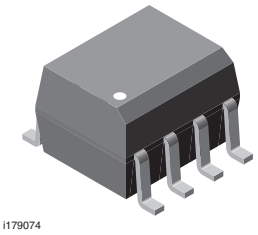
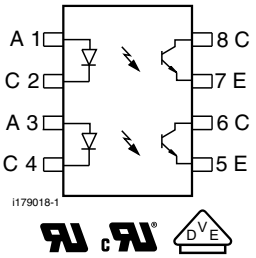
Optocoupler, Phototransistor Output, Dual Channel, SOIC-8 Package, 100 °C Rated





LINKS TO ADDITIONAL RESOURCES

Related Documents

DESCRIPTION

The 100 % rated ILD1206T and ILD1207T 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 ILD1206T and ILD1207T come in a standard SOIC-8 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 V gives a higher safety margin compared to the industry standard of 30 V.

FEATURES

- Two channel coupler
- SOIC-8 surface mountable package
- Standard lead spacing of 0.05"
- Available only on tape and reel option (conforms to EIA standard 481-2)
- Isolation test voltage, 4000 V_{RMS}
- Compatible with dual wave, vapor phase and IR reflow soldering
- Operating temperature from - 55 °C to + 110 °C
- Lead (Pb)-free component
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

Pb-free

e3

RoHS COMPLIANT

APPLICATIONS

- AC adapters
- PLCs
- Switch mode power supplies
- DC/DC converters
- Microprocessor I/O interfaces
- General impedance matching circuits

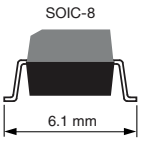
AGENCY APPROVALS

- UL / cUL 1577
- DIN EN 60747-5-5 (VDE 0884), available with option 1

ORDERING INFORMATION

I	L	D	1	2	0	#	T

PART NUMBER



AGENCY CERTIFIED / PACKAGE	CTR (%)	
	10 mA	
UL, cUL, VDE	**63 to 125**	**100 to 200**
SOIC-8	ILD1206T	ILD1207T

Note

- For additional information on the available options refer to option information

ABSOLUTE MAXIMUM RATINGS (T_{amb} = 25 °C, unless otherwise specified)				
PARAMETER	**TEST CONDITION**	**SYMBOL**	**VALUE**	**UNIT**
INPUT				
Peak reverse voltage		V_R	6	V
Peak pulsed voltage	1 µs, 300 pps		1	A
Continuous forward current per channel			30	mA
Power dissipation		P_{diss}	50	mW
Derate linearly from 25 °C			0.5	mW/°C
OUTPUT				
Collector emitter breakdown voltage		BV_{CEO}	70	V
Emitter collector breakdown voltage		BV_{ECO}	7	V
Power dissipation per channel		P_{diss}	125	mW
Derate linearly from 25 °C			1.25	mW/°C
COUPLER				
Isolation test voltage	t = 1 min	V_{ISO}	3333	V_{RMS}
Total package dissipation ambient (2 LEDs and 2 detectors, 2 channels)		P_{tot}	300	mW
Derate linearly from 25 °C			4	mW/°C
Storage temperature		T_{stg}	-55 to +150	°C
Operating temperature		T_{amb}	-55 to +110	°C
Soldering time from 260 °C		T_{sld}	10	s

Note

- Stresses in excess of the absolute maximum ratings can cause permanent damage to the device. Functional operation of the device is not implied at these or any other conditions in excess of those given in the operational sections of this document. Exposure to absolute maximum rating for extended periods of the time can adversely affect reliability

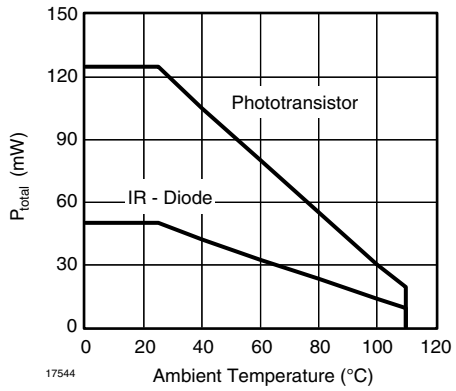


Fig. 1 - Power Dissipation vs. Ambient Temperature

ELECTRICAL CHARACTERISTICS (T_{amb} = 25 °C, unless otherwise specified)							
PARAMETER	**TEST CONDITION**	**PART**	**SYMBOL**	**MIN.**	**TYP.**	**MAX.**	**UNIT**
INPUT							
Forward voltage	I_F = 10 mA		V_F	-	1.2	1.55	V
Reverse current	V_R = 6 V		I_R	-	0.1	100	µA
Capacitance	V_R = 0 V		C_O	-	25	-	pF
OUTPUT							
Collector emitter breakdown voltage	I_C = 10 µA		BV_{CEO}	70	-	-	V
Emitter collector breakdown voltage	I_E = 10 µA		BV_{ECO}	7	-	-	V
Collector emitter leakage current	V_{CE} = 10 V, I_F = 0 A		I_{CEO}	-	5	50	nA
Collector emitter capacitance	V_{CE} = 0 V		C_{CE}	-	10	-	pF
Collector emitter saturation voltage	I_F = 10 mA, I_C = 2.5 mA		V_{CEsat}	-	-	0.4	V
COUPLER							
Capacitance (input to output)			C_{IO}	-	0.5	-	pF
Resistance (input to output)			R_{IO}	-	100	-	GΩ

Note

- Minimum and maximum values were tested requierements. Typical values are characteristics of the device and are the result of engineering evaluations. Typical values are for information only and are not part of the testing requirements

CURRENT TRANSFER RATIO							
PARAMETER	**TEST CONDITION**	**PART**	**SYMBOL**	**MIN.**	**TYP.**	**MAX.**	**UNIT**
I_C/I_F	V_{CE} = 5 V, I_F = 10 mA	ILD1206T	CTR_{DC}	63	-	125	%
		ILD1207T	CTR_{DC}	100	-	200	%

SWITCHING CHARACTERISTICS						
PARAMETER	**TEST CONDITION**	**SYMBOL**	**MIN.**	**TYP.**	**MAX.**	**UNIT**
Turn-on time	I_C = 2 mA, R_L = 100 Ω, V_{CC} = 5 V	t_{on}	5	-	-	µs
Turn-off time	I_C = 2 mA, R_L = 100 Ω, V_{CC} = 5 V	t_{off}	4	-	-	µs

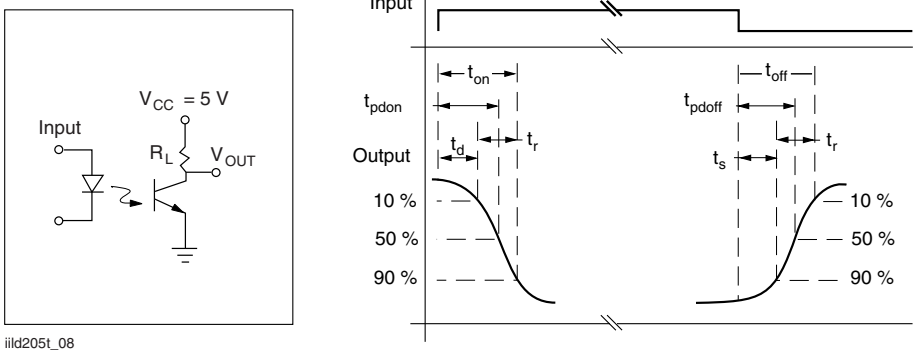


Fig. 2 - Switching Test Circuit

SAFETY AND INSULATION RATINGS (T_{amb} = 25 °C, unless otherwise specified)				
PARAMETER	**TEST CONDITION**	**SYMBOL**	**VALUE**	**UNIT**
Climatic classification	According to IEC 68 part 1		55 / 100 / 21	
Pollution degree	According to DIN VDE 0109		2	
Comparative tracking index	Insulation group IIIa	CTI	175	
Maximum rated withstanding isolation voltage	According to UL1577, t = 1 min	V_{ISO}	3333	V_{RMS}
Maximum transient isolation voltage	According to DIN EN 60747-5-5	V_{IOTM}	6000	V_{peak}
Maximum repetitive peak isolation voltage	According to DIN EN 60747-5-5	V_{IORM}	560	V_{peak}
Isolation resistance	T_{amb} = 25 °C, V_{IO} = 500 V	R_{IO}	≥ 10^{12}	Ω
	T_{amb} = 100 °C, V_{IO} = 500 V	R_{IO}	≥ 10^{11}	Ω
Output safety power		P_{SO}	350	mW
Input safety current		I_{SI}	150	mA
Input safety temperature		T_S	165	°C
Creepage distance			≥ 4	mm
Clearance distance			≥ 4	mm
Insulation thickness		DTI	≥ 0.2	mm

Note

- As per IEC 60747-5-5, §7.4.3.8.2, this optocoupler is suitable for “safe electrical insulation” only within the safety ratings. Compliance with the safety ratings shall be ensured by means of protective circuits

TYPICAL CHARACTERISTICS (T_{amb} = 25 °C, unless otherwise specified)

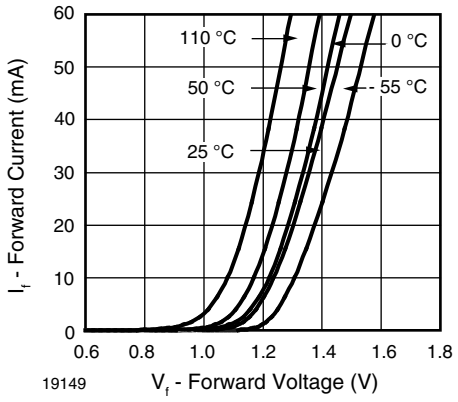


Fig. 3 - Forward Current vs. Forward Voltage

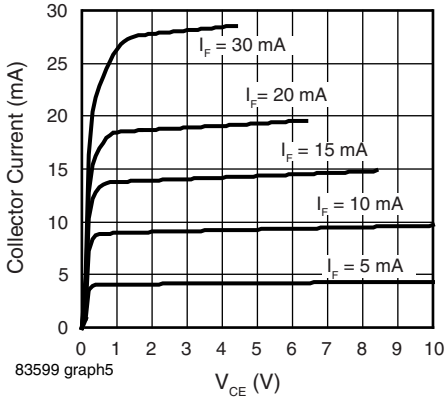


Fig. 4 - V_{CE} vs. I_C, (Non-Saturated)

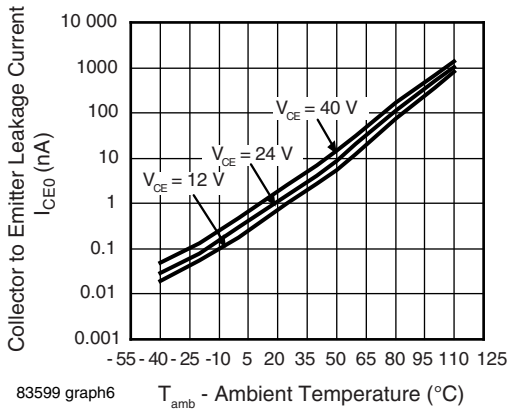


Fig. 5 - Collector to Emitter Leakage Current vs. Ambient Temperature

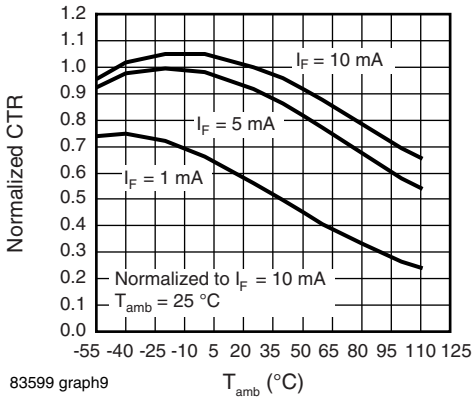


Fig. 8 - Normalized CTR vs. Ambient Temperature (Non-Saturated, V_{CE} = 5 V)

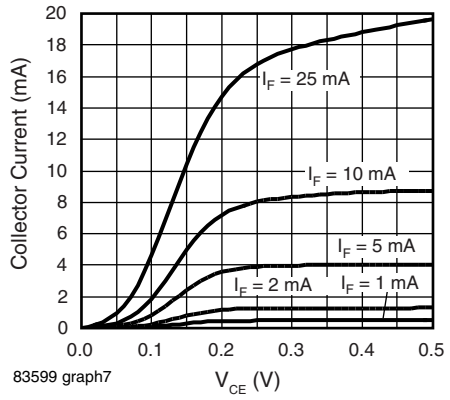


Fig. 6 - V_{CE} vs. I_C, (Saturated)

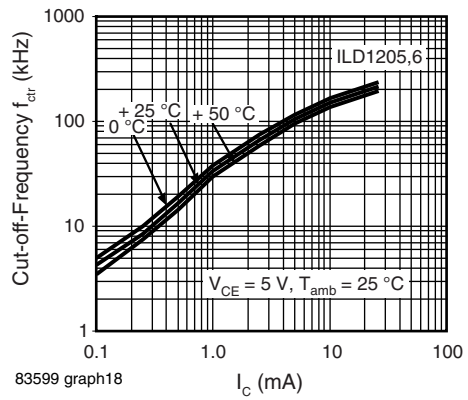


Fig. 9 - Cut-off-Frequency (- 3 dB) vs. Collector Current

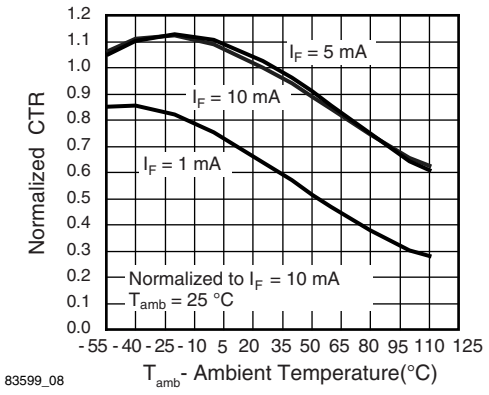


Fig. 7 - Normalized CTR vs. Ambient Temperature (Saturated, V_{CE} = 0.4 V)

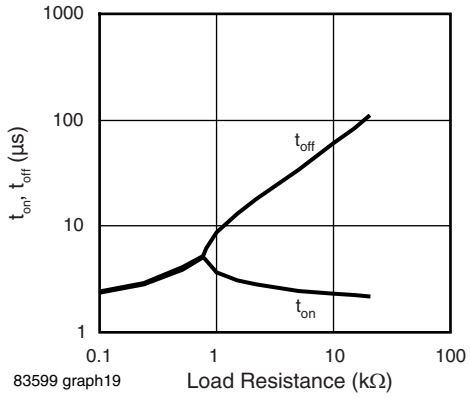
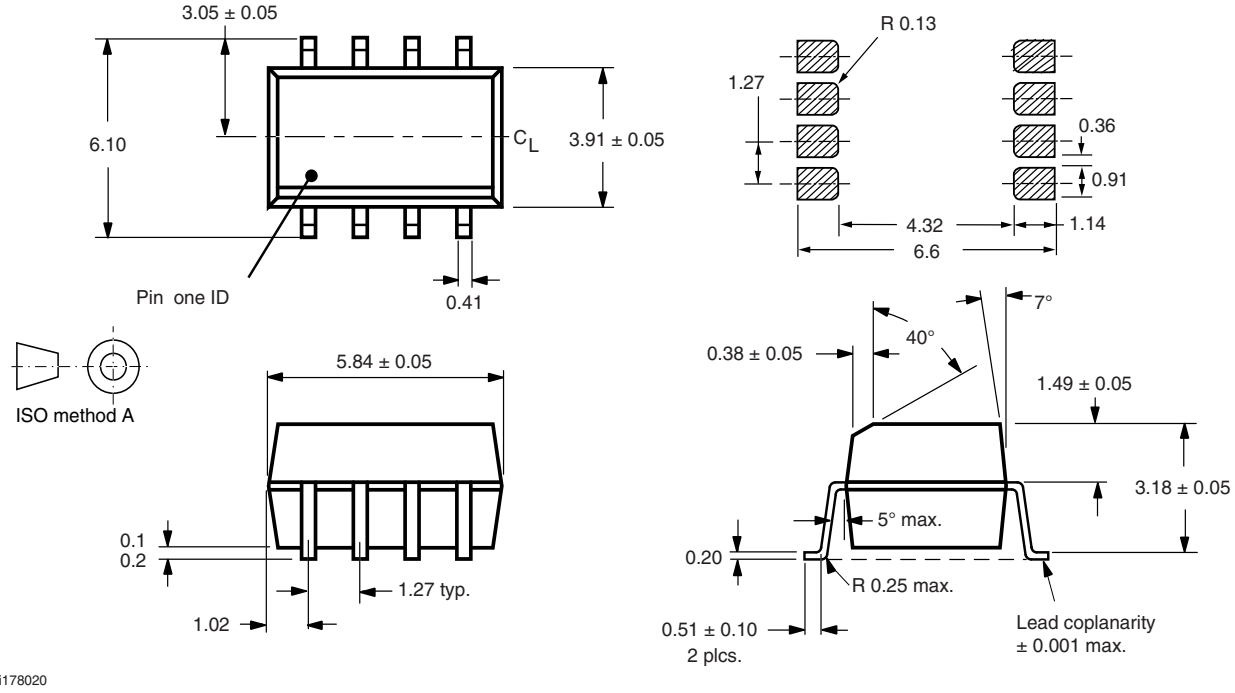


Fig. 10 - t_{on}, t_{off} vs. Load Resistance (100 Ω to 20 000 Ω)

PACKAGE DIMENSIONS (in millimeters)



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