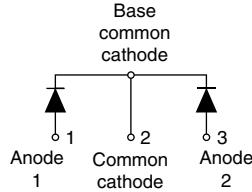
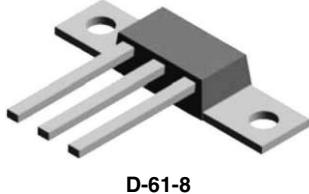
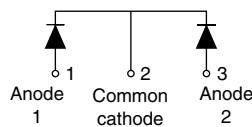
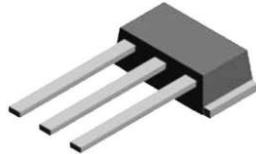
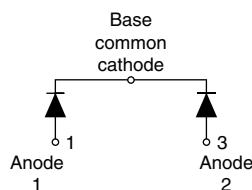


Schottky Rectifier New Generation 3 D-61 Package, 2 x 40 A

VS-87CNQ020APbF

VS-87CNQ020ASMPbF

D-61-8-SM
VS-87CNQ020ASLPbF

PRODUCT SUMMARY

$I_{F(AV)}$	2 x 40 A
V_R at 125 °C	20 V
V_R at 150 °C	10 V
I_{RM}	550 mA at 125 °C

FEATURES

- 150 °C T_J operation
- Center tap module
- Optimized for 3.3 V application
- Ultralow 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
- Through-hole versions are currently available for use in lead (Pb)-free applications ("PbF" suffix)
- Compliant to RoHS directive 2002/95/EC
- Designed and qualified for industrial level


DESCRIPTION

The center tap Schottky rectifier module has been optimized for ultralow forward voltage drop specifically for 3.3 V output power supplies. The proprietary barrier technology allows for reliable operation up to 150 °C junction temperature. Typical applications are in parallel switching power supplies, converters, reverse battery protection, and redundant power subsystems.

MAJOR RATINGS AND CHARACTERISTICS

SYMBOL	CHARACTERISTICS	VALUES	UNITS
$I_{F(AV)}$	Rectangular waveform	80	A
V_{RRM}		20	V
I_{FSM}	$t_p = 5 \mu s$ sine	6000	A
V_F	40 Apk, $T_J = 125$ °C (per leg)	0.32	V
T_J	Range	- 55 to 150	°C

VOLTAGE RATINGS

PARAMETER	SYMBOL	TEST CONDITIONS	VS-87CNQ020APbF	UNITS
Maximum DC reverse voltage	V_R	125 °C	20	V
		150 °C	10	

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

VS-87CNQ020A PbF Series

Vishay High Power Products

Schottky Rectifier
New Generation 3 D-61 Package, 2 x 40 A



ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS	
Maximum average forward current per leg per device	$I_{F(AV)}$	50 % duty cycle at $T_J = 135^\circ\text{C}$, rectangular waveform		40	A	
				80		
Maximum peak one cycle non-repetitive surge current per leg	I_{FSM}	5 μs sine or 3 μs rect. pulse	Following any rated load condition and with rated V_{RRM} applied	6000	A	
		10 ms sine or 6 ms rect. pulse		1100		
Non-repetitive avalanche energy per leg	E_{AS}	$T_J = 25^\circ\text{C}$, $I_{AS} = 8\text{ A}$, $L = 1.12\text{ mH}$		36	mJ	
Repetitive avalanche current per leg	I_{AR}	Current decaying linearly to zero in 1 μs 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	$V_{FM}^{(1)}$	40 A	$T_J = 25^\circ\text{C}$	0.45	V	
		80 A		0.51		
		40 A	$T_J = 125^\circ\text{C}$	0.32		
		80 A		0.39		
		40 A	$T_J = 150^\circ\text{C}$	0.29		
		80 A		0.37		
Maximum reverse leakage current per leg	$I_{RM}^{(1)}$	$T_J = 125^\circ\text{C}$		90	mA	
		$V_R = 3.3\text{ V}$		70		
		$T_J = 150^\circ\text{C}$	$V_R = 10\text{ V}$	480		
		$T_J = 25^\circ\text{C}$	$V_R = \text{Rated } V_R$	5.5		
		$T_J = 125^\circ\text{C}$		550		
Threshold voltage	$V_{F(TO)}$	$T_J = T_J$ maximum		0.191	V	
Forward slope resistance	r_t			2.3	$\text{m}\Omega$	
Maximum junction capacitance per leg	C_T	$V_R = 5\text{ V}_{\text{DC}}$ (test signal range 100 kHz to 1 MHz), 25°C		6500	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	$\text{V}/\mu\text{s}$	

Note

⁽¹⁾ Pulse width < 300 μs , duty cycle < 2 %

THERMAL - MECHANICAL SPECIFICATIONS

PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS	
Maximum junction and storage temperature range	T_J , T_{Stg}			- 55 to 150	°C	
Maximum thermal resistance, junction to case per leg per package	R_{thJC}	DC operation		0.85	°C/W	
				0.42		
Typical thermal resistance, case to heatsink	R_{thCS}	Mounting surface, smooth and greased Device flatness < 5 mils		0.30		
Approximate weight				7.8	g	
				0.28	oz.	
Mounting torque	minimum			40 (35)	kgf · cm (lbf · in)	
	maximum			58 (50)		
Marking device		Case style D-61		87CNQ020A		
		Case style D-61-8-SM		87CNQ020ASM		
		Case style D-61-8-SL		87CNQ020ASL		

Schottky Rectifier
New Generation 3 D-61 Package, 2 x 40 A

Vishay High Power Products

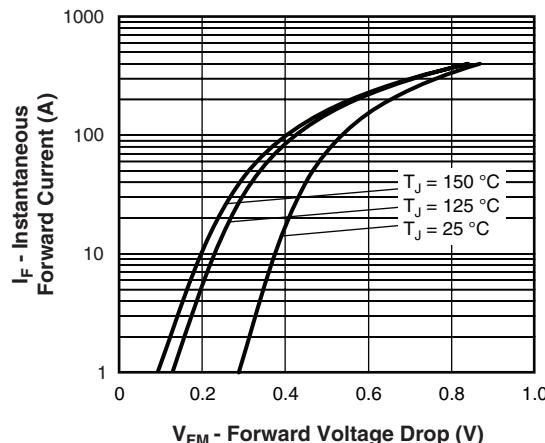


Fig. 1 - Maximum Forward Voltage Drop Characteristics
 (Per Leg)

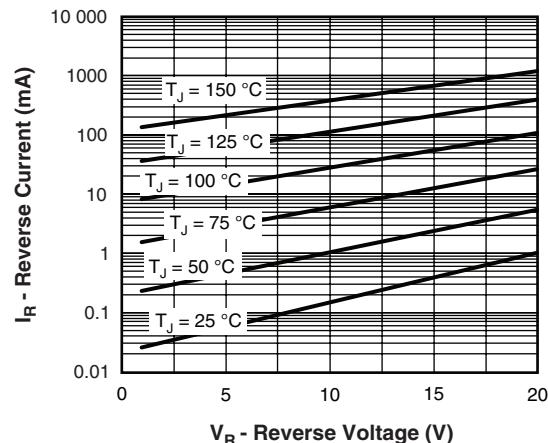


Fig. 2 - Typical Values of Reverse Current vs.
 Reverse Voltage (Per Leg)

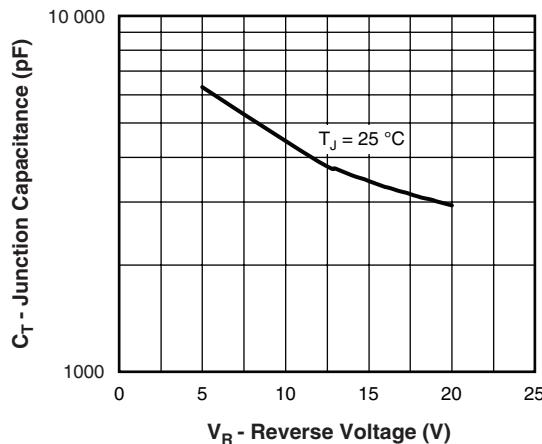


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage (Per Leg)

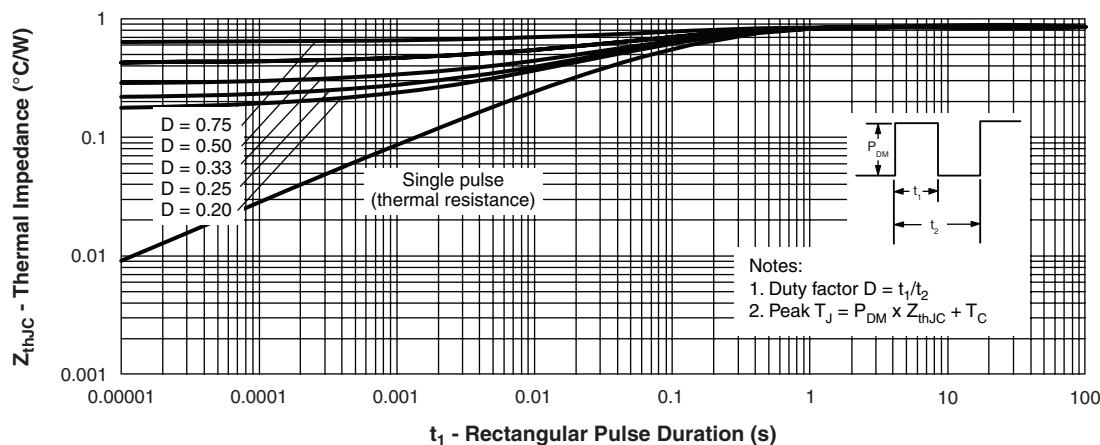


Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics (Per Leg)

VS-87CNQ020A PbF Series

Vishay High Power Products

Schottky Rectifier
New Generation 3 D-61 Package, 2 x 40 A

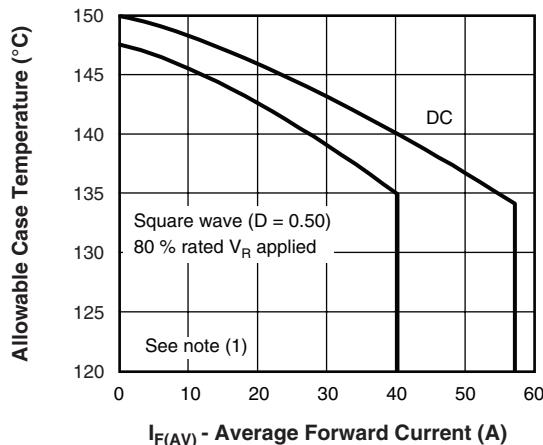


Fig. 5 - Maximum Allowable Case Temperature vs.
Average Forward Current (Per Leg)

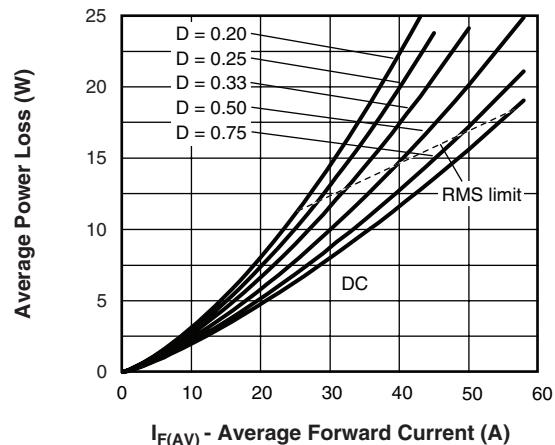


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

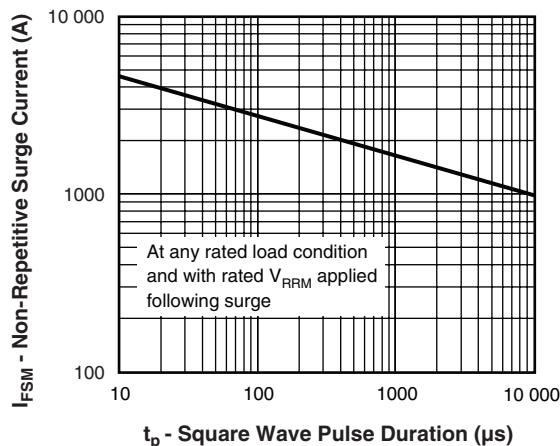


Fig. 7 - Maximum Non-Repetitive Surge Current (Per Leg)

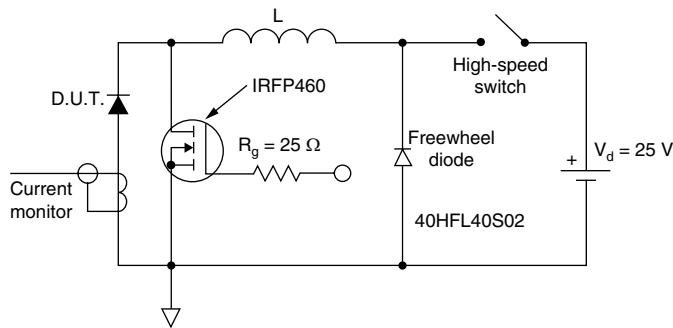


Fig. 8 - Unclamped Inductive Test Circuit

Note

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

**ORDERING INFORMATION TABLE**

Device code	VS-	87	C	N	Q	020	A	PbF
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)

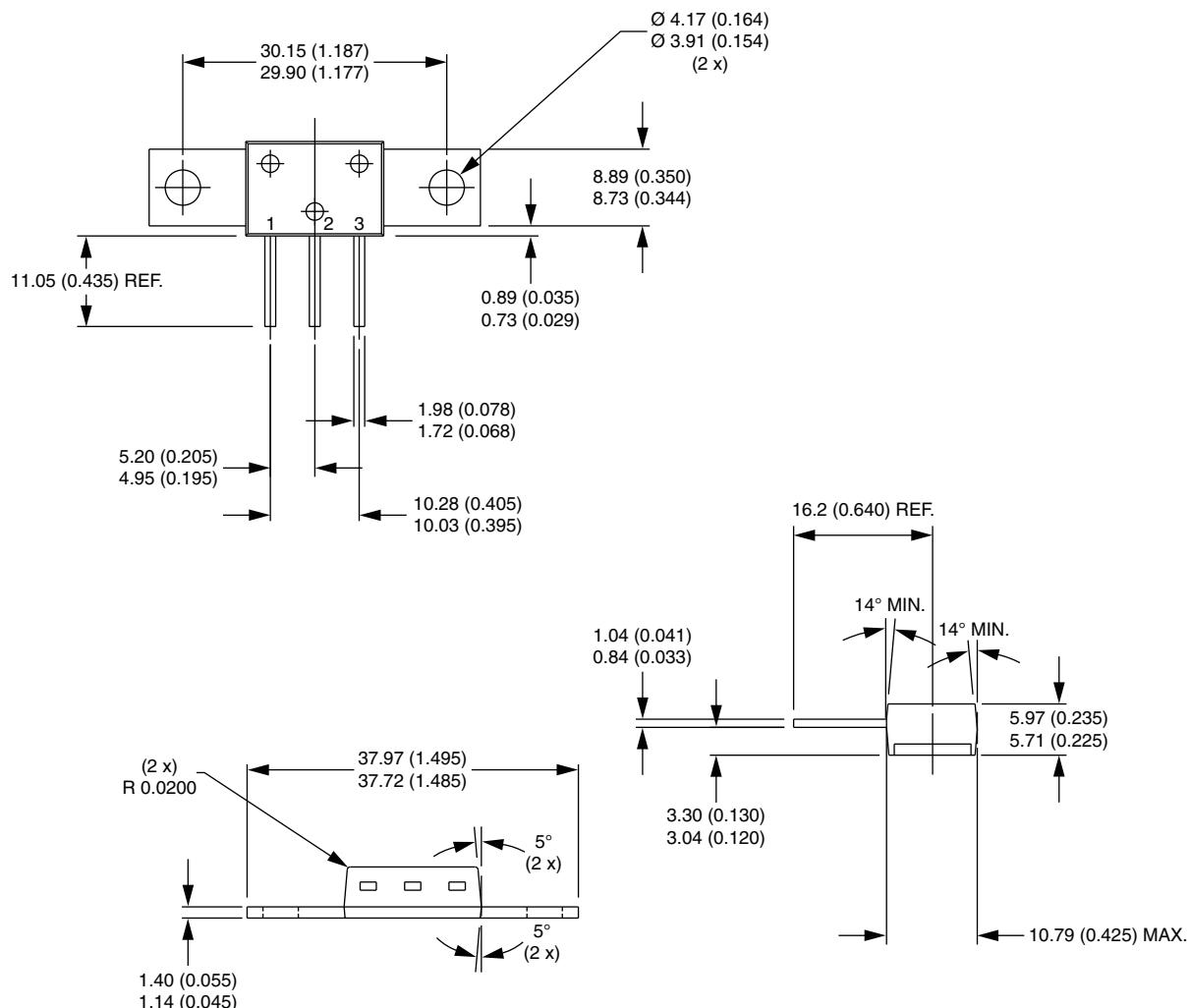
1 - HPP product suffix
2 - Current rating (80 A)
3 - Circuit configuration:
 C = Common cathode
4 - Package:
 N = D-61
5 - Schottky "Q" series
6 - Voltage rating (020 = 20 A)
7 - Package style:
 • A = D-61-8
 • ASM = D-61-8-SM
 • ASL = D-61-8-SL
8 - • None = Standard production
 • PbF = Lead (Pb)-free

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

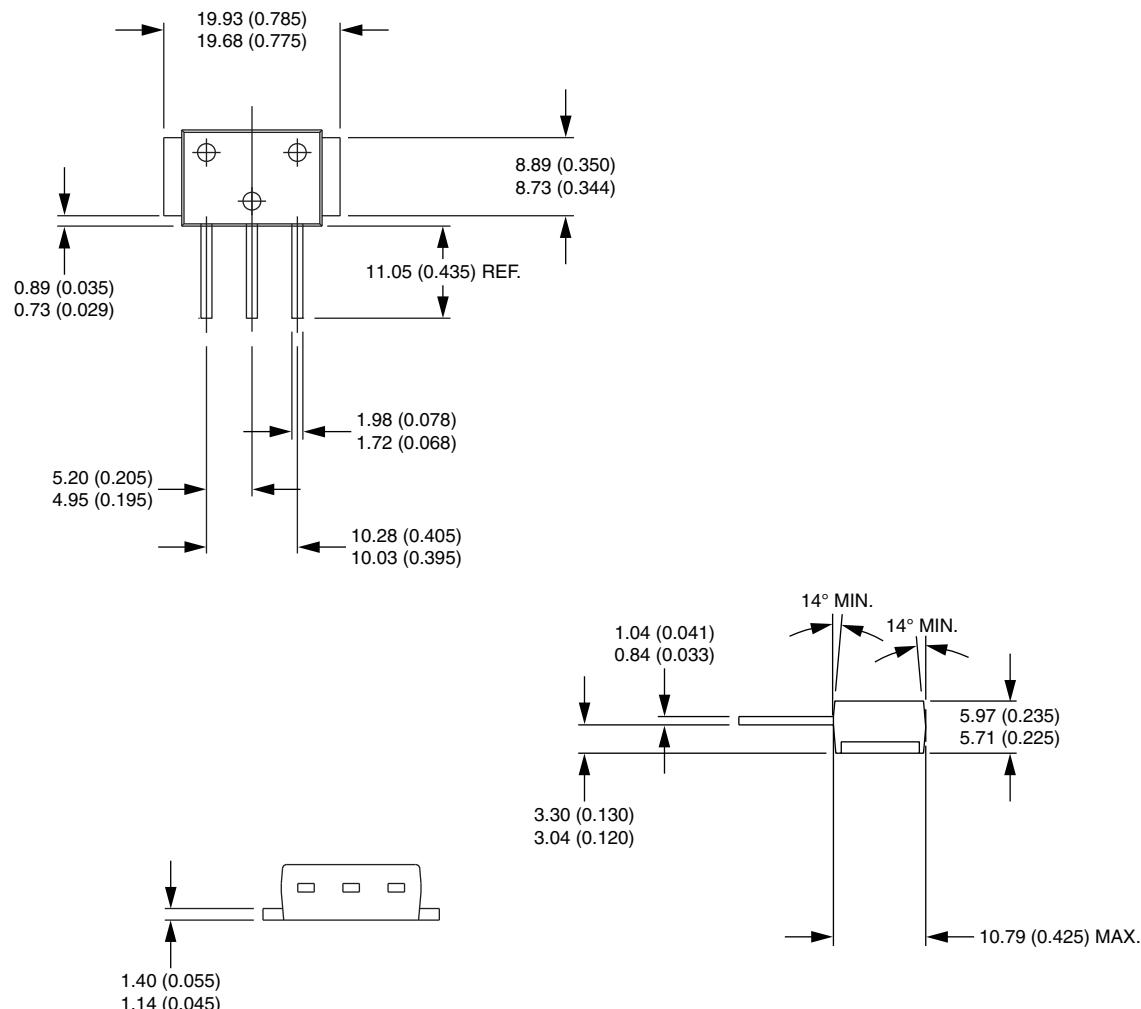
LINKS TO RELATED DOCUMENTS	
Dimensions	www.vishay.com/doc?95354
Part marking information	www.vishay.com/doc?95356

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

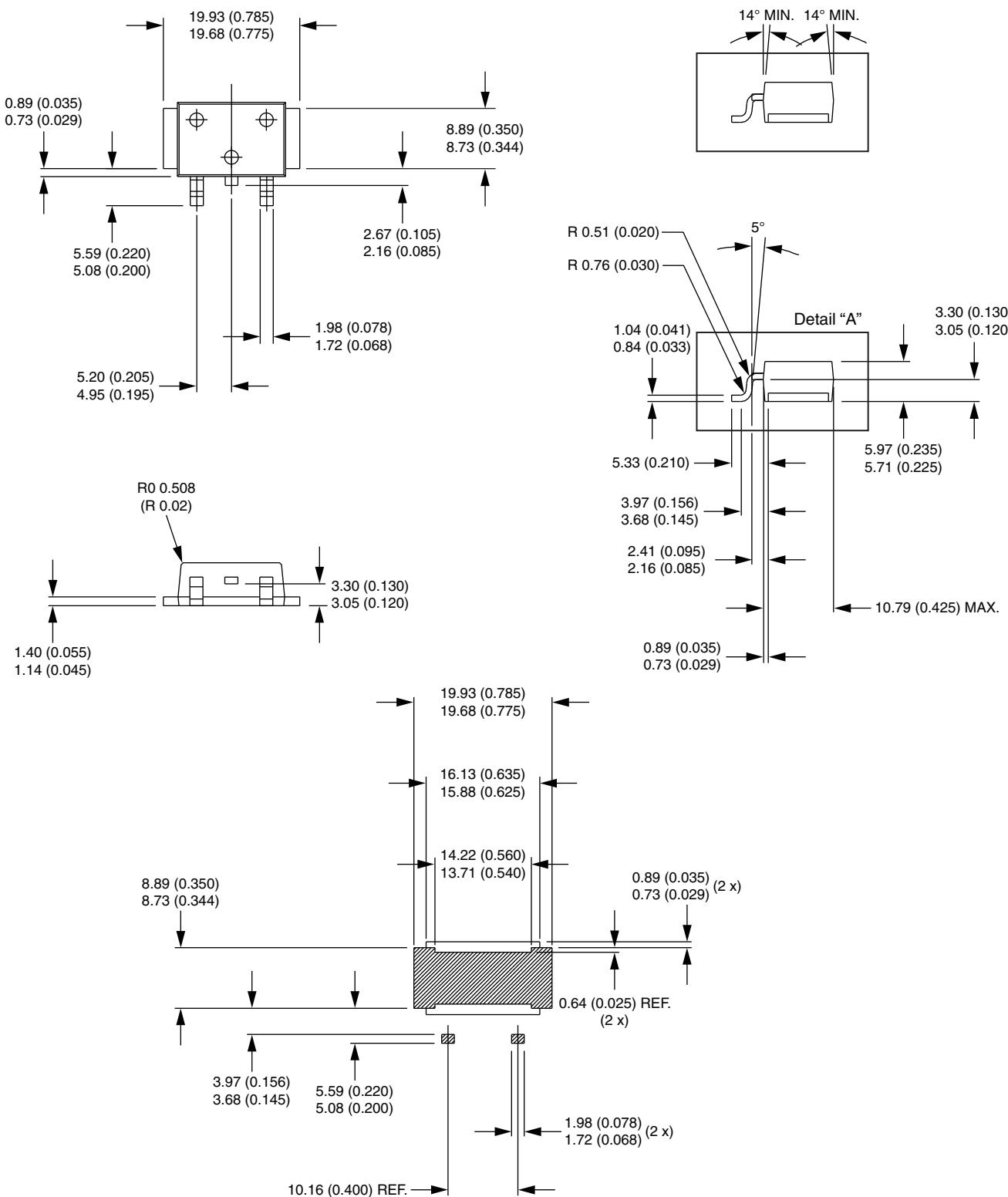
DIMENSIONS - D-61-8 in millimeters (inches)



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



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



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