SIEMENS

SINGLE CHANNEL IL66 SERIES
DUAL CHANNEL ILD66 SERIES
QUAD CHANNEL ILQ66 SERIES

PHOTODARLINGTON OPTOCOUPLER

FEATURES

- **Internal R_{BE} 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 mA, V_{CE}=10 V
  –2, 300% min. at I_F=2 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 mA, V_{CE}=5 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 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)

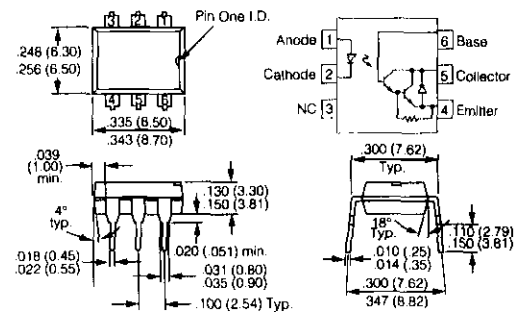
Power Dissipation at 25°C Ambient	150 mW
Derate Linearly from 25°C	2.0 mW/°C

Package

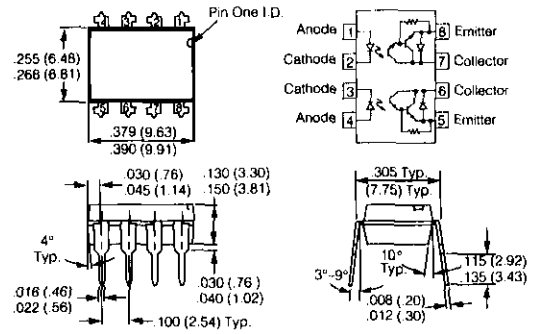
Isolation Test Voltage (t=1 sec.)	5300 VAC_{RMS}
Total Package Power Dissipation at 25°C	
IL66	250 mW
ILD66	400 mW
ILQ66	500 mW
Derate Linearly from 25°C	
IL66	3.3 mW/°C
ILD66	5.33 mW/°C
ILQ66	6.67 mW/°C
Creepage	7 min mm
Clearance	7 min mm
Comparative Tracking Index	175
Isolation Resistance	
V_{IO}=500 V, T_A=25°C	$\geq 10^{12}$ Ω
V_{IO}=500 V, T_A=100°C	$\geq 10^{11}$ Ω
Storage Temperature	–55°C to +125°C
Operating Temperature	–55°C to +100°C
Lead Soldering Time at 260°C	10 sec.

Package Dimensions in Inches (mm)

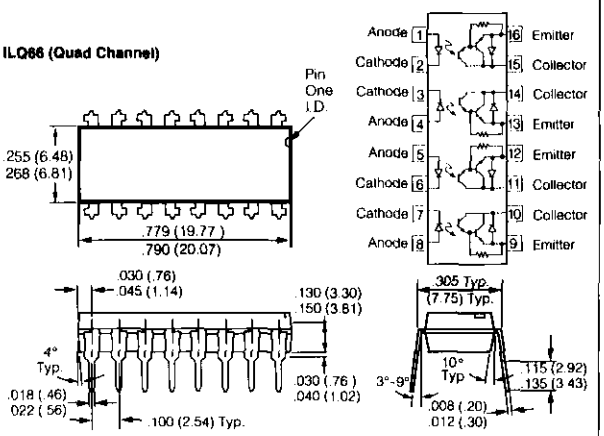
IL66 (Single Channel)



ILD66 (Dual Channel)



ILQ66 (Quad Channel)



Electrical Characteristics (T_A=25°C)

	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_O		25		pF	V_R=0 V
Photodarlington						
Breakdown Voltage						
Collector-Emitter	BV_{CEO}	60			V	I_C=1 mA, I_F=0
Collector-Base (IL66)	BV_{CBO}	60			V	I_C=10 µA
Collector-Emitter						
Leakage Current	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	CTR					
IL/ILD/ILQ66-1		100	400		%	I_F=2 mA, V_{CE}=10 V
IL/ILD/ILQ66-2		300	500		%	I_F=2 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 mA, V_{CE}=5 V
Collector-Emitter						
Saturation Voltage	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	µs	I_F=2 mA, R_C=100 Ω
Rise Time -3	t_R			200	µs	I_F=0.7 mA
Fall Time -3	t_F			200	µs	V_{CC}=10 V, R_L=100 Ω

Figure 1. Forward voltage versus forward current

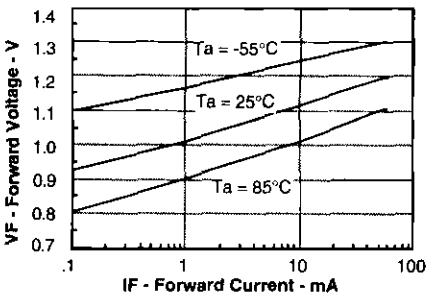


Figure 2. Normalized non-saturated and saturated CTRce versus LED current

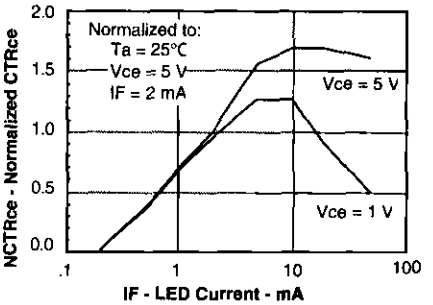


Figure 3. Normalized non-saturated and saturated CTRce versus LED current

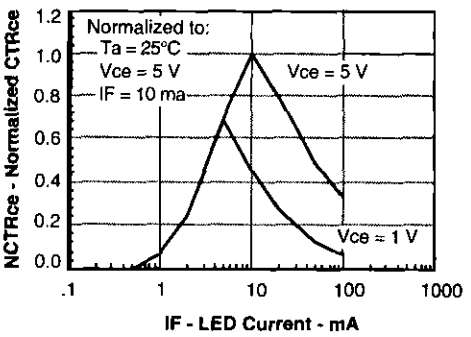


Figure 4. Non-saturated and saturated collector emitter current versus LED current

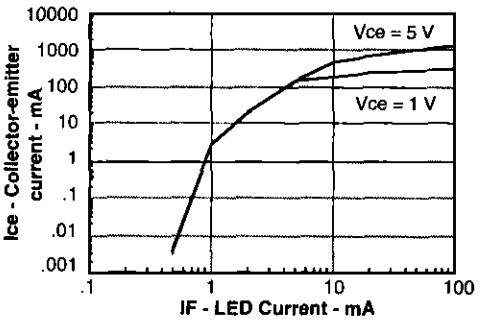


Figure 5. Collector-base photocurrent versus LED current

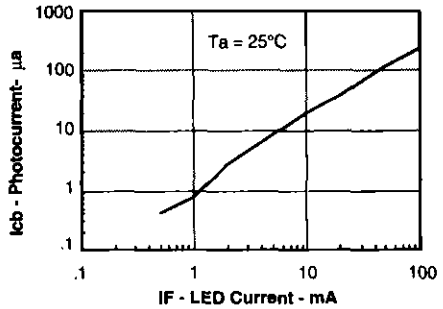


Figure 6. Collector-emitter current versus LED current

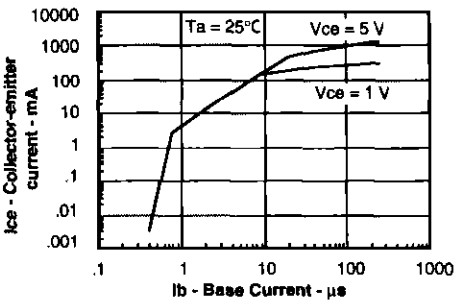


Figure 7. Non-saturated and saturated HFE versus LED current

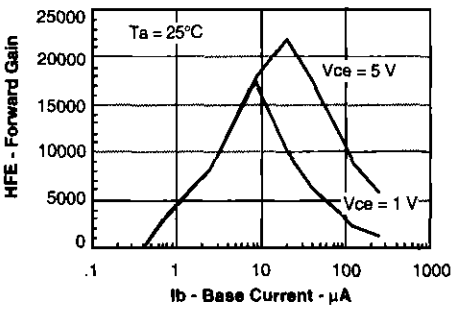


Figure 8. High/low propagation delay versus collector load resistance and LED current

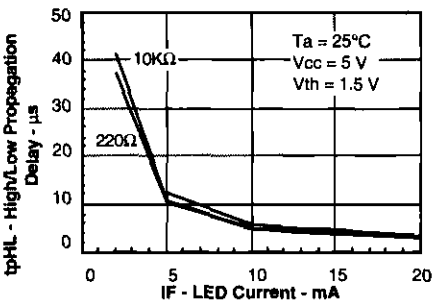


Figure 9. Low/high propagation delay versus collector load resistance and LED current

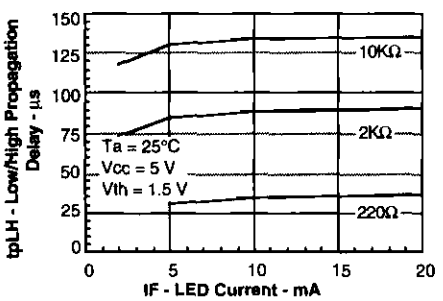


Figure 10. Switching Waveform

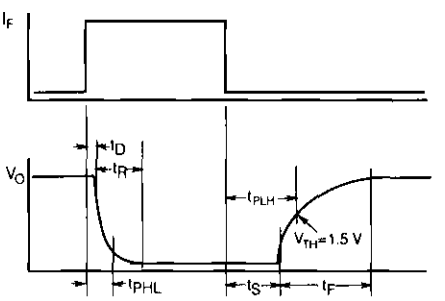


Figure 11. Switching Schematic