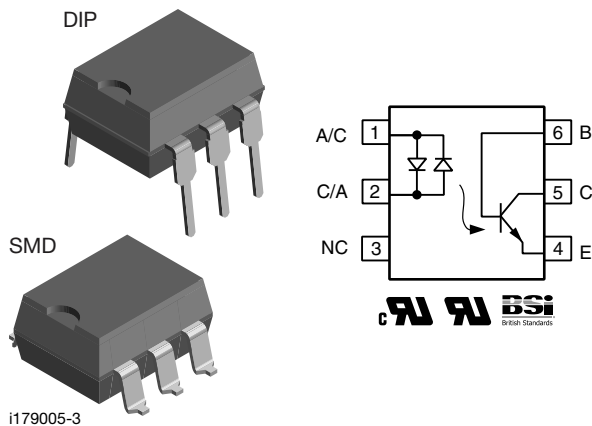




## Optocoupler, Phototransistor Output, AC Input, With Base Connection



### 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](http://www.vishay.com/doc?99912)



**RoHS**  
COMPLIANT

### APPLICATIONS

- Telecommunications
- Ring detection
- Loop current detector

### AGENCY APPROVALS

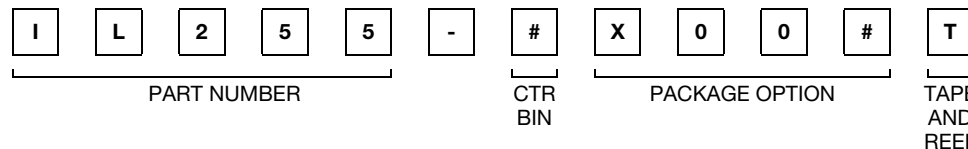
- UL1577, file no. E52744, double protection
- cUL tested to CSA 22.2 bulletin 5A
- BSI EN 60950, BSI EN 60065

### 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



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

### ABSOLUTE MAXIMUM RATINGS (T<sub>amb</sub> = 25 °C, unless otherwise specified)

PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
<b>INPUT</b>				
Peak pulsed current	1 μs, 300 pps	I <sub>FP</sub>	3	A
Forward continuous current		I <sub>F</sub>	130	mA
Power dissipation		P <sub>diss</sub>	175	mW
Derate linearly from 25 °C			2.3	mW/°C
<b>OUTPUT</b>				
Collector emitter breakdown voltage		BV <sub>CEO</sub>	30	V
Emitter base breakdown voltage		BV <sub>EBO</sub>	5	V
Collector base breakdown voltage		BV <sub>CBO</sub>	70	V
Power dissipation		P <sub>diss</sub>	200	mW
Derate linearly from 25 °C			2.6	mW/°C



ABSOLUTE MAXIMUM RATINGS ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)				
PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
<b>COUPLER</b>				
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 $\geq 260\text{ }^{\circ}\text{C}$ (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 ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)							
PARAMETER	TEST CONDITION	PART	SYMBOL	MIN.	TYP.	MAX.	UNIT
<b>INPUT</b>							
Forward voltage	$I_F = \pm 100\text{ mA}$		$V_F$		1.4	1.7	V
<b>OUTPUT</b>							
Collector emitter breakdown voltage	$I_C = 10\text{ mA}$		$BV_{CEO}$	30	50	-	V
Emitter collector breakdown voltage	$I_E = 10\text{ }\mu\text{A}$		$BV_{ECO}$	7	10	-	V
Collector base breakdown voltage	$I_C = 100\text{ }\mu\text{A}$		$BV_{CBO}$	70	-	-	V
Emitter base breakdown voltage	$I_E = 100\text{ }\mu\text{A}$		$BV_{EBO}$	70	-	-	V
Collector emitter leakage current	$V_{CE} = 10\text{ V}$		$I_{CEO}$	-	5	50	nA
<b>COUPLER</b>							
Collector emitter saturation voltage	$I_F = \pm 10\text{ mA}, I_C = 0.5\text{ mA}$	IL255	$V_{CEsat}$	-	-	0.4	V
	$I_F = \pm 16\text{ mA}, I_C = 2\text{ mA}$	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 ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)							
PARAMETER	TEST CONDITION	PART	SYMBOL	MIN.	TYP.	MAX.	UNIT
Current transfer ratio	$I_F = \pm 10\text{ mA}, V_{CE} = 10\text{ V}$	IL255	CTR	20	-	-	%
	$I_F = \pm 10\text{ mA}, V_{CE} = 10\text{ V}$	IL255-2	CTR	50	-	-	%
Current transfer ratio symmetry	$I_F = \pm 10\text{ mA}, V_{CE} = 10\text{ V}$	IL255		0.33	-	3	
	$I_F = \pm 10\text{ mA}, V_{CE} = 10\text{ V}$	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 <sub>ISO</sub>	4420	V <sub>RMS</sub>
Maximum transient isolation voltage		V <sub>IOTM</sub>	10 000	V <sub>peak</sub>
Maximum repetitive peak isolation voltage		V <sub>IORM</sub>	890	V <sub>peak</sub>
Isolation resistance	V <sub>IO</sub> = 500 V, T <sub>amb</sub> = 25 °C	R <sub>IO</sub>	≥ 10 <sup>12</sup>	Ω
	V <sub>IO</sub> = 500 V, T <sub>amb</sub> = 100 °C	R <sub>IO</sub>	≥ 10 <sup>11</sup>	Ω
Output safety power		P <sub>SO</sub>	400	mW
Input safety current		I <sub>SI</sub>	275	mA
Safety temperature		T <sub>S</sub>	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<sub>amb</sub> = 25 °C, unless otherwise specified)

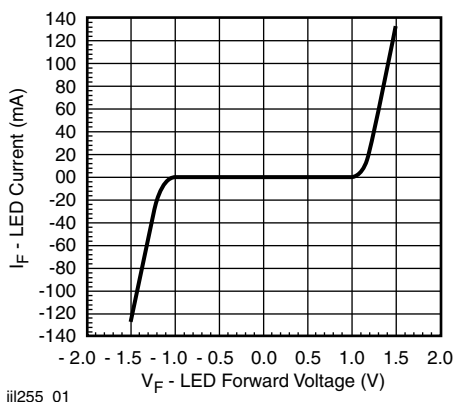


Fig. 1 - LED Forward Current vs. Forward Voltage

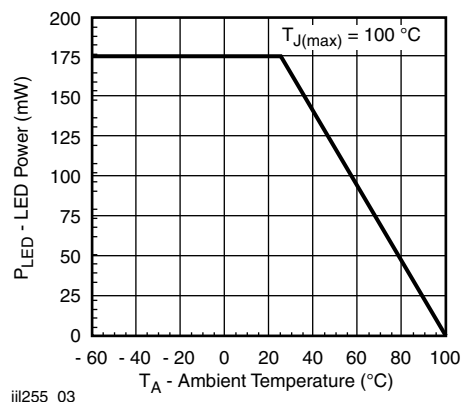


Fig. 3 - Maximum LED Power Dissipation

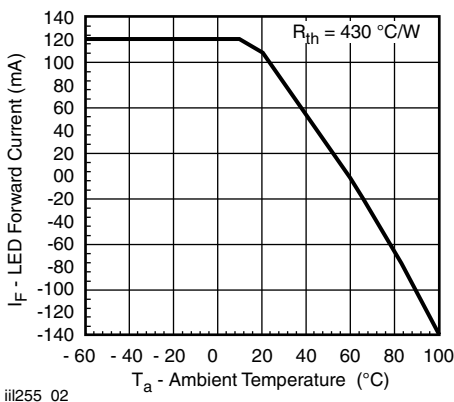


Fig. 2 - Maximum LED Current vs. Ambient Temperature

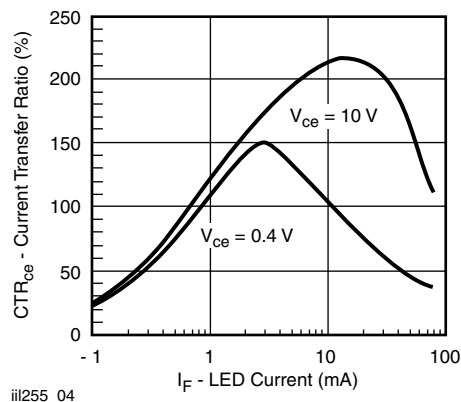
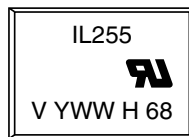


Fig. 4 - Current Transfer Ratio vs. LED Current and Collector-Emitter Voltage





**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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