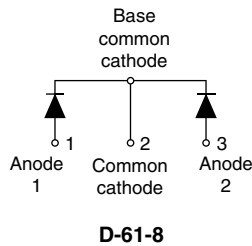


## Schottky Rectifier

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


**FEATURES**

- 150 °C  $T_J$  operation
- Center tap module
- Very low 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-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


 Available  
**RoHS\***  
 COMPLIANT

**PRODUCT SUMMARY**

|             |            |
|-------------|------------|
| $I_{F(AV)}$ | 2 x 40 A   |
| $V_R$       | 35 to 45 V |

**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.

**MAJOR RATINGS AND CHARACTERISTICS**

| SYMBOL      | CHARACTERISTICS                       | VALUES      | UNITS |
|-------------|---------------------------------------|-------------|-------|
| $I_{F(AV)}$ | Rectangular waveform                  | 80          | A     |
| $V_{RRM}$   | Range                                 | 35 to 45    | V     |
| $I_{FSM}$   | $t_p = 5 \mu s$ sine                  | 5800        | A     |
| $V_F$       | 40 Apk, $T_J = 125^\circ C$ (per leg) | 0.47        | V     |
| $T_J$       | Range                                 | - 55 to 150 | °C    |

**VOLTAGE RATINGS**

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

**ABSOLUTE MAXIMUM RATINGS**

| PARAMETER  | SYMBOL      | TEST CONDITIONS   | VALUES | UNITS |
|--|-------------|---|--------|-------|
| Maximum average forward current <span style="float: right;">per leg</span><br>See fig. 5 <span style="float: right;">per device</span> | $I_{F(AV)}$ | 50 % duty cycle at $T_C = 114^\circ C$ , rectangular waveform   | 40     | A     |
| 80   |             |   |        |       |
| Maximum peak one cycle non-repetitive surge current per leg<br>See fig. 7  | $I_{FSM}$   | 5 $\mu s$ sine or 3 $\mu s$ rect. pulse   | 5800   |       |
|  |             | 10 ms sine or 6 ms rect. pulse  |        |       |
|  |             | Following any rated load condition and with rated $V_{RRM}$ applied   | 750    |       |
| Non-repetitive avalanche energy per leg  | $E_{AS}$    | $T_J = 25^\circ C$ , $I_{AS} = 8 A$ , $L = 1.7 mH$  | 54     | mJ    |
| Repetitive avalanche current per leg   | $I_{AR}$    | Current decaying linearly to zero in 1 $\mu s$<br>Frequency limited by $T_J$ maximum $V_A = 1.5 \times V_R$ typical | 8      | A     |

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

| ELECTRICAL SPECIFICATIONS                             |                |  |                                   |        |            |
|---|----------------|--|-----------------------------------|--------|------------|
| PARAMETER   | SYMBOL         | TEST CONDITIONS  |                                   | VALUES | UNITS      |
| Maximum forward voltage drop per leg<br>See fig. 1    | $V_{FM}^{(1)}$ | 40 A   | $T_J = 25\text{ }^\circ\text{C}$  | 0.52   | V          |
|   |                | 80 A   |                                   | 0.66   |            |
|   |                | 40 A   | $T_J = 125\text{ }^\circ\text{C}$ | 0.47   |            |
|   |                | 80 A   |                                   | 0.61   |            |
| Maximum reverse leakage current per leg<br>See fig. 2 | $I_{RM}^{(1)}$ | $T_J = 25\text{ }^\circ\text{C}$                                   | $V_R = \text{Rated } V_R$         | 5      | mA         |
|   |                | $T_J = 125\text{ }^\circ\text{C}$                                  |                                   | 250    |            |
| Threshold voltage                                     | $V_{F(TO)}$    | $T_J = T_J \text{ maximum}$  |                                   | 0.26   | V          |
| Forward slope resistance                              | $r_t$          |  |                                   | 3.93   | m $\Omega$ |
| Maximum junction capacitance per leg                  | $C_T$          | $V_R = 5\text{ }V_{DC}$ (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/ $\mu$ s |

**Note**(1) Pulse width < 300  $\mu$ 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 150 | $^\circ\text{C}$   |
| Maximum thermal resistance, $\frac{\quad}{\quad}$ per leg<br>junction to case $\frac{\quad}{\quad}$ 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  | $R_{thCS}$     | Mounting surface, smooth and greased<br>Device flatness < 5 mils |            | 0.30        |                    |
| Approximate weight  |                |  |            | 7.8         | g                  |
|   |                |  |            | 0.28        | oz.                |
| Mounting torque   | minimum        |  |            | 40 (35)     | kgf · cm           |
|   | maximum        |  |            | 58 (50)     | (lbf · in)         |
| Marking device  |                | Case style D-61  |            | 80CNQ035A   |                    |
|   |                |  |            | 80CNQ040A   |                    |
|   |                |  |            | 80CNQ045A   |                    |

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

Vishay High Power Products

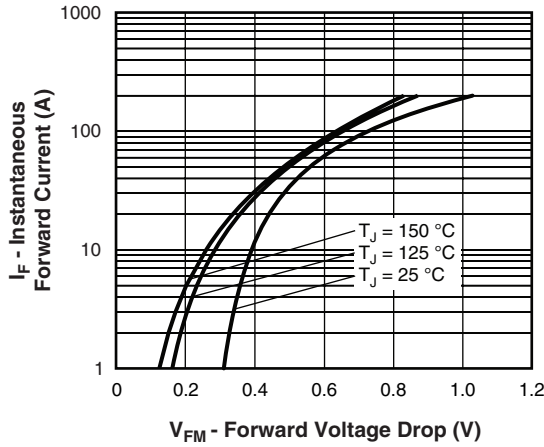


Fig. 1 - Maximum Forward Voltage Drop Characteristics (Per Leg)

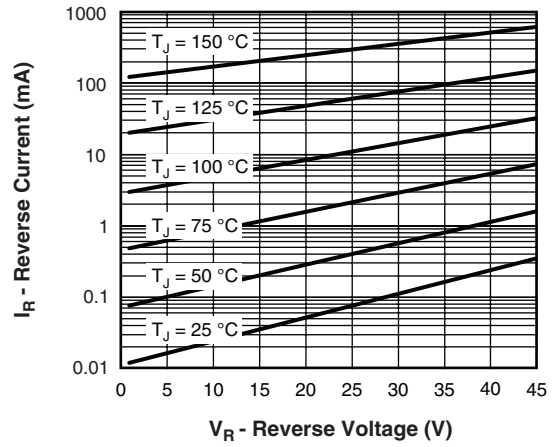


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage (Per Leg)

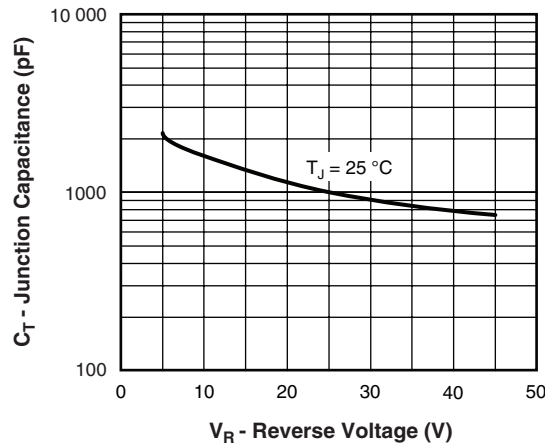


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage (Per Leg)

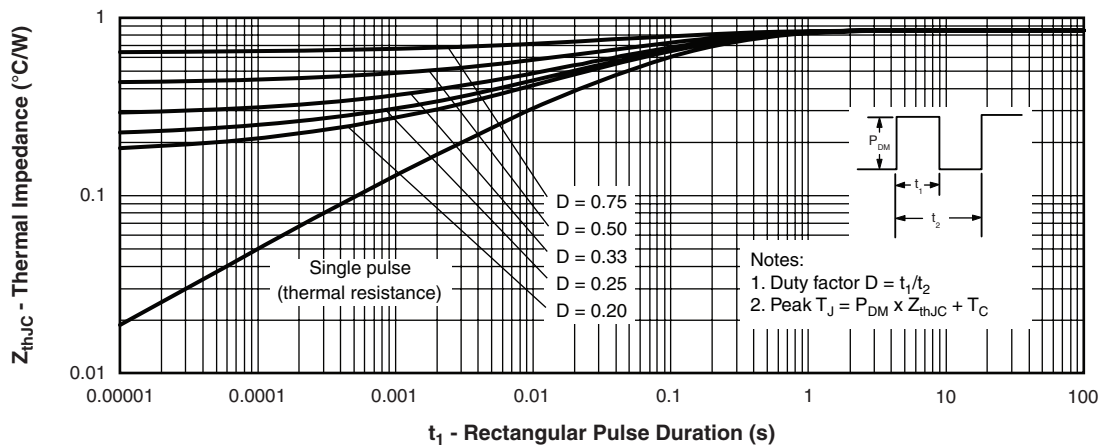


Fig. 4 - Maximum Thermal Impedance  $Z_{thJC}$  Characteristics (Per Leg)

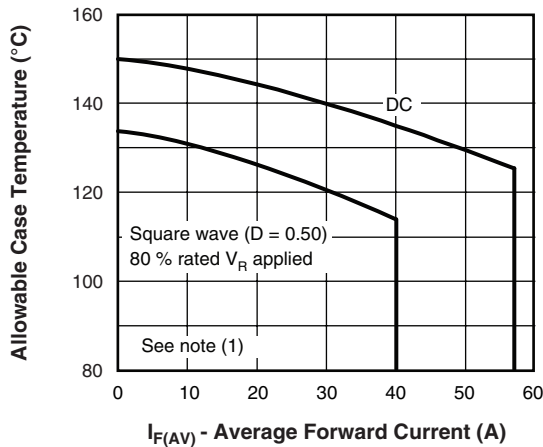


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current (Per Leg)

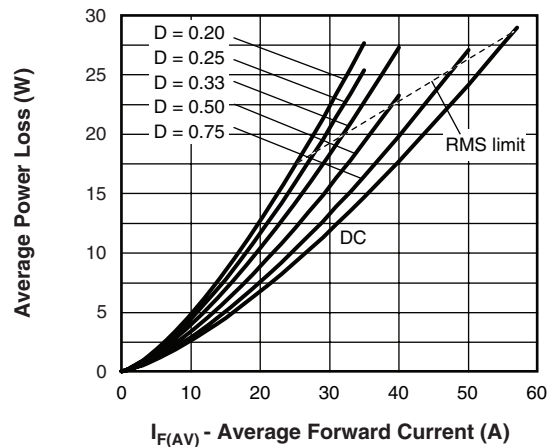


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

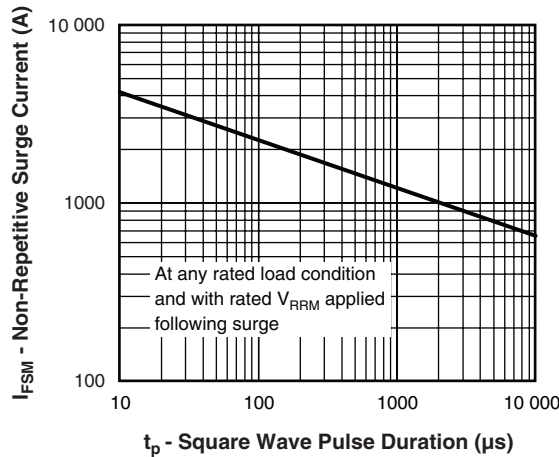


Fig. 7 - Maximum Non-Repetitive Surge Current (Per Leg)

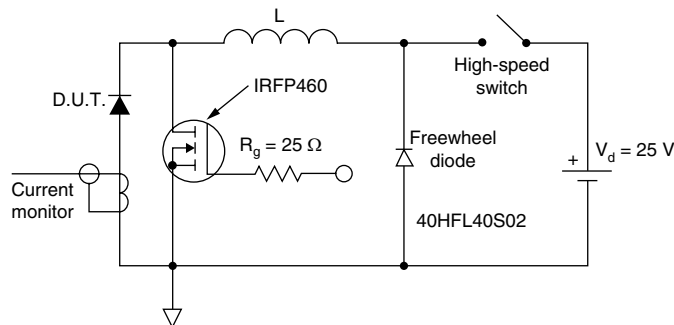


Fig. 8 - Unclamped Inductive Test Circuit

**Note**

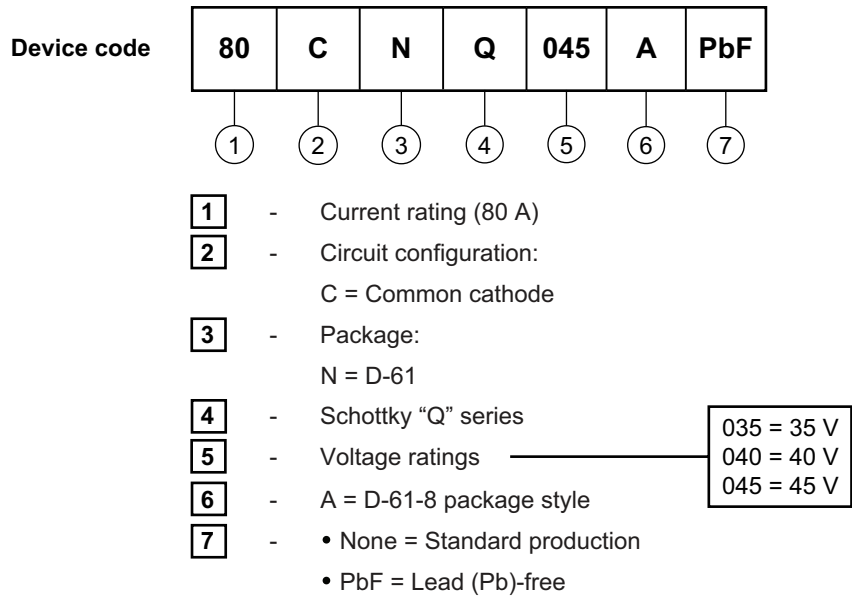
- (1) Formula used:  $T_C = T_J - (P_d + P_{d_{REV}}) \times R_{thJC}$ ;
- $P_d$  = Forward power loss =  $I_{F(AV)} \times V_{FM}$  at  $(I_{F(AV)}/D)$  (see fig. 6);
- $P_{d_{REV}}$  = Inverse power loss =  $V_{R1} \times I_R (1 - D)$ ;  $I_R$  at  $V_{R1} = 80\%$  rated  $V_R$



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

Vishay High Power Products

**ORDERING INFORMATION TABLE**



Standard pack quantity: A = 10 pieces

| LINKS TO RELATED DOCUMENTS |   |
|----------------------------|---|
| Dimensions                 | <a href="http://www.vishay.com/doc?95019">http://www.vishay.com/doc?95019</a> |
| Part marking information   | <a href="http://www.vishay.com/doc?95030">http://www.vishay.com/doc?95030</a> |



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