

EMC components TDK offers small thin-film common mode filters for USB 3.2/4 applications

- · Industry's first* to achieve 30 dB common mode attenuation at 10 GHz
- Achieving 20 GHz or greater cutoff frequency and compatibility with high-speed signals
- Optimal design allows for significant noise control at USB 3.2 and USB 4

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TDK Corporation (TSE:6762) announces the development of its TCM06U series of small thin film common mode filters for noise reduction in high-speed differential transmission (0.65 x 0.5 x 0.3 mm - L x W x T). Mass production of this new common-mode filter began in August 2024.

Laptops, tablets, game consoles and other digital devices increasingly offer convenient expandability, with higher display resolution and functionality. Their transmission signals are also becoming faster and larger in capacity every year. At the same time, electromagnetic interferences (EMI) from devices have increased in frequency and amplitude. Therefore, action needs to be taken to control the impact on other devices and the qualitative deterioration of transmission signals. As a measure against EMI, TDK has launched a common mode filter for high-speed differential transmission at high frequencies. This will support the miniaturization, thinning, and weight reduction of electronic devices.

It is compatible with a 20 Gbps high-speed signal at cutoff frequencies of 20 GHz or higher. Common mode attenuation at 10 GHz is 30 dB or higher, which is effective in controlling high-frequency noise. Impedance matching within a range between 85 and 90 Ω controls the reflections in high-speed USB lines. The internal coil conductor pattern is designed using TDK's proprietary fine patterning, which uses a thin-film production method and applies a technology cultivated by the development of TDK's magnetic heads.

To control radiation and exogenous EMI in the differential transmission lines that are expected to increase in speed in the future, TDK will continue to develop small thin-film common mode filters and provide services contributing to the quality improvement of transmission signals.

* As of August 2024, according to TDK (Model: TCM06UX-020-2P-T201)

Glossary

• Cutoff frequency: frequency that is the border between the passband and transition region in a filter circuit

Main applications

• USB terminals for laptops, tablets, smartphones, STB, AR/VR/MR, game consoles and others



Main features and benefits

- Industry's first* to achieve 30 dB common mode attenuation at 10 GHz
- Achieving 20 GHz or greater cutoff frequency and compatibility with high-speed signals
- Optimal design allows for significant noise control at USB 3.2 and USB 4

Key data

Туре	Common mode attenuation [dB] typ.	Cutoff frequency [GHz] typ.	DC resistance [Ω]/1line	Rated current [mA] max.	Rated voltage [V]	Insulation resistance [MΩ]min.
TCM06UX-020-2P-T201	32 @10.0GHz	20 or more	0.5 ± 30%	100	10	10
TCM06U5-050-2P-T201	35 @5.0GHz	20 or more	0.9 ± 30%	100	10	10
TCM06U2-150-2P-T201	35 @2.4GHz	13	2.5 ± 30%	100	10	10

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 2024, TDK posted total sales of USD 14.6 billion and employed about 101,000 people worldwide.

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