High Reliability Reflective Object Sensor

OPB700TX, OPB700TXV

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 and TXV components processed to MIL-PRF-19500

Description:

Each **OPB700TX** and **OPB700TXV** sensor consists of a gallium aluminum arsenide LED and a silicon phototransistor mounted side-by-side on converging optical axes in a high-temperature black plastic housing. The phototransistor responds to the radiation from the LED only when a reflective object passes within its field of view. Lead wires are #26 AWG polytetrafluoroethylene (PTEF) insulated, which conforms to MIL-W-16878.

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

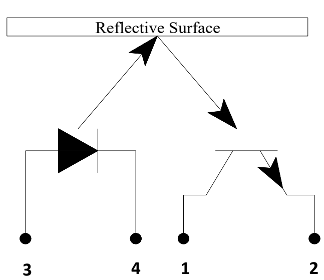
Please refer to Application Bulletins 208 and 210 for additional design information and reliability (degradation) data.

Contact your local representative or OPTEK for more information.

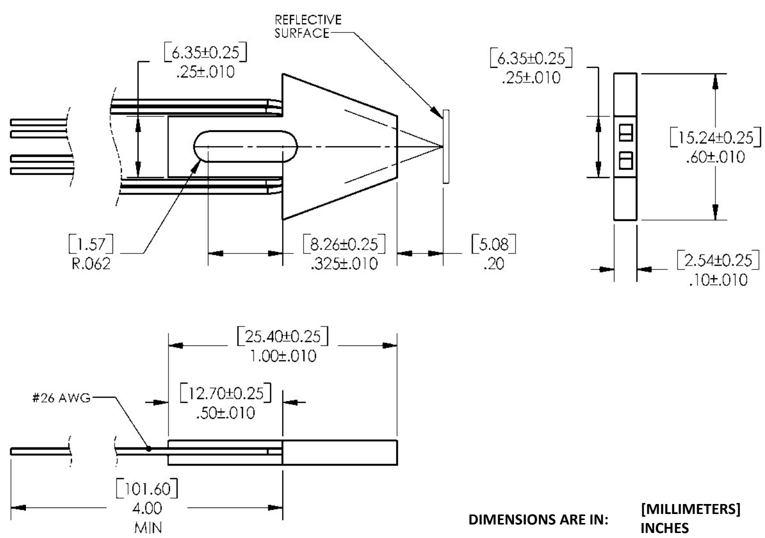
Applications:

- Non-contact reflective object sensor
- Assembly line automation
- Machine automation
- Machine safety
- End of travel sensor
- Door sensor

Part Number	LED Peak Wavelength	Sensor	Reflection Distance Inch (mm)	$I_{C(ON)}$ (mA) Min	I_F (mA) Typ / Max	V_{CE} (Volts) Max	Lead Length / Spacing
OPB700TX	890 nm	Transistor	0.200" (5.08 mm)	0.03	40 / 50	50	24" 26 AWG Wire
OPB700TXV							



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



General Note
TT Electronics reserves the right to make changes in product specification without notice or liability. All information is subject to TT Electronics’ own data and is considered accurate at time of going to print.

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Electrical Specifications

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

Storage Temperature Range	-65° C to + 150° C
Operating Temperature Range	-65° C to + 125° C
Lead Soldering Temperature	260° C

Input Diode

Forward DC 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°C unless otherwise noted)

SYMBOL	PARAMETER	MIN	TYP	MAX	UNITS	TEST CONDITIONS
Input Diode						
V_F	Forward Voltage(6)	1.1	1.6	1.8	V	I_F = 50 mA
		1.3	1.8	2.0		I_F = 50 mA, T_A = -55° C
		0.9	1.4	1.7		I_F = 50 mA, T_A = 100° C
I_R	Reverse Current	-	0.1	100	µA	V_R = 2 V
Output Phototransistor						
$V_{(BR)CEO}$	Collector-Emitter Breakdown Voltage	50	110	-	V	I_C = 1 mA, I_F = 0
$V_{(BR)ECO}$	Emitter-Collector Breakdown Voltage	7	10	-	V	I_E = 100 µA, I_F = 0
$I_{C(OFF)}$	Collector-Emitter Dark Current	-	-	100	nA	V_{CE} = 10 V, I_F = 0
		-	10	100	µA	V_{CE} = 10 V, I_F = 0, T_A = 100° C

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Electrical Specifications

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

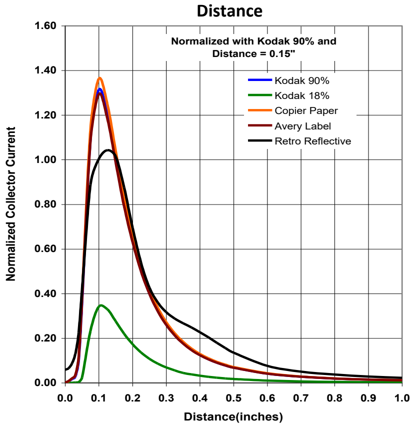
Output Phototransistor

SYMBOL	PARAMETER	MIN	TYP	MAX	UNITS	TEST CONDITIONS
$I_{C(ON)}$	On-State Collector Current d = 0.20" (5.08 mm)[(2)(3)(6)]	50	200	-	µA	V_{CE} = 5 V, I_F = 40 mA
		25	-	-		V_{CE} = 5 V, I_F = 40 mA, T_A = -55° C
		25	-	-		V_{CE} = 5 V, I_F = 40 mA, T_A = 100° C
I_{CX}	Crosstalk (No reflective surface)[(3)]	-	2	-	µA	V_{CE} = 5 V, I_F = 40 mA
$V_{CE(SAT)}$	Collector-Emitter Saturation Voltage d = 0.20" (5.08 mm)[(2)(3)]	-	-	0.4	V	I_C = 10 µA, I_F = 40 mA
t_r	Output Rise Time	-	12	20	µs	V_{CC} = 10 V, I_F = 20 mA, R_L = 1,000 Ω
t_f	Output Fall Time	-	12	20		

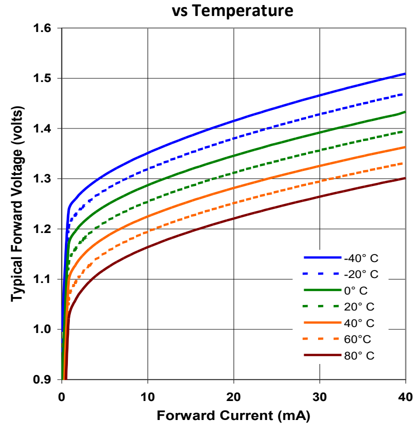
Notes:

(1) Derate linearly 1.00 mW/°C above 25 ° C.
(2) Measured using Eastman Kodak neutral white test card with 90% diffuse reflectance as a reflective surface.
(3) Crosstalk (I_{CX}) is the collector current measured with the indicated current in the input diode and no reflective surface.
(4) The distance from the assembly head to the reflective surface is "d".
(5) Methanol or isopropyl alcohol is recommended as a cleaning agent.
(6) Measurement is taken during the last 500 µs of a single 1.0 ms test phase. Heating due to increment pulse rate or pulse width can cause change in measurement results.

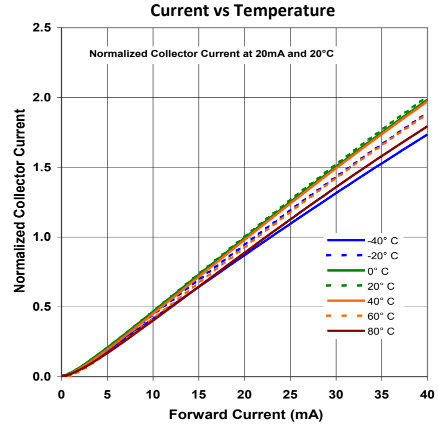
Normalized Collector Current vs Distance



Forward Voltage vs Forward Current vs Temperature



Normalized Collector Current vs Forward Current vs Temperature



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