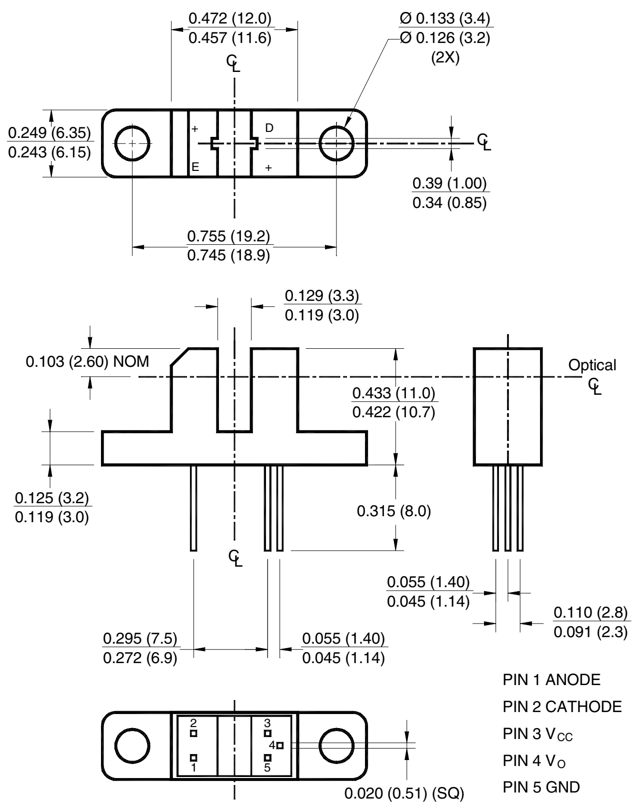
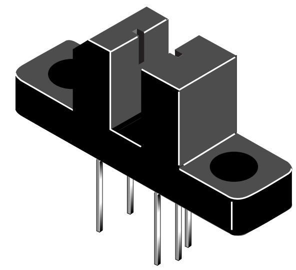
OPTOLOGIC® OPTICAL INTERRUPTER SWITCH

H21LTB H21LTI H21LOB H21LOI

PACKAGE DIMENSIONS



NOTES:
1. Dimensions for all drawings are in inches (mm).
2. Tolerance of ± .010 (.25) on all non-nominal dimensions unless otherwise specified.



PART NUMBER DEFINITIONS

H21LTB	Totem-pole, buffer output
H21LTI	Totem-pole, inverter output
H21LOB	Open-collector, buffer output
H21LOI	Open-collector, inverter output

INPUT/OUTPUT TABLE

Part Number	LED	Output
H21LTB	On	High
H21LTB	Off	Low
H21LTI	On	Low
H21LTI	Off	High
H21LOB	On	High
H21LOB	Off	Low
H21LOI	On	Low
H21LOI	Off	High

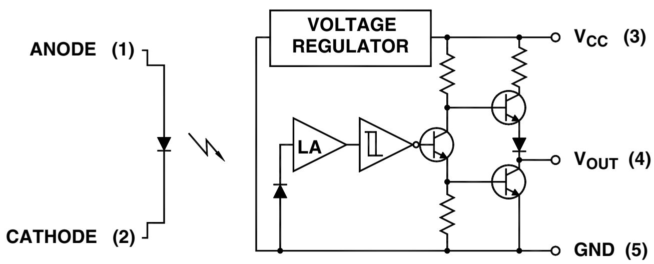
DESCRIPTION

The H21L series are slotted optical switches designed for multipurpose non contact sensing. They consist of a GaAs LED and a silicon OPTOLOGIC®. sensor packaged in an injection molded housing and facing each other across a .124” (3.15 mm) gap. The output is either inverting or non-inverting, with a choice of totem-pole or open-collector configuration for TTL/CMOS compatibility

FEATURES

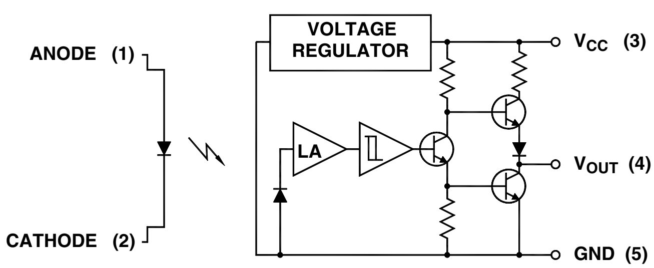
- Low cost
- 0.035” apertures
- Black plastic opaque housing
- Mounting tabs on housing
- Choice of inverter or buffer output functions
- Choice of open-collector or totem-pole output configuration
- TTL/CMOS compatible output functions

SCHEMATICS



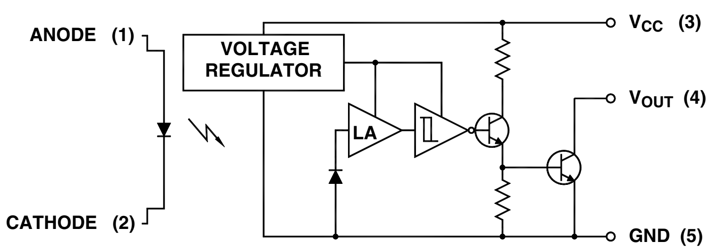
H21LTB

Totem-Pole Output Buffer



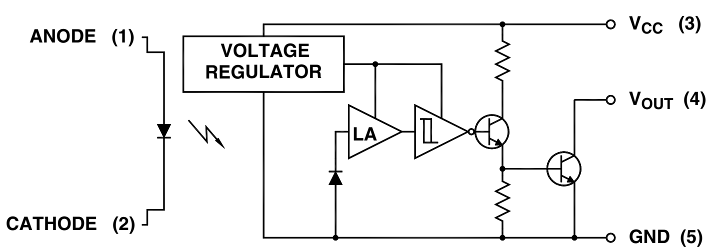
H21LTI

Totem-Pole Output inverter



H21LOB

Open-Collector Output Buffer



H21LOI

Open-Collector Output Inverter

ABSOLUTE MAXIMUM RATINGS (T_A = 25°C unless otherwise specified)

Parameter	Symbol	Rating	Units
Operating Temperature	T_{OPR}	-40 to +85	°C
Storage Temperature	T_{STG}	-40 to +85	°C
Soldering Temperature (Iron)[3,4,5,6]	T_{SOL-I}	240 for 5 sec	°C
Soldering Temperature (Flow)[3,4,6]	T_{SOL-F}	260 for 10 sec	°C
INPUT (EMITTER)			
Continuous Forward Current	I_F	50	mA
Reverse Voltage	V_R	6	V
Power Dissipation[1]	P_D	100	mW
OUTPUT (SENSOR)			
Output Current	I_O	50	mA
Supply Voltage	V_{CC}	4.0 to 16	V
Output Voltage	V_O	30	V
Power Dissipation[2]	P_D	150	mW

NOTES (Applies to Max Ratings and Characteristics Tables.)

1. Derate power dissipation linearly 1.67 mW/°C above 25°C.
2. Derate power dissipation linearly 2.50 mW/°C above 25°C.
3. RMA flux is recommended.
4. Methanol or isopropyl alcohols are recommended as cleaning agents.
5. Soldering iron 1/16” (1.6mm) from housing.
6. As long as leads are not under any stress or spring tension.

ELECTRICAL / OPTICAL CHARACTERISTICS (T_A =25°C)

PARAMETER	TEST CONDITIONS	SYMBOL	MIN.	TYP.	MAX.	UNITS
INPUT (EMITTER)						
Forward Voltage	I_F = 20 mA	V_F	—		1.5	V
Reverse Leakage Current	V_R = 5 V	I_R	—		10	μA
OUTPUT (SENSOR)						
Supply Current	V_{CC} = 5 V	I_{CC}	—		5	mA
COUPLED						
Low Level Output Voltage H21LTB, H21LOB	I_F = 0 mA, V_{CC} = 5 V, R_L = 100 Ω	V_{OL}	—		0.4	V
Low Level Output Voltage H21LTI, H21LOI	I_F = 15 mA, V_{CC} = 5 V, R_L = 360 Ω	V_{OL}	—		0.4	V
High Level Output Voltage H21LTB	I_F = 15 mA, V_{CC} = 5 V, I_{OH} = -800 μA	V_{OH}	2.4		—	V
High Level Output Voltage H21LTI	I_F = 0 mA, V_{CC} = 5 V, I_{OH} = -800 μA	V_{OH}	2.4		—	V
High Level Output Current H21LOB	I_F = 0 mA, V_{CC} = 5 V, I_{OH} = -800 μA	I_{OH}			100	μA
High Level Output Current H21LOI	I_F = 0 mA, V_{CC} = 5 V, V_{OH} = 30 V	I_{OH}	—		100	μA
Turn on Threshold Current	V_{CC} = 5 V, R_L = 360 Ω	$I_F(+)$	—		15	mA
Turn off Threshold Current	V_{CC} = 5 V, R_L = 360 Ω	$I_F(-)$	0.50		—	mA
Hysteresis Ratio		$I_F(+) / I_F(-)$		1.2		
Propagation Delay	V_{CC} = 5 V, R_L = 360 Ω (See Fig, 9)	t_{PLH}, t_{PHL}		5		μs
Output Rise and Fall Time	V_{CC} = 5 V, R_L = 360 Ω (See Fig, 9)	t_r, t_f		70		ns

Fig. 1 Output Voltage vs. Input Current (Inverters)

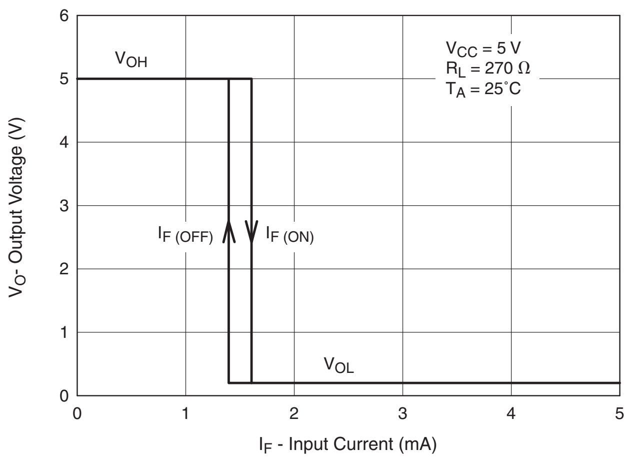


Fig. 2 Output Voltage vs. Input Current (Buffers)

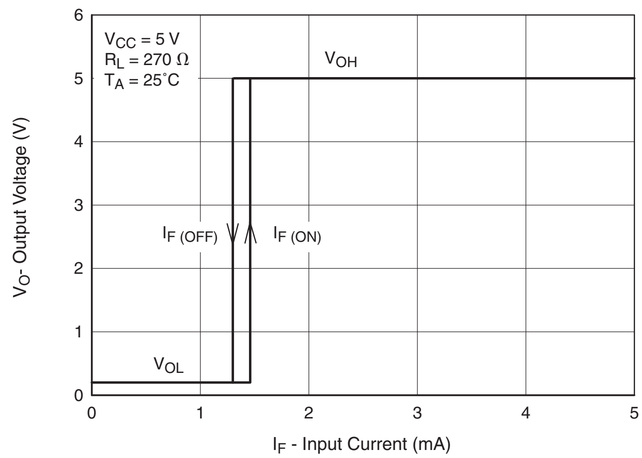


Fig. 3 Normalized Threshold Current vs. Shield Distance

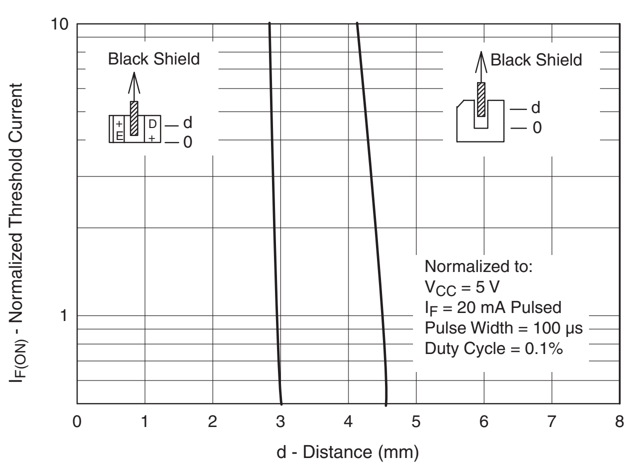


Fig. 4 Normalized Threshold Current vs. Supply Voltage

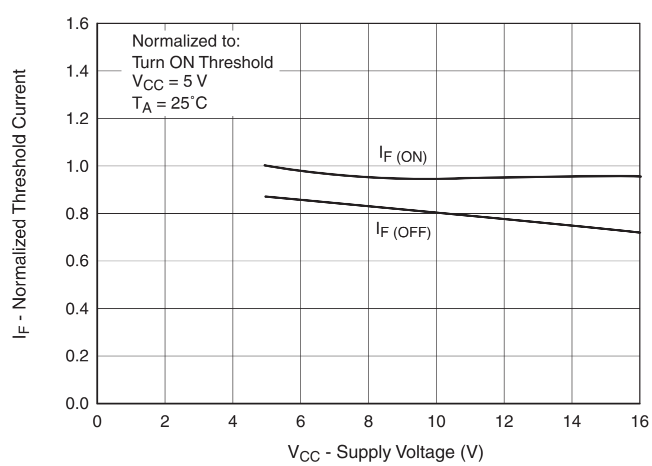


Fig. 5 Normalized Threshold Current vs. Ambient Temperature

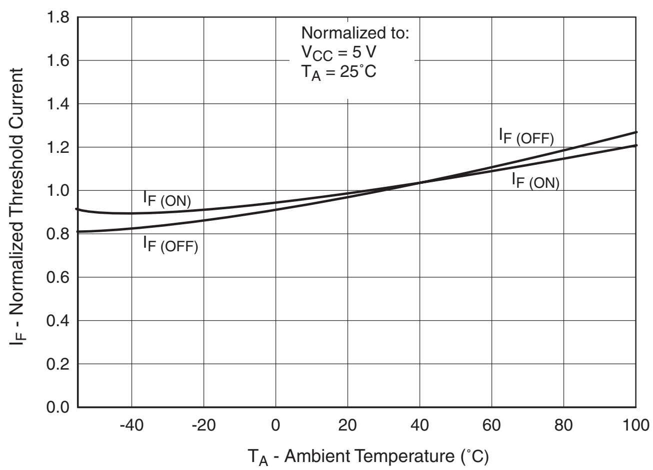


Fig. 6 Forward Current vs. Forward Voltage

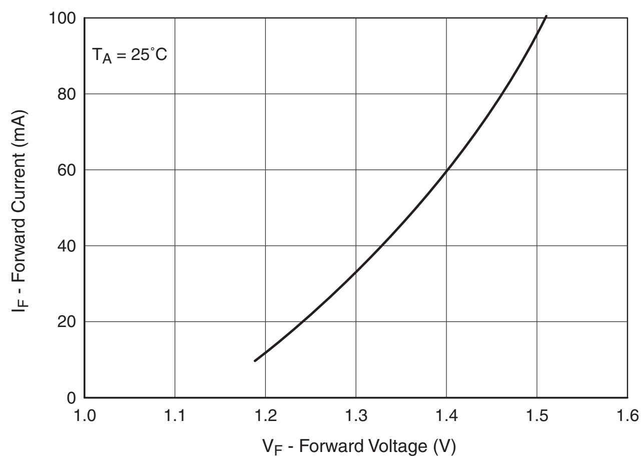


Fig. 7 Low Output Voltage vs. Output Current

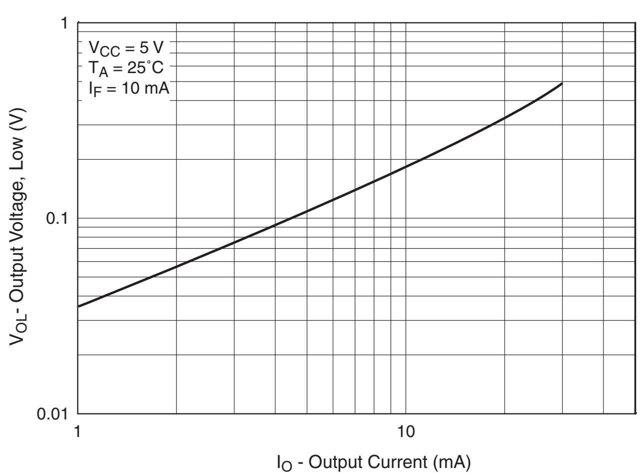


Fig. 8 Response Time vs. Forward Current

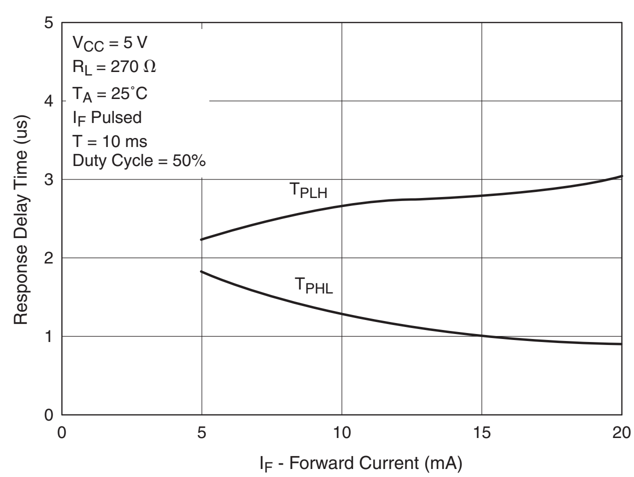
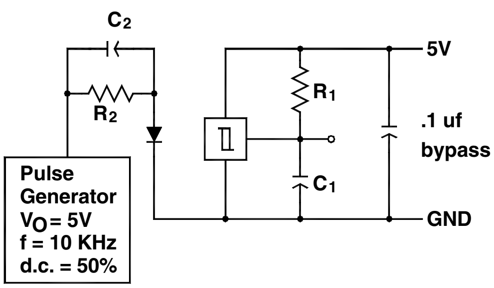


Fig. 9 Switching Speed Test Circuit



R_1 = 360 Ω C_1 = 15 pf C_1 and C_2 include probe and stray wire capacitance
R_2 = 180 Ω C_2 = 20 pf

Fig. 10 Typical Operating Circuit

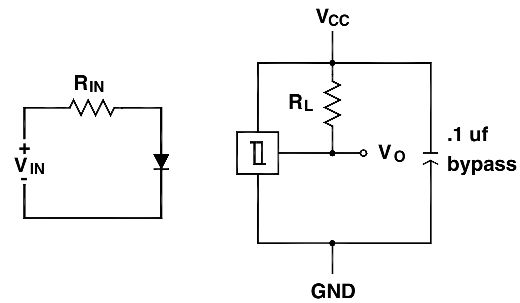


Fig. 11 Switching Times Definition for Buffers

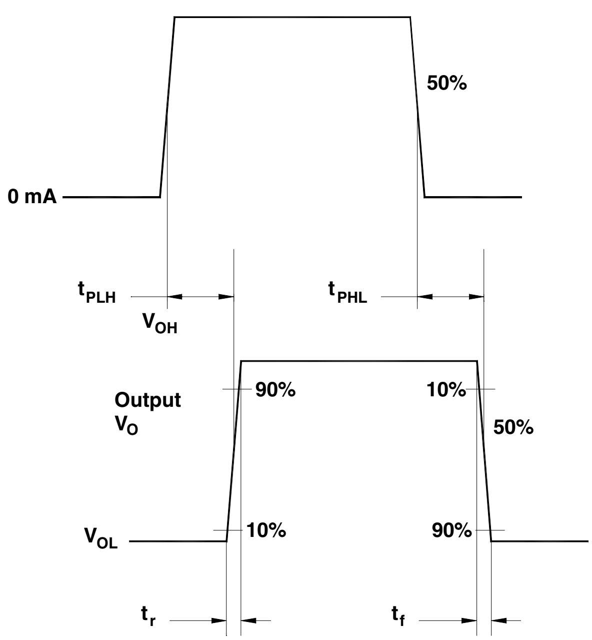
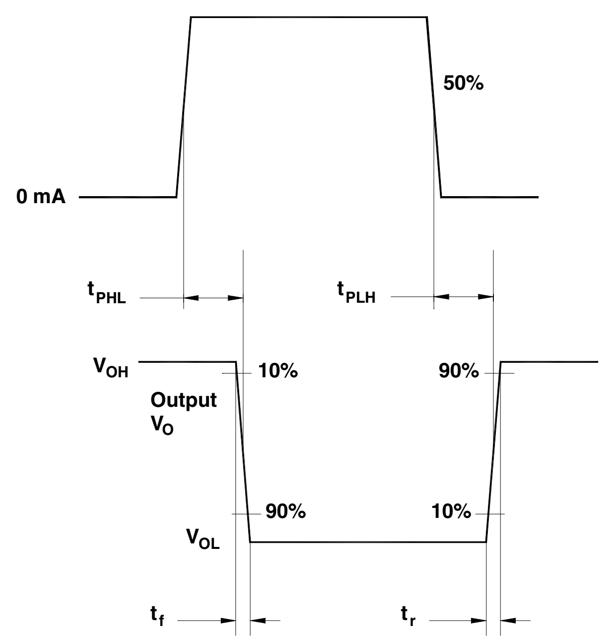


Fig. 12 Switching Times Definition for Inverters



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