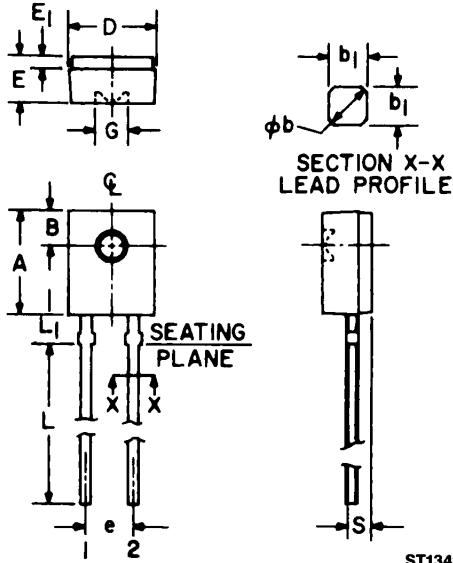


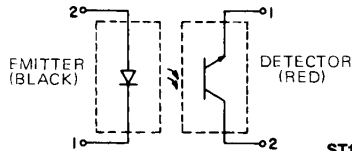
PACKAGE DIMENSIONS



ST1342

SYMBOL	MILLIMETERS		INCHES		NOTES
	MIN.	MAX.	MIN.	MAX.	
A	5.59	5.80	.220	.228	
B	1.78	NOM.	.070	NOM.	2
@b	.60	.75	.024	.030	1
b.	.51	NOM.	.020	NOM.	1
D	4.45	4.70	.175	.185	
E	2.41	2.67	.095	.105	
E1	.58	.69	.023	.027	
e	2.41	2.67	.095	.105	3
G	1.98	NOM.	.078	NOM.	
L	12.7	—	.500	—	
L1	1.40	1.65	.055	.065	
S	.83	.94	.033	.037	3

PACKAGE OUTLINE



ST1611

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 H23A is a matched emitter-detector pair which consists of a gallium arsenide infrared emitting diode and a silicon phototransistor. 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

ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ Unless Otherwise Specified)	
Storage Temperature	-55°C to $+100^\circ\text{C}$
Operating Temperature	-55°C to $+100^\circ\text{C}$
Soldering:	
Lead Temperature (Iron)	240°C for 5 sec. ^(3,4,5)
Lead Temperature (Flow)	260°C for 10 sec. ^(3,4,5)
INPUT DIODE	
Continuous Forward Current	60 mA
Forward Current (pw, $1\mu\text{S}$; 33 Hz)	3 A
Reverse Voltage	6.0 Volts
Power Dissipation	100mW ⁽¹⁾
OUTPUT TRANSISTOR	
Collector-Emitter Voltage	30 Volts
Emitter-Collector Voltage	6 Volts
Power Dissipation	150 mW ⁽²⁾

ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ Unless Otherwise Specified)						
PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNITS	TEST CONDITIONS
INPUT DIODE						
Forward Voltage	V_F	—		1.7	V	$I_F = 60\text{ mA}$
Reverse Leakage Current	I_R	—		10	μA	$V_R = 6\text{V}$
Reverse Breakdown Voltage	BV_R	6.0		—	V	$I_R = 10\mu\text{A}$
OUTPUT TRANSISTOR						
Emitter-Collector Breakdown	BV_{ECO}	6.0		—	V	$I_E = 100\mu\text{A}$
Collector-Emitter Breakdown	BV_{CEO}	30		—	V	$I_C = 10\text{ mA}$
Collector-Emitter Leakage	I_{CEO}	—		100	nA	$V_{CE} = 10\text{ V}$
COUPLED						
On-State Collector Current	$I_{C(ON)}$		See page 3.			
Saturation Voltage	$V_{CE(SAT)}$		See page 3.			
Turn-On Time	t_{on}		150		μS	$I_F = 30\text{ mA}$, $V_{CC} = 5\text{V}$ $R_L = 2.5\text{K}\Omega$
Turn-Off Time	t_{off}		150		μS	$I_F = 30\text{ mA}$, $V_{CC} = 5\text{V}$ $R_L = 2.5\text{K}\Omega$

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°.



PLASTIC SIDELOOKER PAIR

H23A1/2

$I_{C(ON)}$ and $V_{CE(SAT)}$ TABLE						
PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNITS	TEST CONDITIONS
ON-STATE COLLECTOR CURRENT						
H23A1	$I_{C(ON)}$	1.5	—	—	mA	$I_F = 30\text{mA}, V_{CE} = 5\text{V}^{(6)}$
H23A2	$I_{C(ON)}$	0.5	—	—	mA	$I_F = 30\text{mA}, V_{CE} = 5\text{V}^{(6)}$
SATURATION VOLTAGE						
H23A1	$V_{CE(SAT)}$	—	—	0.40	V	$I_F = 30\text{mA}, I_C = 1.0\text{mA}^{(6)}$
H23A2	$V_{CE(SAT)}$	—	—	0.40	V	$I_F = 30\text{mA}, I_C = .4\text{mA}^{(6)}$

TYPICAL CHARACTERISTICS

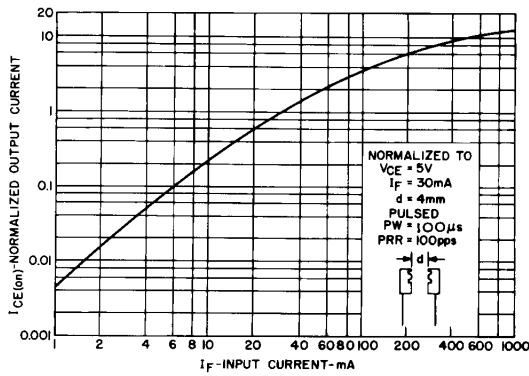


Fig. 1. Output Current vs. Input Current

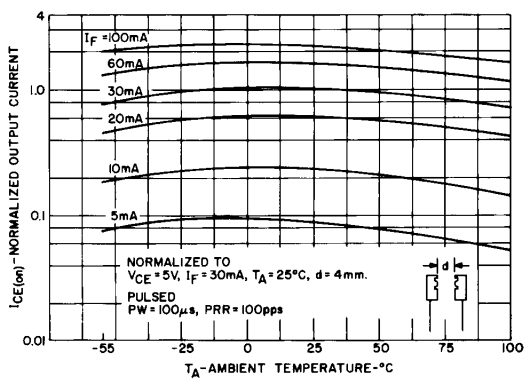


Fig. 2. Output Current vs. Temperature

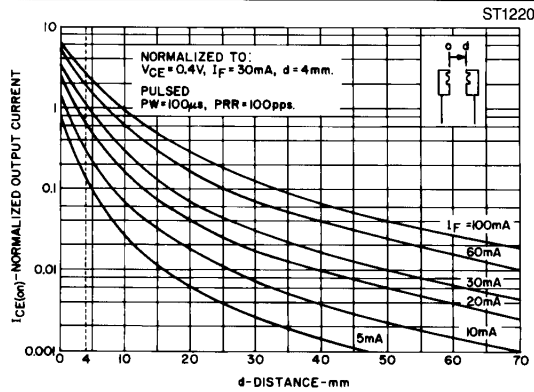


Fig. 3. Output Current vs. Distance

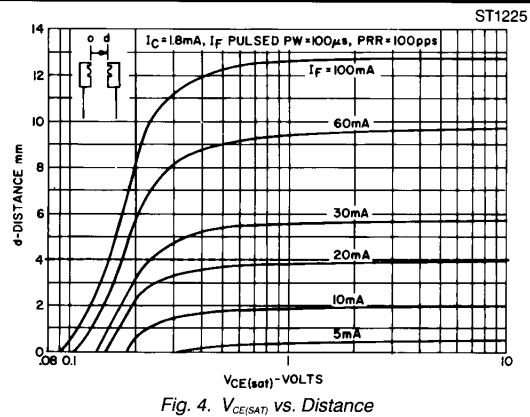


Fig. 4. $V_{CE(SAT)}$ vs. Distance

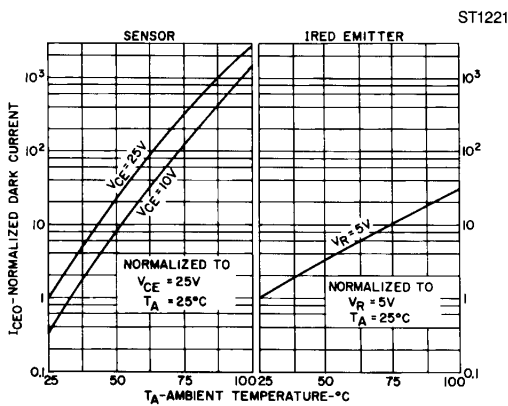


Fig. 5. Leakage Currents vs. Temperature

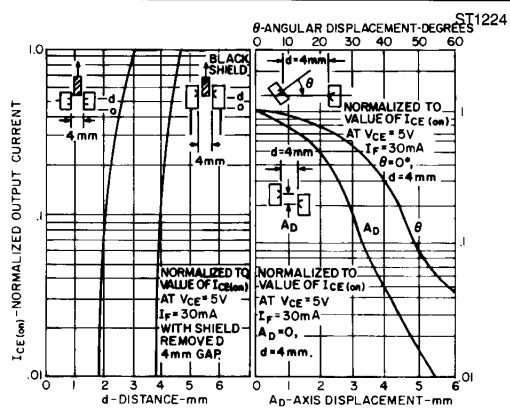


Fig 6A. Output Current vs. Shield Distance

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

ST1222

ST1223



PLASTIC SIDELOOKER PAIR

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:

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.