



SINGLE CHANNEL IL74 DUAL CHANNEL ILD74 QUAD CHANNEL ILQ74 Phototransistor Optocoupler

FEATURES

- 7400 Series T²L Compatible
- Transfer Ratio, 35% Typical
- Coupling Capacitance, 0.5 pF
- Single, Dual, & Quad Channel
- Industry Standard DIP Package
- Underwriters Lab File #E52744
- VDE Approvals #0884
(Optional with Option 1, Add -X001 Suffix)

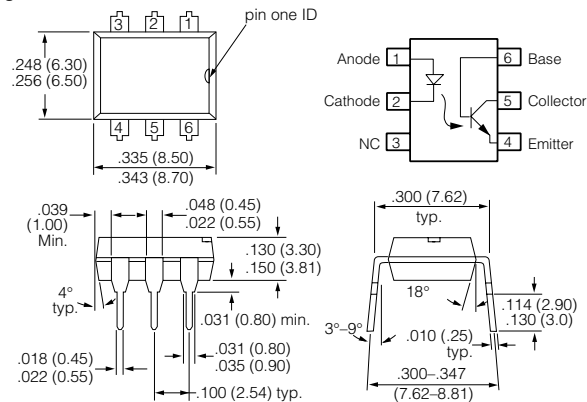
DESCRIPTION

The IL74 is an optically coupled pair with a Gallium Arsenide infrared LED and a silicon NPN phototransistor. Signal information, including a DC level, can be transmitted by the device while maintaining a high degree of electrical isolation between input and output. The IL74 is especially designed for driving medium-speed logic, where it may be used to eliminate troublesome ground loop and noise problems. Also it can be used to replace relays and transformers in many digital interface applications, as well as analog applications such as CRT modulation.

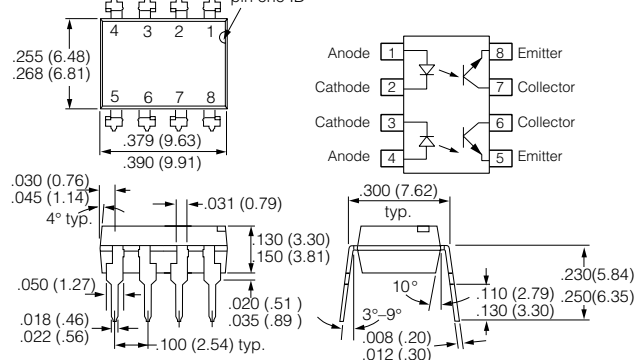
The ILD74 has two isolated channels in a single DIP package; the ILQ74 has four isolated channels per package.

Dimensions in inches (mm)

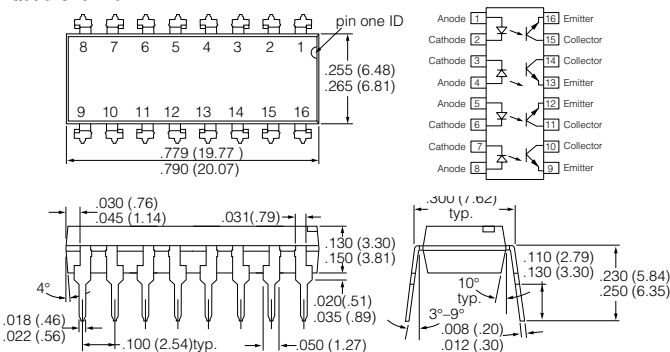
Single Channel



Dual Channel



Quad Channel



Maximum Ratings

Emitter (each channel)

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 (each channel)

Collector-Emitter Breakdown Voltage	20 V
Emitter-Base Breakdown Voltage	5.0 V
Collector-Base Breakdown Voltage	70 V
Power Dissipation at 25°C	150 mW
Derate Linearly from 25°C	2.0 mW/°C

Package

Isolation Test Voltage (t=1.0 sec.)	5300 V _{RMS}
Isolation Resistance	
$V_{IO}=500\text{ V}, T_A=25^\circ\text{C}$	$\geq 10^{12}\ \Omega$
$V_{IO}=500\text{ V}, T_A=100^\circ\text{C}$	$\geq 10^{11}\ \Omega$
Total Package Dissipation	
at 25°C Ambient (LED Plus Detector)	
IL74	200 mW
ILD74	400 mW
ILQ74	500 mW
Derate Linearly from 25°C	
IL74	2.7 mW/°C
ILD74	5.33 mW/°C
ILQ74	6.67 mW/°C
Creepage	$\geq 7.0\text{ mm}$
Clearance	$\geq 7.0\text{ mm}$
Storage Temperature	-55°C to +150°C
Operating Temperature	-55°C to +100°C
Lead Soldering Time at 260°C	10 sec.

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

	Symbol	Min.	Typ.	Max.	Unit	Condition
Emitter						
Forward Voltage	V_F	—	1.3	1.5	V	$I_F=20\text{ mA}$
Reverse Current	I_R	—	0.1	100	μA	$V_R=3.0\text{ V}$
Capacitance	C_O	—	25	—	pF	$V_R=0$
Detector						
Breakdown Voltage, Collector-Emitter	BV_{CEO}	20	50	—	V	$I_C=1.0\text{ mA}$
Leakage Current, Collector-Emitter	I_{CEO}	—	5.0	500	nA	$V_{CE}=5.0\text{ V}$ $I_F=0$
Capacitance, Collector-Emitter	C_{CE}	—	10.0	—	pF	$V_{CE}=0$, $F=1.0\text{ MHz}$
Package						
DC Current Transfer Ratio	CTR_{DC}	12.5	35	—	%	$I_F=16\text{ mA}$, $V_{CE}=5.0\text{ V}$
Saturation Voltage, Collector-Emitter	V_{CEsat}	—	0.3	0.5	V	$I_C=2.0\text{ mA}$ $I_F=16\text{ mA}$
Resistance, Input to Output	R_{IO}	—	100	—	$\text{G}\Omega$	—
Capacitance, Input to Output	C_{IO}	—	0.5	—	pF	—
Switching Times	t_{ON}, t_{OFF}	—	3.0	—	μs	$R_L=100\ \Omega$, $V_{CE}=10\text{ V}$, $I_C=2.0\text{ mA}$

Figure 1. Forward voltage versus forward current

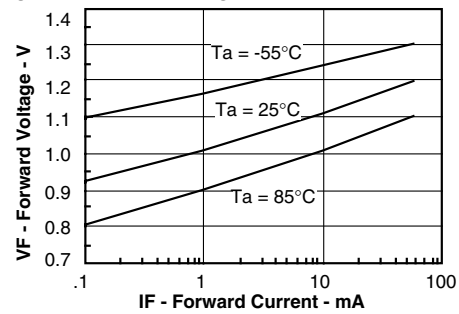


Figure 2. Normalized non-saturated and saturated CTR at $T_A=25^\circ\text{C}$ versus LED current

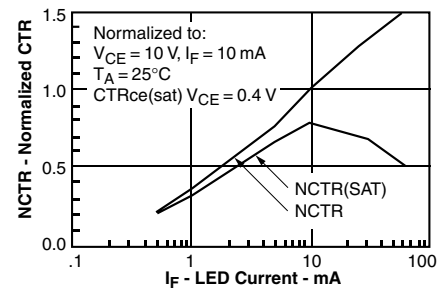


Figure 3. Normalized non-saturated and saturated CTR at $T_A=50^\circ\text{C}$ versus LED current

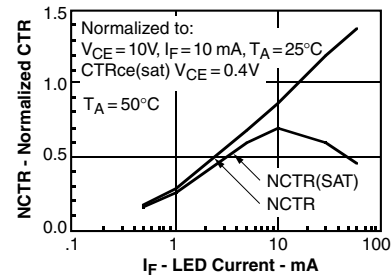


Figure 4. Normalized non-saturated and saturated CTR at $T_A=70^\circ\text{C}$ versus LED current

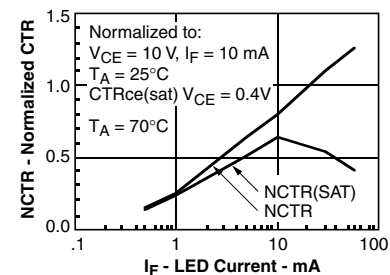


Figure 5. Normalized non-saturated and saturated CTR at $T_A=85^\circ\text{C}$ versus LED current

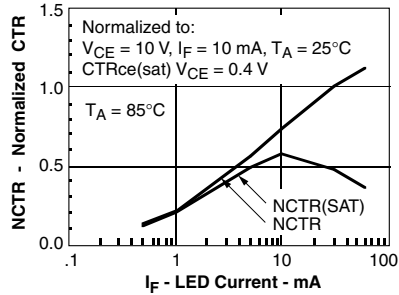


Figure 6. Collector-emitter current versus temperature and LED current

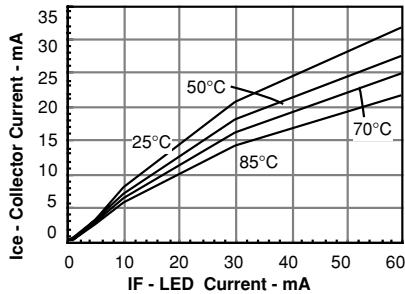


Figure 7. Collector-emitter leakage current versus temperature

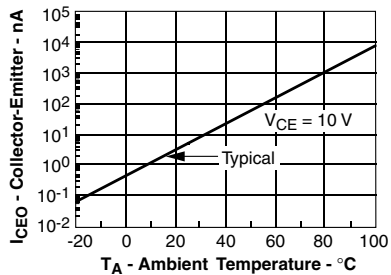


Figure 8. Normalized CTR_{cb} versus LED current and temperature

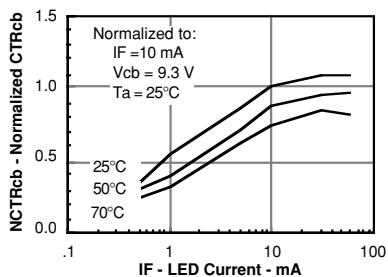


Figure 9. Collector base photocurrent versus LED current

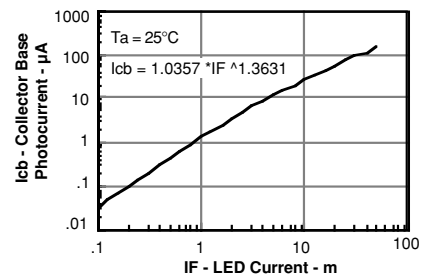


Figure 10. Normalized photocurrent versus I_F and temperature

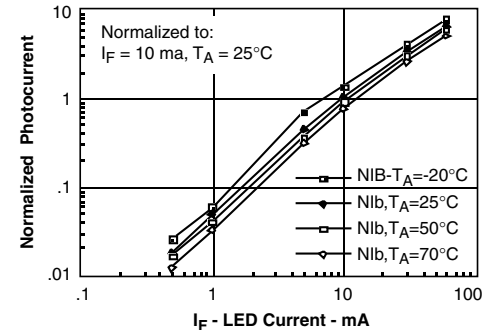


Figure 11. Normalized non-saturated HFE versus base current and temperature

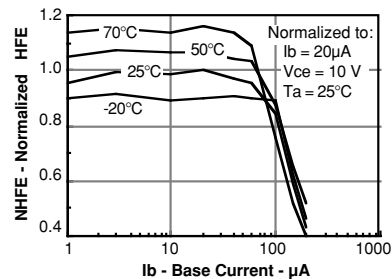


Figure 12. Normalized saturated HFE versus base current and temperature

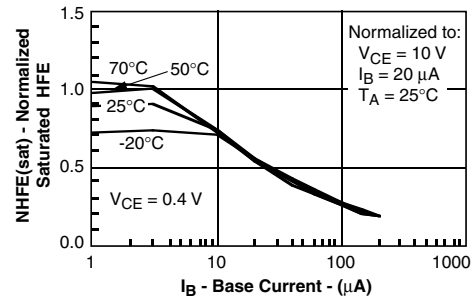


Figure 13. Propagation delay versus collector load resistor

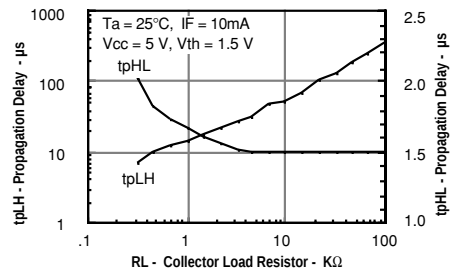


Figure 14. Propagation delay versus collector load resistor

