

SIEMENS

IL221/222/223 PHOTODARLINGTON SMALL OUTLINE SURFACE MOUNT OPTOCOUPLER

FEATURES

- High Current Transfer Ratios, $I_F=1$ mA, IL221, 100% Minimum
IL222, 200% Minimum
IL223, 500% Minimum
- Withstand Test Voltage, 2500 VRMS
- Electrical Specifications Similar to Standard 6 Pin Coupler
- Industry Standard SOIC-8 Surface Mountable Package
- Standard Lead Spacing, .05"
- Available in Tape and Reel Option (Conforms to EIA Standard RS481A)
- Compatible with Dual Wave, Vapor Phase and IR Reflow Soldering
- Underwriters Lab File #E52744 (Code Letter P)

DESCRIPTION

The IL221/222/223 family of devices are high current transfer ratio (CTR) optocouplers. They have a Gallium Arsenide infrared LED emitter and a silicon NPN photodarlington transistor detector.

These devices are offered with CTRs tested at an LED current of 1 mA. This low drive current permits easy interfacing from CMOS to LSTTL or TTL.

These optocouplers are constructed in a standard SOIC-8 foot print which makes them ideally suited for high density applications. In addition to eliminating through-holes requirements, this package conforms to standards for surface mounted devices.

Maximum Ratings

Emitter

Peak Reverse Voltage 6.0 V
Continuous Forward Current 60 mA
Power Dissipation at 25°C 90 mW
Derate Linearly from 25°C 1.2 mW/°C

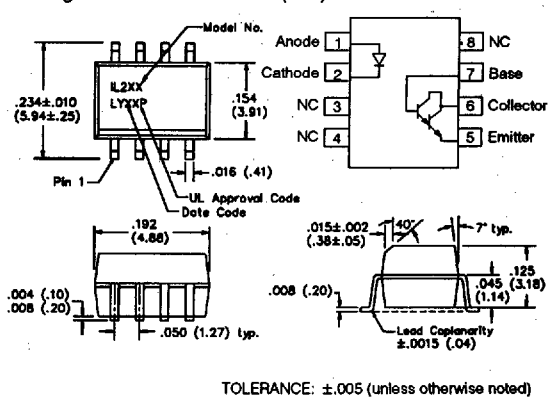
Detector

Collector-Emitter Breakdown Voltage 30 V
Emitter-Collector Breakdown Voltage 5 V
Collector-Base Breakdown Voltage 70 V
Power Dissipation 150 mW
Derate Linearly from 25°C 2.0 mW/°C

Package

Total Package Dissipation at 25°C Ambient (LED + Detector) 240 mW
Derate Linearly from 25°C 3.3 mW/°C
Storage Temperature -55°C to +150°C
Operating Temperature -55°C to +100°C
Soldering Time at 260°C 10 sec.

Package Dimensions in Inches (mm)



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

	Symbol	Min.	Typ.	Max.	Unit	Condition
Emitter						
Forward Voltage	V_F		1.3	1.5	V	$I_F=1$ mA
Reverse Current	I_R		0.1	100	μA	$V_R=6.0$ V
Capacitance	C_O		25		pF	$V_F=0$ V, $F=1$ MHz
Detector						
Breakdown Voltage					V	
Collector-Emitter	BV_{CEO}	30			V	$I_C=100$ μA
Emitter-Collector	BV_{ECO}	5			V	$I_E=100$ μA
Collector-Base Voltage	BV_{CBO}	70			V	$I_C=10$ μA
Collector-Emitter Capacitance	C_{CE}		3.4		pF	$V_{CE}=10$ V
Package						
DC Current Transfer	CTR_{DC}				%	
IL221		100				$I_F=1$ mA, $V_{CE}=5$ V
IL222		200				
IL223		500				
Collector-Emitter Saturation Voltage	$V_{CE sat}$			1	V	$I_F=1$ mA
Withstand Test Voltage	V_{WT}	2500			VAC _{RMS}	$t=1$ min.
Capacitance, Input to Output Resistance,	C_{IO}		0.5		pF	
Input to Output	R_{IO}		100		GΩ	
Turn-On Time	T_{on}		15		μs	$\left\{ \begin{array}{l} V_{CC}=10 \text{ V} \\ R_L=100 \Omega \\ I_F=5 \text{ mA} \end{array} \right.$
Turn-Off Time	T_{off}		30		μs	

See Application Note 39 for solderability information.

Figure 1. Forward voltage versus forward current

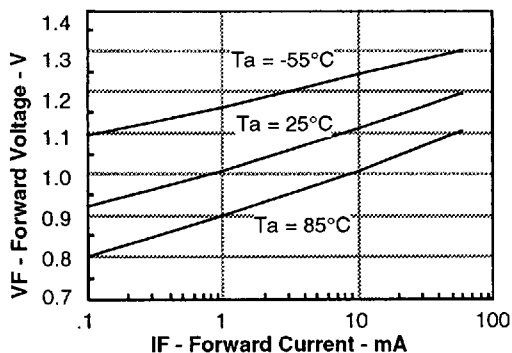


Figure 2. Peak LED current versus duty factor, Tau

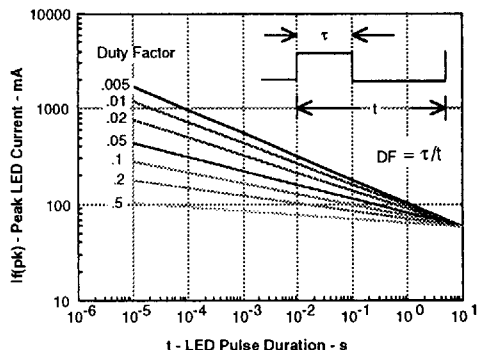


Figure 3. Normalized CTR_{CB} versus I_F

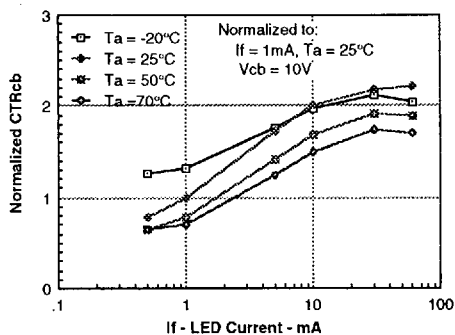


Figure 4. Normalized CTR_{CE} versus LED current

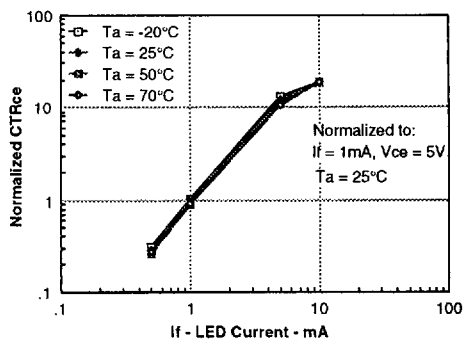


Figure 5. CTR_{CB} versus LED current

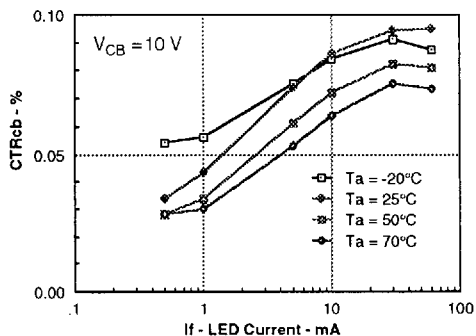


Figure 6. CTR versus LED current

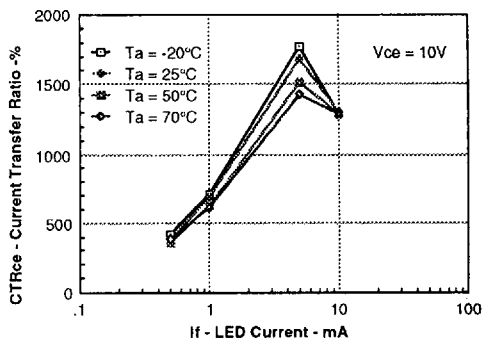


Figure 7. Collector current versus LED current

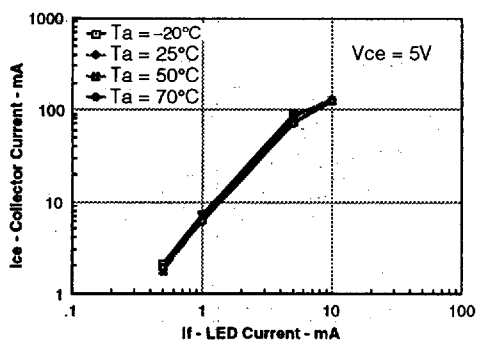


Figure 8. Photocurrent versus LED current

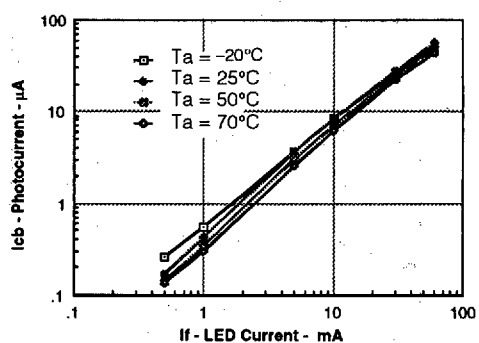


Figure 9. Normalized I_{cb} versus I_f

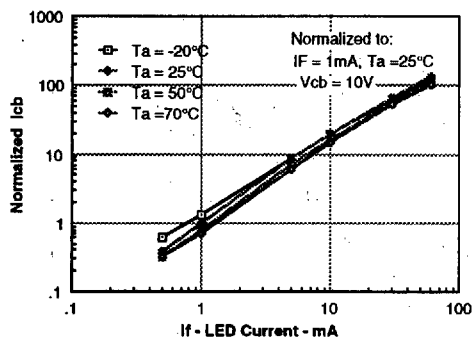


Figure 10. Switching timing

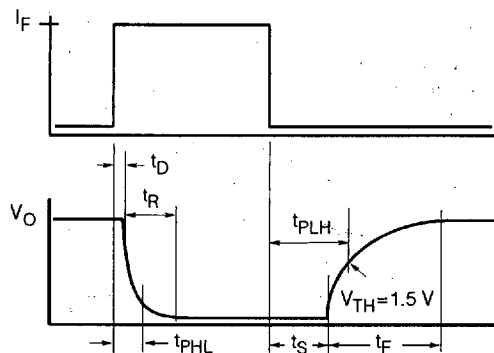


Figure 11. Switching schematic

