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Embedded Motor Controllers Offer Increased Memory, Power And Reliability

[TDK's](#) HVC 5222D and HVC 5422D are fully integrated motor controllers for driving small brushed (BDC), brushless (BLDC), or stepper motors. They offer significant enhancements compared to the popular HVC 5221D, doubling drive current, SRAM, and 4x EEPROM while maintaining pin compatibility. Applications include Smart actuators in combustion and electric vehicles (see the figure).

The HVC 5222D and HVC 5422D feature expanded flash memory capacities of 32 KB and 64 KB respectively, support currents up to 1 A for BLDC and stepper motors, and up to 2 A for dc motors (see the table). These controllers also contain advanced motor-specific functions such as current programming for microstepping and integrated phase voltage comparators, virtual star-point, and current sense amplifier for sensor-based and sensor-less motor control, meeting ISO-26262 standards for ASIL applications.

The HVC family has expanded to include nine fully integrated motor controllers featuring three to six motor outputs, capable of delivering peak currents ranging from 500 mA to 2 A. Each device is powered by a 32-bit Arm Cortex-M3 CPU core, offering options of 32-KB or 64-KB flash memory. Equipped with a 12-bit, 1- μ s ADC for diverse measurements, these devices allow seamless integration of Hall and TMR sensors from TDK.

Additionally, the HVC family devices come with a LIN transceiver and UART for communication, supporting auto-addressing via the Bus Shunt Method (BSM), enhancing their adaptability across various applications. PWM control via the LIN pin is also supported.

Certified to automotive standards AEC-Q100 for temperature Grade 1, all HVC devices ensure reliability, catering to automotive and industrial applications with power requirements of up to 30 W. Samples are now available for customer evaluation.

Start of production is planned for the first quarter of 2025. For more information see the HVX 5x [page](#).



Figure. The HVC 5222D and HVC 5422D motor controllers are capable of 4 x 1-A peak current for driving brushless dc, brushed dc and stepper motors. They feature 4-KB SRAM, 2-KB EEPROM, and either 32-KB ('5222D) or 64-KB ('5422D) flash memory. They are SEooC ASIL B ready according to ISO 26262 to support functional safety applications.

Table. Key specs for the HVC 5222D and HVC 5422D integrated motor controllers.

Key data***		
Type	HVC 5222D	HVC 5422D
Motor terminals	4	
Drive current	1 A peak	
High- and low-side on-resistance	Total power path resistance < 3.2 Ω	
Current measurement	Internal or with external shunt	
Microcontroller	Arm Cortex-M3	
Flash memory	32 KB	64 KB
RAM	4-KB SRAM	
EEPROM (Emulated)	2 KB	
NVR (Non-Volatile Register)	1 KB	
Package	5 x 5 24-pin PQFN with exposed pad	

*IP-Notice: If LIN auto-addressing features are used, third-party rights such as EP 1490 772 B should be considered.

**Any mention of target applications for the company’s products are 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.