

Test Report



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

Equipment Under Test: Diving tank pressure sensor with LF communication capability

Marketing Name: Tank POD

Model: DP142

Manufacturer: Suunto Oy
Valimotie 7
FI-01510 VANTAA
FINLAND

Customer: Suunto Oy
Valimotie 7
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 tank pressure sensor with LF communication capability

Marketing Name: Tank POD

Model: DP142

Serial Number: -

The EUT is a diving tank pressure sensor with LF (123 kHz) communication capability using low power transmission, RX verified.

There are different samples for TX and RX units and samples for conductive measurements with SMA antenna port connectors and wires for external power source.

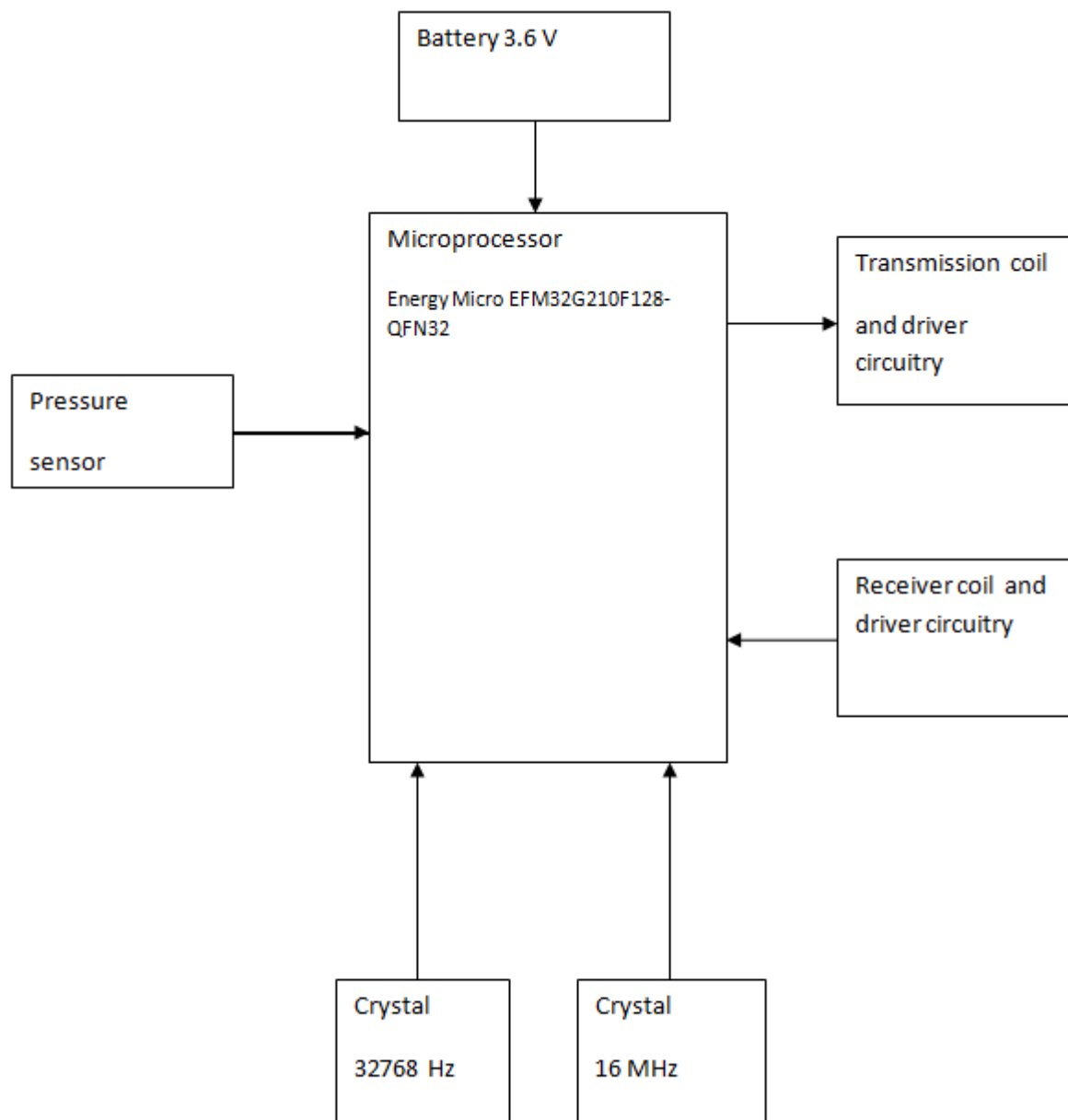


Figure 1. The block diagram of the EUT.

Classification of the device

Fixed device	☐
Mobile Device (Human body distance > 20cm)	☐
Portable Device (Human body distance < 20cm)	☒

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 max

Power Supply

- Internal Lithium battery LS 14250, ½ AA-size bobbin cell, 3.6 V.
- Conductive measurements were tested with an external precision laboratory power source

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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 orthogonal positions: X, Y, Z.

Test Facility

☐	Testing Location / address: FCC registration number: 90598	SGS Fimko Ltd Särkiniementie 3 FI-00210, HELSINKI FINLAND
☒	Testing Location / address: FCC registration number: 178986 Industry Canada registration number: 8708A-2	SGS Fimko Ltd Karakaarenkuja 4 FI-02610, ESPOO FINLAND

RADIATED EMISSION TEST

Radiated Emissions 9 kHz to 1 GHz

Standard: ANSI C63.10 (2009)
Tested by: RRE/ NKO
Date: 12 June 2014, 19 June 2014
Temperature: 23 °C, 23 °C
Humidity: 43 % RH, 31 % 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

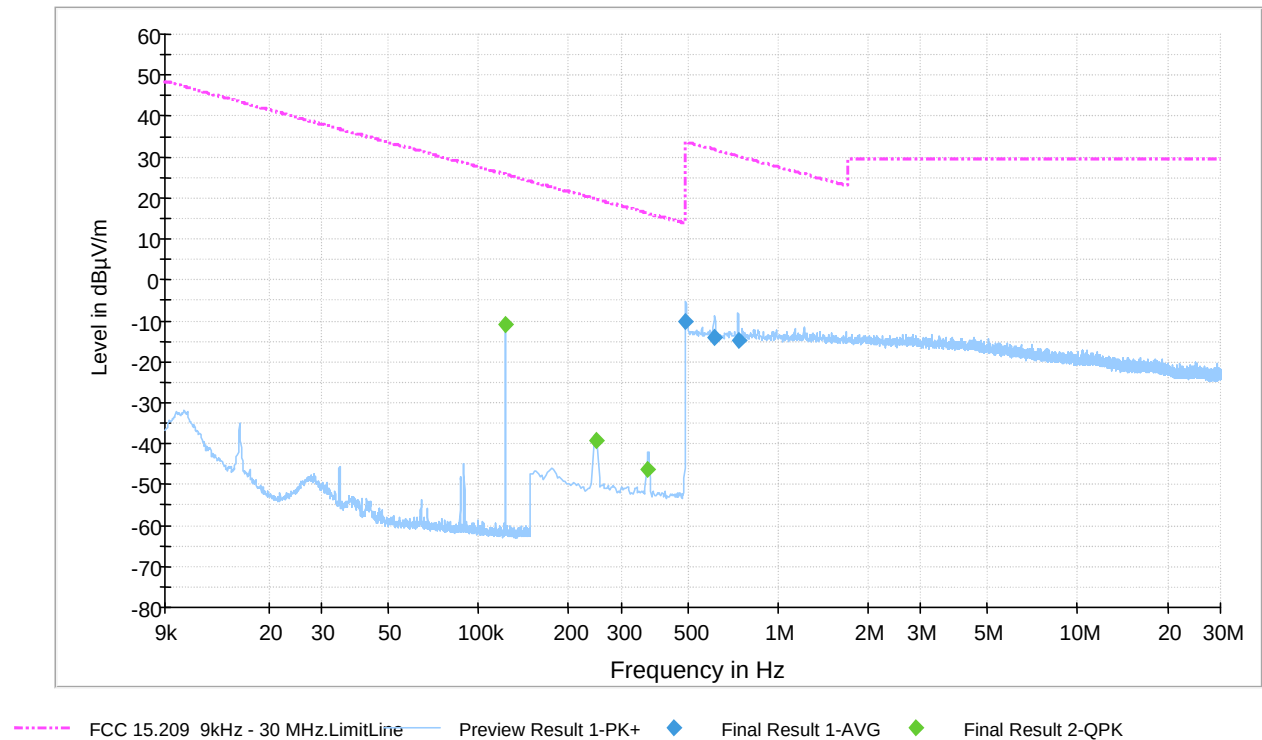


Figure 2. TX radiated emission 9 kHz to 30MHz.

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
0.123090	-11.5	1000.0	0.200	0.0	150.0	-60.0	37.3	25.8	
0.245750	-39.4	1000.0	9.000	0.0	153.0	-60.0	59.1	19.8	
0.367250	-47.6	1000.0	9.000	0.0	157.0	-60.0	63.9	16.3	

Table 2. The final results with Quasi Peak detector.

Frequency (MHz)	QuasiPeak (dBμV/m)	Meas. Time 15x (ms)	Bandwidth (kHz)	Antenna angle (deg)	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)	Comment
0.491000	-8.4	1000.0	9.000	0.0	195.0	-19.9	42.2	33.8	
0.614750	-11.1	1000.0	9.000	0.0	180.0	-19.9	42.9	31.8	
0.740250	-11.9	1000.0	9.000	0.0	157.0	-19.9	42.1	30.2	

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

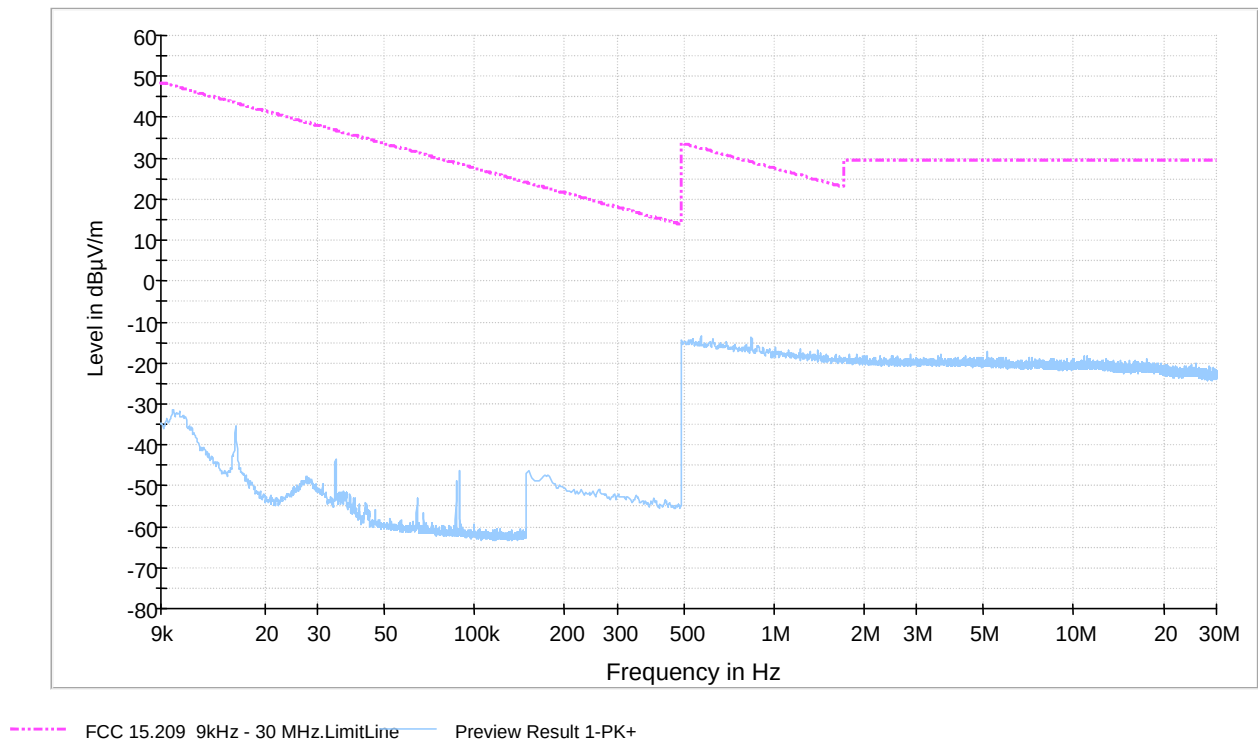


Figure 3. RX radiated emission 9 kHz to 30MHz.

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

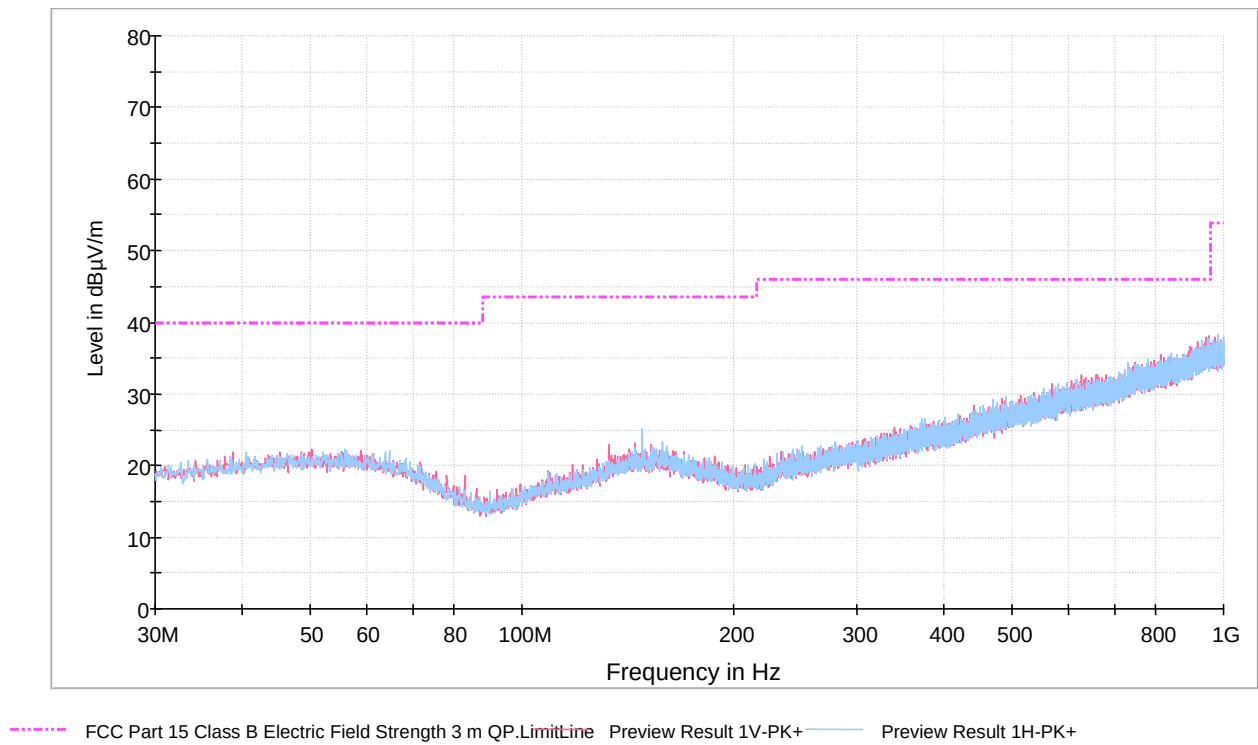


Figure 4. TX radiated emission 30 MHz to 1000 MHz.

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

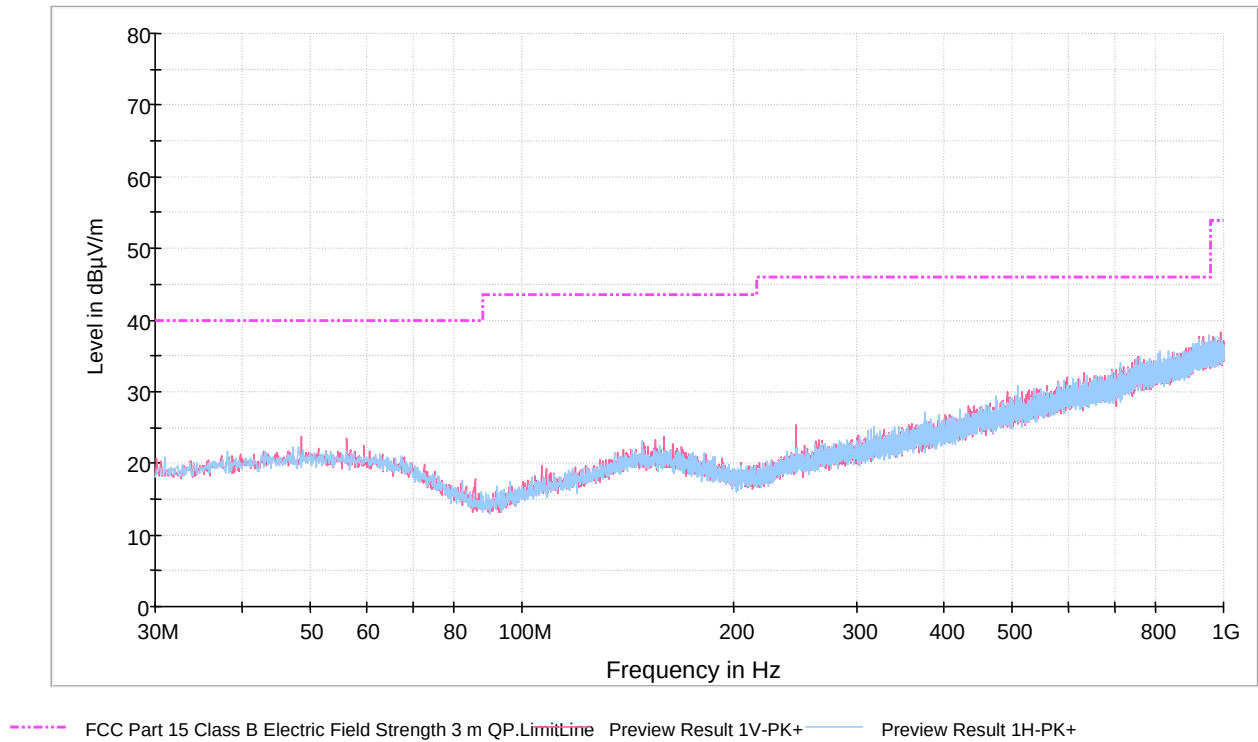


Figure 5. RX radiated emission 30 MHz to 1000 MHz.

Final measurements from the worst frequencies

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

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).