SIEMENS

IL221A/IL222A/IL223A

PHOTODARLINGTON SMALL OUTLINE SURFACE MOUNT OPTOCOUPLER

NEW

FEATURES

- **High Current Transfer Ratio, I_F=1 mA, IL221A, 100% Minimum IL222A, 200% Minimum IL223A, 500% Minimum**
- **Withstand Test Voltage, 2500 VAC_{RMS}**
- **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 IL221A/IL222A/IL223A is a high current transfer ratio (CTR) optocoupler with a Gallium Arsenide infrared LED emitter and a silicon NPN photodarlington transistor detector.

This device has a CTR tested at an 1 mA LED current. This low drive current permits easy interfacing from CMOS to LSTTL or TTL.

This optocoupler 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

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

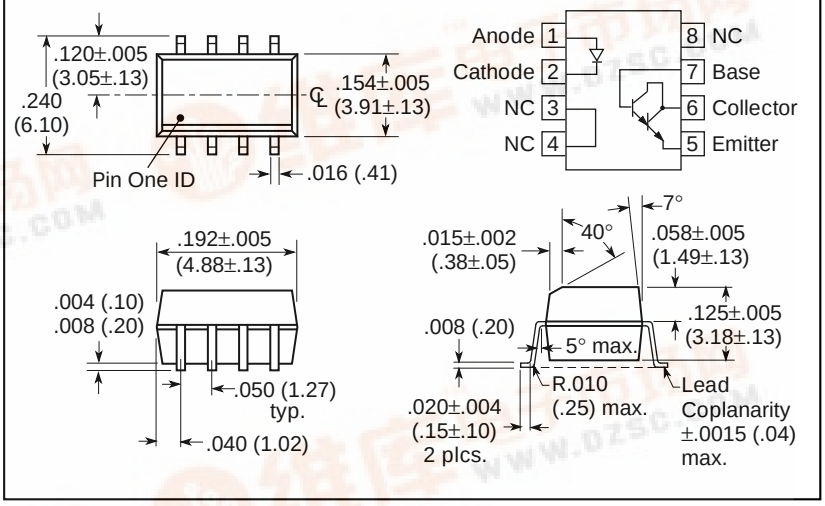
Detector

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.

Dimensions in inches (mm)



Characteristics (T_A=25°C)

	Symbol	Min.	Typ.	Max.	Unit	Condition
Emitter						
Forward Voltage	V_F		1.0	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_R=0 V, F=1 MHz
Detector						
Breakdown Voltage Collector-Emitter Emitter-Collector	B_{VCEO} B_{VECO}	30 5			V V	I_C=100 µA I_E=100 µA
Voltage, Collector-Base	BV_{CBO}	70				I_C=10 µA
Capacitance, Collector-Emitter	C_{CE}		3.4		pF	V_{CE}=10 V
Package						
DC Current Transfer Ratio IL221A IL222A IL223A	CTR_{DC}	100 200 300				I_F=1 mA, V_{CE}=5 V
Saturation Voltage, Collector-Emitter	V_{CEsat}			1	V	I_{CE}=0.5 mA, I_F=1 mA
Isolation Test Voltage	V_{IO}	2500			VAC_{RMS}	t=1 sec.
Capacitance, Input toOutput	C_{IO}		0.5		pF	
Resistance, Input to Output	R_{IO}		100		GΩ	

Figure 1. Forward voltage versus forward current

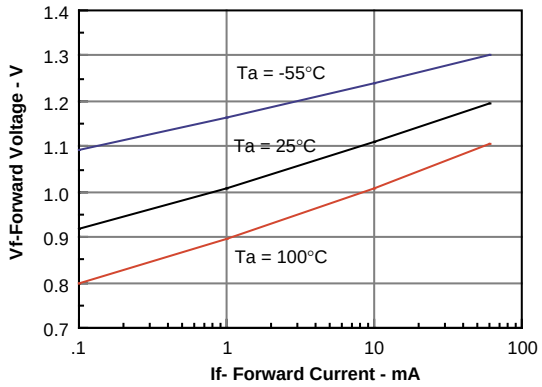


Figure 2. Peak LED current versus duty factor, Tau

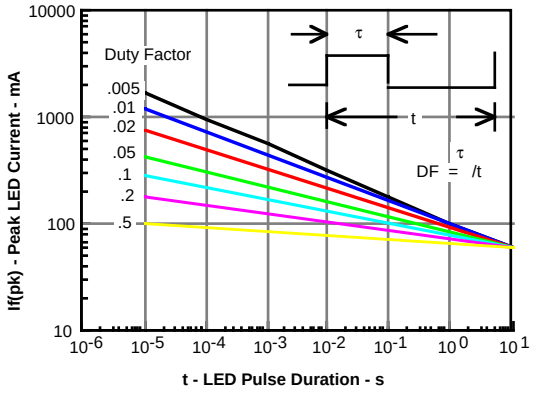


Figure 3. Normalized CTR_{CB} versus I_F

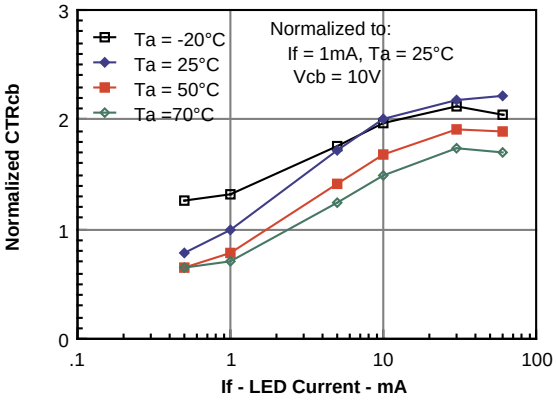


Figure 4. Normalized CTR_{CE} versus LED current

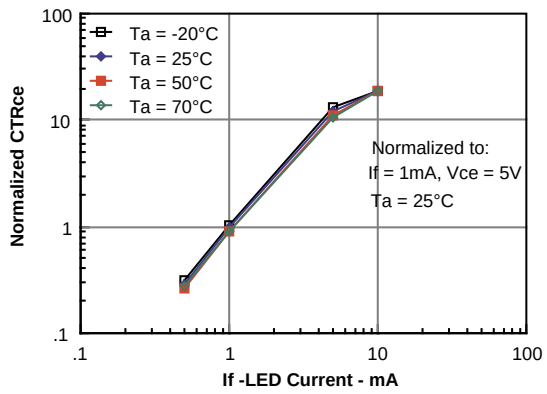


Figure 5. CTR_{CB} versus LED current

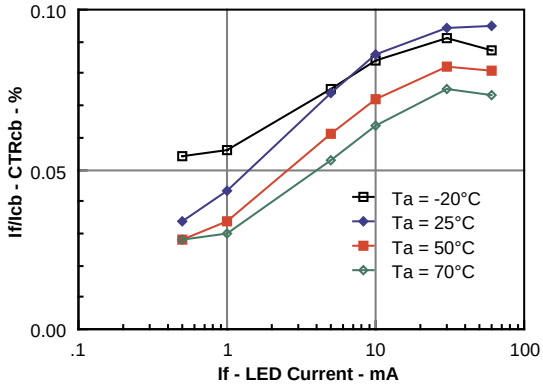


Figure 6. CTR versus LED current

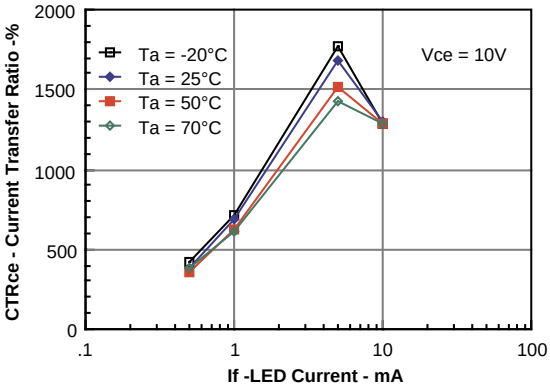


Figure 7. Collector current versus LED current

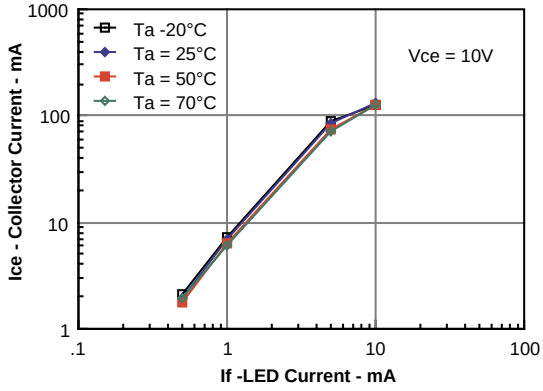


Figure 8. Photocurrent versus LED current

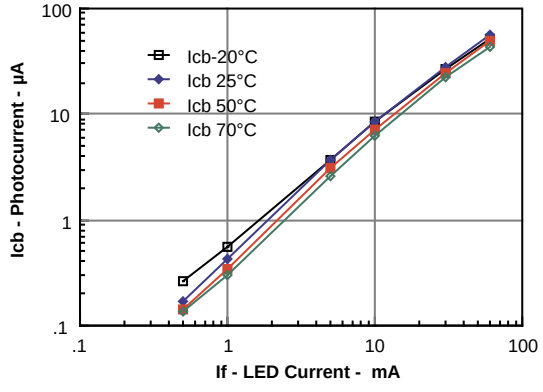


Figure 9. Normalized I_{CB} versus I_F

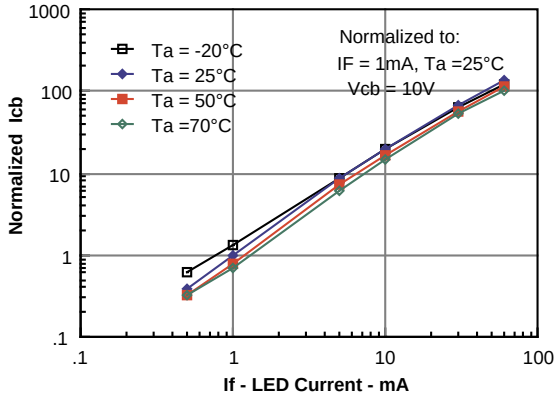


Figure 10. Switching timing

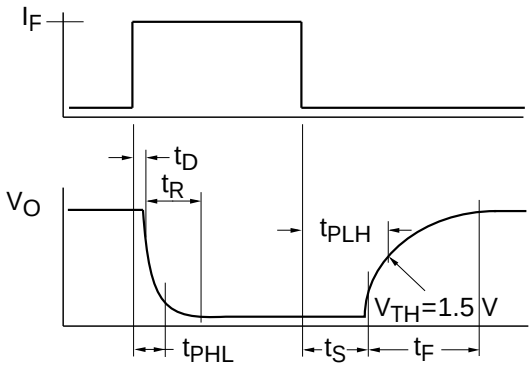


Figure 11. Switching schematic