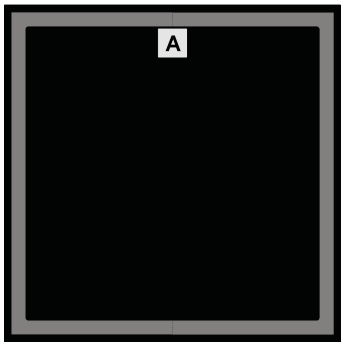
Silicon PIN Photodiode



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FEATURES

- Package type: chip
- Package form: single chip
- Dimensions (L x W x H in mm): 2.37 x 2.37 x 0.28
- Radiant sensitive area (in mm^2): 4.4
- High photo sensitivity
- High radiant sensitivity
- Suitable for visible and near infrared radiation
- Fast response times
- Angle of half sensitivity: $\varphi = \pm 60°$
- Compliant to RoHS Directive 2002/95/EC and in accordance to WEEE 2002/96/EC

Pb-free

e4

RoHS COMPLIANT

DESCRIPTION

T1120P is a high speed and high sensitive PIN photodiode chip with 4.4 mm^2 sensitive area detecting visible and near infrared radiation. Anode is the bond pad on top.

APPLICATIONS

- High speed photo detector

GENERAL INFORMATION

The datasheet is based on Vishay optoelectronics sample testing under certain predetermined and assumed conditions, and is provided for illustration purpose only. Customers are encouraged to perform testing in actual proposed packaged and used conditions. Vishay optoelectronics die products are tested using Vishay optoelectronics based quality assurance procedures and are manufactured using Vishay optoelectronics established processes. Estimates such as those described and set forth in this datasheet for semiconductor die will vary depending on a number of packaging, handling, use, and other factors. Therefore sold die may not perform on an equivalent basis to standard package products.

PRODUCT SUMMARY			
COMPONENT	I_{ra} (µA)	φ (deg)	$\lambda_{0.1}$ (nm)
T1120P	35	± 60	430 to 1100

Note

- Test conditions see table “Basic Characteristics”

ORDERING INFORMATION			
ORDERING CODE	PACKAGING	REMARKS	PACKAGE FORM
T1120P-SD-F	Wafer sawn on foil with discoframe	MOQ: 25 000 pcs	Chip

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
Junction temperature		T_j	100	°C
Operating temperature range		T_{amb}	- 40 to + 100	°C
Storage temperature range		T_{stg1}	- 40 to + 100	°C
Storage temperature range on foil		T_{stg2}	- 40 to + 50	°C

BASIC CHARACTERISTICS (T_{amb} = 25 °C, unless otherwise specified)						
PARAMETER	**TEST CONDITION**	**SYMBOL**	**MIN.**	**TYP.**	**MAX.**	**UNIT**
Breakdown voltage	I_R = 100 µA, E = 0	$V_{(BR)}$		60		V
Forward voltage	I_F = 50 mA	V_F		1	1.3	V
Reverse dark current	V_R = 10 V, E = 0	I_{ro}		2	5	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		pF
Open circuit voltage	E_e = 1 mW/cm², λ = 950 nm	V_{OC}		350		mV
Temperature coefficient of V_{OC}	E_e = 1 mW/cm², λ = 950 nm	TK_{VOC}		- 2.6		mV/K
Short circuit current	E_e = 1 mW/cm², λ = 950 nm	I_k		32		µA
Temperature coefficient of I_k	E_e = 1 mW/cm², λ = 950 nm	TK_{Ik}		0.1		%/K
Reverse light current	E_e = 1 mW/cm², λ = 950 nm, V_R = 5 V	I_{ra}	25	35		µA
Angle of half sensitivity		φ		± 60		deg
Wavelength of peak sensitivity		λ_p		940		nm
Range of spectral bandwidth		$\lambda_{0.1}$		430 to 1100		nm
Noise equivalent power	V_R = 10 V, λ = 950 nm	NEP		4×10^{-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

Notes

- The measurements are based on samples of die which are mounted on a TO-header without resin coating

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

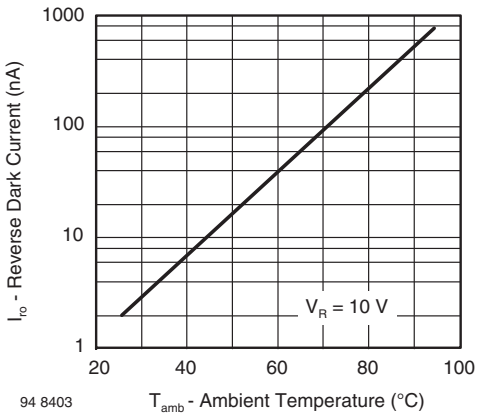

Fig. 1 - Reverse Dark Current vs. Ambient Temperature

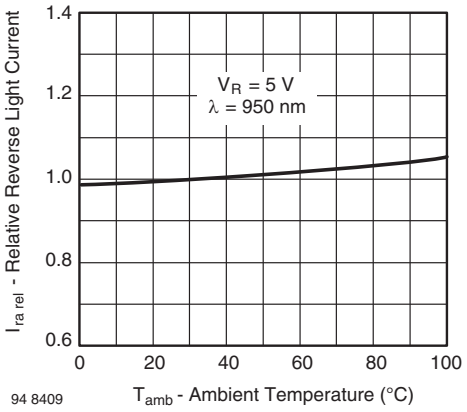

Fig. 2 - Relative Reverse Light Current vs. Ambient Temperature

For technical questions, contact: optochipsupport@vishay.com
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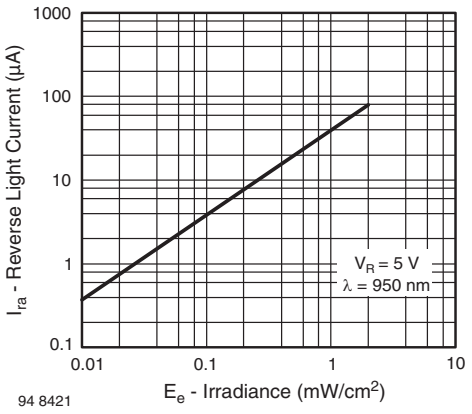

Fig. 3 - Reverse Light Current vs. Irradiance

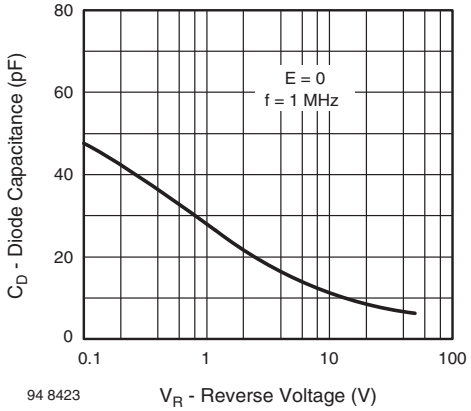

Fig. 5 - Diode Capacitance vs. Reverse Voltage

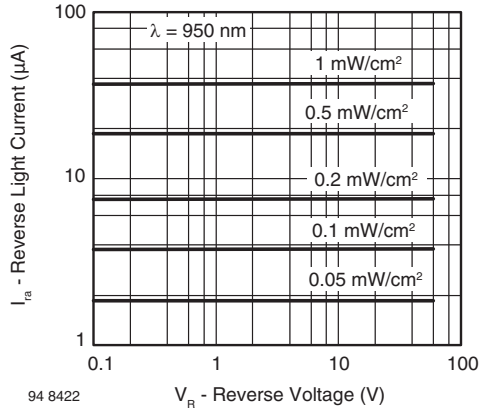

Fig. 4 - Reverse Light Current vs. Reverse Voltage

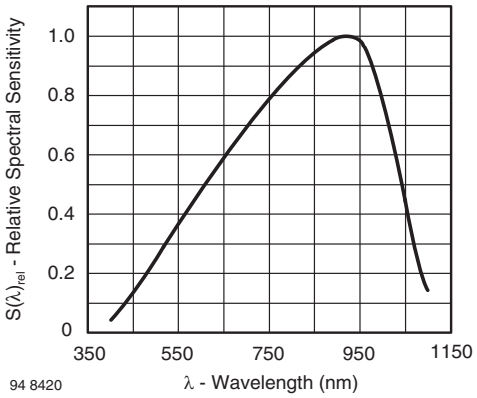

Fig. 6 - Relative Spectral Sensitivity vs. Wavelength

MECHANICAL DIMENSIONS					
PARAMETER	**SYMBOL**	**MIN.**	**TYP.**	**MAX.**	**UNIT**
Length of chip edge (x-direction)	L_x		2.37		mm
Length of chip edge (y-direction)	L_y		2.37		mm
Sensitive area	A_S		4.4		mm^2
Die height	H		0.28		mm
Bond pad anode	a x b		0.2 x 0.2		mm^2

ADDITIONAL INFORMATION (1)	
Frontside metallization, anode	Aluminum
Backside metallization, cathode	NiV-Ag
Dicing	Sawing
Die bonding technology	Epoxy bonding

Note

(1) All chips are checked in accordance with the Vishay Semiconductor, specification of visual inspection FVOV6870.
The visual inspection shall be made in accordance with the “specification of visual inspection as referenced”. The visual inspection of chip backside is performed with stereo microscope with incident light and 40x to 80x magnification.
The quality inspection (final visual inspection) is performed by production. An additional visual inspection step as special release procedure by QM is not installed.

HANDLING AND STORAGE CONDITIONS

- The hermetically sealed shipment lots shall be opened in temperature and moisture controlled cleanroom environment only. It is mandatory to follow the rules for disposition of material that can be hazardous for humans and environment.
- Product must be handled only at ESD safe workstations. Standard ESD precautions and safe work environments are as defined in MIL-HDBK-263.
- Singulated die are not to be handled with tweezers. A vacuum wand with non metallic ESD protected tip should be used.

PACKING

Chips are fixed on adhesive foil. Upon request the foils can be mounted on plastic frame or disco frame. For shipment, the wafers are arranged to stacks and hermetically sealed in plastic bags to ensure protection against environmental influence (humidity and contamination).
Use for recycling reliable operators only. We can help getting in touch with your nearest sales office. By agreement we will take back packing material, if it is sorted. You will have to bear the costs of transport. We will invoice you for any costs incurred for packing material that is returned unsorted or which we are not obliged to accept.

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