

Optoelectronics Division  
TRW Electronic Components Group

Product Bulletin 5224  
January 1985

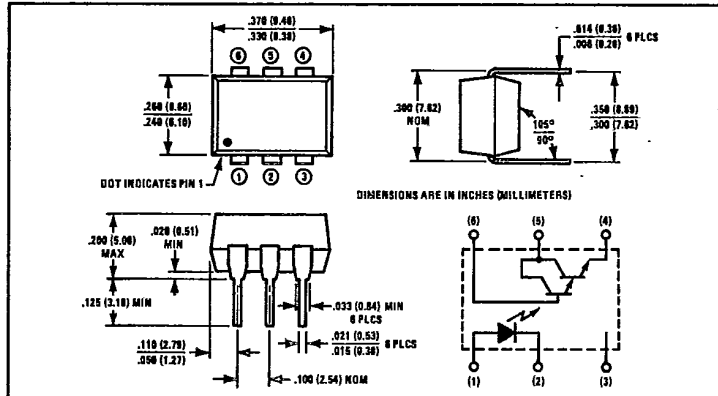
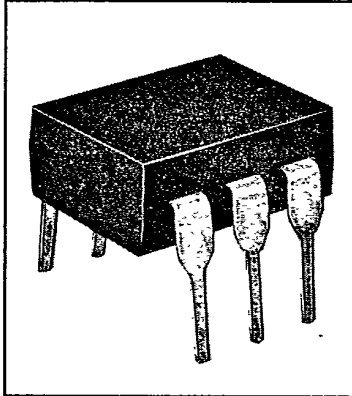
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**TRW**

T-41-85

## Optically Coupled Isolators

### Types OPI3152, OPI3252



#### Features

- Photodarlington output
- High current transfer ratio
- 2500 or 1500 volt isolation ratings
- UL recognized File No. E58730

#### Description

The OPI3152 and OPI3252 are optically coupled isolators each consisting of a gallium arsenide infrared emitting diode and an NPN silicon photodarlington mounted in a standard plastic six pin dual-in-line package. Except for isolation voltage, the OPI3152 and OPI3252 are identical.

#### Absolute Maximum Ratings ( $T_A = 25^\circ\text{C}$ unless otherwise noted)

Input-to-Output Isolation Voltage — OPI3152 .....  $\pm 1500\text{ VDC}^{(1)}$   
OPI3252 .....  $\pm 2500\text{ VDC}^{(1)}$

Storage Temperature Range .....  $-55^\circ\text{C}$  to  $+150^\circ\text{C}$

Operating Temperature Range .....  $-55^\circ\text{C}$  to  $+100^\circ\text{C}$

Lead Soldering Temperature (1/16 inch [1.6 mm] from case for 5 sec. with soldering iron)<sup>(2)</sup> .....  $260^\circ\text{C}$

#### Input Diode

Forward DC Current ..... 60 mA

Peak Forward Current (1  $\mu\text{s}$  pulse width, 330 pps) ..... 3.0 A

Reverse DC Voltage ..... 3.0 V

Power Dissipation ..... 100 mW<sup>(3)</sup>

#### Output Transistor

Collector-Emitter Voltage ..... 55 V

Collector-Base Voltage ..... 55 V

Emitter-Collector Voltage ..... 5.0 V

Power Dissipation ..... 150 mW<sup>(4)</sup>

#### Notes:

- (1) Measured with input diode 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 1.33 mW/ $^\circ\text{C}$  above  $25^\circ\text{C}$ .
- (4) Derate linearly 2.0 mW/ $^\circ\text{C}$  above  $25^\circ\text{C}$ .

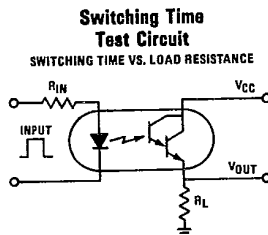
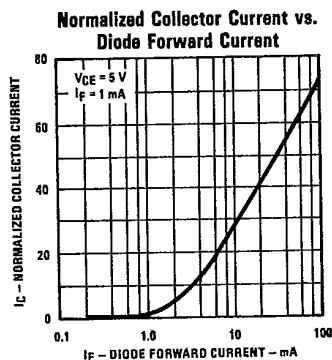
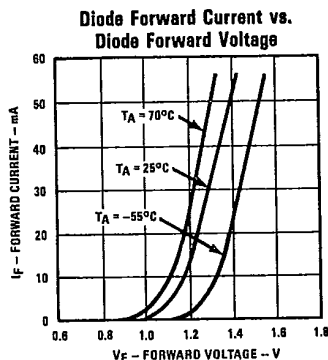
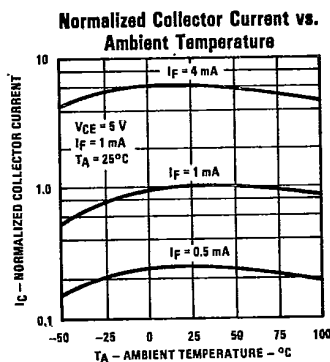
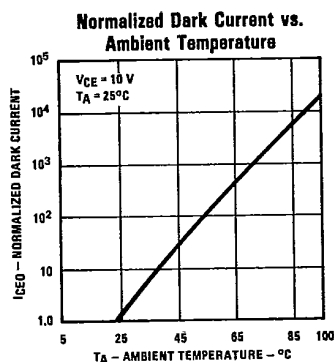
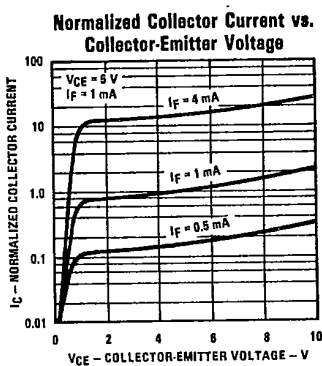
# Types OPI3152, OPI3252

T-41-85

## Electrical Characteristics ( $T_A = 25^\circ\text{C}$ unless otherwise noted)

| Symbol                        | Parameter                            | Min. | Typ. | Max. | Units         | Test Conditions                                                       |
|-------------------------------|--------------------------------------|------|------|------|---------------|-----------------------------------------------------------------------|
| <b>Input Diode</b>            |                                      |      |      |      |               |                                                                       |
| $V_F$                         | Forward Voltage                      |      |      | 1.50 | V             | $I_F = 10.0\text{ mA}$                                                |
| $I_R$                         | Reverse Current                      |      |      | 100  | $\mu\text{A}$ | $V_R = 3.0\text{ V}$                                                  |
| <b>Output Photodarlington</b> |                                      |      |      |      |               |                                                                       |
| $V_{(BR)CEO}$                 | Collector-Emitter Breakdown Voltage  | 55   |      |      | V             | $I_C = 100\text{ }\mu\text{A}$ , $I_B = 0$                            |
| $V_{(BR)CBO}$                 | Collector-Base Breakdown Voltage     | 65   |      |      | V             | $I_C = 100\text{ }\mu\text{A}$ , $I_E = 0$                            |
| $V_{(BR)ECO}$                 | Emitter-Collector Breakdown Voltage  | 5.0  |      |      | V             | $I_E = 100\text{ }\mu\text{A}$ , $I_B = 0$                            |
| $I_{CEO}$                     | Collector-Emitter Dark Current       |      |      | 100  | nA            | $V_{CE} = 10.0\text{ V}$ , $I_B = 0$                                  |
| <b>Coupled</b>                |                                      |      |      |      |               |                                                                       |
| $I_C/I_F$                     | DC Current Transfer Ratio            | 300  |      |      | %             | $I_F = 10.0\text{ mA}$ , $V_{CE} = 5.0\text{ V}$                      |
| $V_{CE(SAT)}$                 | Collector-Emitter Saturation Voltage |      |      | 1.20 | V             | $I_F = 50\text{ mA}$ , $I_C = 50\text{ mA}$ , $I_B = 0$               |
| $t_r$                         | Output Rise Time                     |      | 3.0  |      | $\mu\text{s}$ | $V_{CC} = 10.0\text{ V}$ , $I_C = 10.0\text{ mA}$ , $R_L = 100\Omega$ |
| $t_f$                         | Output Fall Time                     |      | 25   |      | $\mu\text{s}$ | See Test Circuit                                                      |

## Typical Performance Curves



**NOTE:** Rise Time ( $t_r$ ) is time required for collector current to increase from 10% to 90% of its final value. Fall Time ( $t_f$ ) is time required for the collector current to decrease from 90% to 10% of its initial value.

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

Plastic color may vary.

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