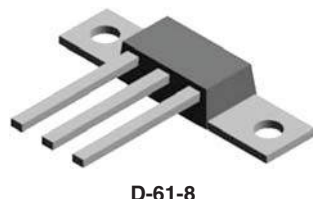
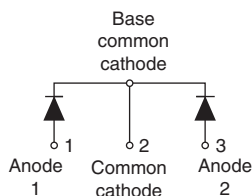
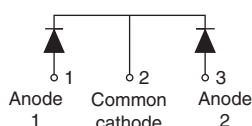
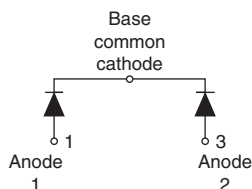


## High Performance Schottky Rectifier Gen 3, D-61 Package, 2 x 40 A

**VS-83CNQ...APbF**

**D-61-8**

**VS-83CNQ...ASMPbF**

**D-61-8-SM**

**VS-83CNQ...ASLPbF**

**D-61-8-SL**


### FEATURES

- 175 °C  $T_J$  operation
- Center tap module
- 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
- 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](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 series has been optimized for low reverse leakage at high temperature. 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

|                 |                 |
|-----------------|-----------------|
| Package         | D-61            |
| $I_{F(AV)}$     | 2 x 40 A        |
| $V_R$           | 80 V, 100 V     |
| $V_F$ at $I_F$  | 0.81            |
| $I_{RM}$ max.   | 35 mA at 125 °C |
| $T_J$ max.      | 175 °C          |
| Diode variation | Common cathode  |
| $E_{AS}$        | 15 mJ           |

### MAJOR RATINGS AND CHARACTERISTICS

| SYMBOL      | CHARACTERISTICS                               | VALUES      | UNITS |
|-------------|-----------------------------------------------|-------------|-------|
| $I_{F(AV)}$ | Rectangular waveform                          | 80          | A     |
| $V_{RRM}$   |                                               | 80, 100     | V     |
| $I_{FSM}$   | $t_p = 5 \mu s$ sine                          | 7000        | A     |
| $V_F$       | 40 A <sub>pk</sub> , $T_J = 125$ °C (per leg) | 0.67        | V     |
| $T_J$       | Range                                         | -55 to +175 | °C    |

### VOLTAGE RATINGS

| PARAMETER                            | SYMBOL    | VS-83CNQ080APbF | VS-83CNQ100APbF | UNITS |
|--------------------------------------|-----------|-----------------|-----------------|-------|
| Maximum DC reverse voltage           | $V_R$     | 80              | 100             | V     |
| Maximum working peak reverse voltage | $V_{RWM}$ |                 |                 |       |

**ABSOLUTE MAXIMUM RATINGS**

| PARAMETER                                                                 | SYMBOL      | TEST CONDITIONS                                                                                                           | VALUES | UNITS |
|---------------------------------------------------------------------------|-------------|---------------------------------------------------------------------------------------------------------------------------|--------|-------|
| Maximum average forward current<br>See fig. 5                             | $I_{F(AV)}$ | 50 % duty cycle at $T_C = 132\text{ }^{\circ}\text{C}$ , rectangular waveform                                             | 80     | A     |
| Maximum peak one cycle non-repetitive surge current per leg<br>See fig. 7 | $I_{FSM}$   | 5 $\mu\text{s}$ sine or 3 $\mu\text{s}$ rect. pulse                                                                       | 7000   |       |
|                                                                           |             | 10 ms sine or 6 ms rect. pulse                                                                                            | 720    |       |
| Non-repetitive avalanche energy per leg                                   | $E_{AS}$    | $T_J = 25\text{ }^{\circ}\text{C}$ , $I_{AS} = 1\text{ A}$ , $L = 30\text{ mH}$                                           | 15     | mJ    |
| Repetitive avalanche current per leg                                      | $I_{AR}$    | Current decaying linearly to zero in 1 $\mu\text{s}$<br>Frequency limited by $T_J$ maximum $V_A = 1.5 \times V_R$ typical | 1      | A     |

**ELECTRICAL SPECIFICATIONS**

| PARAMETER                                             | SYMBOL         | TEST CONDITIONS                                                                            | VALUES | UNITS            |
|-------------------------------------------------------|----------------|--------------------------------------------------------------------------------------------|--------|------------------|
| Maximum forward voltage drop per leg<br>See fig. 1    | $V_{FM}^{(1)}$ | 40 A                                                                                       | 0.81   | V                |
|                                                       |                | 80 A                                                                                       | 1.00   |                  |
|                                                       |                | 40 A                                                                                       | 0.67   |                  |
|                                                       |                | 80 A                                                                                       | 0.82   |                  |
| Maximum reverse leakage current per leg<br>See fig. 2 | $I_{RM}^{(1)}$ | $T_J = 25\text{ }^{\circ}\text{C}$                                                         | 1.5    | mA               |
|                                                       |                | $T_J = 125\text{ }^{\circ}\text{C}$                                                        | 35     |                  |
| Maximum junction capacitance per leg                  | $C_T$          | $V_R = 5\text{ V}_{DC}$ (test signal range 100 kHz to 1 MHz), $25\text{ }^{\circ}\text{C}$ | 1400   | 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<br>per leg<br>per package | $R_{thJC}$     | DC operation, see fig. 4                                         | 0.85        | $^{\circ}\text{C/W}$ |
|                                                                        |                | DC operation                                                     | 0.42        |                      |
| Typical thermal resistance, case to heatsink (D-61-8 only)             | $R_{thCS}$     | Mounting surface, smooth and greased<br>Device flatness < 5 mils | 0.30        |                      |
| Approximate weight                                                     |                |                                                                  | 7.8         | g                    |
|                                                                        |                |                                                                  | 0.28        | oz.                  |
| Mounting torque<br>minimum<br>maximum                                  |                | Recommended hardware 3M stainless screw                          | 12 (10)     | kgf · cm             |
|                                                                        |                |                                                                  | 24 (20)     | (lbf · in)           |
| Marking device                                                         |                | Case style D-61                                                  | 83CNQ080A   |                      |
|                                                                        |                |                                                                  | 83CNQ100A   |                      |
|                                                                        |                | Case style D-61-8-SM                                             | 83CNQ080ASM |                      |
|                                                                        |                |                                                                  | 83CNQ100ASM |                      |
|                                                                        |                | Case style D-61-8-SL                                             | 83CNQ080ASL |                      |
|                                                                        |                |                                                                  | 83CNQ100ASL |                      |

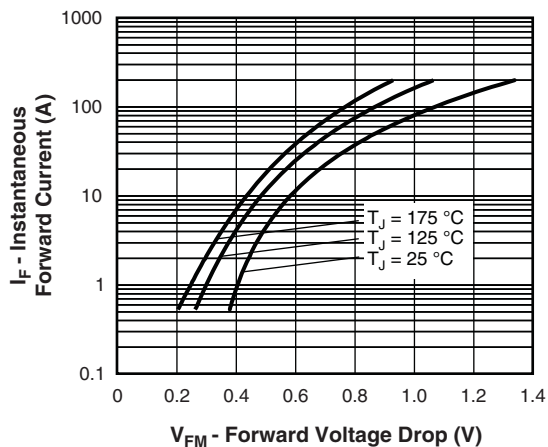


Fig. 1 - Maximum Forward Voltage Drop Characteristics (Per Leg)

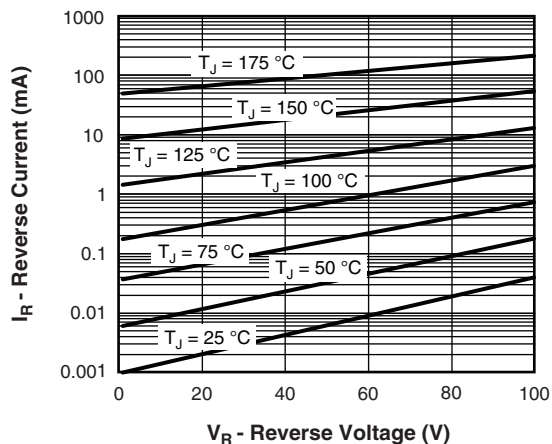


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage (Per Leg)

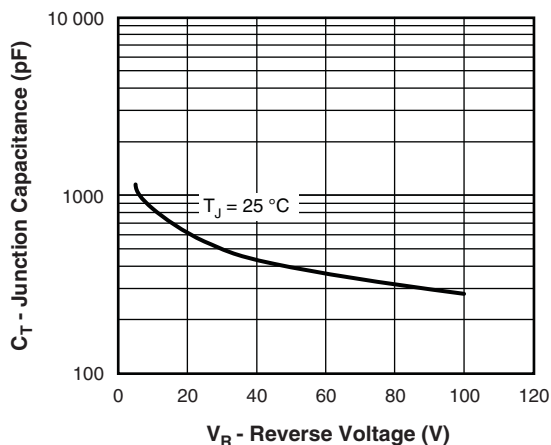


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage (Per Leg)

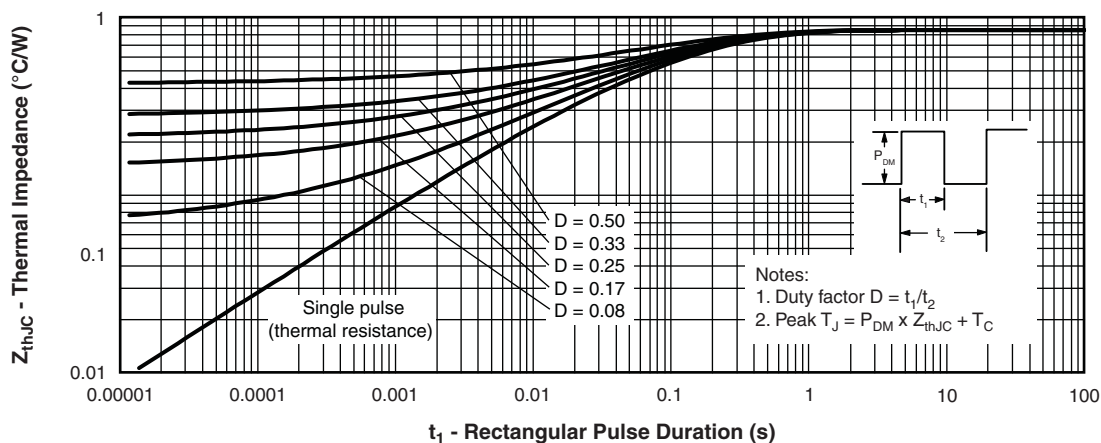


Fig. 4 - Maximum Thermal Impedance  $Z_{thJC}$  Characteristics (Per Leg)

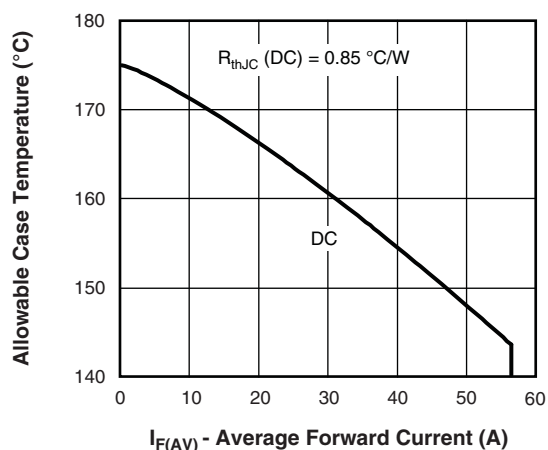


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current (Per Leg)

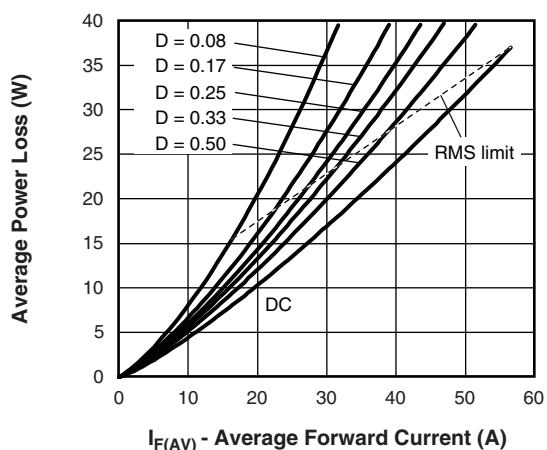


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

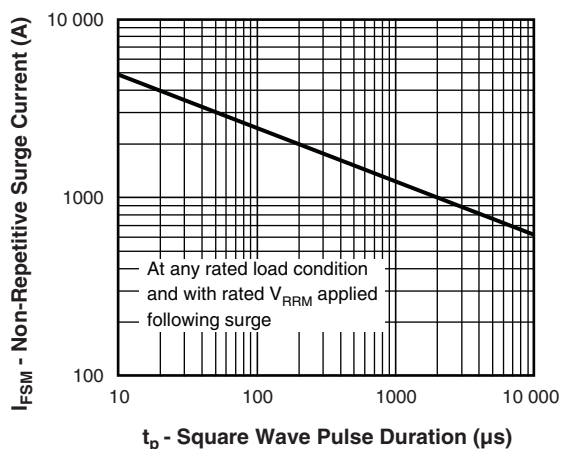


Fig. 7 - Maximum Non-Repetitive Surge Current (Per Leg)

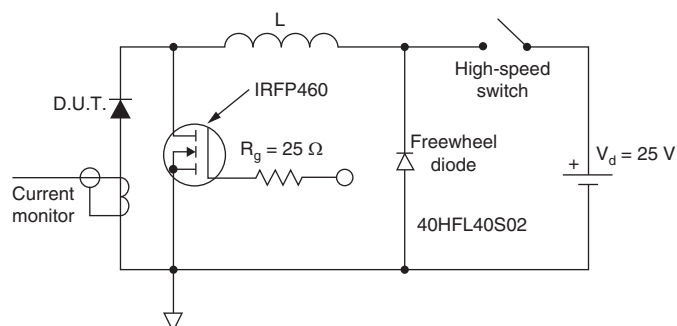


Fig. 8 - Unclamped Inductive Test Circuit



## ORDERING INFORMATION TABLE

|             |     |    |   |   |   |     |   |     |
|-------------|-----|----|---|---|---|-----|---|-----|
| Device code | VS- | 83 | C | N | Q | 100 | A | PbF |
|             | 1   | 2  | 3 | 4 | 5 | 6   | 7 | 8   |

- |          |   |                                                                                                                                 |
|----------|---|---------------------------------------------------------------------------------------------------------------------------------|
| <b>1</b> | - | Vishay Semiconductors product                                                                                                   |
| <b>2</b> | - | Current rating (80 A)                                                                                                           |
| <b>3</b> | - | Circuit configuration:<br>C = common cathode                                                                                    |
| <b>4</b> | - | Package:<br>N = D-61                                                                                                            |
| <b>5</b> | - | Schottky "Q" series                                                                                                             |
| <b>6</b> | - | Voltage ratings                                                                                                                 |
| <b>7</b> | - | Package style: <ul style="list-style-type: none"><li>• A = D-61-8</li><li>• ASM = D-61-8-SM</li><li>• ASL = D-61-8-SL</li></ul> |
| <b>8</b> | - | <ul style="list-style-type: none"><li>• None = standard production</li><li>• PbF = lead (Pb)-free</li></ul>                     |

|                           |
|---------------------------|
| 080 = 80 V<br>100 = 100 V |
|---------------------------|

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> |
| SPICE model                | <a href="http://www.vishay.com/doc?95290">www.vishay.com/doc?95290</a> |



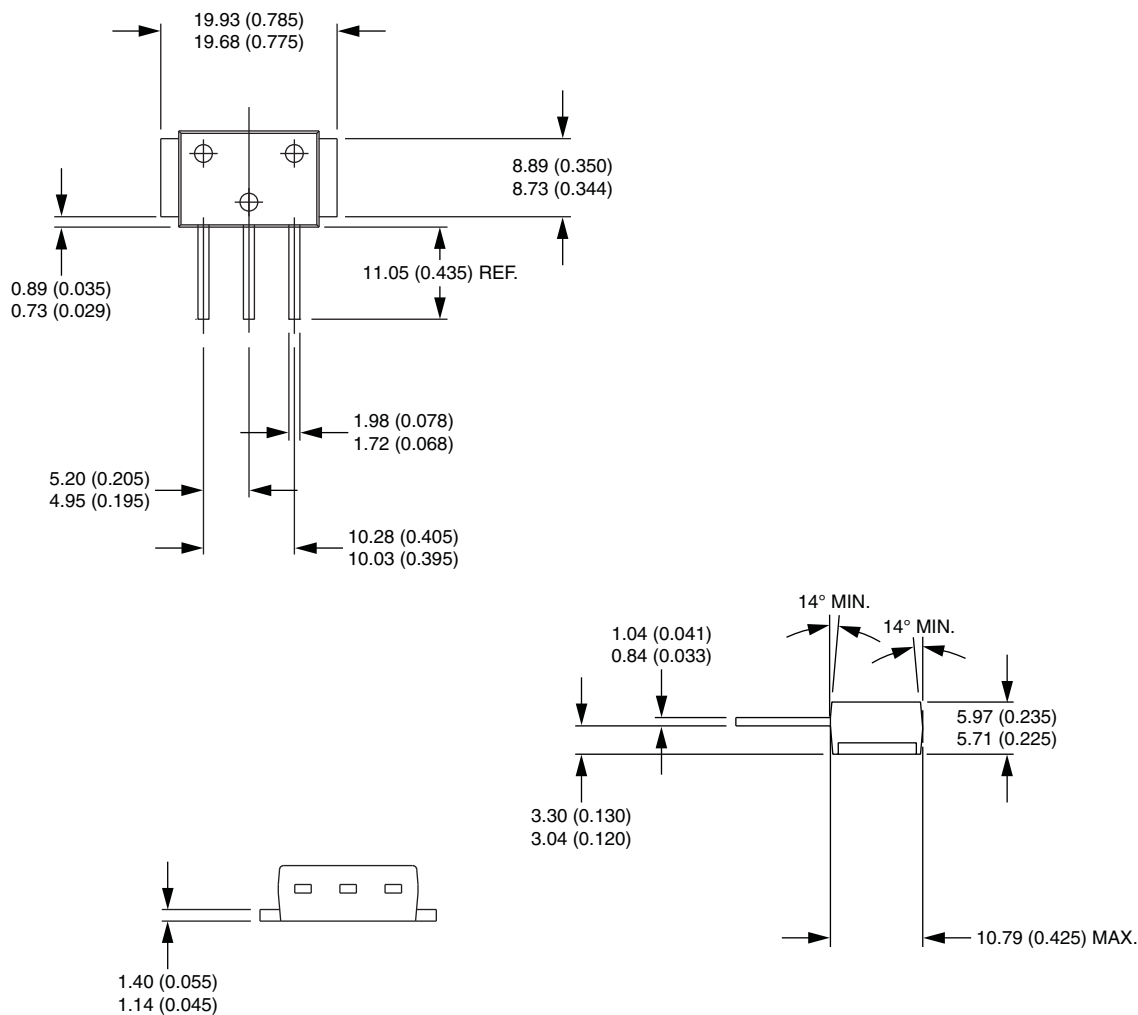
## D-61-8, D-61-8-SM, D-61-8-SL

### 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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