SENSORS FOR TESTING CONSUMER PRODUCTS

PCB PIEZOTRONICS
AN AMPHENOL COMPANY

ENDEVCO
AN AMPHENOL COMPANY

pcb.com | endevco.com

SENSORS FOR TESTING CONSUMER PRODUCTS

Sensors from PCB Piezotronics and Endevco® are used by some of the largest white goods manufacturers to develop and validate products like power tools, large and small household appliances, heating and air conditioning systems, speakers and sound systems. From the research and design phase to end of line production testing, our high performance accelerometers and microphones provide accurate measurements for every step of the product life cycle.

Typical testing applications include:

- Pinpointing Vibration Sources
- Product Life Cycle Testing
- Sound Power
- Sound Quality
- Noise Source Location

Learn more about consumer product testing with PCB.

SENSORS TO MEASURE VIBRATION AND SHOCK:

- Piezoelectric Accelerometers
- Piezoresistive MEMS Shock Accelerometers
- MEMS DC Response Accelerometers

MICROPHONES FOR ACOUSTIC MEASUREMENTS:

- Pre-Polarized ICP® Microphones
- Specialty Microphones

SENSORS TO MEASURE PRESSURE AND FORCE:

- Piezoelectric Force Sensors
- Piezoelectric Pressure Sensors
- Piezoresistive Pressure Sensors

SENSORS TO MEASURE VIBRATION AND SHOCK

PIEZOELECTRIC ACCELEROMETERS

Piezoelectric accelerometers are ideal for environmental stress screening and general vibration testing on consumer electronics. Integrated Electronics Piezo-Electric (IEPE) technology, pioneered by PCB Piezotronics under the trademark ICP®, contributes to their small size, ease of use, and accuracy over a wide frequency range, making them one of the most popular sensor types for vibration and shock testing.





SPECIFICATIONS					
Model Number	**PCB 356A01**	**PCB 356A04**	**PCB 356A33**	**PCB 356A4x series**	**PCB 356B18**
Description	Triaxial, ceramic shear ICP® (IEPE) accelerometer	Triaxial, ceramic shear ICP® (IEPE) accelerometer	Triaxial, ceramic shear ICP® (IEPE) accelerometer with titanium housing	Triaxial ICP® (IEPE) accelerometer with TEDS	Triaxial, high sensitivity, ceramic shear ICP® (IEPE) accelerometer
Measurement Range	±1000 g pk	±5000 g pk	±500 g pk	±500, ±100 or ±50 g pk	±5 g pk
Sensitivity	5 mV/g	1 mV/g	10 mV/g	10, 50, or 100 mV/g	1000 mV/g (±10%)
Frequency Range (+/-5%)	2.0 to 8000 Hz (y or z axis) 2.0 to 5000 Hz (x axis)	1.2 to 10,000 Hz	2.0 to 10,000 (y or z axis) 2.0 to 7000 (x axis)	1.2 to 10,000 Hz	0.5 to 3000 Hz
Key Features	Ideal for small component qualification, structural vibration, environmental stress screening, noise vibration & harshness testing, and vibration measurements with space restrictions	Ideal for small component shock testing, environmental stress screening and electronic board testing	Ideal for component qualification in tight areas where size is restricted	Miniature, lightweight Ideal for small component shock testing, environmental stress screening and electronic board testing	Ideal for applications requiring high output and high resolution for measuring low vibration levels





SPECIFICATIONS					
Model Number	**PCB 352A91**	**PCB 352C23**	**PCB 352A73**	**Endevco 65-100**	**Endevco 7250B series**
Description	Miniature, lightweight, high G, single axis ICP® (IEPE) accelerometer	Miniature, lightweight, single axis ICP® (IEPE) accelerometer	Miniature, lightweight, single axis ICP® (IEPE) accelerometer with titanium housing	IEPE triaxial accelerometer with adhesive mount or M2.5 thread	Subminiature, lightweight, single axis IEPE accelerometer
Measurement Range	±5000 g pk	±1000 g pk	±1000 g pk	±50 g pk	±2500 g pk and ±500 g pk
Sensitivity (±20%)	1 mV/g	5 mV/g	5 mV/g	100 mV/g	2 mV/g and 10 mV/g
Frequency Range (+/-5%)	1.2 to 10,000 Hz	2.0 to 10,000 Hz	2.0 – 10,000 Hz	20.0 to 6,000 Hz (x or y axis) 20.0 to 10,000 Hz (z axis)	2.0 to 30,000 Hz
Key Features	Ideal for modal and structural analysis, NVH studies on automotive parts, space restricted installations,drop testing and package testing, small component qualification testing	Ideal for miniature component tests and tests where size and weight are restricted	Ideal for small component vibration testing, electronics and circuit board qualification, drop testing and package testing, short term underwater testing	Ideal for structural analysis, laboratory testing and modal analysis	Hermetically sealed for use in extreme environments. Ideal for very high frequency vibration measurements on small objects

PIEZORESISTIVE SHOCK AND MEMS DC RESPONSE ACCELEROMETERS

The rugged design of piezoresistive accelerometers makes them ideal for impact testing in harsh shock and vibration environments, while angular rate sensors offer the capability to measure rotational acceleration in small package sizes. The Endevco® Model 7360A features three DC accelerometers and three angular rate sensors, providing accurate measurement of both acceleration and angular velocity. MEMS DC response accelerometers are designed to measure low-frequency vibration and motion and are offered in full-scale ranges from ± 2 to ± 200 g to accommodate a variety of testing requirements




SPECIFICATIONS				
Model Number	**Endevco 726CH series**	**Endevco 728 series**	**Endevco 7310A series**	**Endevco 7360A series**
Description	Lightweight piezoresistive accelerometer with multimode damping	Lightweight piezoresistive accelerometer with adhesive mount	Angular rate silicon MEMS sensor with gyroscope technologies	Six-degrees of freedom (6DOF) sensor
Measurement Range	±2000 g	±2000 g and ±10,000 g	Seven range options from ±100 to ±18k deg/sec	Accelerometer: Seven range options from ±2 to ±500 g Angular Rate: Seven range options from ±100 to ±18k mV/deg/sec
Sensitivity	.030 mV/g	200 µV/g and 16 µV/g	Five sensitivities from 20 to 0.111 mV/deg/sec (±15%)	Accelerometer: Five sensitivities from 1000 to 4 mV/g Angular Rate: Five sensitivities from 20 to 0.111 deg/sec (±15%)
Frequency Response	0 to 5 kHz (±5%)	0 to 8 kHz (±1 dB)	0 to 1 kHz or 0 to 2 kHz (+1dB/-3dB)	Accelerometer: From 0-550 to 0-5000 Hz (±3dB, ref 100 Hz) Angular Rate: 0 to 1 kHz or 0 to 2 kHz (+1dB/-3dB)
Key Features	Ideal for automotive and product safety testing applications that require broad frequency response and minimum zero shift following the event	Ideal for shock measurements in mobile consumer electronic devices and other shock measurements requiring a lightweight, adhesive mount accelerometer	Ideal for safety testing and other system designs requiring accurate measurement of angular velocity	Ideal for component and consumer safety testing, automotive safety testing, testing in harsh shock and vibration environments requiring accurate measurement of accelerations and angular velocity



SPECIFICATIONS			
Model Number	**Endevco 7290G series**	**PCB 3711 series**	**PCB 3713 series**
Description	Single Axis Variable Capacitance Accelerometer	Single Axis MEMS DC accelerometer	Triaxial MEMS DC Accelerometer
Measurement Range	±2, ±5, ±10, ±30, ±50, ±100, ±200 g	±2, ±10, ±30, ±50, ±100, ±200 g pk	±2, ±10, ±30, ±50, ±100, ±200 g pk
Sensitivity	1000 mV/g to 10 mV/g	675 to 6.75 mV/g	675 to 6.75 mV/g
Frequency Range (±5 %)	0 to 15, 0 to 30, 0 to 500, 0 to 1000, or 0 to 2000 Hz	0 to 250, 0 to 1000, or 0 to 1500 Hz	0 to 250, 0 to 1000, or 0 to 1500 Hz
Key Features	Operates in single ended and differential mode; hermetically sealed	Hermetically sealed for accurate measurement in the most severe operating environments.	Hermetically sealed for accurate measurement in the most severe operating environments.

MICROPHONES FOR ACOUSTIC MEASUREMENTS

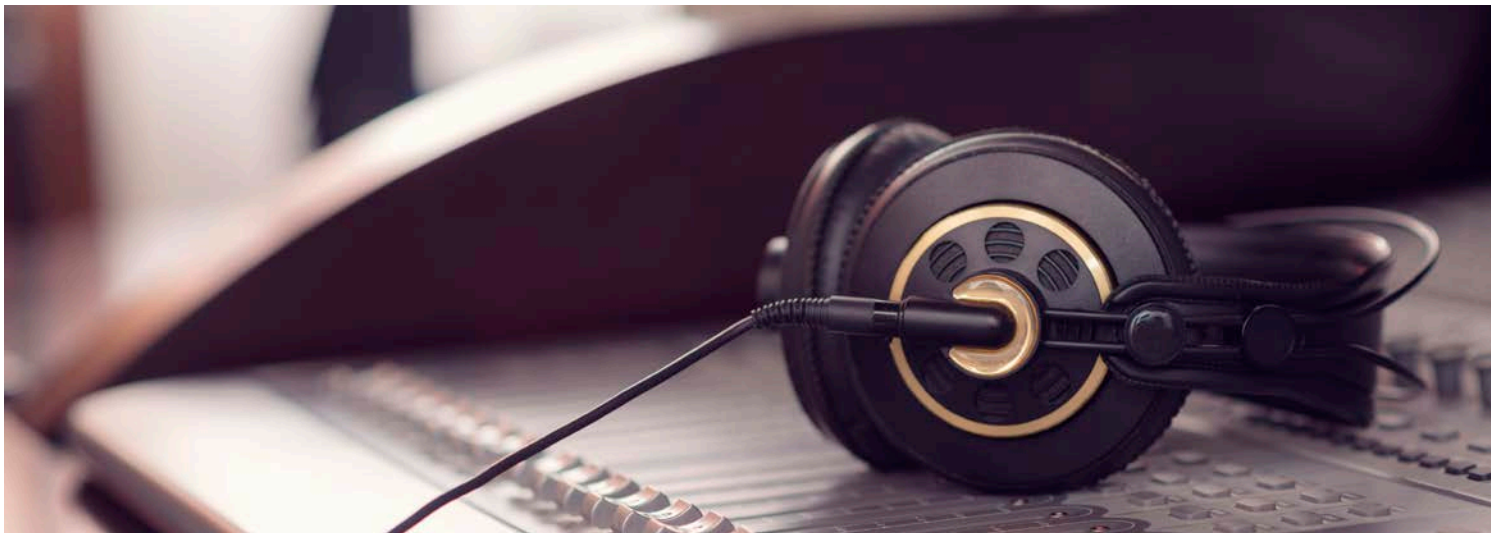
PREPOLARIZED ICP® MICROPHONES

Acoustic testing is becoming increasingly popular for research and design, product component verification, and end of line testing for electrical components and consumer goods. PCB's microphones are a staple for many of the top names in appliance and white goods testing for sound power, sound intensity and sound pressure level measurements.

A full range of 1/2" and 1/4" precision microphones, array style microphones, and specialty microphones are custom designed to help you with your challenging acoustic measurements.



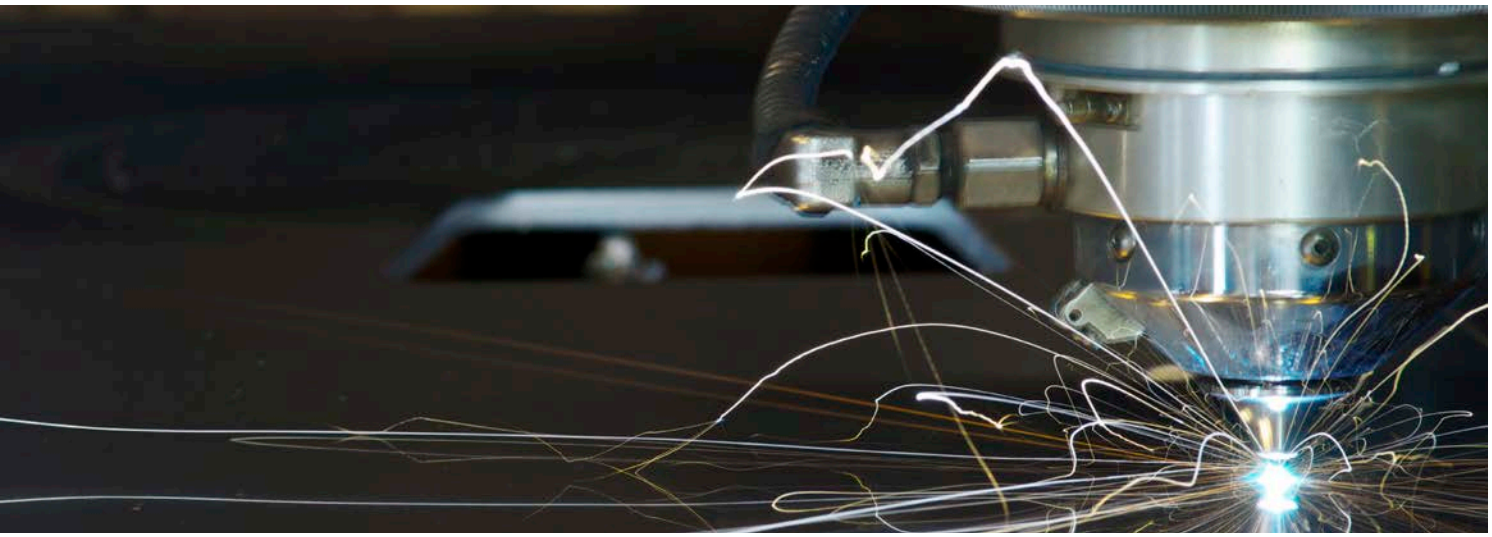

SPECIFICATIONS				
Model Number	**PCB Model 378B02**	**PCB Model 378C20**	**PCB Model 378C13**	**PCB 130F Series**
Description	1/2" ICP® (IEPE) prepolarized, phantom powered free-field microphone and amplifier system, TEDS compatible	1/2" ICP® (IEPE) prepolarized random-incidence condenser microphone and preamplifier, TEDS compatible	1/2" ICP® (IEPE) prepolarized pressure-field microphone featuring extended frequency range, TEDS compatible	1/4" prepolarized free-field ICP® (IEPE) array microphones with integrated preamplifier, TEDS compatible
Sensitivity	50 mV/Pa (±1.5 dB)	50 mV/Pa (±1.5 dB)	12.6 mV/Pa (±2 dB)	45 mV/Pa (±3 dB at 250 Hz)
Frequency Range	(±2 dB) 3.75 - 20,000 Hz	(±2 dB) 3.75 to 16000 Hz	(±2 dB) 3.15 to 20000 Hz	(±2 dB) 10 Hz to 20 kHz
Key Features	Ideal for precision sound level measurements, transfer path analysis, environmental noise monitoring and white goods tests in anechoic chambers	Ideal for cabin measurements, environmental testing, room acoustics and tests within reverberation chambers	Ideal for small closed couplers, impedance tubes, confined spaces, or flush mounted to hard reflective surfaces	Ideal for sound pressure mapping, multichannel measurements, noise source identification and non-contact defect detection



SPECIALTY MICROPHONES

From haptics testing that require extreme low noise testing, to loudspeakers, headphones and earbuds that require high amplitudes with minimal 1% Total Harmonic Distortion (THD) levels, you can be sure that we have the test and measurement acoustic sensor tailored for your application.

SPECIFICATIONS					
Model Number	**PCB 378A04**	**PCB 378A07**	**PCB 376A31**	**PCB 376A32**	**PCB 376A33**
Description	1/2" ICP® (IEPE) low noise free-field, prepolarized microphone with mated preamplifier, TEDS compatible	1/2" ICP® (IEPE) free-field, prepolarized microphone and mated preamplifier, TEDS compatible	1/4" phantom powered 48V, 24V or 12V free-field microphone and preamplifier	1/4" phantom powered 48V, 24V or 12V free-field microphone and preamplifier	1/2" phantom powered 48V, 24V or 12V free-field microphone and preamplifier
Sensitivity	450 mV/Pa	5.8 mV/Pa	2 mV/Pa (±3 dB)	50 mV/Pa (±1.5 dB)	12.6 mV/Pa (±2 dB)
Frequency Range	(±4 dB) 5 Hz to 20 kHz	(±2 dB) 0.13 Hz to 20 kHz	(+2 /-3 dB) 4 Hz to 100 kHz	(±2 dB) 3.75 Hz – 20 kHz	(±2 dB) 3.15 Hz – 31.5 kHz
Key Features	Ideal for computer disk drive testing, electric vehicle sound quality, white goods noise source location and sound power measurements	Ideal for environmental testing, wind turbine measurements, earthquake and tornado analysis and sonic boom measurements	Ideal for loudspeaker design (rub and buzz), accurate modeling and high definition recording	Ideal for loudspeaker design (rub and buzz), accurate modeling and high definition recording	Ideal for loudspeaker design (rub and buzz), accurate modeling and high definition recording



SENSORS TO MEASURE PRESSURE AND FORCE

PIEZOELECTRIC FORCE AND PRESSURE SENSORS; PIEZORESISTIVE PRESSURE SENSORS

Piezoelectric force sensors specialize in dynamic measurements where micro-second response times are required, such as drop and impact testing, force summing, and surface strain sensing applications. Piezoelectric pressure sensors specialize in measuring dynamic pressure events, while Piezoresistive pressure sensors are suitable for dynamic measurements requiring high output and miniature size.





SPECIFICATIONS					
Model Number	**PCB 740B02**	**PCB 201 series**	**PCB 208 series**	**PCB 113 series**	**Endevco 8510B Series**
Description	ICP® piezoelectric adhesive mount strain sensor	Quartz, low profile ICP® piezoelectric force rings with high resonant frequency	General purpose ICP® quartz force sensor	High frequency ICP® pressure sensor	Rugged, miniature pressure transducer in 1, 2 and 5 psig ranges
Measurement Range	100 pk με	Ranges from 10 to 5000 lb. available	Ranges from 10 to 5000 lb. available	Ranges from 50 to 15000 psi available	1, 2 and 5 psig
Sensitivity	50 mV/με (± 20 %)	500, 50, 10, 5, and 1 mV/lb	500, 50, 10, 5, and 1 mv/lb (±15%)	100, 50, 25, 10, 5, 1, 0.5 mV/psi, and 0.44 pC/psi	200 ±50, 100 +55/-25, and 60 ±20 mV/psi
Frequency Range (+/-5%)	0.5-100,000 Hz	90,000 Hz upper freq. limit	36,000 Hz upper freq. limit	>500 kHz resonant frequency	55, 70, 85 kHz resonant frequency
Key Features	Ideal for ground vibration testing, modal analysis, transfer path analysis and active vibration control	Ideal for measuring microsecond duration events common to metal forming equipment (crimp, bend, stake, or stamp), drop test, and product testing applications	Ideal for validation of dynamic force in repetitive process operations, drop testing & integration into force plates, automation & machine tool processes and material sample testing equipment	Ideal for shock tubes and closed bombs, time-of-arrival measurements, and explosion, blast, and shock wave testing	Ideal for a wide variety of testing, research, and industrial measurements which require a combination of small size, high sensitivity, and wideband frequency response

Shop, compare, and get a quote on PCB sensors and accessories.

Shop, compare, and get a quote on Endevco sensors and accessories.

PCB PIEZOTRONICS
AN AMPHENOL COMPANY

3425 Walden Avenue, Depew, NY 14043 USA

pcb.com | info@pcb.com | 800 828 8840 | +1 716 684 0001

ENDEVCO
AN AMPHENOL COMPANY

10869 NC Highway 903, Halifax, NC 27839 USA

endevco.com | sales@endevco.com | 866 363 3826

TM-APP-ConsumerProductsTesting-0722