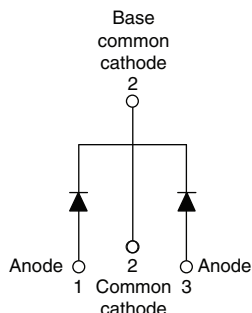


## Schottky Rectifier, 2 x 30 A


**TO-220AB**


### FEATURES

- 175 °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
- Lead (Pb)-free ("PbF" suffix)
- Designed and qualified for industrial level


**RoHS\***  
COMPLIANT

### PRODUCT SUMMARY

|             |          |
|-------------|----------|
| $I_{F(AV)}$ | 2 x 30 A |
| $V_R$       | 100 V    |

### 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 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 (per device) | 60          | A     |
| $V_{RRM}$   |                                   | 100         | V     |
| $I_{FRM}$   | $T_C = 139\text{ °C}$ (per leg)   | 60          | A     |
| $I_{FSM}$   | $t_p = 5\text{ }\mu\text{s}$ sine | 1500        |       |
| $V_F$       | 30 Apk, $T_J = 125\text{ °C}$     | 0.69        | V     |
| $T_J$       | Range                             | - 65 to 175 | °C    |

### VOLTAGE RATINGS

| PARAMETER                            | SYMBOL    | 63CTQ100PbF | UNITS |
|--------------------------------------|-----------|-------------|-------|
| Maximum DC reverse voltage           | $V_R$     | 100         | V     |
| Maximum working peak reverse voltage | $V_{RWM}$ |             |       |

### ABSOLUTE MAXIMUM RATINGS

| PARAMETER                                                   | SYMBOL      | TEST CONDITIONS                                                                                                           | VALUES | UNITS |
|-------------------------------------------------------------|-------------|---------------------------------------------------------------------------------------------------------------------------|--------|-------|
| Maximum average forward current<br>per leg<br>per device    | $I_{F(AV)}$ | 50 % duty cycle at $T_C = 139\text{ °C}$ , rectangular waveform                                                           | 30     | A     |
|                                                             |             |                                                                                                                           | 60     |       |
| Peak repetitive forward current per leg                     | $I_{FRM}$   | Rated $V_R$ , square wave, 20 kHz, $T_C = 140\text{ °C}$                                                                  | 60     |       |
| Maximum peak one cycle non-repetitive surge current per leg | $I_{FSM}$   | 5 $\mu\text{s}$ sine or 3 $\mu\text{s}$ rect. pulse                                                                       | 1500   |       |
|                                                             |             | 10 ms sine or 6 ms rect. pulse                                                                                            | 300    |       |
| Non-repetitive avalanche energy per leg                     | $E_{AS}$    | $T_J = 25\text{ °C}$ , $I_{AS} = 0.75\text{ A}$ , $L = 40\text{ mH}$                                                      | 11.25  | mJ    |
| Repetitive avalanche current per leg                        | $I_{AR}$    | Current decaying linearly to zero in 1 $\mu\text{s}$<br>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                                                                           |                                     | TYP.   | MAX. | UNITS      |
| Maximum forward voltage drop          | $V_{FM}^{(1)}$ | 30 A                                                                                      | $T_J = 25\text{ }^{\circ}\text{C}$  | 0.78   | 0.82 | V          |
|                                       |                | 60 A                                                                                      |                                     | 0.94   | 1.0  |            |
|                                       |                | 30 A                                                                                      | $T_J = 125\text{ }^{\circ}\text{C}$ | 0.64   | 0.69 |            |
|                                       |                | 60 A                                                                                      |                                     | 0.78   | 0.83 |            |
| Maximum instantaneous reverse current | $I_{RM}$       | $T_J = 25\text{ }^{\circ}\text{C}$                                                        | Rated DC voltage                    | 0.02   | 0.3  | mA         |
|                                       |                | $T_J = 125\text{ }^{\circ}\text{C}$                                                       |                                     | 11     | 20   |            |
| Maximum junction capacitance          | $C_T$          | $V_R = 5\text{ V}_{DC}$ (test signal range 100 kHz to 1 MHz) $25\text{ }^{\circ}\text{C}$ |                                     | 1100   |      | 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/ $\mu$ s |

**Note**

<sup>(1)</sup> Pulse width < 300  $\mu$ s, duty cycle < 2 %

| THERMAL - MECHANICAL SPECIFICATIONS                  |                                   |                                      |             |                        |
|------------------------------------------------------|-----------------------------------|--------------------------------------|-------------|------------------------|
| PARAMETER                                            | SYMBOL                            | TEST CONDITIONS                      | VALUES      | UNITS                  |
| Maximum junction and storage temperature range       | T <sub>J</sub> , T <sub>Stg</sub> |                                      | - 65 to 175 | °C                     |
| Maximum thermal resistance, junction to case per leg | R <sub>thJC</sub>                 | DC operation                         | 1.2         | °C/W                   |
| Typical thermal resistance, case to heatsink         | R <sub>thCS</sub>                 | Mounting surface, smooth and greased | 0.50        |                        |
| Approximate weight                                   |                                   |                                      | 2           | g                      |
|                                                      |                                   |                                      | 0.07        | oz.                    |
| Mounting torque                                      | minimum                           | Non-lubricated threads               | 6 (5)       | kgf · cm<br>(lbf · in) |
|                                                      | maximum                           |                                      | 12 (10)     |                        |
| Marking device                                       |                                   | Case style TO-220AB                  | 63CTQ100    |                        |

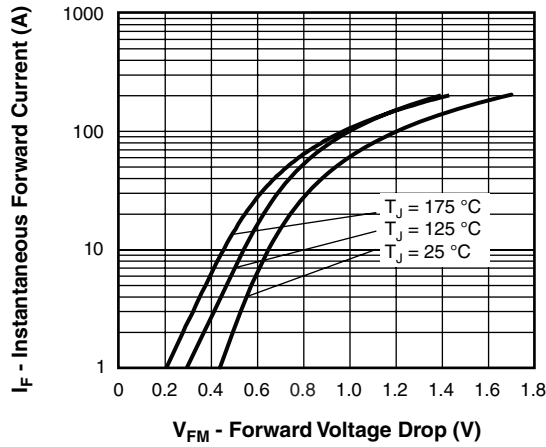


Fig. 1 - Maximum Forward Voltage Drop Characteristics

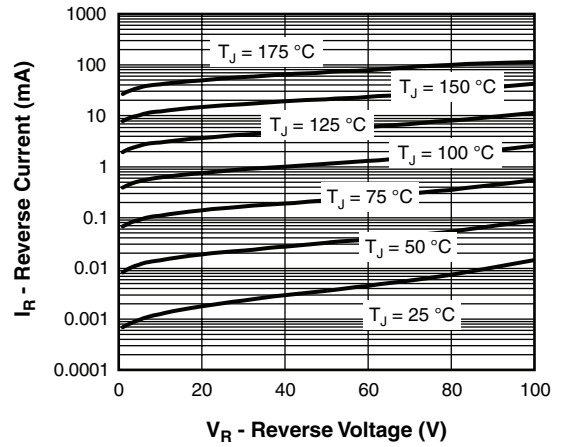


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage

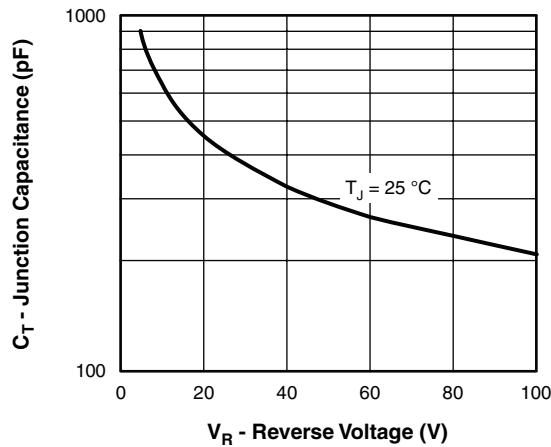


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage

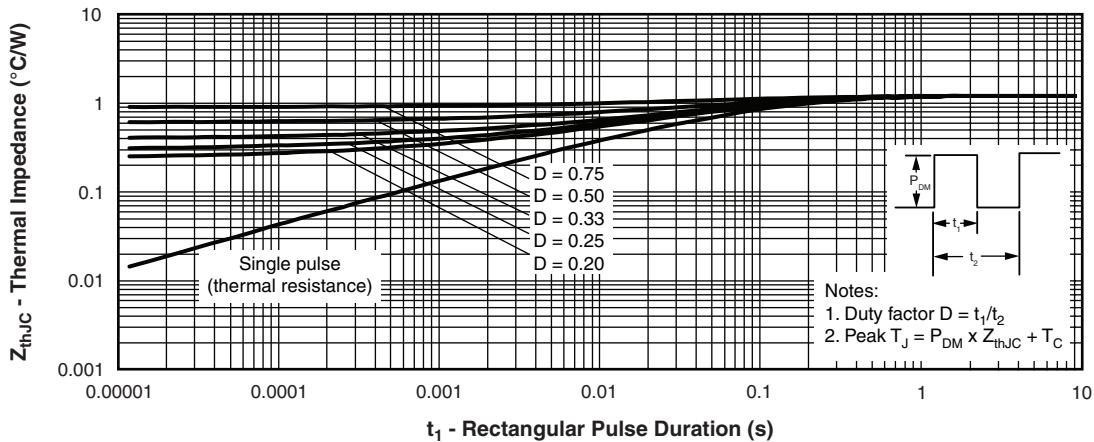


Fig. 4 - Maximum Thermal Impedance  $Z_{thJC}$  Characteristics

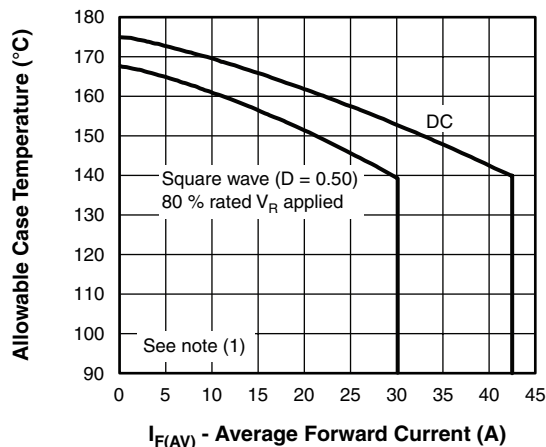


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current

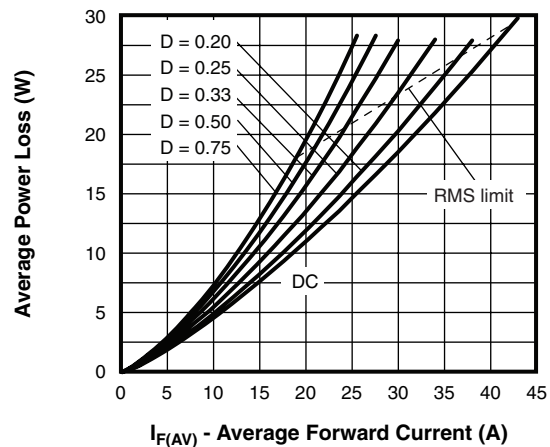


Fig. 6 - Forward Power Loss Characteristics

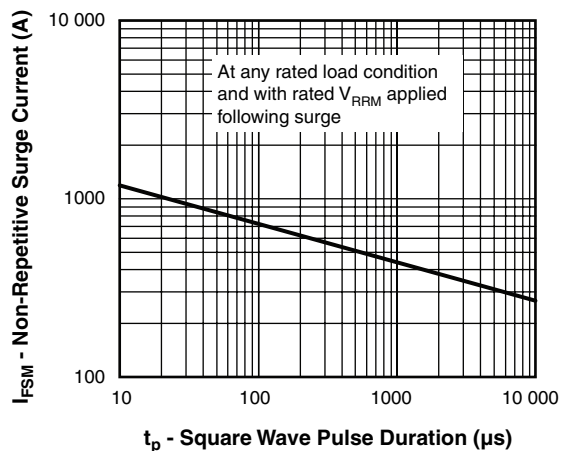


Fig. 7 - Maximum Non-Repetitive Surge Current (Per Leg)

## Note

- (1) Formula used:  $T_C = T_J - (P_d + P_{d_{REV}}) \times R_{thJC}$ ;  
 $P_d$  = 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 | 63                                                       | C | T | Q | 100 | PbF |
|             | ①                                                        | ② | ③ | ④ | ⑤   | ⑥   |
| ①           | - Current rating (60 A)                                  |   |   |   |     |     |
| ②           | - Circuit configuration:<br>C = Common cathode           |   |   |   |     |     |
| ③           | - Package:<br>T = TO-220                                 |   |   |   |     |     |
| ④           | - Schottky "Q" series                                    |   |   |   |     |     |
| ⑤           | - Voltage rating (100 = 100 V)                           |   |   |   |     |     |
| ⑥           | - • None = Standard production<br>• PbF = Lead (Pb)-free |   |   |   |     |     |

Tube standard pack quantity: 50 pieces

| LINKS TO RELATED DOCUMENTS |                                                                               |
|----------------------------|-------------------------------------------------------------------------------|
| Dimensions                 | <a href="http://www.vishay.com/doc?95222">http://www.vishay.com/doc?95222</a> |
| Part marking information   | <a href="http://www.vishay.com/doc?95225">http://www.vishay.com/doc?95225</a> |



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