


## SINGLE CHANNEL IL66 SERIES DUAL CHANNEL ILD66 SERIES QUAD CHANNEL ILQ66 SERIES 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  $I_F=2\text{ mA}$ ,  $V_{CE}=10\text{ V}$
  - 2, 300% min. at  $I_F=2\text{ mA}$ ,  $V_{CE}=10\text{ V}$
  - 3, 400% min. at  $I_F=0.7\text{ mA}$ ,  $V_{CE}=10\text{ V}$
  - 4, 500% min. at  $I_F=2\text{ mA}$ ,  $V_{CE}=5\text{ V}$
- Four Available CTR Categories per Package Type
- $BV_{CEO} > 60\text{ V}$
- 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 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

( $t=1\text{ sec.}$ )..... 5300 VAC<sub>RMS</sub>

#### 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 mm

Clearance..... 7 min mm

Comparative Tracking Index..... 175

#### Isolation Resistance

$V_{IO}=500\text{ V}$ ,  $T_A=25^\circ\text{C}$ .....  $\geq 10^{12}\ \Omega$

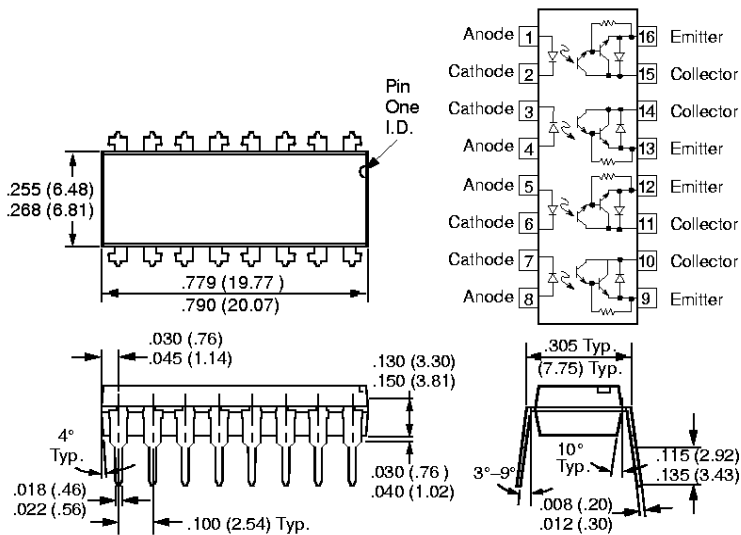
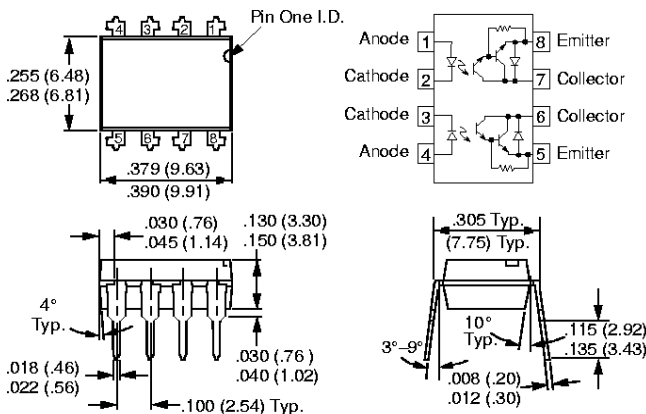
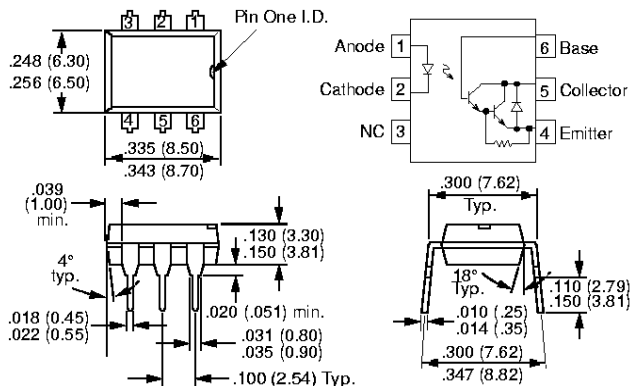
$V_{IO}=500\text{ V}$ ,  $T_A=100^\circ\text{C}$ .....  $\geq 10^{11}\ \Omega$

Storage Temperature..... -55°C to +125°C

Operating Temperature..... -55°C to +100°C

Lead Soldering Time at 260°C..... 10 sec.

Dimensions in inches (mm)



**Electrical Characteristics** ( $T_A=25^\circ\text{C}$ )

	Symbol	Min.	Typ.	Max..	Unit	Condition
<b>GaAs Emitter</b>						
Forward Voltage			1.25	1.5	V	$I_F=20\text{ mA}$
Reverse Current			0.1	10	$\mu\text{A}$	$V_R=6.0\text{ V}$
Capacitance			25		pF	$V_R=0\text{ V}$
<b>Photodarlington</b>						
Breakdown Voltage Collector-Emitter Collector-Base (IL66)	$BV_{CEO}$ $BV_{CBO}$	60 60			V V	$I_C=1\text{ mA}, I_F=0$ $I_C=10\text{ }\mu\text{A}$
Leakage Current, Collector-Emitter	$I_{CEO}$		1.0	100	nA	$V_{CE}=50\text{ V}, I_F=0$
Capacitance, Collector-Emitter			3.4		pF	$V_{CE}=10\text{ V}$
<b>Coupled Characteristics</b>						
Current Transfer Ratio IL/ILD/ILQ66-1 IL/ILD/ILQ66-2 IL/ILD/ILQ66-3 IL/ILD/ILQ66-4	CTR	100 300 400 500	400 500 500 750		% % % %	$I_F=2\text{ mA}, V_{CE}=10\text{ V}$ $I_F=2\text{ mA}, V_{CE}=10\text{ V}$ $I_F=0.7\text{ mA}, V_{CE}=10\text{ V}$ $I_F=2\text{ mA}, V_{CE}=5\text{ V}$
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	$\mu\text{s}$	$V_{CC}=10\text{ V}$
Fall Time -1, -2, -4	$t_F$			200	$\mu\text{s}$	$I_F=2\text{ mA}, R_C=100\text{ }\Omega$
Rise Time -3	$t_R$			200	$\mu\text{s}$	$I_F=0.7\text{ mA}$
Fall Time -3	$t_F$			200	$\mu\text{s}$	$V_{CC}=10\text{ V}, R_L=100\text{ }\Omega$

Figure 1. Forward voltage versus forward current

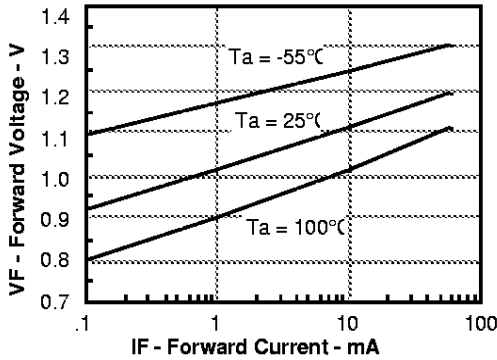


Figure 2. Normalized non-saturated and saturated  $CTR_{ce}$  versus LED current

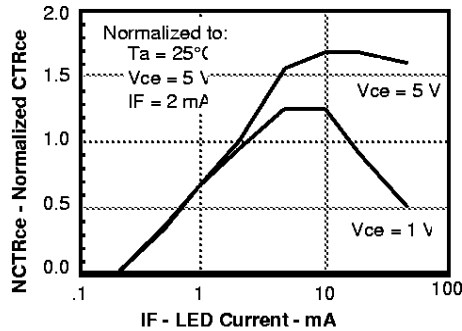


Figure 3. Normalized non-saturated and saturated  $CTR_{ce}$  versus LED current

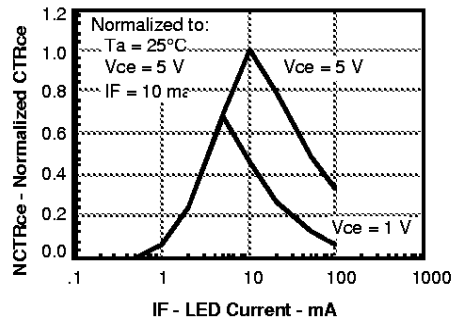


Figure 4. Non-saturated and saturated collector emitter current versus LED current

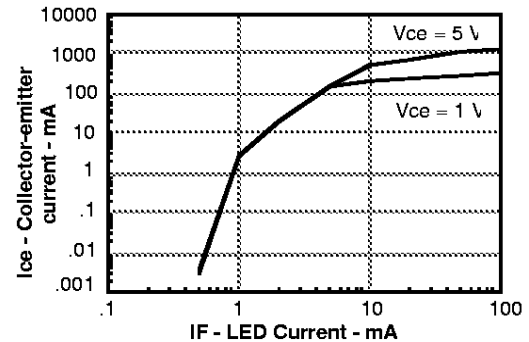


Figure 5. Collector-base photocurrent versus LED current

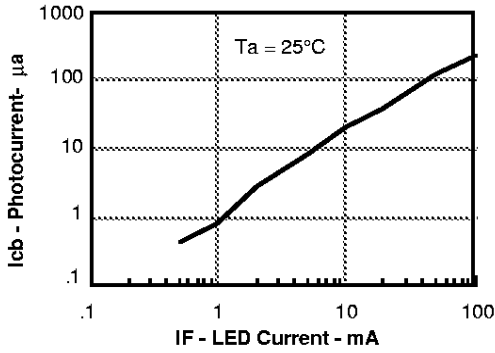


Figure 6. Collector-emitter current versus LED current

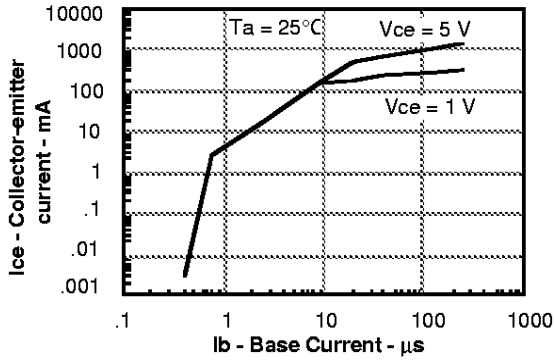


Figure 7. Non-saturated and saturated HFE versus LED current

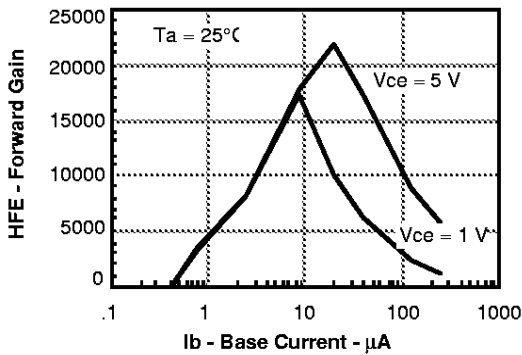


Figure 8. High/low propagation delay versus collector load resistance and LED current

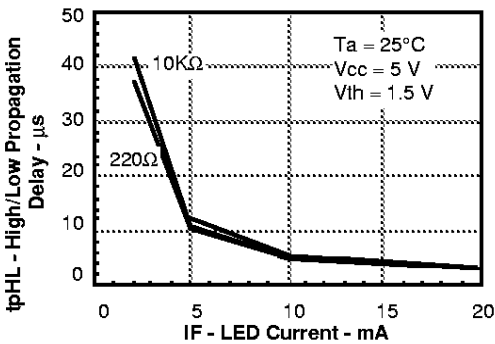


Figure 9. Low/high propagation delay versus collector load resistance and LED current

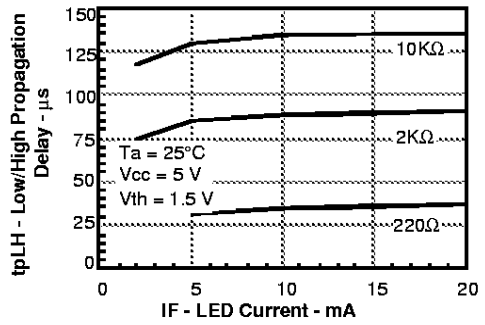


Figure 10. Switching waveform

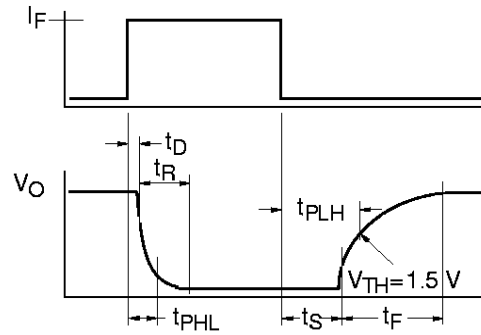


Figure 11. Switching schematic

