Isolated DC-DC Converter Operates Reliably From -55°C to +225°C

From CISSOID, a provider of high-temperature semiconductor solutions, comes Stromboli, a flexible and scalable reference design and associated demo boards for high-voltage isolated dc-dc converters designed to operate reliably and with high efficiency from -55°C to +225°C. Stromboli can convert inputs up to 400 V into multiple, symmetrical (if required), output voltages up to ±25 V. The galvanic isolation between input and outputs is at least 10 MΩ at 500 V.

The Stromboli technology includes an application note, a reference design and a demonstration board with the related datasheet, schematics, and bill-of-materials (BOM). The demonstration board is available in two versions, optimized for input voltage ranges of 15 V to 40 V or 150 V to 350 V (Fig. 1). They both provide a symmetrical output at ±12V and can deliver 25 W with efficiencies up to 70% at 225°C (Fig. 2.)

Besides these examples, Stromboli technology can be used to build isolated dc-dc converters delivering up to 150-W output power. The input voltage range can be adapted to cover the 540-V input-voltage requirement of industrial applications and the level of isolation can be brought as high as the 2.5 kV required for some aeronautics applications. For additional specifications, see the table.

The Stromboli design is based on the flyback architecture, which makes the technology highly flexible and scalable. For high output powers, a synchronous rectification is implemented for improved efficiency. Meanwhile, for low power levels, standard rectification can simplify the BOM.

Magnetic feedback provides the output voltage temperature stability and the load regulation. Stromboli features CISSOID's chipset Magma and Hyperion and high-temperature transistors from the Planet family. Stromboli also features an undervoltage-lockout (UVLO) function and pulse-by-pulse current sensing, which provides intrinsic output-current limitation in case of overload or short circuits.

Stromboli technology is available immediately for licensing. The reference design and its active BOM can be mapped onto high-temperature substrates and assembled in high-reliability modules. For more information, visit www.cissoid.com.

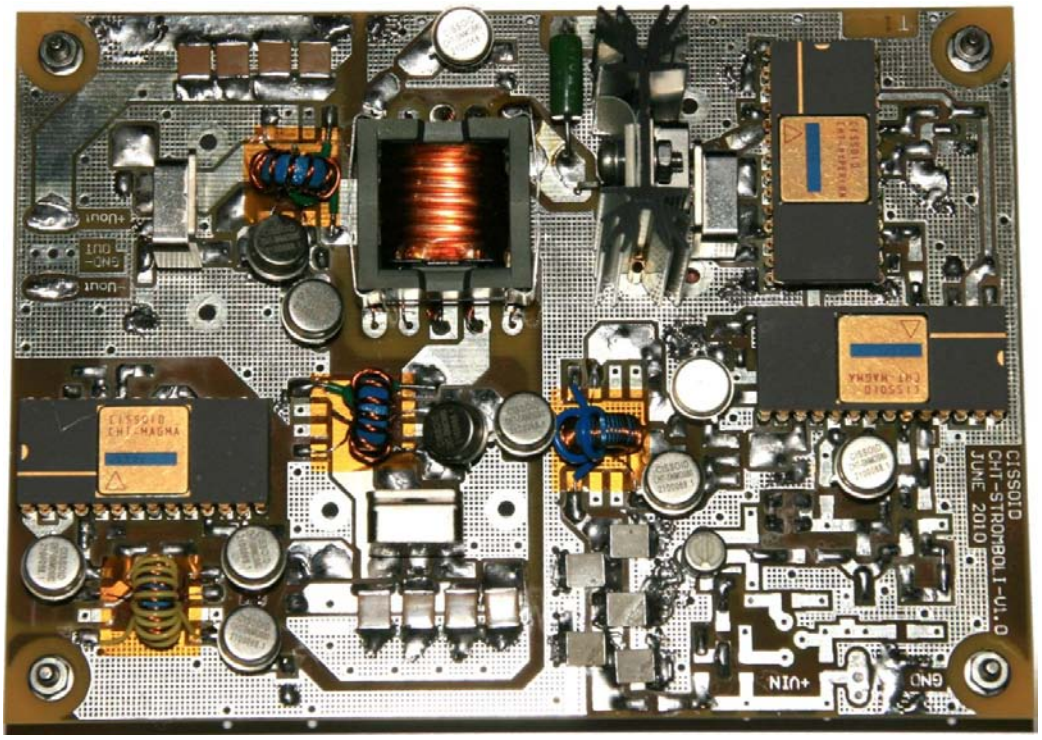

Fig. 1. Stromboli dc-dc converter designs are capable of operation at high input voltages. The dc-dc converter on the demo board shown here has an input range of 150 V to 350 V.

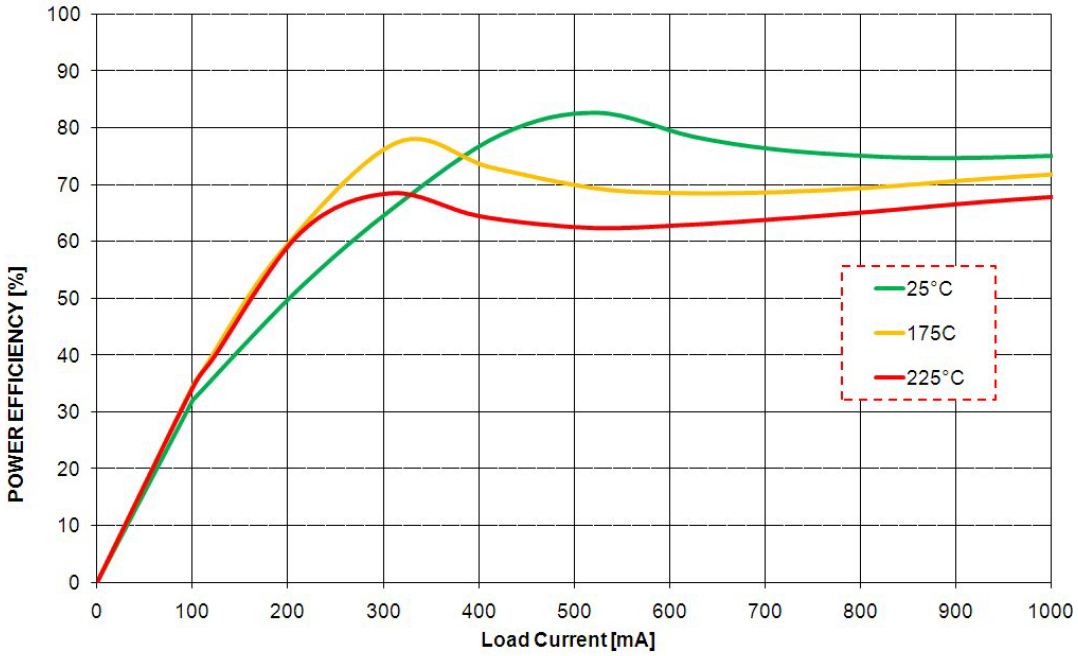

Fig. 2. Stromboli dc-dc converter designs can deliver 25 W with efficiencies up to 70% at 225°C. The data shown here was measured at an input of 250 V.

Table. Key specification for Stromboli dc-dc converter platform.

Operating junction temperature	-55°C to +225°C
Efficiency	up to 70% at 225°C
Input voltage	Up to 400 V
Output voltage	Up to 25 V, symmetrical, multiple outputs
Line regulation	Better than ±0.5% at Pout = 50% and Vin = 150 V to 350 V
Load regulation	±1% at Pout = 0% to 100% and Vin = 250 V
Temperature stability	80 ppm/°C at Pout = 50% and Vin = 250 V
Output power	Up to 150 W
Galvanic isolation, input-to-output	10 MΩ