

MIC4605

85V Half-Bridge MOSFET Driver with Adaptive Dead Time and Shoot-Through Protection

Summary

The MIC4605 is an 85V half-bridge MOSFET driver that features adaptive-dead-time and shoot-through protection. The adaptive-dead-time circuitry actively monitors the half-bridge outputs to minimize the time between high-side and low-side MOSFET transitions, which maximizes power efficiency. Anti-shoot-through circuitry prevents erroneous inputs and noise from turning both MOSFETs on at the same time.

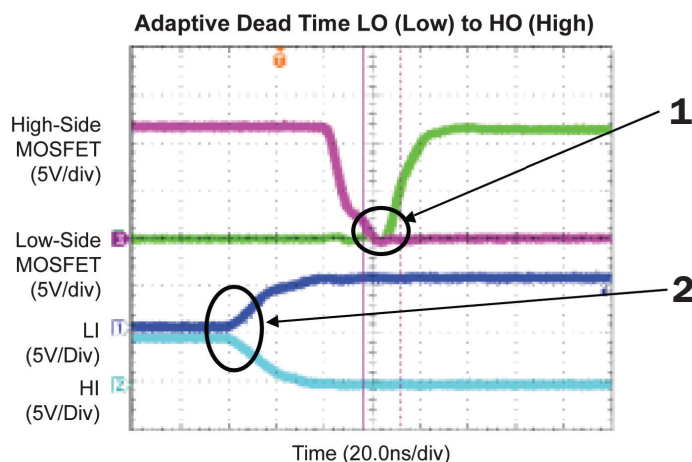
The MIC4605 also offers a wide 5.5V to 16V operating supply range to maximize system efficiency. The low 5.5V operating voltage allows longer run times in battery-powered applications. Additionally, the MIC4605's adjustable gate drive sets the gate drive voltage to V_{DD} for optimal MOSFET $R_{DS(ON)}$, which minimizes power loss due to the MOSFET's $R_{DS(ON)}$.

The MIC4605 is available in an 8-pin SOIC package and a tiny 10-pin 2.5×2.5 mm TDFN package. Both packages have an operating junction temperature range of -40°C to $+125^{\circ}\text{C}$.

Applications

- Battery-operated power tools
- Power inverters
- Full- and half-bridge motor drives
- E-bikes
- Ceiling fans

Typical Performance

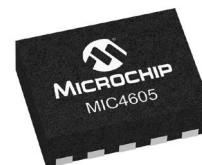


1. Adaptive Dead-Time Under 20 ns

- Automatically sets transition delay
- allows optimal power efficiency

2. Inputs can overlap

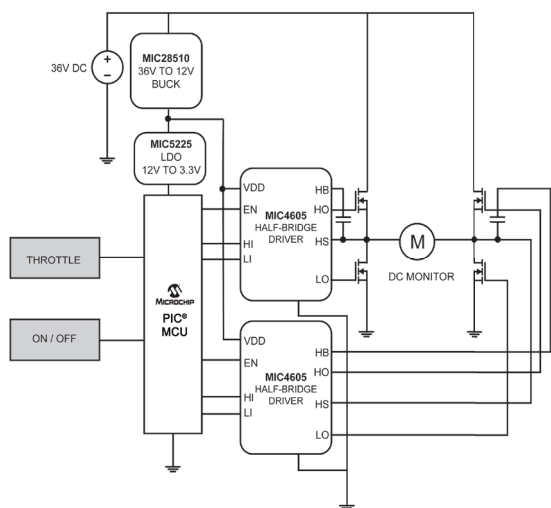
- no cross conduction
- protects switching circuit
- increases reliability



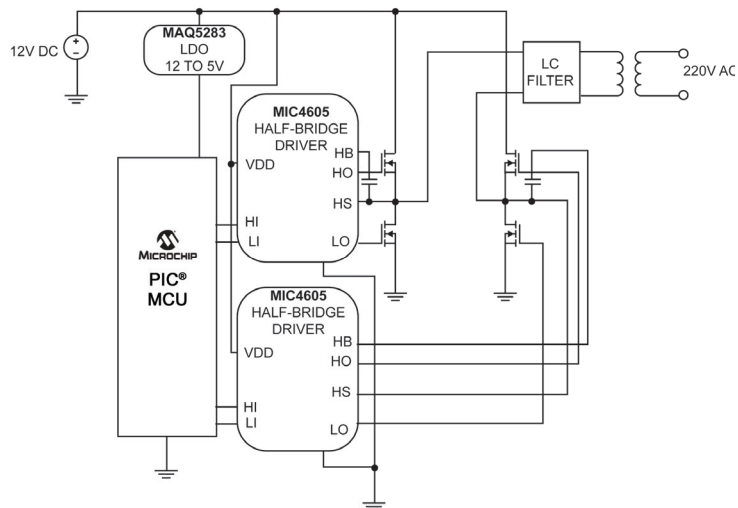
Benefits	Features
Efficiency	■ Adaptive dead-time circuitry automatically adjusts the dead time between high- and low-side MOSFETs ■ Dead-time under 20 ns; best in the industry
Robust	■ 85V operation protects against voltage spikes caused by the motor's back Electromagnetic Force (EMF) ■ Anti-shoot-through protects against cross conduction
Longer Run Time	■ Wide gate drive range: 5.5V to 16V ■ Low 4.9V undervoltage lockout allows longer run time
Small Form Factor	■ 2.5×2.5 mm TDFN package option ■ 8-pin SOIC is also available in an industry standard pinout



MICROCHIP



E-bike Full-Bridge DC Motor



Power Inverter (DC/AC)

Ordering Information

Part Number	Marking Code	Input	Junction Temperature Range	Package
MIC4605-1YMT	165	Dual TTL	-40 to +125°C	10-pin 2.5 mm × 2.5 mm TDFN
MIC4605-2	256	Single PWM TTL	-40 to +125°C	10-pin 2.5 mm × 2.5 mm TDFN
MIC4605-1YM	4605-1TM	Dual TTL	-40 to +125°C	8-pin SOIC
MIC4605-2YM	4605-2YM	Single PWM TTL	-40 to +125°C	8-pin SOIC



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