

T-41-83

SIEMENS

SIEMENS AKTIENGESELLSCHAFT

4 LEADS IL8/IL10

6 LEADS IL9/IL11

PHOTOTRANSISTOR
OPTOCOUPLER

FEATURES

- IL8/IL10: Four Leads
- IL9/IL11: Six Leads with Base Contact
- 2.0 mm Min. Internal Separation between Conductive Parts
- 13 mm Min. External Separation of Leads and Creepage Distance
- Standard DIP Profile on Leads and Package
- Machine Insertable on PCB
- Underwriters Lab Approval #E52744
- VDE and IEC Approvals 0700, 0804/1.83, 0860/8.86, IEC601/VDE0750, IEC380/VDE806/8.81, IEC435/VDE805
- VDE Approval #0884 (Optional with Option 1, add -X001 Suffix)

DESCRIPTION

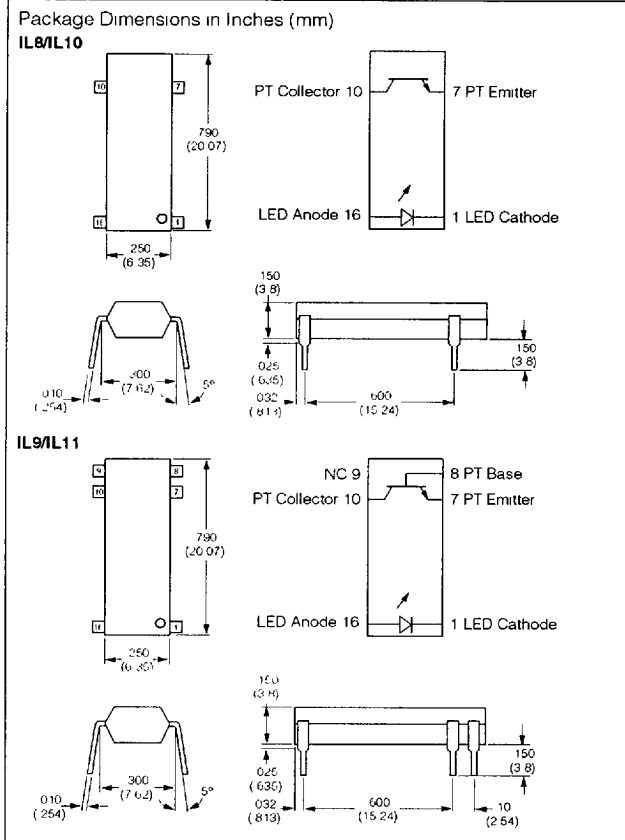
The IL8/IL9/IL10/IL11 are optically coupled isolators consisting of a gallium arsenide infrared emitter and a silicon phototransistor

Maximum Ratings

Emitter
 Reverse Voltage 5.0 V
 Forward DC Current 60 mA
 Peak Forward Current (1 µsec pulse, 300 pps) 3.0
 Power Dissipation 100 mW
 Derate Linearly from 25°C 1.33 mW/°C

Detector
 Collector-Emitter Reverse Voltage 30 V
 Emitter-Base Voltage 7 V
 Collector Current 100 mA
 Power Dissipation at 25°C 300 mW
 Derate Linearly from 25°C 4.0 mW/°C

Package
 Withstand Test Voltage $V_{IO}=5300Vdc$
 Between Emitter and Detector Referred to Standard Climate 23°C/50%RH, DIN 50014
 Leakage Path DIN 57883.6 80 min 8.2 mm
 Air Path, VDE 0883 6 80 min 7.3 mm
 Tracking Resistance, Group III (KC>600 per VDE 110 § 6 Table 3 and DIN 53480/
 VDE 0330, Part 1, $V_{IO}=500V$.. $R_{IO}=10^{11}\Omega$
 Storage Temperature Range -55°C to +150°C
 Operating Temperature Range -55°C to +100°C
 Lead Soldering Time at 260°C (1.6 mm from case) 5 sec



Optocouplers (Optoisolators)

Electrical Characteristics (T_A=25°C)

| Parameter | Symbol | Min. | Typ. | Max. | Unit | Condition |
|----------------------------|-------------|------|-----------------|------|------|--|
| Emitter | | | | | | |
| Forward Voltage | V_F | | | 1.5 | V | $I_F=10\text{ mA}$ |
| Reverse Current | I_R | | | 10 | µA | $V_R=5\text{ V}$ |
| Detector | | | | | | |
| | BV_{CEO} | 30 | | | V | $I_C=1.0\text{ mA}$ |
| | BV_{EBO} | 7 | | | V | $I_E=10\text{ }\mu\text{A}$ |
| | I_{CEO} | | | 50 | nA | $V_{CE}=10\text{ V}$ |
| Package | | | | | | |
| DC Current Transfer Ratio | | | | | | |
| IL8/IL9 | CTR | 20 | | | % | $I_F=10\text{ mA}, V_{CE}=10\text{ V}$ |
| IL10/IL11 | CTR | 50 | | | % | $I_F=10\text{ mA}, V_{CE}=10\text{ V}$ |
| | V_{CEsat} | | | 0.4 | V | $I_F=20\text{ mA}, I_C=2\text{ mA}$ |
| | T_{on} | | 14 | | µs | $I_C=2\text{ mA}, R_E=100\text{ }\Omega$ |
| | T_{off} | | 11 | | µs | 100 µs Pulsewidth, 1% Duty Cycle |
| Input to Output Resistance | | | $10^{10}\Omega$ | | | VDC=500 |

Figure 1. Forward voltage versus forward current

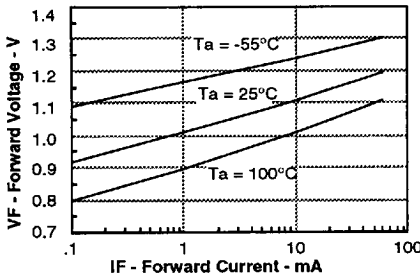


Figure 2. Normalized non-saturated and saturated CTR_{ce} versus LED current

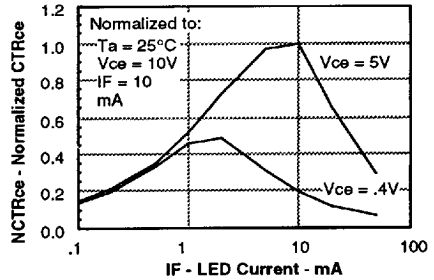


Figure 3. Normalized collector-emitter current versus LED current

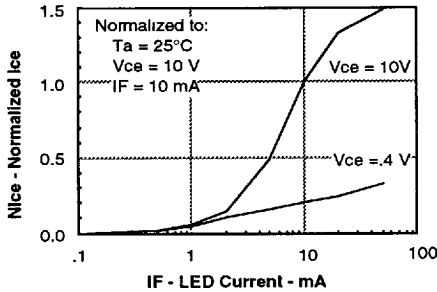


Figure 4. Normalized collector-base photocurrent versus LED current

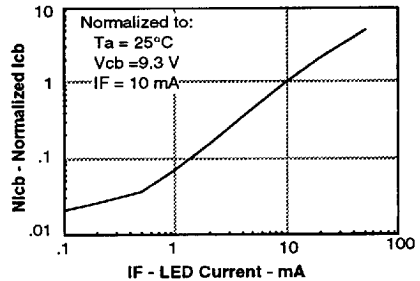


Figure 5. Non-saturated and saturated HFE versus base current

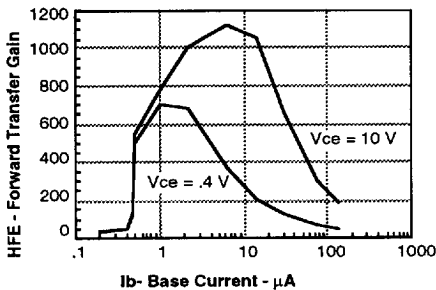


Figure 6. High to low propagation delay versus collector load resistance and LED current

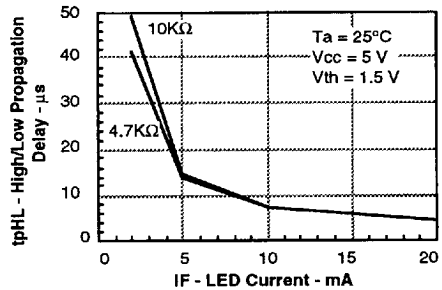


Figure 7. Low to high propagation delay versus collector load resistance and LED current

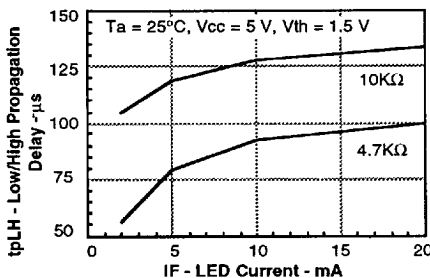


Figure 8. Switching waveform

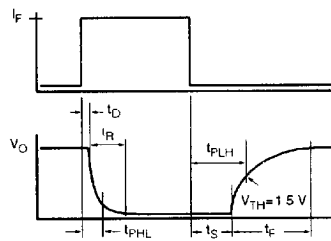


Figure 9. Switching schematic

