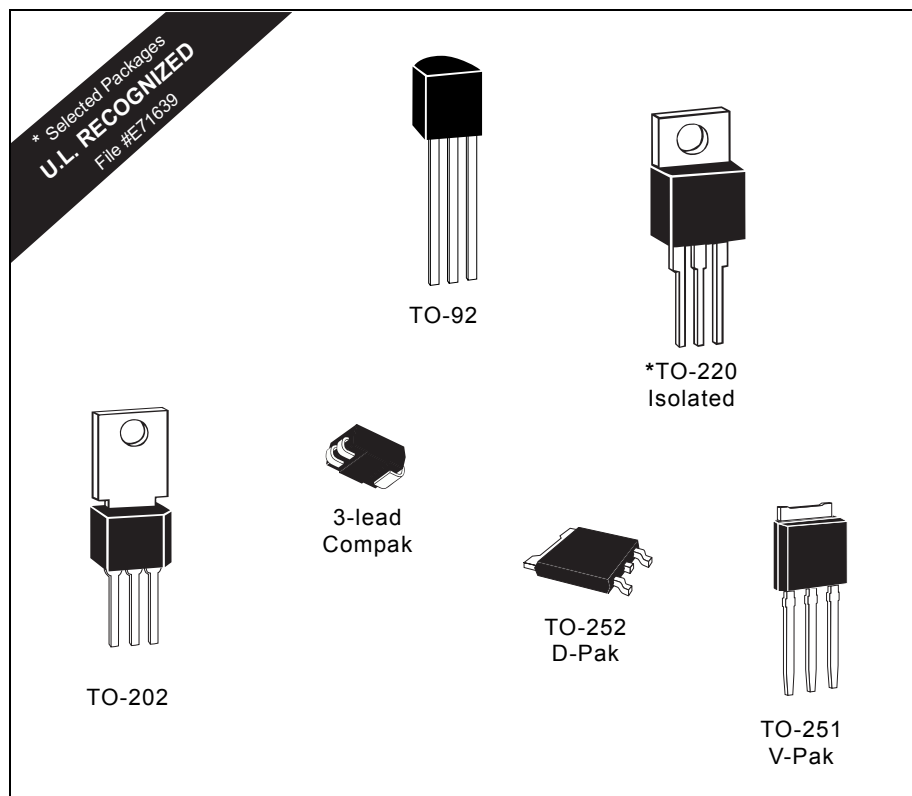


# Sensitive Triacs

(0.8 A to 8 A) RoHS

## General Description

Teccor's line of sensitive gate triacs includes devices with current capabilities through 8 A. Voltage ranges are available from 200 V to 600 V. This line features devices with guaranteed gate control in Quadrants II and IV as well as control in the commonly used Quadrants I and III. Four-quadrant control devices require sensitive gate triacs. They can be controlled by digital circuitry where positive-only or negative-only pulses must control AC current in both directions through the device. Note that triacs with low  $I_{GT}$  values in Quadrants II and IV will have lower  $dv/dt$  characteristics.

The sensitive gate triac is a bidirectional AC switch and is gate controlled for either polarity of main terminal voltage. It is used primarily for AC switching and phase control applications such as motor speed controls, temperature modulation controls, and lighting controls.

The epoxy TO-92 and TO-220 configurations feature Teccor's electrically-isolated construction where the case or mounting tab is internally isolated from the semiconductor chip and lead attachments. Non-isolated epoxy TO-202 packages are available as well as TO-251 and surface mount TO-252 (D-Pak). Tape-and-reel capability and tube packing also are available. See "Packing Options" section of this catalog.

All Teccor triacs have glass-passivated junctions. This glassing process prevents migration of contaminants and ensures long-term device reliability with parameter stability.

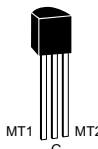
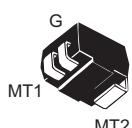
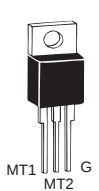
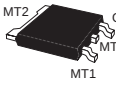
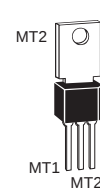
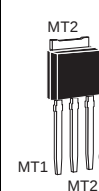
Variations of devices covered in this data sheet are available for custom design applications. Consult factory for more information.

## Features

- RoHS Compliant
- Electrically-isolated packages
- Glass-passivated junctions ensure long device reliability and parameter stability
- Voltage capability — up to 600 V
- Surge capability — up to 80 A
- Four-quadrant gating guaranteed

## Compak Sensitive Gate Triac

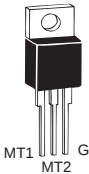
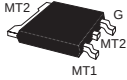
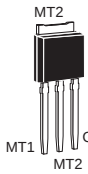
- Surface mount package — 0.8 A and 1 A series
- New small profile three-leaded Compak package
- Packaged in embossed carrier tape with 2,500 devices per reel
- Can replace SOT-223

|                     | Part No.                                                                          |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                  |                 |     |      |      |                           |                            |
|---------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|------------------|-----------------|-----|------|------|---------------------------|----------------------------|
| I <sub>T(RMS)</sub> | Isolated                                                                          |                                                                                   |                                                                                   | Non-isolated                                                                      |                                                                                   |                                                                                    | V <sub>DRM</sub> | I <sub>GT</sub> |     |      |      | I <sub>DRM</sub>          |                            |
| (11)                |  |  |  |  |  |  | (1)              | (3) (6) (9)     |     |      |      | (1) (14)                  |                            |
|                     | TO-92                                                                             | Compak                                                                            | TO-220                                                                            | TO-252<br>D-Pak                                                                   | TO-202                                                                            | TO-251<br>V-Pak                                                                    | Volts            | mAmps           |     |      |      | mAmps                     |                            |
|                     |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    |                  | QI              | QII | QIII | QIV  | T <sub>C</sub> =<br>25 °C | T <sub>C</sub> =<br>110 °C |
| MAX                 | See "Package Dimensions" section for variations. (12)                             |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    | MIN              | MAX             |     |      |      | MAX                       |                            |
| 0.8 A               | L2X8E3                                                                            | L2X3                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                    | 200              | 3               | 3   | 3    | 3    | 0.01                      | 0.1                        |
|                     | L4X8E3                                                                            | L4X3                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                    | 400              | 3               | 3   | 3    | 3    | 0.01                      | 0.1                        |
|                     | L6X8E3                                                                            | L6X3                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                    | 600              | 3               | 3   | 3    | 3    | 0.01                      | 0.1                        |
|                     | L2X8E5                                                                            | L2X5                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                    | 200              | 5               | 5   | 5    | 5    | 0.01                      | 0.1                        |
|                     | L4X8E5                                                                            | L4X5                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                    | 400              | 5               | 5   | 5    | 5    | 0.01                      | 0.1                        |
|                     | L6X8E5                                                                            | L6X5                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                    | 600              | 5               | 5   | 5    | 5    | 0.01                      | 0.1                        |
|                     | L2X8E6                                                                            |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    | 200              | 5               | 5   | 5    | 10   | 0.01                      | 0.1                        |
|                     | L4X8E6                                                                            |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    | 400              | 5               | 5   | 5    | 10   | 0.01                      | 0.1                        |
|                     | L6X8E6                                                                            |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    | 600              | 5               | 5   | 5    | 10   | 0.01                      | 0.1                        |
|                     | L2X8E8                                                                            |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    | 200              | 10              | 10  | 10   | 20   | 0.01                      | 0.1                        |
| 1 A                 | L4X8E8                                                                            |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    | 400              | 10              | 10  | 10   | 20   | 0.01                      | 0.1                        |
|                     | L6X8E8                                                                            |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    | 600              | 10              | 10  | 10   | 20   | 0.01                      | 0.1                        |
|                     | L201E3                                                                            | L2N3                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                    | 200              | 3               | 3   | 3    | 3    | 0.01                      | 0.1                        |
|                     | L401E3                                                                            | L4N3                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                    | 400              | 3               | 3   | 3    | 3    | 0.01                      | 0.1                        |
|                     | L601E3                                                                            | L6N3                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                    | 600              | 3               | 3   | 3    | 3    | 0.01                      | 0.1                        |
|                     | L201E5                                                                            | L2N5                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                    | 200              | 5               | 5   | 5    | 5    | 0.01                      | 0.1                        |
|                     | L401E5                                                                            | L4N5                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                    | 400              | 5               | 5   | 5    | 5    | 0.01                      | 0.1                        |
|                     | L601E5                                                                            | L6N5                                                                              |                                                                                   |                                                                                   |                                                                                   |                                                                                    | 600              | 5               | 5   | 5    | 5    | 0.01                      | 0.1                        |
|                     | L201E6                                                                            |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    | 200              | 5               | 5   | 5    | 10   | 0.01                      | 0.1                        |
|                     | L401E6                                                                            |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    | 400              | 5               | 5   | 5    | 10   | 0.01                      | 0.1                        |
| 4 A                 | L601E6                                                                            |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    | 600              | 5               | 5   | 5    | 10   | 0.01                      | 0.1                        |
|                     | L201E8                                                                            |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    | 200              | 10              | 10  | 10   | 20   | 0.01                      | 0.1                        |
|                     | L401E8                                                                            |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    | 400              | 10              | 10  | 10   | 20   | 0.01                      | 0.1                        |
|                     | L601E8                                                                            |                                                                                   |                                                                                   |                                                                                   |                                                                                   |                                                                                    | 600              | 10              | 10  | 10   | 20   | 0.01                      | 0.1                        |
|                     |                                                                                   |                                                                                   | L2004L3                                                                           | L2004D3                                                                           | L2004F31                                                                          | L2004V3                                                                            | 200              | 3               | 3   | 3    | 3    | 0.01                      | 0.2                        |
|                     |                                                                                   |                                                                                   | L4004L3                                                                           | L4004D3                                                                           | L4004F31                                                                          | L4004V3                                                                            | 400              | 3               | 3   | 3    | 3    | 0.01                      | 0.2                        |
|                     |                                                                                   |                                                                                   | L6004L3                                                                           | L6004D3                                                                           | L6004F31                                                                          | L6004V3                                                                            | 600              | 3               | 3   | 3    | 3    | 0.01                      | 0.2                        |
|                     |                                                                                   |                                                                                   | L2004L5                                                                           | L2004D5                                                                           | L2004F51                                                                          | L2004V5                                                                            | 200              | 5               | 5   | 5    | 5    | 0.01                      | 0.2                        |
|                     |                                                                                   |                                                                                   | L4004L5                                                                           | L4004D5                                                                           | L4004F51                                                                          | L4004V5                                                                            | 400              | 5               | 5   | 5    | 5    | 0.01                      | 0.2                        |
|                     |                                                                                   |                                                                                   | L6004L5                                                                           | L6004D5                                                                           | L6004F51                                                                          | L6004V5                                                                            | 600              | 5               | 5   | 5    | 5    | 0.01                      | 0.2                        |
|                     |                                                                                   | L2004L6                                                                           | L2004D6                                                                           | L2004F61                                                                          | L2004V6                                                                           | 200                                                                                | 5                | 5               | 5   | 10   | 0.01 | 0.2                       |                            |
|                     |                                                                                   | L4004L6                                                                           | L4004D6                                                                           | L4004F61                                                                          | L4004V6                                                                           | 400                                                                                | 5                | 5               | 5   | 10   | 0.01 | 0.2                       |                            |
|                     |                                                                                   | L6004L6                                                                           | L6004D6                                                                           | L6004F61                                                                          | L6004V6                                                                           | 600                                                                                | 5                | 5               | 5   | 10   | 0.01 | 0.2                       |                            |
|                     |                                                                                   | L2004L8                                                                           | L2004D8                                                                           | L2004F81                                                                          | L2004V8                                                                           | 200                                                                                | 10               | 10              | 10  | 20   | 0.01 | 0.2                       |                            |
|                     |                                                                                   | L4004L8                                                                           | L4004D8                                                                           | L4004F81                                                                          | L4004V8                                                                           | 400                                                                                | 10               | 10              | 10  | 20   | 0.01 | 0.2                       |                            |
|                     |                                                                                   | L6004L8                                                                           | L6004D8                                                                           | L6004F81                                                                          | L6004V8                                                                           | 600                                                                                | 10               | 10              | 10  | 20   | 0.01 | 0.2                       |                            |

See "General Notes" on page E1 - 4 and "Electrical Specification Notes" on page E1 - 5.

| $V_{TM}$           | $V_{GT}$           | $I_H$   | $I_{GT}$ | $P_{GM}$ | $P_{G(AV)}$ | $I_{TSM}$ | $dv/dt(c)$       | $dv/dt$             | $t_{gt}$  | $I^2t$                | $di/dt$         |
|--------------------|--------------------|---------|----------|----------|-------------|-----------|------------------|---------------------|-----------|-----------------------|-----------------|
| (1) (4)            | (2) (5) (15)       | (1) (7) | (13)     | (13)     |             | (8) (10)  | (1) (10)         | (1)                 | (9)       |                       |                 |
| Volts              | Volts              |         |          |          |             | Amps      |                  | Volts/ $\mu$ Sec    |           |                       |                 |
| $T_C = 25^\circ C$ | $T_C = 25^\circ C$ | mAmps   | Amps     | Watts    | Watts       | 60/50 Hz  | Volts/ $\mu$ Sec | $T_C = 100^\circ C$ | $\mu$ Sec | Amps <sup>2</sup> Sec | Amps/ $\mu$ Sec |
| MAX                | MAX                | MAX     |          |          |             |           | TYP              | TYP                 | TYP       |                       |                 |
| 1.6                | 2                  | 5       | 1        | 10       | 0.2         | 10/8.3    | 0.5              | 20                  | 2.8       | 0.41                  | 20              |
| 1.6                | 2                  | 5       | 1        | 10       | 0.2         | 10/8.3    | 0.5              | 15                  | 2.8       | 0.41                  | 20              |
| 1.6                | 2                  | 5       | 1        | 10       | 0.2         | 10/8.3    | 0.5              | 10                  | 2.8       | 0.41                  | 20              |
| 1.6                | 2                  | 10      | 1        | 10       | 0.2         | 10/8.3    | 1                | 20                  | 3         | 0.41                  | 20              |
| 1.6                | 2                  | 10      | 1        | 10       | 0.2         | 10/8.3    | 1                | 15                  | 3         | 0.41                  | 20              |
| 1.6                | 2                  | 10      | 1        | 10       | 0.2         | 10/8.3    | 1                | 10                  | 3         | 0.41                  | 20              |
| 1.6                | 2                  | 10      | 1        | 10       | 0.2         | 10/8.3    | 1                | 30                  | 3         | 0.41                  | 20              |
| 1.6                | 2                  | 10      | 1        | 10       | 0.2         | 10/8.3    | 1                | 25                  | 3         | 0.41                  | 20              |
| 1.6                | 2                  | 10      | 1        | 10       | 0.2         | 10/8.3    | 1                | 20                  | 3         | 0.41                  | 20              |
| 1.6                | 2                  | 15      | 1        | 10       | 0.2         | 10/8.3    | 2                | 35                  | 3.2       | 0.41                  | 20              |
| 1.6                | 2                  | 15      | 1        | 10       | 0.2         | 10/8.3    | 2                | 30                  | 3.2       | 0.41                  | 20              |
| 1.6                | 2                  | 15      | 1        | 10       | 0.2         | 10/8.3    | 2                | 25                  | 3.2       | 0.41                  | 20              |
| 1.6                | 2                  | 5       | 1        | 10       | 0.2         | 20/16.7   | 0.5              | 20                  | 2.8       | 1.6                   | 20              |
| 1.6                | 2                  | 5       | 1        | 10       | 0.2         | 20/16.7   | 0.5              | 20                  | 2.8       | 1.6                   | 20              |
| 1.6                | 2                  | 5       | 1        | 10       | 0.2         | 20/16.7   | 0.5              | 10                  | 2.8       | 1.6                   | 20              |
| 1.6                | 2                  | 10      | 1        | 10       | 0.2         | 20/16.7   | 1                | 20                  | 3         | 1.6                   | 20              |
| 1.6                | 2                  | 10      | 1        | 10       | 0.2         | 20/16.7   | 1                | 20                  | 3         | 1.6                   | 20              |
| 1.6                | 2                  | 10      | 1        | 10       | 0.2         | 20/16.7   | 1                | 10                  | 3         | 1.6                   | 20              |
| 1.6                | 2                  | 10      | 1        | 10       | 0.2         | 20/16.7   | 1                | 30                  | 3         | 1.6                   | 20              |
| 1.6                | 2                  | 10      | 1        | 10       | 0.2         | 20/16.7   | 1                | 30                  | 3         | 1.6                   | 20              |
| 1.6                | 2                  | 10      | 1        | 10       | 0.2         | 20/16.7   | 1                | 20                  | 3         | 1.6                   | 20              |
| 1.6                | 2                  | 15      | 1        | 10       | 0.2         | 20/16.7   | 1                | 35                  | 3.2       | 1.6                   | 20              |
| 1.6                | 2                  | 15      | 1        | 10       | 0.2         | 20/16.7   | 1                | 35                  | 3.2       | 1.6                   | 20              |
| 1.6                | 2                  | 15      | 1        | 10       | 0.2         | 20/16.7   | 1                | 25                  | 3.2       | 1.6                   | 20              |
| 1.6                | 2                  | 5       | 1.2      | 15       | 0.3         | 40/33     | 0.5              | 25                  | 2.8       | 6.6                   | 50              |
| 1.6                | 2                  | 5       | 1.2      | 15       | 0.3         | 40/33     | 0.5              | 25                  | 2.8       | 6.6                   | 50              |
| 1.6                | 2                  | 5       | 1.2      | 15       | 0.3         | 40/33     | 0.5              | 15                  | 2.8       | 6.6                   | 50              |
| 1.6                | 2                  | 10      | 1.2      | 15       | 0.3         | 40/33     | 1                | 25                  | 3         | 6.6                   | 50              |
| 1.6                | 2                  | 10      | 1.2      | 15       | 0.3         | 40/33     | 1                | 25                  | 3         | 6.6                   | 50              |
| 1.6                | 2                  | 10      | 1.2      | 15       | 0.3         | 40/33     | 1                | 15                  | 3         | 6.6                   | 50              |
| 1.6                | 2                  | 10      | 1.2      | 15       | 0.3         | 40/33     | 1                | 30                  | 3         | 6.6                   | 50              |
| 1.6                | 2                  | 10      | 1.2      | 15       | 0.3         | 40/33     | 1                | 30                  | 3         | 6.6                   | 50              |
| 1.6                | 2                  | 10      | 1.2      | 15       | 0.3         | 40/33     | 1                | 20                  | 3         | 6.6                   | 50              |
| 1.6                | 2                  | 15      | 1.2      | 15       | 0.3         | 40/33     | 2                | 35                  | 3.2       | 6.6                   | 50              |
| 1.6                | 2                  | 15      | 1.2      | 15       | 0.3         | 40/33     | 2                | 35                  | 3.2       | 6.6                   | 50              |
| 1.6                | 2                  | 15      | 1.2      | 15       | 0.3         | 40/33     | 2                | 25                  | 3.2       | 6.6                   | 50              |

See "General Notes" on page E1 - 4 and "Electrical Specification Notes" on page E1 - 5.

| I <sub>T(RMS)</sub><br>(11) | Part No.                                                                                    |                                                                                                      |                                                                                                      | V <sub>DRM</sub><br>(1) | I <sub>GT</sub><br>(3) (6) |     |      |     | I <sub>DRM</sub><br>(1) (14) |                         |
|-----------------------------|---------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------|-------------------------|----------------------------|-----|------|-----|------------------------------|-------------------------|
|                             | Isolated                                                                                    | Non-isolated                                                                                         |                                                                                                      |                         | mAmps                      |     |      |     | mAmps                        |                         |
|                             | <br>TO-220 | <br>TO-252<br>D-Pak | <br>TO-251<br>V-Pak | Volts                   | QI                         | QII | QIII | QIV | T <sub>C</sub> = 25 °C       | T <sub>C</sub> = 110 °C |
| MAX                         | See "Package Dimensions" section for variations. (12)                                       |                                                                                                      |                                                                                                      | MIN                     | MAX                        |     |      |     | MAX                          |                         |
| 6 A                         | L2006L5                                                                                     | L2006D5                                                                                              | L2006V5                                                                                              | 200                     | 5                          | 5   | 5    | 5   | 0.02                         | 0.5                     |
|                             | L4006L5                                                                                     | L4006D5                                                                                              | L4006V5                                                                                              | 400                     | 5                          | 5   | 5    | 5   | 0.02                         | 0.5                     |
|                             | L6006L5                                                                                     | L6006D5                                                                                              | L6006V5                                                                                              | 600                     | 5                          | 5   | 5    | 5   | 0.02                         | 0.5                     |
|                             | L2006L6                                                                                     | L2006D6                                                                                              | L2006V6                                                                                              | 200                     | 5                          | 5   | 5    | 10  | 0.02                         | 0.5                     |
|                             | L4006L6                                                                                     | L4006D6                                                                                              | L4006V6                                                                                              | 400                     | 5                          | 5   | 5    | 10  | 0.02                         | 0.5                     |
|                             | L6006L6                                                                                     | L6006D6                                                                                              | L6006V6                                                                                              | 600                     | 5                          | 5   | 5    | 10  | 0.02                         | 0.5                     |
|                             | L2006L8                                                                                     | L2006D8                                                                                              | L2006V8                                                                                              | 200                     | 10                         | 10  | 10   | 20  | 0.02                         | 0.5                     |
|                             | L4006L8                                                                                     | L4006D8                                                                                              | L4006V8                                                                                              | 400                     | 10                         | 10  | 10   | 20  | 0.02                         | 0.5                     |
| 8 A                         | L2008L6                                                                                     | L2008D6                                                                                              | L2008V6                                                                                              | 200                     | 5                          | 5   | 5    | 10  | 0.02                         | 0.5                     |
|                             | L4008L6                                                                                     | L4008D6                                                                                              | L4008V6                                                                                              | 400                     | 5                          | 5   | 5    | 10  | 0.02                         | 0.5                     |
|                             | L6008L6                                                                                     | L6008D6                                                                                              | L6008V6                                                                                              | 600                     | 5                          | 5   | 5    | 10  | 0.02                         | 0.5                     |
|                             | L2008L8                                                                                     | L2008D8                                                                                              | L2008V8                                                                                              | 200                     | 10                         | 10  | 10   | 20  | 0.02                         | 0.5                     |
|                             | L4008L8                                                                                     | L4008D8                                                                                              | L4008V8                                                                                              | 400                     | 10                         | 10  | 10   | 20  | 0.02                         | 0.5                     |
|                             | L6008L8                                                                                     | L6008D8                                                                                              | L6008V8                                                                                              | 600                     | 10                         | 10  | 10   | 20  | 0.02                         | 0.5                     |

## Specified Test Conditions

$di/dt$  — Maximum rate-of-change of on-state current;  $I_{GT} = 50\text{ mA}$  with  $0.1\text{ }\mu\text{s}$  rise time

$dv/dt$  — Critical rate-of-rise of off-state voltage at rated  $V_{DRM}$  gate open

$dv/dt(c)$  — Critical rate-of-rise of commutation voltage at rated  $V_{DRM}$  and  $I_{T(RMS)}$  commutating  $di/dt = 0.54$  rated  $I_{T(RMS)}/\text{ms}$ ; gate unenergized

$I^2t$  — RMS surge (non-repetitive) on-state current for period of 8.3 ms for fusing

$I_{DRM}$  — Peak off-state current, gate open;  $V_{DRM} = \text{max rated value}$

$I_{GT}$  — DC gate trigger current in specific operating quadrants;  $V_D = 12\text{ V dc}$ ;  $R_L = 60\text{ }\Omega$

$I_{GTM}$  — Peak gate trigger current

$I_H$  — Holding current gate open; initial on-state current =  $100\text{ mA dc}$

$I_{T(RMS)}$  — RMS on-state current conduction angle of  $360^\circ$

$I_{TSM}$  — Peak one-cycle surge

$P_{G(AV)}$  — Average gate power dissipation

$P_{GM}$  — Peak gate power dissipation;  $I_{GT} \leq I_{GTM}$

$t_{gt}$  — Gate controlled turn-on time;  $I_{GT} = 50\text{ mA}$  with  $0.1\text{ }\mu\text{s}$  rise time

$V_{DRM}$  — Repetitive peak off-state/blocking voltage

$V_{GT}$  — DC gate trigger voltage;  $V_D = 12\text{ V dc}$ ;  $R_L = 60\text{ }\Omega$

$V_{TM}$  — Peak on-state voltage at max rated RMS current

## General Notes

- All measurements are made with 60 Hz resistive load and at an ambient temperature of  $+25\text{ }^\circ\text{C}$  unless otherwise specified.
- Operating temperature range ( $T_J$ ) is  $-65\text{ }^\circ\text{C}$  to  $+110\text{ }^\circ\text{C}$  for TO-92 devices and  $-40\text{ }^\circ\text{C}$  to  $+110\text{ }^\circ\text{C}$  for all other devices.
- Storage temperature range ( $T_S$ ) is  $-65\text{ }^\circ\text{C}$  to  $+150\text{ }^\circ\text{C}$  for TO-92 devices,  $-40\text{ }^\circ\text{C}$  to  $+150\text{ }^\circ\text{C}$  for TO-202 devices, and  $-40\text{ }^\circ\text{C}$  to  $+125\text{ }^\circ\text{C}$  for TO-220 devices.
- Lead solder temperature is a maximum of  $230\text{ }^\circ\text{C}$  for 10 seconds maximum at a minimum of  $1/16"$  ( $1.59\text{ mm}$ ) from case.
- The case or lead temperature ( $T_C$  or  $T_L$ ) is measured as shown on dimensional outline drawings. See "Package Dimensions" section of this catalog.

| $V_{TM}$                 | $V_{GT}$                 | $I_H$   | $I_{GT}$ | $P_{GM}$ | $P_{G(AV)}$ | $I_{TSM}$ | $dv/dt(c)$       | $dv/dt$                   | $t_{gt}$  | $I^2t$                | $di/dt$         |
|--------------------------|--------------------------|---------|----------|----------|-------------|-----------|------------------|---------------------------|-----------|-----------------------|-----------------|
| (1) (4)                  | (2) (5) (15)             | (1) (7) | (13)     | (13)     |             | (8) (10)  | (1) (10)         | (1)                       | (9)       |                       |                 |
| Volts                    | Volts                    |         |          |          |             | Amps      |                  | Volts/ $\mu$ Sec          |           |                       |                 |
| $T_C = 25^\circ\text{C}$ | $T_C = 25^\circ\text{C}$ | mAmps   | Amps     | Watts    | Watts       | 60/50 Hz  | Volts/ $\mu$ Sec | $T_C = 100^\circ\text{C}$ | $\mu$ Sec | Amps <sup>2</sup> Sec | Amps/ $\mu$ Sec |
| MAX                      | MAX                      | MAX     |          |          |             |           | TYP              | TYP                       | TYP       |                       |                 |
| 1.6                      | 2                        | 10      | 1.6      | 18       | 0.4         | 60/50     | 1                | 40                        | 3         | 15                    | 70              |
| 1.6                      | 2                        | 10      | 1.6      | 18       | 0.4         | 60/50     | 1                | 30                        | 3         | 15                    | 70              |
| 1.6                      | 2                        | 10      | 1.6      | 18       | 0.4         | 60/50     | 1                | 20                        | 3         | 15                    | 70              |
| 1.6                      | 2                        | 10      | 1.6      | 18       | 0.4         | 60/50     | 2                | 40                        | 3         | 15                    | 70              |
| 1.6                      | 2                        | 10      | 1.6      | 18       | 0.4         | 60/50     | 2                | 30                        | 3         | 15                    | 70              |
| 1.6                      | 2                        | 10      | 1.6      | 18       | 0.4         | 60/50     | 2                | 20                        | 3         | 15                    | 70              |
| 1.6                      | 2                        | 20      | 1.6      | 18       | 0.4         | 60/50     | 2                | 45                        | 3.2       | 15                    | 70              |
| 1.6                      | 2                        | 20      | 1.6      | 18       | 0.4         | 60/50     | 2                | 40                        | 3.2       | 15                    | 70              |
| 1.6                      | 2                        | 20      | 1.6      | 18       | 0.4         | 60/50     | 2                | 30                        | 3.2       | 15                    | 70              |
| 1.6                      | 2                        | 10      | 1.6      | 18       | 0.4         | 80/65     | 2                | 40                        | 3         | 26.5                  | 70              |
| 1.6                      | 2                        | 10      | 1.6      | 18       | 0.4         | 80/65     | 2                | 30                        | 3         | 26.5                  | 70              |
| 1.6                      | 2                        | 10      | 1.6      | 18       | 0.4         | 80/65     | 2                | 20                        | 3         | 26.5                  | 70              |
| 1.6                      | 2                        | 20      | 1.6      | 18       | 0.4         | 80/65     | 2                | 45                        | 3.2       | 26.5                  | 70              |
| 1.6                      | 2                        | 20      | 1.6      | 18       | 0.4         | 80/65     | 2                | 40                        | 3.2       | 26.5                  | 70              |
| 1.6                      | 2                        | 20      | 1.6      | 18       | 0.4         | 80/65     | 2                | 30                        | 3.2       | 26.5                  | 70              |

### Electrical Specification Notes

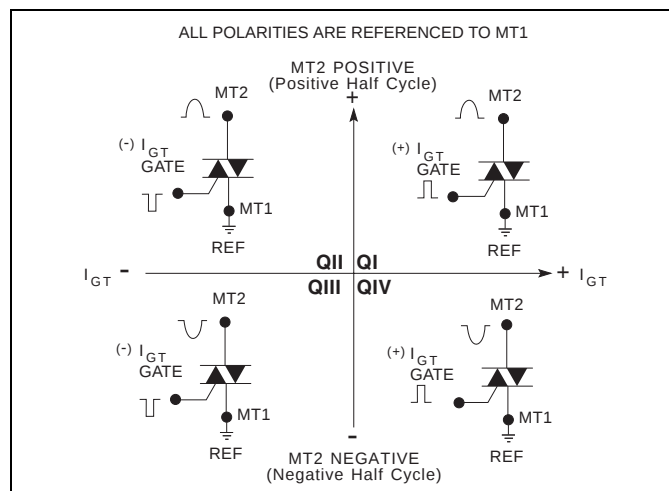
- (1) For either polarity of MT2 with reference to MT1 terminal
- (2) For either polarity of gate voltage  $V_{GT}$  with reference to MT1 terminal
- (3) See Gate Characteristics and Definition of Quadrants.
- (4) See Figure E1.4 for  $i_T$  versus  $v_T$ .
- (5) See Figure E1.6 for  $V_{GT}$  versus  $T_C$ .
- (6) See Figure E1.7 for  $I_{GT}$  versus  $T_C$ .
- (7) See Figure E1.5 for  $I_H$  versus  $T_C$ .
- (8) See Figure E1.9 for surge rating and specific duration.
- (9) See Figure E1.8 for  $t_{gt}$  versus  $I_{GT}$ .
- (10) See Figure E1.2 and Figure E1.3 for maximum allowable case temperature at maximum rated current.
- (11) See Figure E1.1, Figure E1.2, and Figure E1.3 for  $T_A$  or  $T_C$  versus  $I_{T(RMS)}$ .
- (12) See package outlines for lead form configurations. When ordering special lead forming, add type number as suffix to part number.
- (13) Pulse width  $\leq 10 \mu\text{s}$
- (14)  $T_C$  or  $T_L = T_J$  for test conditions in off state
- (15) Minimum non-trigger  $V_{GT}$  at  $110^\circ\text{C}$  is 0.2 V.

### Gate Characteristics

Teccor triacs may be turned on between gate and MT1 terminals in the following ways:

- In-phase signals (with standard AC line) using Quadrants I and III
- Application of unipolar pulses (gate always positive or negative), using Quadrants II and III with negative gate pulses and Quadrants I and IV with positive gate pulses

When maximum surge capability is required, pulses should be a minimum of one magnitude above  $I_{GT}$  rating with a steep rising waveform ( $\leq 1 \mu\text{s}$  rise time).

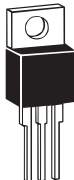
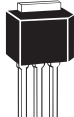
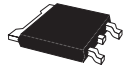
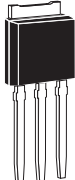


Electrical Isolation

Teccor's isolated triac packages withstand a minimum high potential test of 2500 V ac rms from leads to mounting tab over the device's operating temperature range. The following isolation table shows standard isolation ratings.

| Electrical Isolation<br>from Leads to Mounting Tab |          |
|----------------------------------------------------|----------|
| V AC RMS                                           | TO-220 * |
| 2500                                               | Standard |

\*UL Recognized File #E71639

| Thermal Resistance (Steady State) Junction to Mounting Tab<br>and Junction to Ambient<br>$R_{\theta JC}$ [ $R_{\theta JA}$ ] °C/W (TYP) |                                                                                                       |                                                                                             |                                                                                                       |                                                                                                         |                                                                                                         |                                                                                                        |                                                                                                        |
|-----------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|
| Package Code                                                                                                                            | E                                                                                                     | C                                                                                           | F                                                                                                     | L                                                                                                       | F2                                                                                                      | D                                                                                                      | V                                                                                                      |
| Type                                                                                                                                    | <br>TO-92<br>Plastic | <br>Compak | <br>TO-202<br>Type 1 | <br>TO-220<br>Isolated | <br>TO-202<br>Type 2 | <br>TO-252<br>D-Pak | <br>TO-251<br>V-Pak |
| 0.8 A                                                                                                                                   | 60 [135]                                                                                              | 60 *                                                                                        |                                                                                                       |                                                                                                         |                                                                                                         |                                                                                                        |                                                                                                        |
| 1 A                                                                                                                                     | 50 [95]                                                                                               | 40 *                                                                                        |                                                                                                       |                                                                                                         |                                                                                                         |                                                                                                        |                                                                                                        |
| 4 A                                                                                                                                     |                                                                                                       |                                                                                             | 3.5 [45]                                                                                              | 3.6 [50]                                                                                                | 6.0 [70]                                                                                                | 3.5                                                                                                    | 6.0 [70]                                                                                               |
| 6 A                                                                                                                                     |                                                                                                       |                                                                                             |                                                                                                       | 3.3                                                                                                     |                                                                                                         | 3.2                                                                                                    | 3.2                                                                                                    |
| 8 A                                                                                                                                     |                                                                                                       |                                                                                             |                                                                                                       | 2.8                                                                                                     |                                                                                                         | 2.7                                                                                                    | 2.7                                                                                                    |

\* Mounted on 1 cm<sup>2</sup> copper foil surface; two-ounce copper foil

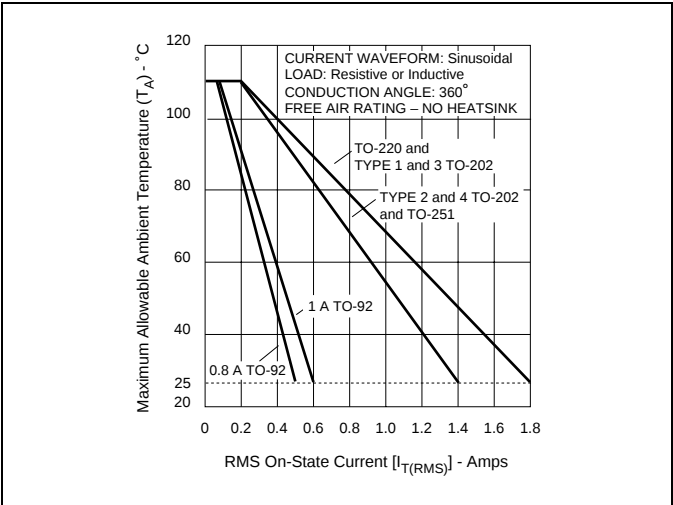


Figure E1.1 Maximum Allowable Ambient Temperature versus On-state Current

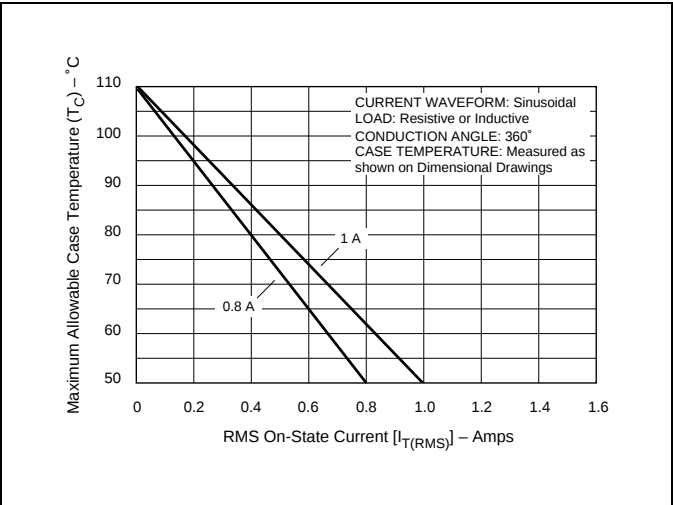


Figure E1.2 Maximum Allowable Case Temperature versus On-state Current (0.8 A and 1 A)

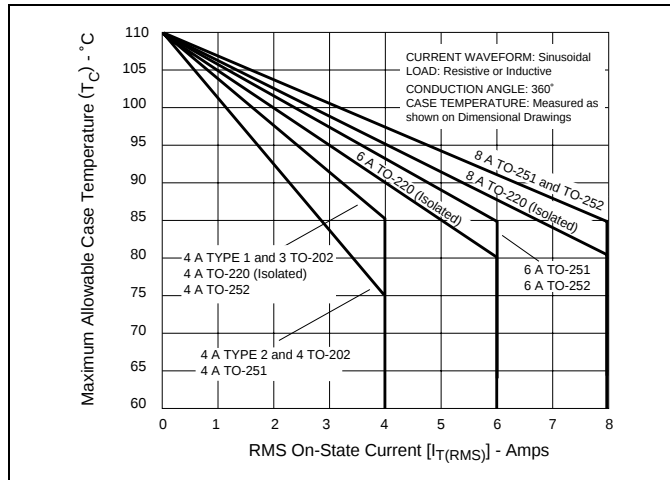


Figure E1.3 Maximum Allowable Case Temperature versus On-state Current (4 A, 6 A, and 8 A)

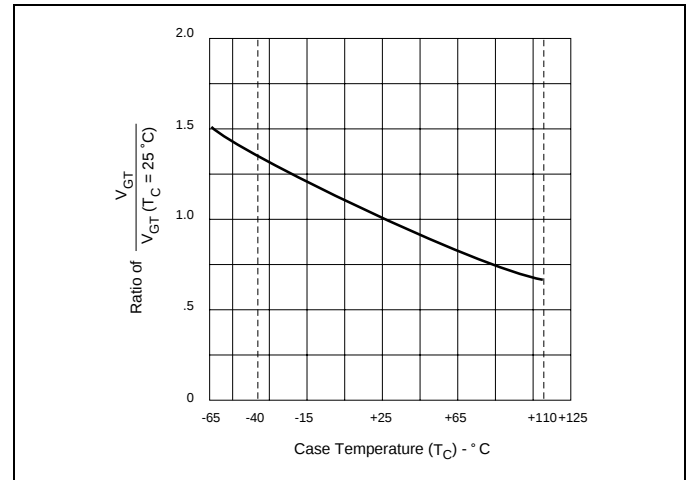


Figure E1.6 Normalized DC Gate Trigger Voltage for All Quadrants versus Case Temperature

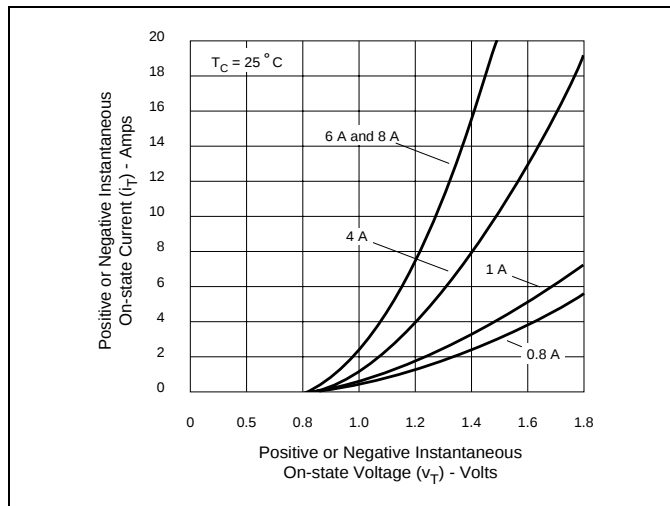


Figure E1.4 On-state Current versus On-state Voltage (Typical)

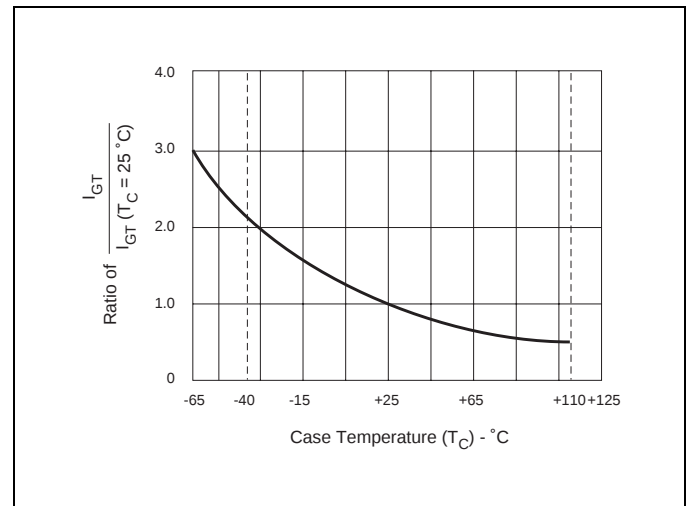


Figure E1.7 Normalized DC Gate Trigger Current for All Quadrants versus Case Temperature

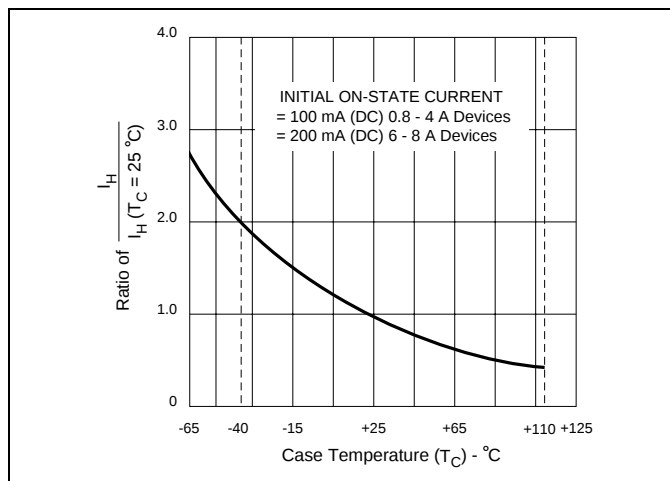


Figure E1.5 Normalized DC Holding Current versus Case Temperature

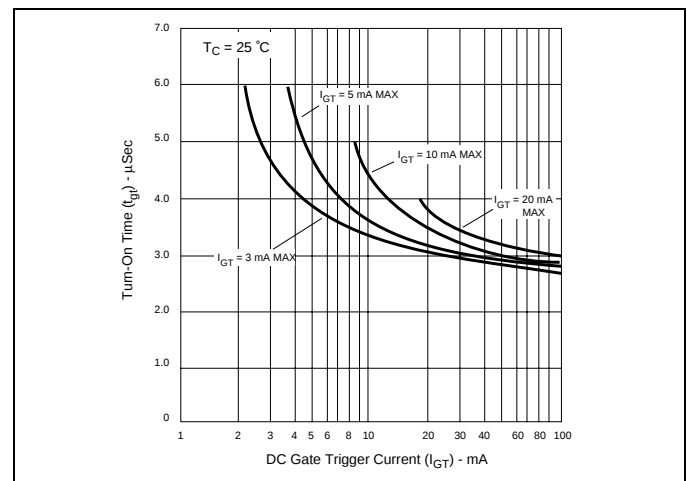


Figure E1.8 Turn-on Time versus Gate Trigger Current (Typical)

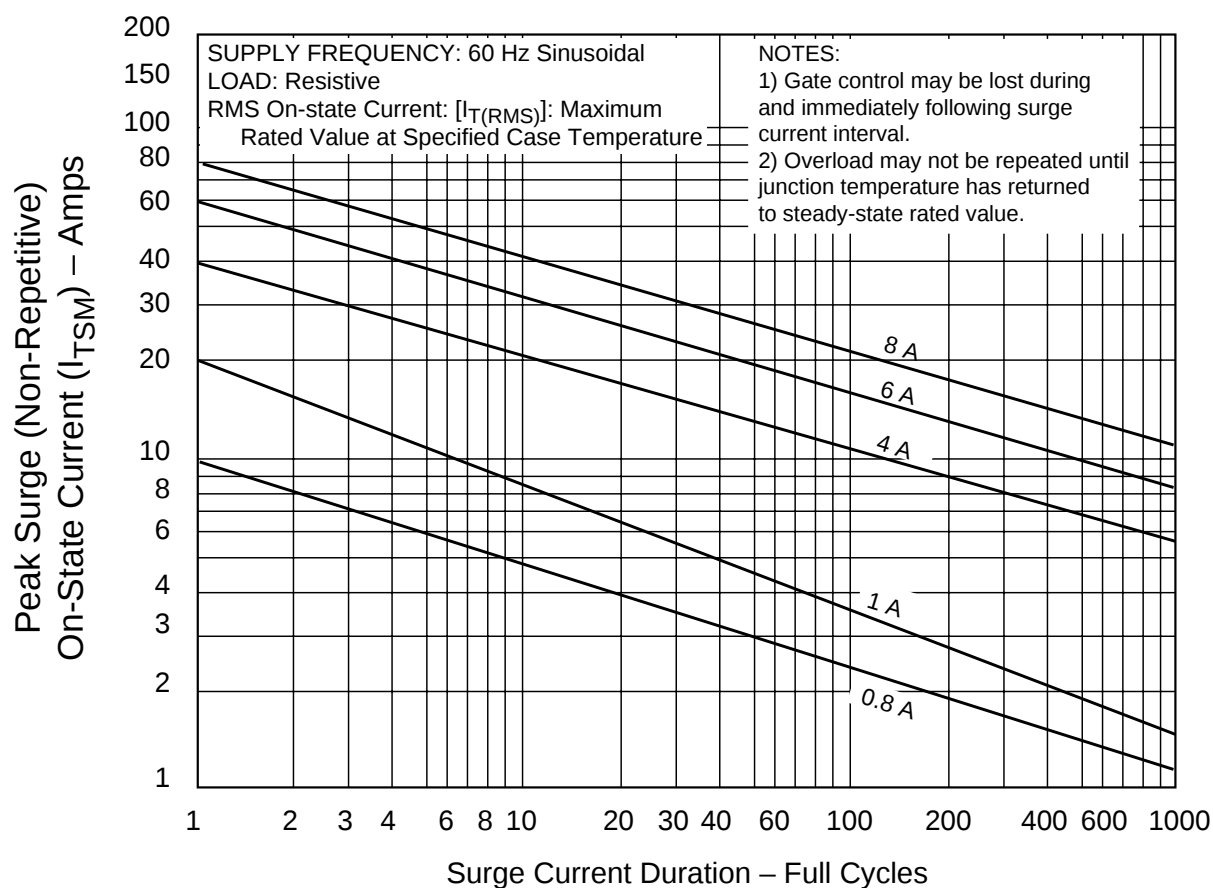


Figure E1.9 Peak Surge Current versus Surge Current Duration

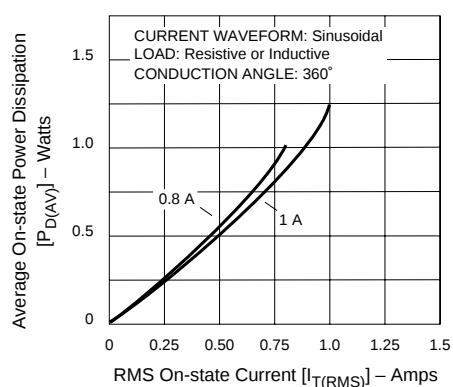


Figure E1.10 Power Dissipation (Typical) versus RMS On-state Current (0.8 A and 1 A)

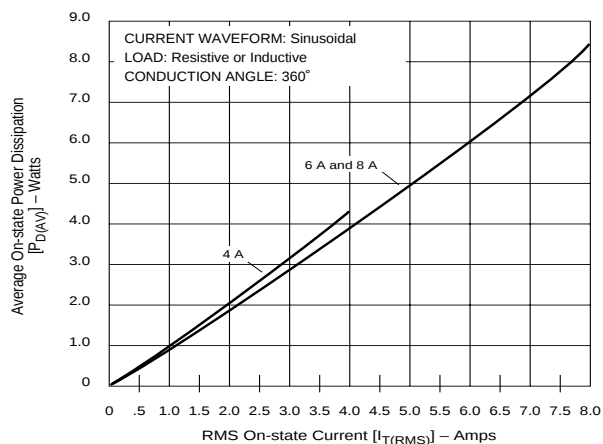


Figure E1.11 Power Dissipation (Typical) versus RMS On-state Current (4 A, 6 A, and 8 A)