



ILCT6/MCT6

Dual Phototransistor Optocoupler

FEATURES

- **Current Transfer Ratio, 50% Typical**
- **Leakage Current, 1.0 nA Typical**
- **Two Isolated Channels Per Package**
- **Direct Replacement for MCT6**
- **Underwriters Lab File #E52744**
- **VDE 0884 Available with Option1**

DESCRIPTION

The ILCT6 is a two channel optocoupler for high density applications. Each channel consists of 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 ILCT6 is especially designed for driving medium-speed logic, where it may be used to eliminate troublesome ground loop and noise problems. It can also be used to replace relays and transformers in many digital interface applications, as well as analog applications such as CRT modulation.

Maximum Ratings

Emitter (each channel)

Rated Forward Current, DC 60 mA
Peak Forward Current, DC

(1.0 μ s pulse, 300 pps) 3.0 A
Power Dissipation at 25°C Ambient 100 mW
Derate Linearly from 25°C 1.3 mW/°C

Detector (each channel)

Collector Current 30 mA
Collector-Emitter Breakdown Voltage 30 V
Power Dissipation at 25°C Ambient 150 mW
Derate Linearly from 25°C 2 mW/°C

Package

Isolation Test Voltage 5300 V_{RMS}
Isolation Resistance
V_{IO}=500 V, T_A=25°C $\geq 10^{12} \Omega$
V_{IO}=500 V, T_A=100°C $\geq 10^{11} \Omega$
Creepage ≥ 7.0 mm
Clearance ≥ 7.0 mm
Total Package Dissipation
at 25°C Ambient 400 mW
Derate Linearly from 25°C 5.33 mW/°C
Storage Temperature -55°C to +150°C
Operating Temperature -55°C to +100°C
Lead Soldering Time at 260°C 10 sec.

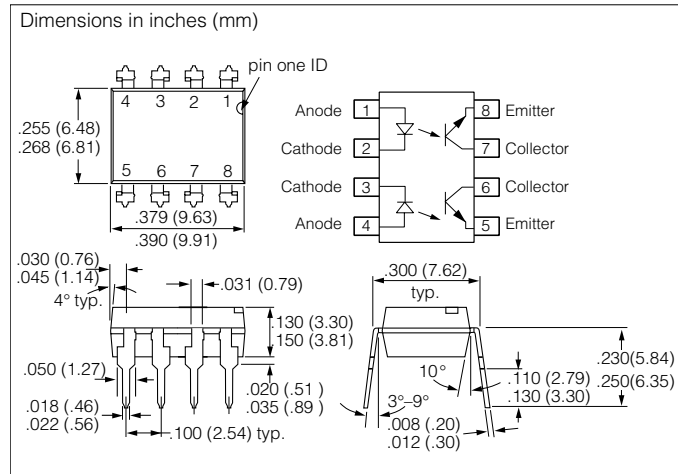


Table 1. Electrical Characteristics T_A=25°C

	Symbol	Min.	Typ.	Max	Unit	Condition
Emitter						
Forward Voltage	V _F	—	1.25	1.50	V	I _F =20 mA
Reverse Current	I _R	—	0.1	10	μ A	V _R =3.0 V
Junction Capacitance	C _J	—	25	—	pF	V _F =0 V
Detector						
Breakdown Voltage	BV _{CEO}	30	65	—	V	I _C =10 μ A I _E =10 μ A
	BV _{ECO}	7.0	10	—	—	
Leakage Current, Collector-Emitter	I _{CEO}	—	1.0	100	nA	V _{CE} =10 V
Capacitance, Collector-Emitter	C _{CE}	—	8.0	—	pF	V _{CE} =0 V
Package						
DC Current Transfer Ratio	CTR	20	50	—	%	I _F =10 mA V _{CE} =10 V
Saturation Voltage, Collector-Emitter	V _{CEsat}	—	—	0.40	V	I _C =2.0 mA I _F =16 mA
Isolation Capacitance	C _{ISOL}	—	0.5	—	pF	f=1.0 MHz
Capacitance between Channels	—	—	0.4	—	pF	f=1.0 MHz
Bandwidth	—	—	150	—	kHz	I _C =2.0 mA V _{CC} =10 V R _L =100 Ω
Switching Times, Output Transistor	t _{on} , t _{off}	—	3.0	—	μ s	I _C =2.0 mA R _E =100 Ω V _{CE} =10

Figure 1. Forward voltage versus forward current

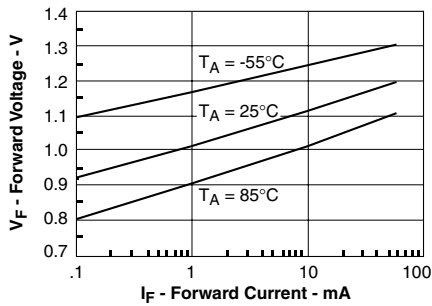


Figure 2. Normalized non-saturated and saturated CTR at $T_A=25^\circ\text{C}$ versus LED current

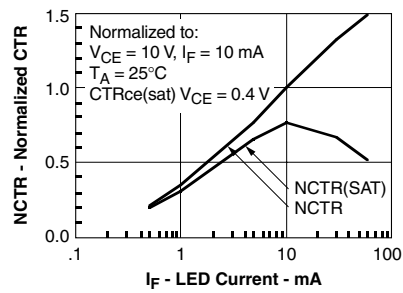


Figure 3. Normalized non-saturated and saturated CTR at $T_A=50^\circ\text{C}$ versus LED current

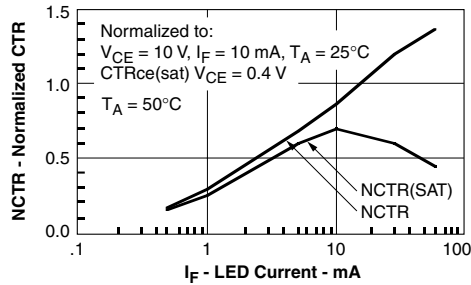


Figure 4. Normalized non-saturated and saturated CTR at $T_A=70^\circ\text{C}$ versus LED current

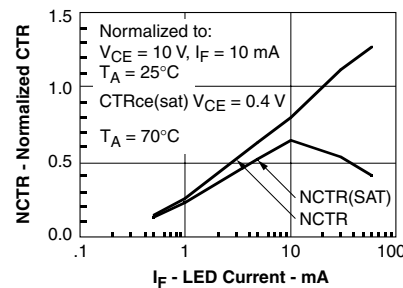


Figure 5. Normalized non-saturated and saturated CTR at $T_A=85^\circ\text{C}$ versus LED current

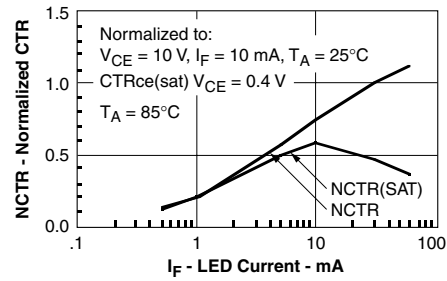


Figure 6. Collector-emitter current versus temperature and LED current

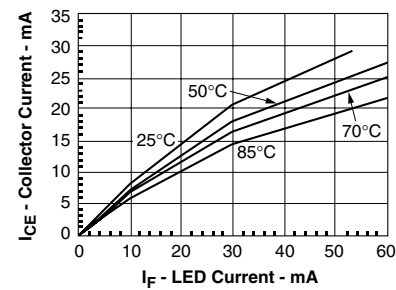


Figure 7. Collector-emitter leakage current versus temperature

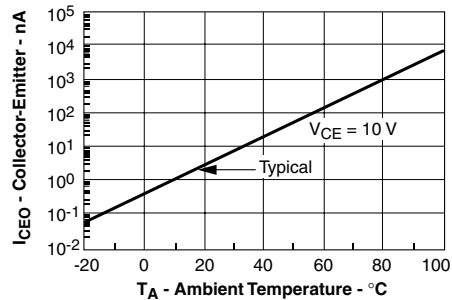


Figure 8. Propagation delay versus collector load resistor

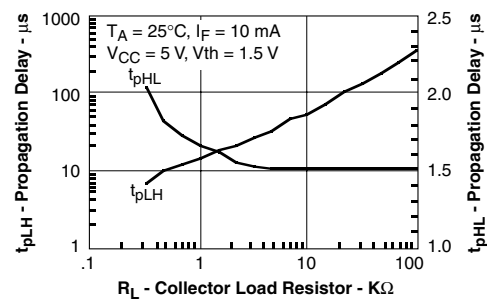


Figure 9. Switching Timing

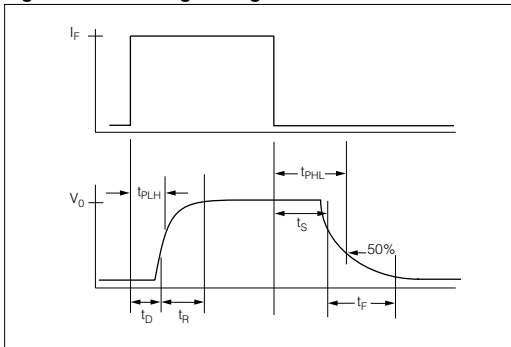


Figure 10. Switching schematic

