Antenna Test Report

REPORT NO.		**OT230315009**
APPLICANT	:	**Tesla, Inc.**
MANUFACTURER	:	**Tesla, Inc.**
EQUIPMENT	:	**UHF Antenna**
DATE OF RECEIPT	:	**February 2, 2023**
DATE OF TEST	:	**February 2, 2023**
ISSUE DATE	:	**April 5, 2023**

Testing by:

Neil Kao

We, SPORTON INTERNATIONAL (USA) INC., would like to declare that the tested sample has been evaluated in accordance with the procedures and shown the compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL (USA) INC., the test report shall not be reproduced except in full.

The declared product specification for EUT presented in this report is provided by the manufacturer / applicant, and the manufacturer / applicant takes all the responsibilities for the accuracy of product specification.

SPORTON INTERNATIONAL (USA) INC.

Table of Contents

Revision History

REPORT NO.	VERSION	DESCRIPTION	ISSUE DATE
OT230315009	1.0	Initial issue of report	April 5, 2023

1. Test Laboratory

Test Site	Sporton International Inc. ☐ EMC & Wireless Communications Laboratory ☐ Wensan Laboratory ■ Sporton International (USA) inc.
Address	Sporton International (USA) inc.: 1175 Montague Expressway, Milpitas, CA 95035 USA
Chamber	EMC & Wireless Communications Laboratory: ☐ OTA01-HY ☐ OTA03-HY ☐ OTA04-HY ☐ OTA05-HY Wensan Laboratory: ☐ OTA07-HY ☐ OTA08-HY ☐ OTA10-HY Sporton International (USA) inc.: ☐ OTA01-CA ☐ OTA02-CA ■ 05CH01-CA

■ : The chamber(s) which used to perform the test in this test report.

2. Client Information

2.1 Applicant

Company Name	Tesla, Inc.
Address	3500 DEER CREEK ROAD PALO ALTO, CA 94304
Contact Person	Viraj Andrabadu Kurundu Patabendige / vandrabadukurundu@tesla.com

2.2 Manufacturer

Company Name	Tesla, Inc.
Address	3500 DEER CREEK ROAD PALO ALTO, CA 94304

3. Equipment Under test(EUT) Information

3.1 Description of EUT

Product Feature & Specification	
EUT Type	AC MAGIC DOCK HANDLE
Brand Name	Tesla
Model Number	1734412-XX-X Note: For internal purposes, the X will be the style code and Y will be the revision. X and Y can be any from 0~9 or A~Z
Antenna Type	PCB Antenna

4. Measurement Environment

Ambient Condition

Temperature (°C):	25℃ +/- 5℃	Humidity (%):	<60%

Test Equipment List

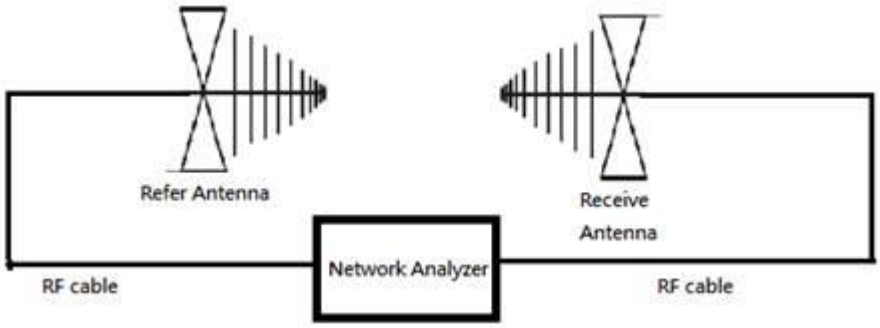
Name	Manufacturer	Type/Model	Serial Number	Calibration	
				Last Cal.	Due Date
ENA Series Network Analyzer	R&S	ZVB8	100110	Sep.02, 2022	Sep.01, 2023
Bilog Antenna	TESEQ	6111D	50391	Jul.28, 2022	Jul.27, 2023
Bilog Antenna	TESEQ	6111D	50392	Jul.11, 2022	Jul.10, 2023
Controller	ChainTek	3000-1	N/A	NCR	NCR
Antenna Mast	ChainTek	MBS-520-1	N/A	NCR	NCR
Turn Table	ChainTek	T-200-S-1	N/A	NCR	NCR

Passive Antenna Measurement Setup

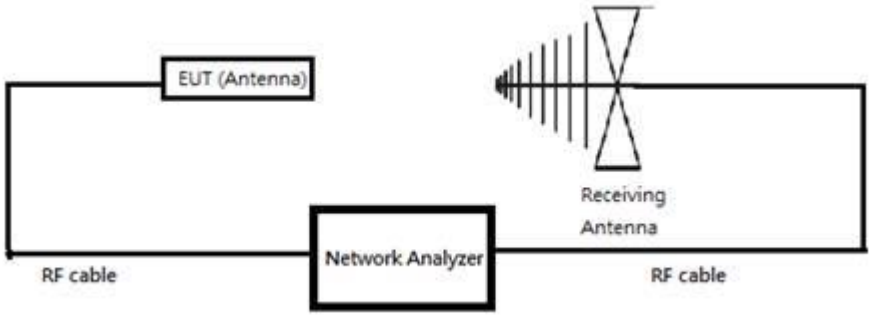
Test procedure

1. To identify the path loss at 315MHz using a reference antenna.
2. 0dBm power transmitted by a network analyzer through the reference antenna while the receiving antenna is placed opposite.
3. Record the reading on the network analyzer to determine the path loss.

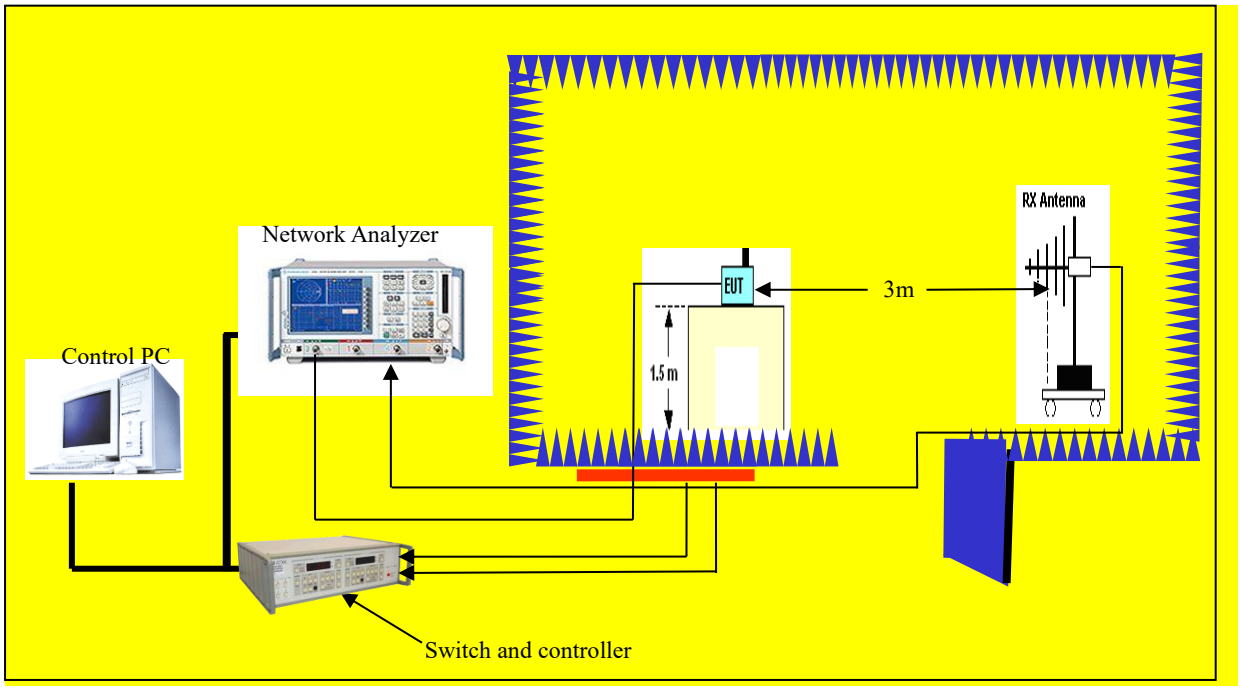
   System Path loss = Network Analyzer readings - reference antenna gain



4. Once the entire system is calibrated and validated, replace the reference antenna with your antenna, then repeat the step mentioned above to obtain the gains.
   Antenna Gain = Network Analyzer readings - system Path loss



Then place the EUT on the turntable for radiated measurement, the measured power level of the EUT was maximized by rotating the EUT on a turntable, adjusting the orientation of the EUT and EUT antenna in three orthogonal axis (X-Y: portrait, Y-Z: landscape, X-Z: flat)



5. Summary of Test Results

5.1 Declaration

Conformity Assessment Condition
The test results with all measurement uncertainty excluded are presented against the regulation limits or in accordance with the requirements stipulated by the applicant/manufacturer.
Disclaimer
The product specifications of the EUT presented in the test report that may affect the test assessments are declared by the manufacturer who shall take full responsibility for the authenticity.

5.2 Abbreviations and Definitions

Please note the following abbreviations in this section:

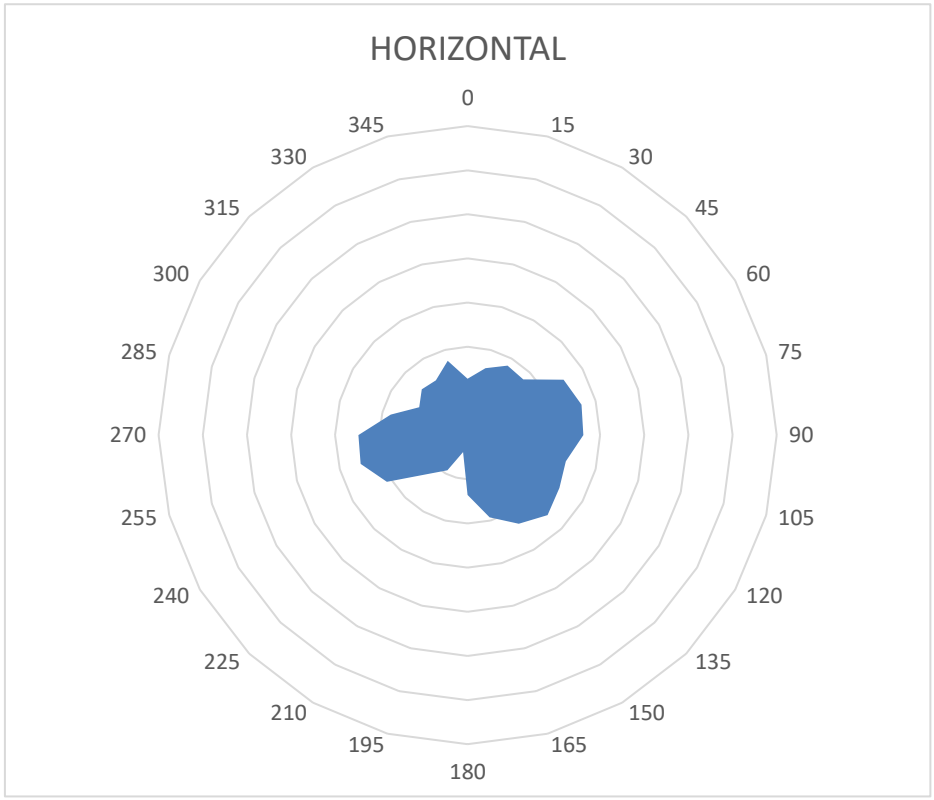
FS = Free Space

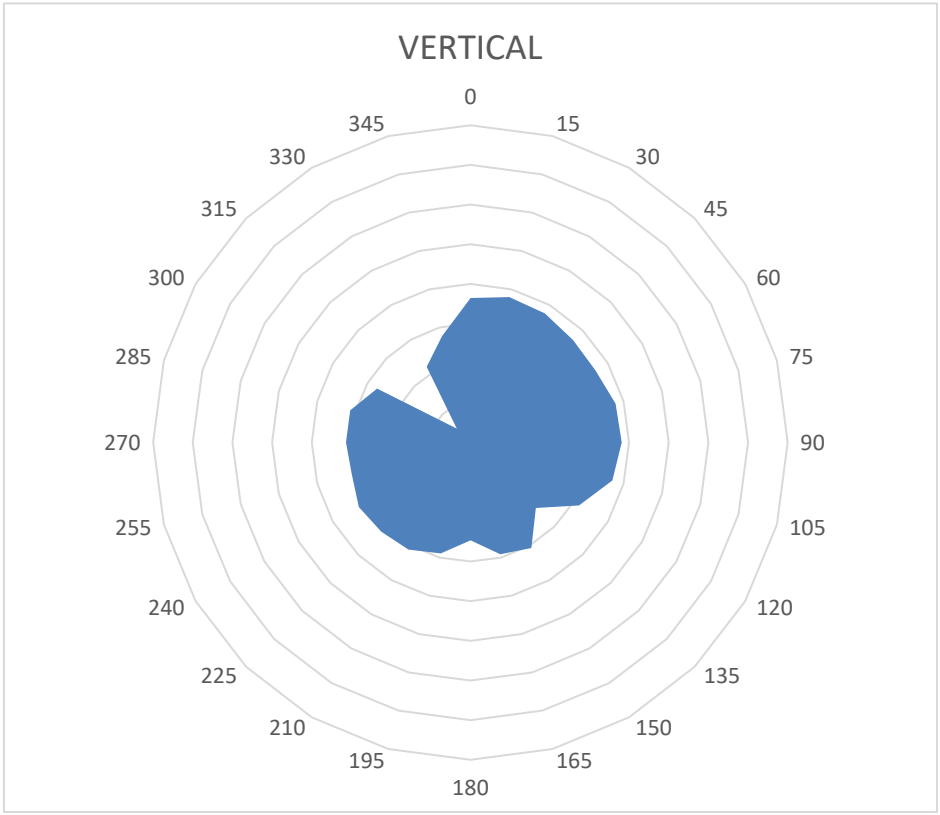
5.3 Summary Table

315 MHz	Ant. Port Input Pwr. (dBm)	2D Plane					
		X-Y		Y-Z		X-Z	
Angle		Gain Horizontal (dBi)	Gain Vertical (dBi)	Gain Horizontal (dBi)	Gain Vertical (dBi)	Gain Horizontal (dBi)	Gain Vertical (dBi)
0	0.00	-57.25	-43.54	-60.12	-44.67	-46.18	-44.24
15	0.00	-54.31	-42.03	-48.59	-48.55	-45.19	-49.95
30	0.00	-51.84	-42.44	-44.65	-52.87	-45.49	-62.57
45	0.00	-52.17	-43.42	-44.48	-53.73	-45.66	-52.12
60	0.00	-44.88	-43.64	-48.03	-52.38	-46.88	-46.98
75	0.00	-43.30	-42.14	-59.12	-52.96	-52.09	-46.55
90	0.00	-43.79	-41.85	-49.56	-50.77	-54.72	-47.98
105	0.00	-46.99	-42.98	-44.61	-48.08	-47.72	-49.75
120	0.00	-46.02	-48.35	-42.83	-45.83	-43.09	-49.19
135	0.00	-44.37	-56.64	-41.36	-44.18	-41.13	-47.80
150	0.00	-46.82	-49.30	-42.18	-45.23	-41.10	-47.85
165	0.00	-50.69	-50.83	-43.90	-47.72	-42.76	-50.02
180	0.00	-56.48	-55.36	-45.77	-51.72	-47.28	-50.56
195	0.00	-66.02	-51.07	-45.98	-50.69	-48.16	-47.37
210	0.00	-60.77	-48.82	-48.09	-49.85	-47.84	-46.69
225	0.00	-57.61	-48.25	-47.37	-52.07	-46.03	-49.63
240	0.00	-48.90	-47.54	-42.95	-58.24	-42.31	-57.00
255	0.00	-44.90	-49.06	-40.75	-60.55	-39.71	-60.32
270	0.00	-45.26	-48.62	-41.15	-53.01	-39.28	-51.15
285	0.00	-51.98	-48.64	-46.50	-45.45	-42.70	-45.64
300	0.00	-57.35	-52.85	-47.45	-45.22	-50.87	-45.02
315	0.00	-55.28	-75.08	-41.53	-45.33	-44.10	-45.04
330	0.00	-55.65	-57.97	-42.62	-42.29	-46.22	-40.51
345	0.00	-52.58	-52.24	-49.51	-41.99	-52.29	-40.06
Peak Gain (dBi)	-39.28						

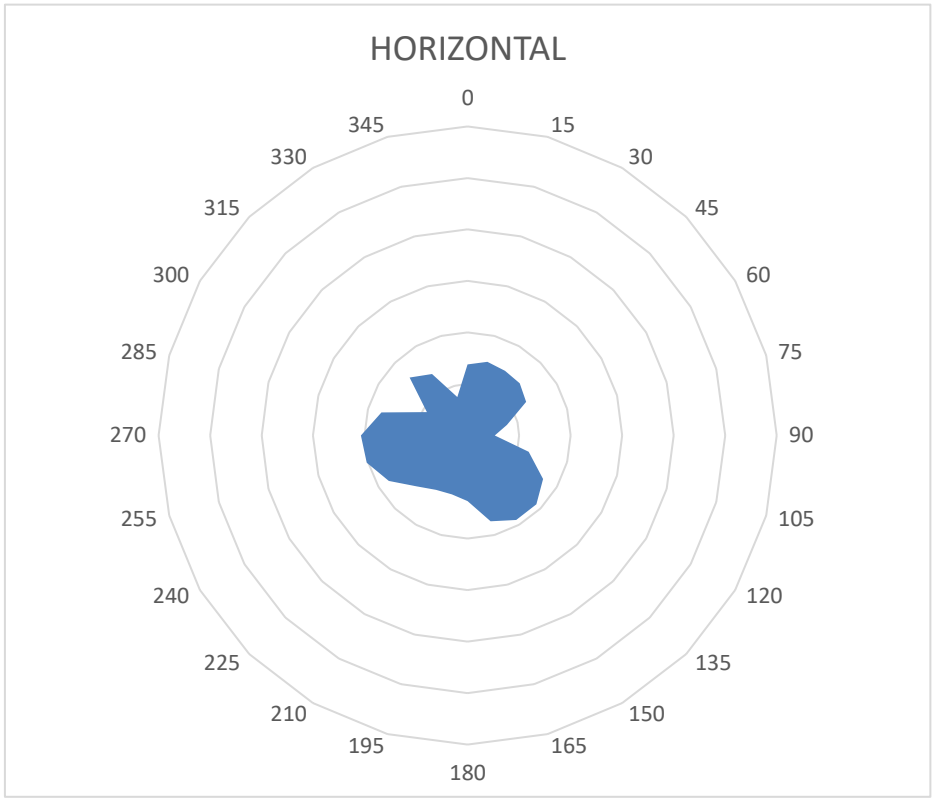
7. Appendix A 2D pattern

X-Y Plane





X-Z Plane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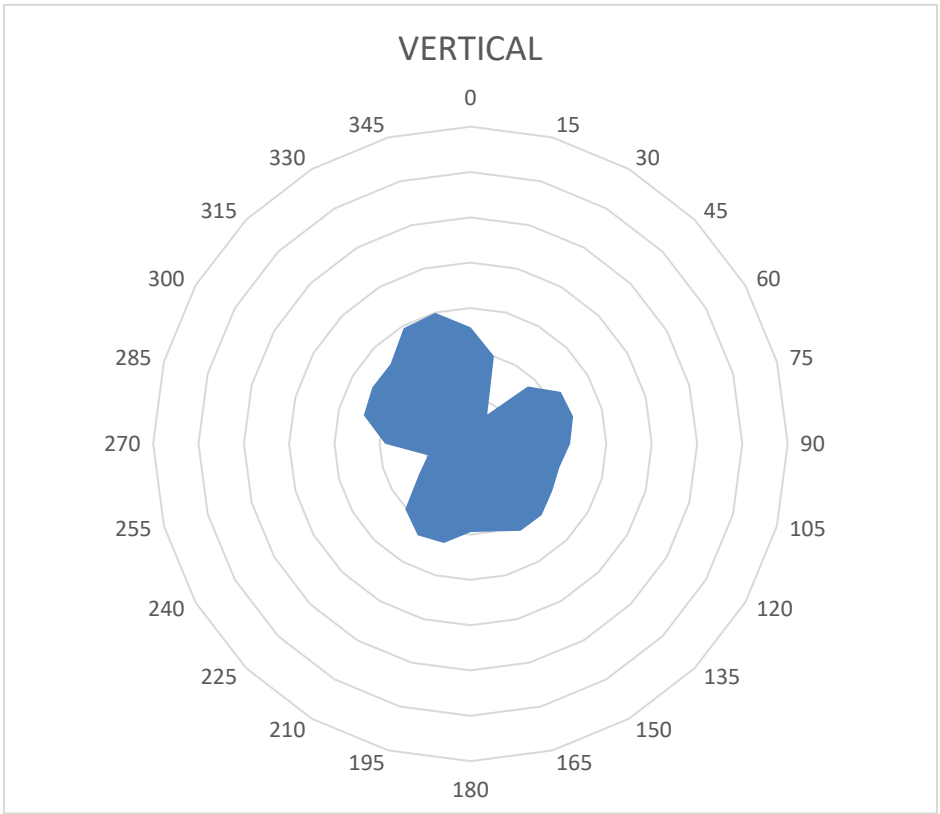
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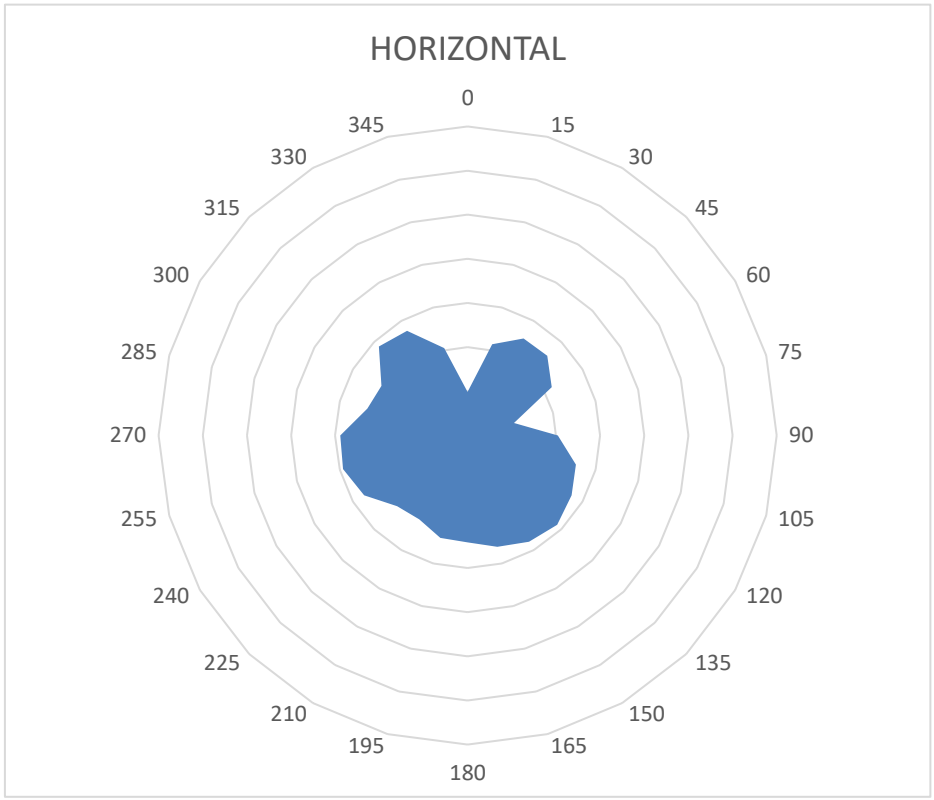
Y-Z Plane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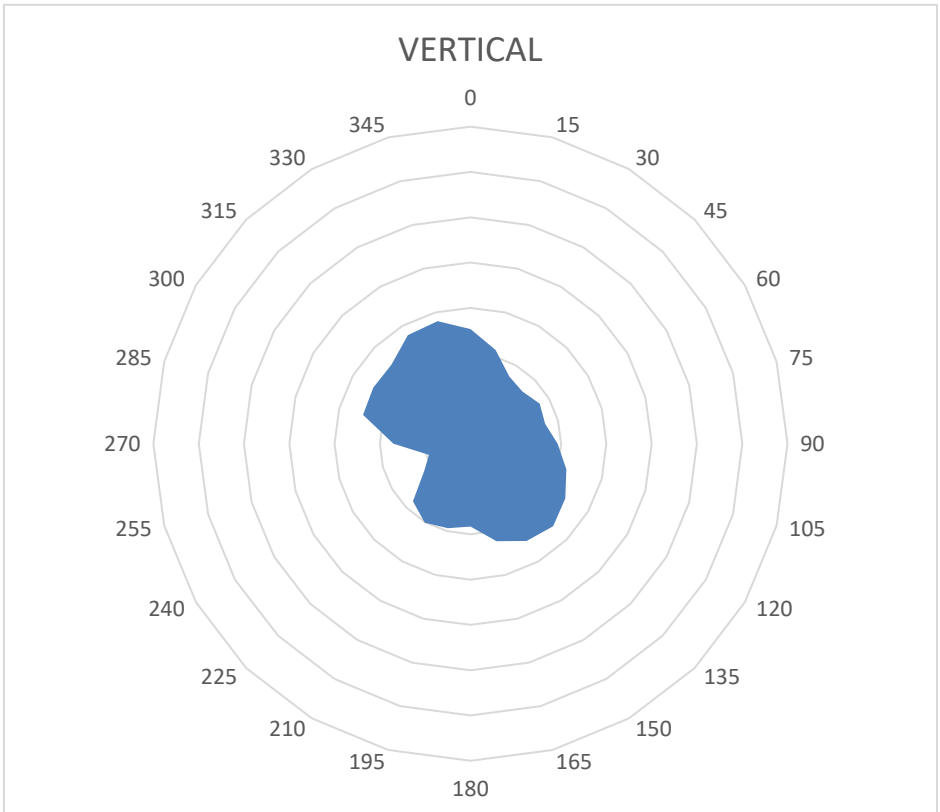
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