

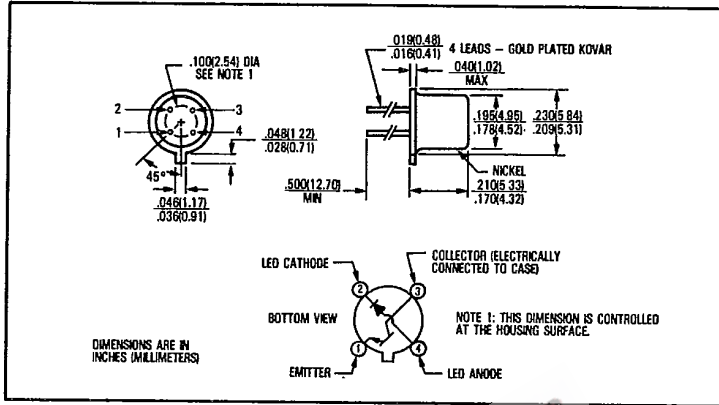
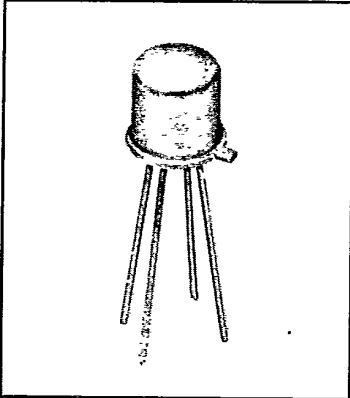
Optoelectronics Division
TRW Electronic Components Group

Product Bulletin 5190
January 1985



T-41-83

Optically Coupled Isolator Type OPI140



Features

- TO-72 hermetically sealed package
- 1000 volt isolation
- Withstands HTRB at 125°C, VCE=20 volts

Description

The OPI140 is an optically coupled isolator consisting of a gallium arsenide infrared emitting diode and an NPN silicon photosensor mounted in a hermetically sealed TO-72 package. TO-72 packages offer high power dissipation, ease of heat sinking and superior hostile environment operation.

Absolute Maximum Ratings (TA=25°C unless otherwise noted)

| | |
|--|---------------------------|
| Input-to-Output Isolation Voltage | ± 1000 VDC ⁽¹⁾ |
| Storage Temperature Range | -65°C to +160°C |
| Operating Temperature Range | -55°C to +125°C |
| Lead Soldering Temperature (1/16 inch [1.6 mm] from case for 5 sec. with soldering iron) | 240°C ⁽²⁾ |
| Input Diode | |
| Forward DC Current | 40 mA |
| Reverse DC Voltage | 3.0 V |
| Power Dissipation | 60 mW ⁽³⁾ |
| Output Phototransistor | |
| Collector-Emitter Voltage | 30 V |
| Emitter-Collector Voltage | 7.0 V |
| Continuous Collector Current | 30 mA |
| Power Dissipation | 200 mW ⁽⁴⁾ |

Notes:

- (1) Measured with input leads shorted together and output leads shorted together.
- (2) RMA flux is recommended. Duration can be extended to 10 sec. max. when flow soldering.
- (3) Derate linearly 0.6 mW/°C above 25°C.
- (4) Derate linearly 2.0 mW/°C above 25°C.

Type OPI140

T-41-83

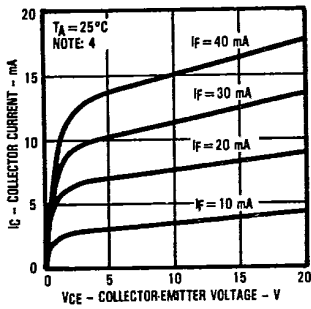
Electrical Characteristics (TA = 25°C unless otherwise noted)

| Symbol | Parameter | Min. | Typ. | Max. | Units | Test Conditions |
|-------------------------------|-------------------------------------|------|------------------|------|-------|--|
| Input Diode | | | | | | |
| V _F | Forward Voltage | | | 1.50 | V | I _F = 40 mA |
| I _R | Reverse Current | | | 10.0 | μA | V _R = 3.0 V |
| Output Phototransistor | | | | | | |
| V _{(BR)CEO} | Collector-Emitter Breakdown Voltage | 30 | | | V | I _C = 1.00 mA, I _F = 0 |
| V _{(BR)ECO} | Emitter-Collector Breakdown Voltage | 7.0 | | | V | I _E = 100 μA, I _F = 0 |
| I _{CEO} | Collector-Emitter Dark Current | | | 50 | nA | V _{CE} = 10.0 V, I _F = 0 |
| Coupled | | | | | | |
| I _{C(ON)} | On-State Collector Current | 1.50 | | | mA | V _{CE} = 10.0 V, I _F = 10.0 mA |
| V _{CE(SAT)} | Saturation Voltage | | | 0.50 | V | I _F = 40 mA, I _C = 1.80 mA |
| I _{IO} | Leakage, Input-to-Output | | | 10.0 | nA | V _{IO} = ±1.00 KVDC. (See Note 1) |
| R _{IO} | Input-to-Output Resistance | | 10 ¹¹ | | Ω | V _{IO} = 600 V (See Note 1) |
| t _r | Output Rise Time | | 2.0 | | μs | V _{CC} = 10.0 V, I _C = 1.00 mA |
| t _f | Output Fall Time | | 2.0 | | μs | R _L = 100 Ω (See Test Circuit) |

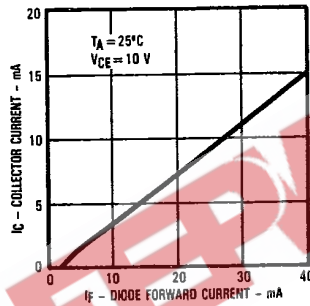


Typical Performance Curves

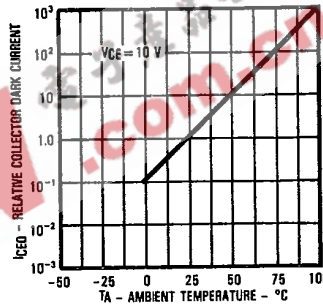
Collector Current vs Collector-Emitter Voltage



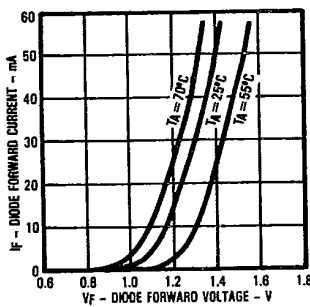
Collector Current vs Diode Forward Voltage



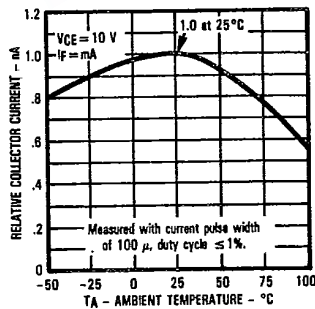
Collector Dark Current vs Ambient Temperature



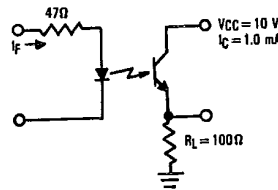
Diode Forward Voltage vs Diode Forward Current



Relative Collector Current vs Ambient Temperature



Test Circuit



TRW reserves the right to make changes at any time in order to improve design and to supply the best product possible.

Optoelectronics Division, TRW Electronic Components Group, 1215 W. Crosby Rd., Carrollton, TX 75006 (214) 323-2200, TLX 6716032 or 215848
 © TRW Inc. 1985. TRW is the name and mark of TRW Inc. Printed in U.S.A.