



Reliability Laboratory

TEST REPORT

Report No.: HHD0021A/2016

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Date: February 9, 2017

ALLTEK MARINE ELECTRONICS CORP.

14F-2, NO.237, SEC. 1, DATONG RD., XIZHI DISTRICT,
NEW TAIPEI CITY, TAIWAN

The following merchandise was submitted and identified by the vendor as:

Product Description: GPS Antenna
Style/ Item No.: GA-22/ No.1
Manufacturer/ Vendor: Alltek Marine Electronics Corp.
Country of Origin: Taiwan
Quantity: Total 1 set
Testing Period: Dec. 4, 2016 to Jan. 3, 2017

We have tested the submitted sample(s) as requested and the following results were obtained:

Test Required: (According to client's test specification, please see following sheets in detail.)

1. Vibration Test

Test Results: -PLEASE SEE ATTACHED SHEETS-

Signed for and on behalf of
SGS TAIWAN Ltd.

Winson Tseng
Asst. Manager

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1. Vibration Test:

Test Equipment:

Name	Brand	Model	Serial No.
Vibration Test System	King Design	EM-800F2K-50N120	RU104080389
Controller	Dactron	LASER	7110357
Control Accelerometer	PCB	353B34	139174
Accelerometer	PCB	356A24/NC	162319

Lab Environmental Conditions:Ambient temperature: $(25 \pm 3) ^\circ\text{C}$ Ambient humidity: $(55 \pm 20) \% \text{ RH}$ Test Method/ Specification:**1. Resonance Search:**Test method: Refer to IEC 60945 Edition 4.0: 2002, section 8.7 Vibration Test and client requestsSample condition: OperatingWave form: SinusoidalFrequency: (2~100) Hz

Frequency (Hz)	Displacement: D_{p-p} (mm)	Velocity (m/s)	Acceleration (m/s^2)
2	2	-	-
13.2	2	-	7
100	-	-	7

Sweep Rate: 0.5 octaves/ minuteDirection: X, Y, Z axesTest duration: 1 sweep cycle

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Test Method/ Specification--Continued:

2. Dwell Vibration test:

Test method: Refer to IEC 6945 Edition 4.0: 2002 Dwell Vibration test and client requests

Sample condition: Operating

Frequency: Frequency of major peaks where the magnitude ratio ≥ 5 (if it appears) during Resonance Search in each direction. If no resonance frequency found, dwell at 30 Hz.

Acceleration: Same condition as specified in resonance search.

Dwell: 2 hours/ peak

Requirement: Functional check shall be carried out at least once during each endurance test period and once before the end of each endurance test period.

- Examine the appearance of specimen(s) by visual check and perform functional check during and after test.
- Functional check: Examine whether the GPS 3D fixed or not.

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Specimen:Style/ Item No.: GA-22/ No.1Quantity: Total 1 setTest Result:

1. Resonance Search Result:

Style/ Item No.	Test Item	Major Resonance Frequency
		Unit: Hz
GA-22/ No.1	X axis	No resonance found
	Y axis	No resonance found
	Z axis	No resonance found

2. Examination of product (Appearance check and functional check):

Style/ Item No.	Check Item	Appearance check (Visual check)	Functional Check
GA-22/ No.1		No visible damage	Normal

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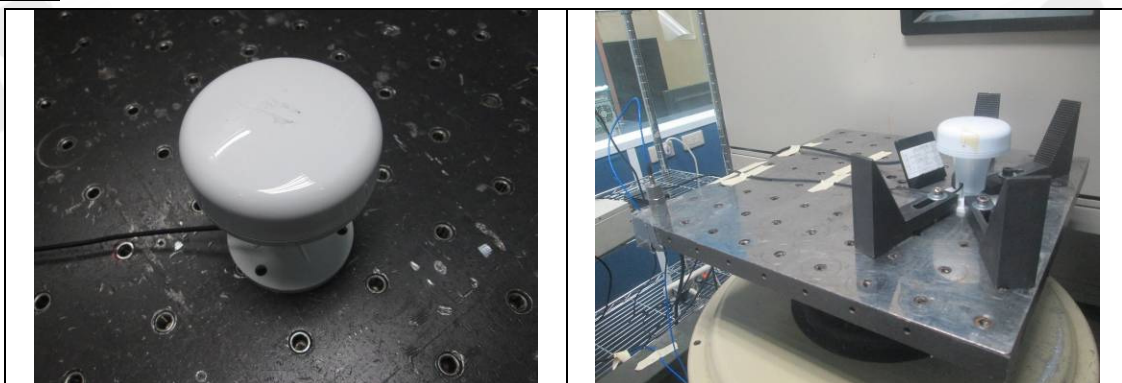
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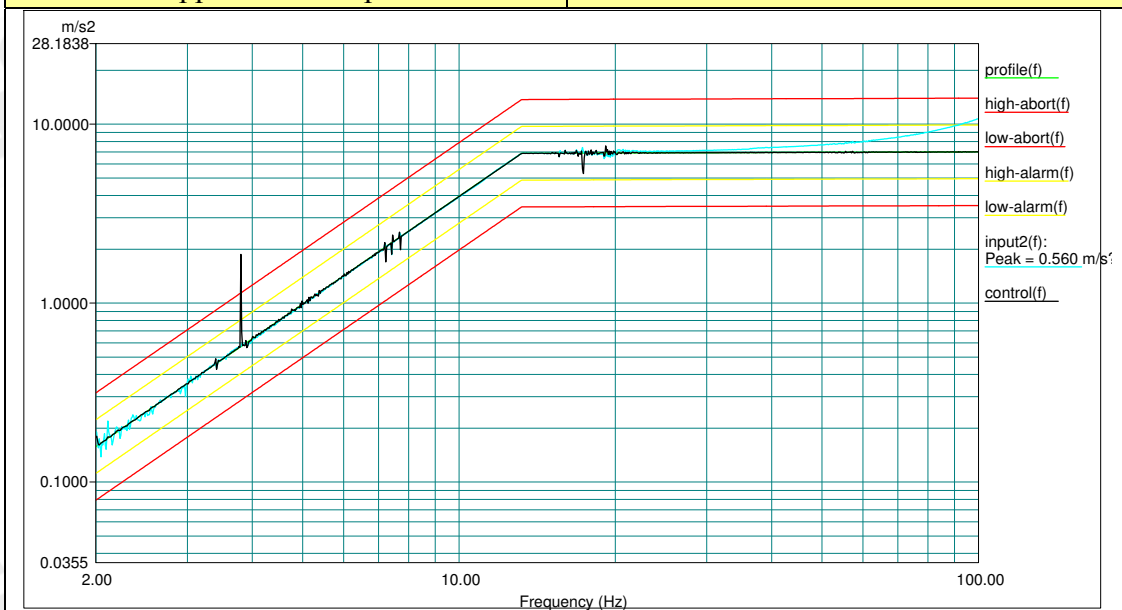
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Test Photos:



1. Appearance of specimen

2. Vibration Test



3. Vibration Test Profile (Resonance Search: X axis)

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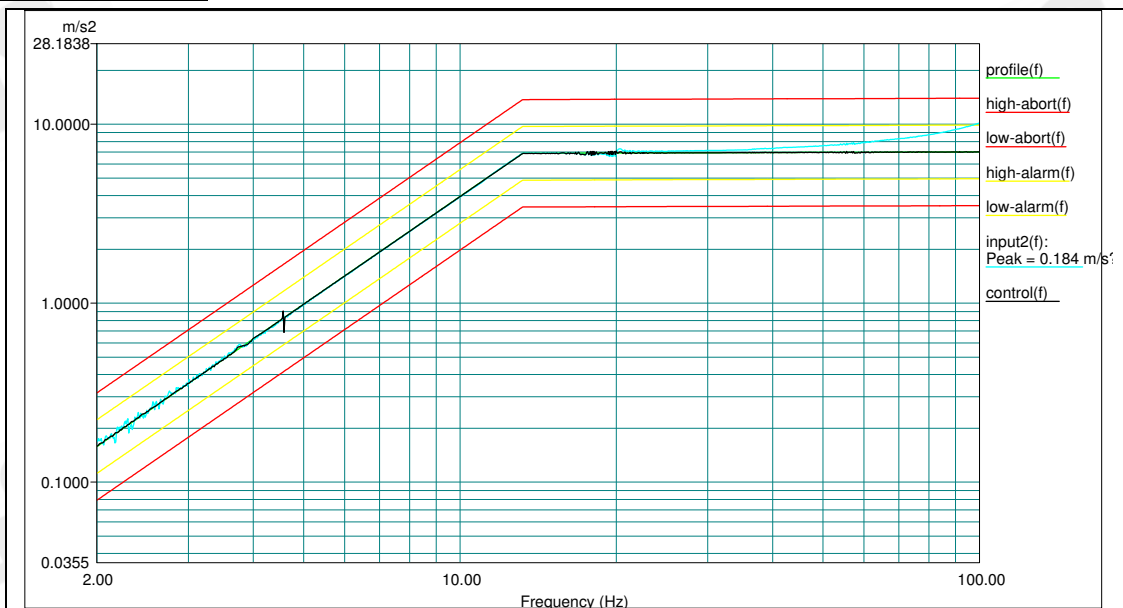
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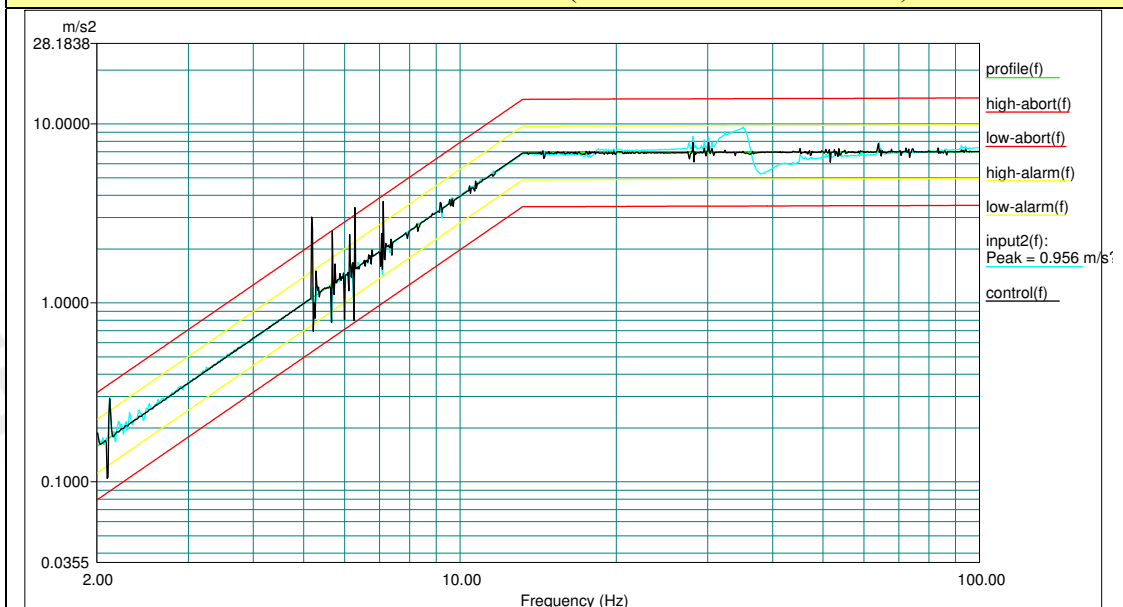
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Test Photos--continued:



4. Vibration Test Profile (Resonance Search: Y axis)



5. Vibration Test Profile (Resonance Search: Z axis)

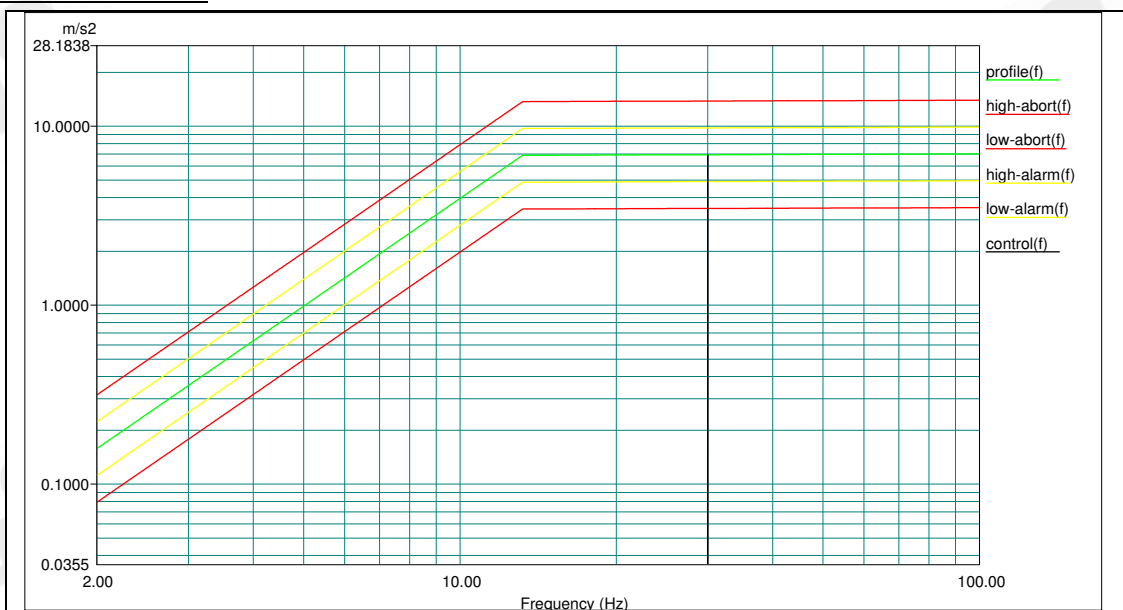
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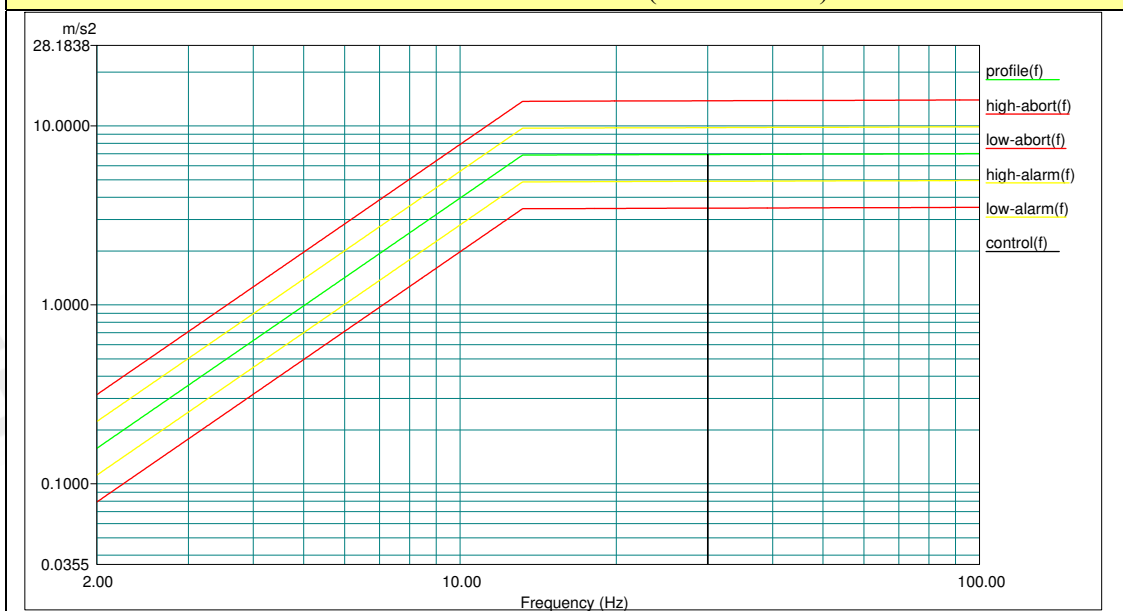
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Test Photos--continued:



6. Vibration Test Profile (Dwell: X axis)



7. Vibration Test Profile (Dwell: Y axis)

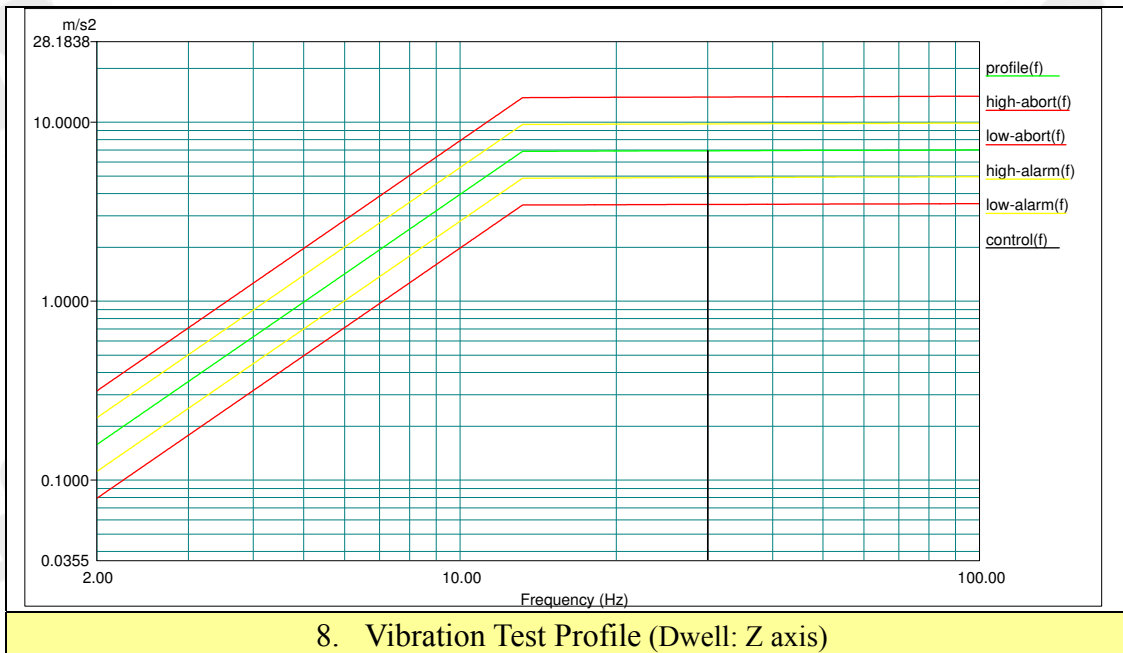
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Test Photos--continued:



8. Vibration Test Profile (Dwell: Z axis)

— — —The End of Test Report — — —

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