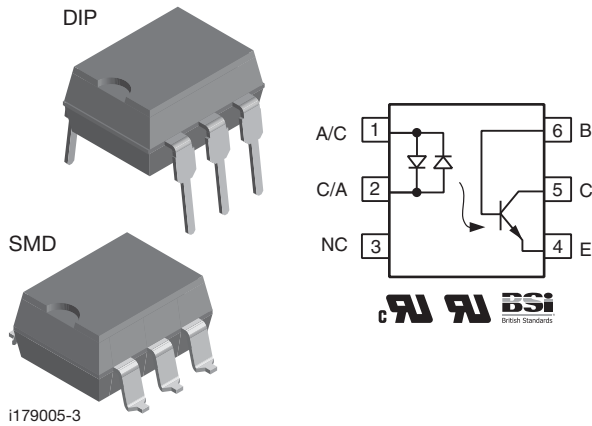


## Optocoupler, Phototransistor Output, AC Input, with Base Connection



### FEATURES

- AC or polarity insensitive inputs
- Continuous forward current, 130 mA
- Built-in reverse polarity input protection
- Improved CTR symmetry
- Industry standard DIP package
- Compliant to RoHS Directive 2002/95/EC and in accordance to WEEE 2002/96/EC


**RoHS**  
COMPLIANT

### APPLICATIONS

- Telecommunications
- Ring detection
- Loop current detector

### AGENCY APPROVALS

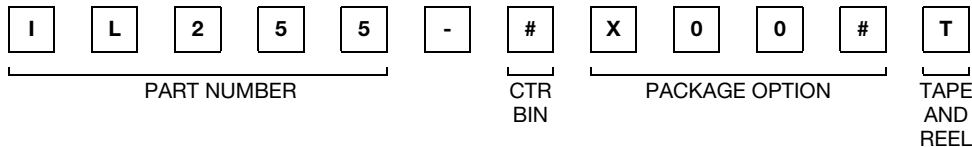
- UL1577, file no. E52744 system code H, double protection
- cUL tested to CSA 22.2 bulletin 5A
- BSI IEC 60950; IEC 60065

### 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 (%)	
<b>UL, cUL, BSI</b>	<b>≥ 20</b>	<b>≥ 50</b>
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

Vishay Semiconductors Optocoupler, Phototransistor Output,  
AC Input, with Base Connection

<b>ABSOLUTE MAXIMUM RATINGS</b> ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)				
PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
<b>COUPLER</b>				
Isolation test voltage between emitter and detector		$V_{ISO}$	5300	$V_{RMS}$
Creepage distance			$\geq 7$	mm
Clearance distance			$\geq 7$	mm
Isolation resistance	$V_{IO} = 500\text{ V}, T_{amb} = 25\text{ }^{\circ}\text{C}$	$R_{IO}$	$\geq 10^{12}$	$\Omega$
	$V_{IO} = 500\text{ V}, T_{amb} = 100\text{ }^{\circ}\text{C}$	$R_{IO}$	$\geq 10^{11}$	$\Omega$
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 $\geq 260\text{ }^{\circ}\text{C}$ <sup>(1)</sup>			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.
- <sup>(1)</sup> Refer to reflow profile for soldering conditions for surface mounted devices (SMD). Refer to wave profile for soldering conditions for through hole devices (DIP).

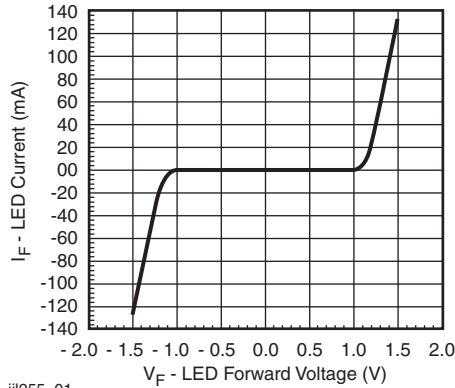
<b>ELECTRICAL CHARACTERISTICS</b> ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)							
PARAMETER	TEST CONDITION	PART	SYMBOL	MIN.	TYP.	MAX.	UNIT
<b>INPUT</b>							
Forward voltage	$I_F = \pm 100\text{ mA}$		$V_F$		1.4	1.7	V
<b>OUTPUT</b>							
Collector emitter breakdown voltage	$I_C = 10\text{ mA}$		$BV_{CEO}$	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.

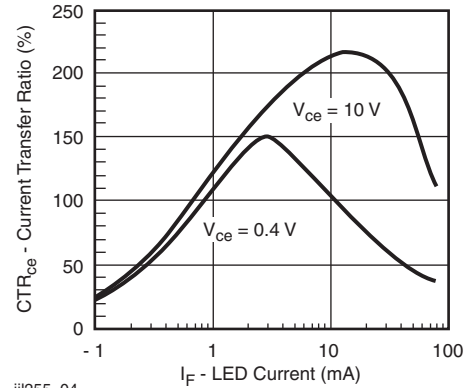
<b>CURRENT TRANSFER RATIO</b> ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)							
PARAMETER	TEST CONDITION	PART	SYMBOL	MIN.	TYP.	MAX.	UNIT
Current transfer ratio	$I_F = \pm 10\text{ mA}, V_{CE} = 10\text{ V}$	IL255	CTR	20			%
	$I_F = \pm 10\text{ mA}, V_{CE} = 10\text{ V}$	IL255-2	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	

# Optocoupler, Phototransistor Output, Vishay Semiconductors AC Input, with Base Connection

**TYPICAL CHARACTERISTICS** ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)


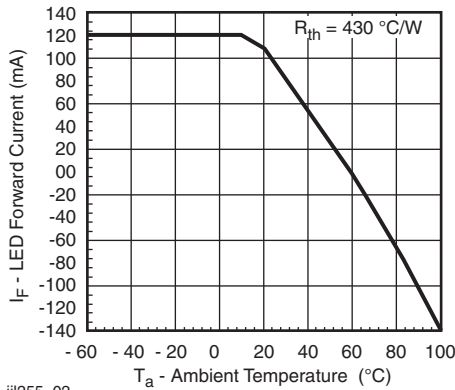
iil255\_01

Fig. 1 - LED Forward Current vs. Forward Voltage



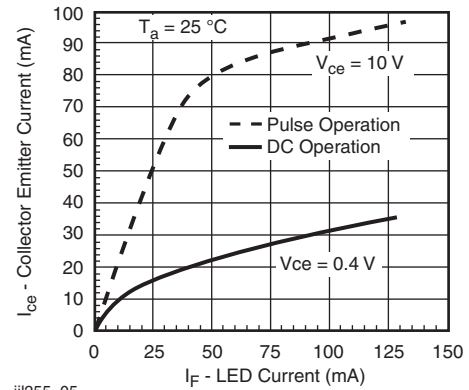
iil255\_04

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



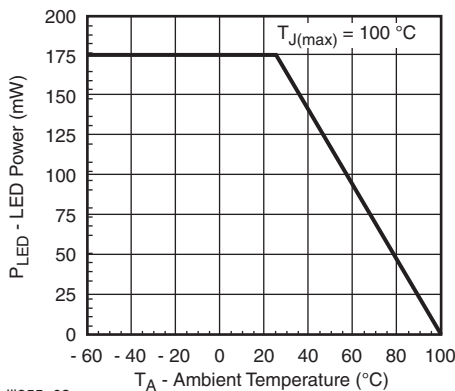
iil255\_02

Fig. 2 - Maximum LED Current vs. Ambient Temperature



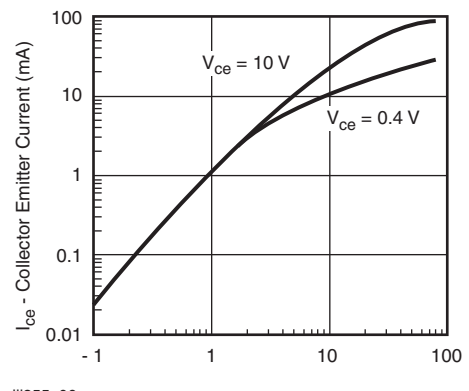
iil255\_05

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



iil255\_03

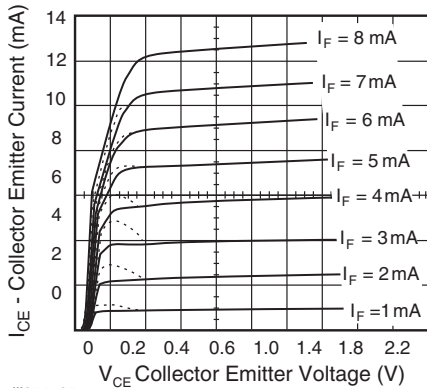
Fig. 3 - Maximum LED Power Dissipation



iil255\_06

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

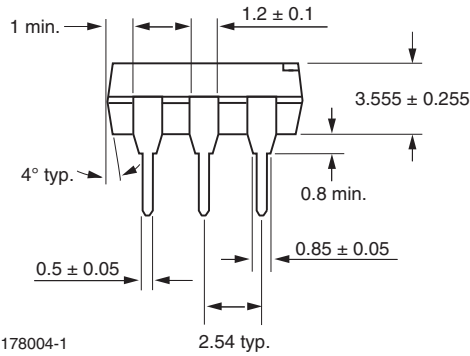
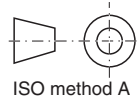
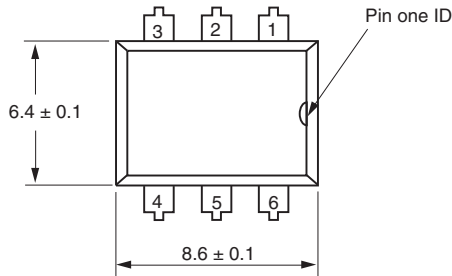
Vishay Semiconductors Optocoupler, Phototransistor Output, AC Input, with Base Connection



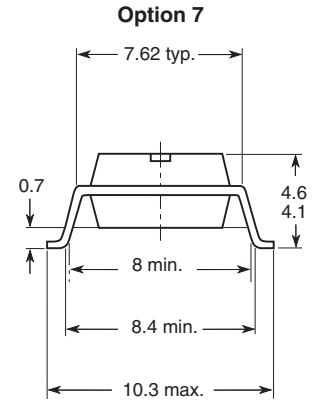
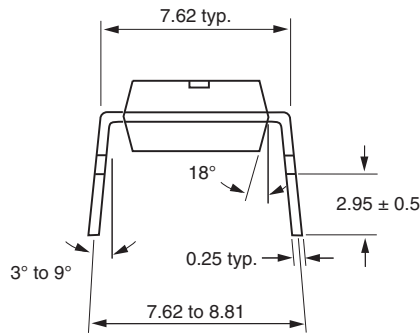
iii255\_07

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

**PACKAGE DIMENSIONS** in millimeters



i178004-1



**PACKAGE MARKING**



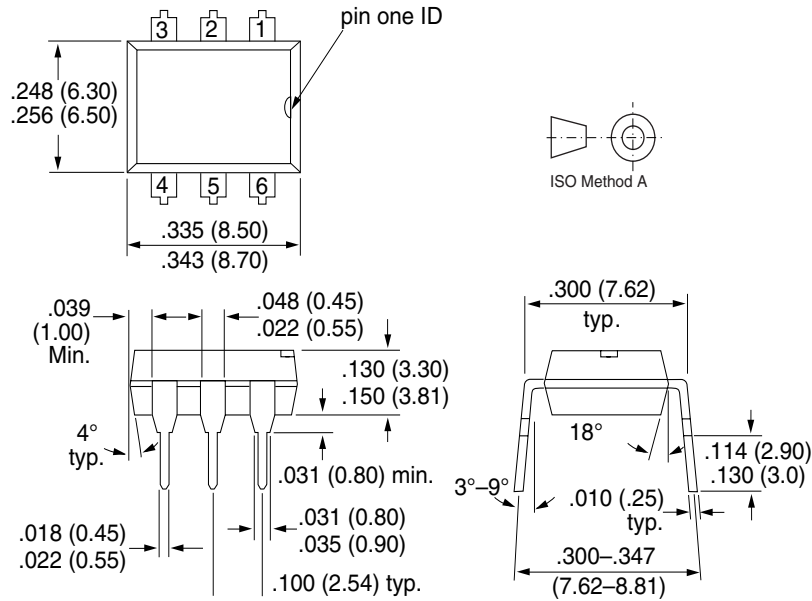
**Notes**

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



## DIP-6A

### Package Dimensions in Inches (mm)



i178004

### 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 operating systems 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.

**We reserve the right to make changes to improve technical design  
and may do so without further notice.**

Parameters can vary in different applications. All operating parameters must be validated for each customer application by the customer. Should the buyer use Vishay Semiconductors products for any unintended or unauthorized application, the buyer shall indemnify Vishay Semiconductors against all claims, costs, damages, and expenses, arising out of, directly or indirectly, any claim of personal damage, injury or death associated with such unintended or unauthorized use.

Vishay Semiconductor GmbH, P.O.B. 3535, D-74025 Heilbronn, Germany  
Telephone: 49 (0)7131 67 2831, Fax number: 49 (0)7131 67 2423

## Footprints

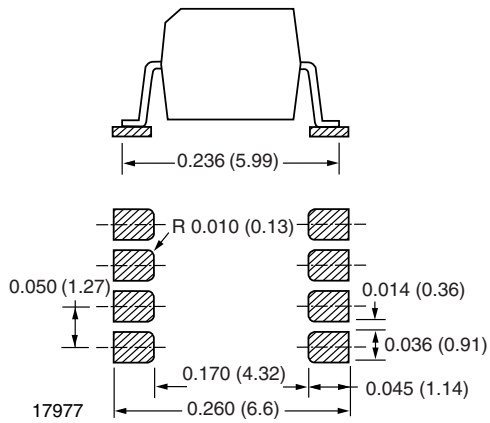
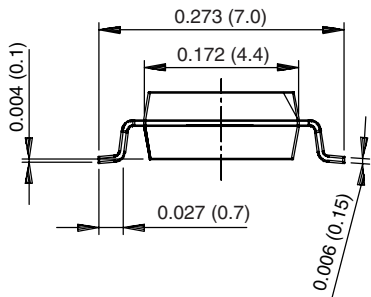
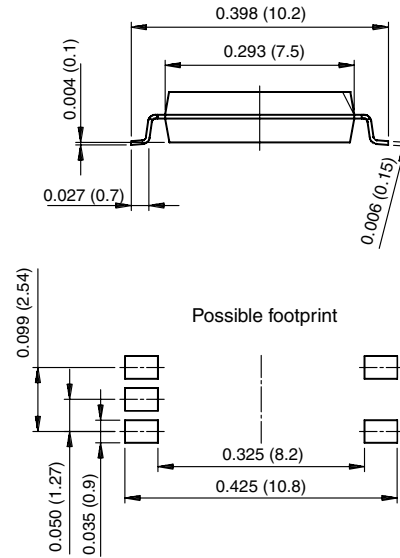


Fig. 1 - SO8A and DSO8A SMD



18403

Fig. 2 - SOP-4, Miniflat



18406

Fig. 3 - SOP-6, 5 Pin Wide Body

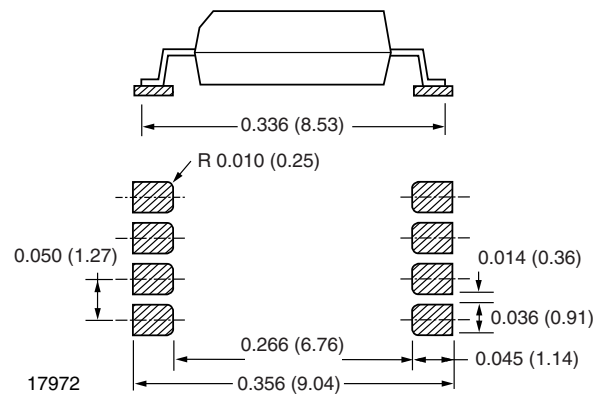
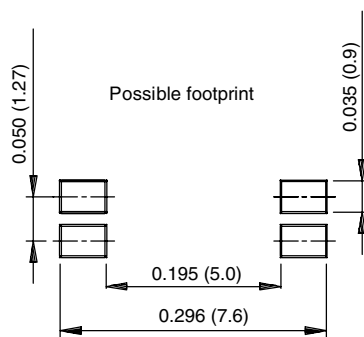


Fig. 4 - 8 Pin PCMCIA

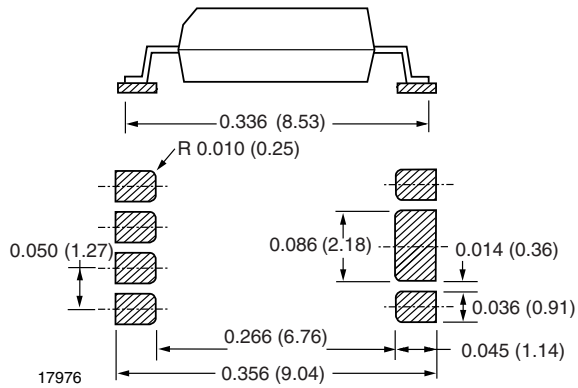


Fig. 5 - 8 Pin PCMCIA, Heat Sink

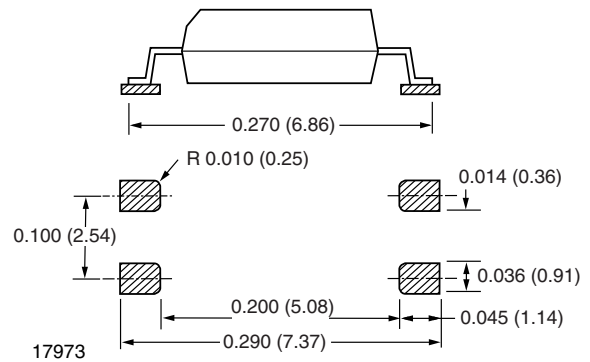


Fig. 8 - 4 Pin Mini-Flat

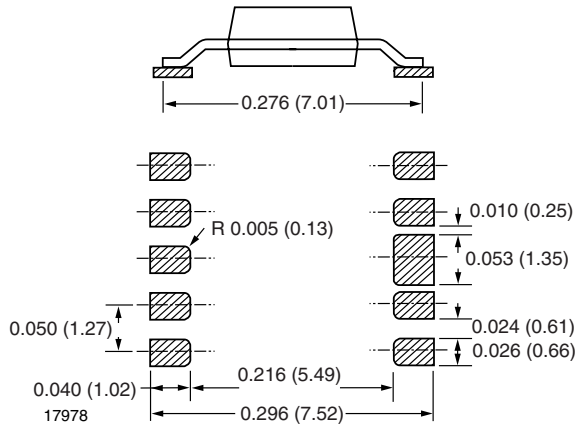


Fig. 6 - Mini Coupler

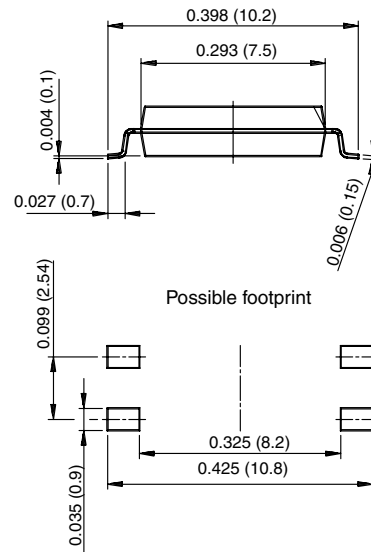


Fig. 9 - SOP-6, 4 Pin Wide Body

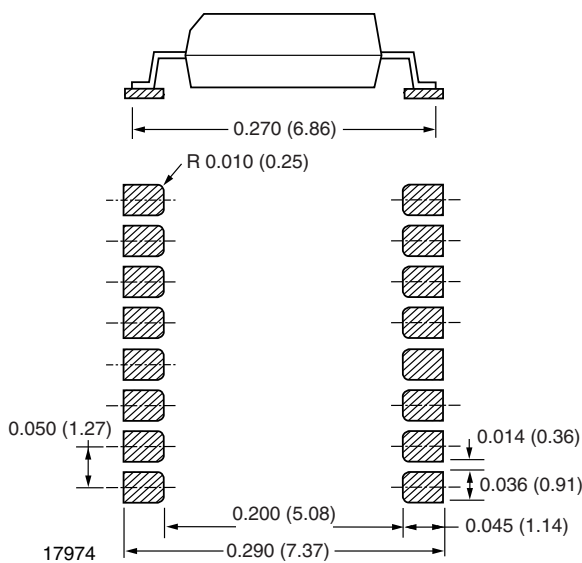


Fig. 7 - SOP-16

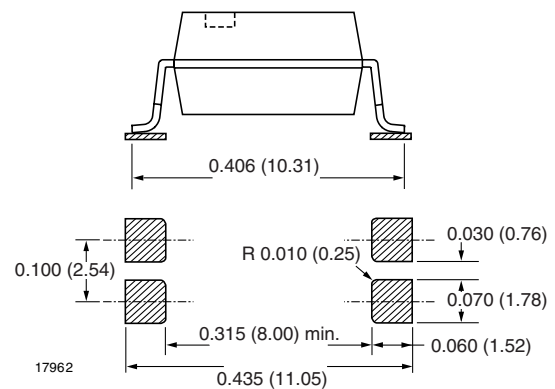


Fig. 10 - 4 Pin SMD Option 7

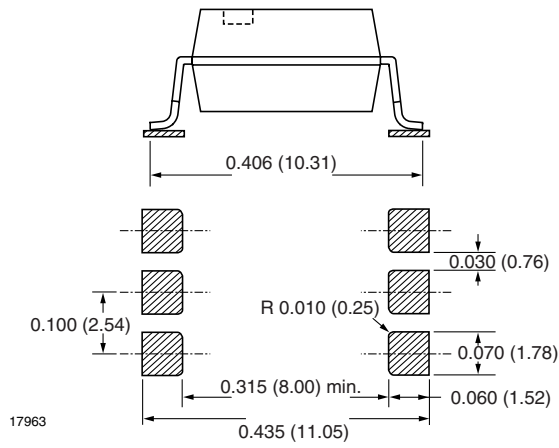


Fig. 11 - 6 Pin SMD Option 7

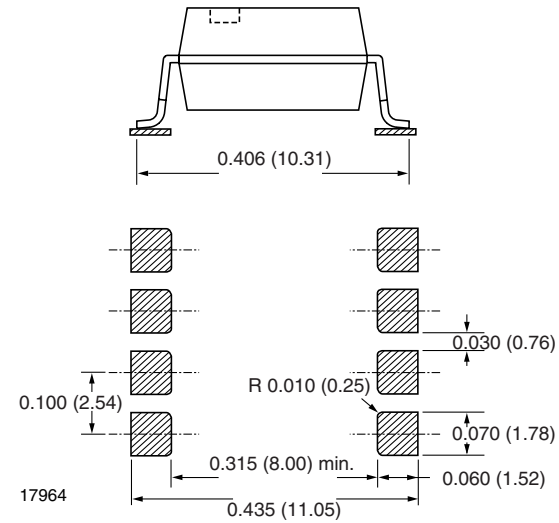


Fig. 12 - 8 Pin SMD Option 7

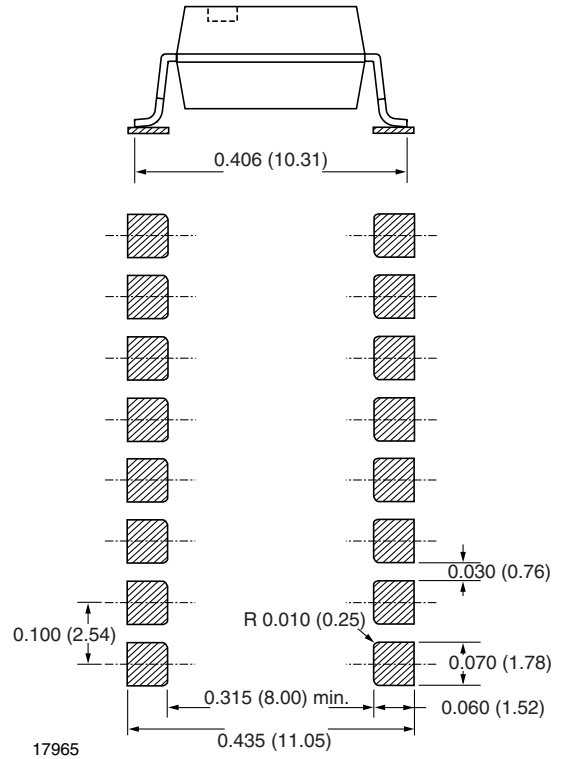


Fig. 13 - 16 Pin SMD Option 7

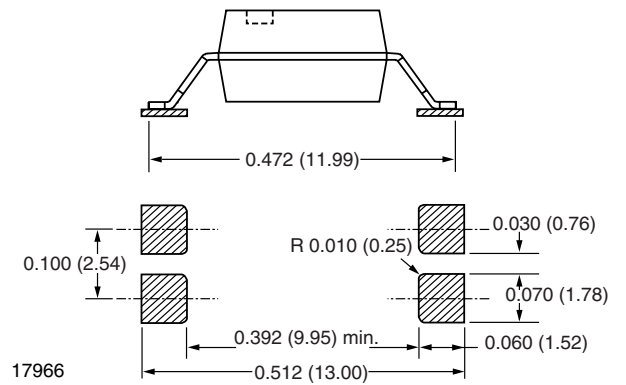


Fig. 14 - 4 Pin SMD Option 8

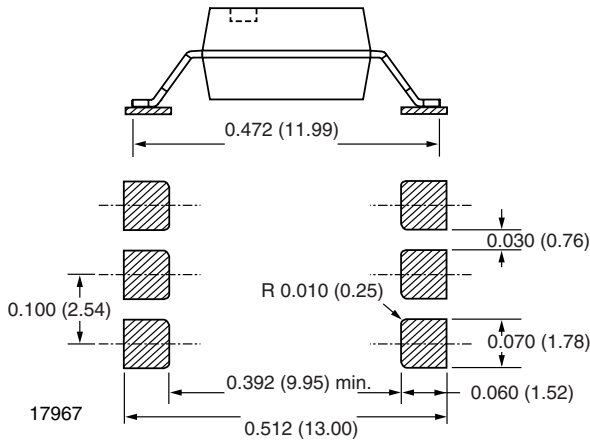


Fig. 15 - 6 Pin SMD Option 8

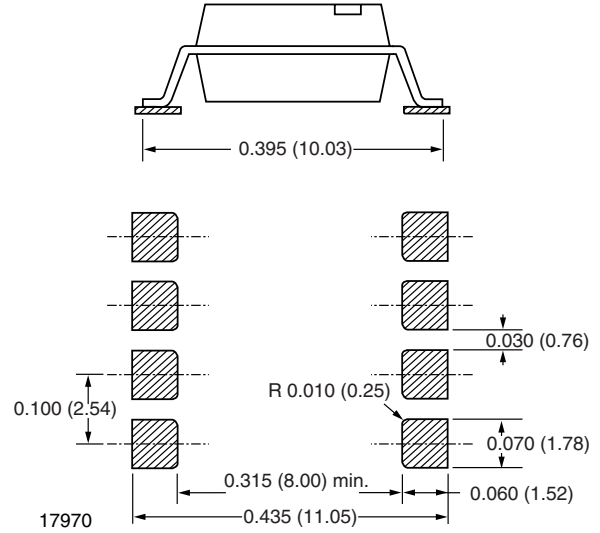


Fig. 18 - 8 Pin SMD Option 9

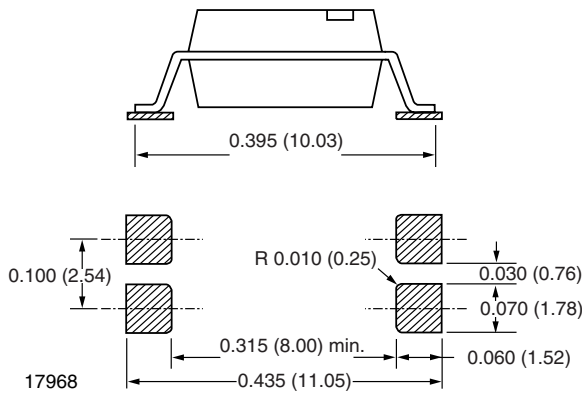


Fig. 16 - 4 Pin SMD Option 9

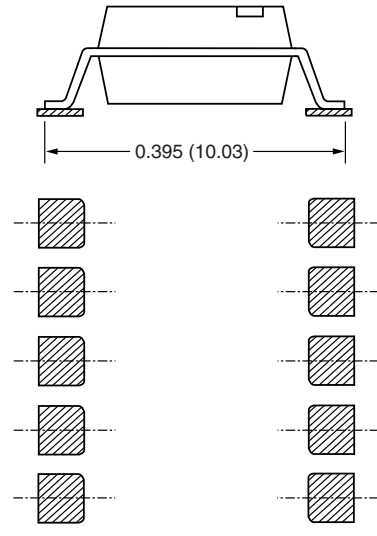


Fig. 19 - 16 Pin SMD Option 9

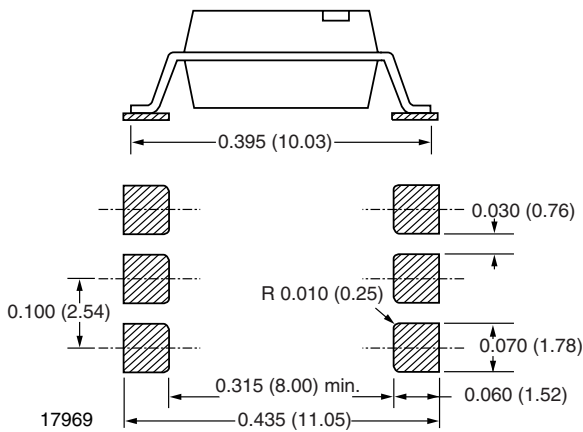


Fig. 17 - 6 Pin SMD Option 9

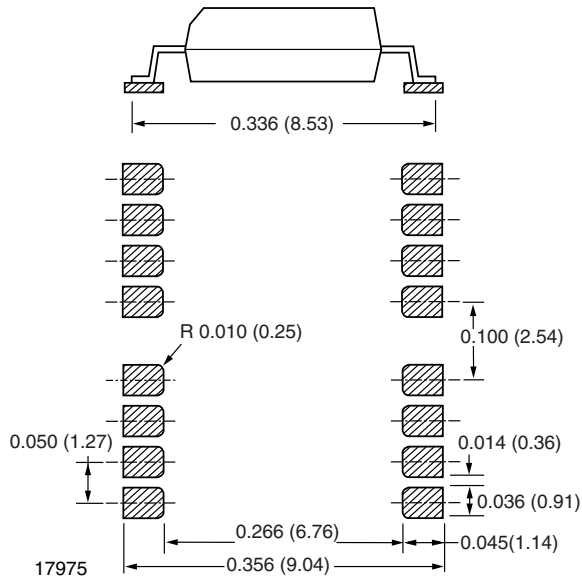


Fig. 20 - 16 Pin PCMCIA



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