

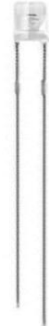
## Features

Fast response time

High photo sensitivity

Pb free

The product itself will remain within RoHS compliant version.



## Application

Infrared applied system

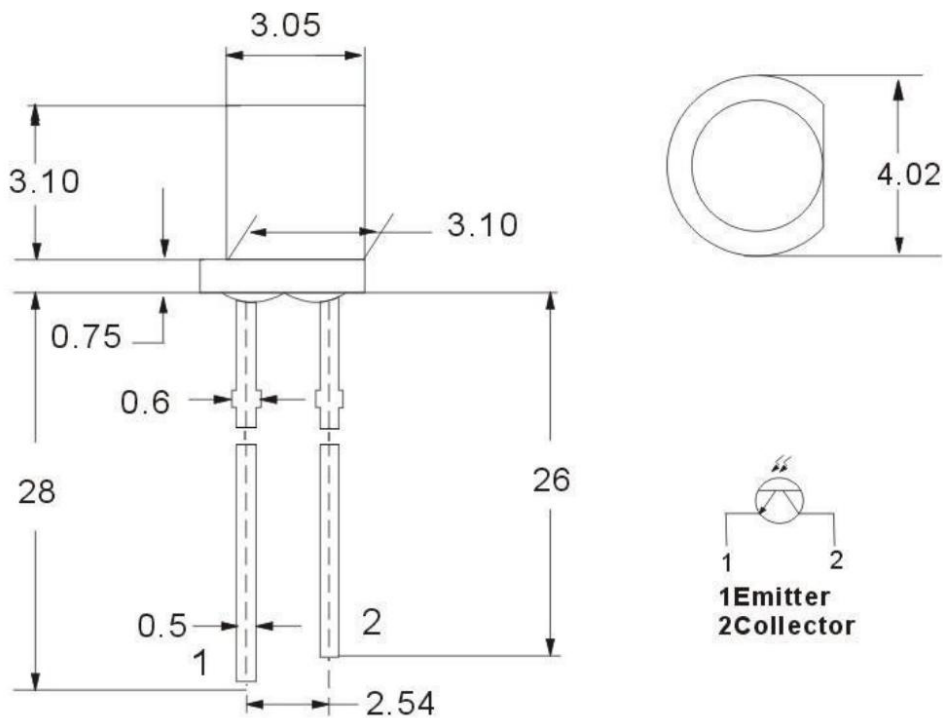
Camera

Printer

Optoelectronic switch

## Description

ST-7L2P-FH is a high speed and high sensitive NPN silicon phototransistor molded in a standard  $\phi 3$  mm package. Due to its water clear epoxy the device is sensitive to visible and near infrared radiation.

**PACKAGE DIMENSIONS****NOTES:**

1. All dimensions are in millimeters (inches).
2. Tolerance is  $\pm 0.25\text{mm}$  (.010") unless otherwise noted.
3. Lead spacing is measured where the leads emerge from the package.

**ABSOLUTE MAXIMUM RATINGS AT TA =25°C**

<b>Parameter</b>	<b>Symbol</b>	<b>Rating</b>	<b>Unit</b>
<b>Power Dissipation at (or below) 25°C Free Air Temperature</b>	<b>Pc</b>	<b>75</b>	<b>mW</b>
<b>Collector-Emitter Voltage</b>	<b>V<sub>CEO</sub></b>	<b>30</b>	<b>V</b>
<b>Emitter-Collector Voltage</b>	<b>V<sub>ECO</sub></b>	<b>5</b>	<b>V</b>
<b>Collector Current</b>	<b>Ic</b>	<b>20</b>	<b>mA</b>
<b>Operating Temperature</b>	<b>Topr</b>	<b>-25~+85</b>	<b>°C</b>
<b>Storage Temperature</b>	<b>Tstg</b>	<b>-40~+85</b>	<b>°C</b>
<b>Soldering Temperature (1/16 inch from body for 5 seconds)</b>	<b>Tsol</b>	<b>260</b>	<b>°C</b>

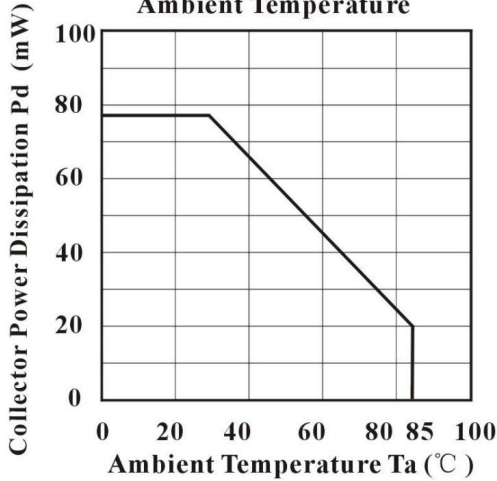
Notes: \*1:Soldering time≤5 seconds.

**ELECTRICAL OPTICAL CHARACTERISTICS AT TA=25°C**

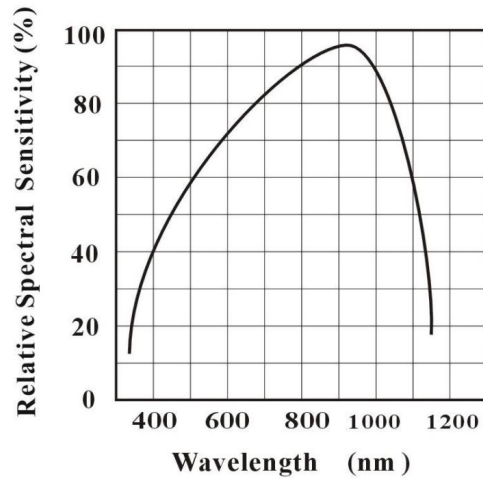
Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Condition
Collector Dark Current	$I_{CEO}$			100	nA	$I_e=0\text{mW/cm}^2$ $V_{CE}=20\text{V}$
On State Collector Current	$I_{C(on)}$	0.7	2.0			$I_e=1\text{mW/cm}^2$ $V_{CE}=5\text{V}$
Emitter-Collector Breakdown Voltage	$BV_{CEO}$	30		100	V	$I_C=100\ \mu\text{A}$ $I_e=0\text{mW/cm}^2$
Collector - Emitter Breakdown Voltage	$BV_{ECO}$	5			V	$I_C=100\ \mu\text{A}$ $I_e=0\text{mW/cm}^2$
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$			0.4	V	$I_C=2\text{mA}$ $I_e=1\text{mW/cm}^2$
Current gain	$h_{FE}$	1000		1800	$\mu\text{A}$	$V_{CE}=5\text{V}$ $I_e=2\text{mW/cm}^2$
Wavelength of Peak Sensitivity	$\lambda_p$		940		nm	
Range of Spectral Bandwidth	$\lambda_{0.5}$	450		1100	nm	
Response Time	Rise Time	$t_r$		15	$\mu\text{S}$	$V_{CE}=5\text{V}$ $I_e=1\text{mA}$ $R_L=1000\Omega$
	Fall Time	$t_f$		15	$\mu\text{S}$	
Collector-Capacitance	$C_{CB}$	5.4	6.4	7.4	PF	$f=1\text{MHz}$ $V_{CB}=3\text{V}$

## Typical Electrical-Optical Characteristics Curves

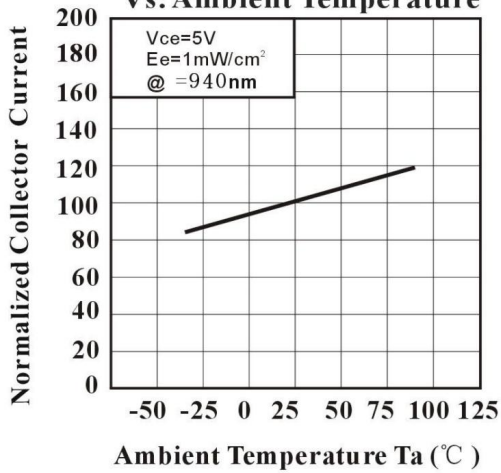
**Fig.1 Collector Power Dissipation vs. Ambient Temperature**



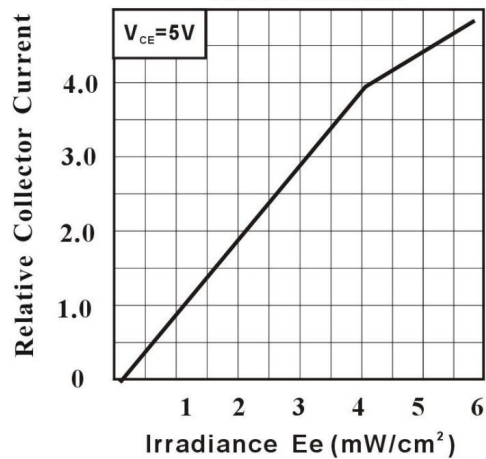
**Fig.2 Spectral Sensitivity**



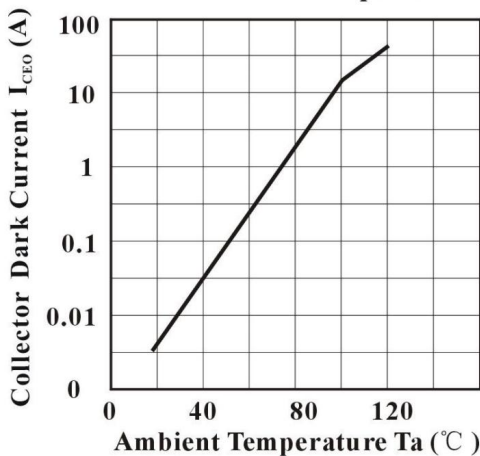
**Fig.3 Normalized Collector Current Vs. Ambient Temperature**



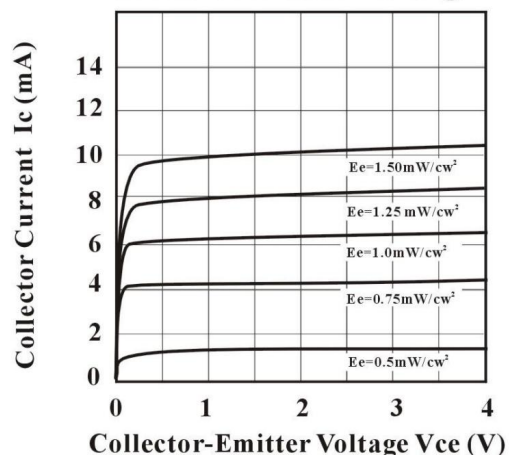
**Fig.4 Relative Collector Current Vs. Irradiance**



**Fig.5 Collector Dark Current Vs. Ambient Temperature**



**Fig.6 Collector Current vs. Collector-Emitter Voltage**



### Packing Quantity Specification

1. 1000Pcs/1Bag,10 Bag/1Box
2. 4Boxes/1Carton

### Label Form Specification

製品名 PRODUCT	
コードNo. CODE No.	
数量 Q'TY	
ロットNo. LOT No.	
備考 REMARKS	
	

- PRODUCT: Part Number
- CODE NO.: Product Serial Number
- QTY: Packing Quantity
- LOT No: Lot Number
- REMARKS:Remarks

### Notes

#### Lead Forming

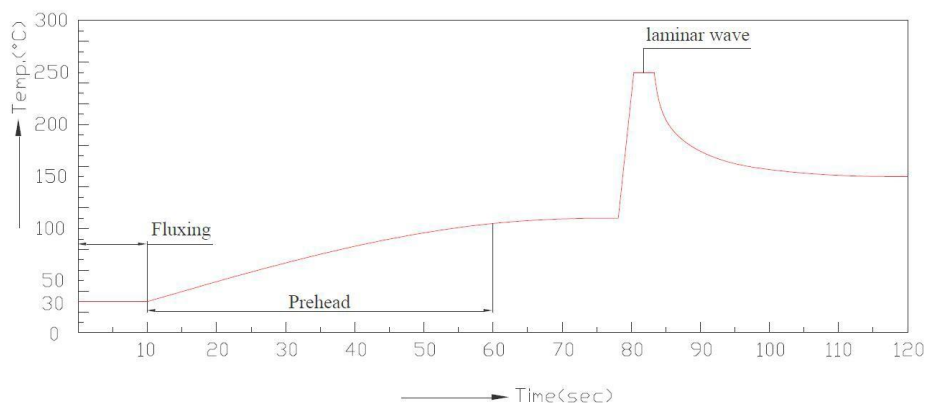
- 4.Avoiding applying any stress to the lead frame while the Phototransistors are at high temperature particularly when soldering.
- 5.Dip and hand soldering should not be done more than one time
- 6.After soldering the Phototransistors, the epoxy bulb should be protected from mechanical shock or vibration until the Phototransistors return to room temperature.
- 7.A rapid-rate process is not recommended for cooling the Phototransistors down from the peak temperature.
- 8.Although the recommended soldering conditions are specified in the above table, dip or hand soldering at the lowest possible temperature is desirable for the Phototransistors.
- 9.Wave soldering parameter must be set and maintain according to recommended temperature and dwell time in the solder wave.

## Soldering

- Careful attention should be paid during soldering. When soldering, leave more than 3mm from solder joint to epoxy bulb, and soldering beyond the base of the tie bar is recommended.
- Recommended soldering conditions:

Hand Soldering		DIP Soldering	
Temp. at tip of iron	300°C Max. (30W Max.)	Preheat temp.	100°C Max. (60 sec Max.)
Soldering time	3 sec Max.	Bath temp. & time	260 Max., 5 sec Max
Distance	3mm Min.(From solder joint to epoxy bulb)	Distance	3mm Min. (From solder joint to epoxy bulb)

### 3. Recommended soldering profile



- Avoiding applying any stress to the lead frame while the Phototransistors are at high temperature particularly when soldering.
- Dip and hand soldering should not be done more than one time
- After soldering the Phototransistors, the epoxy bulb should be protected from mechanical shock or vibration until the Phototransistors return to room temperature.
- A rapid-rate process is not recommended for cooling the Phototransistors down from the peak temperature.
- Although the recommended soldering conditions are specified in the above table, dip or hand soldering at the lowest possible temperature is desirable for the Phototransistors.
- Wave soldering parameter must be set and maintain according to recommended temperature and dwell time in the solder wave.

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