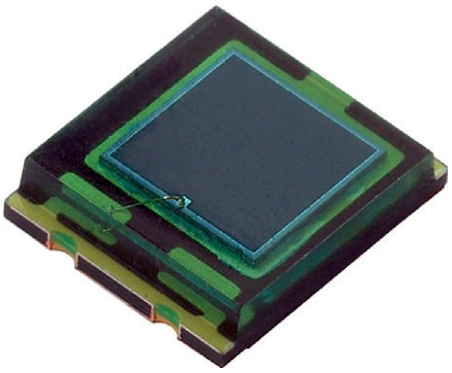
Ambient Light Sensor



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 mm^2): 7.5
- AEC-Q101 qualified
- High photo sensitivity
- Adapted to human eye responsivity
- Supression filter for near infrared radiation
- Angle of half sensitivity: $\varphi = \pm 65°$
- 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

Pb-free

e4

RoHS COMPLIANT

HALOGEN FREE

GREEN (5-2008)

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 mm^2 sensitive area. It is sensitive to visible light much like the human eye and has peak sensitivity at 540 nm.

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 °C, unless otherwise specified)				
PARAMETER	**TEST CONDITION**	**SYMBOL**	**VALUE**	**UNIT**
Reverse voltage		V_R	16	V
Power dissipation	$T_{amb} \leq 25$ °C	P_V	215	mW
Junction temperature		T_j	100	°C
Operating temperature range		T_{amb}	-40 to +100	°C
Storage temperature range		T_{stg}	-40 to +110	°C
Soldering temperature	According to reflow solder profile Fig. 5	T_{sd}	260	°C
Thermal resistance junction-to-ambient	JESD51	R_{thJA}	350	K/W

BASIC CHARACTERISTICS (T_{amb} = 25 °C, unless otherwise specified)						
PARAMETER	**TEST CONDITION**	**SYMBOL**	**MIN.**	**TYP.**	**MAX.**	**UNIT**
Breakdown voltage	I_R = 100 µA, E = 0	$V_{(BR)}$	16	-	-	V
Reverse dark current	V_R = 10 V, E = 0	I_{ro}	-	2	30	nA
Diode capacitance	V_R = 0 V, f = 1 MHz, E = 0	C_D	-	1600	-	pF
	V_R = 3 V, f = 1 MHz, E = 0	C_D	-	730	-	pF
Reverse light current	E_e = 1 mW/cm², λ = 550 nm, V_R = 5 V	I_{ra}	-	26	-	µA
	E_v = 100 lx, CIE illuminant A, V_R = 5 V	I_{ra}	0.8	1	1.4	µA
Temperature coefficient of I_{ra}	E_v = 100 lx, CIE illuminant A, V_R = 5 V	TK_{Ira}	-	0.2	-	%/K
Angle of half sensitivity		φ	-	± 65	-	°
Wavelength of peak sensitivity		λ_p	-	540	-	nm
Range of spectral bandwidth		$\lambda_{0.5}$	-	430 to 610	-	nm

BASIC CHARACTERISTICS (T_{amb} = 25 °C, unless otherwise specified)

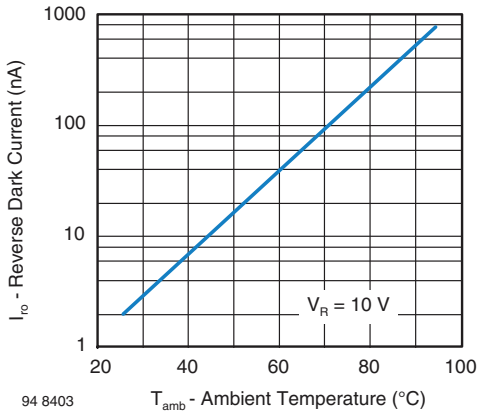


Fig. 1 - Reverse Dark Current vs. Ambient Temperature

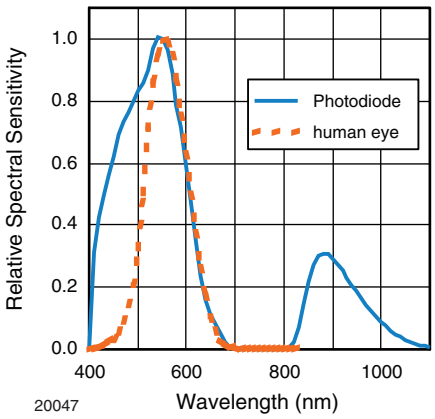


Fig. 3 - Relative Spectral Sensitivity vs. Wavelength

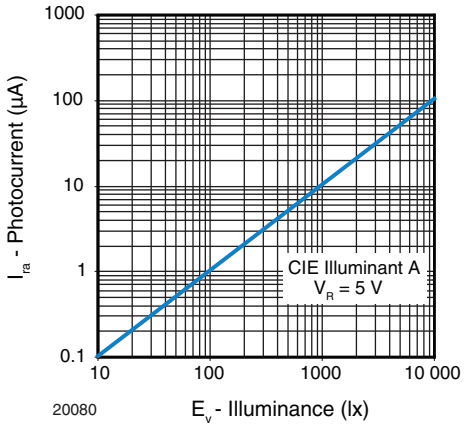


Fig. 2 - Reverse Light Current vs. Irradiance

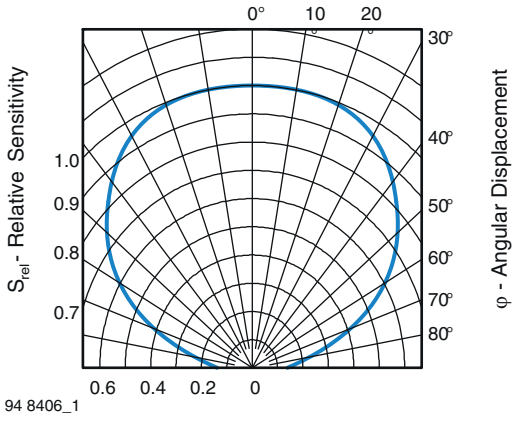
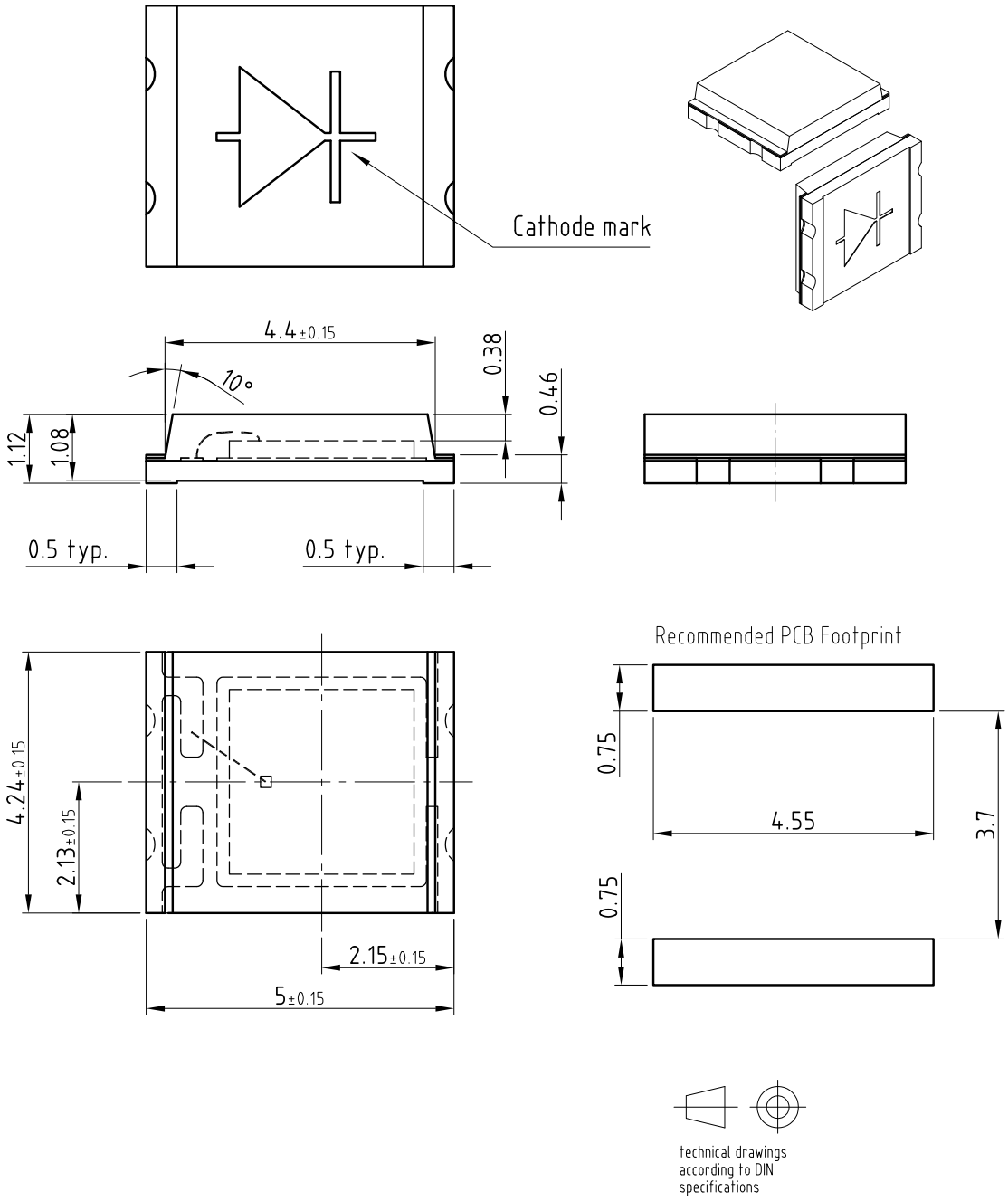


Fig. 4 - Relative Radiant Sensitivity vs. Angular Displacement

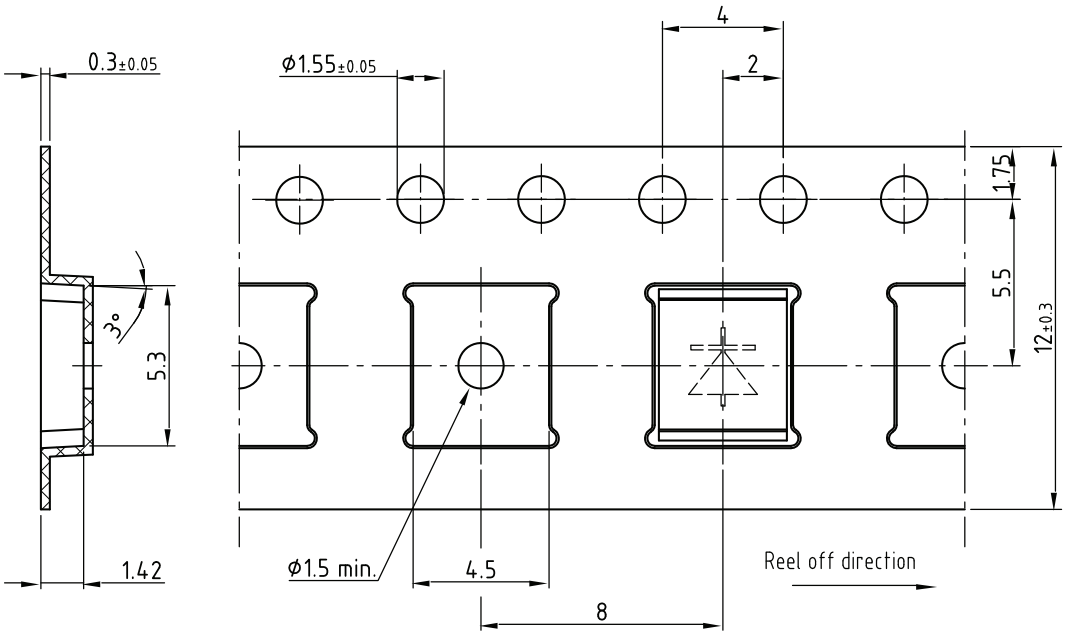
PACKAGE DIMENSIONS in millimeters



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

Not indicated tolerances ± 0.1

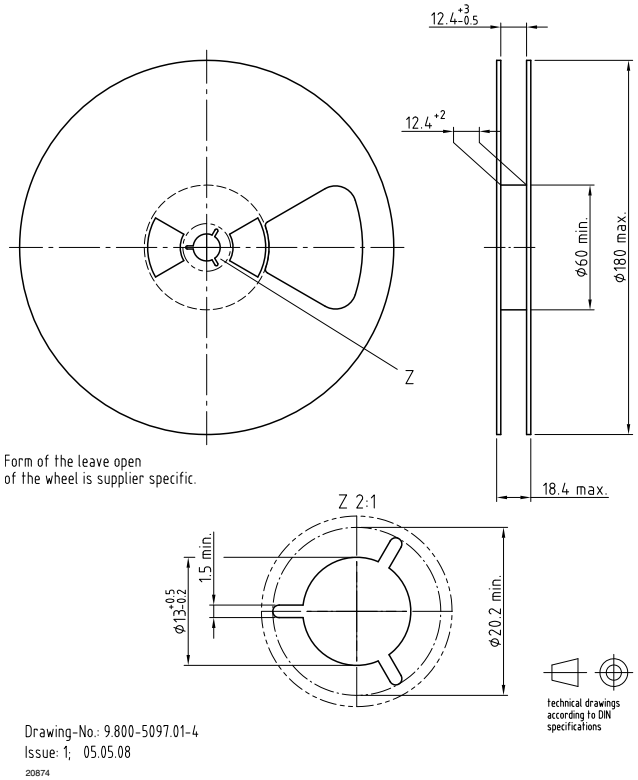
TAPING DIMENSIONS in millimeters



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

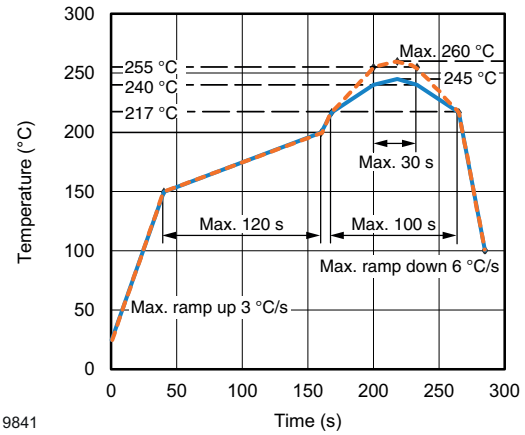


Fig. 5 - Lead (Pb)-free Reflow Solder Profile
According to J-STD-020D

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: $T_{amb} < 30$ °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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