



## SMD Type Phototransistor with Daylight Filter

### Features

- Small double-end package
- High photo sensitivity
- High reliability
- Spectral range of sensitivity: 760-1100nm
- Fast Response time
- RoHS compliance

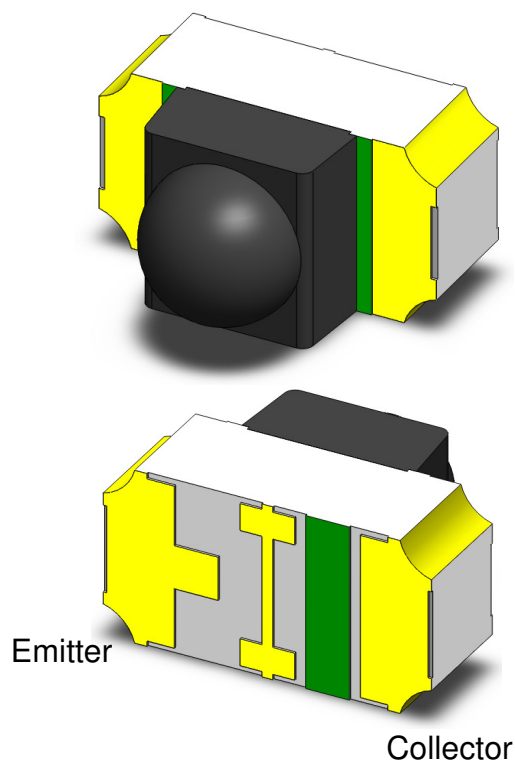
### Applications

- Infrared sensor
- Infrared Touch Panel Solutions

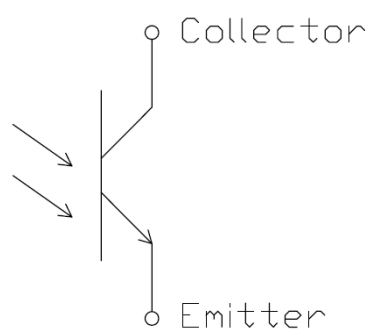
### Description

The PTP83016BT24 is silicon NPN Phototransistor housed in a miniature SMD package. The device comes with a superior filtering for visible light by utilizing special black molding compound.

### Package Outline



### Schematic





## SMD Type Phototransistor with Daylight Filter

## Absolute Maximum Rating at 25°C

Symbol	Parameters	Ratings	Units	Notes
I <sub>C</sub>	Collector Current	20	mA	
V <sub>CEO</sub>	Collector-Emitter Voltage	35	V	1
V <sub>ECO</sub>	Emitter-Collector Voltage	5	V	2
T <sub>opr</sub>	Operating Temperature	-40 ~ +85	°C	
T <sub>stg</sub>	Storage Temperature	-40 ~ +100	°C	
T <sub>sol</sub>	Soldering Temperature	260	°C	3
P <sub>to</sub>	Total Power Dissipation	150	mW	

## Optical Characteristics

Symbol	Parameters	Test Conditions	Min	Typ	Max	Units	Notes
λ	Spectral Bandwidth	-	760	-	1100	nm	
λ <sub>P</sub>	Peak Sensitivity	-	-	880	-	nm	
θ <sub>1/2</sub>	View Angle	V <sub>CE</sub> =5V	-	±22.5	-	deg	

## Electrical Characteristics

Symbol	Parameters	Test Conditions	Min	Typ	Max	Units	Notes
I <sub>CEO</sub>	Dark Current	Ee=0mW /cm <sup>2</sup> V <sub>CE</sub> =20V	-	-	100	nA	
V <sub>CE(sat)</sub>	Collector-Emitter Saturation Voltage	Ee=1mW /cm <sup>2</sup> I <sub>C</sub> =1.4mA	-	-	0.4	V	
I <sub>C</sub>	Collector Light Current	Ee=1mW /cm <sup>2</sup> λ <sub>P</sub> =940nm, V <sub>CE</sub> =5V	1.4	2.8	4.4	mA	4
C <sub>T</sub>	Terminal Capacitance	Ee=0mW /cm <sup>2</sup> f=1MHz, V <sub>CE</sub> =5V	-	3.80	-	pF	



# SMD Type Phototransistor with Daylight Filter

## Switching Characteristics

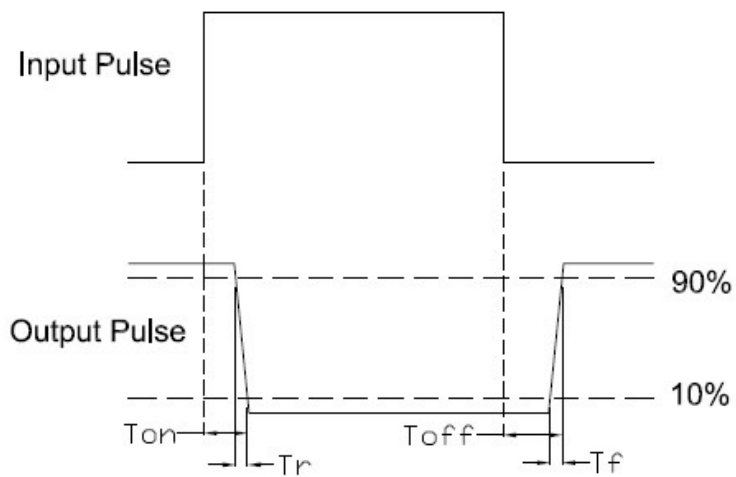
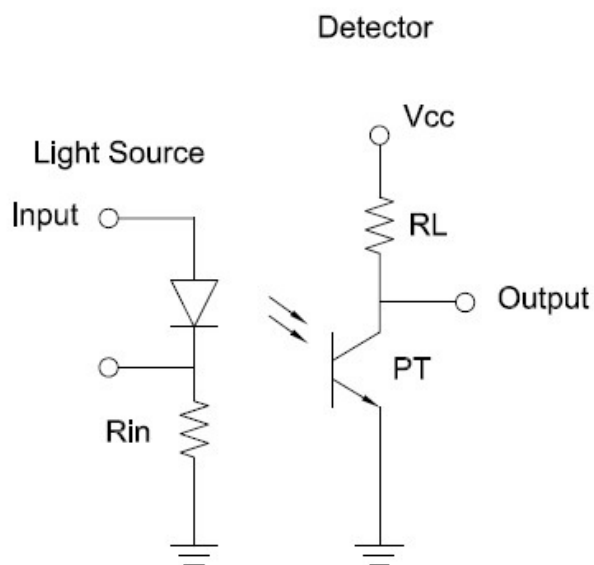
Symbol	Parameters	Test Conditions	Min	Typ	Max	Units	Notes
$t_r$	Rise Time	$V_{ce} = 5V, R_L = 100\Omega$ $I_C = 1.0mA$	-	6	-	$\mu s$	5
$t_f$	Fall Time		-	7	-		
$t_{on}$	Turn on Delay Time		-	11	-		
$t_{off}$	Turn off Delay Time		-	7.9	-		

**Notes:**

- 1 : Test conditions :  $I_C = 100\mu A, E_e = 0mW/cm^2$ .
- 2 : Test conditions :  $I_E = 100\mu A, E_e = 0mW/cm^2$ .
- 3 : Soldering time  $\leq 5$  seconds.
- 4 :  $I_C$  Bin Rank : (Tolerance of Collector Light Current :  $\pm 10\%$ )

Bin Code	Ta	Tb
Min	1.4	2.4
Max	2.4	4.4

5 : Test circuit:



Switching Time



Typical Characteristic Curves

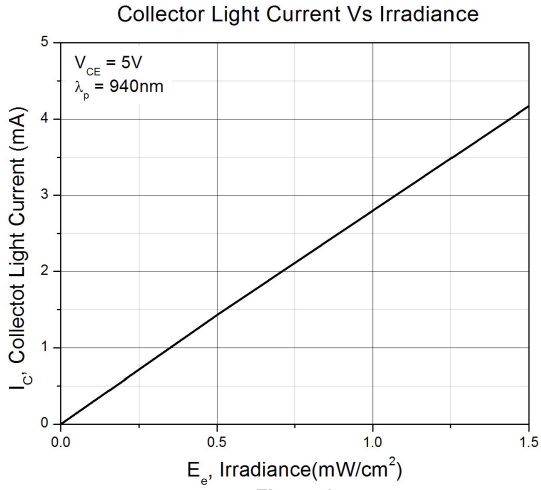


Figure 1

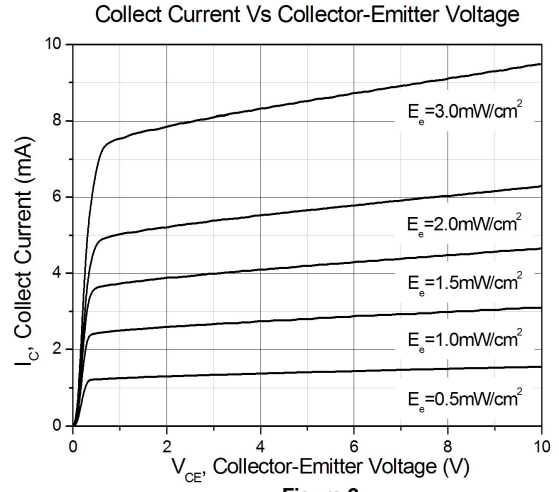


Figure 2

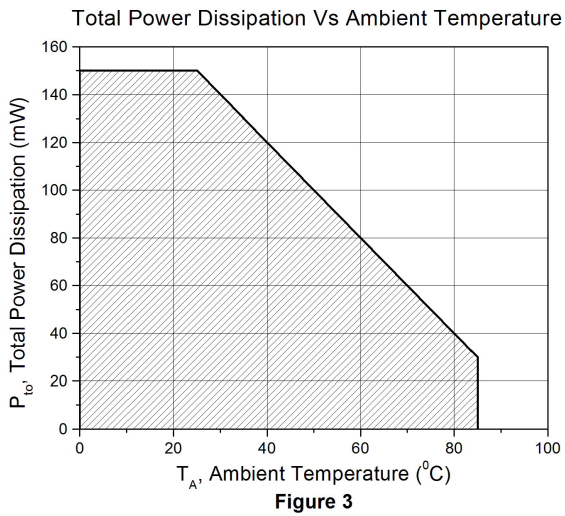


Figure 3

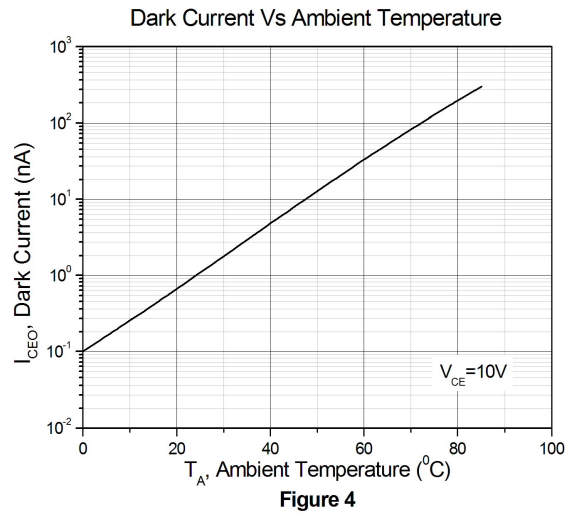


Figure 4

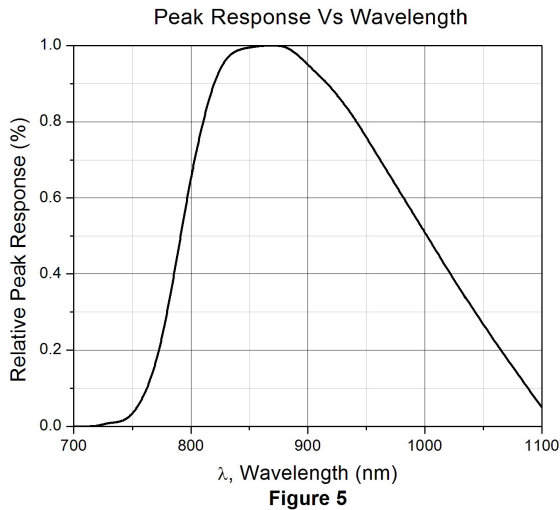


Figure 5

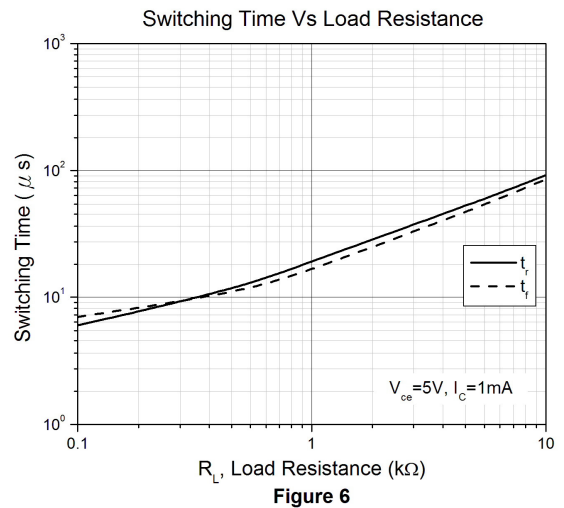
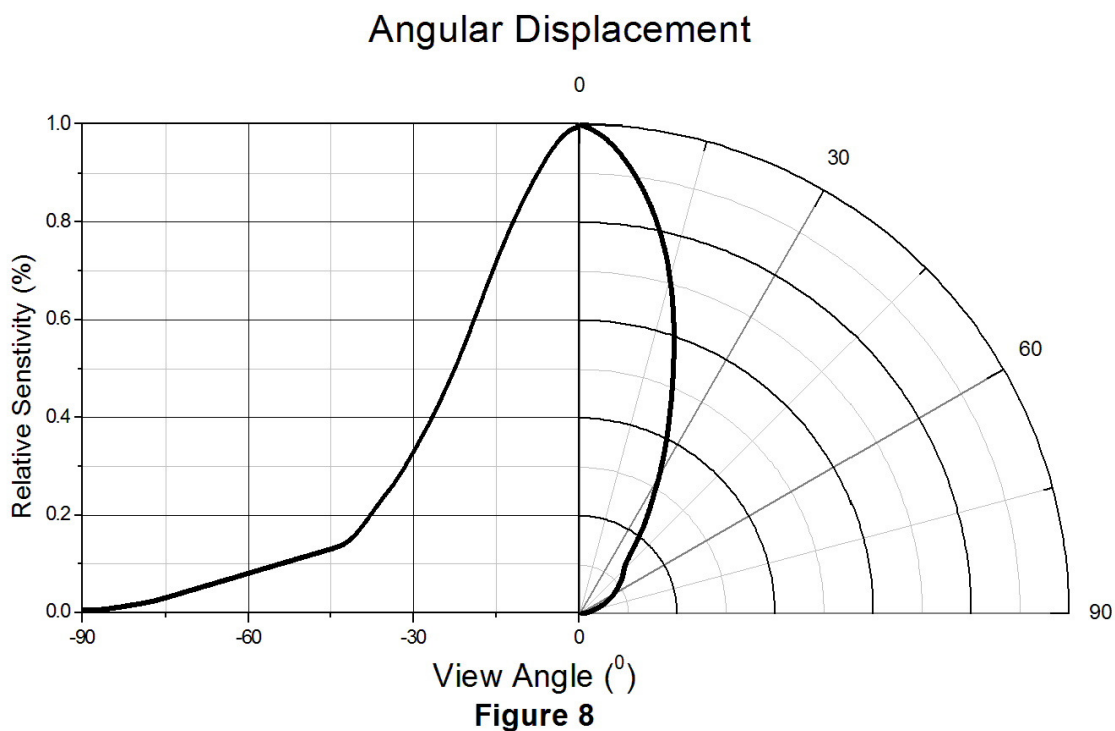
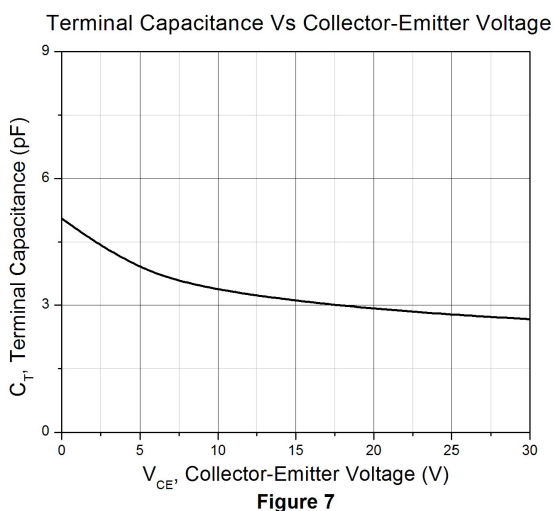


Figure 6



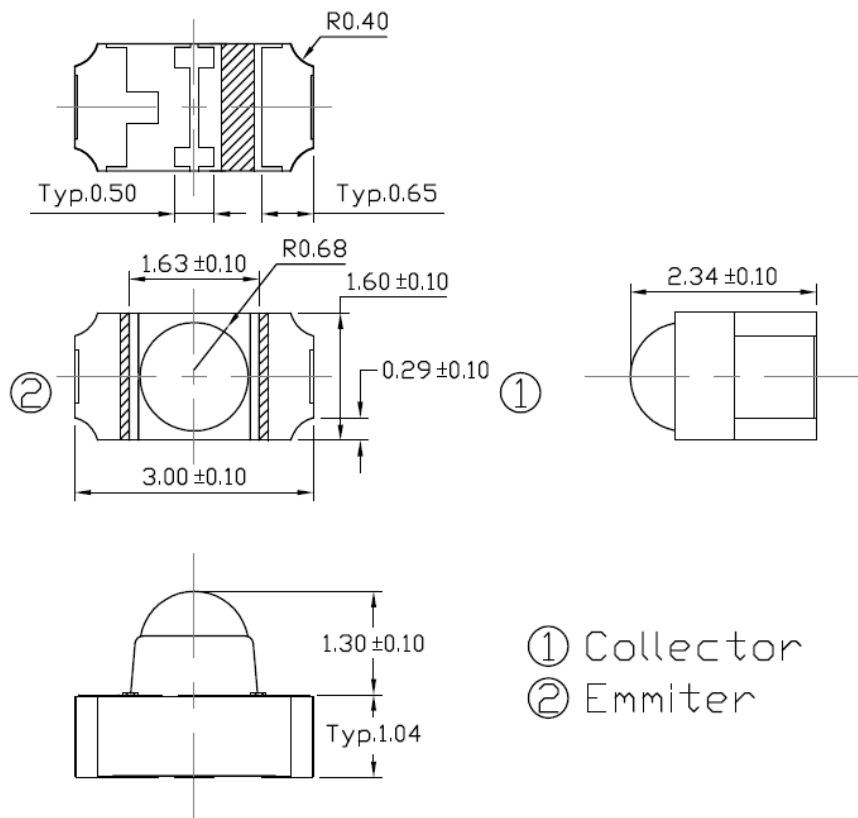
### Typical Characteristic Curves



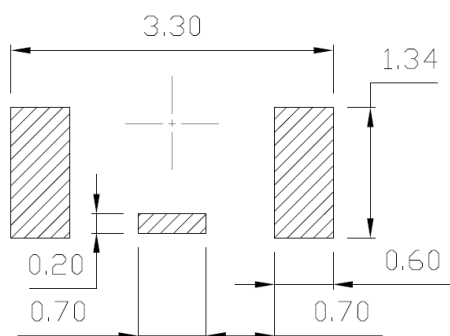


SMD Type Phototransistor with Daylight Filter

**Package Dimension** *All dimensions are in mm, unless otherwise stated*



**Recommended Soldering Mask** *All dimensions are in mm, unless otherwise stated*



**Ordering Information**

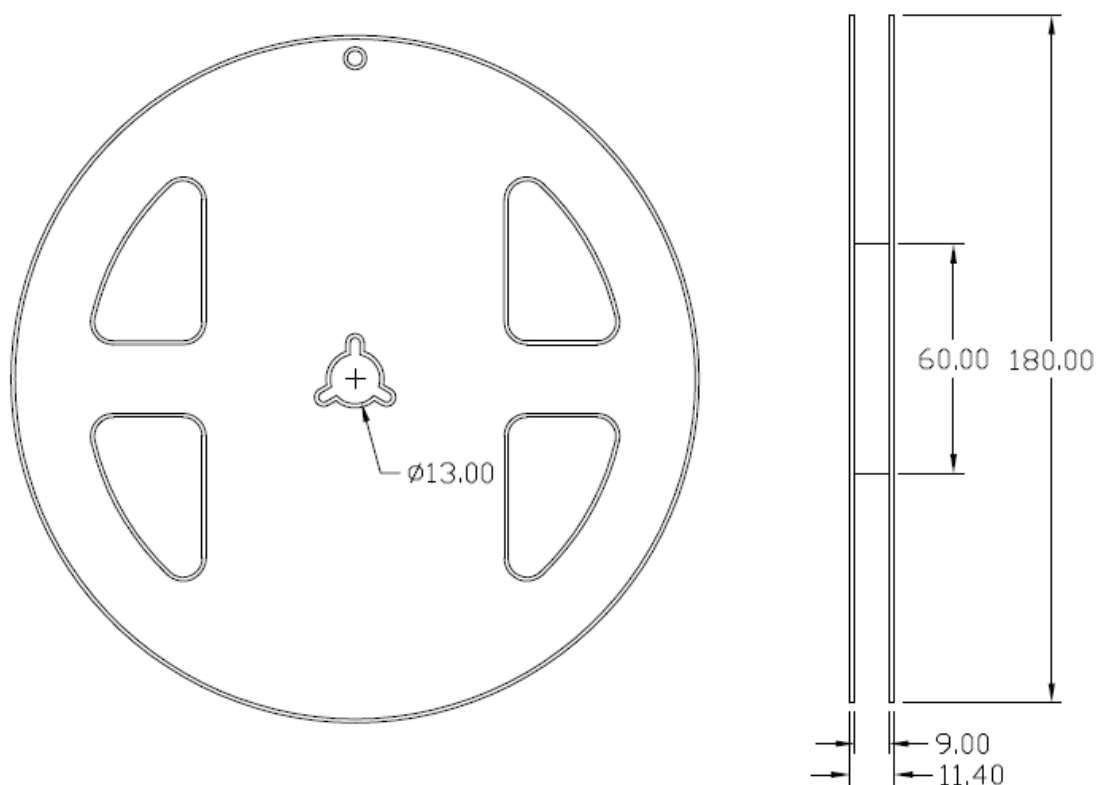
Part Number	Description	Quantity
PTP83016BT24	Tape & Reel	2000 pcs



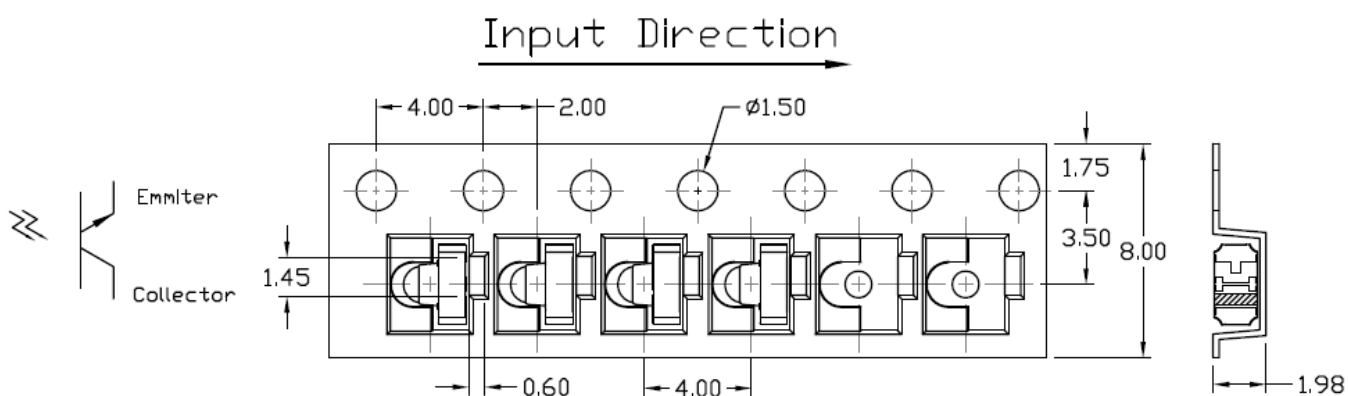
PTP83016BT24

## SMD Type Phototransistor with Daylight Filter

**Reel Dimension** *All dimensions are in mm, unless otherwise stated*



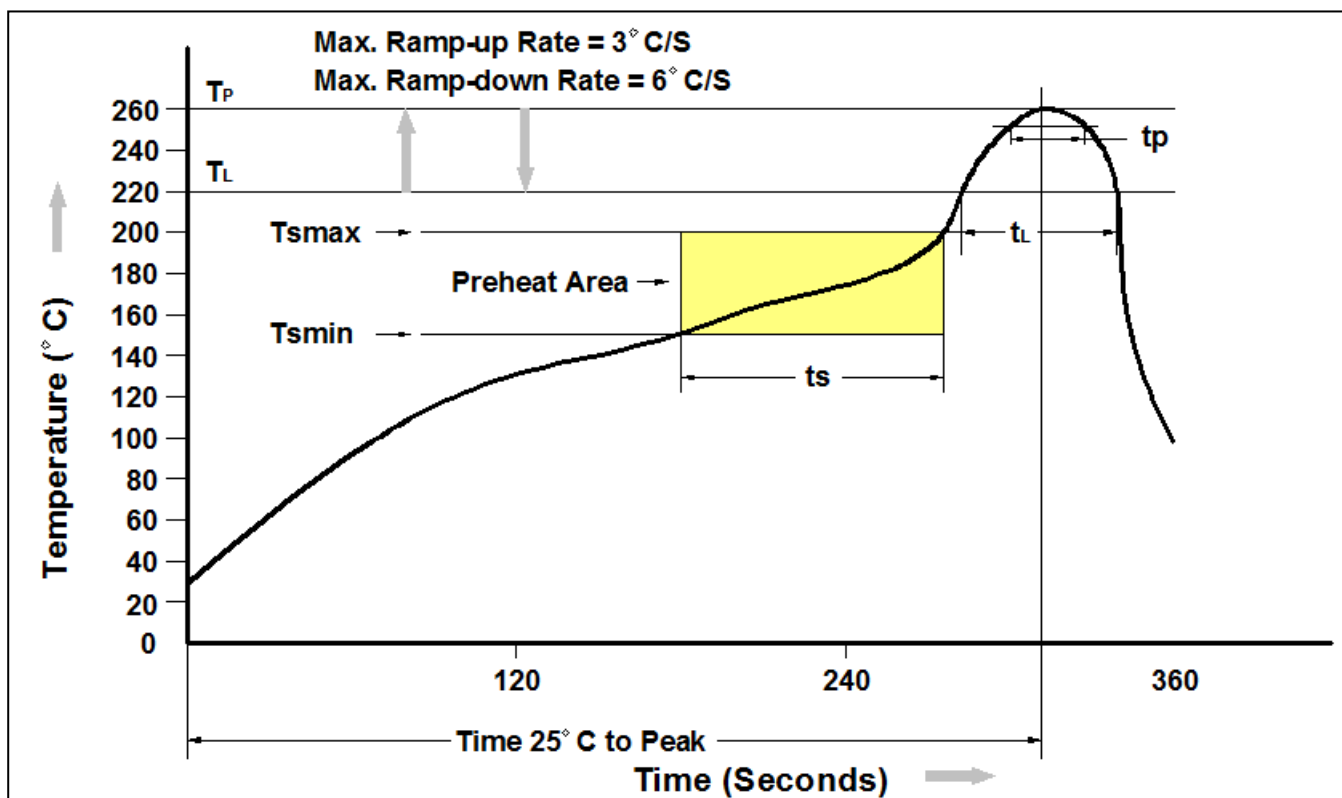
**Tape Dimension** *All dimensions are in mm, unless otherwise stated*





## SMD Type Phototransistor with Daylight Filter

### Reflow Profile



Profile Feature	Pb-Free Assembly Profile
Temperature Min. (Tsmmin)	150 °C
Temperature Max. (Tsmmax)	200 °C
Time (ts) from (Tsmmin to Tsmmax)	60-120 seconds
Ramp-up Rate (tL to tP)	3 °C/second max.
Liquidous Temperature (TL)	217 °C
Time (tL) Maintained Above (TL)	60 – 150 seconds
Peak Body Package Temperature	260 °C +0 °C / -5 °C
Time (tP) within 5 °C of 260 °C	30 seconds
Ramp-down Rate (TP to TL)	6 °C/second max
Time 25 °C to Peak Temperature	8 minutes max.





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