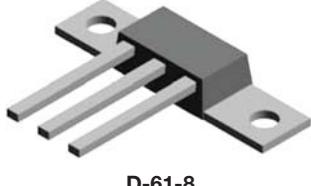
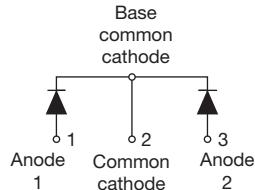


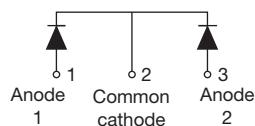
## High Performance Schottky Rectifier New Generation 3 D-61 Package, 2 x 55 A

**VS-111CNQ045APbF**


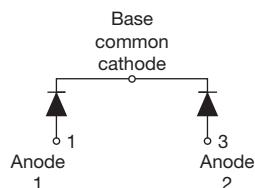
D-61-8


**VS-111CNQ045ASMPbF**


D-61-8-SM


**VS-111CNQ045ASLPbF**


D-61-8-SL


**PRODUCT SUMMARY**

Package	D-61
$I_{F(AV)}$	2 x 55 A
$V_R$	45 V
$V_F$ at $I_F$	0.61
$I_{RM}$ max.	65 mA at 125 °C
$T_J$ max.	175 °C
Diode variation	Common cathode
$E_{AS}$	54 mJ

**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 A <sub>pk</sub> , $T_J = 125$ °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	$V_{RWM}$		


**FEATURES**

- 175 °C  $T_J$  operation
- Center tap module
- Very low forward voltage drop
- High frequency operation
- High power discrete
- 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
- Designed and qualified for industrial level
- Material categorization: For definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)

**Note**

\* This datasheet provides information about parts that are RoHS-compliant and/or parts that are non-RoHS-compliant. For example, parts with lead (Pb) terminations are not RoHS-compliant. Please see the information/tables in this datasheet for details.

**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.

**ABSOLUTE MAXIMUM RATINGS**

PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS	
Maximum average forward current per leg See fig. 5	$I_{F(AV)}$	50 % duty cycle at $T_J = 152^\circ\text{C}$ , rectangular waveform		55	A	
				110		
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	Following any rated load condition and with rated $V_{RRM}$ applied	4000	A	
		10 ms sine or 6 ms rect. pulse		600		
Non-repetitive avalanche energy per leg	$E_{AS}$	$T_J = 25^\circ\text{C}$ , $I_{AS} = 8 \text{ A}$ , $L = 1.7 \text{ mH}$		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	$T_J = 25^\circ\text{C}$	0.61	V	
		110 A		0.75		
		55 A	$T_J = 125^\circ\text{C}$	0.55		
		110 A		0.69		
Maximum reverse leakage current per leg	$I_{RM}^{(1)}$	$T_J = 25^\circ\text{C}$	$V_R = \text{Rated } V_R$	1.5	mA	
		$T_J = 125^\circ\text{C}$		65		
Maximum junction capacitance per leg	$C_T$	$V_R = 5 \text{ V}_{\text{DC}}$ (test signal range 100 kHz to 1 MHz), $25^\circ\text{C}$		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**

<sup>(1)</sup> 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	°C	
Maximum thermal resistance, junction to case per leg	$R_{thJC}$	DC operation		0.5	°C/W	
				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	g	
				0.28	oz.	
Mounting torque (D-61-8 only)	minimum			40 (35)	kgf · cm (lbf · in)	
	maximum			58 (50)		
Marking device		Case style D-61-8		111CNQ045A		
		Case style D-61-8-SM		111CNQ045ASM		
		Case style D-61-8-SL		111CNQ045ASL		

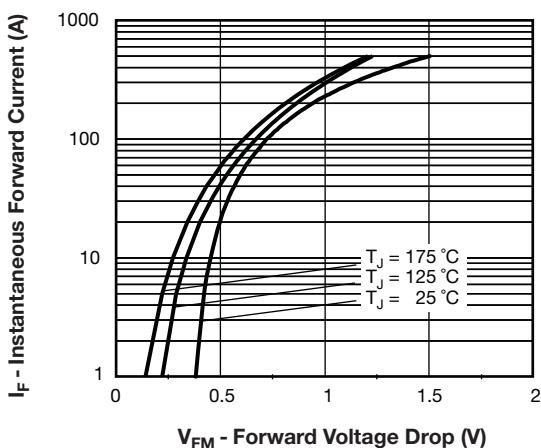


Fig. 1 - Maximum Forward Voltage Drop Characteristics (Per Leg)

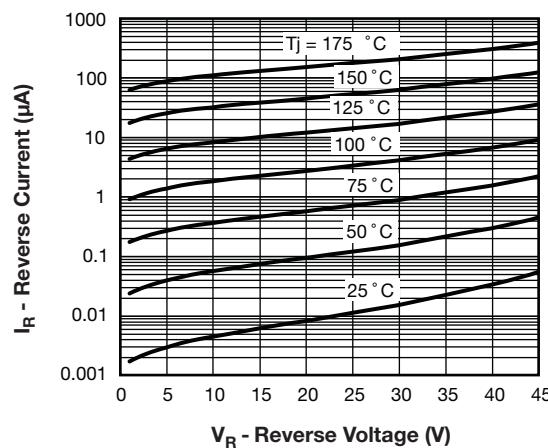


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage (Per Leg)

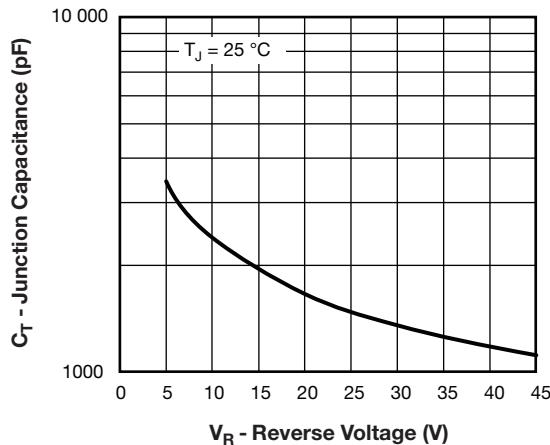


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage (Per Leg)

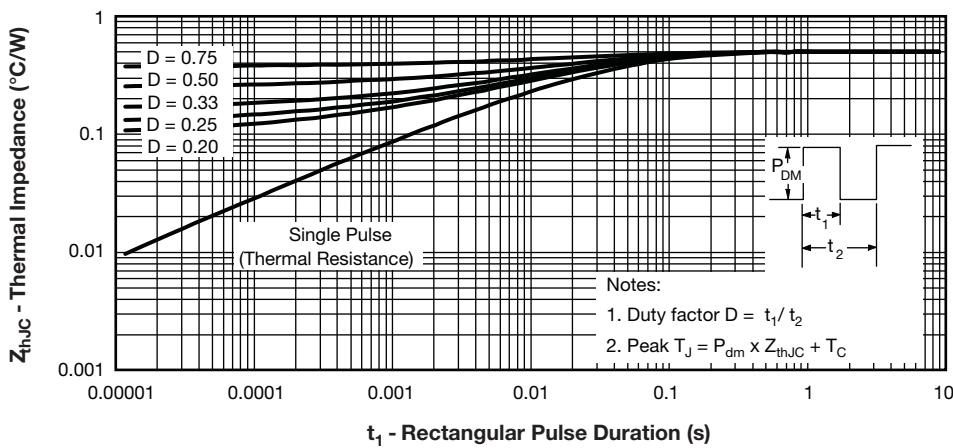


Fig. 4 - Maximum Thermal Impedance  $Z_{thJC}$  Characteristics (Per Leg)

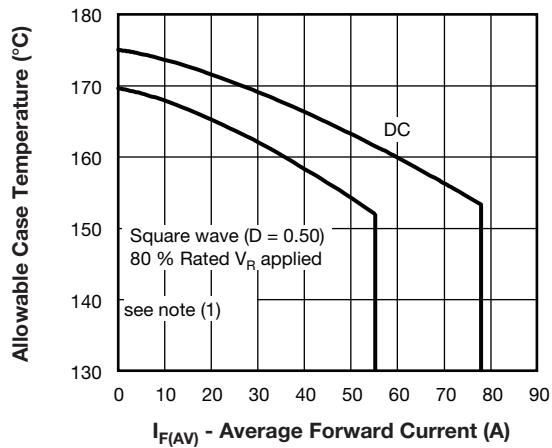


Fig. 5 - Maximum Allowable Case Temperature vs.  
Average Forward Current (Per Leg)

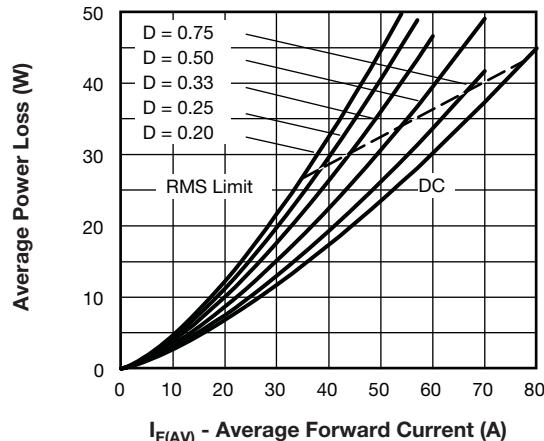


Fig. 6 - Forward Power Loss Characteristics  
(Per Leg)

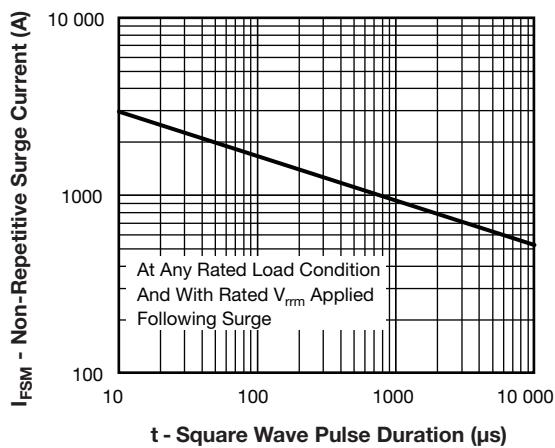


Fig. 7 - Maximum Non-Repetitive Surge Current (Per Leg)

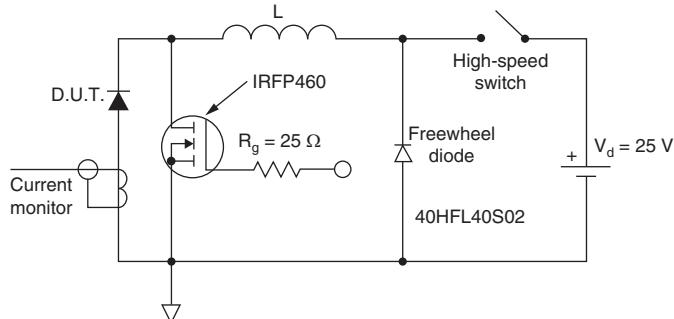


Fig. 8 - Unclamped Inductive Test Circuit

#### Note

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

**ORDERING INFORMATION TABLE**

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

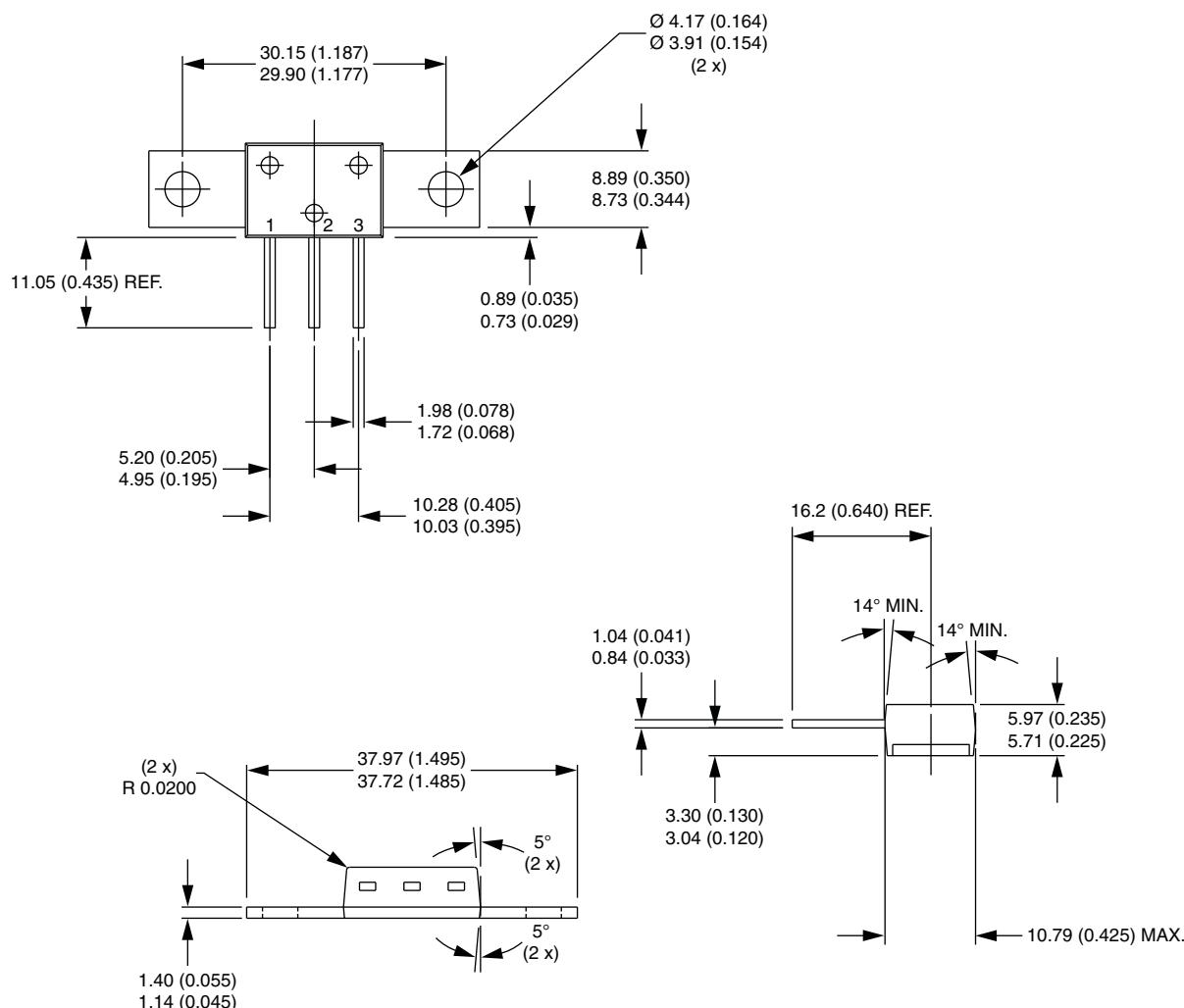
- 1** - Vishay Semiconductors product
- 2** - Current rating (111 = 110 A)
- 3** - Circuit configuration:  
C = Common cathode
- 4** - Package:  
N = D-61
- 5** - Schottky "Q" series
- 6** - Voltage ratings (045 = 45 V)
- 7** - Package style:
  - A = D-61-8
  - ASM = D-61-8-SM
  - ASL = D-61-8-SL
- 8**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

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

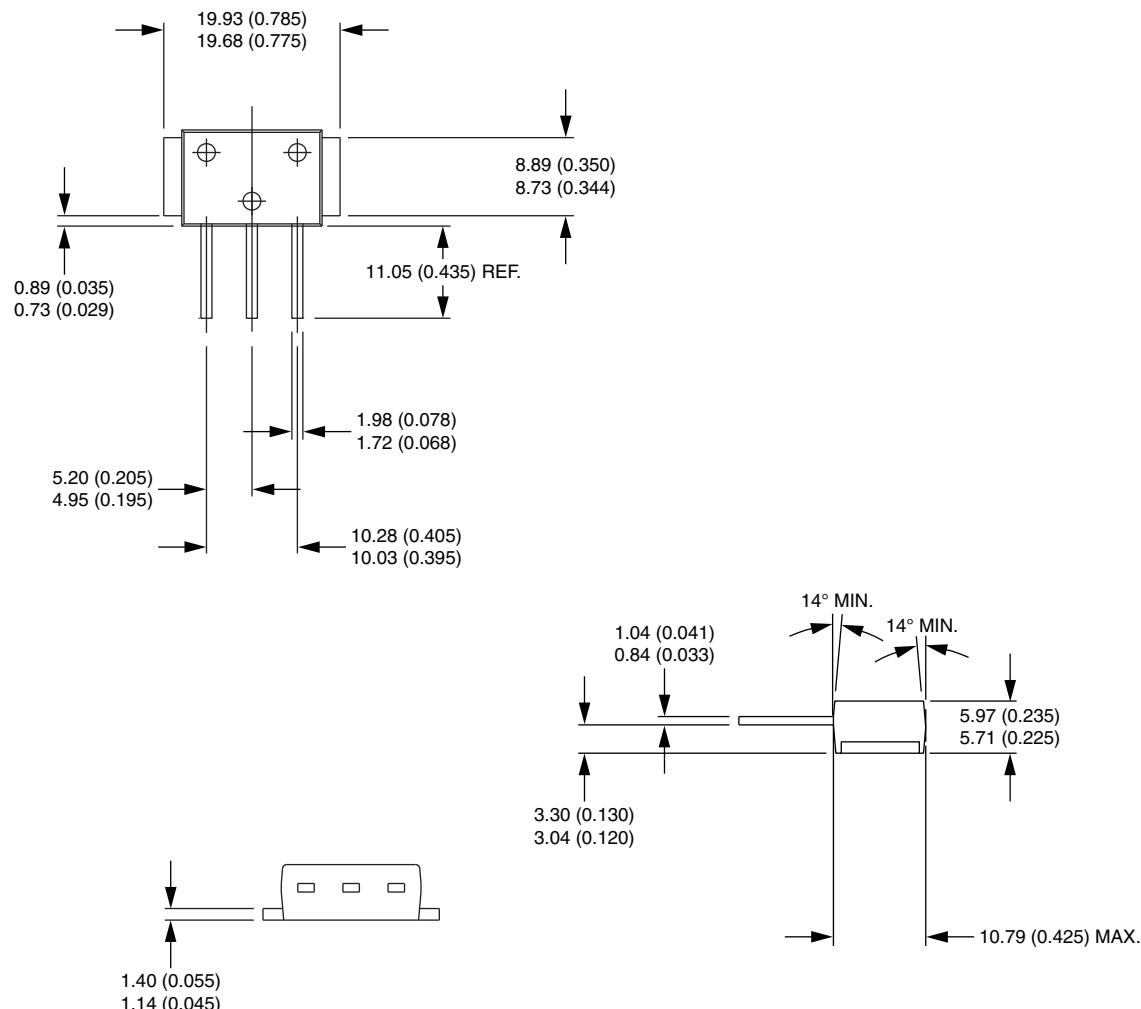
LINKS TO RELATED DOCUMENTS	
Dimensions	<a href="http://www.vishay.com/doc?95354">www.vishay.com/doc?95354</a>
Part marking information	<a href="http://www.vishay.com/doc?95356">www.vishay.com/doc?95356</a>

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

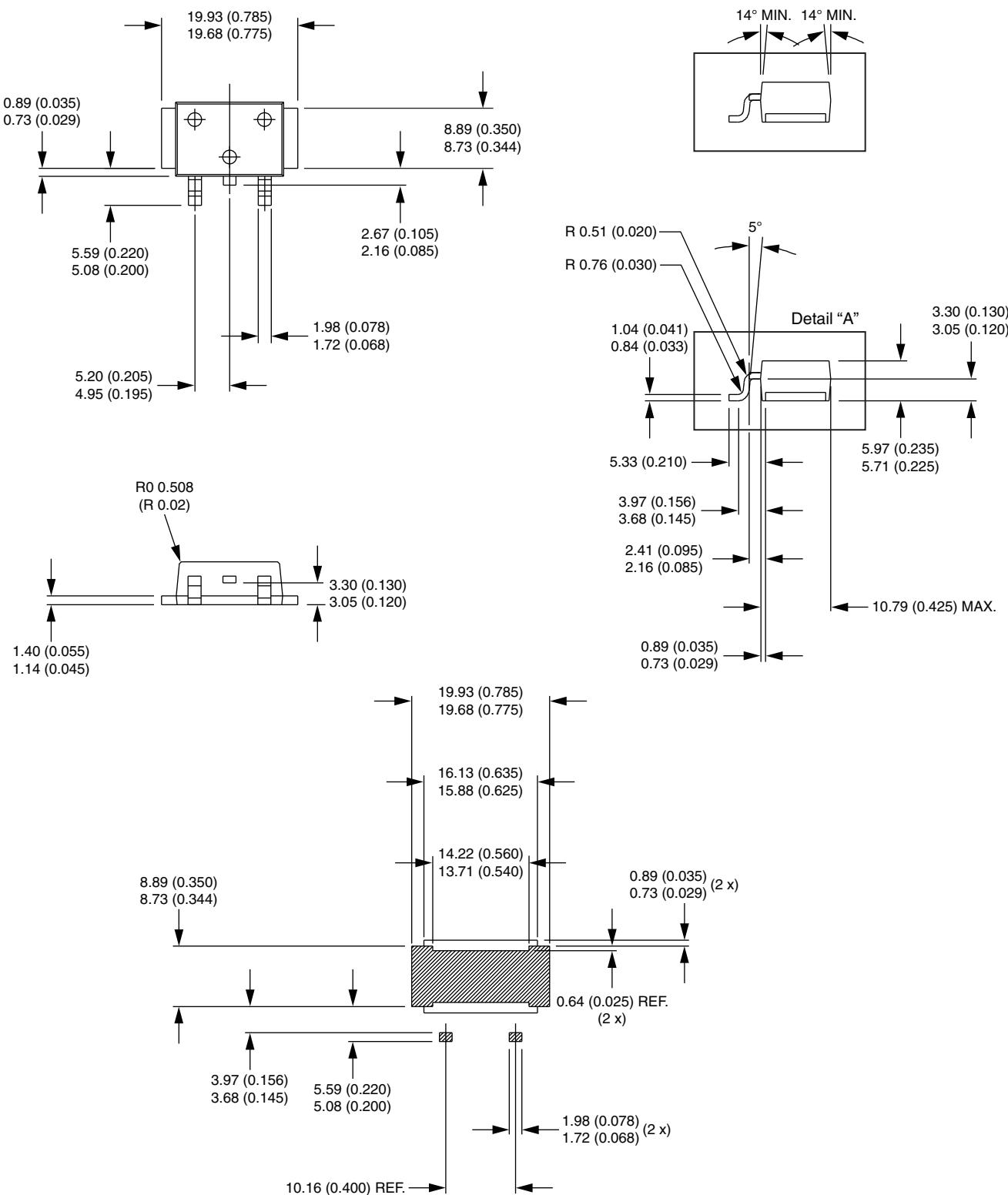
**DIMENSIONS - D-61-8** in millimeters (inches)



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



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



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