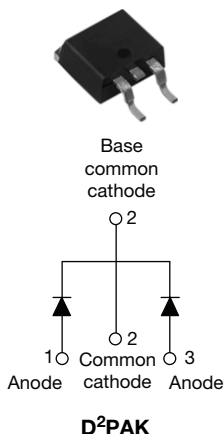
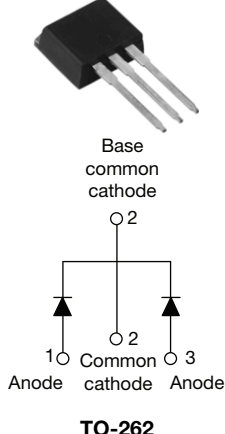


## Schottky Rectifier, 2 x 15 A

VS-30CTQ...SPbF



VS-30CTQ...-1PbF



### 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
- 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

### DESCRIPTION

This center tap Schottky rectifier series 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 15 A
$V_R$	80 V/100 V

### MAJOR RATINGS AND CHARACTERISTICS

SYMBOL	CHARACTERISTICS	VALUES	UNITS
$I_{F(AV)}$	Rectangular waveform	30	A
$V_{RRM}$		80/100	V
$I_{FSM}$	$t_p = 5 \mu s$ sine	850	A
$V_F$	15 Apk, $T_J = 125^\circ C$ (per leg)	0.67	V
$T_J$	Range	- 55 to 175	°C

### VOLTAGE RATINGS

PARAMETER	SYMBOL	VS-30CTQ080SPbF VS-30CTQ080-1PbF	VS-30CTQ100SPbF VS-30CTQ100-1PbF	UNITS
Maximum DC reverse voltage	$V_R$	80	100	V
Maximum working peak reverse voltage	$V_{RWM}$			

### ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Maximum average forward current per device See fig. 5	$I_{F(AV)}$	50 % duty cycle at $T_C = 129^\circ C$ , rectangular waveform	30	A
			15	
Maximum peak one cycle non-repetitive surge current per leg See fig. 7	$I_{FSM}$	5 $\mu s$ sine or 3 $\mu s$ rect. pulse	850	
		10 ms sine or 6 ms rect. pulse	275	
Non-repetitive avalanche energy per leg	$E_{AS}$	$T_J = 25^\circ C$ , $I_{AS} = 0.50 A$ , $L = 60 mH$	7.50	mJ
Repetitive avalanche current per leg	$I_{AR}$	Current decaying linearly to zero in 1 $\mu s$ Frequency limited by $T_J$ maximum $V_A = 1.5 \times V_R$ typical	0.50	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 <sub>FM</sub> <sup>(1)</sup>	15 A	T <sub>J</sub> = 25 °C	0.86	V	
		30 A		1.05		
		15 A	T <sub>J</sub> = 125 °C	0.67		0.82
		30 A				
Maximum reverse leakage current per leg See fig. 2	I <sub>RM</sub> <sup>(1)</sup>	T <sub>J</sub> = 25 °C	V <sub>R</sub> = Rated V <sub>R</sub>	0.55	mA	
		T <sub>J</sub> = 125 °C		7.0		
Maximum junction capacitance per leg	C <sub>T</sub>	V <sub>R</sub> = 5 V <sub>DC</sub> (test signal range 100 kHz to 1 MHz), 25 °C		500	pF	
Typical series inductance per leg	L <sub>S</sub>	Measured lead to lead 5 mm from package body		8.0	nH	
Maximum voltage rate of change	dV/dt	Rated V <sub>R</sub>		10 000	V/μs	

## Note

<sup>(1)</sup> Pulse width < 300  $\mu$ s, duty cycle < 2 %

THERMAL - MECHANICAL SPECIFICATIONS				
PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Maximum junction and storage temperature range	T <sub>J</sub> , T <sub>Stg</sub>		- 55 to 175	°C
Maximum thermal resistance, junction to case per leg	R <sub>thJC</sub>	DC operation	3.25	°C/W
Maximum thermal resistance, junction to case per package			1.63	
Typical thermal resistance, case to heatsink	R <sub>thCS</sub>	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 <sup>2</sup> PAK	30CTQ100S	
		Case style TO-262	30CTQ100-1	



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

Schottky Rectifier, 2 x 15 A Vishay High Power Products

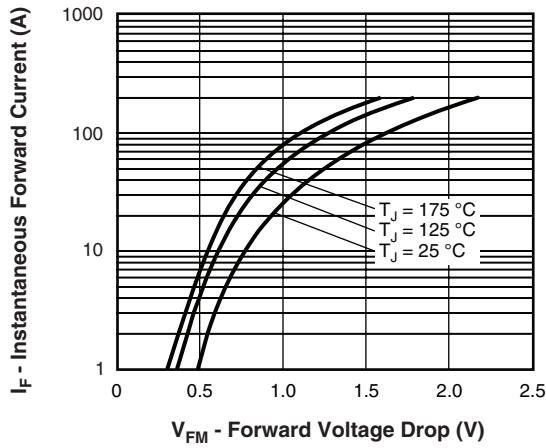


Fig. 1 - Maximum Forward Voltage Drop Characteristics (Per Leg)

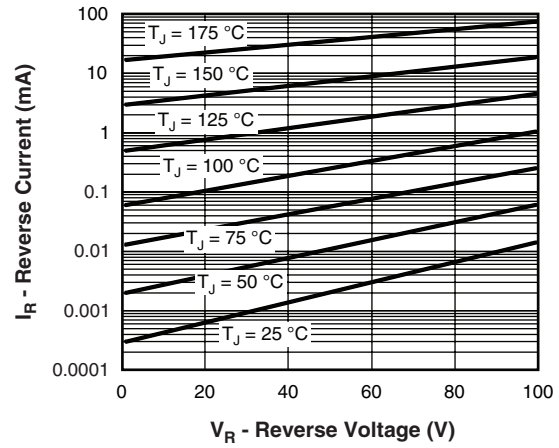


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage (Per Leg)

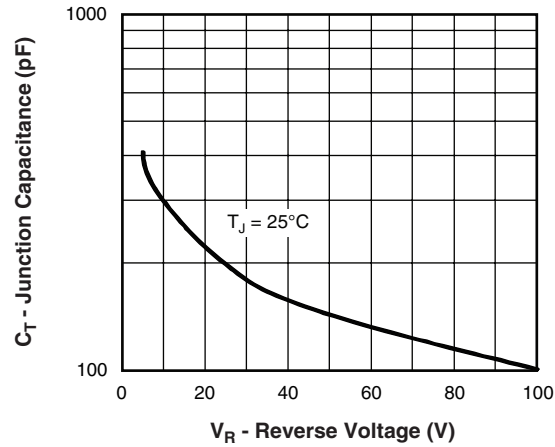


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage (Per Leg)

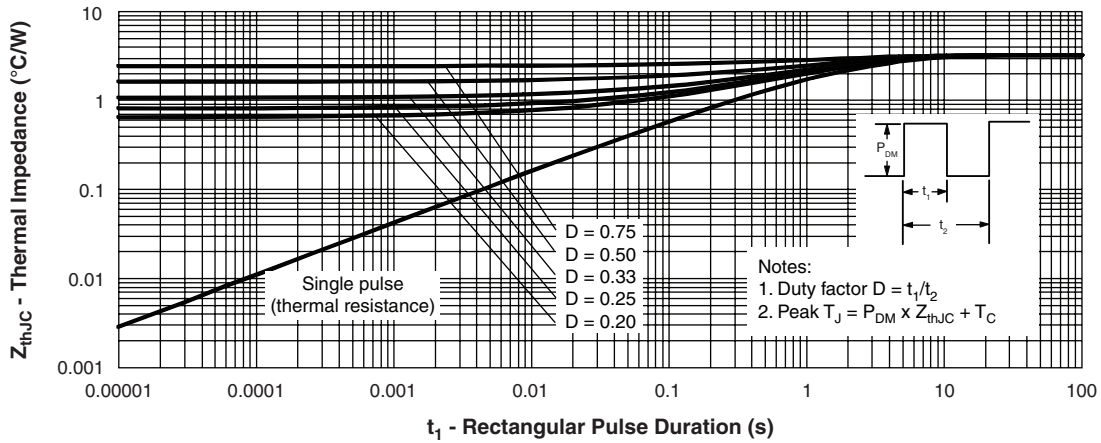


Fig. 4 - Maximum Thermal Impedance  $Z_{thJC}$  Characteristics (Per Leg)

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

Vishay High Power Products Schottky Rectifier, 2 x 15 A

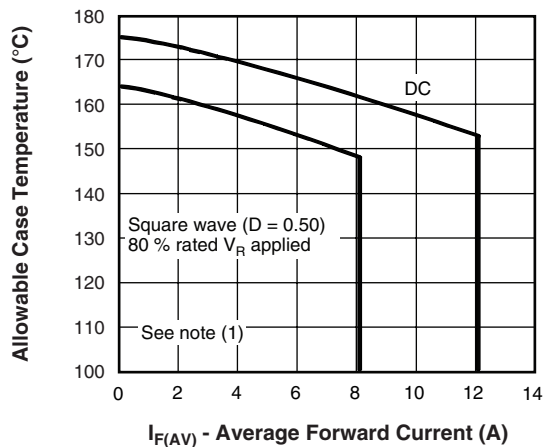


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current (Per Leg)

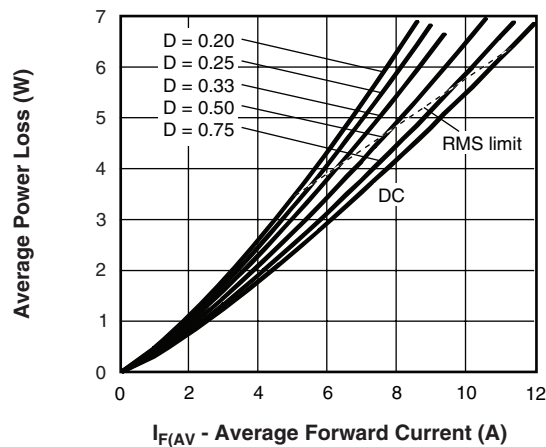


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

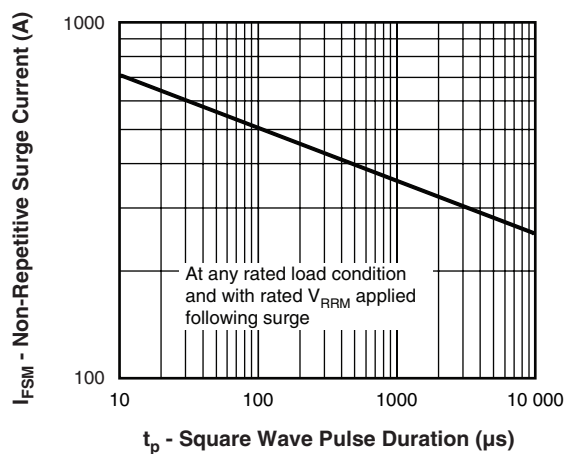


Fig. 7 - Maximum Non-Repetitive Surge Current (Per Leg)

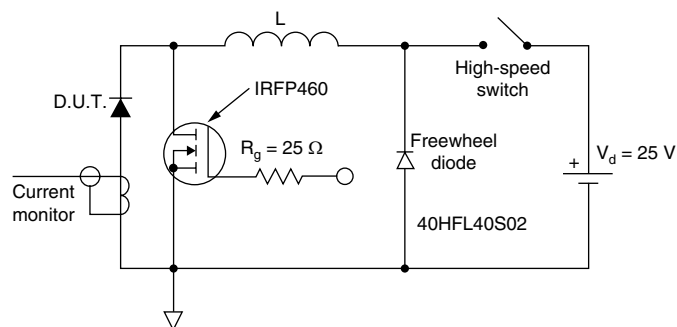


Fig. 8 - Unclamped Inductive Test Circuit

## 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	100	S	TRL	PbF
	1	2	3	4	5	6	7	8	9

- |          |   |  |                           |
|----------|---|--|---------------------------|
| <b>1</b> | - | HPP product suffix   |                           |
| <b>2</b> | - | Current rating (30 A)  |                           |
| <b>3</b> | - | Circuit configuration: C = Common cathode  |                           |
| <b>4</b> | - | T = TO-220   |                           |
| <b>5</b> | - | Schottky "Q" series  |                           |
| <b>6</b> | - | Voltage ratings  | 080 = 80 V<br>100 = 100 V |
| <b>7</b> | - | • S = D <sup>2</sup> PAK<br>• -1 = TO-262  |                           |
| <b>8</b> | - | • None = Tube (50 pieces)<br>• TRL = Tape and reel (left oriented - for D <sup>2</sup> PAK only)<br>• TRR = Tape and reel (right oriented - for D <sup>2</sup> PAK only) |                           |
| <b>9</b> | - | PbF = Lead (Pb)-free   |                           |

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



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