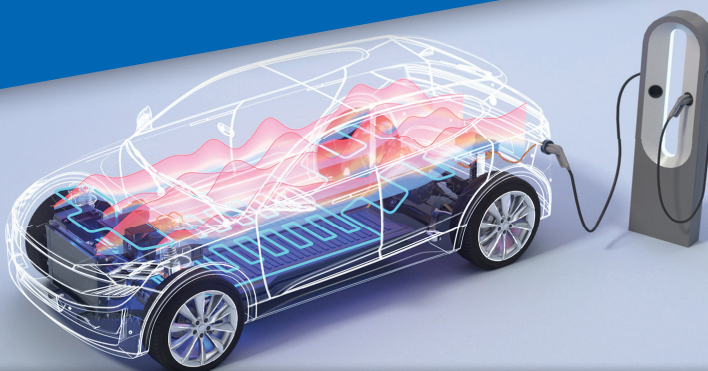


HVC 5481G

Programmable Gate Driver for Automotive smart Actuators

SmartHVC
Technology



With the HVC 5481G, TDK-Micronas is introducing the first gate driver into our HVC5x family of programmable motor drivers. As a result, TDK can now offer the largest fully integrated motor driver portfolio for all types of smart automotive actuator applications, ranging from 5 W to 500 W.

The HVC 5x family motor drivers are targeted at thermal system applications in electric and hybrid electric vehicles with their refrigerant expansion valves, glycol distribution valves, fluid pumps, radiator fans, and HVAC flaps and fans.

- ◆ HVC 5xD devices are universal motor drivers with four terminals, optimized for actuators with bipolar stepper motors or DC motors, such as expansion valves and HVAC flaps.
- ◆ HVC 5xC devices are three-phase motor drivers with peak currents of up to 2 A for BLDC actuators in three-way or multi-valves for glycol distribution.
- ◆ Our new HVC 5481G is a programmable gate driver for up to 6 external nMOSFET with slope control and 100% duty cycle, capable of driving pumps and fans with power levels of up to 500 W.

All HVC 5x devices use an Arm® Cortex®-M3 CPU based microcontroller with largely compatible peripheral motor-control features and LIN bus transceiver plus UART.

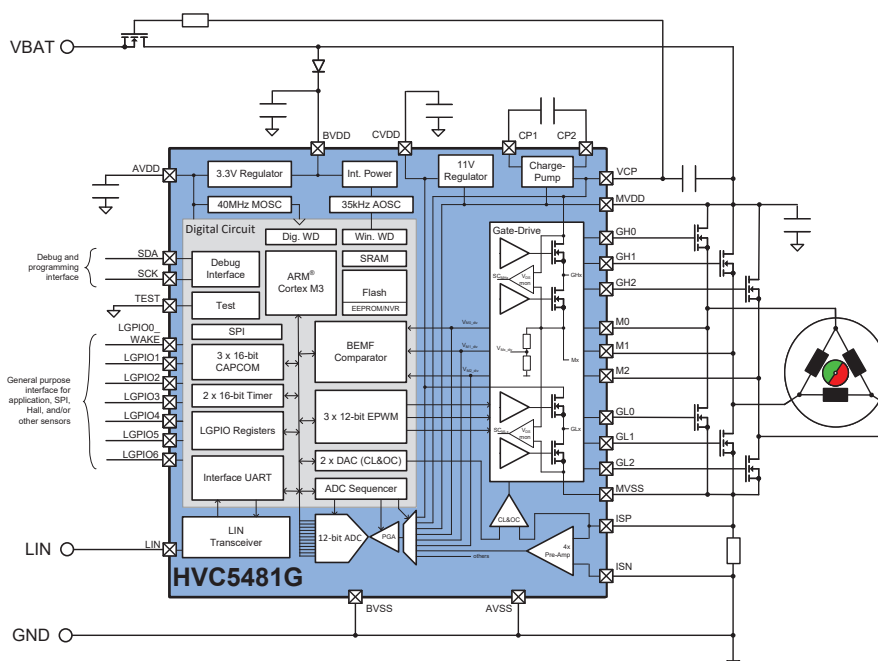
Seven general purpose I/O pins (LGPIO) combined with additional features, such as differential input channels, digital timers,

capture-compare units, and an SPI master interface enable integration of custom application functions as well as connection to TDK's Hall and TMR magnetic sensors for more precise motor control.

The main differences within the HVC 5x family are the motor outputs, memory size, and driver power as shown in the following table:

HVC 5x Family Members

	Drivers	Flash	RAM	Package
HVC 5221D	4 x 0.5 A	32 KB	2 KB	QFN24
HVC 5222C	3 x 1.0 A	32 KB	2 KB	QFN24
HVC 5223C	3 x 2.0 A	32 KB	2 KB	QFN24
HVC 5222D	4 x 1.0 A	32 KB	4 KB	QFN24
HVC 5422D	4 x 1.0 A	64 KB	4 KB	QFN24
HVC 5481G	6 x Gate Drive	64 KB	8 KB	QFN32



HVC 5481G



Main Features

- ◆ Supply voltage range from 6 V to 18 V (transient from 4.5 V to 40 V)
- ◆ 6 x 200 mA gate drivers with slope control
- ◆ 3.3 V, 15 mA supply for peripherals
- ◆ 32-bit Arm® Cortex®-M3 CPU core
- ◆ 64 KB flash memory with 8 KB SRAM
- ◆ 12-bit, 1 μs ADC for internal and external measurements
- ◆ 8-bit current limiting and overcurrent DAC
- ◆ 12-bit PWM generators with center- and edge alignment
- ◆ Single-shunt FOC optimized ADC triggering
- ◆ Two 16-bit timers e.g. for input and output PWM signal handling
- ◆ 7 GPIOs for application and sensor interface
- ◆ LIN Transceiver and UART
- ◆ Small thermally efficient QFN32 package

Evaluation Board (see Fig. 1)

- ◆ HVC 5481G Application Board, 132 mm x 130 mm
- ◆ Clamshell socket for QFN32 package
- ◆ Driving brushless DC, BLDC and PMSM motors with B6 Bridge
- ◆ Commutation via Hall- or TMR- sensor feedback or sensore-less (BEMF or FOC) sensing
- ◆ Standard 20-pin (0.1") and 10-pin debug interface header
- ◆ LIN-bus header and Debug Interface

Software Development

- ◆ Keil MDK 5 μVision IDE and ULINK debug adapters or SEGGER J-LINK debug probes, IAR Development Environment
- ◆ Various Application Notes available on our support site: see link down below (BLDC-, LIN, Bootloader, ...)

Applications

- ◆ HVAC Fans
- ◆ Radiator Fans
- ◆ Water/Oil Pumps
- ◆ Windshield Wipers
- ◆ Seat Movers
- ◆ Door, Hatch Actuators
- ◆ Window, Sunroof Actuators

For further information see <https://www.micronas.tdk.com/en/products/embedded-motor-controllers-smart-actuators>

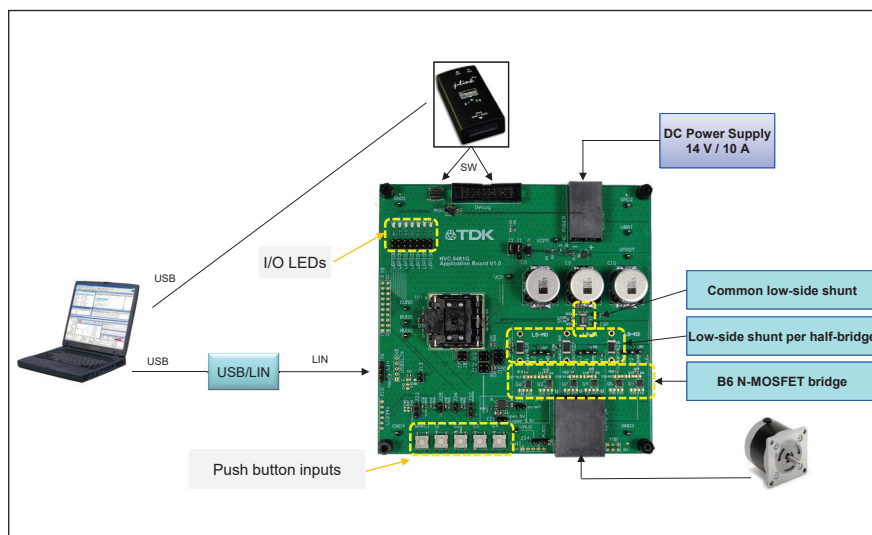


Fig. 1: HVC 5x Application Board

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