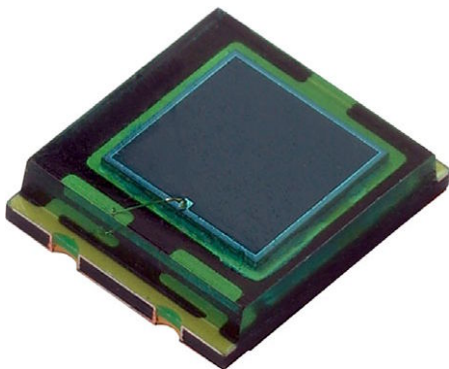


Ambient Light Sensor



DESCRIPTION

TEMD5510FX01 ambient light sensor is a PIN photodiode with high photo sensitivity in a miniature surface mount device (SMD). The detector chip has 7.5 mm² sensitive area. It is sensitive to visible light much like the human eye and has peak sensitivity at 540 nm.

FEATURES

- Package type: surface-mount
- Package form: top view
- Dimensions (L x W x H in mm): 5 x 4.24 x 1.12
- Radiant sensitive area (in mm²): 7.5
- AEC-Q101 qualified
- High photo sensitivity
- Adapted to human eye responsivity
- Supression filter for near infrared radiation
- Angle of half sensitivity: $\varphi = \pm 65^\circ$
- Floor life: 72 h, MSL 4, according to J-STD-020
- Lead (Pb)-free reflow soldering
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912



RoHS
COMPLIANT
HALOGEN
FREE
GREEN
(5-2008)

APPLICATIONS

- Automotive sensors
- Ambient light sensors
- Backlight dimmers
- Notebooks
- Computers

PRODUCT SUMMARY

| COMPONENT | I_{ra} (μA) | φ (°) | $\lambda_{0.5}$ (nm) |
|--------------|---------------|---------------|----------------------|
| TEMD5510FX01 | 1 | ± 65 | 430 to 610 |

Note

- Test conditions see table “Basic Characteristics”

ORDERING INFORMATION

| ORDERING CODE | PACKAGING | REMARKS | PACKAGE FORM |
|-------------------|---------------|------------------------------|--------------|
| TEMD5510FX01 | Tape and reel | MOQ: 1500 pcs, 1500 pcs/reel | Top view |
| TEMD5510FX01-GS15 | Tape and reel | MOQ: 5000 pcs, 5000 pcs/reel | Top view |

Note

- MOQ: minimum order quantity

ABSOLUTE MAXIMUM RATINGS ($T_{amb} = 25^\circ\text{C}$, unless otherwise specified)

| PARAMETER | TEST CONDITION | SYMBOL | VALUE | UNIT |
|--|---|------------|-------------|------------------|
| Reverse voltage | | V_R | 16 | V |
| Power dissipation | $T_{amb} \leq 25^\circ\text{C}$ | P_V | 215 | mW |
| 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 +110 | $^\circ\text{C}$ |
| Soldering temperature | According to reflow solder profile Fig. 5 | T_{sd} | 260 | $^\circ\text{C}$ |
| Thermal resistance junction-to-ambient | JESD51 | R_{thJA} | 350 | K/W |

| BASIC CHARACTERISTICS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified) | | | | | | |
|---|---|-----------------|------|------------|------|---------------|
| PARAMETER | TEST CONDITION | SYMBOL | MIN. | TYP. | MAX. | UNIT |
| Breakdown voltage | $I_R = 100\text{ }\mu\text{A}$, $E = 0$ | $V_{(BR)}$ | 16 | - | - | V |
| Reverse dark current | $V_R = 10\text{ V}$, $E = 0$ | I_{ro} | - | 2 | 30 | nA |
| Diode capacitance | $V_R = 0\text{ V}$, $f = 1\text{ MHz}$, $E = 0$ | C_D | - | 1600 | - | pF |
| | $V_R = 3\text{ V}$, $f = 1\text{ MHz}$, $E = 0$ | C_D | - | 730 | - | pF |
| Reverse light current | $E_e = 1\text{ mW/cm}^2$, $\lambda = 550\text{ nm}$, $V_R = 5\text{ V}$ | I_{ra} | - | 26 | - | μA |
| | $E_v = 100\text{ lx}$, CIE illuminant A, $V_R = 5\text{ V}$ | I_{ra} | 0.8 | 1 | 1.4 | μA |
| Temperature coefficient of I_{ra} | $E_v = 100\text{ lx}$, CIE illuminant A, $V_R = 5\text{ V}$ | $TK_{I_{ra}}$ | - | 0.2 | - | %/K |
| Angle of half sensitivity | | ϕ | - | ± 65 | - | $^{\circ}$ |
| Wavelength of peak sensitivity | | λ_p | - | 540 | - | nm |
| Range of spectral bandwidth | | $\lambda_{0.5}$ | - | 430 to 610 | - | nm |

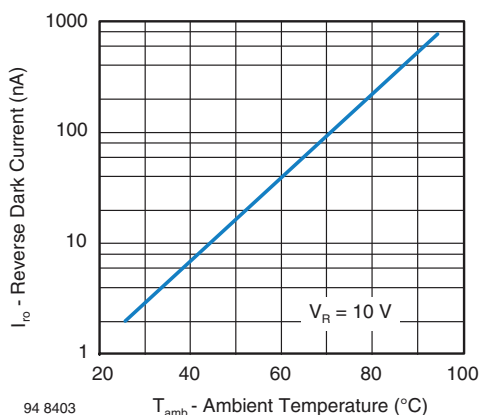
BASIC CHARACTERISTICS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified)


Fig. 1 - Reverse Dark Current vs. Ambient Temperature

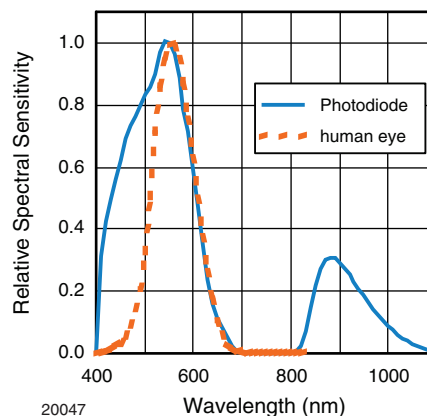


Fig. 3 - Relative Spectral Sensitivity vs. Wavelength

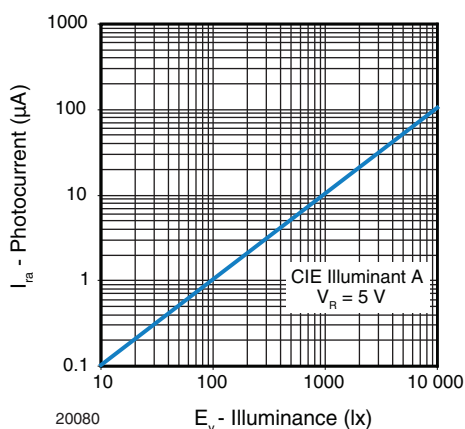


Fig. 2 - Reverse Light Current vs. Irradiance

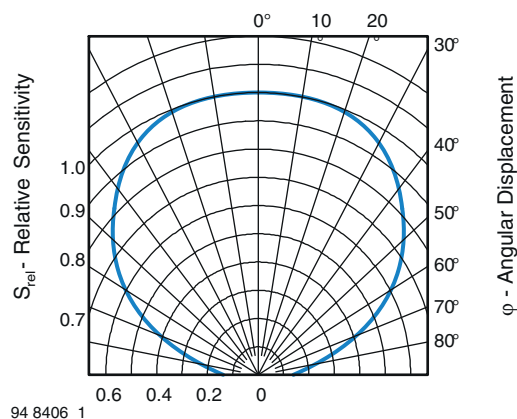
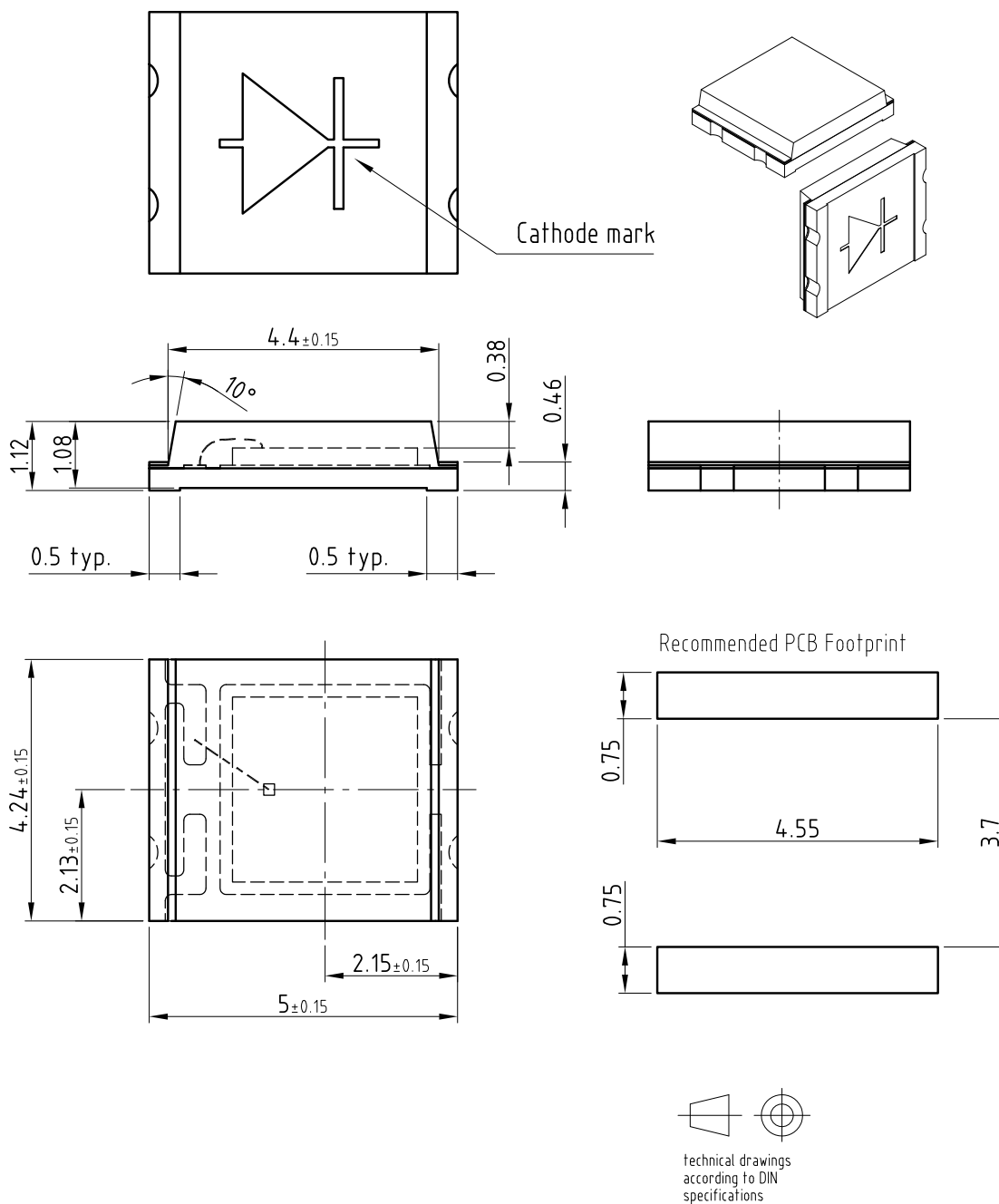


Fig. 4 - Relative Radiant Sensitivity vs. Angular Displacement

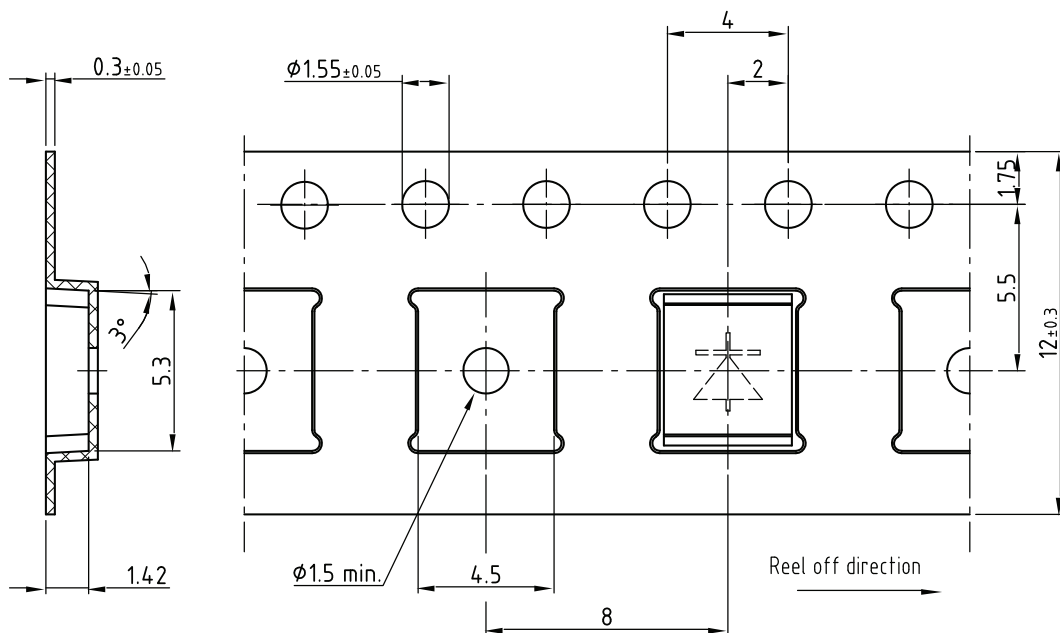


PACKAGE DIMENSIONS in millimeters



Drawing-No.: 6.541-5060.01-4
Issue: 3; 05.02.08
20536

Not indicated tolerances ± 0.1

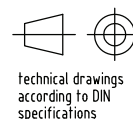
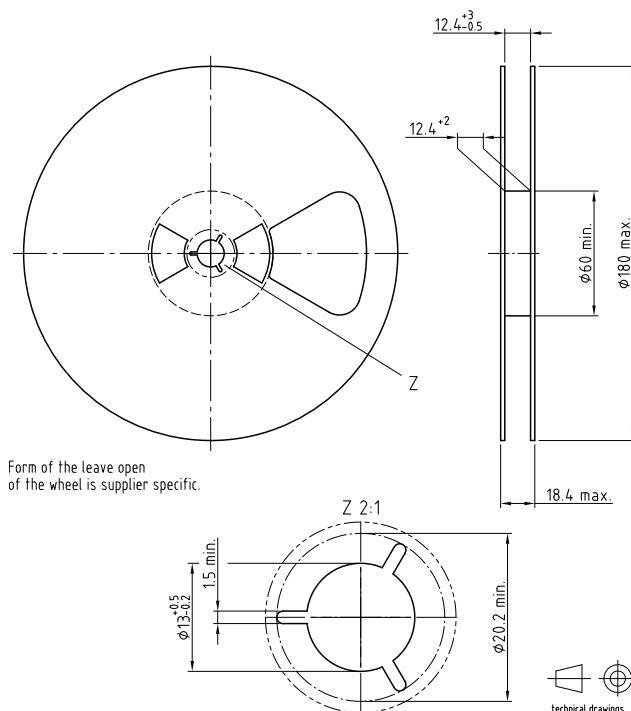
TAPING DIMENSIONS in millimeters


Drawing-No.: 9.700-5293.01-4

Issue: 1; 03.12.04

20537

Not indicated tolerances ±0.1


REEL DIMENSIONS in millimeters


Form of the leave open of the wheel is supplier specific.

Drawing-No.: 9.800-5097.01-4

Issue: 1; 05.05.08

20874





SOLDER PROFILE

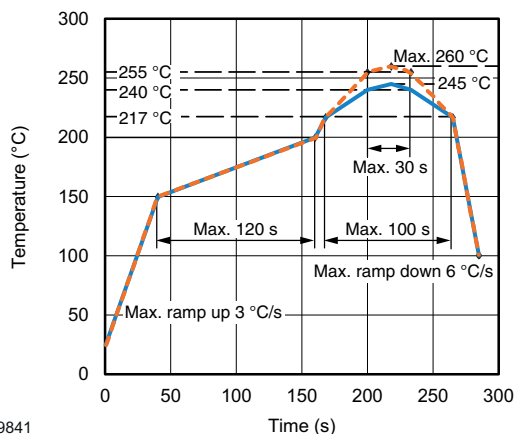


Fig. 5 - Lead (Pb)-free Reflow Solder Profile
According to J-STD-020D

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 4

Floor life: 72 h

Conditions: $T_{amb} < 30\text{ °C}$, $RH < 60\%$

DRYING

In case of moisture absorption devices should be baked before soldering. Conditions see J-STD-033D or recommended conditions:

192 h at 40 °C (+ 5 °C), $RH < 5\%$

or

96 h at 60 °C (+ 5 °C), $RH < 5\%$.



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