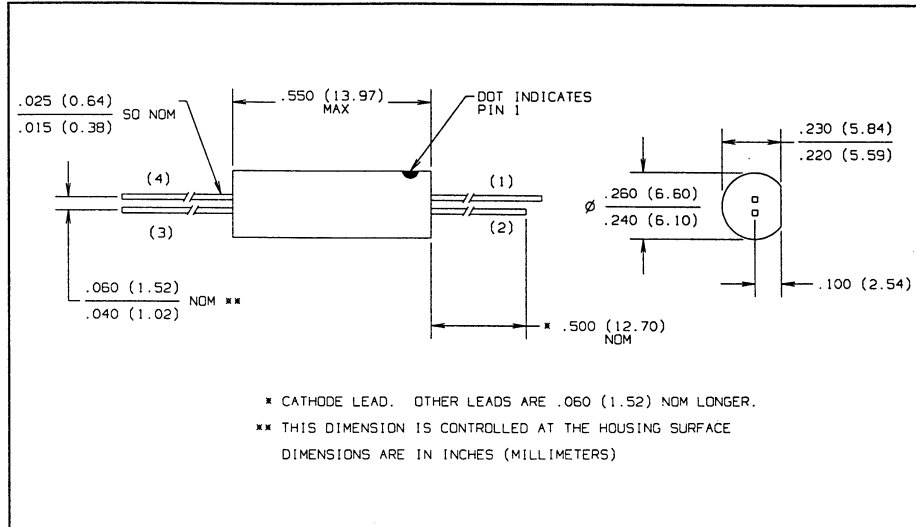
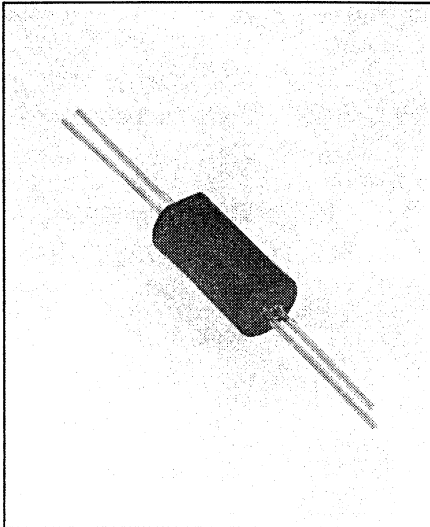


Optically Coupled Isolators

Types OPI110, OPI110A, OPI110B, OPI110C, OPI113



Features

- 10kV electrical isolation
- Phototransistor output
- Low cost plastic housing
- UL Recognized File Number E58730⁽⁶⁾

Description

The OPI110 and OPI113 series devices are optically coupled isolators, each containing an infrared emitting diode and an NPN silicon photosensor. The OPI110 uses a phototransistor and the OPI113 uses either a photodarlington or phototransistor sensor. The devices are sealed in a precast opaque housing. This series is designed for applications requiring high voltage isolation between input and output.

Replaces

K8900 series

Absolute Maximum Ratings ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Input-to-Output Isolation Voltage	$\pm 10\text{ kVDC}^{(1)(6)}$
Storage Temperature Range	-40°C to $+100^\circ\text{C}$
Operating Temperature Range	-40°C to $+85^\circ\text{C}$
Lead Soldering Temperature [1/16 inch (1.6 mm) from case for 5 sec. with soldering iron]	$260^\circ\text{C}^{(2)}$

Input Diode

Forward DC Current	40 mA ⁽³⁾
Reverse DC Voltage	2.0 V
Power Dissipation	50 mW ⁽⁴⁾

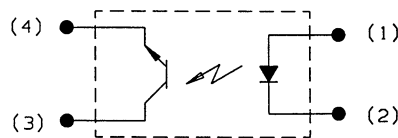
Output Photosensor

Collector-Emitter Voltage OPI110	30 V
OPI113	15 V
Emitter-Collector Voltage	5.0 V
Power Dissipation	100 mW ⁽⁵⁾

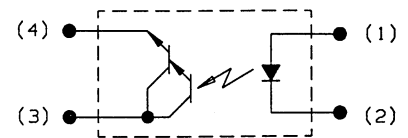
Notes:

- (1) Measured with input and output leads shorted. Typical input/output capacitance is 0.06 pF.
- (2) RMA flux is recommended. Duration can be extended to 10 sec. max. when flow soldering.
- (3) Derate linearly $0.67\text{ mA}/^\circ\text{C}$ above 25°C .
- (4) Derate linearly $0.83\text{ mW}/^\circ\text{C}$ above 25°C .
- (5) Derate linearly $1.67\text{ mW}/^\circ\text{C}$ above 25°C .
- (6) UL recognition is for 3500 VAC, 1 minute only.

Schematics



OPI110



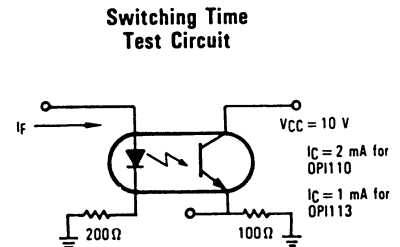
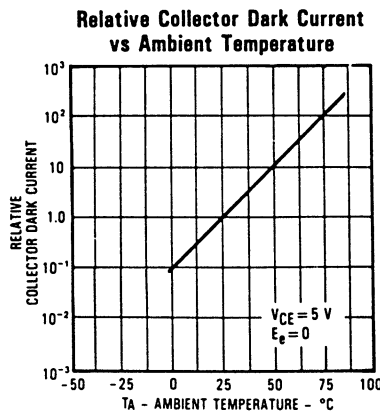
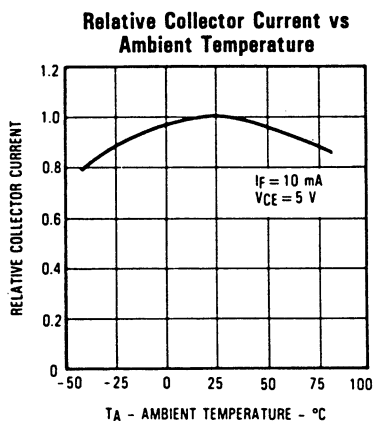
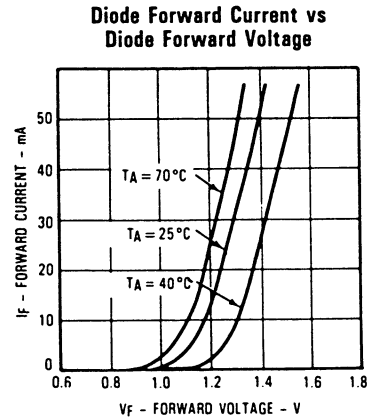
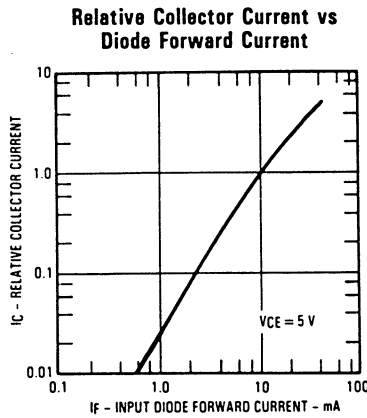
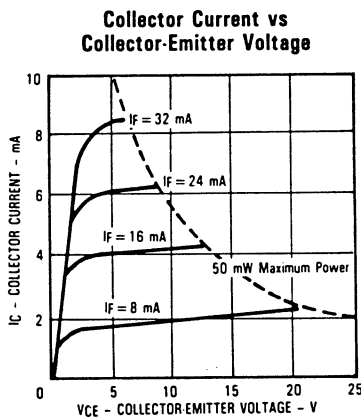
OPI113

Types OPI110, OPI110A, OPI110B, OPI110C, OPI113

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

SYMBOL	PARAMETER	MIN	TYP	MAX	UNITS	TEST CONDITIONS
Input Diode						
V_F	Forward Voltage			1.60	V	$I_F = 20\text{ mA}$
I_R	Reverse Current			100	μA	$V_R = 2.0\text{ V}$
Output Photosensor						
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage	OPI110 OPI113	30 15		V V	$I_C = 100\ \mu\text{A}$ $I_C = 100\ \mu\text{A}, I_F = 0$
$V_{(BR)ECO}$	Emitter-Collector Breakdown Voltage		5.0		V	$I_E = 100\ \mu\text{A}, I_F = 0$
I_{CEO}	Collector-Emitter Dark Current	OPI110 OPI113		100 100	nA nA	$V_{CE} = 15\text{ V}, E_e = 0$ $V_{CE} = 10\text{ V}, E_e = 0$
Coupled						
I_C/I_F	DC Current Transfer Ratio	OPI110 OPI110A OPI110B OPI110C OPI113	12.5 25 50 100 50	400	% % % % %	$I_F = 10.0\text{ mA}, V_{CE} = 5.0\text{ V}$ $I_F = 10.0\text{ mA}, V_{CE} = 5.0\text{ V}$ $I_F = 10.0\text{ mA}, V_{CE} = 5.0\text{ V}$ $I_F = 10.0\text{ mA}, V_{CE} = 5.0\text{ V}$ $I_F = 5.0\text{ mA}, V_{CE} = 2.0\text{ V}$
$V_{CE(SAT)}$	Collector Saturation Voltage	OPI110 OPI113		0.40 1.20	V V	$I_F = 10.0\text{ mA}, I_C = 1.6\text{ mA}$ $I_F = 10.0\text{ mA}, I_C = 5.0\text{ mA}$
I_{CEO}	Collector-Emitter Dark Current	OPI110 OPI113		200 100	nA nA	$V_{CE} = 20.0\text{ V}, I_F = 0$ $V_{CE} = 10.0\text{ V}, I_F = 0$
V_{ISO}	Isolation Voltage		10.0		kVDC	(See Note 1)

Typical Performance Curves (OPI110 Only)



t_r and t_f for OPI110 are typically 4 μs .
 t_r and t_f for OPI113 are typically 40 μs .
 The input waveform is supplied by a generator with the following characteristics: $Z_{OUT} = 50\ \Omega$, $t_r \leq 15\text{ ns}$, duty cycle $\cong 1\%$, pulse width = 100 μs .

OPTICALLY COUPLED ISOLATORS

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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