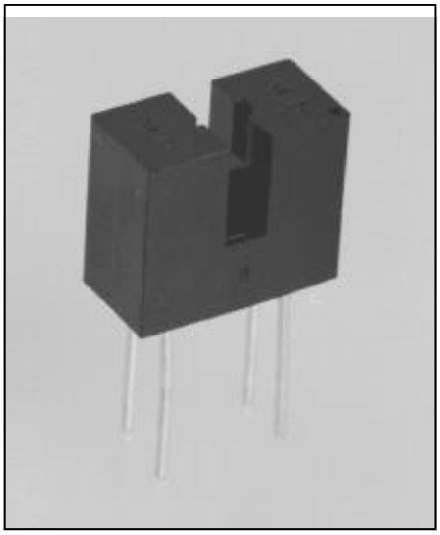
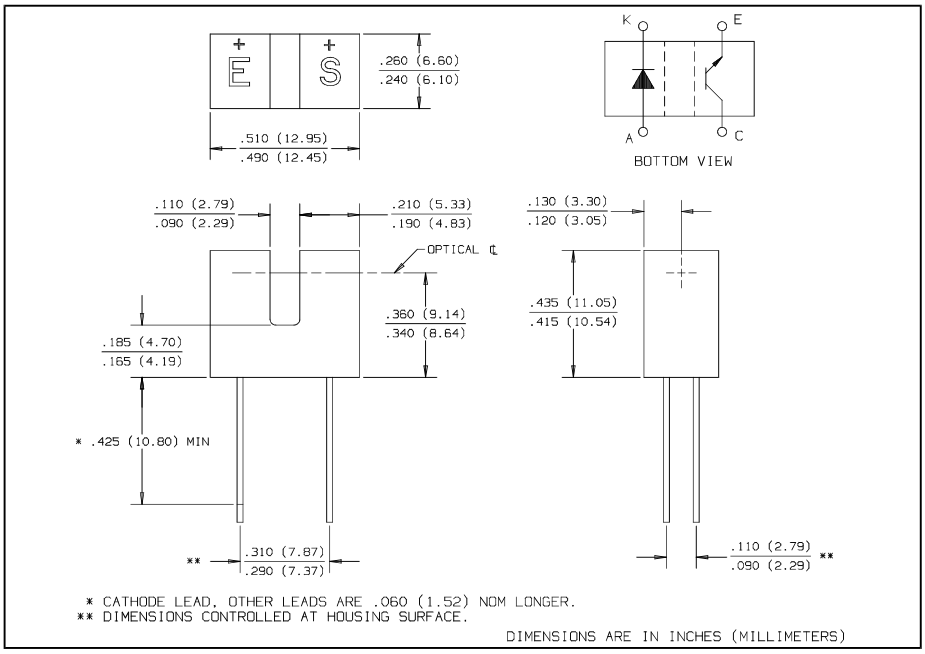
Hi-Rel Slotted Optical Switches
Types OPB847TX, OPB847TXV, OPB848TX, OPB848TXV





Features

- Non-contact switching
- Apertured for high resolution
- Hermetically sealed components
- Components processed to Optek's screening program patterned after MIL-PRF-19500 for TX and TXV devices

Description

The OPB847TX, OPB847TXV, OPB848TX, and OPB848TXV each consist of a gallium aluminum arsenide LED and a silicon phototransistor soldered into a printed circuit board then mounted in a high temperature plastic housing on opposite sides of a 0.100 inch (2.54 mm) wide slot. Phototransistor switching takes place whenever an opaque object passes through the slot. Both device types have a 0.025 inch (0.635 mm) by 0.06 (1.52 mm) aperture in front of the phototransistor for high resolution positioning sensing.

The OPB847TX, OPB847TXV, OPB848TX, and OPB848TXV use optoelectronic components that have been processed and tested as either TX or TXV components per MIL-PRF-19500. Typical screening and lot acceptance tests are provided on page 13-4.

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

Operating Temperature Range . . . . . -65° C to +125° C
Storage Temperature Range . . . . . -65° C to +150° C
Lead Soldering Temperature [1/16 inch (1.6 mm) from case 5 sec. with soldering iron] . . . . . 240° C

Input Diode

Forward DC Current . . . . . 50 mA
Reverse Voltage . . . . . 2.0 V
Power Dissipation . . . . . 100 mW(2)

Output Phototransistor

Collector-Emitter Voltage . . . . . 50 V
Emitter-Collector Voltage . . . . . 7.0 V
Power Dissipation . . . . . 100 mW(2)

Notes:
(1) Duration can be extended to 10 sec. max. when flow soldering.
(2) Derate linearly 1.00 mW/° C above 25° C.
(3) Methanol and isopropanol are recommended as cleaning agents.

Types OPB847TX, OPB847TXV, OPB848TX, OPB848TXV

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

Symbol	Parameter		Min	Typ	Max	Units	Test Conditions
Input Diode							
V_F	Forward Voltage(4)		1.00	1.35	1.70	V	I_F = 20.0 mA
			1.20	1.55	1.90	V	I_F = 20.0 mA, T_A = -55° C
			0.80	1.20	1.60	V	I_F = 20.0 mA, T_A = 100° C
I_R	Reverse Current			0.1	100	µA	V_R = 2.0 V
Output Phototransistor							
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage		50	110		V	I_C = 1.0 mA, I_F = 0
$V_{(BR)ECO}$	Emitter-Collector Breakdown Voltage		7.0	10.0		V	I_E = 100 µA, I_F = 0
$I_{C(off)}$	Collector-Emitter Dark Current			0.2	100	nA	V_{CE} = 10.0 V, I_F = 0
				10	100	µA	V_{CE} = 10.0 V, I_F = 0, T_A = 100° C
Coupled							
$I_{C(on)}$	On-State Collector Current(4)	OPB847	4.0			mA	V_{CE} = 10.0 V, I_F = 20.0 mA
		OPB847	2.5			mA	V_{CE} = 10.0 V, I_F = 20.0 mA, T_A = -55° C
		OPB847	2.5			mA	V_{CE} = 10.0 V, I_F = 20.0 mA, T_A = 100° C
		OPB848	1.0			mA	V_{CE} = 10.0 V, I_F = 20.0 mA
		OPB848	0.6			mA	V_{CE} = 10.0 V, I_F = 20.0 mA, T_A = -55° C
		OPB848	0.6			mA	V_{CE} = 10.0 V, I_F = 20.0 mA, T_A = 100° C
$V_{CE(SAT)}$	Collector-Emitter Saturation Voltage	OPB847		0.20	0.30	V	I_C = 2.0 mA, I_F = 20.0 mA
		OPB848		0.20	0.30	V	I_C = 500 µA, I_F = 20.0 mA
t_r	Output Rise Time	OPB847		12.0	20.0	µs	V_{CC} = 10.0 V, I_F = 20.0 mA, R_L = 1,000 Ω
		OPB848		8.0	15.0	µs	
t_f	Output Fall Time	OPB847		12.0	20.0	µs	
		OPB848		8.0	15.0	µs	

(4) Measurement is taken during the last 500 µs of a single 1.0 ms test pulse. Heating due to increased pulse rate or pulse width can cause change in measurement results.

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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