



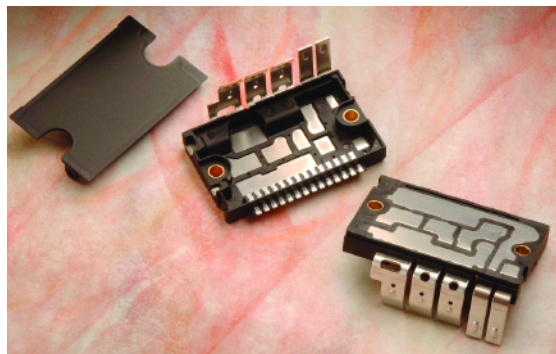
## Tricon manages high-performance materials, logistics for advanced electric power steering component

DOWNERS GROVE, ILLINOIS, APRIL 2007 – Tricon Industries, Inc. is contributing to the revolution that's replacing traditional mechanically-driven auto accessories such as power steering hydraulic pumps and air conditioning compressors with their electrical-driven variants.

Case in point is the participation of Tricon Industries in the development of a new electronic motor controller used in a European automotive electrically powered hydraulic steering (EHPS) system.

The electric system eliminates the mechanically driven pump, belt drives and pulleys of conventional hydraulic steering systems for more energy-efficient and responsive power steering.

Tricon is processing a complex insert-molded shell integral to an advanced, die-on-leadframe (DOL) inverter module from Vishay, a world leader in power management technology. The DOL power module (with its high current field effect transistors) is located with the controller near the motor and hydraulic pump. The power transistors see a very high current which the new die-on-leadframe technology accommodates through reduced electrical resistance for more efficient electrical performance as well as providing for more efficient thermal transfer to cool the device. The DOL configuration also provides advantages in auto assembly.



*3-phase leadframe housing and lid.*

### Managing high-performance materials

The plastic used in the DOL shell is AMODEL® polyphthalamide, a semi-crystalline thermoplastic ideal for the temperatures and vibration that this application is engineered to withstand. The processing characteristics of AMODEL® facilitate precision molding around the considerable

obstructions presented by the large insert (terminal) content of the design.

The DOL shell also embodies high performance in its metal elements. According to Bill McDannel, Product Development Manager, Tricon Industries, "The shell involved complex product and manufacturing engineering to locate the terminals and assure wire bonding performance. The pure copper power terminals, on which the die is directly mounted, provide improved electrical and thermal conductivity. Two different selective platings are applied inside and outside the power modules; one for wire-bondability and the other for weldability. Small gage wirebond capability is provided and enhanced through the use of aluminum onlay material.



These small gage bond pads resemble piano keys in the photo.”

The DOL shell provides clean apertures on the inside exposed lead-frames onto which the power transistors are soldered. It also incorporates compression limiting bushings

### **International value stream**

According to Andy Mapperson, Managing Director, Tricon Industries, Ltd., “The international dimension of Tricon’s operations fits Vishay’s approach to this program which serves its European customers. Vishay has its product development in California while its manufacturing is predominantly UK-based. The DOL shell pro-

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gram taps Tricon’s own UK stamping facility to process the metal parts. Stamped components are shipped to our plant in the Czech Republic for overmolding (with resin supplied from the US). The net result is superior value to Vishay and its European end-customers.”

Tricon Industries, Inc. specializes in insert molding and specialized components for world-wide automotive, mobile communications and appliance markets. Tricon was one of the first in the industry to use insert-molding techniques for the manufacture of switch and relay components as well as other electro-mechanical parts.

For more information visit [www.triconinc.com](http://www.triconinc.com).



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