

# H74C1, H74C2 Optoisolator GaAs Infrared Emitting Diode and Light Activated SCR TTL Interface



The H74C1 and H74C2 are gallium arsenide infrared emitting diodes coupled with light activated silicon controlled rectifiers. They are specifically designed to operate from TTL logic inputs and allow control of 120 or 240V AC power with 7400, 74H00 and 74S00 series logic gates. It can also control up to 400V DC power circuits. They are guaranteed and specified to operate over TTL voltage and temperature ranges using standard tolerance components. The H74C1 and H74C2 are mounted in dual in-line packages. These devices are also available in surface-mount packaging.



| SYMBOL | MILLIMETERS |      | INCHES |      | NOTES |
|--------|-------------|------|--------|------|-------|
|        | MIN         | MAX  | MIN    | MAX  |       |
| A      | 5.33        | 8.29 | .330   | .350 |       |
| B      | 7.62        | REF  | .300   | REF  | 1     |
| C      | 4.06        | 8.54 | .160   | .340 | 2     |
| D      | 4.06        | 5.05 | .160   | .200 | 2     |
| E      | 1.31        | 1.78 | .040   | .070 |       |
| F      | 1.25        | 2.80 | .090   | .110 |       |
| G      | 2.54        | 2.16 | .100   | .085 | 4     |
| H      | 1.03        | .305 | .000   | .012 |       |
| I      | 2.54        |      | .100   |      |       |
| J      |             | 15   |        | 15   |       |
| K      | 3.81        |      | .150   |      |       |
| L      |             | 9.53 |        | .375 |       |
| M      | 2.92        | 3.43 | .115   | .135 |       |
| N      | 6.10        | 6.86 | .240   | .270 |       |

NOTES  
 1. INSTALLED POSITION LEAD CENTERS  
 2. GENERAL INSTALLED DIMENSION  
 3. THESE MEASUREMENTS ARE MADE FROM THE SEATING PLANE 4. FOUR PLACES

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

| INFRARED EMITTING DIODE                         |                 |
|---|-----------------|
| Power Dissipation                               | *100 milliwatts |
| Forward Current (Continuous)                    | 60 milliamps    |
| Forward Current<br>(Peak 100µsec 1% duty cycle) | 1 ampere        |
| Reverse Voltage                                 | 6 volts         |

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

| PHOTO - SCR                                      |         |            |
|--|---------|------------|
| Peak Forward Voltage                             |         |            |
| H74C1  | 200     | volts      |
| H74C2  | 400     | volts      |
| RMS Forward Current                              | 300     | milliamps  |
| Forward Current<br>(Peak, 100µsec 1% duty cycle) | 10      | amperes    |
| Surge Current (10 msec)                          | 5       | amperes    |
| Reverse Gate Voltage                             | 6       | volts      |
| Power Dissipation (25°C Ambient)                 | ** 400  | milliwatts |
| Power Dissipation (25°C Case)                    | ***1000 | milliwatts |

\*\*Derate 5.3 mW/°C above 25°C ambient.  
 \*\*\*Derate 13.3 mW/°C above 25°C case.

## electrical characteristics of H74C

\*All specifications refer to the following bias configuration (Figure 1) over the full operating temperature (0°C to 70°C) and logic supply voltage range (4.5 to 5.5V<sub>DC</sub>) unless otherwise noted.

|  |     |              |
|--|-----|--------------|
| SCR Leakage, Logic Gate V <sub>OUT(1)</sub> , Both Directions                      | 50  | µA Max.      |
| SCR Drop, Anode Positive, Logic Gate V <sub>OUT(0)</sub> , I <sub>TM</sub> = 250mA | 1.3 | V Max.       |
| Coupled dv/dt to Trigger, V <sub>DC</sub> to V <sub>AC</sub> (25°C)                | 500 | V/µsec. Min. |
| Capacitance (Input to Output Voltage = 0, f = 1 MHz)                               | 2   | pF Max.      |
| Isolation Resistance (Input to Output Voltage = 500V <sub>DC</sub> )               | 100 | Gigohms Min. |
| Turn-On Time of SCR: V <sub>OUT(0)</sub> , Input to Output (25°C)                  | 200 | µsec. Max.   |

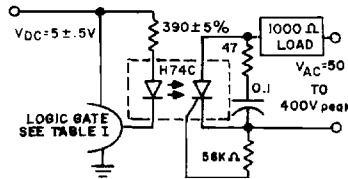


Figure 1. H74C BIAS CIRCUIT

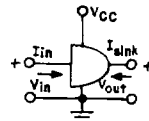


Figure 2.

Covered under U.L. component recognition program, reference file E51868

VDE Approved to 0883;6.80 0110b Certificate # 35025, except type H74C2.

H74C1, H74C2

absolute maximum ratings—total device

|  |                                    |
|--|------------------------------------|
| SCR Current                                      | See Figure 5                       |
| Operating Temperature Range                      | 0°C to 70°C                        |
| Operating Voltage Range, $V_{DC}$                | 4.5 to 5.5 $V_{DC}$                |
| Operating Voltage Range, H74C1                   | 50 to 200 $V_{pk}$                 |
| Operating Voltage Range, H74C2                   | 50 to 400 $V_{pk}$                 |
| Storage Temperature Range                        | -55°C to 150°C                     |
| Lead Soldering Time (at 260°C)                   | 10 sec. Max.                       |
| Surge Isolation Voltage (Input to Output)        |                                    |
|  | 3535 $V_{(peak)}$ 2500 $V_{(RMS)}$ |
| Steady-State Isolation Voltage (Input to Output) |                                    |
|  | 3180 $V_{(peak)}$ 2250 $V_{(RMS)}$ |

TABLE 1. Characteristics required of TTL gate which is to be interfaced with H74C.

| PARAMETER    | TEST CONDITIONS, FIGURE 2 |               |               |               | LIMITS          |                 |      |      |       |
|--------------|---------------------------|---------------|---------------|---------------|-----------------|-----------------|------|------|-------|
|              | $V_{CC}$ MIN.             | $V_{CC}$ MAX. | $I_{IN}$ MIN. | $I_{IN}$ MAX. | $I_{SINK}$ MIN. | $I_{SINK}$ MAX. | MIN. | MAX. | UNITS |
| $V_{OUT(1)}$ | 4.5V                      |               |               |               |                 | -0.4mA          | 2.4  |      | Volts |
| $V_{OUT(0)}$ | 4.5V                      |               |               |               | 12.0mA          |                 |      | 0.4  | Volts |

TYPICAL CHARACTERISTICS OF OUTPUT (SCR)

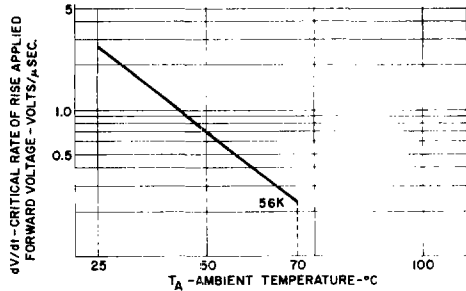


FIGURE 2.  $dv/dt$  VS. TEMPERATURE

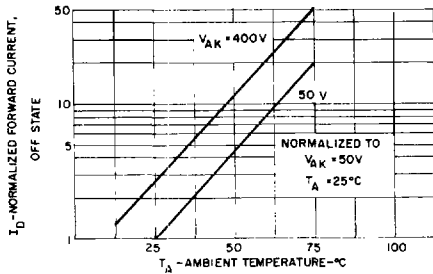


FIGURE 4. OFF-STATE FORWARD CURRENT VS. TEMPERATURE

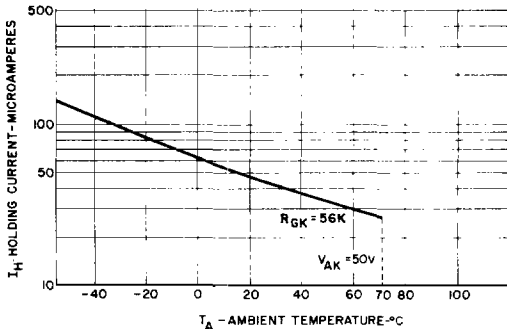


FIGURE 6. HOLDING CURRENT VS. TEMPERATURE

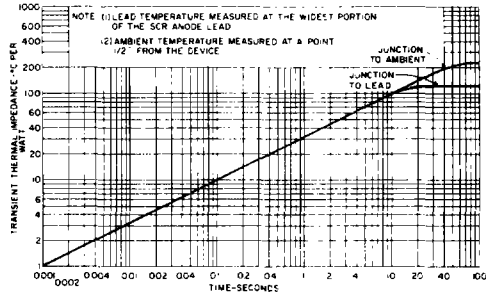


FIGURE 3. MAXIMUM TRANSIENT THERMAL IMPEDANCE

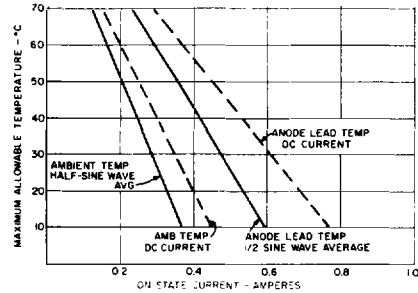


FIGURE 5. ON-STATE CURRENT VS. MAXIMUM ALLOWABLE TEMPERATURE

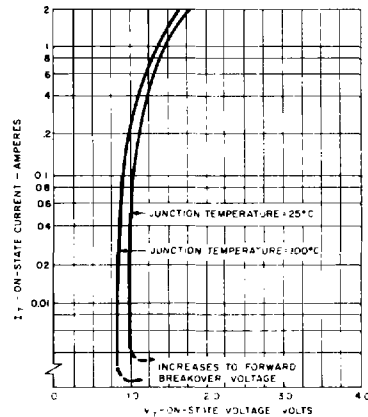


FIGURE 7. ON-STATE CHARACTERISTICS

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