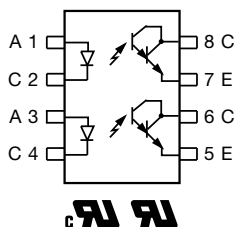
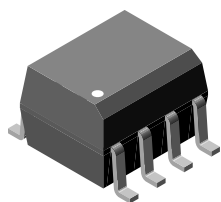


Optocoupler, Photodarlington Output, Dual Channel, SOIC-8 Package



FEATURES

- Two channel optocoupler
- High current transfer ratio at $I_F = 1.0 \text{ mA}$, 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


RoHS
COMPLIANT

LINKS TO ADDITIONAL RESOURCES



DESCRIPTION

The ILD223T 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.

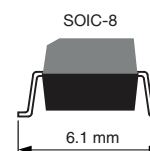
The ILD223T is constructed in a standard SOIC-8 foot print which makes it ideally suited for high density applications. In addition to eliminating through hole requirements, this package conforms to standards for surface mounted devices.

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 ($T_{amb} = 25\text{ }^{\circ}\text{C}$, 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 $^{\circ}\text{C}$			0.4	mW/ $^{\circ}\text{C}$
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 $^{\circ}\text{C}$			3.1	mW/ $^{\circ}\text{C}$
COUPLER				
Isolation test voltage	$t = 1.0\text{ s}$	V_{ISO}	4000	V_{RMS}
Total package dissipation (2 LEDs and 2 detectors, 2 channels)		P_{tot}	250	mW
Derate linearly from 25 $^{\circ}\text{C}$			2.0	mW/ $^{\circ}\text{C}$
Storage temperature		T_{stg}	-55 to +150	$^{\circ}\text{C}$
Operating temperature		T_{amb}	-55 to +100	$^{\circ}\text{C}$
Soldering temperature ⁽¹⁾		T_{sld}	260	$^{\circ}\text{C}$

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 ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified)							
PARAMETER	TEST CONDITION	PART	SYMBOL	MIN.	TYP.	MAX.	UNIT
INPUT							
Forward voltage	$I_F = 10\text{ mA}$		V_F	-	-	1.3	V
Reverse current	$V_R = 6.0\text{ V}$		I_R	-	0.1	100	μA
Capacitance	$V_F = 0\text{ V}$, $f = 1.0\text{ MHz}$		C_O	-	25	-	pF
OUTPUT							
Collector emitter breakdown voltage	$I_C = 10\text{ }\mu\text{A}$		BV_{CEO}	30	-	-	V
Emitter collector breakdown voltage	$I_C = 10\text{ }\mu\text{A}$		BV_{ECO}	5.0	-	-	V
Collector emitter leakage current	$V_{CE} = 50\text{ V}$, $I_F = 0\text{ A}$		I_{CEO}	-	-	50	nA
Collector emitter capacitance	$V_{CE} = 5.0\text{ V}$		C_{CE}	-	3.4	-	pF
COUPLER							
Capacitance (input to output)		ILD223T	C_{IO}	0.5	-	-	pF
Saturation voltage, collector emitter	$I_F = 1.0\text{ mA}$, $I_{CE} = 0.5\text{ mA}$	ILD223T	V_{CEsat}	-	-	1.0	V
Resistance, input to output		ILD223T	C_{IO}	100	-	-	G Ω

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	$I_F = 1.0\text{ mA}$, $V_{CE} = 5.0\text{ V}$	CTR_{DC}	500	-	-	%

SWITCHING CHARACTERISTICS

PARAMETER	TEST CONDITION	PART	SYMBOL	MIN.	TYP.	MAX.	UNIT
Turn-on time	$V_{CC} = 10\text{ V}$, $R_L = 100\ \Omega$, $I_F = 5.0\text{ mA}$	ILD223T	t_{on}	15	-	-	μs
Turn-off time	$V_{CC} = 10\text{ V}$, $R_L = 100\ \Omega$, $I_F = 5.0\text{ mA}$	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	$^{\circ}\text{C}$
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.

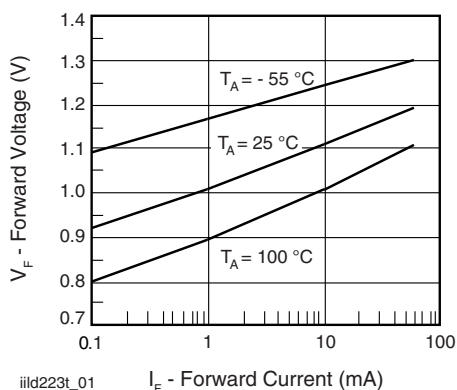
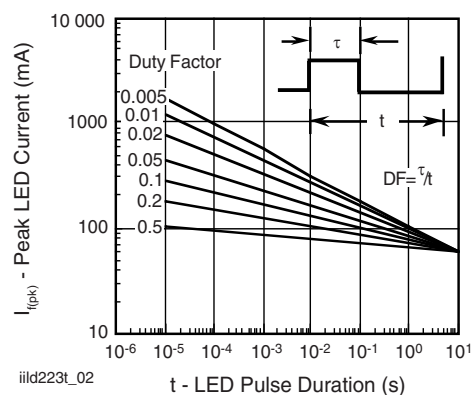
TYPICAL CHARACTERISTICS ($T_{amb} = 25\ ^{\circ}\text{C}$, unless otherwise specified)


Fig. 1 - Forward Voltage vs. Forward Current


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

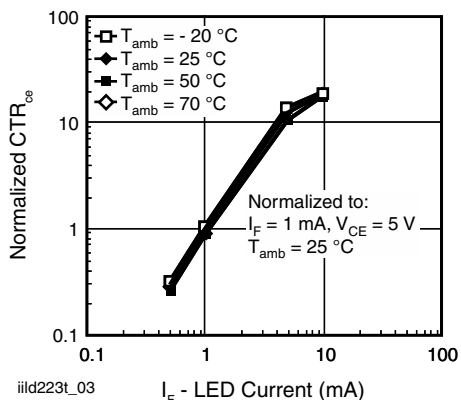
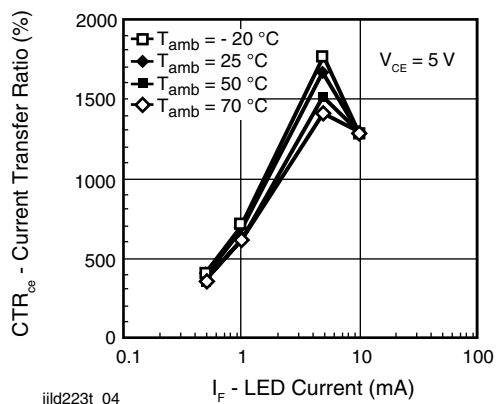

Fig. 3 - Normalized CTR_{CE} vs. LED Current


Fig. 4 - CTR vs. LED Current

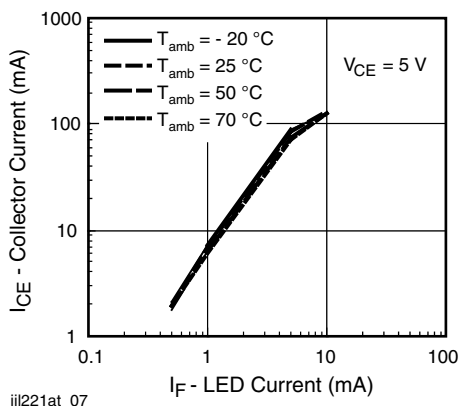


Fig. 5 - Collector Current vs. LED Current

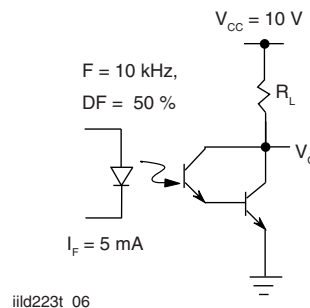


Fig. 6 - Switching Schematic

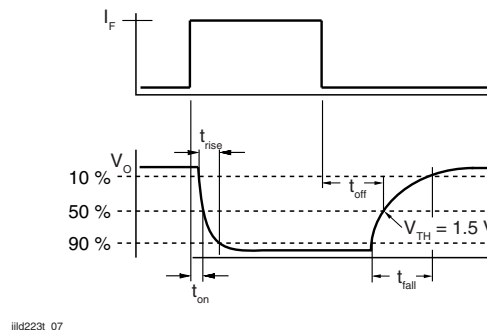


Fig. 7 - Switching Timing



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