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Vishay Semiconductor/Opto Division
TEPT5700

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# Ambient Light Sensor

20118

## FEATURES

- Package type: leaded
- Package form: T-1¾
- Dimensions (in mm): Ø 5
- High photo sensitivity
- Adapted to human eye responsivity
- Angle of half sensitivity: φ = ± 50°
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

Pb-free
e4
RoHS COMPLIANT
HALOGEN FREE
GREEN (5-2008)

## DESCRIPTION

TEPT5700 ambient light sensor is a silicon NPN epitaxial planar phototransistor in a T-1¾ package. 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

| PRODUCT SUMMARY | | | |
|---|---|---|---|
| COMPONENT | $I_{PCE}$ (µA) | φ (deg) | $\lambda_{0.5}$ (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-1¾ |

**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 | $T_{amb} \leq 55$ °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 |

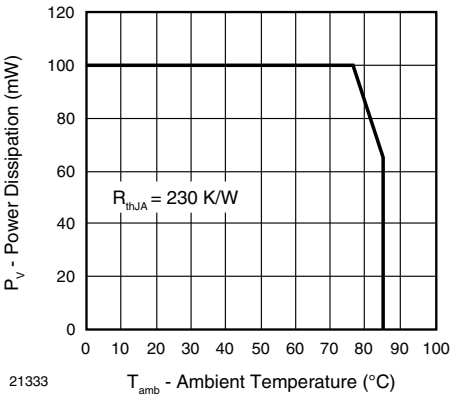



Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

| **BASIC CHARACTERISTICS** ($T_{amb}$ = 25 °C, unless otherwise specified) | | | | | | |
|---|---|---|---|---|---|---|
| **PARAMETER** | **TEST CONDITION** | **SYMBOL** | **MIN.** | **TYP.** | **MAX.** | **UNIT** |
| Collector emitter breakdown voltage | $I_C$ = 0.1 mA | $V_{CEO}$ | 6 | | | V |
| Collector dark current | $V_{CE}$ = 5 V, E = 0 | $I_{CEO}$ | | 3 | 50 | nA |
| Collector emitter capacitance | $V_{CE}$ = 0 V, f = 1 MHz, E = 0 | $C_{CEO}$ | | 16 | | pF |
| Collector light current | $E_v$ = 20 lx, CIE illuminant A, $V_{CE}$ = 5 V | $I_{PCE}$ | 5.2 | | 24 | µA |
| | $E_v$ = 100 lx, CIE illuminant A, $V_{CE}$ = 5 V | $I_{PCE}$ | | 75 | | µA |
| Angle of half sensitivity | | φ | | ± 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 lx, CIE illuminant A, $I_{PCE}$ = 1.2 µA | $V_{CEsat}$ | | 0.1 | | V |

| **TYPE DEDICATED CHARACTERISTICS** | | | | | | |
|---|---|---|---|---|---|---|
| **PARAMETER** | **TEST CONDITION** | **BINNED GROUP** | **SYMBOL** | **MIN.** | **MAX.** | **UNIT** |
| Photo current | $E_V$ = 20 lx, CIE illuminant A, $V_{CE}$ = 5 V, $T_{amb}$ = 25 °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 °C, unless otherwise specified)

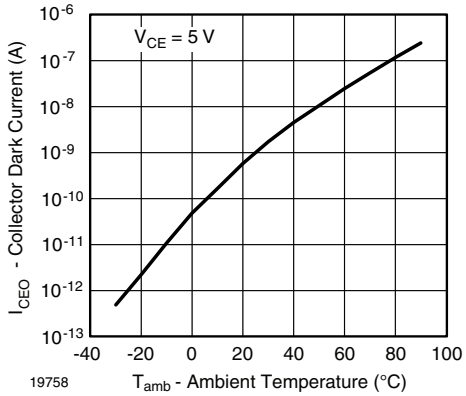



Fig. 2 - Collector Dark Current vs. Ambient Temperature

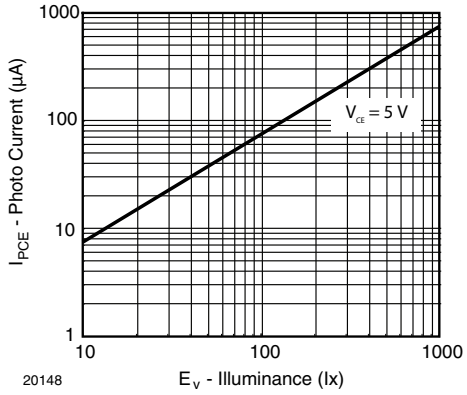



Fig. 5 - Photo Current vs. Illuminance

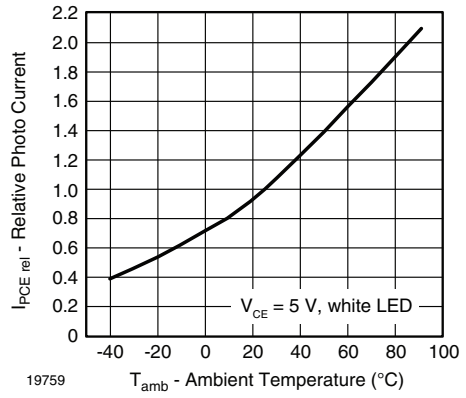



Fig. 3 - Relative Photo Current vs. Ambient Temperature

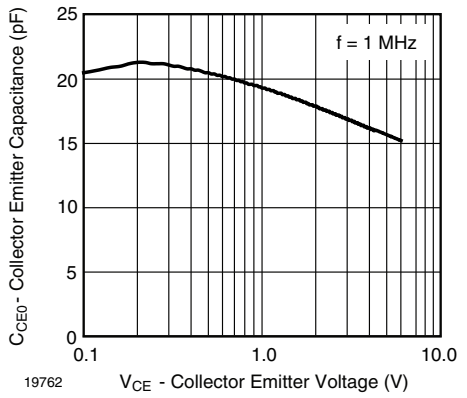



Fig. 6 - Collector Emitter Capacitance vs. Collector Emitter Voltage

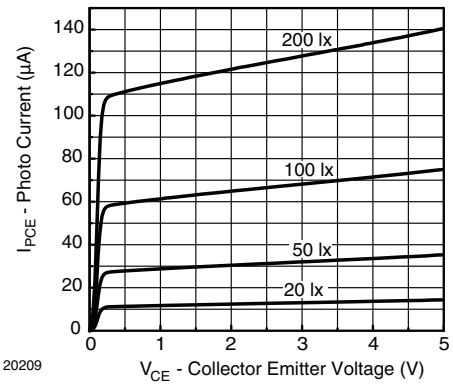



Fig. 4 - Photo Current vs. Collector Emitter Voltage

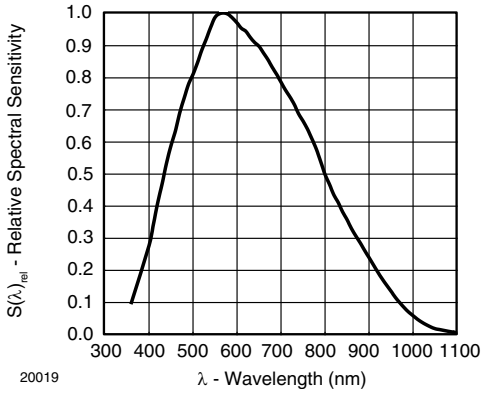



Fig. 7 - Relative Spectral Sensitivity vs. Wavelength

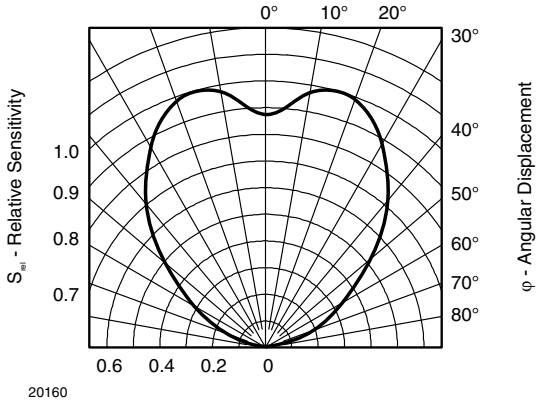
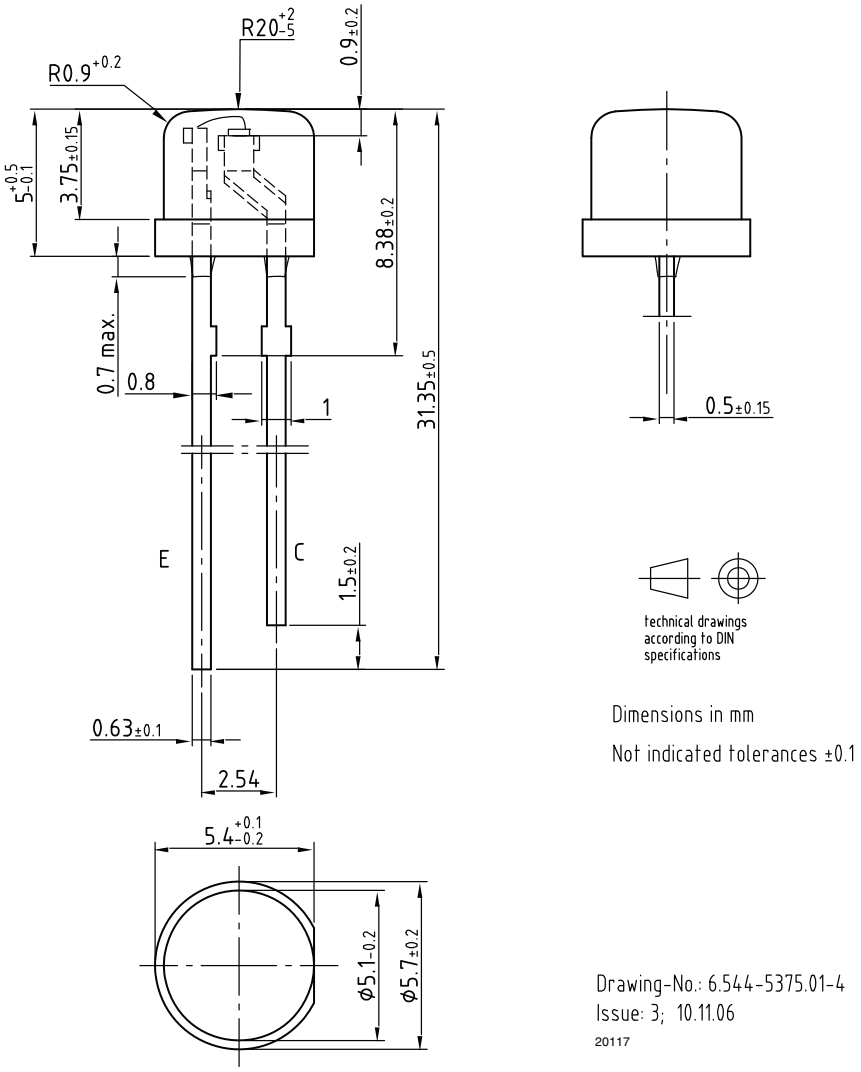



Fig. 8 - Relative Radiant Sensitivity vs. Angular Displacement

## **PACKAGE DIMENSIONS** in millimeters



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