

**Specialty Speakers**

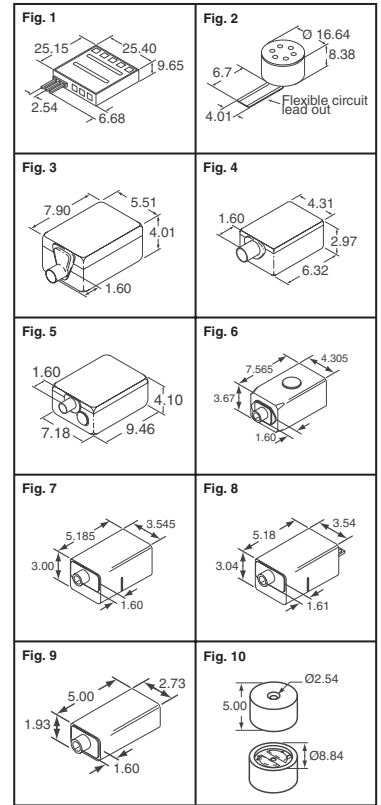
**CB Series:** • Balanced-armature, magnetic technology to give high efficiency, stability and reliability • Excellent sound quality • High speech intelligibility • Suitable for PCB mounting • Can function as a microphone or beeper • Stainless steel enclosure • 3 Position male header attached **CM Series:** • Balanced-armature, magnetic technology to give high efficiency, stability and reliability • High acoustic efficiency enables sufficient sound output even when limited power is available • In-built static protection • Lightweight, matt-black, plastic housing • Ergonomically designed with rounded edge to fit the concha • High-quality sound output • Tailored bandwidth for superb speech intelligibility • Rugged construction • 2 Position flexi-circuit attached **MR Series:** • Highly waterproof no loss of performance after immersion in 15m of water **BK Series:** • Balanced-armature, magnetic technology to give high efficiency, stability and reliability • High sensitivity • Low distortion • Self shielded for low magnetic radiation **ED Series:** • Balanced-armature, magnetic technology to give high efficiency,

stability and reliability • High sensitivity • Low distortion • Self shielded for low magnetic radiation **EP Series:** • ED micro speaker, but with internal, highly-efficient, class D amplifier • Lower current drain prolongs battery life • Lower distortion **CI Series:** • High sensitivity, wide bandwidth response • Low distortion • Self shielded for low magnetic radiation **EC Series:** • Similar SPL output to the BK Series • Rounded corners on the face opposite the terminal pad • 34% smaller volume than the BK Series **EH Series:** • Balanced-armature, magnetic technology to give high efficiency, stability and reliability • High sensitivity • Low distortion • Self-shielded for low magnetic radiation **ES Series:** • EH micro speaker, but with internal, highly-efficient, class D amplifier • Lower current drain prolongs battery life • Lower distortion **FK Series:** • World's smallest balanced-armature magnetic receiver for hearing aid applications • Ideal for CIC instruments **SR Series:** • A magnetic balanced armature receiver with increased DCR/ Impedance ratio for reduced bass response optimized for use in earphones

Fig.	Nominal DC Resistance (Ω)	Impedance @ Frequency	Sound Port Location	Nominal Output @ 1kHz, Distance=30cm (dB SPL)	Nominal Output @ 1kHz, Sealed to IEC 318 Coupler (dB SPL)	Distortion Max % @ Hz	Digi-Key Part No.	Price Each			Knowles Acoustics Part No.	
								1	10	100		
<b>Handset Transceiver</b>												
1	4.2	12@1kHz	Top Edge	73	—	15	423-1030-ND	19.88	17.91	12.79	CB-22844	
	4.2	12@1kHz	Face	73	—	15	423-1033-ND	19.88	17.91	12.79	CB-22846	
	11.5	24@1kHz	Face	73	—	15	423-1034-ND	25.88	23.32	16.66	CB-22847	
	21.5	48@1kHz	Face	73	—	15	423-1035-ND	19.88	17.91	12.79	CB-22848	
	11.5	24@1kHz	Top Edge	73	—	15	423-1031-ND	25.88	23.32	16.66	CB-22849	
	21.5	48@1kHz	Top Edge	73	—	15	423-1032-ND	25.88	23.32	16.66	CB-22850	
<b>Headset Speaker — Flexi-Circuit</b>												
2	65	150@1kHz	—	—	103	2	423-1036-ND	21.92	19.75	14.11	CM-23152	
	8.5	30@1kHz	—	—	103	2	423-1037-ND	26.59	23.96	17.12	CM-28431	
	100	360@1kHz	—	—	—	2	423-1106-ND	19.37	15.22	13.15	CM-28421-000	
	100	360@1kHz	—	—	—	2	423-1107-ND	16.71	12.92	10.83	CM-28452-000	
<b>Headset Speaker — Wire Lead Out — RoHS Compliant</b>												
2	10	21@1kHz	—	—	—	5	423-1118-ND	44.78	36.53	32.41	MR-23333-000	
	65	150@1kHz	—	—	—	2	423-1105-ND	16.71	12.92	10.83	CM-23299-000	
<b>Balanced Armature Speakers</b>												
3	10.7	13.3@500Hz	—	—	—	10	423-1055-ND	17.97	16.20	12.77	BK-28507	
	10.7	13.3@500Hz	—	—	—	10	423-1056-ND	24.39	21.90	17.34	BK-28507-P16	
	895	2320@500Hz	End	—	—	10	423-1101-ND	16.95	13.73	11.51	BK-21604-000	
	10.7	16@500Hz	End	—	—	10	423-1101-ND	16.95	13.73	11.51	BK-26824-000	
	18.5	23@500Hz	End	—	—	10	423-1102-ND	16.95	13.73	11.51	BK-28562-000	
	100	285@500Hz	End	—	—	10	423-1103-ND	16.95	13.73	11.51	BK-29725-000	
4	3.32	10.2@500Hz	—	—	—	5	423-1059-ND	22.73	20.48	16.14	ED-23619	
	3.32	10.2@500Hz	—	—	—	5	423-1060-ND	30.31	27.31	21.53	ED-23619-P16	
	3.76	780@500Hz	End	—	—	5	423-1110-ND	20.38	16.61	14.27	ED-21913-000	
	25	48@500Hz	End	—	—	10	423-1111-ND	20.37	16.61	14.26	ED-23147-000	
	3.3	7.1@500Hz	End	—	—	10	423-1112-ND	20.38	16.61	14.27	ED-26821-000	
	—	50@1kHz	End	—	—	5	423-1114-ND	28.56	23.28	20.00	EP-24075-000	
5	100	400@500Hz	End	—	—	10	423-1104-ND	21.78	17.76	15.25	CI-22960-000	
6	92	200@500Hz	End	—	—	10	800	423-1108-ND	20.73	16.29	14.07	EC-23097-000
7	196	425@500Hz	End	—	—	10	800	423-1109-ND	20.73	16.29	14.07	EC-23098-000
7	395	625@500Hz	End	—	—	10	800	423-1113-ND	29.18	23.78	20.43	EH-23030-000
8	—	50@1kHz	End	—	—	5	800	423-1115-ND	34.40	28.23	24.70	ES-23127-000
9	360	450@500Hz	End	—	—	5	800	423-1116-ND	29.54	24.08	20.68	FK-23451-000
10	18.5	21.5@500Hz	—	—	—	5	550	423-1117-ND	19.36	15.22	13.14	SR8850NWS-000

• RoHS Compliant • Has 1 inch long leads

Dim. in mm



**SiSonic™ Silicon Microphones**

**Features:** • Surface mount microphone • Compatible with standard surface mount soldering process • Automated pick 'n' place using standard equipment • No off-line soldering or insertion • Highly shock resistant • Low vibration sensitivity • Operation at high and low temperature • Ability to integrate additional electronics into package • Omni-directional **Applications:** • Cellular phones • Corded and cordless telephones • PCs, PC tablets, laptops • PDAs, MP3 players • Automotive and automotive accessories • General electronics

**SiSonic Zero-Height:** • SiSonic "Zero Height" shrinks product thickness by up to 30% • Minimizes distance between PCB and mobile device housing • Ideal for microphone placement on reverse side of PCB, while maintaining acoustic port on top side of mobile device, for clamshell phone designs • Enables the thinnest, highest density product designs • Integrated Amplified version increases output signal by up to 20dB **SiSonic Mini:** • New Mini SiSonic with a footprint less than 18mm² reduces manufacturing costs and brings greater design flexibility • Rugged, solid state design process for stable acoustic performance under extreme conditions such as temperature, shock and vibration • Flexible package design allows for future product enhancements and integration of additional components • Integrated Amplified version increases output signal by up to 20dB

Dim. in mm

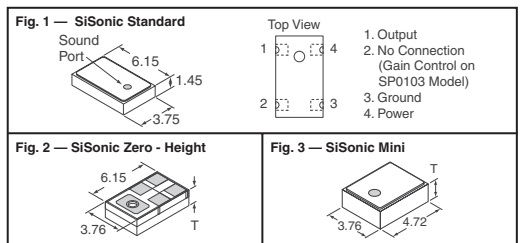
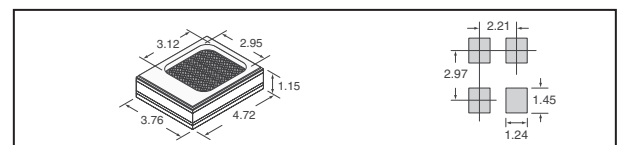


Fig.	Sensitivity @1kHz (dB re 1V/Pa)	Operating Voltage Range DC	Current Consumption	S/N Ratio @ 1kHz	Operating Temperature	Built-in Capacitor	Dim. T	Digi-Key Part No.	Cut Tape Price Each			Digi-Key Part No.	Tape & Reel		Knowles Acoustics Part No.
									1	10	100		Qty.	Pricing	
1	-42 ±4	1.5 - 5.5V	<0.250mA @ 5.5VDC	>55dB	-40°C - 100°C	10pF, 33pF	—	423-1039-1-ND†	6.00	5.28	4.40	—	—	—	SP0102NC3-2
	-42 ±4	1.5 - 5.5V	<0.250mA @ 5.5VDC	>55dB	-40°C - 100°C	—	1.65	423-1069-1-ND	4.62	3.17	2.52	—	—	—	SP0102BE3-5
	-42 ±4	1.5 - 3.6V	<0.250mA @ 3.6VDC	>55dB	-40°C - 100°C	—	1.25	423-1080-1-ND	4.37	3.05	2.50	423-1080-2-ND	1,200	3900.00/M	SP0204LE5-2
	-22 ±3	1.5 - 3.6V	<0.350mA @ 3.6VDC	>55dB	-40°C - 100°C	—	1.25	423-1081-1-ND	4.76	3.32	2.72	423-1081-2-ND	1,200	4250.00/M	SP0208LE5-2
3	-22 ±4	1.5 - 5.5V	<0.350mA @ 5.5VDC	>59dB	-40°C - 100°C	—	1.65	423-1074-1-ND	6.50	6.08	5.22	423-1074-2-ND	900	3827.69	SP0103BE3-5
	-42 ±4	1.5 - 5.5V	<0.250mA @ 5.5VDC	>59dB	-40°C - 100°C	—	1.50	423-1070-1-ND	4.37	3.70	3.18	423-1070-2-ND	1,200	2584.87/M	SPM0102ND3-2
	-42 ±4	1.5 - 5.5V	<0.250mA @ 5.5VDC	>59dB	-40°C - 100°C	—	1.50	423-1071-1-ND	6.50	5.57	4.79	—	—	—	SPM0102NE3-2
	-42 ±4	1.5 - 3.6V	<0.250mA @ 3.6VDC	>55dB	-40°C - 100°C	—	1.25	423-1082-1-ND	4.18	2.88	2.35	423-1082-2-ND	1,200	3550.00/M	SPM0204HD5-2
	-42 ±4	1.5 - 3.6V	<0.250mA @ 3.6VDC	>55dB	-40°C - 100°C	—	1.25	423-1083-1-ND	5.01	4.62	4.24	423-1083-2-ND	1,200	3900.00/M	SPM0204HE5-2
	-22 ±4	1.5 - 3.6V	<0.350mA @ 3.6VDC	>55dB	-40°C - 100°C	—	1.25	423-1084-1-ND	4.31	3.01	2.47	423-1084-2-ND	1,200	3900.00/M	SPM0208HD5-2
	-22 ±4	1.5 - 5.5V	<0.350mA @ 5.5VDC	>59dB	-40°C - 100°C	—	1.50	423-1072-1-ND	4.73	4.06	3.49	423-1072-2-ND	1,200	2838.16/M	SPM0103ND3-2
	-22 ±4	1.5 - 3.6V	<0.350mA @ 3.6VDC	>55dB	-40°C - 100°C	—	1.25	423-1085-1-ND	4.51	3.14	2.58	423-1085-2-ND	1,200	4000.00/M	SPM0208HE5-2

• With enhanced RF filtering † No board washing after solder re-flow

**Ultrasonic Acoustic Sensor**

The Ultrasonic Acoustic Sensor utilizes the latest technology MEMS (Micro Electro Mechanical Systems) to provide a robust mechanical acoustic sensor which performs over a wide environmental range. Compared to conventional Ultrasonic Sensors that have a narrow frequency band of detection, the Knowles sensor is ideal for capturing a wide frequency range applicable to a variety of ultrasonic applications: Ultrasonic Range Detection, Condition Monitoring, Fault detection, Level Sensing and Position Sensing. The sensor can be utilized to monitor and detect frequencies from 10kHz to 65kHz with minimal attenuation across the frequency range.



Sensitivity @1kHz (dB re 1V/Pa)	Operating Voltage Range DC	Max. Current Consumption	S/N Ratio @ 1kHz	Operating Temperature	Digi-Key Part No.	Cut Tape Price Each			Digi-Key Part No.	Tape & Reel		Knowles Acoustics Part No.
						1	10	100		Qty.	Pricing	
-47 ±4	1.5 - 3.6V	<0.250mA @ 3.6VDC	>59dB	-40°C - 100°C	423-1086-1-ND	15.47	13.25	11.76	423-1086-2-ND	1,200	11750.00/M	SPM0204UD5-2

**More Product Available Online: www.digikey.com**

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