| PARTS TABLE | | |
|---|---|---|
| **Carrier frequency** | 38 kHz | TSSP4038 |
| | 56 kHz | TSSP4056 |
| **Package** | | Mold |
| **Pinning** | | 1 = OUT, 2 = GND, 3 = $V_S$ |
| **Dimensions (mm)** | | 6.0 W x 6.95 H x 5.6 D |
| **Mounting** | | Leaded |
| **Application** | | Presence sensors, fast proximity sensors |

| ABSOLUTE MAXIMUM RATINGS | | | | |
|---|---|---|---|---|
| **PARAMETER** | **TEST CONDITION** | **SYMBOL** | **VALUE** | **UNIT** |
| Supply voltage (pin 3) | | $V_S$ | -0.3 to +6.0 | V |
| Supply current (pin 3) | | $I_S$ | 5 | mA |
| Output voltage (pin 1) | | $V_O$ | -0.3 to 5.5 | V |
| Voltage at output to supply | | $V_S - V_O$ | -0.3 to ($V_S$ + 0.3) | V |
| Output current (pin 1) | | $I_O$ | 5 | mA |
| Junction temperature | | $T_j$ | 100 | °C |
| Storage temperature range | | $T_{stg}$ | -25 to +85 | °C |
| Operating temperature range | | $T_{amb}$ | -25 to +85 | °C |
| Power consumption | $T_{amb} \leq 85$ °C | $P_{tot}$ | 10 | mW |

**Note**

- Stresses beyond those listed under “Absolute Maximum Ratings” may cause permanent damage to the device. This is a stress rating only and functional operation of the device at these or any other conditions beyond those indicated in the operational sections of this specification is not implied. Exposure to absolute maximum rating conditions for extended periods may affect the device reliability

| ELECTRICAL AND OPTICAL CHARACTERISTICS ($T_{amb}$ = 25 °C, unless otherwise specified) | | | | | | |
|---|---|---|---|---|---|---|
| **PARAMETER** | **TEST CONDITION** | **SYMBOL** | **MIN.** | **TYP.** | **MAX.** | **UNIT** |
| Supply current (pin 3) | $E_v$ = 0, $V_S$ = 5 V | $I_{SD}$ | 0.55 | 0.7 | 0.9 | mA |
| | $E_v$ = 40 klx, sunlight | $I_{SH}$ | - | 0.8 | - | mA |
| Supply voltage | | $V_S$ | 2.5 | - | 5.5 | V |
| Transmission distance | $E_v$ = 0, test signal see Fig. 1, IR diode TSAL6200, $I_F$ = 50 mA | d | - | 12 | - | m |
| Output voltage low (pin 1) | $I_{OSL}$ = 0.5 mA, $E_e$ = 2 mW/m², test signal see Fig. 1 | $V_{OSL}$ | - | - | 100 | mV |
| Minimum irradiance | Pulse width tolerance: $t_{pi} - 5/f_0 < t_{po} < t_{pi} + 6/f_0$, test signal see Fig. 1 | $E_{e\ min.}$ | - | 0.4 | 0.7 | mW/m² |
| Maximum irradiance | $t_{pi} - 5/f_0 < t_{po} < t_{pi} + 6/f_0$, test signal see Fig. 1 | $E_{e\ max.}$ | 50 | - | - | W/m² |
| Directivity | Angle of half transmission distance | $\varphi_{1/2}$ | - | ± 45 | - | deg |

**TYPICAL CHARACTERISTICS** ($T_{amb}$ = 25 °C, unless otherwise specified)

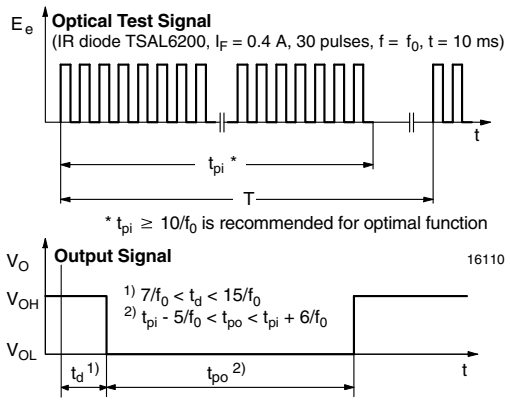



Fig. 1 - Output Active Low

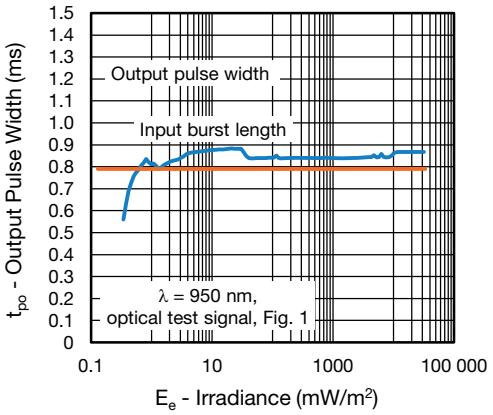



Fig. 2 - Pulse Length and Sensitivity in Dark Ambient

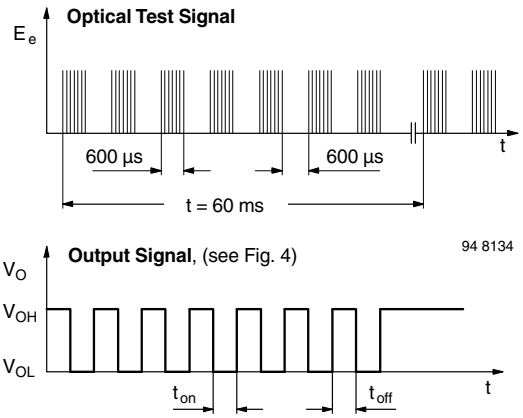



Fig. 3 - Output Function

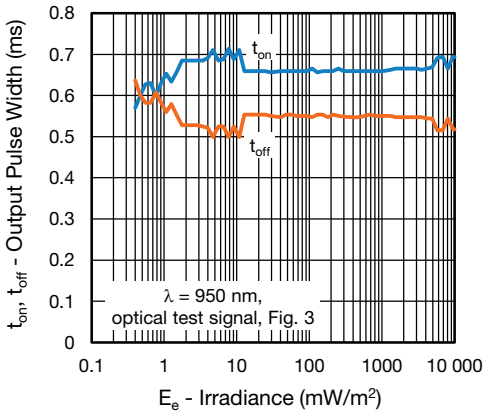



Fig. 4 - Output Pulse Diagram

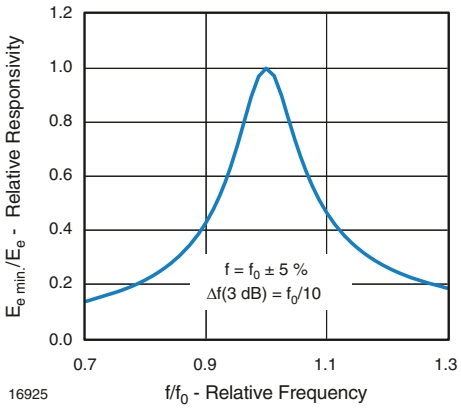



Fig. 5 - Frequency Dependence of Responsivity

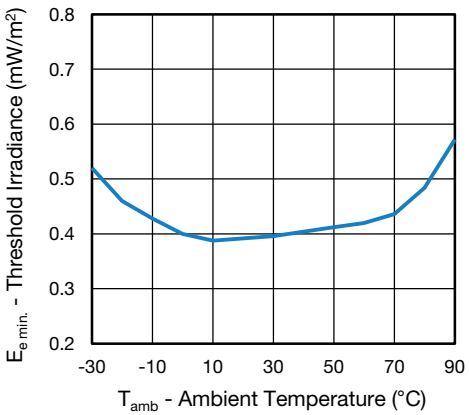



Fig. 6 - Sensitivity vs. Ambient Temperature

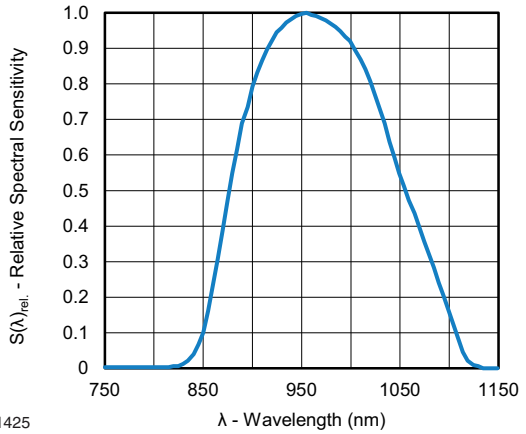



Fig. 7 - Relative Spectral Sensitivity vs. Wavelength

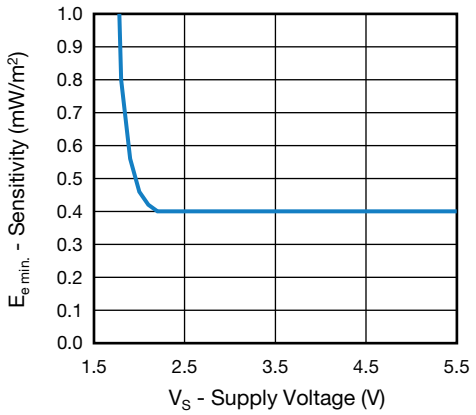



Fig. 9 - Sensitivity vs. Supply Voltage

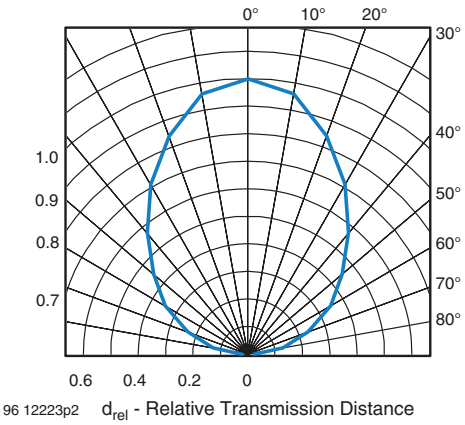
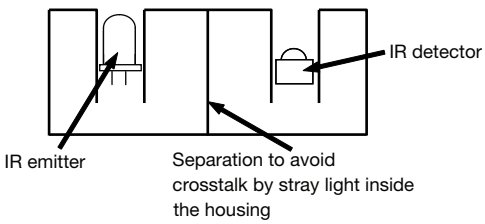



Fig. 8 - Directivity

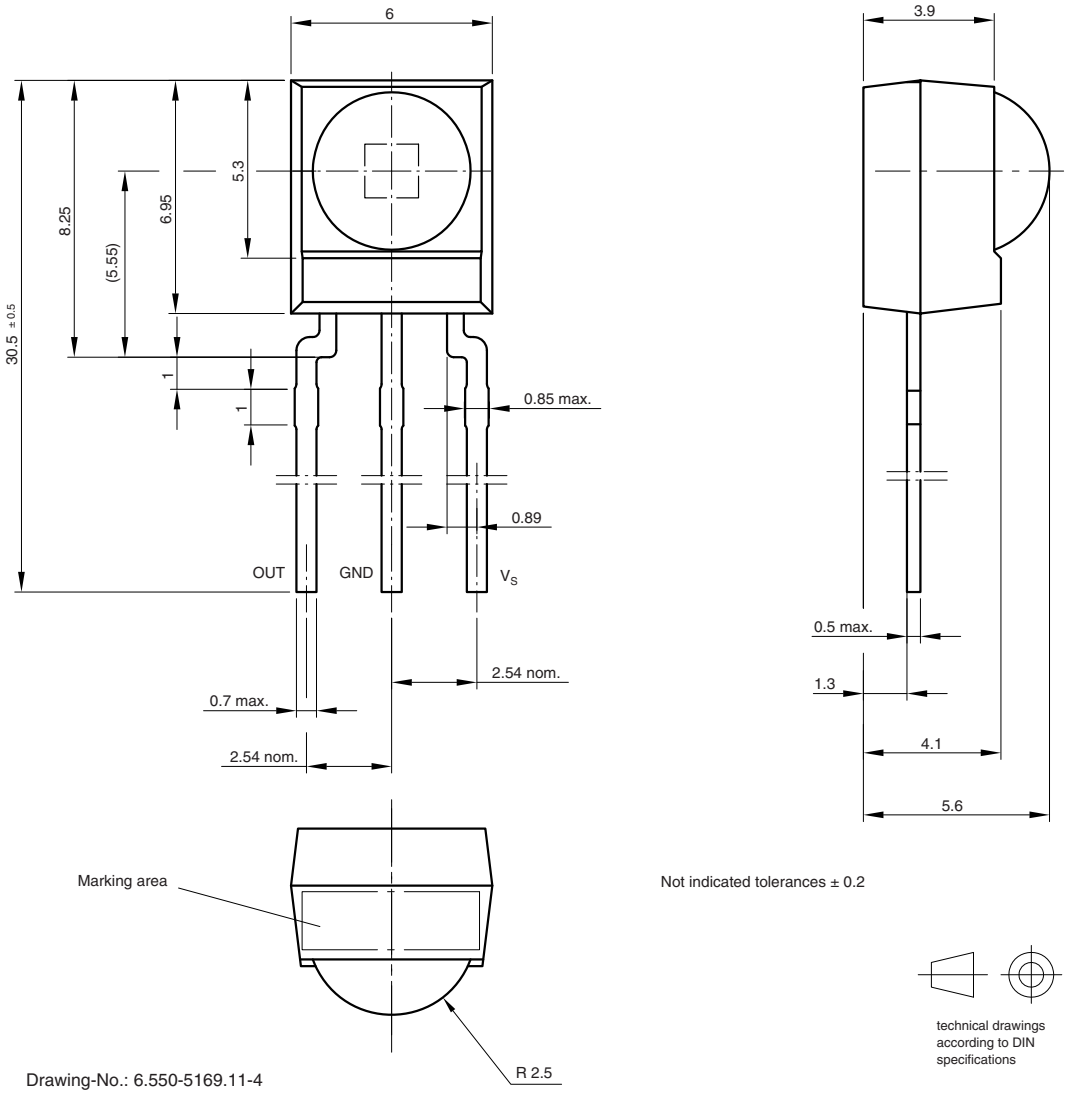
The typical application of these devices is a reflective or beam break sensor with active low “detect” or “no detect” information contained in its output. The TSSP4056 is also suitable for fast (~ 5 ms) proximity sensor applications for ranges between 10 cm and 2 m. Please see application note “Vishay’s TSSP4056 Sensor for Fast Proximity Sensing” (www.vishay.com/doc?82741).

Example for a sensor hardware:




There should be no common window in front of the emitter and detector in order to avoid crosstalk via guided light through the window.

**PACKAGE DIMENSIONS** in millimeters

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