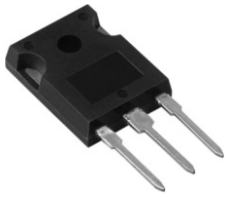
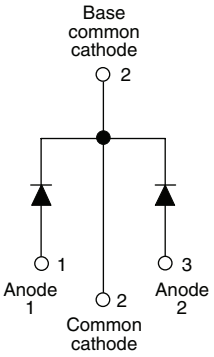
# Schottky Rectifier, 2 x 30 A



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
- Designed and qualified for industrial level

## DESCRIPTION

The 60CPQ150 center tap Schottky rectifier series 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.

| PRODUCT SUMMARY | |
|---|---|
| $I_{F(AV)}$ | 2 x 30 A |
| $V_R$ | 150 V |

| MAJOR RATINGS AND CHARACTERISTICS | | | |
|---|---|---|---|
| SYMBOL | CHARACTERISTICS | VALUES | UNITS |
| $I_{F(AV)}$ | Rectangular waveform | 60 | A |
| $V_{RRM}$ | | 150 | V |
| $I_{FSM}$ | $t_p$ = 5 µs sine | 2300 | A |
| $V_F$ | 30 Apk, $T_J$ = 125 °C (per leg) | 0.67 | V |
| $T_J$ | Range | - 55 to 175 | °C |

| VOLTAGE RATINGS | | | |
|---|---|---|---|
| PARAMETER | SYMBOL | 60CPQ150 | UNITS |
| Maximum DC reverse voltage | $V_R$ | 150 | V |
| Maximum working peak reverse voltage | $V_{RWM}$ | | |

| ABSOLUTE MAXIMUM RATINGS | | | | | | |
|---|---|---|---|---|---|---|
| PARAMETER | | SYMBOL | TEST CONDITIONS | | VALUES | UNITS |
| Maximum average forward current See fig. 5 | per leg | $I_{F(AV)}$ | 50 % duty cycle at $T_C$ = 151 °C, rectangular waveform | | 30 | A |
| | per device | | | | 60 | |
| 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 | 2300 | |
| | | | 10 ms sine or 6 ms rect. pulse | | 510 | |
| Non-repetitive avalanche energy per leg | | $E_{AS}$ | $T_J$ = 25 °C, $I_{AS}$ = 1 A, L = 1 mH | | 0.5 | 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 x $V_R$ typical | | 1 | A |

## ELECTRICAL SPECIFICATIONS

| PARAMETER | SYMBOL | TEST CONDITIONS | | TYP. | MAX. | UNITS |
|---|---|---|---|---|---|---|
| Maximum forward voltage drop per leg See fig. 1 | $V_{FM}$ (1) | 30 A | $T_J$ = 25 °C | 0.80 | 0.83 | V |
| | | 60 A | | 0.93 | 0.99 | |
| | | 30 A | $T_J$ = 125 °C | 0.64 | 0.67 | |
| | | 60 A | | 0.74 | 0.77 | |
| Maximum reverse leakage current per leg See fig. 2 | $I_{RM}$ | $T_J$ = 25 °C | $V_R$ = Rated $V_R$ | 10 | 100 | µA |
| | | $T_J$ = 125 °C | | 12 | 25 | mA |
| Typical junction capacitance per leg | $C_T$ | $V_R$ = 5 $V_{DC}$ (test signal range 100 kHz to 1 MHz) 25 °C | | - | 820 | 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/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 175 | °C |
| Maximum thermal resistance, junction to case per leg | | $R_{thJC}$ | DC operation See fig. 4 | 0.8 | °C/W |
| Maximum thermal resistance, junction to case per package | | | DC operation | 0.4 | |
| Typical thermal resistance, case to heatsink | | $R_{thCS}$ | Mounting surface, smooth and greased | 0.25 | |
| Approximate weight | | | | 6 | g |
| | | | | 0.21 | oz. |
| Mounting torque | minimum | | | 6 (5) | kgf · cm (lbf · in) |
| | maximum | | | 12 (10) | |
| Marking device | | | Case style TO-247AC (JEDEC) | 60CPQ150 | |

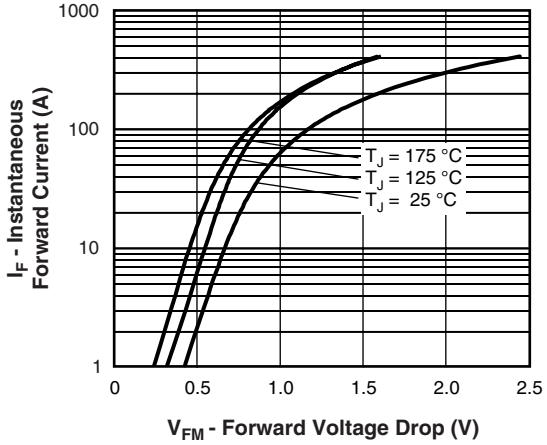



Fig. 1 - Maximum Forward Voltage Drop Characteristics (Per Leg)

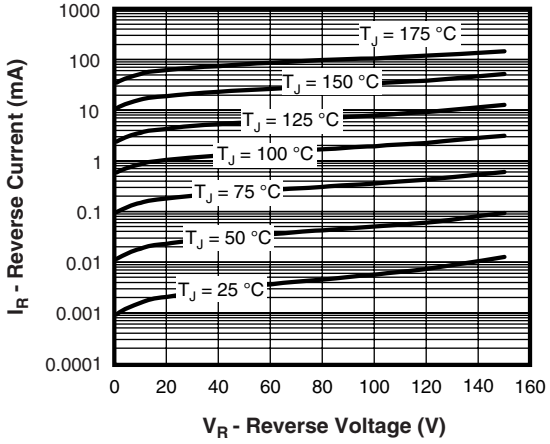



Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage (Per Leg)

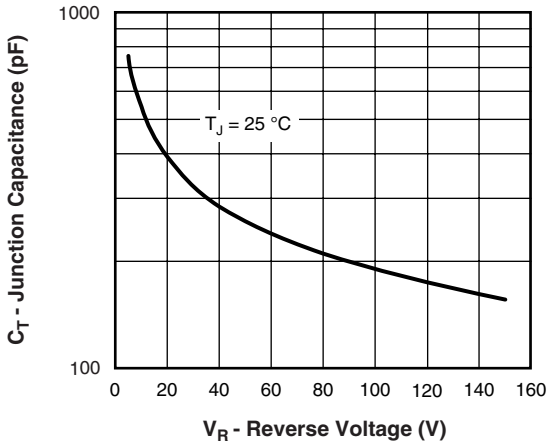



Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage (Per Leg)

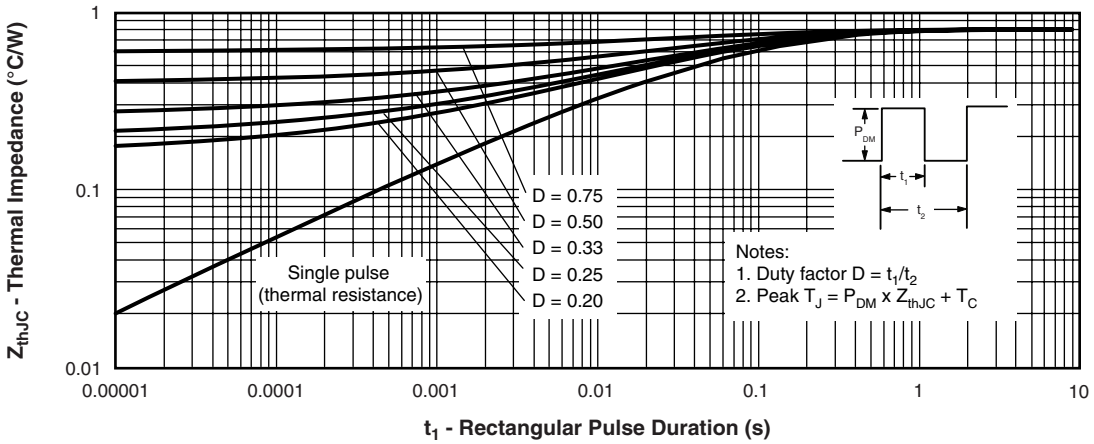



Fig. 4 - Maximum Thermal Impedance $Z_{thJC}$ Characteristics (Per Leg)

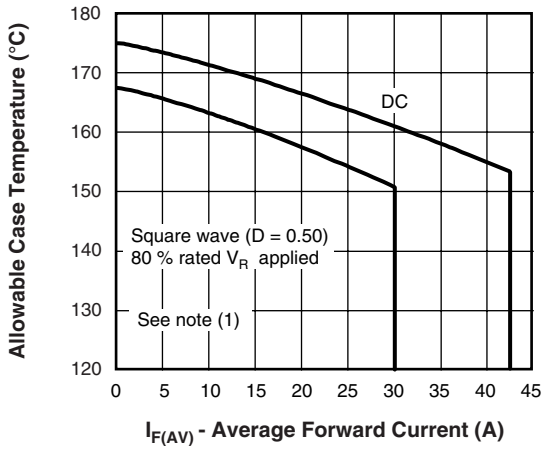



Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current (Per Leg)

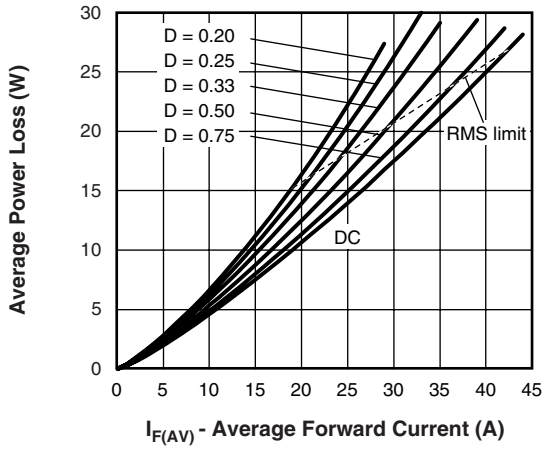



Fig. 6 - Forward Power Loss Characteristics (Per Leg)

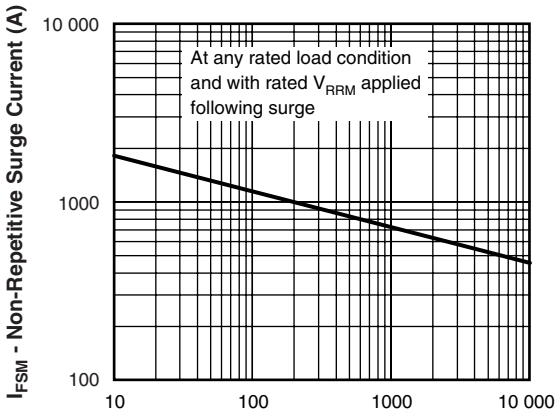



Fig. 7 - Maximum Non-Repetitive Surge Current (Per Leg)

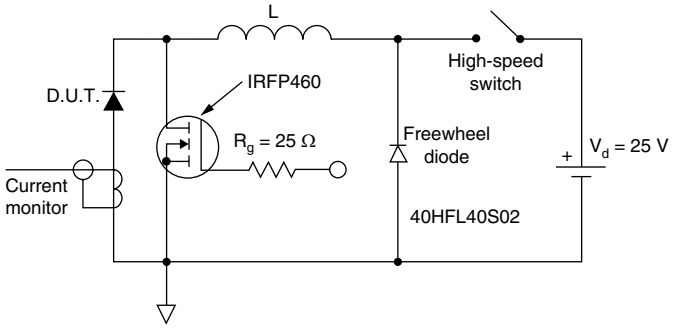


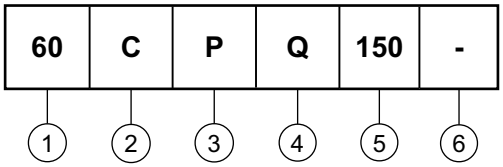

Fig. 8 - Unclamped Inductive Test Circuit

**Note**

(1) Formula used: $T_C = T_J - (Pd + Pd_{REV}) \times R_{thJC}$;
Pd = Forward power loss = $I_{F(AV)} \times V_{FM}$ at ($I_{F(AV)}$/D) (see fig. 6);
$Pd_{REV}$ = Inverse power loss = $V_{R1} \times I_R (1 - D)$; $I_R$ at $V_{R1}$ = 80 % rated $V_R$

## ORDERING INFORMATION TABLE

**Device code**




1 - Current rating (60 = 60 A)
2 - Circuit configuration:
C = Common cathode
3 - Package:
P = TO-247
4 - Schottky “Q” series
5 - Voltage code (150 = 150 V)
6 - • 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 |

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