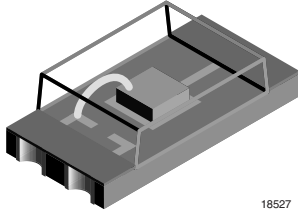




Ambient Light Sensor



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

Note

** Please see document "Vishay Material Category Policy": 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} (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 |

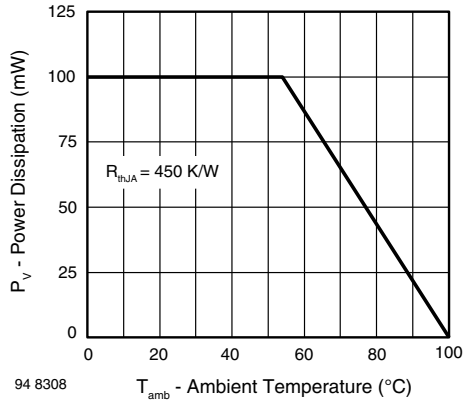


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

| 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)

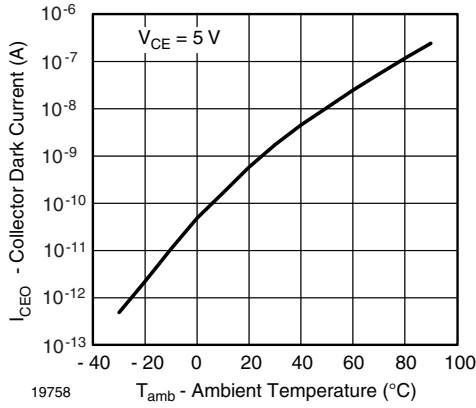


Fig. 1 - Collector Dark Current vs. Ambient Temperature

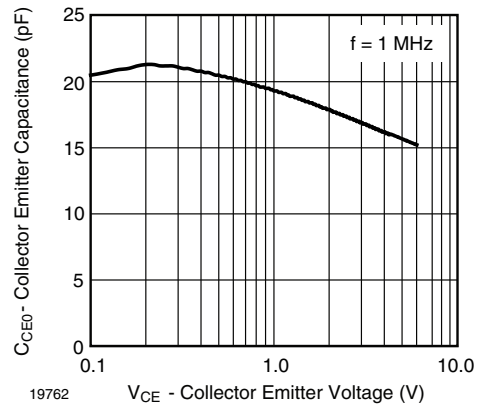


Fig. 4 - Collector Emitter Capacitance vs. Collector Emitter Voltage

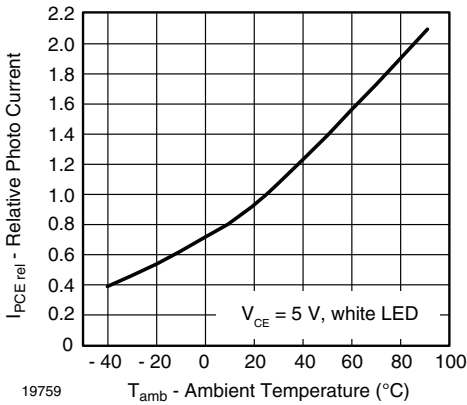


Fig. 2 - Relative Photo Current vs. Ambient Temperature

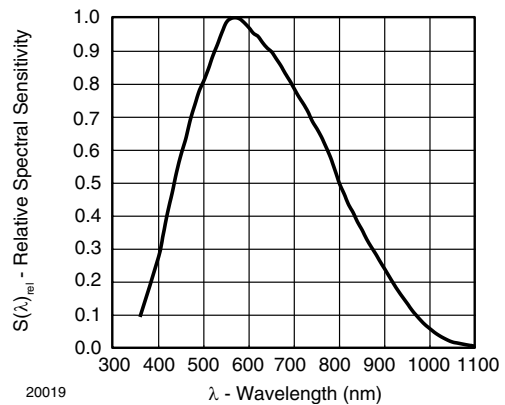


Fig. 5 - Relative Spectral Sensitivity vs. Wavelength

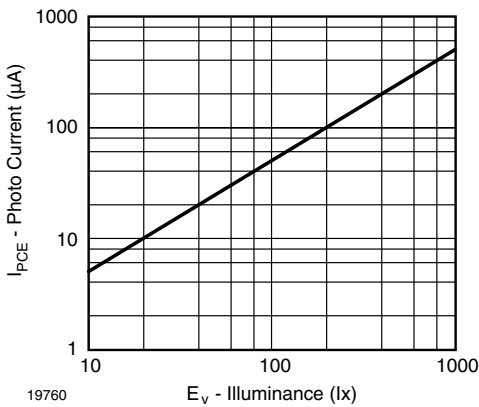


Fig. 3 - Photo Current vs. Illuminance

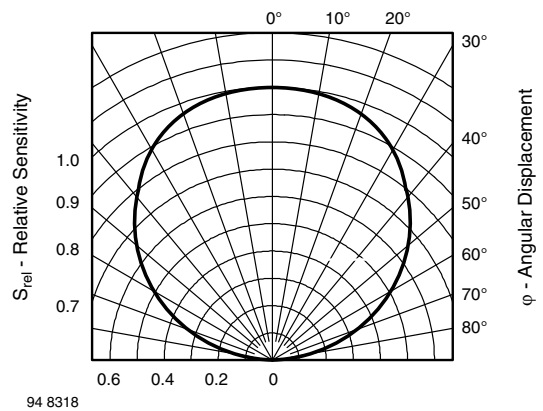


Fig. 6 - Relative Radiant Sensitivity vs. Angular Displacement

REFLOW SOLDER PROFILE

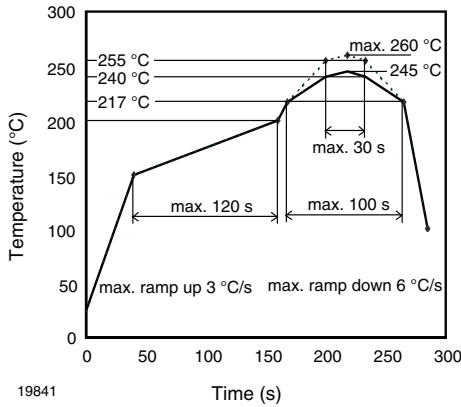


Fig. 7 - Lead (Pb)-free Reflow Solder Profile acc. J-STD-020D

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.

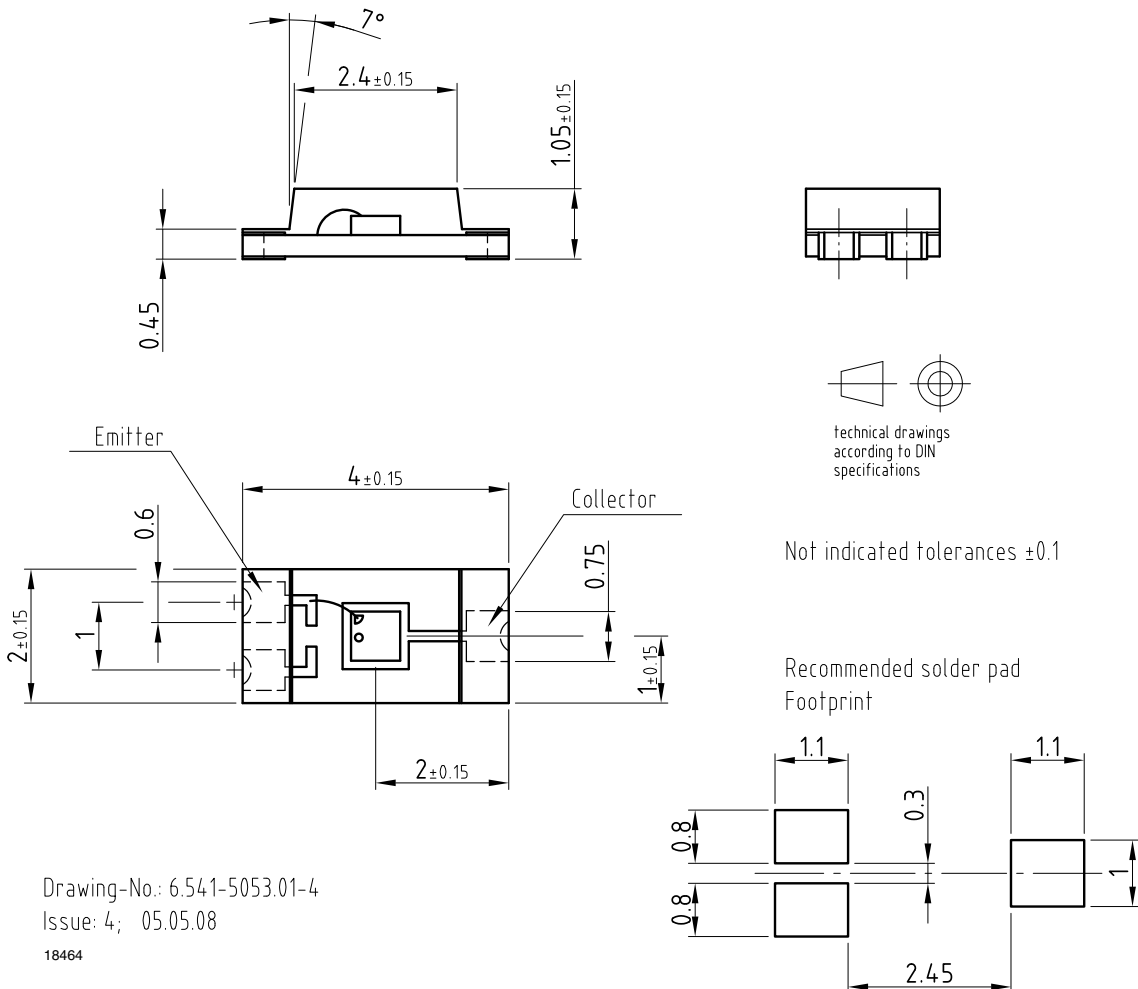
FLOOR LIFE

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



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