



Open Structure Ultrasonic Sensor

Specification

Model Number: FHO10A07LFPA

Version 1.0

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1. Specification

Product Type : Open Structure Ultrasonic Sensors		
Items	Specifications	Conditions
- Function	Transmitter & Receive	
- Sound Pressure Level (0 dB = 0.0002 ubar)	Min. 100.0 dB	10.0 V rms / Sine Wave
- Measuring Distance	30.0 cm	
- Center Frequency	40000 ± 1000 Hz	
-Sensitivity	Min. - 70.0 dB (V / ubar)	
- Beam Angle (- 6.0 dB)	100.0 ° Typical	
- Max. Driving Voltage	20.0 V rms	Sine Wave
-Detectable Range	3.0 ~ 4.0 M	
- Capacitance	1400 pF ± 20 %	At 1000 Hz
- Operating Temperature	-20.0 ~ +70.0 ° C	
- Storage Temperature	-30.0 ~ +80.0 ° C	
- Housing Material	ABS	
- Color	Black	
- Weight	2.0 g	

2. Inspection Standard

Item Tested	Sym	Standard	AQL	Level	Inspection by means of	Remarks
- Sound Pressure Level		Min. 100.0 dB (0 dB = 0.0002 ubar) (10.0 V rms Sine Wave / 30.0 cm)	1.00	II		
- Sensitivity		Min. - 70.0 dB (V / ubar)	1.00	II		
- Capacitance		1400 pF ± 20 %	0.65	I	Multimeter	at 1000 Hz
- Outer Diameter	A	∅ 9.8 ± 0.3 (mm)	1.50	S-3	Electronic Calipers	To be measured at the maximum dia.
- Overall Height	B	7.0 ± 0.3 (mm)	1.50	S-3	Electronic Calipers	
Terminal Strength		More than 1.0 kg	0.65	S-3	Tension Gauge	By Pulling each terminal
State of Solder			1.00	II	magnifying glass	Soldered points and / or coil disposition should be proper. (Crossed coil wires should not be accepted.)
Rust			1.00	II	eye	Any rust should not be accepted.
Stain			1.50	II	eye	There should be no remarkable stains.
Adhesion			1.50	II	eye	Adhesion should be made sufficiently and there should be no outflow of adhesive agent.
Other Appearance			1.50	II	eye	

3. Reliability Test

Item	Standards
High and low temperature (from -20.0 °C to +70.0 °C at a relative humidity of 30.0 %)	Sound pressure level and peak sensitivity shall not change by more than 15.0 dB in the temperature range from the high temperature to the low temperature
Humidity of 10.0 % to 90.0 % at the temperature of 25.0 °C	Sound pressure level and sensitivity shall not change by more than 6.0 dB in the humidity range
Storage at +80.0 °C for 96 hours and at -30.0 °C for 96.0 hours followed by a normalization period at 25.0 °C. As shown in Fig. 1.	All sensitivity or sound pressure level shall be within 3.0 dB of the specified values after the device is subjected to any or all of the conditions.
Operation at 95.0 % relative humidity and 40.0 °C for 100 hours, followed by a normalization period of 24.0 hours at 30.0 % and 25.0 °C. As shown in Fig 2.	
Vibration at 10.0 Hz to 55.0 Hz ,1.5 mm amplitude. 1.0 minute sweep. X,Y,Z,3 each axis for 3 hours. As shown in Fig. 3	
Drop Test : Drop a sensor from the height of 700mm onto the surface of 10mmthick wooden Board. As shown in Fig. 4	

Fig.1 Temperature Test

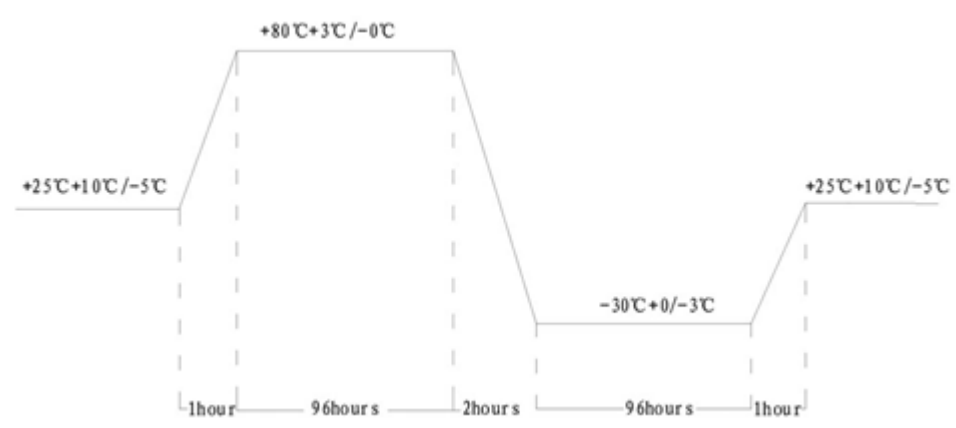


Fig.2 Temperature / Humidity Cycle Test

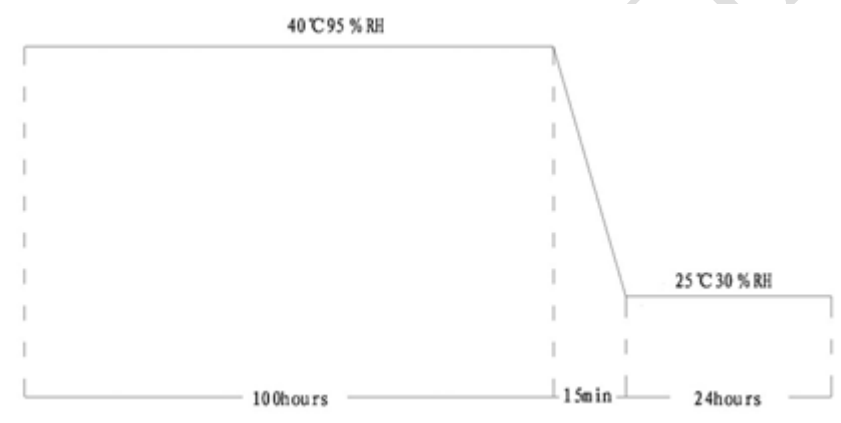


Fig.3 Vibration Test

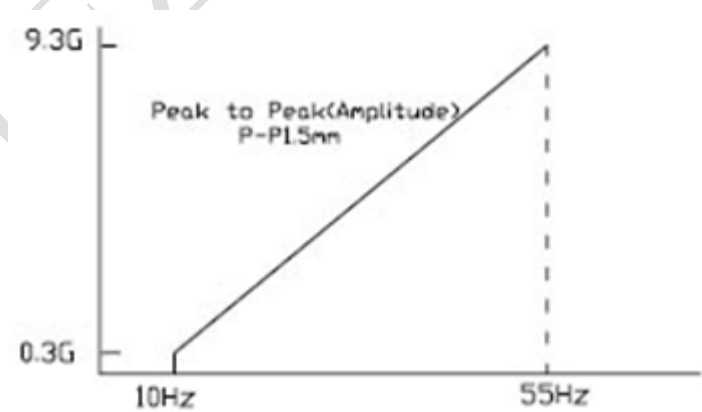
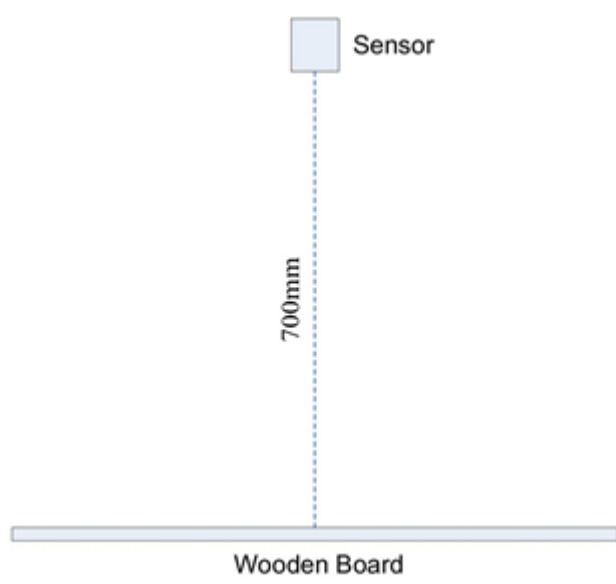


Fig. 4 Drop Test

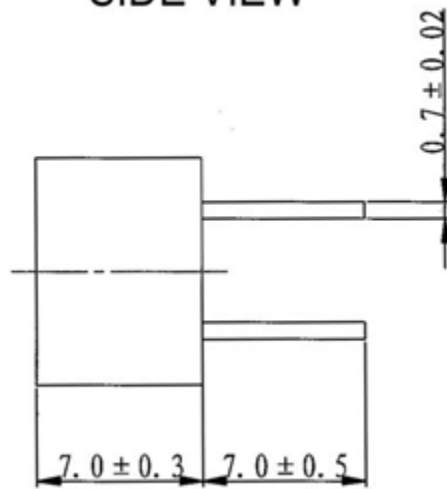


4. Mechanical Draw

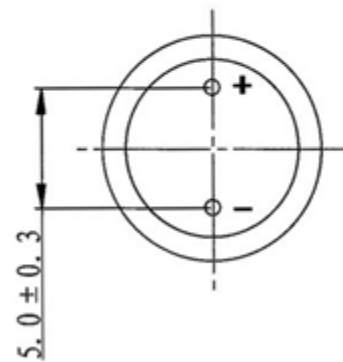
TOP VIEW



SIDE VIEW

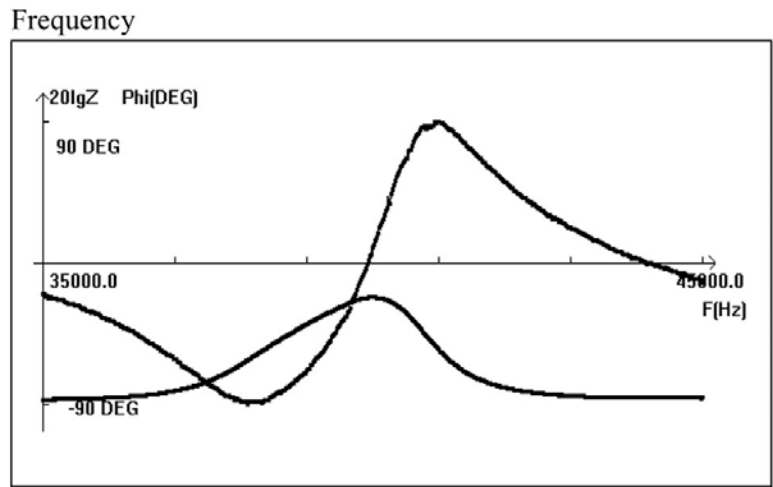


BOTTOM VIEW

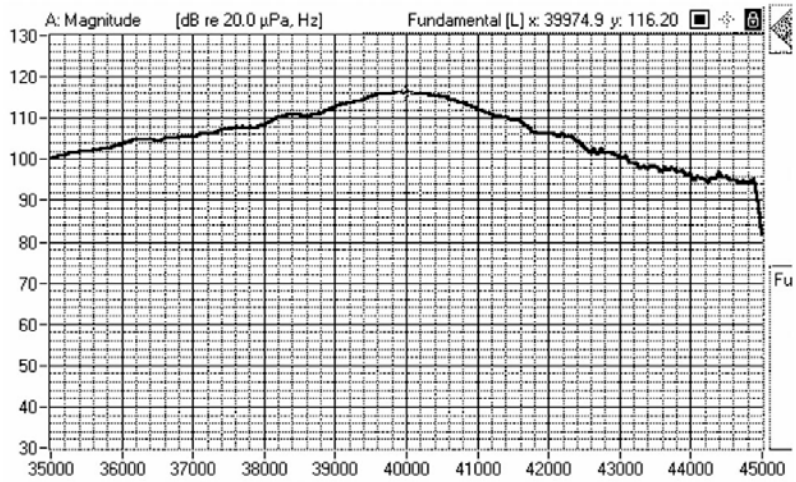


* All dimensions are in mm

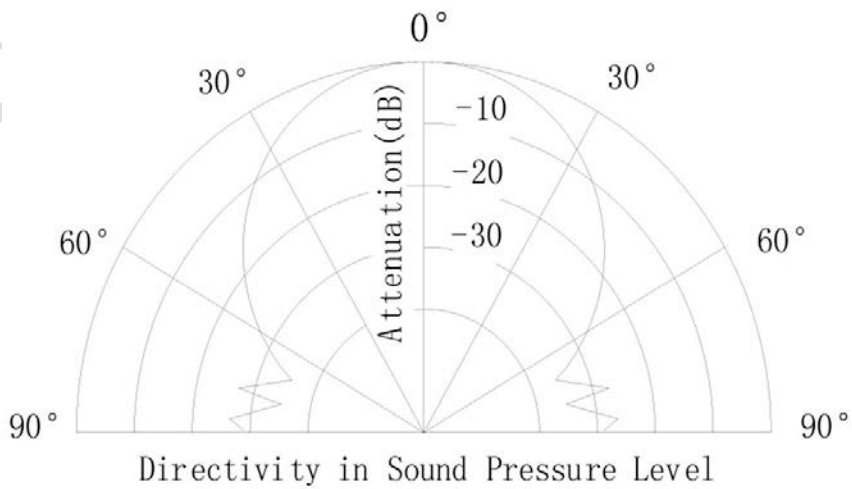
Typical Curve



Transmitter SPL



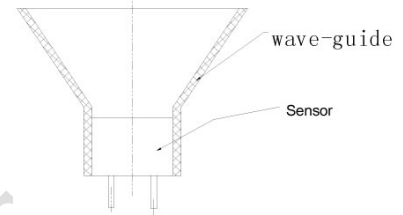
Beam Angle



Note:

1. Design restriction / Precautions.

- This sensor is designed for use in air environment. Do not use it in liquid.
- In the case where secondary accidents due to operation failure or malfunctions can be anticipated, add a fail safe function to the design.
- In the case where this sensor is to be shocked or impacted, fit a "V" wave-guide on the sensor (see the following drawing), which also is to improve receiving sensitivity.



2. Usage restriction / Precautions:

- a) In strong shock or vibration.
- b) In high temperature and humidity for a long time.
- c) In corrosive gases or sea breeze.
- d) In an atmosphere of organic solvents.
- e) In dirty and dusty environments that may contaminate the sensor front.
- f) Over specified allowable input voltage.

3. Warranty:

- Time limit

Warranty period is one year after delivery.

- Scope

Defective sensors attributable to manufacturer' responsibility shall be replaced for free during the warranty period.

However, following cases are out of the scope.

- a) Unsuitable handling or misuse by user.
- b) Modification or repair by user.
- c) Any other cases not due to manufacturer' responsibility such as natural calamity, accident .etc.

This scope covers only replacement.

Any loss derived from failure or malfunction of the sensor, or cost on replacing is excluded from this warranty scope.