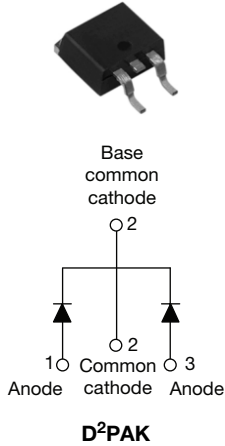
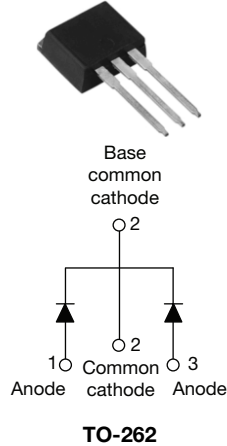


Schottky Rectifier, 2 x 15 A

VS-30CTQ...SPbF



VS-30CTQ...-1PbF



FEATURES

- 150 °C T_J operation
- Center tap configuration
- Very 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
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Halogen-free according to IEC 61249-2-21 definition
- Compliant to RoHS directive 2002/95/EC
- AEC-Q101 qualified



RoHS
COMPLIANT
HALOGEN
FREE

PRODUCT SUMMARY

| | |
|--------------------|-----------|
| I _{F(AV)} | 2 x 15 A |
| V _R | 50 V/60 V |

DESCRIPTION

This center tap Schottky rectifier has been optimized for very low forward voltage drop, with moderate leakage. 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.

MAJOR RATINGS AND CHARACTERISTICS

| SYMBOL | CHARACTERISTICS | VALUES | UNITS |
|--------------------|-------------------------------------------|-------------|-------|
| I _{F(AV)} | Rectangular waveform | 30 | A |
| V _R | | 50/60 | V |
| I _{FSM} | t _p = 5 μs sine | 1000 | A |
| V _F | 15 Apk, T _J = 125 °C (per leg) | 0.56 | V |
| T _J | Range | - 55 to 150 | °C |

VOLTAGE RATINGS

| PARAMETER | SYMBOL | VS-30CTQ050SPbF VS-30CTQ050-1PbF | VS-30CTQ060SPbF VS-30CTQ060-1PbF | UNITS |
|--------------------------------------|------------------|-------------------------------------|-------------------------------------|-------|
| Maximum DC reverse voltage | V _R | 50 | 60 | 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 = 105 °C, rectangular waveform | 30 | A |
| | | | 15 | |
| Maximum peak one cycle non-repetitive surge current per leg See fig. 7 | I _{FSM} | 5 μs sine or 3 μs rect. pulse | 1000 | A |
| | | 10 ms sine or 6 ms rect. pulse | 260 | |
| Non-repetitive avalanche energy per leg | E _{AS} | T _J = 25 °C, I _{AS} = 1.50 A, L = 11.5 mH | 13 | 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 | 1.50 | A |

VS-30CTQ...SPbF, VS-30CTQ...-1PbF Series



Vishay High Power Products

Schottky Rectifier,
2 x 15 A

| ELECTRICAL SPECIFICATIONS | | | | | |
|-------------------------------------------------------|----------------|--------------------------------------------------------------|-----------------------------------|--------|------------|
| PARAMETER | SYMBOL | TEST CONDITIONS | | VALUES | UNITS |
| Maximum forward voltage drop per leg See fig. 1 | $V_{FM}^{(1)}$ | 15 A | $T_J = 25\text{ }^\circ\text{C}$ | 0.62 | V |
| | | 30 A | | 0.82 | |
| | | 15 A | $T_J = 125\text{ }^\circ\text{C}$ | 0.56 | |
| | | 30 A | | 0.71 | |
| Maximum reverse leakage current per leg See fig. 2 | $I_{RM}^{(1)}$ | $T_J = 25\text{ }^\circ\text{C}$ | $V_R = \text{Rated } V_R$ | 0.80 | mA |
| | | $T_J = 125\text{ }^\circ\text{C}$ | | 45 | |
| Threshold voltage | $V_{F(TO)}$ | $T_J = T_J \text{ maximum}$ | | 0.39 | V |
| Forward slope resistance | r_t | | | 8.47 | m Ω |
| Maximum junction capacitance per leg | C_T | $V_R = 5 V_{DC}$ (test signal range 100 kHz to 1 MHz), 25 °C | | 720 | 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/ μ s |

Note

(1) Pulse width < 300 μ s, duty cycle < 2 %

| THERMAL - MECHANICAL SPECIFICATIONS | | | | | |
|----------------------------------------------------------|----------------|--------------------------------------|--|-------------|------------------------|
| PARAMETER | SYMBOL | TEST CONDITIONS | | VALUES | UNITS |
| Maximum junction and storage temperature range | T_J, T_{Stg} | | | - 55 to 150 | $^\circ\text{C}$ |
| Maximum thermal resistance, junction to case per leg | R_{thJC} | DC operation | | 3.25 | $^\circ\text{C/W}$ |
| Maximum thermal resistance, junction to case per package | | | | 1.63 | |
| Typical thermal resistance, case to heatsink | R_{thCS} | Mounting surface, smooth and greased | | 0.50 | |
| Approximate weight | | | | 2 | g |
| | | | | 0.07 | oz. |
| Mounting torque | | | | 6 (5) | kgf · cm (lbf · in) |
| | | | | 12 (10) | |
| Marking device | | Case style D ² PAK | | 30CTQ060S | |
| | | Case style TO-262 | | 30CTQ060-1 | |



VS-30CTQ...SPbF, VS-30CTQ...-1PbF Series

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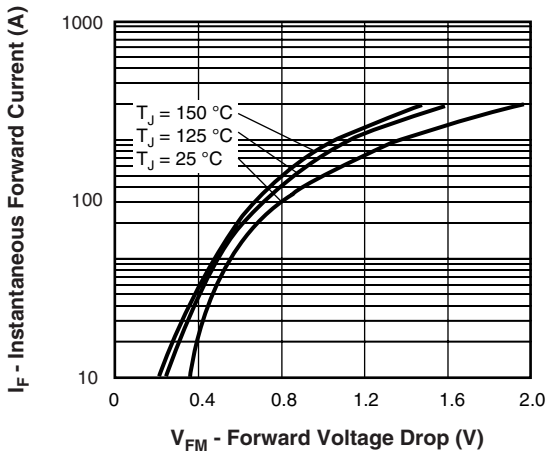


Fig. 1 - Maximum Forward Voltage Drop Characteristics (Per Leg)

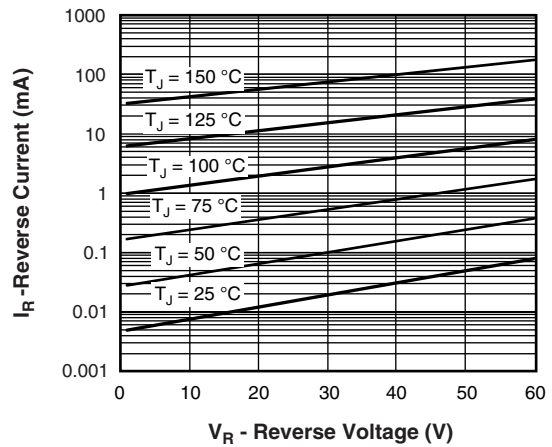


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage (Per Leg)

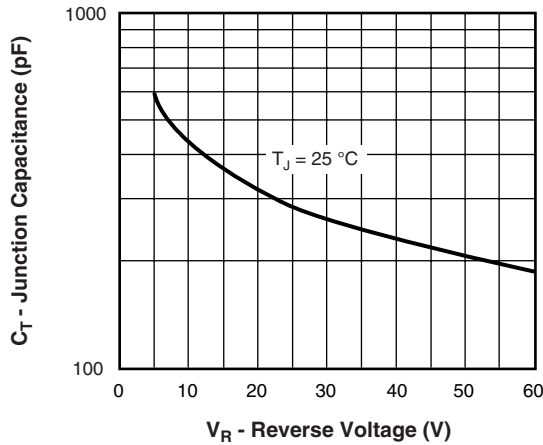


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage (Per Leg)

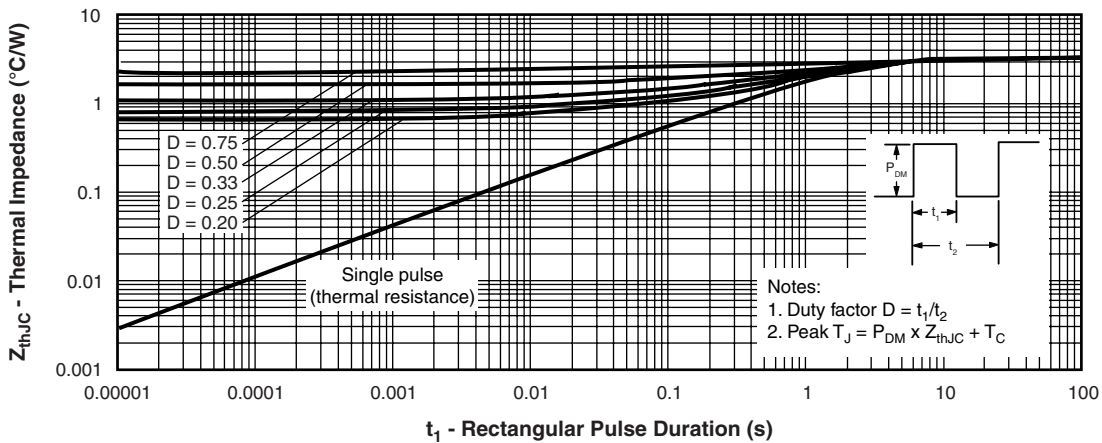


Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics (Per Leg)

VS-30CTQ...SPbF, VS-30CTQ...-1PbF Series



Vishay High Power Products

Schottky Rectifier,
2 x 15 A

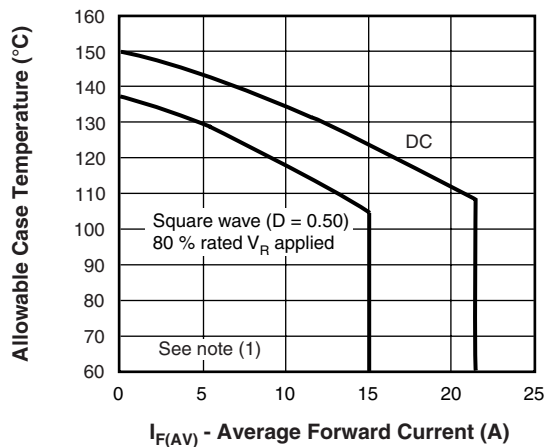


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current (Per Leg)

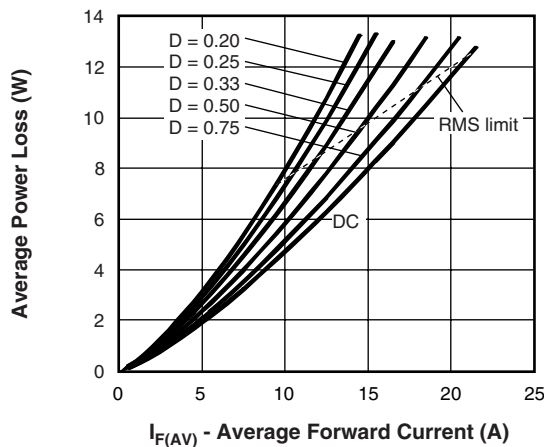


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

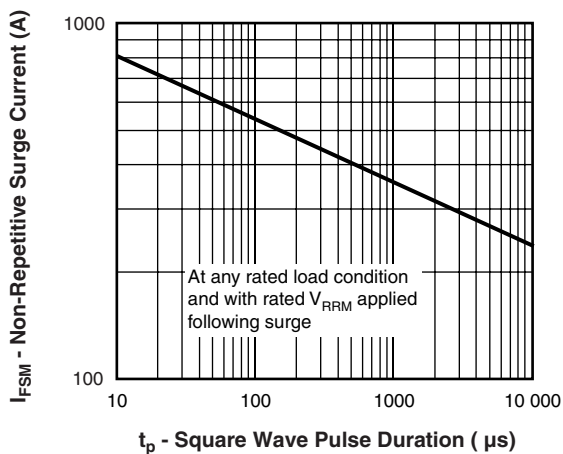


Fig. 7 - Maximum Non-Repetitive Surge Current (Per Leg)

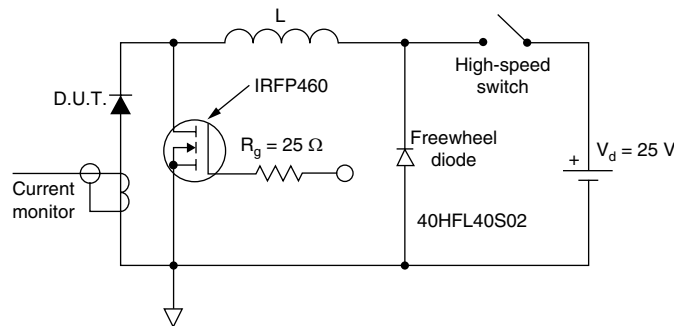


Fig. 8 - Unclamped Inductive Test Circuit

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



VS-30CTQ...SPbF, VS-30CTQ...-1PbF Series

Schottky Rectifier,
2 x 15 A

Vishay High Power Products

ORDERING INFORMATION TABLE

| | | | | | | | | | |
|-------------|-----|----|---|---|---|-----|---|-----|-----|
| Device code | VS- | 30 | C | T | Q | 060 | S | TRL | PbF |
| | ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ | ⑧ | ⑨ |

- 1** - HPP product suffix
- 2** - Current rating (30 A)
- 3** - Circuit configuration: C = Common cathode
- 4** - T = TO-220
- 5** - Schottky "Q" series
- 6** - Voltage ratings

| |
|------------|
| 050 = 50 V |
| 060 = 60 V |
- 7** -
 - S = D²PAK
 - -1 = TO-262
- 8** -
 - None = Tube (50 pieces)
 - TRL = Tape and reel (left oriented - for D²PAK only)
 - TRR = Tape and reel (right oriented - for D²PAK only)
- 9** - PbF = Lead (Pb)-free

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



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