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TRW Electronic Components Group

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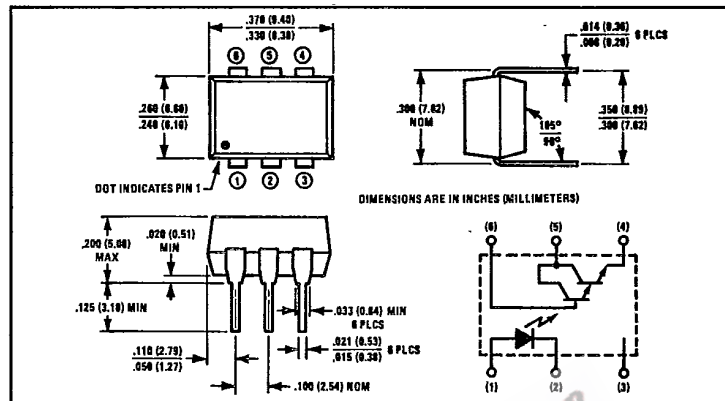
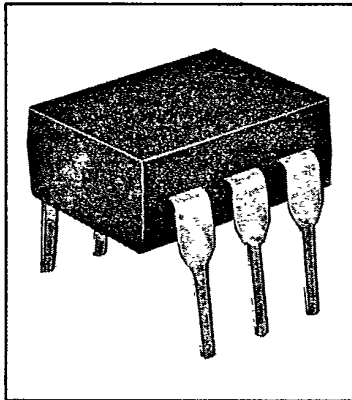


T-41-85

Product Bulletin 5221  
January 1985

## Optically Coupled Isolators

### Types OPI3150, OPI3250



#### Features

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

#### Description

The OPI3150 and OPI3250 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 OPI3150 and OPI3250 are identical.

#### Absolute Maximum Ratings (T<sub>A</sub> = 25°C unless otherwise noted)

Input-to-Output Isolation Voltage — OPI3150 ..... ±1500 VDC<sup>(1)</sup>  
 OPI3250 ..... ±2500 VDC<sup>(1)</sup>

Storage Temperature Range ..... -55°C to +150°C  
 Operating Temperature Range ..... -55°C to +100°C  
 Lead Soldering Temperature (1/16 inch [1.6 mm] from case for 5 sec. with soldering iron)<sup>(2)</sup> ..... 260°C

#### Input Diode

Forward DC Current ..... 60 mA  
 Peak Forward Current (1 μs 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 ..... 30 V  
 Collector-Base Voltage ..... 30 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/°C above 25°C.
- (4) Derate linearly 2.0 mW/°C above 25°C.

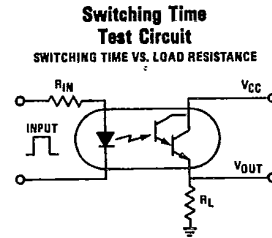
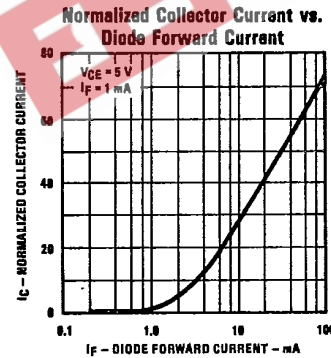
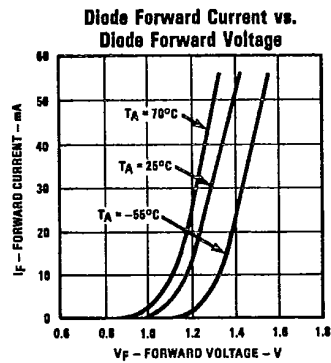
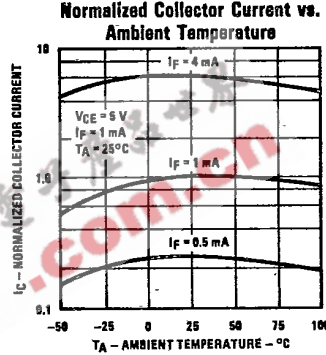
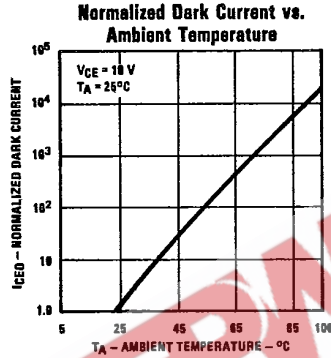
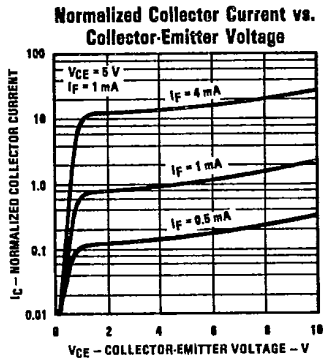
Types OPI3150, OPI3250

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Electrical Characteristics (T<sub>A</sub> = 25°C unless otherwise noted)

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
<b>Input Diode</b>						
V <sub>F</sub>	Forward Voltage		1.50		V	I <sub>F</sub> = 10.0 mA
I <sub>R</sub>	Reverse Current		100		μA	V <sub>R</sub> = 3.0 V
<b>Output Photodarlington</b>						
V <sub>(BR)CEO</sub>	Collector-Emitter Breakdown Voltage	30			V	I <sub>C</sub> = 100 μA, I <sub>B</sub> = 0
V <sub>(BR)CBO</sub>	Collector-Base Breakdown Voltage	30			V	I <sub>C</sub> = 100 μA, I <sub>E</sub> = 0
V <sub>(BR)ECO</sub>	Emitter-Collector Breakdown Voltage	5.0			V	I <sub>E</sub> = 100 μA, I <sub>B</sub> = 0
I <sub>CEO</sub>	Collector-Emitter Dark Current			100	nA	V <sub>CE</sub> = 10.0 V, I <sub>B</sub> = 0
<b>Coupled</b>						
I <sub>C</sub> /I <sub>F</sub>	DC Current Transfer Ratio	300			%	I <sub>F</sub> = 10.0 mA, V <sub>CE</sub> = 2.0 V
V <sub>CE(SAT)</sub>	Collector-Emitter Saturation Voltage		1.20		V	I <sub>F</sub> = 10.0 mA, I <sub>C</sub> = 10.0 mA, I <sub>B</sub> = 0
t <sub>r</sub>	Output Rise Time			3.0	μs	V <sub>CC</sub> = 10.0 V, I <sub>C</sub> = 10.0 mA, R <sub>L</sub> = 100Ω
t <sub>f</sub>	Output Fall Time			25	μs	See Test Circuit

Typical Performance Curves



**NOTE:** Rise Time (t<sub>r</sub>) is time required for collector current to increase from 10% to 90% of its final value, Fall Time (t<sub>f</sub>) is time required for the collector current to decrease from 90% to 10% of its initial value.