

AUTOMOTIVE

ROHS

HALOGEN

FREE

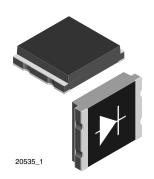
GREEN

(5-2008)



Vishay Semiconductors

Silicon PIN Photodiode



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): 7.5
- AEC-Q101 qualified
- · High radiant sensitivity
- Daylight blocking filter matched with 870 to 950 nm emitters
- · Fast response times
- Angle of half sensitivity: $\varphi = \pm 65^{\circ}$
- Floor life: 72 h, MSL 4, acc. J-STD-020
- Material categorization: for definitions of compliance please see <u>www.vishay.com/doc?99912</u>

DESCRIPTION

TEMD5110X01 is a high speed and high sensitive PIN photodiode. It is a miniature surface mount device (SMD) including the chip with a 7.5 mm² sensitive area and a daylight blocking filter matched with IR emitters operating at wavelength 870 nm or 950 nm.

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} (μΑ)	φ (°)	λ _{0.5} (nm)
TEMD5110X01	55	± 65	790 to 1050

Note

· Test conditions see table "Basic Characteristics"

ORDERING INFORMATION				
ORDERING CODE	PACKAGING	REMARKS	PACKAGE FORM	
TEMD5110X01	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		Tj	100	°C	
Operating temperature range		T _{amb}	-40 to +100	°C	
Storage temperature range		T _{stg}	-40 to +110	°C	
Soldering temperature	Acc. reflow sloder profile fig. 8	T _{sd}	260	°C	
Thermal resistance junction to ambient		R _{thJA}	350	K/W	





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
Diada assasitana	V _R = 0 V, f = 1 MHz, E = 0	C _D		70		pF
Diode capacitance	V _R = 3 V, f = 1 MHz, E = 0	C _D		25	40	pF
Open circuit voltage	$E_e = 1 \text{ mW/cm}^2, \lambda = 950 \text{ nm}$	Vo		350		mV
Temperature coefficient of Vo	$E_e = 1 \text{ mW/cm}^2, \lambda = 950 \text{ nm}$	TK _{Vo}		- 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 _{lk}		0.1		%/K
Reverse light current	$E_{e}=1~\text{mW/cm}^{2},\lambda=950~\text{nm},\\ V_{R}=5~\text{V}$	I _{ra}	45	55		μΑ
Angle of half sensitivity		φ		± 65		0
Wavelength of peak sensitivity		λ_{p}		940		nm
Range of spectral bandwidth		λ _{0.5}		790 to 1050		nm
Noise equivalent power	$V_R = 10 \text{ V}, \lambda = 950 \text{ nm}$	NEP		4 x 10 ⁻¹⁴		W/√Hz
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 V, R_L = 1 kΩ, λ = 820 nm	t _f		100		ns

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

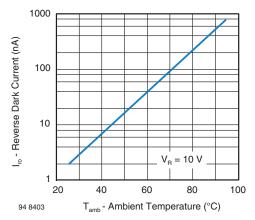


Fig. 1 - Reverse Dark Current vs. Ambient Temperature

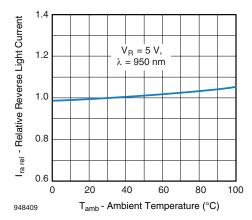


Fig. 2 - Relative Reverse Light Current vs. Ambient Temperature



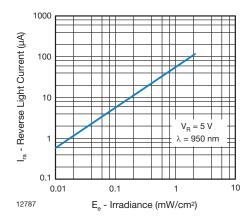


Fig. 3 - Reverse Light Current vs. Irradiance

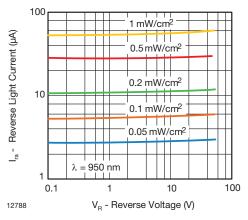


Fig. 4 - Reverse Light Current vs. Reverse Voltage

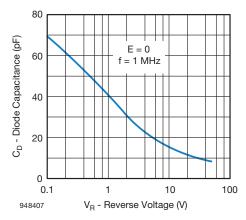


Fig. 5 - Diode Capacitance vs. Reverse Voltage

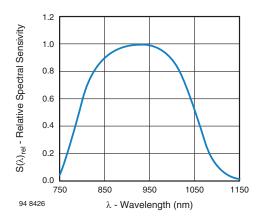


Fig. 6 - Relative Spectral Sensitivity vs. Wavelength

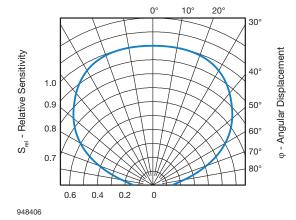
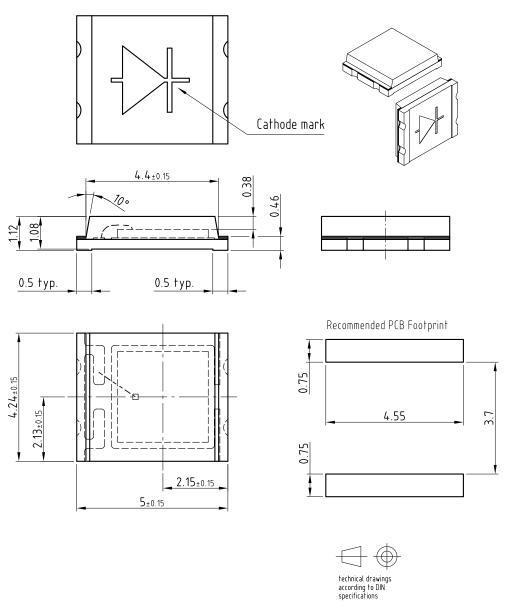


Fig. 7 - Relative Radiant Sensitivity vs. Angular Displacement



PACKAGE DIMENSIONS in millimeters



Drawing-No.: 6.541-5060.01-4

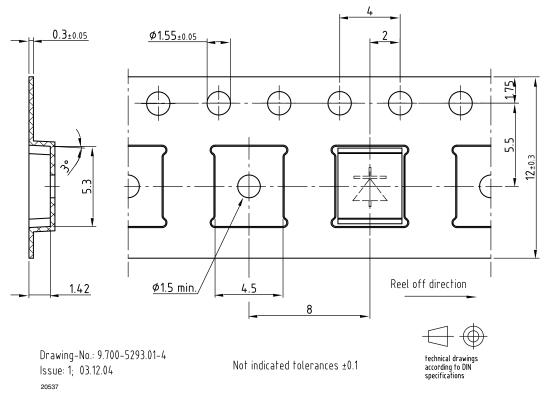
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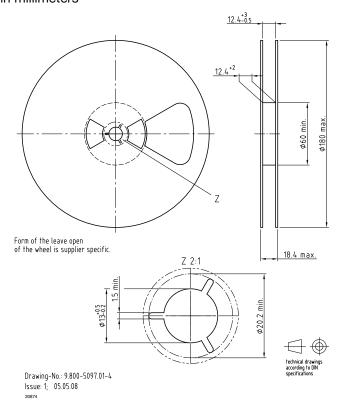
Not indicated tolerances ± 0.1



TAPING DIMENSIONS in millimeters



REEL DIMENSIONS in millimeters

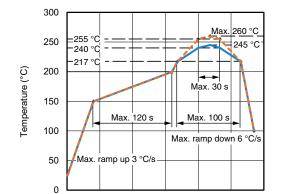


SOLDER PROFILE





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100

50

19841

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

150

200

250

300

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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 °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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