

 Press Information

Multilayer Chip Varistors

TDK extends eco-friendly SMD varistors with X series for standard applications

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TDK Corporation (TSE: 6762) has expanded its surface-mount multilayer varistor (MLV) product family with the standard X series (CT0402*X, CT0603*X, CT0805*X, CT1206*X, CT1210*X, CT1810*X, and CT2220*X) for industrial applications. These new SMD MLVs not only protect electronics against overvoltages, maintaining high reliability and performance in a compact size, but also help customers reduce their CO₂ footprint by up to 30 percent. Based on a tailored, innovative ceramic composition, these components can be sintered at lower temperatures than standard MLVs, reducing energy usage. Additionally, the raw material itself has a smaller CO₂ footprint.

The X series targets power supplies, factory automation, industrial IoT, and sensor interfaces where miniaturization and electrical robustness are required, including harsh environments. This follows the release and ramp-up of the X1 series for automotive applications based on the same technology platform.

Spanning case sizes from EIA0402 to EIA2220, the X series offers RMS voltage ratings from 3.5 to 40 V and varistor voltages from 8 to 350 V. They provide clamping voltages from 24 to 450 V and withstand electrostatic discharge (ESD) up to 15 kV air discharge according to IEC 61000-4-2. For surge protection, peak current handling ranges from 1 A in the smallest footprint up to 800 A. Customer-specific adjustments are possible.

These varistors respond to voltage transients within 0.5 ns and offer capacitance values as low as 6 pF, preserving signal integrity in high-speed data lines. The components operate reliably in a temperature range of -55 to +125 °C. With packaging options that support high-volume automated assembly, the X series integrates seamlessly into modern SMT processes.

By combining compact dimensions, fast response times, and robust electrical ratings, the X series enhances the resilience of electronic designs, contributing to longer service life and improved system reliability across a diverse set of industrial applications.

Main applications

Transient overvoltage protection for:

- Power supplies
- Factory automation
- Industrial IoT
- Sensor interfaces

Main features and benefits

- Reliable ESD protection up to 15 kV air discharge according to IEC 61000-4-2
- Low leakage current
- No temperature derating up to +125 °C
- High lifetime robustness
- Stable protection level

About TDK Corporation

TDK Corporation (TSE:6762) is a global technology company and innovation leader in the electronics industry, based in Tokyo, Japan. With the tagline “In Everything, Better” TDK aims to realize a better future across all aspects of life, industry, and society. For over 90 years, TDK has shaped the world from within; from the pioneering ferrite cores to cassette tapes that defined an era, to powering the digital age with advanced components, sensors, and batteries, leading the way towards a more sustainable future. United by TDK Venture Spirit, a start-up mentality built on visions, courage and mutual trust, TDK’s passionate team members around the globe pursue better—for ourselves, customers, partners, and the world. Today, the state-of-the-art technologies of TDK are in everything, from industrial applications, energy systems, electric vehicles, to smartphones and gaming, at the core of modern life. TDK’s comprehensive, innovative-driven portfolio includes cutting-edge passive components, sensors and sensor systems, power supplies, lithium-ion and solid-state batteries, magnetic heads, AI and enterprise software solutions, and more—featuring numerous market-leading products. These are marketed under the product brands TDK, InvenSense, Micronas, Tronics, TDK-Lambda, TDK SenseEI, and ATL. Positioning the AI ecosystem as a key strategic area, TDK leverages its global network across the automotive, information and communication technology, and industrial equipment sectors to expand its business in a wide range of fields. In fiscal 2026, TDK posted total sales of USD 16.6 billion and employed about 107,000 people worldwide.

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