



Part Number: TC0096-037

Model Number: T/R48-14C279Z-L12-02

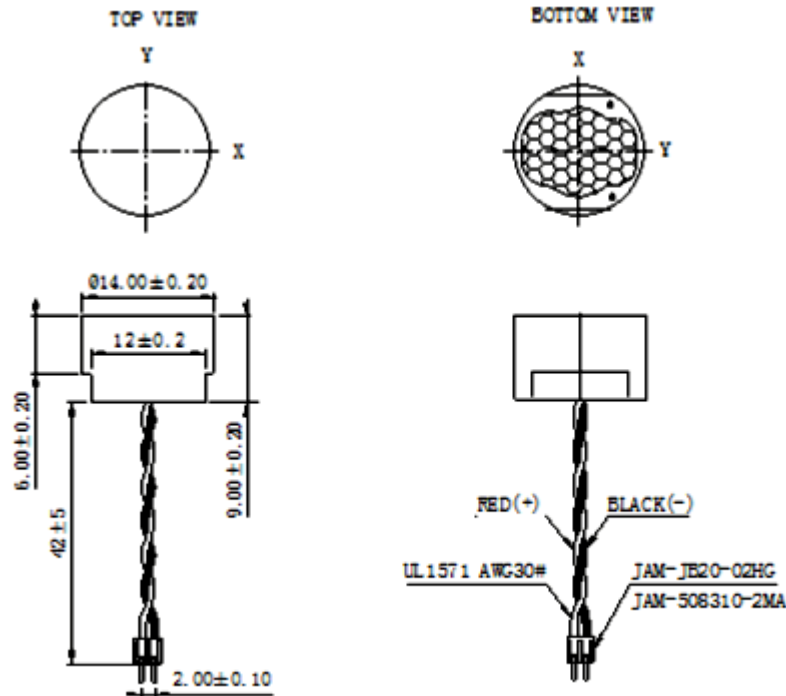
Overview

The UPA ultrasonic sensor is the core component of Parking systems. It uses ultrasound to measure the distance between the vehicle and the front and rear obstructions.

Main features of the UPA Ultrasonic Sensor is a measuring range between 150mm—2500mm; low power consumption, high reliability and excellent waterproof performance and weatherability.

Applications can include Parking assist systems and Blind zone detection.

Appearance and Dimensions, Unit: mm



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Electrical Specifications

1	Center frequency (KHz)	48 ± 1
2	Echo Sensitivity (Vp-p)	3.5 ± 1.5 (Fig1 Simulation Test Circuit)
3	Decay Time (mS)	0.80 ~ 1.80 (Audiowell Test Circuit)
4	Directivity (deg) X-axis	100 ± 15 (Fig 2 Directivity Test)
5	Directivity (deg) Y-axis	50 ± 10 (Fig 2 Directivity Test)
6	Capacitance (pF)	1800 ± 15% (at 25°C, 1KHz)
7	Allowable Maximum Input Voltage (Vp-p)	140 (48KHz) Pulse width 0.42ms, interval 20ms
8	Mean Time to Failure (h)	50000
9	Operating Temperature (°C)	-40 ~ +85
10	Storage Temperature (°C)	-40 ~ +85

Mechanical Characteristics

Lead strength: To pull longitudinally 1.0kg min.

Simulation Test Circuit

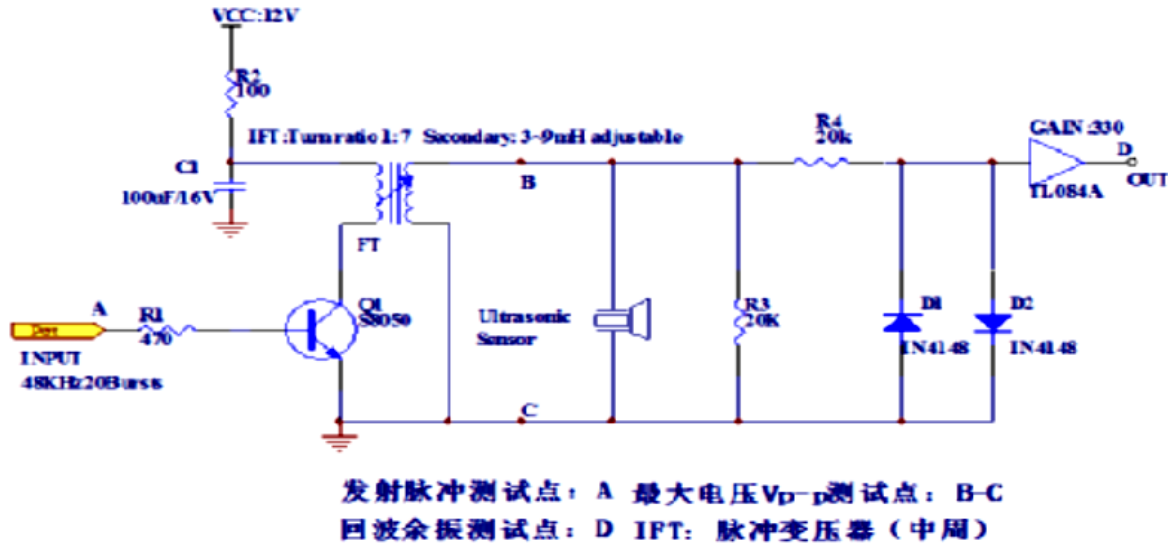


Fig. 1

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Directivity Test

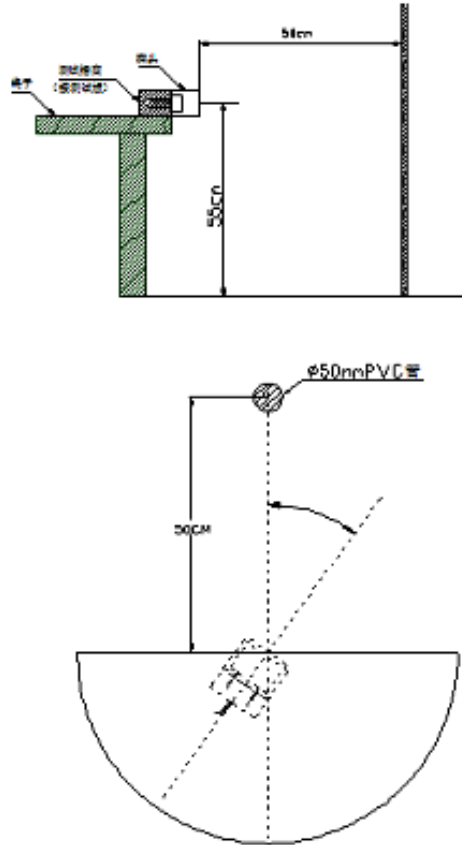


Fig. 2

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Environment Characteristics

Testing Items	Testing Equipment/Methods/Conditions	Criteria
Shock Test	Acceleration: 980m/s ² (100G); Direction: 3 directions; Shock time: 3 times/directions	The variation of the echo sensitivity at 40kHz within 30% compared with initial figures at 25deg
Drop Test	Height: 1 meter onto concrete floor; Times: 10 times	
Vibration Test	Vibration frequency: 10Hz to 55Hz; Amplitude 1.5mm; Sweep Period 1 minute; Direction: 3 directions; Time: 3 hours/ direction	
High-temp storage	Temperature: +85 ± 3°C; time: 96h & followed normalization period at 25 for 24h	
Low-temp storage	Temperature: -40 ± 3°C; Time: 96h, & followed by a normalization period at 25°C for 24h	
Humidity resistance	Temperature: +85 ± 3°C, Humidity: 85% R.H.; Time: 96h, & followed by a normalization period at 25°C for 24h	
Temp. shock	Temperature: -40°C ± 3°C for 0.5h, within 5 min up to +85°C ± 3 for 0.5h, Cycles: 200 cycles & followed by a normalization period at 25°C for 24h	
Pull strength	Force 10N	There should be no substantial damage
Notes: Standard test condition: T=25±3. H = 45~65%R.H. And every test must be more than 5 pcs for test		

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Testing Instrument and Condition List

No.	Testing Items	Testing Equipment/Methods	Testing Conditions
1	Resonant Frequency	Piezoelectric Transducer Resistance Testing System II	Testing Environment temperature
2	Echo Sensitivity	According to Fig. 1 Test Circuit, Audiowell Test Circuit	Distance to obstacle: 1 meter, Obstacle: 20*20*1.0cm organic glass plate 1. The inductance: 5.7mH, Qm Value: 60-80, Pulse: 20 2. The minimum detect distance ≥ 36 cm 3. The acoustic system without coupling
3	Decay Time	According to Audiowell Test Circuit	Distance to obstacle: 1 meter, Obstacle: 20*20*1.0cm organic glass plate 1. The inductance: 5.7mH, Qm Value: 60-80, Pulse: 20 2. The minimum detect distance ≥ 36 cm 3. The acoustic system without coupling
4	Directivity	According to Fig. 1 Test Circuitry & Fig. 2 Directivity Test	In normal room temperature, the distance to the ground: 55cm the distance to the obstacle: 50cm the obstacle: diameter of 50mm PVC pipe, the obstacle height: 1 meter NOTE: there is no other obstacle in the circumference of 1 meter
5	Capacitance	Digital LC ZL5	Testing temperature: 25 \pm 3°C
6	Maximum Input Voltage (Vp-p)	According to Fig. 1 Test Circuitry Oscilloscope: Tektronix TDS1002	Pulse width: 0.42mS, Interval: 20mS
7	Mean Time to Failure	Aging Equipment AWHY001	Normal room temperature
8	Operating Temperature (°C)	High-Low alternating temperature cabinet	In normal room temperature, according to the Fig. 1 test circuit
9	Storage Temperature (°C)	High-Low alternating temperature cabinet	In normal room temperature, according to the Fig. 1 test circuit

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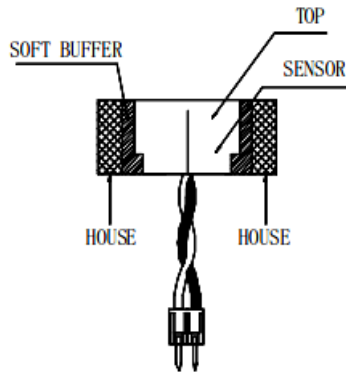
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Notes:

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 held in a housing, use soft buffer between sensor and housing. The front convex part of this sensor vibrates in large extension. If this part is held, its characteristics will vary. The top must be free to vibrate.



2. Usage Restriction/Precautions

- To prevent sensor malfunctions, operational failure or any deterioration of its characteristics, do not use this sensor in the following or similar conditions:
 - 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 (V_{p-p})
- Do not solder adding stress on outer lead, also do not apply stress like spin or pressure just after soldering.
- In case you form the leads, support the root firmly.

Revision History:

Version	Date (MM/DD/YY)	DWN	Statement
A1	01/24/2015		Initial Release

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