High-Rel Dual-Output DC-DC Converters Target Satellite Power Systems

International Rectifier's D Series of low-power radiation-tolerant two-output dc-dc converters were developed to meet the high-reliability design needs of satellite power systems. The D28xxD and D50xxxxP D Series of dc-dc converters offer extremely low output noise, guaranteed End-of-Life (EOL) output voltage drift with excellent output cross regulation. Each converter output is independently regulated with 5-W maximum rated output power or 10-W total output power (see the figure.)

Available in two output configurations, the first configuration offers the traditional positive and negative output combination for analog and linear circuit loads. The second configuration features two positive outputs where each output may have the same or different voltages with each voltage as low as 1 V or as high as 5 V (see the table.) This version is well suited to DSP, FPGA, DDR memory and other digital loads.

Each converter output is independently regulated with 5-W maximum rated output power or 10-W total output power. Following IR's design standards, the D series are designed to meet MIL-STD-1547B and NASA's EEE-INST-002, the industry's derating standards for EEE components stress derating.

"Developed using a proven design methodology, and featuring two outputs with excellent output cross regulation in one compact converter package, IR's D Series offers a highly reliable, high efficiency, small and lightweight solution for both analog and digital satellite system applications," says Tiva Bussarakons, marketing director, IR's HiRel Business Unit.

The D Series dc-dc converters incorporate IR's PWM controller IC, which integrates several performance enhancing circuitries to minimize overall component count and improve reliability. Linear post regulation based on proprietary design is used for both outputs for low noise and high audio rejection. With a low weight of <55 g, these converters are characterized with total ionizing dose (TID) of greater than 50K Rad(Si), and single event effect (SEE) linear energy transfer (LET) of heavy ions greater than 40 MeV.cm^2 /mg.

Design analysis reports which include reliability analysis, components stress analysis, thermal analysis, radiation tests, and worst-case analysis are available upon request. Pricing for the D28xxD and D5001R803R3P begins at $3,750 each in 5-unit quantities. Production orders are available immediately. This product is subject to U.S. export control laws and regulations.

Figure. Rated for up to 10 W of total max power output, the D28xxD and D50xxxxP D series of rad-tolerant dc-dc converters generate two independently regulated outputs with extremely low output noise, guaranteed end-of-life output voltage drift, and excellent output cross regulation.

Table. Key specifications for the D28xxD and D50xxxxP D dc-dc converters for space applications.

Part Number	Output Voltage	Rated Output Current	Rated Output Power	Typical Efficiency
D2805D	±5.0 V	±1.0 A	10 W	58%
D2812D	±12.0 V	±0.42 A	10 W	64%
D2815D	±15.0 V	±0.33 A	10 W	65%
D5001R803R3P	+1.8 V, +3.3 V	+1.5 A, +1.5 A	8.7 W	47%