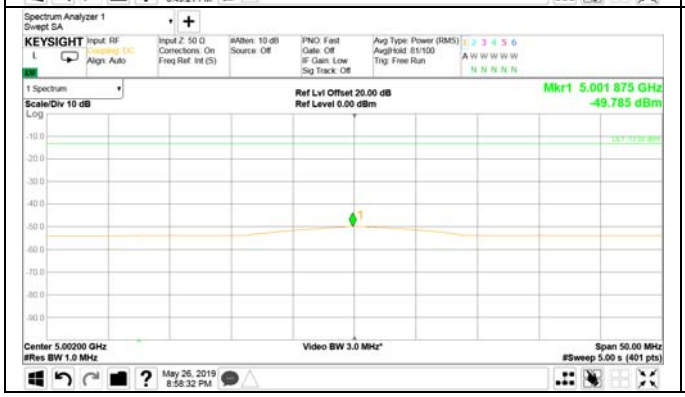
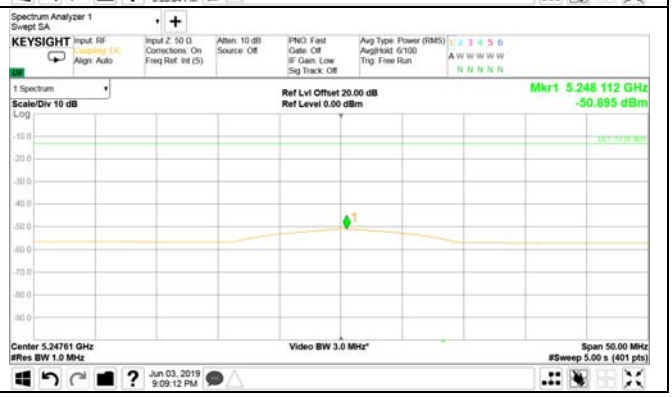
Test specification:	Section 27.53, Spurious emissions at RF antenna connector		
Test procedure:	47 CFR, Sections 2.1051, 27.53; TIA/EIA-603-E, Section 2.2.13		
Test mode:	Compliance	Verdict:	PASS
Date(s):	02-Jun-19		
Temperature: 24 ºC	Relative Humidity: 51 %	Air Pressure: 1004 hPa	Power: 120 VAC
Remarks:			

Plot 7.4.13 Spurious emission measurements in 3000 - 9000 MHz range at low carrier frequency

Antenna port #1	Antenna port #2
	
	
	

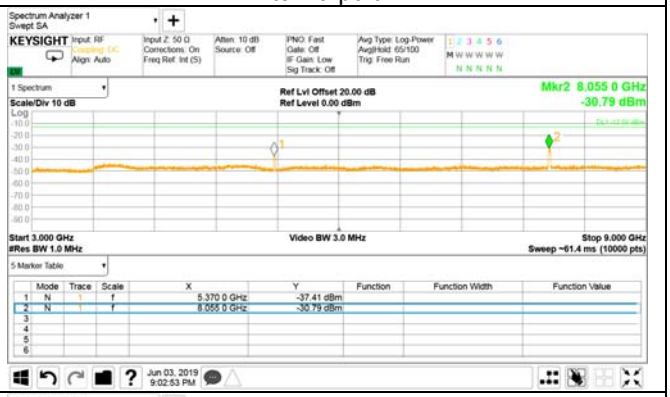
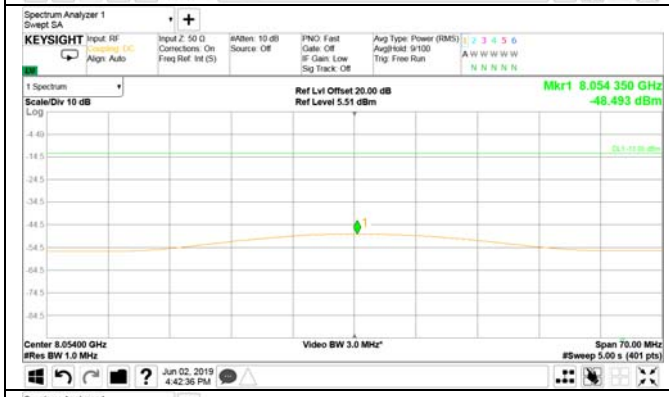
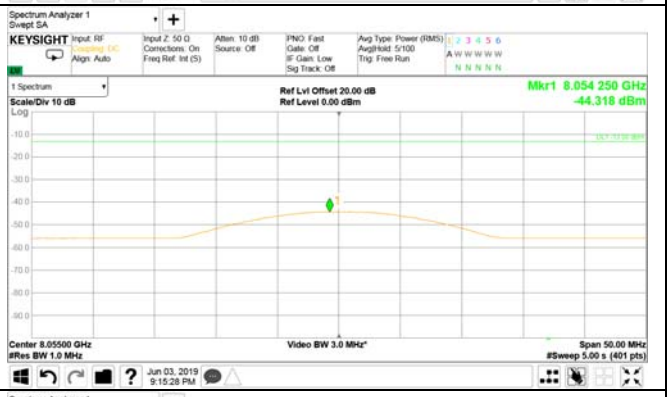
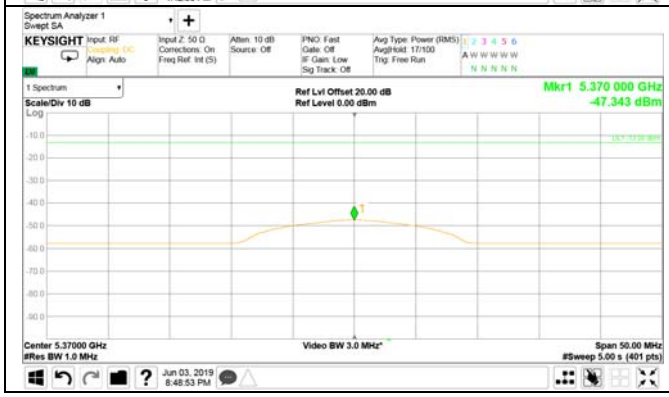
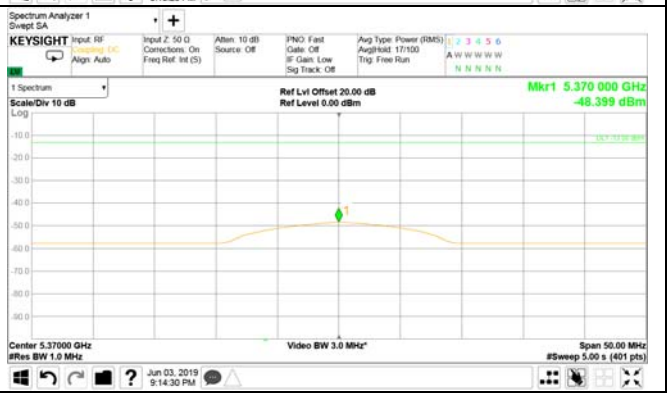
Test specification:	Section 27.53, Spurious emissions at RF antenna connector		
Test procedure:	47 CFR, Sections 2.1051, 27.53; TIA/EIA-603-E, Section 2.2.13		
Test mode:	Compliance	Verdict:	PASS
Date(s):	02-Jun-19		
Temperature: 24 ºC	Relative Humidity: 51 %	Air Pressure: 1004 hPa	Power: 120 VAC
Remarks:			

Plot 7.4.14 Spurious emission measurements in 3000 - 9000 MHz at mid carrier frequency

Antenna port #1	Antenna port #2
	
	
	

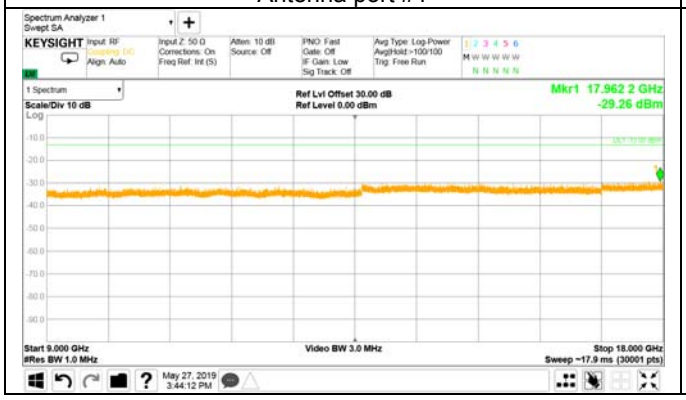
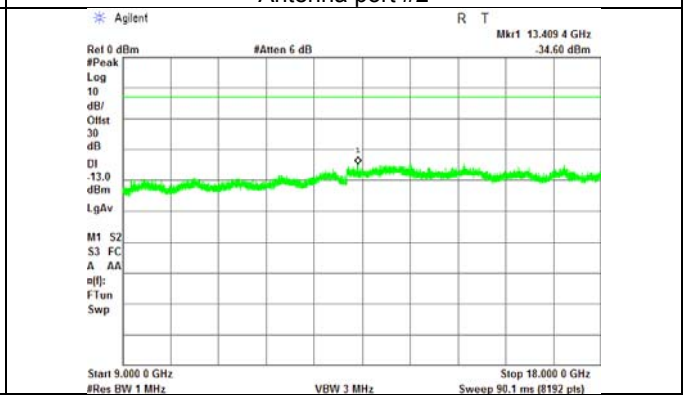
Test specification:	Section 27.53, Spurious emissions at RF antenna connector		
Test procedure:	47 CFR, Sections 2.1051, 27.53; TIA/EIA-603-E, Section 2.2.13		
Test mode:	Compliance	Verdict:	PASS
Date(s):	02-Jun-19		
Temperature: 24 ºC	Relative Humidity: 51 %	Air Pressure: 1004 hPa	Power: 120 VAC
Remarks:			

Plot 7.4.15 Spurious emission measurements in 3000 - 9000 MHz at high carrier frequency

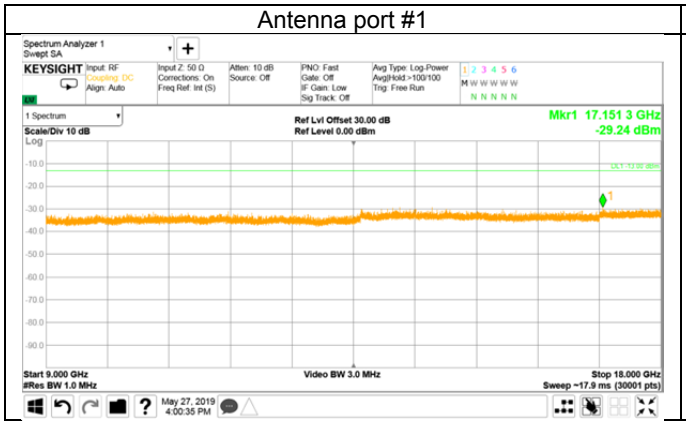
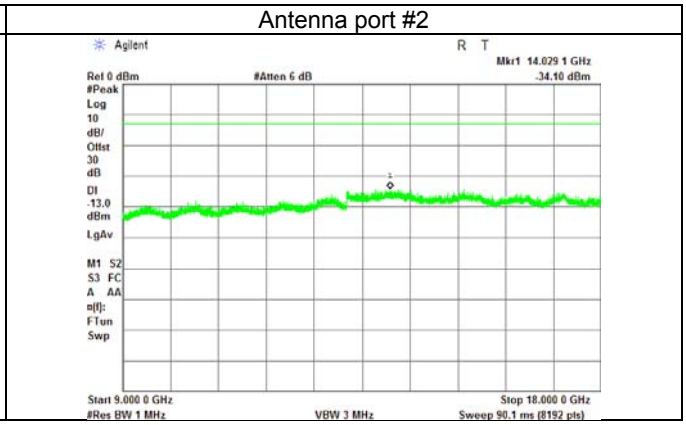
Antenna port #1	Antenna port #2
	
	
	

Test specification:	Section 27.53, Spurious emissions at RF antenna connector		
Test procedure:	47 CFR, Sections 2.1051, 27.53; TIA/EIA-603-E, Section 2.2.13		
Test mode:	Compliance	Verdict:	PASS
Date(s):	02-Jun-19		
Temperature: 24 ºC	Relative Humidity: 51 %	Air Pressure: 1004 hPa	Power: 120 VAC
Remarks:			

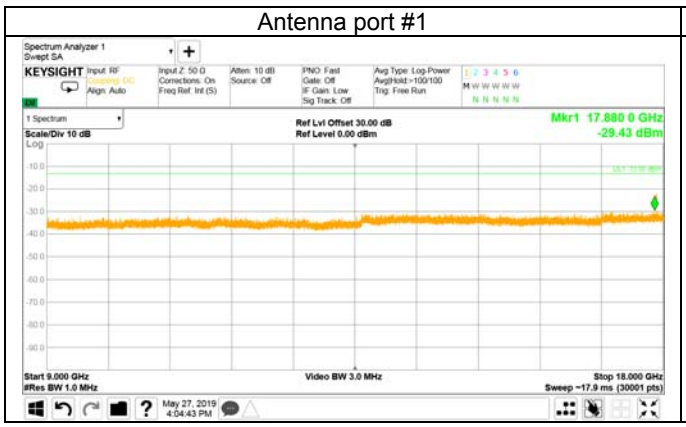
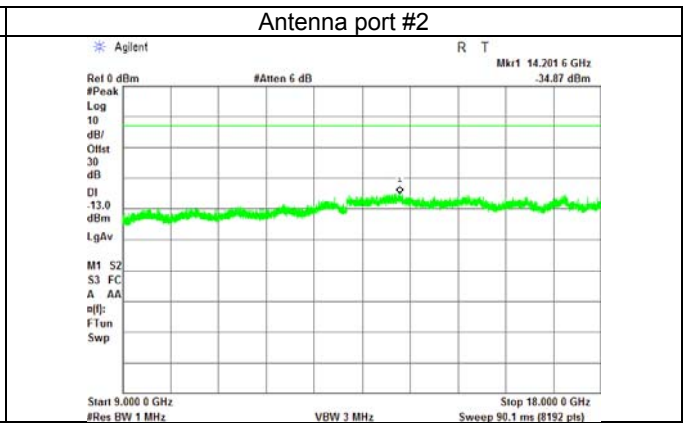
Plot 7.4.16 Spurious emission measurements in 9000 - 18000 MHz range at low carrier frequency

Antenna port #1	Antenna port #2
	

Plot 7.4.17 Spurious emission measurements in 9000 - 18000 MHz at mid carrier frequency

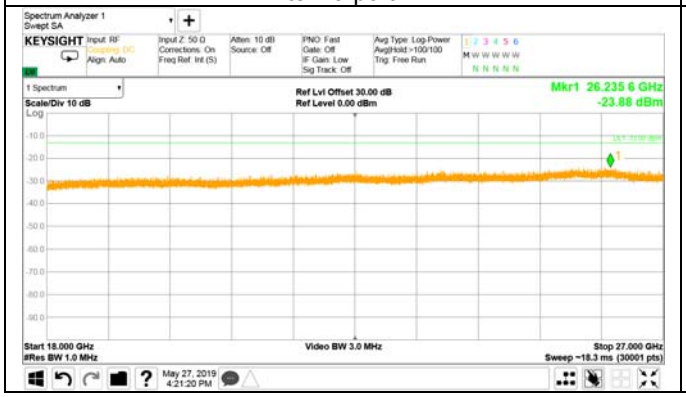
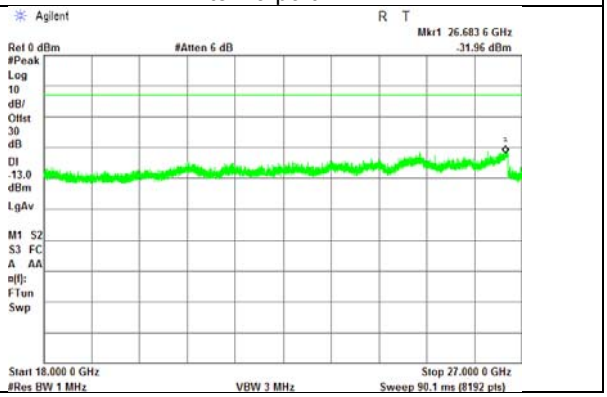
Antenna port #1	Antenna port #2
	

Plot 7.4.18 Spurious emission measurements in 9000 - 18000 MHz at high carrier frequency

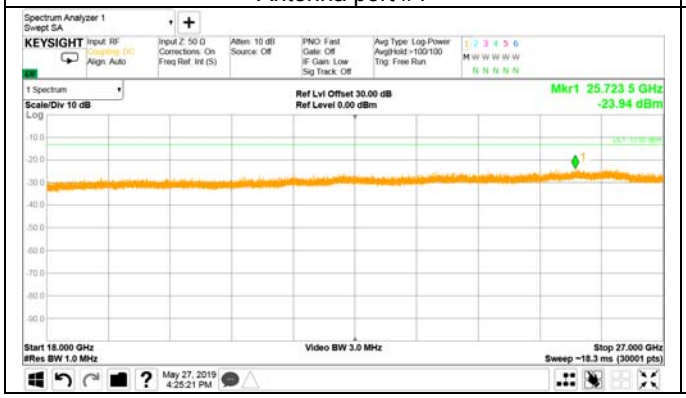
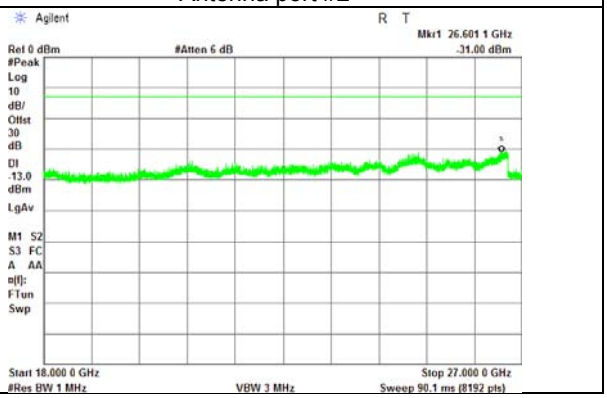
Antenna port #1	Antenna port #2
	

Test specification:	Section 27.53, Spurious emissions at RF antenna connector		
Test procedure:	47 CFR, Sections 2.1051, 27.53; TIA/EIA-603-E, Section 2.2.13		
Test mode:	Compliance	Verdict:	PASS
Date(s):	02-Jun-19		
Temperature: 24 ºC	Relative Humidity: 51 %	Air Pressure: 1004 hPa	Power: 120 VAC
Remarks:			

Plot 7.4.19 Spurious emission measurements in 18000 - 27000 MHz range at low carrier frequency

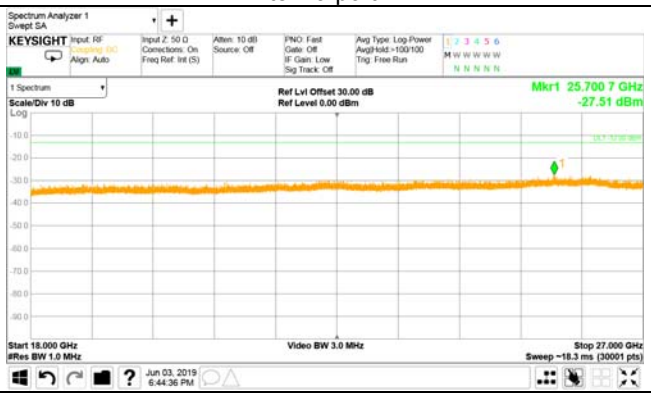
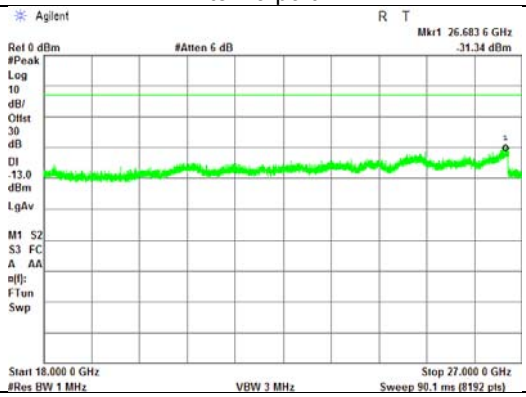
Antenna port #1	Antenna port #2
	

Plot 7.4.20 Spurious emission measurements in 18000 - 27000 MHz at mid carrier frequency

Antenna port #1	Antenna port #2
	

Test specification:	Section 27.53, Spurious emissions at RF antenna connector		
Test procedure:	47 CFR, Sections 2.1051, 27.53; TIA/EIA-603-E, Section 2.2.13		
Test mode:	Compliance	Verdict:	PASS
Date(s):	02-Jun-19		
Temperature: 24 ºC	Relative Humidity: 51 %	Air Pressure: 1004 hPa	Power: 120 VAC
Remarks:			

Plot 7.4.21 Spurious emission measurements in 18000 - 27000 MHz at high carrier frequency

Antenna port #1	Antenna port #2
	

Test specification:	Section 27.53, Radiated spurious emissions		
Test procedure:	47 CFR, Sections 2.1053; TIA/EIA-603-E, Section 2.2.12		
Test mode:	Compliance	Verdict:	PASS
Date(s):	26-May-19		
Temperature: 24 ºC	Relative Humidity: 54 %	Air Pressure: 1002 hPa	Power: 120 VAC
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	Attenuation below carrier, dBc	ERP of spurious, dBm	Equivalent field strength limit @ 3m, dB(μV/m)***
0.009 – 10th harmonic*	**43+10logP** fixed**	**-13**	**84.4**
0.009 – 10th harmonic*	55+10logP** mobile	-25	72.4

* - Excluding the band emission

** - P is transmitter output power in Watts

*** - 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

The EUT was set up as shown in

7.5.3.1 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.

Test specification:	Section 27.53, Radiated spurious emissions		
Test procedure:	47 CFR, Sections 2.1053; TIA/EIA-603-E, Section 2.2.12		
Test mode:	Compliance	Verdict:	PASS
Date(s):	26-May-19		
Temperature: 24 ºC	Relative Humidity: 54 %	Air Pressure: 1002 hPa	Power: 120 VAC
Remarks:			

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

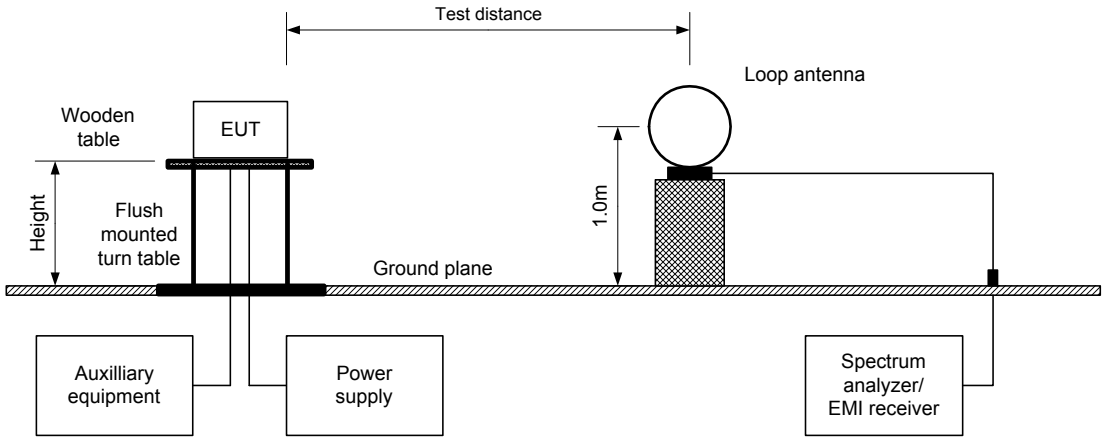
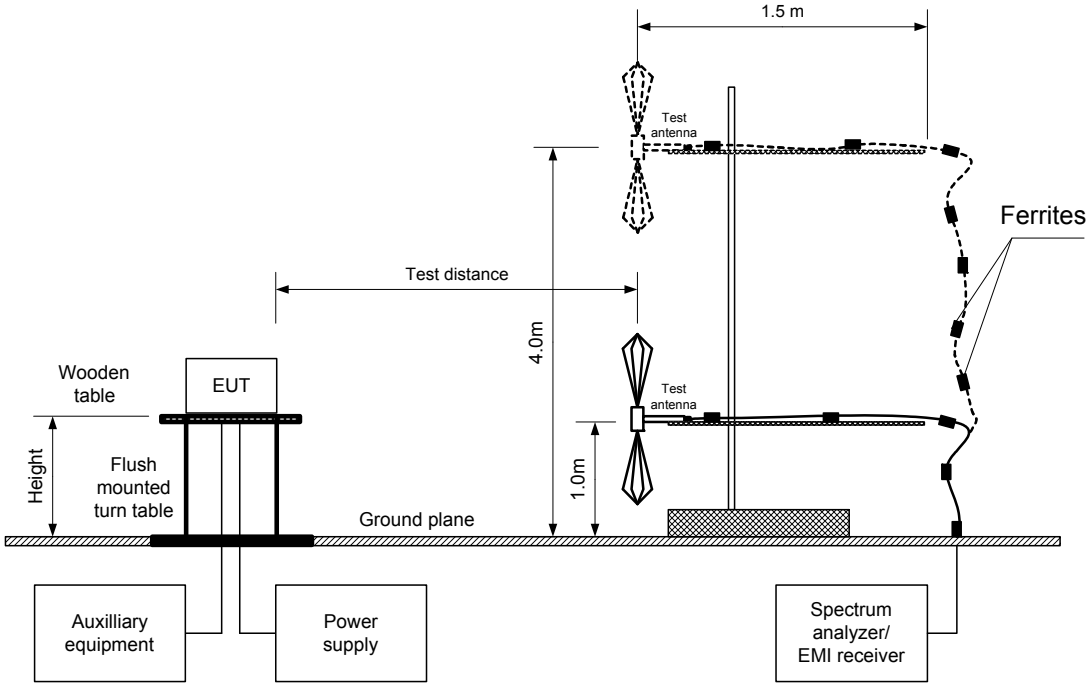


Figure 7.5.2 Setup for spurious emission field strength measurements above 30 MHz



Test specification:	**Section 27.53, Radiated spurious emissions**		
Test procedure:	47 CFR, Sections 2.1053; TIA/EIA-603-E, Section 2.2.12		
Test mode:	Compliance	**Verdict:**	PASS
Date(s):	26-May-19		
Temperature: 24 ºC	**Relative Humidity:** 54 %	**Air Pressure:** 1002 hPa	**Power:** 120 VAC
Remarks:			

Table 7.5.2 Spurious emission field strength test results

ASSIGNED FREQUENCY RANGE:	2496.0 – 2690.0 MHz
TEST DISTANCE:	3 m
TEST SITE:	OATS
EUT HEIGHT:	0.8 m
INVESTIGATED FREQUENCY RANGE:	0.009 – 27000 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
OPERATION CHANNEL WIDTH:	10 MHz
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	Verdict
Low carrier frequency								
No emissions were found								Pass
Mid carrier frequency								
No emissions were found								Pass
High carrier frequency								
No emissions were found								Pass

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

Reference numbers of test equipment used

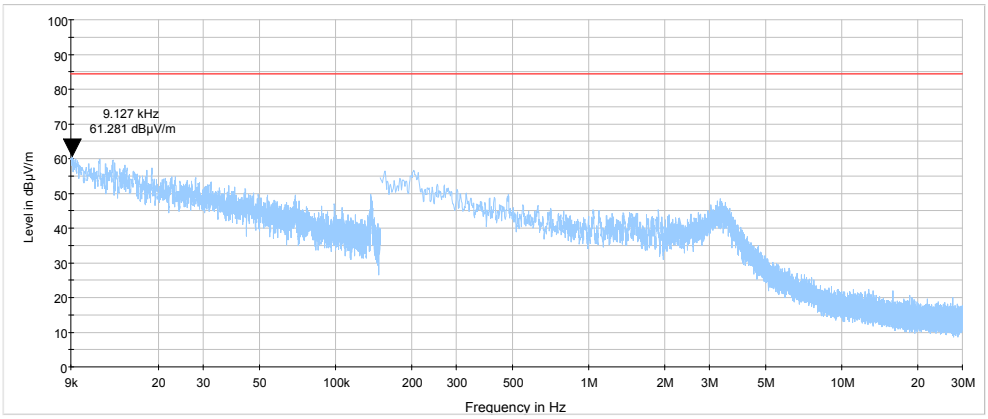
HL 0446	HL 0604	HL 4114	HL 4360	HL 4933	HL 4956	HL 5110	HL 5111
HL 5112							

Full description is given in Appendix A.

Test specification:	Section 27.53, Radiated spurious emissions		
Test procedure:	47 CFR, Sections 2.1053; TIA/EIA-603-E, Section 2.2.12		
Test mode:	Compliance	Verdict:	PASS
Date(s):	26-May-19		
Temperature: 24 ºC	Relative Humidity: 54 %	Air Pressure: 1002 hPa	Power: 120 VAC
Remarks:			

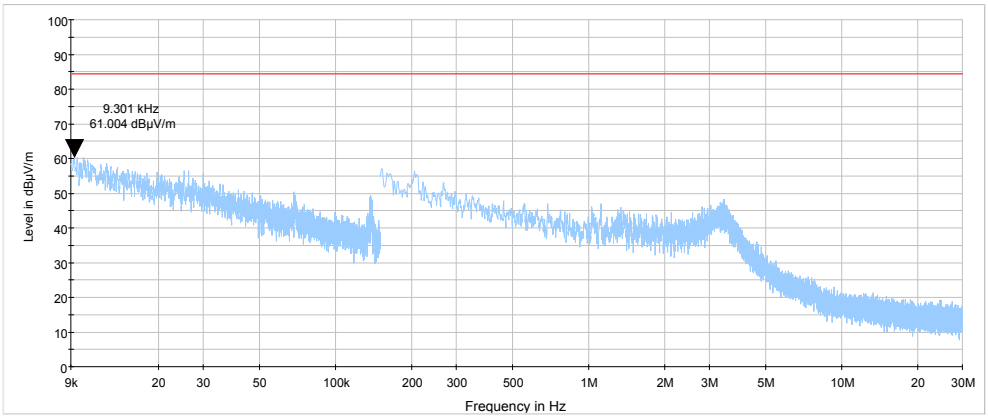
Plot 7.5.1 Radiated emission measurements in 9 - 150 kHz range

TEST SITE:	Semi anechoic chamber
TEST DISTANCE:	3 m
ANTENNA POLARIZATION:	Vertical
EUT POSITION:	Typical (Vertical)
CARRIER FREQUENCY:	Low



Plot 7.5.2 Radiated emission measurements in 9 - 150 kHz range

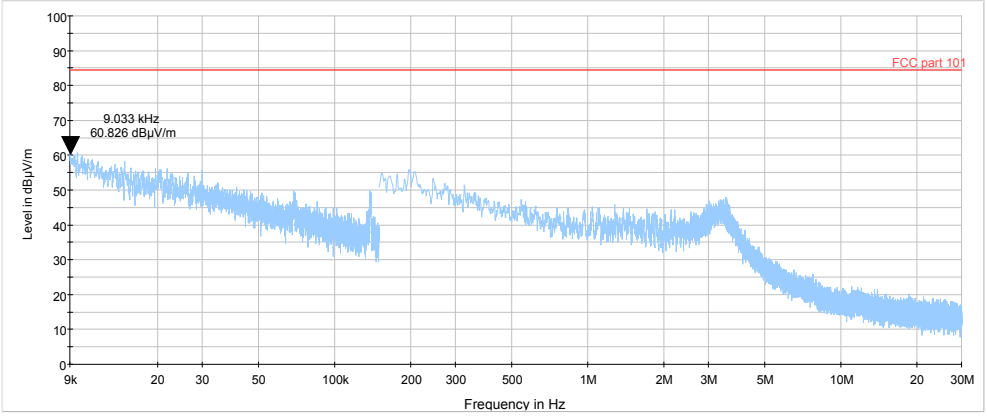
TEST SITE:	Semi anechoic chamber
TEST DISTANCE:	3 m
ANTENNA POLARIZATION:	Vertical
EUT POSITION:	Typical (Vertical)
CARRIER FREQUENCY:	Mid



Test specification:	Section 27.53, Radiated spurious emissions		
Test procedure:	47 CFR, Sections 2.1053; TIA/EIA-603-E, Section 2.2.12		
Test mode:	Compliance	Verdict:	PASS
Date(s):	26-May-19		
Temperature: 24 ºC	Relative Humidity: 54 %	Air Pressure: 1002 hPa	Power: 120 VAC
Remarks:			

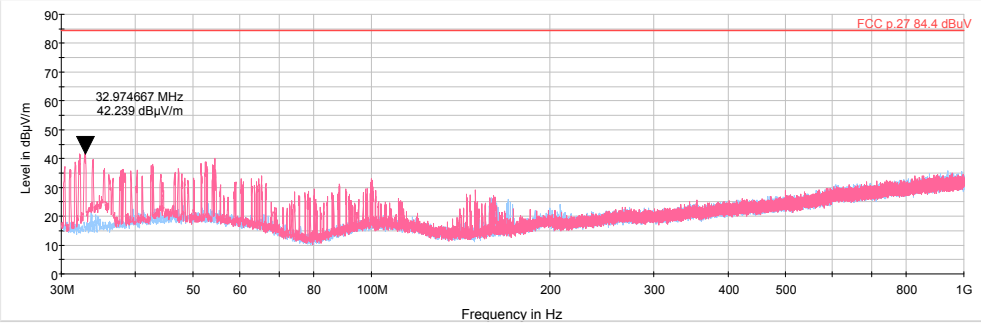
Plot 7.5.3 Radiated emission measurements in 9 - 150 kHz range

TEST SITE:	Semi anechoic chamber
TEST DISTANCE:	3 m
ANTENNA POLARIZATION:	Vertical
EUT POSITION:	Typical (Vertical)
CARRIER FREQUENCY:	High



Plot 7.5.4 Radiated emission measurements in 30 - 1000 MHz range

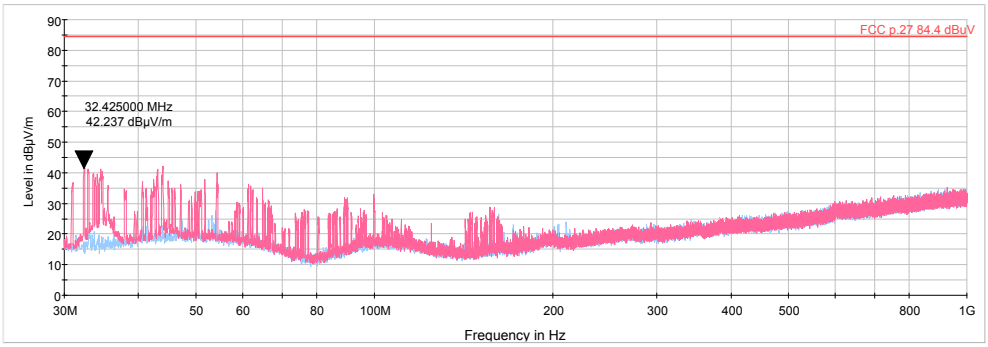
TEST SITE:	Semi anechoic chamber
CARRIER FREQUENCY:	Low
ANTENNA POLARIZATION:	Vertical and Horizontal
TEST DISTANCE:	3 m



Test specification:	Section 27.53, Radiated spurious emissions		
Test procedure:	47 CFR, Sections 2.1053; TIA/EIA-603-E, Section 2.2.12		
Test mode:	Compliance	Verdict:	PASS
Date(s):	26-May-19		
Temperature: 24 ºC	Relative Humidity: 54 %	Air Pressure: 1002 hPa	Power: 120 VAC
Remarks:			

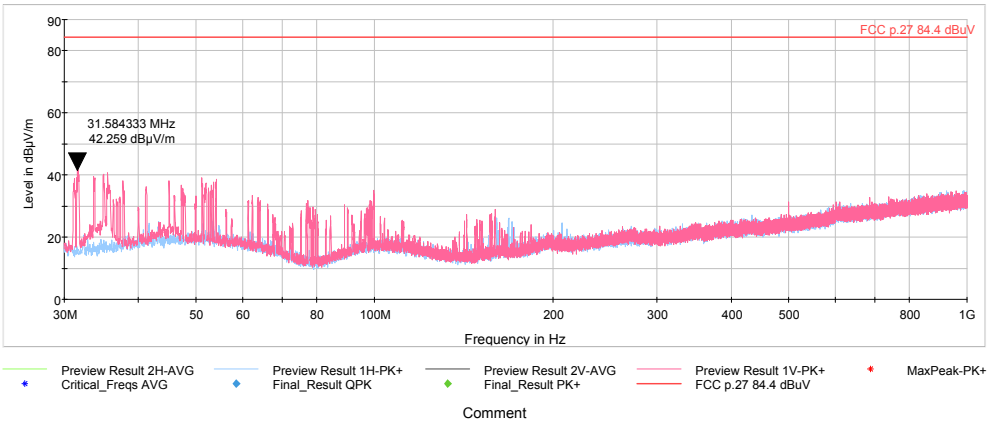
Plot 7.5.5 Radiated emission measurements in 30 - 1000 MHz range

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



Plot 7.5.6 Radiated emission measurements in 30 - 1000 MHz range

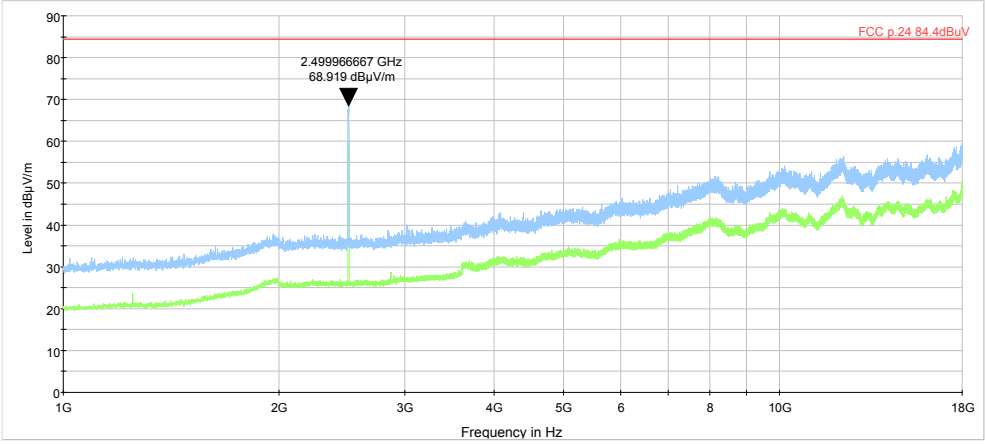
TEST SITE: Semi anechoic chamber
CARRIER FREQUENCY: High
ANTENNA POLARIZATION: Vertical and Horizontal
TEST DISTANCE: 3 m



Test specification:	Section 27.53, Radiated spurious emissions		
Test procedure:	47 CFR, Sections 2.1053; TIA/EIA-603-E, Section 2.2.12		
Test mode:	Compliance	Verdict:	PASS
Date(s):	26-May-19		
Temperature: 24 ºC	Relative Humidity: 54 %	Air Pressure: 1002 hPa	Power: 120 VAC
Remarks:			

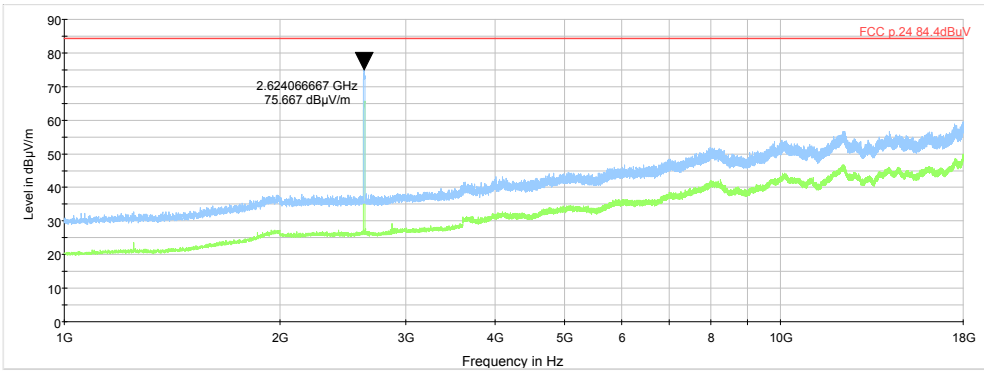
Plot 7.5.7 Radiated emission measurements in 1000 – 18000 MHz range

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



Plot 7.5.8 Radiated emission measurements in 1000 – 18000 MHz range

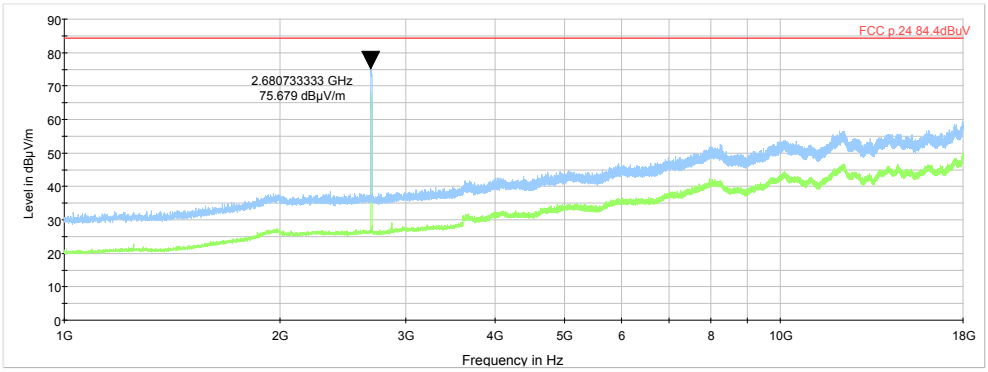
TEST SITE:	Semi anechoic chamber
CARRIER FREQUENCY:	Mid
ANTENNA POLARIZATION:	Vertical and Horizontal
TEST DISTANCE:	3 m



Test specification:	Section 27.53, Radiated spurious emissions		
Test procedure:	47 CFR, Sections 2.1053; TIA/EIA-603-E, Section 2.2.12		
Test mode:	Compliance	Verdict:	PASS
Date(s):	26-May-19		
Temperature: 24 ºC	Relative Humidity: 54 %	Air Pressure: 1002 hPa	Power: 120 VAC
Remarks:			

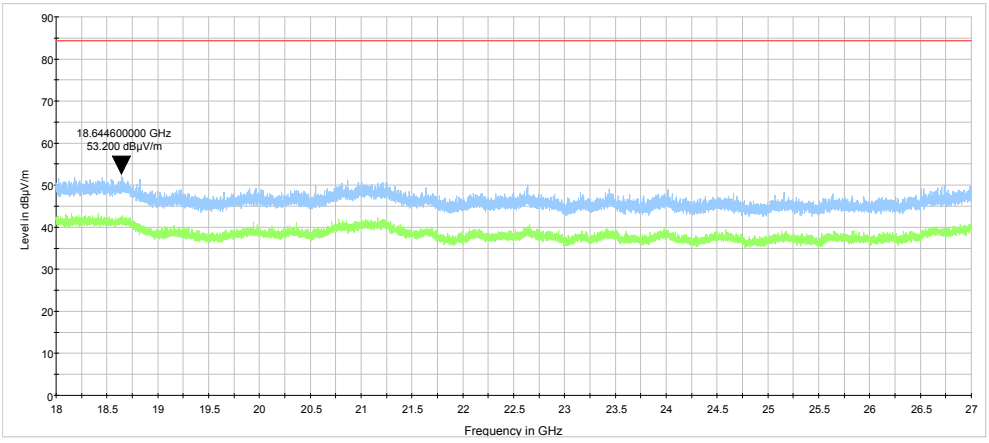
Plot 7.5.9 Radiated emission measurements in 1000 – 18000 MHz range

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



Plot 7.5.10 Radiated emission measurements in 18000 – 27000 MHz range

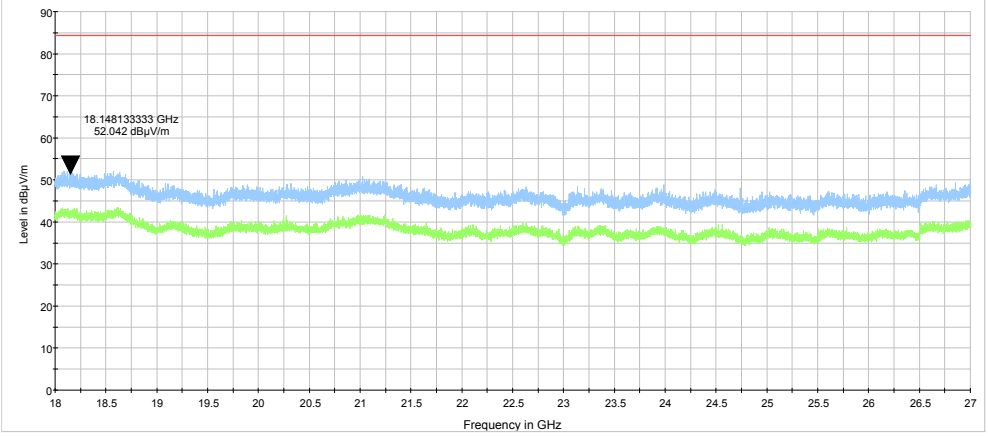
TEST SITE:	Semi anechoic chamber
TEST DISTANCE:	3 m
ANTENNA POLARIZATION:	Vertical
EUT POSITION:	Typical (Vertical)
CARRIER FREQUENCY:	Low



Test specification:	Section 27.53, Radiated spurious emissions		
Test procedure:	47 CFR, Sections 2.1053; TIA/EIA-603-E, Section 2.2.12		
Test mode:	Compliance	Verdict:	PASS
Date(s):	26-May-19		
Temperature: 24 ºC	Relative Humidity: 54 %	Air Pressure: 1002 hPa	Power: 120 VAC
Remarks:			

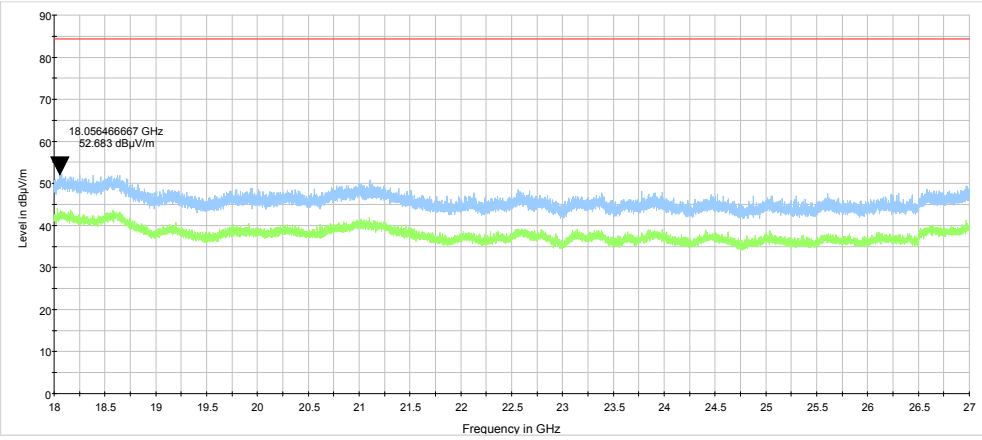
Plot 7.5.11 Radiated emission measurements in 18000 – 27000 MHz range

TEST SITE:	Semi anechoic chamber
TEST DISTANCE:	3 m
ANTENNA POLARIZATION:	Vertical
EUT POSITION:	Typical (Vertical)
CARRIER FREQUENCY:	Mid



Plot 7.5.12 Radiated emission measurements in 18000 – 27000 MHz range

TEST SITE:	Semi anechoic chamber
TEST DISTANCE:	3 m
ANTENNA POLARIZATION:	Vertical
EUT POSITION:	Typical (Vertical)
CARRIER FREQUENCY:	High



Test specification:	Section 27.54, Frequency stability		
Test procedure:	47 CFR, Section 2.1055; TIA/EIA-603-E Section 2.2.2		
Test mode:	Compliance	Verdict:	PASS
Date(s):	02-Jun-19		
Temperature: 24 ºC	Relative Humidity: 51 %	Air Pressure: 1004 hPa	Power: 120 VAC
Remarks:			

7.6 Frequency stability test

7.6.1 General

This test was performed to measure frequency stability of transmitter RF carrier. Specification test limits are given in Table 7.6.1.

Table 7.6.1 Frequency stability limits

Assigned frequency, MHz	Maximum allowed frequency displacement
2496 -2690	The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

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 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.

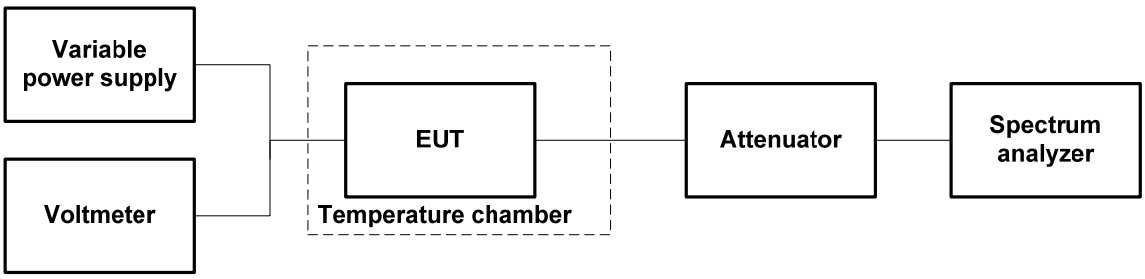
7.6.2.3 The EUT was powered on and carrier frequency was measured at start up moment and then every minute until frequency had been stabilized or 10 minutes elapsed whichever reached the last. The EUT was powered off.

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

7.6.2.5 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.

7.6.2.6 Frequency displacement was calculated and provided in Table 7.6.2.

Figure 7.6.1 Frequency stability test setup



Test specification:	**Section 27.54, Frequency stability**		
Test procedure:	47 CFR, Section 2.1055; TIA/EIA-603-E Section 2.2.2		
Test mode:	Compliance	**Verdict:**	PASS
Date(s):	02-Jun-19		
Temperature: 24 ºC	**Relative Humidity:** 51 %	**Air Pressure:** 1004 hPa	**Power:** 120 VAC
Remarks:			

Table 7.6.2 Frequency stability test results

OPERATING FREQUENCY: 2496.0 – 2690.0 MHz
NOMINAL POWER VOLTAGE: 120 VAC
TEMPERATURE STABILIZATION PERIOD: 20 min
POWER DURING TEMPERATURE TRANSITION: Off
SPECTRUM ANALYZER MODE: Counter
RESOLUTION BANDWIDTH: 10 Hz
VIDEO BANDWIDTH: 30 Hz
MODULATION: Unmodulated

T, ºC	Voltage, V	Frequency, MHz							Max frequency drift, Hz	
		Start up	1st min	2nd min	3rd min	4th min	5th min	10th min	Positive	Negative
Low carrier frequency										
-30	nominal	2501000.001	2500999.999	2501000.004	2500999.996	2501000.003	2501000.004	2500999.953	-3	-54
-20	nominal	2501000.001	NA	NA	NA	NA	NA	2501000.006	-1	-54
-10	nominal	2501000.002	NA	NA	NA	NA	NA	2501.000.04	-5	-6
0	nominal	2501000.007	2500999.998	2501000.005	2501000.002	2500999.995	2500999.994	2500999.997	0	-13
10	nominal	2500999.999	NA	NA	NA	NA	NA	2501000.003	-4	-13
20	15%	2500999.998	NA	NA	NA	NA	NA	2500999.996	-9	-11
20	nominal	2500999.996	NA	NA	NA	NA	NA	2501000.007	0	-11
20	-15%	2500999.997	NA	NA	NA	NA	NA	2501000.002	-5	-11
30	nominal	2500999.996	2501000.007	2500999.995	2501000.004	2501000.003	2501000.004	2500999.997	0	-12
40	nominal	2500999.995	NA	NA	NA	NA	NA	2501000.005	-2	-12
50	nominal	2501000.001	NA	NA	NA	NA	NA	2501000.004	-3	-12
Mid carrier frequency										
-30	nominal	2623999.997	2624000.015	2624000.015	2624000.01	2623999.997	2624000.001	2623999.999	8	-10
-20	nominal	2624000.001	NA	NA	NA	NA	NA	2623999.994	-6	-13
-10	nominal	2624.000.001	NA	NA	NA	NA	NA	2624000.005	-2	-2
0	nominal	2624000.004	2623999.994	2624000.005	2623999.996	2624000.005	2623999.995	2623999.997	-2	-13
10	nominal	2624000.005	NA	NA	NA	NA	NA	2624000.004	-2	-3
20	15%	2624000.007	NA	NA	NA	NA	NA	2623999.996	0	-11
20	nominal	2623999.997	NA	NA	NA	NA	NA	2624000.007	0	-10
20	-15%	2623999.996	NA	NA	NA	NA	NA	2623999.999	-8	-11
30	nominal	2624000.007	2624000.005	2624000.009	2623999.997	2623999.995	2623999.997	2624000.007	2	-12
40	nominal	2624000.002	NA	NA	NA	NA	NA	2624000.003	-4	-5
50	nominal	2624000.001	NA	NA	NA	NA	NA	2624000.004	-3	-6
High carrier frequency										
-30	nominal	2684999.998	2684999.994	2684999.996	2684999.996	2685000.001	2684999.996	2684999.985	0	-16
-20	nominal	2685000.002	NA	NA	NA	NA	NA	2684999.991	1	-10
-10	nominal	2685000.000	NA	NA	NA	NA	NA	2685000.002	1	-1
0	nominal	2685000.003	2685000.003	2685000.001	2685000.002	2685000.000	2685000.008	2684999.994	7	-7
10	nominal	2685000.001	NA	NA	NA	NA	NA	2685000.005	4	0
20	15%	2685000.006	NA	NA	NA	NA	NA	2685000.004	5	3
20	nominal	2684999.997	NA	NA	NA	NA	NA	2685000.001	0	-4
20	-15%	2685000.003	NA	NA	NA	NA	NA	2684999.999	2	-2
30	nominal	2684999.995	2685000.004	2684999.993	2685000.005	2684999.994	2685000.004	2684999.994	4	-8
40	nominal	2685000.001	NA	NA	NA	NA	NA	2685000.004	3	0
50	nominal	2685000.001	NA	NA	NA	NA	NA	2685000.002	1	0

* - Reference frequency

Reference numbers of test equipment used

HL 3286	HL 5376						

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 (9) kHz - 30 MHz	EMCO	6502	2857	24-Feb-19	24-Feb-20
0604	Antenna BiconiLog Log-Periodic/T Bow-TIE, 26 - 2000 MHz	EMCO	3141	9611-1011	03-Jun-18	03-Jun-20
3286	Temperature Chamber, (-50 to +170) °C	Thermotron	EL-8-CH-1-1-CO2	21-9048	18-Nov-18	18-Nov-19
3301	Power Meter, P-series, 50 MHz to 40 GHz	Agilent Technologies	N1911A	MY45101057	28-Apr-19	28-Apr-20
3302	Power sensor, P-Series, 50 MHz to 40 GHz, -35/30 to 20 dBm	Agilent Technologies	N1922A	MY45240586	28-Apr-19	28-Apr-20
3433	Test Cable , DC-18 GHz, 1.5 m, SMA - SMA	Mini-Circuits	CBL-5FT-SMSM+	25679	15-Apr-19	15-Apr-20
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	24-Apr-19	24-Apr-20
4068	Attenuator, SMA, 30 dB, DC to 12.4 GHz	Midwest Microwave	ATT-0527-30-SMA-07	NA	09-Aug-18	09-Aug-19
4071	Attenuator, SMA, 30 dB, DC to 18 GHz, 5 W	Weinschel	WA7	NA	09-Aug-18	09-Aug-19
4114	Antenna, Double-Ridged Waveguide Horn, 1 to 18 GHz	ETS Lindgren	3117	00123515	10-Mar-19	10-Mar-20
4360	EMI Test Receiver, 20 Hz to 40 GHz.	Rohde & Schwarz	ESU40	100322	31-Dec-18	31-Dec-19
4366	Directional coupler, 1 GHz to 18 GHz, 10 dB, SMA Female	Tiger Micro-Electronics Institute	TGD-A1101-10	01e-JSDE805-007	21-May-18	21-May-20
4933	Active Horn Antenna, 1 GHz to 18 GHz	COM-POWER CORPORATION	AHA-118	701046	06-Jan-19	06-Jan-20
4956	Active horn antenna, 18 to 40 GHz	COM-POWER CORPORATION	AHA-840	105004	25-Jan-19	25-Jan-20
5110	RF cable, 18 GHz, 3 m, N-type	Huber-Suhner	ST18A/Nm/Nm/3000	600818/18A	01-Aug-18	01-Aug-19
5111	RF cable, 40 GHz, 5.5 m, K-type	Huber-Suhner	SF102EA/11SK/11SK/5500MM	502493/2EA	18-Apr-19	18-Apr-20
5112	RF cable, 40 GHz, 5.5 m, K-type	Huber-Suhner	SF102EA/11SK/11SK/5500MM	502494/2EA	18-Apr-19	18-Apr-20
5376	EXA Signal Analyzer, 10 Hz - 32 GHz	Keysight Technologies	N9010B	MY57470404	18-Mar-19	18-Mar-20

HL No	Description	Manufacturer	Model	Ser. No.	Last Cal./ Check	Due Cal./ Check
5409	RF cable, 40 GHz, SMA-SMA, 2 m	Huber-Suhner	SF102EA/ 11SK/11S K/2000M M	503973/2E A	19-Aug-18	19-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 %

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 relevant parts of Code of Federal Regulations 47 (CFR 47), Test Firm Registration Number is 927748, Designation Number is IL1001; Recognized by Innovation, Science and Economic Development Canada for wireless and terminal testing (ISED), ISED #2186A, CAB identifier is IL1001; 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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Person for contact: Mr. Alex Usoskin, CEO.

11 APPENDIX D Specification references

47CFR part 27: 2018	Private land mobile radio services
47CFR part 1: 2018	Practice and procedure
47CFR part 2: 2018	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.
ANSI/TIA/EIA-603-E:2016	Land Mobile FM or PM Communications Equipment Measurement and Performance Standards

12 APPENDIX E Test equipment correction factors

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

Frequency, MHz	Measured antenna factor, dBS/m
0.009	-32.5
0.010	-33.4
0.020	-37.9
0.050	-40.6
0.075	-41.0
0.100	-41.2
0.150	-41.2
0.250	-41.2
0.500	-41.3
0.750	-41.3
1.000	-41.4
2.000	-41.4
3.000	-41.4
4.000	-41.5
5.000	-41.5
10.000	-41.8
15.000	-42.2
20.000	-42.9
25.000	-43.9
30.000	-45.4

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

Antenna factor
Double-ridged waveguide horn antenna
ETS Lindgren, Model 3117, serial number: 00123515, HL 4114

Frequency, MHz	Antenna factor, dB/m		
	Measured	Manufacturer	Deviation
1000	28.0	28.4	-0.4
1500	28.0	27.4	0.6
2000	31.2	30.9	0.3
2500	32.5	33.4	-0.9
3000	32.9	32.6	0.3
3500	32.7	32.8	-0.1
4000	33.1	33.4	-0.3
4500	33.8	33.9	-0.1
5000	33.8	34.1	-0.3
5500	34.4	34.5	-0.1
6000	35.0	35.2	-0.2
6500	35.4	35.5	-0.1
7000	35.7	35.7	0.0
7500	35.9	35.7	0.2
8000	35.8	35.8	0.0
8500	35.9	35.8	0.1
9000	36.3	36.2	0.1
9500	36.6	36.6	0.0
10000	37.1	37.1	0.0
10500	37.6	37.5	0.1
11000	37.9	37.7	0.2
11500	38.5	38.1	0.4
12000	39.2	38.7	0.5
12500	39.0	38.9	0.1
13000	39.1	39.1	0.0
13500	38.9	38.8	0.1
14000	39.0	38.8	0.2
14500	39.6	39.9	-0.3
15000	39.9	39.7	0.2
15500	39.9	40.1	-0.2
16000	40.7	40.8	-0.1
16500	41.3	41.8	-0.5
17000	42.5	42.1	0.4
17500	41.3	41.2	0.1
18000	41.4	40.9	0.5

Antenna factor is to be added to receiver meter reading in dB(μV) to convert to field strength in dB(μV/meter)

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 dBμV to obtain field strength in dBμV/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 dBμV to obtain field strength in dBμV/m.

Cable loss
RF Cable, Huber-Suhner, 18 GHz, 3 m, N- type,
ST18A/Nm/Nm/3000, S/N 600818/18A
HL 5110

Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB
0.1	0.01	5500	1.99
50	0.17	6000	2.10
100	0.24	6500	2.20
200	0.34	7000	2.29
300	0.42	7500	2.38
400	0.48	8000	2.47
500	0.54	8500	2.57
600	0.59	9000	2.65
700	0.64	9500	2.74
800	0.69	10000	2.83
900	0.73	10500	2.91
1000	0.77	11000	2.99
1100	0.82	11500	3.07
1200	0.86	12000	3.14
1300	0.89	12500	3.22
1400	0.93	13000	3.29
1500	0.96	13500	3.37
1600	1.00	14000	3.45
1700	1.03	14500	3.52
1800	1.06	15000	3.59
1900	1.10	15500	3.66
2000	1.13	16000	3.74
2500	1.28	16500	3.80
3000	1.41	17000	3.88
3500	1.54	17500	4.00
4000	1.66	18000	4.02
4500	1.78		
5000	1.89		

Cable loss
RF Cable, Huber-Suhner, 40 GHz, 5.5 m, K type,
SF102EA/11SK/11SK/5500MM, S/N 502493/2EA
HL 5111

Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB
100	0.68	20500	10.17
200	0.97	21000	10.30
300	1.18	21500	10.43
500	1.52	22000	10.58
1000	2.14	22500	10.73
1500	2.62	23000	10.85
2000	3.03	23500	10.98
2500	3.39	24000	11.11
3000	3.72	24500	11.20
3500	4.03	25000	11.32
4000	4.32	25500	11.47
4500	4.59	26000	11.59
5000	4.84	26500	11.72
5500	5.09	27000	11.83
6000	5.32	27500	11.94
6500	5.55	28000	12.04
7000	5.77	28500	12.16
7500	5.99	29000	12.28
8000	6.19	29500	12.40
8500	6.40	30000	12.50
9000	6.60	30500	12.59
9500	6.79	31000	12.68
10000	6.98	31500	12.80
10500	7.16	32000	12.94
11000	7.34	32500	13.09
11500	7.51	33000	13.23
12000	7.68	33500	13.32
12500	7.84	34000	13.44
13000	8.00	34500	13.54
13500	8.15	35000	13.68
14000	8.31	35500	13.81
14500	8.46	36000	13.90
15000	8.62	36500	13.99
15500	8.76	37000	14.12
16000	8.91	37500	14.22
16500	9.06	38000	14.33
17000	9.21	38500	14.47
17500	9.35	39000	14.54
18000	9.49	39500	14.62
18500	9.62	40000	14.75
19000	9.76		
19500	9.90		
20000	10.05		

Cable loss
RF Cable, Huber-Suhner, 40 GHz, 5.5 m, K type,
SF102EA/11SK/11SK/5500MM, S/N 502494/2EA
HL 5112

Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB
100	0.69	20500	10.18
200	0.97	21000	10.32
300	1.18	21500	10.47
500	1.52	22000	10.60
1000	2.14	22500	10.75
1500	2.62	23000	10.87
2000	3.03	23500	11.00
2500	3.40	24000	11.12
3000	3.73	24500	11.23
3500	4.04	25000	11.35
4000	4.33	25500	11.52
4500	4.60	26000	11.64
5000	4.86	26500	11.73
5500	5.10	27000	11.84
6000	5.34	27500	11.93
6500	5.57	28000	12.05
7000	5.79	28500	12.19
7500	6.00	29000	12.33
8000	6.21	29500	12.44
8500	6.43	30000	12.53
9000	6.62	30500	12.58
9500	6.82	31000	12.71
10000	7.01	31500	12.86
10500	7.17	32000	13.00
11000	7.34	32500	13.11
11500	7.51	33000	13.24
12000	7.68	33500	13.33
12500	7.84	34000	13.44
13000	8.00	34500	13.58
13500	8.16	35000	13.69
14000	8.32	35500	13.81
14500	8.48	36000	13.93
15000	8.63	36500	14.05
15500	8.77	37000	14.24
16000	8.92	37500	14.28
16500	9.08	38000	14.38
17000	9.23	38500	14.50
17500	9.37	39000	14.61
18000	9.51	39500	14.70
18500	9.66	40000	14.83
19000	9.78		
19500	9.92		
20000	10.07		

Cable loss
RF Cable, Huber-Suhner, 40 GHz, 2 m, ,
SF102EA/11SK/11SK/2000MM, S/N 503973/2EA
HL 5409

Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB
100	0.26	20500	3.75
200	0.36	21000	3.80
300	0.45	21500	3.85
500	0.58	22000	3.90
1000	0.82	22500	3.95
1500	0.99	23000	4.00
2000	1.15	23500	4.04
2500	1.28	24000	4.09
3000	1.40	24500	4.13
3500	1.51	25000	4.19
4000	1.61	25500	4.25
4500	1.71	26000	4.30
5000	1.80	26500	4.37
5500	1.89	27000	4.45
6000	1.98	27500	4.47
6500	2.06	28000	4.45
7000	2.14	28500	4.49
7500	2.22	29000	4.57
8000	2.29	29500	4.60
8500	2.36	30000	4.59
9000	2.43	30500	4.63
9500	2.50	31000	4.68
10000	2.58	31500	4.74
10500	2.63	32000	4.81
11000	2.70	32500	4.89
11500	2.76	33000	4.89
12000	2.82	33500	4.92
12500	2.87	34000	4.94
13000	2.94	34500	4.99
13500	3.00	35000	5.07
14000	3.06	35500	5.12
14500	3.11	36000	5.14
15000	3.17	36500	5.22
15500	3.23	37000	5.28
16000	3.29	37500	5.30
16500	3.35	38000	5.39
17000	3.41	38500	5.48
17500	3.47	39000	5.44
18000	3.51	39500	5.45
18500	3.56	40000	5.51
19000	3.60		
19500	3.66		
20000	3.71		

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(μV)	decibel referred to one microvolt
dB(μV/m)	decibel referred to one microvolt per meter
dB(μA)	decibel referred to one microampere
dBΩ	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
μs	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