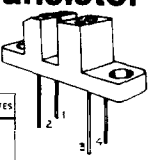
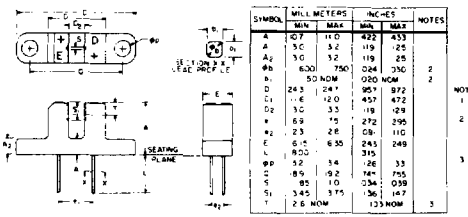
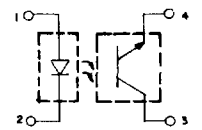
H21A4, H21A5, H21A6
Optointerrupter
GaAs Infrared Emitting Diode and NPN Silicon Phototransistor Module with 1mm Aperture

The 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_{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.

PHOTOTRANSISTOR			
Power Dissipation	P_D	**150	mW
Collector Current (Continuous)	I_C	100	mA
Collector-Emitter Voltage	V_{CEO}	55	V
Emitter-Collector Voltage	V_{ECO}	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 $V_{(BR)R}$ I_R = 10 μA	6	–	–	V
Forward Voltage V_F I_F = 60 mA	–	–	1.7	V
Reverse Current I_R V_R = 3V	–	–	1	μA
Capacitance C_t V = 0, f = 1 MHz	–	30	–	pF

DETECTOR	MIN.	TYP.	MAX.	UNITS
Breakdown Voltage $V_{(BR)CEO}$ I_C = 1 mA	55	–	–	V
Breakdown Voltage $V_{(BR)ECO}$ I_E = 100 μA	6	–	–	V
Collector Dark Current I_{CEO} V_{CE} = 45V	–	–	100	nA
Capacitance C_{ce} V_{CE} = 5V, f = 1 MHz	–	3.3	5	pF

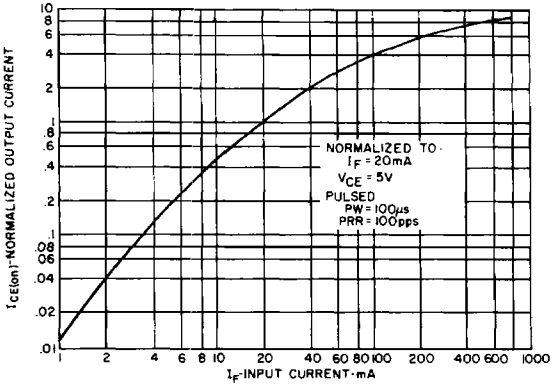
coupled electrical characteristics:(25°C) (See Note 1)

		H21A4			H21A5			H21A6			UNITS
		MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.	
$I_{CE(on)}$	I_F = 5mA, V_{CE} = 5V	0.15	–	–	0.30	–	–	0.60	–	–	mA
$I_{CE(on)}$	I_F = 20mA, V_{CE} = 5V	1.0	–	–	2.0	–	–	4.0	–	–	mA
$I_{CE(on)}$	I_F = 30mA, V_{CE} = 5V	1.9	–	–	3.0	–	–	5.5	–	–	mA
$V_{CE(sat)}$	I_F = 20mA, I_C = 1.8mA	–	–	–	–	–	0.40	–	–	0.40	V
$V_{CE(sat)}$	I_F = 30mA, I_C = 1.8mA	–	–	0.40	–	–	–	–	–	–	V
t_{on}	V_{CC} = 5V, I_F = 30mA, R_L = 2.5KΩ	–	8	–	–	8	–	–	8	–	μs
t_{off}	V_{CC} = 5V, I_F = 30mA, R_L = 2.5KΩ	–	50	–	–	50	–	–	50	–	μs

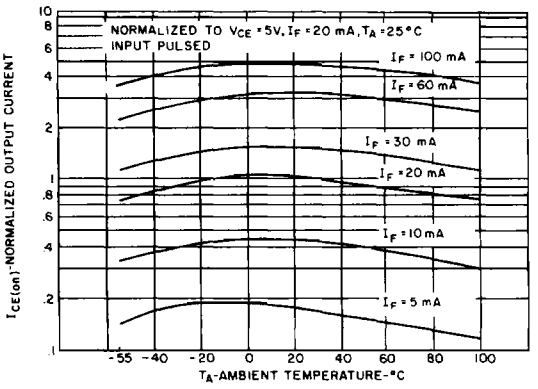
Note 1: Stray irradiation can alter values of characteristics. Adequate shielding should be provided.

H21A4, H21A5, H21A6

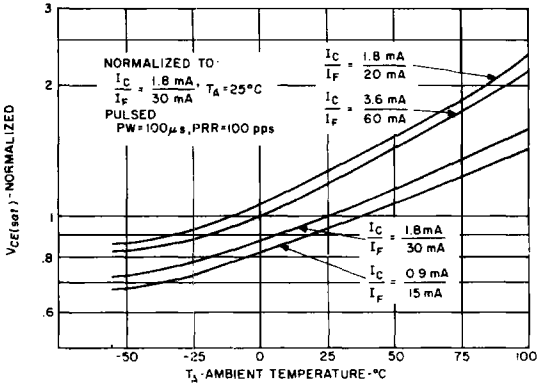
TYPICAL CHARACTERISTICS



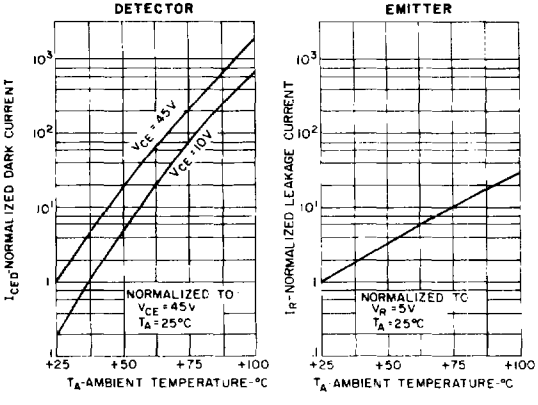
1. OUTPUT CURRENT VS. INPUT CURRENT



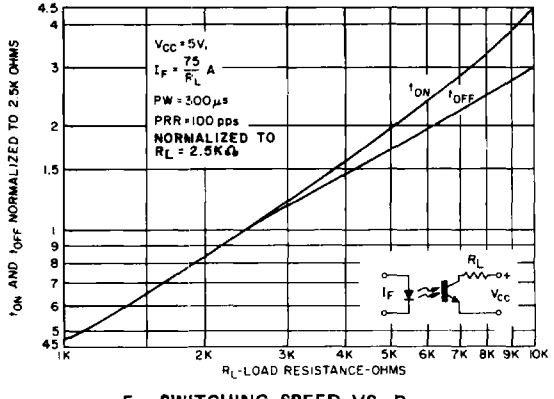
2. OUTPUT CURRENT VS. TEMPERATURE



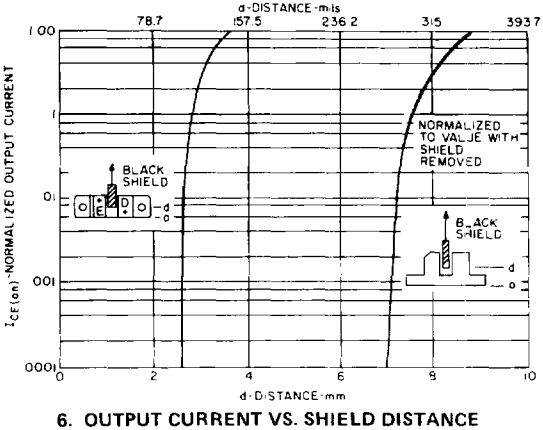
3. $V_{CE\ (sat)}$ VS. TEMPERATURE



4. LEAKAGE CURRENTS VS. TEMPERATURE



5. SWITCHING SPEED VS. R_L



6. OUTPUT CURRENT VS. SHIELD DISTANCE

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