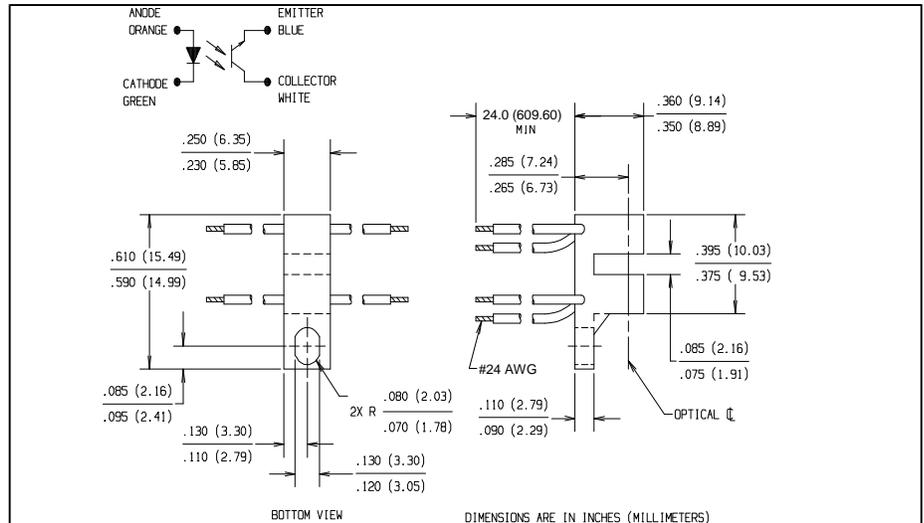
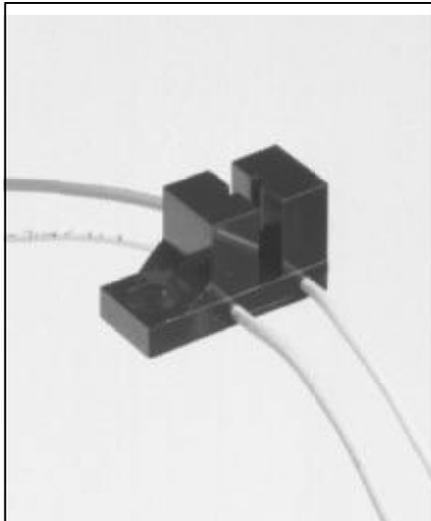


Hi-Rel Slotted Optical Switches

Types OPB821TX, OPB821TXV



Features

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

Description

The OPB821TX or OPB821TXV consists 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 an 0.080 inch (2.03 mm) wide slot. Lead wires are #24 AWG polytetrafluoroethylene (PTFE) insulated conforming to MIL-W-16878.

Phototransistor switching takes place whenever an opaque object passes through the slot. For maximum output signal, neither the LED or the phototransistor in the OPB821TX or the OPB821TXV is apertured.

The OPB821TX and OPB821TXV 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 ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Operating Temperature Range -65°C to $+125^\circ\text{C}$
 Storage Temperature Range -65°C to $+150^\circ\text{C}$

Input Diode

Forward DC Current 50 mA
 Reverse Voltage 2.0 V

Power Dissipation 100 mW⁽¹⁾

Output Phototransistor

Collector-Emitter Voltage 50 V

Emitter-Collector Voltage 7.0 V

Power Dissipation 100 mW⁽¹⁾

Notes:

(1) Derate Linearly 1.00 mW/ $^\circ\text{C}$ above 25°C .

(2) Methanol or isopropanol are recommended cleaning agents.

Types OPB821TX, OPB821TXV

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 ⁽³⁾	1.00	1.35	1.70	V	$I_F = 20.0\text{ mA}$
		1.20	1.55	1.90	V	$I_F = 20.0\text{ mA}, T_A = -55^\circ\text{C}$
		0.80	1.20	1.60	V	$I_F = 20.0\text{ mA}, T_A = 100^\circ\text{C}$
I_R	Reverse Current		0.1	100	μA	$V_R = 2.0\text{ V}$
Output Phototransistor						
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage	50	110		V	$I_C = 1.0\text{ mA}, I_F = 0$
$V_{(BR)ECO}$	Emitter-Collector Breakdown Voltage	7.0	10.0		V	$I_E = 100\ \mu\text{A}, I_F = 0$
$I_{C(off)}$	Collector-Emitter Dark Current		0.2	100	nA	$V_{CE} = 10.0\text{ V}, I_F = 0$
			10	100	μA	$V_{CE} = 10.0\text{ V}, I_F = 0, T_A = 100^\circ\text{C}$
Coupled						
$I_{C(on)}$	On-State Collector Current ⁽³⁾	800			μA	$V_{CE} = 10.0\text{ V}, I_F = 20.0\text{ mA}$
		500			μA	$V_{CE} = 10.0\text{ V}, I_F = 20.0\text{ mA}, T_A = -55^\circ\text{C}$
		500			μA	$V_{CE} = 10.0\text{ V}, I_F = 20.0\text{ mA}, T_A = 100^\circ\text{C}$
$V_{CE(SAT)}$	Collector-Emitter Saturation Voltage		0.20	0.30	V	$I_C = 250\ \mu\text{A}, I_F = 20.0\text{ mA}$
t_r	Output Rise Time		12.0	20.0	μs	$V_{CC} = 10.0\text{ V}, I_F = 20.0\text{ mA}, R_L = 1,000\ \Omega$
t_f	Output Fall Time		12.0	20.0	μs	

(3) 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.

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