

SIEMENS

IL211/212/213
PHOTOTRANSISTOR
SMALL OUTLINE
SURFACE MOUNT OPTOCOUPLER

FEATURES

- **High Current Transfer Ratios**
IL211, 20% Minimum
IL212, 50% Minimum
IL213, 100% Minimum
- **Isolation 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 IL211/212/213 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 IL211/212/213 come 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 (IL211/212/213, respectively) at $I_F = 10$ mA makes these optocouplers suitable for a variety of different applications.

Maximum Ratings

Emitter

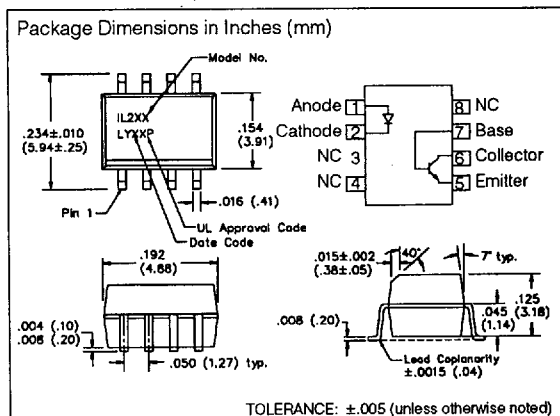
Peak Reverse Voltage	6.0 V
Continuous Forward Current	60 mA
Power Dissipation at 25°C	90 mW
Derate Linearly from 25°C	1.2 mW/°C

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	$I_F=10\text{ mA}$
Reverse Current	I_R		0.1	100	μA	$V_R=6.0\text{ V}$
Capacitance	C_O		25		pF	$V_R=0$.
Detector						
Breakdown Voltage						
Collector-Emitter	BV_{CEO}	30	90		V	$I_C=10\text{ }\mu\text{A}$
Emitter-Collector	BV_{ECO}	7	10		V	$I_E=10\text{ }\mu\text{A}$
Collector-Emitter						$V_{CE}=10\text{ V}$,
Dark Current	$I_{CEO\text{dark}}$		5	50	nA	$I_F=0$
Collector-Emitter						
Capacitance	C_{CE}		10		pF	$V_{CE}=0$
Package						
DC Current Transfer	CTR_{DC}				%	$I_F=10\text{ mA}$,
IL211		20	50			$V_{CE}=5\text{ V}$
IL212		50	80			
IL213		100	130			
Collector-Emitter						$I_C=2.0\text{ mA}$,
Saturation Voltage	$V_{CE\text{ sat}}$			0.4		$I_F=10\text{ mA}$
Withstand Test						
Voltage	WTV	2500			VAC _{RMS}	$t=1\text{ min.}$
Equivalent DC						
Isolation Voltage		3535			VDC	
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		ms	$I_C=2\text{ mA}$,
						$R_E=100\text{ }\Omega$,
						$V_{CE}=10\text{ V}$

See Application Note 39 for solderability information.

Figure 1. Forward voltage versus forward current

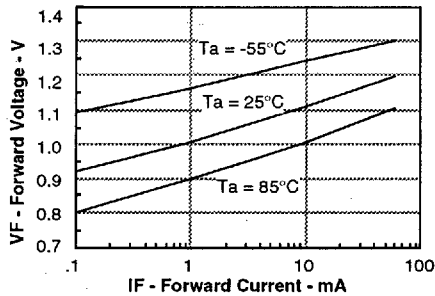


Figure 3. Collector-emitter current versus LED current

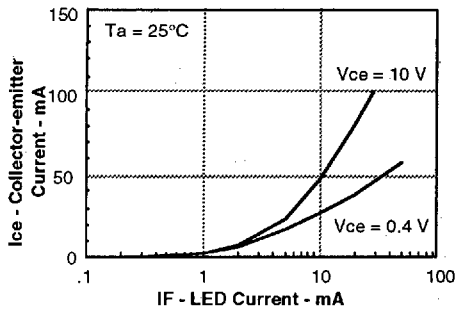


Figure 5. Normalized collector-base photocurrent versus LED current

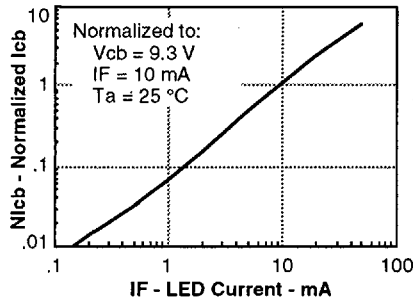


Figure 7. Collector-emitter leakage current versus temperature

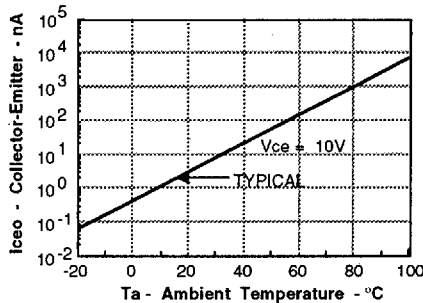


Figure 2. Normalized non-saturated and saturated CTR_{CE} versus LED current

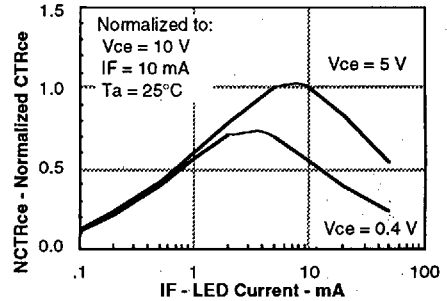


Figure 4. Normalized collector-base photocurrent versus LED current

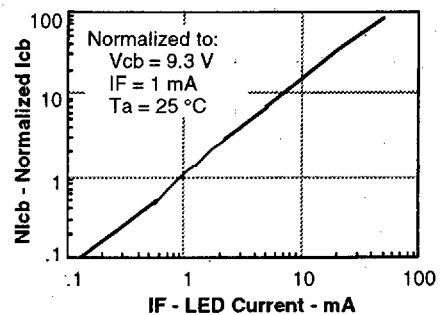


Figure 6. Collector-base photocurrent versus LED current

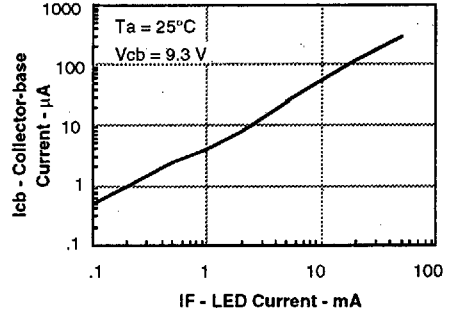


Figure 8. Normalized saturated HFE versus base current and temperature

