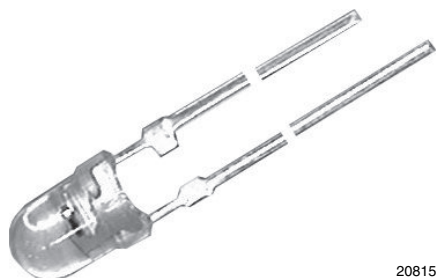


## Ambient Light Sensor



### FEATURES

- Package type: leaded
- Package form: T-1
- Dimensions (in mm):  $\varnothing$  3
- High photo sensitivity
- Adapted to human eye responsivity
- Angle of half sensitivity:  $\varphi = \pm 30^\circ$
- 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)

### DESCRIPTION

TEPT4400 ambient light sensor is a silicon NPN epitaxial planar phototransistor in a T-1 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
- Replacement of CdS photoresistors

### PRODUCT SUMMARY

| COMPONENT | $I_{PCE}$ ( $\mu A$ ) | $\varphi$ (deg) | $\lambda_{0.5}$ (nm) |
|-----------|-----------------------|-----------------|----------------------|
| TEPT4400  | 200                   | $\pm 30$        | 440 to 800           |

#### Note

- Test condition see table "Basic Characteristics"

### ORDERING INFORMATION

| ORDERING CODE | PACKAGING | REMARKS                                                                                                                                                       | PACKAGE FORM |
|---------------|-----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|
| TEPT4400      | Bulk      | MOQ: 5000 pcs, 1000 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          |

#### 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                     | $T_{amb} \leq 55^\circ C$ | $P_V$      | 100         | mW         |
| Junction temperature                  |                           | $T_j$      | 100         | $^\circ C$ |
| Operating temperature range           |                           | $T_{amb}$  | -40 to +85  | $^\circ C$ |
| Storage temperature range             |                           | $T_{stg}$  | -40 to +100 | $^\circ C$ |
| Soldering temperature                 | $t \leq 3$ s              | $T_{sd}$   | 260         | $^\circ C$ |
| Thermal resistance junction / ambient | JESTD 51                  | $R_{thJA}$ | 300         | K/W        |

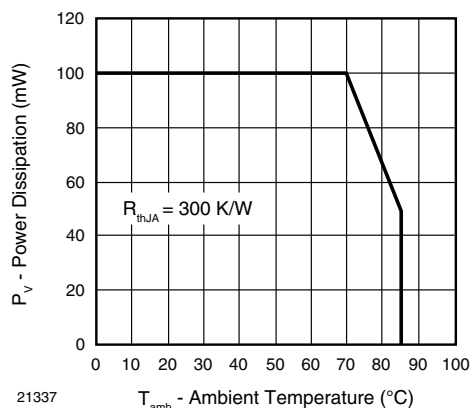


Fig. 1 - Power Dissipation Limit vs. Ambient Temperature

| <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                                                                             | $E_v = 20\text{ lx}$ , CIE illuminant A, $V_{CE} = 5\text{ V}$              | $I_{PCE}$       | 15   | -          | 70   | $\mu\text{A}$ |
|                                                                                                     | $E_v = 100\text{ lx}$ , CIE illuminant A, $V_{CE} = 5\text{ V}$             | $I_{PCE}$       | -    | 200        | -    | $\mu\text{A}$ |
| Angle of half sensitivity                                                                           |                                                                             | $\phi$          | -    | $\pm 30$   | -    | deg           |
| Wavelength of peak sensitivity                                                                      |                                                                             | $\lambda_p$     | -    | 570        | -    | nm            |
| Range of spectral bandwidth                                                                         |                                                                             | $\lambda_{0.5}$ | -    | 440 to 800 | -    | nm            |
| Collector emitter saturation voltage                                                                | $E_v = 20\text{ lx}$ , 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                         | $E_v = 20\text{ lx}$ , CIE illuminant A, $V_{CE} = 5\text{ V}$ , $T_{amb} = 25\text{ }^{\circ}\text{C}$ | A            | $I_{PCE}$ | 15   | 28.4 | $\mu\text{A}$ |
|                                       |                                                                                                         | B            | $I_{PCE}$ | 23.5 | 44.6 | $\mu\text{A}$ |
|                                       |                                                                                                         | C            | $I_{PCE}$ | 36.9 | 70   | $\mu\text{A}$ |

**Note**

- Each 5000 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.

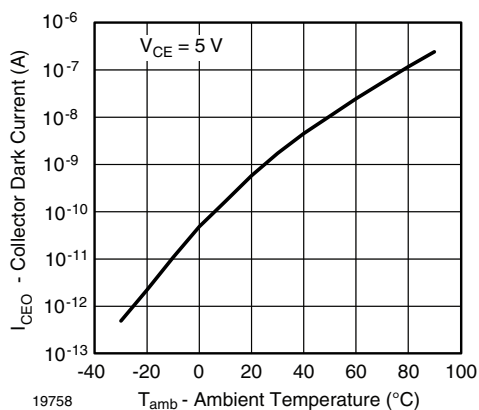
**BASIC CHARACTERISTICS** ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)


Fig. 2 - Collector Dark Current vs. Ambient Temperature

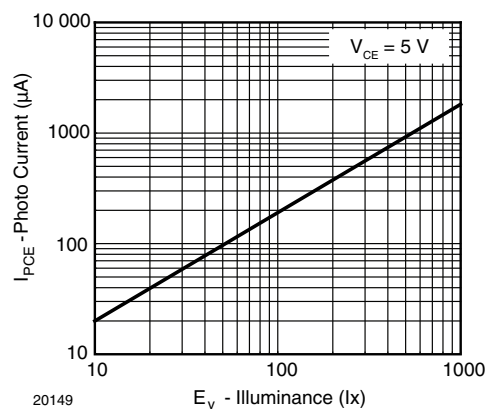


Fig. 5 - Photo Current vs. Illuminance

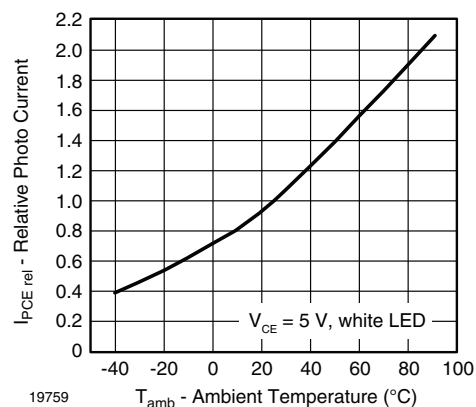


Fig. 3 - Relative Photo Current vs. Ambient Temperature

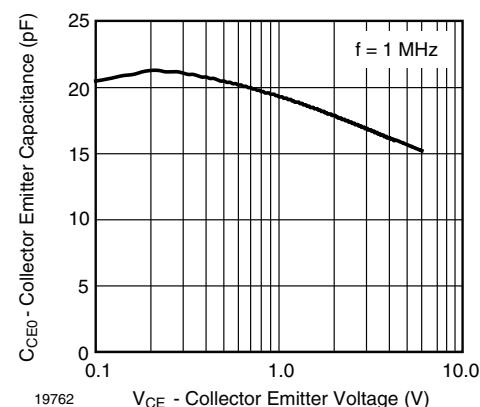


Fig. 6 - Collector Emitter Capacitance vs. Collector Emitter Voltage

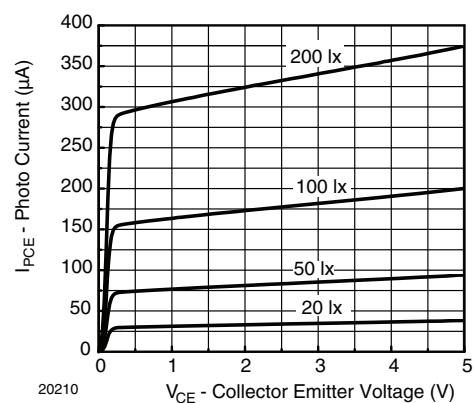


Fig. 4 - Photo Current vs. Collector Emitter Voltage

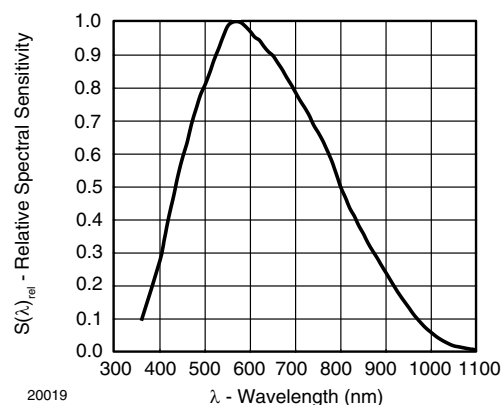


Fig. 7 - Relative Spectral Sensitivity vs. Wavelength

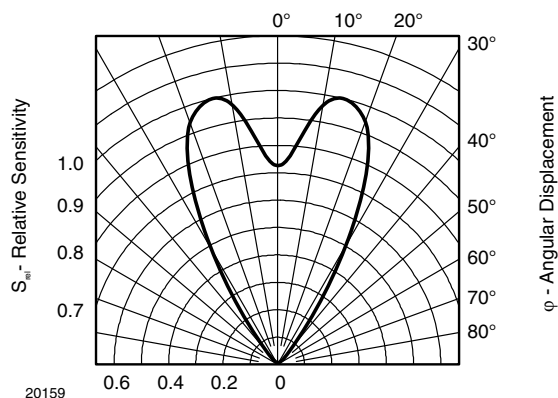
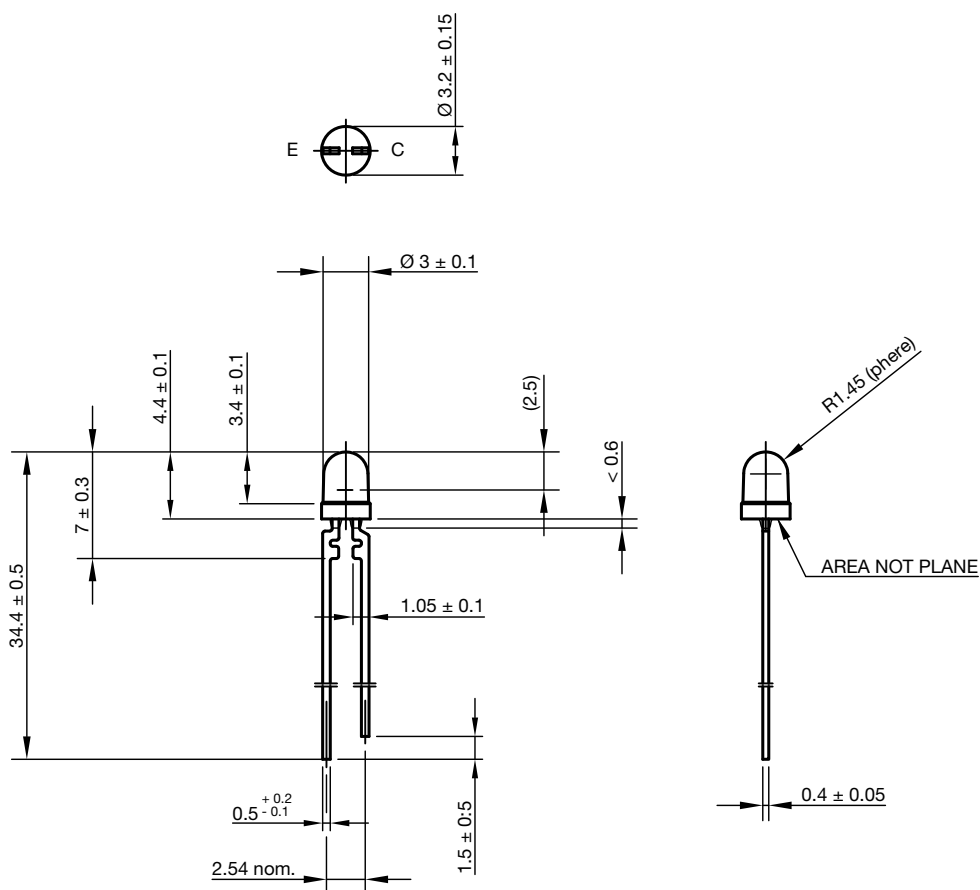
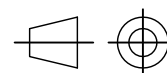


Fig. 8 - Relative Radiant Sensitivity vs. Angular Displacement

### PACKAGE DIMENSIONS in millimeters



Drawing-No.: 6.544-5054.01-4  
Issue: 5; 28.07.14



technical drawings  
according to DIN  
specifications



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