



IL205AT/206AT/207AT/208AT

Phototransistor

Small Outline Surface Mount

Optocoupler

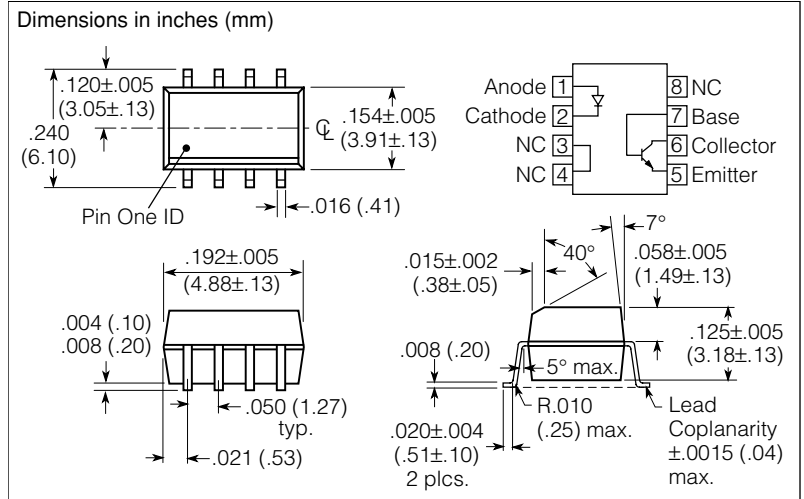
FEATURES

- **High Current Transfer Ratio,**
 $I_F=10 \text{ mA}$, $V_{CE}=5.0 \text{ V}$
IL205AT, 40–80%
IL206AT, 63–125%
IL207AT, 100–200%
IL208AT, 160–320%
- **High BV_{CEO} , 70 V**
- **Isolation Test Voltage, 3000 V_{RMS} , 1 s**
- **Industry Standard SOIC-8A Surface Mountable Package,**
- **Standard Lead Spacing, .05"**
- **Compatible with Dual Wave, Vapor Phase and IR Reflow Soldering**
- **Underwriters Lab File #E52744 (Code Letter Y)**
- **VDE 0884 Available with Option 1**

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. This family comes in a standard SOIC-8A 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, $T_A=25^\circ\text{C}$ (except where noted)

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
$I_{C\text{MAX}} \text{ DC}$	50 mA
$I_{C\text{MAX}} (t < 1.0 \text{ ms})$	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
Operating Temperature	-55°C to +100°C
Storage Temperature	-55°C to +150°C
Soldering Time at 260°C	10 s

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

Parameter	Sym.	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_O	—	13	—	pF	$V_R=0$	
Detector							
Breakdown Voltage	BV_{CEO}	70	—	—	V	$I_C=100\ \mu\text{A}$	
	BV_{ECO}	7.0	10	—		$I_E=100\ \mu\text{A}$	
Leakage Current, Collector-Emitter	I_{CEO}	—	5.0	50	nA	$V_{CE}=10\text{ V}$	
Package							
DC Current Transfer	IL205AT	CTR_{DC}	40	—	80	%	$I_F=10\text{ mA}, V_{CE}=5.0\text{ V}$
	IL206AT		63	—	125		
	IL207AT		100	—	200		
	IL208AT		100	—	320		
DC Current Transfer	IL205AT	CTR_{DC}	13	25	—	%	$I_F=1.0\text{ mA}, V_{CE}=5.0\text{ V}$
	IL206AT		22	40	—		
	IL207AT		34	60	—		
	IL208AT		56	95	—		
Saturation Voltage, Collector-Emitter	V_{CEsat}	—	—	0.4	—	$I_C=2.0\text{ mA}, I_F=10\text{ mA},$	
Isolation Test Voltage	V_{IO}	3000	—	—	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	$I_C=2.0\text{ mA}, R_L=100\ \Omega, V_{CC}=10\text{ V}$	

Figure 1. Forward voltage vs. forward current

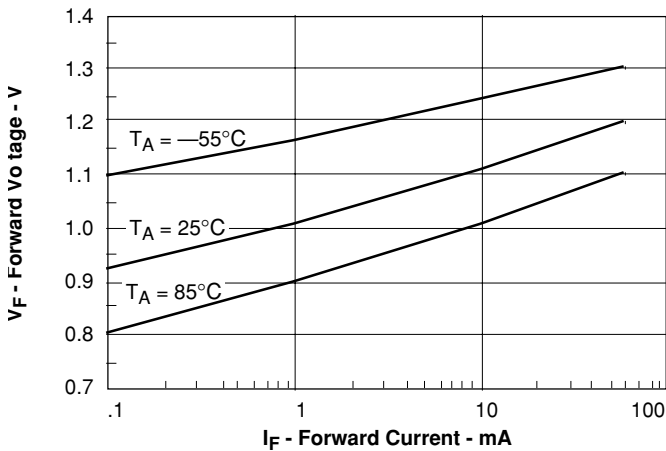


Figure 2. Normalized non-saturated and saturated CTR_{CE} vs. LED current

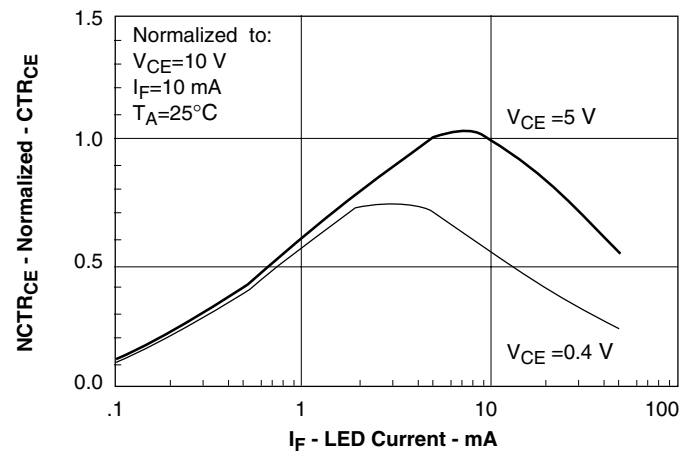


Figure 3. Collector-emitter current vs. LED current

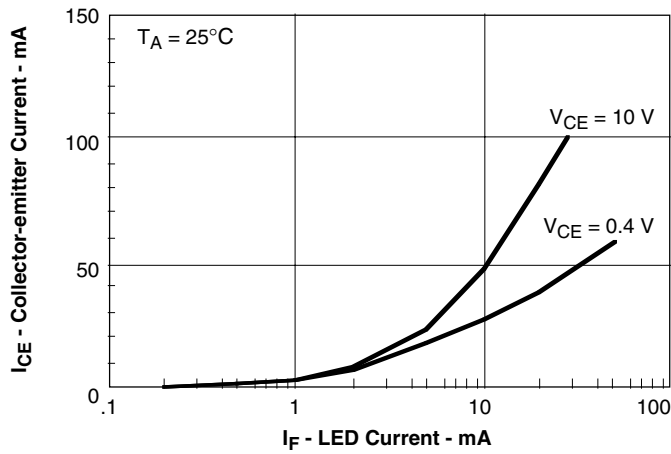


Figure 6. Collector-emitter photo current vs. LED current

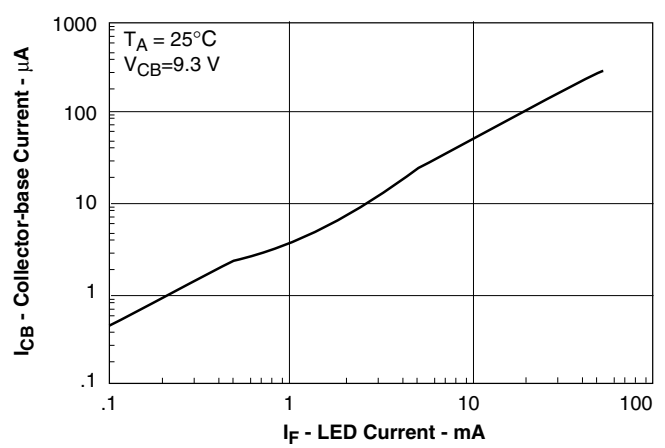


Figure 4. Normalized collector-base photo current vs. LED current

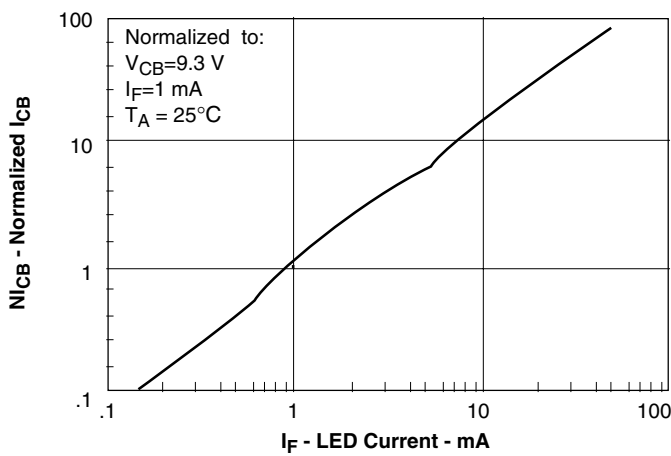


Figure 7. Collector-emitter photo current vs. LED current

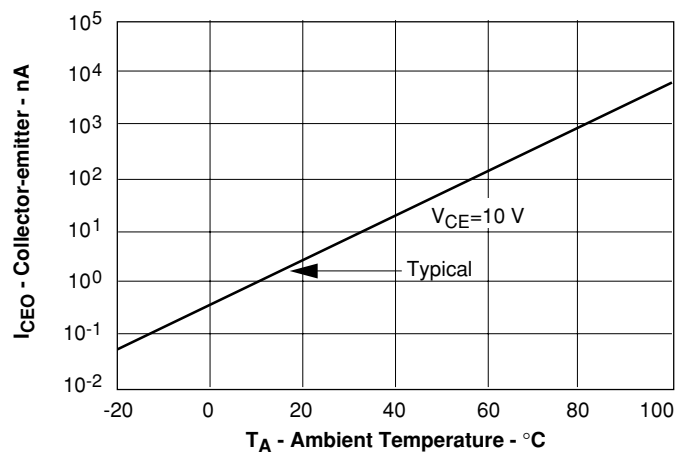


Figure 5. Normalized collector-base photo current vs. LED current

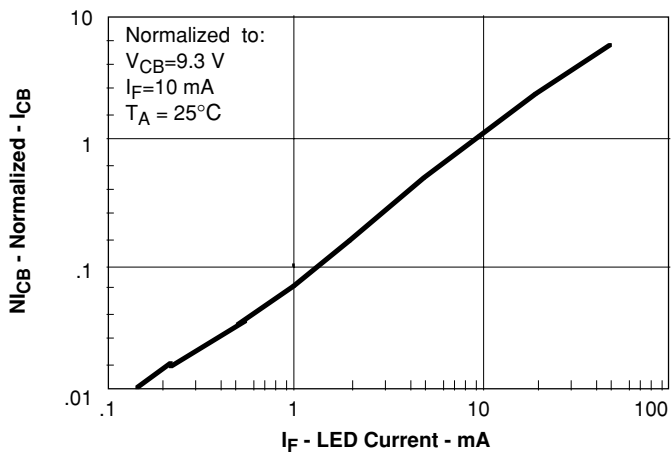


Figure 8. Base current vs. IF and HFE

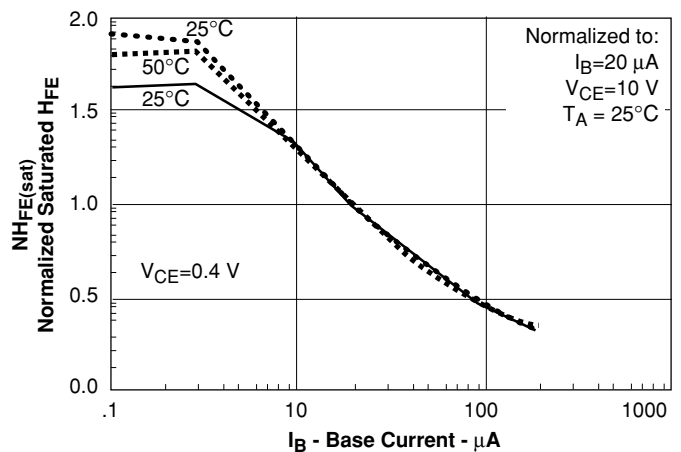


Figure 9. Typical switching characteristics vs. base resistance (saturated operation)

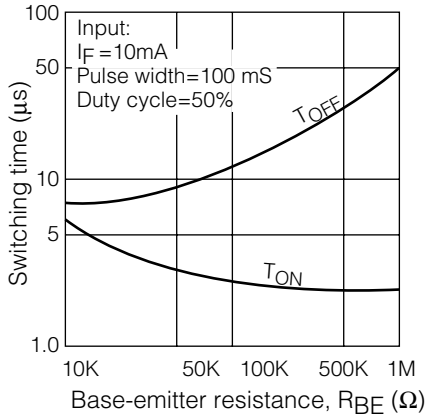


Figure 11. Switching time test schematic and waveform

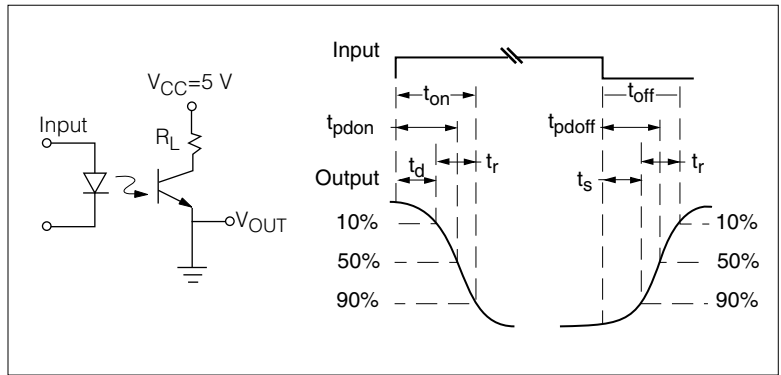


Figure 10. Typical switching times vs. load resistance

