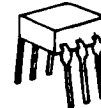
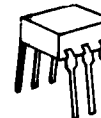


PROGRAMMABLE THRESHOLD COUPLER

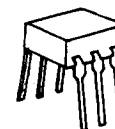
GE TYPE	PAGE NO.	ISOLATION VOLTAGE (V_{pk}) MIN.	CURRENT TRANSFER RATIO MIN.	I_D (nA) MAX.	BV_{CEO} (VOLTS) MIN.	TYPICAL (μ SEC.)		$V_{CE(SAT)}$ MAX.
						T_R	T_F	
H11A10	1281	1500	10%	50	30	2	2	.4

**AC INPUT COUPLER**

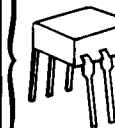
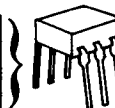
H11AA1	1289	1500	20%	100	30	2	2	.4
H11AA2	1289	1500	10%	200	30	2	2	.4

**HIGH VOLTAGE COUPLER**

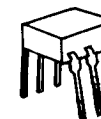
H11D1	1307	2500	20%	100	300	5	5	.4
H11D2	1307	1500	20%	100	300	5	5	.4
H11D3	1307	1500	20%	100	200	5	5	.4
H11D4	1307	1500	10%	100	200	5	5	.4
4N38	539	1500	10%	50	80	5	5	1.0
4N38A	539	1775 V_{RMS}	10%	50	80	5	5	1.0

**PHOTO DARLINGTON OUTPUT**

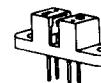
H11B1	1293	2500	500%	100	25	125	100	1.0
H11B2	1293	1500	200%	100	25	125	100	1.0
H11B3	1293	1500	100%	100	25	125	100	1.0
H11B255	1295	1500	100%	100	55	125	100	1.0
H15B1	1315	4000 V_{RMS}	400%	100	25	125	100	1.4
H15B2	1315	4000 V_{RMS}	200%	100	25	125	100	1.4
4N29	533	2500	100%	100	30	5	40	1.0
4N29A	533	1775 V_{RMS}	100%	100	30	5	40	1.0
4N30	533	1500	100%	100	30	5	40	1.0
4N31	533	1500	50%	100	30	5	40	1.2
4N32	533	2500	500%	100	30	5	100	1.0
4N32A	533	1775 V_{RMS}	500%	100	30	5	100	1.0
4N33	533	1500	500%	100	30	5	100	1.0

**PHOTO SCR OUTPUT**

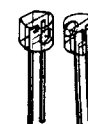
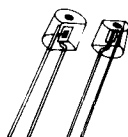
GE TYPE	PAGE NO.	ISOLATION VOLTAGE MIN.	I_F TRIGGER (MAX.)	I_D 100°C (MAX.) μ A	BLOCKING VOLTAGE (MIN.)	TYPICAL T_{ON} (μ SEC.)	V_F (MAX.)
H11C1	1299	2500	20mA	50	200	1	1.5
H11C2	1299	1500	20mA	50	200	1	1.5
H11C3	1299	1500	30mA	50	200	1	1.5
H11C4	1303	2500	20mA	100	400	1	1.5
H11C5	1303	1500	20mA	100	400	1	1.5
H11C6	1303	1500	30mA	100	400	1	1.5
4N39	541	1500	14mA	50	200	1	1.5
4N40	541	1500	14mA	150	400	1	1.5
H74C1	1327	1500			200		
H74C2	1327	1500			400		

**PHOTON COUPLED INTERRUPTER MODULE**

GE TYPE	PAGE NO.	OUTPUT CURRENT		I_D (nA)	BV_{ECO} (V)	TYPICAL		$V_{CE(SAT)}$ MAX.
		I_F				T_{ON} (μ SEC.)	t_f (μ SEC.)	
H13A1	1309	$I_F = 20mA$	200 μ A	100	30	5	5	.4
H13A2	1309	$I_F = 20mA$	50 μ A	100	30	5	5	.4
H13B1	1311	$I_F = 20mA$	2500 μ A	100	25	150	150	1.2
H13B2	1311	$I_F = 20mA$	1000 μ A	100	25	150	150	1.2

**MATCHED EMITTER DETECTOR PAIRS**

H17A1	1317	$I_F = 20mA$	50 μ A	100	30	5	5	.4
H17B1	1319	$I_F = 20mA$	1000 μ A	100	25	150	150	1.2
H19A1	1321	$I_F = 20mA$	100 μ A	100	30	5	5	.4
H19B1	1325	$I_F = 20mA$	2000 μ A	100	25	150	150	1.2



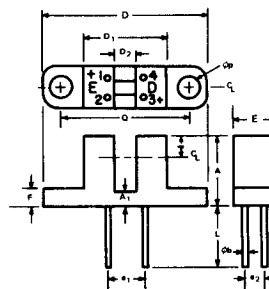
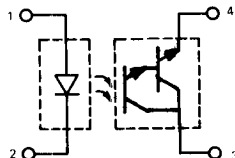


Photon Coupled Interrupter Module H13B1-H13B2

The General Electric H13B1 and H13B2 are gallium arsenide infrared emitting diodes coupled with a silicon photo-darlington in a plastic housing. The gap in the housing provides a means of interrupting the signal with tape, cards, shaft encoders, or other opaque material, switching the output transistor from an "ON" into an "OFF" state.

FEATURES:

- Low cost, plastic module
- Non-contact switching
- Solid state reliability
- I/O compatible with integrated circuits



SYMBOL	INCHES		MILLIMETERS		NOTES
	MIN.	MAX.	MIN.	MAX.	
A	.390	.400	9.91	10.16	1
A ₁	.075	.085	1.91	2.15	
φb	.016	.019	.407	.482	
b	.954	.984	24.24	24.99	
D ₁	.475	.495	12.07	12.57	
D ₂	.120	.130	3.06	3.30	
e ₁	.205	.235	5.21	5.96	
e ₂	.080	.110	2.29	2.79	
E	.250	.250	6.35	6.35	
F	.095	.105	2.42	2.66	
L	.300		7.62		1
φp	.120	.130	3.06	3.30	
Q	.745	.755	18.93	19.17	
T	.110 NOM.		2.79 NOM.		

NOTES:

- Four leads. Lead diameter controlled between .050" (1.27 MM) from the seating plane and the end of the leads.
- The sensing area falls within a .080" (1.52 MM) square on this centerline.

absolute maximum ratings: (25°C) (unless otherwise specified)

Storage and Operating Temperature -55° to 85°C. Lead Soldering Time (at 260°C) 10 seconds.

INFRARED EMITTING DIODE			PHOTO-DARLINGTON		
Power Dissipation	*100	milliwatts	Power Dissipation	**150	milliwatts
Forward Current (Continuous)	60	milliamps	Collector Current (Continuous)	100	milliamps
Forward Current (peak, 100 μs, 1% duty cycle)	1	amp	V _{CEO}	25	volts
Reverse Voltage	3	volts	V _{ECO}	7	volts
*Derate 1.67mW/°C above 25°C ambient			**Derate 2.5mW/°C above 25°C ambient		

individual electrical characteristics (25°C)

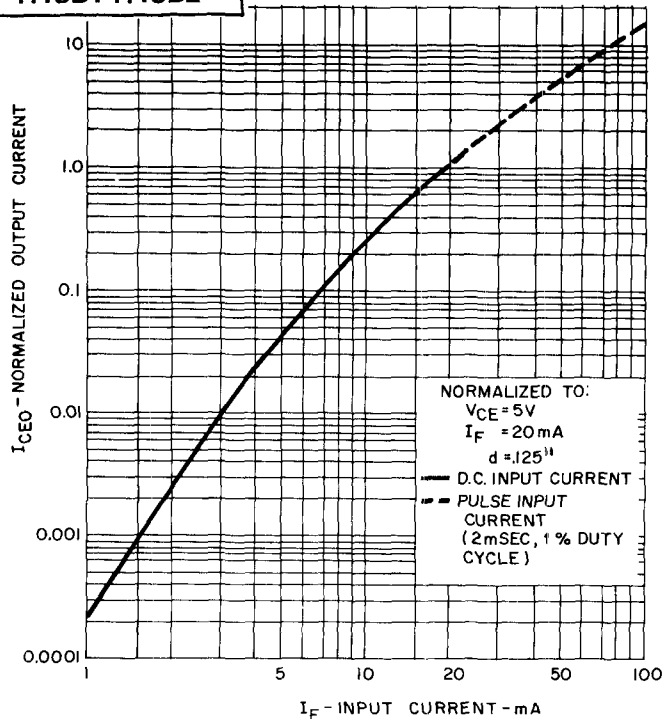
INFRARED EMITTING DIODE	TYP.	MAX.	UNITS	PHOTO-DARLINGTON	MIN.	MAX.	UNITS
Forward Voltage (I _F = 10 mA)	1.2	1.7	volts	Breakdown Voltage V _{(BR)CEO} (I _C = 10 mA)	25	—	volts
Reverse Current (V _R = 2V)	—	10	μamps	Breakdown Voltage V _{(BR)ECO} (I _E = 100μA)	7	—	volts
Capacitance (V = 0, f = 1MHz)	150	—	pf	Collector Dark Current I _{CEO} (V _{CE} = 10V, I _F = 0, H = 0)	—	100	nA

coupled electrical characteristics (25°C)

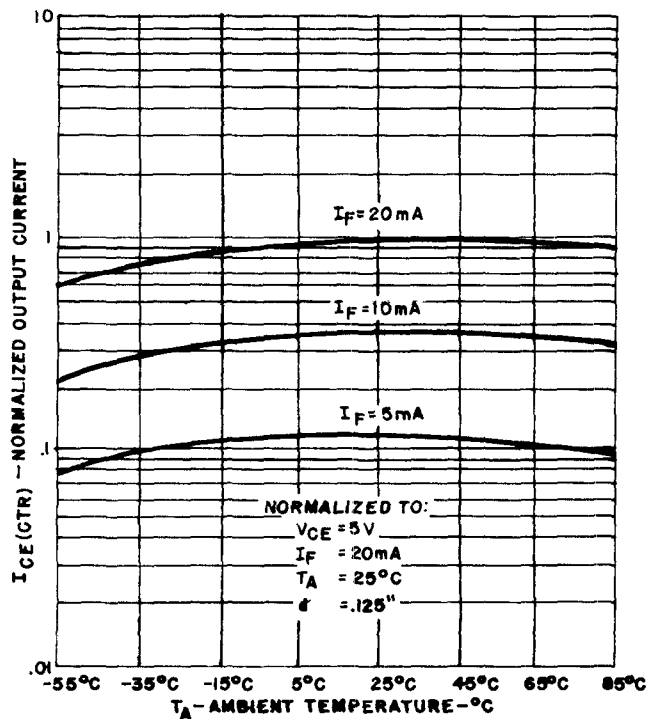
		MIN.	TYP.	MAX.	UNITS
Output Current (I _F = 20 mA, V _{CE} = 5V)	H13B1	2500	—	—	μamps
	H13B2	1000	—	—	μamps
Saturation Voltage (I _F = 20 mA, I _C = 0.5 mA)		—	—	1.2	volts
Switching Speeds (V _{CE} = 10V, I _C = 2 mA, R _L = 100Ω)					
On Time (t _d + t _r)		—	150	—	μsecs
Off Time (t _s + t _f)		—	150	—	μsecs

TYPICAL CHARACTERISTICS

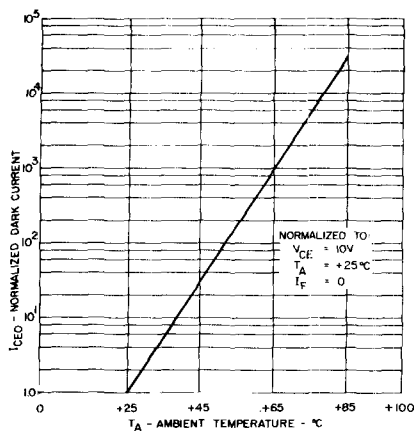
H13B1-H13B2



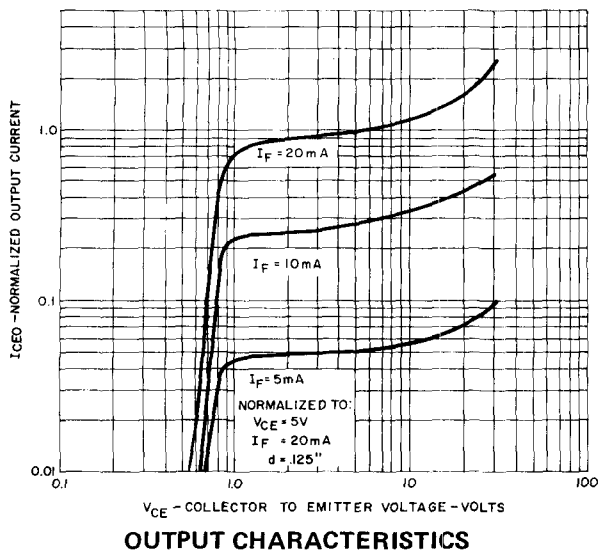
OUTPUT CURRENT VS INPUT CURRENT



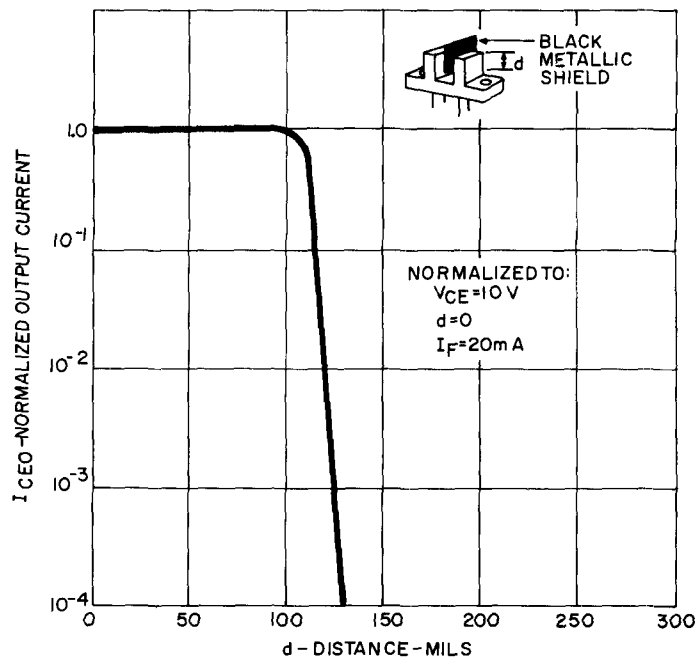
OUTPUT CURRENT VS TEMPERATURE



NORMALIZED DARK CURRENT VS TEMPERATURE



OUTPUT CHARACTERISTICS



OUTPUT CURRENT VS SHIELD DISTANCE