Transformers

SMD pulse transformers for Gigabit Ethernet and PoE

- Designed for high transmission rates of up to 10 Gbit/s
- Support Power over Ethernet applications at 1 Gbit/s
- Special core design optimized for fully-automated production processes

February 6, 2018

TDK Corporation has expanded the ALT4532 series of pulse transformers with new types for Gigabit Ethernet and Power over Ethernet (PoE) applications. The new ALT4532P type is designed for emerging 2.5GBASE-T (2.5 Gbit/s) and 5GBASE-T (5 Gbit/s) LAN applications as well as 1000BASE-T (1 Gbit/s) applications with 600-mA PoE. The new ALT4532H type is compatible with the 10GBASE-T standard (10 Gbit/s). The components feature a compact SMD package with dimensions of 4.5 mm x 3.2 mm x 2.9 mm. Mass production of the new pulse transformers was launched in February 2018.

In recent years, Ethernet standards have been established for higher transmission rates up to 10 Gbit/s. With the new ALT4532 components TDK is responding to the rising demand for compact pulse transformers for these high-speed LAN interfaces, in particular, for the growing number of IoT devices. Thanks to their compact IEC 4532 packages, these SMD components are suitable for circuit board layouts with many pulse transformers.

Unlike conventional products with toroidal shaped cores, the new TDK transformers feature a special core design that is optimized for fully-automated production and winding processes, resulting in extremely stable quality. The discrete ALT4532 types offer designers greater flexibility for circuit board layouts than conventional LAN modules that combine pulse transformer and common-mode filters in a single package, for example, enabling mounting on both sides of the PCB.

Glossary

- Gigabit Ethernet: LAN systems based on IEEE 1000BASE-T, 2.5GBASE-T, 5GBASE-T, and 10GBASE-T standards for transmission rates of 1 Gbit/s, 2.5 Gbit/s, 5 Gbit/s, and 10 Gbit/s, respectively, over twisted-pair copper media.
- Power over Ethernet (PoE): The Ethernet standard defined by IEEE 802.3af and IEEE 802.3at for the simultaneous data transmission and supply power via LAN cables.

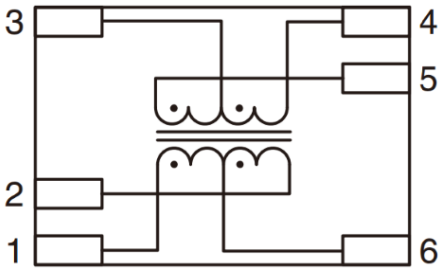
Main applications

- LAN interface for network devices, communication equipment, digital appliances, and IoT devices

Main features and benefits

- Designed for high transmission rates of up to 10 Gbit/s
- Support Power over Ethernet (PoE) applications at 1 Gbit/s
- Special core design optimized for fully-automated production processes
- Compact dimensions of 4.5 mm x 3.2 mm x 2.9 mm

Key data

Type	Turns ratio 1;6;2 : 5;3;4	Min. inductance @ 100 kHz [µH] 1-2 : 5-4	Max. insertion loss [dB] 1;2 : 5;4	Max. inter-winding stray capacitance @ 100 kHz [pF] 1-5
ALT4532P-181-T05G (2.5- / 5GBASE-T)	1 : 1	180 (DC bias 8 mA)	0.9 @ 1-100 MHz 1.4 @ 100-200 MHz	35
ALT4532H-121-T10G (10GBASE-T)	1 : 1	120 (no bias)	0.5 @ 1-150 MHz 1.0 @ 150-500 MHz	35
Terminal layout				

About TDK Corporation

TDK Corporation is a leading electronics company based in Tokyo, Japan. It was established in 1935 to commercialize ferrite, a key material in electronic and magnetic products. TDK's portfolio includes passive components, such as ceramic, aluminum electrolytic and film capacitors, ferrites and inductors, high-frequency products, and piezo and protection components, as well as sensors and sensor systems and power supplies. These products are marketed under the product brands TDK, EPCOS, InvenSense, Micronas, Tronics and TDK-Lambda. TDK's further main product groups include magnetic application products, energy devices, and flash memory application devices. TDK focuses on demanding markets in the areas of information and communication technology and automotive, industrial and consumer electronics. The company has a network of design and manufacturing locations and sales offices in Asia, Europe, and in North and South America. In fiscal 2017, TDK posted total sales of USD 10.5 billion and employed about 100,000 people worldwide.

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