# SIEMENS

# QUAD CHANNEL ILQ3
# PHOTOTRANSISTOR OPTOCOUPLER

**FEATURES**

- **Current Transfer Ratio at IF=1.6 mA, 300% Min.**
- **High Collector-Emitter Voltage**
- **$BV_{CEO}$=50 V**
- **Field-Effect Stable by TRansparent IOn Shield (TRIOS)**
- **Double Molded Package Offers Isolation Test Voltage 5300 $VAC_{RMS}$, 1 sec.**
- **Underwriters Lab File #E52744**
- **VDE 0884 Available with Option 1**

**Maximum Ratings** (Each Channel)

**Emitter**

Reverse Voltage ..... 6 V
Continuous Forward Current ..... 60 mA
Surge Current ..... 2.5 A
Power Dissipation ..... 100 mW
Derate Linearly from 25°C ..... 1.3 mW/°C

**Detector**

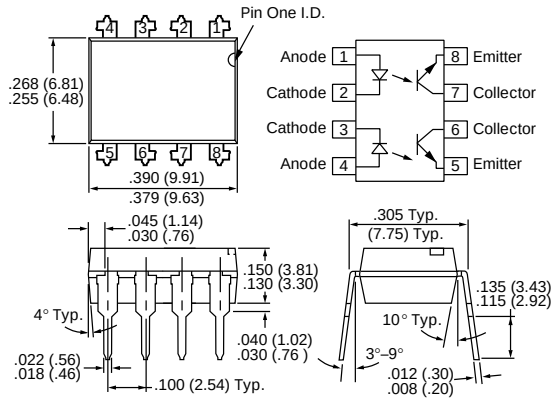
Collector-Emitter Reverse Voltage ..... 50 V
Collector Current ..... 50 mA
Collector Current (t<1 ms) ..... 400 mA
Total Power Dissipation ..... 200 mW
Derate Linearly from 25°C ..... 2.6 mW/°C

**Package**

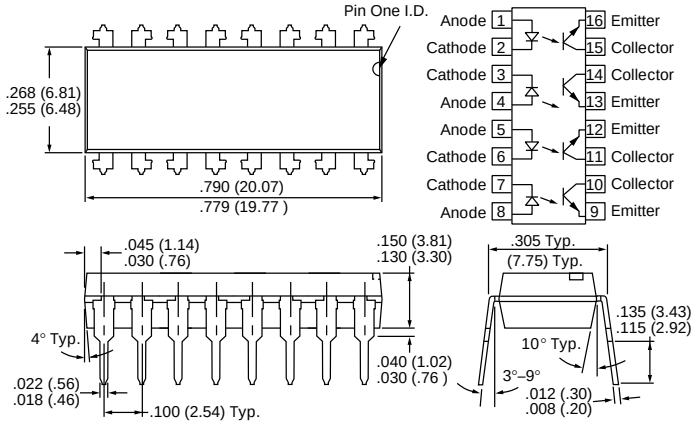
Isolation Test Voltage (between emitter and detector, refer to standard climate 23°C/50% RH, DIN50014) ..... $V_{IO}$=5300 $VAC_{RMS}$
Creepage ..... min. 7 mm
Clearance ..... min. 7 mm
Isolation Resistance
$V_{IO}$=500 V, $T_A$=25°C ..... $R_{IO}=10^{12}\ \Omega$
$V_{IO}$=500 V, $T_A$=100°C ..... $R_{IO}=10^{11}\ \Omega$
Power Dissipation ..... 250 mW
Derate Linearly from 25°C ..... 3.3 mW/°C
Storage Temperature Range ..... –40 to +150°C
Operating Temperature Range ..... –40 to +100°C
Junction Temperature ..... 100°C
Soldering Temperature, 2 mm from case bottom. ..... 260°C

Package Dimensions in Inches (mm)

**ILD3—Dual Channel**




**ILQ3—Quad Channel**




**DESCRIPTION**

The ILD/Q3 are optically coupled isolated pairs employing GaAs infrared LEDs and silicon NPN phototransistor. Signal information, including a DC level, can be transmitted by the drive while maintaining a high degree of electrical isolation between input and output. The ILD/Q3 are especially designed for driving medium-speed logic and can be used to eliminate troublesome ground loop and noise problems. Also these couplers can be used to replace relays and transformers in many digital interface applications such as CRT modulation. The ILD3 has two isolated channels in a single DIP package and the ILQ3 has four isolated channels per package.

See Appnote 45, *"How to Use Optocoupler Normalized Curves."*

**Characteristics**

| Emitter (IR GaAs) | Symbol | Min. | Typ. | Max. | Unit | Test Condition |
|---|---|---|---|---|---|---|
| Forward Voltage | $V_F$ | | 1.25 | 1.65 | V | $I_F$=60 mA |
| Reverse Current | $I_R$ | | 0.01 | 10 | µA | $V_R$=6 V |
| Capacitance | $C_0$ | | 25 | | pF | $V_R$=0 V, f=1 MHz |
| Thermal Resistance, Junction to Lead | $R_{THJL}$ | | 750 | | °C/W | |
| **Detector** | | | | | | |
| Collector-Emitter Leakage Current | $I_{CEO}$ | | 5 | 70 | nA | $V_{CE}$=15 V |
| Capacitance | $C_{CE}$ | | 6.8 | | pF | $V_{CE}$=5 V, f=1 MHz |
| Thermal Resistance, Junction to Lead | $R_{THJL}$ | | 500 | | °C/W | |
| **Package Transfer Characteristics (Each Channel)** | | | | | | |
| Saturated Current Transfer Ratio, ILD/Q3-1 | $CTR_{SAT}$ | 300 | | | % | $I_F$=1.6 mA, $V_{CE}$=0.4 V |
| Saturated Current Transfer Ratio, ILD/Q3-2 | $CTR_{SAT}$ | 100 | | | % | $I_F$=1.0 mA, $V_{CE}$=0.4 V |
| Common Mode Rejection Output High | CMH | | 5000 | | V/µs | $V_{CM}$=50 $V_{P-P}$, $R_L$=10 kΩ, $I_F$=0 mA |
| Common Mode Rejection Output Low | CML | | 5000 | | V/µs | $V_{CM}$=50 $V_{P-P}$, $R_L$=10 kΩ, $I_F$=0 mA |
| Common Mode Coupling Capacitance | $C_{CM}$ | | 0.01 | | pF | |
| Package Capacitance | $C_{IO}$ | | 0.8 | | pF | $V_{IO}$=0 V, f=1 MHz |