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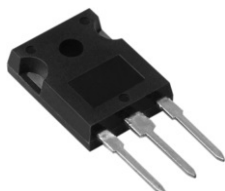
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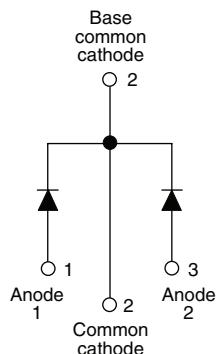
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Schottky Rectifier, 2 x 20 A



TO-247AC



FEATURES

- 175 °C T_J operation
- Center tap TO-247 package
- 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
- Lead (Pb)-free ("PbF" suffix)
- Designed and qualified for industrial level



RoHS*
COMPLIANT

PRODUCT SUMMARY

| | |
|-------------|----------|
| $I_{F(AV)}$ | 2 x 20 A |
| V_R | 80/100 V |

DESCRIPTION

The 40CPQ...GPbF center tap Schottky rectifier has been optimized for low reverse leakage at high temperature. The proprietary barrier technology allows for reliable operation up to 175 °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 | 40 | A |
| V_{RRM} | | 80/100 | V |
| I_{FSM} | $t_p = 5 \mu s$ sine | 2950 | A |
| V_F | 20 Apk, $T_J = 125^\circ C$ (per leg) | 0.61 | V |
| T_J | | - 55 to 175 | $^\circ C$ |

VOLTAGE RATINGS

| PARAMETER | SYMBOL | 40CPQ080GPbF | 40CPQ100GPbF | UNITS |
|--------------------------------------|-----------|--------------|--------------|-------|
| Maximum DC reverse voltage | V_R | 80 | 100 | V |
| Maximum working peak reverse voltage | V_{RWM} | | | |

ABSOLUTE MAXIMUM RATINGS

| PARAMETER | SYMBOL | TEST CONDITIONS | | VALUES | UNITS |
|--|-------------|---|---|--------|-------|
| Maximum average forward current See fig. 5 | $I_{F(AV)}$ | 50 % duty cycle at $T_C = 145\text{ }^{\circ}\text{C}$, rectangular waveform | | 40 | A |
| 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_{RRM} applied | 2950 | |
| | | 10 ms sine or 6 ms rect. pulse | | 300 | |
| Non-repetitive avalanche energy per leg | E_{AS} | $T_J = 25\text{ }^{\circ}\text{C}$, $I_{AS} = 2\text{ A}$, $L = 5.6\text{ mH}$ | | 11.25 | 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 | | 0.75 | 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 See fig. 1 | $V_{FM}^{(1)}$ | 20 A | $T_J = 25\text{ }^{\circ}\text{C}$ | 0.77 | V | |
| | | 40 A | | 0.91 | | |
| | | 20 A | $T_J = 125\text{ }^{\circ}\text{C}$ | 0.61 | | |
| | | 40 A | | 0.75 | | |
| Maximum reverse leakage current per leg See fig. 2 | $I_{RM}^{(1)}$ | $T_J = 25\text{ }^{\circ}\text{C}$ | $V_R = \text{Rated } V_R$ | 0.27 | mA | |
| | | $T_J = 125\text{ }^{\circ}\text{C}$ | | 15 | | |
| Maximum junction capacitance per leg | C_T | $V_R = 5\text{ V}_{DC}$ (test signal range 100 kHz to 1 MHz) $25\text{ }^{\circ}\text{C}$ | | 600 | pF | |
| Typical series inductance per leg | L_S | Measured lead to lead 5 mm from package body | | 7.5 | nH | |
| Maximum voltage rate of change | dV/dt | Rated V_R | | 10 000 | V/ μ s | |

Note

(1) Pulse width < 300 μ 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 175 | °C |
| Maximum thermal resistance, junction to case per leg | R _{thJC} | DC operation See fig. 4 | 1.25 | °C/W |
| Maximum thermal resistance, junction to case per package | | DC operation | 0.63 | |
| Typical thermal resistance, case to heatsink | R _{thCS} | Mounting surface, smooth and greased | 0.24 | |
| Approximate weight | | | 6 | g |
| | | | 0.21 | oz. |
| Mounting torque | minimum | Non-lubricated threads | 6 (5) | kgf · cm (lbf · in) |
| | maximum | | 12 (10) | |
| Marking device | | Case style TO-247AC (JEDEC) | 40CPQ080G | |
| | | | 40CPQ100G | |

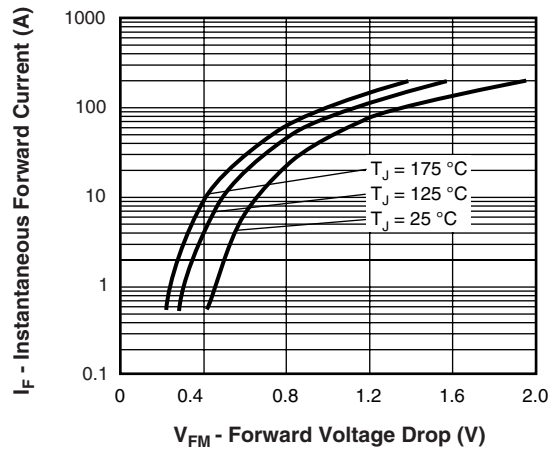


Fig. 1 - Maximum Forward Voltage Drop Characteristics (Per Leg)

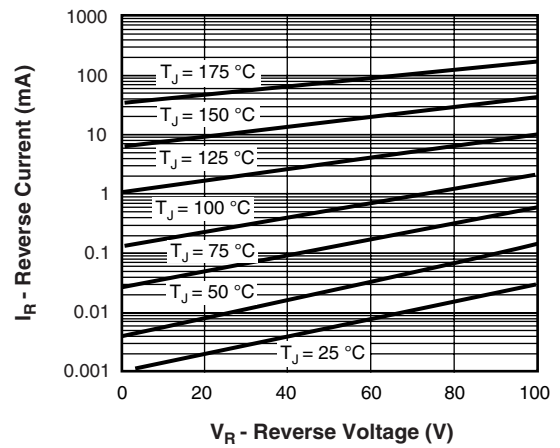


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage (Per Leg)

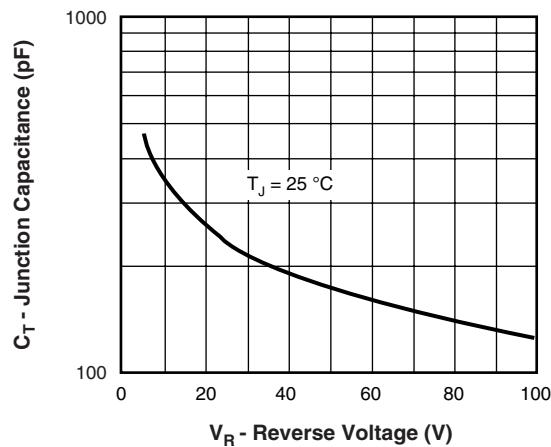


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage (Per Leg)

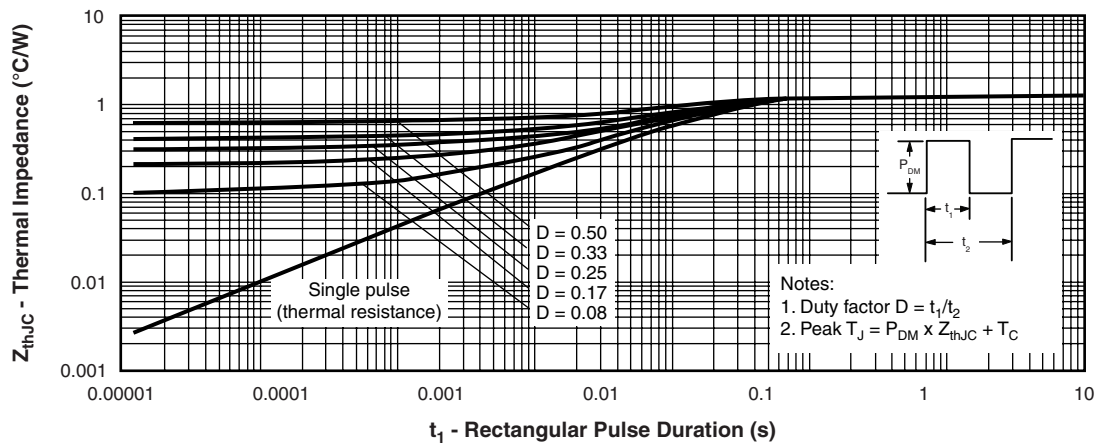


Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics (Per Leg)

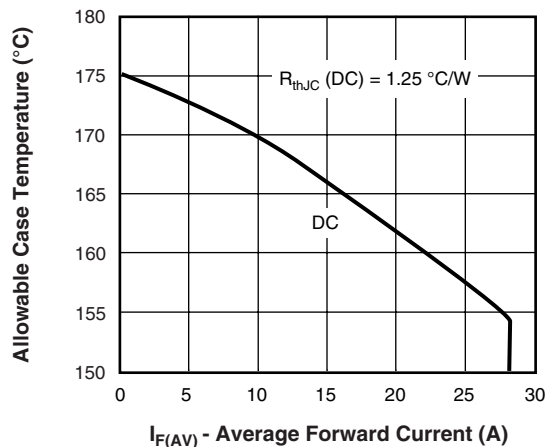


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current (Per Leg)

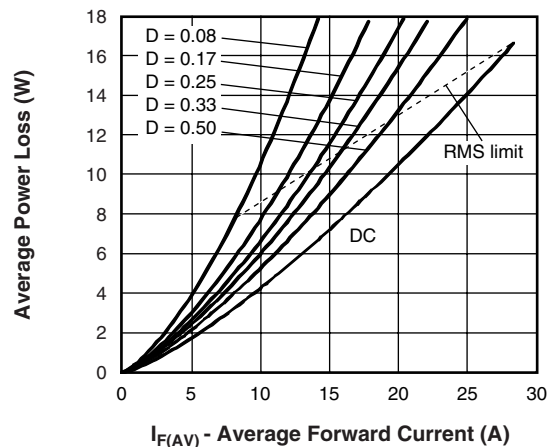


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

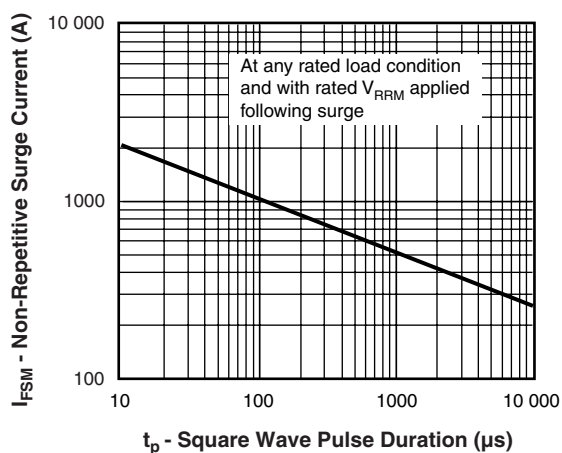


Fig. 7 - Maximum Non-Repetitive Surge Current (Per Leg)

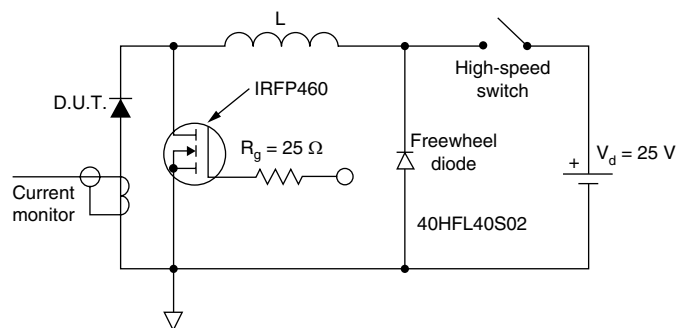


Fig. 8 - Unclamped Inductive Test Circuit



40CPQ080GPbF/40CPQ100GPbF

Schottky Rectifier, 2 x 20 A Vishay High Power Products

ORDERING INFORMATION TABLE

| | | | | | | | |
|-------------|----|---|---|---|-----|---|-----|
| Device code | 40 | C | P | Q | 100 | G | PbF |
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |

- 1** - Current rating (40 = 40 A)
- 2** - Circuit configuration:
C = Common cathode
- 3** - Package:
P = TO-247
- 4** - Schottky "Q" series
- 5** - Voltage code

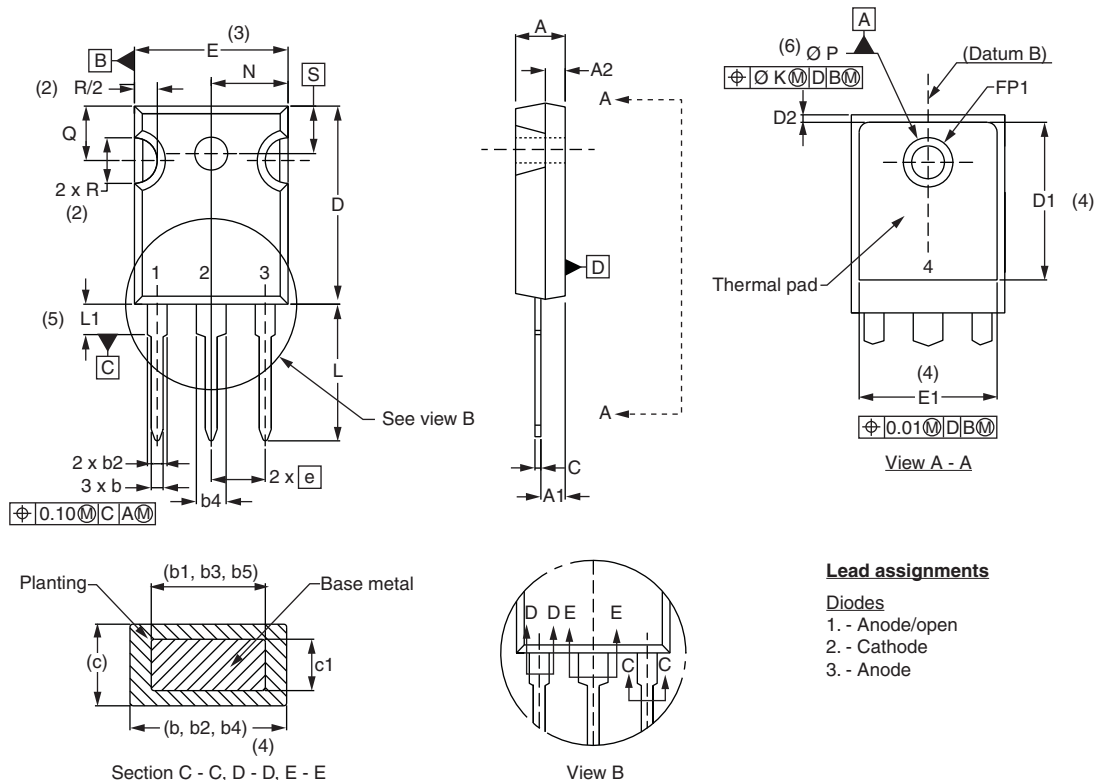
| |
|-------------|
| 080 = 80 V |
| 100 = 100 V |
- 6** - G = Schottky generation
- 7**
 - None = Standard production
 - PbF = Lead (Pb)-free

Tube standard pack quantity: 25 pieces

| LINKS TO RELATED DOCUMENTS | |
|----------------------------|---|
| Dimensions | http://www.vishay.com/doc?95223 |
| Part marking information | http://www.vishay.com/doc?95226 |



DIMENSIONS in millimeters and inches



Lead assignments

Diodes

1. - Anode/open
2. - Cathode
3. - Anode

| SYMBOL | MILLIMETERS | | INCHES | | NOTES |
|--------|-------------|-------|--------|-------|-------|
| | MIN. | MAX. | MIN. | MAX. | |
| A | 4.65 | 5.31 | 0.183 | 0.209 | |
| A1 | 2.21 | 2.59 | 0.087 | 0.102 | |
| A2 | 1.50 | 2.49 | 0.059 | 0.098 | |
| b | 0.99 | 1.40 | 0.039 | 0.055 | |
| b1 | 0.99 | 1.35 | 0.039 | 0.053 | |
| b2 | 1.65 | 2.39 | 0.065 | 0.094 | |
| b3 | 1.65 | 2.37 | 0.065 | 0.094 | |
| b4 | 2.59 | 3.43 | 0.102 | 0.135 | |
| b5 | 2.59 | 3.38 | 0.102 | 0.133 | |
| c | 0.38 | 0.86 | 0.015 | 0.034 | |
| c1 | 0.38 | 0.76 | 0.015 | 0.030 | |
| D | 19.71 | 20.70 | 0.776 | 0.815 | 3 |
| D1 | 13.08 | - | 0.515 | - | 4 |

| SYMBOL | MILLIMETERS | | INCHES | | NOTES |
|-----------|-------------|-------|-----------|-------|-------|
| | MIN. | MAX. | MIN. | MAX. | |
| D2 | 0.51 | 1.30 | 0.020 | 0.051 | |
| E | 15.29 | 15.87 | 0.602 | 0.625 | 3 |
| E1 | 13.72 | - | 0.540 | - | |
| e | 5.46 BSC | | 0.215 BSC | | |
| FK | 2.54 | | 0.010 | | |
| L | 14.20 | 16.10 | 0.559 | 0.634 | |
| L1 | 3.71 | 4.29 | 0.146 | 0.169 | |
| N | 7.62 BSC | | 0.3 | | |
| ΦP | 3.56 | 3.66 | 0.14 | 0.144 | |
| $\Phi P1$ | - | 6.98 | - | 0.275 | |
| Q | 5.31 | 5.69 | 0.209 | 0.224 | |
| R | 4.52 | 5.49 | 1.78 | 0.216 | |
| S | 5.51 BSC | | 0.217 BSC | | |

Notes

- (1) Dimensioning and tolerancing per ASME Y14.5M-1994
- (2) Contour of slot optional
- (3) Dimension D and E do not include mold flash. Mold flash shall not exceed 0.127 mm (0.005") per side. These dimensions are measured at the outermost extremes of the plastic body
- (4) Thermal pad contour optional with dimensions D1 and E1
- (5) Lead finish uncontrolled in L1
- (6) ΦP to have a maximum draft angle of 1.5 to the top of the part with a maximum hole diameter of 3.91 mm (0.154")
- (7) Outline conforms to JEDEC outline TO-247 with exception of dimension c



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