

NEW

### FEATURES

- High Current Transfer Ratio,  $I_F=1$  mA, IL221A, 100% Minimum  
IL222A, 200% Minimum  
IL223A, 500% Minimum
- Withstand Test Voltage, 2500 VAC<sub>RMS</sub>
- 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

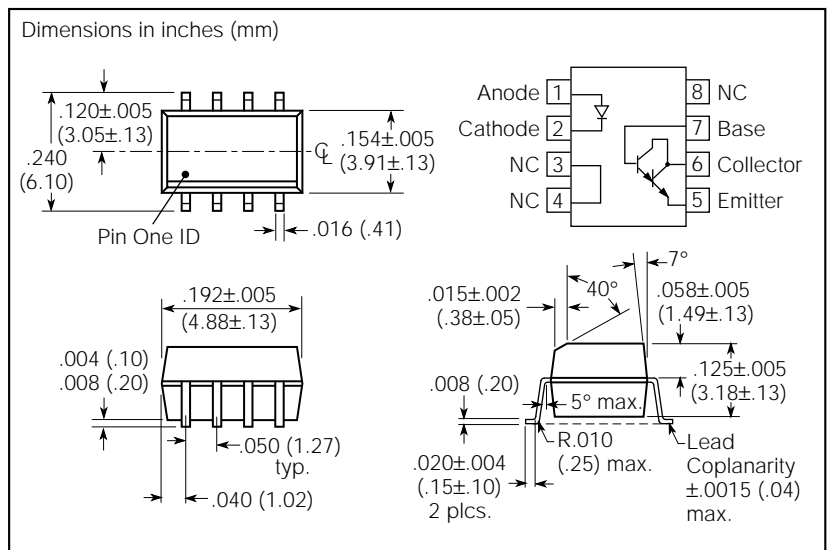
Peak Reverse Voltage ..... 6.0 V  
 Continuous Forward Current ..... 60 mA  
 Power Dissipation at 25°C ..... 90 mW  
 Derate Linearly from 25°C ..... 1.2 mW/°C

#### 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.



### Characteristics (T<sub>A</sub>=25°C)

	Symbol	Min.	Typ.	Max.	Unit	Condition
<b>Emitter</b>						
Forward Voltage	V <sub>F</sub>		1.0	1.5	V	I <sub>F</sub> =1 mA
Reverse Current	I <sub>R</sub>		0.1	100	μA	V <sub>R</sub> =6.0 V
Capacitance	C <sub>O</sub>		25		pF	V <sub>R</sub> =0 V, F=1 MHz
<b>Detector</b>						
Breakdown Voltage Collector-Emitter	B <sub>VCEO</sub>	30			V	I <sub>C</sub> =100 μA
Breakdown Voltage Emitter-Collector	B <sub>VECO</sub>	5			V	I <sub>E</sub> =100 μA
Voltage, Collector-Base	BV <sub>CBO</sub>	70				I <sub>C</sub> =10 μA
Capacitance, Collector-Emitter	C <sub>CE</sub>		3.4		pF	V <sub>CE</sub> =10 V
<b>Package</b>						
DC Current Transfer Ratio	CTR <sub>DC</sub>					I <sub>F</sub> =1 mA, V <sub>CE</sub> =5 V
IL221A			100			
IL222A			200			
IL223A			300			
Saturation Voltage, Collector-Emitter	V <sub>CEsat</sub>			1	V	I <sub>CE</sub> =0.5 mA, I <sub>F</sub> =1 mA
Isolation Test Voltage	V <sub>IO</sub>	2500			VAC <sub>RMS</sub>	t=1 sec.
Capacitance, Input to Output	C <sub>IO</sub>		0.5		pF	
Resistance, Input to Output	R <sub>IO</sub>		100		GΩ	

Figure 1. Forward voltage versus forward current

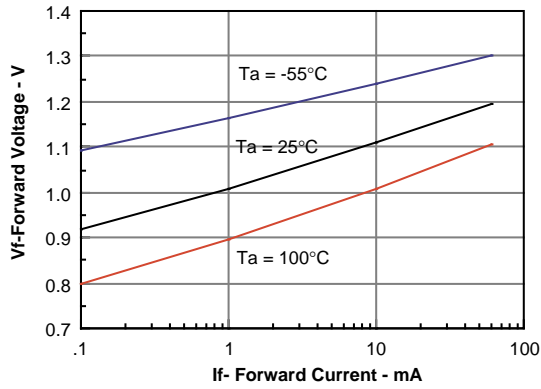


Figure 2. Peak LED current versus duty factor, Tau

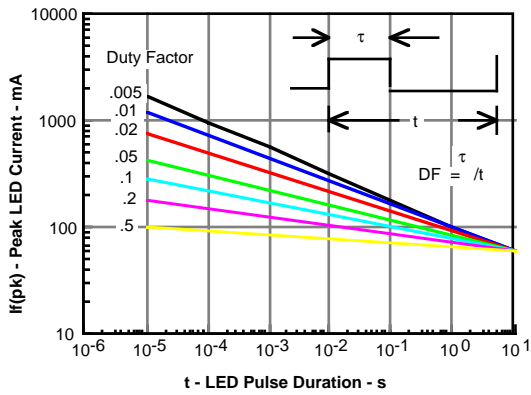


Figure 3. Normalized CTR<sub>CB</sub> versus I<sub>F</sub>

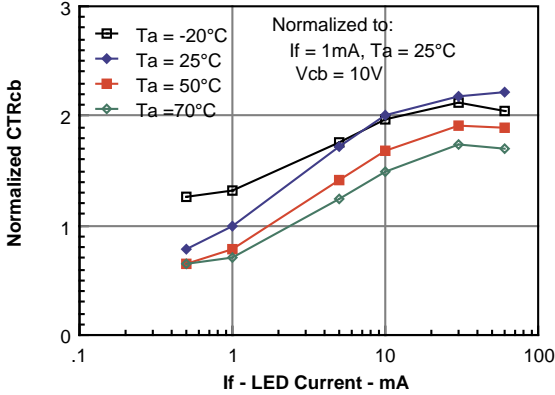


Figure 4. Normalized CTR<sub>CE</sub> versus LED current

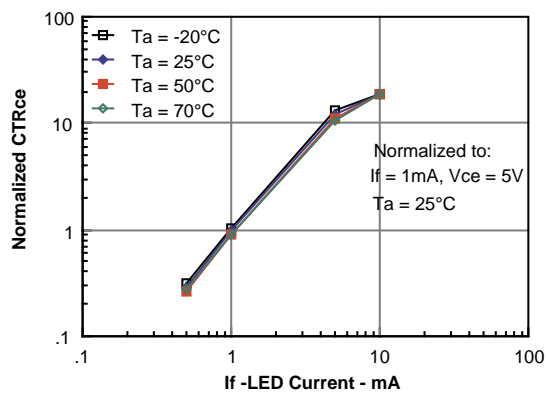


Figure 5. CTR<sub>CB</sub> versus LED current

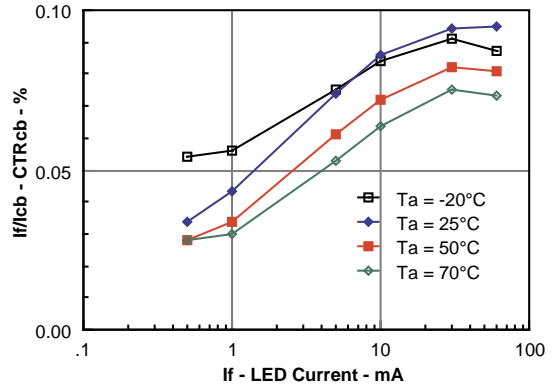


Figure 6. CTR versus LED current

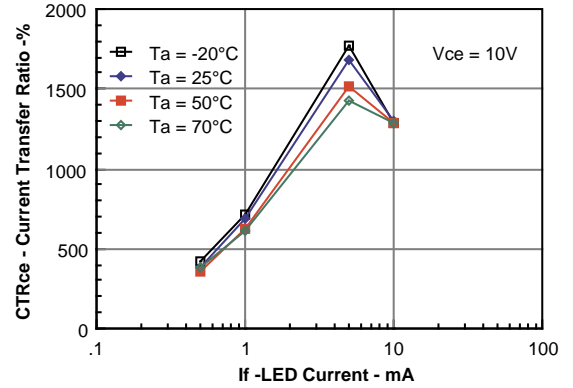


Figure 7. Collector current versus LED current

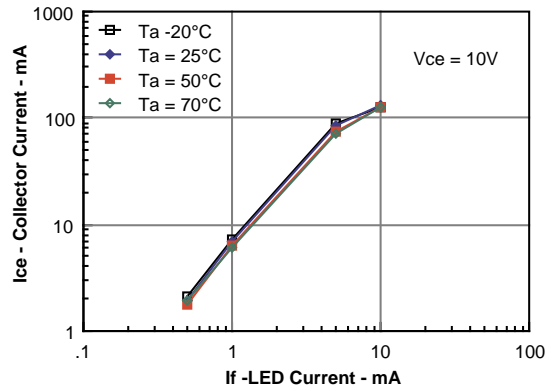
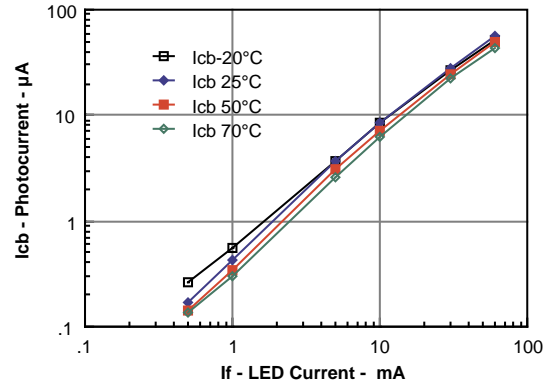
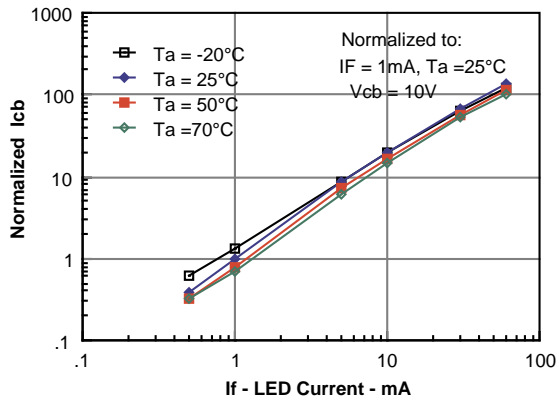


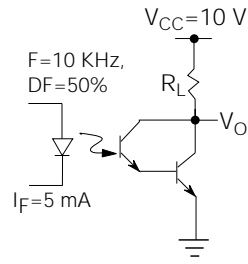
Figure 8. Photocurrent versus LED current



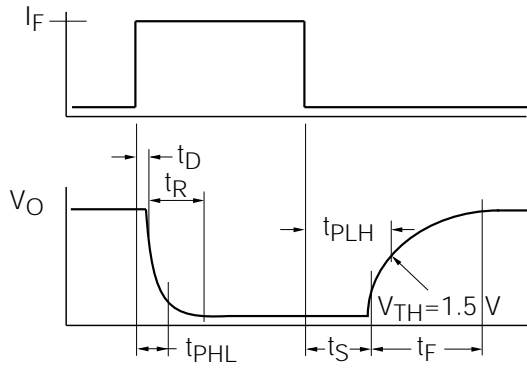
**Figure 9. Normalized  $I_{CB}$  versus  $I_F$**



**Figure 11. Switching schematic**



**Figure 10. Switching timing**





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