

30V Brushless Motor Controller Pre-Driver

TC78B009FTG
TC78B011FTG



Sensorless Closed Loop Speed Control for Brushless DC Motor

This feature-rich device incorporates the complete controller and pre-driver for a three-phase BLDC motor. Its sensor less design saves the space and cost of a Hall sensor. The built-in closed loop speed control regulates and maintains the motor's rotational speed during dynamic power supply fluctuations and load variations. Precise setting of a speed profile can be programmed into the built-in non-volatile memory (NVM). The TC78B011FTG uses sine-wave drive method, reducing vibration and noise.

Applications

- Server Fans
- Pumps
- Blowers
- Suction motor for vacuum cleaners
- Robot cleaners

Features

- Sine-wave drive (TC78B011FTG)
- Trapezoidal drive (TC78B009FTG)
- Sensorless PWM drive
- Wide range of operating voltage VM=5.5 to 27V
- Charge pump and adjustable gate drive current up to 200mA
- Built-in error detection

Advantages

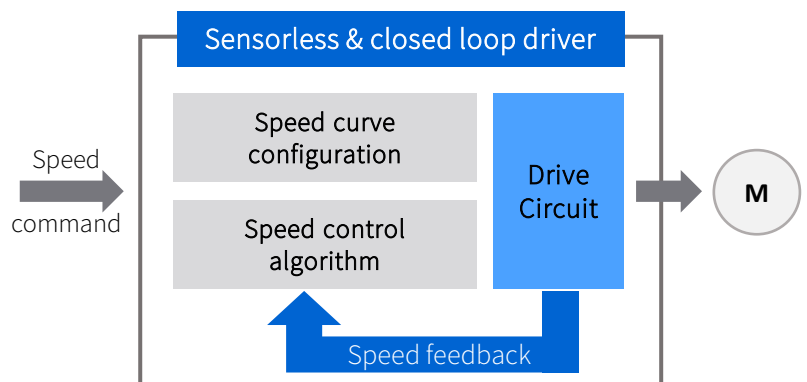
- Sinusoidal motor drive
- No additional sensors required
- Rotor position is detected by induced voltage
- Regulates motor speed during torque load changes
- External N-ch MOSFETs for a scalable inverter stage choice

Benefits

- High comfort due to less vibration and less noise
- No Hall sensors needed
- Reduced cabling effort
- Constant rotational speed during load variations without the need of a microcontroller
- Error detection functions improve system reliability

Advanced BLDC motor control

After parameterization of the device via I²C bus or using a pre-programmed configuration from the NVM, the device can operate independently from a microcontroller. The target speed can be set either by analog voltage, PWM duty or by setting a register through the I²C bus. The device provides several internal feedback signals to ensure proper operation.



TC78B009FTG / TC78B011FTG functions

Configurable pre-driver

Separately selectable level of drive current for high side and low side N-ch MOSFETs.

I²C bus with configurable device address

Internal configuration and status registers can be easily accessed through this standard bus. All parameters changeable on the fly.

Current monitor output

Amplified voltage over shunt resistor, converting it to a DC level with peak hold circuit.

Integrated LDO regulator

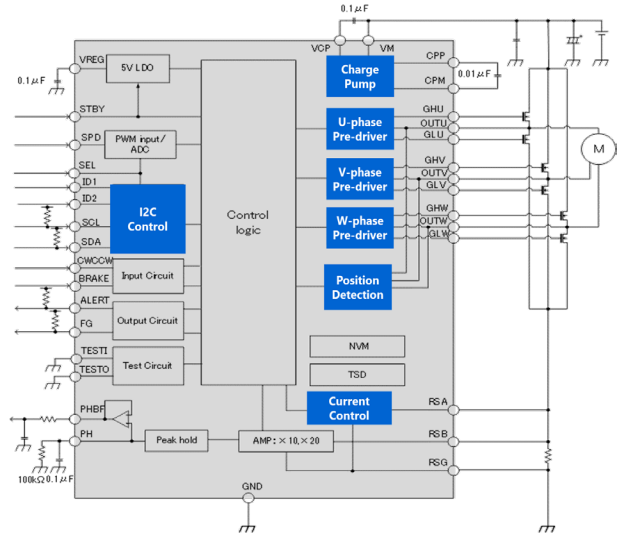
5V available for pull-up resistors or voltage reference.

Safety features

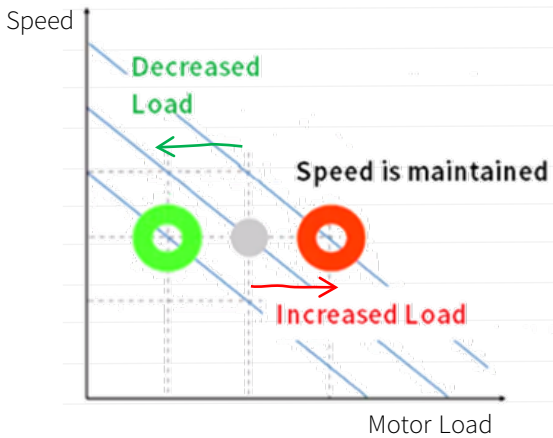
- Thermal shutdown function (TSD)
- Under voltage lockout function (UVLO)
- Charge pump low voltage detection (CPVSD)
- Over current detection function (ISD)

Built-in closed loop speed control

Provides adjustable speed curve functionality.

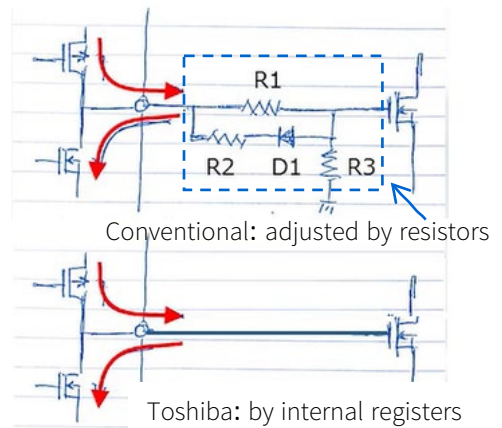


Closed loop control



The device maintains constant rotation speed during load variation

EMC noise suppression



The source & sink currents can be set individually per gate by registers

Low cost evaluations boards

The Mikroelektronika Click boards™ allow quick and easy device evaluation and prototyping.



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Toshiba brushless DC motor drivers

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N-ch MOSFETs

