

IL211A/212A/213A PHOTOTRANSISTOR SMALL OUTLINE SURFACE MOUNT OPTOCOUPLER

FEATURES

- **High Current Transfer Ratio**
IL211A—20% Minimum
IL212A—50% Minimum
IL213A—100% Minimum
- **Isolation 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 IL211A/212A/213A are optically coupled pairs with a Gallium Arsenide infrared LED and a silicon NPN phototransistor. Signal information, including a DC level, can be transmitted by the device while maintaining a high degree of electrical isolation between input and output. The IL211A/212A/213A comes in a standard SOIC-8 small outline package for surface mounting which makes it ideally suited for high density applications with limited space. In addition to eliminating through-holes requirements, this package conforms to standards for surface mounted devices.

A choice of 20, 50, and 100% minimum CTR at $I_F = 10$ mA makes these optocouplers suitable for a variety of different applications.

Maximum Ratings

Emitter

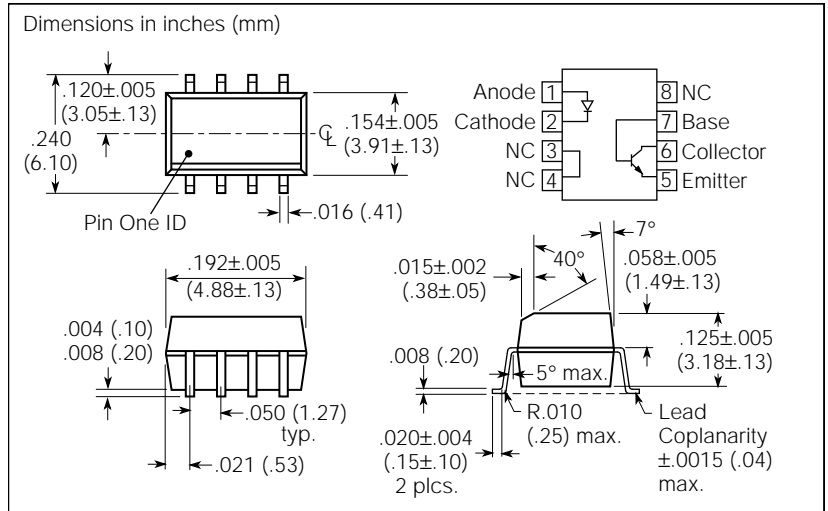
Peak Reverse Voltage 6.0 V
 Continuous Forward Current 60 mA
 Power Dissipation at 25°C 90 mW
 Derate Linearly from 25°C 1.2 mW/°C

Detector

Collector-Emitter Breakdown Voltage 30 V
 Emitter-Collector Breakdown Voltage 7 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) 280 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 ($T_A = 25^\circ\text{C}$)

	Symbol	Min.	Typ.	Max.	Unit	Condition
Emitter						
Forward Voltage	V_F		1.3	1.5	V	$I_F = 10$ mA
Reverse Current	I_R		0.1	100	μA	$V_R = 6.0$ V
Capacitance	C_O		25		pF	$V_R = 0$
Detector						
Breakdown Voltage	$B_{V_{CE0}}$ $B_{V_{ECO}}$		30 7		V V	$I_C = 10$ μA $I_E = 10$ μA
Dark Current, Collector-Emitter	$I_{CE0\text{dark}}$		5	50	nA	$V_{CE} = 10$ V $I_F = 0$
Capacitance, Collector-Emitter	C_{CE}		10		pF	$V_{CE} = 0$
Package						
DC Current Transfer Ratio	CTR_{DC}				%	$I_F = 10$ mA, $V_{CE} = 5$ V
IL211A		20	50			
IL212A		50	80			
IL213A		100	130			
Saturation Voltage, Collector-Emitter	$V_{CE\text{sat}}$			0.4		$I_F = 10$ mA, $I_C = 2.0$ mA
Isolation Test Voltage	V_{IO}	2500			VAC _{RMS}	
Capacitance, Input to Output	C_{IO}		0.5		pF	
Resistance, Input to Output	R_{IO}		100		G Ω	
Switching Time	t_{on}, t_{off}		3.0		μs	$I_C = 2$ mA, $R_E = 100$ Ω , $V_{CE} = 10$ V

Figure 1. Forward voltage versus forward current

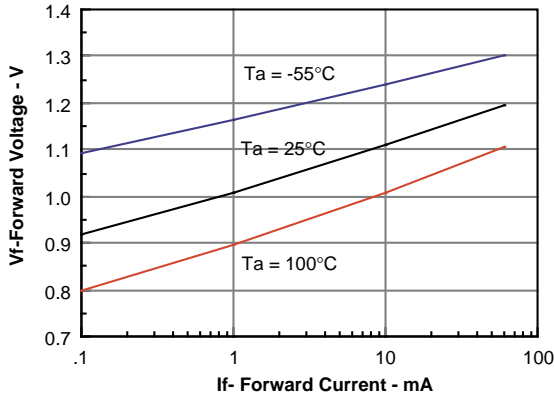


Figure 2. Normalized non-saturated and saturated CTR_{ce} versus LED current

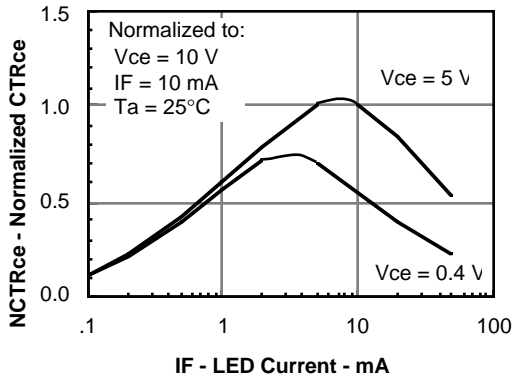


Figure 3. Collector-emitter current versus LED current

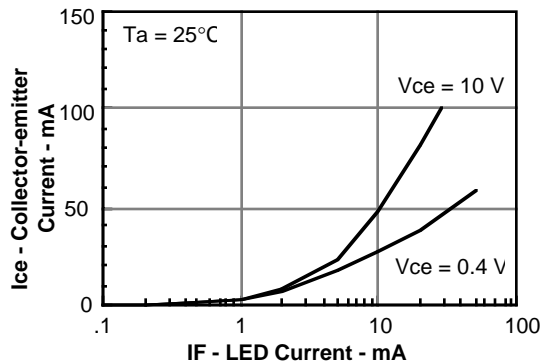


Figure 4. Normalized collector-base photocurrent versus LED current

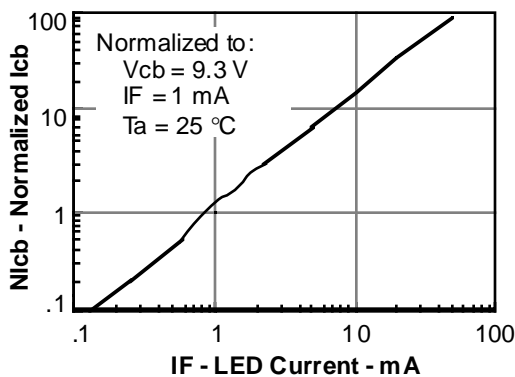


Figure 5. Normalized collector-base photocurrent versus LED current

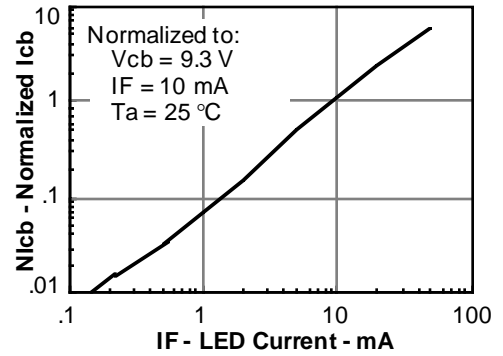


Figure 6. Collector-base photocurrent versus LED current

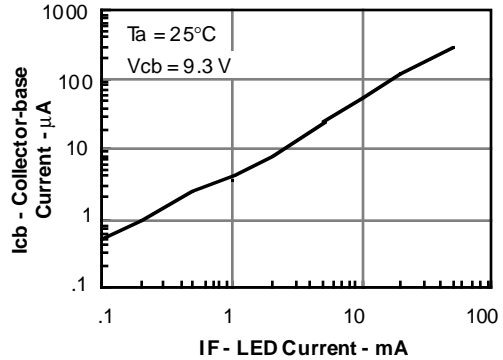


Figure 7. Collector-emitter leakage current versus temperature

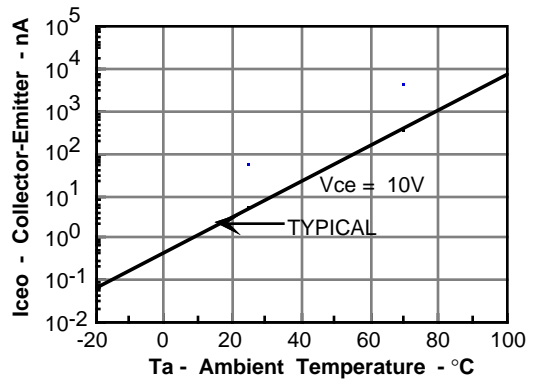


Figure 8. Normalized saturated HFE versus base current and temperature

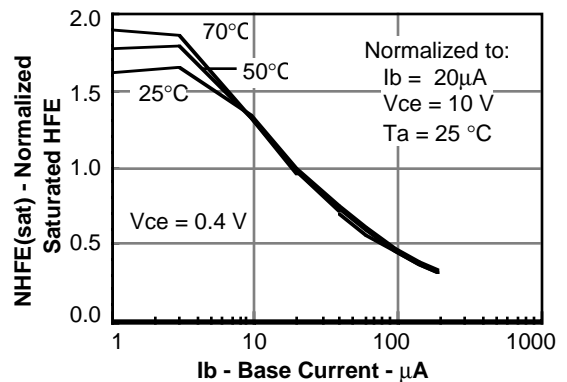


Figure 9. Typical switching characteristics versus base resistance (saturated operation)

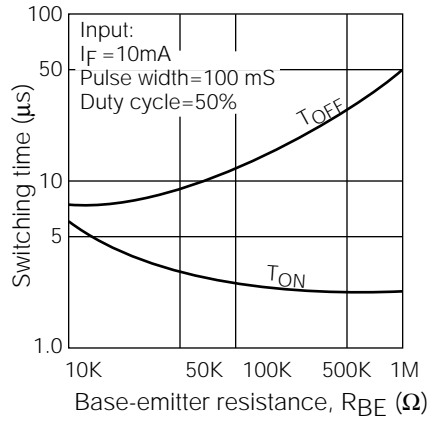


Figure 10. Typical switching times versus load resistance

