



SINGLE CHANNEL IL66 DUAL CHANNEL ILD66 QUAD CHANNEL ILQ66 Photodarlington Optocoupler

FEATURES

- **Internal RBE for High Stability**
- **Current Transfer Ratio is Tested at 2.0 mA and 0.7 mA Input**
IL/ILD/ILQ66 Series:
 - 1, 100% min. at $I_F=2.0$ mA, $V_{CE}=10$ V
 - 2, 300% min. at $I_F=2.0$ mA, $V_{CE}=10$ V
 - 3, 400% min. at $I_F=0.7$ mA, $V_{CE}=10$ V
 - 4, 500% min. at $I_F=2.0$ mA, $V_{CE}=5.0$ V
- **Four Available CTR Categories per Package Type**
- **$BV_{CEO}>60$ V**
- **Standard DIP Packages**
- **Underwriters Lab File #E52744**
- **VDE 0884 Available with Option 1**

DESCRIPTION

IL66, ILD66, and ILQ66 are optically coupled isolators employing Gallium Arsenide infrared emitters and silicon photodarlington detectors. Switching can be accomplished while maintaining a high degree of isolation between driving and load circuits, with no crosstalk between channels.

Maximum Ratings

Emitter Each Channel

Peak Reverse Voltage 6.0 V
 Continuous Forward Current 60 mA
 Power Dissipation at 25°C 100 mW
 Derate Linearly from 25°C 1.33 mW/°C

Detector (Each Channel)

Power Dissipation at 25°C Ambient 150 mW
 Derate Linearly from 25°C 2.0 mW/°C

Package

Isolation Test Voltage (t=1.0 sec.) 5300 V_{RMS}
 Total Package Power Dissipation at 25°C

IL66 250 mW
 ILD66 400 mW
 ILQ66 500 mW

Derate Linearly from 25°C

IL66 3.3 mW/°C
 ILD66 5.33 mW/°C
 ILQ66 6.67 mW/°C

Creepage ≥ 7 min
 Clearance ≥ 7 min
 Comparative Tracking Index 175

Isolation Resistance

$V_{IO}=500$ V, $T_A=25^\circ\text{C}$ $\geq 10^{12}$ Ω
 $V_{IO}=500$ V, $T_A=100^\circ\text{C}$ $\geq 10^{11}$ Ω

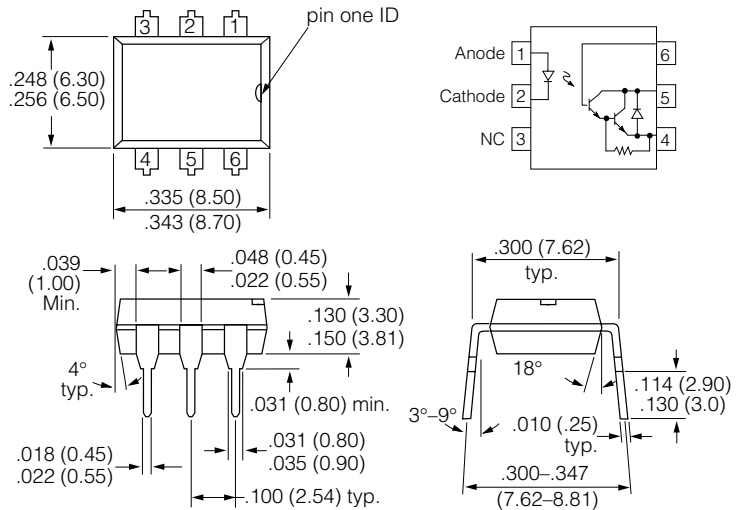
Storage Temperature -55°C to $+125^\circ\text{C}$

Operating Temperature -55°C to $+100^\circ\text{C}$

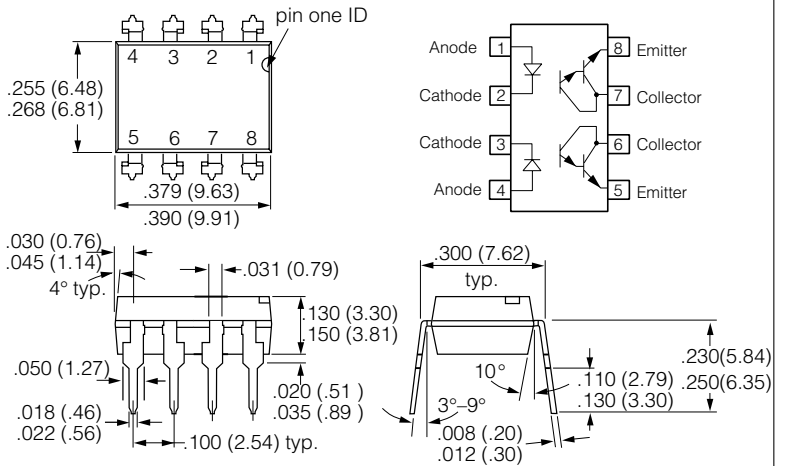
Lead Soldering Time at 260°C 10 sec.

Dimensions in inches (mm)

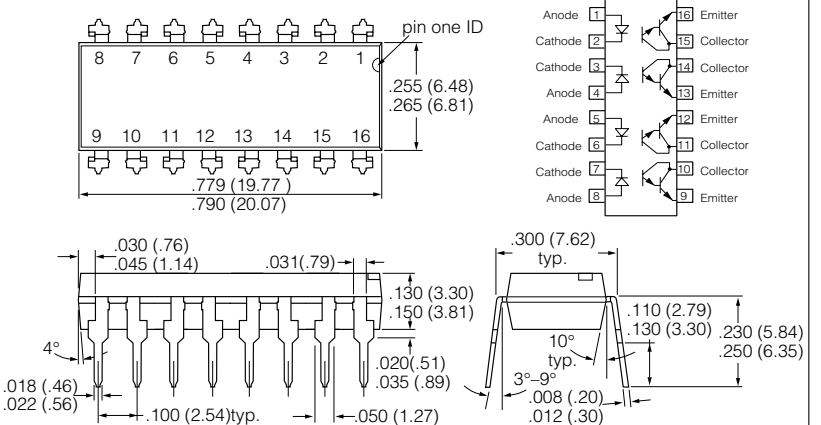
Single Channel



Dual Channel



Quad Channel



Electrical Characteristics, $T_A=25^\circ\text{C}$

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition	
GaAs Emitter							
Forward Voltage	V_F	—	1.25	1.5	V	$I_F=20\text{ mA}$	
Reverse Current	I_R	—	0.1	10	μA	$V_R=6.0\text{ V}$	
Capacitance	C_0	—	25	—	pF	$V_R=0\text{ V}$	
Photodarlington							
Breakdown Voltage	Collector-Emitter	BV_{CEO}	60	—	—	V	$I_C=1.0\text{ mA}, I_F=0$
	Collector-Base (IL66)	BV_{CBO}	60	—	—	—	$I_C=10\text{ }\mu\text{A}$
Leakage Current, Collector-Emitter		I_{CEO}	—	1.0	100	nA	$V_{CE}=50\text{ V}, I_F=0$
Capacitance, Collector-Emitter		—	3.4	—	pF	$V_{CE}=10\text{ V}$	
Coupled Characteristics							
Current Transfer Ratio	IL/ILD/ILQ66-1	CTR	100	400	—	%	$I_F=2.0\text{ mA}, V_{CE}=10\text{ V}$
	IL/ILD/ILQ66-2		300	500	—		$I_F=2.0\text{ mA}, V_{CE}=10\text{ V}$
	IL/ILD/ILQ66-3		400	500	—		$I_F=0.7\text{ mA}, V_{CE}=10\text{ V}$
	IL/ILD/ILQ66-4		500	750	—		$I_F=2.0\text{ mA}, V_{CE}=5.0\text{ V}$
Saturation Voltage, Collector-Emitter		V_{CEsat}	—	0.9	1.0	V	$I_C=10\text{ mA}, I_F=10\text{ mA}$
Rise Time -1, -2, -4		t_r	—	—	200	μs	$V_{CC}=10\text{ V}$
Fall Time -1, -2, -4		t_f	—	—	200		$I_F=2.0\text{ mA}, R_L=100\text{ }\Omega$
Rise Time -3		t_r	—	—	200		$I_F=0.7\text{ mA}$
Fall Time -3		t_f	—	—	200		$V_{CC}=10\text{ V}, R_L=100\text{ }\Omega$

Figure 1. Forward voltage versus forward current

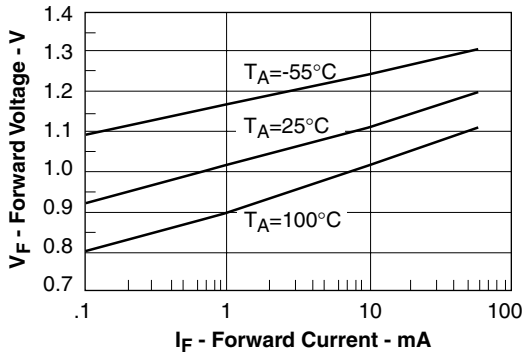


Figure 3. Normalized non-saturated and saturated CTR_{CE} versus LED current

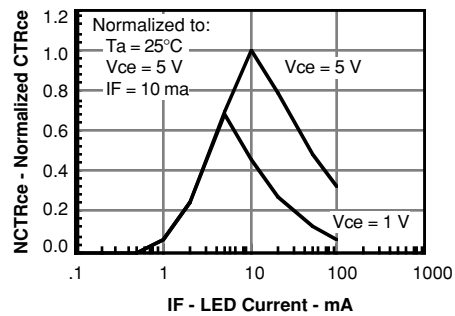


Figure 2. Normalized non-saturated and saturated CTR_{CE} versus LED current

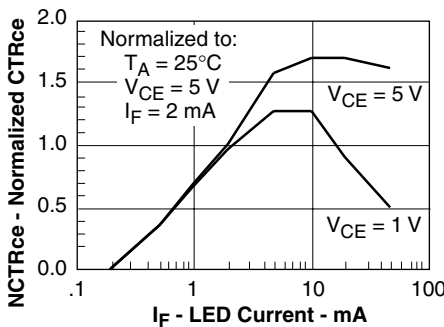


Figure 4. Non-saturated and saturated collector emitter current versus LED current

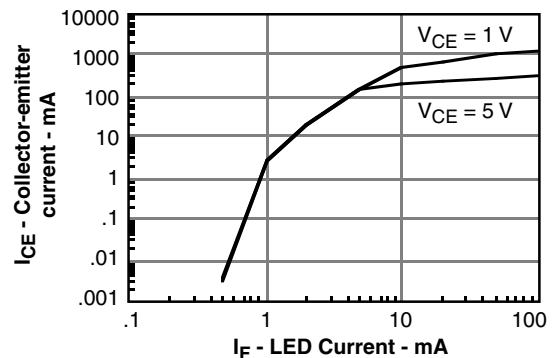


Figure 5. Collector-base photocurrent versus LED current

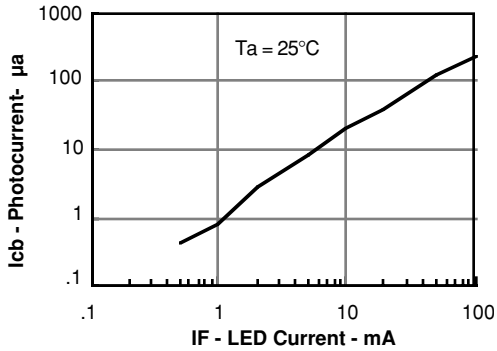


Figure 6. Collector-emitter current versus LED current

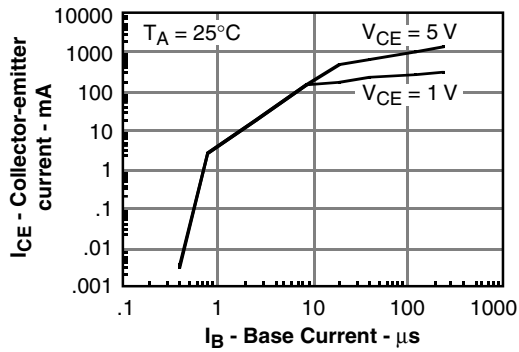


Figure 7. Non-saturated and saturated HFE versus LED current

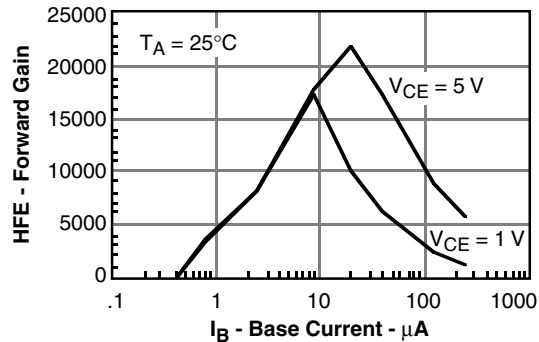


Figure 8. High/low propagation delay versus collector load resistance and LED current

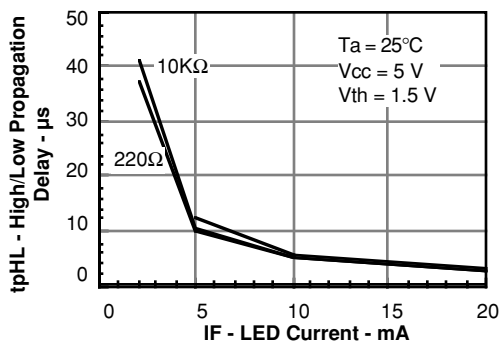


Figure 9. Low/high propagation delay versus collector load resistance and LED current

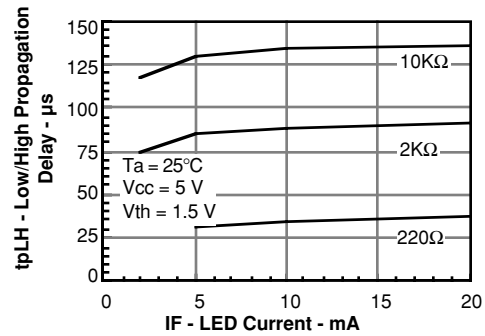


Figure 10. Switching waveform

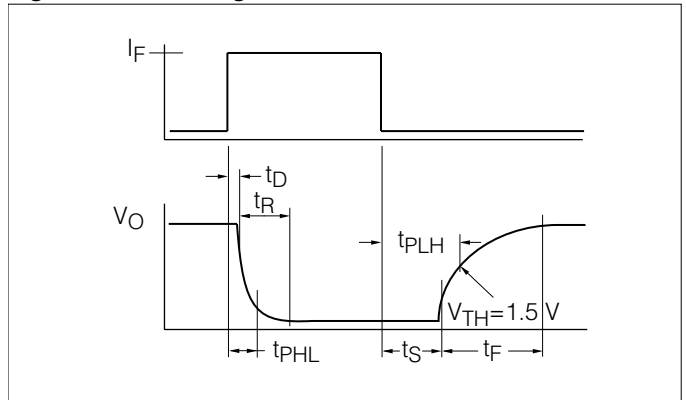


Figure 11. Switching schematic

