IL205AT/206AT/207AT/208AT

Phototransistor
Small Outline Surface Mount
Optocoupler

FEATURES

- **High Current Transfer Ratio, I_F=10 mA, V_{CE}=5.0 V**
  IL205AT, 40–80%
  IL206AT, 63–125%
  IL207AT, 100–200%
  IL208AT, 160–320%
- **High BV_{CEO}, 70 V**
- **Isolation Test Voltage, 2500 V_{RMS}**
- **Industry Standard SOIC-8 Surface Mountable Package**
- **Standard Lead Spacing, .05"**
- **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 IL205AT/206AT/207AT/208AT 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

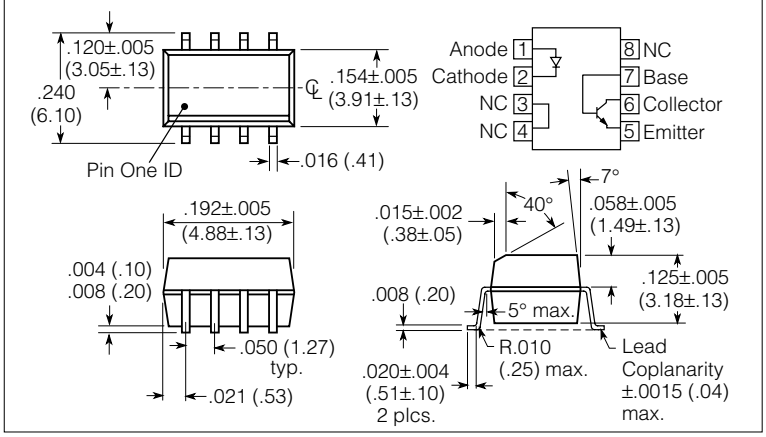
Detector

Collector-Emitter Breakdown Voltage ..... 70 V
Emitter-Collector Breakdown Voltage ..... 7.0 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) ..... 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.

Dimensions in inches (mm)



Characteristics T_A=25°C

Parameter		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	—	13	—	pF	V_R=0
Detector							
Breakdown Voltage		BV_{CEO}	70	—	—	V	I_C=100 µA
		BV_{ECO}	7.0	10	—		I_E=100 µA
Leakage Current, Collector-Emitter		I_{CEO}	—	5.0	50	nA	V_{CE}=10 V
Package							
DC Current Transfer	IL205AT	CTR_{DC}	40	—	80	%	I_F=10 mA, V_{CE}=5.0 V
	IL206AT		63	—	125		
	IL207AT		100	—	200		
	IL208AT		100	—	320		
DC Current Transfer	IL205AT	CTR_{DC}	13	25	—	%	I_F=1.0 mA, V_{CE}=5.0 V
	IL206AT		22	40	—		
	IL207AT		34	60	—		
	IL208AT		56	95	—		
Saturation Voltage, Collector-Emitter		V_{CEsat}	—	—	0.4	—	I_C=2.0 mA, I_F=10 mA,
Isolation Test Voltage		V_{IO}	2500	—	—	V_{RMS}	—
Equivalent DC Isolation Voltage		—	3535	—	—	VDC	—
Capacitance, Input to Output		C_{IO}	—	0.5	—	pF	—
Resistance, Input to Output		R_{IO}	—	100	—	Ω	—
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

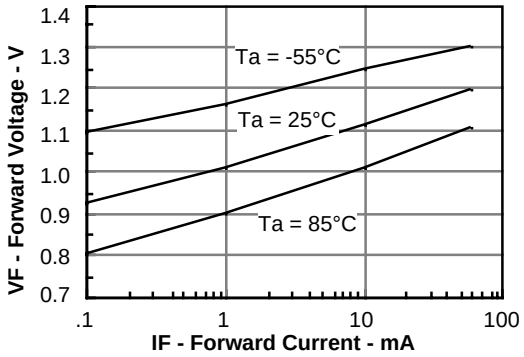


Figure 2. Normalized non-saturated and saturated CTRce versus LED current

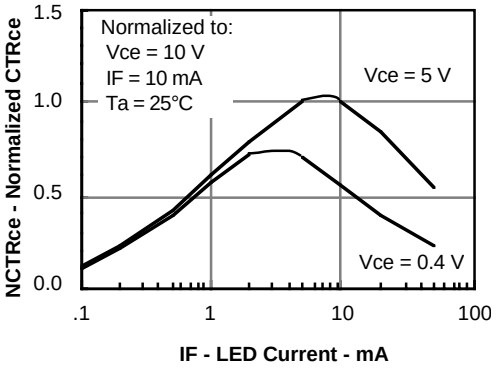


Figure 3. Collector-emitter current versus LED current

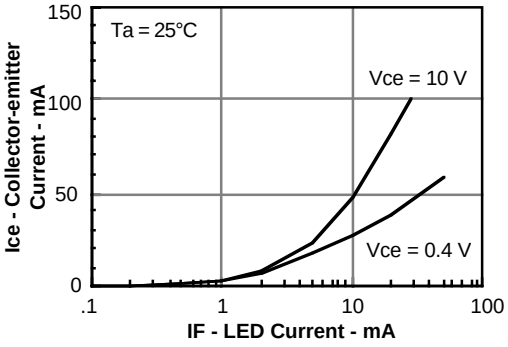


Figure 4. Normalized collector-base photocurrent versus LED current

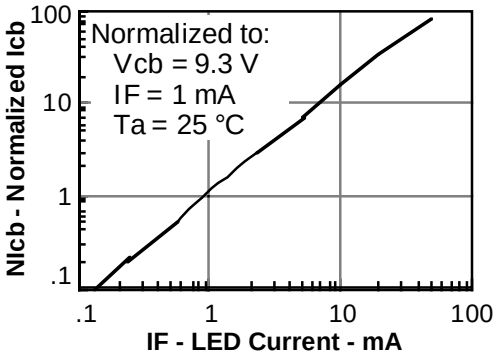


Figure 5. Normalized collector-base photocurrent versus LED current

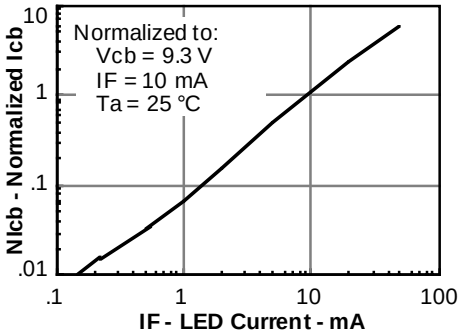


Figure 6. Collector-emitter photocurrent versus LED current

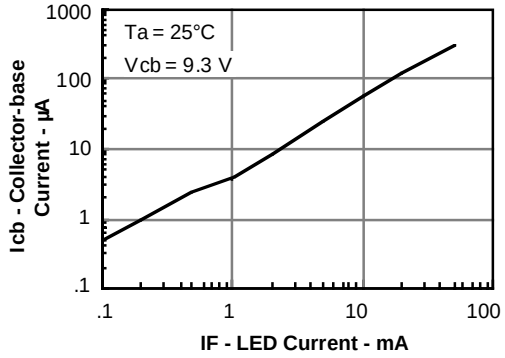


Figure 7. Collector-emitter photocurrent versus LED current

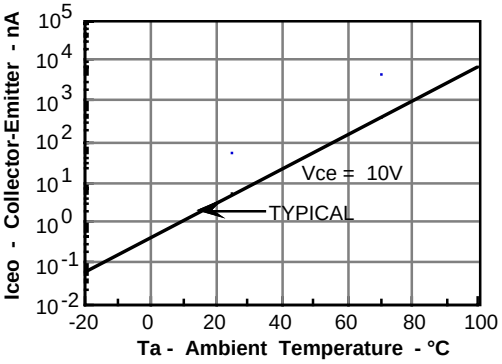


Figure 8. Base current versus If and HFE

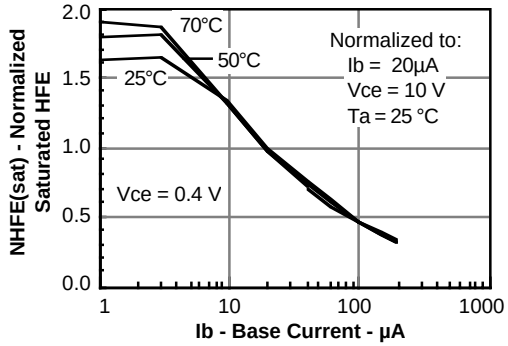


Figure 9. Typical switching characteristics versus base resistance (saturated operation)

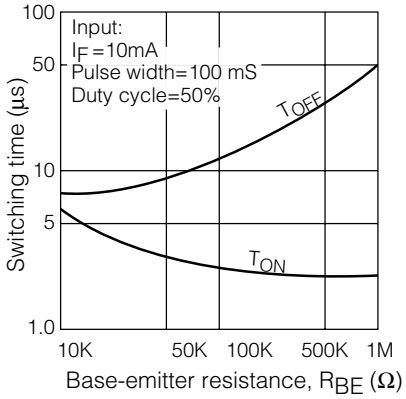


Figure 10. Typical switching times versus load resistance

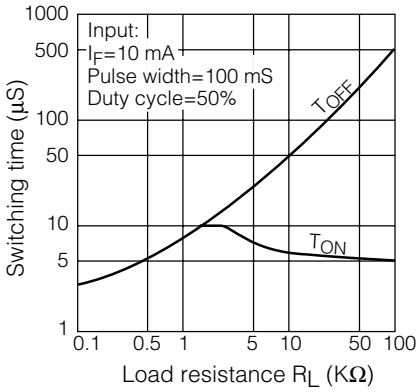


Figure 11. Switching time test schematic and waveform