Piezo Actuators

TDK releases two new piezo actuators, expanding portfolio

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TDK Corporation presents two new piezo actuators made of RoHS-compatible lead zirconate titanate (PZT) with an internal copper electrode. COM30S5 (B58004M4030A020) and COM45S5 (B58004M4040A020) are available as unhoused, passivated components. They are characterized by an extraordinary dynamic range, a high force-to-volume ratio, and precision in the nanometer range. TDK achieves this through its patented copper-based High Active Stack (HAS) technology. Compared to other technologies, HAS piezo actuators from TDK offer superior performance, robustness to moisture, and a longer lifetime.

The voltage range goes from -10 to +180 V, their nominal stroke is reached at +160 V, and their allowed surface temperature ranges from -40 to +160 °C. With 30 mm and 45 mm heights, and with a cross-section of 5.2 mm x 5.2 mm, these actuators reach strokes of 55 and 83 µm correspondingly, at 160 V and 730 N of preload.

In addition, TDK plans to release three more actuators in 2023 to cover a wider application range. Today, these are available only as prototypes in limited quantities, and are not intended for series production: COM10S5 (Z63000Z2910Z001Z78) with 10 mm height and 16 µm of stroke, COM27S3 (Z63000Z2910Z001Z77, leaded) with 27 mm height and 47 µm of stroke, and the COM30S7 (Z63000Z2910Z001Z70) with 30 mm of height and 7 mm x 7 mm of cross-section delivering 55 µm of stroke and 2600 N of blocking force.

Numerous high-end solutions in the field of nano-positioning technology, valve control for liquids and gasses in process engineering, and semiconductor manufacturing are already relying on piezo actuators from TDK.

Main applications

- Nano positioning systems
- High-precision valve control for liquids and gasses
- Bonding wire machines

Main features and benefits

- Copper inner electrodes for superior robustness against humidity and cost-effectiveness
- Minimized inactive areas for higher performance, longer lifetime, and compact design
- A lead-free high melting metal bond for operation at high temperatures

Series/Type	Ordering code (Z numbers are prototypes)	Dimensions (l x w x h) [mm]	Stroke [µm] at +160 V	Recommended pre-load [N]	Blocking force (typ.) [N]
COM30S5	B58004M4030A020	5.2 x 5.2 x 30	55 ±10%	730	1400
COM45S5	B58004M4040A020	5.2 x 5.2 x 45	83 ±10%	730	1400
COM10S5	Z63000Z2910Z001Z78	5.2 x 5.2 x 10	16 ±10%	730	1400
COM27S3	Z63000Z2910Z001Z77 (leaded)	3.4 x 3.4 x 27	47 ±10%	320	600
COM30S7	Z63000Z2910Z001Z70	7.0 x 7.0 x 30	55 ±10%	1320	2600

Prototypes are not intended to be used in series production.

About TDK Corporation

TDK Corporation is a world leader in electronic solutions for the smart society based in Tokyo, Japan. Built on a foundation of material sciences mastery, TDK welcomes societal transformation by resolutely remaining at the forefront of technological evolution and deliberately “Attracting Tomorrow.” It was established in 1935 to commercialize ferrite, a key material in electronic and magnetic products. TDK’s comprehensive, innovation-driven portfolio features passive components such as ceramic, aluminum electrolytic and film capacitors, as well as magnetics, high-frequency, and piezo and protection devices. The product spectrum also includes sensors and sensor systems such as temperature and pressure, magnetic, and MEMS sensors. In addition, TDK provides power supplies and energy devices, magnetic heads and more. These products are marketed under the product brands TDK, EPCOS, InvenSense, Micronas, Tronics and TDK-Lambda. TDK focuses on demanding markets in automotive, industrial and consumer electronics, and information and communication technology. The company has a network of design and manufacturing locations and sales offices in Asia, Europe, and in North and South America. In fiscal 2023, TDK posted total sales of USD 16.1 billion and employed about 103,000 people worldwide.

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Further information on the products can be found under

www.tdk-electronics.tdk.com/en/542398/products/product-catalog/switching-heating-piezo-components-buzzers-microphones/multilayer-piezo-actuators

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