

### *PFC Inductors Use Metglass Or Nanocrystalline Cores for High Performance*

[Payton Planar Magnetics](#) is offering a line of PFC inductors employing Metglass or nanocrystalline cores to deliver high power in very compact designs that also achieve low cost. These devices complement the low-profile, 7-mm high PFC inductors that the company introduced last year.

An example device in this series is a 70-mm (L) x 55-mm (W) x 40-mm (H) inductor designed for a 5000-W system. The core is a special design produced by Payton using nanocrystalline material.

Metglass (amorphous iron) and nanocrystalline are used for compact PFC designs from 50 kHz to 100 kHz, while ferrite is used for low-profile designs above 50 kHz. Inductance for devices in this series typically ranges from 100 to 250  $\mu$ H. These devices incorporate an aluminum clasp that provides mechanical and thermal properties necessary for the compact design. In addition, the PFC inductors can operate from -40°C to 100°C ambient at full load.

Jim Marinos, executive VP of Payton America, points to two key parameters to help explain the value of these core materials in the applications. Marinos notes that the flux density of ferrite material is 0.5 T, while the flux density of amorphous iron is 1.5 T. Meanwhile, power density for these materials—expressed in terms of core losses at 100 kHz, 100 mT, and 25°C—is 100 mW/cm<sup>3</sup> for ferrites, 360 mW/cm<sup>3</sup> for nanocrystalline material, and 900 mW/cm<sup>3</sup> for amorphous iron.



*Fig. Payton Planar Magnetics' new line of PFC boost inductors employ Metglass (amorphous) or nanocrystalline core material to achieve high-power, compact designs. This example inductor, which measures 70 mm (L) x 55 mm (W) x 40 mm (H), is designed for a 5000-W system. The core is a special design produced using nanocrystalline material.*