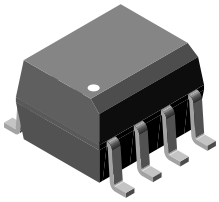
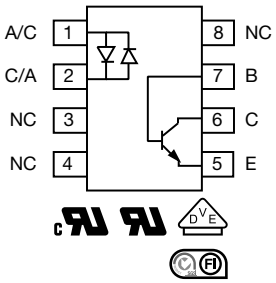
# Optocoupler, Phototransistor Output, AC Input, With Base Connection






## FEATURES

- Guaranteed CTR symmetry, 2:1 maximum
- Bidirectional AC input industry standard SOIC-8 surface mountable package
- Isolation test voltage, 4000 $V_{RMS}$
- Standard lead
- spacing, 0.05"
- Available only on tape and reel (conform to EIA standard RS481A)
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

Pb-free

e3

RoHS COMPLIANT

## LINKS TO ADDITIONAL RESOURCES

Related Documents | Design Tools | 3D Models | Footprints | Schematics

## DESCRIPTION

The IL256AT is an AC input phototransistor optocoupler. The device consists of two infrared emitters connected in reverse parallel and coupled to a silicon NPN phototransistor detector.

These circuit elements are constructed with a standard SOIC-8 foot print.

The product is well suited for telecom applications such as ring detection or off / on hook status, given its bidirectional LED input and guaranteed current transfer ratio (CTR) minimum of 20 % at $I_F$ = 10 mA.

## APPLICATIONS

- Telecom applications ring detection

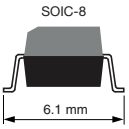
## AGENCY APPROVALS

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

## ORDERING INFORMATION

| I | L | 2 | 5 | 6 | A | T |
|---|---|---|---|---|---|---|

PART NUMBER




| AGENCY CERTIFIED / PACKAGE | CTR (%) |
|---|---|
| **UL, cUL, VDE** | **≥ 20** |
| SOIC-8, tape and reel | IL256AT |

**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** | **CONDITION** | **SYMBOL** | **VALUE** | **UNIT** |
| **INPUT** | | | | |
| Forward continuous current | | $I_F$ | 60 | mA |
| Power dissipation | | $P_{diss}$ | 90 | mW |
| Derate linearly from 25 °C | | | 0.8 | mW/°C |
| **OUTPUT** | | | | |
| Collector-emitter breakdown voltage | | $BV_{CEO}$ | 30 | V |
| Emitter-collector breakdown voltage | | $BV_{ECO}$ | 5 | V |
| Collector-base breakdown voltage | | $BV_{CBO}$ | 70 | V |
| Power dissipation | | $P_{diss}$ | 150 | mW |
| Derate linearly from 25 °C | | | 2.0 | mW/°C |
| **COUPLER** | | | | |
| Isolation voltage, input to output | | $V_{ISO}$ | 4000 | $V_{RMS}$ |
| Total package dissipation (LED and detector) | | $P_{tot}$ | 240 | mW |
| Derate linearly from 25 °C | | | 3.2 | mW/°C |
| Storage temperature | | $T_{stg}$ | -55 to +150 | °C |
| Operating temperature | | $T_{amb}$ | -55 to +100 | °C |
| Soldering time at 260 °C | | | 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

| **ELECTRICAL CHARACTERISTICS** ($T_{amb}$ = 25 °C, unless otherwise specified) | | | | | | |
|---|---|---|---|---|---|---|
| **PARAMETER** | **TEST CONDITION** | **SYMBOL** | **MIN.** | **TYP.** | **MAX.** | **UNIT** |
| **INPUT** | | | | | | |
| Forward voltage | $I_F$ = 50 mA | $V_F$ | - | 1.2 | 1.5 | V |
| **OUTPUT** | | | | | | |
| Collector emitter breakdown voltage | $I_C$ = 1.0 mA | $BV_{CEO}$ | 30 | 50 | - | V |
| Emitter collector breakdown voltage | $I_E$ = 100 µA | $BV_{ECO}$ | 5 | 10 | - | V |
| Collector base breakdown voltage | $I_C$ = 100 µA | $BV_{CBO}$ | 70 | 90 | - | V |
| Collector emitter leakage current | $V_{CE}$ = 10 V | $I_{CEO}$ | - | 5 | 50 | nA |
| **COUPLER** | | | | | | |
| Saturation voltage, collector emitter | $I_F$ = 16 mA, $I_C$ = 2 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** | **SYMBOL** | **MIN.** | **TYP.** | **MAX.** | **UNIT** |
| $I_C/I_F$ | $I_F$ = 10 mA, $V_{CE}$ = 5 V | CTR | 20 | - | - | % |
| Symmetry (CTR at +10 mA)/(CTR at -10 mA) | | | 0.5 | 1 | 2 | |


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| SAFETY AND INSULATION RATINGS | | | | | | |
|---|---|---|---|---|---|---|
| **PARAMETER** | **TEST CONDITION** | **SYMBOL** | **MIN.** | **TYP.** | **MAX.** | **UNIT** |
| Climatic classification | According to IEC 68 part 1 | | - | 55 / 100 / 21 | - | |
| Comparative tracking index | | CTI | 175 | - | 399 | |
| $V_{IOTM}$ | | | 6000 | - | - | V |
| $V_{IORM}$ | | | 560 | - | - | V |
| $P_{SO}$ | | | - | - | 350 | mW |
| $I_{SI}$ | | | - | - | 150 | mA |
| $T_{SI}$ | | | - | - | 165 | °C |
| Creepage distance | | | 4 | - | - | mm |
| Clearance distance | | | 4 | - | - | mm |
| Insulation thickness | | | 0.2 | - | - | 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)

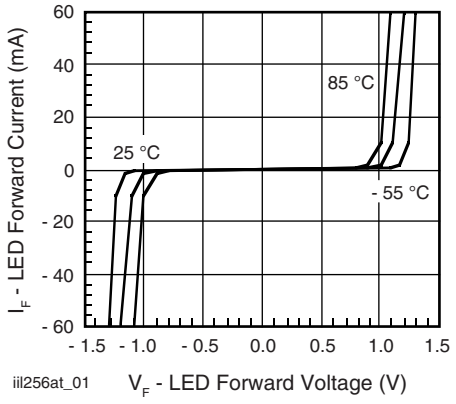



Fig. 1 - LED Forward Current vs.Forward Voltage

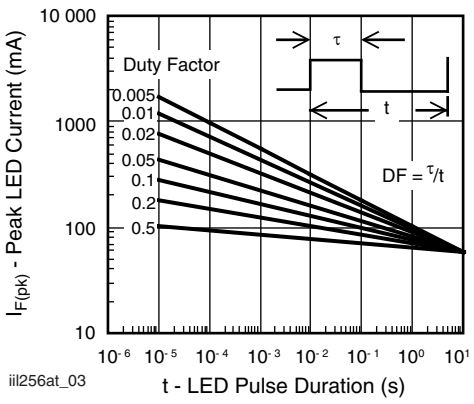



Fig. 3 - Peak LED Current vs. Duty Factor, Tau

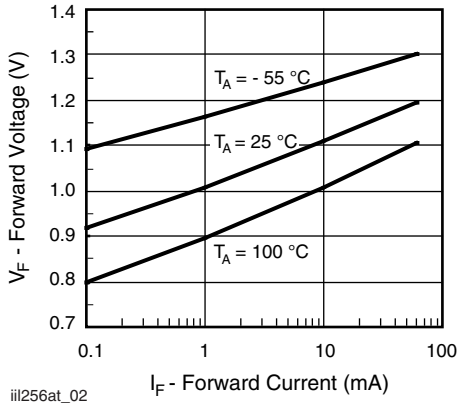



Fig. 2 - Forward Voltage vs. Forward Current

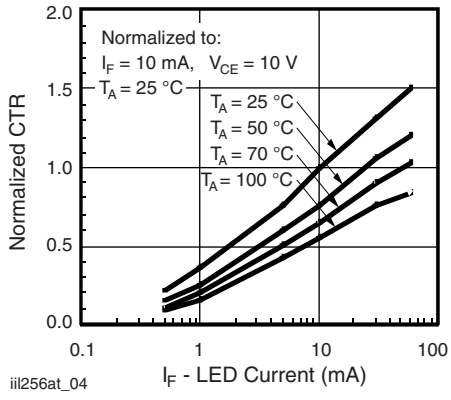



Fig. 4 - Normalized CTR vs. $I_F$ and $T_{amb}$


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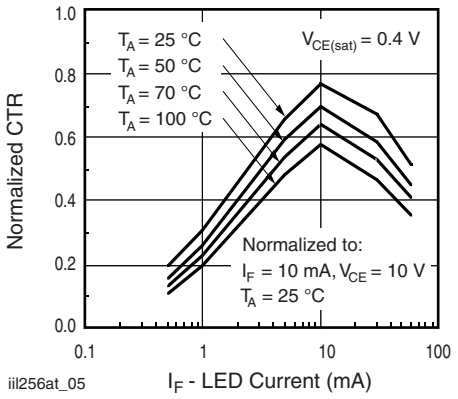



Fig. 5 - Normalized Saturated CTR

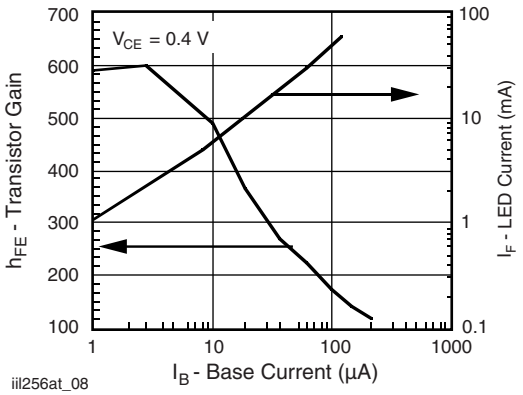



Fig. 8 - Base Current vs. $I_F$ and $h_{FE}$

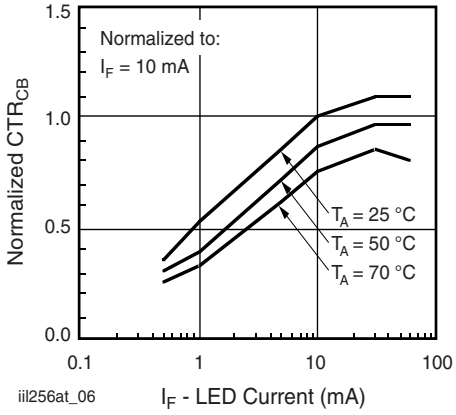



Fig. 6 - Normalized $CTR_{cb}$

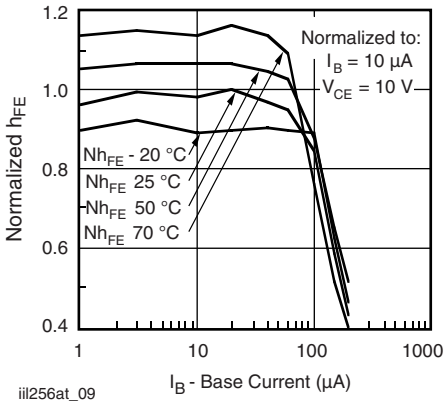



Fig. 9 - Normalized $h_{FE}$ vs. Base Current and Temp.

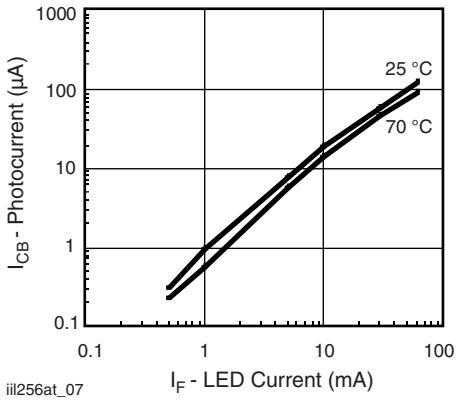



Fig. 7 - Photocurrent vs. LED Current

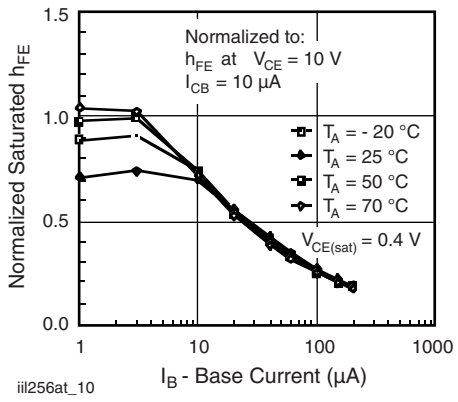



Fig. 10 - Normalized Saturated $h_{FE}$ vs. Base Current


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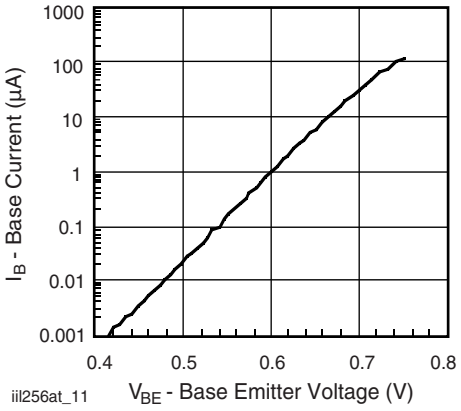



Fig. 11 - Base Emitter Voltage vs. Base Current

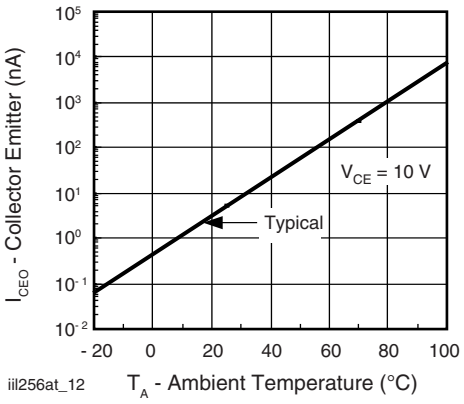
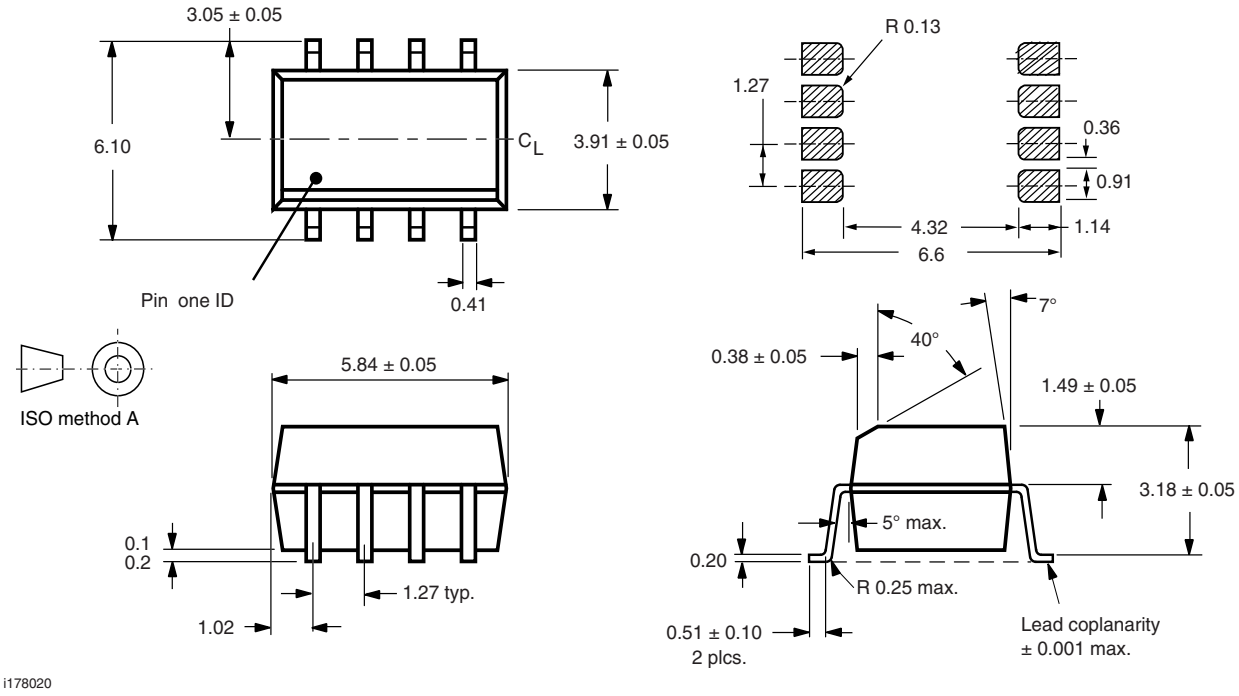
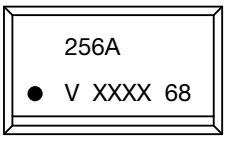



Fig. 12 - Collector-Emitter Leakage Current vs.Temp.

## **PACKAGE DIMENSIONS** in millimeters




## **PACKAGE MARKING** (example)




**Notes**

- XXXX = LMC (lot marking code)
- Tape and reel suffix (T) is not part of the package marking


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