

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_{RMS}
- 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_{CEO}, 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_{CEO} of 70 volts gives a higher safety margin compared to the industry standard of 30 volts.

Maximum Ratings (Each Channel)

Emitter

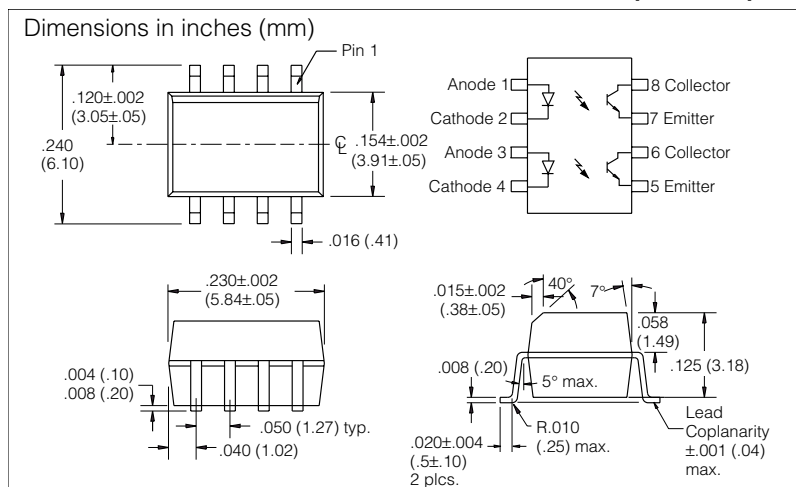
Peak Reverse Voltage	6.0 V
Peak Pulsed Current (1.0 μ s, 300 pps)	1.0 A
Continuous Forward Current per Channel	30 mA
Power Dissipation at 25°C	50 mW
Derate Linearly from 25°C	0.66 mW/°C

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
Emitter						
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	$V_R=0$
Detector						
Breakdown Voltage	BV_{CEO}	70	—	—	V	$I_C=10\text{ }\mu\text{A}$
	BV_{ECO}	7.0	—	—	V	$I_E=10\text{ }\mu\text{A}$
	I_{CEO}	—	5.0	50	nA	$V_{CE}=10\text{ V}$ $I_F=0$
Collector-Emitter Capacitance		—	10	—	pF	$V_{CE}=0$
Package						
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	—		
	ILD206	22	45	—		
	ILD207	34	70	—		
	ILD217	100	120	—	$I_F=1.0\text{ mA}$	
Collector-Emitter Saturation Voltage $V_{CE(sat)}$		—	—	0.4	V	$I_F=10\text{ mA}$ $I_C=2.5\text{ mA}$
Capacitance, Input to Output		—	0.5	—	pF	—
Isolation Test Voltage		3000		—	V_{RMS}	t=1.0 sec.
Resistance, Input to Output		—	100	—	$G\Omega$	—
Turn-on Time		—	5.0	—	μs	$I_C=2.0\text{ mA}$ $R_L=100\text{ }\Omega$
Turn-off Time		—	4.0	—	μs	$V_{CC}=5.0\text{ V}$

Figure 1. Forward current versus forward voltage

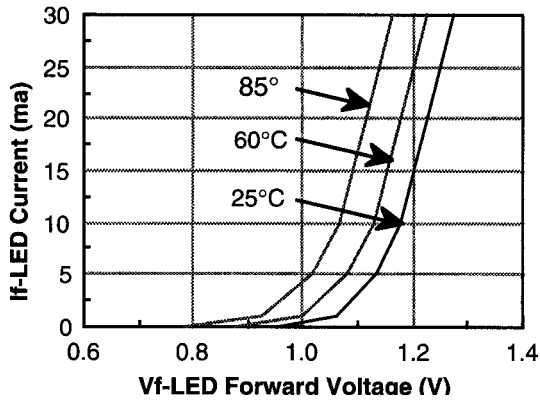


Figure 2. Collector-emitter current versus temperature

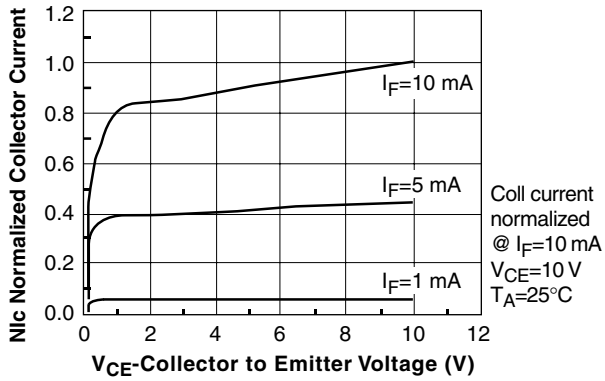


Figure 3. Normalized CTR_{ce} versus forward current

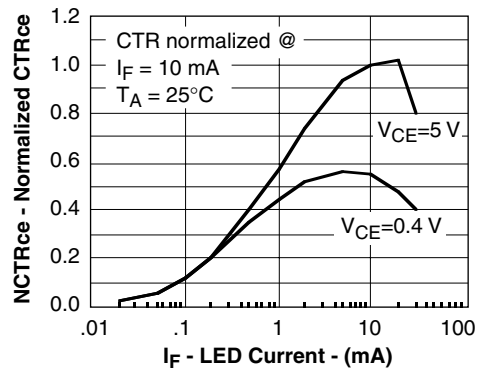


Figure 4. CTR (normalized) versus temperature

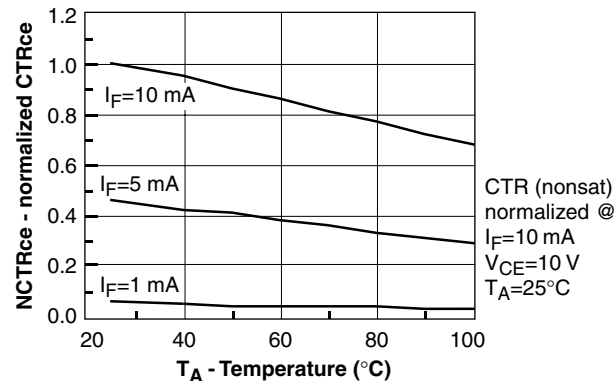


Figure 5. Switching speed versus load resistor

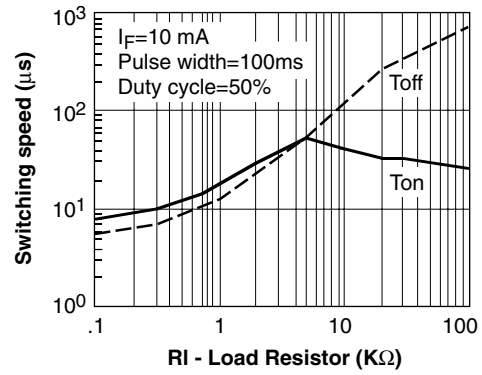


Figure 6. Collector current versus temperature

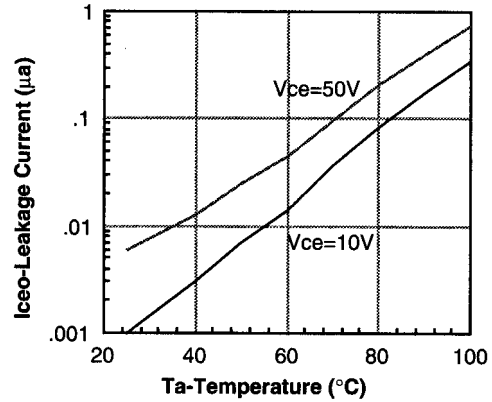


Figure 7. Power dissipation versus ambient temperature

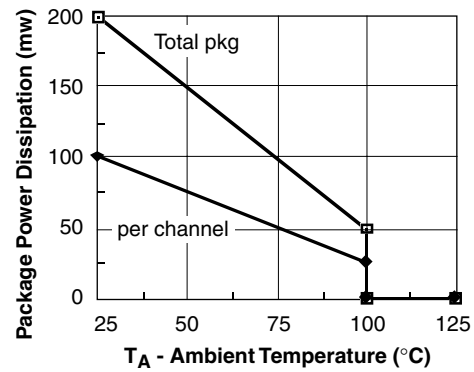


Figure 8. Switching time test schematic and waveform

