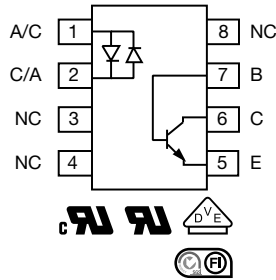
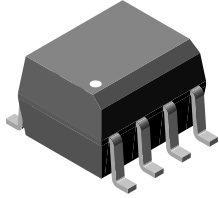




## Optocoupler, Phototransistor Output, AC Input, With Base Connection



### FEATURES

- Guaranteed CTR symmetry, 2:1 maximum
- Bidirectional AC input industry standard SOIC-8 surface mountable package
- Isolation test voltage, 4000 V<sub>RMS</sub>
- 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](http://www.vishay.com/doc?99912)



**RoHS**  
COMPLIANT

### LINKS TO ADDITIONAL RESOURCES



### 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<sub>F</sub> = 10 mA.

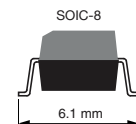
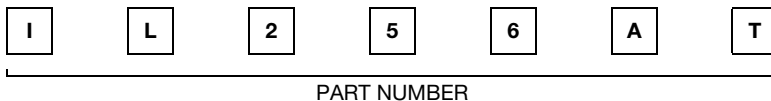
### APPLICATIONS

- Telecom applications ring detection

### AGENCY APPROVALS

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

### ORDERING INFORMATION



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

#### Note

- Additional options may be possible, please contact sales office



<b>ABSOLUTE MAXIMUM RATINGS</b> ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)				
PARAMETER	CONDITION	SYMBOL	VALUE	UNIT
<b>INPUT</b>				
Forward continuous current		$I_F$	60	mA
Power dissipation		$P_{diss}$	90	mW
Derate linearly from 25 °C			0.8	mW/°C
<b>OUTPUT</b>				
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
<b>COUPLER</b>				
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

<b>ELECTRICAL CHARACTERISTICS</b> ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)						
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
<b>INPUT</b>						
Forward voltage	$I_F = 50\text{ mA}$	$V_F$	-	1.2	1.5	V
<b>OUTPUT</b>						
Collector emitter breakdown voltage	$I_C = 1.0\text{ mA}$	$BV_{CEO}$	30	50	-	V
Emitter collector breakdown voltage	$I_E = 100\text{ }\mu\text{A}$	$BV_{ECO}$	5	10	-	V
Collector base breakdown voltage	$I_C = 100\text{ }\mu\text{A}$	$BV_{CBO}$	70	90	-	V
Collector emitter leakage current	$V_{CE} = 10\text{ V}$	$I_{CEO}$	-	5	50	nA
<b>COUPLER</b>						
Saturation voltage, collector emitter	$I_F = 16\text{ mA}, I_C = 2\text{ mA}$	$V_{CEsat}$	-	-	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.

<b>CURRENT TRANSFER RATIO</b> ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)						
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
$I_C/I_F$	$I_F = 10\text{ mA}, V_{CE} = 5\text{ V}$	CTR	20	-	-	%
Symmetry (CTR at +10 mA)/(CTR at -10 mA)			0.5	1	2	



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 <sub>IOTM</sub>			6000	-	-	V
V <sub>IORM</sub>			560	-	-	V
P <sub>SO</sub>			-	-	350	mW
I <sub>SI</sub>			-	-	150	mA
T <sub>SI</sub>			-	-	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<sub>amb</sub> = 25 °C, unless otherwise specified)

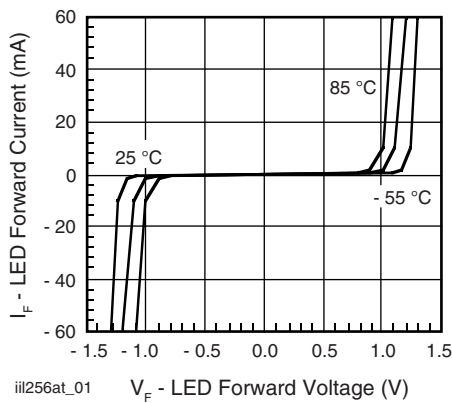


Fig. 1 - LED Forward Current vs. Forward Voltage

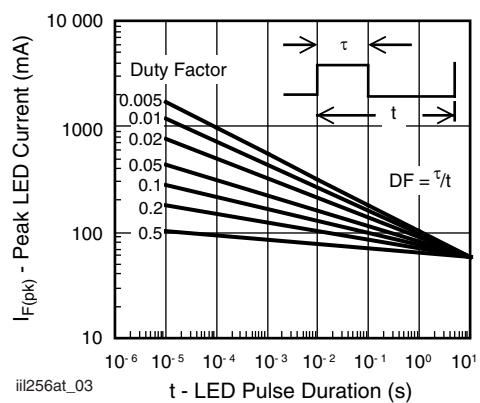


Fig. 3 - Peak LED Current vs. Duty Factor, Tau

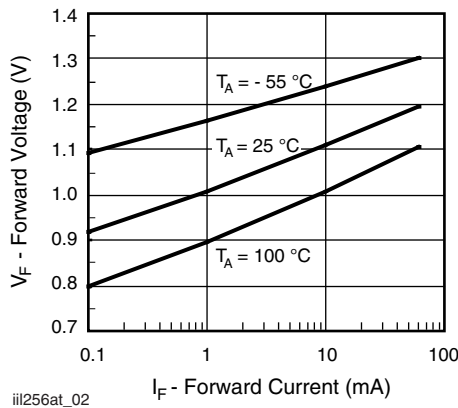


Fig. 2 - Forward Voltage vs. Forward Current

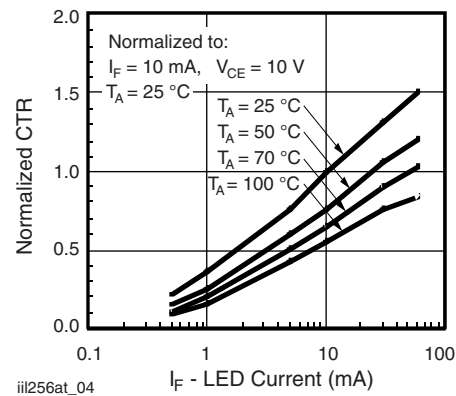


Fig. 4 - Normalized CTR vs. I<sub>F</sub> and T<sub>amb</sub>

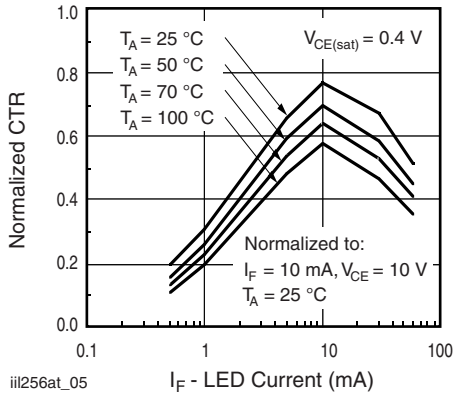


Fig. 5 - Normalized Saturated CTR

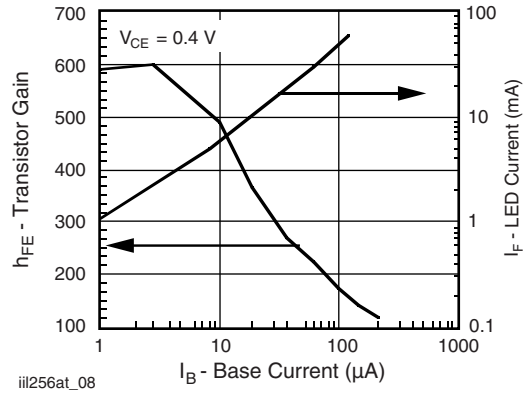


Fig. 8 - Base Current vs.  $I_F$  and  $h_{FE}$

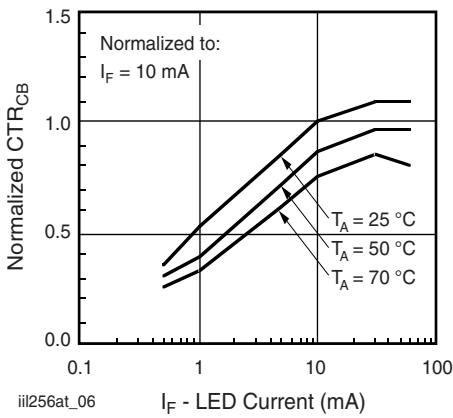


Fig. 6 - Normalized  $CTR_{CB}$

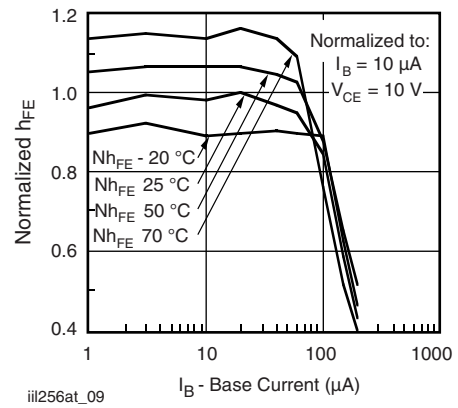


Fig. 9 - Normalized  $h_{FE}$  vs. Base Current and Temp.

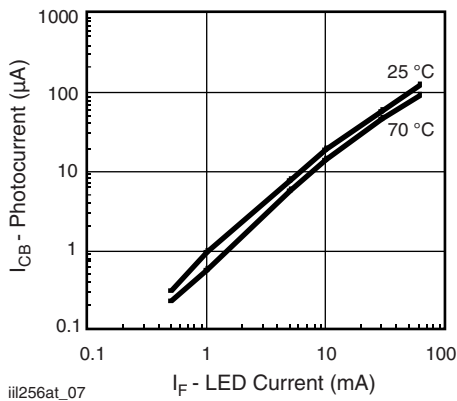


Fig. 7 - Photocurrent vs. LED Current

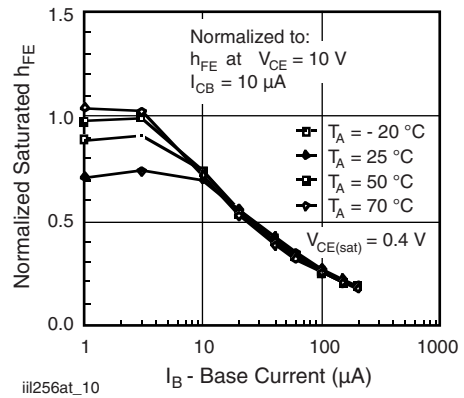


Fig. 10 - Normalized Saturated  $h_{FE}$  vs. Base Current

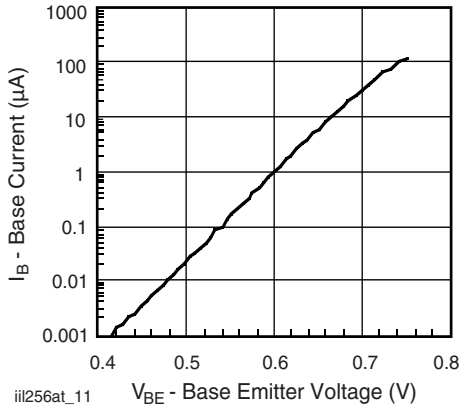


Fig. 11 - Base Emitter Voltage vs. Base Current

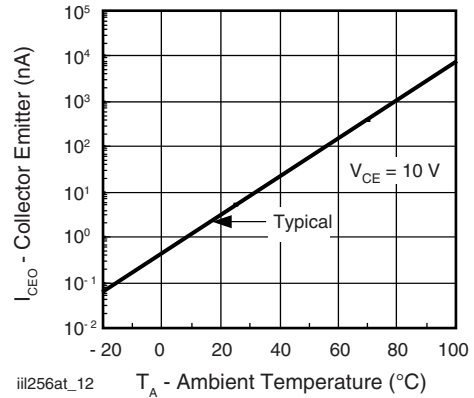
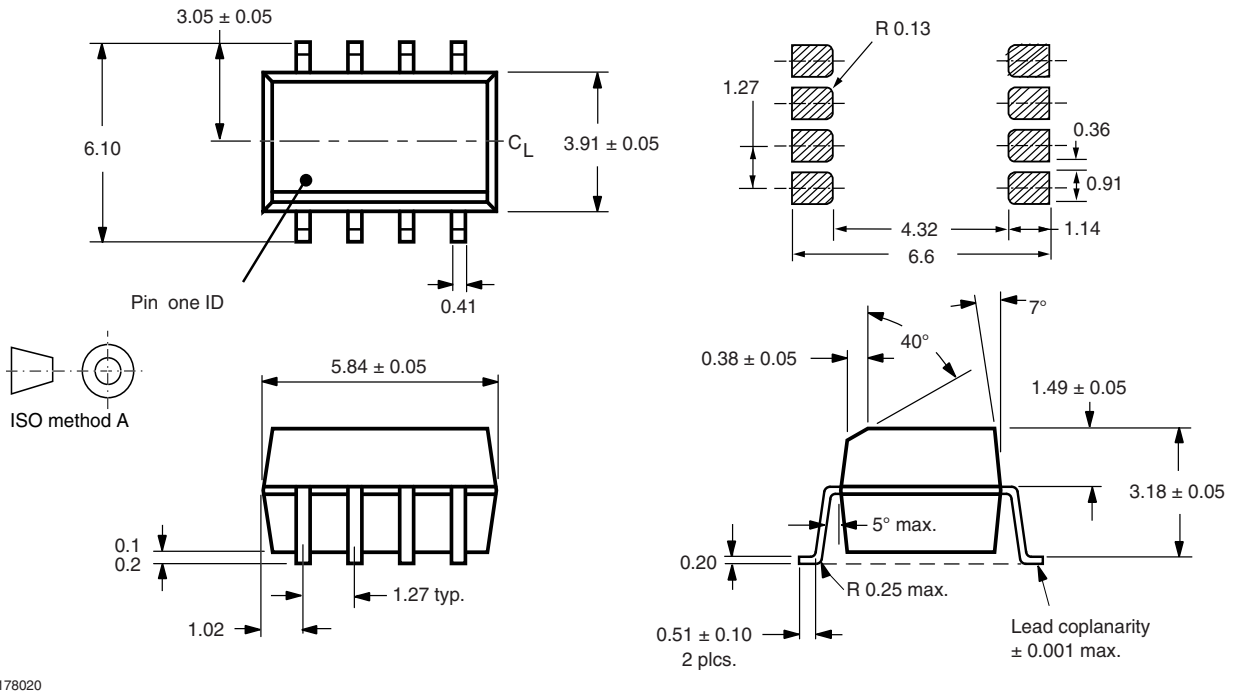


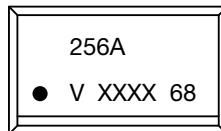
Fig. 12 - Collector-Emitter Leakage Current vs.Temp.

**PACKAGE DIMENSIONS** in millimeters



i178020

**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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