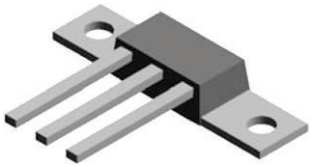
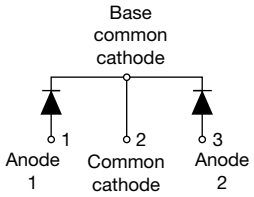
# High Performance Schottky Rectifier New Generation 3, D-61 Package, 2 x 55 A

**VS-115CNQ015APbF**



**D-61-8**

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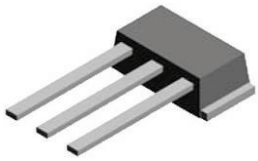
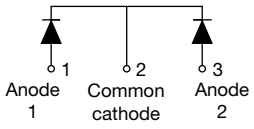
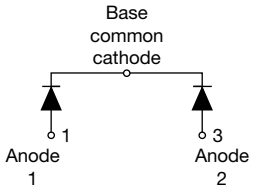


**D-61-8-SM**




**VS-115CNQ015ASLPbF**

**D-61-8-SL**




## FEATURES

Available

RoHS* Available

- 125 °C $T_J$ operation ($V_R$ < 5 V)
- Center tap module
- Optimized for OR-ing applications
- Ultralow forward voltage drop
- High frequency operation
- High power discrete
- Guard ring for enhanced ruggedness and long term reliability
- High purity, high temperature epoxy encapsulation for enhanced mechanical strength and moisture resistance
- 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

**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 ultra low forward voltage drop specifically for the OR-ing of parallel power supplies. The proprietary barrier technology allows for reliable operation up to 125 °C junction temperature. Typical applications are in parallel switching power supplies, converters, reverse battery protection, and redundant power subsystems.

| PRODUCT SUMMARY | |
|---|---|
| Package | D-61-8, D-61-8-SM, D-61-8-SL |
| $I_{F(AV)}$ | 2 x 55 A |
| $V_R$ | 15 V |
| $V_F$ at $I_F$ | 0.37 V |
| $I_{RM}$ max. | 1200 mA at 100 °C |
| $T_J$ max. | 125 °C |
| Diode variation | Common cathode |
| $E_{AS}$ | 54 mJ |

| MAJOR RATINGS AND CHARACTERISTICS | | | |
|---|---|---|---|
| SYMBOL | CHARACTERISTICS | VALUES | UNITS |
| $I_{F(AV)}$ | Rectangular waveform | 110 | A |
| $V_{RRM}$ | | 15 | V |
| $I_{FSM}$ | $t_p$ = 5 µs sine | 5050 | A |
| $V_F$ | 55 $A_{pk}$, $T_J$ = 75 °C (per leg) | 0.33 | V |
| $T_J$ | Range | -55 to +125 | °C |

| VOLTAGE RATINGS | | | | |
|---|---|---|---|---|
| PARAMETER | SYMBOL | TEST CONDITIONS | VS-115CNQ015APbF | UNITS |
| Maximum DC reverse voltage | $V_R$ | $T_J$ = 100 °C | 15 | V |
| Maximum working peak reverse voltage | $V_{RWM}$ | $T_J$ = 125 °C | 5 | |

## 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 $T_C$ = 112 °C, rectangular waveform | | 55 | A |
| | per device | | | | 110 | |
| 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 | 5050 | A |
| | | | 10 ms sine or 6 ms rect. pulse | | 830 | |
| Non-repetitive avalanche energy per leg | | $E_{AS}$ | $T_J$ = 25 °C, $I_{AS}$ = 2 A, L = 4.5 mH | | 54 | mJ |
| Repetitive avalanche current per leg | | $I_{AR}$ | Current decaying linearly to zero in 1 µs Frequency limited by $T_J$ maximum $V_A$ = 3 x $V_R$ typical | | 2 | 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 °C | 0.37 | V |
| | | 110 A | | 0.46 | |
| | | 55 A | $T_J$ = 75 °C | 0.33 | |
| | | 110 A | | 0.43 | |
| Maximum reverse leakage current per leg See fig. 2 | $I_{RM}$ (1) | $T_J$ = 25 °C | $V_R$ = Rated $V_R$ | 20 | mA |
| | | $T_J$ = 100 °C | | 1200 | |
| | | $T_J$ = 100 °C | $V_R$ = 12 V | 900 | |
| | | $T_J$ = 100 °C | $V_R$ = 5 V | 540 | |
| Maximum junction capacitance per leg | $C_T$ | $V_R$ = 5 $V_{DC}$ (test signal range 100 kHz to 1 MHz), 25 °C | | 5500 | 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 temperature range | | $T_J$ | | -55 to +125 | °C |
| Maximum storage temperature range | | $T_{Stg}$ | | -55 to +150 | |
| Maximum thermal resistance, junction to case per leg | | $R_{thJC}$ | DC operation See fig. 4 | 0.5 | °C/W |
| Maximum thermal resistance, junction to case per package | | | DC operation | 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 | 115CNQ015A | |
| | | | Case style D-61-8-SM | 115CNQ015ASM | |
| | | | Case style D-61-8-SL | 115CNQ015ASL | |

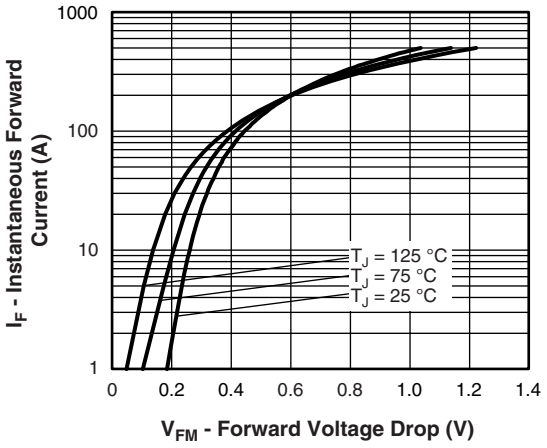



Fig. 1 - Maximum Forward Voltage Drop Characteristics (Per Leg)

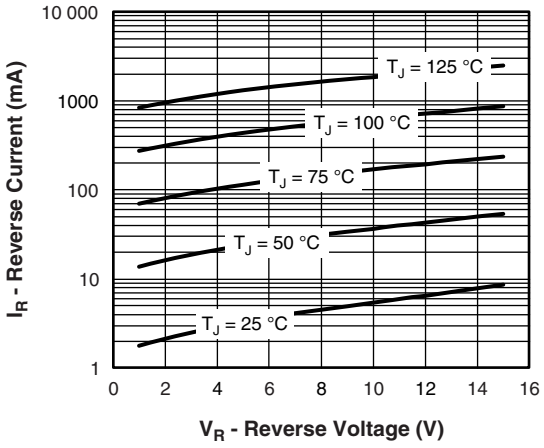



Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage (Per Leg)

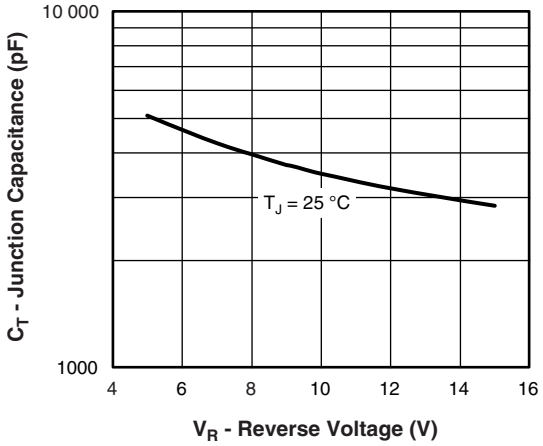



Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage (Per Leg)

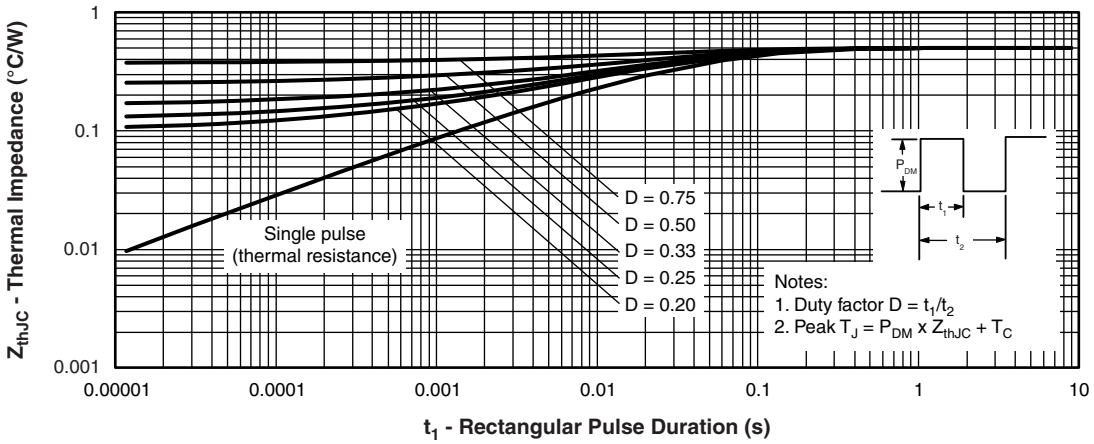



Fig. 4 - Maximum Thermal Impedance $Z_{thJC}$ Characteristics (Per Leg)

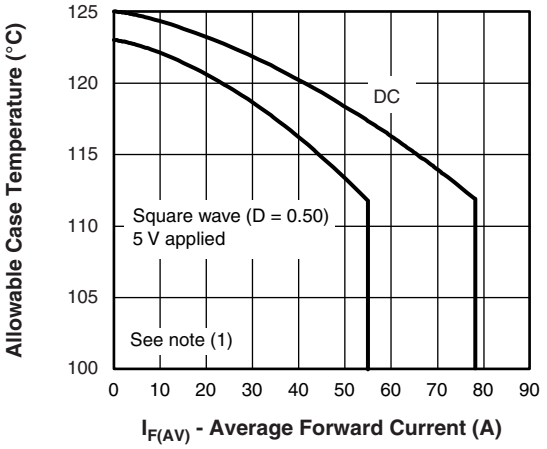



Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current (Per Leg)

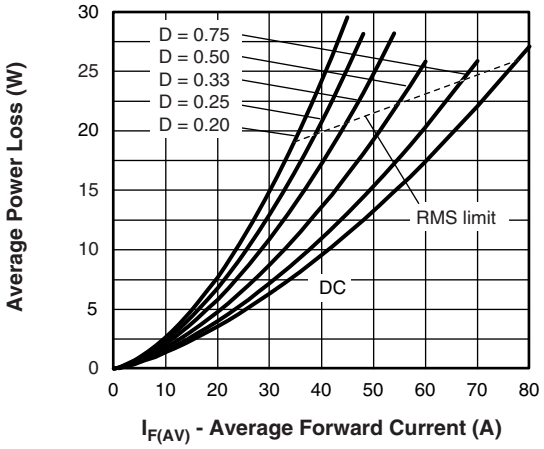



Fig. 6 - Forward Power Loss Characteristics (Per Leg)

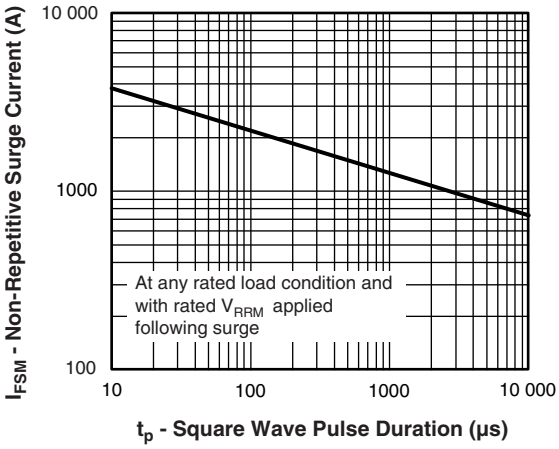



Fig. 7 - Maximum Non-Repetitive Surge Current (Per Leg)

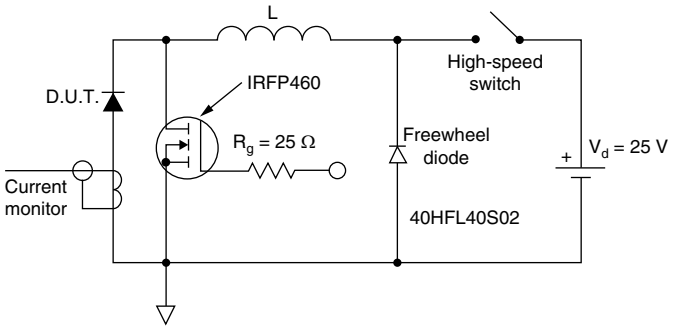



Fig. 8 - Unclamped Inductive Test Circuit

**Note**

(1) Formula used: $T_C = T_J - (Pd + Pd_{REV}) \times R_{thJC}$;
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 $V_{R1}$ = 5 V

## ORDERING INFORMATION TABLE

**Device code**

| VS- | 115 | C | N | Q | 015 | A | PbF |
|---|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |

1 - Vishay Semiconductors product

2 - Current rating (110 A)

3 - Circuit configuration:
C = common cathode

4 - Package:
N = D-61

5 - Schottky “Q” series

6 - Voltage rating (015 = 15 V)

7 - Package style:
- A = D-61-8
- ASM = D-61-8-SM
- ASL = D-61-8-SL

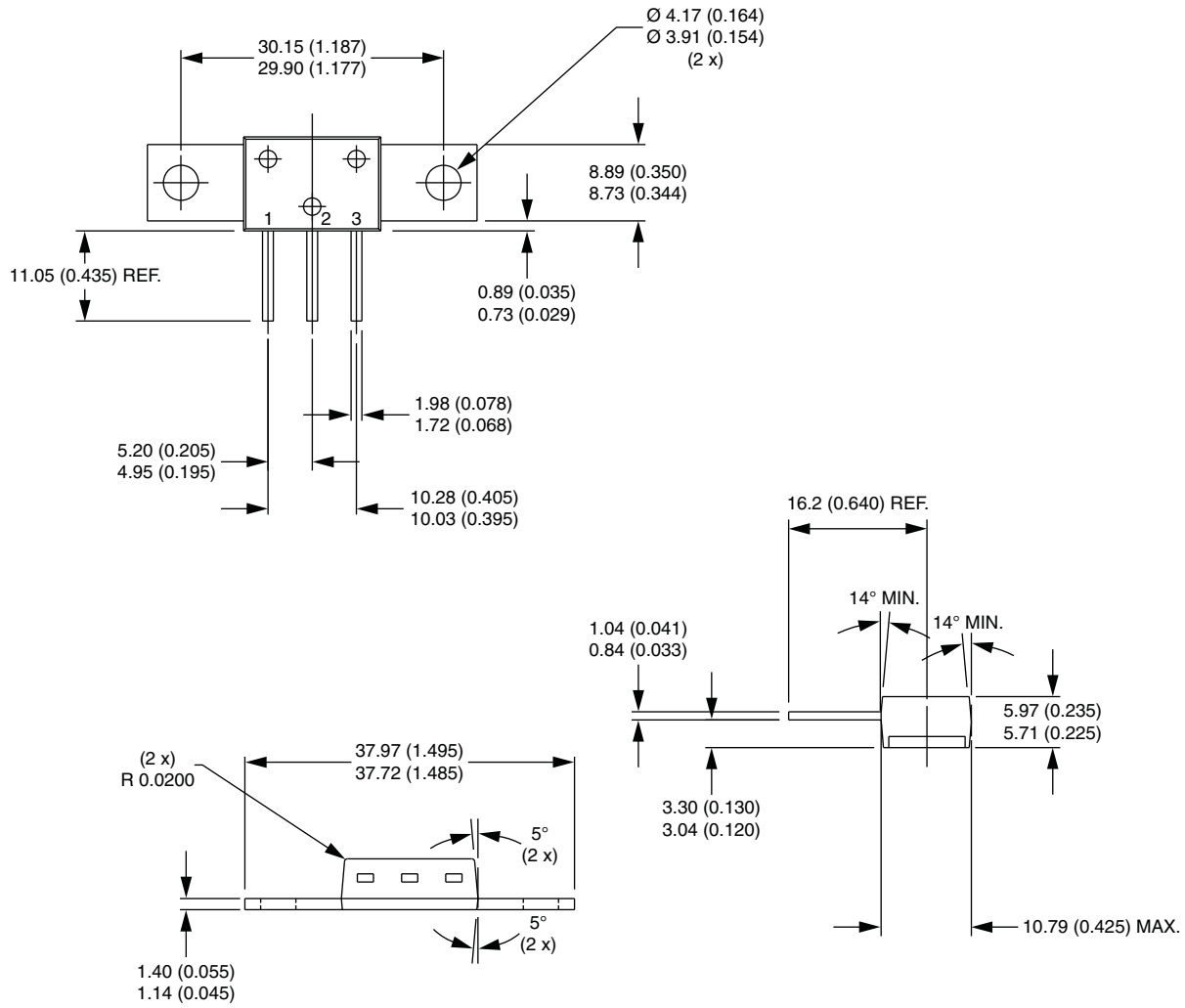
8 -
-

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

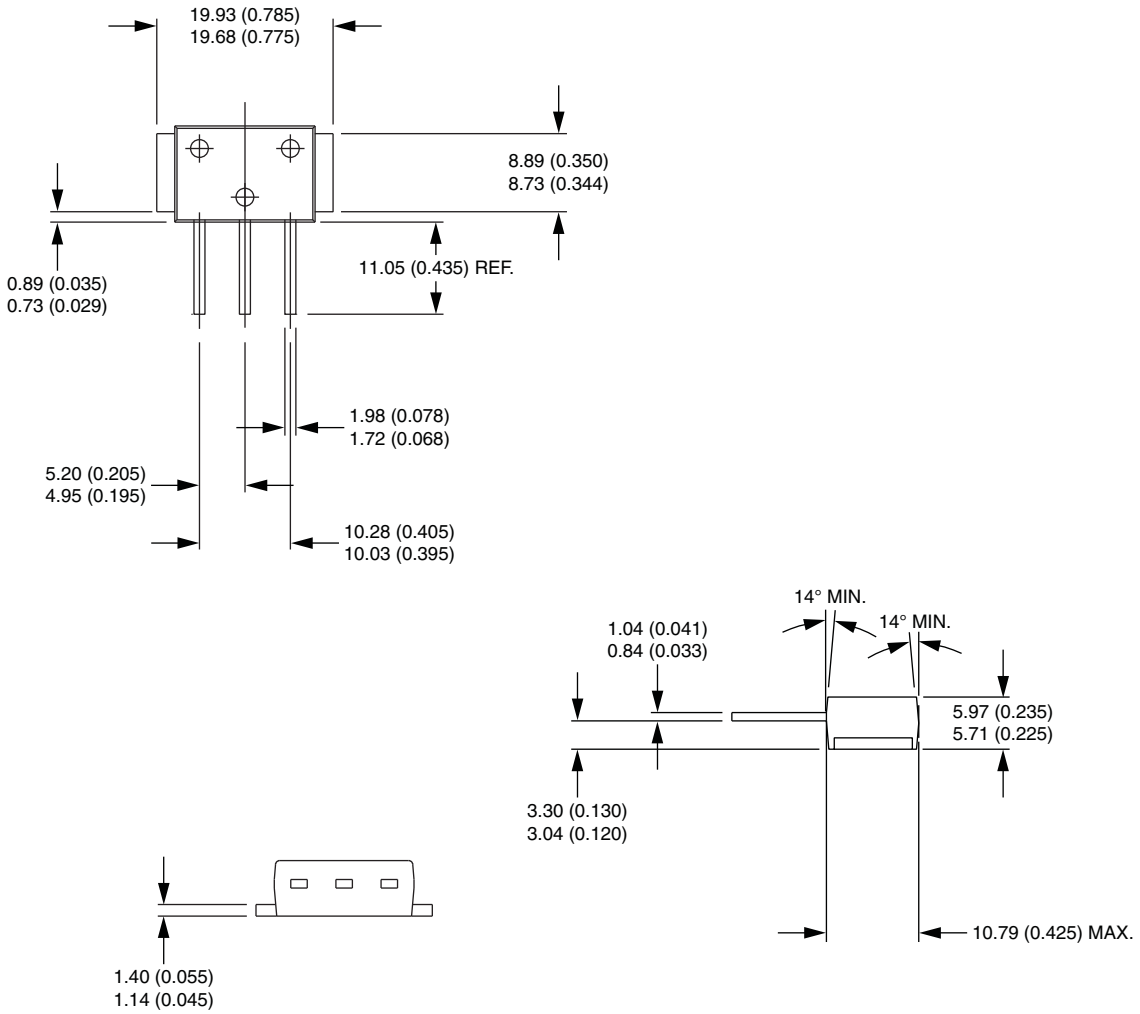
| LINKS TO RELATED DOCUMENTS | |
|---|---|
| Dimensions | www.vishay.com/doc?95354 |
| Part marking information | www.vishay.com/doc?95356 |

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

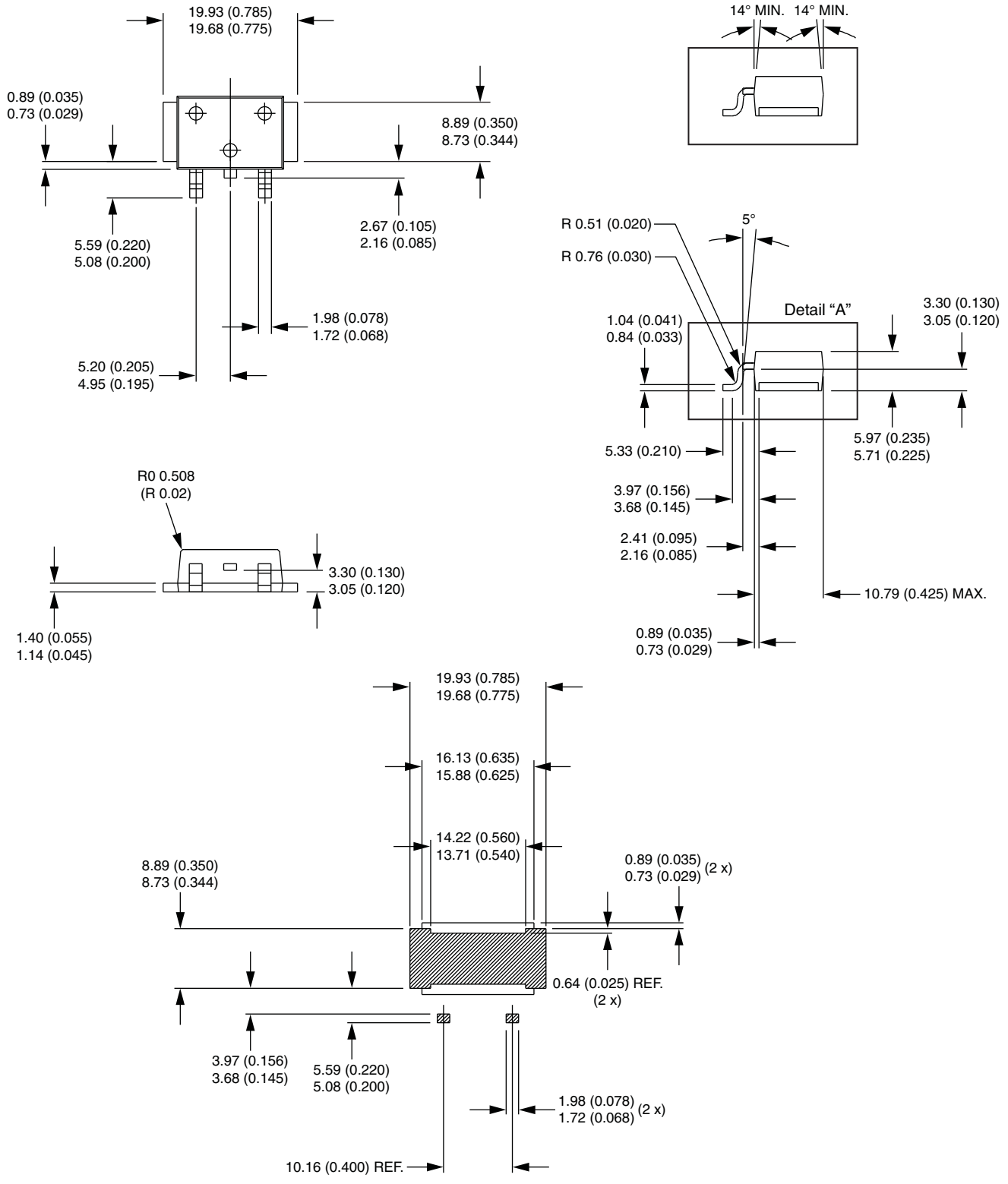
**DIMENSIONS - D-61-8** in millimeters (inches)



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



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



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