

SCR/GTO/Diode POW-R-BLOK™ Modules Application Information

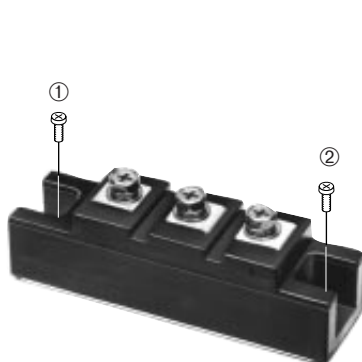
2.0 POW-R-BLOK™ Module Mounting

When mounting POW-R-BLOK™ modules to a heatsink, care should be taken to avoid applying uneven torque to the baseplate due to one sided tightening. It is recommended that the mounting screws be tightened in the fashion shown in Figure 2.1. The device data sheet lists the maximum torque rating for both the mounting screws and, where applicable, the terminal screws.

The use of thermal compounds when mounting POW-R-BLOK™ modules to heatsinks is highly recommended to prevent hot spots due to voids between the package and the heatsink surface. It is important to select a thermal compound which has a stable characteristic over the operating temperature range and the lifetime of the equipment.

The compound should be applied in a very thin layer, applying a thin coating with a spatula or lintless brush and wiping lightly to remove excess material. Another method is to place a predetermined minimal amount at or along the center of the contact area. Then in mounting, rotation and pressure will force the compound over the contact area and experience will indicate whether the quantity is sufficient as excess will appear around the edges of the contact area. Excess compound may be wiped away using a cloth wetted with acetone or alcohol. The use of thick consistency thermal compounds should be avoided, particularly with larger modules, since it may

Figure 2.1 Mounting Screw Fastening Pattern

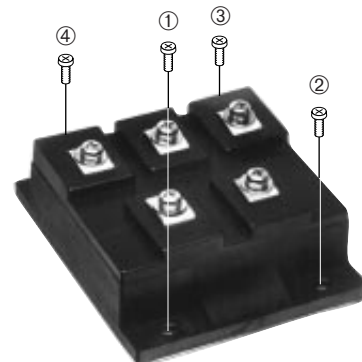


Two-point mounting type
temporary tightening ① → ②
final tightening ② → ①

not compress evenly when the module is torqued.

A number of manufacturers supply a wide variety of thermal grease and fluid type compounds. Among these are Wakefield, Dow-Corning, Alcoa, and Thermalloy. In addition, some manufacturers offer alternative thermal interface pads which avoid the application problems of greases. These materials, such as THERMSTRATE™, are often available in pre-cut shapes that accommodate many POW-R-BLOK™, module packages.

It is recommended that heatsink surfaces be flat within ± 1 mil/inch over the mounting area and have a surface finish of less than 64 microinches. It is also important to properly prepare the heatsink mounting surface just prior to module mounting. The heatsink surface should be thoroughly cleaned to remove any foreign material, oxides, or films. A satisfactory cleaning technique is to polish the mounting area with



Four-point mounting type
temporary tightening ① → ② → ③ → ④
final tightening ④ → ③ → ② → ①

No. 000 fine steel wool, followed by an alcohol or acetone rinse.

2.1 Gate Drive Recommendations

SCRs have extraordinarily high power gain. For example, a 90 Ampere, 1000 Volt SCR is guaranteed to turn on if a 100 mA, 3 Volt gate drive is applied. This is a power gain of 3×10^5 . The power gain is further magnified as the required gate controlled signal is a pulse only a few microseconds wide.

To achieve reliable performance of the SCR, a gate drive signal greater than the minimum specified I_{GT} and V_{GT} values is required. Because of the diverse range of SCR applications, a DC gate test condition with a resistive load was established for the basic gate parameters, I_{GT} and V_{GT} , found on a typical data sheet.

These DC gate trigger parameters are not intended to reflect operational application requirements.