

 Press Information

Transformers

TDK introduces compact SMD components for gate drivers and isolated DC-DC converters in xEVs

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TDK Corporation (TSE:6762) introduces the E13 EM series (ordering code: B8280*F*). These IGBT/FET gate drive transformers are designed for automotive 500-V battery systems, enabling reliable isolation in traction inverters and compact DC-DC converters. By meeting stringent creepage and clearance requirements, this new series supports safe and efficient power conversion in xEV platforms, where robust insulation and space-efficient design are crucial to next-generation electrified mobility.

The E13 EM series features a compact SMD design built on a MnZn ferrite core, with a footprint of 18.6 x 14.6 mm and a height of up to 12 mm. The components support typical operating frequencies between 100 kHz and 400 kHz and are available for either flyback or push-pull topologies. They have inductance values ranging from approximately 1.8 μ H to 240 μ H and saturation currents of up to 9 A. This enables design flexibility across various power architectures. Low leakage inductance and optimized winding structures ensure stable signal transmission and high efficiency in applications with fast-switching power semiconductors.

A key feature of the E13 EM series is its advanced insulation system. The transformers have creepage distances of up to 6.3 mm and clearance distances of up to 5.5 mm and meet the requirements for basic insulation at 500 V (DC) and reinforced insulation at 300 V, compliant with IEC 60664-1 and IEC 61558-2-16. The components are specified for transient overvoltages up to 2500 V and a partial discharge extinction voltage of 900 V. They are qualified to AEC-Q200 Rev. E and designed for operation from -40 °C to +150 °C, meeting the reliability requirements of automotive applications.

Main applications

- AC-DC power supplies
- Isolated DC-DC converters (flyback and push-pull topology)
- Gate drive transformers for IGBT/MOSFET
- xEV inverter and auxiliary power systems

Main features and benefits

- Insulation compliant with IEC 60664-1 and IEC 61558-2-16
- Basic insulation: 500 V DC working voltage; reinforced insulation: 300 V (RMS), OVC II
- Compact SMD design: 18.6 x 14.6 mm footprint, 12 mm max. height
- Wide operating temperature range: -40 °C to +150 °C
- Qualified to AEC-Q200 Rev. E
- RoHS compatible
- Suitable for lead-free reflow soldering (JEDEC J-STD-020F)

Ordering code	Topology	Turns ratio	L_{N1} [μH]	I_{SAT} [A]	Frequency [kHz]
B82802F0007A213	Flyback	1:1:0.5 (N1+N2:N3:N4)	30 ±10 % (N1+N2)	2	100 ... 400
B82802F0004A213	Flyback	1:2:2 (N1:N2:N3)	14.4 ±15 %	1.6	
B82802F0005A113	Flyback	1:1 (N1:N2)	1.8 ±10 %	9	
B82804F0503A200	Push-pull	1:3.78:1.55 (N1:N2:N3)	≥ 50	—	
B82804F0114A200	Push-pull	1:1:1.5:1.5 (N1:N2:N3:N4)	≥ 110	—	
B82804F0244A210	Push-pull	1:1:1 (N1:N2:N3)	≥ 240	—	

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.

You can download this text and associated images from www.tdk-electronics.tdk.com/en/260701.
Further information on the products can be found at www.tdk-electronics.tdk.com/en/transformers_igbt_fet.

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