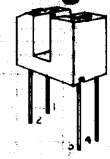
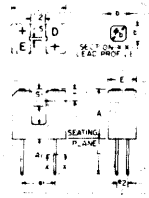
H22B1, H22B2, H22B3
Optointerrupter
GaAs Infrared Emitting Diode and NPN Silicon Photo-Darlington Module with 1mm Aperture

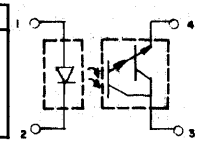
The H22B Interrupter Module is a gallium arsenide infrared emitting diode coupled to a silicon Darlington-connected phototransistor in a plastic housing. The packaging system is designed to optimize the mechanical resolution, coupling efficiency, ambient light rejection, cost, and reliability. The gap in the housing provides a means of interrupting the signal with an opaque material, switching the output from an "ON" into an "OFF" state.





SYMBOL	MILLIMETERS MIN	MILLIMETERS MAX	INCHES MIN	INCHES MAX	NOTES
A	2.7	11.0	.462	.433	
A_1	3.0	3.2	.118	.125	
ϕb_1	.650	.750	.024	.030	2
b_1		50 NOM		020 NOM	2
D_1	11.6	12.0	.457	.472	
D_2	3.0	3.3	.118	.129	
e_1	6.9	7.5	.272	.295	
e_2	2.3	2.8	.091	.110	
E	6.15	6.35	.243	.249	
L	.800		.346		
S	.85	1.0	.034	.039	
S_1	3.45	3.75	.136	.147	
T	2.6 NOM		.103 NOM		3

NOTES
1. INCH DIMENSIONS ARE DERIVED FROM MILLIMETERS
2. FOUR LEADS. LEAD CROSS SECTION IS CONTROLLED BETWEEN 1.27 MM (.050") FROM SEATING PLANE AND THE END OF THE LEADS.
3. THE SENSING AREA IS DEFINED BY THE 'S' DIMENSION AND BY DIMENSION 'T' ±0.75 MM (± .030 INCH)



absolute maximum ratings: (25°C)

TOTAL DEVICE		
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 ≤ 1 μs PRR ≤ 300 pps)	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 $V_{(BR)R}$ $I_R = 10\,\mu A$	6	–	–	V
Forward Voltage V_F $I_F = 60$ mA	–	–	1.7	V
Reverse Current I_R $V_R = 3V$	–	–	1	μA
Capacitance C_i V = O, f = 1MHz	–	30	–	pF

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

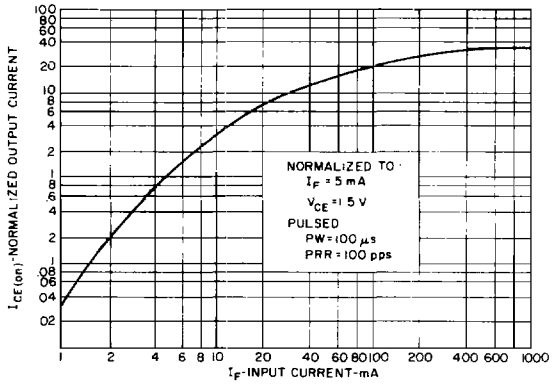
coupled electrical characteristics:(25°C) (See Note 1)

		H22B1			H22B2			H22B3			UNITS
		MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	
$I_{CE(on)}$	I_F = 2mA, V_{CE} = 1.5V	0.5	–	–	1.0	–	–	2.0	–	–	mA
$I_{CE(on)}$	I_F = 5mA, V_{CE} = 1.5V	2.5	–	–	5.0	–	–	10	–	–	mA
$I_{CE(on)}$	I_F = 10mA, V_{CE} = 1.5V	7.5	–	–	14	–	–	25	–	–	mA
$V_{CE(sat)}$	I_F = 10mA, I_C = 1.8mA	–	–	1.0	–	–	1.0	–	–	1.0	V
$V_{CE(sat)}$	I_F = 60mA, I_C = 50mA	–	–	–	–	–	1.5	–	–	1.5	V
t_{on}	V_{CC} = 5V, I_F = 10mA, R_L = 750Ω	–	45	–	–	45	–	–	45	–	μs
	V_{CC} = 5V, I_F = 60mA, R_L = 75Ω	–	–	–	–	7	–	–	7	–	μs
t_{off}	V_{CC} = 5V, I_F = 10mA, R_L = 750Ω	–	250	–	–	250	–	–	250	–	μs
	V_{CC} = 5V, I_F = 60mA, R_L = 75Ω	–	–	–	–	45	–	–	45	–	μs

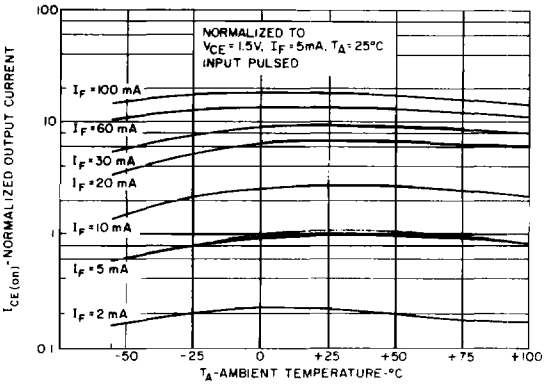
Note 1: Stray irradiation can alter values of characteristics. Adequate shielding should be provided.

H22B1, H22B2, H22B3

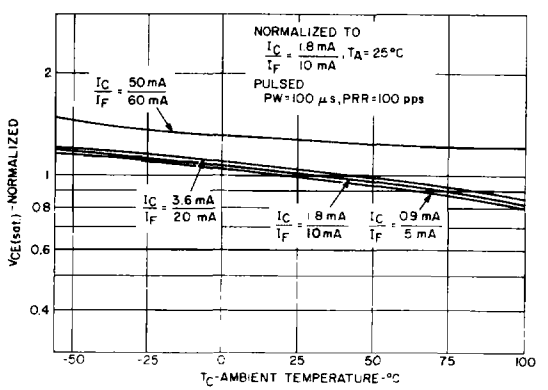
TYPICAL CHARACTERISTICS



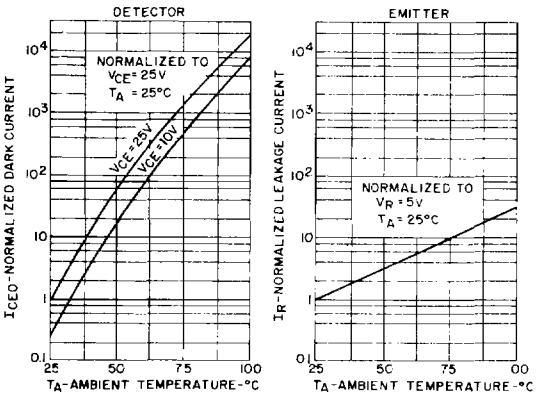
1. OUTPUT CURRENT VS. INPUT CURRENT



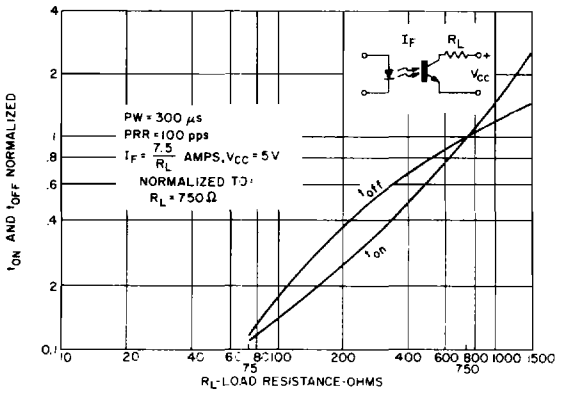
2. OUTPUT CURRENT VS. TEMPERATURE



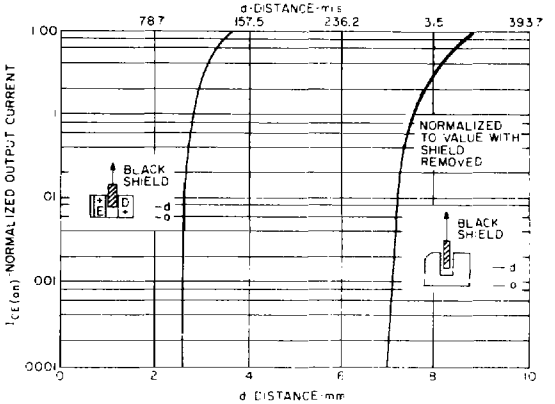
3. $V_{CE\,(sat)}$ VS. TEMPERATURE



4. LEAKAGE CURRENTS VS. TEMPERATURE



5. SWITCHING SPEED VS. R_L



6. OUTPUT CURRENT VS. SHIELD DISTANCE

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