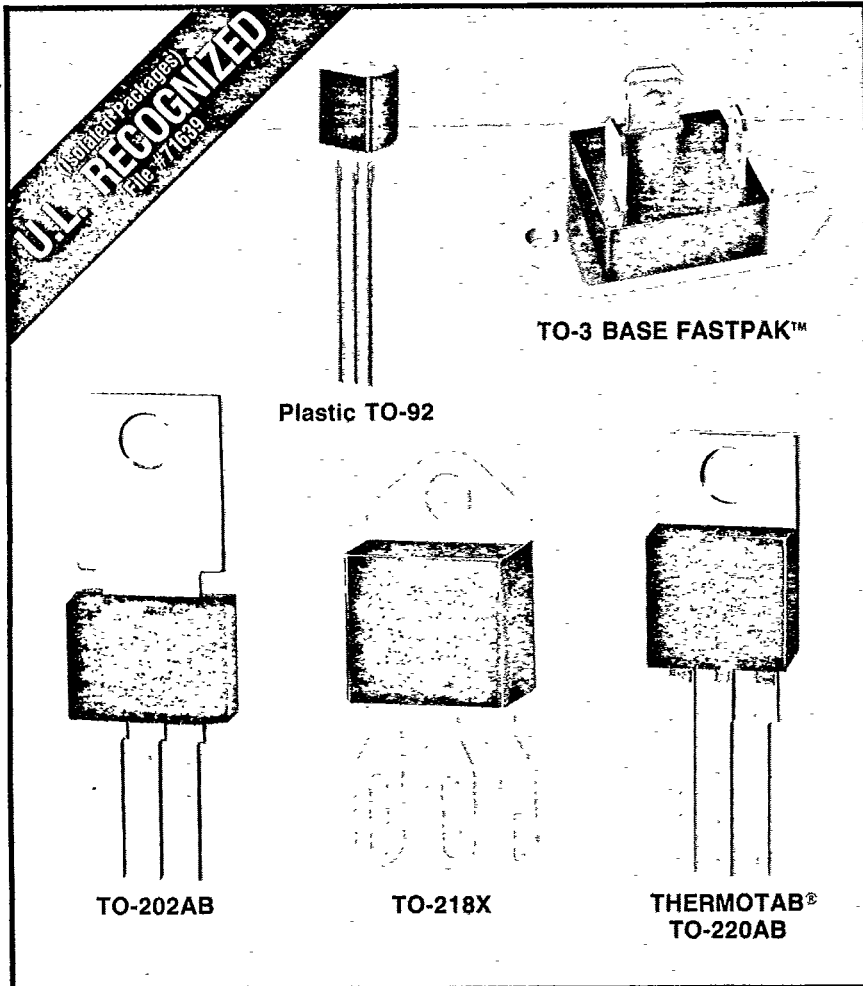




1801 HURD DRIVE  
IRVING, TEXAS 75038-4385  
PHONE 214/580-1515  
TWX 910-860-5068  
TELEX 79-1600

## SCR's 1-70 AMPS

### NON-SENSITIVE GATE

#### General Information

The Teccor Electronics line of thyristor SCR semiconductors are half-wave unidirectional gate-controlled rectifiers which complement Teccor's line of sensitive gate SCR's. Teccor offers devices with current ratings from 1-70 Amps and Voltage ratings from 30-600 Volts with gate sensitivities from 10-50 milliamps. If gate currents in the 1-500 microamp ranges are required, please consult Teccor's sensitive gate SCR technical data sheets.

#### Electrically Isolated Packages

Teccor's SCR's are available in a choice of 8 different device packages. Four of the 8 packages are offered in electrically isolated construction where the case or tab is internally isolated to allow

the use of low cost assembly and convenient packaging techniques.

The Teccor line of SCR's features glass passivated device junctions to insure long term device reliability and parameter stability. Teccor's glass offers a rugged, reliable barrier against junction contamination.

#### Features

- Electrically Isolated Packages
- High Voltage Capability — 30-600 Volts
- High Surge Capability — up to 950 Amps
- Glass Passivated Chip

# SCR's—Non Sensitive Gate

| TYPE                                                      | Part Number                                                                       |                                                                                   |                                                                                   |                                                                                   |                                                                                   | IT                               |        | VDRM & VRRM | IGT                                                 |                                                                | IDRM & IRRM                                            |           |            | VTM                                                                | VGT                                                            |       |
|-----------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|----------------------------------|--------|-------------|-----------------------------------------------------|----------------------------------------------------------------|--------------------------------------------------------|-----------|------------|--------------------------------------------------------------------|----------------------------------------------------------------|-------|
|                                                           | Isolated                                                                          |                                                                                   | Non-Isolated                                                                      |                                                                                   |                                                                                   | Maximum On-State Current (1) (2) |        |             | Repetitive Peak Off-State Forward & Reverse Voltage | DC Gate-Trigger Current<br>VD = 12 VDC<br>RL = 60Ω<br>(4) (12) | Peak Off-State Forward & Reverse Current @ VDRM & VRRM |           |            | Peak On-State Voltage at Max Rated RMS Current<br>TC = 25°C<br>(3) | DC Gate-Trigger Voltage<br>VD = 12 VDC<br>RL = 60Ω<br>(8) (13) |       |
|                                                           |  |  |  |  |  | Amps                             |        | mA          |                                                     |                                                                | Volts                                                  |           |            |                                                                    |                                                                |       |
|                                                           |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   | IT(RMS)                          | IT(AV) | Volts       |                                                     |                                                                | mA                                                     | TC = 25°C | TC = 100°C |                                                                    | TC = 125°C                                                     | Volts |
| FOR DIMENSIONAL OUTLINES & PACKAGE VARIATIONS SEE PAGE 67 |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   | MAX                              | MAX    | MIN         | MIN                                                 | MAX                                                            | MAXIMUM                                                |           |            | MAX                                                                | MAX                                                            | MIN   |
| 1 Amp                                                     | S031E                                                                             |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 1.0                              | 0.64   | 30          | 1                                                   | 10                                                             | .01                                                    | 0.2       | 0.5        | 1.6                                                                | 1.5                                                            | 0.2   |
|                                                           | S051E                                                                             |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 1.0                              | 0.64   | 50          | 1                                                   | 10                                                             | .01                                                    | 0.2       | 0.5        | 1.6                                                                | 1.5                                                            | 0.2   |
|                                                           | S101E                                                                             |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 1.0                              | 0.64   | 100         | 1                                                   | 10                                                             | .01                                                    | 0.2       | 0.5        | 1.6                                                                | 1.5                                                            | 0.2   |
|                                                           | S201E                                                                             |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 1.0                              | 0.64   | 200         | 1                                                   | 10                                                             | .01                                                    | 0.2       | 0.5        | 1.6                                                                | 1.5                                                            | 0.2   |
|                                                           | S401E                                                                             |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 1.0                              | 0.64   | 400         | 1                                                   | 10                                                             | .01                                                    | 0.2       | 0.5        | 1.6                                                                | 1.5                                                            | 0.2   |
|                                                           | S601E                                                                             |                                                                                   |                                                                                   |                                                                                   |                                                                                   | 1.0                              | 0.64   | 600         | 1                                                   | 10                                                             | .01                                                    | 0.2       | 0.5        | 1.6                                                                | 1.5                                                            | 0.2   |
| 1.6 Amps                                                  |                                                                                   | S0301L                                                                            |                                                                                   |                                                                                   |                                                                                   | 1.6                              | 1.0    | 30          | 1                                                   | 10                                                             | .01                                                    | 0.2       | 0.5        | 1.6                                                                | 1.5                                                            | 0.2   |
|                                                           |                                                                                   | S0501L                                                                            |                                                                                   |                                                                                   |                                                                                   | 1.6                              | 1.0    | 50          | 1                                                   | 10                                                             | .01                                                    | 0.2       | 0.5        | 1.6                                                                | 1.5                                                            | 0.2   |
|                                                           |                                                                                   | S1001L                                                                            |                                                                                   |                                                                                   |                                                                                   | 1.6                              | 1.0    | 100         | 1                                                   | 10                                                             | .01                                                    | 0.2       | 0.5        | 1.6                                                                | 1.5                                                            | 0.2   |
|                                                           |                                                                                   | S2001L                                                                            |                                                                                   |                                                                                   |                                                                                   | 1.6                              | 1.0    | 200         | 1                                                   | 10                                                             | .01                                                    | 0.2       | 0.5        | 1.6                                                                | 1.5                                                            | 0.2   |
|                                                           |                                                                                   | S4001L                                                                            |                                                                                   |                                                                                   |                                                                                   | 1.6                              | 1.0    | 400         | 1                                                   | 10                                                             | .01                                                    | 0.2       | 0.5        | 1.6                                                                | 1.5                                                            | 0.2   |
|                                                           |                                                                                   | S6001L                                                                            |                                                                                   |                                                                                   |                                                                                   | 1.6                              | 1.0    | 600         | 1                                                   | 10                                                             | .01                                                    | 0.2       | 0.5        | 1.6                                                                | 1.5                                                            | 0.2   |
| 3 Amps                                                    |                                                                                   | S0303L                                                                            |                                                                                   |                                                                                   |                                                                                   | 3.0                              | 1.9    | 30          | 1                                                   | 10                                                             | .01                                                    | 0.2       | 0.5        | 1.6                                                                | 1.5                                                            | 0.2   |
|                                                           |                                                                                   | S0503L                                                                            |                                                                                   |                                                                                   |                                                                                   | 3.0                              | 1.9    | 50          | 1                                                   | 10                                                             | .01                                                    | 0.2       | 0.5        | 1.6                                                                | 1.5                                                            | 0.2   |
|                                                           |                                                                                   | S1003L                                                                            |                                                                                   |                                                                                   |                                                                                   | 3.0                              | 1.9    | 100         | 1                                                   | 10                                                             | .01                                                    | 0.2       | 0.5        | 1.6                                                                | 1.5                                                            | 0.2   |
|                                                           |                                                                                   | S2003L                                                                            |                                                                                   |                                                                                   |                                                                                   | 3.0                              | 1.9    | 200         | 1                                                   | 10                                                             | .01                                                    | 0.2       | 0.5        | 1.6                                                                | 1.5                                                            | 0.2   |
|                                                           |                                                                                   | S4003L                                                                            |                                                                                   |                                                                                   |                                                                                   | 3.0                              | 1.9    | 400         | 1                                                   | 10                                                             | .01                                                    | 0.2       | 0.5        | 1.6                                                                | 1.5                                                            | 0.2   |
|                                                           |                                                                                   | S6003L                                                                            |                                                                                   |                                                                                   |                                                                                   | 3.0                              | 1.9    | 600         | 1                                                   | 10                                                             | .01                                                    | 0.2       | 0.5        | 1.6                                                                | 1.5                                                            | 0.2   |
| 4 Amps                                                    |                                                                                   |                                                                                   | S0304F1                                                                           | S0304N1                                                                           |                                                                                   | 4.0                              | 2.5    | 30          | 1                                                   | 10                                                             | .01                                                    | 0.2       | 0.5        | 1.6                                                                | 1.5                                                            | 0.2   |
|                                                           |                                                                                   |                                                                                   | S0504F1                                                                           | S0504N1                                                                           |                                                                                   | 4.0                              | 2.5    | 50          | 1                                                   | 10                                                             | .01                                                    | 0.2       | 0.5        | 1.6                                                                | 1.5                                                            | 0.2   |
|                                                           |                                                                                   |                                                                                   | S1004F1                                                                           | S1004N1                                                                           |                                                                                   | 4.0                              | 2.5    | 100         | 1                                                   | 10                                                             | .01                                                    | 0.2       | 0.5        | 1.6                                                                | 1.5                                                            | 0.2   |
|                                                           |                                                                                   |                                                                                   | S2004F1                                                                           | S2004N1                                                                           |                                                                                   | 4.0                              | 2.5    | 200         | 1                                                   | 10                                                             | .01                                                    | 0.2       | 0.5        | 1.6                                                                | 1.5                                                            | 0.2   |
|                                                           |                                                                                   |                                                                                   | S4004F1                                                                           | S4004N1                                                                           |                                                                                   | 4.0                              | 2.5    | 400         | 1                                                   | 10                                                             | .01                                                    | 0.2       | 0.5        | 1.6                                                                | 1.5                                                            | 0.2   |
|                                                           |                                                                                   |                                                                                   | S6004F1                                                                           | S6004N1                                                                           |                                                                                   | 4.0                              | 2.5    | 600         | 1                                                   | 10                                                             | .01                                                    | 0.2       | 0.5        | 1.6                                                                | 1.5                                                            | 0.2   |
| 6 Amps                                                    |                                                                                   | S0306L                                                                            | S0306F1                                                                           |                                                                                   |                                                                                   | 6.0                              | 3.8    | 30          | 1                                                   | 15                                                             | .01                                                    | 0.2       | 0.5        | 1.6                                                                | 1.5                                                            | 0.2   |
|                                                           |                                                                                   | S0506L                                                                            | S0506F1                                                                           |                                                                                   |                                                                                   | 6.0                              | 3.8    | 50          | 1                                                   | 15                                                             | .01                                                    | 0.2       | 0.5        | 1.6                                                                | 1.5                                                            | 0.2   |
|                                                           |                                                                                   | S1006L                                                                            | S1006F1                                                                           |                                                                                   |                                                                                   | 6.0                              | 3.8    | 100         | 1                                                   | 15                                                             | .01                                                    | 0.2       | 0.5        | 1.6                                                                | 1.5                                                            | 0.2   |
|                                                           |                                                                                   | S2006L                                                                            | S2006F1                                                                           |                                                                                   |                                                                                   | 6.0                              | 3.8    | 200         | 1                                                   | 15                                                             | .01                                                    | 0.2       | 0.5        | 1.6                                                                | 1.5                                                            | 0.2   |
|                                                           |                                                                                   | S4006L                                                                            | S4006F1                                                                           |                                                                                   |                                                                                   | 6.0                              | 3.8    | 400         | 1                                                   | 15                                                             | .01                                                    | 0.2       | 0.5        | 1.6                                                                | 1.5                                                            | 0.2   |
|                                                           |                                                                                   | S6006L                                                                            | S6006F1                                                                           |                                                                                   |                                                                                   | 6.0                              | 3.8    | 600         | 1                                                   | 15                                                             | .01                                                    | 0.2       | 0.5        | 1.6                                                                | 1.5                                                            | 0.2   |
| 8 Amps                                                    |                                                                                   | S0308L                                                                            | S0308F1                                                                           |                                                                                   | S0308R                                                                            | 8.0                              | 5.1    | 30          | 1                                                   | 15                                                             | .01                                                    | 0.2       | 0.5        | 1.6                                                                | 1.5                                                            | 0.2   |
|                                                           |                                                                                   | S0508L                                                                            | S0508F1                                                                           |                                                                                   | S0508R                                                                            | 8.0                              | 5.1    | 50          | 1                                                   | 15                                                             | .01                                                    | 0.2       | 0.5        | 1.6                                                                | 1.5                                                            | 0.2   |
|                                                           |                                                                                   | S1008L                                                                            | S1008F1                                                                           |                                                                                   | S1008R                                                                            | 8.0                              | 5.1    | 100         | 1                                                   | 15                                                             | .01                                                    | 0.2       | 0.5        | 1.6                                                                | 1.5                                                            | 0.2   |
|                                                           |                                                                                   | S2008L                                                                            | S2008F1                                                                           |                                                                                   | S2008R                                                                            | 8.0                              | 5.1    | 200         | 1                                                   | 15                                                             | .01                                                    | 0.2       | 0.5        | 1.6                                                                | 1.5                                                            | 0.2   |
|                                                           |                                                                                   | S4008L                                                                            | S4008F1                                                                           |                                                                                   | S4008R                                                                            | 8.0                              | 5.1    | 400         | 1                                                   | 15                                                             | .01                                                    | 0.2       | 0.5        | 1.6                                                                | 1.5                                                            | 0.2   |
|                                                           |                                                                                   | S6008L                                                                            | S6008F1                                                                           |                                                                                   | S6008R                                                                            | 8.0                              | 5.1    | 600         | 1                                                   | 15                                                             | .01                                                    | 0.2       | 0.5        | 1.6                                                                | 1.5                                                            | 0.2   |
|                                                           |                                                                                   |                                                                                   |                                                                                   |                                                                                   | C122F                                                                             | 8.0                              | 5.1    | 50          |                                                     | 25                                                             | 0.1                                                    | 0.5       |            | 1.83                                                               | 1.5                                                            | 0.2   |
|                                                           |                                                                                   |                                                                                   |                                                                                   |                                                                                   | C122A                                                                             | 8.0                              | 5.1    | 100         |                                                     | 25                                                             | 0.1                                                    | 0.5       |            | 1.83                                                               | 1.5                                                            | 0.2   |
|                                                           |                                                                                   |                                                                                   |                                                                                   |                                                                                   | C122B                                                                             | 8.0                              | 5.1    | 200         |                                                     | 25                                                             | 0.1                                                    | 0.5       |            | 1.83                                                               | 1.5                                                            | 0.2   |
|                                                           |                                                                                   |                                                                                   |                                                                                   |                                                                                   | C122C                                                                             | 8.0                              | 5.1    | 300         |                                                     | 25                                                             | 0.1                                                    | 0.5       |            | 1.83                                                               | 1.5                                                            | 0.2   |
|                                                           |                                                                                   |                                                                                   |                                                                                   |                                                                                   | C122D                                                                             | 8.0                              | 5.1    | 400         |                                                     | 25                                                             | 0.1                                                    | 0.5       |            | 1.83                                                               | 1.5                                                            | 0.2   |
|                                                           |                                                                                   |                                                                                   |                                                                                   |                                                                                   | C122E                                                                             | 8.0                              | 5.1    | 500         |                                                     | 25                                                             | 0.1                                                    | 0.5       |            | 1.83                                                               | 1.5                                                            | 0.2   |
|                                                           |                                                                                   |                                                                                   |                                                                                   |                                                                                   | C122M                                                                             | 8.0                              | 5.1    | 600         |                                                     | 25                                                             | 0.1                                                    | 0.5       |            | 1.83                                                               | 1.5                                                            | 0.2   |

## GENERAL NOTES

- Teccor's 2N6394 Series, 2N6400 Series, and 2N6504 Series devices conform to all JEDEC registered data.
- All measurements are made at 60 Hz with a resistive load at an ambient temperature of +25°C unless otherwise specified.
- Operating temperature range (T<sub>J</sub>) is -65°C to +125°C for TO-92 devices, 0°C to +125°C for Fastpak, and -40°C to +125°C for all other packages.

- Storage temperature range (T<sub>S</sub>) is -65°C to +150°C for TO-92 devices, -40°C to +150°C for TO-202 and TO-220 devices, -20°C to +125°C for Fastpak and -40°C to +125°C for all others.
- Lead solder temperature is a maximum of 230°C for 10 seconds maximum; 1/16" from case.
- The case temperature (T<sub>C</sub>) is measured as shown on dimensional outline drawings. See "package dimensions" section of catalog.

## Electrical Specifications

|  | I <sub>H</sub>                        | I <sub>GM</sub>        | P <sub>GM</sub>                  | P <sub>G(AV)</sub>             | I <sub>TSM</sub>                              |      | dv/dt                                    |            | I <sup>2</sup> t                                                                | di/dt                                                                                 | t <sub>gt</sub>                                                                             | t <sub>q</sub>                            |    |
|--|---------------------------------------|------------------------|----------------------------------|--------------------------------|-----------------------------------------------|------|------------------------------------------|------------|---------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|-------------------------------------------|----|
|  | DC Holding Current Gate Open (5) (14) | Peak Gate Current (11) | Peak Gate Power Dissipation (11) | Average Gate Power Dissipation | Peak One Cycle Surge Forward Current (6) (10) |      | Critical Rate of Applied Forward Voltage |            | RMS Surge (Non-Repetitive) On-State Current For a Period of 8.3 msec for Fusing | Maximum Rate of Rise of On-State Current I <sub>GT</sub> = 150mA With 0.1μs Rise Time | Gate Controlled Turn-On Time Gate Pulse = 100mA Min. Width = 5μs With Rise Time ≤ 0.1μs (7) | Circuit Commutated Turn-Off Time (9) (10) |    |
|  |                                       |                        |                                  |                                | Amps                                          |      | Volts/μs                                 |            |                                                                                 |                                                                                       |                                                                                             |                                           |    |
|  | mA                                    | Amps                   | Watts                            | Watts                          | 60Hz                                          | 50Hz | TC = 100°C                               | TC = 125°C |                                                                                 | Amps²sec                                                                              | Amps/μs                                                                                     | μs                                        | μs |
|  | MAX                                   | MAX                    |                                  |                                | MAX                                           | MAX  | MIN                                      | MIN        |                                                                                 |                                                                                       | MAX                                                                                         | MAX                                       |    |
|  | 20                                    | 1.5                    | 15                               | 0.3                            | 30                                            | 25   | 40                                       | 30         | 3.7                                                                             | 50                                                                                    | 2.0                                                                                         | 35                                        |    |
|  | 20                                    | 1.5                    | 15                               | 0.3                            | 30                                            | 25   | 40                                       | 30         | 3.7                                                                             | 50                                                                                    | 2.0                                                                                         | 35                                        |    |
|  | 20                                    | 1.5                    | 15                               | 0.3                            | 30                                            | 25   | 40                                       | 30         | 3.7                                                                             | 50                                                                                    | 2.0                                                                                         | 35                                        |    |
|  | 20                                    | 1.5                    | 15                               | 0.3                            | 30                                            | 25   | 40                                       | 30         | 3.7                                                                             | 50                                                                                    | 2.0                                                                                         | 35                                        |    |
|  | 20                                    | 1.5                    | 15                               | 0.3                            | 30                                            | 25   | 30                                       | 20         | 3.7                                                                             | 50                                                                                    | 2.0                                                                                         | 35                                        |    |
|  | 20                                    | 1.5                    | 15                               | 0.3                            | 30                                            | 25   | 30                                       | 20         | 3.7                                                                             | 50                                                                                    | 2.0                                                                                         | 35                                        |    |
|  | 20                                    | 1.5                    | 15                               | 0.3                            | 30                                            | 25   | 40                                       | 30         | 3.7                                                                             | 50                                                                                    | 2.0                                                                                         | 35                                        |    |
|  | 20                                    | 1.5                    | 15                               | 0.3                            | 30                                            | 25   | 40                                       | 30         | 3.7                                                                             | 50                                                                                    | 2.0                                                                                         | 35                                        |    |
|  | 20                                    | 1.5                    | 15                               | 0.3                            | 30                                            | 25   | 40                                       | 30         | 3.7                                                                             | 50                                                                                    | 2.0                                                                                         | 35                                        |    |
|  | 20                                    | 1.5                    | 15                               | 0.3                            | 30                                            | 25   | 30                                       | 20         | 3.7                                                                             | 50                                                                                    | 2.0                                                                                         | 35                                        |    |
|  | 20                                    | 1.5                    | 15                               | 0.3                            | 30                                            | 25   | 30                                       | 20         | 3.7                                                                             | 50                                                                                    | 2.0                                                                                         | 35                                        |    |
|  | 20                                    | 1.5                    | 15                               | 0.3                            | 30                                            | 25   | 40                                       | 30         | 3.7                                                                             | 50                                                                                    | 2.0                                                                                         | 35                                        |    |
|  | 20                                    | 1.5                    | 15                               | 0.3                            | 30                                            | 25   | 40                                       | 30         | 3.7                                                                             | 50                                                                                    | 2.0                                                                                         | 35                                        |    |
|  | 20                                    | 1.5                    | 15                               | 0.3                            | 30                                            | 25   | 40                                       | 30         | 3.7                                                                             | 50                                                                                    | 2.0                                                                                         | 35                                        |    |
|  | 20                                    | 1.5                    | 15                               | 0.3                            | 30                                            | 25   | 30                                       | 20         | 3.7                                                                             | 50                                                                                    | 2.0                                                                                         | 35                                        |    |
|  | 20                                    | 1.5                    | 15                               | 0.3                            | 30                                            | 25   | 30                                       | 20         | 3.7                                                                             | 50                                                                                    | 2.0                                                                                         | 35                                        |    |
|  | 20                                    | 1.5                    | 15                               | 0.3                            | 30                                            | 25   | 40                                       | 30         | 3.7                                                                             | 50                                                                                    | 2.0                                                                                         | 35                                        |    |
|  | 20                                    | 1.5                    | 15                               | 0.3                            | 30                                            | 25   | 40                                       | 30         | 3.7                                                                             | 50                                                                                    | 2.0                                                                                         | 35                                        |    |
|  | 20                                    | 1.5                    | 15                               | 0.3                            | 30                                            | 25   | 40                                       | 30         | 3.7                                                                             | 50                                                                                    | 2.0                                                                                         | 35                                        |    |
|  | 20                                    | 1.5                    | 15                               | 0.3                            | 30                                            | 25   | 40                                       | 30         | 3.7                                                                             | 50                                                                                    | 2.0                                                                                         | 35                                        |    |
|  | 20                                    | 1.5                    | 15                               | 0.3                            | 30                                            | 25   | 30                                       | 20         | 3.7                                                                             | 50                                                                                    | 2.0                                                                                         | 35                                        |    |
|  | 20                                    | 1.5                    | 15                               | 0.3                            | 30                                            | 25   | 30                                       | 20         | 3.7                                                                             | 50                                                                                    | 2.0                                                                                         | 35                                        |    |
|  | 30                                    | 2.0                    | 20                               | 0.5                            | 100                                           | 60   | 175                                      | 125        | 41                                                                              | 100                                                                                   | 2.0                                                                                         | 35                                        |    |
|  | 30                                    | 2.0                    | 20                               | 0.5                            | 100                                           | 60   | 175                                      | 125        | 41                                                                              | 100                                                                                   | 2.0                                                                                         | 35                                        |    |
|  | 30                                    | 2.0                    | 20                               | 0.5                            | 100                                           | 60   | 175                                      | 125        | 41                                                                              | 100                                                                                   | 2.0                                                                                         | 35                                        |    |
|  | 30                                    | 2.0                    | 20                               | 0.5                            | 100                                           | 60   | 175                                      | 125        | 41                                                                              | 100                                                                                   | 2.0                                                                                         | 35                                        |    |
|  | 30                                    | 2.0                    | 20                               | 0.5                            | 100                                           | 60   | 175                                      | 125        | 41                                                                              | 100                                                                                   | 2.0                                                                                         | 35                                        |    |
|  | 30                                    | 2.0                    | 20                               | 0.5                            | 100                                           | 60   | 175                                      | 125        | 41                                                                              | 100                                                                                   | 2.0                                                                                         | 35                                        |    |
|  | 30                                    | 2.0                    | 20                               | 0.5                            | 100                                           | 60   | 150                                      | 100        | 41                                                                              | 100                                                                                   | 2.0                                                                                         | 35                                        |    |
|  | 30                                    | 2.0                    | 20                               | 0.5                            | 100                                           | 60   | 175                                      | 125        | 41                                                                              | 100                                                                                   | 2.0                                                                                         | 35                                        |    |
|  | 30                                    | 2.0                    | 20                               | 0.5                            | 100                                           | 60   | 175                                      | 125        | 41                                                                              | 100                                                                                   | 2.0                                                                                         | 35                                        |    |
|  | 30                                    | 2.0                    | 20                               | 0.5                            | 100                                           | 60   | 175                                      | 125        | 41                                                                              | 100                                                                                   | 2.0                                                                                         | 35                                        |    |
|  | 30                                    | 2.0                    | 20                               | 0.5                            | 100                                           | 60   | 175                                      | 125        | 41                                                                              | 100                                                                                   | 2.0                                                                                         | 35                                        |    |
|  | 30                                    | 2.0                    | 20                               | 0.5                            | 100                                           | 60   | 175                                      | 125        | 41                                                                              | 100                                                                                   | 2.0                                                                                         | 35                                        |    |
|  | 30                                    | 2.0                    | 20                               | 0.5                            | 100                                           | 60   | 150                                      | 100        | 41                                                                              | 100                                                                                   | 2.0                                                                                         | 35                                        |    |
|  | 30                                    | 2.0                    | 5                                | 0.5                            | 90                                            | 82   |                                          |            | 34                                                                              | 100                                                                                   |                                                                                             |                                           |    |
|  | 30                                    | 2.0                    | 5                                | 0.5                            | 90                                            | 82   |                                          |            | 34                                                                              | 100                                                                                   |                                                                                             |                                           |    |
|  | 30                                    | 2.0                    | 5                                | 0.5                            | 90                                            | 82   |                                          |            | 34                                                                              | 100                                                                                   |                                                                                             |                                           |    |
|  | 30                                    | 2.0                    | 5                                | 0.5                            | 90                                            | 82   |                                          |            | 34                                                                              | 100                                                                                   |                                                                                             |                                           |    |
|  | 30                                    | 2.0                    | 5                                | 0.5                            | 90                                            | 82   |                                          |            | 34                                                                              | 100                                                                                   |                                                                                             |                                           |    |
|  | 30                                    | 2.0                    | 5                                | 0.5                            | 90                                            | 82   |                                          |            | 34                                                                              | 100                                                                                   |                                                                                             |                                           |    |
|  | 30                                    | 2.0                    | 5                                | 0.5                            | 90                                            | 82   |                                          |            | 34                                                                              | 100                                                                                   |                                                                                             |                                           |    |

## NOTES TO ELECTRICAL SPECIFICATIONS

- (1) See Figures 2 and 3 for current rating at specified operating case temperature.
- (2) See Figure 1 for free air current rating.
- (3) See Figure 6 for instantaneous on-state current vs on-state voltage (typical).
- (4) See Figure 5 for IGT vs TC.
- (5) See Figure 4 for IH vs TC.
- (6) For more than one full cycle rating, see Figure 9.
- (7) See Figure 8 for Igt vs IGT.
- (8) See Figure 7 for VGT vs TC.

- (9) Test conditions are as follows:  $i_T = 1$  amp for  $\leq 1.6$  amp devices and 2 amp for  $\geq 3$  amp devices. Pulse duration = 50  $\mu$ sec.  $dv/dt = 20$  V/ $\mu$ s.  $di/dt = -10$  amps/ $\mu$ s for  $\leq 1.6$  amp devices, and  $-30$  amps/ $\mu$ s for  $\geq 3$  amp devices.  $I_{GT} = 200$  mA @ turn-on
- (10) See Figure 2 (A,B,C,D,E) for maximum allowable case temperatures @ maximum rated current.
- (11) Pulse width  $\leq 3 \mu$ s.
- (12)  $I_{GT} = 40$  mA maximum @  $-40^\circ\text{C}$  for C122 devices
- (13)  $V_{GT} = 2.0$  V maximum @  $-40^\circ\text{C}$  for C122 devices.
- (14) Initial on-state current = 200 mA (DC) for 1 to 20 amp devices 400 mA (DC) for 25 to 70 amp devices.

# SCR's—Non Sensitive Gate

| TYPE                                                      | Part Number                                                                       |                                                                                   |                                                                                   | I <sub>T</sub>               |                    | V <sub>DRM</sub> & V <sub>RRM</sub>                 |  | I <sub>GT</sub>                                                          |     | I <sub>DRM</sub> & I <sub>RRM</sub>                                            |                        |                        | V <sub>TM</sub>                                                          |  | V <sub>GT</sub>                                                          |                        |
|-----------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------|--------------------|-----------------------------------------------------|--|--------------------------------------------------------------------------|-----|--------------------------------------------------------------------------------|------------------------|------------------------|--------------------------------------------------------------------------|--|--------------------------------------------------------------------------|------------------------|
|                                                           | Isolated                                                                          | Non-Isolated                                                                      |                                                                                   | Maximum On-State Current (1) |                    | Repetitive Peak Off-State Forward & Reverse Voltage |  | DC Gate-Trigger Current V <sub>D</sub> = 12 VDC R <sub>L</sub> = 60Ω (4) |     | Peak Off-State Forward & Reverse Current @ V <sub>DRM</sub> & V <sub>RRM</sub> |                        |                        | Peak On-State Voltage at Max Rated RMS Current T <sub>C</sub> = 25°C (3) |  | DC Gate-Trigger Voltage V <sub>D</sub> = 12 VDC R <sub>L</sub> = 60Ω (8) |                        |
|                                                           |  |  |  | Amps                         |                    | Volts                                               |  | mA                                                                       |     | mA                                                                             |                        |                        | Volts                                                                    |  | Volts                                                                    |                        |
|                                                           | TO-220AB                                                                          | TO-202AB                                                                          | NON-ISOLATED TO-220AB                                                             | I <sub>T(RMS)</sub>          | I <sub>T(AV)</sub> |                                                     |  |                                                                          |     | T <sub>C</sub> = 25°C                                                          | T <sub>C</sub> = 100°C | T <sub>C</sub> = 125°C |                                                                          |  | T <sub>C</sub> = 25°C                                                    | T <sub>C</sub> = 125°C |
| FOR DIMENSIONAL OUTLINES & PACKAGE VARIATIONS SEE PAGE 67 |                                                                                   |                                                                                   |                                                                                   | MAX                          | MAX                | MIN                                                 |  | MIN                                                                      | MAX | MAXIMUM                                                                        |                        |                        | MAX                                                                      |  | MAX                                                                      | MIN                    |
| 10 Amps                                                   | S0310L                                                                            | S0310F1                                                                           |                                                                                   | 10                           | 6.4                | 30                                                  |  | 1                                                                        | 15  | .01                                                                            | 0.2                    | 0.5                    | 1.6                                                                      |  | 1.5                                                                      | 0.2                    |
|                                                           | S0510L                                                                            | S0510F1                                                                           |                                                                                   | 10                           | 6.4                | 50                                                  |  | 1                                                                        | 15  | .01                                                                            | 0.2                    | 0.5                    | 1.6                                                                      |  | 1.5                                                                      | 0.2                    |
|                                                           | S1010L                                                                            | S1010F1                                                                           |                                                                                   | 10                           | 6.4                | 100                                                 |  | 1                                                                        | 15  | .01                                                                            | 0.2                    | 0.5                    | 1.6                                                                      |  | 1.5                                                                      | 0.2                    |
|                                                           | S2010L                                                                            | S2010F1                                                                           |                                                                                   | 10                           | 6.4                | 200                                                 |  | 1                                                                        | 15  | .01                                                                            | 0.2                    | 0.5                    | 1.6                                                                      |  | 1.5                                                                      | 0.2                    |
|                                                           | S4010L                                                                            | S4010F1                                                                           |                                                                                   | 10                           | 6.4                | 400                                                 |  | 1                                                                        | 15  | .01                                                                            | 0.2                    | 0.5                    | 1.6                                                                      |  | 1.5                                                                      | 0.2                    |
|                                                           | S6010L                                                                            | S6010F1                                                                           |                                                                                   | 10                           | 6.4                | 600                                                 |  | 1                                                                        | 15  | .01                                                                            | 0.2                    | 0.5                    | 1.6                                                                      |  | 1.5                                                                      | 0.2                    |
|                                                           |                                                                                   |                                                                                   | S2800F                                                                            | 10                           | 6.4                | 50                                                  |  |                                                                          | 15  |                                                                                | 2.0                    |                        | 2.0*                                                                     |  | 1.5                                                                      |                        |
|                                                           |                                                                                   |                                                                                   | S2800A                                                                            | 10                           | 6.4                | 100                                                 |  |                                                                          | 15  |                                                                                | 2.0                    |                        | 2.0*                                                                     |  | 1.5                                                                      |                        |
|                                                           |                                                                                   |                                                                                   | S2800B                                                                            | 10                           | 6.4                | 200                                                 |  |                                                                          | 15  |                                                                                | 2.0                    |                        | 2.0*                                                                     |  | 1.5                                                                      |                        |
|                                                           |                                                                                   |                                                                                   | S2800C                                                                            | 10                           | 6.4                | 300                                                 |  |                                                                          | 15  |                                                                                | 2.0                    |                        | 2.0*                                                                     |  | 1.5                                                                      |                        |
| 12 Amps                                                   |                                                                                   |                                                                                   | S2800D                                                                            | 10                           | 6.4                | 400                                                 |  |                                                                          | 15  |                                                                                | 2.0                    |                        | 2.0*                                                                     |  | 1.5                                                                      |                        |
|                                                           |                                                                                   |                                                                                   | S2800E                                                                            | 10                           | 6.4                | 500                                                 |  |                                                                          | 15  |                                                                                | 2.0                    |                        | 2.0*                                                                     |  | 1.5                                                                      |                        |
|                                                           |                                                                                   |                                                                                   | S2800M                                                                            | 10                           | 6.4                | 600                                                 |  |                                                                          | 15  |                                                                                | 2.0                    |                        | 2.0*                                                                     |  | 1.5                                                                      |                        |
|                                                           | S0312L                                                                            |                                                                                   | S0312R                                                                            | 12                           | 7.6                | 30                                                  |  | 1                                                                        | 20  | .01                                                                            | 0.5                    | 1.0                    | 1.6                                                                      |  | 1.5                                                                      | 0.2                    |
|                                                           | S0512L                                                                            |                                                                                   | S0512R                                                                            | 12                           | 7.6                | 50                                                  |  | 1                                                                        | 20  | .01                                                                            | 0.5                    | 1.0                    | 1.6                                                                      |  | 1.5                                                                      | 0.2                    |
|                                                           | S1012L                                                                            |                                                                                   | S1012R                                                                            | 12                           | 7.6                | 100                                                 |  | 1                                                                        | 20  | .01                                                                            | 0.5                    | 1.0                    | 1.6                                                                      |  | 1.5                                                                      | 0.2                    |
|                                                           | S2012L                                                                            |                                                                                   | S2012R                                                                            | 12                           | 7.6                | 200                                                 |  | 1                                                                        | 20  | .01                                                                            | 0.5                    | 1.0                    | 1.6                                                                      |  | 1.5                                                                      | 0.2                    |
|                                                           | S4012L                                                                            |                                                                                   | S4012R                                                                            | 12                           | 7.6                | 400                                                 |  | 1                                                                        | 20  | .01                                                                            | 0.5                    | 1.0                    | 1.6                                                                      |  | 1.5                                                                      | 0.2                    |
|                                                           | S6012L                                                                            |                                                                                   | S6012R                                                                            | 12                           | 7.6                | 600                                                 |  | 1                                                                        | 20  | .01                                                                            | 0.5                    | 1.0                    | 1.6                                                                      |  | 1.5                                                                      | 0.2                    |
|                                                           |                                                                                   |                                                                                   | 2N6394                                                                            | 12                           | 7.6                | 50                                                  |  |                                                                          | 30  | .01                                                                            |                        | 2.0                    | 2.2                                                                      |  | 1.5                                                                      | 0.2                    |
| 15 Amps                                                   |                                                                                   |                                                                                   | 2N6395                                                                            | 12                           | 7.6                | 100                                                 |  |                                                                          | 30  | .01                                                                            |                        | 2.0                    | 2.2                                                                      |  | 1.5                                                                      | 0.2                    |
|                                                           |                                                                                   |                                                                                   | 2N6396                                                                            | 12                           | 7.6                | 200                                                 |  |                                                                          | 30  | .01                                                                            |                        | 2.0                    | 2.2                                                                      |  | 1.5                                                                      | 0.2                    |
|                                                           |                                                                                   |                                                                                   | 2N6397                                                                            | 12                           | 7.6                | 400                                                 |  |                                                                          | 30  | .01                                                                            |                        | 2.0                    | 2.2                                                                      |  | 1.5                                                                      | 0.2                    |
|                                                           |                                                                                   |                                                                                   | 2N6398                                                                            | 12                           | 7.6                | 600                                                 |  |                                                                          | 30  | .01                                                                            |                        | 2.0                    | 2.2                                                                      |  | 1.5                                                                      | 0.2                    |
|                                                           | S0315L                                                                            |                                                                                   |                                                                                   | 15                           | 9.5                | 30                                                  |  | 1                                                                        | 30  | .01                                                                            | 0.5                    | 1.0                    | 1.6                                                                      |  | 1.5                                                                      | 0.2                    |
|                                                           | S0515L                                                                            |                                                                                   |                                                                                   | 15                           | 9.5                | 50                                                  |  | 1                                                                        | 30  | .01                                                                            | 0.5                    | 1.0                    | 1.6                                                                      |  | 1.5                                                                      | 0.2                    |
| 16 Amps                                                   | S1015L                                                                            |                                                                                   |                                                                                   | 15                           | 9.5                | 100                                                 |  | 1                                                                        | 30  | .01                                                                            | 0.5                    | 1.0                    | 1.6                                                                      |  | 1.5                                                                      | 0.2                    |
|                                                           | S2015L                                                                            |                                                                                   |                                                                                   | 15                           | 9.5                | 200                                                 |  | 1                                                                        | 30  | .01                                                                            | 0.5                    | 1.0                    | 1.6                                                                      |  | 1.5                                                                      | 0.2                    |
|                                                           | S4015L                                                                            |                                                                                   |                                                                                   | 15                           | 9.5                | 400                                                 |  | 1                                                                        | 30  | .01                                                                            | 0.5                    | 1.0                    | 1.6                                                                      |  | 1.5                                                                      | 0.2                    |
|                                                           | S6015L                                                                            |                                                                                   |                                                                                   | 15                           | 9.5                | 600                                                 |  | 1                                                                        | 30  | .01                                                                            | 0.5                    | 1.0                    | 1.6                                                                      |  | 1.5                                                                      | 0.2                    |
|                                                           |                                                                                   |                                                                                   | S0316R                                                                            | 16                           | 10                 | 30                                                  |  | 1                                                                        | 30  | .01                                                                            | 0.5                    | 1.0                    | 1.6                                                                      |  | 1.5                                                                      | 0.2                    |
|                                                           |                                                                                   |                                                                                   | S0516R                                                                            | 16                           | 10                 | 50                                                  |  | 1                                                                        | 30  | .01                                                                            | 0.5                    | 1.0                    | 1.6                                                                      |  | 1.5                                                                      | 0.2                    |
| 20 Amps                                                   |                                                                                   |                                                                                   | S1016R                                                                            | 16                           | 10                 | 100                                                 |  | 1                                                                        | 30  | .01                                                                            | 0.5                    | 1.0                    | 1.6                                                                      |  | 1.5                                                                      | 0.2                    |
|                                                           |                                                                                   |                                                                                   | S2016R                                                                            | 16                           | 10                 | 200                                                 |  | 1                                                                        | 30  | .01                                                                            | 0.5                    | 1.0                    | 1.6                                                                      |  | 1.5                                                                      | 0.2                    |
|                                                           |                                                                                   |                                                                                   | S4016R                                                                            | 16                           | 10                 | 400                                                 |  | 1                                                                        | 30  | .01                                                                            | 0.5                    | 1.0                    | 1.6                                                                      |  | 1.5                                                                      | 0.2                    |
|                                                           |                                                                                   |                                                                                   | S6016R                                                                            | 16                           | 10                 | 600                                                 |  | 1                                                                        | 30  | .01                                                                            | 0.5                    | 1.0                    | 1.6                                                                      |  | 1.5                                                                      | 0.2                    |
|                                                           |                                                                                   |                                                                                   | 2N6400                                                                            | 16                           | 10                 | 50                                                  |  |                                                                          | 30  | .01                                                                            |                        | 2.0                    | 1.7                                                                      |  | 1.5                                                                      | 0.2                    |
|                                                           |                                                                                   |                                                                                   | 2N6401                                                                            | 16                           | 10                 | 100                                                 |  |                                                                          | 30  | .01                                                                            |                        | 2.0                    | 1.7                                                                      |  | 1.5                                                                      | 0.2                    |
| 20 Amps                                                   |                                                                                   |                                                                                   | 2N6402                                                                            | 16                           | 10                 | 200                                                 |  |                                                                          | 30  | .01                                                                            |                        | 2.0                    | 1.7                                                                      |  | 1.5                                                                      | 0.2                    |
|                                                           |                                                                                   |                                                                                   | 2N6403                                                                            | 16                           | 10                 | 400                                                 |  |                                                                          | 30  | .01                                                                            |                        | 2.0                    | 1.7                                                                      |  | 1.5                                                                      | 0.2                    |
|                                                           |                                                                                   |                                                                                   | 2N6404                                                                            | 16                           | 10                 | 600                                                 |  |                                                                          | 30  | .01                                                                            |                        | 2.0                    | 1.7                                                                      |  | 1.5                                                                      | 0.2                    |
|                                                           | S0320L                                                                            |                                                                                   |                                                                                   | 20                           | 13                 | 30                                                  |  | 1                                                                        | 30  | .01                                                                            | 0.5                    | 1.0                    | 1.6                                                                      |  | 1.5                                                                      | 0.2                    |
|                                                           | S0520L                                                                            |                                                                                   |                                                                                   | 20                           | 13                 | 50                                                  |  | 1                                                                        | 30  | .01                                                                            | 0.5                    | 1.0                    | 1.6                                                                      |  | 1.5                                                                      | 0.2                    |
|                                                           | S1020L                                                                            |                                                                                   |                                                                                   | 20                           | 13                 | 100                                                 |  | 1                                                                        | 30  | .01                                                                            | 0.5                    | 1.0                    | 1.6                                                                      |  | 1.5                                                                      | 0.2                    |
| 20 Amps                                                   | S2020L                                                                            |                                                                                   |                                                                                   | 20                           | 13                 | 200                                                 |  | 1                                                                        | 30  | .01                                                                            | 0.5                    | 1.0                    | 1.6                                                                      |  | 1.5                                                                      | 0.2                    |
|                                                           | S4020L                                                                            |                                                                                   |                                                                                   | 20                           | 13                 | 400                                                 |  | 1                                                                        | 30  | .01                                                                            | 0.5                    | 1.0                    | 1.6                                                                      |  | 1.5                                                                      | 0.2                    |
|                                                           | S6020L                                                                            |                                                                                   |                                                                                   | 20                           | 13                 | 600                                                 |  | 1                                                                        | 30  | .01                                                                            | 0.5                    | 1.0                    | 1.6                                                                      |  | 1.5                                                                      | 0.2                    |
|                                                           |                                                                                   |                                                                                   |                                                                                   | 20                           | 13                 |                                                     |  |                                                                          |     |                                                                                |                        |                        |                                                                          |  |                                                                          |                        |

\*V<sub>TM</sub> @ I<sub>T</sub> = 30Apk

## GENERAL NOTES

- Teccor's 2N6394 Series, 2N6400 Series, and 2N6504 Series devices conform to all JEDEC registered data.
- All measurements are made at 60 Hz with a resistive load at an ambient temperature of +25°C unless otherwise specified.
- Operating temperature range (T<sub>J</sub>) is -65°C to +125°C for TO-92 devices, 0°C to +125°C for Fastpak, and -40°C to +125°C for all other packages.
- Storage temperature range (T<sub>S</sub>) is -65°C to +150°C for TO-92 devices, -40°C to +150°C for TO-202 and TO-220 devices, -20°C to +125°C for Fastpaks and -40°C to +125°C for all others.
- Lead solder temperature is a maximum of 230°C for 10 seconds maximum; 1/16" from case.
- The case temperature (T<sub>C</sub>) is measured as shown on dimensional outline drawings. See "package dimensions" section of catalog.

## NOTES FOR JEDEC DEVICES

- 2N6400-6405 series of devices also conform to the following specifications:
  - Maximum V<sub>GT</sub> = 2.5 volts @ -40°C
  - Maximum I<sub>H</sub> = 60 milliamps @ -40°C
- 2N6504-6508 series of devices also conform to the following specifications:
  - Maximum V<sub>GT</sub> = 1.5 volts @ -40°C
  - Maximum I<sub>GT</sub> = 75 milliamps @ -40°C
  - Maximum I<sub>H</sub> = 40 milliamps @ -40°C

## Electrical Specifications

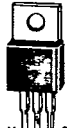
|  | I <sub>H</sub>                        | I <sub>GM</sub>        | P <sub>GM</sub>                  | P <sub>G(AV)</sub>             | I <sub>TSM</sub>                              |      | dv/dt                                    |            | I <sub>2t</sub>                                                                 | di/dt                                                                                   | t <sub>gt</sub>                                                                             | t <sub>q</sub>                            |
|--|---------------------------------------|------------------------|----------------------------------|--------------------------------|-----------------------------------------------|------|------------------------------------------|------------|---------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|-------------------------------------------|
|  | DC Holding Current Gate Open (5) (14) | Peak Gate Current (11) | Peak Gate Power Dissipation (11) | Average Gate Power Dissipation | Peak One Cycle Surge Forward Current (6) (10) |      | Critical Rate of Applied Forward Voltage |            | RMS Surge (Non-Repetitive) On-State Current For a Period of 8.3 msec for Fusing | Maximum Rate of Change of On-State Current I <sub>GT</sub> = 150mA With 0.1μs Rise Time | Gate Controlled Turn-On Time Gate Pulse = 100mA Min. Width = 5μs With Rise Time ≤ 0.1μs (7) | Circuit Commutated Turn-Off Time (9) (10) |
|  |                                       |                        |                                  |                                | Amps                                          |      | Volts/μs                                 |            |                                                                                 |                                                                                         |                                                                                             |                                           |
|  | mA                                    | Amps                   | Watts                            | Watts                          | 60Hz                                          | 50Hz | TC = 100°C                               | TC = 125°C | Amps²sec                                                                        | Amps/μs                                                                                 | μs                                                                                          | μs                                        |
|  | MAX                                   |                        |                                  |                                | MAX                                           | MAX  | MIN                                      | MIN        |                                                                                 |                                                                                         | MAX                                                                                         | MAX                                       |
|  | 30                                    | 2.0                    | 20                               | 0.5                            | 100                                           | 83   | 175                                      | 125        | 41                                                                              | 100                                                                                     | 2.0                                                                                         | 35                                        |
|  | 30                                    | 2.0                    | 20                               | 0.5                            | 100                                           | 83   | 175                                      | 125        | 41                                                                              | 100                                                                                     | 2.0                                                                                         | 35                                        |
|  | 30                                    | 2.0                    | 20                               | 0.5                            | 100                                           | 83   | 175                                      | 125        | 41                                                                              | 100                                                                                     | 2.0                                                                                         | 35                                        |
|  | 30                                    | 2.0                    | 20                               | 0.5                            | 100                                           | 83   | 175                                      | 125        | 41                                                                              | 100                                                                                     | 2.0                                                                                         | 35                                        |
|  | 30                                    | 2.0                    | 20                               | 0.5                            | 100                                           | 83   | 175                                      | 125        | 41                                                                              | 100                                                                                     | 2.0                                                                                         | 35                                        |
|  | 30                                    | 2.0                    | 20                               | 0.5                            | 100                                           | 83   | 150                                      | 100        | 41                                                                              | 100                                                                                     | 2.0                                                                                         | 35                                        |
|  | 30                                    | 2.0                    | 20                               | 0.5                            | 100                                           | 85   | 100                                      |            | 40                                                                              | 100                                                                                     | 2.5                                                                                         | 35                                        |
|  | 20                                    |                        | 20                               | 0.5                            | 100                                           | 85   | 75                                       |            | 40                                                                              | 100                                                                                     | 2.5                                                                                         | 35                                        |
|  | 20                                    |                        | 20                               | 0.5                            | 100                                           | 85   | 50                                       |            | 40                                                                              | 100                                                                                     | 2.5                                                                                         | 35                                        |
|  | 20                                    |                        | 20                               | 0.5                            | 100                                           | 85   | 40                                       |            | 40                                                                              | 100                                                                                     | 2.5                                                                                         | 35                                        |
|  | 20                                    |                        | 20                               | 0.5                            | 100                                           | 85   | 30                                       |            | 40                                                                              | 100                                                                                     | 2.5                                                                                         | 35                                        |
|  | 20                                    |                        | 20                               | 0.5                            | 100                                           | 85   | 25                                       |            | 40                                                                              | 100                                                                                     | 2.5                                                                                         | 35                                        |
|  | 20                                    |                        | 20                               | 0.5                            | 100                                           | 85   | 20                                       |            | 40                                                                              | 100                                                                                     | 2.5                                                                                         | 35                                        |
|  | 40                                    | 2.0                    | 20                               | 0.5                            | 120                                           | 100  | 175                                      | 125        | 60                                                                              | 100                                                                                     | 2.0                                                                                         | 35                                        |
|  | 40                                    | 2.0                    | 20                               | 0.5                            | 120                                           | 100  | 175                                      | 125        | 60                                                                              | 100                                                                                     | 2.0                                                                                         | 35                                        |
|  | 40                                    | 2.0                    | 20                               | 0.5                            | 120                                           | 100  | 175                                      | 125        | 60                                                                              | 100                                                                                     | 2.0                                                                                         | 35                                        |
|  | 40                                    | 2.0                    | 20                               | 0.5                            | 120                                           | 100  | 175                                      | 125        | 60                                                                              | 100                                                                                     | 2.0                                                                                         | 35                                        |
|  | 40                                    | 2.0                    | 20                               | 0.5                            | 120                                           | 100  | 175                                      | 125        | 60                                                                              | 100                                                                                     | 2.0                                                                                         | 35                                        |
|  | 40                                    | 2.0                    | 20                               | 0.5                            | 120                                           | 100  | 150                                      | 100        | 60                                                                              | 100                                                                                     | 2.0                                                                                         | 35                                        |
|  | 40                                    | 2.0                    | 20                               | 0.5                            | 100                                           |      |                                          |            | 40                                                                              | 100                                                                                     | 2.0                                                                                         |                                           |
|  | 40                                    | 2.0                    | 20                               | 0.5                            | 100                                           |      |                                          |            | 40                                                                              | 100                                                                                     | 2.0                                                                                         |                                           |
|  | 40                                    | 2.0                    | 20                               | 0.5                            | 100                                           |      |                                          |            | 40                                                                              | 100                                                                                     | 2.0                                                                                         |                                           |
|  | 40                                    | 2.0                    | 20                               | 0.5                            | 100                                           |      |                                          |            | 40                                                                              | 100                                                                                     | 2.0                                                                                         |                                           |
|  | 40                                    | 2.0                    | 20                               | 0.5                            | 100                                           |      |                                          |            | 40                                                                              | 100                                                                                     | 2.0                                                                                         |                                           |
|  | 40                                    | 3.0                    | 30                               | 0.6                            | 225                                           | 188  | 250                                      | 175        | 210                                                                             | 125                                                                                     | 2.0                                                                                         | 35                                        |
|  | 40                                    | 3.0                    | 30                               | 0.6                            | 225                                           | 188  | 250                                      | 175        | 210                                                                             | 125                                                                                     | 2.0                                                                                         | 35                                        |
|  | 40                                    | 3.0                    | 30                               | 0.6                            | 225                                           | 188  | 250                                      | 175        | 210                                                                             | 125                                                                                     | 2.0                                                                                         | 35                                        |
|  | 40                                    | 3.0                    | 30                               | 0.6                            | 225                                           | 188  | 250                                      | 175        | 210                                                                             | 125                                                                                     | 2.0                                                                                         | 35                                        |
|  | 40                                    | 3.0                    | 30                               | 0.6                            | 225                                           | 188  | 250                                      | 175        | 210                                                                             | 125                                                                                     | 2.0                                                                                         | 35                                        |
|  | 40                                    | 3.0                    | 30                               | 0.6                            | 225                                           | 188  | 200                                      | 150        | 210                                                                             | 125                                                                                     | 2.0                                                                                         | 35                                        |
|  | 40                                    | 3.0                    | 30                               | 0.6                            | 225                                           | 188  | 250                                      | 175        | 210                                                                             | 125                                                                                     | 2.0                                                                                         | 35                                        |
|  | 40                                    | 3.0                    | 30                               | 0.6                            | 225                                           | 188  | 250                                      | 175        | 210                                                                             | 125                                                                                     | 2.0                                                                                         | 35                                        |
|  | 40                                    | 3.0                    | 30                               | 0.6                            | 225                                           | 188  | 250                                      | 175        | 210                                                                             | 125                                                                                     | 2.0                                                                                         | 35                                        |
|  | 40                                    | 3.0                    | 30                               | 0.6                            | 225                                           | 188  | 250                                      | 175        | 210                                                                             | 125                                                                                     | 2.0                                                                                         | 35                                        |
|  | 40                                    | 3.0                    | 30                               | 0.6                            | 225                                           | 188  | 250                                      | 175        | 210                                                                             | 125                                                                                     | 2.0                                                                                         | 35                                        |
|  | 40                                    | 3.0                    | 30                               | 0.6                            | 225                                           | 188  | 200                                      | 150        | 210                                                                             | 125                                                                                     | 2.0                                                                                         | 35                                        |
|  | 40                                    | 2.0                    | 20                               | 0.5                            | 160                                           |      |                                          |            | 100                                                                             | 125                                                                                     |                                                                                             |                                           |
|  | 40                                    | 2.0                    | 20                               | 0.5                            | 160                                           |      |                                          |            | 100                                                                             | 125                                                                                     |                                                                                             |                                           |
|  | 40                                    | 2.0                    | 20                               | 0.5                            | 160                                           |      |                                          |            | 100                                                                             | 125                                                                                     |                                                                                             |                                           |
|  | 40                                    | 2.0                    | 20                               | 0.5                            | 160                                           |      |                                          |            | 100                                                                             | 125                                                                                     |                                                                                             |                                           |
|  | 40                                    | 2.0                    | 20                               | 0.5                            | 160                                           |      |                                          |            | 100                                                                             | 125                                                                                     |                                                                                             |                                           |
|  | 40                                    | 3.0                    | 30                               | 0.6                            | 300                                           | 255  | 250                                      | 175        | 374                                                                             | 125                                                                                     | 2.0                                                                                         | 35                                        |
|  | 40                                    | 3.0                    | 30                               | 0.6                            | 300                                           | 255  | 250                                      | 175        | 374                                                                             | 125                                                                                     | 2.0                                                                                         | 35                                        |
|  | 40                                    | 3.0                    | 30                               | 0.6                            | 300                                           | 255  | 250                                      | 175        | 374                                                                             | 125                                                                                     | 2.0                                                                                         | 35                                        |
|  | 40                                    | 3.0                    | 30                               | 0.6                            | 300                                           | 255  | 250                                      | 175        | 374                                                                             | 125                                                                                     | 2.0                                                                                         | 35                                        |
|  | 40                                    | 3.0                    | 30                               | 0.6                            | 300                                           | 255  | 250                                      | 175        | 374                                                                             | 125                                                                                     | 2.0                                                                                         | 35                                        |
|  | 40                                    | 3.0                    | 30                               | 0.6                            | 300                                           | 255  | 200                                      | 150        | 374                                                                             | 125                                                                                     | 2.0                                                                                         | 35                                        |

## NOTES TO ELECTRICAL SPECIFICATIONS

- (1) See Figures 2 and 3 for current rating at specified operating case temperature.
- (2) See Figure 1 for free air current rating.
- (3) See Figure 6 for instantaneous on-state current vs on-state voltage (typical).
- (4) See Figure 5 for I<sub>GT</sub> vs T<sub>C</sub>.
- (5) See Figure 4 for I<sub>H</sub> vs T<sub>C</sub>.
- (6) For more than one full cycle rating, see Figure 9.
- (7) See Figure 8 for t<sub>gt</sub> vs I<sub>GT</sub>.
- (8) See Figure 7 for V<sub>GT</sub> vs T<sub>C</sub>.

- (9) Test conditions are as follows: I<sub>T</sub> = 1 amp for ≤ 1.6 amp devices and 2 amp for ≥ 3 amp devices. Pulse duration = 50μsec. dv/dt = 20 V/μs, di/dt = -10 amps/μs for ≤ 1.6 amp devices, and -30 amps/μs for ≥ 3 amp devices. I<sub>GT</sub> = 200 mA @ turn-on.
- (10) See Figure 2 (A,B,C,D,E) for maximum allowable case temperatures @ maximum rated current.
- (11) Pulse width ≤ 3μs.
- (12) I<sub>GT</sub> = 40 mA maximum @ -40°C for C122 devices.
- (13) V<sub>GT</sub> = 2.0 V maximum @ -40°C for C122 devices.
- (14) Initial on-state current = 200 mA (DC) for 1 to 20 amp devices. 400 mA (DC) for 25 to 70 amp devices.

# SCR's—Non Sensitive Gate

| TYPE    | Part Number                                                                       |                                                                                   |                                                                                   |                                                                                   |                                                                                   | IT                           |        | VDRM & VRRM                                         |                                                           | IGT                                                    |                                                                    | IDRM & IRRM                                               |            |       | VTM       |            | VGT |  |
|---------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------|--------|-----------------------------------------------------|-----------------------------------------------------------|--------------------------------------------------------|--------------------------------------------------------------------|-----------------------------------------------------------|------------|-------|-----------|------------|-----|--|
|         | Isolated                                                                          |                                                                                   |                                                                                   | Non-Isolated                                                                      |                                                                                   |                              |        |                                                     |                                                           |                                                        |                                                                    |                                                           |            |       |           |            |     |  |
|         |  |  |  |  |  | Maximum On-State Current (1) | Amps   | Repetitive Peak Off-State Forward & Reverse Voltage | DC Gate-Trigger Current<br>VD = 12 VDC<br>RL = 60Ω<br>(4) | Peak Off-State Forward & Reverse Current @ VDRM & VRRM | Peak On-State Voltage at Max Rated RMS Current<br>TC = 25°C<br>(3) | DC Gate-Trigger Voltage<br>VD = 12 VDC<br>RL = 60Ω<br>(8) |            |       |           |            |     |  |
|         | TO-220AB                                                                          | TO-218                                                                            | FASTPAK TO-3 BASE                                                                 | NON-ISOLATED TO-220AB                                                             | NON-ISOLATED TO-218                                                               | IT(RMS)                      | IT(AV) | Volts                                               | mA                                                        | mA                                                     | TC = 25°C                                                          | TC = 100°C                                                | TC = 125°C | Volts | TC = 25°C | TC = 125°C |     |  |
|         | FOR DIMENSIONAL OUTLINES & PACKAGE VARIATIONS SEE PAGE 67                         |                                                                                   |                                                                                   |                                                                                   |                                                                                   | MAX                          | MAX    | MIN                                                 | MIN                                                       | MAX                                                    | MAXIMUM                                                            |                                                           |            | MAX   | MAX       | MIN        |     |  |
| 25 Amps | S0325L                                                                            |                                                                                   |                                                                                   | S0325R                                                                            |                                                                                   | 25                           | 16     | 30                                                  | 1                                                         | 30                                                     | .01                                                                | 1.0                                                       | 2.0        | 1.6   | 1.5       | 0.2        |     |  |
|         | S0525L                                                                            |                                                                                   |                                                                                   | S0525R                                                                            |                                                                                   | 25                           | 16     | 50                                                  | 1                                                         | 30                                                     | .01                                                                | 1.0                                                       | 2.0        | 1.6   | 1.5       | 0.2        |     |  |
|         | S1025L                                                                            |                                                                                   |                                                                                   | S1025R                                                                            |                                                                                   | 25                           | 16     | 100                                                 | 1                                                         | 30                                                     | .01                                                                | 1.0                                                       | 2.0        | 1.6   | 1.5       | 0.2        |     |  |
|         | S2025L                                                                            |                                                                                   |                                                                                   | S2025R                                                                            |                                                                                   | 25                           | 16     | 200                                                 | 1                                                         | 30                                                     | .01                                                                | 1.0                                                       | 2.0        | 1.6   | 1.5       | 0.2        |     |  |
|         | S4025L                                                                            |                                                                                   |                                                                                   | S4025R                                                                            |                                                                                   | 25                           | 16     | 400                                                 | 1                                                         | 30                                                     | .01                                                                | 1.0                                                       | 2.0        | 1.6   | 1.5       | 0.2        |     |  |
|         | S6025L                                                                            |                                                                                   |                                                                                   | S6025R                                                                            |                                                                                   | 25                           | 16     | 600                                                 | 1                                                         | 30                                                     | .01                                                                | 1.0                                                       | 2.0        | 1.6   | 1.5       | 0.2        |     |  |
|         |                                                                                   |                                                                                   |                                                                                   | 2N6504                                                                            |                                                                                   | 25                           | 16     | 50                                                  |                                                           | 40                                                     | .01                                                                |                                                           | 2.0        | 1.8   |           | 0.2        |     |  |
|         |                                                                                   |                                                                                   |                                                                                   | 2N6505                                                                            |                                                                                   | 25                           | 16     | 100                                                 |                                                           | 40                                                     | .01                                                                |                                                           | 2.0        | 1.8   |           | 0.2        |     |  |
|         |                                                                                   |                                                                                   |                                                                                   | 2N6506                                                                            |                                                                                   | 25                           | 16     | 200                                                 |                                                           | 40                                                     | .01                                                                |                                                           | 2.0        | 1.8   |           | 0.2        |     |  |
| 35 Amps |                                                                                   | S0335J                                                                            |                                                                                   |                                                                                   | S0335W                                                                            | 35                           | 22     | 30                                                  | 5                                                         | 40                                                     | .01                                                                | 1.0                                                       | 2.0        | 1.8   | 1.5       | 0.2        |     |  |
|         |                                                                                   | S0535J                                                                            |                                                                                   |                                                                                   | S0535W                                                                            | 35                           | 22     | 50                                                  | 5                                                         | 40                                                     | .01                                                                | 1.0                                                       | 2.0        | 1.8   | 1.5       | 0.2        |     |  |
|         |                                                                                   | S1035J                                                                            |                                                                                   |                                                                                   | S1035W                                                                            | 35                           | 22     | 100                                                 | 5                                                         | 40                                                     | .01                                                                | 1.0                                                       | 2.0        | 1.8   | 1.5       | 0.2        |     |  |
|         |                                                                                   | S2035J                                                                            |                                                                                   |                                                                                   | S2035W                                                                            | 35                           | 22     | 200                                                 | 5                                                         | 40                                                     | .01                                                                | 1.0                                                       | 2.0        | 1.8   | 1.5       | 0.2        |     |  |
|         |                                                                                   | S4035J                                                                            |                                                                                   |                                                                                   | S4035W                                                                            | 35                           | 22     | 400                                                 | 5                                                         | 40                                                     | .01                                                                | 1.0                                                       | 2.0        | 1.8   | 1.5       | 0.2        |     |  |
|         |                                                                                   | S6035J                                                                            |                                                                                   |                                                                                   | S6035W                                                                            | 35                           | 22     | 600                                                 | 5                                                         | 40                                                     | .01                                                                | 1.0                                                       | 2.0        | 1.8   | 1.5       | 0.2        |     |  |
| 50 Amps |                                                                                   | S0550J                                                                            |                                                                                   |                                                                                   |                                                                                   | 50                           | 32     | 50                                                  | 5                                                         | 40                                                     | .01                                                                | 1.0                                                       | 2.0        | 1.8   | 1.5       | 0.2        |     |  |
|         |                                                                                   | S1050J                                                                            |                                                                                   |                                                                                   |                                                                                   | 50                           | 32     | 100                                                 | 5                                                         | 40                                                     | .01                                                                | 1.0                                                       | 2.0        | 1.8   | 1.5       | 0.2        |     |  |
|         |                                                                                   | S2050J                                                                            |                                                                                   |                                                                                   |                                                                                   | 50                           | 32     | 200                                                 | 5                                                         | 40                                                     | .01                                                                | 1.0                                                       | 2.0        | 1.8   | 1.5       | 0.2        |     |  |
|         |                                                                                   | S4050J                                                                            |                                                                                   |                                                                                   |                                                                                   | 50                           | 32     | 400                                                 | 5                                                         | 40                                                     | .01                                                                | 1.0                                                       | 2.0        | 1.8   | 1.5       | 0.2        |     |  |
|         |                                                                                   | S6050J                                                                            |                                                                                   |                                                                                   |                                                                                   | 50                           | 32     | 600                                                 | 5                                                         | 40                                                     | .01                                                                | 1.0                                                       | 2.0        | 1.8   | 1.5       | 0.2        |     |  |
| 55 Amps |                                                                                   |                                                                                   |                                                                                   |                                                                                   | S0555W                                                                            | 55                           | 35     | 50                                                  | 5                                                         | 40                                                     | .01                                                                | 1.0                                                       | 2.0        | 1.8   | 1.5       | 0.2        |     |  |
|         |                                                                                   |                                                                                   |                                                                                   |                                                                                   | S1055W                                                                            | 55                           | 35     | 100                                                 | 5                                                         | 40                                                     | .01                                                                | 1.0                                                       | 2.0        | 1.8   | 1.5       | 0.2        |     |  |
|         |                                                                                   |                                                                                   |                                                                                   |                                                                                   | S2055W                                                                            | 55                           | 35     | 200                                                 | 5                                                         | 40                                                     | .01                                                                | 1.0                                                       | 2.0        | 1.8   | 1.5       | 0.2        |     |  |
|         |                                                                                   |                                                                                   |                                                                                   |                                                                                   | S4055W                                                                            | 55                           | 35     | 400                                                 | 5                                                         | 40                                                     | .01                                                                | 1.0                                                       | 2.0        | 1.8   | 1.5       | 0.2        |     |  |
|         |                                                                                   |                                                                                   |                                                                                   |                                                                                   | S6055W                                                                            | 55                           | 35     | 600                                                 | 5                                                         | 40                                                     | .01                                                                | 1.0                                                       | 2.0        | 1.8   | 1.5       | 0.2        |     |  |
| 65 Amps |                                                                                   |                                                                                   | S0565P                                                                            |                                                                                   |                                                                                   | 65                           | 41     | 50                                                  | 5                                                         | 50                                                     | .02                                                                | 1.5                                                       | 3.0        | 1.8   | 2.0       | 0.2        |     |  |
|         |                                                                                   |                                                                                   | S1065P                                                                            |                                                                                   |                                                                                   | 65                           | 41     | 100                                                 | 5                                                         | 50                                                     | .02                                                                | 1.5                                                       | 3.0        | 1.8   | 2.0       | 0.2        |     |  |
|         |                                                                                   |                                                                                   | S2065P                                                                            |                                                                                   |                                                                                   | 65                           | 41     | 200                                                 | 5                                                         | 50                                                     | .02                                                                | 1.5                                                       | 3.0        | 1.8   | 2.0       | 0.2        |     |  |
|         |                                                                                   |                                                                                   | S4065P                                                                            |                                                                                   |                                                                                   | 65                           | 41     | 400                                                 | 5                                                         | 50                                                     | .02                                                                | 1.5                                                       | 3.0        | 1.8   | 2.0       | 0.2        |     |  |
|         |                                                                                   |                                                                                   | S6065P                                                                            |                                                                                   |                                                                                   | 65                           | 41     | 600                                                 | 5                                                         | 50                                                     | .02                                                                | 1.5                                                       | 3.0        | 1.8   | 2.0       | 0.2        |     |  |
|         |                                                                                   | S0565J                                                                            |                                                                                   |                                                                                   |                                                                                   | 65                           | 41     | 50                                                  | 5                                                         | 50                                                     | .02                                                                | 1.5                                                       | 3.0        | 1.8   | 2.0       | 0.2        |     |  |
|         |                                                                                   | S1065J                                                                            |                                                                                   |                                                                                   |                                                                                   | 65                           | 41     | 100                                                 | 5                                                         | 50                                                     | .02                                                                | 1.5                                                       | 3.0        | 1.8   | 2.0       | 0.2        |     |  |
|         |                                                                                   | S2065J                                                                            |                                                                                   |                                                                                   |                                                                                   | 65                           | 41     | 200                                                 | 5                                                         | 50                                                     | .02                                                                | 1.5                                                       | 3.0        | 1.8   | 2.0       | 0.2        |     |  |
|         |                                                                                   | S4065J                                                                            |                                                                                   |                                                                                   |                                                                                   | 65                           | 41     | 400                                                 | 5                                                         | 50                                                     | .02                                                                | 1.5                                                       | 3.0        | 1.8   | 2.0       | 0.2        |     |  |
|         |                                                                                   | S6065J                                                                            |                                                                                   |                                                                                   |                                                                                   | 65                           | 41     | 600                                                 | 5                                                         | 50                                                     | .02                                                                | 1.5                                                       | 3.0        | 1.8   | 2.0       | 0.2        |     |  |
| 70 Amps |                                                                                   |                                                                                   |                                                                                   |                                                                                   | S0570W                                                                            | 70                           | 45     | 50                                                  | 5                                                         | 50                                                     | .02                                                                | 1.5                                                       | 3.0        | 1.8   | 2.0       | 0.2        |     |  |
|         |                                                                                   |                                                                                   |                                                                                   |                                                                                   | S1070W                                                                            | 70                           | 45     | 100                                                 | 5                                                         | 50                                                     | .02                                                                | 1.5                                                       | 3.0        | 1.8   | 2.0       | 0.2        |     |  |
|         |                                                                                   |                                                                                   |                                                                                   |                                                                                   | S2070W                                                                            | 70                           | 45     | 200                                                 | 5                                                         | 50                                                     | .02                                                                | 1.5                                                       | 3.0        | 1.8   | 2.0       | 0.2        |     |  |
|         |                                                                                   |                                                                                   |                                                                                   |                                                                                   | S4070W                                                                            | 70                           | 45     | 400                                                 | 5                                                         | 50                                                     | .02                                                                | 1.5                                                       | 3.0        | 1.8   | 2.0       | 0.2        |     |  |
|         |                                                                                   |                                                                                   |                                                                                   |                                                                                   | S6070W                                                                            | 70                           | 45     | 600                                                 | 5                                                         | 50                                                     | .02                                                                | 1.5                                                       | 3.0        | 1.8   | 2.0       | 0.2        |     |  |

## GENERAL NOTES

- Teccor's 2N6394 Series, 2N6400 Series, and 2N6504 Series devices conform to all JEDEC registered data.
- All measurements are made at 60 Hz with a resistive load at an ambient temperature of +25°C unless otherwise specified.
- Operating temperature range (T<sub>J</sub>) is -65°C to +125°C for TO-92 devices, 0°C to +125°C for Fastpak, and -40°C to +125°C for all other packages.
- Storage temperature range (T<sub>S</sub>) is -65°C to +150°C for TO-92 devices, -40°C to +150°C for TO-202 and TO-220 devices, -20°C to +125°C for Fastpaks, and -40°C to +125°C for all others.
- Lead solder temperature is a maximum of 230°C for 10 seconds maximum; 1/16" from case.
- The case temperature (T<sub>C</sub>) is measured as shown on dimensional outline drawings. See "package dimensions" section of catalog.

## NOTES FOR JEDEC DEVICES

1. 2N6400-6405 series of devices also conform to the following specifications
  - a. Maximum V<sub>GT</sub> = 2.5 volts @ -40°C
  - b. Maximum I<sub>H</sub> = 60 milliamperes @ -40°C
2. 2N6504-6508 series of devices also conform to the following specifications
  - a. Maximum V<sub>GT</sub> = 1.5 volts @ -40°C
  - b. Maximum I<sub>GT</sub> = 75 milliamperes @ -40°C
  - c. Maximum I<sub>H</sub> = 40 milliamperes @ -40°C

# Electrical Specifications

|  | I <sub>H</sub>                        | I <sub>GM</sub>        | P <sub>GM</sub>                  | P <sub>G(AV)</sub>             | I <sub>TSM</sub>                              |      | dv/dt                                    |            | I <sup>2</sup> t                                                                | di/dt                                                                                         | t <sub>gt</sub>                                                                                  | t <sub>q</sub>                            |
|--|---------------------------------------|------------------------|----------------------------------|--------------------------------|-----------------------------------------------|------|------------------------------------------|------------|---------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------|-------------------------------------------|
|  | DC Holding Current Gate Open (5) (14) | Peak Gate Current (11) | Peak Gate Power Dissipation (11) | Average Gate Power Dissipation | Peak One Cycle Surge Forward Current (6) (10) |      | Critical Rate of Applied Forward Voltage |            | RMS Surge (Non-Repetitive) On-State Current For a Period of 8.3 msec for Fusing | Maximum Rate of Change of On-State Current<br>I <sub>GT</sub> = 150mA<br>With 0.1μs Rise Time | Gate Controlled Turn-On Time Gate Pulse = 150mA<br>Min Width = 5μs<br>With Rise Time ≤ 0.1μs (7) | Circuit Commutated Turn-Off Time (9) (10) |
|  |                                       |                        |                                  |                                | Amps                                          |      | Volts/μs                                 |            |                                                                                 |                                                                                               |                                                                                                  |                                           |
|  | mA                                    | Amps                   | Watts                            | Watts                          | 60Hz                                          | 50Hz | TC = 100°C                               | TC = 125°C | Amps²sec                                                                        | μs                                                                                            | μs                                                                                               | μs                                        |
|  | MAX                                   |                        |                                  |                                | MAX                                           | MAX  | MIN                                      | MIN        |                                                                                 |                                                                                               | MAX                                                                                              | MAX                                       |
|  | 40                                    | 3.5                    | 35                               | 0.8                            | 350                                           | 300  | 250                                      | 175        | 510                                                                             | 150                                                                                           | 2.0                                                                                              | 35                                        |
|  | 40                                    | 3.5                    | 35                               | 0.8                            | 350                                           | 300  | 250                                      | 175        | 510                                                                             | 150                                                                                           | 2.0                                                                                              | 35                                        |
|  | 40                                    | 3.5                    | 35                               | 0.8                            | 350                                           | 300  | 250                                      | 175        | 510                                                                             | 150                                                                                           | 2.0                                                                                              | 35                                        |
|  | 40                                    | 3.5                    | 35                               | 0.8                            | 350                                           | 300  | 250                                      | 175        | 510                                                                             | 150                                                                                           | 2.0                                                                                              | 35                                        |
|  | 40                                    | 3.5                    | 35                               | 0.8                            | 350                                           | 300  | 250                                      | 175        | 510                                                                             | 150                                                                                           | 2.0                                                                                              | 35                                        |
|  | 40                                    | 3.5                    | 35                               | 0.8                            | 350                                           | 300  | 200                                      | 150        | 510                                                                             | 150                                                                                           | 2.0                                                                                              | 35                                        |
|  |                                       | 2.0                    | 20                               | 0.5                            | 300                                           | 255  |                                          |            | 375                                                                             | 150                                                                                           | 2.0                                                                                              |                                           |
|  |                                       | 2.0                    | 20                               | 0.5                            | 300                                           | 255  |                                          |            | 375                                                                             | 150                                                                                           | 2.0                                                                                              |                                           |
|  |                                       | 2.0                    | 20                               | 0.5                            | 300                                           | 255  |                                          |            | 375                                                                             | 150                                                                                           | 2.0                                                                                              |                                           |
|  |                                       | 2.0                    | 20                               | 0.5                            | 300                                           | 255  |                                          |            | 375                                                                             | 150                                                                                           | 2.0                                                                                              |                                           |
|  |                                       | 2.0                    | 20                               | 0.5                            | 300                                           | 255  |                                          |            | 375                                                                             | 150                                                                                           | 2.0                                                                                              |                                           |
|  | 50                                    | 3.5                    | 35                               | 0.8                            | 500                                           | 425  | 250                                      | 175        | 1035                                                                            | 150                                                                                           | 2.0                                                                                              | 35                                        |
|  | 50                                    | 3.5                    | 35                               | 0.8                            | 500                                           | 425  | 250                                      | 175        | 1035                                                                            | 150                                                                                           | 2.0                                                                                              | 35                                        |
|  | 50                                    | 3.5                    | 35                               | 0.8                            | 500                                           | 425  | 250                                      | 175        | 1035                                                                            | 150                                                                                           | 2.0                                                                                              | 35                                        |
|  | 50                                    | 3.5                    | 35                               | 0.8                            | 500                                           | 425  | 250                                      | 175        | 1035                                                                            | 150                                                                                           | 2.0                                                                                              | 35                                        |
|  | 50                                    | 3.5                    | 35                               | 0.8                            | 500                                           | 425  | 250                                      | 175        | 1035                                                                            | 150                                                                                           | 2.0                                                                                              | 35                                        |
|  | 50                                    | 3.5                    | 35                               | 0.8                            | 500                                           | 425  | 200                                      | 150        | 1035                                                                            | 150                                                                                           | 2.0                                                                                              | 35                                        |
|  | 50                                    | 4.0                    | 40                               | 0.8                            | 650                                           | 550  | 425                                      | 300        | 1750                                                                            | 175                                                                                           | 2.5                                                                                              | 35                                        |
|  | 50                                    | 4.0                    | 40                               | 0.8                            | 650                                           | 550  | 425                                      | 300        | 1750                                                                            | 175                                                                                           | 2.5                                                                                              | 35                                        |
|  | 50                                    | 4.0                    | 40                               | 0.8                            | 650                                           | 550  | 425                                      | 300        | 1750                                                                            | 175                                                                                           | 2.5                                                                                              | 35                                        |
|  | 50                                    | 4.0                    | 40                               | 0.8                            | 650                                           | 550  | 425                                      | 300        | 1750                                                                            | 175                                                                                           | 2.5                                                                                              | 35                                        |
|  | 50                                    | 4.0                    | 40                               | 0.8                            | 650                                           | 550  | 375                                      | 250        | 1750                                                                            | 175                                                                                           | 2.5                                                                                              | 35                                        |
|  | 50                                    | 4.0                    | 40                               | 0.8                            | 650                                           | 550  | 425                                      | 300        | 1750                                                                            | 175                                                                                           | 2.5                                                                                              | 35                                        |
|  | 50                                    | 4.0                    | 40                               | 0.8                            | 650                                           | 550  | 425                                      | 300        | 1750                                                                            | 175                                                                                           | 2.5                                                                                              | 35                                        |
|  | 50                                    | 4.0                    | 40                               | 0.8                            | 650                                           | 550  | 425                                      | 300        | 1750                                                                            | 175                                                                                           | 2.5                                                                                              | 35                                        |
|  | 50                                    | 4.0                    | 40                               | 0.8                            | 650                                           | 550  | 425                                      | 300        | 1750                                                                            | 175                                                                                           | 2.5                                                                                              | 35                                        |
|  | 50                                    | 4.0                    | 40                               | 0.8                            | 650                                           | 550  | 375                                      | 250        | 1750                                                                            | 175                                                                                           | 2.5                                                                                              | 35                                        |
|  | 50                                    | 5.0                    | 50                               | 1.0                            | 900                                           | 750  | 425                                      | 300        | 3360                                                                            | 200                                                                                           | 2.5                                                                                              | 35                                        |
|  | 50                                    | 5.0                    | 50                               | 1.0                            | 900                                           | 750  | 425                                      | 300        | 3360                                                                            | 200                                                                                           | 2.5                                                                                              | 35                                        |
|  | 50                                    | 5.0                    | 50                               | 1.0                            | 900                                           | 750  | 425                                      | 300        | 3360                                                                            | 200                                                                                           | 2.5                                                                                              | 35                                        |
|  | 50                                    | 5.0                    | 50                               | 1.0                            | 900                                           | 750  | 425                                      | 300        | 3360                                                                            | 200                                                                                           | 2.5                                                                                              | 35                                        |
|  | 50                                    | 5.0                    | 50                               | 1.0                            | 900                                           | 750  | 375                                      | 250        | 3360                                                                            | 200                                                                                           | 2.5                                                                                              | 35                                        |
|  | 50                                    | 5.0                    | 50                               | 1.0                            | 950                                           | 800  | 425                                      | 300        | 3745                                                                            | 200                                                                                           | 2.5                                                                                              | 35                                        |
|  | 50                                    | 5.0                    | 50                               | 1.0                            | 950                                           | 800  | 425                                      | 300        | 3745                                                                            | 200                                                                                           | 2.5                                                                                              | 35                                        |
|  | 50                                    | 5.0                    | 50                               | 1.0                            | 950                                           | 800  | 425                                      | 300        | 3745                                                                            | 200                                                                                           | 2.5                                                                                              | 35                                        |
|  | 50                                    | 5.0                    | 50                               | 1.0                            | 950                                           | 800  | 425                                      | 300        | 3745                                                                            | 200                                                                                           | 2.5                                                                                              | 35                                        |
|  | 50                                    | 5.0                    | 50                               | 1.0                            | 950                                           | 800  | 375                                      | 250        | 3745                                                                            | 200                                                                                           | 2.5                                                                                              | 35                                        |
|  | 50                                    | 5.0                    | 50                               | 1.0                            | 950                                           | 800  | 425                                      | 300        | 3745                                                                            | 200                                                                                           | 2.5                                                                                              | 35                                        |
|  | 50                                    | 5.0                    | 50                               | 1.0                            | 950                                           | 800  | 425                                      | 300        | 3745                                                                            | 200                                                                                           | 2.5                                                                                              | 35                                        |
|  | 50                                    | 5.0                    | 50                               | 1.0                            | 950                                           | 800  | 425                                      | 300        | 3745                                                                            | 200                                                                                           | 2.5                                                                                              | 35                                        |
|  | 50                                    | 5.0                    | 50                               | 1.0                            | 950                                           | 800  | 425                                      | 300        | 3745                                                                            | 200                                                                                           | 2.5                                                                                              | 35                                        |
|  | 50                                    | 5.0                    | 50                               | 1.0                            | 950                                           | 800  | 425                                      | 300        | 3745                                                                            | 200                                                                                           | 2.5                                                                                              | 35                                        |
|  | 50                                    | 5.0                    | 50                               | 1.0                            | 950                                           | 800  | 375                                      | 250        | 3745                                                                            | 200                                                                                           | 2.5                                                                                              | 35                                        |

## NOTES TO ELECTRICAL SPECIFICATIONS

- (1) See Figures 2 and 3 for current rating at specified operating case temperature.
- (2) See Figure 1 for free air current rating
- (3) See Figure 6 for instantaneous on-state current vs on-state voltage (typical)
- (4) See Figure 5 for I<sub>GT</sub> vs T<sub>C</sub>.
- (5) See Figure 4 for I<sub>H</sub> vs T<sub>C</sub>.
- (6) For more than one full cycle rating, see Figure 9.
- (7) See Figure 8 for t<sub>gt</sub> vs I<sub>GT</sub>.
- (8) See Figure 7 for V<sub>GT</sub> vs T<sub>C</sub>.

- (9) Test conditions are as follows: i<sub>T</sub> = 1 amp for ≤ 1.6 amp devices and 2 amp for ≥ 3 amp devices. Pulse duration = 50μsec, dv/dt = 20 V/μs, di/dt = -10 amps/μs for ≤ 1.6 amp devices, and -30 amps/μs for ≥ 3 amp devices. I<sub>GT</sub> = 200 mA @ turn-on
- (10) See Figure 2 (A,B,C,D,E) for maximum allowable case temperatures @ maximum rated current.
- (11) Pulse width ≤ 3μs.
- (12) I<sub>GT</sub> = 40 mA maximum @ -40°C for C122 devices.
- (13) V<sub>GT</sub> = 2.0 V maximum @ -40°C for C122 devices.
- (14) Initial on-state current = 200 mA (DC) for 1 to 20 amp devices, 400 mA (DC) for 25 to 70 amp devices.

# SCR's—Non Sensitive Gate

## THERMAL RESISTANCE (STEADY STATE)

 $R_{\theta JC}/R_{\theta JA} \text{ } ^\circ\text{C/W (TYP.)}$ 

| TYPE     | PLASTIC<br>TO-92 | THERMOTAB<br>TO-220AB | TYPE 1<br>TO-202 | TYPE 2<br>TO-202 | NON-ISOLATED<br>TO-220AB | ISOLATED<br>TO-218X | NON-ISOLATED<br>TO-218X | FASTPAK<br>TO-3 BASE |
|----------|------------------|-----------------------|------------------|------------------|--------------------------|---------------------|-------------------------|----------------------|
| 1.0 Amp  | 50/145           |                       |                  |                  |                          |                     |                         |                      |
| 1.6 Amp  |                  | 6.7                   |                  |                  |                          |                     |                         |                      |
| 3.0 Amp  |                  | 6.3/50                |                  |                  |                          |                     |                         |                      |
| 4.0 Amp  |                  |                       | 5.6/45           | 9.5/70           |                          |                     |                         |                      |
| 6.0 Amp  |                  | 4.0                   | 4.3              |                  |                          |                     |                         |                      |
| 8.0 Amp  |                  | 3.4                   | 3.9              |                  | 2.1/40                   |                     |                         |                      |
| 10.0 Amp |                  | 3.0                   | 3.4              |                  | 1.9                      |                     |                         |                      |
| 12.0 Amp |                  | 2.1                   |                  |                  | 1.7                      |                     |                         |                      |
| 15.0 Amp |                  | 1.95                  |                  |                  |                          |                     |                         |                      |
| 16.0 Amp |                  |                       |                  |                  | 1.5                      |                     |                         |                      |
| 20.0 Amp |                  | 1.8                   |                  |                  |                          |                     |                         |                      |
| 25 Amp   |                  | 2.5                   |                  |                  | 1.1                      |                     |                         |                      |
| 35 Amp   |                  |                       |                  |                  |                          | .70                 | .50                     |                      |
| 50 Amp   |                  |                       |                  |                  |                          | .80                 |                         |                      |
| 55 Amp   |                  |                       |                  |                  |                          |                     | .53                     |                      |
| 65 Amp   |                  |                       |                  |                  |                          | .86                 |                         | .80                  |
| 70 Amp   |                  |                       |                  |                  |                          |                     | .60                     |                      |

## ELECTRICAL ISOLATION

Most Teccor isolated SCR packages will withstand a minimum high potential test of 2500 VAC RMS from leads to case over the device's operating temperature range. See table for standard and optional isolation ratings.

## ELECTRICAL ISOLATION FROM LEADS TO CASE

U.L. RECOGNIZED FILE #71639

| TYPE      | TO-92    | ISOLATED<br>TO-220AB | ISOLATED<br>TO-218 | FASTPAK  |
|-----------|----------|----------------------|--------------------|----------|
| VAC (RMS) |          |                      |                    |          |
| 1600      | Standard | —                    | —                  | —        |
| 2500      | No       | Standard             | Standard           | Standard |
| 4000      | No       | Optional*            | No                 | No       |

\*For 4000V Isolation Use "V" Suffix

FIGURE 1A — Maximum Allowable Ambient Temperature vs RMS On-State Current

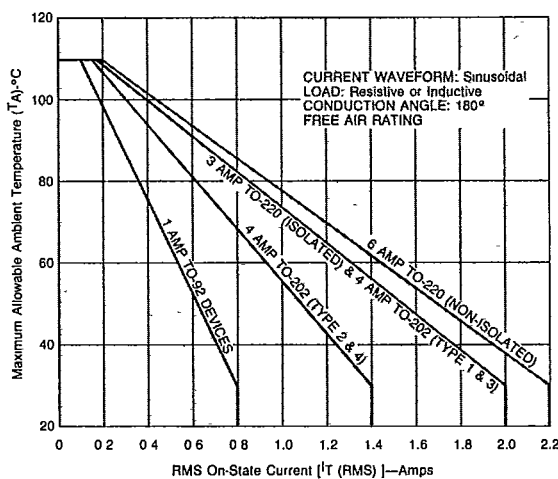
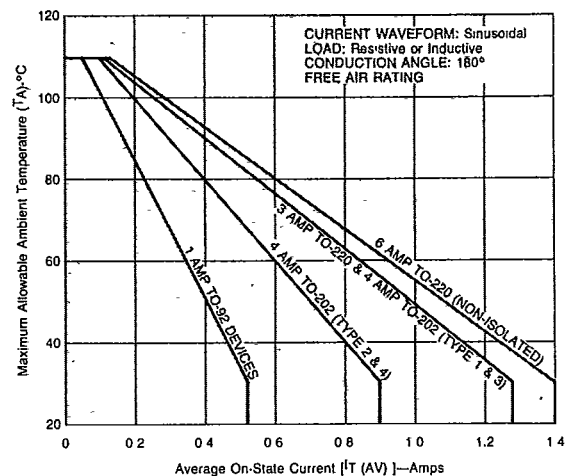


FIGURE 1B — Maximum Allowable Ambient Temperature vs Average On-State Current



# SCR's—Non Sensitive Gate

FIGURE 2A — Maximum Allowable Case Temperature vs RMS On-State Current

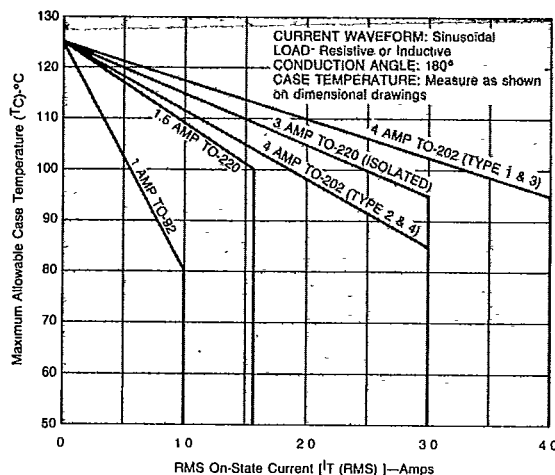


FIGURE 2B — Maximum Allowable Case Temperature vs RMS On-State Current

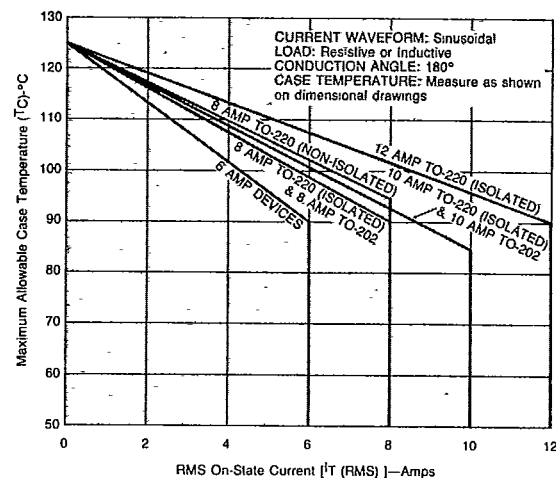


FIGURE 2C — Maximum Allowable Case Temperature vs RMS On-State Current

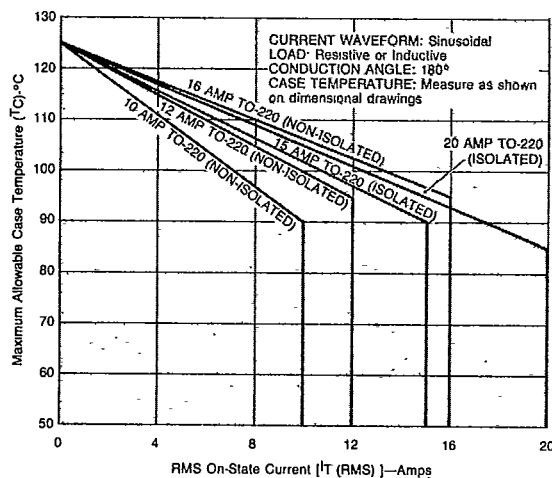


FIGURE 2D — Maximum Allowable Case Temperature vs RMS On-State Current

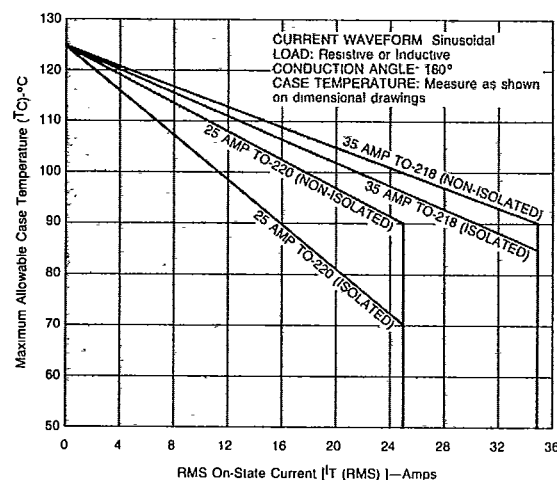


FIGURE 2E — Maximum Allowable Case Temperature vs RMS On-State Current

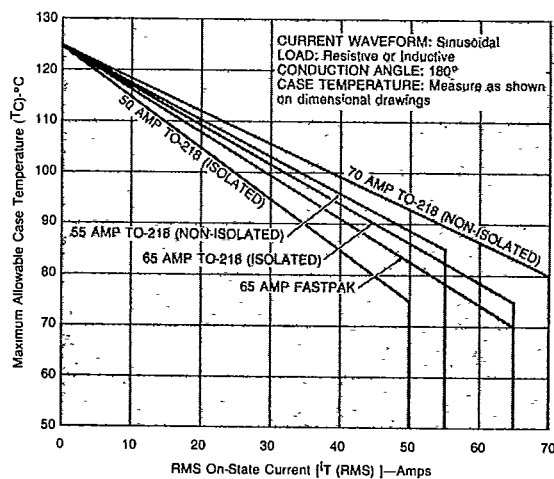
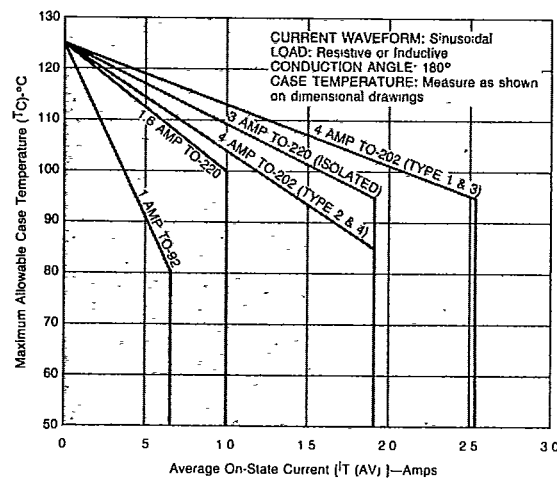
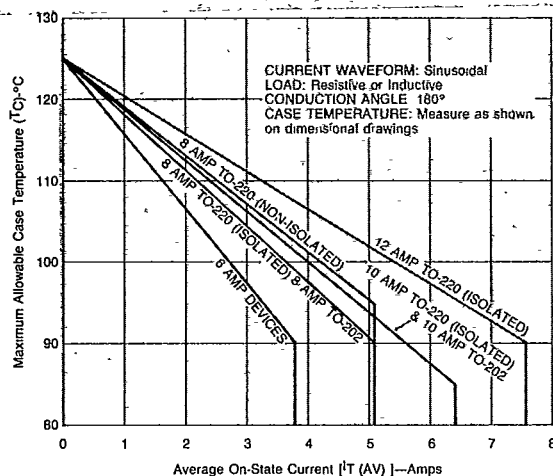


FIGURE 3A — Maximum Allowable Case Temperature vs Average On-State Current

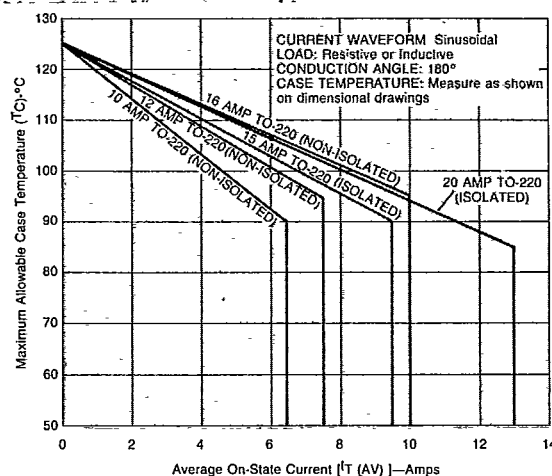


# SCR's—Non Sensitive Gate

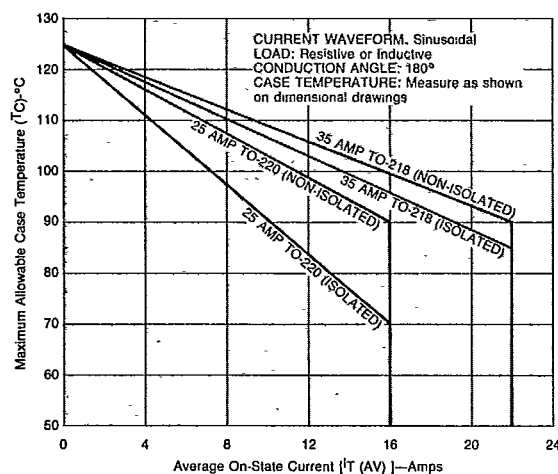
**FIGURE 3B — Maximum Allowable Case Temperature vs Average On-State Current**



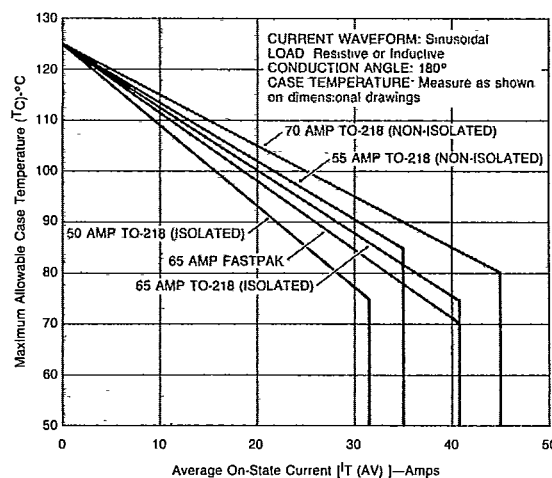
**FIGURE 3C — Maximum Allowable Case Temperature vs Average On-State Current**



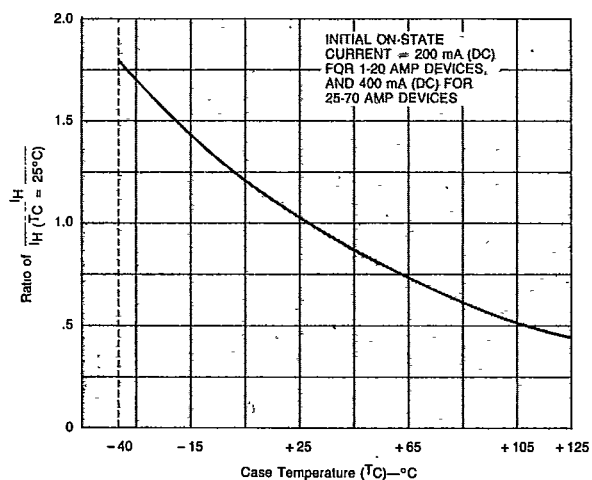
**FIGURE 3D — Maximum Allowable Case Temperature vs Average On-State Current**



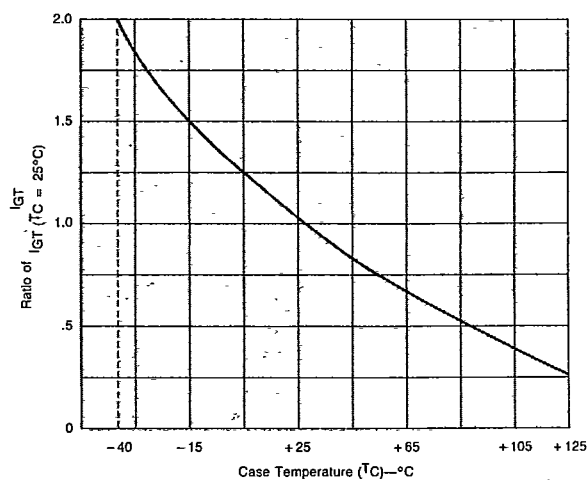
**FIGURE 3E — Maximum Allowable Case Temperature vs Average On-State Current**



**FIGURE 4 — Normalized DC Holding Current vs Case Temperature**



**FIGURE 5 — Normalized DC Gate-Trigger Current vs Case Temperature**



# SCR's—Non Sensitive Gate

FIGURE 6A — Instantaneous On-State Current vs On-State Voltage (Typical)

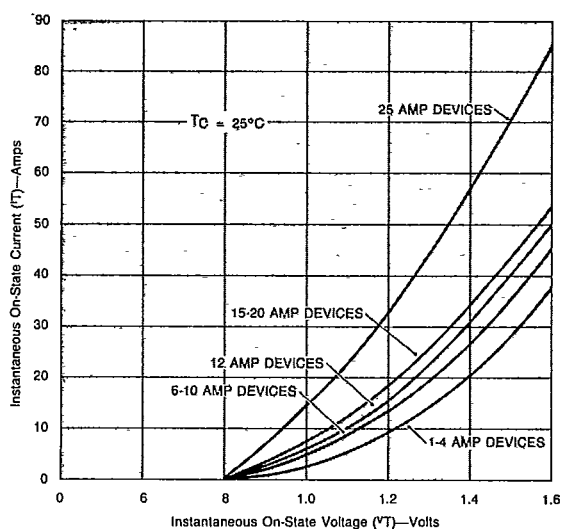


FIGURE 6B — Instantaneous On-State Current vs On-State Voltage (Typical)

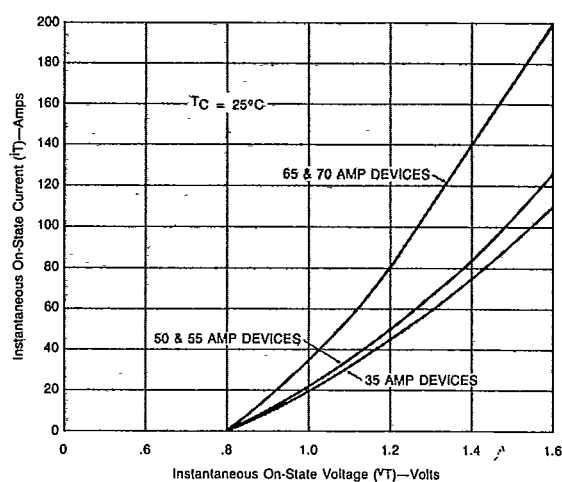


FIGURE 7 — Normalized DC Gate-Trigger Voltage vs Case Temperature

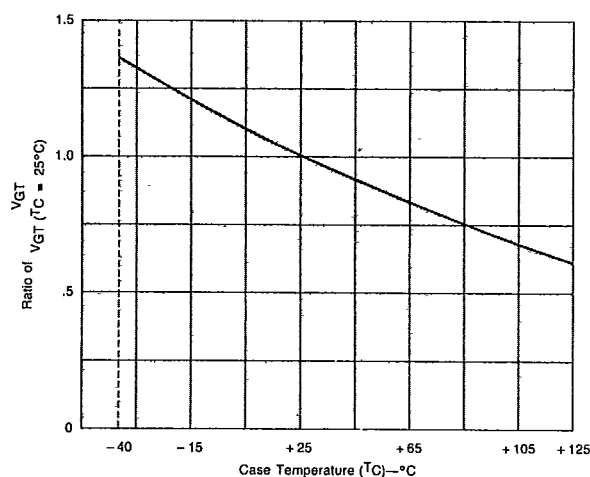


FIGURE 8 — Typical Turn-On Time vs Gate Trigger Current

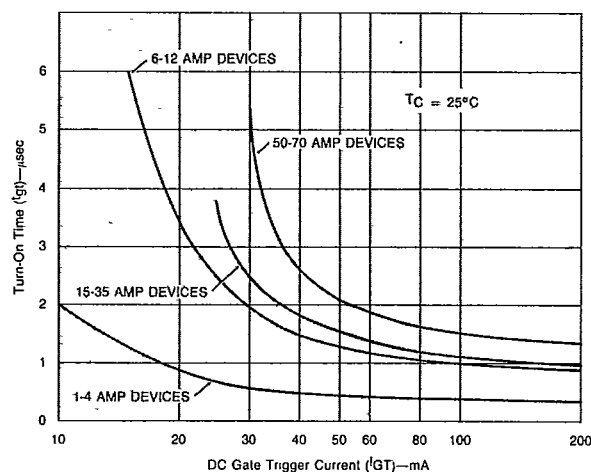


FIGURE 10A — Power Dissipation (Typical) vs RMS On-State Current

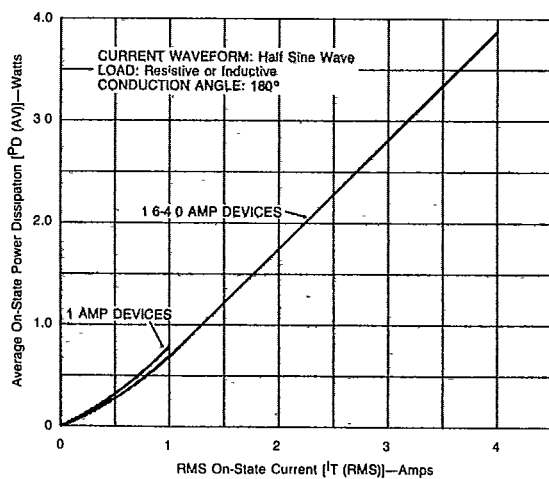
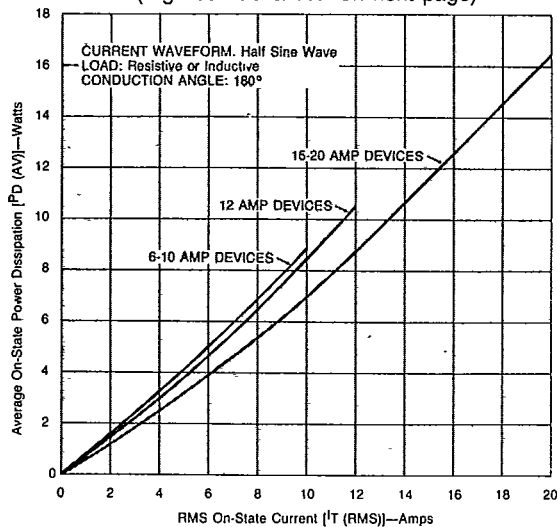
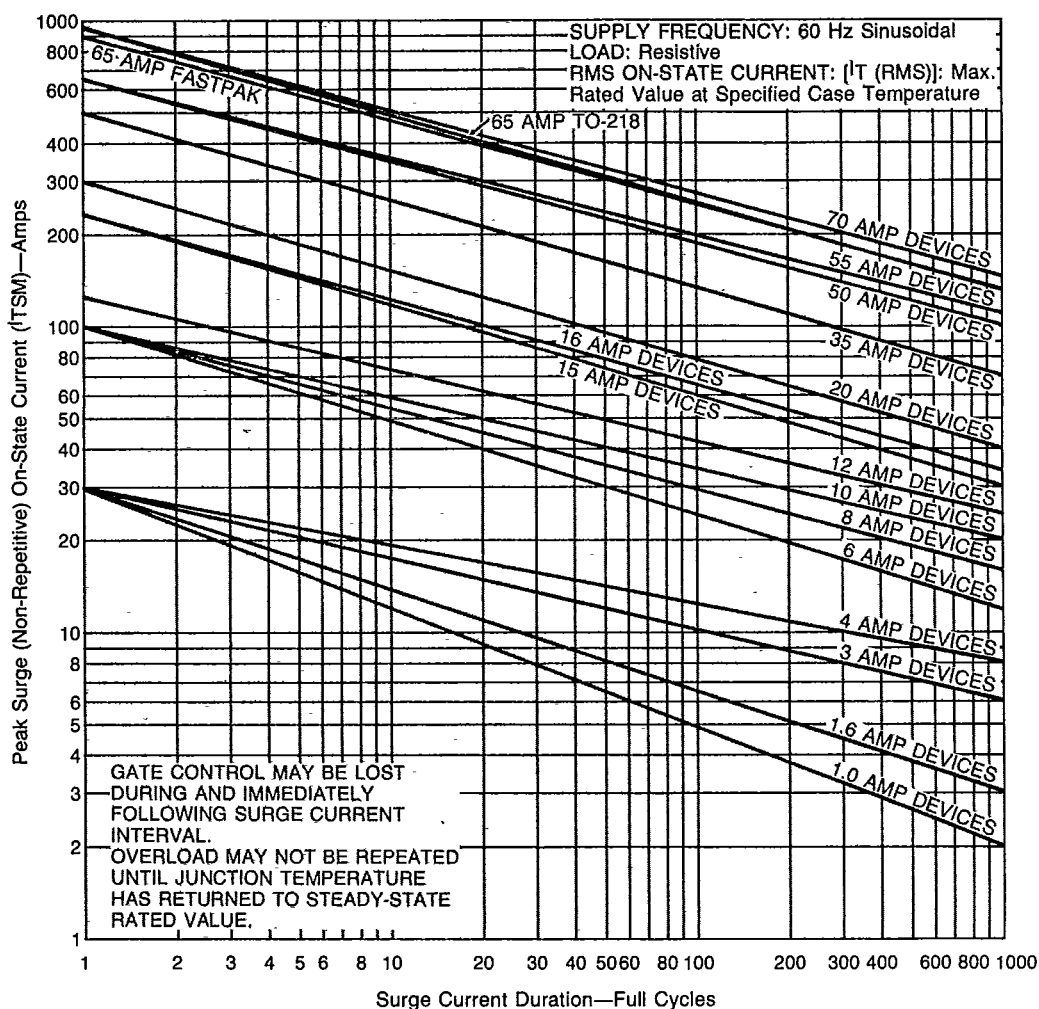


FIGURE 10B — Power Dissipation (Typical) vs RMS On-State Current  
(Figures 10C & 10D on next page)

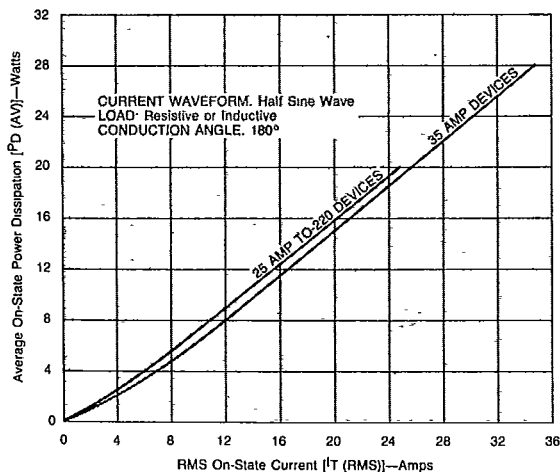


# SCR's—Non Sensitive Gate

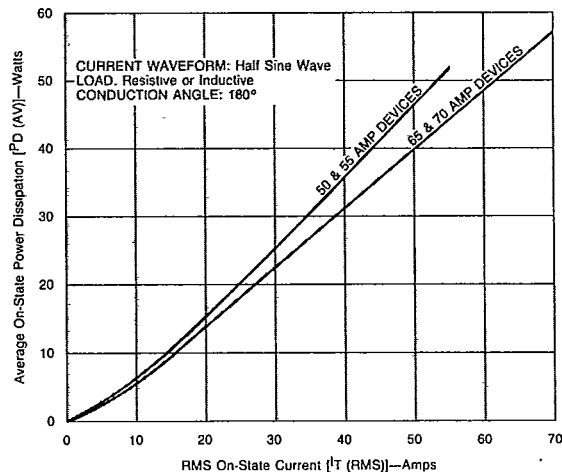
**FIGURE 9 — Peak Surge Current vs Surge Current Duration**



**FIGURE 10C — Power Dissipation (Typical) vs RMS On-State Current**



**FIGURE 10D — Power Dissipation (Typical) vs RMS On-State Current**



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