

Silicon PIN Photodiode



20535

DESCRIPTION

TEMD5080X01 is a PIN photodiode with enhanced blue sensitivity. The miniature surface mount package (SMD) include a chip with 7.7 mm² 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 mm²): 7.7
- AEC-Q101 qualified
- Enhanced blue photo sensitivity: S (400 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, acc. J-STD-020
- Lead (Pb)-free reflow soldering
- Compliant to RoHS Directive 2002/95/EC and in accordance to WEEE 2002/96/EC

AUTOMOTIVE GRADE


RoHS
COMPLIANT
GREEN
(5-2008)**

Note

** Please see document "Vishay Material Category Policy":
www.vishay.com/doc?99902

APPLICATIONS

- High speed photo detector

PRODUCT SUMMARY

COMPONENT	I_{ra} (μ A)	ϕ (deg)	$\lambda_{0.1}$ (nm)
TEMD5080X01	60	± 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	$^\circ\text{C}$
Operating temperature range		T_{amb}	- 40 to + 100	$^\circ\text{C}$
Storage temperature range		T_{stg}	- 40 to + 110	$^\circ\text{C}$
Soldering temperature	Acc. reflow solder profile fig. 8	T_{sd}	260	$^\circ\text{C}$
Thermal resistance junction/ambient		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
Forward voltage	$I_F = 50\text{ mA}$	V_F		1	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}		2	10	nA
Diode capacitance	$V_R = 0\text{ V}$, $f = 1\text{ MHz}$, $E = 0$	C_D		90		pF
	$V_R = 3\text{ V}$, $f = 1\text{ MHz}$, $E = 0$	C_D		30	40	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		50		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	$E_e = 1\text{ mW/cm}^2$, $\lambda = 400\text{ nm}$, $V_R = 5\text{ V}$	I_{ra}		18		μA
	$E_v = 100\text{ lx}$, CIE illuminant A, $V_R = 5\text{ V}$	I_{ra}		8.5		μA
	$E_e = 1\text{ mW/cm}^2$, $\lambda = 950\text{ nm}$, $V_R = 5\text{ V}$	I_{ra}		60		μA
Temperature coefficient of I_{ra}	CIE illuminant A	$TK_{I_{ra}}$		0.15		%/K
	$\lambda = 950\text{ nm}$	$TK_{I_{ra}}$		0.1		%/K
Angle of half sensitivity		φ		± 65		deg
Wavelength of peak sensitivity		λ_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		1.1×10^{-13}		$\text{W}/\sqrt{\text{Hz}}$
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

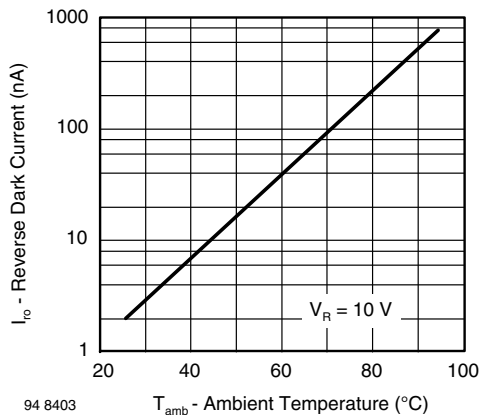
BASIC CHARACTERISTICS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified)


Fig. 1 - Reverse Dark Current vs. Ambient Temperature

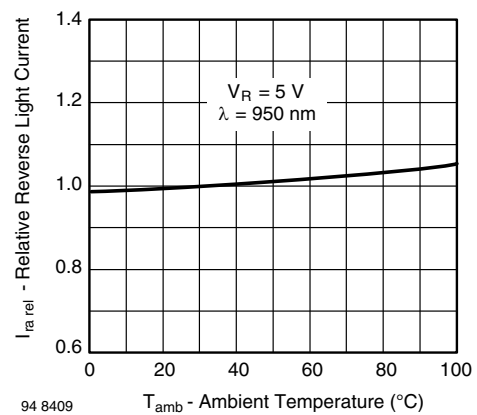


Fig. 2 - Relative Reverse Light Current vs. Ambient Temperature

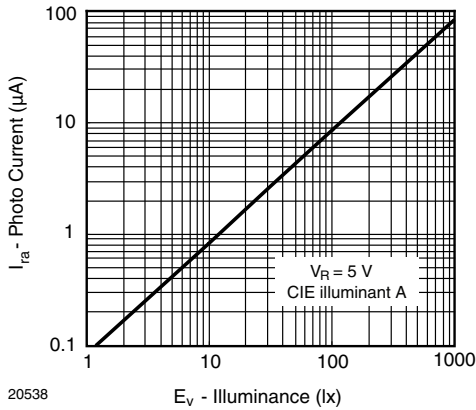


Fig. 3 - Reverse Light Current vs. Irradiance

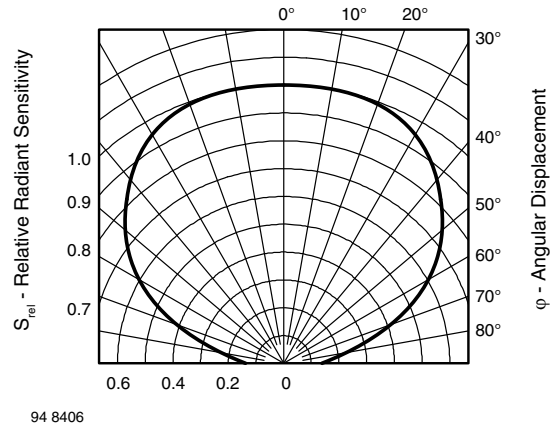


Fig. 6 - Relative Radiant Sensitivity vs. Angular Displacement

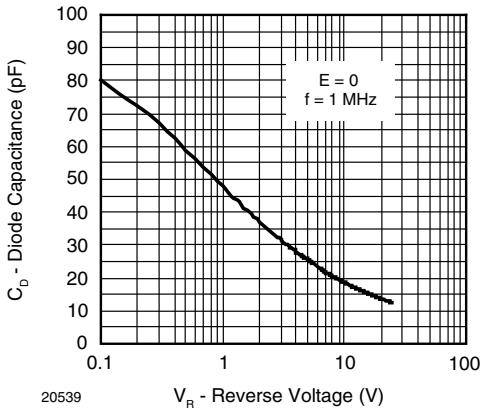


Fig. 4 - Diode Capacitance vs. Reverse Voltage

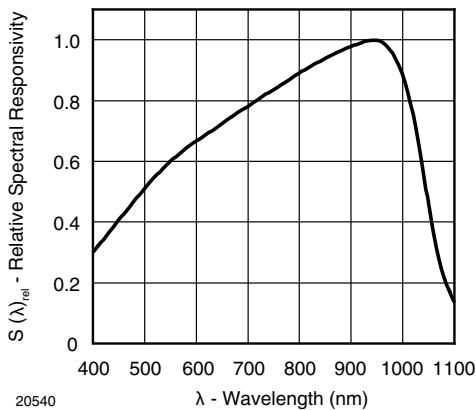
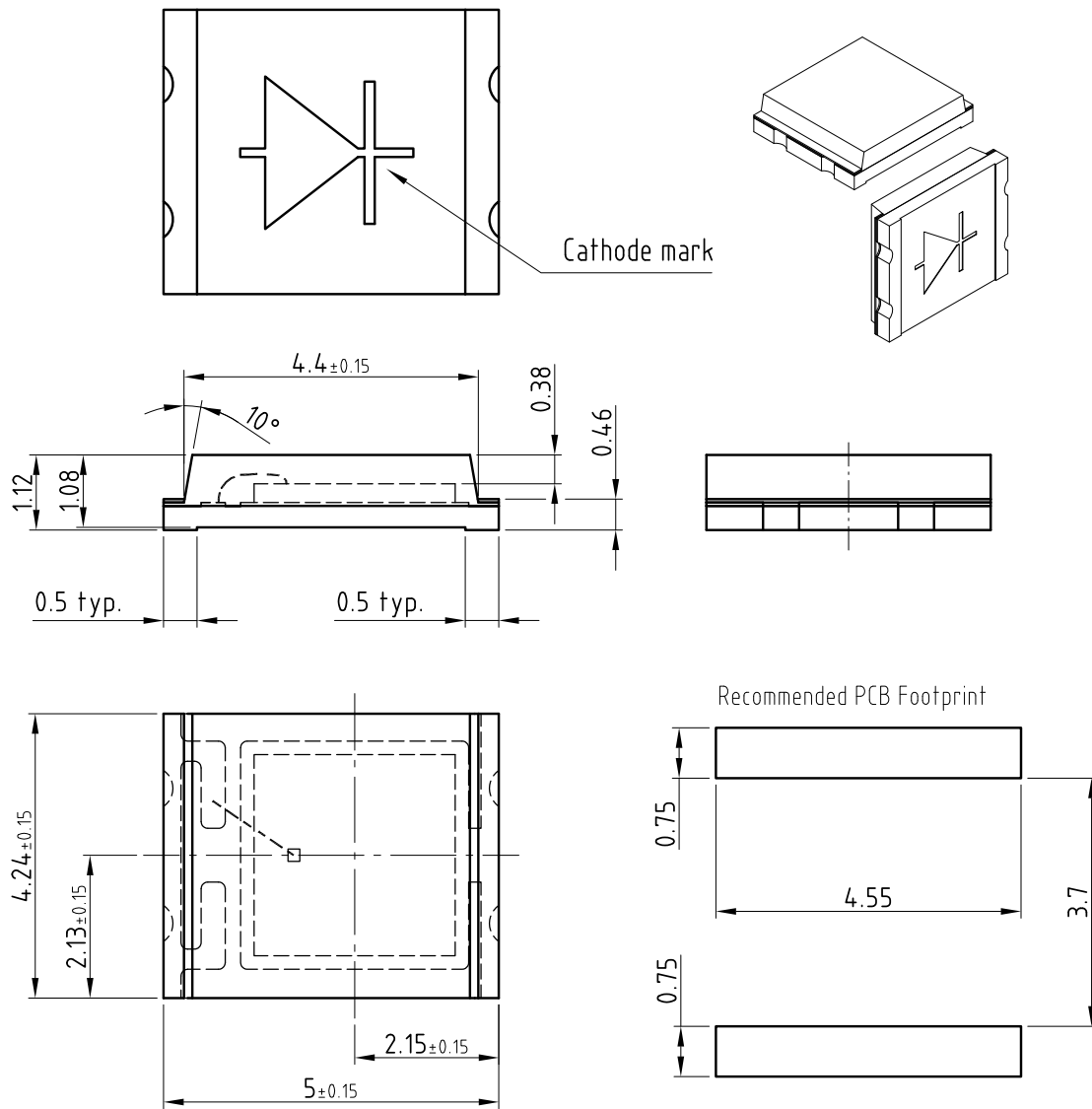


Fig. 5 - Relative Spectral Sensitivity vs. Wavelength



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

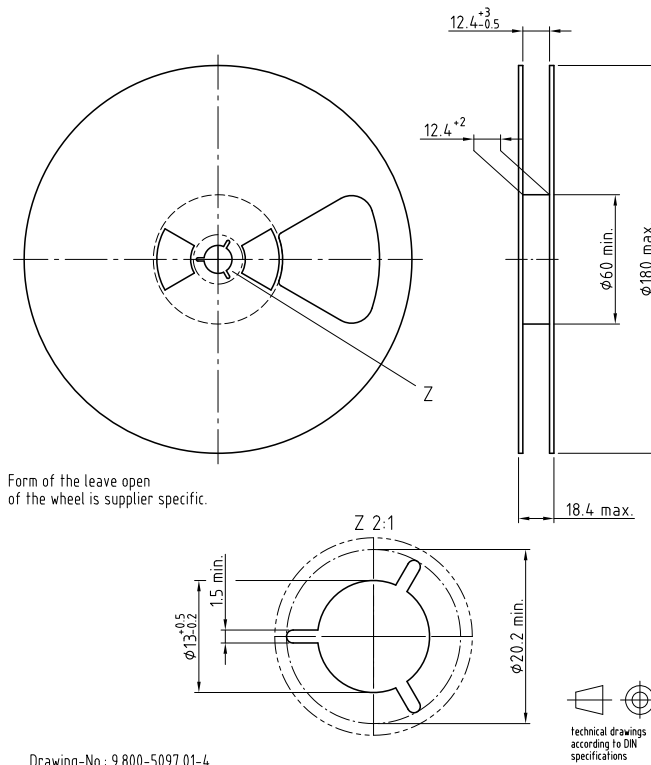


Drawing-No.: 9.700-5293.01-4
 Issue: 1; 03.12.04
 20537

Not indicated tolerances ±0.1

technical drawings according to DIN specifications

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

technical drawings according to DIN specifications

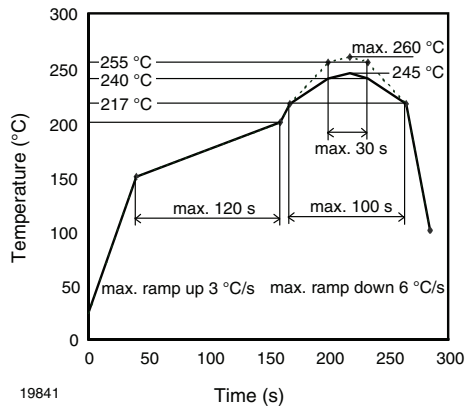
SOLDER PROFILE


Fig. 7 - 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

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: $T_{amb} < 30\text{ }^{\circ}\text{C}$, 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 $40\text{ }^{\circ}\text{C}$ (+ 5 $^{\circ}\text{C}$), RH < 5 %

or

96 h at $60\text{ }^{\circ}\text{C}$ (+ 5 $^{\circ}\text{C}$), RH < 5 %.



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