

Test report No:  
 NIE: 66539REM.002A1

## Test report

### FCC Rules and Regulations CFR 47, Part 15, Subpart B (10-1-19 Edition) & ICES-003 Issue 7 (October 2020)

(*) Identification of item tested	Sports watch with GPS and BLE connectivity
(*) Trademark	SUUNTO
(*) Model and /or type reference	Model number: OW194
Other identification of the product	HW Version: C2 SW Version: 2.13.xx FCC ID: RYP2609 IC ID: 5175A-2609
(*) Features	GNSS, BLE
Manufacturer	Suunto Oy Tammiston kauppatie 7A, 01510 Vantaa, Finland
Test method requested, standard	FCC Rules and Regulations CFR 47, Part 15, Subpart B (10-1-19 Edition) & ICES-003 Issue 7 (October 2020)
Summary	IN COMPLIANCE
Approved by (name / position & signature)	José Manuel Gómez Industrial & Automotive EMC Lab. Manager
Date of issue	2021-03-04
Report template No	FDT08_23 (*) "Data provided by the client"

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## Acronyms

Acronym ID	Acronym Description
Avg	Radiated Average Level
Avg	Conducted Average Level
Az	Azimuth
CPL	Zones / Coupling Cables
Code	EMC Test Code
Freq	Frequency
Freq Rng	Frequency Range
H	Height
Line	Conducted Emissions - Tested Line
MP	Measurement Point
Max	Conducted Maximum Level
MaxPeak	Radiated Maximum Peak Level
OM	Operation Mode
Pol	Polarization
QuasiPeak	Conducted Quasi Peak Level
QuasiPeak	Radiated Quasi Peak Level
S/	Sample
V	Verdict
Volt Immunity Lvl	Voltage Immunity Severity Level
Volt Immunity Type	Voltage Immunity Type

## Competences and guarantees

DEKRA Testing and Certification S.A.U. 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 S.A.U. has a calibration and maintenance program for its measurement equipment.

DEKRA Testing and Certification S.A.U. 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 S.A.U. at the time of performance of the test.

DEKRA Testing and Certification S.A.U. 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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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 S.A.U.
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 S.A.U. and the Accreditation Bodies.

## Uncertainty

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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 radio disturbance characteristics of EUT from 30 MHz to 1000 MHz is  $l = \pm 4,9$  dB for quasi-peak measurements,  $l = \pm 4,6$  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 12.75 GHz is  $l = \pm 2,6$  dB for peaks and average measurements ( $k = 2$ ).

## Data provided by the client

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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 sample is a sports watch with GPS for tracking outdoor trainings, optical heart rate measurement and BLE connectivity to connect with a smart phone and the Suunto App for recording training logs and analyze training and 24/7 data.

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

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Samples under test have been selected by: The client.

Id	Control Number	Description	Model	Serial N°	Date of Reception	Application
S/01	66539_017	Sports watch with GPS and BLE connectivity	OW194	020491300125	2021-01-12	Element under test
S/01	66539_018	USB charger	---	---	2021-01-12	Auxiliary element

Notes referenced to samples during the project.

Id	Note
S/01	N/A

## Test sample description

Ports..... :	Port name and description	Cable			
		Specified max length [m]	Attached during test	Shielded	Coupled to patient <sup>(3)</sup>
	Not Provided Data				
Supplementary information to the ports..... :	Not Provided Data				
Rated power supply .....	Voltage and Frequency		Reference poles		
			L1	L2	L3
	<input type="checkbox"/> AC:				
<input checked="" type="checkbox"/> DC: 5 Vdc via USB of a PC powered at 115Vac.					
Rated Power .....	Not provided data				
Clock frequencies..... :	Not provided data				
Other parameters .....	Not provided data				
Software version .....	2.13.xx				
Hardware version .....	C2				
Dimensions in cm (W x H x D) .....	Not provided data				
Mounting position .....	X	Other: Wearable device			
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

Suunto Oy  
Tammiston kauppatie 7A,  
01510 Vantaa, Finland

## Testing period and place

<b>Test Location</b>	DEKRA Testing and Certification S.A.U.
<b>Date (start)</b>	2021-01-15
<b>Date (finish)</b>	2021-02-11

## Document history

Report number	Date	Description
66539REM.002	2021-02-19	First release
66539REM.002A1	2021-03-04	Second release: It was corrected a typo in Operational Modes descriptions. It was corrected a typo in test specification description at page 10. This test reports replaces and cancels the report with NIE: 66539REM.002

## Environmental conditions

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

<b>Temperature</b>	Min. = 15 °C Max. = 35 °C
<b>Relative humidity</b>	Min. = 20 % Max. = 75 %

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

<b>Temperature</b>	Min. = 15 °C Max. = 35 °C
<b>Relative humidity</b>	Min. = 20 % Max. = 75 %

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

<b>Temperature</b>	Min. = 15 °C Max. = 35 °C
<b>Relative humidity</b>	Min. = 20 % Max. = 75 %



## Remarks and comments

The tests have been performed by the technical personnel: Humberto Pérez.

## Testing verdicts

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

## List of equipment used during the test

Control Number	Description	Model	Manufacturer	Next Calibration
1650	THREE-PHASE ARTIFICIAL V-NETWORK 100A	NNLK8121	SCHWARZBECK	2021-09-24
1935	EMI TEST RECEIVER 9kHz-3GHz	ESPI3	ROHDE AND SCHWARZ	2022-02-05
3547	USB TEMPERATURE AND HUMIDITY SENSOR	HUMIDIPROBE	PICO TECHNOLOGY	2021-12-02
3548	USB TEMPERATURE AND HUMIDITY SENSOR	HUMIDIPROBE	PICO TECHNOLOGY	2021-04-29
6196	PRE-AMPLIFIER G>55dB 1-18GHz	AMF-7D-01001800-22-10P	NARDA	2020-12-17
7743	HORN ANTENNA 0,75-18GHz	3115	ETS LINDGREN	2023-08-24
7746	HYBRID BILOG ANTENNA 30MHz-6GHz	3142E	ETS LINDGREN	2023-07-23
7771	TRANSIENT LIMITER 10DB N CONNECTOR	VTSD 9561-F	SCHWARZBECK	2021-11-24
7816	EMI TEST RECEIVER 1Hz-26.5GHz	ESW26	ROHDE AND SCHWARZ	2021-09-05

## Summary

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Test Specification.	Requirement – Test case	Verdict	Remark
FCC CFR 47, Part 15, Subpart B (10-1-19 Edition) Sec. 15.109 & ICES-003 Issue 7 (October 2020). ANSI C63.4 (2014)	Radiated emission	Pass	---
FCC CFR 47, Part 15, Subpart B & C (10-1-19 Edition) Secs. 15.107 and 15.207 & ICES-003 Issue 7 (October 2020) ANSI C63.4 (2014)	Conducted emission	Pass	---

## 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 a 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:

Id	Description
OM_01	EUT ON. Bluetooth LE OFF. GNSS OFF. Charging batteries by USB using the PC. Power Supply EUT: 5Vdc. Power supply PC: 115Vac.
OM_02	EUT ON. Bluetooth LE ON in communication with auxiliary device. GPS ON receiving valid positioning signal. Charging batteries by USB using the PC. Power Supply EUT: 5Vdc. Power supply PC: 115Vac.

## Test standards version applied

The product standards and test standards applied for each test cases are shown in the following table:

Product Test Standard	Test standard	Requirement – Test case
FCC CFR 47, Part 15, Subpart B y C (10-1-19 Edition) Secs. 15.109 & ICES-003 Issue 7 (October 2020).	ANSI C63.4 (2014)	Radiated emission
FCC CFR 47, Part 15, Subpart B y C (10-1-19 Edition) Secs. 15.107 and 15.207 & ICES-003 Issue 7 (October 2020).	ANSI C63.4 (2014)	Conducted emission

## Test Cases Details

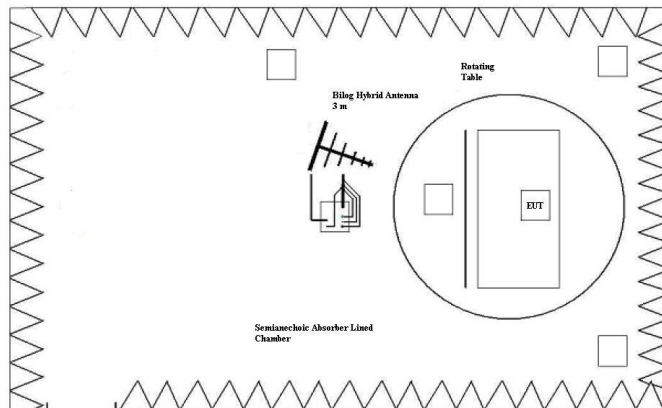
### RE Radiated emission

#### Limits of interference Class B

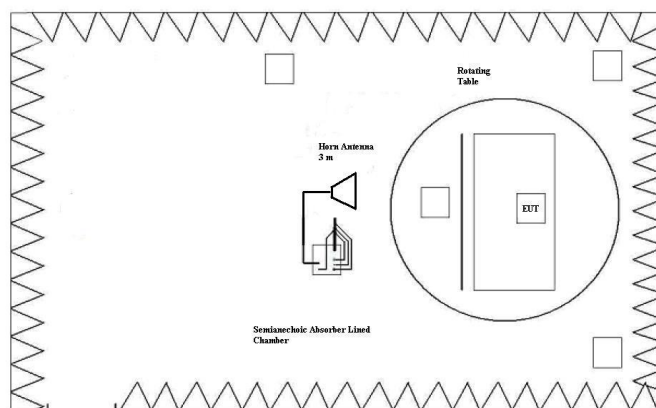
The applied limit for radiated emissions, 3 m distance, according with the requirements of FCC Rules and Regulations 47 CFR Part 15, Subpart B (10-1-19 Edition), Secs. 15.109 & ICES-003 Issue 7 (Updated 04-2020)

Frequency of emission (MHz)	Field strength limit (microvolt/meter) (QuasiPeak Detector)	ICES-003 Issue 7 Field strength (dBµV/m)
30-88	100	40
88-216	150	43.5
216-230	200	46
230-960	200	47
Above 960	500	54

\*Above 1GHz, the limit is defined for an AVG detector.



Setup for measurements < 1GHz.



Setup for measurements > 1GHz.

## RESULTS

CRmmnnRR	Description	Result
CR0101LR	Range: 30 MHz - 1000 MHz.	P
CR0101HR_PH	Range: 1 MHz – 12.75 GHz. Horizontal polarization.	P
CR0101HR_PV	Range: 1 MHz – 12.75 GHz. Vertical polarization.	P

mm: Sample number; nn: Operation mode; RR: Measurement range; XX: Polarization

\*According to FCC 47 CFR Part 15B / ICES-003 Issue 6, this measurement is only needed up to the fifth harmonic of the internal working frequency.

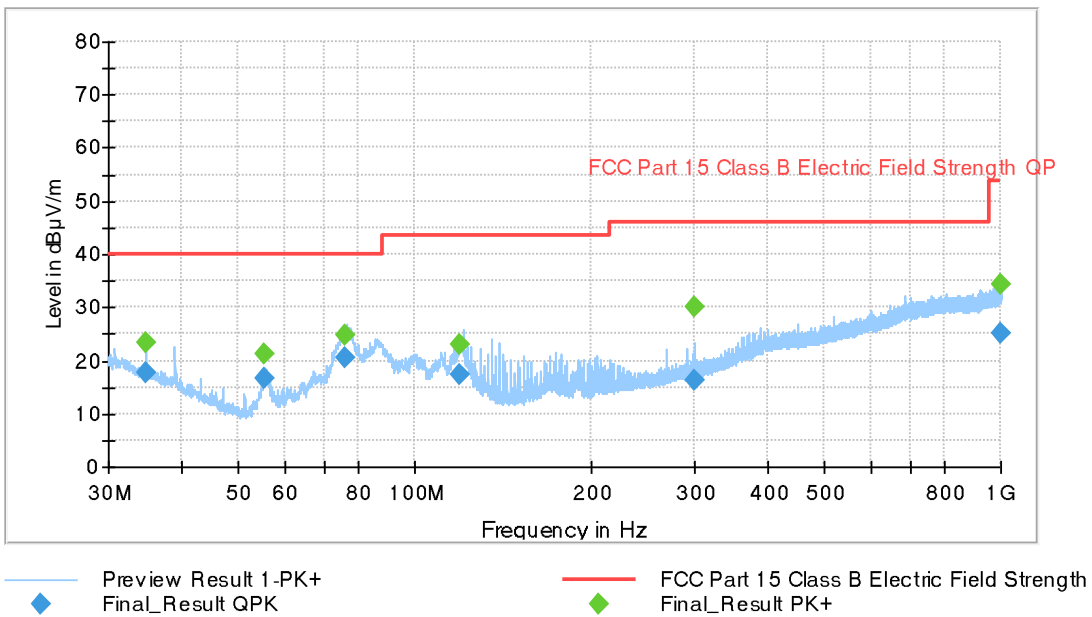
## **VERDICT**

Pass

**Images:**

Project: 66539REM.002  
 Company: SUUNTO  
 Sample: S/01  
 Operation mode: OM#01  
 Description: EUT ON. Bluetooth LE OFF. GNSS OFF. Charging batteries by USB using the PC. Power Supply EUT: 5Vdc. Power supply PC: 115Vac.  
 Test verdict: PASS

Full Spectrum



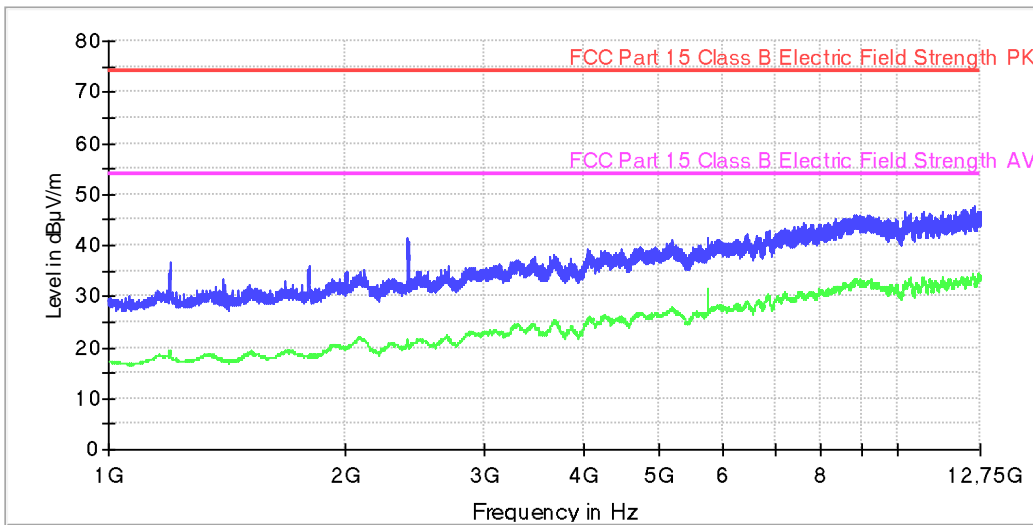
**Final\_Result**

Frequency (MHz)	QuasiPeak (dBµV/m)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)
34.830000	17.76	---	40.00	22.24	184.0	V	98.0
34.830000	---	23.45	---	---	184.0	V	98.0
55.441000	---	21.36	---	---	100.0	V	52.0
55.441000	16.76	---	40.00	23.24	100.0	V	52.0
76.045000	20.40	---	40.00	19.60	100.0	V	156.0
76.045000	---	24.84	---	---	100.0	V	156.0
119.598000	17.28	---	43.52	26.24	203.0	V	164.0
119.598000	---	22.93	---	---	203.0	V	164.0
299.763000	---	30.03	---	---	121.0	H	240.0
299.763000	16.24	---	46.00	29.76	121.0	H	240.0
996.489000	25.29	---	53.97	28.68	205.0	H	328.0
996.489000	---	34.26	---	---	205.0	H	328.0



Project: 66539REM.002  
 Company: SUUNTO  
 Sample: S/01  
 Operation mode: OM#01  
 Description: EUT ON. Bluetooth LE OFF. GNSS OFF. Charging batteries by USB using the PC. Power Supply EUT: 5Vdc. Power supply PC: 115Vac.Horizontal Polarization  
 Test verdict: PASS

RE FCC Part 15 ClassB 1-12.75 GHz



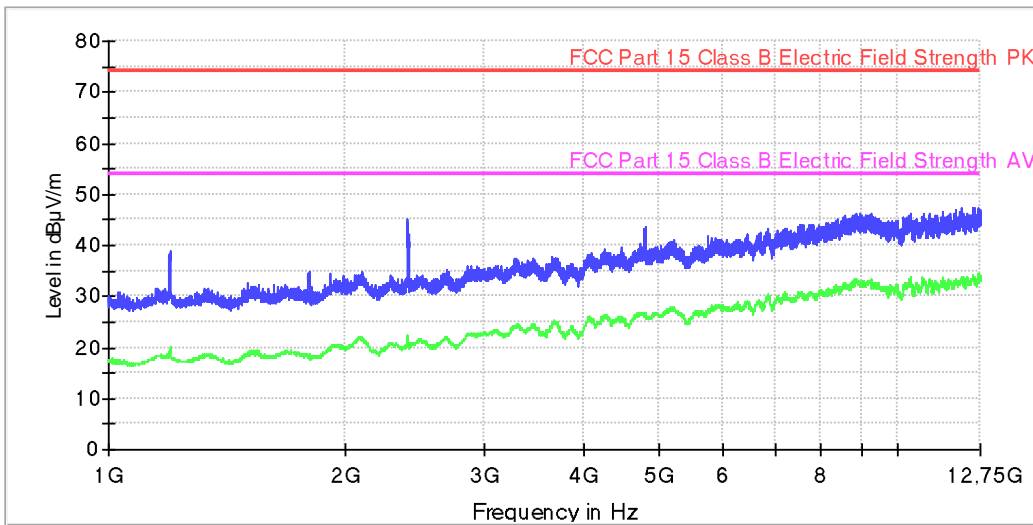
— AVG\_CLRWR — PK+\_CLRWR  
 — FCC Part 15 Class B Electric Field Strength PK — FCC Part 15 Class B Electric Field Strength

### Subrange Maxima

Frequency (MHz)	PK+_CLRWR (dBµV/m)	AVG_CLRWR (dBµV/m)
2081.600000	33.3	22.0
3290.800000	36.2	24.7
4257.600000	38.7	26.4
5189.200000	40.0	27.7
5760.000000	41.6	31.7
7969.600000	42.7	31.4
8834.000000	44.9	33.4
10385.600000	45.0	33.8
11403.200000	45.2	33.8
12698.800000	46.4	34.4

Project: 66539REM.002  
 Company: SUUNTO  
 Sample: S/01  
 Operation mode: OM#01  
 Description: EUT ON. Bluetooth LE OFF. GNSS OFF. Charging batteries by USB using the PC. Power Supply EUT: 5Vdc. Power supply PC: 115Vac. Vertical Polarization  
 Test verdict: PASS

RE FCC Part 15 ClassB 1-12.75 GHz



— AVG\_CLRWR — PK+\_CLRWR  
 — FCC Part 15 Class B Electric Field Strength PK — FCC Part 15 Class B Electric Field Strength

### Subrange Maxima

Frequency (MHz)	PK+_CLRWR (dBµV/m)	AVG_CLRWR (dBµV/m)
1196.400000	38.8	19.6
2398.400000	45.0	21.2
4461.200000	39.7	25.8
4792.400000	43.5	26.7
6842.800000	43.2	30.2
7825.600000	44.1	30.5
8860.800000	46.3	33.0
10392.000000	46.4	33.8
11401.600000	46.6	33.7
12525.600000	47.4	33.4

## CE Conducted emission

### Limits of interference 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 (10-1-19 Edition), Secs. 15.107 & ICES-003 Issue 7 (October 2020), 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

### RESULTS

CCmmnnhh	Description	Result
CC01010N	Range: 150kHz – 30MHz. Neutral AC wire noise.	P
CC0101L1	Range: 150kHz – 30MHz. Phase AC wire noise.	P
CC01020N	Range: 150kHz – 30MHz. Neutral AC wire noise.	P
CC0102L1	Range: 150kHz – 30MHz. Phase AC wire noise.	P

mm: Sample number; nn: Operation mode; hh: Wire

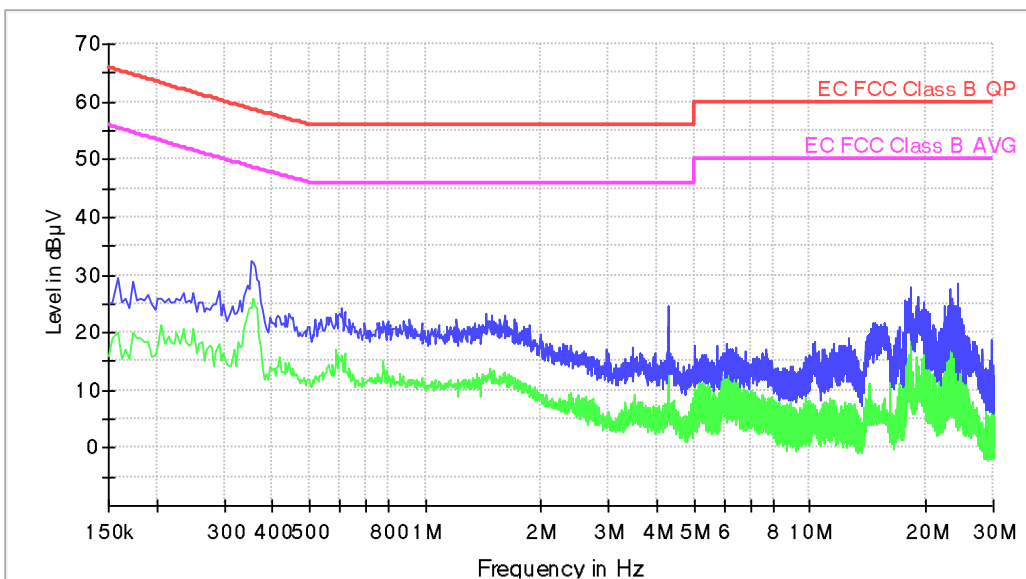
### VERDICT

Pass

**Images:**

Project: 66539REM.002  
 Company: SUUNTO  
 Sample: S/01  
 Operation mode: OM#01  
 Description: EUT ON. Bluetooth LE ON in communication with auxiliary device.  
 GPS ON receiving valid positioning signal. Charging batteries by USB using the PC. Power Supply EUT: 5Vdc. Power supply PC: 115Vac.. Neutral wire noise.

**CE FCC Part 15 150 kHz – 30 MHz Class B**



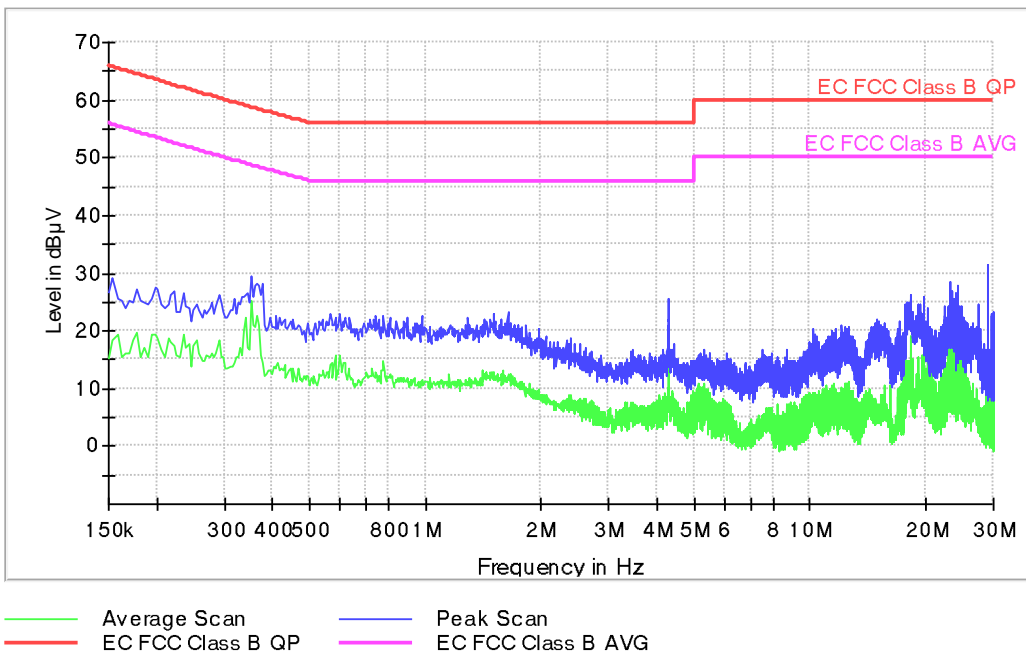
— Average Scan      — Peak Scan  
 — EC FCC Class B QP      — EC FCC Class B AVG

**Subrange Maxima**

Frequency (MHz)	PK+ CLRWR	AVG CLRWR (dBµV)	Line
0.158000	29.4	20.0	N
0.354000	32.4	24.2	N
0.606000	24.3	16.1	N
0.910000	22.3	11.0	N
1.442000	23.2	12.4	N
2.286000	18.0	7.6	N
4.270000	24.7	15.3	N
10.310000	18.4	4.8	N
14.634000	21.7	6.5	N
24.350000	28.5	20.5	N

Project: 66539REM.002  
 Company: SUUNTO  
 Sample: S/01  
 Operation mode: OM#01  
 Description: EUT ON. Bluetooth LE ON in communication with auxiliary device.  
 GPS ON receiving valid positioning signal. Charging batteries by  
 USB using the PC. Power Supply EUT: 5Vdc. Power supply PC:  
 115Vac.. Phase wire noise.

## CE FCC Part 15 150 kHz – 30 MHz Class B

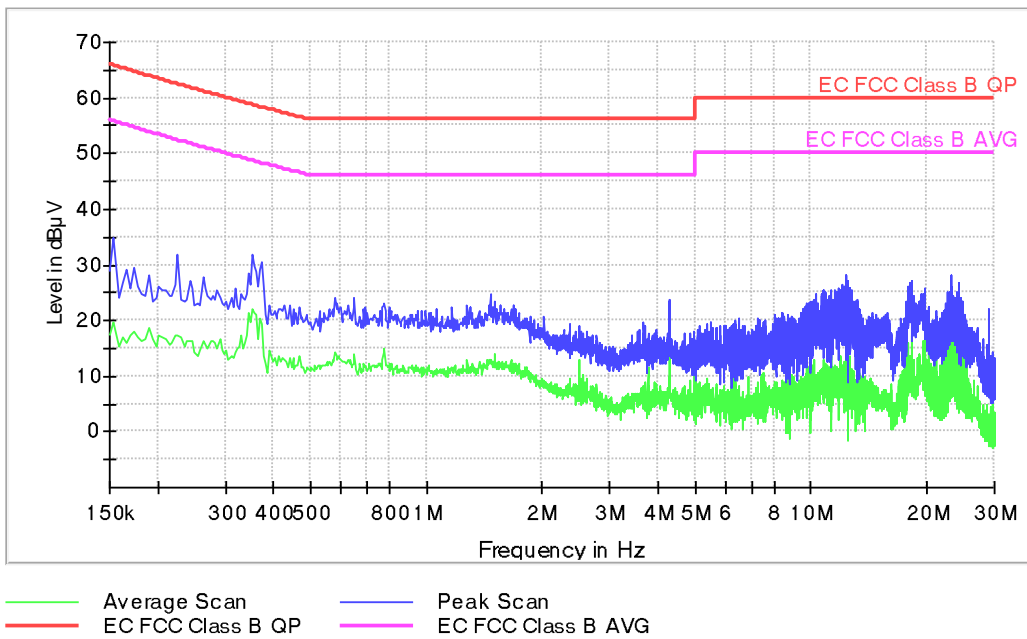


### Subrange Maxima

Frequency (MHz)	PK+ CLRWR	AVG CLRWR (dBµV)	Line
0.154000	29.2	18.3	L1
0.354000	29.7	25.3	L1
0.598000	23.1	15.6	L1
0.978000	22.8	11.6	L1
1.638000	23.2	12.7	L1
2.386000	18.8	8.0	L1
4.270000	25.5	19.7	L1
10.154000	20.2	8.9	L1
14.886000	21.8	7.0	L1
29.086000	31.4	5.7	L1

Project: 66539REM.002  
 Company: SUUNTO  
 Sample: S/01  
 Operation mode: OM#02  
 Description: EUT ON. Bluetooth LE ON in communication with auxiliary device.  
 GPS ON receiving valid positioning signal. Charging batteries by  
 USB using the PC. Power Supply EUT: 5Vdc. Power supply PC:  
 115Vac. Neutral Wire Noise

## CE FCC Part 15 150 kHz – 30 MHz Class B

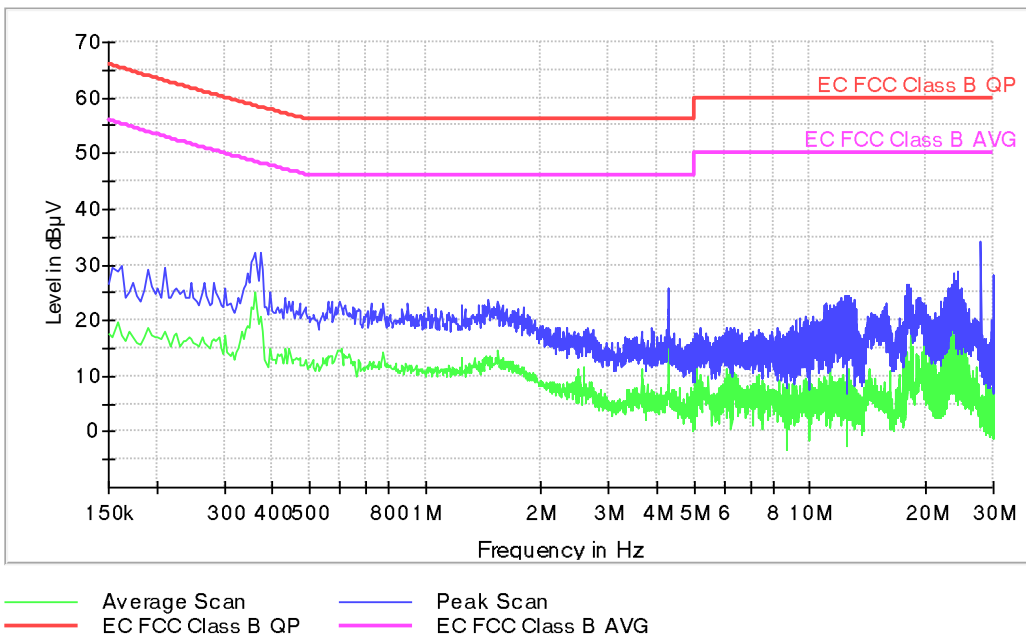


## Subrange Maxima

Frequency (MHz)	PK+ CLRWR	AVG CLRWR (dBµV)	Line
0.154000	34.8	19.9	N
0.354000	31.8	21.9	N
0.650000	24.2	14.0	N
0.778000	23.1	14.9	N
1.466000	24.7	13.1	N
2.366000	19.5	9.7	N
4.274000	23.8	17.3	N
10.258000	24.7	10.1	N
12.362000	28.1	15.7	N
23.130000	28.1	21.3	N

Project: 66539REM.002  
 Company: SUUNTO  
 Sample: S/01  
 Operation mode: OM#02  
 Description: EUT ON. Bluetooth LE ON in communication with auxiliary device.  
 GPS ON receiving valid positioning signal. Charging batteries by  
 USB using the PC. Power Supply EUT: 5Vdc. Power supply PC:  
 115Vac. Phase Wire Noise

## CE FCC Part 15 150 kHz – 30 MHz Class B



### Subrange Maxima

Frequency (MHz)	PK+ CLRWR	AVG CLRWR (dBµV)	Line
0.162000	30.0	17.3	L1
0.374000	32.3	20.7	L1
0.434000	23.9	15.0	L1
0.778000	23.0	14.2	L1
1.462000	23.9	13.2	L1
2.654000	18.8	7.0	L1
4.274000	25.6	19.3	L1
9.714000	20.7	8.3	L1
12.610000	24.5	11.2	L1
27.882000	34.2	6.1	L1