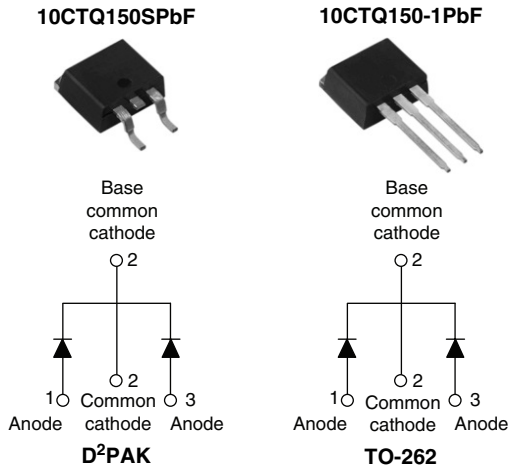


Schottky Rectifier, 2 x 5 A



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 and qualified for industrial level



Available
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 5 A |
| V_R | 150 V |

MAJOR RATINGS AND CHARACTERISTICS

| SYMBOL | CHARACTERISTICS | VALUES | UNITS |
|-------------|---|-------------|------------------|
| $I_{F(AV)}$ | Rectangular waveform | 10 | A |
| V_{RRM} | | 150 | V |
| I_{FSM} | $t_p = 5 \mu s$ sine | 620 | A |
| V_F | 5 Apk, $T_J = 125 \text{ }^\circ\text{C}$ (per leg) | 0.73 | V |
| T_J | Range | - 55 to 175 | $^\circ\text{C}$ |

VOLTAGE RATINGS

| PARAMETER | SYMBOL | 10CTQ150SPbF 10CTQ150-1PbF | 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 $T_C = 155 \text{ }^\circ\text{C}$, rectangular waveform | 5 | A |
| | | | 10 | |
| Maximum peak one cycle non-repetitive surge current per leg See fig. 7 | I_{FSM} | 5 μs sine or 3 μs rect. pulse | 620 | A |
| | | 10 ms sine or 6 ms rect. pulse | | |
| Non-repetitive avalanche energy per leg | E_{AS} | $T_J = 25 \text{ }^\circ\text{C}$, $I_{AS} = 1 \text{ A}$, $L = 10 \text{ mH}$ | 5 | mJ |
| Repetitive avalanche current per leg | I_{AR} | Current decaying linearly to zero in 1 μs Frequency limited by T_J maximum $V_A = 1.5 \times V_R$ typical | 1 | A |

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

10CTQ150SPbF/10CTQ150-1PbF



Vishay High Power Products Schottky Rectifier, 2 x 5 A

| ELECTRICAL SPECIFICATIONS | | | | | |
|---|----------------|---|-----------------------------------|--------|------------------|
| PARAMETER | SYMBOL | TEST CONDITIONS | | VALUES | UNITS |
| Maximum forward voltage drop per leg See fig. 1 | $V_{FM}^{(1)}$ | 5 A | $T_J = 25\text{ }^\circ\text{C}$ | 0.93 | V |
| | | 10 A | | 1.10 | |
| | | 5 A | $T_J = 125\text{ }^\circ\text{C}$ | 0.73 | |
| | | 10 A | | 0.86 | |
| Maximum reverse leakage current per leg See fig. 2 | $I_{RM}^{(1)}$ | $T_J = 25\text{ }^\circ\text{C}$ | $V_R = \text{Rated } V_R$ | 0.05 | mA |
| | | $T_J = 125\text{ }^\circ\text{C}$ | | 7 | |
| Threshold voltage | $V_{F(TO)}$ | $T_J = T_J \text{ maximum}$ | | 0.468 | V |
| Forward slope resistance | r_t | | | 28 | m Ω |
| Maximum junction capacitance per leg | C_T | $V_R = 5 V_{DC}$ (test signal range 100 kHz to 1 MHz) 25 $^\circ\text{C}$ | | 200 | 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, junction to case per leg | R_{thJC} | DC operation | | 3.50 | $^\circ\text{C/W}$ |
| Maximum thermal resistance, junction to case per package | | | | 1.75 | |
| Typical thermal resistance, case to heatsink (only for TO-220) | R_{thCS} | Mounting surface, smooth and greased | | 0.50 | |
| Approximate weight | | | | 2 | g |
| | | | | 0.07 | oz. |
| Mounting torque | minimum | | | 6 (5) | kgf · cm (lbf · in) |
| | maximum | | | 12 (10) | |
| Marking device | | Case style D ² PAK | | 10CTQ150S | |
| | | Case style TO-262 | | 10CTQ150-1 | |



10CTQ150SPbF/10CTQ150-1PbF

Schottky Rectifier, 2 x 5 A Vishay High Power Products

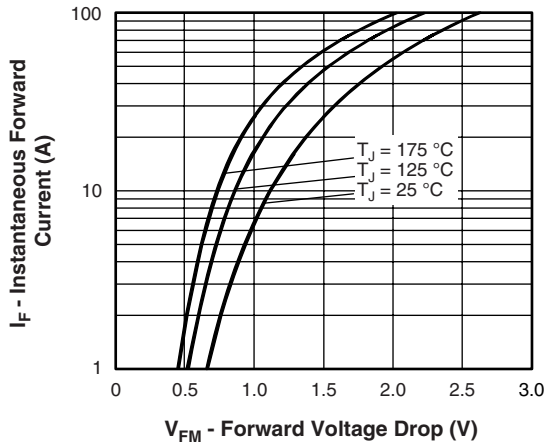


Fig. 1 - Maximum Forward Voltage Drop Characteristics (Per Leg)

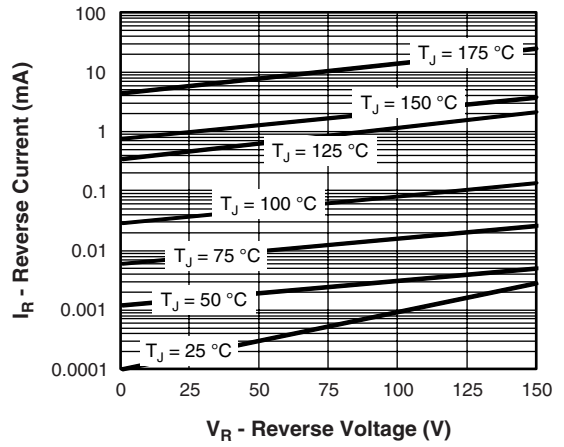


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage (Per Leg)

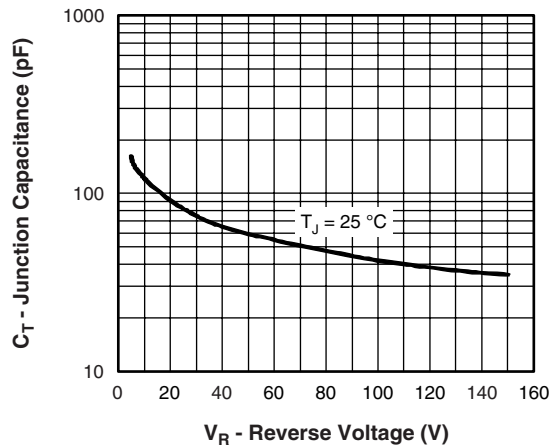


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage (Per Leg)

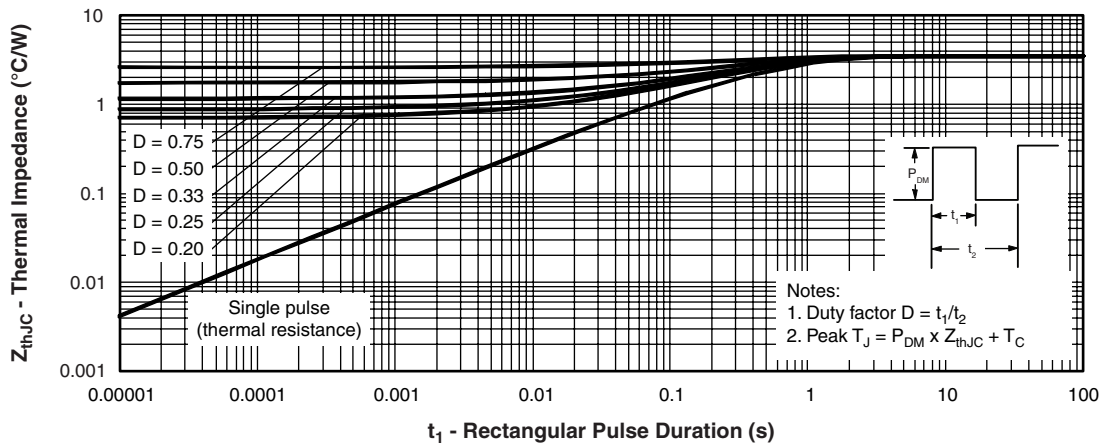


Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics (Per Leg)

10CTQ150SPbF/10CTQ150-1PbF

Vishay High Power Products Schottky Rectifier, 2 x 5 A

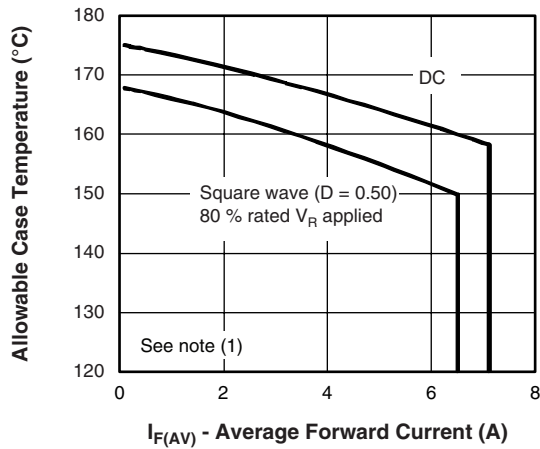


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current (Per Leg)

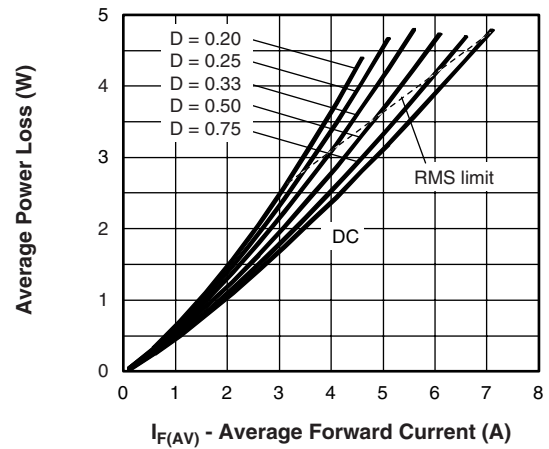


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

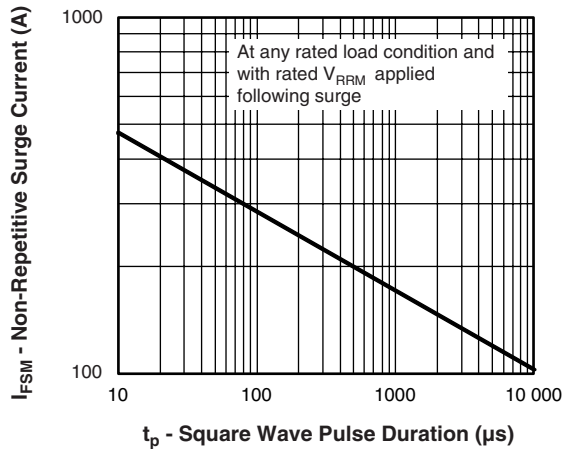


Fig. 7 - Maximum Non-Repetitive Surge Current (Per Leg)

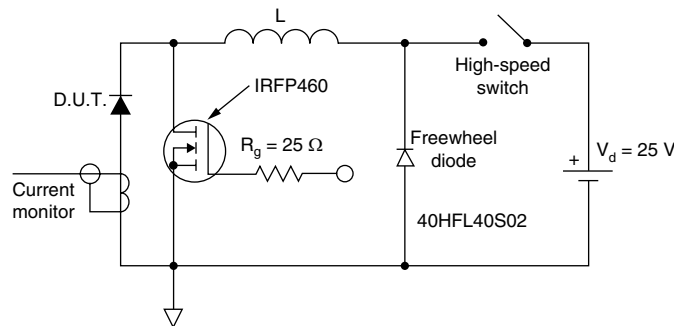


Fig. 8 - Unclamped Inductive Test Circuit

Note

- (1) Formula used: $T_C = T_J - (P_d + P_{d_{REV}}) \times R_{thJC}$;
 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 $V_{R1} = 10 V$



ORDERING INFORMATION TABLE

| | | | | | | | | |
|-------------|-----------|----------|----------|----------|------------|----------|------------|------------|
| Device code | 10 | C | T | Q | 150 | S | TRL | PbF |
| | ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ | ⑧ |

- 1** - Current rating (10 A)
- 2** - Circuit configuration
C = Common cathode
- 3** - T = TO-220
- 4** - Schottky "Q" series
- 5** - Voltage rating (150 = 150 V)
- 6** -
 - S = D²PAK
 - -1 = TO-262
- 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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