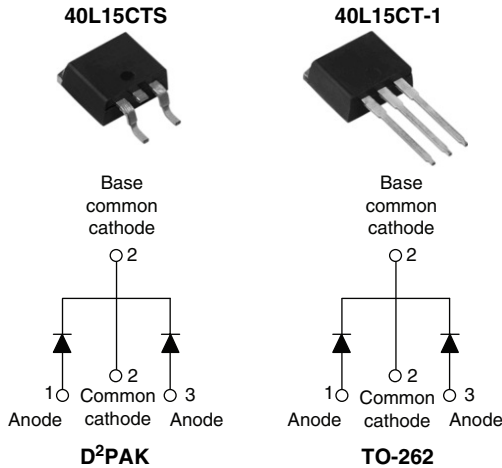




Schottky Rectifier, 2 x 20 A



FEATURES

- 125 °C T_J operation ($V_R < 5 V$)
- Center tap module
- Optimized for OR-ing applications
- Ultra 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 Q101 level

DESCRIPTION

The center tap Schottky rectifier module has been optimized for ultra low forward voltage drop specifically for the OR-ing of parallel power supplies. The proprietary barrier technology allows for reliable operation up to 125 °C junction temperature. Typical applications are in parallel switching power supplies, converters, reverse battery protection, and redundant power subsystems.

| PRODUCT SUMMARY | |
|-----------------|------------------|
| $I_{F(AV)}$ | 2 x 20 A |
| V_R | 15 V |
| I_{RM} | 600 mA at 100 °C |

| MAJOR RATINGS AND CHARACTERISTICS | | | |
|-----------------------------------|---|-------------|-------|
| SYMBOL | CHARACTERISTICS | VALUES | UNITS |
| $I_{F(AV)}$ | Rectangular waveform | 40 | A |
| V_{RRM} | | 15 | V |
| I_{FSM} | $t_p = 5 \mu s$ sine | 700 | A |
| V_F | 19 Apk, $T_J = 125 \text{ }^\circ\text{C}$ (per leg, typical) | 0.25 | V |
| T_J | | - 55 to 125 | °C |

| VOLTAGE RATINGS | | | | |
|--------------------------------------|-----------|------------------------------------|-----------------------|-------|
| PARAMETER | SYMBOL | TEST CONDITIONS | 40L15CTS 40L15CT-1 | UNITS |
| Maximum DC reverse voltage | V_R | $T_J = 100 \text{ }^\circ\text{C}$ | 15 | 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 $T_C = 85 \text{ }^\circ\text{C}$, rectangular waveform | | 20 | A |
| | | | | 40 | |
| Maximum peak one cycle non-repetitive surge current per leg See fig. 7 | I_{FSM} | 5 μs sine or 3 μs rect. pulse | Following any rated load condition and with rated V_{RRM} applied | 700 | |
| | | 10 ms sine or 6 ms rect. pulse | | 330 | |
| Non-repetitive avalanche energy per leg | E_{AS} | $T_J = 25 \text{ }^\circ\text{C}$, $I_{AS} = 2 A$, $L = 6 mH$ | | 10 | 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 | | 2 | A |

40L15CTS/40L15CT-1



Vishay High Power Products Schottky Rectifier, 2 x 20 A

| ELECTRICAL SPECIFICATIONS | | | | | | |
|--|----------------|---|-----------------------------------|--------|------|------------------|
| PARAMETER | SYMBOL | TEST CONDITIONS | | TYP. | MAX. | UNITS |
| Maximum forward voltage drop per leg See fig. 1 | $V_{FM}^{(1)}$ | 19 A | $T_J = 25\text{ }^\circ\text{C}$ | - | 0.41 | V |
| | | 40 A | | - | 0.52 | |
| | | 19 A | $T_J = 125\text{ }^\circ\text{C}$ | 0.25 | 0.33 | |
| | | 40 A | | 0.37 | 0.50 | |
| Reverse leakage current per leg See fig. 2 | $I_{RM}^{(1)}$ | $T_J = 25\text{ }^\circ\text{C}$ | $V_R = \text{Rated } V_R$ | - | 10 | mA |
| | | $T_J = 100\text{ }^\circ\text{C}$ | | - | 600 | |
| Threshold voltage | $V_{F(TO)}$ | $T_J = T_J \text{ maximum}$ | | 0.182 | | V |
| Forward slope resistance | r_t | | | 7.6 | | m Ω |
| Maximum junction capacitance per leg | C_T | $V_R = 5 V_{DC}$ (test signal range 100 kHz to 1 MHz) 25 $^\circ\text{C}$ | | - | 2000 | pF |
| Typical series inductance per leg | L_S | Measured lead to lead 5 mm from package body | | 8 | - | 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 temperature range | T_J | | - 55 to 125 | $^\circ\text{C}$ |
| Maximum storage temperature range | T_{Stg} | | - 55 to 150 | |
| Maximum thermal resistance, junction to case per leg | R_{thJC} | DC operation See fig. 4 | 1.5 | $^\circ\text{C/W}$ |
| Typical thermal resistance, case to heatsink | R_{thCS} | Mounting surface, smooth and greased (Only for TO-262) | 0.50 | |
| Maximum thermal resistance, junction to ambient | R_{thJA} | DC operation | 40 | |
| 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 D ² PAK | 40L15CTS | |
| | | Case style TO-262 | 40L15CT-1 | |



40L15CTS/40L15CT-1

Schottky Rectifier, 2 x 20 A Vishay High Power Products

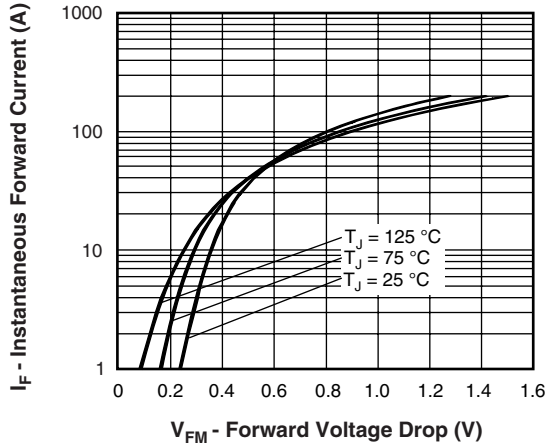


Fig. 1 - Maximum Forward Voltage Drop Characteristics

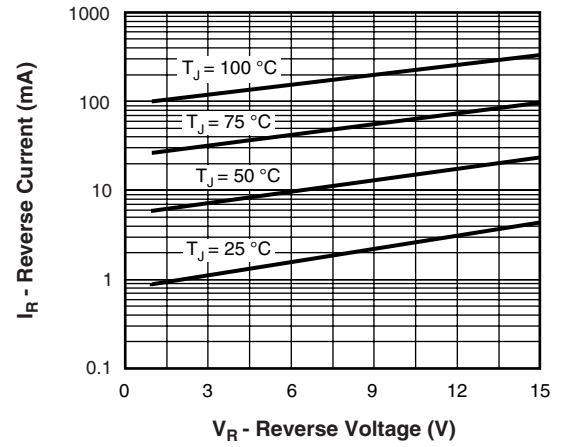


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage

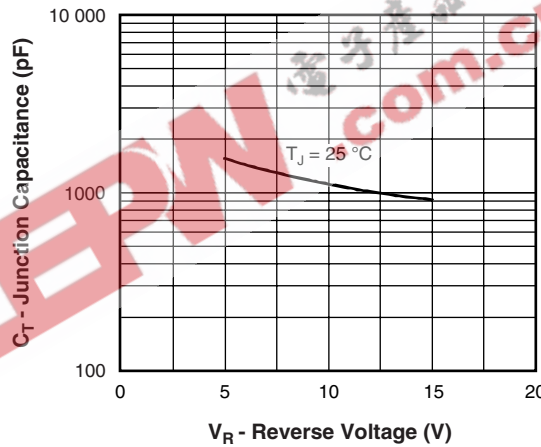


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage

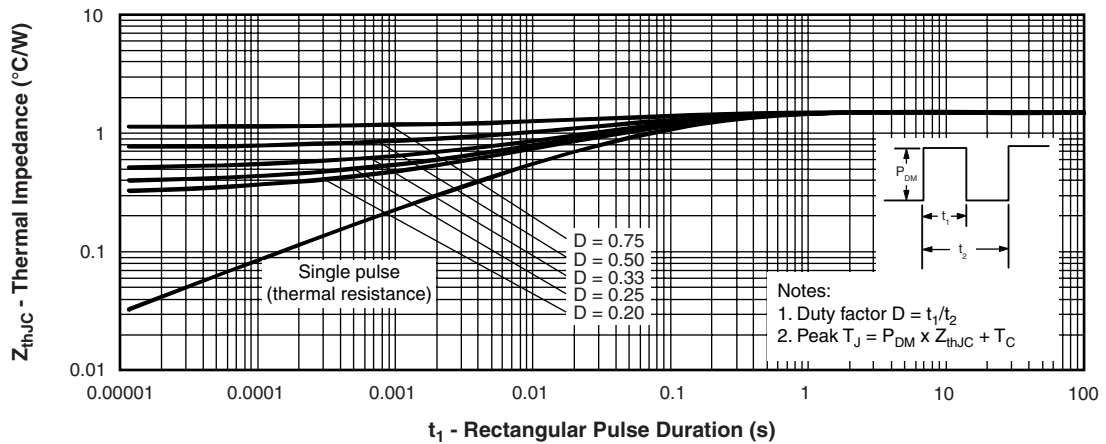


Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics

40L15CTS/40L15CT-1



Vishay High Power Products Schottky Rectifier, 2 x 20 A

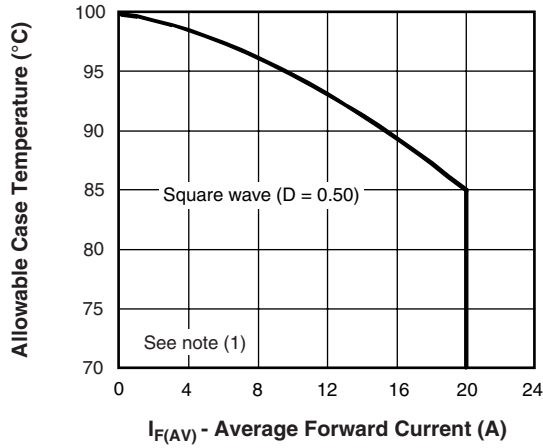


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current

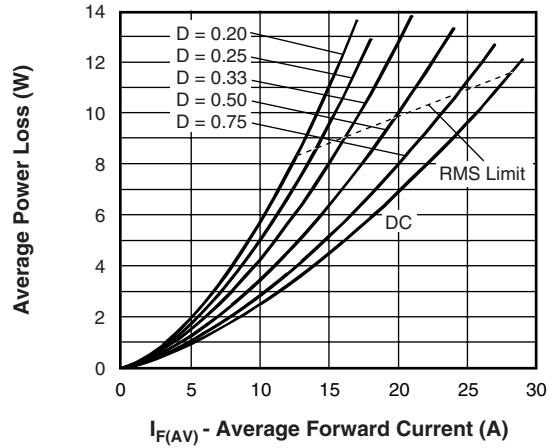


Fig. 6 - Forward Power Loss Characteristics

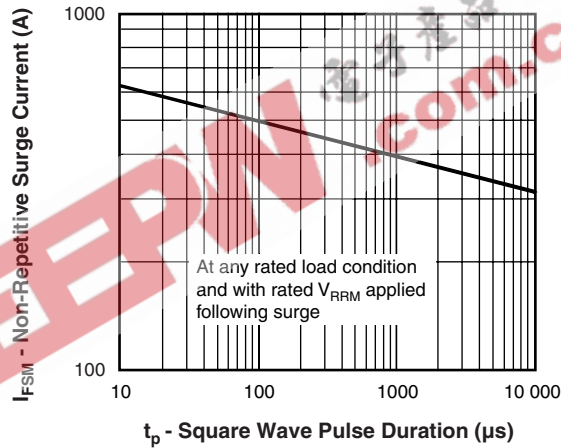


Fig. 7 - Maximum Non-Repetitive Surge Current

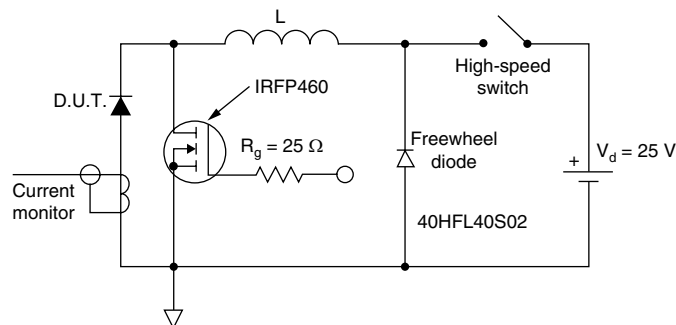


Fig. 8 - Unclamped Inductive Test Circuit

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 $V_{R1} = 80\%$ rated V_R



40L15CTS/40L15CT-1

Schottky Rectifier, 2 x 20 A Vishay High Power Products

ORDERING INFORMATION TABLE

| | | | | | | | | |
|-------------|-----------|----------|-----------|----------|----------|----------|------------|----------|
| Device code | 40 | L | 15 | C | T | S | TRL | - |
| | ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ | ⑧ |

- 1** - Current rating (40 A)
- 2** - L = Schottky "L" series
- 3** - Voltage rating (15 V)
- 4** - C = Common cathode
- 5** - T = TO-220
- 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 |



Disclaimer

All product specifications and data are subject to change without notice.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, "Vishay"), disclaim any and all liability for any errors, inaccuracies or incompleteness contained herein or in any other disclosure relating to any product.

Vishay disclaims any and all liability arising out of the use or application of any product described herein or of any information provided herein to the maximum extent permitted by law. The product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein, which apply to these products.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay.

The products shown herein are not designed for use in medical, life-saving, or life-sustaining applications unless otherwise expressly indicated. Customers using or selling Vishay products not expressly indicated for use in such applications do so entirely at their own risk and agree to fully indemnify Vishay for any damages arising or resulting from such use or sale. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

Product names and markings noted herein may be trademarks of their respective owners.