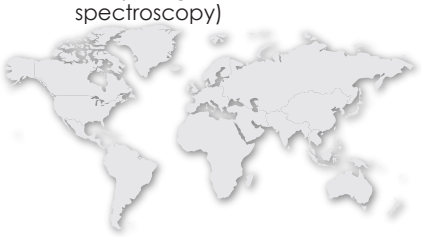
Powerex Military-AERO Expertise

Product Advantages when Engaging with Powerex

- USA based manufacturing
- AS9100 certified (aviation supplier for 30+ years)
- MIL-PRF-38534 Class D (hybrid microcircuits)
- Full custom design capability to meet your requirements including:
  - Lighter weight packaging
  - High isolation voltage
  - Space constraints
  - Low inductance
- 100% visual inspected to military standards
- 100% screened to customer specifications with in house testing for:
  - Burn in
  - Gate burn in Vibration Mechanical Shock
  - Air to air temperature cycling
  - Dynamic testing
  - Moisture resistance
  - HAST
  - Salt spray
- Full analytical capabilities include:
  - X-ray
  - Acoustic microscopy (sonoscan)
  - X-ray fluorescence
  - SEM (scanning electron microscopy)
  - EDS (energy dispersive spectroscopy)

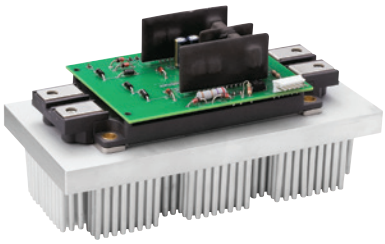


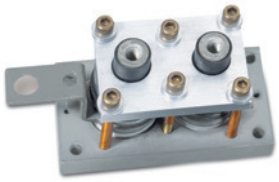
Overview

When looking for demanding applications, and customer specific power modules, Powerex Military-Aero experience leads to next generation proven technology. Reliability and qualification testing meet rigid, military qualifications. Powerex experience covers many long-running aviation applications, including the F-16, C-130, F-18 Super Hornet, AH-64 Apache Helicopter, F-35 Lightning II, and commercial applications including the Dreamliner. When power dissipation demands solid state power, Powerex engineers can select the correct chip technology and screening of module capabilities and parameters, such as hermeticity; T_j; to optimize the design. SiC advantages can include increased operating temperatures or lower weight modules.

Applications

- Solid state circuit breakers
- Generator systems
  - 3-PAC SCR modules for military jet generators, hermetic and near hermetic
  - 6-PAC SCR modules for military jet generators
  - Reliable supplier of power modules used in 270V DC electric power generation, conversion and distribution systems
  - Rotating diodes Si and SiC, including planar diodes
- Flight control systems
  - 7-PAC IGBT modules with brake and "soft-start" SCR
  - Brake modules
  - Dual IGBT flight surface control modules using two IGBT transistors in a half-bridge with each IGBT connected to a superfast free-wheel diode
- High energy power pulse
  - Light triggered diode for high energy pulse applications
- Turret rotation and targeting systems
  - Darlington and MOSFET modules for aviation applications
  - IFV (infantry fighting vehicle) power devices
- Traditional systems
  - 3-level power modules
  - Aviation module next level assembly capability
  - Devices that require MIL-PRF-19500 qualifications
  - Full SiC and hybrid SiC IGBT modules for R&D to reduce switching losses and high temperature operation
  - GCV (ground combat vehicle) power devices, including water cooled heatsinks
  - High voltage SiC power modules up to 15kV
  - Munition and missile systems, including the Aegis and Patriot Missile
  - Naval ships and submarine power systems
  - SCR based SABT (Static Automatic Bus Transfer) switches using large area phase control SCRs





Commercial / Moisture Resistant / Hermetic Custom Modules

Reliability / Qualification Testing

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

Capabilities

Customers looking for application specific custom power modules benefit from Powerex's years of experience in chip manufacturing and design / engineering. 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.

Features

- Different circuit configurations (i.e. common emitter, chopper)
- Different termination styles (i.e. thicker bus bars, D-sub connectors, press-on pins, etc.)
- Extended temperature range, -55°C to 200°C
- Hermetic modules
- High voltage isolation
- Integrated heatsinks – both air and liquid cooled by eliminating the baseplate
- Larger, free-wheel diodes
- Low module weight
- Moisture resistance
- Over-current shutdown
- Package height, width and length
- Temperature and current sense

Substrates:

- Alumina
- Aluminum Nitride
- BeO
- IMS

Die Technology:

- Diode
- FR Diode
- GTO
- HVIGBT
- IGBT
- JBS Shottky Diode
- MOSFET
- Planar Diode
- SCR
- SiC Diode
- SiC MOSFET

Packages:

- Custom development for both plastic and hermetic packages
- Picture frame
- Standard IGBT cases

Registered Directorate of Defense Trade Controls (DDTC)
Certified MIL-PRF-38534 Class D (Hybrid Microcircuits)

For more information:
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