



Medium Voltage Thyristors

Overview

Powerex has expanded its discrete thyristor product line with the addition of new devices which increase the available blocking voltages to 6500V.

The 6500V SCRs are high voltage, high-current disc package devices with a gate design that allows the SCR to be reliably operated at high di/dt and dv/dt conditions in various phase control applications.

Features

- Low on-state voltage
- Gate design and large active conduction area results in high current ratings.
- Distributed gate structure provides a high di/dt capability greater than 150 A/ μ sec and reliability in the field with in-house developed di/dt testing.
- Turn-on gate periphery length not as susceptible to mechanical fatigue caused by stress as compared to the gate architectures of other manufacturers.
- High dv/dt capability
- Hermetic ceramic package assures optimized thermal impedance to allow $T_j = 125^\circ\text{C}$. Contact factory for 140°C T_j conditions and for optimized thermal resistance packaging in slim styles, such as TBSC651402DH (27.2 mm height).
- Alloyed construction employs eutectic aluminum-silicon fusions for proven greater reliability than floating silicon construction. Floating silicon promotes thermal runaway and significantly higher total costs due to greater clamping force requirements.
- Serialized data available by special request to allow user to match devices on reverse recovery current ($I_{R(REC)}$) for series connections in pairs, or strings of 3, 4 or 6 SCRs. Automated test sequence employs barcode scanners as shown to capture parametric data for storage, record retention and report generation.

Applications

- Soft starters for medium voltage drives
- HVDC
- Static VAR compensators
- Exciter systems
- General purpose drives for general purpose line voltage rectifiers (power supplies)

Product Advantages

- Excellent high surge capability and I^2t ratings
- Engineered silicon design provides significant benefits for series or parallel connections with lower leakage currents and better turn-on speed to achieve excellent voltage sharing under demanding operating conditions for critical capital equipment.
- Excellent switching performance over a wide range of voltage, current, and di/dt
- Alloyed construction and gate design provide greater reliability than the design used by other manufacturers.

Bar Code Scanner



Line-up Table

Part Number	Voltage* ¹ (V)	Current Rating* ² (A)
T8KC-3203DH	6000-6500	325
T9KC-0603DH	6000-6500	600
TAKC-1103DH	6000-6500	1100
TBKC-1203DH	6000-6500	1250
TBSC-1402DH	5500-6500	1400

*1 5500V devices available by special request

*2 Selected devices available with up to 15% increased current ratings. Please contact GlobalSales @pwr.com.

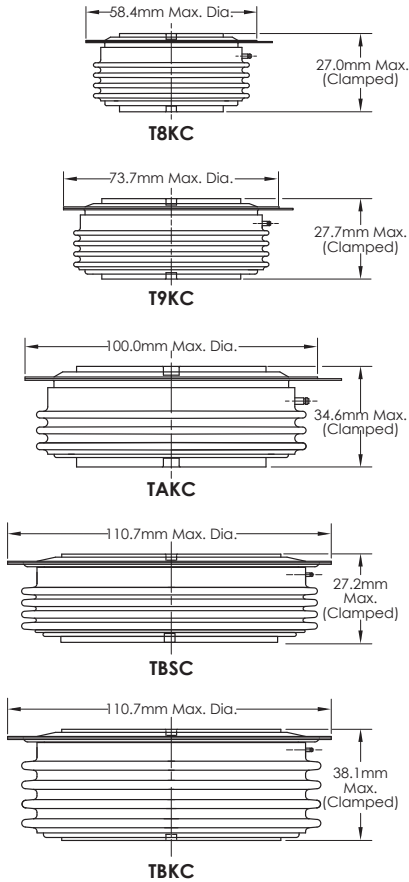


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Serving Our Customers Through Expertise, Innovation and Reliability

Series Connection Matching

SCR Packages



Why Match SCRs?

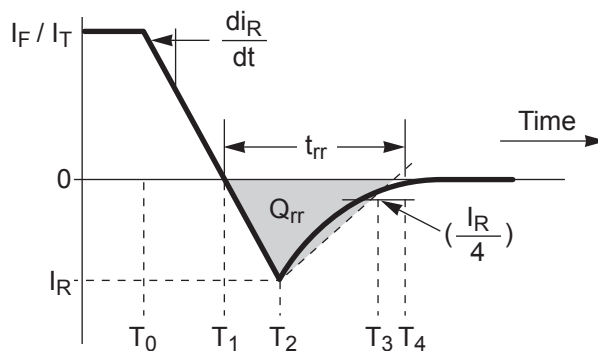
Powerex has demonstrated success with multiple customers for matching SCRs in a series connection. Series connected SCRs are matched to turn off at the same time with similar reverse recovery current. Series connection matching, measured by Powerex, avoids Q_{rr} or I_{rm} estimation and inaccuracy. Matching also allows for the use of similar and more cost effective snubber components.

Turn-on matching allows SCRs to turn on normally within 1 to 1.5 μ sec. Powerex has in-house full di/dt testing capability to JEDEC standards.

SCR PIV voltage rating requires a 2.25 / 2.5X line-to-line ratio along with appropriate sized snubbers and a typical motor load.

- 4160V needs to be ≥ 10.4 kV total (or 3 SCRs $\geq \sim 3500$ V PIV).
- Must consider input voltage tolerances, such as +10%, (typically more of a concern with low voltage than medium voltage).
- By using a higher voltage rated device, one can have more margin for reliability by allowing SCRs to run hotter and trading off blocking voltage for more current capability or using smaller snubbers and allowing a higher ring-up voltage.
- Larger SCRs should be considered if there is a short-circuit withstand requirement.
- Powerex expertise in soft starter applications extends to low voltage 480V/600V/690V line-to-line voltages.
- HV 6500 mating diodes available from Powerex.
- Rupture-proof resistant robust designs available upon request.

Reverse Recovery Waveform and Parameter Definitions



I_{RR} (hot)

$\Delta = 2A$ for 8-size SCRs

4A for 9-size SCRs

5A for B-size SCRs

For more information:

visit: <http://www.pwr.com/summary/DiscreteThyristor-SCR.aspx>

email: globalsales@pwr.com

phone: 724-925-7272, Option 3 (Applications Engineering Assistance)

