

H22L Series OPTOLOGIC® Optical Interrupter Switch

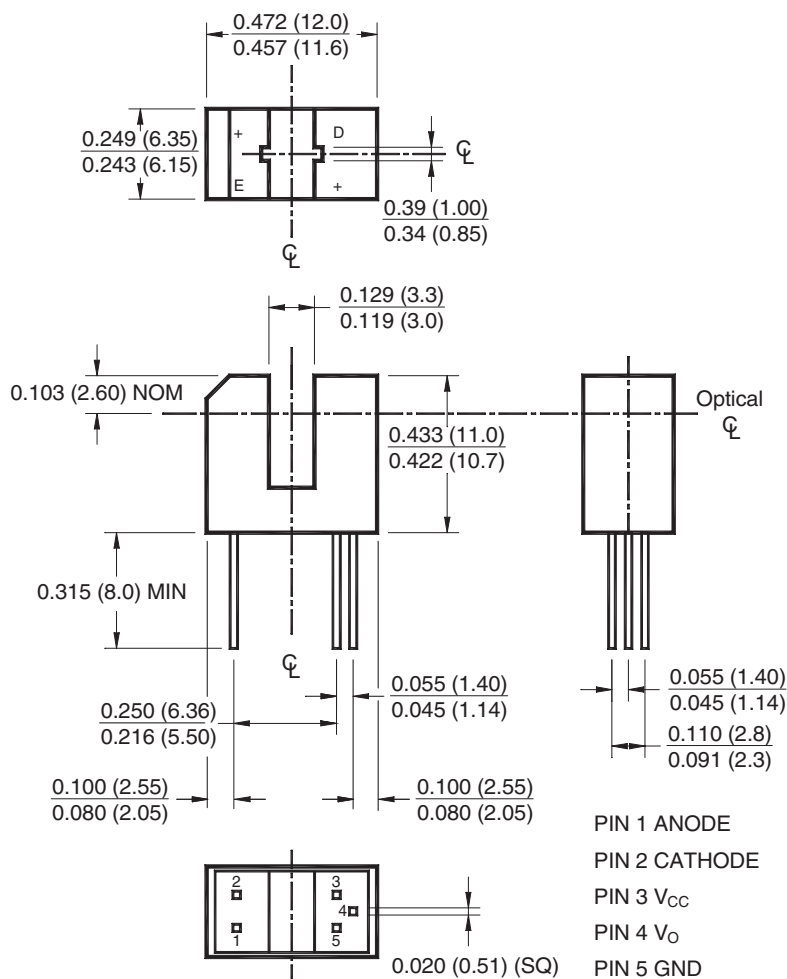
Features

- 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 $\pm .010$ (.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.

Absolute Maximum Ratings ($T_A = 25^\circ\text{C}$ 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
TOTAL DEVICE			
T_{OPR}	Operating Temperature	-40 to +85	$^\circ\text{C}$
T_{STG}	Storage Temperature	-40 to +85	$^\circ\text{C}$
T_{SOL-I}	Soldering Temperature (Iron) ⁽⁶⁾⁽⁷⁾⁽⁸⁾⁽⁹⁾	240 for 5 sec	$^\circ\text{C}$
T_{SOL-F}	Soldering Temperature (Flow) ⁽⁶⁾⁽⁷⁾⁽⁹⁾	260 for 10 sec	$^\circ\text{C}$
EMITTER			
I_F	Continuous Forward Current	50	mA
V_R	Reverse Voltage	5	V
P_D	Power Dissipation ⁽⁴⁾	100	mW
SENSOR			
I_F	Continuous Forward Current	50	mA
I_O	Output Current	50	mA
V_{CC}	Supply Voltage	4.0 to 16	V
V_O	Output Voltage	30	V
P_D	Power Dissipation ⁽⁵⁾	150	mW

Notes:

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

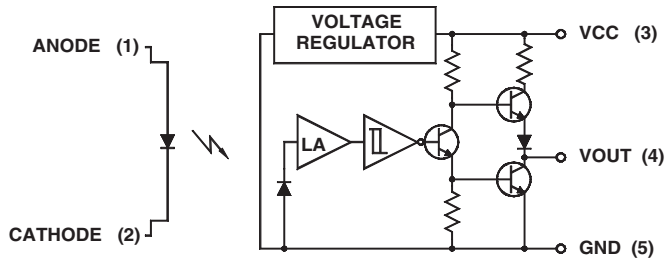
Electrical/Optical Characteristics ($T_A = 25^\circ\text{C}$)

Symbol	Part Number	Test Conditions	Min.	Typ.	Max	Units
V_{CC}	Operating Supply Voltage	V_{CC}	4.5		16	V
INPUT DIODE						
V_F	Forward Voltage	$I_F = 20\text{mA}$			1.7	V
I_R	Reverse Leakage Current	$V_R = 5\text{V}$			10	μA
COUPLED						
I_{CC}	Operating Supply Current	$I_F = 15\text{mA}$ or 0 mA , $V_{CC} = 16\text{V}$			5	mA
V_{OL}	Low Level Output Voltage H22LTB, H22LOB	$I_F = 0\text{mA}$, $V_{CC} = 5\text{V}$, $I_{OL} = 16\text{mA}$			0.4	V
	Low Level Output Voltage H22LTI, H22LOI	$I_F = 15\text{mA}$, $V_{CC} = 5\text{V}$, $I_{OL} = 16\text{mA}$			0.4	
V_{OH}	High Level Output Voltage H22LTB	$I_F = 15\text{mA}$, $V_{CC} = 5\text{V}$, $I_{OH} = -1\text{mA}$	2.4			V
	High Level Output Voltage H22LTI	$I_F = 0\text{mA}$, $V_{CC} = 5\text{V}$, $I_{OH} = -1\text{mA}$	2.4			
I_{OH}	High Level Output Current H22LOB	$I_F = 15\text{mA}$, $V_{CC} = 5\text{V}$, $V_{OH} = 30\text{V}$			100	μA
	High Level Output Current H22LOI	$I_F = 0\text{mA}$, $V_{CC} = 5\text{V}$, $V_{OH} = 30\text{V}$	—		100	
$I_F(+)$	Turn on Threshold Current	$V_{CC} = 5\text{V}$	—		15	mA
$I_F(-)$	Turn off Threshold Current	$V_{CC} = 5\text{V}$	0.50			mA
$I_F(+)/I_F(-)$	Hysteresis Ratio			1.3		
t_{PLH} , t_{PHL}	Propagation Delay, H22LOI, H22LOB	$V_{CC} = 5\text{V}$, $R_L = 300\Omega$		6		μs
	Propagation Delay, H22LTI, H22LTB	$V_{CC} = 5\text{V}$, $R_L = 10\text{ TTL Loads}$		6		
t_r , t_f	Output Rise and Fall Time, H22LOI, H22LOB	$V_{CC} = 5\text{V}$, $R_L = 300\Omega$		100		ns
	Output Rise and Fall Time, H22LTI, H22LTB	$V_{CC} = 5\text{V}$, $R_L = 10\text{ TTL Loads}$		70		

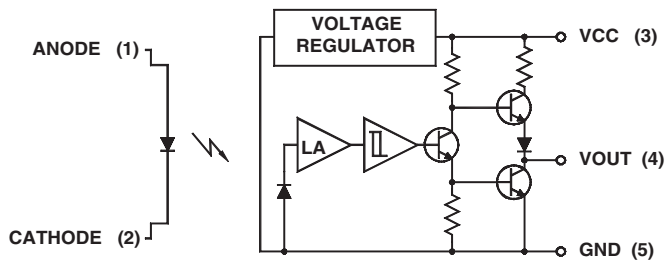
Input/Output Table

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

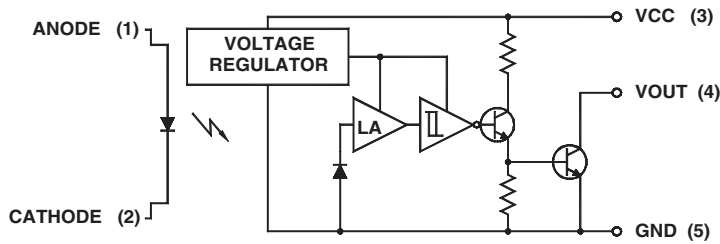
Circuit Schematics



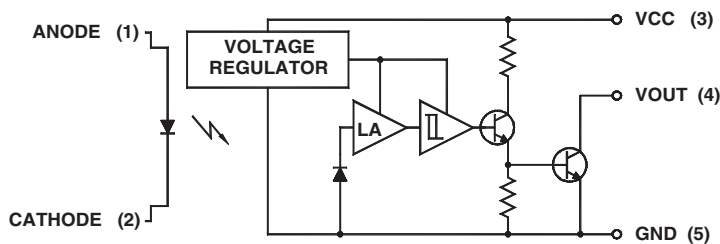
H22LTB
Totem-Pole Output Buffer



H22LTI
Totem-Pole Output Inverter



H22LOB
Open-Collector Output Buffer



H22LOI
Open-Collector Output Inverter

Typical Performance Characteristics

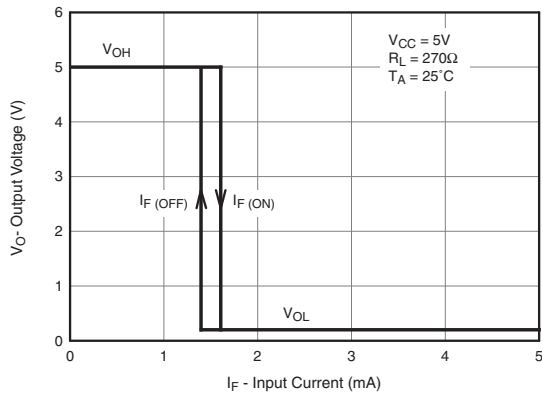


Figure 1. Output Voltage vs. Input Current (Inverters)

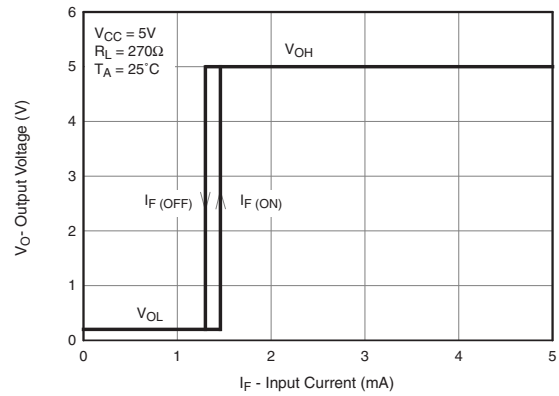


Figure 2. Output Voltage vs. Input Current (Buffers)

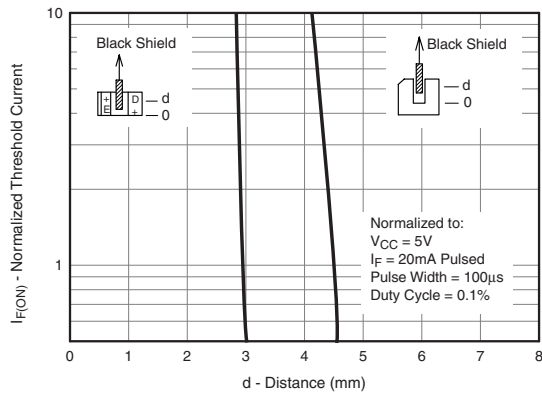


Figure 3. Normalized Threshold Current vs. Shield Distance

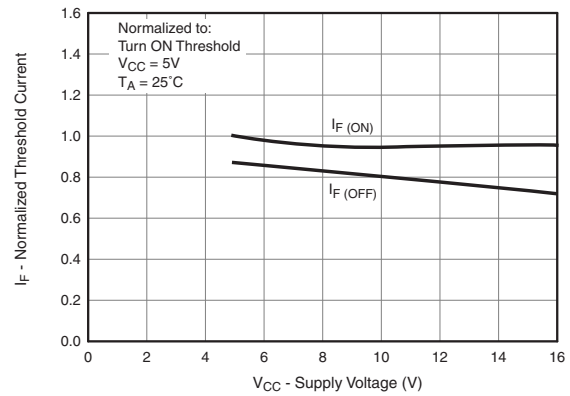


Figure 3. Normalized Threshold Current vs. Supply Voltage

Typical Performance Characteristics (Continued)

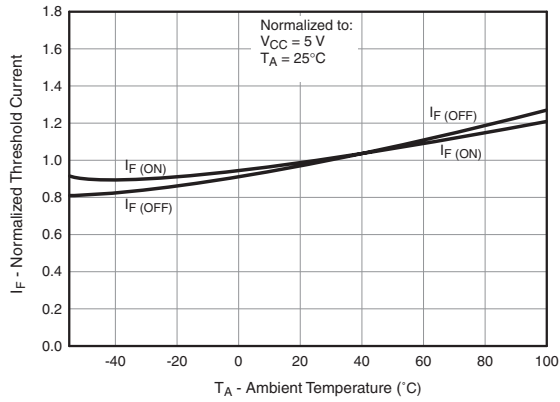


Figure 5. Normalized Threshold Current vs. Ambient Temperature

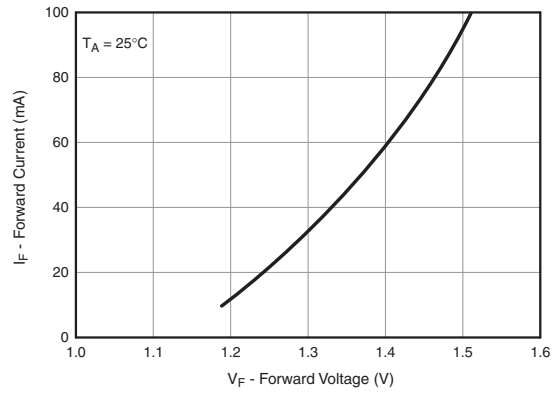


Figure 6. Forward Current vs. Forward Voltage

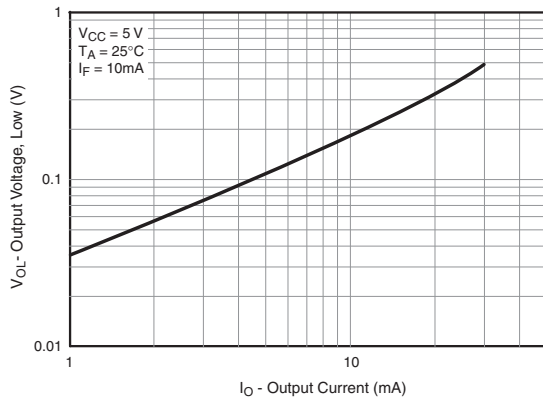


Figure 7. Low Output Voltage vs. Output Current

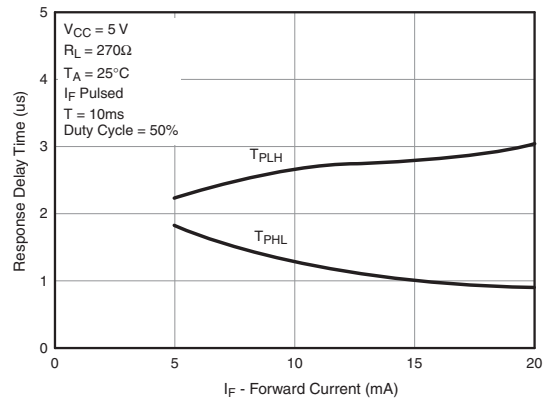
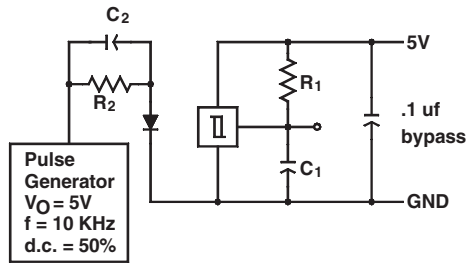


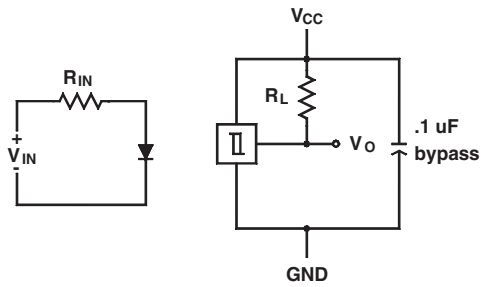
Figure 8. Response Time vs. Forward Current

Switching Speed Test Circuit

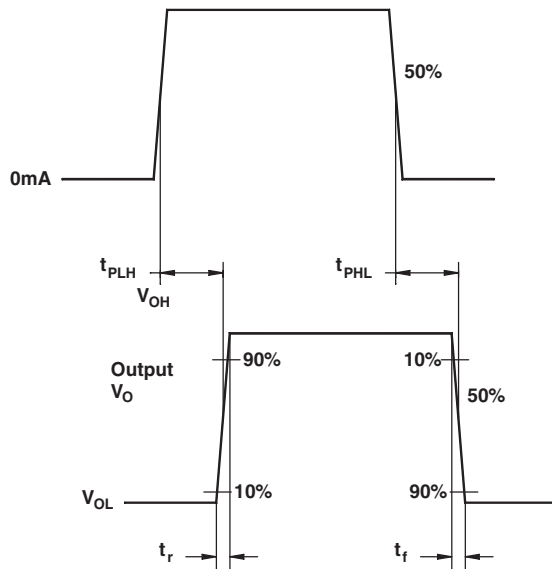


$R_1 = 300\Omega$ $C_1 = 15\text{pF}$ C_1 and C_2 include probe and
 $R_2 = 360\Omega$ $C_2 = 20\text{pF}$ stray wire capacitance

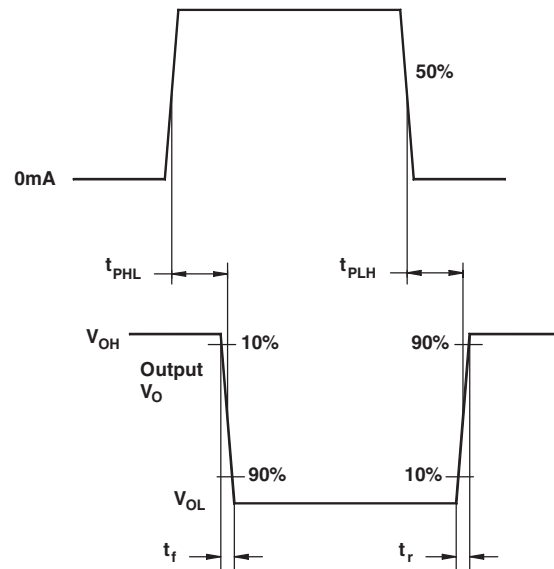
Typical Operating Circuit



Switching Test Curve for Buffers



Switching Test Curve for Inverters



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