TÜV CERT
EN ISO 9002
QA : 041008878

You're hearing
What we're producing

Condenser Microphone

SMD Products

Transducer

Buzzer

RINGFORD Products Limited

Welcome to the Ringford sound and microphone catalogue, In the catalogue you'll find a range of products to cover all your sounding and microphone application needs. We are convinced that the impressive scope of these products will show that Ringford is your good supplier for complete solutions, from first input to final output.

But first, let's take a look at what our business is all about and how we can support you.

Ringford Products Ltd. was founded in 1995, the company has steadily expanded operations in its global market on sounding and microphone products. As well as full range of sounding, microphone and related products, the Company's core products in categories as:
- Cellular & Mobile communications
- Health-care equipments
- OA & PCs equipments

Toward new business developments, the Company's aims to be its customers' strongest business partner, achieving solid market growth by providing innovative products and services. Our challenges is to response to the trends of a drastically changing market with faster R&D, faster products development and faster marketing, and marshal our full range of proprietary technologies to work toward greater competitiveness.

CONTENTS

ELECTRET CONDENSER MICROPHONE

You 're hearing
What we're producing

Electret Condenser Microphone

(Example)

CZ034 A P 40 2 H -X1

- Size (A=9.4X6.5mm)
- Connection (P=Pin, S=Solderless, "Blank"=Solder)
- Sensitvity (40=-40dB)
- Tolerance (2=+/- 2dB)
- Test condition (H="4.5V, 1.0Kohm", Otherwise please see spec.)
- Modification & Value Added

Model No.	Size (mm)	Connection	Directivity	Sensitivity Range (0dB=1V/Pa, 1KHz) (dB)	Operation Voltage (VDC)	External Resistor (Kohm)	Page No.
CZ034M	6.0 x 1.3	Solder	Omnidirectional	-38dB ~ -52dB	2.0	2.2	5
CZ034MP	6.0 x 1.3	Pin	Omnidirectional	-38dB ~ -52dB	2.0	2.2	
CZ034MS	6.0 x 1.3	Solderless	Omnidirectional	-38dB ~ -52dB	2.0	2.2	
CZ034T	6.0 x 1.5	Solder	Omnidirectional	-38dB ~ -52dB	2.0	2.2	6
CZ034TP	6.0 x 1.5	Pin	Omnidirectional	-38dB ~ -52dB	2.0	2.2	
CZ034TS	6.0 x 1.5	Solderless	Omnidirectional	-38dB ~ -52dB	2.0	2.2	
CZ034R	6.0 x 1.8	Solder	Omnidirectional	-38dB ~ -52dB	2.0	2.2	7
CZ034RP	6.0 x 1.8	Pin	Omnidirectional	-38dB ~ -52dB	2.0	2.2	
CZ034RS	6.0 x 1.8	Solderless	Omnidirectional	-38dB ~ -52dB	2.0	2.2	
CZ034H	6.0 x 2.2	Solder	Omnidirectional	-33dB ~ -49dB	2.0	2.2	8
CZ034HP	6.0 x 2.2	Pin	Omnidirectional	-33dB ~ -49dB	2.0	2.2	
CZ034HS	6.0 x 2.2	Solderless	Omnidirectional	-33dB ~ -49dB	2.0	2.2	
CZ034FB	6.0 x 2.7	Solder	Omnidirectional	-35dB ~ -49dB	2.0	2.2	9
CZ034FBP	6.0 x 2.7	Pin	Omnidirectional	-35dB ~ -49dB	2.0	2.2	
CZ034F	6.0 x 2.7	Solder	Omnidirectional	-38dB ~ -48dB	2.0	2.2	
CZ034FP	6.0 x 2.7	Pin	Omnidirectional	-38dB ~ -48dB	2.0	2.2	
CZ034FS	6.0 x 2.7	Solderless	Omnidirectional	-38dB ~ -48dB	2.0	2.2	
CZ034E	6.0 x 3.5	Solder	Omnidirectional	-33dB ~ -49dB	2.0	2.2	10
CZ034EP	6.0 x 3.5	Pin	Omnidirectional	-33dB ~ -49dB	2.0	2.2	
CZ034D	6.0 x 5.0	Solder	Omnidirectional	-34dB ~ -49dB	2.0	2.2	
CZ034DP	6.0 x 5.0	Pin	Omnidirectional	-34dB ~ -49dB	2.0	2.2	
CZ034V	9.4 x 4.5	Solder	Omnidirectional	-34dB ~ -48dB	4.5	2.2	11
CZ034VP	9.4 x 4.5	Pin	Omnidirectional	-34dB ~ -48dB	4.5	2.2	
CZ034A	9.4 x 6.5	Solder	Omnidirectional	-30dB ~ -48dB	4.5	1.0/2.2	
CZ034AP	9.4 x 6.5	Pin	Omnidirectional	-30dB ~ -48dB	4.5	1.0/2.2	
CZ034CPC	9.7 x 4.5	Pin	Omnidirectional	-34dB ~ -48dB	4.5	2.2	12
CZ034CPCR	9.7 x 4.5	Pin	Omnidirectional	-34dB ~ -48dB	4.5	2.2	
CZ034C	9.7 x 4.5	Solder	Omnidirectional	-32dB ~ -46dB	4.5	2.2	
CZ034CP	9.7 x 4.5	Pin	Omnidirectional	-32dB ~ -46dB	4.5	2.2	
CZ034C2P	9.7 x 4.5	Pin	Omnidirectional	-32dB ~ -46dB	4.5	2.2	
CZ034	9.7 x 6.5	Solder	Omnidirectional	-30dB ~ -48dB	4.5	1.0/2.2	13
CZ034P	9.7 x 6.5	Pin	Omnidirectional	-30dB ~ -48dB	4.5	1.0/2.2	
CZ034W	10 x 5.3	Solder	Omnidirectional	-31dB ~ -47dB	4.5	2.2	
CZ034WP	10 x 5.3	Pin	Omnidirectional	-31dB ~ -47dB	4.5	2.2	
CZ034J	4.5 x 3.0	Solder	Omnidirectional	-38dB ~ -52dB	2.0	2.2	14
CZ034JP	4.5 x 3.0	Pin	Omnidirectional	-38dB ~ -52dB	2.0	2.2	
CZ034FU	6.0 x 2.7	Solder	Unidirectional	-47dB ~ -58dB	2.0	2.2	
CZ034DU	6.0 x 5.0	Solder	Unidirectional	-47dB ~ -58dB	2.0	2.2	
CZ034IU	8.0 x 5.0	Solder	Unidirectional	-43dB ~ -55dB	1.5	0.68	15
CZ034CU	9.7 x 4.5	Solder	Unidirectional	-43dB ~ -55dB	1.5	0.68	
CZ034GU	9.7 x 5.2	Solder	Unidirectional	-43dB ~ -55dB	1.5	0.68	
CZ034U	9.7 x 6.5	Solder	Unidirectional	-43dB ~ -55dB	1.5	0.68	
CZ034FN	6.0 x 2.7	Solder	Noise Cancelling	-47dB ~ -58dB	2.0	2.2	16
CZ034FNP	6.0 x 2.7	Pin	Noise Cancelling	-47dB ~ -58dB	2.0	2.2	
CZ034DN	6.0 x 5.0	Solder	Noise Cancelling	-43dB ~ -55dB	1.5	0.68	
CZ034GN	9.7 x 5.2	Solder	Noise Cancelling	-43dB ~ -55dB	1.5	0.68	

We use "Pascal(Pa)" as the unit of sensitivity in our catalogue instead of "ubar". This is the recommendation of I.E.C. (International Electrotechnical Commission). To convert "ubar" to "Pascal", simply increase 20dB. Be sure you are adding a positive number to a negative number

Example : -62dB (0dB=1V/ubar) =-42 (0dB=1V/Pa)

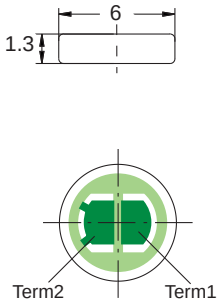
Cross Reference

Size	Ringford	"B"	"M"	"P"	"H"
6x1.3	CZ034M424	OBG-13L42			
	CZ034M444	OBG-13L44	WM-63GCT		
	CZ034M464	OBG-13L46	WM-63GCX		
	CZ034M484	OBG-13L48			
	CZ034MP444	OBG-13P44		EM-150	
	CZ034MP464	OBG-13P46		EM-150	
	CZ034MS444	OBG-13S44			
	CZ034MS464	OBG-13S46			
6x1.5	CZ034T444	OBG-15L44			
	CZ034T464	OBG-15L46			
	CZ034TP444	OBG-15P44			KUF4323
	CZ034TP464	OBG-15P46			KUF4323
	CZ034TS444	OBG-15S44		EM-146	KUF4323
	CZ034TS464	OBG-15S46		EM-146	KUF4323
6x1.8	CZ034R444	OBG-18L44		EM-147	KUB4223
	CZ034R464	OBG-18L46		EM-147	KUB4223
	CZ034RP444	OBG-18P44		EM-140	KUB4223
	CZ034RP464	OBG-18P46		EM-140	KUB4223
	CZ034RS444	OBG-18S44		EM-147	KUB4223
	CZ034RS464	OBG-18S46		EM-147	KUB4223
6x2.2	CZ034H423	OB-22L42			KUF-3323
	CZ034H443	OB-22L44	WM-64(A,C,K)T	EM-131/EM-134	KUF-3323
	CZ034H463	OB-22L46	WM-64(A,C,K)X	EM-131/EM-134	KUF-3323
	CZ034HP423	CB-22P42			KUF-3323/KUB3323
	CZ034HP443	OB-22P44	WM-64B(C,K)T	EM-140	KUF-3323/KUB3323
	CZ034HP463	OB-22P46	WM-64B(C,K)X	EM-140	KUF-3323/KUB3323
	CZ034HS423	OB-22S42			KUF-3323/KUB3323
	CZ034HS443	OB-22S44	WM-64MCT		KUF-3323/KUB3323
	CZ034HS463	OB-22S46	WM-64MCX		KUF-3323/KUB3323
6x2.7	CZ034FB423	OB-27L42		EM-123/EM-132/EM-125	KUB-2823
	CZ034FB443	OB-27L44	WM-62(A,C,CC,K)T	EM-123/EM-132/EM-125	KUB-2823
	CZ034FB463	OB-27L46	WM-62(A,C,CC,K)X	EM-123/EM-132/EM-125	KUB-2823
	CZ034FS402	OB-27S42			KUB-2823/KUF3123
	CZ034FS422	OB-27S44			KUB-2823/KUF3123
	CZ034FS442	OB-27S46			KUB-2823/KUF3123
	CZ034FBP403	OB-27P40	WM-62P(C,K)U		KUB-2823
	CZ034FBP423	OB-27P42		EM-123T	KUB-2823
	CZ034FBP443	OB-27P44	WM-62P(C,K)T	EM-123T	KUB-2823
	CZ034FBP463	OB-27P46	WM-62P(C,K)X	EM-123T	KUB-2823
	CZ034FU474			EM-144/EM-142	KUB-8823
	CZ034FN514	NB-27L51	WM-66D103	EM-139/EM-124	KUB-6123
	CZ034FNP474				
6x3.5	CZ034E402	CMS-60	WM-61AU		
	CZ034E422	CMS-62			
	CZ034E442	CMS-64	WM-61AT		
	CZ034E462	CMS-66	WM-61AX		
	CZ034EP402		WM-61BU		
	CZ034EP442		WM-61BT		
	CZ034EP462		WM-61BX		
6x5	CZ034DN514				
	CZ034DU474			EM-136/EM-118	
	CZ034DU514		WM-65A103X	EM-136/EM-118	KUB7823
	CZ034D423		WM-60AY		KUB2023
	CZ034D443		WM-60AT		KUB2023
	CZ034DP422				KUB2023
	CZ034DP442				KUB2023
9.4x4.5	CZ034V422				KUC3523
	CZ034VP422				KUC3523
9.4x6.5	CZ034A402H	CMT-60			KUC2123
	CZ034A422H	CMT-62			KUC2123
	CZ034AP402H	CMP-60			KUC2123
	CZ034AP422H	CMP-62			KUC2123
10X5.3	CZ034W402			EM-100(T)/EM-100P(T)	KUC3723
	CZ034WP402			EM-100(T)/EM-100P(T)	KUC3723
9.7x6.5	CZ034382	CMT-758	WM-034CZ		KUC4023
	CZ034422	CMT-762	WM-034CY		KUC4023
	CZ034442	CMT-764			KUC4023
	CZ034P382	CMP-758	WM-034BZ		KUC4023
	CZ034P422	CMP-762	WM-034BY		KUC4023
	CZ034U474				KUC8023/KUC8323
	CZ034U514				KUC8023/KUC8323
9.7x4.5	CZ034C402	CMT-4540			KUC3623
	CZ034C422	CMT-4542			KUC3623
	CZ034CP403	CMP-4540	WM-54BU		KUC3623
	CZ034CP422	CMP-4542	WM-54BH		KUC3623
	CZ034CU474	UB-45L47	WM-55A103	EM-135	
	CZ034CU514	UB-45L51	WM-56A103		
4.5x3	CZ034J444				
	CZ034J464				
	CZ034JP444				KUC2423
	CZ034JP464				KUC2423
8x5	CZ034IU514			EM-121	KUB8223
9.7x5.2	CZ034GU514				
	CZ034GU474				
	CZ034GN514			EM-138	
	CZ034GN474				

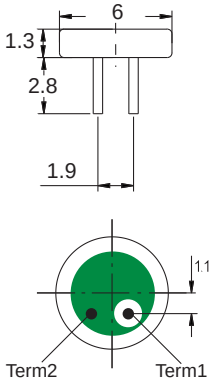
Electret Condenser Microphone

Omnidirectional
CZ034M Series (ø6X1.3)

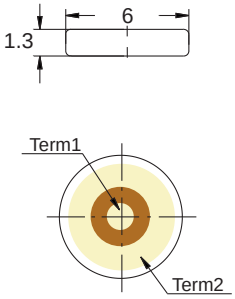
CZ034M



CZ034MP



CZ034MS



unit : mm

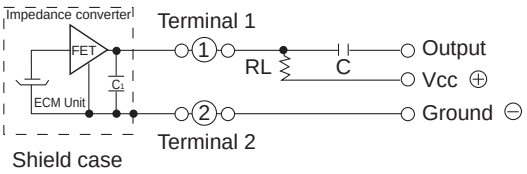
RINGFORD

Specification

1) Sensitivity :	As part no. table
2) Directivity:	
3) Impedance :	Low impedance
4) Current consumption :	Max.500uA
5) Standard operation voltage :	2.0V
6) Sensitivity reduction :	Within-3dB at 1.5V
7) S/N ratio :	More than 58dB

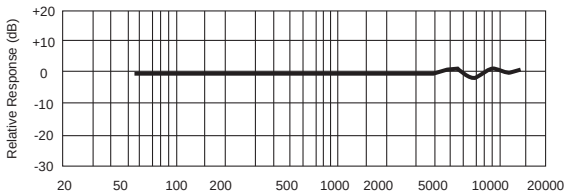
Schematic Circuit

(Test Condition : As part no. table)



C_1 = 10pF or 33pF

Typical Frequency Response

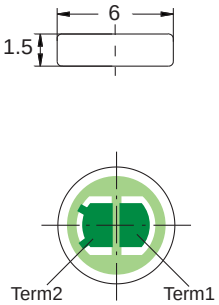


Part No. Table

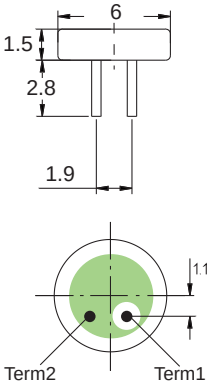
Sensitivity (0dB=1V/pa, 1KHz)	(Vs=2.0V, RL=2.2KΩ)		
	Solder type	Pin type	Solderless type
-42 ± 4dB	CZ034M424	CZ034MP424	CZ034MS424
-44 ± 4dB	4M444	CZ034MP444	CZ034MS444
-46 ± 4dB	4M464	CZ034MP464	CZ034MS464
-48 ± 4dB	4M484	CZ034MP484	CZ034MS484

Omnidirectional
CZ034T Series (ø6X1.5)

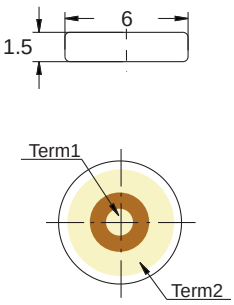
CZ034T



CZ034TP



CZ034TS



unit : mm

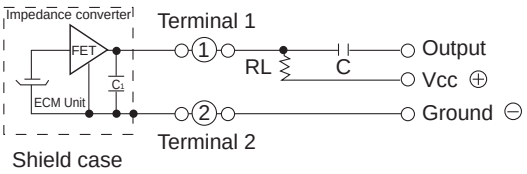
RINGFORD

Specification

1) Sensitivity :	As part no. table
2) Directivity:	
3) Impedance :	Low i mpedance
4) Current consumption :	Max.500uA
5) Standard operation voltage :	2.0V
6) Sensitivity reduction :	Within-3dB at 1.5V
7) S/N ratio :	More than 58dB

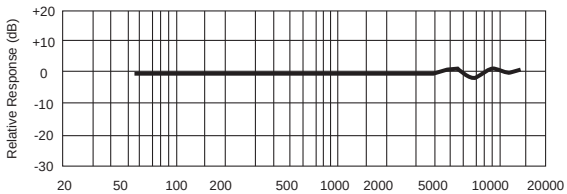
Schematic Circuit

(Test Condition : As part no. table)



C_1 = 10pF or 33pF

Typical Frequency Response

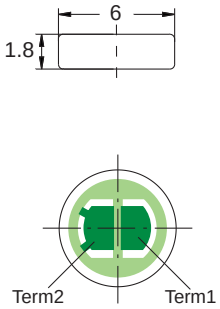


Part No. Table

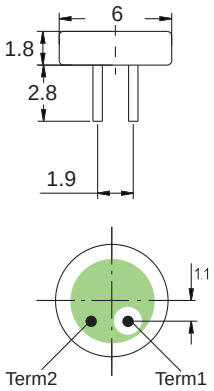
Sensitivity (0dB=1V/pa, 1KHz)	(Vs=2.0V, RL=2.2KΩ)		
	Solder type	Pin type	Solderless type
-42 ± 4dB	CZ034T424	CZ034TP424	CZ034TS424
-44 ± 4dB	CZ034T444	CZ034TP444	CZ034TS444
-46 ± 4dB	CZ034T464	CZ034TP464	CZ034TS464
-48 ± 4dB	CZ034T484	CZ034TP484	CZ034TS484

Omnidirectional
CZ034R Series (ø6X1.8)

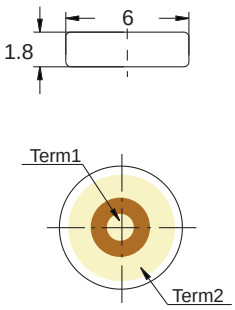
CZ034R



CZ034RP



CZ034RS



unit : mm

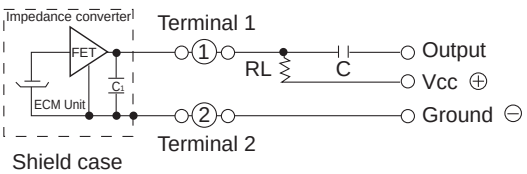
RINGFORD

Specification

1) Sensitivity :	As part no. table
2) Directivity:	
3) Impedance :	Low impedance
4) Current consumption :	Max.500uA
5) Standard operation voltage :	2.0V
6) Sensitivity reduction :	Within-3dB at 1.5V
7) S/N ratio :	More than 58dB

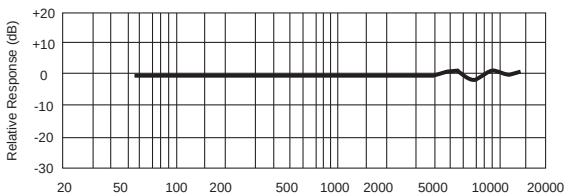
Schematic Circuit

(Test Condition : As part no. table)



C_1 = 10pF or 33pF

Typical Frequency Response

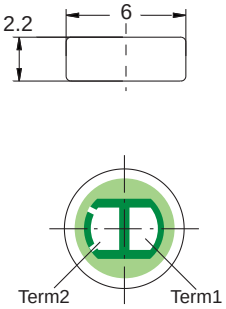


Part No. Table

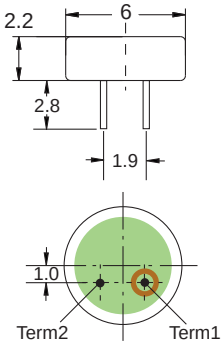
Sensitivity (0dB=1V/pa, 1KHz)	(Vs=2.0V, RL=2.2KΩ)		
	Solder type	Pin type	Solderless type
-42 ± 4dB	CZ034R424	CZ034RP424	CZ034RS424
-44 ± 4dB	4R444	4RP444	4RS444
-46 ± 4dB	4R464	4RP464	4RS464
-48 ± 4dB	4R484	4RP484	4RS484

Omnidirectional
CZ034H Series (ø6X2.2)

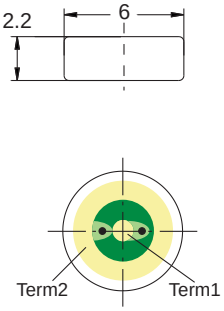
CZ034H



CZ034HP



CZ034HS



unit : mm

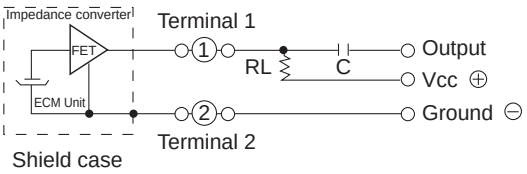
RINGFORD

Specification

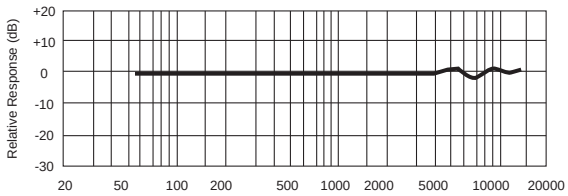
1) Sensitivity :	As part no. table
2) Directivity:	
3) Impedance :	Low impedance
4) Current consumption :	Max.500uA
5) Standard operation voltage :	2.0V
6) Sensitivity reduction :	Within-3dB at 1.5V
7) S/N ratio :	More than 58dB

Schematic Circuit

(Test Condition : As part no. table)



Typical Frequency Response



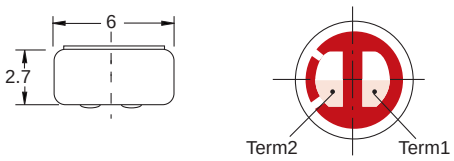
Part No. Table

Sensitivity (0dB=1V/pa, 1KHz)	(Vs=2.0V, RL=2.2KΩ)		
	Solder type	Pin type	Solderless type
-36 ± 3dB	CZ034H363	CZ034HP363	CZ034HS363
-40 ± 3dB	CZ034H403	CZ034HP403	CZ034HS403
-42 ± 3dB	CZ034H423	CZ034HP423	CZ034HS423
-44 ± 3dB	CZ034H443	CZ034HP443	CZ034HS443
-46 ± 3dB	CZ034H463	CZ034HP463	CZ034HS463

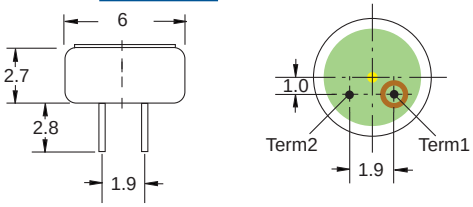
Electret Condenser Microphone

Omnidirectional CZ034FB Series (ø6X2.7)

CZ034FB



CZ034FBP



unit : mm

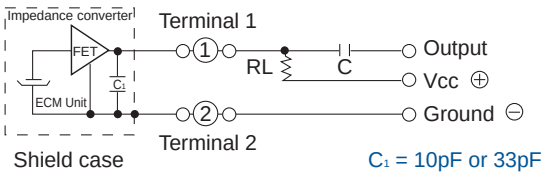
PART NO. TABLE		
Sensitivity (0dB=1V/pa, 1KHz)	(Vs=2.0V, RL=2.2KΩ)	
	Solder type	Pin type
-38 ± 3dB	CZ034FB383	CZ034FBP383
-40 ± 3dB	CZ034FB403	CZ034FBP403
-42 ± 3dB	CZ034FB423	CZ034FBP423
-44 ± 3dB	CZ034FB443	CZ034FBP443
-46 ± 3dB	CZ034FB463	CZ034FBP463

Specification

1) Sensitivity :	As part no. table
2) Directivity:	
3) Impedance :	Low impedance
4) Current consumption :	Max.500uA
5) Standard operation voltage :	2.0V
6) Sensitivity reduction :	Within-3dB at 1.5V
7) S/N ratio :	More than 58dB

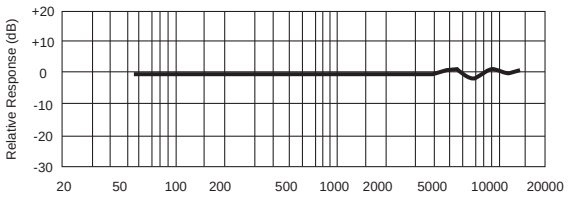
Schematic Circuit

(Test Condition : As part no. table)



C_1 = 10pF or 33pF

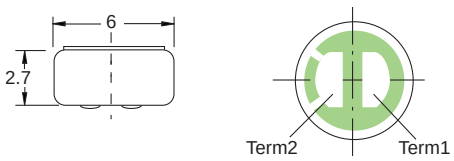
Typical Frequency Response



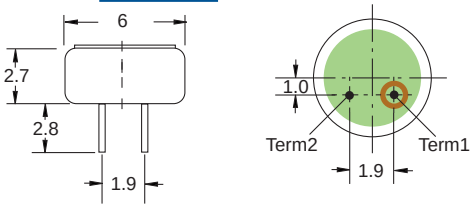
RINGHORD

Omnidirectional CZ034F Series (ø6X2.7)

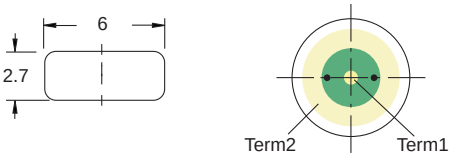
CZ034F



CZ034FP



CZ034FS



unit : mm

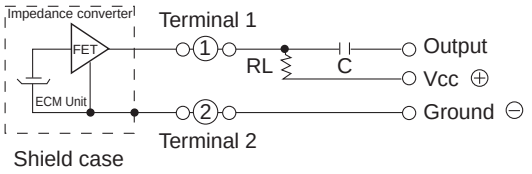
PART NO. TABLE			
Sensitivity (0dB=1V/pa, 1KHz)	(Vs=2.0V, RL=2.2KΩ)		
	Solder type	Pin type	Solderless type
-40 ± 2dB	CZ034F402	CZ034FP402	CZ034FS402
-42 ± 2dB	CZ034F422	CZ034FP422	CZ034FS422
-44 ± 2dB	CZ034F442	CZ034FP442	CZ034FS442
-46 ± 2dB	CZ034F462	CZ034FP462	CZ034FS462

Specification

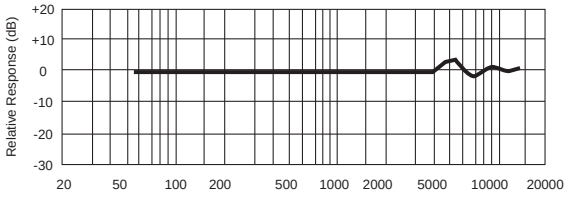
1) Sensitivity :	As part no. table
2) Directivity:	
3) Impedance :	Low impedance
4) Current consumption :	Max.500uA
5) Standard operation voltage :	2.0V
6) Sensitivity reduction :	Within-3dB at 1.5V
7) S/N ratio :	More than 58dB

Schematic Circuit

(Test Condition : As part no. table)

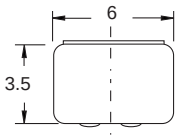


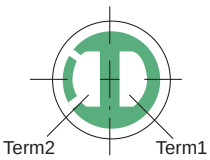
Typical Frequency Response



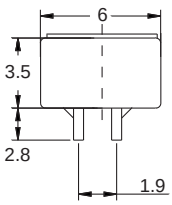
Omnidirectional CZ034E Series (ø6X3.5)

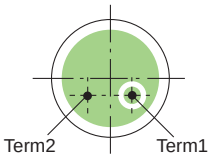
CZ034E





CZ034EP





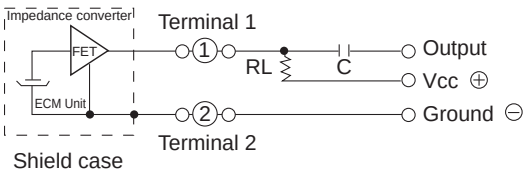
unit : mm

Specification

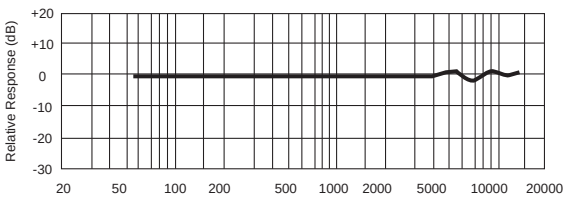
1) Sensitivity :	As part no. table
2) Directivity:	
3) Impedance :	Low impedance
4) Current consumption :	Max.500uA
5) Standard operation voltage :	2.0V
6) Sensitivity reduction :	Within-3dB at 1.5V
7) S/N ratio :	More than 60dB

Schematic Circuit

(Test Condition : As part no. table)



Typical Frequency Response



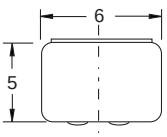
PART NO. TABLE

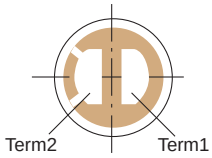
Sensitivity (0dB=1V/pa, 1KHz)	(Vs=2.0V, RL=2.2KΩ) Solder type	Pin type
-36 ± 3dB	CZ034E363	CZ034EP363
-38 ± 3dB	CZ034E383	CZ034EP383
-40 ± 2dB	CZ034E402	CZ034EP402
-42 ± 3dB	CZ034E423	CZ034EP423
-44 ± 2dB	CZ034E442	CZ034EP442
-46 ± 3dB	CZ034E463	CZ034EP463

RINGFORD

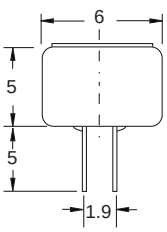
Omnidirectional CZ034D Series (ø6X5)

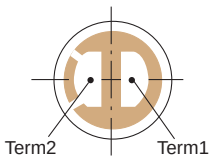
CZ034D





CZ034DP





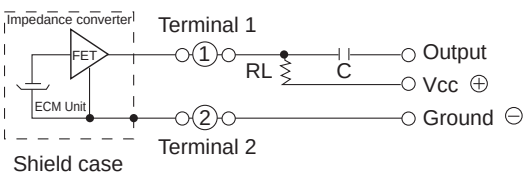
unit : mm

Specification

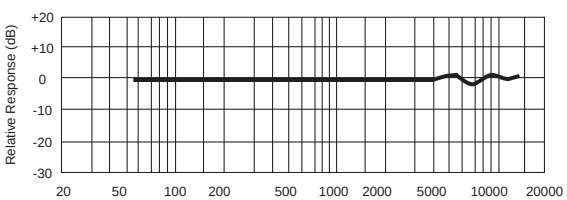
1) Sensitivity :	As part no. table
2) Directivity:	
3) Impedance :	Low impedance
4) Current consumption :	Max.500uA
5) Standard operation voltage :	2.0V
6) Sensitivity reduction :	Within-3dB at 1.5V
7) S/N ratio :	More than 58dB

Schematic Circuit

(Test Condition : As part no. table)



Typical Frequency Response



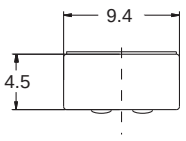
PART NO. TABLE

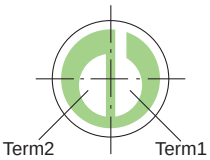
Sensitivity (0dB=1V/pa, 1KHz)	(Vs=2.0V, RL=2.2KΩ) Solder type	Pin type
-36 ± 2dB	CZ034D362	CZ034DP362
-38 ± 2dB	CZ034D382	CZ034DP382
-40 ± 2dB	CZ034D402	CZ034DP402
-42 ± 2dB	CZ034D422	CZ034DP422
-44 ± 2dB	CZ034D442	CZ034DP442
-46 ± 3dB	CZ034D463	CZ034DP463

Electret Condenser Microphone

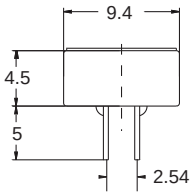
Omnidirectional CZ034V Series (ø9.4X4.5)

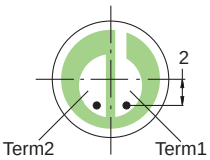
CZ034V





CZ034VP



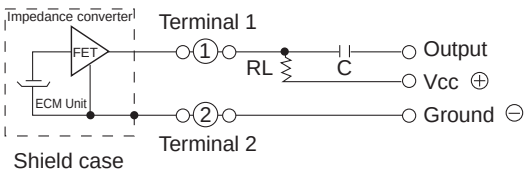


Specification

1) Sensitivity :	As part no. table
2) Directivity:	
3) Impedance :	Low impedance
4) Current consumption :	Max.500uA
5) Standard operation voltage :	4.5V
6) Sensitivity reduction :	Within-3dB at 1.5V
7) S/N ratio :	More than 60dB

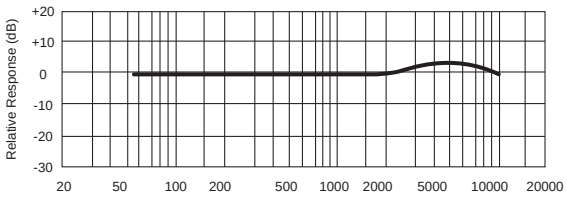
Schematic Circuit

(Test Condition : As part no. table)



unit : mm

Typical Frequency Response



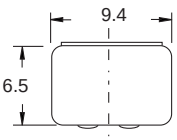
PART NO. TABLE

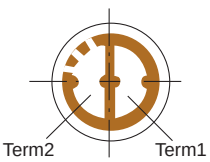
Sensitivity (0dB=1V/pa, 1KHz)	(Vs=4.5V, RL=2.2KΩ)	
	Solder type	Pin type
-36 ± 2dB	CZ034V362	CZ034VP362
-38 ± 2dB	CZ034V382	CZ034VP382
-40 ± 2dB	CZ034V402	CZ034VP402
-42 ± 2dB	CZ034V422	CZ034VP422
-44 ± 2dB	CZ034V442	CZ034VP442
-46 ± 2dB	CZ034V462	CZ034VP462

RINGFORD

Omnidirectional CZ034A Series (ø9.4X6.5)

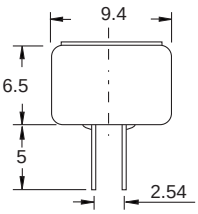
CZ034A

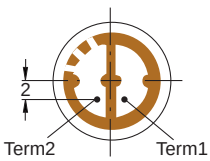




unit : mm

CZ034AP





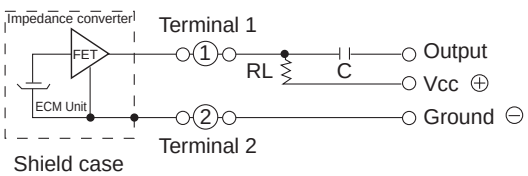
unit : mm

Specification

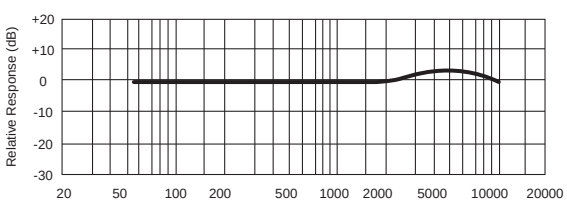
1) Sensitivity :	As part no. table
2) Directivity:	
3) Impedance :	Low impedance
4) Current consumption :	Max.500uA
5) Standard operation voltage :	4.5V
6) Sensitivity reduction :	Within-3dB at 1.5V
7) S/N ratio :	More than 60dB

Schematic Circuit

(Test Condition : As part no. table)



Typical Frequency Response

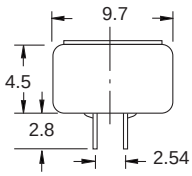


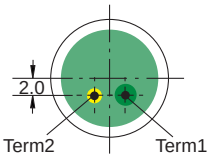
PART NO. TABLE

Sensitivity (0dB=1V/pa, 1KHz)	(Vs=4.5V, RL=1.0KΩ)		(Vs=4.5V, RL=2.2KΩ)	
	Solder type	Pin type	Solder type	Pin type
-32 ± 2dB			CZ034A322	CZ034AP322
-34 ± 2dB			CZ034A342	CZ034AP342
-36 ± 2dB			CZ034A362	CZ034AP362
-38 ± 2dB			CZ034A382	CZ034AP382
-40 ± 2dB	CZ034A402H	CZ034AP402H	CZ034A402	CZ034AP402
-42 ± 2dB	CZ034A422H	CZ034AP422H	CZ034A422	CZ034AP422
-44 ± 2dB	CZ034A442H	CZ034AP442H	CZ034A442	CZ034AP442
-46 ± 2dB	CZ034A462H	CZ034AP462H	CZ034A462	CZ034AP462

Electret Condenser Microphone

Omnidirectional CZ034CPC Series (ø9.7X4.5)



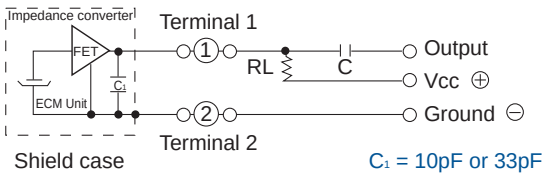


unit : mm

Schematic Circuit

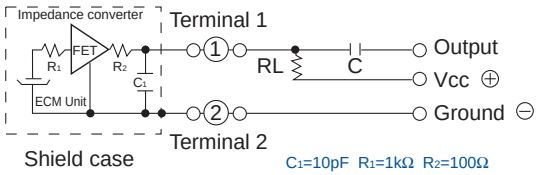
(Test Condition : As part no. table)

CZ034CPC



C₁ = 10pF or 33pF

CZ034CPCR

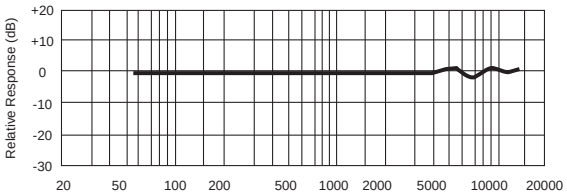


C₁=10pF R₁=1kΩ R₂=100Ω

Specification

1) Sensitivity :	As part no. table
2) Directivity:	
3) Impedance :	Low impedance
4) Current consumption :	Max.500uA
5) Standard operation voltage :	4.5V
6) Sensitivity reduction :	Within-3dB at 1.5V
7) S/N ratio :	More than 60dB

Typical Frequency Response



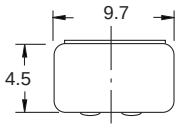
PART NO. TABLE

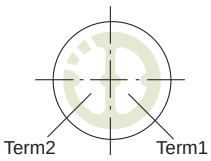
Sensitivity (0dB=1V/pa, 1KHz)	(Vs=4.5V, RL=2.2KΩ)	
	CZ034CPC	CZ034CPCR
-36 ± 2dB	CZ034CPC362	CZ034CPCR362
-38 ± 2dB	CZ034CPC382	CZ034CPCR382
-40 ± 2dB	CZ034CPC402	CZ034CPCR402
-42 ± 2dB	CZ034CPC422	CZ034CPCR422
-44 ± 2dB	CZ034CPC442	CZ034CPCR442
-46 ± 2dB	CZ034CPC462	CZ034CPCR462

RINGFORD

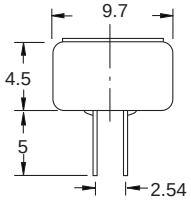
Omnidirectional CZ034C Series (ø9.7X4.5)

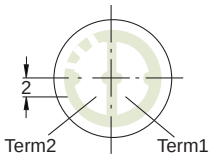
CZ034C



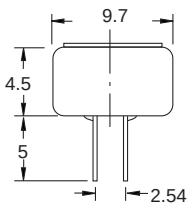


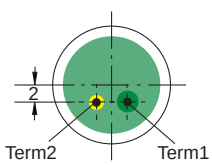
CZ034CP





unit : mm CZ034C2P





unit : mm

PART NO. TABLE

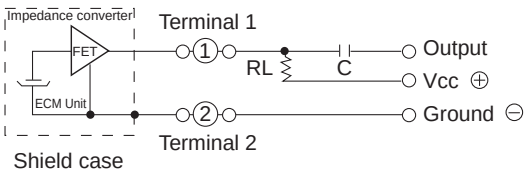
Sensitivity (0dB=1V/pa, 1KHz)	(Vs=4.5V, RL=2.2KΩ)		
	Solder type	Pin type	Pin type
-34 ± 2dB	CZ034C342	CZ034CP342	CZ034C2P342
-36 ± 2dB	CZ034C362	CZ034CP362	CZ034C2P362
-38 ± 2dB	CZ034C382	CZ034CP382	CZ034C2P382
-40 ± 2dB	CZ034C402	CZ034CP402	CZ034C2P402
-42 ± 2dB	CZ034C422	CZ034CP422	CZ034C2P422
-44 ± 2dB	CZ034C442	CZ034CP442	CZ034C2P442

Specification

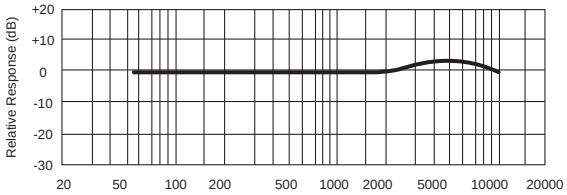
1) Sensitivity :	As part no. table
2) Directivity:	
3) Impedance :	Low impedance
4) Current consumption :	Max500uA
5) Standard operation voltage :	4.5V
6) Sensitivity reduction :	Within-3dB at 1.5V
7) S/N ratio :	More than 60dB

Schematic Circuit

(Test Condition : As part no. table)



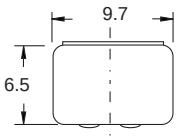
Typical Frequency Response

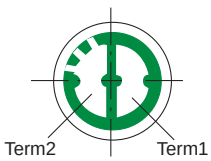


Electret Condenser Microphone

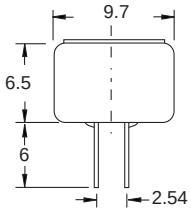
Omnidirectional CZ034 Series (ø9.7X6.5)

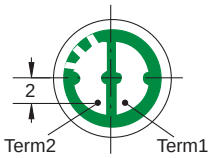
CZ034





CZ034P





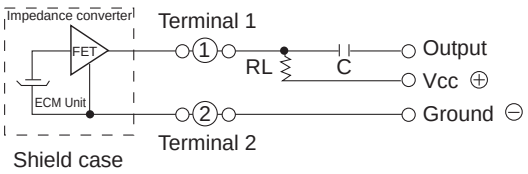
unit : mm

Specification

1) Sensitivity :	As part no. table
2) Directivity:	
3) Impedance :	Low impedance
4) Current consumption :	Max.500uA
5) Standard operation voltage :	4.5V
6) Sensitivity reduction :	Within-3dB at 1.5V
7) S/N ratio :	More than 60dB

Schematic Circuit

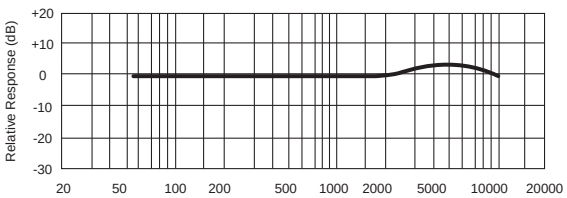
(Test Condition : As part no. table)



PART NO. TABLE

Sensitivity (0dB=1V/pa, 1KHz)	(Vs=4.5V, RL=1.0KΩ)		(Vs=4.5V, RL=2.2KΩ)	
	Solder type	Pin type	Solder type	Pin type
-32 ± 2dB			CZ034322	CZ034P322
-34 ± 2dB			CZ034342	CZ034P342
-36 ± 2dB			CZ034362	CZ034P362
-38 ± 2dB			CZ034382	CZ034P382
-40 ± 2dB	CZ034402H	CZ034P402H	CZ034402	CZ034P402
-42 ± 2dB	CZ034422H	CZ034P422H	CZ034422	CZ034P422
-44 ± 2dB	CZ034442H	CZ034P442H	CZ034442	CZ034P442
-46 ± 2dB	CZ034462H	CZ034P462H	CZ034462	CZ034P462

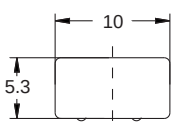
Typical Frequency Response

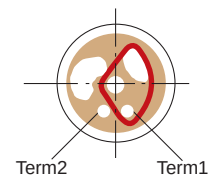


RINGFORD

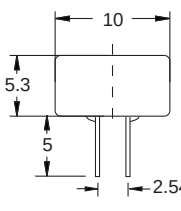
Omnidirectional CZ034W Series (ø10X5.3)

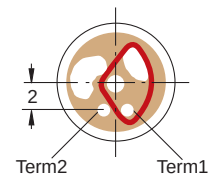
CZ034W





CZ034WP





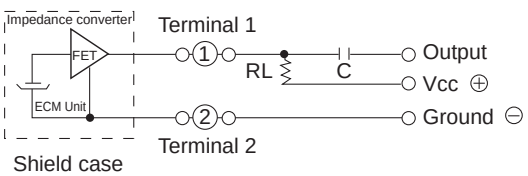
unit : mm

Specification

1) Sensitivity :	As part no. table
2) Directivity:	
3) Impedance :	Low impedance
4) Current consumption :	Max.500uA
5) Standard operation voltage :	4.5V
6) Sensitivity reduction :	Within-3dB at 1.5V
7) S/N ratio :	More than 60dB

Schematic Circuit

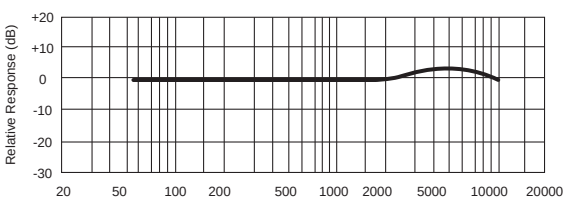
(Test Condition : As part no. table)



PART NO. TABLE

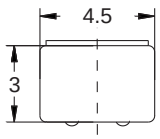
Sensitivity (0dB=1V/pa, 1KHz)	(Vs=4.5V, RL=2.2KΩ)	
	Solder type	Pin type
-34 ± 3dB	CZ034W343	CZ034WP343
-36 ± 3dB	CZ034W363	WP363
-38 ± 3dB	CZ034W383	WP383
-40 ± 3dB	CZ034W403	WP403
-42 ± 3dB	CZ034W423	WP423
-44 ± 3dB	CZ034W443	WP443

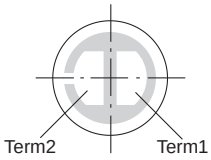
Typical Frequency Respnose



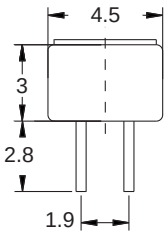
Omnidirectional CZ034J Series (ø4.5X3)

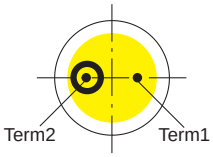
CZ034J





CZ034JP





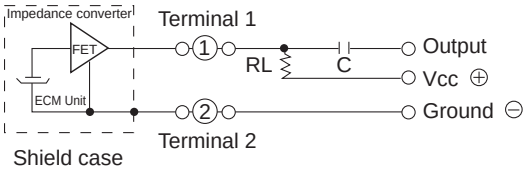
unit : mm

Specification

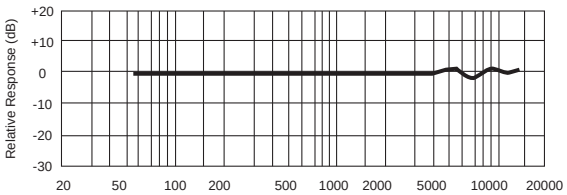
1) Sensitivity :	As part no. table
2) Directivity:	
3) Impedance :	Low i mpedance
4) Current consumption :	Max.500uA
5) Standard operation voltage :	2.0V
6) Sensitivity reduction :	Within-3dB at 1.5V
7) S/N ratio :	More than 60dB

Schematic Circuit

(Test Condition : As part no. table)



Typical Frequency Response



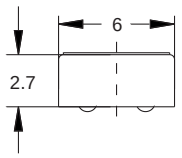
PART NO. TABLE

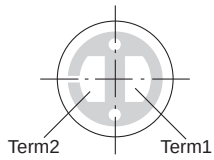
Sensitivity (0dB=1V/pa, 1KHz)	(Vs=2.0V, RL=2.2KΩ) Solder type	Pin type
-42 ± 4dB	CZ034J424	CZ034JP424
-44 ± 4dB	CZ034J444	CZ034JP444
-46 ± 4dB	CZ034J464	CZ034JP464
-48 ± 4dB	CZ034J484	CZ034JP484

RINGFORD

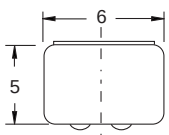
Unidirectional CZ034FU(ø6X2.7) CZ034DU(ø6X5)

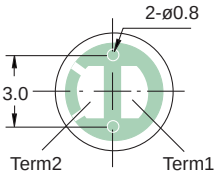
CZ034FU





CZ034DU





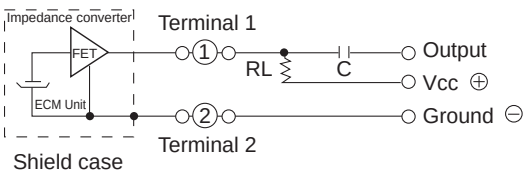
unit : mm

Specification

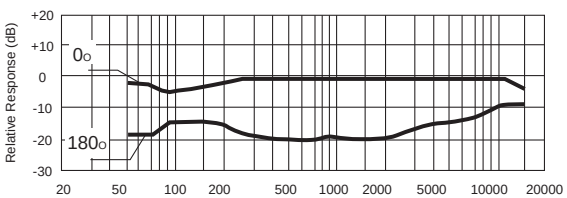
1) Sensitivity :	As part no. table
2) Directivity:	
3) Impedance :	Low impedance
4) Current consumption :	Max.500uA
5) Standard operation voltage :	2.0V
6) Sensitivity reduction :	Within-3dB at 1.5V
7) S/N ratio :	More than 58dB

Schematic Circuit

(Test Condition : As part no. table)



Typical Frequency Response



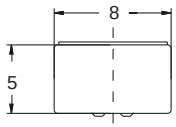
PART NO. TABLE

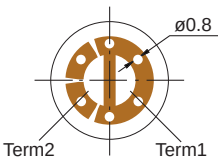
Sensitivity (0dB=1V/pa, 1KHz)	(Vs=2.0V, RL=2.2KΩ) CZ034FU	CZ034DU
-51 ± 4dB	CZ034FU514	CZ034DU514
-54 ± 4dB	CZ034FU544	CZ034DU544

Electret Condenser Microphone

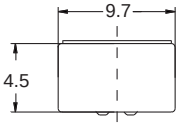
Unidirectional
CZ034IU(ø8X5)
CZ034CU(ø9.7X4.5)

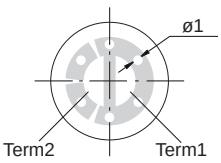
CZ034IU





CZ034CU





unit : mm

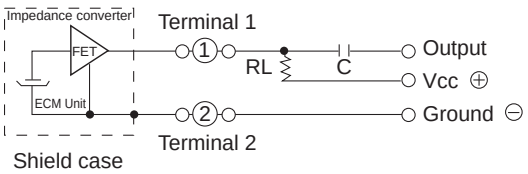
PART NO. TABLE		
Sensitivity (0dB=1V/pa, 1KHz)	(Vs=1.5V, RL=680Ω)	
	CZ034IU	CZ034CU
-47 ± 4dB	CZ034IU474	CZ034CU474
-51 ± 4dB	IU514	CZ034CU514

Specification

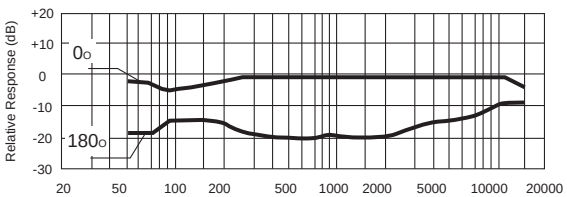
1) Sensitivity :	As part no. table
2) Directivity:	
3) Impedance :	Low impedance
4) Current consumption :	Max.500uA
5) Standard operation voltage :	1.5V
6) Sensitivity reduction :	Within-3dB at 1V
7) S/N ratio :	More than 58dB

Schematic Circuit

(Test Condition : As part no. table)



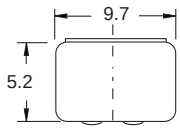
Typical Frequency Response

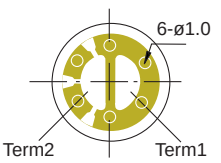


RINGFORD

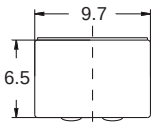
Unidirectional
CZ034GU(ø9.7X5.2)
CZ034U(ø9.7X6.5)

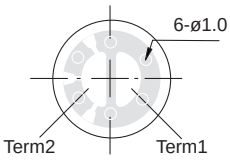
CZ034GU





CZ034U





unit : mm

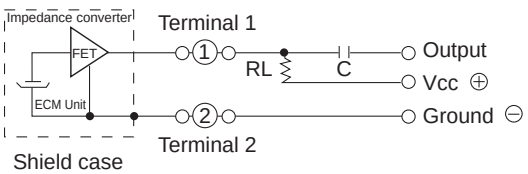
PART NO. TABLE		
Sensitivity (0dB=1V/pa, 1KHz)	(Vs=1.5V, RL=680Ω)	
	CZ034GU	CZ034U
-47 ± 4dB	CZ034GU474	CZ034U474
-51 ± 4dB	CZ034GU514	CZ034U514

Specification

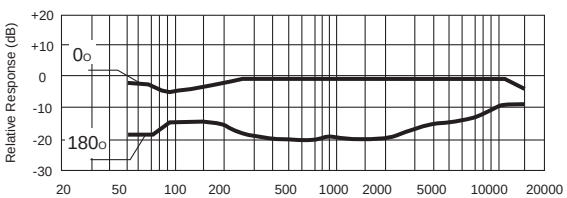
1) Sensitivity :	As part no. table
2) Directivity:	
3) Impedance :	Low impedance
4) Current consumption :	Max.500uA
5) Standard operation voltage :	1.5V
6) Sensitivity reduction :	Within-3dB at 1V
7) S/N ratio :	More than 58dB

Schematic Circuit

(Test Condition : As part no. table)

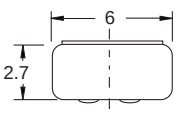


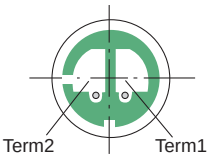
Typical Frequency Response



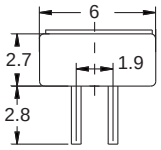
Noise Cancelling CZ034FN Series (ø6X2.7)

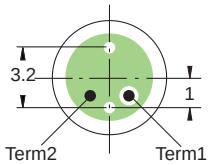
CZ034FN





CZ034FNP





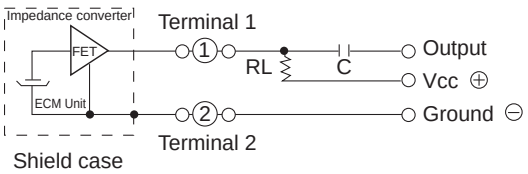
unit : mm

Specification

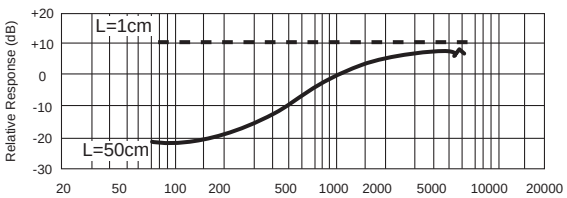
1) Sensitivity :	As part no. table
2) Directivity:	
3) Impedance :	Low impedance
4) Current consumption :	Max.500uA
5) Standard operation voltage :	2.0V
6) Sensitivity reduction :	Within-3dB at 1.5V
7) S/N ratio :	More than 58dB

Schematic Circuit

(Test Condition : As part no. table)



Typical Frequency Response



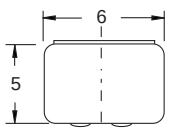
PART NO. TABLE

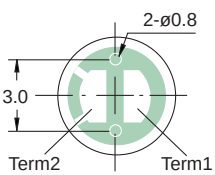
Sensitivity (0dB=1V/pa, 1KHz)	(Vs=2.0V, RL=2.2KΩ)	
	Solder type	Pin type
-51 ± 4dB	CZ034FN514	CZ034FNP514
-54 ± 4dB	FN544	FNP544

RINGFORD

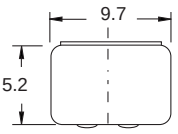
Noise Cancelling ø6X5) CZ034GN(ø9.7X5.2)

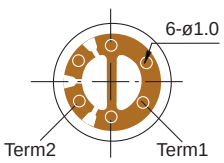
CZ034DN





CZ034GN





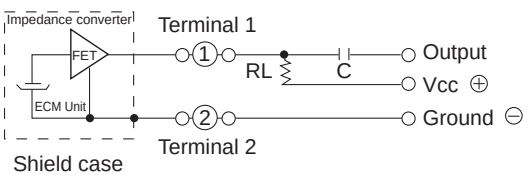
unit : mm

Specification

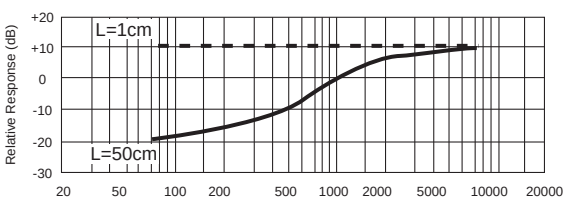
1) Sensitivity :	As part no. table
2) Directivity:	
3) Impedance :	Low impedance
4) Current consumption :	Max.500uA
5) Standard operation voltage :	1.5V
6) Sensitivity reduction :	Within-3dB at 1V
7) S/N ratio :	More than 58dB

Schematic Circuit

(Test Condition : As part no. table)



Typical Frequency Response



PART NO. TABLE

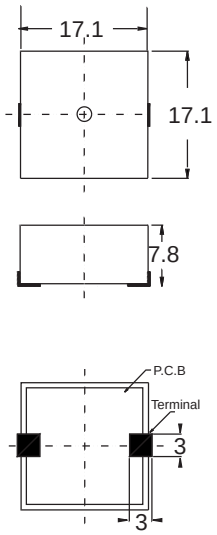
Sensitivity (0dB=1V/pa, 1KHz)	(Vs=1.5V, RL=680Ω)	
	CZ034DN	CZ034GN
-47 ± 4dB	CZ034DN474	CZ034GN474
-51 ± 4dB	CZ034DN514	CZ034GN514

SOUNDER PRODUCTS

You 're hearing
What we're producing

Index

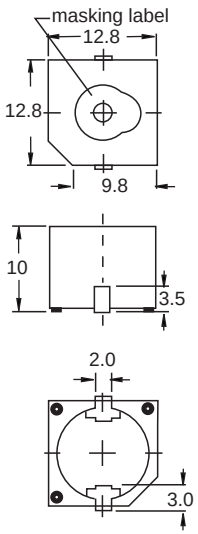
SMPB17S412



		SMPB17S412
Operating Voltage	VDC	6~16
Rated Voltage	VDC	12
Max. Rated Current	mA	8
Min. S.P.L. at 10cm	dB	85
Frequency	kHz	4.0±0.5
Operating Temperature	C	-20~+60
Pulse Rate	Pulse/Sec	/
Tone		single

RINGFORD

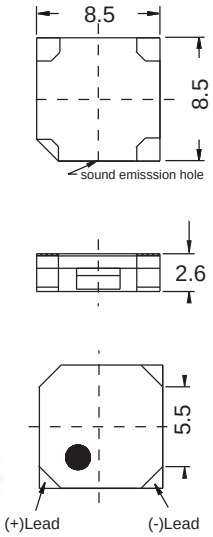
SXMB13S Series



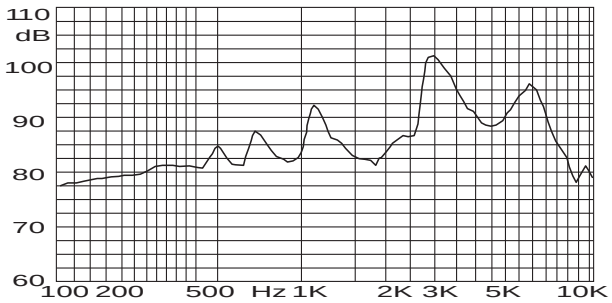
		SXMB13S01	SXMB13S05	SXMB13S12
Operating Voltage	VDC	1.5~3	4~7	8~15
Rated Voltage	VDC	1.5	5	12
Max. Rated Current	mA	20	30	30
Min. S.P.L. at 10cm	dB	75	85	85
Frequency	kHz	2.4±0.5	2.3±0.4	2.3±0.4
Operating Temperature	C	-20~+70	-20~+70	-20~+70
Pulse Rate	Pulse/Sec	/	/	/
Tone		single	single	single

SMD Magnetic Transducer

SMT25

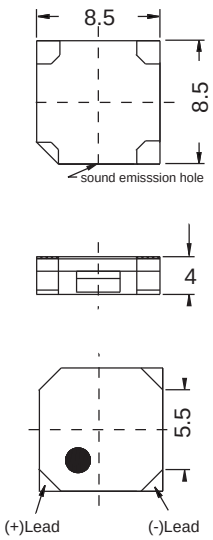


		SMT25
Operating Voltage	V	2~5
Rated Voltage	V	3
Max. Rated Current	mA	100
Coil Resistance	Ω	10±1
Typical S.P.L. at 5cm	dB	96
Rated Frequency	Hz	2500
Operating Temperature	C	-30~+70

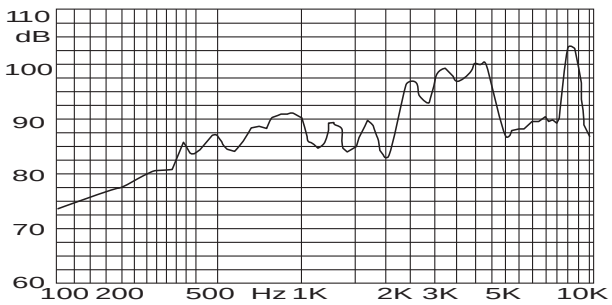


RINGFORD

SMT28 Series

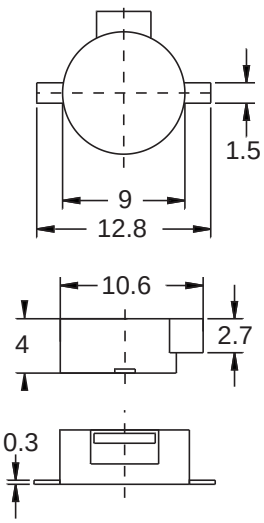


		SMT28H	SMT28G
Operating Voltage	V	2~5	2~5
Rated Voltage	V	3.6	3.0
Max. Rated Current	mA	100	80
Coil Resistance	Ω	10±2	15±2
Typical S.P.L. at 10cm	dB	95	91
Resonant Frequency	Hz	3000	3000
Operating Temperature	C	-30~+70	-30~+70

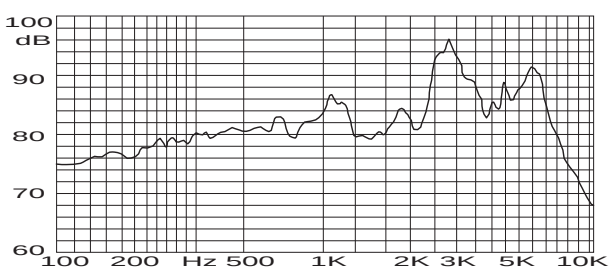


RINGFORD

SMT17 Series

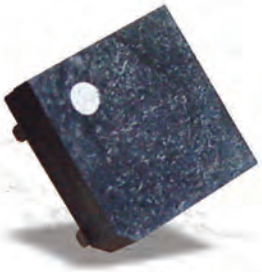


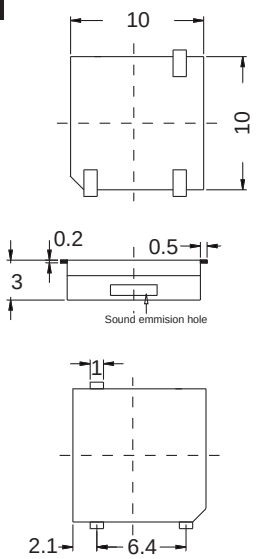
		SMT17H	SMT17G
Operating Voltage	V	2~4.6	2~4.6
Rated Voltage	V	3.6	3.6
Max. Rated Current	mA	150	100
Coil Resistance	Ω	8±1	16±2
Min. S.P.L. at 10cm	dB	89	87
Resonant Frequency	Hz	2731	2731
Operating Temperature	C	-20~+70	-20~+70



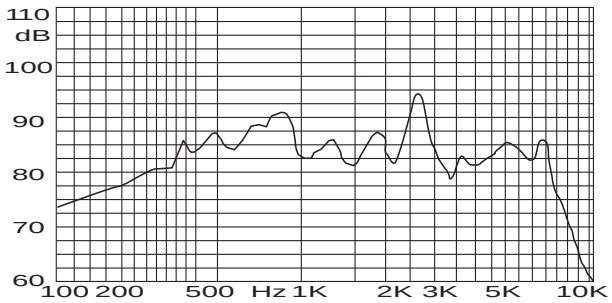
SMD Magnetic Transducer

SMT29 Series



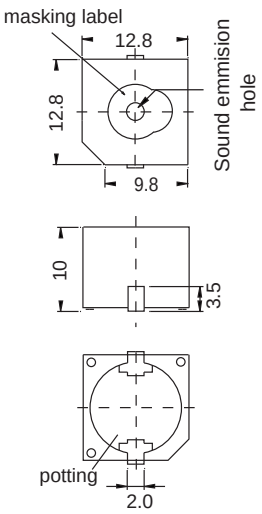


		SMT29H	SMT29E	SMT29D
Operating Voltage	V	1~2	3~5	3~7
Rated Voltage	V	1.5	3.6	5.0
Max. Rated Current	mA	80	80	90
Coil Resistance	Ω	9	25	40
Min. S.P.L. at 10cm	dB	85	85	96
Resonant Frequency	Hz	2700	2700	2700
Operating Temperature	C	-30~+70	-30~+70	-30~+70

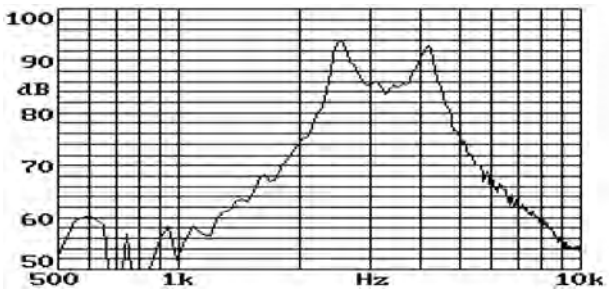


RINGFORD

SMTX Series

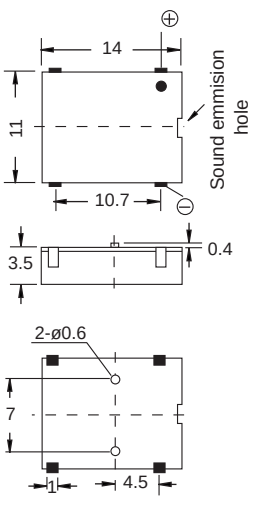


		SMTX01	SMTX06	SMTX12
Operating Voltage	V	1.2~3	4~8	8~16
Rated Voltage	V	1.5	6	12
Max. Rated Current	mA	70	40	40
Coil Resistance	Ω	15	47	140
Coil Impedance	Ω	40	80	240
Min. S.P.L. at 10cm	dB	85	90	90
Resonant Frequency	Hz	2400	2400	2400
Operating Temperature	C	-40~+85	-40~+85	-40~+85

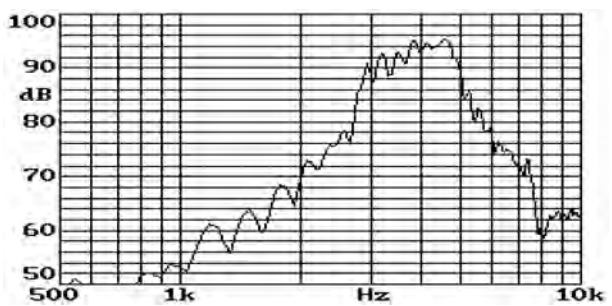


RINGFORD

SMT Series

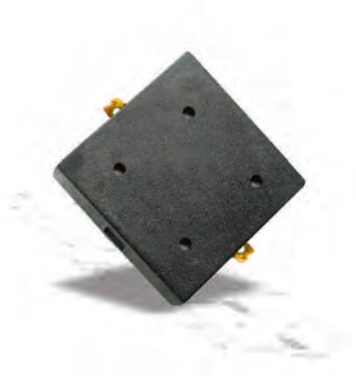


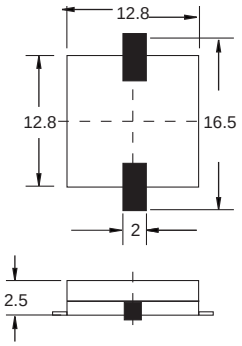
		SMT01A	SMT03A
Operating Voltage	V	1.2~1.7	2~4.5
Rated Voltage	V	1.5	3
Max. Rated Current	mA	80	70
Coil Resistance	Ω	9±2	19±2
Min. S.P.L. at 10cm	dB	85	87
Resonant Frequency	Hz	3200	3200
Operating Temperature	C	-10~+55	-10~+55



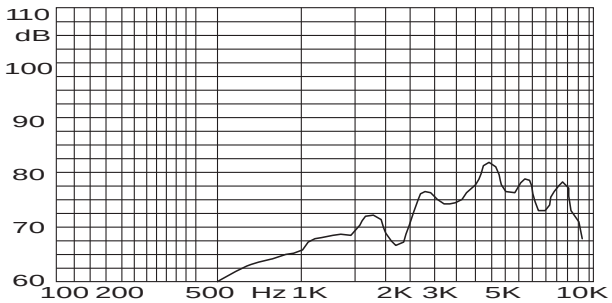
SMD Piezo Transducer

SMPT13S410



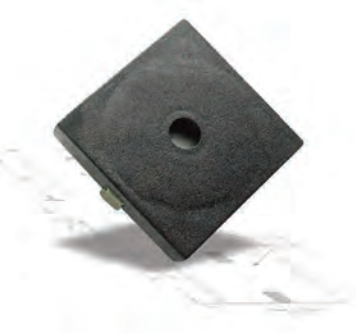


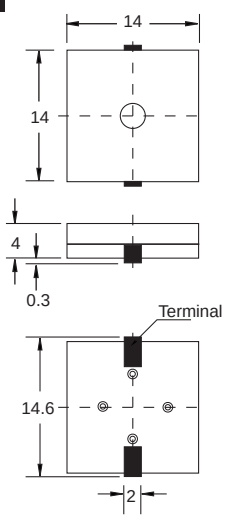
		SMPT13S410
Max. Input Voltage	V	25 Vp-p
Rated Voltage	V	5Vp-p square wave
Max. Rated Current	mA	3
Capacitance	nF	16±30%
Min. S.P.L. at 10cm	dB	80
Resonant Frequency	Hz	4100±500
Operating Temperature	C	-20~+70
Plate Material		Brass



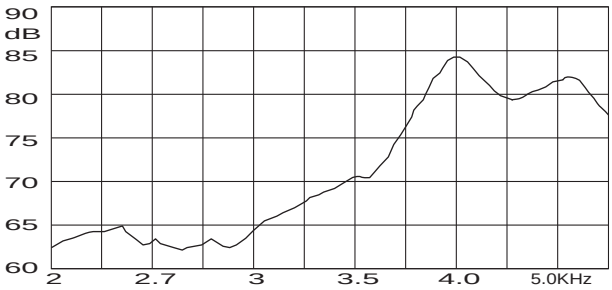
RINGFORD

SMPT14S400



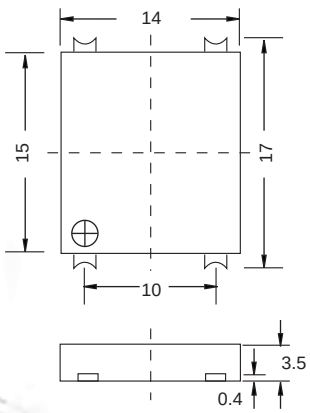


		SMPT14S400
Max. Input Voltage	V	30Vp-p
Rated Voltage	V	5Vp-p square wave
Max. Rated Current	mA	2
Capacitance	pF	10,000±30%
Min. S.P.L. at 10cm	dB	75
Resonant Frequency	Hz	4000±500
Operating Temperature	C	-20~+85
Plate Material		Alloy

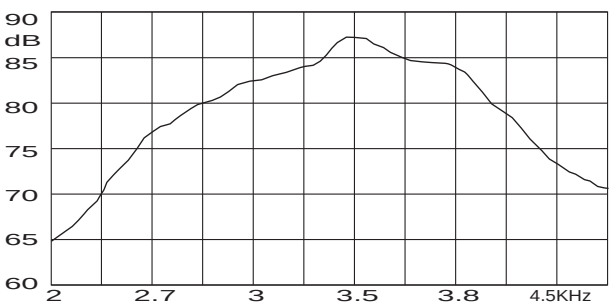


RINGFORD

SMPT15S400

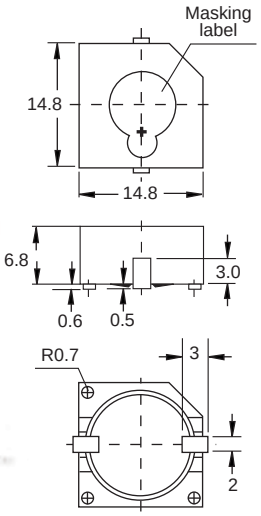


		SMPT15S400
Max. Input Voltage	V	20Vp-p
Rated Voltage	V	3Vp-p square wave
Max. Rated Current	mA	2
Capacitance	pF	20,000±30%
Min. S.P.L. at 10cm	dB	75
Resonant Frequency	Hz	4000±500
Operating Temperature	C	-30~+70
Plate Material		Alloy

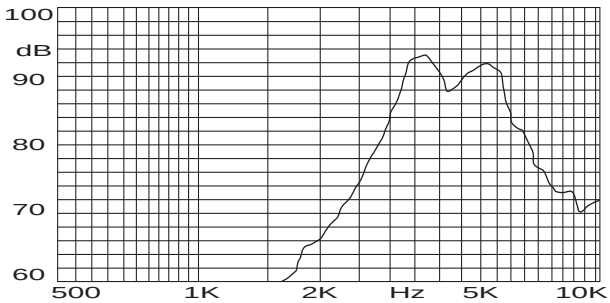


SMD Piezo Transducer

SMPT15S500

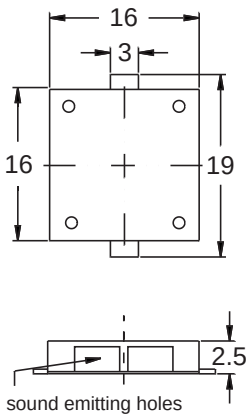


		SMPT15S500
Max. Input Voltage	V	20Vp-p
Rated Voltage	V	12Vp-p square wave
Max. Rated Current	mA	3
Capacitance	pF	15,000±30%
Min. S.P.L. at 10cm	dB	85
Resonant Frequency	Hz	5000±500
Operating Temperature	C	-20~+70
Plate Material		Alloy

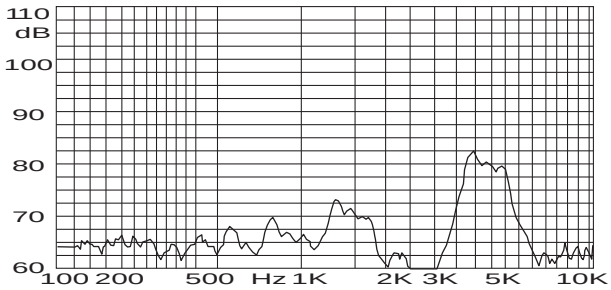


RINGFORD

SMPT16S400



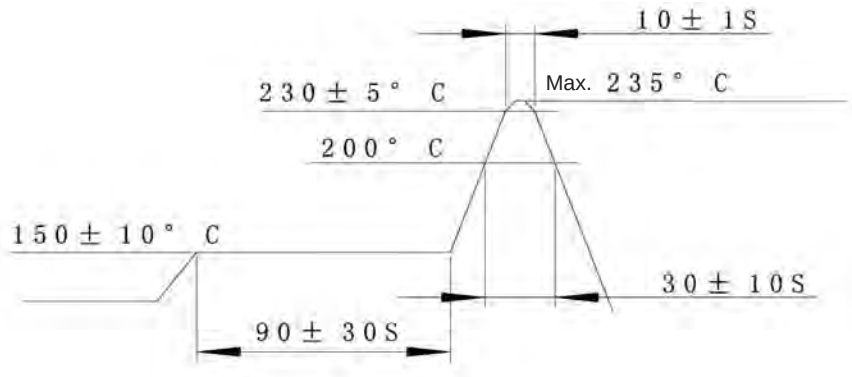
		SMPT16S400
Max. Input Voltage	V	30Vp-p
Rated Voltage	V	3Vp-p square wave
Max. Rated Current	mA	1
Capacitance	pF	14,000±30%
Min. S.P.L. at 10cm	dB	70
Resonant Frequency	Hz	4000±500
Operating Temperature	C	-20~+85
Plate Material		Alloy



RINGFORD

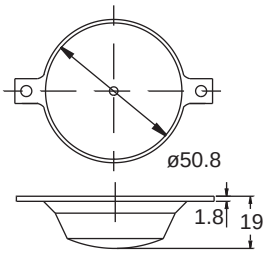
PRECAUTION

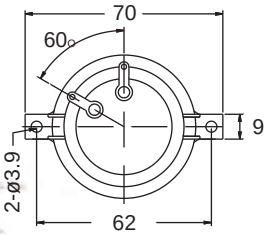
1. Connect with right polarity
2. Use the peak reflow temperature not higher than 235ºC
3. Please follow below reflow condition



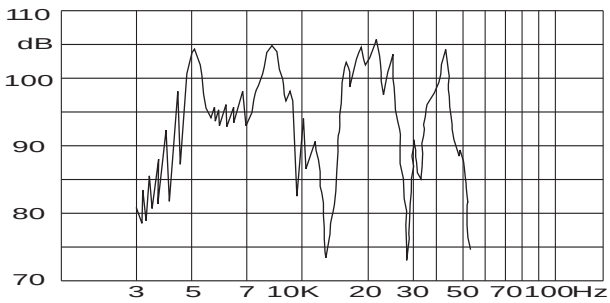
Ultrasonic Speaker

RW-03A



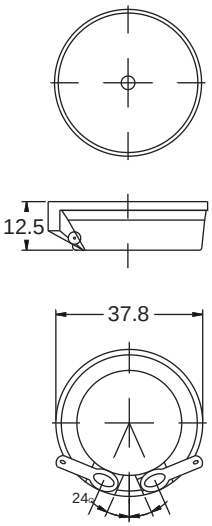


		RW-03A
Max. Input Voltage	V	10Vrms
Rated Voltage	V	2.83 Vrms sine wave
Min. S.P.L. at 50cm	dB	92
Resonant Frequency	KHz	40±3
Operating Temperature	°C	-20~+70
Plate Material		Brass

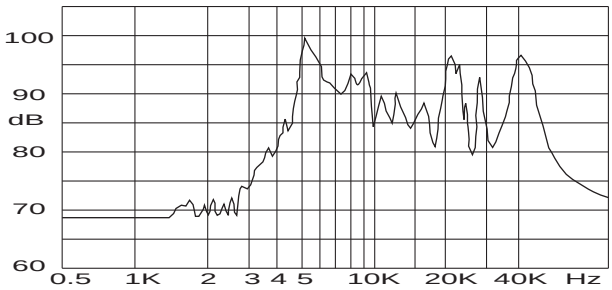


RINGFORD

RW-08A

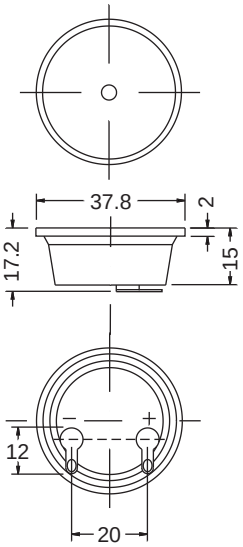


		RW-08A
Max. Input Voltage	V	10Vrms
Rated Voltage	V	2.83 Vrms sine wave
Min. S.P.L. at 50cm	dB	88
Resonant Frequency	KHz	40±3
Operating Temperature	°C	-20~+70
Plate Material		Brass

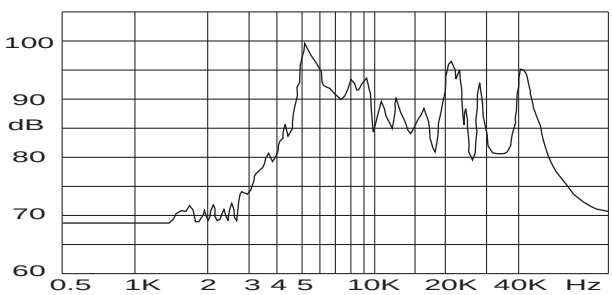


RINGFORD

RW-08B

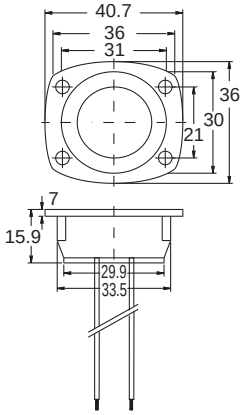


		RW-08B
Max. Input Voltage	V	10Vrms
Rated Voltage	V	3Vrms sine wave
Min. S.P.L. at 50cm	dB	90
Resonant Frequency	KHz	40±3
Operating Temperature	°C	-20~+70
Plate Material		Brass

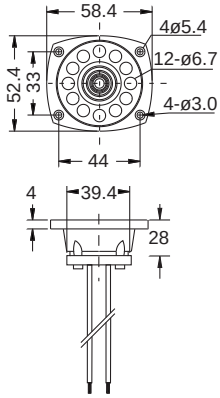


Mini-Piezo Siren

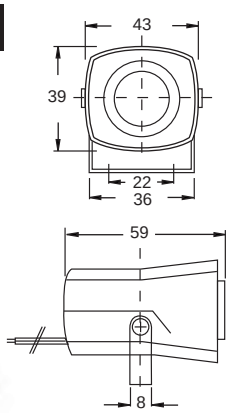
PH41 Series



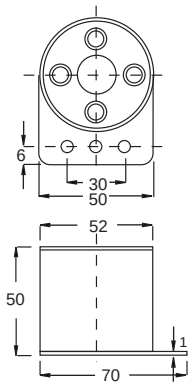
PH58L260



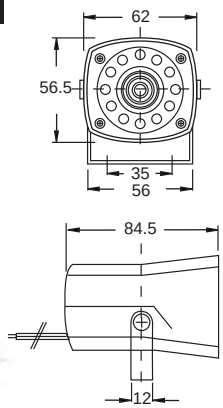
PH43 Series



PH52 Series



PH62R12



RINGFORD

	Operating Voltage	Rated Voltage	Max Rated Current	Frequency	Min S.P.L.	Pulse Rate	Tone
	V	V	mA	KHz	dB/30cm	Pulse / Sec	
PH41L250	50~150Vp-p	85Vp-p	150	2.5 ± 0.5	90	/	/
PH41L440	3~30Vp-p	12Vp-p	5	4.4 ± 0.5	85	/	/
PH58L260	3~85Vp-p	85Vp-p	15	2.6 ± 0.5	95	/	/
PH43R12	6~13	12	300	3.0 ± 0.5	114	/	Siren
PH43P212	6~13	12	300	1.6 ~ 2.3	105	2-7	Pulse
PH43P224	6~27	24	300	1.6 ~ 2.3	105	2-7	Pulse
PH52R12	6~15	12	300	2.5 ~ 2.8	115±5	/	Siren
PH52P12	6~15	12	350	2.9 ± 0.5	115±5	1.6~2.3	Pulse
PH62R12	6~15	12	320	3.5 ± 0.5	120	/	Siren

Speaker

S20I3201-1000

S36I4025-550

S13I3210-250

Model No.	Ref. Type	Rated Impedance (Ω)	Power (W)		Resonance Frequency (Hz)	Rated Freq. Range (Hz)	S.P.L (dB)	Size (mm)
			Rated	Max.				
S13I3210-250	/	32 ± 10%	1	0.02	250	fo ~ 20000	100 ± 3	ø 13 x H 5.3
S14I8001-300	YDB 13-12	8 ± 15%	0.01	0.03	300	fo ~ 10000	105 ± 3	ø 13.6 x H 3.8
S15I3201-800	/	32 ± 15%	0.1	0.2	800 ±20%	fo ~ 4000	77 ± 3	ø 15 x H 3.5
S15I801-300	YDB 23-12	8 ± 150	0.1	0.2	300	fo ~ 15000	95 ± 3	ø 15 x H 5.1
S16I8001-300	YDB 15-12	8 ± 15%	0.01	0.03	300	fo ~ 10000	105 ± 3	ø 16.2 x H 3.7
S20O801-750	/	8 ± 15%	0.1	0.3	750 ±20%	fo ~ 6000	77 ± 3	ø 20 x H 3.6
S20I3201-1000	YDB 20-11	32 ± 15%	0.1	0.2	1000 ±20%	fo ~ 3500	72 ± 3	ø 20 x H 4
S20I2501-500	YDB 23-11	25 ± 15%	0.1	0.2	500 ±25%	fo ~ 3200	78 ± 3	ø 20 x H 3.7
S20I810-600	YDB 2035-11	8 ± 15%	1	2	600 ±20%	fo ~ 5000	75 ± 3	ø 20 x H 35
S20I810-450	YDB 2040	8 ± 15%	1	2	450 ±20%	fo ~ 5000	78 ± 3	ø 20 x H 40
S23I801-300	YDB 20-12	8 ± 150	0.1	0.2	300	fo ~ 10000	95 ± 3	ø 23 x H 3
S23I801-900	/	8 ± 15%	0.1	0.2	900 ±100	fo ~ 10000	79 ± 3	ø 23.3 x H 3.3
S27O16025-600	/	16 ± 15%	0.25	0.5	600 ±20%	fo ~ 4000	80 ± 2	ø 27 x H 4.8
S27I801-300	YDB 27-12A	8 ± 15%	0.1	0.2	300 ±20%	fo ~ 5000	68 ± 3	ø 27 x H 9.6
S28I1602-450	/	16 ± 15%	0.2	0.25	450 ±100	fo ~ 5500	92 ± 3	ø 28 x H 5
S28I1602-550	/	16 ± 15%	0.2		550 ±100	fo ~ 5000	92 ± 3	ø 28 x H 5
S28I801-600	/	8 ± 15%	0.1	0.2	600 ±20%	fo ~ 4000	80 ± 3	ø 28 x H 4.5
S28I802-540	/	8 ± 15%	0.2	0.25	540 ±20%	fo ~ 5000	80 ± 2	ø 28 x H 4.5
S28I802-480	/	8 ± 15%	0.2	0.25	480 ±100	fo ~ 5500	94 ± 3	ø 28 x H 5
S28I801-700	YDB 28-11	8 ± 15%	0.1	0.2	700 ±20%	fo ~ 3500	78 ± 3	ø 28 x H 4.3
S28I801-600	YDB 28-12	8 ± 15%	0.1	0.2	600 ±20%	fo ~ 5000	82 ± 3	ø 28 x H 4.5
S28I803-320	YDB 28-14	8 ± 15%	0.3	0.5	320 ±20%	fo ~ 5000	78 ± 3	ø 28 x H 5.8
S29I1601-550	YDB 29-11	16 ± 15%	0.1	0.2	550 ±20%	fo ~ 3500	80 ± 3	ø 29 x H 5
S30I1602-750	/	16 ± 15%	0.2	0.25	750 ±20%	fo ~ 6000	82 ± 2	ø 30 x H 5
S30I802-720	/	8 ± 15%	0.2	0.25	720 ±20%	fo ~ 6000	94 ± 3	ø 30 x H 4.5
S30I8025-600	/	8 ± 15%	0.25	0.5	600 ±20%	fo ~ 4000	80 ± 2	ø 30 x H 5
S30I3201-550	YDB 30-12	32 ± 15%	0.1	0.2	550 ±20%	fo ~ 5000	80 ± 3	ø 30 x H 5.5
S30I3201-600	YDB 30-15	32 ± 15%	0.1	0.15	600 ±20%	fo ~ 5000	81 ± 3	ø 30 x H 3
S32I803-500	/	8 ± 15%	0.3	0.5	500 ±100	fo ~ 6000	91 ± 3	ø 32 x H 4.8
S36I4025-550	/	4 ± 15%	0.25	0.5	550 ±20%	fo ~ 4000	80 ± 3	ø 36 x H 5
S36I6025-550	/	6 ± 15%	0.25	0.5	550 ±20%	fo ~ 4000	80 ± 3	ø 36 x H 5
S36I8015-500	YDB 36-11	8 ± 20%	0.15	0.3	500 ±25%	fo ~ 3400	81 ± 3	ø 36 x H 6.5
S36I3202-500	YDB 36-12	32 ± 20%	0.2	0.4	500 ±25%	fo ~ 3500	83 ± 3	ø 36 x H 5
S36I8025-600	YDB 36-13A	8 ± 15%	0.25	0.5	600 ±25%	fo ~ 5000	83 ± 3	ø 36 x H 4.3
S36I802-500	YDB 36-14	8 ± 15%	0.2	0.3	500 ±20%	fo ~ 5000	83 ± 3	ø 36 x H 4
S38I8025-550	YDB 3608B	8 ± 15%	0.25	0.5	550 ±100	fo ~ 5000	83 ± 3	ø 38 x H 5.3
S40I8025-450	YDB 3608	8 ± 15%	0.25	0.5	450 ±100	fo ~ 5000	83 ± 3	ø 39.5 x H 4.75
S40I4502CL-486	/	45 ± 15%	0.2	0.4	486 ±100	/	87 ± 3	ø 40 x H 17.8
S40I802-500	/	8 ± 15%	0.2	0.4	500 ±100	fo ~ 3000	83 ± 3	ø 40 x H 5.8
S40I810-750	/	8 ± 15%	1	1.2	750 ±20%	fo ~ 5500	91 ± 3	ø 40 x H 4.8
S40I8015-550	YDB 40-13	8 ± 15%	0.15	0.3	550 ±15%	fo ~ 2800	83 ± 3	ø 40 x H 4.5
S40I802-500	YDB 40-14	8 ± 15%	0.2	0.4	500 ±20%	fo ~ 3000	83 ± 3	ø 40 x H 4.5
S45I8025-350	/	8 ± 15%	0.25	0.5	350 ±110	fo ~ 12000	84 ± 3	ø 45 x H 6
S49I820-450	/	8 ± 15%	2	3	450 ±20%	fo ~ 4000	81 ± 3	ø 49 x H 14
S50O8025-550	/	8 ± 15%	0.25	0.5	550 ±20%	fo ~ 3500	85 ± 3	ø 50 x H 15
S50I5002-350	YDB 50-11	50 ± 15%	0.2	0.4	350 ±20%	fo ~ 3500	83 ± 3	ø 50 x H 7.8
S57I3205-500	/	32 ± 15%	0.5	•	500 ±25%	fo ~ 6000	80 ± 5	ø 57 x H 8
S57I805-500	/	8 ± 15%	0.5	•	500 ±25%	fo ~ 6000	80 ± 5	ø 57 x H 8
S57O1605-1700	/	16 ± 15%	5	8	1700 ±20%	fo ~ 15000	100 ± 3	ø 57 x H 25
S57O3250-1500	/	32 ± 15%	5	8	1500 ±20%	fo ~ 1500	95 ± 3	ø 57 x H 25
S57I8025-500	YDB 58-11	8 ± 15%	0.25	0.5	500 ±20%	fo ~ 4000	85 ± 3	ø 57 x H 7.5
S65O650-1500	/	6 ± 15%	5	10	1500 ±20%	fo ~ 18000	90 ± 3	ø 65 x H 30
S79I4500-180	/	4 ± 15%	50	•	180 ±36%	fo ~ 15000	88 ± 2	ø 79 x H 57
S102O425-120	/	4 ± 20%	2.5	4	120 ±15%	fo ~ 8000	88 ± 3	ø 102 x H 93
S102O425-125	/	4 ± 20%	2.5	•	125 ±10%	fo ~ 10000	88 ± 3	ø 102 x H 35
S118O6150-75	/	6 ± 15%	15	•	75 ±10	fo ~ 5000	90 ± 3	ø 119 x H 71
S156O6600-55	/	6 ± 15%	60	80	55 ±20%	fo ~ 10000	88 ± 3	ø 156 x H 63.6

Receiver

DR131083-32

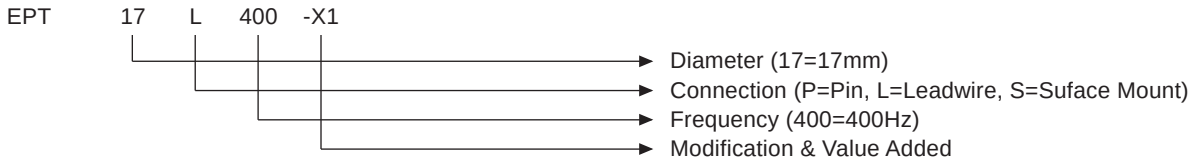
DR200883-32

DR38P0963-150

Model No.	Type	Ref. Type	Rated Impedance (Ω)	Sensitivity (dB)	Distortion	Size (mm)
DR130963-120	Dynamic Receiver	/	120 ± 10%	96 ± 3	≦ 1%	ø 13 x 18
DR130963-120	Dynamic Receiver	/	120 ± 10%	96 ± 3	/	ø 13 x 7.2
DR131083-32	Dynamic Receiver	SD1513B	32 ± 10%	108 ± 3(100mv)	≦ 2%	ø 13 x 2.6
DR131083-32 H	Dynamic Receiver	SD1513T	32 ± 10%	108 ± 3(100mv)	≦ 2%	ø 13 x 2.6
DR151103-32	Dynamic Receiver	SD1532B	32 ± 10%	110 ± 3(100mv)	≦ 2%	ø 15 x 2.8
DR151103-32 H	Dynamic Receiver	SD1532T	32 ± 10%	110 ± 3(100mv)	≦ 2%	ø 15 x 2.6
DR200883-32	Dynamic Receiver	/	32 ± 20%	88 ± 3	/	ø 20 x 3.1
DR200903-150	Dynamic Receiver	SD157B	150 ± 20%	90 ± 3	≦ 2%	ø 20 x 3.8
DR200903-150 H	Dynamic Receiver	SD157BH	150 ± 20%	90 ± 3	≦ 2%	ø 20 x 3.8
DR200933-150	Dynamic Receiver	SD1520B	150 ± 20%	93 ± 3	≦ 2%	ø 20 x 5.6
DR200903-150	Dynamic Receiver	SD157T	150 ± 20%	90 ± 3	≦ 2%	ø 20 x 3.8
DR201023-32	Dynamic Receiver	SD1533T	32 ± 10%	102 ± 3(100mv)	≦ 2%	ø 20 x 2.6
DR201163-150	Dynamic Receiver	SD1534B	150 ± 20%	116 ± 3(100mv)	≦ 2%	ø 20 x 3.8
DR201163-150	Dynamic Receiver	SD1536B	150 ± 20%	116 ± 3(100mv)	≦ 2%	ø 20 x 3.0
DR210962-150	Dynamic Receiver	/	150 ± 20%	96 ± 2	/	ø 21 x 4.4
DR230903-150	Dynamic Receiver	SD1523B	150 ± 30%	90 ± 3	≦ 2%	ø 23 x 3.8
DR230903-150 H	Dynamic Receiver	SD1523BH	150 ± 20%	90 ± 3	≦ 2%	ø 23 x 3.8
DR231003-200	Dynamic Receiver	SD1535B	200 ± 20%	100 ± 3(100mv)	≦ 2%	ø 23 x 4.8
DR250963-150	Dynamic Receiver	SD1525B	150 ± 20%	96 ± 3	≦ 2%	ø 25 x 4.8
DR250963-150 H	Dynamic Receiver	SD1525BH	150 ± 20%	96 ± 3	≦ 2%	ø 25 x 4.8
DR28L9102-150	Dynamic Receiver	/	150 ± 20%	91 ± 2	/	ø 28 x 7.4
DR280933-150	Dynamic Receiver	SD153B	150 ± 20%	93 ± 3	≦ 2%	ø 28 x 7.2
DR280933-150 H	Dynamic Receiver	SD153BH	150 ± 20%	93 ± 3	≦ 2%	ø 28 x 7.2
DR280953-150	Dynamic Receiver	SD154B	150 ± 20%	95 ± 3	≦ 2%	ø 28 x 7.2
DR280943-150 H	Dynamic Receiver	SD154B	150 ± 20%	94 ± 3	≦ 2%	ø 28 x 7.2
DR280903-150	Dynamic Receiver	SD1528B	150 ± 20%	90 ± 3	≦ 2%	ø 28 x 3.8
DR280903-150 H	Dynamic Receiver	SD1528BH	150 ± 20%	90 ± 3	≦ 2%	ø 28 x 3.8
DR310963-150	Dynamic Receiver	SD152B	150 ± 20%	96 ± 3	≦ 2%	ø 31 x 11
DR310963-150 H	Dynamic Receiver	SD152BH	150 20%	96 ± 3	≦ 2%	ø 31 x 11
DR310943-150	Dynamic Receiver	SD158B	150 ± 20%	94 ± 3	≦ 2%	ø 31 x 14
DR310943-150 H	Dynamic Receiver	SD158BH	150 ± 20%	94 ± 3	≦ 2%	ø 31 x 14
DR311103-60	Dynamic Receiver	SD1537B	60 ± 10%	110 ± 3(100mv)	≦ 2%	ø 31 x 9.8
DR350963-150	Dynamic Receiver	SD150T	150 ± 20%	96 ± 3	≦ 2%	ø 35 x 18
DR350963-150 H	Dynamic Receiver	SD15TH	150 ± 20%	96 ± 3	≦ 2%	ø 35 x 18
DR350963-150	Dynamic Receiver	SD151L(DR-0.5)	150 ± 20%	96 ± 3	≦ 2%	ø 35 x 18
DR350963-150 H	Dynamic Receiver	SD151LH(DR-0.5h)	150 ± 20%	96 ± 3	≦ 2%	ø 35 x 18
DR360963-150	Dynamic Receiver	SD1516BH	150 ± 20%	96 ± 3	≦ 2%	ø 36 x 12.5
DR360963-150 H	Dynamic Receiver	SD1516BH	150 ± 20%	96 ± 3	≦ 2%	ø 36 x 12.5
DR380983-150	Dynamic Receiver	SD150(DR904)	150 ± 20%	98 ± 3	≦ 2%	ø 38 x 21.2
DR380983-150 H	Dynamic Receiver	SD150PH(DR904H)	150 ± 20%	98 ± 3	≦ 2%	ø 38 x 21.2
DR38P0963-150	Dynamic Receiver	/	150 ± 20%	96 ± 3	≦ 3%	ø 38 x 21
DR380993-150	Dynamic Receiver	SD150B	150 ± 20%	99 ± 3	≦ 2%	ø 38 x 19
DR380943-150	Dynamic Receiver	SD1510B	150 ± 20%	94 ± 3	≦ 2%	ø 38 x 13.5
DR380943-150 H	Dynamic Receiver	SD150BH	150 ± 20%	94 ± 3	≦ 2%	ø 38 x 13.5
DR400923-150	Dynamic Receiver	SD159B	150 ± 20%	92 ± 3	≦ 2%	ø 40 x 10.5
DR400923-150 H	Dynamic Receiver	SD159BH	150 ± 20%	92 ± 3	≦ 2%	ø 40 x 10.5
PR22L1064	Piezo Recevier	/	/	106 ± 4	≦ 2%	ø 22 x 2
PR23L1055	Piezo Recevier	/	/	105 ± 5	/	ø 23 x 3.2
PR23L1083	Piezo Recevier	/	/	108 ± 3	/	ø 23 x 3.8

Transducer

(Example)

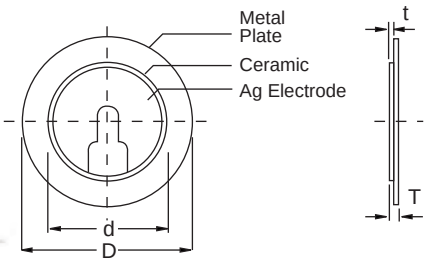


Magnetic Transducer - Please refer our part no. Specific in specification

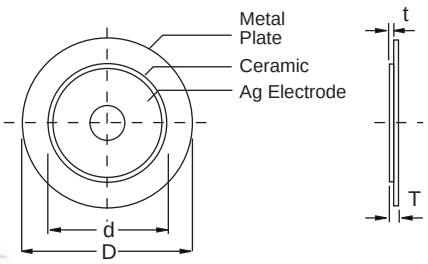
Model No.	Type	Size (mm)	Max. Rated Current (mA)	Frequency (Hz)	Operating Voltage (V)	Page No.
SPE SERIES	Piezo Element	20 ~ 50	/	1600 ~ 7000	1~30	29
APT24L650	Piezo Transducer	24 x 4.5	10	6500	3~20	30
APT24P380	Piezo Transducer	24 x 11	12	3800	3~20	31
APT25 SERIES	Piezo Transducer	24.5 x 7	20	3500 / 6800	3~20	
APT30P360	Piezo Transducer	30 x 12.4	10	3600	3~20	
APT39P340	Piezo Transducer	39.5 x 20	15	3400	5~15	32
APT40P360	Piezo Transducer	40 x 9	10	3600	7~12	
APT42P300G	Piezo Transducer	42 x 14	12	3000	6~15	
EPE SERIES	Piezo Element	12 ~ 50	/	1100 ~ 16500	1~30	33
EPT14L480	Piezo Transducer	14 x 4	5	4800	30	34
EPT17L400 / FPT17L400	Piezo Transducer	16.5 x 5 / 17 x 4	2 / 4	4000	30	
FPT24L550	Piezo Transducer	24 x 3.9	8	5500	30	
FPT24L410 / FPT24L400	Piezo Transducer	24 x 4.5 / 24 x 5.5	5 / 1.5	4000	30	35
FPT30L280	Piezo Transducer	30 x 5.5	1.5	2800	30	
FPT34L SERIES	Piezo Transducer	34.5 x 9	1.5 / 2	1100 / 1400	30 / 40	
FPT44L100	Piezo Transducer	44 x 14	1.5	1000	30	36
FPT45L120	Piezo Transducer	45.3 x 4.2	4	1200	30	
EPT13P400	Piezo Transducer	12.6 x 7	1	4000	30	
XPT14P400	Piezo Transducer	14 x 7	5	4000	20	37
EPT17P400	Piezo Transducer	17 x 7	3	4000	30	
EPT22P200	Piezo Transducer	22 x 10.6	1	2000	30	
EPT22P400	Piezo Transducer	22 x 7	1	4000	30	38
FPT22P250	Piezo Transducer	22 x 9	3	2500	30	
FPT23P200	Piezo Transducer	22.5 x 9	3	2048	30	
SPT27P200	Piezo Transducer	27 x 7.1	3	2000	25	39
EPT30 SERIES	Piezo Transducer	29.6 x 7.5	3 / 5	2800 / 4600	30	
EPT30P250	Piezo Transducer	30 x 10	2	2500	30	
FPT33P100	Piezo Transducer	33 x 7.5	2	1100	30	40
FPT34P100	Piezo Transducer	34 x 6.3	3	1000	30	
FPT44P100	Piezo Transducer	44 x 17	1.5	1400	30	
MT15	Magnetic Transducer	9 x 5	70	2731	3~5	41
MT09	Magnetic Transducer	9 x 5.5	80	2731	2~6	42
MT08 SERIES	Magnetic Transducer	9.6 x 5	80	2700 / 3200	1~2	
MT07 SERIES	Magnetic Transducer	9.5 x 6.7	80	2731 / 3100	0.8~2	
MT105 SERIES	Magnetic Transducer	12 x 5.4	10 / 30	2048	1~3	43
MT106	Magnetic Transducer	12 x 6	80	2000	2~4	
MT01 SERIES	Magnetic Transducer	12 x 8.5	10 / 30	2048	1~2	
MT113	Magnetic Transducer	12 x 13	30	2048	1~2	44
MTX SERIES	Magnetic Transducer	12 x 9	40 / 70	2400	1~16	
MT22	Magnetic Transducer	14 x 5	35	2000	1~4	
MTE12G	Magnetic Transducer	16 x 12	50	1700 ~ 2200	6~18	45
MTB SERIES	Magnetic Transducer	16 x 14	12 / 40	2048	1~15	
MT23 SERIES	Magnetic Transducer	25 x 12.5	55 / 70 / 80	1000 ~ 1500	3~14	

Piezo Element (Self-Drive)

SPE Series



Type E



Type F

Model No.	Resonant Frequency (KHz)	MAX. Resonant Impedance (Ω)	Static Capacitance (pf±30%)	Type	D ±0.1	d ±0.2	T ±0.05	t ±0.03	Plate Material
20T-36TS	3.6 ± 0.5	400	25,000	E	20	15	0.22	0.10	Brass
20T-70S	7.0 ± 0.7	250	15,000	E	20	15	0.50	0.25	Brass
27G-46S	4.6 ± 0.5	200	25,000	E	27	20	0.50	0.25	SUS
27T-26TS	2.6 ± 0.5	300	60,000	E	27	20	0.22	0.10	Brass
27T-42S	4.2 ± 0.5	200	25,000	E	27	20	0.50	0.25	Brass
34.7G-32S	3.2 ± 0.5	250	38,000	E	34.7	25	0.53	0.25	SUS
35G-16TS	1.6 ± 0.3	300	100,000	E	35	25	0.22	0.10	SUS
35G-28S	2.8 ± 0.5	250	40,000	EF	35	25	0.50	0.25	SUS
35G-32S	3.2 ± 0.5	250	38,000	E	35	25	0.53	0.25	SUS
35T-26S	2.6 ± 0.5	250	40,000	EF	35	25	0.50	0.25	Brass
38T-20S	2.0 ± 0.5	500	40,000	E	38	25	0.50	0.25	Brass
50T-27S	2.7 ± 0.5	300	40,600	E	50	36	1.05	0.5	Brass

Piezo Transducer (Self-Drive)

PIEZO GENERATORS ARE AVAILABLE IN TWO TYPES:

1. External drive (two-terminal type)
2. Self drive (three-terminal type)

The external drive works when signal voltage is applied on the metal diaphragm as one electrode and the conductive-material-screened piezo element as the other electrode.

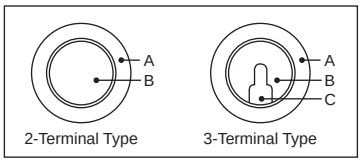


Fig.1

The self-drive has split electrode on the piezo element. When the signal is applied between A & B in figure 1, the phase-shifted signal will be induced between C & A so that it works as a piezoelectric transformer. The phase-shifted signal can be used as the feedback component in a simple oscillation circuit, which operates automatically at the natural resonant frequency

MOUNTING METHOD
Common mounting methods for piezo element:
-Edge Mounting Method (figure 2)
Edge mount is to fix the outside circumference of the element to the supporting ring of the plate. Considerable sound output can be obtained covering a wide frequency range around the resonant frequency.

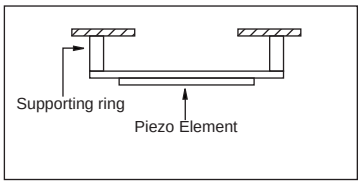


Fig.2

Nodal Mounting Method (figure 3)
-Nodal mount is to fix the nodal diameter of the element to the supporting ring of the plate. Loud sound output can be obtained at the resonant frequency. The sound pressure will drastically reduce when the frequency is shifted out from the resonant frequency.

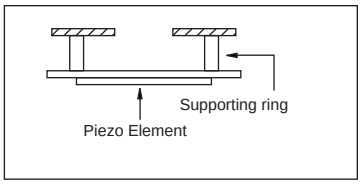


Fig.3

MOUNTING GLUE
The adhesive material used between the element and the support ring should be elastic, such as silicon rubber.

FIXTURE DESIGN
Maximum sound output could be achieved when build suitable case with piezo element

Case Design For Edge Mounting Method.
When building a case for edge mounting, the cavity resonant frequency of the case (F0) is determined by the following formula in figure 4.
-Case Design For Nodal Mounting Method. The self-drive piezo element should be oscillated in the basic mode and supported at the nodal point to obtain stability.

The resonant frequency for the case (F0) is determined by the same formula. Common case design is shown in figure 5.

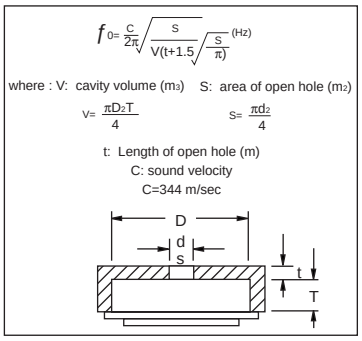


Fig.4

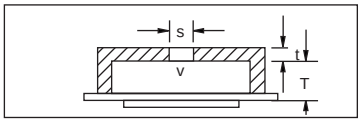
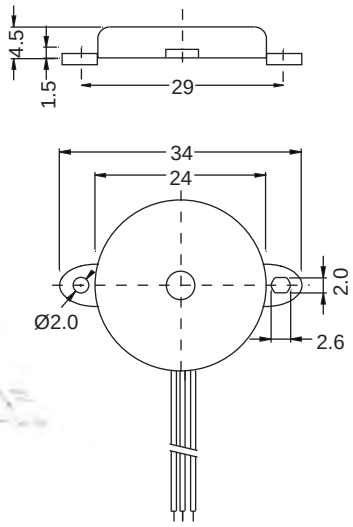


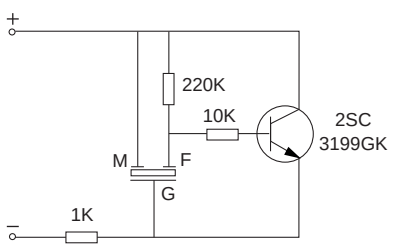
Fig.5

RINGFORD

APT24L650

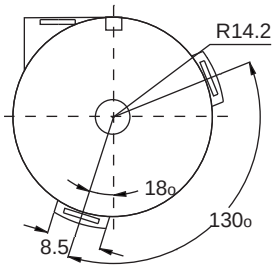


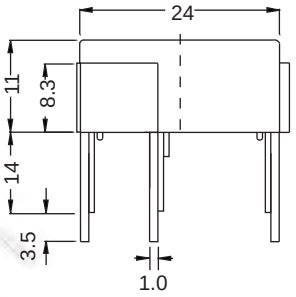
		APT24L650
Operating Voltage	VDC	3~20
Rated Voltage	DC	12
Max. Rated Current		10
Min. S.P.L. at 10cm	dB	85
Resonant Frequency	Hz	6500±500
Operating Temperature	C	-20~+70
Tone		Single
Plate Material		Brass



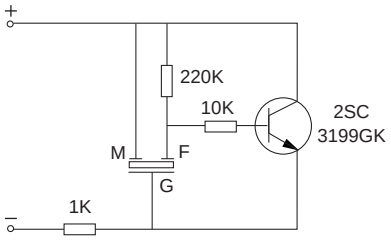
Piezo Transducer (Self-Drive)

APT24P380





		APT24P380
Operating Voltage	VDC	3~20
Rated Voltage	DC	12
Max. Rated Current		12
Min. S.P.L. at 10cm	dB	90
Resonant Frequency	Hz	3800±500
Operating Temperature	C	-20~+70
Tone		Single
Plate Material		Alloy



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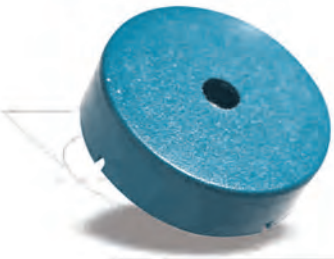
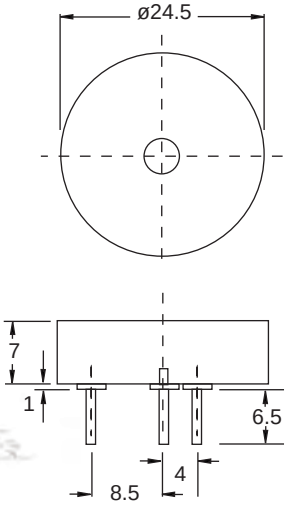
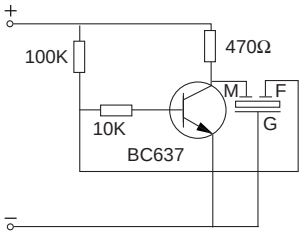
APT25 Series



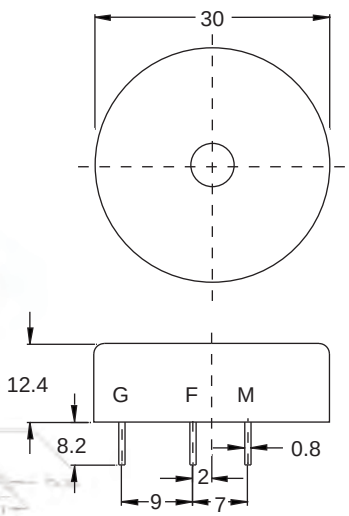


		APT25P350	APT25P680
Operating Voltage	VDC	3~20	3~20
Rated Voltage	DC	12	6.5
Max. Rated Current		20	20
Min. S.P.L. at 10cm	dB	80	87
Resonant Frequency	Hz	3500±500	6800±500
Operating Temperature	C	-20~+110	-20~+60
Tone		Single	Single
Plate Material		Brass	Brass

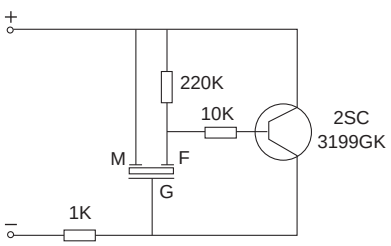


RINGFORD

APT30P360

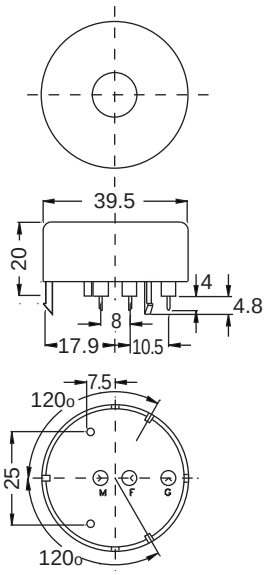


		APT30P360
Operating Voltage	VDC	3~20
Rated Voltage	DC	12
Max. Rated Current		10
Min. S.P.L. at 10cm	dB	88
Resonant Frequency	Hz	3600±500
Operating Temperature	C	-20~+60
Tone		Single
Plate Material		Brass

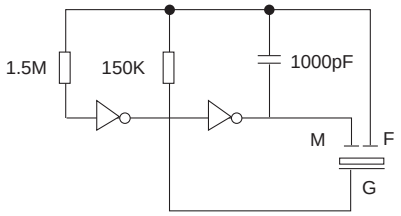


Piezo Transducer (Self-Drive)

APT39P340

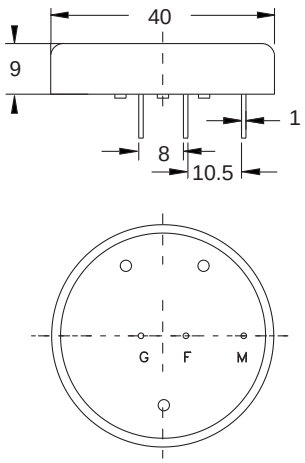


		APT39P340
Operating Voltage	VDC	5~15
Rated Voltage	DC	9
Max. Rated Current		15
Min. S.P.L. at 30cm	dB	100
Resonant Frequency	Hz	3400±500
Operating Temperature	C	-20~+70
Tone		Single
Plate Material		Alloy

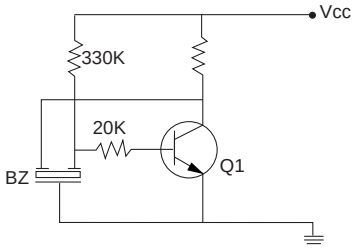


RINGFORD

APT40P360

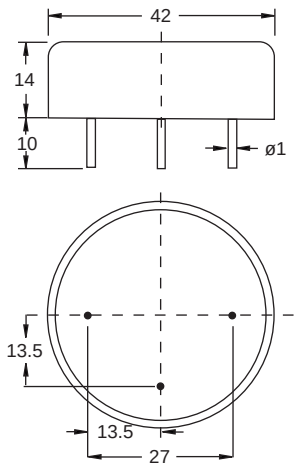


		APT40P360
Operating Voltage	VDC	7~12
Rated Voltage	DC	9
Max. Rated Current		10
Min. S.P.L. at 30cm	dB	90
Resonant Frequency	Hz	3600±500
Operating Temperature	C	-20~+70
Tone		Single
Plate Material		SUS

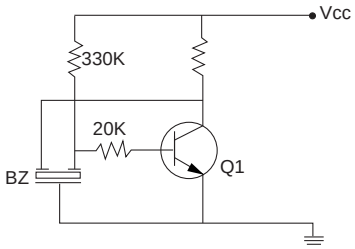


RINGFORD

APT42P300G

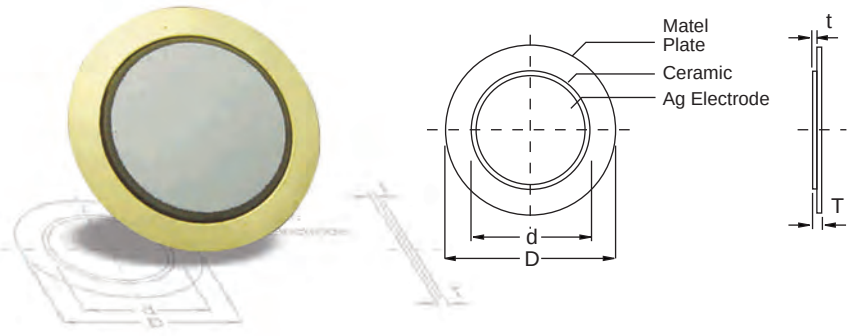


		APT42P300G
Operating Voltage	VDC	6~15
Rated Voltage	DC	12
Max. Rated Current		12
Min. S.P.L. at 30cm	dB	88
Resonant Frequency	Hz	3000±500
Operating Temperature	C	-20~+70
Tone		Single
Plate Material		SUS



Piezo Element (External-Drive)

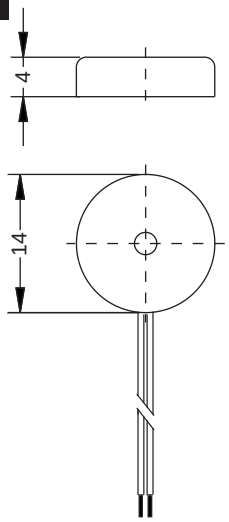
EPE Series



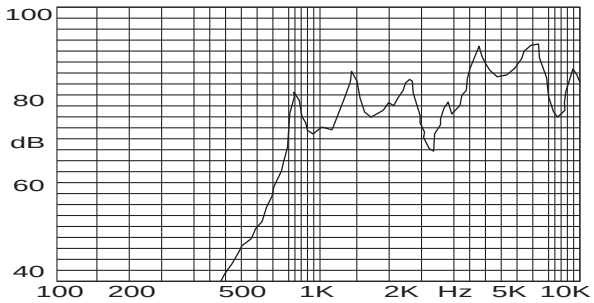
Model No.	Resonant Frequency (KHz)	MAX. Resonant Impedance (Ω)	Static Capacitance (pf±30%)	D ±0.1	d ±0.2	T ±0.05	t ±0.03	Plate Material
12T-16E	16.5 ± 1.0	800	6,000	12	9	0.45	0.25	Brass
12T-8.5TE	8.5 ± 0.6	600	13,000	12	9	0.22	0.10	Brass
15T-10E	10 ± 1.0	400	9,000	15	11	0.45	0.25	Brass
15T-63TE	6.3 ± 0.5	600	15,000	15	11	0.22	0.10	Brass
18G-95E	9.5 ± 0.7	300	15,000	18	15	0.50	0.25	SUS
18T-90E	9.0 ± 0.7	300	15,000	18	15	0.50	0.25	Brass
18A-30TE	3.0 ± 0.3	150	80,000	18	13.5	0.13	0.05	Alloy
20A-27E	2.7 ± 0.3	100	100,000	20	15	0.18	0.05	Alloy
20G-75E	7.5 ± 0.7	250	15,000	20	15	0.50	0.25	SUS
20T-39TE	3.9 ± 0.3	400	25,000	20	15	0.22	0.10	Brass
20T-70E	7.0 ± 0.7	250	15,000	20	15	0.50	0.25	Brass
21T-35TE	3.5 ± 0.3	250	60,000	21	20	0.22	0.10	Brass
25T-27TE	2.7 ± 0.3	300	60,000	25	20	0.22	0.10	Brass
27G-46E	4.6 ± 0.5	200	25,000	27	20	0.50	0.25	SUS
27T-25TE	2.5 ± 0.3	200	100,000	27	25	0.22	0.10	Brass
27T-26TE	2.6 ± 0.3	200	60,000	27	20	0.22	0.10	Brass
27T-30E	3.0 ± 0.5	300	35,000	27	20	0.38	0.15	Brass
27T-42E	4.2 ± 0.5	200	25,000	27	20	0.50	0.25	Brass
30G-19TE	1.9 ± 0.3	500	60,000	30	20	0.22	0.10	SUS
30T-18TE	1.8 ± 0.3	500	60,000	30	20	0.22	0.10	Brass
30T-29E	2.9 ± 0.5	300	25,000	30	20	0.50	0.25	Brass
31G-19TE	1.9 ± 0.3	800	60,000	31	20	0.22	0.10	SUS
31G-30E	3.0 ± 0.5	300	25,000	31	20	0.50	0.25	SUS
31T-17TE	1.7 ± 0.3	800	60,000	31	20	0.22	0.10	Brass
31T-23TE	2.3 ± 0.3	200	100,000	31	25	0.22	0.10	Brass
31T-29E	2.9 ± 0.5	300	25,000	31	20	0.50	0.25	Brass
35G-15TE	1.5 ± 0.3	300	100,000	35	25	0.22	0.10	SUS
35G-28E	2.8 ± 0.5	250	40,000	35	25	0.50	0.25	SUS
35T-15TE	1.5 ± 0.3	300	100,000	35	25	0.22	0.10	Brass
35T-26E	2.6 ± 0.5	250	40,000	35	25	0.50	0.25	Brass
38T-15TE	1.5 ± 0.3	1000	100,000	38	25	0.22	0.10	Brass
38T-20E	2.0 ± 0.5	500	40,000	38	25	0.50	0.25	Brass
41G-14TE	1.4 ± 0.3	1200	100,000	41	25	0.22	0.10	SUS
41T-13TE	1.3 ± 0.3	1200	100,000	41	25	0.22	0.10	Brass
41T-15E	1.5 ± 0.5	400	40,000	41	25	0.50	0.25	Brass
41T-26TE	2.6 ± 0.3	300	60,000	41	20	0.22	0.10	Brass
42T-12TE	1.2 ± 0.3	1200	100,000	42	25	0.22	0.10	Brass
42T-14E	1.4 ± 0.5	500	40,000	42	25	0.50	0.25	Brass
45T-11TE	1.1 ± 0.3	1400	100,000	45	25	0.22	0.10	Brass
50T-13E	1.3 ± 0.5	300	60,000	50	30	0.50	0.25	Brass
50T-14TE	1.4 ± 0.3	1000	160,000	50	30	0.22	0.10	Brass
50T-20TE	2.0 ± 0.3	500	100,000	50	25	0.22	0.10	Brass
50T-32E	3.2 0.5	200	40,000	50	25	0.50	0.25	Brass

Piezo Transducer (External-Drive)

EPT14L480



		EPT14L480
Max. Input Voltage	V	30Vp-p
Rated Voltage	V	10Vp-p square wave
Max. Rated Current	mA	5
Capacitance	pF	15,000±30%
Min. S.P.L. at 10cm	dB	85
Resonant Frequency	Hz	4800±500
Operating Temperature	oC	-20~+80
Plate Material		Brass



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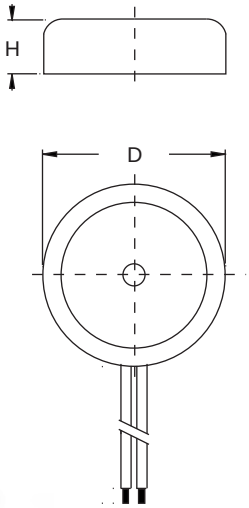
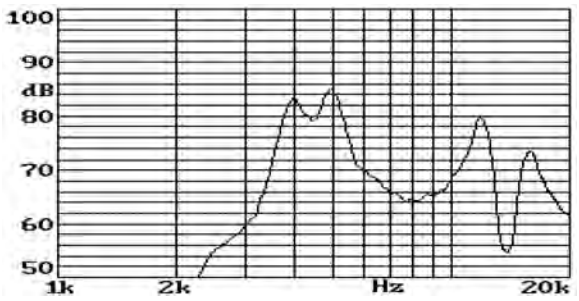
EPT17L400 / FPT17L400

	EPT17L400	FPT17L400
D	16.5	17
H	5	4

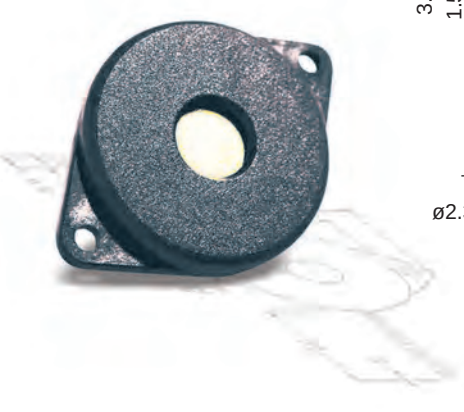


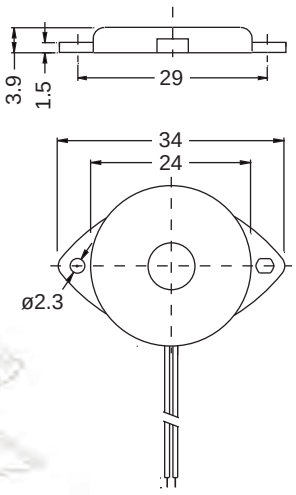
		EPT17L400	FPT17L400
Max. Input Voltage	V	30Vp-p	30Vp-p
Rated Voltage	V	3Vp-p square wave	9Vp-p square wave
Max. Rated Current	mA	2	4
Capacitance	pF	12,000±30%	12,000±30%
Min. S.P.L. at 10cm	dB	85	80
Resonant Frequency	Hz	4000±500	4000±500
Operating Temperature	oC	-20~+60	-20~+60
Plate Material		Brass	Brass



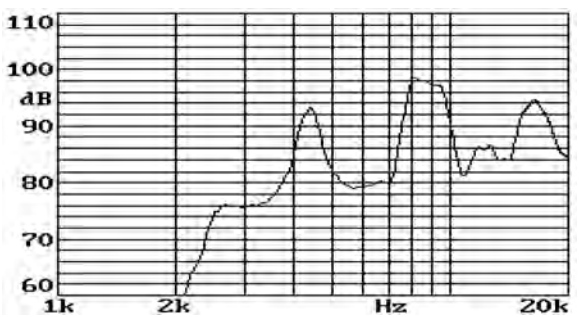
RINGFORD

FPT24L550





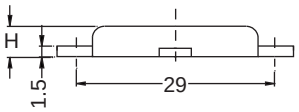
		FPT24L550
Max. Input Voltage	V	30Vp-p
Rated Voltage	V	15Vp-p square wave
Max. Rated Current	mA	8
Capacitance	pF	18,000±30%
Min. S.P.L. at 10cm	dB	90
Resonant Frequency	Hz	5500±500
Operating Temperature	oC	-20~+70
Plate Material		Brass

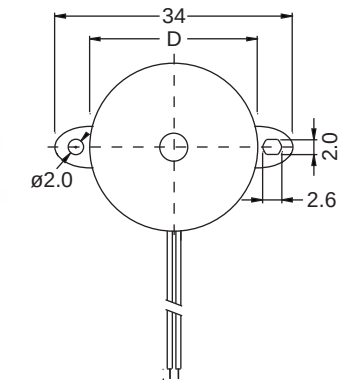


Piezo Transducer (External-Drive)

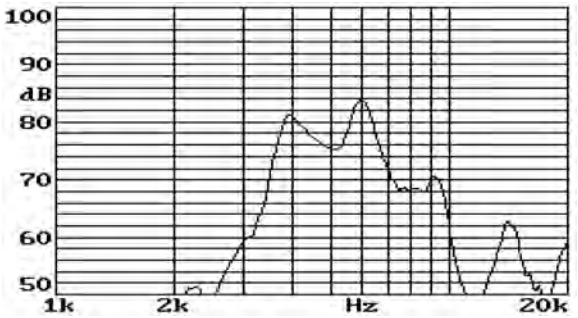
FPT24L410 / FPT24L400

	FPT24L410	FPT24L400
D	24	24
H	4.5	5.5





		FPT24L410	FPT24L400
Max. Input Voltage	V	30Vp-p	30Vp-p
Rated Voltage	V	10Vp-p square wave	3Vrms sine wave
Max. Rated Current	mA	5	1.5
Capacitance	pF	17,000±30%	20,000±30%
Min. S.P.L. at 10cm	dB	80	85
Resonant Frequency	Hz	4000±500	4000±500
Operating Temperature	₀C	-20~+70	-20~+70
Plate Material		Brass	Brass



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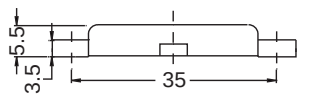
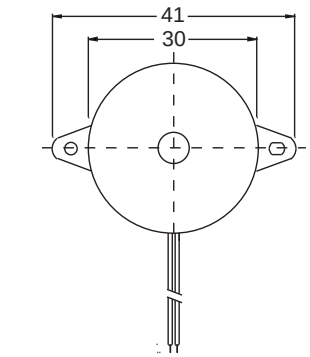
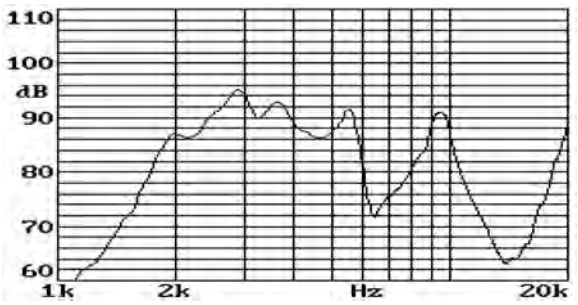
FPT30L280





		FPT30L280
Max. Input Voltage	V	30Vp-p
Rated Voltage	V	3Vrms sine wave
Max. Rated Current	mA	1.5
Capacitance	pF	50,000±30%
Min. S.P.L. at 10cm	dB	80
Resonant Frequency	Hz	2800±500
Operating Temperature	₀C	-20~+70
Plate Material		Brass



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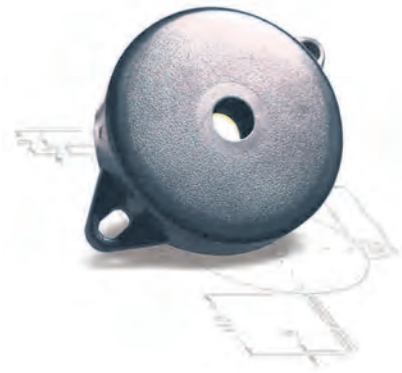
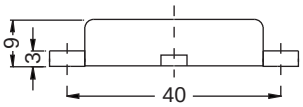
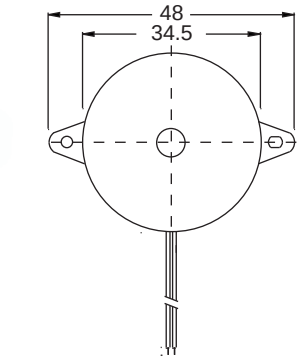
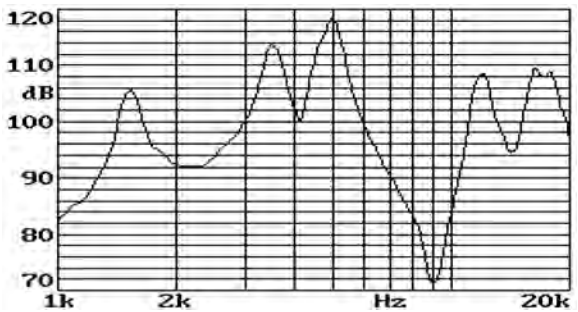
FPT34L Series





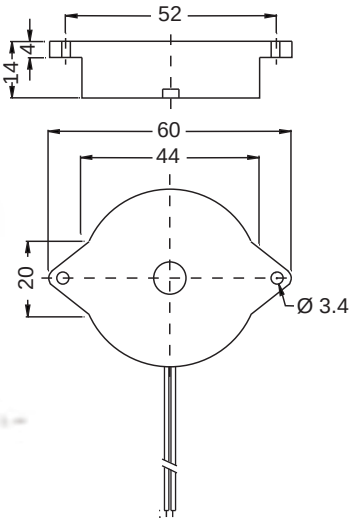


		FPT34L110	FPT34L110-X7
Max. Input Voltage	V	30Vp-p	40Vp-p
Rated Voltage	V	9Vp-p square wave	9Vp-p square wave
Max. Rated Current	mA	1.5	2
Capacitance	pF	48,000±30%	48,000±30%
Min. S.P.L. at 10cm	dB	80	87
Resonant Frequency	Hz	1100±500	1400±500
Operating Temperature	₀C	-20~+70	-20~+70
Plate Material		Brass	Brass

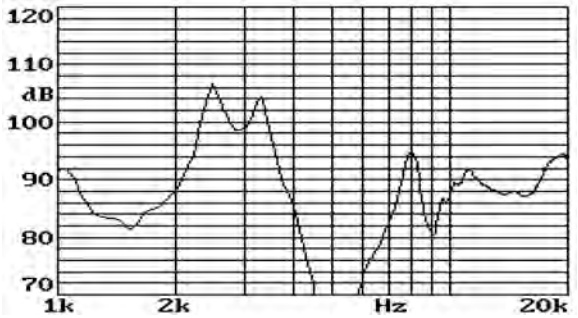


Piezo Transducer (External-Drive)

FPT44L100

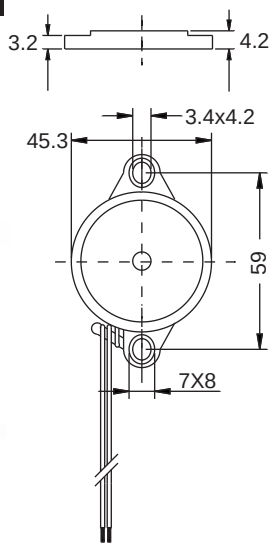


		FPT44L100
Max. Input Voltage	V	30Vp-p
Rated Voltage	V	3Vrms sine wave
Max. Rated Current	mA	1.5
Capacitance	pF	40,000±30%
Min. S.P.L. at 10cm	dB	70
Resonant Frequency	Hz	1000±500
Operating Temperature	₀C	-20~+70
Plate Material		Brass

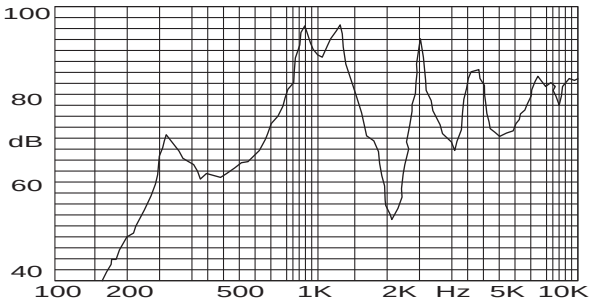


RINGFORD

FPT45L120

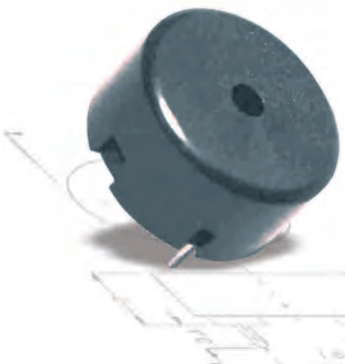


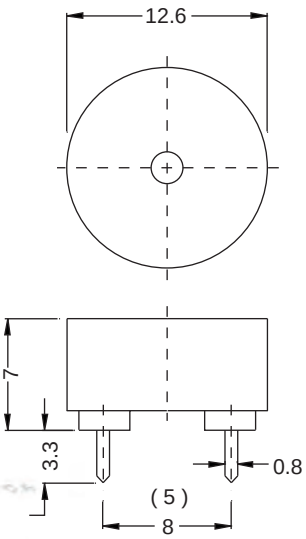
		FPT45L120
Max. Input Voltage	V	30Vp-p
Rated Voltage	V	12Vp-p square wave
Max. Rated Current	mA	4
Capacitance	pF	66,000±30%
Min. S.P.L. at 30cm	dB	85
Resonant Frequency	Hz	1200±500
Operating Temperature	₀C	-20~+60
Plate Material		Brass



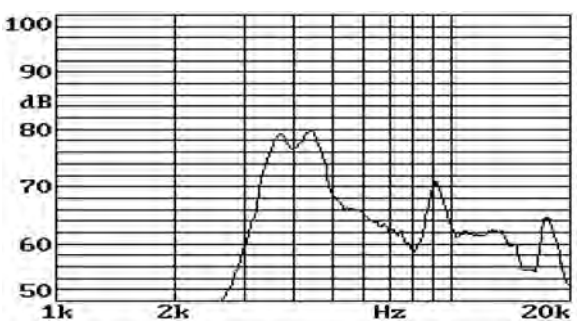
RINGFORD

EPT13P400



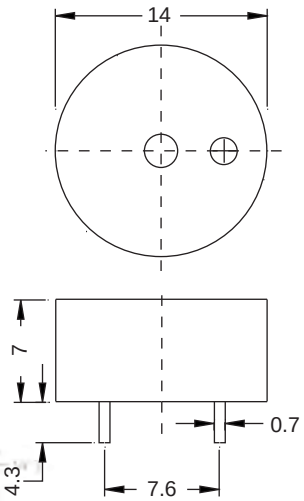


		EPT13P400
Max. Input Voltage	V	30Vp-p
Rated Voltage	V	3Vp-p square wave
Max. Rated Current	mA	1
Capacitance	pF	12,000±30%
Min. S.P.L. at 10cm	dB	70
Resonant Frequency	Hz	4000±500
Operating Temperature	₀C	-20~+70
Plate Material		Alloy

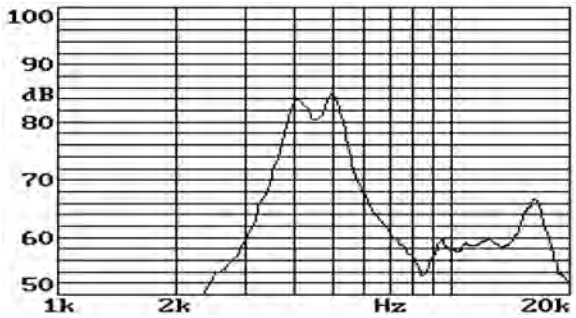


Piezo Transducer (External-Drive)

XPT14P400

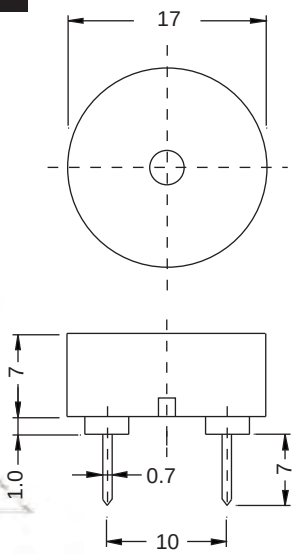


		XPT14P400
Max. Input Voltage	V	20Vp-p
Rated Voltage	V	12Vp-p square wave
Max. Rated Current	mA	5
Capacitance	pF	10,000±30%
Min. S.P.L. at 10cm	dB	80
Resonant Frequency	Hz	4000±500
Operating Temperature	oC	-20~+70
Plate Material		Brass

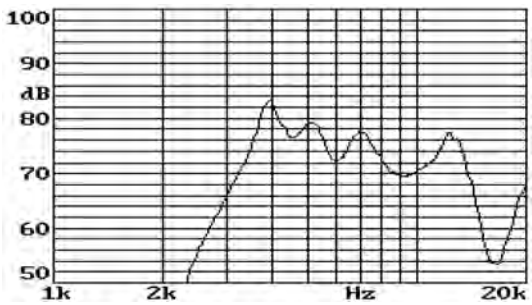


RINGFORD

EPT17P400

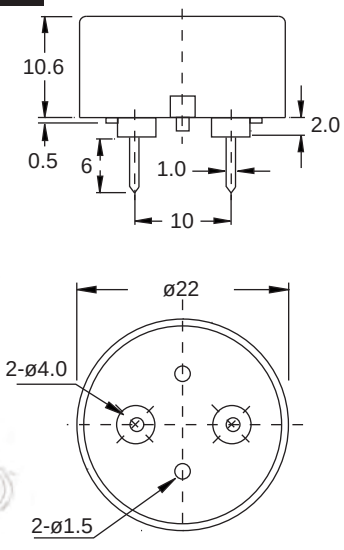


		EPT17P400
Max. Input Voltage	V	30Vp-p
Rated Voltage	V	5Vp-p square wave
Max. Rated Current	mA	3
Capacitance	pF	14,000±30%
Min. S.P.L. at 10cm	dB	88
Resonant Frequency	Hz	4000±500
Operating Temperature	oC	-20~+85
Plate Material		Brass

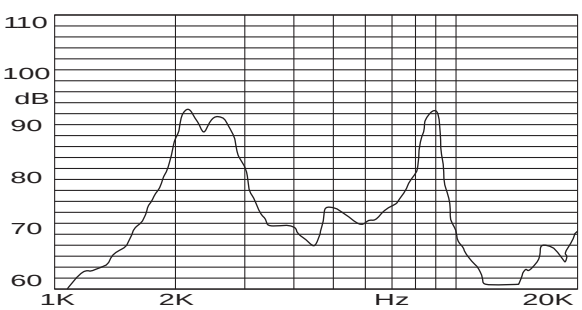


RINGFORD

EPT22P200

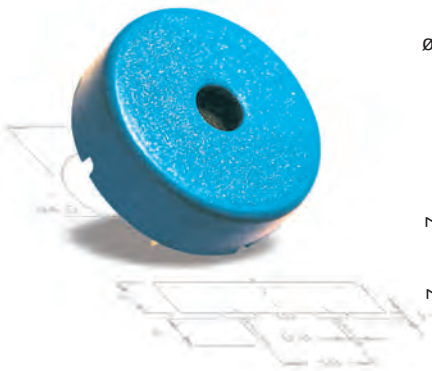


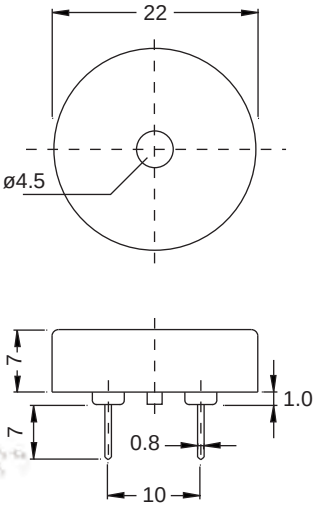
		EPT22P200
Max. Input Voltage	V	30Vp-p
Rated Voltage	V	3Vp-p square wave
Max. Rated Current	mA	1
Capacitance	pF	19,000±30%
Min. S.P.L. at 10cm	dB	75
Resonant Frequency	Hz	2000±500
Operating Temperature	oC	-20~+85
Plate Material		Brass



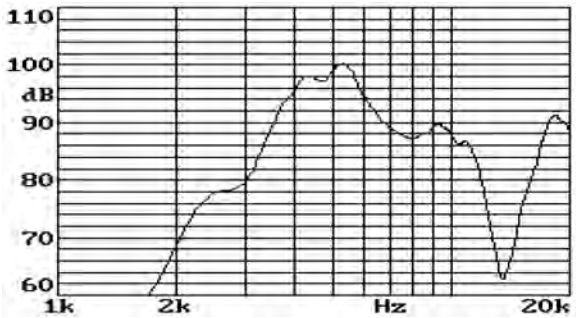
Piezo Transducer (External-Drive)

EPT22P400



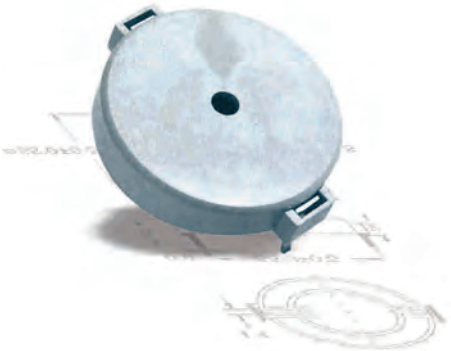


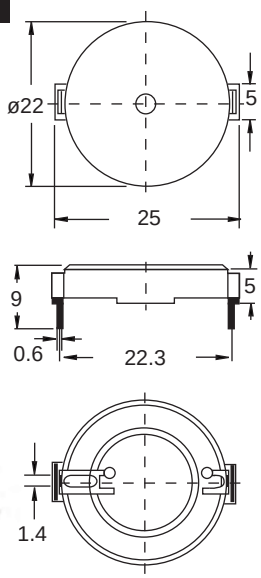
		EPT22P400
Max. Input Voltage	V	30Vp-p
Rated Voltage	V	3Vrms sine wave
Max. Rated Current	mA	1
Capacitance	pF	15,000±30%
Min. S.P.L. at 10cm	dB	80
Resonant Frequency	Hz	4000±500
Operating Temperature	₀C	-20~+70
Plate Material		Brass



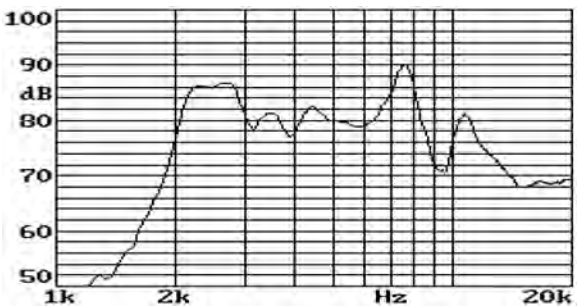
RINGFORD

FPT22P250





		FPT22P250
Max. Input Voltage	V	30Vp-p
Rated Voltage	V	10Vp-p square wave
Max. Rated Current	mA	3
Capacitance	pF	18,000±30%
Min. S.P.L. at 10cm	dB	80
Resonant Frequency	Hz	2500±500
Operating Temperature	₀C	-20~+85
Plate Material		Brass



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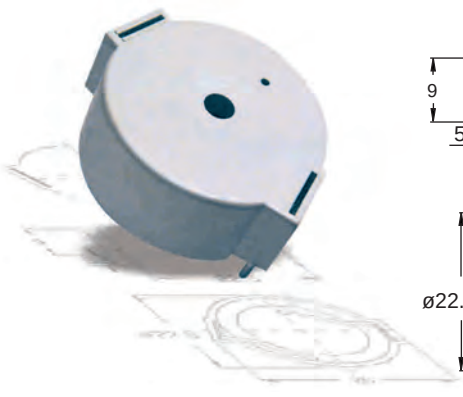
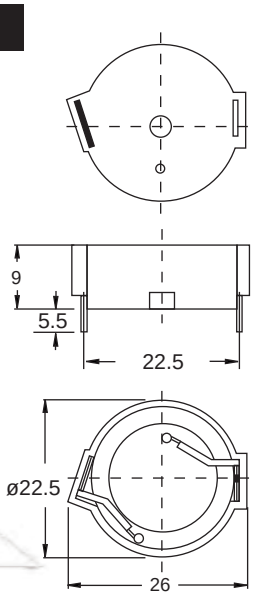
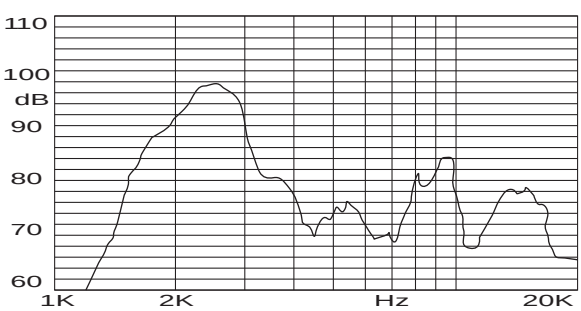


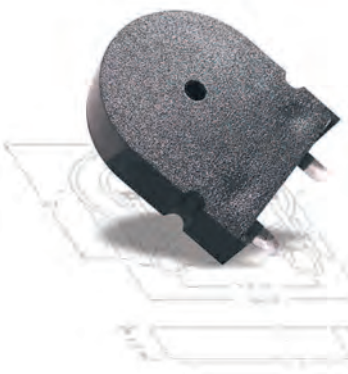


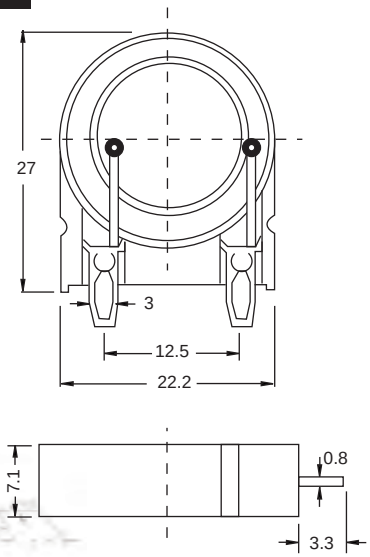
		FPT23P200
Max. Input Voltage	V	30Vp-p
Rated Voltage	V	10Vp-p square wave
Max. Rated Current	mA	3
Capacitance	pF	24,000±30%
Min. S.P.L. at 10cm	dB	85
Resonant Frequency	Hz	2048±500
Operating Temperature	₀C	-20~+70
Plate Material		Alloy



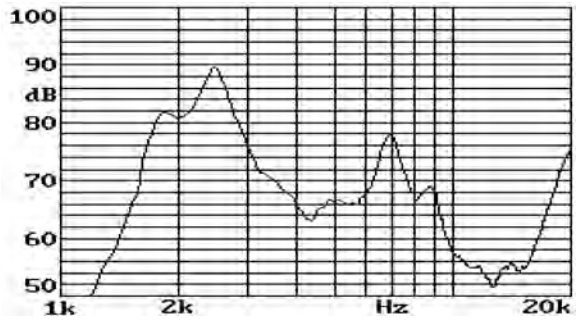
Piezo Transducer

SPT27P200





		SPT27P200
Max. Input Voltage	V	25Vp-p
Rated Voltage	V	3Vrms sine wave
Max. Rated Current	mA	3
Capacitance	pF	30,000±30%
Min. S.P.L. at 10cm	dB	80
Resonant Frequency	Hz	2000±500
Operating Temperature	₀C	-20~+70
Plate Material		Brass



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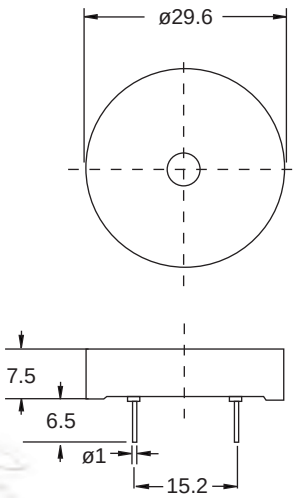
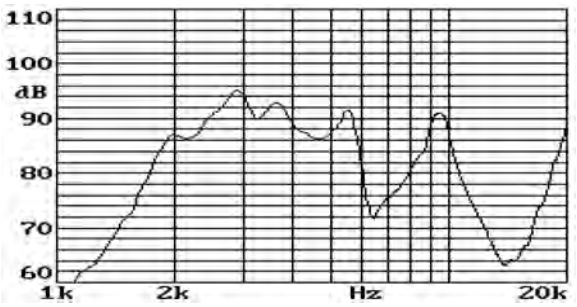
EPT30 Series

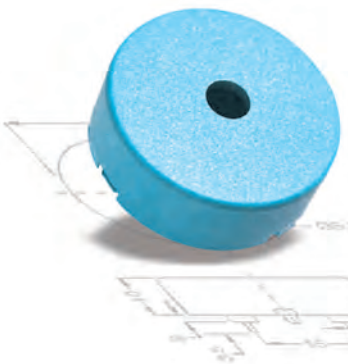


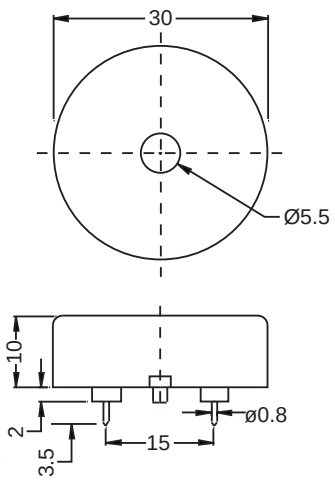
		ETP30P280	EPT30P460
Max. Input Voltage	V	30Vp-p	30Vp-p
Rated Voltage	V	10Vp-p square wave	5Vp-p square wave
Max. Rated Current	mA	5	3
Capacitance	pF	30,000±30%	30,000±30%
Min. S.P.L. at 10cm	dB	90	90
Resonant Frequency	Hz	2800±500	4600±400
Operating Temperature	₀C	-20~+60	-20~+60
Plate Material		Brass	SUS



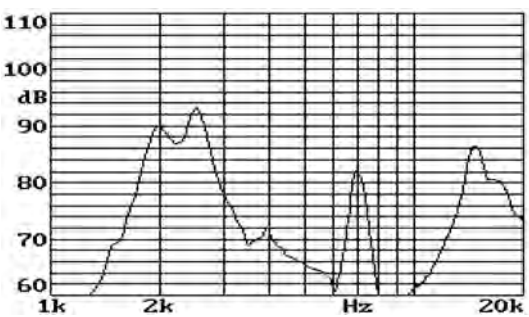
RINGFORD

EPT30P250



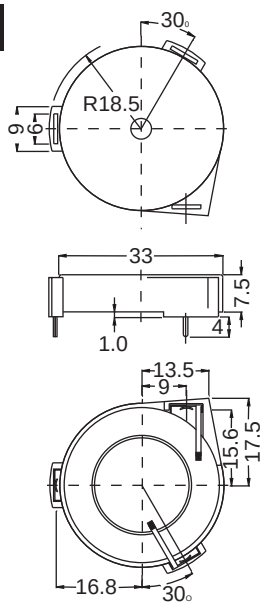


		EPT30P250
Max. Input Voltage	V	30Vp-p
Rated Voltage	V	3Vrms sine wave
Max. Rated Current	mA	2
Capacitance	pF	25,000±30%
Min. S.P.L. at 10cm	dB	80
Resonant Frequency	Hz	2500±500
Operating Temperature	₀C	-20~+70
Plate Material		SUS

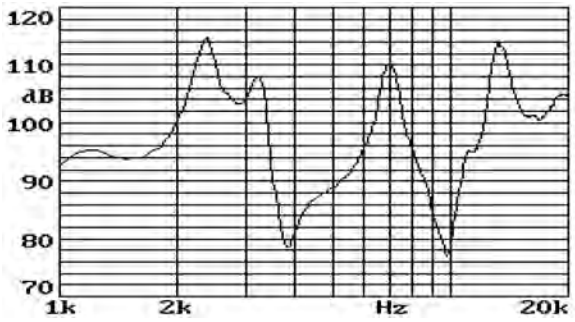


Piezo Transducer (External-Drive)

FPT33P100

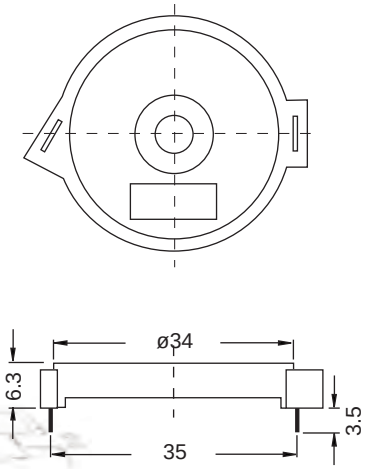


		FPT33P100
Max. Input Voltage	V	30Vp-p
Rated Voltage	V	3Vrms sine wave
Max. Rated Current	mA	2
Capacitance	pF	60,000±30%
Min. S.P.L. at 10cm	dB	80
Resonant Frequency	Hz	1100±500
Operating Temperature	°C	-20~+70
Plate Material		SUS

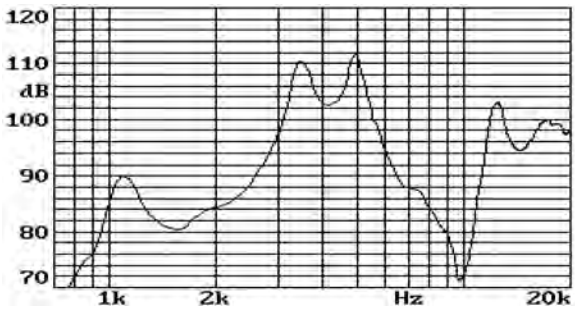


RINGFORD

FPT34P100

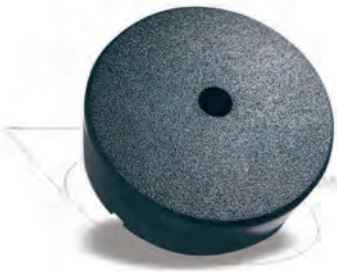


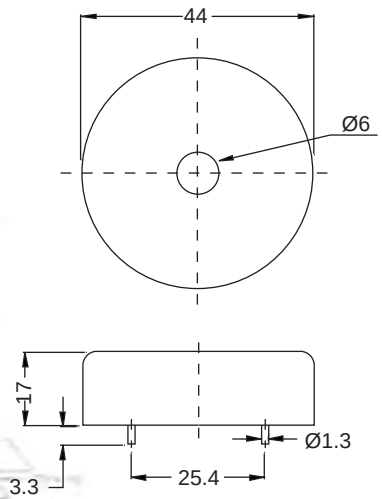
		FPT34P100
Max. Input Voltage	V	30Vp-p
Rated Voltage	V	10Vp-p square wave
Max. Rated Current	mA	3
Capacitance	pF	40,000±30%
Min. S.P.L. at 10cm	dB	85
Resonant Frequency	Hz	1000±500
Operating Temperature	°C	-20~+70
Plate Material		SUS



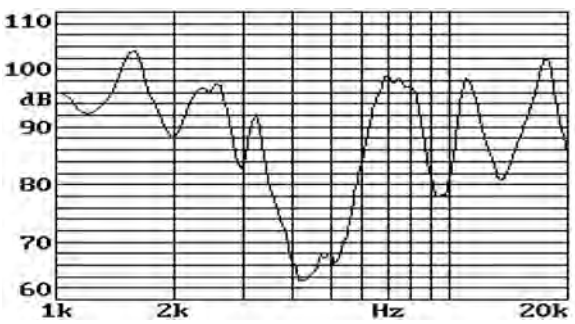
RINGFORD

FPT44P100



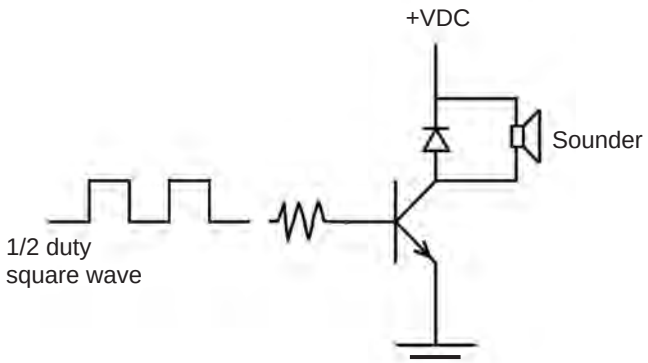


		FPT44P100
Max. Input Voltage	V	30Vp-p
Rated Voltage	V	3Vrms sine wave
Max. Rated Current	mA	1.5
Capacitance	pF	50,000±30%
Min. S.P.L. at 10cm	dB	72
Resonant Frequency	Hz	1400±500
Operating Temperature	°C	-20~+70
Plate Material		Brass

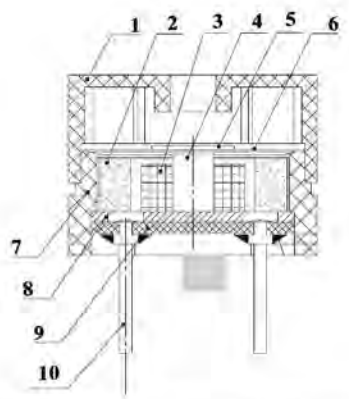


DRIVING CIRCUIT OF MAGNETIC TRANSDUCER

Standard driver circuit in figure 1 is required for magnetic transducer for generated AC magnetic field to obtain vibration of diaphragm,thus produce frequency of the sound.



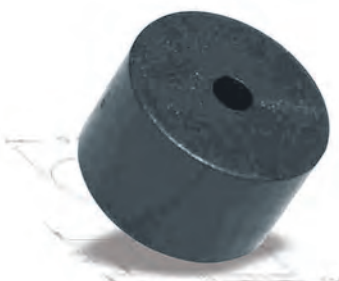
Structural diagram in figure 2 shows parts of material in magnetic transducer.

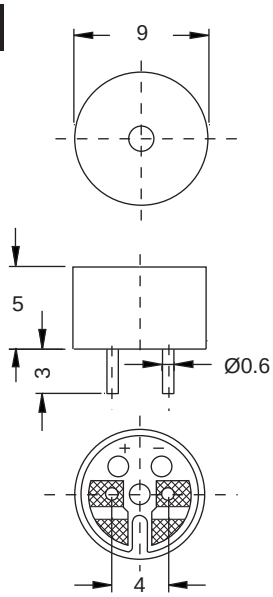


	Component part		Component part
1	Front housing	6	Vibrating piece
2	Magnetic ring	7	Back housing
3	Coil	8	Pole piece
4	Pole	9	P.C. board
5	Mass piece	10	Pin

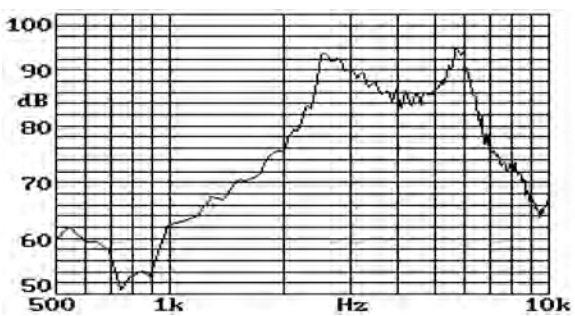
RINGFORD

MT15



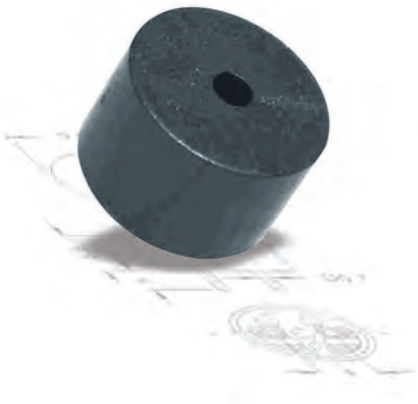


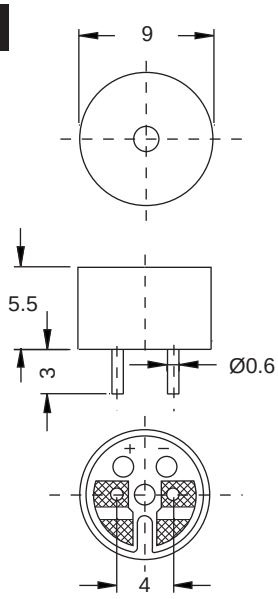
		MT15
Operating Voltage	V	3~5
Rated Voltage	V	3.6
Max. Rated Current	mA	70
Coil Resistance	Ω	25±4
Min. S.P.L. at 10cm	dB	87
Resonant Frequency	Hz	2731
Operating Temperature	C	-25~+70



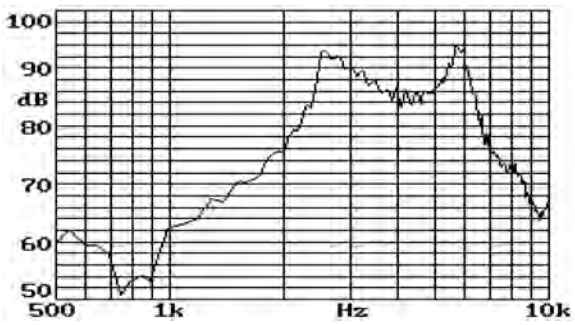
Magnetic Transducer

MT09



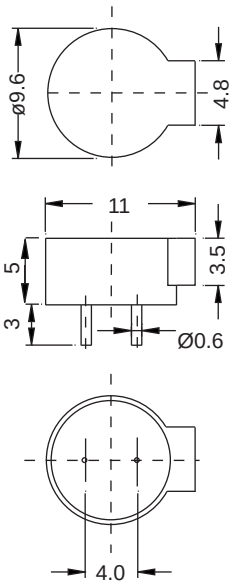


		MT09
Operating Voltage	V	2~6
Rated Voltage	V	3
Max. Rated Current	mA	80
Coil Resistance	Ω	25±4
Min. S.P.L. at 10cm	dB	82
Resonant Frequency	Hz	2731
Operating Temperature	C	-25~+70

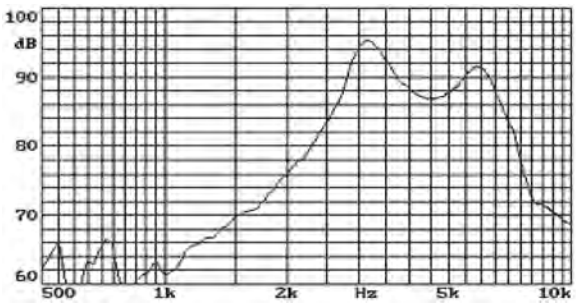


RINGFORD

MT08 Series

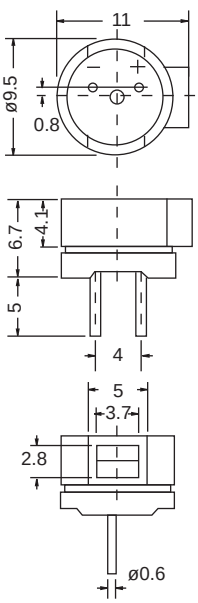


		MT08A	MT08B
Operating Voltage	V	1~2	1~2
Rated Voltage	V	1.5	1.5
Max. Rated Current	mA	80	80
Coil Resistance	Ω	5.5±1	5.5±1
Coil Impedance	Ω	9.5±3	9.5±3
Min. S.P.L. at 10cm	dB	90	85
Resonant Frequency	Hz	3200	2700
Operating Temperature	C	-20~+60	-20~+60

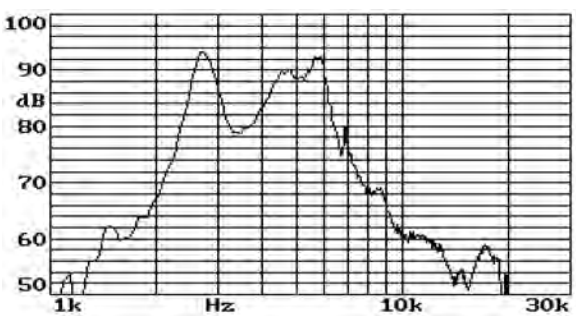


RINGFORD

MT07 Series

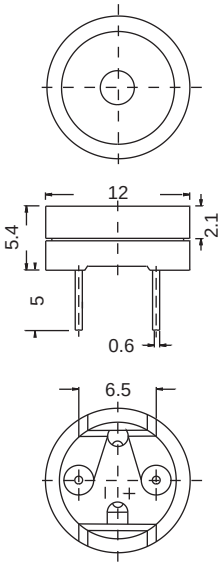


		MT07A	MT07B
Operating Voltage	V	0.85~1.5	1~2
Rated Voltage	V	1.5	1.5
Max. Rated Current	mA	80	80
Coil Resistance	Ω	5.5±1	5.5±1
Coil Impedance	Ω	9.5±3	9.5±3
Min. S.P.L. at 10cm	dB	85	85
Resonant Frequency	Hz	3100	2731
Operating Temperature	C	-20~+60	-20~+60

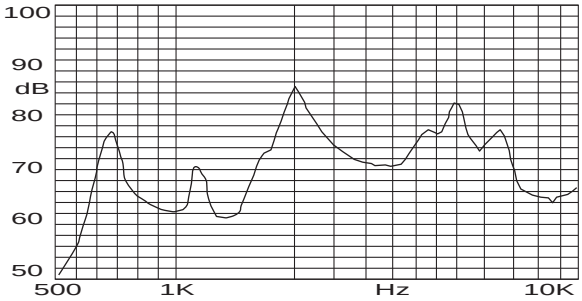


Magnetic Transducer

MT105 Series

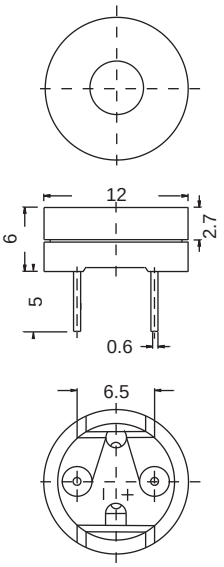


		MT105G	MT105A
Operating Voltage	V	1~3	1~3
Rated Voltage	V	1.5	1.5
Max. Rated Current	mA	30	10
Coil Resistance	Ω	16±4	50±7.5
Min. S.P.L. at 10cm	dB	75	70
Resonant Frequency	Hz	2048	2048
Operating Temperature	C	-20~+70	-20~+70

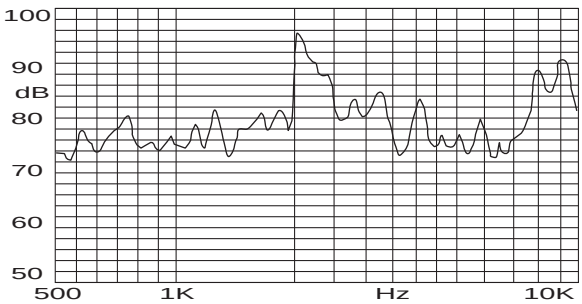


RINGFORD

MT106

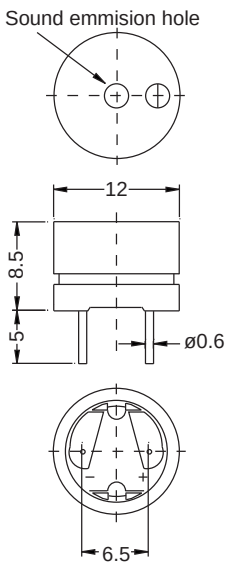


		MT106
Operating Voltage	V	2~4
Rated Voltage	V	3
Max. Rated Current	mA	80
Coil Resistance	Ω	15±2
Min. S.P.L. at 10cm	dB	85
Resonant Frequency	Hz	2000
Operating Temperature	C	-20~+50

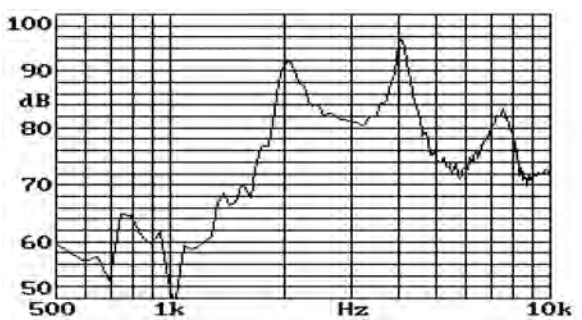


RINGFORD

MT01 Series

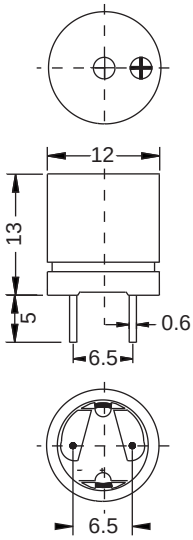


		MT01G	MT01D	MT01A
Operating Voltage	V	1~2	1~2	1~2
Rated Voltage	V	1.5	1.5	1.5
Max. Rated Current	mA	30	10	10
Coil Resistance	Ω	16±4	42±6	50±7.5
Coil Impedance	Ω	40	120	140
Min. S.P.L. at 10cm	dB	85	80	80
Resonant Frequency	Hz	2048	2048	2048
Operating Temperature	C	-25~+70	-25~+70	-25~+70

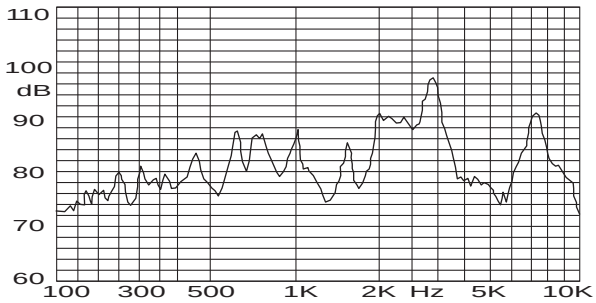


Magnetic Transducer

MT113

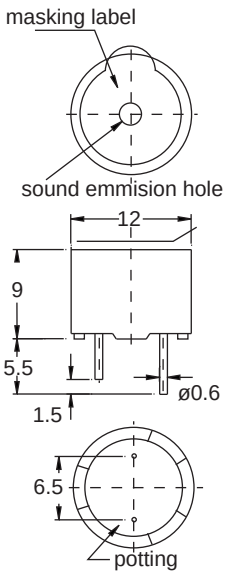


		MT113
Operating Voltage	V	1~2
Rated Voltage	V	1.5
Max. Rated Current	mA	30
Coil Resistance	Ω	16±4
Min. S.P.L. at 10cm	dB	85
Resonant Frequency	Hz	2048
Operating Temperature	C	-20~+60

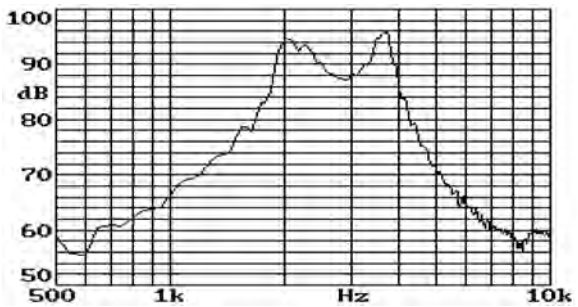


RINGFORD

MTX Series

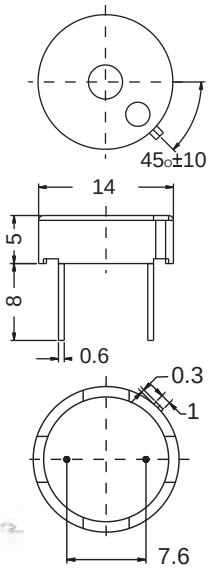


		MTX01	MTX05	MTX12
Operating Voltage	V	1~2	4~8	7~16
Rated Voltage	V	1.5	6	12
Max. Rated Current	mA	70	40	40
Coil Resistance	Ω	6.5±1	45±5	140±14
Coil Impedance	Ω	16	80	240
Min. S.P.L. at 10cm	dB	75	85	85
Resonant Frequency	Hz	2400	2400	2400
Operating Temperature	C	-25~+70	-25~+70	-25~+70

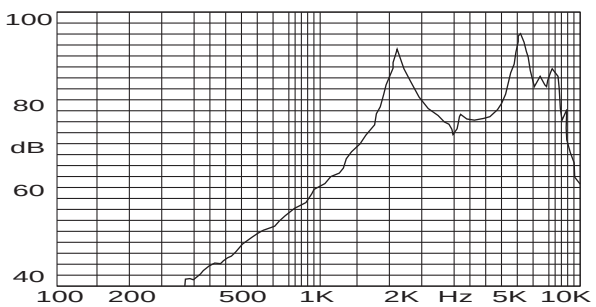


RINGFORD

MT22

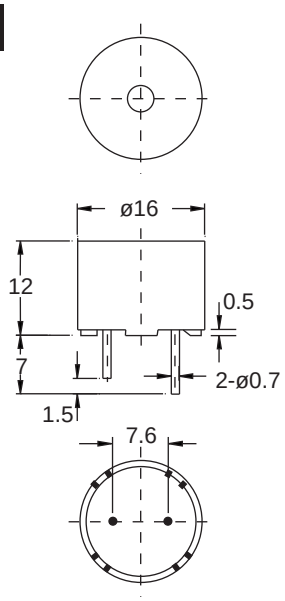


		MT22
Operating Voltage	V	1~4
Rated Voltage	V	3
Max. Rated Current	mA	35
Coil Resistance	Ω	40±6
Min. S.P.L. at 10cm	dB	85
Resonant Frequency	Hz	2000
Operating Temperature	C	-20~+70

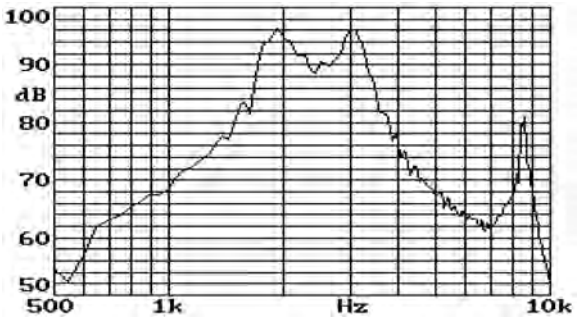


Magnetic Transducer

MTE12G

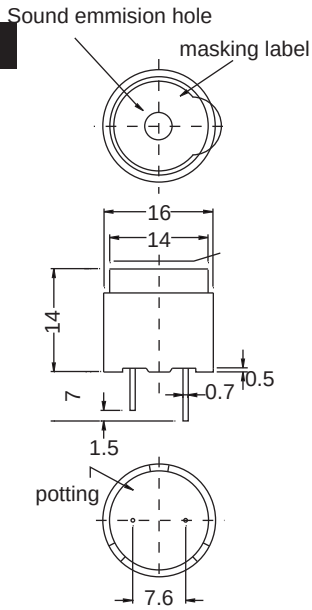


		MTE12G
Operating Voltage	V	6~18
Rated Voltage	V	12
Max. Rated Current	mA	50
Coil Resistance	Ω	135±20
Coil Impedance	Ω	210
Min. S.P.L. at 10cm	dB	85
Resonant Frequency	Hz	1700~2200
Operating Temperature	C	-40~+90

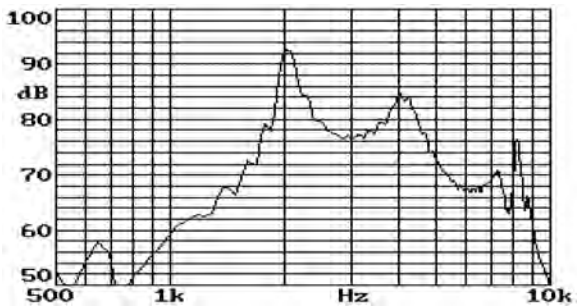


RINGFORD

MTB Series

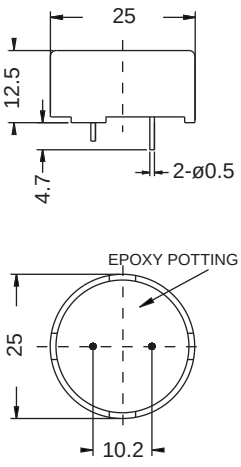


		MTB01	MTB06	MTB12
Operating Voltage	V	1~2	4~8	9~15
Rated Voltage	V	1.5	6	12
Max. Rated Current	mA	12	40	40
Coil Resistance	Ω	27±3	50±5	115±12
Coil Impedance	Ω	80	110	200
Min. S.P.L. at 10cm	dB	80	85	85
Resonant Frequency	Hz	2048	2048	2048
Operating Temperature	C	-25~+70	-25~+70	-25~+70

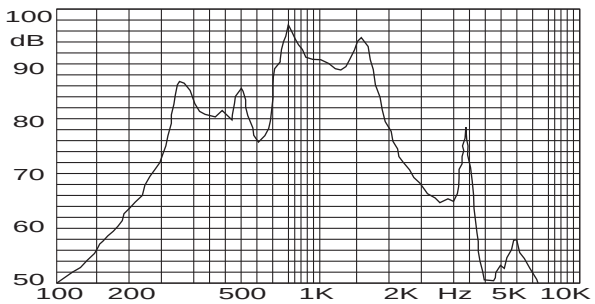


RINGFORD

MT23 Series

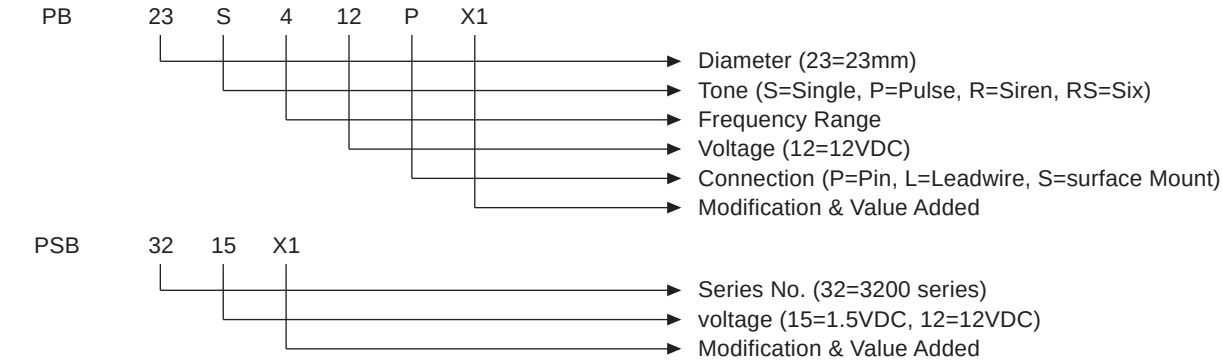


		MT23A	MT23B	MT23C
Operating Voltage	V	3~7	3~8	8~14
Rated Voltage	V	5	6	12
Max. Rated Current	mA	80	70	55
Coil Resistance	Ω	27±4	36±5	120±15
Min. S.P.L. at 10cm	dB	85 at 1000Hz		
Resonant Frequency	Hz	1000-1500 (min 80dBA)		
Operating Temperature	C	-20~+70	-20~+70	-20~+70



Buzzer

(Example)

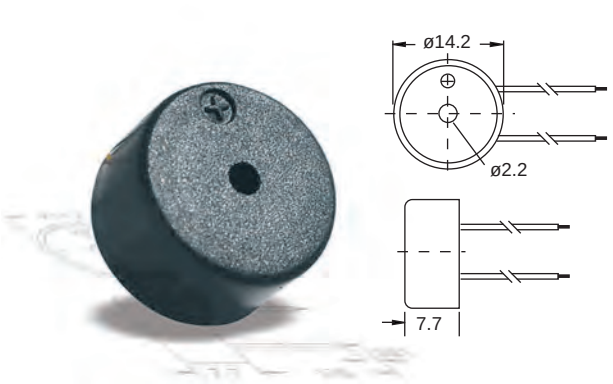


Magnetic Buzzer - Please refer our part no. Specific in specification

Model No.	Type	Size (mm)	Operating Voltage (VDC)	Frequency (Hz)	Page No.
PB14S412L	Piezo Buzzer	14.2 x 7.7	3 ~ 15	4100	47
PB22 SERIES	Piezo Buzzer	22 x 11.5	2 ~ 16	3300	
PB23S412L	Piezo Buzzer	28 x 17	3 ~ 16	3700	
PB30 SERIES	Piezo Buzzer	30 x 10	3 ~ 28	1500 / 3200	
PB32DT12	Piezo Buzzer	31.8 x 11.6	2.5 ~ 27	4000	48
PB42 SERIES	Piezo Buzzer	41.8 x 16	3 ~ 20	2500 / 2900	
PB45 SERIES	Piezo Buzzer	45 x 26	1.5 ~ 28	2900 / 3200	
PB53S306L	Piezo Buzzer	53 x 31	3 ~ 12	2800	
XPB14 SERIES	Piezo Buzzer	14 x 7.5	3 ~ 16	4000 / 4100	49
PB23S412P	Piezo Buzzer	23 x 9.8	3 ~ 24	3500	
LPB24 SERIES	Piezo Buzzer	23.8 x 16	3 ~ 20	2800	
PB24 SERIES	Piezo Buzzer	24 x 9.5	3 ~ 28	2100 / 3000	
PB30S412P	Piezo Buzzer	30 x 19.5	3 ~ 20	3600	50
PB40S306P	Piezo Buzzer	40 x 20	3~9	3200	
PB42S312P	Piezo Buzzer	42.3 x 14	3 ~ 28	2800	
PB50S212P	Piezo Buzzer	50 x 29	5 ~ 13	2500	
XMB12US SERIES	Magnetic Buzzer	12 x 7.5	1.4 ~ 15	2300	51
XMB12BS SERIES	Magnetic Buzzer	12 x 7.5	1.4 ~ 15	3100	
XMB12S SERIES	Magnetic Buzzer	12 x 9.5	1.3 ~ 15	2300	
XMB16S SERIES	Magnetic Buzzer	16 x 14	4 ~ 15	2300	
PSB32 SERIES	Solid State Electronics Buzzer	23 x 13.8 x 16	1.1 ~ 28	/	52
PSB34 SERIES	Solid State Electronics Buzzer	23 x 13.8 x 16	3 ~ 16	/	
PSB36 SERIES	Solid State Electronics Buzzer	32 x 17.5 x 15.5	1.1 ~ 28	/	
PSB66 SERIES	Solid State Electronics Buzzer	26 x 16	1.1 ~ 28	/	
PSB68 SERIES	Solid State Electronics Buzzer	26 x 19.7	4 ~ 28	/	

Piezo Buzzer

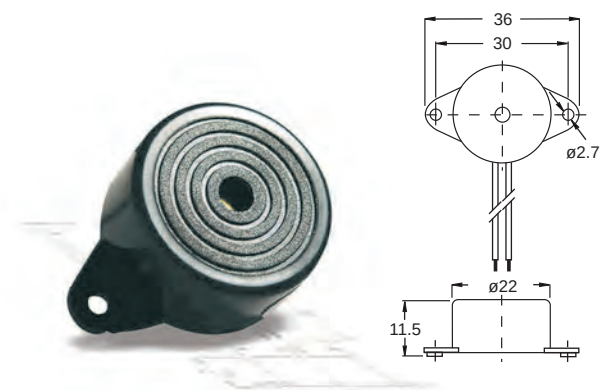
PB14S412L



	Operating Voltage	Rated Voltage	Max Rated Current	Min S.P.L.	Frequency	Operating Temperature	Pulse Rate	Tone
	VDC	VDC	mA	dB/10cm	KHz	ºC	Pulse/ Sec	
PB14S412L	3~15	12	10	83	4.1±0.5	-20~+70	/	Single

RINGFORD

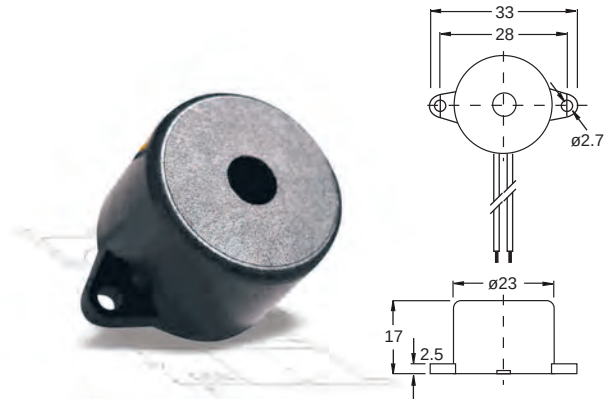
PB22 Series



	Operating Voltage	Rated Voltage	Max Rated Current	Min S.P.L.	Frequency	Operating Temperature	Pulse Rate	Tone
	VDC	VDC	mA	dB/10cm	KHz	ºC	Pulse/ Sec	
PB22S303L	2~5	3	5	80	3.3±0.5	-20~+60	/	Single
PB22S306	3~9	6	10	85	3.3±0.5	-20~+60	/	Single
PB22S309	3~12	9	15	90	3.3±0.5	-20~+60	/	Single
PB22S312L	3~16	12	20	90	3.3±0.5	-20~+60	/	Single

RINGFORD

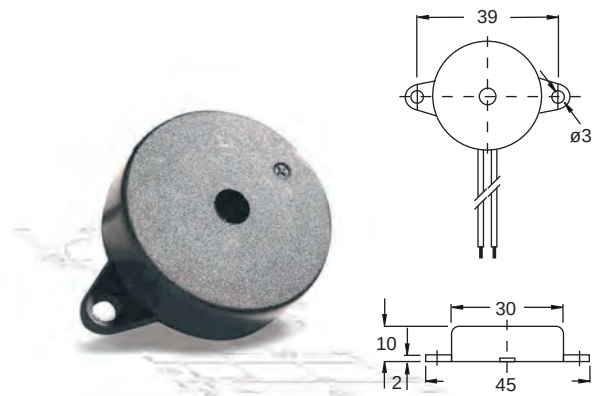
PB23S412L



	Operating Voltage	Rated Voltage	Max Rated Current	Min S.P.L.	Frequency	Operating Temperature	Pulse Rate	Tone
	VDC	VDC	mA	dB/30cm	KHz	ºC	Pulse/ Sec	
PB23S412L	3~16	12	8	90	3.7±0.5	-20~+60	/	Single

RINGFORD

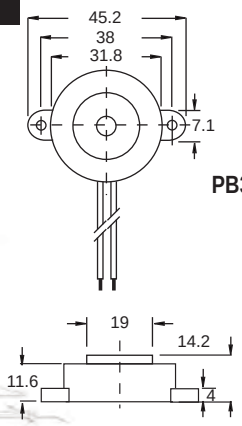
PB30 Series



	Operating Voltage	Rated Voltage	Max Rated Current	Min S.P.L.	Frequency	Operating Temperature	Pulse Rate	Tone
	VDC	VDC	mA	dB/30cm	KHz	ºC	Pulse/ Sec	
PB30S312L	3~28	12	20	90	3.2±0.5	-20~+60	/	Single
PB30FP312L	3~28	12	20	90	3.2±0.5	-20~+60	1-3	Pulse
PB30T312L	6~15	12	20	90	1.5~3.7	-20~+60	/	Hi/Low

Piezo Buzzer

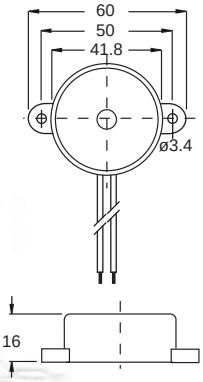
PB32DT12



	Operating Voltage	Rated Voltage	Max Rated Current	Min S.P.L.	Frequency	Operating Temperature	Pulse Rate	Tone
	VDC	VDC	mA	dB/30cm	KHz	ºC	Pulse/ Sec	
PB32DT12	2.5~27	12	10	90	4.0±0.5	-20~+60	/	Single

RINGFORD

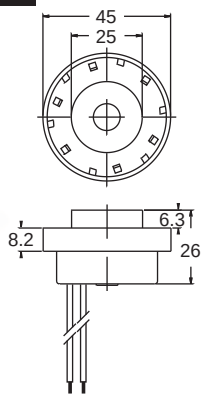
PB42 Series



	Operating Voltage	Rated Voltage	Max Rated Current	Min S.P.L.	Frequency	Operating Temperature	Pulse Rate	Tone
	VDC	VDC	mA	dB/30cm	KHz	ºC	Pulse/ Sec	
PB42S312L	3~20	12	12	90	2.9±0.5	-20~+70	/	Single
PB42P312L	3~20	12	12	90	2.9±0.5	-20~+70	1-3	Pulse
PB42R309L	6~12	9	150	100	2.5±0.5	-20~+70	/	Siren

RINGFORD

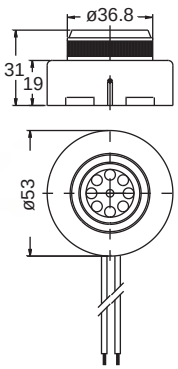
PB45 Series



	Operating Voltage	Rated Voltage	Max Rated Current	Min S.P.L.	Frequency	Operating Temperature	Pulse Rate	Tone
	VDC	VDC	mA	dB/30cm	KHz	ºC	Pulse/ Sec	
PB45S312L	1.5~15	12	35	105	2.9±0.5	-20~+60	/	Single
PB45S324L	1.5~28	24	20	100	2.9±0.5	-20~+60	/	Single
PB45P312L	1.5~13	12	20	100	2.9±0.5	-20~+60	2-7	Pulse
PB45D312L	1.5~13	12	35/20	105/100	2.9±0.5	-20~+60	2-7	Pulse/Single
PB45R312L	9~15	12	35	100	3.2±0.5	-20~+60	/	Siren

RINGFORD

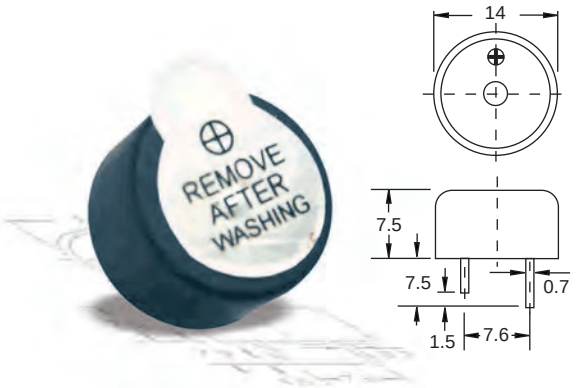
PB53S306L



	Operating Voltage	Rated Voltage	Max Rated Current	Min S.P.L.	Frequency	Operating Temperature	Pulse Rate	Tone
	VDC	VDC	mA	dB/30cm	KHz	ºC	Pulse/ Sec	
PB53S306L	3~12	6	10	93	2.8±0.5	-20~+60	/	Single

Piezo Buzzer

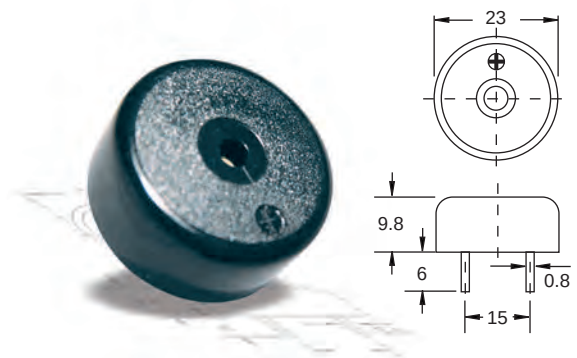
XPB14 Series



	Operating Voltage	Rated Voltage	Max Rated Current	Min S.P.L.	Frequency	Operating Temperature	Pulse Rate	Tone
	VDC	VDC	mA	dB/10cm	KHz	ºC	Pulse/ Sec	
XPB14S412P	3~16	12	7	80	4.0±0.5	-20~+70	/	Single
XPB14S412P-1	3~15	12	10	83	4.1±0.5	-20~+70	/	Single

RINGFORD

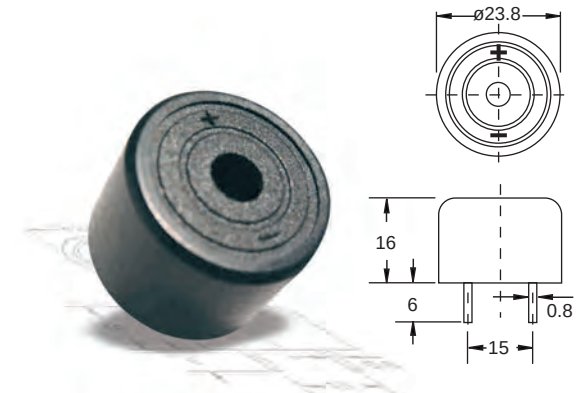
PB23S412P



	Operating Voltage	Rated Voltage	Max Rated Current	Min S.P.L.	Frequency	Operating Temperature	Pulse Rate	Tone
	VDC	VDC	mA	dB/10cm	KHz	ºC	Pulse/ Sec	
PB23S412P	3~24	12	12	85	3.5±0.5	-20~+70	/	Single

RINGFORD

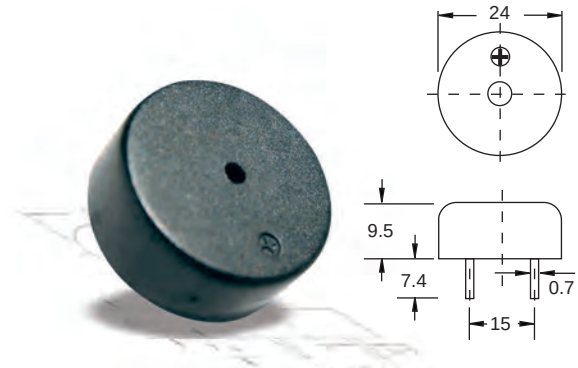
LPB24 Series



	Operating Voltage	Rated Voltage	Max Rated Current	Min S.P.L.	Frequency	Operating Temperature	Pulse Rate	Tone
	VDC	VDC	mA	dB/10cm	KHz	ºC	Pulse/ Sec	
LPB24S312P	3~20	12	8	90	2.8±0.5	-20~+60	/	Single
LPB24FP412P	3~20	12	10	90	2.8±0.5	-30~+85	1-3	Pulse

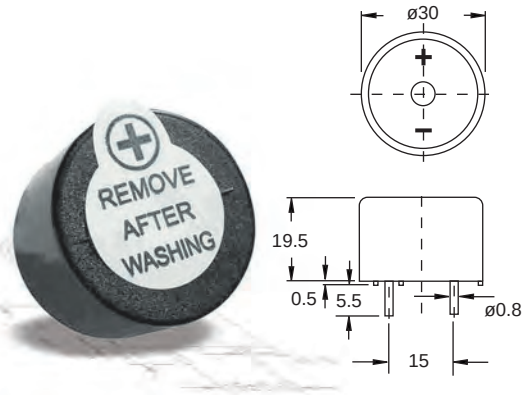
RINGFORD

PB24 Series



	Operating Voltage	Rated Voltage	Max Rated Current	Min S.P.L.	Frequency	Operating Temperature	Pulse Rate	Tone
	VDC	VDC	mA	dB/10cm	KHz	ºC	Pulse/ Sec	
PB24S312P	3~28	12	20	90	3.0±0.5	-20~+70	/	Single
PB24FP312P	3~28	12	20	90	3.0±0.5	-20~+70	1-3	Pulse
PB24T312P	3~28	12	20	85	2.1~3.3	-20~+70	/	Hi/Low

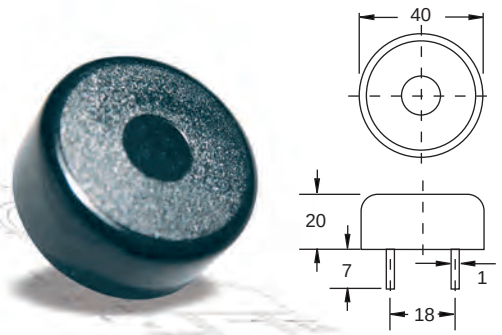
PB30S412P



	Operating Voltage	Rated Voltage	Max Rated Current	Min S.P.L.	Frequency	Operating Temperature	Pulse Rate	Tone
	VDC	VDC	mA	dB/100cm	KHz	ºC	Pulse/ Sec	
PB30S412P	3~20	12	10	90	3.6±0.5	-30~+85	/	Single

RINGFORD

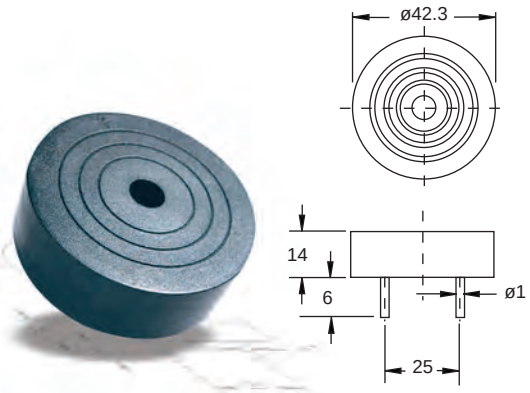
PB40S306P



	Operating Voltage	Rated Voltage	Max Rated Current	Min S.P.L.	Frequency	Operating Temperature	Pulse Rate	Tone
	VDC	VDC	mA	dB/30cm	KHz	ºC	Pulse/ Sec	
PB40S306P	3~9	6	30	100	3.2±0.5	-20~+60	/	Single

RINGFORD

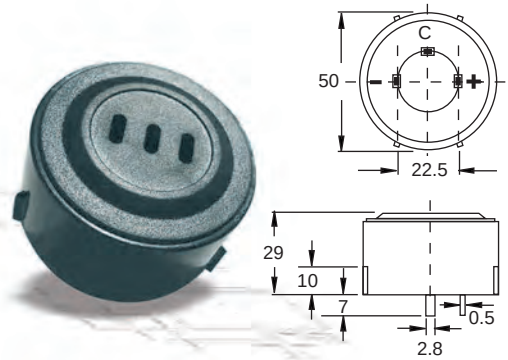
PB42S312P



	Operating Voltage	Rated Voltage	Max Rated Current	Min S.P.L.	Frequency	Operating Temperature	Pulse Rate	Tone
	VDC	VDC	mA	dB/30cm	KHz	ºC	Pulse/ Sec	
PB42S312P	3~28	12	8	90	2.8±0.5	-20~+60	/	Single

RINGFORD

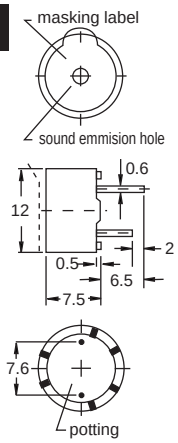
PB50S212P



	Operating Voltage	Rated Voltage	Max Rated Current	Min S.P.L.	Frequency	Operating Temperature	Pulse Rate	Tone
	VDC	VDC	mA	dB/30cm	KHz	ºC	Pulse/ Sec	
PB50S212P	5~13	12	75	108	2.5±0.5	-20~+60	/	Single

Magnetic Buzzer

XMB12US Series

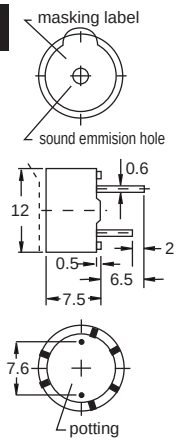


	Operating Voltage	Rated Voltage	Max Rated Current	Min S.P.L.	Frequency	Operating Temperature	Pulse Rate	Tone
	VDC	VDC	mA	dB/10cm	KHz	ºC	Pulse/ Sec	
XMB12US01	1.4~2	1.5	25	75	2.3±0.5	-20~+70	/	Single
XMB12US05	3~7	5	30	82	2.3±0.4	-20~+70	/	Single
XMB12US12	9~15	12	30	82	2.3±0.4	-20~+70	/	Single

response time ≤50ms

RINGFORD

XMB12BS Series

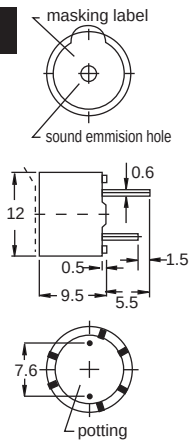


	Operating Voltage	Rated Voltage	Max Rated Current	Min S.P.L.	Frequency	Operating Temperature	Pulse Rate	Tone
	VDC	VDC	mA	dB/10cm	KHz	ºC	Pulse/ Sec	
XMB12BS01	1.4~2	1.5	25	75	3.1±0.5	-20~+70	/	Single
XMB12BS05	3~7	5	30	82	3.1±0.3	-20~+70	/	Single
XMB12BS12	9~15	12	30	82	3.1±0.3	-20~+70	/	Single

response time ≤50ms

RINGFORD

XMB12S Series



	Operating Voltage	Rated Voltage	Max Rated Current	Min S.P.L.	Frequency	Operating Temperature	Pulse Rate	Tone
	VDC	VDC	mA	dB/10cm	KHz	ºC	Pulse/ Sec	
XMB12S01	1.3~2	1.5	20	75	2.3±0.4	-25~+80	/	Single
XMB12S03	2~5	3	30	82	2.3±0.4	-25~+80	/	Single
XMB12S05	4~7	5	30	85	2.3±0.3	-25~+80	/	Single
XMB12S09	7~11	9	30	85	2.3±0.3	-25~+80	/	Single
XMB12S12	8~15	12	30	85	2.3±0.3	-25~+80	/	Single

response time ≤50ms

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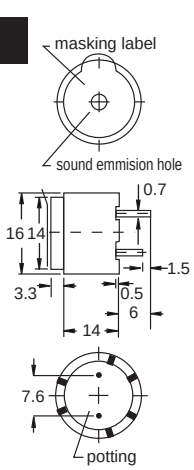
XMB16S Series

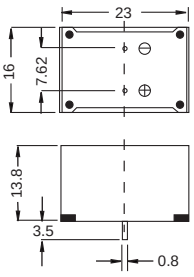


	Operating Voltage	Rated Voltage	Max Rated Current	Min S.P.L.	Frequency	Operating Temperature	Pulse Rate	Tone
	VDC	VDC	mA	dB/10cm	KHz	ºC	Pulse/ Sec	
XMB16S06	4~8	6	30	85	2.3±0.3	-20~+70	/	Single
XMB16S12	8~15	12	30	85	2.3±0.3	-20~+70	/	Single

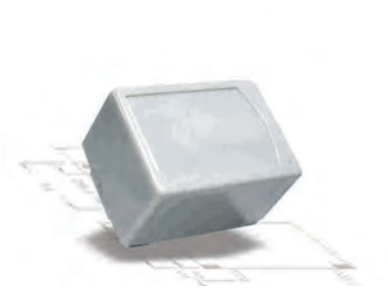
response time ≤50ms

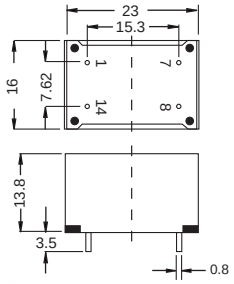
Solid State Electronics Buzzer

PSB32 Series

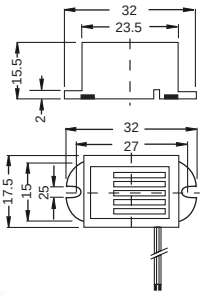


PSB34 Series

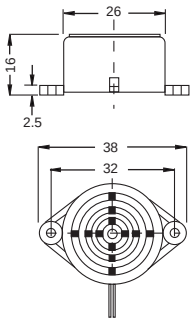




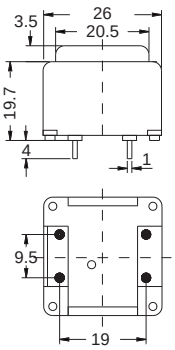
PSB36 Series



PSB66 Series



PSB68 Series



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	Operating Voltage (VDC)	Rated Voltage (VDC)	Max Rated Current (mA)	Min S.P.L. (dB/20cm)	Weight (gram)	Tone
PSB3215	1.1~2	1.5	28	80	8.5	Single
PSB3203	2~4	3	45	85	8.5	Single
PSB3245	3~6	4.5	30	85	8.5	Single
PSB3206	4~8	6	30	85	8.5	Single
PSB3212	8~16	12	35	85	8.5	Single
PSB3224	20~28	24	35	85	8.5	Single
PSB3406	3~8	6	20	70	8.5	/
PSB3412	8~16	12	35	70	8.5	/
PSB3615	1.1~2	1.5	30	85	9.5	Single
PSB3603	2~4	3	45	85	9.5	Single
PSB3645	3~6	4.5	30	85	9.5	Single
PSB3606	4~8	6	30	85	9.5	Single
PSB3612	8~16	12	35	85	9.5	Single
PSB3624	20~28	24	35	85	9.5	Single
PSB6615	1.1~2	1.5	30	80	12	Single
PSB6603	2~4	3	40	85	12	Single
PSB6606	4~8	6	40	90	12	Single
PSB6612	8~16	12	40	90	12	Single
PSB6624	20~28	24	40	90	12	Single
PSB6806	4~8	6	50	95	17	Single
PSB6812	8~16	12	50	95	17	Single
PSB6824	20~28	24	50	95	17	Single

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