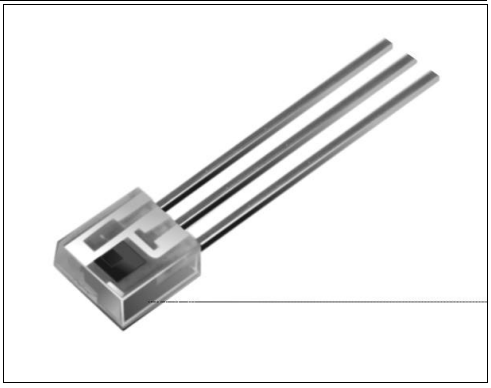
# SDP8371

## Precision Optoschmitt Detector

**FEATURES**

- Side-looking plastic package
- 180° (nominal) acceptance angle
- TTL/LSTTL/CMOS compatible
- Precision laser- trimmed switch points
- Highly sensitive, no lens necessary
- Wide field of view
- 30 kHz frequency range
- Spectrally matched to SEP8506 and SEP8706 infrared emitting diodes



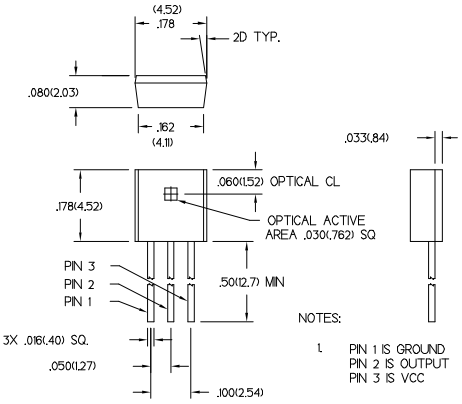
INFRA-72.TIF

**DESCRIPTION**

The SDP8371 is a precision Optoschmitt detector molded in a side-looking clear plastic package. The detector is a monolithic IC, consisting of a 0.030 in.(0.762 mm) square photodiode, amplifier, voltage regulator, Schmitt trigger and an NPN open-collector output transistor. The output is a buffer logic type, switching from low to high when illumination is increased to the threshold irradiance. Detector sensitivity has been internally temperature compensated and laser trimmed for narrow sensitivity range.

**OUTLINE DIMENSIONS** in inches (mm)

| | | |
|---|---|---|
| Tolerance | 3 plc decimals | ±0.005(0.12) |
| | 2 plc decimals | ±0.020(0.51) |

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**ELECTRICAL CHARACTERISTICS** (-40°C to +70°C unless otherwise noted)

| PARAMETER | SYMBOL | MIN | TYP | MAX | UNITS | TEST CONDITIONS |
|---|---|---|---|---|---|---|
| Operating Supply Voltage | $V_{CC}$ | 4.0 | | 15.0 | V | $T_A$=25°C |
| Supply Current | $I_{CC}$ | | 4.0 | 8.0 | mA | $V_{CC}$=5.5 V |
| High Level Output Current | $I_{OH}$ | | | 1.0 | µA | $V_{CC}$=5 V<br>$E_e$=.1mW/cm², $V_{OH}$=5 V |
| Low Level Output Voltage | $V_{OL}$ | | | 0.5 | V | $V_{CC}$=5 V, $I_{OL}$=15 mA<br>$E_e$=0 |
| Release Point<br>SDP8371-001 | $R_P$ | 45 | 55 | 65 | µW/cm² | $V_{CC}$=5 V<br>(2) |
| Operate Point | $O_P$ | | 62 | | µW/cm² | $V_{CC}$=5 V (2) |
| Hysteresis (3) | HYST | 8 | 12 | 20 | % | |
| Operate Point Temperature Coefficient | | | -1.0 | | %/°C | Emitter @ Constant Temperature |
| Output Rise Time | $t_r$ | | 200 | | ns | $R_L$=390 Ω, $C_L$=50 pF |
| Output Fall Time | $t_f$ | | 200 | | ns | $R_L$=390 Ω, $C_L$=50 pF |

Notes
1. It is recommended that a bypass capacitor, 0.1 µF typical, be added between $V_{CC}$ and GND near the device in order to stabilize power supply line.
2. The radiation source is an IRED with a peak wavelength of 880 nm.
3. Hysteresis is defined as the difference between the operating and release threshold intensities, expressed as a percentage of the operate threshold intensity.

**ABSOLUTE MAXIMUM RATINGS**

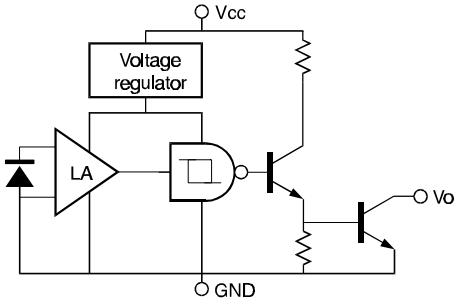
(25°C Free-Air Temperature unless otherwise noted)

| | |
|---|---|
| Supply Voltage | 15 V (1) |
| Duration of Output | |
| Short to $V_{CC}$ or Ground | 1.0 sec |
| Applied Output Voltage | 15 V |
| Output Current | 25 mA |
| Operating Temperature Range | -40°C to 70°C |
| Storage Temperature Range | -40°C to 85°C |
| Soldering Temperature (5 sec) | 240°C |

Notes
1. Derate linearly from 25°C to 5.5 V at 70°C.

**SCHEMATIC**

SDP8371 BUFFER, OPEN-COLLECTOR



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**SWITCHING TIME TEST CIRCUIT**

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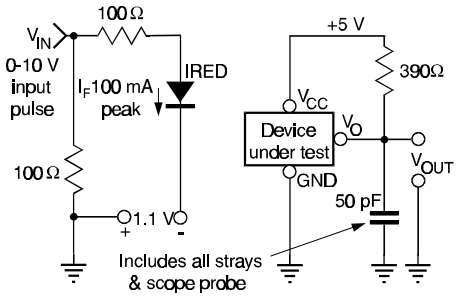


**SWITCHING WAVEFORM**

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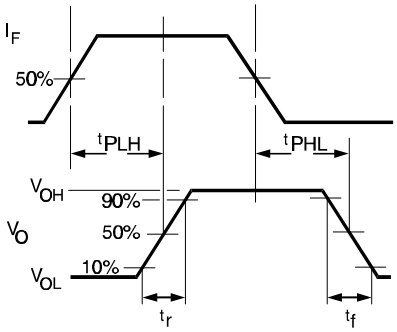


Fig. 1 Responsivity vs Angular Displacement

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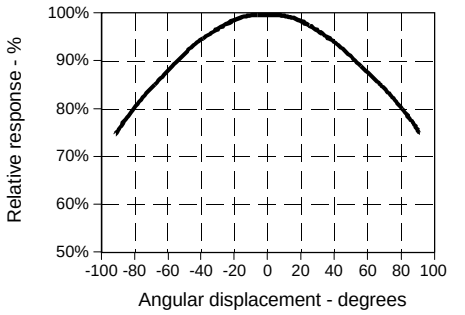


Fig. 2 Propagation Delay as a Function of Illumination Intensity

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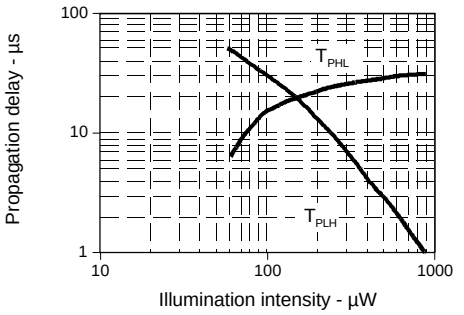


Fig. 3 Low Level Output Voltage vs Temperature

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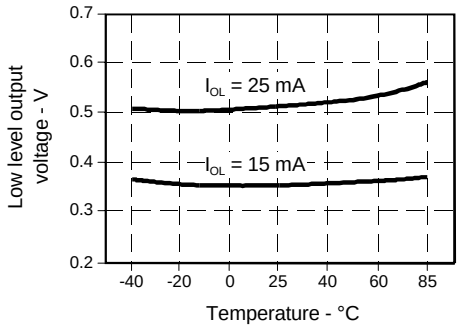


Fig. 4 Sensitivity vs Supply Voltage

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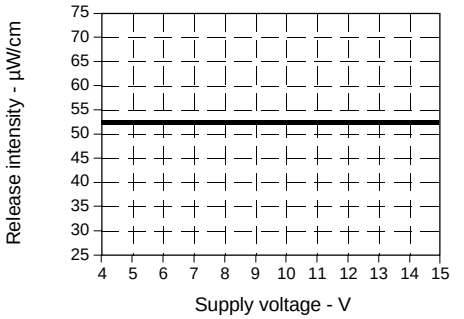




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Fig. 5 Spectral Responsivity

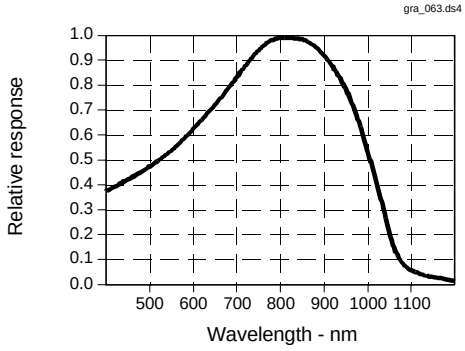
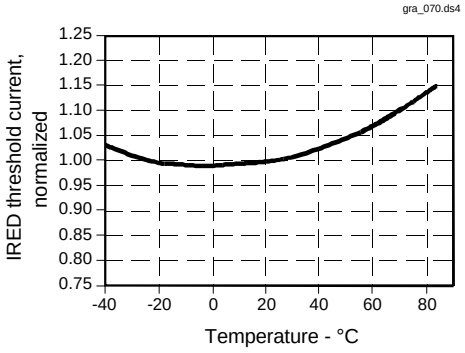



Fig. 6 Sensitivity vs Temperature




All Performance Curves Show Typical Values



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