

Silicon PIN Photodiode



20043-1

DESCRIPTION

TEMD7100X01 is a high speed and high sensitive PIN photodiode. It is a miniature surface mount device (SMD) including the chip with a 0.23 mm² sensitive area and a daylight blocking filter matched with IR emitters operating at wavelength of 830 nm to 950 nm.

FEATURES

- Package type: surface mount
- Package form: 0805
- Dimensions (L x W x H in mm): 2 x 1.25 x 0.85
- Radiant sensitive area (in mm²): 0.23
- AEC-Q101 qualified
- High radiant sensitivity
- Daylight blocking filter matched with 830 nm to 950 nm emitters
- Fast response times
- Angle of half sensitivity: $\varphi = \pm 60^\circ$
- Floor life: 168 h, MSL 3, acc. J-STD-020
- Lead (Pb)-free reflow soldering
- Compliant to RoHS directive 2002/95/EC and in accordance to WEEE 2002/96/EC
- Find out more about Vishay's Automotive Grade Product requirements at: www.vishay.com/applications

 AUTOMOTIVE
GRADE

RoHS
COMPLIANT

APPLICATIONS

- High speed photo detector
- Infrared remote control
- Infrared data transmission
- Photo interrupters
- Shaft encoders

PRODUCT SUMMARY

COMPONENT	I_{ra} (μA)	φ (deg)	$\lambda_{0.5}$ (nm)
TEMD7100X01	3	± 60	750 to 1050

Note

Test conditions see table "Basic Characteristics"

ORDERING INFORMATION

ORDERING CODE	PACKAGING	REMARKS	PACKAGE FORM
TEMD7100X01	Tape and reel	MOQ: 3000 pcs, 3000 pcs/reel	0805

Note

MOQ: minimum order quantity

ABSOLUTE MAXIMUM RATINGS

PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
Reverse voltage		V_R	60	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 + 100	$^\circ C$
Soldering temperature	Acc. reflow solder profile fig. 8	T_{sd}	260	$^\circ C$
Thermal resistance junction/ambient	Acc. J-STD-051	R_{thJA}	270	K/W

Note

$T_{amb} = 25^\circ C$, unless otherwise specified

BASIC CHARACTERISTICS						
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Forward voltage	$I_F = 50 \text{ mA}$	V_F		1		V
Breakdown voltage	$I_R = 100 \text{ }\mu\text{A}, E = 0$	$V_{(BR)}$	32			V
Reverse dark current	$V_R = 10 \text{ V}, E = 0$	I_{ro}		1	10	nA
Diode capacitance	$V_R = 0 \text{ V}, f = 1 \text{ MHz}, E = 0$	C_D		4		pF
	$V_R = 5 \text{ V}, f = 1 \text{ MHz}, E = 0$	C_D		1.3		pF
Open circuit voltage	$E_e = 1 \text{ mW/cm}^2, \lambda = 950 \text{ nm}$	V_o		350		mV
Temperature coefficient of V_o	$E_e = 1 \text{ mW/cm}^2, \lambda = 950 \text{ nm}$	TK_{V_o}		-2.6		mV/K
Short circuit current	$E_e = 1 \text{ mW/cm}^2, \lambda = 950 \text{ nm}$	I_k		3		μA
Temperature coefficient of I_k	$E_e = 1 \text{ mW/cm}^2, \lambda = 950 \text{ nm}$	TK_{I_k}		0.1		%/K
Reverse light current	$E_e = 1 \text{ mW/cm}^2, \lambda = 950 \text{ nm}, V_R = 5 \text{ V}$	I_{ra}		3		μA
Angle of half sensitivity		φ		± 60		deg
Wavelength of peak sensitivity		λ_p		950		nm
Range of spectral bandwidth		$\lambda_{0.5}$		750 to 1050		nm
Rise time	$V_R = 10 \text{ V}, R_L = 1 \text{ k}\Omega, \lambda = 820 \text{ nm}$	t_r		100		ns
Fall time	$V_R = 10 \text{ V}, R_L = 1 \text{ k}\Omega, \lambda = 820 \text{ nm}$	t_f		100		ns

Note

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

BASIC CHARACTERISTICS

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

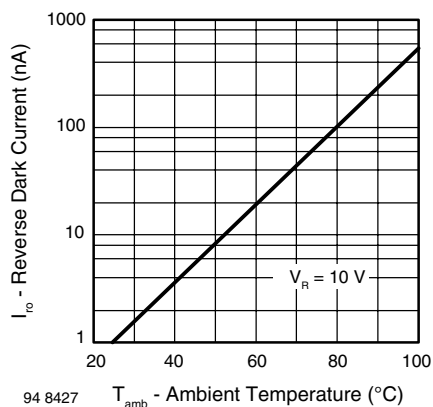


Fig. 1 - Reverse Dark Current vs. Ambient Temperature

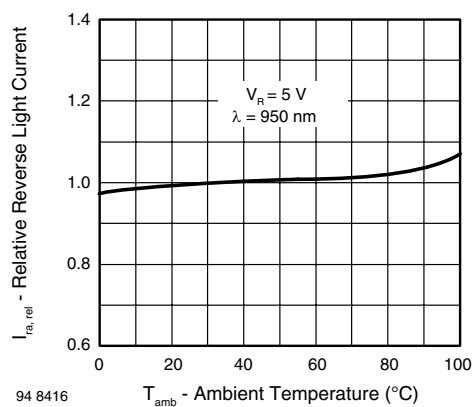


Fig. 2 - Relative Reverse Light Current vs. Ambient Temperature

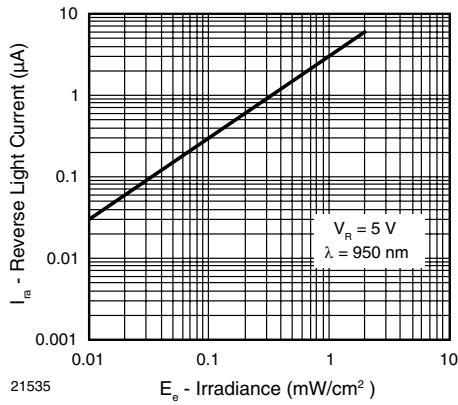


Fig. 3 - Reverse Light Current vs. Irradiance

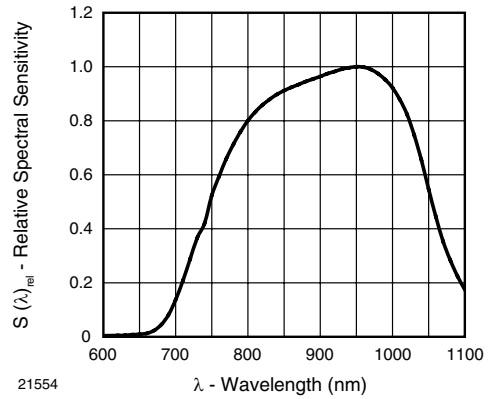


Fig. 6 - Relative Spectral Sensitivity vs. Wavelength

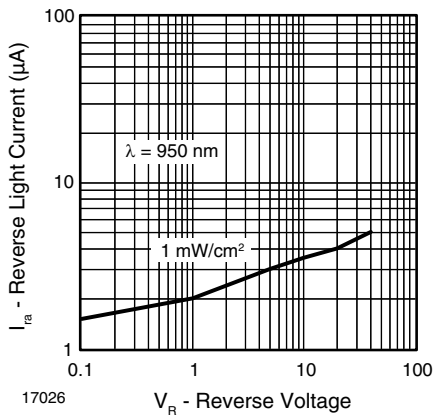


Fig. 4 - Reverse Light Current vs. Reverse Voltage

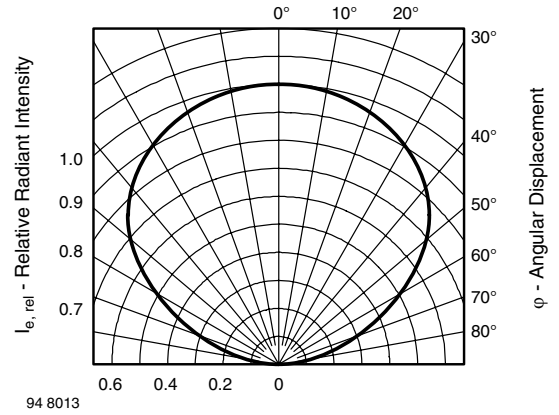


Fig. 7 - Relative Radiant Intensity vs. Angular Displacement

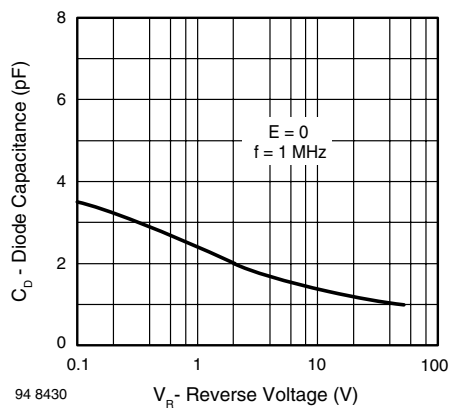


Fig. 5 - Diode Capacitance vs. Reverse Voltage

REFLOW SOLDER PROFILE

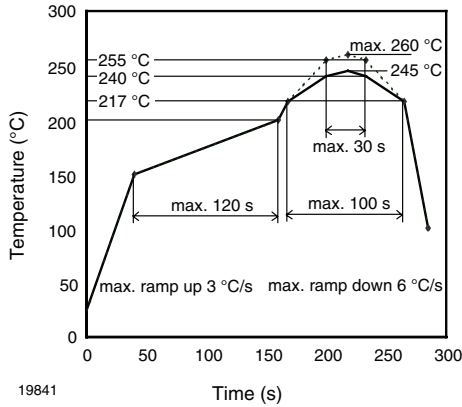


Fig. 8 - Lead (Pb)-free Reflow Solder Profile acc. J-STD-020D

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.

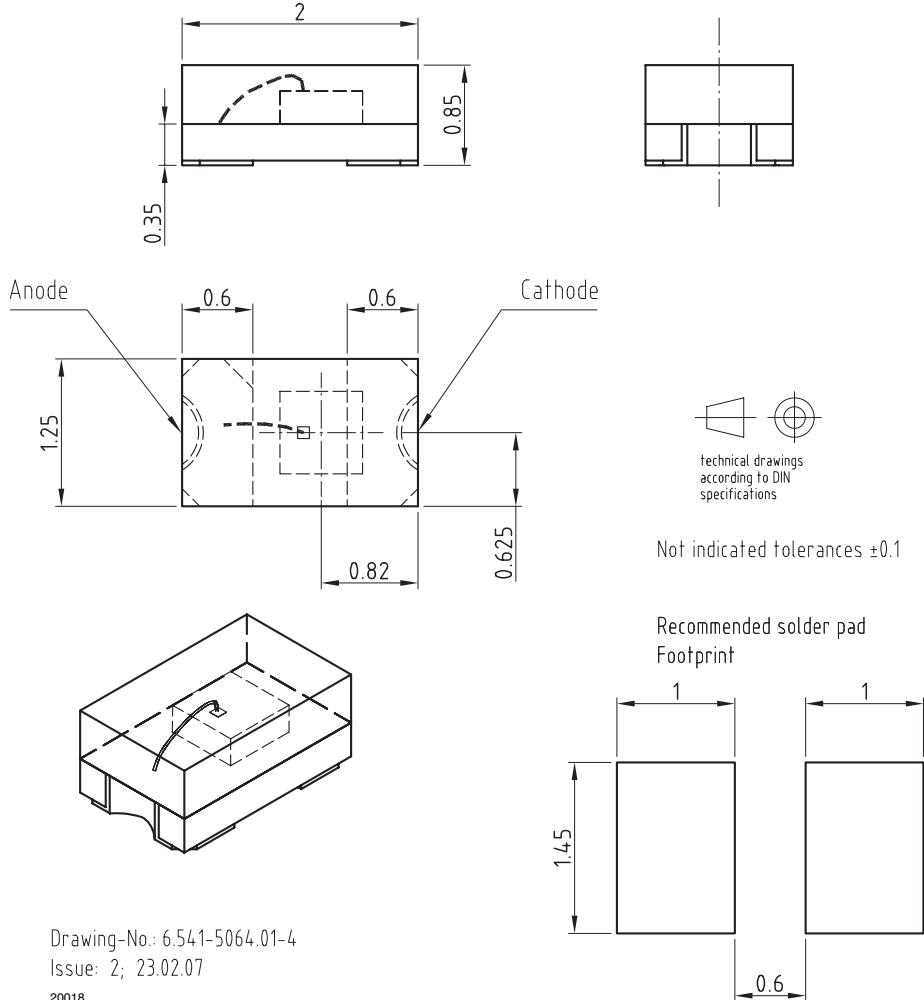
FLOOR LIFE

Floor life (time between soldering and removing from MBB) must not exceed the time indicated on MBB label:
 Floor life: 168 h
 Conditions: $T_{amb} < 30\text{ }^{\circ}\text{C}$, $RH < 60\%$
 Moisture sensitivity level 3, acc. to J-STD-020.

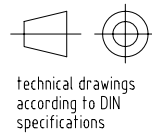
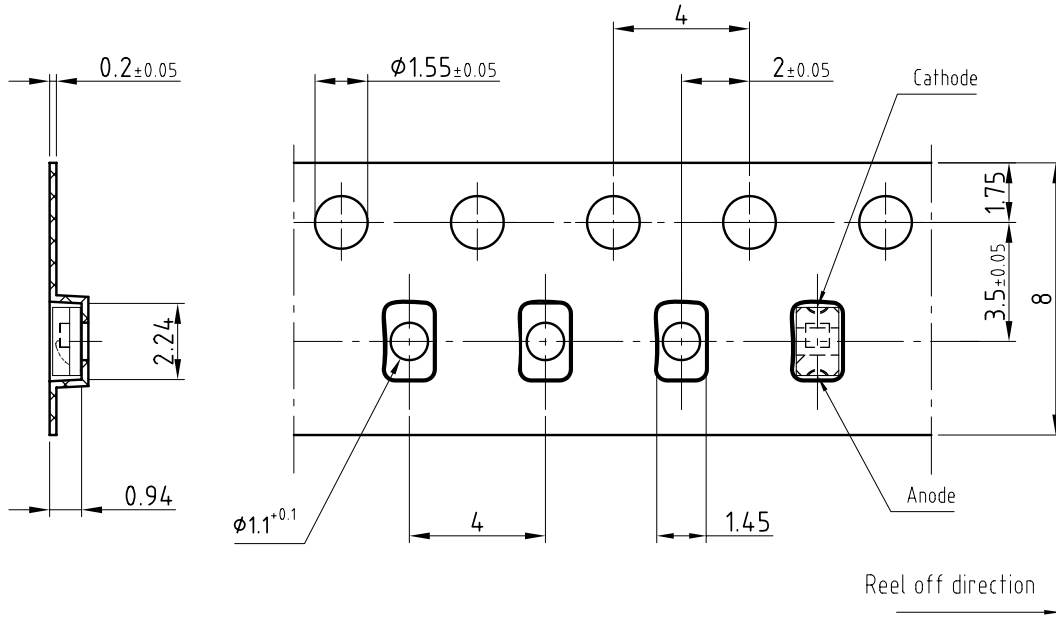
DRYING

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 $40\text{ }^{\circ}\text{C}$ (+ $5\text{ }^{\circ}\text{C}$), $RH < 5\%$.

PACKAGE DIMENSIONS in millimeters



BLISTER TAPE DIMENSIONS in millimeters



Drawing-No.: 9.700-5311.01-4

Issue: 1; 23.02.07

21501

Not indicated tolerances ±0.1

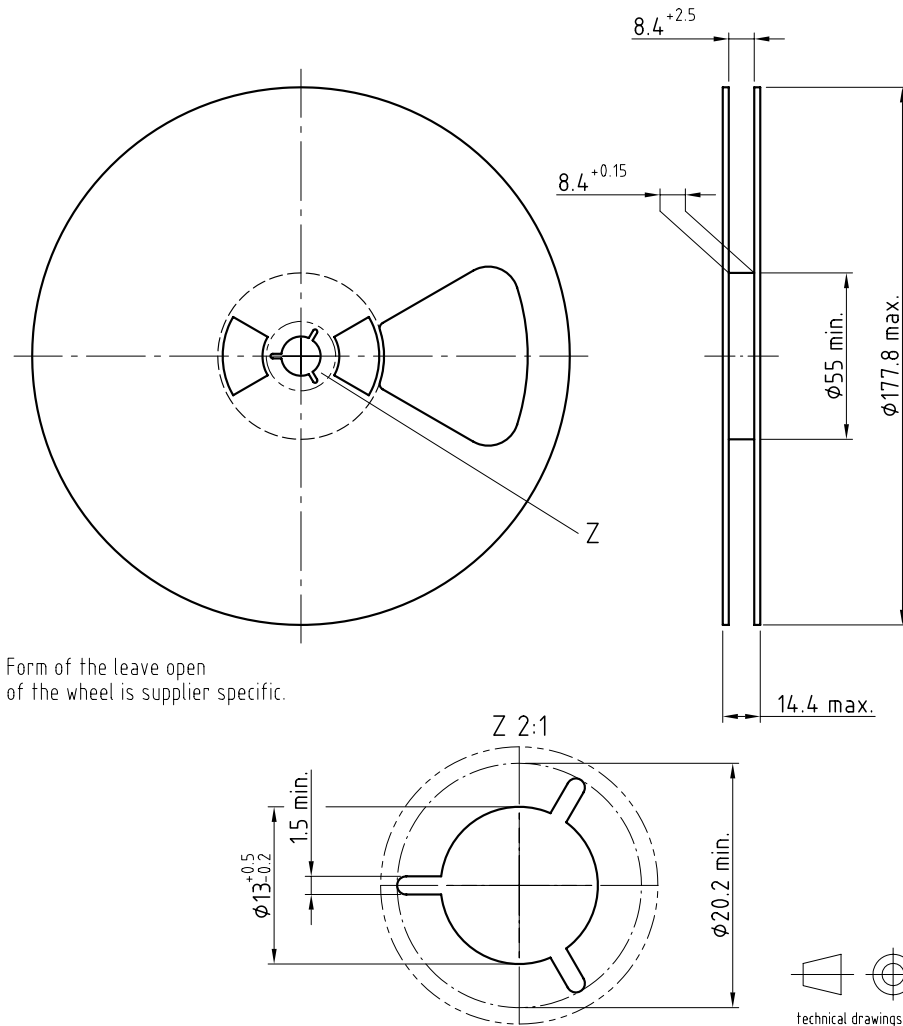
TEMD7100X01

Vishay Semiconductors

Silicon PIN Photodiode



REEL DIMENSIONS in millimeters



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

Drawing-No.: 9.800-5096.01-4

Issue: 1; 05.05.08

20875



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