

Test report

Number **T251-0715/23**

Project file: C20230303

Date: 2023-08-18

Pages: 10

Product: **Smart watch**

Type reference: **ECG200**

Ratings: 3,8 V_{DC} (Battery powered)
Protection class: III

Trademark: **TeltoHeart**

Applicant: **UAB TELTONIKA TELEMEDIC**
Naugarduko st. 102, LT-03160 Vilnius, Lithuania

Manufacturer: **TELTONIKA EMS, UAB**
Ditvos g. 6, LT-02121 Vilnius, Lithuania

Place of manufacture: **TELTONIKA EMS, UAB**
Ditvos g. 6, LT-02121 Vilnius, Lithuania

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: 2023-02-07
Number of items tested: 1
Date of performance of tests: 2023-03-19
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

The report shall not be reproduced except in full.

CONTENTS

	page
1 <u>GENERAL</u>	3
1.1 EQUIPMENT UNDER TEST	3
1.2 ANTENNA PATTERN MEASUREMENT	5
1.3 TEST RESULTS BLE ANTENNA	6
1.4 MAXIMUM BLE ANTENNA GAIN	9
2 <u>USED TEST EQUIPMENT</u>	10

1 GENERAL

History sheet			
Date	Report No.	Change	Revision
2023-08-18	T251-0715/23	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

Smart watch

Type: ECG200

Tested was antenna pattern of the sample below.



Picture of test sample – BLE Antenna

Copy of marking plate

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.



1.2 Antenna pattern measurement

1.2.1 Test procedure

The radiation pattern for BLE antenna implemented to PCB reference design has been measured in an anechoic chamber with 3 meters test distance. Test results show radiation patterns for two planes, measured with vertical and horizontal polarization of measuring antenna. All measurements were performed at 2402, 2440 and 2480 MHz frequency.

1.3 Test results BLE Antenna

EUT Information

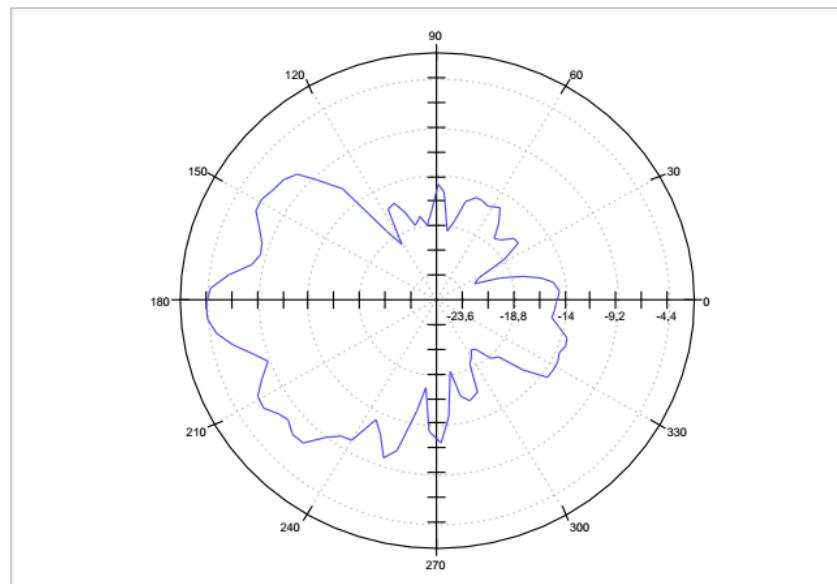
EUT:
Operating mode

Teltonika ECG200
TX, 2402 MHz

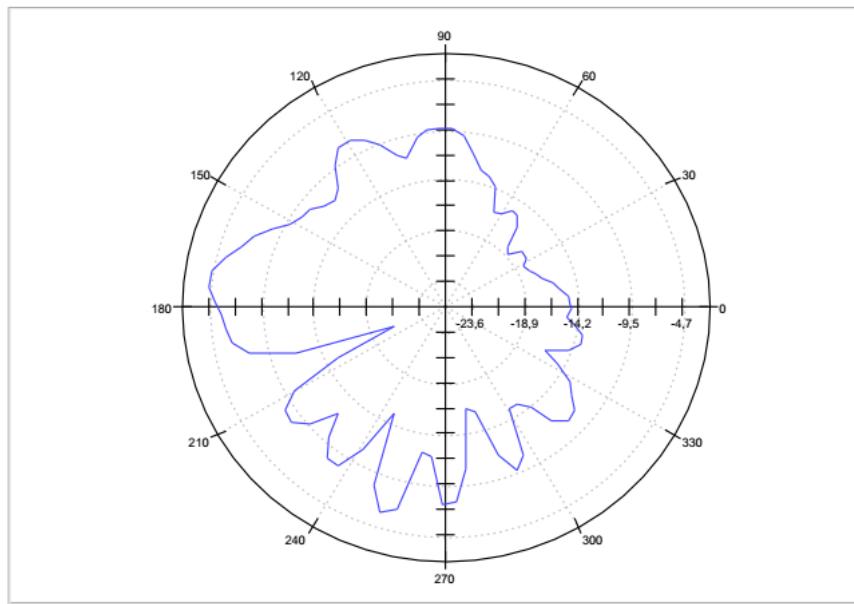
AziChart MinMax Eval

Frequency (MHz)	Max. Value (dBm)	Azimuth max. (deg)	Pol max.	Min. Value (dBm)	Azimuth min. (deg)	Pol min.
2402.000000	-4.42	181	H	-22.10	24	H

Azimuth Chart: Horizontal



Azimuth Chart: Vertical



EUT Information

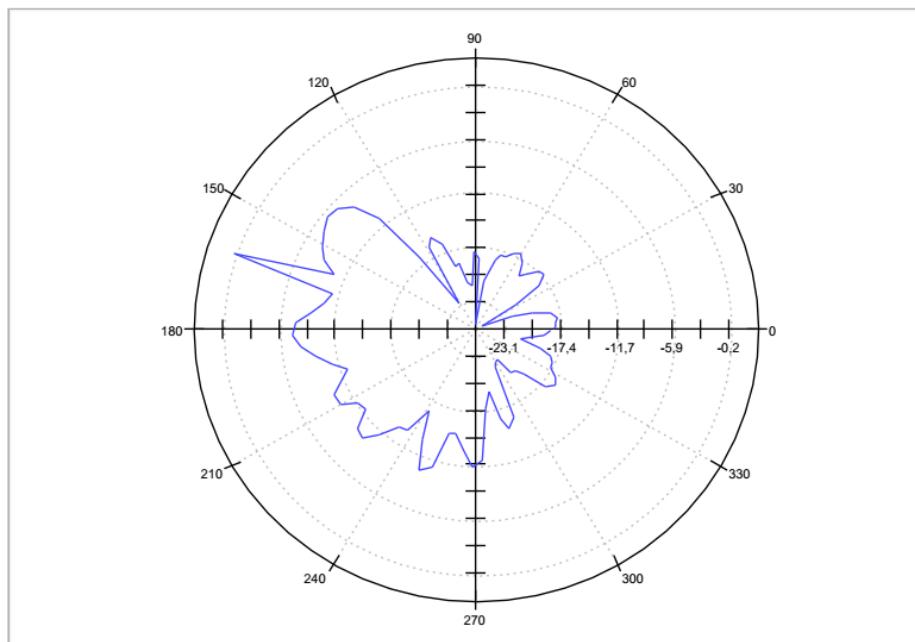
EUT:
Operating mode

Teltonika ECG200
TX, 2440 MHz

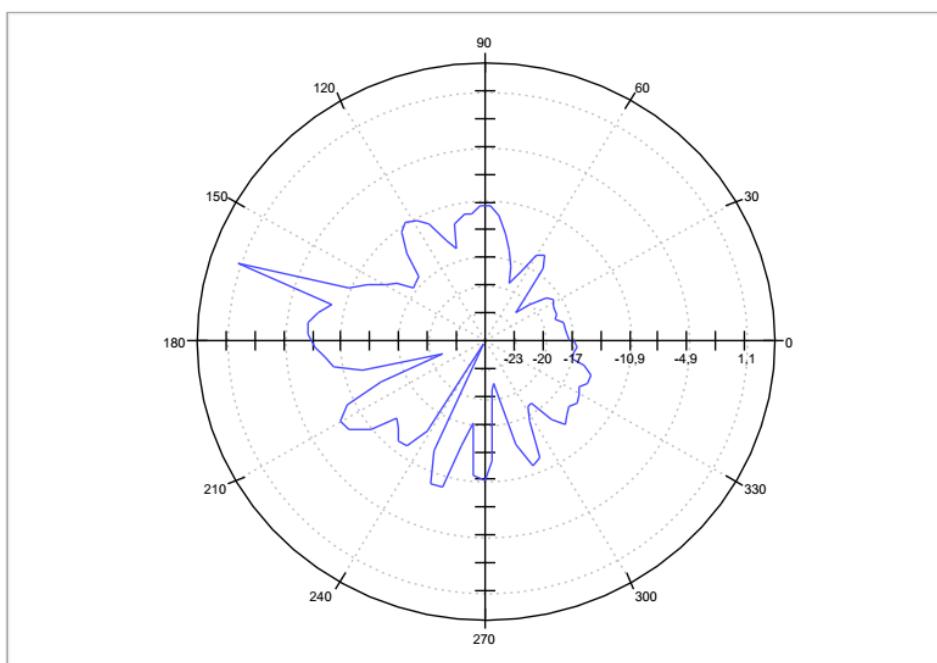
AziChart MinMax Eval

Frequency (MHz)	Max. Value (dBm)	Azimuth max. (deg)	Pol max.	Min. Value (dBm)	Azimuth min. (deg)	Pol min.
2440.000000	1.12	162	V	-25.61	242	V

Azimuth Chart: Horizontal



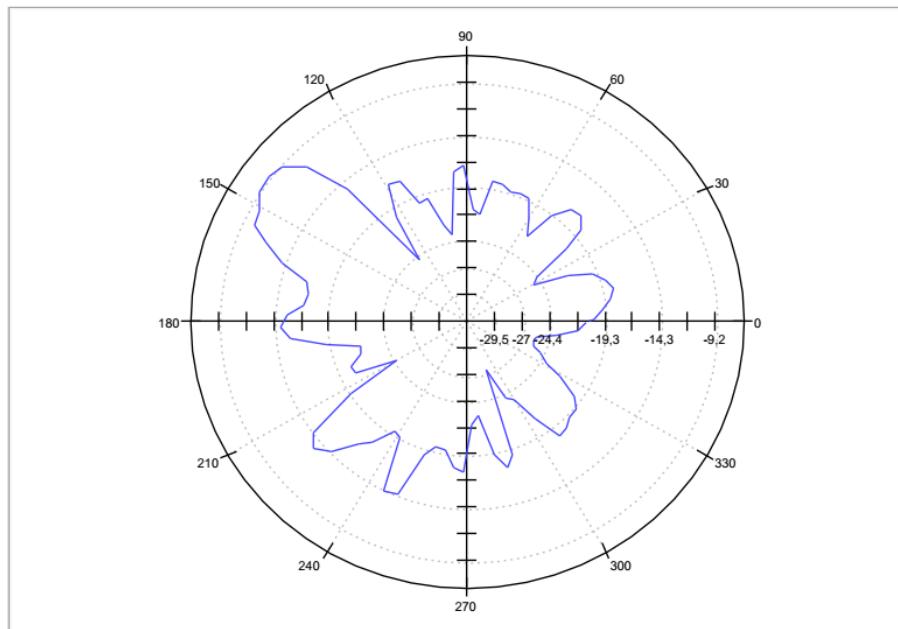
Azimuth Chart: Vertical



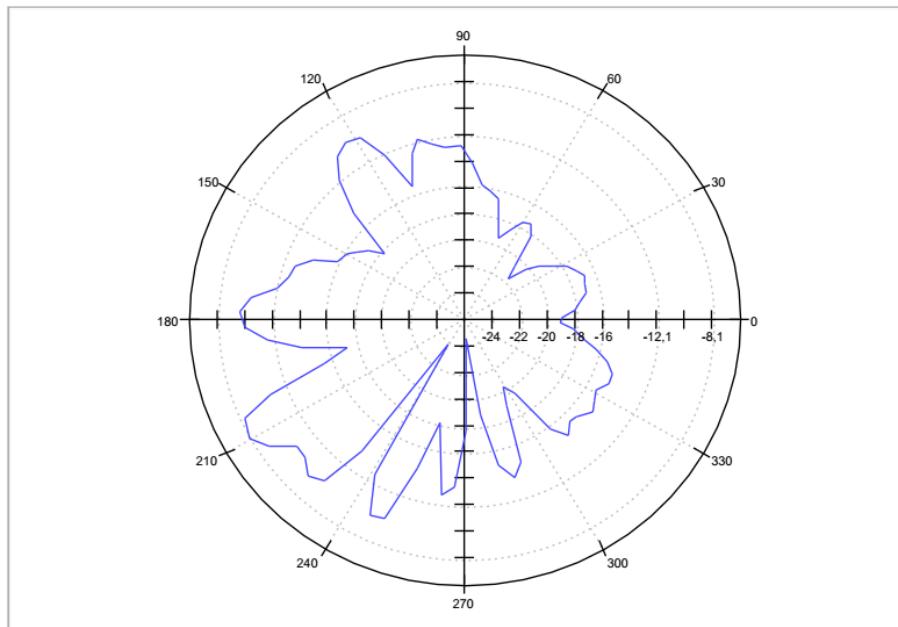
EUT InformationEUT:
Operating modeTeltonika ECG200
TX, 2480 MHz**AziChart MinMax Eval**

Frequency (MHz)	Max. Value (dBm)	Azimuth max. (deg)	Pol max.	Min. Value (dBm)	Azimuth min. (deg)	Pol min.
2480.000000	-8.08	210	V	-27.07	292	H

Azimuth Chart: Horizontal



Azimuth Chart: Vertical



1.4 Maximum BLE antenna gain

DUT Frequency (MHz)	Maximum antenna gain (dBi)
2402.000000	-4.42
2440.000000	1.12
2480.000000	-8.08

2 USED TEST EQUIPMENT

Antenna pattern measurement

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	X	/	/
Maturo, positioning equipment	NCD	X	/	/
Rohde & Schwarz, RFI receiver	ESW 44	X	2023-03-09	2024-09-09
R&S, Ultra Broadband Antenna	HL562E	/	2020-09-30	2023-09-30
R&S, Horn Antenna	HF907	X	2020-08-21	2023-08-21