

Test Report



INTENTIONAL RADIATOR TESTS ACCORDING TO FCC PART 15 C and INDUSTRY CANADA REQUIREMENTS

Equipment Under Test: Diving computer with BT4.0 and LF communication capability

Marketing Name: EON

Model: DW141

Manufacturer: Suunto Oy
Valimotie 7
FI-01510 VANTAA
FINLAND

Customer: Suunto Oy
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FI-01510 VANTAA
FINLAND

FCC Rule Part: 15.209: 2013
IC Rule Part: RSS-210, Issue 8, 2010
RSS-GEN Issue 3, 2010

Date: 1 July 2014

Issued by:

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Niko Kotsalo
Testing Engineer

Date: 1 July 2014

Checked by:

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Jari Merikari
Technical Manager

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Equipment Under Test (EUT)

Diving computer with BT4.0 and LF communication capability

Marketing Name: EON

Model: DW141

Serial Number: -

The EUT is a diving computer with LF (123 kHz) and BT V4.0 single mode communication capability using low power transmission.

There are different samples for radiated and conductive measurements. The units for conductive measurements have SMA antenna port connectors and wires for external power source.

This report contains the LF transmission (123 kHz) measurements according to FCC part 15.209.

Classification of the device

Fixed device	<input type="checkbox"/>
Mobile Device (Human body distance > 20cm)	<input type="checkbox"/>
Portable Device (Human body distance < 20cm)	<input checked="" type="checkbox"/>

Modifications Incorporated in the EUT

No modifications were applied to the EUT during testing

Ratings and declarations

Operating Frequency Range (OFR): 0.123 MHz

Channels: 1

Output power (Peak): 25 dBm

Modulation: PSK

Integral coil antenna gain: -2.15 dBi

Power Supply

-Internal Lithium battery LS 14250, ½ AA-size bobbin cell, 3.6 V.

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Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 90 days only. This document cannot be reproduced except in full, without prior approval of the Company.

SUMMARY OF TESTING

Test Specification	Description of Test	Result
§15.209, RSS-310, RSS-GEN	Radiated Emissions 9 kHz to 1 GHz	PASS

EUT Test Conditions during Testing

The EUT was operating on 123 kHz and was in continuous transmit mode during all the tests.

The tests were performed with the EUT being in three different orthogonal positions: X, Y, Z.

Test Facility

<input type="checkbox"/> Testing Location / address: FCC registration number: 90598	SGS Fimko Ltd Särkiniementie 3 FI-00210, HELSINKI FINLAND
<input checked="" type="checkbox"/> Testing Location / address: FCC registration number: 178986 Industry Canada registration number: 8708A-2	SGS Fimko Ltd Karakaarenkuja 4 FI-02610, ESPOO FINLAND

RADIATED EMISSION TESTS

Radiated Emissions 9 kHz to 1 GHz

Standard: ANSI C63.10 (2009)
Tested by: RRE/ NKO
Date: 22.5., 12.6.2014
Temperature: 21°C, 23 °C
Humidity: 49 % RH, 43 % RH
Measurement uncertainty ± 4.51 dB Level of confidence 95 % (k = 2)

FCC Rule: 15.209

The emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100 **	3
88-216	150 **	3
216-960	200 **	3
Above 960	500	3

The level of any unwanted emissions from an intentional radiator operating under these general provisions shall not exceed the level of the fundamental emission. The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.

According to ANSI C63.10 (clause 5.3.2) and RSS-Gen (Clause 4.11) the measurements below 30 MHz can be performed at a closer distance than the EUT limit distance, the results shall be extrapolated to shorter distance by using the square of an inverse linear distance extrapolation factor (40 dB/ decade). This method was used when performing measurements at a distance of 3 m instead of limit distances 300 m or 30 m.

The correction factor in the final result table contains the sum of the transducers (antenna + cables + distance). The result value is the measured value corrected with the correction factor.

Test results

FCC Part 15 Class B (15.209) Spurious Emission 9 kHz - 30 MHz 3m

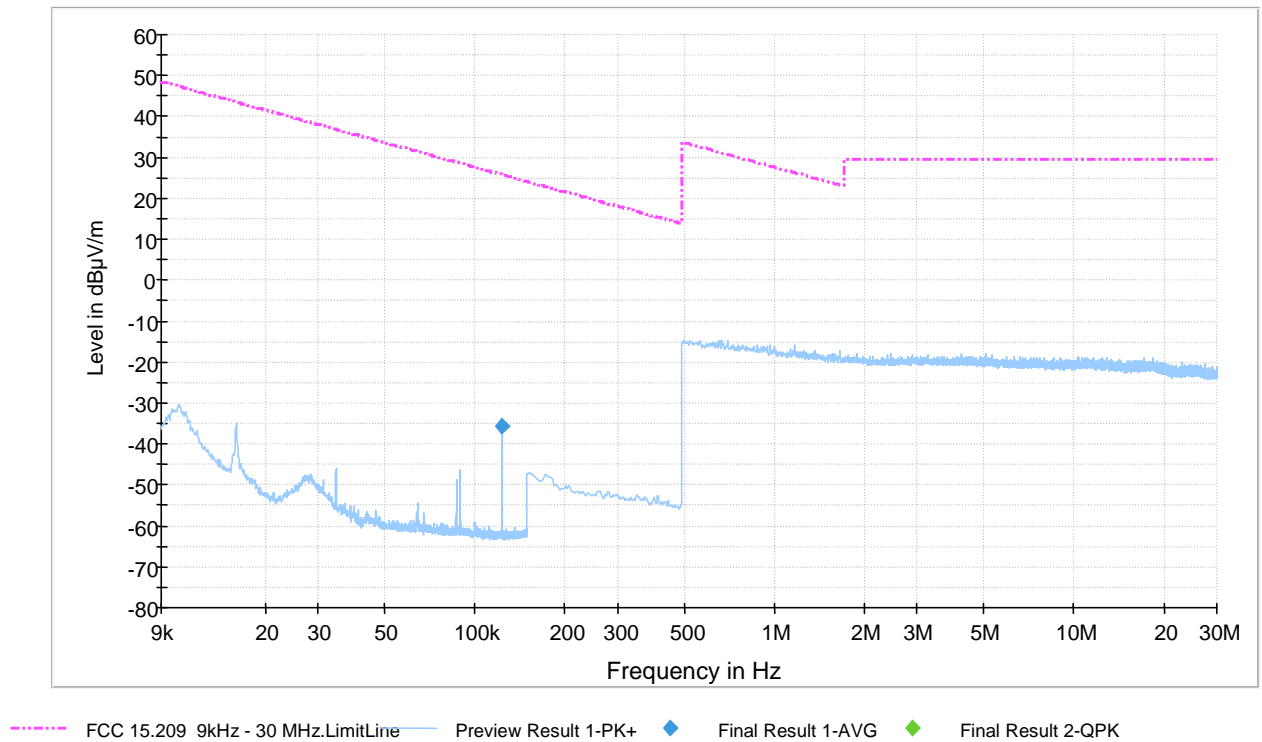


Figure 1. TX radiated emission 9 kHz to 30MHz.

Final measurements from the worst frequencies

Table 1. The final results with Average detector.

Frequency (MHz)	Average (dBμV/m)	Meas. Time 15x(ms)	Bandwidth (kHz)	Antenna angle (deg)	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)	Comment
0.123060	-35.8	1000.0	0.200	0.0	235.0	-60.0	61.6	25.8	

FCC Part 15 Class B (15.209) Spurious Emission 9 kHz - 30 MHz 3m

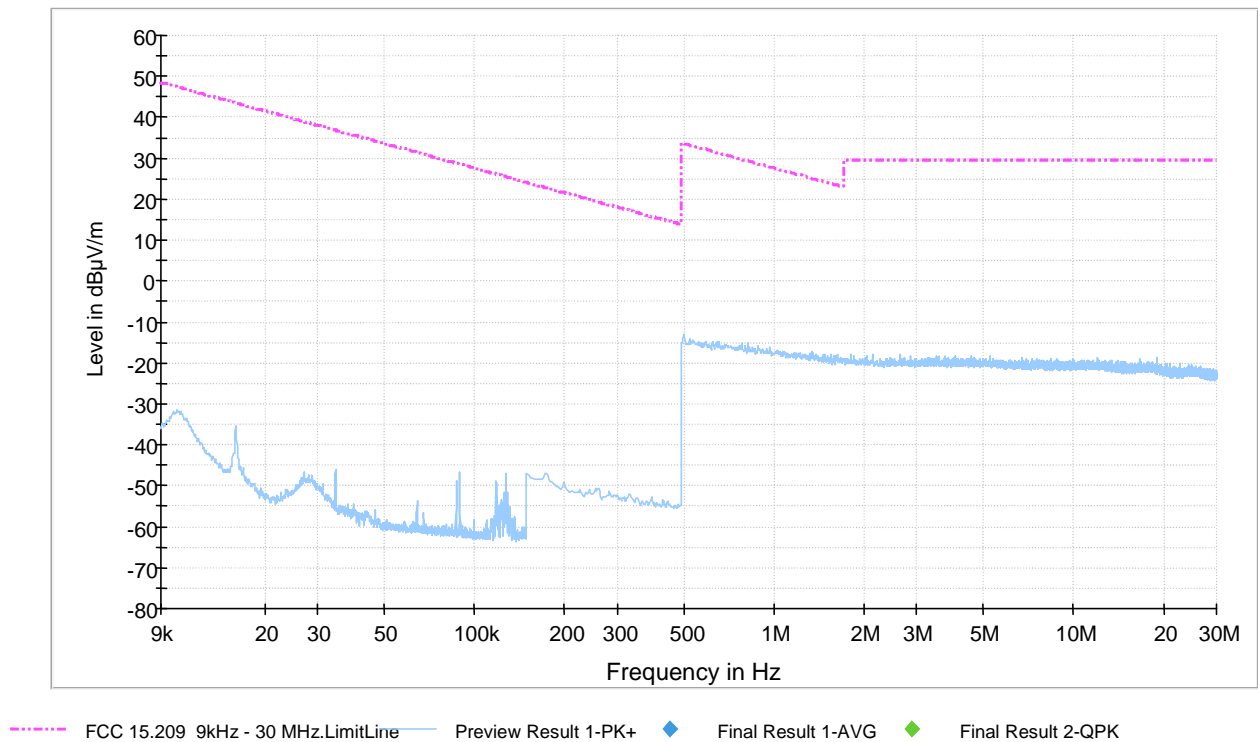
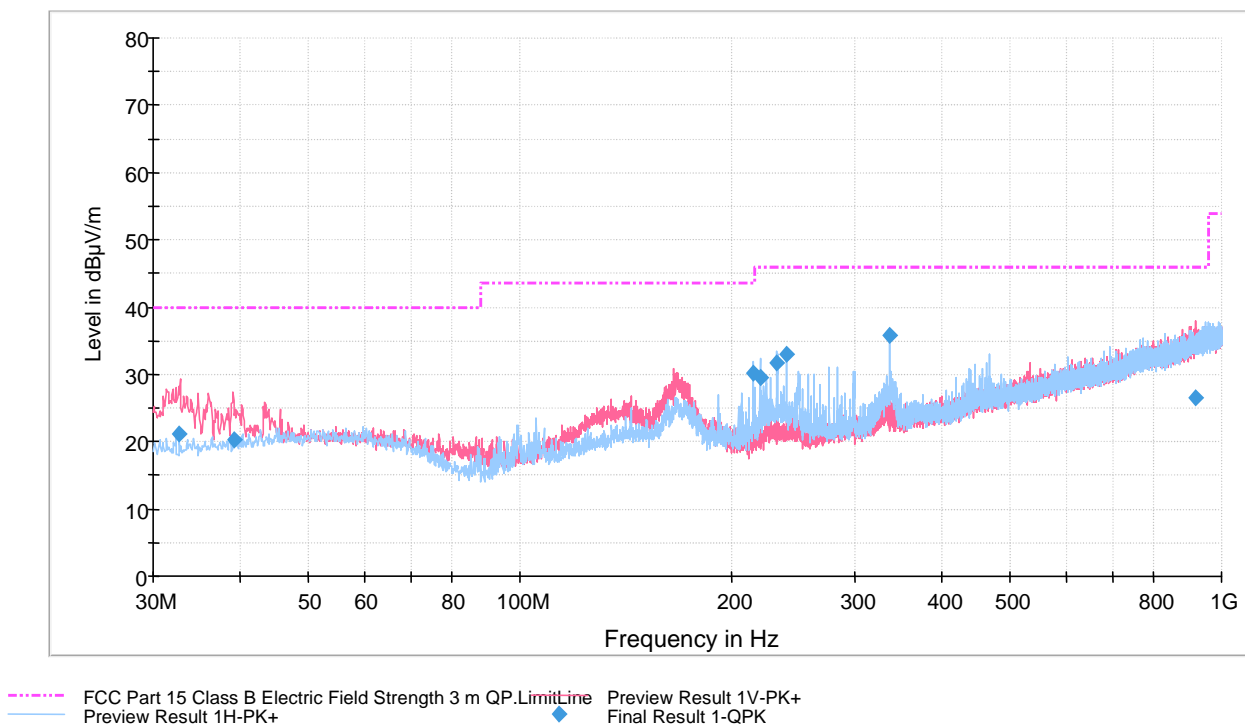


Figure 2. RX radiated emission 9 kHz to 30MHz.

Final measurements from the worst frequencies

Due to the low emission level no final measurements were made.

FCC Part 15 Class B Spurious Emission 30-1000MHz 3m


Figure 3. TX radiated emission 30 MHz to 1000 MHz.

Final measurements from the worst frequencies

Table 2. The final results.

Frequency (MHz)	QuasiPeak (dBμV/m)	Meas. Time 15x(ms)	Bandwidth (kHz)	Height (cm)	Pol.	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)	Comment
32.673000	21.1	1000.0	120.000	115.0	V	72.0	14.2	18.9	40.0	
39.081000	20.2	1000.0	120.000	100.0	V	121.0	14.7	19.8	40.0	
214.728000	30.1	1000.0	120.000	140.0	H	28.0	12.5	13.4	43.5	
219.792000	29.5	1000.0	120.000	157.0	H	27.0	12.5	16.5	46.0	
232.422000	31.8	1000.0	120.000	165.0	H	182.0	13.3	14.2	46.0	
240.005000	33.1	1000.0	120.000	116.0	H	184.0	13.9	12.9	46.0	
335.995000	35.9	1000.0	120.000	100.0	H	62.0	16.9	10.1	46.0	
918.326000	26.6	1000.0	120.000	377.0	V	166.0	27.8	19.4	46.0	

FCC Part 15 Class B Spurious Emission 30-1000MHz 3m

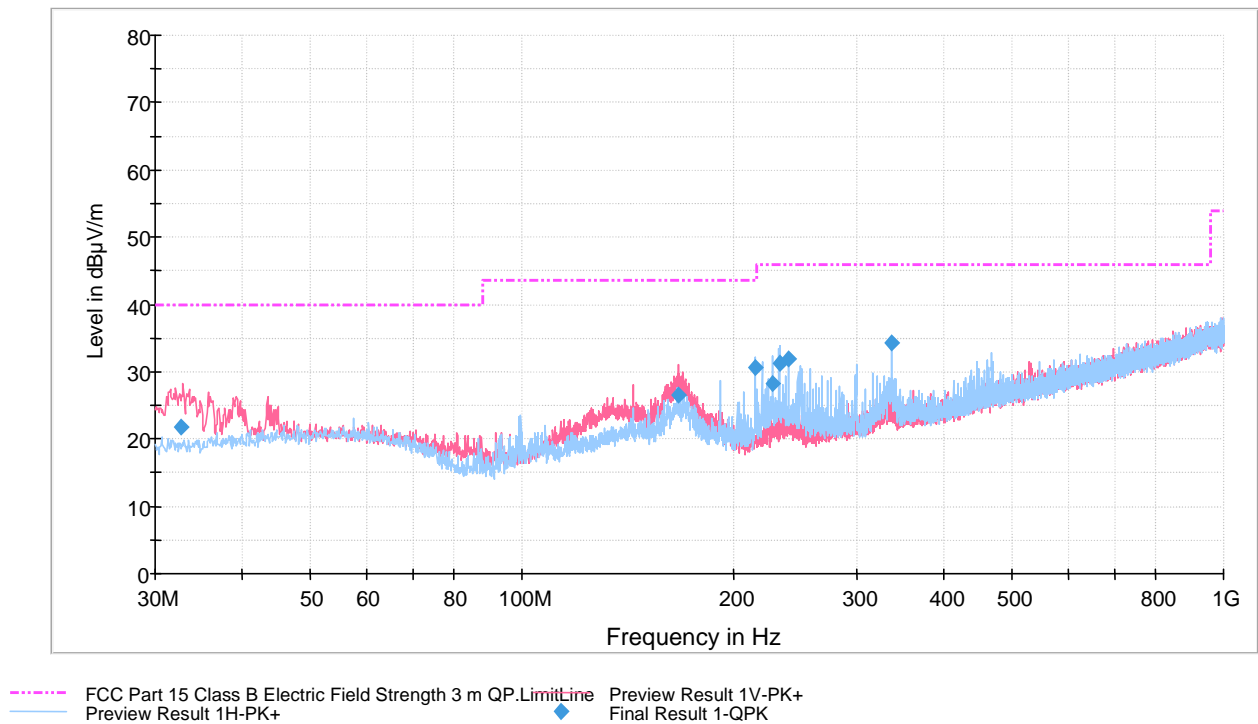


Figure 4. RX radiated emission 30 MHz to 1000 MHz.

Final measurements from the worst frequencies

Table 3. The final results.

Frequency (MHz)	QuasiPeak (dBμV/m)	Meas. Time 15x(ms)	Bandwidth (kHz)	Height (cm)	Pol.	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)	Comment
32.730000	21.7	1000.0	120.000	100.0	V	358.0	14.2	18.3	40.0	
166.758000	26.6	1000.0	120.000	100.0	V	236.0	14.8	16.9	43.5	
214.728000	30.6	1000.0	120.000	140.0	H	185.0	12.5	12.9	43.5	
227.395000	28.3	1000.0	120.000	139.0	H	20.0	12.8	17.7	46.0	
233.078000	31.2	1000.0	120.000	140.0	H	180.0	13.4	14.8	46.0	
240.025000	32.0	1000.0	120.000	134.0	H	184.0	13.9	14.0	46.0	
336.015000	34.3	1000.0	120.000	110.0	H	76.0	16.9	11.7	46.0	

List of Test Equipment

LIST OF TEST EQUIPMENT

Manufacturer	Type	Serial no	Inv. no
ROHDE & SCHWARZ			
Signal Analyzer	FSV40	101068	9093
EMI Test receiver	ESU 26	100185	8453
Loop Antenna	HFH2-Z2	860004/016	8013
Test software	EMC32	-	-
DAVIS			
Weather station	Vantage Pro	-	5297
SCHWARZBECK			
Antenna (30 MHz - 1 GHz)	VULB 9168	9168-503	8911
DEISEL			
Antenna mast	MA 240	240/455	7896
Turntable	DS 430	-	-

All used measurement equipment was calibrated (if required).