



SOLID STATE

# OPTO ELECTRONICS

## 1mm Aperture

## Photon Coupled Interrupter Module H21A4, H21A5, H21A6

The General Electric H21A Interrupter Module is a gallium arsenide infrared emitting diode coupled to a silicon 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.

absolute maximum ratings: (25°C)

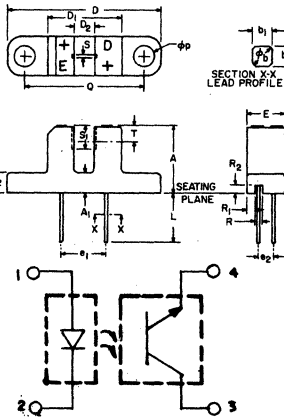
TOTAL DEVICE			
Storage Temperature	T <sub>STG</sub>	-55°C to +100°C	
Operating Temperature	T <sub>J</sub>	-55°C to +100°C	
Lead Soldering Temperature (5 seconds maximum)	T <sub>L</sub>	260°C	

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

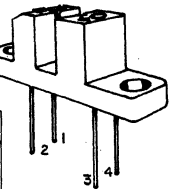
\*Derate 1.33 mW/°C above 25°C ambient.

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> = 60mA	—	—	1.7	V
Reverse Current I <sub>R</sub> V <sub>R</sub> = 5V	—	—	100	nA
Capacitance C <sub>i</sub> V = 0, f = 1MHz	—	30	—	pF



SYMBOL	MILLIMETERS		INCHES		NOTES
	MIN	MAX	MIN	MAX	
A	10.7	11.0	.422	.433	
A <sub>1</sub>	3.0	3.2	.119	.125	
A <sub>2</sub>	3.0	3.2	.119	.125	
φb	.600	.750	.024	.030	2
b <sub>1</sub>	50 NOM.		.020 NOM.		2
D	24.3	24.7	.957	.972	
D <sub>1</sub>	11.6	12.0	.457	.472	
D <sub>2</sub>	3.0	3.3	.119	.129	
e <sub>1</sub>	6.9	7.5	.272	.295	
e <sub>2</sub>	2.3	2.8	.091	.110	
E	6.15	6.35	.243	.249	
L	6.00		.315		
φp	3.2	3.4	.126	.133	
Q	18.9	19.2	.745	.755	
R	1.3 NOM.		.051 NOM.		
R <sub>1</sub>	1.3 NOM.		.051 NOM.		
R <sub>2</sub>	1.3 NOM.		.051 NOM.		
S	.85	1.0	.034	.039	
SI	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).

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>	55	V
Emitter-Collector Voltage	V <sub>ECO</sub>	6	V

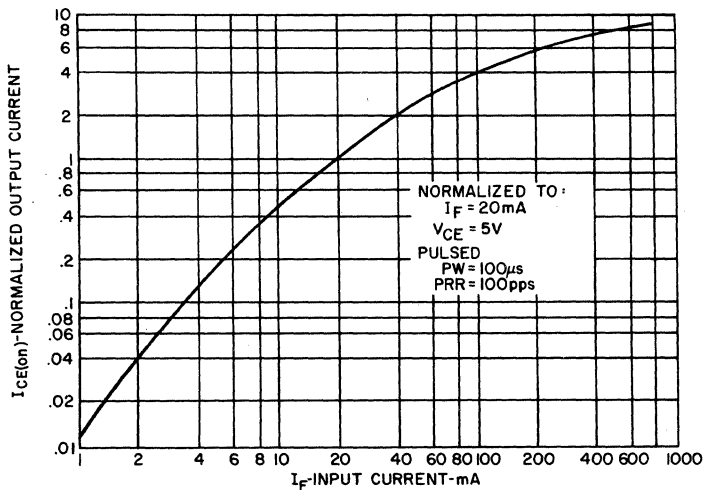
\*\*Derate 2.0 mW/°C above 25°C ambient.

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

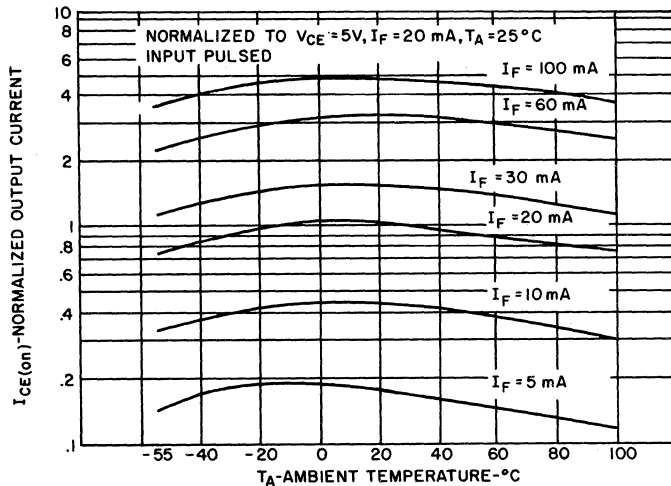
	H21A4			H21A5			H21A6			UNITS
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	
I <sub>CE(on)</sub> I <sub>F</sub> = 5mA, V <sub>CE</sub> = 5V	0.15	—	—	0.30	—	—	0.60	—	—	mA
I <sub>CE(on)</sub> I <sub>F</sub> = 20mA, V <sub>CE</sub> = 5V	1.0	—	—	2.0	—	—	4.0	—	—	mA
I <sub>CE(on)</sub> I <sub>F</sub> = 30mA, V <sub>CE</sub> = 5V	1.9	—	—	3.0	—	—	5.5	—	—	mA
V <sub>CE(sat)</sub> I <sub>F</sub> = 20mA, I <sub>C</sub> = 1.8mA	—	—	—	—	—	0.40	—	—	0.40	V
V <sub>CE(sat)</sub> I <sub>F</sub> = 30mA, I <sub>C</sub> = 1.8mA	—	—	0.40	—	—	—	—	—	—	V
t <sub>on</sub> V <sub>CC</sub> = 5V, I <sub>F</sub> = 30mA, R <sub>L</sub> = 2.5KΩ	—	8	—	—	8	—	—	8	—	μs
t <sub>off</sub> V <sub>CC</sub> = 5V, I <sub>F</sub> = 30mA, R <sub>L</sub> = 2.5KΩ	—	50	—	—	50	—	—	50	—	μs

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

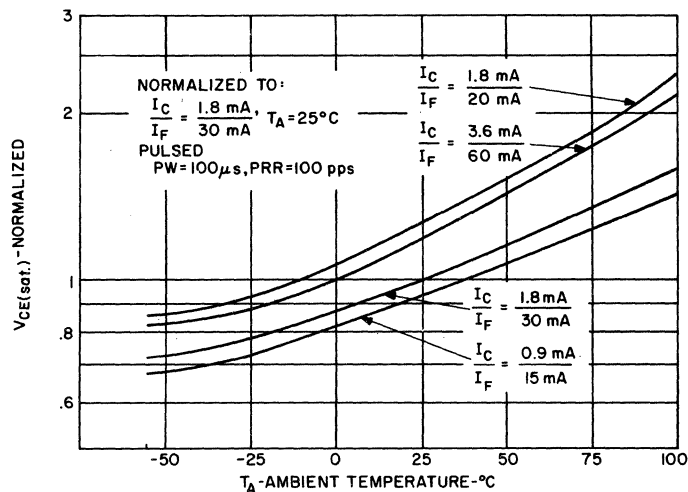
TYPICAL CHARACTERISTICS



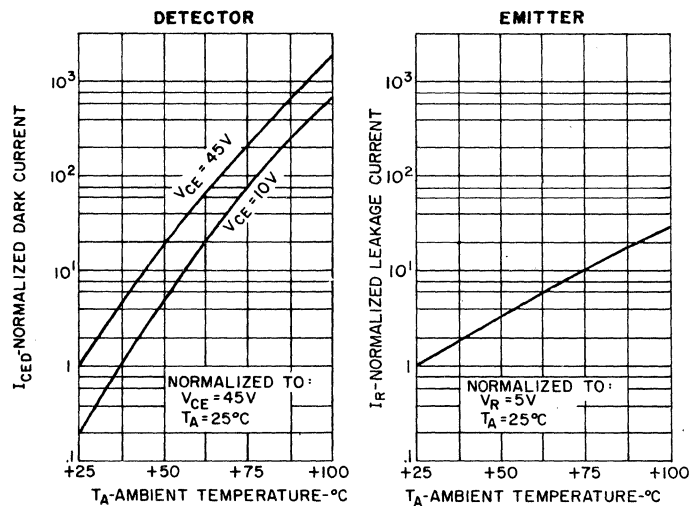
1. OUTPUT CURRENT VS. INPUT CURRENT



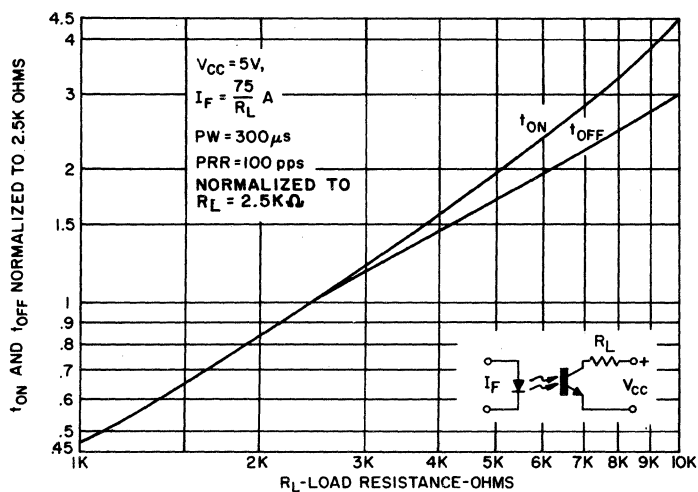
2. OUTPUT CURRENT VS. TEMPERATURE



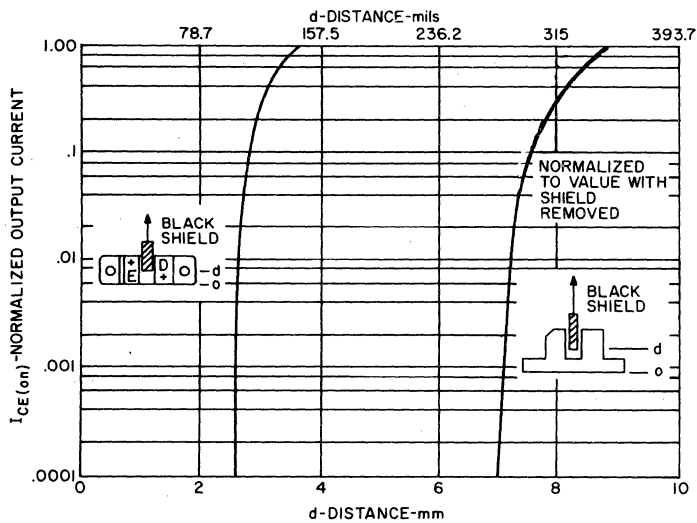
3. V<sub>CE</sub>(sat) VS. TEMPERATURE



4. LEAKAGE CURRENTS VS. TEMPERATURE



5. SWITCHING SPEED VS. R<sub>L</sub>



6. OUTPUT CURRENT VS. SHIELD DISTANCE