

 Press Information

Embedded Motor Controllers

TDK introduces HVC 5422C embedded motor controller for silent BLDC applications up to 1A

- Single-chip solution with integrated LIN transceiver, MCU, and motor driver help reduce system complexity and BOM cost
- 64 K Flash and 4 KB EEPROM support over-the-air (OTA) software updates and sophisticated control algorithms
- Advanced Field Oriented Control (FOC) capabilities enable smooth motor operation while reducing acoustic noise to a minimum
- Cyber Security ready with optional 256-bit unlock key

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TDK Corporation (TSE:6762) announces the Micronas HVC 5422C, a new automotive-qualified embedded motor controller for BLDC and BDC motors that combines advanced FOC capabilities for smooth, silent motor operation with increased memory resources and software flexibility. Designed for compact actuator applications in thermal management systems, such as grille shutters, valves, airflow control systems, and other comfort and efficiency functions, the HVC 5422C helps automotive manufacturers meet growing demands for acoustic comfort, energy efficiency, and system integration.*

Samples of the HVC 5422C are available now and production will start in the first quarter of 2027.

The device integrates three half-bridges capable of driving up to 1 A peak current together with an Arm® Cortex®-M3 CPU, 64 KB Flash memory, and 4 KB EEPROM. The highly integrated architecture combines motor control, communication, and system functionality in a single device. Compared to the earlier models in the HVC 5x family, the increased memory capacity enables the implementation of more sophisticated control algorithms, enhanced diagnostics, and application-specific features while providing the resources required to support OTA software updates. This helps design engineers reduce system complexity and overall BOM cost while enabling greater flexibility for future design requirements.

Supporting both sensored and sensorless motor-control concepts, the HVC 5422C offers greater freedom to tailor system architecture and performance to specific application requirements.

To simplify system integration, the device incorporates an auto-addressing LIN transceiver, seven GPIOs, and an integrated 3.3 V supply output for external sensors and peripheral functions. Extensive diagnostic and protection features further contribute to robust and reliable system operation.

The HVC 5422C also includes a cyber security 256-bit encryption mechanism that helps protect application software and intellectual property after programming.

By combining advanced motor control, increased memory resources, integrated connectivity, and compact packaging in a 5 x 5 mm² PQFN24 package, the HVC 5422C provides an efficient solution for next-generation automotive actuator applications.

Glossary

- BDC: Brushed DC motor
- BLDC: Brushless DC motor
- FOC: Field Oriented Control
- LIN: Local interconnect network for automotive applications

Main applications

- Smart actuators in combustion, hybrid and electric vehicles

Main features and benefits

- Automotive-qualified integrated motor controller
- Arm® Cortex®-M3 CPU 64 KB Flash memory and 4 KB EEPROM
- Three integrated half-bridges with up to 1 A peak drive current
- Advanced FOC support for smooth and silent motor operation
- Sensored and sensorless BLDC motor control
- Integrated LIN transceiver with auto-addressing
- Seven GPIOs and integrated 3.3 V supply output
- 256-bit cyber security software protection encryption
- Compact 5 × 5 mm² PQFN24 package

Type	Package	Motor terminals	Drive current	Microcontroller	Flash memory	EEPROM (emulated)	NVR (non volatile register)
HVC 5422C	PQFN24	BDC & BLDC	1 A peak	Arm® Cortex®-M3	64 KB	4 KB	1 KB

* Any mention of target applications for our products is made without a claim for fit for purpose as this has to be checked at system level.

** All operating parameters must be validated for each customer application by customers' technical experts.

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.

About TDK-Micronas

TDK-Micronas is the center of competence for magnetic-field sensors and CMOS integration within the TDK Group. TDK-Micronas has gained operational excellence for sensors and actuators production in over 25 years of in-house manufacturing. It was the first company to integrate a Hall-effect based sensor into CMOS technology in 1993. Since then, TDK-Micronas has shipped over eight billion Hall sensors to the automotive and industrial market. The operational headquarters are located in Freiburg im Breisgau (Germany). Currently, TDK-Micronas employs around 1,000 people.

You can download this text and associated images from www.micronas.tdk.com/en/tradenews/pr2603.

Further information on the products can be found under www.micronas.tdk.com/en/products/embedded-motor-controllers/hvc-5x.

Contacts for regional media

Region	Contact	Phone	Mail
Global	Julia ANDRIS TDK-Micronas Freiburg, Deutschland	+49 761 517 2531	Mic-media@tdk.com