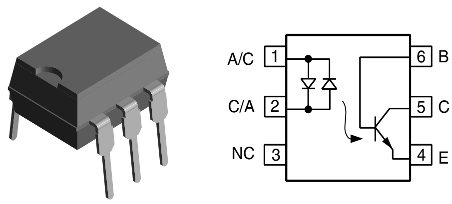
Optocoupler, Phototransistor Output, AC Input, With Base Connection

Features

- AC or Polarity Insensitive Inputs
- Continuous Forward Current, 130 mA
- Built-in Reverse Polarity Input Protection
- Improved CTR Symmetry
- Industry Standard DIP Package
- Lead-free component
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC



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Agency Approvals

- UL1577, File No. E52744 System Code H or J, Double Protection
- DIN EN 60747-5-2 (VDE0884)
  DIN EN 60747-5-5 pending
  Available with Option 1
- BSI IEC60950 IEC60065

Applications

Telecommunications
Ring Detection
Loop Current Detector

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.

Order Information

Part	Remarks
IL255	CTR > 20 %, DIP-6
IL255-1	CTR 20 - 80 %, DIP-6
IL255-2	CTR > 50 %, DIP-6
IL255-X007	CTR > 20 %, SMD-6 (option 7)
IL255-X009	CTR > 20 %, SMD-6 (option 9)

For additional information on the available options refer to Option Information.

Absolute Maximum Ratings

T_{amb} = 25 °C, unless otherwise specified
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 Rating for extended periods of the time can adversely affect reliability.

Input

Parameter	Test condition	Symbol	Value	Unit
Peak pulsed current	1.0 µs, 300 pps	I_{FP}	3.0	A
Forward continuous current		I_F	130	mA
Power dissipation		P_{diss}	175	mW
Derate linearly from 25 °C			2.3	mW/°C

Output

Parameter	Test condition	Symbol	Value	Unit
Collector-emitter breakdown voltage		BV_{CEO}	30	V
Emitter-base breakdown voltage		BV_{EBO}	5.0	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

Parameter	Test condition	Symbol	Value	Unit
Isolation test voltage (between emitter and detector, refer to standard climate 23 °C/50 %RH, DIN 50014)		V_{ISO}	5300	V_{RMS}
Creepage			≥ 7.0	mm
Clearance			≥ 7.0	mm
Isolation resistance	V_{IO} = 500 V, T_{amb} = 25 °C	R_{IO}	≥ 10^{12}	Ω
	V_{IO} = 500 V, T_{amb} = 100 °C	R_{IO}	≥ 10^{11}	Ω
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			10	sec.

Electrical Characteristics

T_{amb} = 25 °C, unless otherwise specified
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.

Input

Parameter	Test condition	Symbol	Min	Typ.	Max	Unit
Forward voltage	I_F = ± 100 mA	V_F		1.4	1.7	V

Output

Parameter	Test condition	Symbol	Min	Typ.	Max	Unit
Collector-emitter breakdown voltage	I_C = 10 mA	BV_{CEO}	30	50		V
Emitter-collector breakdown voltage	I_E = 10 μA	BV_{ECO}	7.0	10		V
Collector-base breakdown voltage	I_C = 100 μA	BV_{CBO}	70			V
Emitter-base breakdown voltage	I_E = 100 μA	BV_{EBO}	7.0			V
Collector-emitter leakage current	V_{CE} = 10 V	I_{CEO}		5.0	50	nA

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Coupler

Parameter	Test condition	Part	Symbol	Min	Typ.	Max	Unit
Collector-emitter saturation voltage	I_F = ± 10 mA, I_C = 0.5 mA	IL255	$V_{CE(sat)}$			0.4	V
	I_F = ± 100 mA, I_C = 1.0 mA	IL255-1	$V_{CE(sat)}$		0.1	0.2	V
	I_F = ± 16 mA, I_C = 2.0 mA	IL255-2	$V_{CE(sat)}$			0.4	V

Current Transfer Ratio

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 = ± 100 mA, V_{CE} = 2.0 V	IL255-1	CTR	20		80	%
	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		3.0	
		IL255-1					
	I_F = ± 10 mA, V_{CE} = 10 V	IL255-2		0.5	1.0	2.0	

Typical Characteristics (Tamb = 25 °C unless otherwise specified)

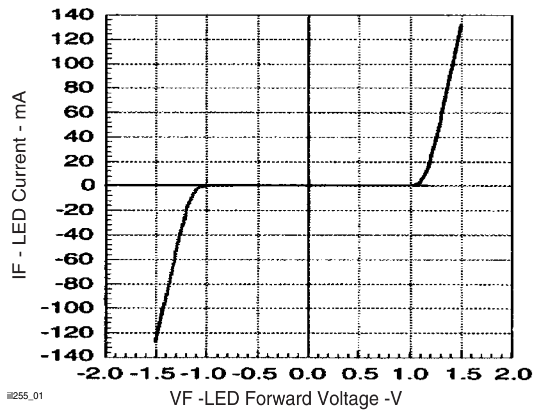


Figure 1. LED Forward Current vs.Forward Voltage

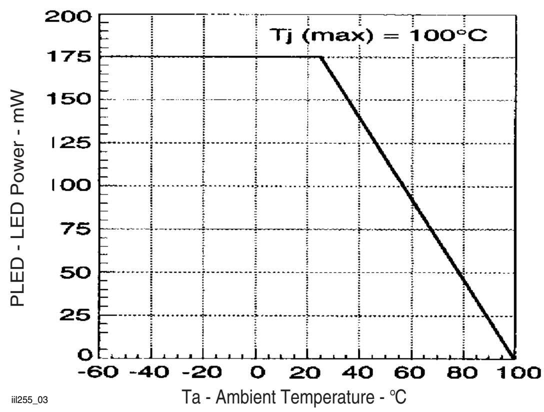


Figure 3. Maximum LED Power Dissipation

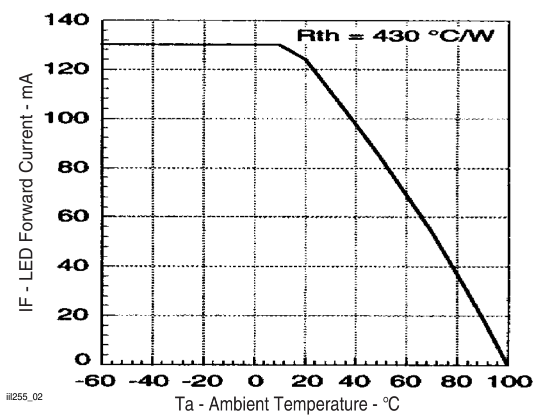


Figure 2. Maximum LED Current vs. Ambient Temperature

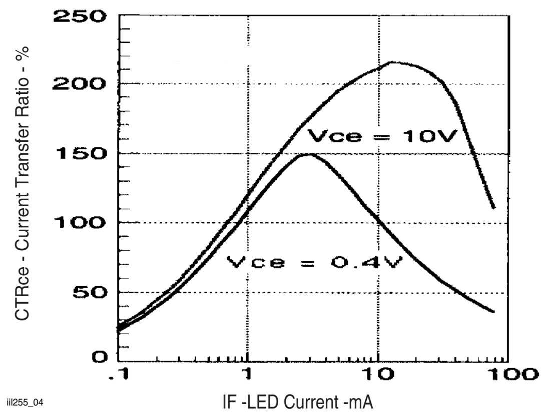


Figure 4. Current Transfer Ratio vs. LED Current and Collector-Emitter Voltage

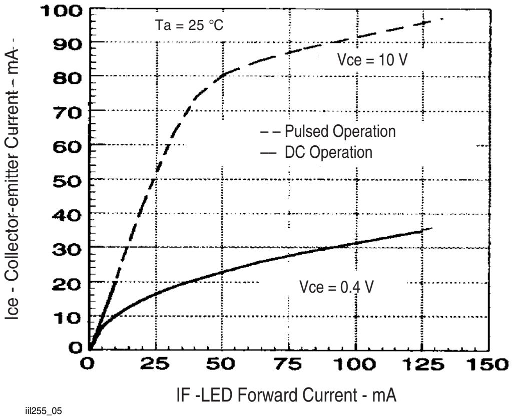


Figure 5. Non-Saturated and Saturated Collector Emitter Current vs. LED Current

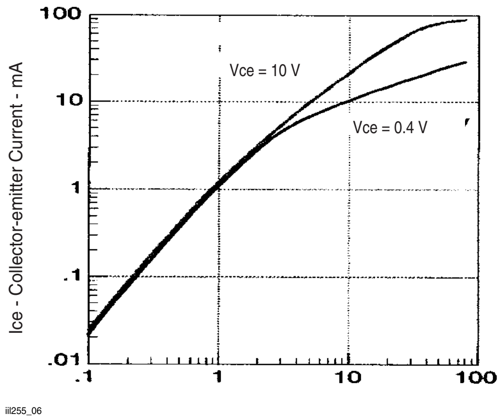


Figure 6. Non-Saturated and Saturated Collector Emitter Current vs. LED Current

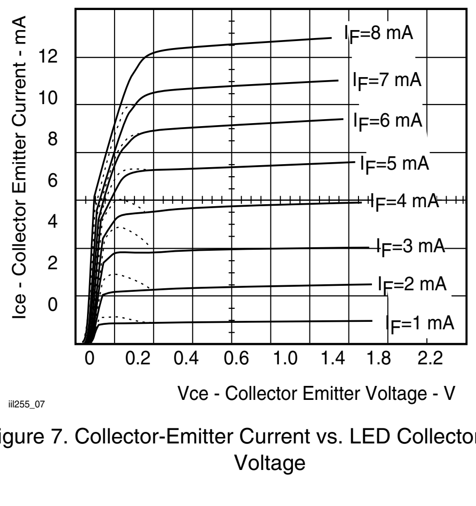
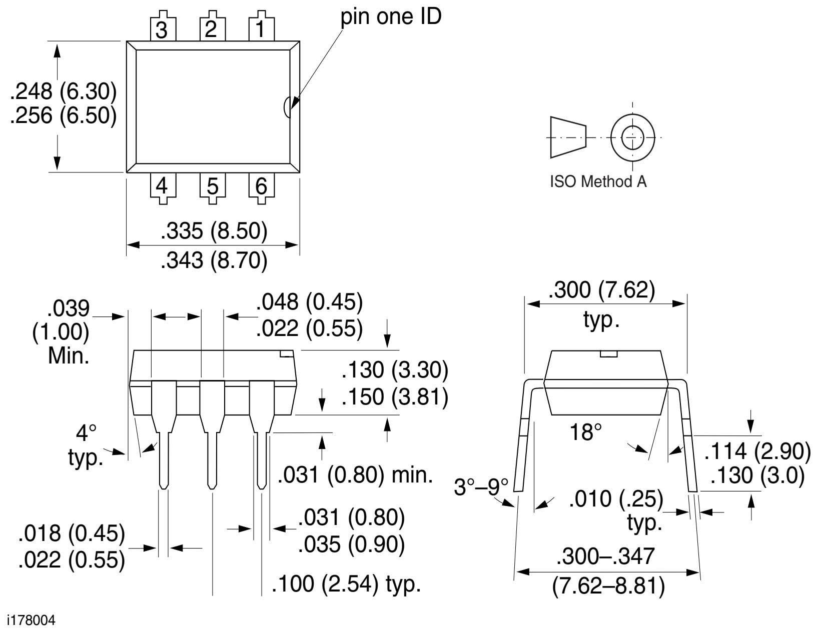
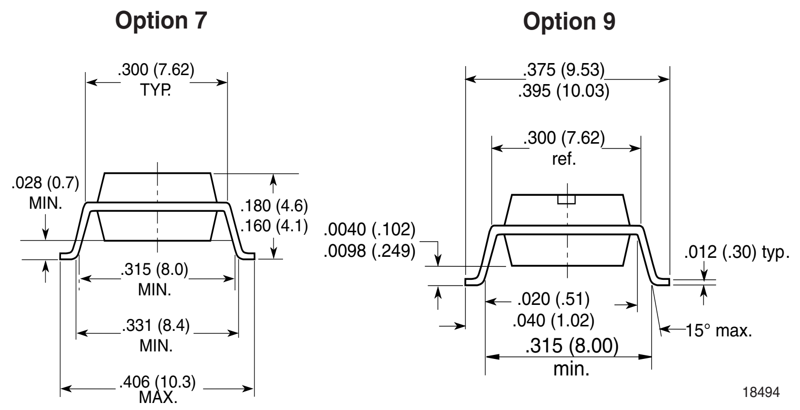


Figure 7. Collector-Emitter Current vs. LED Collector-Emitter Voltage

Package Dimensions in Inches (mm)





Ozone Depleting Substances Policy Statement

It is the policy of Vishay Semiconductor GmbH to

1. Meet all present and future national and international statutory requirements.
2. Regularly and continuously improve the performance of our products, processes, distribution and operatingsystems with respect to their impact on the health and safety of our employees and the public, as well as their impact on the environment.

It is particular concern to control or eliminate releases of those substances into the atmosphere which are known as ozone depleting substances (ODSs).

The Montreal Protocol (1987) and its London Amendments (1990) intend to severely restrict the use of ODSs and forbid their use within the next ten years. Various national and international initiatives are pressing for an earlier ban on these substances.

Vishay Semiconductor GmbH has been able to use its policy of continuous improvements to eliminate the use of ODSs listed in the following documents.

1. Annex A, B and list of transitional substances of the Montreal Protocol and the London Amendments respectively
2. Class I and II ozone depleting substances in the Clean Air Act Amendments of 1990 by the Environmental Protection Agency (EPA) in the USA
3. Council Decision 88/540/EEC and 91/690/EEC Annex A, B and C (transitional substances) respectively.

Vishay Semiconductor GmbH can certify that our semiconductors are not manufactured with ozone depleting substances and do not contain such substances.

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