



Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of "Quality Parts,Customers Priority,Honest Operation,and Considerate Service",our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!



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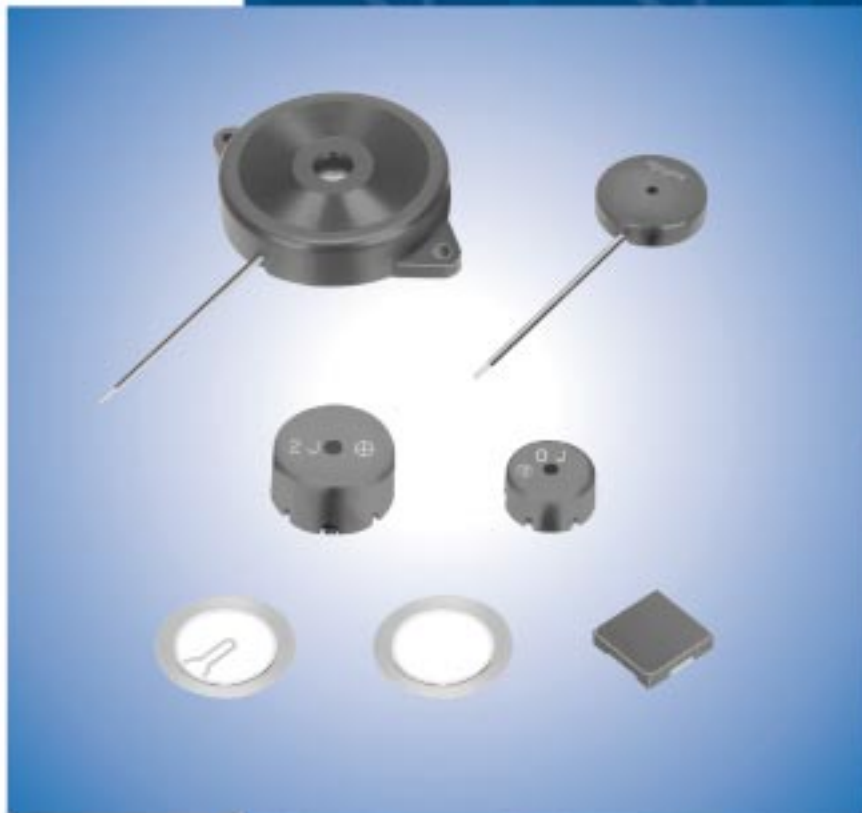
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Piezoelectric Sound Components



for EU RoHS Compliant

- All the products in this catalog comply with EU RoHS.
- EU RoHS is "the European Directive 2002/95/EC on the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment".
- For more details, please refer to our website 'Murata's Approach for EU RoHS' (<http://www.murata.com/info/rohs.html>).

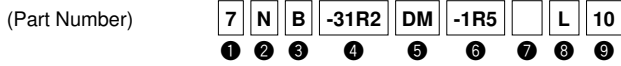
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● **Part Numbering**

Piezoelectric Diaphragms



① Product ID

Product ID	
7	Ceramic Material

② Material

Code	Metal Plate Material
B	Brass
N	Nickel Alloy
S	SUS

③ Product

Code	Product
B	Piezoelectric Diaphragms

④ Metal Plate Diameter

Code	Metal Plate Diameter
-31R2	A hyphen (-) plus four digits alphanumerics express metal plate outer dimensions. A decimal point is expressed by the capital letter "R".

If there is no decimal point, the decimal point code is omitted.

⑤ Form of Piezoelectric Style

Code	Form of Piezoelectric Style
DM	Two digits express shape of ceramics.

For an Ag electrode, this digit remains blank, the corresponding code is omitted.

⑥ Resonant Frequency Type

Code	Resonant Frequency (kHz)
-1R5	A hyphen (-) and three digits alphanumerics express resonant frequency. A decimal point is expressed by the capital letter "R".

If there is no decimal point, the decimal point is omitted.

⑦ With Feedback Electrode

Code	With Feedback Electrode
C	With Feedback Electrode
-	Without Feedback Electrode

⑧ Product Specification

Code	Product Specification
L	With lead (available for RoHS)
-	No lead (omitted)

⑨ Individual Specification Code

Code	Individual Specification Code
10	These digits express a lead length, lead number, and presence/absence of a connector.

If the product has no individual specification, the corresponding code is omitted.

Piezoelectric Sounders/Piezoelectric Buzzers/Piezoelectric Ringers (PIEZORINGER®)

(Part Number)

PK	M	13	E	P	YH	40	00	P	-A0
①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩

① Product ID

Product ID	
PK	Piezoelectric Sound Components

② Product

Code	Product
M	Sounder, Ringer
B	Buzzer

③ Outer Dimensions

Expressed by two figures in mm.

Ex.)

Code	Outer Dimensions
13	ø12.6mm

④ Drive

Code	Drive
E	External-Drive
S	Self-Drive

⑤ Outer Electrode Style

Code	Outer Electrode Style
P	Pin Type
W	Lead Wire Type

⑥ Structure

Code	Structure
T <input type="checkbox"/>	Standing Type
P <input type="checkbox"/>	Flat Type Auto-assemble
Y <input type="checkbox"/>	Flat Type/Available for Taping
C <input type="checkbox"/>	Flat Type/Semi-auto-assemble
<input type="checkbox"/>	Exclude above mentioned

means specification of outer electrode.

SMD Piezoelectric Sounder

(Part Number)

PK	LCS	1212	E	40	01	-R1
①	②	③	④	⑤	⑥	⑦

① Product ID

Product ID	
PK	Piezoelectric Sound Components

② Product

Code	Product
LCS	SMD Sounder

③ Dimensions

Code	Outer Dimensions
1212	□12mm

④ Drive

Code	Drive
E	External Drive

⑦ Oscillating Frequency Type

Code	Oscillating Frequency Type
40	Expressed resonant frequency by two-digit alphanumerics. The unit is in 100 hertz (Hz). In case of 4kHz (4000Hz), expressed as "40".

⑧ Individual Specification Code

Code	Individual Specification Code
00	Two digits express custom specification in characteristics.

⑨ Special Quality Guarantee

Code	Special Quality Guarantee
P	Post Plated Terminal
-	Blank

⑩ Packaging

Code	Packaging
-B0	Bulk
-A0	Radial Taping
-M0	Magazine

Radial taping or magazines are not available for all types.

Please contact us.

Packaging Code is blank in the case of types for which radial taping or magazines are not available.

⑤ Oscillating Frequency Type

Code	Oscillating Frequency Type
40	Expressed resonant frequency by two-digit alphanumerics. The unit is in 100 hertz (Hz). In case of 4kHz (4000Hz), expressed as "40".

⑥ Individual Specification Code

Code	Individual Specification Code
01	Two digits express specific specification in characteristics.

⑦ Packaging

Code	Packaging
-R1	Plastic taping

Application Matrix

		Application	Tele- phone	Watch	Clock	Medical Equip- ment	Fire/ Gas Alarm	Digital Camera	Toy	Bar Code Scanner	Printer	Note- PC PDA	DVD- Player	Micro- wave Oven	Air Condi- tioner	Fan Heater	Instru- ment Cluster		
		Part Number																	
Piezoelectric Diaphragm	External Drive Type	7BB-12-9		●	●	●		●	●			●							
		7BB-15-6			●	●		●	●			●							
		7BB-20-3	●	●	●	●	●		●	●	●		●						
		7BB-20-6			●	●			●	●			●						
		7BB-20-6L0			●	●			●	●			●						
		7BB-27-4	●		●	●			●	●	●								
		7BB-27-4L0	●		●	●			●	●	●								
		7BB-35-3	●		●				●	●	●								
		7BB-35-3L0	●		●			●	●	●	●								
		7BB-41-2	●																
		7BB-41-2L0	●																
	7NB-31R2-1					●	●												
	Self Drive Type	7BB-20-6C	●						●	●									
		7BB-20-6CL0	●						●	●									
		7BB-27-4C	●					●	●	●									
		7BB-27-4CL0	●					●	●	●									
		7BB-35-3C	●					●	●	●									
		7BB-35-3CL0	●					●	●	●									
7BB-41-2C		●																	
7BB-41-2CL0		●																	
7SB-34R7-3C						●													
Piezoelectric Sounder	External Drive Type	PKM13EPYH4000-A0	●		●	●		●	●	●	●	●	●		●	●	●		
		PKM13EPYH4002-B0	●		●	●		●	●	●	●	●	●	●	●	●	●	●	
		PKM17EPP-2002-B0	●		●	●			●	●	●	●	●	●	●	●	●	●	
		PKM17EPPH4001-B0	●		●	●			●	●	●	●	●	●	●	●	●	●	
		PKM17EWH2001	●		●	●		●	●	●	●	●	●	●	●	●	●	●	
		PKM22EPH2001							●	●		●	●	●	●	●	●	●	
		PKM22EPPH2001-B0	●		●	●			●	●	●	●	●	●	●	●	●	●	
		PKM22EPPH4001-B0	●		●	●			●	●	●	●	●	●	●	●	●	●	
		PKM22EPPH4005-B0	●		●	●			●	●	●	●	●	●	●	●	●	●	
		PKM22EPPH4007-B0	●		●	●	●	●	●	●	●	●	●	●	●	●	●	●	
		PKM22EPTH2001-B0							●	●	●	●	●	●	●	●	●	●	
		PKM17EWH4000	●		●	●			●	●	●	●	●	●	●	●	●	●	
		PKLCS1212E2000-R1	●			●			●	●	●	●	●	●	●	●	●	●	
		PKLCS1212E20A0-R1							●	●	●	●	●	●	●	●	●	●	
	PKLCS1212E4001-R1	●			●			●	●	●	●	●	●	●	●	●	●		
	PKLCS1212E40A1-R1							●	●	●	●	●	●	●	●	●	●		
Self Drive Type	PKM24SPH3805	●					●	●	●					●	●	●			
	PKM30SPTH2001-B0							●	●	●	●	●	●	●	●	●			
	PKM30SPTH2501-B0							●	●	●	●	●	●	●	●	●			
Piezoelectric Buzzer	PKB24SPCH3601-B0	●			●			●	●	●	●	●	●	●	●	●			
	PKB24SWH3301	●		●				●	●	●	●	●	●	●	●	●			
Piezoelectric Ringer	PKM33EPH1201C	●																	
	PKM34EWH1101C	●																	
	PKM34EWH1201C	●																	
	PKM44EWH1001C	●																	

There are various applications besides those listed in the above table, including:

Burglar Alarm, Laundry Machine, Bath, Interphone, Chime, Back Buzzer, ME Instruments, Measuring Instruments, Vending Machine, Calculator, Automobile, Communication Radio, Hemodynamometer, Thermometer, Running Meter, Facsimile, Audio Timer, Automatic Controlling Devices.

Piezoelectric Sound Components



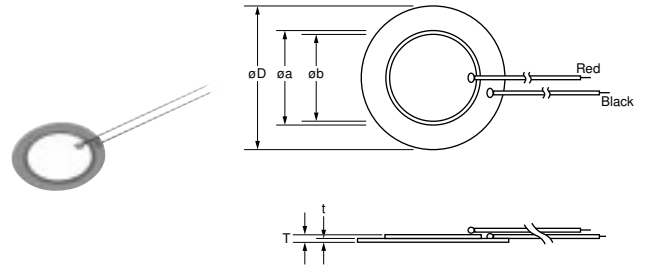
Piezoelectric Diaphragms

■ Features

1. Clear sound
2. Ultra thin and lightweight
3. No contacts: therefore, no noise and highly reliable
4. Low power consumption for voltage type

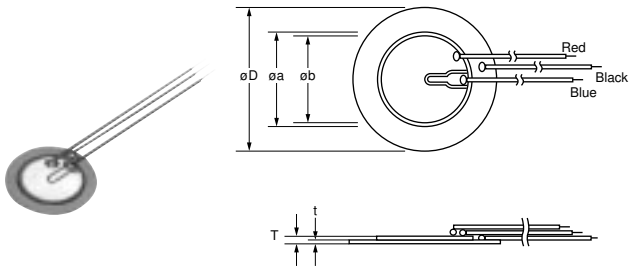
■ Applications

Clocks/Calculators/Digital camera/Various alarms
(Burglar alarms, etc.)



External Drive Type

Part Number	Resonant Frequency (kHz)	Resonant Impedance (ohm)	Capacitance (nF)	Plate Size dia. D (mm)	Element Size dia. a (mm)	Electrode Size dia. b (mm)	Thickness T (mm)	Plate Thickness t (mm)	Plate Material
7BB-12-9	9.0 ±1.0kHz	1000 max.	8.0 ±30% [1kHz]	12.0	9.0	8.0	0.22	0.10	Brass
7BB-15-6	6.0 ±1.0kHz	800 max.	10.0 ±30% [1kHz]	15.0	10.0	9.0	0.22	0.10	Brass
7BB-20-3	3.6 ±0.6kHz	500 max.	20.0 ±30% [1kHz]	20.0	14.0	12.8	0.22	0.10	Brass
7BB-20-6	6.3 ±0.6kHz	350 max.	10.0 ±30% [1kHz]	20.0	14.0	12.8	0.42	0.20	Brass
7BB-20-6L0	6.3 ±0.6kHz	1000 max.	10.0 ±30% [1kHz]	20.0	14.0	12.8	0.42	0.20	Brass (with Lead Wire: AWG32 Length 50mm)
7BB-27-4	4.6 ±0.5kHz	200 max.	20.0 ±30% [1kHz]	27.0	19.7	18.2	0.54	0.30	Brass
7BB-27-4L0	4.6 ±0.5kHz	300 max.	20.0 ±30% [1kHz]	27.0	19.7	18.2	0.54	0.30	Brass (with Lead Wire: AWG32 Length 50mm)
7BB-35-3	2.8 ±0.5kHz	200 max.	30.0 ±30% [1kHz]	35.0	25.0	23.0	0.53	0.30	Brass
7BB-35-3L0	2.8 ±0.5kHz	200 max.	30.0 ±30% [1kHz]	35.0	25.0	23.0	0.53	0.30	Brass (with Lead Wire: AWG32 Length 50mm)
7BB-41-2	2.2 ±0.3kHz	250 max.	30.0 ±30% [1kHz]	41.0	25.0	23.0	0.63	0.40	Brass
7BB-41-2L0	2.2 ±0.3kHz	300 max.	30.0 ±30% [1kHz]	41.0	25.0	23.0	0.63	0.40	Brass (with Lead Wire: AWG32 Length 50mm)
7NB-31R2-1	1.3 ±0.5kHz	300 max.	40.0 ±30% [120Hz]	31.2	19.7	18.2	0.22	0.10	Nickel Alloy



Self Drive Type

Part Number	Resonant Frequency (kHz)	Resonant Impedance (ohm)	Capacitance (nF)	Plate Size dia. D (mm)	Element Size dia. a (mm)	Electrode Size dia. b (mm)	Thickness T (mm)	Plate Thickness t (mm)	Plate Material
7BB-20-6C	6.3 ±0.6kHz	500 max.	8.5 ±30% [1kHz]	20.0	14.0	12.8	0.42	0.20	Brass
7BB-20-6CLO	6.3 ±0.6kHz	800 max.	8.5 ±30% [1kHz]	20.0	14.0	12.8	0.42	0.20	Brass (with Lead Wire: AWG32 Length 50mm)
7BB-27-4C	4.6 ±0.5kHz	200 max.	18.0 ±30% [1kHz]	27.0	19.7	18.2	0.54	0.30	Brass
7BB-27-4CLO	4.6 ±0.5kHz	350 max.	18.0 ±30% [1kHz]	27.0	19.7	18.2	0.54	0.30	Brass (with Lead Wire: AWG32 Length 50mm)
7BB-35-3C	2.8 ±0.5kHz	200 max.	26.0 ±30% [1kHz]	35.0	25.0	23.0	0.53	0.30	Brass
7BB-35-3CLO	2.8 ±0.5kHz	200 max.	26.0 ±30% [1kHz]	35.0	25.0	23.0	0.53	0.30	Brass (with Lead Wire: AWG32 Length 50mm)
7BB-41-2C	2.2 ±0.3kHz	250 max.	24.0 ±30% [1kHz]	41.0	25.0	23.0	0.63	0.40	Brass
7BB-41-2CLO	2.2 ±0.3kHz	350 max.	24.0 ±30% [1kHz]	41.0	25.0	23.0	0.63	0.40	Brass (with Lead Wire: AWG32 Length 50mm)
7SB-34R7-3C	3.1 ±0.3kHz	150 max.	24.0 ±30% [1kHz]	34.7	25.0	23.4	0.50	0.25	Stainless

■ Node Diameter

Part Number	Node Diameter (mm)
7BB-20-6C	φ13.5
7BB-27-4C	φ17.5
7BB-35-3C	φ22.5
7BB-41-2C	φ26.5

• Sound diaphragms without feedback electrode also have the same node diameters.

Piezoelectric Diaphragms Notice

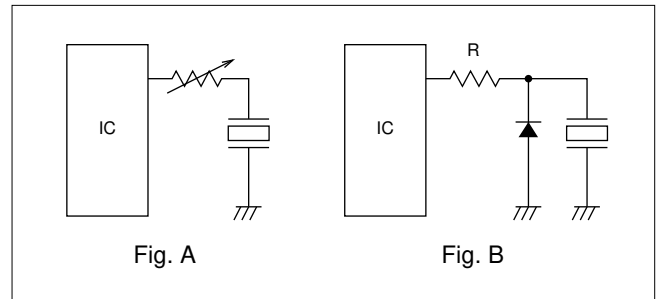
1

■ Notice (Soldering and Mounting)

1. Applying load on the center area of the diaphragm may cause cracking in the ceramic element. When the diaphragm is supported by the edge, the load should be applied only around the edge.
2. Please consult with Murata or Murata representative if soldering of the component is needed.

■ Notice (Handling)

1. Please do not touch the component with bare hand because electrode may be corroded.
2. The component may be damaged if mechanical stress exceeding specifications is applied.
3. Take care to protect operating circuit from surge voltage resulting from excessive force, falling, shock or temperature change.
4. If DC voltage is applied to the component, silver migration may occur. Please pay full attention to avoid subjecting the component to DC voltage for long periods.
5. The resistor should be used as shown in Fig. A.
A suitable resistance value should be chosen, preferably 1k Ω to 2k Ω . Instead of this measure, a diode may also be applied as shown in Fig. B.



6. Avoid excessive pulling of lead wire because wire may break or soldering point may come off.

Piezoelectric Sound Components



Piezoelectric Sounders External Drive Pin Type

2

Microcomputers are widely used for microwave ovens, air conditioners, cars, toys, timers, and other alarm equipment. Externally driven piezoelectric sounders are used in digital watches, electronic calculators, telephones and other equipment. They are driven by a signal (ex.: 2048Hz or 4096Hz) from an LSI and provide melodious sound.

■ Features

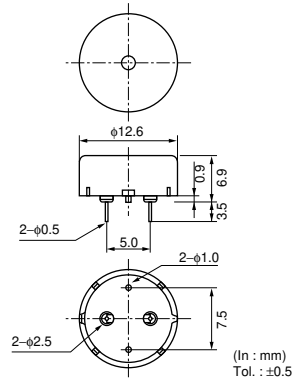
1. Low power consumption
2. No contacts therefore, no noise and highly reliable

■ Applications

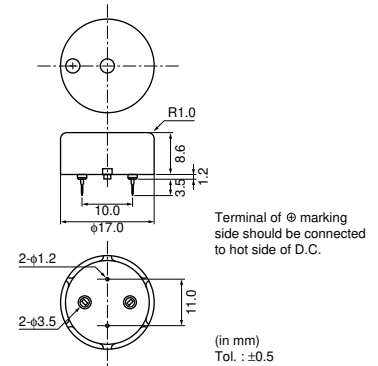
1. Various office equipment such as PPCs, printers and keyboards
2. Various home appliances such as microwave ovens
3. Confirmation sound of various audio equipment



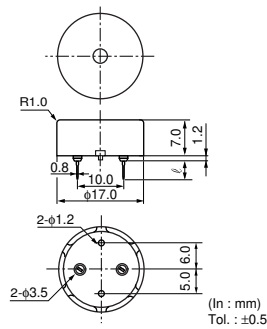
PKM13EPYH4002-B0



PKM17EPP-2002-B0



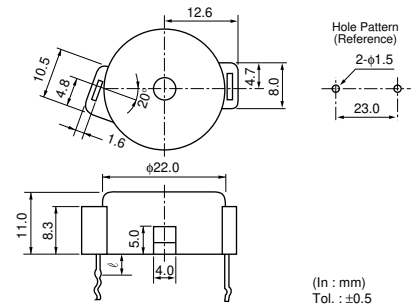
PKM17EPPH4001-B0



Part Number	ℓ
PKM17EPPH4001-B0	6.5
PKM17EPPH4002-B0	3.5



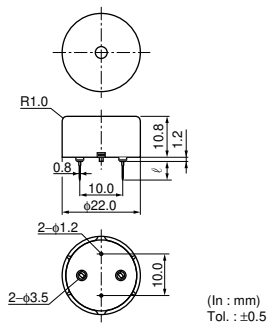
PKM22EPH2001



Part Number	ℓ
PKM22EPH2001	4.0
PKM22EPH2002	8.0
PKM22EPH2003	12.0



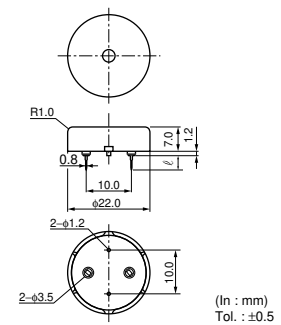
PKM22EPPH2001-B0



Part Number	ℓ
PKM22EPPH2001-B0	6.5
PKM22EPPH2002-B0	3.5



PKM22EPPH4001-B0



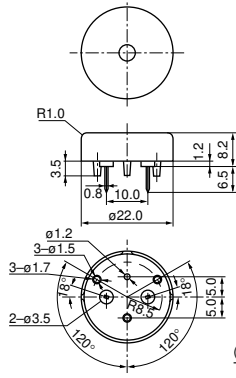
Part Number	ℓ
PKM22EPPH4001-B0	6.5
PKM22EPPH4002-B0	3.5

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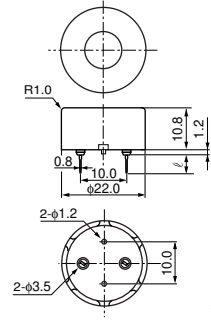
PKM22EPPH4005-B0



(In : mm)
Tol. : ±0.5



PKM22EPPH4007-B0

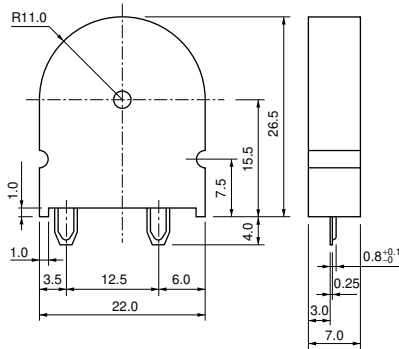


(In : mm)
Tol. : ±0.5

Part Number	ℓ
PKM22EPPH4007-B0	6.5
PKM22EPPH4012-B0	3.5



PKM22EPTH2001-B0



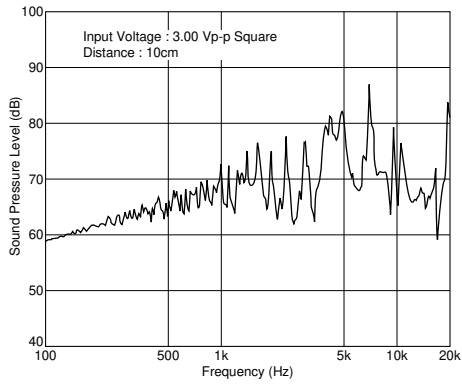
(in mm)
Tol.±0.5

Part Number	Sound Pressure Level (dB)	Sound Pressure Level (Ref. only) (dB)	Operating Voltage Range	Capacitance (nF)	Operating Temp. Range (°C)	Storage Temp. Range (°C)
PKM13EPYH4002-B0	70 min. [3Vp-p,4kHz,square wave,10cm]	70 min. [1Vrms,4kHz,sine wave,10cm]	30.0 Vp-p max.	5.5 ±30% [1kHz]	-40 to +85	-40 to +85
PKM17EPP-2002-B0	70 min. [3Vo-p,2kHz,square wave,10cm]	70 min. [1Vrms,2kHz,sine wave,10cm]	25.0 Vo-p max. [with polarity]	34.0 ±30% [120Hz]	-20 to +70	-30 to +80
PKM17EPPH4001-B0	72 min. [3Vp-p,4kHz,square wave,10cm]	72 min. [1Vrms,4kHz,sine wave,10cm]	25.0 Vp-p max.	7.0 ±30% [1kHz]	-20 to +70	-30 to +80
PKM22EPH2001	75 min. [3Vp-p,2kHz,square wave,10cm]	75 min. [1Vrms,2kHz,sine wave,10cm]	25.0 Vp-p max.	17.0 ±30% [120Hz]	-20 to +70	-30 to +80
PKM22EPPH2001-B0	70 min. [3Vp-p,2kHz,square wave,10cm]	70 min. [1Vrms,2kHz,sine wave,10cm]	30.0 Vp-p max.	19.0 ±30% [120Hz]	-20 to +70	-30 to +80
PKM22EPPH4001-B0	75 min. [3Vp-p,4kHz,square wave,10cm]	75 min. [1Vrms,4kHz,sine wave,10cm]	30.0 Vp-p max.	12.0 ±30% [1kHz]	-20 to +70	-30 to +80
PKM22EPPH4005-B0	75 min. [3Vp-p,4kHz,square wave,10cm]	75 min. [1Vrms,4kHz,sine wave,10cm]	30.0 Vp-p max.	12.0 ±30% [1kHz]	-20 to +70	-30 to +80
PKM22EPPH4007-B0	85 min. [3Vp-p,4kHz,square wave,10cm]	85 min. [1Vrms,4kHz,sine wave,10cm]	30.0 Vp-p max.	12.0 ±30% [1kHz]	-20 to +70	-30 to +80
PKM22EPTH2001-B0	70 min. [3Vp-p,2kHz,square wave,10cm]	70 min. [1Vrms,2kHz,sine wave,10cm]	25.0 Vp-p max.	19.0 ±30% [120Hz]	-20 to +70	-30 to +80

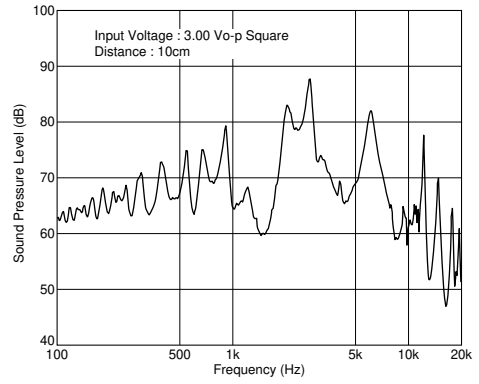
■ Freq. Response (Square Wave 3Vp-p, 10cm)

2

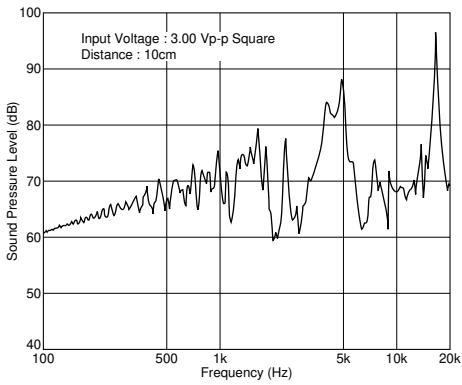
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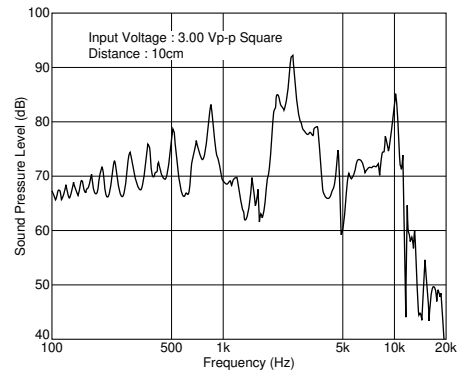
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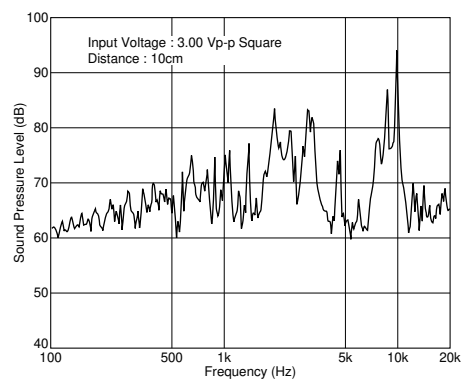
PKM17EPPH4001-B0



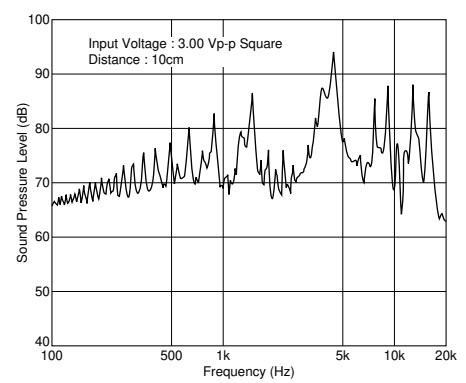
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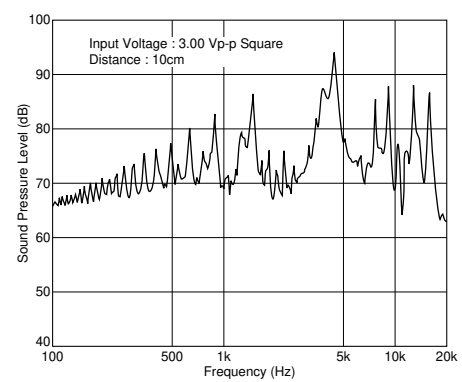
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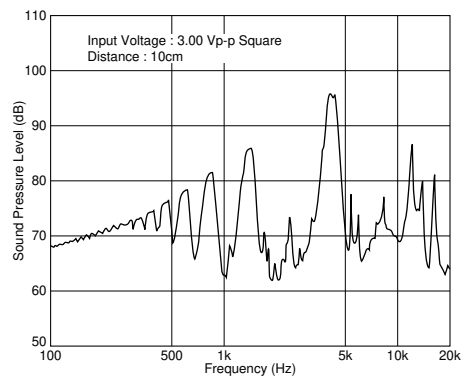
PKM22EPPH4001-B0



PKM22EPPH4005-B0



PKM22EPPH4007-B0

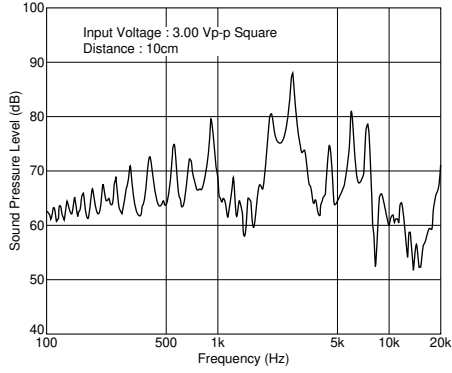


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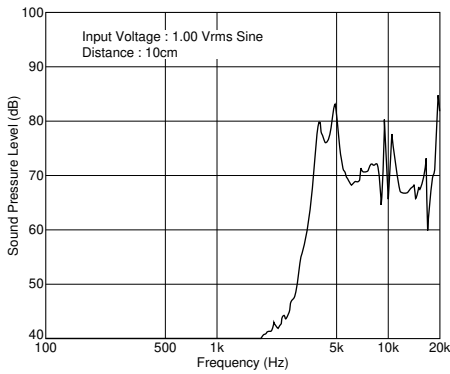
■ Freq. Response (Square Wave 3Vp-p, 10cm)

PKM22EPH2001-B0

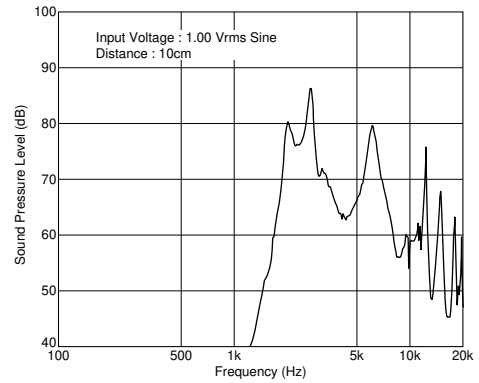


■ Freq. Response (Sine Wave 1Vrms, 10cm)

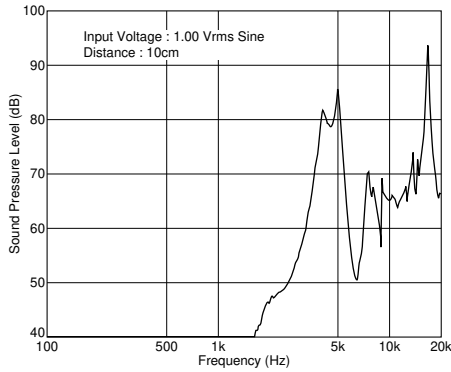
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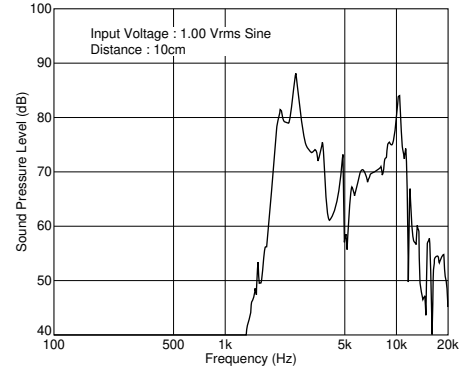
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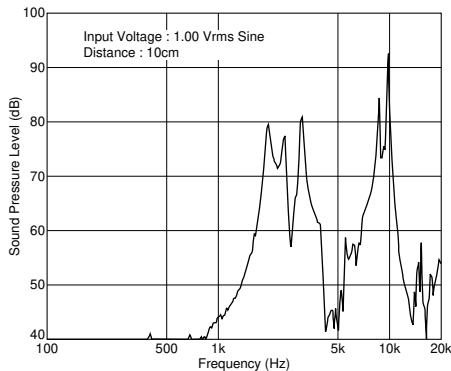
PKM17EPPH4001-B0



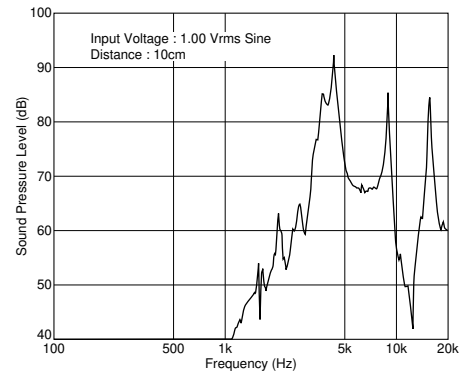
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PKM22EPPH2001-B0



PKM22EPPH4001-B0

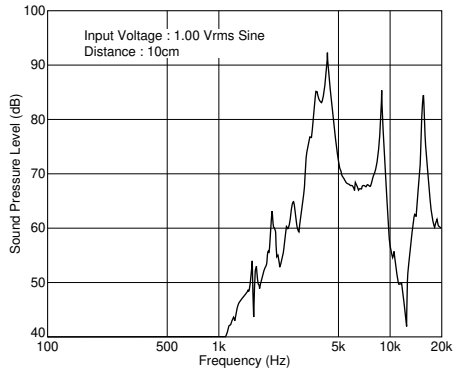


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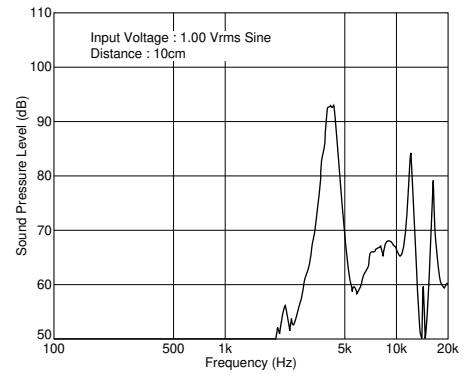
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■ Freq. Response (Sine Wave 1Vrms, 10cm)

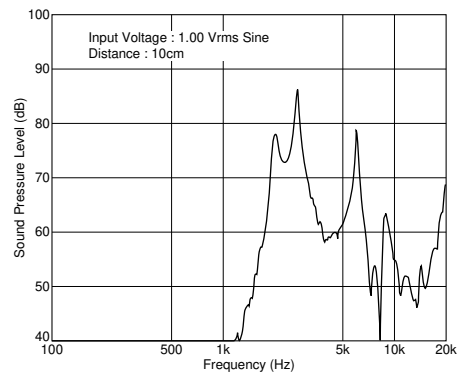
PKM22EPPH4005-B0



PKM22EPPH4007-B0



PKM22EPTH2001-B0

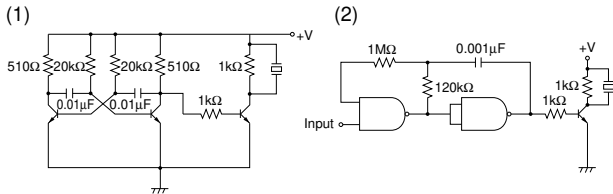


Piezoelectric Sounders (External Drive Pin Type) Circuit/Notice

■ Circuit

The following are examples of externally driven circuits.

- (1) Unstable multi-vibrator using Tr.
- (2) Circuits using inverters or NAND gates.



■ Notice (Soldering and Mounting)

1. Notice (Soldering and Mounting)

(1) Soldering Iron

- (a) Lead terminals are immersed up to 1.5mm from components body in soldering bath of +260+/-5 degrees C for 10+/-1.0 seconds, and then components shall be left in natural condition for 4 hours.
- (b) Lead terminal is directly contacted with the tip of soldering iron of +350+/-0.5 seconds, and then components shall be left in natural condition for 4 hours.

(2) Reflow

The component cannot withstand reflow soldering.

■ Notice (Handling)

1. The component may be damaged if mechanical stress exceeding specifications is applied.
2. Take care to protect operating circuit from surge voltage resulting from excessive force, falling, shock or temperature change.
3. If DC voltage is applied to the component, silver migration may occur. Please pay full attention to avoid subjecting the component to DC voltage for long periods.
4. The resistor should be used as shown in Fig. A. A suitable resistance value should be chosen, preferably 1kΩ to 2kΩ. Instead of this measure, a diode may also be applied as shown in Fig. B.

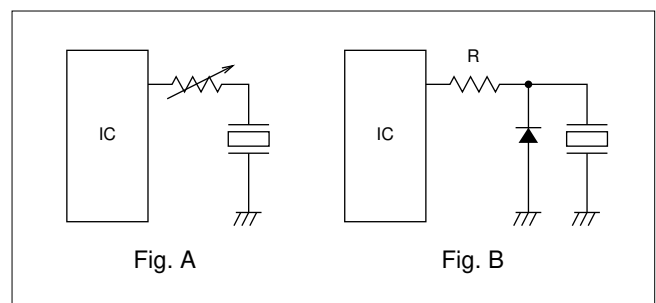
2. Washing of the component is not acceptable.

Because it is not sealed.

3. For Part Numbers mentioned below, please do not insert the component on double sided PCB with plated through hole. When melted solder touches to the base of lead terminal, a part of plastic case shall be melted and it may cause electrical failure.

• Part Number

PKM13EPYH4002-B0/PKM17EPP-2002-B0
 PKM17EPPH4001-B0/PKM22EPPH2001-B0
 PKM22EPPH4001-B0/PKM22EPPH4007-B0



5. Avoid excessive pulling of lead wire because wire may break or soldering point may come off.

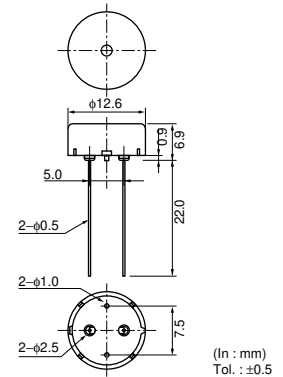
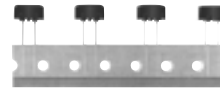
Piezoelectric Sound Components



Piezoelectric Sounders External Drive Pin Type Taping

Taking advantage of extensive automatic insertion design technology and materials experience, Murata has developed standard taping type piezoelectric sounders.

This Murata technology supports labor and cost saving activities.



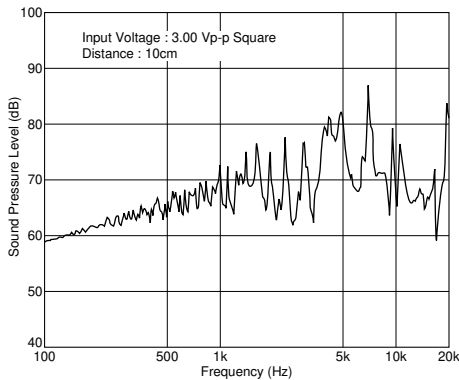
3

■ Features

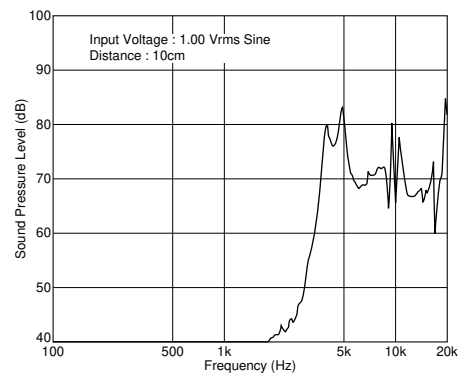
1. Lead dimension: Improved mouting reliability (cut & clinch) due to round terminal
2. High and stable mountability
3. Ammo packaging

Part Number	Sound Pressure Level (dB)	Sound Pressure Level (Ref. only) (dB)	Operating Voltage Range	Capacitance (nF)	Operating Temp. Range (°C)	Storage Temp. Range (°C)
PKM13EPYH4000-A0	70 min. [3Vp-p,4kHz,square wave,10cm]	70 min. [1Vrms,4kHz,sine wave,10cm]	30.0 Vp-p max.	5.5 ±30% [1kHz]	-40 to +85	-40 to +85

■ Freq. Response (Square Wave 3Vp-p, 10cm)



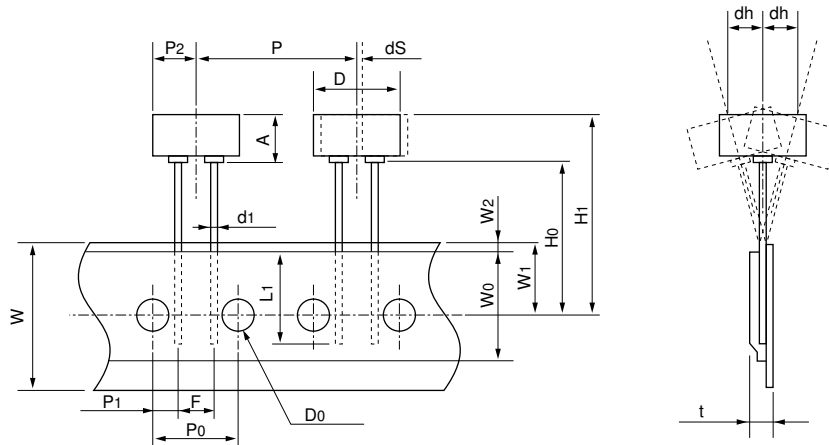
■ Freq. Response (Sine Wave 1Vrms, 10cm)



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■ Taping Dimension



Item	Code	Nominal Value	Tol.	Remarks
Width of diameter	D	ø12.6	±0.5	
Height of component	A	6.9	±0.5	
Dimensions of terminal	d ₁	ø0.5	±0.1	
Lead length under the hold down tape	L ₁	8.0 min.	—	
Pitch of component	P	25.4	±0.5	
Pitch of sprocket	P ₀	12.7	±0.2	Tolerance for Pitches 10×P ₀ =127±2mm
Length from hole center to lead	P ₁	3.85	±0.7	
Length from hole center to component center	P ₂	6.35	±0.7	
Lead spacing	F	5.0	±0.5	
Slant forward or backward	dh	0	±1.0	360° : 1mm max.
Width of carrier tape	W	18.0	±0.5	
Width of hold down tape	W ₀	12.5 min.	—	Hold down tape does not exceed the carrier tape.
Position of sprocket hole	W ₁	9.0	±0.5	
Gap of hold down tape and carrier tape	W ₂	2.0 max.	—	
Distance between the center of sprocket hole and lead stopper	H ₀	18.0	±0.5	
Total height of component	H ₁	26.0 max.	—	
Diameter of sprocket hole	D ₀	ø4.0	±0.2	
Total thickness of tape	t	0.6	±0.2	
Body tilt	d _S	0	±1.0	

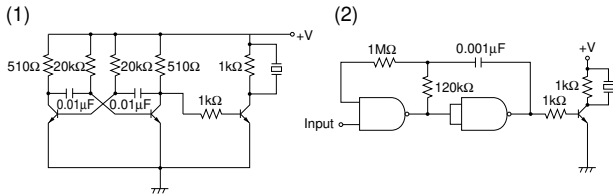
(in mm)

Piezoelectric Sounders (External Drive Pin Type Taping) Circuit/Notice

■ Circuit

The following are examples of externally driven circuits.

- (1) Unstable multi-vibrator using Tr.
- (2) Circuits using inverters or NAND gates.



3

■ Notice (Soldering and Mounting)

1. Notice (Soldering and Mounting)

(1) Soldering Iron

- (a) Lead terminals are immersed up to 1.5mm from components body in soldering bath of $+260 \pm 5$ degrees C for 10 ± 1.0 seconds, and then components shall be left in natural condition for 4 hours.
- (b) Lead terminal is directly contacted with the tip of soldering iron of $+350 \pm 0.5$ seconds, and then components shall be left in natural condition for 4 hours.

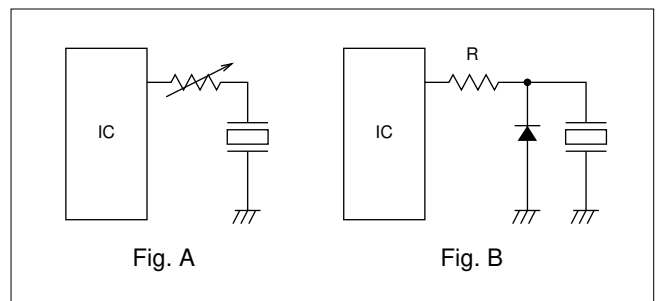
(2) Reflow

The component cannot withstand reflow soldering.

2. Please do not insert the component on double sided PCB with plated through hole. When melted solder touches to the base of lead terminal, a part of plastic case shall be melted and it may cause electrical failure.
3. Washing of the component is not acceptable. Because it is not sealed.

■ Notice (Handling)

1. The component may be damaged if mechanical stress exceeding specifications is applied.
2. Take care to protect operating circuit from surge voltage resulting from excessive force, falling, shock or temperature change.
3. If DC voltage is applied to the component, silver migration may occur. Please pay full attention to avoid subjecting the component to DC voltage for long periods.
4. The resistor should be used as shown in Fig. A. A suitable resistance value should be chosen, preferably $1k\Omega$ to $2k\Omega$. Instead of this measure, a diode may also be applied as shown in Fig. B.



5. Avoid excessive pulling of lead wire because wire may break or soldering point may come off.

Piezoelectric Sound Components



Piezoelectric Sounders External Drive Lead Wire Type

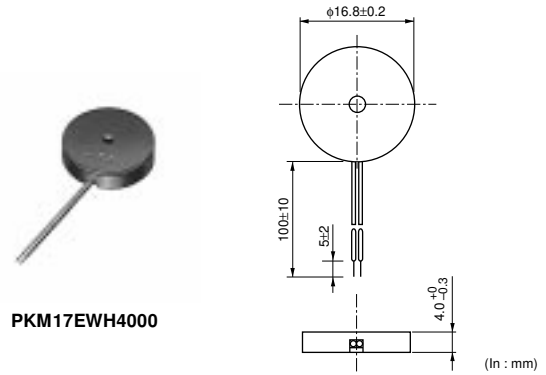
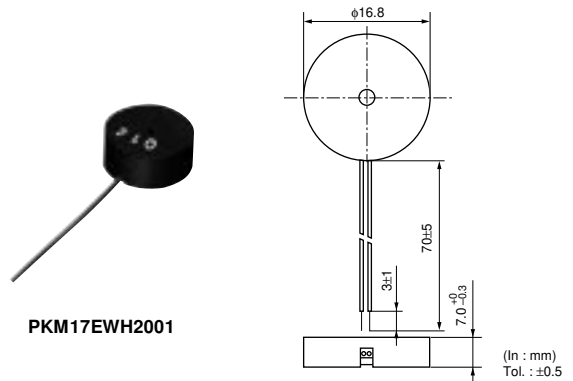
Microcomputers are widely used for microwave ovens, air conditioners, cars, toys, timers, and other alarm equipment. Externally driven piezoelectric sounders are used in digital watches, electronic calculators, telephones and other equipment. They are driven by a signal (ex.: 2048Hz or 4096Hz) from an LSI and provide melodious sound.

■ Features

1. Low power consumption
2. No contacts therefore, no noise and highly reliable

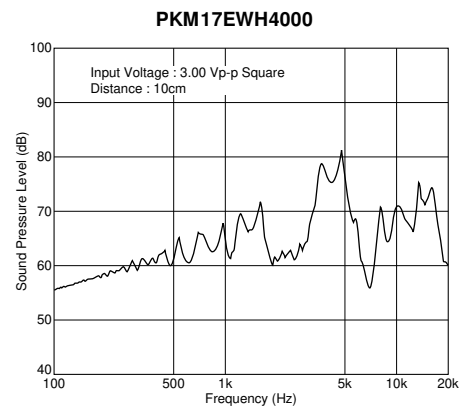
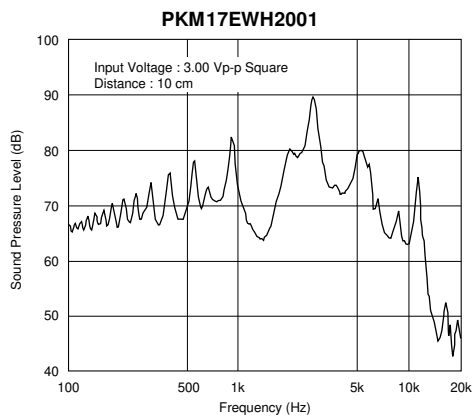
■ Applications

1. Various office equipment such as PPCs, printers and keyboards
2. Various home appliances such as microwave ovens
3. Confirmation sound of various audio equipment



Part Number	Sound Pressure Level (dB)	Sound Pressure Level (Ref. only) (dB)	Operating Voltage Range	Capacitance (nF)	Operating Temp. Range (°C)	Storage Temp. Range (°C)
PKM17EWH2001	72 min. [3Vp-p,2kHz,square wave,10cm]	70 min. [1Vrms,2kHz,sine wave,10cm]	7.0 Vp-p max.	40.0 ±30% [120Hz]	-20 to +70	-30 to +80
PKM17EWH4000	75 min. [3Vp-p,4kHz,square wave,10cm]	70 min. [1Vrms,4kHz,sine wave,10cm]	25.0 Vp-p max.	9.5 ±30% [1kHz]	-20 to +70	-30 to +80

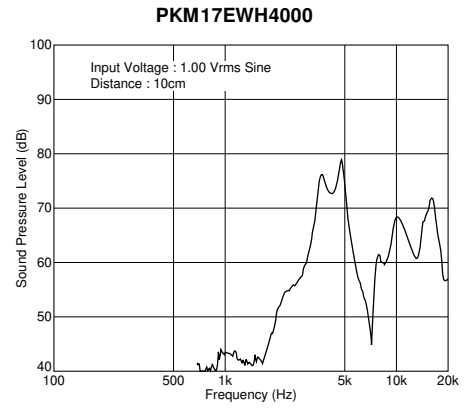
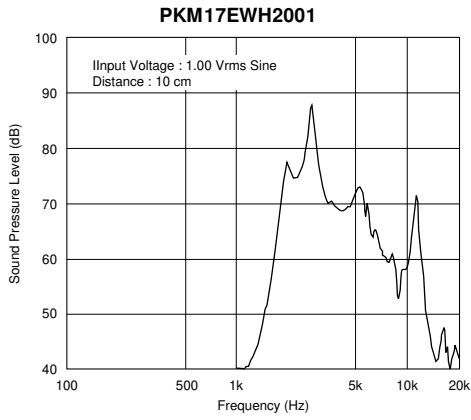
■ Freq. Response (Square Wave 3Vp-p, 10cm)



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■ Freq. Response (Sine Wave 1Vrms, 10cm)

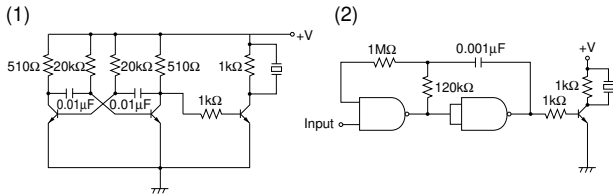


Piezoelectric Sounders (External Drive Lead Wire Type) Circuit/Notice

■ Circuit

The following are examples of externally driven circuits.

- (1) Unstable multi-vibrator using Tr.
- (2) Circuits using inverters or NAND gates.

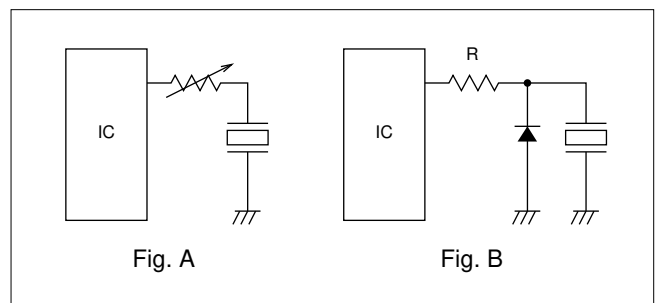


■ Notice (Soldering and Mounting)

Washing of the component is not acceptable, because it is not sealed.

■ Notice (Handling)

1. The component may be damaged if mechanical stress exceeding specifications is applied.
2. Take care to protect operating circuit from surge voltage resulting from excessive force, falling, shock or temperature change.
3. If DC voltage is applied to the component, silver migration may occur. Please pay full attention to avoid subjecting the component to DC voltage for long periods.
4. The resistor should be used as shown in Fig. A.
 A suitable resistance value should be chosen, preferably 1kΩ to 2kΩ. Instead of this measure, a diode may also be applied as shown in Fig. B.



5. Avoid excessive pulling of lead wire because wire may break or soldering point may come off.

Piezoelectric Sound Components



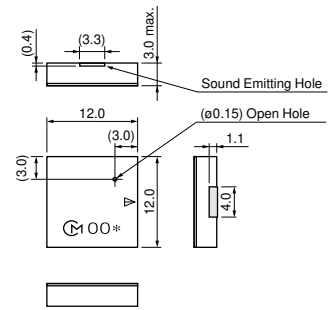
Piezoelectric Sounders External Drive SMD Type

Taking advantage of extensive acoustic and mechanical design technology and high performance ceramics, Murata has developed SMD piezoelectric sounders that suit the thin, high-density design of electronic equipment.

■ Features

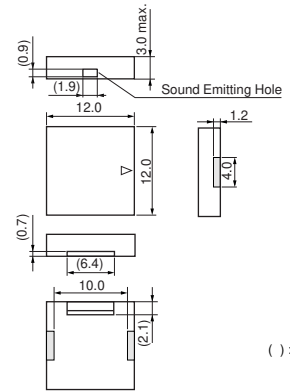
1. Small, thin and lightweight
2. High sound pressure level and clear sound
3. Reflowable
4. Tape & Reel supply

PKLCS1212E2000-R1



() : Ref. only
(in mm)
Tol. ±0.2

PKLCS1212E4001-R1

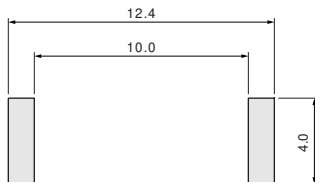


() : Ref. only
(in mm)
Tol. ±0.2

5

Part Number	Sound Pressure Level (dB)	Operating Voltage Range (Vp-p)	Operating Temp. Range (°C)	Storage Temp. Range (°C)	Use
PKLCS1212E2000-R1	70 min.[3Vp-p,2kHz,square wave,10cm]	25 max.	-20 to +70	-30 to +80	For consumer electronics
PKLCS1212E20A0-R1	70 min.[3Vp-p,2kHz,square wave,10cm]	25 max.	-40 to +85	-40 to +85	For automotive electronics
PKLCS1212E4001-R1	75 min.[3Vp-p,4kHz,square wave,10cm]	25 max.	-20 to +70	-30 to +80	For consumer electronics
PKLCS1212E40A1-R1	75 min.[3Vp-p,4kHz,square wave,10cm]	25 max.	-40 to +85	-40 to +85	For automotive electronics

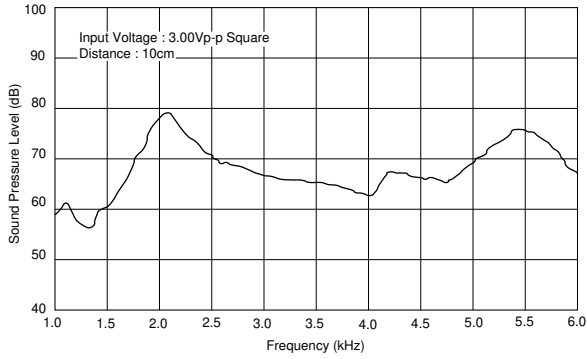
■ Standard Land Pattern Dimensions



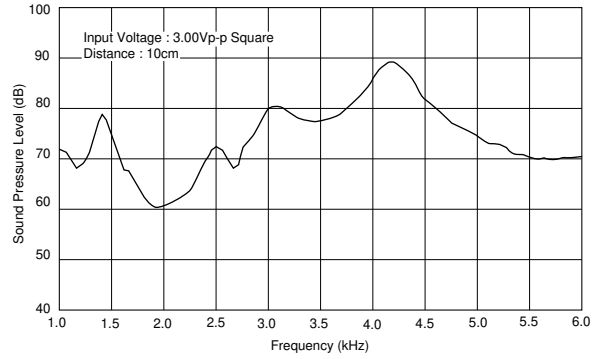
(in mm)

■ Freq. Response (Square Wave 3Vp-p, 10cm)

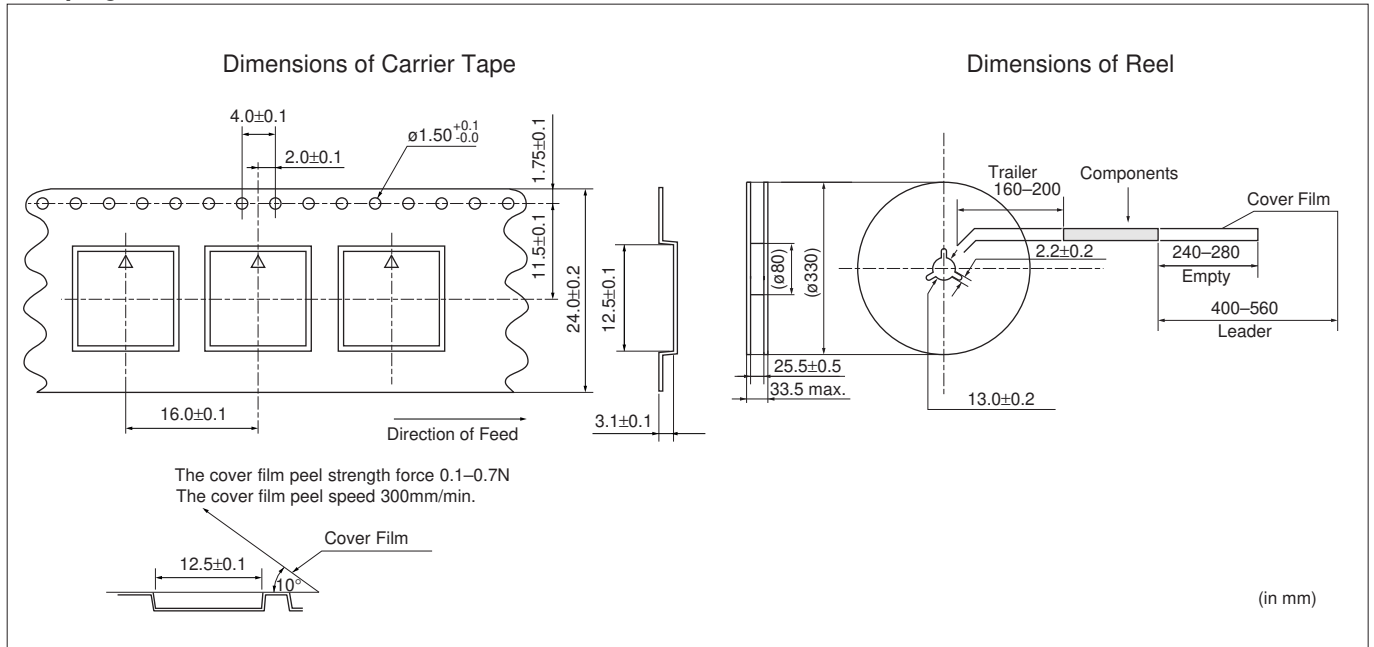
PKLCS1212E2000-R1



PKLCS1212E4001-R1



■ Taping Dimension



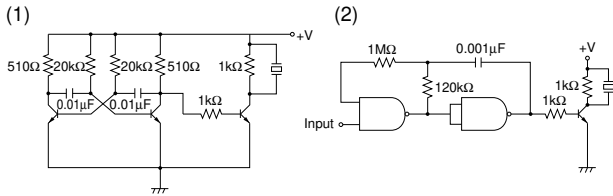
5

Piezoelectric Sounders (External Drive SMD Type) Circuit/Notice

■ Circuit

The following are examples of externally driven circuits.

- (1) Unstable multi-vibrator using Tr.
- (2) Circuits using inverters or NAND gates.

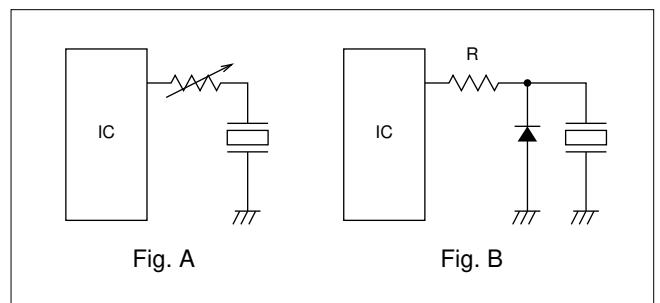


■ Notice (Soldering and Mounting)

Washing of the component is not acceptable, because it is not sealed.

■ Notice (Handling)

1. The component may be damaged if mechanical stress exceeding specifications is applied.
2. Take care to protect operating circuit from surge voltage resulting from excessive force, falling, shock or temperature change.
3. If DC voltage is applied to the component, silver migration may occur. Please pay full attention to avoid subjecting the component to DC voltage for long periods.
4. The resistor should be used as shown in Fig. A.
 A suitable resistance value should be chosen, preferably 1kΩ to 2kΩ. Instead of this measure, a diode may also be applied as shown in Fig. B.



5. Avoid excessive pulling of lead wire because wire may break or soldering point may come off.

5

Piezoelectric Sound Components



Piezoelectric Ringers (PIEZORINGER®)

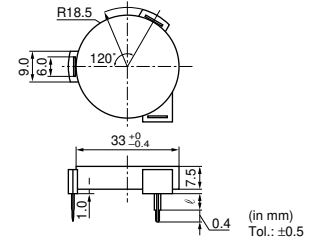
As the result of rapid development of ICs in telephones, demand for piezoelectric sounders as telephone ringers has also rapidly increased. To effectively satisfy this rising demand, Murata provides a suitable piezoelectric sounder called "PIEZORINGER" with the following features.

■ Features

1. Extremely clear sound
2. Since it is voltage driven, the power consumption is quite negligible.
3. It can be driven directly from ICs.
4. Thin and lightweight



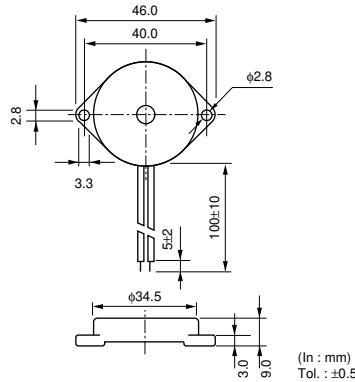
PKM33EPH1201C



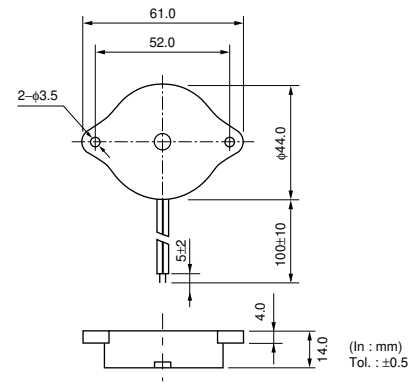
Part Number	ℓ
PKM33EPH1201C	5.0
PKM33EPH1202C	0



PKM34EWH1101C/1201C



PKM44EWH1001C



Pin Type

Part Number	Sound Pressure Level (dB)	Sound Pressure Level (Ref. only) (dB)	Operating Voltage Range	Capacitance (nF)	Operating Temp. Range (°C)	Storage Temp. Range (°C)
PKM33EPH1201C	68 min. [30Vp-p, 1.2kHz, square wave, 1m]	65 min. [1Vrms, 1.2kHz, sine wave, 10cm]	40.0 Vp-p max.	40.0 ±30% [120Hz]	-20 to +70	-30 to +80

Lead Wire Type

Part Number	Sound Pressure Level (dB)	Sound Pressure Level (Ref. only) (dB)	Operating Voltage Range	Capacitance (nF)	Operating Temp. Range (°C)	Storage Temp. Range (°C)
PKM34EWH1101C	70 min. [30Vp-p, 1.1kHz, square wave, 1m]	60 min. [1Vrms, 1.1kHz, sine wave, 10cm]	40.0 Vp-p max.	40.0 ±30% [120Hz]	-20 to +70	-30 to +80
PKM34EWH1201C	70 min. [30Vp-p, 1.2kHz, square wave, 1m]	60 min. [1Vrms, 1.2kHz, sine wave, 10cm]	60.0 Vp-p max.	32.0 ±30% [120Hz]	-20 to +70	-30 to +80
PKM44EWH1001C	75 min. [30Vp-p, 1kHz, square wave, 1m]	70 min. [1Vrms, 1kHz, sine wave, 10cm]	30.0 Vp-p max.	68.0 ±30% [120Hz]	-20 to +70	-30 to +80