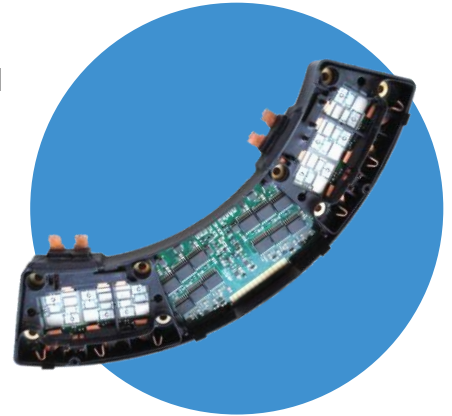# Fast Facts

IPM - Intelligent Power Modules

Demands on efficiency, reliability and lifetime of motors and switches are increasing.

Therefore, intelligent power modules become more and more important looking at controllable, the application adapted switching performance

Power Modules with Driver Circuits

The intelligent power module controls the power output via analog driver according to the control mode of an external micro controller. For high voltage applications Al2O3 Aluminiumoxyd or AlN Aluminiumnitrid ceramic is used as substrate. The driver circuit is mostly found on an organic substrate which is also the interface to the micro controller. For high voltage systems an insulation control is normally reached by optoelectronic coupler components. Self protecting functions are integrated in the hardware of the control circuit. Any measuring systems (current, voltage, temperature) are either directly implemented at the power electronics or are realised externally.

All components are verified referring to little difference in the temperature coefficient, so that a lifetime of minimum 7.000 h at high temperature (150 °C) can be reached.

Intelligent power modules process only analog signals .

These modules are used in vehicles as battery switch, electrical line disconnector, control module for electrical units.

Using the chip-stack technology the single chips can be stacked between the aluminium plates. This allows double-sided cooling of the power components and following a significant increase of the power density.

Special Features

Power Electronics:	Cooling:
• Different bridge inverters: symmetrical/asymmetrical half bridges, B6 bridge: 40 V, 100 V, 600 V	• Heat management : Tcooling element, max=84 °C, **double-sided water cooling**
• Resistive / inductive current measurement: 90 A peak current	
• Insulation voltage control: especially at >48 V systems	**Electrical I/O:**
• Temperature control: T board, max=118 °C	• LV supply: screwed/welded connection
	• 3 motor phases welding and/or screwing termination, battery screwing termination
Drive Control:	
• Control-IC for half and full bridge inverters	• Communication: multipin plug connection - analog signals