



FCC LISTED, REGISTRATION
NUMBER: 2764.01

ISED LISTED REGISTRATION
NUMBER: 23595-1

Test report No:
2240ERM.003

Test report

**FCC Rules and Regulations CFR 47, Part 15, Subpart B (10-1-17 Edition)&
ICES-003 ISSUE 6 – Update April (2017)**

Identification of item tested	Rechargeable multipurpose sensor module
Trademark	SUUNTO
Model and /or type reference	OP184 (Movesense RC)
Other identification of the product	FCC ID: RYP2538 IC: 5175A-2538
Features	Rechargeable multipurpose sensor module
Manufacturer	SUUNTO Oy Tammiston kauppatie 7A, 01510 Vantaa, Finland
Test method requested, standard	FCC Rules and Regulations CFR 47, Part 15, Subpart B (10-1-17 Edition) ICES-003 ISSUE 6 – Update April (2017)
Summary	IN COMPLIANCE
Approved by (name / position & signature)	Domingo Galvez EMC&RF Lab Manager 
Date of issue	09-14-2018
Report template No	FDT08_21

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Competences and guarantees

DEKRA Certification Inc. is a testing laboratory accredited by A2LA (The American Association for Laboratory Accreditation), to perform the tests indicated in the Certificate 2764.01

DEKRA Certification Inc. is a testing laboratory competent to carry out the tests described in this report.

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

DEKRA Certification Inc. 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.

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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

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.
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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 Certification Inc. and the Accreditation Bodies.

Uncertainty

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

	Frequency (MHz)	U(k=2)	Units
Conducted emission	0,009 - 30	2.69	dB
Radiated emission	30 - 6000	5.44	dB
	1000-18000	2.92	dB
	18000-40000	2.15	dB

Data provided by the client

Rechargeable multipurpose sensor module - 2.4 GHz ISM band transceiver.

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
2240/02	BUILD 3 Device	OP184	ECNF4F0776AD	08/08/2018
2240/03	BUILD 3 Device	OP184	ECNF10EB6C90	08/08/2018
2240/11	Charger	-	-	08/08/2018
2240/12	USB Cable	-	-	08/08/2018

1. Sample S/03 has undergone following test(s):

Tests indicated in appendix A.

Test sample description

Ports..... :	Port name and description	Cable		
		Specified length [m]	Attached during test	Shielded
	<i>Not provided data</i>		☐	☐
			☐	☐
			☐	☐
			☐	☐
			☐	☐
			☐	☐
Supplementary information to the ports..... :	<i>Not provided data</i>			

Rated power supply	Voltage and Frequency		Reference poles				
			L1	L2	L3	N	PE
	☐	AC: 230Vac / 50Hz.	☐	☐	☐	☐	☐
	☐	AC:	☐	☐	☐	☐	☐
	☐	DC: 8-18 Vdc					
	☒	DC: 4.2 (Battery)					
Rated Power	Not provided data						
Clock frequencies	Not provided data						
Other parameters	Not provided data						
Software version	0.9.100						
Hardware version	B						
Dimensions in cm (L x W x D)	Not provided data						
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		
	Not provided data						
Documents as provided by the applicant	Description			File name	Issue date		
	Not provided data						

Copy of marking plate:



Identification of the client

SUUNTO Oy
Tammiston kauppatie 7A, 01510 Vantaa, Finland

Testing period and place

Test Location	DEKRA Testing and Certification S.A.U.
Date (start)	08-10-2018
Date (finish)	08-17-2018

Document history

Report number	Date	Description
2240ERM.003	09-14-2018	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 tests have been performed by the technical personnel: Koji Nishimoto and Nasir Khan.

Testing verdicts

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

Summary

Emission Test		
Requirement – Test case	Verdict	Remark
A.1. Radiated emission test (30 MHz – 1000 MHz)	Pass	N/A
Radiated emission test (1 GHz – 18 GHz)	Pass	N/A
A.2. Conducted emission test (150 KHz to 30 MHz)	Pass	N/A
<u>Supplementary information and remarks:</u>		
No comments		

List of equipment used during the test

Conducted Measurements

CONTROL NUMBER	DESCRIPTION	LAST CALIBRATION	NEXT CALIBRATION
1010	EMI Test Receiver - ESR7 - Rohde & Schwarz	2017/03	2019/03
0997	LISN - PMM L3-32 - Narda	2017/03	2019/03
1073	Pulse Limiter - PMM PL01 - Narda	2017/06	2019/06

Radiated Measurements

CONTROL NUMBER	DESCRIPTION	LAST CALIBRATION	NEXT CALIBRATION
1179	Semi anechoic Absorber Lined Chamber Frankonia SAC 3 plus "L"	N/A	N/A
1065	BiconicalLog antenna ETS LINDGREN 3142E	2017/03	2020/03
1058	Double-ridge Waveguide Horn antenna 1-18 GHz	2017/03	2019/03
1014	Spectrum analyzer Rohde & Schwarz FSV40	2017/03	2019/03
1012	EMI Test Receiver Rohde & Schwarz ESR26	2018/09	2019/03
0981	RF pre-amplifier 1-18 GHz Bonn Elektronik BLMA 0118-2A	2017/05	2019/05
1015, 1017, 1019, 1020	Rohde & Schwarz EMC32 software	N/A	N/A

Appendix A: Test results

Appendix A Content

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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. Every operation mode takes failure criteria for the immunity test that they were applying to it and a monitoring to guarantee performance of the same ones.

The operation modes used by the samples to which the present report refers, are shown in the following table:

OPERATION MODE	DESCRIPTION
OM#01*	EUTs ON. Two EUTs being charged on a charger with USB port. Power supply: DC 5V. No data communications on USB port - Bluetooth not transmitting

* Worst case detected

A.1. RADIATED EMISSION ELECTROMAGNETIC FIELD

LIMITS:	Product standard :	FCC CFR 47, Part 15, Subpart B (10-1-17 Edition), Secs. 15.109 & ICES-003 Issue 6 – Update April (2017)
	Test standard :	FCC CFR 47, Part 15, Subpart B (10-1-17 Edition), Secs. 15.109 & ICES-003 Issue 6 – Update 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 (10-01-17 Edition), Secs. 15.109 & ICES-003 Issue 6 – Update April (2017) in the frequency range 30 MHz to 40 GHz for class B equipment.

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

TEST SETUP

All radiated tests were performed in a semi-anechoic chamber. The measurement antenna is situated at a distance of 3 m for the frequency range 30-1000 MHz (Bilog antenna) and at a distance of 1m for the frequency range 1-40 GHz (1 GHz-18 GHz and 18 GHz-40 GHz Double ridge horn antennas).

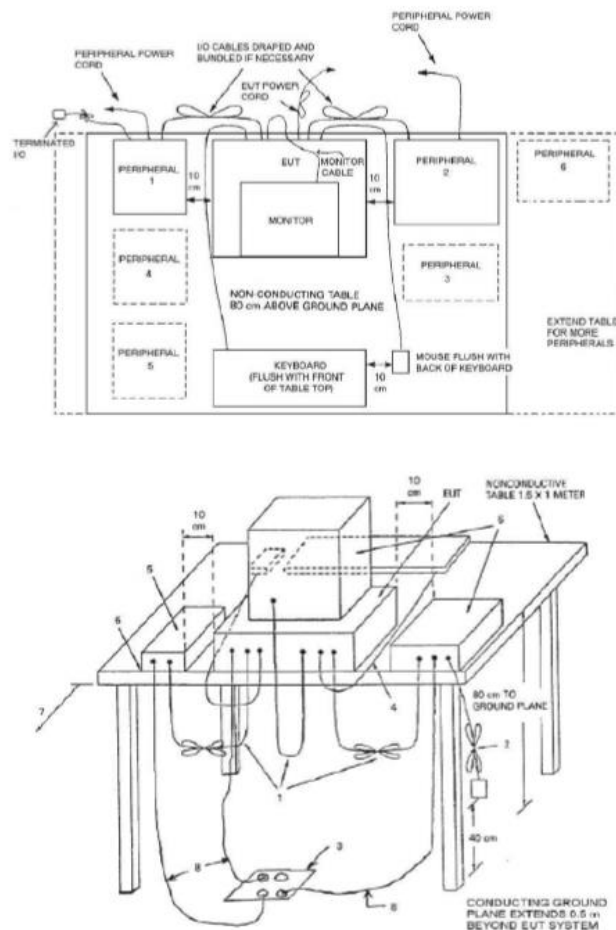
For radiated emissions in the range 1-40 GHz that is performed at a distance closer than the specified distance, an inverse proportionality factor of 20 dB per decade is used to normalize the measured data for determining compliance.

The equipment under test was set up on a non-conductive platform above the ground plane and the situation and orientation was varied to find the maximum radiated emission. It was also rotated 360° and the antenna height was varied from 1 to 4 meters to find the maximum radiated emission.

Measurements were made in both horizontal and vertical planes of polarization.

The field strength is calculated by adding correction factor to the measured level from the spectrum analyzer. This correction factor includes antenna factor, cable loss and pre-amplifiers gain.

TEST SETUP (CONT.)



TESTED SAMPLES:

S/01

TESTED CONDITIONS MODES:

OM#01

TEST RESULTS :

CRmmnnxx: CR, Radiation Condition; mm: Sample number; nn: Operation mode.,xx:Range,

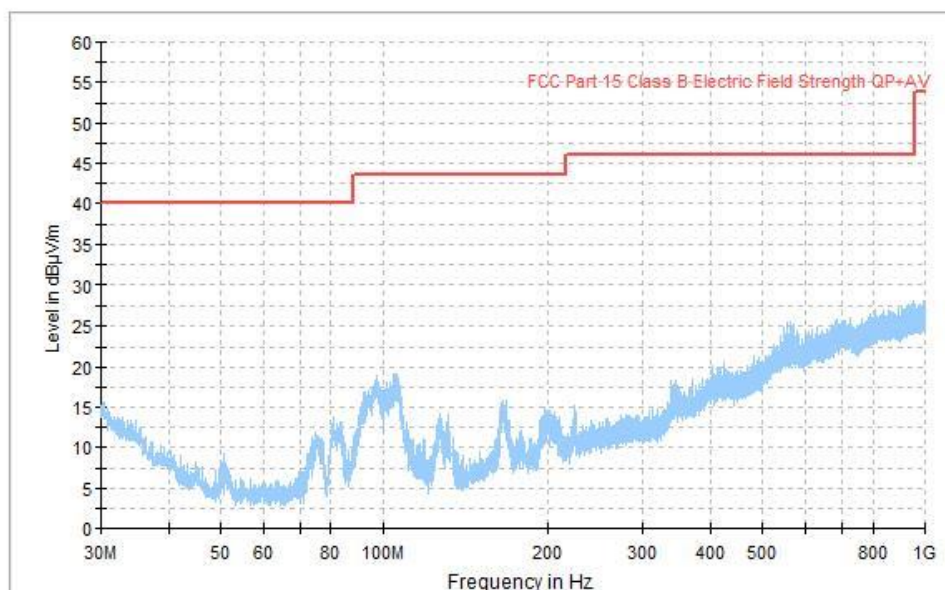
CRmmnnxx	Description	Result
CR0101LR	Range: 30 MHz - 1000 MHz Horizontal and Vertical Polarization	P
CR0101HR	Range: 1GHz - 18 GHz Horizontal and Vertical Polarization	P

TEST RESULTS (Cont.):

CR0101LR

Project: 02240ERM003
Company: Suunto Oy
Sample: S/01
Operation mode: OM#01
Description: EUTs ON. Two EUTs being charged on a charger with USB port.
Power supply: DC 5V. No data communications on USB port.

Full Spectrum



Preview Result 1-PK+

FCC Part 15 Class B Electric Field Strength QP+AV

Maximizations

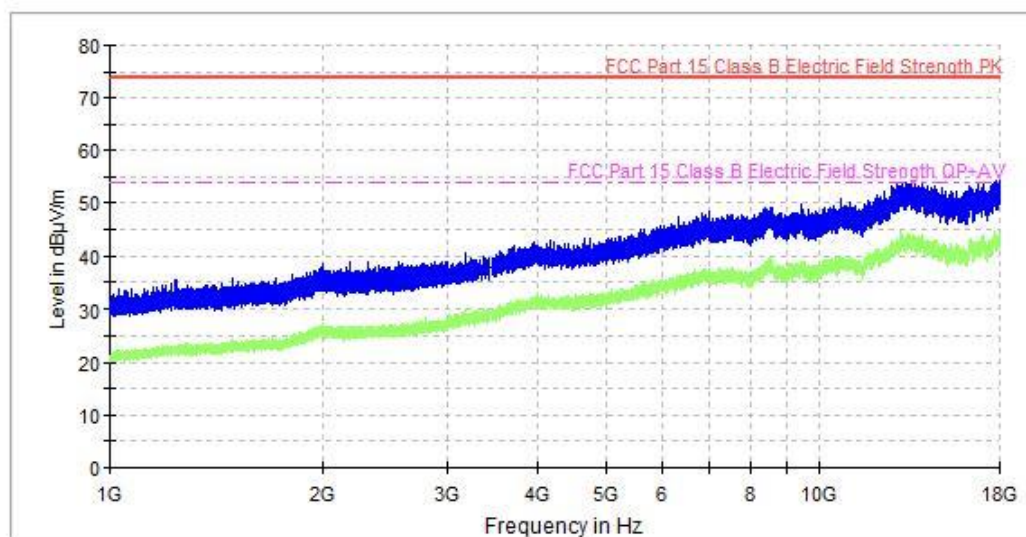
Frequency (MHz)	QuasiPeak (dBµV/m)	MaxPeak (dBµV/m)	Height (cm)	Pol	Azimuth (deg)
80.570000	4.52	17.38	166.0	V	118.0
96.900000	7.94	19.68	117.0	V	51.0
104.630000	9.98	22.09	100.0	V	-114.0
165.680000	10.28	22.12	114.0	V	-24.0
556.880000	17.98	31.23	148.0	V	-49.0
951.560000	22.43	35.57	176.0	V	-74.0

TEST RESULTS (Cont.):

CR0101HR

Project: 02240ERM003
Company: Suunto Oy
Sample: S/01
Operation mode: OM#01
Description: EUTs ON. Two EUTs being charged on a charger with USB port.
Power supply: DC 5V. No data communications on USB port.

Full Spectrum



— Preview Result 2-AVG
 — Preview Result 1-PK+
 — FCC Part 15 Class B Electric Field Strength PK
 - - - FCC Part 15 Class B Electric Field Strength QP+AV
 × Final_Result PK+
 ▽ Final_Result AVG

Maximizations

Frequency (MHz)	PK+ _MAXH (dBµV/m)	AVG _MAXH (dBµV/m)	Pol
1488.400000	35.7	23.0	H
2315.700000	38.9	25.8	H
4179.500000	42.9	30.7	V
6838.000000	48.2	36.2	V
10714.000000	50.7	37.9	H
17776.000000	54.4	42.1	V

A.2. CONTINUOUS CONDUCTED EMISSION ON POWER LEADS

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

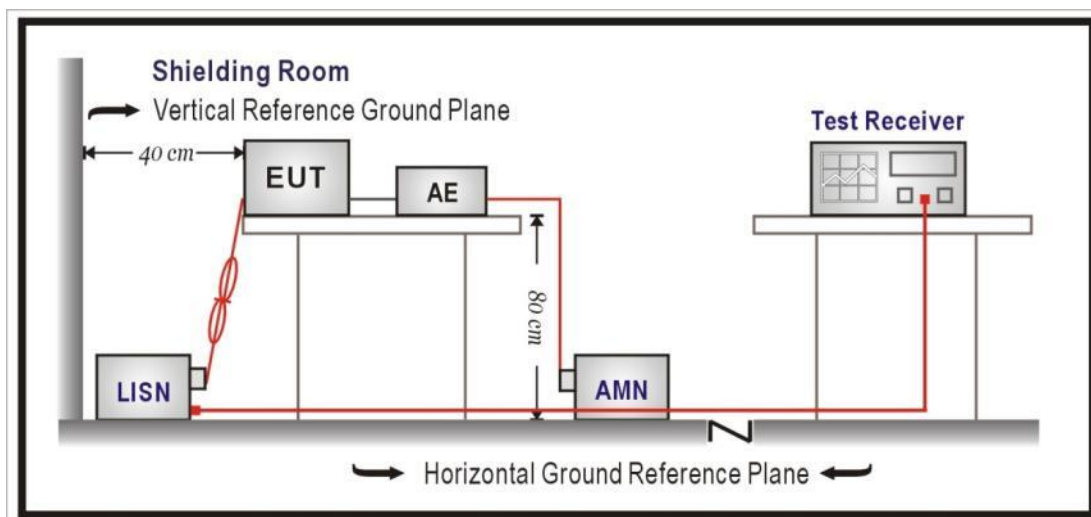
LIMITS

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 (10-01-17 Edition), Secs. 15.107 & ICES-003 Issue 6 (2017), in the frequency range 0,15 to 30 MHz, for Class B equipment was:

Frequency range (MHz)	Limit	
	Quasi-peak [dB(μV) ¹⁾	Average [dB(μV) ¹⁾
0,15 to 0,5	66-56 ²⁾	56-46 ²⁾
0,5 to 5	56	46
5 to 30	60	50

¹⁾ At the transition frequency, the lower limit applies.
²⁾ The limit decreases linearly with the logarithm of the frequency.

TEST SETUP



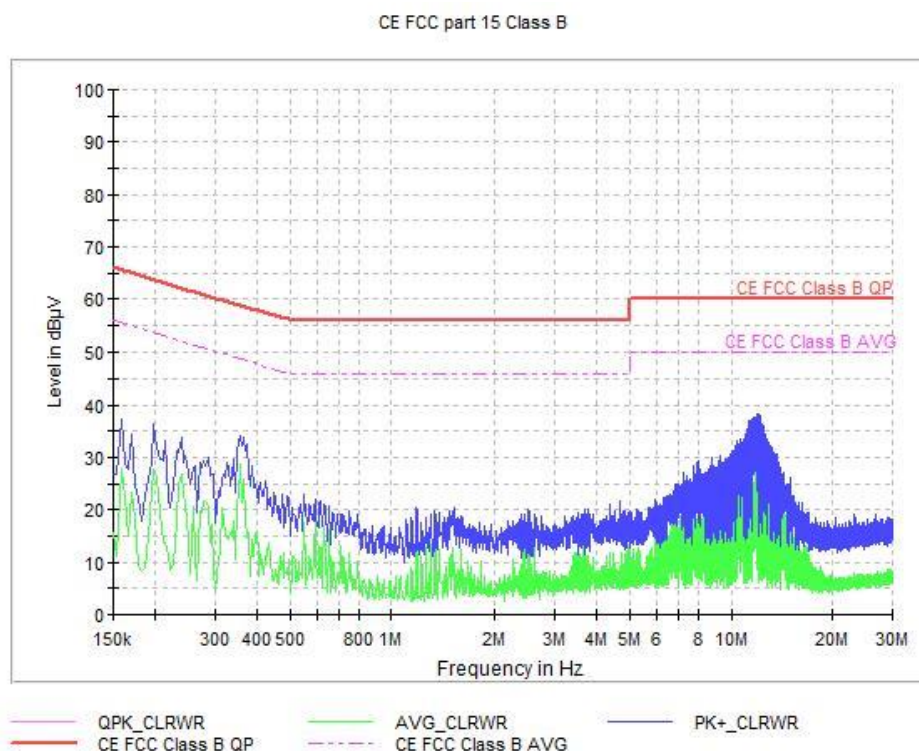
TESTED SAMPLES:	S/01
TESTED CONDITIONS MODES:	OM#01
TEST RESULTS :	CCmmnnhh:CC, Conducted Condition; mm: Sample number; nn: Test condition mode; hh: wire

CRmmnnhh	DESCRIPTION	RESULT
CC01010N	Neutral wire noise.	P
CC0101L1	Phase wire noise.	P

TEST RESULTS (Cont.):

CC03020N

Project: 02240ERM003
Company: Suunto Oy
Sample: S/01
Operation mode: OM#01
Description: EUTs ON. Two EUTs being charged through AC/DC charger, N wire measurement.



Maximizations

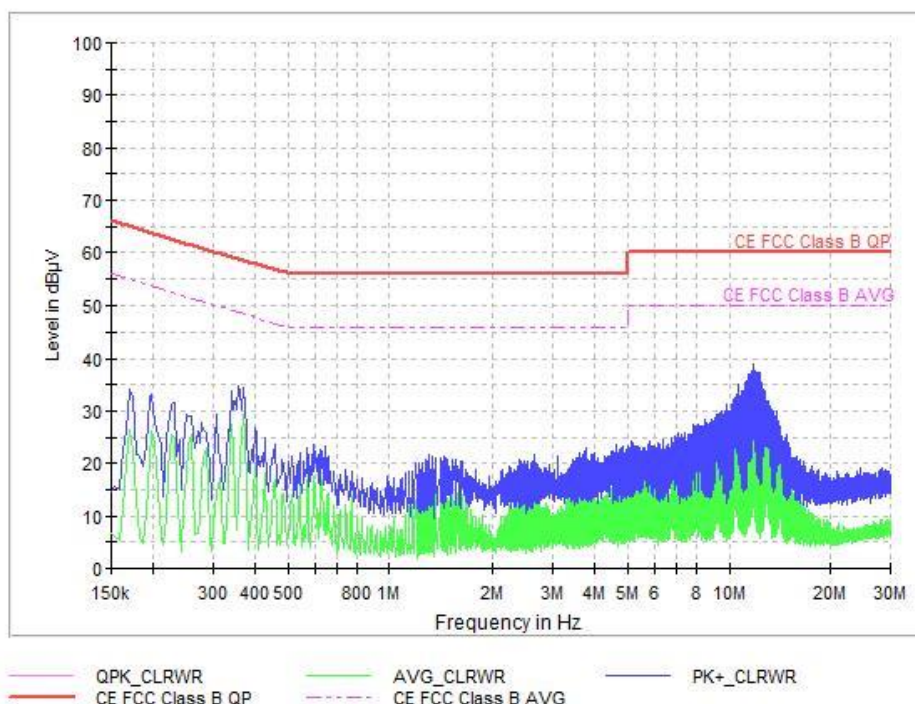
Frequency (MHz)	PK+_CLRWR (dBµV)	AVG_CLRWR (dBµV)	Line
0.358000	34.2	28.9	N
9.846000	30.1	23.4	N
12.222000	37.9	30.1	N
15.106000	22.8	18.4	N
23.058000	14.7	8.1	N
29.002000	16.9	8.6	N

TEST RESULTS (Cont.):

CC0302L1

Project: 02240ERM003
Company: Suunto Oy
Sample: S/01
Operation mode: OM#01
Description: EUTs ON. Two EUTs being charged through AC/DC charger, L1 wire measurement.

CE FCC part 15 Class B



Maximizations

Frequency (MHz)	PK+_CLRWR (dBµV)	AVG_CLRWR (dBµV)
0.370000	34.5	29.3
9.810000	31.3	24.7
12.042000	37.5	29.1
15.094000	22.3	18.0
21.002000	15.8	8.6
28.078000	17.9	9.4