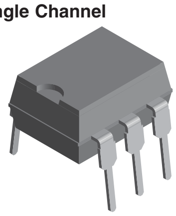
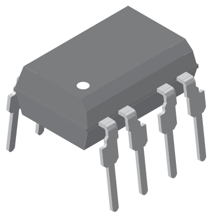
Optocoupler, Photodarlington Outtput, with Internal RBE (Single, Dual, Quad Channel)

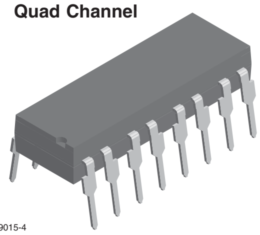
Single Channel



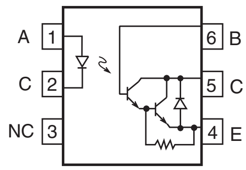
Dual Channel

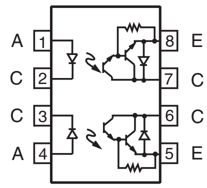


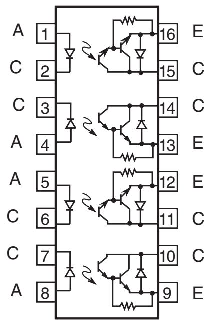
Quad Channel



i179015-4







FEATURES

- Internal RBE for high stability
- Four available CTR categories per package type
- BV_{CEO} > 60 V
- Standard DIP packages
- Compliant to RoHS Directive 2002/95/EC and in accordance to WEEE 2002/96/EC

Pb-free

e3 RoHS COMPLIANT

DESCRIPTION

IL66, ILD66, and ILQ66 are optically coupled isolators employing gallium arsenide infrared emitters and silicon photodarlington detectors. Switching can be accomplished while maintaining a high degree of isolation between driving and load circuits, with no crosstalk between channels.

AGENCY APPROVALS

- UL1577, file no. E52744 system code H, double protection
- cUL tested to CSA 22.2 bulletin 5A
- DIN EN 60747-5-2 (VDE 0884)/DIN EN 60747-5-5 pending available with option 1
- BSI IEC 60950; IEC 60065

ORDERING INFORMATION

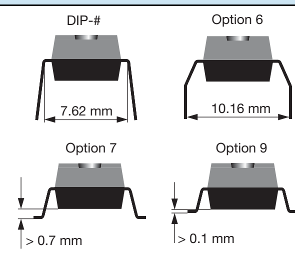
I	L	x	6	6	-	#	X	0	#	#	T

PART NUMBER: I L x 6 6 — x = D (Dual) or Q (Quad)

CTR BIN: #

PACKAGE OPTION: X 0 # #

TAPE AND REEL: T



AGENCY CERTIFIED/PACKAGE	SINGLE CHANNEL		DUAL CHANNEL		QUAD CHANNEL			
	CTR (%)							
	2 mA						0.7 mA	2 mA
UL, cUL, BSI	**≥ 100**	**≥ 300**	**≥ 300**	**≥ 500**	**≥ 100**	**≥ 300**	**≥ 400**	**≥ 500**
DIP-4	IL66-1	IL66-2	-	-	-	-	-	-
DIP-8	-	-	ILD66-2	ILD66-4	-	-	-	-
SMD-8, option 7	-	-	-	ILD66-4X007T	-	-	-	-
SMD-8, option 9	-	-	-	ILD66-4X009	-	-	-	-
DIP-16	-	-	-	-	ILQ66-1	ILQ66-2	ILQ66-3	ILQ66-4
SMD-16, option 7	-	-	-	-	-	-	-	ILQ66-4X007T
SMD-16, option 9	-	-	-	-	-	-	-	ILQ66-4X009T
VDE, UL, cUL, BSI	**≥ 100**	**≥ 300**	**≥ 300**	**≥ 500**	**≥ 100**	**≥ 300**	**≥ 400**	**≥ 500**
DIP-4, 400 mil, option 6	IL66-1X016							
DIP-16								ILQ66-4X001

Note

- Additional optiony may be possible, please contact sales office.

ABSOLUTE MAXIMUM RATINGS (T_{amb} = 25 °C, unless otherwise specified)					
PARAMETER	**TEST CONDITION**	**PART**	**SYMBOL**	**VALUE**	**UNIT**
INPUT					
Peak reverse voltage			V_{RM}	6.0	V
Forward continuous current			I_F	60	mA
Power dissipation			P_{diss}	100	mW
Derate linearly from 25 °C				1.33	mW/°C
OUTPUT					
Power dissipation			P_{diss}	150	mW
Derate from 25 °C				2.0	mW/°C
COUPLER					
Isolation test voltage	t = 1.0 s		V_{ISO}	5300	V_{RMS}
Total package power dissipation		IL66	P_{tot}	250	mW
		ILD66	P_{tot}	400	mW
		ILQ66	P_{tot}	500	mW
Derate linearly from 25 °C		IL66		3.3	mW/°C
		ILD66		5.33	mW/°C
		ILQ66		6.67	mW/°C
Creepage distance				≥ 7.0	mm
Clearance distance				≥ 7.0	mm
Comparative tracking index			CTI	175	
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
Storage temperature			T_{stg}	- 55 to + 125	°C
Operating temperature			T_{amb}	- 55 to + 100	°C
Lead soldering time at 260 °C				10	s

Note

- 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.

ELECTRICAL CHARACTERISTICS (T_{amb} = 25 °C, unless otherwise specified)						
PARAMETER	**TEST CONDITION**	**SYMBOL**	**MIN.**	**TYP.**	**MAX.**	**UNIT**
INPUT						
Forward voltage	I_F = 20 mA	V_F		1.25	1.5	V
Reverse current	V_R = 6.0 V	I_R		0.1	10	µA
Capacitance	V_R = 0 V	C_O		25		pF
OUTPUT						
Collector emitter breakdown voltage	I_C = 1.0 mA, I_F = 0 A	BV_{CEO}	60			V
Collector base breakdown voltage (IL66)	I_C = 10 µA	BV_{CBO}	60			V
Collector emitter leakage current	V_{CE} = 50 V, I_F = 0 A	I_{CEO}		1.0	100	nA
Capacitance collector emitter	V_{CE} = 10 V			3.4		pF
COUPLER						
Saturation voltage, collector emitter	I_C = 10 mA, I_F = 10 mA	V_{CEsat}		0.9	1.0	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	PART	SYMBOL	MIN.	TYP.	MAX.	UNIT
Current transfer ratio	I_F = 2.0 mA, V_{CE} = 10 V	IL(D,Q)66-1	CTR	100	400		%
		IL(D,Q)66-2	CTR	300	500		%
	I_F = 0.7 mA, V_{CE} = 10 V	IL(D,Q)66-3	CTR	400	500		%
	I_F = 2.0 mA, V_{CE} = 5.0 V	IL(D,Q)66-4	CTR	500	750		%

SWITCHING CHARACTERSITICS (T_{amb} = 25 °C, unless otherwise specified)						
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
NON SATURATED						
Rise time -1, -2, -4	V_{CC} = 10 V, I_F = 2.0 mA, R_L = 100 Ω	t_r			200	µs
Fall time -1, -2, -4	V_{CC} = 10 V, I_F = 2.0 mA, R_L = 100 Ω	t_f			200	µs
Rise time -3	V_{CC} = 10 V, I_F = 0.7 mA, R_L = 100 Ω	t_r			200	µs
Fall time -3	V_{CC} = 10 V, I_F = 0.7 mA, R_L = 100 Ω	t_f			200	µs

TYPICAL CHARACTERISTICS (T_{amb} = 25 °C, unless otherwise specified)

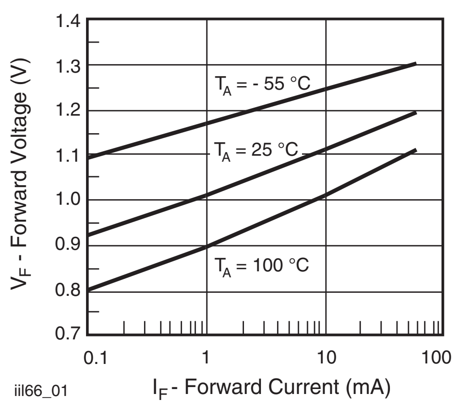


Fig. 1 - Forward Voltage vs. Forward Current

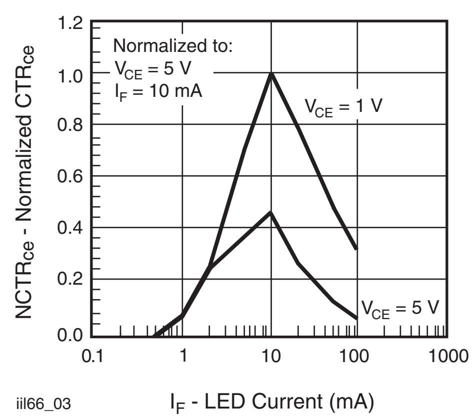


Fig. 3 - Normalized Non-Saturated and Saturated CTR_{CE} vs. LED Current

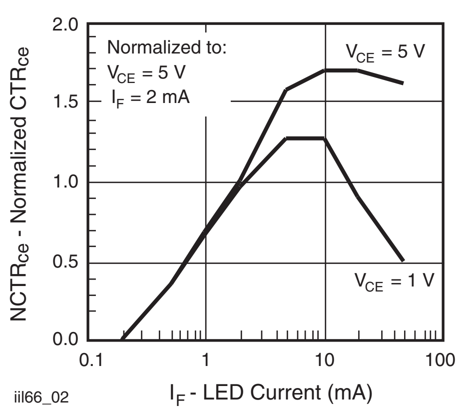


Fig. 2 - Normalized Non-Saturated and Saturated CTR_{CE} vs. LED Current

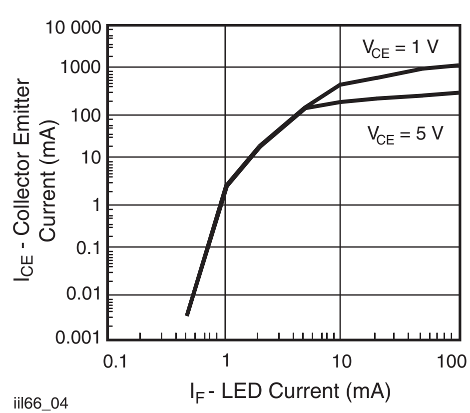


Fig. 4 - Non-Saturated and Saturated Collector Emitter Current vs. LED Current

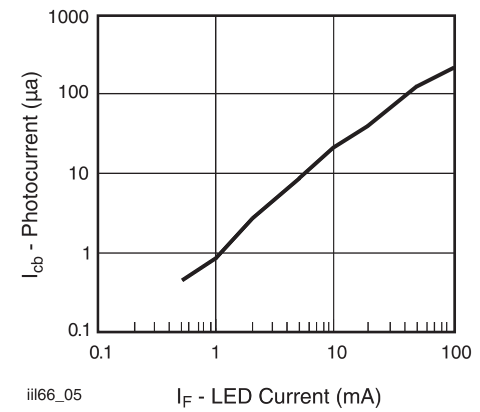


Fig. 5 - Collector Base Photocurrent vs. LED Current

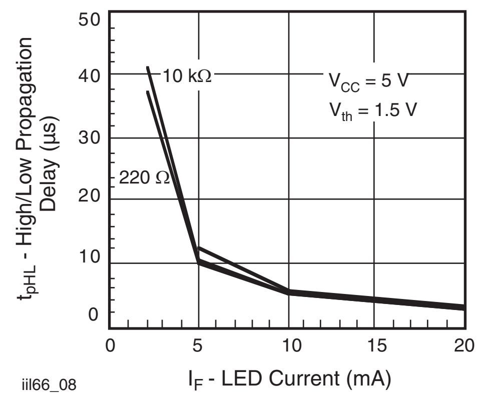


Fig. 8 - High to Low Propagation Delay vs. Collector Load Resistance and LED Current

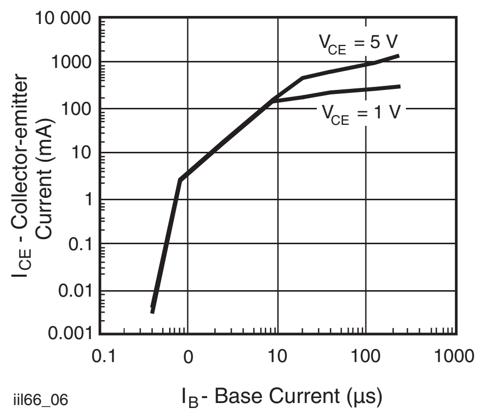


Fig. 6 - Collector Emitter Current vs. LED Current

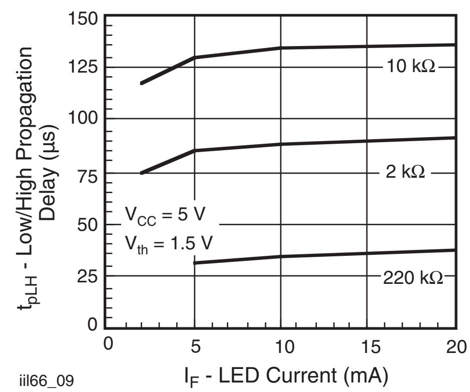


Fig. 9 - Low to High Propagation Delay vs. Collector Load Resistance and LED Current

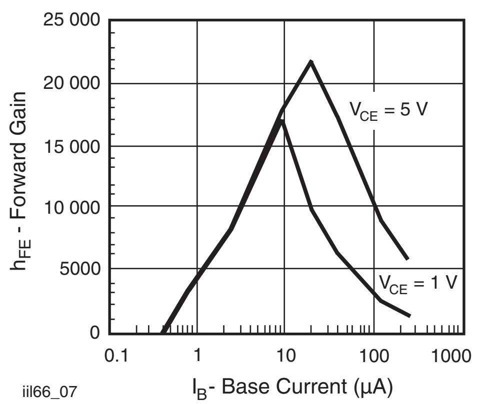


Fig. 7 - Non-Saturated and Saturated h_{FE} vs. LED Current

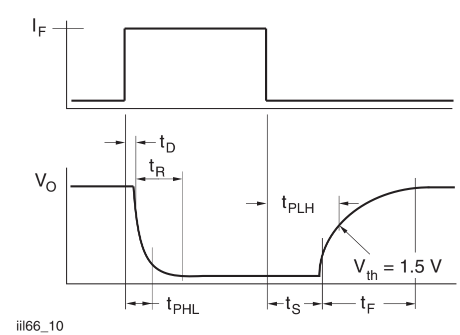


Fig. 10 - Switching Waveform

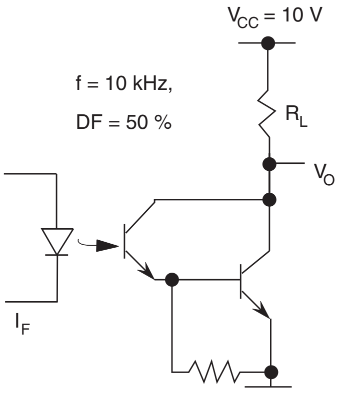
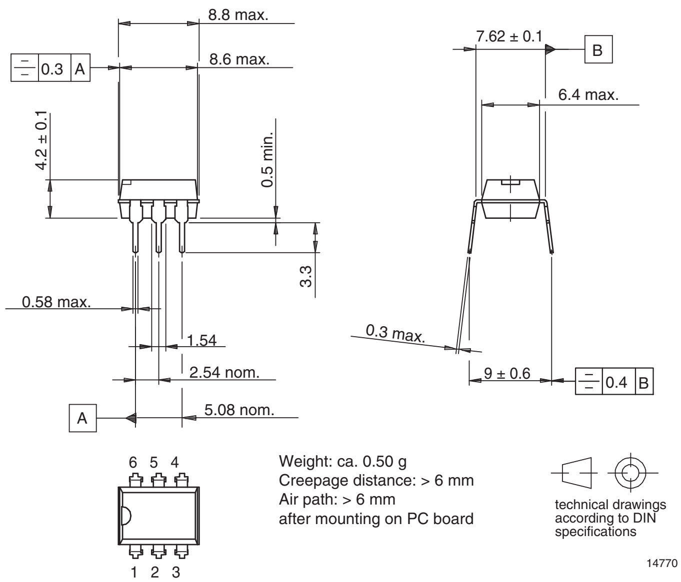
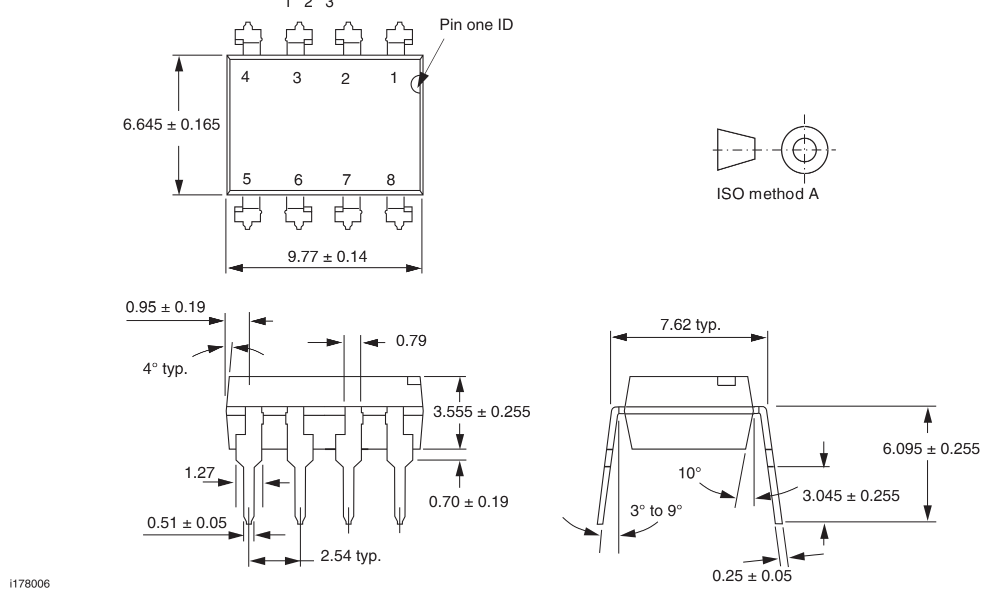
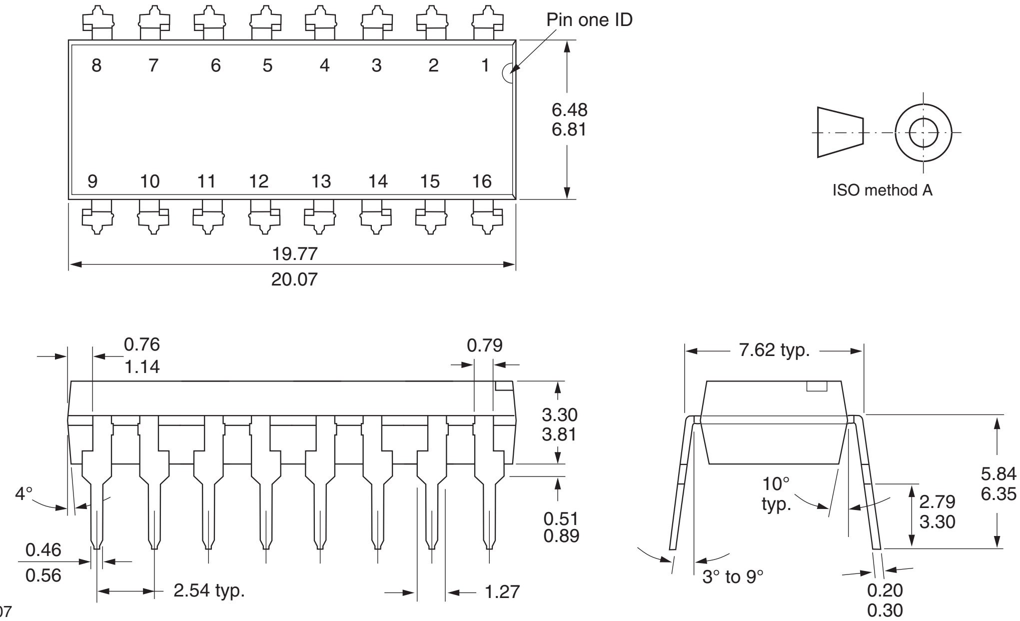


Fig. 11 - Switching Schematic

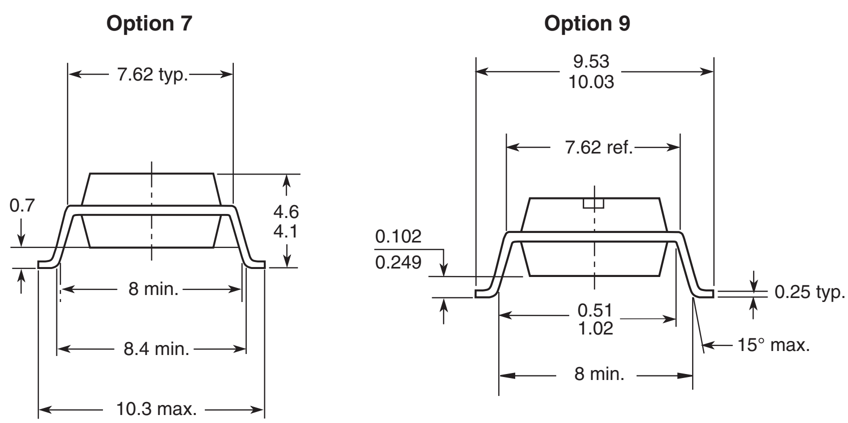
PACKAGE DIMENSIONS in millimeters

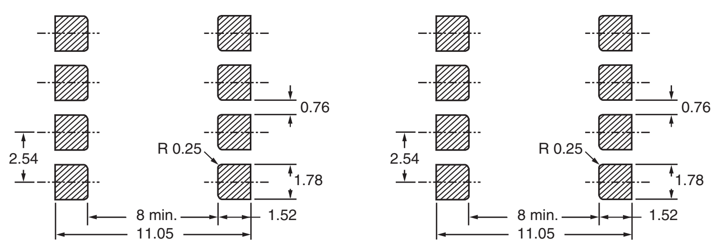






i178007





18450-7

PACKAGE MARKING (example)

ILD66
V YWW H 68

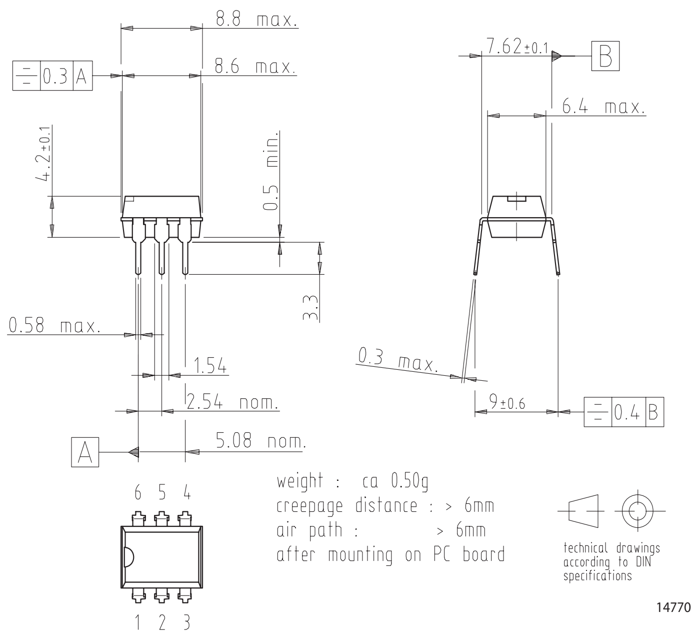
ILQ66
V YWW H 68

Notes

- Only options 1 and 7 reflected in the package marking
- The VDE logo is only marked on option 1 parts
- Tape and reel suffix (T) is not part of the package marking

DIL300-6

Package Dimensions in 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.

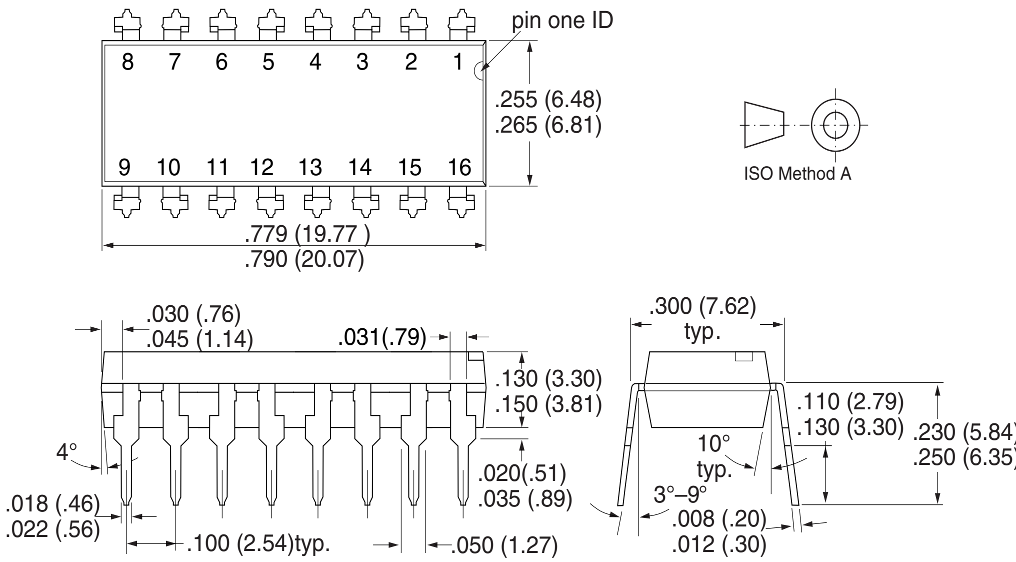
1. Annex A, B and list of transitional substances of the Montreal Protocol and the London Amendments respectively
2. Class I and II ozone depleting substances in the Clean Air Act Amendments of 1990 by the Environmental Protection Agency (EPA) in the USA
3. Council Decision 88/540/EEC and 91/690/EEC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

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

DIP-16

Package Dimensions in Inches (mm)



i178007

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

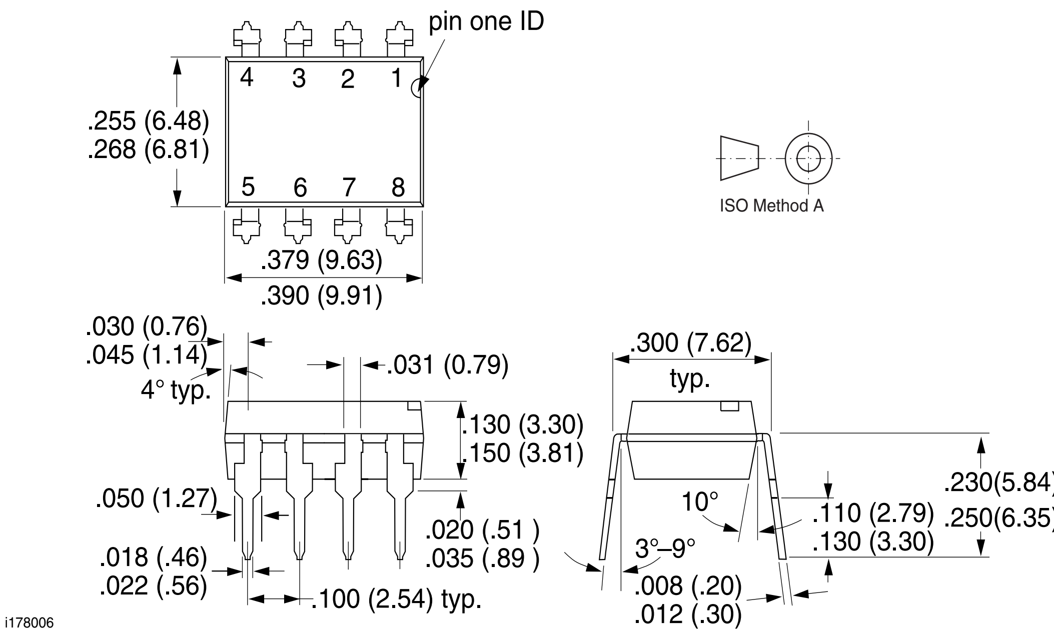
We reserve the right to make changes to improve technical design and may do so without further notice.

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

DIP-8

Package Dimensions in Inches (mm)



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Telephone: 49 (0)7131 67 2831, Fax number: 49 (0)7131 67 2423

Footprints

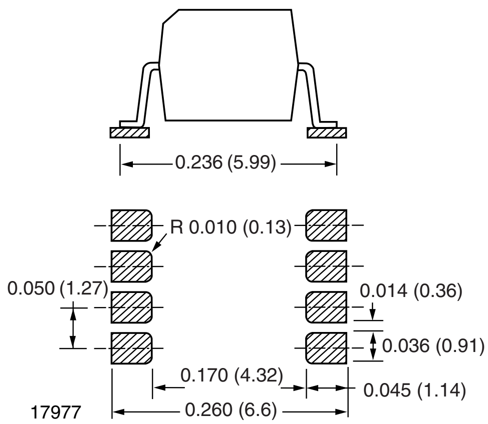

Fig. 1 - SO8A and DSO8A SMD

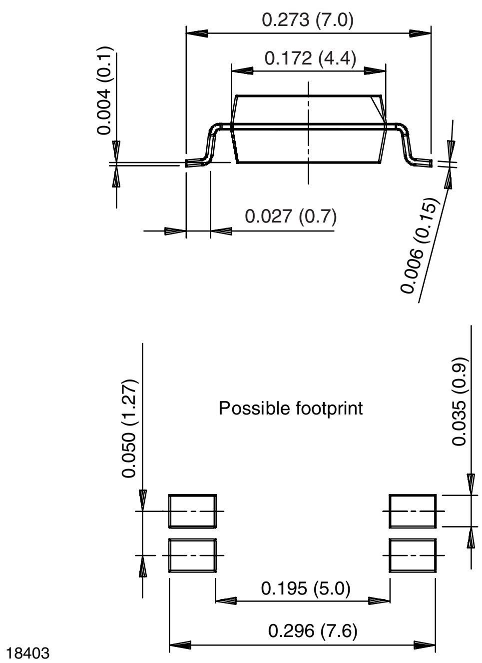

Fig. 2 - SOP-4, Miniflat

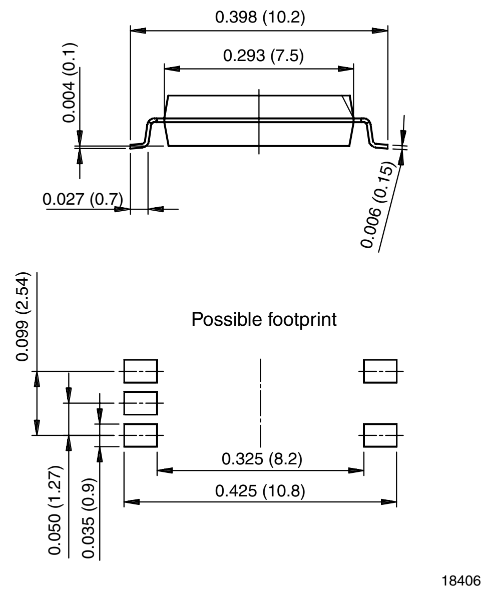

Fig. 3 - SOP-6, 5 Pin Wide Body

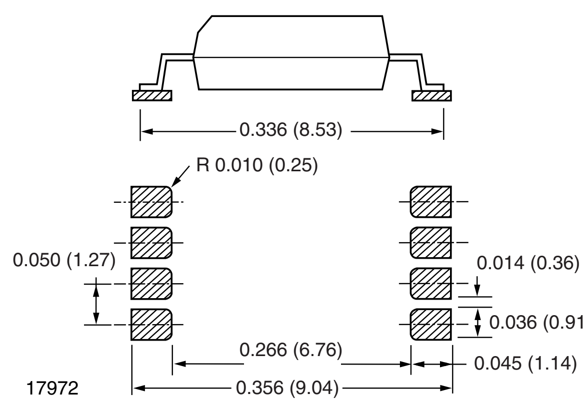

Fig. 4 - 8 Pin PCMCIA

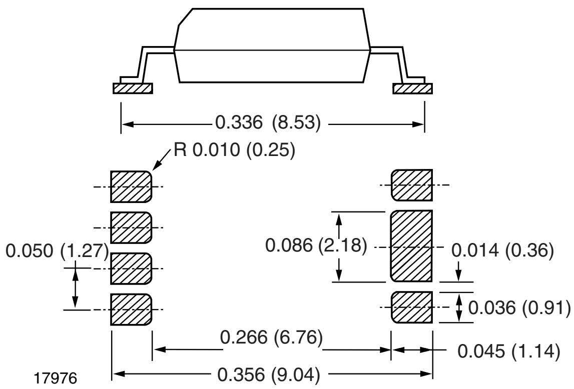

Fig. 5 - 8 Pin PCMCIA, Heat Sink

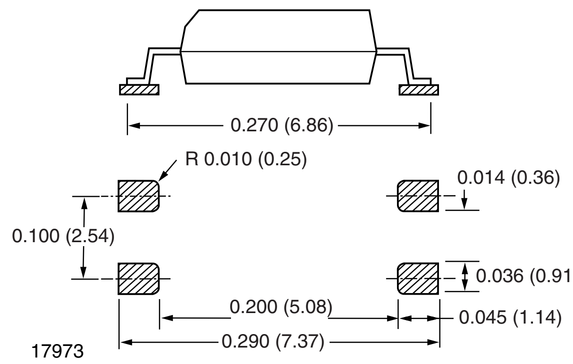

Fig. 8 - 4 Pin Mini-Flat

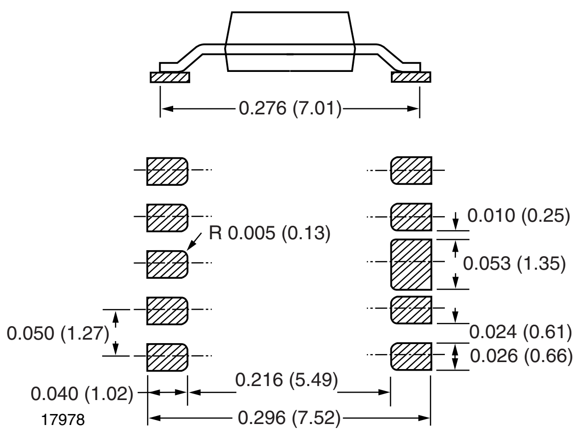

Fig. 6 - Mini Coupler

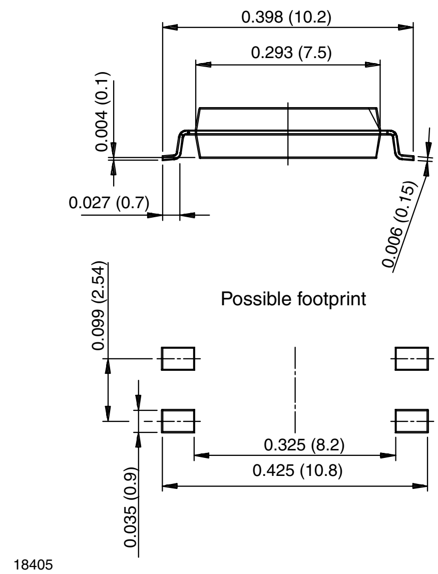

Fig. 9 - SOP-6, 4 Pin Wide Body

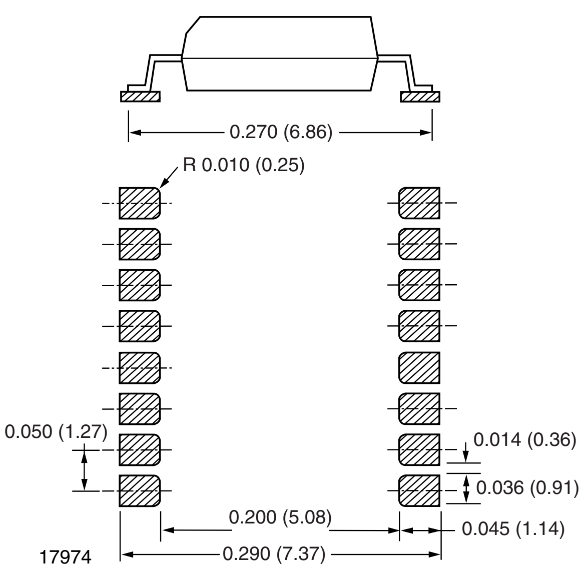

Fig. 7 - SOP-16

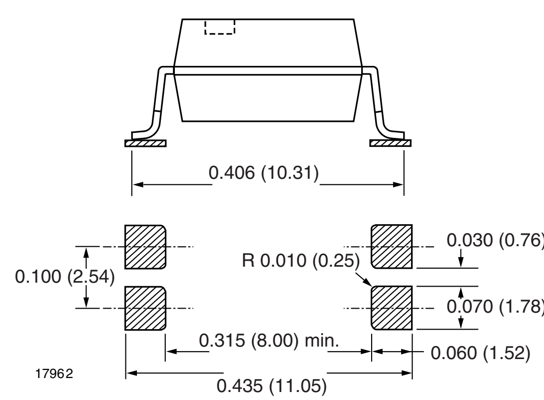

Fig. 10 - 4 Pin SMD Option 7

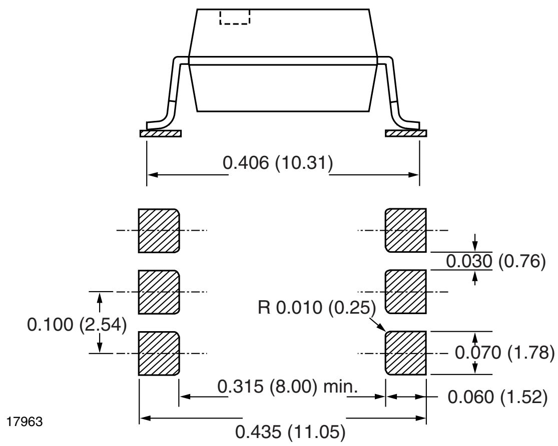

Fig. 11 - 6 Pin SMD Option 7

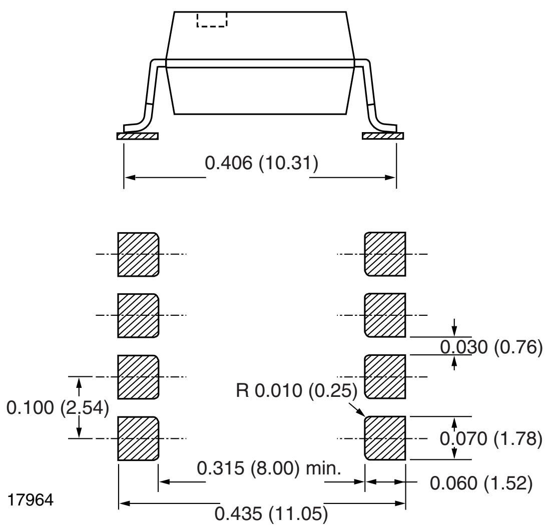

Fig. 12 - 8 Pin SMD Option 7

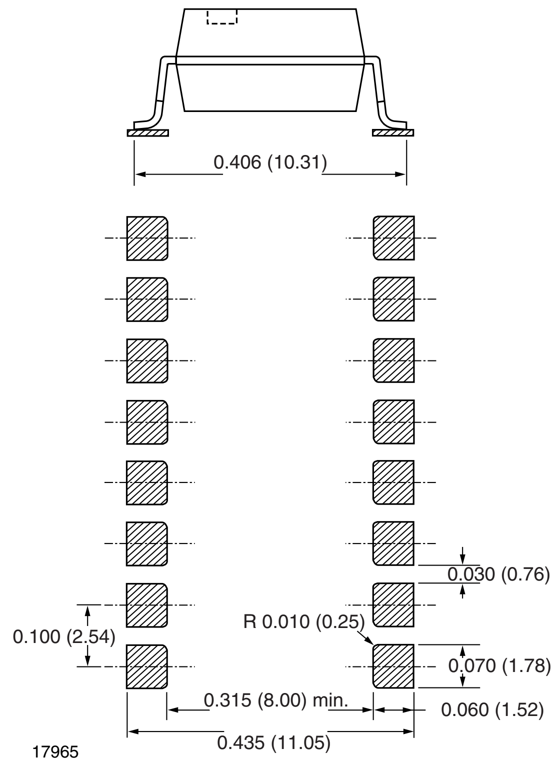

Fig. 13 - 16 Pin SMD Option 7

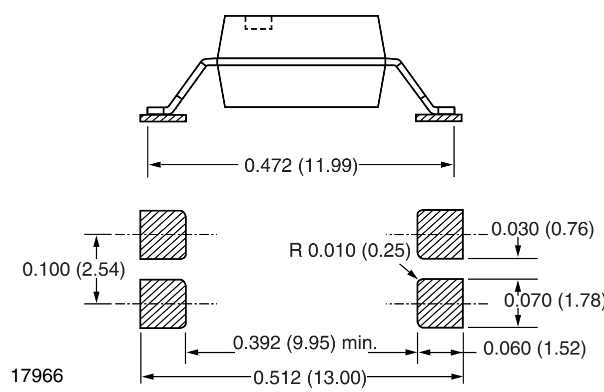

Fig. 14 - 4 Pin SMD Option 8

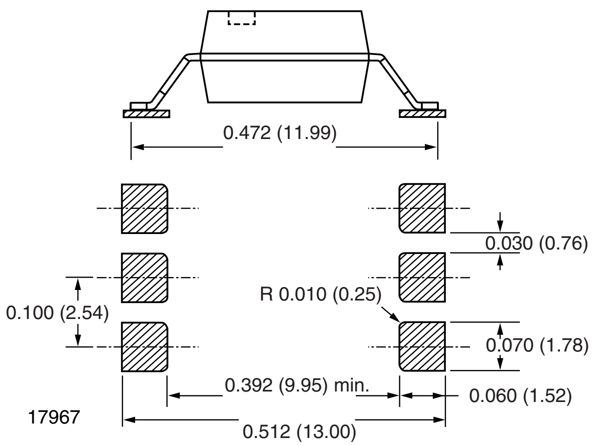

Fig. 15 - 6 Pin SMD Option 8

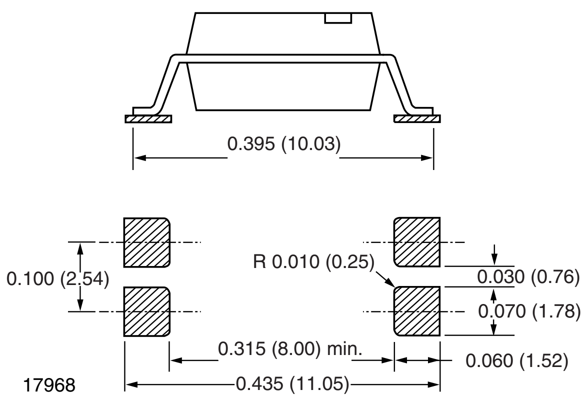

Fig. 16 - 4 Pin SMD Option 9

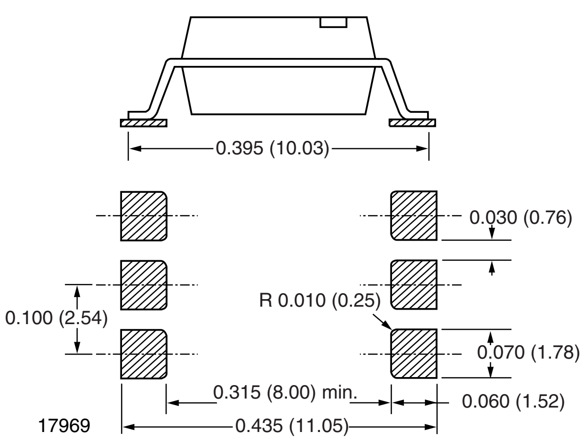

Fig. 17 - 6 Pin SMD Option 9

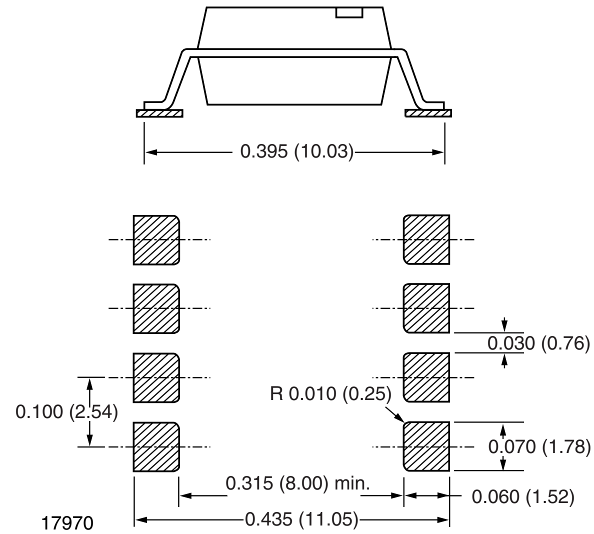

Fig. 18 - 8 Pin SMD Option 9

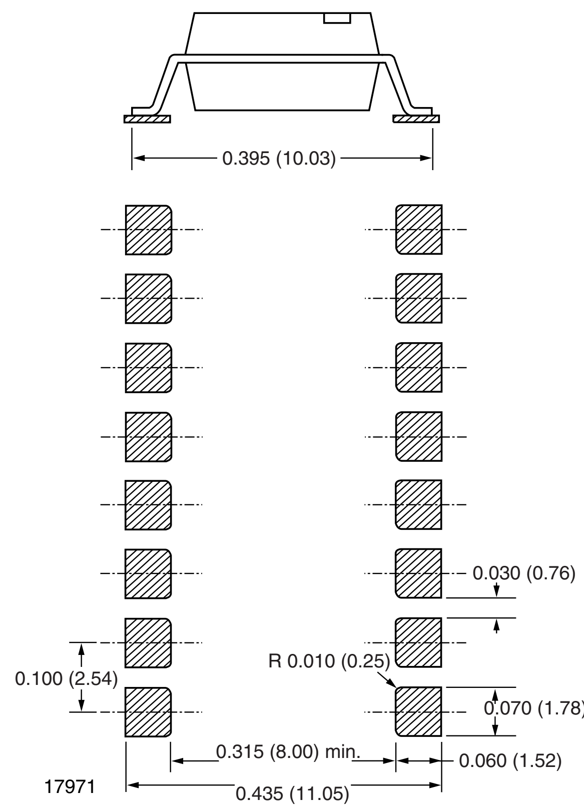

Fig. 19 - 16 Pin SMD Option 9

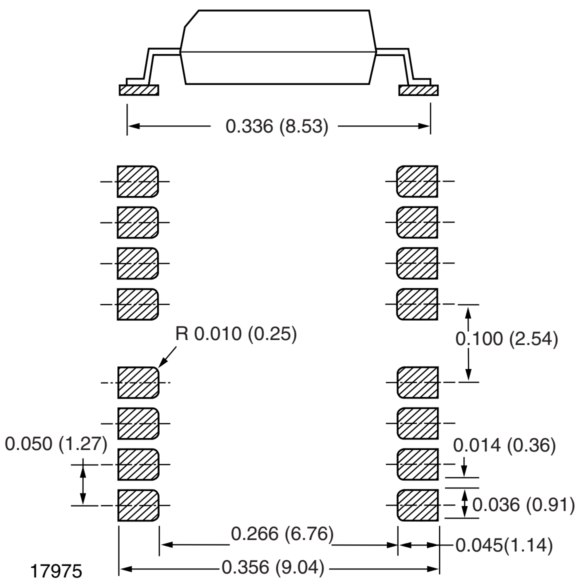

Fig. 20 - 16 Pin PCMCIA

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