**DEKRA Testing and Certification, S.A.U.**
Parque Tecnológico de Andalucía,
c/ Severo Ochoa nº 2 · 29590 Campanillas · Málaga · España
C.I.F. A29 507 456

Nº 51/LE147

Test report No:
NIE: 56962REM.002

# Test report

## FCC Rules and Regulations CFR 47, Part 15, Subpart B (10-1-17 Edition) & ICES-003 (January 2016, Updated April 2017)

| | |
|---|---|
| Identification of item tested | GPS Sports watch with wrist based heartrate |
| Trademark | Polar |
| Model and /or type reference | 3A |
| Other identification of the product | S/N: F8203A1300582<br>Hw version: 00769657.00<br>Sw version: 0.23.0<br>FCC ID: INW3A<br>IC: 6248A-3A |
| Features | BLE, GPS, GLONASS |
| Manufacturer | POLAR ELECTRO OY<br>Professorintie 5<br>90440, Kempele, FINLAND |
| Test method requested, standard | FCC CFR 47, Part 15, Subpart B (10-1-17 Edition) & ICES-003 (January 2016, updated April 2017) |
| Summary | IN COMPLIANCE |
| Approved by (name / position & signature) | Rafael López<br>EMC LAB Manager<br>RAFAEL LÓPEZ MARTÍN 2018.07.18 13:42:54 +02'00' |
| Date of issue | 2018-06-26 |
| Report template No | FDT08_21 |

# Index

# Competences and guarantees

DEKRA Testing and Certification is a testing laboratory accredited by the National Accreditation Body (ENAC - Entidad Nacional de Acreditación), to perform the tests indicated in the Certificate No. 51/LE 147.

In order to assure the traceability to other national and international laboratories, DEKRA Testing and Certification has a calibration and maintenance program for its measurement equipment.

DEKRA Testing and Certification guarantees the reliability of the data presented in this report, which is the result of the measurements and the tests performed to the item under test on the date and under the conditions stated on the report and, it is based on the knowledge and technical facilities available at DEKRA Testing and Certification at the time of performance of the test.

DEKRA Testing and Certification is liable to the client for the maintenance of the confidentiality of all information related to the item under test and the results of the test.

The results presented in this Test Report apply only to the particular item under test established in this document.

**IMPORTANT:** No parts of this report may be reproduced or quoted out of context, in any form or by any means, except in full, without the previous written permission of DEKRA Testing and Certification.

# General conditions

1. This report is only referred to the item that has undergone the test.
2. This report does not constitute or imply on its own an approval of the product by the Certification Bodies or competent Authorities.
3. This document is only valid if complete; no partial reproduction can be made without previous written permission of DEKRA Testing and Certification.
4. This test report cannot be used partially or in full for publicity and/or promotional purposes without previous written permission of DEKRA Testing and Certification and the Accreditation Bodies.

# Uncertainty

Uncertainty (factor k=2) was calculated according to the DEKRA Testing and Certification internal document PODT000.

The total uncertainty of the measurement system for the measured conducted disturbance characteristics of EUT from 150kHz to 30 MHz is I = ± 3,9 dB for quasi-peak measurements, I = ± 3,2 dB for average measurements (k = 2)

The total uncertainty of the measurement system for the measured radio disturbance characteristics of EUT from 30 MHz to 1000 MHz is I = ± 4,9 dB for quasi-peak measurements, I = ± 4,6 dB for peak measurements (k = 2)

The total uncertainty of the measurement system for the measured radio disturbance characteristics of EUT from 1000 MHz to 26 GHz is I = ± 2,6 dB for peaks and average measurements (k = 2)

# Data provided by the client

The test sample consists of a GPS sports watch with Bluetooth low-energy connectivity and wrist-based heartrate.

DEKRA declines any responsibility with respect to the information provided by the client and that may affect the validity of results.

# Usage of samples

Samples undergoing test have been selected by: The client.

Sample S/01 is composed of the following elements:

| Control Nº | Description | Model | Serial Nº | Date of reception |
|---|---|---|---|---|
| 56962B/010 | USB adaptor | --- | --- | 2018-05-21 |
| 56962B/030 | Sport watch | 3A | F8203A1300582 | 2018-05-21 |

# Test sample description

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Ports…… : | Port name and description | | Cable | | | | |
| | | | Specified length [m] | Attached during test | Shielded | | |
| | | | | ☐ | ☐ | | |
| | | | | ☐ | ☐ | | |
| | | | | ☐ | ☐ | | |
| | | | | ☐ | ☐ | | |
| | | | | ☐ | ☐ | | |
| | | | | ☐ | ☐ | | |
| Supplementary information to the ports…… : | | | | | | | |
| Rated power supply ……: | Voltage and Frequency | | Reference poles | | | | |
| | | | L1 | L2 | L3 | N | PE |
| | ☐ | AC: | ☐ | ☐ | ☐ | ☐ | ☐ |
| | ☐ | AC: | ☐ | ☐ | ☐ | ☐ | ☐ |
| | ☒ | DC: 5Vdc (From a USB port) | | | | | |
| | ☐ | DC: | | | | | |
| Rated Power ……: | | | | | | | |
| Clock frequencies ……: | | | | | | | |
| Other parameters……: | | | | | | | |

| | | | |
|---|---|---|---|
| Software version .....: | 0.23.0 | | |
| Hardware version.....: | 00769657.00 | | |
| Dimensions in cm (W x H x D)....: | | | |
| Mounting position.....: | ☐ | Table top equipment | |
| | ☐ | Wall/Ceiling mounted equipment | |
| | ☐ | Floor standing equipment | |
| | ☒ | Hand-held equipment | |
| | ☐ | Other: | |
| Modules/parts .....: | Module/parts of test item | Type | Manufacturer |
| | | | |
| | | | |
| | | | |
| | | | |
| Accessories (not part of the test item) .....: | Description | Type | Manufacturer |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| Documents as provided by the applicant.....: | Description | File name | Issue date |
| | | | |
| | | | |
| | | | |
| | | | |

## Identification of the client

POLAR ELECTRO OY

Professorintie 5

90440, Kempele, FINLAND

## Testing period and place

| | |
|---|---|
| **Test Location** | DEKRA Testing and Certification S.A.U. |
| **Date (start)** | 2018-05-24 |
| **Date (finish)** | 2018-06-01 |

## Document history

| Report number | Date | Description |
|---|---|---|
| 56962REM.002 | 2018-06-26 | First release |

# Environmental conditions

In the control chamber, the following limits were not exceeded during the test:

| | |
|---|---|
| **Temperature** | Min. = 15 ºC<br>Max. = 35 ºC |
| **Relative humidity** | Min. = 30 %<br>Max. = 75 % |
| **Air pressure** | Min. = 860 mbar<br>Max. = 1060 mbar |

In the semianechoic chamber, the following limits were not exceeded during the test.

| | |
|---|---|
| **Temperature** | Min. = 15 ºC<br>Max. = 35 ºC |
| **Relative humidity** | Min. = 30 %<br>Max. = 75 % |
| **Air pressure** | Min. = 860 mbar<br>Max. = 1060 mbar |

In the chamber for conducted measurements, the following limits were not exceeded during the test:

| | |
|---|---|
| **Temperature** | Min. = 15 ºC<br>Max. = 35 ºC |
| **Relative humidity** | Min. = 30 %<br>Max. = 60 % |
| **Air pressure** | Min. = 860 mbar<br>Max. = 1060 mbar |

## Remarks and comments

The test have been performed by the technical personnel: Ismael Gamarro, Antonio Ruiz, David Rubio & Miguel Quesada.

## Testing verdicts

| | |
|---|---|
| Not applicable : | N/A |
| Pass : | P |
| Fail : | F |
| Not measured : | N/M |

## Summary

| Emission Test<br>Requirement – Test case | Verdict | Remark |
|---|---|---|
| Radiated emission. Electromagnetic field measure (30 KHz – 1000 MHz) | P | N/A |
| Radiated emission. Electromagnetic field measure (1 GHz – 18 GHz) | P | N/A |
| Radiated emission. Electromagnetic field measure (18 GHz – 26 GHz) | P | N/A |
| Continuous conducted emission (150 KHz – 30 MHz) | P | N/A |
| Supplementary information and remarks: | | |

# **Appendix A:** Test results

# Appendix A Content

# DESCRIPTION OF THE OPERATION MODES

The operation modes described in this paragraph constitute a functionality of the sample under test for itself. The operation modes used by the samples to which the present report refers, are shown in the following table:

| OPERATION MODE | DESCRIPTION |
|---|---|
| OM#01 | EUT ON. Bluetooth OFF. GPS and GNSS in RX mode. Transferring data via USB. ANSI Setup. Charging batteries. Power supply: 5Vdc (by USB port). |

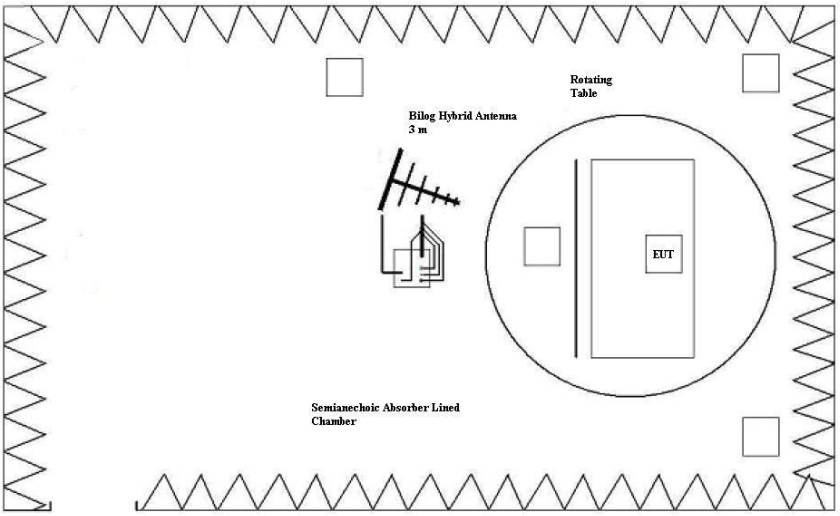
## RADIATED EMISSION. ELECTROMAGNETIC FIELD MEASURE

| | | |
|---|---|---|
| **LIMITS:** | Product standard: | FCC CFR 47, Part 15, Subpart B (10-1-17 Edition), Secs. 15.109; ICES-003 (January 2016, updated April 2017) & ANSI C63.4 (2014) |
| | Test standard: | FCC CFR 47, Part 15, Subpart B (10-1-17 Edition), Secs. 15.109; ICES-003 (January 2016, updated April 2017) & ANSI C63.4 (2014) |

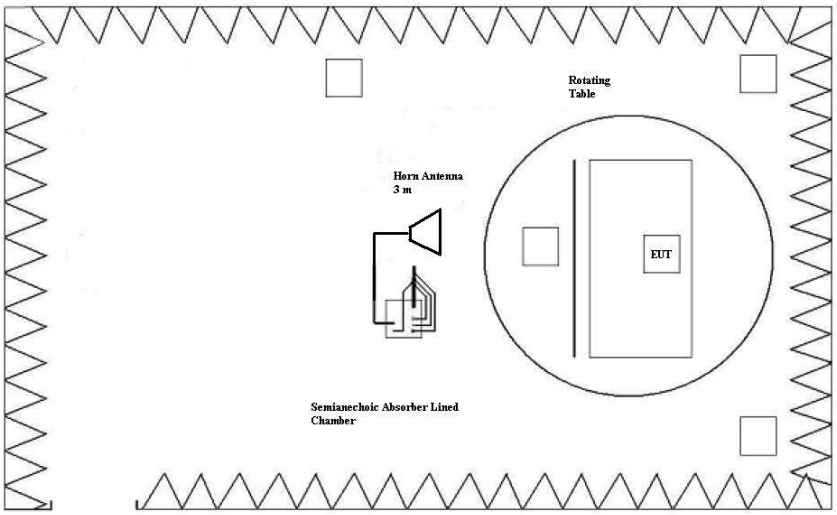
**Limits of interference Class B**

The applied limit for radiated emissions, 3 m distance, according with the requirements of FCC Rules and Regulations 47 CFR Part 15, Subpart B (10-1-17 Edition), Secs. 15.109 & ICES-003 (January 2016, updated April 2017) in the frequency range 30 MHz to 18 GHz for class B equipments.

| Frequency range (MHz) | QP Limit for 3 m | | PK Limit for 3 m |
|---|---|---|---|
| | (μV/m) | (dBμV/m) | (dBμV/m) |
| 30 to 88 | 100 | 40 | --- |
| 88 to 216 | 150 | 43.5 | --- |
| 216 to 960 | 200 | 46 | --- |
| Above 960 | 500 | 54 | 74 |




Setup for measurements < 1GHz.



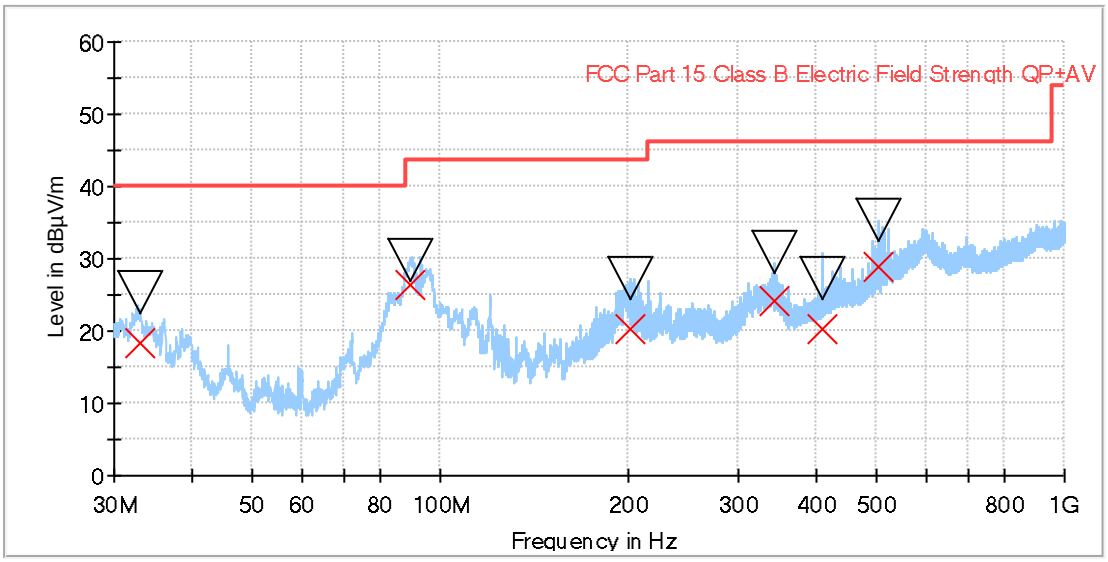

Setup for measurements > 1GHz.

| | |
|---|---|
| **TESTED SAMPLE:** | S/01 |
| **TESTED OPERATION MODES:** | OM#01 |
| **TEST RESULTS:** | CRmmnnRRPP: CR, Radiated Condition; mm: Sample number; nn: Operation mode; RR: Range; PP: Polarization. |

| CRmmnnRRPP | Description | Result |
|---|---|---|
| CR0101LR | Range: 30 MHz - 1000 MHz. (ANSI Setup) | P |
| CR0101HR1_PH | Range: 1 GHz - 18 GHz. Horizontal Polarization. (ANSI Setup) | P |
| CR0101HR1_PV | Range: 1 GHz - 18 GHz. Vertical Polarization. (ANSI Setup) | P |
| CR0101HR2_PH | Range: 18 GHz - 26 GHz. Horizontal Polarization. (ANSI Setup) | P |
| CR0101HR2_PV | Range: 18 GHz - 26 GHz. Vertical Polarization. (ANSI Setup) | P |

**Radiated Emission. CR0101LR ANSI SETUP**

| | |
|---|---|
| Project: | 56962REM.002 |
| Company: | POLAR ELECTRO OY |
| Sample: | S/01 |
| Operation mode: | OM#01 |
| Description: | EUT ON. Bluetooth OFF. GPS and GNSS in RX mode. Transferring data via USB. ANSI Setup. Charging batteries. Power supply: 5Vdc (by USB port). |




Peak Scan
FCC Part 15 Class B Electric Field Strength QP+AV
Final_Result PK+
Final_Result QPK

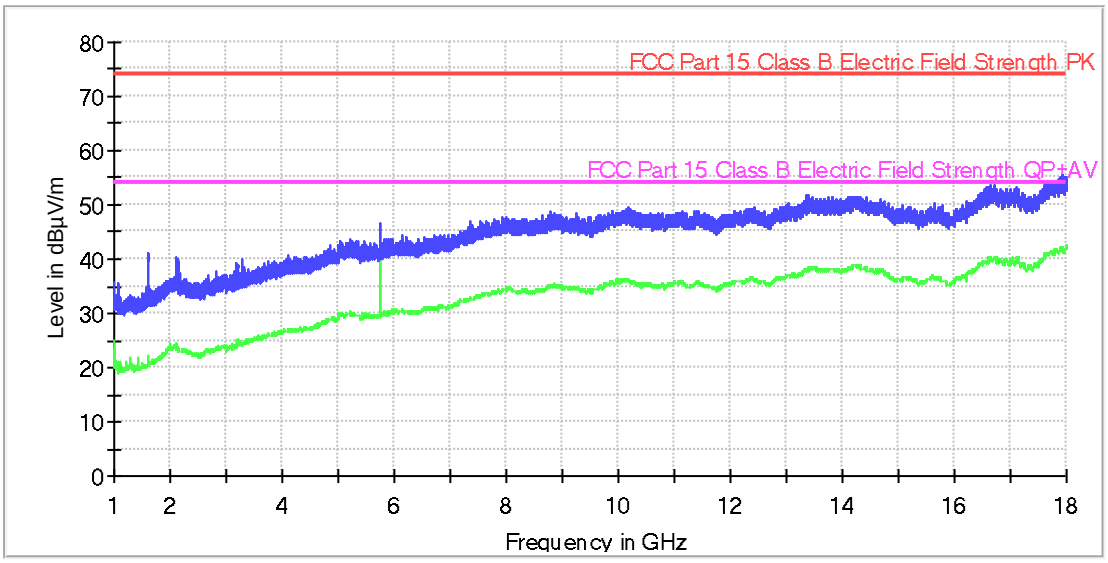
## Maximizations

| Frequency (MHz) | MaxPeak (dBµV/m) | QuasiPeak (dBµV/m) | Height (cm) | Pol |
|---|---|---|---|---|
| 33.065000 | 25.38 | 18.45 | 151.0 | V |
| 89.585000 | 29.71 | 26.43 | 111.0 | V |
| 202.065000 | 27.18 | 20.24 | 137.0 | H |
| 342.230000 | 30.87 | 24.26 | 166.0 | V |
| 408.110000 | 27.30 | 20.27 | 106.0 | V |
| 504.150000 | 35.25 | 28.99 | 140.0 | V |

**Radiated Emission. CR0101HR1_PH ANSI SETUP**

| | |
|---|---|
| Project: | 56962REM.002 |
| Company: | POLAR ELECTRO OY |
| Sample: | S/01 |
| Operation mode: | OM#01 |
| Description: | EUT ON. Bluetooth OFF. GPS and GNSS in RX mode. Transferring data via USB. ANSI Setup. Charging batteries. Power supply: 5Vdc (by USB port). Horizontal polarization. |

## ER EMI FCC 15 Class B (1-18GHz)




Average Scan
Peak Scan
FCC Part 15 Class B Electric Field Strength PK
FCC Part 15 Class B Electric Field Strength QP+AV

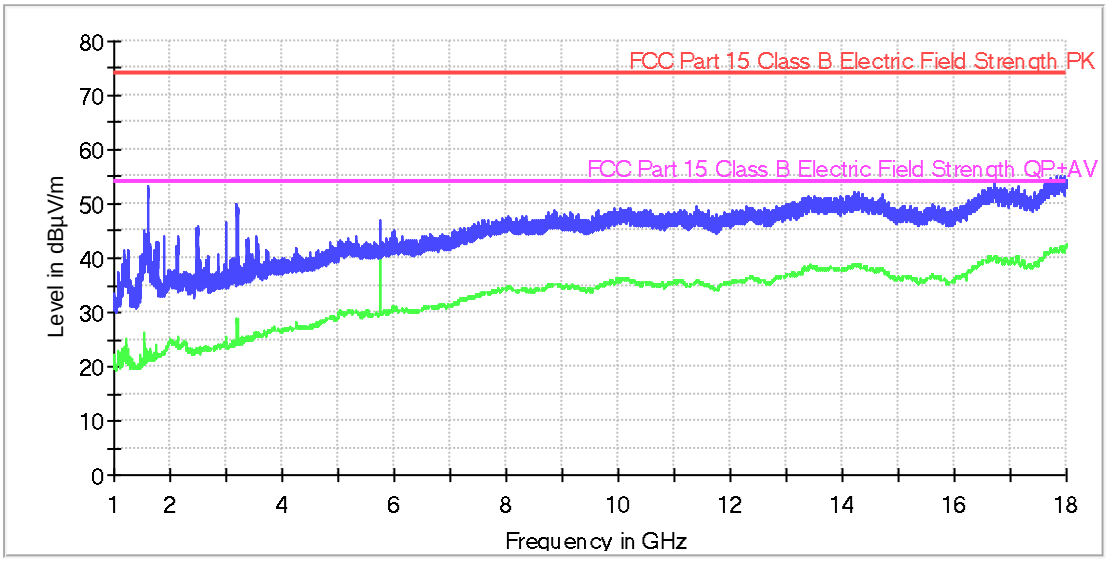
## Subrange Maxima

| Frequency (MHz) | Peak Scan (dBµV/m) | Average Scan (dBµV/m) |
|---|---|---|
| 1000.000000 | 36.1 | 25.3 |
| 1599.200000 | 41.2 | 21.0 |
| 2123.600000 | 40.3 | 23.6 |
| 3157.200000 | 37.8 | 23.9 |
| 4095.200000 | 40.9 | 26.8 |
| 5203.600000 | 43.6 | 30.1 |
| 7523.200000 | 47.0 | 33.1 |
| 9890.000000 | 49.0 | 35.9 |
| 13395.200000 | 51.9 | 38.3 |
| 17912.400000 | 55.7 | 42.1 |

**Radiated Emission. CR0101HR1_PV ANSI SETUP**

| | |
|---|---|
| Project: | 56962REM.002 |
| Company: | POLAR ELECTRO OY |
| Sample: | S/01 |
| Operation mode: | OM#01 |
| Description: | EUT ON. Bluetooth OFF. GPS and GNSS in RX mode. Transferring data via USB. ANSI Setup. Charging batteries. Power supply: 5Vdc (by USB port). Vertical polarization. |

## ER EMI FCC 15 Class B (1-18GHz)




Average Scan
Peak Scan
FCC Part 15 Class B Electric Field Strength PK
FCC Part 15 Class B Electric Field Strength QP+AV

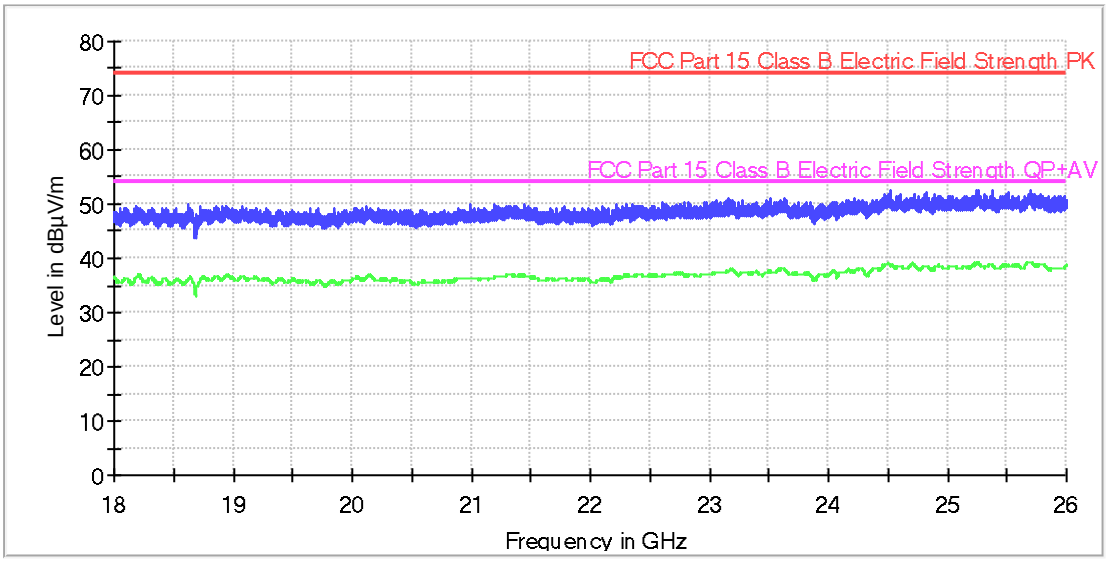
## Subrange Maxima

| Frequency (MHz) | PK+_CLRWR (dBµV/m) | AVG_CLRWR (dBµV/m) |
|---|---|---|
| 1238.800000 | 41.6 | 21.0 |
| 1596.800000 | 53.4 | 22.5 |
| 1893.600000 | 44.2 | 23.0 |
| 2988.000000 | 46.8 | 25.5 |
| 3191.600000 | 50.0 | 28.6 |
| 5326.000000 | 44.0 | 29.9 |
| 5760.000000 | 47.2 | 41.3 |
| 10037.200000 | 49.3 | 35.9 |
| 13392.800000 | 51.4 | 38.2 |
| 17980.400000 | 55.1 | 41.9 |

**Radiated Emission. CR0101HR2_PH ANSI SETUP**

| | |
|---|---|
| Project: | 56962REM.002 |
| Company: | POLAR ELECTRO OY |
| Sample: | S/01 |
| Operation mode: | OM#01 |
| Description: | EUT ON. Bluetooth OFF. GPS and GNSS in RX mode. Transferring data via USB. ANSI Setup. Charging batteries. Power supply: 5Vdc (by USB port). Horizontal polarization. |

## ER EMI FCC 15 Class B (18-26GHz)




Average Scan
Peak Scan
FCC Part 15 Class B Electric Field Strength PK
FCC Part 15 Class B Electric Field Strength QP+AV

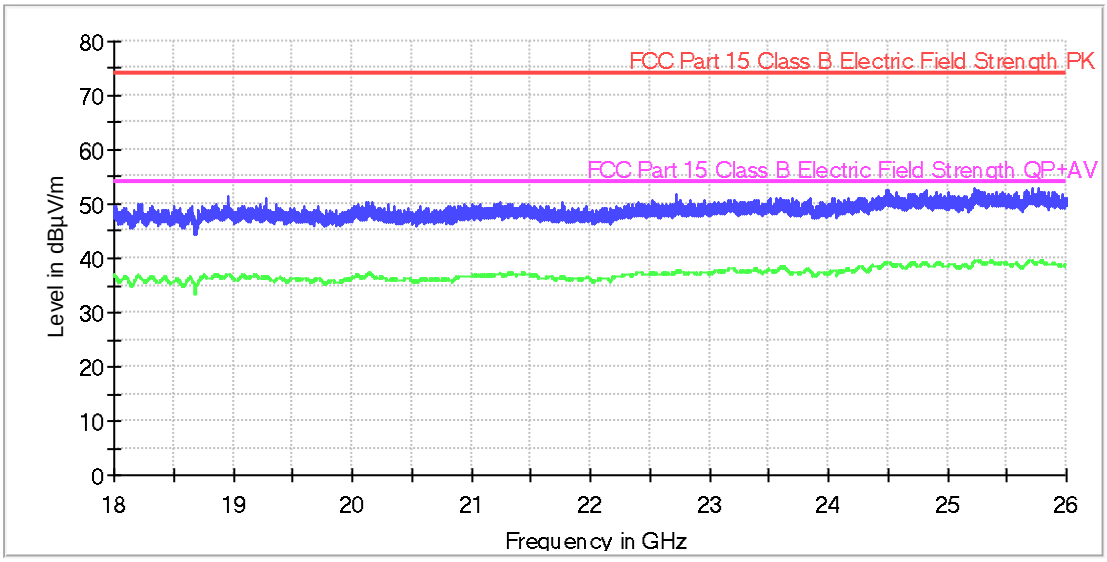
## Subrange Maxima

| Frequency (MHz) | Peak Scan (dBµV/m) | Average Scan (dBµV/m) |
|---|---|---|
| 18624.000000 | 49.9 | 36.3 |
| 18948.400000 | 49.7 | 36.7 |
| 19712.800000 | 49.4 | 35.9 |
| 20118.000000 | 49.5 | 36.4 |
| 20995.600000 | 50.1 | 36.3 |
| 22223.200000 | 50.1 | 36.5 |
| 23166.400000 | 51.0 | 37.8 |
| 23506.800000 | 51.0 | 37.6 |
| 24517.600000 | 52.4 | 38.8 |
| 25258.400000 | 52.6 | 39.1 |

**Radiated Emission. CR0101HR2_PV ANSI SETUP**

| | |
|---|---|
| Project: | 56962REM.002 |
| Company: | POLAR ELECTRO OY |
| Sample: | S/01 |
| Operation mode: | OM#01 |
| Description: | EUT ON. BLE OFF. GPS and GNSS in RX mode. Transferring data via USB. ANSI Setup. Equipment charging batteries. Power supply: 5Vdc (by USB port). Auxiliary PC for ANSI Setup powered 115Vac. Vertical polarization. |

# ER EMI FCC 15 Class B (18-26GHz)




Average Scan
Peak Scan
FCC Part 15 Class B Electric Field Strength PK
FCC Part 15 Class B Electric Field Strength QP+AV

# Subrange Maxima

| Frequency (MHz) | Peak Scan (dBµV/m) | Average Scan (dBµV/m) |
|---|---|---|
| 18229.200000 | 50.0 | 36.4 |
| 18956.800000 | 51.6 | 37.1 |
| 20058.000000 | 49.9 | 36.8 |
| 20164.400000 | 50.3 | 37.1 |
| 21248.000000 | 50.4 | 37.1 |
| 22408.800000 | 50.4 | 37.4 |
| 22724.000000 | 51.7 | 37.5 |
| 23570.800000 | 51.2 | 37.8 |
| 24817.600000 | 52.6 | 39.2 |
| 25708.000000 | 52.9 | 39.5 |

## CONTINUOUS CONDUCTED EMISSION

| | | |
|---|---|---|
| **LIMITS:** | Product standard : | FCC CFR 47, Part 15, Subpart B (10-1-17 Edition), Secs. 15.107; ICES-003 Issue 6 (January 2016, updated April 2017) & ANSI C63.4 (2014) |
| | Test standard : | FCC CFR 47, Part 15, Subpart B (10-1-17 Edition), Secs. 15.107; ICES-003 Issue 6 (January 2016, updated April 2017) & ANSI C63.4 (2014) |

**CLASS B**

The applied limit for continuous conducted emissions in power leads, according with the requirements of FCC Rules and Regulations 47 CFR Part 15, Subpart B (10-1-17 Edition), Secs. 15.107 & ICES-003 (January 2016, updated April 2017), in the frequency range 0,15 to 30 MHz, for Class B equipment was:

| **Frequency range** | **Limit (dBµV)** | |
|---|---|---|
| **(MHz)** | **Quasi-peak** | **Average** |
| 0,15 to 0,5 | 66-56* | 56-46* |
| 0,5 to 5 | 56 | 46 |
| 5 to 30 | 60 | 50 |

*Decreases with the logarithm of the frequency.

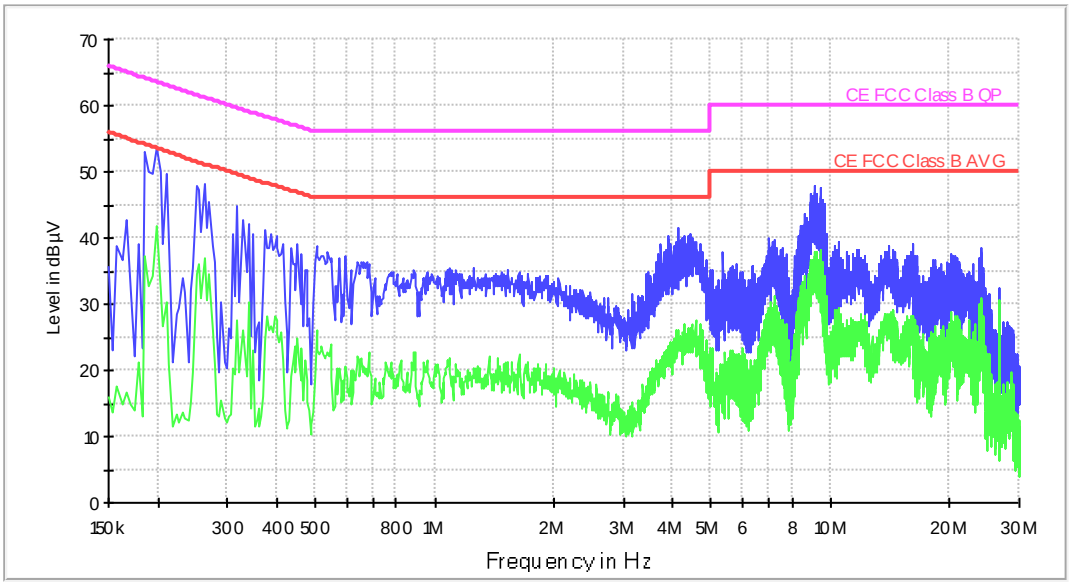
| | |
|---|---|
| **TESTED SAMPLES:** | S/01 |
| **TESTED OPERATION MODES:** | OM#01 |
| **TEST RESULTS:** | CCmmnnhh: CC, Conducted Condition; mm: Sample number; nn: Operation mode; hh: wire |

| **CCmmnnhh** | **DESCRIPTION** | **RESULT** |
|---|---|---|
| CC01010N | Range: 150kHz – 30MHz. Neutral wire noise. | P |
| CC0101L1 | Range: 150kHz – 30MHz. Phase wire noise. | P |

**Conducted Emission. CC01010N**

| | |
|---|---|
| Project: | 56962REM.002 |
| Company: | POLAR ELECTRO OY |
| Sample: | S/01 |
| Operation mode: | OM#01 |
| Description: | EUT ON. BLE OFF. GPS and GNSS in RX mode. Transferring data via USB. ANSI Setup. Equipment charging batteries. Power supply: 5Vdc (by USB port). Auxiliary PC for ANSI Setup powered 115Vac. Neutral wire noise. |

## EC FCC Class B ESPI CC



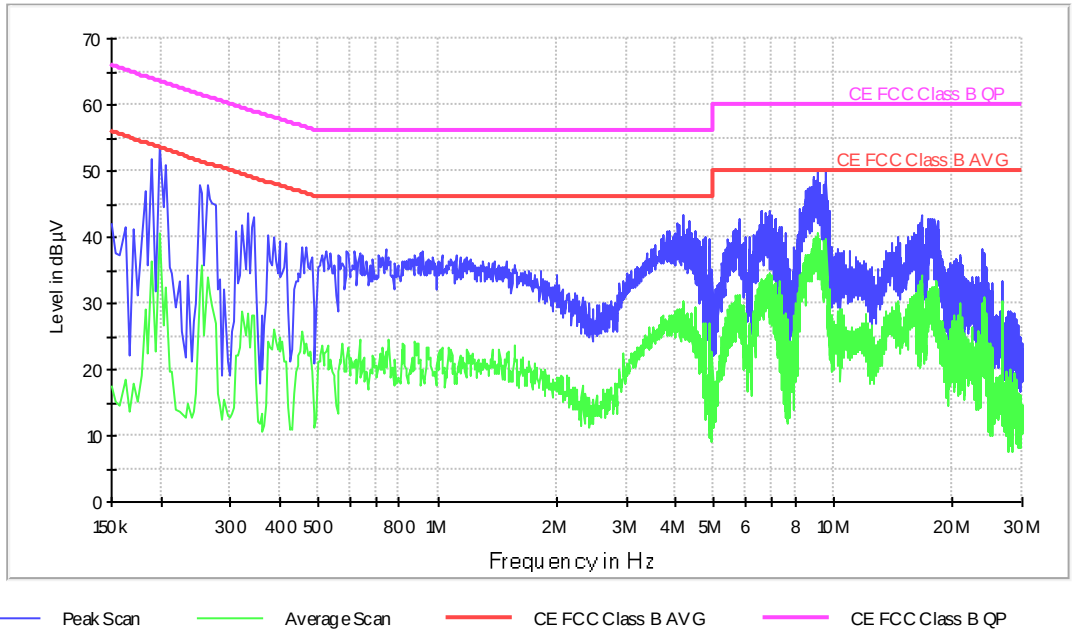

## Subrange Maxima

| Frequency (MHz) | MaxPeak-ClearWrite (dBµV) | Average-ClearWrite (dBµV) |
|---|---|---|
| 0.198000 | 53.5 | 41.8 |
| 0.262000 | 48.2 | 37.0 |
| 0.450000 | 39.2 | 24.9 |
| 1.086000 | 35.5 | 20.9 |
| 1.254000 | 35.3 | 20.4 |
| 3.478000 | 34.7 | 18.7 |
| 4.114000 | 41.6 | 25.9 |
| 9.154000 | 47.9 | 37.4 |
| 10.450000 | 39.3 | 28.9 |
| 23.962000 | 38.5 | 29.7 |

**Conducted Emission. CC0101L1**

| | |
|---|---|
| Project: | 56962REM.002 |
| Company: | POLAR ELECTRO OY |
| Sample: | S/01 |
| Operation mode: | OM#01 |
| Description: | EUT ON. BLE OFF. GPS and GNSS in RX mode. Transferring data via USB. ANSI Setup. Equipment charging batteries. Power supply: 5Vdc (by USB port). Auxiliary PC for ANSI Setup powered 115Vac. Phase wire noise. |

# EC FCC Class B ESPI CC




# Subrange Maxima

| Frequency (MHz) | MaxPeak-ClearWrite (dBµV) | Average-ClearWrite (dBµV) |
|---|---|---|
| 0.198000 | 53.6 | 40.6 |
| 0.262000 | 47.9 | 33.9 |
| 0.454000 | 38.6 | 25.8 |
| 0.738000 | 38.1 | 22.8 |
| 1.306000 | 36.5 | 21.5 |
| 3.550000 | 38.9 | 25.6 |
| 4.174000 | 43.3 | 30.3 |
| 9.562000 | 50.1 | 39.7 |
| 16.642000 | 43.3 | 34.1 |
| 18.054000 | 42.8 | 31.4 |