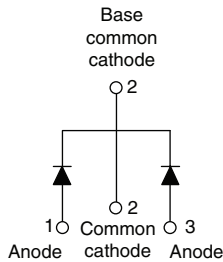


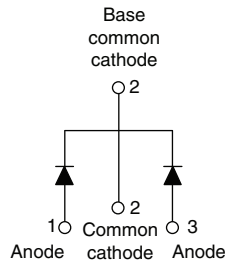
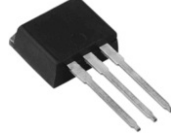
Schottky Rectifier, 2 x 10 A

20CTQ150SPbF



D²PAK

20CTQ150-1PbF



TO-262

FEATURES

- 175 °C T_J operation
- Center tap configuration
- 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 for industrial level



RoHS*
COMPLIANT

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.

PRODUCT SUMMARY

| | |
|--------------------|----------|
| I _{F(AV)} | 2 x 10 A |
| V _R | 150 V |

MAJOR RATINGS AND CHARACTERISTICS

| SYMBOL | CHARACTERISTICS | VALUES | UNITS |
|--------------------|---|-------------|-------|
| I _{F(AV)} | Rectangular waveform | 20 | A |
| V _{RRM} | | 150 | V |
| I _{FSM} | t _p = 5 μs sine | 1030 | A |
| V _F | 10 Apk, T _J = 125 °C (per leg) | 0.66 | V |
| T _J | Range | - 55 to 175 | °C |

VOLTAGE RATINGS

| PARAMETER | SYMBOL | 20CTQ150SPbF 20CTQ150-1PbF | 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 | I _{F(AV)} | 50 % duty cycle at T _C = 154 °C, rectangular waveform | 10 | A |
| | | | 20 | |
| Maximum peak one cycle non-repetitive surge current per leg See fig. 7 | I _{FSM} | 5 μs sine or 3 μs rect. pulse | 1030 | A |
| | | 10 ms sine or 6 ms rect. pulse | 180 | |
| Non-repetitive avalanche energy per leg | E _{AS} | T _J = 25 °C, I _{AS} = 1 A, L = 2 mH | 1.0 | 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 |

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

20CTQ150SPbF, 20CTQ150-1PbF



Vishay High Power Products Schottky Rectifier, 2 x 10 A

| ELECTRICAL SPECIFICATIONS | | | | | | |
|---|----------------|--|-----------------------------------|------|--------|------------------|
| PARAMETER | SYMBOL | TEST CONDITIONS | | TYP. | MAX. | UNITS |
| Maximum forward voltage drop per leg See fig. 1 | $V_{FM}^{(1)}$ | 10 A | $T_J = 25\text{ }^\circ\text{C}$ | 0.80 | 0.88 | V |
| | | 20 A | | 0.90 | 1.0 | |
| | | 10 A | $T_J = 125\text{ }^\circ\text{C}$ | 0.63 | 0.66 | |
| | | 20 A | | 0.73 | 0.77 | |
| Maximum reverse leakage current per leg See fig. 2 | $I_{RM}^{(1)}$ | $T_J = 25\text{ }^\circ\text{C}$ | $V_R = \text{Rated } V_R$ | 3.0 | 25 | μA |
| | | $T_J = 125\text{ }^\circ\text{C}$ | | 2.7 | 5.0 | mA |
| Typical junction capacitance per leg | C_T | $V_R = 5 V_{DC}$ (test signal range 100 kHz to 1 MHz) at 25 °C | | - | 280 | pF |
| Typical series inductance per leg | L_S | Measured lead to lead 5 mm from package body | | - | 8.0 | 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 | $^\circ\text{C}$ |
| Maximum thermal resistance, $\frac{\text{per leg}}{\text{per package}}$ | R_{thJC} | DC operation | 2.0 | $^\circ\text{C/W}$ |
| | | | 1.0 | |
| Typical thermal resistance, case to heatsink | R_{thCS} | Mounting surface, smooth and greased (Only for TO-262) | 0.50 | |
| Approximate weight | | | 2 | g |
| | | | 0.07 | oz. |
| Mounting torque | minimum | | 6 (5) | kgf · cm |
| | maximum | | 12 (10) | (lbf · in) |
| Marking device | | Case style D ² PAK | 20CTQ150S | |
| | | Case style TO-262 | 20CTQ150-1 | |



20CTQ150SPbF, 20CTQ150-1PbF

Schottky Rectifier, 2 x 10 A Vishay High Power Products

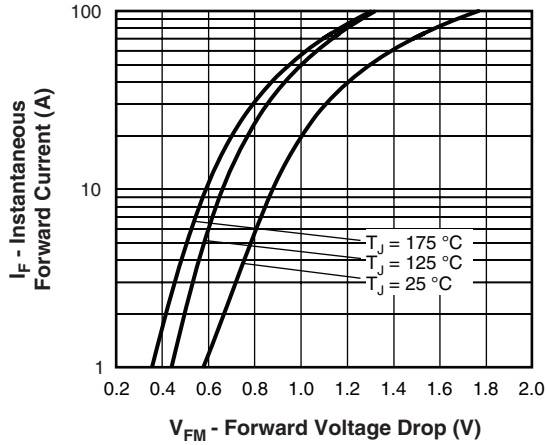


Fig. 1 - Maximum Forward Voltage Drop Characteristics (Per Leg)

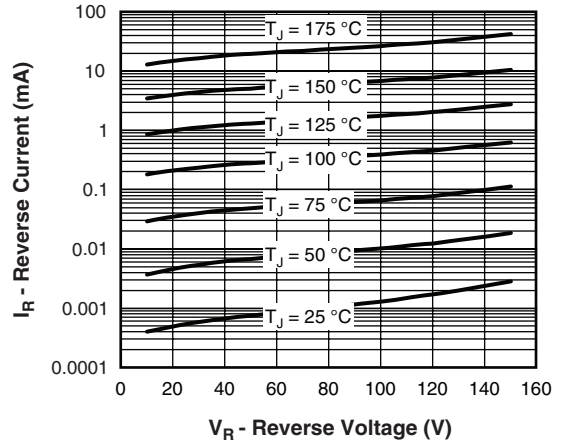


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage (Per Leg)

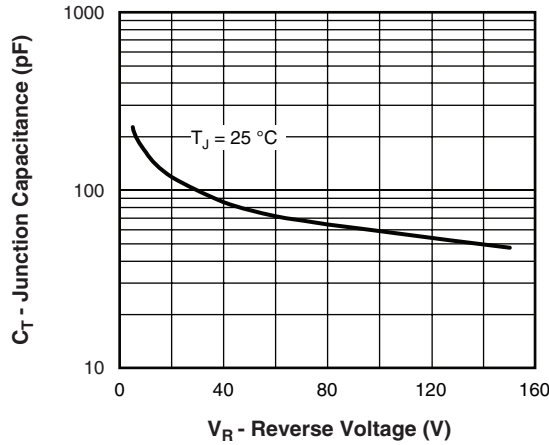


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage (Per Leg)

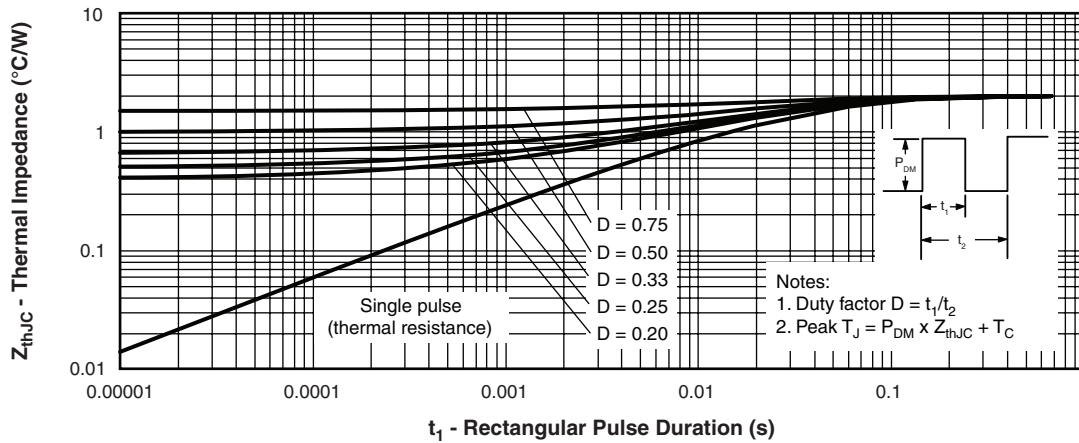


Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics (Per Leg)

20CTQ150SPbF, 20CTQ150-1PbF



Vishay High Power Products Schottky Rectifier, 2 x 10 A

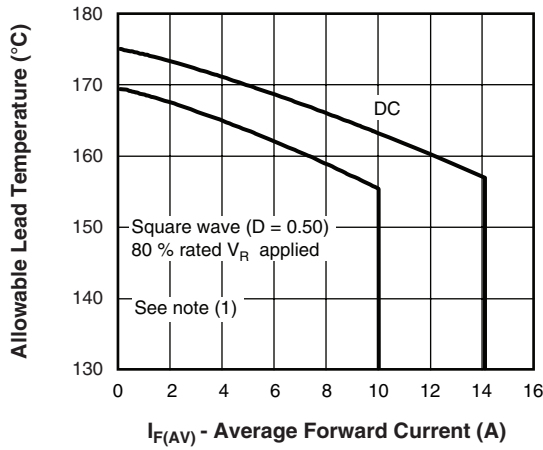


Fig. 5 - Maximum Average Forward Current vs. Allowable Lead Temperature

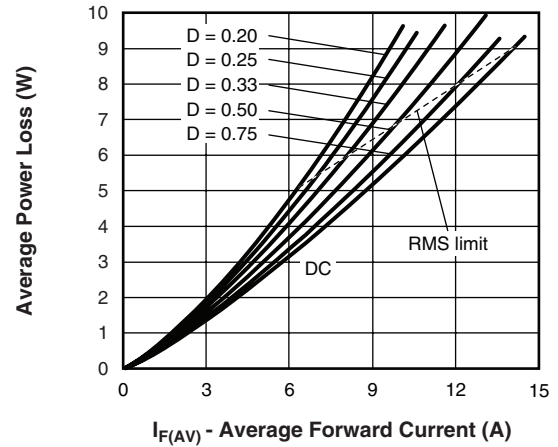


Fig. 6 - Maximum Average Forward Dissipation vs. Average Forward Current

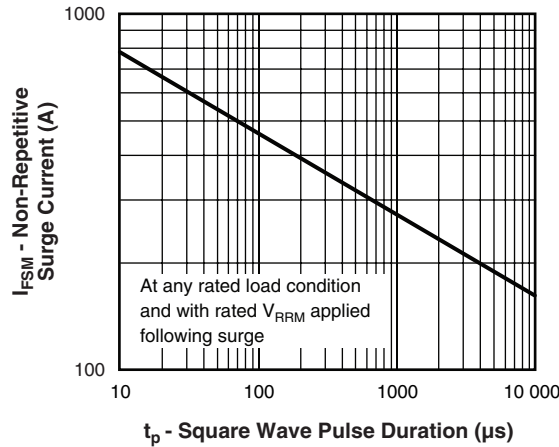


Fig. 7 - Maximum Peak Surge Forward Current vs. Pulse Duration

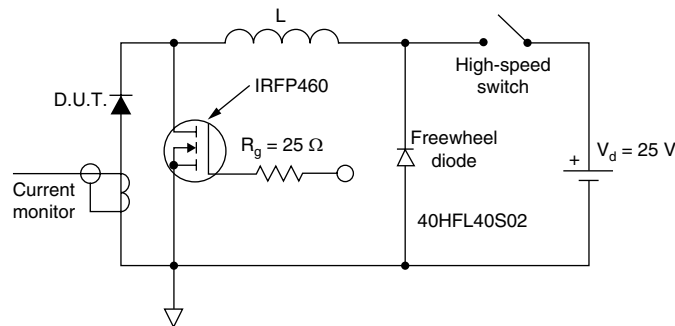


Fig. 8 - Unclamped Inductive Test Circuit

Note

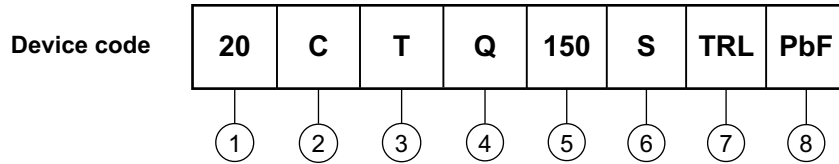
- (1) Formula used: $T_C = T_J - (P_d + P_{dREV}) \times R_{thJC}$;
- P_d = Forward power loss = $I_{F(AV)} \times V_{FM}$ at $(I_{F(AV)}/D)$ (see fig. 6);
- P_{dREV} = Inverse power loss = $V_{R1} \times I_R (1 - D)$; I_R at $V_{R1} = 80\%$ rated V_R



20CTQ150SPbF, 20CTQ150-1PbF

Schottky Rectifier, 2 x 10 A Vishay High Power Products

ORDERING INFORMATION TABLE



- 1** - Current rating (20 = 20 A)
- 2** - C = Common cathode
- 3** - T = TO-220
- 4** - Q = Schottky "Q" series
- 5** - Voltage rating (150 = 150 V)
- 6** -
 - -1 = TO-262
 - S = D²PAK
- 7** -
 - None = Tube (50 pieces)
 - TRL = Tape and reel (left oriented - for D²PAK only)
 - TRR = Tape and reel (right oriented - for D²PAK only)
- 8** -
 - None = Standard production
 - PbF = Lead (Pb)-free

| LINKS TO RELATED DOCUMENTS | |
|----------------------------|---|
| Dimensions | http://www.vishay.com/doc?95014 |
| Part marking information | http://www.vishay.com/doc?95008 |
| Packaging information | http://www.vishay.com/doc?95032 |



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