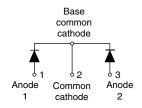


## Vishay High Power Products

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

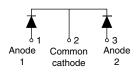
#### 82CNQ030A





#### 82CNQ030ASM



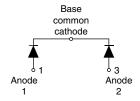


D-61-8-SM

82CNQ030ASL







# PRODUCT SUMMARY I<sub>F(AV)</sub> 2 x 40 A V<sub>R</sub> 30 V

#### **FEATURES**

- 150 °C T<sub>J</sub> operation
- Dual 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 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 <sub>F(AV)</sub>                | Rectangular waveform                      | 80          | Α     |  |  |
| V <sub>RRM</sub>                  |   | 30          | V     |  |  |
| I <sub>FSM</sub>                  | t <sub>p</sub> = 5 μs sine                | 5100        | Α     |  |  |
| V <sub>F</sub>                    | 40 Apk, T <sub>J</sub> = 125 °C (per leg) | 0.37        | V     |  |  |
| TJ                                | Range                                     | - 55 to 150 | °C    |  |  |

| VOLTAGE RATINGS                      |           |           |       |  |  |
|--------------------------------------|-----------|-----------|-------|--|--|
| PARAMETER                            | SYMBOL    | 82CNQ030A | UNITS |  |  |
| Maximum DC reverse voltage           | $V_{R}$   | 30        | V     |  |  |
| Maximum working peak reverse voltage | $V_{RWM}$ | 30        | V     |  |  |

# 82CNQ030A

Vishay High Power Products

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| ABSOLUTE MAXIMUM RATINGS                                    |                    |   |      |        |       |
|---|--------------------|---|------|--------|-------|
| PARAMETER   | SYMBOL             | TEST CONDITIONS   |      | VALUES | UNITS |
| Maximum average forward current<br>See fig. 5               | I <sub>F(AV)</sub> | 50 % duty cycle at T <sub>C</sub> = 119 °C, rectangular waveform  |      | 80     |       |
| Maximum peak one cycle non-repetitive surge current per leg | I                  | 1 5 μs sine or 3 μs rect. pulse Following any rated load condition and with rated V <sub>RRM</sub> applied                                  | 5100 | Α      |       |
| See fig. 7  | 'FSM               |   | 880  |        |       |
| Non-repetitive avalanche energy per leg                     | E <sub>AS</sub>    | $T_J = 25 ^{\circ}\text{C}$ , $I_{AS} = 8  \text{A}$ , $L = 1.12  \text{mH}$  |      | 36     | mJ    |
| Repetitive avalanche current per leg                        | I <sub>AR</sub>    | Current decaying linearly to zero in 1 $\mu$ s<br>Frequency limited by T <sub>J</sub> maximum V <sub>A</sub> = 1.5 x V <sub>R</sub> typical |      | 8      | Α     |

| ELECTRICAL SPECIFICATIONS            |                                |   |                                       |        |       |
|--------------------------------------|--------------------------------|---|---------------------------------------|--------|-------|
| PARAMETER                            | SYMBOL                         | . TEST CONDITIONS V   |                                       | VALUES | UNITS |
|                                      |                                | 40 A  | T <sub>.1</sub> = 25 °C               | 0.47   |       |
| Maximum forward voltage drop per leg | V <sub>EM</sub> <sup>(1)</sup> | 80 A  | 1j=25 C                               | 0.55   | V     |
| See fig. 1                           | V FM (1)                       | 40 A  | T <sub>J</sub> = 125 °C               | 0.37   | v     |
| J                                    |                                | 80 A  | 1J=125 C                              | 0.47   |       |
| Maximum reverse                      | I <sub>RM</sub> <sup>(1)</sup> | T <sub>J</sub> = 25 °C                                      | V Dated V                             | 5      | mA    |
| leakage current per leg              |                                | T <sub>J</sub> = 125 °C                                     | V <sub>R</sub> = Rated V <sub>R</sub> | 280    | IIIA  |
| Maximum junction capacitance per leg | C <sub>T</sub>                 | $V_R = 5 V_{DC}$ (test signal range 100 kHz to 1 MHz) 25 °C |                                       | 3700   | pF    |
| Typical series inductance per leg    | L <sub>S</sub>                 | Measured lead to lead 5 mm from package body                |                                       | 5.5    | nΗ    |
| Maximum voltage rate of change       | dV/dt                          | Rated V <sub>R</sub>  |                                       | 10 000 | V/µs  |

#### Note

 $<sup>^{(1)}\,</sup>$  Pulse width < 300  $\mu s,$  duty cycle < 2 %

| THERMAL - MECHANICAL SPECIFICATIONS                        |         |                                   |   |             |                  |
|--|---------|-----------------------------------|---|-------------|------------------|
| PARAMETER  |         | SYMBOL                            | TEST CONDITIONS   | VALUES      | UNITS            |
| Maximum junction and storage temperature range             |         | T <sub>J</sub> , T <sub>Stg</sub> |   | - 55 to 150 | °C               |
| Maximum thermal resistance, junction to case per leg       |         | Б                                 | DC operation See fig. 4                                       | 0.85        | °C/W             |
| Maximum thermal resistance, junction to case per package   |         | $R_{thJC}$                        | DC operation  | 0.42        |                  |
| Typical thermal resistance, case to heatsink (D-61-8 only) |         | R <sub>thCS</sub>                 | Mounting surface, smooth and greased Device flatness < 5 mils | 0.30        |                  |
| Approximate weight   |         |                                   |   | 7.8         | g                |
|  |         |                                   |   | 0.28        | OZ.              |
| Mounting torque  | minimum |                                   |   | 40 (35)     | kgf · cm         |
| (D-61-8 only)  | maximum |                                   |   | 58 (50)     | (lbf $\cdot$ in) |
|  |         |                                   | Case style D-61-8   | 82CN        | Q030A            |
| Marking device   |         |                                   | Case style D-61-8-SM  | 82CNQ030ASM |                  |
|  |         |                                   | Case style D-61-8-SL  | 82CNQ       | 030ASL           |

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

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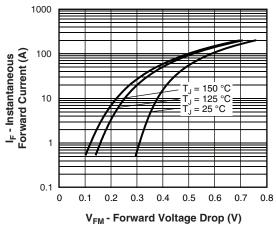


Fig. 1 - Maximum Forward Voltage Drop Characteristics (Per Leg)

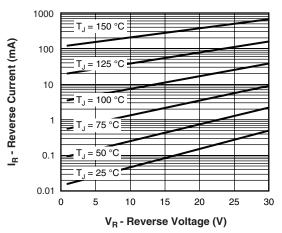


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage (Per Leg)

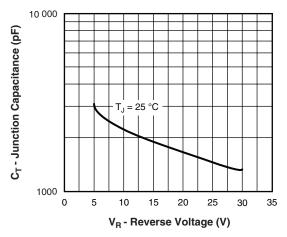


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage (Per Leg)

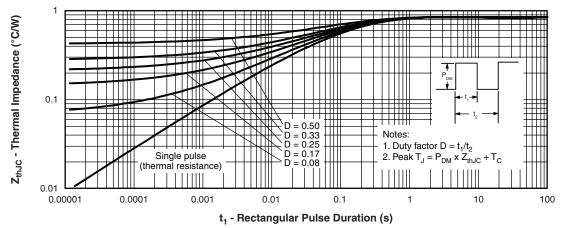


Fig. 4 - Maximum Thermal Impedance  $Z_{\text{thJC}}$  Characteristics (Per Leg)

# Vishay High Power Products

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



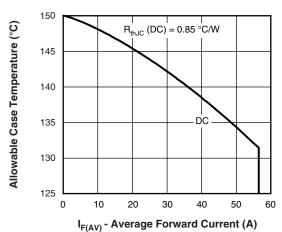


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current (Per Leg)

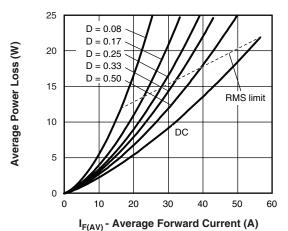


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

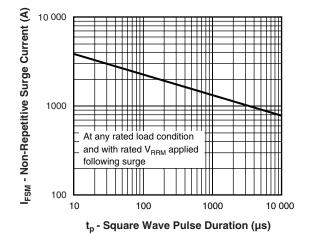


Fig. 7 - Maximum Non-Repetitive Surge Current (Per Leg)

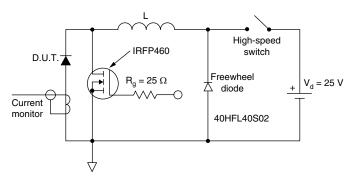


Fig. 8 - Unclamped Inductive Test Circuit

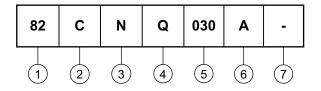


### Schottky Rectifier New Generation 3 D-61 Package, 2 x 40 A

# Vishay High Power Products

#### **ORDERING INFORMATION TABLE**

**Device code** 



- 1 Current rating (80 A)
- 2 Circuit configuration:
  - C = Common cathode
- 3 Package:
  - N = D-61
- 4 Schottky "Q" series
- Voltage ratings (030 = 30 V)
- 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)

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

| LINKS TO RELATED DOCUMENTS |                                 |  |  |
|----------------------------|---------------------------------|--|--|
| Dimensions                 | http://www.vishay.com/doc?94354 |  |  |
| Part marking information   | http://www.vishay.com/doc?94356 |  |  |



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