# Dual Optically-Coupled Isolator

# ILD-74

Optoelectronic Products



## General Description

The ILD-74 comprises two distinct optoisolators with transistor output, in a single 8-pin dual in-line package. Each channel consists of a GaAs emitter optically coupled to a phototransistor.

**High Current Transfer Ratio**
**1500 V Minimum Isolation Input-to-Output**
**$10^{11}$ Ω Isolation Resistance**
**Low Coupling Capacitance—Typically 0.5 pF**
**I/O Compatible With Integrated Circuits**
**Two Packages Fit Into a Standard 16-Pin DIP Socket**

## Absolute Maximum Ratings

**Maximum Temperature**

| | |
|---|---|
| Storage Temperature | −55°C to +150°C |
| Operating Temperature | −55°C to +100°C |
| Pin Temperature (Soldering, 7 s) | 260°C |
| Total Package Power Dissipation at $T_A$ = 25°C | 400 mW |
| Derate Linearly from 25°C | 5.33 mW/°C |

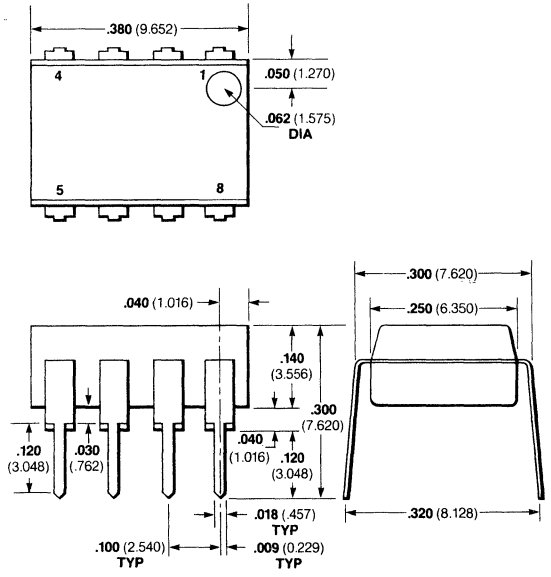
**Input Diode (Each Channel)**

| | | |
|---|---|---|
| $V_R$ | Reverse Voltage | 3.0 V |
| $I_F$ | Forward dc Current | 100 mA |
| $I_{pk}$ | Peak Forward Current at 1 μs pulse, 300 pps | 3.0 A |
| $P_D$ | Power Dissipation at $T_A$ = 25°C | 150 mW |
| | Derate Linearly from 50°C | 1.33 mW/°C |

**Output Transistor (Each Channel)**

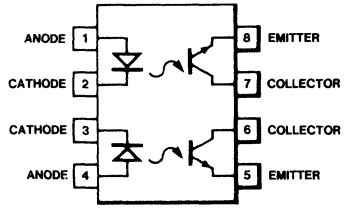
| | | |
|---|---|---|
| $V_{CE}$ | Collector-to-Emitter Voltage | 20 V |
| $V_{EC}$ | Emitter-to-Collector Voltage | 6.0 V |
| $P_D$ | Power Dissipation at $T_A$ = 25°C | 150 mW |
| | Derate Linearly from 25°C | 2.0 mW/°C |
| $I_C$ | Collector Current | 30 mA |

## Package Outline




**Notes**
All dimensions in inches **bold** and millimeters (parentheses)
Tolerance unless specified = ±.015 (±.381)
Package weight is 0.4 gram

## Connection Diagram
## DIP (Top View)




| Pin | | |
|---|---|---|
| 1 | Anode | Channel #1 |
| 2 | Cathode | |
| 3 | Cathode | Channel #2 |
| 4 | Anode | |
| 5 | Emitter | Channel #2 |
| 6 | Collector | |
| 7 | Collector | Channel #1 |
| 8 | Emitter | |

# Typical Electrical Characteristics

# ILD-74

**Electrical Characteristics—Input Diode** $T_A = 25°C$

| Symbol | Characteristic | Min | Typ | Max | Units | Test Conditions |
|---|---|---|---|---|---|---|
| $V_F$ | Forward Voltage | | 1.3 | | V | $I_F = 60$ mA |
| $V_R$ | Reverse Voltage | | 3.0 | | V | $I_R = 100\ \mu A$ |
| $C_J$ | Junction Capacitance | | 100 | | pF | $V_F = 0$ V |

**Electrical Characteristics—Output Transistor** $T_A = 25°C$

| Symbol | Characteristic | Min | Typ | Max | Units | Test Conditions |
|---|---|---|---|---|---|---|
| $V_{CEO}$ | Collector-to-Emitter Voltage | 20 | | | V | $I_C = 1.0$ mA, $I_F = 0$ |
| $I_{CEO}$ | Collector-to-Emitter Leakage Current | | 5.0 | 500 | nA | $V_{CE} = 5.0$ V, $I_F = 0$ |
| $C_{CE}$ | Collector-to-Emitter Capacitance | | 2.0 | | pF | $V_{CE} = 0$ |

**Electrical Characteristics—Coupled** $T_A = 25°C$

| Symbol | Characteristic | Min | Typ | Max | Units | Test Conditions |
|---|---|---|---|---|---|---|
| $V_{IO}$ | Input-to-Output Voltage | 1500 | | | V | |
| $V_{CE(sat)}$ | Collector-to-Emitter Saturation Voltage | | | 0.5 | V | $I_C = 2.0$ mA, $I_F = 16$ mA |
| $I_C/I_F(CTR)$ | Collector Current Transfer Ratio (Note 1) | 12.5 | 35 | | % | $V_{CE} = 5.0$ V, $I_F = 16$ mA |
| $R_{IO}$ | Input-to-Output Resistance | | $10^{14}$ | | Ω | $V_{IO} = 500$ V |
| $C_{IO}$ | Input-to-Output Capacitance | | 0.5 | | pF | f = 1.0 MHz |
| $t_{D(on)}$ | Propagation Delay Times | | 6.0 | | μs | $V_{CE} = 5.0$ V, $I_F = 16$ mA |
| $t_{D(off)}$ | | | 25 | | μs | $R_L = 2.4$ kΩ |

**Notes**

1. Collector current transfer ratio is defined as the ratio of the collector current to the forward bias input current.
2. Rise time is defined as the time for the collector current to rise from 10% to 90% of peak value. Fall time is defined as the time required for the current to decrease from 90% to 10% of peak value.