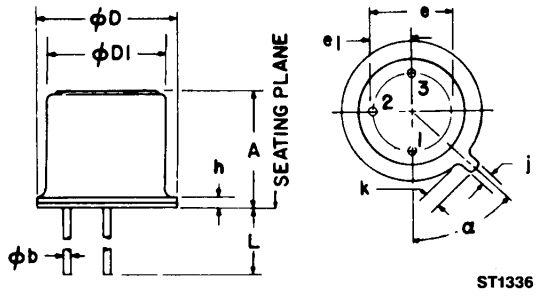
OPTOELECTRONICS

HERMETIC SILICON PHOTOTRANSISTOR

L14N1/2

PACKAGE DIMENSIONS



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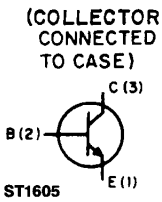
SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN.	MAX.	MIN.	MAX.	
A	—	210	—	5.34	
Ⓜb	.016	.021	.406	.534	
ⓂD	.209	.230	5.30	5.85	
ⓂD$_1$	.178	.195	4.52	4.96	
e	.100 NOM		2.54 NOM		2
e$_1$	0.50 NOM		1.27 NOM		2
h	—	.030	—	.76	
j	.036	.046	.91	1.17	
k	.028	.048	.71	1.22	1
L	.500	—	12.7	—	
α	45°	45°	45°	45°	3

PACKAGE OUTLINE



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NOTES:
1. MEASURED FROM MAXIMUM DIAMETER OF DEVICE.
2. LEADS HAVING MAXIMUM DIAMETER .021″ (.533mm) MEASURED IN GAUGING PLANE .054″ + .001″ – .000 (137 + .025 – .000mm) BELOW THE REFERENCE PLANE OF THE DEVICE SHALL BE WITHIN .007″ (.778mm) THEIR TRUE POSITION RELATIVE TO MAXIMUM WIDTH TAB.
3. FROM CENTERLINE TAB.

DESCRIPTION

The L14N series is a silicon phototransister mounted in a wide angle, TO-18 package.

FEATURES

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

QT OPTOELECTRONICS

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ABSOLUTE MAXIMUM RATINGS (T_A = 25°C Unless Otherwise Specified)

Storage Temperature ..... −65°C to +150°C
Operating Temperature ..... −65°C to +125°C
Soldering:
Lead Temperature (Iron) ..... 240°C for 5 sec.[3,4,5,6]
Lead Temperature (Flow) ..... 260°C for 10 sec.[3,4,6]
Collector-Emitter Breakdown Voltage ..... 30 Volts
Collector-Base Breakdown Voltage ..... 40 Volts
Emitter-Base Breakdown Voltage ..... 5 Volts
Power Dissipation (T_A = 25°C) ..... 300 mW[1]
Power Dissipation (T_C = 25°C) ..... 600 mW[2]

ELECTRICAL CHARACTERISTICS (T_A = 25°C Unless Otherwise Specified)
(All measurements made under pulse conditions.)

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNITS	TEST CONDITIONS
Collector-Emitter Breakdown	BV_{CEO}	30		—	V	I_C = 10 mA, Ee = 0
Emitter-Base Breakdown	BV_{EBO}	5		—	V	I_E = 100 μA, Ee = 0
Collector-Base Breakdown	BV_{CBO}	40		—	V	I_C = 100 μA, Ee = 0
Collector-Emitter Leakage	I_{CEO}	—		100	nA	V_{CE} = 10 V, Ee = 0
Collector-Base Leakage	I_{CBO}	—		25	nA	V_{CB} = 25 V, Ee = 0
Reception Angle at ½ Sensitivity	θ		±40		Degrees	
On-State Collector Current L14N1	$I_{C(ON)}$	3.0		—	mA	Ee = 1.5 mW/cm², V_{CE} = 5 V[7,8]
On-State Collector Current L14N2	$I_{C(ON)}$	6.0			mA	Ee = 1.5 mW/cm², V_{CE} = 5 V[7,8]
On-State Photodiode Current	$I_{CB(ON)}$		5.0		μA	Ee = 1.5 mW/cm², V_{CB} = 5 V
Rise Time	t_r		14		μS	I_C = 10 mA, V_{CC} = 5 V, R_L = 100Ω
Fall Time	t_f		16		μS	I_C = 10 mA, V_{CC} = 5 V, R_L = 100Ω
Saturation Voltage L14N1	$V_{CE(SAT)}$	—		0.40	V	I_C = 0.8 mA, Ee = 3.0 mW/cm²[2,7,8]
Saturation Voltage L14N2	$V_{CE(SAT)}$	—		0.40	V	I_C = 1.6 mA, Ee = 3.0 mW/cm²[2,7,8]

NOTES

1. *Derate power dissipation linearly 3.00mW/°C above 25°C ambient.*
2. *Derate power dissipation linearly 6.00mW/°C above 25°C case.*
3. *RMA flux is recommended.*
4. *Methanol or Isopropyl alcohols are recommended as cleaning agents.*
5. *Soldering iron tip 1/16" (1.6 mm) 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/cm² is approximately equivalent to a tungsten source, at 2870°K, of 10 mW/cm².*

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TYPICAL CHARACTERISTICS

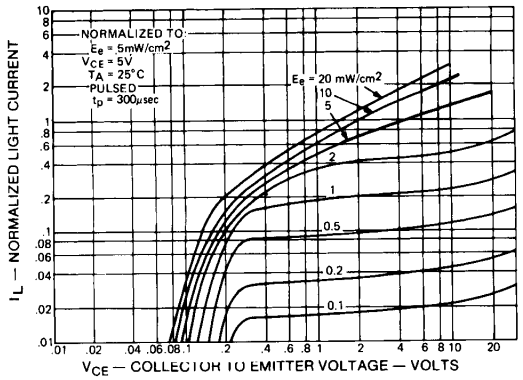

Fig. 1. Light Current vs. Collector to Emitter Voltage ST1092

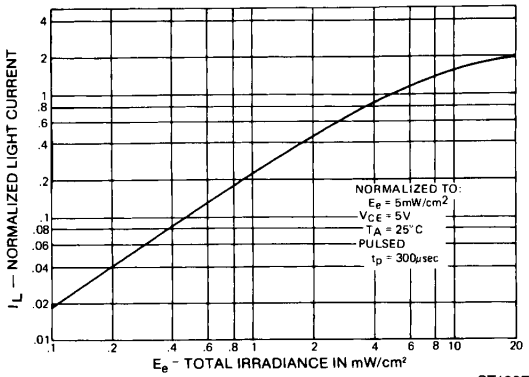

Fig. 2. Light Current vs. Radiation ST1097

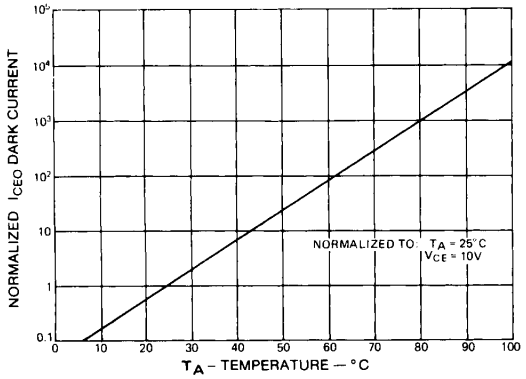

Fig. 3. Dark Current vs. Temperature ST1093

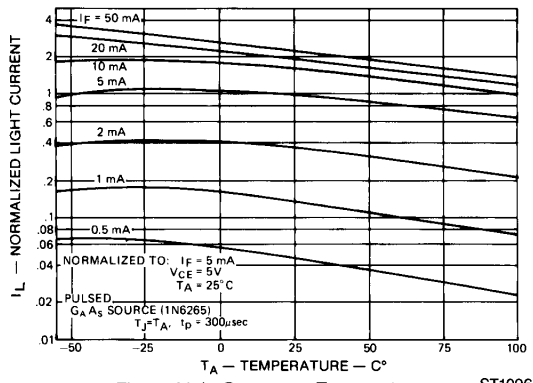

Fig. 4. Light Current vs. Temperature ST1096

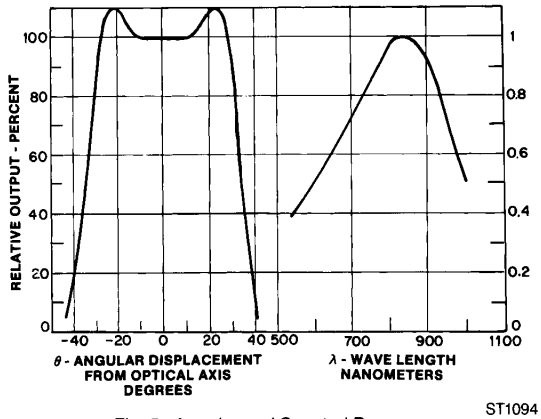

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Fig. 5. Angular and Spectral Response

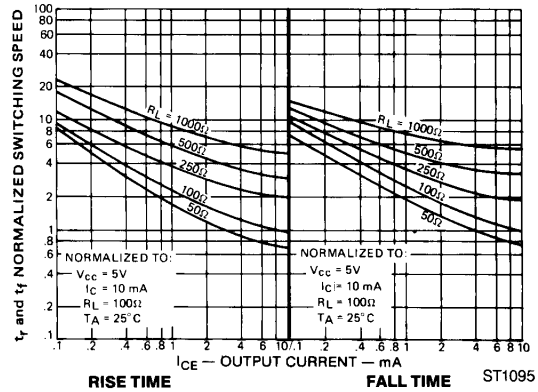

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Fig. 6. Switching Speed vs. Bias