



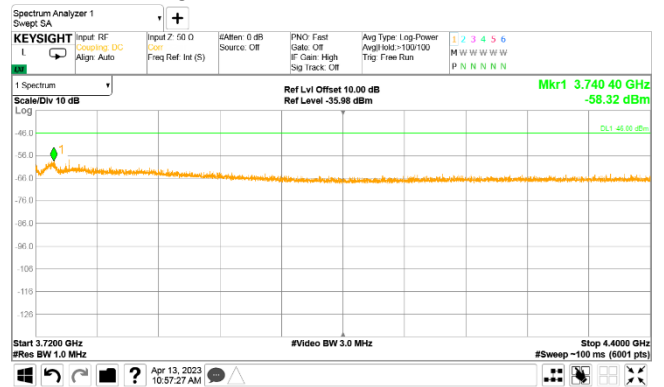
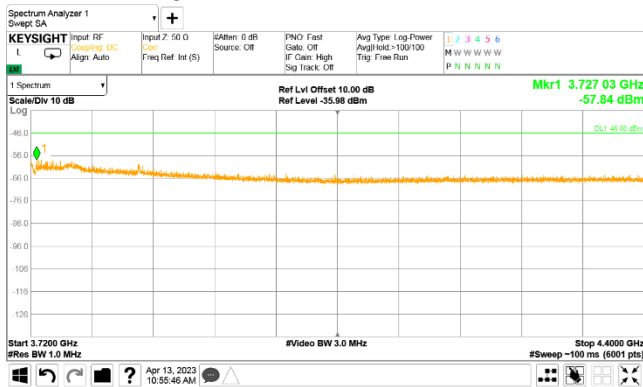
HERMON LABORATORIES

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

Plot 7.6.46 Spurious emission measurements in 3720 - 4400 MHz range at high carrier frequency

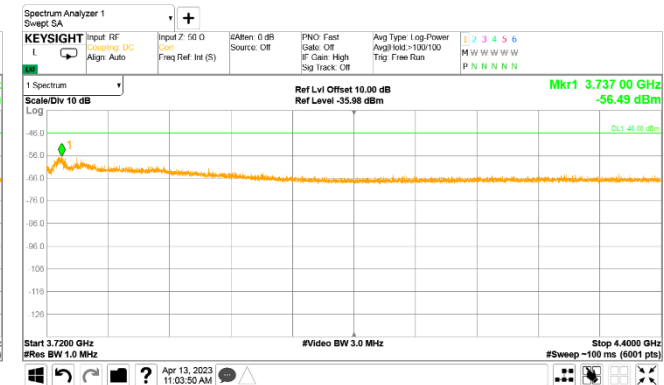
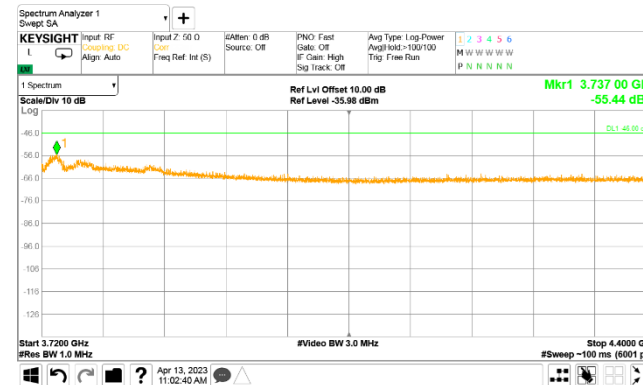
MODULATION:
CHANNEL SPACING:
ANTENNA CHAIN: #1

256QAM
20 MHz
ANTENNA CHAIN: #2



ANTENNA CHAIN: #3

ANTENNA CHAIN: #4



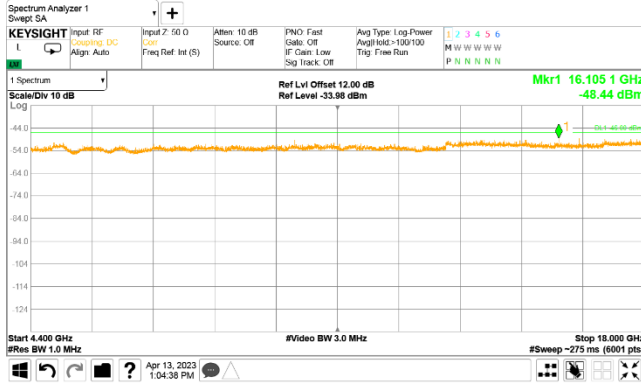


HERMON LABORATORIES

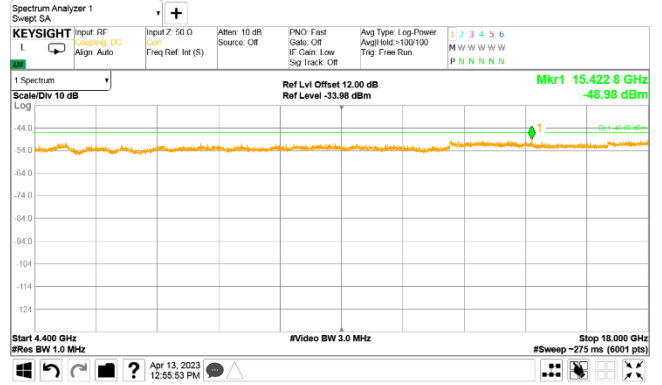
Test specification: Section 96.41(e)(3), Conducted spurious emissions			
Test procedure: Section 96.41(e)(3)			
Test mode: Compliance		Verdict: PASS	
Date(s): 29-Oct-18 - 31-Oct-18			
Temperature: 24.1 °C	Relative Humidity: 49 %	Air Pressure: 1011 hPa	Power: 48 VDC
Remarks:			

Plot 7.6.47 Spurious emission measurements in 4400 - 18000 MHz range at low carrier frequency

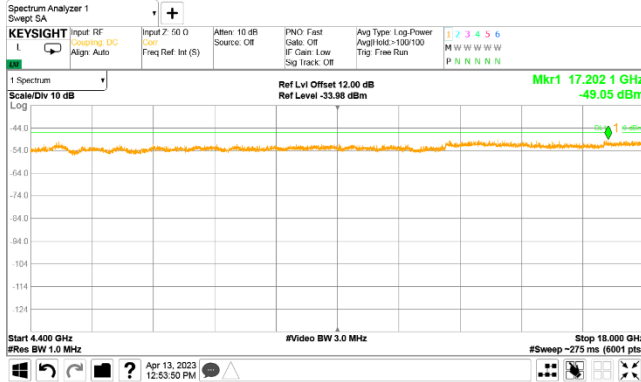
MODULATION:
CHANNEL SPACING:
ANTENNA CHAIN: #1



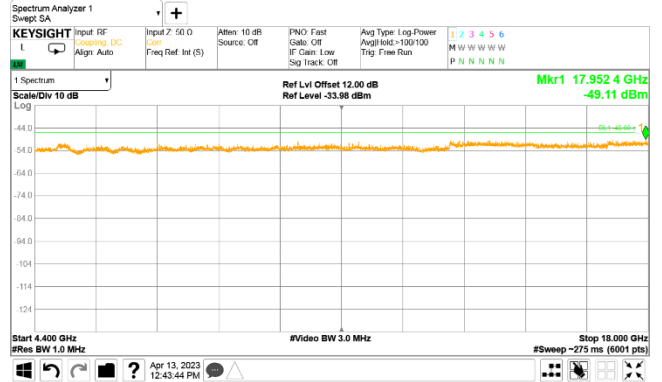
256QAM
20 MHz
ANTENNA CHAIN: #2



ANTENNA CHAIN: #3



ANTENNA CHAIN: #4



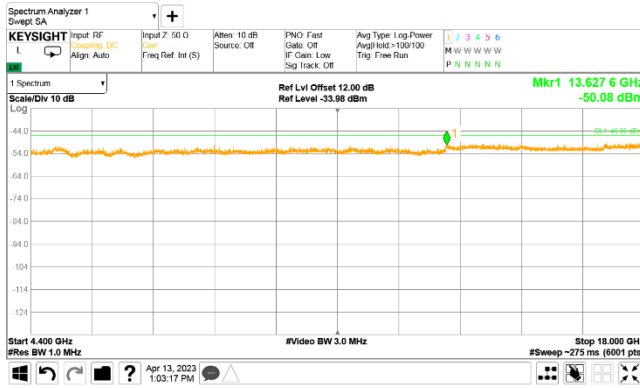


HERMON LABORATORIES

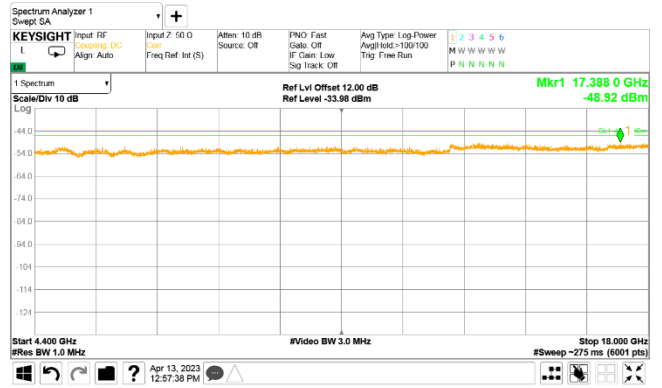
Test specification: Section 96.41(e)(3), Conducted spurious emissions			
Test procedure: Section 96.41(e)(3)			
Test mode: Compliance		Verdict: PASS	
Date(s): 29-Oct-18 - 31-Oct-18			
Temperature: 24.1 °C	Relative Humidity: 49 %	Air Pressure: 1011 hPa	Power: 48 VDC
Remarks:			

Plot 7.6.48 Spurious emission measurements in 4400 - 18000 MHz range at mid carrier frequency

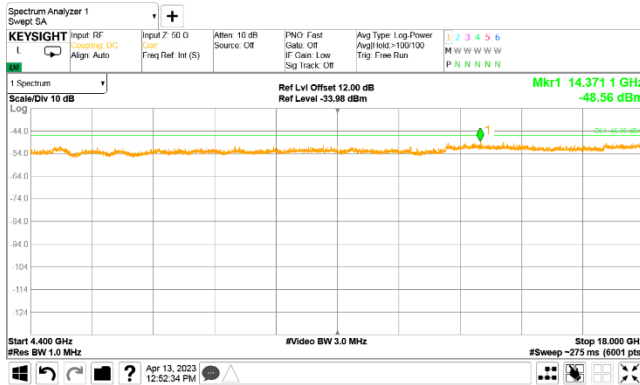
MODULATION:
CHANNEL SPACING:
ANTENNA CHAIN: #1



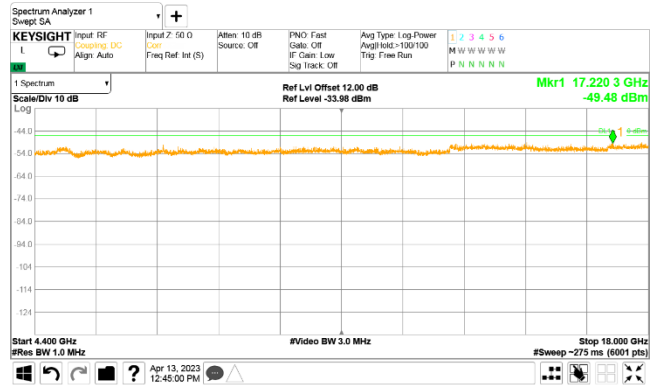
256QAM
20 MHz
ANTENNA CHAIN: #2



ANTENNA CHAIN: #3



ANTENNA CHAIN: #4



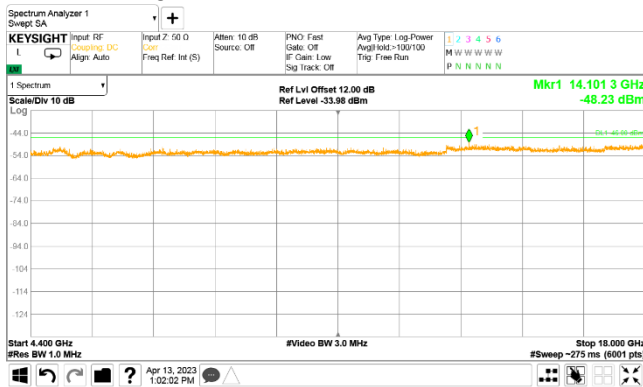


HERMON LABORATORIES

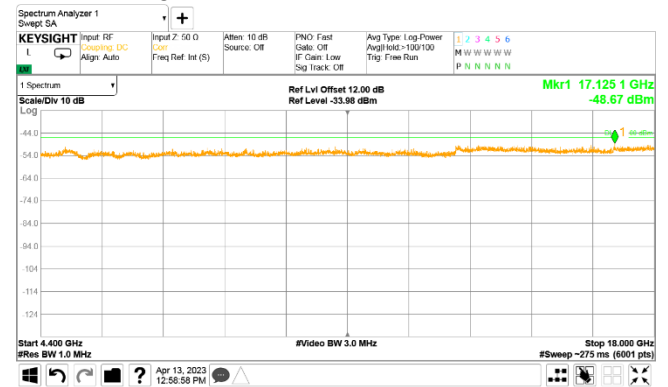
Test specification: Section 96.41(e)(3), Conducted spurious emissions			
Test procedure: Section 96.41(e)(3)			
Test mode: Compliance		Verdict: PASS	
Date(s): 29-Oct-18 - 31-Oct-18			
Temperature: 24.1 °C	Relative Humidity: 49 %	Air Pressure: 1011 hPa	Power: 48 VDC
Remarks:			

Plot 7.6.49 Spurious emission measurements in 4400 - 18000 MHz range at high carrier frequency

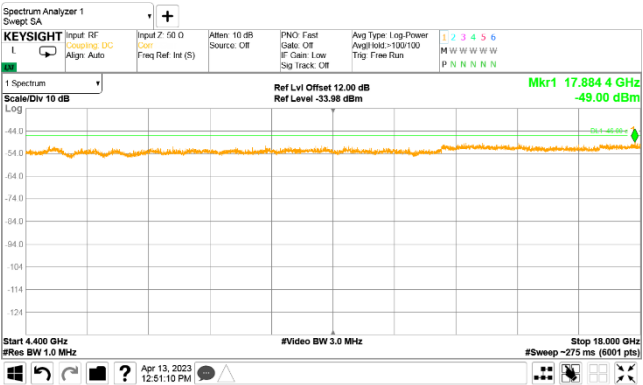
MODULATION:
CHANNEL SPACING:
ANTENNA CHAIN: #1



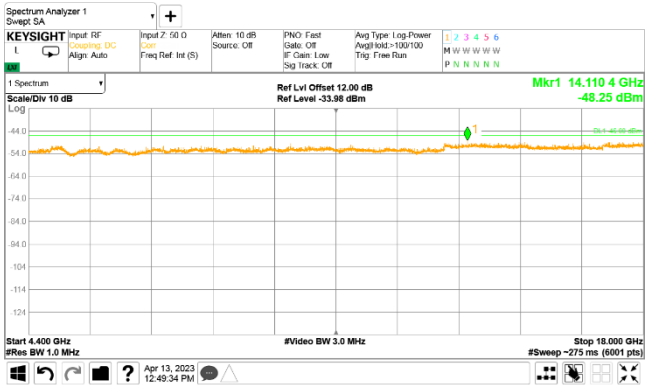
256QAM
20 MHz
ANTENNA CHAIN: #2



ANTENNA CHAIN: #3



ANTENNA CHAIN: #4



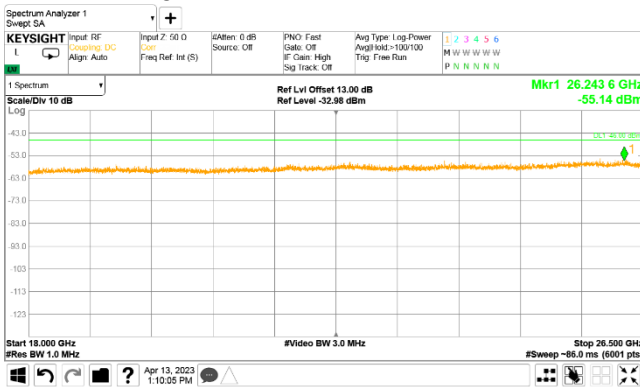


HERMON LABORATORIES

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

Plot 7.6.50 Spurious emission measurements in 18000 - 26500 MHz range at low carrier frequency

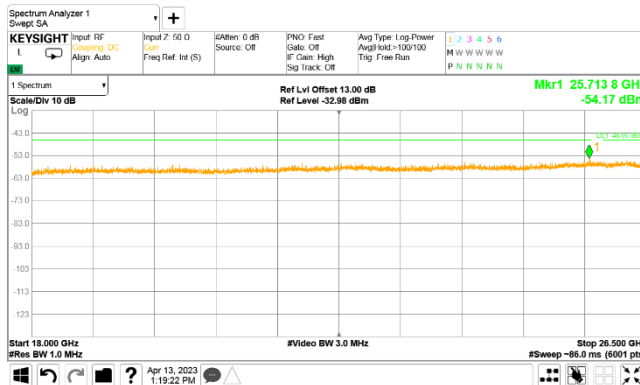
MODULATION:
CHANNEL SPACING:
ANTENNA CHAIN: #1



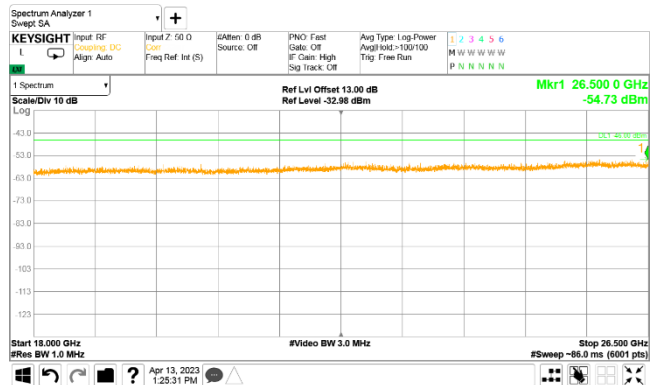
256QAM
20 MHz
ANTENNA CHAIN: #2



ANTENNA CHAIN: #3



ANTENNA CHAIN: #4



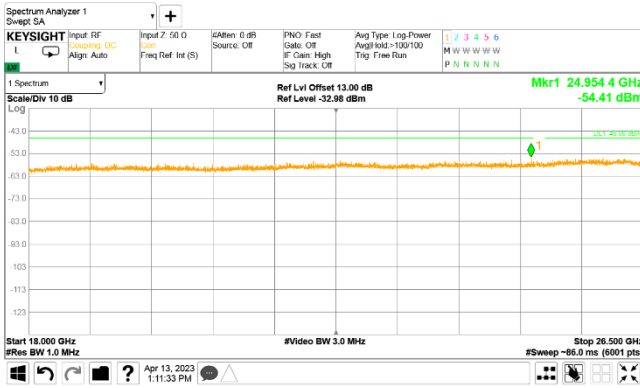


HERMON LABORATORIES

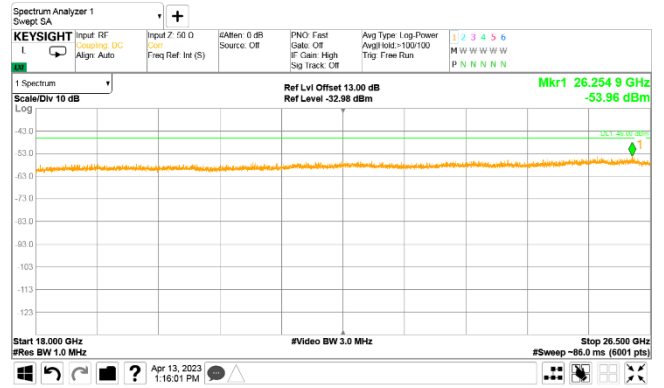
Test specification: Section 96.41(e)(3), Conducted spurious emissions			
Test procedure: Section 96.41(e)(3)			
Test mode: Compliance		Verdict: PASS	
Date(s): 29-Oct-18 - 31-Oct-18			
Temperature: 24.1 °C	Relative Humidity: 49 %	Air Pressure: 1011 hPa	Power: 48 VDC
Remarks:			

Plot 7.6.51 Spurious emission measurements in 18000 - 26500 MHz range at mid carrier frequency

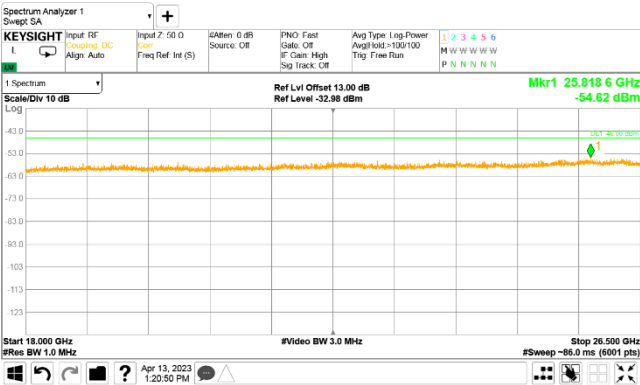
MODULATION:
CHANNEL SPACING:
ANTENNA CHAIN: #1



256QAM
20 MHz
ANTENNA CHAIN: #2



ANTENNA CHAIN: #3



ANTENNA CHAIN: #4



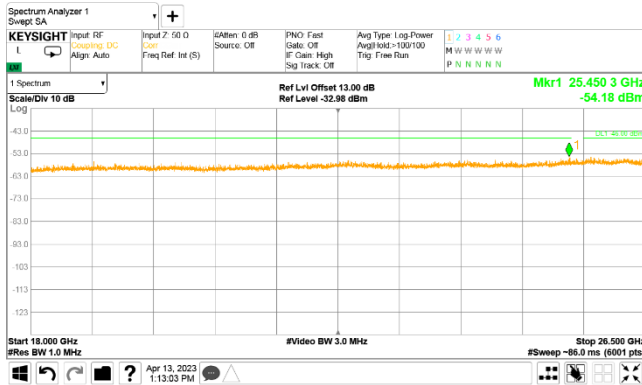


HERMON LABORATORIES

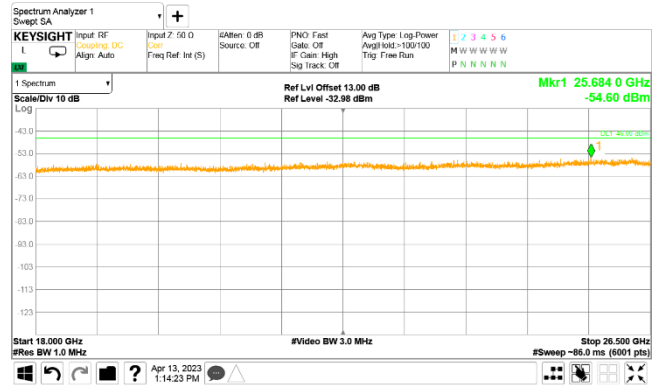
Test specification: Section 96.41(e)(3), Conducted spurious emissions			
Test procedure: Section 96.41(e)(3)			
Test mode: Compliance		Verdict:	PASS
Date(s): 29-Oct-18 - 31-Oct-18			
Temperature: 24.1 °C	Relative Humidity: 49 %	Air Pressure: 1011 hPa	Power: 48 VDC
Remarks:			

Plot 7.6.52 Spurious emission measurements in 18000 - 26500 MHz range at high carrier frequency

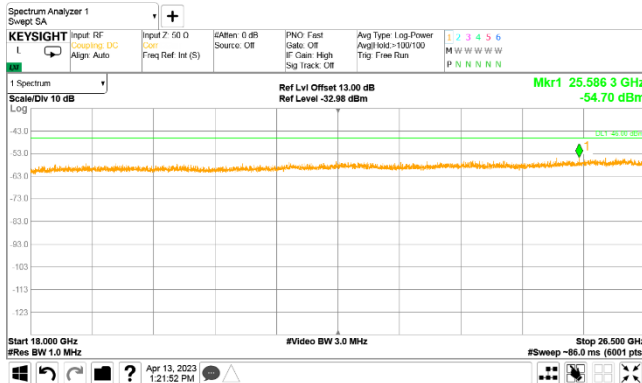
MODULATION:
CHANNEL SPACING:
ANTENNA CHAIN: #1



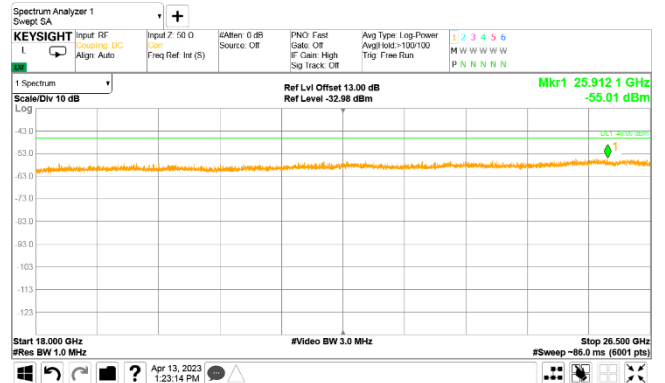
256QAM
20 MHz
ANTENNA CHAIN: #2



ANTENNA CHAIN: #3



ANTENNA CHAIN: #4

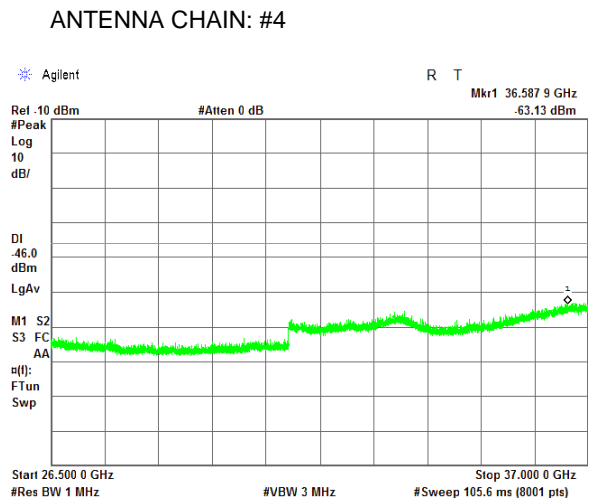
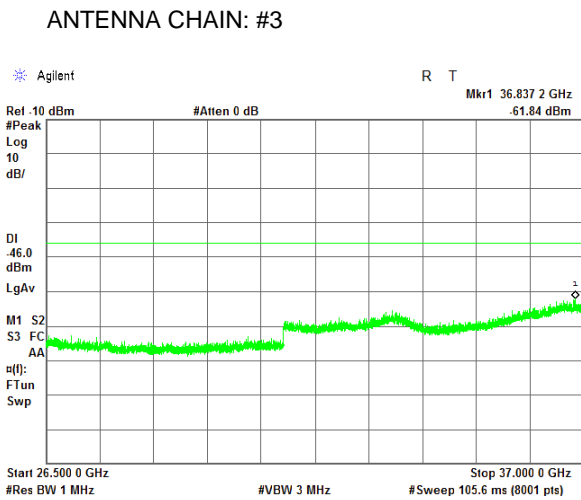
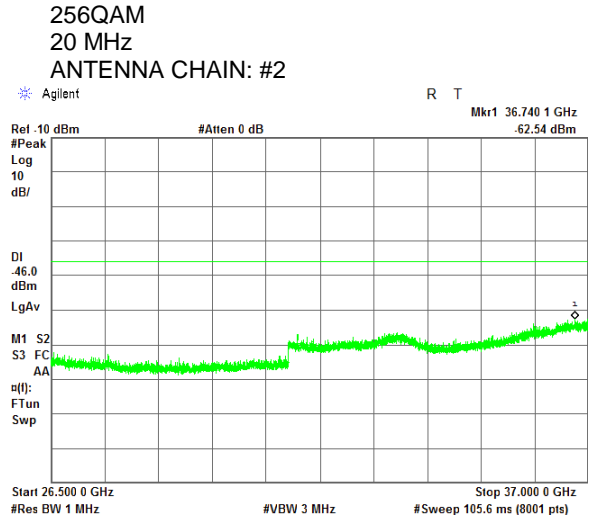
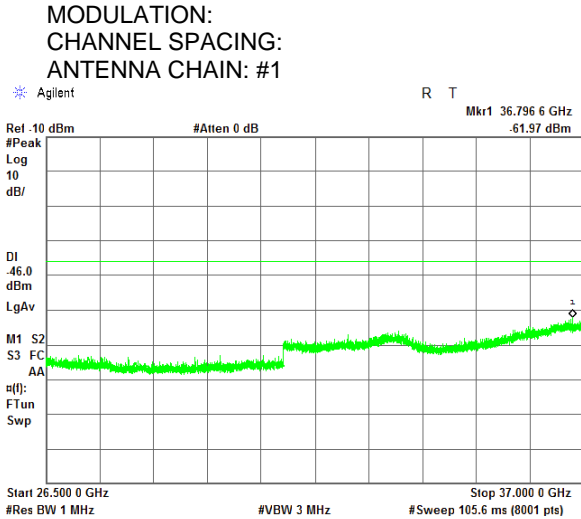




HERMON LABORATORIES

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

Plot 7.6.53 Spurious emission measurements in 26500 - 37000 MHz range at low carrier frequency





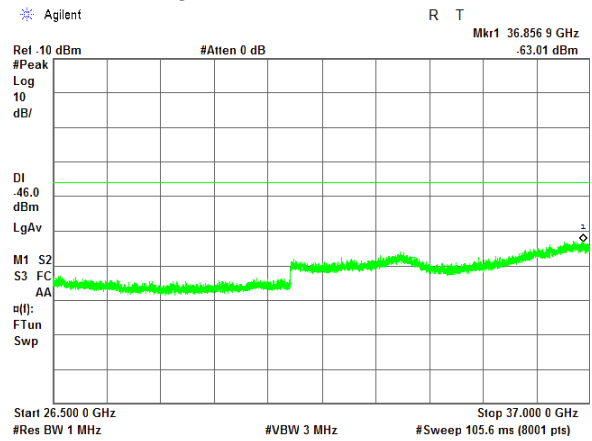
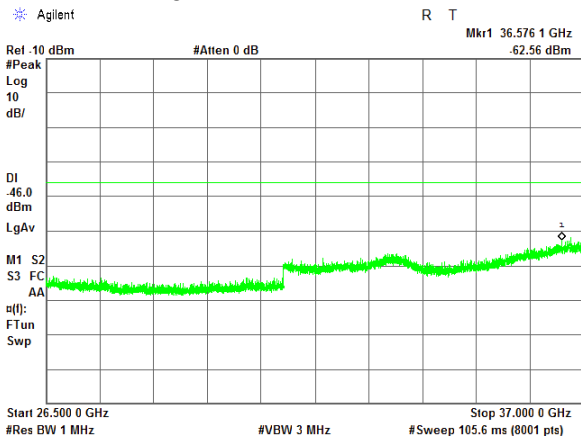
HERMON LABORATORIES

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

Plot 7.6.54 Spurious emission measurements in 26500 - 37000 MHz range at mid carrier frequency

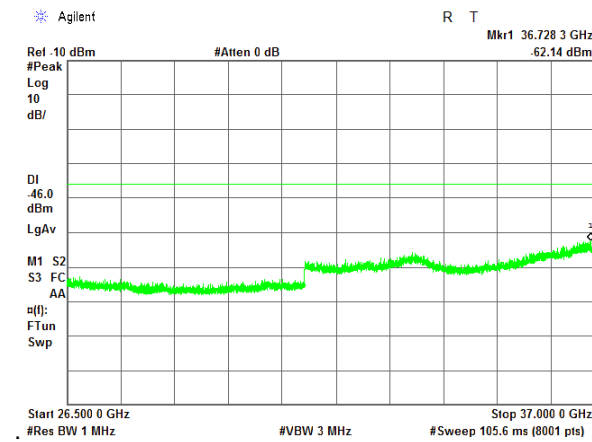
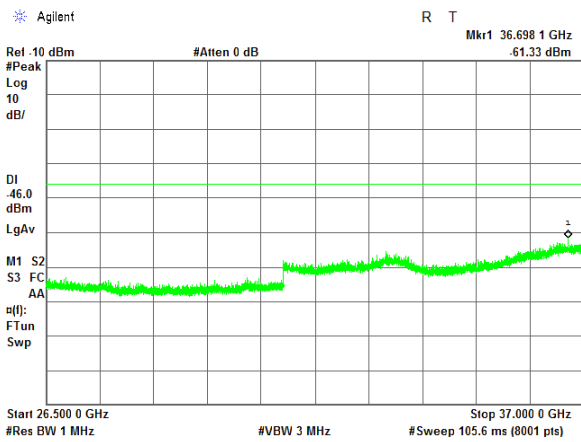
MODULATION:
CHANNEL SPACING:
ANTENNA CHAIN: #1

256QAM
20 MHz
ANTENNA CHAIN: #2



ANTENNA CHAIN: #3

ANTENNA CHAIN: #4



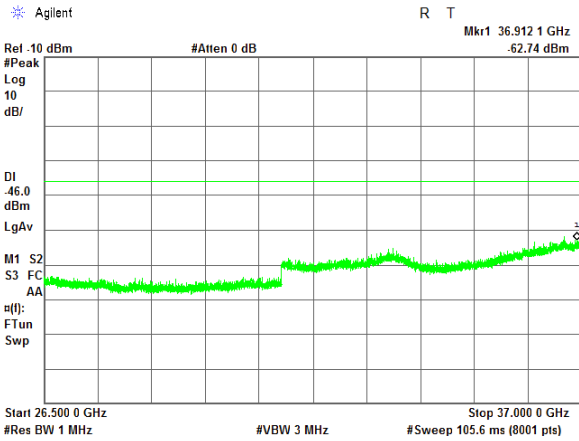


HERMON LABORATORIES

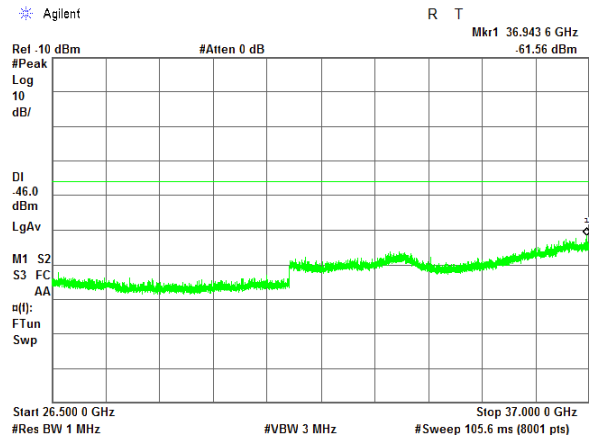
Test specification: Section 96.41(e)(3), Conducted spurious emissions			
Test procedure: Section 96.41(e)(3)			
Test mode: Compliance		Verdict: PASS	
Date(s): 29-Oct-18 - 31-Oct-18			
Temperature: 24.1 °C	Relative Humidity: 49 %	Air Pressure: 1011 hPa	Power: 48 VDC
Remarks:			

Plot 7.6.55 Spurious emission measurements in 26500 - 37000 MHz range at high carrier frequency

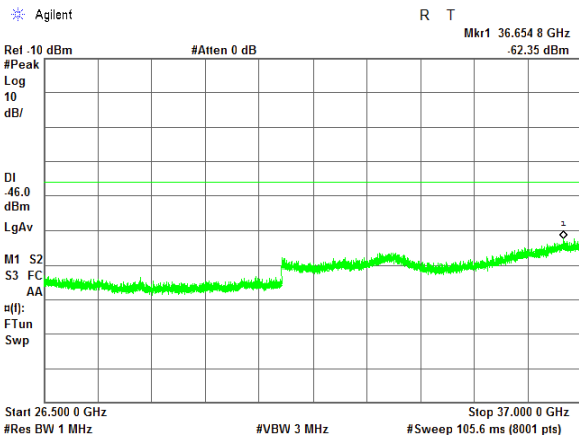
MODULATION:
CHANNEL SPACING:
ANTENNA CHAIN: #1



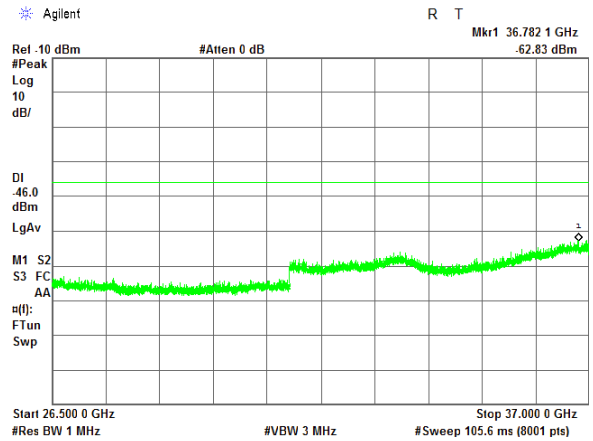
256QAM
20 MHz
ANTENNA CHAIN: #2



ANTENNA CHAIN: #3



ANTENNA CHAIN: #4





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

7.7 Frequency stability test

7.7.1 General

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

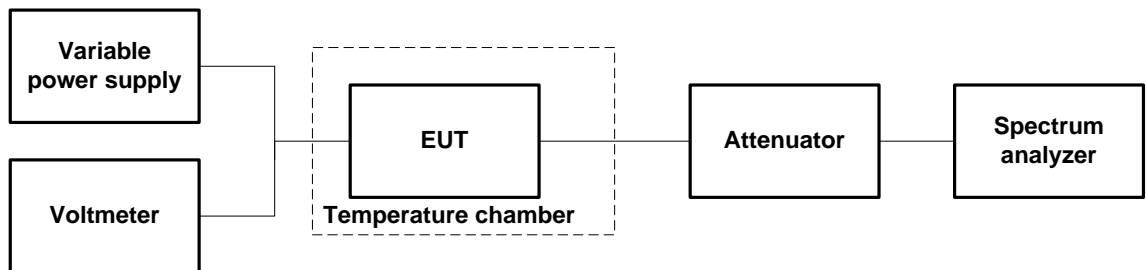
Table 7.7.1 Frequency stability limits

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

7.7.2 Test procedure

- 7.7.2.1 The EUT was set up as shown in Figure 7.7.1, energized and its proper operation was checked.
- 7.7.2.2 The EUT power was turned off. Temperature within test chamber was set to +30°C and a period of time sufficient to stabilize all of the oscillator circuit components was allowed.
- 7.7.2.3 The EUT was powered on and carrier frequency was measured at start up moment and then every minute until frequency had been stabilized or 10 minutes elapsed whichever reached the last. The EUT was powered off.
- 7.7.2.4 The above procedure was repeated at 0°C and at the lowest test temperature.
- 7.7.2.5 The EUT was powered on and carrier frequency was measured at start up moment and at the end of stabilization period at the rest of test temperatures and voltages. The EUT was powered off.
- 7.7.2.6 Frequency displacement was calculated and compared with the limit as provided in Table 7.7.2.

Figure 7.7.1 Frequency stability test setup





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

Table 7.7.2 Frequency stability test results

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

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

* - Reference frequency

Reference numbers of test equipment used

HL 0493	HL 2171	HL 3901	HL 4164	HL 4355		
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Full description is given in Appendix A.

**8 APPENDIX A Test equipment and ancillaries used for tests**

HL No	Description	Manufacturer	Model	Ser. No.	Last Cal./ Check	Due Cal./ Check
0030	Antenna, Dipole, Tunable, 30 - 200 MHz	Electro-Metrics	TDA-25/30	261	08-Feb-18	08-Feb-19
0446	Antenna, Loop, Active, 10 kHz - 30 MHz	EMCO	6502	2857	11-Feb-18	11-Feb-19
0446	Antenna, Loop, Active, 10 (9) kHz - 30 MHz	EMCO	6502	2857	07-Mar-23	07-Apr-24
0493	Temperature Chamber -45...175 deg C	Thermotron	S-1.2 Mini-Max	14016	11-Jun-18	11-Jun-19
0614	Antenna, Dipole, Tunable, 200 - 500 MHz	Electro-Metrics	TDS-30-1	334	08-Feb-18	08-Feb-19
0661	Generator Swept Signal, 10 MHz to 40 GHz, + 10 dBm	Hewlett Packard	83640B	3614A00266	11-Jul-18	11-Jul-19
2016	Attenuator, Manual Step, 0-9/1 dB, 0-8 GHz, 2 W	Midwest Microwave	1072	1315	27-Mar-23	27-Mar-24
2171	Multimeter	Fluke	177	79960418	19-Jul-17	19-Jul-19
3301	Power Meter, P-series, 50 MHz to 40 GHz	Agilent Technologies	N1911A	MY45101057	02-May-18	02-May-19
3301	Power Meter, P-series, 50 MHz to 40 GHz	Agilent Technologies	N1911A	MY45101057	08-Jun-22	08-Jul-23
3302	Power sensor, P-Series, 50 MHz to 40 GHz, -35/30 to 20 dBm	Agilent Technologies	N1922A	MY45240586	02-May-18	02-May-19
3302	Power sensor, P-Series, 50 MHz to 40 GHz, -35/30 to 20 dBm	Agilent Technologies	N1922A	MY45240586	08-Jun-22	08-Jul-23
3433	Test Cable , DC-18 GHz, 1.5 m, SMA - SMA	Mini-Circuits	CBL-5FT-SMSM+	25679	25-Apr-22	25-Apr-23
3787	Precision Fixed Attenuator, 50 Ohm, 5 W, 10 dB, DC to 18 GHz	Mini-Circuits	BW-S10W5+	NA	10-Dec-18	10-Dec-19
3818	PSA Series Spectrum Analyzer, 3 Hz- 44 GHz	Agilent Technologies	E4446A	MY48250288	28-May-18	28-May-19
3868	Directional coupler, 2 GHz to 8 GHz, 10 dB, SMA Female	Narda	4203-10	06978	21-May-18	21-May-20
3901	Microwave Cable Assembly, 40.0 GHz, 3.5 m, SMA/SMA	Huber-Suhner	SUCOFL EX 102A	1225/2A	07-Feb-18	07-Feb-19
3903	Microwave Cable Assembly, 40.0 GHz, 1.5 m, SMA/SMA	Huber-Suhner	SUCOFL EX 102A	1226/2A	07-Feb-18	07-Feb-19
3903	Microwave Cable Assembly, 40.0 GHz, 1.5 m, SMA/SMA	Huber-Suhner	SUCOFL EX 102A	1226/2A	07-Apr-22	07-Apr-23
4164	DC Power Supply, 60V, 5A	Standig	605D	NA	05-Nov-18	05-Nov-19
4278	Test Cable , DC-18 GHz, 4.6 m, N/M - N/M	Mini-Circuits	APC-15FT-NMNM+	0755A	01-Aug-18	01-Aug-19
4355	Signal and Spectrum Analyzer, 9 kHz to 7 GHz	Rohde & Schwarz	FSV 7	101630	28-Jun-18	28-Sep-19
4360	EMI Test Receiver, 20 Hz to 40 GHz.	Rohde & Schwarz	ESU40	100322	26-Dec-17	26-Dec-18
4366	Directional coupler, 1 GHz to 18 GHz, 10 dB, SMA Female	Tiger Micro-Electronics Institute	TGD-A1101-10	01e-JSDE805-007	29-May-22	29-May-24
4771	Tape-measure, 5m/16FT	FISCO	Tri-Matic	NA	03-Oct-18	03-Oct-19
4933	Active Horn Antenna, 1 GHz to 18 GHz	Com-Power Corporation	AHA-118	701046	04-Jan-18	04-Jan-19



HL No	Description	Manufacturer	Model	Ser. No.	Last Cal./ Check	Due Cal./ Check
4933	Active Horn Antenna, 1 GHz to 18 GHz	COM-POWER CORPORATION	AHA-118	701046	19-Jan-23	19-Jan-24
4956	Active horn antenna, 18 to 40 GHz	Com-Power Corporation	AHA-840	105004	11-Jan-18	11-Jan-19
4956	Active horn antenna, 18 to 40 GHz	COM-POWER CORPORATION	AHA-840	105004	08-Mar-23	08-Mar-24
5084	Attenuator, 4 dB, DC - 6 GHz, 1 W	Mini-Circuits	UNAT-4+	NA	15-May-22	15-May-24
5085	Attenuator, 4 dB, DC - 6 GHz, 1 W	Mini-Circuits	UNAT-4+	NA	24-Mar-22	24-Mar-25
5111	RF cable, 40 GHz, 5.5 m, K-type	Huber-Suhner	SF102EA/11SK/11SK/5500MM	502493/2EA	09-Apr-18	09-Apr-19
5288	Trilog Antenna, 25 MHz - 8 GHz, 100W	Frankonia	ALX-8000E	00809	21-Jan-18	21-Jan-19
5288	Trilog Antenna, 25 MHz - 8 GHz, 100W	Frankonia	ALX-8000E	00809	24-Mar-22	24-Mar-25
5405	RF cable, 18 GHz, N-N, 6 m	Huber-Suhner	SF118/11N(x2)	500023/118	01-Aug-18	01-Aug-19
5594	Precision Fixed Attenuator, 50 Ohm, 5 W, 10 dB, DC to 18000 MHz	Mini Circuits	BW-N10W5+	NA	08-Mar-23	08-Mar-24
5606	Precision Fixed Attenuator, 50 Ohm, 5 W, 10 dB, DC to 18000 MHz	Mini Circuits	BW-N10W5+	NA	08-Mar-23	08-Mar-24
5637	Cable, 50 Ohm, DC to 18 GHz, 1.8 m, SMA/SMA	Mini Circuits	CBL-6FT-SMSM+	NA	21-Jul-22	21-Jul-23
5642	Cable, 50 Ohm, DC to 18 GHz, 1.8 m, SMA/SMA	Mini Circuits	CBL-6FT-SMSM+	NA	21-Jul-22	21-Jul-23
5902	RF cable, 18 GHz, 6.0m, N-type	Huber-Suhner	SF126EA/11N/11N/6000	NA	08-Dec-22	08-Dec-23
7585	EMI Test Receiver, 1 Hz to 44 GHz	Rohde & Schwarz	ESW44	103130	19-May-22	19-Jun-23
7683	Precision Fixed Attenuator, 50 Ohm, 5 W, 10 dB, DC to 18000 MHz-Copy	Mini Circuits	BW-N10W5+		23-Aug-22	23-Aug-23

**9 APPENDIX B Measurement uncertainties****Expanded uncertainty at 95% confidence in Hermon Labs EMC measurements**

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

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

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

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



10 APPENDIX C Test facility description

T Tests were performed at Hermon Laboratories Ltd., which is a fully independent, private, EMC, Radio, Safety, Environmental and Telecommunication testing facility.

Hermon Laboratories is recognized and accredited by the Federal Communications Commission (USA) for 1, 2, 15, 18 parts of Code of Federal Regulations 47 (CFR 47), Test Firm Registration Number is 927748, Designation Number is IL1001; registered by Industry Canada for electromagnetic emissions, file number IC 2186A-1 for OATS, certified by VCCI, Japan (the registration numbers are R-10808 for OATS, R-1082 for anechoic chamber, G-10869 for RE measurements above 1 GHz, C-10845 for conducted emissions site and T-11606 for conducted emissions at telecommunication ports).

The laboratory is accredited by American Association for Laboratory Accreditation (USA) according to ISO/IEC 17025 for electromagnetic compatibility, product safety, telecommunications testing, environmental simulation and calibration (for exact scope please refer to Certificate No. 839.01, 839.03 and 839.04).

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Telephone: +972 4628 8001
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e-mail: mail@hermonlabs.com
website: www.hermonlabs.com

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

11 APPENDIX D Specification references

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



12 APPENDIX E Test equipment correction factors

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

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

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



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

Frequency, MHz	Antenna factor, dB/m
30	14.96
35	15.33
40	16.37
45	17.56
50	17.95
60	16.87
70	13.22
80	10.56
90	13.61
100	15.46
120	14.03
140	12.23
160	12.67
180	13.34
200	15.40
250	16.42
300	17.28
400	19.98
500	21.11
600	22.90
700	24.13
800	25.25
900	26.35
1000	27.18

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



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

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

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

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



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

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

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

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



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

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



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

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



Cable loss
Test cable, Mini-Circuits, S/N 0755A, 18 GHz, 4.6 m, N/M - N/M
APC-15FT-NMNM+, HL 4278

Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB
10	0.24	4900	4.19	10000	6.47	15100	8.33
30	0.26	5000	4.25	10100	6.50	15200	8.35
50	0.34	5100	4.29	10200	6.52	15300	8.37
100	0.50	5200	4.32	10300	6.57	15400	8.40
200	0.72	5300	4.38	10400	6.59	15500	8.42
300	0.90	5400	4.41	10500	6.61	15600	8.46
400	1.06	5500	4.46	10600	6.64	15700	8.50
500	1.20	5600	4.51	10700	6.64	15800	8.52
600	1.32	5700	4.56	10800	6.65	15900	8.56
700	1.44	5800	4.59	10900	6.68	16000	8.61
800	1.54	5900	4.64	11000	6.68	16100	8.64
900	1.64	6000	4.69	11100	6.69	16200	8.66
1000	1.74	6100	4.72	11200	6.70	16300	8.70
1100	1.83	6200	4.77	11300	6.74	16400	8.73
1200	1.92	6300	4.80	11400	6.78	16500	8.74
1300	2.01	6400	4.83	11500	6.81	16600	8.75
1400	2.09	6500	4.89	11600	6.84	16700	8.78
1500	2.18	6600	4.90	11700	6.87	16800	8.79
1600	2.25	6700	4.95	11800	6.92	16900	8.81
1700	2.33	6800	5.01	11900	6.98	17000	8.85
1800	2.39	6900	4.99	12000	7.02	17100	8.90
1900	2.47	7000	5.04	12100	7.08	17200	8.95
2000	2.53	7100	5.11	12200	7.15	17300	8.99
2100	2.60	7200	5.14	12300	7.20	17400	9.03
2200	2.67	7300	5.21	12400	7.26	17500	9.07
2300	2.73	7400	5.29	12500	7.31	17600	9.11
2400	2.80	7500	5.33	12600	7.36	17700	9.15
2500	2.87	7600	5.38	12700	7.41	17800	9.19
2600	2.93	7700	5.46	12800	7.46	17900	9.24
2700	3.00	7800	5.52	12900	7.51	18000	9.28
2800	3.06	7900	5.58	13000	7.55		
2900	3.12	8000	5.64	13100	7.59		
3000	3.18	8100	5.69	13200	7.65		
3100	3.24	8200	5.75	13300	7.69		
3200	3.30	8300	5.80	13400	7.72		
3300	3.35	8400	5.84	13500	7.78		
3400	3.42	8500	5.90	13600	7.82		
3500	3.46	8600	5.97	13700	7.86		
3600	3.52	8700	5.99	13800	7.91		
3700	3.57	8800	6.04	13900	7.96		
3800	3.61	8900	6.10	14000	8.01		
3900	3.67	9000	6.13	14100	8.06		
4000	3.71	9100	6.17	14200	8.10		
4100	3.77	9200	6.23	14300	8.13		
4200	3.83	9300	6.27	14400	8.16		
4300	3.89	9400	6.30	14500	8.19		
4400	3.94	9500	6.35	14600	8.21		
4500	4.00	9600	6.37	14700	8.23		
4600	4.05	9700	6.40	14800	8.26		
4700	4.10	9800	6.44	14900	8.28		
4800	4.16	9900	6.45	15000	8.30		



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, 18 GHz, 6 m,
SF118/11N(x2), S/N 500023/118
HL 5405

5405



Specific Test Report

Frequency Range [GHz]	IL min S21 [dB]	IL min S12 [dB]	RL max S11 [dB]	RL max S22 [dB]
0.040 - 1.836	-1.431	-1.431	-37.037	-37.704
1.836 - 3.632	-2.062	-2.066	-33.573	-32.848
3.632 - 5.428	-2.576	-2.576	-28.548	-29.602
5.428 - 7.224	-3.013	-3.014	-30.738	-32.523
7.224 - 9.020	-3.415	-3.416	-33.728	-32.257
9.020 - 10.816	-3.772	-3.772	-29.302	-30.735
10.816 - 12.612	-4.138	-4.138	-28.768	-26.255
12.612 - 14.408	-4.456	-4.462	-27.109	-26.151
14.408 - 16.204	-4.786	-4.786	-26.056	-27.116
16.204 - 18.000	-5.113	-5.111	-27.762	-28.508

Type: SF118/11N/11N/6000MM
Sales no.: 10497130
Serial no.: 500023 /118
PA no.: 1956306
Ring no.:
Cable length: 6 m
Test length:
Connector 1: SF_11_N-656
Connector 2: SF_11_N-656
Cable: SUCOFLEX_118
Meas. System: N5230C,MY49001834,A.09.42.22
Time: 7:04:21 AM
Date: 6/6/2018
Inspected by: AZ /111
Start Freq.: 0.04000 GHz
Stop Freq.: 18.00000 GHz
Meas Points: 801
Source Power: -5 dBm



13 APPENDIX F Abbreviations and acronyms

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



14 APPENDIX G Manufacturer's declaration of Identity



We, the undersigned,

Company: Airspan Networks Inc.
Address: Bareket Bldg., 2 Negev St. Airport City, Ben Gurison
Country: Israel
Telephone number: +972- (0)3-9777483
Fax number: +972- (0)3-9777400

Declare under our sole responsibility that the following equipment:

Brand/Item	Type/Model	Short Product description
Airspan Outdoor LTE Category B Base Station	AirSpeed 1000 3.55-3.7GHz (B48) FCC ID: PIDAS1000	LTE Base station

Is internally, electrically and mechanically identical to the following equipment (including Software/Hardware version(s):

Brand/Item	Type/Model	Short Product description
Airspan Outdoor LTE Category A Base Station	AirSpeed 1000 3.55-3.7GHz (B48) FCC ID: PIDAS1000A	LTE Base station

The only differences are adding 256QAM modulation and antenna gain changed from 20.5dBi to 9dBi for PIDAS1000A.

08.05.2023

Zion Levi

Compliances Team Leader

Airspan Networks Inc.
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(company stamp)

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