FAIRCHILD SEMICONDUCTOR®

November 2004

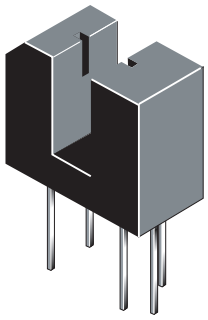
H22L Series
OPTOLOGIC® OPTICAL INTERRUPTER SWITCH

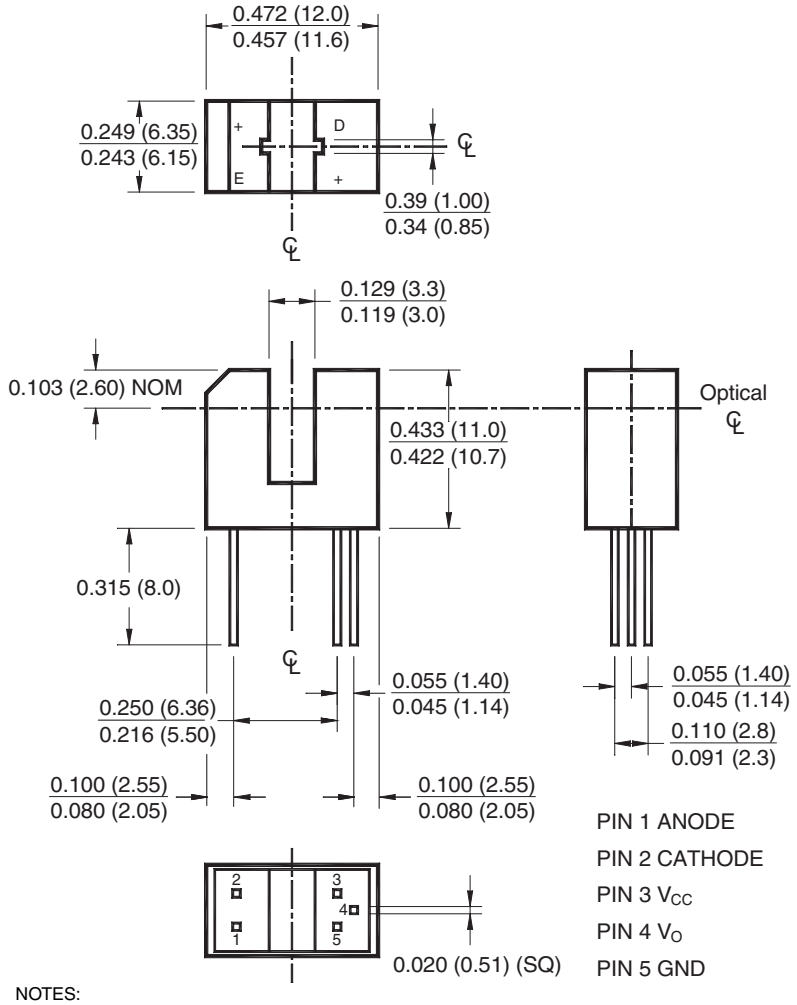
Features

- 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





PIN 1 ANODE
PIN 2 CATHODE
PIN 3 V_{CC}
PIN 4 V_O
PIN 5 GND

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.

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ABSOLUTE MAXIMUM RATINGS (T_A = 25°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			
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[1]	P_D	150	mW

ELECTRICAL / OPTICAL CHARACTERISTICS (T_A =25°C)

Part Number	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

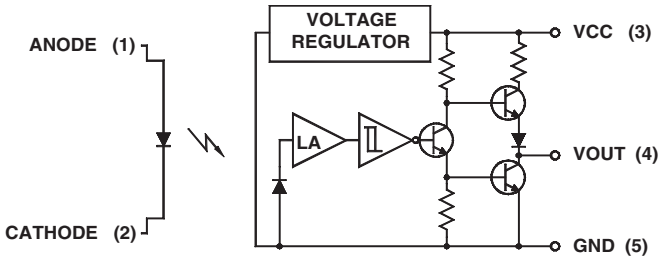
NOTES (Applies to Max Ratings and Characteristics Tables.):

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.

INPUT / OUTPUT TABLE

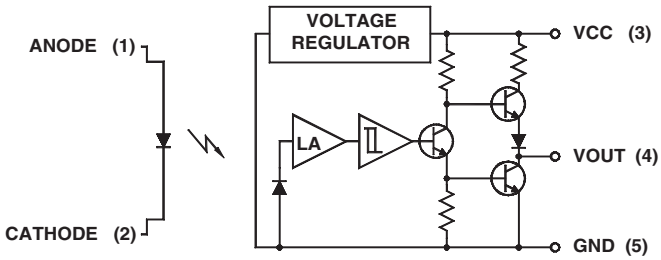
Part Number	LED	Output
H22LTB	On	High
H22LTB	Off	Low
H22LTI	On	Low
H22LTI	Off	High
H22LOB	On	High
H22LOB	Off	Low
H22LOI	On	Low
H22LOI	Off	High

Circuit Schematics



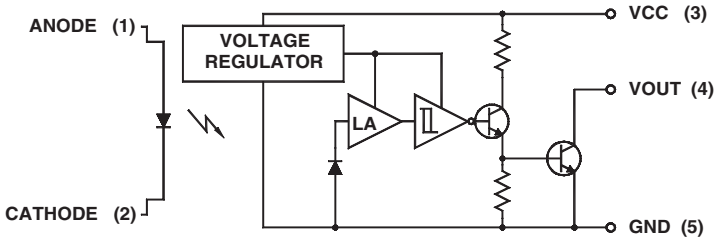
H22LTB

Totem-Pole Output Buffer



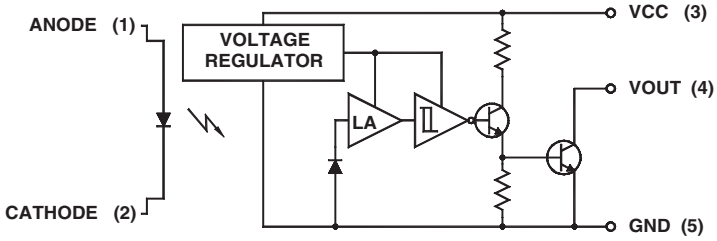
H22LTI

Totem-PoleOutput inverter



H22LOB

Open-Collector Output Buffer

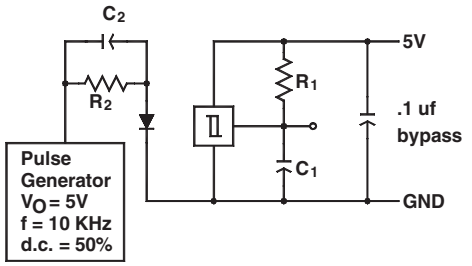


H22LOI

Open-Collector Output Inverter

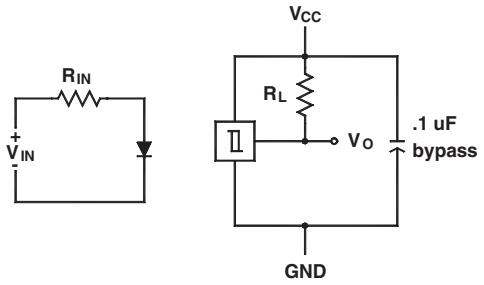
Circuit Schematics (Continued)

Switching Speed Test Circuit

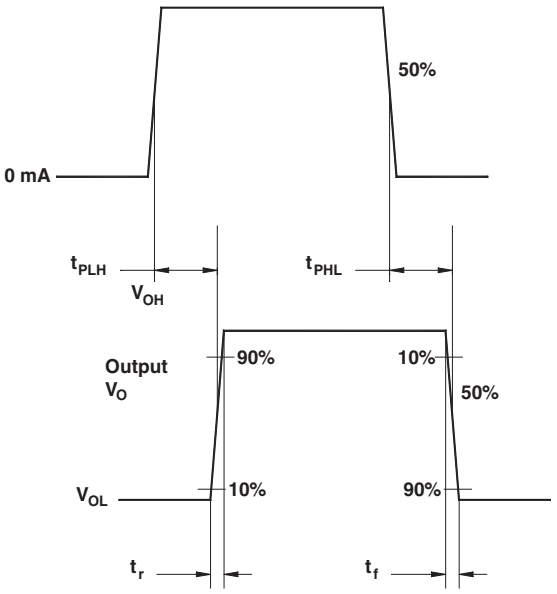


$R_1 = 180\,\Omega$ $C_1 = 15$ pf C_1 and C_2 include probe and
$R_2 = 360\,\Omega$ $C_2 = 20$ pf stray wire capacitance

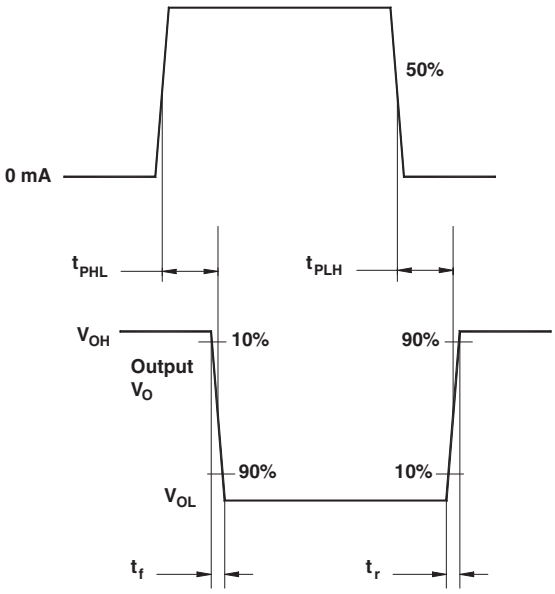
Typical Operating Circuit



Switching Test Curve for Buffers



Switching Test Curve for Inverters



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