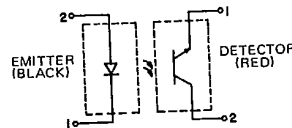


### Matched Emitter-Detector pair H23A1-H23A2

The GE Solid State H23A1 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.

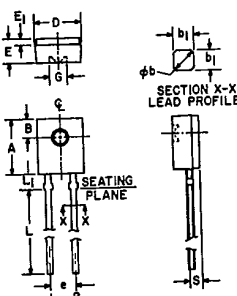


SYM	MILLI-METERS		INCHES		NOTES
	MIN	MAX	MIN	MAX	
A	5.59	5.80	.220	.228	
B	1.78	NOM.	.070	NOM.	2
∅B	.60	.75	.024	.030	1
b1	.51	NOM.	.020	NOM.	1
D	4.45	4.70	.175	.185	
E	2.41	2.67	.095	.105	
E1	.68	.69	.023	.027	
* G	2.41	2.67	.095	.105	3
G	1.98	NOM.	.078	NOM.	
L	12.7	-	.500	-	
L1	1.40	1.65	.055	.065	
S	.83	.84	.033	.037	3

absolute maximum ratings: (25°C)

EMITTER-DETECTOR PAIR		
Storage Temperature	T <sub>STG</sub>	-55°C to +100°C
Operating Temperature	T <sub>J</sub>	-55°C to +100°C
Lead Soldering Temperature	T <sub>L</sub>	260°C
(5 seconds maximum)		

INFRARED EMITTING DIODE			
Power Dissipation	P <sub>E</sub>	*100	mW
Forward Current (Continuous)	I <sub>F</sub>	60	mA
Forward Current (Peak) (Pulse Width ≤ 1μs, PRR ≤ 300 pps)	I <sub>F</sub>	3	A
Reverse Voltage	V <sub>R</sub>	6	V
*Derate 1.33 mW/°C above 25°C ambient.			



- NOTES
- Two leads. Lead cross section dimensions uncontrolled within 1.27 MM (.050") of seating plane.
  - Centerline of active element located within .25 MM (.010") of true position.
  - As measured at the seating plane.
  - Inch dimensions derived from millimeters.

PHOTOTRANSISTOR			
Power Dissipation	P <sub>D</sub>	**150	mW
Collector Current (Continuous)	I <sub>C</sub>	100	mA
Collector-Emitter Voltage	V <sub>CEO</sub>	30	V
Emitter-Collector Voltage	V <sub>ECO</sub>	6	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 <sub>(BR)R</sub> I <sub>R</sub> = 10μA	6	-	-	V
Forward Voltage V <sub>F</sub> I <sub>F</sub> = 60 mA	-	-	1.7	V
Reverse Current I <sub>R</sub> V <sub>R</sub> = 5V	-	-	100	nA
Capacitance C <sub>i</sub> V = 0, f = 1 MHz	-	30	-	pF

DETECTOR	MIN.	TYP.	MAX.	UNITS
Breakdown Voltage V <sub>(BR)CEO</sub> I <sub>C</sub> = 1 mA	30	-	-	V
Breakdown Voltage V <sub>(BR)ECO</sub> I <sub>E</sub> = 100μA	6	-	-	V
Collector Dark Current I <sub>CEO</sub> V <sub>CE</sub> = 25V	-	-	100	nA
Capacitance C <sub>ce</sub> V <sub>CE</sub> = 5V, f = 1 MHz	-	3.3	5	pF

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

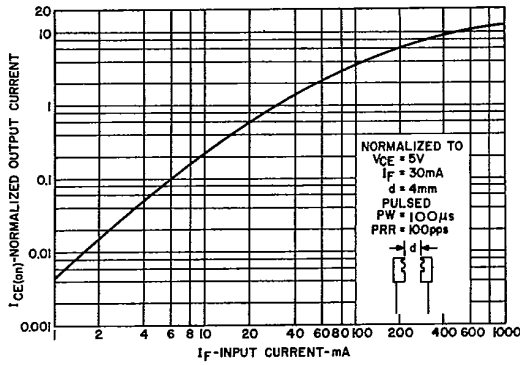
Note: Coupled electrical characteristics are measured at a separation distance of 4mm (.155 inches) with the lenses of the emitter and detector on a common axis within 0.1mm and parallel within 5°.

			MIN.	TYP.	MAX.	UNITS
I <sub>CE(on)</sub>	I <sub>F</sub> = 30mA, V <sub>CE</sub> = 5V	H23A1:	1.5	-	-	mA
		H23A2:	1.0	-	-	mA
V <sub>CE(sat)</sub>	I <sub>F</sub> = 30mA, I <sub>C</sub> = 1.8mA	H23A1:	-	-	0.40	V
	I <sub>F</sub> = 30mA, I <sub>C</sub> = .5mA	H23A2:	-	-	0.40	V
t <sub>on</sub>	V <sub>CC</sub> = 5V, I <sub>F</sub> = 30mA, R <sub>L</sub> = 2.5KΩ		-	8	-	μS
t <sub>off</sub>	V <sub>CC</sub> = 5V, I <sub>F</sub> = 30mA, R <sub>L</sub> = 2.5KΩ		-	50	-	μS

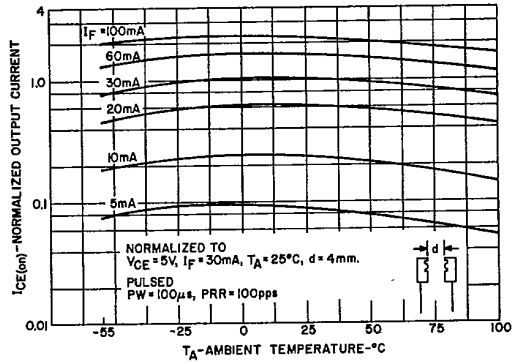
Note 1: Stray irradiation can alter values of characteristics. Adequate shielding should be provided.

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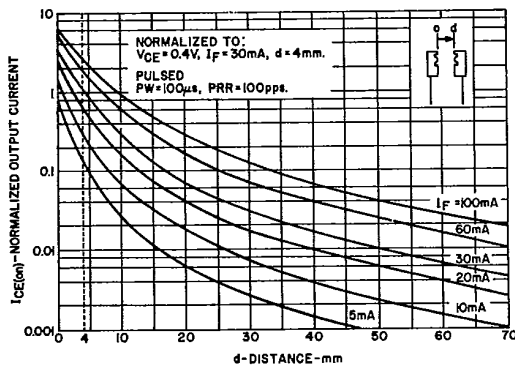
TYPICAL CHARACTERISTICS



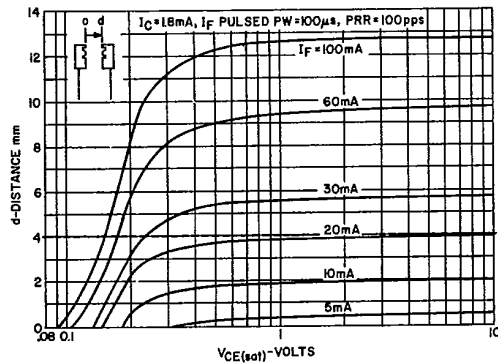
1. OUTPUT CURRENT VS. INPUT CURRENT



2. OUTPUT CURRENT VS. TEMPERATURE

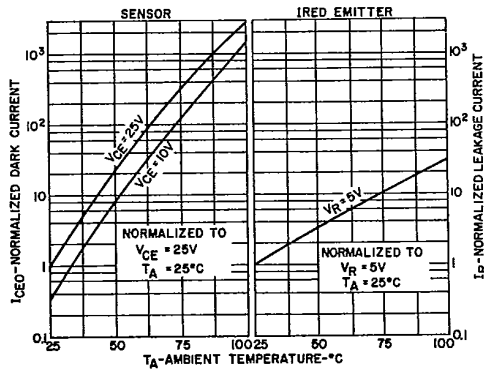


3. OUTPUT CURRENT VS. DISTANCE

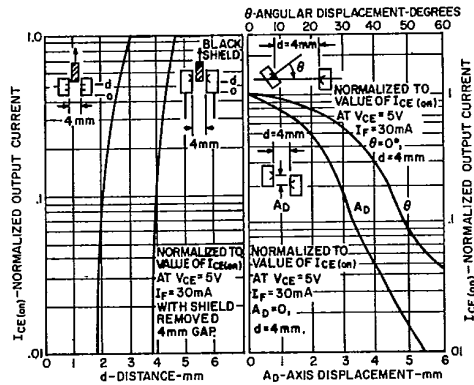


4. V<sub>CE(sat)</sub> VS. DISTANCE

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5. LEAKAGE CURRENTS VS. TEMPERATURE



6A. OUTPUT CURRENT VS. SHIELD DISTANCE

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