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 µs 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.

Dimensions in inches (mm)

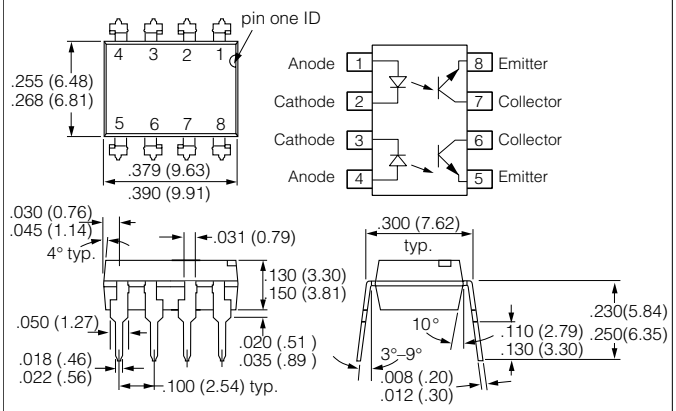

Table 1. Electrical Characteristics T_A=25°C

	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	µA	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 µA, I_E=10 µA
	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	—	µs	I_C=2.0 mA, R_E=100 Ω, V_{CE}=10

Figure 1. Forward voltage versus forward current

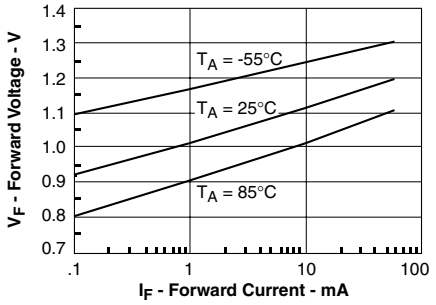

Figure 2. Normalized non-saturated and saturated CTR at T_A=25°C versus LED current

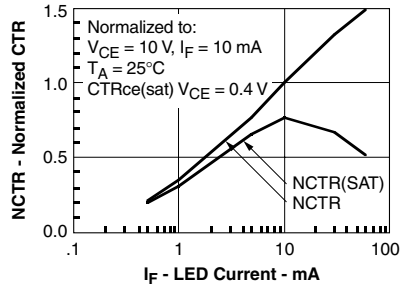

Figure 3. Normalized non-saturated and saturated CTR at T_A=50°C versus LED current

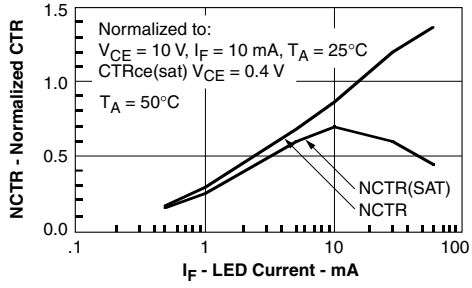

Figure 4. Normalized non-saturated and saturated CTR at T_A=70°C versus LED current

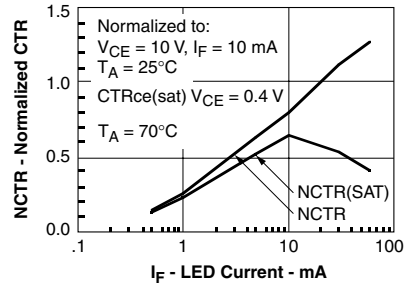

Figure 5. Normalized non-saturated and saturated CTR at T_A=85°C versus LED current

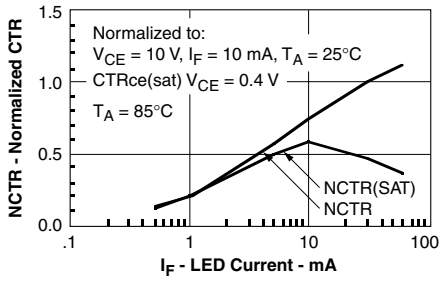

Figure 6. Collector-emitter current versus temperature and LED current

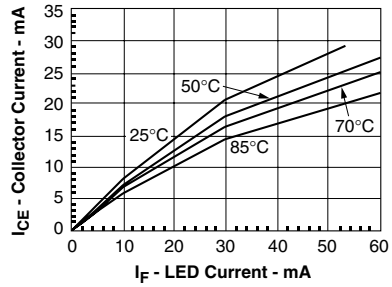

Figure 7. Collector-emitter leakage current versus temperature

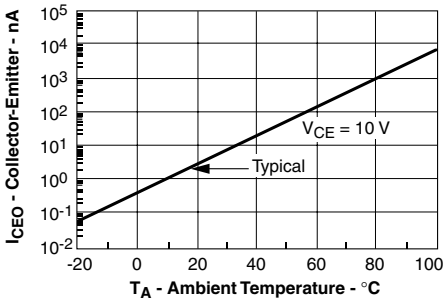

Figure 8. Propagation delay versus collector load resistor

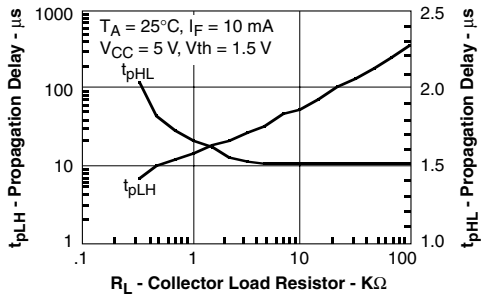

Figure 9. Switching Timing

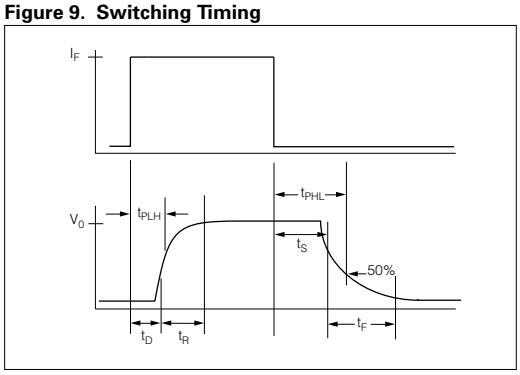

Figure 10. Switching schematic