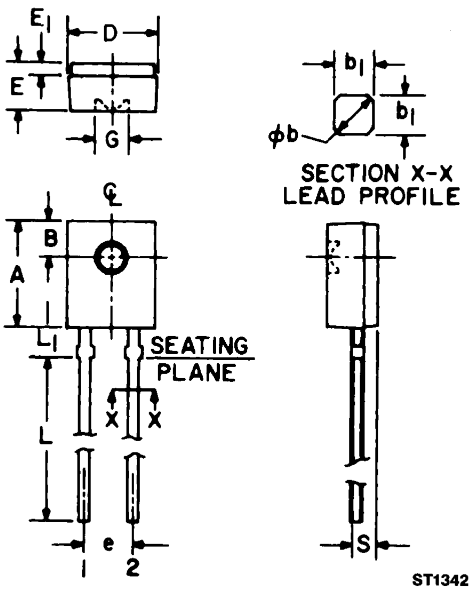
FAIRCHILD SEMICONDUCTOR™

PLASTIC SIDELOOKER PAIR

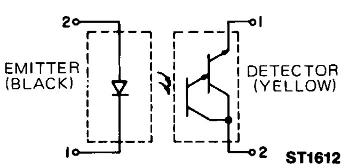
H23B1

PACKAGE DIMENSIONS



SYMBOL	MILLIMETERS		INCHES		NOTES
	MIN.	MAX.	MIN.	MAX.	
A	5.59	5.80	.220	.228	
B	1.78	NOM.	.070	NOM.	2
ϕb	.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_1	.58	.69	.023	.027	
e	2.41	2.67	.095	.105	3
G	1.98	NOM.	.078	NOM.	
L	12.7	—	.500	—	
L_1	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

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ABSOLUTE MAXIMUM RATINGS (T_A = 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.[3,4,5]
Lead Temperature (Flow) .... 260°C for 10 sec.[3,4]

INPUT DIODE

Continuous Forward Current .... 60 mA
Reverse Voltage .... 6.0 Volts
Power Dissipation .... 100mW[1]

OUTPUT DARLINGTON

Collector-Emitter Voltage .... 30 Volts
Emitter-Collector Voltage .... 7 Volts
Power Dissipation .... 150 mW[2]

ELECTRICAL CHARACTERISTICS (T_A = 25°C Unless Otherwise Specified)

PARAMETER	SYMBOL	MIN.	TYP.	MAX.	UNITS	TEST CONDITIONS
INPUT DIODE						
Forward Voltage	V_F	—		1.7	V	I_F = 60 mA
Reverse Leakage Current	I_R	—		1.0	μA	V_R = 3V
Reverse Breakdown Voltage	V_R	6.0		—	V	I_R = 10μA
OUTPUT DARLINGTON						
Emitter-Collector Breakdown	BV_{ECO}	7.0		—	V	I_E = 100μA, Ee=0
Collector-Emitter Breakdown	BV_{CEO}	30		—	V	I_C = 1 mA, Ee=0
Collector-Emitter Leakage	I_{CEO}	—		100	nA	V_{CE} = 25 V, Ee=0
COUPLED						
On-State Collector Current	$I_{C(ON)}$	7.5		—	mA	I_F = 10 mA, V_{CE} = 1.5 V [6]
Saturation Voltage	$V_{CE(SAT)}$	—		1.0	V	I_F = 10 mA, I_C = 1.8 mA [6]
Turn-On Time	t_{on}		8		μS	I_F = 30 mA, V_{CC} = 5 V, R_L=2.5KΩ[6]
Turn-Off Time	t_{off}		50		μS	I_F = 30 mA, V_{CC} = 5 V, R_L=2.5KΩ[6]

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

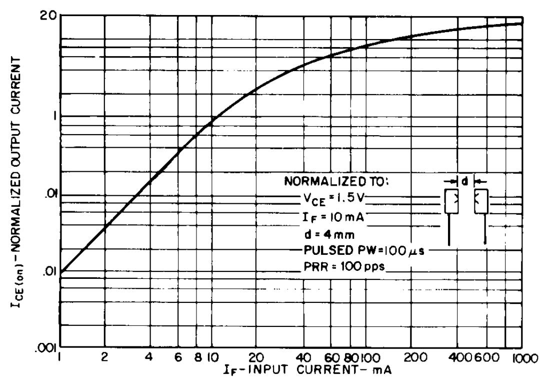


Fig. 1. Output Current vs. Input Current

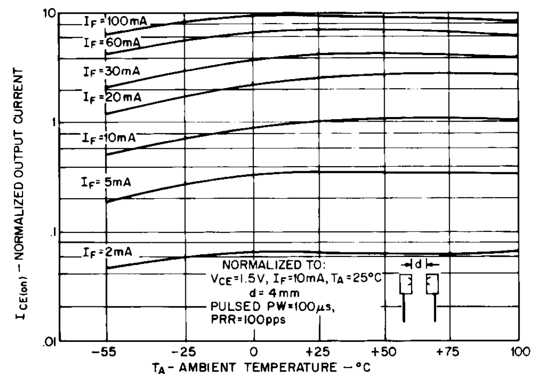


Fig. 2. Output Current vs. Temperature

ST1228

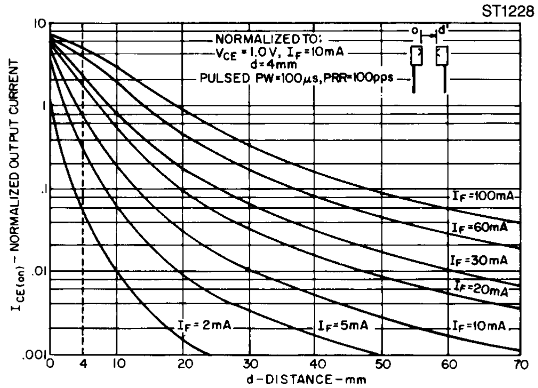


Fig. 3. Output Current vs. Distance

ST1233

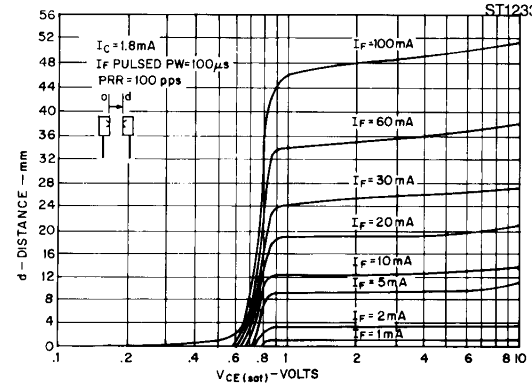


Fig. 4. $V_{CE(SAT)}$ vs. Distance

ST1229

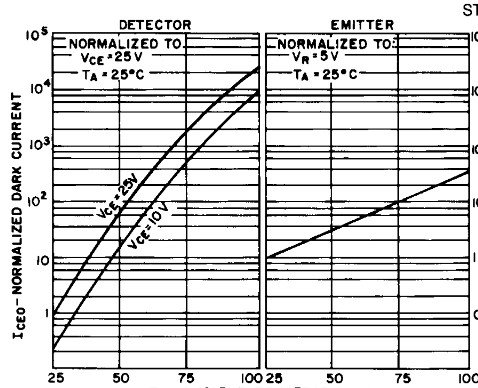


Fig. 5. Leakage Currents vs. Temperature

ST1230

ST1232

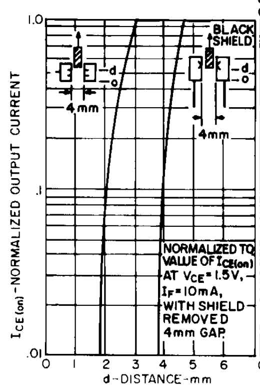
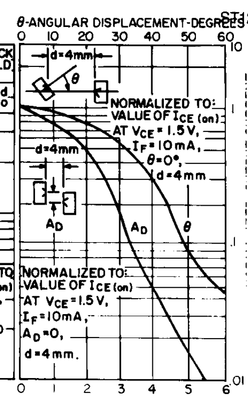


Fig 6A. Output Current vs. Shield Distance



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

ST1231

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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.