F2 Labs
16740 Peters Road
Middlefield, Ohio 44062
United States of America
www.f2labs.com

Manufacturer:	**Chandler Systems, Inc.** **710 Orange Street** **Ashland, Ohio 44805 USA**
Applicant:	**Same as Above**
Antenna:	**Chandler Custom PCB Trace Antenna**
Testing Commenced:	2024-04-25
Testing Ended:	2024-04-25
	Note: Test report reflects antenna measurements to support FCC ID: SWP-EVB-034.
Evaluation Conducted by:	Julius Chiller, Senior Wireless Project Engineer
Report Reviewed by:	Ken Littell, Vice President of Operations

F2 Labs
26501 Ridge Road
Damascus, MD 20872
Ph 301.253.4500

F2 Labs
16740 Peters Road
Middlefield, OH 44062
Ph 440.632.5541

F2 Labs
8583 Zionsville Road
Indianapolis, IN 46268
Ph 317.610.0611

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1 ADMINISTRATIVE INFORMATION

1.1 Measurement Location:

F2 Labs in Middlefield, Ohio. Site description and attenuation data are on file with the FCC's Sampling and Measurement Branch at the FCC Laboratory in Columbia, MD.

1.2 Measurement Procedure:

All measurements were performed according to ANSI C63.10 and recommended FCC procedure of measurement.

1.3 Document History

Document Number	Description	Issue Date	Approved By
F2P30963A-05E	First Issue	2024-04-27	K. Littell

2 EUT INFORMATION AND DATA

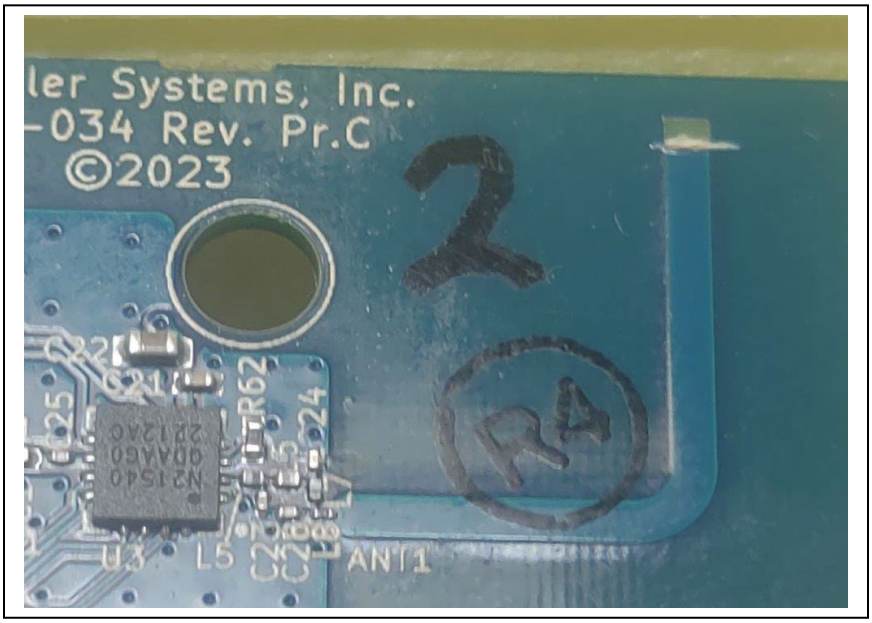
2.1 Equipment Under Test:

Antenna: Chandler Custom PCB Trace Antenna
Monopole, -2.7dBi Gain
Note: The gain was determined using the method stated in ANSI C63.10;

$$P(dBm) = E(dBuV/m) + 20LOG(d) - G - 104.77$$

- **G = 111.5 + 9.5 - 104.7 - 18.37 = -2.07dBi**

Radiated power – Conducted power = Gain (dBi)



2.2 Accessories:

Device	Manufacturer	Model Number	Serial Number
Legacy View Valve FCC ID: SWP-EVB-034	Chandler Systems, Inc.	EVB-034	000001

3 LIST OF MEASUREMENT INSTRUMENTATION

Equipment Type	Asset Number	Manufacturer	Model	Serial Number	Calibration Due Date
Shielded Chamber	CL166-E	Albatross Projects	B83117-DF435-T261	US140023	2024-11-15
Temp/Hum. Recorder	CL232	Extech	445814	01	2025-05-19
Receiver	CL151	Rohde & Schwarz	ESU40	100319	2025-04-09
Horn Antenna	CL098	Emco	3115	9809-5580	2025-01-02
Pre-Amplifier	CL153	Agilent	83006-69007	MY57280115	2024-11-14
Software:	EMC 32, Version 8.53.0		Software Verified: 2024-04-25		

4 MEASUREMENTS

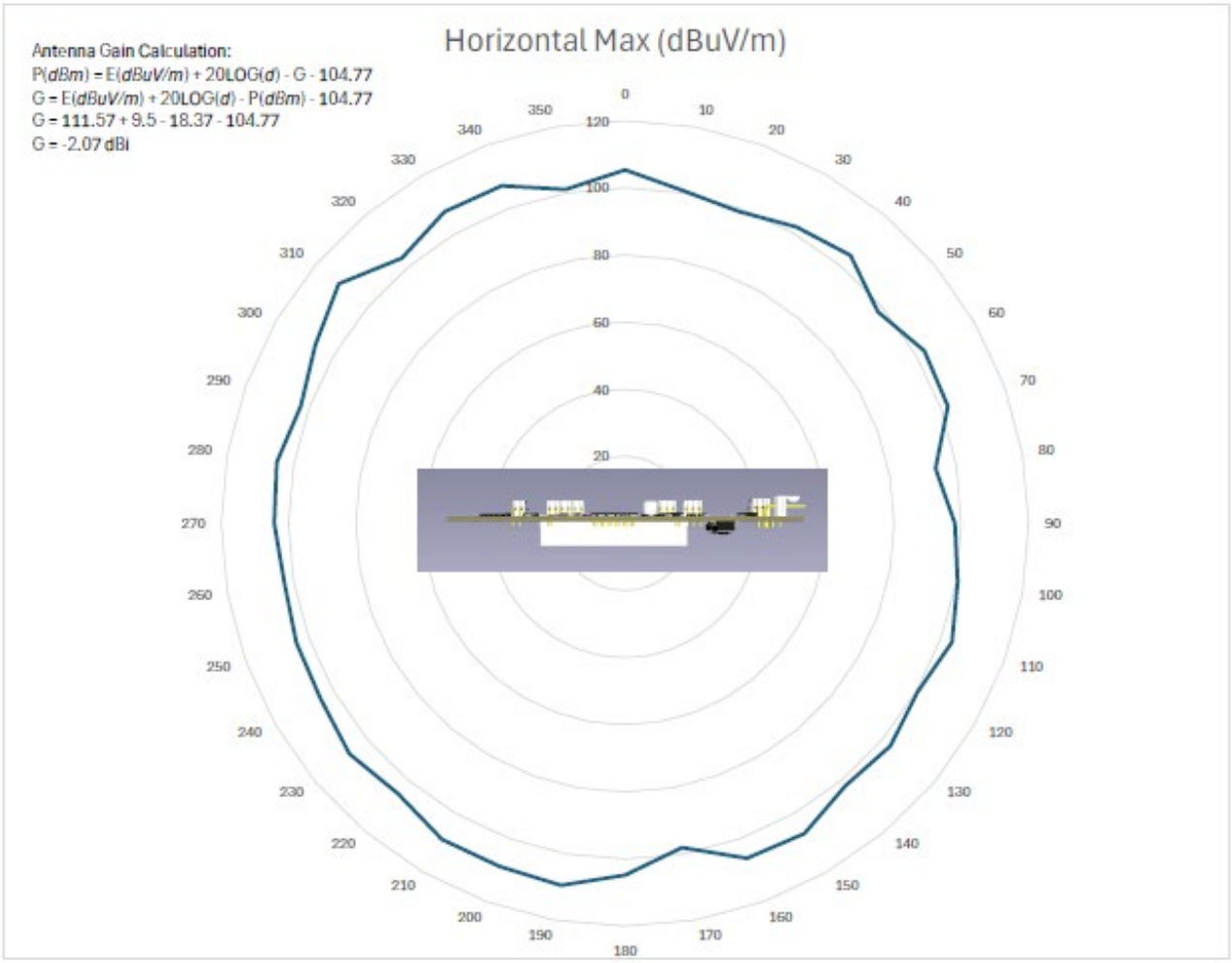
Test Date(s):	2024-04-25	**Test Engineer:**	J. Chiller
Relative Humidity:	41%	**Air Temperature:**	20.7ºC

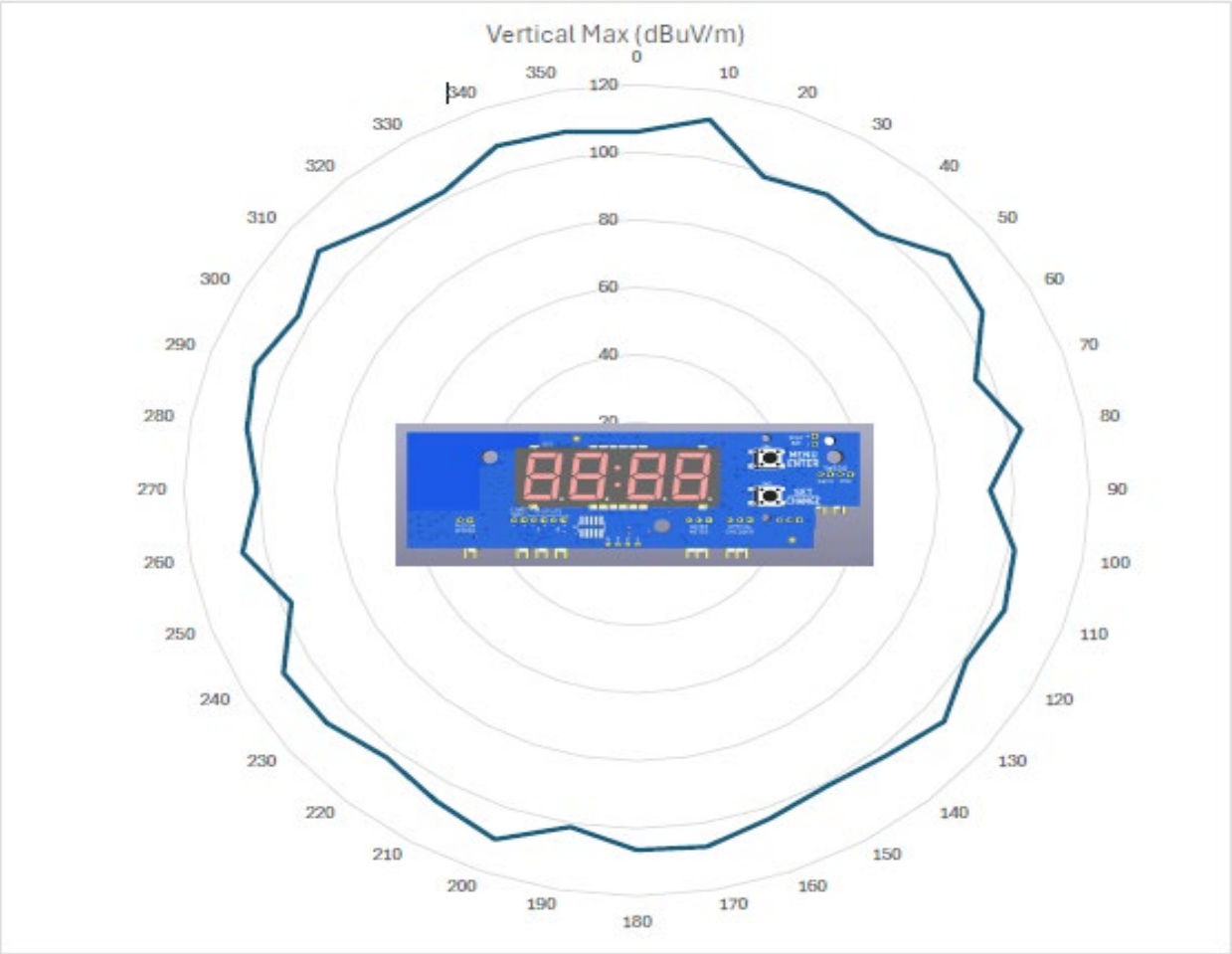
Vertical

Frequency (MHz)	MaxPeak dBuV/m	Azimuth (deg)	Delta
2480.000000	106.0	0.0	5.3
2480.000000	111.3	10.0	0.0
2480.000000	98.6	20.0	12.7
2480.000000	100.9	30.0	10.4
2480.000000	99.2	40.0	12.1
2480.000000	107.9	50.0	3.4
2480.000000	105.8	60.0	5.5
2480.000000	95.6	70.0	15.7
2480.000000	103.5	80.0	7.8
2480.000000	93.7	90.0	17.6
2480.000000	101.7	100.0	9.6
2480.000000	103.7	110.0	7.6
2480.000000	100.9	120.0	10.4
2480.000000	106.4	130.0	4.9
2480.000000	102.6	140.0	8.7
2480.000000	101.0	150.0	10.3
2480.000000	103.3	160.0	8.0
2480.000000	107.0	170.0	4.3
2480.000000	106.4	180.0	4.9
2480.000000	101.1	190.0	10.2
2480.000000	109.9	200.0	1.4
2480.000000	106.2	210.0	5.1
2480.000000	103.1	220.0	8.2
2480.000000	107.2	230.0	4.1
2480.000000	108.1	240.0	3.2
2480.000000	97.4	250.0	13.9
2480.000000	106.1	260.0	5.2
2480.000000	100.6	270.0	10.7
2480.000000	104.9	280.0	6.4
2480.000000	107.6	290.0	3.7
2480.000000	103.5	300.0	7.8
2480.000000	110.0	310.0	1.3
2480.000000	103.3	320.0	8.0
2480.000000	102.0	330.0	9.3
2480.000000	108.4	340.0	2.9
2480.000000	107.7	350.0	3.6

Horizontal

Frequency (MHz)	MaxPeak dBuV/m	Azimuth (deg)	Delta
2480.000000	101.1	350.0	10.0
2480.000000	107.1	340.0	4.0
2480.000000	107.3	330.0	3.8
2480.000000	103.2	320.0	7.9
2480.000000	111.1	310.0	0.0
2480.000000	106.3	300.0	4.8
2480.000000	102.5	290.0	8.6
2480.000000	105.1	280.0	6.0
2480.000000	104.3	270.0	6.8
2480.000000	102.8	260.0	8.3
2480.000000	104.0	250.0	7.1
2480.000000	104.5	240.0	6.6
2480.000000	106.9	230.0	4.2
2480.000000	105.1	220.0	6.0
2480.000000	108.8	210.0	2.3
2480.000000	108.8	200.0	2.3
2480.000000	109.5	190.0	1.6
2480.000000	104.8	180.0	6.3
2480.000000	98.1	170.0	13.0
2480.000000	106.2	160.0	4.9
2480.000000	106.7	150.0	4.4
2480.000000	102.0	140.0	9.1
2480.000000	103.1	130.0	8.0
2480.000000	100.5	120.0	10.6
2480.000000	103.5	110.0	7.6
2480.000000	100.5	100.0	10.6
2480.000000	98.1	90.0	13.0
2480.000000	93.8	80.0	17.3
2480.000000	102.2	70.0	8.9
2480.000000	102.8	60.0	8.3
2480.000000	98.2	50.0	12.9
2480.000000	104.3	40.0	6.8
2480.000000	102.0	30.0	9.1
2480.000000	99.0	20.0	12.1
2480.000000	100.7	10.0	10.4
2480.000000	105.4	0.0	5.7


Antenna Gain Calculation:
P(dBm) = E(dBuV/m) + 20LOG(d) - G - 104.77
G = E(dBuV/m) + 20LOG(d) - P(dBm) - 104.77
G = 111.57 + 9.5 - 18.37 - 104.77
G = -2.07 dBi
Horizontal Max (dBuV/m)
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
160
170
180
190
200
210
220
230
240
250
260
270
280
290
300
310
320
330
340
350
120
100
80
60
40
20


Vertical Max (dBuV/m)
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
160
170
180
190
200
210
220
230
240
250
260
270
280
290
300
310
320
330
340
350
120
100
80
60
40
20

5 EUT SETUP PHOTOGRAPH(S)

Radiated Measurement Test Setup