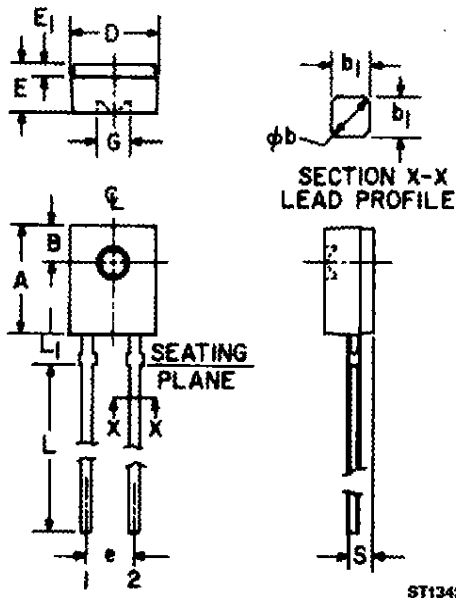
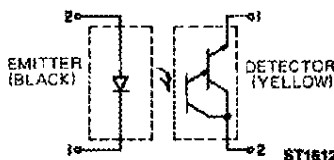


**PACKAGE DIMENSIONS**



| SYMBOL   | MILLIMETERS |      | INCHES |      | NOTES |
|----------|-------------|------|--------|------|-------|
|          | MIN.        | MAX. | MIN.   | MAX. |       |
| A        | 9.59        | 9.90 | .220   | .228 |       |
| B        | 1.78        | NOM. | .070   | NOM. | 2     |
| $\phi b$ | .60         | .75  | .024   | .030 | 1     |
| $b_1$    | .51         | NOM. | .020   | NOM. | 1     |
| D        | 4.45        | 4.70 | .175   | .185 |       |
| E        | 2.41        | 2.67 | .095   | .105 |       |
| E'       | .58         | .69  | .023   | .027 |       |
| e        | 2.41        | 2.67 | .095   | .105 | 3     |
| G        | 1.98        | NOM. | .078   | NOM. |       |
| L        | 12.7        | —    | .500   | —    |       |
| L'       | 1.40        | 1.65 | .055   | .065 |       |
| S        | .83         | .94  | .033   | .037 | 3     |

**PACKAGE OUTLINE**



**NOTES**

1. TWO LEADS. LEAD CROSS SECTION DIMENSIONS UNCONTROLLED WITHIN 1.27 mm (0.50") OF SEATING PLANE.
2. CENTERLINE OF ACTIVE ELEMENT LOCATED WITHIN .25 mm (.010") OF TRUE POSITION.
3. AS MEASURED AT THE SEATING PLANE.
4. INCH DIMENSIONS DERIVED FROM MILLIMETERS.

**DESCRIPTION**

The H23B1 is a matched emitter-detector pair which consists of a gallium arsenide infrared emitting diode and a silicon photodarlington. The clear epoxy packaging system is designed to optimize the mechanical resolution, coupling efficiency, cost, and reliability. The devices are marked with a color dot for easy identification of the emitter and detector.

**FEATURES**

- Good optical to mechanical alignment
- Color dot for easy recognition of LED and phototransistor
- Low cost



## PLASTIC SIDELOOKER PAIR

| ABSOLUTE MAXIMUM RATINGS (T <sub>a</sub> = 25°C Unless Otherwise Specified) |                                      |
|-----------------------------------------------------------------------------|--------------------------------------|
| Storage Temperature .....                                                   | -55°C to +100°C                      |
| Operating Temperature .....                                                 | -55°C to +100°C                      |
| Soldering:                                                                  |                                      |
| Lead Temperature (Iron) .....                                               | 240°C for 5 sec. <sup>(A),(B)</sup>  |
| Lead Temperature (Flow) .....                                               | 260°C for 10 sec. <sup>(A),(B)</sup> |
| <b>INPUT DIODE</b>                                                          |                                      |
| Continuous Forward Current .....                                            | 60 mA                                |
| Reverse Voltage .....                                                       | 6.0 Volts                            |
| Power Dissipation .....                                                     | 100mW <sup>(1)</sup>                 |
| <b>OUTPUT DARLINGTON</b>                                                    |                                      |
| Collector-Emitter Voltage .....                                             | 30 Volts                             |
| Emitter-Collector Voltage .....                                             | 7 Volts                              |
| Power Dissipation .....                                                     | 150 mW <sup>(2)</sup>                |

| ELECTRICAL CHARACTERISTICS (T <sub>a</sub> = 25°C Unless Otherwise Specified) |                      |      |      |      |       |                                                                                      |
|-------------------------------------------------------------------------------|----------------------|------|------|------|-------|--------------------------------------------------------------------------------------|
| PARAMETER                                                                     | SYMBOL               | MIN. | TYP. | MAX. | UNITS | TEST CONDITIONS                                                                      |
| <b>INPUT DIODE</b>                                                            |                      |      |      |      |       |                                                                                      |
| Forward Voltage                                                               | V <sub>f</sub>       | —    | —    | 1.7  | V     | I <sub>c</sub> = 60 mA                                                               |
| Reverse Leakage Current                                                       | I <sub>r</sub>       | —    | —    | 1.0  | μA    | V <sub>R</sub> = 3V                                                                  |
| Reverse Breakdown Voltage                                                     | V <sub>R</sub>       | 6.0  | —    | —    | V     | I <sub>r</sub> = 10μA                                                                |
| <b>OUTPUT DARLINGTON</b>                                                      |                      |      |      |      |       |                                                                                      |
| Emitter-Collector Breakdown                                                   | BV <sub>ECO</sub>    | 7.0  | —    | —    | V     | I <sub>c</sub> = 100μA, Ee=0                                                         |
| Collector-Emitter Breakdown                                                   | BV <sub>CEO</sub>    | 30   | —    | —    | V     | I <sub>c</sub> = 1 mA, Ee=0                                                          |
| Collector-Emitter Leakage                                                     | I <sub>CEP</sub>     | —    | —    | 100  | nA    | V <sub>CE</sub> = 25 V, Ee=0                                                         |
| <b>COUPLED</b>                                                                |                      |      |      |      |       |                                                                                      |
| On-State Collector Current                                                    | I <sub>COV</sub>     | 7.5  | —    | —    | mA    | I <sub>f</sub> = 10 mA, V <sub>CE</sub> = 1.5 V <sup>(6)</sup>                       |
| Saturation Voltage                                                            | V <sub>CE(SAT)</sub> | —    | —    | 1.0  | V     | I <sub>f</sub> = 10 mA, I <sub>c</sub> = 1.8 mA <sup>(6)</sup>                       |
| Turn-On Time                                                                  | t <sub>on</sub>      | —    | 8    | —    | μS    | I <sub>c</sub> = 30 mA, V <sub>CE</sub> = 5 V, R <sub>L</sub> = 2.5KΩ <sup>(6)</sup> |
| Turn-Off Time                                                                 | t <sub>off</sub>     | —    | 50   | —    | μS    | I <sub>f</sub> = 30 mA, V <sub>CE</sub> = 5 V, R <sub>L</sub> = 2.5KΩ <sup>(6)</sup> |

| NOTES                                                                                                                                                                              |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. Derate power dissipation linearly 1.33mW/°C above 25°C.                                                                                                                         |
| 2. Derate power dissipation linearly 2.00mW/°C above 25°C.                                                                                                                         |
| 3. RMA flux is recommended.                                                                                                                                                        |
| 4. Methanol or Isopropyl alcohols are recommended as cleaning agents.                                                                                                              |
| 5. Soldering iron tip 1/16" (1.6 mm) minimum from housing.                                                                                                                         |
| 6. Coupled characteristics are measured at a separation distance of .155" (4 mm) with the lenses of the emitter and detector on a common axis within 0.1mm and parallel within 5°. |

**TYPICAL CHARACTERISTICS**

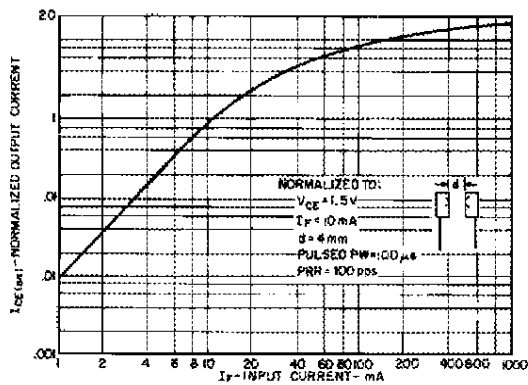


Fig. 1. Output Current vs. Input Current

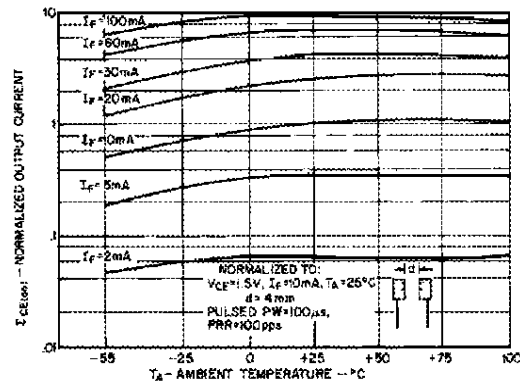


Fig. 2. Output Current vs. Temperature

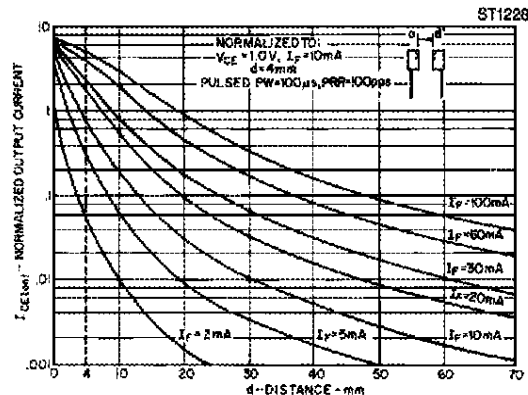


Fig. 3. Output Current vs. Distance

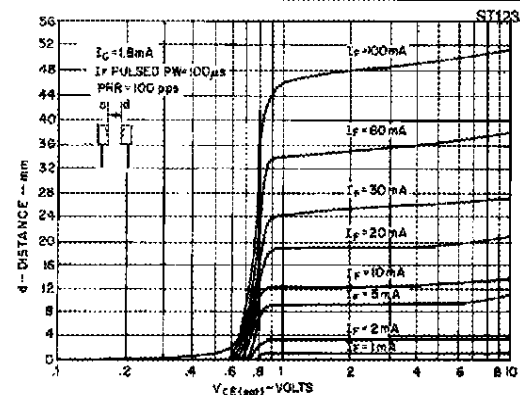


Fig. 4.  $V_{CE(OUT)}$  vs. Distance

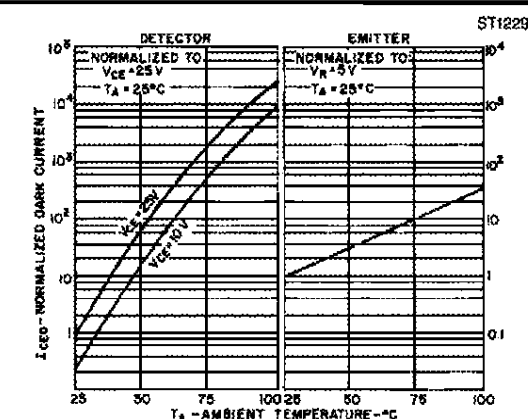


Fig. 5. Leakage Currents vs. Temperature

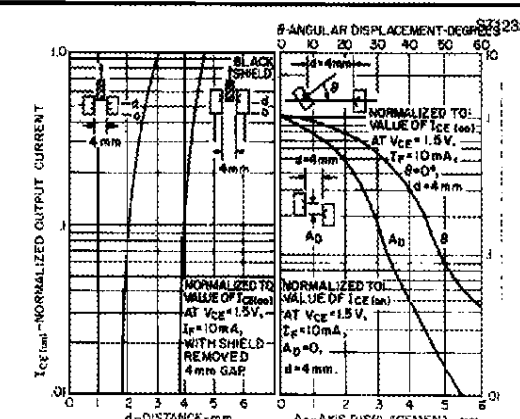


Fig 6A. Output Current vs. Shield Distance

Fig 6B. Output Current vs. Displacement (Angular & Axis)