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)

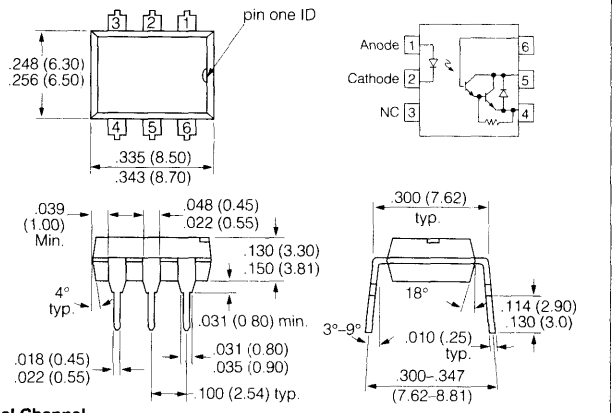
Power Dissipation at 25°C Ambient ..... 150 mW
Derate Linearly from 25°C ..... 2.0 mW/°C

Package

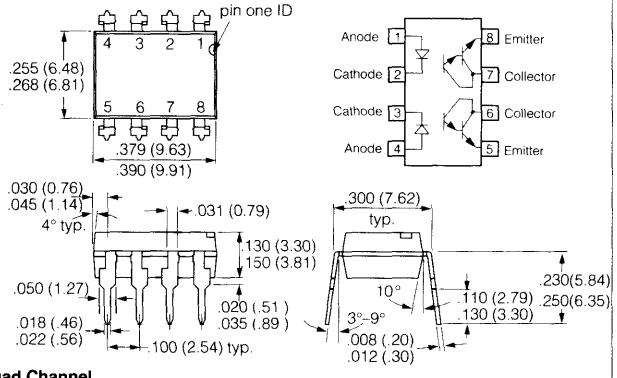
Isolation Test Voltage (t=1.0 sec.) ..... 5300 V_{RMS}
Total Package Power Dissipation at 25°C
IL66 ..... 250 mW
ILD66 ..... 400 mW
ILQ66 ..... 500 mW
Derate Linearly from 25°C
IL66 ..... 3.3 mW/°C
ILD66 ..... 5.33 mW/°C
ILQ66 ..... 6.67 mW/°C
Creepage ..... ≥7 min
Clearance ..... ≥7 min
Comparative Tracking Index 175
Isolation Resistance
V_{IO}=500 V, T_A=25°C ..... $\geq 10^{12}\ \Omega$
V_{IO}=500 V, T_A=100°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)

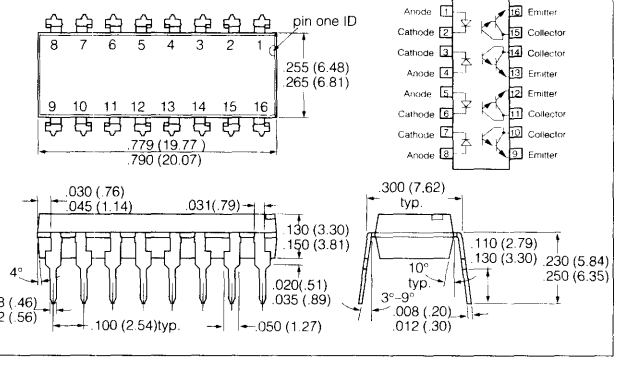
Single Channel



Dual Channel



Quad Channel



Electrical Characteristics, T_A=25°C

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

Figure 1. Forward voltage versus forward current

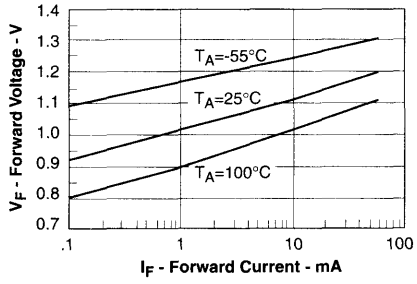


Figure 2. Normalized non-saturated and saturated CTR_{ce} versus LED current

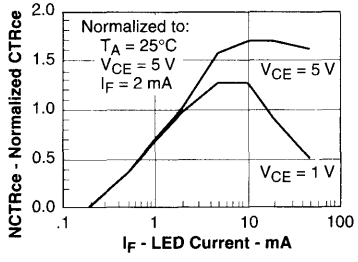


Figure 3. Normalized non-saturated and saturated CTR_{ce} versus LED current

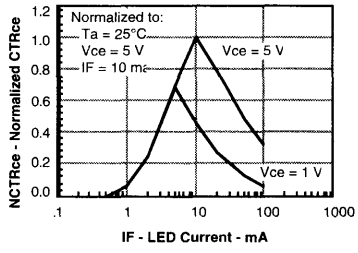


Figure 4. Non-saturated and saturated collector emitter current versus LED current

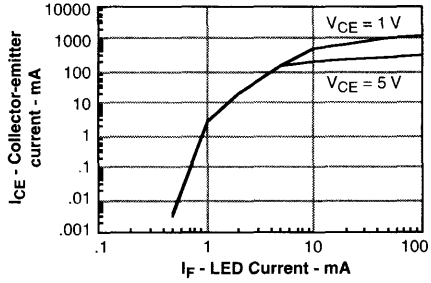


Figure 5. Collector-base photocurrent versus LED current

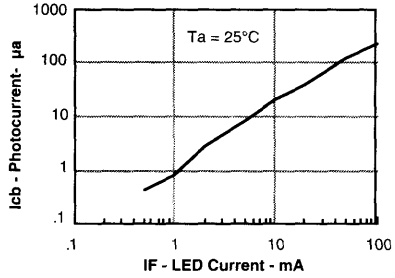


Figure 6. Collector-emitter current versus LED current

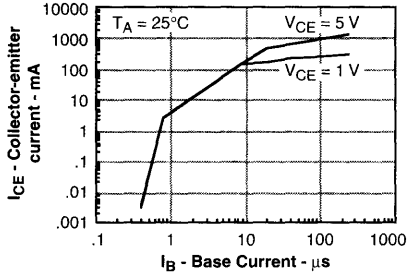


Figure 7. Non-saturated and saturated HFE versus LED current

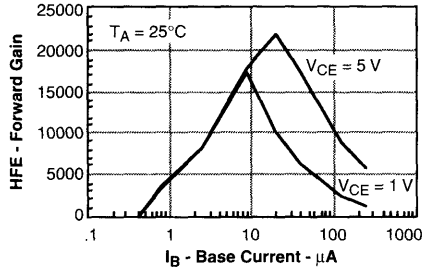


Figure 8. High/low propagation delay versus collector load resistance and LED current

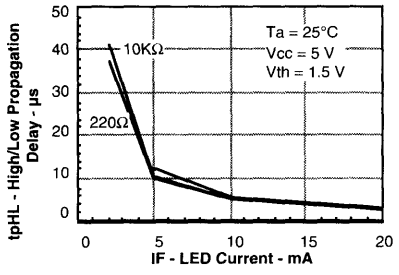


Figure 9. Low/high propagation delay versus collector load resistance and LED current

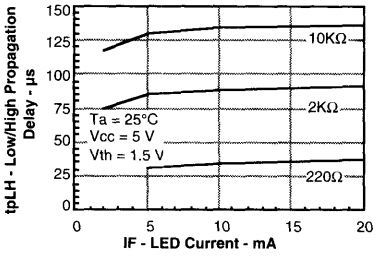


Figure 10. Switching waveform

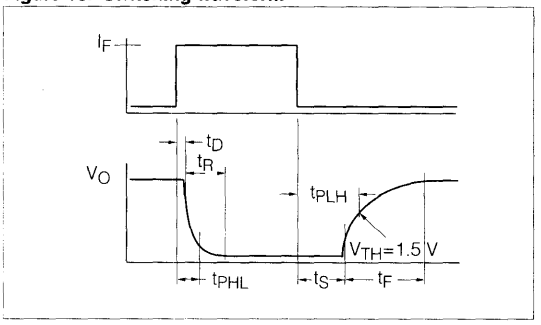


Figure 11. Switching schematic