IL55B/IL56B/MOC8021

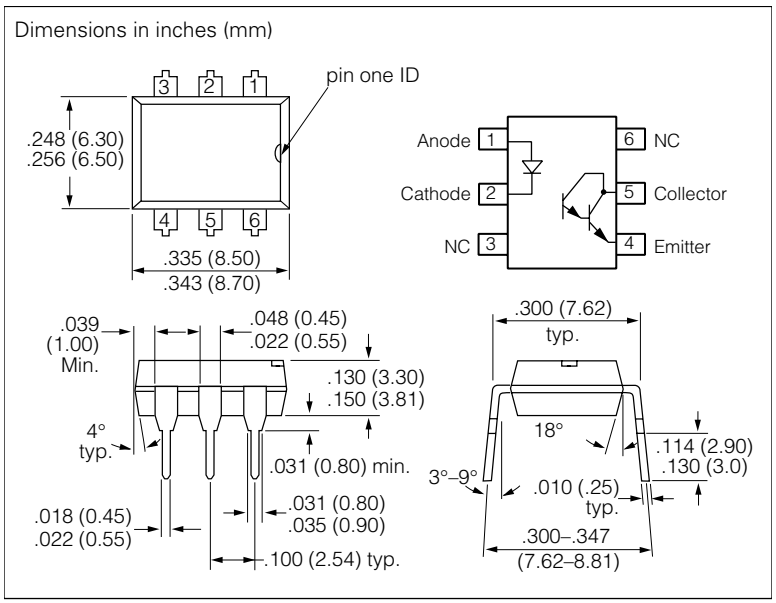
No Base Connection Photodarlington Optocoupler

FEATURES

- **High Collector-Emitter Breakdown Voltage, 80 V minimum**
- **High Isolation Resistance, 10^{11} Ω Typical**
- **Standard Plastic DIP Package**
- **No Base Terminal Connection for Improved Common Mode Interface Immunity**
- **Underwriters Lab File #E52744**
- **VDE Approval #0884 Available with Option 1**

DESCRIPTION

The IL5xB and MOC8021 are optically coupled isolators 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.



ABSOLUTE MAXIMUM RATINGS

T_A=25°C (except where noted)

Emitter

Peak Reverse Voltage ..... 3.0 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} ..... 5.0 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 referred to standard climate 23°C/50%RH, DIN 50014) ..... 5300 V_{RMS}
Creepage ..... ≥7.0 mm
Clearance ..... ≥7.0 mm
Tracking Resistance, 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.

ELECTRICAL CHARACTERISTICS, T_A=25°C (except where noted)

Table 1.

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=1.0 mA, I_F=0
BV_{ECO}	5.0	10	—	V	I_E=100 µA, I_F=0
I_{CEO}	—	—	1.0	µA	V_{CE}=60 V, I_F=0
Package					
Current Transfer Ratio IL55B IL56B/MOC8021	 500 1000	 — —	 — —	 % %	 I_F=10 mA V_{CE} =1.5 V
Coupling Capacitance	—	1.5	—	pF	—
Turn-On Time	—	5.0	—	µs	V_{CC}=10 V
Turn-Off Time	—	100	—	µs	I_F=5.0 mA R_L=100 Ω

Figure 1. Forward Voltage versus Forward Current

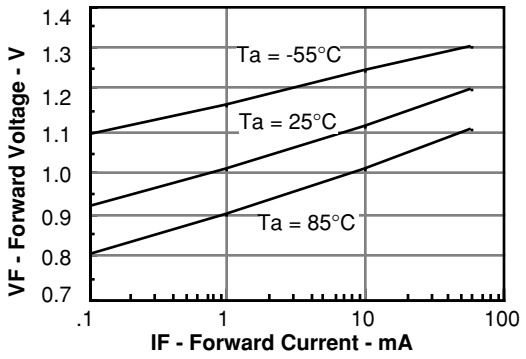


Figure 2. Normalized Non-saturated and Saturated Ctrce At T_A=25°C versus LED Current

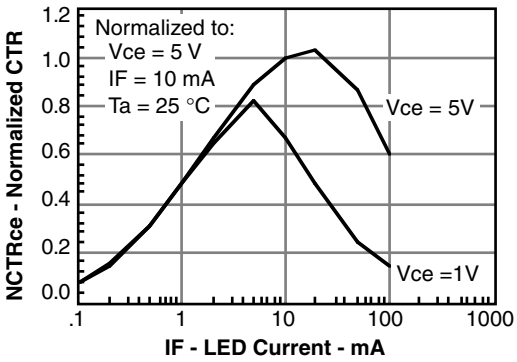


Figure 3. Normalized Non-saturated and Saturated Collector-emitter Current versus LED Current

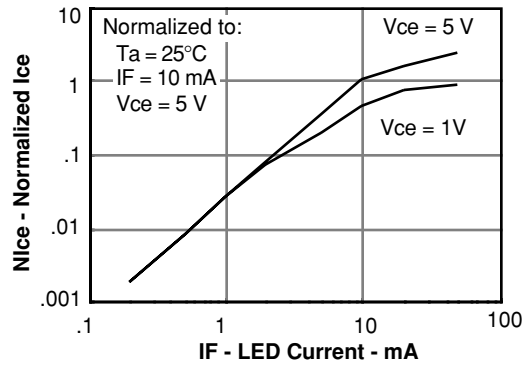


Figure 4. Low to High Propagation Delay versus Collector Load Resistance and LED Current

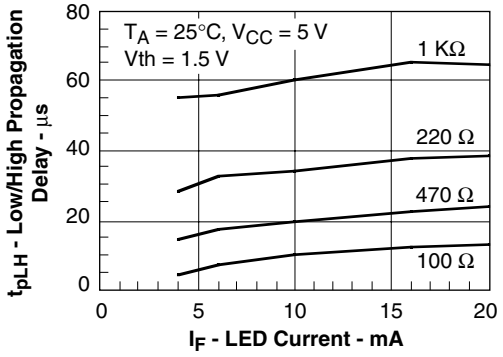


Figure 5. High to Low Propagation Delay versus Collector Load Resistance and LED Current

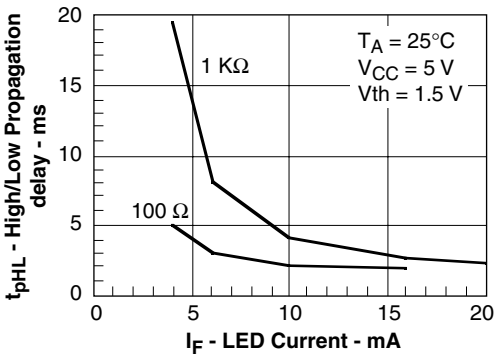


Figure 6. Switching Waveforms

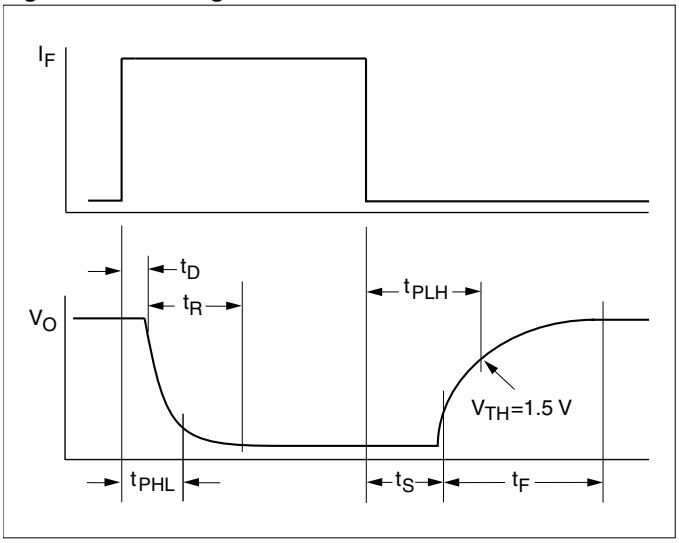


Figure 7. Switching Schematic