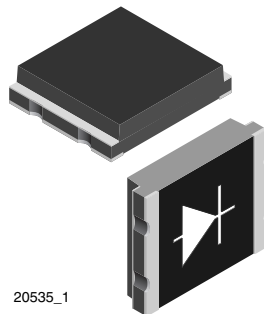




Silicon PIN Photodiode, RoHS Compliant, Released for Lead (Pb)-free Reflow Soldering, AEC-Q101 Released



20535_1

DESCRIPTION

TEMD5120X01 is a high speed and high sensitive PIN photodiode. It is a miniature surface mount device (SMD) including the chip with a 4.4 mm² sensitive area and a daylight blocking filter matched with IR emitters operating at wavelength 870 nm or 950 nm.

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): 4.4
- AEC-Q101 qualified
- High radiant sensitivity
- Daylight blocking filter matched with 870 nm to 950 nm emitters
- Fast response times
- Angle of half sensitivity: $\phi = \pm 65^\circ$
- Floor life: 72 h, MSL 4, acc. J-STD-020
- Compliant to RoHS Directive 2002/95/EC and in accordance to WEEE 2002/96/EC



Note

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

APPLICATIONS

- High speed detector for infrared radiation
- Infrared remote control and free air data transmissionsystems, e.g. in combination with TSFFxxxx series IR emitters

PRODUCT SUMMARY			
COMPONENT	I _{ra} (μA)	φ (deg)	λ _{0.5} (nm)
TEMD5120X01	35	± 65	790 to 1050

Note

- Test conditions see table "Basic Characteristics"

ORDERING INFORMATION			
ORDERING CODE	PACKAGING	REMARKS	PACKAGE FORM
TEMD5120X01	Tape and reel	MOQ: 1500 pcs, 1500 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	60	V
Power dissipation	T _{amb} ≤ 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	Acc. reflow solder profile fig. 8	T _{sd}	260	°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)	60			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		48		pF
	V _R = 3 V, f = 1 MHz, E = 0	C _D		17	40	pF
Open circuit voltage	E ₀ = 1 mW/cm ² , λ = 950 nm	V _o		350		mV
Temperature coefficient of V _o	E ₀ = 1 mW/cm ² , λ = 950 nm	TK _{V_o}		-2.6		mV/K
Short circuit current	E ₀ = 1 mW/cm ² , λ = 950 nm	I _k		32		μA
Temperature coefficient of I _k	E ₀ = 1 mW/cm ² , λ = 950 nm	TK _{I_k}		0.1		%/K
Reverse light current	E ₀ = 1 mW/cm ² , λ = 950 nm, V _R = 5 V	I _{ra}	25	35		μA
Angle of half sensitivity		φ		± 65		deg
Wavelength of peak sensitivity		λ _p		940		nm
Range of spectral bandwidth		λ _{0.5}		790 to 1050		nm
Noise equivalent power	V _R = 10 V, λ = 950 nm	NEP		4 x 10 ⁻¹⁴		W/√Hz
Rise time	V _R = 10 V, R _L = 1 kΩ, λ = 820 nm	t _r		100		ns
Fall time	V _R = 10 V, R _L = 1 kΩ, λ = 820 nm	t _f		100		ns

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

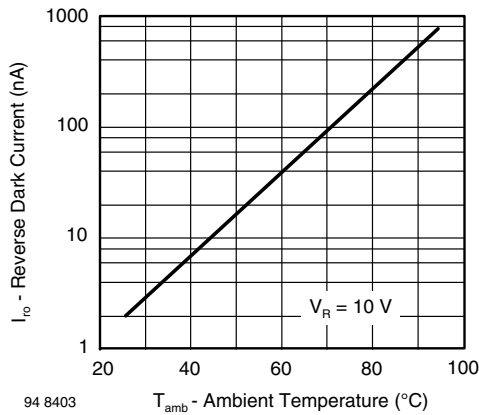


Fig. 1 - Reverse Dark Current vs. Ambient Temperature

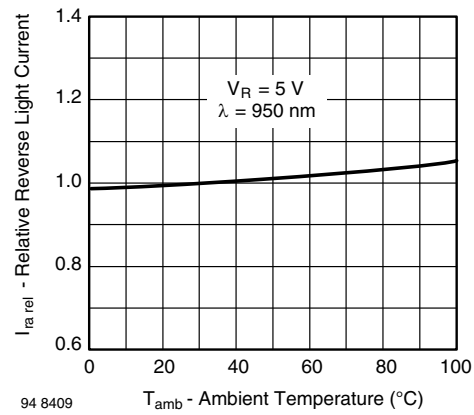


Fig. 2 - Relative Reverse Light Current vs. Ambient Temperature

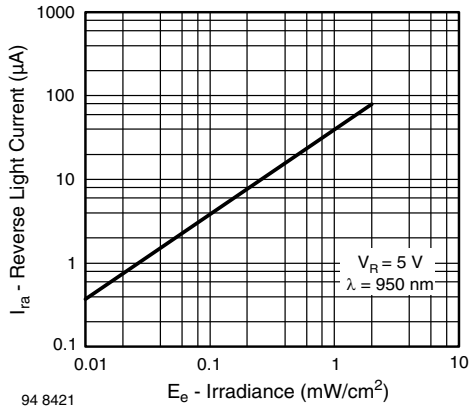


Fig. 3 - Reverse Light Current vs. Irradiance

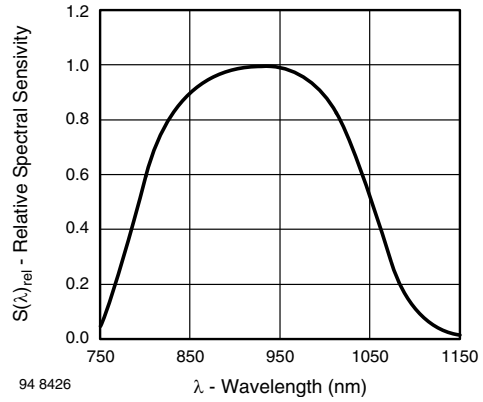


Fig. 6 - Relative Spectral Sensitivity vs. Wavelength

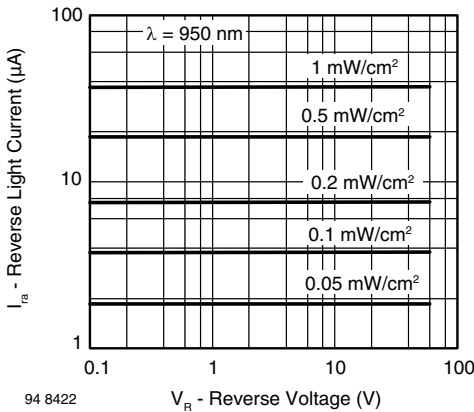


Fig. 4 - Reverse Light Current vs. Reverse Voltage

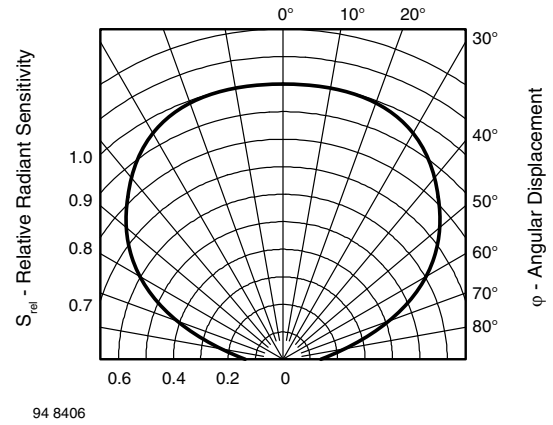


Fig. 7 - Relative Radiant Sensitivity vs. Angular Displacement

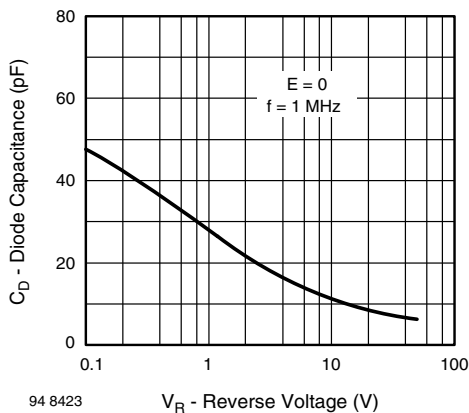
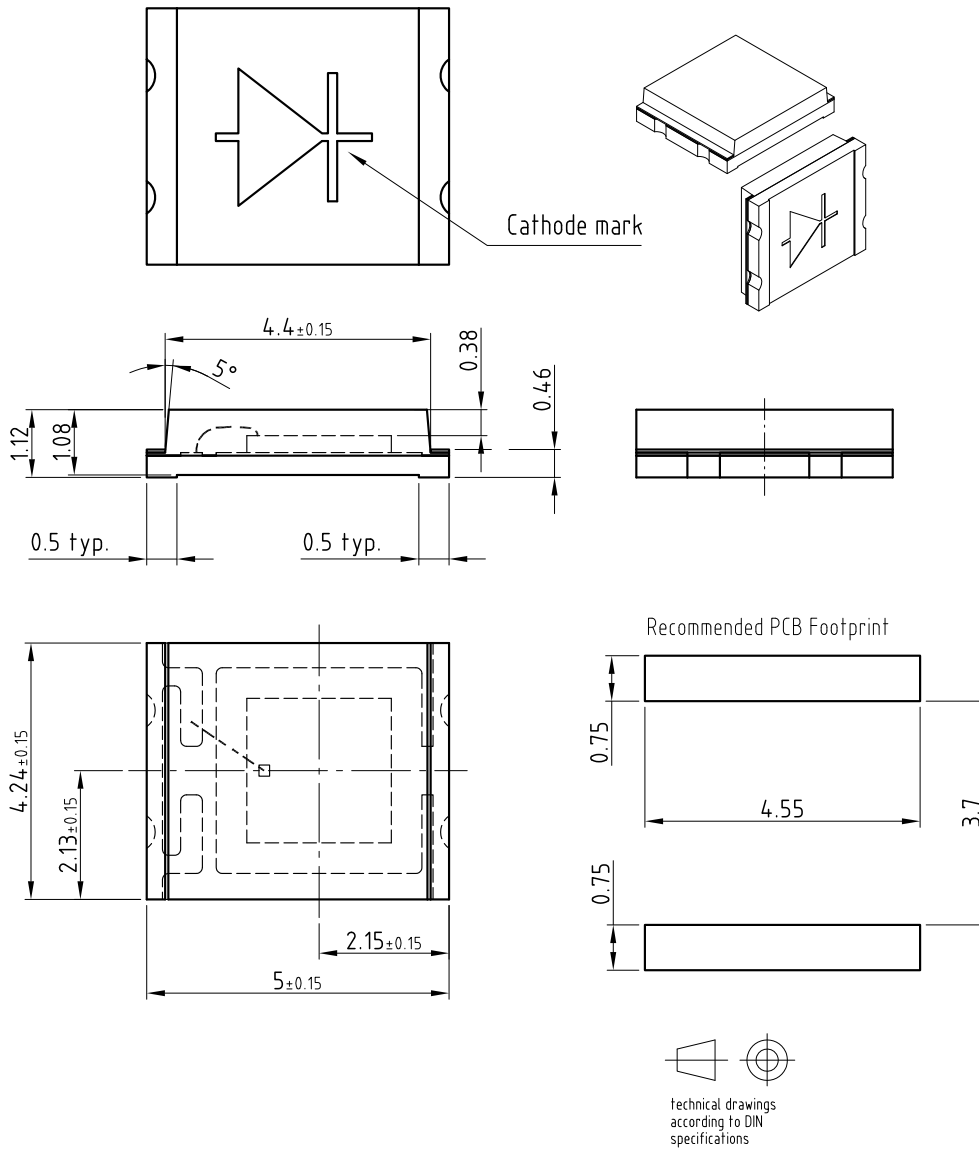


Fig. 5 - Diode Capacitance vs. Reverse Voltage



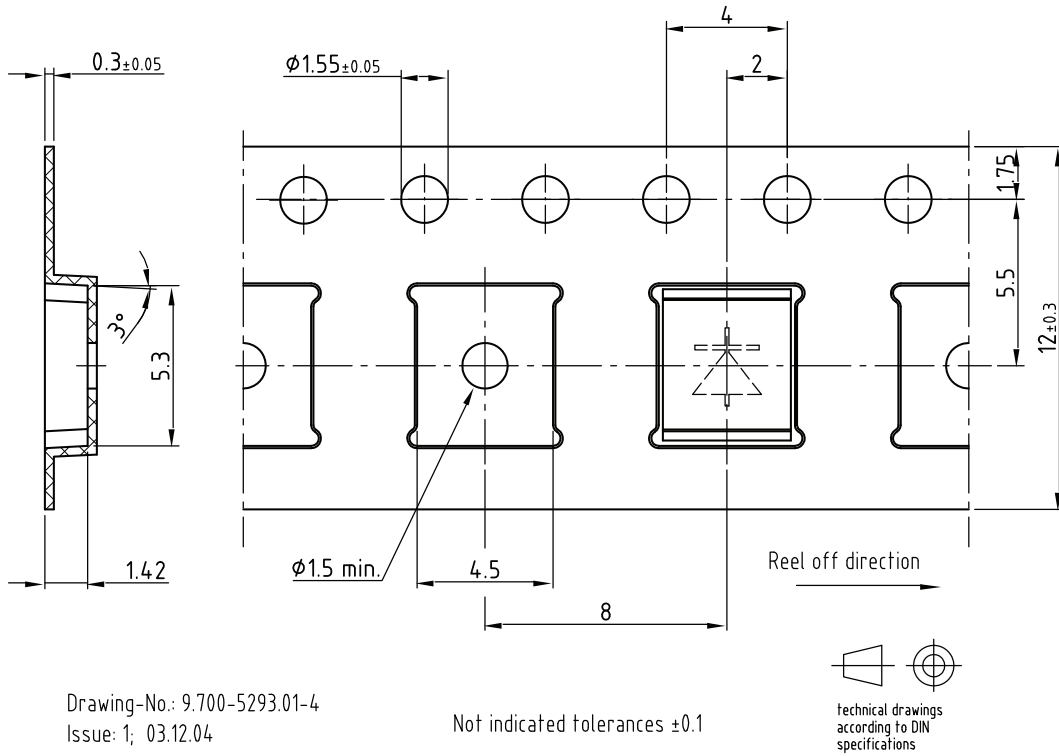
PACKAGE DIMENSIONS in millimeters



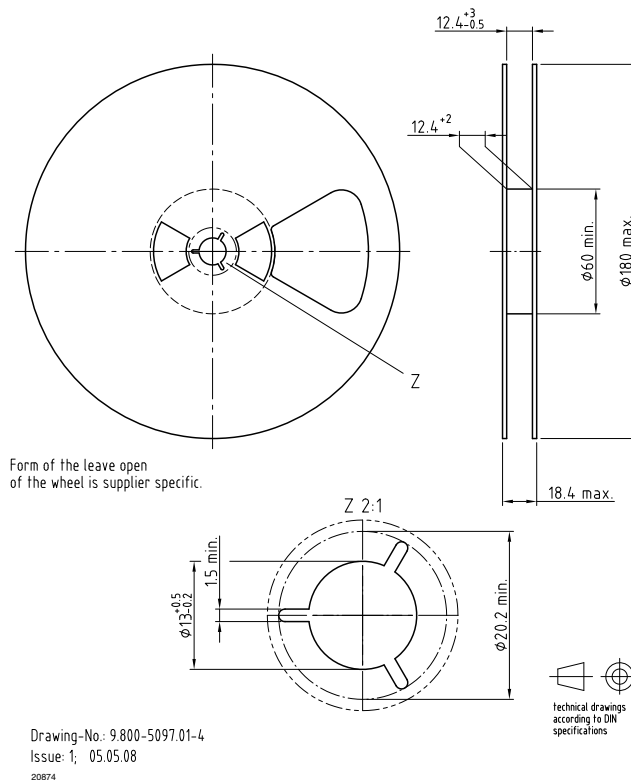
Drawing-No.: 6.541-5059.01-4
Issue: 4; 26.04.07
19280

Not indicated tolerances ± 0.1

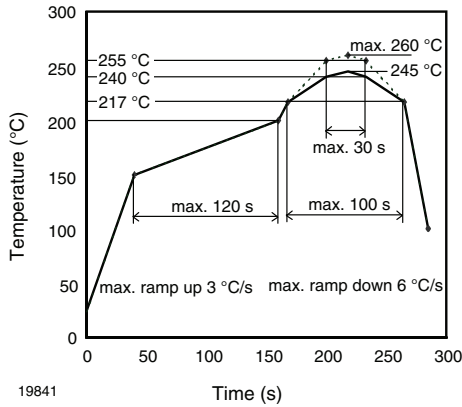
TAPING DIMENSIONS in millimeters



REEL DIMENSIONS in millimeters



SOLDER PROFILE



19841

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

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 %.



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