EKTOS
Testing & Reliability Services

EKTOS TRS A/S
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REPORT

Accredited by DANAK under registration number 563 to testing.
TEST: Testing laboratory (DS/EN ISO/IEC 17025)

Test Report

of

Handcontroller

Duty Cycle measurement according to
ANSI 63.10-2013 sec. 7.5

Performed by

Søren Søltoft
Senior EMC Engineer

Examined by

David Busk
Lab. Manager, M. Sc. EE.

Report no.:	P20-0100-9 rev.1	**Report date:**	2020-09-21
Test started:	2020-09-15	**Test ended:**	2020-09-15
Test laboratory:	EKTOS TRS A/S (TLS) Peter Bangs Vej 17 7600 Struer Denmark EKTOS TRS A/S (TLC) Hammerholmen 45A 2650 Hvidovre Denmark	**Client:**	Ride Awake AB Limhamnsvägen 111 21613 Limhamn Sweden
Contact person:	Søren Søltoft	**Contact person:**	Niels Degn

Test specimen:	Handcontroller
Test specification:	ANSI 63.10-2013 sec. 7.5 The tests relevant for the test specimens are listed in *section 1.1*.
Documentation:	P20-0100-9 rev.1 supersedes P20-0100-9 from 2020-09-17. Changes: Address changed on the front page and test laboratory changed. This test report must always be reproduced in full; reproduction of an excerpt only is subject to written approval of the testing laboratory. The complete test documentation is archived for 10 years at the testing laboratory.
Test results:	The test specimen complies with relevant parts of the test specifications. The test results relate only to the specimen tested.
Test personnel:	Søren Søltoft

CONTENTS

Appendix

None

1 SUMMARY

1.1 Test plan

Standard	Name of the test	Results
ANSI 63.10-2013 sec 7.5	Duty cycle measurement	n.a.

PASSED The test was performed and the test specimen complies with the essential requirements in the standard.
FAILED The test was performed and the test specimen does not comply with the essential requirements in the standard.
REF The test is covered by a test in another report and/or on a similar test specimen.
NR The test is not relevant for the test specimen or has been waived by the manufacturer.
n.a. Test is performed to establish the duty cycle.

1.2 Test Specimen

Manufacturer	Ride Awake AB
Name	Handcontroller
Radio module	IEEE 802.15.4 module
Radio Model	2AXC8RAV13
Radio Firmware	200B
Radio Hardware	Rev N
Radio Function set	Digi Xbee3 802.15.4 TH
Supply voltage	Internal battery

The test specimen uses a XBee3 radio to communicate in the 2.4 GHz frequency band.
The radio is at a fix frequency.

2 TESTS

2.1 Duty Cycle

Test specimen	Handcontroller
Test specification	ANSI C63.10:2013 sec 7.5
Test method	ANSI C63.10:2013 sec 7.5
Comments	None
Temperature / Humidity	25°C / 46%RH
Dates of measurements	2020-09-15
Test personnel	Søren Søltoft
Test laboratory	TLS

2.1.1 Test setup

The test specimen was placed in a shielded chamber with a sniffer loop antenna. The antenna was connected via a feedthrough to a spectrum analyzer.

The test specimen was set to transmit with highest power and the highest duty cycle continuously on one frequency by client.

The carrier frequency was measured to 2.41003006 GHz.

The 99% occupied bandwidth to 2.24448898 MHz.

Thus the RBW was chosen to 3 MHz and VBW to 10 MHz

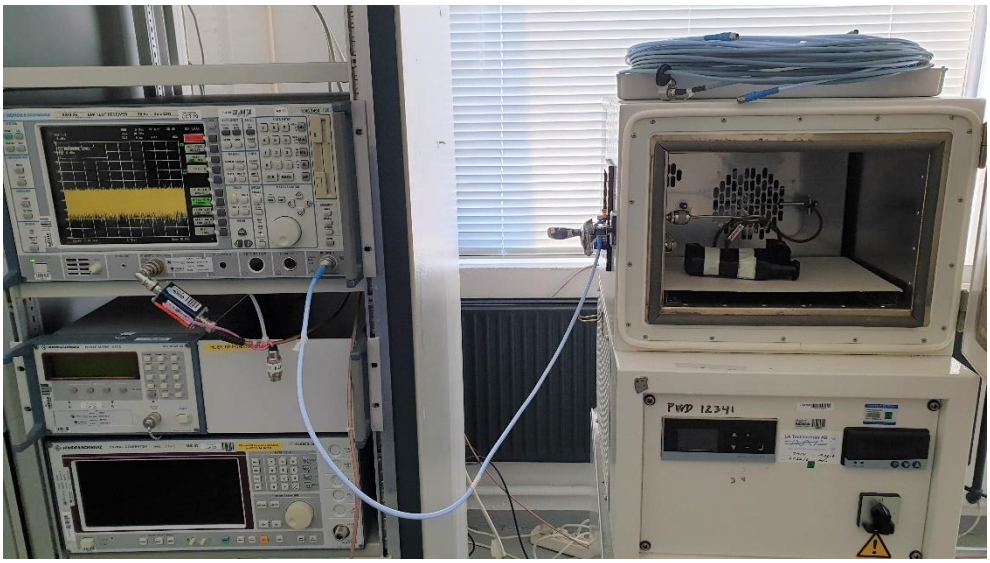

Photo 1. Test setup.

2.1.2 Test result

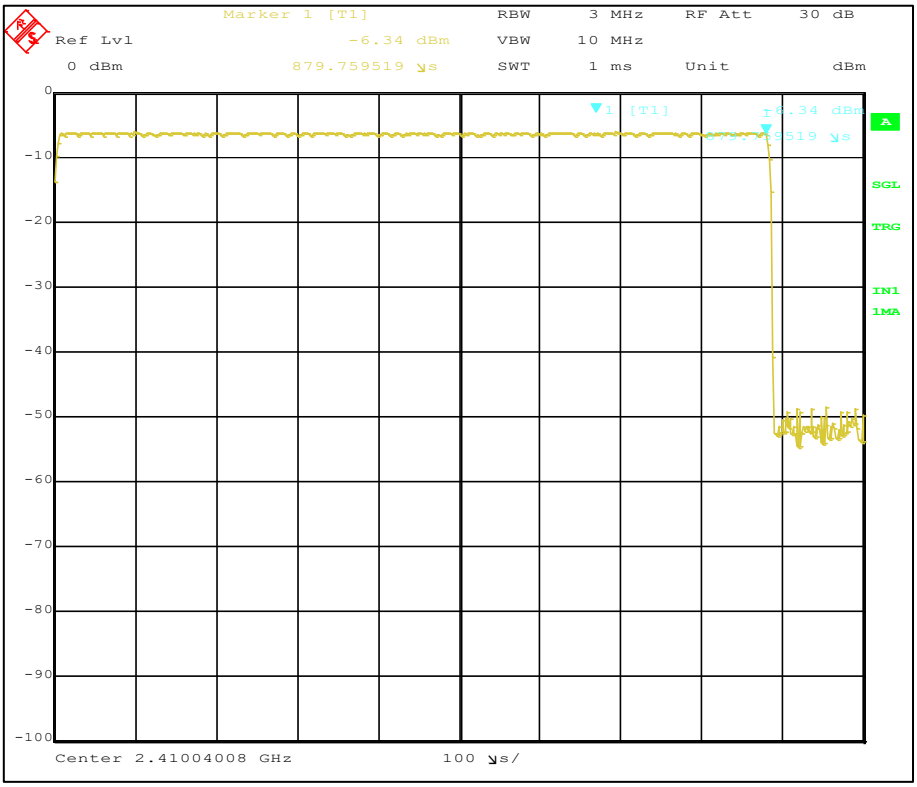

Figure 1. ON time.

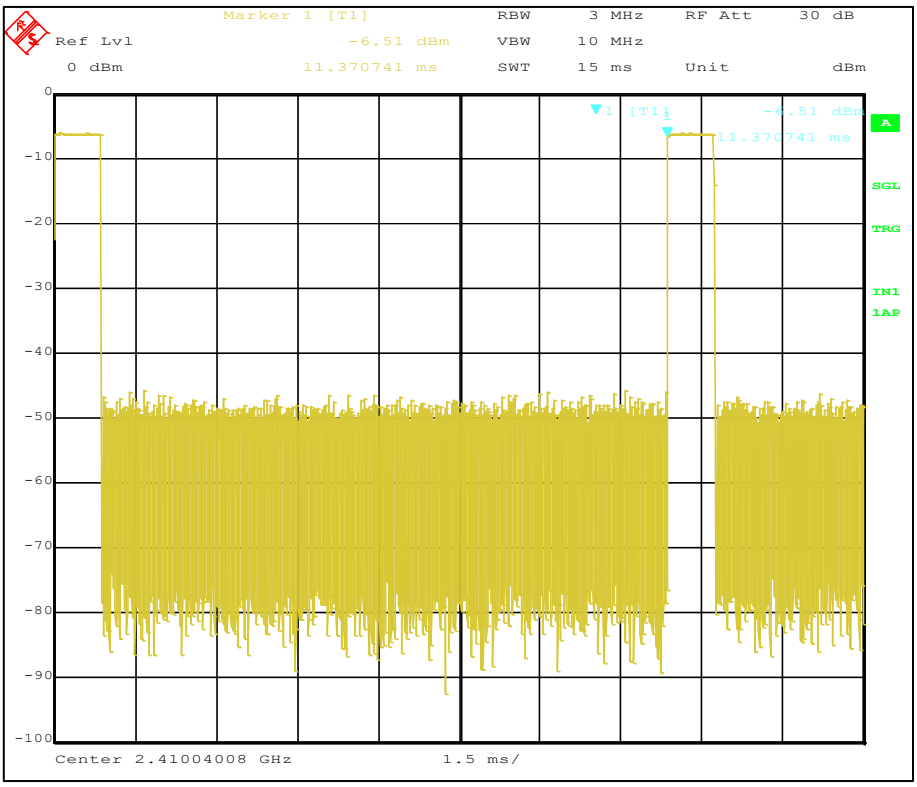

Figure 2. Period time.

t_{on}: 0.87975 ms
T: 11.37074 ms
Duty cycle = t_{on} / T = 0.87975 ms / 11.37074 ms = 0.07737 = 7.737%

ON Time	Period time	Duty Cycle
0.87975 ms	11.37074 ms	7.737%

Table 1. Test results.

2.1.3 Test equipment

Description	Supplier	Model	Tag no.	Cal. due date
Receiver EMI Test 20Hz-26.5GHz	Rohde & Schwarz	ESIB 26	18880	2020-10-15

Table 2. Test equipment for Duty Cycle test.

3 MEASURING UNCERTAINTIES

Compliancy evaluation is based on a shared risk principle with respect to the measurement uncertainty.

			Expanded Uncertainty [%] (k=2)
Time Measurement using ESIB Receiver			**8.42**