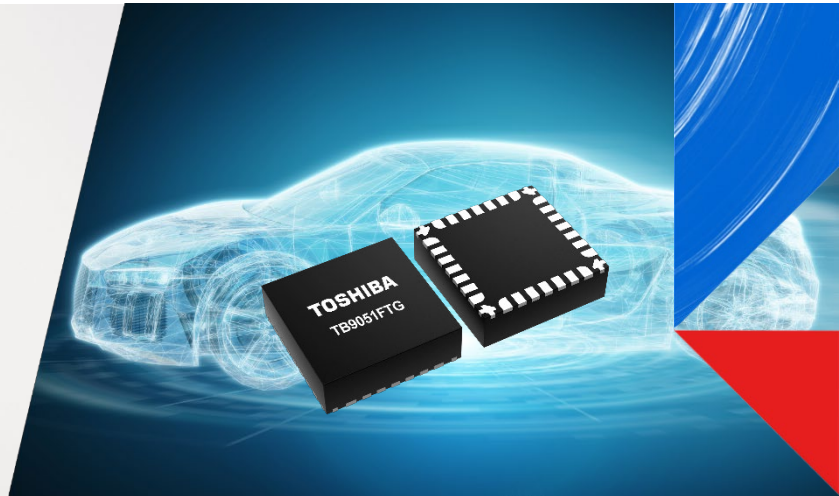


# 5A H-Bridge Motor Driver TB9051FTG



## Brushed DC Motor Driver in a small 6x6 mm QFN package

Qualified according to AEC-Q100 Grade 1, the TB9051FTG integrates a 5A low Ron H-bridge to directly drive a DC brushed motor. The device was developed with a compact package, adding a copper plate between the chip and the die pad achieving a high heat dissipation capability. Motors can be controlled in real-time by PWM. Various failure detection mechanisms ensure a safe system operation.

### Applications

- Throttle valves / engine valves
- Door mirror folding
- Seat adjustment
- Grill shutter control
- Power door opening & closing
- Shift-by-wire actuators
- Small fans

### Features

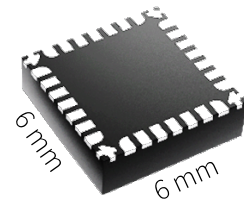
- Integrated 5A H-Bridge  
Ron = 450 mΩ (Max.)  
High + Low side driver
- Operation voltage range :  
V<sub>CC</sub> : 4.5 ~ 5.5 V  
Power stage : 4.5 ~ 28 V
- Operation temp. : Ta = - 40 ~ 125°C
- AEC-Q100 qualified
- Built-in various detection circuits  
Current Monitoring, Over Temperature, High/Low voltage Initial Diagnostics (VBAT LV, VCC LV/HV)

### Advantages

- No external MOSFET drivers required
- Small power dissipation
- Simplified system cooling design possible due to thermal enhanced package version
- Improved system reliability using the build-in detection functions

### Benefits

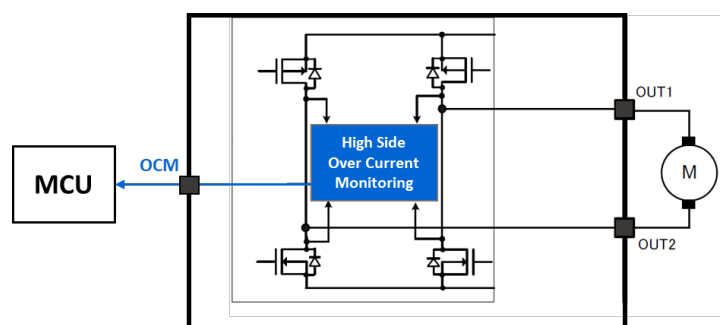
- Less components
- Less PCB space
- Lower bill of material cost
- Less qualification efforts



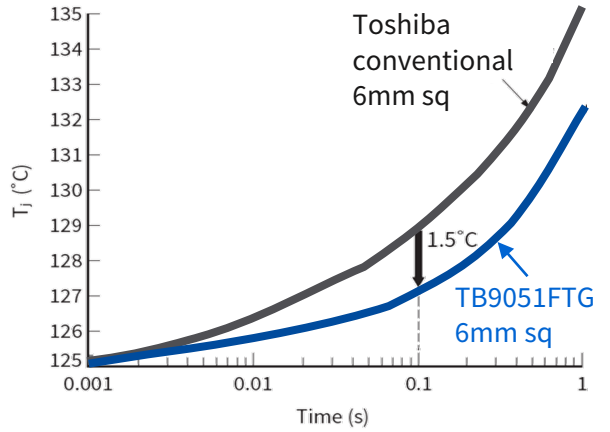
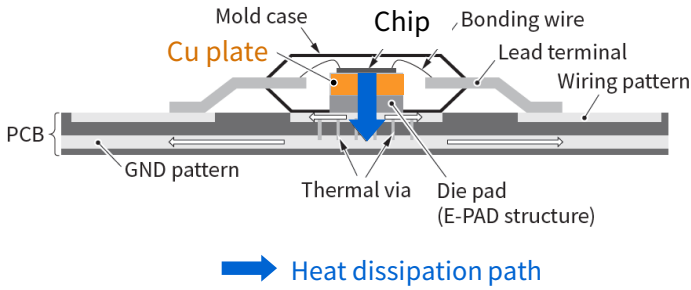
P-QFN | 28 Pins

### Over Current Monitoring (OCM)

The TB9051 has a build-in overcurrent detection circuit signaling to the MCU an abnormal system behavior.

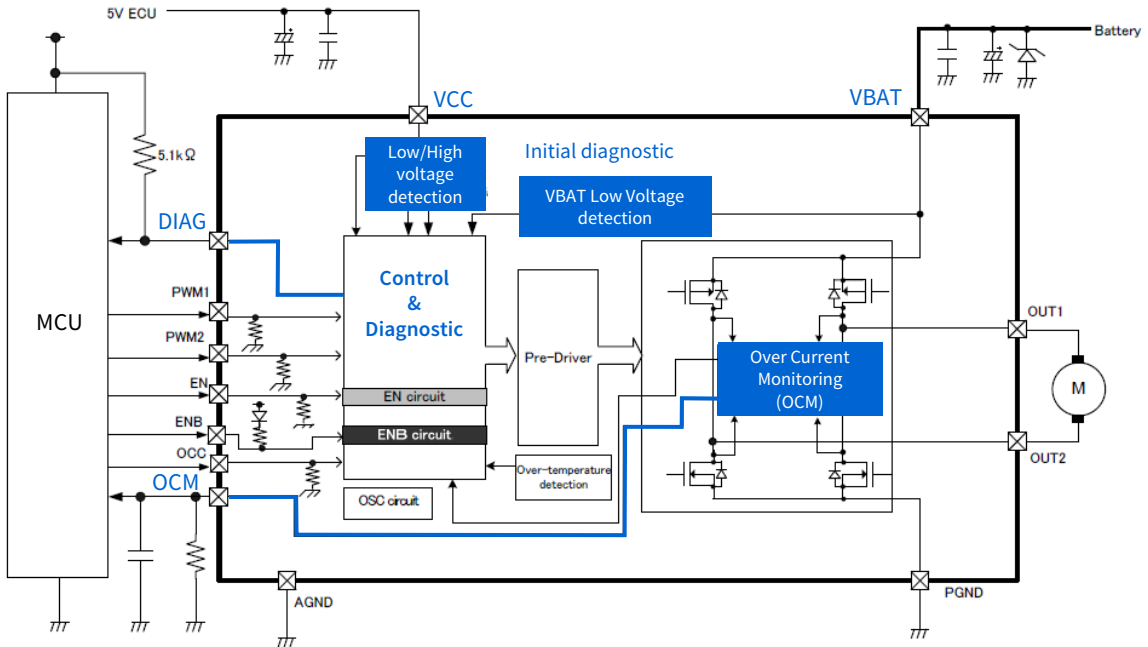


## Reduction of thermal resistance by using Cu plates



By adopting an E-PAD structure that separates the die pad from the mold case, heat generated by the chip is released via the PCB's patterns even when using a small package. With TB9051FTG in a 6mm square package, the rise of  $T_j$  after 0.1 sec is reduced by 1.5 °C, compared to other products having the same package dimensions.

## System diagram



## Low cost evaluation board

The MIKROE Click board™ allows quick and easy TC9051 device evaluation and prototyping.

<https://www.mikroe.com/dc-motor-18-click>



## TB9051 technical data

<https://toshiba.semicon-storage.com/eu/semiconductor/product/automotive-devices/detail.TB9051FTG.html>

