## TIC236 SERIES
### SILICON TRIACS

- **High Current Triacs**
- **12 A RMS**
- **Glass Passivated Wafer**
- **400 V to 800 V Off-State Voltage**
- **Max $I_{GT}$ of 50 mA (Quadrants 1 - 3)**

### absolute maximum ratings over operating case temperature (unless otherwise noted)

<table>
<thead>
<tr>
<th>RATING</th>
<th>SYMBOL</th>
<th>VALUE</th>
<th>UNIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Repetitive peak off-state voltage (see Note 1)</td>
<td>$V_{DRM}$</td>
<td>TIC236D</td>
<td>400</td>
</tr>
<tr>
<td></td>
<td></td>
<td>TIC236M</td>
<td>600</td>
</tr>
<tr>
<td></td>
<td></td>
<td>TIC236S</td>
<td>700</td>
</tr>
<tr>
<td></td>
<td></td>
<td>TIC236N</td>
<td>800</td>
</tr>
<tr>
<td>Full-cycle RMS on-state current at (or below) 70°C case temperature (see Note 2)</td>
<td>$I_{T(RMS)}$</td>
<td>12</td>
<td>A</td>
</tr>
<tr>
<td>Peak on-state surge current full-sine-wave at (or below) 25°C case temperature (see Note 3)</td>
<td>$I_{TSM}$</td>
<td>100</td>
<td>A</td>
</tr>
<tr>
<td>Peak gate current</td>
<td>$I_{GM}$</td>
<td>±1</td>
<td>A</td>
</tr>
<tr>
<td>Operating case temperature range</td>
<td>$T_C$</td>
<td>-40 to +110</td>
<td>°C</td>
</tr>
<tr>
<td>Storage temperature range</td>
<td>$T_{stg}$</td>
<td>-40 to +125</td>
<td>°C</td>
</tr>
<tr>
<td>Lead temperature 1.6 mm from case for 10 seconds</td>
<td>$T_L$</td>
<td>230</td>
<td>°C</td>
</tr>
</tbody>
</table>

### NOTES:
1. These values apply bidirectionally for any value of resistance between the gate and Main Terminal 1.
2. This value applies for 50-Hz full-sine-wave operation with resistive load. Above 70°C derate linearly to 110°C case temperature at the rate of 300 mA/°C.
3. This value applies for one 50-Hz full-sine-wave when the device is operating at (or below) the rated value of peak reverse voltage and on-state current. Surge may be repeated after the device has returned to original thermal equilibrium.

### electrical characteristics at 25°C case temperature (unless otherwise noted)

<table>
<thead>
<tr>
<th>PARAMETER</th>
<th>TEST CONDITIONS</th>
<th>MIN</th>
<th>TYP</th>
<th>MAX</th>
<th>UNIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>$I_{DRM}$</td>
<td>Repetitive peak off-state current</td>
<td>$V_D$</td>
<td>Rated $V_{DRM}$</td>
<td>$I_G = 0$</td>
<td>$T_C = 110°C$</td>
</tr>
<tr>
<td>$I_{GT}$</td>
<td>Gate trigger current</td>
<td>$V_{supply} = +12$ V†</td>
<td>$R_L = 10$ Ω</td>
<td>$t_{p(g)} &gt; 20$ μs</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>$R_L = 10$ Ω</td>
<td>$t_{p(g)} &gt; 20$ μs</td>
<td>-19</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>$R_L = 10$ Ω</td>
<td>$t_{p(g)} &gt; 20$ μs</td>
<td>-16</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>$R_L = 10$ Ω</td>
<td>$t_{p(g)} &gt; 20$ μs</td>
<td>34</td>
</tr>
<tr>
<td>$V_{GT}$</td>
<td>Gate trigger voltage</td>
<td>$V_{supply} = +12$ V†</td>
<td>$R_L = 10$ Ω</td>
<td>$t_{p(g)} &gt; 20$ μs</td>
<td>0.8</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>$R_L = 10$ Ω</td>
<td>$t_{p(g)} &gt; 20$ μs</td>
<td>-0.8</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>$R_L = 10$ Ω</td>
<td>$t_{p(g)} &gt; 20$ μs</td>
<td>0.9</td>
</tr>
<tr>
<td>$V_T$</td>
<td>On-state voltage</td>
<td>$I_{TM} = ±17$ A</td>
<td>$I_G = 50$ mA</td>
<td>(see Note 4)</td>
<td>±1.4</td>
</tr>
</tbody>
</table>

† All voltages are with respect to Main Terminal 1.

NOTE 4: This parameter must be measured using pulse techniques, $t_p = \leq 1$ ms, duty cycle $\leq 2\%$. Voltage-sensing contacts separate from the current carrying contacts are located within 3.2 mm from the device body.
electrical characteristics at 25°C case temperature (unless otherwise noted) (continued)

<table>
<thead>
<tr>
<th>PARAMETER</th>
<th>TEST CONDITIONS</th>
<th>MIN</th>
<th>TYP</th>
<th>MAX</th>
<th>UNIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>$I_H$ Holding current</td>
<td>$V_{supply} = +12 \text{ V}$†</td>
<td>22</td>
<td>40</td>
<td>-12</td>
<td>mA</td>
</tr>
<tr>
<td></td>
<td>$V_{supply} = -12 \text{ V}$†</td>
<td>-40</td>
<td>-40</td>
<td>-40</td>
<td>mA</td>
</tr>
<tr>
<td>$I_L$ Latching current</td>
<td>$V_{supply} = +12 \text{ V}$†</td>
<td>80</td>
<td>-80</td>
<td>-80</td>
<td>mA</td>
</tr>
<tr>
<td></td>
<td>$V_{supply} = -12 \text{ V}$†</td>
<td>(see Note 5)</td>
<td>(see Note 5)</td>
<td>(see Note 5)</td>
<td>(see Note 5)</td>
</tr>
<tr>
<td>$dv/dt$ Critical rate of rise of off-state voltage</td>
<td>$V_D = \text{Rated } V_D$</td>
<td>$T_C = 110^\circ \text{C}$</td>
<td>±400</td>
<td>V/µs</td>
<td></td>
</tr>
<tr>
<td>$dv/dt_{(c)}$ Critical rise of commutation voltage</td>
<td>$V_D = \text{Rated } V_D$</td>
<td>$T_C = 80^\circ \text{C}$</td>
<td>±1.2</td>
<td>V/µs</td>
<td></td>
</tr>
<tr>
<td>$di/dt$ Critical rate of rise of on-state current</td>
<td>$V_D = \text{Rated } V_D$</td>
<td>$T_C = 110^\circ \text{C}$</td>
<td>±100</td>
<td>A/µs</td>
<td></td>
</tr>
</tbody>
</table>

† All voltages are with respect to Main Terminal 1.

NOTE 5: The triacs are triggered by a 15-V (open-circuit amplitude) pulse supplied by a generator with the following characteristics:
- $R_G = 100 \Omega$
- $t_{p(g)} = 20 \mu s$
- $t_r = \leq 15 \text{ ns}$
- $f = 1 \text{ kHz}$

thermal characteristics

<table>
<thead>
<tr>
<th>PARAMETER</th>
<th>MIN</th>
<th>TYP</th>
<th>MAX</th>
<th>UNIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>$R_{juc}$ Junction to case thermal resistance</td>
<td>2</td>
<td></td>
<td></td>
<td>°C/W</td>
</tr>
<tr>
<td>$R_{jua}$ Junction to free air thermal resistance</td>
<td>62.5</td>
<td></td>
<td></td>
<td>°C/W</td>
</tr>
</tbody>
</table>

TYPICAL CHARACTERISTICS

**GATE TRIGGER CURRENT VS CASE TEMPERATURE**

**GATE TRIGGER VOLTAGE VS CASE TEMPERATURE**
TYPICAL CHARACTERISTICS

HOLDING CURRENT

vs

CASE TEMPERATURE

TC08AD

LATCHING CURRENT

vs

CASE TEMPERATURE

TC08AE

Figure 3.

Figure 4.

OBSOLETE