Embedded Motor Control with our HVC 4x Family
Smart Actuator Solutions for Automotive Applications
Typical Motor Control Applications

- Adaptive Headlights
- Door Mirrors
- Grille Shutter
- Intelligent Fluid Valves
- HVAC Flap-Control
- Rear-View Cam
- Seat Climatization
- EPS Force-Feedback
- Automatic Flap
- Intelligent Fluid Valves
Typical Motor Control Applications in a Car with HVC 4x

- Adaptive Headlights
- Door Mirrors
- Grille Shutter
- EPS Force-Feedback
- HVAC Flap-Control
- Rear-View Cam
- Automatic Flap
- Intelligent Fluid Valves
- Seat Climatization
- HVAC Flap-Control
Embedded Motor Control for Direct Control of Electric Motors (Stepper / BLDC / BDC)

- Enables cost-effective realization of powerful and compact DC motor control
- Economically addresses growing challenges in the automotive market and beyond (industrial, consumer, instrumentation, etc.)
- Powered by a 32-bit CPU core (Arm® Cortex®-M3) and integrating high-performance analog functions
- Flexible peripherals provide all means to directly control brush-type, stepper (bipolar or three phase), or brushless direct current (BLDC) motors via integrated high-performance half-bridges without the need for external components
- HVC 4422F offers extended memory size to address the OEM diagnostics requirements and allows operation in high-temperature environments up to 160 °C with fully guaranteed parameters. An integrated memory protection unit (MPU) supports RTOS requirements.

**HVC 4x Family**

- Arm® Cortex®-M3 CPU
- Comparators
- References: Starpoint D/A Converter
- Integrated Bridges including Diagnosis
- LIN-UART+LIN-PHY
- High-Precision A/D Converter
- Temperature Sensors with Overtemperature Detection/Shutdown
- High-Side Power-Switch
- Main- and Aux-Oscillator
- Flash Memory and NVRAM
- Automotive Voltage Regulator

**Functional Safety Support, ISO-Pulses, AEC-Q100, LIN 2.x conform, EMC conformity according to worldwide OEM Specifications, ESD (8 kV @ LIN Port), −40 °C ≤ TJ ≤ +150 °C/160 °C**

*) high-temperature versions
Examples for HVC Motor Control

Sensor-Controlled Block/Six-Step Commutation or Sensor-Controlled Space Vector Modulation. Motor currents driven by internal MOSFET bridge. For continuous motor currents up to 1000 mA.

Stepper Motor Current Control. Motor currents driven by internal MOSFET bridge. For continuous motor currents up to 500 mA.
## Product Versions

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## Package Information

Dimensions in mm

- Width: 6 mm
- Height: 6 mm
- Thickness: 0.2 mm
- Lead spacing: 0.5 mm
- Orientation: 0.35x45°
- Tin plated
Development Tools and Compiler

**Small Demo Board - I (SDB-I)**
First steps with HVC 4223F and HVC 4420F to evaluate the small yet “all-onboard” solution.

**Application Board (APB)**
Full access to all I/O pins and motor connections. Flexible due to onboard programming socket.

**KEIL MDK for Arm® Cortex®-M3**
Complete software development environment
Ask for free evaluation version.

**ULINK-ME**
Debug adapter
via JTAG or SWD

Application Support

**3rd-Party Firmware Package**

**Segger Flasher Arm**
In-circuit programmer
via JTAG or SWD

TDK-Micronas Contact

<table>
<thead>
<tr>
<th>Contact</th>
<th>Information available</th>
</tr>
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<tbody>
<tr>
<td><a href="http://www.micronas.tdk.com">www.micronas.tdk.com</a></td>
<td>General</td>
</tr>
<tr>
<td>service.micronas.com</td>
<td>Data sheets, application notes, programming guides, software…</td>
</tr>
<tr>
<td><a href="mailto:mic-product-support@tdk.com">mic-product-support@tdk.com</a></td>
<td>Technical support</td>
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www.micronas.tdk.com
TDK-Micronas Company Profile

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 has been the first company to integrate a Hall-effect based sensor into CMOS technology in 1993. Since then, TDK-Micronas has shipped over five 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.

Global Presence

Design-Centers
Freiburg – Germany
Munich – Germany

Production Site
Freiburg – Germany

- Production + R&D
- Marketing, Sales, FAE