

Matched Emitter-Detector Pair H23L1

The GE Solid State H23L1 is a matched emitter-detector pair which consists of a gallium arsenide, infrared emitting diode and a high speed integrated circuit detector. The output incorporates a Schmitt Trigger which provides hysteresis for noise immunity and pulse shaping. The detector circuit is optimized for simplicity of operation and utilizes an open collector output for maximum application flexibility. 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.

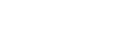
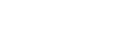
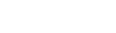
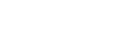
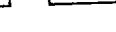
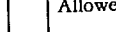
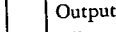
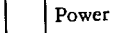
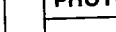
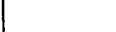
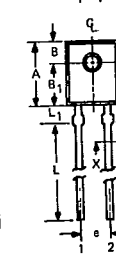
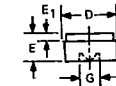
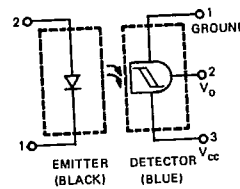
absolute maximum ratings: (25°C)

EMITTER-DETECTOR PAIR

Storage Temperature	T _{STG}	-55°C to +85°C
Operating Temperature	T _J	-55°C to +85°C
Lead Soldering Temperature	T _L	260°C
(5 seconds maximum)		
≥ 1/16" (1.6 mm) from Case		

INFRARED EMITTING DIODE

Power Dissipation	P _E	*100 mW
Forward Current	I _F	60 mA
(Continuous)		
Forward Current (Peak)	I _F	3 A
(Pulse Width ≤ 1 μs)		
PRR ≤ 300 pps)		
Reverse Voltage	V _R	6 V
*Derate 1.33 mW/°C above 25°C ambient.		



SYM.	MILLIMETERS		INCHES		NOTES
	MIN.	MAX.	MIN.	MAX.	
A	5.59	5.80	.220	.228	2
B	1.78	NOM	.070	NOM	
B1	3.68	3.94	.145	.155	1
φb	.60	.75	.024	.030	
b1	.51	NOM	.020	NOM	1
D	4.45	4.70	.175	.185	
E	2.41	2.67	.095	.105	3
E1	.58	.69	.023	.027	
e	2.41	2.67	.095	.105	3
e1	1.14	1.40	.045	.055	
G	1.98	NOM	.078	NOM	1
L	12.7	—	.500	—	
L1	1.40	1.65	.055	.065	3
R	1.27	.94	.050	.037	
S	.63	.94	.033	.065	3
T	—	1.65	—	—	

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.

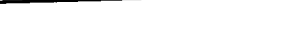
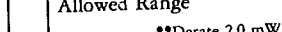
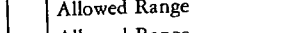
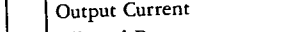
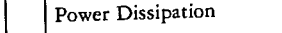
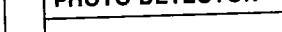
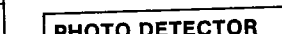
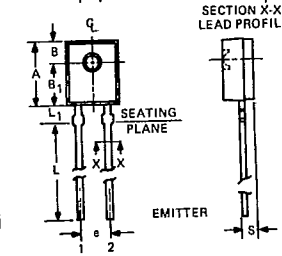


PHOTO DETECTOR

Power Dissipation	P _D	**150 mW
Output Current	I ₂	50 mA
Allowed Range	V _{CC}	0 to 16 V
Allowed Range	V ₂₁	0 to 16 V

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

individual electrical characteristics (0-70°C)

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EMITTER		MIN.	TYP.	MAX.	UNITS
Forward Voltage $I_F = 20 \text{ mA}$	V_F	—	1.10	1.50	volts
Reverse Current ($V_R = 3 \text{ V}$)	I_R	—	—	10	micro-ampere
Capacitance ($V = 0, f = 1 \text{ MHz}$)	C_J	—	—	100	pico-farads

DETECTOR ($E_o = 0$)	MIN.	TYP.	MAX.	UNITS
Operating Voltage Range V_{CC}	4	—	15	volts
Supply Current ($I_F = 0, V_{CC} = 5 \text{ V}$)	$I_{3(off)}$	—	1.0	milli-ampere
Output Current, High ($I_F = 0, V_{CC} = V_o = 15 \text{ V}$)	I_{OH}	—	100	micro-ampere

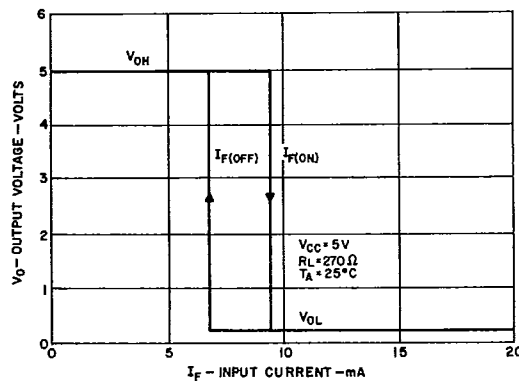
coupled electrical characteristics (0-70°C)

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°.

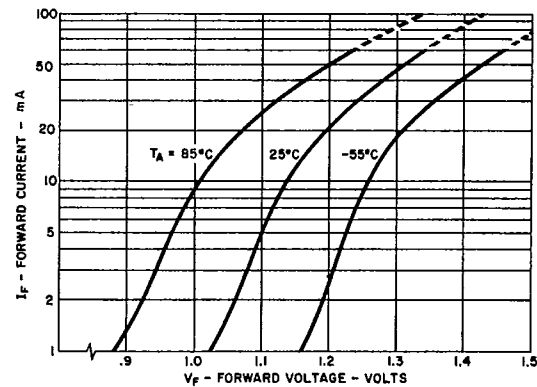
		MIN.	TYP.	MAX.	UNITS
Supply Current ($I_F = 5 \text{ mA}, V_{CC} = 5 \text{ V}$)	$I_{3(on)}$	—	1.6	5.0	milliampere
Output Voltage, Low ($R_L = 270 \Omega, V_{CC} = 5 \text{ V}$)	V_{OL}	—	0.2	0.4	volts
Turn-On Threshold Current ($R_L = 270 \Omega, V_{CC} = 5 \text{ V}$)	$I_{F(on)}$	—	10.0	20.0	milliampere
Turn-Off Threshold Current ($R_L = 270 \Omega, V_{CC} = 5 \text{ V}$)	$I_{F(off)}$	1.0	7.5	—	milliampere
Hysteresis Ratio ($R_L = 270 \Omega, V_{CC} = 5 \text{ V}$)	$I_{F(off)}/I_{F(on)}$	0.50	0.75	0.90	—
Switching Speeds: ($R_L = 270 \Omega, V_{CC} = 5 \text{ V}, T_A = 25^\circ \text{C}$)					
Rise Time	t_r	—	0.1	—	$\mu\text{sec.}$
Fall Time	t_f	—	0.1	—	$\mu\text{sec.}$

TYPICAL CHARACTERISTICS

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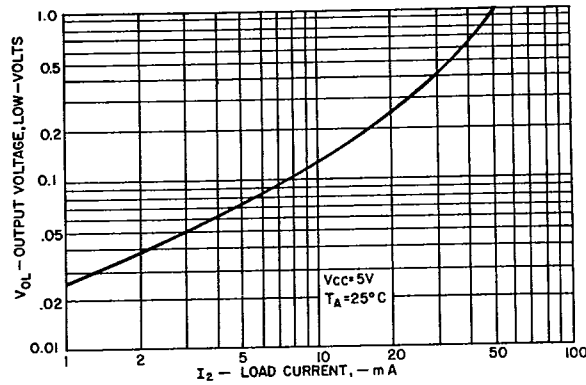
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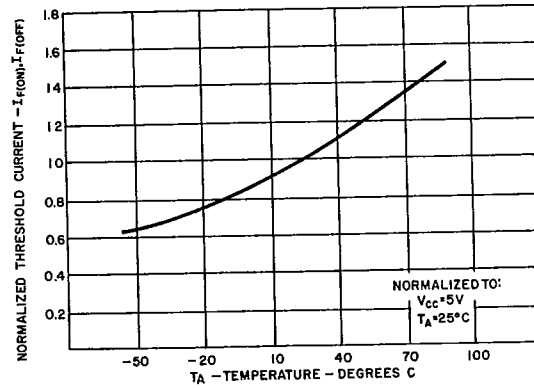
2. FORWARD VOLTAGE VS. FORWARD CURRENT

TYPICAL CHARACTERISTICS

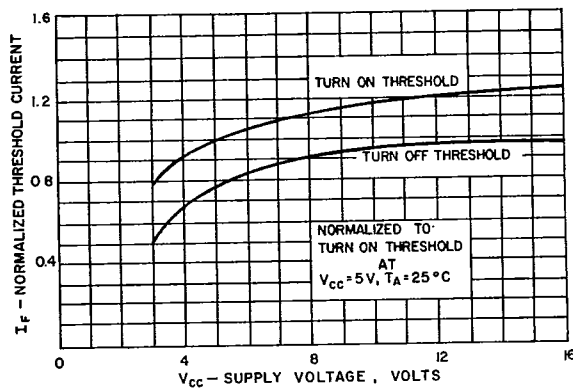
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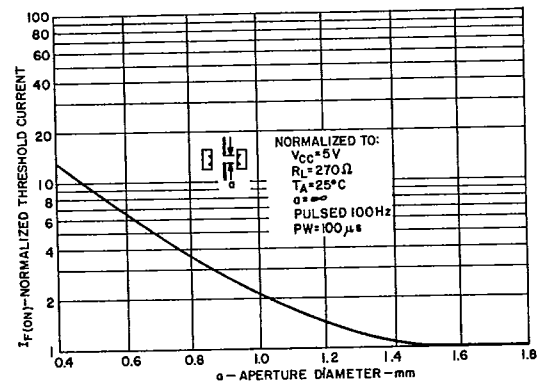
3. ON VOLTAGE VS. LOAD CURRENT



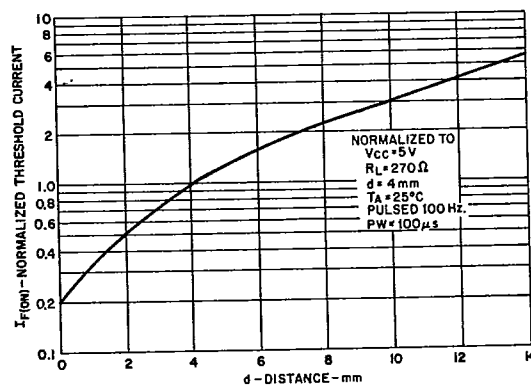
4. THRESHOLD CURRENTS VS. TEMPERATURE



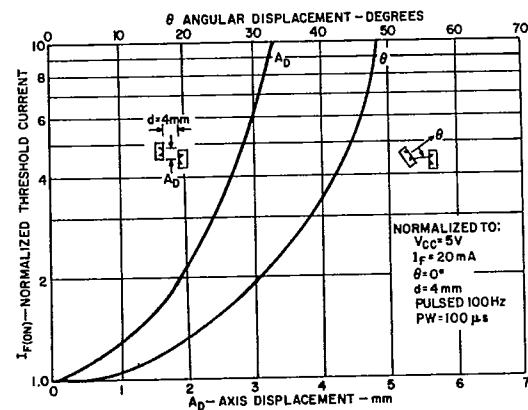
5. THRESHOLD CURRENT VS. SUPPLY VOLTAGE



6. THRESHOLD CURRENT VS. APERTURE DIAMETER



7. THRESHOLD CURRENT VS. DISTANCE

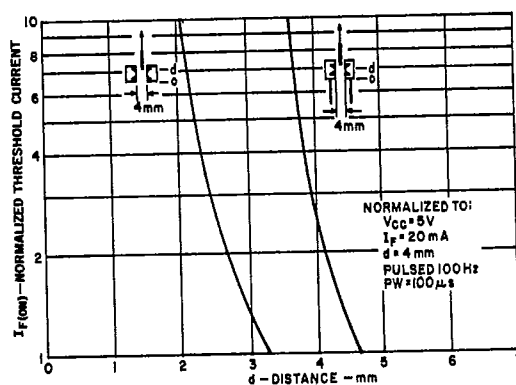


8. THRESHOLD CURRENT VS. DISPLACEMENT (ANGULAR AND AXIS)

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TYPICAL CHARACTERISTICS



9. THRESHOLD CURRENT VS. SHIELD DISTANCE