Light in Motion

H22LTB H22LTI H22LOB H22LOI
Logic Output Interrupter Switch

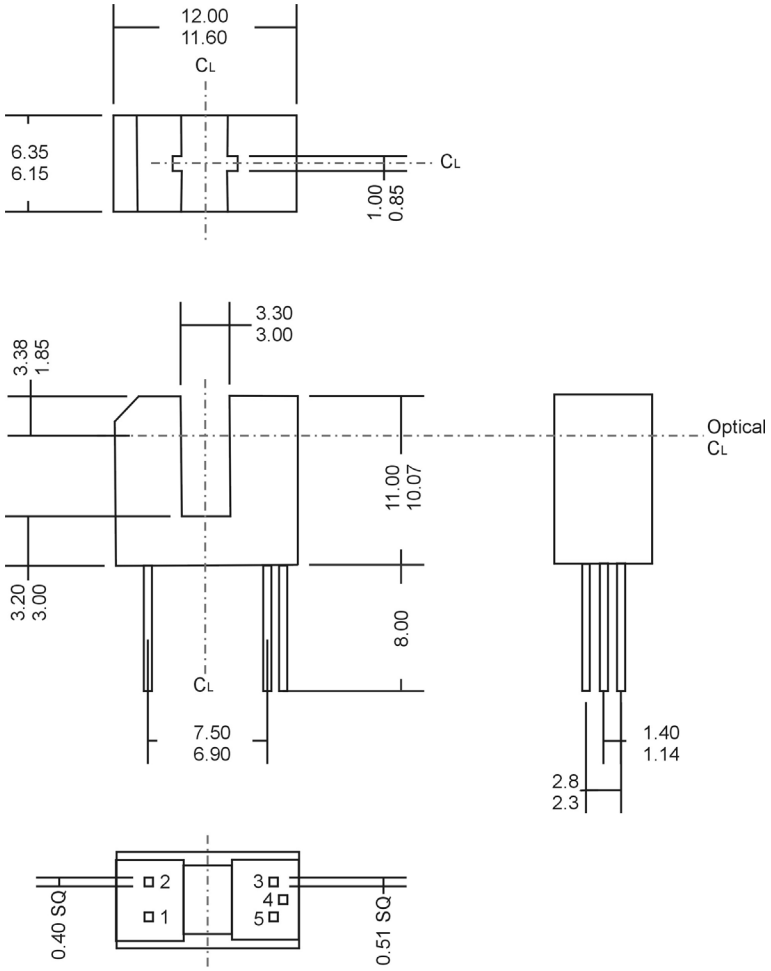
Features

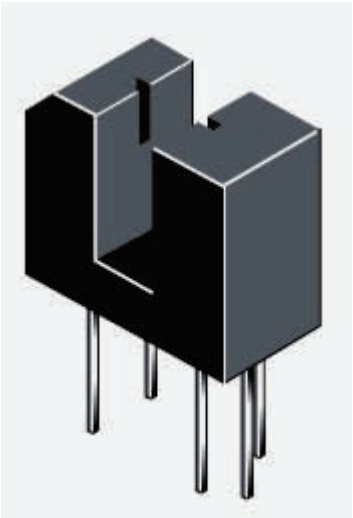
- Low Cost
- 1.00 mm aperture
- Black plastic opaque housing
- Choice of inverter or buffer output options
- Choice of open-collector or totem-pole output configuration
- TTL/CMOS compatible output functions

Description

The H22L 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 configuration for TTL/CMOS compatibility.

Package Dimensions





Pin # 1 = Anode
Pin # 2 = Cathode
Pin # 3 = Vcc
Pin # 4 = Vo
Pin # 5 = Ground

Notes

1. Dimensions for all drawings are in millimeters.

2. Tolerance of .+/- 0.25mm on all non nominal dimensions unless otherwise specified

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	^{O}C
T_{STG}	Storage Temperature	-40 to +85	^{O}C
T_{SOL-I}	Soldering Temperature (Solder Iron) (3,4,5,6)	240 for 5 sec	^{O}C
T_{SOL-F}	Soldering Temperature (Solder Flow) (3,4.5.6)	260 for 10 sec	^{O}C
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

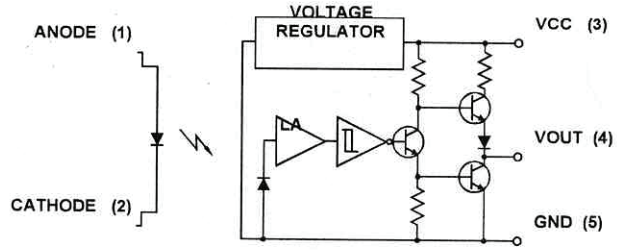
Input/Output Table

Part Number	LED	Output
H22LTB	On	High
H22LTB	Off	Low
H22LTI	On	Low
H22LTI	Off	High
H22LOB	On	High
H22LOB	Off	Low
H22LOI	On	Low
H22LOI	Off	High

Electrical/Optical Characteristics Cont. ($T_A = 25^O$ C)

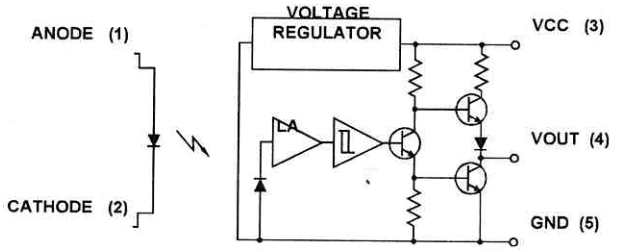
Symbol	Parameter	Test Condtions	Min.	Typ.	Max.	Units
V_{CC}	Operating Supply Voltage	V_{CC}	4.5		16	V
Input Diode						
V_F	Forward Voltage	I_F = 20mA			1.5	V
I_R	Reverse Leakage Current	V_R = 5V			10	µA
Output (Sensor)						
I_{CC}	Supply Current	V_{CC} = 5V			5	mA
Coupled						
V_{OL}	Low Level Output Voltage H22LTB, H22LOB	I_F = 0mA, V_{CC} = 5V, I_{OL} = 16mA			0.4	V
	Low Level Output Voltage H22LTI, H22LOI	I_F = 15mA, V_{CC} = 5V, I_{OL} = 16mA			0.4	
V_{OH}	High Level Output H22LTB	I_F = 15mA, V_{CC} = 5V, I_{OL} = -1mA	2.4			V
	High Level Output H22LTI	I_F = 0mA, V_{CC} = 5V, I_{OL} = -1mA	2.4			
I_{OH}	High Level Output Current H22LOB	I_F = 15mA, V_{CC} = 5V, I_{OH} = 30V			100	µA
	High Level Output Current H22LOI	I_F = 0mA, V_{CC} = 5V, I_{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 H22LOI, H22LOB	V_{CC} = 5V, RL = 300Ω (Fig 9)		6		µS
	Propagation Delay H22LTI, H22LTB	V_{CC} = 5V, RL = 300Ω (Fig 9)		6		
T_r, T_f	Output Rise and Fall Time, H22LOI, H22LOB	V_{CC} = 5V, RL = 300Ω (Fig 9)		100		nS
	Output Rise and Fall Time, H22LTI, H22LTB	V_{CC} = 5V, RL = 300Ω (Fig 9)		70		

Schematics



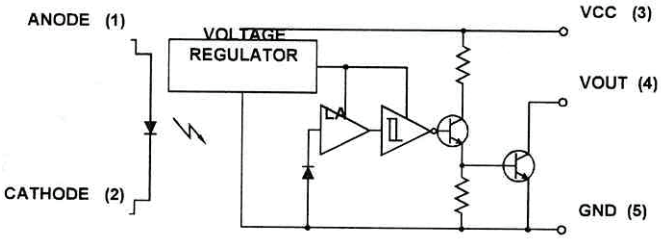
H22LTB

Totem-Pole Output Buffer



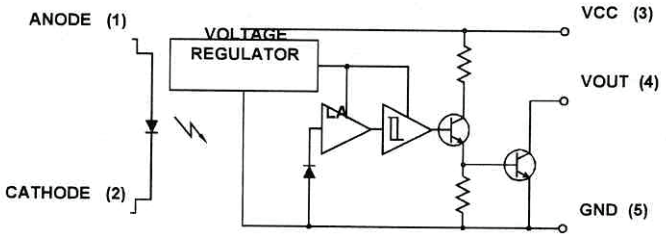
H22LTI

Totem-PoleOutput inverter



H22LOB

Open-Collector Output Buffer



H22LOI

Open-Collector Output Inverter

Typical Performance Characteristics

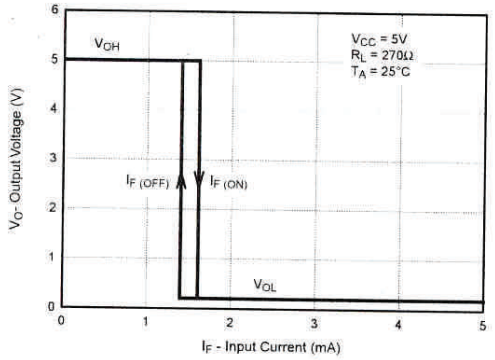


Figure 1. Output Voltage vs. Input Current (Inverters)

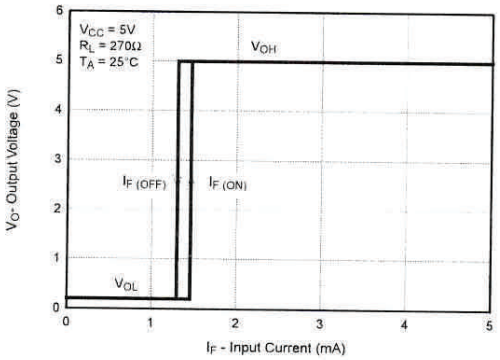


Figure 2. Output Voltage vs. Input Current (Buffers)

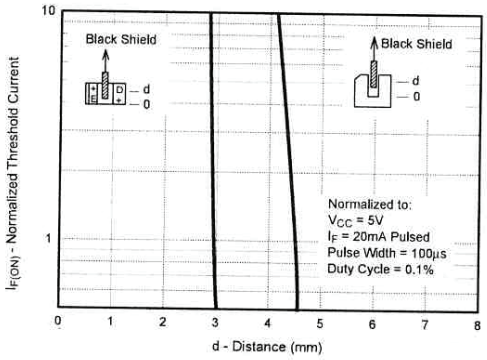


Figure 3. Normalized Threshold Current vs. Shield Distance

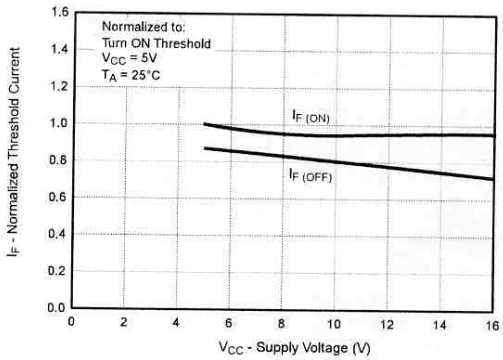


Figure 4. Normalized Threshold Current vs. Supply Voltage

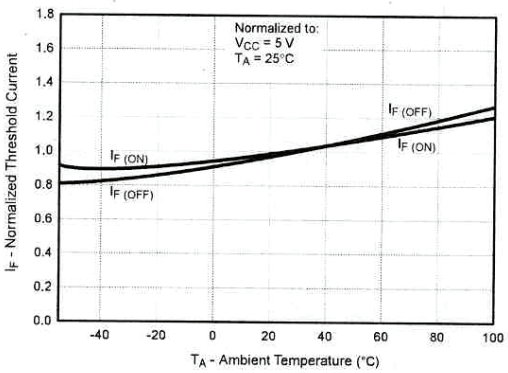


Figure 5. Normalized Threshold Current vs. Ambient Temperature

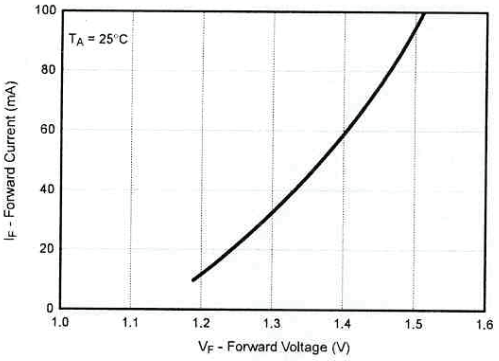


Figure 6. Forward Current vs. Forward Voltage

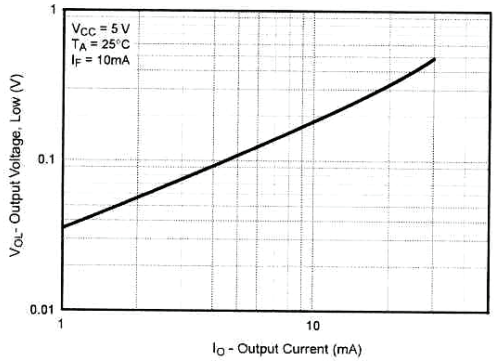


Figure 7. Low Output Voltage vs. Output Current

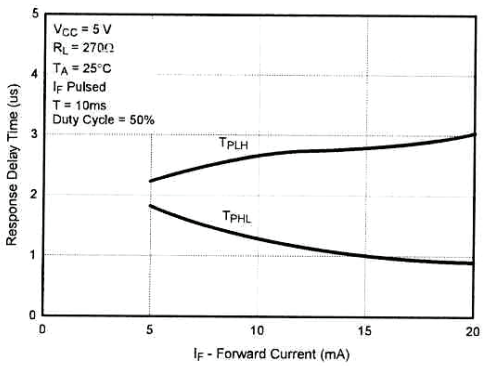
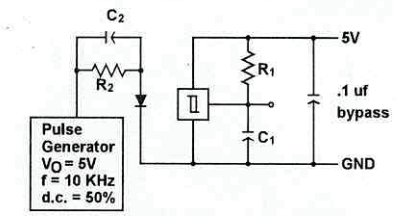


Figure 8. Response Time vs. Forward Current

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

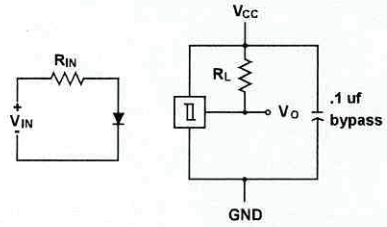


Figure 11. Switching Times Definition for Buffer

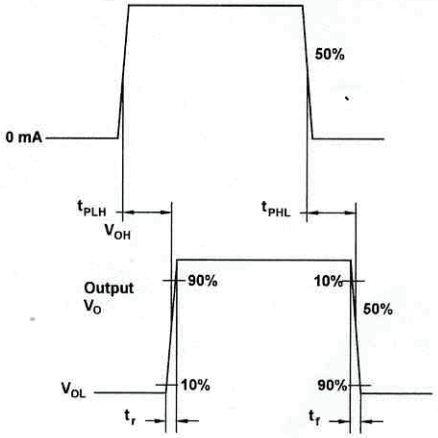
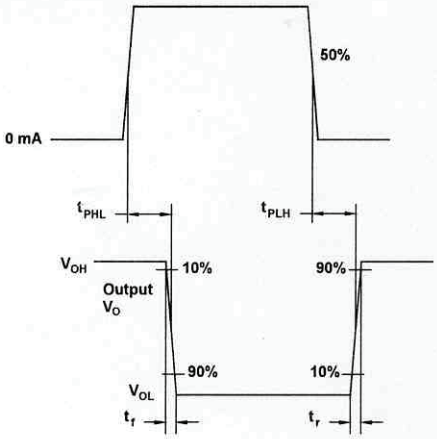


Figure 12. Switching Times Definitions for Inverters



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