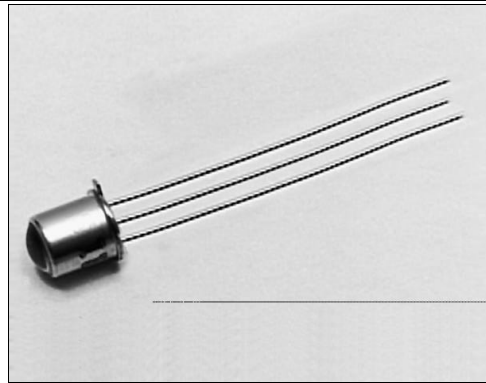


SD5600/5610

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

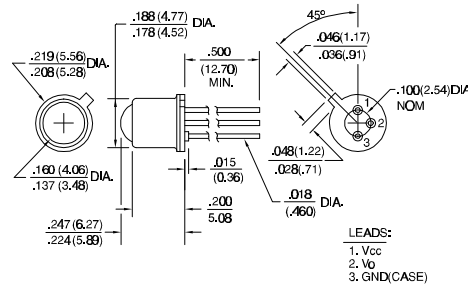
The SD5600/5610 series is a family of single chip Optoschmitt IC detectors mounted in a TO-46 metal can package. The photodetector consists of a photodiode, amplifier, voltage regulator, Schmitt trigger and an NPN output transistor with 10 kΩ (nominal) pull-up resistor. Output rise and fall times are 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)



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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.

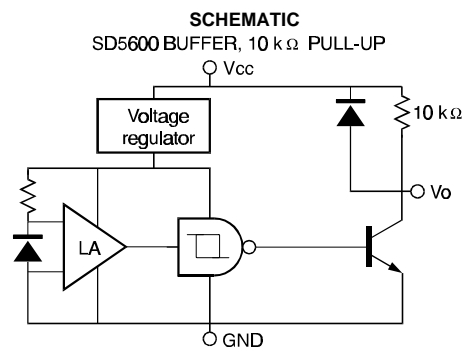
ABSOLUTE MAXIMUM RATINGS

(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.

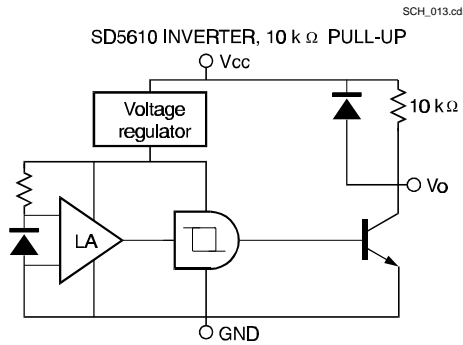
Honeywell

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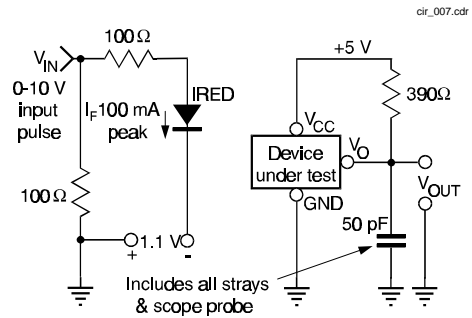
SD5600/5610

Optoschmitt Detector

SCHEMATIC



SWITCHING TIME TEST CIRCUIT



SWITCHING WAVEFORM FOR BUFFERS

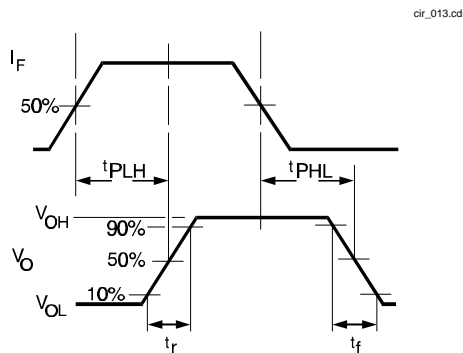
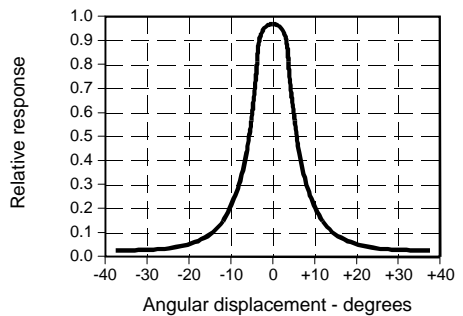


Fig. 1 Responsivity vs Angular Displacement



SWITCHING WAVEFORM FOR INVERTERS

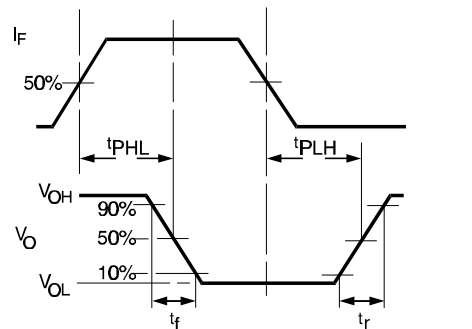
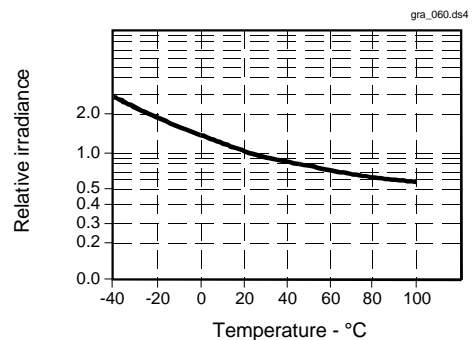


Fig. 2 Threshold Irradiance vs Temperature



SD5600/5610

Optoschmitt Detector

Fig. 3 Output Rise Time (t_r) and Output Fall Time (t_f) vs Temperature gra_061.ds4

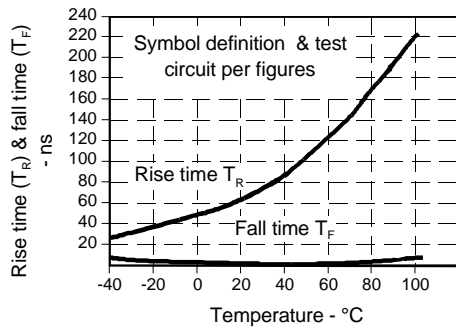


Fig. 4 Delay Time vs Temperature gra_062.ds4

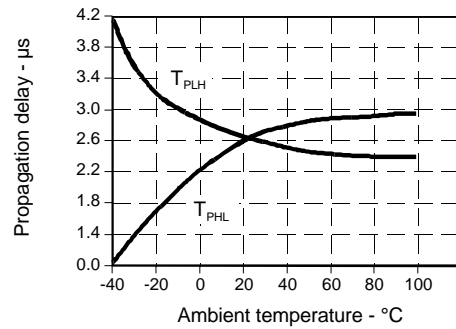
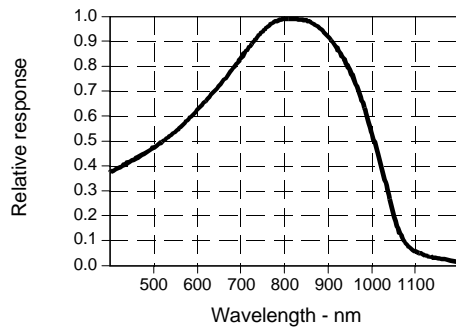


Fig. 5 Spectral Responsivity gra_063.ds4



All Performance Curves Show Typical Values