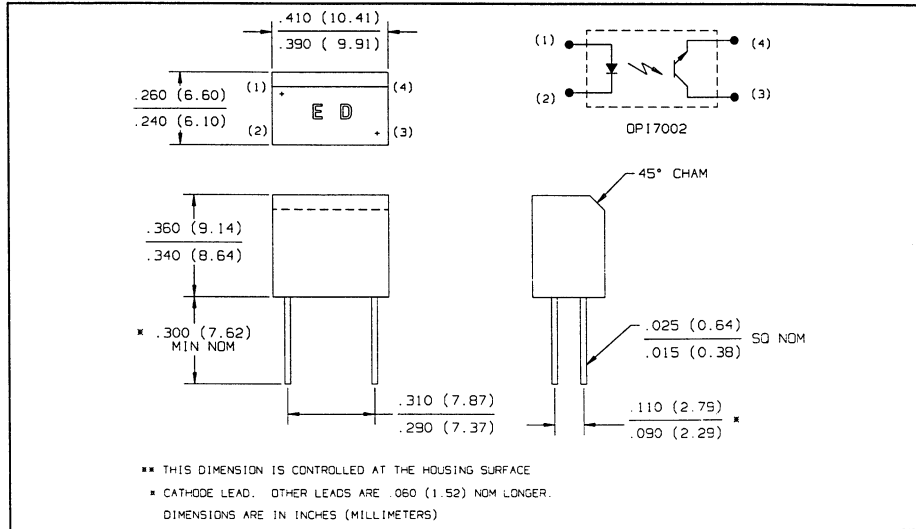
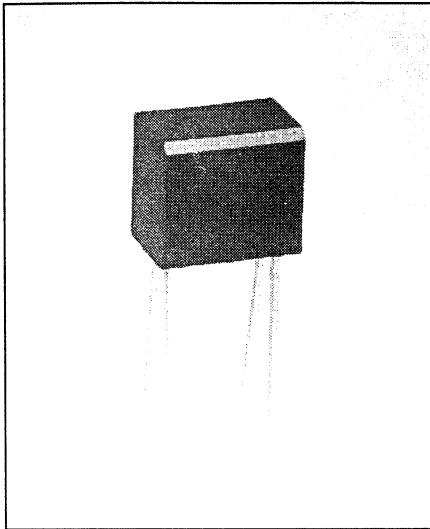


# Optically Coupled Isolators

## Types OPI7002, OPI7010



### Features

- 6kV electrical isolation
- Low cost plastic housing
- UL recognized File No. E58730<sup>(4)</sup>
- Phototransistor output

### Description

The OPI7002 and OPI7010 each consist of an infrared emitting diode coupled to an NPN silicon phototransistor. The LED and sensor are encased in a black, low-cost plastic housing. Pin spacing is compatible with standard dual-in-line packages.

### Absolute Maximum Ratings (T<sub>A</sub> = 25° C unless otherwise noted)

Input-to-Output Isolation Voltage . . . . . ± 6 kVDC<sup>(1)(4)</sup>  
 Operating and Storage Temperature Range . . . . . -40° C to +85° C  
 Lead Soldering Temperature [1/16 inch (1.6 mm) from case for 5 sec. with soldering iron] . . . . . 260° C<sup>(2)</sup>

### Input Diode

Forward DC Current . . . . . 50 mA  
 Peak Forward Current (1 μs pulse width, 300 pps) . . . . . 3.0 A  
 Reverse Voltage . . . . . 2.0 V  
 Power Dissipation . . . . . 100 mW<sup>(3)</sup>

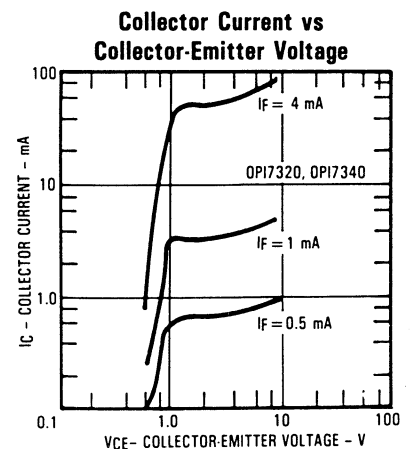
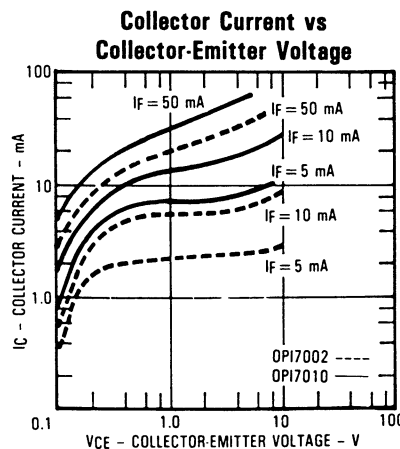
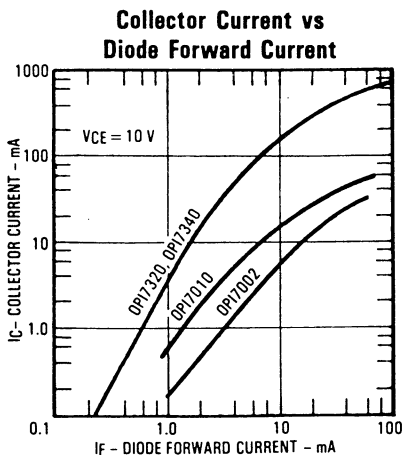
### Output Phototransistor

Collector-Emitter Voltage . . . . . 30 V  
 Emitter-Collector Voltage . . . . . 5.0 V  
 Power Dissipation . . . . . 100 mW<sup>(3)</sup>

### Notes:

- (1) Measured with input leads and output leads shorted.
- (2) RMA flux is recommended. Duration can be extended to 10 sec. max. when flow soldering.
- (3) Derate linearly 1.66 mW/° C above 25° C.
- (4) UL recognition is for 3500 VAC, 1 minute only.

### Typical Performance Curves



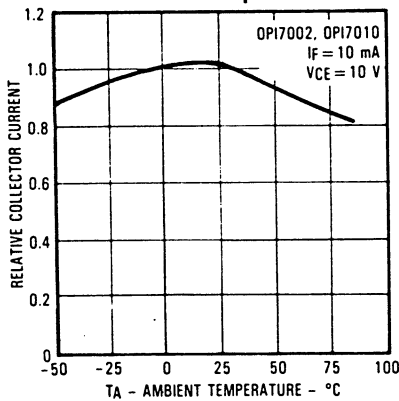
# Types OPI7002, OPI7010

Electrical Characteristics ( $T_A = 25^\circ\text{C}$  unless otherwise noted)

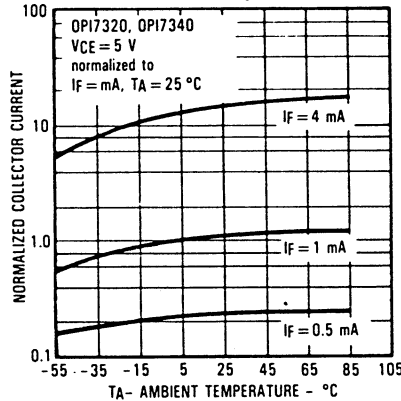
SYMBOL	PARAMETER	MIN	TYP	MAX	UNITS	TEST CONDITIONS
<b>Input Diode</b>						
$V_F$	Forward Voltage			1.70	V	$I_F = 10\text{ mA}$
$I_R$	Reverse Current			100	$\mu\text{A}$	$V_R = 2\text{ V}$
<b>Output Phtotransistor</b>						
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage	30.0			V	$I_C = 100\ \mu\text{A}, I_F = 0$
$V_{(BR)ECO}$	Emitter-Collector Breakdown Voltage	5.0			V	$I_E = 100\ \mu\text{A}, I_F = 0$
$I_{CEO}$	Collector Dark Current			100	nA	$V_{CE} = 10\text{ V}, I_F = 0$
<b>Coupled</b>						
$I_C/I_F$	DC Current Transfer Ratio	OPI7002 OPI7010	20 100		% %	$I_F = 10\text{ mA}, V_{CE} = 5\text{ V}$ $I_F = 10\text{ mA}, V_{CE} = 5\text{ V}$
$V_{CE}$	Collector-Emitter Saturation Voltage			0.40	V	$I_F = 10\text{ mA}, I_C = 0.50\text{ mA}$
$V_{ISO}$	Isolation Voltage		6		kVDC	(See Note 1)
$t_{ON}$	Turn-On Time			4.0	$\mu\text{s}$	$V_{CE} = 10\text{ V}, I_C = 10\text{ mA}, R_L = 100\ \Omega$
$t_{OFF}$	Turn-Off Time			3.0	$\mu\text{s}$	$V_{CE} = 10\text{ V}, I_C = 10\text{ mA}, R_L = 100\ \Omega$
$C_{IO}$	Capacitance Input-to-Output			0.20	pF	$V_{IO} = 0, f = 1\text{ MHz}^{(1)}$

## Typical Performance Curves

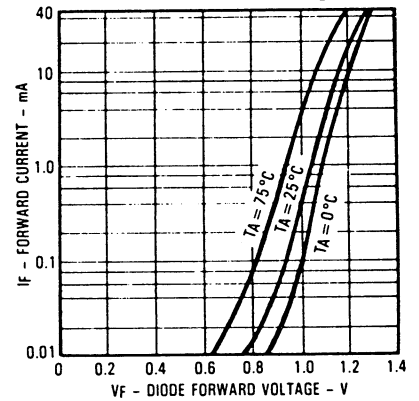
Relative Collector Current vs Ambient Temperature



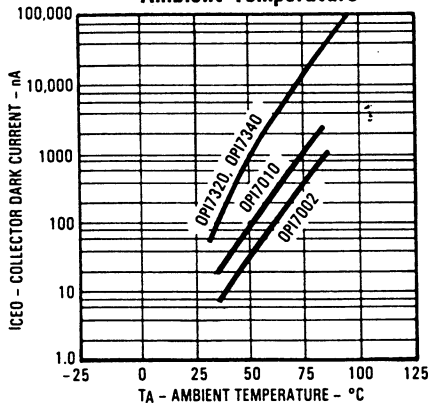
Normalized Collector Current vs Ambient Temperature



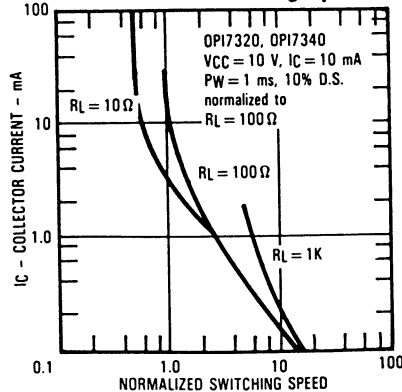
Diode Forward Current vs Diode Forward Voltage



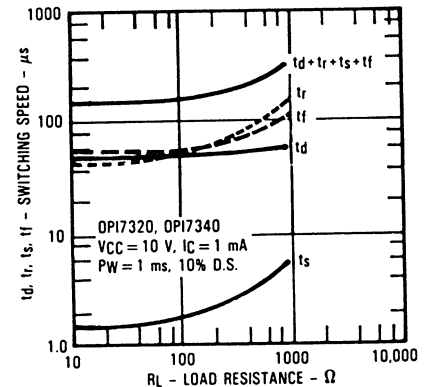
Collector Dark Current vs Ambient Temperature



Collector Current vs Normalized Switching Speed



Switching Speed vs Load Resistance



Optek reserves the right to make changes at any time in order to improve design and to supply the best product possible.  
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OPTICALLY  
COUPLED  
ISOLATORS