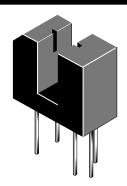


NOTES:

- 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.



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 | | | | |
|-------------------|-------------------------|---------------------------------|--|--|--|
| Γ | H22LTB | Totem-pole, buffer output | | | |
| H22LTI Totem-pole | | 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°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⁾ | PD | 100 | mW | | | | |
| SENSOR | | | | | | | |
| Output Current | Io | 50 | mA | | | | |
| Supply Voltage | Vcc | 4.0 to 16 | V | | | | |
| Output Voltage | Vo | 30 | V | | | | |
| Power Dissipation ⁽¹⁾ | P _D | 150 | mW | | | | |

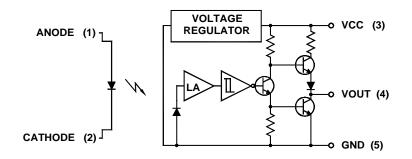


| ELECTRICAL / OPTICAL CHARACTERISTICS (TA =25°C) | | | | | | |
|---|---|---|------|------|------|---------|
| PARAMETER | TEST CONDITIONS | SYMBOL | MIN. | TYP. | MAX. | UNITS |
| Operating Supply Voltage | V_{CC} | V_{CC} | 4.5 | | 16 | V |
| INPUT DIODE | | | | | | |
| Forward Voltage | $I_F = 20 \text{ mA}$ | V_{F} | _ | | 1.7 | V |
| Reverse Leakage Current | V _R = 5 V | I _R | _ | | 10 | μΑ |
| COUPLED | | | | | | |
| Operating Supply Current | $I_F = 15$ mA or 0 mA, $V_{CC} = 16$ V | I_{CC} | _ | | 5 | mA |
| Low Level Output Voltage | I_F = 0 mA, V_{CC} = 5 V, R_L = 100 Ω | V _{OL} | _ | | 0.4 | V |
| H22LTB, H22LOB | | | | | | |
| Low Level Output Voltage | $\rm I_F$ = 15 mA, $\rm V_{CC}$ = 5 V, $\rm R_L$ = 360 Ω | V _{OL} | _ | | 0.4 | V |
| H22LTI, H22LOI | | | | | | |
| High Level Output Voltage | I_F = 15 mA, V_{CC} = 5 V, I_{OH} = -800 μ A | V_{OH} | 2.4 | | _ | V |
| H22LTB | | | | | | |
| High Level Output Voltage | $I_F = 0$ mA, $V_{CC} = 5$ V, $I_{OH} = -800 \ \mu A$ | V_{OH} | 2.4 | | _ | V |
| H22LTI | | | | | | |
| High Level Output Current | $I_F = 0$ mA, $V_{CC} = 5$ V, $I_{OH} = -800 \ \mu A$ | I _{OH} | | | 100 | μ A |
| H22LOB | | | | | | |
| High Level Output Current | $I_F = 0$ mA, $V_{CC} = 5$ V, $V_{OH} = 30$ V | I _{OH} | _ | | 100 | μ A |
| H22LOI | | | | | | |
| 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 | | | | | |

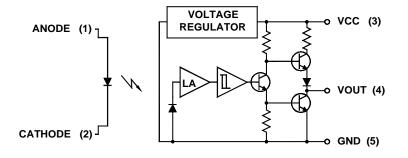


CIRCUIT SCHEMATICS



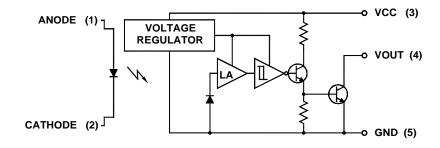
H22LTB

Totem-Pole Output Buffer



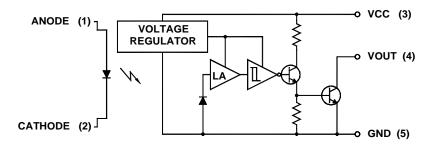
H22LTI

Totem-PoleOutput inverter



H22LOB

Open-Collector Output Buffer

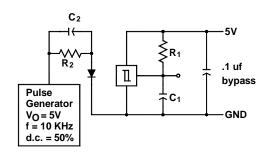


H22LOI

Open-Collector Output Inverter

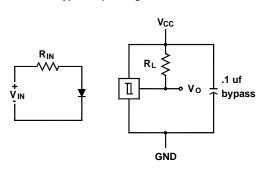


Switching Speed Test Circuit

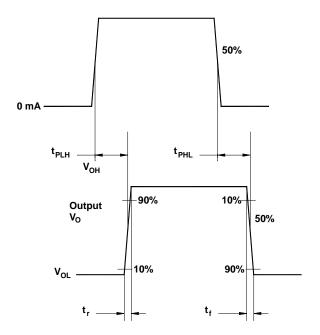


 $R_1 = 180 \Omega$ $R_2 = 360 \Omega$ $C_1 = 15 \text{ pf}$ $C_2 = 20 \text{ pf}$ C₁and C₂include probe and stray wire capacitance

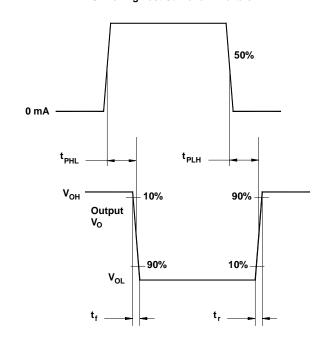
Typical Operating Circuit



Switching Test Curve for Buffers



Switching Test Curve for Inverters





DISCLAIMER

FAIRCHILD SEMICONDUCTOR RESERVES THE RIGHT TO MAKE CHANGES WITHOUT FURTHER NOTICE TO ANY PRODUCTS HEREIN TO IMPROVE RELIABILITY, FUNCTION OR DESIGN. FAIRCHILD DOES NOT ASSUME ANY LIABILITY ARISING OUT OF THE APPLICATION OR USE OF ANY PRODUCT OR CIRCUIT DESCRIBED HEREIN; NEITHER DOES IT CONVEY ANY LICENSE UNDER ITS PATENT RIGHTS, NOR THE RIGHTS OF OTHERS.

LIFE SUPPORT POLICY

FAIRCHILD'S PRODUCTS ARE NOT AUTHORIZED FOR USE AS CRITICAL COMPONENTS IN LIFE SUPPORT DEVICES OR SYSTEMS WITHOUT THE EXPRESS WRITTEN APPROVAL OF THE PRESIDENT OF FAIRCHILD SEMICONDUCTOR CORPORATION. As used herein:

- 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.

www.fairchildsemi.com

© 2000 Fairchild Semiconductor Corporation