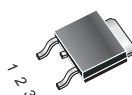


#### Description

Glass passivated, sensitive gate thyristors in a plastic envelope, intended for use in general purpose switching and phase control applications. These devices are intended to be interfaced directly to microcontrollers, logic integrated circuits and other low power gate trigger circuits.

|                                                                                   |  |                                                                                   |  |
|-----------------------------------------------------------------------------------|--|-----------------------------------------------------------------------------------|--|
| Symbol                                                                            |  | Simplified outline                                                                |  |
|  |  |  |  |
|                                                                                   |  | TO-252                                                                            |  |
| Pin                                                                               |  | Description                                                                       |  |
| 1                                                                                 |  | Cathode                                                                           |  |
| 2                                                                                 |  | anode                                                                             |  |
| 3                                                                                 |  | gate                                                                              |  |
| TAB                                                                               |  | anode                                                                             |  |

#### Applications:

- ◆ Motor control
- ◆ Industrial and domestic lighting
- ◆ Heating
- ◆ Static switching

#### Features

- ◆ Blocking voltage to 600 V
- ◆ On-state RMS current to 6 A
- ◆ Ultra low gate trigger current

| SYMBOL      | PARAMETER                             | Value | Unit |
|-------------|---------------------------------------|-------|------|
| $V_{DRM}$   | Repetitive peak off-state voltages    | 600   | V    |
| $I_T (RMS)$ | RMS on-state current (full sine wave) | 6     | A    |
| $I_{TAV}$   | Average on-state current              | 3.8   | A    |

| SYMBOL   | PARAMETER                                       | CONDITIONS  | MIN | TYP | MAX | UNIT |
|----------|-------------------------------------------------|-------------|-----|-----|-----|------|
| Rth j-mb | Thermal resistance<br>Junction to mounting base |             | -   | -   | 2.0 | K/W  |
| Rth j-a  | Thermal resistance<br>Junction to am bient      | In free air | -   | 70  | -   | K/W  |

Limiting values in accordance with the Maximum system(IEC 134)

| SYMBOL       | PARAMETER                                                                                 | CONDITIONS                                                                 | MIN | Value | UNIT             |
|--------------|-------------------------------------------------------------------------------------------|----------------------------------------------------------------------------|-----|-------|------------------|
| $V_{RRM}$    | Repetitive peak reverse voltage                                                           |                                                                            | -   | 600   | V                |
| $I_{T(RMS)}$ | RMS on-state current                                                                      |                                                                            | -   | 6     | A                |
| $I_{GM}$     | Peak gate current                                                                         |                                                                            | -   | 2     | A                |
| $I^2t$       | $I^2t$ for fusing                                                                         | RMS surge (non-repetitive) on-state current for period of 8.3ms for fusing | -   | 41    | A <sup>2</sup> s |
| $I_{TSM}$    | Peak one-cycle forward surge current                                                      | 60Hz                                                                       | -   | 100   | A                |
|              |                                                                                           | 50Hz                                                                       | -   | 83    | A                |
| $P_{G(AV)}$  | Average gate power dissipation                                                            |                                                                            | -   | 0.5   | W                |
| $P_{GM}$     | Peak gate power dissipation                                                               |                                                                            | -   | 20    | W                |
| $T_q$        | Circuit commutated turn-off time                                                          |                                                                            | -   | 35    | μs               |
| $T_{tg}$     | Gate controlled turn-on time; gate pulse=100mA; minmum width=15 μs with rise time=<0.1 μs |                                                                            | -   | 20    | μs               |

$T_j=25^{\circ}\text{C}$  unless otherwise stated

| SYMBOL                 | PARAMETER                                                             | CONDITIONS                                                         | MIN | TYP | MAX | UNIT |
|------------------------|-----------------------------------------------------------------------|--------------------------------------------------------------------|-----|-----|-----|------|
| Static characteristics |                                                                       |                                                                    |     |     |     |      |
| $I_{GT}$               | Dc gate trigger current                                               | $V_D=12\text{V}, R_L=60\Omega$                                     | -   | -   | 200 | μA   |
| $V_{GT}$               | DC gate trigger voltage                                               | $V_D=12\text{V dc}, R_L=60\Omega$                                  | -   | -   | 1.5 | V    |
| $DI/dt$                | Maximum rate-of-rise of on-state current;                             | $I_{GT}=150\text{mA}$ with $\leq 0.1\mu\text{s}$ rise time,        | -   | -   | 100 | A/μs |
| $V_{TM}$               | On-state voltage                                                      | $T_a=25^{\circ}\text{C}, I_{TM}=0.6\text{A}$ , instantaneous value | -   | -   | 1.6 | V    |
| $I_H$                  |                                                                       | $V_D=12\text{V}; I_{GT}=0.1\text{A}$                               | -   | -   | 6   | mA   |
| $I_{DRM}$              | Peak off-state forward and reverse current at $V_{DRM}$ and $V_{RRM}$ | $T_c=125^{\circ}\text{C}, V_{DRM}$                                 | -   | -   | 0.5 | mA   |
| $I_{RRM}$              |                                                                       | $T_c=125^{\circ}\text{C}, V_{RRM}$                                 | -   | -   | 0.5 | mA   |

#### Dynamic Characteristics

|             |                                            |                                                                                                                                                                                                    |    |     |   |      |
|-------------|--------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|-----|---|------|
| $D_{vD}/dt$ | Critical rate of rise of Off-state voltage | $V_{DM}=67\% V_{DRM(max)}$ ; $T_j=125^{\circ}\text{C}$ ; Exponential wave form; $R_{GK}=100\Omega$                                                                                                 | 50 | 100 | - | V/μs |
| $t_{gt}$    | Gate controlled turn-on time               | $I_{TM}=10\text{A}; V_D=V_{DRM(max)}$ ; $I_G=5\text{mA}$ ; $DI_G/dt=0.2\text{A}/\mu\text{s}$                                                                                                       | -  | 2   | - | μs   |
| $t_g$       | Crcuit commutated turn-off time            | $V_{DM}=67\% V_{DRM(max)}$ ; $T_j=125^{\circ}\text{C}$ ; $I_{TM}=12\text{A}$ ; $V_R=24\text{V}$ ; $dI_{TM}/dt=10\text{A}/\mu\text{s}$ ; $dV_R/dt=2\text{V}/\mu\text{s}$ ; $R_{GK}=1\text{k}\Omega$ | -  | 100 | - | μs   |

#### Description

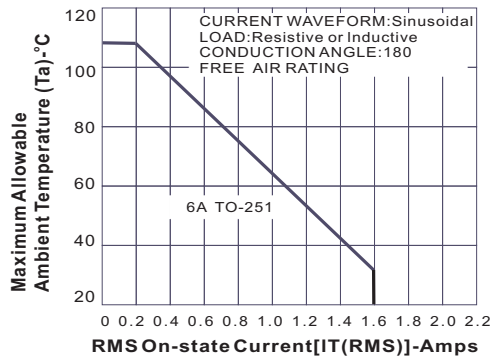


Figure E6.1 Maximum allowable ambient temperature versus RMS On-state current

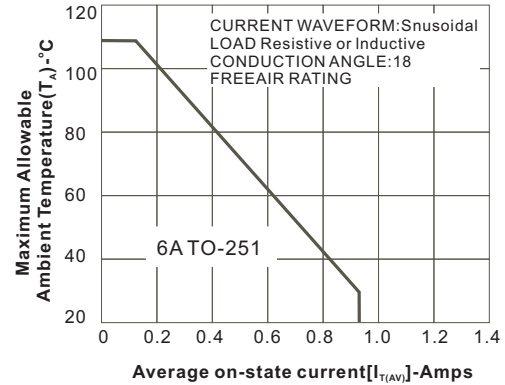


Figure E6.2 Maximum Allowable Ambient Temperature Versus Average on-state Current

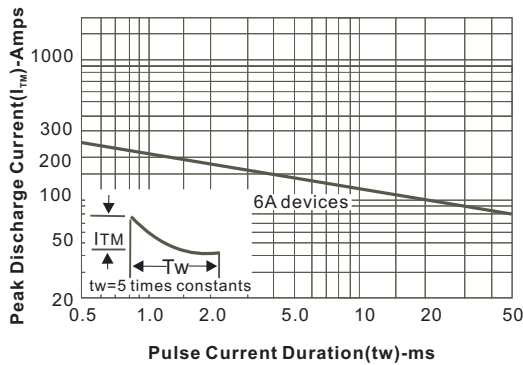


Figure E6.3 Peak Capacitor Discharge Current(6A)

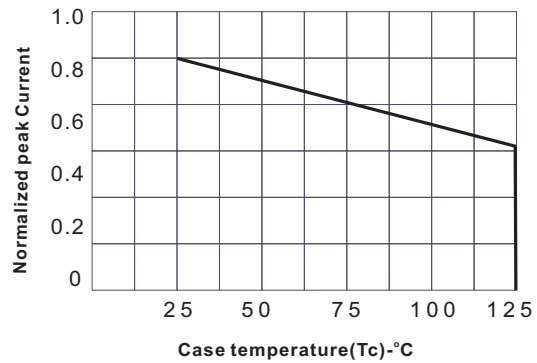


Figure E6.4 peak capacitor discharge current derating(6A)

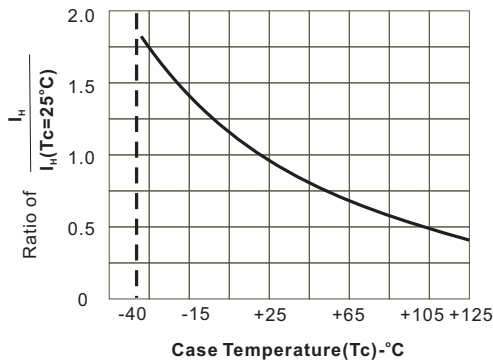


Figure E6.5 Normalized dc Holding Current versus Case Temperature

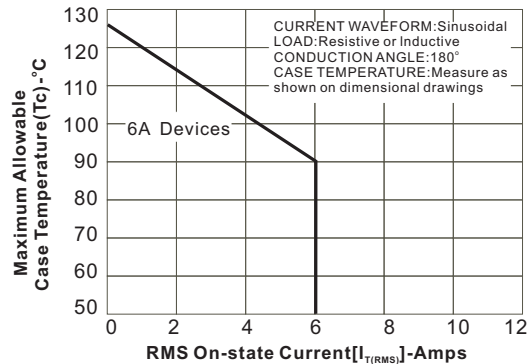


Figure E6.6 Maximum Allowable case temperature versus RMS On-state current 6A

#### Description

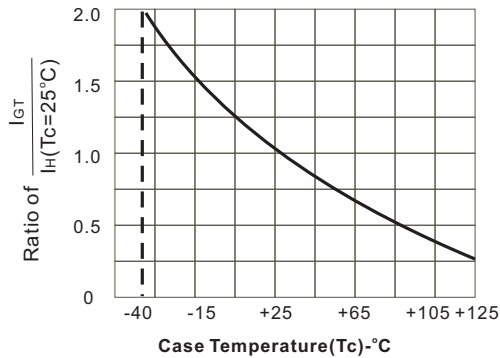


Figure E6.7 Normalized dc Gate-Trigger Current versus Case Temperature

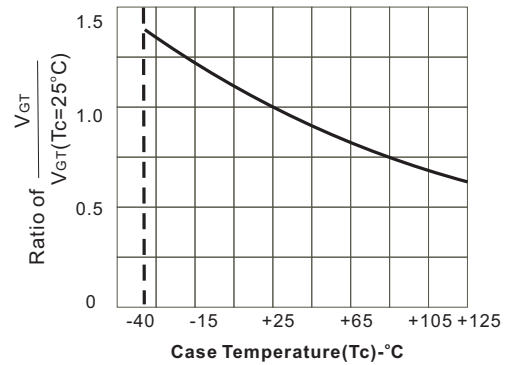


Figure E6.8 Normalized dc Gate-trigger Voltage versus Case Temperature

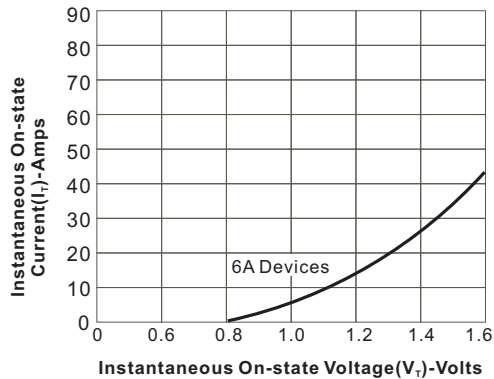


Figure E6.9 Instantaneous On-state Current versus On-state Voltage (Typical) 6A

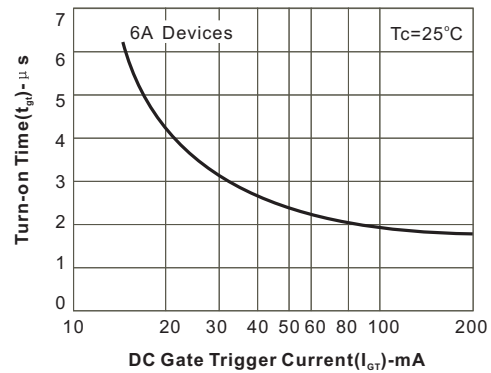


Figure E6.10 Typical Turn-on Time versus Gate-trigger Current

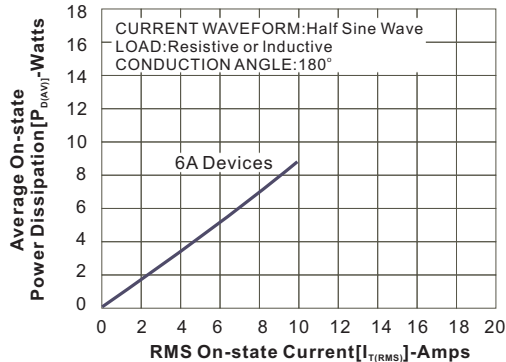


Figure E6.11 Power Dissipation (Typical) versus RMS On-state Current (6A)

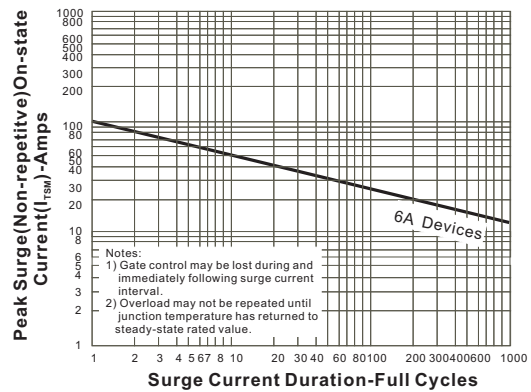


Figure E6.12 Peak Surge Current versus Surge Current Duration

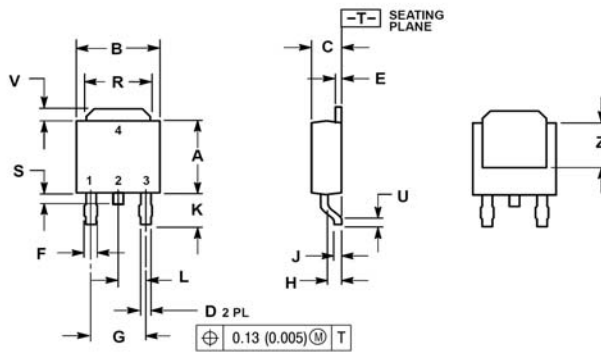
#### MECHANICAL DATA

Dimensions in mm

Net Mass: 0.45g

TO-252(DPAK)

DPAK  
CASE 369C  
ISSUE O



NOTES:  
1. DIMENSIONING AND TOLERANCING  
PER ANSI Y14.5M, 1982.  
2. CONTROLLING DIMENSION: INCH.

| DIM | MIN   | MAX   | MIN  | MAX  |
|-----|-------|-------|------|------|
| A   | 0.235 | 0.245 | 5.97 | 6.22 |
| B   | 0.250 | 0.265 | 6.35 | 6.73 |
| C   | 0.086 | 0.094 | 2.19 | 2.38 |
| D   | 0.027 | 0.035 | 0.69 | 0.88 |
| E   | 0.018 | 0.023 | 0.46 | 0.58 |
| F   | 0.037 | 0.045 | 0.94 | 1.14 |
| G   | 0.180 | BSC   | 4.58 | BSC  |
| H   | 0.034 | 0.040 | 0.87 | 1.01 |
| J   | 0.018 | 0.023 | 0.46 | 0.58 |
| K   | 0.102 | 0.114 | 2.60 | 2.89 |
| L   | 0.090 | BSC   | 2.29 | BSC  |
| R   | 0.180 | 0.215 | 4.57 | 5.45 |
| S   | 0.025 | 0.040 | 0.63 | 1.01 |
| U   | 0.020 | ---   | 0.51 | ---  |
| V   | 0.035 | 0.050 | 0.89 | 1.27 |
| Z   | 0.155 | ---   | 3.93 | ---  |

STYLE 6:  
PIN 1. MT1  
2. MT2  
3. GATE  
4. MT2

#### SOLDERING FOOTPRINT\*

