SIEMENS

IL205A/206A/207/208A

SMALL OUTLINE SURFACE MOUNT PHOTOTRANSISTOR OPTOCOUPLER

FEATURES

- **High Current Transfer Ratio, IF=10 mA, VCE=5 V**
  IL205A, 40–80%
  IL206A, 63–125%
  IL207A, 100–200%
  IL208A, 160–320%
- **High BV_{CEO}, 70 V**
- **Isolation Test Voltage, 2500 VAC_{RMS}**
- **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, Fapor 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

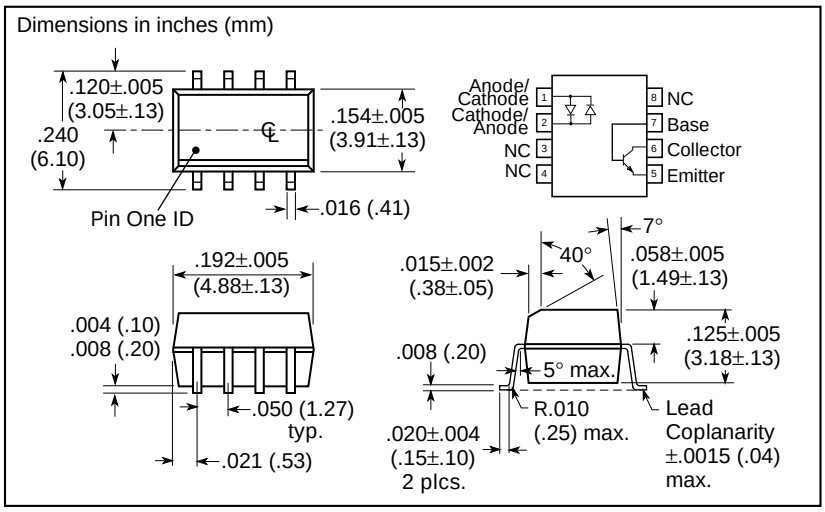
Peak Reverse Voltage.....6.0 V
Continuous Forward Current.....60 mA
Power Dissipation at 25°C.....90 mW
Derate Linearly from 25°C .....1.2 mW/°C

Detector

Collector-Emitter Breakdown Voltage .....70 V
Emitter-Collector Breakdown Voltage .....7 V
Collector-Base Breakdown Voltage .....70 V
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°C)

	Sym	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 Emitter-Collector	 BV_{CEO} BV_{ECO}	 70 7	 10	 	 V V	 I_C=100 mA I_E=100 µA
Leakage Current, Collector-Emitter	I_{CEO}		5	50	nA	V_{CE}=10 V
Package						
DC Current Transfer IL205A IL206A IL207A IL208A	CTR_{DC}	 40 63 100 100	 	 80 125 200 320	%	I_F=±10 mA, V_{CE}=5 V
DC Current Transfer IL205A IL206A IL207A IL208A	CTR_{DC}	 13 22 34 56	 25 40 60 95		%	I_F=±1 mA, V_{CE}=5 V
Saturation Voltage, Collector-Emitter	V_{CEsat}			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=2.0 mA, R_E=100 Ω, V_{CE}=10 V

Figure 1. Forward voltage versus forward current

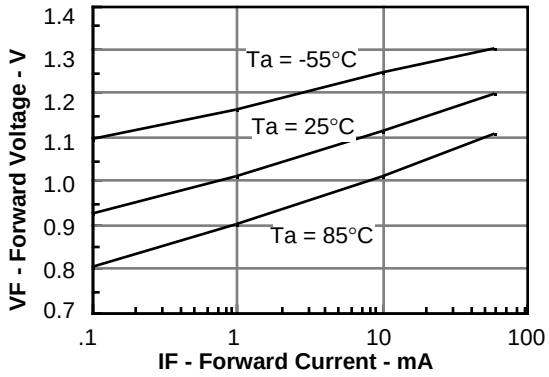


Figure 2. Normalized non-saturated and saturated CTRce versus LED current

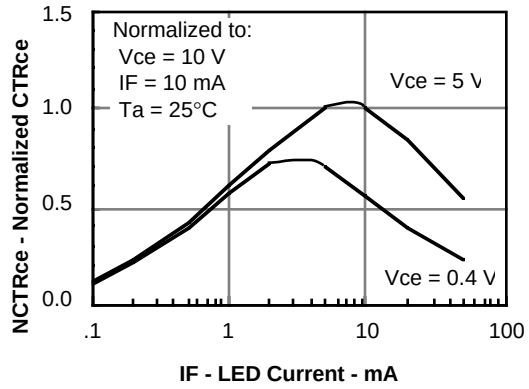


Figure 3. Collector-emitter current versus LED current

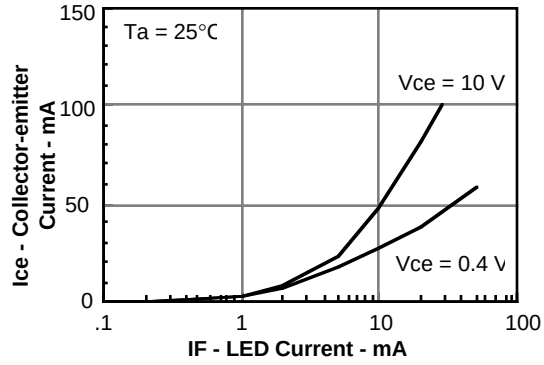


Figure 4. Normalized collector-base photocurrent versus LED current

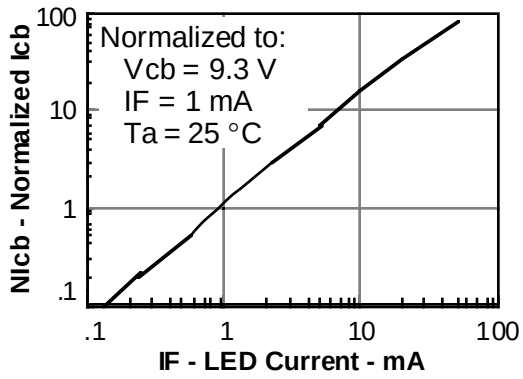


Figure 5. Normalized collector-base photocurrent versus LED current

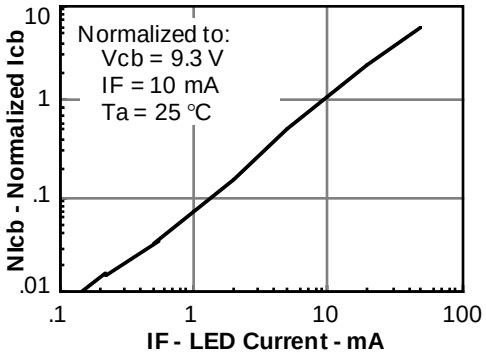


Figure 6. Collector-emitter photocurrent versus LED current

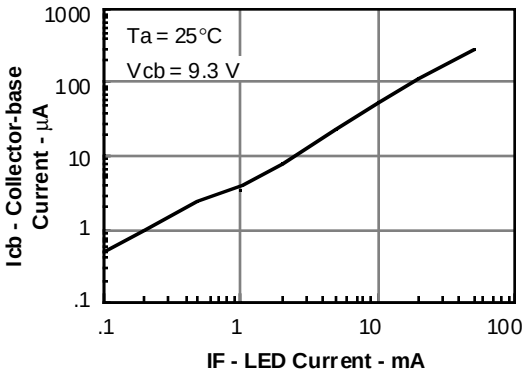


Figure 7. Collector-emitter photocurrent versus LED current

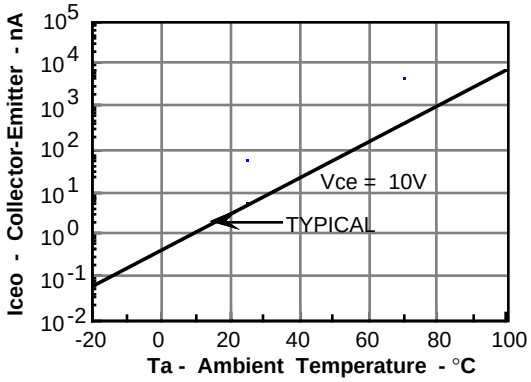


Figure 8. Base current versus If and HFE

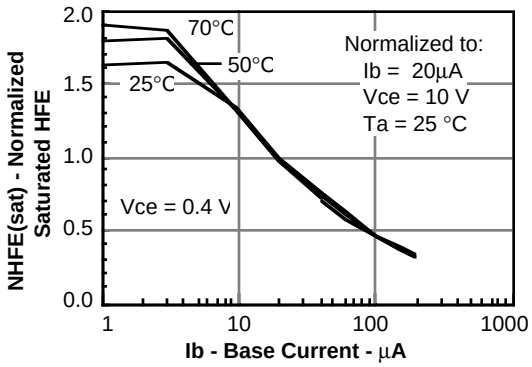


Figure 9. Typical switching characteristics versus base resistance (saturated operation)

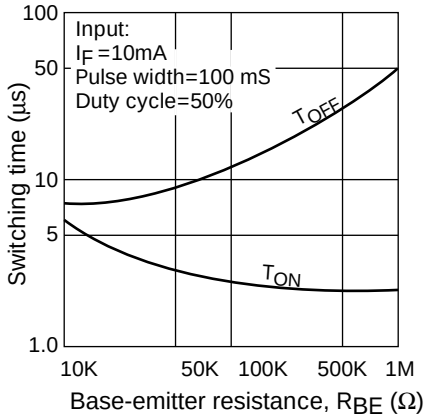


Figure 10. Typical switching times versus load resistance