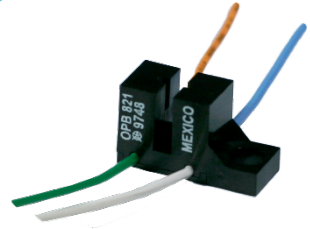


High Resolution Slotted Optical Switch

OPB821TX



Features:

- Non-contact switching
- Low profile to facilitate stacking
- Hermetically sealed components
- 24" (609.60 mm) minimum length wire conforms to MIL-W-16878
- TX components processed to MIL-PRF-19500

Description:

Each **OPB821TX** device consists of a hermetically sealed gallium aluminum arsenide LED and a silicon phototransistor, which are soldered into a printed circuit board and mounted in a high temperature plastic housing on opposite sides of an 0.080" (2.03 mm) wide slot. Lead wires are #24 AWG polytetrafluoroethylene (PTFE) insulated, which conforms to MIL-W-16878.

Phototransistor switching takes place when an opaque object passes through the slot. For maximum output signal, neither the LED nor the phototransistor is apertured.

TX device components are processed to OPTEK's military screening program patterned after MIL-PRF-19500.

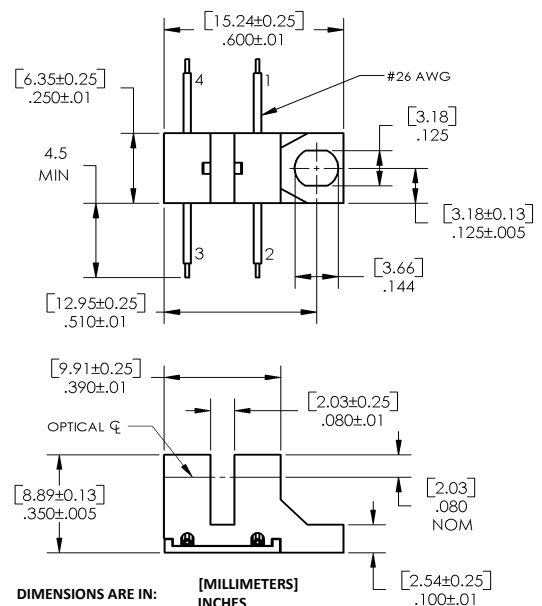
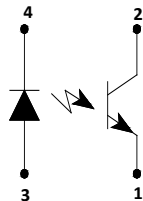
Please refer to Application Bulletins 248 and 213 for additional design information and reliability (degradation) data.

Custom electrical, wire and cabling and connectors are available. Contact your local representative or OPTEK for more information.

Part Number	LED Peak Wavelength	Sensor	Slot Width / Depth	I _{C(ON)} (mA) Min	I _F (mA) Typ / Max	V _{CE} (V) Max	Aperture Emitter/Sensor	Lead Length / Spacing
OPB821TX	890 nm	Transistor	0.080" / 0.255"	0.80	20 / 50	30	0.040" / .040"	24" / #26 AWG wire

Applications:

- Non-contact object sensing
- Assembly line automation
- Machine automation
- Equipment safety
- Machine safety



RoHS

Color/Pin #	Description	Color/Pin #	Description
Green-3	Cathode	White-2	Collector
Orange-4	Anode	Blue-1	Emitter

General Note

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Electrical Specifications

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

Storage Temperature	-65° C to +150° C
Operating Temperature	-65° C to +125° C
Lead Soldering Temperature (1/16 inch [1.6 mm] from case for 5 seconds with soldering iron) ⁽²⁾	260° C
Input Diode	
Continuous Forward Current	50 mA
Reverse Voltage	2 V
Power Dissipation ⁽¹⁾	100 mW
Output Phototransistor	
Collector-Emitter Voltage	50 V
Emitter-Collector Voltage	7 V
Power Dissipation ⁽¹⁾	100 mW

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

SYMBOL	PARAMETER	MIN	TYP	MAX	UNITS	TEST CONDITIONS
Input Diode						
$V_F^{(3)}$	Forward Voltage	1.00	1.35	1.70	V	$I_F = 20\text{ mA}$
		1.20	1.55	1.90		$I_F = 20\text{ mA}, T_A = -55^\circ\text{ C}$
		0.80	1.20	1.60		$I_F = 20\text{ mA}, T_A = 100^\circ\text{ C}$
I_R	Reverse Current	-	0.10	100	μA	$V_R = 2\text{ V}$
Output Phototransistor						
$V_{(\text{BR})\text{CEO}}$	Collector-Emitter Breakdown Voltage	50	110	-	V	$I_C = 1\text{ mA}, I_F = 0$
$V_{(\text{BR})\text{ECO}}$	Emitter-Collector Breakdown Voltage	7	10	-	V	$I_E = 100\text{ }\mu\text{A}, I_F = 0$
$I_{\text{C}(\text{OFF})}$	Collector-Emitter Dark Current	-	0.20	100	nA	$V_{\text{CE}} = 10\text{ V}, I_F = 0$
		-	10	100	μA	$V_{\text{CE}} = 10\text{ V}, I_F = 0, T_A = 100^\circ\text{ C}$
Coupled						
$I_{\text{C}(\text{ON})}^{(3)}$	On-State Collector Current	800	-	-	μA	$V_{\text{CE}} = 10\text{ V}, I_F = 20\text{ mA}$
		500	-	-		$V_{\text{CE}} = 10\text{ V}, I_F = 20\text{ mA}, T_A = -55^\circ\text{ C}$
		500	-	-		$V_{\text{CE}} = 10\text{ V}, I_F = 20\text{ mA}, T_A = 100^\circ\text{ C}$
$V_{\text{CE}(\text{SAT})}$	Collector-Emitter Saturation Voltage	-	0.20	0.30	V	$I_C = 250\text{ }\mu\text{A}, I_F = 20\text{ mA}$
t_r	Output Rise Time	-	12	20	μs	$V_{\text{CC}} = 10\text{ V}, I_F = 20\text{ mA}, R_L = 1000\text{ }\Omega$
t_f	Output Fall Time	-	12	20		

Notes:

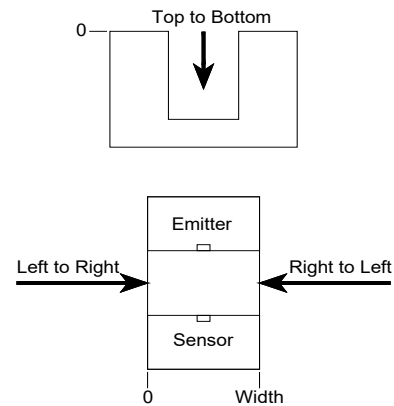
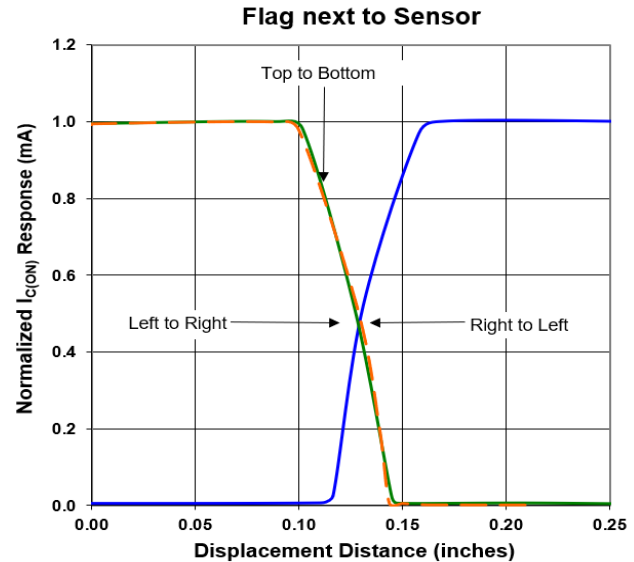
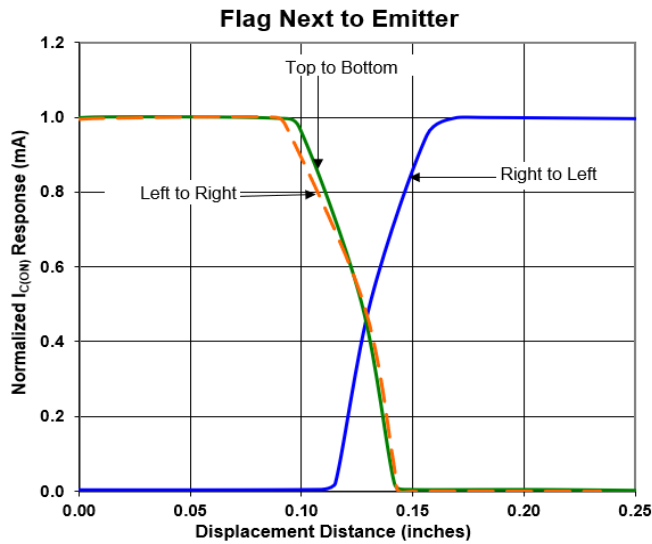
- (1) Derate linearly 0.80 mW/° C above 25° C.
- (2) Methanol or isopropanol are recommended cleaning agents.
- (3) Measurement is taken during the last 500 μs of a single 1.0 ms test pulse. Heating due to increased pulse rate or pulse width can cause change in measurement results.

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Typical Performance



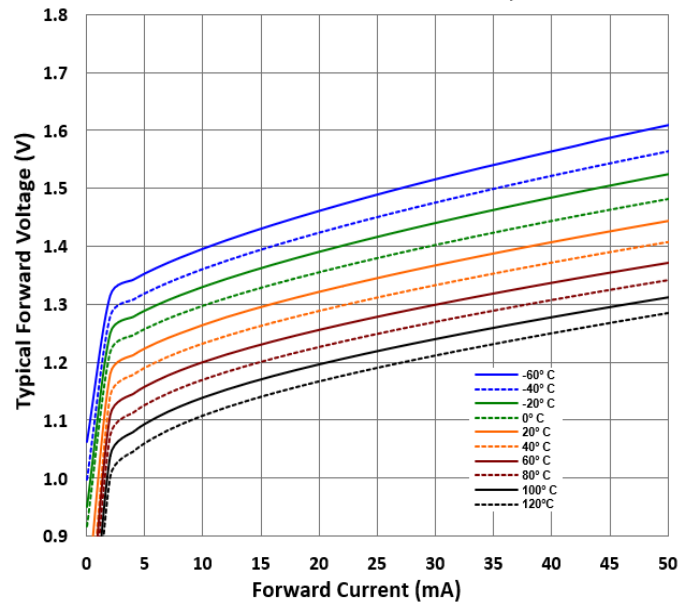
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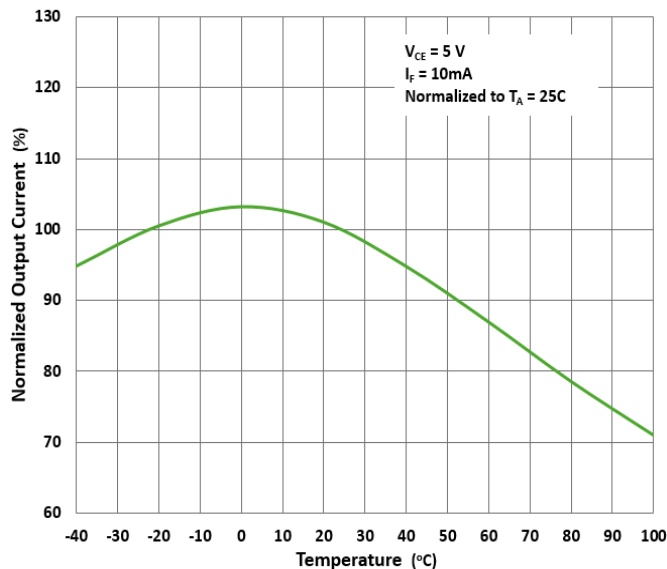
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Typical Performance

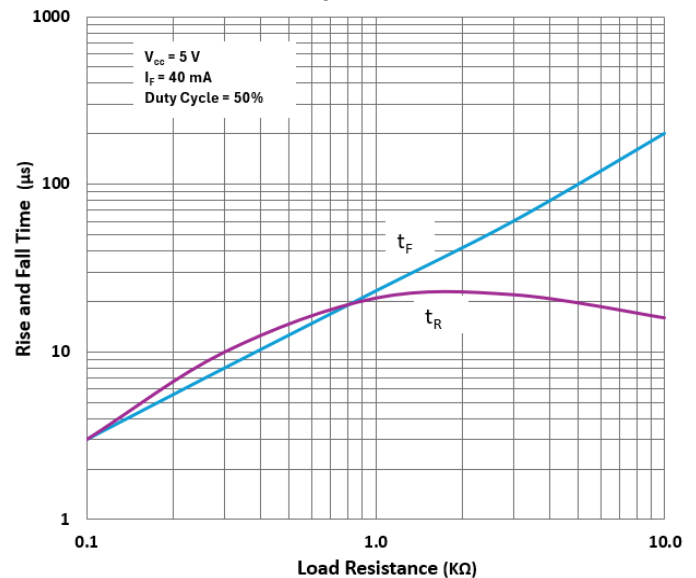
890nm LED Forward Voltage vs I_F vs Temp



Output Current vs Temperature



Transistor Output - Rise and Fall Time



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