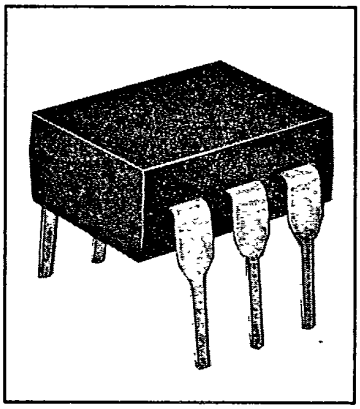
Optoelectronics Division
TRW Electronic Components Group

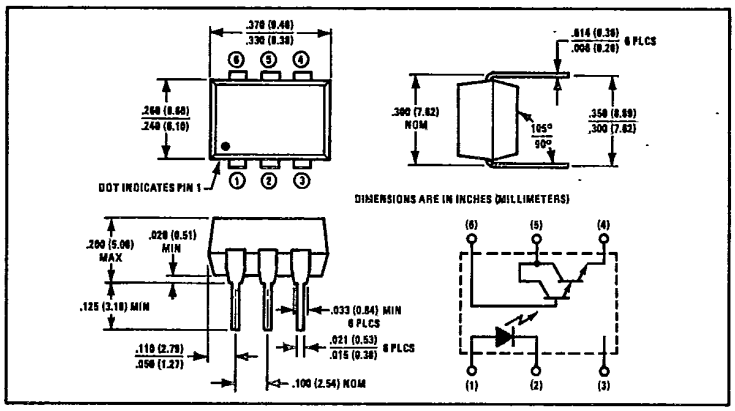
Product Bulletin 5224
January 1985

1987 Cost Saver Product!
Call TRW for more information!

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°C unless otherwise noted)

Input-to-Output Isolation Voltage — OPI3152	±1500 VDC[1]
OPI3252	±2500 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, 330 pps)	3.0 A
Reverse DC Voltage	3.0 V
Power Dissipation	100 mW[3]
Output Transistor	
Collector-Emitter Voltage	55 V
Collector-Base Voltage	55 V
Emitter-Collector Voltage	5.0 V
Power Dissipation	150 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 2.0 mW/°C above 25°C.

Types OPI3152, OPI3252

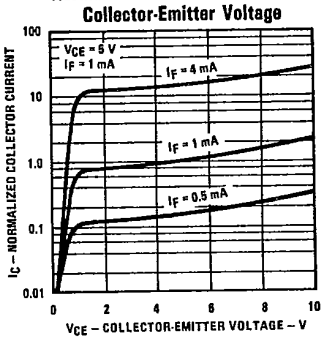
Electrical Characteristics (T_A = 25°C unless otherwise noted)

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			100	μA	V_R = 3.0 V
Output Photodarlington						
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage	55			V	I_C = 100 μA, I_B = 0
$V_{(BR)CBO}$	Collector-Base Breakdown Voltage	55			V	I_C = 100 μA, I_E = 0
$V_{(BR)ECO}$	Emitter-Collector Breakdown Voltage	5.0			V	I_E = 100 μA, I_B = 0
I_{CEO}	Collector-Emitter Dark Current			100	nA	V_{CE} = 10.0 V, I_B = 0
Coupled						
I_C/I_F	DC Current Transfer Ratio	300			%	I_F = 10.0 mA, V_{CE} = 5.0 V
$V_{CE(SAT)}$	Collector-Emitter Saturation Voltage			1.20	V	I_F = 50 mA, I_C = 50 mA, I_B = 0
t_r	Output Rise Time		3.0		μs	V_{CC} = 10.0 V, I_C = 10.0 mA, R_L = 100Ω
t_f	Output Fall Time		26		μs	See Test Circuit

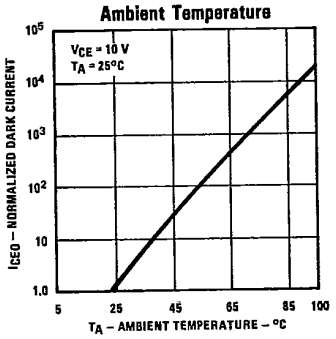
E

Typical Performance Curves

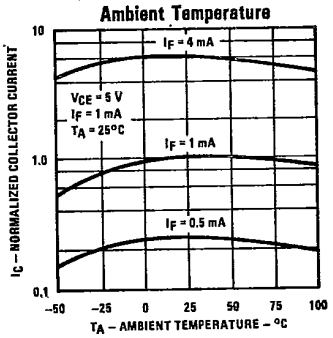
Normalized Collector Current vs. Collector-Emitter Voltage



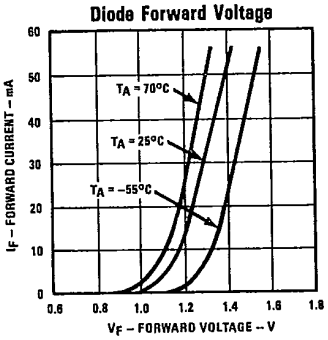
Normalized Dark Current vs. Ambient Temperature



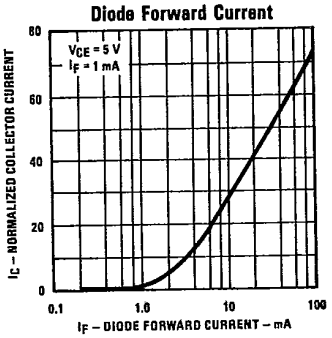
Normalized Collector Current vs. Ambient Temperature



Diode Forward Current vs. Diode Forward Voltage

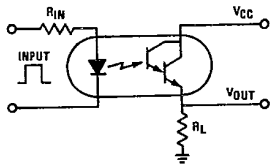


Normalized Collector Current vs. Diode Forward Current



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.

Optoelectronics Division, TRW Electronic Components Group, 1215 W. Crosby Rd., Carrollton, TX 75006 (214) 323-2200, TLX 6716032 or 215649