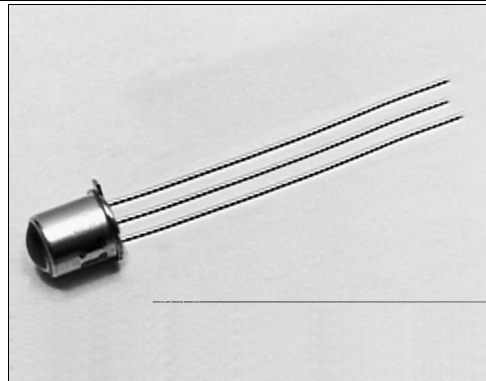


SD5600/5610

Optoschmitt Detector

FEATURES

- TO-46 metal can package
- 6° (nominal) acceptance angle
- High noise immunity output
- TTL/LSTTL/CMOS compatible
- Buffer (SD5600) or inverting (SD5610) logic available
- Mechanically and spectrally matched to SE3450/5450, SE3455/5455 and SE3470/5470 infrared emitting diodes



INFRA-81.TIF

DESCRIPTION

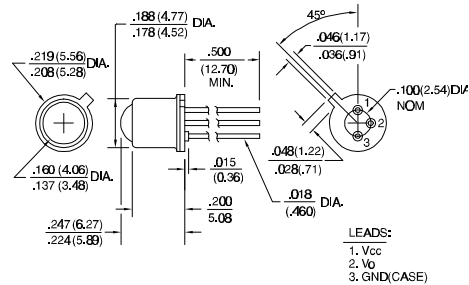
The SD5600/5610 series is a family of single chip Optoschmitt IC detectors mounted in a TO-46 metal can package. The photodetector consists of a photodiode, amplifier, voltage regulator, Schmitt trigger and an NPN output transistor with 10 kΩ (nominal) pull-up resistor. Output rise and fall times are independent of the rate of change of incident light. Detector sensitivity has been internally temperature compensated. The TO-46 package is ideally suited for operation in hostile environments.

Device Polarity:

- Buffer - Output is HI when incident light intensity is above the turn- on threshold level.
- Inverter - Output is LO when incident light intensity is above the turn- on threshold level.

OUTLINE DIMENSIONS in inches (mm)

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



DIM_025.cdr

SD5600/5610

Optoschmitt Detector

ELECTRICAL CHARACTERISTICS (-40°C to +100°C unless otherwise noted)

| PARAMETER | SYMBOL | MIN | TYP | MAX | UNITS | TEST CONDITIONS |
|---|-------------------------------------|------------|-------|--------------|--------------------|---|
| Operating Supply Voltage | V _{CC} | 4.5 | 16.0 | | V | T _A =25°C |
| Turn-on Threshold Irradiance ⁽²⁾ SD5600-001, SD5610-001 | E _{ET(+)} | | 2.50 | | mW/cm ² | V _{CC} =5 V T _A =25°C |
| Hysteresis ⁽³⁾ | HYST | 5 | | 30 | % | |
| Supply Current | I _{CC} | | | 12.0 15.0 | mA | E _e =0 Or 3.0 mW/cm ² V _{CC} =5 V V _{CC} =16 V |
| High Level Output Voltage SD5600 SD5610 | V _{OH} | 2.4 2.4 | | | V | V _{CC} =5 V, I _{OH} =0 E _e =0 E _e =3.0 mW/cm ² |
| Low Level Output Voltage SD5600 SD5610 | V _{OL} | | | 0.4 0.4 | V | V _{CC} =5 V, I _{OL} =12.8 mA E _e =0 E _e =3.0 mW/cm ² |
| Internal Pull-Up Resistor | R _{INT} | 5.0 | 10.0 | 20.0 | kΩ | |
| Operate Point Temperature Coefficient | O _{PTC} | | -0.76 | | %/°C | Emitter @ Constant Temperature |
| Output Rise Time | t _r | | 60 | | ns | R _L =390 Ω, C _L =50 pF |
| Output Fall Time | t _f | | 15 | | ns | R _L =390 Ω, C _L =50 pF |
| Propagation Delay, Low-High, High-Low | t _{PLH} , t _{PHL} | | 5.0 | | μs | R _L =390 Ω, C _L =50 pF |
| Clock Frequency | | | | 100 | kHz | R _L =390 Ω, C _L =50 pF |

Notes

- 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.
- The radiation source is an IRED with a peak wavelength of 935 nm.
- Hysteresis is defined as the difference between the operating and release threshold intensities, expressed as a percentage of the operate threshold intensity.

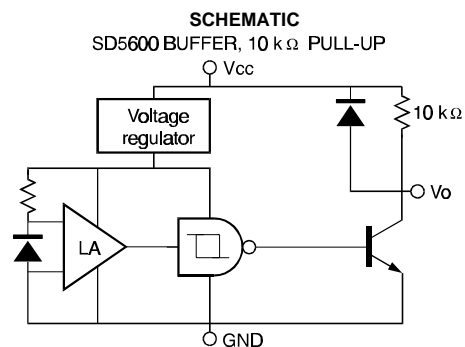
ABSOLUTE MAXIMUM RATINGS

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

| | |
|--|---------------------|
| Supply Voltage | 16 V ⁽¹⁾ |
| Duration of Output Short to V _{CC} or Ground | 1.0 sec |
| Output Current | 18 mA |
| Operating Temperature Range | -40°C to 100°C |
| Storage Temperature Range | -55°C to 125°C |
| Soldering Temperature (10 sec) | 260°C |

Notes

- Derate linearly from 25°C to 7 V at 100°C.



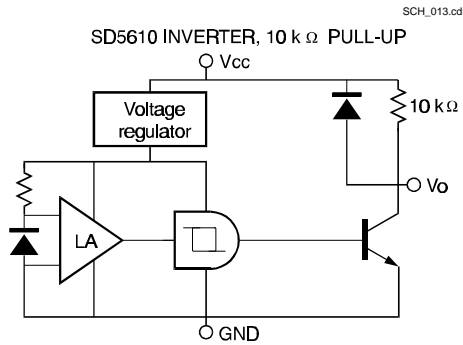
Honeywell reserves the right to make changes in order to improve design and supply the best products possible.

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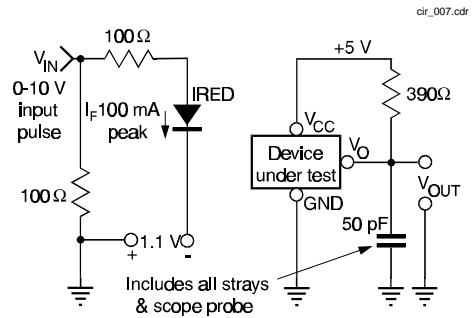
SD5600/5610

Optoschmitt Detector

SCHEMATIC



SWITCHING TIME TEST CIRCUIT



SWITCHING WAVEFORM FOR BUFFERS

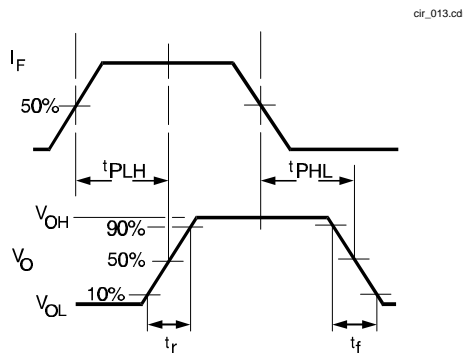
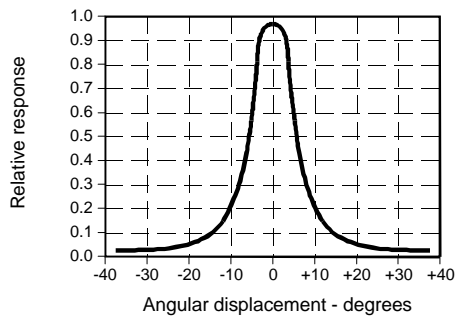


Fig. 1 Responsivity vs Angular Displacement



SWITCHING WAVEFORM FOR INVERTERS

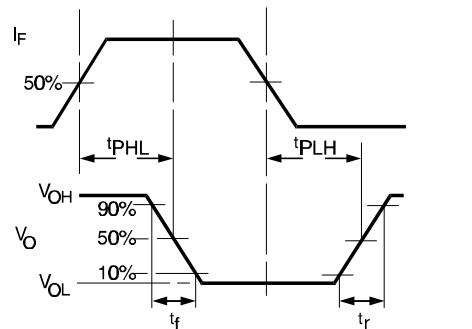
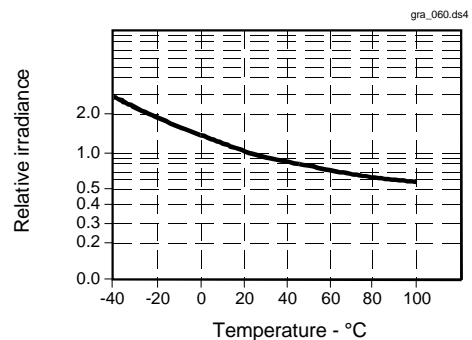


Fig. 2 Threshold Irradiance vs Temperature



SD5600/5610

Optoschmitt Detector

Fig. 3 Output Rise Time (t_r) and Output Fall Time (t_f) vs Temperature

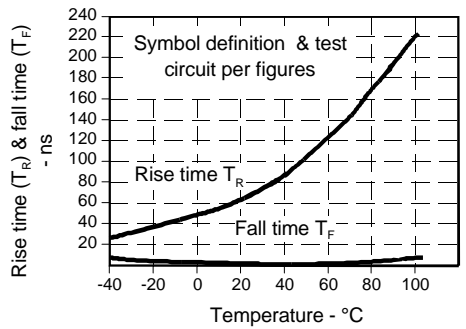


Fig. 4 Delay Time vs Temperature

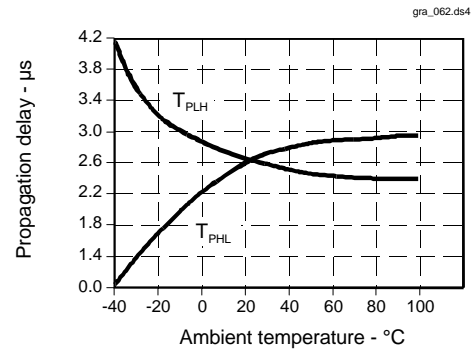
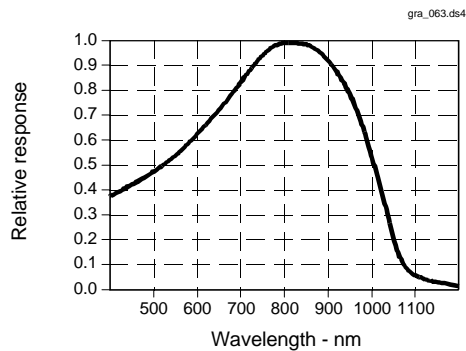


Fig. 5 Spectral Responsivity



All Performance Curves Show Typical Values

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