

# SIEMENS

## IL205A/206A/207A/208A

Phototransistor  
Small Outline Surface Mount  
Optocoupler

### FEATURES

- High Current Transfer Ratio,  $I_F=10$  mA,  $V_{CE}=5$  V  
IL205A, 40–80%  
IL206A, 63–125%  
IL207A, 100–200%  
IL208A, 160–320%
- High  $BV_{CEO}$  70 V
- Isolation Test Voltage, 2500 VAC<sub>RMS</sub>
- Industry Standard SOIC-8 Surface Mountable Package
- Standard Lead Spacing, .05"
- Available only on Tape and Reel Option—  
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 IL205A/206A/207A/208A 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

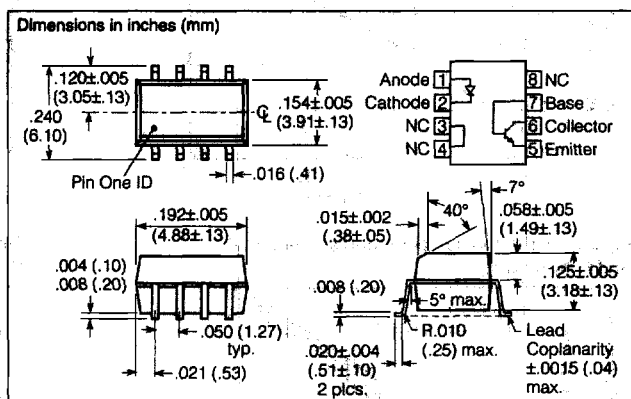
Peak Reverse Voltage ..... 6.0 V  
Continuous Forward Current ..... 60 mA  
Power Dissipation at 25°C ..... 90 mW  
Derate Linearly from 25°C ..... 1.2 mW/°C

#### Detector

Collector-Emitter Breakdown Voltage ..... 70 V  
Emitter-Collector Breakdown Voltage ..... 7 V  
Collector-Base Breakdown Voltage ..... 70 V  
 $I_{CMAX}$  DC ..... 50 mA  
 $I_{CMAX}$  ( $t < 1$  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 ..... 3.3 mW/°C  
Storage/Operating Temperature ... -55°C to +150°C  
Soldering Time at 260°C ..... 10 sec.



### Characteristics $T_A=25^\circ\text{C}$

Parameter	Sym.	Min.	Typ.	Max.	Unit	Condition	
<b>Emitter</b>							
Forward Voltage	$V_F$		1.3	1.5	V	$I_F=\pm 10$ mA	
Reverse Current	$I_R$		0.1	100	$\mu\text{A}$	$V_R=6.0$ V	
Capacitance	$C_O$		25		pF	$V_R=0$	
<b>Detector</b>							
Breakdown Voltage	$BV_{CEO}$	70			V	$I_C=100$ mA $I_E=100$ $\mu\text{A}$	
	$BV_{ECO}$	7	10				
Leakage Current, Collector-Emitter	$I_{CEO}$		5	50	nA	$V_{CE}=10$ V	
<b>Package</b>							
DC Current Transfer	IL205A	$CTR_{DC}$	40		80	%	$I_F=\pm 10$ mA, $V_{CE}=5$ V
	IL206A		63		125		
	IL207A		100		200		
	IL208A		100		320		
DC Current Transfer	IL205A	$CTR_{DC}$	13	25		%	$I_F=\pm 1$ mA, $V_{CE}=5$ V
	IL206A		22	40			
	IL207A		34	60			
	IL208A		56	95			
Saturation Voltage, Collector-Emitter	$V_{CEsat}$			0.4		$I_C=2.0$ mA, $I_E=10$ mA,	
Isolation Test Voltage	$V_{IO}$	2500			VAC <sub>RMS</sub>		
Equivalent DC Isolation Voltage		3535			VDC		
Capacitance, Input to Output	$C_{IO}$		0.5		pF		
Resistance, Input to Output	$R_{IO}$		100		G $\Omega$		
Switching Time	$t_{ON}$ , $t_{OFF}$		3.0		$\mu\text{s}$	$I_C=2.0$ mA, $R_E=100$ $\Omega$ , $V_{CE}=10$ V	

Figure 1. Forward voltage versus forward current

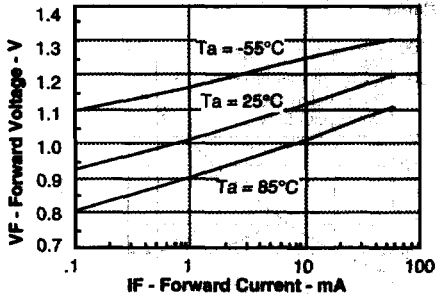


Figure 2. Normalized non-saturated and saturated  $CTR_{Rce}$  versus LED current

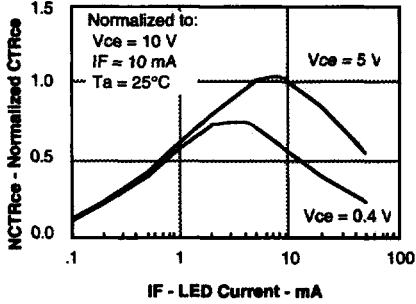


Figure 3. Collector-emitter current versus LED current

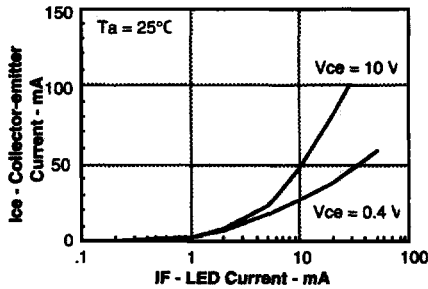


Figure 4. Normalized collector-base photocurrent versus LED current

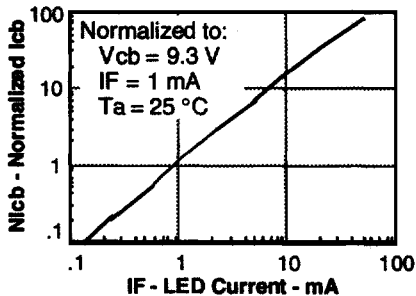


Figure 5. Normalized collector-base photocurrent versus LED current

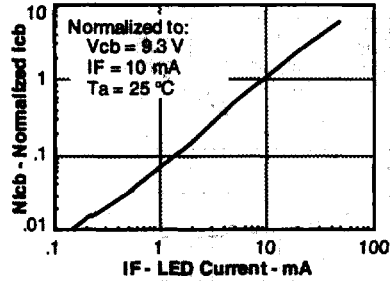


Figure 6. Collector-emitter photocurrent versus LED current

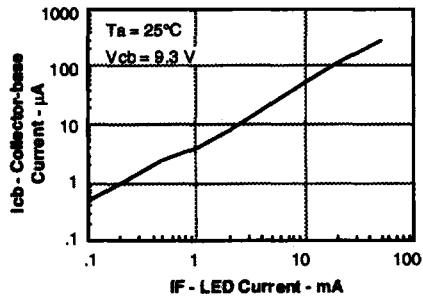


Figure 7. Collector-emitter photocurrent versus LED current

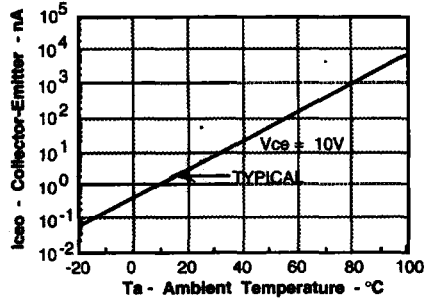
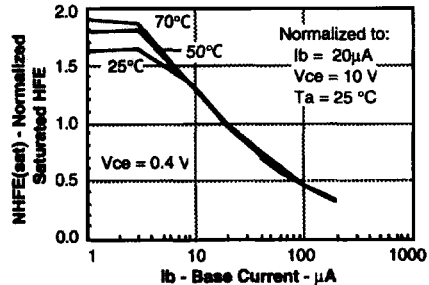
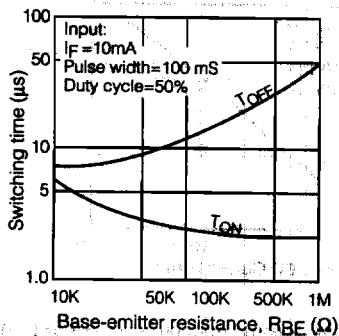


Figure 8. Base current versus  $I_f$  and HFE



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



**Figure 10. Typical switching times versus load resistance**

