

Isolated SiC Gate Driver

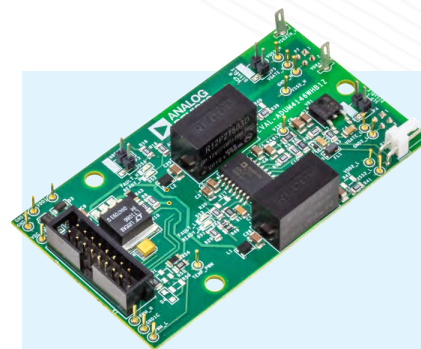
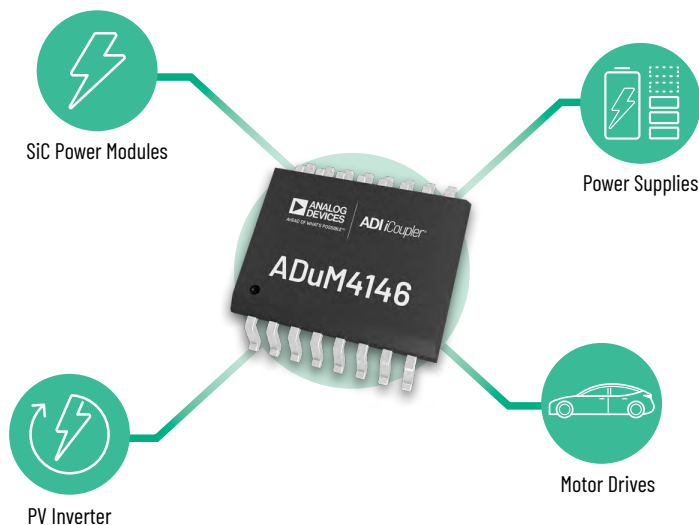
Reinforced 1500 V Isolation Optimized for High Performance Silicon Carbide Applications

Product Details

The Analog Devices **ADuM4146** is an isolated SiC gate driver with integrated Miller clamp. This single-channel gate driver is optimized for driving silicon carbide (SiC) metal-oxide semiconductor field effect transistors (MOSFETs) and allows for unipolar or bipolar operation. The *iCoupler*™ technology provides isolation between the input signal and the output gate drive.

Integrated onto the ADuM4146 is a desaturation detection circuit that provides protection against high voltage short-circuit SiC operation. The internal blanking switch allows for the addition of an external current source if more noise immunity is needed. The secondary undervoltage lockout (UVLO) is set for common SiC levels.

The integrated Miller clamp allows for the full utilization of SiC's faster switching speeds by preventing the Miller effect induced turn-on. The ADuM4146's industry-leading common-mode transient immunity (CMTI) assures that no gate timing errors will occur during this fast switching. Faster switching, without any dV/dt induced shoot-through or timing errors, increases the power converter's efficiency.



Key Benefits

- ▶ Industry's fastest short-circuit protection (SCP) response time
- ▶ Improved DESAT blanking and noise response
- ▶ DESAT fault reporting and soft shutdown

Solutions for High Speed SiC Device Switching

- ▶ Supports bipolar drive (negative supply) including +15 V/-3 V for 3rd gen SiC devices
- ▶ Internal Miller clamp for an integrated solution with reduced component count
- ▶ High CMTI (150 kV/ μ s min) ensures the gate driver withstands the high dV/dt of SiC devices



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ADI *iCoupler*®

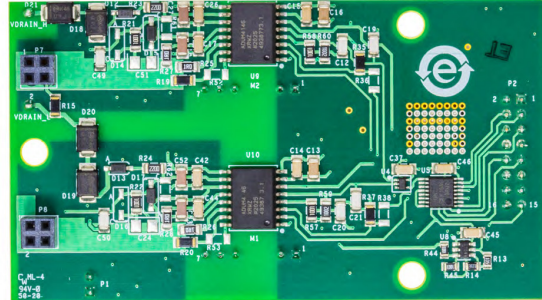
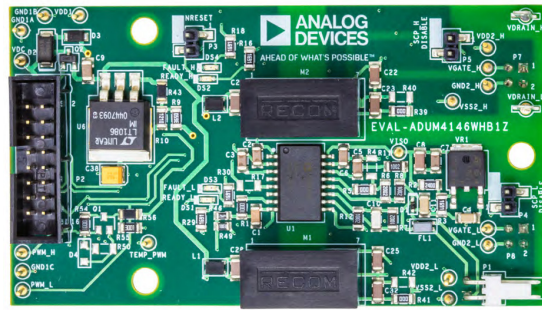
Evaluating the ADuM4146

High Voltage Isolated SiC Gate Driver with Integrated Miller Clamp

The EVAL-ADuM4146WHB1Z is a half-bridge gate driver board that allows simple evaluation of the performance of the ADuM4146 when driving advanced Wolfspeed third generation C3M™ silicon carbide (SiC) metal-oxide semiconductor field effect transistors (MOSFETs) and power modules. Use the EVAL-ADuM4146WHB1Z in conjunction with Wolfspeed's clamped inductive load (CIL) test boards or half-bridge evaluation boards and differential transceiver boards.

Key Features:

- ▶ Optimized for use with Wolfspeed SiC MOSFETs and power modules
- ▶ Compatible with Wolfspeed CIL test boards and half-bridge evaluation boards
- ▶ High frequency, ultrafast switching operation
- ▶ Differential inputs for increased noise immunity
- ▶ Input and output side UVLO
- ▶ Short-circuit protection
- ▶ Shoot-through protection interlock
- ▶ Internal Miller clamp
- ▶ Fault and ready indicators
- ▶ Isolated NTC thermistor measurement
- ▶ 12 V power input



Ordering Information

Part Number	Description	Package
ADuM4146	Single-supply, high voltage, isolated SiC gate driver with Miller clamp	16-lead SOIC wide
EVAL-ADuM4146	ADuM4146 evaluation board optimized for half-bridge power modules	91 mm × 51 mm PCB

Safety Certifications

The iCoupler family of digital isolation products has been tested and approved by various regulatory agencies, including UL, CSA, VDE, TÜV, CQC, and now, for intrinsic safety, ATEX and IECEx. For a full listing and downloadable PDF, visit analog.com/iCouplerSafety. Analog Devices' isolator µModule® platforms are certified by safety houses including UL, CSA, and IEC.



Engage with the ADI technology experts in our online support community. Ask your tough design questions, browse FAQs, or join a conversation.



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