

Thyristor, Diode and IGBT Modules



SEMIKRON invented the SEMIPACK®, the beginning of a new industry standard for isolated power semiconductor modules. The SEMIKRON power modules represent quality, continued innovation and engineering know-how that reduce customer design time and time to market.

SEMIKRON today produces over 1500 different power modules comprising diode, thyristor, MOS and IGBT technology.

Power levels of SEMIKRON's power electronic systems range from 1 kW to over 1 MW. Most important of all, the customer can take advantage of SEMIKRON's product performance and expertise for the reliability and performance of his equipment.

SEMIKRON has a complete catalog with all data-sheets on our web site at [www.semikron.com](http://www.semikron.com). For additional applications engineering support, please call 1-800-258-1308.

SEMIPACK® Thyristor/Diode Modules

Thyristor/Diode Modules

- Features**

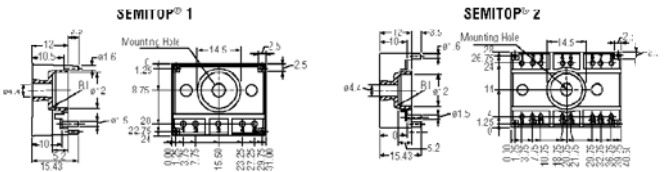
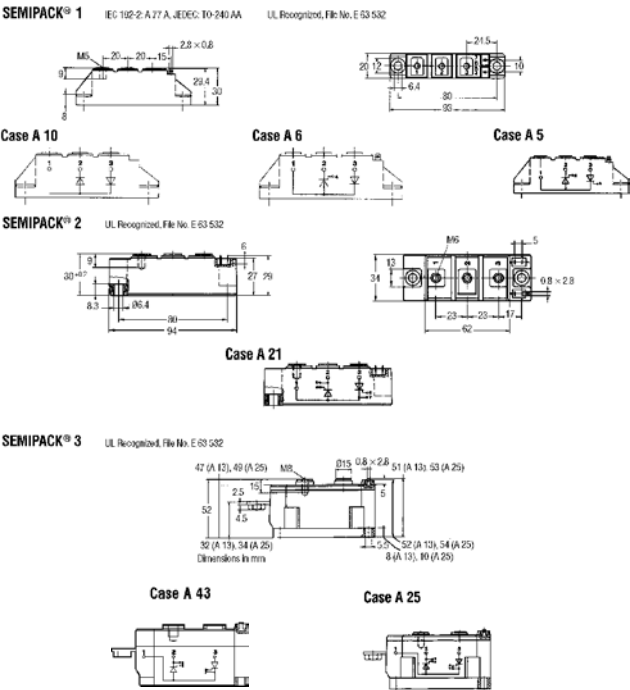
  - Heat Transfer through Ceramic Isolated Metal Baseplate
  - Hard Soldered Joints for High Reliability
  - UL Recognized; File No. E 63 532
  - Free of BEO Ceramic
- SEMIPACK® 1 and 2 Features**

  - DCB Ceramic (Aluminum Oxide)
  - Glass Passivated Thyristor Chips
- SEMIPACK® 3 Features**

  - Heat Transfer through AlN Ceramic Isolated Metal Baseplate
  - Precious Metal Pressure Contacts for High Reliability
- Typical Applications**

  - DC Motor Control, i.e. for Machine Tools
  - Temperature Control, i.e. for Ovens, Chemical Processes
  - Professional Light Dimming
  - Non-Controllable Rectifiers for AC/AC Converters
  - Line Rectifiers for Transistorized AC Motor Controllers
  - Field Supply for DC Motors
  - Soft Starters for Induction Motors

| Mfr.'s Type  | V <sub>ORM</sub><br>V <sub>ORM</sub> (V) | I <sub>TRMS</sub><br>I <sub>TRMS</sub> (A) | I <sub>TAV</sub> @ T <sub>case</sub> |      | I <sub>TSM</sub> /I <sub>FSM</sub><br>25°C; 10 ms (A) | I <sub>T</sub><br>(A's) | T <sub>J</sub><br>Max. (°C) | R <sub>thJC</sub><br>Sin. 180 (°C/W) | SEMIPACK® | Case/<br>Circuit Diagram |
|--------------|------------------------------------------|--------------------------------------------|--------------------------------------|------|-------------------------------------------------------|-------------------------|-----------------------------|--------------------------------------|-----------|--------------------------|
|              |                                          |                                            | I <sub>FAV</sub><br>(A)              | (°C) |                                                       |                         |                             |                                      |           |                          |
| SKKD 46/16   | 1600                                     | 90                                         | 45                                   | 86   | 700                                                   | 2450                    | 125                         | 0.600                                | 1         | A 10                     |
| SKKD 81/16   | 1600                                     | 140                                        | 80                                   | 87   | 2000                                                  | 20000                   | 125                         | 0.400                                | 1         | A 10                     |
| SKKH 41/16E  | 1600                                     | 75                                         | 40                                   | 85   | 1000                                                  | 5000                    | 125                         | 0.690                                | 1         | A 6                      |
| SKKH 91/12E  | 1200                                     | 150                                        | 95                                   | 85   | 2000                                                  | 20000                   | 125                         | 0.300                                | 1         | A 6                      |
| SKKH 91/16E  | 1600                                     | 150                                        | 95                                   | 85   | 2000                                                  | 20000                   | 125                         | 0.300                                | 1         | A 6                      |
| SKKH 105/16E | 1600                                     | 180                                        | 106                                  | 85   | 2250                                                  | 25000                   | 130                         | 0.300                                | 1         | A 6                      |
| SKKT 41/12E  | 1200                                     | 75                                         | 40                                   | 85   | 1000                                                  | 5000                    | 125                         | 0.690                                | 1         | A 5                      |
| SKKT 41/16E  | 1600                                     | 75                                         | 40                                   | 85   | 1000                                                  | 5000                    | 125                         | 0.690                                | 1         | A 5                      |
| SKKT 56/12E  | 1200                                     | 95                                         | 55                                   | 80   | 1500                                                  | 11000                   | 125                         | 0.600                                | 1         | A 5                      |
| SKKT 56/16E  | 1600                                     | 95                                         | 55                                   | 80   | 1500                                                  | 11000                   | 125                         | 0.600                                | 1         | A 5                      |
| SKKT 91/12E  | 1200                                     | 150                                        | 95                                   | 85   | 2000                                                  | 20000                   | 125                         | 0.300                                | 1         | A 5                      |
| SKKT 91/16E  | 1600                                     | 150                                        | 95                                   | 85   | 2000                                                  | 20000                   | 125                         | 0.300                                | 1         | A 5                      |
| SKKT 122/16E | 1600                                     | 195                                        | 122                                  | 88   | 3600                                                  | 51200                   | 130                         | 0.210                                | 2         | A 21                     |
| SKKT 132/12E | 1200                                     | 220                                        | 130                                  | 87   | 4700                                                  | 110000                  | 125                         | 0.190                                | 2         | A 21                     |
| SKKT 132/16E | 1600                                     | 220                                        | 130                                  | 87   | 4700                                                  | 110000                  | 125                         | 0.190                                | 2         | A 21                     |
| SKKT 253/12E | 1200                                     | 420                                        | 253                                  | 85   | 9000                                                  | 320000                  | 130                         | 0.115                                | 3         | A 43                     |
| SKKT 253/16E | 1600                                     | 420                                        | 253                                  | 85   | 9000                                                  | 320000                  | 130                         | 0.115                                | 3         | A 43                     |
| SKKT 250/12E | 1200                                     | 420                                        | 250                                  | 85   | 9000                                                  | 405000                  | 130                         | 0.150                                | 3         | A 25                     |
| SKKT 250/16E | 1600                                     | 420                                        | 250                                  | 85   | 9000                                                  | 405000                  | 130                         | 0.150                                | 3         | A 25                     |



SEMITOP®

Thyristor Modules for AC Controllers

- Features**

  - MOS Input (Voltage Controlled)
  - N Channel Homogenous Si
  - Low Inductance
  - Very Low Tail Current with Low Temperature Dependence
- Typical Applications**

  - Switching (Not for Linear Use)
  - Small Inverters
- One Screw Mounting**

**► Compact Design**

**► Low Thermal Impedance Due to Durable Ceramic Insulation**

| Mfr.'s Type | V <sub>ORM</sub><br>V <sub>ORM</sub> (V) | I <sub>TRMS</sub> @ T <sub>J</sub> =85°C<br>Max. (A) | I <sub>TSM</sub><br>25°C; 10 ms (A) | I <sub>T</sub><br>(A's) | R <sub>thJC</sub> *<br>Sin. 180 (°C/W) | T <sub>J</sub><br>Max. (°C) | Circuit            | SEMITOP® | Schematic |
|-------------|------------------------------------------|------------------------------------------------------|-------------------------------------|-------------------------|----------------------------------------|-----------------------------|--------------------|----------|-----------|
| SK 45KQ12   | 1200                                     | 45                                                   | 450                                 | 1000                    | 1.30                                   | 125                         | Dual SCR AC Switch | 1        | KQ        |
| SK 45KQ16   | 1600                                     | 45                                                   | 450                                 | 1000                    | 1.30                                   | 125                         | Dual SCR AC Switch | 1        | KQ        |
| SK 70KQ12   | 1200                                     | 70                                                   | 1000                                | 5000                    | 0.90                                   | 125                         | Dual SCR AC Switch | 1        | KQ        |
| SK 70KQ16   | 1600                                     | 70                                                   | 1000                                | 5000                    | 0.90                                   | 125                         | Dual SCR AC Switch | 1        | KQ        |
| SK 100KQ12  | 1200                                     | 100                                                  | 1500                                | 11250                   | 0.65                                   | 125                         | Dual SCR AC Switch | 2        | KQ        |
| SK 100KQ16  | 1600                                     | 100                                                  | 1500                                | 11250                   | 0.65                                   | 125                         | Dual SCR AC Switch | 2        | KQ        |
| SK 120KQ12  | 1200                                     | 120                                                  | 2000                                | 20000                   | 0.55                                   | 125                         | Dual SCR AC Switch | 2        | KQ        |
| SK 120KQ16  | 1600                                     | 120                                                  | 2000                                | 20000                   | 0.55                                   | 125                         | Dual SCR AC Switch | 2        | KQ        |

\*Per thyristor.

IGBT Modules

- Features**

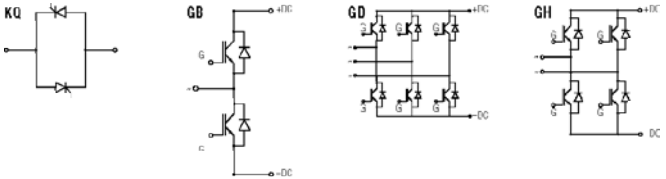
  - Glass Passivated Thyristor Chips
  - Heat Transfer through Direct Copper Bonded Aluminum Oxide
- Typical Applications**

  - Soft Starters
  - Light Control
- Ceramic Base Plate**

**► Up to 1600 V Reverse Voltage**

**► High Surge Currents**

| Mfr.'s Type | V <sub>CE</sub><br>(V) | I <sub>C</sub> @ T <sub>J</sub> =25°C<br>(A) | V <sub>CE</sub> @ I <sub>C</sub><br>25°C Typ. |     | R <sub>thJC</sub><br>IGBT Max. (°C/W) | E <sub>sw</sub> (mJ) Typ.<br>I <sub>C</sub> @ T <sub>J</sub> =80°C | Circuit               | SEMITOP® | Schematic |
|-------------|------------------------|----------------------------------------------|-----------------------------------------------|-----|---------------------------------------|--------------------------------------------------------------------|-----------------------|----------|-----------|
|             |                        |                                              | (V)                                           | (A) |                                       |                                                                    |                       |          |           |
| SK 25GB063  | 600                    | 30                                           | 2.1                                           | 30  | 1.00                                  | 1.7                                                                | Dual IGBT Half Bridge | 1        | GB        |
| SK 45GB063  | 600                    | 45                                           | 1.8                                           | 30  | 1.00                                  | 2.5                                                                | Dual IGBT Half Bridge | 2        | GB        |
| SK 30GB123  | 1200                   | 33                                           | 2.5                                           | 25  | 1.00                                  | 5.5                                                                | Dual IGBT Half Bridge | 2        | GB        |
| SK 25GD063  | 600                    | 30                                           | 2.1                                           | 30  | 1.00                                  | 1.7                                                                | 3 Phase Bridge        | 3        | GD        |
| SK 45GD063  | 600                    | 45                                           | 1.8                                           | 30  | 0.85                                  | 3.5                                                                | 3 Phase Bridge        | 3        | GD        |
| SK 20GD123  | 1200                   | 23                                           | 2.5                                           | 15  | 1.00                                  | 4.0                                                                | 3 Phase Bridge        | 3        | GD        |
| SK 15GH063  | 600                    | 20                                           | 2.1                                           | 15  | 2.80                                  | 2.1                                                                | IGBT H-Bridge         | 2        | GH        |
| SK 25GH063  | 600                    | 30                                           | 2.1                                           | 30  | 1.00                                  | 1.7                                                                | IGBT H-Bridge         | 2        | GH        |
| SK 45GH063  | 600                    | 45                                           | 1.8                                           | 30  | 0.85                                  | 2.5                                                                | IGBT H-Bridge         | 3        | GH        |
| SK 20GH123  | 1200                   | 23                                           | 2.5                                           | 15  | 1.00                                  | 4.0                                                                | IGBT H-Bridge         | 2        | GH        |
| SK 30GH123  | 1200                   | 33                                           | 2.5                                           | 25  | 0.85                                  | 5.5                                                                | IGBT H-Bridge         | 3        | GH        |



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