

# PT4600/PT4600F/PT4610/ PF4610F/PF4650F

## Double Ended Mold Type Phototransistors

### ■ Features

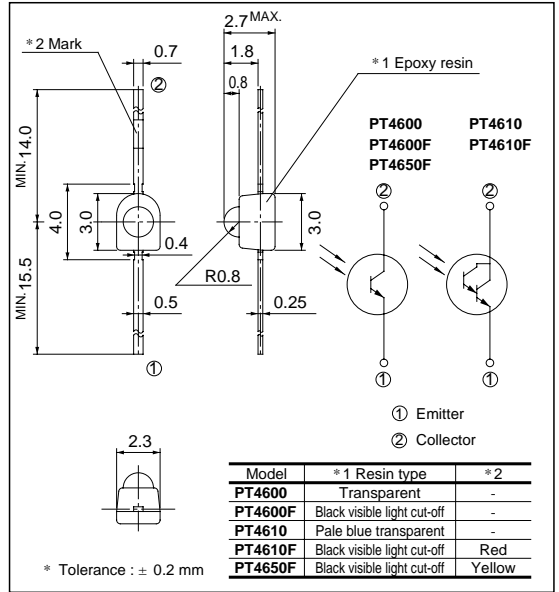
1. Compact double ended mold package  
(Packaging area : 37% smaller than **PT480**)
2. Narrow beam angle (Half intensity angle :  $\pm 20^\circ$ )  
Light sensitivity : 3 times as large as **PT460** series)
3. Darlington output type (**PT4610**), visible light cut-off type (**PT4600F/4610F/4650F**), VCR tape end detection type (**PT4650F**) available as standard
4. Taped model (2,000 pieces/reel) also available

### ■ Applications

1. Floppy disk drives
2. VCRs
3. Audio equipment
4. Video-movie kits

### ■ Outline Dimensions

(Unit : mm)



### ■ Absolute Maximum Ratings

(Ta = 25°C)

Parameter	Symbol	Rating	Unit
Collector-emitter voltage	V <sub>CEO</sub>	35	V
Emitter-collector voltage	V <sub>ECO</sub>	6	V
Collector current	I <sub>C</sub>	20	mA
		50	
Collector power dissipation	P <sub>C</sub>	50	mW
		100	
Operating temperature	T <sub>opr</sub>	-20 to +85	°C
Storage temperature	T <sub>stg</sub>	-40 to +85	°C
*1 Soldering temperature	T <sub>sol</sub>	260	°C

\*1 For MAX. 3 seconds at the position of 2.5 mm from the resin edge

## Electro-optical Characteristics

(Ta = 25°C)

Parameter		Symbol	Conditions	MIN.	TYP.	MAX.	Unit	
Collector current	PT4600	I <sub>c</sub>	<sup>*2</sup> E <sub>e</sub> = 1mW/cm <sup>2</sup> V <sub>CE</sub> = 5V	0.95	-	2.80	mA	
	PT4600F			0.55	-	1.85		
	PT4650F			0.55	-	1.2		
	PT4610		<sup>*2</sup> E <sub>e</sub> = 0.01mW/cm <sup>2</sup> V <sub>CE</sub> = 5V	0.6	-	3.05		
	PT4610F			0.4	-	2.0		
Dark current	PT4600/4600F/4650F	I <sub>CEO</sub>	<sup>*2</sup> E <sub>e</sub> = 0, V <sub>CE</sub> = 20V	-	-	0.1	μA	
	PT4610/PT4610F		<sup>*2</sup> E <sub>e</sub> = 0, V <sub>CE</sub> = 10V	-	-	1.0		
Collector-emitter saturation voltage	PT4600/PT4600F	V <sub>CE(sat)</sub>	<sup>*2</sup> E <sub>e</sub> = 10mW/cm <sup>2</sup> I <sub>c</sub> = 0.5mA	-	0.2	0.4	V	
	PT4650F			<sup>*2</sup> E <sub>e</sub> = 1mW/cm <sup>2</sup> I <sub>c</sub> = 2.5mA	-	-		1.2
	PT4610/PT4610F							
Collector-emitter breakdown voltage		BV <sub>CEO</sub>	I <sub>c</sub> = 0.1mA, <sup>*2</sup> E <sub>e</sub> = 0	35	-	-	V	
Emitter-collector breakdown voltage		BV <sub>ECO</sub>	I <sub>c</sub> = 0.01mA, <sup>*2</sup> E <sub>e</sub> = 0	6	-	-	V	
Peak sensitivity wavelength		PT4600/4610	λ <sub>p</sub>	-	-	800	-	nm
		PT4600F/4610F/4650F			-	860	-	
Response time	Rise	PT4600/4600F/4650F	V <sub>CE</sub> = 20V, I <sub>c</sub> = 1mA R <sub>L</sub> = 1kΩ	-	10	40	μs	
	Fall			-	8	35		
Response time	Rise	PT4610/4610F	V <sub>CE</sub> = 2V, I <sub>c</sub> = 10mA R <sub>L</sub> = 100Ω	-	400	2 000		
	Fall			-	300	1 500		
Half intensity angle		Δθ	-	-	± 20	-	°	

\*2 E<sub>e</sub> : Irradiance by CIE standard light source

Fig. 1-a Collector Power Dissipation vs. Ambient temperature(PT4600/4600F/4650F)

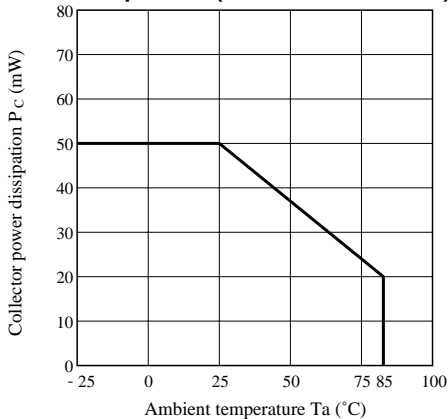
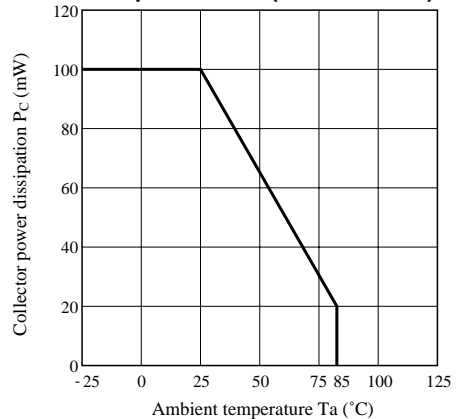
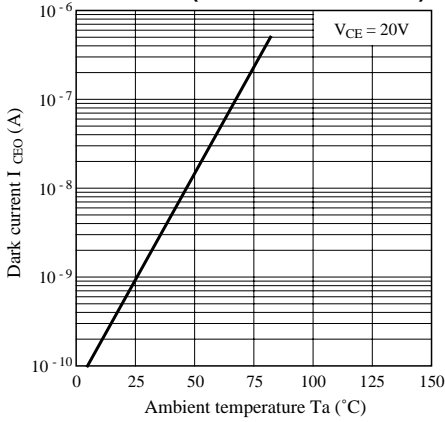


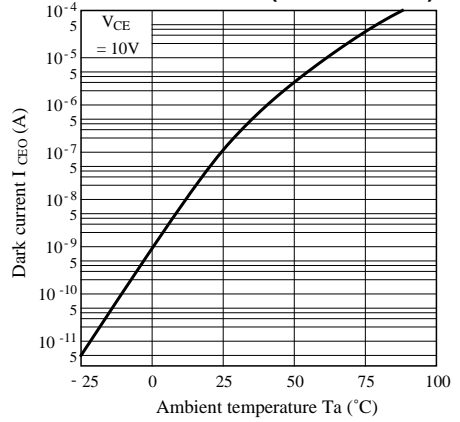
Fig. 1-b Collector Power Dissipation vs. Ambient temperature (PT4610/4610F)



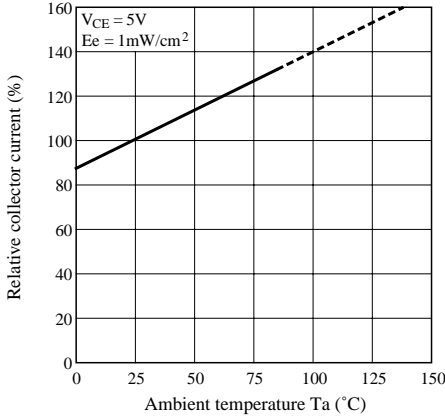
**Fig. 2-a Dark Current vs. Ambient temperature (PT4600/4600F/4650F)**



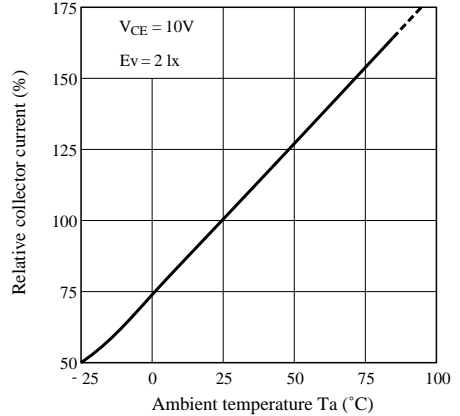
**Fig. 2-b Dark Current vs. Ambient temperature (PT4610/4610F)**



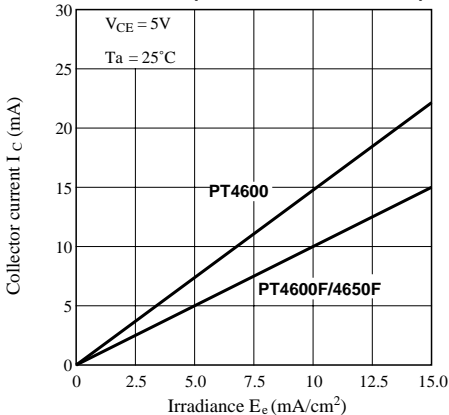
**Fig. 3-a Relative Collector Current vs. Ambient temperature (PT4600/4600F/4650F)**



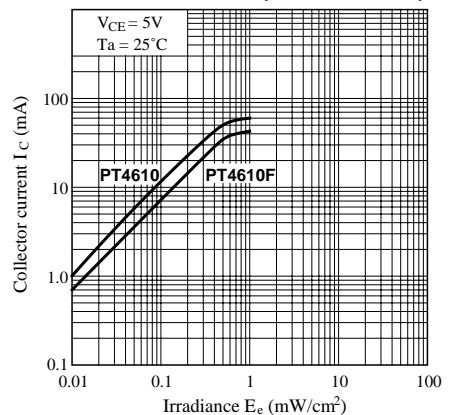
**Fig. 3-b Relative Collector Current vs. Ambient temperature (PT4610/4610F)**



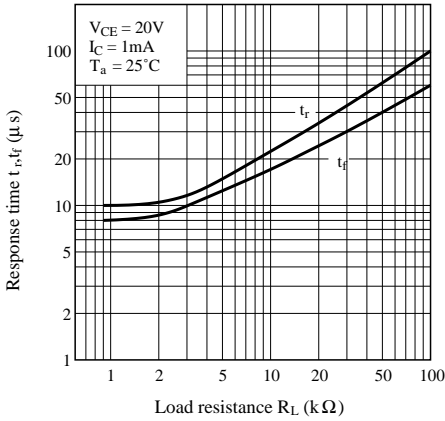
**Fig. 4-a Collector Current vs. Irradiance (PT4600/4600F/4650F)**



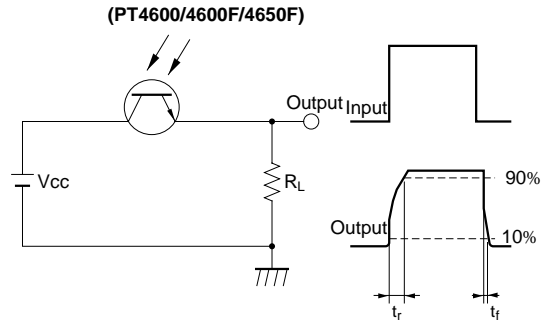
**Fig. 4-b Collector Current vs. Irradiance (PT4610/4610F)**



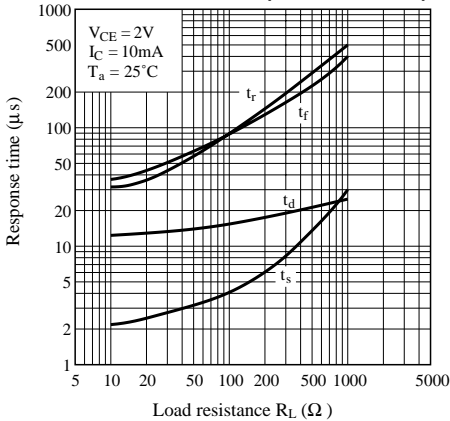
**Fig. 7-a Response Time vs. Load Resistance (PT4600/4600F/4650F)**



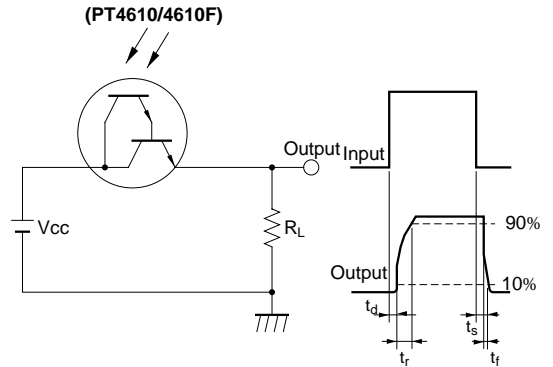
**Test Circuit for Response Time**



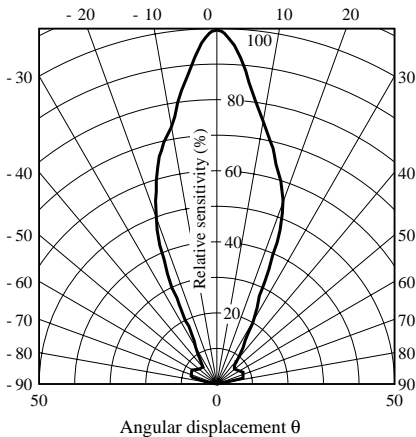
**Fig. 7-b Response Time vs. Load Resistance (PT4610/4610F)**



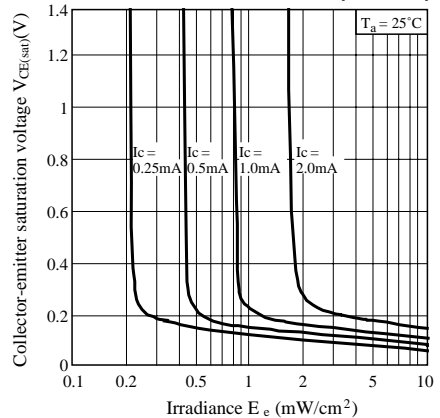
**Test Circuit for Response Time**



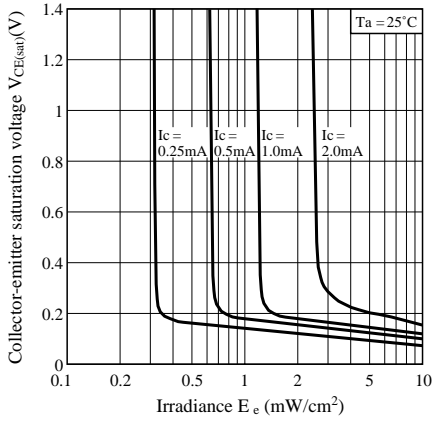
**Fig. 8 Radiation Diagram**



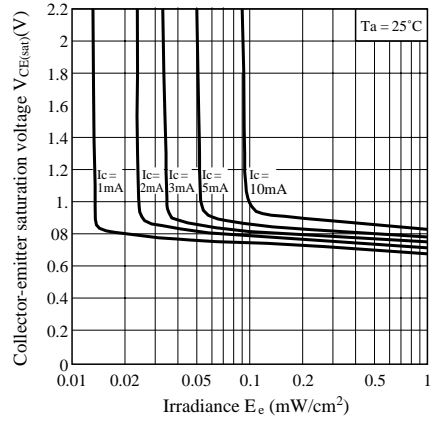
**Fig. 9-a Collector-emitter Saturation Voltage vs. Irradiance (PT4600)**



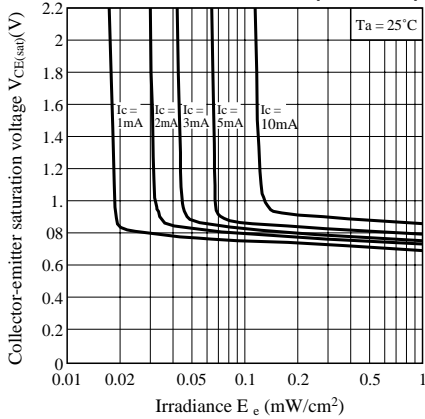
**Fig. 9-b Collector-emitter Saturation Voltage vs. Irradiance(PT4600F/PT4650F)**



**Fig. 9-c Collector-emitter Saturation Voltage vs. Irradiance (PT4610)**



**Fig. 9-d Collector-emitter Saturation Voltage vs. Irradiance (PT4610F)**



● Please refer to the chapter "Precautions for Use". (Page 78 to 93)