

Rating

Do not use the product beyond the rated temperature range and the rated voltage range. If using it beyond this range, characteristics might degrade.

Storage and Operating Condition

1. Product Storage Condition

Please store the products in a room where the temperature/humidity is stable and avoid places where there are large temperature changes. Please store the products under the following conditions.

Temperature: -10 to +40°C

Humidity: 15 to 85%R.H.

2. Expiration Date on Storage

Expiration date (shelf life) of the products is six months after delivery under the condition of a sealed and unopened package. Please use the products within six months after delivery. If you store the products for a long time (more than six months), use carefully because the products may be degraded in solderability due to storage under poor conditions.

Please confirm solderability and characteristics for the products regularly.

3. Notice on Product Storage

(1) Please do not store the products in a chemical atmosphere (Acids, Alkali, Bases, Organic gas, Sulfides and so on), because the characteristics may be reduced in quality, may be degraded in solderability due to storage in a chemical atmosphere.

(2) Please do not store the products directly on the floor without anything under them to avoid damp places and/or dusty places.

(3) Please do not store the product in places such as in a damp heated place or any place exposed to direct sunlight or excessive vibration.

(4) Please use the products immediately after the package is opened, because the characteristics may be reduced in quality, and/or be degraded in solderability due to storage under poor conditions.

(5) Please be sure to consult with our sales representative or engineer whenever the products are to be used in conditions not listed above.

4. Operating Environment

This product is designed for application in an ordinary environment (normal room temperature, humidity and atmospheric pressure).

Do not use the products in a chemical atmosphere such as chlorine gas, acid or sulfide gas.

Characteristics might degrade by a chemical reaction with the material used in products.

Handling

1. Piezoelectric ceramic is used in this product. Please use care in handling, because ceramic is broken when excessive force is applied.
2. Please do not apply force to the piezoelectric diaphragm from the sound emission hole. If applying force, cracks occur and the sounds might become unstable.
3. Please do not drop the product or apply shock or temperature change to it. If so, the LSI might be destroyed by the charge (surge voltage) generated. Fig. 1 shows an example driving circuit using zener diode.

4. The standard self-driven circuits utilizes transistor switching. Since the circuit constants for hfe of the transistor are optimally chosen to maintain stable oscillation, please design a circuit following the standard.

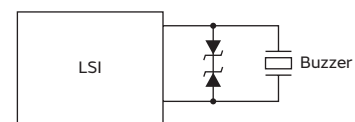


Fig. 1 Protect Circuit

Driving

1. Ag migration might occur if DC voltage is applied to the product under a high humidity environment. Please avoid using it under high humidity and design the circuit not to apply DC voltage.
2. When driving the product by IC, please insert the resistance of 1 to 2kΩ in series. The purpose is to protect the IC and to obtain stable sound. (Please see Fig. 2a). Inserting a diode in parallel to the product has the same effect. (Please see Fig. 2b)

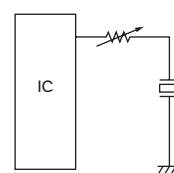


Fig. 2a

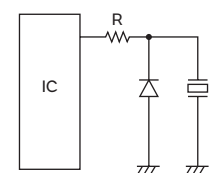


Fig. 2b