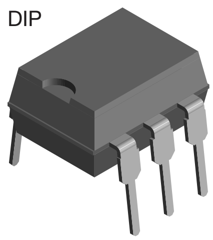
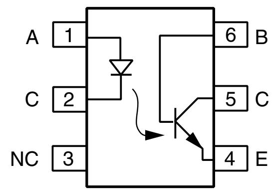
Optocoupler, Phototransistor Output, Low Input Current, With Base Connection





FEATURES

- Guaranteed at I_F = 1.0 mA
- High collector emitter voltage, BV_{CEO} = 70 V
- Long term stability
- Industry standard DIP package
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

AGENCY APPROVALS

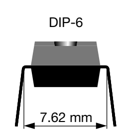
- UL file no. E52744 system code H, double protection
- cUL tested to CSA 22.2 bulletin 5A
- DIN EN 60747-5-2 (VDE 0884) / DIN EN 60747-5-5 (pending), available with option 1
- BSI: EN 60065:2002, EN 60950-1:2006
- FIMKO

DESCRIPTION

The IL202 is optically coupled pairs employing 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 IL202 can be used to replace relays and transformers in many digital interface applications, as well as analog applications such as CRT modulation.

ORDERING INFORMATION

I	L	2	0	#	-	X	0	0	#	T
PART NUMBER						PACKAGE OPTION				TAPE AND REEL



AGENCY CERTIFIED/PACKAGE	CTR (%)
VDE, UL, cUL, BSI, FIMKO	**125 to 250**
DIP-6	IL202-X001

For technical questions, contact: optocoupleranswers@vishay.com

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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 continuous current		I_F	60	mA
Power dissipation		P_{diss}	100	mW
Derate linearly from 25 °C			1.33	mW/°C
OUTPUT				
Collector emitter breakdown voltage		BV_{CEO}	70	V
Emitter collector breakdown voltage		BV_{ECO}	7.0	V
Collector base breakdown voltage		BV_{CBO}	70	V
Power dissipation		P_{diss}	200	mW
Derate linearly from 25 °C			2.6	mW/°C
COUPLER				
Isolation test voltage	t = 1.0 s	V_{ISO}	5300	V_{RMS}
Total package dissipation (LED and detector)		P_{tot}	250	mW
Derate linearly from 25 °C			3.3	mW/°C
Creepage distance			≥ 7.0	mm
Clearance distance			≥ 7.0	mm
Storage temperature		T_{stg}	-55 to +150	°C
Operating temperature		T_{amb}	-55 to +100	°C
Lead soldering time	≤ 260 °C		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 ratings for extended periods of the time can adversely affect reliability

ELECTRICAL CHARACTERISTICS (T_{amb} = 25 °C, unless otherwise specified)						
PARAMETER	**TEST CONDITION**	**SYMBOL**	**MIN.**	**TYP.**	**MAX.**	**UNIT**
INPUT						
Forward voltage	I_F = 20 mA	V_F	-	1.2	1.5	V
	I_F = 1.0 mA	V_F	-	1.0	1.2	V
Breakdown voltage	I_R = 10 μA	V_F	6.0	20		V
Reverse current	V_R = 6.0 V	I_R		0.1	10	μA
OUTPUT						
DC forward current gain	V_{CE} = 5.0 V, I_C = 100 μA	h_{FE}	100	200	-	
Collector emitter breakdown voltage	I_C = 100 μA	BV_{CEO}	70	-	-	V
Emitter collector breakdown voltage	I_E = 100 μA	BV_{ECO}	7.0	10	-	V
Collector base breakdown voltage	I_C = 10 μA	BV_{CBO}	70	90	-	V
Leakage current collector emitter	V_{CE} = 10 V, T_A = 25 °C	I_{CEO}	-	5.0	50	nA

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 (T_{amb} = 25 °C, unless otherwise specified)							
PARAMETER	**TEST CONDITION**	**PART**	**SYMBOL**	**MIN.**	**TYP.**	**MAX.**	**UNIT**
Current transfer ratio (collector to base)	I_F = 10 mA, V_{CB} = 10 V		CTR_{CB}	15	-	-	%
Collector emitter saturation voltage	I_F = 10 mA, I_C = 2.0 mA		V_{CEsat}	-	-	0.4	V
DC current transfer ratio	I_F = 10 mA, V_{CE} = 10 V	IL202	CTR_{DC}	125	200	250	%
	I_F = 1.0 mA, V_{CE} = 10 V	IL202	CTR_{DC}	30	-	-	%

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

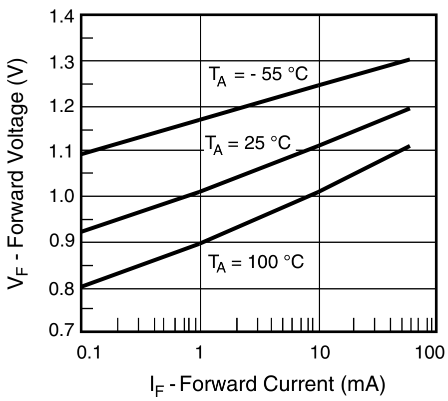

Fig. 1 - Forward Voltage vs. Forward Current

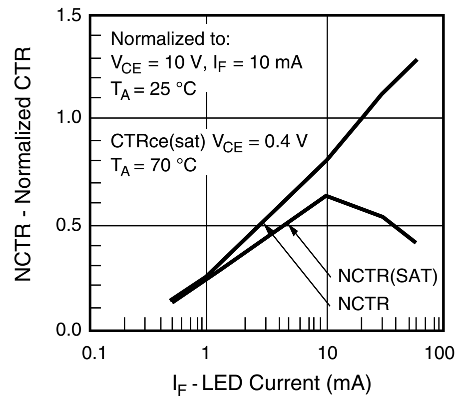

Fig. 4 - Normalized Non-Saturated and Saturated CTR vs. LED Current

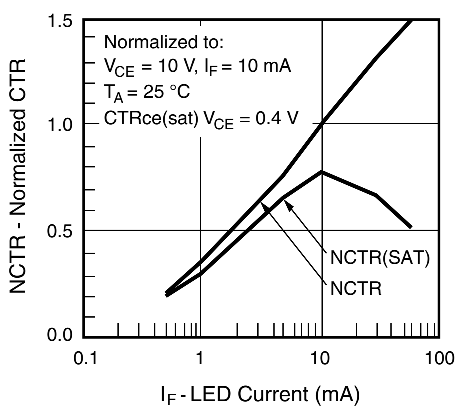

Fig. 2 - Normalized Non-Saturated and Saturated CTR vs. LED Current

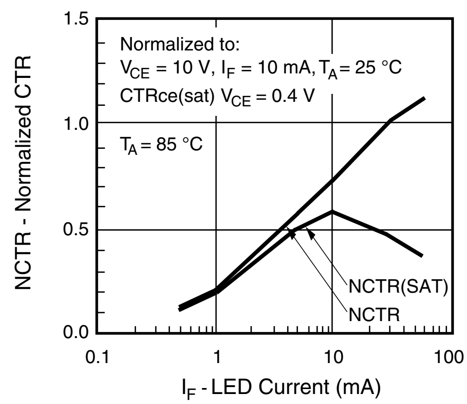

Fig. 5 - Normalized Non-Saturated and Saturated CTR vs. LED Current

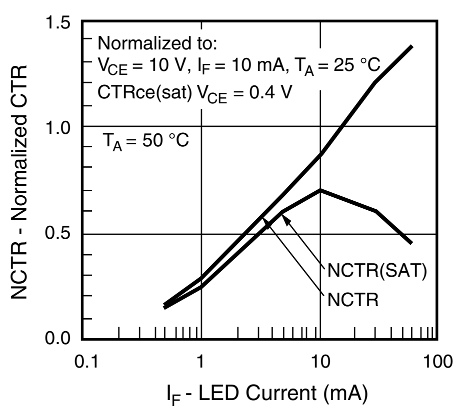

Fig. 3 - Normalized Non-Saturated and Saturated CTR vs. LED Current

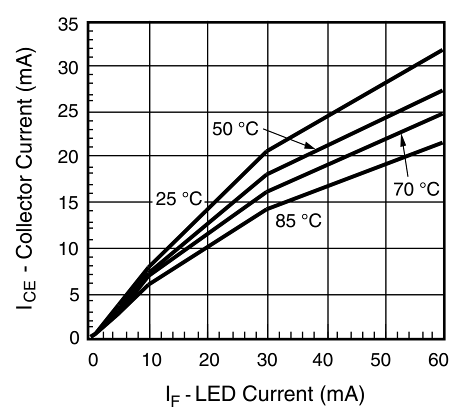

Fig. 6 - Collector Emitter Current vs. Temperature and LED Current

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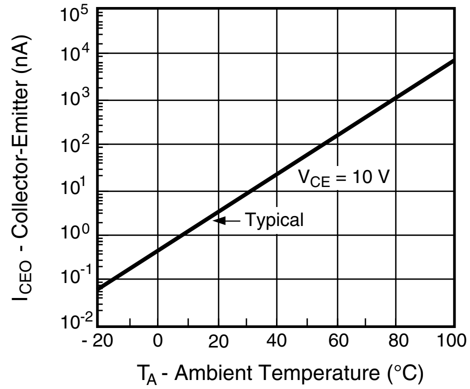

Fig. 7 - Collector Emitter Leakage Current vs.Temperature

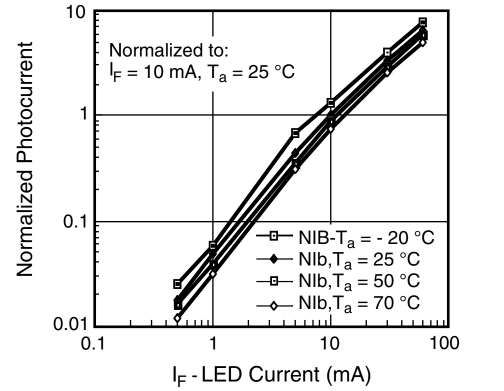

Fig. 10 - Normalized Photocurrent vs. I_F and Temperature

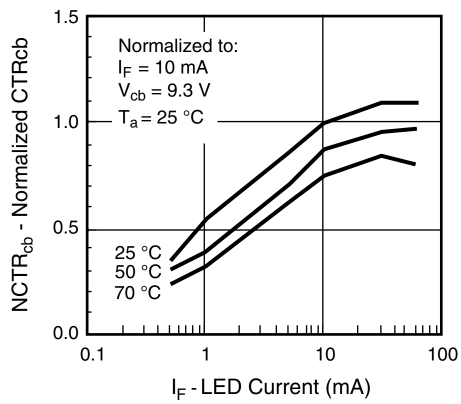

Fig. 8 - Normalized CTR_{cb} vs. LED Current and Temperature

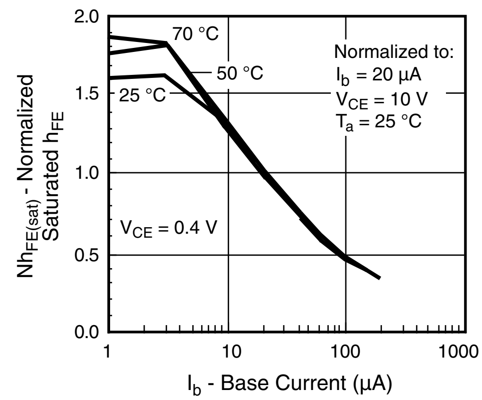

Fig. 11 - Normalized Saturated h_{FE} vs. Base Current and Temperature

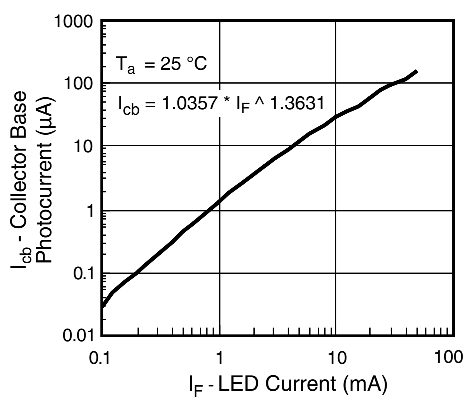

Fig. 9 - Collector Base Photocurrent vs. LED Current

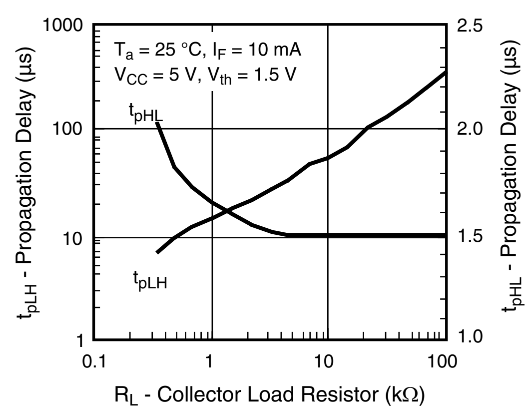

Fig. 12 - Propagation Delay vs. Collector Load Resistor

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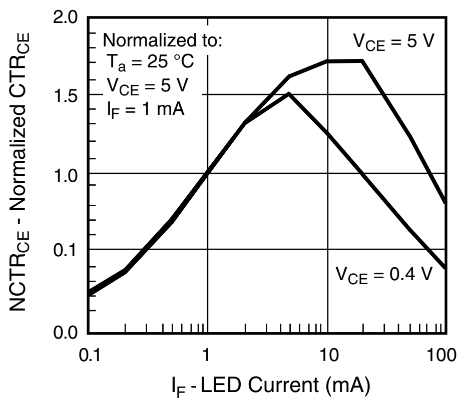


Fig. 13 - Normalized Non-Saturated and Saturated CTR_{CE} vs. LED Current

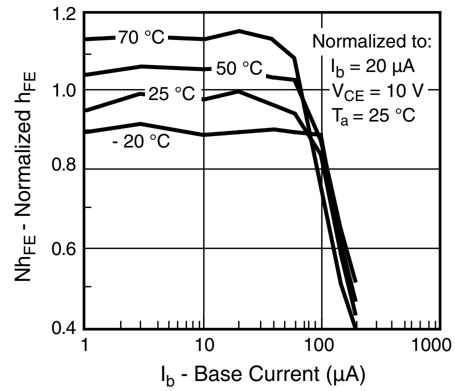
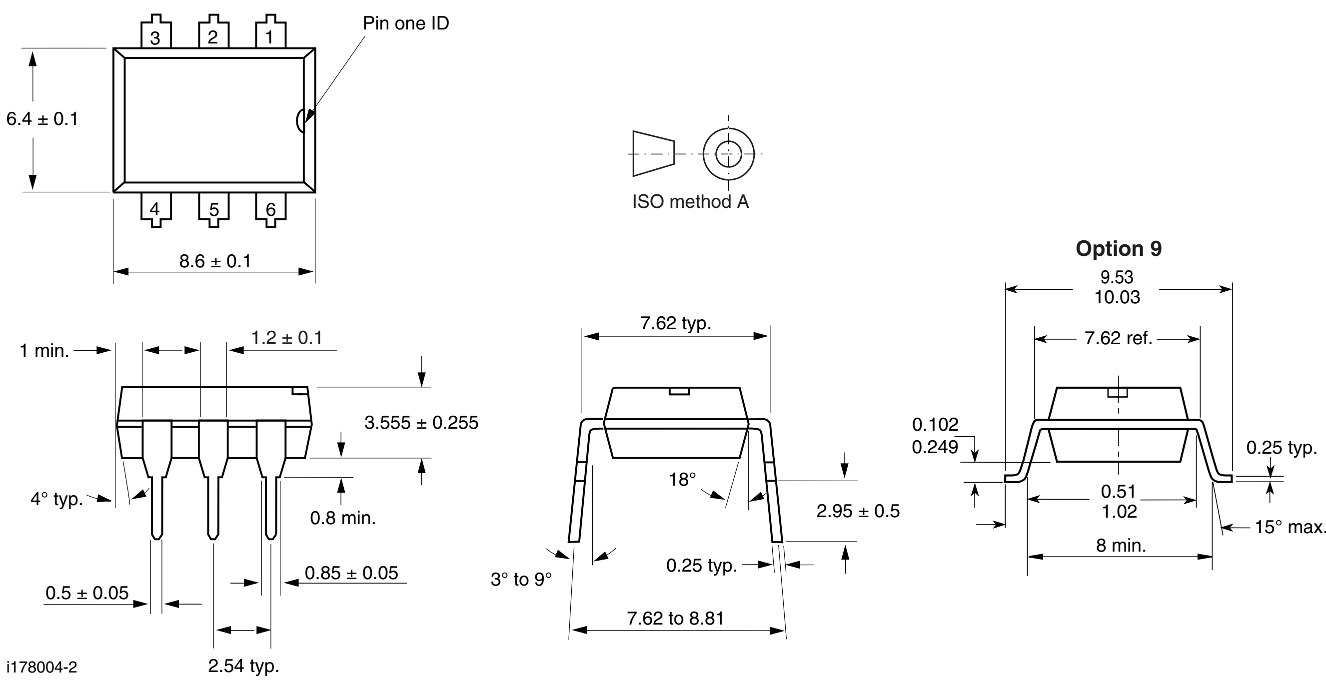
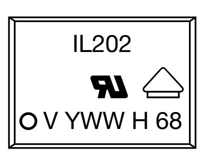


Fig. 14 - Normalized Non-Saturated h_{FE} vs. Base Current and Temperature

PACKAGE DIMENSIONS in millimeters



PACKAGE MARKING (example)



Notes

- Only option 1 is reflected in the package marking
- The VDE logo is only marked on option 1 parts
- Tape and reel suffix (T) is not part of the package marking

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