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Rad-Hard Low-Voltage Rectifiers Are Offered In Plastic Packages For LEO Satellites

STMicroelectronics has expanded its range of rad-hard ICs with three new low-voltage rectifier diodes for the power circuits of low earth orbit (LEO) satellites. Delivered in mass-produced, lightweight SOD128 plastic packages, the flight-ready LEO1N58xx diodes provide power management and protection in circuits such as switched-mode power supplies and high-frequency dc-dc converters (see the figure).

Developed from ST's space-grade European Space Components Coordination (ESCC) approved diodes, the LEO-ready parts are produced under strict quality controls using automotive IATF-16949 manufacturing processes with wafer-level traceability. The devices are AEC-Q101 qualified, subject to wafer-lot acceptance testing (WLAT), and supplied with a certificate of conformity (CoC).

The LEO1N5819 and LEO1N5822 Schottky diodes offer 1-A , 45-V and 3-A, 40-V performance respectively, while the ultra-fast LEO1N5811 operates at up to 6 A and 150 V. The two Schottky devices are specified across the -40°C to 150°C temperature range, while the LEO1N5811 features an even wider temperature tolerance, up to 175°C.

All three variants are radiation-hardened by design for operation in demanding conditions with respect to temperature, total ionizing and non-ionizing radiation (TID and TNID), and single-event effects (SEE). Qualification complies with ESCC 22900 for TID (up to 300 krad(Si)), ESCC 22500 for TNID (up to 3 x 10^{11} p/cm^2), and ESCC 25100 for single-event burnout (SEB, up to 60 MeV/cm²/mg).

The three devices are in production now, priced at $3.00 for the LEO1N5819AF, $5.00 for the LEO1N5822AF and $4.50 for the LEO1N5811AF, for orders of 1000 units. For more information on ST's LEO rad-hard ICs, see the LEO1N58xx family page or see the LEO1N5819, LEO1N5822 and LEO1N5811 product pages.

Figure. Manufactured using ST's space-proven power Schottky and ultrafast technologies, the LEO1N58xx family meets the new space industry's stringent demands for cost-effectiveness, radiation hardness, small size, quality assurance, and higher-volume availability, says the vendor. The LEO1N5819 and LEO1N5822 Schottky diodes offer 1-A , 45-V and 3-A, 40-V performance respectively, while the ultra-fast LEO1N5811 operates at up to 6 A and 150 V.