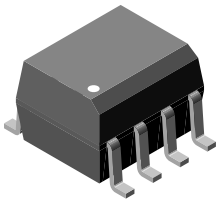
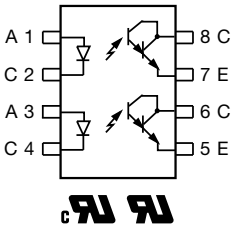
Optocoupler, Photodarlington Output, Dual Channel, SOIC-8 Package





LINKS TO ADDITIONAL RESOURCES

Related Documents | Design Tools | 3D Models | SPICE Models

DESCRIPTION

The ILD233T is a high current transfer ratio (CTR) optocoupler. It has a gallium arsenide infrared LED emitter and silicon NPN photodarlington transistor detector.

This device has CTRs tested at an LED current of 1.0 mA. This low drive current permits easy interfacing from CMOS to LSTTL or TTL.

The ILD223T is constructed in a standard SOIC-8 foot print which makes it ideally suited for high density applications. In addition to eliminating through hole requirements, this package conforms to standards for surface mounted devices.

FEATURES

- Two channel optocoupler
- High current transfer ratio at I_F = 1.0 mA, 500 % minimum
- Isolation test voltage, 4000 V_{RMS}
- Electrical specifications similar to standard 6-pin coupler
- Compatible with dual wave, vapor phase and IR reflow soldering
- SOIC-8 surface mountable package
- Standard lead spacing, 0.05"
- Available only on tape and reel (conforms to EIA standard 481-2)
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

Pb-free

e3

RoHS COMPLIANT

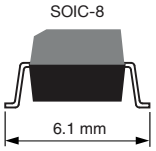
AGENCY APPROVALS

- UL
- cUL

ORDERING INFORMATION

I	L	D	2	2	3	T	-	X	0	#	#

PART NUMBER — PACKAGE OPTION



AGENCY CERTIFIED / PACKAGE	CTR (%)
	1 mA
UL, cUL	≥ 500
SOIC-8	ILD223T

ABSOLUTE MAXIMUM RATINGS (T_{amb} = 25 °C, unless otherwise specified)				
PARAMETER	**TEST CONDITION**	**SYMBOL**	**VALUE**	**UNIT**
INPUT				
Peak reverse voltage		V_R	6.0	V
Forward current		I_F	60	mA
Peak pulsed current	1.0 µs, 300 pps		3.0	A
Continuous forward current per channel			30	mA
Power dissipation		P_{diss}	45	mW
Derate linearly from 25 °C			0.4	mW/°C
OUTPUT				
Collector emitter breakdown voltage		BV_{CEO}	30	V
Emitter collector breakdown voltage		BV_{ECO}	5.0	V
Power dissipation per channel		P_{diss}	75	mW
Derate linearly from 25 °C			3.1	mW/°C
COUPLER				
Isolation test voltage	t = 1.0 s	V_{ISO}	4000	V_{RMS}
Total package dissipation (2 LEDs and 2 detectors, 2 channels)		P_{tot}	250	mW
Derate linearly from 25 °C			2.0	mW/°C
Storage temperature		T_{stg}	-55 to +150	°C
Operating temperature		T_{amb}	-55 to +100	°C
Soldering temperature (1)		T_{sld}	260	°C

Notes

- 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 ratings for extended periods of the time can adversely affect reliability.

(1) Refer to reflow profile for soldering conditions for surface mounted devices (SOP/SOIC)

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	-	-	1.3	V
Reverse current	V_R = 6.0 V		I_R	-	0.1	100	µA
Capacitance	V_F = 0 V, f = 1.0 MHz		C_O	-	25	-	pF
OUTPUT							
Collector emitter breakdown voltage	I_C = 10 µA		BV_{CEO}	30	-	-	V
Emitter collector breakdown voltage	I_C = 10 µA		BV_{ECO}	5.0	-	-	V
Collector emitter leakage current	V_{CE} = 50 V, I_F = 0 A		I_{CEO}	-	-	50	nA
Collector emitter capacitance	V_{CE} = 5.0 V		C_{CE}	-	3.4	-	pF
COUPLER							
Capacitance (input to output)		ILD223T	C_{IO}	0.5	-	-	pF
Saturation voltage, collector emitter	I_F = 1.0 mA, I_{CE} = 0.5 mA	ILD223T	V_{CEsat}	-	-	1.0	V
Resistance, input to output		ILD223T	C_{IO}	100	-	-	GΩ

Note

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

CURRENT TRANSFER RATIO						
PARAMETER	**TEST CONDITION**	**SYMBOL**	**MIN.**	**TYP.**	**MAX.**	**UNIT**
I_C/I_F	I_F = 1.0 mA, V_{CE} = 5.0 V	CTR_{DC}	500	-	-	%

SWITCHING CHARACTERISTICS							
PARAMETER	TEST CONDITION	PART	SYMBOL	MIN.	TYP.	MAX.	UNIT
Turn-on time	V_{CC} = 10 V, R_L = 100 Ω, I_F = 5.0 mA	ILD223T	t_{on}	15	-	-	µs
Turn-off time	V_{CC} = 10 V, R_L = 100 Ω, I_F = 5.0 mA	ILD223T	t_{off}	30	-	-	µs

SAFETY AND INSULATION RATINGS						
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Climatic classification	According to IEC 68 part 1		-	55 / 100 / 21	-	
Comparative tracking index		CTI	175	-	399	
V_{IOTM}			6000	-	-	V
V_{IORM}			560	-	-	V
PSO			-	-	350	mW
I_{SI}			-	-	150	mA
T_{SI}			-	-	165	°C
Creepage distance			4	-	-	mm
Clearance distance			4	-	-	mm
Insulation thickness			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)

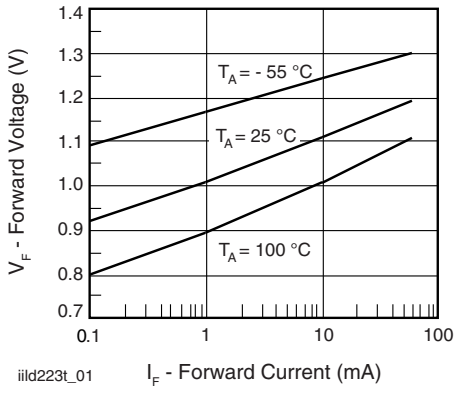


Fig. 1 - Forward Voltage vs. Forward Current

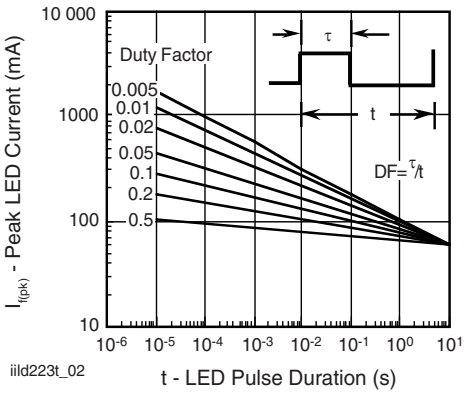


Fig. 2 - Peak LED Current vs. Duty Factor, t

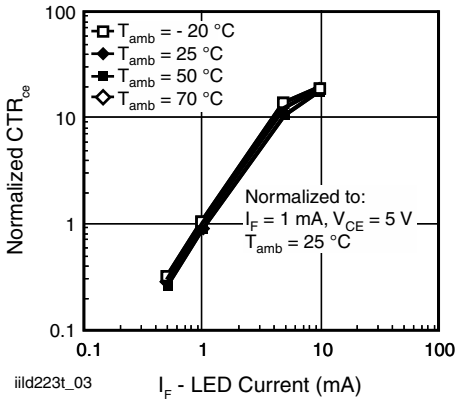


Fig. 3 - Normalized CTR_{CE} vs. LED Current

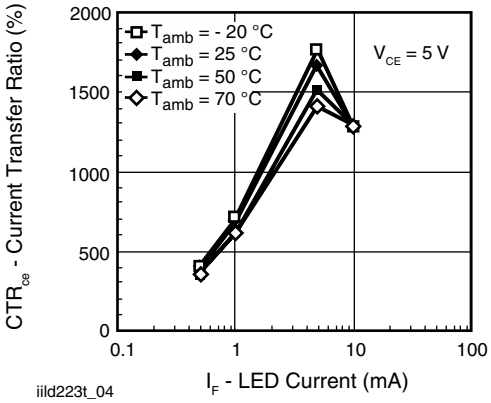


Fig. 4 - CTR vs. LED Current

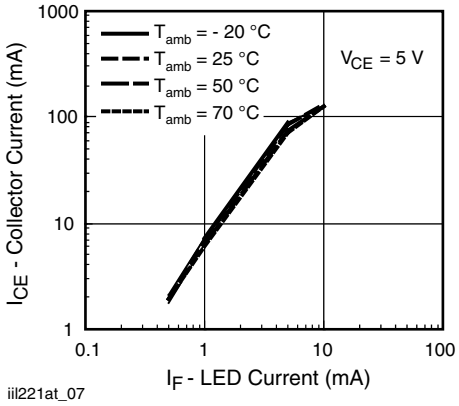


Fig. 5 - Collector Current vs. LED Current

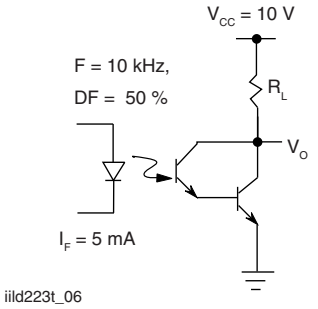


Fig. 6 - Switching Schematic

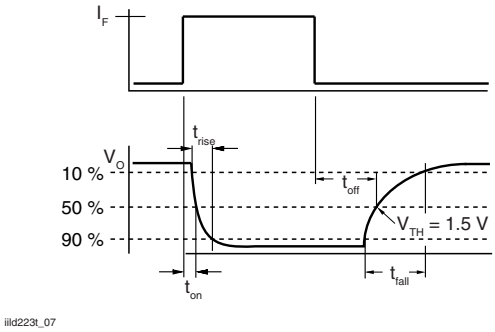
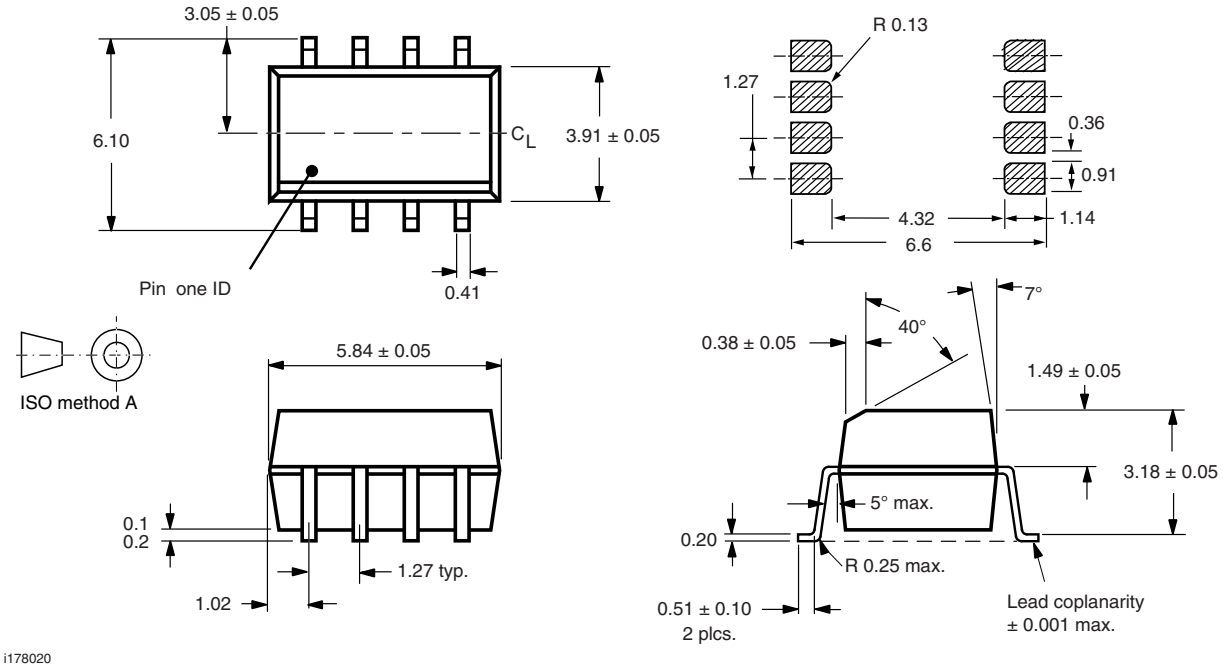
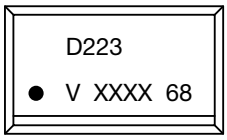


Fig. 7 - Switching Timing

PACKAGE DIMENSIONS in inches (millimeters)



PACKAGE MARKING (example)



Notes

- XXXX = LMC (lot marking code)
- Tape and reel suffix (T) is not part of the package marking

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