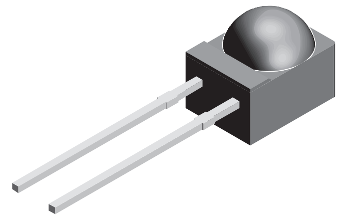
Silicon PIN Photodiode

Description

TESP5700 PIN photodiode is applicable to high speed data transmission specifically at low reverse voltage. Black epoxy package include side view lens and daylight filter, matched to high speed IR emitters.



Features

- Ultra high speed at low supply voltage
- Fast response times t_r/t_f = 10 ns
- High cut-off frequency f_c = 35 MHz
- Low operating voltage V_R = 2 V
- High sensitivity $s(\lambda)$ = 0.57 A/W
- Low junction capacitance
- High efficient side view lens
- Wide viewing angle $\varphi = \pm 60$ °
- Daylight filter, matched to IR emitters using λ_p = 850 nm or λ_p = 870 nm
- Lead-free component
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

Applications

High speed data transmission specifically using low supply voltage

Infrared remote control and free air data transmission systems in combination with IR emitters TSFF5200 or TSFF5400.

Parts Table

Part	Ordering code	Remarks
TESP5700	TESP5700	MOQ 7500 pc

Absolute Maximum Ratings

T_{amb} = 25 °C, unless otherwise specified

Parameter	Test condition	Symbol	Value	Unit
Reverse Voltage		V_R	60	V
Power Dissipation	$T_{amb} \leq 25$ °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 + 100	°C
Soldering Temperature	$t \leq 5$ s	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		0.9	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}		1	10	nA
Diode capacitance	V_R = 0 V, f = 1 MHz, E = 0	C_D		17		pF
Serial Resistance	V_R = 2 V, f = 1 MHz	R_S		40		Ω
Open Circuit Voltage	E_e = 1 mW/cm^2, λ = 870 nm	V_o		430		mV
Temp. Coefficient of V_o	E_e = 1 mW/cm^2, λ = 870 nm	TK_{Vo}		- 2.6		mV/K
Short Circuit Current	E_e = 1 mW/cm^2, λ = 870 nm	I_k		23		μA
Reverse Light Current	E_e = 1 mW/cm^2, λ = 870 nm, V_R = 2 V	I_{ra}	16	25		μA
Temp. Coefficient of I_{ra}	E_e = 1 mW/cm^2, λ = 870 nm, V_R = 2 V	TK_{Ira}		0.13		%/K
Absolute Spectral Sensitivity	V_R = 2 V, λ = 870 nm	s(λ)		0.57		A/W
	V_R = 5 V, λ = 950 nm	s(λ)		0.37		A/W
Angle of Half Sensitivity		φ		± 60		deg
Wavelength of Peak Sensitivity		$λ_p$		870		nm
Range of Spectral Bandwidth		$λ_{0.5}$		790 to 980		nm
Rise Time	V_R = 2 V, R_L = 50 Ω, λ = 870 nm	t_r		10		ns
Fall Time	V_R = 2 V, R_L = 50 Ω, λ = 870 nm	t_f		10		ns
Cut-Off Frequency	V_R = 2 V, R_L = 50 Ω, λ = 870 nm	f_c		35		MHz

Typical Characteristics (Tamb = 25 °C unless otherwise specified)

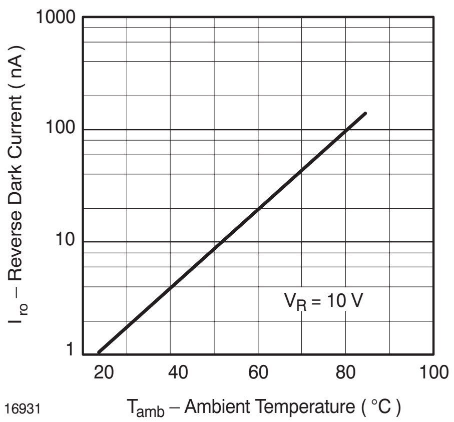


Figure 1. Reverse Dark Current vs. Ambient Temperature

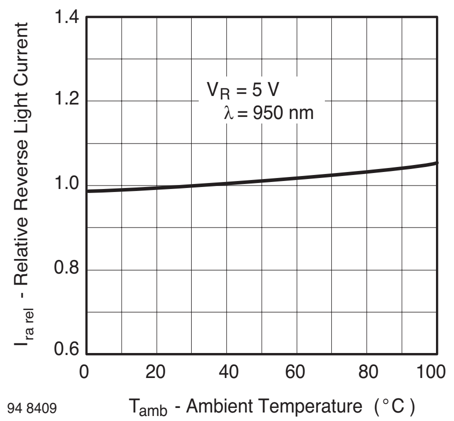


Figure 2. Relative Reverse Light Current vs. Ambient Temperature

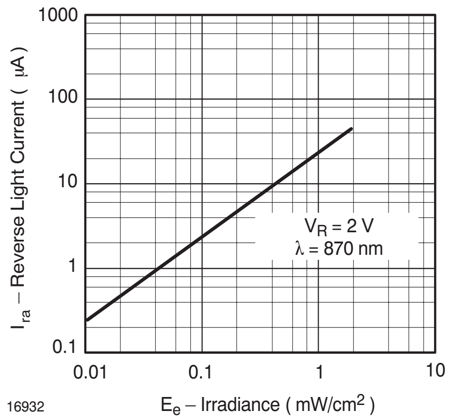


Figure 3. Reverse Light Current vs. Irradiance

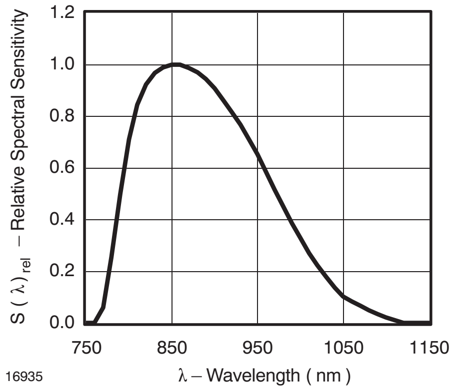


Figure 6. Relative Spectral Sensitivity vs. Wavelength

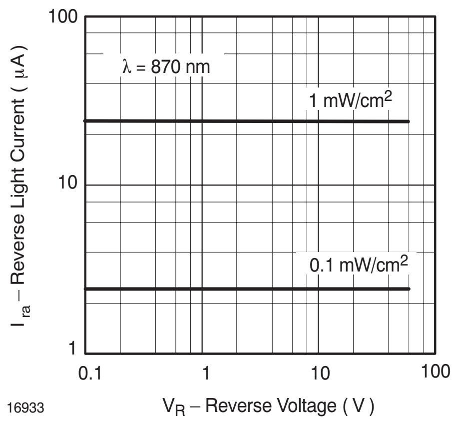


Figure 4. Reverse Light Current vs. Reverse Voltage

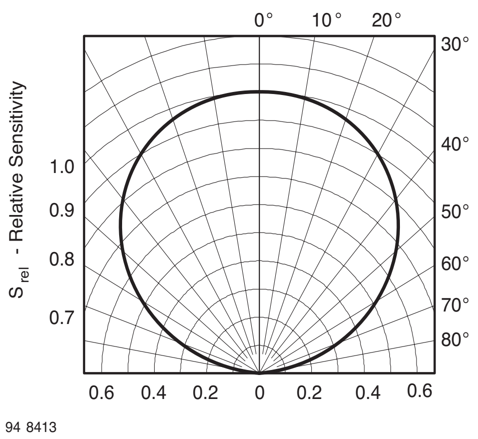


Figure 7. Relative Radiant Sensitivity vs. Angular Displacement

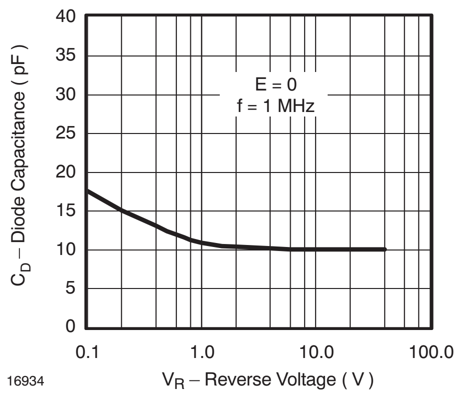
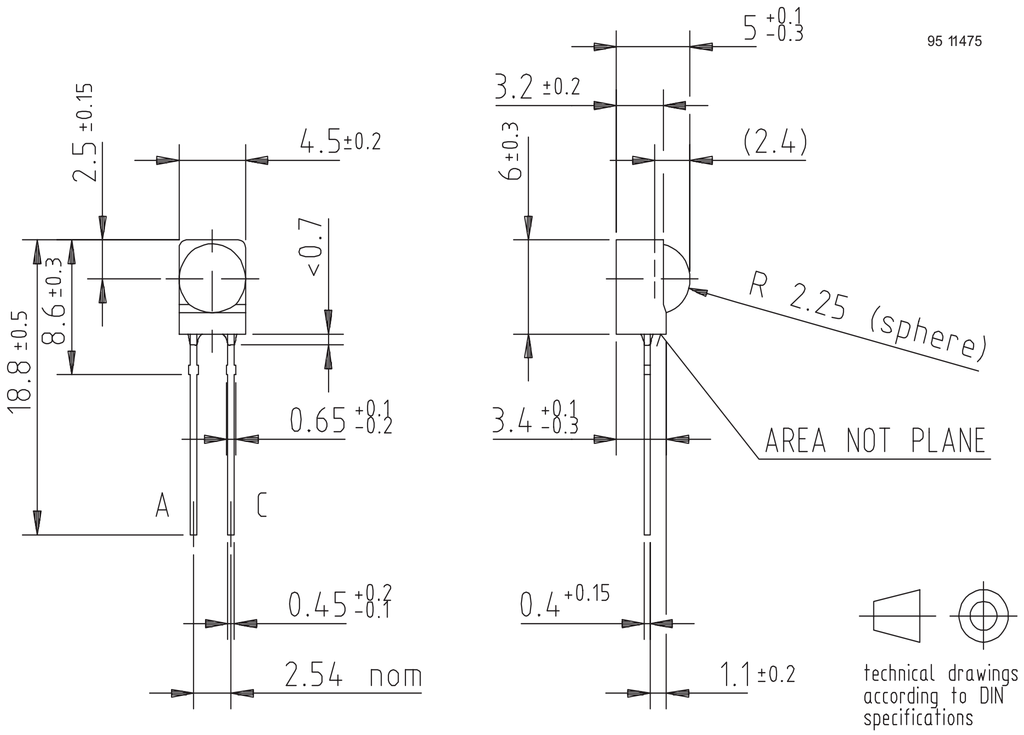


Figure 5. Diode Capacitance vs. Reverse Voltage

Package Dimensions in mm



Ozone Depleting Substances Policy Statement

It is the policy of Vishay Semiconductor GmbH to

1. Meet all present and future national and international statutory requirements.
2. Regularly and continuously improve the performance of our products, processes, distribution and operatingsystems with respect to their impact on the health and safety of our employees and the public, as well as their impact on the environment.

It is particular concern to control or eliminate releases of those substances into the atmosphere which are known as ozone depleting substances (ODSs).

The Montreal Protocol (1987) and its London Amendments (1990) intend to severely restrict the use of ODSs and forbid their use within the next ten years. Various national and international initiatives are pressing for an earlier ban on these substances.

Vishay Semiconductor GmbH has been able to use its policy of continuous improvements to eliminate the use of ODSs listed in the following documents.

1. Annex A, B and list of transitional substances of the Montreal Protocol and the London Amendments respectively
2. Class I and II ozone depleting substances in the Clean Air Act Amendments of 1990 by the Environmental Protection Agency (EPA) in the USA
3. Council Decision 88/540/EEC and 91/690/EEC Annex A, B and C (transitional substances) respectively.

Vishay Semiconductor GmbH can certify that our semiconductors are not manufactured with ozone depleting substances and do not contain such substances.

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