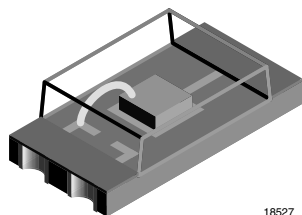


## Ambient Light Sensor, RoHS Compliant, Released for Lead (Pb)-free Reflow Soldering, AEC-Q101 Released



### FEATURES

- Package type: surface mount
- Package form: 1206
- Dimensions (L x W x H in mm): 4 x 2 x 1.05
- Product designed and qualified acc. AEC-Q101 for the automotive market
- High photo sensitivity
- Adapted to human eye responsivity
- Angle of half sensitivity:  $\varphi = \pm 60^\circ$
- Floor life: 72 h, MSL 4, acc. J-STD-020
- Lead (Pb)-free reflow soldering
- Lead (Pb)-free component in accordance with RoHS 2002/95/EC and WEEE 2002/96/EC


**RoHS**  
COMPLIANT

### 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

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

## Note

$T_{\text{amb}} = 25^{\circ}\text{C}$ , unless otherwise specified

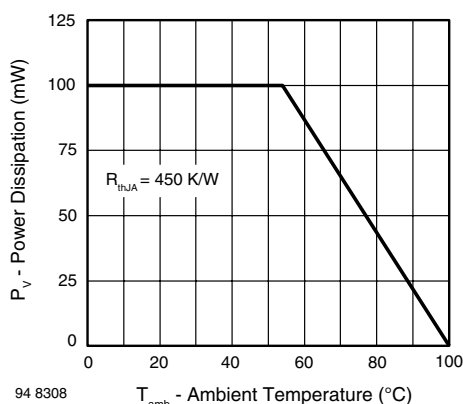


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

| BASIC CHARACTERISTICS                       |  |                           |      |            |      |               |
|---|--|---------------------------|------|------------|------|---------------|
| PARAMETER                                   | TEST CONDITION   | SYMBOL                    | MIN. | TYP.       | MAX. | UNIT          |
| Collector emitter breakdown voltage         | $I_C = 0.1 \text{ mA}$   | $V_{\text{CEO}}$          | 6    |            |      | V             |
| Collector dark current                      | $V_{\text{CE}} = 5 \text{ V}, E = 0$   | $I_{\text{CEO}}$          |      | 3          | 50   | nA            |
| Collector emitter capacitance               | $V_{\text{CE}} = 0 \text{ V}, f = 1 \text{ MHz}, E = 0$                      | $C_{\text{CEO}}$          |      | 16         |      | pF            |
| Collector light current                     | $E_V = 20 \text{ lx}$ , CIE illuminant A, $V_{\text{CE}} = 5 \text{ V}$      | $I_{\text{PCE}}$          | 3.5  | 10         | 16   | $\mu\text{A}$ |
|   | $E_V = 100 \text{ lx}$ , CIE illuminant A, $V_{\text{CE}} = 5 \text{ V}$     | $I_{\text{PCE}}$          |      | 50         |      | $\mu\text{A}$ |
| Temperature coefficient of $I_{\text{PCE}}$ | CIE illuminant A   | $\text{TK}_{\text{IPCE}}$ |      | 1.18       |      | %/K           |
|   | LED, white   | $\text{TK}_{\text{IPCE}}$ |      | 0.9        |      | %/K           |
| Angle of half sensitivity                   |  | $\varphi$                 |      | $\pm 60$   |      | 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, $I_{\text{PCE}} = 1.2 \mu\text{A}$ | $V_{\text{CEsat}}$        |      | 0.1        |      | V             |

## Note

$T_{\text{amb}} = 25^{\circ}\text{C}$ , unless otherwise specified



## BASIC CHARACTERISTICS

$T_{amb} = 25^{\circ}\text{C}$ , unless otherwise specified

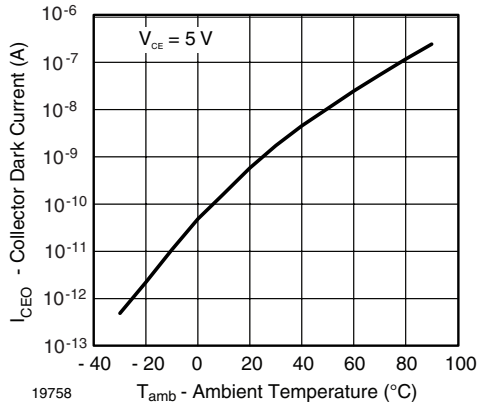


Fig. 2 - Collector Dark Current vs. Ambient Temperature

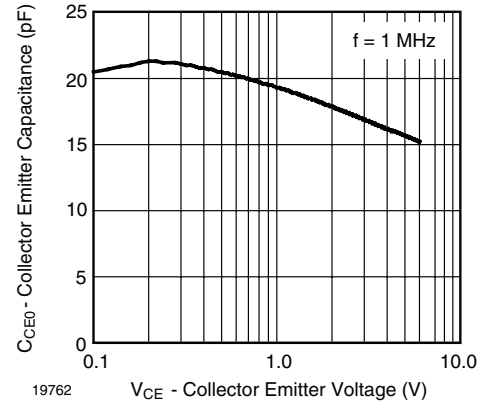


Fig. 5 - Collector Emitter Capacitance vs. Collector Emitter Voltage

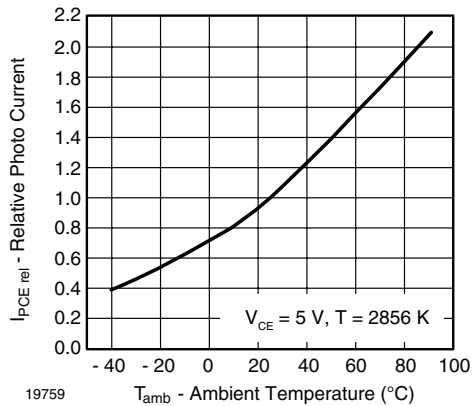


Fig. 3 - Relative Photo Current vs. Ambient Temperature

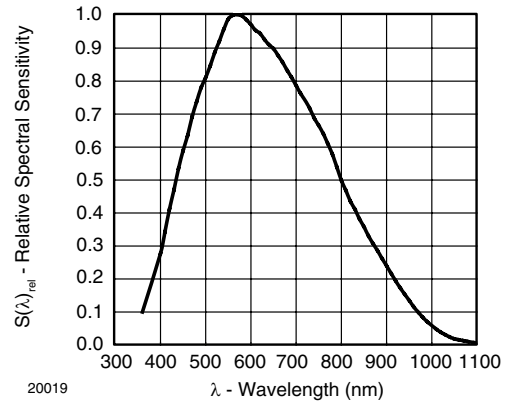


Fig. 6 - Relative Spectral Sensitivity vs. Wavelength

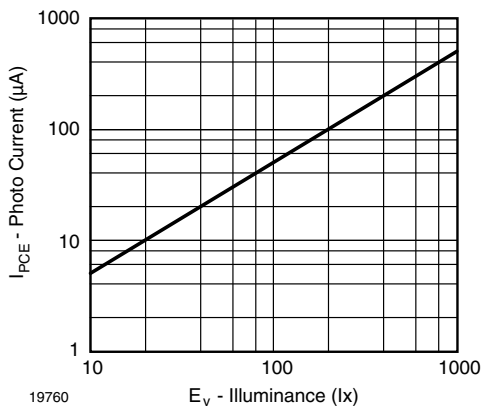


Fig. 4 - Photo Current vs. Illuminance

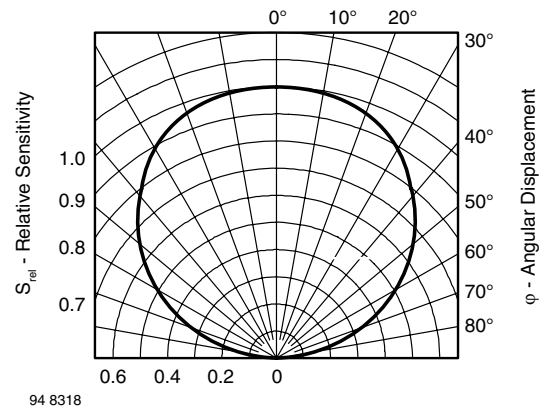


Fig. 7 - Relative Radiant Sensitivity vs. Angular Displacement

## REFLOW SOLDER PROFILE

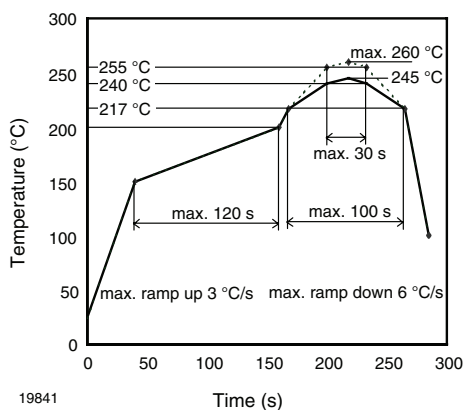


Fig. 8 - Lead (Pb)-free Reflow Solder Profile acc. J-STD-020D

## 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 4

Floor life: 72 h

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

## DRYING

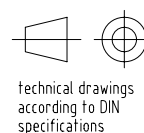
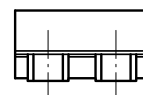
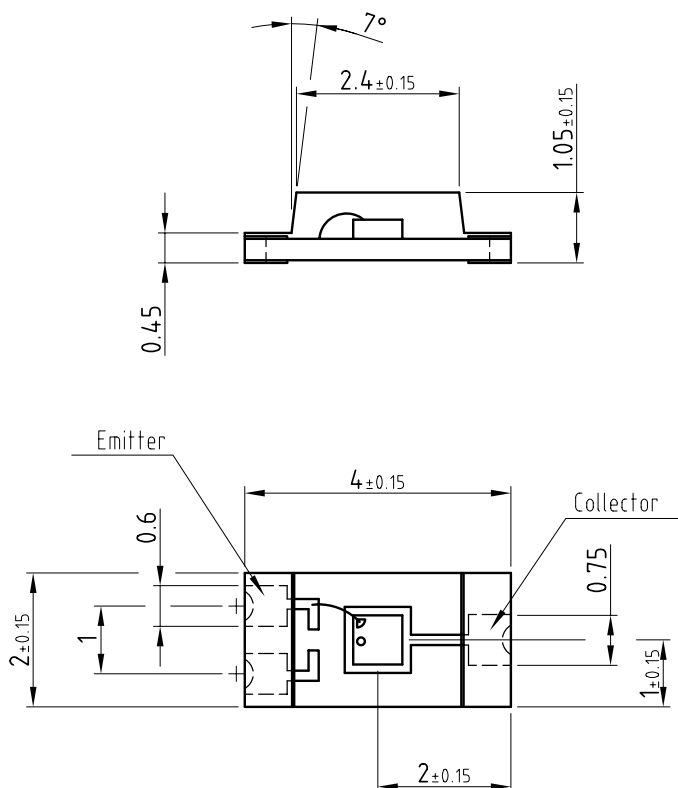
In case of moisture absorption devices should be baked before soldering. Conditions see J-STD-020 or recommended conditions:

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

or

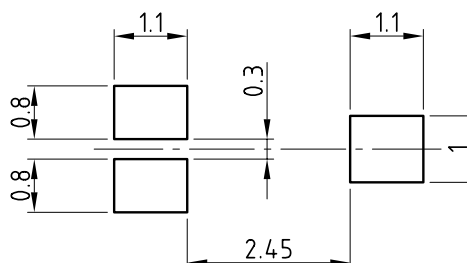
96 h at  $60\text{ °C}$  ( $+5\text{ °C}$ ),  $RH < 5\%$ .

## PACKAGE DIMENSIONS in millimeters



Not indicated tolerances  $\pm 0.1$

Recommended solder pad  
Footprint

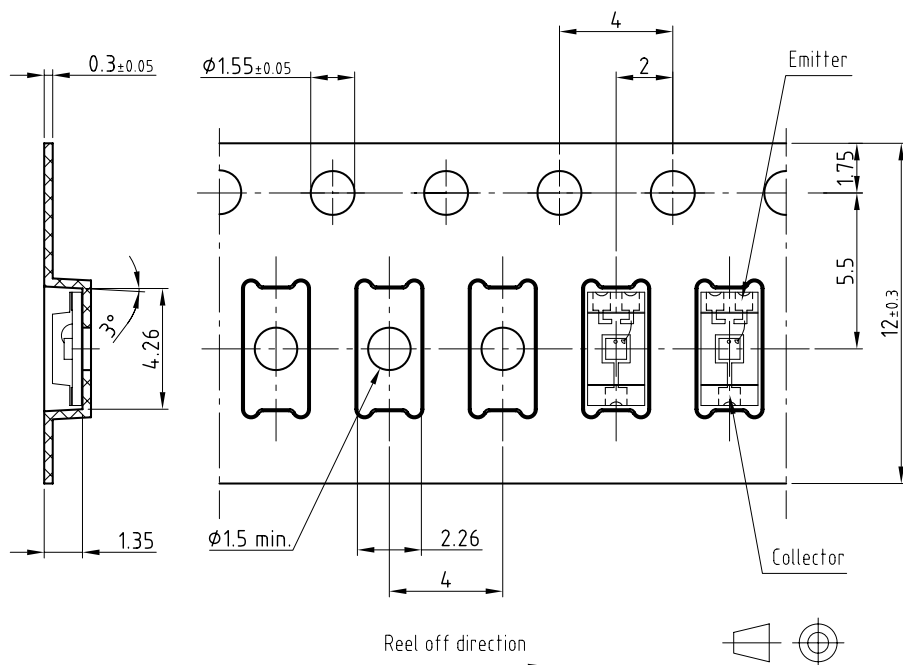


Drawing-No.: 6.541-5053.01-4

Issue: 4; 05.05.08

18464


Ambient Light Sensor, RoHS Compliant, Released for Vishay Semiconductors  
Lead (Pb)-free Reflow Soldering, AEC-Q101 Released

**BLISTER TAPE DIMENSIONS** in millimeters

Drawing-No.: 9.700-5329.01-4

Issue: 1: 05.05.08

20876

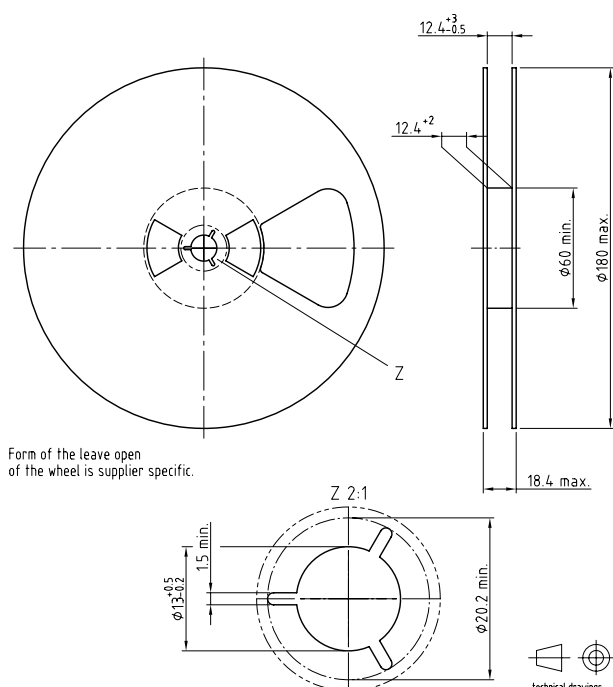


technical drawings  
according to DIN  
specifications

Not indicated tolerances  $\pm 0.1$

**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

technical drawings  
according to DIN  
specifications



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All product specifications and data are subject to change without notice.

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