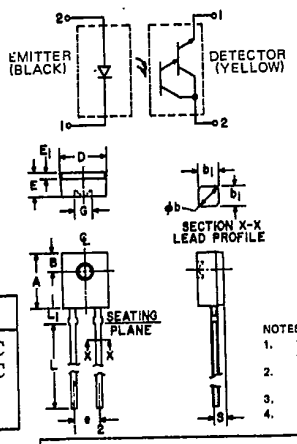
Matched Emitter-Detector Pair H23B1

The GE Solid State H23B1 is a matched emitter-detector pair which consists of a gallium arsenide, infrared emitting diode and a silicon, darlington connected, 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.



SYM	MILLIMETERS MIN	MILLIMETERS MAX	INCHES MIN	INCHES MAX	NOTES
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

NOTES:
1. Two leads. Lead cross section dimensions uncontrolled within 1.27 MM (.050") of seating plane.
2. Centerline of active element located within .26 MM (.010") of true position.
3. As measured at the seating plane
4. Inch dimensions derived from millimeters.

absolute maximum ratings: (25°C)

EMITTER – DETECTOR PAIR		
Storage Temperature	T_{STG}	-55°C to +100°C
Operating Temperature	T_J	-55°C to +100°C
Lead Soldering Temperature (5 seconds maximum)	T_L	260°C

INFRARED EMITTING DIODE			
Power Dissipation	P_E	*100	mW
Forward Current (Continuous)	I_F	60	mA
Forward Current (Peak) (Pulse Width ≤ 1μs PRR ≤ 300pps)	I_F	3	A
Reverse Voltage	V_R	6	V

*Derate 1.33 mW/°C above 25°C ambient.

DARLINGTON CONNECTED PHOTOTRANSISTOR			
Power Dissipation	P_D	**150	mW
Collector Current (Continuous)	I_C	100	mA
Collector-Emitter Voltage	V_{CEO}	30	V
Emitter-Collector Voltage	V_{ECO}	7	V

**Derate 2.0 mW/°C above 25°C ambient.

individual electrical characteristics (25°C) (See Note 1)

EMITTER	MIN.	TYP.	MAX.	UNITS
Reverse Breakdown Voltage $V_{(BR)R}$ I_R = 10μA	6	–	–	V
Forward Voltage V_F I_F = 60 mA	–	–	1.7	V
Reverse Current I_R V_R = 5V	–	–	100	nA
Capacitance C_j V = 0, f = 1 MHz	–	30	–	pF

DETECTOR	MIN	TYP.	MAX.	UNITS
Breakdown Voltage $V_{(BR)CEO}$ I_C = 1 mA	30	–	–	V
Breakdown Voltage $V_{(BR)ECO}$ I_E = 100 μA	7	–	–	V
Collector Dark Current I_{CEO} V_{CE} = 25 V	–	–	100	nA
Capacitance C_{ce} V_{CE} = 5V, f = 1 MHz	–	5	8	pF

coupled electrical characteristics (25°C) (See Note 1)

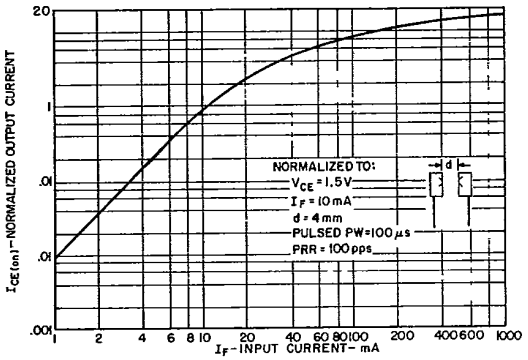
Note: Coupled electrical characteristics are measured at a separation distance of 4mm (.155 inches) with the lenses of the emitter and detector on a common axis within 0.1mm and parallel within 5°.

		MIN.	TYP.	MAX.	UNITS
$I_{CE(on)}$	I_F = 10mA, V_{CE} = 1.5V	7.5	–	–	mA
$V_{CE(sat)}$	I_F = 10mA, I_C = 1.8 mA	--	–	1.0	V
t_{on}	V_{CC} = 5V, I_F = 10mA, R_L = 750Ω	–	45	–	μs
t_{off}	V_{CC} = 5V, I_F = 10mA, R_L = 750Ω	–	250	–	μs

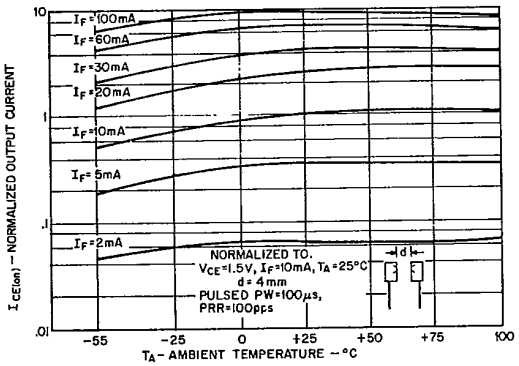
Note 1: Stray irradiation can alter values of characteristics. Adequate shielding should be provided.

T-41-71

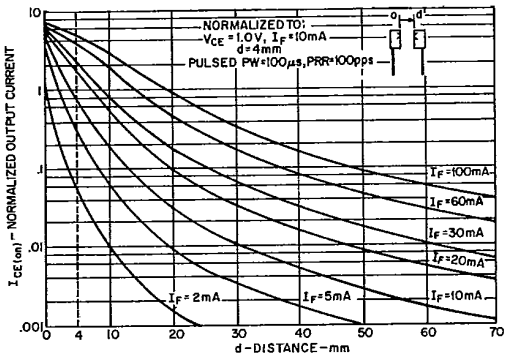
TYPICAL CHARACTERISTICS



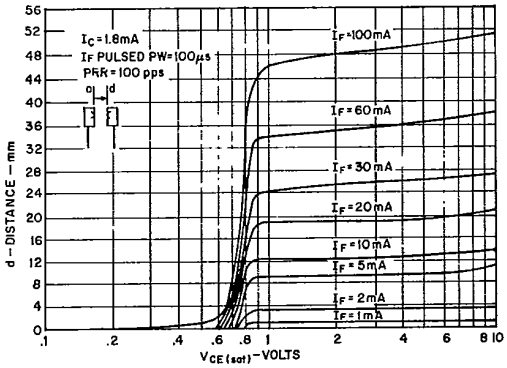
1. OUTPUT CURRENT VS. INPUT CURRENT



2. OUTPUT CURRENT VS. TEMPERATURE

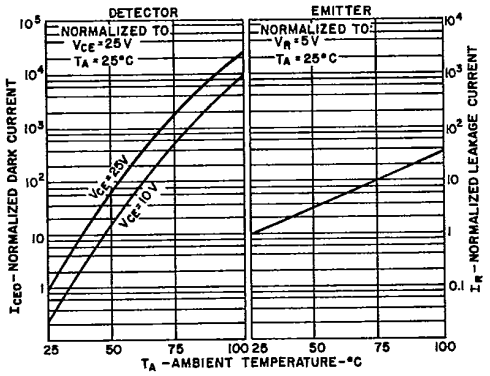


3. OUTPUT CURRENT VS. DISTANCE

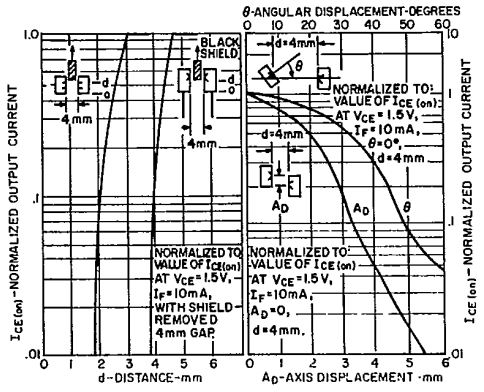


4. $V_{CE(sat)}$ VS. DISTANCE

10



5. LEAKAGE CURRENTS VS. TEMPERATURE



6A. OUTPUT CURRENT VS. SHIELD DISTANCE

6B. OUTPUT CURRENT VS. DISPLACEMENT (ANGULAR & AXIS)