CUSTOM DESIGNED POWER MODULES

Solutions for High Power Applications
High Power
Solutions in
Custom Module

Design

Powerex has addressed the need for application specific custom power modules with its Custom Power Products Division. Dedicated to the task of providing cost effective solutions to complex semiconductor applications, Powerex brings its formidable experience and knowledge to bear on chip manufacturing, electronic materials and design/engineering techniques.

CUSTOM DESIGNED POWER MODULES

- Extended temperature range, -55° - 125°C
- Moisture resistance
- Hermetic modules
- Different circuit configurations – i.e. common emitter, chopper
- High voltage isolation
- Low module weight
- Larger free wheel diodes
- Package height, width and length
- Integrated heatsinks – both air and liquid cooled by eliminating the baseplate
- Over current shutdown
- Temperature and current sense
- Different termination styles – i.e. thicker bus bars, D-sub connectors, press on pins, etc.

High Voltage Discretes

IGBT Modules
Customizing an electronic package specifically for your needs involves the precise selection of many components. High power IGBT’s, MOSFETs, SCR’s, Diodes and Darlington Transistors, along with driver circuits, isolated materials, packages and terminals, are the key elements in custom package design. Powerex has continuing access to the most advanced circuit and chip design.
Packages

- **Standard Cases**, including IGBT, IPM, CIB, HVIGBT
- **Picture Frame**
- **Custom Package Development**, including plastic and hermetic

Die Selection

In addition to its exclusive access to IGBT, FWD, Bipolar, GTO chips manufactured by its strategic partner, and the Thyristor, Diode, and Darlington chips created in its own facility, Powerex can also use any other manufacturer’s chip on the market.
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Powerex Custom Power Modules employ performance proven features. Soldered-down and wire bonding fabrication and compression bonded encapsulation (CBE) of SCR/Diode elements offer increased switching speeds, lower losses, more efficient cooling and higher power handling capabilities.

- **Thermal, Mechanical and Electro-Static Simulation using Algor Software – both Static and Dynamic Simulation**
- **Two Dimensional and Three Dimensional CAD**
- **Mechanical Desktop Tools**

![Vacuum Soldering](image1)

![Thermal Mechanical and Electro-Static Simulation](image2)

![Wire Bonding](image3)

![Two Dimensional and Three Dimensional CAD](image4)
RELIABILITY /
QUALIFICATION
TESTING

Complete facility for Military and other high reliability testing.

Reliability and qualification testing can be performed in accordance to military specifications, including Group A, B and C and specific customer requirements.

Highly Accelerated Stress Testing (H.A.S.T.) is also a part of the Powerex custom module design process.

Baseplate Flatness Verification
The alliance between Powerex and its strategic partners continues the advancement of new classes of power semiconductor technology. Powerex’s commitment to the discovery process is on-going and results in power semiconductor innovation that embraces customer system issues for decreased size, reduced costs, increased energy efficiency, switches that operate at higher frequencies, are more durable and offer integrated functions.

Anticipating future industry demands and proactive involvement with each customer results in the continued expansion of manufacturing facilities, research commitment and product development to meet customer power semiconductor needs for shortened product to market cycles.

Powerex is a leading producer to OEM’s and component producers and supports many markets including: transportation, AC and DC motor controls, UPS, welding, industrial heating, electrical vehicles, aircraft, and communications.