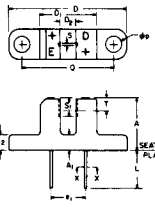
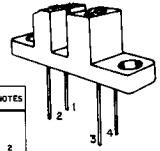


1mm Aperture Photon Coupled Interrupter Module H21A4, H21A5, H21A6

The GE Solid State 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.



| SYMBOL | MILLIMETERS | | INCHES | | NOTES |
|--------|-------------|------|--------|-------|-------|
| | MIN. | MAX. | MIN. | MAX. | |
| A1 | .80 | 11.0 | .032 | .433 | |
| A2 | 3.0 | 3.2 | .119 | .125 | |
| #6 | .800 | .750 | .0314 | .0300 | |
| #1 | .90 | NOM. | .0350 | NOM. | 2 |
| D | .243 | .247 | .0097 | .0097 | |
| D1 | 11.6 | 12.0 | .457 | .472 | |
| D2 | 5.0 | 5.3 | .197 | .209 | |
| #1 | 6.8 | 7.5 | .272 | .296 | |
| #2 | 2.5 | 2.8 | .091 | .110 | |
| E | 8.15 | 8.55 | .321 | .337 | |
| L | 8.00 | | .315 | | |
| #P | 3.2 | 3.4 | .126 | .133 | |
| Q | 18.9 | 19.2 | .745 | .756 | |
| S | .85 | 1.0 | .034 | .039 | |
| S1 | 3.45 | 3.75 | .136 | .147 | |
| T | 2.6 | NOM. | .103 | NOM. | 3 |

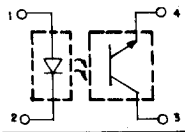
- NOTES:
 1. INCH DIMENSIONS ARE DERIVED FROM MILLIMETERS.
 2. FOUR LEADS, LEAD CROSS SECTION IS CONTROLLED, BETWEEN 1.27 MM (.050") FROM TIP OF PLASMA GUN THE END OF THE LEADS.
 3. THE SENSING AREA IS DEFINED BY THE .5" DIMENSION AND BY DIMENSION T ± 0.75 MM (± 0.030 INCH).

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 ≤ 1μs, 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 = 10μA | 6 | — | — | V |
| Forward Voltage V _F I _F = 60mA | — | — | 1.7 | V |
| Reverse Current I _R V _R = 5V | — | — | 100 | nA |
| Capacitance C _i V = 0, f = 1MHz | — | 30 | — | pF |

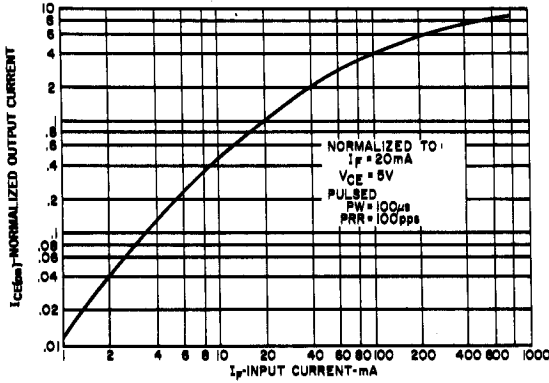
| DETECTOR | MIN. | TYP. | MAX. | UNITS |
|---|------|------|------|-------|
| Breakdown Voltage V _{(BR)CEO} I _C = 1mA | 55 | — | — | V |
| Breakdown Voltage V _{(BR)ECO} I _E = 100μA | 6 | — | — | V |
| Collector Dark Current I _{CEO} V _{CE} = 45V | — | — | 100 | nA |
| Capacitance C _{ce} V _{CE} = 5V, f = 1MHz | — | 3.3 | 5 | pF |

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

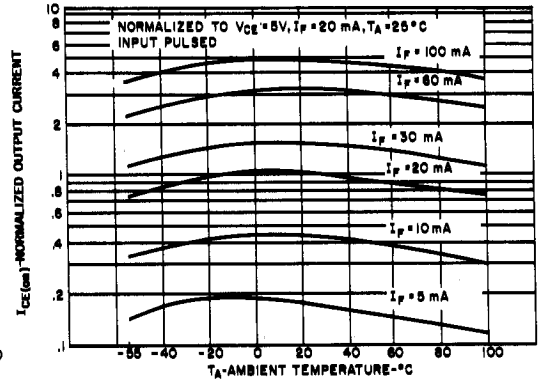
| | H21A4 | | | H21A5 | | | H21A6 | | | UNITS |
|--|-------|------|------|-------|------|------|-------|------|------|-------|
| | MIN. | TYP. | MAX. | MIN. | TYP. | MAX. | MIN. | TYP. | MAX. | |
| I _{CE(on)} I _F = 5mA, V _{CE} = 5V | 0.15 | — | — | 0.30 | — | — | 0.60 | — | — | mA |
| I _{CE(on)} 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.

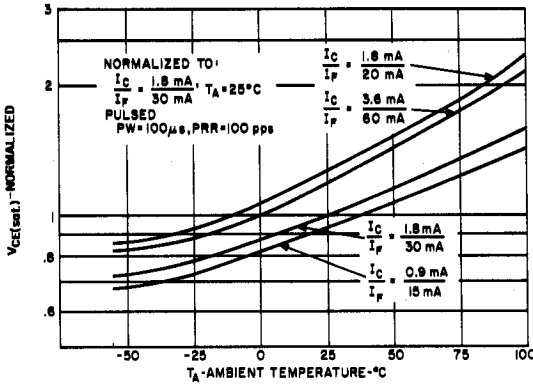
TYPICAL CHARACTERISTICS



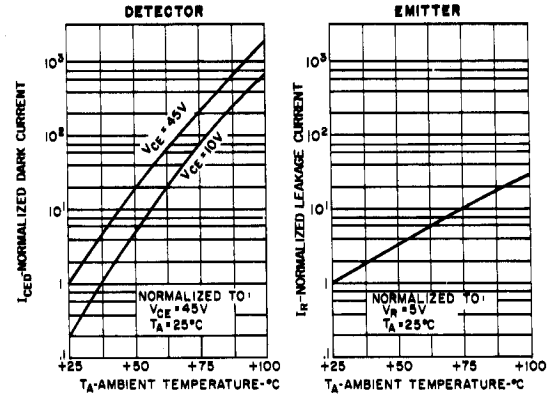
1. OUTPUT CURRENT VS. INPUT CURRENT



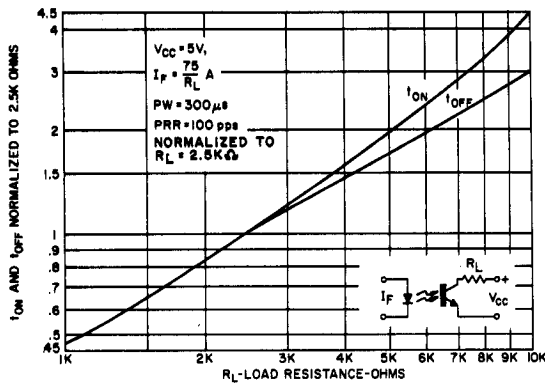
2. OUTPUT CURRENT VS. TEMPERATURE



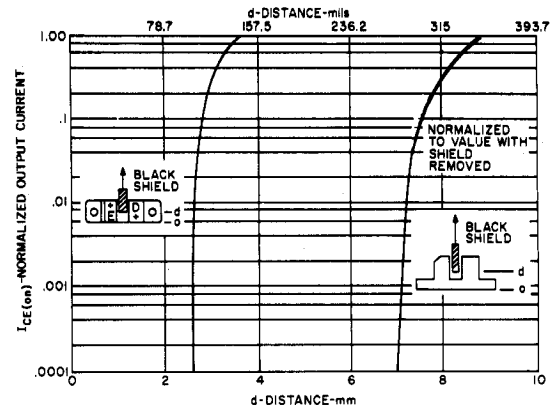
3. $V_{CE(sat)}$ VS. TEMPERATURE



4. LEAKAGE CURRENTS VS. TEMPERATURE



5. SWITCHING SPEED VS. R_L



6. OUTPUT CURRENT VS. SHIELD DISTANCE