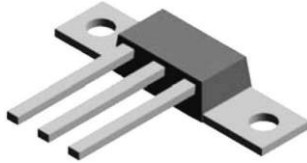
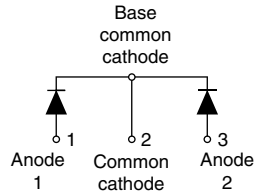
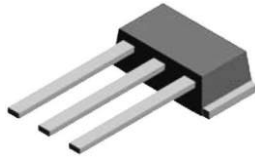
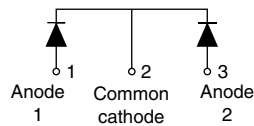
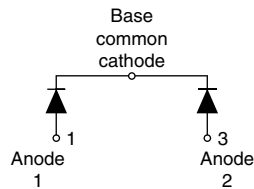


## Schottky Rectifier

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

**80CNQ...A**

**D-61-8**

**80CNQ...ASM**

**D-61-8-SM**

**80CNQ...ASL**

**D-61-8-SL**

**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-mold low profile, small footprint, high current package
- Designed and qualified for industrial level

**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**

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

**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    | 80CNQ035A | 80CNQ040A | 80CNQ045A | 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<br>See fig. 5                                | $I_{F(AV)}$ | 50 % duty cycle at $T_C = 114\text{ }^\circ\text{C}$ , rectangular waveform   |   | 40     | A     |
|  |             |   |   | 80     |       |
| Maximum peak one cycle<br>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<br>load condition and with<br>rated $V_{RRM}$ applied | 5800   |       |
|  |             | 10 ms sine or 6 ms rect. pulse  |   | 750    |       |
| Non-repetitive avalanche energy per leg                                      | $E_{AS}$    | $T_J = 25\text{ }^\circ\text{C}$ , $I_{AS} = 8\text{ A}$ , $L = 1.7\text{ mH}$  |   | 54     | 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 |   | 8      | A     |

| ELECTRICAL SPECIFICATIONS                             |                |   |                                   |        |                        |
|---|----------------|---|-----------------------------------|--------|------------------------|
| PARAMETER   | SYMBOL         | TEST CONDITIONS   |                                   | VALUES | UNITS                  |
| Maximum forward voltage drop per leg<br>See fig. 1    | $V_{FM}^{(1)}$ | 40 A  | $T_J = 25\text{ }^\circ\text{C}$  | 0.52   | 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                                     | $V_{F(TO)}$    | $T_J = T_J$ maximum   |                                   | 0.26   | V                      |
| Forward slope resistance                              | $r_t$          |   |                                   | 3.93   | $\text{m}\Omega$       |
| Maximum junction capacitance per leg                  | $C_T$          | $V_R = 5\text{ V}_{DC}$ (test signal range 100 kHz to 1 MHz) $25\text{ }^\circ\text{C}$ |                                   | 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 | $\text{V}/\mu\text{s}$ |

**Note**(1) Pulse width < 300  $\mu\text{s}$ , duty cycle < 2 %



| <b>THERMAL - MECHANICAL SPECIFICATIONS</b>                 |                      |  |             |                        |  |
|--|----------------------|--|-------------|------------------------|--|
| 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<br>See fig. 4                                       | 0.85        | °C/W                   |  |
| Maximum thermal resistance, junction to case per package   |                      | 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 (D-61-8 only)                              | minimum              |  | 40 (35)     | kgf · cm<br>(lbf · in) |  |
|  | maximum              |  | 58 (50)     |                        |  |
| Marking device   | Case style D-61-8    |  | 80CNQ035A   |                        |  |
|  |                      |  | 80CNQ040A   |                        |  |
|  |                      |  | 80CNQ045A   |                        |  |
|  | Case style D-61-8-SM |  |             | 80CNQ035ASM            |  |
|  |                      |  |             | 80CNQ040ASM            |  |
|  |                      |  |             | 80CNQ045ASM            |  |
|  | Case style D-61-8-SL |  |             | 80CNQ035ASL            |  |
|  |                      |  |             | 80CNQ040ASL            |  |
|  |                      |  |             | 80CNQ045ASL            |  |

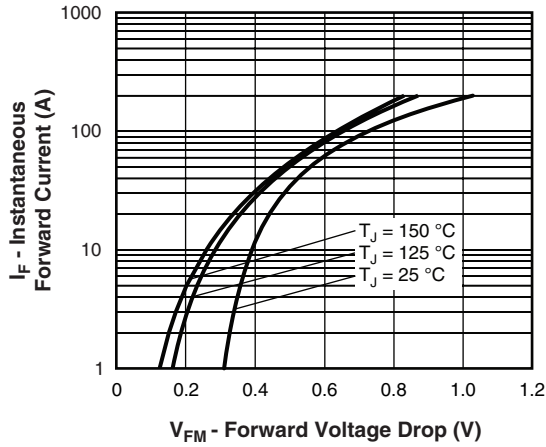


Fig. 1 - Maximum Forward Voltage Drop Characteristics (Per Leg)

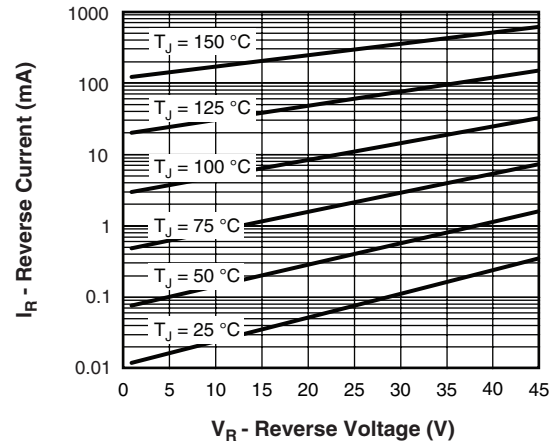


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage (Per Leg)

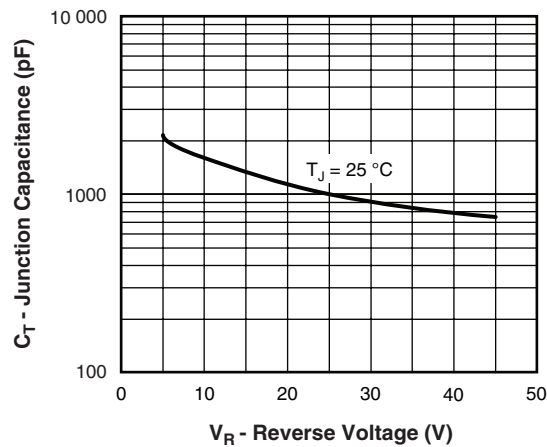


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage (Per Leg)

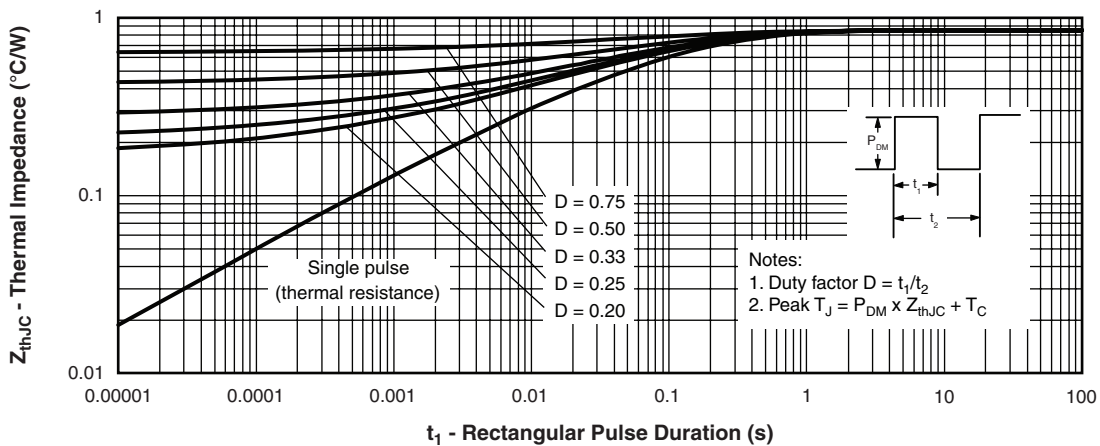


Fig. 4 - Maximum Thermal Impedance  $Z_{thJC}$  Characteristics (Per Leg)

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

Vishay High Power Products

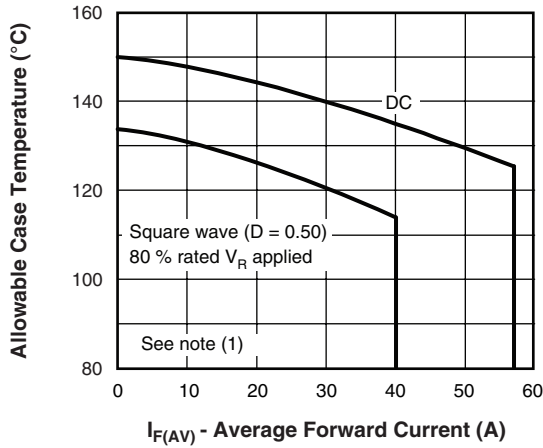


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current (Per Leg)

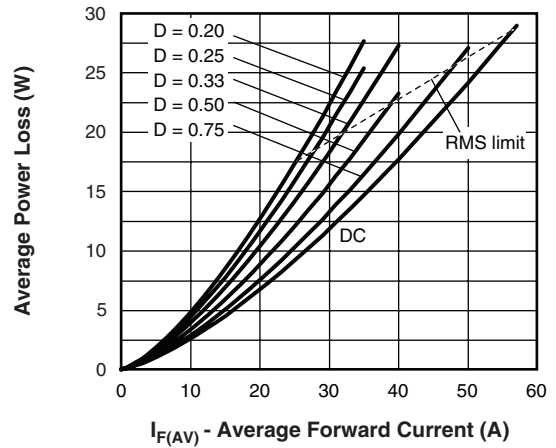


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

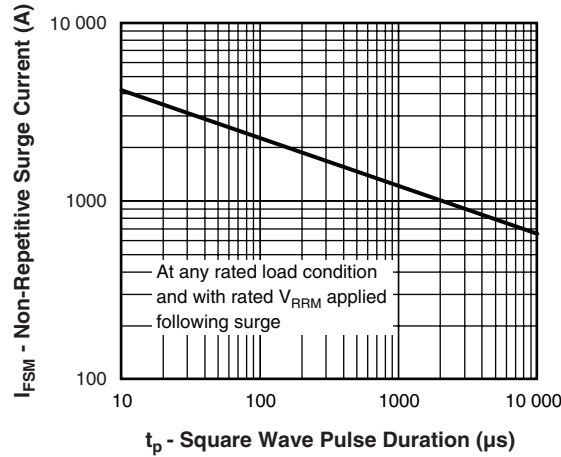


Fig. 7 - Maximum Non-Repetitive Surge Current (Per Leg)

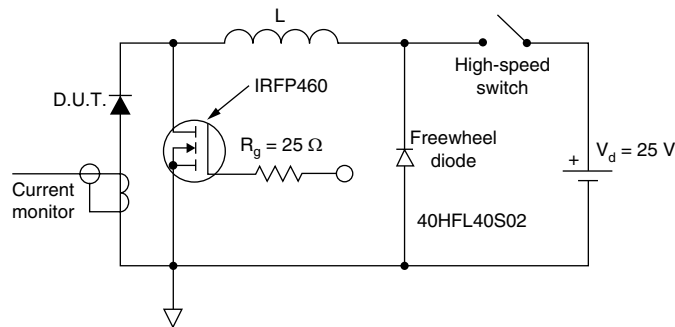


Fig. 8 - Unclamped Inductive Test Circuit

**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  $V_R$

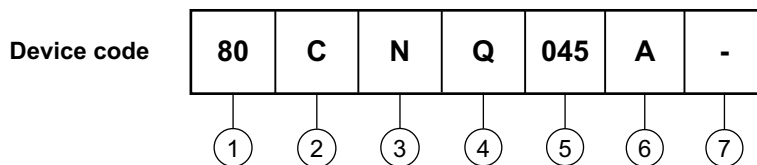
# 80CNQ...A Series



Vishay High Power Products

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

## ORDERING INFORMATION TABLE



- 1** - Current rating (80 A)
- 2** - Circuit configuration:
  - C = Common cathode
- 3** - Package:
  - N = D-61
- 4** - Schottky "Q" series
- 5** - Voltage ratings
- 6** - Package style:
  - A = D-61-8
  - ASM = D-61-8-SM
  - ASL = D-61-8-SL
- 7** -
  - None = Standard production
  - PbF = Lead (Pb)-free (D-61-8 only)

|            |
|------------|
| 035 = 35 V |
| 040 = 40 V |
| 045 = 45 V |

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

| LINKS TO RELATED DOCUMENTS |   |
|----------------------------|---|
| Dimensions                 | <a href="http://www.vishay.com/doc?95354">http://www.vishay.com/doc?95354</a> |
| Part marking information   | <a href="http://www.vishay.com/doc?95356">http://www.vishay.com/doc?95356</a> |



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