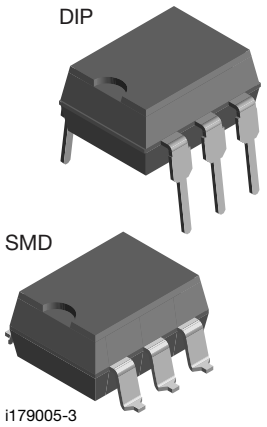
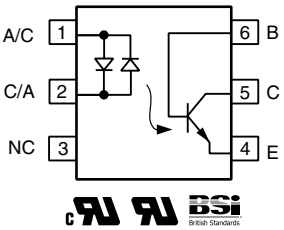
Optocoupler, Phototransistor Output, AC Input, With Base Connection





FEATURES

- AC or polarity insensitive inputs
- Continuous forward current, 130 mA
- Built-in reverse polarity input protection
- Improved CTR symmetry
- Industry standard DIP package
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

Pb-free

e3

RoHS COMPLIANT

APPLICATIONS

- Telecommunications
- Ring detection
- Loop current detector

AGENCY APPROVALS

- UL1577, file no. E52744, double protection
- cUL tested to CSA 22.2 bulletin 5A
- BSI EN 60950, BSI EN 60065

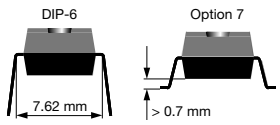
DESCRIPTION

The IL255 is a bidirectional input optically coupled isolator consisting of two high current GaAs infrared LEDs coupled to a silicon NPN phototransistor. The IL255 has a minimum CTR of 20 %.

This optocoupler is ideal for applications requiring AC signal detection and monitoring.

ORDERING INFORMATION

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



AGENCY CERTIFIED/PACKAGE	CTR (%)	
UL, cUL, BSI	≥ **20**	≥ **50**
DIP-6	-	IL255-2
SMD-6, option 7	IL255-X007T	-

ABSOLUTE MAXIMUM RATINGS (T_{amb} = 25 °C, unless otherwise specified)

PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
INPUT				
Peak pulsed current	1 µs, 300 pps	I_{FP}	3	A
Forward continuous current		I_F	130	mA
Power dissipation		P_{diss}	175	mW
Derate linearly from 25 °C			2.3	mW/°C
OUTPUT				
Collector emitter breakdown voltage		BV_{CEO}	30	V
Emitter base breakdown voltage		BV_{EBO}	5	V
Collector base breakdown voltage		BV_{CBO}	70	V
Power dissipation		P_{diss}	200	mW
Derate linearly from 25 °C			2.6	mW/°C

ABSOLUTE MAXIMUM RATINGS (T_{amb} = 25 °C, unless otherwise specified)				
PARAMETER	**TEST CONDITION**	**SYMBOL**	**VALUE**	**UNIT**
COUPLER				
Total dissipation		P_{tot}	250	mW
Derate linearly from 25 °C			3.3	mW/°C
Storage temperature		T_{stg}	-55 to +150	°C
Operating temperature		T_{amb}	-55 to +100	°C
Lead soldering time at ≥ 260 °C (1)			10	s

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 (SMD). Refer to wave profile for soldering conditions for through hole devices (DIP)

ELECTRICAL CHARACTERISTICS (T_{amb} = 25 °C, unless otherwise specified)							
PARAMETER	**TEST CONDITION**	**PART**	**SYMBOL**	**MIN.**	**TYP.**	**MAX.**	**UNIT**
INPUT							
Forward voltage	I_F = ± 100 mA		V_F		1.4	1.7	V
OUTPUT							
Collector emitter breakdown voltage	I_C = 10 mA		BV_{CEO}	30	50	-	V
Emitter collector breakdown voltage	I_E = 10 µA		BV_{ECO}	7	10	-	V
Collector base breakdown voltage	I_C = 100 µA		BV_{CBO}	70	-	-	V
Emitter base breakdown voltage	I_E = 100 µA		BV_{EBO}	70	-	-	V
Collector emitter leakage current	V_{CE} = 10 V		I_{CEO}	-	5	50	nA
COUPLER							
Collector emitter saturation voltage	I_F = ± 10 mA, I_C = 0.5 mA	IL255	V_{CEsat}	-	-	0.4	V
	I_F = ± 16 mA, I_C = 2 mA	IL255-2	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**
Current transfer ratio	I_F = ± 10 mA, V_{CE} = 10 V	IL255	CTR	20	-	-	%
	I_F = ± 10 mA, V_{CE} = 10 V	IL255-2	CTR	50	-	-	%
Current transfer ratio symmetry	I_F = ± 10 mA, V_{CE} = 10 V	IL255		0.33	-	3	
	I_F = ± 10 mA, V_{CE} = 10 V	IL255-2		0.5	1	2	

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}	4420	V_{RMS}
Maximum transient isolation voltage		V_{IOTM}	10 000	V_{peak}
Maximum repetitive peak isolation voltage		V_{IORM}	890	V_{peak}
Isolation resistance	V_{IO} = 500 V, T_{amb} = 25 °C	R_{IO}	$\geq 10^{12}$	Ω
	V_{IO} = 500 V, T_{amb} = 100 °C	R_{IO}	$\geq 10^{11}$	Ω
Output safety power		P_{SO}	400	mW
Input safety current		I_{SI}	275	mA
Safety temperature		T_S	175	°C
Creepage distance			≥ 7	mm
Clearance distance			≥ 7	mm
Insulation thickness		DTI	≥ 0.4	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)

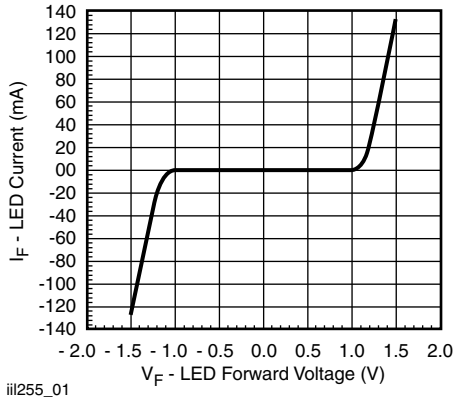


Fig. 1 - LED Forward Current vs.Forward Voltage

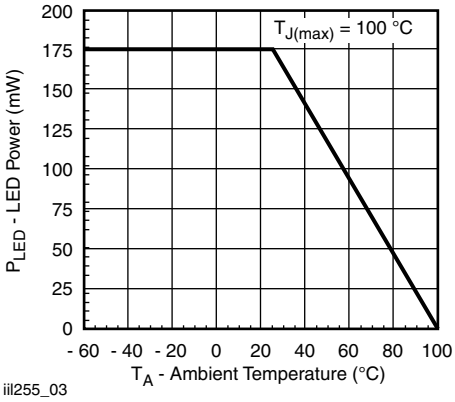


Fig. 3 - Maximum LED Power Dissipation

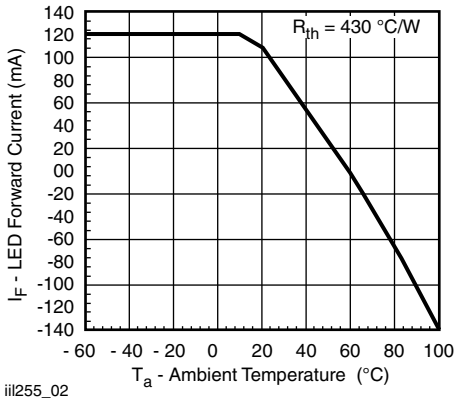


Fig. 2 - Maximum LED Current vs. Ambient Temperature

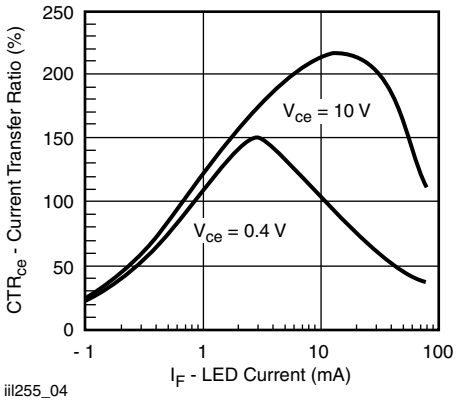


Fig. 4 - Current Transfer Ratio vs.
LED Current and Collector-Emitter Voltage

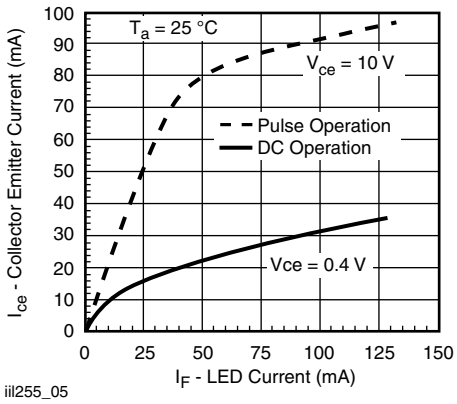


Fig. 5 - Non-Saturated and Saturated Collector Emitter Current vs. LED Current

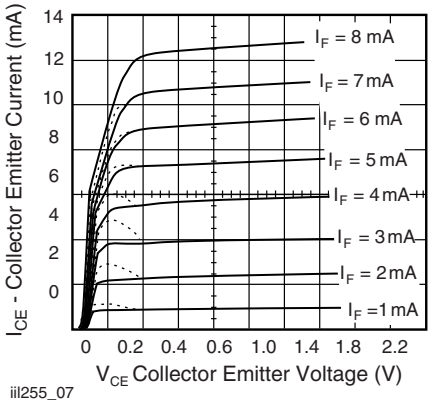


Fig. 7 - Collector Emitter Current vs. LED Collector Emitter Voltage

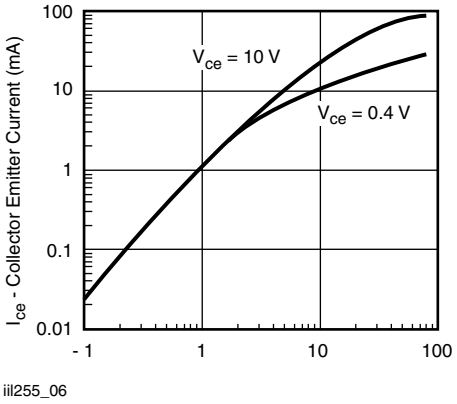
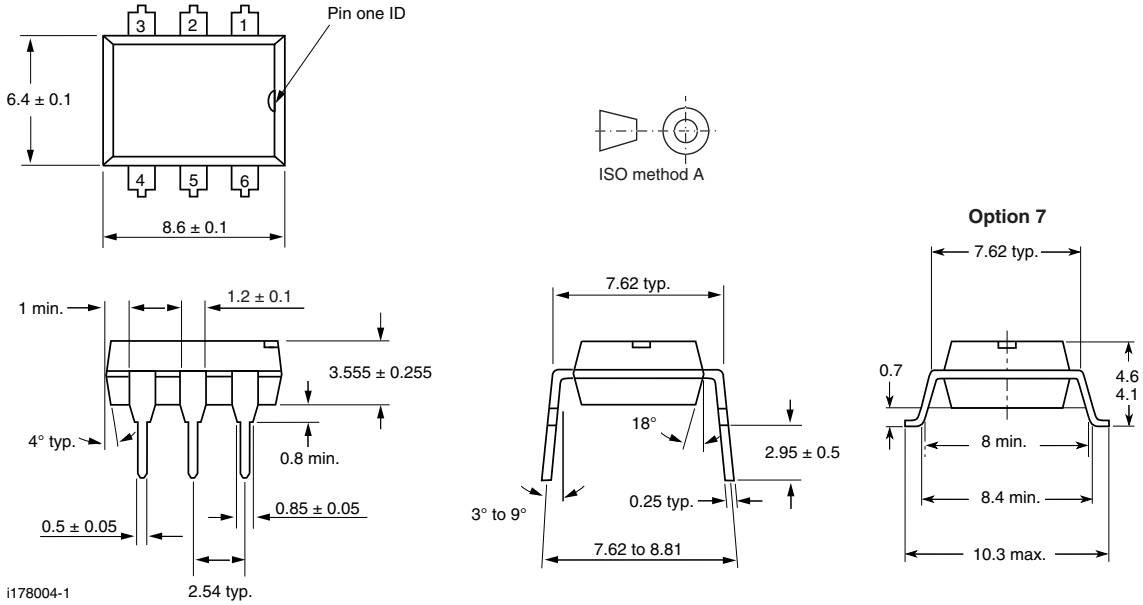


Fig. 6 - Non-Saturated and Saturated Collector Emitter Current vs. LED Current

PACKAGE DIMENSIONS in millimeters



PACKAGE MARKING

Notes

- Only option 7 reflected in the package marking
- Tape and reel suffix (T) is not part of the package marking

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