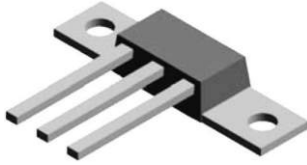
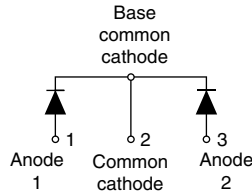


Schottky Rectifier New Generation 3 D-61 Package, 2 x 40 A

VS-88CNQ060APbF



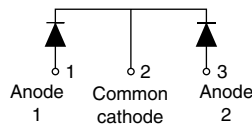
D-61-8



VS-88CNQ060ASMPbF



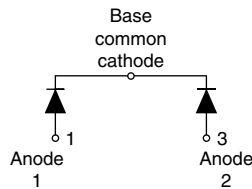
D-61-8-SM



VS-88CNQ060ASLPbF



D-61-8-SL



FEATURES

- 150 °C T_J operation
- Center tap module
- Low forward voltage drop
- High frequency operation
- Guard ring for enhanced ruggedness and long term reliability
- High purity, high temperature epoxy encapsulation for enhanced mechanical strength and moisture resistance
- 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)
- Compliant to RoHS directive 2002/95/EC
- Designed and qualified for industrial level



Available
RoHS*
COMPLIANT

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.

PRODUCT SUMMARY

| | |
|-------------|------------------|
| $I_{F(AV)}$ | 2 x 40 A |
| V_R | 60 V |
| I_{RM} | 240 mA at 125 °C |

MAJOR RATINGS AND CHARACTERISTICS

| SYMBOL | CHARACTERISTICS | VALUES | UNITS |
|-------------|------------------------------------------------------|-------------|------------------|
| $I_{F(AV)}$ | Rectangular waveform | 80 | A |
| V_{RRM} | | 60 | V |
| I_{FSM} | $t_p = 5 \mu s$ sine | 5000 | A |
| V_F | 40 Apk, $T_J = 125 \text{ }^\circ\text{C}$ (per leg) | 0.56 | V |
| T_J | Range | - 55 to 150 | $^\circ\text{C}$ |

VOLTAGE RATINGS

| PARAMETER | SYMBOL | VS-88CNQ060APbF | UNITS |
|--------------------------------------|-----------|-----------------|-------|
| Maximum DC reverse voltage | V_R | 60 | V |
| Maximum working peak reverse voltage | V_{RWM} | | |

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

| ABSOLUTE MAXIMUM RATINGS | | | | | |
|---------------------------------------------------------------------------|-------------|---------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|--------|-------|
| PARAMETER | SYMBOL | TEST CONDITIONS | | VALUES | UNITS |
| Maximum average forward current See fig. 5 | $I_{F(AV)}$ | 50 % duty cycle at $T_C = 120\text{ }^\circ\text{C}$, rectangular waveform, rated V_R | | 40 | A |
| | | | | 80 | |
| Maximum peak one cycle non-repetitive surge current per leg See fig. 7 | I_{FSM} | 5 μs sine or 3 μs rect. pulse | Following any rated load condition and with rated V_R applied | 5000 | |
| | | 10 ms sine or 6 ms rect. pulse | | 600 | |
| Non-repetitive avalanche energy per leg | E_{AS} | $T_J = 25\text{ }^\circ\text{C}$, $I_{AS} = 1\text{ A}$, $L = 0.57\text{ mH}$ | | 75 | mJ |
| Repetitive avalanche current per leg | I_{AR} | Current decaying linearly to zero in 1 μs Frequency limited by T_J maximum $V_A = 1.5 \times V_R$ typical | | 1.0 | A |

| ELECTRICAL SPECIFICATIONS | | | | | |
|-------------------------------------------------------|----------------|-----------------------------------------------------------------------------------------|-----------------------------------|--------|------------------|
| PARAMETER | SYMBOL | TEST CONDITIONS | | VALUES | UNITS |
| Maximum forward voltage drop per leg | $V_{FM}^{(1)}$ | 40 A | $T_J = 25\text{ }^\circ\text{C}$ | 0.58 | V |
| | | 80 A | | 0.77 | |
| | | 40 A | $T_J = 125\text{ }^\circ\text{C}$ | 0.56 | |
| | | 80 A | | 0.67 | |
| Typical reverse leakage current per leg See fig. 2 | $I_{RM}^{(1)}$ | $T_J = 25\text{ }^\circ\text{C}$ | $V_R = \text{Rated } V_R$ | 0.64 | mA |
| | | $T_J = 125\text{ }^\circ\text{C}$ | | 240 | |
| Maximum junction capacitance per leg | C_T | $V_R = 5\text{ }V_{DC}$ (test signal range 100 kHz to 1 MHz) $25\text{ }^\circ\text{C}$ | | 5200 | 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/ μs |

Note

⁽¹⁾ Pulse width < 300 μs , 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, junction to case | R_{thJC} | DC operation | | 0.85 | $^\circ\text{C/W}$ |
| | | | | 0.42 | |
| Typical thermal resistance, case to heatsink | R_{thCS} | 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 (lbf · in) |
| | maximum | | | 58 (50) | |
| Marking device | | Case style D-61 | | 88CNQ060A | |
| | | Case style D-61-8-SM | | 88CNQ060ASM | |
| | | Case style D-61-8-SL | | 88CNQ060ASL | |



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

Vishay High Power Products

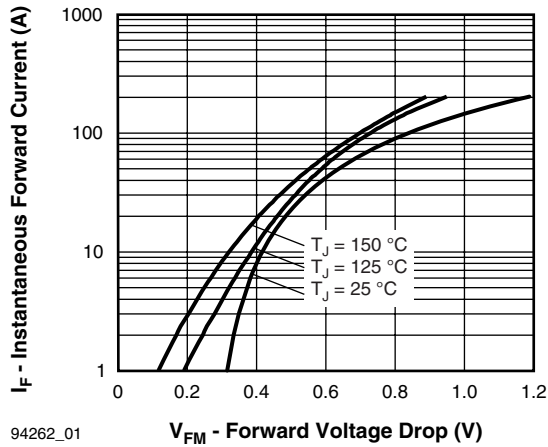


Fig. 1 - Maximum Forward Voltage Drop Characteristics (Per Leg)

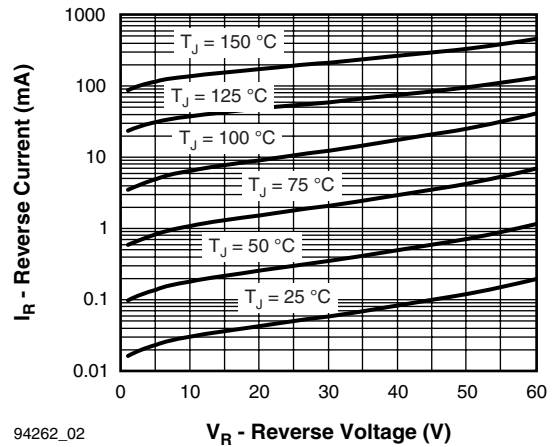


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage (Per Leg)

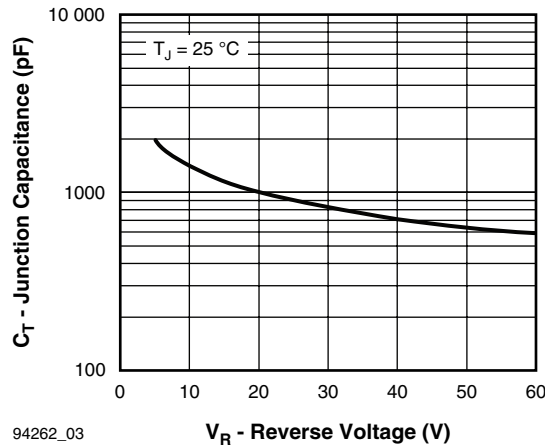


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage (Per Leg)

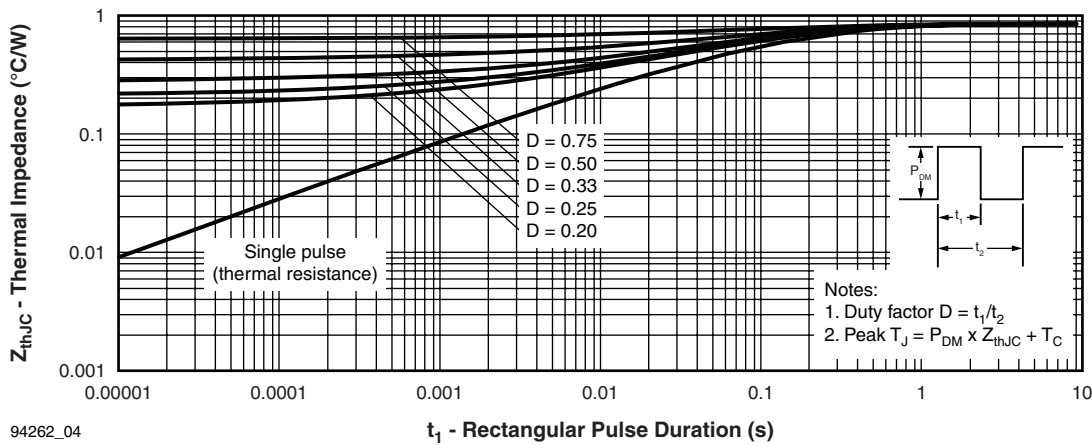


Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics (Per Leg)

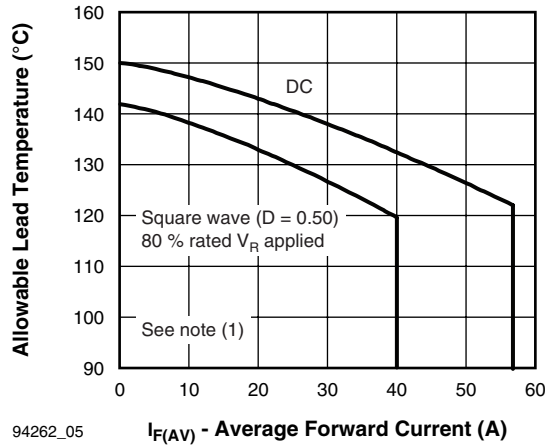


Fig. 5 - Maximum Allowable Lead Temperature vs. Average Forward Current

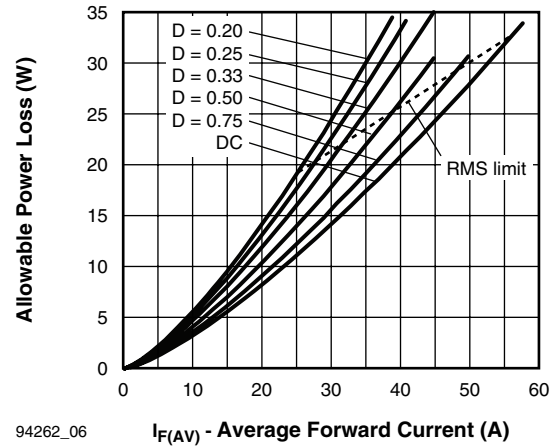


Fig. 6 - Maximum Average Forward Dissipation vs. Average Forward Current

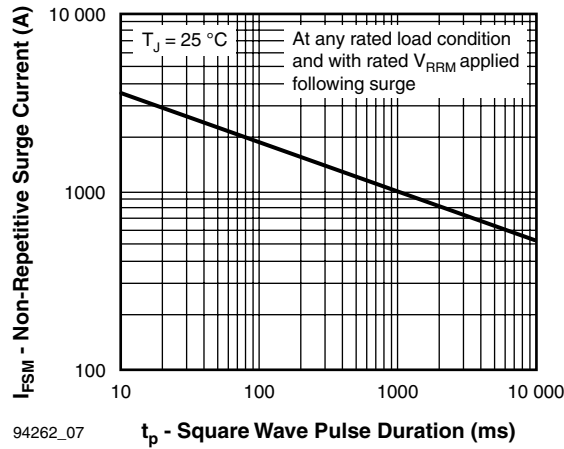


Fig. 7 - Maximum Peak Surge Forward Current vs. Pulse Duration

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



ORDERING INFORMATION TABLE

| | | | | | | | | |
|-------------|------------|-----------|----------|----------|----------|------------|----------|------------|
| Device code | VS- | 88 | C | N | Q | 060 | A | PbF |
| | ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ | ⑧ |

- 1** - HPP product suffix
- 2** - Current rating (80 A)
- 3** - Circuit configuration:
C = Common cathode
- 4** - Package:
N = D-61
- 5** - Schottky "Q" series
- 6** - Voltage ratings (060 = 60 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 | www.vishay.com/doc?95354 |
| Part marking information | www.vishay.com/doc?95356 |



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