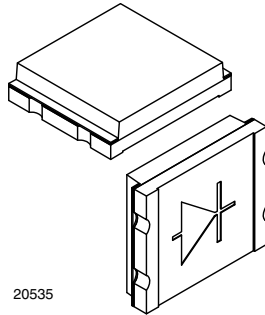


## Silicon PIN Photodiode



### DESCRIPTION

TEMD5080X01 is a PIN photodiode with enhanced blue sensitivity. The miniature surface-mount package (SMD) include a chip with 7.7 mm<sup>2</sup> sensitive area, covered by clear epoxy.

### 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<sup>2</sup>): 7.7
- AEC-Q101 qualified
- Enhanced blue photo sensitivity: S (460 nm) rel > 30 %
- Peak sensitivity at 940 nm
- Suitable for visible and near infrared radiation
- Low junction capacitance
- Fast response times
- Angle of half sensitivity:  $\phi = \pm 65^\circ$
- 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](http://www.vishay.com/doc?99912)

 AUTOMOTIVE  
GRADE

**RoHS**  
COMPLIANT  
HALOGEN  
**FREE**  
**GREEN**  
(5-2008)

### APPLICATIONS

- High speed photo detector

### PRODUCT SUMMARY

COMPONENT	$I_{ra}$ ( $\mu$ A)	$\phi$ (°)	$\lambda_{0.1}$ (nm)
TEMD5080X01	8.6	$\pm 65$	350 to 1100

#### Note

- Test conditions see table "Basic Characteristics"

### ORDERING INFORMATION

ORDERING CODE	PACKAGING	REMARKS	PACKAGE FORM
TEMD5080X01	Tape and reel	MOQ: 1500 pcs, 1500 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		$V_R$	25	V
Power dissipation	$T_{amb} \leq 25^\circ\text{C}$	$P_V$	215	mW
Junction temperature		$T_j$	100	$^\circ\text{C}$
Ambient 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. 7	$T_{sd}$	260	$^\circ\text{C}$
Thermal resistance junction to ambient		$R_{thJA}$	350	K/W

<b>BASIC CHARACTERISTICS</b> ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)						
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Forward voltage	$I_F = 50\text{ mA}$	$V_F$	-	0.8	1.3	V
Breakdown voltage	$I_R = 100\text{ }\mu\text{A}$ , $E = 0$	$V_{(BR)}$	25	-	-	V
Reverse dark current	$V_R = 10\text{ V}$ , $E = 0$	$I_{ro}$	-	0.3	3	nA
Diode capacitance	$V_R = 0\text{ V}$ , $f = 1\text{ MHz}$ , $E = 0$	$C_D$	-	87	-	pF
	$V_R = 3\text{ V}$ , $f = 1\text{ MHz}$ , $E = 0$	$C_D$	-	30	-	pF
Open circuit voltage	$E_e = 1\text{ mW/cm}^2$ , $\lambda = 940\text{ nm}$	$V_o$	-	370	-	mV
Short circuit current	$E_e = 1\text{ mW/cm}^2$ , $\lambda = 940\text{ nm}$	$I_k$	-	51	-	$\mu\text{A}$
Reverse light current	$E_e = 1\text{ mW/cm}^2$ , $\lambda = 460\text{ nm}$ , $V_R = 5\text{ V}$	$I_{ra}$	-	17.1	-	$\mu\text{A}$
	$E_V = 100\text{ lx}$ , CIE illuminant A, $V_R = 5\text{ V}$	$I_{ra}$	6.3	8.6	-	$\mu\text{A}$
	$E_V = 100\text{ lx}$ , white LED 4300K, $V_R = 5\text{ V}$	$I_{ra}$	0.8	1.1	-	$\mu\text{A}$
Temperature coefficient of $I_{ra}$	CIE illuminant A	$TK_{I_{ra}}$	-	0.05	-	%/K
	$\lambda = 940\text{ nm}$	$TK_{I_{ra}}$	-	0.17	-	%/K
Angle of half sensitivity		$\phi$	-	$\pm 65$	-	$^{\circ}$
Wavelength of peak sensitivity		$\lambda_p$	-	940	-	nm
Range of spectral bandwidth		$\lambda_{0.1}$	-	350 to 1100	-	nm
Noise equivalent power	$V_R = 10\text{ V}$ , $\lambda = 400\text{ nm}$	NEP	-	$1.1 \times 10^{-13}$	-	W/ $\sqrt{\text{Hz}}$
Rise time	$V_R = 5\text{ V}$ , $R_L = 50\text{ }\Omega$ , $\lambda = 850\text{ nm}$	$t_r$	-	40	-	ns
Fall time	$V_R = 5\text{ V}$ , $R_L = 50\text{ }\Omega$ , $\lambda = 850\text{ nm}$	$t_f$	-	40	-	ns

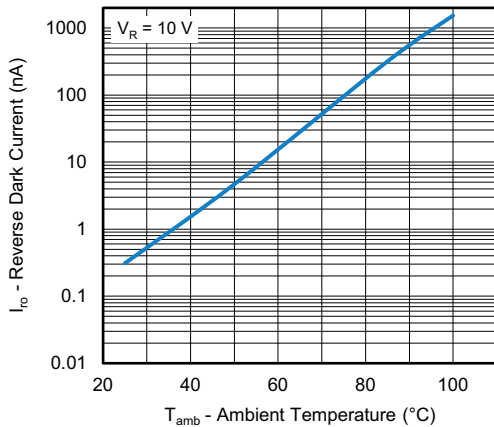
**BASIC CHARACTERISTICS** ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)


Fig. 1 - Reverse Dark Current vs. Ambient Temperature

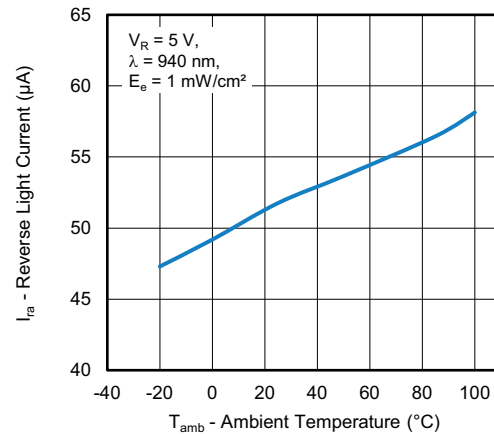


Fig. 2 - Reverse Light Current vs. Ambient Temperature

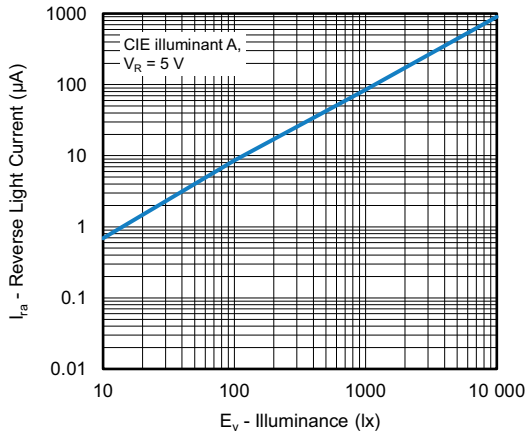


Fig. 3 - Reverse Light Current vs. Illuminance

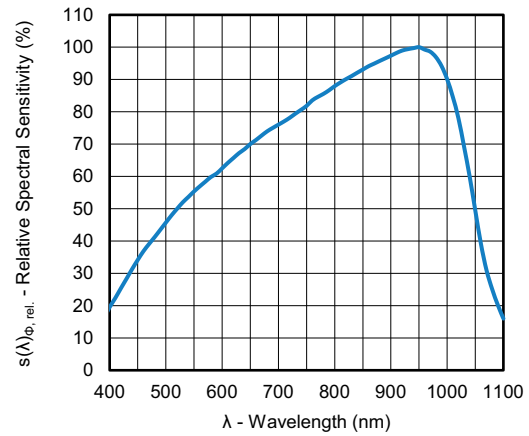


Fig. 5 - Relative Spectral Sensitivity vs. Wavelength

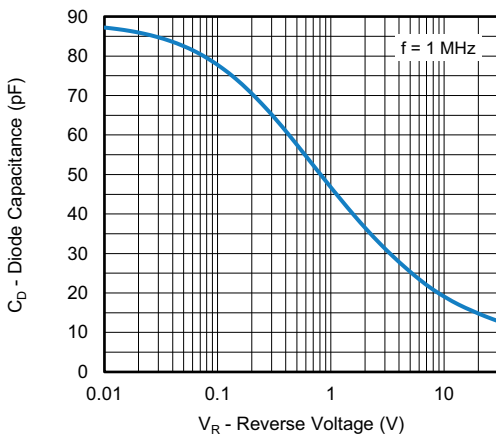


Fig. 4 - Diode Capacitance vs. Reverse Voltage

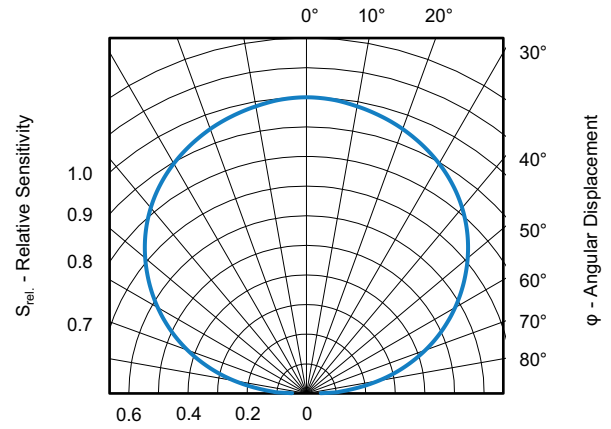
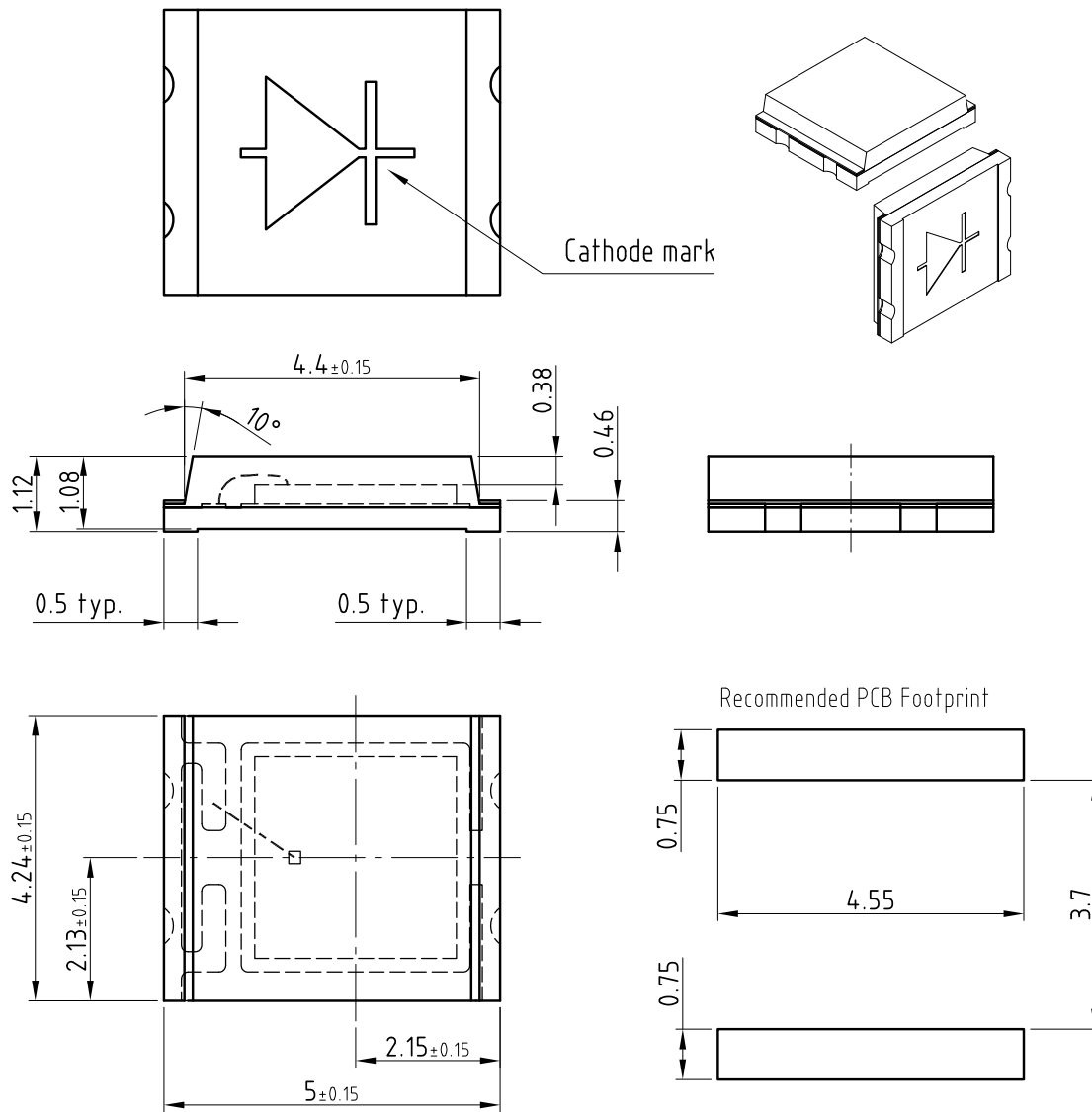


Fig. 6 - Relative Sensitivity vs. Angular Displacement

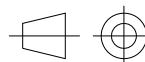


### PACKAGE DIMENSIONS in millimeters



Cathode mark

Recommended PCB Footprint

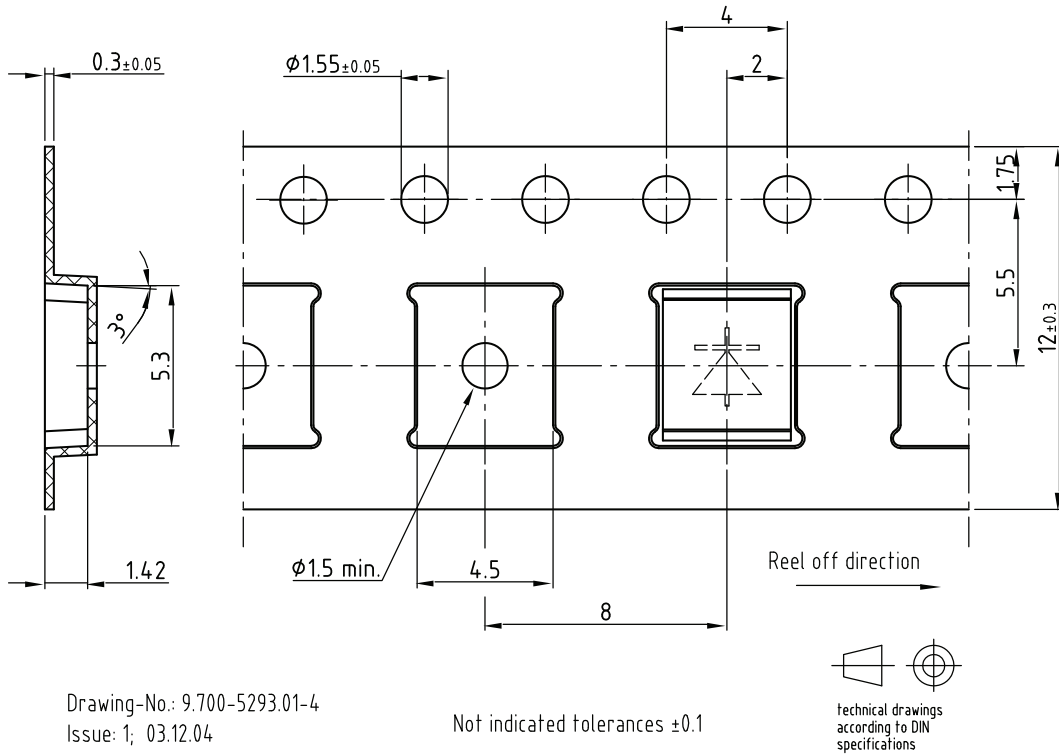


Technical drawings according to DIN specifications

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

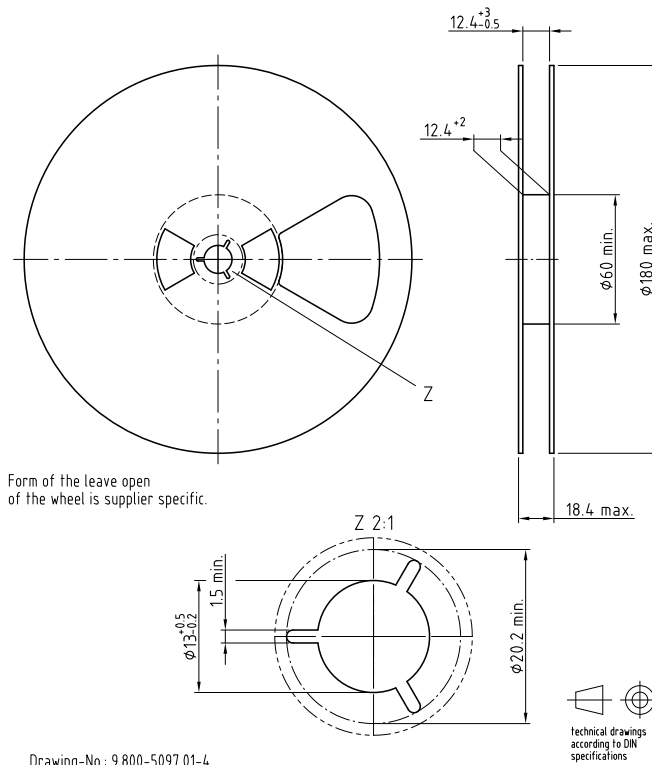
Not indicated tolerances  $\pm 0.1$

**TAPING DIMENSIONS** in millimeters



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

**REEL DIMENSIONS** in millimeters



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



**SOLDER PROFILE**

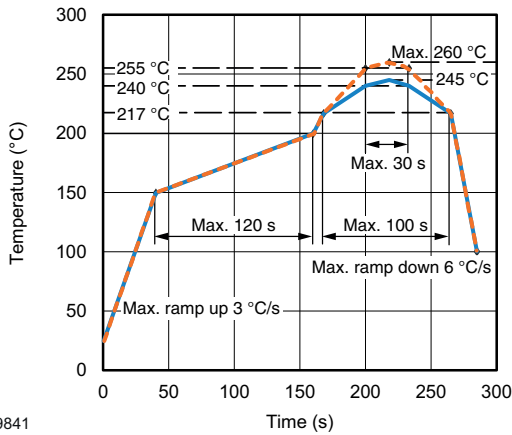


Fig. 7 - Lead (Pb)-Free Reflow Solder Profile According to J-STD-020D

**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-020 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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