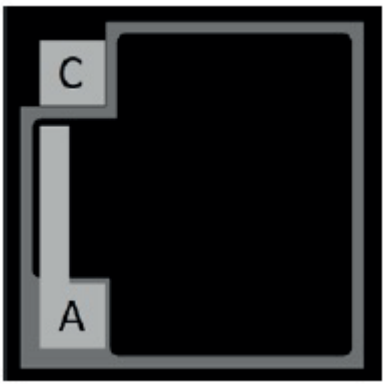
Silicon PIN Photodiode



FEATURES

- Package type: chip
- Package form: single chip
- Dimensions (L x W x H in mm): 0.72 x 0.72 x 0.2
- Radiant sensitive area (in mm^2): 0.34
- Peak sensitivity wavelength: 570 nm
- High photo sensitivity
- Fast response times
- Angle of half sensitivity: φ = ± 60°
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

Pb-free

e4

RoHS COMPLIANT

HALOGEN FREE

GREEN (5-2008)

APPLICATIONS

- Ambient light sensor

DESCRIPTION

T1678P ambient light chip is an epitaxial photodiode with ambient light spectral characteristic. Anode and cathode contact are bond pads on top of the chip.

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} (nA)	φ (deg)	$\lambda_{0.5}$ (nm)
T1678P	15	± 60	440 to 700

Note

- Test conditions see table “Basic Characteristics”

ORDERING INFORMATION			
ORDERING CODE	PACKAGING	REMARKS	PACKAGE FORM
T1678P-SD-F	Wafer sawn on foil with disco frame	MOQ: 58 000 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	16	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

For technical questions, contact: optochipsupport@vishay.com

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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	$V_{(BR)}$	16			V
Reverse dark current	V_R = 10 V, E = 0	I_{ro}		0.1	2	nA
Diode capacitance	V_R = 0 V, f = 1 MHz, E = 0	C_D		72		pF
	V_R = 3 V, f = 1 MHz, E = 0	C_D		35		pF
Reverse light current	E_e = 10 µW/cm², λ = 530 nm, V_R = 5 V	I_{ra}		15		nA
	E_V = 100 lux, white LED 4300 K, V_R = 5 V	I_{ra}		43		nA
	E_V = 100 lux, CIE illumination A, V_R = 5 V	I_{ra}		87		nA
Angle of half sensitivity		φ		± 60		deg
Wavelength of peak sensitivity		λ_p		570		nm
Range of spectral bandwidth		$\lambda_{0.5}$		440 to 700		nm
Rise time	V_R = 5 V, R_L = 50 kΩ, λ = 515 nm	t_r		100		ns
Fall time		t_f		100		ns
Rise time	V_R = 5 V, R_L = 1000 kΩ, λ = 515 nm	t_r		415		ns
Fall time		t_f		415		ns

Note

- The measurements are based on samples of die which are mounted on a TO18-header without resin coating

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

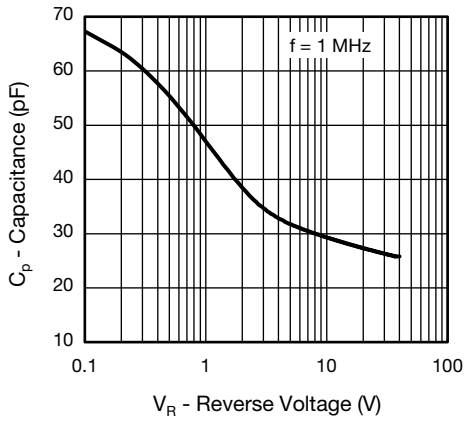


Fig. 1 - Diode Capacitance vs. Reverse Voltage

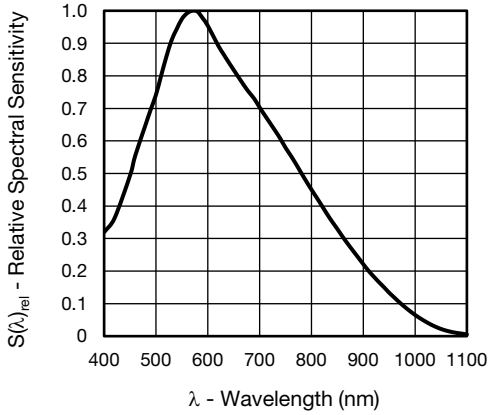


Fig. 3 - Relative Spectral Sensitivity vs. Wavelength of Epoxy Coated Die

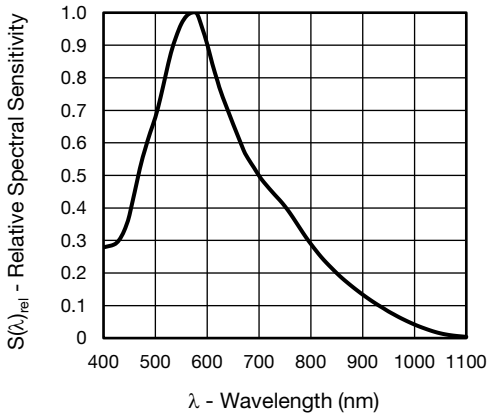
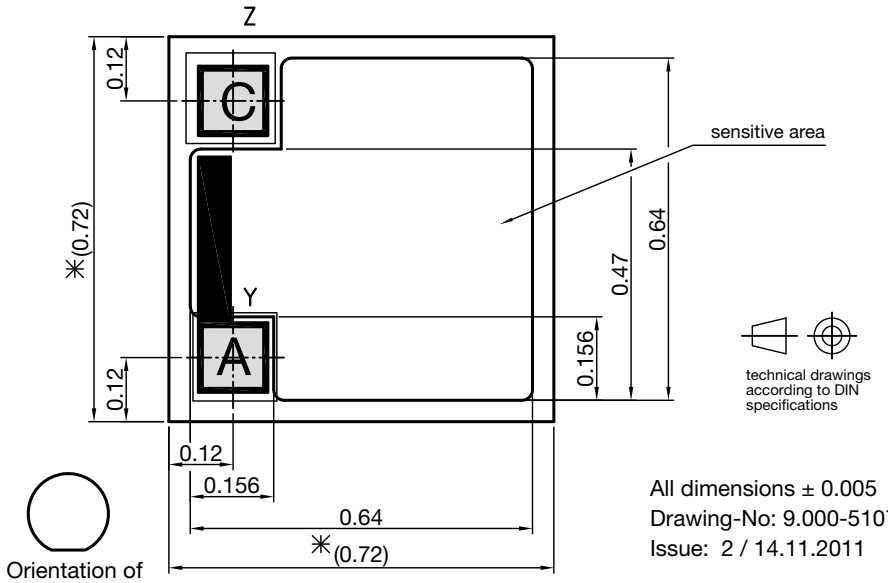


Fig. 2 - Relative Spectral Sensitivity vs. Wavelength of Bare Die

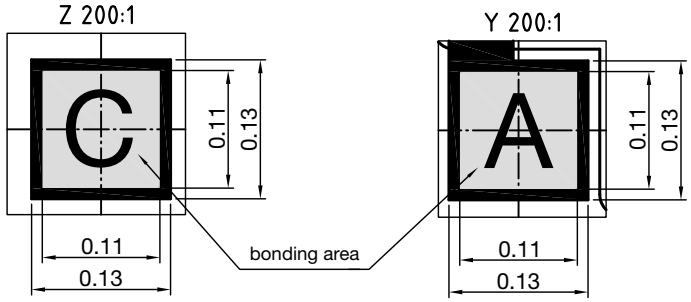
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DIMENSIONS in millimeters



All dimensions ± 0.005
Drawing-No: 9.000-5107.01-4
Issue: 2 / 14.11.2011

✳ Only for information: dimension of sawn die under consideration of 30 µm saw kerf



A: Anode
C: Cathode

Opt. sensitive area: 0.34 mm²

Thickness: 200 µm ± 15 µm

Bonding area: A: 110 µm x 110 µm
C: 110 µm x 110 µm

Bonding restricted to this area in order to avoid damage of adjacent structures

MECHANICAL DIMENSIONS					
PARAMETER	**SYMBOL**	**MIN.**	**TYP.**	**MAX.**	**UNIT**
Length of chip edge (x-direction)	L_x		0.72		mm
Length of chip edge (y-direction)	L_y		0.72		mm
Sensitive area	A_S		0.34		mm^2
Wafer diameter	D		100		mm
Die height	H	0.185	0.2	0.215	mm
Bond pad anode			0.11 x 0.11		mm^2
Bond pad cathode			0.11 x 0.11		mm^2

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ADDITIONAL INFORMATION	
Frontside metallization, anode, cathode	AlSi
Backside	Electrically isolated
Dicing	Sawing
Die bonding technology	Epoxy bonding

Note

- 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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