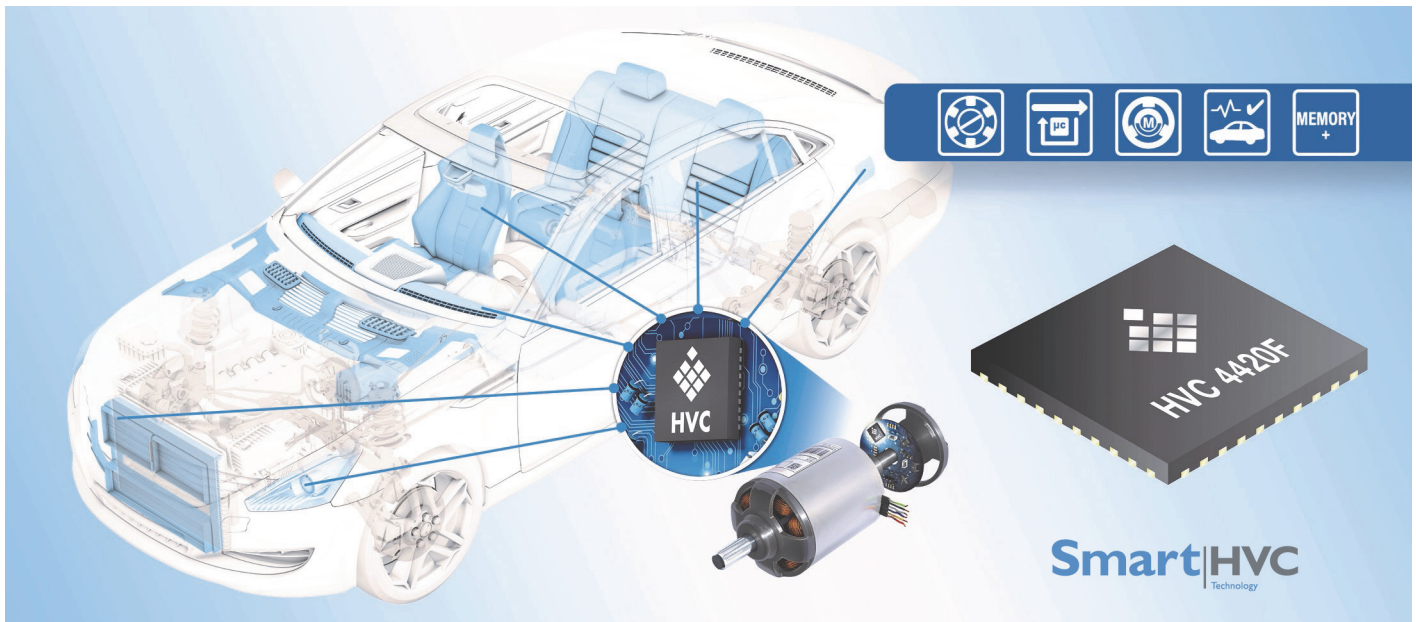


HVC 4420F

Feb/2019



HVC 4420F Flex Servo-Drive for Direct Control of Electric Motors (Stepper/BLDC/BDC) addressing OEM Diagnostic Requirements

The HVC flex servo-drive family from TDK-Micronas enables cost-effective realization of high-performance compact electric motor control. The new HVC 4420F offers extended memory size to address the OEM diagnostics requirements. An integrated MPU supports RTOS requirements. Powered by a 32-bit CPU core (ARM® Cortex®-M3), the HVC 4420F economically addresses growing challenges in the automotive market and beyond (industrial, consumer, instrumentation, etc.). The flexible peripherals of the product provide all means to directly control brush-type, stepper (bipolar or three phase), or brushless (BLDC) motors directly via the integrated high-performance half-bridges without the need for external drivers.

Beside timers/counters, interrupt controller, multichannel ADC, SPI, and enhanced PWMs with diagnostic functions, this device contains an advanced LIN-UART with a LIN 2.x transceiver, as well as voltage regulators to connect the device directly to an automotive board net. Various power management modes minimize current consumption. The HVC 4420F further features a Flash program memory with a size of 64 kbytes, providing high flexibility in code development, production ramp-up, and in-system firmware update.

Various integrated digital and analog circuit units such as comparators with virtual star point reference, current scaling and an embedded programmable gain amplifier allow users to minimize the number of external components. The computation capacity supports complex motor control algorithms with sensored-/sensorless control, as well as various stepper configurations. The increased Flash memory size enables suppliers to implement complex diagnostic routines, supported by the built-in diagnostic capabilities. Due to the increasing amount of connected electronics in a car, OEM requirements on diagnostic status in smart actuators become more and more important. The HVC 4420F provides a solution in HW as well as in SW thanks to the increased amount of Flash memory to store and execute dedicated OEM's diagnostic library functions.

Core

- ◆ ARM® Cortex®-M3 core with on-chip two-wire debug interface
- ◆ 4 kbyte SRAM
- ◆ 64 kbyte flash memory
- ◆ Integrated Memory Protection Unit (MPU) supports RTOS requirements
- ◆ NVRAM to store dedicated diagnostic data
- ◆ Two on-chip oscillators (no external crystal needed)

High-Voltage Technology

- ◆ 5.4 V to 18 V operation with dual-mode power supply
- ◆ 40 V load-dump resistance
- ◆ Integrated N-channel MOSFET half-bridges with charge pump
- ◆ LIN 2.x compliant

Advanced Integration

- ◆ Digital and window watchdog timers with different, independent clocks
- ◆ Comparators with integrated virtual star point and reference currents
- ◆ 12-bit multi-channel ADC
- ◆ Programmable gain amplifier
- ◆ 16-bit free-running counter with three capture/compare-modules
- ◆ Two 16-bit timers
- ◆ Synchronous serial peripheral interface (SPI)
- ◆ Enhanced PWMs (EPWMs) drive the half-bridge FETs with non-overlapping edge/center-aligned signals
- ◆ Power supply for external devices
- ◆ Voltage, current, and temperature supervision
- ◆ Diagnostics capability
- ◆ PQFN40 package (6 × 6 mm²)
- ◆ Up to 150 °C junction temperature

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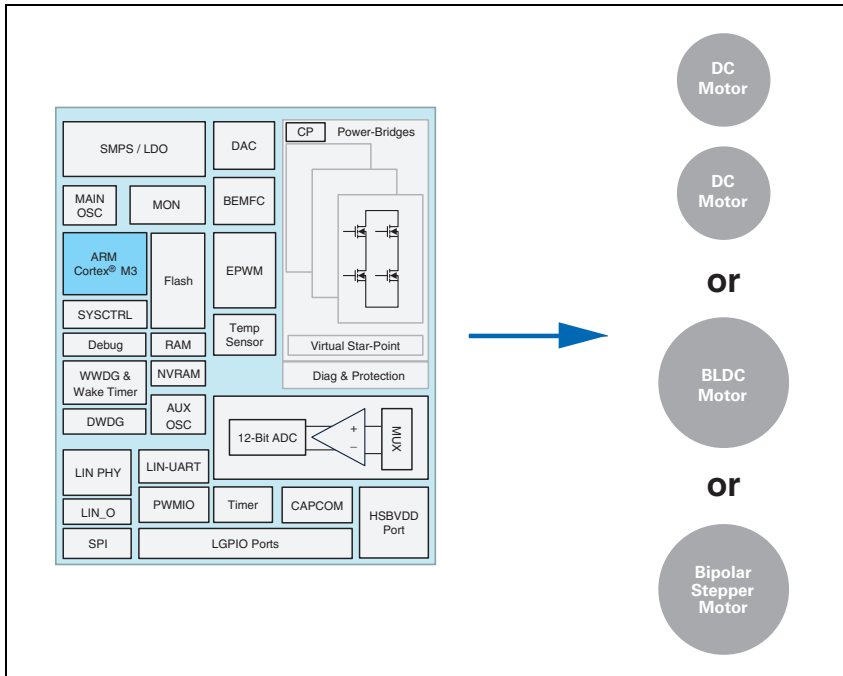


Fig. 1: Motor control applications with HVC 4420F

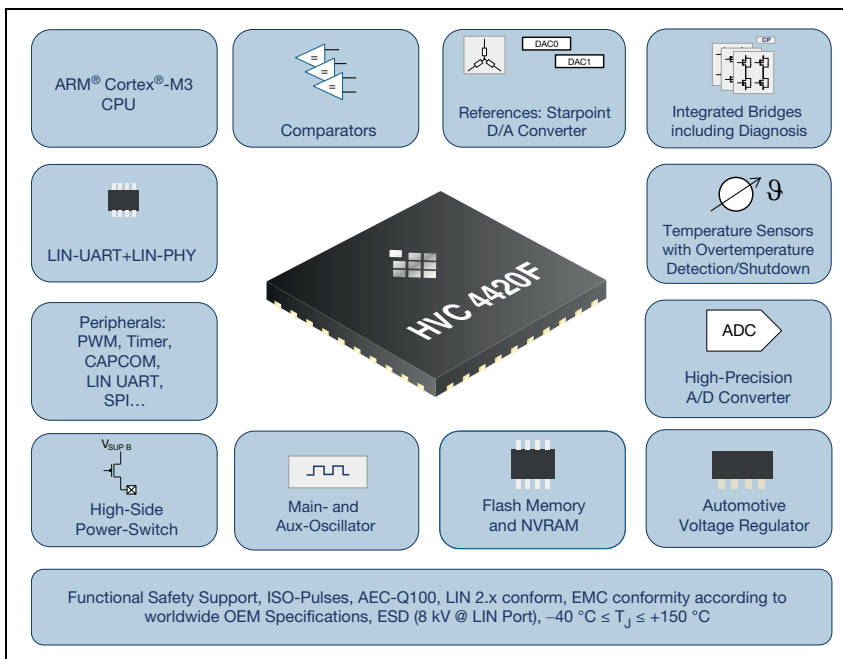


Fig. 2: HVC 4420F device overview

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