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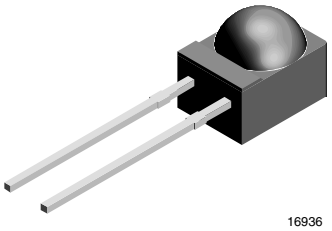
# Silicon PIN Photodiode, RoHS Compliant




## FEATURES

- Package type: leaded
- Package form: side view
- Dimensions (L x W x H in mm): 4.5 x 5 x 6
- Radiant sensitive area (in $mm^2$): 2.2
- High radiant sensitivity
- Daylight blocking filter matched with 870 nm to 950 nm emitters
- High cut-off frequency at $V_R$ = 2 V: 35 MHz
- Angle of half sensitivity: $\varphi = \pm 60°$
- Lead (Pb)-free component in accordance with RoHS 2002/95/EC and WEEE 2002/96/EC

Pb-free

e4

RoHS COMPLIANT

## 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 blocking filter, matched to high speed IR emitters.

## APPLICATIONS

- High speed data transmission specifically using low supply voltage
- 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) | $\varphi$ (deg) | $\lambda_{0.5}$ (nm) |
|---|---|---|---|
| TESP5700 | 25 | ± 60 | 790 to 980 |

**Note**

Test condition see table “Basic Characteristics”

## ORDERING INFORMATION

| ORDERING CODE | PACKAGING | REMARKS | PACKAGE FORM |
|---|---|---|---|
| TESP5700 | Bulk | MOQ: 4000 pcs, 4000 pcs/bulk | Side view |

**Note**

MOQ: minimum order quantity

## ABSOLUTE MAXIMUM RATINGS

| 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 | Connected with Cu wire, 0.14 $mm^2$ | $R_{thJA}$ | 350 | K/W |

**Note**

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

| BASIC CHARACTERISTICS | | | | | | |
|---|---|---|---|---|---|---|
| **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/cm², λ = 870 nm | $V_o$ | | 430 | | mV |
| Temperature coefficient of $V_o$ | $E_e$ = 1 mW/cm², λ = 870 nm | $TK_{Vo}$ | | - 2.6 | | mV/K |
| Short circuit current | $E_e$ = 1 mW/cm², λ = 870 nm | $I_k$ | | 23 | | µA |
| Reverse light current | $E_e$ = 1 mW/cm², λ = 870 nm, $V_R$ = 2 V | $I_{ra}$ | 16 | 25 | | µA |
| Temperature coefficient of $I_{ra}$ | $E_e$ = 1 mW/cm², 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 | | $\lambda_p$ | | 870 | | nm |
| Range of spectral bandwidth | | $\lambda_{0.5}$ | | 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 |

**Note**

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

## BASIC CHARACTERISTICS

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

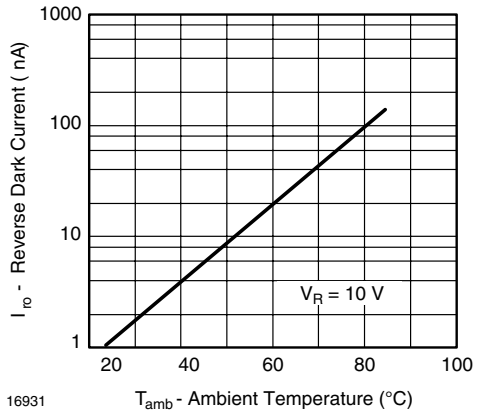



Fig. 1 - Reverse Dark Current vs. Ambient Temperature

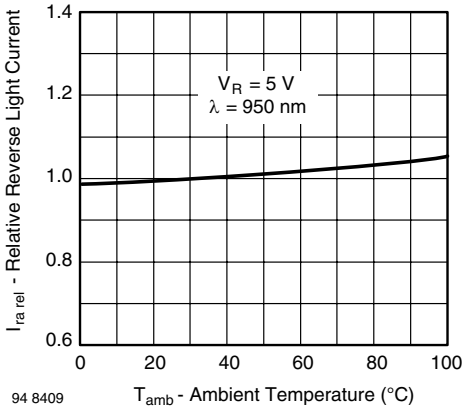



Fig. 2 - Relative Reverse Light Current vs. Ambient Temperature

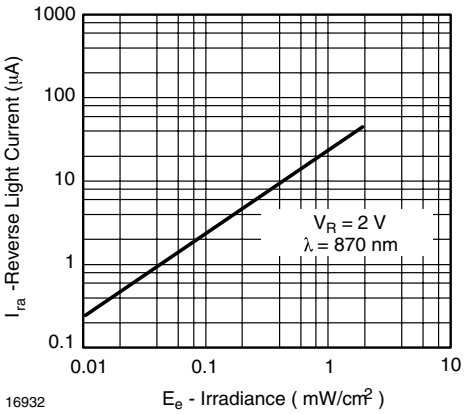



Fig. 3 - Reverse Light Current vs. Irradiance

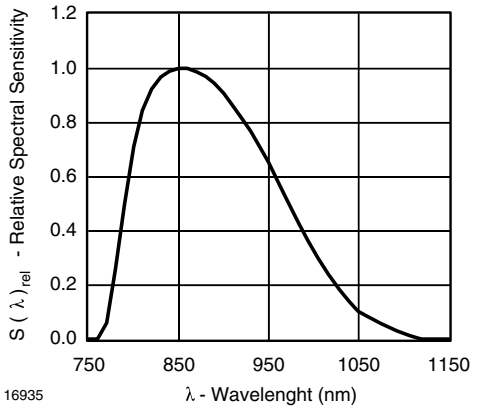



Fig. 6 - Relative Spectral Sensitivity vs. Wavelength

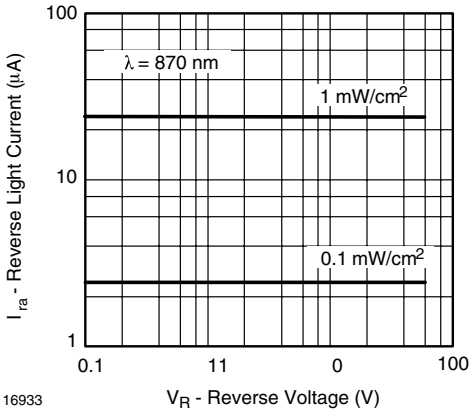



Fig. 4 - Reverse Light Current vs. Reverse Voltage

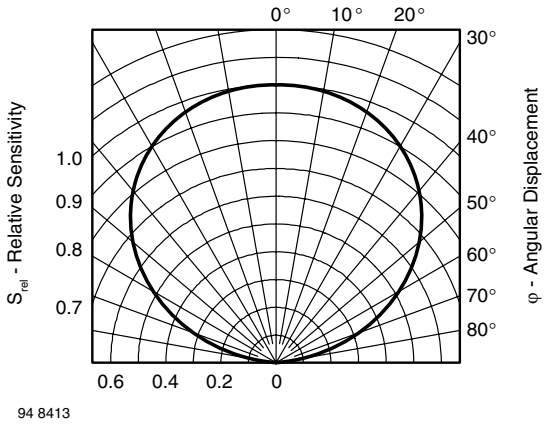



Fig. 7 - Relative Radiant Sensitivity vs. Angular Displacement

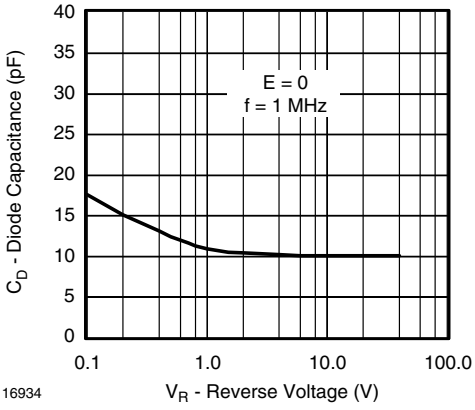
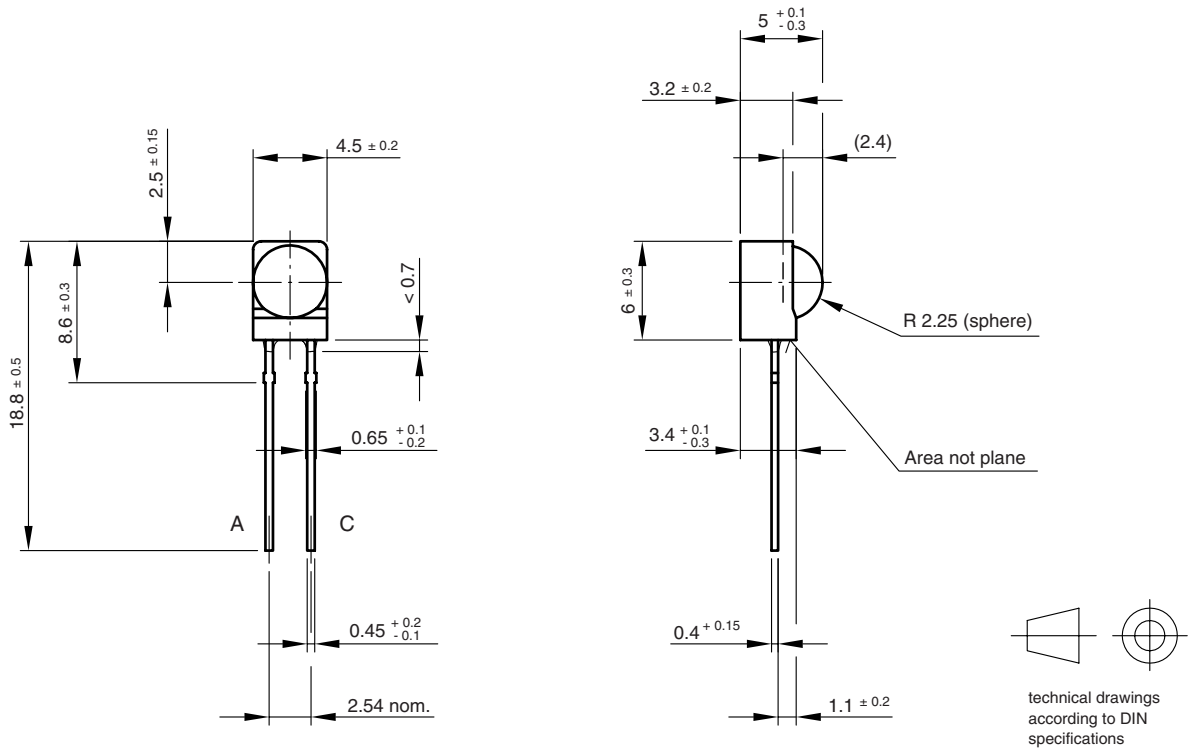



Fig. 5 - Diode Capacitance vs. Reverse Voltage

**PACKAGE DIMENSIONS** in millimeters

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