



Test report

Number T251-0710/23

Project file: C20230005

Date: 2023-07-25

Pages: 11

Product: Contactless reader

Type reference: CLRD730

Ratings: 5 Vdc; 450 mA
Protection class: III

Trademark: /

Applicant: ČETRТА POT, d.o.o., Kranj
Planina 3, SI-4000 Kranj, Slovenia

Manufacturer: ČETRТА POT, d.o.o., Kranj
Planina 3, SI-4000 Kranj, Slovenia

Place of manufacture: ČETRТА POT, d.o.o., Kranj
Planina 3, SI-4000 Kranj, Slovenia

Summary of testing

Testing method: Antenna pattern measurements

Testing location: SIQ Ljubljana
Mašera-Spasičeva ulica 10, SI-1000 Ljubljana, Slovenia

Remarks: Date of receipt of test items: 2023-07-12
Number of items tested: 1
Date of performance of tests: 2023-07-14
The test results presented in this report relate only to the items tested.
The test items were tested in the condition as received.
The product complies with the requirements of the testing methods.

Tested by: Luka Cvajnar

Approved by: Marjan Mak

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1 GENERAL

History sheet			
Date	Report No.	Change	Revision
2023-07-25	T251-0710/23	Initial Test Report issued.	--

Environmental conditions:

Ambient temperature: 15 °C to 35 °C

Relative humidity: 30 % to 60 %

Atmospheric pressure: 860 mbar to 1060 mbar

1.1 Equipment under test

Contactless reader

Type: CLRD730

FCC ID: 2ADMJCLRD730

Equipment Description

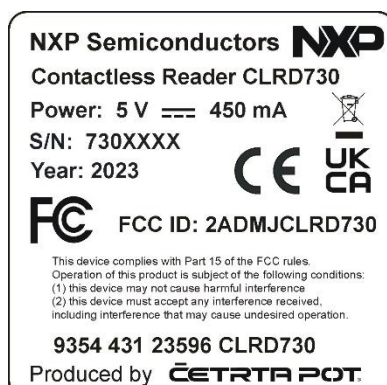
Software version :	05.02.00
Firmware version :	01.00.00
Hardware version:	1.1
SIQ tested number :	S202300809
Serial number :	0025..44
One/two/three phase EUT:	USB powered
Floor standing / table-top equipment or a combination:	Table top
Operating frequency:	13.56 MHz
Built in RFID module	
Manufacturer:	Četrta pot
Antenna type:	PCB type, 63 mm x 63 mm
Modulation type:	100% ASK modified Muller encoding
Number of channels:	2

Highest Internal Frequency (F_x)

Frequency (MHz)	Description
13.56 MHz	RFID module
27.12 MHz	Microcontroller clock

Copy of marking plates (examples):

The artwork below may be only a draft. The use of certification marks on a product must be authorized by the respective NCBS that own these marks.



Tested was antenna pattern of the sample below.

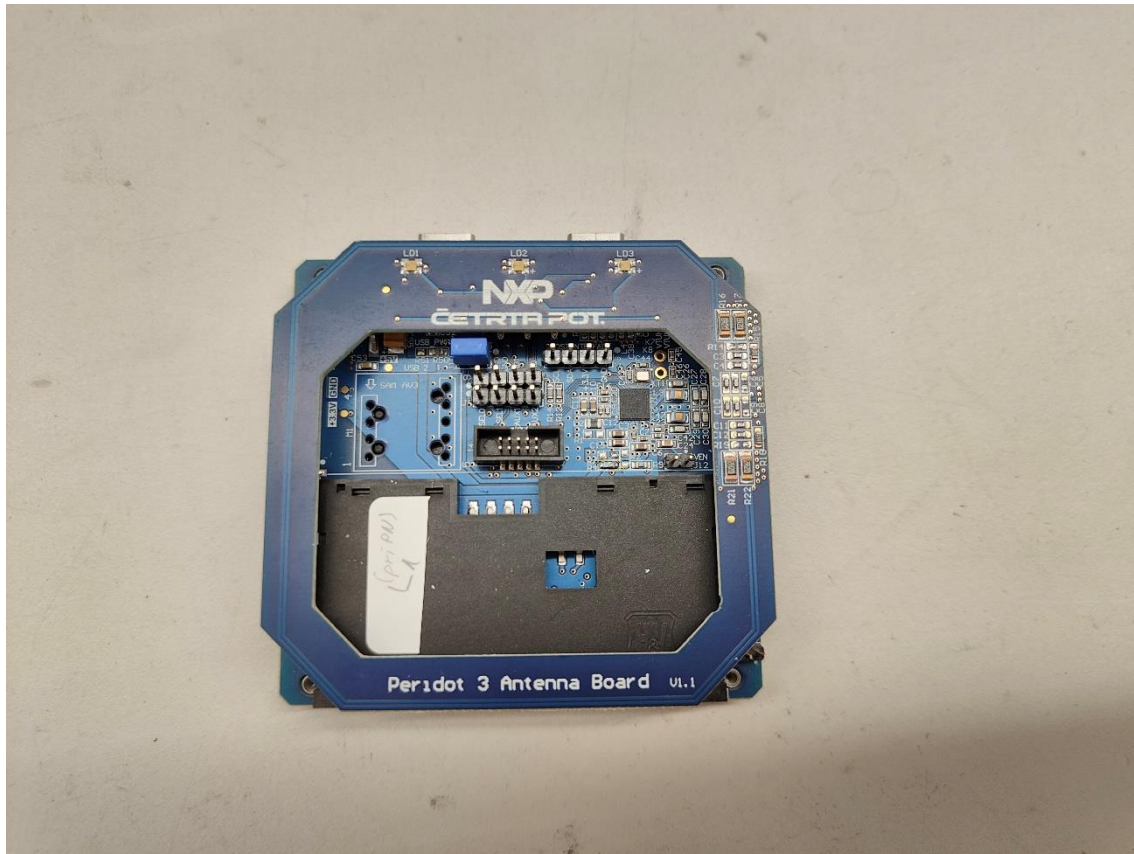


Figure 1: Picture of test sample

1.2 Antenna pattern measurement

1.2.1 Test procedure

The radiation pattern at 13.56 MHz antenna antennas has been measured in an anechoic chamber with 3 meters test distance. Test results show maximum radiation pattern.



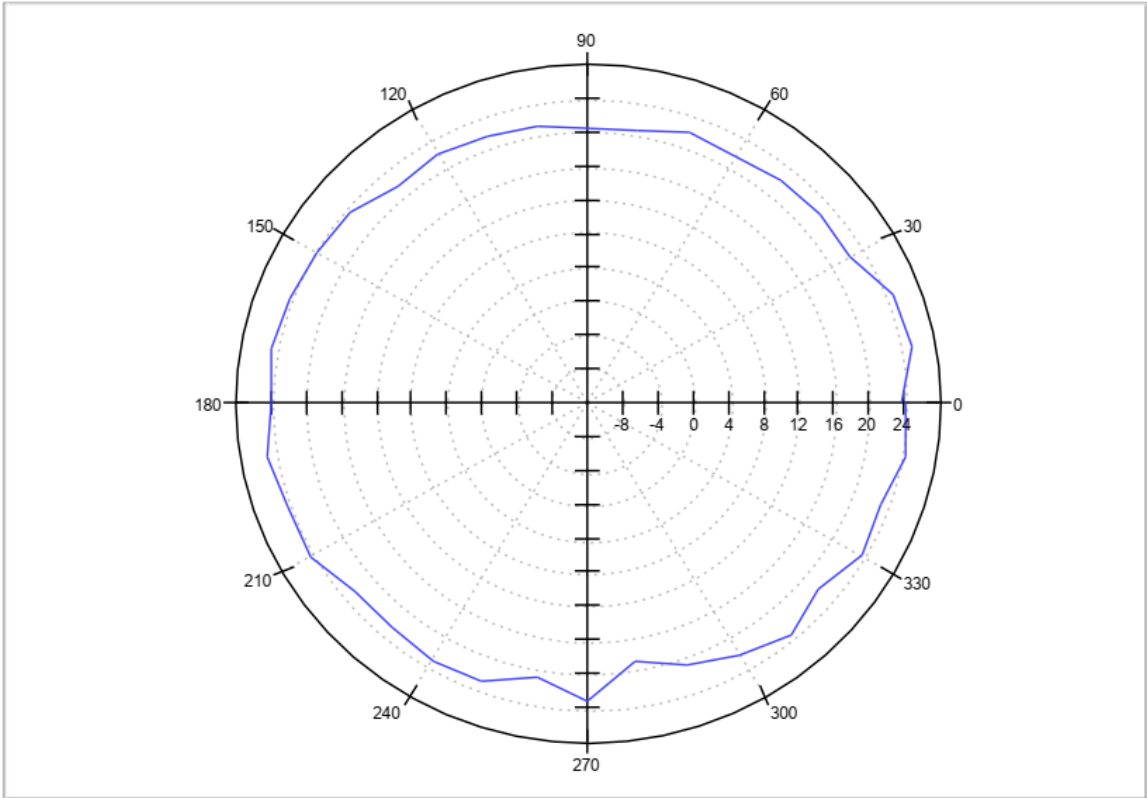
1.3 Test results

EUT Information

EUT:
Operating mode:
Sample orientation:

CLRD730
Waiting for a card
Vertical

Azimuth Chart: Horizontal



AziChart hor Eval

Frequency	Max. value	Min. value	Azimuth	Average
y	(dBµV/m)	(dBµV/m)	(deg)	(dBµV/m)
13.560000	25.57	19.11	280	22.86

AziChart MinMax Eval

Frequency	Max. Value	Azimuth	Pol max.	Min. Value	Azimuth	Pol min.
(MHz)	(dBµV/m)	max.		(dBµV/m)	min.	
		(deg)			(deg)	
13.560000	25.57	10	H	19.11	280	H



Azimuth (deg)	Frequency 13.560 MHz (dBµV/m)
0.0	23.76
10.0	25.57
20.0	25.09
30.0	22.52
40.0	22.58
50.0	22.22
60.0	21.60
70.0	21.88
80.0	20.72
90.0	20.46
100.0	21.13
110.0	21.47
120.0	22.01
130.0	21.37
140.0	23.16
150.0	23.43
160.0	23.91
170.0	24.51
180.0	24.06
190.0	24.96
200.0	24.27
210.0	24.23
220.0	22.66
230.0	22.58
240.0	23.16
250.0	23.08
260.0	20.82
270.0	23.16
280.0	19.11
290.0	21.03
300.0	22.55
310.0	23.93
320.0	22.19
330.0	24.01
340.0	23.50
350.0	24.78
360.0	24.27

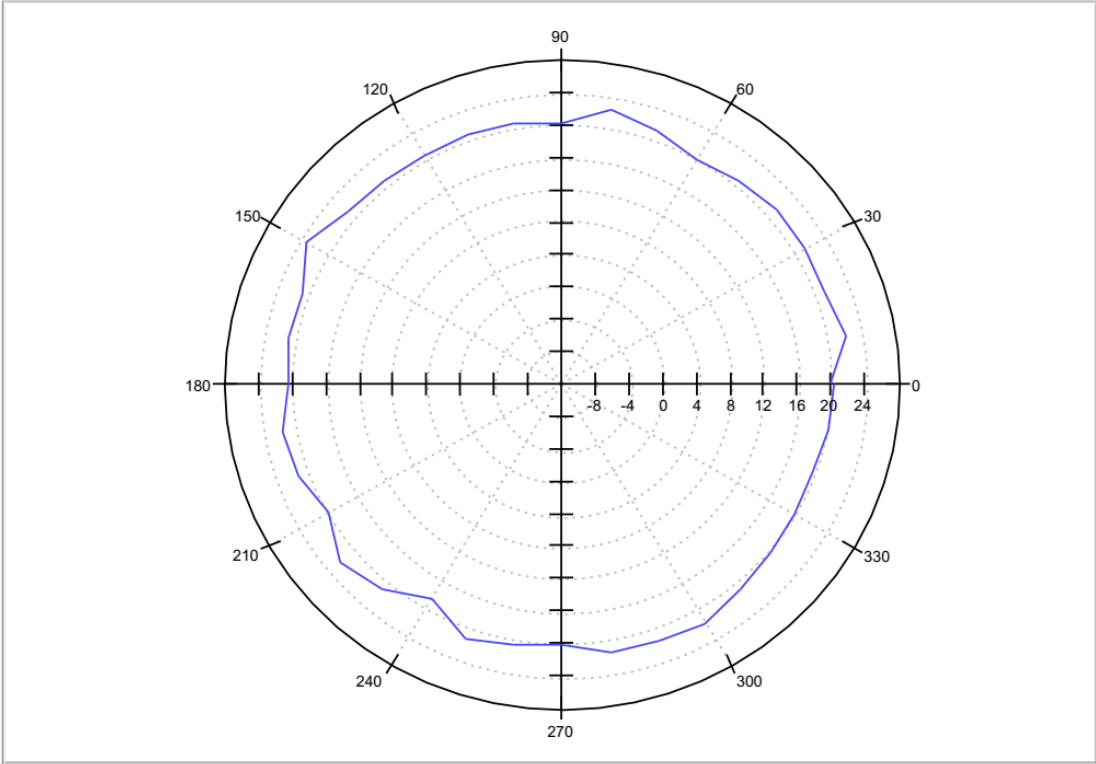


EUT Information

EUT:
Operating mode:
Sample orientation:

CLRD730
Waiting for a card
Horizontal

Azimuth Chart: Horizontal



AziChart MinMax Eval

Frequency (MHz)	Max. Value (dBµV/m)	Azimuth max. (deg)	Pol max.	Min. Value (dBµV/m)	Azimuth min. (deg)	Pol min.
13.560000	22.86	150	H	18.67	240	H

AziChart hor Eval

Frequency (MHz)	Max. value (dBµV/m)	Azimuth (deg)	Min. value (dBµV/m)	Azimuth (deg)	Average (dBµV/m)
13.560000	22.86	150	18.67	240	20.92



AziChart_hor

Azimuth (deg)	Frequency 13.560 MHz (dBµV/m)
0.0	19.89
10.0	22.28
20.0	21.27
30.0	21.47
40.0	21.44
50.0	20.75
60.0	20.09
70.0	21.13
80.0	22.43
90.0	20.28
100.0	20.75
110.0	20.68
120.0	20.50
130.0	20.75
140.0	21.03
150.0	22.86
160.0	20.64
170.0	21.03
180.0	20.50
190.0	21.53
200.0	21.24
210.0	19.93
220.0	22.16
230.0	21.03
240.0	18.67
250.0	21.40
260.0	20.61
270.0	20.09
280.0	21.60
290.0	21.66
300.0	22.10
310.0	21.10
320.0	20.57
330.0	20.01
340.0	19.77
350.0	20.24
360.0	20.50



Figure 2: Test setup

2 USED TEST EQUIPMENT

Manufacturer	Model No.	Used	Calibrated	Calibrated until
Comtest engineering, SAC2 (together with controlling equipment)	SAC 3m	X	2022-04-14	2025-04-14
Maturo, Turn table (2 m diameter)	TT 2.0 SI	X	/	/
Maturo, Bore-sight antenna mast	BAM-4.0-P	/	/	/
Maturo, positioning equipment	NCD	X	/	/
Rohde & Schwarz, RFI receiver	ESW 8	X	2022-05-19	2023-11-19
R&S, Ultra Broadband Antenna	HL562E		2020-09-30	2023-09-30
R&S, Horn Antenna	HF907	/	2020-08-21	2023-08-21
Schwarzbeck, Loop Antenna	FMZB 1519 B	X	2023-03-16	2024-09-16