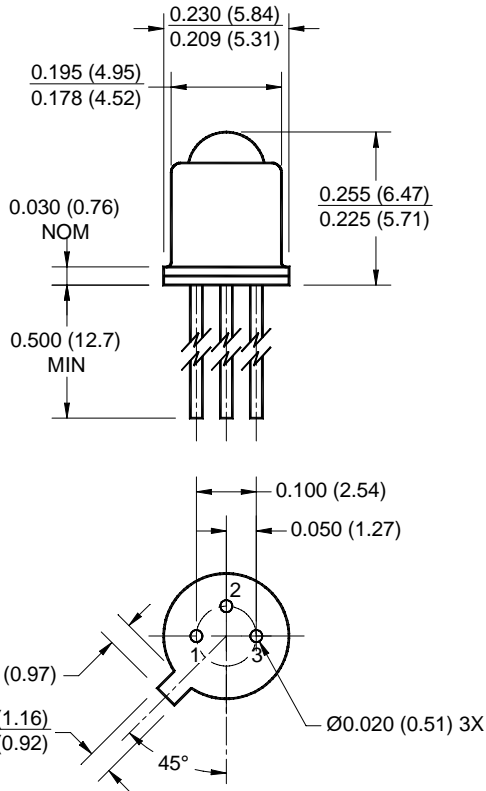
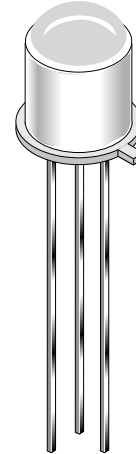


**PACKAGE DIMENSIONS**

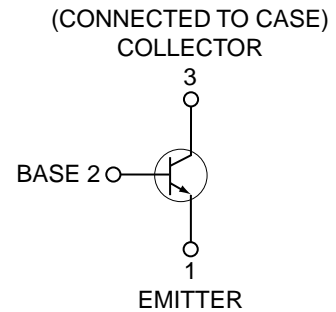


**NOTES:**

1. Dimensions for all drawings are in inches (mm).
2. Tolerance of  $\pm .010$  (.25) on all non-nominal dimensions unless otherwise specified.



**SCHEMATIC**



**DESCRIPTION**

The L14P1/L14P2 are silicon phototransistors mounted in a narrow angle, TO-18 package.

**FEATURES**

- Hermetically sealed package
- Narrow reception angle
- Devices can be used as a photodiode by wiring the collector and base leads.

<b>ABSOLUTE MAXIMUM RATINGS</b> ( $T_A = 25^\circ\text{C}$ unless otherwise specified)			
Parameter	Symbol	Rating	Unit
Operating Temperature	$T_{OPR}$	-65 to +125	$^\circ\text{C}$
Storage Temperature	$T_{STG}$	-65 to +150	$^\circ\text{C}$
Soldering Temperature (Iron) <sup>(3,4,5 and 6)</sup>	$T_{SOL-I}$	240 for 5 sec	$^\circ\text{C}$
Soldering Temperature (Flow) <sup>(3,4 and 6)</sup>	$T_{SOL-F}$	260 for 10 sec	$^\circ\text{C}$
Collector to Emitter Breakdown Voltage	$V_{CEO}$	30	V
Collector to Base Breakdown Voltage	$V_{CBO}$	40	V
Emitter to Base Breakdown Voltage	$V_{EBO}$	5	V
Power Dissipation ( $T_A = 25^\circ\text{C}$ ) <sup>(1)</sup>	$P_D$	300	mW
Power Dissipation ( $T_C = 25^\circ\text{C}$ ) <sup>(2)</sup>	$P_D$	600	mW

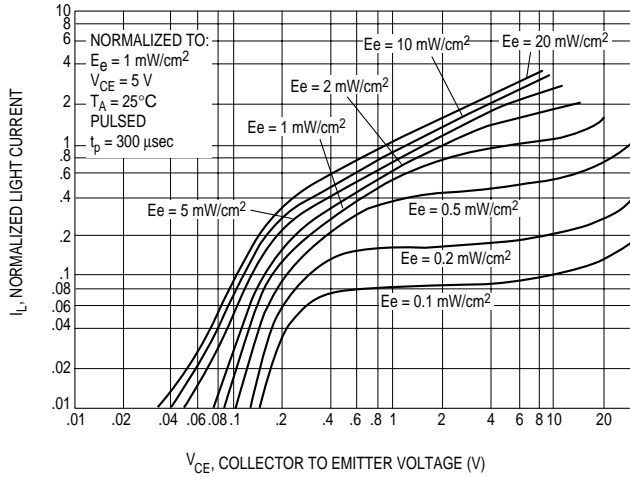
**NOTE:**

1. Derate power dissipation linearly 3.00 mW/ $^\circ\text{C}$  above 25 $^\circ\text{C}$  ambient.
2. Derate power dissipation linearly 6.00 mW/ $^\circ\text{C}$  above 25 $^\circ\text{C}$  case.
3. RMA flux is recommended.
4. Methanol or isopropyl alcohols are recommended as cleaning agents.
5. Soldering iron tip 1/16" (1.6mm) minimum from housing.
6. As long as leads are not under any stress or spring tension.
7. Light source is a GaAs LED emitting light at a peak wavelength of 940 nm.
8. Figure 1 and figure 2 use light source of tungsten lamp at 2870°K color temperature. A GaAs source of 3.0 mW/cm<sup>2</sup> is approximately equivalent to a tungsten source, at 2870°K, of 10 mW/cm<sup>2</sup>.

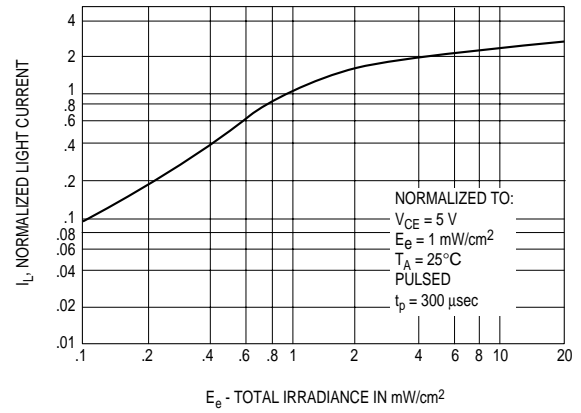
<b>ELECTRICAL / OPTICAL CHARACTERISTICS</b> ( $T_A = 25^\circ\text{C}$ ) (All measurements made under pulse conditions)						
PARAMETER	TEST CONDITIONS	SYMBOL	MIN	TYP	MAX	UNITS
Collector-Emitter Breakdown	$I_C = 10\text{ mA}, E_e = 0$	$BV_{CEO}$	30		—	V
Emitter-Base Breakdown	$I_E = 100\ \mu\text{A}, E_e = 0$	$BV_{EBO}$	5.0		—	V
Collector-Base Breakdown	$I_C = 100\ \mu\text{A}, E_e = 0$	$BV_{CBO}$	40		—	V
Collector-Emitter Leakage	$V_{CE} = 12\text{ V}, E_e = 0$	$I_{CEO}$	—		100	nA
Reception Angle at 1/2 Sensitivity		$\theta$		$\pm 8$		Degrees
On-State Collector Current L14P1	$E_e = 0.5\text{ mW/cm}^2, V_{CE} = 5\text{ V}^{(7,8)}$	$I_{C(ON)}$	6.5		—	mA
On-State Collector Current L14P2	$E_e = 0.5\text{ mW/cm}^2, V_{CE} = 5\text{ V}^{(7,8)}$	$I_{C(ON)}$	13.0			mA
On-State Photodiode Current	$E_e = 0.3\text{ mW/cm}^2, V_{CB} = 5\text{ V}$	$I_{CB(ON)}$		6.0		$\mu\text{A}$
Rise Time	$I_C = 10\text{ mA}, V_{CC} = 5\text{ V}, R_L = 100\ \Omega$	$t_r$		10		$\mu\text{s}$
Fall Time	$I_C = 10\text{ mA}, V_{CC} = 5\text{ V}, R_L = 100\ \Omega$	$t_f$		12		$\mu\text{s}$
Saturation Voltage L14P1	$I_C = 0.8\text{ mA}, E_e = 0.6\text{ mW/cm}^2^{(7,8)}$	$V_{CE(SAT)}$	—		0.40	V
Saturation Voltage L14P2	$I_C = 1.6\text{ mA}, E_e = 0.6\text{ mW/cm}^2^{(7,8)}$	$V_{CE(SAT)}$	—		0.40	V

**L14P1 L14P2**

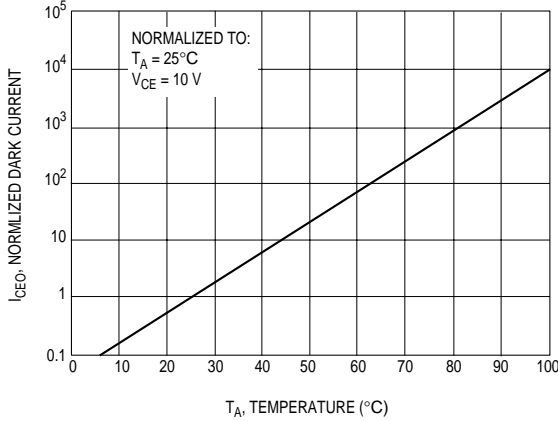
**Figure 1. Light Current vs. Collector to Emitter Voltage**



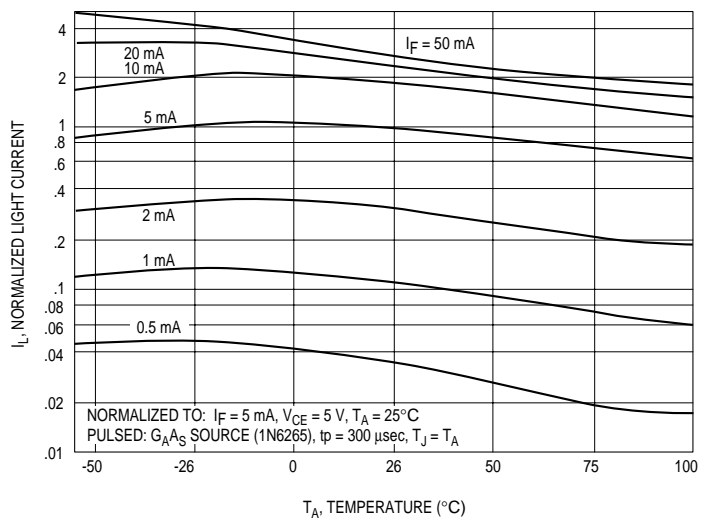
**Figure 2. Light Current vs. Total Irradiance**



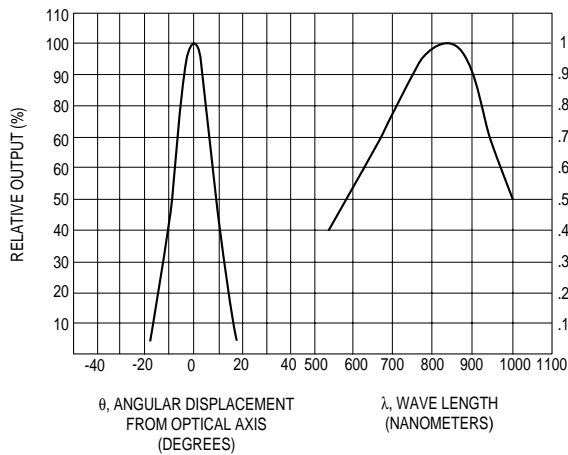
**Figure 3. Dark Current vs. Temperature**



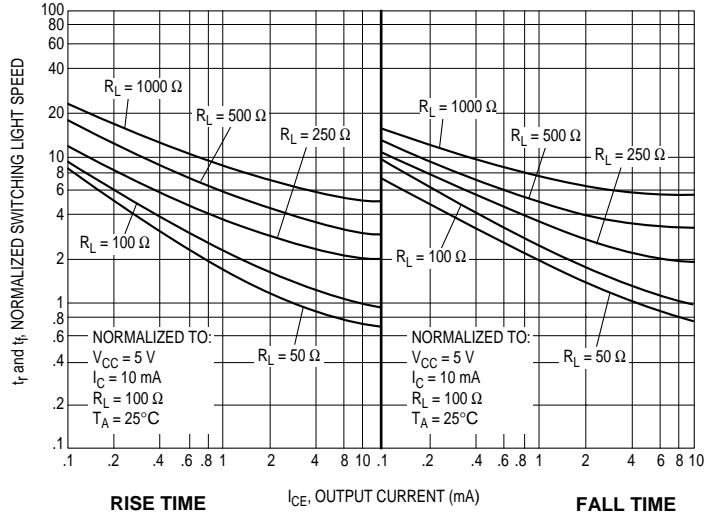
**Figure 4. Light Current vs. Temperature**



**Figure 5. Angular and Spectral Response**



**Figure 6. Switching Speed vs. Bias**



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