



# 承认书

## SPECIFICATION FOR APPROVAL

客户(CUSTOMER):
客户料号(CUST P/N):
奥迪威产品名称(DESCRIPTION): TC0039-001
奥迪威产品型号(P/N): T/R40-18D0Z-01
规格书编号(SPECIFICATION NO.): K2-WSP-TC-00319
规格书版本(VERSION): A1

■规格书状态(Specs Type):

样件(Sample Specs)

量产(Standard Specs)

样件规格书(Sample Specs):

适用于产品的小批量试制. (Apply to trial order.)

量产规格书(Standard Specs):

适用于产品的批量生产. (Apply to mass production.)

客户承认 CUSTOMER APPROVAL	签名 SIGNATURE.	承认章 COMPANY CHOP.

编制 DWN.	审核 CHK.	批准 APPD.

■产品规格书仅供参考, 在产品量产之前, 需要确认最新版本的量产规格书, 并得到客户的签名承认. (Specifications are for reference only, and it is required to be approved by customers before mass production.)

注: 承认书一式两份, 请返回一份. (Note: Specs are in duplicate, please send one copy back.)

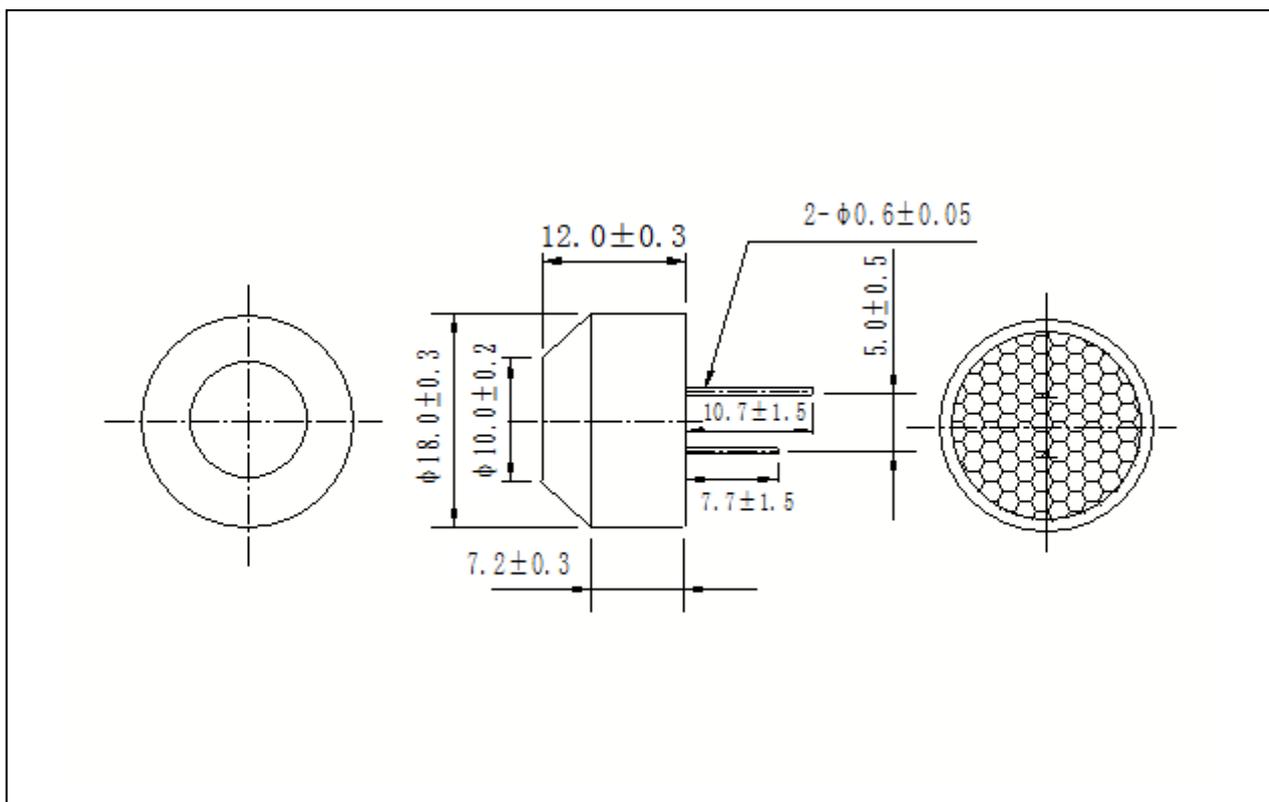
## PIEZO ULTRASONIC SENSOR SPECIFICATIONS

### ■MODEL: T/R40-18D0Z-01

### ■ELECTRICAL SPECIFICATION:

1	Center frequency(KHz)	$40 \pm 1.0$
2	Echo Sensitivity(mV)	$\geq 160$ (FIG1 SIMULATION TEST CIRCUIT)
3	Decay Time(ms)	$\leq 1.3$ (FIG1 SIMULATION TEST CIRCUIT)
4	Directivity (deg)	$80 \pm 15$
5	Capacitance (pF)	$1800 \pm 15\%$
6	Allowable Maximum Input Voltage( $V_{p-p}$ )	140 (40KHz, Pulse width 0.5ms, interval 20ms)
7	Mean Time To Failure(h)	50000
8	Operating Temperature( $^{\circ}C$ )	-40~+80
9	Storage temperature( $^{\circ}C$ )	-40~+85

### ■APPEARANCE AND DIMENSIONS



NOTE: All materials are RoHS, But Piezo is released.

## ■ SIMULATION TEST CIRCUIT

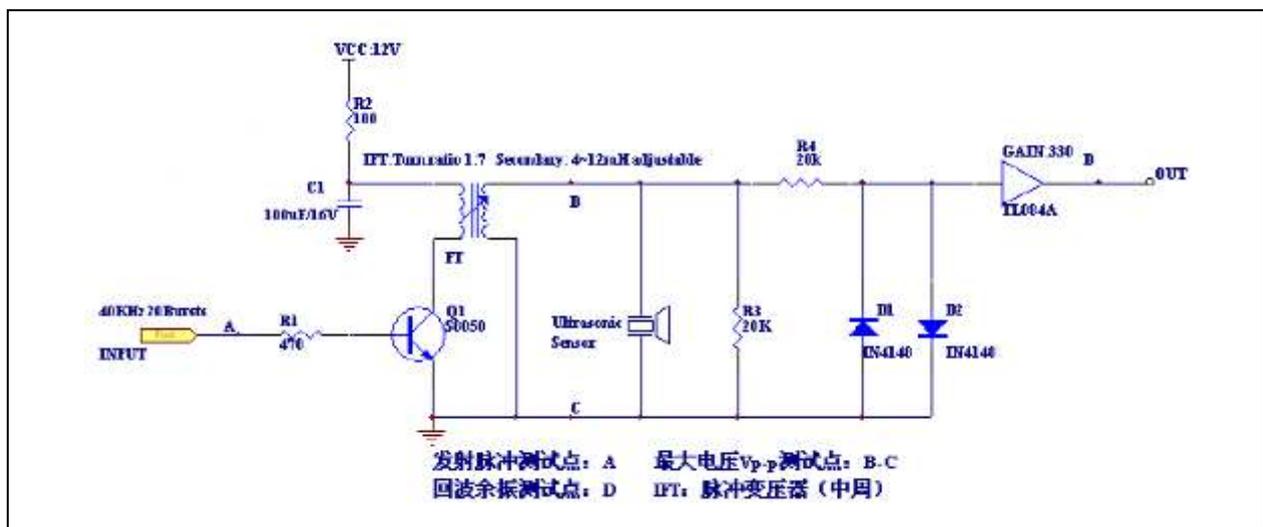


FIG. 1

## ■ DIRECTIVITY TEST

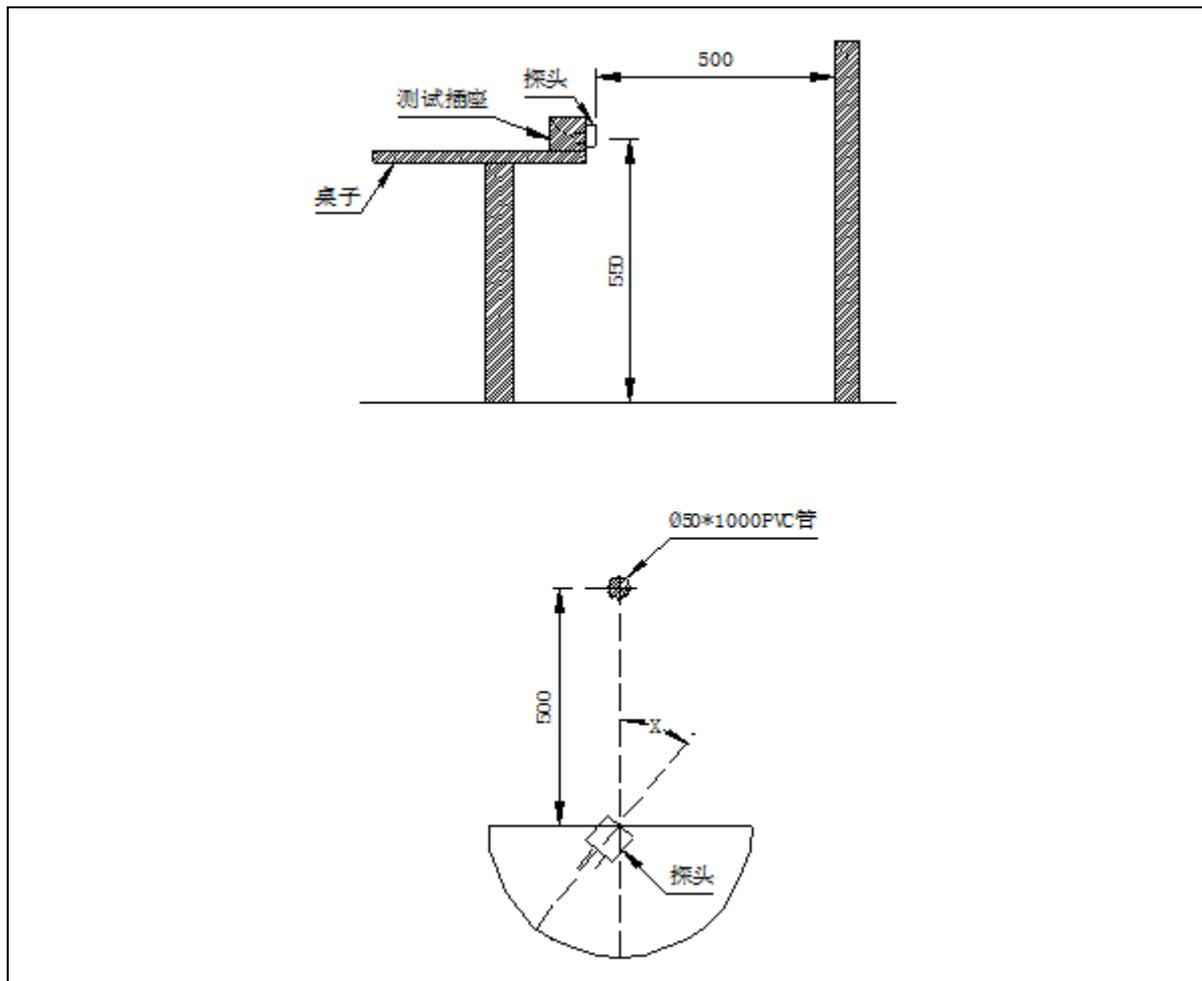


FIG. 2

## ■ ENVIRONMENT CHARACTERISTICS

Testing items	Testing Equipment/Methods/Conditions	Criteria
Shock Test	Acceleration: $980\text{m/s}^2$ (100G); Direction: 3 directions; Shock time: 3 times/directions	The variation of the echo sensitivity at 40kHz within 30% compared with initial figures at 25°C.
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: $+85 \pm 3^\circ\text{C}$ ; time: 96h & followed normalization period at 25 for 24h	
Low-temp. storage	Temperature: $-40 \pm 3^\circ\text{C}$ ; time: 96h, & followed by a normalization period at 25°C for 24h	

Humidity resistance	Temperature: $+85 \pm 3^{\circ}\text{C}$ , Humidity: 85% R.H; time: 96h, & followed by a normalization period at $25^{\circ}\text{C}$ for 24h	
Temp. shock	Temperature: $-40^{\circ}\text{C} \pm 3^{\circ}\text{C}$ for 0.5h, within 5 min up to $+85^{\circ}\text{C} \pm 3^{\circ}\text{C}$ for 0.5h, cycles: 200 cycles & followed by a normalization period at $25^{\circ}\text{C}$ for 24h	
NOTES: Standard Test Condition: $T=25 \pm 3^{\circ}\text{C}$ , $H=45\sim 65\%\text{R.H.}$ . And every test must be more than 5 pcs for test.		

## ■ TESTING INSTRUMENT AND CONDITION LIST

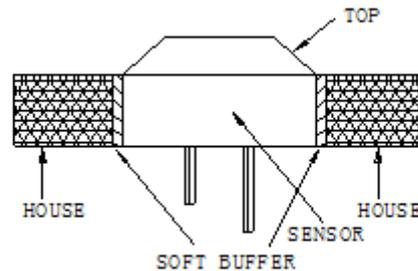
No.	Testing item	Testing Equipment/Methods	Testing conditions
1	Resonant Frequency	Piezoelectric Transducer Resistance Testing System II	Testing temperature : $25 \pm 3^{\circ}\text{C}$
2	Echo Sensitivity	According to Fig. 1 Test Circuit	Distance to obstacle: 1 meter , Obstacle: organic glass board with $20\text{CM} \times 20\text{CM} \times 1.0\text{CM}$ 1.The inductance : 8mH, $Q_m$ Value: 60-80, Pulse: 20 2.The Minimum detect distance $\geq 35\text{cm}$ 3.The acoustic system without coupling
3	Ring Time	According to Fig. 1 Test Circuit	The sensor surface is covered by 100mm thickness of sponge 1.The inductance : 8mH, $Q_m$ Value: 60-80, Max

			<p>Pulse <math>\leq 20</math></p> <p>2.The Minimum detect distance <math>\geq 35\text{cm}</math></p> <p>3.The acoustic system without coupling</p>
4	Directivity	According to Fig.1& Fig. 2 Test Circuit	<p>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 a circumference of 1 meter.</p>
5	Capacitance	Digital LCR ZL5	Testing temperature : $25\pm 3^{\circ}\text{C}$
6	Maximum Input Voltage ( $V_{p-p}$ )	According to Fig.1 Test Circuit Oscillograph: Fektronix TDS1002	Pulse Width: 0.5mS, Interval :20mS
7	Mean Time to Failure	Aging Equipment AWHY001	Testing temperature : $25\pm 3^{\circ}\text{C}$
8	Operating Temperature( $^{\circ}\text{C}$ )	High-Low alternating temperature Cabinet	
9	Storage Temperature( $^{\circ}\text{C}$ )	High-Low alternating temperature Cabinet	

## ■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 hold in housing, use soft buffer between sensor and housing. The front convex part of this sensor vibrates in large extension. If this part is hold, 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



文件修订记录 File revision history			
修订时间 Revision time	修订版本 Version of revision	内部 ECR 编号 The number of ECR	修订内容 Contents of revision
2015/09/17	A1	/	/