

750-V Input Railway DC-DC Converter Delivers High Efficiency, Long Life

[ABSOPULSE Electronics'](#) HVI 41R-F1, a 50-W addition to its line of high-input-voltage railway quality dc-dc converters, employs the latest silicon carbide (SiC) semiconductor technology to deliver high conversion efficiency, high power density and a smaller form factor than similar designs with the same output power. It measures 114 x 51 x 201 mm (see the figure).

The HVI 41R-F1 converter operates from 750 V (525 V to 975 V), the traction voltage required for mass transit vehicles including trams, metros and light rail, mining locomotives and trolleybuses. It also incorporates input surge withstand capacity of 1300 Vdc. The unit delivers 24-V/2-A regulated output. Custom input/output values are available on request.

The converter is designed for an operating life of up to 30 years. The elimination of optocouplers from the feedback loop contributes to significantly lower component count and higher MTBF compared to conventional designs. The design is verified for 5600-Vdc input-to-output isolation and production-level testing is 5000 Vdc input-to-output. Other electronic protection includes inrush current limiting, reverse-polarity protection and output current limiting with short-circuit protection.

The HVI 41R-F1 meets the requirements of EN 50155 for electronic equipment used on rolling stock including EN 61000-4-2, EN 61000-4-3, EN 61000-4-4 and EN 61000-4-6 standards. Heavy filtering on the input and output ensures compliance with EN 50121-3-2. Please consult the company regarding compliance to any other standards not listed here.

The 50-W converter is cooled by conduction via baseplate. Additional cooling is achieved by natural convection through the cooling slots. This enables operation over a -25°C to 55°C temperature range for full specification. Wider temperature ranges are available on request. The unit is ruggedized to ensure immunity to shock and vibration. The internal boards are conformal coated for protection from moisture, humidity and airborne contaminants.

For more information, see the [data sheet](#). Contact the company for pricing and delivery via the website or by calling 613-836-3511.



Figure. Operating from 750 V, the traction voltage required for mass transit vehicles, the HVI 41R-F1 dc-dc converter delivers a regulated 24-V/2-A output or custom output, while achieving a typical efficiency of 85% at full load. The converter is designed for up to 30 years of operating life.