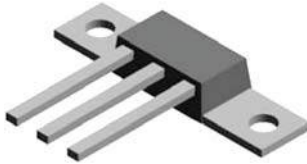
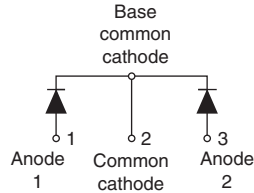
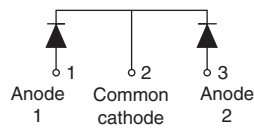
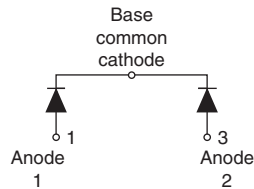


## High Performance Schottky Rectifier Gen 3, D-61 Package, 2 x 40 A

**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)


 Available  
**RoHS\***  
 Available

**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 $A_{pk}$ , $T_J = 125$ °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   | Following any rated load condition and with rated $V_{RRM}$ applied | 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   | $T_J = 25\text{ }^\circ\text{C}$  | 0.81   | V                |
|   |                | 80 A   |                                   | 1.00   |                  |
|   |                | 40 A   | $T_J = 125\text{ }^\circ\text{C}$ | 0.67   |                  |
|   |                | 80 A   |                                   | 0.82   |                  |
| Maximum reverse leakage current per leg<br>See fig. 2 | $I_{RM}^{(1)}$ | $T_J = 25\text{ }^\circ\text{C}$   | $V_R = \text{Rated } V_R$         | 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 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 maximum                                  |                | Recommended hardware 3M stainless screw                          |  | 12 (10)     | kgf · cm<br>(lbf · in) |
|   |                |  |  | 24 (20)     |                        |
| Marking device  |                | Case style D-61  |  | 83CNQ080A   |                        |
|   |                |  |  | 83CNQ100A   |                        |
|   |                | Case style D-61-8-SM   |  | 83CNQ080ASM |                        |
|   |                |  |  | 83CNQ100ASM |                        |
|   |                | Case style D-61-8-SL   |  | 83CNQ080ASL |                        |
|   |                |  |  | 83CNQ100ASL |                        |

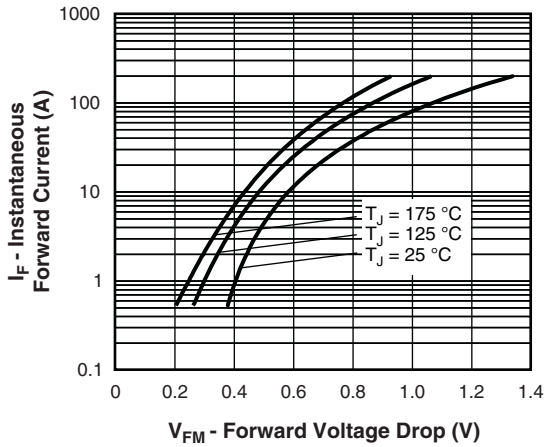


Fig. 1 - Maximum Forward Voltage Drop Characteristics (Per Leg)

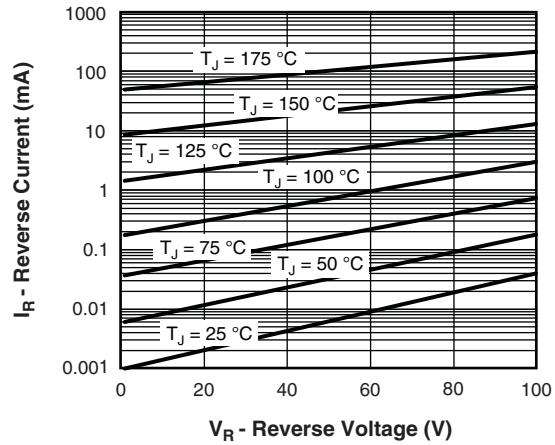


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage (Per Leg)

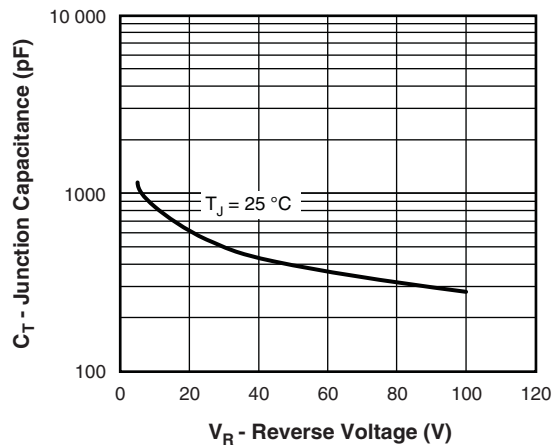


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage (Per Leg)

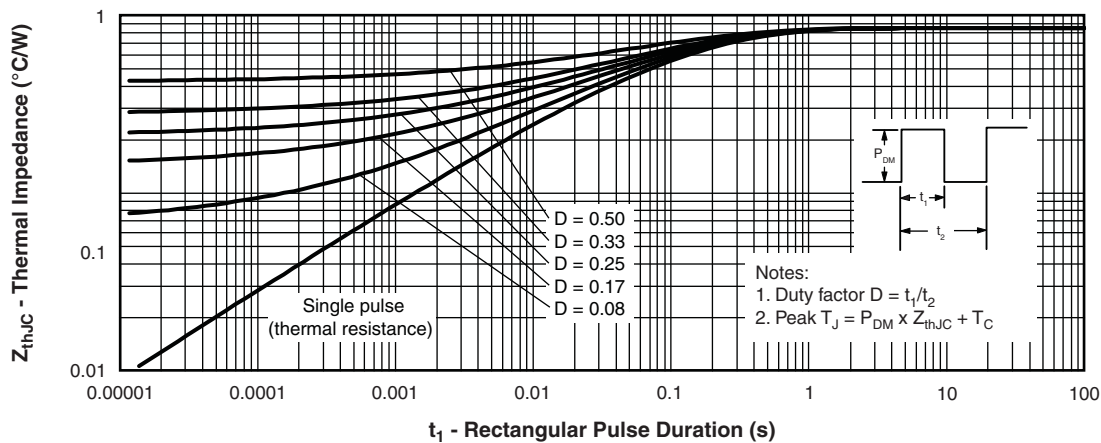


Fig. 4 - Maximum Thermal Impedance  $Z_{thJC}$  Characteristics (Per Leg)

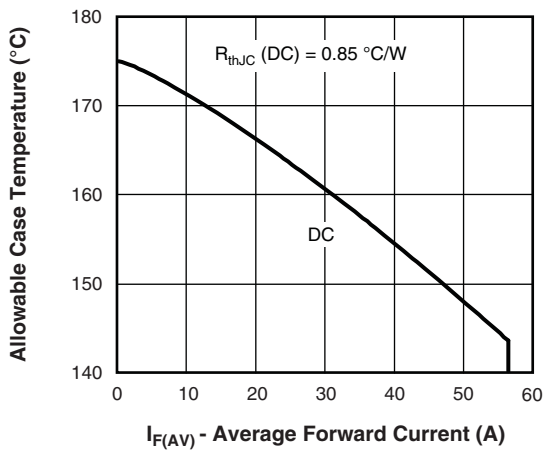


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current (Per Leg)

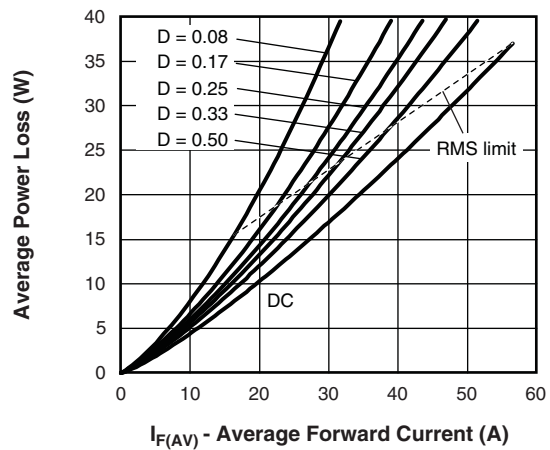


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

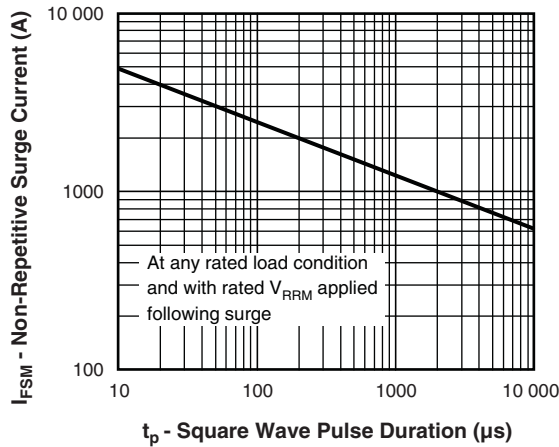


Fig. 7 - Maximum Non-Repetitive Surge Current (Per Leg)

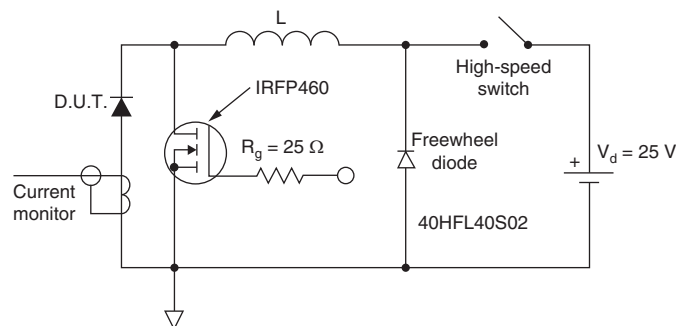
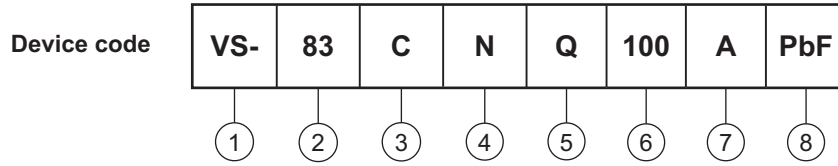


Fig. 8 - Unclamped Inductive Test Circuit



## ORDERING INFORMATION TABLE



- 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 ———— 

|             |
|-------------|
| 080 = 80 V  |
| 100 = 100 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> |
| SPIICE 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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