HIGH DENSITY MOUNTING
PHOTOTRANSISTOR
OPTICALLY COUPLED ISOLATORS

APPROVALS
- UL recognised, file no. E91231
  Package " EE "

*X'SPECIFICATION APPROVALS
- VDE 0884 in 3 available lead form : -
  - STD
  - G form
  - SMD approved to CECC 00802

DESCRIPTION
The TIL191, TIL192, TIL193 series of optically
coupled isolators consist of infrared light emitting
diodes and NPN silicon photo transistors in space
efficient dual in line plastic packages. The
standard parts TIL191, TIL192, TIL193 are tested
for a CTR of 20% minimum. Parts with the suffix A
or B are tested for a CTR of 50 and 100% minimum
respectively.

FEATURES
- Options :-
  - 10mm lead spread - add G after part no.
  - Surface mount - add SM after part no.
  - Tape&reel - add SMT&R after part no.
- Three Current Transfer Ratio grades
- High Isolation Voltage (5.3kV<sub>acc</sub>, 7.5kV<sub>pk</sub>)
- All electrical parameters 100% tested
- Custom electrical selections available

APPLICATIONS
- Computer terminals
- Industrial systems controllers
- Measuring instruments
- Signal transmission between systems of
different potentials and impedances

OPTION SM
SURFACE MOUNT

OPTION G
7.62
### ABSOLUTE MAXIMUM RATINGS

(25°C unless otherwise specified)

- **Storage Temperature**: -55°C to +125°C
- **Operating Temperature**: -30°C to +100°C
- **Lead Soldering Temperature**: (1/16 inch (1.6mm) from case for 10 secs) 260°C

### INPUT DIODE

- **Forward Current**: 50mA
- **Reverse Voltage**: 6V
- **Power Dissipation**: 70mW

### OUTPUT TRANSISTOR

- **Collector-emitter Voltage**: $V_{CEO}$ 35V
- **Emitter-collector Voltage**: $V_{ECO}$ 6V
- **Collector Current**: 50mA
- **Power Dissipation**: 150mW

### POWER DISSIPATION

- **Total Power Dissipation**: 200mW
  (derate linearly 2.67mW/°C above 25°C)

### ELECTRICAL CHARACTERISTICS ($T_A = 25°C$ Unless otherwise noted)

<table>
<thead>
<tr>
<th>PARAMETER Description</th>
<th>MIN</th>
<th>TYP</th>
<th>MAX</th>
<th>UNITS</th>
<th>TEST CONDITION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input Forward Voltage ($V_F$)</td>
<td>1.2</td>
<td>1.4</td>
<td>V</td>
<td>I_F = 20mA</td>
<td></td>
</tr>
<tr>
<td>Reverse Current ($I_R$)</td>
<td>10</td>
<td>μA</td>
<td></td>
<td>V_R = 4V</td>
<td></td>
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<tr>
<td>Collector-emitter Breakdown ($BV_{CEO}$)</td>
<td>35</td>
<td>V</td>
<td></td>
<td>I_C = 0.5mA</td>
<td></td>
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<tr>
<td>Emitter-collector Breakdown ($BV_{ECO}$)</td>
<td>6</td>
<td>V</td>
<td></td>
<td>I_E = 100μA</td>
<td></td>
</tr>
<tr>
<td>Collector-emitter Dark Current ($ICEO$)</td>
<td>100</td>
<td>nA</td>
<td></td>
<td>$V_{CE} = 20V$</td>
<td></td>
</tr>
<tr>
<td>Current Transfer Ratio (CTR) (Note 2)</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>TIL191, TIL192, TIL193</td>
<td>20</td>
<td>%</td>
<td></td>
<td>5mA $I_F$, 5V $V_{CE}$</td>
<td></td>
</tr>
<tr>
<td>TIL191A, TIL192A, TIL193A</td>
<td>50</td>
<td>%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TIL191B, TIL192B, TIL193B</td>
<td>100</td>
<td>%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Collector-emitter Saturation Voltage ($V_{CE(sat)}$)</td>
<td>0.4</td>
<td>V</td>
<td></td>
<td>5mA $I_F$, 1mA $I_C$</td>
<td></td>
</tr>
<tr>
<td>Input to Output Isolation Voltage ($V_{ISO}$)</td>
<td>5300</td>
<td></td>
<td></td>
<td>$V_{RMS}$ See note 1</td>
<td></td>
</tr>
<tr>
<td></td>
<td>7500</td>
<td></td>
<td></td>
<td>$V_{PK}$ See note 1</td>
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</tr>
<tr>
<td>Input-output Isolation Resistance ($R_{ISO}$)</td>
<td>$5 \times 10^{10}$</td>
<td></td>
<td></td>
<td>$V_{ISO} = 500V$ (note 1)</td>
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<tr>
<td>Output Rise Time ($tr$)</td>
<td>4</td>
<td>μs</td>
<td></td>
<td>$V_{CE} = 2V$,</td>
<td></td>
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<tr>
<td>Output Fall Time ($tf$)</td>
<td>3</td>
<td>μs</td>
<td></td>
<td>$I_C = 2mA$, $R_L = 100Ω$</td>
<td></td>
</tr>
</tbody>
</table>

**Note 1** Measured with input leads shorted together and output leads shorted together.

**Note 2** Special Selections are available on request. Please consult the factory.