



HERMON LABORATORIES

Test specification: Section 2.1055, Frequency stability			
Test procedure: 47 CFR, Section 2.1055			
Test mode: Compliance		Verdict: PASS	
Date(s): 15-Feb-22			
Temperature: 24.2 °C	Relative Humidity: 48 %	Air Pressure: 1011 hPa	Power: 48 VAC
Remarks:			

Table 7.7.2 Frequency stability test results

OPERATING FREQUENCY: 3550 – 3700 MHz
 NOMINAL POWER VOLTAGE: 63 VDC
 TEMPERATURE STABILIZATION PERIOD: 20 min
 POWER DURING TEMPERATURE TRANSITION: Off
 SPECTRUM ANALYZER MODE: Counter
 RESOLUTION BANDWIDTH: 100 Hz
 VIDEO BANDWIDTH: 1 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	3.554999779	3.554999779	3.554999779	3.554999779	3.554999779	3.554999778	3.554999779	3.55499978	0	0	Comply
-20	nominal	3.554999779	NA	NA	NA	NA	NA	NA	3.554999778	0	0	Comply
-10	nominal	3.554999779	NA	NA	NA	NA	NA	NA	3.554999778	0	0	Comply
0	nominal	3.554999779	3.554999779	3.554999779	3.554999779	3.554999778	3.554999779	3.554999779	3.55499978	0	0	Comply
10	nominal	3.554999776	NA	NA	NA	NA	NA	NA	3.554999776	0	0	Comply
20	15%	3.554999775	NA	NA	NA	NA	NA	NA	3.554999774	0	0	Comply
20	nominal	3.554999774	NA	NA	NA	NA	NA	NA	3.554999775	0	0	Comply
20	-15%	3.554999775	NA	NA	NA	NA	NA	NA	3.554999775	0	0	Comply
30	nominal	3.554999775	3.554999776	3.554999775	3.554999776	3.554999776	3.554999775	3.554999775	3.554999775	0	0	Comply
40	nominal	3.554999775	NA	NA	NA	NA	NA	NA	3.554999774	0	0	Comply
50	nominal	3.554999774	NA	NA	NA	NA	NA	NA	3.554999774	0	0	Comply
Mid frequency 3625.0 MHz												
-30	nominal	3.624999725	3.624999764	3.624999764	3.624999765	3.624999764	3.624999976	3.624999976	3.624999764	0	0	Comply
-20	nominal	3.624999725	NA	NA	NA	NA	NA	NA	3.624999763	0	0	Comply
-10	nominal	3.62499974	NA	NA	NA	NA	NA	NA	3.624999763	0	0	Comply
0	nominal	3.624999764	3.624999764	3.624999764	3.624999764	3.624999764	3.624999976	3.624999976	3.624999734	0	0	Comply
10	nominal	3.624999761	NA	NA	NA	NA	NA	NA	3.624999764	0	0	Comply
20	15%	3.624999725	NA	NA	NA	NA	NA	NA	3.624999976	0	0	Comply
20	nominal	3.62499973	NA	NA	NA	NA	NA	NA	3.624999976	0	0	Comply
20	-15%	3.62499976	NA	NA	NA	NA	NA	NA	3.62499976	0	0	Comply
30	nominal	3.624999726	3.624999726	3.624999726	3.624999726	3.624999759	3.62499976	3.624999759	3.624999759	0	0	Comply
40	nominal	3.624999759	NA	NA	NA	NA	NA	NA	3.62499976	0	0	Comply
50	nominal	3.624999759	NA	NA	NA	NA	NA	NA	3.624999725	0	0	Comply
High frequency 3695.0 MHz												
-30	nominal	3.694999769	3.694999768	3.694999763	3.694999764	3.694999765	3.694999766	3.694999763	3.694999763	0	0	Comply
-20	nominal	3.694999762	NA	NA	NA	NA	NA	NA	3.694999762	0	0	Comply
-10	nominal	3.694999763	NA	NA	NA	NA	NA	NA	3.694999763	0	0	Comply
0	nominal	3.694999763	3.694999763	3.694999763	3.694999763	3.694999763	3.694999763	3.694999763	3.694999764	0	0	Comply
10	nominal	3.69499976	NA	NA	NA	NA	NA	NA	3.694999759	0	0	Comply
20	15%	3.694999758	NA	NA	NA	NA	NA	NA	3.694999759	0	0	Comply
20	nominal	3.69499976	NA	NA	NA	NA	NA	NA	3.69499976	0	0	Comply
20	-15%	3.69499976	NA	NA	NA	NA	NA	NA	3.69499976	0	0	Comply
30	nominal	3.69499976	3.694999758	3.694999758	3.694999758	3.694999758	3.694999759	3.694999759	3.694999759	0	0	Comply
40	nominal	3.69499976	NA	NA	NA	NA	NA	NA	3.69499976	0	0	Comply
50	nominal	3.694999759	NA	NA	NA	NA	NA	NA	3.694999756	0	0	Comply

* - Reference frequency

Reference numbers of test equipment used

HL 3286	HL 4355	HL 3286	HL 2358	HL 3521					
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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
1294	Adapter 35WR42Kf, 18 - 26.5 GHz	Getronics	35WR42KF	1294	09-Nov-21	09-Nov-23
1295	Adapter 35WR28Kf, 26.5-40 GHz	Wiltron	35WR28KF	1295	14-Sep-20	14-Sep-23
2358	Power Supply, 2 X 0-36VDC / 5A, 5VDC / 5A	Horizon Electronics	DHR3655D	767469	30-May-21	30-May-22
3251	Multimeter	Fluke	115	94771103	06-Jul-21	06-Jul-22
3286	Temperature Chamber, (-50 to +170) °C	Thermotron	EL-8-CH-1-1-CO2	21-9048	12-Dec-21	12-Dec-22
3287	Low pass filter, DC-3.0 GHz	Unknown	NA	3287	15-Jun-21	15-Jun-23
3301	Power Meter, P-series, 50 MHz to 40 GHz	Agilent Technologies	N1911A	MY45101057	18-May-21	18-Jun-22
3302	Power sensor, P-Series, 50 MHz to 40 GHz, -35/30 to 20 dBm	Agilent Technologies	N1922A	MY45240586	08-Jun-22	08-Jun-23
3355	Low Pass Filter, 50 Ohm, DC to 1450 MHz.	Mini-Circuits	VLF-1450+	NA	15-Jun-21	15-Jun-23
3818	PSA Series Spectrum Analyzer, 3 Hz- 44 GHz	Agilent Technologies	E4446A	MY48250288	19-Jul-21	19-Jul-22
4366	Directional coupler, 1 GHz to 18 GHz, 10 dB, SMA Female	Tiger Micro-Electronics Institute	TGD-A1101-10	01e-JSDE805-007	29-May-20	29-May-22
3901	Microwave Cable Assembly, 40.0 GHz, 3.5 m, SMA/SMA	Huber-Suhner	SUCOFLEX 102A	1225/2A	06-Apr-21	06-Apr-22
3903	Microwave Cable Assembly, 40.0 GHz, 1.5 m, SMA/SMA	Huber-Suhner	SUCOFLEX 102A	1226/2A	06-Apr-21	06-Apr-22
4355	Signal and Spectrum Analyzer, 9 kHz to 7 GHz	Rohde & Schwarz	FSV 7	101630	20-Sep-21	20-Sep-22
4360	EMI Test Receiver, 20 Hz to 40 GHz.	Rohde & Schwarz	ESU40	100322	13-Jan-22	13-Jan-23
4366	Directional coupler, 1 GHz to 18 GHz, 10 dB, SMA Female	Tiger Micro-Electronics Institute	TGD-A1101-10	01e-JSDE805-007	03-Jun-20	03-Jun-22
4933	Active Horn Antenna, 1 GHz to 18 GHz	COM-POWER CORPORATION	AHA-118	701046	13-Jan-22	13-Jan-23
4956	Active horn antenna, 18 to 40 GHz	COM-POWER CORPORATION	AHA-840	105004	26-Jan-21	26-Mar-22
5112	RF cable, 40 GHz, 5.5 m, K-type	Huber-Suhner	SF102EA/11 SK/11SK/55 00MM	502494/2EA	19-Apr-21	19-Apr-22
5174	Medium Power Fixed Coaxial Attenuator DC to 40 GHz, 10 dB, 5 W	API Weinschel, Inc	75A-10-12	TD854	06-Apr-21	06-Apr-22
5232	WR42 to coaxial Right Angle Adapter. Freq. Range: 18.0 - 26.5 GHz	AINFO(HK)LIMITE D	42WCA3_Cu	J504063308	18-Jul-21	18-Jul-22
5233	WR28 to coaxial Right Angle Adapter. Freq. Range: 26.5.0 - 40.0 GHz	AINFO(HK)LIMITE D	28WCAK_Cu	J504063051	24-Jan-21	24-Jan-23
5286	Band Pass Filter, 50 Ohm, 4.4 to 18 GHz, SMA/M-SMA/F	A-INFOMW	WBLB-T-HP-4.4-18-S	J10800000305	15-Jun-21	15-Jun-23

9 APPENDIX B Test equipment and ancillaries used for tests

HL No	Description	Manufacturer	Model	Ser. No.	Last Cal./ Check	Due Cal./ Check
5288	Trilog Antenna, 25 MHz - 8 GHz, 100W	Frankonia	ALX-8000E	00809	08-Feb-19	08-Mar-22
5908	RF cable, 18 GHz, 8.0m, N-type	Huber-Suhner	SF126EA/11 N/11N/8000	NA	28-Oct-21	28-Oct-22
6143	RF-cable, 40.0 GHz, 2.0m, 2.92mm/2.92mm	Mechanc	CFT360AP4 060S- KMKM-2M	NA	05-Jan-22	05-Jul-22

10 APPENDIX C Test equipment correction factors

HL 4956: Active horn antenna
COM-POWER Corp., model: AHA-840, s/n 105004

Frequency, MHz	Measured antenna factor, dB/m	Frequency, MHz	Measured antenna factor, dB/m
18000	5.1	29500	1.4
18500	3.6	30000	2.9
19000	2.2	30500	2.9
19500	0.7	31000	2.9
20000	0.7	31500	1.2
20500	0.8	32000	0.7
21000	0.5	32500	0.2
21500	-1.3	33000	-1.7
22000	-2.1	33500	-2.2
22500	-2.0	34000	2.3
23000	-1.6	34500	-1.1
23500	-2.9	35000	0.7
24000	-2.3	35500	-1.1
24500	-2.6	36000	0.1
25000	-1.8	36500	1.4
25500	-1.2	37000	3.7
26000	-0.5	37500	5.8
26500	-1.2	38000	6.6
27000	-0.1	38500	7.3
27500	-1.0	39000	6.5
28000	-0.7	39500	7.3
28500	0.5	40000	7.1

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

HL 4933 Active Horn Antenna, 1 GHz to 18 GHz
COM-POWER CORPORATION AHA-118 , s/n 701046

Frequency, MHz	Measured antenna factor, dB/m
1000	-16.1
1050	-16.0
1100	-15.1
1150	-16.4
1200	-16.0
1250	-15.6
1300	-15.1
1350	-14.8
1400	-15.1
1450	-15.1
1500	-15.5
1550	-15.2
1600	-14.7
1650	-14.4
1700	-14.4
1750	-14.0
1800	-13.6
1850	-12.7
1900	-11.9
1950	-11.9
2000	-11.8
2050	-11.3
2100	-11.3
2150	-11.7
2200	-12.3
2250	-12.3
2300	-12.4
2350	-12.2
2400	-11.7
2450	-11.5
2500	-11.5
2550	-11.5
2600	-11.5
2650	-11.3
2700	-11.3
2750	-11.1
2800	-11.1
2850	-11.3
2900	-11.1
2950	-11.0
3000	-11.1
3050	-10.9
3100	-10.7
3150	-10.6

Frequency, MHz	Measured antenna factor, dB/m
3200	-11.2
3250	-10.8
3300	-10.8
3350	-10.7
3400	-10.3
3450	-10.2
3500	-10.1
3550	-10.4
3600	-10.5
3650	-10.4
3700	-10.4
3750	-10.3
3800	-10.1
3850	-10.0
3900	-9.9
3950	-9.8
4000	-9.7
4050	-9.3
4100	-8.6
4150	-8.2
4200	-8.3
4250	-8.5
4300	-8.5
4350	-8.3
4400	-8.0
4450	-7.7
4500	-7.6
4550	-7.4
4600	-7.5
4650	-7.8
4700	-7.6
4750	-6.8
4800	-6.1
4850	-5.7
4900	-5.8
4950	-5.8
5000	-6.0
5050	-5.7
5100	-5.4
5150	-5.1
5200	-4.6
5250	-4.6
5300	-4.8
5350	-5.1

Frequency, MHz	Measured antenna factor, dB/m	Frequency, MHz	Measured antenna factor, dB/m
5400	-5.1	8200	1.1
5450	-4.6	8250	1.0
5500	-4.0	8300	0.8
5550	-3.5	8350	0.5
5600	-3.1	8400	0.3
5650	-3.3	8450	0.5
5700	-3.8	8500	0.8
5750	-4.3	8550	0.9
5800	-4.3	8600	0.9
5850	-4.0	8650	0.6
5900	-3.5	8700	0.0
5950	-3.2	8750	-0.3
6000	-3.2	8800	0.0
6050	-3.2	8850	0.5
6100	-3.3	8900	0.6
6150	-3.3	8950	0.4
6200	-3.1	9000	-0.3
6250	-2.9	9050	-1.0
6300	-2.8	9100	-1.2
6350	-3.0	9150	-0.6
6400	-3.2	9200	-0.1
6450	-3.4	9250	0.0
6500	-3.7	9300	-0.1
6550	-3.6	9350	-0.5
6600	-3.4	9400	-0.7
6650	-2.9	9450	-0.4
6700	-2.6	9500	0.2
6750	-2.5	9550	0.5
6800	-2.6	9600	0.5
6850	-2.8	9650	0.3
6900	-2.7	9700	0.0
6950	-2.3	9750	0.0
7000	-2.0	9800	0.6
7050	-1.9	9850	1.4
7100	-1.8	9900	1.8
7150	-1.8	9950	1.7
7200	-1.7	10000	1.4
7250	-1.7	10100	0.8
7300	-1.6	10200	1.2
7350	-1.5	10300	1.5
7400	-1.5	10400	1.1
7450	-1.3	10500	1.6
7500	-1.4	10600	3.0
7550	-1.3	10700	2.9
7600	-1.0	10800	1.3
7650	-0.7	10900	1.0
7700	-0.3	11000	1.1
7750	0.1	11100	0.7
7800	0.3	11200	1.1
7850	0.4	11300	1.5
7900	0.2	11400	1.4
7950	0.1	11500	0.6
8000	0.2	11600	1.0
8050	0.3	11700	1.4
8100	0.8	11800	0.7
8150	1.1	11900	0.9



Frequency, MHz	Measured antenna factor, dB/m
12400	2.1
12500	1.2
12600	1.3
12700	2.4
12800	1.8
12900	0.6
13000	0.9
13100	1.1
13200	0.7
13300	0.9
13400	1.8
13500	2.1
13600	1.2
13700	0.8
13800	1.2
13900	1.5
14000	1.7
14100	2.2
14200	2.8
14300	3.0
14400	3.0
14500	3.3
14600	4.0
14700	5.4
14800	5.4
14900	4.7
15000	3.1
15100	2.0
15200	1.5
15300	1.4
15400	1.7

Frequency, MHz	Measured antenna factor, dB/m
15500	1.9
15600	1.2
15700	0.2
15800	0.6
15900	1.2
16000	0.6
16100	0.6
16200	1.9
16300	2.2
16400	0.9
16500	0.7
16600	1.7
16700	1.3
16800	1.0
16900	2.0
17000	2.4
17100	1.8
17200	1.8
17300	2.5
17400	2.7
17500	3.1
17600	3.7
17700	4.3
17800	4.8
17900	5.7
18000	5.1

HL 5288: Trilog Antenna
Frankonia, model: ALX-8000E, s/n: 00809
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

Frequency, MHz	Antenna factor, dB/m
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.
above 1000 MHz

Frequency, MHz	Antenna factor, dB/m
1000	26.9
1100	28.1
1200	28.4
1300	29.6
1400	29.1
1500	30.4
1600	30.7
1700	31.5
1800	32.3
1900	32.6
2000	32.5
2100	32.9
2200	33.5
2300	33.2
2400	33.7
2500	34.6
2600	34.7
2700	34.6
2800	35.0
2900	35.5
3000	36.2
3100	36.8
3200	36.8
3300	37.0
3400	37.5
3500	38.2

Frequency, MHz	Antenna factor, dB/m
3600	38.9
3700	39.4
3800	39.4
3900	39.6
4000	39.7
4100	39.8
4200	40.5
4300	40.9
4400	41.1
4500	41.4
4600	41.3
4700	41.6
4800	41.9
4900	42.3
5000	42.7
5100	43.0
5200	42.9
5300	43.5
5400	43.6
5500	44.3
5600	44.7
5700	45.0
5800	45.0
5900	45.3
6000	45.9

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

11 APPENDIX D 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	$\pm 8\%$
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 $\pm 13.9\%$
Duty cycle, timing (Tx ON / OFF) and average factor measurements	$\pm 1.0\%$
Unintentional radiator tests	
Conducted emissions with LISN	9 kHz to 150 kHz: ± 3.9 dB 150 kHz to 30 MHz: ± 3.8 dB
Radiated emissions at 3 m measuring distance Horizontal polarization Vertical polarization	Biconilog antenna: ± 5.3 dB Biconical antenna: ± 5.0 dB Log periodic antenna: ± 5.3 dB Double ridged horn antenna: ± 5.3 dB Biconilog antenna: ± 6.0 dB Biconical antenna: ± 5.7 dB Log periodic antenna: ± 6.0 dB Double ridged horn antenna: ± 6.0 dB

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

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

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

12 APPENDIX E 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 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. Michael Nikishin, EMC&Radio group manager

13 APPENDIX F Specification references

FCC 47CFR part 96: 2020	Citizens Broadband Radio Service
FCC 47CFR part 1: 2020	Practice and procedure
FCC 47CFR part 2: 2020	Frequency allocations and radio treaty matters; general rules and regulations

14 APPENDIX G Manufacturer's declaration



We, the undersigned,

Company: Airspan Networks Inc.

Address: Bareket Bldg., 2 Negev St. Airport City, Ben Gurion

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 Indoor 5G NR Base Station	AirStar 1200 5G, 3.55-3.7GHz (n48) PoE	5G NR 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 Indoor 5G NR Base station	AirVelocity 1901 5G, 3.55-3.7GHz (n48) PoE	5G NR Base station

The only differences between the products are a slight height difference of the cooling fins of the AirVelocity 1901 as compared to the cooling fins of the AirStar 1200.



05.04.2022



Zion Levi

Compliances Team Leader

Airspan Networks Inc.

15 APPENDIX H 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

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