

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} (μA)	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 ($T_{amb} = 25^\circ C$, unless otherwise specified)				
PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
Reverse voltage		V_R	25	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	Acc. reflow solder profile fig. 8	T_{sd}	260	$^\circ C$
Thermal resistance junction/ambient		R_{thJA}	350	K/W



BASIC CHARACTERISTICS (T _{amb} = 25 °C, unless otherwise specified)						
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Forward voltage	I _F = 50 mA	V _F		1	1.3	V
Breakdown voltage	I _R = 100 μA, E = 0	V _(BR)	25			V
Reverse dark current	V _R = 10 V, E = 0	I _{ro}		2	10	nA
Diode capacitance	V _R = 0 V, f = 1 MHz, E = 0	C _D		90		pF
	V _R = 3 V, f = 1 MHz, E = 0	C _D		30	40	pF
Open circuit voltage	E _e = 1 mW/cm ² , λ = 950 nm	V _o		350		mV
Temperature coefficient of V _o	E _e = 1 mW/cm ² , λ = 950 nm	TK _{V_o}		- 2.6		mV/K
Short circuit current	E _e = 1 mW/cm ² , λ = 950 nm	I _k		50		μA
Temperature coefficient of I _k	E _e = 1 mW/cm ² , λ = 950 nm	TK _{I_k}		0.1		%/K
Reverse light current	E _e = 1 mW/cm ² , λ = 400 nm, V _R = 5 V	I _{ra}		18		μA
	E _v = 100 lx, CIE illuminant A, V _R = 5 V	I _{ra}		8.5		μA
	E _e = 1 mW/cm ² , λ = 950 nm, V _R = 5 V	I _{ra}		60		μA
Temperature coefficient of I _{ra}	CIE illuminant A	TK _{I_{ra}}		0.15		%/K
	λ = 950 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		λ _{0.1}		350 to 1100		nm
Noise equivalent power	V _R = 10 V, λ = 400 nm	NEP		1.1 x 10 ⁻¹³		W/√Hz
Rise time	V _R = 5 V, R _L = 50 Ω, λ = 850 nm	t _r		40		ns
Fall time	V _R = 5 V, R _L = 50 Ω, λ = 850 nm	t _f		40		ns

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

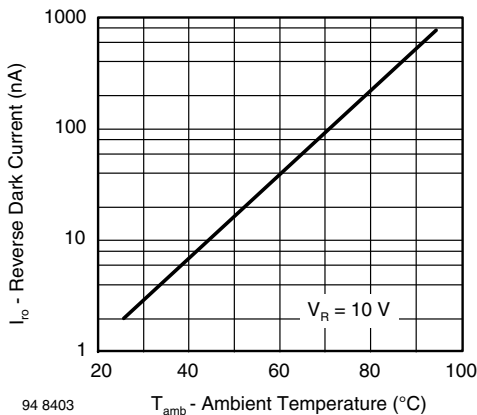


Fig. 1 - Reverse Dark Current vs. Ambient Temperature

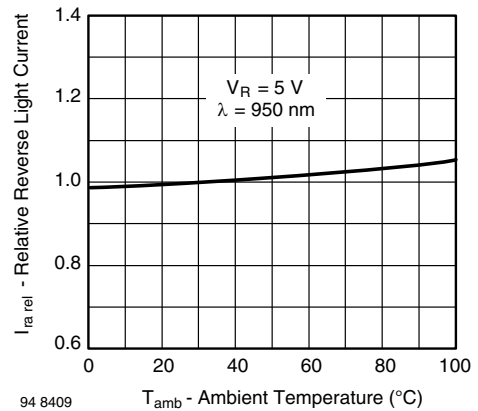


Fig. 2 - Relative Reverse Light Current vs. Ambient Temperature

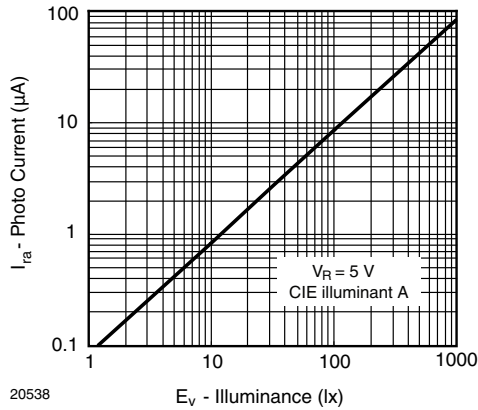


Fig. 3 - Reverse Light Current vs. Irradiance

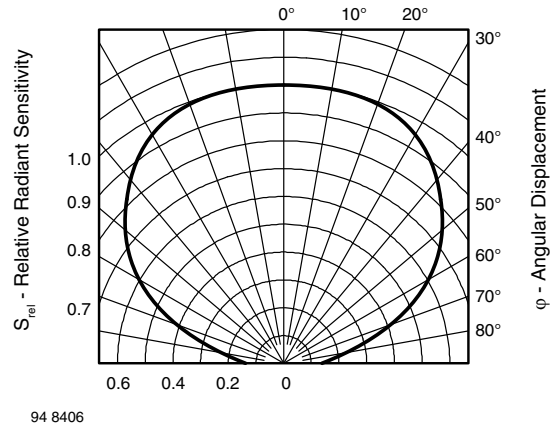


Fig. 6 - Relative Radiant Sensitivity vs. Angular Displacement

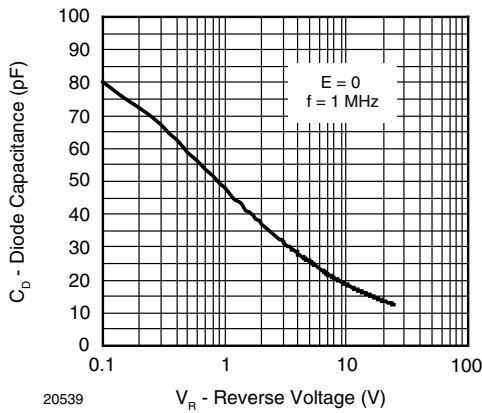


Fig. 4 - Diode Capacitance vs. Reverse Voltage

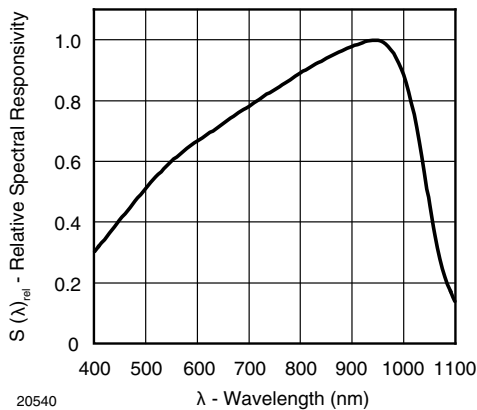
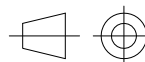
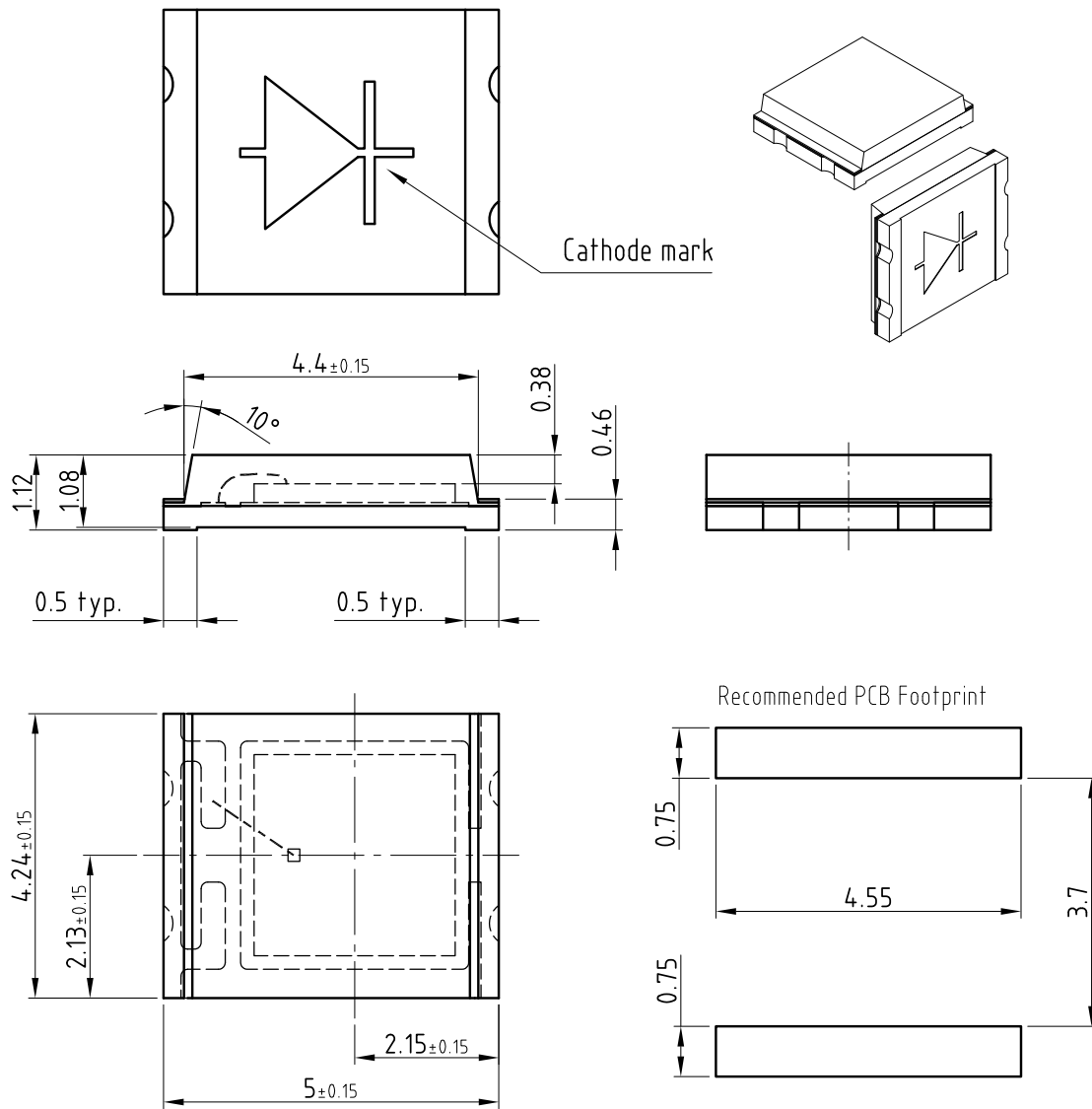


Fig. 5 - Relative Spectral Sensitivity vs. Wavelength



PACKAGE DIMENSIONS in millimeters

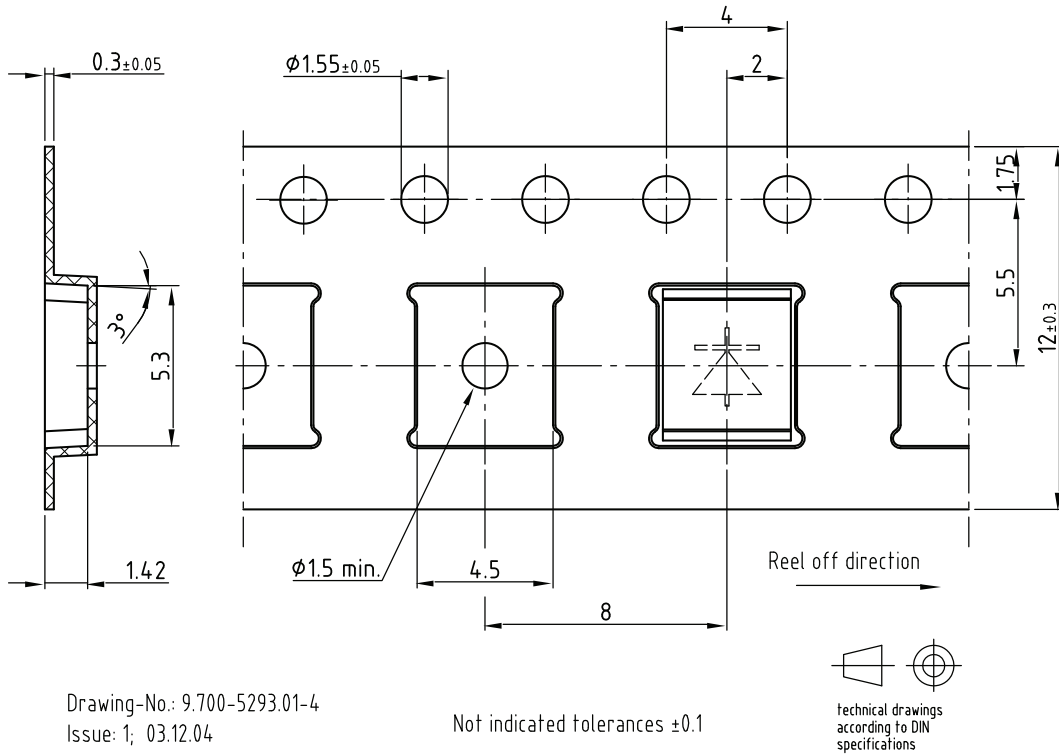


Technical drawings according to DIN specifications

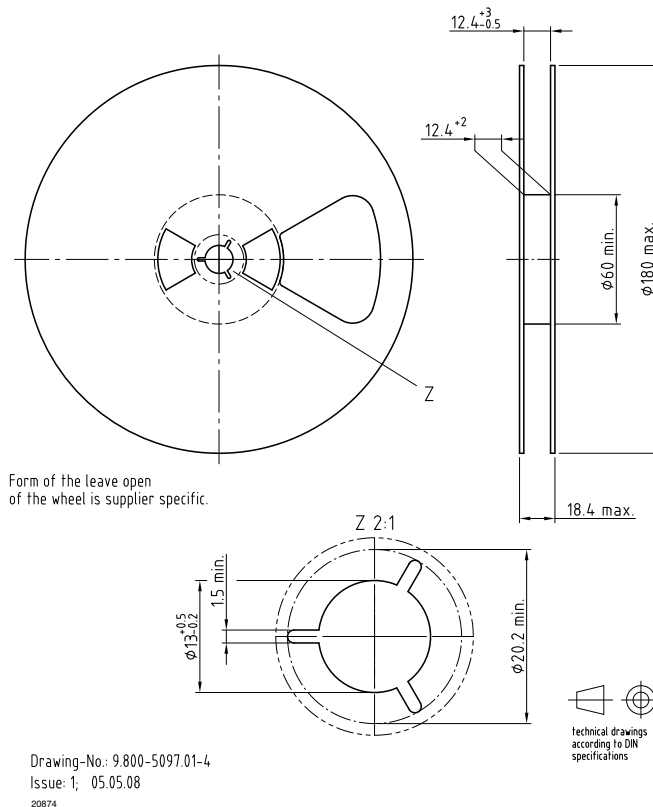
Drawing-No.: 6.541-5060.01-4
Issue: 3; 05.02.08
20536

Not indicated tolerances ± 0.1

TAPING DIMENSIONS in millimeters



REEL DIMENSIONS in millimeters





SOLDER PROFILE

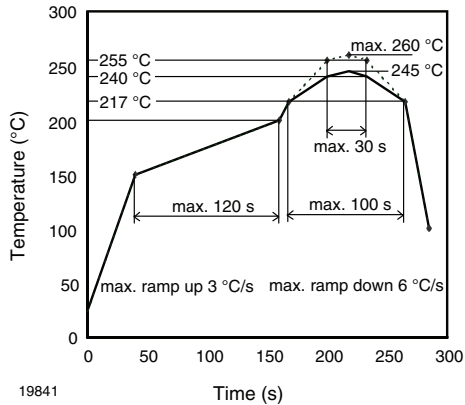


Fig. 7 - Lead (Pb)-free Reflow Solder Profile acc. J-STD-020D

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 °C (+ 5 °C), RH < 5 %

or

96 h at 60 °C (+ 5 °C), RH < 5 %.



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