



Test report No:
NIE: 58401REM.002

Test report

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

Identification of item tested	Pro multisport watch
Trademark	Polar
Model and /or type reference	2X
Other identification of the product	HW Version: 00766694.03 SW Version: 0.28.2 FCC ID: INW2X IC: 6248A-2x
Features	BLE, GPS, GLONASS
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 04-2017)
Summary	IN COMPLIANCE
Approved by (name / position & signature)	Rafael López EMC LAB Manager
Date of issue	2018-08-31
Report template No	FDT08_21

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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.

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General conditions

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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 $I = \pm 3,9$ dB for quasi-peak measurements, $I = \pm 3,2$ 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 $I = \pm 4,9$ dB for quasi-peak measurements, $I = \pm 4,6$ 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 $I = \pm 2,6$ dB for peaks and average measurements ($k = 2$)

Data provided by the client

The sample is 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 N°	Description	Model	Serial N°	Date of reception
58401/002	Pro multisport watch	2X	3C3E4927	2018-08-21

Auxiliary elements used with the sample S/01:

Control N°	Description	Model	Serial N°	Date of reception
56960B/013	USB cable	--	---	2018-05-28

Test sample description

Ports..... :	Port name and description	Cable				
		Specified length [m]	Attached during test	Shielded		
	USB port	0.8	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
			<input type="checkbox"/>	<input type="checkbox"/>		
			<input type="checkbox"/>	<input type="checkbox"/>		
			<input type="checkbox"/>	<input type="checkbox"/>		
			<input type="checkbox"/>	<input type="checkbox"/>		
Supplementary information to the ports..... :						
Rated power supply	Voltage and Frequency	Reference poles				
		L1	L2	L3	N	PE
	<input type="checkbox"/> AC:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/> AC:	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/> DC: 3.8Vdc (Battery Nominal Voltage)						

	<input type="checkbox"/>	DC:	
Rated Power	1,6W		
Clock frequencies	26MHz, 32MHz, 32.768kHz		
Other parameters			
Software version	0.28.2		
Hardware version	00766694.03		
Dimensions in cm (W x H x D)	H=15,3 mm, Ø=45.4mm		
Mounting position	<input type="checkbox"/>	Table top equipment	
	<input type="checkbox"/>	Wall/Ceiling mounted equipment	
	<input type="checkbox"/>	Floor standing equipment	
	<input checked="" type="checkbox"/>	Hand-held equipment	
	<input type="checkbox"/>	Other:	
Modules/parts	Module/parts of test item	Type	Manufacturer
	Not provided data		
Accessories (not part of the test item)	Description	Type	Manufacturer
	Not provided data		
Documents as provided by the applicant	Description	File name	Issue date
	Not provided data		

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)	2018-08-21
Date (finish)	2018-08-22

Document history

Report number	Date	Description
58401REM.002	2018-08-31	First release

Environmental conditions

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

Temperature	Min. = 15 °C Max. = 35 °C
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 °C Max. = 35 °C
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 °C Max. = 35 °C
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: David Rubio & Verónica García.

Testing verdicts

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

List of equipment used during the test

CONTROL NUMBER	DESCRIPTION	MANUFACTURER	MODEL	LAST CALIBRATION	NEXT CALIBRATION
4526	EMI TEST Receiver	ROHDE & SCHWARZ	ESU26	2018-02-21	2020-02-21
4578	Bilog Antenna	ETS LINDGREN	3142E	2017-04-03	2020-04-03
4612	Horn Antenna	SCHWARZBECK	BBHA 9120 D	2016-12-19	2019-12-19
3783	Preamplifier	BONN ELEKTRONIK	BLMA 0118-3A	2018-03-28	2019-03-28
4656	Horn Antenna	SCHWARZBECK	BBHA 9170	2017-03-24	2020-03-24
4570	Thermohigrometer	HW GROUP	HWg-STE	2018-04-03	2019-04-03
4567	Thermohigrometer	HW GROUP	HWg-STE	2018-04-04	2019-04-04
4522	EMC measurement software	ROHDE & SCHWARZ	EMC32 V9.01	---	---
6121	Preamplifier	BONN ELEKTRONIK	BLNA 0160-01N	2018-03-20	2019-03-20
4729	Preamplifier	BONN ELEKTRONIK	BLMA 1840-1M	2018-02-23	2020-02-23

Appendix A: Test results

APPENDIX A CONTENT

DESCRIPTION OF THE OPERATION MODES	10
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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. BLE OFF. GNSS interfaces in RX mode. Transferring data via USB. Equipment charging batteries. Power supply: 5Vdc. (By USB port) Auxiliary Laptop power supply: 115Vac.
OM#02	EUT ON. BLE linked to ancillary Equipment. GPS receiving valid positioning signal. Transferring data via USB. Equipment charging batteries. Power supply: 5Vdc. (By USB port). Auxiliary Laptop power supply: 115Vac.
OM#03	EUT ON. BLE linked to ancillary equipment. Glonass receiving valid positioning signal. Transferring data via USB. Equipment charging batteries. Power supply: 5Vdc. (By USB port). Auxiliary Laptop power supply: 115Vac.

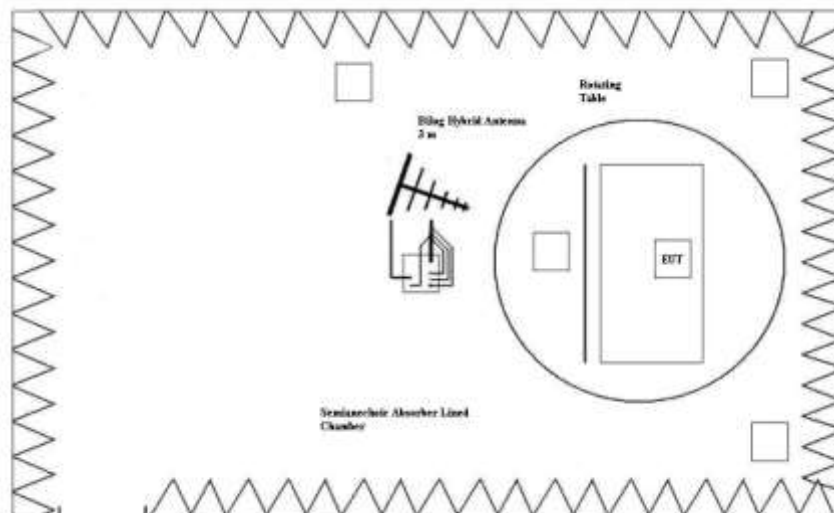
RADIATED EMISSION. ELECTROMAGNETIC FIELD MEASURE

LIMITS:	Product standard:	FCC CFR 47, Part 15, Subpart B (10-1-16 Edition), Secs. 15.109; ICES-003 Issue 6 (Updated 04-2017) & ANSI C63.4 (2014)
	Test standard:	FCC CFR 47, Part 15, Subpart B (10-1-16 Edition), Secs. 15.109; ICES-003 Issue 6 (Updated 04-2017) & ANSI C63.4 (2014)

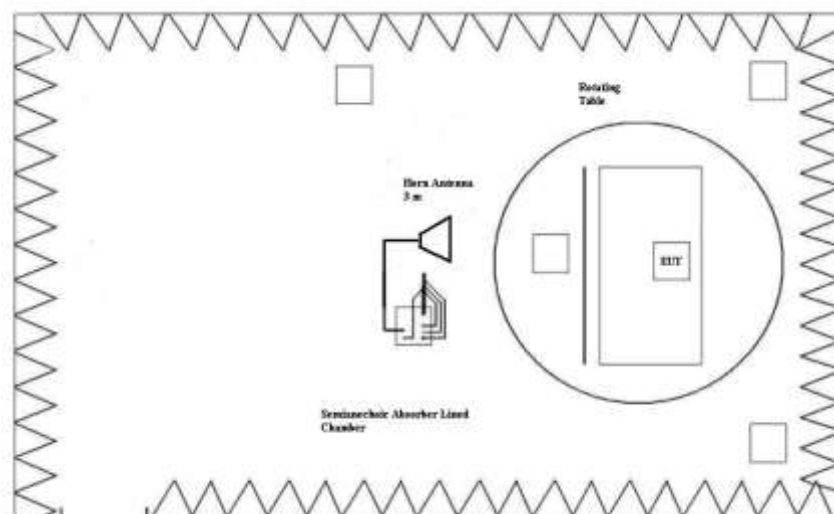
Limits of interference Class B

The applied limit for radiated emissions, 3 m distance, according with the requirements of FCC Rules and Regulations 47 CFR Part 15, Subpart B (10-1-16 Edition), Secs. 15.109 & ICES-003 Issue 6 (Updated 04-2017) 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
	($\mu\text{V/m}$)	($\text{dB}\mu\text{V/m}$)	($\text{dB}\mu\text{V/m}$)
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.

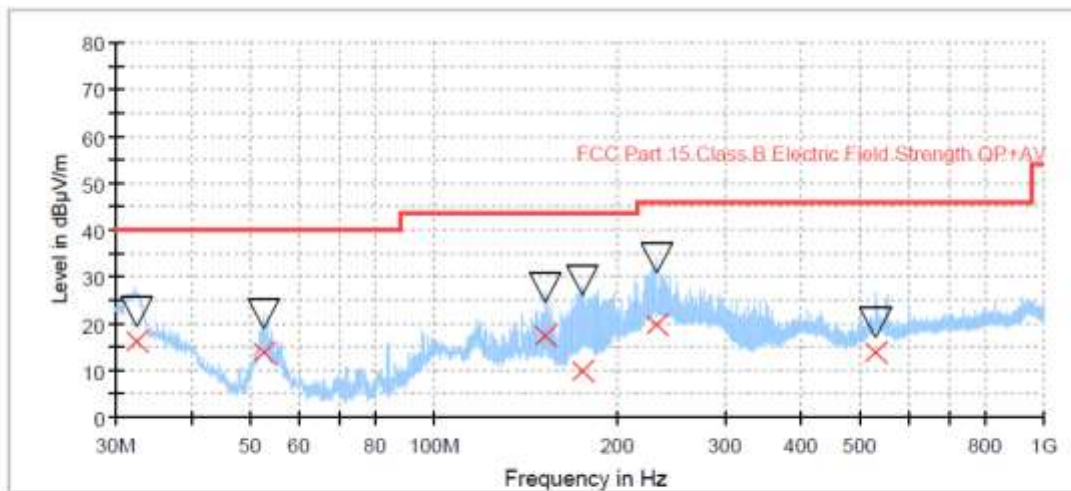
TESTED SAMPLE:	S/01
TESTED OPERATION MODES:	OM#01
TEST RESULTS:	CRmmnnRRPP: CR, Radiated Condition; mm: Sample number; nn: Operation mode; RR: Range; PP: Polarization.

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

Radiated Emission. CR0101LR

Project: 58401REM.002
 Company: POLAR ELECTRO OY
 Sample: S/01
 Operation mode: OM#01
 Description: EUT ON. BLE OFF. GNSS interfaces in RX mode. Transferring data via USB. Equipment charging batteries. Power supply: 5Vdc. (By USB port) Auxiliary Laptop power supply: 115Vac.

FCC Class B



- Peak Preview
- FCC Part 15 Class B Electric Field Strength QP+AV
- x QuasiPeak
- ▽ MaxPeak

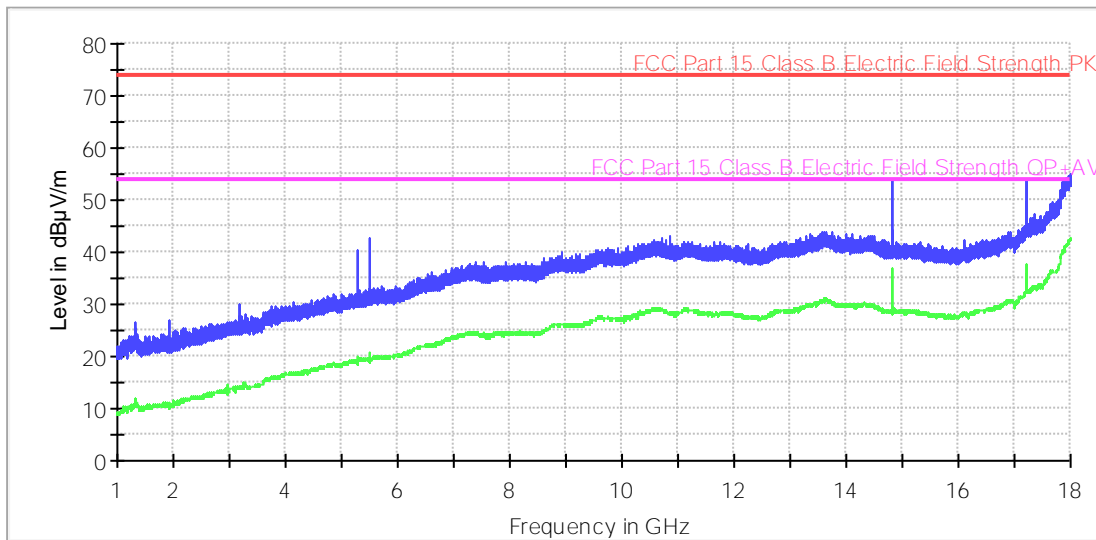
Maximizations

Frequency (MHz)	QuasiPeak (dBµV/m)	MaxPeak (dBµV/m)	Height (cm)	Pol	Azimuth (deg)
32.655000	16.11	22.48	104.0	V	-125.0
52.667500	14.02	22.34	195.0	H	90.0
152.220000	17.52	27.63	310.0	H	-116.0
175.310000	9.87	29.39	261.0	H	-121.0
231.810000	19.90	33.97	149.0	H	75.0
531.345000	13.88	20.03	148.0	V	109.0

Radiated Emission. CR0101HR1_PH

Project: 58401REM.002
 Company: POLAR ELECTRO OY
 Sample: S/01
 Operation mode: OM#01
 Description: EUT ON. BLE OFF. GNSS interfaces in RX mode. Transferring data via USB. Equipment charging batteries. Power supply: 5Vdc. (By USB port) Auxiliary Laptop power supply: 115Vac. Horizontal Polarization

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

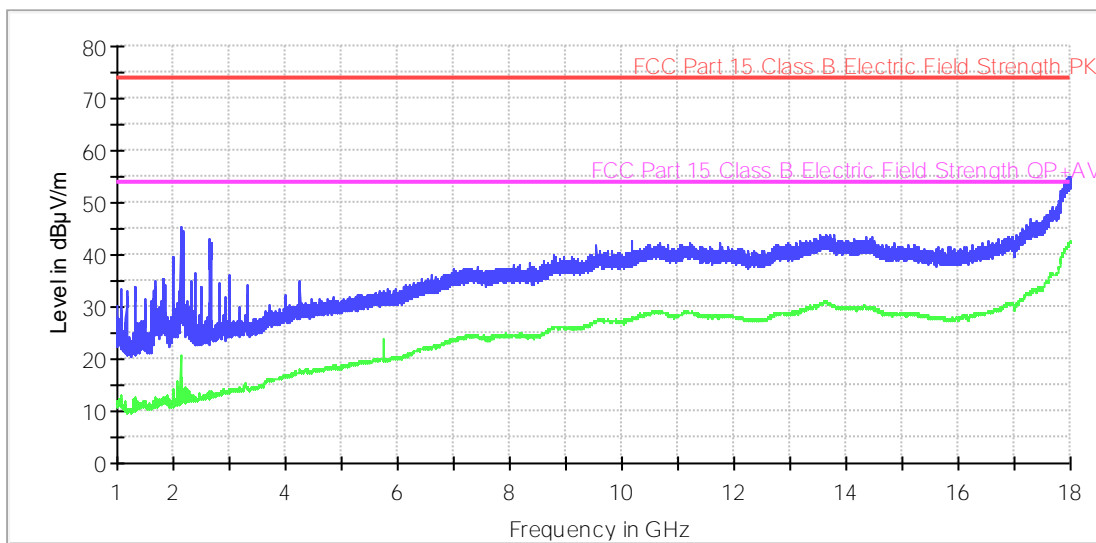
Subrange Maxima

Frequency (MHz)	Peak Scan (dBµV/m)	Average Scan
1939.600000	27.1	10.7
4148.800000	30.3	16.7
5505.600000	42.7	20.9
7528.400000	38.2	24.3
8927.200000	39.9	26.2
10856.400000	43.1	28.5
12824.800000	42.1	28.9
13630.000000	43.9	30.9
14835.200000	53.7	37.0
17995.600000	54.9	42.5

Radiated Emission. CR0101HR1_PV

Project: 58401REM.002
 Company: POLAR ELECTRO OY
 Sample: S/01
 Operation mode: OM#01
 Description: EUT ON. BLE OFF. GNSS interfaces in RX mode. Transferring data via USB. Equipment charging batteries. Power supply: 5Vdc. (By USB port) Auxiliary Laptop power supply: 115Vac. Vertical Polarization

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

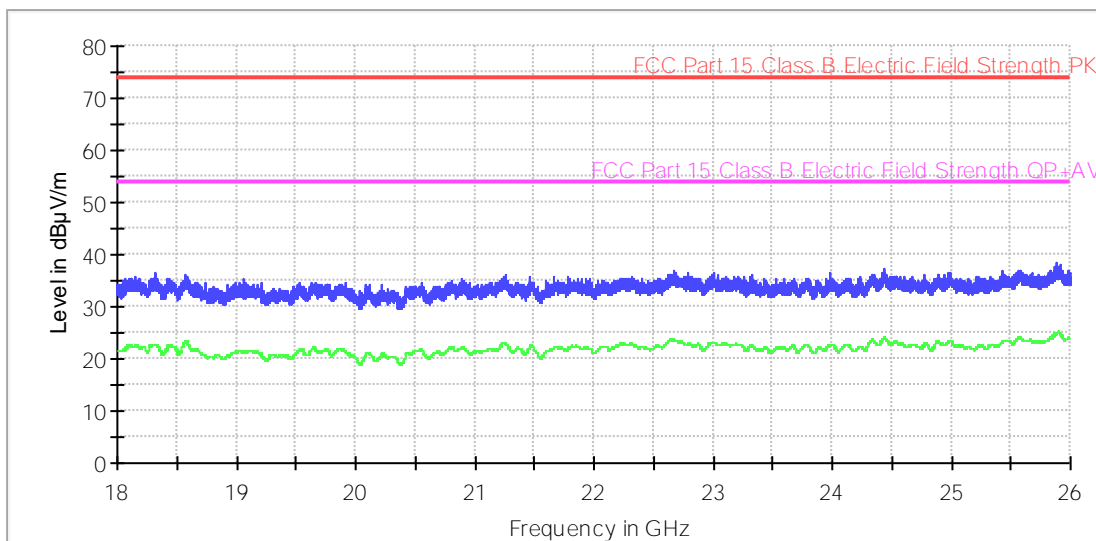
Subrange Maxima

Frequency (MHz)	Peak Scan (dBµV/m)	Average Scan
2125.600000	45.2	17.5
2987.600000	36.0	13.6
5966.400000	33.4	20.1
7423.200000	37.5	24.5
8781.600000	40.1	26.2
10195.600000	42.7	28.1
11209.200000	42.2	29.0
13703.600000	43.8	30.7
14870.800000	42.3	29.0
17990.800000	55.2	42.3

Radiated Emission. CR0101HR2_PH

Project: 58401REM.002
 Company: POLAR ELECTRO OY
 Sample: S/01
 Operation mode: OM#01
 Description: EUT ON. BLE OFF. GNSS interfaces in RX mode. Transferring data via USB. Equipment charging batteries. Power supply: 5Vdc. (By USB port) Auxiliary Laptop power supply: 115Vac. Horizontal Polarization

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

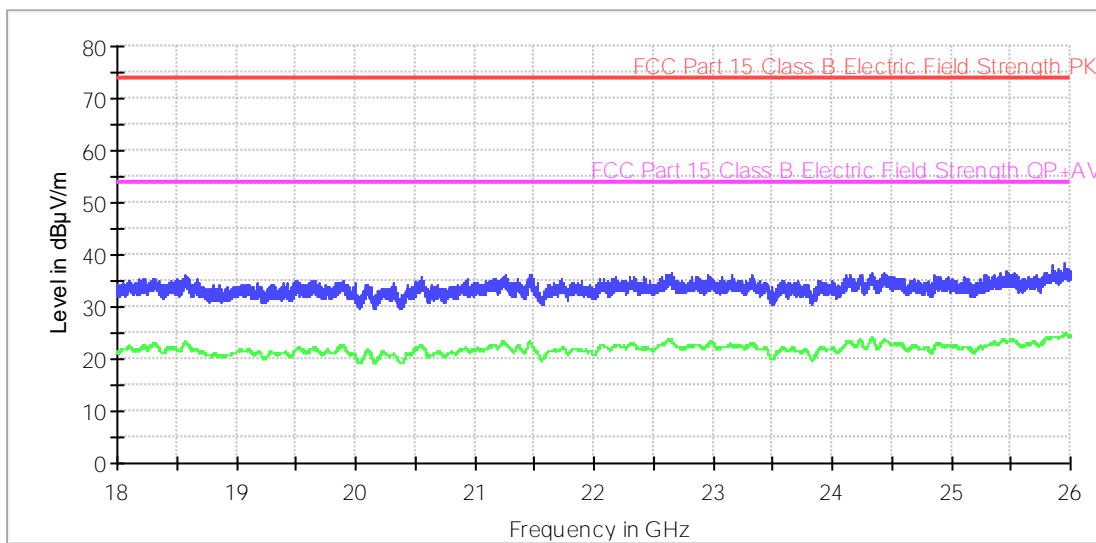
Subrange Maxima

Frequency (MHz)	PK+ CLRWR (dBµV/m)	AVG CLRWR (dBµV/m)
18324.400000	36.5	22.7
19067.200000	35.4	21.3
19627.200000	34.7	21.7
20885.200000	35.4	21.9
21260.800000	36.0	23.0
22674.800000	36.8	23.7
23012.000000	36.5	22.9
23978.800000	36.5	22.6
24432.400000	37.2	24.0
25886.400000	38.4	25.1

Radiated Emission. CR0101HR2_PV

Project: 58401REM.002
 Company: POLAR ELECTRO OY
 Sample: S/01
 Operation mode: OM#01
 Description: EUT ON. BLE OFF. GNSS interfaces in RX mode. Transferring data via USB. Equipment charging batteries. Power supply: 5Vdc. (By USB port) Auxiliary Laptop power supply: 115Vac. Vertical Polarization

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)	PK+ CLRWR (dBµV/m)	AVG CLRWR (dBµV/m)
18578.800000	36.1	23.2
19494.000000	35.0	21.7
19897.200000	35.0	22.5
20550.000000	35.8	22.5
21255.600000	36.3	23.1
22656.000000	36.7	23.2
22964.000000	36.2	22.9
24328.400000	36.6	23.9
24436.400000	36.4	23.6
25950.400000	38.3	24.9

CONTINUOUS CONDUCTED EMISSION

LIMITS:	Product standard :	FCC CFR 47, Part 15, Subpart B (10-1-16 Edition), Secs. 15.107; ICES-003 Issue 6 (January 2016) & ANSI C63.4 (2014)
	Test standard :	FCC CFR 47, Part 15, Subpart B (10-1-16 Edition), Secs. 15.107; ICES-003 Issue 6 (January 2016) & 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 (10-1-16 Edition), Secs. 15.107 & ICES-003 Issue 6 (Updated 04-2017), in the frequency range 0,15 to 30 MHz, for Class B equipment was:

Frequency range (MHz)	Limit (dB μ V)	
	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.

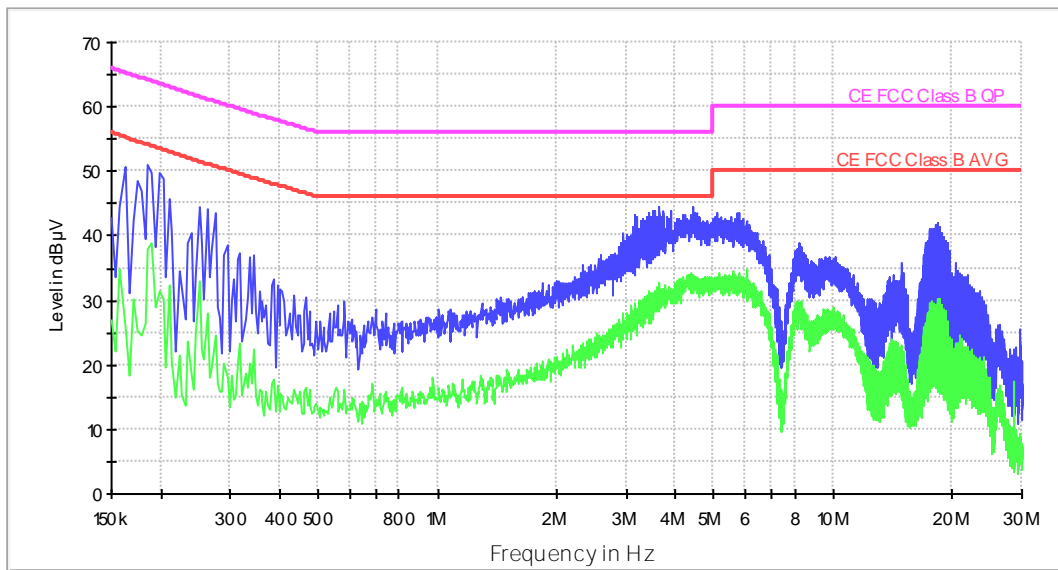
TESTED SAMPLES:	S/01
TESTED OPERATION MODES:	OM#01; OM#02 & OM#03
TEST RESULTS:	CCmmnnhh: CC, Conducted Condition; mm: Sample number; nn: Operation mode; hh: wire

CCmmnnhh	DESCRIPTION	RESULT
CC01010N	Range: 150kHz – 30MHz. Neutral wire noise.	P
CC0101L1	Range: 150kHz – 30MHz. Phase wire noise.	P
CC01020N	Range: 150kHz – 30MHz. Neutral wire noise.	P
CC0102L1	Range: 150kHz – 30MHz. Phase wire noise.	P
CC01030N	Range: 150kHz – 30MHz. Neutral wire noise.	P
CC0103L1	Range: 150kHz – 30MHz. Phase wire noise.	P

Conducted Emission. CC01010N

Project: 58401REM.002
 Company: POLAR ELECTRO OY
 Sample: S/01
 Operation mode: OM#01
 Description: EUT ON. BLE OFF. GNSS interfaces in RX mode. Transferring data via USB. Equipment charging batteries. Power supply: 5Vdc. (By USB port) Auxiliary Laptop power supply: 115Vac. Neutral Wire Noise

EC FCC Class B



— Peak Scan — Average Scan — CE FCC Class B AVG — CE FCC Class B QP

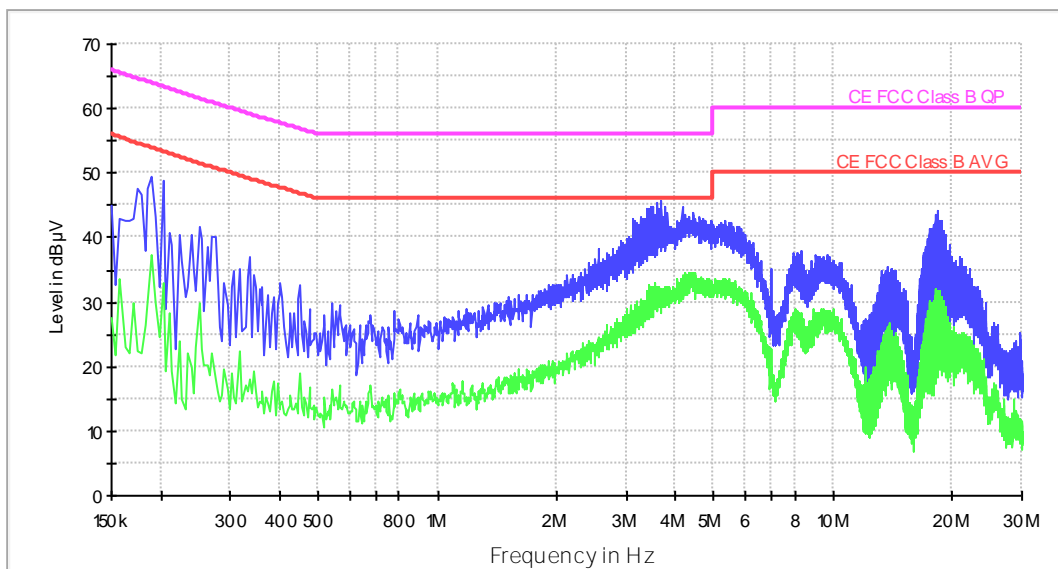
Subrange Maxima

Frequency (MHz)	MaxPeak-ClearWrite (dBµV)	Average-ClearWrite (dBµV)
0.186000	51.1	38.0
0.262000	44.1	27.9
0.434000	30.8	16.1
1.010000	28.6	16.4
2.034000	33.0	20.2
3.542000	44.0	30.8
3.614000	44.6	32.5
6.154000	41.2	32.0
17.590000	41.2	29.4
18.374000	42.0	30.1

Conducted Emission. CC0101L1

Project: 58401REM.002
 Company: POLAR ELECTRO OY
 Sample: S/01
 Operation mode: OM#01
 Description: EUT ON. BLE OFF. GNSS interfaces in RX mode. Transferring data via USB. Equipment charging batteries. Power supply: 5Vdc. (By USB port) Auxiliary Laptop power supply: 115Vac. Phase Wire Noise

EC FCC Class B



— Peak Scan — Average Scan — CE FCC Class B AVG — CE FCC Class B QP

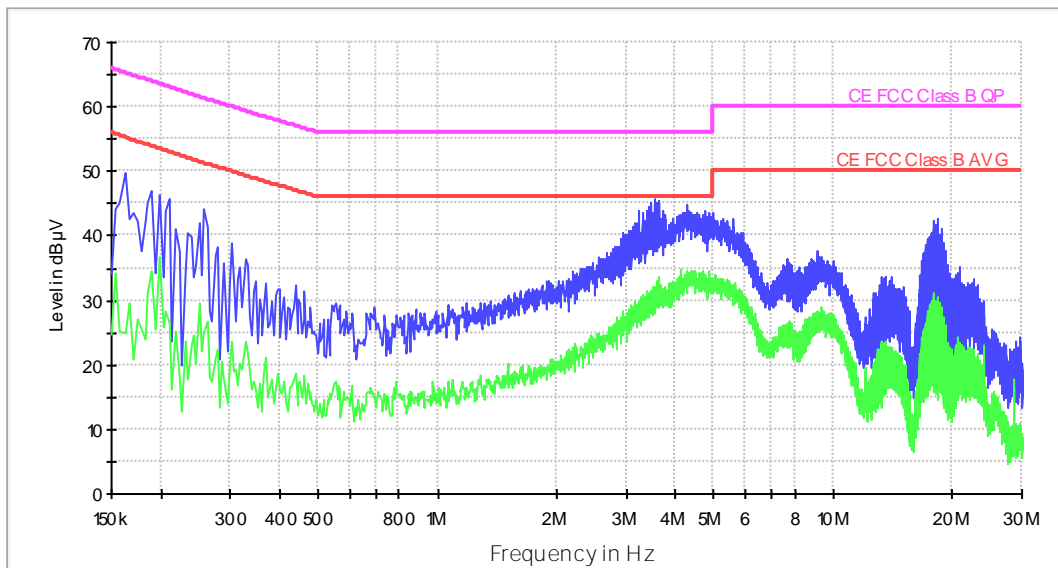
Subrange Maxima

Frequency (MHz)	MaxPeak-ClearWrite (dBµV)	Average-ClearWrite (dBµV)
0.190000	49.4	37.3
0.270000	40.2	22.1
0.450000	32.7	19.0
1.182000	28.9	15.4
2.098000	33.3	19.9
3.454000	44.8	31.4
3.670000	45.7	31.5
6.138000	39.6	29.7
17.530000	41.4	26.9
18.450000	44.3	31.0

Conducted Emission. CC01020N

Project: 58401REM.002
 Company: POLAR ELECTRO OY
 Sample: S/01
 Operation mode: OM#02
 Description: EUT ON. BLE linked to ancillary Equipment. GPS receiving valid positioning signal. Transferring data via USB. Equipment charging batteries. Power supply: 5Vdc. (By USB port). Auxiliary Laptop power supply: 115Vac. Neutral Wire Noise

EC FCC Class B



— Peak Scan — Average Scan — CE FCC Class B AVG — CE FCC Class B QP

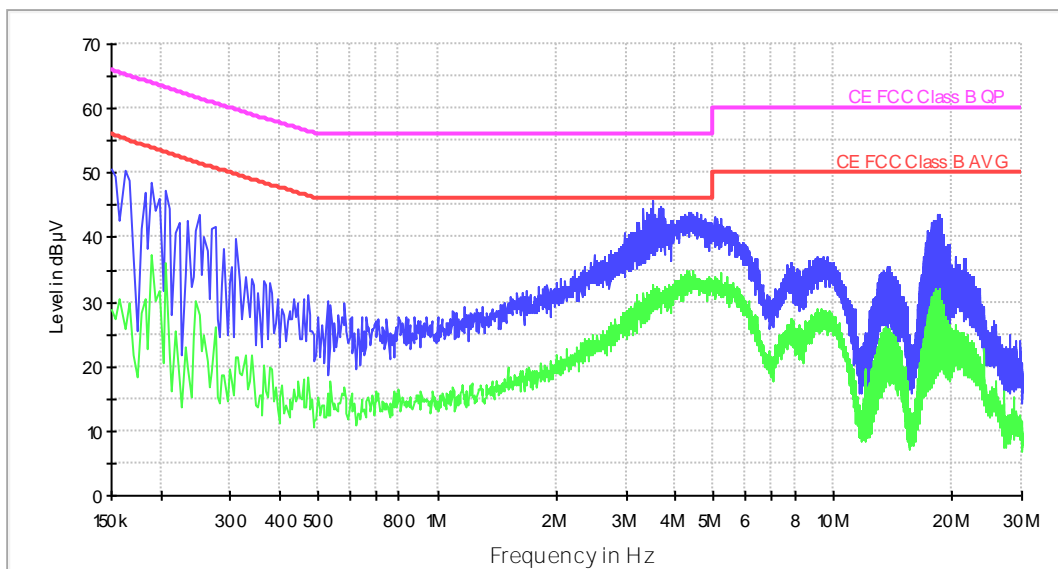
Subrange Maxima

Frequency (MHz)	MaxPeak-ClearWrite (dBµV)	Average-ClearWrite (dBµV)
0.162000	49.7	25.0
0.258000	44.3	25.0
0.438000	32.3	18.5
1.182000	29.5	15.7
1.898000	33.1	19.6
3.526000	45.8	31.8
3.634000	45.4	31.2
6.154000	38.0	27.0
17.562000	39.9	27.3
18.366000	42.5	30.4

Conducted Emission. CC0102L1

Project: 58401REM.002
 Company: POLAR ELECTRO OY
 Sample: S/01
 Operation mode: OM#02
 Description: EUT ON. BLE linked to ancillary Equipment. GPS receiving valid positioning signal. Transferring data via USB. Equipment charging batteries. Power supply: 5Vdc. (By USB port). Auxiliary Laptop power supply: 115Vac. Phase Wire Noise

EC FCC Class B



— Peak Scan — Average Scan — CE FCC Class B AVG — CE FCC Class B QP

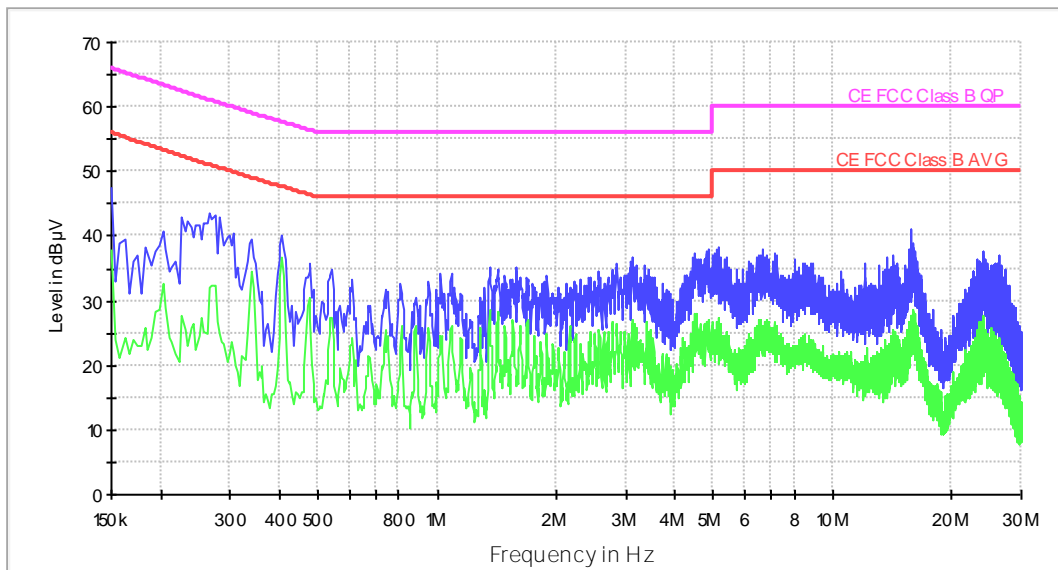
Subrange Maxima

Frequency (MHz)	MaxPeak-ClearWrite (dBµV)	Average-ClearWrite (dBµV)
0.150000	50.8	29.0
0.274000	41.8	26.1
0.470000	31.0	18.4
1.170000	29.2	15.6
2.050000	33.6	21.6
3.494000	45.7	31.0
3.654000	44.9	31.3
6.150000	37.8	28.9
17.402000	41.2	25.8
18.502000	43.6	31.9

Conducted Emission. CC01030N

Project: 58401REM.002
 Company: POLAR
 Sample: S/01
 Operation mode: OM#03
 Description: EUT ON. BLE linked to ancillary Equipment. Glonass receiving valid positioning signal. Transferring data via USB. Equipment charging batteries. Power supply: 3.8Vdc. (By USB port). Auxiliary Laptop power supply: 115Vac. Neutral wire noise.

EC FCC Class B



— Peak Scan — Average Scan — CE FCC Class B AVG — CE FCC Class B QP

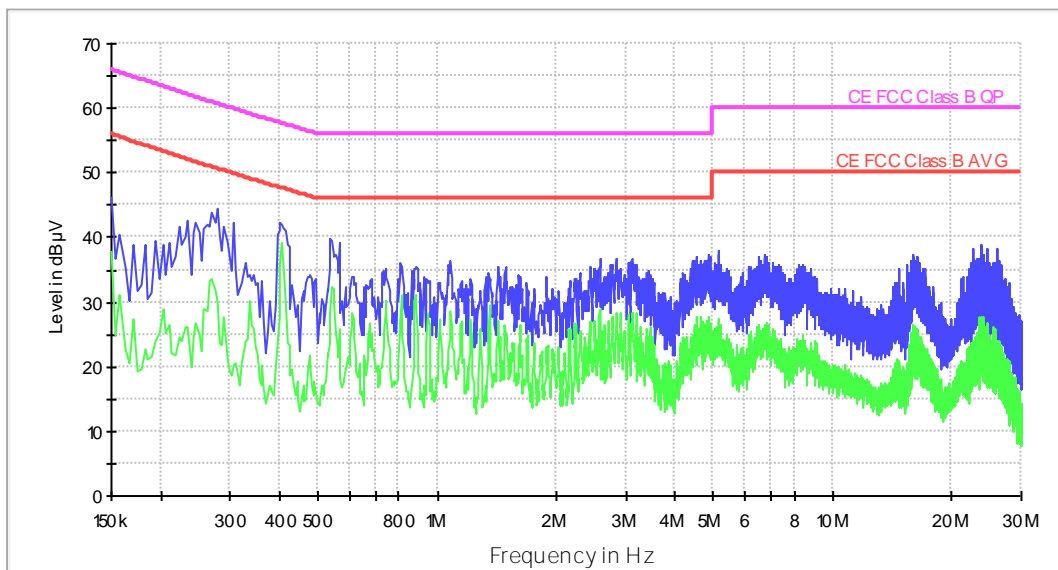
Subrange Maxima

Frequency (MHz)	MaxPeak-ClearWrite (dBµV)	Average-ClearWrite (dBµV)
0.150000	47.6	38.1
0.266000	43.5	32.1
0.478000	35.6	27.1
1.086000	34.3	26.2
1.358000	35.3	27.3
3.106000	36.6	27.2
5.146000	38.2	27.5
6.658000	38.1	25.6
15.818000	41.2	26.2
23.938000	37.6	25.7

Conducted Emission. CC0103L1

Project: 58401REM.002
 Company: POLAR
 Sample: S/01
 Operation mode: OM#03
 Description: EUT ON. BLE linked to ancillary Equipment. Glonass receiving valid positioning signal. Transferring data via USB. Equipment charging batteries. Power supply: 3.8Vdc. (By USB port). Auxiliary Laptop power supply: 115Vac. Phase wire noise.

EC FCC Class B



— Peak Scan — Average Scan — CE FCC Class B AVG — CE FCC Class B QP

Subrange Maxima

Frequency (MHz)	MaxPeak-ClearWrite (dBµV)	Average-ClearWrite (dBµV)
0.150000	46.5	38.0
0.278000	44.6	29.8
0.538000	39.7	28.3
1.082000	36.3	28.6
1.490000	35.4	24.9
2.838000	36.9	28.4
5.146000	37.8	25.5
6.734000	37.2	25.3
15.958000	37.4	25.2
23.810000	39.0	22.8