ILD223T

Dual Photodarlington
Small Outline Surface Mount Optocoupler

FEATURES

- **Two Channel Optocoupler**
- **High Current Transfer Ratio at I_F=1.0 mA, 500% Min.**
- **Isolation Test Voltage, 3000 V_{RMS}**
- **Electrical Specifications Similar to Standard 6-pin Coupler**
- **Compatible with Dual Wave, Vapor Phase and IR Reflow Soldering**
- **SOIC-8 Surface Mountable Package**
- **Standard Lead Spacing, .05"**
- **Available only on Tape and Reel Option (Conforms to EIA Standard 481-2)**
- **Underwriters Lab File #E52744**

DESCRIPTION

The ILD223T is a high current transfer ratio (CTR) optocoupler. It has a Gallium Arsenide infrared LED emitter and a silicon NPN photodarlington transistor detector.

This device has CTRs tested at an LED current of 1.0 mA. This low drive current permits easy interfacing from CMOS to LSTTL or TTL.

The ILD223T is constructed in a standard SOIC-8A foot print which makes it ideally suited for high density applications. In addition to eliminating through-holes requirements, this package conforms to standards for surface mounted devices.

Maximum Ratings (Each Channel)

Emitter

Peak Reverse Voltage ..... 6.0 V
Peak Pulsed Current (1.0 µs, 300 pps) ..... 3.0 A
Continuous Forward Current per Channel .... 30 mA
Power Dissipation at 25°C ..... 45 mW
Derate Linearly from 25°C ..... 0.4 mW/°C

Detector

Collector-Emitter Breakdown Voltage ..... 30 V
Emitter-Collector Breakdown Voltage ..... 5.0 V
Power Dissipation per Channel ..... 75 mW
Derate Linearly from 25°C ..... 3.1 mW/°C

Package

Total Package Dissipation at 25°C Ambient
(2 LEDs + 2 Detectors, 2 Channels) ..... 240 mW
Derate Linearly from 25°C ..... 2.0 mW/°C
Storage Temperature ..... –55°C to +150°C
Operating Temperature ..... –55°C to +100°C
Soldering Time at 260°C ..... 10 sec

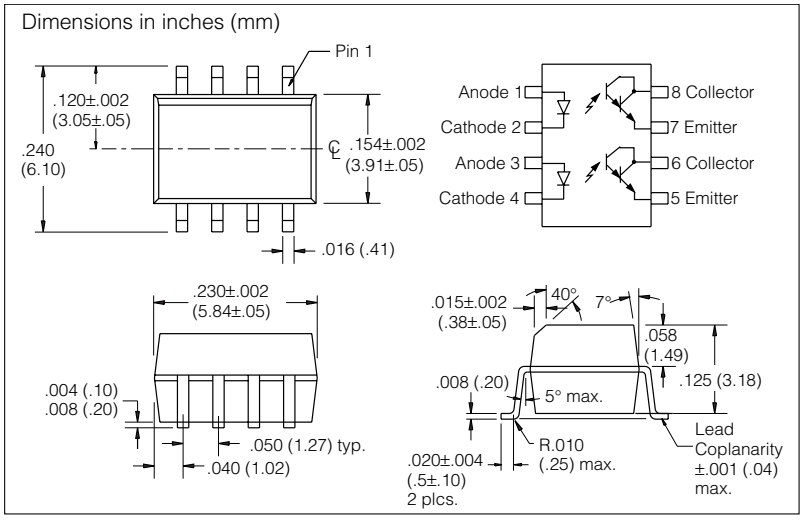

Table 1. Characteristics T_A=25°C

Parameter	Symbol	Min.	Typ.	Max.	Unit	Condition
Emitter						
Forward Voltage	V_F	—	—	1.3	V	I_F=1.0 mA
Reverse Current	I_R	—	0.1	100	µA	V_R=6.0 V
Capacitance	C_O	—	25	—	pF	V_F=0 V F=1.0 MHz
Detector						
Breakdown Voltage	BV_{CEO}	30	—	—	V	I_C=10 µA I_E=10 µA
	BV_{ECO}	5.0	—	—		
Current, Collector-Emitter	I_{CEO}	—	—	50	nA	V_{CE}=5.0 V I_F=0
Capacitance, Collector-Emitter	C_{CE}	—	3.4	—	pF	V_{CE}=5.0 V
Package						
DC Current Transfer Ratio	CTR_{DC}	500	—	—	%	I_F=1.0 mA, V_{CE}=5.0 V
Saturation Voltage, Collector-Emitter	V_{CEsat}	—	—	1.0	V	I_F=1.0 mA, I_{CE}=0.5 mA
Capacitance, Input to Output	C_{IO}	0.5	—	pF	—	—
Resistance, Input to Output	R_{IO}	100	—	GΩ	—	—
Turn-On Time	t_{ON}	15	—	µs	—	V_{CC}=10 V R_L=100 Ω I_F=5.0 mA
Turn-Off Time	t_{OFF}	30	—	µs	—	
Isolation Test Voltage	V_{IO}	3000	—	—	V_{RMS}	t=1.0 sec.

Figure 1. Forward voltage versus forward current

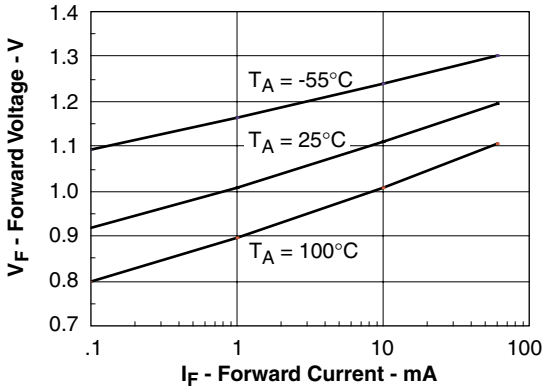

Figure 2. Peak LED current versus duty factor, Tau

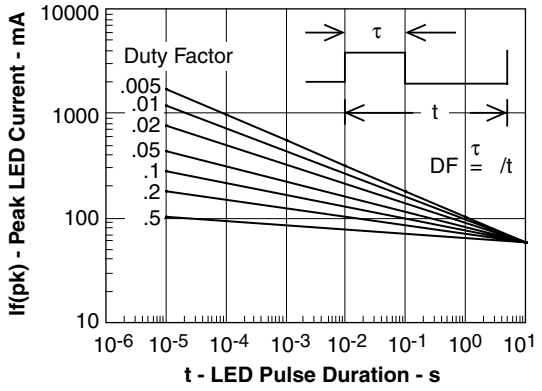

Figure 3. Normalized CTR_{CE} versus LED current

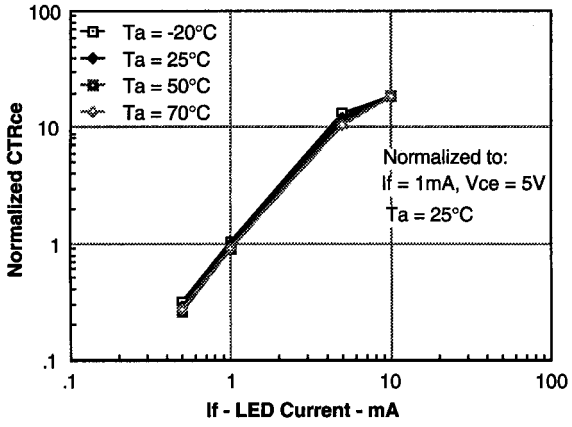

Figure 4. CTR versus LED current

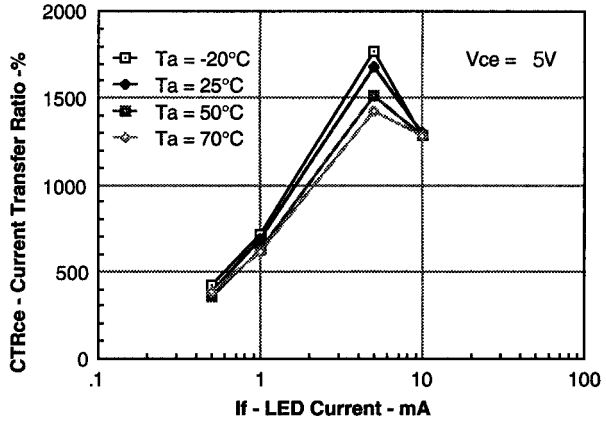

Figure 5. Collector current versus LED current

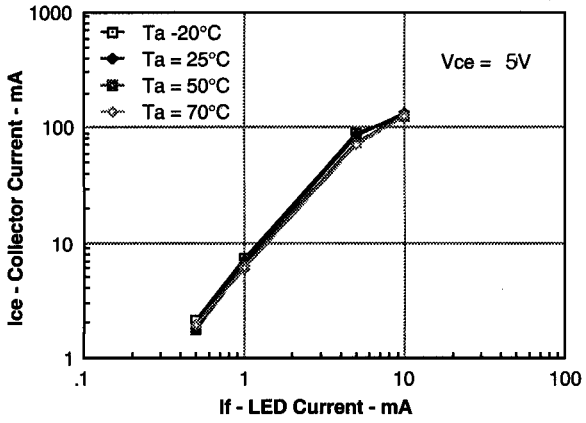

Figure 6. Switching schematic and switching timing