

ANTENNA TEST REPORT Antenna operating within the 2400.0 MHz - 2483.5 MHz band	
Report Reference No	G0M-2306-2102-TFCAUT-V02
Testing Laboratory	Eurofins Product Service GmbH
Address	Storkower Str. 38c 15526 Reichenwalde Germany
Applicant	Bridgestone Mobility Solutions B.V.
Address	Beethovenstraat 503 1083 HK Amsterdam Netherlands
Equipment under Test (EUT):	
Product Description	Telematic Accessory with Display + RFID + Bluetooth
Model(s)	PROI
Additional Model(s)	None
Brand Name(s)	webfleet PRO i
Hardware Version(s)	46/2022
Software Version(s)	0.0.25
FCC ID	2AGPAPROI

Testing:		
Test Lab Temperature	20 °C - 30 °C	
Test Lab Humidity	25 % - 55 %	
Date of receipt of test item	2023-07-11	
Report:		
Compiled by	Godson Ekezie Offorji	
Tested by (+ signature) (Responsible for Test)	Godson Ekezie Offorji	
Supervised (+ signature) (Responsible for Test)	Radwan Jaafar	
Approved by (+ signature) (Test Lab Engineer)	Wilfried Treffke	
Date of Issue	2023-11-15	
Total number of pages	20	
General Remarks:		
The test results presented in this report relate only to the object tested. The results contained in this report reflect the results for this particular model and serial number. It is the responsibility of the manufacturer to ensure that all production models meet the intent of the requirements detailed within this report. This report shall not be reproduced, except in full, without the written approval of the Issuing testing laboratory.		
Additional Comments:		

VERSION HISTORY

Version History			
Version	Issue Date	Remarks	Revised By
01	2023-10-19	Initial Release	-
02	2023-11-15	Replaced document: G0M-2306-2102-TFCAUT-V01 Replaced by: G0M-2306-2102-TFCAUT-V02 Reason: Antenna Measurements for 2402 MHz and 2480 MHz added.	R. Jaafar

ABBREVIATIONS AND ACRONYMS

Acronyms	
Acronym	Description
EUT	Equipment Under Test
FCC	Federal Communications Commission
V _{NOM}	Nominal supply voltage

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1 Equipment (Test Item) Under Test

Description	Telematic Accessory with Display + RFID + Bluetooth	
Model	PROIC	
Additional Model(s)	None	
Brand Name(s)	webfleet PRO i	
Serial Number(s)	00213E8059F6	
Test Sample Id(s)	44644	
Hardware Version(s)	46/2022	
Software Version(s)	0.0.25	
FCC ID	2AGPAPROI	
Equipment type	End Product	
Radio type	Transceiver	
Assigned frequency bands	2400.0 MHz - 2483.5 MHz	
Radio technology	Bluetooth Classic	
Modulation	GFSK, PI/4-DQPSK, 8-DPSK	
Number of antenna ports	1	
Antenna	Type	integral
	Model	PCB trace antenna
	Manufacturer	Webfleet Solutions
	Gain	2.6 dBi (by antenna pattern measurement)
Supply Voltage	V _{NOM}	12/24 VDC
Operating Temperature	T _{NOM}	25 °C
AC/DC-Adaptor	None	
Manufacturer	Bridgestone Mobility Solutions B.V. Beethovenstraat 503 1083 HK Amsterdam Netherlands	

1.1 Photos

EUT Overview



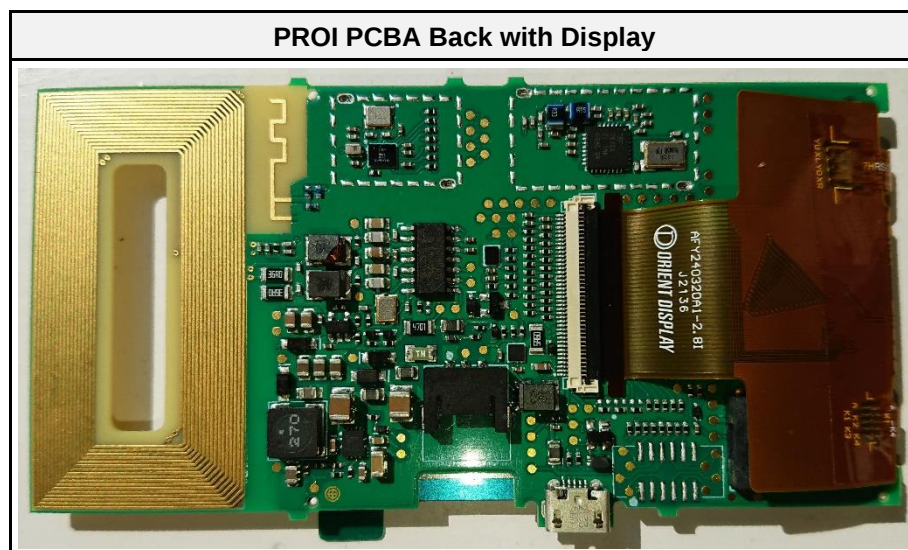
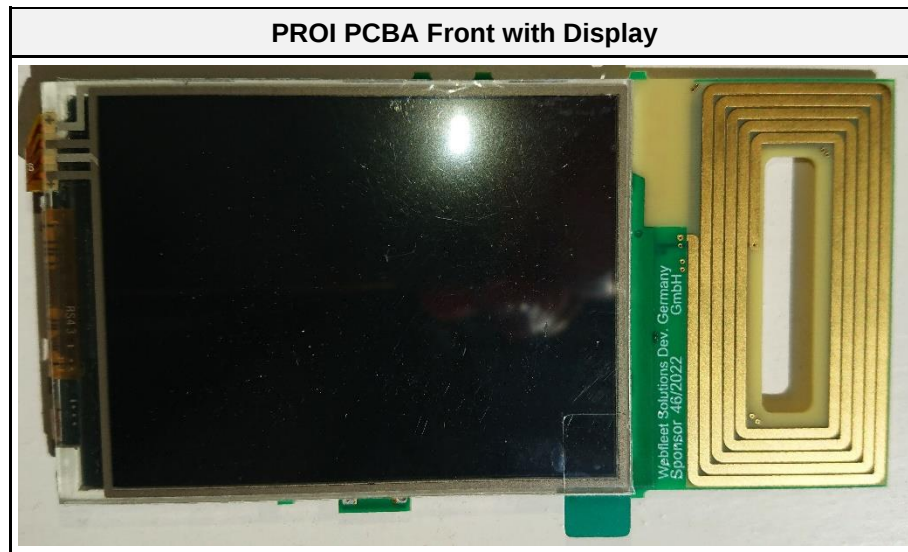
EUT Top View

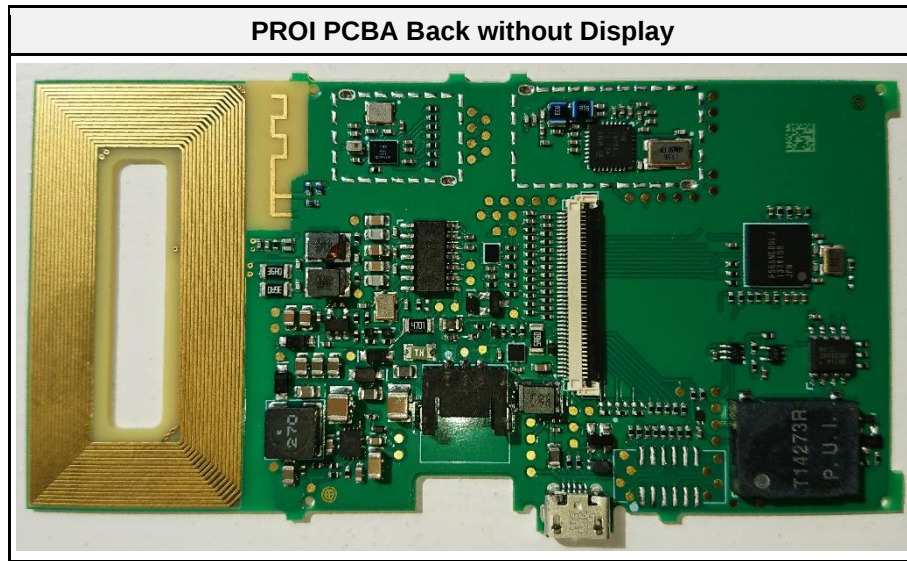


EUT Bottom View



1.2 Photos – Equipment Internal





1.3 Support Equipment

Product Type	Device	Manufacturer	Model	Comment
SIM	Communication Tester	R&S	CMW270	BT-Tester
Description:				
AE	Auxiliary Equipment			
SIM	Simulator			
CBL	Connecting Cable			
SFT	Software			
Comment:				

1.4 Test Modes

Mode	Description
DH5 Single	Mode = Transmit Modulation = GFSK Spreading = None Packet type = DH5 Duty cycle = 78%
Comment:	

1.5 Test Frequencies

Designator	Mode	Channel	Frequency [MHz]
F1	Tx	0	2402
F2	Tx	39	2441
F3	Tx	79	2480

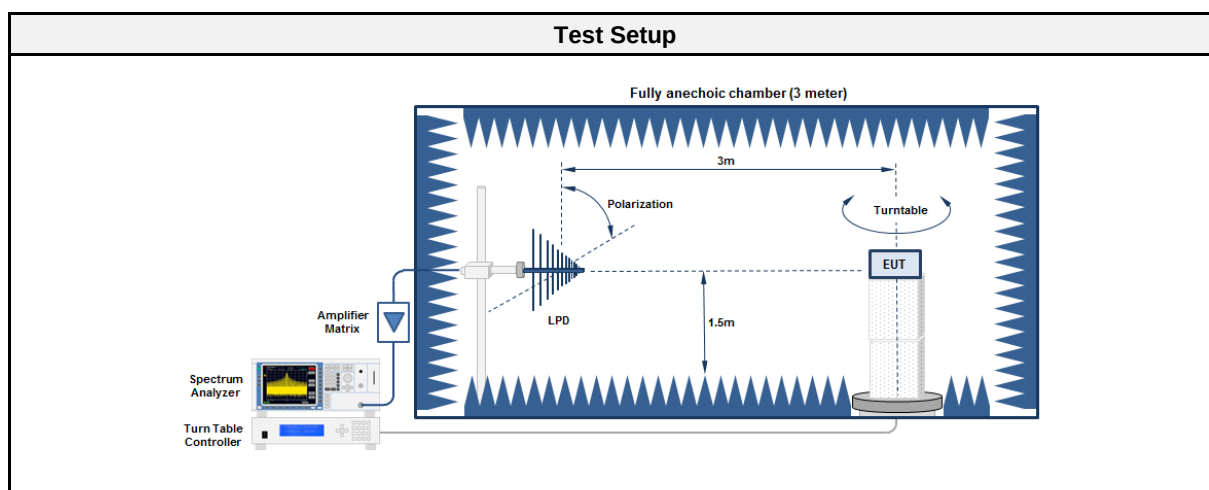
2 Test Conditions and Results

2.1 Test Conditions and Results – Antenna pattern

2.1.1 Information

Test Information	
Operator	Mr. Offorji
Date	2023-08-23

2.1.2 Setup



2.1.3 Equipment

Test Software			
Description	Manufacturer	Name	Version
Antenna pattern software	Eurofins Product Service GmbH	Eurofins Antenna Pattern	1.9

Test Equipment					
Description	Manufacturer	Model	Identifier	Cal. Date	Cal. Due
Anechoic chamber	Frankonia	AC 4	EF00200	---	---
Spectrum analyzer	R&S	FSU26	EF01407	2023-08	2024-08
Antenna	Schwarzbeck	BBHA 9120B	EF01678	2021-03	2024-03

2.1.4 Procedure

Test Procedure
1. EUT is placed on a non conducting support at the center of a turn table 1.5 m above the ground 2. EUT set to the test mode here the highest conducted output power has been measured 3. The receiver is set to peak detection with max hold 4. The EUT is rotated through 360° in horizontal plane 5. The measurement procedure is repeated for all possible EUT positions.

2.1.5 Results

Test Result			
Channel [MHz]	Antenna polarization	Max. rad. Power [dBm e.i.r.p]	Max. antenna gain [dBi]
2402	vertical	-0.65	-1.7
2402	horizontal	-3.08	-4.13
2441	vertical	0.05	-2.18
2441	horizontal	1.06	-1.17
2480	vertical	3.21	0.74
2480	horizontal	5.1	2.63

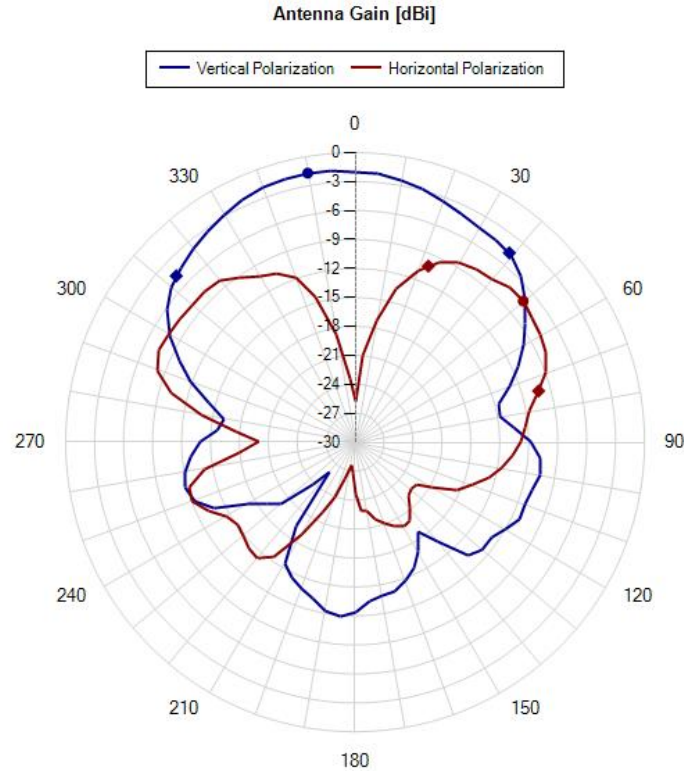
ANNEX A Antenna patterns

Project Number: G0M-2306-2102

Product: Telematic Accessory with Display + RFID + Bluetooth
 Model: PROI
 EUT Position: Vertical
 Operating Conditions: Tnom / Vnom
 Operating Frequency: 2402 MHz
 Detector: Peak
 RBW: 3 MHz
 VBW: 10 MHz
 Sweep Time: 1000 ms
 Conducted Power: 1.051 dBm
 Operator: Mr. Offorji
 Date: 2023-11-13

Result Summary

Antenna Polarization	Turn table Angle [°]	Max. rad. power [dBm e.i.r.p.]	Max. antenna gain [dBi]
Vertical	350	-0.65	-1.7
Horizontal	50	-6.2	-7.25

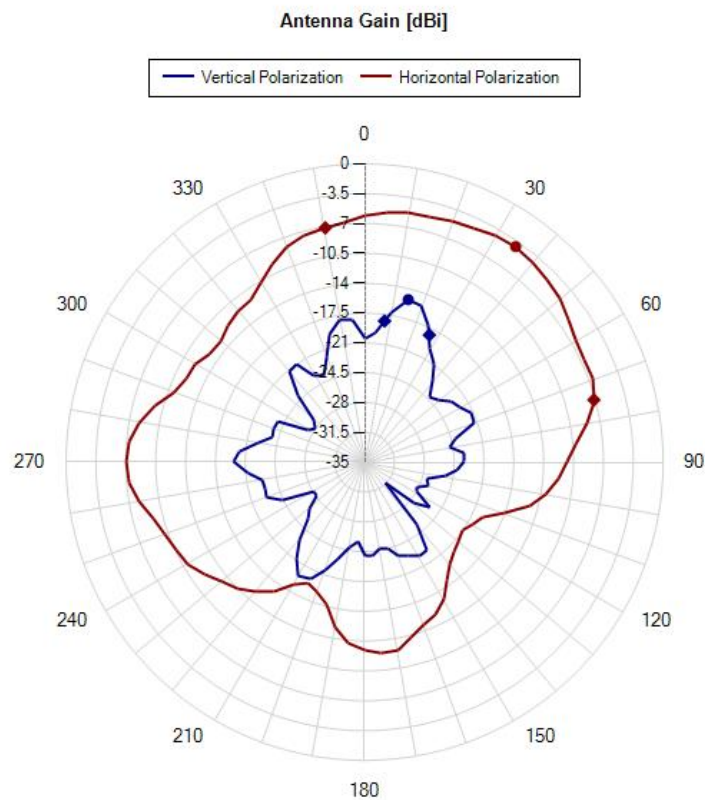


Project Number: G0M-2306-2102

Product: Telematic Accessory with Display + RFID + Bluetooth
Model: PROI
EUT Position: Horizontal
Operating Conditions: Tnom / Vnom
Operating Frequency: 2402 MHz
Detector: Peak
RBW: 3 MHz
VBW: 10 MHz
Sweep Time: 1000 ms
Conducted Power: 1.051 dBm
Operator: Mr. Offorji
Date: 2023-11-13

Result Summary

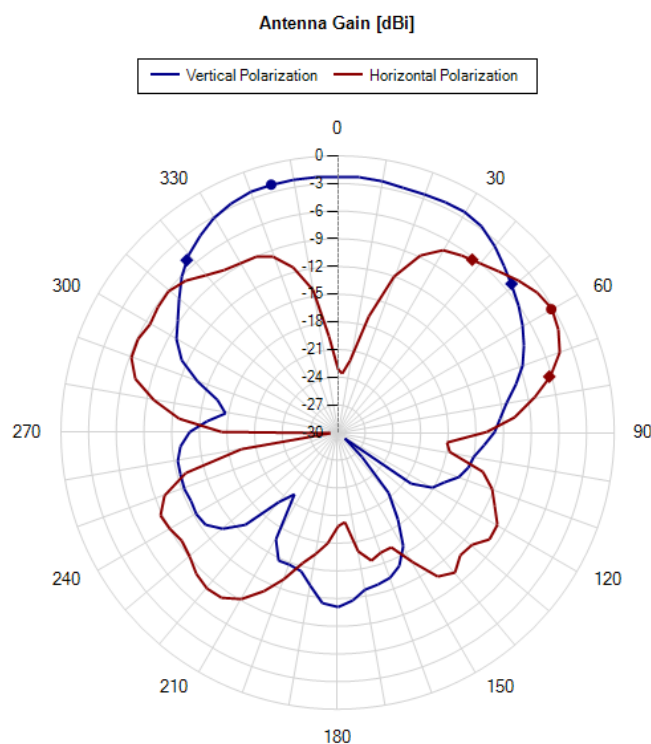
Antenna Polarization	Turn table Angle [°]	Max. rad. power [dBm e.i.r.p.]	Max. antenna gain [dBi]
Vertical	15	-14.21	-15.26
Horizontal	35	-3.08	-4.13



Project Number: G0M-2306-2102
 Product: Telematic Accessory with Display + RFID + Bluetooth
 Model: PROI
 EUT Position: Vertical
 Operating Conditions: Tnom / Vnom
 Operating Frequency: 2441 MHz
 Detector: Peak
 RBW: 3 MHz
 VBW: 10 MHz
 Sweep Time: 1000 ms
 Conducted Power: 2.23 dBm
 Operator: Mr. Offorji
 Date: 2023-11-13

Result Summary

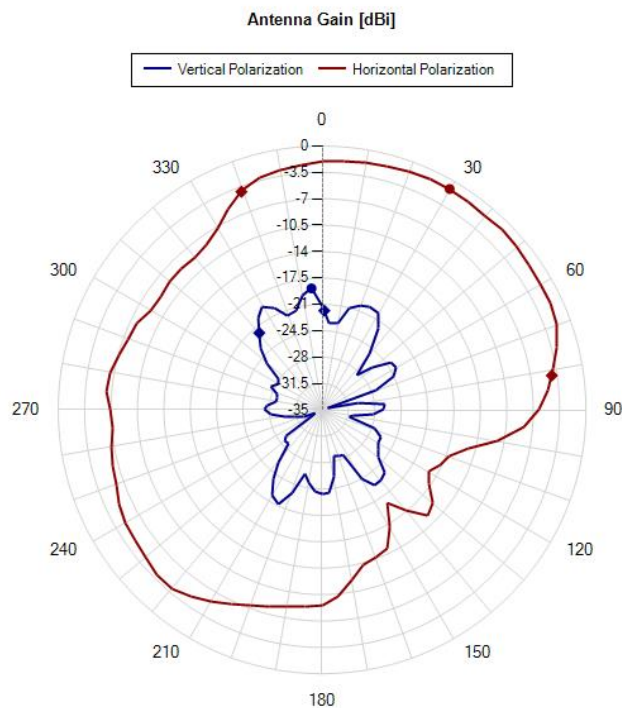
Antenna Polarization	Turn table Angle [°]	Max. rad. power [dBm e.i.r.p.]	Max. antenna gain [dBi]
Vertical	345	0.05	-2.18
Horizontal	60	-1.02	-3.25



Project Number: G0M-2306-2102
 Product: Telematic Accessory with Display + RFID + Bluetooth
 Model: PROI
 EUT Position: Horizontal
 Operating Conditions: Tnom / Vnom
 Operating Frequency: 2441 MHz
 Detector: Peak
 RBW: 3 MHz
 VBW: 10 MHz
 Sweep Time: 1000 ms
 Conducted Power: 2.23 dBm
 Operator: Mr. Offorji
 Date: 2023-11-13

Result Summary

Antenna Polarization	Turn table Angle [°]	Max. rad. power [dBm e.i.r.p.]	Max. antenna gain [dBi]
Vertical	355	-16.6	-18.83
Horizontal	30	1.06	-1.17

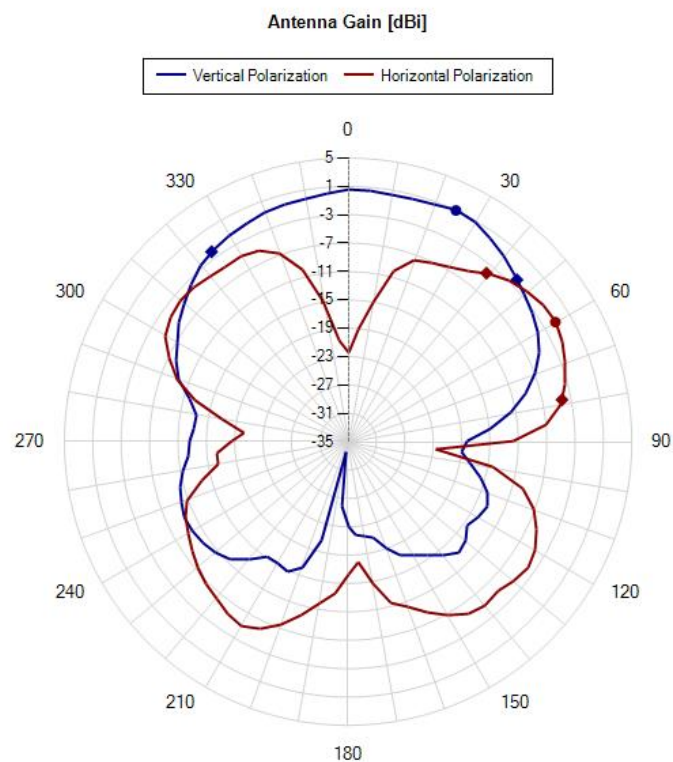


Project Number: G0M-2306-2102

Product: Telematic Accessory with Display + RFID + Bluetooth
Model: PROI
EUT Position: Vertical
Operating Conditions: Tnom / Vnom
Operating Frequency: 2480 MHz
Detector: Peak
RBW: 3 MHz
VBW: 10 MHz
Sweep Time: 1000 ms
Conducted Power: 2.467 dBm
Operator: Mr. Offorji
Date: 2023-11-13

Result Summary

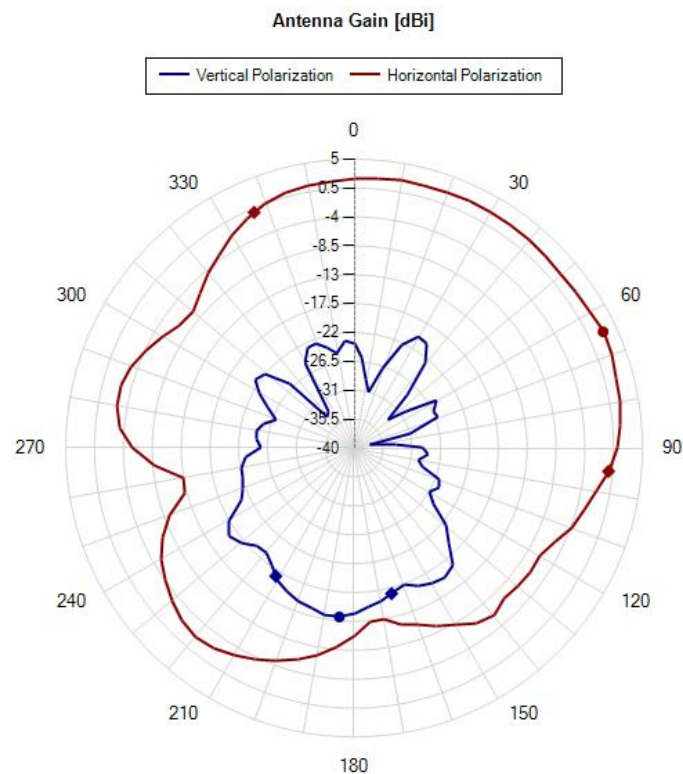
Antenna Polarization	Turn table Angle [°]	Max. rad. power [dBm e.i.r.p.]	Max. antenna gain [dBi]
Vertical	25	3.21	0.74
Horizontal	60	0.97	-1.49



Project Number: G0M-2306-2102
 Product: Telematic Accessory with Display + RFID + Bluetooth
 Model: PROI
 EUT Position: Horizontal
 Operating Conditions: Tnom / Vnom
 Operating Frequency: 2480 MHz
 Detector: Peak
 RBW: 3 MHz
 VBW: 10 MHz
 Sweep Time: 1000 ms
 Conducted Power: 2.467 dBm
 Operator: Mr. Offorji
 Date: 2023-11-13

Result Summary

Antenna Polarization	Turn table Angle [°]	Max. rad. power [dBm e.i.r.p.]	Max. antenna gain [dBi]
Vertical	185	-11.37	-13.84
Horizontal	65	5.1	2.63



== END OF TEST REPORT ==

Test Report No.: G0M-2306-2102-TFCAUT-V02

Eurofins Product Service GmbH
 Storkower Str. 38c, D-15526 Reichenwalde, Germany