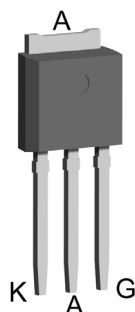
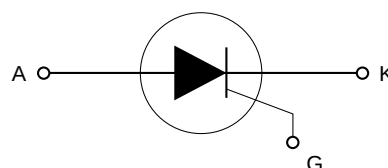


D-PAK  
TO-252AA



D-PAK  
TO-251AA

**Preliminary**



New D-PAK Sensitive

# New D-PAK Sensitive SCRs

## (4 – 10 Amps)

### General Description

Teccor's new line of D-PAK sensitive SCR semi-conductors are half-wave, unidirectional, gate-controlled rectifiers. These devices are offered with current ratings of 4 -10 amps and voltage ratings of 100-600 volts, with three gate sensitivities: 50, 200, and 500 microamperes. These sensitive SCRs are very useful in applications where high gain is required. Gate currents of microamperes control load currents of several amperes.

Teccor's D-PAK SCRs are available in a choice of two packages as shown above, surface mount (SMT) TO-252AA and through hole TO-251AA. The sturdy built assembled SCRs have copper connections going directly to the die without any intermediate wiring.

These SCRs from Teccor Electronics are part of a broad line of thyristor products with robust surge current capabilities.

This new line of devices is designed for high volume, low cost AC power applications such as controllers for motor loads, tools, ground fault circuits, alarms, and general line voltage switching.

All Teccor SCRs have glass-passivated junctions to ensure long term device reliability and permanent stability. Teccor's glass offers a rugged, reliable barrier against junction contamination. Variations of devices covered in this data sheet are available

for custom design applications. Please consult factory for more information.

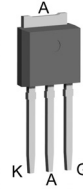
Tape-and-reel capability is available for through hole TO-251AA.

The TO-252AA is furnished in pocket / embossed tape on reels.

### Features

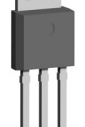
- Surface mount package TO-252AA and through hole TO-251AA
- Glass-passivated junctions ensure long device reliability and parameter stability
- Sensitive gate input
- Voltage capability — up to 600 Volts
- Surge capability — up to 100 Amps

## Electrical Specifications

|              | Part No.                                                                          |                                                                                   | $I_T$                        | $V_{DRM}$ & $V_{RRM}$                               | $I_{GT}$                                                   | $I_{DRM}$ & $I_{RRM}$                                                   |                    | $V_{TM}$                                                          | $V_{GT}$                                                   |                    |                    |                     |
|--------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------|-----------------------------------------------------|------------------------------------------------------------|-------------------------------------------------------------------------|--------------------|-------------------------------------------------------------------|------------------------------------------------------------|--------------------|--------------------|---------------------|
|              | Surface Mount                                                                     | Through Hole                                                                      |                              |                                                     |                                                            |                                                                         |                    |                                                                   |                                                            |                    |                    |                     |
| TYPE         |  |  | Maximum On-State Current (9) | Repetitive Peak Off-State Forward & Reverse Voltage | DC Gate Trigger Current $V_D = 6VDC$ $R_L = 100\Omega$ (5) | Peak Off-State Current Gate Open $V_{DRM} = \text{Max}$ Rated Value (2) |                    | Peak On-State Voltage at Max Rated RMS Current $T_C = 25^\circ C$ | DC Gate Trigger Voltage $V_D = 6VDC$ $R_L = 100\Omega$ (4) |                    |                    |                     |
|              | TO-252AA D-PAK                                                                    | TO-251AA D-PAK                                                                    | Amps                         |                                                     | Volts                                                      | $\mu A$ mps                                                             | mAmps              |                                                                   | Volts                                                      | Volts              |                    |                     |
|              |                                                                                   |                                                                                   | $I_{T(RMS)}$                 | $I_{T(AV)}$                                         |                                                            |                                                                         | $T_C = 25^\circ C$ | $T_C = 110^\circ C$                                               |                                                            | $T_C = 40^\circ C$ | $T_C = 25^\circ C$ | $T_C = 110^\circ C$ |
|              |                                                                                   |                                                                                   |                              |                                                     |                                                            |                                                                         |                    |                                                                   |                                                            |                    |                    |                     |
| Non Isolated | Non Isolated                                                                      |                                                                                   |                              | MIN                                                 | MAX                                                        | MAX                                                                     | MAX                | MAX                                                               | MAX                                                        | MAX                | MIN                |                     |
| 4 Amps       | S1004DS1                                                                          |                                                                                   | 4.0                          | 2.5                                                 | 100                                                        | 50                                                                      | .002               | 0.10                                                              | 2.2                                                        | 1.0                | 0.8                | 0.2                 |
|              | S1004DS2                                                                          |                                                                                   | 4.0                          | 2.5                                                 | 100                                                        | 200                                                                     | .002               | 0.10                                                              | 2.2                                                        | 1.0                | 0.8                | 0.2                 |
|              | S2004DS1                                                                          |                                                                                   | 4.0                          | 2.5                                                 | 200                                                        | 50                                                                      | .002               | 0.10                                                              | 2.2                                                        | 1.0                | 0.8                | 0.2                 |
|              | S2004DS2                                                                          |                                                                                   | 4.0                          | 2.5                                                 | 200                                                        | 200                                                                     | .002               | 0.10                                                              | 2.2                                                        | 1.0                | 0.8                | 0.2                 |
|              | S4004DS1                                                                          |                                                                                   | 4.0                          | 2.5                                                 | 400                                                        | 50                                                                      | .002               | 0.10                                                              | 2.2                                                        | 1.0                | 0.8                | 0.2                 |
|              | S4004DS2                                                                          |                                                                                   | 4.0                          | 2.5                                                 | 400                                                        | 200                                                                     | .002               | 0.10                                                              | 2.2                                                        | 1.0                | 0.8                | 0.2                 |
|              | S6004DS1                                                                          |                                                                                   | 4.0                          | 2.5                                                 | 600                                                        | 50                                                                      | .002               | 0.10                                                              | 2.2                                                        | 1.0                | 0.8                | 0.2                 |
|              | S6004DS2                                                                          |                                                                                   | 4.0                          | 2.5                                                 | 600                                                        | 200                                                                     | .002               | 0.10                                                              | 2.2                                                        | 1.0                | 0.8                | 0.2                 |
|              |                                                                                   | S1004VS1                                                                          | 4.0                          | 2.5                                                 | 100                                                        | 50                                                                      | .002               | 0.10                                                              | 2.2                                                        | 1.0                | 0.8                | 0.2                 |
|              |                                                                                   | S1004VS2                                                                          | 4.0                          | 2.5                                                 | 100                                                        | 200                                                                     | .002               | 0.10                                                              | 2.2                                                        | 1.0                | 0.8                | 0.2                 |
|              |                                                                                   | S2004VS1                                                                          | 4.0                          | 2.5                                                 | 200                                                        | 50                                                                      | .002               | 0.10                                                              | 2.2                                                        | 1.0                | 0.8                | 0.2                 |
|              |                                                                                   | S2004VS2                                                                          | 4.0                          | 2.5                                                 | 200                                                        | 200                                                                     | .002               | 0.10                                                              | 2.2                                                        | 1.0                | 0.8                | 0.2                 |
|              |                                                                                   | S4004VS1                                                                          | 4.0                          | 2.5                                                 | 400                                                        | 50                                                                      | .002               | 0.10                                                              | 2.2                                                        | 1.0                | 0.8                | 0.2                 |
|              |                                                                                   | S4004VS2                                                                          | 4.0                          | 2.5                                                 | 400                                                        | 200                                                                     | .002               | 0.10                                                              | 2.2                                                        | 1.0                | 0.8                | 0.2                 |
| 6 Amps       | S1006DS2                                                                          |                                                                                   | 6.0                          | 3.8                                                 | 100                                                        | 200                                                                     | .005               | 0.25                                                              | 1.6                                                        | 1.0                | 0.8                | 0.25                |
|              | S1006DS3                                                                          |                                                                                   | 6.0                          | 3.8                                                 | 100                                                        | 500                                                                     | .005               | 0.25                                                              | 1.6                                                        | 1.0                | 0.8                | 0.25                |
|              | S2006DS2                                                                          |                                                                                   | 6.0                          | 3.8                                                 | 200                                                        | 200                                                                     | .005               | 0.25                                                              | 1.6                                                        | 1.0                | 0.8                | 0.25                |
|              | S2006DS3                                                                          |                                                                                   | 6.0                          | 3.8                                                 | 200                                                        | 500                                                                     | .005               | 0.25                                                              | 1.6                                                        | 1.0                | 0.8                | 0.25                |
|              | S4006DS2                                                                          |                                                                                   | 6.0                          | 3.8                                                 | 400                                                        | 200                                                                     | .005               | 0.25                                                              | 1.6                                                        | 1.0                | 0.8                | 0.25                |
|              | S4006DS3                                                                          |                                                                                   | 6.0                          | 3.8                                                 | 400                                                        | 500                                                                     | .005               | 0.25                                                              | 1.6                                                        | 1.0                | 0.8                | 0.25                |
|              | S6006DS2                                                                          |                                                                                   | 6.0                          | 3.8                                                 | 600                                                        | 200                                                                     | .005               | 0.25                                                              | 1.6                                                        | 1.0                | 0.8                | 0.25                |
|              | S6006DS3                                                                          |                                                                                   | 6.0                          | 3.8                                                 | 600                                                        | 500                                                                     | .005               | 0.25                                                              | 1.6                                                        | 1.0                | 0.8                | 0.25                |
|              |                                                                                   | S1006VS2                                                                          | 6.0                          | 3.8                                                 | 100                                                        | 200                                                                     | .005               | 0.25                                                              | 1.6                                                        | 1.0                | 0.8                | 0.25                |
|              |                                                                                   | S1006VS3                                                                          | 6.0                          | 3.8                                                 | 100                                                        | 500                                                                     | .005               | 0.25                                                              | 1.6                                                        | 1.0                | 0.8                | 0.25                |
|              |                                                                                   | S2006VS2                                                                          | 6.0                          | 3.8                                                 | 200                                                        | 200                                                                     | .005               | 0.25                                                              | 1.6                                                        | 1.0                | 0.8                | 0.25                |
|              |                                                                                   | S2006VS3                                                                          | 6.0                          | 3.8                                                 | 200                                                        | 500                                                                     | .005               | 0.25                                                              | 1.6                                                        | 1.0                | 0.8                | 0.25                |
|              |                                                                                   | S4006VS2                                                                          | 6.0                          | 3.8                                                 | 400                                                        | 200                                                                     | .005               | 0.25                                                              | 1.6                                                        | 1.0                | 0.8                | 0.25                |
|              |                                                                                   | S4006VS3                                                                          | 6.0                          | 3.8                                                 | 400                                                        | 500                                                                     | .005               | 0.25                                                              | 1.6                                                        | 1.0                | 0.8                | 0.25                |
|              |                                                                                   | S6006VS2                                                                          | 6.0                          | 3.8                                                 | 600                                                        | 200                                                                     | .005               | 0.25                                                              | 1.6                                                        | 1.0                | 0.8                | 0.25                |
|              |                                                                                   | S6006VS3                                                                          | 6.0                          | 3.8                                                 | 600                                                        | 500                                                                     | .005               | 0.25                                                              | 1.6                                                        | 1.0                | 0.8                | 0.25                |
| 8 Amps       | S1008DS2                                                                          |                                                                                   | 8.0                          | 5.1                                                 | 100                                                        | 200                                                                     | .005               | 0.25                                                              | 1.6                                                        | 1.0                | 0.8                | 0.25                |
|              | S1008DS3                                                                          |                                                                                   | 8.0                          | 5.1                                                 | 100                                                        | 500                                                                     | .005               | 0.25                                                              | 1.6                                                        | 1.0                | 0.8                | 0.25                |
|              | S2008DS2                                                                          |                                                                                   | 8.0                          | 5.1                                                 | 200                                                        | 200                                                                     | .005               | 0.25                                                              | 1.6                                                        | 1.0                | 0.8                | 0.25                |
|              | S2008DS3                                                                          |                                                                                   | 8.0                          | 5.1                                                 | 200                                                        | 500                                                                     | .005               | 0.25                                                              | 1.6                                                        | 1.0                | 0.8                | 0.25                |
|              | S4008DS2                                                                          |                                                                                   | 8.0                          | 5.1                                                 | 400                                                        | 200                                                                     | .005               | 0.25                                                              | 1.6                                                        | 1.0                | 0.8                | 0.25                |
|              | S4008DS3                                                                          |                                                                                   | 8.0                          | 5.1                                                 | 400                                                        | 500                                                                     | .005               | 0.25                                                              | 1.6                                                        | 1.0                | 0.8                | 0.25                |
|              | S6008DS2                                                                          |                                                                                   | 8.0                          | 5.1                                                 | 600                                                        | 200                                                                     | .005               | 0.25                                                              | 1.6                                                        | 1.0                | 0.8                | 0.25                |
|              | S6008DS3                                                                          |                                                                                   | 8.0                          | 5.1                                                 | 600                                                        | 500                                                                     | .005               | 0.25                                                              | 1.6                                                        | 1.0                | 0.8                | 0.25                |
|              |                                                                                   | S1008VS2                                                                          | 8.0                          | 5.1                                                 | 100                                                        | 200                                                                     | .005               | 0.25                                                              | 1.6                                                        | 1.0                | 0.8                | 0.25                |
|              |                                                                                   | S1008VS3                                                                          | 8.0                          | 5.1                                                 | 100                                                        | 500                                                                     | .005               | 0.25                                                              | 1.6                                                        | 1.0                | 0.8                | 0.25                |
|              |                                                                                   | S2008VS2                                                                          | 8.0                          | 5.1                                                 | 200                                                        | 200                                                                     | .005               | 0.25                                                              | 1.6                                                        | 1.0                | 0.8                | 0.25                |
|              |                                                                                   | S2008VS3                                                                          | 8.0                          | 5.1                                                 | 200                                                        | 500                                                                     | .005               | 0.25                                                              | 1.6                                                        | 1.0                | 0.8                | 0.25                |
|              |                                                                                   | S4008VS2                                                                          | 8.0                          | 5.1                                                 | 400                                                        | 200                                                                     | .005               | 0.25                                                              | 1.6                                                        | 1.0                | 0.8                | 0.25                |
|              |                                                                                   | S4008VS3                                                                          | 8.0                          | 5.1                                                 | 400                                                        | 500                                                                     | .005               | 0.25                                                              | 1.6                                                        | 1.0                | 0.8                | 0.25                |
|              |                                                                                   | S6008VS2                                                                          | 8.0                          | 5.1                                                 | 600                                                        | 200                                                                     | .005               | 0.25                                                              | 1.6                                                        | 1.0                | 0.8                | 0.25                |
|              |                                                                                   | S6008VS3                                                                          | 8.0                          | 5.1                                                 | 600                                                        | 500                                                                     | .005               | 0.25                                                              | 1.6                                                        | 1.0                | 0.8                | 0.25                |

| $I_H$                                                         | $I_{GM}$              | $V_{GRM}$                 | $P_{GM}$                        | $P_{G(AV)}$                    | $I_{TSM}$                      |      | $dv/dt$                          | $di/dt$                                                                                      | $t_{gt}$                                                                                    | $t_q$                                | $I^2t$                                                                     |
|---------------------------------------------------------------|-----------------------|---------------------------|---------------------------------|--------------------------------|--------------------------------|------|----------------------------------|----------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|--------------------------------------|----------------------------------------------------------------------------|
| Holding Current Gate Open Initial on State Current = 20mA (6) | Peak Gate Current (1) | Peak Reverse Gate Voltage | Peak Gate Power Dissipation (1) | Average Gate Power Dissipation | Peak One Cycle Surge (3)(7)(9) |      | Critical Rate-of-Applied Voltage | Maximum Rate-of-Change of On-State Current<br>$I_{GT} = 150mA$<br>With 0.1 $\mu s$ Rise Time | Gate Controlled Turn-OnTime Gate Pulse=10mA Min. Width=15 $\mu s$ $\leq 0.1\mu s$ Rise Time | Circuit Commulated Turn-Off Time (8) | RMS Surge (Non-Repetitive) On-State Current for Period of 8.3ms for Fusing |
| mAmps                                                         | Amps                  | Volts                     | Watts                           | Watts                          | Amps                           |      | Volts/ $\mu Sec$                 |                                                                                              |                                                                                             |                                      |                                                                            |
|                                                               |                       |                           |                                 |                                | 60Hz                           | 50Hz | $T_C = 110^\circ C$              | Amps/ $\mu Sec$                                                                              | $\mu Sec$                                                                                   | $\mu Sec$                            | Amps <sup>2</sup> Sec                                                      |
| MAX                                                           |                       | MIN                       |                                 |                                |                                |      | TYP                              |                                                                                              | TYP                                                                                         | MAX                                  |                                                                            |
| 4.0                                                           | 1.0                   | 6.0                       | 1.0                             | 0.1                            | 20                             | 16   | 8                                | 50                                                                                           | 3.0                                                                                         | 50                                   | 1.6                                                                        |
| 6.0                                                           | 1.0                   | 6.0                       | 1.0                             | 0.1                            | 20                             | 16   | 8                                | 50                                                                                           | 4.0                                                                                         | 50                                   | 1.6                                                                        |
| 4.0                                                           | 1.0                   | 6.0                       | 1.0                             | 0.1                            | 20                             | 16   | 8                                | 50                                                                                           | 3.0                                                                                         | 50                                   | 1.6                                                                        |
| 6.0                                                           | 1.0                   | 6.0                       | 1.0                             | 0.1                            | 20                             | 16   | 8                                | 50                                                                                           | 4.0                                                                                         | 50                                   | 1.6                                                                        |
| 4.0                                                           | 1.0                   | 6.0                       | 1.0                             | 0.1                            | 20                             | 16   | 8                                | 50                                                                                           | 3.0                                                                                         | 50                                   | 1.6                                                                        |
| 6.0                                                           | 1.0                   | 6.0                       | 1.0                             | 0.1                            | 20                             | 16   | 8                                | 50                                                                                           | 4.0                                                                                         | 50                                   | 1.6                                                                        |
| 4.0                                                           | 1.0                   | 6.0                       | 1.0                             | 0.1                            | 20                             | 16   | 8                                | 50                                                                                           | 3.0                                                                                         | 50                                   | 1.6                                                                        |
| 6.0                                                           | 1.0                   | 6.0                       | 1.0                             | 0.1                            | 20                             | 16   | 8                                | 50                                                                                           | 4.0                                                                                         | 50                                   | 1.6                                                                        |
| 4.0                                                           | 1.0                   | 6.0                       | 1.0                             | 0.1                            | 20                             | 16   | 8                                | 50                                                                                           | 3.0                                                                                         | 50                                   | 1.6                                                                        |
| 6.0                                                           | 1.0                   | 6.0                       | 1.0                             | 0.1                            | 20                             | 16   | 8                                | 50                                                                                           | 4.0                                                                                         | 50                                   | 1.6                                                                        |
| 4.0                                                           | 1.0                   | 6.0                       | 1.0                             | 0.1                            | 20                             | 16   | 8                                | 50                                                                                           | 3.0                                                                                         | 50                                   | 1.6                                                                        |
| 6.0                                                           | 1.0                   | 6.0                       | 1.0                             | 0.1                            | 20                             | 16   | 8                                | 50                                                                                           | 4.0                                                                                         | 50                                   | 1.6                                                                        |
| 4.0                                                           | 1.0                   | 6.0                       | 1.0                             | 0.1                            | 20                             | 16   | 8                                | 50                                                                                           | 3.0                                                                                         | 50                                   | 1.6                                                                        |
| 6.0                                                           | 1.0                   | 6.0                       | 1.0                             | 0.1                            | 20                             | 16   | 8                                | 50                                                                                           | 4.0                                                                                         | 50                                   | 1.6                                                                        |
| 6.0                                                           | 1.0                   | 6.0                       | 1.0                             | 0.1                            | 100                            | 83   | 10                               | 100                                                                                          | 4.0                                                                                         | 50                                   | 41                                                                         |
| 8.0                                                           | 1.0                   | 6.0                       | 1.0                             | 0.1                            | 100                            | 83   | 10                               | 100                                                                                          | 5.0                                                                                         | 45                                   | 41                                                                         |
| 6.0                                                           | 1.0                   | 6.0                       | 1.0                             | 0.1                            | 100                            | 83   | 10                               | 100                                                                                          | 4.0                                                                                         | 50                                   | 41                                                                         |
| 8.0                                                           | 1.0                   | 6.0                       | 1.0                             | 0.1                            | 100                            | 83   | 10                               | 100                                                                                          | 5.0                                                                                         | 45                                   | 41                                                                         |
| 6.0                                                           | 1.0                   | 6.0                       | 1.0                             | 0.1                            | 100                            | 83   | 8                                | 100                                                                                          | 4.0                                                                                         | 50                                   | 41                                                                         |
| 8.0                                                           | 1.0                   | 6.0                       | 1.0                             | 0.1                            | 100                            | 83   | 8                                | 100                                                                                          | 5.0                                                                                         | 45                                   | 41                                                                         |
| 6.0                                                           | 1.0                   | 6.0                       | 1.0                             | 0.1                            | 100                            | 83   | 8                                | 100                                                                                          | 4.0                                                                                         | 50                                   | 41                                                                         |
| 8.0                                                           | 1.0                   | 6.0                       | 1.0                             | 0.1                            | 100                            | 83   | 8                                | 100                                                                                          | 5.0                                                                                         | 45                                   | 41                                                                         |
| 6.0                                                           | 1.0                   | 6.0                       | 1.0                             | 0.1                            | 100                            | 83   | 10                               | 100                                                                                          | 4.0                                                                                         | 50                                   | 41                                                                         |
| 8.0                                                           | 1.0                   | 6.0                       | 1.0                             | 0.1                            | 100                            | 83   | 10                               | 100                                                                                          | 5.0                                                                                         | 45                                   | 41                                                                         |
| 6.0                                                           | 1.0                   | 6.0                       | 1.0                             | 0.1                            | 100                            | 83   | 10                               | 100                                                                                          | 4.0                                                                                         | 50                                   | 41                                                                         |
| 8.0                                                           | 1.0                   | 6.0                       | 1.0                             | 0.1                            | 100                            | 83   | 10                               | 100                                                                                          | 5.0                                                                                         | 45                                   | 41                                                                         |
| 6.0                                                           | 1.0                   | 6.0                       | 1.0                             | 0.1                            | 100                            | 83   | 10                               | 100                                                                                          | 4.0                                                                                         | 50                                   | 41                                                                         |
| 8.0                                                           | 1.0                   | 6.0                       | 1.0                             | 0.1                            | 100                            | 83   | 10                               | 100                                                                                          | 5.0                                                                                         | 45                                   | 41                                                                         |
| 6.0                                                           | 1.0                   | 6.0                       | 1.0                             | 0.1                            | 100                            | 83   | 8                                | 100                                                                                          | 4.0                                                                                         | 50                                   | 41                                                                         |
| 8.0                                                           | 1.0                   | 6.0                       | 1.0                             | 0.1                            | 100                            | 83   | 8                                | 100                                                                                          | 5.0                                                                                         | 45                                   | 41                                                                         |
| 6.0                                                           | 1.0                   | 6.0                       | 1.0                             | 0.1                            | 100                            | 83   | 8                                | 100                                                                                          | 4.0                                                                                         | 50                                   | 41                                                                         |
| 8.0                                                           | 1.0                   | 6.0                       | 1.0                             | 0.1                            | 100                            | 83   | 8                                | 100                                                                                          | 5.0                                                                                         | 45                                   | 41                                                                         |
| 6.0                                                           | 1.0                   | 6.0                       | 1.0                             | 0.1                            | 100                            | 83   | 10                               | 100                                                                                          | 4.0                                                                                         | 50                                   | 41                                                                         |
| 8.0                                                           | 1.0                   | 6.0                       | 1.0                             | 0.1                            | 100                            | 83   | 10                               | 100                                                                                          | 5.0                                                                                         | 45                                   | 41                                                                         |
| 6.0                                                           | 1.0                   | 6.0                       | 1.0                             | 0.1                            | 100                            | 83   | 10                               | 100                                                                                          | 4.0                                                                                         | 50                                   | 41                                                                         |
| 8.0                                                           | 1.0                   | 6.0                       | 1.0                             | 0.1                            | 100                            | 83   | 10                               | 100                                                                                          | 5.0                                                                                         | 45                                   | 41                                                                         |
| 6.0                                                           | 1.0                   | 6.0                       | 1.0                             | 0.1                            | 100                            | 83   | 8                                | 100                                                                                          | 4.0                                                                                         | 50                                   | 41                                                                         |
| 8.0                                                           | 1.0                   | 6.0                       | 1.0                             | 0.1                            | 100                            | 83   | 8                                | 100                                                                                          | 5.0                                                                                         | 45                                   | 41                                                                         |
| 6.0                                                           | 1.0                   | 6.0                       | 1.0                             | 0.1                            | 100                            | 83   | 8                                | 100                                                                                          | 4.0                                                                                         | 50                                   | 41                                                                         |
| 8.0                                                           | 1.0                   | 6.0                       | 1.0                             | 0.1                            | 100                            | 83   | 8                                | 100                                                                                          | 5.0                                                                                         | 45                                   | 41                                                                         |
| 6.0                                                           | 1.0                   | 6.0                       | 1.0                             | 0.1                            | 100                            | 83   | 10                               | 100                                                                                          | 4.0                                                                                         | 50                                   | 41                                                                         |
| 8.0                                                           | 1.0                   | 6.0                       | 1.0                             | 0.1                            | 100                            | 83   | 10                               | 100                                                                                          | 5.0                                                                                         | 45                                   | 41                                                                         |
| 6.0                                                           | 1.0                   | 6.0                       | 1.0                             | 0.1                            | 100                            | 83   | 10                               | 100                                                                                          | 4.0                                                                                         | 50                                   | 41                                                                         |
| 8.0                                                           | 1.0                   | 6.0                       | 1.0                             | 0.1                            | 100                            | 83   | 10                               | 100                                                                                          | 5.0                                                                                         | 45                                   | 41                                                                         |
| 6.0                                                           | 1.0                   | 6.0                       | 1.0                             | 0.1                            | 100                            | 83   | 8                                | 100                                                                                          | 4.0                                                                                         | 50                                   | 41                                                                         |
| 8.0                                                           | 1.0                   | 6.0                       | 1.0                             | 0.1                            | 100                            | 83   | 8                                | 100                                                                                          | 5.0                                                                                         | 45                                   | 41                                                                         |
| 6.0                                                           | 1.0                   | 6.0                       | 1.0                             | 0.1                            | 100                            | 83   | 8                                | 100                                                                                          | 4.0                                                                                         | 50                                   | 41                                                                         |
| 8.0                                                           | 1.0                   | 6.0                       | 1.0                             | 0.1                            | 100                            | 83   | 8                                | 100                                                                                          | 5.0                                                                                         | 45                                   | 41                                                                         |
| 6.0                                                           | 1.0                   | 6.0                       | 1.0                             | 0.1                            | 100                            | 83   | 8                                | 100                                                                                          | 4.0                                                                                         | 50                                   | 41                                                                         |
| 8.0                                                           | 1.0                   | 6.0                       | 1.0                             | 0.1                            | 100                            | 83   | 8                                | 100                                                                                          | 5.0                                                                                         | 45                                   | 41                                                                         |
| 6.0                                                           | 1.0                   | 6.0                       | 1.0                             | 0.1                            | 100                            | 83   | 8                                | 100                                                                                          | 4.0                                                                                         | 50                                   | 41                                                                         |
| 8.0                                                           | 1.0                   | 6.0                       | 1.0                             | 0.1                            | 100                            | 83   | 8                                | 100                                                                                          | 5.0                                                                                         | 45                                   | 41                                                                         |
| 6.0                                                           | 1.0                   | 6.0                       | 1.0                             | 0.1                            | 100                            | 83   | 8                                | 100                                                                                          | 4.0                                                                                         | 50                                   | 41                                                                         |
| 8.0                                                           | 1.0                   | 6.0                       | 1.0                             | 0.1                            | 100                            | 83   | 8                                | 100                                                                                          | 5.0                                                                                         | 45                                   | 41                                                                         |
| 6.0                                                           | 1.0                   | 6.0                       | 1.0                             | 0.1                            | 100                            | 83   | 8                                | 100                                                                                          | 4.0                                                                                         | 50                                   | 41                                                                         |
| 8.0                                                           | 1.0                   | 6.0                       | 1.0                             | 0.1                            | 100                            | 83   | 8                                | 100                                                                                          | 5.0                                                                                         | 45                                   | 41                                                                         |
| 6.0                                                           | 1.0                   | 6.0                       | 1.0                             | 0.1                            | 100                            | 83   | 8                                | 100                                                                                          | 4.0                                                                                         | 50                                   | 41                                                                         |
| 8.0                                                           | 1.0                   | 6.0                       | 1.0                             | 0.1                            | 100                            | 83   | 8                                | 100                                                                                          | 5.0                                                                                         | 45                                   | 41                                                                         |
| 6.0                                                           | 1.0                   | 6.0                       | 1.0                             | 0.1                            | 100                            | 83   | 8                                | 100                                                                                          | 4.0                                                                                         | 50                                   | 41                                                                         |
| 8.0                                                           | 1.0                   | 6.0                       | 1.0                             | 0.1                            | 100                            | 83   | 8                                | 100                                                                                          | 5.0                                                                                         | 45                                   | 41                                                                         |
| 6.0                                                           | 1.0                   | 6.0                       | 1.0                             | 0.1                            | 100                            | 83   | 8                                | 100                                                                                          | 4.0                                                                                         | 50                                   | 41                                                                         |
| 8.0                                                           | 1.0                   | 6.0                       | 1.0                             | 0.1                            | 100                            | 83   | 8                                | 100                                                                                          | 5.0                                                                                         | 45                                   | 41                                                                         |
| 6.0                                                           | 1.0                   | 6.0                       | 1.0                             | 0.1                            | 100                            | 83   | 8                                | 100                                                                                          | 4.0                                                                                         | 50                                   | 41                                                                         |
| 8.0                                                           | 1.0                   | 6.0                       | 1.0                             | 0.1                            | 100                            | 83   | 8                                | 100                                                                                          | 5.0                                                                                         | 45                                   | 41                                                                         |
| 6.0                                                           | 1.0                   | 6.0                       | 1.0                             | 0.1                            | 100                            | 83   | 8                                | 100                                                                                          | 4.0                                                                                         | 50                                   | 41                                                                         |
| 8.0                                                           | 1.0                   | 6.0                       | 1.0                             | 0.1                            | 100                            | 83   | 8                                | 100                                                                                          | 5.0                                                                                         | 45                                   | 41                                                                         |
| 6.0                                                           | 1.0                   | 6.0                       | 1.0                             | 0.1                            | 100                            | 83   | 8                                | 100                                                                                          | 4.0                                                                                         | 50                                   | 41                                                                         |
| 8.0                                                           | 1.0                   | 6.0                       | 1.0                             | 0.1                            | 100                            | 83   | 8                                | 100                                                                                          | 5.0                                                                                         | 45                                   | 41                                                                         |
| 6.0                                                           | 1.0                   | 6.0                       | 1.0                             | 0.1                            | 100                            | 83   | 8                                | 100                                                                                          | 4.0                                                                                         | 50                                   | 41                                                                         |
| 8.0                                                           | 1.0                   | 6.0                       | 1.0                             | 0.1                            | 100                            | 83   | 8                                | 100                                                                                          | 5.0                                                                                         | 45                                   | 41                                                                         |
| 6.0                                                           | 1.0                   | 6.0                       | 1.0                             | 0.1                            | 100                            | 83   | 8                                | 100                                                                                          | 4.0                                                                                         | 50                                   | 41                                                                         |
| 8.0                                                           | 1.0                   | 6.0                       | 1.0                             | 0.1                            | 100                            | 83   | 8                                | 100                                                                                          | 5.0                                                                                         | 45                                   | 41                                                                         |
| 6.0                                                           | 1.0                   | 6.0                       | 1.0                             | 0.1                            | 100                            | 83   | 8                                | 100                                                                                          | 4.0                                                                                         | 50                                   | 41                                                                         |
| 8.0                                                           | 1.0                   | 6.0                       | 1.0                             | 0.1                            | 100                            | 83   | 8                                | 100                                                                                          | 5.0                                                                                         | 45                                   | 41                                                                         |
| 6.0                                                           | 1.0                   | 6.0                       | 1.0                             | 0.1                            | 100                            | 83   | 8                                | 100                                                                                          | 4.0                                                                                         | 50                                   | 41                                                                         |
| 8.0                                                           | 1.0                   | 6.0                       | 1.0                             | 0.1                            | 100                            | 83   | 8                                | 100                                                                                          | 5.0                                                                                         | 45                                   | 41                                                                         |
| 6.0                                                           | 1.0                   | 6.0                       | 1.0                             | 0.1                            | 100                            | 83   | 8                                | 100                                                                                          | 4.0                                                                                         | 50                                   | 41                                                                         |
| 8.0                                                           | 1.0                   | 6.0                       | 1.0                             | 0.1                            | 100                            | 83   | 8                                | 100                                                                                          | 5.0                                                                                         | 45                                   | 41                                                                         |
| 6.0                                                           | 1.0                   | 6.0                       | 1.0                             | 0.1                            | 100                            | 83   | 8                                | 100                                                                                          | 4.0                                                                                         | 50                                   | 41                                                                         |
| 8.0                                                           | 1.0                   | 6.0                       | 1.0                             | 0.1                            | 100                            | 83   | 8                                | 100                                                                                          | 5.0                                                                                         | 45                                   | 41                                                                         |
| 6.0                                                           | 1.0                   | 6.0                       | 1.0                             | 0.1                            | 100                            | 83   | 8                                | 100                                                                                          | 4.0                                                                                         | 50                                   | 41                                                                         |
| 8.0                                                           | 1.0                   | 6.0                       | 1.0                             | 0.1                            | 100                            | 83   | 8                                | 100                                                                                          | 5.0                                                                                         | 45                                   | 41                                                                         |
| 6.0                                                           | 1.0                   | 6.0                       | 1.0                             | 0.1                            | 100                            | 83   | 8                                | 100                                                                                          | 4.0                                                                                         | 50                                   | 41                                                                         |
| 8.0                                                           | 1.0                   | 6.0                       | 1.0                             | 0.1                            | 100                            | 83   | 8                                | 100                                                                                          | 5.0                                                                                         | 45                                   | 41                                                                         |
| 6.0                                                           | 1.0                   | 6.0                       | 1.0                             | 0.1                            | 100                            | 83   | 8                                | 100                                                                                          | 4.0                                                                                         | 50                                   | 41                                                                         |
| 8.0                                                           | 1.0                   | 6.0                       | 1.0                             | 0.1                            | 100                            | 83   | 8                                | 100                                                                                          | 5.0                                                                                         | 45                                   | 41                                                                         |
| 6.0                                                           | 1.0                   | 6.0                       | 1.0                             | 0.1                            | 100                            | 83   | 8                                | 100                                                                                          | 4.0                                                                                         | 50                                   | 41                                                                         |
| 8.0                                                           | 1.0                   | 6.0                       | 1.0                             | 0.1                            | 100                            | 83   | 8                                | 100                                                                                          | 5.0                                                                                         | 45                                   | 41                                                                         |
| 6.0                                                           | 1.0                   | 6.0                       | 1.0                             | 0.1                            | 100                            | 83   | 8                                | 100                                                                                          | 4.0                                                                                         | 50                                   | 41                                                                         |
| 8.0                                                           | 1.0                   | 6.0                       | 1.0                             | 0.1                            | 100                            | 83   | 8                                | 100                                                                                          | 5.0                                                                                         | 45                                   | 41                                                                         |
| 6.0                                                           | 1.0                   | 6.0                       | 1.0                             | 0.1                            | 100                            | 83   | 8                                | 100                                                                                          | 4.0                                                                                         | 50                                   | 41                                                                         |
| 8.0                                                           | 1.0                   | 6.0                       | 1.0                             | 0.1                            | 100                            | 83   | 8                                | 100                                                                                          | 5.0                                                                                         | 45                                   | 41                                                                         |
| 6.0                                                           | 1.0                   | 6.0                       | 1.0                             | 0.1                            | 100                            | 83   | 8                                | 100                                                                                          | 4.0                                                                                         | 50                                   | 41                                                                         |
| 8.0                                                           | 1.0                   | 6.0                       | 1.0                             | 0.1                            | 100                            | 83   | 8                                | 100                                                                                          | 5.0                                                                                         | 45                                   | 41                                                                         |
| 6.0                                                           | 1.0                   | 6.0                       | 1.0                             | 0.1                            | 100                            | 83   | 8                                | 100                                                                                          | 4.0                                                                                         | 50                                   | 41                                                                         |
| 8.0                                                           | 1.0                   | 6.0                       | 1.0                             | 0.1                            | 100                            | 83   | 8                                | 100                                                                                          | 5.0                                                                                         | 45                                   | 41                                                                         |
| 6.0                                                           | 1.0                   | 6.0                       | 1.0                             | 0.1                            | 100                            | 83   | 8                                | 100                                                                                          | 4.0                                                                                         | 50                                   | 41                                                                         |
| 8.0                                                           | 1.0                   | 6.0                       | 1.0                             | 0.1                            | 100                            | 83   | 8                                | 100                                                                                          | 5.0                                                                                         | 45                                   | 41                                                                         |
| 6.0                                                           | 1.0                   | 6.0                       | 1.0                             | 0.1                            | 100                            | 83   | 8                                | 100                                                                                          | 4.0                                                                                         | 50                                   | 41                                                                         |
| 8.0                                                           | 1.0                   | 6.0                       | 1.0                             | 0.1                            | 100                            | 83   | 8                                | 100                                                                                          | 5.0                                                                                         | 45                                   | 41                                                                         |
| 6.0                                                           | 1.0                   | 6.0                       | 1.0                             | 0.1                            | 100                            | 83   | 8                                | 100                                                                                          | 4.0                                                                                         | 50                                   | 41                                                                         |
| 8.0                                                           | 1.0                   | 6.0                       | 1.0                             | 0.1                            | 100                            | 83   | 8                                | 100                                                                                          | 5.0                                                                                         | 45                                   | 41                                                                         |
| 6.0                                                           | 1.0                   | 6.0                       | 1.0                             | 0.1                            | 100                            | 83   | 8                                | 100                                                                                          | 4.0                                                                                         | 50                                   | 41                                                                         |
| 8.0                                                           | 1.0                   | 6.0                       | 1.0                             | 0.1                            | 100                            | 83   | 8                                | 100                                                                                          | 5.0                                                                                         | 45                                   | 41                                                                         |
| 6.0                                                           | 1.0                   | 6.0                       | 1.0                             | 0.1                            | 100                            | 83   | 8                                | 100                                                                                          | 4.0                                                                                         | 50                                   | 41                                                                         |
| 8.0                                                           | 1.0                   | 6.0                       | 1.0                             | 0.1                            | 100                            | 83   | 8                                | 100                                                                                          | 5.0                                                                                         | 45                                   | 41                                                                         |
| 6.0                                                           | 1.0                   | 6.0                       | 1.0                             | 0.1                            | 100                            | 83   | 8                                | 100                                                                                          | 4.0                                                                                         | 50                                   | 41                                                                         |
| 8.0                                                           | 1.0                   | 6.0                       | 1.0                             | 0.1                            | 100                            | 83   | 8                                | 100                                                                                          | 5.0                                                                                         | 45                                   | 41                                                                         |
| 6.0                                                           | 1.0                   | 6.0                       | 1.0                             | 0.1                            | 100                            | 83   | 8                                | 100                                                                                          | 4.0                                                                                         | 50                                   | 41                                                                         |
| 8.0                                                           | 1.0                   | 6.0                       | 1.0                             | 0.1                            | 100                            | 83   | 8                                | 100                                                                                          | 5.0                                                                                         | 45                                   | 41                                                                         |
| 6.0                                                           | 1.0                   | 6.0                       | 1.0                             | 0.1                            | 100                            | 83   | 8                                | 100                                                                                          | 4.0                                                                                         | 50                                   | 41                                                                         |
| 8.0                                                           | 1.0                   | 6.0                       | 1.0                             | 0.1                            | 100                            | 83   | 8                                | 100                                                                                          | 5.0                                                                                         | 45                                   | 41                                                                         |
| 6.0                                                           | 1.0                   | 6.0                       | 1.0                             | 0.1                            | 100                            | 83   | 8                                | 100                                                                                          | 4.0                                                                                         | 50                                   | 41                                                                         |
| 8.0                                                           | 1.0                   | 6.0                       | 1.0                             | 0.1                            | 100                            | 83   | 8                                | 100                                                                                          | 5.0                                                                                         | 45                                   | 41                                                                         |
| 6.0                                                           | 1.0                   | 6.0                       | 1.0                             | 0.1                            | 100                            | 83   | 8                                | 100                                                                                          | 4.0                                                                                         | 50                                   | 41                                                                         |
| 8.0                                                           | 1.0                   | 6.0                       | 1.0                             | 0.1                            | 100                            | 83   | 8                                | 100                                                                                          | 5.0                                                                                         | 45                                   | 41                                                                         |
| 6.0                                                           | 1.0                   | 6.0                       | 1.0                             | 0.1                            | 100                            | 83   | 8                                | 100                                                                                          | 4.0                                                                                         | 50                                   | 41                                                                         |
| 8.0                                                           | 1.0                   | 6.0                       | 1.0                             | 0.1                            | 100                            | 83   | 8                                | 100                                                                                          | 5.0                                                                                         | 45                                   | 41                                                                         |
| 6.0                                                           | 1.0                   | 6.0                       | 1.0                             | 0.1                            | 100                            | 83   | 8                                | 100                                                                                          | 4.0                                                                                         | 50                                   | 41                                                                         |
| 8.0                                                           | 1.0                   | 6.0                       | 1.0                             | 0.1                            | 100                            | 83   | 8                                | 100                                                                                          | 5.0                                                                                         | 45                                   | 41                                                                         |
| 6.0                                                           | 1.0                   | 6.0                       | 1.0                             | 0.1                            | 100                            | 83   | 8                                | 100                                                                                          | 4.0                                                                                         | 50                                   | 41                                                                         |
|                                                               |                       |                           |                                 |                                |                                |      |                                  |                                                                                              |                                                                                             |                                      |                                                                            |

## Electrical Specifications

|         | Part No.                                                                          |                                                                                   | $I_T$                           |             | $V_{DRM}$ & $V_{RRM}$                               | $I_{GT}$                                                            | $I_{DRM}$ & $I_{RRM}$                                                         |       | $V_{TM}$                                                             | $V_{GT}$                                                            |                     |       |
|---------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|---------------------------------|-------------|-----------------------------------------------------|---------------------------------------------------------------------|-------------------------------------------------------------------------------|-------|----------------------------------------------------------------------|---------------------------------------------------------------------|---------------------|-------|
|         | Surface Mount                                                                     | Through Hole                                                                      |                                 |             |                                                     |                                                                     |                                                                               |       |                                                                      |                                                                     |                     |       |
| TYPE    |  |  | Maximum On-State Current<br>(9) |             | Repetitive Peak Off-State Forward & Reverse Voltage | DC Gate Trigger Current<br>$V_D = 6VDC$<br>$R_L = 100\Omega$<br>(5) | Peak Off-State Current Gate Open<br>$V_{DRM} = \text{Max Rated Value}$<br>(2) |       | Peak On-State Voltage at Max Rated RMS Current<br>$T_C = 25^\circ C$ | DC Gate Trigger Voltage<br>$V_D = 12VDC$<br>$R_L = 60\Omega$<br>(4) |                     |       |
|         | TO-252AA D-PAK                                                                    | TO-251AA D-PAK                                                                    | Amps                            |             |                                                     |                                                                     | mAmps                                                                         |       |                                                                      | Volts                                                               |                     |       |
|         |                                                                                   |                                                                                   | $I_{T(RMS)}$                    | $I_{T(AV)}$ |                                                     |                                                                     | Volts                                                                         | mAmps |                                                                      | $T_C = 25^\circ C$                                                  | $T_C = 110^\circ C$ | Volts |
|         | Non Isolated                                                                      | Non Isolated                                                                      |                                 |             | MIN                                                 | MAX                                                                 | MAX                                                                           | MAX   | MAX                                                                  | MAX                                                                 | MAX                 | MAX   |
| 10 Amps | S1010DS2                                                                          |                                                                                   | 10.0                            | 6.4         | 100                                                 | 200                                                                 | .005                                                                          | 0.25  | 1.6                                                                  | 1.0                                                                 | 0.8                 | 0.25  |
|         | S1010DS3                                                                          |                                                                                   | 10.0                            | 6.4         | 100                                                 | 500                                                                 | .005                                                                          | 0.25  | 1.6                                                                  | 1.0                                                                 | 0.8                 | 0.25  |
|         | S2010DS2                                                                          |                                                                                   | 10.0                            | 6.4         | 200                                                 | 200                                                                 | .005                                                                          | 0.25  | 1.6                                                                  | 1.0                                                                 | 0.8                 | 0.25  |
|         | S2010DS3                                                                          |                                                                                   | 10.0                            | 6.4         | 200                                                 | 500                                                                 | .005                                                                          | 0.25  | 1.6                                                                  | 1.0                                                                 | 0.8                 | 0.25  |
|         | S4010DS2                                                                          |                                                                                   | 10.0                            | 6.4         | 400                                                 | 200                                                                 | .005                                                                          | 0.25  | 1.6                                                                  | 1.0                                                                 | 0.8                 | 0.25  |
|         | S4010DS3                                                                          |                                                                                   | 10.0                            | 6.4         | 400                                                 | 500                                                                 | .005                                                                          | 0.25  | 1.6                                                                  | 1.0                                                                 | 0.8                 | 0.25  |
|         | S6010DS2                                                                          |                                                                                   | 10.0                            | 6.4         | 600                                                 | 200                                                                 | .005                                                                          | 0.25  | 1.6                                                                  | 1.0                                                                 | 0.8                 | 0.25  |
|         | S6010DS3                                                                          |                                                                                   | 10.0                            | 6.4         | 600                                                 | 500                                                                 | .005                                                                          | 0.25  | 1.6                                                                  | 1.0                                                                 | 0.8                 | 0.25  |
|         |                                                                                   | S1010VS2                                                                          | 10.0                            | 6.4         | 100                                                 | 200                                                                 | .005                                                                          | 0.25  | 1.6                                                                  | 1.0                                                                 | 0.8                 | 0.25  |
|         |                                                                                   | S1010VS3                                                                          | 10.0                            | 6.4         | 100                                                 | 500                                                                 | .005                                                                          | 0.25  | 1.6                                                                  | 1.0                                                                 | 0.8                 | 0.25  |
|         |                                                                                   | S2010VS2                                                                          | 10.0                            | 6.4         | 200                                                 | 200                                                                 | .005                                                                          | 0.25  | 1.6                                                                  | 1.0                                                                 | 0.8                 | 0.25  |
|         |                                                                                   | S2010VS3                                                                          | 10.0                            | 6.4         | 200                                                 | 500                                                                 | .005                                                                          | 0.25  | 1.6                                                                  | 1.0                                                                 | 0.8                 | 0.25  |
|         |                                                                                   | S4010VS2                                                                          | 10.0                            | 6.4         | 400                                                 | 200                                                                 | .005                                                                          | 0.25  | 1.6                                                                  | 1.0                                                                 | 0.8                 | 0.25  |
|         |                                                                                   | S4010VS3                                                                          | 10.0                            | 6.4         | 400                                                 | 500                                                                 | .005                                                                          | 0.25  | 1.6                                                                  | 1.0                                                                 | 0.8                 | 0.25  |
|         |                                                                                   | S6010VS2                                                                          | 10.0                            | 6.4         | 600                                                 | 200                                                                 | .005                                                                          | 0.25  | 1.6                                                                  | 1.0                                                                 | 0.8                 | 0.25  |
|         |                                                                                   | S6010VS3                                                                          | 10.0                            | 6.4         | 600                                                 | 500                                                                 | .005                                                                          | 0.25  | 1.6                                                                  | 1.0                                                                 | 0.8                 | 0.25  |

### Electrical Specification Notes

- Pulse width  $\leq 10\mu s$ .
- $T_C = T_J$  for test conditions in off-state.
- For more than one full cycle rating, see Figure 1.2
- See Figure 1.1 for  $V_{GT}$  vs  $T_C$
- See Figure 1.6 for  $I_{GT}$  vs  $T_C$
- See Figure 1.5 for  $I_H$  vs  $T_C$
- 4.0A devices also have a pulse peak forward current on-state rating (repetitive) of 75A. This rating applies for operation at 60Hz, 75°C maximum tab (or anode) lead temperature, switching from 80V peak, sinusoidal current pulse width of 10μs minimum, 15μs maximum.
- Test conditions as follows:  
 $T_C \leq 80^\circ C$ , rectangular current waveform; rate-of-rise of current  $\leq 10A/\mu s$ . Rate-of-reversal of current  $\leq 5A/\mu s$ .  $I_{TM} = 1A$  (50μs pulse) Repetition Rate = 60pps.  $V_{RRM} = \text{Rated}$ .  $V_R = 15V$  minimum,  $V_{DRM} = \text{Rated}$ . Rate-of-rise reapplied forward blocking voltage = 5V/μs. Gate Bias = 0V, 100Ω (during turn-off time interval)
- See Figure 1.3 and 1.4 for current rating at specified operating case temperature.

### General Notes

- All measurements are made at 60Hz with a resistive load at an ambient temperature of +25°C unless otherwise specified.
- Operating temperature range ( $T_J$ ) is -40°C to +110°C
- Storage temperature range ( $T_S$ ) is -65°C to +150°C
- Lead solder temperature is a maximum of 230°C for 10 seconds maximum; 1/16" (1.59mm) from case.
- The case temperature ( $T_C$ ) is measured as shown on dimensional outline specifications on page 6 of this data sheet.

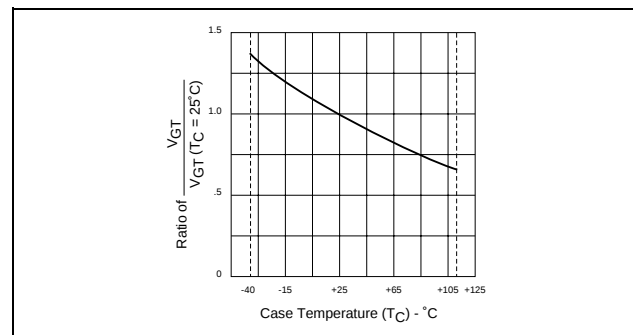


Figure 1.1 Normalized DC Gate-Trigger Voltage vs Case Temperature

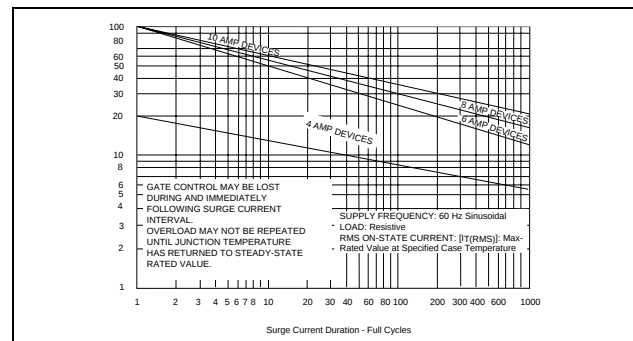


Figure 1.2 Peak Surge Current vs Surge Current Duration

| $I_H$                                                                        | $I_{GM}$                    | $V_{GRM}$                       | $P_{GM}$                                 | $P_{G(AV)}$                          | $I_{TSM}$                            |      | $dv/dt$                              | $di/dt$                                                                                                      | $t_{gt}$                                                                                                                                 | $t_q$                                            | $I^2t$                                                                                           |
|------------------------------------------------------------------------------|-----------------------------|---------------------------------|------------------------------------------|--------------------------------------|--------------------------------------|------|--------------------------------------|--------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------|--------------------------------------------------------------------------------------------------|
| Holding Current<br>Gate Open<br>Initial on State<br>Current =<br>20mA<br>(6) | Peak Gate<br>Current<br>(1) | Peak Reverse<br>Gate<br>Voltage | Peak Gate<br>Power<br>Dissipation<br>(1) | Average Gate<br>Power<br>Dissipation | Peak One<br>Cycle<br>Surge<br>(3)(9) |      | Critical Rate-of-<br>Applied Voltage | Maximum<br>Rate-of-<br>Change of<br>On-State<br>Current<br>$I_{GT} = 150mA$<br>With 0.1 $\mu s$<br>Rise Time | Gate<br>Controlled<br>Turn-On Time<br>Gate<br>Pulse=100mA<br>Min.<br>Width=15 $\mu s$<br>$I_{GT} = 50mA$<br>$\leq 0.1\mu s$<br>Rise Time | Circuit<br>Commulated<br>Turn-Off<br>Time<br>(8) | RMS Surge<br>(Non-<br>Repetitive)<br>On-State<br>Current<br>for Period of<br>8.3ms<br>for Fusing |
|                                                                              |                             |                                 |                                          |                                      | Amps                                 |      | Volts/ $\mu Sec$                     |                                                                                                              |                                                                                                                                          |                                                  |                                                                                                  |
| mAmps                                                                        | Amps                        | Volts                           | Watts                                    | Watts                                | 60Hz                                 | 50Hz | $T_C = 110^\circ C$                  | Amps/ $\mu Sec$                                                                                              | $\mu Sec$                                                                                                                                | $\mu Sec$                                        | Amps <sup>2</sup> Sec                                                                            |
| MAX                                                                          |                             | MIN                             |                                          |                                      |                                      |      | TYP                                  |                                                                                                              | TYP                                                                                                                                      | MAX                                              |                                                                                                  |
| 6.0                                                                          | 1.0                         | 6.0                             | 1.0                                      | 0.1                                  | 100                                  | 83   | 10                                   | 100                                                                                                          | 4.0                                                                                                                                      | 50                                               | 41                                                                                               |
| 8.0                                                                          | 1.0                         | 6.0                             | 1.0                                      | 0.1                                  | 100                                  | 83   | 10                                   | 100                                                                                                          | 5.0                                                                                                                                      | 45                                               | 41                                                                                               |
| 6.0                                                                          | 1.0                         | 6.0                             | 1.0                                      | 0.1                                  | 100                                  | 83   | 10                                   | 100                                                                                                          | 4.0                                                                                                                                      | 50                                               | 41                                                                                               |
| 8.0                                                                          | 1.0                         | 6.0                             | 1.0                                      | 0.1                                  | 100                                  | 83   | 10                                   | 100                                                                                                          | 5.0                                                                                                                                      | 45                                               | 41                                                                                               |
| 6.0                                                                          | 1.0                         | 6.0                             | 1.0                                      | 0.1                                  | 100                                  | 83   | 8                                    | 100                                                                                                          | 4.0                                                                                                                                      | 50                                               | 41                                                                                               |
| 8.0                                                                          | 1.0                         | 6.0                             | 1.0                                      | 0.1                                  | 100                                  | 83   | 8                                    | 100                                                                                                          | 5.0                                                                                                                                      | 45                                               | 41                                                                                               |
| 6.0                                                                          | 1.0                         | 6.0                             | 1.0                                      | 0.1                                  | 100                                  | 83   | 8                                    | 100                                                                                                          | 4.0                                                                                                                                      | 50                                               | 41                                                                                               |
| 8.0                                                                          | 1.0                         | 6.0                             | 1.0                                      | 0.1                                  | 100                                  | 83   | 8                                    | 100                                                                                                          | 5.0                                                                                                                                      | 45                                               | 41                                                                                               |
| 6.0                                                                          | 1.0                         | 6.0                             | 1.0                                      | 0.1                                  | 100                                  | 83   | 10                                   | 100                                                                                                          | 4.0                                                                                                                                      | 50                                               | 41                                                                                               |
| 8.0                                                                          | 1.0                         | 6.0                             | 1.0                                      | 0.1                                  | 100                                  | 83   | 10                                   | 100                                                                                                          | 5.0                                                                                                                                      | 45                                               | 41                                                                                               |
| 6.0                                                                          | 1.0                         | 6.0                             | 1.0                                      | 0.1                                  | 100                                  | 83   | 10                                   | 100                                                                                                          | 4.0                                                                                                                                      | 50                                               | 41                                                                                               |
| 8.0                                                                          | 1.0                         | 6.0                             | 1.0                                      | 0.1                                  | 100                                  | 83   | 10                                   | 100                                                                                                          | 5.0                                                                                                                                      | 45                                               | 41                                                                                               |
| 6.0                                                                          | 1.0                         | 6.0                             | 1.0                                      | 0.1                                  | 100                                  | 83   | 8                                    | 100                                                                                                          | 4.0                                                                                                                                      | 50                                               | 41                                                                                               |
| 8.0                                                                          | 1.0                         | 6.0                             | 1.0                                      | 0.1                                  | 100                                  | 83   | 8                                    | 100                                                                                                          | 5.0                                                                                                                                      | 45                                               | 41                                                                                               |
| 6.0                                                                          | 1.0                         | 6.0                             | 1.0                                      | 0.1                                  | 100                                  | 83   | 8                                    | 100                                                                                                          | 4.0                                                                                                                                      | 50                                               | 41                                                                                               |
| 8.0                                                                          | 1.0                         | 6.0                             | 1.0                                      | 0.1                                  | 100                                  | 83   | 8                                    | 100                                                                                                          | 5.0                                                                                                                                      | 45                                               | 41                                                                                               |

New D-PAK Sensitive

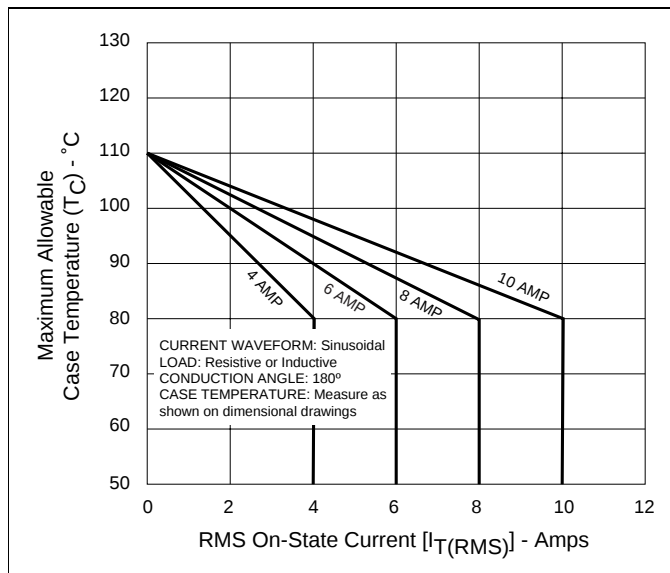


Figure 1.3 Maximum Allowable Case Temperature vs RMS On-State Current

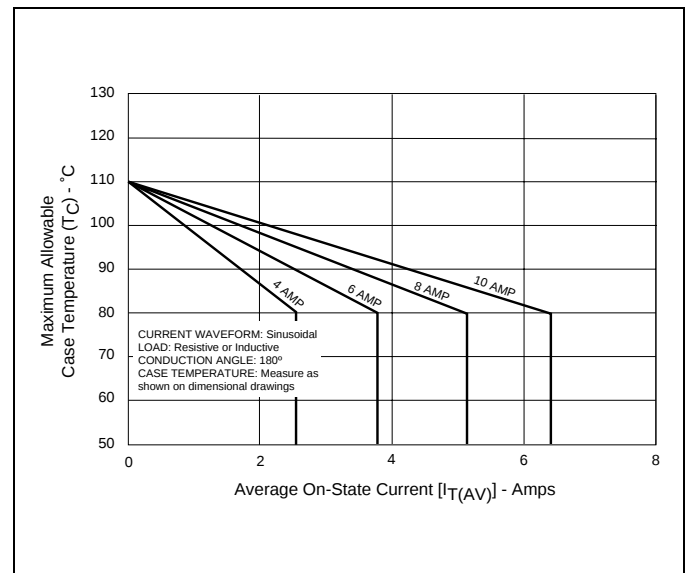
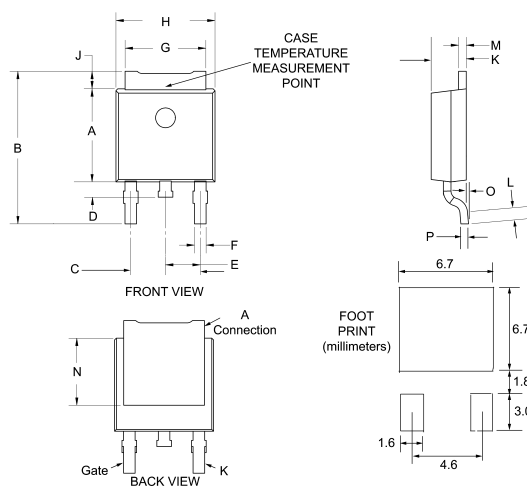


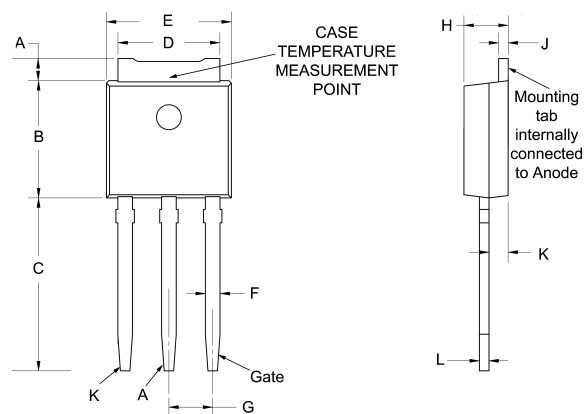
Figure 1.4 Maximum Allowable Case Temperature vs Average On-State Current

## Mechanical Specifications

### TO-252AA D-PAK Surface Mount



### TO-251AA D-PAK Through Hole



| DIM | INCHES |      | MILLIMETERS |       |
|-----|--------|------|-------------|-------|
|     | MIN    | MAX  | MIN         | MAX   |
| A   | .236   | .244 | 6.00        | 6.20  |
| B   | .379   | .409 | 9.63        | 10.39 |
| C   | .176   | .184 | 4.47        | 4.67  |
| D   | .035   | .050 | 0.89        | 1.27  |
| E   | .087   | .093 | 2.21        | 2.36  |
| F   | .027   | .033 | 0.69        | 0.84  |
| G   | .205   | .213 | 5.21        | 5.41  |
| H   | .251   | .261 | 6.38        | 6.63  |
| J   | .040   | .050 | 1.02        | 1.27  |
| K   | .086   | .094 | 2.18        | 2.39  |
| L   | .026   | .036 | 0.66        | 0.91  |
| M   | .018   | .023 | 0.46        | 0.58  |
| N   | .170   | .180 | 4.32        | 4.57  |
| O   | .002   | .010 | 0.05        | 0.25  |
| P   | .018   | .023 | 0.46        | 0.58  |

| DIM | INCHES |      | MILLIMETERS |      |
|-----|--------|------|-------------|------|
|     | MIN    | MAX  | MIN         | MAX  |
| A   | .040   | .050 | 1.02        | 1.27 |
| B   | .236   | .244 | 6.00        | 6.20 |
| C   | .350   | .375 | 8.89        | 9.53 |
| D   | .205   | .213 | 5.21        | 5.41 |
| E   | .251   | .261 | 6.38        | 6.63 |
| F   | .027   | .033 | 0.69        | 0.84 |
| G   | .087   | .093 | 2.21        | 2.36 |
| H   | .086   | .094 | 2.18        | 2.39 |
| J   | .018   | .023 | 0.46        | 0.58 |
| K   | .036   | .042 | 0.91        | 1.07 |
| L   | .018   | .023 | 0.46        | 0.58 |

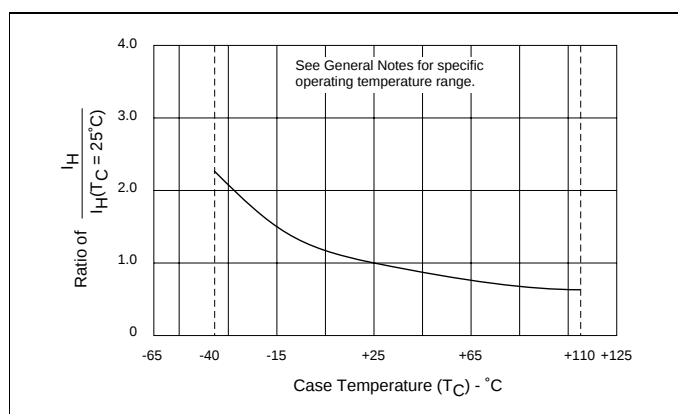


Figure 1.5 Normalized DC Holding Current vs Case Temperature

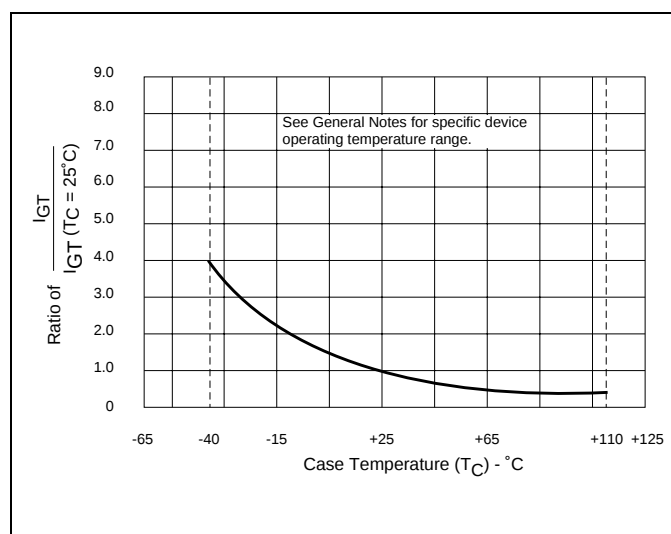


Figure 1.6 Normalized DC Gate - Trigger Current vs Case Temperature