



FCC LISTED, REGISTRATION
 NUMBER: 2764.01

Test report No:

ISED LISTED REGISTRATION
 NUMBER: 23595-1

02099ERM.004

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.....:	2.4 GHz ISM band transceiver, GPS receiver
Trademark	SUUNTO
Model and /or type reference	OW183
Other identification of the product	FCC ID: RYP2539 IC: 5175A-2539
Final HW version	C
Final SW version	Test sw Ibiza/K26NC v0.2.1
Features.....	GPS CNo, location and BTLE standalone test modes
Manufacturer	SUUNTO Oy Tammiston Kauppaite 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.....:	05/21/2018
Report template No.....:	FDT08_20

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Competences and guarantees

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 certification Inc. at the time of performance of the test.

DEKRA certification Inc. 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

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 certification.
4. This test report cannot be used partially or in full for publicity and/or promotional purposes without previous written permission of DEKRA certification and the Accreditation Bodies.

Uncertainty

Uncertainty (factor $k=2$) was calculated according to the DEKRA certification Inc. internal document PODT000.

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
2099.007	SUUNTO Radiated Sample without Conducted Port	OW183	18121300058	03/22/2018
2099.008	USB Cable	NA	NA	03/22/2018

Test sample description

Outdoor Watch with GPS receiver and Bluetooth Low Energy Transceiver.

Identification of the client

SUUNTO Oy

Tammiston Kauppatie 7A, 01510 Vantaa, Finland

Testing period

The performed test started on 2018-04-03 and finished on 2018-04-07

The tests have been performed at DEKRA certification Inc.

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. = 20 % Max. = 75 %

In the semi anechoic chamber the following limits were not exceeded during the test.

Temperature	Min. = 15 °C Max. = 35 °C
Relative humidity	Min. = 20 % 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. = 20 % Max. = 35 %
Air pressure	Min. = 860 mbar Max. = 1060 mbar

Remarks and comments

1. The tests have been performed by the technical personnel: Koji Nishimoto and Nasir Khan.

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 ($k = 2$)

2. Used instrumentation for Radiated Testing

Control#	Description	Model	Manufacturer	Last Cal. Date	Cal. Due Date
1065	BiconicalLog antenna	3142E	ETS LINDGREN	2017/03	2020/03
1058	Double-ridge Waveguide Horn antenna 1-18 GHz	3115	ETS LINDGREN	2017/03	2019/03
1012	EMI Test Receiver	ESR26	Rohde & Schwarz	2017/03	2019/03
980	RF pre-amplifier 30 MHz-6 GHz	BLMA 0360-01N	Bonn Elektronik	2017/05	2019/05
1041	Signal Generator	SMB100A	Rohde & Schwarz	2017/04	2019/04
866	RF Broad Band Amplifier	200S1G6	Amplifier Research	N/A	N/A
869	RF Broad Band Amplifier	1000W1000F	Amplifier Research	N/A	N/A
865	Log-Periodic Antenna	ATR80M6G	Amplifier Research	N/A	N/A

3. Used instrumentation for Continuous Conducted Emission

Control#	DESCRIPTION	Model	Manufacturer	Last Cal. Date	Cal. Due Date
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	2019/03

Testing verdicts

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

PARAGRAPH	VERDICT			
	NA	P	F	NM
RADIATED EMISSION ELECTROMAGNETIC FIELD MEASURE	-	P	-	-
CONTINUOUS CONDUCTED EMISSION	-	P	-	-

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. 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. IDLE Bluetooth. GPS Rx: ON. Exercise /Running. Battery charging and transferring data with the PC by USB port from a laptop (120 Vac/60Hz) (ANSI 63.4 setup).

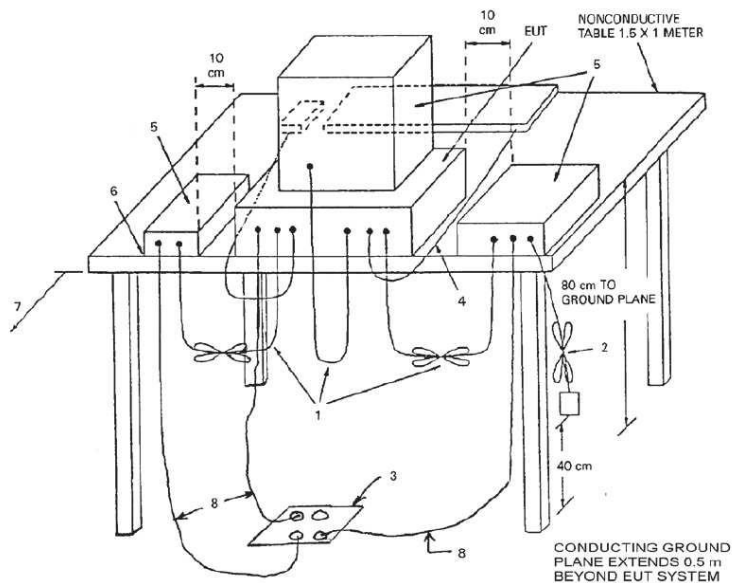
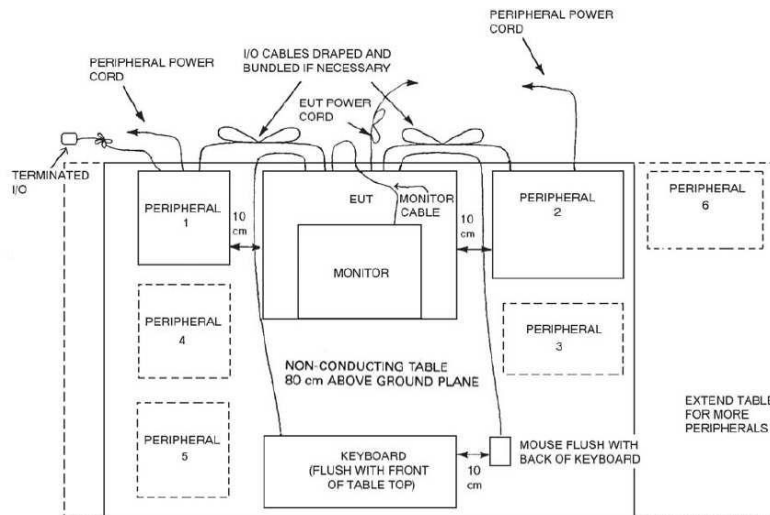
RADIATED EMISSION. ELECTROMAGNETIC FIELD MEASURE

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 (10-01-16 Edition), Secs. 15.109 & ICES-003 Issue 6 – Update April (2017) in the frequency range 30 MHz to 26 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



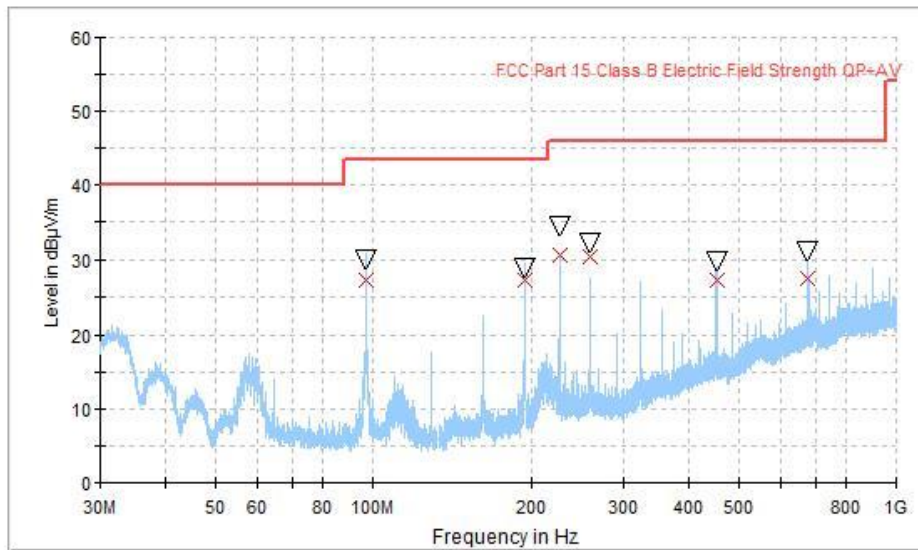
TESTED SAMPLE:	S/01
TESTED OPERATION MODES:	OM#01
TEST RESULTS:	CRmmnnRR_PP: CR, Radiated Condition; mm: Sample number; nn: Operation mode; RR: Range.

CRmmnnRR	Description (FCC CFR 47, Part 15, Subpart B)	Result
CR0101LR	Range: 30 MHz - 1000 MHz PH/PV	P
CR0101HR1	Range: 1 GHz - 18 GHz. Horizontal / Vertical Polarization	P
CR0101HR2	Range: 18 GHz - 40 GHz. Horizontal / Vertical Polarization	P

Radiated Emission. CR0101LR

Project: 2099ERM004
 Company: Suunto
 Sample: S/01
 Operation mode: OM#01
 Description: EUT ON. Idle. Vnom.

Full Spectrum



- Preview Result 2-QPK
- Preview Result 1-PK+
- FCC Part 15 Class B Electric Field Strength QP+AV
- FCC Part 15 Class B Electric Field Strength PK
- x QPK_Maximizations
- v PK+_Maximizations

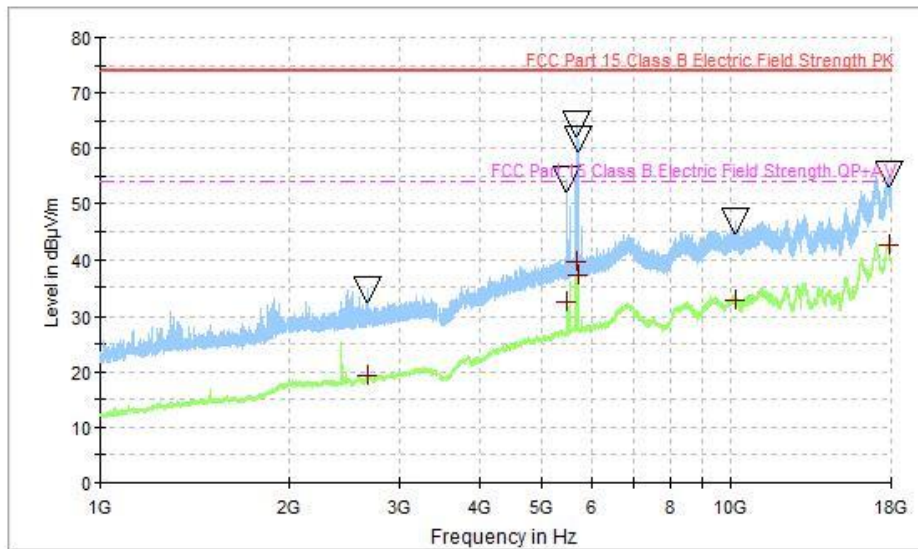
Maximizations

Frequency (MHz)	QuasiPeak (dBµV/m)	MaxPeak (dBµV/m)	Height (cm)	Pol	Azimuth (deg)
96.890000	27.20	29.97	115.0	V	49.0
193.870000	27.16	28.77	100.0	V	9.0
226.140000	30.51	34.45	115.0	H	173.0
258.430000	30.28	32.17	126.0	H	-77.0
452.370000	27.09	29.74	100.0	H	94.0
678.480000	27.41	30.98	115.0	V	106.0

Radiated Emission. CR0101HR1

Project: 2099ERM004
 Company: Suunto
 Sample: S/01
 Operation mode: OM#01
 Description: EUT ON. Idle. Vnom.

Full Spectrum



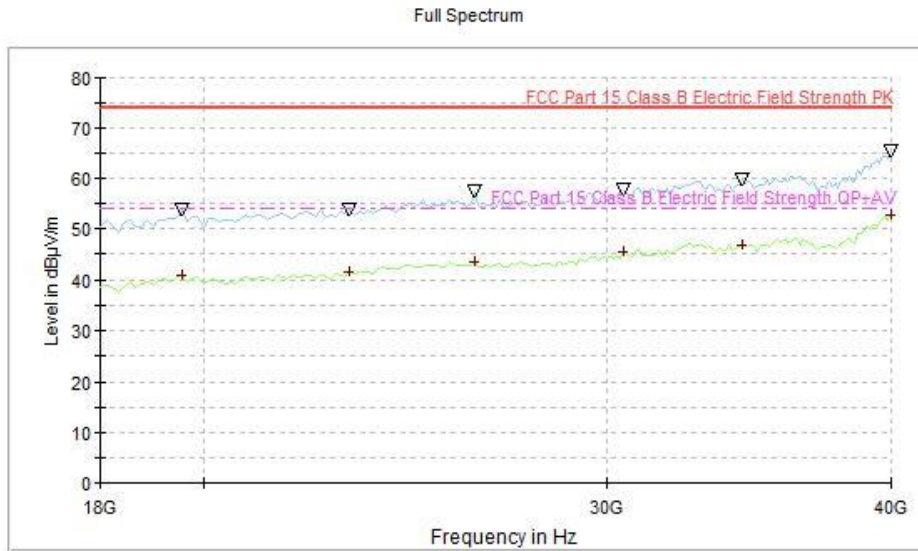
- Preview Result 2-AVG
- Preview Result 1-PK+
- ▽ PK_Maximizations
- + AVG_Maximizations
- FCC Part 15 Class B Electric Field Strength PK
- - - FCC Part 15 Class B Electric Field Strength QP+AV

Maximizations

Frequency (MHz)	PK+_CLRWR (dBµV/m)	AVG_CLRWR (dBµV/m)	PoI
2656.000000	34.6	19.2	V
5498.000000	54.4	32.2	V
5680.000000	64.3	39.5	H
5726.400000	61.5	37.1	V
10208.400000	46.7	32.6	V
17841.200000	55.2	42.7	V

Radiated Emission. CR0101HR2

Project: 2099ERM004
 Company: Suunto
 Sample: S/01
 Operation mode: OM#01
 Description: EUT ON. Idle. Vnom.



- Preview Result 2-AVG
- Preview Result 1-PK+
- ▽ PK_MAXH_Maximizations
- + AVG_MAXH_Maximizations
- 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
19540.000000	53.7	40.7	H
23170.000000	53.6	41.6	V
26250.000000	57.4	43.5	H
30540.000000	57.8	45.3	H
34390.000000	59.7	46.8	H
40000.000000	65.2	52.9	H

CONTINUOUS CONDUCTED EMISSION

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)

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 (10-01-15 Edition), Secs. 15.107 & ICES-003 Issue 6 (2016), in the frequency range 0,15 to 30 MHz, for Class B equipment was:

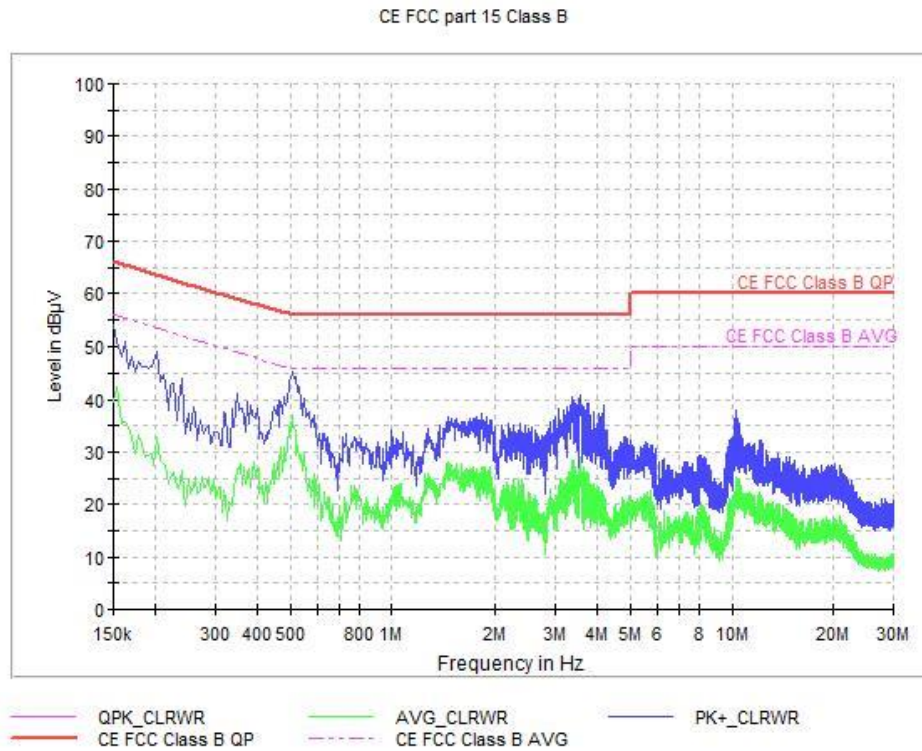
Frequency range (MHz)	Limit (dBµV)	
	Quasi-peak	Average
0,15 to 0,5	66-56	56-46
0,5 to 5	56	46
5 to 30	60	50

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
CC01020N	Neutral wire noise.	P
CC0102L1	Phase wire noise.	P

Conducted Emission. CC02010N

Project: 2099ERM004
 Company: Suunto Oy
 Sample: S/01
 Operation mode: OM#01
 Description: EUT ON. Connected to PC. PC powered by Power supply: 120VAC. N wire

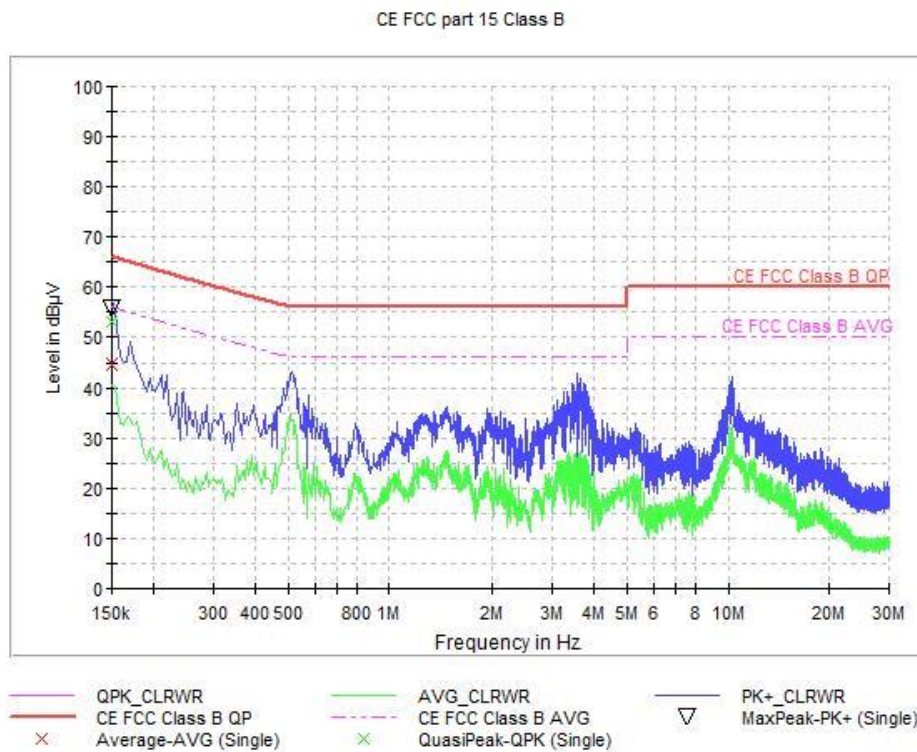


Subrange Maxima

Frequency (MHz)	PK+_CLRWR (dBµV)	AVG_CLRWR (dBµV)
0.174000	50.1	35.2
3.642000	42.1	24.5
4.894000	33.1	21.6
7.762000	29.7	14.6
10.690000	35.3	23.7
10.914000	33.5	21.3
14.082000	29.3	19.2
15.146000	27.5	18.6
17.918000	27.2	14.7
19.834000	27.9	17.3
21.882000	26.0	16.0
24.382000	21.9	10.8
27.494000	20.6	9.2
29.602000	21.1	9.4

Conducted Emission. CC0201L1

Project: 2099ERM004
 Company: Suunto Oy
 Sample: S/01
 Operation mode: OM#01
 Description: EUT ON. Connected to PC. PC powered by Power supply: 120VAC. L1 wire



Subrange Maxima

Frequency (MHz)	PK+_CLRWR (dBµV)	AVG_CLRWR (dBµV)
0.166000	21.7	10.8
3.470000	19.9	8.0
5.038000	19.7	7.4
6.682000	20.3	8.8
9.086000	19.5	8.3
11.318000	20.2	8.5
12.998000	18.9	7.6
16.398000	19.0	7.7
18.526000	18.6	7.5
19.786000	19.8	8.3
23.242000	19.9	7.9
25.110000	19.4	8.1
27.758000	21.1	8.0
29.582000	21.0	9.3