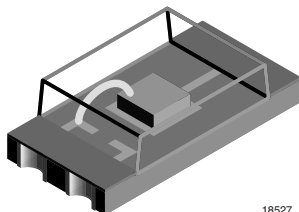


## Ambient Light Sensor



18527

### FEATURES

- Package type: surface mount
- Package form: 1206
- Dimensions (L x W x H in mm): 4 x 2 x 1.05
- AEC-Q101 qualified
- High photo sensitivity
- Adapted to human eye responsivity
- Angle of half sensitivity:  $\varphi = \pm 60^\circ$
- Floor life: 168 h, MSL 3, acc. J-STD-020
- Lead (Pb)-free reflow soldering
- Compliant to RoHS Directive 2002/95/EC and in accordance to WEEE 2002/96/EC

AUTOMOTIVE  
GRADE

RoHS  
COMPLIANT

GREEN  
(5-2008)\*\*

### Note

\*\* Please see document "Vishay Material Category Policy":  
[www.vishay.com/doc?99902](http://www.vishay.com/doc?99902)

### DESCRIPTION

TEMT6000X01 ambient light sensor is a silicon NPN epitaxial planar phototransistor in a miniature transparent 1206 package for surface mounting. It is sensitive to visible light much like the human eye and has peak sensitivity at 570 nm.

### APPLICATIONS

Ambient light sensor for control of display backlight dimming in LCD displays and keypad backlighting of mobile devices and in industrial on/off-lighting operation.

- Automotive sensors
- Mobile phones
- Notebook computers
- PDA's
- Cameras
- Dashboards

### PRODUCT SUMMARY

| COMPONENT   | $I_{PCE}$ ( $\mu A$ ) | $\varphi$ (deg) | $\lambda_{0.5}$ (nm) |
|-------------|-----------------------|-----------------|----------------------|
| TEMT6000X01 | 50                    | $\pm 60$        | 440 to 800           |

### Note

- Test condition see table "Basic Characteristics"

### ORDERING INFORMATION

| ORDERING CODE | PACKAGING     | REMARKS                      | PACKAGE FORM |
|---------------|---------------|------------------------------|--------------|
| TEMT6000X01   | Tape and reel | MOQ: 3000 pcs, 3000 pcs/reel | 1206         |

### Note

- MOQ: minimum order quantity

### ABSOLUTE MAXIMUM RATINGS ( $T_{amb} = 25^\circ C$ , unless otherwise specified)

| PARAMETER                 | TEST CONDITION | SYMBOL    | VALUE | UNIT |
|---------------------------|----------------|-----------|-------|------|
| Collector emitter voltage |                | $V_{CEO}$ | 6     | V    |
| Emitter collector voltage |                | $V_{ECO}$ | 1.5   | V    |
| Collector current         |                | $I_C$     | 20    | mA   |
| Power dissipation         |                | $P_V$     | 100   | mW   |

**ABSOLUTE MAXIMUM RATINGS** ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)

| PARAMETER                           | TEST CONDITION                                   | SYMBOL     | VALUE         | UNIT               |
|-------------------------------------|--------------------------------------------------|------------|---------------|--------------------|
| Junction temperature                |                                                  | $T_j$      | 100           | $^{\circ}\text{C}$ |
| Operating temperature range         |                                                  | $T_{amb}$  | - 40 to + 100 | $^{\circ}\text{C}$ |
| Storage temperature range           |                                                  | $T_{stg}$  | - 40 to + 100 | $^{\circ}\text{C}$ |
| Soldering temperature               | Acc. reflow solder profile fig. 8                | $T_{sd}$   | 260           | $^{\circ}\text{C}$ |
| Thermal resistance junction/ambient | Soldered on PCB with pad dimensions: 4 mm x 4 mm | $R_{thJA}$ | 450           | K/W                |

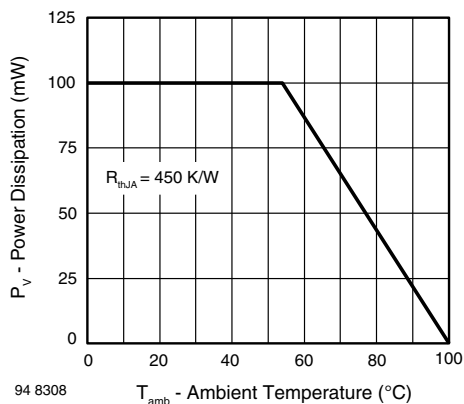


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

**BASIC CHARACTERISTICS** ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)

| PARAMETER                            | TEST CONDITION                                                              | SYMBOL          | MIN. | TYP.       | MAX. | UNIT          |
|--------------------------------------|-----------------------------------------------------------------------------|-----------------|------|------------|------|---------------|
| Collector emitter breakdown voltage  | $I_C = 0.1\text{ mA}$                                                       | $V_{CEO}$       | 6    |            |      | V             |
| Collector dark current               | $V_{CE} = 5\text{ V}$ , $E = 0$                                             | $I_{CEO}$       |      | 3          | 50   | nA            |
| Collector emitter capacitance        | $V_{CE} = 0\text{ V}$ , $f = 1\text{ MHz}$ , $E = 0$                        | $C_{CEO}$       |      | 16         |      | pF            |
| Collector light current              | $E_V = 20\text{ lx}$ , CIE illuminant A, $V_{CE} = 5\text{ V}$              | $I_{PCE}$       | 3.5  | 10         | 16   | $\mu\text{A}$ |
|                                      | $E_V = 100\text{ lx}$ , CIE illuminant A, $V_{CE} = 5\text{ V}$             | $I_{PCE}$       |      | 50         |      | $\mu\text{A}$ |
| Temperature coefficient of $I_{PCE}$ | CIE illuminant A                                                            | $TK_{IPCE}$     |      | 1.18       |      | %/K           |
|                                      | LED, white                                                                  | $TK_{IPCE}$     |      | 0.9        |      | %/K           |
| Angle of half sensitivity            |                                                                             | $\phi$          |      | $\pm 60$   |      | deg           |
| Wavelength of peak sensitivity       |                                                                             | $\lambda_p$     |      | 570        |      | nm            |
| Range of spectral bandwidth          |                                                                             | $\lambda_{0.5}$ |      | 440 to 800 |      | nm            |
| Collector emitter saturation voltage | $E_V = 20\text{ lx}$ , CIE illuminant A, $I_{PCE} = 1.2\text{ }\mu\text{A}$ | $V_{CEsat}$     |      | 0.1        |      | V             |

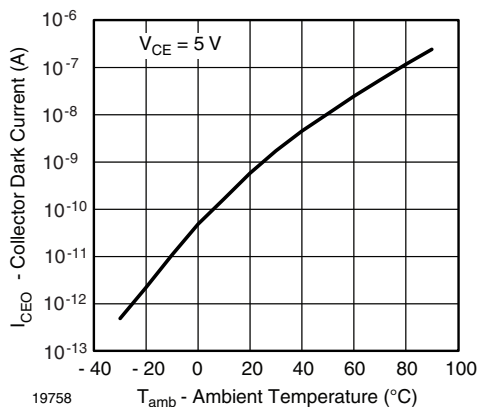
**BASIC CHARACTERISTICS** ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)


Fig. 1 - Collector Dark Current vs. Ambient Temperature

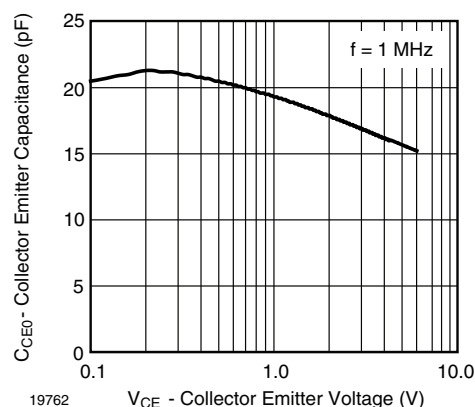


Fig. 4 - Collector Emitter Capacitance vs. Collector Emitter Voltage

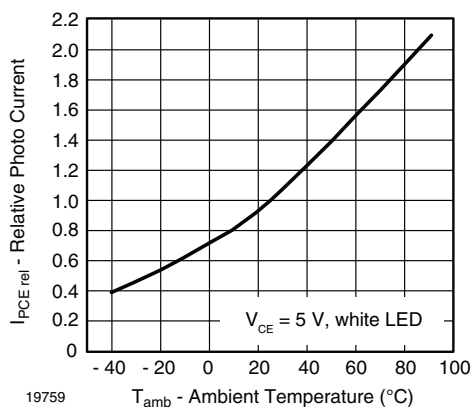


Fig. 2 - Relative Photo Current vs. Ambient Temperature

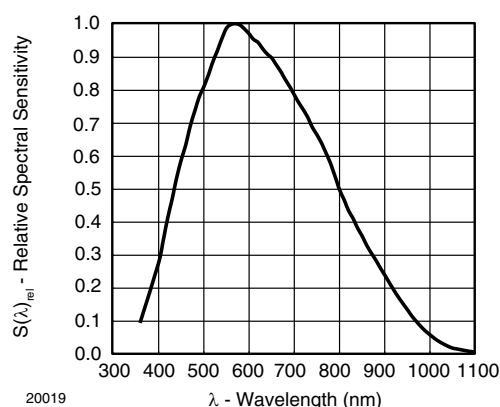


Fig. 5 - Relative Spectral Sensitivity vs. Wavelength

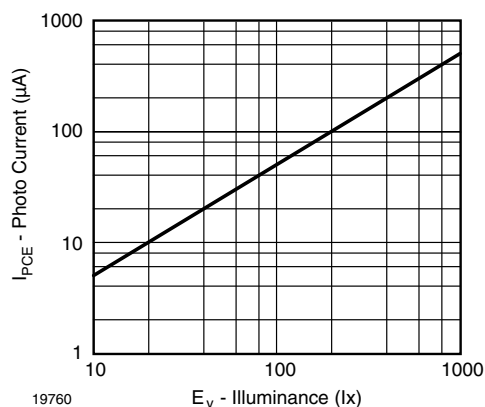


Fig. 3 - Photo Current vs. Illuminance

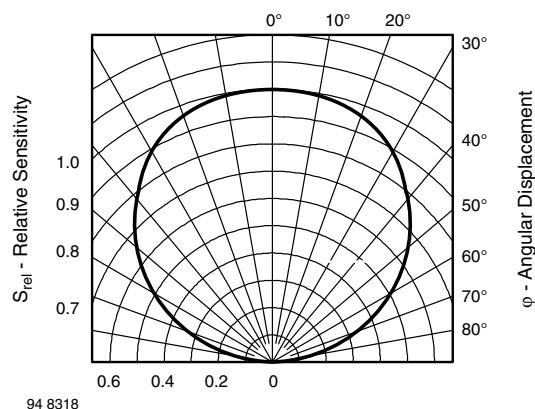


Fig. 6 - Relative Radiant Sensitivity vs. Angular Displacement

## REFLOW SOLDER PROFILE

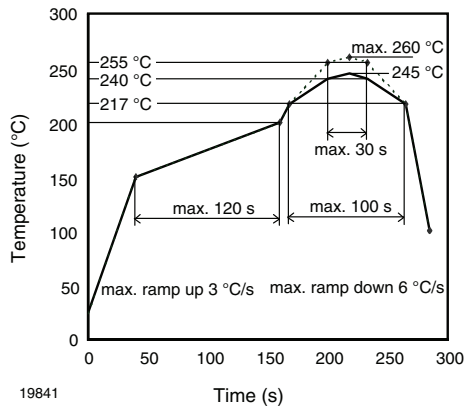


Fig. 7 - Lead (Pb)-free Reflow Solder Profile acc. J-STD-020D

## DRYPACK

Devices are packed in moisture barrier bags (MBB) to prevent the products from moisture absorption during transportation and storage. Each bag contains a desiccant.

## FLOOR LIFE

Time between soldering and removing from MBB must not exceed the time indicated in J-STD-020:

Moisture sensitivity: level 3

Floor life: 168 h

Conditions:  $T_{amb} < 30^{\circ}\text{C}$ , RH < 60 %

## DRYING

In case of moisture absorption devices should be baked before soldering. Conditions see J-STD-020 or label.

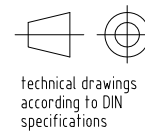
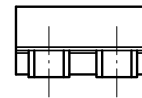
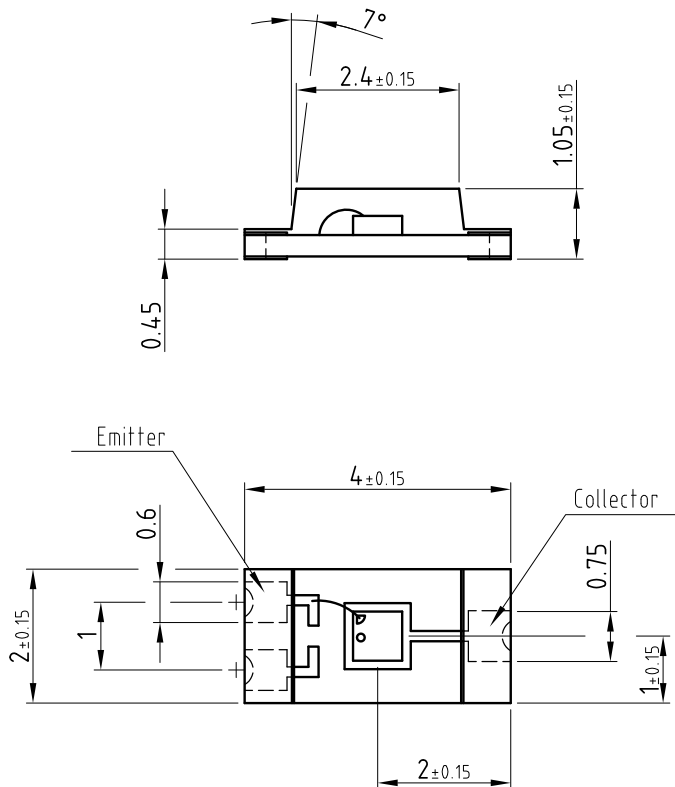
Devices taped on reel dry using recommended conditions:

192 h at  $40^{\circ}\text{C}$  (+ 5  $^{\circ}\text{C}$ ), RH < 5 %

or

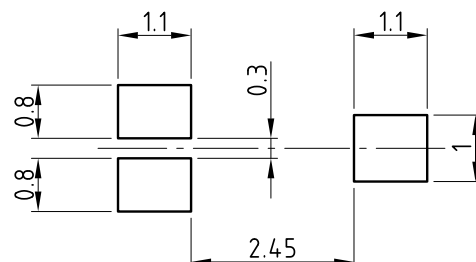
96 h at  $60^{\circ}\text{C}$  (+ 5  $^{\circ}\text{C}$ ), RH < 5 %.

## PACKAGE DIMENSIONS in millimeters



Not indicated tolerances  $\pm 0.1$

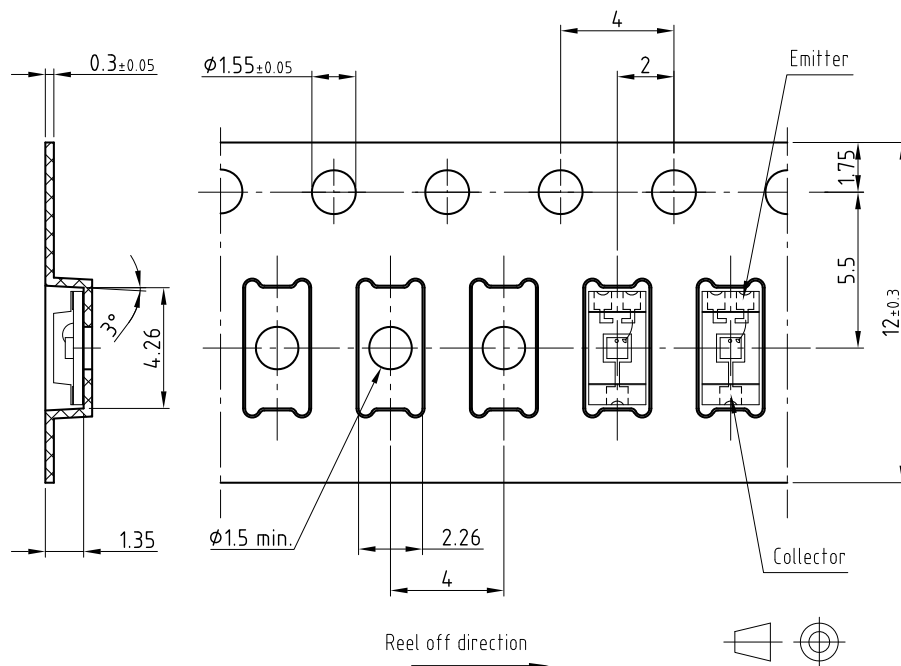
Recommended solder pad  
Footprint



Drawing-No.: 6.541-5053.01-4

Issue: 4; 05.05.08

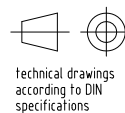
18464

**BLISTER TAPE DIMENSIONS** in millimeters


Drawing-No.: 9.700-5329.01-4

Issue: 1; 05.05.08

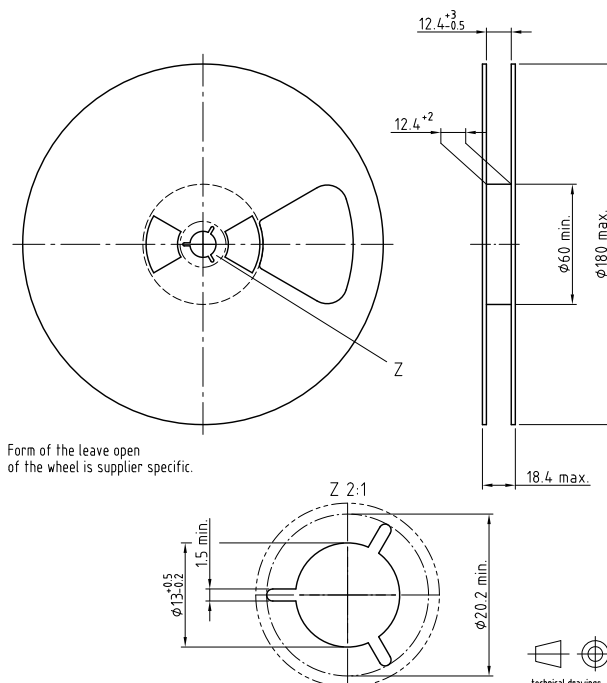
20876



Not indicated tolerances ±0.1

**REEL DIMENSIONS** in millimeters

Volume: 3000 pcs/reel



Form of the leave open of the wheel is supplier specific.

Drawing-No.: 9.800-5097.01-4

Issue: 1; 05.05.08

20874





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