

# Piezoelectronic Buzzers(without circuit)

## PS Series(Pin Terminal/Lead)

Conformity to RoHS Directive

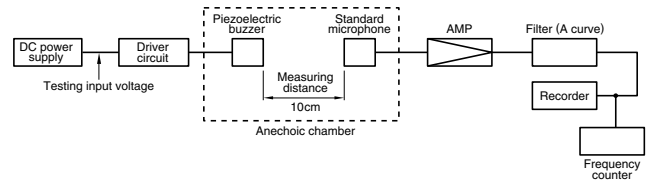
### FEATURES

- The PS series are high-performance buzzers that employ unimorph piezoelectric elements and are designed for easy incorporation into various circuits.
- They feature extremely low power consumption in comparison to electromagnetic units.
- Because these buzzers are designed for external excitation, the same part can serve as both a musical tone oscillator and a buzzer.
- They can be used with automated inserters. Moisture-resistant models are also available.
- The lead wire type(PS1550L40N) with both-sided adhesive tape installed easily is prepared.

### APPLICATIONS

Electric ranges, washing machines, computer terminals, various devices that require speech synthesis output.

### SOUND MEASURING METHOD



### SPECIFICATIONS AND CHARACTERISTICS

| Type      | Part No.     | External dimensions |                           |            | Characteristics                      |                 |                                        |
|-----------|--------------|---------------------|---------------------------|------------|--------------------------------------|-----------------|----------------------------------------|
|           |              | Outer diameter (mm) | Height (mm)               | Pitch (mm) | Sound pressure (dB(A)/10cm)          | Frequency (kHz) | Input voltage (Vo-p)[Rectangular wave] |
| PS12 Type | PS1240P02BT  | ø12.2               | 6.5                       | 5          | 70 min.                              | 4               | 3                                      |
|           | PS1240P02CT3 | ø12.2               | 3.5                       | 5          | 60 min.                              | 4               | 3                                      |
| PS14 Type | PS1440P02BT  | ø14                 | 8                         | 5          | 75 min.                              | 4               | 3                                      |
|           | PS1420P02CT  | ø14                 | 11                        | 5          | 70 min.                              | 2               | 5                                      |
| PS17 Type | PS1720P02    | ø17                 | 8                         | 10         | 70 min.                              | 2               | 3                                      |
| PS19 Type | PS1927P02    | ø19                 | 10.5 [excluding terminal] | 20         | 90 min.                              | 2.7             | 10                                     |
|           | PS1920P02    | ø19                 | 10.5 [excluding terminal] | 20         | 80 min.                              | 2               | 10                                     |
| Others    | PS1550L40N   | ø15                 | 1.6                       | —          | Depend on the installation condition |                 |                                        |

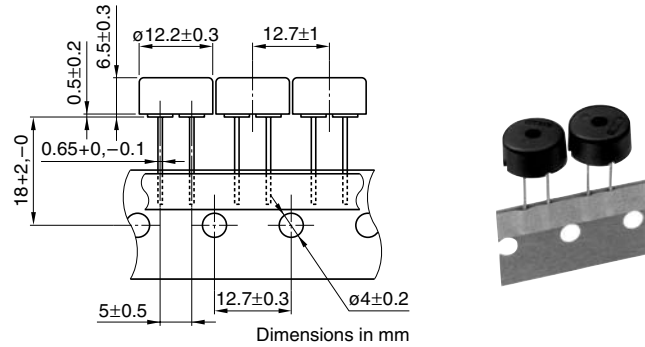
| Type      | Part No.     | Applications                                                                                                                    | Features                                                               |
|-----------|--------------|---------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------|
| PS12 Type | PS1240P02BT  | For warning and alarm sounds of home appliances(air conditioners, refrigerators, fan forced heaters, cordless telephones, etc.) | • Compact • Automatic mountable • 12.7mm pitch radial taping           |
|           | PS1240P02CT3 |                                                                                                                                 | • Thin type • Automatic mountable • 12.7mm pitch radial taping         |
| PS14 Type | PS1440P02BT  |                                                                                                                                 | • High sound pressure • Automatic mountable • 15mm pitch radial taping |
|           | PS1420P02CT  |                                                                                                                                 | • Low frequency tone • Automatic mountable • 15mm pitch radial taping  |
| PS17 Type | PS1720P02    | For potted circuit (washing machines, drying machines, hot water supply systems, etc.)                                          | • Low frequency tone • High sound pressure                             |
| PS19 Type | PS1927P02    |                                                                                                                                 | • High sound pressure • Water-proof processing element                 |
|           | PS1920P02    |                                                                                                                                 | • Low frequency tone • Water-proof processing element                  |
| Others    | PS1550L40N   | Digital camera                                                                                                                  | • Compact, Thin type • Fix in both-sided adhesive tape                 |

• Conformity to RoHS Directive: This means that, in conformity with EU Directive 2002/95/EC, lead, cadmium, mercury, hexavalent chromium, and specific bromine-based flame retardants, PBB and PBDE, have not been used, except for exempted applications.

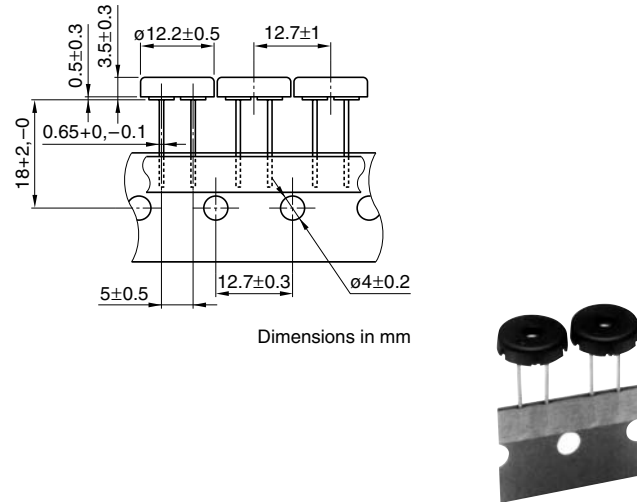
• All specifications are subject to change without notice.

**PIN TERMINAL TYPE****PS12 TYPE****PS1240P02BT****FEATURES**

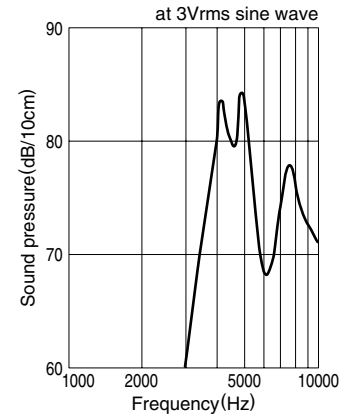
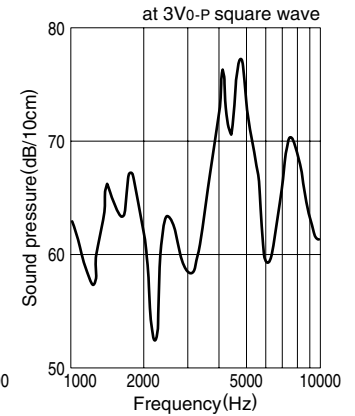
- Miniature size( $\phi 12.2 \times T6.5\text{mm}$ ).
- High cost performance.
- Suitable for automatic radial taping machine(12.7mm-pitch).

**SHAPES AND DIMENSIONS****PS1240P02CT3****FEATURES**

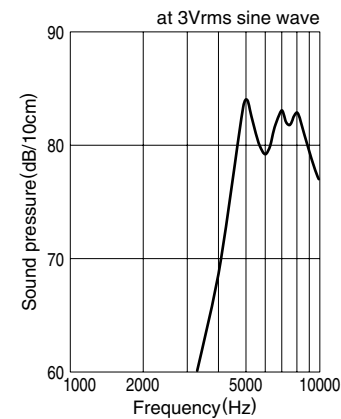
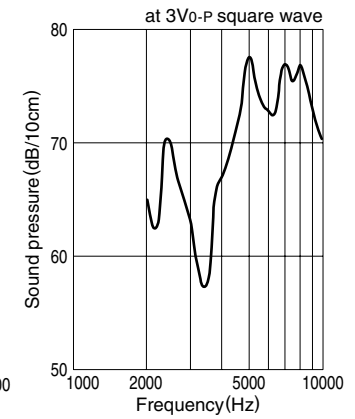
- Thin type( $\phi 12.2 \times T3.5\text{mm}$ ).
- Suitable for automatic radial taping machine(12.7mm-pitch).

**SHAPES AND DIMENSIONS****SPECIFICATIONS AND CHARACTERISTICS**

|                       |                                                |                                                                                                |
|-----------------------|------------------------------------------------|------------------------------------------------------------------------------------------------|
| Sound pressure        | 70dBA/<br>10cm min.                            | [at 4kHz, 3V <sub>0-P</sub> rectangular wave, measuring temperature: 25±5°C, humidity: 60±10%] |
| Temperature range     | Operating -20 to +70°C<br>Storage -30 to +80°C |                                                                                                |
| Maximum input voltage | 30V <sub>0-P</sub> max.                        | [without DC bias]                                                                              |
| Minimum delivery unit | 2500 pieces                                    | [500 pieces/1 reel×5 reels]                                                                    |

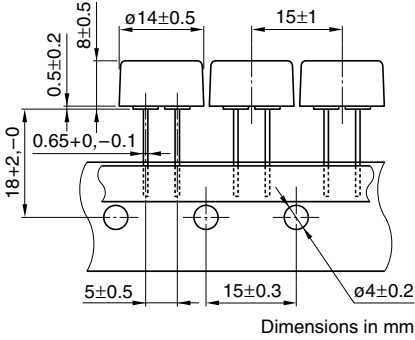
**FREQUENCY SOUND PRESSURE CHARACTERISTICS****SINE WAVE DRIVE****SQUARE WAVE DRIVE****SPECIFICATIONS AND CHARACTERISTICS**

|                       |                                                |                                                                                                |
|-----------------------|------------------------------------------------|------------------------------------------------------------------------------------------------|
| Sound pressure        | 60dBA/<br>10cm min.                            | [at 4kHz, 3V <sub>0-P</sub> rectangular wave, measuring temperature: 25±5°C, humidity: 60±10%] |
| Temperature range     | Operating -20 to +70°C<br>Storage -30 to +80°C |                                                                                                |
| Maximum input voltage | 30V <sub>0-P</sub> max.                        | [without DC bias]                                                                              |
| Minimum delivery unit | 2500 pieces                                    | [500 pieces/1 reel×5 reels]                                                                    |

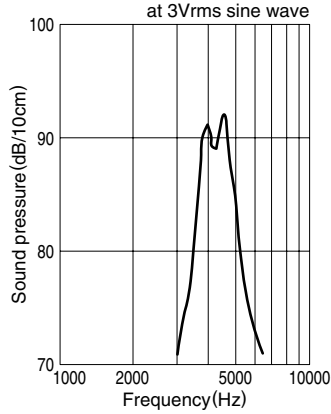
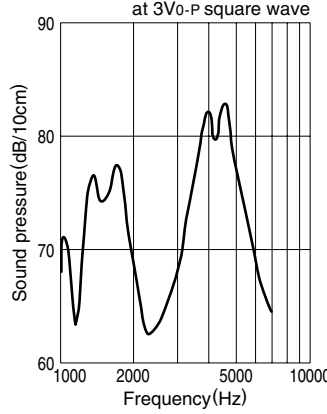
**FREQUENCY SOUND PRESSURE CHARACTERISTICS****SINE WAVE DRIVE****SQUARE WAVE DRIVE**

**PS14 TYPE****PS1440P02BT****FEATURES**

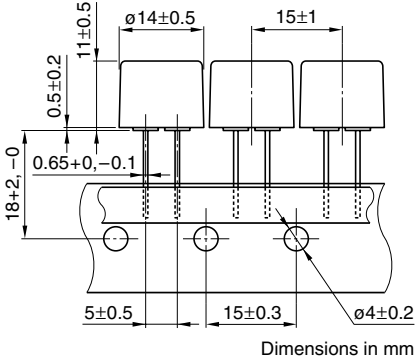
- High sound pressure.
- Miniature size( $\phi 14 \times T8$ mm).
- Suitable for automatic radial taping machine(15mm-pitch).

**SHAPES AND DIMENSIONS****SPECIFICATIONS AND CHARACTERISTICS**

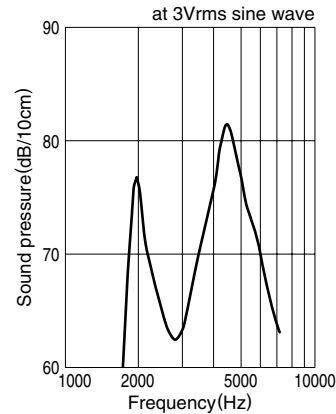
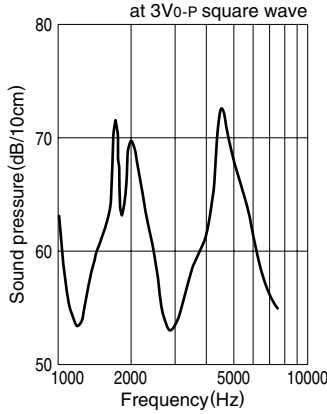
|                       |                                                |                                                                                                |
|-----------------------|------------------------------------------------|------------------------------------------------------------------------------------------------|
| Sound pressure        | 75dBA/<br>10cm min.                            | [at 4kHz, 3V <sub>0-P</sub> rectangular wave, measuring temperature: 25±5°C, humidity: 60±10%] |
| Temperature range     | Operating -20 to +70°C<br>Storage -30 to +80°C |                                                                                                |
| Maximum input voltage | 30V <sub>0-P</sub> max.                        | [without DC bias]                                                                              |
| Minimum delivery unit | 1750 pieces                                    | [350 pieces/1 reel×5 reels]                                                                    |

**FREQUENCY SOUND PRESSURE CHARACTERISTICS****SINE WAVE DRIVE****SQUARE WAVE DRIVE****PS1420P02CT****FEATURES**

- Low frequency tone(2kHz).
- Suitable for automatic radial taping machine(15mm-pitch).

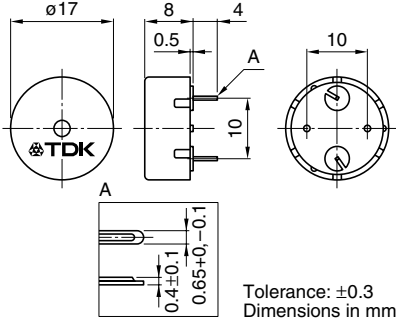
**SHAPES AND DIMENSIONS****SPECIFICATIONS AND CHARACTERISTICS**

|                       |                                                |                                                                                                |
|-----------------------|------------------------------------------------|------------------------------------------------------------------------------------------------|
| Sound pressure        | 70dBA/<br>10cm min.                            | [at 2kHz, 5V <sub>0-P</sub> rectangular wave, measuring temperature: 25±5°C, humidity: 60±10%] |
| Temperature range     | Operating -20 to +70°C<br>Storage -30 to +80°C |                                                                                                |
| Maximum input voltage | 30V <sub>0-P</sub> max.                        | [without DC bias]                                                                              |
| Minimum delivery unit | 1750 pieces                                    | [350 pieces/1 reel×5 reels]                                                                    |

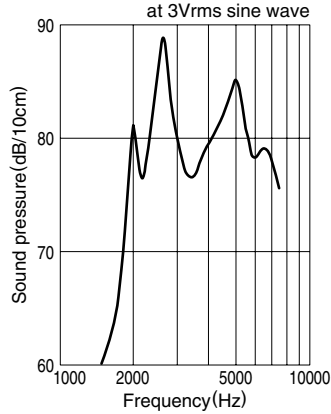
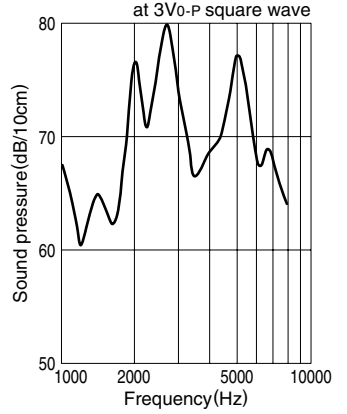
**FREQUENCY SOUND PRESSURE CHARACTERISTICS****SINE WAVE DRIVE****SQUARE WAVE DRIVE**

**PS17 TYPE****PS1720P02****FEATURES**

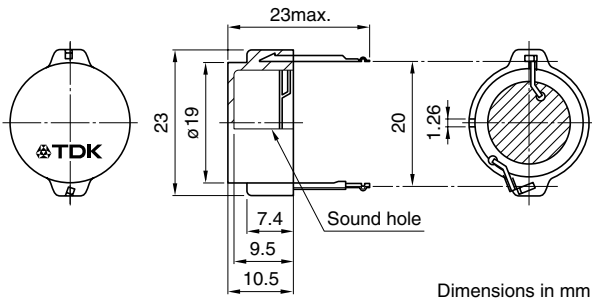
- Low frequency tone.
- High sound pressure.

**SHAPES AND DIMENSIONS****SPECIFICATIONS AND CHARACTERISTICS**

|                       |                                                |                                                                                                            |
|-----------------------|------------------------------------------------|------------------------------------------------------------------------------------------------------------|
| Sound pressure        | 70dBA/<br>10cm min.                            | [at 2kHz, 3V <sub>0-P</sub> rectangular wave, measuring temperature: 25 $\pm$ 5°C, humidity: 60 $\pm$ 10%] |
| Temperature range     | Operating -20 to +70°C<br>Storage -30 to +80°C |                                                                                                            |
| Maximum input voltage | 30V <sub>0-P</sub> max.                        | [without DC bias]                                                                                          |
| Minimum delivery unit | 1500 pieces                                    |                                                                                                            |

**FREQUENCY SOUND PRESSURE CHARACTERISTICS**  
**SINE WAVE DRIVE**
**SQUARE WAVE DRIVE****PS19 TYPE****PS1920P02****FEATURES**

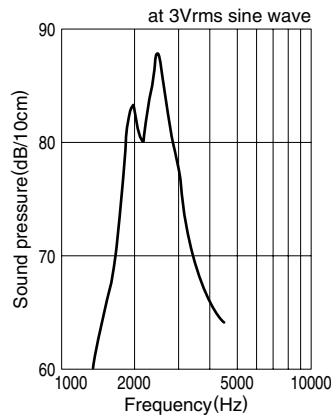
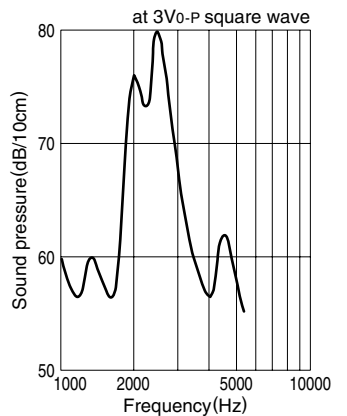
- Low frequency tone(2kHz).
- Piezo element is coated with water proof processing.

**SHAPES AND DIMENSIONS**

- It considers that water escapes from sound release hole and please decide an attachment angle.

**SPECIFICATIONS AND CHARACTERISTICS**

|                       |                                                |                                                                                                             |
|-----------------------|------------------------------------------------|-------------------------------------------------------------------------------------------------------------|
| Sound pressure        | 80dBA/<br>10cm min.                            | [at 2kHz, 10V <sub>0-P</sub> rectangular wave, measuring temperature: 25 $\pm$ 5°C, humidity: 60 $\pm$ 10%] |
| Temperature range     | Operating -20 to +70°C<br>Storage -30 to +80°C |                                                                                                             |
| Maximum input voltage | 20V <sub>0-P</sub> max.                        | [without DC bias]                                                                                           |
| Minimum delivery unit | 600 pieces                                     |                                                                                                             |

**FREQUENCY SOUND PRESSURE CHARACTERISTICS**  
**SINE WAVE DRIVE**
**SQUARE WAVE DRIVE**

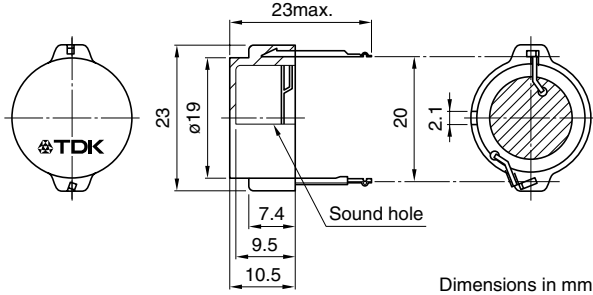
## PS19 TYPE

### PS1927P02

#### FEATURES

- High sound pressure.
- Piezo element is coated with water proof processing.

#### SHAPES AND DIMENSIONS



- It considers that water escapes from sound release hole and please decide an attachment angle.

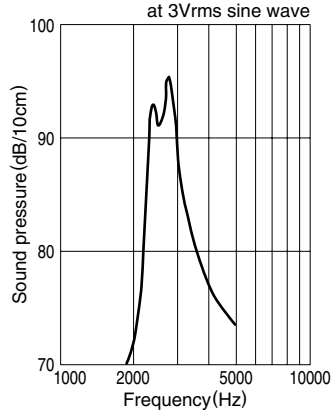


#### SPECIFICATIONS AND CHARACTERISTICS

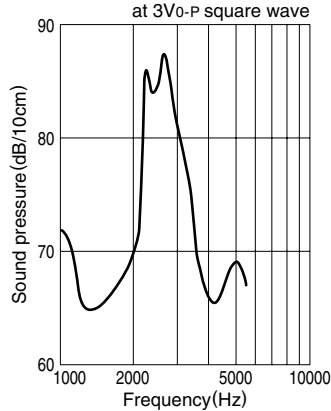
|                       |                                                |                                                                                                   |
|-----------------------|------------------------------------------------|---------------------------------------------------------------------------------------------------|
| Sound pressure        | 90dBA/<br>10cm min.                            | [at 2.7kHz, 10V <sub>0-P</sub> rectangular wave, measuring temperature: 25±5°C, humidity: 60±10%] |
| Temperature range     | Operating -20 to +70°C<br>Storage -30 to +80°C |                                                                                                   |
| Maximum input voltage | 20V <sub>0-P</sub> max.                        | [without DC bias]                                                                                 |
| Minimum delivery unit | 600 pieces                                     |                                                                                                   |

#### FREQUENCY SOUND PRESSURE CHARACTERISTICS

##### SINE WAVE DRIVE



##### SQUARE WAVE DRIVE



## LEAD WIRE TYPE

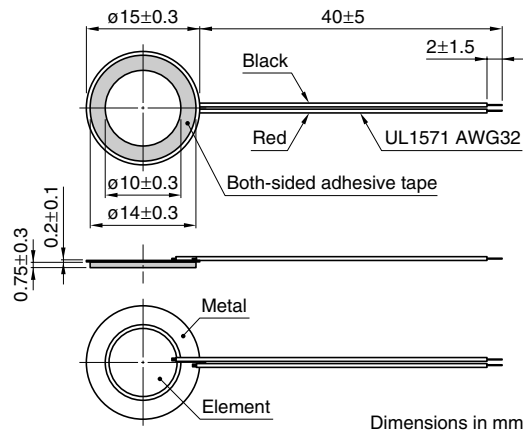
### PS15 TYPE

### PS1550L40N

#### FEATURES

- Miniature size (ø15×T1.6mm).
- High cost performance.
- The installation of this type is easy with both-sided tape.
- This product adopts an excellent both-sided adhesive tape in bonding and the sound characteristic.

#### SHAPES AND DIMENSIONS

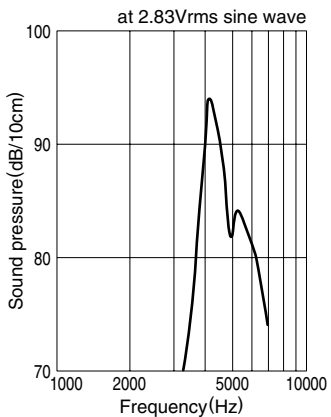


#### SPECIFICATIONS AND CHARACTERISTICS

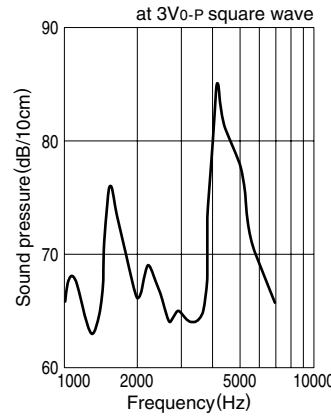
|                       |                                                |                   |
|-----------------------|------------------------------------------------|-------------------|
| Temperature range     | Operating -20 to +70°C<br>Storage -30 to +80°C |                   |
| Maximum input voltage | 20V <sub>0-P</sub> max.                        | [without DC bias] |
| Minimum delivery unit | 4000 pieces                                    |                   |

#### FREQUENCY SOUND PRESSURE CHARACTERISTICS

##### SINE WAVE DRIVE



##### SQUARE WAVE DRIVE

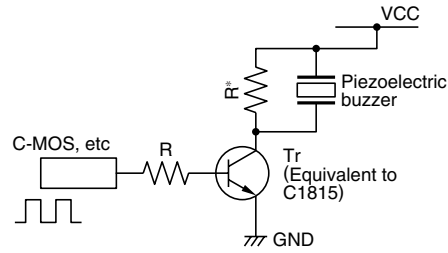


\* The frequency characteristic changes depending on the case shape and the installation method.

## PRECAUTIONS FOR USE

- Do not apply DC bias to the piezoelectric buzzer; otherwise insulation resistance may become low and affect the performance.
- Do not supply any voltage higher than applicable to the piezoelectric buzzer.
- Do not use the piezoelectric buzzer outdoors. It is designed for indoor use. If the piezoelectric buzzer has to be used outdoors, provide it with waterproofing measures; it will not operate normally if subjected to moisture.
- Do not wash the piezoelectric buzzer with solvent or allow gas to enter it while washing; any solvent that enters it may stay inside a long time and damage it.
- A piezoelectric ceramic material of approximately 100 $\mu$ m thick is used in the sound generator of the buzzer. Do not press the sound generator through the sound release hole otherwise the ceramic material may break. Do not stack the piezoelectric buzzers without packing.
- Do not apply any mechanical force to the piezoelectric buzzer; otherwise the case may deform and result in improper operation.
- Do not place any shielding material or the like just in front of the sound release hole of the buzzer; otherwise the sound pressure may vary and result in unstable buzzer operation. Make sure that the buzzer is not affected by a standing wave or the like.
- Be sure to solder the buzzer terminal at 350°C max.(80W max.)(soldering iron trip) within 5 seconds using a solder containing silver.
- Avoid using the piezoelectric buzzer for a long time where any corrosive gas (H<sub>2</sub>S, etc.) exists; otherwise the parts or sound generator may corroded and result in improper operation.
- Be careful not to drop the piezoelectric buzzer.

## RECOMMENDED OPERATING CIRCUIT EXAMPLE



\* Resistor to do charging and discharging to a piezoelectric element (Value of about 1k $\Omega$  is good efficiency).