**DESCRIPTION**

The ISP815, ISP825, ISP845 series of optically coupled isolators consist of infrared light emitting diodes and NPN silicon photodarlington in space efficient dual in line plastic packages.

**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.  
- High Current Transfer Ratio (600% min)  
- High Isolation Voltage (5.3kV RMS, 7.5kV Pk)  
- 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

---

**APPROVALS**

- UL recognised, File No. E91231  
  Package Code FF  
- 'X' SPECIFICATION APPROVALS  
  - VDE 0884 in 3 available lead form: - STD  
    - G form  
    - SMD approved to CECC 00802  
  - Certified to EN60950 by Nemko - Certificate No. P01102465

**DIMENSIONS IN MM**

- ISP815X ISP815
  - 2.54  
  - 7.0  
  - 6.0  
  - 1.2  
  - 0.5  
  - 3.35

- ISP825X ISP825
  - 10.16  
  - 9.16  
  - 4.0  
  - 3.0  
  - 0.5  
  - 3.35  
  - 0.26

- ISP845X ISP845
  - 20.32  
  - 19.32  
  - 4.0  
  - 3.0  
  - 0.5  
  - 3.35  
  - 0.26
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 $V_{EBO}$ ______ 6V
Collector Current _____________ 80mA
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</th>
<th>MIN</th>
<th>TYP</th>
<th>MAX</th>
<th>UNITS</th>
<th>TEST CONDITION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Forward Voltage ($V_F$)</td>
<td>1.2</td>
<td>1.4</td>
<td>V</td>
<td></td>
<td>$I_F = 20mA$</td>
</tr>
<tr>
<td>Reverse Current ($I_R$)</td>
<td>10</td>
<td>μA</td>
<td></td>
<td></td>
<td>$V_R = 4V$</td>
</tr>
<tr>
<td>Output</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Collector-emitter Breakdown ($BV_{CEO}$) (Note 2)</td>
<td>35</td>
<td>V</td>
<td></td>
<td></td>
<td>$I_C = 1mA$</td>
</tr>
<tr>
<td>Emitter-collector Breakdown ($BV_{EBO}$)</td>
<td>6</td>
<td>V</td>
<td></td>
<td></td>
<td>$I_E = 100μA$</td>
</tr>
<tr>
<td>Collector-emitter Dark Current ($I_{CEO}$)</td>
<td>100</td>
<td>nA</td>
<td></td>
<td></td>
<td>$V_{CE} = 20V$</td>
</tr>
<tr>
<td>Coupled</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Current Transfer Ratio (CTR) (Note 2)</td>
<td>600</td>
<td>7500</td>
<td>%</td>
<td></td>
<td>1mA $I_F$, 2V $V_{CE}$</td>
</tr>
<tr>
<td>Collector-emitter Saturation Voltage $V_{CE(SAT)}$</td>
<td>1.0</td>
<td>V</td>
<td></td>
<td></td>
<td>20mA $I_F$, 5mA $I_C$</td>
</tr>
<tr>
<td>Input to Output Isolation Voltage $V_{ISO}$</td>
<td>5300</td>
<td>7500</td>
<td>V$_{RMS}$</td>
<td>See note 1</td>
<td></td>
</tr>
<tr>
<td>Input-output Isolation Resistance $R_{ISO}$</td>
<td>5x10$^{10}$</td>
<td>Ω</td>
<td></td>
<td>$V_{IO} = 500V$ (note 1)</td>
<td></td>
</tr>
<tr>
<td>Output Rise Time $tr$</td>
<td>60</td>
<td>300</td>
<td>μs</td>
<td>$V_{CE} = 2V$,</td>
<td></td>
</tr>
<tr>
<td>Output Fall Time $tf$</td>
<td>53</td>
<td>250</td>
<td>μs</td>
<td>$I_C = 10mA$, $R_s = 100Ω$</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.