SIEMENS

IL205AT/206AT/207AT/208AT

PHOTOTRANSISTOR SMALL OUTLINE SURFACE MOUNT OPTOCOUPLER

FEATURES

- **High Current Transfer Ratio, I_F=10mA, V_{CE}=5 V**
  IL205AT, 40 – 80%
  IL206AT, 63 –125%
  IL207AT, 100 – 200%
  IL208AT, 160 – 320%
- **High BV_{CEO}, 70 V**
- **Isolation Voltage, 2500 VAC_{RMS}**
- **Industry Standard SOIC-8 Surface Mountable Package**
- **Standard Lead Spacing, .05"**
- **Available in Tape and Reel (suffix T) (Conforms to EIA Standard RS481A)**
- **Compatible with Dual Wave, Vapor Phase and IR Reflow Soldering**
- **Underwriters Lab File #E52744 (Code Letter P)**

DESCRIPTION

The IL205AT/206AT/207AT/208AT 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 IL205/6/7/8 come in a standard SOIC-8 small outline package for surface mounting which makes them 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 specified minimum and maximum CTR allows a narrow tolerance in the electrical design of the adjacent circuits. The high BV_{CEO} of 70 volts gives a higher safety margin compared to the industry standard 30 volts.

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

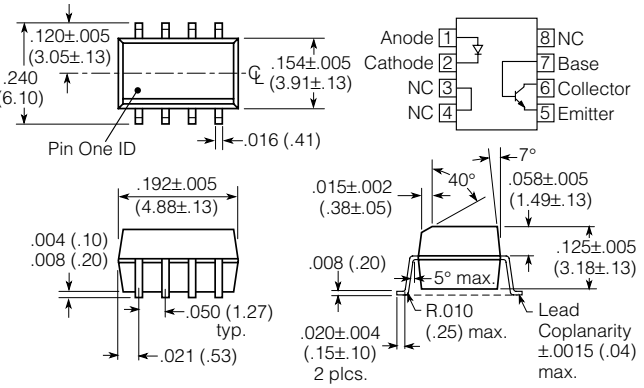
Detector

Collector-Emitter Breakdown Voltage ..... 70 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) ..... 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.

Package Dimensions in Inches (mm)



TOLERANCE: ±.005 (unless otherwise noted)

Characteristics (T_A=25°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						
Collector-Emitter	BV_{CEO}	70			V	I_C=100 µA
Emitter-Collector	BV_{ECO}	7	10		V	I_E=100 µA
Collector-Emitter Dark Current	$I_{CEOdark}$		5	50	nA	V_{CE}=10 V, I_F=0
Collector-Emitter Capacitance	C_{CE}		10		pF	V_{CE}=0
Package						
DC Current Transfer	CTR_{DC}				%	I_F=10 mA, V_{CE}=5 V
IL205AT		40		80		
IL206AT		63		125		
IL207AT		100		200		
IL208AT		160		320		
DC Current Transfer	CTR_{DC}				%	I_F=1 mA, V_{CE}=5 V
IL205AT		13	25			
IL206AT		22	40			
IL207AT		34	60			
IL208AT		56	95			
Collector-Emitter Saturation Voltage	$V_{CE\ sat}$			0.4		I_C=2.0 mA, I_F=10 mA
Isolation Test Voltage	V_{IO}	2500			VAC_{RMS}	
Equivalent DC Isolation Voltage		3535			VDC	
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 mA, R_E=100 Ω, V_{CE}=10 V

Specifications subject to change.

Figure 1. Forward voltage versus forward current

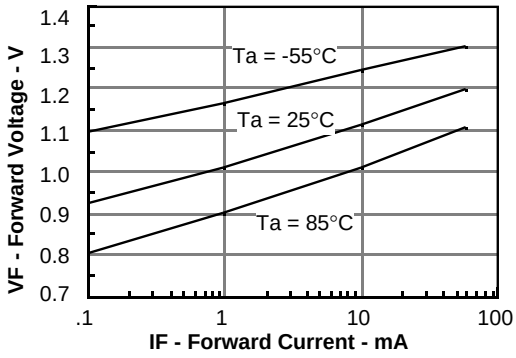


Figure 2. Normalized non-saturated and saturated CTRce versus LED current

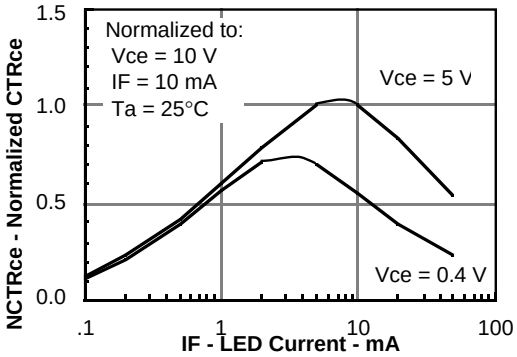


Figure 3. Collector-emitter current versus LED current

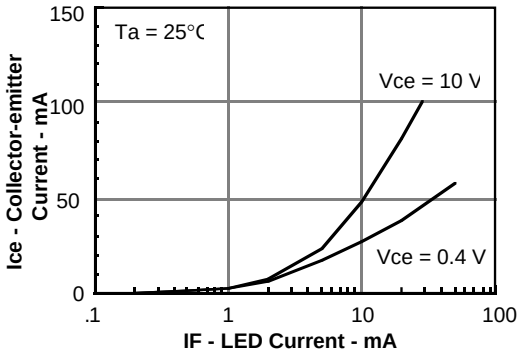


Figure 4. Normalized collector-base photocurrent versus LED current

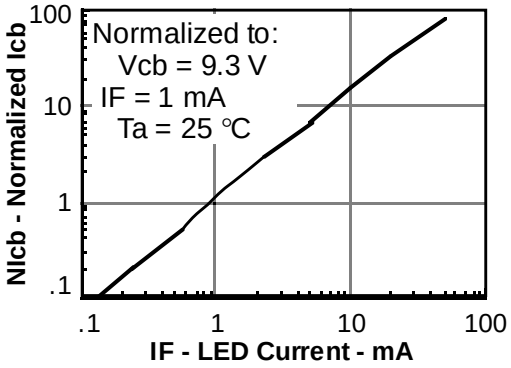


Figure 5. Normalized collector-base photocurrent versus LED current

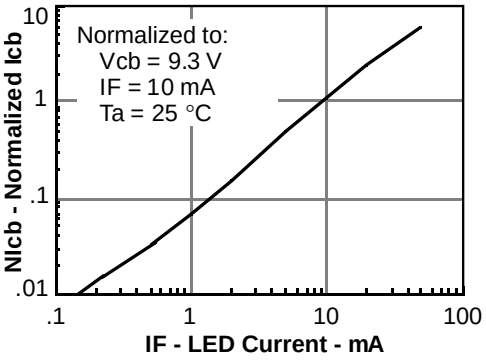


Figure 6. Collector-base photocurrent versus LED current

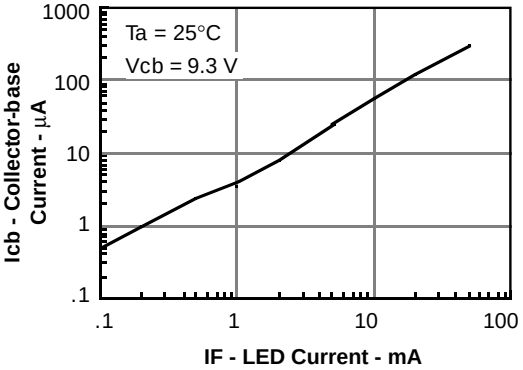


Figure 7. Collector-emitter leakage current versus temperature

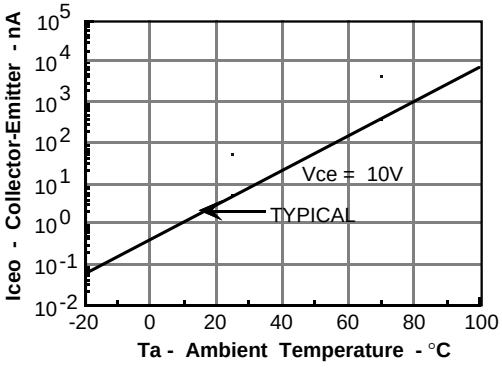


Figure 8. Normalized saturated HFE versus base current and temperature

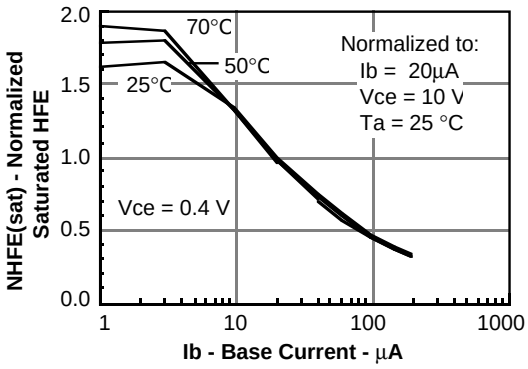


Figure 9. Typical switching characteristics versus base resistance (saturated operation)

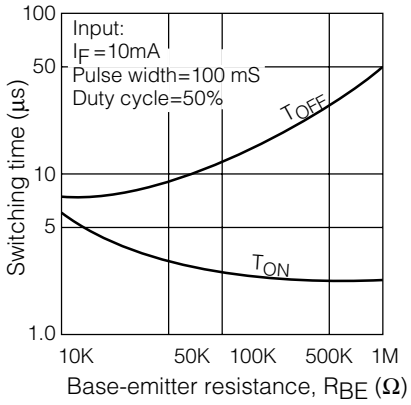


Figure 10. Typical switching times versus load resistance