



# THE DATASHEET OF H22LOB



# H22L Series OPTOLOGIC® OPTICAL INTERRUPTER SWITCH

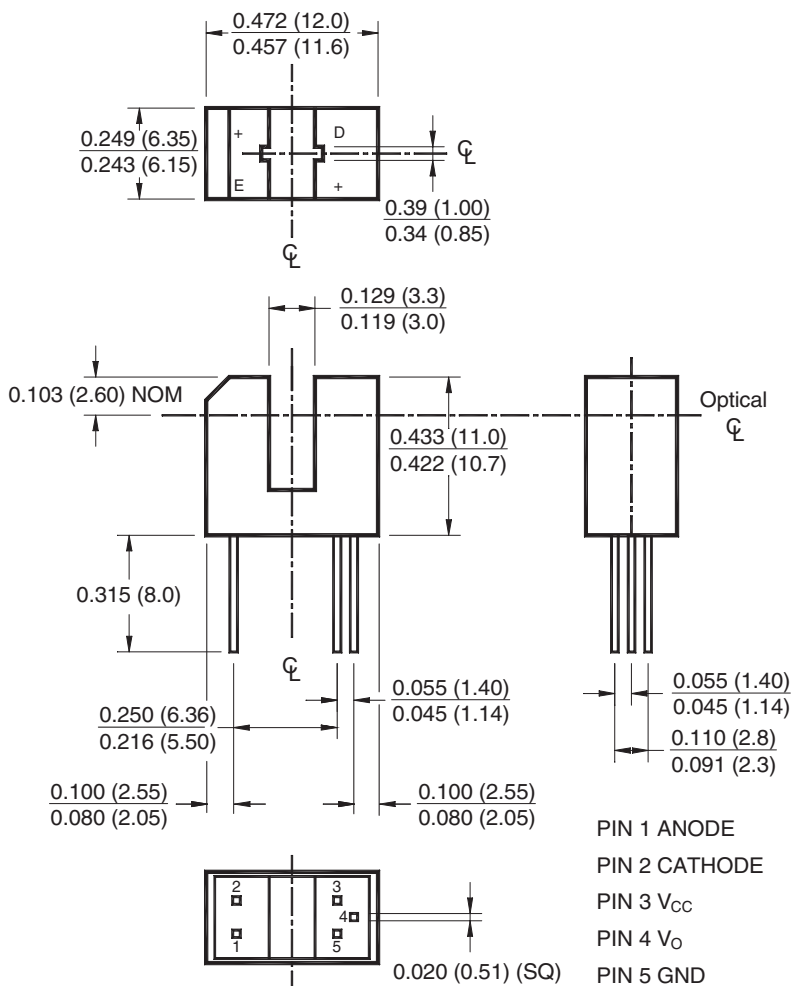
## Features

- Black plastic housing
- Choice of inverter or buffer output functions
- Choice of open-collector or totem-pole output configuration
- No contact switching
- TTL/CMOS compatible output functions

## PART NUMBER DEFINITIONS

H22LTB	Totem-pole, buffer output
H22LTI	Totem-pole, inverter output
H22LOB	Open-collector, buffer output
H22LOI	Open-collector, inverter output

## Package Dimensions



### NOTES:

1. Dimensions for all drawings are in inches (millimeters).
2. Tolerance of ± .010 (.25) on all non-nominal dimensions unless otherwise specified.
3. Lead cross section is controlled between .050 (1.27) from the seating plane and the end of the leads.

<b>ABSOLUTE MAXIMUM RATINGS</b> ( $T_A = 25^\circ\text{C}$ Unless otherwise specified)			
Parameter	Symbol	Rating	Units
Operating Temperature	$T_{OPR}$	-40 to +85	$^\circ\text{C}$
Storage Temperature	$T_{STG}$	-40 to +85	$^\circ\text{C}$
Soldering Temperature (Iron) <sup>(3,4,5,6)</sup>	$T_{SOL-I}$	240 for 5 sec	$^\circ\text{C}$
Soldering Temperature (Flow) <sup>(3,4,6)</sup>	$T_{SOL-F}$	260 for 10 sec	$^\circ\text{C}$
<b>EMITTER</b>			
Continuous Forward Current	$I_F$	50	mA
Reverse Voltage	$V_R$	5	V
Power Dissipation <sup>(1)</sup>	$P_D$	100	mW
<b>SENSOR</b>			
Continuous Forward Current	$I_F$	50	mA
Output Current	$I_O$	50	mA
Supply Voltage	$V_{CC}$	4.0 to 16	V
Output Voltage	$V_O$	30	V
Power Dissipation <sup>(1)</sup>	$P_D$	150	mW

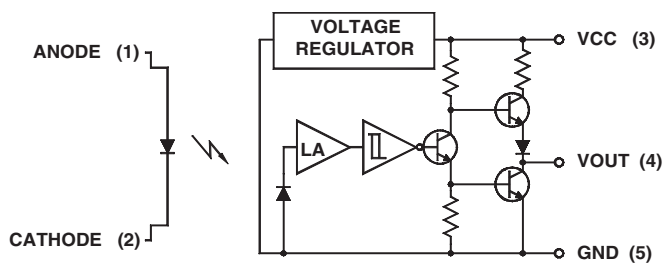
<b>ELECTRICAL / OPTICAL CHARACTERISTICS</b> ( $T_A = 25^\circ\text{C}$ )						
Part Number	Test Conditions	Symbol	Min.	Typ.	Max	Units
Operating Supply Voltage	$V_{CC}$	$V_{CC}$	4.5		16	V
<b>INPUT DIODE</b>						
Forward Voltage	$I_F = 20\text{ mA}$	$V_F$	—		1.7	V
Reverse Leakage Current	$V_R = 5\text{ V}$	$I_R$	—		10	$\mu\text{A}$
<b>COUPLED</b>						
Operating Supply Current	$I_F = 15\text{ mA}$ or $0\text{ mA}$ , $V_{CC} = 16\text{ V}$	$I_{CC}$	—		5	mA
Low Level Output Voltage H22LTB, H22LOB	$I_F = 0\text{ mA}$ , $V_{CC} = 5\text{ V}$ , $R_L = 100\ \Omega$	$V_{OL}$	—		0.4	V
Low Level Output Voltage H22LTI, H22LOI	$I_F = 15\text{ mA}$ , $V_{CC} = 5\text{ V}$ , $R_L = 360\ \Omega$	$V_{OL}$	—		0.4	V
High Level Output Voltage H22LTB	$I_F = 15\text{ mA}$ , $V_{CC} = 5\text{ V}$ , $I_{OH} = -800\ \mu\text{A}$	$V_{OH}$	2.4		—	V
High Level Output Voltage H22LTI	$I_F = 0\text{ mA}$ , $V_{CC} = 5\text{ V}$ , $I_{OH} = -800\ \mu\text{A}$	$V_{OH}$	2.4		—	V
High Level Output Current H22LOB	$I_F = 0\text{ mA}$ , $V_{CC} = 5\text{ V}$ , $I_{OH} = -800\ \mu\text{A}$	$I_{OH}$			100	$\mu\text{A}$
High Level Output Current H22LOI	$I_F = 0\text{ mA}$ , $V_{CC} = 5\text{ V}$ , $V_{OH} = 30\text{ V}$	$I_{OH}$	—		100	$\mu\text{A}$
Turn on Threshold Current	$V_{CC} = 5\text{ V}$ , $R_L = 360\ \Omega$	$I_{F(+)}$	—		15	mA
Turn off Threshold Current	$V_{CC} = 5\text{ V}$ , $R_L = 360\ \Omega$	$I_{F(-)}$	0.50		—	mA
Hysteresis Ratio		$I_{F(+)} / I_{F(-)}$		1.3		
Propagation Delay	$V_{CC} = 5\text{ V}$ , $R_L = 360\ \Omega$	$t_{PLH}$ , $t_{PHL}$		5		$\mu\text{s}$
Output Rise and Fall Time	$V_{CC} = 5\text{ V}$ , $R_L = 360\ \Omega$	$t_r$ , $t_f$		70		ns

**NOTES (Applies to Max Ratings and Characteristics Tables.):**

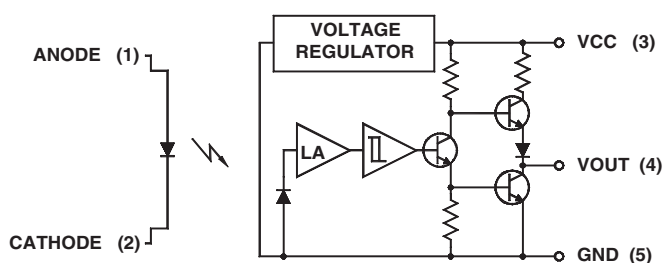
1. Derate power dissipation linearly 1.67 mW/°C above 25°C.
2. Derate power dissipation linearly 2.50 mW/°C above 25°C.
3. RMA flux is recommended.
4. Methanol or isopropyl alcohols are recommended as cleaning agents.
5. Soldering iron 1/16" (1.6mm) from housing.
6. As long as leads are not under any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

<b>INPUT / OUTPUT TABLE</b>		
<b>Part Number</b>	<b>LED</b>	<b>Output</b>
H22LTB	On	High
H22LTB	Off	Low
H22LTI	On	Low
H22LTI	Off	High
H22LOB	On	High
H22LOB	Off	Low
H22LOI	On	Low
H22LOI	Off	High

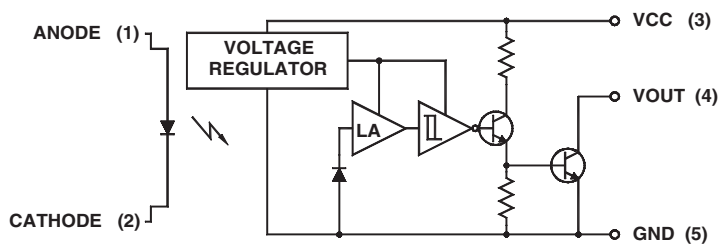
**Circuit Schematics**



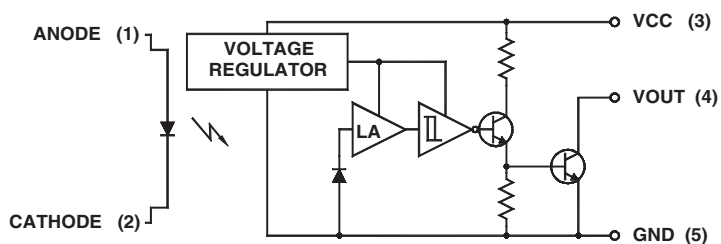
**H22LTB**  
Totem-Pole Output Buffer



**H22LTI**  
Totem-Pole Output Inverter



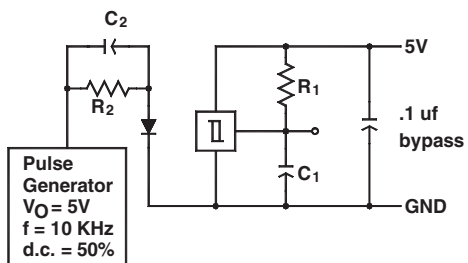
**H22LOB**  
Open-Collector Output Buffer



**H22LOI**  
Open-Collector Output Inverter

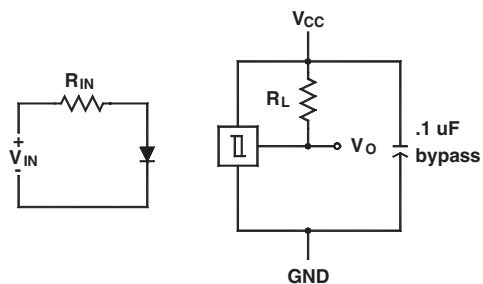
## Circuit Schematics (Continued)

Switching Speed Test Circuit

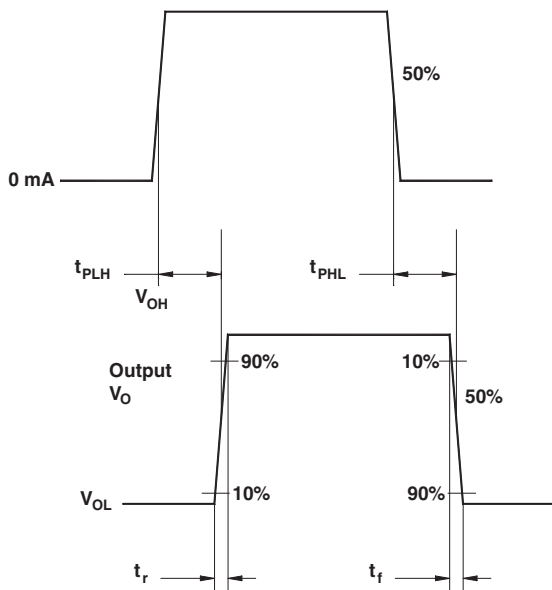


$R_1 = 180\ \Omega$      $C_1 = 15\ \text{pf}$      $C_1$  and  $C_2$  include probe and  
 $R_2 = 360\ \Omega$      $C_2 = 20\ \text{pf}$     stray wire capacitance

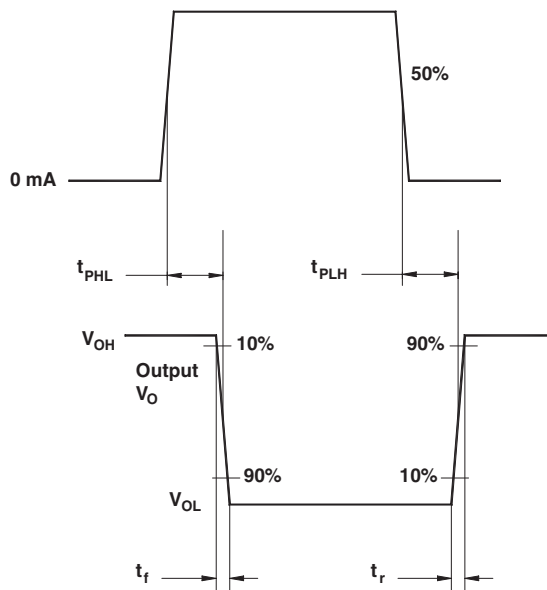
Typical Operating Circuit



Switching Test Curve for Buffers



Switching Test Curve for Inverters



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Rev. I12

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