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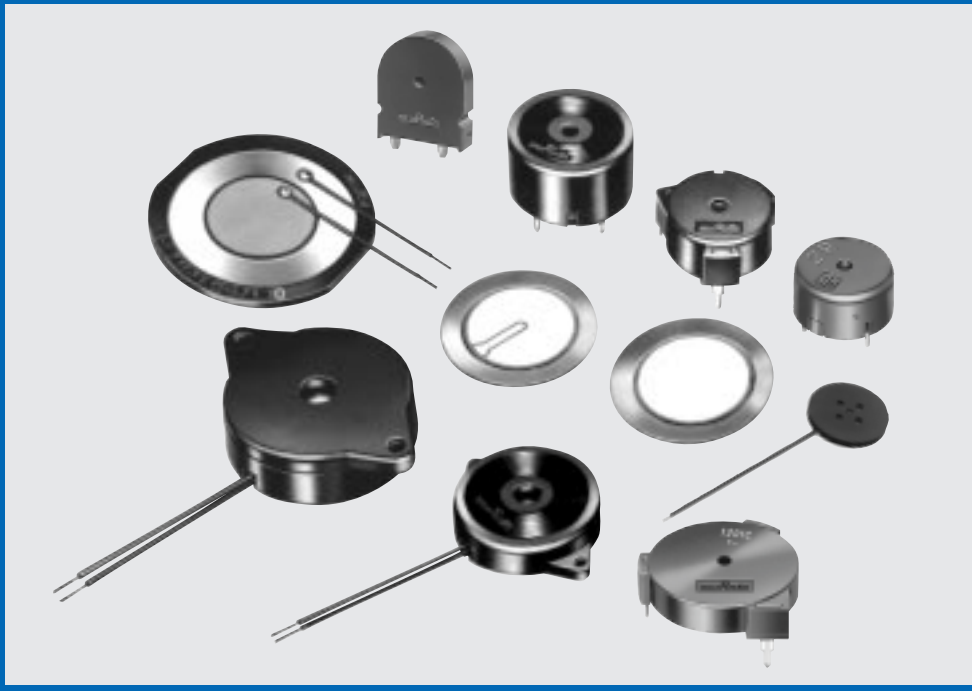
Piezoelectric Sound Components

PIEZOELECTRIC SOUND COMPONENTS



muRata Innovator in Electronics

Murata
Manufacturing Co., Ltd.

Cat.No.P37E-14

INTRODUCTION

Recently, technological innovations are being rapidly introduced in the area of Office Automation (OA) equipment, VCR, and Communication equipment, etc.. The core technologies behind these innovations are multifunction, down-sizing and weight reduction. MURATA, as the leader of technologies for piezoelectric ceramics, has been successing to develop various unique products which meet needs in the advanced information society.
The "piezoelectric sound component", which is introduced herein, is also one of MURATA's original products.
Piezoelectric sound components are now drawing attention widely as suitable components for various electronic equipment like as OA equipment (ex. word-processor, typewriter, FAX machine, etc..),audio equipment (ex. radio-cassette, tape recorder, etc..), and telephone sets.
Also, the application range is expanding from a monitor sound for the controller to time signal, alarm, speaker, ringer and receiver for telephone set. So, now piezoelectric sound components are working as an " interface" between human and electrical equipment.
This catalog is providing various types of piezoelectric sound component which could help design of equipments to lead the best solution.

CONTENTS AND APPLICATION MATRIX OF PIEZOELECTRIC SOUND COMPONENTS

		Part Number \ Application	Tele-phone	Radio Cassette Tweeter	Watch	Clock	Medical Equip-ment	Gas Alarm	Camera	Toy	Bar Code Scanner	Type-Writer	Printer	Word Processor	Compact Disk	Micro-Wave Oven	Air Condi-tioner	Fan Heater	Page
Piezoelectric Diaphragm	External drive type	7BB-12-9		●	●	●	●		●	●									3
		7BB-15-6		●		●	●		●	●									
		7BB-20-3	●	●	●	●	●			●	●								
		7BB-20-6		●		●	●		●	●									
		7BB-27-3	●	●		●	●			●	●								
		7BB-27-3R5	●	●		●	●			●	●								
		7BB-27-4	●	●		●	●			●	●								
		7BB-35-3	●			●				●	●								
		7BB-41-2	●																
		7BB-50M-1	●																
		7SB-20-7		●	●	●	●		●										
		7MB-15-11		●															
		7MB-20-7		●		●				●									
		7MB-27-3		●		●				●									
		7MB-27-4		●		●				●									
		7NB-31R2-19R7DM-1	●																
		7NB-35-1	●																
		7SB-20-7A1		●					●										
	Self drive type	7BB-20-6C	●						●	●									4
		7BB-27-3C	●					●		●									
		7BB-27-4C	●					●		●	●								
		7BB-35-3C	●					●			●								
		7BB-41-2C	●																
		7SB-34R7-3C						●											
		7NB-27-2C	●																
		7NB-27-3C	●					●											
		7NB-27-4C	●					●											
Piezoelectric Sounder	External drive type	PKM17EW-2001	●																5—7
		PKM35-4A0	●			●	●		●	●	●	●	●	●	●		●		
		PKM11-4A0	●			●	●		●	●	●	●	●	●	●		●		
		PKM13EPY-4002	●	●		●	●			●	●	●	●	●	●		●	●	
		PKM17EPP-4001	●			●	●			●	●	●	●	●	●	●	●	●	
		PKM22EPP-2001	●			●	●			●		●	●	●	●	●	●	●	
		PKM22EPP-4001	●			●	●			●		●	●	●	●	●	●	●	
		PKM22EPP-4005	●			●	●			●		●	●	●	●	●	●	●	
		PKM22EPP-4007	●			●	●			●		●	●	●	●	●	●	●	
		PKM22EP-2001								●		●	●	●	●	●	●	●	
		PKM17EPT-4001								●		●	●	●	●	●	●	●	
		PKM22EPT-2001								●		●	●	●	●	●	●	●	
		PKM22EPT-4001								●		●	●	●	●	●	●	●	
		PKM13EPY-4000-TF01	●	●		●	●			●	●	●	●	●	●		●	●	8
		PKMC16E-4000-TY	●				●		●	●	●	●	●	●			●		9
	Self dirve type	PKM11-6A0	●			●	●		●	●	●	●	●	●	●		●	●	12—13
		PKM25-6A0	●			●	●			●		●	●	●	●		●	●	
		PKM29-3A0						●		●									
		PKM24SP-3805	●					●		●						●	●	●	
		PKM30SPT-2001								●			●	●		●			
		PKM30SPT-2501								●			●	●					
Piezoelectric Buzzer	With Circuit	PKB24SW-3301	●			●				●		●	●	●		●	●	●	14—15
		PKB6-5A0						●		●		●	●	●					
		PKB5-3A0						●		●		●	●	●					
		PKB24SPC-3601	●				●			●		●	●	●	●		●	●	
		PKB8-4A0	●					●		●		●	●	●	●		●	●	
		PKB30SPC-2001	●					●		●		●	●	●		●	●	●	
		PKB30SPC-3001	●					●		●		●	●	●		●	●	●	
Speaker		VSB41D25-07AR0	●							●									17—18
		VSB30EW-0701B	●							●									
		VSB50EW-0301B	●							●									

Fire Alarm, Burglar Alarm, Laundry Machine, Bath, Interphone, Chime, Pager, Back Buzzer, ME Instruments, Measuring Instruments, Vending Machine, Calculator, Automobile, Communication Radio, Hemadynamometer, Thermometer, Running meter, Facsimile, Audio timer, Automatic Controlling Devices.

PIEZOELECTRIC DIAPHRAGM

Piezoelectric Diaphragm External Drive/Self Drive type

■FEATURES

1. Very clear sound.
2. Ultra thin and light weight.
3. No contacts ; therefore, no noise and highly reliable.
4. Low power consumption for voltage type.

■APPLICATIONS

Clocks/Pagers/Calculators/Washing machine/
Various alarms (Burglar alarms, etc.)

■PART NUMBERING

(✻Please specify the part number when ordering.)

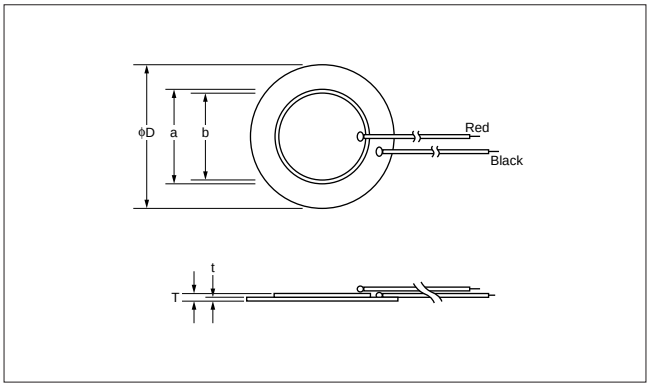
(Ex.) 7 N B – 31R2 – 19R7 D M – 1 C A O

❶ ❷ ❸ ❹ ❺ ❻ ❼ ❽ ❾ ❿ ⓫

❶Material of piezoelectric ceramic.
❷Material of metal plate.
❸Sound element, B : bender.
❹Metal plate diameter.
❺Dimensions of piezoelectric ceramic.
❻Form of piezoelectric ceramic.
❼Ni-electrode.
❽Oscillating frequency by measurement of nodal supporting.
❾With feedback electrode.
❿With lead wire.
⓫Other specifications.
✻❺❻❼ is omitted for silver electrode.

■DIMENSIONS

●Flat plate type



External Drive Type Specifications

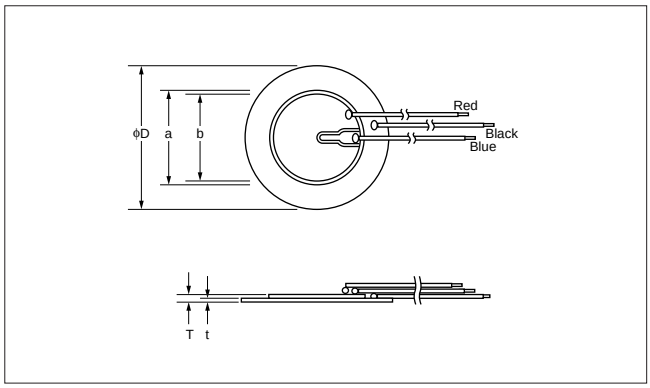
Part Number	EIAJ Part Number	Characteristics			Dimensions (mm)					Packaging Quantity (pcs.)	Remarks
		Resonant Freq. (kHz)	Resonant (Ω) Impedance	Capacitance (nF)	ϕD	a	b	T	t		
7BB-12-9	PD-SU2-C12-90	9.0 ±1.0	≦1000	8±30%	12.0	9.0	8.0	0.22	0.10	5120	Brass Plate
7BB-15-6	PD-SU2-C15-60	6.0 ±1.0	≦ 350	10±30%	15.0	10.0	9.0	0.22	0.10	8000	
7BB-20-3	PD-SU2-C20-36	3.6 ±0.6	≦ 500	20±30%	20.0	14.0	12.8	0.22	0.10	3000	
7BB-20-6	PD-SU2-C20-63	6.3 ±0.6	≦ 300	10±30%	20.0	14.0	12.8	0.42	0.20	1800	
7BB-27-3	PD-SU2-C27-36	3.6 ±0.6	≦ 600	10±30%	27.0	14.0	12.8	0.52	0.30	1500	
7BB-27-3R5	PD-SU2-C27-30	3.0 ±0.6	≦ 300	26±30%	27.0	19.7	18.2	0.32	0.15	2400	
7BB-27-4	PD-SU2-C27-46	4.6 ±0.5	≦ 200	20±30%	27.0	19.7	18.2	0.54	0.30	1500	
7BB-35-3	PD-SU2-C35-28	2.8 ±0.5	≦ 200	30±30%	35.0	25.0	23.0	0.53	0.30	800	
7BB-41-2	PD-SU2-C41-22	2.2 ±0.3	≦ 250	30±30%	41.0	25.0	23.0	0.63	0.40	400	
7BB-50M-1	PD-SU2-C50-10	1.0 ±0.3	≦1200	28±30%	50.0	25.0	23.0	0.44	0.20	600	Nickel-Plated Brass Plate
7SB-20-7	PD-SU2-C20-72	7.2 ±0.8	≦ 350	10±30%	20.0	14.0	12.8	0.42	0.20	1800	Stainless Plate
7MB-15-11	PD-SU2-C15-B0	11.0 ±3.0	≦ 400	5±30%	15.0	10.0	9.0	0.42	0.20	4000	Nickel plated Iron
7MB-20-7	PD-SU2-C20-72	7.2 ±1.0	≦ 350	10±30%	20.0	14.0	12.8	0.42	0.20	1800	
7MB-27-3	PD-SU2-C27-34	3.4 ±0.5	≦ 500	10±30%	27.0	14.0	12.8	0.42	0.20	1800	
7MB-27-4	PD-SU2-C27-46	4.6 ±0.6	≦ 300	18±30%	27.0	19.7	18.2	0.44	0.20	7000	
7NB-31R2-19R7DM-1	PD-SU2-C31-13	1.3 ±0.5	≦ 500	40±30%	31.2	19.7	18.2	0.22	0.10	1600	Iron Nickel Alloy Plate
7NB-35-1	PD-SU2-C35-12	1.16±0.2	≦ 500	38±30%	35.0	19.7	18.2	0.27	0.15	1200	
7BB-20-6A0	PD-SU2-C20-63	6.3 ±0.6	≦ 550	10±30%	20.0	14.0	12.8	0.42	0.20	600	•With lead wire AWG32 Length : 50±5 Strip : 5±2 (in mm)
7BB-27-4A0	PD-SU2-C27-46	4.6 ±0.5	≦ 200	20±30%	27.0	19.7	18.2	0.54	0.30	600	
7BB-35-3A0	PD-SU2-C35-28	2.8 ±0.5	≦ 200	30±30%	35.0	25.0	23.0	0.53	0.30	400	
7BB-41-2A0	PD-SU2-C41-22	2.2 ±0.3	≦ 300	30±30%	41.0	25.0	23.0	0.63	0.40	250	
7SB-20-7A1	PD-SU2-C20-72	7.2 ±0.8	≦ 350	10±30%	20.0	14.0	12.8	0.42	0.20	1600	With solder dot

PIEZOELECTRIC DIAPHRAGM

Piezoelectric Diaphragm External Drive/Self Drive type

■DIMENSIONS

●Flat plate type



■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 diaphragm without feedback electrode also have the same node diameters.

■NOTICE

1. LSI protection
   Protect LSI by using a varistor or zener diode.
   External heat or mechanical shock makes piezoelectric sounder to generate several 10 Vp-p voltage.
2. Migration prevention
   If DC voltage is applied to a piezoelectric sounder, silver migration may occur. Please pay full attention not to subject piezoelectric sounder to DC voltage for long periods.
3. Mounting method
   Since the mounting method deeply influences the resonant frequency and sound pressure level, the most suitable mounting method should be determined according to the acoustic and electrical requirements.
4. Connecting to ICs.
   (1) When capacitors or resistors are used to change the phoning frequency, the timbre may be distorted. (See Fig. 1)
   (2) Various types of Ringer ICs are made by various manufacters. Please refer to us or the IC manufacter for IC application.
   (3) When distortion, as on (1) above, has occurred, a resistor should be used as shown in Fig. 2. A suitable resistance value should be chosen, preferably 1kΩ - 2kΩ. Instead of this is measure, a diode may also be applied as shown in Fig. 3.

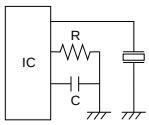


Fig.1

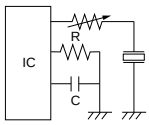


Fig.2

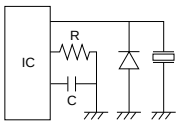


Fig.3

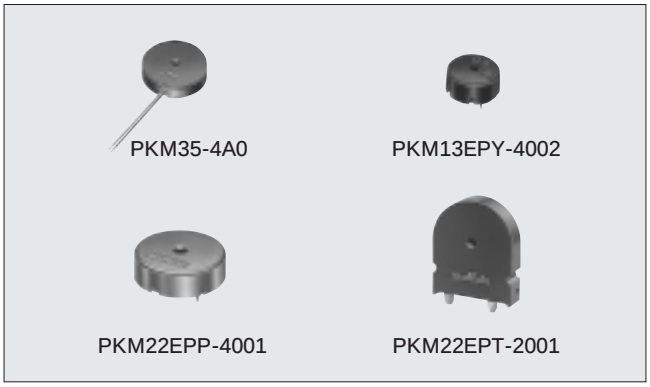
Self Drive Type Specifications

Part Number	EIAJ Part Number	Characteristics			Dimensions (mm)					Packaging Quantity (pcs.)	Remarks
		Resonant Freq. (kHz)	Resonant (Ω) Impedance	Capacitance (nF)	ϕD	a	b	T	t		
7BB-20-6C	PD-SU3-C20-63	6.3±0.6	≦500	8.5±30%	20.0	14.0	12.8	0.42	0.20	1800	Brass Plate
7BB-27-3C	PD-SU3-C27-30	3.0±0.5	≦300	35±30%	27.0	19.7	18.2	0.27	0.15	2400	
7BB-27-4C	PD-SU3-C27-46	4.6±0.5	≦200	18±30%	27.0	19.7	18.2	0.54	0.30	1500	
7BB-35-3C	PD-SU3-C35-28	2.8±0.5	≦200	24±30%	35.0	25.0	23.0	0.53	0.30	800	
7BB-41-2C	PD-SU3-C41-22	2.2±0.3	≦250	24±30%	41.0	25.0	23.0	0.63	0.40	400	
7SB-34R7-3C	PD-SU3-C35-31	3.1±0.3	≦150	24±30%	34.7	25.0	23.4	0.50	0.25	800	Stainless Plate
7NB-27-2C	PD-SU3-C27-22	2.2±0.5	≦300	27±30%	27.0	19.7	18.2	0.22	0.10	3000	Iron Nickel Alloy Plate
7NB-27-3C	PD-SU3-C27-30	3.0±0.5	≦300	24±30%	27.0	19.7	18.2	0.32	0.15	1800	
7NB-27-4C	PD-SU3-C27-38	3.8±0.5	≦300	19±30%	27.0	19.7	18.2	0.42	0.20	1800	
7BB-20-6CA0	PD-SU3-C20-63	6.3±0.6	≦800	8.5±30%	20.0	14.0	12.8	0.42	0.20	600	•With lead wire AWG32 Length : 50±5 Strip : 5±2 (in mm)
7BB-27-4CA0	PD-SU3-C27-46	4.6±0.5	≦200	18±30%	27.0	19.7	18.2	0.54	0.30	600	
7BB-35-3CA0	PD-SU3-C35-28	2.8±0.5	≦200	24±30%	35.0	25.0	23.0	0.53	0.30	400	
7BB-41-2CA0	PD-SU3-C41-22	2.2±0.3	≦350	24±30%	41.0	25.0	23.0	0.63	0.40	250	

PIEZOELECTRIC SOUNDER

Piezoelectric Sounder External Drive type

Now, 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

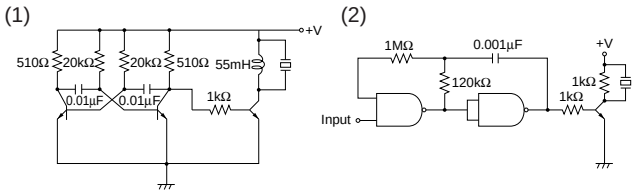
1. Low power consumption.
2. No contacts ; therefore, no noise and highly reliable.

■APPLICATIONS

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

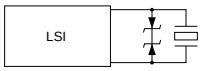
■CIRCUIT

The following are examples of externally driven circuits.
(1) Unstable multi-vibrator using Tr.
(2) Circuits using inverters or NAND gates.



■NOTICE

1. LSI protection
   Protect LSI by using a varistor or zener diode.
   External heat or mechanical shock makes piezoelectric sounder to generate several 10 Vp-p voltage.



2. Migration prevention
   If DC voltage is applied to a piezoelectric sounder, silver migration may occur. Please pay full attention not to subject piezoelectric sounder to DC voltage for long periods.
3. Sound pressure test
   Test the sound pressure level on an actual condition. The frequency response depends on acoustic impedance of the surroundings.

■SPECIFICATIONS

Lead Wire Type

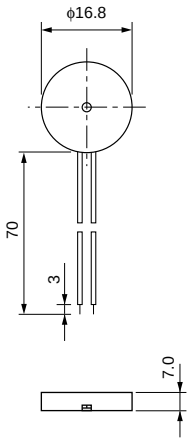
Part Number	EIAJ Part Number	Sound Pressure Level [dB] (3Vp-p Square wave 10cm)	Sound Pressure Level [dB] (1Vrms sine wave 10cm) (Ref. only)	Capacitance [nF]	Max. Input Voltage [Vp-p]	Operating Temp. Range [℃]	Storage Temp. Range [℃]	Packaging Quantity [pcs]
PKM17EW-2001	PS-RW2-C17-20	72 min. (2kHz)	70 min. (2kHz)	40±30% (120Hz)	7	−20 to +70	−30 to +80	250
PKM35-4A0	PS-RW2-C17-40	75 min. (4kHz)	70 min. (4kHz)	9.5±30% (1kHz)	25			500
PKM11-4A0	PS-RW2-C24-40	75 min. (4kHz)	75 min. (4kHz)	10±30% (1kHz)				400

Pin Type

Part Number	EIAJ Part Number	Sound Pressure Level [dB] (3Vp-p Square wave 10cm)	Sound Pressure Level [dB] (1Vrms sine wave 10cm) (Ref. only)	Capacitance [nF]	Max. Input Voltage [Vp-p]	Operating Temp. Range [℃]	Storage Temp. Range [℃]	Packaging Quantity [pcs]
PKM13EPY-4002	PS-RP2-C13-40	70 min. (4kHz)	70 min. (4kHz)	5.5±30% (1kHz)	25	−20 to +70	−30 to +80	1980
PKM17EPP-4001	PS-RP2-C17-40	72 min. (4kHz)	70 min. (4kHz)	7±30% (1kHz)				1200
PKM22EPP-2001	PS-RP2-C22-20	70 min. (2kHz)	70 min. (2kHz)	19±30% (120Hz)				750
PKM22EPP-4001	PS-RP2-C22-40	75 min. (4kHz)	75 min. (4kHz)	12±30% (1kHz)				900
PKM22EPP-4005	PS-RP2-C22-40	75 min. (4kHz)	75 min. (4kHz)	12±30% (1kHz)				750
PKM22EPP-4007	PS-RP2-C22-40	85 min. (4kHz)	85 min. (4kHz)	12±30% (1kHz)				750
PKM22EP-2001	PS-RP2-C22-20	75 min. (2kHz)	75 min. (2kHz)	17±30% (120Hz)				360
PKM17EPT-4001	PS-RP2-V20-40	75 min. (4kHz)	75 min. (4kHz)	9.5±30% (1kHz)				180
PKM22EPT-2001	PS-RP2-V27-20	70 min. (2kHz)	70 min. (2kHz)	19±30% (120Hz)				1200
PKM22EPT-4001	PS-RP2-V27-40	85 min. (4kHz)	85 min. (4kHz)	10±30% (1kHz)				1200

■DIMENSIONS

PKM17EW-2001



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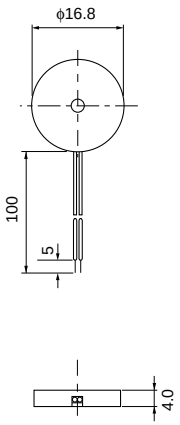
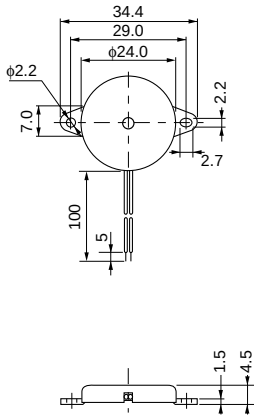
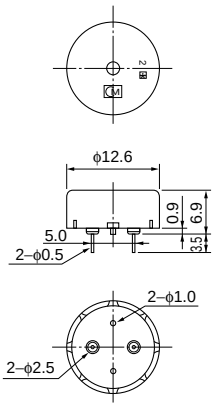


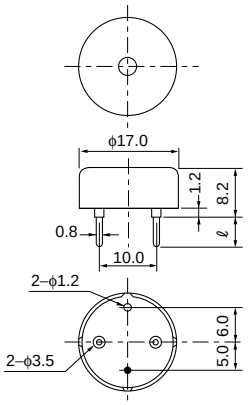
PKM11-4A0



PKM13EPY-4002

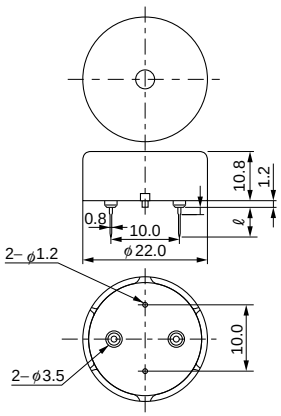


PKM17EPP-4001



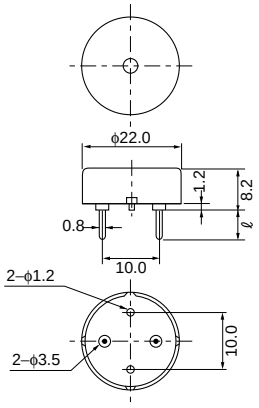
Part Number	ℓ (mm)
PKM17EPP-4001	6.5
PKM17EPP-4002	3.5

PKM22EPP-2001



Part Number	ℓ (mm)
PKM22EPP-2001	6.5
PKM22EPP-2002	3.5

PKM22EPP-4001



Part Number	ℓ (mm)
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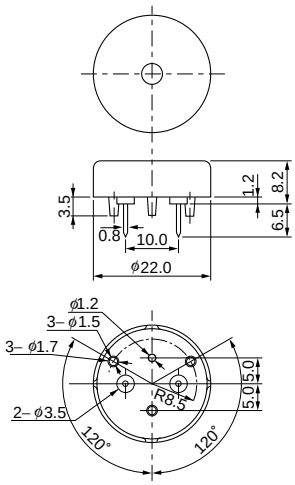
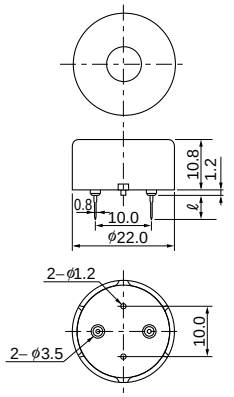
PKM22EPP-4002	3.5

PKM22EPP-4005

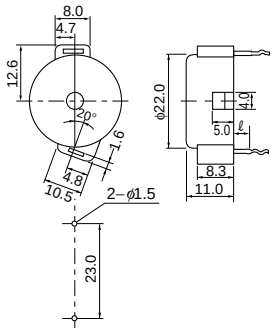


PKM22EPP-4007



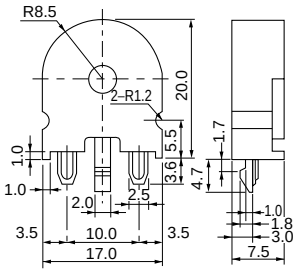
Part Number	ℓ (mm)
PKM22EPP-4007	6.5
PKM22EPP-4012	3.5

PKM22EP-2001



Part Number	ℓ (mm)
PKM22EP-2001	4.0
PKM22EP-2002	8.0
PKM22EP-2003	12.0

PKM17EPT-4001



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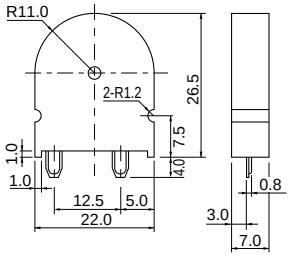

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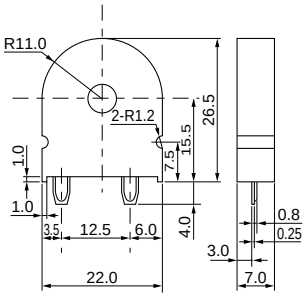
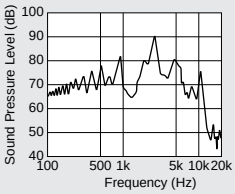


(in mm)

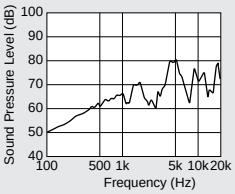
■FREQUENCY RESPONSE

(Input Volt : Square Wave 3Vp-p
Measuring Distance : 10cm)

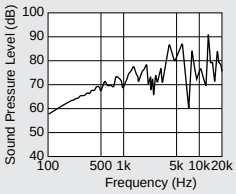
PKM17EW-2001



PKM35-4A0



PKM11-4A0



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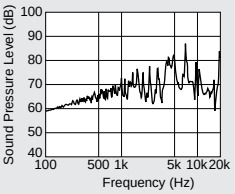
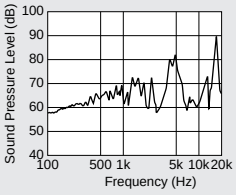
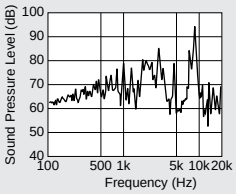


PKM17EPP-4001



PKM22EPP-2001



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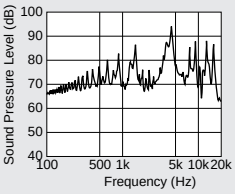
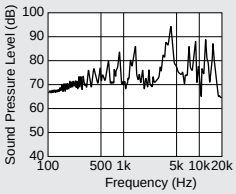
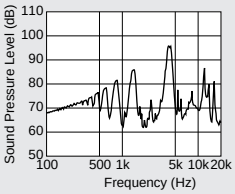


PKM22EPP-4005



PKM22EPP-4007



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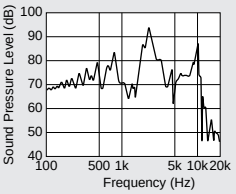

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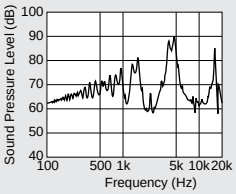

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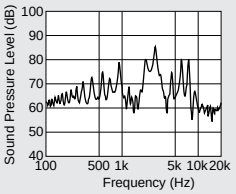

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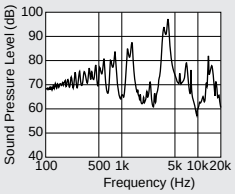
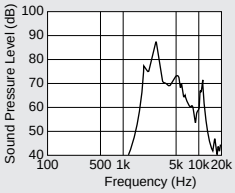
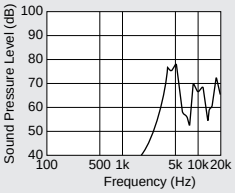


(Input Volt : Sine Wave 1Vrms
Measuring Distance : 10cm)

PKM17EW-2001



PKM35-4A0



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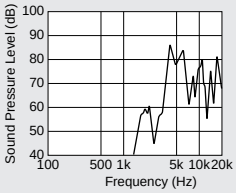

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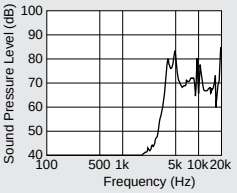

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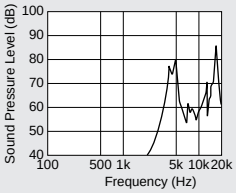

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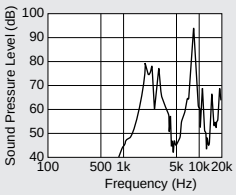

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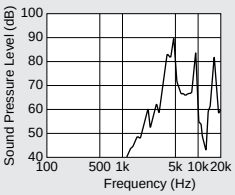

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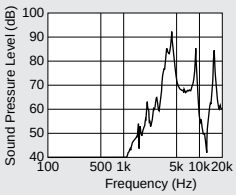
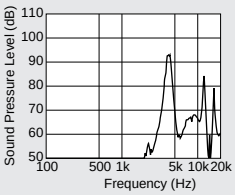
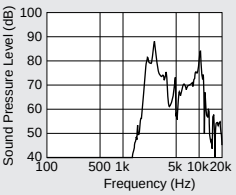


PKM22EPP-4007



PKM22EP-2001



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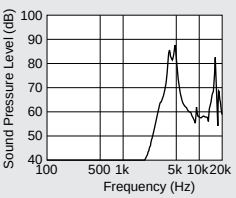

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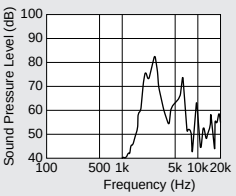

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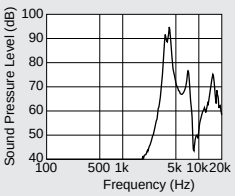
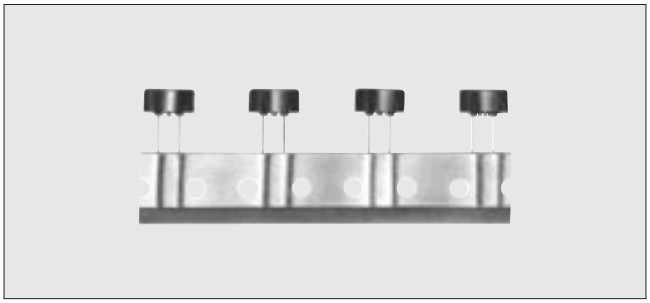


PIEZOELECTRIC SOUNDER

Taping Type Piezoelectric Sounder

Taking advantage of extensive automatic insertion designing technology and materials experience, Murata has developed standard taping type piezoelectric sounder. This Murata technology supports labor and cost saving activities.



■FEATURES

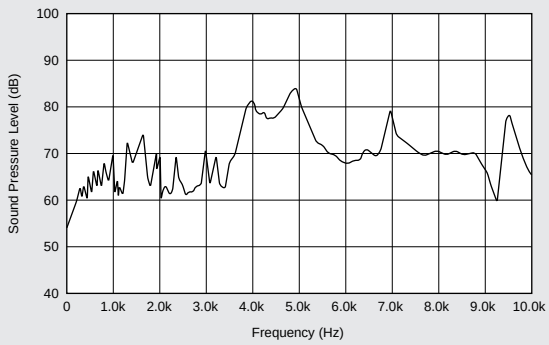
1. High and stable mountability.
2. Flat packaging.
3. Minimum quantity (order in sets only) : 500 pcs

■SPECIFICATIONS

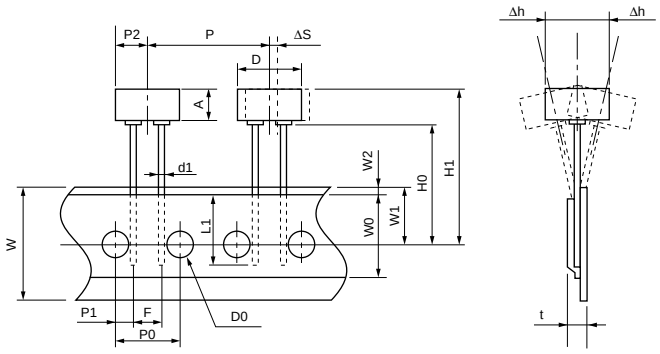
Part Number	PKM13EPY-4000-TF01
Sound Pressure Level (3Vp-p Square wave 10cm)	70dB min. (4kHz)
Capacitance	5.5nF±30% (1kHz)
Max. Input Voltage	25Vp-p
Operating Temp. Range	−20℃ to +70℃
Storage Temp. Range	−30℃ to +80℃
Packaging Quantity	500 pcs/1 pack

■FREQUENCY RESPONSE

Input Volt : Square Wave 3V p-p Measuring Distance : 10cm



■DIMENSIONS



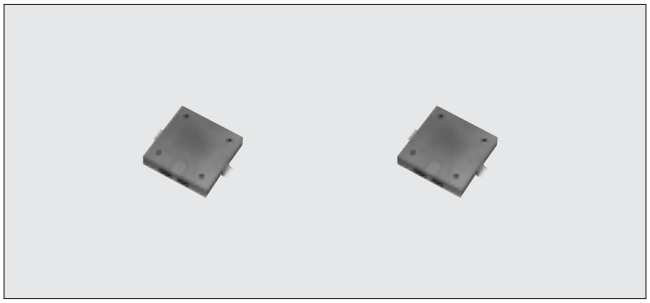
(in mm)

Item	Code	Nominal Value	Tol.	Remarks
Width of Diameter	D	ϕ12.6	±0.5	
Height of Resonator	A	6.9	±0.5	
Dimensions of Terminal	d1	ϕ0.5	±0.1	
Lead length Under The Hold down Tape	L1	8.0 min.	—	
Pitch of Component	P	25.4	±0.5	
Pitch of Sprocket	P0	12.7	±0.2	Tolerance for Pitches 10×P0=127±2mm
Length from Hole Center to Lead	P1	3.85	±0.7	
Length from Hole Center to Component Center	P2	6.35	±0.7	
Lead Spacing	F	5.0	±0.5	
Slant to The Forward or Backward	Δh	0	±1.0	360°: 1mm max.
Width of Carrier Tape	W	18.0	±0.5	
Width of Hold down Tape	W0	12.5 min.	—	Hold down tape does not exceed the carrier tape
Position of Sprocket Hole	W1	9.0	±0.5	
Gap of Hold Down Tape and Carrier Tape	W2	2.0 max.	—	
Distance Between The Center of Sprocket Hole and Lead Stopper	H0	18.0	±0.5	
Total Height of Resonator	H1	26.0 max.	—	
Diameter of Sprocket Hole	D0	ϕ4.0	±0.2	
Total Thickness of Tape	t	0.6	±0.2	
Body Tilt	ΔS	0	±1.0	

PIEZOELECTRIC SOUNDER

SMD Piezoelectric Sounder

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



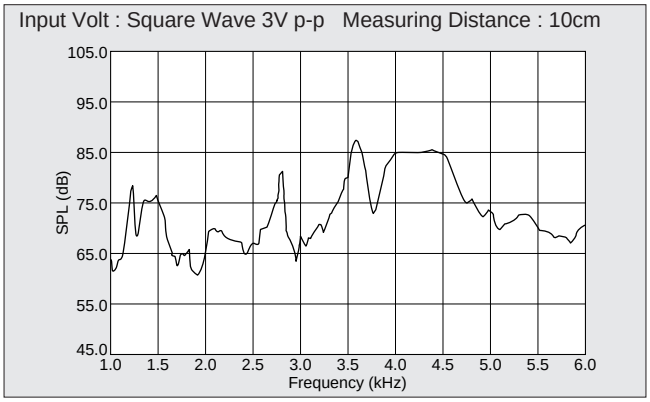
■FEATURES

1. High S.P.L. and clear sound.
2. Reflowable.
3. Tray packaging.
3. Minimum quantity (order in sets only) : 1,200 pcs

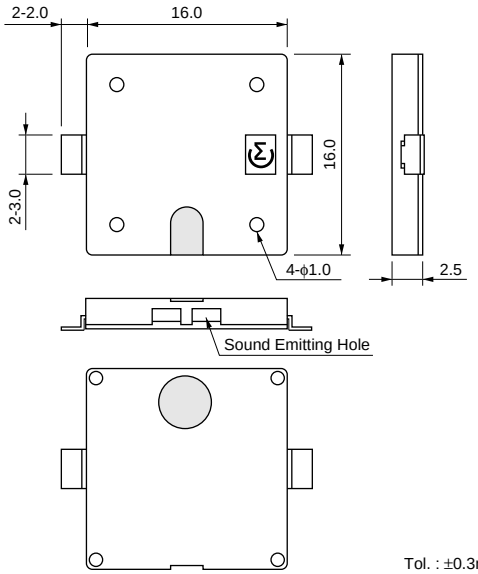
■SPECIFICATIONS

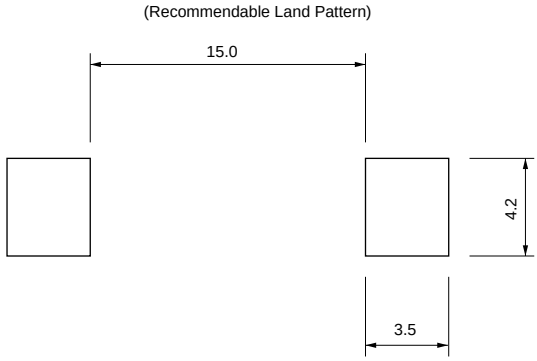
Part Number	PKMC16E-4000-TY
Sound Pressure Level (3Vp-p Square wave 10cm)	75dB min. (4kHz)
Capacitance	14nF±30% (1kHz)
Max. Input Voltage	25Vp-p
Operating Temp. Range	−20℃ to +70℃
Storage Temp. Range	−30℃ to +80℃

■FREQUENCY RESPONSE



■DIMENSIONS





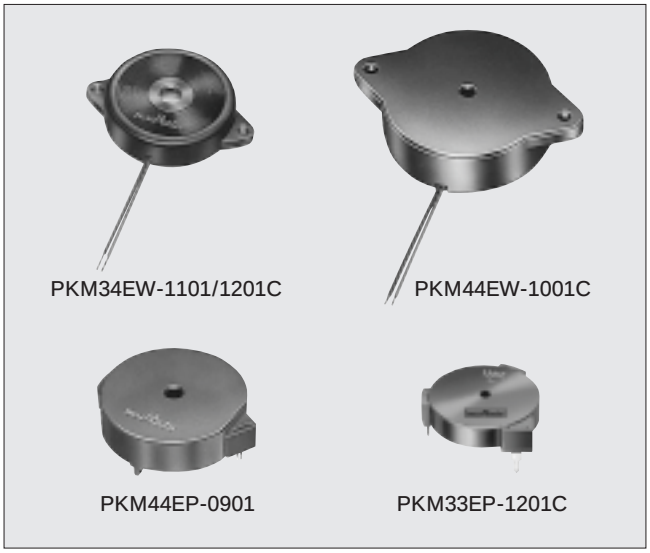
Tol. : ±0.3mm

(in mm)

PIEZOELECTRIC SOUNDER

Piezoelectric Sounder/PIEZORINGER® for Telephones

As the result of rapid development of ICs in telephones, demand for piezoelectric sounder 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. Extremely thin and light.

■SPECIFICATIONS

Lead Wire Type

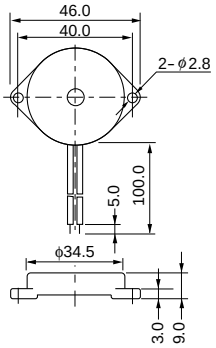
Part Number	EIAJ Part Number	Sound Pressure Level [dB] (30Vp-p Square wave 1m)	Sound Pressure Level [dB] (1Vrms sine wave 10cm) (Ref. only)	Capacitance [nF] (120Hz)	Max. Input Voltage [Vp-p]	Operating Temp. Range [℃]	Storage Temp. Range [℃]	Packaging Quantity [pcs]
PKM34EW-1101C	PS-RW2-C34-11	70 min. (1.1kHz)	60 min. (1.1kHz)	40±30%	40	−20 to +70	−30 to +80	25
PKM34EW-1201C	PS-RW2-C34-12	70 min. (1.2kHz)	60 min. (1.2kHz)	32±30%	60			
PKM44EW-1001C	PS-RW2-C44-10	75 min. (1kHz)	70 min. (1kHz)	68±30%	30			

Pin Type

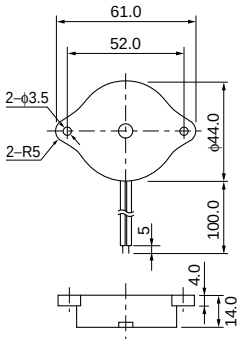
Part Number	EIAJ Part Number	Sound Pressure Level [dB] (30Vp-p Square wave 1m)	Sound Pressure Level [dB] (1Vrms sine wave 10cm) (Ref. only) (1kHz)	Capacitance [nF] (120Hz)	Max. Input Voltage [Vp-p]	Operating Temp. Range [℃]	Storage Temp. Range [℃]	Packaging Quantity [pcs]
PKM44EP-0901	PS-RP2-C44-09	70 min. (1kHz)	60 min.	68±30%	40	−20 to +70	−30 to +80	160
PKM33EP-1201C	PS-RP2-C33-12		65 min.	40±30%				300

■DIMENSIONS

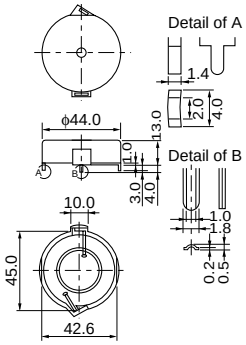
PKM34EW-1101/1201C



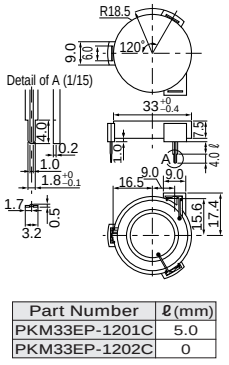
PKM44EW-1001C



PKM44EP-0901



PKM33EP-1201C



Part Number	ℓ(mm)
PKM33EP-1201C	5.0
PKM33EP-1202C	0

(in mm)

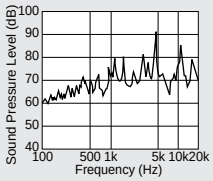
PIEZOELECTRIC SOUNDER

Piezoelectric Sounder/PIEZORINGER® for Telephones

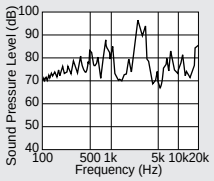
■FREQUENCY RESPONSE

(Input Volt : Square Wave 30Vp-p
Measuring Distance : 1m)

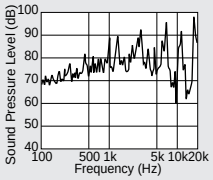
PKM34EW-1101/1201C



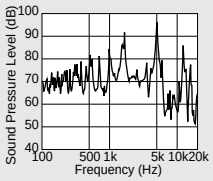
PKM44EW-1001C



PKM44EP-0901

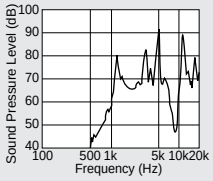


PKM33EP-1201C

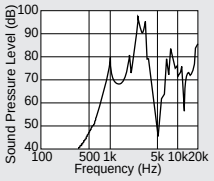


(Input Volt : Sine Wave 1Vrms
Measuring Distance : 10cm)

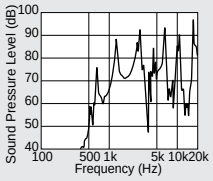
PKM34EW-1101/1201C



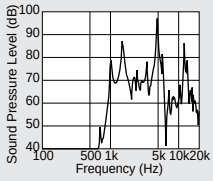
PKM44EW-1001C



PKM44EP-0901



PKM33EP-1201C



■NOTICE

1. LSI protection
   Protect LSI by using a varistor or zener diode.
   External heat or mechanical shock makes piezoelectric sounder to generate several 10 Vp-p voltage.
2. Migration prevention
   If DC voltage is applied to a piezoelectric sounder, silver migration may occur. Please pay full attention not to subject piezoelectric sounder to DC voltage for long periods.
3. Mounting method
   Since the mounting method deeply influences the resonant frequency and sound pressure level, the most suitable mounting method should be determined according to the acoustic and electrical requirements.
4. Connecting to ICs.
   (1) When capacitors or resistors are used to change the phoning frequency, the timbre may be distorted. (See Fig. 1)
   (2) Various types of Ringer ICs are made by various manufacters. Please refer to us or the IC manufacter for IC application.
   (3) When distortion, as on (1) above, has occurred, a resistor should be used as shown in Fig. 2. A suitable resistance value should be chosen, preferably 1kΩ - 2kΩ. Instead of this is measure, a diode may also be applied as shown in Fig. 3.

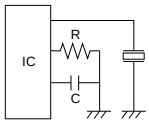


Fig.1

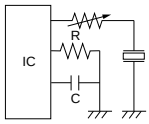


Fig.2

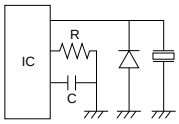


Fig.3

PIEZOELECTRIC SOUNDER

Piezoelectric Sounder Self Drive Type

Piezoelectric sounder self drive type requires only simple circuit and Dc power supply. Since this type uses resonant system, it is also available for alarms which need large sound volume.

■APPLICATIONS

1. Gas alarms, burglar alarms, smoke detectors.
2. Air conditioners, Microwave ovens, washing machines and other home-electronic appliance controlled by microcomputer.
3. Toys, game machines.

■CIRCUITS

The standard self-driven circuits utilizes transistor switching. The circuit constants shown in the table below are optimally chosen to maintain stable oscillation. So please follow it when you design a circuit.

■NOTICE

Please pay attention to following points in order piezoelectric sounder to maintain stable oscillation.

1. Be sure to use a low impedance type power supply.
2. Do not cover the hole with tape or other obstacle.
3. There should not be any obstacle within 15mm from the top of sounder.

■SPECIFICATIONS

Lead Wire Type

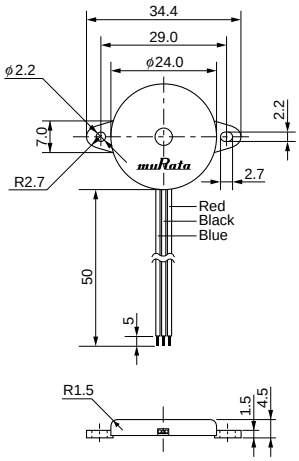
Part Number	EIAJ Part Number	Sound Pressure Level [dB] (12VDC, 10cm)	Oscillating Frequency [kHz]	Current Consumption [mA]	Operating Voltage Range [VDC]	Operating Temp. Range [℃]	Storage Temp. Range [℃]	Packaging Quantity [pcs]
PKM11-6A0	PS-RW3-C24-65	80 min.	6.5±0.7	8 max.	3.0 to 20.0	−20 to +70	−30 to +80	400

Pin Type

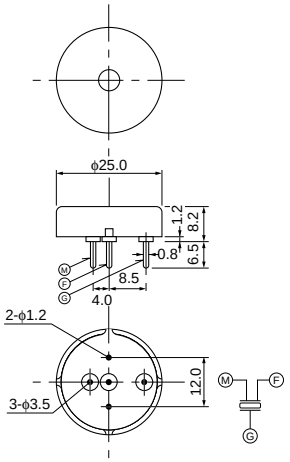
Part Number	EIAJ Part Number	Sound Pressure Level [dB] (12VDC, 10cm)	Oscillating Frequency [kHz]	Current Consumption [mA]	Operating Voltage Range [VDC]	Operating Temp. Range [℃]	Storage Temp. Range [℃]	Packaging Quantity [pcs]
PKM25-6A0	PS-RP3-C25-68	90 min.	6.8±0.7	10 max.	3.0 to 20.0	−20 to +70	−30 to +80	630
PKM29-3A0	PS-RP3-C39-34	105 min. (9VDC)	3.4±0.4	20 max.	4.5 to 18.0			180
PKM24SP-3805	PS-RP3-C24-38	90 min.	3.8±0.4	12 max.	3.0 to 20.0			360
PKM30SPT-2001	PS-RP3-V33-20	75 min.	2.0±0.3	20 max.				70
PKM30SPT-2501	PS-RP3-V33-25	80 min.	2.5±0.3	20 max.				

■DIMENSIONS

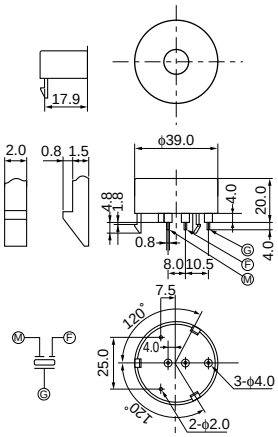
PKM11-6A0



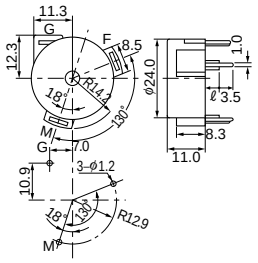
PKM25-6A0



PKM29-3A0

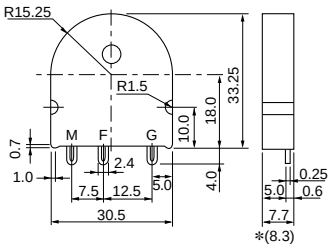


PKM24SP-3805



Part Number	ℓ (mm)
PKM24SP-3805	4.0
PKM24SP-3810	8.0
PKM24SP-3807	12.0
PKM24SP-3801	14.0

PKM30SPT-2001/2501

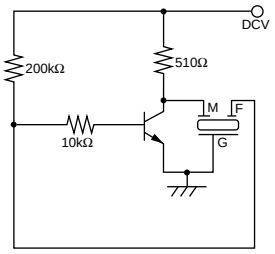


* (8.3) : cover type
(PKM30SPT-2002/2502)

(in mm)

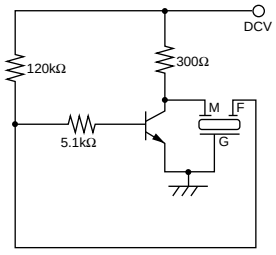
■STANDARD CIRCUIT EXAMPLES

PKM11-6A0



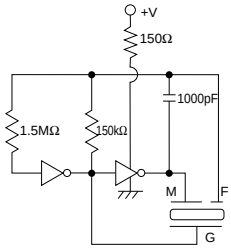
Tr : 2SC458C or equivalent
M : Red, F : Blue, G : Black

PKM25-6A0



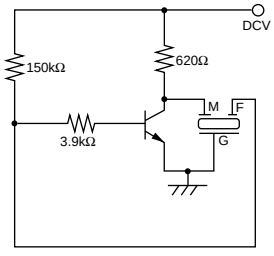
Tr : 2SC458C or equivalent

PKM29-3A0



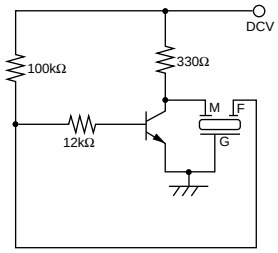
IC : CD4049A or equivalent

PKM24SP-3805



Tr : 2SC1815Y or equivalent

PKM30SPT-2001/2501



Tr : 2SC1815Y or equivalent

PIEZOELECTRIC BUZZER

Piezoelectric Buzzer

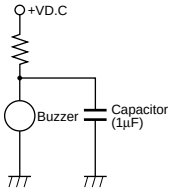
This is unified piezoelectric sounder which has piezoelectric diaphragm of 3 terminals connected to self drive circuit, and it easily generates sound with only a DC power supply (DC3.0-20V). Using suitably designed resonant system, this type can be used where large sound volumes are needed.

■APPLICATIONS

1. Gas alarms, burglar alarms.
2. Air conditioners, microwave ovens and various types of microcomputer controlled home-electronic appliances.
3. Automobile speed alarms, navigators, car stereos and other automobile equipment.
4. Toys, games, and other simple electronic devices such as teaching aids.

■CIRCUITS

This type of piezoelectric buzzer is built in complete circuit ; so there is no need for another circuit for generating sound.
Resistors should not be connected in series to the power supply as this will produce irregular oscillation.
When resistor is necessary to control sound volume, use capacitor (1μF) parallel with the buzzer together.



■NOTICE

Please pay attention to following points in order piezoelectric sounder to maintain stable oscillation.

1. Do not cover the hole with tape or other obstacles.
2. There should not be any obstacle within 15mm from top of buzzer.
3. Please use these piezoelectric buzzer within the limit of rated voltage. Consult us if higher voltage type is required.

■SPECIFICATIONS

Lead Wire Type

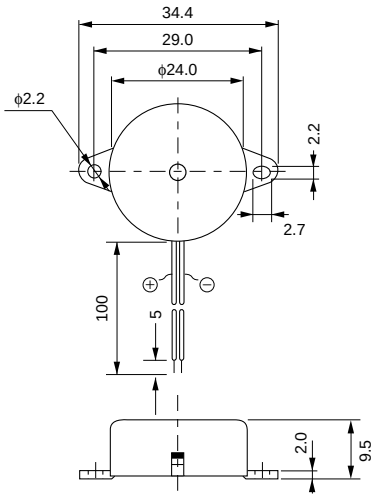
Part Number	EIAJ Part Number	Sound Pressure Level [dB] (12VDC, 10cm)	Oscillating Frequency [kHz]	Current Consumption [mA]	Operating Voltage Range [VDC]	Operating Temp. Range [℃]	Storage Temp. Range [℃]	Packaging Quantity [pcs]
PKB24SW-3301	PB-RWD-C24-33	80 min.	3.3±0.5	12 max.	3.0 to 20.0	−20 to +70	−30 to +80	50
PKB6-5A0	PB-RWD-C34-47	95 min.	4.7±0.7					25
PKB5-3A0	PB-RWD-C42-28		2.8±0.5					

Pin Type

Part Number	EIAJ Part Number	Sound Pressure Level [dB] (12VDC, 10cm)	Oscillating Frequency [kHz]	Current Consumption [mA]	Operating Voltage Range [VDC]	Operating Temp. Range [℃]	Storage Temp. Range [℃]	Packaging Quantity [pcs]
PKB24SPC-3601	PB-RPD-C24-36	90 min.	3.6±0.5	16 max.	3.0 to 15.0	−20 to +70	−30 to +80	650
PKB8-4A0	PB-RPD-C24-38	95 min.	3.8±0.5	13 max.	3.0 to 20.0			90
PKB30SPC-2001	PB-RPD-C30-20	92 min.	2.0±0.4	15 max.	3.0 to 15.0			320
PKB30SPC-3001	PB-RPD-C30-27		2.7±0.4					

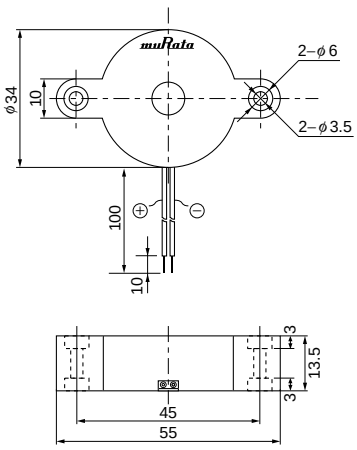
■DIMENSIONS

PKB24SW-3301



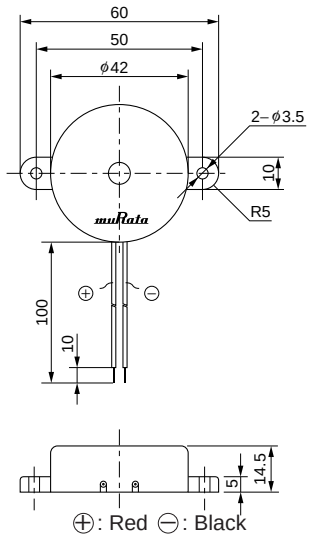
⊕: Red ⊖: Black

PKB6-5A0



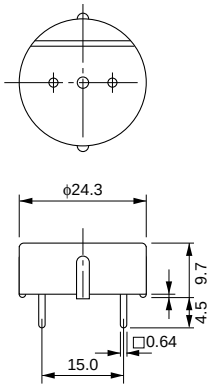
⊕: Red ⊖: Black

PKB5-3A0

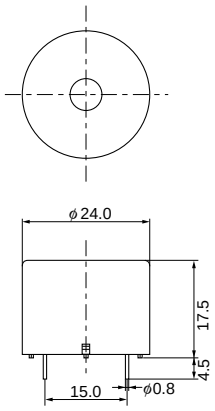


⊕: Red ⊖: Black

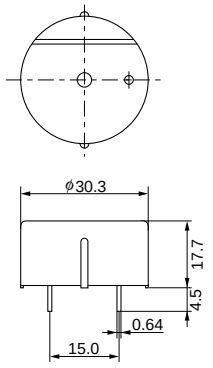
PKB24SPC-3601



PKB8-4A0



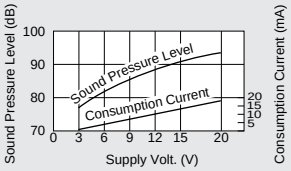
PKB30SPC-2001/3001



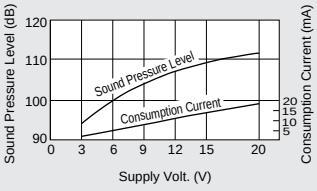
(in mm)

■VOLTAGE:SOUND PRESSURE LEVEL / VOLTAGE:CURRENT CONSUMPTION CHARACTERISTICS (Measuring Distance : 10cm)

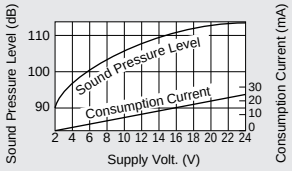
PKB24SW-3301



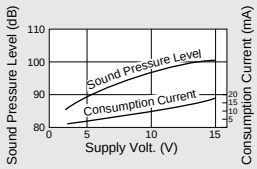
PKB6-5A0



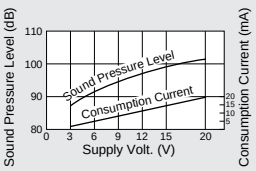
PKB5-3A0



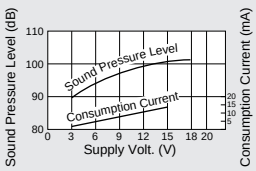
PKB24SPC-3601



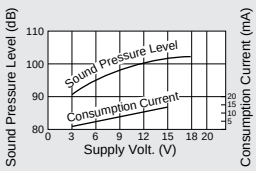
PKB8-4A0



PKB30SPC-2001

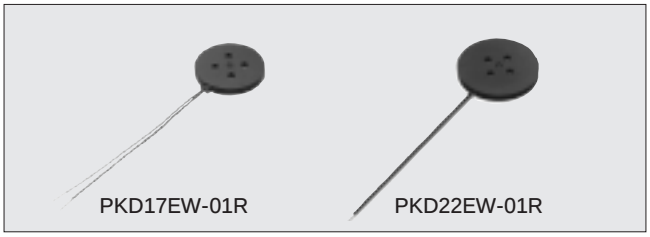


PKB30SPC-3001



Piezoelectric Receiver for Telephones

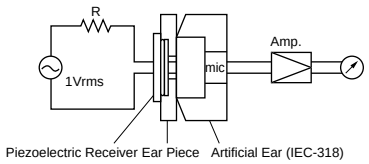
According to the progress of LSI and digital technology, more sophisticated and multi-functioning telephones have been developed for office automation.
The piezoelectric receiver PKD series for telephone (CERAMIPHONE®) use was developed to function as an electroacoustic transducer, especially for portable equipment such as mobile communication requiring small and thin components.



■FEATURES

1. Thin shape, Light Weight.
2. Low current consumption and good matching impedance for a voltage drive.

■METHOD OF MEASUREMENT

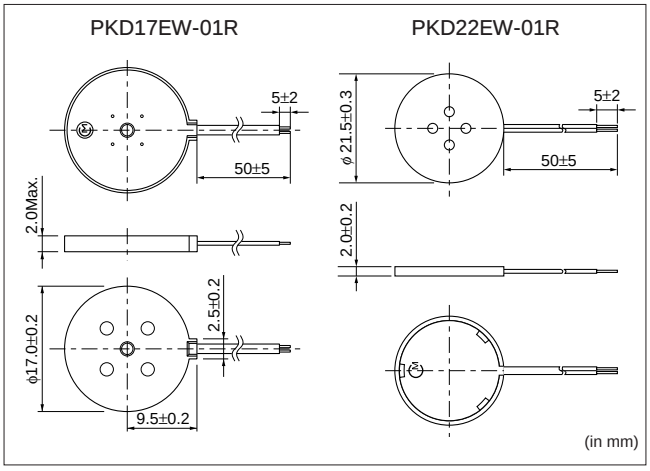


PKD17EW-01R : R=500Ω
PKD22EW-01R : R=1kΩ

■NOTICE

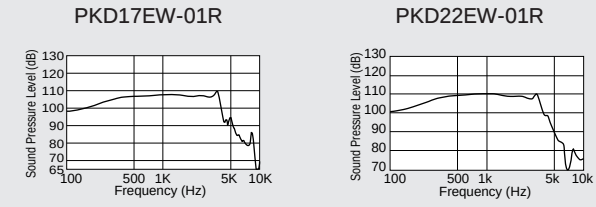
Sound Pressure Level-Frequency Characteristics are affected by the handset design. During design in check balance of the sound emitting hole and the air damping hole.

■DIMENSIONS



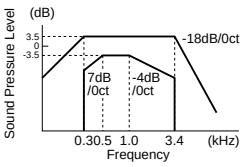
■FREQUENCY RESPONSE

(1Vrms, IEC-318 coupler)



■SPECIFICATIONS

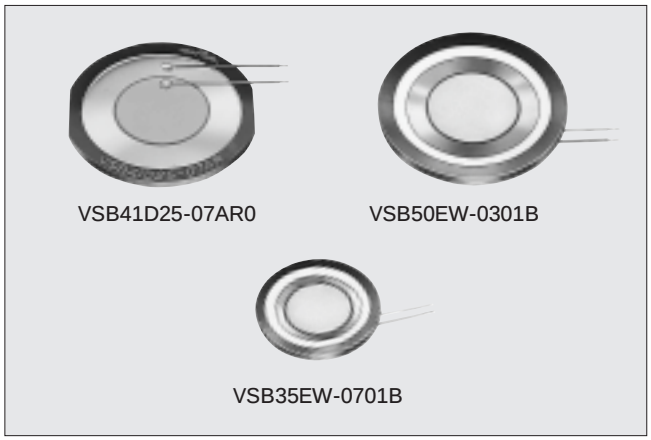
Lead Wire Type

Part Number	PKD17EW-01R	PKD22EW-01R
Sound Pressure Level [dB] (1kHz, 1Vrms, IEC-318 coupler)	107±3	109±3.5
Sound Pressure Level-Frequency Characteristics (0dB at 1kHz, 1Vrms IEC-318 coupler)		
Operating Temp. Range [℃]	−20 to +70	
Storange Temp. Range [℃]	−30 to +70	
Packaging Quantity [pcs]	450	300

PIEZOELECTRIC SPEAKER

Piezoelectric Speaker (CERAMITONE®)

As voice synthesizing techniques with ICs and LSIs are rapidly progressed, human voice synthesizing devices are put into practical use for portable calculators, clocks, vending machines, translating machines and so forth. In order to meet the demand, Murata has developed Piezoelectric Speaker best suited for making synthesized voice or melody.



■FEATURES

1. High efficiency compared with conventional electromagnetic type speakers.
2. Ultra-thin and light-weight.
3. High impedance with less power consumption.
4. No electric noise, because they have no mechanical contacts.
5. Direct drive by IC is available.

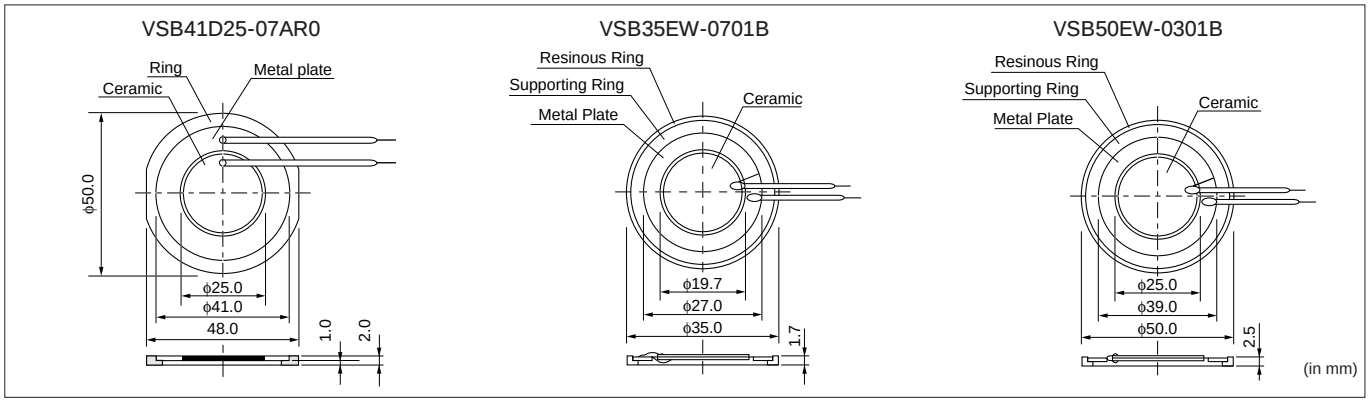
■NOTICE

1. Please pay full attention not to subject piezoelectric sounder to DC voltage for long periods.
2. Protect LSI by using a varistor or zener diode. External heat or mechanical shock makes piezoelectric sounder to generate several 10 Vp-p voltage.

■SPECIFICATIONS

Part Number	Freq. Range [Hz]	Capacitance [nF] (120Hz)	Impedance [Ω] (1kHz)	Lowest Resonant Freq. [Hz]	Max. Input	Operating Temp. Range [℃]	Storange Temp. Range [℃]	Packaging Quantity [pcs]
VSB41D25-07AR0	500 to 20k	140±30%	1200	900	30Vp-p	−20 to +70	−30 to +80	100
VSB35EW-0701B	600 to 20k	340±35%	600	950	75mW			160
VSB50EW-0301B	250 to 20k	600±35%	300	400	150mW			80

■DIMENSIONS



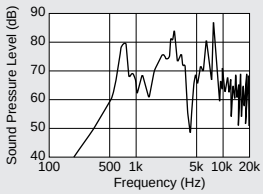
PIEZOELECTRIC SPEAKER

Piezoelectric Speaker (CERAMITONE®)

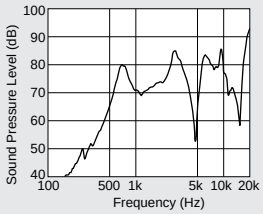
■FREQUENCY RESPONSE

(Input Volt : Sine Wave 1Vrms
Measuring Distance : 10cm)

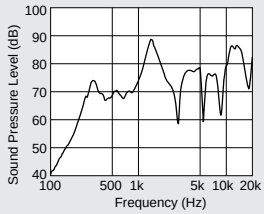
VSB41D25-07AR0



VSB35EW-0701B

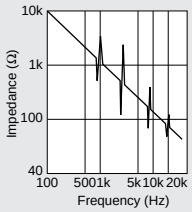


VSB50EW-0301B

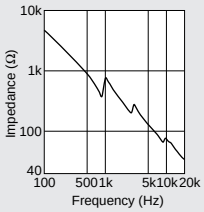


■IMPEDANCE / FREQUENCY CHARACTERISTICS

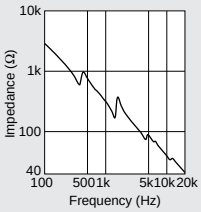
VSB41D25-07AR0



VSB35EW-0701B



VSB50EW-0301B



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