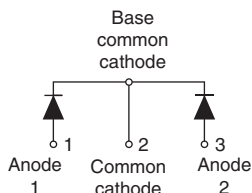


## Schottky Rectifier New Generation 3 D-61 Package, 2 x 55 A

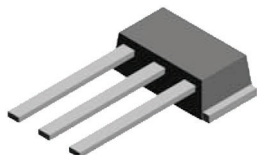
VS-111CNQ045APbF



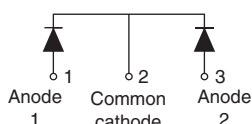
D-61-8



VS-111CNQ045ASMPbF



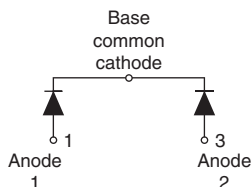
D-61-8-SM



VS-111CNQ045ASLPbF



D-61-8-SL



### FEATURES

- 175 °C  $T_J$  operation
- Center tap module
- Very low forward voltage drop
- High frequency operation
- High purity, high temperature epoxy encapsulation for enhanced mechanical strength and moisture resistance
- Guard ring for enhanced ruggedness and long term reliability
- New fully transfer-mold low profile, small footprint, high current package
- Compliant to RoHS directive 2002/95/EC
- Designed and qualified for industrial level



Available  
**RoHS\***  
COMPLIANT

### DESCRIPTION

The center tap Schottky rectifier module has been optimized for very low forward voltage drop, with moderate leakage. The proprietary barrier technology allows for reliable operation up to 175 °C junction temperature. Typical applications are in switching power supplies, converters, freewheeling diodes, and reverse battery protection.

### PRODUCT SUMMARY

$I_{F(AV)}$	2 x 55 A
$V_R$	45 V

### MAJOR RATINGS AND CHARACTERISTICS

SYMBOL	CHARACTERISTICS	VALUES	UNITS
$I_{F(AV)}$	Rectangular waveform	110	A
$V_{RRM}$		45	V
$I_{FSM}$	$t_p = 5 \mu s$ sine	4000	A
$V_F$	55 Apk, $T_J = 125^\circ C$ (per leg)	0.55	V
$T_J$	Range	- 55 to 175	°C

### VOLTAGE RATINGS

PARAMETER	SYMBOL	VS-111CNQ045APbF	UNITS
Maximum DC reverse voltage	$V_R$	45	V
Maximum working peak reverse voltage	$V_{RWM}$		

\* Pb containing terminations are not RoHS compliant, exemptions may apply

**ABSOLUTE MAXIMUM RATINGS**

PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Maximum average forward current See fig. 5	$I_{F(AV)}$	50 % duty cycle at $T_C = 152\text{ }^{\circ}\text{C}$ , rectangular waveform	55 110	A
Maximum peak one cycle non-repetitive surge current per leg See fig. 7	$I_{FSM}$	5 $\mu\text{s}$ sine or 3 $\mu\text{s}$ rect. pulse 10 ms sine or 6 ms rect. pulse	4000 600	A
Non-repetitive avalanche energy per leg	$E_{AS}$	$T_J = 25\text{ }^{\circ}\text{C}$ , $I_{AS} = 8\text{ A}$ , $L = 1.7\text{ mH}$	54	mJ
Repetitive avalanche current per leg	$I_{AR}$	Current decaying linearly to zero in 1 $\mu\text{s}$ Frequency limited by $T_J$ maximum $V_A = 1.5 \times V_R$ typical	8	A

**ELECTRICAL SPECIFICATIONS**

PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Maximum forward voltage drop per leg See fig. 1	$V_{FM}^{(1)}$	55 A 110 A 55 A 110 A	0.61 0.75 0.55 0.69	V
Maximum reverse leakage current per leg	$I_{RM}^{(1)}$	$T_J = 25\text{ }^{\circ}\text{C}$ $T_J = 125\text{ }^{\circ}\text{C}$	1.5 65	mA
Maximum junction capacitance per leg	$C_T$	$V_R = 5\text{ V}_{DC}$ (test signal range 100 kHz to 1 MHz), $25\text{ }^{\circ}\text{C}$	3900	pF
Typical series inductance per leg	$L_S$	Measured lead to lead 5 mm from package body	5.5	nH
Maximum voltage rate of change	dV/dt	Rated $V_R$	10 000	V/ $\mu\text{s}$

**Note**(1) Pulse width < 300  $\mu\text{s}$ , duty cycle < 2 %**THERMAL - MECHANICAL SPECIFICATIONS**

PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Maximum junction and storage temperature range	$T_J, T_{Stg}$		- 55 to 175	$^{\circ}\text{C}$
Maximum thermal resistance, junction to case per leg	$R_{thJC}$	DC operation	0.5	$^{\circ}\text{C/W}$
Maximum thermal resistance, junction to case per package			0.25	
Typical thermal resistance, case to heatsink (D-61-8 only)	$R_{thCS}$	Mounting surface, smooth and greased Device flatness < 5 mils	0.30	
Approximate weight			7.8 0.28	g oz.
Mounting torque (D-61-8 only)	minimum maximum		40 (35) 58 (50)	kgf · cm (lbf · in)
Marking device		Case style D-61-8	111CNQ045A	
		Case style D-61-8-SM	111CNQ045ASM	
		Case style D-61-8-SL	111CNQ045ASL	

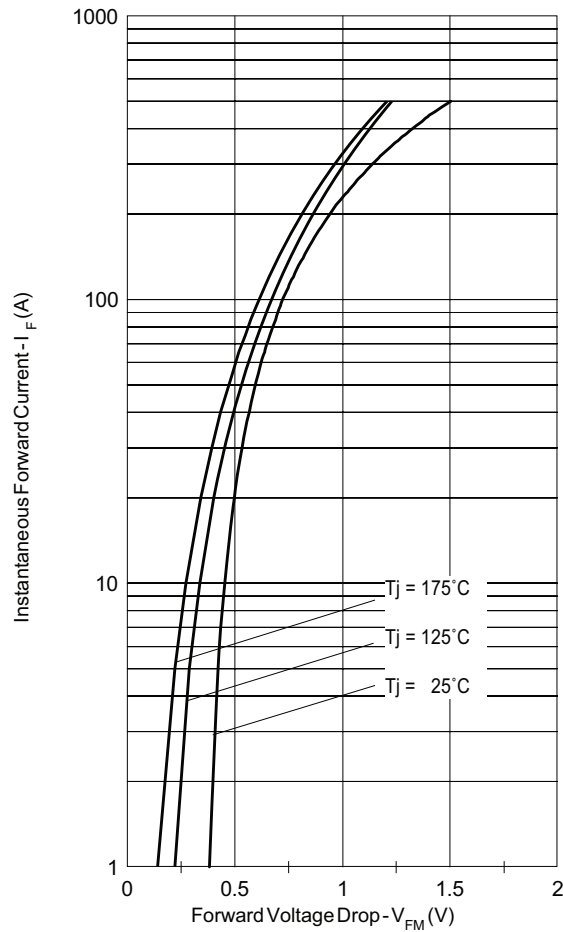


Fig. 1 - Maximum Forward Voltage Drop Characteristics (Per Leg)

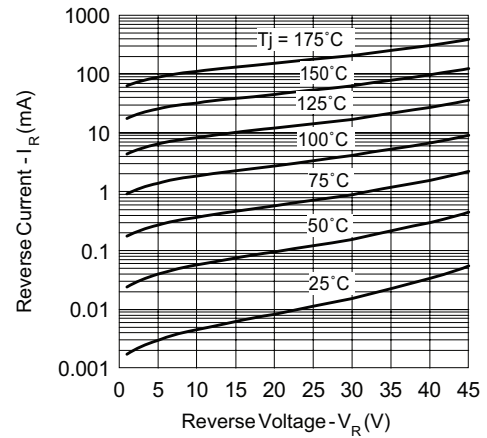


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage (Per Leg)

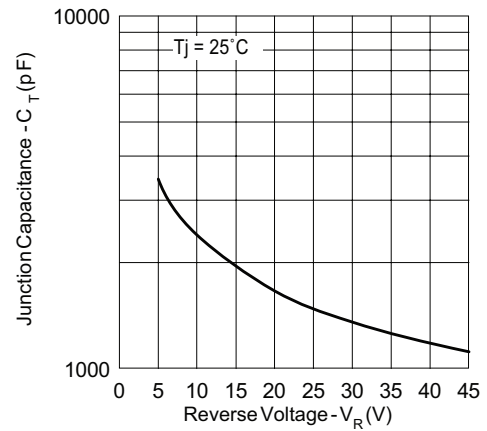


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage (Per Leg)

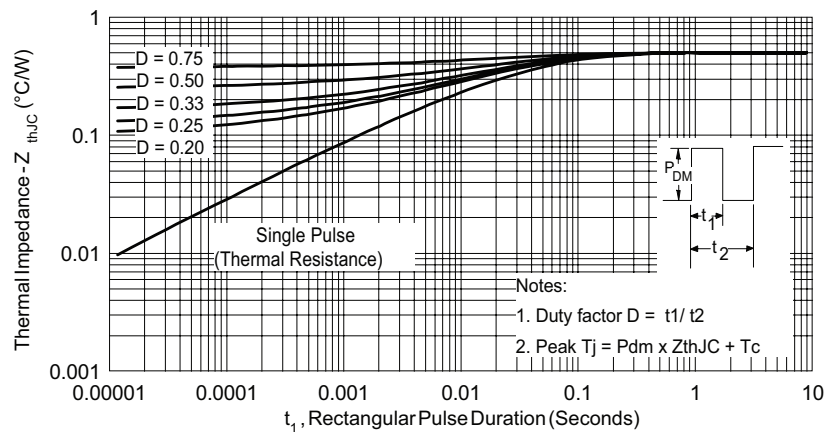


Fig. 4 - Maximum Thermal Impedance  $Z_{thJC}$  Characteristics (Per Leg)

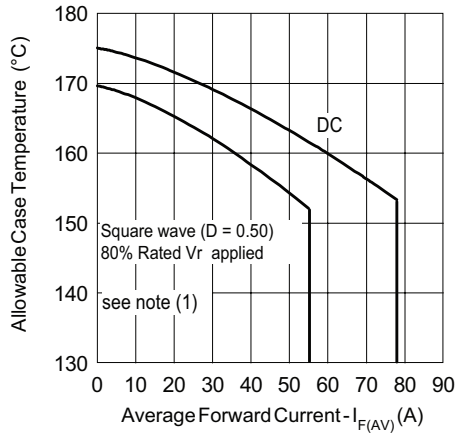


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current (Per Leg)

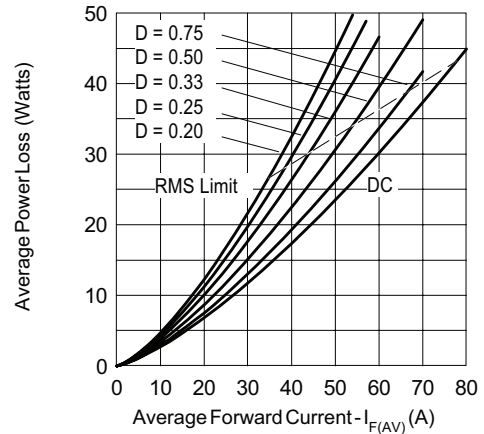


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

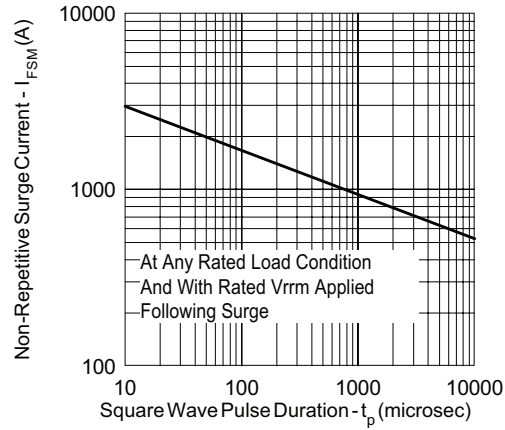


Fig. 7 - Maximum Non-Repetitive Surge Current (Per Leg)

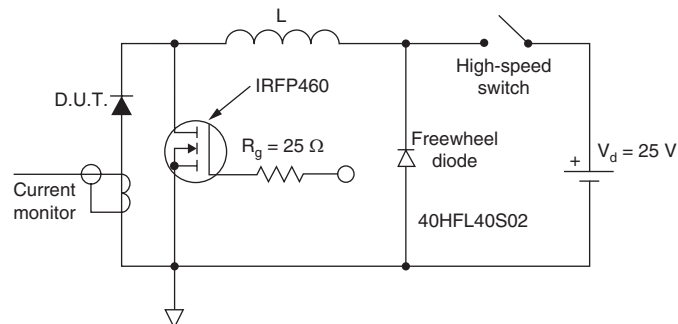


Fig. 8 - Unclamped Inductive Test Circuit

### Note

- (1) Formula used:  $T_C = T_J - (P_d + P_{dREV}) \times R_{thJC}$ ;  
 $P_d$  = Forward power loss =  $I_{F(AV)} \times V_{FM}$  at  $(I_{F(AV)}/D)$  (see fig. 6);  
 $P_{dREV}$  = Inverse power loss =  $V_{R1} \times I_R (1 - D)$ ;  $I_R$  at  $V_{R1} = 80\%$  rated  $V_R$



## VS-111CNQ045A PbF Series

Schottky Rectifier  
New Generation 3 D-61 Package, 2 x 55 A

Vishay High Power Products

### ORDERING INFORMATION TABLE

Device code	VS-	111	C	N	Q	045	A	PbF
	1	2	3	4	5	6	7	8

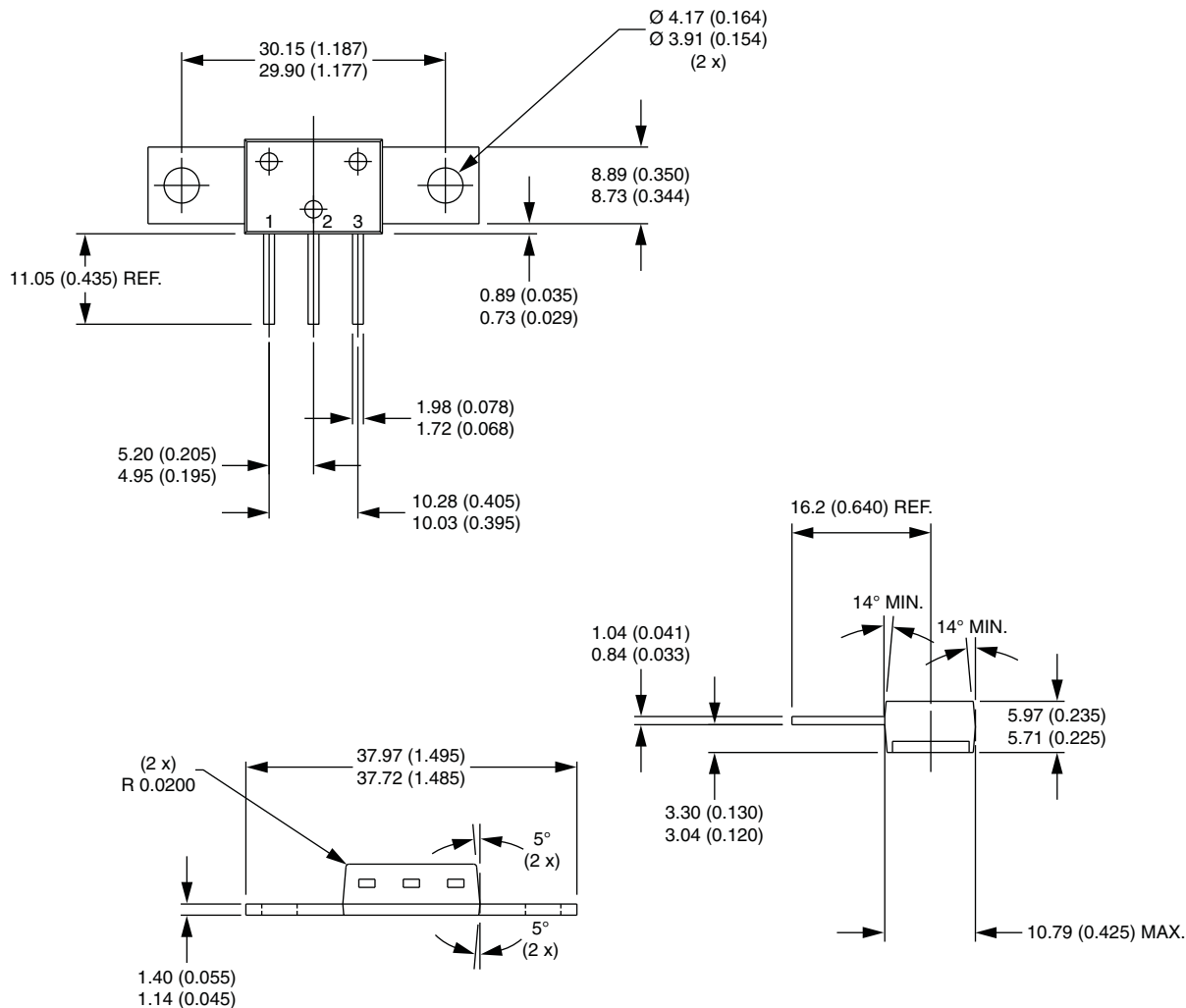
- 1** - HPP product suffix
- 2** - Current rating (111 = 110 A)
- 3** - Circuit configuration:
  - C = Common cathode
- 4** - Package:
  - N = D-61
- 5** - Schottky "Q" series
- 6** - Voltage ratings (045 = 45 V)
- 7** - Package style:
  - A = D-61-8
  - ASM = D-61-8-SM
  - ASL = D-61-8-SL
- 8** -
  - None = Standard production
  - PbF = Lead (Pb)-free

Standard pack quantity: A = 10 pieces; ASM/ASL = 20 pieces

LINKS TO RELATED DOCUMENTS	
Dimensions	<a href="http://www.vishay.com/doc?95354">www.vishay.com/doc?95354</a>
Part marking information	<a href="http://www.vishay.com/doc?95356">www.vishay.com/doc?95356</a>

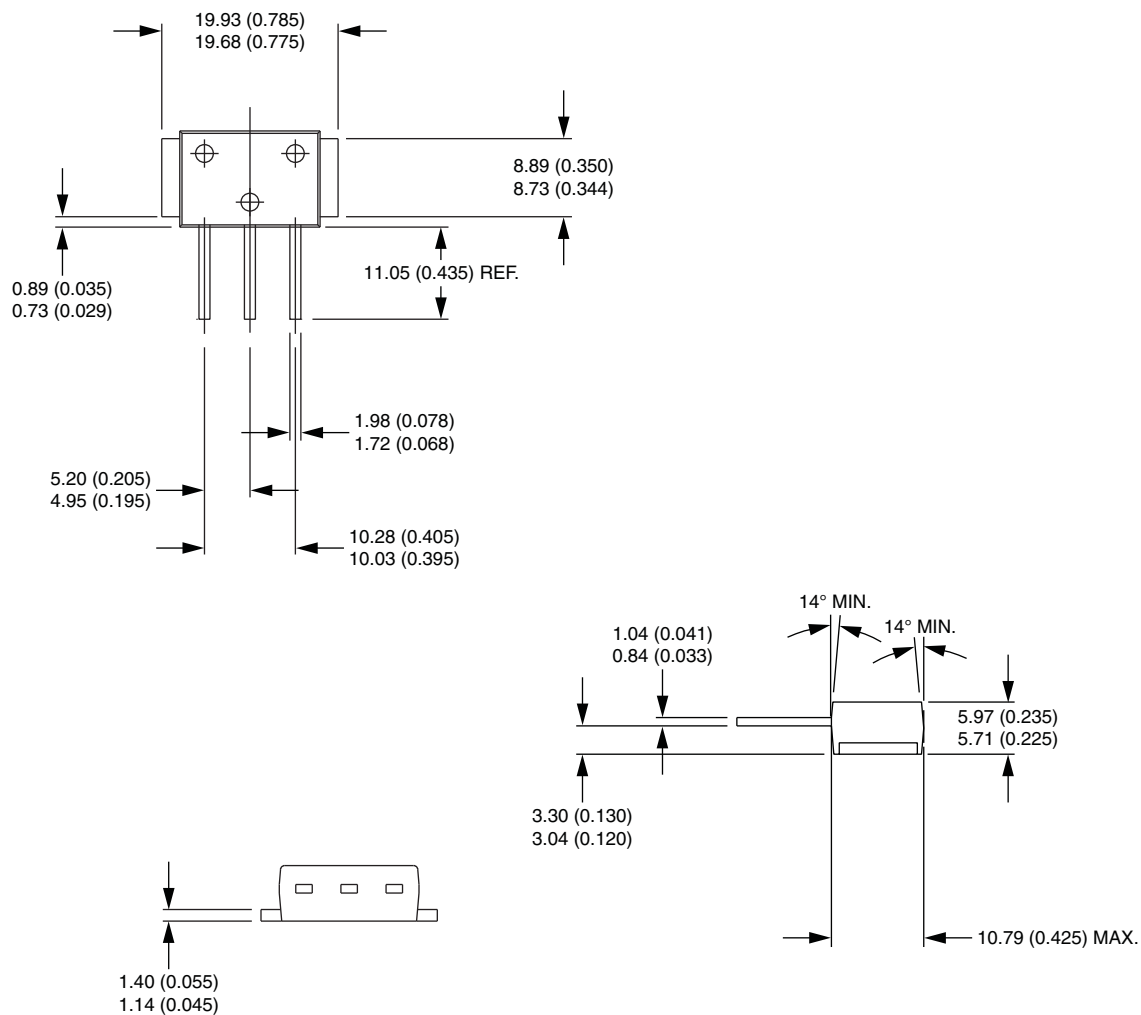
## D-61-8, D-61-8-SM, D-61-8-SL

**DIMENSIONS - D-61-8** in millimeters (inches)



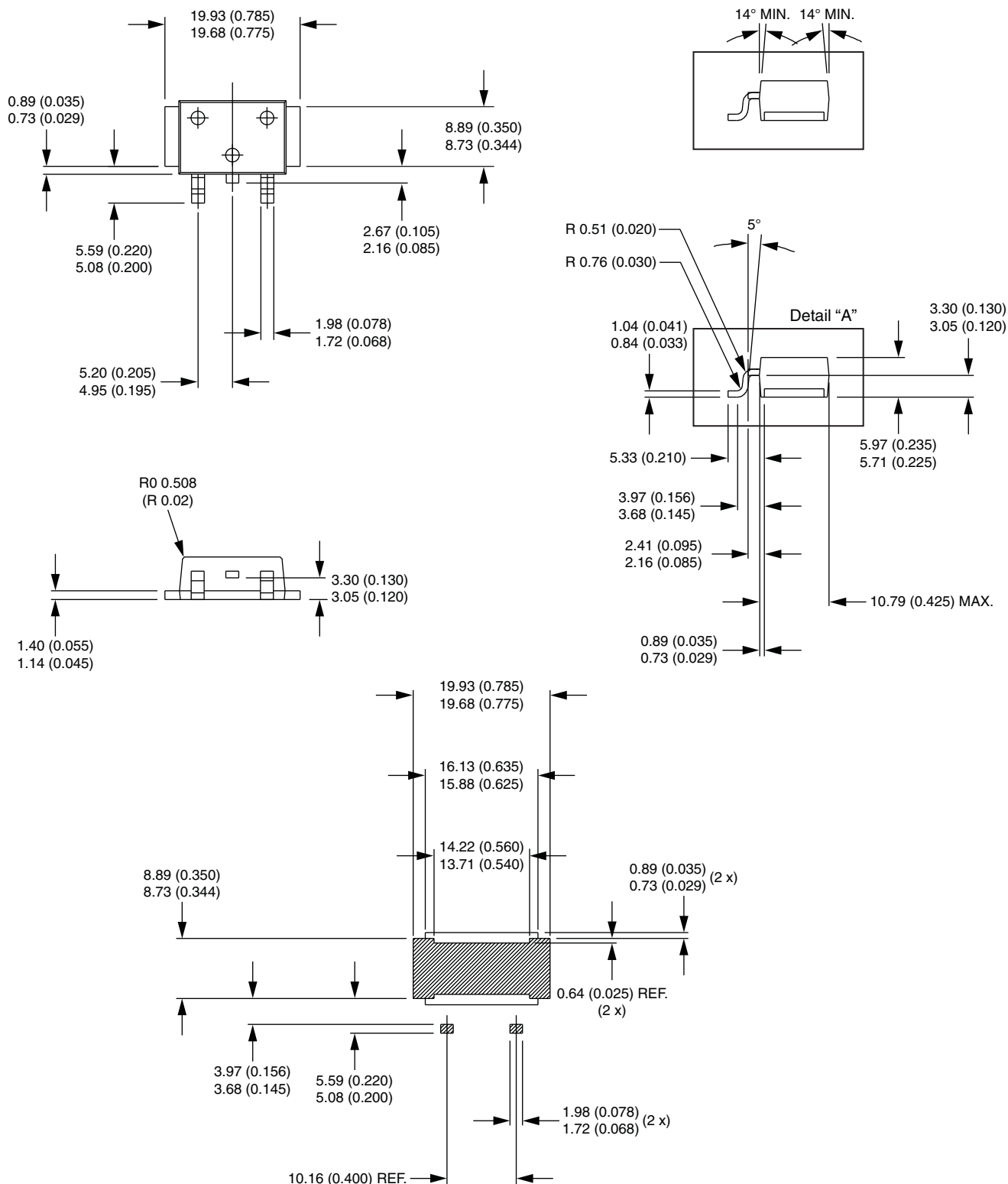


## DIMENSIONS - D-61-8-SM in millimeters (inches)





## DIMENSIONS - D-61-8-SL in millimeters (inches)







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**Please note that some Vishay documentation may still make reference to RoHS Directive 2002/95/EC. We confirm that all the products identified as being compliant to Directive 2002/95/EC conform to Directive 2011/65/EU.**

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Components Supply Platform

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