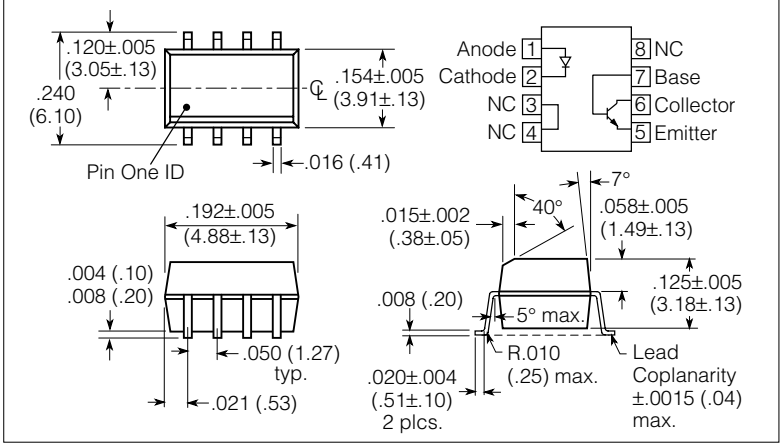
IL211AT/212AT/213AT

Phototransistor
Small Outline Surface Mount
Optocoupler

FEATURES

- **High Current Transfer Ratio**
  IL211A, 20% Minimum
  IL212A, 50% Minimum
  IL213A, 100% Minimum
- **Isolation Voltage, 2500 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 P)**

Dimensions in inches (mm)



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)..... 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°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_{VCEO}	30	—	—	V	I_C=10 µA
		B_{VECO}	7.0	—	—		I_E=10 µA
Dark Current, Collector-Emitter		$I_{CEOdark}$	—	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_{CEsat}	—	—	0.4	—	I_F=10 mA, I_C=2.0 mA
Isolation Test Voltage		V_{IO}	2500	—	—	V_{RMS}	—
Capacitance, Input to Output		C_{IO}	—	0.5	—	pF	—
Resistance, Input to Output		R_{IO}	—	100	—	GΩ	—
Switching Time		t_{on}, t_{off}	—	3.0	—	µs	I_C=2.0 mA, R_E=100 Ω, V_{CC}=10 V

Figure 1. Forward voltage versus forward current

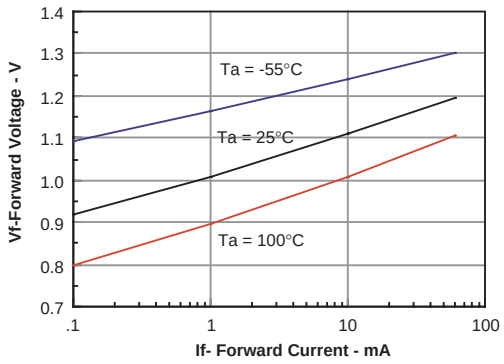


Figure 2. Normalized non-saturated and saturated CTR_{ce} versus LED current

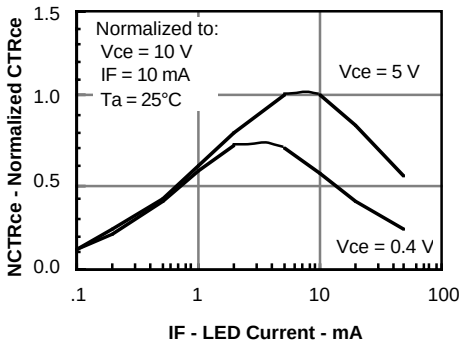


Figure 3. Collector-emitter current versus LED current

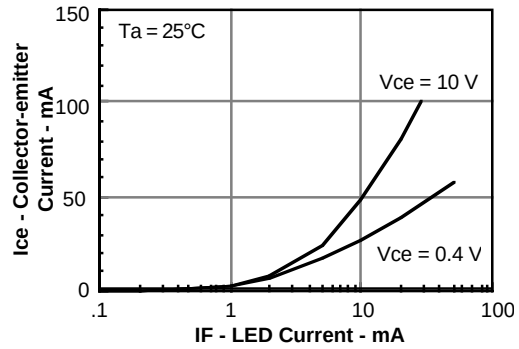


Figure 4. Normalized collector-base photocurrent versus LED current

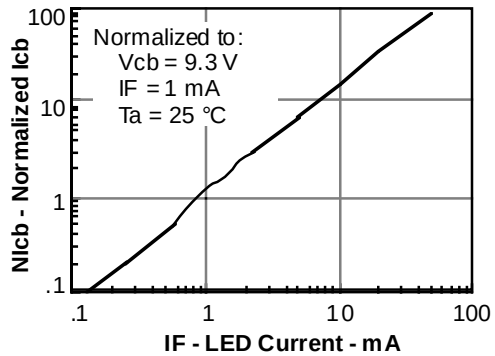


Figure 5. Normalized collector-base photocurrent versus LED current

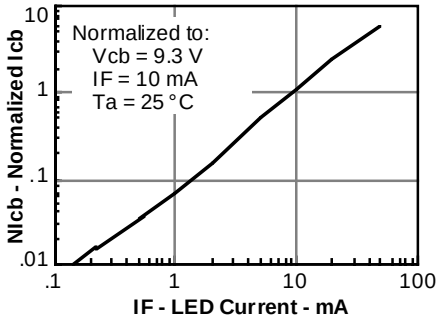


Figure 6. Collector-base photocurrent versus LED current

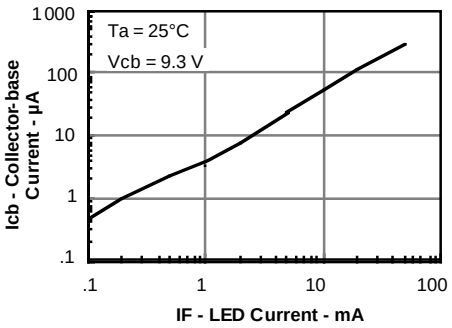


Figure 7. Collector-emitter leakage current versus temperature

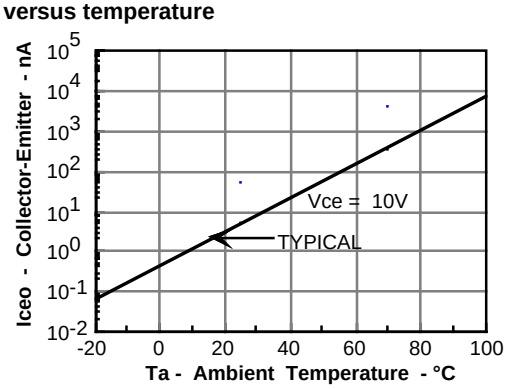


Figure 8. Normalized saturated HFE versus base current and temperature

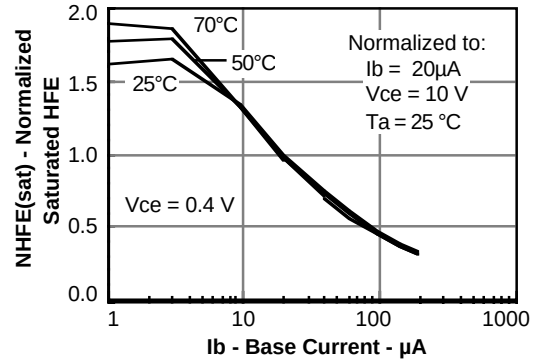


Figure 9. Typical switching characteristics versus base resistance (saturated operation)

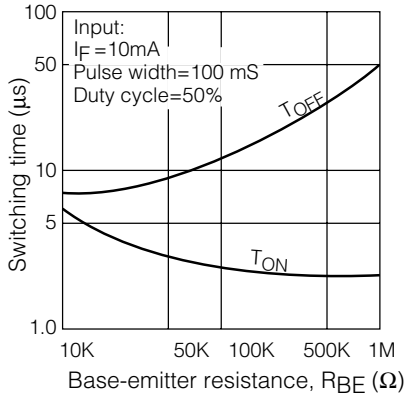


Figure 10. Typical switching times versus load resistance

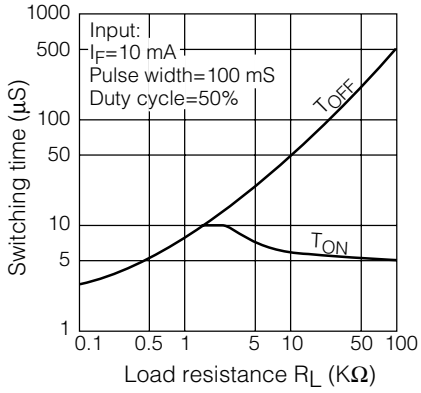


Figure 11. Switching time test schematic and waveform