SIEMENS

# ILD205/206/207/211/213/217

## DUAL PHOTOTRANSISTOR SMALL OUTLINE SURFACE MOUNT OPTOCOUPLER

### FEATURES

- **Two Channel Coupler**
- **Industry Standard SOIC-8 Surface Mountable Package**
- **Standard Lead Spacing of .05"**
- **Available in Tape and Reel Option (Conforms to EIA Standard 481-2)**
- **Isolation Test Voltage, 2500 VRMS**
- **High Current Transfer Ratios**
  **ILD205, 40 – 80%**
  **ILD206, 63 –125%**
  **ILD207, 100 – 200%**
  **ILD211, 20% Minimum**
  **ILD213, 100% Minimum**
  **ILD217, 100% Minimum at 1 mA**
- **High BVCEO, 70 V**
- **Compatible with Dual Wave, Vapor Phase and IR Reflow Soldering**

### DESCRIPTION

The ILD205/206/207/211/213/217 are optically coupled pairs with a gallium arsenide infrared LED and a silicon NPN phototransistor. Signal information, including a DC level, can be transmitted by the device while maintaining a high degree of electrical isolation between input and output. The ILD205/6/7/11/13/17 come in a standard SOIC-8 small outline package for surface mounting which makes it ideally suited for high density applications with limited space. In addition to eliminating through-holes requirements, this package conforms to standards for surface mounted devices.

A specified minimum and maximum CTR allows a narrow tolerance in the electrical design of the adjacent circuits. The high $BV_{CEO}$ of 70 volts gives a higher safety margin compared to the industry standard of 30 volts.

**Maximum Ratings** (Each Channel)

**Emitter**

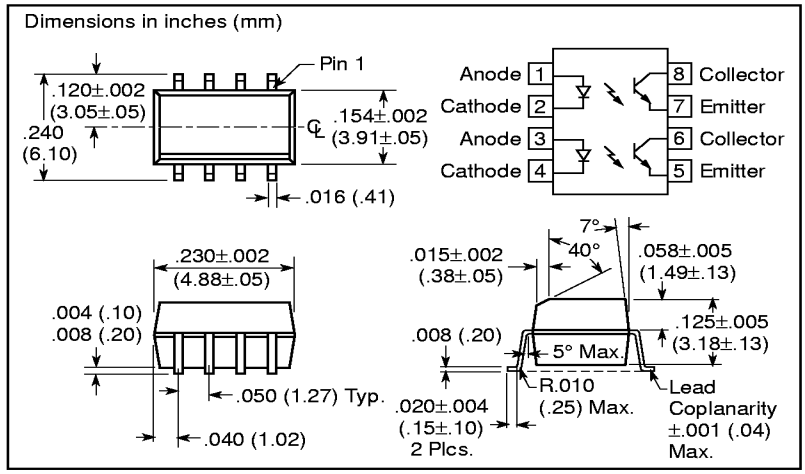
Peak Reverse Voltage .....6.0 V
Peak Pulsed Current (1 µs, 300 pps) .....1 A
Continuous Forward Current per Channel ....30 mA
Power Dissipation at 25°C.....45 mW
Derate Linearly from 25°C.....0.5 mW/°C

**Detector**

Collector-Emitter Breakdown Voltage.....70 V
Emitter-Collector Breakdown Voltage.....7 V
Power Dissipation per Channel.....55 mW
Derate Linearly from 25°C.....0.55 mW/°C

**Package**

Total Package Dissipation at 25°C Ambient
(2 LEDs + 2 Detectors, 2 Channels).....200 mW
Derate Linearly from 25°C.....2.0 mW/°C
Storage Temperature –55°C..... to +150°C
Operating Temperature –55°C ..... to +100°C
Soldering Time at 260°C ..... 10 sec.




**Characteristics** ($T_A$=25°C)

| Parameter | Min. | Typ | Max. | Unit | Test Condition |
|---|---|---|---|---|---|
| **Emitter** | | | | | |
| Forward Voltage | | 1.2 | 1.55 | V | $I_F$=10 mA |
| Reverse Current | | 0.1 | 100 | mA | $V_R$=6.0 V |
| Capacitance | | 25 | | pF | $V_R$=0 |
| **Detector** | | | | | |
| $BV_{CEO}$ | 70 | | | V | $I_C$=10 mA |
| $BV_{ECO}$ | 7 | | | V | $I_E$=10 mA |
| $I_{CEO}$ | | 5 | 50 | nA | $V_{CE}$=10 V, $I_F$=0 |
| Collector-Emitter Capacitance | | 10 | | pF | $V_{CE}$=0 |
| **Package** | | | | | |
| DC Current Transfer | | | | | $V_{CE}$=5 V |
| ILD205 | 40 | | 80 | % | $I_F$=10 mA |
| ILD206 | 63 | | 125 | % | $I_F$=10 mA |
| ILD207 | 100 | | 200 | % | $I_F$=10 mA |
| ILD211 | 20 | | | | $I_F$=10 mA |
| ILD213 | 100 | | | % | $I_F$=10 mA |
| ILD205 | 13 | 30 | | % | $I_F$=1 mA |
| ILD206 | 22 | 45 | | % | $I_F$=1 mA |
| ILD207 | 34 | 70 | | % | $I_F$=1 mA |
| ILD217 | 100 | 130 | | % | $I_F$=1 mA |
| Collector-Emitter Saturation Voltage $V_{CE\ (sat)}$ | | | 0.4 | V | $I_F$=10 mA, $I_F$=2.5 mA |
| Capacitance, Input to Output | | 0.5 | | pF | |
| Isolation Test Voltage | 2500 | | | $VAC_{RMS}$ | t=1 min. |
| Resistance, Input to Output | | 100 | | GΩ | |
| Turn-on Time | | 5.0 | | µs | $I_C$=2 mA, $R_E$= 100 Ω, $V_{CE}$=5 V |
| Turn-off Time | | 4.0 | | µs | |

**AUGUST 1995**

**Figure 1. Forward current versus forward voltage**

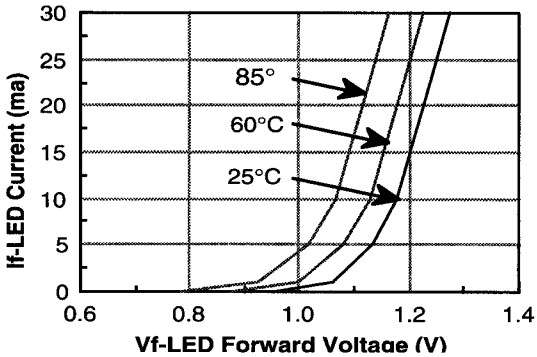



**Figure 2. Collector-emitter current versus temperature**

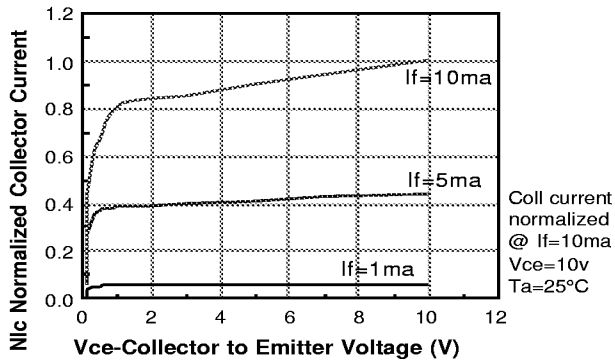



**Figure 3. Normalized CTRce versus forward current**

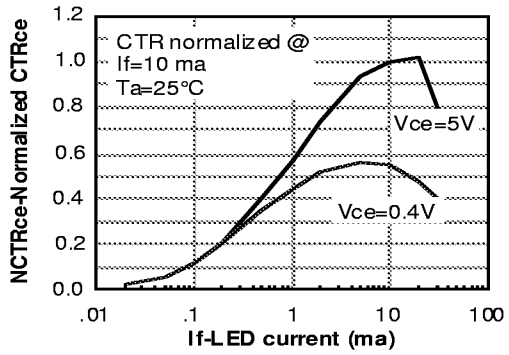



**Figure 4. CTR (normalized) versus temperature**

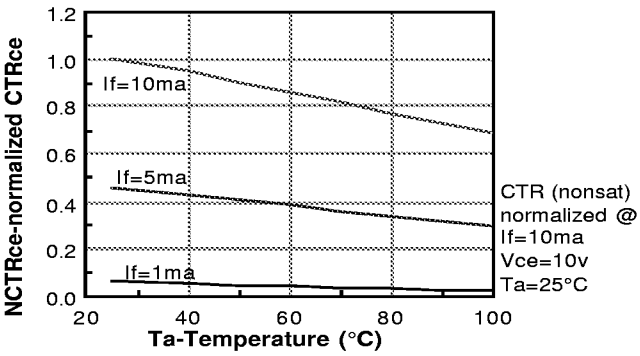



**Figure 5. Switching speed versus load resistor**

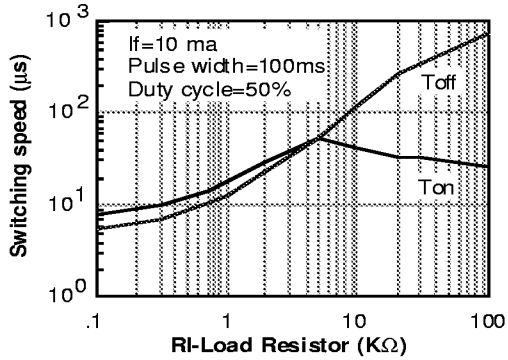



**Figure 6. Collector current versus temperature**

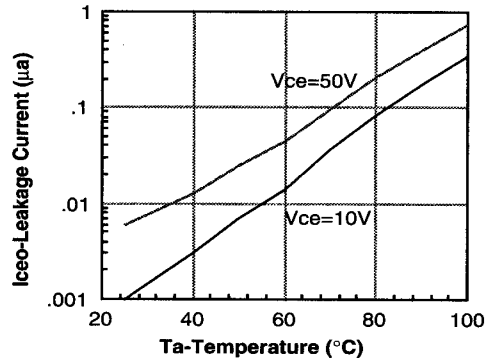



**Figure 7. Power dissipation versus ambient temperature**

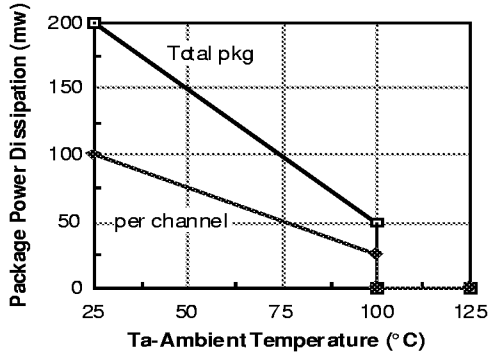



**Figure 8. Switching time test schematic and waveform**