

Ambient Light Sensor



20118

DESCRIPTION

TEPT5700 ambient light sensor is a silicon NPN epitaxial planar phototransistor in a T-1 $\frac{3}{4}$ package. It is sensitive to visible light much like the human eye and has peak sensitivity at 570 nm.

FEATURES

- Package type: leaded
- Package form: T-1 $\frac{3}{4}$
- Dimensions (in mm): \varnothing 5
- High photo sensitivity
- Adapted to human eye responsivity
- Angle of half sensitivity: $\varphi = \pm 50^\circ$
- Material categorization:
for definitions of compliance please see www.vishay.com/doc?99912



RoHS
COMPLIANT
HALOGEN
FREE
GREEN
(5-2008)

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

PRODUCT SUMMARY

| COMPONENT | I _{PCE} (μA) | φ (deg) | λ _{0.5} (nm) |
|-----------|-----------------------|---------|-----------------------|
| TEPT5700 | 75 | ± 50 | 440 to 800 |

Note

- Test condition see table “Basic Characteristics”

ORDERING INFORMATION

| ORDERING CODE | PACKAGING | REMARKS | PACKAGE FORM |
|---------------|-----------|--|-------------------|
| TEPT5700 | Bulk | MOQ: 4000 pcs, 4000 pcs/bulk. Label with I _{PCE} group on each bulk. Specifications of group A/B/C see table “Type Dedicated Characteristics” on page 2 | T-1 $\frac{3}{4}$ |

Note

- MOQ: minimum order quantity

ABSOLUTE MAXIMUM RATINGS (T_{amb} = 25 °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 | T _{amb} ≤ 55 °C | P _V | 100 | mW |
| Junction temperature | | T _j | 100 | °C |
| Operating temperature range | | T _{amb} | -40 to +85 | °C |
| Storage temperature range | | T _{stg} | -40 to +100 | °C |
| Soldering temperature | t ≤ 5 s, 2 mm distance to package | T _{sd} | 260 | °C |
| Thermal resistance junction/ambient | J-STD-051, soldered on PCB | R _{thJA} | 230 | K/W |

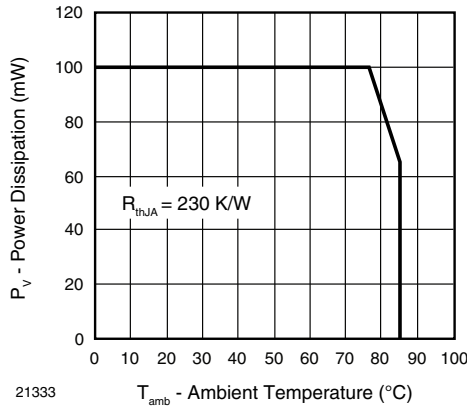


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

| 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 | $E_v = 20\text{ lx}, \text{CIE illuminant A}, V_{CE} = 5\text{ V}$ | I_{PCE} | 5.2 | | 24 | μA |
| | $E_v = 100\text{ lx}, \text{CIE illuminant A}, V_{CE} = 5\text{ V}$ | I_{PCE} | | 75 | | μA |
| Angle of half sensitivity | | φ | | ± 50 | | deg |
| Wavelength of peak sensitivity | | λ_p | | 570 | | nm |
| Range of spectral bandwidth | | $\lambda_{0.5}$ | | 440 to 800 | | nm |
| Collector emitter saturation voltage | $E_v = 20\text{ lx}, \text{CIE illuminant A}, I_{PCE} = 1.2\text{ }\mu\text{A}$ | V_{CEsat} | | 0.1 | | V |

| TYPE DEDICATED CHARACTERISTICS | | | | | | |
|---------------------------------------|--|--------------|-----------|------|------|---------------|
| PARAMETER | TEST CONDITION | BINNED GROUP | SYMBOL | MIN. | MAX. | UNIT |
| Photo current | $E_v = 20\text{ lx}, \text{CIE illuminant A}, V_{CE} = 5\text{ V}, T_{amb} = 25\text{ }^{\circ}\text{C}$ | A | I_{PCE} | 5.2 | 9.9 | μA |
| | | B | I_{PCE} | 8.2 | 15.4 | μA |
| | | C | I_{PCE} | 12.7 | 24 | μA |

Note

- Each 4000 piece bag will contain a single group. The label on the bag will indicate which binned group is in the bag. A specific group cannot be ordered. Production shipments containing multiple bags will likely include multiple groups. Please design accordingly.

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

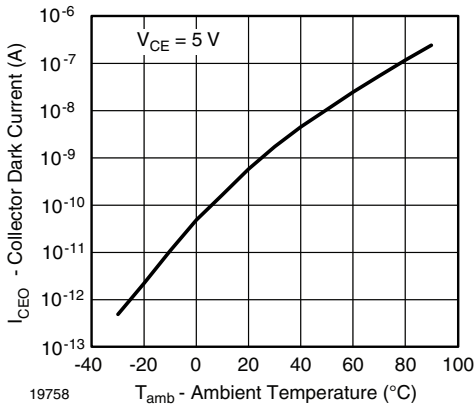


Fig. 2 - Collector Dark Current vs. Ambient Temperature

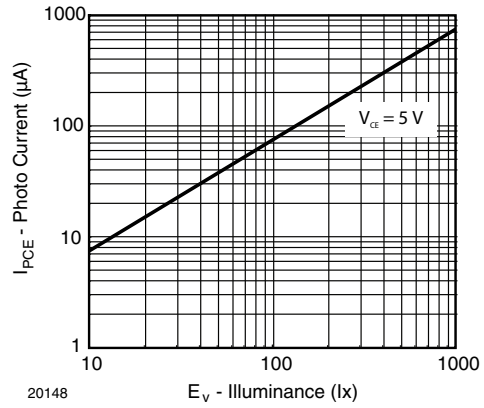


Fig. 5 - Photo Current vs. Illuminance

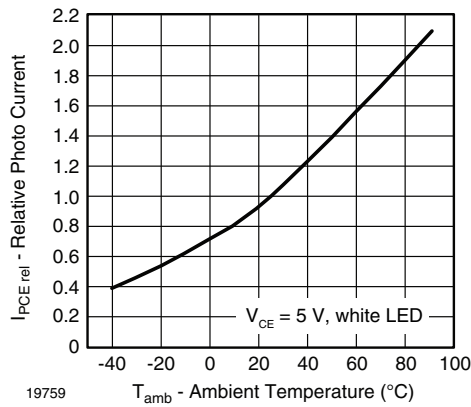


Fig. 3 - Relative Photo Current vs. Ambient Temperature

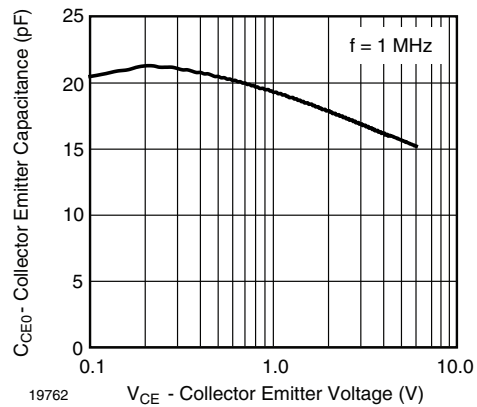


Fig. 6 - Collector Emitter Capacitance vs. Collector Emitter Voltage

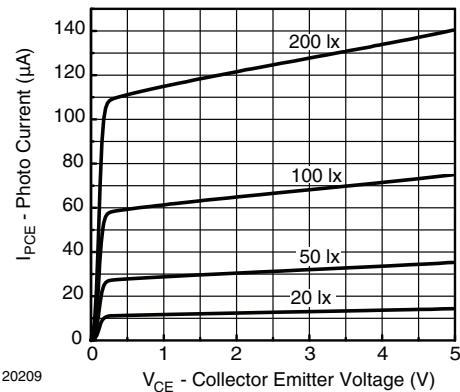


Fig. 4 - Photo Current vs. Collector Emitter Voltage

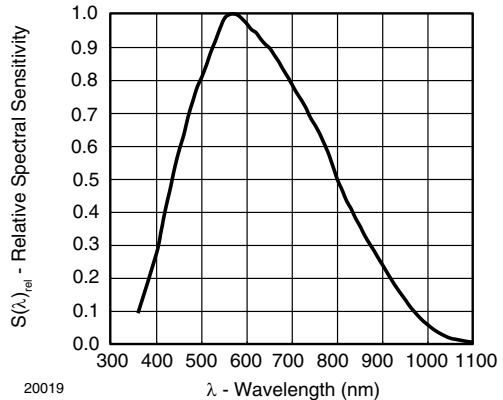


Fig. 7 - Relative Spectral Sensitivity vs. Wavelength

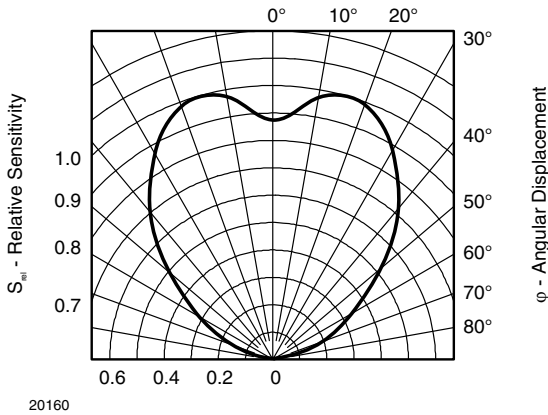
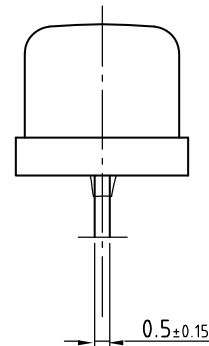
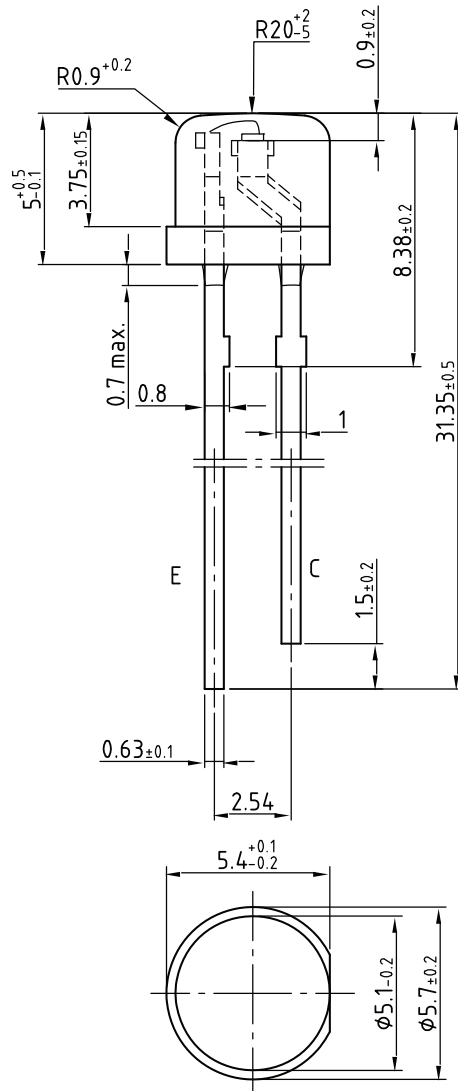


Fig. 8 - Relative Radiant Sensitivity vs. Angular Displacement

PACKAGE DIMENSIONS in millimeters



technical drawings according to DIN specifications

Dimensions in mm
Not indicated tolerances ±0.1

Drawing-No.: 6.544-5375.01-4
Issue: 3; 10.11.06
20117



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