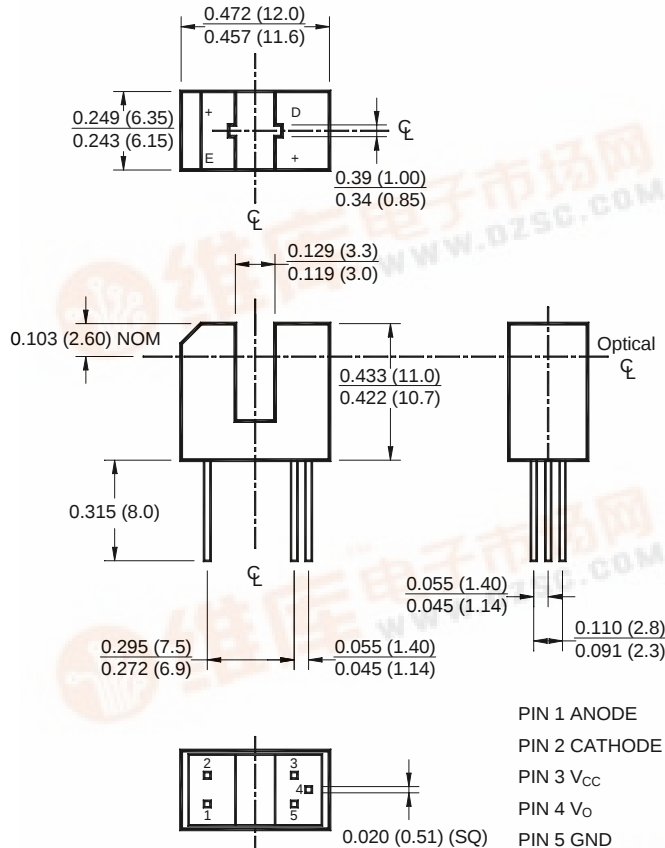


FAIRCHILD
SEMICONDUCTOR™

H22L SERIES

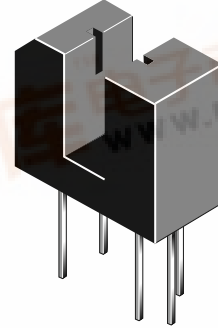
OPTOLOGIC® OPTICAL INTERRUPTER SWITCH

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.



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

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.

ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ 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
EMITTER			
Continuous Forward Current	I_F	50	mA
Reverse Voltage	V_R	5	V
Power Dissipation ⁽¹⁾	P_D	100	mW
SENSOR			
Output Current	I_O	50	mA
Supply Voltage	V_{CC}	4.0 to 16	V
Output Voltage	V_O	30	V
Power Dissipation ⁽¹⁾	P_D	150	mW

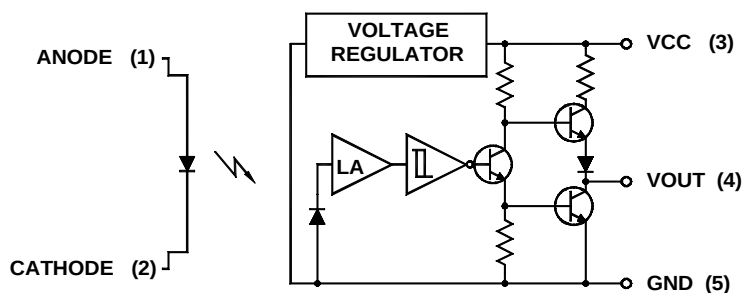
H22L SERIES

OPTOLOGIC® OPTICAL INTERRUPTER SWITCH

ELECTRICAL / OPTICAL CHARACTERISTICS (T _A = 25°C)						
PARAMETER	TEST CONDITIONS	SYMBOL	MIN.	TYP.	MAX.	UNITS
Operating Supply Voltage	V _{CC}	V _{CC}	4.5		16	V
INPUT DIODE						
Forward Voltage	I _F = 20 mA	V _F	—		1.7	V
Reverse Leakage Current	V _R = 5 V	I _R	—		10	μA
COUPLED						
Operating Supply Current	I _F = 15 mA or 0 mA, V _{CC} = 16 V	I _{CC}	—		5	mA
Low Level Output Voltage H22LTB, H22LOB	I _F = 0 mA, V _{CC} = 5 V, R _L = 100 Ω	V _{OL}	—		0.4	V
Low Level Output Voltage H22LTI, H22LOI	I _F = 15 mA, V _{CC} = 5 V, R _L = 360 Ω	V _{OL}	—		0.4	V
High Level Output Voltage H22LTB	I _F = 15 mA, V _{CC} = 5 V, I _{OH} = -800 μA	V _{OH}	2.4		—	V
High Level Output Voltage H22LTI	I _F = 0 mA, V _{CC} = 5 V, I _{OH} = -800 μA	V _{OH}	2.4		—	V
High Level Output Current H22LOB	I _F = 0 mA, V _{CC} = 5 V, I _{OH} = -800 μA	I _{OH}			100	μA
High Level Output Current H22LOI	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 (-)		1.3		
Propagation Delay	V _{CC} = 5 V, R _L = 360 Ω	t _{PLH} , t _{PHL}		5		μs
Output Rise and Fall Time	V _{CC} = 5 V, R _L = 360 Ω	t _r , t _f		70		ns

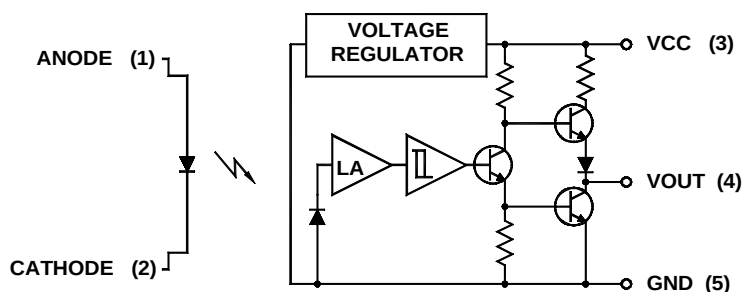
INPUT/OUTPUT TABLE		
Part Number	LED	Output
H22LTB	On	High
H22LTB	Off	Low
H22LTI	On	Low
H22LTI	Off	High
H22LOB	On	High
H22LOB	Off	Low
H22LOI	On	Low
H22LOI	Off	High

CIRCUIT SCHEMATICS



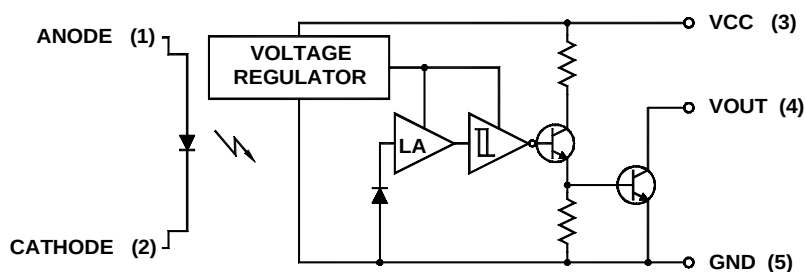
H22LTB

Totem-Pole Output Buffer



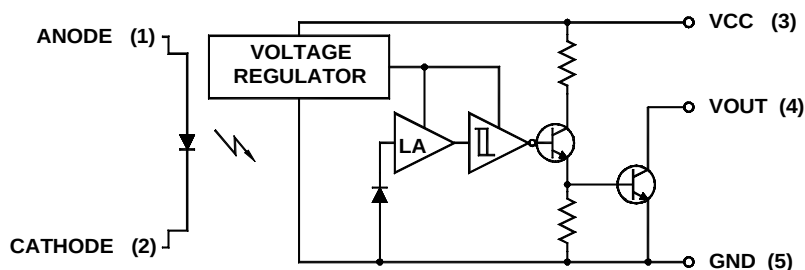
H22LTI

Totem-Pole Output inverter



H22LOB

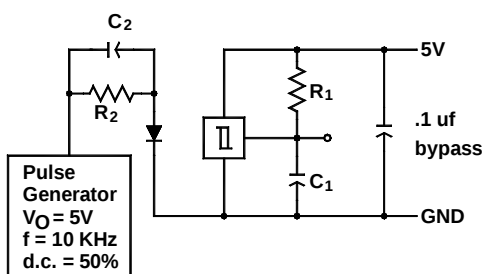
Open-Collector Output Buffer



H22LOI

Open-Collector Output Inverter

Switching Speed Test Circuit

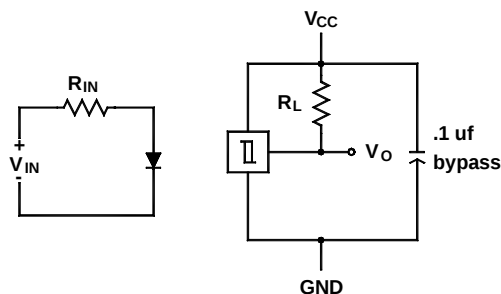


$R_1 = 180\ \Omega$
 $R_2 = 360\ \Omega$

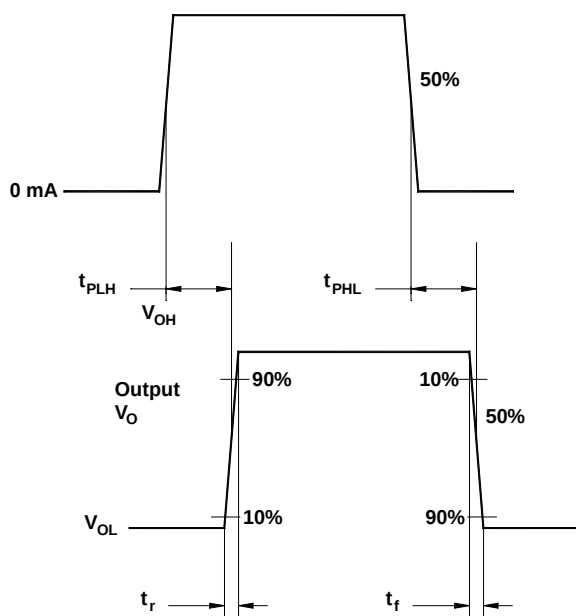
$C_1 = 15\text{ pf}$
 $C_2 = 20\text{ pf}$

C_1 and C_2 include probe and
stray wire capacitance

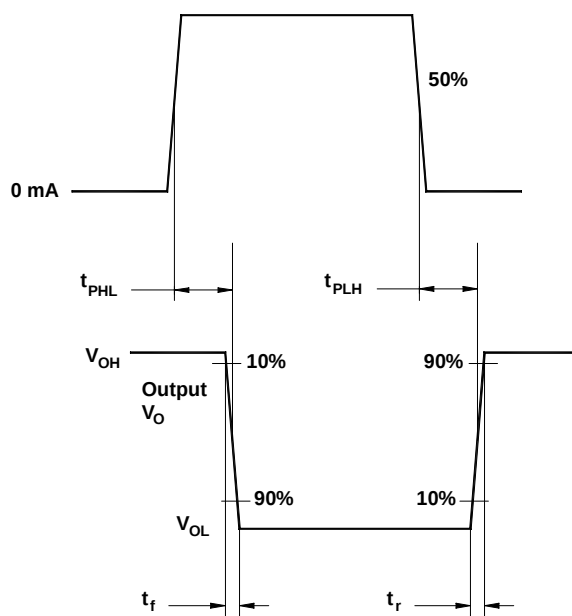
Typical Operating Circuit



Switching Test Curve for Buffers



Switching Test Curve for Inverters





H22L SERIES

OPTOLOGIC® OPTICAL INTERRUPTER SWITCH

DISCLAIMER

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1. Life support devices or systems are devices or systems which, (a) are intended for surgical implant into the body, or (b) support or sustain life, and (c) whose failure to perform when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in a significant injury of the user.
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.