Optoelectronics Division
TRW Electronic Components Group

Product Bulletin 5228
January 1985

1987 Cost Saver Product!
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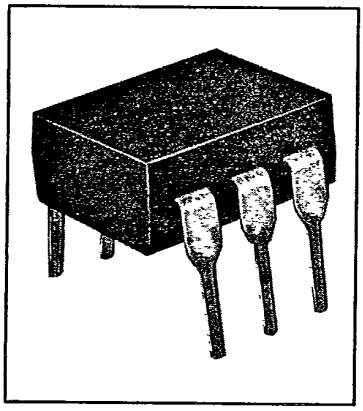
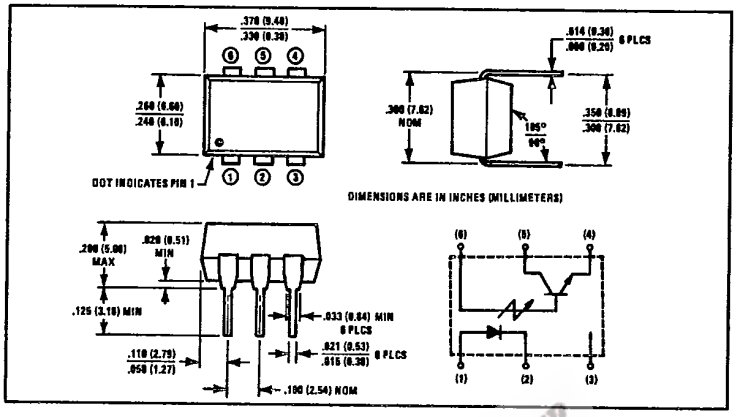
T-41-83

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°C unless otherwise noted)

Input-to-Output Isolation Voltage	±1500 VDC[1]
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)[2]	260°C
Input Diode	
Forward DC Current	60 mA
Peak Forward Current (1 μs pulse width, 300 pps)	3.0 A
Reverse Voltage	3.0 V
Power Dissipation	100 mW[3]
Output Phototransistor	
$B_{(BR)CEO}$ OPI6000	300 V
OPI6100	200 V
$V_{(BR)CBO}$ OPI6000	300 V
OPI6100	200 V
$V_{(BR)ECO}$	7.0 V
Power Dissipation	300 mW[4]

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 4.0 mW/°C above 25°C.

Types OPI6000, OPI6100

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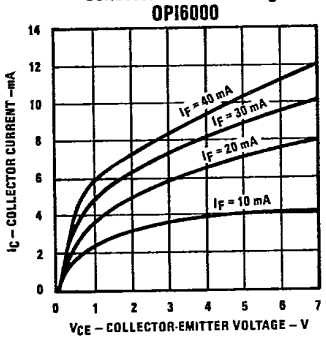
Electrical Characteristics (T_A = 25°C unless otherwise noted)

Symbol	Parameter		Min.	Typ.	Max.	Units	Test Conditions
Input Diode							
V_F	Forward Voltage				1.50	V	I_F = 10.0 mA
I_R	Reverse Current				10.0	μA	V_R = 3.0 V
Output Phototransistor							
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage (See Note 1)	OPI6000 OPI6100	300 200			V	I_C = 1.00 mA
$V_{(BR)ECO}$	Emitter-Collector Breakdown Voltage		7.0			V	I_E = 100 μA
$V_{(BR)CBO}$	Collector-Base Breakdown Voltage	OPI6000 OPI6100	300 200			V	I_C = 100 μA, I_F = 0
I_{CEO}	Collector Dark Current	OPI6000 OPI6100			100 100	nA nA	V_{CE} = 200 V, R_{BE} = 1.00 MΩ V_{CE} = 100 V, R_{BE} = 1.00 MΩ
Coupled							
I_C/I_F	DC Current Transfer Ratio	OPI6000 OPI6100	20 10.0			% %	I_F = 10.0 mA, V_{CE} = 5.0 V I_F = 10.0 mA, V_{CE} = 5.0 V
$V_{CE(SAT)}$	Collector-to-Emitter Saturation Voltage				0.40	V	I_F = 10.0 mA, I_C = 0.50 mA
V_{ISO}	Isolation Voltage		1500			VDC	See Note 1
R_{IO}	Input-to-Output Resistance		10^{11}			Ω	V_{IO} = 500 V, See Note 1
C_{IO}	Input-to-Output Capacitance			2.0		pF	f = 1.00 MHz, See Note 1
t_{on} t_{off}	Turn On Time Turn Off Time			4.0 2.5		μs μs	V_{CC} = 10.0 V, R_L = 100Ω I_F = 2.0 mA, See Test Circuit

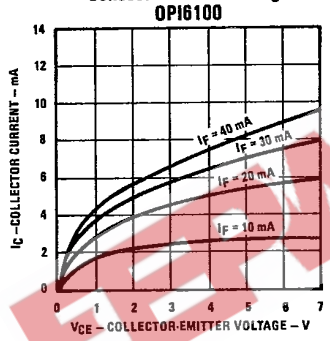
E

Typical Performance Curves

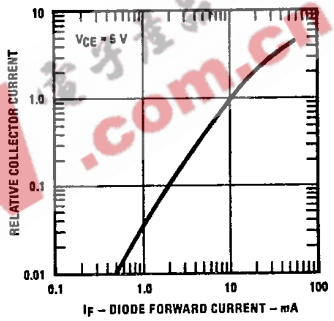
Collector Current vs Collector-Emitter Voltage OPI6000



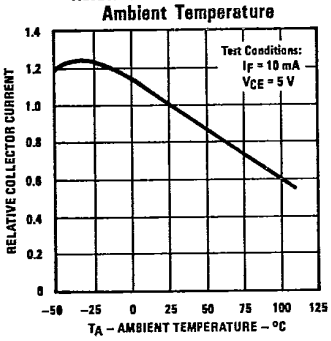
Collector Current vs Collector-Emitter Voltage OPI6100



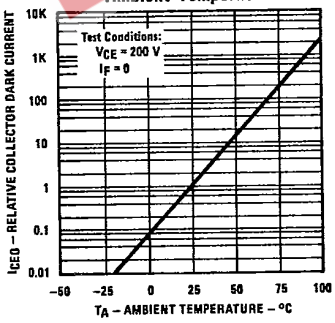
Relative Collector Current vs Diode Forward Current



Relative Collector Current vs Ambient Temperature

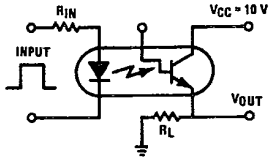


Relative Collector Dark Current vs Ambient Temperature



Switching Time Test Circuit

Switching Time vs Load Resistance



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.

Plastic color may vary.

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