100-V Half-Bridge MOSFET Drivers Offer Ruggedness And High Performance

Renesas Electronics' HIP2211 and HIP2210 are 100-V half-bridge MOSFET drivers. The HIP2211 is a next-generation pin-compatible upgrade to Renesas' popular ISL2111 bridge driver, while the HIP2210 offers a tri-level PWM input to simplify power supply and motor drive design. The HIP2211 and HIP2210 are well suited for 48-V telecom power supplies, class-D audio amplifiers, solar inverters, and UPS inverters. They are also rugged enough to power the demanding 48-V motor drives found in Li-ion battery-powered household and outdoor products, water pumps, and cooling fans (see the figure).

The HIP221x drivers are designed to work reliably under difficult operating conditions, with the high-speed, high-voltage HS pin tolerating up to -10 V continuously and slewing as quickly as 50 V/ns. Comprehensive undervoltage protection works in tandem with the HIP2210's programmable anti-shoot-through protection to ensure the driven MOSFETs are not damaged due to power supply or other external fault conditions.

The HIP221x drivers feature strong 3-A source, 4-A sink drivers with very fast typical propagation delay and typical delay matching, making them well suited for high-frequency switching applications. Both the HIP2210 and HIP2211 are designed to complement Renesas microcontrollers in advanced dc-dc and brushless motor drive systems.

When compared with the ISL2211, the HIP2211 provides lower typical propagation delay (15 ns versus 32 ns); lower typical delay matching (1.5 ns versus 8 ns) and a wider operating voltage range (6 V to 18 V versus 8 V to 14 V). In addition, the HIP2211 HS pin's -10-Vdc continuous rating, which enables robust noise tolerance, represents an improvement over the -1-Vdc continuous rating of the ISL2211.

"The innovative HIP221x devices continue our 25-year heritage of developing industry leading Harris Intelligent Power (HIP) half-bridge drivers, said Philip Chesley, vice president, Industrial and Communications Business Division at Renesas. "Robust noise tolerance, ultra-fast propagation delays, and high system efficiency are some of the key features our customers have come to rely on from our entire range of HIP half-bridge MOSFET drivers."

Other features of HIP2211 and HIP2210 include:

- 115-Vdc bootstrap supply maximum voltage (120-V HS absolute maximum) supports 100 V on the half-bridge
- Integrated 0.5-Ω typical bootstrap diode eliminates external discrete diodes
- VDD and boot UVLO prevent low gate voltage drive to the NFETs
- Adjustable dead time delay via RDT pin (HIP2210 only) prevents shoot-through conditions, adjustable from 35 ns to 350 ns with a single resistor.

The HIP2211 and HIP2210 are available now from Renesas' worldwide distributors, both priced at $1.30 in 1,000-unit quantities. The HIP2211 is supplied in an 8-lead SOIC and a 10-lead 4-mm x 4-mm TDFN package. For more information and evaluation board, see the HIP2211 product page. The HIP2210 is supplied in a 10-lead 4-mm x 4-mm TDFN package. For more information and an evaluation board, see the HIP2210 product page.

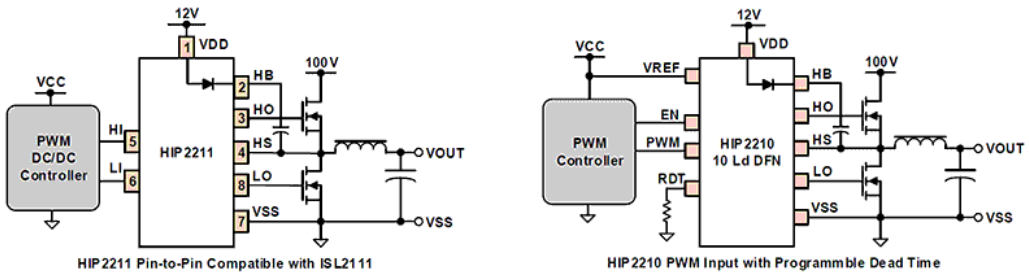

Figure. The HIP2211 is a next-generation pin-compatible upgrade to Renesas' popular ISL2111 bridge driver, while the HIP2210 offers a tri-level PWM input to simplify power supply and motor drive design. When compared with the ISL2211, the HIP2211 provides lower typical propagation delay, lower typical delay matching and a wider operating voltage range.