

SIEMENS

IL205/206/207/208 PHOTOTRANSISTOR SMALL OUTLINE SURFACE MOUNT OPTOCOUPLER

FEATURES

- High Current Transfer Ratios, $I_F=10\text{mA}$, $V_{CE}=5\text{V}$
IL205, 40 – 80%
IL206, 63 – 125%
IL207, 100 – 200%
IL208, 160 – 320%
- High BV_{CEO} , 70 V
- Isolation Voltage, 2500 VRMS
- Industry Standard SOIC-8 Surface Mountable Package
- Standard Lead Spacing, .05"
- Available in 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 IL205/206/207/208 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

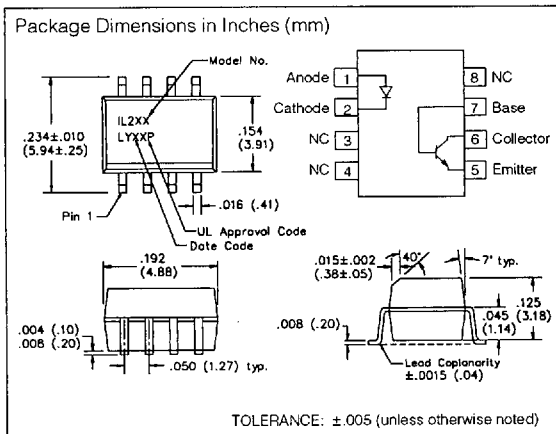
Peak Reverse Voltage 6.0 V
Continuous Forward Current 60 mA
Power Dissipation at 25°C 90 mW
Derate Linearly from 25°C 1.2 mW/°C

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.



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_C		25		pF	$V_R=0$
Detector						
Breakdown Voltage						
Collector-Emitter	BV_{CEO}	70			V	$I_C=100\text{ }\mu\text{A}$
Emitter-Collector	BV_{ECO}	7	10		V	$I_E=100\text{ }\mu\text{A}$
Collector-Emitter						$V_{CE}=10\text{ V}$, $I_F=0$
Dark Current	$I_{CE\text{Dark}}$		5	50	nA	
Collector-Emitter						$V_{CE}=0$
Capacitance	C_{CE}		10		pF	
Package						
DC Current Transfer	CTR_{DC}				%	$I_F=10\text{ mA}$, $V_{CE}=5\text{ V}$
IL205		40		80		
IL206		63		125		
IL207		100		200		
IL208		160		320		
DC Current Transfer	CTR_{DC}				%	$I_F=1\text{ mA}$, $V_{CE}=5\text{ V}$
IL205		13	25			
IL206		22	40			
IL207		34	60			
IL208		56	95			
Collector-Emitter						$I_C=2.0\text{ mA}$, $I_F=10\text{ mA}$, $t=1\text{ min.}$
Saturation Voltage	$V_{CE\text{sat}}$			0.4		
Withstand Test Voltage	WTV	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		G Ω	
Switching Time	t_{ON}, t_{OFF}		3.0		μs	$I_C=2\text{ mA}$, $R_E=100\text{ }\Omega$, $V_{CE}=10\text{ V}$

See Application Note 39 for solderability information.

Optocouplers
(Optoisolators)

Figure 1. Forward voltage versus forward current

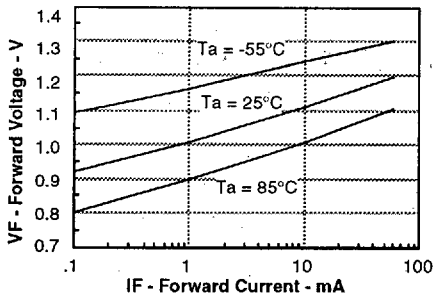


Figure 3. Collector-emitter current versus LED current

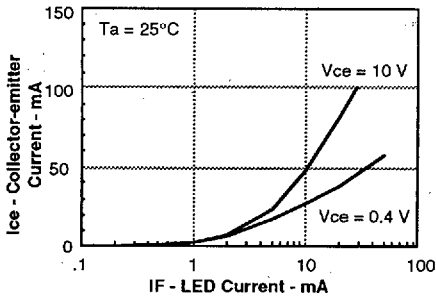


Figure 5. Normalized collector-base photocurrent versus LED current

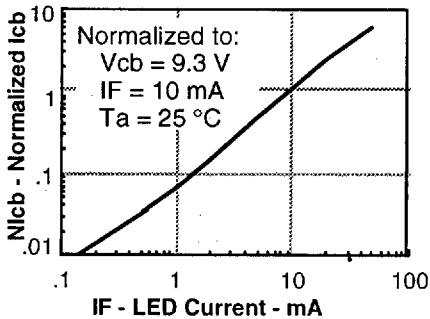


Figure 7. Collector-emitter leakage current versus temperature

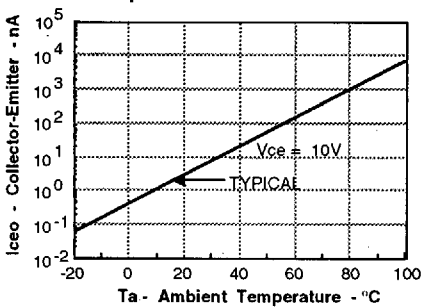


Figure 2. Normalized non-saturated and saturated CTRce versus LED current

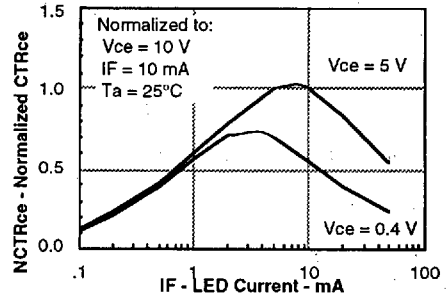


Figure 4. Normalized collector-base photocurrent versus LED current

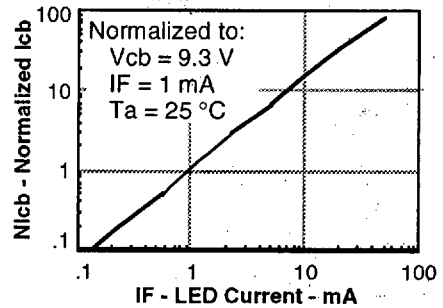


Figure 6. Collector-base photocurrent versus LED current

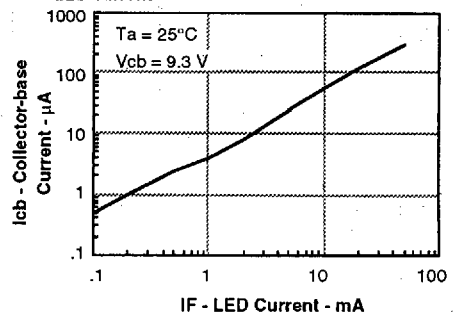


Figure 8. Normalized saturated HFE versus base current and temperature

