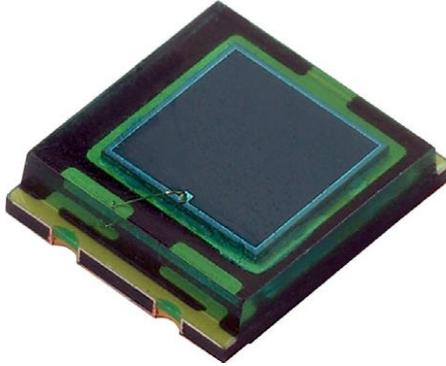


Ambient Light Sensor



DESCRIPTION

TEM5510FX01 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
- Suppression 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



APPLICATIONS

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

PRODUCT SUMMARY

COMPONENT	I_{ra} (μA)	φ ($^\circ$)	$\lambda_{0.5}$ (nm)
TEM5510FX01	1	± 65	430 to 610

Note

- Test conditions see table “Basic Characteristics”

ORDERING INFORMATION

ORDERING CODE	PACKAGING	REMARKS	PACKAGE FORM
TEM5510FX01	Tape and reel	MOQ: 1500 pcs, 1500 pcs/reel	Top view
TEM5510FX01-GS15	Tape and reel	MOQ: 5000 pcs, 5000 pcs/reel	Top view

Note

- MOQ: minimum order quantity

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

PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
Reverse voltage		V_R	16	V
Power dissipation	$T_{amb} \leq 25^\circ C$	P_V	215	mW
Junction temperature		T_j	100	$^\circ C$
Operating temperature range		T_{amb}	-40 to +100	$^\circ C$
Storage temperature range		T_{stg}	-40 to +110	$^\circ C$
Soldering temperature	According to reflow solder profile Fig. 5	T_{sd}	260	$^\circ C$
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

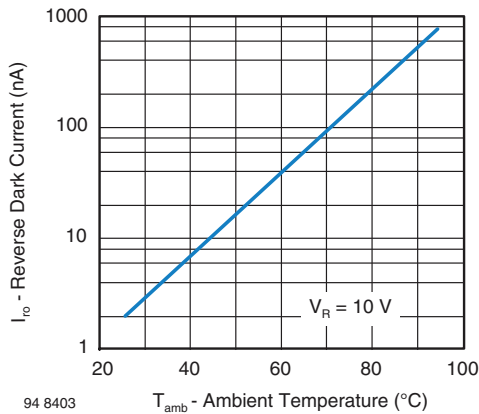
BASIC CHARACTERISTICS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified)


Fig. 1 - Reverse Dark Current vs. Ambient Temperature

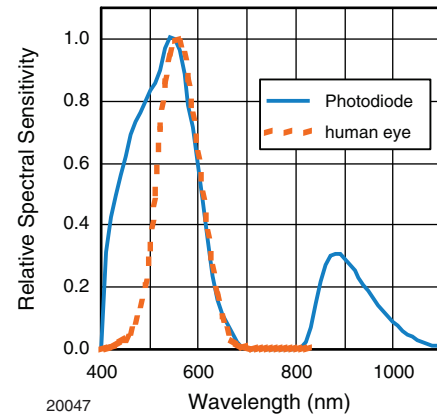


Fig. 3 - Relative Spectral Sensitivity vs. Wavelength

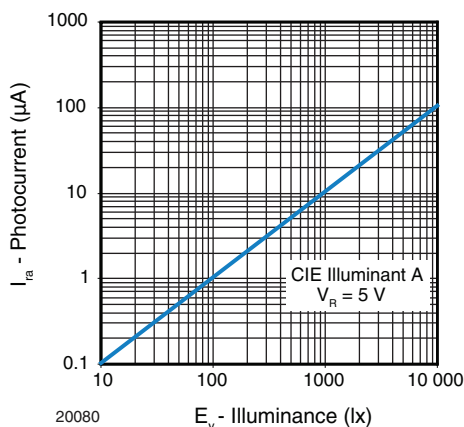


Fig. 2 - Reverse Light Current vs. Irradiance

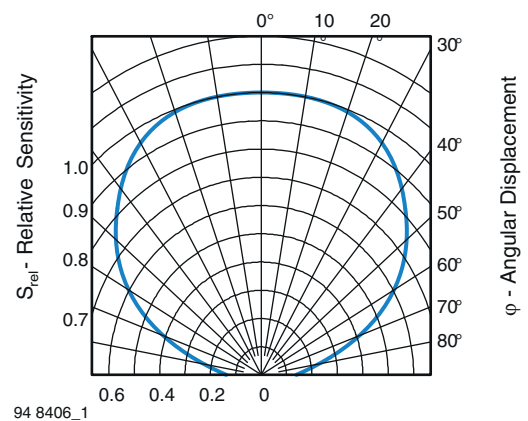
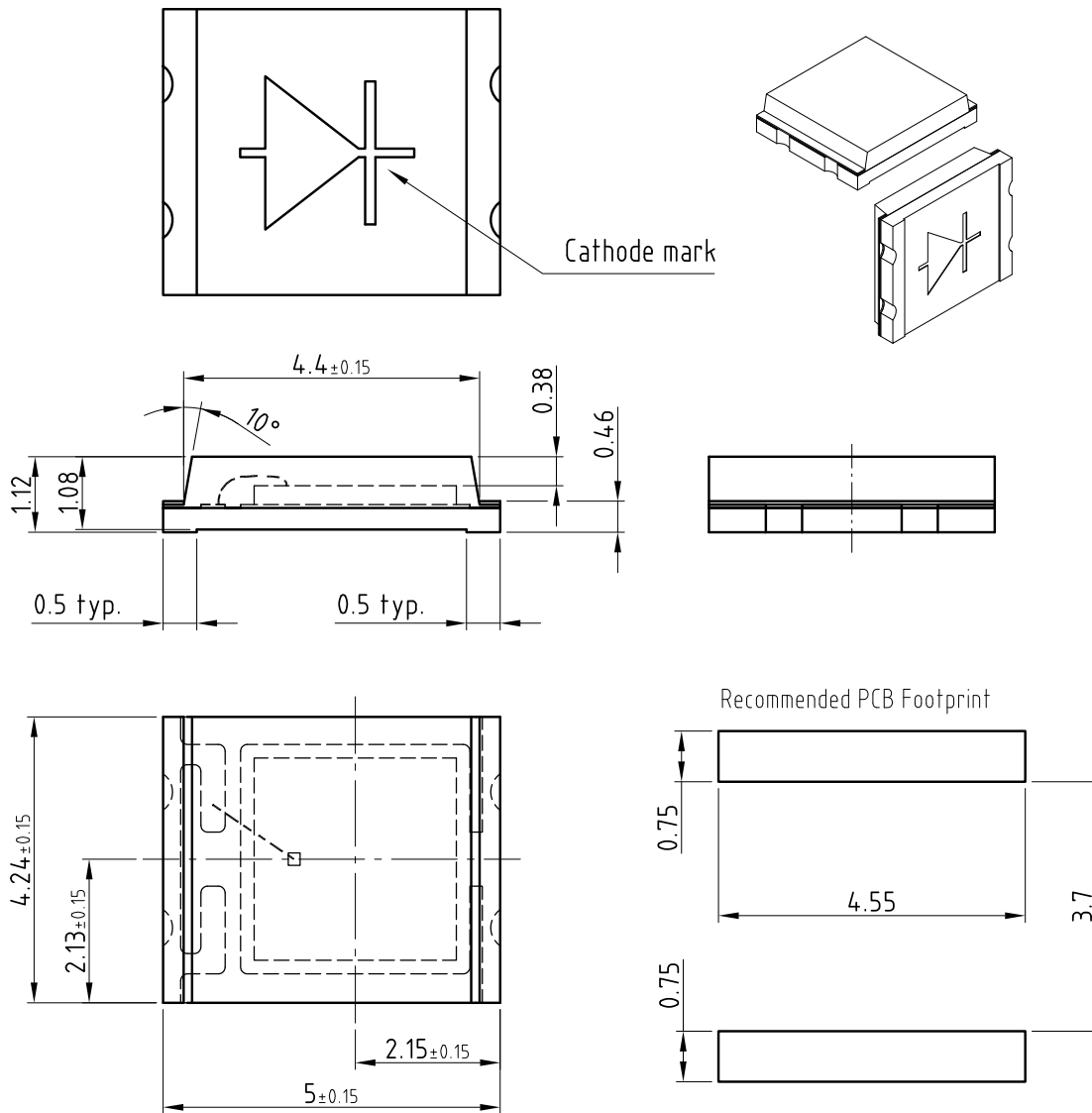


Fig. 4 - Relative Radiant Sensitivity vs. Angular Displacement

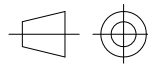


PACKAGE DIMENSIONS in millimeters



Cathode mark

Recommended PCB Footprint

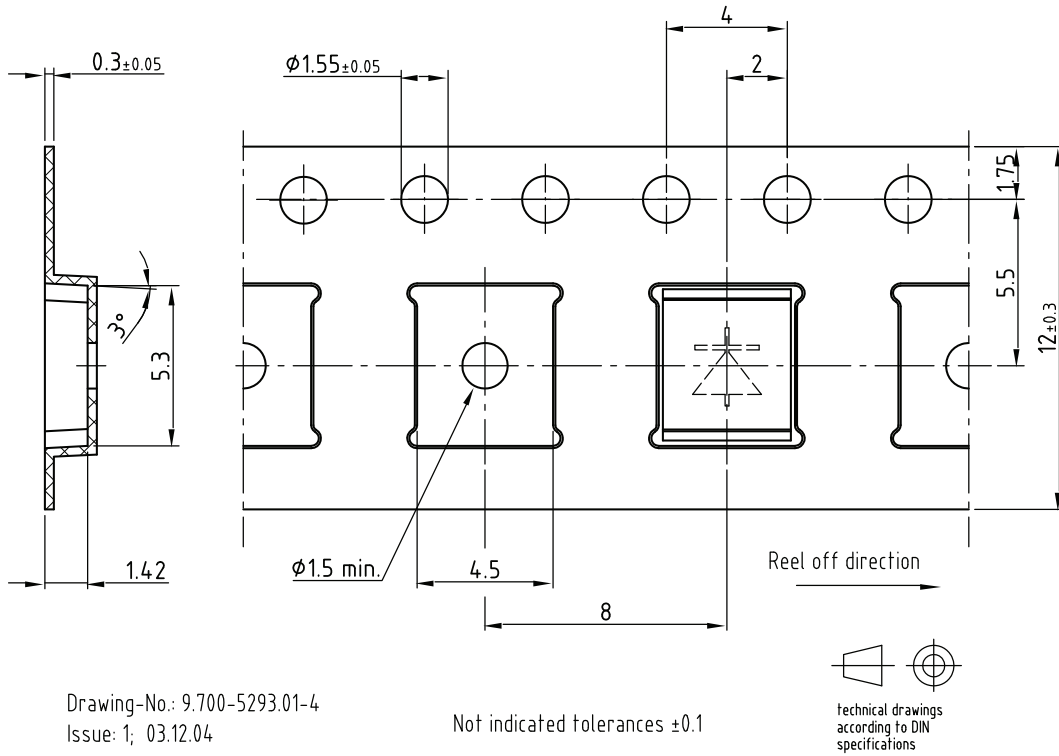


technical drawings according to DIN specifications

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

Not indicated tolerances ± 0.1

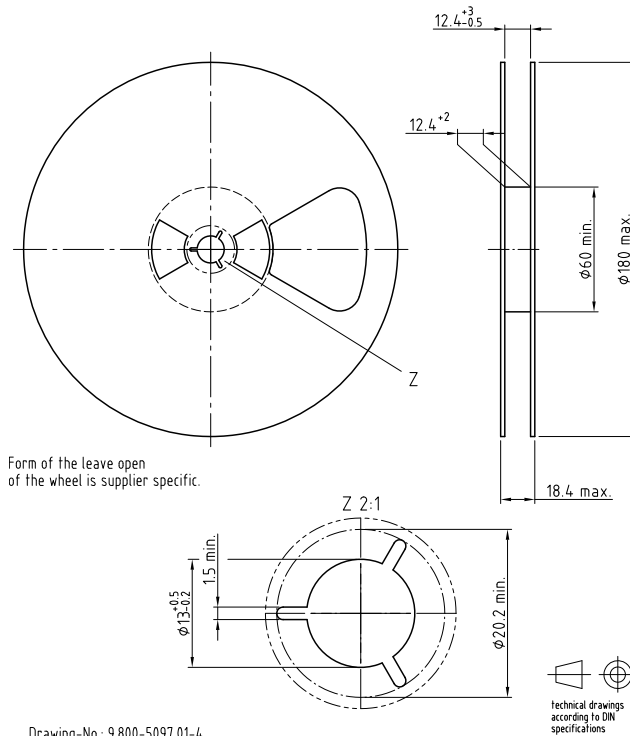
TAPING DIMENSIONS in millimeters



Drawing-No.: 9.700-5293.01-4
 Issue: 1; 03.12.04
 20537

technical drawings according to DIN specifications

REEL DIMENSIONS in millimeters



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

technical drawings according to DIN specifications

SOLDER PROFILE

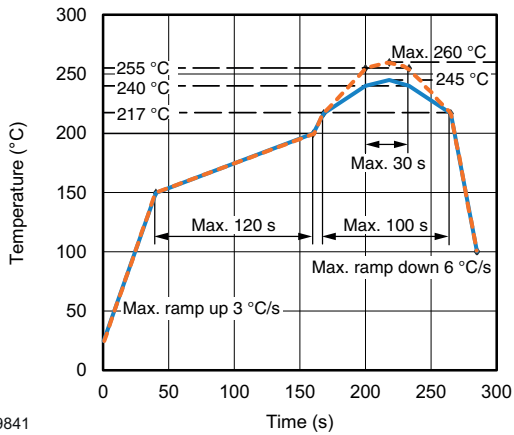


Fig. 5 - Lead (Pb)-free Reflow Solder Profile According to J-STD-020D

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 %.

19841



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