

Optoelectronics Division  
TRW Electronic Components Group

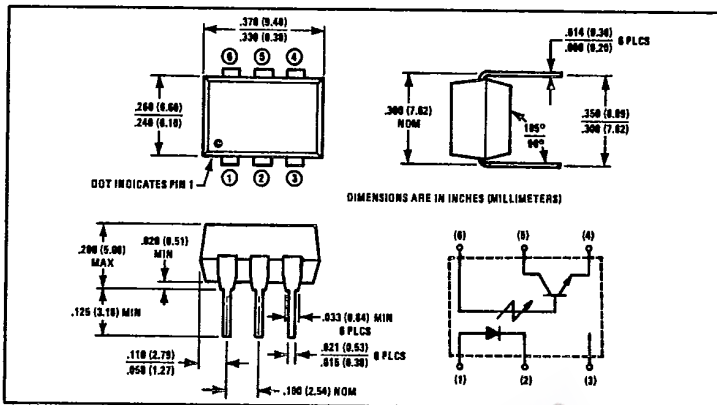
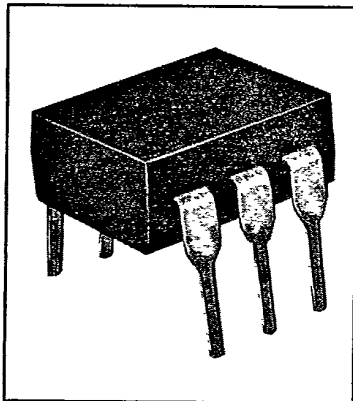
Product Bulletin 5228  
January 1985

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**TRW**

T-41-83

## Optically Coupled Isolators, High $V_{(BR)CEO}$ Types OPI6000, OPI6100



### Features

- 300 V collector-emitter breakdown voltage
- Low cost 6 pin dual-in-line package
- UL recognized File No. E58730

### Description

The OPI6000 and OPI6100 are optically coupled isolators each consisting of a gallium arsenide infrared emitting diode and an NPN silicon phototransistor mounted in a standard plastic six pin dual-in-line package. This series is intended for applications where high collector-emitter breakdown voltages are required.

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

Input-to-Output Isolation Voltage	.....	$\pm 1500$ VDC <sup>(1)</sup>
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>	.....	$260^\circ\text{C}$
<b>Input Diode</b>		
Forward DC Current	.....	60 mA
Peak Forward Current (1 $\mu\text{s}$ pulse width, 300 pps)	.....	3.0 A
Reverse Voltage	.....	3.0 V
Power Dissipation	.....	100 mW <sup>(3)</sup>
<b>Output Phototransistor</b>		
$B_{(BR)CEO}$	.....	OPI6000 ..... 300 V OPI6100 ..... 200 V
$V_{(BR)CBO}$	.....	OPI6000 ..... 300 V OPI6100 ..... 200 V
$V_{(BR)CEO}$	.....	7.0 V
Power Dissipation	.....	300 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 4.0 mW/ $^\circ\text{C}$  above  $25^\circ\text{C}$ .

Types OPI6000, OPI6100

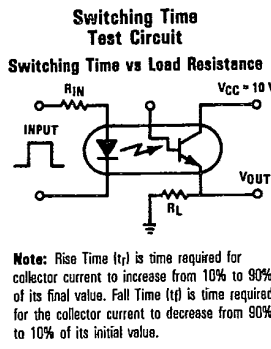
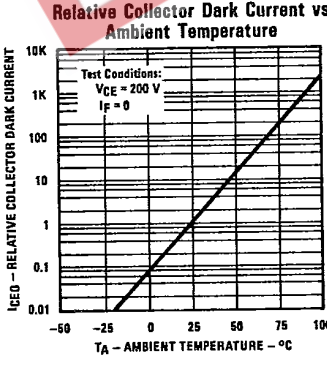
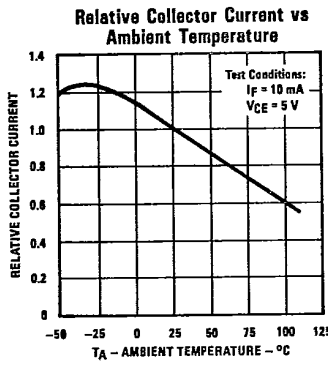
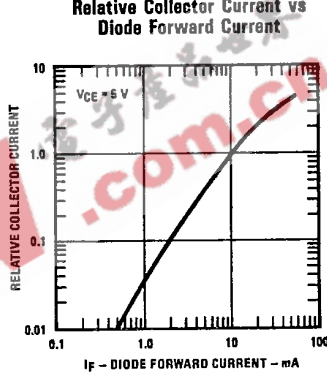
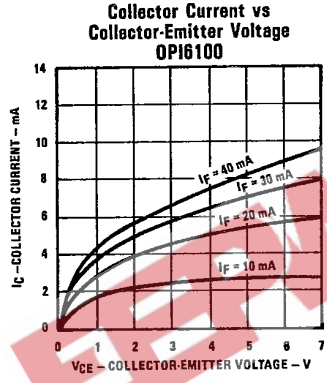
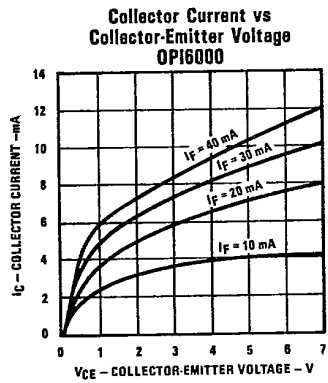
T-41-83

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			10.0	μA	V <sub>R</sub> = 3.0 V
<b>Output Phototransistor</b>						
V <sub>(BR)CEO</sub>	Collector-Emitter Breakdown Voltage (See Note 1)	OPI6000 OPI6100	300 200		V	I <sub>C</sub> = 1.00 mA
V <sub>(BR)ECO</sub>	Emitter-Collector Breakdown Voltage		7.0		V	I <sub>E</sub> = 100 μA
V <sub>(BR)CBO</sub>	Collector-Base Breakdown Voltage	OPI6000 OPI6100	300 200		V	I <sub>C</sub> = 100 μA, I <sub>F</sub> = 0
I <sub>CEO</sub>	Collector Dark Current	OPI6000 OPI6100		100 100	nA	V <sub>CE</sub> = 200 V, R <sub>BE</sub> = 1.00 MΩ V <sub>CE</sub> = 100 V, R <sub>BE</sub> = 1.00 MΩ
<b>Coupled</b>						
I <sub>C</sub> /I <sub>F</sub>	DC Current Transfer Ratio	OPI6000 OPI6100	20 10.0		%	I <sub>F</sub> = 10.0 mA, V <sub>CE</sub> = 5.0 V I <sub>F</sub> = 10.0 mA, V <sub>CE</sub> = 5.0 V
V <sub>CE(SAT)</sub>	Collector-to-Emitter Saturation Voltage			0.40	V	I <sub>F</sub> = 10.0 mA, I <sub>C</sub> = 0.50 mA
V <sub>ISO</sub>	Isolation Voltage		1500		VDC	See Note 1
R <sub>IO</sub>	Input-to-Output Resistance		10 <sup>11</sup>		Ω	V <sub>IO</sub> = 500 V, See Note 1
C <sub>IO</sub>	Input-to-Output Capacitance			2.0	pF	f = 1.00 MHz, See Note 1
t <sub>on</sub>	Turn On Time			4.0	μs	V <sub>CE</sub> = 10.0 V, R <sub>L</sub> = 100 Ω
t <sub>off</sub>	Turn Off Time			2.5	μs	I <sub>F</sub> = 2.0 mA, See Test Circuit



Typical Performance Curves



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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