Test specification:	FCC section 15.255(f)/RSS-210 section J.6, Frequency stability		
Test procedure:	ANSI C63.10, Section 9.14		
Test mode:	Compliance	Verdict:	PASS
Date(s):	24-May-21 - 25-May-21		
Temperature: 23 ºC	Relative Humidity: 46 %	Air Pressure: 1008 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
58320	NA
62640	NA
64800	NA

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.

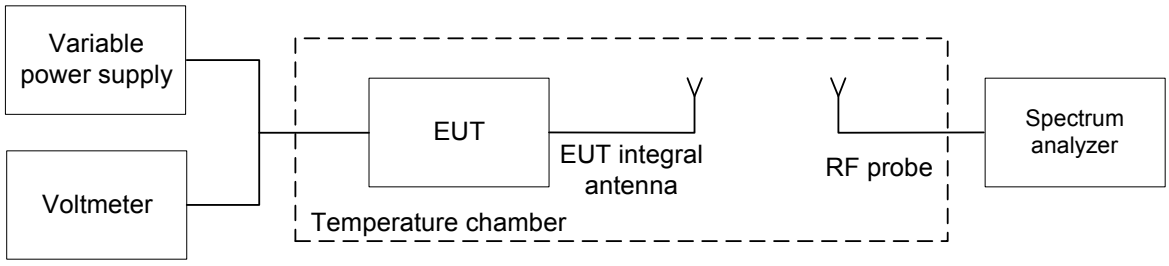
7.5.2.2 The EUT power was turned off. Temperature within test chamber was set to +30˚C and a period of time sufficient to stabilize all of the oscillator circuit components was allowed.

7.5.2.3 The EUT was powered on and carrier frequency was measured at start up moment +30˚C 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 the rest of the test temperatures and voltages as provided in Table 7.5.2. The EUT was powered off.

7.5.2.5 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:	**FCC section 15.255(f)/RSS-210 section J.6, Frequency stability**		
Test procedure:	ANSI C63.10, Section 9.14		
Test mode:	Compliance	**Verdict:**	PASS
Date(s):	24-May-21 - 25-May-21		
Temperature: 23 ºC	**Relative Humidity:** 46 %	**Air Pressure:** 1008 hPa	**Power:** 48 VDC
Remarks:			

Table 7.5.2 Frequency stability test results

ASSIGNED FREQUENCY RANGE: 57000 – 71000 MHz
NOMINAL POWER VOLTAGE: 48 V
TEMPERATURE STABILIZATION PERIOD: 20 min
POWER DURING TEMPERATURE TRANSITION: Off
SPECTRUM ANALYZER MODE: Counter
RESOLUTION BANDWIDTH: 3 kHz
VIDEO BANDWIDTH: 10 kHz
MODULATION: Unmodulated

T, ºC	Voltage, V	Frequency, MHz							Max frequency drift, kHz	
		Start up	1st min	2nd min	3rd min	4th min	5th min	10th min	Positive	Negative
Low frequency 58320 MHz										
-45	nominal	58319.9333	NA	NA	NA	NA	NA	58319.9335	30.9	NA
-40	nominal	58319.9223	NA	NA	NA	NA	NA	58319.9213	19.7	NA
-30	nominal	58319.9246	NA	NA	NA	NA	NA	58319.9249	22.3	NA
-20	nominal	58319.9087	58319.9086	58319.9092	58319.9088	58319.9089	58319.9093	58319.9105	7.9	NA
-10	nominal	58319.9088	NA	NA	NA	NA	NA	58319.9084	6.2	NA
0	nominal	58319.9055	58319.9057	58319.9053	58319.9060	58319.9055	58319.9057	58319.9057	3.4	NA
10	nominal	58319.9058	NA	NA	NA	NA	NA	58319.9064	3.8	NA
20	+15%	58319.9030	NA	NA	NA	NA	NA	58319.9030	0.4	NA
20	nominal	58319.9023	NA	NA	NA	NA	NA	58319.9026*	NA	-0.3
20	-15%)	58319.9025	NA	NA	NA	NA	NA	58319.9030	0.4	-0.1
30	nominal	58319.9029	58319.9030	58319.9029	58319.9029	58319.9030	58319.9030	58319.9029	0.4	NA
40	nominal	58319.9069	NA	NA	NA	NA	NA	58319.9073	4.7	NA
50	nominal	58319.9123	NA	NA	NA	NA	NA	58319.9124	9.8	NA
55	nominal	58319.9148	NA	NA	NA	NA	NA	58319.9150	12.4	NA
Mid frequency 62640 MHz										
-45	nominal	62639.9336	NA	NA	NA	NA	NA	62639.9351	32.1	NA
-40	nominal	62639.9225	NA	NA	NA	NA	NA	62639.9220	19.5	NA
-30	nominal	62639.9260	NA	NA	NA	NA	NA	62639.9261	23.1	NA
-20	nominal	62639.9117	62639.9111	62639.9107	62639.9113	62639.9110	62639.9112	62639.9119	8.9	NA
-10	nominal	62639.9084	NA	NA	NA	NA	NA	62639.9088	5.8	NA
0	nominal	62639.9057	62639.9056	62639.9054	62639.9057	62639.9055	62639.9059	62639.9062	3.2	NA
10	nominal	62639.9058	NA	NA	NA	NA	NA	62639.9059	2.9	NA
20	+15%	62639.9026	NA	NA	NA	NA	NA	62639.9026	NA	-0.4
20	nominal	62639.9029	NA	NA	NA	NA	NA	62639.9030*	NA	-0.1
20	-15%)	62639.9027	NA	NA	NA	NA	NA	62639.9029	NA	-0.3
30	nominal	62639.9029	62639.9028	62639.9030	62639.9028	62639.9031	62639.9028	62639.9028	0.1	-0.2
40	nominal	62639.9082	NA	NA	NA	NA	NA	62639.9075	5.2	NA
50	nominal	62639.9136	NA	NA	NA	NA	NA	62639.9134	10.6	NA
55	nominal	62639.9163	NA	NA	NA	NA	NA	62639.9165	13.5	NA

Test specification:	**FCC section 15.255(f)/RSS-210 section J.6, Frequency stability**		
Test procedure:	ANSI C63.10, Section 9.14		
Test mode:	Compliance	**Verdict:**	PASS
Date(s):	24-May-21 - 25-May-21		
Temperature: 23 ºC	**Relative Humidity:** 46 %	**Air Pressure:** 1008 hPa	**Power:** 48 VDC
Remarks:			

Table 7.5.2 Frequency stability test results (continued)

ASSIGNED FREQUENCY RANGE: 57000 – 71000 MHz
NOMINAL POWER VOLTAGE: 48 V
TEMPERATURE STABILIZATION PERIOD: 20 min
POWER DURING TEMPERATURE TRANSITION: Off
SPECTRUM ANALYZER MODE: Counter
RESOLUTION BANDWIDTH: 3 kHz
VIDEO BANDWIDTH: 10 kHz
MODULATION: Unmodulated

T, ºC	Voltage, V	Frequency, MHz							Max frequency drift, kHz	
		Start up	1st min	2nd min	3rd min	4th min	5th min	10th min	Positive	Negative
High frequency 64800 MHz										
-45	nominal	64799.9332	NA	NA	NA	NA	NA	64799.9346	31.8	NA
-40	nominal	64799.9222	NA	NA	NA	NA	NA	64799.9228	20	NA
-30	nominal	64799.9265	NA	NA	NA	NA	NA	64799.9265	23.7	NA
-20	nominal	64799.9123	64799.9123	64799.9119	64799.9127	64799.9121	64799.9124	64799.9128	10	NA
-10	nominal	64799.9087	NA	NA	NA	NA	NA	64799.9090	6.2	NA
0	nominal	64799.9055	64799.9053	64799.9056	64799.9054	64799.9055	64799.9060	64799.9064	3.6	NA
10	nominal	64799.9045	NA	NA	NA	NA	NA	64799.9060	3.2	NA
20	+15%	64799.9030	NA	NA	NA	NA	NA	64799.9037	0.9	NA
20	nominal	64799.9027	NA	NA	NA	NA	NA	64799.9028*	NA	-0.1
20	-15%)	64799.9026	NA	NA	NA	NA	NA	64799.9026	NA	-0.2
30	nominal	64799.9030	64799.9030	64799.9033	64799.9026	64799.9032	64799.9027	64799.9030	0.5	-0.2
40	nominal	64799.9078	NA	NA	NA	NA	NA	64799.9082	5.4	NA
50	nominal	64799.9141	NA	NA	NA	NA	NA	64799.9140	11.3	NA
55	nominal	64799.9163	NA	NA	NA	NA	NA	64799.9160	13.5	NA

* - Reference frequency

Reference numbers of test equipment used

HL 2171	HL 2358	HL 5376	HL 5380	HL 5391	HL 5985		

Full description is given in Appendix A.

Test specification:	FCC Section 15.207(a)/RSS-Gen 8.8, Conducted emission		
Test procedure:	ANSI C63.4, Section 13.1.3		
Test mode:	Compliance	Verdict:	PASS
Date(s):	07-Jun-21		
Temperature: 25 ºC	Relative Humidity: 41 %	Air Pressure: 1011 hPa	Power: 120 VAC, 60 Hz
Remarks:			

7.6 Conducted emissions

7.6.1 General

This test was performed to measure common mode conducted emissions at the power port. Specification test limits are given in Table 7.6.1.

Table 7.6.1 Limits for conducted emissions

Frequency, MHz	Class B limit, dB(μV)	
	QP	AVRG
0.15 - 0.5	66 - 56*	56 - 46*
0.5 - 5.0	56	46
5.0 - 30	60	50

* The limit decreases linearly with the logarithm of frequency.

7.6.2 Test procedure

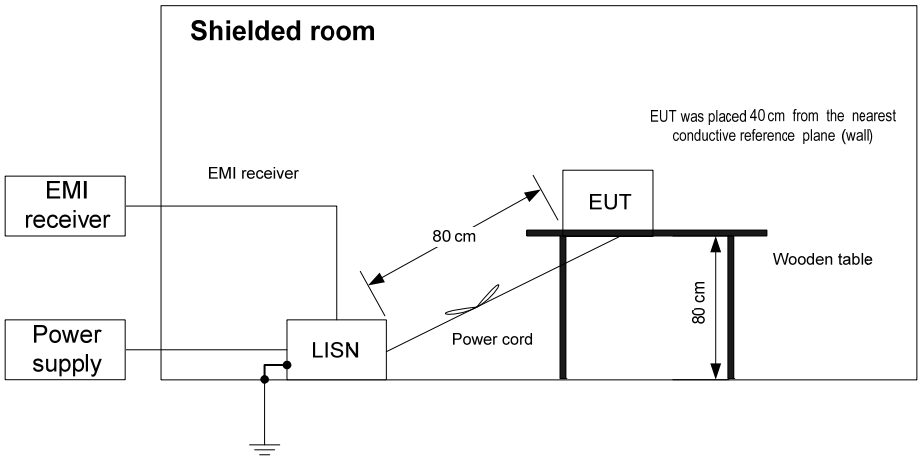
7.6.2.1 The EUT was set up as shown in Figure 7.6.1 and associated photographs, energized and the performance check was conducted.

7.6.2.2 The measurements were performed at power terminals with the LISN, connected to a spectrum analyzer in the frequency range referred to in Table 7.6.2. Unused coaxial connector of the LISN was terminated with 50 Ohm. Quasi-peak and average detectors were used throughout the testing.

7.6.2.3 The position of the device cables was varied to determine maximum emission level.

7.6.2.4 The worst test results (the lowest margins) were recorded in Table 7.6.2 and shown in the associated plots.

Figure 7.6.1 Setup for conducted emission measurements, table-top equipment



Test specification:	**FCC Section 15.207(a)/RSS-Gen 8.8, Conducted emission**		
Test procedure:	ANSI C63.4, Section 13.1.3		
Test mode:	Compliance	**Verdict:**	PASS
Date(s):	07-Jun-21		
Temperature: 25 ºC	**Relative Humidity:** 41 %	**Air Pressure:** 1011 hPa	**Power:** 120 VAC, 60 Hz
Remarks:			

Table 7.6.2 Conducted emission test results

LINE: AC mains
EUT OPERATING MODE: Transmit
EUT SET UP: TABLE-TOP
TEST SITE: SHIELDED ROOM
DETECTORS USED: PEAK / QUASI-PEAK / AVERAGE
FREQUENCY RANGE: 150 kHz - 30 MHz
RESOLUTION BANDWIDTH: 9 kHz

Frequency, MHz	Peak emission, dB(μV)	Quasi-peak			Average			Line ID	Verdict
		Measured emission, dB(μV)	Limit, dB(μV)	Margin, dB*	Measured emission, dB(μV)	Limit, dB(μV)	Margin, dB*		
0.154	NA	49.85	65.78	-15.93	34.01	55.78	-21.77	L1	Pass
0.620	NA	41.64	56.00	-14.36	35.28	46.00	-10.72		
2.283	NA	33.80	56.00	-22.20	28.32	46.00	-17.68		
7.698	NA	31.60	60.00	-28.40	27.60	50.00	-22.40		
8.911	NA	35.70	60.00	-24.30	35.29	50.00	-14.71		
12.152	NA	33.51	60.00	-26.49	29.03	50.00	-20.97		
0.154	NA	50.90	65.78	-14.88	34.31	55.78	-21.47	L2	Pass
0.620	NA	40.77	56.00	-15.23	34.60	46.00	-11.40		
2.269	NA	33.08	56.00	-22.92	27.65	46.00	-18.35		
8.884	NA	35.23	60.00	-24.77	34.52	50.00	-15.48		
11.794	NA	33.23	60.00	-26.77	26.56	50.00	-23.44		
21.471	NA	30.30	60.00	-29.70	26.18	50.00	-23.82		

*- Margin = Measured emission - specification limit.

Reference numbers of test equipment used

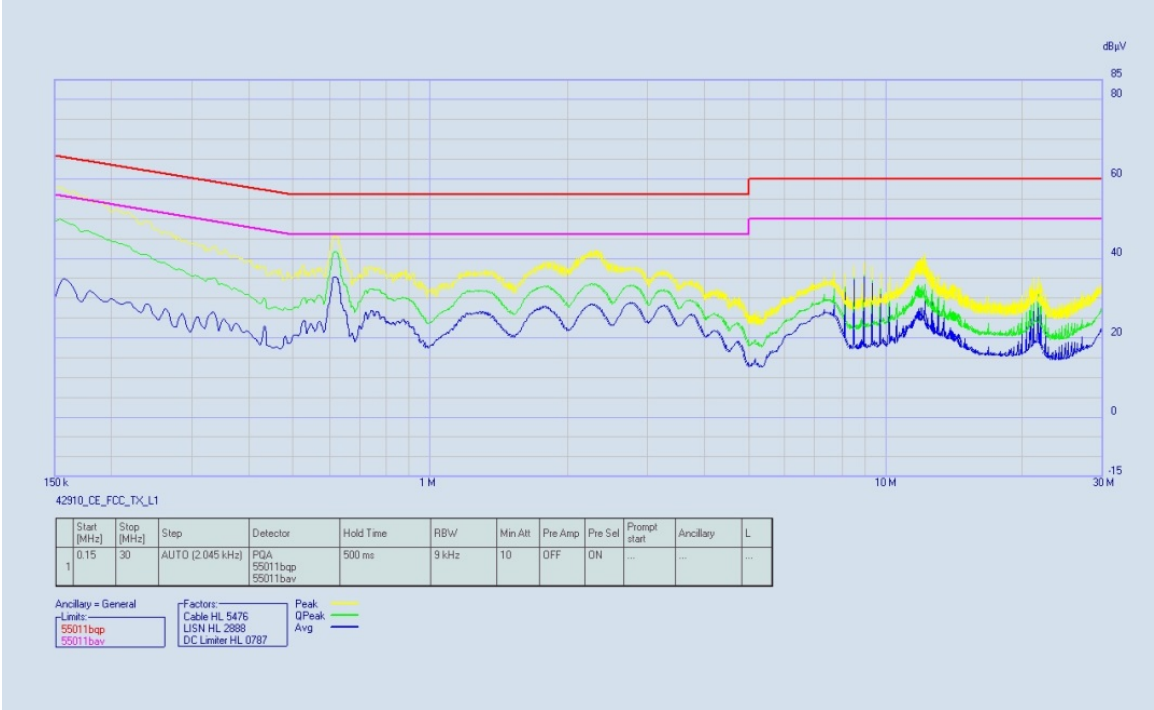
HL 0787	HL 2888	HL 5476	HL 5707				

Full description is given in Appendix A.

Test specification:	**FCC Section 15.207(a)/RSS-Gen 8.8, Conducted emission**		
Test procedure:	ANSI C63.4, Section 13.1.3		
Test mode:	Compliance	**Verdict:**	PASS
Date(s):	07-Jun-21		
Temperature: 25 ºC	**Relative Humidity:** 41 %	**Air Pressure:** 1011 hPa	**Power:** 120 VAC, 60 Hz
Remarks:			

Plot 7.6.1 Conducted emission measurements

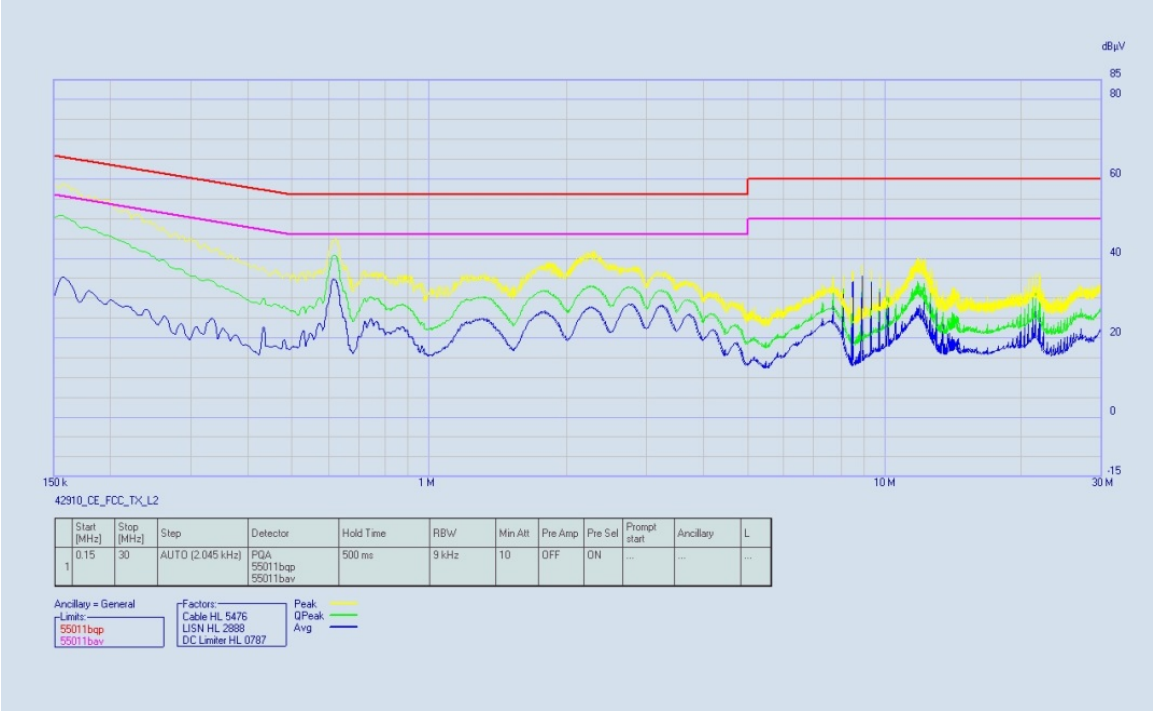
LINE: L1
EUT OPERATING MODE: Transmit
LIMIT: QUASI-PEAK, AVERAGE
DETECTOR: PEAK



Test specification:	**FCC Section 15.207(a)/RSS-Gen 8.8, Conducted emission**		
Test procedure:	ANSI C63.4, Section 13.1.3		
Test mode:	Compliance	**Verdict:**	PASS
Date(s):	07-Jun-21		
Temperature: 25 ºC	**Relative Humidity:** 41 %	**Air Pressure:** 1011 hPa	**Power:** 120 VAC, 60 Hz
Remarks:			

Plot 7.6.2 Conducted emission measurements

LINE: L2
EUT OPERATING MODE: Transmit
LIMIT: QUASI-PEAK, AVERAGE
DETECTOR: PEAK



Test specification:	FCC section 15.203/ RSS-Gen, Section 6.8, Antenna requirement		
Test procedure:	Visual inspection / supplier declaration		
Test mode:	Compliance	Verdict:	PASS
Date(s):	07-Jun-21		
Temperature: 24 ºC	Relative Humidity: 45 %	Air Pressure: 1011 hPa	Power: 48 VDC
Remarks:			

7.7 Antenna requirements

The EUT was verified for compliance with antenna requirements. A transmitter shall be designed to ensure that no antenna other than that furnished by the responsible party will be used with the device. It may be either permanently attached or employs a unique antenna connector for every antenna proposed for use with the EUT. This requirement does not apply to professionally installed transmitters.
The rationale for compliance with the above requirements was either visual inspection results or supplier declaration. The summary of results is provided in Table 7.7.1.

Table 7.7.1 Antenna requirements

Requirement	Rationale	Verdict
The transmitter antenna is permanently attached	NA	Comply
The transmitter employs a unique antenna connector	Visual inspection	
The transmitter requires professional installation	NA	

Test specification:	**FCC 47 CFR, Section 15.107 / ICES-003, Section 3.2.1, Class B, AC power lines conducted emissions**		
Test procedure:	ANSI C63.4, Section 7.3		
Test mode:	Compliance	**Verdict:**	PASS
Date(s):	07-Jun-21		
Temperature: 25 ºC	**Relative Humidity:** 41 %	**Air Pressure:** 1011 hPa	**Power:** 120 VAC, 60 Hz
Remarks:			

8 Emission tests according to 47CFR part 15 subpart B requirements

8.1 Conducted emissions

8.1.1 General

This test was performed to measure common mode conducted emissions at the mains power port. Specification test limits are given in Table 8.1.1.

Table 8.1.1 Limits for conducted emissions

Frequency, MHz	Class B limit, dB(μV)		Class A limit, dB(μV)	
	QP	AVRG	QP	AVRG
0.15 - 0.5	66 - 56*	56 - 46*	79	66
0.5 - 5.0	56	46	73	60
5.0 - 30	60	50	73	60

* The limit decreases linearly with the logarithm of frequency.

8.1.2 Test procedure

8.1.2.1 The EUT was set up as shown in Figure 8.1.1 and associated photographs, energized and the performance check was conducted.

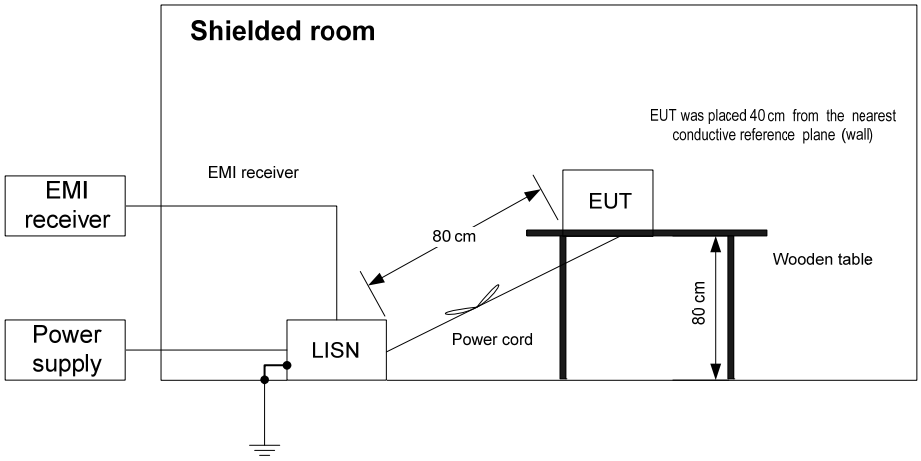
8.1.2.2 The measurements were performed at power terminals with the LISN, connected to a spectrum analyzer in the frequency range referred to in Table 8.1.2. Unused coaxial connector of the LISN was terminated with 50 Ohm. Quasi-peak and average detectors were used throughout the testing.

8.1.2.3 The position of the device cables was varied to determine maximum emission level.

8.1.2.4 The worst test results (the lowest margins) were recorded in Table 8.1.2 and shown in the associated plots.

Test specification:	**FCC 47 CFR, Section 15.107 / ICES-003, Section 3.2.1, Class B, AC power lines conducted emissions**		
Test procedure:	ANSI C63.4, Section 7.3		
Test mode:	Compliance	**Verdict:**	PASS
Date(s):	07-Jun-21		
Temperature: 25 ºC	**Relative Humidity:** 41 %	**Air Pressure:** 1011 hPa	**Power:** 120 VAC, 60 Hz
Remarks:			

Figure 8.1.1 Setup for conducted emission measurements, table-top equipment



Photograph 8.1.1 Setup for conducted emission measurements

Test specification:	**FCC 47 CFR, Section 15.107 / ICES-003, Section 3.2.1, Class B, AC power lines conducted emissions**		
Test procedure:	ANSI C63.4, Section 7.3		
Test mode:	Compliance	**Verdict:**	PASS
Date(s):	07-Jun-21		
Temperature: 25 ºC	**Relative Humidity:** 41 %	**Air Pressure:** 1011 hPa	**Power:** 120 VAC, 60 Hz
Remarks:			

Table 8.1.2 Conducted emission test results

LINE: AC mains
LIMIT: Class B
EUT OPERATING MODE: Receive
EUT SET UP: TABLE-TOP
TEST SITE: SHIELDED ROOM
DETECTORS USED: PEAK / QUASI-PEAK / AVERAGE
FREQUENCY RANGE: 150 kHz - 30 MHz
RESOLUTION BANDWIDTH: 9 kHz

Frequency, MHz	Peak emission, dB(μV)	Quasi-peak			Average			Line ID	Verdict
		Measured emission, dB(μV)	Limit, dB(μV)	Margin, dB*	Measured emission, dB(μV)	Limit, dB(μV)	Margin, dB*		
0.154	NA	45.32	65.78	-20.46	29.27	55.78	-26.51	L1	Pass
0.614	NA	38.83	56.00	-17.17	33.20	46.00	-12.80		
11.896	NA	32.23	60.00	-27.77	27.37	50.00	-22.63		
0.154	NA	45.29	65.78	-20.49	28.76	55.78	-27.02	L2	Pass
0.618	NA	38.40	56.00	-17.60	33.19	46.00	-12.81		
11.653	NA	33.05	60.00	-26.95	25.45	50.00	-24.55		

*- Margin = Measured emission - specification limit.

Reference numbers of test equipment used

HL 0787	HL 2888	HL 5476	HL 5707				

Full description is given in Appendix A.

Test specification:	**FCC 47 CFR, Section 15.107 / ICES-003, Section 3.2.1, Class B, AC power lines conducted emissions**		
Test procedure:	ANSI C63.4, Section 7.3		
Test mode:	Compliance	**Verdict:**	PASS
Date(s):	07-Jun-21		
Temperature: 25 ºC	**Relative Humidity:** 41 %	**Air Pressure:** 1011 hPa	**Power:** 120 VAC, 60 Hz
Remarks:			

Plot 8.1.1 Conducted emission measurements

LINE:	L1
LIMIT:	Class B
EUT OPERATING MODE:	Receive
LIMIT:	QUASI-PEAK, AVERAGE
DETECTOR:	PEAK

Test specification:	**FCC 47 CFR, Section 15.107 / ICES-003, Section 3.2.1, Class B, AC power lines conducted emissions**		
Test procedure:	ANSI C63.4, Section 7.3		
Test mode:	Compliance	**Verdict:**	PASS
Date(s):	07-Jun-21		
Temperature: 25 ºC	**Relative Humidity:** 41 %	**Air Pressure:** 1011 hPa	**Power:** 120 VAC, 60 Hz
Remarks:			

Plot 8.1.2 Conducted emission measurements

LINE: L2
LIMIT: Class B
EUT OPERATING MODE: Receive
LIMIT: QUASI-PEAK, AVERAGE
DETECTOR: PEAK

Test specification:	**FCC 47 CFR, Section 15.109 / ICES-003, Section 3.2.2, Class B, Radiated emissions**		
Test procedure:	ANSI C63.4, Section 8.3		
Test mode:	Compliance	**Verdict:**	PASS
Date(s):	02-Jun-21 - 03-Jun-21		
Temperature: 24 ºC	**Relative Humidity:** 48 %	**Air Pressure:** 1009 hPa	**Power:** 48 VDC
Remarks:			

8.2 Radiated emission measurements

8.2.1 General

This test was performed to measure radiated emissions from the EUT enclosure. Specification test limits are given in Table 8.2.1.

Table 8.2.1 Radiated emission test limits

FCC part 15

Frequency, MHz	Class B limit, dB(μV/m)		Class A limit, dB(μV/m)	
	10 m distance	3 m distance	10 m distance	3 m distance
30 - 88	29.5*	40.0	39.0	49.5*
88 - 216	33.0*	43.5	43.5	54.0*
216 - 960	35.5*	46.0	46.4	56.9*
Above 960	43.5*	54.0	49.5	60.0*

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

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Frequency, MHz	Class B limit, dB(μV/m)		Class A limit, dB(μV/m)	
	10 m distance	3 m distance	10 m distance	3 m distance
30 - 88	30.0	40.0	40.0	50.0
88 - 216	33.1	43.5	43.5	54.0
216 - 230	35.6	46.0	46.4	56.9
230 - 960	37.0	47.0	47.0	57.0
960 - 1000	43.5	54.0	49.5	60.0
Above 1000	Class B limit, dB(μV/m)		Class A limit, dB(μV/m)	
	Peak	Average	Peak	Average
	74.0	54.0	80.0	60.0

*The more stringent limit applies at transition frequencies

8.2.2 Test procedure

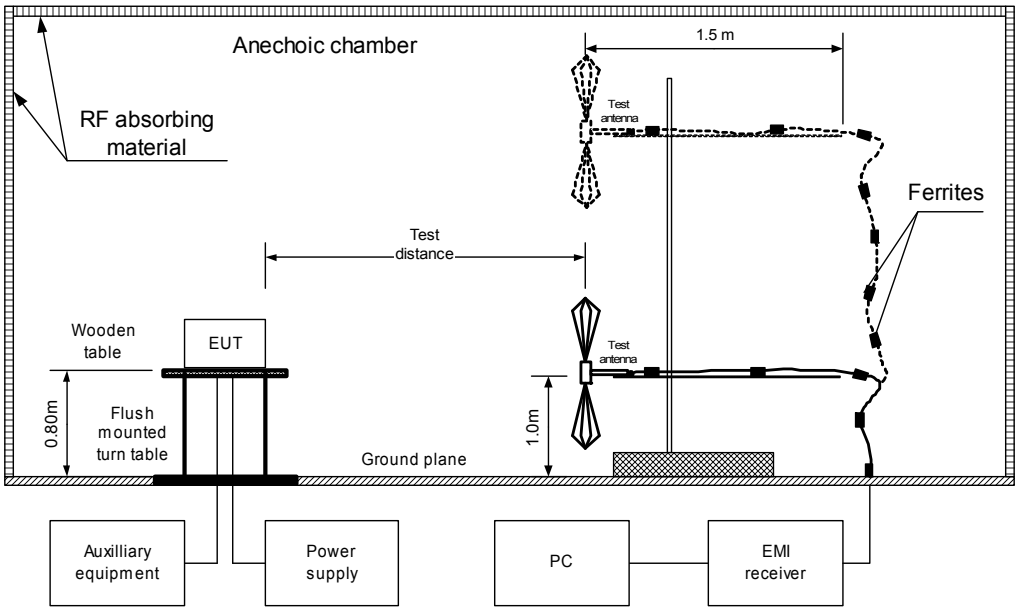
8.2.2.1 The EUT was set up as shown in Figure 8.2.1 and associated photograph/s, energized and the performance check was conducted.

8.2.2.2 The measurements were performed in the anechoic chamber at 3 m test distance.The specified frequency range was investigated with biconilog antenna connected to EMI receiver. To find maximum radiation the turntable was rotated 360^0, the measuring antenna height was changed from 1 to 4 m, its polarization was switched from vertical to horizontal and the EUT cables position was varied.

8.2.2.3 The worst test results (the lowest margins) were recorded in Table 8.2.2 and shown in the associated plots.

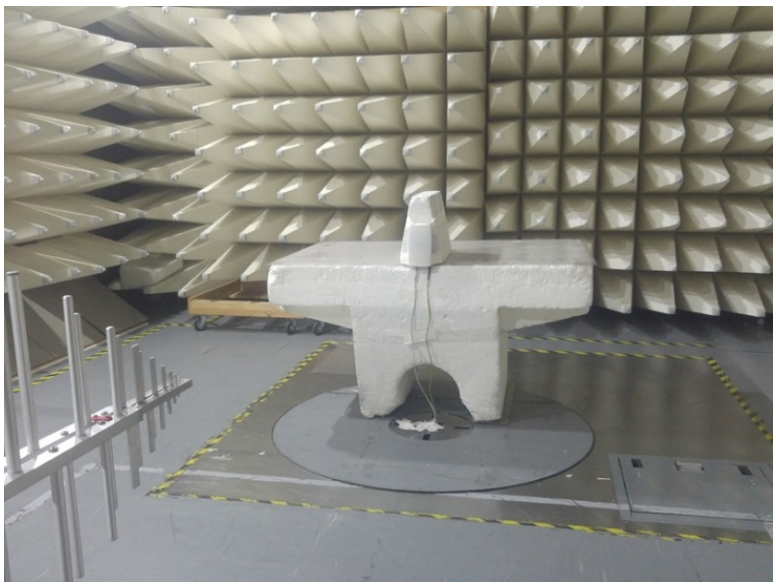
Test specification:	**FCC 47 CFR, Section 15.109 / ICES-003, Section 3.2.2, Class B, Radiated emissions**		
Test procedure:	ANSI C63.4, Section 8.3		
Test mode:	Compliance	**Verdict:**	PASS
Date(s):	02-Jun-21 - 03-Jun-21		
Temperature: 24 ºC	**Relative Humidity:** 48 %	**Air Pressure:** 1009 hPa	**Power:** 48 VDC
Remarks:			

Figure 8.2.1 Setup for radiated emission measurements in anechoic chamber, table-top equipment

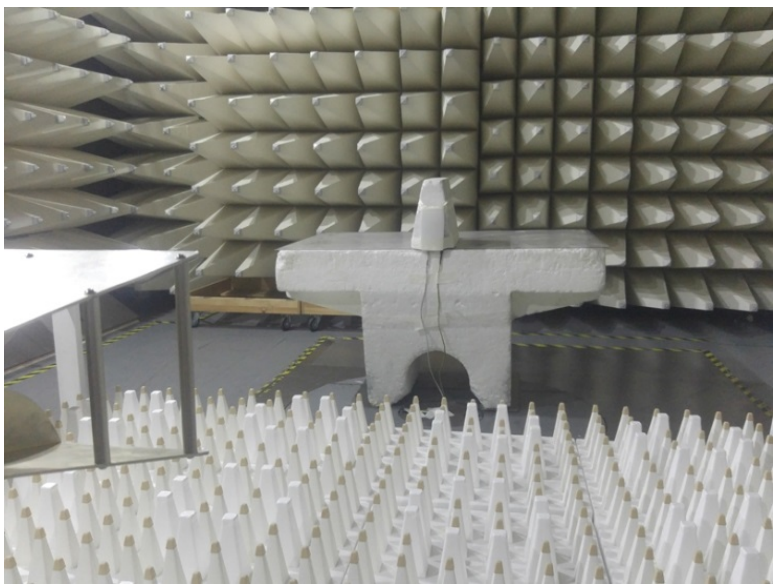


Test specification:	FCC 47 CFR, Section 15.109 / ICES-003, Section 3.2.2, Class B, Radiated emissions		
Test procedure:	ANSI C63.4, Section 8.3		
Test mode:	Compliance	Verdict:	PASS
Date(s):	02-Jun-21 - 03-Jun-21		
Temperature: 24 ºC	Relative Humidity: 48 %	Air Pressure: 1009 hPa	Power: 48 VDC
Remarks:			

Photograph 8.2.1 Setup for radiated emission measurements in 30-1000 MHz

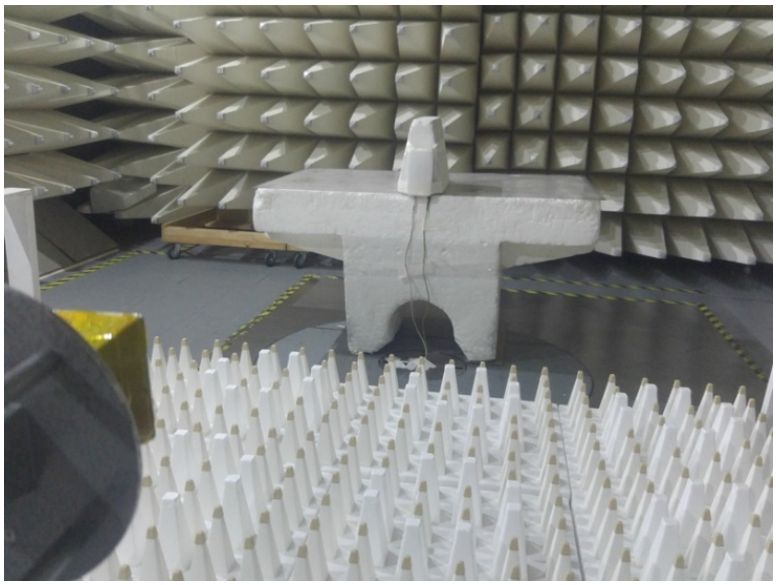


Photograph 8.2.2 Setup for radiated emission measurements in 1-18 GHz

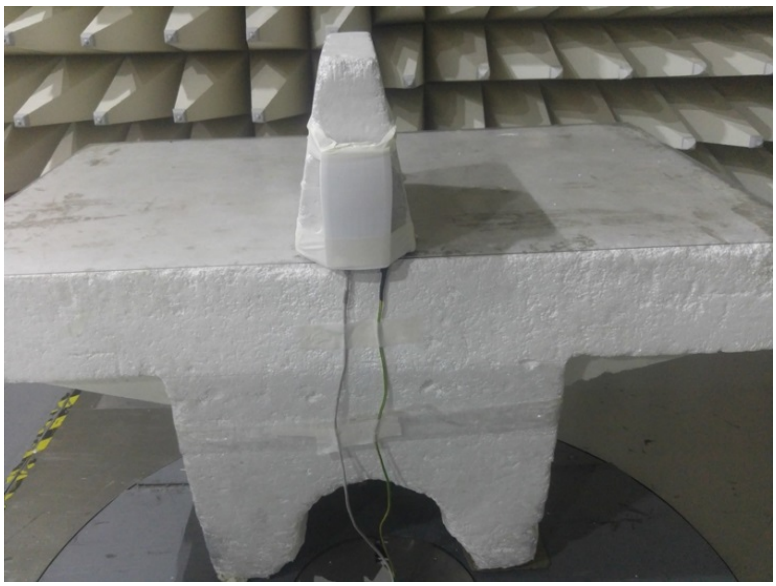


Test specification:	FCC 47 CFR, Section 15.109 / ICES-003, Section 3.2.2, Class B, Radiated emissions		
Test procedure:	ANSI C63.4, Section 8.3		
Test mode:	Compliance	Verdict:	PASS
Date(s):	02-Jun-21 - 03-Jun-21		
Temperature: 24 ºC	Relative Humidity: 48 %	Air Pressure: 1009 hPa	Power: 48 VDC
Remarks:			

Photograph 8.2.3 Setup for radiated emission measurements in 18-40 GHz



Photograph 8.2.4 Setup for radiated emission measurements, EUT cabling



Test specification:	**FCC 47 CFR, Section 15.109 / ICES-003, Section 3.2.2, Class B, Radiated emissions**		
Test procedure:	ANSI C63.4, Section 8.3		
Test mode:	Compliance	**Verdict:**	PASS
Date(s):	02-Jun-21 - 03-Jun-21		
Temperature: 24 ºC	**Relative Humidity:** 48 %	**Air Pressure:** 1009 hPa	**Power:** 48 VDC
Remarks:			

Table 8.2.2 Radiated emission test results

EUT SET UP: TABLE-TOP
LIMIT: Class B
EUT OPERATING MODE: Receive/Stand-by

TEST SITE: SEMI ANECHOIC CHAMBER
TEST DISTANCE: 3 m
DETECTORS USED: PEAK / QUASI-PEAK
FREQUENCY RANGE: 30 MHz – 1000 MHz
RESOLUTION BANDWIDTH: 120 kHz

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*				
31.984	28.53	21.92	40.0	-18.08	Vertical	1.04	288	Pass
42.761	42.73	36.28	40.0	-3.72	Vertical	1.04	313	
43.281	42.28	35.48	40.0	-4.52	Vertical	1.00	335	
46.012	44.11	37.10	40.0	-2.90	Vertical	1.00	338	
50.035	40.28	34.25	40.0	-5.75	Vertical	1.02	26	
68.091	41.96	35.19	40.0	-4.81	Vertical	1.00	360	
71.983	42.18	38.51	40.0	-1.49	Vertical	1.00	26	
783.132	44.92	39.38	46.0	-6.62	Horizontal	1.00	0	
934.930	45.99	34.38	46.0	-11.62	Horizontal	2.20	100	

TEST SITE: SEMI ANECHOIC CHAMBER
TEST DISTANCE: 3 m
DETECTORS USED: PEAK / AVERAGE
FREQUENCY RANGE: 1000 MHz – 40000 MHz
RESOLUTION BANDWIDTH: 1000 kHz

Frequency, MHz	Peak			Average			Antenna polarization	Antenna height, m	Turn-table position**, degrees	Verdict
	Measured emission, dB(μV/m)	Limit, dB(μV/m)	Margin, dB*	Measured emission, dB(μV/m)	Limit, dB(μV/m)	Margin, dB*				
2437.633	41.33	74.0	-32.67	36.44	54.0	-17.56	Horizontal	1.00	58	Pass
2500.467	40.57	74.0	-33.43	35.19	54.0	-18.81	Horizontal	1.04	55	
2802.267	45.23	74.0	-28.77	32.04	54.0	-21.96	Horizontal	1.62	210	
6250.667	46.56	74.0	-27.44	40.64	54.0	-13.36	Vertical	1.00	205	
8099.767	50.36	74.0	-23.64	45.24	54.0	-8.76	Horizontal	1.32	204	
8750.867	49.89	74.0	-24.11	42.88	54.0	-11.12	Vertical	2.24	189	
10063.267	50.92	74.0	-23.08	44.79	54.0	-9.21	Horizontal	1.02	210	
12501.067	50.15	74.0	-23.85	41.73	54.0	-12.27	Horizontal	2.24	155	

*- Margin = Measured emission - specification limit.
**- EUT front panel refer to 0 degrees position of turntable.

Reference numbers of test equipment used

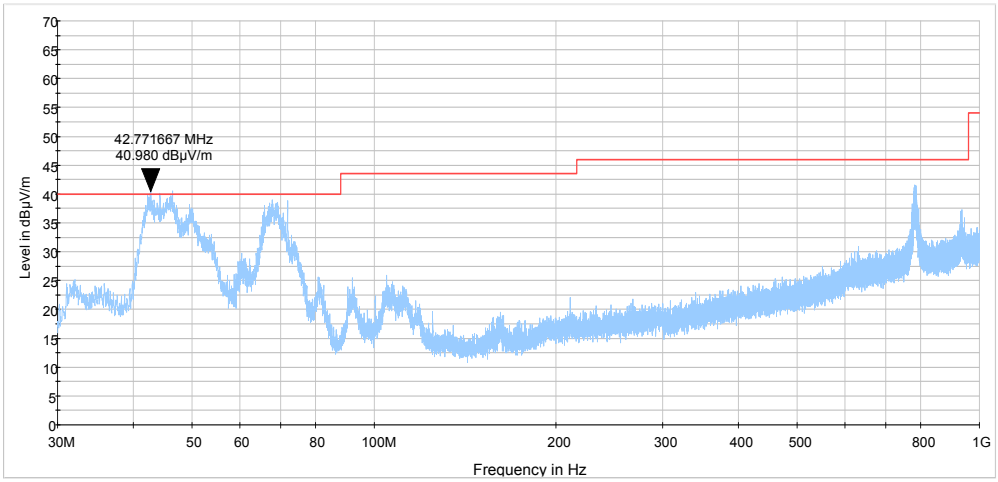
HL 3903	HL 4360	HL 4933	HL 4956	HL 5112	HL 5288		

Full description is given in Appendix A.

Test specification:	**FCC 47 CFR, Section 15.109 / ICES-003, Section 3.2.2, Class B, Radiated emissions**		
Test procedure:	ANSI C63.4, Section 8.3		
Test mode:	Compliance	**Verdict:**	PASS
Date(s):	02-Jun-21 - 03-Jun-21		
Temperature: 24 ºC	**Relative Humidity:** 48 %	**Air Pressure:** 1009 hPa	**Power:** 48 VDC
Remarks:			

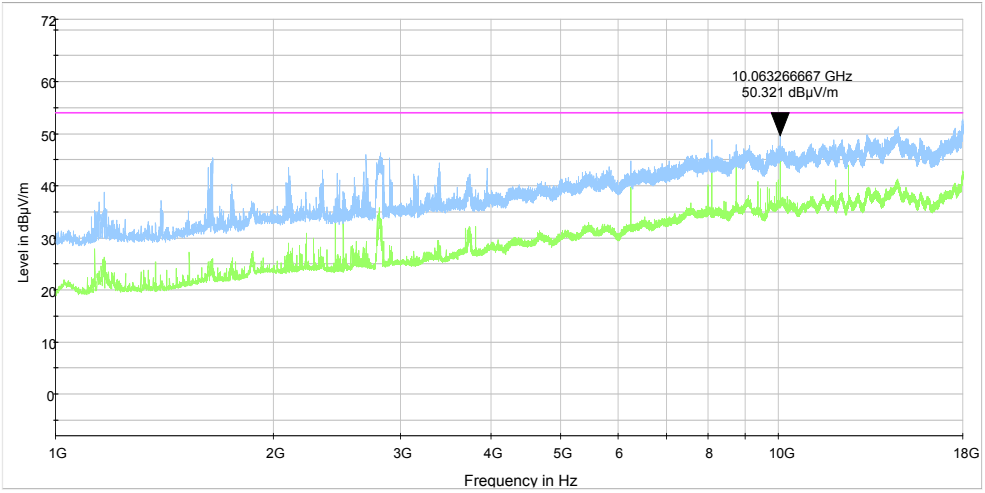
Plot 8.2.1 Radiated emission measurements in 30 - 1000 MHz range, vertical and horizontal antenna polarization

TEST SITE: Semi anechoic chamber
LIMIT: Class B
TEST DISTANCE: 3 m
EUT OPERATING MODE: Receive/Stand-by



Plot 8.2.2 Radiated emission measurements in 1 – 18 GHz range, vertical and antenna polarization

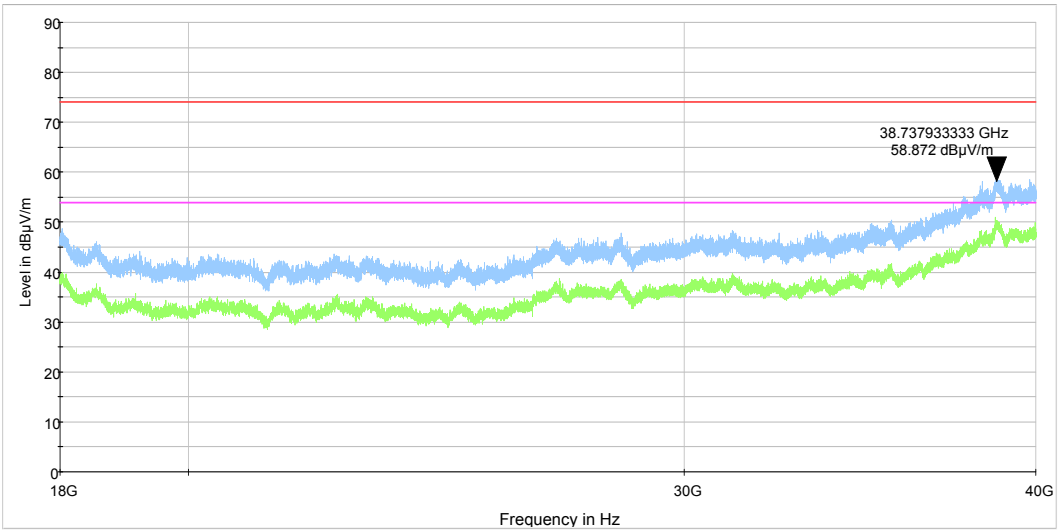
TEST SITE: Semi anechoic chamber
LIMIT: Class B
TEST DISTANCE: 3 m
EUT OPERATING MODE: Receive/Stand-by



Test specification:	**FCC 47 CFR, Section 15.109 / ICES-003, Section 3.2.2, Class B, Radiated emissions**		
Test procedure:	ANSI C63.4, Section 8.3		
Test mode:	Compliance	**Verdict:**	PASS
Date(s):	02-Jun-21 - 03-Jun-21		
Temperature: 24 ºC	**Relative Humidity:** 48 %	**Air Pressure:** 1009 hPa	**Power:** 48 VDC
Remarks:			

Plot 8.2.3 Radiated emission measurements in 18 - 40 GHz range, vertical and antenna polarization

TEST SITE:	Semi anechoic chamber
LIMIT:	Class B
TEST DISTANCE:	3 m
EUT OPERATING MODE:	Receive/Stand-by



9 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	28-Feb-21	28-Feb-22
0747	Mixer, Millimeter Wave Harmonic 90 - 140 GHZ	Oleson Microwave Labs	M08HW	F80429-1	19-May-20	19-May-23
0770	Antenna Standard Gain Horn, 40-60 GHz WR-19, U-band, 24 dB mid-band gain	Quinstar Technology	QWH-1900-AA	118	22-Nov-20	22-Nov-21
0771	Antenna Standard Gain Horn, 60-90 GHz, WR-12, 24 dB mid-band gain	Quinstar Technology	QWH-1200-AA	111	05-Aug-20	05-Aug-21
0772	Antenna Standard Gain Horn, 75-110 GHz, WR-10, 24 dB mid-band gain	Quinstar Technology	QWH-0800-AA	110	22-Nov-20	22-Nov-21
0787	Transient Limiter 9 kHz-200 MHz	Hewlett Packard	11947A	3107A01877	06-Oct-20	06-Oct-21
1312	Mixer Millimeter Wave Harmonic 140-220 GHz	Oleson Microwave Labs	M05HWD	G91112-1	19-May-20	19-May-23
2171	Multimeter	Fluke	177	79960418	15-Jul-20	15-Jul-21
2358	Power Supply, 2 X 0-36VDC / 5A, 5VDC / 5A	Horizon Electronics	DHR3655D	767469	25-Jun-20	25-Jun-21
2888	LISN Two-line V-Network 50 Ohm / 50 uH + 5 Ohm, 16A, MIL STD 461E, CISPR 16-1	Rolf Heine	NNB-2/16Z	02/10018	14-Mar-21	14-Mar-22
3235	Harmonic mixer 40 to 60 GHz	Agilent Technologies	11970U	MY30030182	30-Jan-20	30-Jan-23
3290	Attenuator, direct reading, 40 to 60 GHz, 0.4 W	Quinstar Technology	QAD-U00000	10381008	24-Sep-19	24-Sep-21
3291	Attenuator, direct reading, 60 to 90 GHz, 0.2 W	Quinstar Technology	QAD-E00000	10381009	24-Sep-19	24-Sep-21
3293	Frequency multiplier, input 20-30 GHz, output 60-90 GHz	Quinstar Technology	QPM-75003E	10381003	17-Nov-20	17-Nov-21
3306	Harmonic mixer 75 to 110 GHz	Agilent Technologies	11970W	MY25210273	30-Jan-20	30-Jan-23
3329	Antenna Standard Gain Horn, 140-220 GHz, WR-5, 24 dB mid-band gain	Quinstar Technology	NA	3329	22-Nov-20	22-Nov-21
3536	Antenna Standard Gain Horn, 90-140 GHz, WR-8, 24 dB mid-band gain	Quinstar Technology	QWH-FPRR00	11159004001	22-Nov-20	22-Nov-21
3903	Microwave Cable Assembly, 40.0 GHz, 1.5 m, SMA/SMA	Huber-Suhner	SUCOFLEX 102A	1226/2A	06-Apr-21	06-Apr-22
4023	Diplexer for use OML mixers with Agilent spectrum analyzer	Oleson Microwave Labs	DPL.26	NA	31-Mar-21	31-Mar-22
4360	EMI Test Receiver, 20 Hz to 40 GHz.	Rohde & Schwarz	ESU40	100322	19-Jan-21	19-Jan-22

HL No	Description	Manufacturer	Model	Ser. No.	Last Cal./ Check	Due Cal./ Check
4856	Amplifier, solid state, 18 GHz to 40 GHz, 20 dBm output power	Quinstar Technology	QGW-18402023-JO	16779001001	30-May-21	30-May-22
4933	Active Horn Antenna, 1 GHz to 18 GHz	Com-Power Corporation	AHA-118	701046	26-Jan-21	26-Jan-22
4956	Active horn antenna, 18 to 40 GHz	Com-Power Corporation	AHA-840	105004	26-Jan-21	26-Jan-22
5112	RF cable, 40 GHz, 5.5 m, K-type	Huber-Suhner	SF102EA/11SK/11SK/5500MM	502494/2EA	19-Apr-21	19-Apr-22
5288	Trilog Antenna, 25 MHz - 8 GHz, 100W	Frankonia	ALX-8000E	00809	08-Feb-19	08-Feb-22
5360	Broadband detector, 55 to 90 GHz	Pacific Millimeter Products, Inc	ED	200	30-Dec-20	30-Dec-21
5371	EXG Analog Signal Generator, 9 kHz - 40 GHz	Keysight Technologies	N5173B	MY57280540	25-Aug-20	25-Aug-21
5372	MXE EMI receiver, 3 Hz to 44 GHz	Keysight Technologies	N9038A	MY57290155	15-Mar-21	15-Mar-22
5376	EXA Signal Analyzer, 10 Hz - 32 GHz	Keysight Technologies	N9010B	MY57470404	22-Oct-20	22-Oct-21
5377	USB Thermocouple Power Sensor, DC-120 GHz	Keysight Technologies	U8489A	US56430158	21-Oct-20	21-Oct-21
5380	Wavequide Harmonic Mixer 55-90GHz	Keysight Technologies	M1971E	MY56130239	13-Nov-20	13-Nov-22
5391	Temperature/Humidity Cycle Chamber, -77 - +177 deg., Humidity Range 20% RH to 95% RH	Thermotron	SM-8C	27737	19-Aug-20	19-Aug-21
5410	RF cable, 40 GHz, SMA-SMA, 5.5 m	Huber-Suhner	SF102EA/11SK/11SK/5500MM	503974/EA	03-Aug-20	03-Aug-21
5476	Cable, BNC/BNC, 10.5 m	Western wire	MIL-C-17G	NA	24-May-21	24-May-22
5707	EMI receiver	PMM / Narda	PMM 9010F	060WW91101	01-Feb-21	01-Feb-22
5714	Handheld Oscilloscope, 60 MHz, 4 channels	Rohde & Schwarz	RTH1004	104416	09-Feb-21	09-Feb-22
5902	RF cable, 18 GHz, 6.0m, N-type	Huber-Suhner	SF126EA/11N/11N/6000	5902	01-Dec-20	01-Dec-21
5985	Piramidal Horn antenna, 50 - 75 GHz	Quinstar Technology	QWH-VPRR00	NA	22-Mar-21	22-Mar-22

10 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.

11 APPENDIX C Test laboratory 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 for OATS are R-10808 for RE measurements below 1 GHz, G-20112 for RE measurements above 1 GHz, R-11082 for anechoic chamber for RE measurements below 1 GHz, 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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website: www.hermonlabs.com

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

12 APPENDIX D Specification references

FCC 47CFR part 15: 2020	Radio Frequency Devices
ANSI C63.10: 2013	American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices
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
RSS-210 Issue 10: 2019	Licence-Exempt Radio Apparatus:Category I Equipment
RSS-Gen Issue 5 with Am.1: 2019	General Requirements for Compliance of Radio Apparatus
ICES-003 Issue 7: 2020	Information Technology Equipment (Including Digital Apparatus)

13 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 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
Standard gain horn antenna
Quinstar Technology
Model QWH
S/N 118 HL 0770, S/N 111 HL 0771, S/N 110 HL 0772, S/N 11159004001 HL 3536; S/N 3329 HL 3329

HL number	Frequency min, GHz	Frequency max, GHz	Antenna factor, dB(1/m)	Typical mid-band gain, dBi
0770	40.000	60.000	38.24	24
0771	60.000	90.000	41.76	24
0772	75.000	110.000	44.70	24
3536	90.000	140.000	45.28	24
3329	140.000	220.000	49.12	24

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

Antenna factor
Trilog antenna
Model ALX-8000E, Frankonia, S/N 00809, HL 5288, 30-1000 MHz

Frequency, MHz	Antenna factor, dB/m		
	Vert Up	Vert Down	Delta
30	-51.19	-51.28	0.09
35	-44.03	-44.12	0.09
40	-43.07	-43.12	0.05
45	-39.61	-39.79	0.18
50	-37.84	-38.14	0.3
60	-34.93	-34.9	0.03
70	-29.76	-29.66	0.1
80	-27.69	-27.82	0.13
90	-29.05	-29.07	0.02
100	-31.19	-31.19	0
120	-31.61	-31.6	0.01
140	-28.13	-28.06	0.07
160	-27.71	-27.75	0.04
180	-26.19	-26.15	0.04
200	-28.2	-28.15	0.05
250	-27.45	-27.47	0.02
300	-29.61	-29.63	0.02
400	-31.77	-31.78	0.01
500	-32.81	-32.81	0
600	-33.64	-33.61	0.03
700	-34.21	-34.21	0
800	-35.66	-35.66	0
900	-36.99	-36.91	0.08
1000	-38	-37.91	0.09

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

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

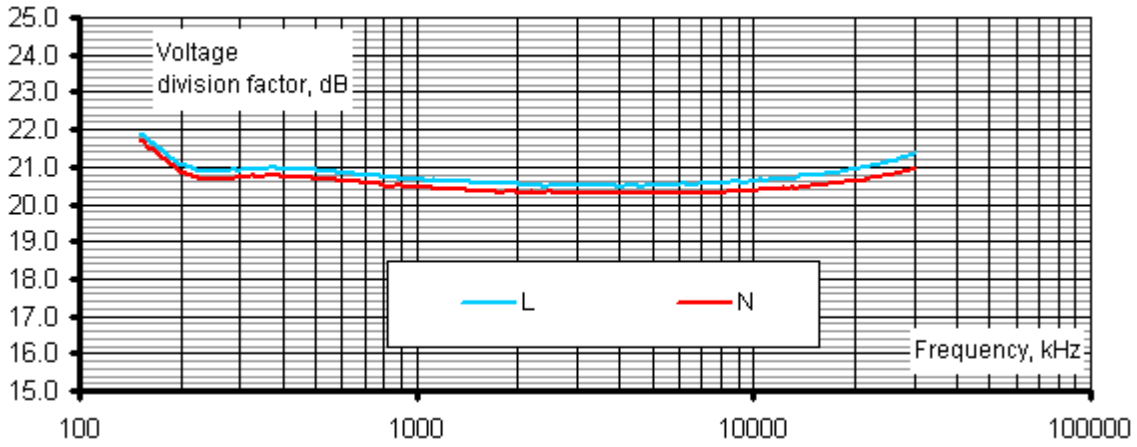
Frequency, MHz	Measured antenna factor (with preamplifier), dB/m
18000	2.5
18500	0.5
19000	-1.0
19500	-2.4
20000	-2.5
20500	-2.2
21000	-2.0
21500	-2.7
22000	-3.7
22500	-3.8
23000	-3.7
23500	-5.0
24000	-4.5
24500	-5.0
25000	-4.7
25500	-4.4
26000	-4.3
26500	-5.6
27000	-4.3
27500	-4.9
28000	-5.2
28500	-4.4

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.

Correction factor
Line impedance stabilization network
Model NNB-2/16Z, Rolf Heine, HL 2888

Frequency, kHz	Correction factor, dB	
	L	N
150	21.92	21.74
170	21.52	21.36
200	21.06	20.85
250	20.88	20.68
300	20.92	20.70
350	20.96	20.77
400	20.96	20.74
500	20.92	20.69
600	20.85	20.63
700	20.78	20.58
800	20.73	20.52
900	20.68	20.50
1000	20.67	20.45
1200	20.61	20.43
1500	20.56	20.33
2000	20.54	20.32
2500	20.51	20.33
3000	20.53	20.29
4000	20.46	20.30
5000	20.53	20.33
7000	20.54	20.32
10000	20.62	20.36
15000	20.78	20.49
20000	20.94	20.63
30000	21.37	20.95



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, 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, 5.5 m, ,
SF102EA/11SK/11SK/5500MM, S/N 503974/EA
HL 5410

Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB
100	0.70	20500	10.47
200	0.99	21000	10.62
300	1.21	21500	10.75
500	1.56	22000	10.87
1000	2.20	22500	10.98
1500	2.69	23000	11.11
2000	3.12	23500	11.24
2500	3.50	24000	11.37
3000	3.84	24500	11.52
3500	4.17	25000	11.65
4000	4.47	25500	11.74
4500	4.76	26000	11.89
5000	5.03	26500	12.04
5500	5.29	27000	12.14
6000	5.54	27500	12.27
6500	5.77	28000	12.38
7000	5.99	28500	12.48
7500	6.20	29000	12.61
8000	6.39	29500	12.73
8500	6.58	30000	12.83
9000	6.77	30500	12.92
9500	6.96	31000	13.03
10000	7.14	31500	13.18
10500	7.31	32000	13.32
11000	7.49	32500	13.45
11500	7.67	33000	13.57
12000	7.84	33500	13.68
12500	8.00	34000	13.80
13000	8.18	34500	13.91
13500	8.34	35000	14.01
14000	8.50	35500	14.15
14500	8.66	36000	14.29
15000	8.82	36500	14.39
15500	8.98	37000	14.49
16000	9.13	37500	14.63
16500	9.29	38000	14.76
17000	9.44	38500	14.87
17500	9.59	39000	14.93
18000	9.75	39500	15.03
18500	9.90	40000	15.13
19000	10.04		
19500	10.18		
20000	10.32		

Cable loss
Cable, BNC/BNC, 10.5 m MIL-C-17G
Western wire, HL 5476

Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB
0.01	0.12	270	3.07
10	0.56	280	3.13
20	0.79	290	3.19
30	0.97	300	3.26
40	1.11	310	3.32
50	1.25	320	3.40
60	1.37	330	3.46
70	1.48	340	3.52
80	1.58	350	3.58
90	1.68	360	3.62
100	1.79	370	3.70
110	1.88	380	3.75
120	1.96	390	3.82
130	2.05	400	3.87
140	2.12	410	3.93
150	2.20	420	3.98
160	2.29	430	4.06
170	2.37	440	4.11
180	2.44	450	4.18
190	2.51	460	4.22
200	2.58	470	4.27
210	2.66	480	4.35
220	2.74	490	4.39
230	2.80	500	4.45
240	2.87		
250	2.93		
260	3.01		

Cable loss
RF cable, 18 GHz, 6.0m, N-type, Huber-Suhner, S/N 511435/126EA, SF126EA/11N/11N/6000, HL 5902

Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB
0.1	0.00	4800	3.24	10000	4.82	15200	6.08
1	0.01	4900	3.30	10100	4.85	15300	6.11
10	0.07	5000	3.32	10200	4.87	15400	6.12
30	0.18	5100	3.37	10300	4.91	15500	6.14
50	0.25	5200	3.40	10400	4.93	15600	6.15
100	0.41	5300	3.42	10500	4.95	15700	6.18
200	0.56	5400	3.46	10600	4.99	15800	6.20
300	0.68	5500	3.50	10700	5.01	15900	6.23
400	0.76	5600	3.53	10800	5.03	16000	6.22
500	0.87	5700	3.56	10900	5.06	16100	6.26
600	1.03	5800	3.58	11000	5.08	16200	6.29
700	1.14	5900	3.63	11100	5.12	16300	6.30
800	1.23	6000	3.67	11200	5.13	16400	6.33
900	1.34	6100	3.69	11300	5.16	16500	6.35
1000	1.43	6200	3.73	11400	5.18	16600	6.37
1100	1.51	6300	3.76	11500	5.22	16700	6.40
1200	1.59	6400	3.80	11600	5.24	16800	6.43
1300	1.66	6500	3.81	11700	5.25	16900	6.46
1400	1.73	6600	3.83	11800	5.28	17000	6.47
1500	1.78	6700	3.87	11900	5.32	17100	6.49
1600	1.82	6800	3.91	12000	5.33	17200	6.51
1700	1.87	6900	3.91	12100	5.35	17300	6.53
1800	1.89	7000	3.93	12200	5.38	17400	6.56
1900	1.95	7100	3.95	12300	5.39	17500	6.60
2000	1.99	7200	3.98	12400	5.43	17600	6.62
2100	2.02	7300	4.02	12500	5.46	17700	6.60
2200	2.06	7400	4.04	12600	5.48	17800	6.63
2300	2.11	7500	4.07	12700	5.50	17900	6.64
2400	2.16	7600	4.11	12800	5.52	18000	6.66
2500	2.21	7700	4.15	12900	5.57		
2600	2.29	7800	4.17	13000	5.57		
2700	2.32	7900	4.20	13100	5.60		
2800	2.38	8000	4.22	13200	5.61		
2900	2.44	8100	4.26	13300	5.64		
3000	2.47	8200	4.30	13400	5.67		
3100	2.53	8300	4.32	13500	5.70		
3200	2.57	8400	4.35	13600	5.71		
3300	2.61	8500	4.39	13700	5.73		
3400	2.67	8600	4.43	13800	5.74		
3500	2.71	8700	4.45	13900	5.80		
3600	2.76	8800	4.47	14000	5.82		
3700	2.80	8900	4.49	14100	5.85		
3800	2.85	9000	4.53	14200	5.86		
3900	2.89	9100	4.55	14300	5.87		
4000	2.93	9200	4.57	14400	5.92		
4100	2.98	9300	4.61	14500	5.93		
4200	3.01	9400	4.64	14600	5.95		
4300	3.05	9500	4.68	14700	5.97		
4400	3.10	9600	4.70	14800	6.01		
4500	3.12	9700	4.73	14900	6.04		
4600	3.18	9800	4.78	15000	6.04		
4700	3.21	9900	4.80	15100	6.08		

14 APPENDIX F Abbreviations and acronyms

A	ampere
AC	alternating current
A/m	ampere per meter
AM	amplitude modulation
AVRG	average (detector)
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
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
k	kilo
kHz	kilohertz
LO	local oscillator
m	meter
MHz	megahertz
min	minute
mm	millimeter
ms	millisecond
μs	microsecond
NA	not applicable
NB	narrow band
OATS	open area test site
Ω	Ohm
PM	pulse modulation
PS	power supply
ppm	part per million (10^{-6})
QP	quasi-peak
RE	radiated emission
RF	radio frequency
rms	root mean square
Rx	receive
s	second
T	temperature
Tx	transmit
V	volt
WB	wideband

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