Product brief

R9 rad hard MOSFET technology
Higher performance & efficiencies with low risk design reuse

International Rectifier HiRel (IR HiRel)’s new R9 superjunction technology platform offers notable size, weight and power improvements over prior rad hard MOSFET generations, delivering superior performance and efficiencies with a well-known silicon gate drive setup. A simple drop-in, R9 enables a high degree of design reuse, yielding immediate efficiency improvements in your proven circuitry. R9 is a low risk upgrade path to higher performing space-grade power systems, with assured confidence in overall system reliability.

In systems such as high-throughput satellites, using R9-based rad hard MOSFETs enables simpler circuit topologies and can significantly reduce cost-per-bit ratio and overall system cost. Our full ecosystem of N- and P-channel R9 MOSFETs delivers a range of options for high-reliability applications such as:

- Space-grade DC-DC converters
- Intermediate bus converters
- Motor controllers
- Other high-speed switching designs
- High-side, low frequency load switching
- Overload protection switching
- Circuits requiring linear mode operation

Rugged, reliable performance you can count on
IR HiRel’s R9 MOSFET technology supports wide gate-source voltage variation (±20V), making the portfolio far less sensitive to circuit parasitics than alternatives. Especially for high frequency applications, designers must balance between higher switching frequency, design and verification time to optimal board layout and reliability. R9-based rad hard MOSFETs are also highly ruggedized, designed to absorb avalanche energy for momentary drain-source voltage overshoot. Combined with superior SOA, transient thermal impedance and high ESD ratings, our R9-based MOSFET portfolio is a low risk path to improved reliability and performance.

Key features
- $V_{GS}$ rating of ±20V
- Avalanche capability
- Enhanced Safe Operating Area (SOA)
- Largest portfolio of N- and P-channel power MOSFETs

Customer benefits
- Rugged designs, less sensitive to electrical parasitics
- Superior linear mode operation
- Design heritage/reuse
- Well-known Si gate driver setup
- Simplified circuit topologies
- Low risk upgrade path

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Backed by the confidence of QPLs
To help our customers accelerate new product development, IR HiRel's R9 rad hard MOSFETs are qualified for direct release to DLA's Qualified Parts List (QPL) in the newest generation packages. This reduces packaging, assembly, and testing risk, ensuring confidence in the reliability of long-lasting, high performance specification compliance to known industry standards.

IR HiRel continues to make holistic investments in its silicon platforms, packaging, die sizes and more to deliver next-gen technology for space and other demanding applications. We offer the largest portfolio of N- and P-channel power MOSFETs with continuously enhanced performance and packaging. With silicon's proven flight heritage, performance, and robustness, why risk your mission with anything else?

R9 rad hard MOSFET technology outperforms the competition with a 30 percent improvement in FoM\(^1\).

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\(^1\) Figure of Merit is \(R_{\text{DS(on)}} \times Q_G\) (Gate Charge)
R9 rad hard MOSFET technology

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*pending as of publication date
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A pioneer in power electronics since 1947, IR HiRel is a leader in high-reliability, radiation-hardened power conversion solutions for space. For decades, customers have used IR HiRel’s semiconductor-based power conversion and custom hybrid solutions in thousands of mission-critical space, aerospace, and national security programs. Applications range from satellite buses to space exploration vehicles and more, where failure-free performance is expected in extreme mechanical, thermal, and radiation environments. Our team of technical experts provides proven, high performance and high-reliability products that reduce development effort and risk for customers, paving the path for successful missions.

IR HiRel is an Infineon Technologies company. Together with our parent company, we offer a broad selection of solutions qualified to ESA and DLA standards for our global customers.

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