# SIEMENS

# IL55B
## PHOTODARLINGTON OPTOCOUPLER

### FEATURES
- **High Collector-Emitter Breakdown Voltage—80 V minimum**
- **High Isolation Resistance, 1011 W Typical**
- **Standard Plastic DIP Package**
- **Underwriters Lab File #E52744**
- **VDE 0884 Available with Option 1**

### DESCRIPTION

The IL55B is an optically coupled isolator with a Gallium Arsenide infrared LED and a silicon photodarlington sensor. Switching can be achieved while maintaining a high degree of isolation between driving and load circuits. These optocouplers can be used to replace reed and mercury relays with advantages of long life, high speed switching and elimination of magnetic fields.

### Maximum Ratings

**Emitter**

Peak Reverse Voltage ..... 3 V
Continuous Forward Current ..... 60 mA
Power Dissipation at 25°C ..... 100 mW
Derate Linearly from 55°C ..... 1.33 mW/°C

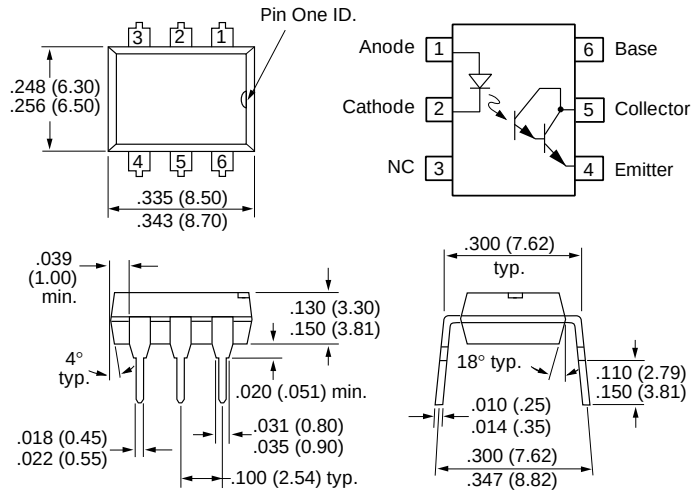
**Detector**

Collector-Emitter Breakdown Voltage, $BV_{CEO}$ ..... 80 V
Emitter-Collector Breakdown Voltage $BV_{ECO}$ ..... 5 V
Collector (load) Current ..... 125 mA
Power Dissipation at 25°C Ambient ..... 150 mW
Derate Linearly from 25°C ..... 2.0 mW/°C

**Package**

Total Dissipation at 25°C Ambient ..... 250 mW
Derate Linearly from 25°C ..... 3.3 mW/°C
Isolation Test Voltage (between emitter and detector refered to standard climate 23°C/50%RH, DIN 50014) ..... 5300 $VAC_{RMS}$
Creepage ..... 7 mm min.
Clearance ..... 7 mm min.
Tracking Resitance, Group III (KC>600 per VDE 110 § 6,Table 3 and DIN 53480/VDE 0330, Part 1
Isolation Resistance
$V_{IO}$=500 V, $T_A$=25°C ..... $10^{12}$ Ω
$V_{IO}$=500 V, $T_A$=100°C ..... $10^{11}$ Ω
Storage Temperature ..... –55°C to +150°C
Operating Temperature ..... –55°C to +100°C
Lead Soldering Time at 260°C ..... 10 sec.

Package Dimensions in Inches (mm)




**Electrical Characteristics** ($T_A$=25°C)

| Parameter | Min. | Typ. | Max. | Unit | Condition |
|---|---|---|---|---|---|
| **Emitter** | | | | | |
| Forward Voltage* | | 1.25 | 1.5 | V | $I_F$=50 mA |
| Reverse Current* | | 0.1 | 10 | µA | $V_R$=3.0 V |
| Capacitance | | 25 | | pF | $V_R$=0 V |
| **Detector** | | | | | |
| $BV_{CEO}$ | 80 | | | V | $I_C$=1 mA, $I_F$=0 |
| $BV_{ECO}$ | 5 | 10 | | V | $I_E$=100 µA, $I_F$=0 |
| $I_{CEO}$ | | | 1 | µA | $V_{CE}$=60 V, $I_F$=0 |
| **Package** | | | | | |
| Current Transfer Ratio | 500 | | | % | $I_F$=10 mA $V_{CE}$ =1.5 V |
| Coupling Capacitance | | 1.5 | | pF | |
| Turn-On Time | | 5 | | µs | $V_{CC}$=10 V |
| Turn -Off Time | | 100 | | µs | $I_F$=5 mA $R_L$=100 Ω |

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

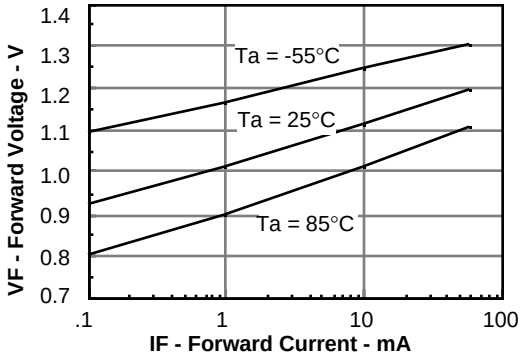



**Figure 2. Normalized non-saturated and saturated CTRce at $T_A$=25°C versus LED current**

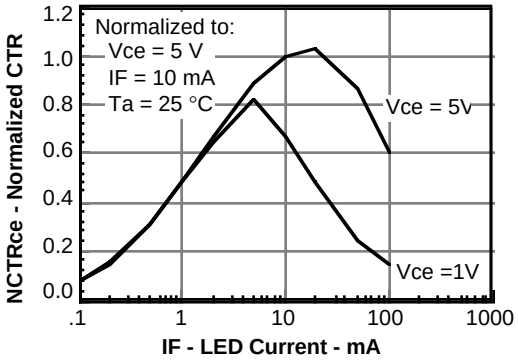



**Figure 3. Normalized non-saturated and saturated collector-emitter current versus LED current**

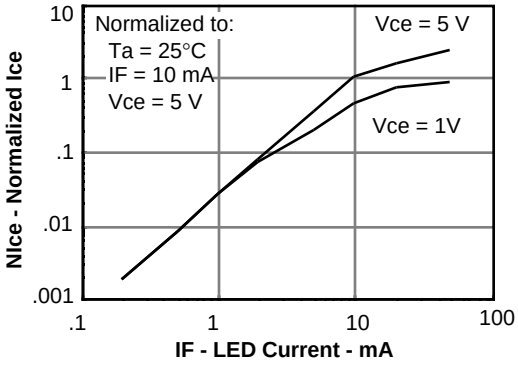



**Figure 4. Low to high propagation delay versus collector load resistance and LED current**

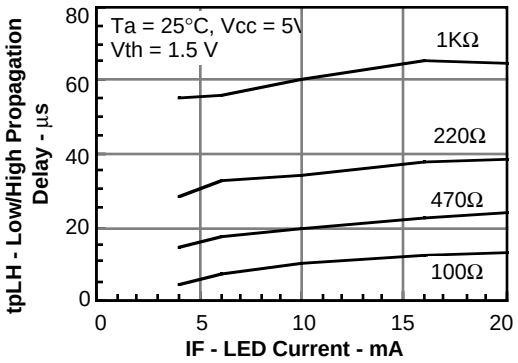



**Figure 5. High to low propagation delay verus collector load resistance and LED current**

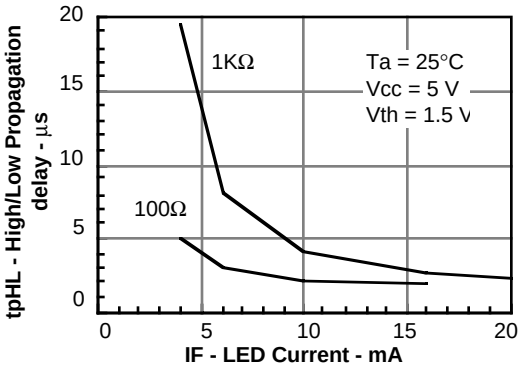



**Figure 6. Switching waveforms**

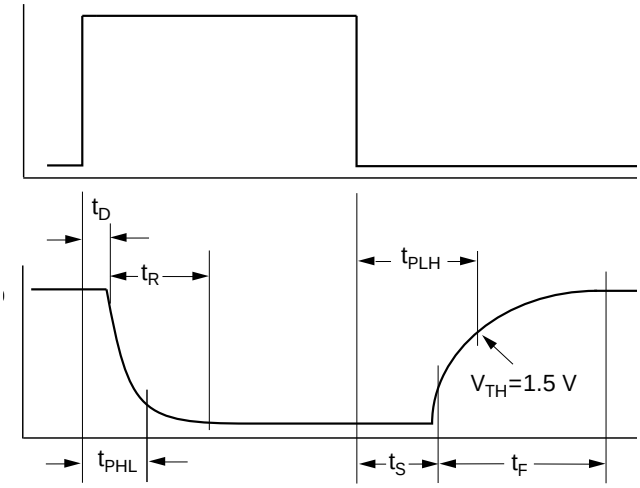



**Figure 7. Switching schematic**