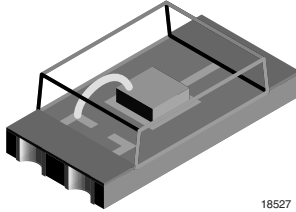


Ambient Light Sensor



18527

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.

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
(5-2009)**

Note

** Please see document "Vishay Material Category Policy":
www.vishay.com/doc?99902

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} (μA) | φ (deg) | $\lambda_{0.5}$ (nm) |
|-------------|-----------------------|-----------------|----------------------|
| TEMT6000X01 | 50 | ± 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 |

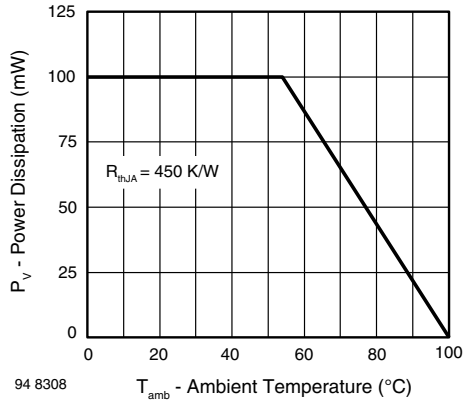


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

| 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 | μA |
| | $E_V = 100\text{ lx}$, CIE illuminant A, $V_{CE} = 5\text{ V}$ | I_{PCE} | | 50 | | μA |
| Temperature coefficient of I_{PCE} | CIE illuminant A | $TK_{I_{PCE}}$ | | 1.18 | | %/K |
| | LED, white | $TK_{I_{PCE}}$ | | 0.9 | | %/K |
| Angle of half sensitivity | | φ | | ± 60 | | deg |
| Wavelength of peak sensitivity | | λ_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)

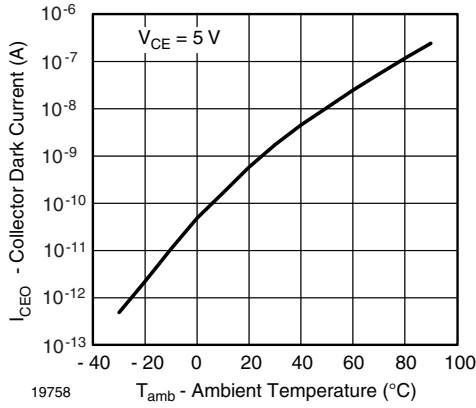


Fig. 1 - Collector Dark Current vs. Ambient Temperature

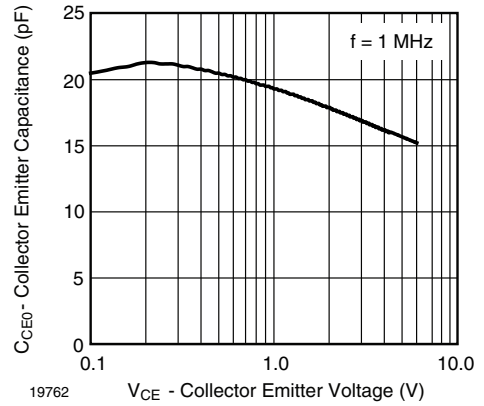


Fig. 4 - Collector Emitter Capacitance vs. Collector Emitter Voltage

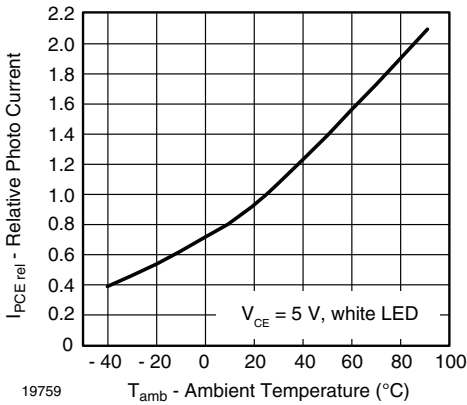


Fig. 2 - Relative Photo Current vs. Ambient Temperature

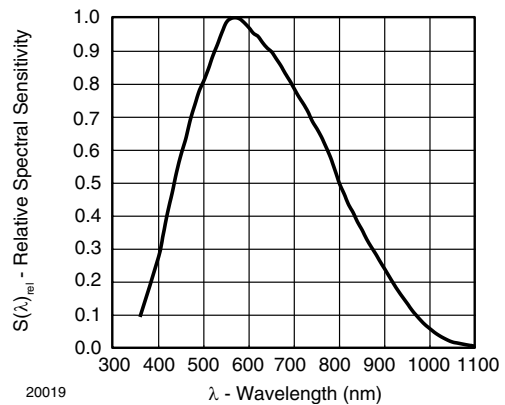


Fig. 5 - Relative Spectral Sensitivity vs. Wavelength

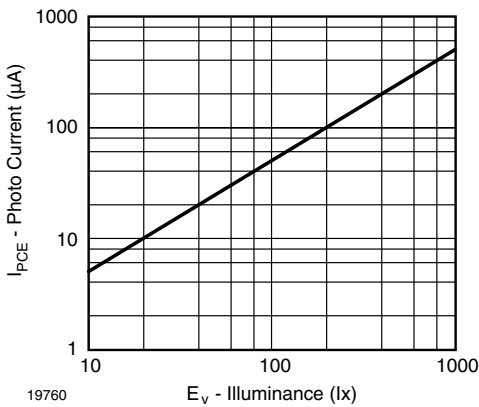


Fig. 3 - Photo Current vs. Illuminance

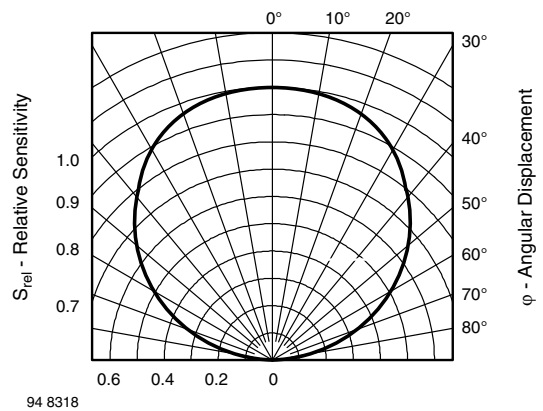


Fig. 6 - Relative Radiant Sensitivity vs. Angular Displacement

REFLOW SOLDER PROFILE

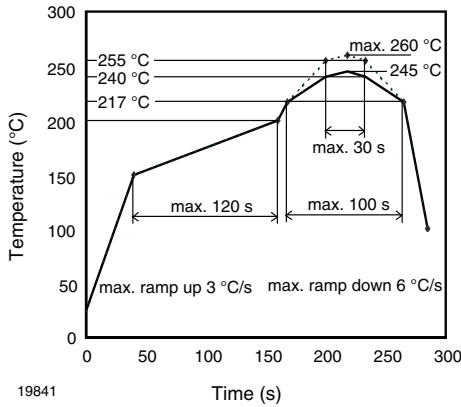


Fig. 7 - Lead (Pb)-free Reflow Solder Profile acc. J-STD-020D

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.

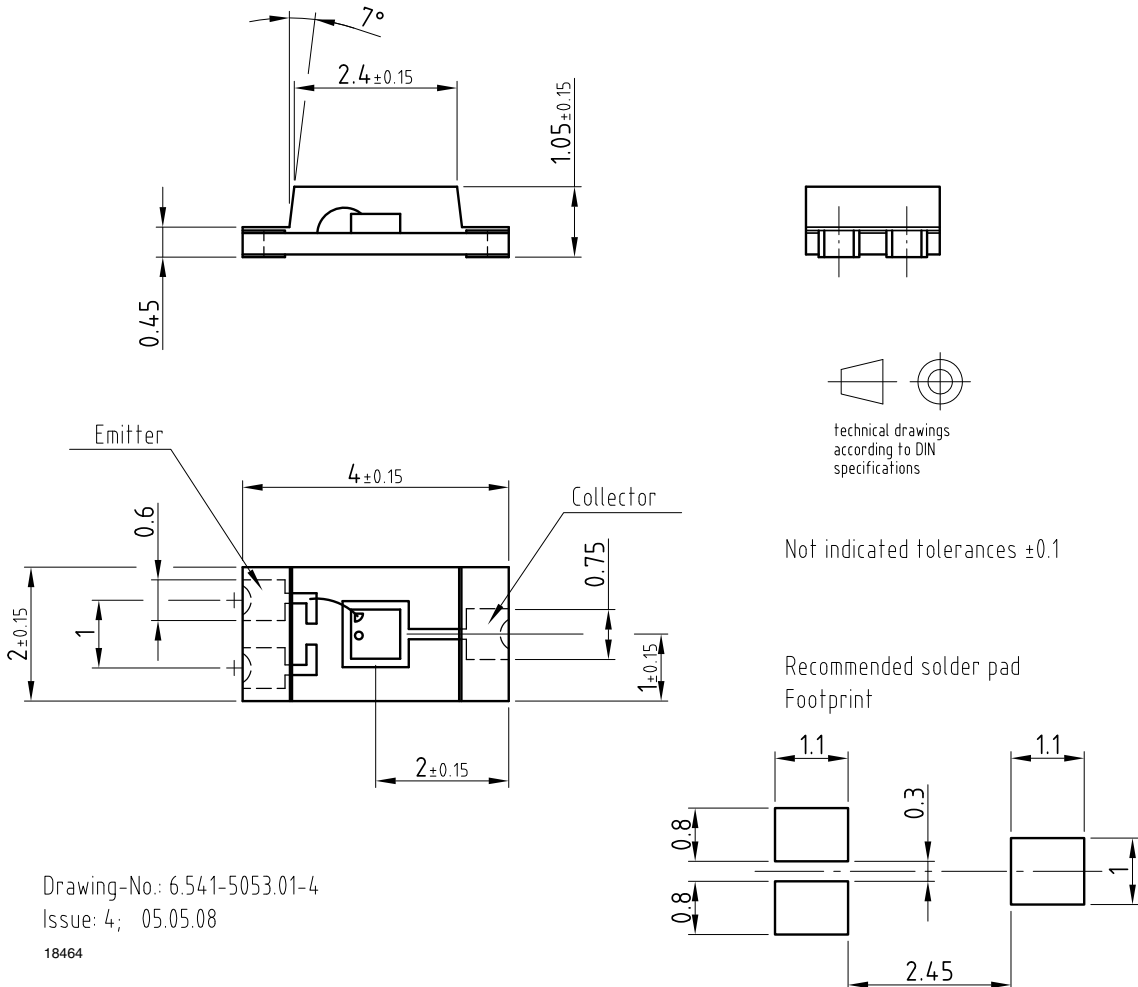
FLOOR LIFE

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: $T_{amb} < 30\text{ }^{\circ}\text{C}$, 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 °C (+ 5 °C), RH < 5 %
 or
 96 h at 60 °C (+ 5 °C), RH < 5 %.

PACKAGE DIMENSIONS in millimeters

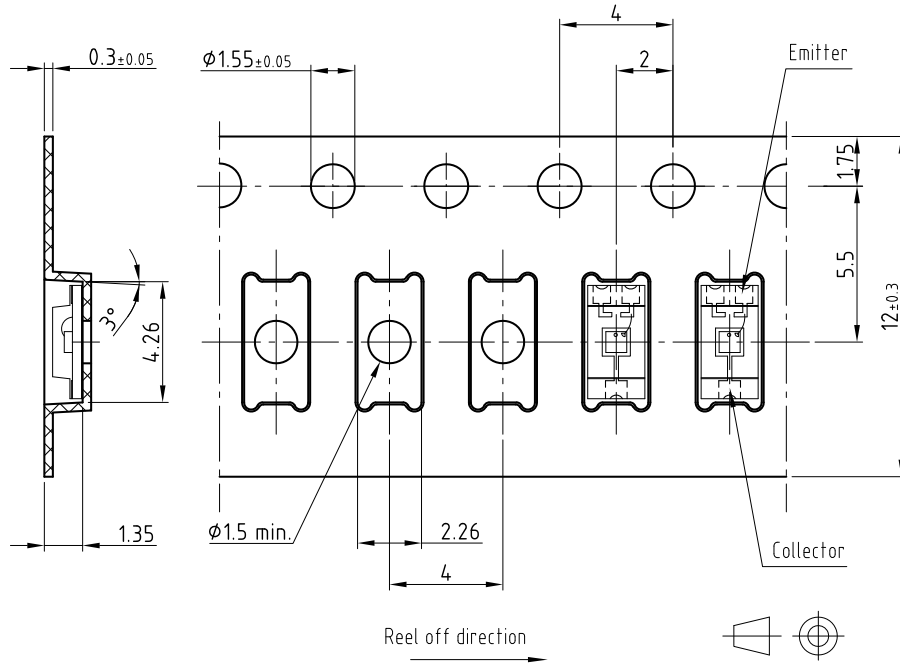


Drawing-No.: 6.541-5053.01-4
 Issue: 4; 05.05.08
 18464

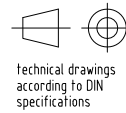
Not indicated tolerances ±0.1

Recommended solder pad
 Footprint

BLISTER TAPE DIMENSIONS in millimeters



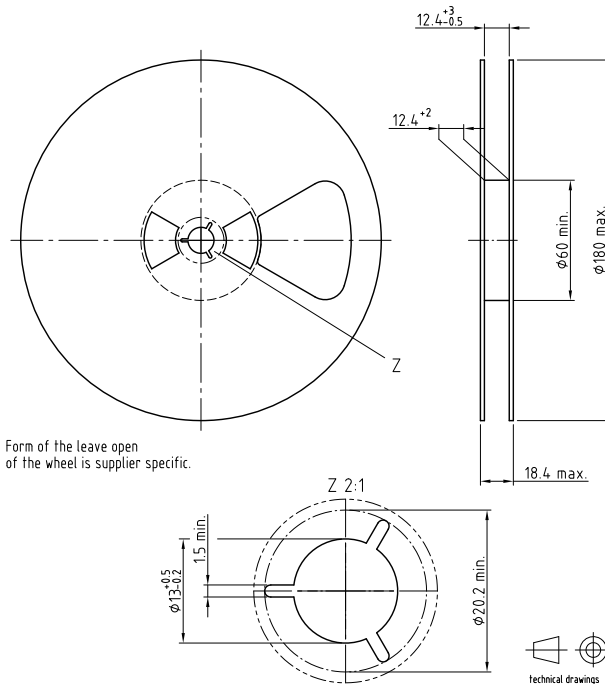
Drawing-No.: 9.700-5329.01-4
 Issue: 1; 05.05.08
 20876



Not indicated tolerances ±0.1

REEL DIMENSIONS in millimeters

Volume: 3000 pcs/reel



Drawing-No.: 9.800-5097.01-4
 Issue: 1; 05.05.08
 20874





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