PHOENIX TESTLAB

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Test Report

No.: U130840E1, 4th Version

Designation of equipment under test: Class B AIS Transponder

Test Laboratory

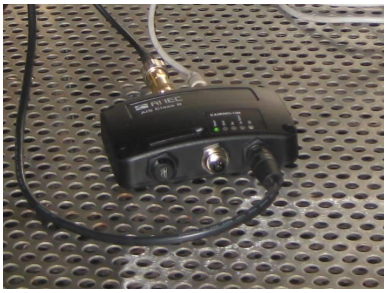
for

"Safety of Electrical Equipment and Industrial Low-Voltage Devices as well as Environmental Tests"

accredited by
DGA Deutsche Gesellschaft für Akkreditierung mbH
in compliance with DIN EN ISO/IEC 17025
under
Reg. No. DGA-PL-105/00-12

Testing body:	PHOENIX TESTLAB GmbH Königswinkel 10 D-32825 Blomberg
Applicant:	Alltek Marine Electronics Corp. 7F, No.605, Ruei Guang Rd., Neihu, 114 Taipei Taiwan
Order number:	13-110840
Type of test:	Environmental tests: - Dry Heat - Cold - Damp heat
Method of measure-ment according to:	EN 60945 : 2002 IEC 62287-1 Edition 2: 2010-11 EN 60068-2-1: 2008 EN 60068-2-2: 2008 EN 60068-2-78: 2002

Equipment under test (EUT):

EUT	Type	Photo
130840-1	Class B AIS Transponder	

Manufacturer: See applicant

Date equipment was received: 11 March 2013

Test specifications: EN 60945 : 2002
IEC 62287-1 Edition 2: 2010-11

Applicant/Client represented during the test by following person(s): Mr. Yang

Place of test: PHOENIX TESTLAB GmbH, Blomberg

Date of test: 11 March 2013 to 14 March 2013

Test result:	The complete test results are present in the following.
	The valuation of the test will be carried out by the applicant and not by the testing body, PHOENIX TESTLAB GmbH.

Blomberg, 10 October 2013

Testengineer: Daniel Niehus

Authorized reviewer: Andreas Budde

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1 Test specifications and test conditions

1.1 Dry heat

Test B: Dry heat / EN 60068-2-2; chapter 8.2.2, EN 60945

This test determines the ability of equipment to be operated at high ambient temperatures and operate through temperature changes. The reasonable maximum air temperature likely to be encountered over the sea is +32 °C and the maximum solar gain at sea is +23 °C giving +55 °C as the maximum temperature likely to be encountered by ships at sea.
The EUT shall be placed in a chamber at normal room temperature and relative humidity. The EUT and, if appropriate, any climatic control devices with which it is provided shall then be switched on. The temperature shall then be raised to and maintained at +55 °C ± 3 °C.
At the end of a soak period of 10 to 16 hours at +55 °C ± 3 °C, the EUT shall be subjected to a performance test a check as specified in the relevant equipment standard.

At the end of the test, the EUT shall be returned to normal environmental conditions.

Severity:

Temperature:	+ 55 °C ± 3 °C
Duration:	16 hours
Operation mode:	Connected and supplied

1.2 Cold

Test A: Cold / EN 60068-2-1; chapter 8.4.2.4, EN 60945

The EUT shall be placed in a chamber at normal room temperature and relative humidity. The temperature shall then be reduced to, and maintained at -15 °C ± 3 °C, for a period of 10 h to 16 h. Any climatic control devices provided in the EUT may be switched on at the conclusion of this period.

The EUT shall be switched on 30 minutes later, or after such a period as agreed by the manufacturer, and shall be kept operational for at least 2 h during which period the EUT shall be subjected to a performance check test and check as specified in the relative equipment standard.

The temperature of the chamber shall be maintained at - 15 °C ± 3 °C during the whole test period.

At the end of the test the EUT shall be returned to normal environmental conditions.

Severity:

Temperature:	- 15 °C ± 3 °C
Duration:	16 hours
Operation mode	Connected and supplied

1.3 Damp heat

Test Db: Damp heat cyclic / EN 60068-2-30; chapter 8.3, EN 60945

This test determines the ability of equipments to be operated under conditions of high humidity.
The EUT shall be placed in a chamber at normal room temperature and relative humidity. The temperature shall then be raised to + 40 °C ± 2 °C, and the relative humidity raised to 93 % ± 3 % over a period of 3 h ± 0.5 h. These conditions shall be maintained for a period of 10 h to 16 h. Any climatic control devices provided in the EUT may be switched on at the conclusion of this period.
The EUT shall be switched on 30 minutes later, or after such a period as agreed by the manufacturer, and shall be kept operational for at least 2 h during which period the EUT shall be subjected to a check as specified in the relevant equipment standards.

The temperature and relative humidity of the chamber shall be maintained as specified during the whole test period.
At the end of the test period and with the EUT still in the chamber, the chamber shall be brought to room temperature in not less than 1 h.

At the end of the test the EUT shall be returned to normal environmental conditions or to those required at the start of the next test.

Severity:

Temperature:	+ 40 °C ± 2 °C
Relative humidity:	93 % ± 3 %
Duration:	16 hours (1 cycle)
Operation mode	Connected and supplied

1.4 Operating states and test set-up

- During the tests the EUT is connected and in operating mode according to section 1.1, 1.2 and 1.3.

- Before and after the tests there shall be no damages or malfunctions.

- An additional functional test at room temperature is carried out before and after each test.

- Definition of the functions of the monitoring and their tolerances:

    - Optical test for mechanical stability
    - Functional test before and after the test

1.5 Performance Check

The AIS-Transponder (EUT) is connected via RF-Link to an AIS-Simulator (Attingimus). With the Attingmus AIS-Messages are sent to the EUT and the EUT responds the AIS-Messages by sending AIS-Messages back to the Attingmus. All transmissions of the AIS-Transponder were monitored and valued.
In addition a GPS antenna was connected.

2 Test performance and test results

2.1 Test performance

The tests will be carried out as follows:

Step	EUT	Test
1	130840-1	Cold
2		Dry heat
3		Damp heat

2.2 Test results

2.2.1 Dry Heat

Requirements:

- Optical test for mechanical stability
- Functional test before and after the test
- Performance check during the test

Temperature	Test duration	Visual damage	Functional test	Test carried out
+ 55 °C	16 h	None	Ok [1)]	Yes

Note: *[1)] The functional test before and after the test were carried out by the customer.*

2.2.2 Cold

Requirements:

- Optical test for mechanical stability
- Functional test before and after the test
- Performance check during the test

Temperature	Test duration	Visual damage	Functional test	Test carried out
- 15 °C	16 h	None	Ok [1)]	Yes

Note: *[1)] The functional test before and after the test were carried out by the customer.*

2.2.3 Damp heat

Requirements:

- Optical test for mechanical stability
- Functional test before and after the test
- Performance check during the test

Severity	Test duration	Visual damage	Functional test	Test carried out
+ 40 °C // 93 %	16 h	None	Ok [1)]	Yes

Note: *[1)] The functional test before and after the test were carried out by the customer.*

3 List of measurement equipment

Measurement equipment	PM No.
Climatic Chamber KS 600/75-5K	490161
DC power supply TOE	480801

4 Photos

Picture 1: Class B AIS Transponder

Picture 2: Test set-up EUT in climatic chamber

5 Diagrams

Diagram 1: Temperature profile, dry heat

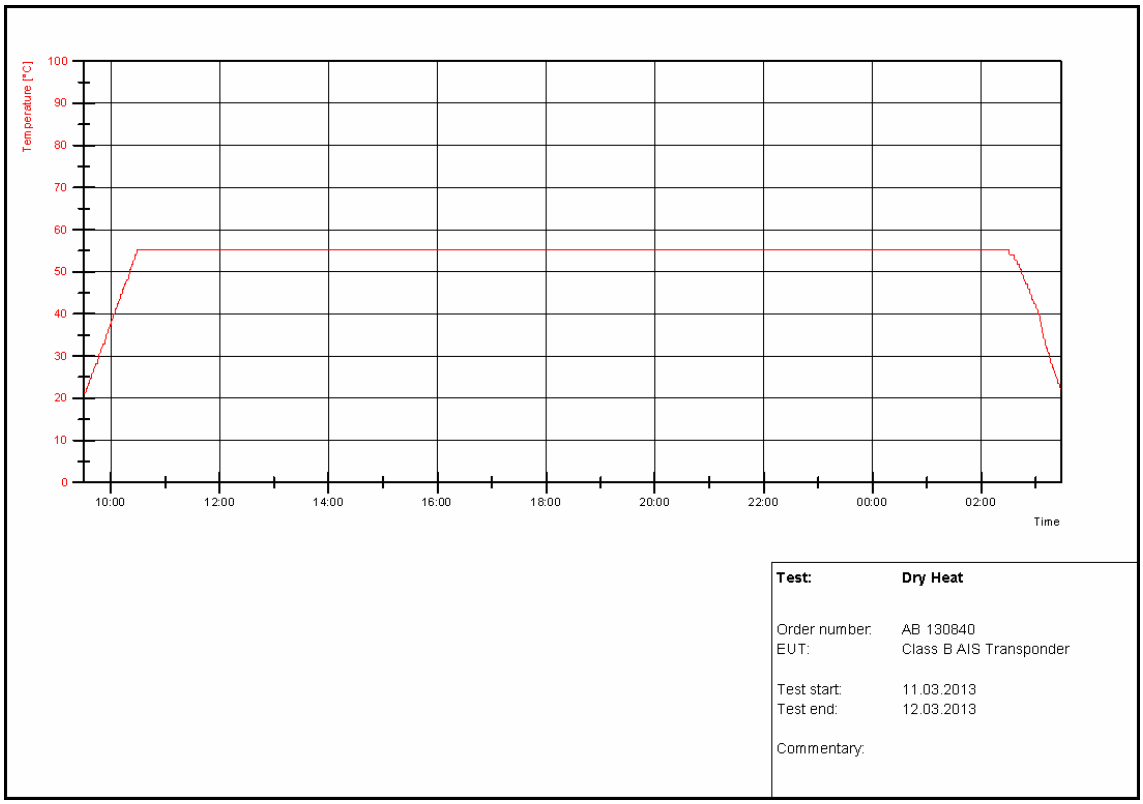

Diagram 2: Temperature profile, cold

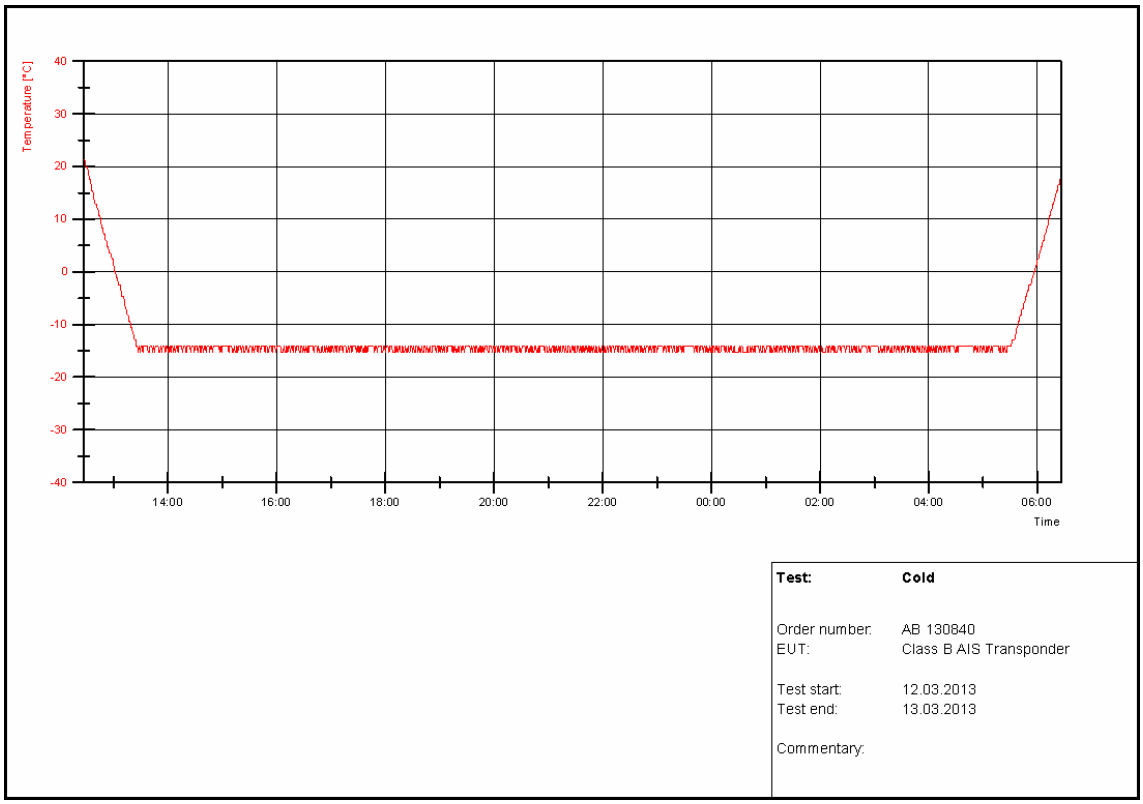

Diagram 3: Temperature profile, damp heat