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## *Radiation-Hardened GaN HEMT Driver For Satellite Applications*

Infineon Technologies' RIC70115 is a radiation-hardened GaN HEMT driver designed for satellite and high-reliability space applications where power conversion performance and long-term operational integrity are critical requirements. The RIC70115 supports both silicon (logic-level) MOSFET and GaN HEMT designs in low-side and high-side configurations, giving power system designers greater flexibility to adopt GaN-based power architectures in space platforms without compromising safe operation across varying bias voltage conditions.

The RIC70115 integrates an independent Miller clamp function that prevents parasitic induced turn-on while maintaining the desired switching speed, reducing switching losses and improving overall efficiency. A truly differential input (TDI) logic stage delivers high noise immunity by rejecting common-mode noise and mitigating the effects of electromagnetic interference and radio frequency interference, both particularly relevant in the electrically demanding environment of a satellite power bus.

An integrated low dropout regulator (LDO) generates a tightly regulated 4.8-V drive voltage from a 5-V or 12-V source, reducing the need for external regulation components and supporting a power input range of 4.75 V to 13.2 V (Figs. 1 and 2).

Together, these integrated functions reduce external component count, simplify circuit design, and improve system reliability in high-cycle space power applications. The RIC70115 meets the requirements of MIL-PRF-38535 across an extended operating temperature range of -55°C to 125°C. It is radiation hardened to a TID rating of up to 100 krad (Si) and has been characterized for SEEs up to a LET of 81.9 MeV·cm²/mg, providing the radiation performance margins required for low-earth orbit and beyond.

According to the company, the RIC70115 is unique among rad hard drivers in its ability to drive both high and low-side devices and in its integration of an LDO. When paired with the company's rad-hard 100-V GaN HEMTs, the driver can be used to implement bus converters and point-of-load regulators (Fig. 3).

"GaN power solutions are becoming an integral part of the design ecosystem for New Space applications, and the pace of adoption is accelerating," said Mike Mills, senior vice president and general manager HiRel at Infineon. "The RIC70115 reflects Infineon's commitment to delivering the integration, performance, and radiation hardness that space power designers need to move to GaN-based systems with confidence. We are giving designers a proven, qualified path to higher efficiency and greater design flexibility in one of the most demanding environments in the industry."

The Infineon GaN HEMT driver RIC70115 is available in a ceramic package (Fig. 4) and an evaluation board (RIC70115EVAL1) is also offered. For more information, see the RIC70115 page.

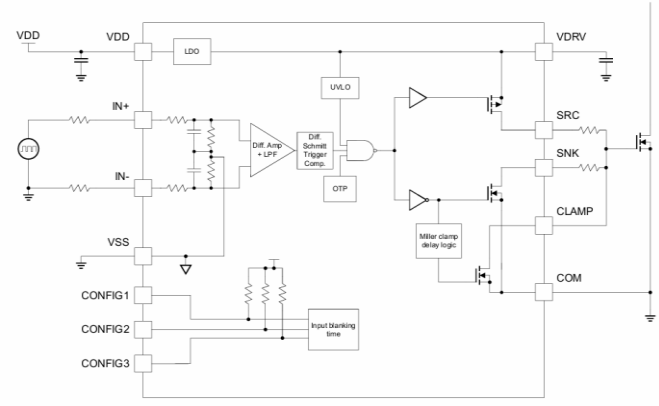


*Fig 1. Internal block diagram. The RIC70115 rad-hard GaN HEMT driver has robust noise immunity features such as truly differential input that allow it to operate in high or low side applications.Additionally, an independent Miller clamp function prevents parasitic-induced turn-on. The IC is characterized for single event effects up to 81.9 MeV·cm²/mg linear energy transfer and total ionizing dose up to 100 krad(Si).*

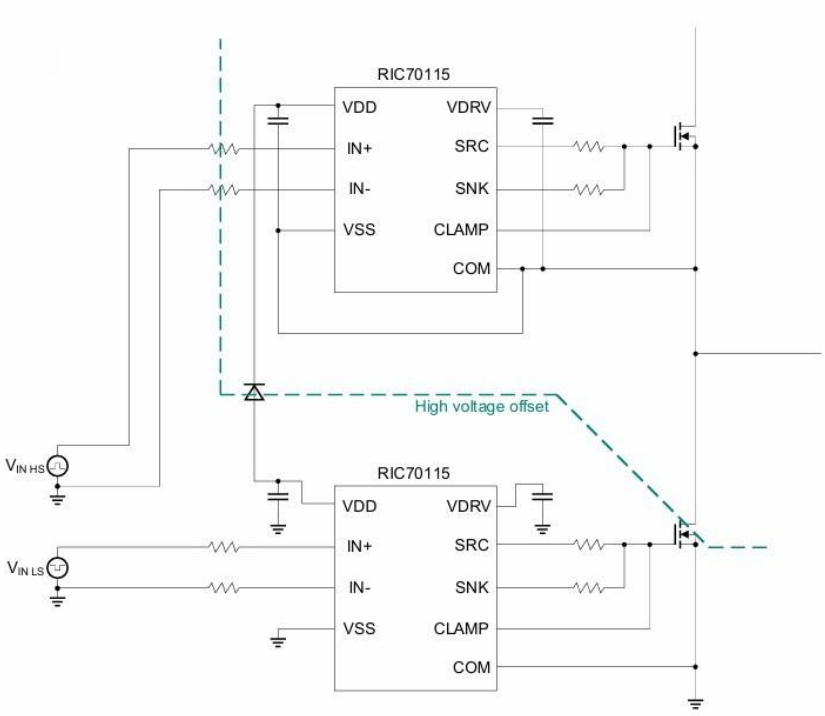


*Fig. 2 Half-bridge application circuit for the RIC70155.*

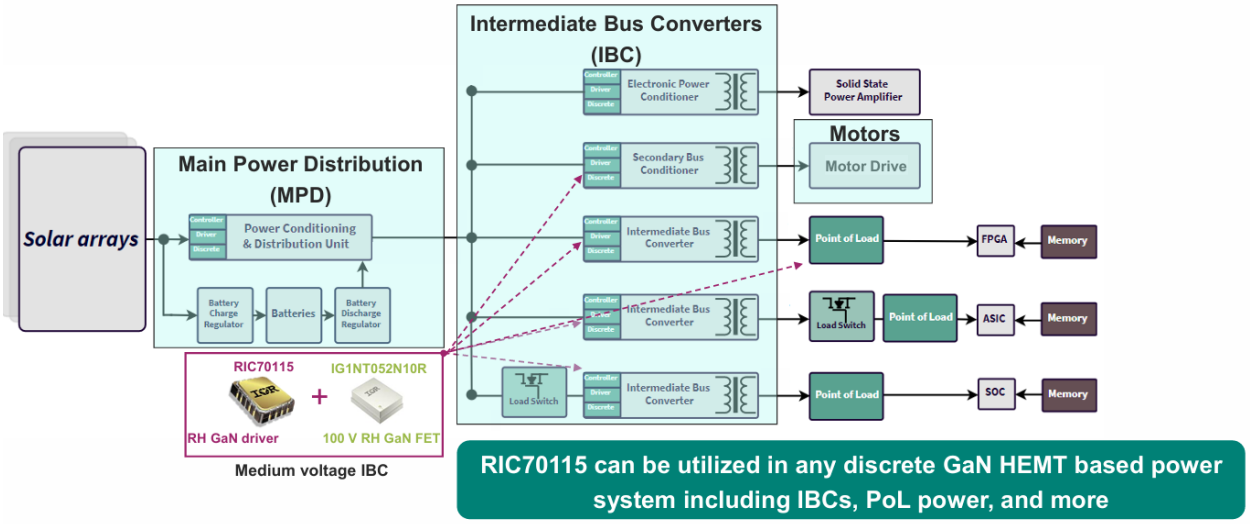


*Fig. 3. The RIC70115 can be used to implement bus converters and point-of-load converters in satellite systems and other space applications requiring rad hard devices. Infineon currently has a 100-V JANS rad-hard GaN HEMT (the IG1NT052N10R) that can be paired with this gate driver. According to Infineon, RIC70115 + GaN-based POL design offers ~50% size reduction vs. similar silicon-MOSFET-based POL designs, while also providing significant efficiency improvements.*


*Fig. 4. The RIC701115 is being introduced in a ceramic hermetically sealed 16-pin LCC package. However, the company is aware of the need for rad-hard plastic and rad-tolerant plastic devices and is working to address those requirements as well.*