

# ILD205T/206T/207T/211T/213T/217T

## Dual Phototransistor

### Small Outline Surface Mount Optocoupler

#### FEATURES

- Two Channel Coupler
- SOIC-8A Surface Mountable Package
- Standard Lead Spacing of .05"
- Available only on Tape and Reel Option (Conforms to EIA Standard 481-2)
- Isolation Test Voltage, 3000 V<sub>RMS</sub>
- High Current Transfer Ratios  
 ILD205T, 40 – 80%  
 ILD206T, 63 –125%  
 ILD207T, 100 – 200%  
 ILD211T, 20% Minimum  
 ILD213T, 100% Minimum  
 ILD217T, 100% Minimum at 1.0 mA
- High BV<sub>CEO</sub>, 70 V
- Compatible with Dual Wave, Vapor Phase and IR Reflow Soldering
- Underwriters Laboratory File #E52744 (Code Letter Y)

#### DESCRIPTION

The ILD205T/206T/207T/211T/213T/217T 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 ILD205T/6T/7T/11T/13T/17T come in a standard SOIC-8A small outline package for surface mounting which makes it 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<sub>CEO</sub> of 70 volts gives a higher safety margin compared to the industry standard of 30 volts.

#### Maximum Ratings (Each Channel)

##### Emitter

Peak Reverse Voltage ..... 6.0 V  
 Peak Pulsed Current (1.0 μs, 300 pps) ..... 1.0 A  
 Continuous Forward Current per Channel .... 30 mA  
 Power Dissipation at 25°C ..... 50 mW  
 Derate Linearly from 25°C ..... 0.66 mW/°C

##### Detector

Collector-Emitter Breakdown Voltage ..... 70 V  
 Emitter-Collector Breakdown Voltage ..... 7.0 V  
 Power Dissipation per Channel ..... 125 mW  
 Derate Linearly from 25°C ..... 1.67 mW/°C

##### Package

Total Package Dissipation at 25°C Ambient  
 (2 LEDs + 2 Detectors, 2 Channels) ..... 300 mW  
 Derate Linearly from 25°C ..... 4.0 mW/°C  
 Storage Temperature ..... -55°C to +150°C  
 Operating Temperature ..... -55°C to +100°C  
 Soldering Time at 260°C ..... 10 sec.

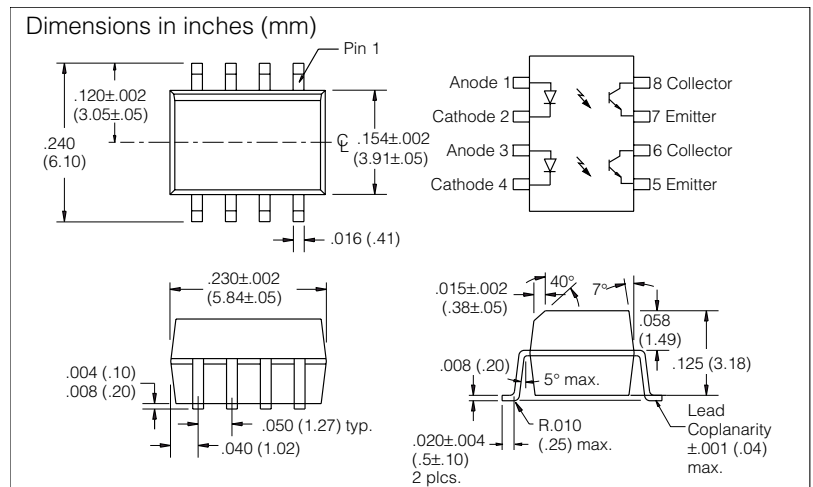


Table 1. Characteristics  $T_A=25^\circ\text{C}$

Parameter	Min.	Typ.	Max.	Unit	Condition
<b>Emitter</b>					
Forward Voltage	—	1.2	1.55	V	$I_F=10\text{ mA}$
Reverse Current	—	0.1	100	μA	$V_R=6.0\text{ V}$
Capacitance	—	25	—	pF	$V_R=0$
<b>Detector</b>					
Breakdown Voltage	BV <sub>CEO</sub>	70	—	—	V $I_C=10\text{ μA}$
	BV <sub>ECO</sub>	7.0	—	—	V $I_E=10\text{ μA}$
	$I_{CEO}$	—	5.0	50	nA $V_{CE}=10\text{ V}$ $I_F=0$
Collector-Emitter Capacitance	—	10	—	pF	$V_{CE}=0$
<b>Package</b>					
DC Current Transfer, $V_{CE}=5.0\text{ V}$	ILD205	40	—	80	% $I_F=10\text{ mA}$
	ILD206	63	—	125	
	ILD207	100	—	200	
	ILD211	20	—	—	
	ILD213	100	—	—	
	ILD205	13	30	—	$I_F=1.0\text{ mA}$
	ILD206	22	45	—	
Collector-Emitter Saturation Voltage $V_{CE(sat)}$	ILD207	34	70	—	$I_F=10\text{ mA}$ $I_C=2.5\text{ mA}$
	ILD217	100	120	—	
	Collector-Emitter Saturation Voltage $V_{CE(sat)}$	—	—	0.4	V
Capacitance, Input to Output	—	0.5	—	pF	—
Isolation Test Voltage	3000	—	—	V <sub>RMS</sub>	t=1.0 sec.
Resistance, Input to Output	—	100	—	GΩ	—
Turn-on Time	—	5.0	—	μs	$I_C=2.0\text{ mA}$ $R_L=100\text{ Ω}$ $V_{CC}=5.0\text{ V}$
Turn-off Time	—	4.0	—	μs	

Figure 1. Forward current versus forward voltage

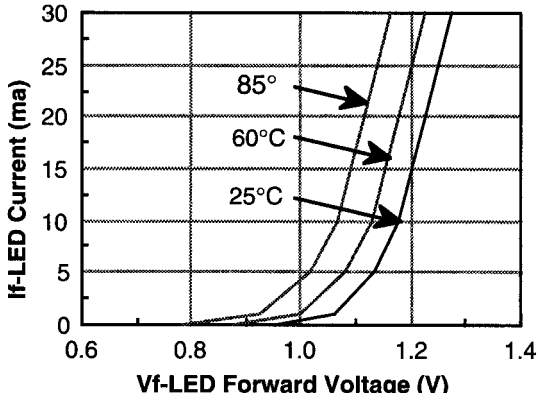


Figure 5. Switching speed versus load resistor

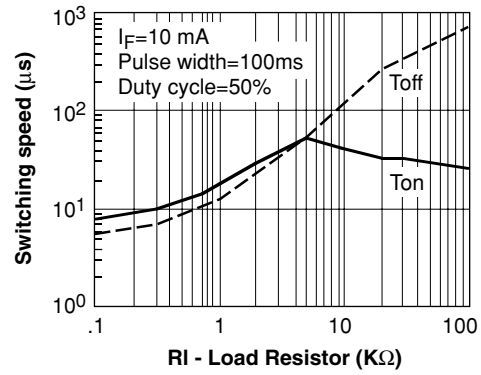


Figure 2. Collector-emitter current versus temperature

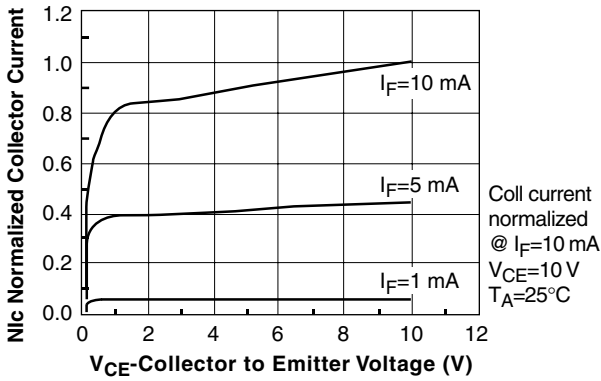


Figure 6. Collector current versus temperature

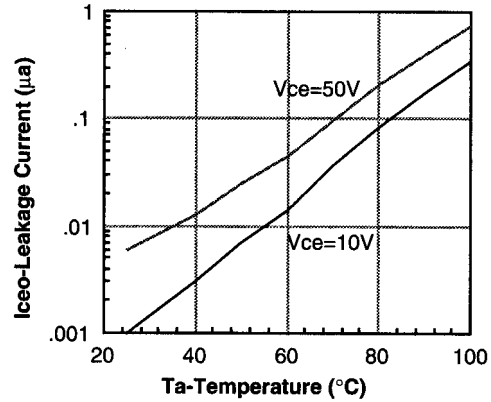


Figure 3. Normalized  $CTR_{ce}$  versus forward current

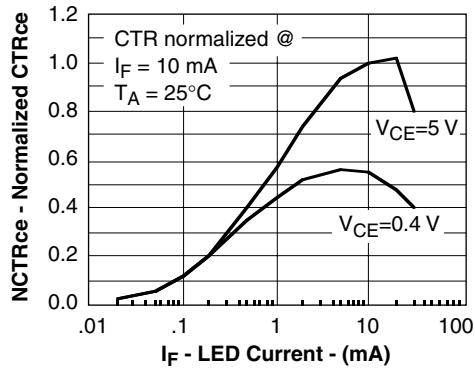


Figure 7. Power dissipation versus ambient temperature

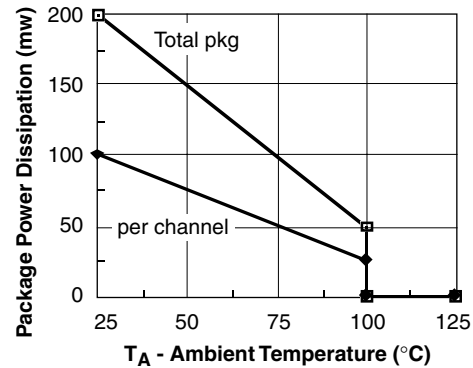


Figure 4. CTR (normalized) versus temperature

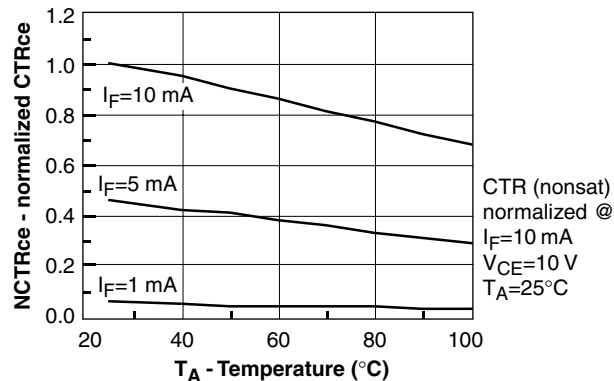


Figure 8. Switching time test schematic and waveform

