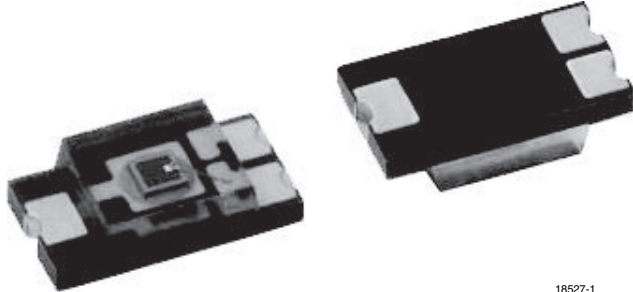


Ambient Light Sensor



18527-1

DESCRIPTION

TEMD6010FX01 ambient light sensor is a PIN photodiode with high speed and high photo sensitivity in a clear, surface mount plastic package. The detector chip has 0.27 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: 1206
- Dimensions (L x W x H in mm): 4 x 2 x 1.05
- Radiant sensitive area (in mm²): 0.27
- AEC-Q101 qualified
- High photo sensitivity
- Adapted to human eye responsivity
- Supression filter for near infrared radiation
- Angle of half sensitivity: $\phi = \pm 60^\circ$
- Floor life: 168 h, MSL 3, acc. J-STD-020
- Lead (Pb)-free reflow soldering
- Material categorization: For definitions of compliance please see www.vishay.com/doc?99912

AUTOMOTIVE GRADE


RoHS
 COMPLIANT
GREEN
 (5-2009)

APPLICATIONS

- Automotive sensors
- Ambient light sensors
- Backlight dimming
- Mobil phones
- Notebooks
- Computers

PRODUCT SUMMARY

| COMPONENT | I_{ra} (μ A) | ϕ (deg) | $\lambda_{0.5}$ (nm) |
|--------------|---------------------|--------------|----------------------|
| TEMD6010FX01 | 0.04 | ± 60 | 430 to 610 |

Note

- Test conditions see table "Basic Characteristics"

ORDERING INFORMATION

| ORDERING CODE | PACKAGING | REMARKS | PACKAGE FORM |
|---------------|---------------|------------------------------|--------------|
| TEMD6010FX01 | Tape and reel | MOQ: 3000 pcs, 3000 pcs/reel | 1206 |

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 | | P_V | 100 | 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 + 100 | $^\circ\text{C}$ |
| Soldering temperature | Acc. reflow solder profile fig. 7 | T_{sd} | 260 | $^\circ\text{C}$ |
| Thermal resistance junction/ambient | Soldered on PCB with pad dimensions: 4 mm x 4 mm | R_{thJA} | 450 | K/W |

| BASIC CHARACTERISTICS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified) | | | | | | |
|---|--|-----------------|------|------------|------|---------------|
| PARAMETER | TEST CONDITION | SYMBOL | MIN. | TYP. | MAX. | UNIT |
| Breakdown voltage | $I_R = 100\text{ }\mu\text{A}$, $E = 0\text{ lx}$ | $V_{(BR)}$ | 16 | | | V |
| Reverse dark current | $V_{CE} = 10\text{ V}$, $E = 0\text{ lx}$ | I_{ro} | | 0.1 | 5 | nA |
| Diode capacitance | $V_R = 0\text{ V}$, $f = 1\text{ MHz}$, $E = 0\text{ lx}$ | C_D | | 60 | | pF |
| | $V_R = 5\text{ V}$, $f = 1\text{ MHz}$, $E = 0\text{ lx}$ | C_D | | 24 | | pF |
| Reverse light current | $E_e = 1\text{ mW/cm}^2$, $\lambda = 550\text{ nm}$, $V_R = 5\text{ V}$ | I_{ra} | | 1 | | μA |
| | $E_V = 100\text{ lx}$, CIE illuminant A, $V_R = 5\text{ V}$ | I_{ra} | 0.03 | 0.04 | 0.09 | 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 | | ± 60 | | deg |
| Wavelength of peak sensitivity | | λ_p | | 540 | | nm |
| Range of spectral bandwidth | | $\lambda_{0.5}$ | | 430 to 610 | | nm |

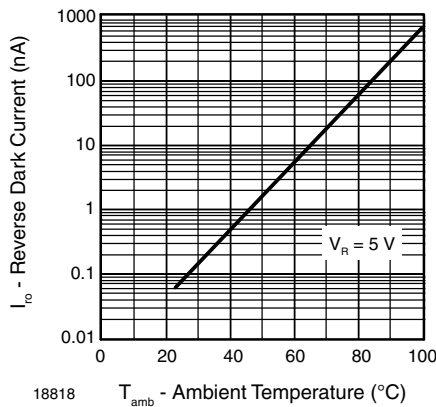
BASIC CHARACTERISTICS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified)


Fig. 1 - Reverse Dark Current vs. Ambient Temperature

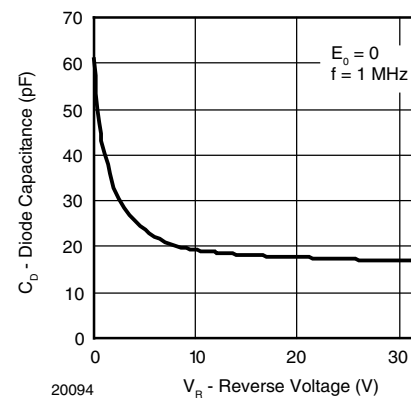


Fig. 3 - Diode Capacitance vs. Reverse Voltage

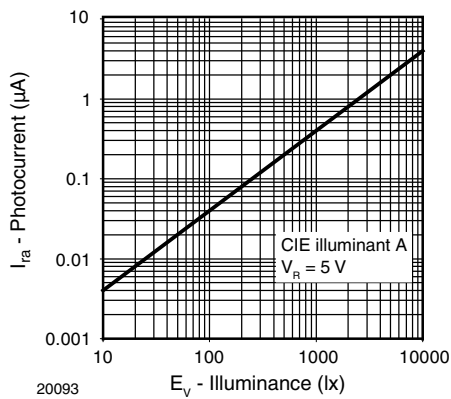


Fig. 2 - Reverse Light Current vs. Illuminance

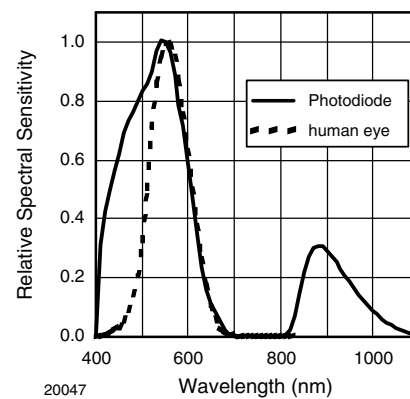


Fig. 4 - Relative Spectral Sensitivity vs. Wavelength

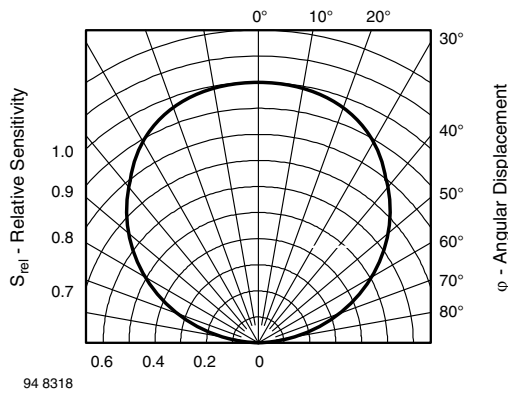


Fig. 1 - Relative Radiant Sensitivity vs. Angular Displacement

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 3
 Floor life: 168 h
 Conditions: $T_{amb} < 30\text{ }^{\circ}\text{C}$, $\text{RH} < 60\%$

DRYING

In case of moisture absorption devices should be baked before soldering. Conditions see J-STD-020 or label. Devices taped on reel dry using recommended conditions:
 192 h at $40\text{ }^{\circ}\text{C}$ (+ 5 $^{\circ}\text{C}$), $\text{RH} < 5\%$
 or
 96 h at $60\text{ }^{\circ}\text{C}$ (+ 5 $^{\circ}\text{C}$), $\text{RH} < 5\%$.

REFLOW SOLDER PROFILE

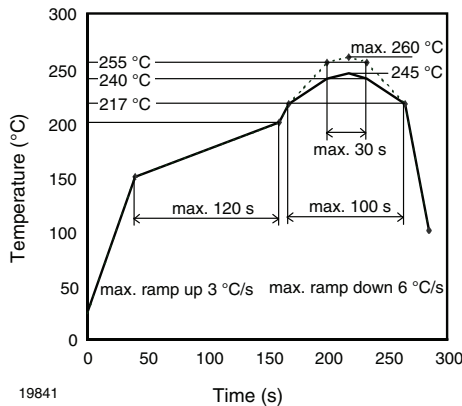
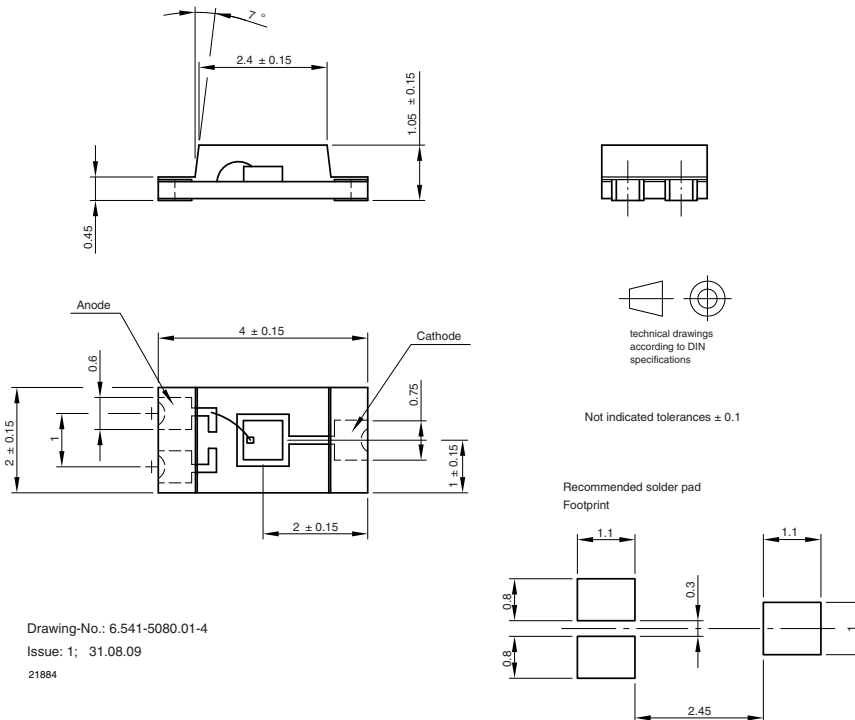


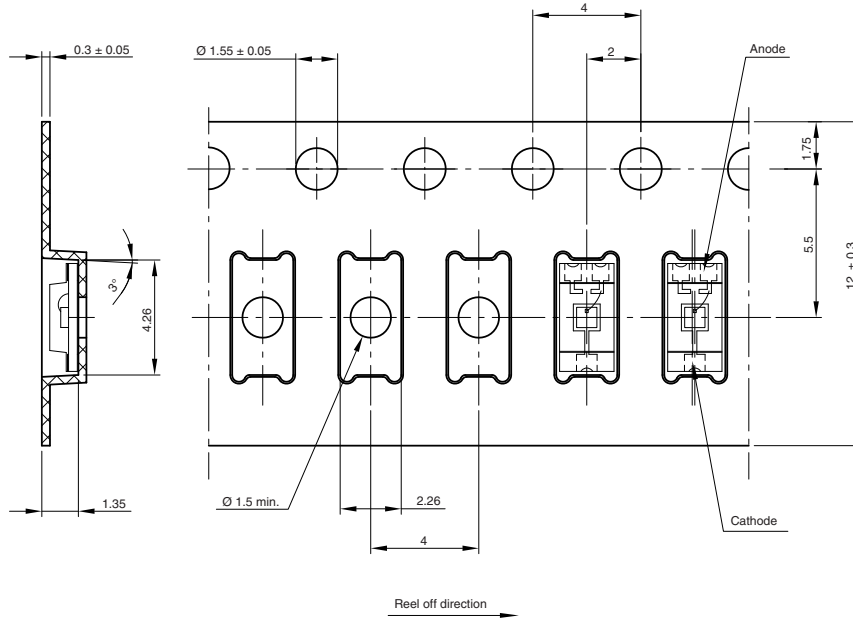
Fig. 5 - Lead (Pb)-free Reflow Solder Profile acc. J-STD-020D

PACKAGE DIMENSIONS in millimeters



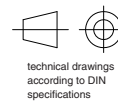
Drawing-No.: 6.541-5080.01-4
 Issue: 1; 31.08.09
 21884

BLISTER TAPE DIMENSIONS in millimeters



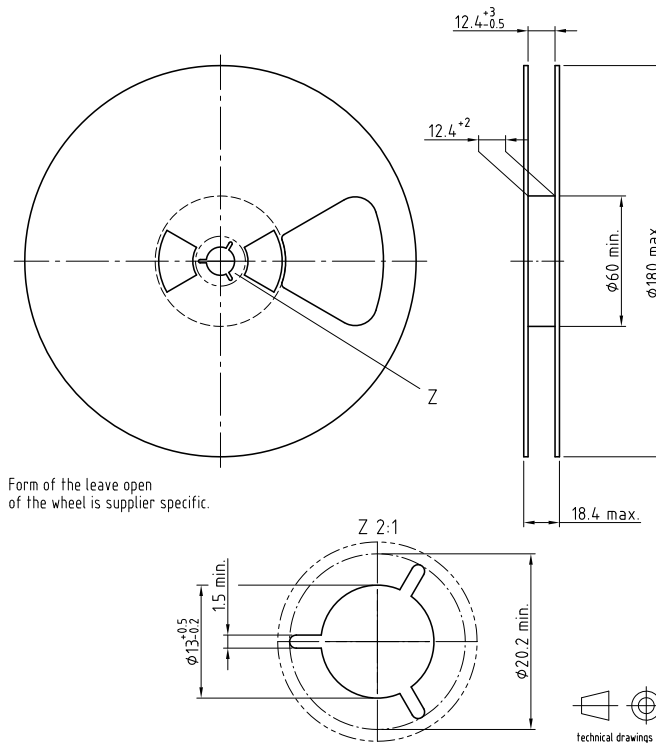
Drawing-No.: 9.700-5329.02-4
 Issue: 2; 31.08.09
 20877

Not indicated tolerances ± 0.1



REEL DIMENSIONS in millimeters

Volume: 3000 pcs/reel



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

Drawing-No.: 9.800-5097.01-4
 Issue: 1; 05.05.08
 20874





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