H21LTB H21LTI H21LOB H21LOI
Logic Output Interrupter Switch

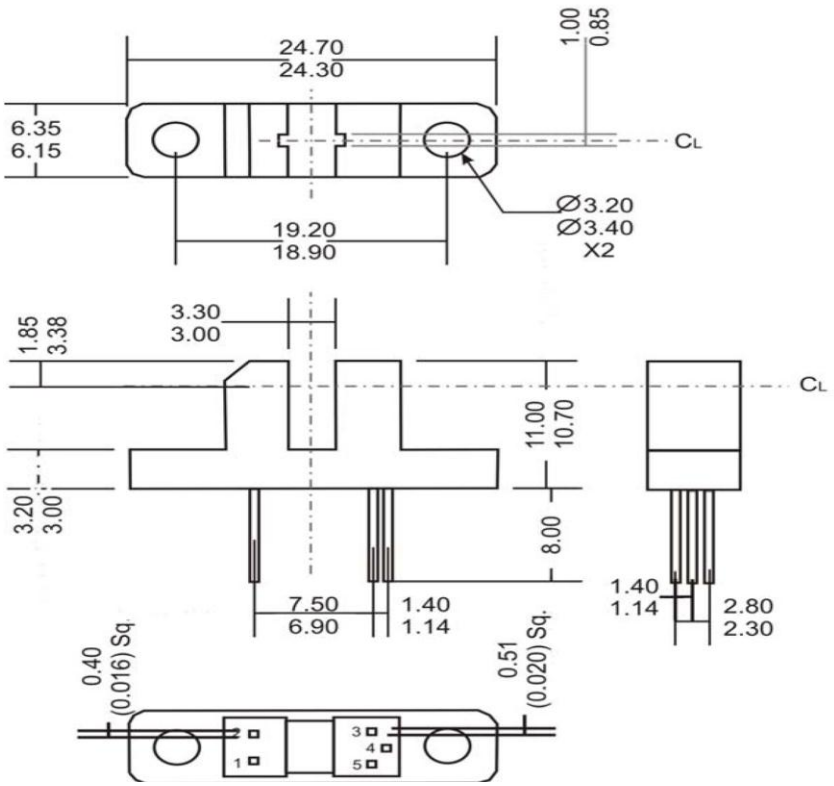
Features

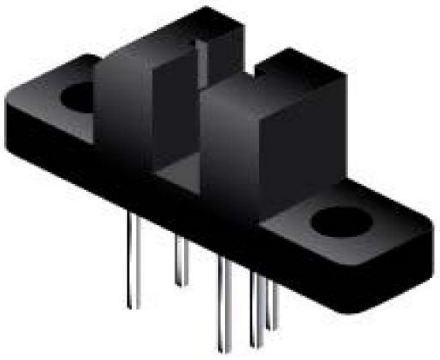
- 1.00 mm aperture
- Mounting tabs on Housing
- Choice of inverter or buffer outputs
- Choice of open-collector or totem-pole output configuration
- TTL/CMOS compatible output
- RoHS compliant

Description

The H21L series are slotted switches designed for multipurpose non contact sensing. The consist of a GaAs LED and silicon LOGIC OUTPUT sensor packaged in an injection molded housing , facing each other across a 3mm gap.The output is either inverting on non inverting, with a choice of totem-pole or open collector confiquration for TTL/CMOS compatibility.

Package Dimensions





Pin # 1 = Anode
Pin # 2 = Cathode
Pin #3 = V_{CC}
Pin # 4 = V_O
Pin # 5 = Ground

Notes

1. Dimensions for all drawings are in millimeters.
2. Tolerance of . +/- 0.25mm (0.010) on all non nominal dimensions unless otherwise specified

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Absolute Maximum Ratings (T_A = 25^O C unless otherwise specified)
Stresses exceeding the absolute maximum ratings may damage the device. The device may not function or be operable above the recommended operating conditions and stressing the parts to these levels is not recommended. In Addition, extended exposure to stresses above the recommended operating conditions may affect device reliability. The absolute maximum ratings are stress ratings only.

Symbol	Parameter	Rating	Units
T_{OPR}	Operating Temperature	-40 to +85	**ºC**
T_{STG}	Storage Temperature	-40 to +85	**ºC**
T_{SOL-I}	Soldering Temperature (Solder Iron) (3,4,5,6)	240 for 5 sec	**ºC**
T_{SOL-F}	Soldering Temperature (Solder Flow) (3,4.5.6)	260 for 10 sec	**ºC**
Emitter			
I_F	Continuous Forward Current (1)	**50**	**mA**
V_R	Reverse Voltage	**5**	**V**
P_D	Power Dissipation(1)	100	mW
Sensor			
I_O	Output Current	50	mA
V_{CC}	Supply Voltage	4.0-16	V
V_O	Output Voltage	30	V
P_D	Power Dissipation (2)	150	mW

Notes:
1. Derate power dissipation linearly, on Emitter, 1.67 mW/^{O}C above 25^{O}C.
2. Derate power dissipation linearly, 2.50 mW/^{O}C above 25^{O}C.
3. RMA Flux is recommended.
4. Methanol or isopropyl alcohols are recommended as cleaning agents.
5. Soldering iron tip 1.6mm from housing.
6. As long as leads are not under stress or spring tension

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

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Electrical/Optical Characteristics Cont. (T_A = 25° C)

Symbol	Parameter	Test Condtions	Min.	Typ.	Max.	Units
V_{CC}	Recommended Operating Supply Voltage	I_F = 20mA	4.4		5.5	V
V_F	Forward Voltage	I_F = 20mA			1.5	V
I_R	Reverse Leakage Current	V_R = 5V			10	µA
Output (Sensor)						
I_{CC}	Supply Current	V_{CC} = 5V			5	mA
Coupled						
V_{OL}	Low Level Output Voltage H21LTB, H21LOB	I_F = 0mA, V_{CC} = 5V, I_{OL} = 16mA			0.4	V
	Low Level Output Voltage H21LTI, H21LOI	I_F = 15mA, V_{CC} = 5V, I_{OL} = 16mA			0.4	
V_{OH}	High Level Output H21LTB	I_F = 15mA, V_{CC} = 5V, I_{OH} = -1mA	2.4			V
	High Level Output H21LTI	I_F = 0mA, V_{CC} = 5V, I_{OH} = -1mA	2.4			
I_{OH}	High Level Output Current H21LOB	I_F = 15mA, V_{CC} = 5V, V_{OH} = 30V			100	µA
	High Level Output Current H21LOI	I_F = 0mA, V_{CC} = 5V, V_{OH} = 30V			100	µA
$I_F^{(+)}$	Turn on Threshold Current	V_{CC} = 5V			15	mA
$I_F^{(-)}$	Turn off Threshold Current	V_{CC} = 5V	0.5			mA
$I_F^{(+)}/I_F^{(-)}$	Hysteresis Ratio			1.2		
t_{PLH}, t_{PHL}	Propagation Delay H21LOI, H21LOB	V_{CC} = 5V, RL = 300Ω (Fig 9)		6		µS
	Propagation Delay H21LTI, H21LTB	V_{CC} = 5V, RL = 300Ω (Fig 9)		6		
T_r, T_f	Output Rise and Fall Time, H21LOI, H21LOB	V_{CC} = 5V, RL = 300Ω (Fig 9)		100		nS
	Output Rise and Fall Time, H21LTI, H21LTB	V_{CC} = 5V, RL = 300Ω (Fig 9)		70		

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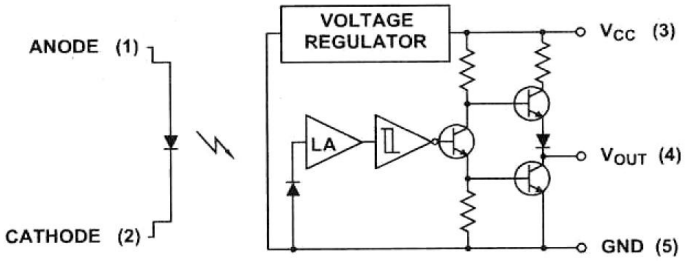
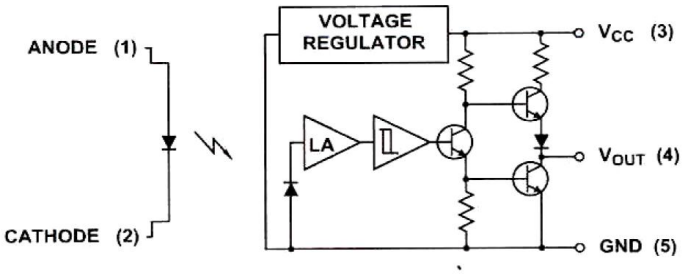
Schematics



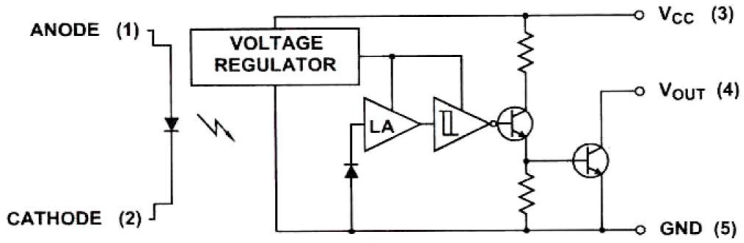
H21LTB

Totem-Pole Output Buffer



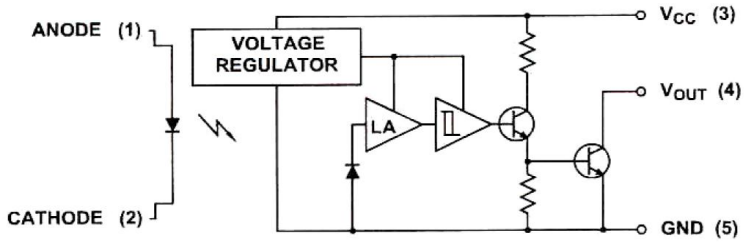
H21LTI

Totem-Pole Output inverter



H21LOB

Open-Collector Output Buffer



H21LOI

Open-Collector Output Inverte

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Typical Performance Characteristics

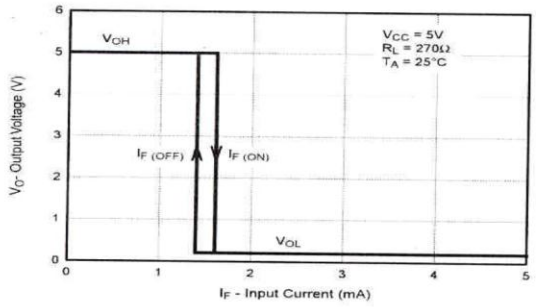

Figure 1. Output Voltage vs. Input Current (Inverters)

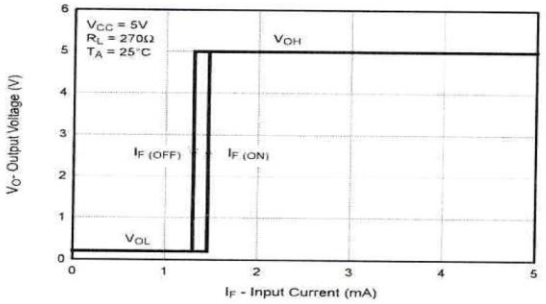

Figure 2. Output Voltage vs. Input Current (Buffers)

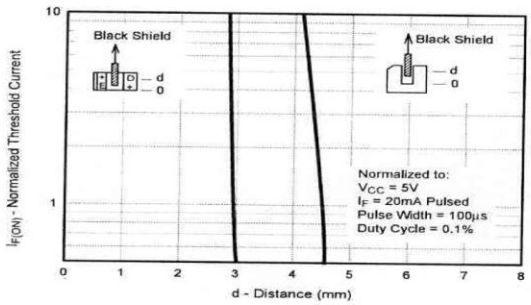

Figure 3. Normalized Threshold Current vs. Shield Distance

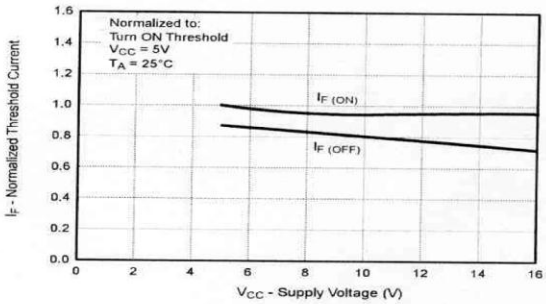

Figure 4. Normalized Threshold Current vs. Supply Voltage

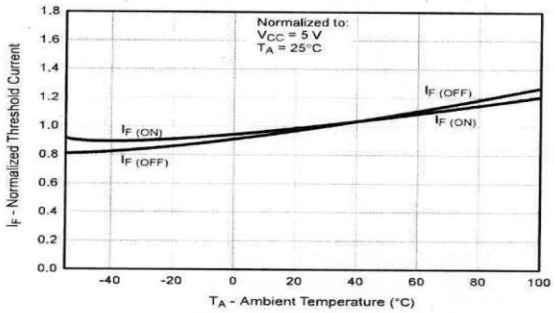

Figure 5. Normalized Threshold Current vs. Ambient Temperature

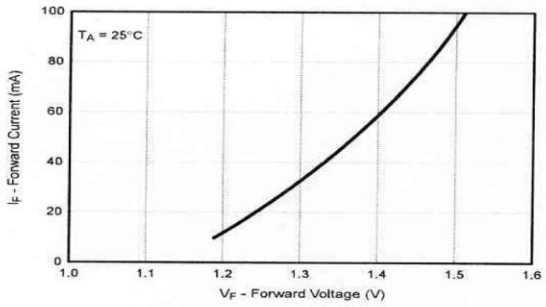

Figure 6. Forward Current vs. Forward Voltage

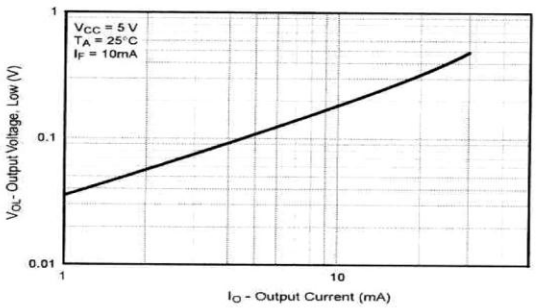

Figure 7. Low Output Voltage vs. Output Current

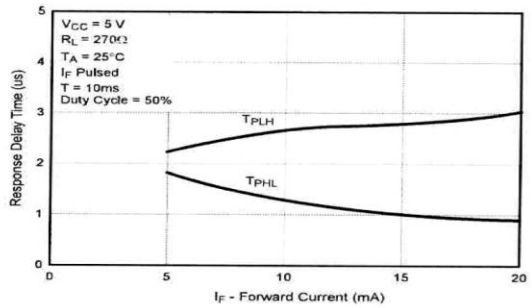

Figure 8. Response Time vs. Forward Current

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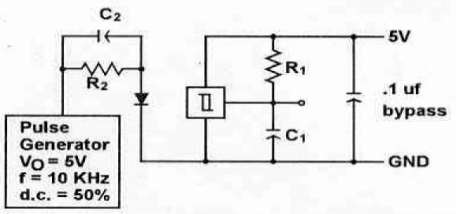
Switching Criteria

Figure 9. Switching Speed Test Circuit



$R_1 = 300\Omega$ $C_1 = 15pF$ C_1 and C_2 include probe and
$R_2 = 180\Omega$ $C_2 = 20pF$ stray wire capacitance

Figure 10. Typical Operating Circuit

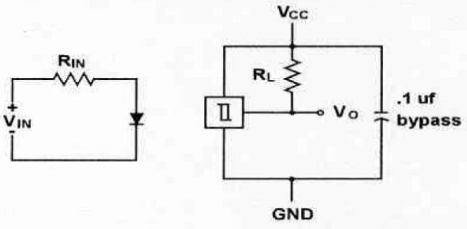


Figure 11. Switching Times Definition for Buffer

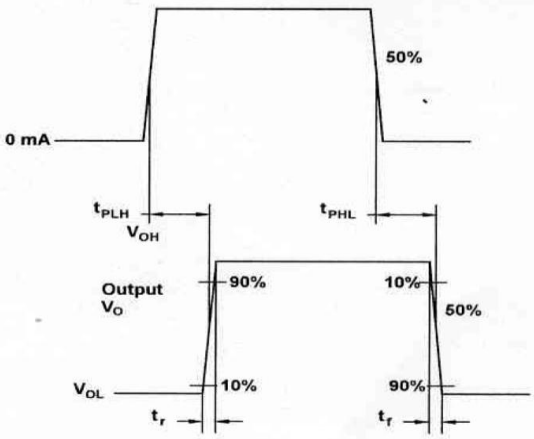
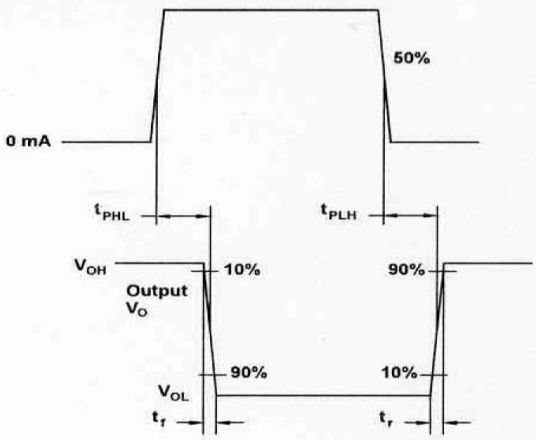


Figure 12. Switching Times Definitions for Inverters



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2. A critical component in any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.

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