2016

CHALLENGE ELECTRONICS

ALARMS • BUZZERS • SOUND TRANSDUCERS • SPEAKERS • MICROPHONES

Vol. V

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SHORT FORM CATALOG

AUDIO COMPONENT MANUFACTURING & ENGINEERING

NEW DIGITAL ALARM SERIES
MOBILE SPEAKER SERIES

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Table of Contents

PRODUCT NEWS

Challenge Electronics announces the Smart-Control-Alert*, a digitally-controlled piezo-electric alarm. The Smart-Control-Alert offers several advantages over traditional alarms and are available as both programmable, and non-programmable devices.

*Smart-Control-Alert is a registered trademark of Challenge Electronics

Challenge Electronics is also announcing a low-profile speaker series for mobile applications. Our speakers cover a range of physical dimensions and audio capabilities in additional to product interfacing – customized gaskets and enclosures made to order.

CHALLENGE ELECTRONICS
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Challenge Electronics is a world class supplier of high performance audible products used worldwide in security, medical, appliance, industrial, marine and wireless applications.

With outstanding product breadth and top of the line technical expertise, Challenge provides both standard and custom products at competitive prices and off-the-shelf delivery. Our clients get the benefit of a mature infrastructure, ISO-certified factory operations, decentralized warehousing and sales offices located strategically around the globe.

Need a better component? Challenge Electronics makes audio components louder, smaller, more rugged, more energy-efficient and more cost-effective.

Need to ramp up now? Challenge Electronics extends your manufacturing capabilities with pre-assembled parts and supply chain management.

NEW

SMART-CONTROL-ALERT™

PIEZOELECTRIC DIGITAL SMART ALARMS

Piezoelectric Digital Smart Alarms

This new line of SMART-CONTROL-ALERT™ utilizes Microcontroller Technology providing many benefits over the traditional analog technology:

Increased Reliability

The Microcontroller significantly reduces the number of components required by analog circuits. As a result, the Potential Failure Modes and Effects Analysis score is substantially improved.

Increased Stability

The effects of voltage fluctuations, component tolerances, and temperature variations on the audio characteristics of digital alarms are negligable. Matching output frequency to the alarm case resonant frequency reduces the audio tolerances in the field even further. Analog alarms, on the other hand, can experience frequency shifts by as much as ±10%.

More Versatility with Fewer Parts

Programmable digital alarms achieve the following with a single device:

- Multiple sounds: single tone, dual tone, tri tone – limited only by customer design
- Time delay, time limit, priority alert.
- Direct connections to sensors for alarm control
- Control of functions or sounds via **Hex/Binary/Frequency input signals**
- System interface to alarm via **LIN/CAN/SPI/I2C BUS**
- Quick Design and Production Time

The universal Microcontroller circuit reduces product design and production time from inception to delivery.

SMART-CONTROL-ALERT™ Features

- Microcontroller Sound Programming Technology
- Reliable Solid State Piezoelectric Technology
- Polarity and Voltage Surge Protected
- Corrosion Resistant Stainless Steel Diaphragm
- Extended Temperatures
- Flame Retardant Plastic
- IP-68; Water and Dust Proof Hermetically Sealed Alarm
- NEMA 3R, 4X, or 12 with Gasket
- RoHS, Lead Free Compliance

ALARM TYPES

Single Tone	Dual Tone
Continuous	Intermittent/Continuous
Intermittent	Chime/Continuous
Chime	Pulsating/Continuous NEW
Pulsating NEW	Warble/Continuous
Warble	Siren/Continuous NEW
Siren	

APPLICATIONS

- Agriculture
- Appliances
- Automotive
- Communication
- Construction Equipment
- Electronics Equipment
- Emergency Equipment and Vehicles
- Fitness and Health Equipment
- Gaming and Sport
- Industrial Controls
- Marine
- Medical Equipment
- Power Equipment
- Security
- Tools
- Toys
- Utility Vehicle

AUDIBLE SOLUTIONS FOR THE MOBILE INDUSTRY

Our new speakers are made for mobile

Multi-magnet design increases the output, shrinks the size.
IPX7 (water resistant) rating
Custom gaskets (front and back, adhesive and non-adhesive)
Custom enclosures, grills and wiring assemblies
Spring, solder point and wire termination styles

MOBILE SPEAKER SERIES GUIDE

SERIES[1]	WIDTH[2]	HEIGHT[2]						MAGNETS			TERMINATION	
		2.0	2.3	2.5	2.7	3.0	3.5	1	3	5	SPRING	SOLDER
CES250	9.0					✓		✓				✓
CES180	13.0			✓				✓	✓		✓	✓
CES170	12.0		✓							✓		✓
CES160	9.0				✓	✓		✓	✓	✓	✓	✓
CES150	11.0			✓		✓	✓	✓	✓		✓	✓
CES150[3]	6.0	✓						✓			✓	
CES120[3]	6.0	✓						✓			✓	

1. CESXXX where 'XXX' is 'length' in tenths of a milimeter
2. Dimensions are given in millimeters
3. Receiver

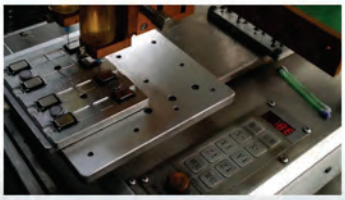
PRODUCTS AND/OR SPECIFICATIONS SUBJECT TO CHANGE

GASKETS

Custom gaskets are available for the front and back, with or without single or double-sided adhesives.

IPX7

All speakers are available with an IPX7 Water Resistant rating.

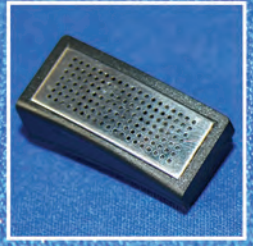


HIGH VOLUME

All speakers are produced at our semi-automated facility for high volume and fast turnaround.

ENCLOSURES

Custom enclosures and terminations are available for the entire series. Grills, molded housings, wiring and connectors are made to specifications.



PIEZOELECTRIC ALARMS

Part Number	Loudness Category	Operating Voltage			Typical SPL at 24 inch (61cm) dB(A)		Sound Frequency		Rate ±20%	Operating Current mA		Termination	Plastic Housing Style V= with Volume Control
		Min V	Max V	Type	At Min V	At Max V	Center Hz.	Range ±Hz.	Hz.	At Min V	At Max V		
CE-CM216AS	Medium Loud	2	16	Vdc	70	93	2900	500		5	15	Two 0.25 Blades with M3 Screws	A
CE-CM201AS	Medium Loud	40	120	Vac	70	93	2900	500		10	25	Two (2), 0.25 Quick Disconn…	A
CE-CM301AS	Medium Loud	130	220	Vac	75	97	2900	250		15	30	Two, 0.25 Quick Disconnect …	A
CE-C80WIR	Extra Loud	5	16	Vdc	94	103	2900	250		8	40	Wire Leads 12.7 cm Long 18 AWG	M
CE-CX215AS	Extra Loud	2	15	Vdc	75	103	2900	500		5	30	Two 0.25 Blades with M3 Screws	A
CE-CX201AS	Extra Loud	40	120	Vac dc	80	103	2900	500		15	50	Two 0.25 Blades with M3 Screws	A
CE-CU515BS	Ultra Loud	5	15	Vdc	97	108	2100	200		30	70	Two 0.25 Blades with M3 Screws	B
CE-CU628BS	Ultra Loud	6	28	Vdc	95	108	2100	200		20	50	Two 0.25 Blades with M3 Screws	B
CE-BM530ASF	Fast Medium Loud	5	30	Vdc	85	98	2900	250	3	2	20	Two 0.25 Blades with M3 Screws	A
CE-BX515ASS	Slow Extra Loud	5	15	Vdc	90	103	2900	500	1	15	40	Two 0.25 Blades with M3 Screws	A
CE-BX630ASS	Slow Extra Loud	6	30	Vdc	85	103	2900	500	1	10	50	Two 0.25 Blades with M3 Screws	A
CE-BU515BSS	Slow Ultra Loud	5	15	Vdc	97	108	2100	200	1	30	70	Two 0.25 Blades with M3 Screws	B
CE-BU628BSF	Fast Ultra Loud	6	28	Vdc	95	108	2100	200	3	20	50	Two 0.25 Blades with M3 Screws	B
CE-HM630ASM	Moderate Medium Loud	6	30	Vdc	80	96	2900	250	2	10	40	Two 0.25 Blades with M3 Screws	A
CE-HM201ASS	Slow Medium Loud	40	120	Vac	70	94	2900	250	1	5	30	Two 0.25 Blades with M3 Screws	A
CE-HX616ASS	Slow Extra Loud	6	16	Vdc	85	98	2900	250	1	14	45	Two 0.25 Blades with M3 Screws	A
CE-WM530ASF	Fast Medium Loud	5	30	Vdc	85	98	2900	250	3	2	20	Two 0.25 Blades with M3 Screws	A
CE-WM550ASV	Very Fast Medium Loud	10	50	Vac dc	85	98	2900	250	10	10	25	Two 0.25 Blades with M3 Screws	A
CE-WU515BSS	Slow Ultra Loud	5	15	Vdc	97	108	2100	200	1	30	70	Two 0.25 Blades with M3 Screws	B
CE-WU628BSS	Slow Ultra Loud	6	28	Vdc	95	108	2100	200	1	20	50	Two 0.25 Blades with M3 Screws	B
CE-SU515BQ	Ultra Loud	5	15	Vdc	100	108	2100	200	4	20	70	Two 0.25 Quick Disconnect B…	B
CE-SU628BS	Ultra Loud	6	28	Vdc	98	108	2100	200	4	20	70	Two 0.25 Blades with M3 Screws	B
CE-BCX515AQF	Fast Extra Loud	5	15	Vdc	90	103	2900	500	3	15	40	Three 0.25 Quick Disconnect…	A
CE-BCX515AWF	Fast Extra Loud	5	15	Vdc	90	103	2900	500	3	12	40	Wire Leads 12.7 cm Long 18 AWG	A
CE-C80WIR	Extra Loud	3	16	Vdc	94	103	2900	250		8	40	Two (2) Wires Leads, 18 AWG…	M
CE-C80WIT	Extra Loud	3	16	Vdc	94	103	2900	250		8	40	Two (2) Wires Leads, 18 AWG…	M
Part Number	Loudness Category	Operating Voltage			Typical SPL at 24 inch (61cm) dB(A)		Sound Frequency		Rate ±20%	Operating Current mA		Termination	Plastic Housing Style V= with Volume Control
		Min V	Max V	Type	At Min V	At Max V	Center Hz.	Range ±Hz.	Hz.	At Min V	At Max V		

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BUZZERS

Part Number	Tone	Size			Operating Voltage			Loudness (at Nom. Vpp)		Resonant Frequency	Current (at Nom. V)	Termination Type		Sound Port	Washing Label	RoHS Lead Free
		Long Dia. mm	Wide mm	High mm	Nom Vdc	Min Vdc	Max Vdc	SPL db(A)	at cm	F_o Hz	mA	Type	Spacing Long mm			
CEMB128M070-05C24MLR	Cont.	12.8	12.8	7.1	5	4	7	85	10	2400	30	SMD		Top	Yes	Yes
CEEB128N095-815C23MR	Cont.	12.8	12.8	10	12	8	15	85	10	2300	30	SMD		Top	No	Yes
CEEB128N100-103C24MLR	Cont.	12.8	12.8	10	1.5	1	3	80	10	2400	20	SMD		Top	Yes	Yes

Part Number	Tone	Size			Operating Voltage			Loudness (at Nom. Vpp)		Resonant Frequency	Current (at Nom. V)	Termination Type		Sound Port	Washing Label	RoHS Lead Free
		Long Dia. mm	Wide mm	High mm	Nom Vdc	Min Vdc	Max Vdc	SPL db(A)	at cm	F_o Hz	mA	Type	Spacing Long mm			
CEEB096A050-307C25P5LR	Cont.	9.6		5.0	5	3	7	80	10	2500	30	Pins	5.0	Top	Yes	Yes
CEEB12A095-205C23P7.6LR	Cont.	12.0		9.5	3	2	5	80	10	2300	30	Pins	7.6	Top	Yes	Yes
CEEB12A095-407C23P7.6LR	Cont.	12.0		9.5	5	4	7	85	10	2300	30	Pins	7.6	Top	Yes	Yes
CEEB12A095-816C23P7.6LR	Cont.	12.0		9.5	12	8	16	88	10	2300	30	Pins	7.6	Top	Yes	Yes
CEMB160A140-12C23PLR	Cont	16.0		14.0	12	8	15	85	10	2300	30	Pins	7.6	Top	Yes	Yes

Part Number	Tone	Size			Operating Voltage			Loudness (at Nom. Vpp)		Resonant Frequency	Current (at Nom. V)	Termination Type		Sound Port	Washing Label	RoHS Lead Free
		Long Dia. mm	Wide mm	High mm	Nom Vdc	Min Vdc	Max Vdc	SPL db(A)	at cm	F_o Hz	mA	Type	Spacing Long mm			
CEPB143N072-316C40MR	Cont.	14.3	14.3	7.2	12	3	16	90	10	4000	8	SMD	9.5	Top	No	Yes
CEPB143N080-316C40MR	Cont.	14.3	14.3	8.0	5	3	16	85	10	4000	8	SMD	9.5	Top	No	Yes

Part Number	Tone	Size			Operating Voltage			Loudness (at Nom. Vpp)		Resonant Frequency	Current (at Nom. V)	Termination Type		Sound Port	Washing Label	RoHS Lead Free
		Long Dia. mm	Wide mm	High mm	Nom Vdc	Min Vdc	Max Vdc	SPL db(A)	at cm	F_o Hz	mA	Type	Spacing Long mm			
CEPB295I245-315CSP32W150R	Dual	29.5		31.5	12	3	15	95/90	30	3200	20	Wire	150	Top	No	Yes
CEPB300B205-308C35PLR	Cont.	30.0		20.5	5	3	8	100	10	3500	15	Pins	15.0	Top	Yes	Yes
CEPB300B200-315B30P15R	Beep	30.0		20.0	12	3	15	100	10	3000	30	Pins	15	Top	No	Yes
CEPB310A140-320C35WR100	Cont.	31.0		14.0	5	3	20	100	10	3500	8	Wire	100	Top	No	Yes
CEPB330R412-714S30PR	Siren	33.0	37.4	41.2	12	7	14	102	61	2000 - 3500	130	Pins	19.7	Top	No	Yes
CEPB418I160-324A28WR	Slow Pulse	41.8		16.0	12	3	24	90	30	2800	9	Wire	140	Top	No	Yes
CEPB418I160-324C28WR	Cont.	41.8		16.0	12	3	24	100	10	2800	18	Wire	140	Top	No	Yes
CEPB500A290-513C25PR	Cont.	50.0		29.0	12	5	13	105	30	2500	75	Pins	22.5	Top	No	Yes

Part Number	Tone	Operating Voltage			Typical SPL at 24 inches (61cm)			Resonant Frequency		Rate	Operating Current			Termination Type	Washing Label
		Min Vdc	Max Vdc	Nom Vdc	Min db(A)	Nom db(A)	Max db(A)	Center Hz	Range ±Hz	±20% Hz	Min mA	Nom mA	Max mA	Type	
CE-C55	Continuous	2.0	6.0	5.0	88	98	98	3,000	500	NA	10	33	38	Pins	No
CE-C55A	Continuous	2.0	6.0	5.0	88	98	98	3,000	500	NA	10	33	38	Pins	Yes
CE-C55W	Continuous	2.0	6.0	5.0	88	98	98	3,000	500	NA	10	33	38	Wire Leads 12.7 cm Long 18 AWG	No
CE-C75	Continuous	3.0	18.0	12.0	78	96	100	3,000	500	NA	5	28	40	Pins	No
CE-C75A	Continuous	3.0	18.0	12.0	78	96	100	3,000	500	NA	5	28	40	Pins	Yes
CE-C75W	Continuous	3.0	18.0	12.0	78	96	100	3,000	500	NA	5	28	40	Wire Leads 12.7 cm Long 18 AWG	No
CE-C75W3	Continuous	3.0	18.0	12.0	78	96	100	3,000	500	NA	5	28	40	Wire Leads 76.2 cm Long 18 AWG	No
CE-C80	Continuous	5.0	16.0	12.0	94	102	103	2,900	250	NA	8	30	40	Pins	No
CE-C80A	Continuous	5.0	16.0	12.0	94	102	103	2,900	250	NA	8	30	40	Pins	Yes
CE-C80W	Continuous	5.0	16.0	12.0	94	102	103	2,900	250	NA	8	30	40	Wire Leads 12.7 cm Long 18 AWG	No
CE-C80W3	Continuous	5.0	16.0	12.0	94	102	103	2,900	250	NA	8	30	40	Wire Leads 76.2 cm Long 18 AWG	No

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SOUND TRANSDUCERS

Part Number	Size			Operating Voltage			Loudness (at Nom. Vpp)		Resonant Frequency	Current (at Nom. V)	Impedance (at Nom. Vpp)	Termination Type (at Nom. Vpp)		Sound Port	Washing Label	RoHS Lead Free
	Long Dia. mm	Wide mm	High mm	Nom Vdc	Min Vdc	Max Vdc	SPL db(A)	at cm	F_o Hz	mA	R Ohms	Type	Spacing Long mm			
CEET040K019-10-204-11MR	4.0	3.0	1.9	3	2	4	68	5	1100	120	10	SMD		Top	No	Yes
CET050R020-12-205-40MR	5.0	5.0	2.0	3	2	5	78	10	4000	100	12	SMD		Side	No	Yes
CEET050M020-12-204-40MR	5.0	5.0	2.0	3	2	4	78	10	4000	90	12	SMD		Top	No	Yes
CEET050M025-17-204-40MR	5.0	5.0	2.5	3	2	4	75	10	4000	80	17	SMD		Top	No	Yes
CEET050M030-17-204-40MR	5.0	5.0	3.0	3	2	4	82	10	4000	80	17	SMD		Top	No	Yes
CSET8.5L3.6-17-2.7-5F	8.5	8.5	4.0	3.6	2	4	94	10	2710	100	17	SMD		Side	No	Yes
CEET100L020-16-205-27MR	10.0	10.0	2.0	3.6	2	5	88	10	2670	100	16	SMD		Side	No	Yes
CEET100L035-18-305-28MR	10.0	10.0	3.5	3.6	3.0	4.6	98	10	2830	100	18	SMD		Side	No	Yes
CEET105A025-16-2545-27MLR	10.5	10.5	2.5	3.6	2.5	4.5	85	10	2700	100	16	SMD		Top	No	Yes
Part Number	Size			Operating Voltage			Loudness (at Nom. Vpp)		Resonant Frequency	Current (at Nom. V)	Impedance (at Nom. Vpp)	Termination Type (at Nom. Vpp)		Sound Port	Washing Label	RoHS Lead Free
	Long Dia. mm	Wide mm	High mm	Nom Vdc	Min Vdc	Max Vdc	SPL db(A)	at cm	F_o Hz	mA	R Ohms	Type	Spacing Long mm			
CEET090A055-40-27P4LR	9.0		5.5	5	4	6	85	10	2731	60	40	Pins	4.0	Top	No	Yes
CEET120B085-42-205-20P6.5R	12.0		8.5	3.5	2	5	88	10	2048	30	42	Pins	6.5	Top	No	Yes
CEET12A090-16-205-24P6.5LR	12.0		9.0	3	1	5	85	10	2400	30	16	Pins	6.5	Top	Yes	Yes
CEET12A090-47-308-24P6.5LR	12.0		9.0	5	3	8	85	10	2400	40	47	Pins	6.5	Top	Yes	Yes
CEET12A090-140-615-24P6.5LR	12.0		9.0	12	6	15	85	10	2400	40	140	Pins	6.5	Top	Yes	Yes
CEET14E050-40-104-20PR	14.0		5.0	3	1	4	85	10	2000	35	40	Pins	7.6	Top	No	Yes
CEET160B140-50-408-20P7.6LR	16.0		14.0	6	4	8	85	10	2048	40	50	Pins	7.6	Top	Yes	Yes
Part Number	Size			Operating Voltage			Loudness (at Nom. Vpp)		Resonant Frequency	Current (at Nom. V)	Impedance (at Nom. Vpp)	Termination Type (at Nom. Vpp)		Sound Port	Washing Label	RoHS Lead Free
	Long Dia. mm	Wide mm	High mm	Nom Vdc	Min Vdc	Max Vdc	SPL db(A)	at cm	F_o Hz	mA	R Ohms	Type	Spacing Long mm			

Part Number	Size			Operating Voltage			Loudness (at Nom. Vpp)		Resonant Frequency	Current (at Nom. V)	Capacitance	Termination Type (at Nom. Vpp)		Sound Port	Washing Label	RoHS Lead Free
	Long Dia. mm	Wide mm	High mm	Nom Vdc	Min Vdc	Max Vdc	SPL db(A)	at cm	F_o Hz	mA	pF	Type	Spacing mm			
CEPT090L018-120-21MHR	9.0	9.0	1.8	3	1	20	70	10	2100	1	15000	SMD		Side	No	Yes
CEPT090L018-120-40MHR	9.0	9.0	1.8	3	1	20	70	10	4000	1	15000	SMD		Side	No	Yes
CEPT090L019-125-40MR	9.0	9.0	1.9	3	1	25	70	10	4000	1	12000	SMD		Side	No	Yes
CEPT110K017-5-120-41NR	11.0	9.0	1.7	5	1	20	73	10	4100	2	10000	SMD		Top	No	Yes
CEPT146M043-5-120-40MR	14.6	14.0	4.3	5	1	20	80	10	4000	2	15000	SMD		Top	No	Yes
CEPT170A060-12-125-40MR	17.0		6.0	12	1	25	90	10	4000	3	15000	SMD		Top	No	Yes
CEPT220A070-12-125-40MR	22.0		7.0	3	1	25	90	10	4000	1	15000	SMD		Top	No	Yes
CEPT230A111-9-130-40MR	23.0		11.1	9	1	30	100	10	4000	2	12000	SMD		Top	No	Yes
Part Number	Size			Operating Voltage			Loudness (at Nom. Vpp)		Resonant Frequency	Current (at Nom. V)	Capacitance	Termination Type (at Nom. Vpp)		Sound Port	Washing Label	RoHS Lead Free
	Long Dia. mm	Wide mm	High mm	Nom Vdc	Min Vdc	Max Vdc	SPL db(A)	at cm	F_o Hz	mA	pF	Type	Spacing mm			
CEPT126A067-130C40PR	12.0		6.7	3	1	30	70	10	4000	1	12000	Pins	5.0	Top	No	Yes
CPT14A05-4.0R	14.0		6.8	5	1	25	85	10	4000	2	15000	Pins	7.6	Top	No	Yes
CEPT229P273-200PR	22.9	10.0	26.3	24	1	30	100	10	2000	10	30000	PC Lug	12.5	Side	No	Yes
CEPT240B075-130-40PR	24.0		7.5	10	1	30	90	10	4000	5	21000	Pins	10.0	Top	No	Yes
CEPT300B100-330-20P15R	30.0		10.0	10	3	30	90	10	2000	5	35000	Pins	15	Top	No	Yes
CEC-116	30.0		14.0	12	1	30	100	10	2600/2400	5	26000	Pins	15	Top	No	Yes
CEC-116-2K-20	30.0		14.0	10	1	30	93	10	2000	10	26000	Pins	20	Top	No	Yes
Part Number	Size			Operating Voltage			Loudness (at Nom. Vpp)		Resonant Frequency	Current (at Nom. V)	Capacitance	Termination Type (at Nom. Vpp)		Sound Port	Washing Label	RoHS Lead Free
	Long Dia. mm	Wide mm	High mm	Nom Vdc	Min Vdc	Max Vdc	SPL db(A)	at cm	F_o Hz	mA	pF	Type	Spacing Long mm			

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SPEAKERS

Part Number	Dimensions			Input Voltage		Capacitance	Loudness			Frequency		Material		Shielded	Termination	RoHS
	L/ Dia mm	W mm	H mm	Nom V	Max V	µFD	SPL dB	At W/V	At cm	Fo Hz.	Range Hz.	Frame	Membrane			
CES22P15H14-100U	22	15	1.4	7.0	9.0	0.85	92	5.0	5	1000	12000	Stainless Steel	Kapton	No	Bonding Pad	Yes
CES25P17H17-80U	25	17	1.7	7.0	9.0	0.85	95	5.0	5	800	10000	Stainless Steel	Kapton	No	Bonding Pad	Yes
CES26P23H13-80U	26	23	1.3	7.0	9.0	0.85	99.5	5.0	5	800	10000	Stainless Steel	Kapton	No	Bonding Pad	Yes
CES30P15H16-80U	30.2	15.2	1.6	7.0	9.0	0.88	95	5.0	5	800	11000	Stainless Steel	Kapton	No	Bonding Pad	Yes
CES30P20H13-80U	30.0	20.0	1.3	7.0	9.0	0.87	96.5	5.0	5	800	10000	Stainless Steel	Kapton	No	Bonding Pad	Yes
CES100R028AE8SMN1200SR	10.0		2.8	0.3	0.5	8	86	0.1	10	1200	6000	Steel	Mylar	No	Solder Points	Yes
CES280R042AE8SMN750UR	28.0		4.2	0.25	0.5	8	92	0.1	10	750	7000	Steel	PET	No	Solder Points	Yes
CES300R048BA08SMN500UR	30.0		4.8	0.5	1.0	8	88	0.1	10	500	5000	Steel	Mylar	No	Solder Points	Yes
CES500R190AE8SMN550TR	50.0		19.0	0.2	0.4	8	80	0.2	0.5	550	5500	Steel	Mylar	No	Tabs	Yes

Part Number	Dimensions			Input Power		Impedance	Loudness			Frequency		Material		Shielded	Termination	Certified	RoHS
	L/ Dia mm	W mm	H mm	Nom W	Max W	Ω	SPL dB	At W/V	At cm	Fo Hz.	Range Hz.	Frame	Cone				
CES250V048BA08PCN900UR	25.0	15.0	5.0	0.5	1.0	8	82	1.0	50	900	5000	Plastic	Cloth	Yes	PCB		Yes
CES250V075CF8PMN650UR	25.0	14.0	7.5	2	2.5	8	81	1.0	50	650	20000	Plastic	Mylar	No	PCB	IP65	Yes
CES270V062DA08PCN650STR	27.0	20.0	6.2	1.0	3.0	8	80	1.0	50	650	20000	Plastic	Cloth	No	Tabs		Yes
CES350V058CA08PCN670UR	35.0	16.0	5.8	1.0	2.0	8	83	1.0	50	670	20000	Plastic	Cloth	No	Solder Points		Yes
CES350V080CA08PCN500TR	35.0	20.0	8.0	1.0	2.0	8	84	0.25	50	500	5000	Plastic	Cloth	No	Tabs		Yes
CES400V094EA8PMN480UR	40.0	20.0	9.4	3	4	8	95	1.0	10	480	20000	Plastic	Mylar	No	Tabs	IP65	Yes
CES400V115DA08PMN700TR	40.0	28.5	11.5	2.0	3.0	8	86	1.0	50	700	15000	Plastic	Mylar	No	Tabs	IP65	Yes
CES400S080CB08PCN550SUR	40.0	20.0	8.0	1.5	3.0	8	84	1.0	50	550	20000	Plastic	Cloth	Yes	PCB		Yes
CES400S120CA08PCN380STR	40.0	28.3	12.0	1.0	2.0	8	84	1.0	50	380	20000	Plastic	Paper	No	Tabs		Yes
CES710O255CD08RPN250STR	71.0	40.0	25.5	3.0	5.0	8	86	1.0	50	250	20000	Steel	Paper	Yes	Tabs		Yes
CES1260O585KB8FPN151SHP17GR	126.5	58.5	49.0	10.0	11.0	8	100	1.0	10	151	18000	Steel	Paper	Yes	Pins		Yes

Part Number	Dimensions			Input Power		Impedance	Loudness			Frequency		Material		Shielded	Termination	RoHS
	L/ Dia mm	W mm	H mm	Nom W	Max W	Ω	SPL dB	At W/V	At cm	Fo Hz.	Range Hz.	Frame	Cone			
CES280S115CB8SPN360T	28.0	28.0	11.5	2.0	3.0	8	80	1.0	50	360	20000	Steel	PU+Paper	No	Tabs	Yes
CES505S120DA8SMN800T	50.5	50.5	12.0	1.5	3	8	85	1.0	100	800	6000	Steel	Mylar	No	Tabs	Yes
CES102S470KF4APN110TGR	102.0	102.0	47.0	8.0	15.0	4	83	1.0	100	111	18000	Steel	Paper	No	Tabs	Yes
5060CE-1	117.0	117.0	51.1	5.0	10.0	8	90	1.0	100	140	10000	Steel	Paper	No	Tabs	Yes
51410CE	134.0	134.0	51.0	8.0	15.0	8	90	1.0	100	121	18000	Steel	Paper	No	Tabs	Yes
51410CESH	134.0	134.0	56.0	8.0	15.0	8	90	1.0	100	134	18000	Steel	Paper	Yes	Tabs	Yes
5412PX	134.2	134.2	55.0	15.0	30.0	4	88	1.0	100	75	10000	Steel	Paper	No	Tabs	Yes
CES136S029AH08PMN800SR	13.6	9.6	2.9	0.3	0.8	8	83		10	800	20000	PPA Plastic	Polymer	No	Spring	Yes
CES130S040BA08PPS850MR	13.0	13.0	2.9	0.7	1.0	8	88	0.7	10	850	20000	Plastic	Mylar	No	SMD	Yes
CES280R035BA8SMN500PR	28.0	28.0	3.5	0.5	1.0	8	87	0.1	10	500	6000	Steel	Mylar	No	Pins	Yes

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MICROPHONES

Part Number	Directionality	Dimensions		Sensitivity/db		Min S/N Ratio	VDD			Frequency Response Mask		Termination
		Dia. mm	High mm	dB	±		Min. Vdc	Nom. Vdc	Max. Vdc	±3 Hz	±5 Hz	
CEM-DB60221-283AD-L01CAR-00-0	Omni	6.0	2.2	-28	3	57	2.4	3.3	3.63	100-8K	20-20K	Solder Pads
CEM-DB60223-283AD-PAHCAR-00-0	Omni	6.0	2.2	-28	3	57	2.4	3.3	3.63	100-8K	20-20K	Pins

Part Number	Dimensions		Sensitivity/db		Min S/N Ratio	Operating Voltage			Frequency Range	Internal Capacitors	Termination	
	Dia. mm	High mm	dB	±		Min. Vdc	Nom. Vdc	Max. Vdc	Hz	pFD	Type	Long mm
CEM-N9750EAA544NR	9.7	5.0	-54	4	60	1.0	1.5	5.0	100-10000	–	Solder Points	
CEM-N9767JAD544P2.54R	9.7	6.7	-54	4	50	1.0	1.5	10.0	100-10000	–	PC Pin	

Part Number	Dimensions		Sensitivity/db		Min S/N Ratio	Operating Voltage			Frequency Range	Internal Capacitors	Termination		IP57
	Dia. mm	High mm	dB	±		Min. Vdc	Nom. Vdc	Max. Vdc	Hz	pFD	Type	Long mm	
CEM-OB6018-3EAD443C43MR	6.0	1.8	-44	3	58	1.0	2.0	10	50-20000	33 + 10	SMD		-
CEM-OB6027-8JAD403CR	6.0	2.7	-40	3	58	1.0	2.0	10	50-20000	–	Solder Points		-
CEM-C9745JAD462P2.54R	9.7	4.5	-46	2	58	1.0	1.5	10	100-10000	–	PC Pin		-

Part Number	Dimensions		Sensitivity/db		Min S/N Ratio	Operating Voltage			Frequency Range	Internal Capacitors	Termination	
	Dia. mm	High mm	dB	±		Min. Vdc	Nom. Vdc	Max. Vdc	Hz	pFD	Type	Long mm
CEM-UB4020MBAD503NR	4.0	2.0	-50	3	55	1	2.0	10	100-10000		Solder Points	
U9752BA474LFP	9.7	5.2	-47	4	55	1	1.5	10	100-10000		PC Pin	

Battery Accessories

Part Number	Description
CONTACT-202A	Anode
CONTACT-202B	Cathode
CONTACT-202D	1 Anode and 1 Cathode
CONTACT-307C	2 Anodes
CONTACT-307F	2 Cathode
CONTACT-304B	Cathode
CONTACT-308A	Anode
CONTACT-308F	2 Cathode
CONTACT-305IE	9V PCB
CONTACT-306A	Anode
CONTACT-319A	Anode

Part Number	Battery / Cell Style	Number of Cells	Mounting Style
SNAP-ON	9 Volt	2	DIP
BC-0302	AA	1	DIP
BC-0401	AAA	1	DIP
BC-0403	AAA	1	DIP

Part Number	Cell Style	Number of Cells	Terminals	Dimensions (mm)		
				Len./Dia.	Width	Height
BC-2002	CR2032	1	PCB	22.4	19.6	6.1
BC-2003	CR 2023	1	PCB	24.8	7.0	3.7
BC-2401	CR-2430	1	SMD	25.6	24.5	3.3

Part Number	Cell Style	Number of Cells	Terminals	Dimensions (mm)		
				Len./Dia.	Width	Height
CH-23-1220	CR 1220	1	PC PIN	13 dia.		5.4
CH-25-2032	CR 2032	1	PC PIN	28 dia.		6.0
CH-26-2032LF	CR 2032	1	PC PIN	23.0	27.0	5.8
CH-74-2032	CR 2032	1	PC PIN	22.5	18.1	6.4

9 Voltios

Part Number	Number of Cells	Termination Style	Dimensions (mm)		
BH-9VA	1	Wire Leads, 26 AWG, UL 1007…	54.0	30.3	20.7
BS-IC	1	PVC Vinyl , 26 AWG, I Style…	28	14.5	6.8
BS-EC	1	PVC Vinyl, 26 AWG, E Style …	24.7	13	6.1
BS-IR	1	Safety, 26 AWG, SNAP I Styl…	25.0	12.0	7.7
BS-ER	1	Safety, 26 AWG, SNAP E Styl…	25.5	12.7	7.2

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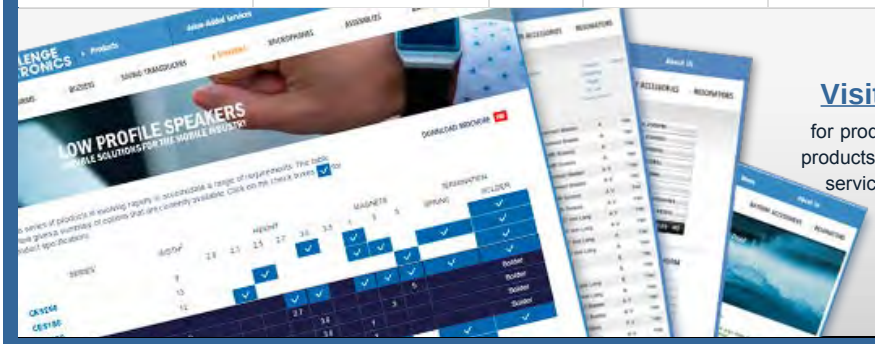
BATTERY HOLDERS

Part Number	Number of Cells	Termination Style	Dimensions (mm)		
			Len./Dia.	Width	Height
BH-125A	2	Wire Leads, 24 AWG, UL 1007…	130	37	28
BH-131A	3	Wire Leads, 24 AWG, UL 1007…	106	70	27.8
BH-141A	4	Wire Leads, 24 AWG, UL 1007…	130	74	29
BH-161A	6	Wire Leads, 24 AWG, UL 1007…	105	70	56
BH-211-1A	1	Wire Leads, 24 AWG, UL 1007…	58	29	24
BH-221A	2	Wire Leads, 24 AWG, UL 1007…	63	56	23
BH-231A	3	Wire Leads, 24 AWG, UL 1007…	160	30	27
BH-241A	4	Wire Leads, 24 AWG, UL 1007…	210	30	26
BH-261A	6	Wire Leads, 24 AWG, UL 1007…	159	57	25
BH-281A	8	Wire Leads, 24 AWG, UL 1007…	106	59	45
BH-411-3D	1	Solder Lugs	50	13	12
BH-421-1A	2	Wire Leads, 26 AWG, UL 1007…	52.3	25	13.2
BH-432	3	Solder Points - Contact # 4…	56.6 Long	22.3 Dia.	
BH-441A	4	Wire Leads, 26 AWG, UL 1007…	53	50	13
BH-463A	6	Wire Leads, 26 AWG, UL 1007…	53	38	27
BH-482A	8	Wire Leads, 26 AWG, UL 1007…	97	24.4	23.8

Part Number	Number of Cells	Rating	Termination Style	Dimensions (mm)		
				Len./Dia.	Width	Height
BH-311-1A	1	-	Wire Leads, 26 AWG, UL 1007…	57	17	14
BH-321-1A	2	-	Wire Leads, 26 AWG, UL 1007…	57	32	16
BH-333A	3	-	Wire Leads, 26 AWG, UL 1007…	158	17	14
BH-341-1A	4	-	Wire Leads, 26 AWG, UL 1007…	63.1	58	16
BH-351A	5	-	Wire Leads, 26 AWG, UL 1007…	79	59	17
BH-361A	6	-	Wire Leads, 26 AWG, UL 1007…	111	48	17
BH-382A	8	-	Wire Leads, 26 AWG, UL 1007…	108	31	29
BH-3101A	10	-	Wire Leads, 26 AWG, UL 1007…	151	57.4	15.8

Part Number	Number of Cells	Rating	Battery Type	Termination Style	Dimensions (mm)		
					Len./Dia.	Width	Height
SBH-131A	3	-	D Cell	Wire Leads, 24 AWG, UL 1007…	108	70	39
SBH-221A	2	-	C Cell	Wire Leads, 24 AWG, UL 1007…	82.4	57	30
SBH-321-1A	2	-	AA Cell	Wire Leads, 26 AWG, UL 1007…	68.5	33.4	18.6
SBH-341-5A	4	IP68	AA Cell	Wire Leads, 24 AWG, UL 1007…	67	79	18
SBH-421-1A	2	-	AAA Cell	Wire Leads, 26 AWG, UL 1007…	62.6	25.7	15.7
SBH-441A	4	-	AAA Cell	Wire Leads, 26 AWG, UL 1007…	62	49	15



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