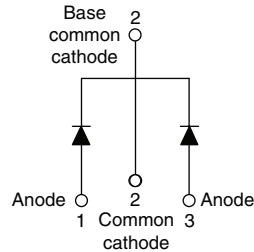


Schottky Rectifier, 2 x 30 A


TO-220AB


FEATURES

- 150 °C T_J operation
- Center tap TO-220 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

This center tap Schottky rectifier has been optimized for low reverse leakage at high temperature. 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 30 A |
| V_R | 45 V |

MAJOR RATINGS AND CHARACTERISTICS

| SYMBOL | CHARACTERISTICS | VALUES | UNITS |
|-------------|-----------------------------------|-------------|-------|
| $I_{F(AV)}$ | Rectangular waveform (per device) | 60 | A |
| V_{RRM} | | 45 | V |
| I_{FRM} | $T_C = 113\text{ °C}$ (per leg) | 60 | A |
| I_{FSM} | $t_p = 5\ \mu\text{s}$ sine | 1500 | |
| V_F | 30 Apk, $T_J = 125\text{ °C}$ | 0.53 | V |
| T_J | Range | - 65 to 150 | °C |

VOLTAGE RATINGS

| PARAMETER | SYMBOL | 60CTQ045 | UNITS |
|--------------------------------------|-----------|----------|-------|
| Maximum DC reverse voltage | V_R | 45 | V |
| Maximum working peak reverse voltage | V_{RWM} | | |

ABSOLUTE MAXIMUM RATINGS

| PARAMETER | SYMBOL | TEST CONDITIONS | VALUES | UNITS |
|---|-------------|---|--------|-------|
| Maximum average forward current per leg per device | $I_{F(AV)}$ | 50 % duty cycle at $T_C = 113\text{ °C}$, rectangular waveform | 30 | A |
| | | | 60 | |
| Peak repetitive forward current per leg | I_{FRM} | Rated V_R , square wave, 20 kHz, $T_C = 113\text{ °C}$ | 60 | |
| Maximum peak one cycle non-repetitive surge current per leg | I_{FSM} | 5 μs sine or 3 μs rect. pulse | 1500 | |
| | | 10 ms sine or 6 ms rect. pulse | 300 | |
| Non-repetitive avalanche energy per leg | E_{AS} | $T_J = 25\text{ °C}$, $I_{AS} = 3\text{ A}$, $L = 4.40\text{ mH}$ | 20 | 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 | 3 | A |



| ELECTRICAL SPECIFICATIONS | | | | | | |
|---------------------------------------|----------------|--|-----------------------------------|--------|------|------------|
| PARAMETER | SYMBOL | TEST CONDITIONS | | TYP. | MAX. | UNITS |
| Maximum forward voltage drop | $V_{FM}^{(1)}$ | 30 A | $T_J = 25\text{ }^\circ\text{C}$ | 0.51 | 0.56 | V |
| | | 60 A | | 0.66 | 0.72 | |
| | | 30 A | $T_J = 125\text{ }^\circ\text{C}$ | 0.48 | 0.53 | |
| | | 60 A | | 0.68 | 0.75 | |
| Maximum instantaneous reverse current | I_{RM} | $T_J = 25\text{ }^\circ\text{C}$ | Rated DC voltage | 0.33 | 2 | mA |
| | | $T_J = 125\text{ }^\circ\text{C}$ | | 145 | 250 | |
| Maximum junction capacitance | C_T | $V_R = 5\text{ }V_{DC}$ (test signal range 100 kHz to 1 MHz) 25 °C | | 2000 | | pF |
| Typical series inductance | L_S | Measured from top of terminal to mounting plane | | 8.0 | | 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 temperature range | T_J | | | - 65 to 150 | $^\circ\text{C}$ |
| Maximum storage temperature range | T_{Stg} | | | - 65 to 175 | |
| Maximum thermal resistance, junction to case per leg | R_{thJC} | DC operation | | 1.2 | $^\circ\text{C/W}$ |
| Typical thermal resistance, case to heatsink | R_{thCS} | Mounting surface, smooth and greased | | 0.50 | |
| Approximate weight | | | | 2 | g |
| | | | | 0.07 | oz. |
| Mounting torque | minimum | | Non-lubricated threads | 6 (5) | kgf · cm (lbf · in) |
| | maximum | | | 12 (10) | |
| Marking device | | Case style TO-220AB | | 60CTQ045 | |

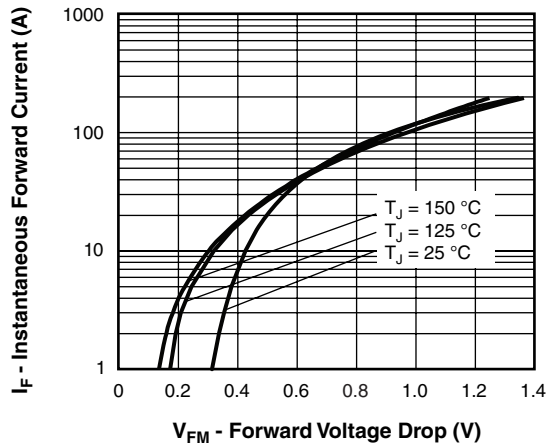


Fig. 1 - Maximum Forward Voltage Drop Characteristics

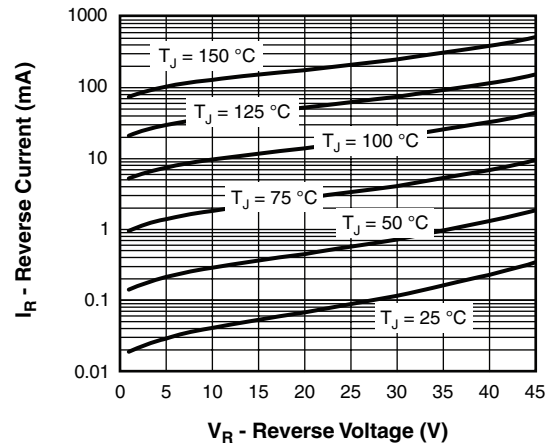


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage

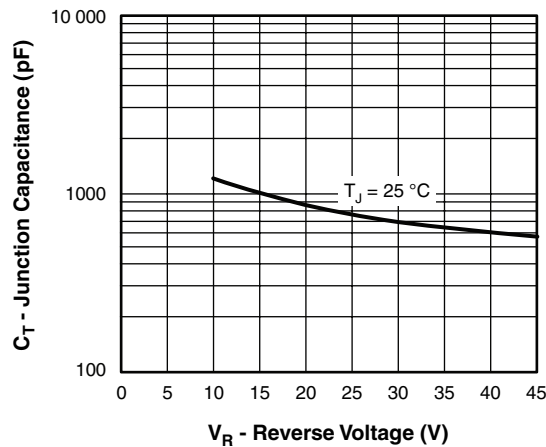
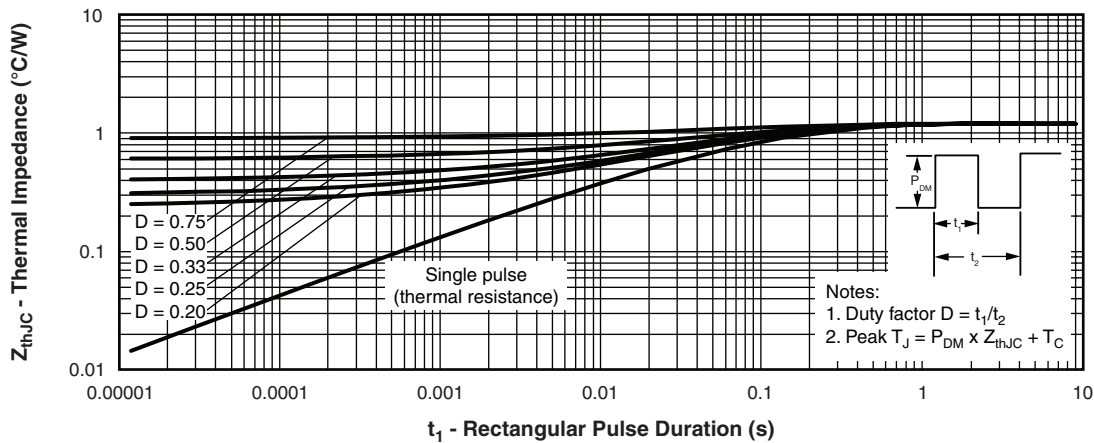


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage


 Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics

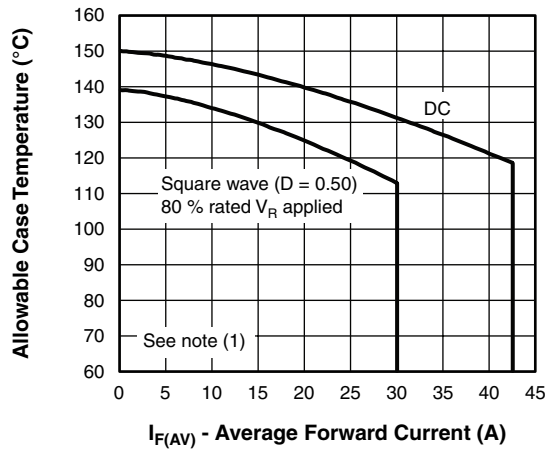


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current

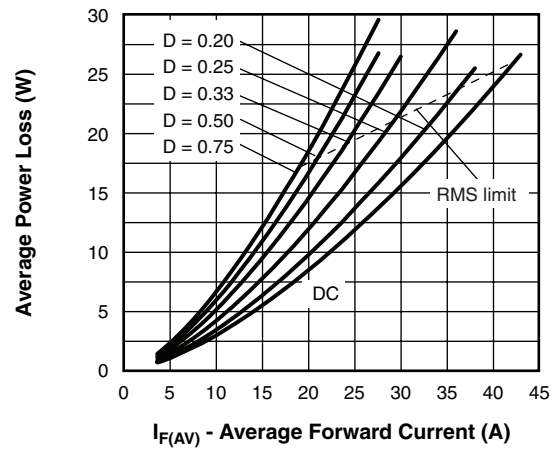


Fig. 6 - Forward Power Loss Characteristics

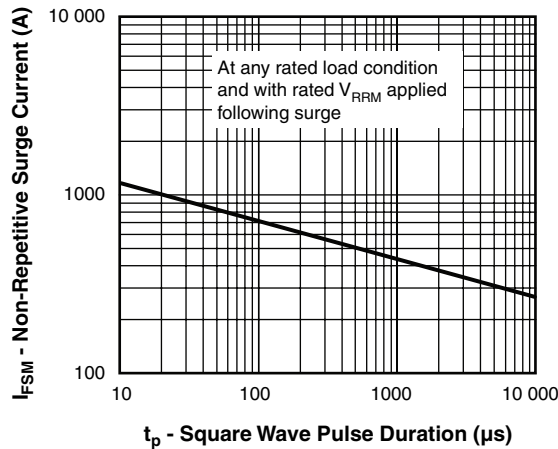


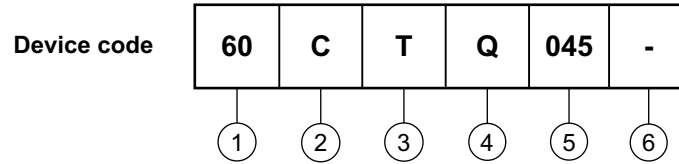
Fig. 7 - Maximum Non-Repetitive Surge Current (Per Leg)

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



- 1** - Current rating (60 = 60 A)
- 2** - Circuit configuration:
C = Common cathode
- 3** - Package:
T = TO-220
- 4** - Schottky "Q" series
- 5** - Voltage rating (045 = 45 V)
- 6** -
 - None = Standard production
 - PbF = Lead (Pb)-free

Tube standard pack quantity: 50 pieces

| LINKS TO RELATED DOCUMENTS | |
|----------------------------|---|
| Dimensions | http://www.vishay.com/doc?95222 |
| Part marking information | http://www.vishay.com/doc?95225 |



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