DUAL/QUADCHANNEL ILD32/ILQ32

Photodarlington Optocoupler

FEATURES

- **Very High Current Transfer Ratio, 500% Min.**
- **Isolation Test Voltage, 5300 V_{RMS}**
- **High Isolation Resistance, 10^{11} Ω Typical**
- **Low Coupling Capacitance**
- **Standard Plastic DIP Package**
- **Underwriters Lab File #E52744**
- **VDE 0884 Available with Option 1**

Maximum Ratings (Each Channel)

Emitter

Peak Reverse Voltage .... 3.0 V
Continuous Forward Current .... 60 mA
Power Dissipation at 25°C........................... 100 mW
Derate Linearly from 25°C .... 1.33 mW/°C

Detector

Collector-Emitter Breakdown Voltage .... 30 V
Collector (Load) Current.............................. 125 mA
Power Dissipation at 25°C Ambient .... 150 mW
Derate Linearly from 25°C .... 2.0 mW/°C

Package

Isolation Test Voltage (between emitter and detector refer to standard climate 23°C/50%RH, DIN 50014)
t=1.0 sec. .... 5300 V_{RMS}
Creepage .... ≥7.0 mm
Clearance .... ≥7.0 mm
Comparative Tracking Index per DIN IEC 112/VDE303, part 1 .... ≥175
Isolation Resistance
V_{IO}=500V, T_A=25°C .... $R_{IO}=10^{12}$ Ω
V_{IO}=500V, T_A=100°C .... $R_{IO}=10^{11}$ Ω
Total Dissipation at 25°C Ambient
ILD32 .... 400 mW
ILQ32 .... 500 mW
Derate Linearly from 25°C
ILD32 .... 5.33 mW/°C
ILQ32 .... 6.67 mW/°C
Storage Temperature .... –55°C to +150°C
Operating Temperature .... –55°C to +100°C
Lead Soldering Time at 260°C .... 10 sec.

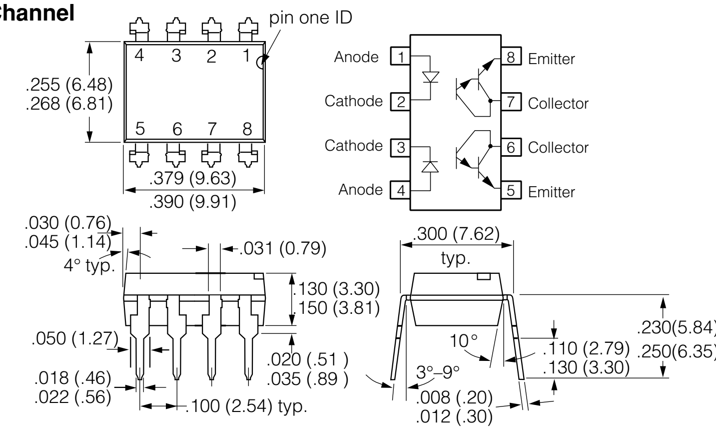
DESCRIPTION

The ILD32/ILQ32 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.

The ILD32 has two isolated channels in a DIP package, and the ILQ32 has four channels. These devices can be used to replace 4N32s or 4N33s in applications calling for several single channel optocouplers on a board.

Dimensions in inches (mm)

Dual Channel



Quad Channel

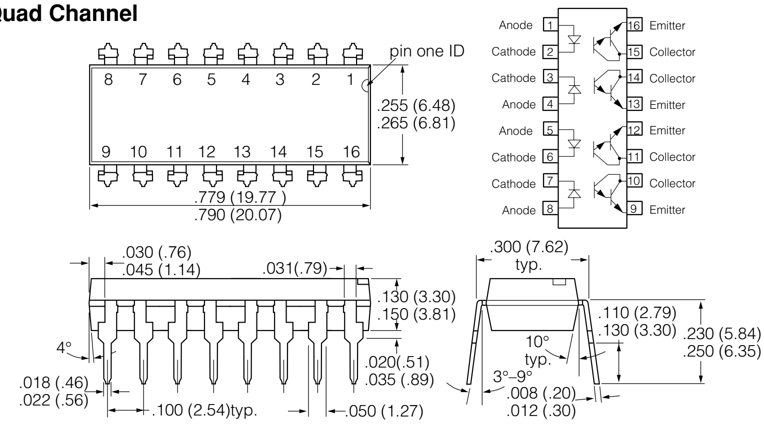


Table 1. Electrical Characteristics, T_A=25°C

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
Emitter						
Forward Voltage	V_F	—	1.25	1.5	V	I_F=10 mA
Reverse Current	I_R	—	0.1	100	µA	V_R=3.0 V
Capacitance	C_O	—	25	—	pF	V_R=0 V
Detector						
Breakdown Voltage Collector-Emitter	BV_{CEO}	30	—	—	V	I_C=100 µA I_F=0
Breakdown Voltage Emitter-Collector	BV_{ECO}	5.0	10	—	V	I_E=100 µA
Collector-Emitter Leakage Current	I_{CEO}	—	1.0	100	nA	V_{CE}=10V I_F=0
Package						
Current Transfer Ratio	CTR	500	—	—	%	I_F=10 mA V_{CE}=10V
Collector Emitter Saturation Voltage	V_{CEsat}	—	—	1.0	V	I_C=2.0 mA I_F=8.0 mA
Isolation Capacitance	C_{ISOL}	—	0.5	—	pF	—
Turn-On Time	t_{on}	—	15	—	µs	V_{CC}=10 V I_F=5.0 mA R_L=100 Ω
Turn-Off Time	t_{off}	—	30	—	µs	

Figure 1. Forward voltage versus forward current

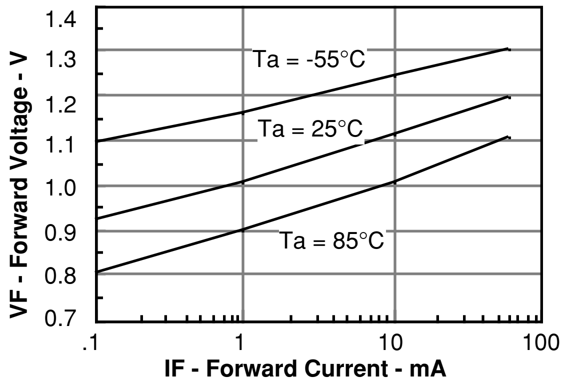


Figure 2. Normalized non-saturated and saturated CTR_{ce} at T_A=25°C versus LED current

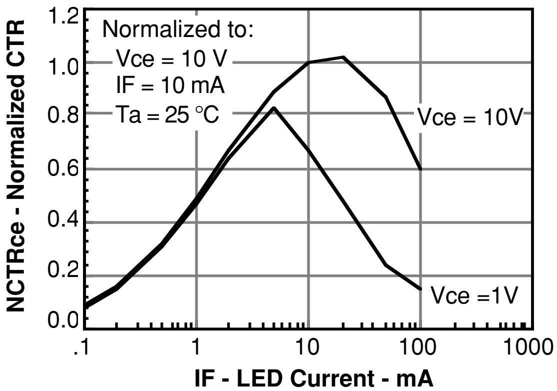


Figure 3. Normalized non-saturated and saturated collector-emitter current versus LED current

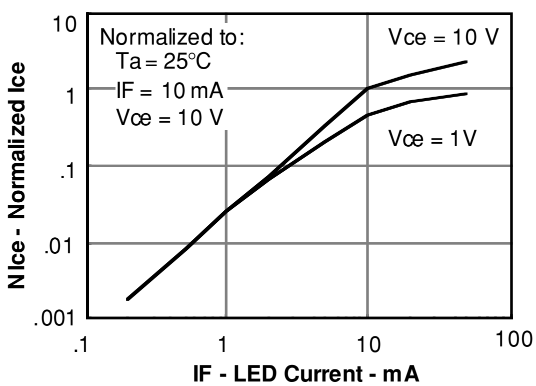


Figure 4. Low to high propagation delay versus collector load resistance and LED current

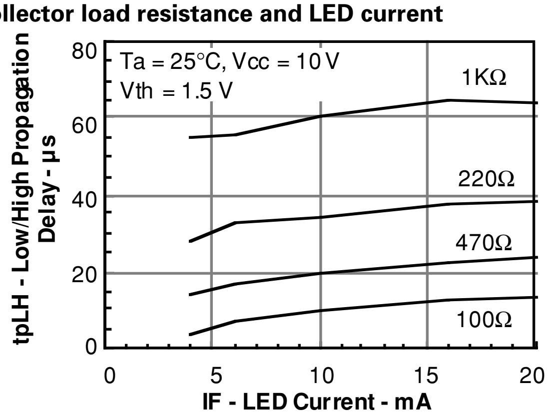


Figure 5. High to low propagation delay versus collector load resistamce and LED current

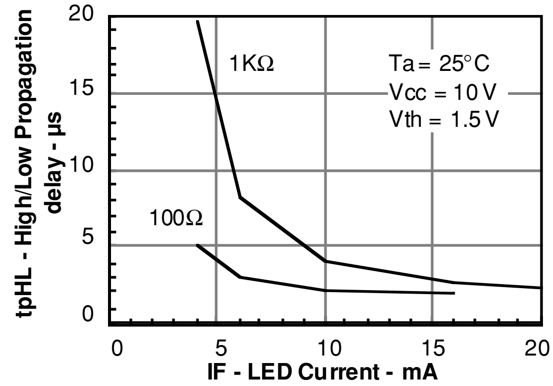


Figure 6. Switching timing

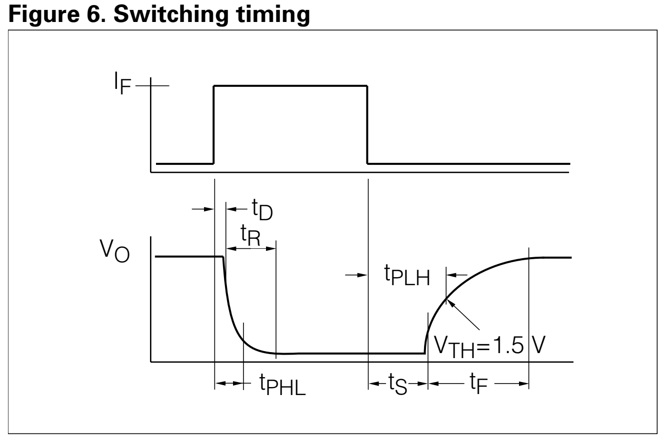


Figure 7. Switching schematic