

TEST REPORT
FROM
SIEMIC

For
WirelessGRID
To
FCC Part 15.247

Test Report Serial No.:
SL05033101T-ARY-003AR1

This report supersedes SL05033101T-ARY-003A

Remarks:

Equipment complied with the specification	☒
Equipment did not comply with the specification	☐

This Test Report is Issued Under the Authority of:


.....
Tested by: Alvin Ilarina, Test Engineer


.....
Reviewed by: Leslie Bai, Lab Manager

Issue date: 26 October 2005

Equipment Details:

Manufacturer: Airaya



Registration No. 783147



Industry Canada
Industrie Canada

Registration No. 4842



Registration No. 2195

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WirelessGRID**
To: **FCC Part 15.247**

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Executive Summary

The purpose of this test programme was to demonstrate compliance of the Airaya, WirelessGRID against the current FCC Part 15.247. The WirelessGRID demonstrated compliance with the FCC Part 15.247.

Airaya is the applicant and claimed manufacturer of this tested product. For the detailed description of this product, please refer to the WirelessGRID User Manual.

The equipment was tested with the following antennas:

23dB Patch

Mars Antenna's and RF Systems
Model # MA-WA58-1x

28dB Grid

Stella Doradus
Model # 58-SD24

28dB Grid

Pacific Wireless
Model # GD57-28

Omni

Mars Antenna's and RF Systems
Model # MA-WO-58-9x

Sectors

Mars Antenna's and RF Systems
60 degree - MA-WC50-5x

The following modification was made to the equipment in order to make it comply with radiated emissions limits:

ECCOSORB® LS-26 Broadband Cavity Resonance Absorber material was added to the bottom of the PCB, inside the RF shield, and above the RF shield.

The test has demonstrated that this unit complies with stipulated standards.



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1 Technical Details

Purpose	Compliance testing of WirelessGRID with FCC Part 15.247
Applicant / Client	Airaya 637 Adair Court Morgan Hill, CA 95037
Manufacturer	Airaya
Laboratory performing the tests	SIEMIC Labs 2206 Ringwood Avenue San Jose, CA 95131
Test location(s)	SIEMIC Labs 2206 Ringwood Avenue San Jose, CA 95131
Test report reference number	SL05033101T-ARY-003AR1
Date EUT received	DateRCV
Standard applied	FCC Part 15.247
No of Units:	1
Equipment Category:	Equipment Category
Trade/Product Name:	WirelessGRID
Type/Model Name/No:	WirelessGRID
Technical Variants:	none
FCC ID No.	QDE-GRID-C

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2 Tests Required

The product was tested in accordance with the following specifications.
The test results recorded in this Test Report are exclusively referred to the tested sample(s).

Test Standard	Description	Pass / Fail
47 CFR 15.247		
15.207	Power Line Conducted Emissions	
15.247(a)	6dB Bandwidth	
15.247(b)	Power Output (conducted)	
15.247(c)	Spurious Emissions (conducted)	
15.209/15.247(c)	Spurious Emissions Radiated	
15.247(d)	Power Spectral Density	
ANSI C63.4: 2003		

Notes: *Deviations to above standards are outlined in specific test sections if applicable.
Cable loss and external attenuation are compensated for in the measurement system when applicable.*



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3 Measurements, Examinations and Derived Results

3.1 General observations

Equipment serial number(s)		
Module:	Part number:	Serial number:
Wireless Bridge Module	AI108	none

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3.2 Test Results

3.2.1 Power Line Conducted Emissions

Requirement(s): 47 CFR §15.207

Procedures: Conducted Emissions measurements were made with a spectrum analyzer and LISN.

Results:

Line Under Test	Result
Phase	Pass
Neutral	Pass

Line Under Test	FREQ. (MHz)	Corrected Amplitude (dBuV) QP	Limit (dBuV) QP	Margin (dB) QP	Corrected Amplitude (dBuV) AVG	Limit (dBuV) AVG	Margin (dB) AVG
Phase A	0.155	27.9	79	-51.1	27.9	66	-38.1
Phase A	0.175	34.3	79	-44.7	34.3	66	-31.7
Phase A	0.39	27	79	-52	27	66	-39
Phase A	2.69	12.5	73	-60.5	12.5	60	-47.5
Phase A	4.43	26.6	73	-46.4	26.6	60	-33.4
Phase A	19.45	19.8	73	-53.2	19.8	60	-40.2
Neutral	0.155	27.9	79	-51.1	27.9	66	-38.1
Neutral	0.22	30.2	79	-48.8	30.2	66	-35.8
Neutral	0.39	30.6	79	-48.4	30.6	66	-35.4
Neutral	2.19	25.4	73	-47.6	25.4	60	-34.6
Neutral	2.6	34	73	-39	34	60	-26
Neutral	18.2	26	73	-47	26	60	-34

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3.2.2 6db Bandwidth

Requirement(s): 47 CFR §15.247(a)(2)

Procedures: The Emission Masks were measured at the antenna terminal using a spectrum analyzer. The measurements were made for the 5MHz, 10MHz, 20MHz, 40MHz, and 50MHz bandwidths at the high, middle, and low channels.

Results:

Plot #	Frequency (MHz)	Channel	Channel Bandwidth (MHz)	Pass/Fail
1	5840	hi	5	Pass
2	5790	mid	5	Pass
3	5735	low	5	Pass
4	5840	hi	10	Pass
5	5790	mid	10	Pass
6	5735	low	10	Pass
7	5835	hi	20	Pass
8	5790	mid	20	Pass
9	5745	low	20	Pass
10	5820	hi	40	Pass
11	5790	mid	40	Pass
12	5755	low	40	Pass
13	5815	hi	50	Pass
14	5790	mid	50	Pass
15	5760	low	50	Pass

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3.2.3 Peak Output Power

Requirement(s): 47 CFR §15.247(b)

Procedures: The peak output power was measured at the antenna terminal using Acceptable Procedures: Peak conducted transmit output power outlined in FCC DA 02-2138 Appendix A. The measurements were made for the 5MHz, 10MHz, 20MHz, 40MHz, and 50MHz bandwidths at the high, middle, and low channels.

Results:

Plot #	Frequency (MHz)	Channel	Channel Bandwidth (MHz)	Peak Power (dBm)	Peak Limit (dBm)
16	5840	hi	5	25.6	30
17	5790	mid	5	26.2	30
18	5735	low	5	26.7	30
19	5840	hi	10	22.4	30
20	5790	mid	10	25.6	30
21	5735	low	10	24.0	30
22	5835	hi	20	19.5	30
23	5790	mid	20	24.2	30
24	5745	low	20	22.4	30
25	5820	hi	40	20.8	30
26	5790	mid	40	21.9	30
27	5755	low	40	21.7	30
28	5815	hi	50	20.0	30
29	5790	mid	50	22.4	30
30	5760	low	50	22.3	30

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3.2.4 Spurious Emissions at Antenna Terminals (conducted)

Requirement(s): 47 CFR §15.247(c)

Procedures: The spurious emissions at the antenna terminal as measured at the antenna terminal using a spectrum analyzer. The measurements were made for the 5MHz, 10MHz, 20MHz, 40MHz, and 50MHz bandwidths at the high, middle, and low channels.

The spurious limit was determined by:

Highest Emission Level in Authorized Band with 100kHz RBW – 30 dBm

Results:

Plots #	Frequency (MHz)	Channel	Channel Bandwidth (MHz)	Pass/Fail
31 to 35	5840	Hi	5	Pass
36 to 40	5790	Mid	5	Pass
41 to 45	5735	Low	5	Pass
46 to 50	5840	Hi	10	Pass
51 to 55	5790	Mid	10	Pass
56 to 60	5735	Low	10	Pass
61 to 65	5835	Hi	20	Pass
66 to 70	5790	Mid	20	Pass
71 to 75	5745	Low	20	Pass
76 to 80	5820	Hi	40	Pass
81 to 85	5790	Mid	40	Pass
86 to 90	5755	Low	40	Pass
91 to 95	5815	Hi	50	Pass
96 to 100	5790	Mid	50	Pass
101 to 105	5760	Low	50	Pass

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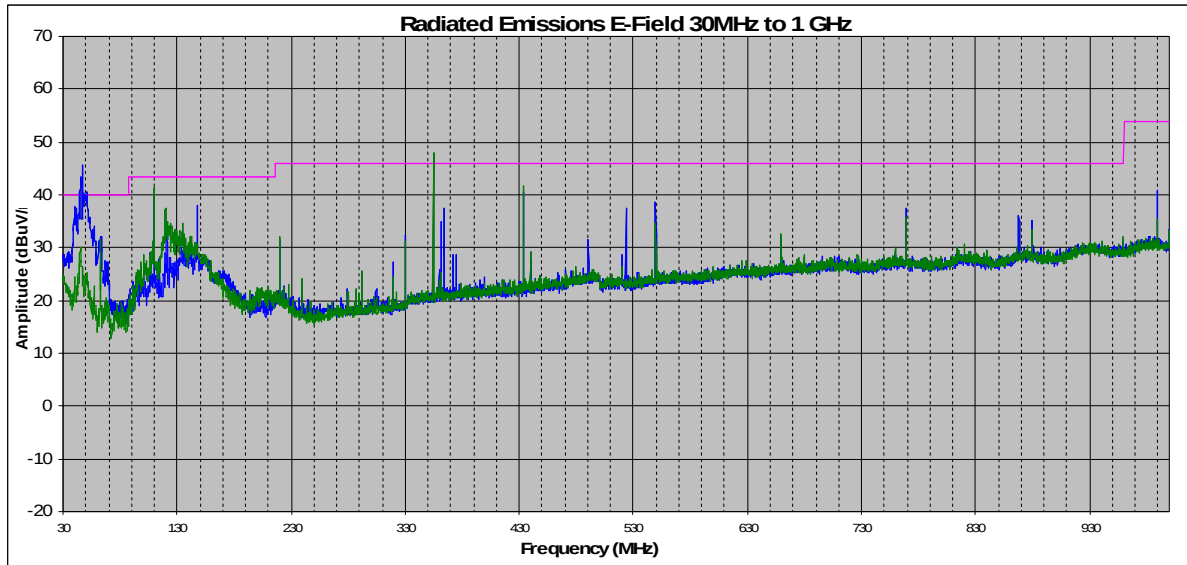
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3.2.5 Radiated Spurious Emissions (below 1 GHz)

Requirement(s): 47 CFR §15.209

Procedures: Radiated emissions were measured according to ANSI C63.4. Equipment was tested in three orthogonal axis at hi mid and low with the worse case reported

Results:



Radiated Emissions Plot

Frequency	Azimuth	Measure	Antenna Polarity	Antenna Height	Raw Amplitude @ 3m	ACF	CBL loss	Corrected Amplitude @ 3m	Limit @ 3m	Delta
(MHz)	(degrees)	(Avg/QP)	(H/V)	(m)	(dBuV/m)	(dBm)	(dBm)	(dBuV/m)	(dBuV/m)	(dBuV/m)
44.893	330	qp	v	1	26.6	8.5856	0.7426	35.92	40	-4.07
50	45	qp	v	1	23.2	7.4	0.7571	31.35714286	40	-8.64
109.987	90	qp	h	2.94	29	12.797	0.91	42.707387	43.5	-0.79
114.44	0	qp	v	1	14.3	13.544	0.9144	28.75844	43.5	-14.74
329.978	30	qp	h	2	15.5	14.5	1.545	31.544527	46	-14.45
549.98	50	qp	v	1	15.8	18.2	1.85	35.84978	46	-10.15

Radiated Emissions Table

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3.2.6 Radiated Spurious Emissions (above 1GHz)

Requirement(s): 47 CFR §15.247(c)

Procedures: Radiated emissions were measured according to ANSI C63.4. Equipment was tested in three orthogonal axis at hi mid and low with the worse case reported.

The following antennas were tested:

23dB Patch - Mars Antenna's and RF Systems: Model # MA-WA58-1x
28dB Grid - Stella Doradus: Model # 58-SD24
28dB Grid - Pacific Wireless: Model # GD57-28
Omni - Mars Antenna's and RF Systems: Model # MA-WO-58-9x
Sector - Mars Antenna's and RF Systems: 60 degree - MA-WC50-5x

Results:

3.2.6.1 23dB Patch - Mars Antenna's and RF Systems: Model # MA-WA58-1x

Frequency (GHz)	Azimuth (Degrees)	Antenna Polarity (H/V)	Detector (avg/pk)	Height (m)	Raw Amp (dBuV)	Preamp Gain (dB)	Antenna Factor (dB)	Cable Loss (dB)	Distance Factor (dB)	Field Strength (dBuV/m)	Limit (dBuV/m)	Delta (dBuV/m)
5MHz 5735												
11.4	180	v	pk	1m	61.5	34.5	39.5	6.8	10.46	62.84	74	-11.16
11.4	180	v	avg	1m	51.3	34.5	39.5	6.8	10.46	52.64	54	-1.36
17.2	185	v	pk	1m	55	33.5	43	7.9	10.46	61.94	74	-12.06
17.2	185	v	avg	1m	42.8	33.5	43	7.9	10.46	49.74	54	-4.26
11.4	185	h	pk	1m	55	34.5	39.5	6.8	10.46	56.34	74	-17.66
11.4	185	h	avg	1m	44.67	34.5	39.5	6.8	10.46	46.01	54	-7.99
17.2		h	noise floor									
5MHz 5790												
11.58	260	h	pk	1m	49.67	34.5	39.5	6.8	10.46	51.01	74	-22.99
11.58	260	h	avg	1m	38.5	34.5	39.5	6.8	10.46	39.84	54	-14.16
17.36	260	h	pk	1m	46.6	33.5	43	7.9	10.46	53.54	74	-20.46
17.36	260	h	avg	1m	35.8	33.5	43	7.9	10.46	42.74	54	-11.26
11.58	260	v	pk	1m	57.5	34.5	39.5	6.8	10.46	58.84	74	-15.16
11.58	260	v	avg	1m	48.1	34.5	39.5	6.8	10.46	49.44	54	-4.56
17.36	280	v	pk	1m	48	33.5	43	7.9	10.46	54.94	74	-19.06
17.36	280	v	avg	1m	35.8	33.5	43	7.9	10.46	42.74	54	-11.26
5MHz 5840												
11.68	260	v	pk	1m	63.8	34.5	39.5	6.8	10.46	65.14	74	-8.86
11.68	260	v	avg	1m	51	34.5	39.5	6.8	10.46	52.34	54	-1.66
17.51	260	v	pk	1m	45	33.5	43	7.9	10.46	51.94	74	-22.06
17.51	260	v	avg	1m	34.1	33.5	43	7.9	10.46	41.04	54	-12.96
11.68	260	h	pk	1m	55	34.5	39.5	6.8	10.46	56.34	74	-17.66
11.68	260	h	avg	1m	41.5	34.5	39.5	6.8	10.46	42.84	54	-11.16
17.51	280	h	pk	1m	49.33	33.5	43	7.9	10.46	56.27	74	-17.73
17.51	280	h	avg	1m	36.1	33.5	43	7.9	10.46	43.04	54	-10.96

Sample Calculation: Field Strength = Raw – Preamp Gain + ACF + Cable Loss - DCF

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3.2.6.1 23dB Patch - Mars Antenna's and RF Systems: Model # MA-WA58-1x (continued)

Frequency (GHz)	Azimuth (Degrees)	Antenna Polarity (H/V)	Detector (avg/pk)	Height (m)	Raw Amp (dBuV)	Preamp Gain (dB)	Antenna Factor (dB)	Cable Loss (dB)	Distance Factor (dB)	Field Strength (dBuV/m)	Limit (dBuV/m)	Delta (dBuV/m)
10MHz 5735												
11.47	185	h	pk	1m	51.5	34.5	39.5	6.8	10.46	52.84	74	-21.16
11.47	185	h	avg	1m	40.5	34.5	39.5	6.8	10.46	41.84	54	-12.16
17.2	265	h	pk	1m	47.33	33.5	43	7.9	10.46	54.27	74	-19.73
17.2	265	h	avg	1m	35.5	33.5	43	7.9	10.46	42.44	54	-11.56
11.4	175	v	pk	1m	58.33	34.5	39.5	6.8	10.46	59.67	74	-14.33
11.4	175	v	avg	1m	47.17	34.5	39.5	6.8	10.46	48.51	54	-5.49
17.2	225	v	pk	1m	46.83	33.5	43	7.9	10.46	53.77	74	-20.23
17.2	225	v	avg	1m	33.8	33.5	43	7.9	10.46	40.74	54	-13.26
10MHz 5790												
11.58	260	h	pk	1m	48	34.5	39.5	6.8	10.46	49.34	74	-24.66
11.58	260	h	avg	1m	36.66	34.5	39.5	6.8	10.46	38	54	-16
17.36		h			noise floor							
11.58	260	v	pk	1m	57.1	34.5	39.5	6.8	10.46	58.44	74	-15.56
11.58	260	v	avg	1m	46.1	34.5	39.5	6.8	10.46	47.44	54	-6.56
17.36		v			noise floor							
10MHz 5840												
11.68	260	v	pk	1m	62.8	34.5	39.5	6.8	10.46	64.14	74	-9.86
11.68	260	v	avg	1m	50.5	34.5	39.5	6.8	10.46	51.84	54	-2.16
17.51	260	v	pk	1m	45.5	33.5	43	7.9	10.46	52.44	74	-21.56
17.51	260	v	avg	1m	33.5	33.5	43	7.9	10.46	40.44	54	-13.56
11.68	260	h	pk	1m	53.5	34.5	39.5	6.8	10.46	54.84	74	-19.16
11.68	260	h	avg	1m	41.5	34.5	39.5	6.8	10.46	42.84	54	-11.16
17.51	260	h	pk	1m	46.5	33.5	43	7.9	10.46	53.44	74	-20.56
17.51	260	h	avg	1m	34.5	33.5	43	7.9	10.46	41.44	54	-12.56



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Frequency (GHz)	Azimuth (Degrees)	Antenna Polarity (H/V)	Detector (avg/pk)	Height (m)	Raw Amp (dBuV)	Preamp Gain (dB)	Antenna Factor (dB)	Cable Loss (dB)	Distance Factor (dB)	Field Strength (dBuV/m)	Limit (dBuV/m)	Delta (dBuV/m)
20MHz 5745												
11.4	175	v	pk	1m	56.17	34.5	39.5	6.8	10.46	57.51	74	-16.49
11.4	175	v	avg	1m	43	34.5	39.5	6.8	10.46	44.34	54	-9.66
17.2		v			noise floor							
11.48	190	h	pk	1m	49.83	34.5	39.5	6.8	10.46	51.17	74	-22.83
11.48	190	h	avg	1m	37.5	34.5	39.5	6.8	10.46	38.84	54	-15.16
17.2		h			noise floor							
20MHz 5790												
11.58	340	h	pk	1m	48.33	34.5	39.5	6.8	10.46	49.67	74	-24.33
11.58	340	h	avg	1m	36.8	34.5	39.5	6.8	10.46	38.14	54	-15.86
17.36		h			noise floor							
11.58	170	v	pk	1m	55.17	34.5	39.5	6.8	10.46	56.51	74	-17.49
11.58	170	v	avg	1m	42.8	34.5	39.5	6.8	10.46	44.14	54	-9.86
17.36		v			noise floor							
20MHz 5835												
11.66	265	v	pk	1m	60.17	34.5	39.5	6.8	10.46	61.51	74	-12.49
11.66	175	v	avg	1m	47.33	34.5	39.5	6.8	10.46	48.67	54	-5.33
17.5		v			noise floor							
11.66	190	h	pk	1m	50.8	34.5	39.5	6.8	10.46	52.14	74	-21.86
11.66	190	h	avg	1m	37.5	34.5	39.5	6.8	10.46	38.84	54	-15.16
17.5		h			noise floor							

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3.2.6.1 23dB Patch - Mars Antenna's and RF Systems: Model # MA-WA58-1x (continued)

Frequency (GHz)	Azimuth (Degrees)	Antenna Polarity (H/V)	Detector (avg/pk)	Height (m)	Raw Amp (dBuV)	Preamp Gain (dB)	Antenna Factor (dB)	Cable Loss (dB)	Distance Factor (dB)	Field Strength (dBuV/m)	Limit (dBuV/m)	Delta (dBuV/m)
40MHz 5755												
11.4		h								noise floor		
17.2		h								noise floor		
11.4		v								noise floor		
17.2		v								noise floor		
40MHz 5790												
11.58	340	h	pk	1m	46	34.5	39.5	6.8	10.46	47.34	74	-26.66
11.58	340	h	avg	1m	32.8	34.5	39.5	6.8	10.46	34.14	54	-19.86
17.36		h								noise floor		
11.58	260	v	pk	1m	52	34.5	39.5	6.8	10.46	53.34	74	-20.66
11.58	260	v	avg	1m	40.3	34.5	39.5	6.8	10.46	41.64	54	-12.36
17.36		v								noise floor		
40MHz 5820												
11.64	320	h	pk	1m	48.1	34.5	39.5	6.8	10.46	49.44	74	-24.56
11.64	340	h	avg	1m	35.5	34.5	39.5	6.8	10.46	36.84	54	-17.16
17.46		h								noise floor		
11.64	265	v	pk	1m	58.6	34.5	39.5	6.8	10.46	59.94	74	-14.06
11.64	265	v	avg	1m	44.8	34.5	39.5	6.8	10.46	46.14	54	-7.86
17.46		v								noise floor		



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Frequency (GHz)	Azimuth (Degrees)	Antenna Polarity (H/V)	Detector (avg/pk)	Height (m)	Raw Amp (dBuV)	Preamp Gain (dB)	Antenna Factor (dB)	Cable Loss (dB)	Distance Factor (dB)	Field Strength (dBuV/m)	Limit (dBuV/m)	Delta (dBuV/m)
50MHz 5760												
11.51	175	v	pk	1m	53	34.5	39.5	6.8	10.46	54.34	74	-19.66
11.51	175	v	avg	1m	38.8	34.5	39.5	6.8	10.46	40.14	54	-13.86
17.2		v		noise floor								
11.51	295	h	pk	1m	45.8	34.5	39.5	6.8	10.46	47.14	74	-26.86
11.51	295	h	avg	1m	33.3	34.5	39.5	6.8	10.46	34.64	54	-19.36
17.2		h		noise floor								
50MHz 5790												
11.58	295	h	pk	1m	45.1	34.5	39.5	6.8	10.46	46.44	74	-27.56
11.58	260	h	avg	1m	32.5	34.5	39.5	6.8	10.46	33.84	54	-20.16
17.36		h		noise floor								
11.58	260	v	pk	1m	51.1	34.5	39.5	6.8	10.46	52.44	74	-21.56
11.58	260	v	avg	1m	38.1	34.5	39.5	6.8	10.46	39.44	54	-14.56
17.36		v		noise floor								
50MHz 5815												
11.63	260	v	pk	1m	59	34.5	39.5	6.8	10.46	60.34	74	-13.66
11.64	260	v	avg	1m	46.5	34.5	39.5	6.8	10.46	47.84	54	-6.16
17.43		v		noise floor								
11.64	320	h	pk	1m	49.8	34.5	39.5	6.8	10.46	51.14	74	-22.86
11.64	320	h	avg	1m	37	34.5	39.5	6.8	10.46	38.34	54	-15.66
17.43		h		noise floor								

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3.2.6.2 28dB Grid - Stella Doradus: Model # 58-SD24

Frequency (GHz)	Azimuth (Degrees)	Antenna Polarity (H/V)	Detector (avg/pk)	Height (m)	Raw Amp (dBuV)	Preamp Gain (dB)	Antenna Factor (dB)	Cable Loss (dB)	Distance Factor (dB)	Field Strength (dBuV/m)	Limit (dBuV/m)	Delta (dBuV/m)
5MHz 5735												
11.4	180	v	pk	1m	61.5	34.5	39.5	6.8	10.46	62.84	74	-11.16
11.4	180	v	avg	1m	51.3	34.5	39.5	6.8	10.46	52.64	54	-1.36
17.2	185	v	pk	1m	55	33.5	43	7.9	10.46	61.94	74	-12.06
17.2	185	v	avg	1m	42.8	33.5	43	7.9	10.46	49.74	54	-4.26
11.4	185	h	pk	1m	55	34.5	39.5	6.8	10.46	56.34	74	-17.66
11.4	185	h	avg	1m	44.67	34.5	39.5	6.8	10.46	46.01	54	-7.99
17.2		h	noise floor									
5MHz 5790												
11.58	260	h	pk	1m	49.67	34.5	39.5	6.8	10.46	51.01	74	-22.99
11.58	260	h	avg	1m	38.5	34.5	39.5	6.8	10.46	39.84	54	-14.16
17.36	260	h	pk	1m	46.6	33.5	43	7.9	10.46	53.54	74	-20.46
17.36	260	h	avg	1m	35.8	33.5	43	7.9	10.46	42.74	54	-11.26
11.58	260	v	pk	1m	57.5	34.5	39.5	6.8	10.46	58.84	74	-15.16
11.58	260	v	avg	1m	48.1	34.5	39.5	6.8	10.46	49.44	54	-4.56
17.36	280	v	pk	1m	48	33.5	43	7.9	10.46	54.94	74	-19.06
17.36	280	v	avg	1m	35.8	33.5	43	7.9	10.46	42.74	54	-11.26
5MHz 5840												
11.68	260	v	pk	1m	63.8	34.5	39.5	6.8	10.46	65.14	74	-8.86
11.68	260	v	avg	1m	51	34.5	39.5	6.8	10.46	52.34	54	-1.66
17.51	260	v	pk	1m	45	33.5	43	7.9	10.46	51.94	74	-22.06
17.51	260	v	avg	1m	34.1	33.5	43	7.9	10.46	41.04	54	-12.96
11.68	260	h	pk	1m	55	34.5	39.5	6.8	10.46	56.34	74	-17.66
11.68	260	h	avg	1m	41.5	34.5	39.5	6.8	10.46	42.84	54	-11.16
17.51	280	h	pk	1m	49.33	33.5	43	7.9	10.46	56.27	74	-17.73
17.51	280	h	avg	1m	36.1	33.5	43	7.9	10.46	43.04	54	-10.96

Sample Calculation: Field Strength = Raw – Preamp Gain + ACF + Cable Loss - DCF

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3.2.6.2 28dB Grid - Stella Doradus: Model # 58-SD24 (continued)

Frequency (GHz)	Azimuth (Degrees)	Antenna Polarity (H/V)	Detector (avg/pk)	Height (m)	Raw Amp (dBuV)	Preamp Gain (dB)	Antenna Factor (dB)	Cable Loss (dB)	Distance Factor (dB)	Field Strength (dBuV/m)	Limit (dBuV/m)	Delta (dBuV/m)
10MHz 5735												
11.47	185	h	pk	1m	51.5	34.5	39.5	6.8	10.46	52.84	74	-21.16
11.47	185	h	avg	1m	40.5	34.5	39.5	6.8	10.46	41.84	54	-12.16
17.2	265	h	pk	1m	47.33	33.5	43	7.9	10.46	54.27	74	-19.73
17.2	265	h	avg	1m	35.5	33.5	43	7.9	10.46	42.44	54	-11.56
11.4	175	v	pk	1m	58.33	34.5	39.5	6.8	10.46	59.67	74	-14.33
11.4	175	v	avg	1m	47.17	34.5	39.5	6.8	10.46	48.51	54	-5.49
17.2	225	v	pk	1m	46.83	33.5	43	7.9	10.46	53.77	74	-20.23
17.2	225	v	avg	1m	33.8	33.5	43	7.9	10.46	40.74	54	-13.26
10MHz 5790												
11.58	260	h	pk	1m	48	34.5	39.5	6.8	10.46	49.34	74	-24.66
11.58	260	h	avg	1m	36.66	34.5	39.5	6.8	10.46	38	54	-16
17.36		h			noise floor							
11.58	260	v	pk	1m	57.1	34.5	39.5	6.8	10.46	58.44	74	-15.56
11.58	260	v	avg	1m	46.1	34.5	39.5	6.8	10.46	47.44	54	-6.56
17.36		v			noise floor							
10MHz 5840												
11.68	260	v	pk	1m	62.8	34.5	39.5	6.8	10.46	64.14	74	-9.86
11.68	260	v	avg	1m	50.5	34.5	39.5	6.8	10.46	51.84	54	-2.16
17.51	260	v	pk	1m	45.5	33.5	43	7.9	10.46	52.44	74	-21.56
17.51	260	v	avg	1m	33.5	33.5	43	7.9	10.46	40.44	54	-13.56
11.68	260	h	pk	1m	53.5	34.5	39.5	6.8	10.46	54.84	74	-19.16
11.68	260	h	avg	1m	41.5	34.5	39.5	6.8	10.46	42.84	54	-11.16
17.51	260	h	pk	1m	46.5	33.5	43	7.9	10.46	53.44	74	-20.56
17.51	260	h	avg	1m	34.5	33.5	43	7.9	10.46	41.44	54	-12.56



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Frequency (GHz)	Azimuth (Degrees)	Antenna Polarity (H/V)	Detector (avg/pk)	Height (m)	Raw Amp (dBuV)	Preamp Gain (dB)	Antenna Factor (dB)	Cable Loss (dB)	Distance Factor (dB)	Field Strength (dBuV/m)	Limit (dBuV/m)	Delta (dBuV/m)
20MHz 5745												
11.4	175	v	pk	1m	56.17	34.5	39.5	6.8	10.46	57.51	74	-16.49
11.4	175	v	avg	1m	43	34.5	39.5	6.8	10.46	44.34	54	-9.66
17.2		v			noise floor							
11.48	190	h	pk	1m	49.83	34.5	39.5	6.8	10.46	51.17	74	-22.83
11.48	190	h	avg	1m	37.5	34.5	39.5	6.8	10.46	38.84	54	-15.16
17.2		h			noise floor							
20MHz 5790												
11.58	340	h	pk	1m	48.33	34.5	39.5	6.8	10.46	49.67	74	-24.33
11.58	340	h	avg	1m	36.8	34.5	39.5	6.8	10.46	38.14	54	-15.86
17.36		h			noise floor							
11.58	170	v	pk	1m	55.17	34.5	39.5	6.8	10.46	56.51	74	-17.49
11.58	170	v	avg	1m	42.8	34.5	39.5	6.8	10.46	44.14	54	-9.86
17.36		v			noise floor							
20MHz 5835												
11.66	265	v	pk	1m	60.17	34.5	39.5	6.8	10.46	61.51	74	-12.49
11.66	175	v	avg	1m	47.33	34.5	39.5	6.8	10.46	48.67	54	-5.33
17.5		v			noise floor							
11.66	190	h	pk	1m	50.8	34.5	39.5	6.8	10.46	52.14	74	-21.86
11.66	190	h	avg	1m	37.5	34.5	39.5	6.8	10.46	38.84	54	-15.16
17.5		h			noise floor							

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3.2.6.2 28dB Grid - Stella Doradus: Model # 58-SD24 (continued)

Frequency (GHz)	Azimuth (Degrees)	Antenna Polarity (H/V)	Detector (avg/pk)	Height (m)	Raw Amp (dBuV)	Preamp Gain (dB)	Antenna Factor (dB)	Cable Loss (dB)	Distance Factor (dB)	Field Strength (dBuV/m)	Limit (dBuV/m)	Delta (dBuV/m)
40MHz 5755												
11.4		h								noise floor		
17.2		h								noise floor		
11.4		v								noise floor		
17.2		v								noise floor		
40MHz 5790												
11.58	340	h	pk	1m	46	34.5	39.5	6.8	10.46	47.34	74	-26.66
11.58	340	h	avg	1m	32.8	34.5	39.5	6.8	10.46	34.14	54	-19.86
17.36		h								noise floor		
11.58	260	v	pk	1m	52	34.5	39.5	6.8	10.46	53.34	74	-20.66
11.58	260	v	avg	1m	40.3	34.5	39.5	6.8	10.46	41.64	54	-12.36
17.36		v								noise floor		
40MHz 5820												
11.64	320	h	pk	1m	48.1	34.5	39.5	6.8	10.46	49.44	74	-24.56
11.64	340	h	avg	1m	35.5	34.5	39.5	6.8	10.46	36.84	54	-17.16
17.46		h								noise floor		
11.64	265	v	pk	1m	58.6	34.5	39.5	6.8	10.46	59.94	74	-14.06
11.64	265	v	avg	1m	44.8	34.5	39.5	6.8	10.46	46.14	54	-7.86
17.46		v								noise floor		



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Frequency (GHz)	Azimuth (Degrees)	Antenna Polarity (H/V)	Detector (avg/pk)	Height (m)	Raw Amp (dBuV)	Preamp Gain (dB)	Antenna Factor (dB)	Cable Loss (dB)	Distance Factor (dB)	Field Strength (dBuV/m)	Limit (dBuV/m)	Delta (dBuV/m)
50MHz 5760												
11.51	175	v	pk	1m	53	34.5	39.5	6.8	10.46	54.34	74	-19.66
11.51	175	v	avg	1m	38.8	34.5	39.5	6.8	10.46	40.14	54	-13.86
17.2		v		noise floor								
11.51	295	h	pk	1m	45.8	34.5	39.5	6.8	10.46	47.14	74	-26.86
11.51	295	h	avg	1m	33.3	34.5	39.5	6.8	10.46	34.64	54	-19.36
17.2		h		noise floor								
50MHz 5790												
11.58	295	h	pk	1m	45.1	34.5	39.5	6.8	10.46	46.44	74	-27.56
11.58	260	h	avg	1m	32.5	34.5	39.5	6.8	10.46	33.84	54	-20.16
17.36		h		noise floor								
11.58	260	v	pk	1m	51.1	34.5	39.5	6.8	10.46	52.44	74	-21.56
11.58	260	v	avg	1m	38.1	34.5	39.5	6.8	10.46	39.44	54	-14.56
17.36		v		noise floor								
50MHz 5815												
11.63	260	v	pk	1m	59	34.5	39.5	6.8	10.46	60.34	74	-13.66
11.64	260	v	avg	1m	46.5	34.5	39.5	6.8	10.46	47.84	54	-6.16
17.43		v		noise floor								
11.64	320	h	pk	1m	49.8	34.5	39.5	6.8	10.46	51.14	74	-22.86
11.64	320	h	avg	1m	37	34.5	39.5	6.8	10.46	38.34	54	-15.66
17.43		h		noise floor								

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3.2.6.3 28dB Grid - Pacific Wireless: Model # GD57-28

Frequency (GHz)	Azimuth (Degrees)	Antenna Polarity (H/V)	Detector (avg/pk)	Height (m)	Raw Amp (dBuV)	Preamp Gain (dB)	Antenna Factor (dB)	Cable Loss (dB)	Distance Factor (dB)	Field Strength (dBuV/m)	Limit (dBuV/m)	Delta (dBuV/m)
5MHz 5735												
11.4	180	v	pk	1m	61.5	34.5	39.5	6.8	10.46	62.84	74	-11.16
11.4	180	v	avg	1m	51.3	34.5	39.5	6.8	10.46	52.64	54	-1.36
17.2	185	v	pk	1m	55	33.5	43	7.9	10.46	61.94	74	-12.06
17.2	185	v	avg	1m	42.8	33.5	43	7.9	10.46	49.74	54	-4.26
11.4	185	h	pk	1m	55	34.5	39.5	6.8	10.46	56.34	74	-17.66
11.4	185	h	avg	1m	44.67	34.5	39.5	6.8	10.46	46.01	54	-7.99
17.2		h	noise floor									
5MHz 5790												
11.58	260	h	pk	1m	49.67	34.5	39.5	6.8	10.46	51.01	74	-22.99
11.58	260	h	avg	1m	38.5	34.5	39.5	6.8	10.46	39.84	54	-14.16
17.36	260	h	pk	1m	46.6	33.5	43	7.9	10.46	53.54	74	-20.46
17.36	260	h	avg	1m	35.8	33.5	43	7.9	10.46	42.74	54	-11.26
11.58	260	v	pk	1m	57.5	34.5	39.5	6.8	10.46	58.84	74	-15.16
11.58	260	v	avg	1m	48.1	34.5	39.5	6.8	10.46	49.44	54	-4.56
17.36	280	v	pk	1m	48	33.5	43	7.9	10.46	54.94	74	-19.06
17.36	280	v	avg	1m	35.8	33.5	43	7.9	10.46	42.74	54	-11.26
5MHz 5840												
11.68	260	v	pk	1m	63.8	34.5	39.5	6.8	10.46	65.14	74	-8.86
11.68	260	v	avg	1m	51	34.5	39.5	6.8	10.46	52.34	54	-1.66
17.51	260	v	pk	1m	45	33.5	43	7.9	10.46	51.94	74	-22.06
17.51	260	v	avg	1m	34.1	33.5	43	7.9	10.46	41.04	54	-12.96
11.68	260	h	pk	1m	55	34.5	39.5	6.8	10.46	56.34	74	-17.66
11.68	260	h	avg	1m	41.5	34.5	39.5	6.8	10.46	42.84	54	-11.16
17.51	280	h	pk	1m	49.33	33.5	43	7.9	10.46	56.27	74	-17.73
17.51	280	h	avg	1m	36.1	33.5	43	7.9	10.46	43.04	54	-10.96

Sample Calculation: Field Strength = Raw – Preamp Gain + ACF + Cable Loss - DCF

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3.2.6.3 28dB Grid - Pacific Wireless: Model # GD57-28 (continued)

Frequency (GHz)	Azimuth (Degrees)	Antenna Polarity (H/V)	Detector (avg/pk)	Height (m)	Raw Amp (dBuV)	Preamp Gain (dB)	Antenna Factor (dB)	Cable Loss (dB)	Distance Factor (dB)	Field Strength (dBuV/m)	Limit (dBuV/m)	Delta (dBuV/m)
10MHz 5735												
11.47	185	h	pk	1m	51.5	34.5	39.5	6.8	10.46	52.84	74	-21.16
11.47	185	h	avg	1m	40.5	34.5	39.5	6.8	10.46	41.84	54	-12.16
17.2	265	h	pk	1m	47.33	33.5	43	7.9	10.46	54.27	74	-19.73
17.2	265	h	avg	1m	35.5	33.5	43	7.9	10.46	42.44	54	-11.56
11.4	175	v	pk	1m	58.33	34.5	39.5	6.8	10.46	59.67	74	-14.33
11.4	175	v	avg	1m	47.17	34.5	39.5	6.8	10.46	48.51	54	-5.49
17.2	225	v	pk	1m	46.83	33.5	43	7.9	10.46	53.77	74	-20.23
17.2	225	v	avg	1m	33.8	33.5	43	7.9	10.46	40.74	54	-13.26
10MHz 5790												
11.58	260	h	pk	1m	48	34.5	39.5	6.8	10.46	49.34	74	-24.66
11.58	260	h	avg	1m	36.66	34.5	39.5	6.8	10.46	38	54	-16
17.36		h		noise floor								
11.58	260	v	pk	1m	57.1	34.5	39.5	6.8	10.46	58.44	74	-15.56
11.58	260	v	avg	1m	46.1	34.5	39.5	6.8	10.46	47.44	54	-6.56
17.36		v		noise floor								
10MHz 5840												
11.68	260	v	pk	1m	62.8	34.5	39.5	6.8	10.46	64.14	74	-9.86
11.68	260	v	avg	1m	50.5	34.5	39.5	6.8	10.46	51.84	54	-2.16
17.51	260	v	pk	1m	45.5	33.5	43	7.9	10.46	52.44	74	-21.56
17.51	260	v	avg	1m	33.5	33.5	43	7.9	10.46	40.44	54	-13.56
11.68	260	h	pk	1m	53.5	34.5	39.5	6.8	10.46	54.84	74	-19.16
11.68	260	h	avg	1m	41.5	34.5	39.5	6.8	10.46	42.84	54	-11.16
17.51	260	h	pk	1m	46.5	33.5	43	7.9	10.46	53.44	74	-20.56
17.51	260	h	avg	1m	34.5	33.5	43	7.9	10.46	41.44	54	-12.56



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Frequency (GHz)	Azimuth (Degrees)	Antenna Polarity (H/V)	Detector (avg/pk)	Height (m)	Raw Amp (dBuV)	Preamp Gain (dB)	Antenna Factor (dB)	Cable Loss (dB)	Distance Factor (dB)	Field Strength (dBuV/m)	Limit (dBuV/m)	Delta (dBuV/m)
20MHz 5745												
11.4	175	v	pk	1m	56.17	34.5	39.5	6.8	10.46	57.51	74	-16.49
11.4	175	v	avg	1m	43	34.5	39.5	6.8	10.46	44.34	54	-9.66
17.2		v			noise floor							
11.48	190	h	pk	1m	49.83	34.5	39.5	6.8	10.46	51.17	74	-22.83
11.48	190	h	avg	1m	37.5	34.5	39.5	6.8	10.46	38.84	54	-15.16
17.2		h			noise floor							
20MHz 5790												
11.58	340	h	pk	1m	48.33	34.5	39.5	6.8	10.46	49.67	74	-24.33
11.58	340	h	avg	1m	36.8	34.5	39.5	6.8	10.46	38.14	54	-15.86
17.36		h			noise floor							
11.58	170	v	pk	1m	55.17	34.5	39.5	6.8	10.46	56.51	74	-17.49
11.58	170	v	avg	1m	42.8	34.5	39.5	6.8	10.46	44.14	54	-9.86
17.36		v			noise floor							
20MHz 5835												
11.66	265	v	pk	1m	60.17	34.5	39.5	6.8	10.46	61.51	74	-12.49
11.66	175	v	avg	1m	47.33	34.5	39.5	6.8	10.46	48.67	54	-5.33
17.5		v			noise floor							
11.66	190	h	pk	1m	50.8	34.5	39.5	6.8	10.46	52.14	74	-21.86
11.66	190	h	avg	1m	37.5	34.5	39.5	6.8	10.46	38.84	54	-15.16
17.5		h			noise floor							

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3.2.6.3 28dB Grid - Pacific Wireless: Model # GD57-28 (continued)

Frequency (GHz)	Azimuth (Degrees)	Antenna Polarity (H/V)	Detector (avg/pk)	Height (m)	Raw Amp (dBuV)	Preamp Gain (dB)	Antenna Factor (dB)	Cable Loss (dB)	Distance Factor (dB)	Field Strength (dBuV/m)	Limit (dBuV/m)	Delta (dBuV/m)
40MHz 5755												
11.4		h								noise floor		
17.2		h								noise floor		
11.4		v								noise floor		
17.2		v								noise floor		
40MHz 5790												
11.58	340	h	pk	1m	46	34.5	39.5	6.8	10.46	47.34	74	-26.66
11.58	340	h	avg	1m	32.8	34.5	39.5	6.8	10.46	34.14	54	-19.86
17.36		h								noise floor		
11.58	260	v	pk	1m	52	34.5	39.5	6.8	10.46	53.34	74	-20.66
11.58	260	v	avg	1m	40.3	34.5	39.5	6.8	10.46	41.64	54	-12.36
17.36		v								noise floor		
40MHz 5820												
11.64	320	h	pk	1m	48.1	34.5	39.5	6.8	10.46	49.44	74	-24.56
11.64	340	h	avg	1m	35.5	34.5	39.5	6.8	10.46	36.84	54	-17.16
17.46		h								noise floor		
11.64	265	v	pk	1m	58.6	34.5	39.5	6.8	10.46	59.94	74	-14.06
11.64	265	v	avg	1m	44.8	34.5	39.5	6.8	10.46	46.14	54	-7.86
17.46		v								noise floor		



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Frequency (GHz)	Azimuth (Degrees)	Antenna Polarity (H/V)	Detector (avg/pk)	Height (m)	Raw Amp (dBuV)	Preamp Gain (dB)	Antenna Factor (dB)	Cable Loss (dB)	Distance Factor (dB)	Field Strength (dBuV/m)	Limit (dBuV/m)	Delta (dBuV/m)
50MHz 5760												
11.51	175	v	pk	1m	53	34.5	39.5	6.8	10.46	54.34	74	-19.66
11.51	175	v	avg	1m	38.8	34.5	39.5	6.8	10.46	40.14	54	-13.86
17.2		v		noise floor								
11.51	295	h	pk	1m	45.8	34.5	39.5	6.8	10.46	47.14	74	-26.86
11.51	295	h	avg	1m	33.3	34.5	39.5	6.8	10.46	34.64	54	-19.36
17.2		h		noise floor								
50MHz 5790												
11.58	295	h	pk	1m	45.1	34.5	39.5	6.8	10.46	46.44	74	-27.56
11.58	260	h	avg	1m	32.5	34.5	39.5	6.8	10.46	33.84	54	-20.16
17.36		h		noise floor								
11.58	260	v	pk	1m	51.1	34.5	39.5	6.8	10.46	52.44	74	-21.56
11.58	260	v	avg	1m	38.1	34.5	39.5	6.8	10.46	39.44	54	-14.56
17.36		v		noise floor								
50MHz 5815												
11.63	260	v	pk	1m	59	34.5	39.5	6.8	10.46	60.34	74	-13.66
11.64	260	v	avg	1m	46.5	34.5	39.5	6.8	10.46	47.84	54	-6.16
17.43		v		noise floor								
11.64	320	h	pk	1m	49.8	34.5	39.5	6.8	10.46	51.14	74	-22.86
11.64	320	h	avg	1m	37	34.5	39.5	6.8	10.46	38.34	54	-15.66
17.43		h		noise floor								

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3.2.6.4 Omni - Mars Antenna's and RF Systems: Model # MA-WO-58-9x

Frequency (GHz)	Azimuth (Degrees)	Antenna Polarity (H/V)	Detector (avg/pk)	Height (m)	Raw Amp (dBuV)	Preamp Gain (dB)	Antenna Factor (dB)	Cable Loss (dB)	Distance Factor (dB)	Field Strength (dBuV/m)	Limit (dBuV/m)	Delta (dBuV/m)
5MHz 5735												
11.4	180	v	pk	1m	61.5	34.5	39.5	6.8	10.46	62.84	74	-11.16
11.4	180	v	avg	1m	51.3	34.5	39.5	6.8	10.46	52.64	54	-1.36
17.2	185	v	pk	1m	55	33.5	43	7.9	10.46	61.94	74	-12.06
17.2	185	v	avg	1m	42.8	33.5	43	7.9	10.46	49.74	54	-4.26
11.4	185	h	pk	1m	55	34.5	39.5	6.8	10.46	56.34	74	-17.66
11.4	185	h	avg	1m	44.67	34.5	39.5	6.8	10.46	46.01	54	-7.99
17.2		h	noise floor									
5MHz 5790												
11.58	260	h	pk	1m	49.67	34.5	39.5	6.8	10.46	51.01	74	-22.99
11.58	260	h	avg	1m	38.5	34.5	39.5	6.8	10.46	39.84	54	-14.16
17.36	260	h	pk	1m	46.6	33.5	43	7.9	10.46	53.54	74	-20.46
17.36	260	h	avg	1m	35.8	33.5	43	7.9	10.46	42.74	54	-11.26
11.58	260	v	pk	1m	57.5	34.5	39.5	6.8	10.46	58.84	74	-15.16
11.58	260	v	avg	1m	48.1	34.5	39.5	6.8	10.46	49.44	54	-4.56
17.36	280	v	pk	1m	48	33.5	43	7.9	10.46	54.94	74	-19.06
17.36	280	v	avg	1m	35.8	33.5	43	7.9	10.46	42.74	54	-11.26
5MHz 5840												
11.68	260	v	pk	1m	63.8	34.5	39.5	6.8	10.46	65.14	74	-8.86
11.68	260	v	avg	1m	51	34.5	39.5	6.8	10.46	52.34	54	-1.66
17.51	260	v	pk	1m	45	33.5	43	7.9	10.46	51.94	74	-22.06
17.51	260	v	avg	1m	34.1	33.5	43	7.9	10.46	41.04	54	-12.96
11.68	260	h	pk	1m	55	34.5	39.5	6.8	10.46	56.34	74	-17.66
11.68	260	h	avg	1m	41.5	34.5	39.5	6.8	10.46	42.84	54	-11.16
17.51	280	h	pk	1m	49.33	33.5	43	7.9	10.46	56.27	74	-17.73
17.51	280	h	avg	1m	36.1	33.5	43	7.9	10.46	43.04	54	-10.96

Sample Calculation: Field Strength = Raw – Preamp Gain + ACF + Cable Loss - DCF

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3.2.6.4 Omni - Mars Antenna's and RF Systems: Model # MA-WO-58-9x (continued)

Frequency (GHz)	Azimuth (Degrees)	Antenna Polarity (H/V)	Detector (avg/pk)	Height (m)	Raw Amp (dBuV)	Preamp Gain (dB)	Antenna Factor (dB)	Cable Loss (dB)	Distance Factor (dB)	Field Strength (dBuV/m)	Limit (dBuV/m)	Delta (dBuV/m)
10MHz 5735												
11.47	185	h	pk	1m	51.5	34.5	39.5	6.8	10.46	52.84	74	-21.16
11.47	185	h	avg	1m	40.5	34.5	39.5	6.8	10.46	41.84	54	-12.16
17.2	265	h	pk	1m	47.33	33.5	43	7.9	10.46	54.27	74	-19.73
17.2	265	h	avg	1m	35.5	33.5	43	7.9	10.46	42.44	54	-11.56
11.4	175	v	pk	1m	58.33	34.5	39.5	6.8	10.46	59.67	74	-14.33
11.4	175	v	avg	1m	47.17	34.5	39.5	6.8	10.46	48.51	54	-5.49
17.2	225	v	pk	1m	46.83	33.5	43	7.9	10.46	53.77	74	-20.23
17.2	225	v	avg	1m	33.8	33.5	43	7.9	10.46	40.74	54	-13.26
10MHz 5790												
11.58	260	h	pk	1m	48	34.5	39.5	6.8	10.46	49.34	74	-24.66
11.58	260	h	avg	1m	36.66	34.5	39.5	6.8	10.46	38	54	-16
17.36		h		noise floor								
11.58	260	v	pk	1m	57.1	34.5	39.5	6.8	10.46	58.44	74	-15.56
11.58	260	v	avg	1m	46.1	34.5	39.5	6.8	10.46	47.44	54	-6.56
17.36		v		noise floor								
10MHz 5840												
11.68	260	v	pk	1m	62.8	34.5	39.5	6.8	10.46	64.14	74	-9.86
11.68	260	v	avg	1m	50.5	34.5	39.5	6.8	10.46	51.84	54	-2.16
17.51	260	v	pk	1m	45.5	33.5	43	7.9	10.46	52.44	74	-21.56
17.51	260	v	avg	1m	33.5	33.5	43	7.9	10.46	40.44	54	-13.56
11.68	260	h	pk	1m	53.5	34.5	39.5	6.8	10.46	54.84	74	-19.16
11.68	260	h	avg	1m	41.5	34.5	39.5	6.8	10.46	42.84	54	-11.16
17.51	260	h	pk	1m	46.5	33.5	43	7.9	10.46	53.44	74	-20.56
17.51	260	h	avg	1m	34.5	33.5	43	7.9	10.46	41.44	54	-12.56



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Frequency (GHz)	Azimuth (Degrees)	Antenna Polarity (H/V)	Detector (avg/pk)	Height (m)	Raw Amp (dBuV)	Preamp Gain (dB)	Antenna Factor (dB)	Cable Loss (dB)	Distance Factor (dB)	Field Strength (dBuV/m)	Limit (dBuV/m)	Delta (dBuV/m)
20MHz 5745												
11.4	175	v	pk	1m	56.17	34.5	39.5	6.8	10.46	57.51	74	-16.49
11.4	175	v	avg	1m	43	34.5	39.5	6.8	10.46	44.34	54	-9.66
17.2		v			noise floor							
11.48	190	h	pk	1m	49.83	34.5	39.5	6.8	10.46	51.17	74	-22.83
11.48	190	h	avg	1m	37.5	34.5	39.5	6.8	10.46	38.84	54	-15.16
17.2		h			noise floor							
20MHz 5790												
11.58	340	h	pk	1m	48.33	34.5	39.5	6.8	10.46	49.67	74	-24.33
11.58	340	h	avg	1m	36.8	34.5	39.5	6.8	10.46	38.14	54	-15.86
17.36		h			noise floor							
11.58	170	v	pk	1m	55.17	34.5	39.5	6.8	10.46	56.51	74	-17.49
11.58	170	v	avg	1m	42.8	34.5	39.5	6.8	10.46	44.14	54	-9.86
17.36		v			noise floor							
20MHz 5835												
11.66	265	v	pk	1m	60.17	34.5	39.5	6.8	10.46	61.51	74	-12.49
11.66	175	v	avg	1m	47.33	34.5	39.5	6.8	10.46	48.67	54	-5.33
17.5		v			noise floor							
11.66	190	h	pk	1m	50.8	34.5	39.5	6.8	10.46	52.14	74	-21.86
11.66	190	h	avg	1m	37.5	34.5	39.5	6.8	10.46	38.84	54	-15.16
17.5		h			noise floor							

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3.2.6.4 Omni - Mars Antenna's and RF Systems: Model # MA-WO-58-9x (continued)

Frequency (GHz)	Azimuth (Degrees)	Antenna Polarity (H/V)	Detector (avg/pk)	Height (m)	Raw Amp (dBuV)	Preamp Gain (dB)	Antenna Factor (dB)	Cable Loss (dB)	Distance Factor (dB)	Field Strength (dBuV/m)	Limit (dBuV/m)	Delta (dBuV/m)
40MHz 5755												
11.4		h								noise floor		
17.2		h								noise floor		
11.4		v								noise floor		
17.2		v								noise floor		
40MHz 5790												
11.58	340	h	pk	1m	46	34.5	39.5	6.8	10.46	47.34	74	-26.66
11.58	340	h	avg	1m	32.8	34.5	39.5	6.8	10.46	34.14	54	-19.86
17.36		h								noise floor		
11.58	260	v	pk	1m	52	34.5	39.5	6.8	10.46	53.34	74	-20.66
11.58	260	v	avg	1m	40.3	34.5	39.5	6.8	10.46	41.64	54	-12.36
17.36		v								noise floor		
40MHz 5820												
11.64	320	h	pk	1m	48.1	34.5	39.5	6.8	10.46	49.44	74	-24.56
11.64	340	h	avg	1m	35.5	34.5	39.5	6.8	10.46	36.84	54	-17.16
17.46		h								noise floor		
11.64	265	v	pk	1m	58.6	34.5	39.5	6.8	10.46	59.94	74	-14.06
11.64	265	v	avg	1m	44.8	34.5	39.5	6.8	10.46	46.14	54	-7.86
17.46		v								noise floor		



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Frequency (GHz)	Azimuth (Degrees)	Antenna Polarity (H/V)	Detector (avg/pk)	Height (m)	Raw Amp (dBuV)	Preamp Gain (dB)	Antenna Factor (dB)	Cable Loss (dB)	Distance Factor (dB)	Field Strength (dBuV/m)	Limit (dBuV/m)	Delta (dBuV/m)
50MHz 5760												
11.51	175	v	pk	1m	53	34.5	39.5	6.8	10.46	54.34	74	-19.66
11.51	175	v	avg	1m	38.8	34.5	39.5	6.8	10.46	40.14	54	-13.86
17.2		v		noise floor								
11.51	295	h	pk	1m	45.8	34.5	39.5	6.8	10.46	47.14	74	-26.86
11.51	295	h	avg	1m	33.3	34.5	39.5	6.8	10.46	34.64	54	-19.36
17.2		h		noise floor								
50MHz 5790												
11.58	295	h	pk	1m	45.1	34.5	39.5	6.8	10.46	46.44	74	-27.56
11.58	260	h	avg	1m	32.5	34.5	39.5	6.8	10.46	33.84	54	-20.16
17.36		h		noise floor								
11.58	260	v	pk	1m	51.1	34.5	39.5	6.8	10.46	52.44	74	-21.56
11.58	260	v	avg	1m	38.1	34.5	39.5	6.8	10.46	39.44	54	-14.56
17.36		v		noise floor								
50MHz 5815												
11.63	260	v	pk	1m	59	34.5	39.5	6.8	10.46	60.34	74	-13.66
11.64	260	v	avg	1m	46.5	34.5	39.5	6.8	10.46	47.84	54	-6.16
17.43		v		noise floor								
11.64	320	h	pk	1m	49.8	34.5	39.5	6.8	10.46	51.14	74	-22.86
11.64	320	h	avg	1m	37	34.5	39.5	6.8	10.46	38.34	54	-15.66
17.43		h		noise floor								

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3.2.6.5 Sector - Mars Antenna's and RF Systems: 60 degree - MA-WC50-5x

Frequency (GHz)	Azimuth (Degrees)	Antenna Polarity (H/V)	Detector (avg/pk)	Height (m)	Raw Amp (dBuV)	Preamp Gain (dB)	Antenna Factor (dB)	Cable Loss (dB)	Distance Factor (dB)	Field Strength (dBuV/m)	Limit (dBuV/m)	Delta (dBuV/m)
5MHz 5735												
11.4	180	v	pk	1m	61.5	34.5	39.5	6.8	10.46	62.84	74	-11.16
11.4	180	v	avg	1m	51.3	34.5	39.5	6.8	10.46	52.64	54	-1.36
17.2	185	v	pk	1m	55	33.5	43	7.9	10.46	61.94	74	-12.06
17.2	185	v	avg	1m	42.8	33.5	43	7.9	10.46	49.74	54	-4.26
11.4	185	h	pk	1m	55	34.5	39.5	6.8	10.46	56.34	74	-17.66
11.4	185	h	avg	1m	44.67	34.5	39.5	6.8	10.46	46.01	54	-7.99
17.2		h	noise floor									
5MHz 5790												
11.58	260	h	pk	1m	49.67	34.5	39.5	6.8	10.46	51.01	74	-22.99
11.58	260	h	avg	1m	38.5	34.5	39.5	6.8	10.46	39.84	54	-14.16
17.36	260	h	pk	1m	46.6	33.5	43	7.9	10.46	53.54	74	-20.46
17.36	260	h	avg	1m	35.8	33.5	43	7.9	10.46	42.74	54	-11.26
11.58	260	v	pk	1m	57.5	34.5	39.5	6.8	10.46	58.84	74	-15.16
11.58	260	v	avg	1m	48.1	34.5	39.5	6.8	10.46	49.44	54	-4.56
17.36	280	v	pk	1m	48	33.5	43	7.9	10.46	54.94	74	-19.06
17.36	280	v	avg	1m	35.8	33.5	43	7.9	10.46	42.74	54	-11.26
5MHz 5840												
11.68	260	v	pk	1m	63.8	34.5	39.5	6.8	10.46	65.14	74	-8.86
11.68	260	v	avg	1m	51	34.5	39.5	6.8	10.46	52.34	54	-1.66
17.51	260	v	pk	1m	45	33.5	43	7.9	10.46	51.94	74	-22.06
17.51	260	v	avg	1m	34.1	33.5	43	7.9	10.46	41.04	54	-12.96
11.68	260	h	pk	1m	55	34.5	39.5	6.8	10.46	56.34	74	-17.66
11.68	260	h	avg	1m	41.5	34.5	39.5	6.8	10.46	42.84	54	-11.16
17.51	280	h	pk	1m	49.33	33.5	43	7.9	10.46	56.27	74	-17.73
17.51	280	h	avg	1m	36.1	33.5	43	7.9	10.46	43.04	54	-10.96

Sample Calculation: Field Strength = Raw – Preamp Gain + ACF + Cable Loss - DCF

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3.2.6.5 Sector - Mars Antenna's and RF Systems: 60 degree - MA-WC50-5x (continued)

Frequency (GHz)	Azimuth (Degrees)	Antenna Polarity (H/V)	Detector (avg/pk)	Height (m)	Raw Amp (dBuV)	Preamp Gain (dB)	Antenna Factor (dB)	Cable Loss (dB)	Distance Factor (dB)	Field Strength (dBuV/m)	Limit (dBuV/m)	Delta (dBuV/m)
10MHz 5735												
11.47	185	h	pk	1m	51.5	34.5	39.5	6.8	10.46	52.84	74	-21.16
11.47	185	h	avg	1m	40.5	34.5	39.5	6.8	10.46	41.84	54	-12.16
17.2	265	h	pk	1m	47.33	33.5	43	7.9	10.46	54.27	74	-19.73
17.2	265	h	avg	1m	35.5	33.5	43	7.9	10.46	42.44	54	-11.56
11.4	175	v	pk	1m	58.33	34.5	39.5	6.8	10.46	59.67	74	-14.33
11.4	175	v	avg	1m	47.17	34.5	39.5	6.8	10.46	48.51	54	-5.49
17.2	225	v	pk	1m	46.83	33.5	43	7.9	10.46	53.77	74	-20.23
17.2	225	v	avg	1m	33.8	33.5	43	7.9	10.46	40.74	54	-13.26
10MHz 5790												
11.58	260	h	pk	1m	48	34.5	39.5	6.8	10.46	49.34	74	-24.66
11.58	260	h	avg	1m	36.66	34.5	39.5	6.8	10.46	38	54	-16
17.36		h		noise floor								
11.58	260	v	pk	1m	57.1	34.5	39.5	6.8	10.46	58.44	74	-15.56
11.58	260	v	avg	1m	46.1	34.5	39.5	6.8	10.46	47.44	54	-6.56
17.36		v		noise floor								
10MHz 5840												
11.68	260	v	pk	1m	62.8	34.5	39.5	6.8	10.46	64.14	74	-9.86
11.68	260	v	avg	1m	50.5	34.5	39.5	6.8	10.46	51.84	54	-2.16
17.51	260	v	pk	1m	45.5	33.5	43	7.9	10.46	52.44	74	-21.56
17.51	260	v	avg	1m	33.5	33.5	43	7.9	10.46	40.44	54	-13.56
11.68	260	h	pk	1m	53.5	34.5	39.5	6.8	10.46	54.84	74	-19.16
11.68	260	h	avg	1m	41.5	34.5	39.5	6.8	10.46	42.84	54	-11.16
17.51	260	h	pk	1m	46.5	33.5	43	7.9	10.46	53.44	74	-20.56
17.51	260	h	avg	1m	34.5	33.5	43	7.9	10.46	41.44	54	-12.56



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Frequency (GHz)	Azimuth (Degrees)	Antenna Polarity (H/V)	Detector (avg/pk)	Height (m)	Raw Amp (dBuV)	Preamp Gain (dB)	Antenna Factor (dB)	Cable Loss (dB)	Distance Factor (dB)	Field Strength (dBuV/m)	Limit (dBuV/m)	Delta (dBuV/m)
20MHz 5745												
11.4	175	v	pk	1m	56.17	34.5	39.5	6.8	10.46	57.51	74	-16.49
11.4	175	v	avg	1m	43	34.5	39.5	6.8	10.46	44.34	54	-9.66
17.2		v		noise floor								
11.48	190	h	pk	1m	49.83	34.5	39.5	6.8	10.46	51.17	74	-22.83
11.48	190	h	avg	1m	37.5	34.5	39.5	6.8	10.46	38.84	54	-15.16
17.2		h		noise floor								
20MHz 5790												
11.58	340	h	pk	1m	48.33	34.5	39.5	6.8	10.46	49.67	74	-24.33
11.58	340	h	avg	1m	36.8	34.5	39.5	6.8	10.46	38.14	54	-15.86
17.36		h		noise floor								
11.58	170	v	pk	1m	55.17	34.5	39.5	6.8	10.46	56.51	74	-17.49
11.58	170	v	avg	1m	42.8	34.5	39.5	6.8	10.46	44.14	54	-9.86
17.36		v		noise floor								
20MHz 5835												
11.66	265	v	pk	1m	60.17	34.5	39.5	6.8	10.46	61.51	74	-12.49
11.66	175	v	avg	1m	47.33	34.5	39.5	6.8	10.46	48.67	54	-5.33
17.5		v		noise floor								
11.66	190	h	pk	1m	50.8	34.5	39.5	6.8	10.46	52.14	74	-21.86
11.66	190	h	avg	1m	37.5	34.5	39.5	6.8	10.46	38.84	54	-15.16
17.5		h		noise floor								

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3.2.6.5 Sector - Mars Antenna's and RF Systems: 60 degree - MA-WC50-5x (continued)

Frequency (GHz)	Azimuth (Degrees)	Antenna Polarity (H/V)	Detector (avg/pk)	Height (m)	Raw Amp (dBuV)	Preamp Gain (dB)	Antenna Factor (dB)	Cable Loss (dB)	Distance Factor (dB)	Field Strength (dBuV/m)	Limit (dBuV/m)	Delta (dBuV/m)
40MHz 5755												
11.4		h								noise floor		
17.2		h								noise floor		
11.4		v								noise floor		
17.2		v								noise floor		
40MHz 5790												
11.58	340	h	pk	1m	46	34.5	39.5	6.8	10.46	47.34	74	-26.66
11.58	340	h	avg	1m	32.8	34.5	39.5	6.8	10.46	34.14	54	-19.86
17.36		h								noise floor		
11.58	260	v	pk	1m	52	34.5	39.5	6.8	10.46	53.34	74	-20.66
11.58	260	v	avg	1m	40.3	34.5	39.5	6.8	10.46	41.64	54	-12.36
17.36		v								noise floor		
40MHz 5820												
11.64	320	h	pk	1m	48.1	34.5	39.5	6.8	10.46	49.44	74	-24.56
11.64	340	h	avg	1m	35.5	34.5	39.5	6.8	10.46	36.84	54	-17.16
17.46		h								noise floor		
11.64	265	v	pk	1m	58.6	34.5	39.5	6.8	10.46	59.94	74	-14.06
11.64	265	v	avg	1m	44.8	34.5	39.5	6.8	10.46	46.14	54	-7.86
17.46		v								noise floor		



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Frequency (GHz)	Azimuth (Degrees)	Antenna Polarity (H/V)	Detector (avg/pk)	Height (m)	Raw Amp (dBuV)	Preamp Gain (dB)	Antenna Factor (dB)	Cable Loss (dB)	Distance Factor (dB)	Field Strength (dBuV/m)	Limit (dBuV/m)	Delta (dBuV/m)
50MHz 5760												
11.51	175	v	pk	1m	53	34.5	39.5	6.8	10.46	54.34	74	-19.66
11.51	175	v	avg	1m	38.8	34.5	39.5	6.8	10.46	40.14	54	-13.86
17.2		v		noise floor								
11.51	295	h	pk	1m	45.8	34.5	39.5	6.8	10.46	47.14	74	-26.86
11.51	295	h	avg	1m	33.3	34.5	39.5	6.8	10.46	34.64	54	-19.36
17.2		h		noise floor								
50MHz 5790												
11.58	295	h	pk	1m	45.1	34.5	39.5	6.8	10.46	46.44	74	-27.56
11.58	260	h	avg	1m	32.5	34.5	39.5	6.8	10.46	33.84	54	-20.16
17.36		h		noise floor								
11.58	260	v	pk	1m	51.1	34.5	39.5	6.8	10.46	52.44	74	-21.56
11.58	260	v	avg	1m	38.1	34.5	39.5	6.8	10.46	39.44	54	-14.56
17.36		v		noise floor								
50MHz 5815												
11.63	260	v	pk	1m	59	34.5	39.5	6.8	10.46	60.34	74	-13.66
11.64	260	v	avg	1m	46.5	34.5	39.5	6.8	10.46	47.84	54	-6.16
17.43		v		noise floor								
11.64	320	h	pk	1m	49.8	34.5	39.5	6.8	10.46	51.14	74	-22.86
11.64	320	h	avg	1m	37	34.5	39.5	6.8	10.46	38.34	54	-15.66
17.43		h		noise floor								

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3.2.7 Peak Power Spectral Density

Requirement(s): 47 CFR §15.247(d)

Procedures: The peak power spectral density measured at the antenna terminal using a spectrum analyzer. The measurements were made for the 5MHz, 10MHz, 20MHz, 40MHz, and 50MHz bandwidths at the high, middle, and low channels.

Results:

Plot #	Frequency (MHz)	Channel	Channel Bandwidth (MHz)		PPSD (dBm)	Limit (dBm)
106	5840	hi	5	1.67	-3.67	8
107	5790	mid	5	3.17	-1.67	8
108	5735	low	5	-1.5	-2.0	8
109	5840	hi	10	0.83	-0.33	8
110	5790	mid	10	0.83	-2.83	8
111	5735	low	10	-4.5	-3.83	8
112	5835	hi	20	-1.33	-6.5	8
113	5790	mid	20	0.33	0.17	8
114	5745	low	20	-2.5	-2.67	8
115	5820	hi	40	-0.17	-5.33	8
116	5790	mid	40	-0.5	-4.5	8
117	5755	low	40	-3.83	-4.67	8
118	5815	hi	50	-0.5	-6.0	8
119	5790	mid	50	-0.33	-0.5	8
120	5760	low	50	4.0	-4.33	8



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4.1 TEST INSTRUMENTATION

[illegible]

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APPENDIX A: EUT TEST CONDITIONS

The following is the description of supporting equipment and details of cables used with the EUT.

Equipment Description (Including Brand Name)	Cable Description
PC Laptop	1. Power cord 2. Ethernet

EUT Description	: AIRAYA WirelessGRID
Model No	: AI108
Serial No	: none

The following is the description of how the EUT is exercised during testing.

Test	Description Of Operation
	The EUT was controlled and monitored via Ethernet by a PC running a radio test program. The data rate was set at maximum at each bandwidth to simulate worse case conditions during the equipment operation.



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APPENDIX B: External Photos

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APPENDIX C: CIRCUIT/BLOCK DIAGRAMS

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APPENDIX D: Internal Photos

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APPENDIX F: PRODUCT DESCRIPTION

Detail description of this product is shown in the User's Guide.



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APPENDIX H: FCC LABEL LOCATION

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APPENDIX I: USER MANUAL

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APPENDIX J: Plots

See Attachment