Bulletin PD-20699 rev. A 12/02

International
IOR Rectifier

# 80CNT020A

## TRENCH SCHOTTKY RECTIFIER

80 Amp

*New GenIII D-61 Package*

### Major Ratings and Characteristics

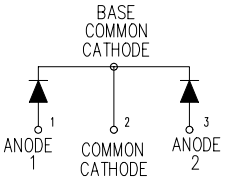
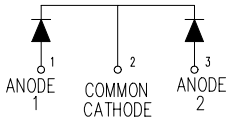
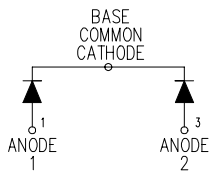
| Characteristics | | Value | Units |
|---|---|---|---|
| $I_{F(AV)}$ | Rectangular waveform | 80 | A |
| $V_{RRM}$ | range | 20 | V |
| $I_{FSM}$ | @ tp = 5 µs sine | 5300 | A |
| $V_F$ | @ 40 Apk, $T_J$ = 150°C (per leg) | 0.21 | V |
| $T_J$ | range | -55 to 150 | °C |

### Description/ Features

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, free-wheeling diodes, and reverse battery protection.

- 150° C $T_J$ operation
- Center tap module
- Very low forward voltage drop
- High purity, high temperature epoxy encapsulation for enhanced mechanical strength and moisture resistance
- High frequency operation
- Guard ring for enhanced ruggedness and long term reliability
- *New fully transfer-mould low profile, small footprint, high current package*

## Case Styles

| 80CNT...A | 80CNT...ASM | 80CNT...ASL |
|---|---|---|
|  |  |  |
|   |   |   |
| **D61-8** | **D61-8-SM** | **D61-8-SL** |

## Voltage Ratings

| | Part number | | 80CNT020A |
|---|---|---|---|
| $V_R$ | Max. DC Reverse Voltage (V) | @125°C | 20 |
| | | @150°C | 13 |

## Absolute Maximum Ratings

| | Parameters | | Values | Units | Conditions | |
|---|---|---|---|---|---|---|
| $I_{F(AV)}$ | Max. Average Forward Current | (Per Leg) | 40 | A | 50% duty cycle @ $T_C$ = 137°C, rectangular wave form | |
| | | (Per Device) | 80 | | | |
| $I_{FSM}$ | Max. Peak One Cycle Non-Repetitive Surge Current (Per Leg) | | 5300 | A | 5µs Sine or 3µs Rect. pulse | Following any rated load condition and with rated $V_{RRM}$ applied |
| | | | 700 | | 10ms Sine or 6ms Rect. pulse | |
| $E_{AS}$ | Non-Repetitive Avalanche Energy (Per Leg) | | 4.5 | mJ | $T_J$ = 25 °C, $I_{AS}$ = 1 Amps, L = 4.5 mH | |
| $I_{AR}$ | Repetitive Avalanche Current (Per Leg) | | 1 | A | Current decaying linearly to zero in 1 µsec<br>Frequency limited by $T_J$ max. $V_A$ = 1.5 x $V_R$ typical | |

## Electrical Specifications

| | Parameters | | Typ | Max | Units | Conditions | |
|---|---|---|---|---|---|---|---|
| $V_{FM}$ | Max. Forward Voltage Drop (Per Leg) | (1) | 0.33 | 0.37 | V | @ 40A | $T_J$ = 25°C |
| | | | 0.39 | 0.45 | | @ 80A | |
| | | | 0.24 | 0.27 | | @ 40A | $T_J$ = 125°C |
| | | | 0.31 | 0.36 | | @ 80A | |
| | | | 0.21 | 0.25 | | @ 40A | $T_J$ = 150°C |
| | | | 0.29 | 0.34 | | @ 80A | |
| $I_{RM}$ | Max. Reverse Leakage Current (Per Leg) | (1) | 2.5 | 5.0 | mA | $T_J$ = 25°C | $V_R$ = rated $V_R$ |
| | | | 640 | 950 | | $T_J$ = 125°C | $V_R$ = rated $V_R$ |
| | | | 480 | 750 | | $T_J$ = 125°C | $V_R$ = 3.3V |
| | | | 530 | 800 | | $T_J$ = 125°C | $V_R$ = 5V |
| | | | 1630 | 2500 | | $T_J$ = 150°C | $V_R$ = 10V |
| $C_T$ | Max. Junction Capacitance (Per Leg) | | - | 5500 | pF | $V_R$=10$V_{DC}$ (test signal range 100KHz to 1MHz) 25°C | |
| $L_S$ | Typical Series Inductance (Per Leg) | | - | 5.5 | nH | Measured lead to lead 5mm from package body | |
| dv/dt | Max. Voltage Rate of Change | | - | 10000 | V/µs | (Rated $V_R$) | |

(1) Pulse Width < 300µs, Duty Cycle < 2%

## Thermal-Mechanical Specifications

| | Parameters | | 80CNT | Units | Conditions |
|---|---|---|---|---|---|
| $T_J$ | Max. Junction Temperature Range | | -55 to 125 | °C | |
| $T_{stg}$ | Max. Storage Temperature Range | | -55 to 150 | °C | |
| $R_{thJC}$ | Max. Thermal Resistance Junction to Case (Per Leg) | | 0.50 | °C/W | DC operation |
| $R_{thJC}$ | Max. Thermal Resistance Junction to Case (Per Package) | | 0.42 | °C/W | DC operation |
| $R_{thCS}$ | Typical Thermal Resistance, Case to Heatsink **(D61-8 Only)** | | 0.30 | °C/W | Mounting surface, smooth and greased |
| wt | Approximate Weight | | 7.8 (0.28) | g (oz.) | |
| T | Mounting Torque | Min. | 40 (35) | Kg -cm (lbf-in) | |
| | **(D61-8 Only)** | Max. | 58 (50) | | |

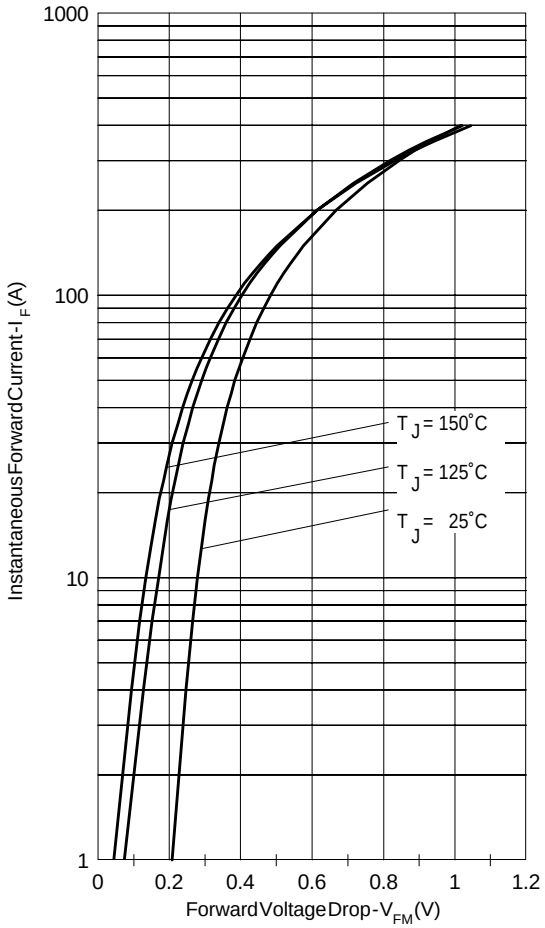



Fig. 1 - Max. Forward Voltage Drop Characteristics (Per Leg)

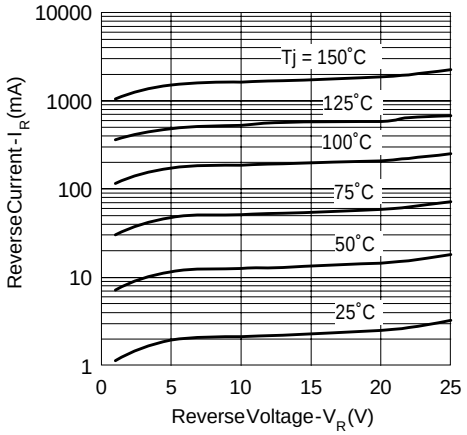



Fig. 2 - Typical Values Of Reverse Current Vs. Reverse Voltage (Per Leg)

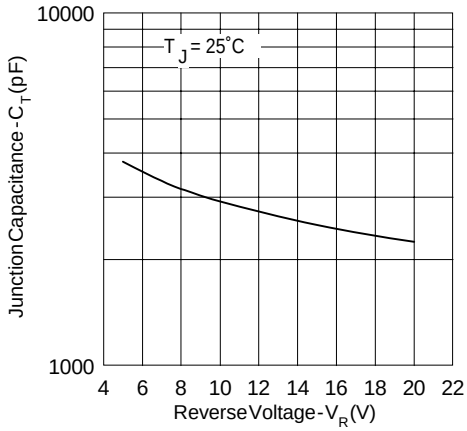



Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage (Per Leg)

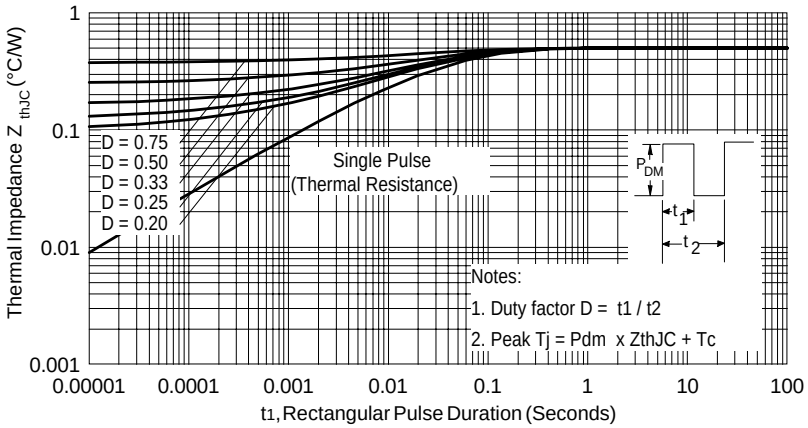



Fig. 4 - Max. Thermal Impedance $Z_{thJC}$ Characteristics (Per Leg)

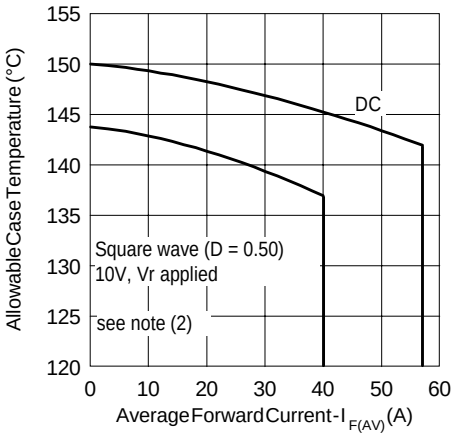



Fig. 5 - Max. Allowable Case Temperature Vs. Average Forward Current (Per Leg)

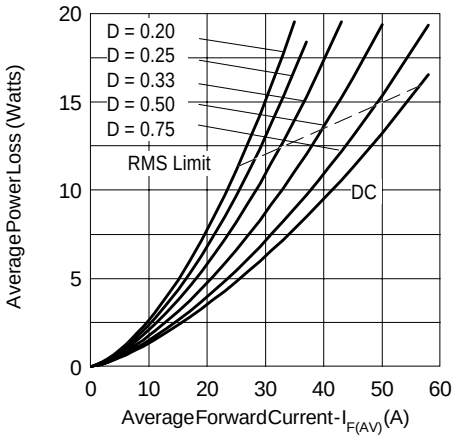



Fig. 6 - Forward Power Loss Characteristics (Per Leg)

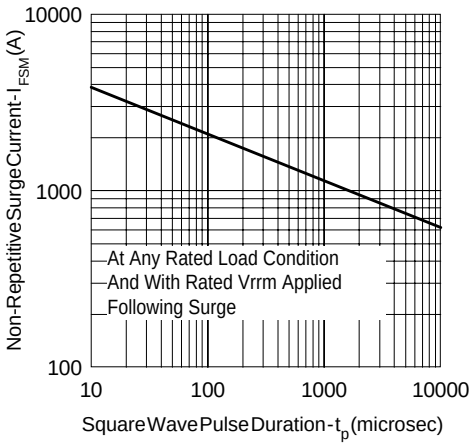



Fig. 7 - Max. Non-Repetitive Surge Current (Per Leg)

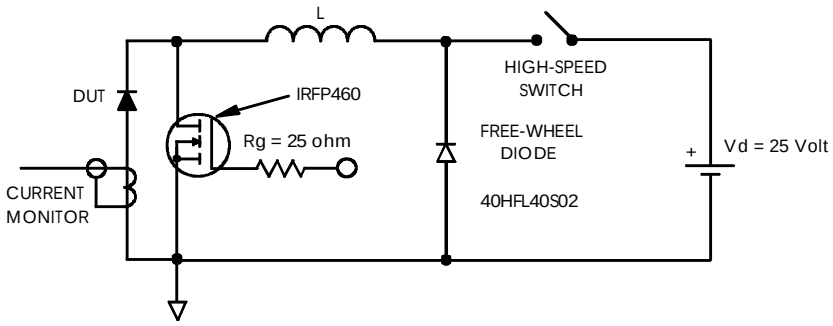



Fig. 8 - Unclamped Inductive Test Circuit

**(2)** Formula used: $T_C = T_J - (Pd + Pd_{REV}) \times R_{thJC}$;
Pd = Forward Power Loss = $I_{F(AV)} \times V_{FM}$ @ ($I_{F(AV)}$ / D) (see Fig. 6);
$Pd_{REV}$ = Inverse Power Loss = $V_{R1} \times I_R$ (1 - D); $I_R$ @ 10V, $V_R$ applied

Data and specifications subject to change without notice.
This product has been designed and qualified for Industrial Level.
Qualification Standards can be found on IR's Web site.

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**IR WORLD HEADQUARTERS:** 233 Kansas St., El Segundo, California 90245, USA Tel: (310) 252-7105
TAC Fax: (310) 252-7309
Visit us at www.irf.com for sales contact information. 12/02