

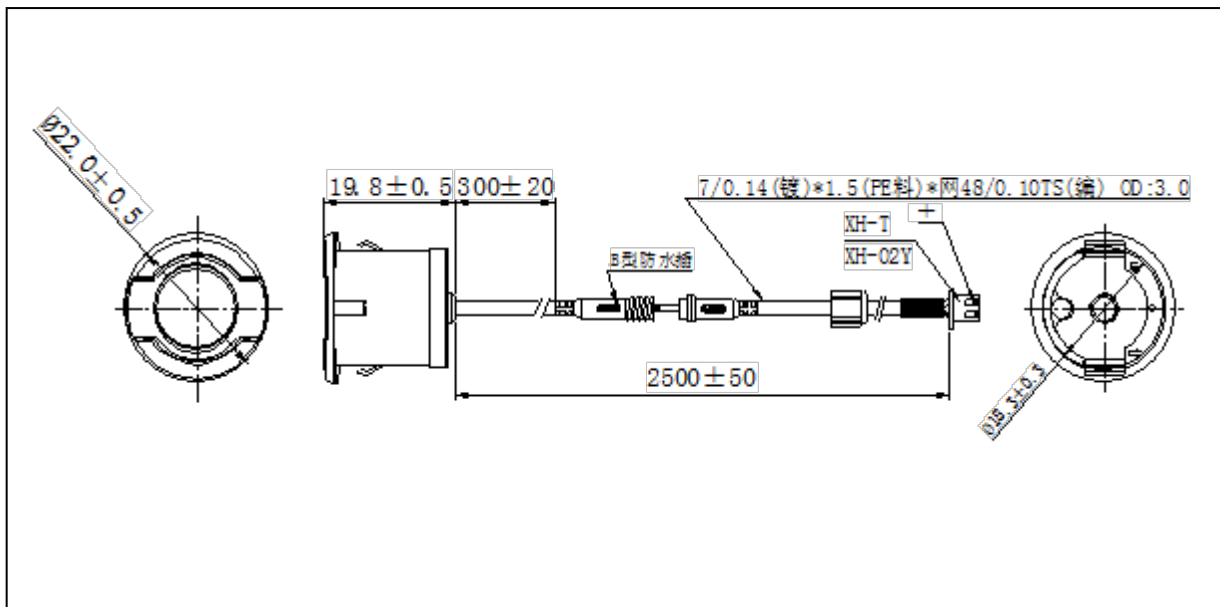
PIEZO ULTRASONIC SENSOR SPECIFICATIONS

■MODEL: 12U01-TK054L237Z-01

■ELECTRICAL SPECIFICATION:

1	Center frequency (KHz)	40±1.0 (Piezoelectric Transducer Resistance Testing System)
2	Echo Sensitivity (mV)	≥300 (Fig. 4 Test Circuit)
3	Decay Time (ms)	≤1.2 (Fig. 4 Test Circuit)
4	Directivity (deg) X-axis	100±15 (Fig. 4 & Fig. 5 Test Circuit)
5	Directivity (deg) Y-axis	75±10 (Fig. 4 & Fig. 5 Test Circuit)
6	Capacitance (pF)	2100±15% (at 25℃, 1KHZ)
7	Allowable Maximum Input Voltage(Vp-p)	140(40KHz) Pulse width 0.5ms, interval 20ms
8	Mean Time To Failure (h)	50000 (Normal room temperature)
9	Operating Temperature(℃)	-40~+80
10	Storage temperature(℃)	-40~+85

■APPEARANCE AND DIMENSIONS



■ENVIRONMENT CHARACTERISTICS

CONDITIONS	STANDARDS
High and low temperature (from-40℃ to +85℃ at a relative humidity of 30%)	Sensitivity shall not change by more than 30 % in the temperature range from the high temperature to the low temperature
Humidity of 10% to 90% at the temperature of 25℃	Sensitivity shall not change by more than 30 % in the humidity range
Storage at +85℃ for 96 hours and at -40℃ for 96hours followed by a normalization period at 25℃. As shown in FIG1.	Sensitivity shall be within 30 % of the specified values after the device is subjected to any or all of the conditions.
Operation at 95% relative humidity and 40℃ for 100 hours, followed by a normalization period of 24hours at 30% and 25℃.As shown in FIG2.	
Vibration at 10Hz to 55Hz ,1.5mm amplitude. 1 minute sweep. X,Y,Z,3 each axis for 3 hours.	

■ WATER PROOF TYPE

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.

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(Vp-p)

3. WARRANTY:

■ Period

Warranty period is three years 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.

■MEASURING METHOD

FIG1 TEMP. TEST

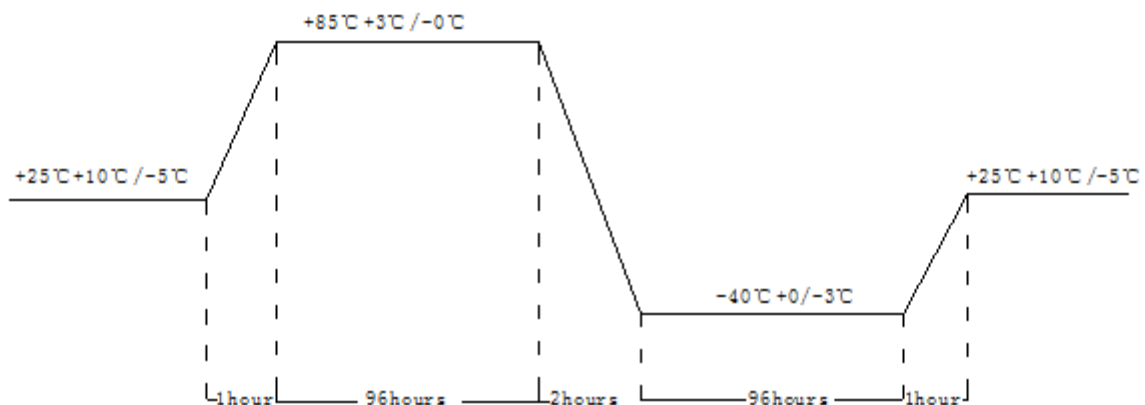


FIG 2 TEMP. /HUMIDITY TEST

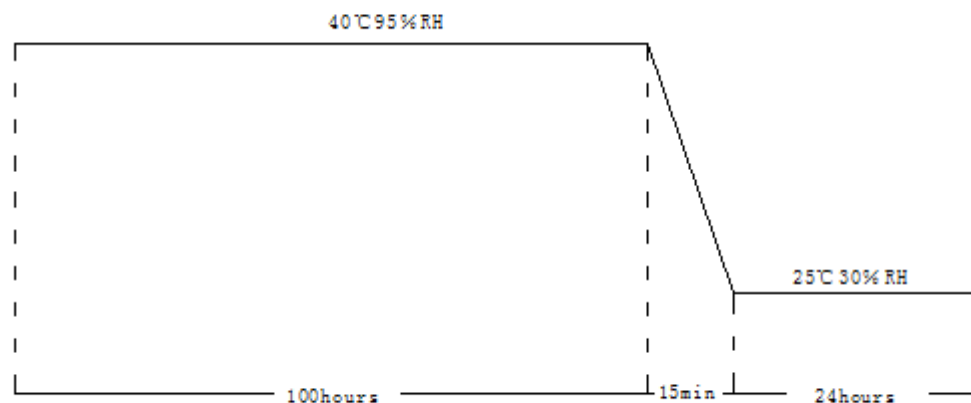
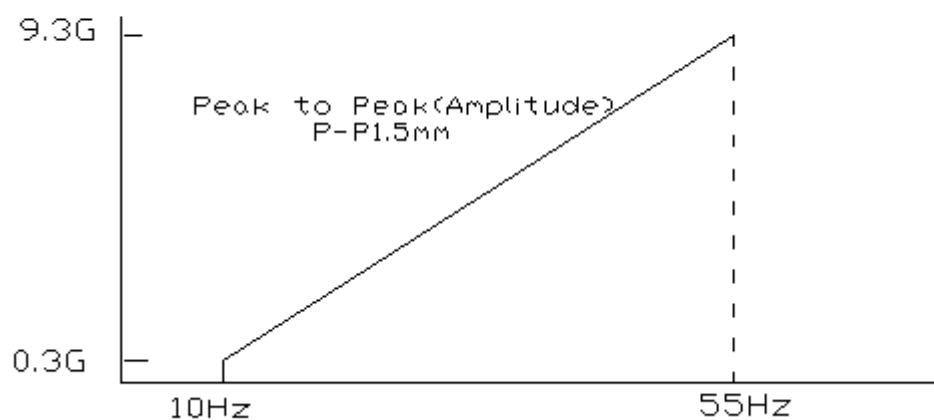


FIG3 VIBRATION TEST



发射脉冲测试点: A 最大电压 V_{P-P} 测试点: B-C
回波余振测试点: D IFT: 脉冲变压器 (中周)

No.	Testing item	Testing Equipment/Methods	Testing conditions
1	Resonant Frequency	Piezoelectric Transducer Resistance Testing System II	Testing Environment temperature :25±2℃

2	Echo Sensitivity	According to Fig. 4 Test Circuit	Distance to obstacle: 1 meter. Obstacle: organic glass board with 20CM*20CM*1.0CM. 1.The inductance :8mH, Qm Value: 60-80, Max Pulse ≤ 20 2.The Minimum detect distance ≥ 35 cm 3.The acoustic system without coupling
3	Ring Time	According to Fig. 4 Test Circuit	The sensor surface is covered by 100mm thickness of sponge 1.The inductance :8mH, Qm Value: 60-80, Max Pulse ≤ 20 2.The Minimum detect distance ≥ 35 cm 3.The acoustic system without coupling
4	Directivity (X-axis &Y-axis)	According to Fig. 4 & Fig. 5 Test Circuit	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.
5	Capacitance	Digital LC ZL5	Testing temperature : $25\pm 2^{\circ}\text{C}$
6	Maximum Input Voltage	According to Fig. 4 Test Circuit Oscilloscope: Tektronix TDS1002	Pulse Width: 0.5mS, Interval :20mS
7	Mean Time to Failure	Aging Equipment AWHY001	Normal room temperature
8	Operating Temperature($^{\circ}\text{C}$)	According to Fig. 4 Test Circuit, High-Low alternating temperature Cabinet	In normal room temperature, according to the Fig. 4 test circuit
9	Storage Temperature($^{\circ}\text{C}$)	High-Low alternating temperature Cabinet	In normal room temperature, according to the Fig. 4 test circuit

■Installation key Notes

1	size of fixing hole	$\phi 18.5\text{mm}$
2	height	$\geq 50\text{cm}$
3	direction	according to the UP sign
4	space between the sensor	40-50cm