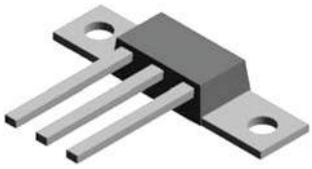
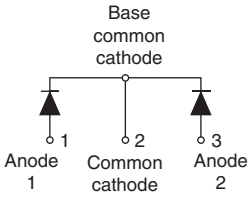
High Performance Schottky Rectifier, New Generation 3, D-61 Package, 2 x 40 A

VS-80CNQ...APbF

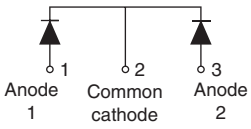


D-61-8



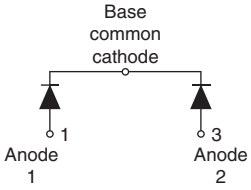
VS-80CNQ...ASMPbF

D-61-8-SM



VS-80CNQ...ASLPbF

D-61-8-SL



FEATURES

RoHS COMPLIANT

- 150 °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-mould low profile, small footprint, high current package
- Through-hole versions are currently available for use in lead (Pb)-free applications (“PbF” suffix)
- Designed and qualified for industrial level
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

DESCRIPTION

The center tap Schottky rectifier module series has been optimized for very low forward voltage drop, with moderate leakage. The proprietary barrier technology allows for reliable operation up to 150 °C junction temperature. Typical applications are in switching power supplies, converters, freewheeling diodes, and reverse battery protection.

PRODUCT SUMMARY	
Package	D-61
$I_{F(AV)}$	2 x 40 A
V_R	35 V, 40 V, 45 V
V_F at I_F	0.51 V
I_{RM} max.	250 mA at 125 °C
T_J max.	150 °C
Diode variation	Common cathode
E_{AS}	54 mJ

MAJOR RATINGS AND CHARACTERISTICS			
SYMBOL	CHARACTERISTICS	VALUES	UNITS
$I_{F(AV)}$	Rectangular waveform	80	A
V_{RRM}	Range	35 to 45	V
I_{FSM}	t_p = 5 µs sine	5800	A
V_F	40 A_{pk}, T_J = 125 °C (per leg)	0.47	V
T_J	Range	-55 to +150	°C

VOLTAGE RATINGS					
PARAMETER	SYMBOL	VS-80CNQ035APbF	VS-80CNQ040APbF	VS-80CNQ045APbF	UNITS
Maximum DC reverse voltage	V_R	35	40	45	V
Maximum working peak reverse voltage	V_{RWM}				

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ABSOLUTE MAXIMUM RATINGS

PARAMETER		SYMBOL	TEST CONDITIONS		VALUES	UNITS
Maximum average forward current See fig. 5	per leg	$I_{F(AV)}$	50 % duty cycle at T_C = 114 °C, rectangular waveform		40	A
	per device				80	
Maximum peak one cycle non-repetitive surge current per leg See fig. 7		I_{FSM}	5 µs sine or 3 µs rect. pulse	Following any rated load condition and with rated V_{RRM} applied	5800	
			10 ms sine or 6 ms rect. pulse		750	
Non-repetitive avalanche energy per leg		E_{AS}	T_J = 25 °C, I_{AS} = 8 A, L = 1.7 mH		54	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 x 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)	40 A	T_J = 25 °C	0.52	V
		80 A		0.66	
		40 A	T_J = 125 °C	0.47	
		80 A		0.61	
Maximum reverse leakage current per leg See fig. 2	I_{RM} (1)	T_J = 25 °C	V_R = Rated V_R	5	mA
		T_J = 125 °C		250	
Threshold voltage	$V_{F(TO)}$	T_J = T_J maximum		0.26	V
Forward slope resistance	r_t			3.93	mΩ
Maximum junction capacitance per leg	C_T	V_R = 5 V_{DC} (test signal range 100 kHz to 1 MHz) 25 °C		2600	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/µs

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	R_{thJC}	DC operation (see fig. 4)	0.85	°C/W
	per package		DC operation	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	80CNQ035A	
				80CNQ040A	
				80CNQ045A	
			Case style D-61-8-SM	80CNQ035ASM	
				80CNQ040ASM	
				80CNQ045ASM	
			Case style D-61-8-SL	80CNQ035ASL	
				80CNQ040ASL	
				80CNQ045ASL	

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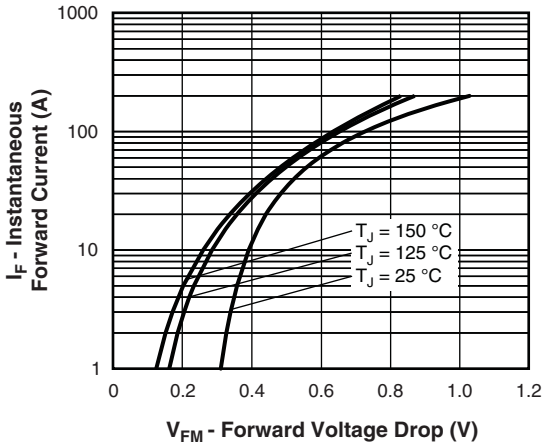

Fig. 1 - Maximum Forward Voltage Drop Characteristics (Per Leg)

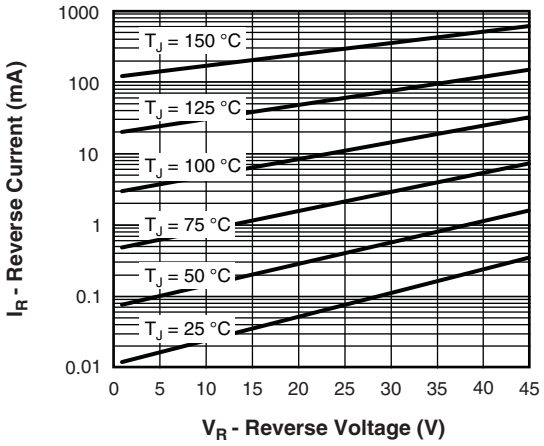

Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage (Per Leg)

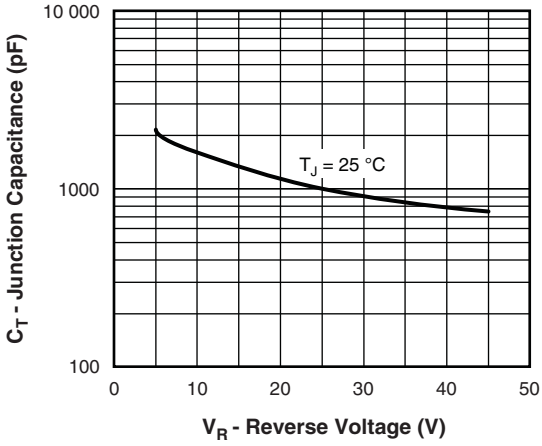

Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage (Per Leg)

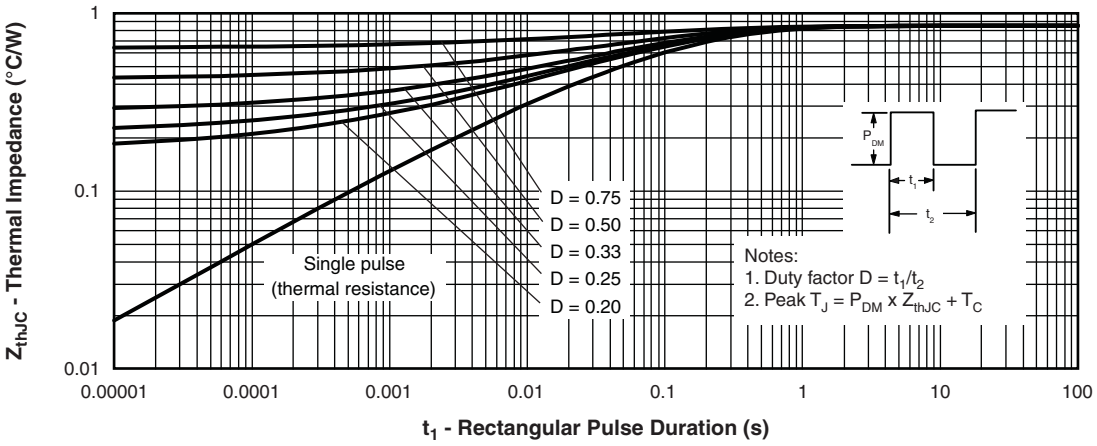

Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics (Per Leg)

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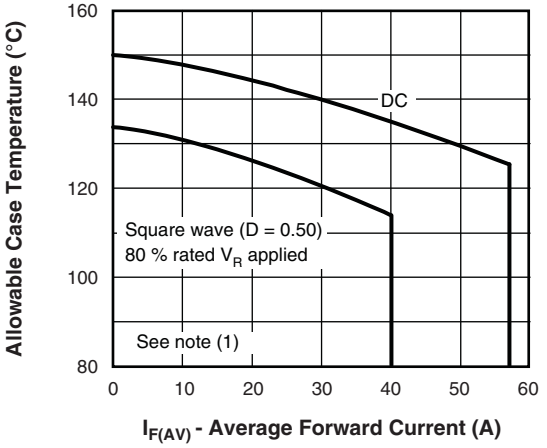

Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current (Per Leg)

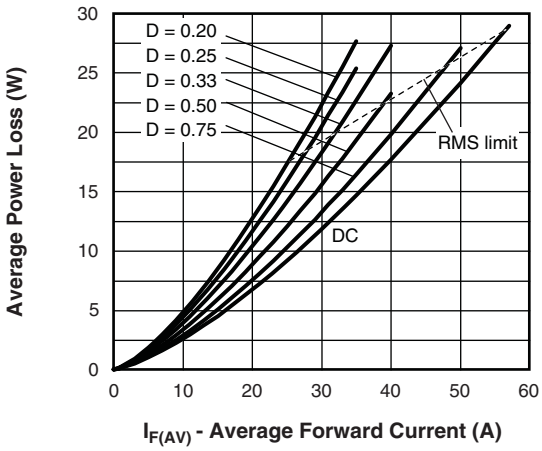

Fig. 6 - Forward Power Loss Characteristics (Per Leg)

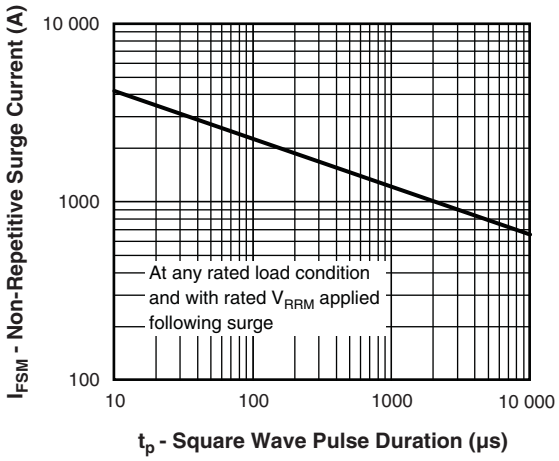

Fig. 7 - Maximum Non-Repetitive Surge Current (Per Leg)

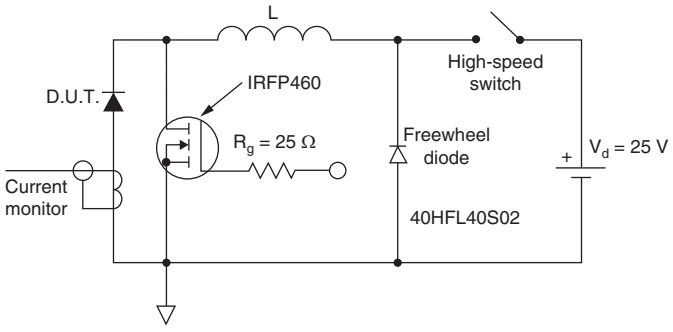

Fig. 8 - Unclamped Inductive Test Circuit

Note

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

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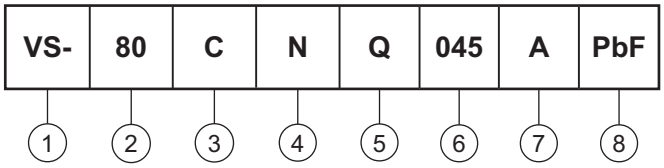
ORDERING INFORMATION TABLE

Device code



1 - Vishay Semiconductors product

2 - Current rating (80 A)

3 - Circuit configuration:
C = common cathode

4 - Package:
N = D-61

5 - Schottky "Q" series

6 - Voltage ratings
035 = 35 V
040 = 40 V
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

ORDERING INFORMATION (Example)			
PREFERRED P/N	**QUANTITY PER REEL**	**MINIMUM ORDER QUANTITY**	**PACKAGING DESCRIPTION**
VS-80CNQ035PBF	10	200	Antistatic plastic tubes
VS-80CNQ035ASLPBF	20	400	Antistatic plastic tubes
VS-80CNQ035ASMPBF	20	400	Antistatic plastic tubes
VS-80CNQ040APBF	10	200	Antistatic plastic tubes
VS-80CNQ040ASLPBF	20	400	Antistatic plastic tubes
VS-80CNQ040ASMPBF	20	400	Antistatic plastic tubes
VS-80CNQ035APBF	10	200	Antistatic plastic tubes
VS-80CNQ035ASLPBF	20	400	Antistatic plastic tubes
VS-80CNQ035ASMPBF	20	400	Antistatic plastic tubes

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

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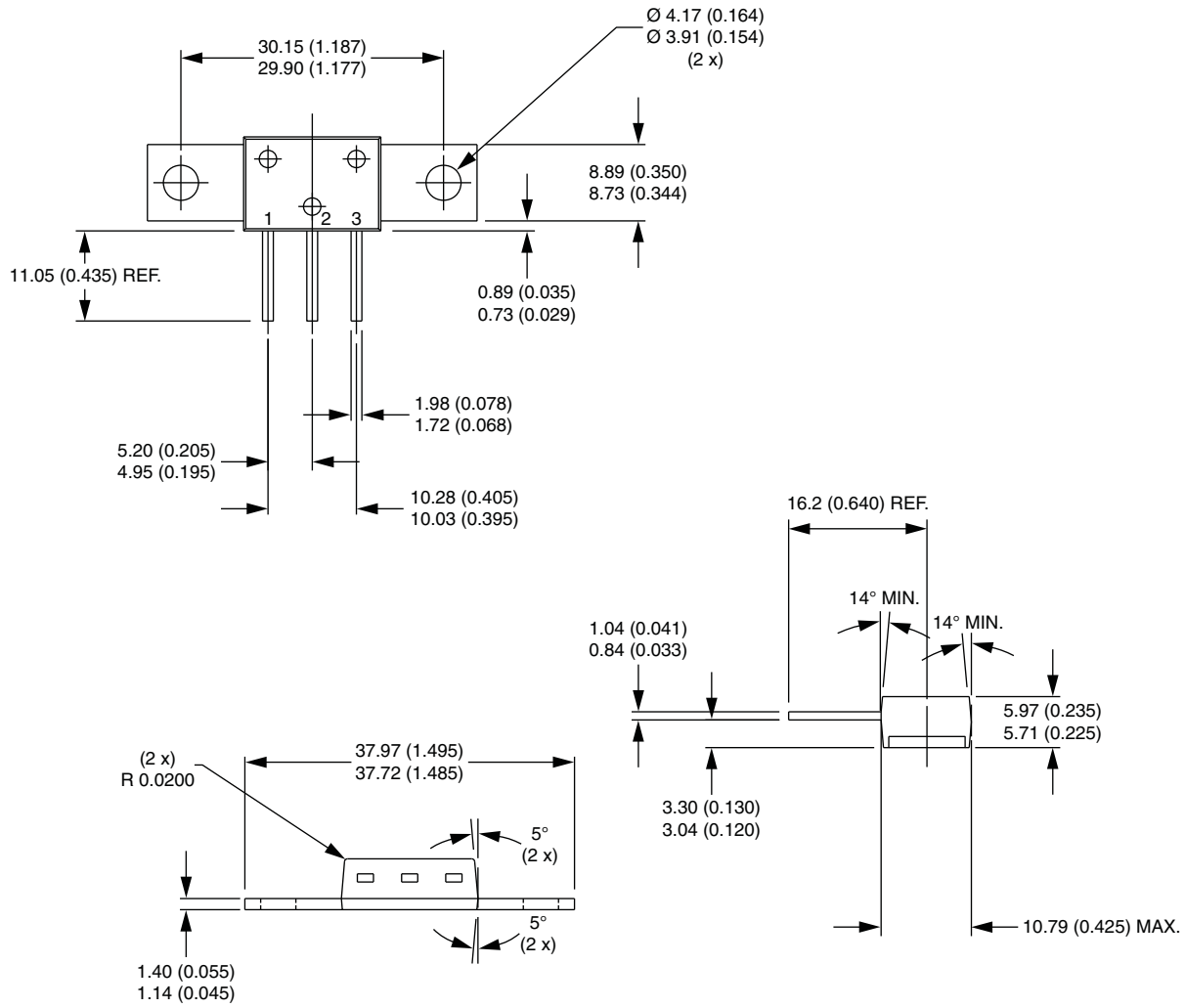
D-61-8, D-61-8-SM, D-61-8-SL

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



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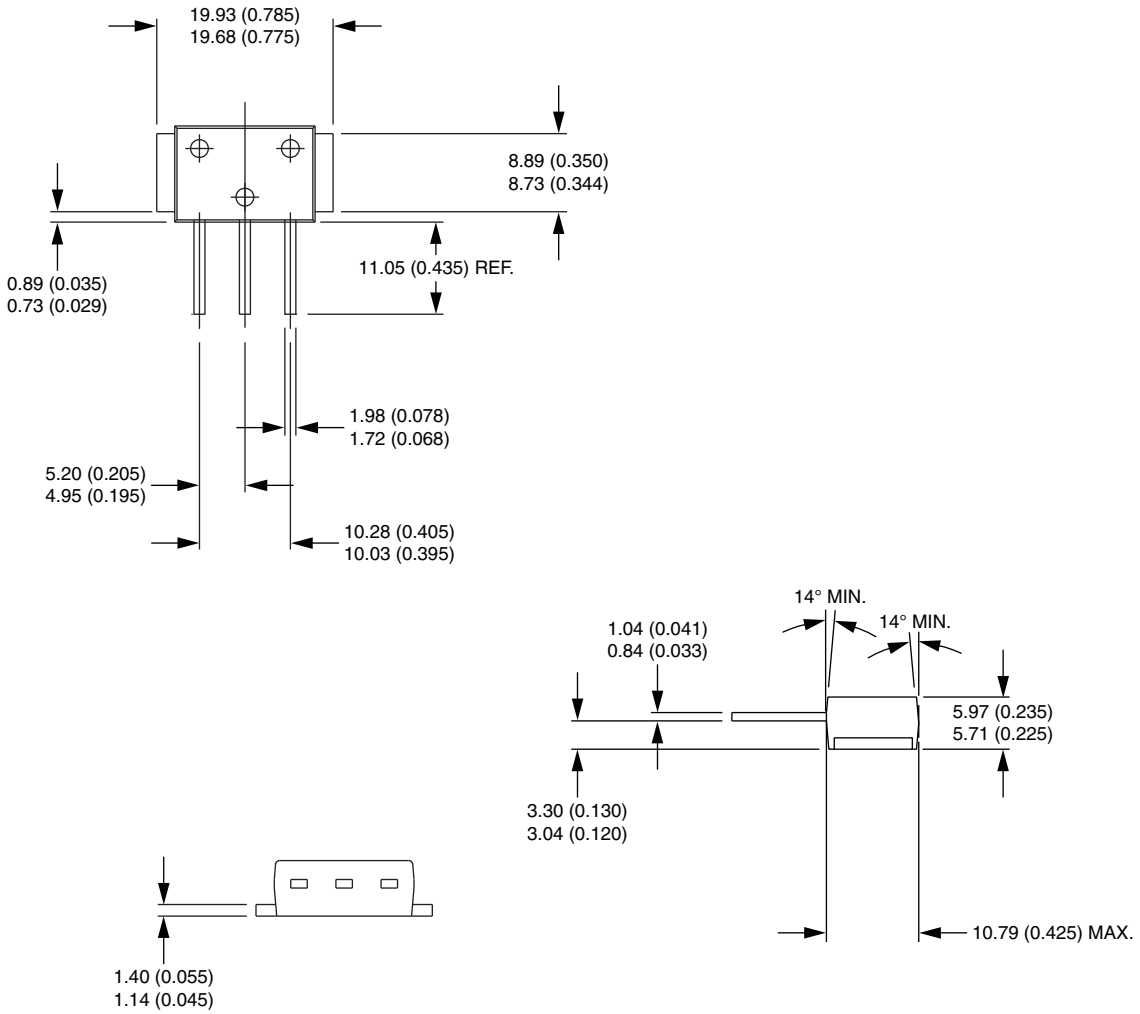
DIMENSIONS - D-61-8-SM in millimeters (inches)



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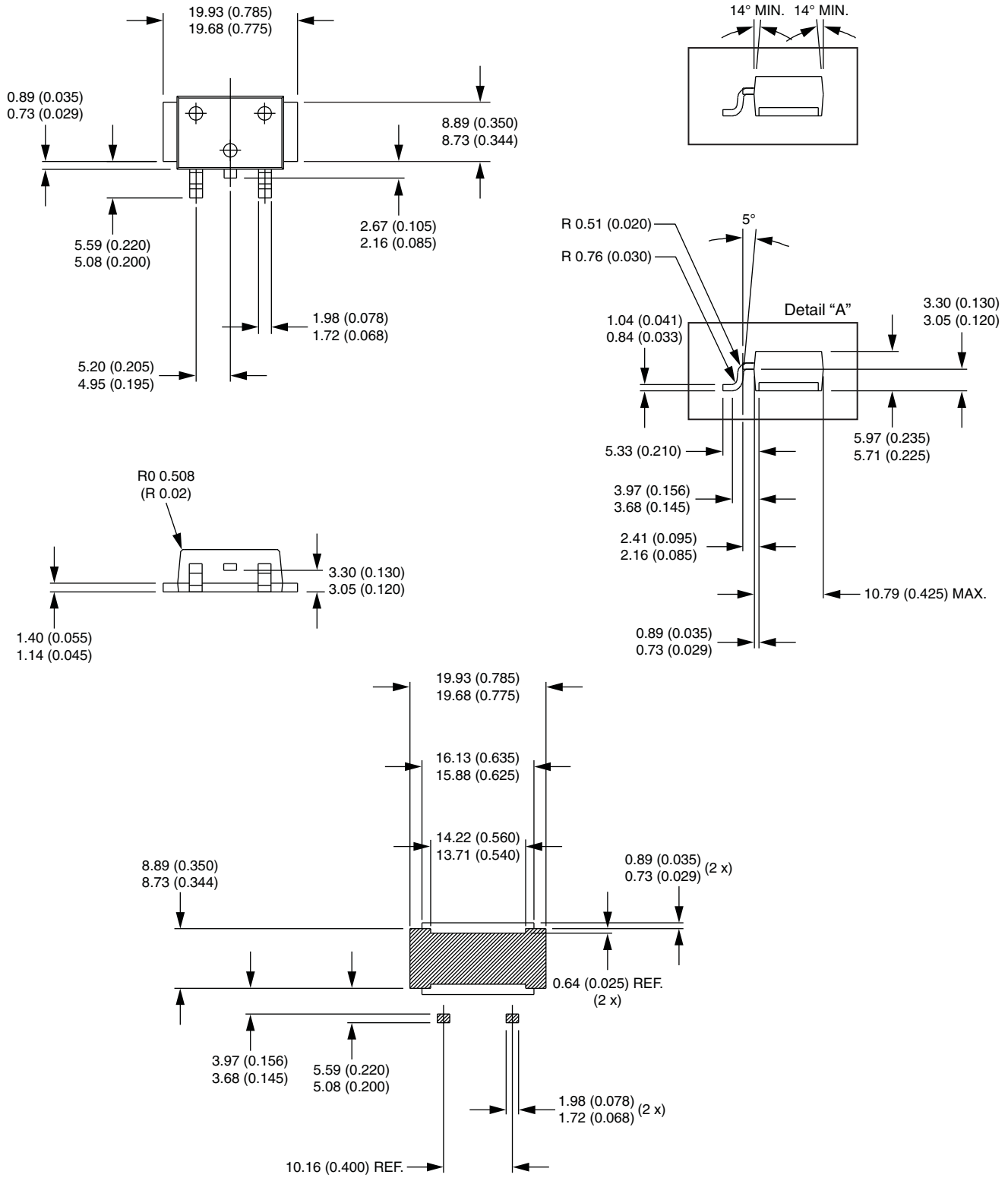
DIMENSIONS - D-61-8-SL in millimeters (inches)



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Офис по работе с юридическими лицами:

105318, г.Москва, ул.Щербаковская д.3, офис 1107, 1118, ДЦ «Щербаковский»

Телефон: +7 495 668-12-70 (многоканальный)

Факс: +7 495 668-12-70 (доб.304)

E-mail: info@moschip.ru

Skype отдела продаж:
moschip.ru
moschip.ru_4
moschip.ru_6
moschip.ru_9