

SIEMENS

ILD223 DUAL PHOTODARLINGTON SMALL OUTLINE SURFACE MOUNT OPTOCOUPLER

FEATURES

- Two Channel Optocoupler
- High Current Transfer Ratio at $I_F=1\text{ mA}$, 500% Min.
- Isolation Test Voltage, 2500 VRMS
- Electrical Specifications Similar to Standard 6-pin Coupler
- Compatible with Dual Wave, Vapor Phase and IR Reflow Soldering
- Industry Standard SOIC-8 Surface Mountable Package
- Standard Lead Spacing, .05"
- Available in Tape and Reel Option (Conforms to EIA Standard 481-2)
- Underwriters Lab File #E52744

DESCRIPTION

The ILD223 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 mA. This low drive current permits easy interfacing from CMOS to LSTTL or TTL.

The ILD223 is constructed in a standard SOIC-8 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

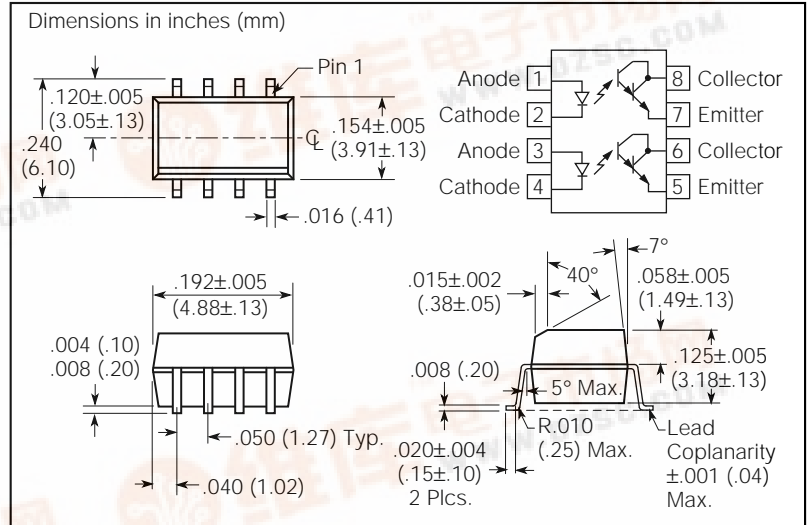
Peak Reverse Voltage 6.0 V
Peak Pulsed Current (1 μs , 300 pps) 3 A
Continuous Forward Current per Channel 30 mA
Power Dissipation at 25°C 45 mW
Derate Linearly from 25°C 0.4 mW/°C

Detector

Collector-Emitter Breakdown Voltage 30 V
Emitter-Collector Breakdown Voltage 5 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 mW/°C
Storage Temperature -55°C to +150°C
Operating Temperature -55°C to +100°C
Soldering Time at 260°C 10 sec.



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

	Symbol	Min.	Typ.	Max.	Unit	Condition
Emitter						
Forward Voltage	V_F			1.3	V	$I_F=1\text{ mA}$
Reverse Current	I_R		0.1	100	μA	$V_R=6.0\text{ V}$
Capacitance	C_O		25		pF	$V_F=0\text{ V}$, $F=1\text{ MHz}$
Detector						
Breakdown Voltage Collector-Emitter	BV_{CEO}	30			V	$I_C=10\text{ mA}$
Emitter-Collector	BV_{ECO}	5			V	$I_E=10\text{ mA}$
Current, Collector-Emitter	I_{CEO}			50	nA	$V_{CE}=5\text{ V}$, $I_F=0$
Capacitance, Collector-Emitter	C_{CE}		3.4		pF	$V_{CE}=5\text{ V}$
Package						
DC Current Transfer Ratio	CTR_{DC}	500			%	$I_F=1\text{ mA}$, $V_{CE}=5\text{ V}$
Saturation Voltage, Collector-Emitter	V_{CEsat}			1	V	$I_F=1\text{ mA}$, $I_{CE}=0.5\text{ mA}$
Capacitance, Input to Output	C_{IO}	0.5			pF	
Resistance, Input to Output	R_{IO}	100			$G\Omega$	
Turn-On Time	t_{ON}	15			μs	$V_{CC}=10\text{ V}$ $R_L=100\Omega$
Turn-Off Time	t_{OFF}	30			μs	$I_F=5\text{ mA}$
Isolation Test Voltage	V_{IO}					($t=1\text{ min.}$) 2500 $V_{AC_{RMS}}$



Figure 1. Forward voltage versus forward current

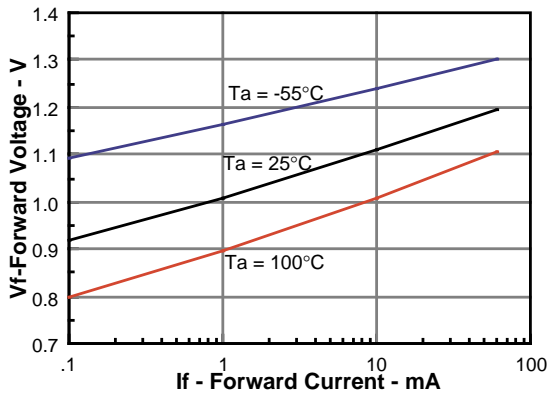


Figure 2. Peak LED current versus duty factor, Tau

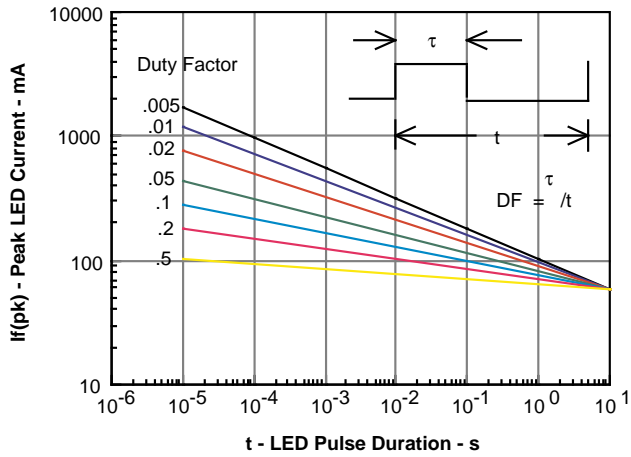


Figure 3. Normalized CTR_{CE} versus LED current

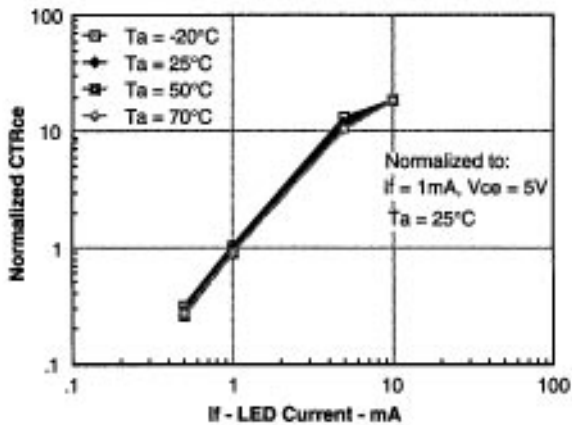


Figure 4. CTR versus LED current

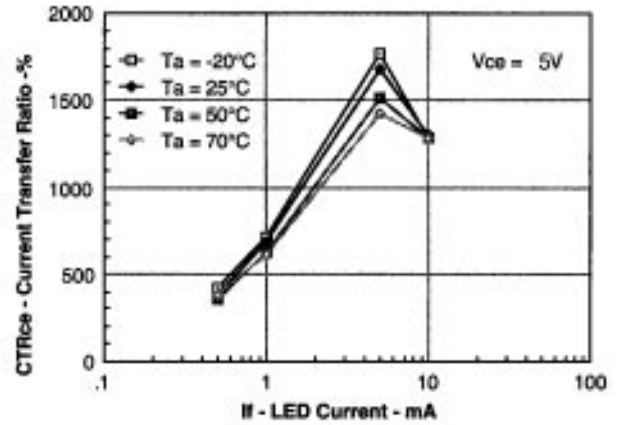


Figure 5. Collector current versus LED current

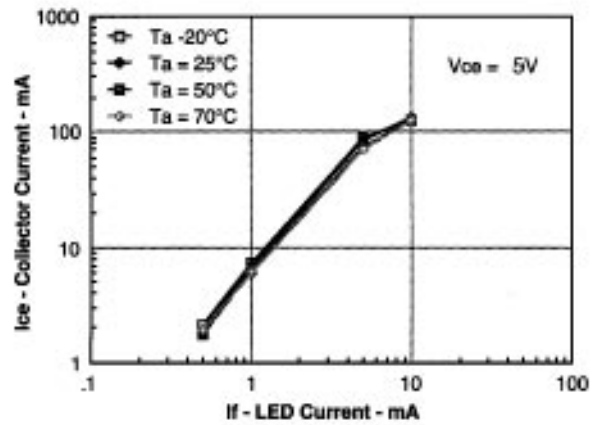


Figure 6. Switching schematic and switching timing

