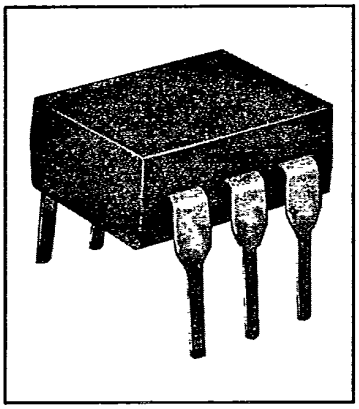
Optoelectronics Division
TRW Electronic Components Group

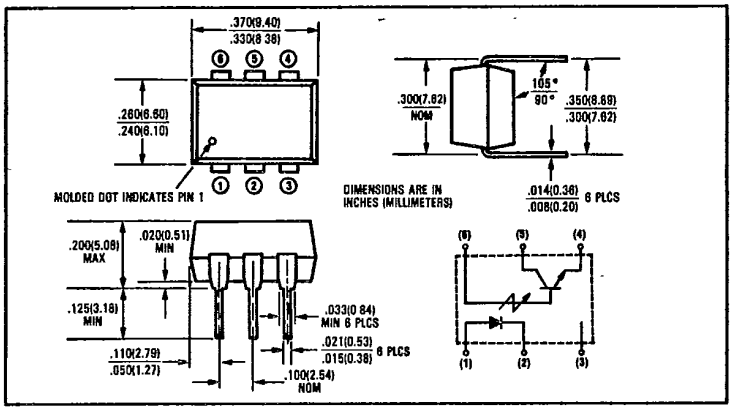
Product Bulletin 5206
January 1985

1987 Cost Saver Product!
Call TRW for more information!

T-41-83

Optically Coupled Isolators
Types OPI2153, OPI2253





Features
- 1500 or 2500 volt isolation
- High current transfer ratio
- Low cost 6 pin dual-in-line package
- UL recognized File No. E58730

Description
The OPI2153 and OPI2253 each consist of a gallium arsenide infrared light emitting diode coupled to an NPN silicon phototransistor mounted in a six pin dual-in-line package. The OPI2153 and OPI2253 are identical except for input-to-output isolation voltage.

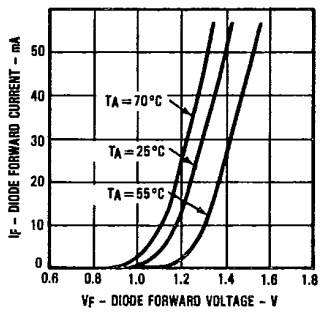
Absolute Maximum Ratings (T_A=25°C unless otherwise noted)

Input-to-Output Isolation Voltage OPI2153	±1500 VDC[1]
OPI2253	±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, 300 pps)	3.0 A
Reverse Voltage	3.0 V
Power Dissipation (25°C)	100 mW[3]
Output Transistor	
Power Dissipation	150 mW[4]
$B_{(BR)CEO}$	30 V
$V_{(BR)CBO}$	50 V
$V_{(BR)ECO}$	5.0 V

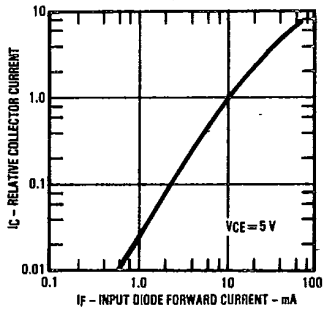
Notes: (1) Measured with input diode leads shorted together and output leads shorted together. (2) RMA flux is recommended. Duration can be extended to 10 sec. max. when flow soldering. (3) Derate linearly 1.33 mW/°C above 25°C. (4) Derate linearly 2.0 mW/°C above 25°C.

Typical Performance Curves

Diode Forward Current vs Diode Forward Voltage



Relative Collector Current vs Diode Forward Current



Types OPI2153, OPI2253

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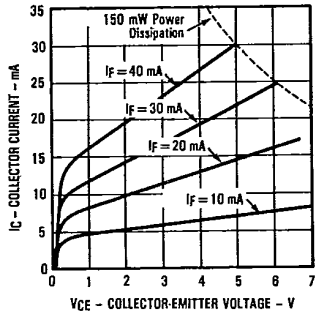
Electrical Characteristics (T_A = 25°C unless otherwise noted)

Symbol	Parameter	Min.	Typ.	Max.	Units	Test Conditions
Input Diode						
V_F	Forward Voltage			1.40	V	I_F = 16.0 mA
$V_{(BR)R}$	Reverse Breakdown Voltage	3.0			V	I_R = 10.0 μA
I_R	Reverse Leakage Current			10.0	μA	V_R = 3.0 V
Output Phototransistor						
$V_{(BR)CEO}$	Collector-to-Emitter Breakdown Voltage	30			V	I_C = 1.00 mA
$V_{(BR)ECO}$	Emitter-to-Collector Breakdown Voltage	5.0			V	I_E = 100 μA
$V_{(BR)CBO}$	Collector-to-Base Breakdown Voltage	50			V	I_C = 100 μA
I_{CEO}	Collector-Emitter Dark Current		5.0	50	nA	V_{CE} = 10.0 V
I_{CBO}	Collector-Base Dark Current			20	nA	V_{CB} = 10.0 V
C_{CE}	Capacitance Collector-to-Emitter		8.0		pF	V_{CE} = 0
h_{FE}	DC Current Gain		360			V_{CE} = 5.0 V, I_C = 100 μA
Coupled						
I_C/I_F	DC Current Transfer Ratio	50	80		%	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 = 2.0 mA
V_{ISO}	Isolation Voltage OPI2153 OPI2253	1500 2500			VDC 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_r t_f	Output Rise Time Output Fall Time		2.0 2.0		μs μs	V_{CC} = 10.0 V, I_C = 2.0 mA R_L = 100Ω, See Test Circuit 1

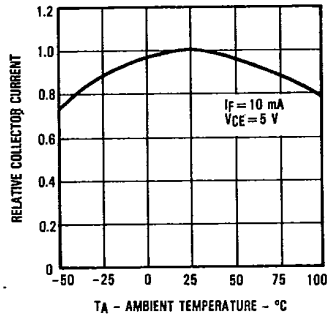
E

Typical Performance Curves

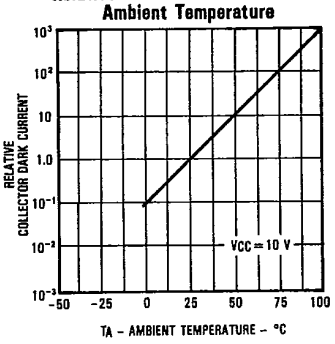
Collector Current vs Collector-Emitter Voltage



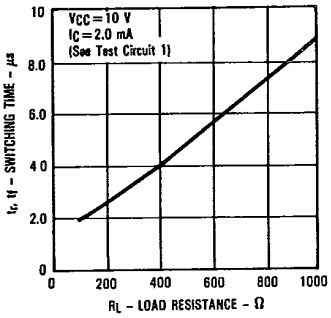
Relative Collector Current vs Ambient Temperature



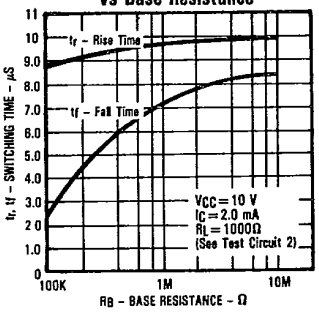
Relative Collector Dark Current vs Ambient Temperature



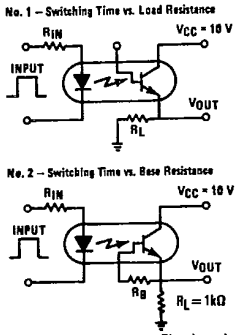
Rise and Fall Time vs Load Resistance



Delay, Rise, and Fall Time vs Base Resistance



Switching Time Test Circuits



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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