

# PT501 Datasheet

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DiGi Electronics Part Number	PT501-DG
Manufacturer	<a href="#">Sharp Microelectronics</a>
Manufacturer Product Number	PT501
Description	SENSOR PHOTO 800NM TOP TO18-2
Detailed Description	Phototransistors 800nm Top View TO-18-2 Metal Can

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## Purchase and inquiry

Manufacturer Product Number:

PT501

Series:

-

Voltage - Collector Emitter Breakdown (Max):

45 V

Current - Dark (I<sub>d</sub>) (Max):

100 nA

Viewing Angle:

12°

Mounting Type:

Through Hole

Operating Temperature:

-25°C ~ 125°C (TA)

Manufacturer:

Sharp Microelectronics

Product Status:

Obsolete

Current - Collector (I<sub>c</sub>) (Max):

10 mA

Wavelength:

800nm

Power - Max:

75 mW

Orientation:

Top View

Package / Case:

TO-18-2 Metal Can

## Environmental & Export classification

Moisture Sensitivity Level (MSL):

1 (Unlimited)

HTSUS:

8541.49.7080

ECCN:

EAR99

# PT501/PT510

## TO-18 Type Narrow Acceptance Phototransistor

### ■ Features

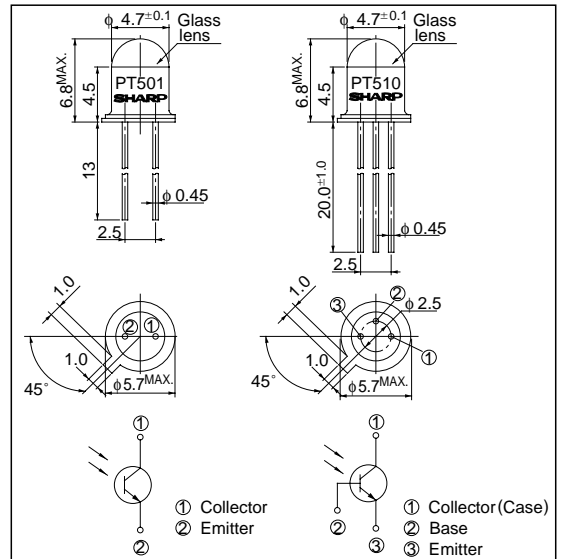
1. Narrow acceptance ( $\Delta\theta$  : TYP.  $\pm 6^\circ$ )
2. TO -18 type standard package
3. With base terminal : **PT510**

### ■ Applications

1. Optoelectronic switches, optoelectronic counters
2. Smoke detectors
3. Infrared applied systems

### ■ Outline Dimensions

(Unit : mm)



### ■ Absolute Maximum Ratings

(Ta = 25°C)

Parameter	Symbol	PT501	PT510	Unit
Collector-emitter voltage	V <sub>CEO</sub>	45	35	V
Emitter-collector voltage	V <sub>ECO</sub>	6	6	V
Collector-base voltage	V <sub>CBO</sub>	-	35	V
Emitter-base voltage	V <sub>EBO</sub>	-	6	V
Collector power dissipation	P <sub>C</sub>	75	75	mW
Operating temperature	T <sub>opr</sub>	- 25 to + 125	- 25 to + 125	°C
Storage temperature	T <sub>stg</sub>	- 55 to + 150	- 55 to + 150	°C
*1 Soldering temperature	T <sub>sol</sub>	260	260	°C

\*1 For 10 seconds at the position of 1.3mm from the bottom face of can package

### ■ Electro-optical Characteristics

(Ta = 25°C)

Parameter		Symbol	Conditions	MIN.	TYP.	MAX.	Unit		
*2 Collector current		I <sub>C</sub>	V <sub>CE</sub> = 5V, E <sub>e</sub> = 10mW/cm <sup>2</sup>	2.5	<b>PT501</b>	10	-	mA	
					<b>PT510</b>	20			
Collector dark current		I <sub>CEO</sub>	V <sub>CE</sub> = 30V, E <sub>e</sub> = 0	-	2 x 10 <sup>-9</sup>	10 <sup>-7</sup>	A		
*2 Collector-emitter saturation voltage		V <sub>CE (sat)</sub>	I <sub>C</sub> = 1mA, E <sub>e</sub> = 10mW/cm <sup>2</sup>	-	0.2	-	V		
Peak sensitivity wavelength		λ <sub>P</sub>		-	800	-	nm		
Response time	Rise time	t <sub>r</sub>	V <sub>CE</sub> = 2V, I <sub>C</sub> = 2mA, R <sub>L</sub> = 100Ω (PT501 : 1kΩ)	-	<b>PT501</b>	10	-	μs	
					<b>PT510</b>	2			
	Fall time	t <sub>f</sub>			<b>PT501</b>	10		-	μs
					<b>PT510</b>	3			

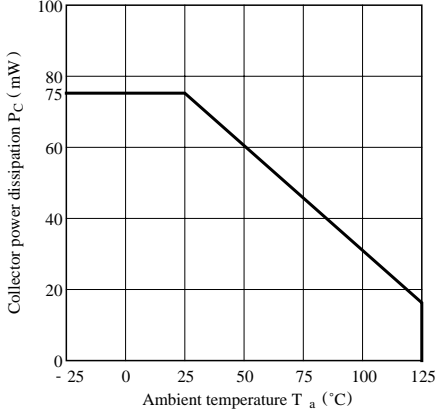
\*2 E<sub>e</sub> : Irradiance by CIE standard light source A (tungsten lamp)

\*2 Classification Table of Collector Current( $I_C$ )

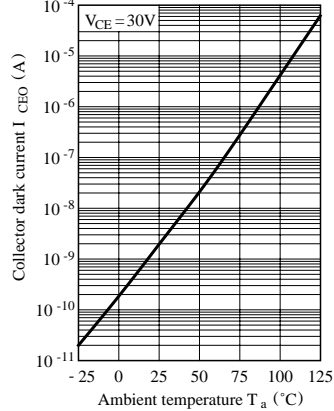
Model No.	$I_C$ (mA)
<b>PT501A</b>	20 to 80
<b>PT501B</b>	10 to 25
<b>PT501C</b>	2.5 to 15

at  $V_{CE} = 5V, E_e = 10mW/cm^2, T_a = 25^\circ C$

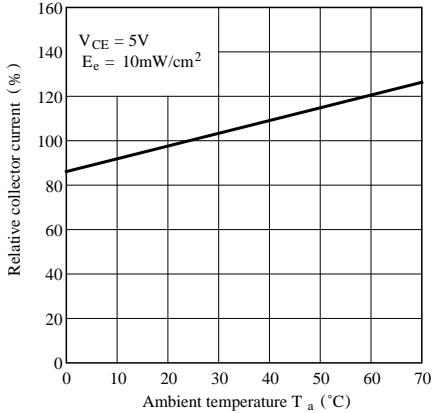
**Fig. 1 Collector Power Dissipation vs. Ambient Temperature**



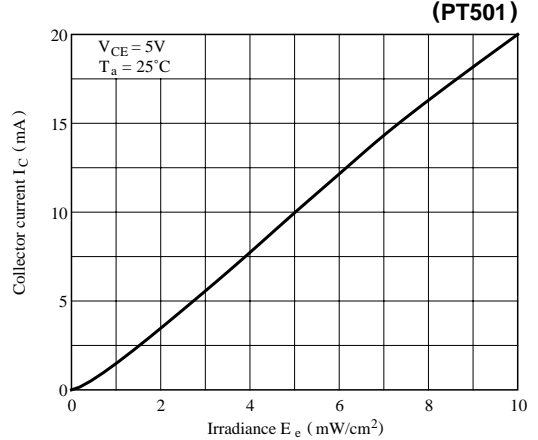
**Fig. 2 Collector Dark Current vs. Ambient Temperature**



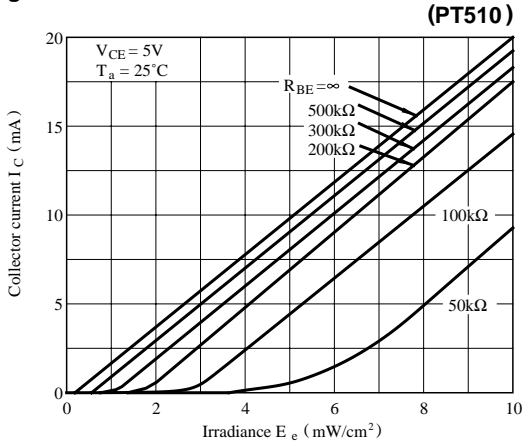
**Fig. 3 Relative Collector Current vs. Ambient Temperature**



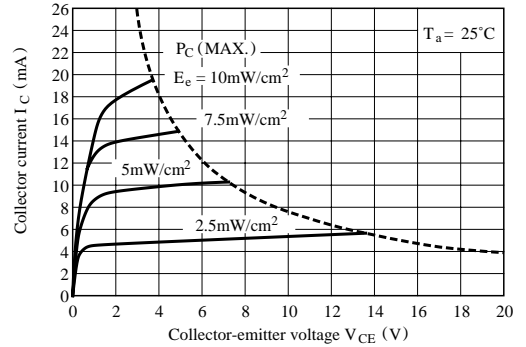
**Fig.4-a Collector Current vs. Irradiance (PT501)**



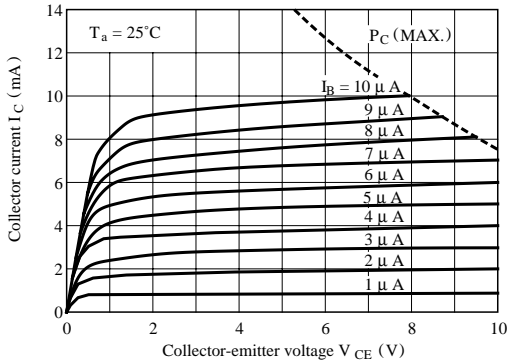
**Fig.4-b Collector Current vs. Irradiance**



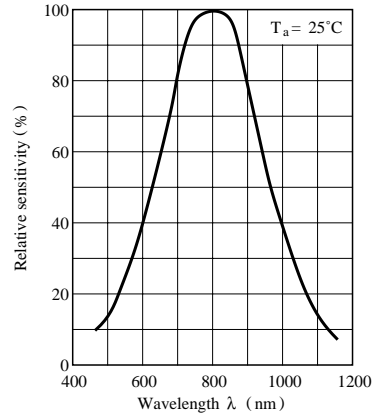
**Fig.5-a Collector Current vs. Collector-emitter Voltage**



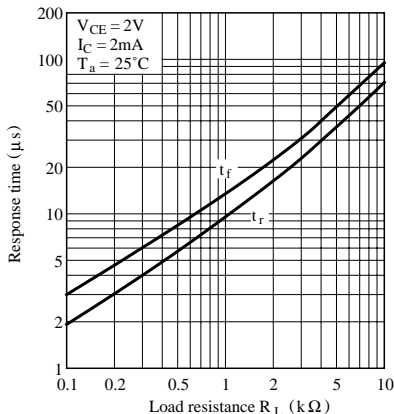
**Fig.5-b Collector Current vs. Collector-emitter Voltage**



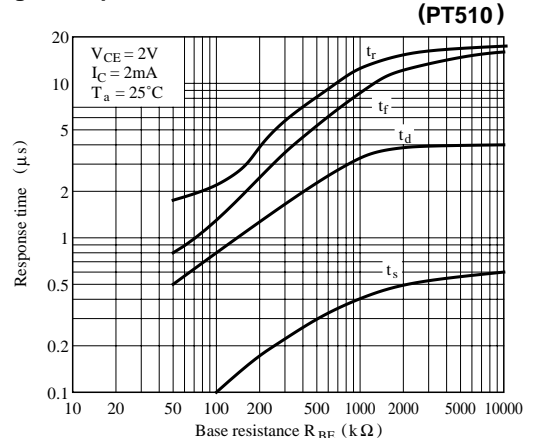
**Fig. 6 Spectral Sensitivity**



**Fig. 7 Response Time vs. Load Resistance**



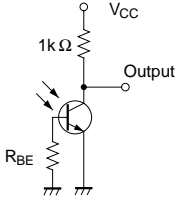
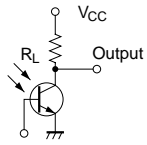
**Fig. 8 Response Time vs. Base Resistance**



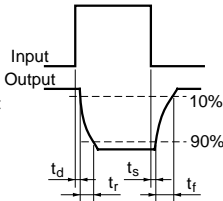
**Test Circuit for Response Time**

Correspond to Fig. 7

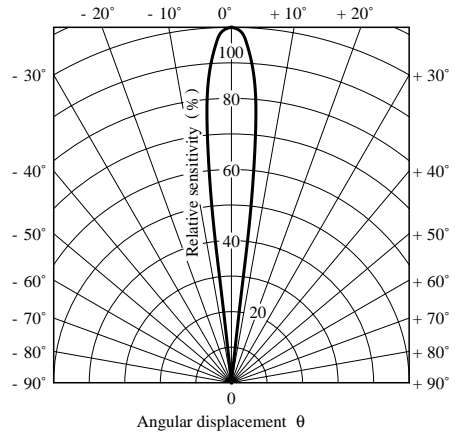
Correspond to Fig. 8



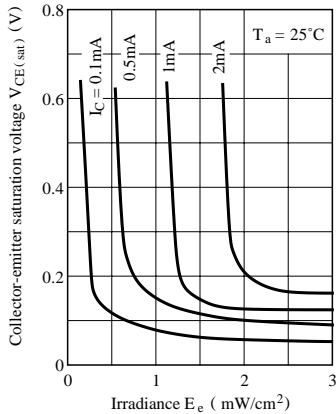
(PT501 has no base terminal.)



**Fig. 9 Sensitivity Diagram** ( $T_a = 25^\circ\text{C}$ )



**Fig.10 Collector-emitter Saturation Voltage vs. Irradiance**



● Please refer to the chapter “Precautions for Use.”

