IL221AT/IL222AT/IL223AT

Photodarlington Small Outline Surface Mount Optocoupler

FEATURES

- **High Current Transfer Ratio, I_F=1.0 mA, IL221AT, 100% Minimum IL222AT, 200% Minimum IL223AT, 500% Minimum**
- **Withstand Test Voltage, 3000 V_{RMS}**
- **Electrical Specifications Similar to Standard 6 Pin Coupler**
- **Industry Standard SOIC-8 Surface Mountable Package**
- **Standard Lead Spacing, .05"**
- **Available only on 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 Y)**
- **VDE 0884 Available with Option 1**

DESCRIPTION

The IL221AT/IL222AT/IL223AT 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 1.0 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

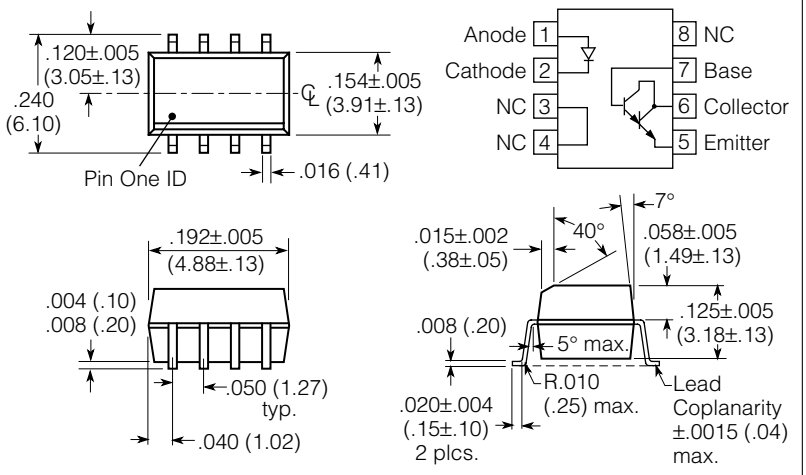
Detector

Collector-Emitter Breakdown Voltage ..... 30 V
Emitter-Collector Breakdown Voltage ..... 5.0 V
Collector-Base Breakdown Voltage ..... 70 V
$I_{CMAX\ DC}$ ..... 50 mA
I_{CMAX} (t<1.0 ms) ..... 100 mA
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 ..... 3.2 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

Parameter		Symbol	Min.	Typ.	Max.	Unit	Condition
Emitter							
Forward Voltage		V_F	—	1.0	1.5	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_R=0 V, F=1.0 MHz
Detector							
Breakdown Voltage		B_{VCEO}	30	—	—	V	I_C=100 µA
		B_{VECO}	5.0	—	—	V	I_E=100 µA
Voltage, Collector-Base		BV_{CBO}	70	—	—	V	I_C=10 µA
Capacitance, Collector-Emitter		C_{CE}	—	3.4	—	pF	V_{CE}=10 V
Package							
DC Current Transfer Ratio	IL221A	CTR_{DC}	100	—	—	—	I_F=1.0 mA, V_{CE}=5.0 V
	IL222A		200	—	—	—	
	IL223A		500	—	—	—	
Saturation Voltage, Collector-Emitter		V_{CEsat}	—	—	1.0	V	I_{CE}=0.5 mA, I_F=1.0 mA
Isolation Test Voltage		V_{IO}	3000	—	—	V_{RMS}	t=1.0 sec.
Capacitance, Input to Output		C_{IO}	—	0.5	—	pF	—
Resistance, Input to Output		R_{IO}	—	100	—	GΩ	—

Figure 1. Forward voltage versus forward current

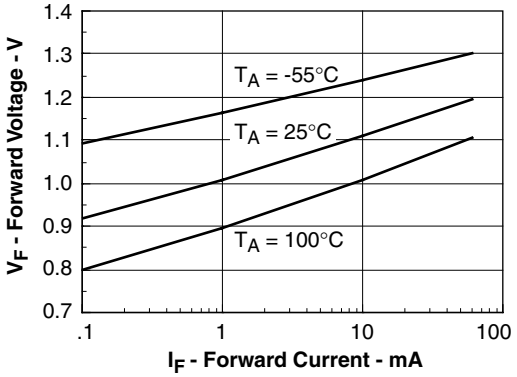


Figure 2. Peak LED current versus duty factor, Tau

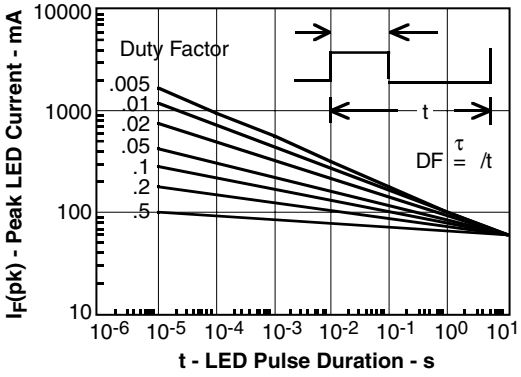


Figure 3. Normalized CTR_{CB} versus I_F

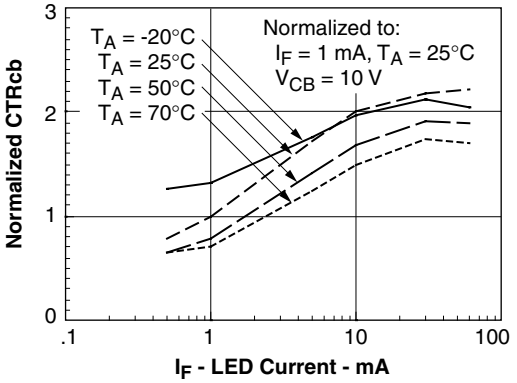


Figure 4. Normalized CTR_{CE} versus LED current

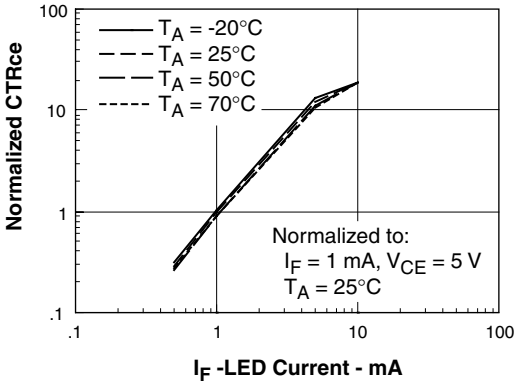


Figure 5. CTR_{CB} versus LED current

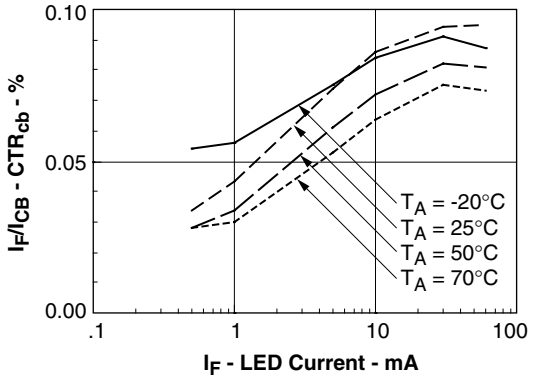


Figure 6. CTR versus LED current

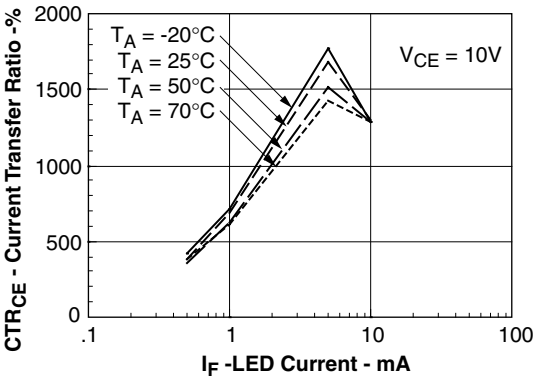


Figure 7. Collector current versus LED current

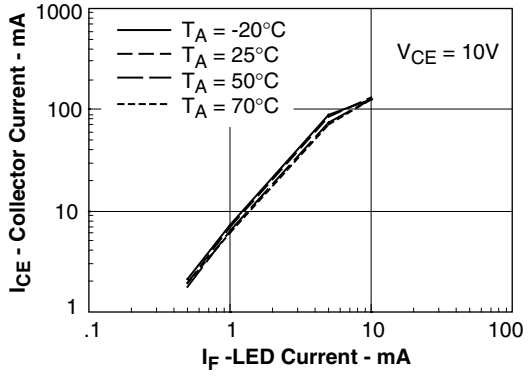


Figure 8. Photocurrent versus LED current

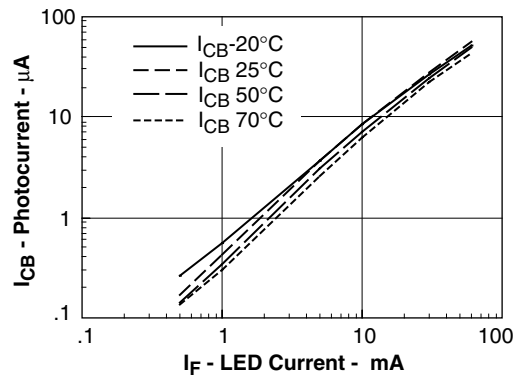


Figure 9. Normalized I_{CB} versus I_F

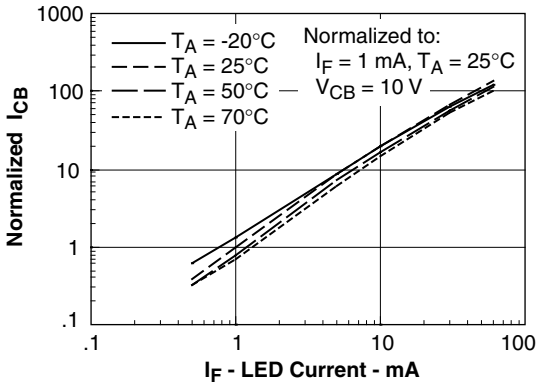


Figure 10. Switching timing

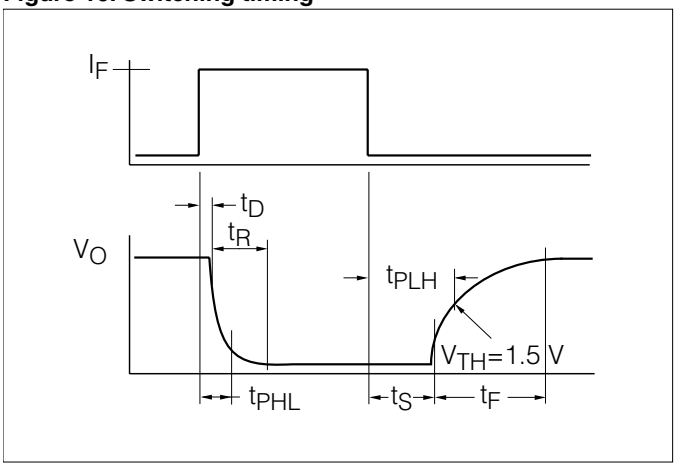


Figure 11. Switching schematic