

## 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](http://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 <sub>PCE</sub> (μA) | φ (deg) | λ <sub>0.5</sub> (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 <sub>PCE</sub> 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<sub>amb</sub> = 25 °C, unless otherwise specified)

| PARAMETER                           | TEST CONDITION                    | SYMBOL            | VALUE       | UNIT |
|-------------------------------------|-----------------------------------|-------------------|-------------|------|
| Collector emitter voltage           |                                   | V <sub>CEO</sub>  | 6           | V    |
| Emitter collector voltage           |                                   | V <sub>ECO</sub>  | 1.5         | V    |
| Collector current                   |                                   | I <sub>C</sub>    | 20          | mA   |
| Power dissipation                   | T <sub>amb</sub> ≤ 55 °C          | P <sub>V</sub>    | 100         | mW   |
| Junction temperature                |                                   | T <sub>j</sub>    | 100         | °C   |
| Operating temperature range         |                                   | T <sub>amb</sub>  | -40 to +85  | °C   |
| Storage temperature range           |                                   | T <sub>stg</sub>  | -40 to +100 | °C   |
| Soldering temperature               | t ≤ 5 s, 2 mm distance to package | T <sub>sd</sub>   | 260         | °C   |
| Thermal resistance junction/ambient | J-STD-051, soldered on PCB        | R <sub>thJA</sub> | 230         | K/W  |



Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

| <b>BASIC CHARACTERISTICS</b> ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , 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   | $\mu\text{A}$ |
|   | $E_v = 100\text{ lx}, \text{CIE illuminant A}, V_{CE} = 5\text{ V}$             | $I_{PCE}$       |      | 75         |      | $\mu\text{A}$ |
| Angle of half sensitivity   |   | $\varphi$       |      | $\pm 50$   |      | deg           |
| Wavelength of peak sensitivity  |   | $\lambda_p$     |      | 570        |      | nm            |
| Range of spectral bandwidth   |   | $\lambda_{0.5}$ |      | 440 to 800 |      | nm            |
| Collector emitter saturation voltage  | $E_v = 20\text{ lx}, \text{CIE illuminant A}, I_{PCE} = 1.2\text{ }\mu\text{A}$ | $V_{CEsat}$     |      | 0.1        |      | V             |

| <b>TYPE DEDICATED CHARACTERISTICS</b> |  |              |           |      |      |               |
|---------------------------------------|--|--------------|-----------|------|------|---------------|
| 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  | $\mu\text{A}$ |
|                                       |  | B            | $I_{PCE}$ | 8.2  | 15.4 | $\mu\text{A}$ |
|                                       |  | C            | $I_{PCE}$ | 12.7 | 24   | $\mu\text{A}$ |

**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

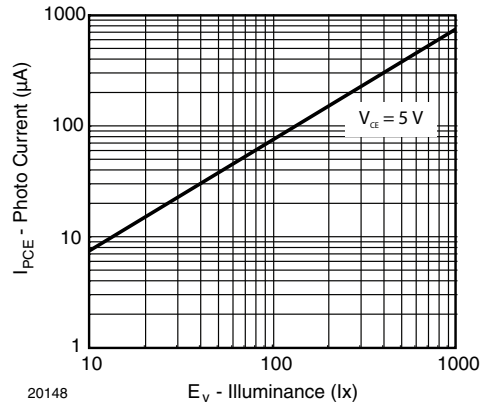


Fig. 5 - Photo Current vs. Illuminance

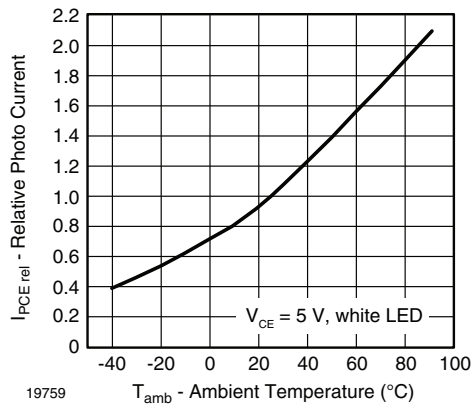


Fig. 3 - Relative Photo Current vs. Ambient Temperature

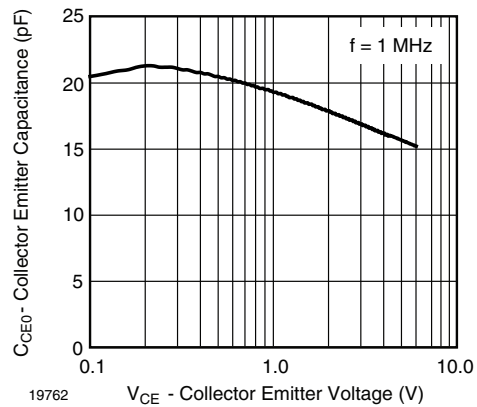


Fig. 6 - Collector Emitter Capacitance vs. Collector Emitter Voltage

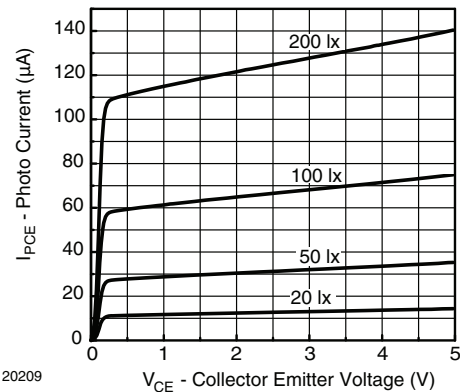


Fig. 4 - Photo Current vs. Collector Emitter Voltage

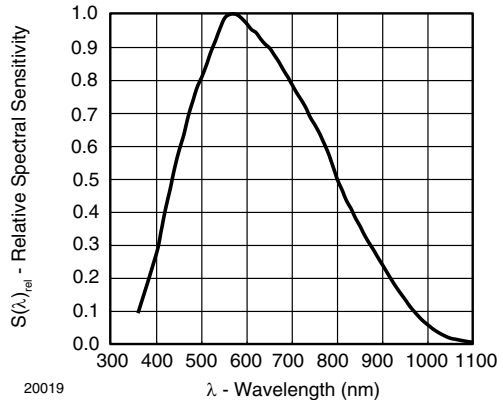


Fig. 7 - Relative Spectral Sensitivity vs. Wavelength

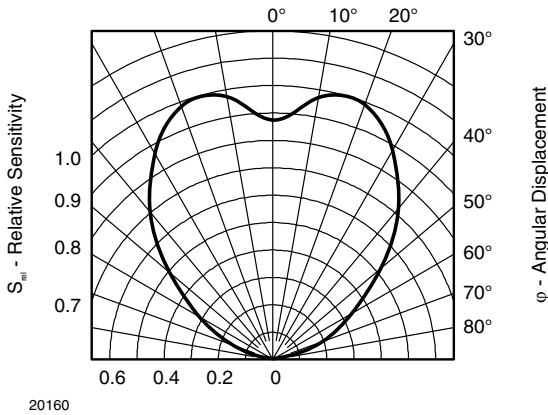
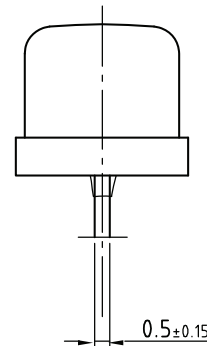
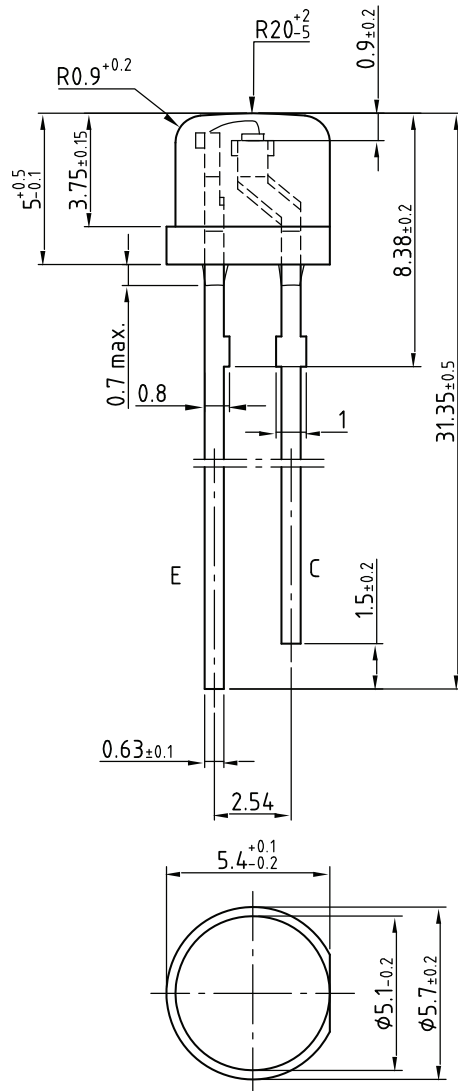


Fig. 8 - Relative Radiant Sensitivity vs. Angular Displacement

**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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