

HVC 4223F

May/2015



HVC 4223F Flex Servo-Drive for Direct Control of Electric Motors (Stepper / BLDC / BDC)

The new HVC 4223F flex servo-drive from Micronas enables cost-effective realization of high-performance compact electric motor control. Powered by a 32-bit CPU core (ARM® Cortex®-M3), the HVC 4223F 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 diagnosis functions, this device contains an advanced LIN UART with a LIN 2.1 transceiver, as well as voltage regulators to connect the device directly to a 5.4 V...18 V Automotive board net. Various power management modes minimize current consumption. The HVC 4223F further features a flash program memory with a size of 32 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 such as Space Vector Modulation (SVM) for permanent magnet synchronous motors (PMSM) in addition to six-step commutation with sensor feedback or sensorless control, as well as various stepper configurations.

Core

- ◆ ARM® Cortex®-M3 core with on-chip two-wire debug interface
- ◆ 2 kbyte RAM
- ◆ 32 kbyte flash memory
- ◆ NVRAM
- ◆ 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 2.1 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
- ◆ PQFN40 package (6 × 6 mm²)
- ◆ Up to 150 °C junction temperature

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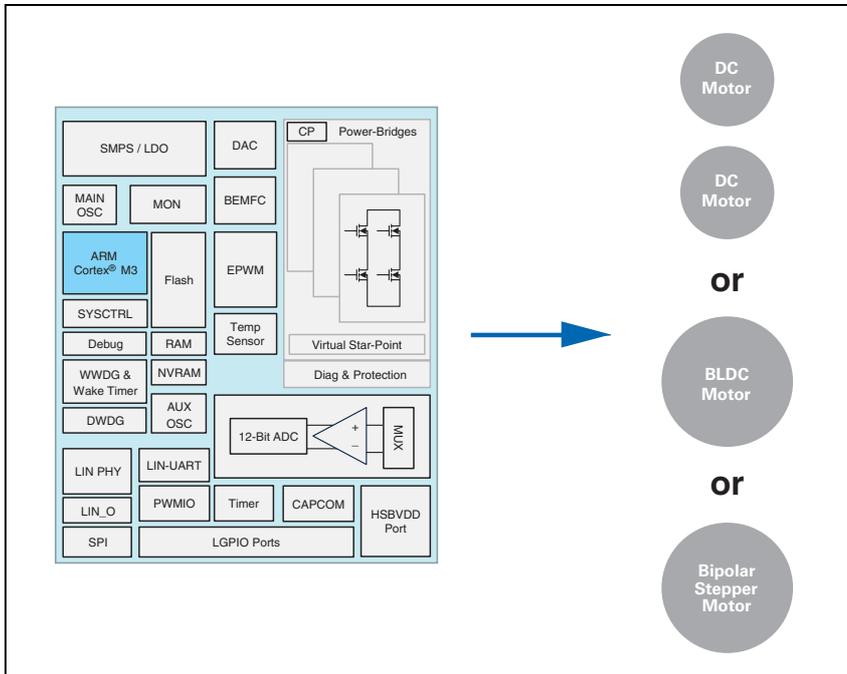


Fig. 1: Motor control applications with HVC 4223F

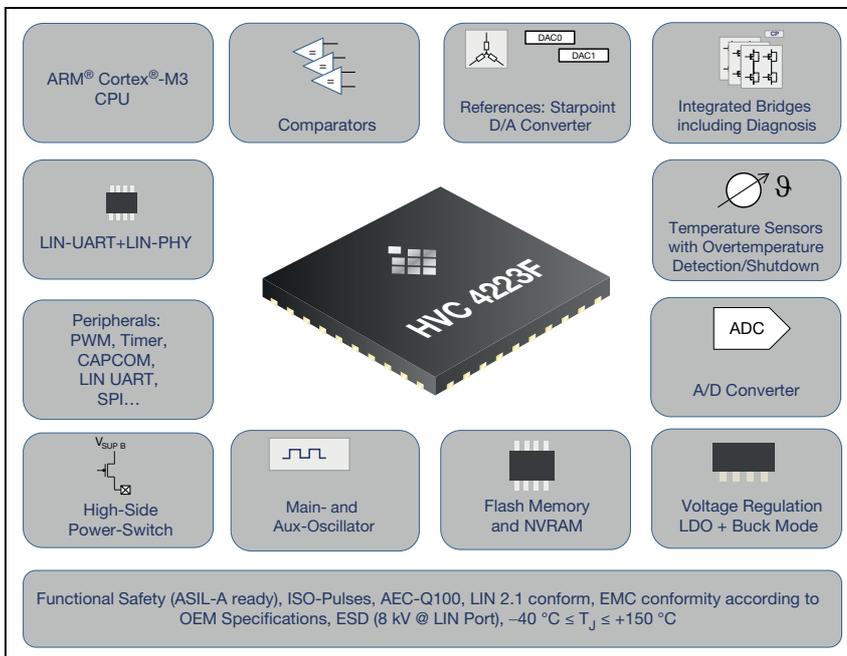


Fig. 2: HVC 4223F device overview

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Edition May 13, 2015; Order No. PI 000154_001EN