



HIGH-EFFICIENCY DRIVE CIRCUIT AND BIDIRECTIONAL FET

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Overview

Typically, bidirectional switching elements are fabricated using two FET devices, for example, arranged in series with opposite polarities, each device shunted by a diode to steer current to the proper FET polarity depending on the polarity of voltage applied to the switching element. These diodes produce a forward diode voltage drop when conducting resulting in a significant power loss at high currents.

The Invention

UW researchers have developed a bidirectional FET switch employing a single gate architecture that eliminates power loss from shunting diodes. A special gate drive circuit provides high-speed switching of the bidirectional FET by actively sinking and sourcing gate currents. In one embodiment the FET further provides dynamic biasing of the field plates for improved performance. This design may thus provide a first and third quadrant switch and eliminate operation in second and fourth quadrant where diode voltage drop occurs.

Additional Information

For More Information About the Inventors

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Tech Fields

- [Engineering : Power electronics & control systems](#)
- [Semiconductors & Integrated Circuits : Design & fabrication](#)

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