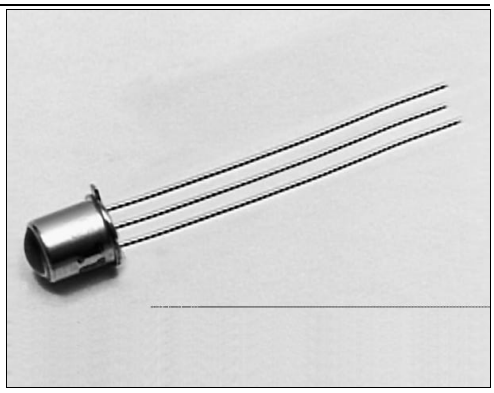
SD5620/5630

Optoschmitt Detector

FEATURES

- TO-46 metal can package
- 6° (nominal) acceptance angle
- TTL/LSTTL/CMOS compatible
- High noise immunity output
- Buffer (SD5620) or inverting (SD5630) logic available
- Two sensitivity ranges
- Mechanically and spectrally matched to SE3450/5450, SE3455/5455 and SE3470/5470 infrared emitting diodes



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DESCRIPTION

The SD5620/5630 series is 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 a 10 kΩ (nominal) pull-up resistor. Output rise and fall times are independent of 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.

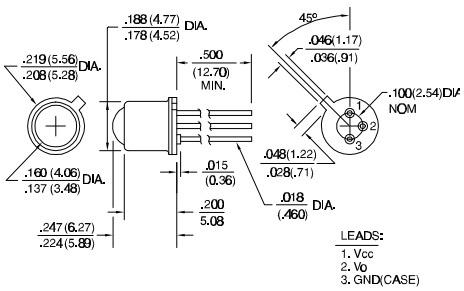
Device Polarity:

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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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)	$E_{eT(+)}$				mW/cm²	V_{CC}=5 V
SD5620-001, SD5630-001				0.25		T_A=25°C
SD5620-002, SD5630-002				0.13		
Hysteresis (3)	HYST	5		30	%	
Supply Current	I_{CC}				mA	E_e=0 Or 3.0 mW/cm²
				12.0		V_{CC}=5 V
				15.0		V_{CC}=16 V
High Level Output Voltage	V_{OH}				V	V_{CC}=5 V, I_{OH}=0
SD5620		2.4				E_e=3.0 mW/cm²
SD5630		2.4				E_e=0
Low Level Output Voltage	V_{OL}				V	V_{CC}=5 V, I_{OL}=12.8 mA
SD5620				0.4		E_e=0
SD5630				0.4		E_e=3.0 mW/cm²
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
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 935 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

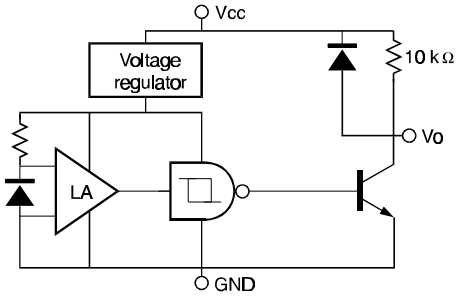
(25°C Free-Air Temperature unless otherwise noted)

Supply Voltage	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
1. Derate linearly from 25°C to 7 V at 100°C.

SCHEMATIC

SD5620 BUFFER, 10 k Ω PULL-UP



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SCHEMATIC

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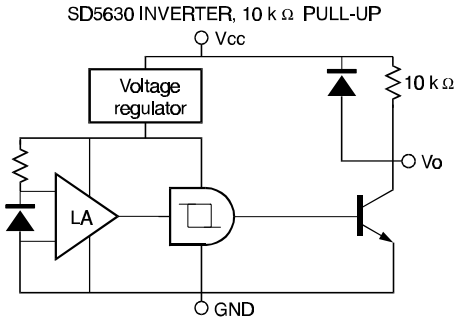

SWITCHING TIME TEST CIRCUIT

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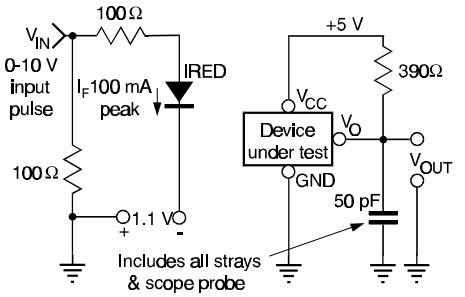

SWITCHING WAVEFORM FOR BUFFERS

cir_013.cdr

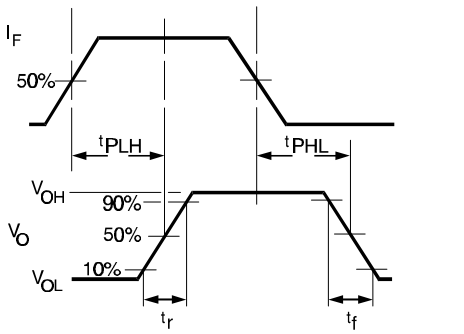

Fig. 1 Responsivity vs Angular Displacement

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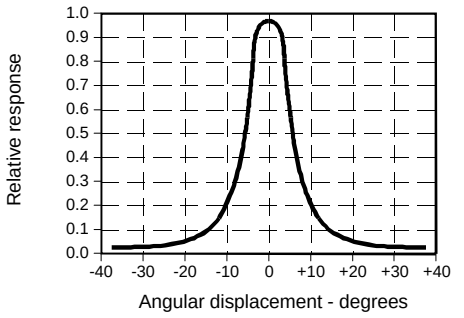

SWITCHING WAVEFORM FOR INVERTERS

cir_011.cdr

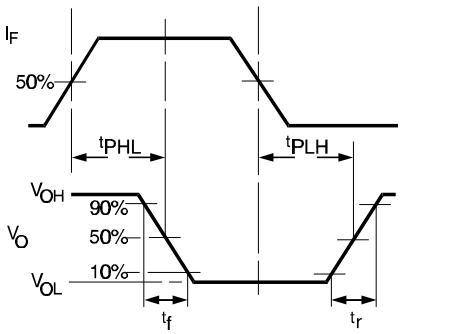

Fig. 2 Threshold Irradiance vs Temperature

gra_060.ds4

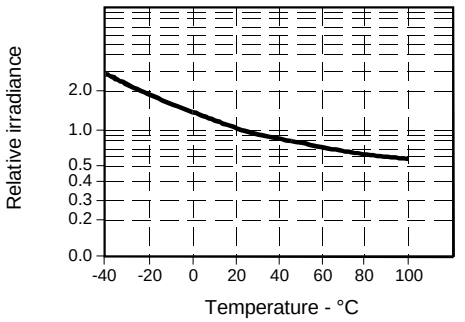

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Fig. 3 Output Rise Time (t_r) and Output Fall Time (t_f) vs Temperature

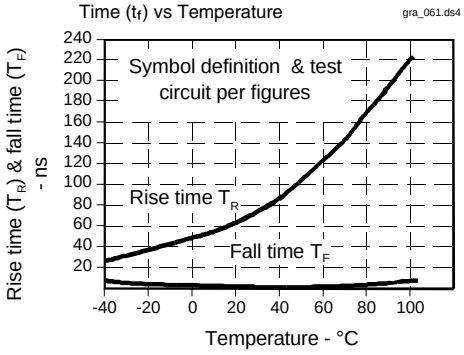


Fig. 4 Delay Time vs Temperature

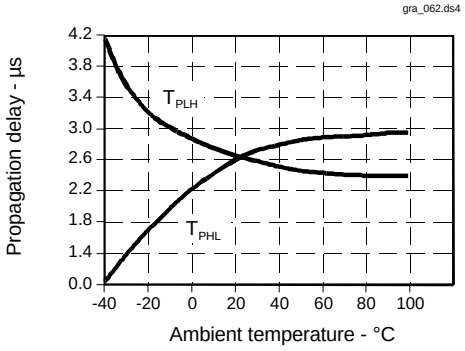
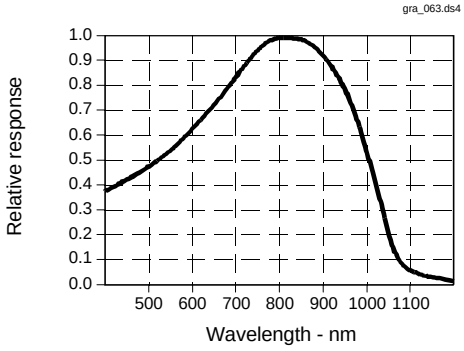


Fig. 5 Spectral Responsivity



All Performance Curves Show Typical Values

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