



IL211AT/212AT/213AT

Phototransistor Small Outline Surface Mount Optocoupler

FEATURES

- **High Current Transfer Ratio**
IL211A, 20% Minimum
IL212A, 50% Minimum
IL213A, 100% Minimum
- **Isolation Voltage, 3000 V_{RMS}**
- **Electrical Specifications Similar to Standard 6 Pin Coupler**
- **Industry Standard SOIC-8A 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 IL211AT/212AT/213AT 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 IL211AT/212AT/213AT 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

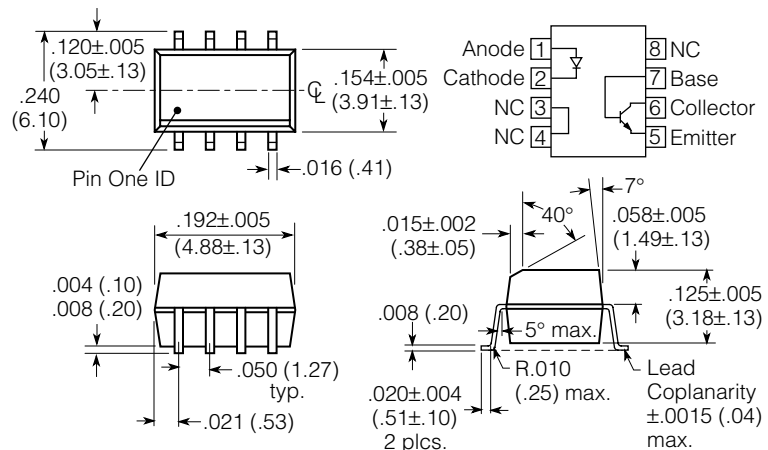
Detector

Collector-Emitter Breakdown Voltage 30 V
Emitter-Collector Breakdown Voltage 7.0 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 $T_A = 25^\circ\text{C}$

Parameter	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_0	—	13	—	pF	$V_R = 0$
Detector						
Breakdown Voltage	$B_{V_{CEO}}$	30	—	—	V	$I_C = 10$ μA
	$B_{V_{ECO}}$	7.0	—	—	V	$I_E = 10$ μA
Dark Current, Collector-Emitter	$I_{CEO\text{dark}}$	—	5.0	50	nA	$V_{CE} = 10$ V $I_F = 0$
Capacitance, Collector-Emitter	C_{CE}	—	10	—	pF	$V_{CE} = 0$
Package						
DC Current Transfer Ratio	IL211AT	CTR _{DC}	20	50	—	% $I_F = 10$ mA, $V_{CE} = 5.0$ V
	IL212AT		50	80	—	
	IL213AT		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}	3000	—	—	V _{RMS}	1 sec.
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	$I_C = 2.0$ mA, $R_L = 100$ Ω , $V_{CC} = 10$ V

Figure 1. Forward voltage versus forward current

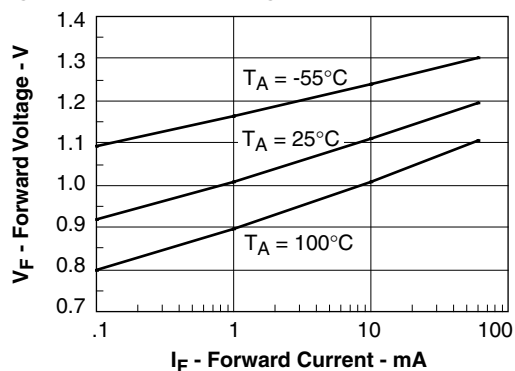


Figure 2. Normalized non-saturated and saturated CTR_{ce} versus LED current

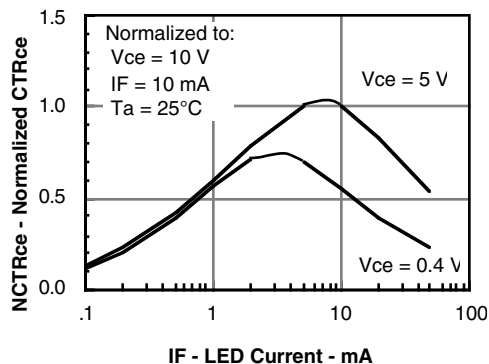


Figure 3. Collector-emitter current versus LED current

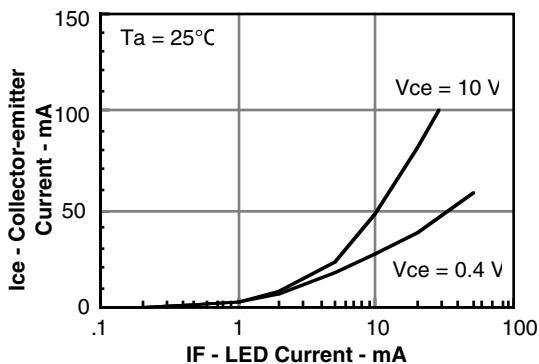


Figure 4. Normalized collector-base photocurrent versus LED current

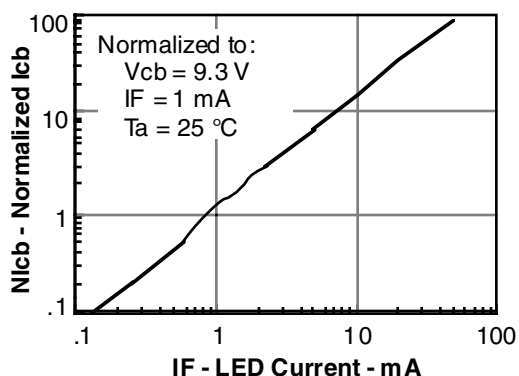


Figure 5. Normalized collector-base photocurrent versus LED current

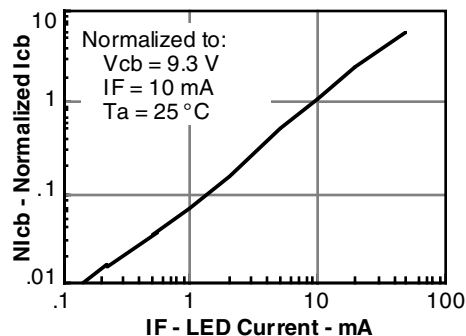


Figure 6. Collector-base photocurrent versus LED current

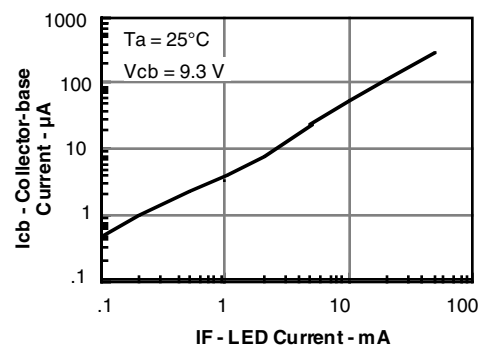


Figure 7. Collector-emitter leakage current versus temperature

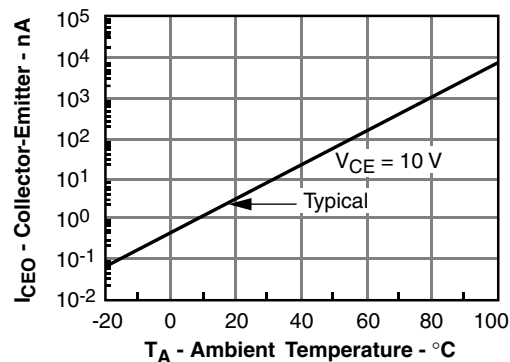


Figure 8. Normalized saturated HFE versus base current and temperature

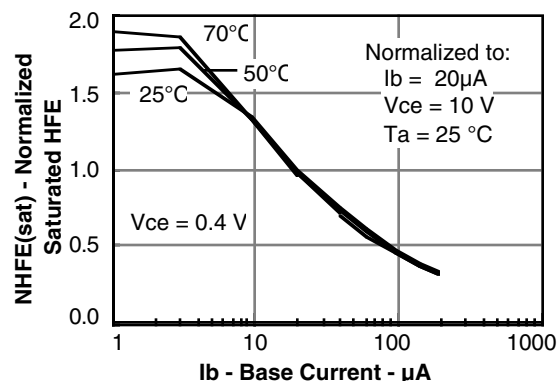


Figure 9. Typical switching characteristics versus base resistance (saturated operation)

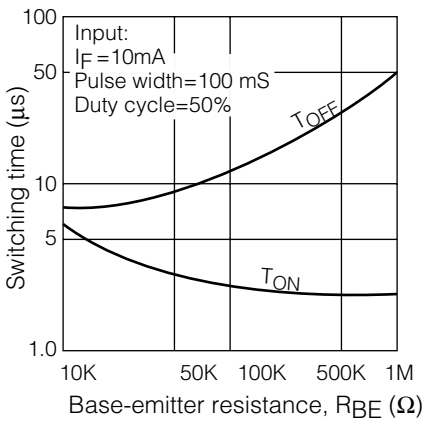


Figure 10. Typical switching times versus load resistance

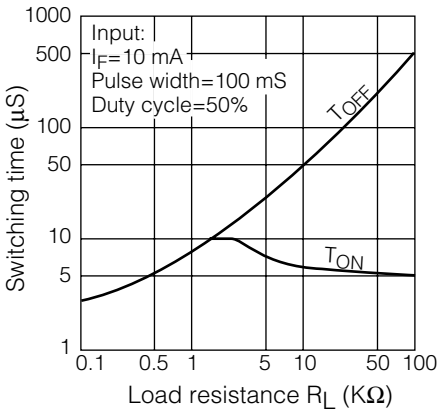


Figure 11. Switching time test schematic and waveform

