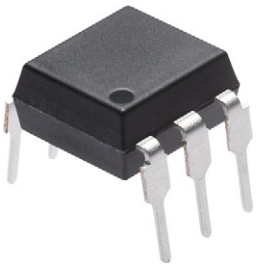
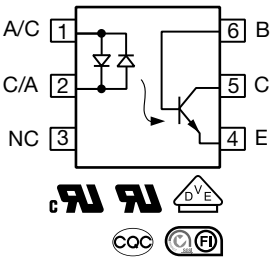
Optocoupler, Phototransistor Output, AC Input, With Base Connection





FEATURES

- AC or polarity insensitive input
- Built-in reverse polarity input protection
- Isolation voltage: 5000 V_{RMS}
- Industry standard DIP package
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

Pb-free

e3

RoHS COMPLIANT

DESCRIPTION

The IL250 and IL252 are bidirectional input optically coupled isolators consisting of two infrared LEDs coupled to a silicon NPN phototransistor.

The IL250 has a minimum CTR of 50 % and the IL252 has a minimum CTR of 100 %.

APPLICATIONS

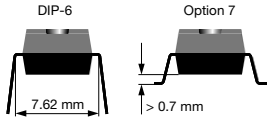
- Ideal for AC signal detection and monitoring

AGENCY APPROVALS

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

ORDERING INFORMATION

I	L	2	5	x	-	X	0	#	#	T
PART NUMBER						PACKAGE OPTION				TAPE AND REEL



AGENCY CERTIFIED / PACKAGE	CTR (%)	
	± 10 mA	
UL, cUL, CQC	≥ **50**	≥ **100**
DIP-6	IL250	IL252
SMD-6, option 7	-	IL252-X007T

Note

- Additional options may be possible, please contact sales office

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ABSOLUTE MAXIMUM RATINGS (T_{amb} = 25 °C, unless otherwise specified)				
PARAMETER	**TEST CONDITION**	**SYMBOL**	**VALUE**	**UNIT**
INPUT				
Forward continuous current		I_F	± 40	mA
Power dissipation		P_{diss}	120	mW
Derate linearly from 90 °C			3.8	mW/°C
OUTPUT				
Collector emitter breakdown voltage		BV_{CEO}	80	V
Emitter collector breakdown voltage		BV_{ECO}	7	V
Collector base breakdown voltage		BV_{CBO}	80	V
Power dissipation		P_{diss}	150	mW
COUPLER				
Total dissipation		P_{tot}	200	mW
Storage temperature		T_{stg}	-55 to +125	°C
Operating temperature		T_{amb}	-55 to +100	°C
Lead soldering time at 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 = ± 10 mA	V_F	-	1.2	1.5	V
OUTPUT						
Collector emitter breakdown voltage	I_C = 1 mA	BV_{CEO}	80	-	-	V
Emitter collector breakdown voltage	I_E = 100 µA	BV_{ECO}	7	-	-	V
Collector base breakdown voltage	I_C = 100 µA	BV_{CBO}	80	-	-	V
Collector emitter leakage current	V_{CE} = 10 V	I_{CEO}	-	-	50	nA
COUPLER						
Collector emitter saturation voltage	I_F = ± 10 mA, I_C = 0.5 mA	V_{CEsat}	-	-	0.4	V

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**
I_C/I_F	I_F = ± 10 mA, V_{CE} = 10 V	IL250	CTR_{DC}	50	-	-	%
		IL252	CTR_{DC}	100	-	-	%

SWITCHING CHARACTERISTICS (T_{amb} = 25 °C, unless otherwise specified)						
PARAMETER	**TEST CONDITION**	**SYMBOL**	**MIN.**	**TYP.**	**MAX.**	**UNIT**
Turn-on time	V_{CC} = 10 V, I_C = 10 mA, R_L = 100 Ω	t_{on}	-	-	10	µs
Turn-off time		t_{off}	-	-	10	µs

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SAFETY AND INSULATION RATINGS				
PARAMETER	**TEST CONDITION**	**SYMBOL**	**VALUE**	**UNIT**
Climatic classification	According to IEC 68 part 1		55/100/21	
Comparative tracking index		CTI	175	
Maximum rated withstanding isolation voltage	t = 1 min	V_{ISO}	5000	V_{RMS}
Maximum transient isolation voltage		V_{IOTM}	6000	V_{peak}
Maximum repetitive peak isolation voltage		V_{IORM}	850	V_{peak}
Isolation resistance	V_{IO} = 500 V, T_{amb} = 25 °C	R_{IO}	≥ 10^{11}	Ω
Output safety power		P_{SO}	150	mW
Input safety current		I_{SI}	60	mA
Safety temperature		T_S	125	°C
Creepage distance			≥ 7	mm
Clearance distance			≥ 7	mm
Insulation thickness		DTI	≥ 0.4	mm

Note

- As per IEC 60747-5-5, 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)

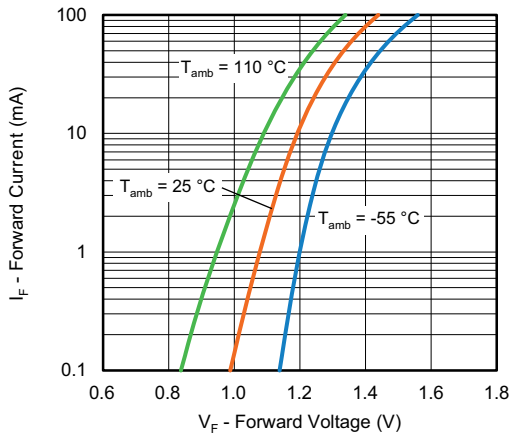


Fig. 1 - Forward Current vs. Forward Voltage

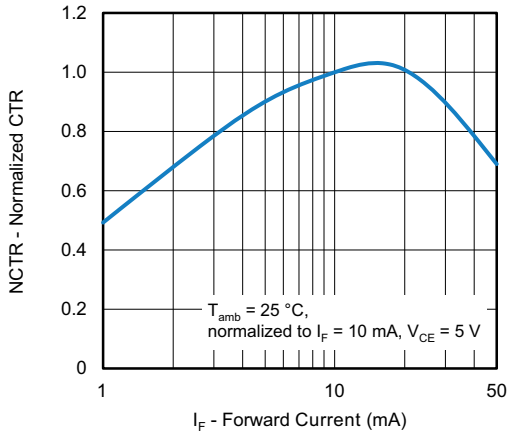


Fig. 2 - Normalized CTR vs. Forward Current

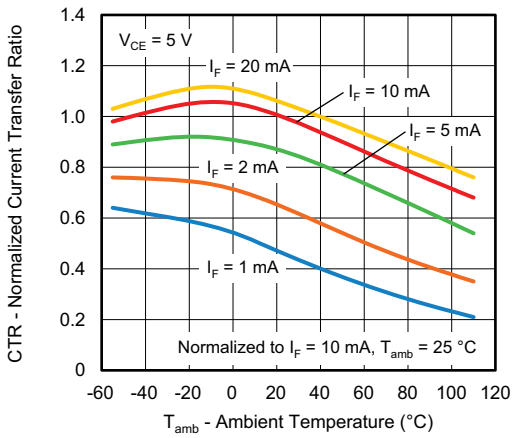


Fig. 3 - Current Transfer Ratio vs. Ambient Temperature

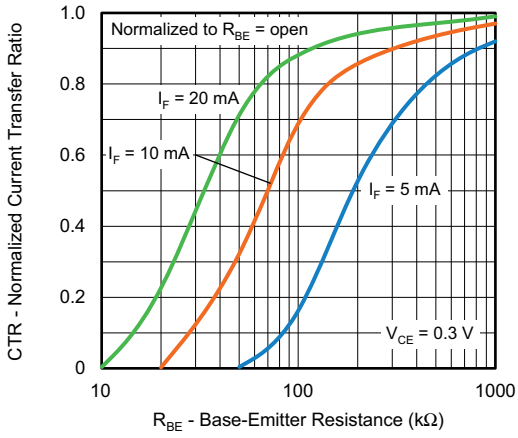


Fig. 4 - Current Transfer Ratio (saturated) vs. Base Emitter Resistance

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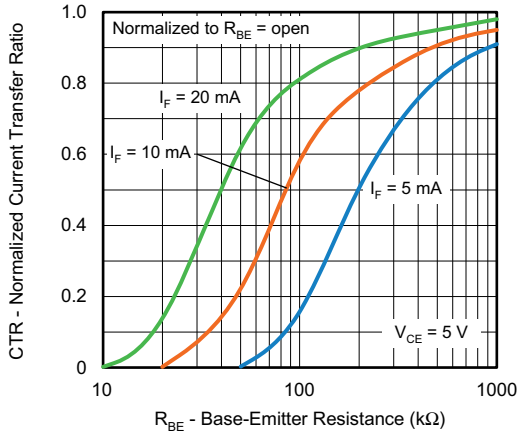


Fig. 5 - Current Transfer Ratio (saturated) vs. Base Emitter Resistance

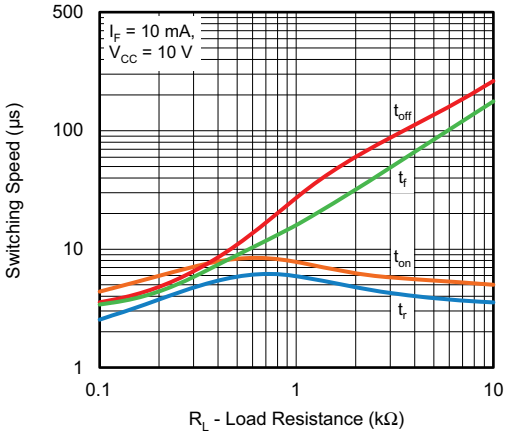


Fig. 8 - Switching Time vs. Load Resistance

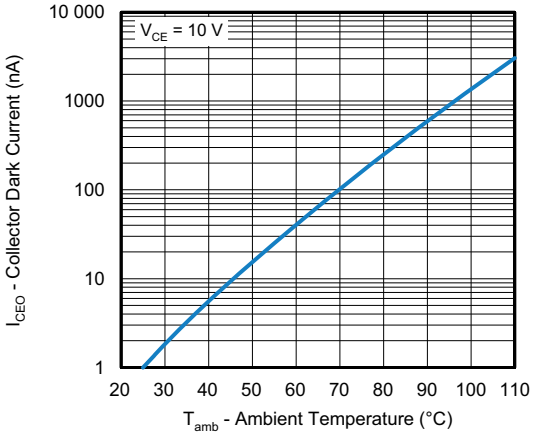


Fig. 6 - Dark Current vs. Ambient Temperature

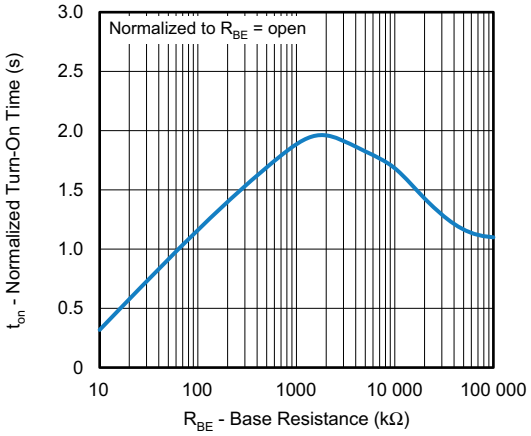


Fig. 9 - Turn-On Time vs. Base Emitter Resistance

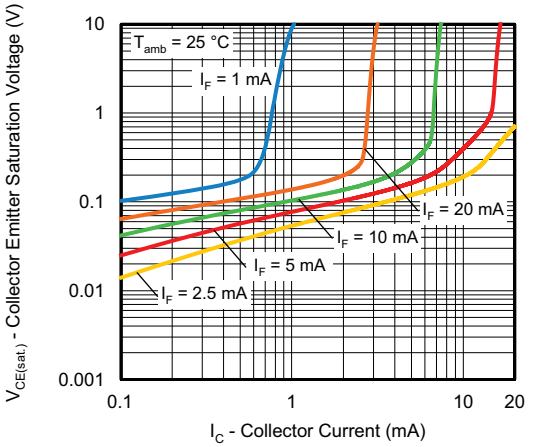


Fig. 7 - Collector Emitter Saturation Voltage vs. Collector Current

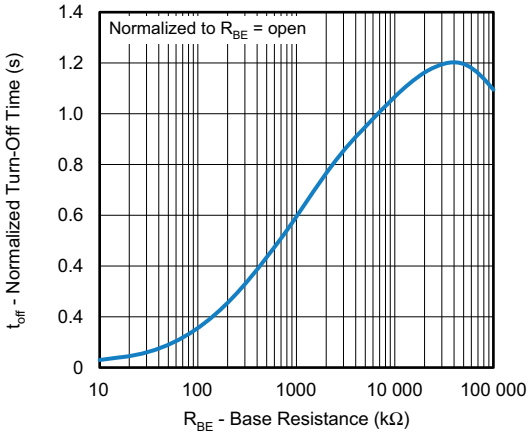


Fig. 10 - Turn-Off Time vs. Base Emitter Resistance

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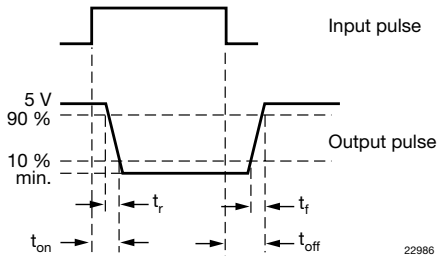


Fig. 11 - Switching Waveform

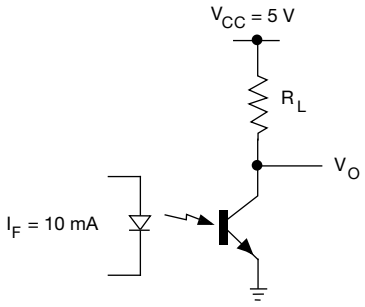
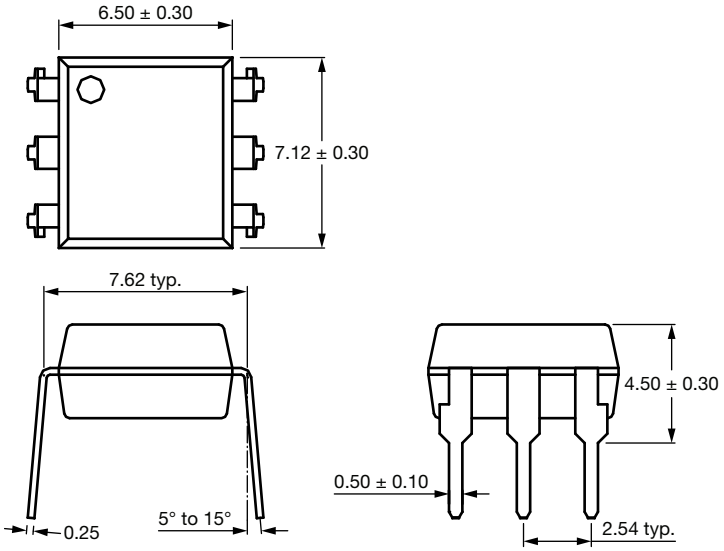


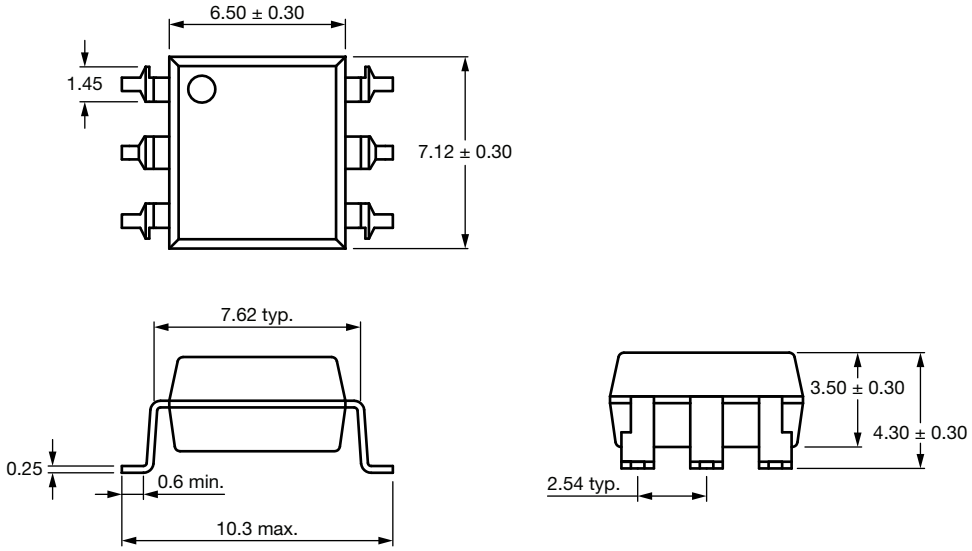
Fig. 12 - Switching Schematic

PACKAGE DIMENSIONS in millimeters

DIP-6

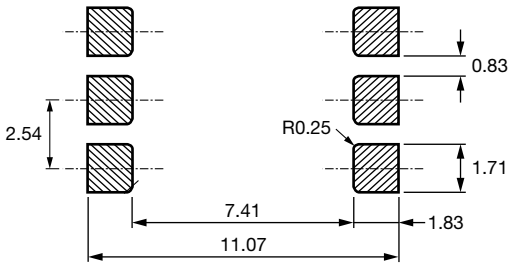


SMD-6, Option 7

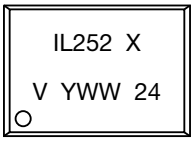


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RECOMMENDED PAD LAYOUT



PACKAGE MARKING (example)



Notes

- YWW = date code
- Option 1 is reflected with letter “X”
- Tape and reel suffix (T) is not part of the package marking

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