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Optoelectronics Division
TRW Electronic Components Group

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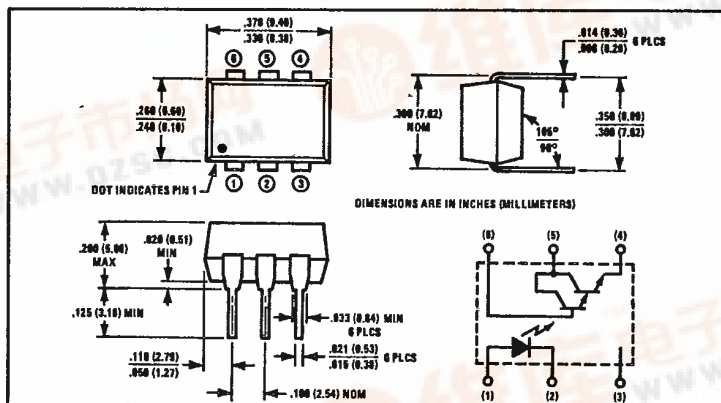
TRW

Product Bulletin 5226
January 1985

T-41-85

Optically Coupled Isolators

Types OPI3153, OPI3253



Features

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

Description

The OPI3153 and OPI3253 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 OPI3153 and OPI3253 are identical.

Absolute Maximum Ratings (T_A = 25°C unless otherwise noted)

Input-to-Output Isolation Voltage — OPI3153 ±1500 VDC⁽¹⁾
OPI3253 ±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⁾ 280°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 25 V

Collector-Base Voltage 30 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.



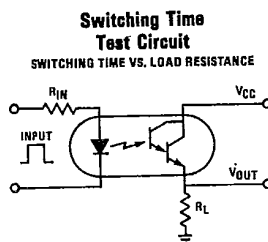
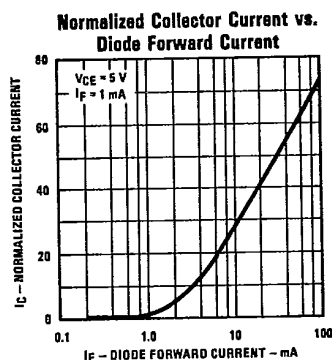
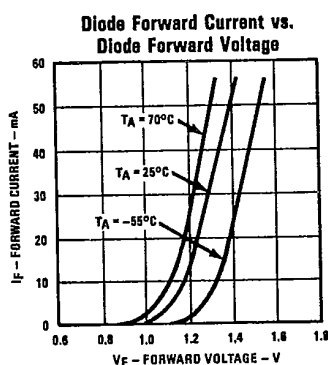
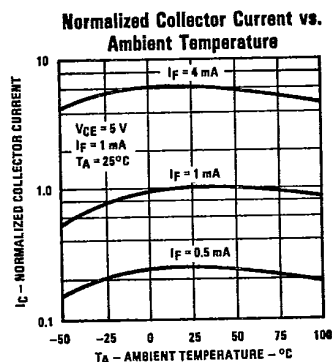
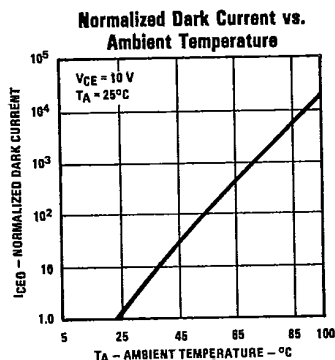
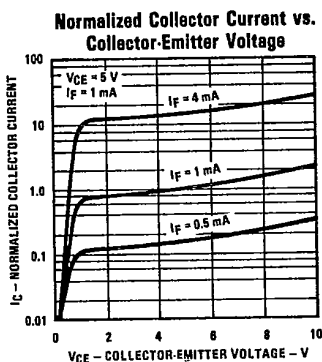
Types OPI3153, OPI3253

T-41-85

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 Photosensor						
V _{(BR)CEO}	Collector-Emitter Breakdown Voltage	25			V	I _C = 1.00 mA
V _{(BR)CBO}	Collector-Base Breakdown Voltage	30			V	I _C = 100 μA
V _{(BR)ECO}	Emitter-Collector Breakdown Voltage	5.0			V	I _E = 100 μA
I _{CEO}	Collector-Emitter Dark Current			100	nA	V _{CE} = 10.0 V
Coupled						
I _C /I _F	DC Current Transfer Ratio	500			%	I _F = 1.00 mA, V _{CE} = 5.0 V
V _{CE(SAT)}	Collector-Emitter Saturation Voltage			1.26	V	I _F = 1.00 mA, I _C = 1.00 mA
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		25		μs	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.