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

ENSAYOS Nº 51/LE147

Test report No:
NIE: 63634REM.002

Test report

FCC Rules and Regulations CFR 47, Part 15, Subpart B (10-1-16 Edition) & ICES-003 Issue 6 (Updated 2017-04)

(*) Identification of item tested	Fitness watch
(*) Trademark	Polar
(*) Model and /or type reference	4B
Other identification of the product	HW version: 00782070 SW version: 0.1.4 FCC ID: INW4B IC: 6248A-4B
(*) Features	Bluetooth LE
Manufacturer	POLAR ELECTRO OY Professorintie 5, 90440. Kempele. Finland.
Test method requested, standard	FCC CFR 47, Part 15, Subpart B (10-1-16 Edition) & ICES-003 Issue 6 (Updated 2017-04)
Summary	IN COMPLIANCE
Approved by (name / position & signature)	Rafael López EMC Consumer & RF Lab. Manager RAFAEL LÓPEZ MARTÍN 2020.04.13 08:21:37 +02'00'
Date of issue	2020-03-26
Report template No	FDT08_22

Index

Competences and guarantees 3
General conditions 3
Uncertainty 3
Data provided by the client 4
Usage of samples 4
Test sample description 4
Identification of the client 5
Testing period and place 5
Document history 5
List of equipment used during the test 6
Environmental conditions 7
Remarks and comments 8
Testing verdicts 8
Summary 8

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.

DEKRA Testing and Certification is a FCC recognized accredited testing laboratory with appropriate scope of accreditation that include testing performed in this test report, FCC designation number ES0004.

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.

Data provided by the client

The following data has been provided by the client:

1. Information relating to the description of the sample ("Identification of the item tested", "Trademark", "Model and/or type reference tested")

2. The tested sample consists of a fitness watch with Bluetooth low-energy connectivity and wrist-based heartrate.

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

Usage of samples

Samples under 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
63634/001	Fitness watch	4B	F0094B1000247	2020-03-05
63634/010	USB-adapter	---	---	2020-03-05
63634/016	USB-Cable	---	---	2020-03-05

Test sample description

Ports…… :	Port name and description		Cable				
			Specified length [m]	Attached during test	Shielded		
	USB port		0.07	☒	☐		
				☐	☐		
				☐	☐		
				☐	☐		
Supplementary information to the ports……:							
Rated power supply .....:	Voltage and Frequency		Reference poles				
			L1	L2	L3	N	PE
	☐	AC:	☐	☐	☐	☐	☐
	☐	AC:	☐	☐	☐	☐	☐
	☒	DC: 3.8Vdc.					
	☐	DC:					
Rated Power .....:	0.63W						
Clock frequencies.....:	32MHz, 32.768kHz						
Other parameters .....:	Not provided data						
Software version .....:	0.1.4						
Hardware version .....:	00782070						
Dimensions in cm (W x H x D) ....:	Ø 42 mm, H 10 mm						

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
	N/A			
Accessories (not part of the test item) .....:	Description		Type	Manufacturer
	N/A			
Documents as provided by the applicant.....:	Description		File name	Issue date
	N/A			

Identification of the client

POLAR ELECRO OY
Professorintie 5, 90440 Kempele, Finland.

Testing period and place

Test Location	DEKRA Testing and Certification S.A.U.
Date (start)	2020-03-06
Date (finish)	2020-03-11

Document history

Report number	Date	Description
63634REM.002	2020-03-26	First release

List of equipment used during the test

Control Number	Description	Model	Manufacturer	Next Calibration
3541	HYBRID BILOG ANTENNA 30MHz-6GHz	JB6	SUNOL SCIENCES CORPORATION	2021-10-10
4523	EMI TEST RECEIVER 20Hz-26.5GHz	ESU26	ROHDE AND SCHWARZ	2020-02-21
5641	HYBRID BILOG ANTENNA 30MHz-6GHz	3142E	ETS LINDGREN	2021-07-31
6064	SEMIANECHOIC ABSORBER LINED CHAMBER	SAC-3	Frankonia	---
6126	ETHERNET TEMPERATURE AND HUMIDITY LOGGER	HWg-STE	HW GROUP	2020-04-03
6129	ETHERNET TEMPERATURE AND HUMIDITY LOGGER	HWg-STE	HW GROUP	2020-04-03
6132	ETHERNET TEMPERATURE AND HUMIDITY LOGGER	HWg-STE	HW GROUP	2020-04-05
6195	PRE-AMPLIFIER G>55dB 1-18GHz	AMF-7D-01001800-22-10P	NARDA	2020-02-21
6330	SHIELDED ROOM	---	FRANKONIA	---
6496	HORN ANTENNA 1-18GHz	BBHA 9120 D	SCHWARZBECK	2021-01-03
7763	HORN ANTENNA 1-18GHz	BBHA 9120D	SCHWARZBECK MESS-ELEKTRONIK	2022-11-15
7769	PREAMPLIFIER 30dB 500MHz-18GHz	BBV 9718 C	SCHWARZBECK	2021-01-09
7817	EMI TEST RECEIVER 2Hz-44GHz	ESW44	ROHDE AND SCHWARZ	2021-10-29
7826	ULTRALOG ANTENNA 30MHz-6GHz	HL562E_UPG	ROHDE AND SCHWARZ	2022-10-15
7853	EMI RECEIVER 10Hz-30MHz	PMM 9010F	NARDA	2021-10-30
7859	THREE-PHASE ARTIFICIAL NETWORK 32A	PMM L3-32	NARDA	2021-11-20

Environmental conditions

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

Temperature	Min. = 15 ºC Max. = 35 ºC
Relative humidity	Min. = 30 % Max. = 75 %
Air pressure	Min. = 860 mbar Max. = 1060 mbar

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

Temperature	Min. = 15 ºC Max. = 35 ºC
Relative humidity	Min. = 30 % Max. = 75 %
Air pressure	Min. = 860 mbar Max. = 1060 mbar

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

Temperature	Min. = 15 ºC Max. = 35 ºC
Relative humidity	Min. = 30 % Max. = 60 %
Air pressure	Min. = 860 mbar Max. = 1060 mbar

Remarks and comments

The test have been performed by the technical personnel: Carlos Haro, Humberto Pérez & Victoria Olmedo.

Testing verdicts

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

Summary

Emission Test		
Requirement – Test case	**Verdict**	**Remark**
Radiated emission. Electromagnetic field measure (30 KHz – 1000 MHz)	P	---
Radiated emission. Electromagnetic field measure (1 GHz – 12.75 GHz)	P	---
Radiated emission. Electromagnetic field measure (12.75 GHz – 26 GHz)	N/A	(1)
Continuous conducted emission (150 KHz – 30 MHz)	P	---
Supplymentary information and remarks: (1) Not applicable by the equipment internal work frequency.		

Appendix A: Test results

Appendix A Content

DESCRIPTION OF THE OPERATION MODES.....11
RADIATED EMISSION. ELECTROMAGNETIC FIELD MEASURE.....12
CONTINUOUS CONDUCTED EMISSION ON POWER LEADS.....20

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. Airplane mode. Charging battery. Power supply: 3.8Vdc (by USB port).
OM#02	EUT ON. Airplane mode. Charging battery. Transferring data to the PC. Power supply: 5Vdc by USB (through a laptop powered by 115Vac.)

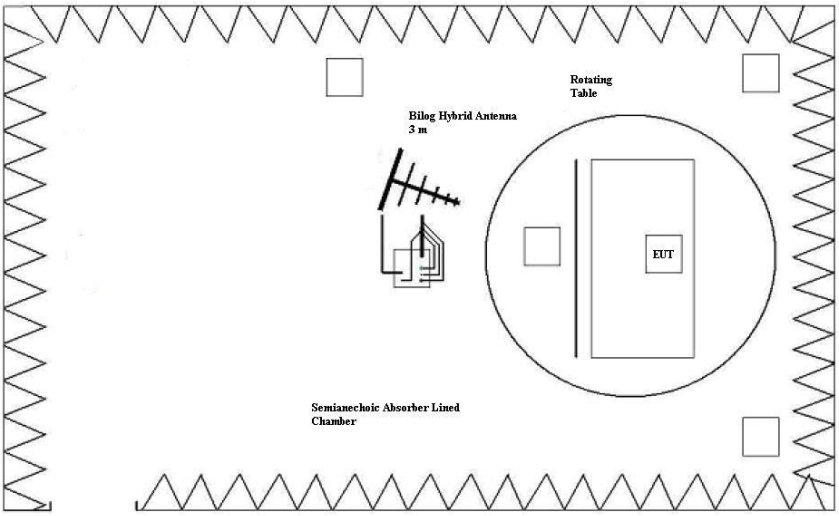
RADIATED EMISSION. ELECTROMAGNETIC FIELD MEASURE

LIMITS:	Product standard:	FCC CFR 47, Part 15, Subpart B (10-1-16 Edition), Secs. 15.109 & ICES-003 Issue 6 (Updated 04-2017)
	Test standard:	FCC CFR 47, Part 15, Subpart B (10-1-16 Edition), Secs. 15.109 & ICES-003 Issue 6 (Updated 04-2017)

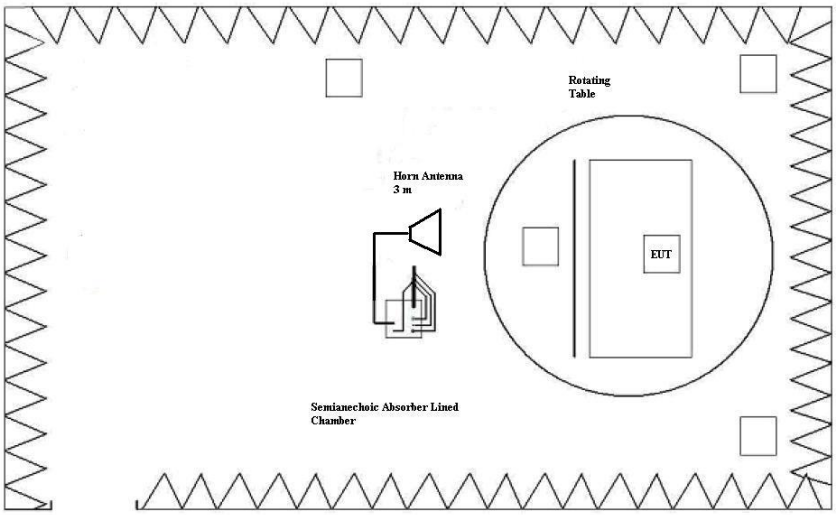
Limits of interference Class B

The applied limit for radiated emissions, 3 m distance, according with the requirements of FCC Rules and Regulations 47 CFR Part 15, Subpart B (10-1-16 Edition), Secs. 15.109 & ICES-003 Issue 6 (Updated 04-2017) in the frequency range 30 MHz to 17 GHz for class B devices.

Frequency range (MHz)	QP Limit for 3 m	
	(μV/m)	(dBμV/m)
30 to 88	100	40
88 to 216	150	43.5
216 to 960	200	46.02
Above 960	500	53.97



Setup for measurements < 1GHz.



Setup for measurements > 1GHz.

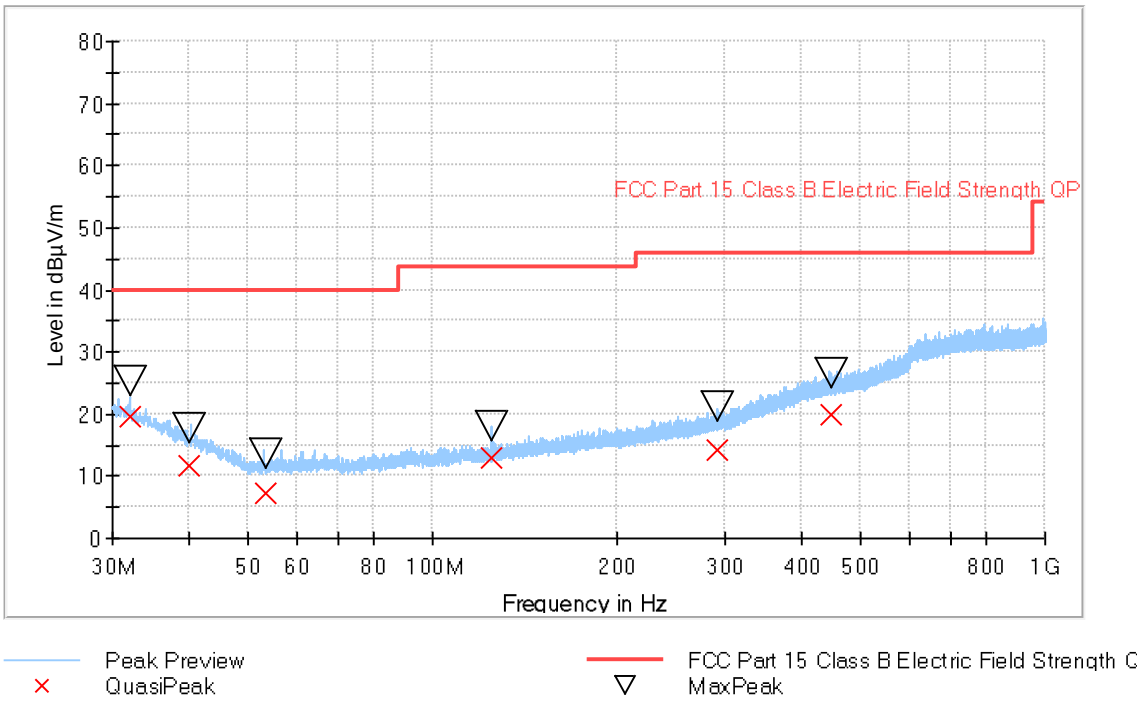
TESTED SAMPLE:	S/01
TESTED OPERATION MODES:	OM#01 & OM#02
TEST RESULTS:	CRmmnnRRPP: CR, Radiated Condition; mm: Sample number; nn: Operation mode; RR: Range; PP: Polarization.

CRmmnnRRPP	Description	Result
CR0101LR	Range: 30 MHz - 1000 MHz.	P
CR0101HR1_PH	Range: 1 GHz – 12.75 GHz. Horizontal Polarization.	P
CR0101HR1_PV	Range: 1 GHz – 12.75 GHz. Vertical Polarization.	P
CR0102LR	Range: 30 MHz - 1000 MHz.	P
CR0102HR1_PH	Range: 1 GHz – 12.75 GHz. Horizontal Polarization.	P
CR0102HR1_PV	Range: 1 GHz – 12.75 GHz. Vertical Polarization.	P

Radiated Emission. CR0101LR

Project:	63634REM.002
Company:	POLAR ELECTRO OY
Sample:	S/01
Operation mode:	OM#01
Description:	EUT ON. Airplane Mode Charging battery. Power supply: 3.8Vdc (by USB port)

Full Spectrum



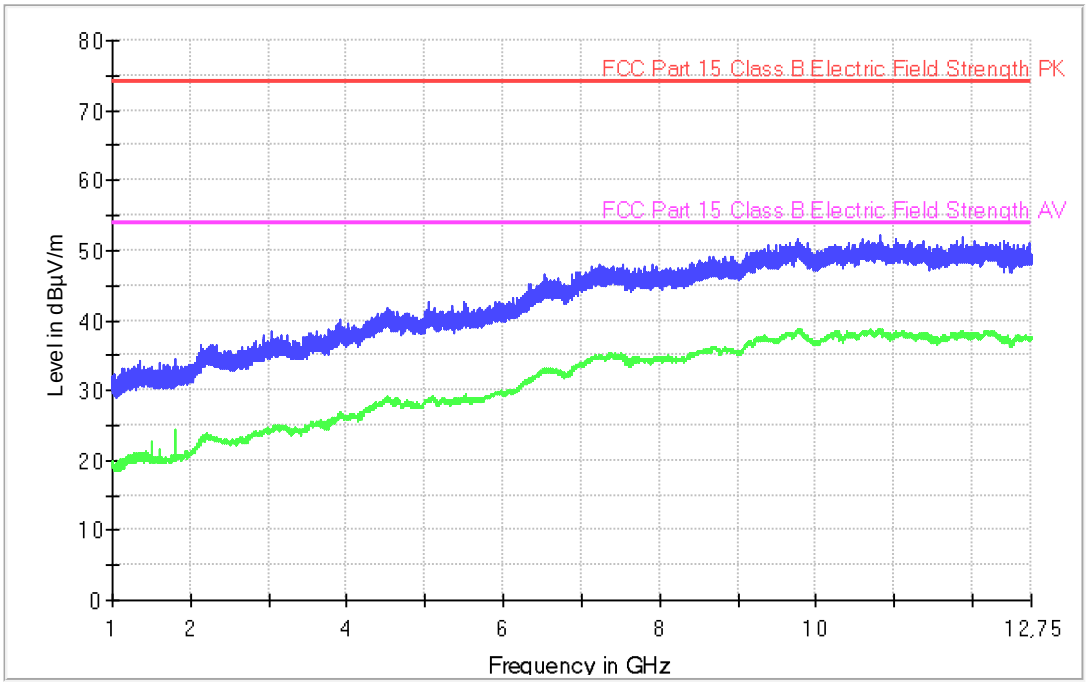
Maximizations

Frequency (MHz)	QuasiPeak (dBµV/m)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Height (cm)	Pol
31.984000	19.66	25.34	40.00	356.0	V
39.985000	11.66	17.66	40.00	182.0	H
53.328000	7.17	13.69	40.00	314.0	H
125.035000	13.00	17.95	40.00	149.0	H
291.401000	14.26	21.23	47.00	338.0	H
446.613000	19.95	26.53	47.00	400.0	V

Radiated Emission. CR0101HR1_PH

Project:	63634REM.002
Company:	POLAR ELECTRO OY
Sample:	S/01
Operation mode:	OM#01
Description:	EUT ON. Airplane Mode Charging battery. Power supply: 3.8Vdc (by USB port). Horizontal Polarization

RE FCC Part 15 Class B 1-12,75 GHz



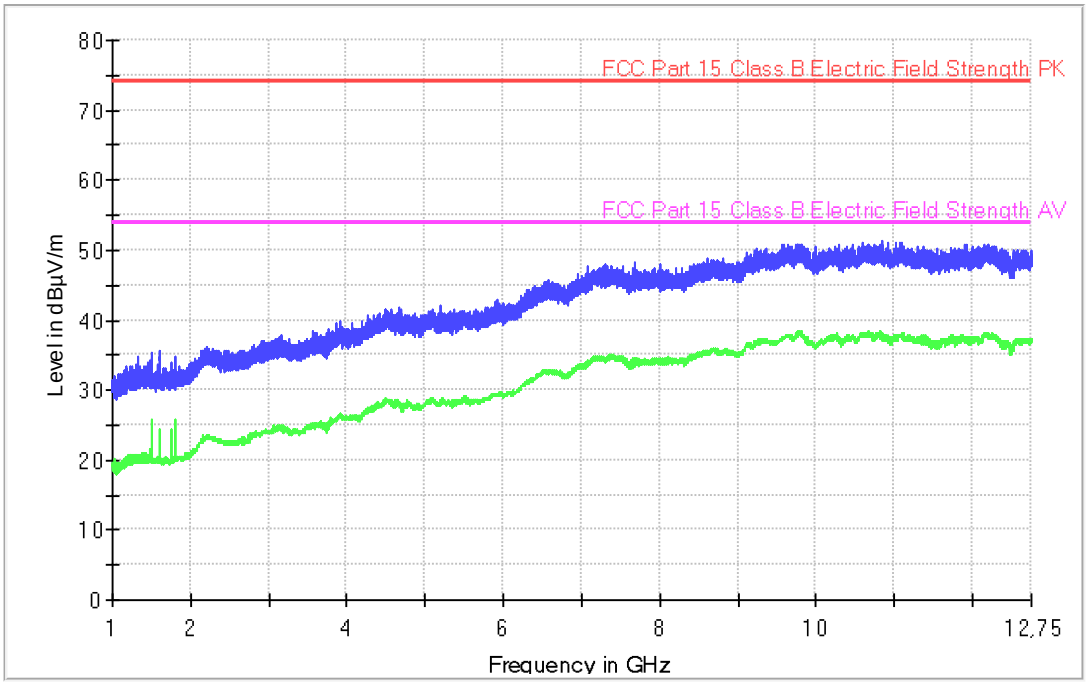
Subrange Maxima

Frequency (MHz)	PK+_CLRWR (dBµV/m)	AVG_CLRWR (dBµV/m)
2141.600000	36.5	23.2
3024.000000	38.4	24.0
4506.400000	41.7	28.9
5041.600000	42.7	28.5
6511.600000	46.5	33.0
7534.000000	48.1	34.9
9161.200000	49.7	36.7
9759.600000	51.7	38.5
10805.600000	52.2	38.6
11882.000000	52.0	37.7

Radiated Emission. CR0101HR1_PV

Project:	63634REM.002
Company:	POLAR ELECTRO OY
Sample:	S/01
Operation mode:	OM#01
Description:	EUT ON. Airplane Mode. Charging battery. Power supply: 3.8Vdc (by USB port). Horizontal Polarization

RE FCC Part 15 Class B 1-12,75 GHz



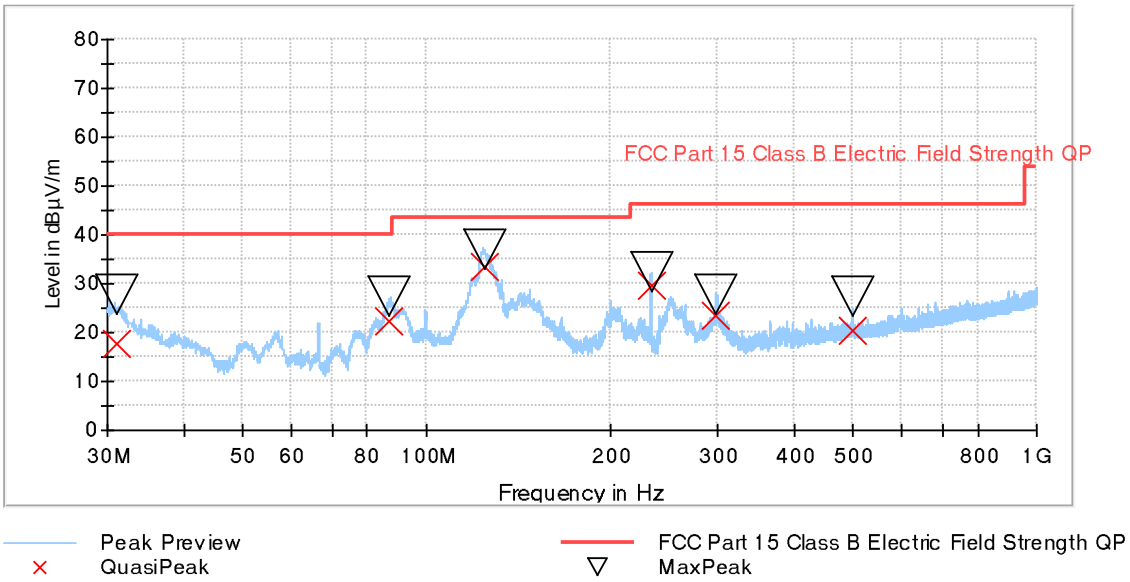
Subrange Maxima

Frequency (MHz)	PK+_CLRWR (dBµV/m)	AVG_CLRWR (dBµV/m)
2125.200000	35.8	22.5
3169.200000	38.0	24.9
4485.200000	41.7	28.8
5198.800000	42.0	28.6
6583.600000	45.7	32.7
7674.400000	48.1	34.5
9198.000000	49.8	36.5
9594.400000	50.9	37.4
10833.600000	51.5	38.0
12142.800000	50.9	38.0

Radiated Emission. CR0102LR

Project:	63634REM.002
Company:	POLAR ELECTRO OY
Sample:	S/01
Operation mode:	OM#02
Description:	EUT ON. Airplane Mode Charging battery.Transferring data to the PC. Power supply: 5Vdc by USB (through a laptop powered by 115 Vac)

Full Spectrum



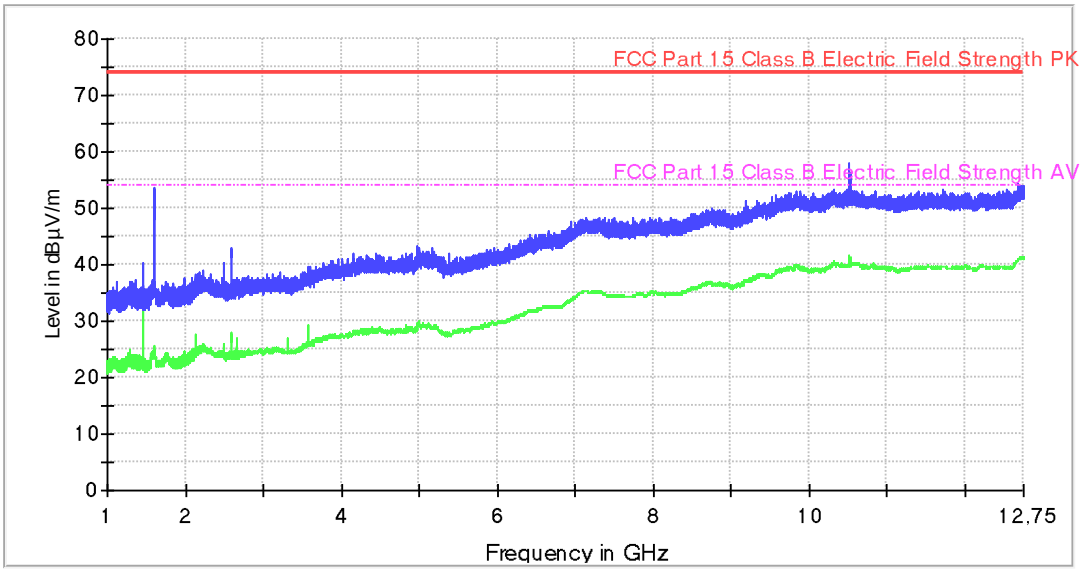
Maximizations

Frequency (MHz)	QuasiPeak (dBµV/m)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)
30.989000	17.88	27.62	40.00	22.12	141.0	V	264.0
86.628000	22.41	27.38	40.00	17.59	107.0	V	20.0
124.188000	33.43	36.98	43.52	10.09	108.0	V	349.0
233.238000	29.58	32.21	46.00	16.42	133.0	H	98.0
298.789000	23.48	27.65	46.00	22.52	155.0	V	324.0
497.927000	20.38	27.34	46.00	25.62	151.0	H	353.0

Radiated Emission. CR0102HR1_PH

Project:	63634REM.002
Company:	POLAR ELECTRO OY
Sample:	S/01
Operation mode:	OM#02
Description:	EUT ON. Airplane Mode Charging battery.Transferring data to the PC. Power supply: 5Vdc by USB (through a laptop powered by 115 Vac). Horizontal polarization.

RE FCC Part 15 ClassB 1-12,75 GHz



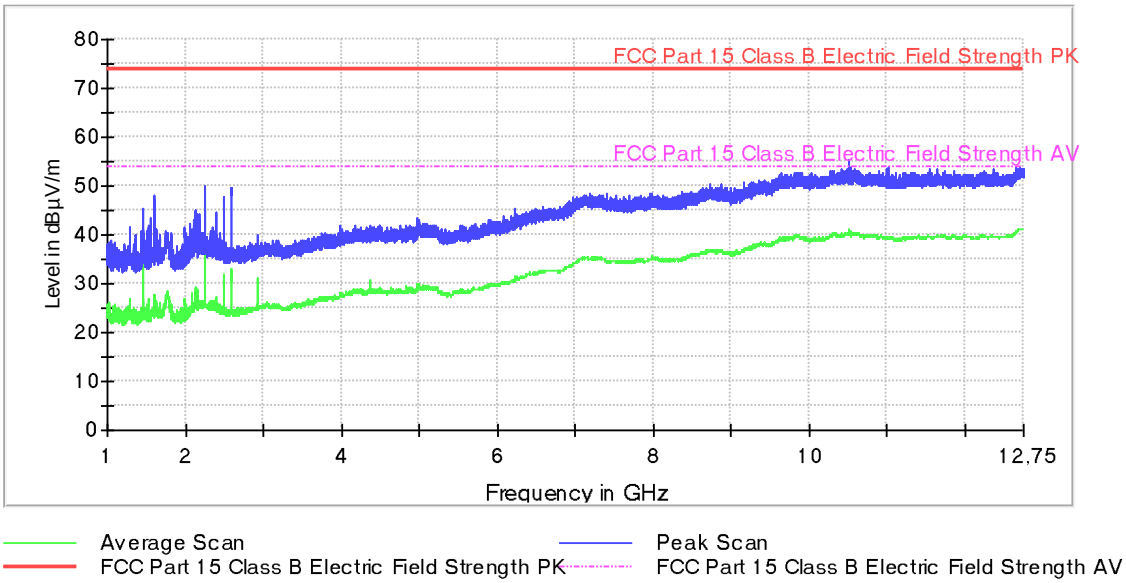
Subrange Maxima

Frequency (MHz)	PK+_CLRWR (dBµV/m)	AVG_CLRWR (dBµV/m)
1598.800000	53.7	25.2
4828.400000	42.2	28.4
6833.600000	46.0	32.6
8743.600000	50.0	36.9
10520.800000	58.0	41.7
12681.200000	54.5	41.0

Radiated Emission. CR0102HR1_PV

Project:	63634REM.002
Company:	POLAR ELECTRO OY
Sample:	S/01
Operation mode:	OM#02
Description:	EUT ON. Airplane Mode Charging battery.Transferring data to the PC. Power supply: 5Vdc by USB (through a laptop powered by 115 Vac). Vertical polarization.

RE FCC Part 15 ClassB 1-12,75 GHz



Subrange Maxima

Frequency (MHz)	PK+_CLRWR (dBµV/m)	AVG_CLRWR (dBµV/m)
2252.400000	50.0	46.8
4492.400000	42.0	28.6
6860.400000	46.0	33.0
8730.800000	50.3	37.0
10520.800000	55.2	41.0
12650.400000	54.0	40.4

CONTINUOUS CONDUCTED EMISSION ON POWER LEADS

LIMITS:	Product standard:	FCC CFR 47, Part 15, Subpart B (10-1-16 Edition), Secs. 15.107; ICES-003 Issue 6 (January 2016); Subpart C (10-1-16 Edition). Sec. 15.207
	Test standard:	FCC CFR 47, Part 15, Subpart B (10-1-16 Edition), Secs. 15.107; ICES-003 Issue 6 (January 2016); Subpart C (10-1-16 Edition). Sec. 15.207

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 (10-1-16 Edition), Secs. 15.107 & ICES-003 Issue 6 (January 2016) & Subpart C (10-1-16 Edition). Sec. 15.207, 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.

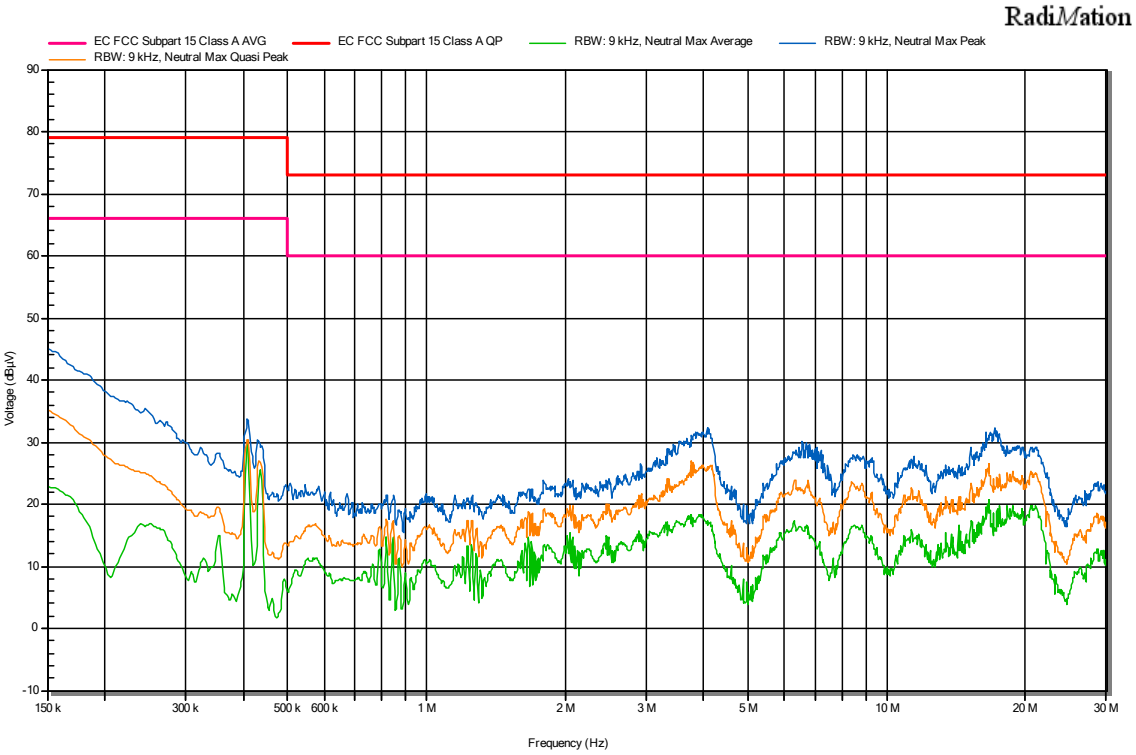
TESTED SAMPLES:	S/01
TESTED OPERATION MODES:	OM#02
TEST RESULTS:	CCmmnnhh: CC, Conducted Condition; mm: Sample number; nn: Operation mode; hh: wire

CCmmnnhh	**DESCRIPTION**	**RESULT**
CC01020N	Neutral wire noise.	P
CC0102L1	Phase wire noise.	P

Conducted Emission. CC01020N

Project:	63634REM.002
Company:	POLAR ELECTRO OY
Sample:	S/01
Operation mode:	OM#02
Description:	EUT ON. Airplane Mode Charging battery. Transferring data to the PC. Power supply: 5Vdc by USB (through a laptop powered by 115 Vac). Phase wire noise.

Full Spectrum



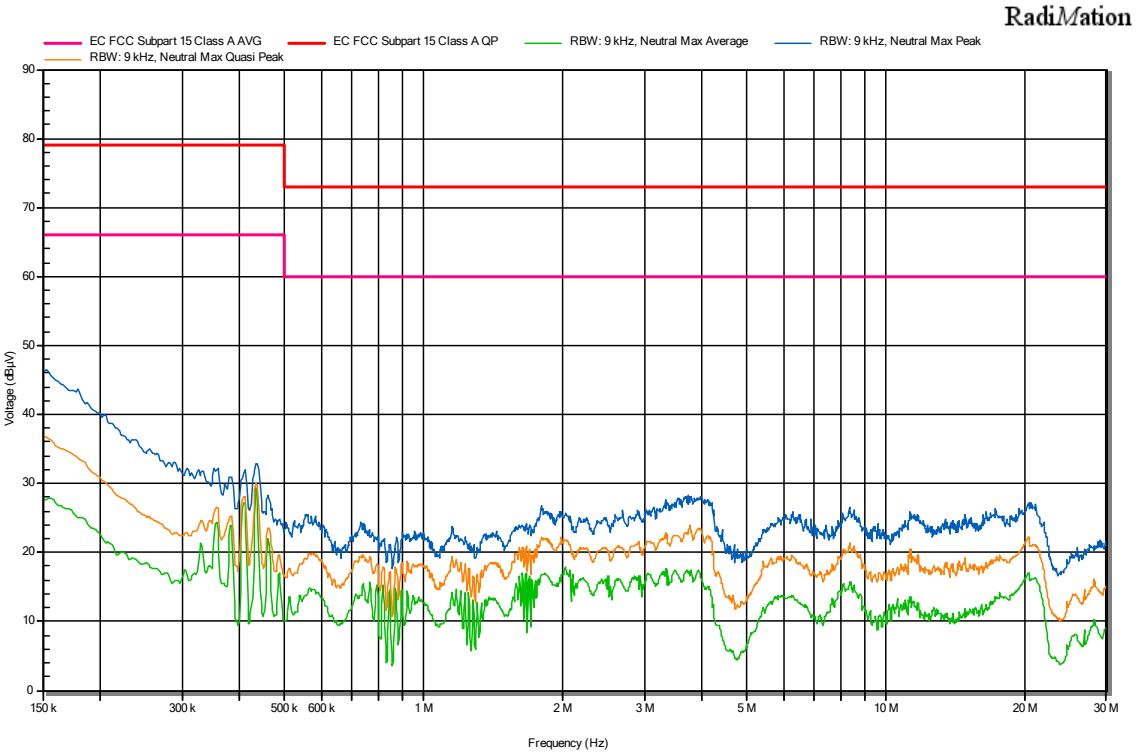
Subrange Maxima

Peak Number	Frequency	Peak	Average	Average Limit	Quasi-Peak	Quasi-Peak Limit
1	150 kHz	45,1 dBµV	22,9 dBµV	66 dBµV	35,1 dBµV	79 dBµV
2	250,189 kHz	34,7 dBµV	16,8 dBµV	66 dBµV	24,6 dBµV	79 dBµV
3	3,963 MHz	31 dBµV	18,2 dBµV	60 dBµV	26,1 dBµV	73 dBµV
4	4,094 MHz	32,3 dBµV	16,9 dBµV	60 dBµV	25,6 dBµV	73 dBµV
5	6,664 MHz	29,8 dBµV	15,6 dBµV	60 dBµV	21,8 dBµV	73 dBµV
6	7,2 MHz	28,6 dBµV	9,3 dBµV	60 dBµV	18,2 dBµV	73 dBµV

Conducted Emission. CC0102L1

Project:	63634REM.002
Company:	POLAR ELECTRO OY
Sample:	S/01
Operation mode:	OM#02
Description:	EUT ON. Airplane Mode Charging battery. Transferring data to the PC. Power supply: 5Vdc by USB (through a laptop powered by 115 Vac). Neutral wire noise.

Full Spectrum



Subrange Maxima

Peak Number	Frequency	Peak	Average	Average Limit	Quasi-Peak	Quasi-Peak Limit
1	150 kHz	46,1 dBµV	27,7 dBµV	66 dBµV	36,8 dBµV	79 dBµV
2	354,468 kHz	31,8 dBµV	24,3 dBµV	66 dBµV	26,3 dBµV	79 dBµV
3	434,21 kHz	32,9 dBµV	29,3 dBµV	66 dBµV	29,9 dBµV	79 dBµV
4	1,8 MHz	26,2 dBµV	16,8 dBµV	60 dBµV	22,1 dBµV	73 dBµV
5	3,493 MHz	26,5 dBµV	17,4 dBµV	60 dBµV	22,4 dBµV	73 dBµV
6	3,79 MHz	27,7 dBµV	16,2 dBµV	60 dBµV	23,1 dBµV	73 dBµV