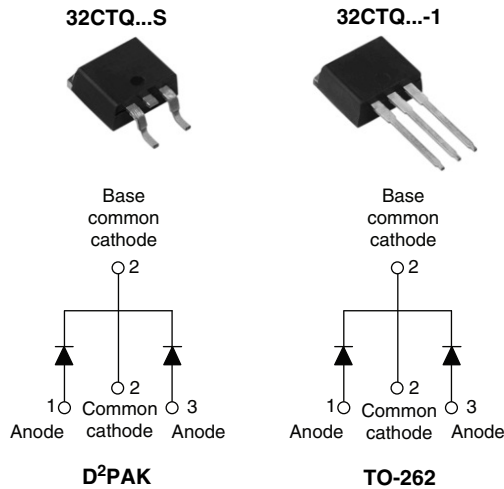




**THE DATASHEET OF  
VS-32CTQ030-1PBF**



## Schottky Rectifier, 2 x 15 A



### FEATURES

- 150 °C  $T_J$  operation
- 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 32CTQ... Schottky rectifier series has been optimized for low reverse leakage at high temperature. 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.

### PRODUCT SUMMARY

$I_{F(AV)}$	2 x 15 A
$V_R$	25/30 V

### MAJOR RATINGS AND CHARACTERISTICS

SYMBOL	CHARACTERISTICS	VALUES	UNITS
$I_{F(AV)}$	Rectangular waveform	30	A
$V_{RRM}$		25/30	V
$I_{FSM}$	$t_p = 5 \mu s$ sine	900	A
$V_F$	15 Apk, $T_J = 125 \text{ }^\circ\text{C}$	0.40	V
$T_J$	Range	- 55 to 150	$^\circ\text{C}$

### VOLTAGE RATINGS

PARAMETER	SYMBOL	32CTQ025S 32CTQ025-1	32CTQ030S 32CTQ030-1	UNITS
Maximum DC reverse voltage	$V_R$	25	30	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 $T_C = 115 \text{ }^\circ\text{C}$ , rectangular waveform	30	A	
Maximum peak one cycle non-repetitive surge current See fig. 7	$I_{FSM}$	5 $\mu s$ sine or 3 $\mu s$ rect. pulse	Following any rated load condition and with rated $V_{RRM}$ applied		900
		10 ms sine or 6 ms rect. pulse			250
Non-repetitive avalanche energy	$E_{AS}$	$T_J = 25 \text{ }^\circ\text{C}$ , $I_{AS} = 1.20 \text{ A}$ , $L = 11.10 \text{ mH}$	13	mJ	
Repetitive avalanche current	$I_{AR}$	Current decaying linearly to zero in 1 $\mu s$ Frequency limited by $T_J$ maximum $V_A = 1.5 \times V_R$ typical	3	A	

ELECTRICAL SPECIFICATIONS					
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS
Maximum forward voltage drop See fig. 1	$V_{FM}^{(1)}$	15 A	$T_J = 25\text{ }^\circ\text{C}$	0.49	V
		30 A		0.58	
		15 A	$T_J = 125\text{ }^\circ\text{C}$	0.40	
		30 A		0.53	
Maximum reverse leakage current See fig. 2	$I_{RM}^{(1)}$	$T_J = 25\text{ }^\circ\text{C}$	$V_R = \text{Rated } V_R$	1.75	mA
		$T_J = 125\text{ }^\circ\text{C}$		97	
Threshold voltage	$V_{F(TO)}$	$T_J = T_J \text{ maximum}$		0.233	V
Forward slope resistance	$r_t$			9.09	$m\Omega$
Maximum junction capacitance per leg	$C_T$	$V_R = 5\text{ }V_{DC}$ (test signal range 100 kHz to 1 MHz) $25\text{ }^\circ\text{C}$		1300	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	$V/\mu\text{s}$

**Note**(1) Pulse width < 300  $\mu\text{s}$ , 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 See fig. 4		3.25	$^\circ\text{C}/\text{W}$
Typical thermal resistance, case to heatsink	$R_{thCS}$	Mounting surface, smooth and greased		0.50	
Approximate weight				2	g
				0.07	oz.
Mounting torque	minimum			6 (5)	$\text{kgf} \cdot \text{cm}$ ( $\text{lbf} \cdot \text{in}$ )
	maximum			12 (10)	
Marking device		Case style D <sup>2</sup> PAK		32CTQ025S	
				32CTQ030S	
		Case style TO-262		32CTQ025-1	
				32CTQ030-1	

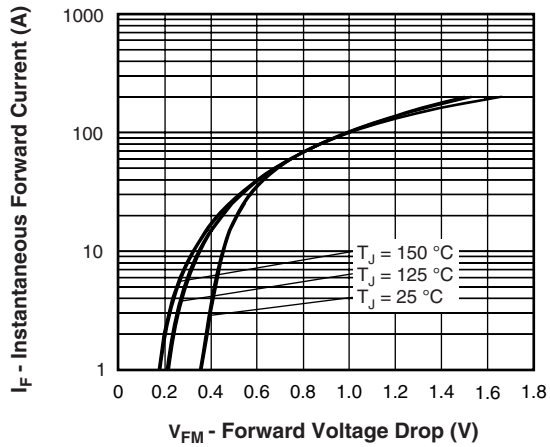


Fig. 1 - Maximum Forward Voltage Drop Characteristics

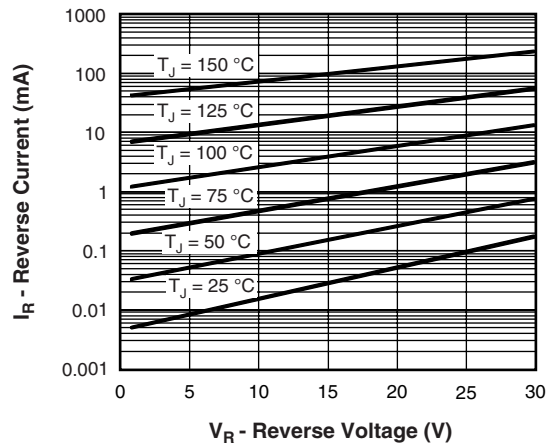


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage

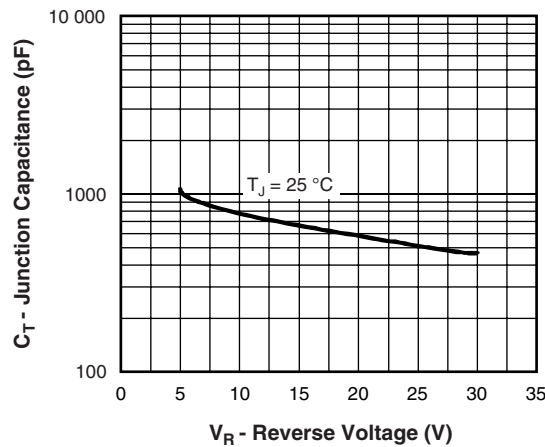


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage

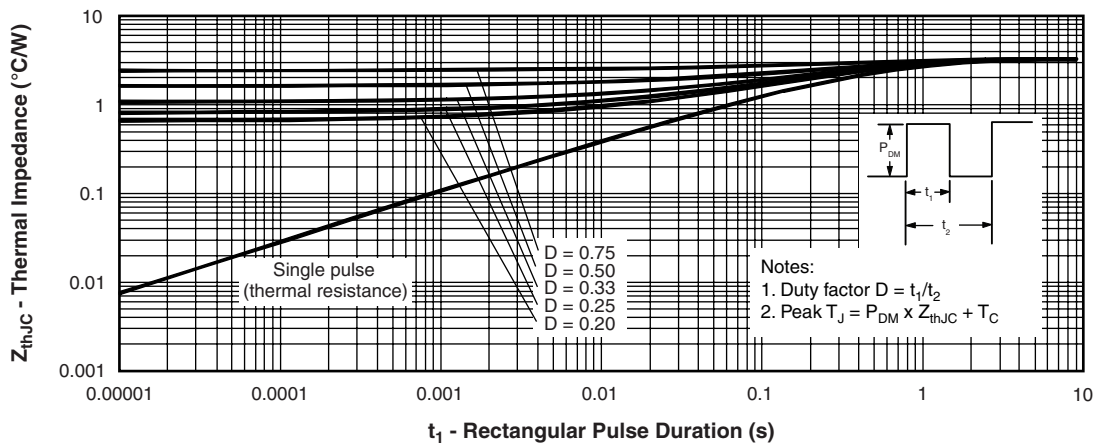


Fig. 4 - Maximum Thermal Impedance  $Z_{thJC}$  Characteristics

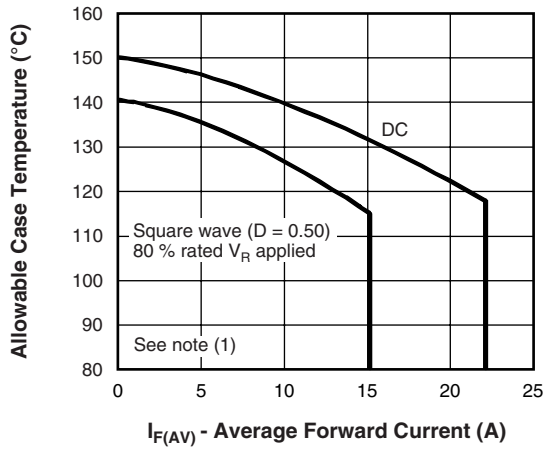


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current

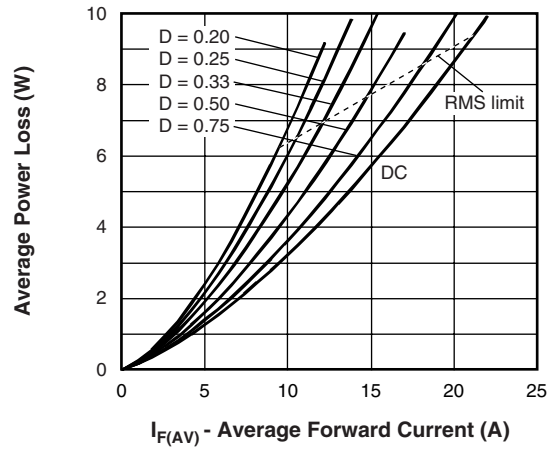


Fig. 6 - Forward Power Loss Characteristics

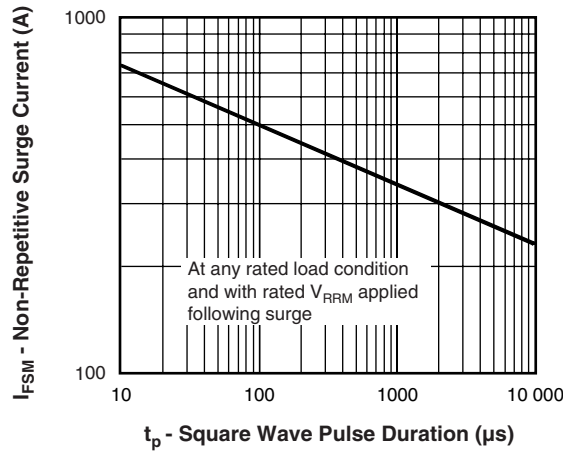


Fig. 7 - Maximum Non-Repetitive Surge Current

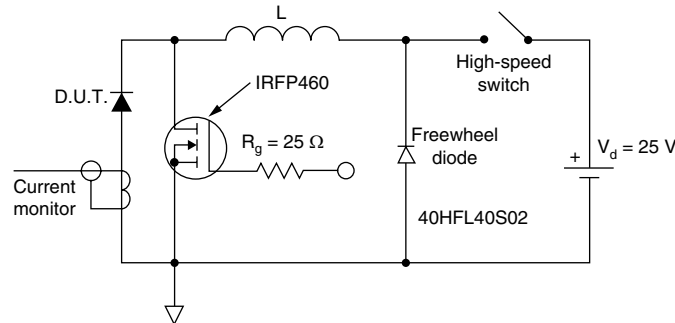


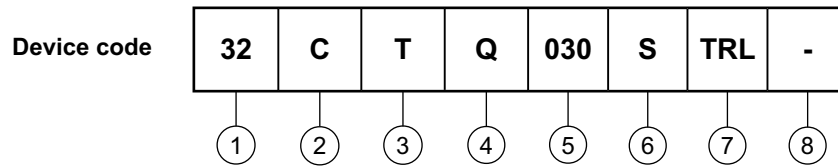
Fig. 8 - Unclamped Inductive Test Circuit

**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  $V_R$



### ORDERING INFORMATION TABLE



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

025 = 25 V
030 = 30 V
- 6** -
  - S = D<sup>2</sup>PAK
  - -1 = TO-262
- 7** -
  - None = Tube (50 pieces)
  - TRL = Tape and reel (left oriented - for D<sup>2</sup>PAK only)
  - TRR = Tape and reel (right oriented - for D<sup>2</sup>PAK only)
- 8** -
  - None = Standard production
  - PbF = Lead (Pb)-free

LINKS TO RELATED DOCUMENTS	
Dimensions	<a href="http://www.vishay.com/doc?95014">http://www.vishay.com/doc?95014</a>
Part marking information	<a href="http://www.vishay.com/doc?95008">http://www.vishay.com/doc?95008</a>
Packaging information	<a href="http://www.vishay.com/doc?95032">http://www.vishay.com/doc?95032</a>



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