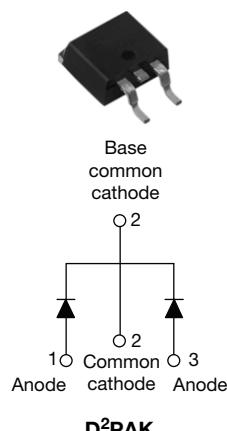
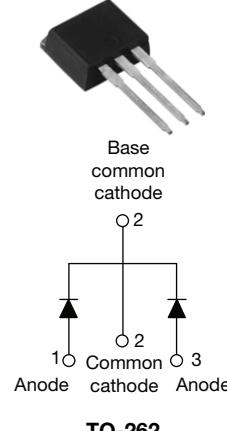


Schottky Rectifier, 2 x 15 A

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

PRODUCT SUMMARY

$I_{F(AV)}$	2 x 15 A
V_R	80 V/100 V

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.

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, $T_J = 125$ °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 $T_C = 129$ °C, rectangular waveform		30	A
Maximum peak one cycle non-repetitive surge current per leg See fig. 7		$5 \mu s$ sine or 3 μs rect. pulse	Following any rated load condition and with rated V_{RRM} applied	850	
Non-repetitive avalanche energy per leg	E_{AS}	$T_J = 25$ °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 μs Frequency limited by T_J maximum $V_A = 1.5 \times V_R$ typical		0.50	A

ELECTRICAL SPECIFICATIONS

PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS	
Maximum forward voltage drop per leg See fig. 1	$V_{FM}^{(1)}$	15 A	$T_J = 25 \text{ }^\circ\text{C}$	0.86	V	
		30 A		1.05		
		15 A	$T_J = 125 \text{ }^\circ\text{C}$	0.67		
		30 A		0.82		
Maximum reverse leakage current per leg See fig. 2	$I_{RM}^{(1)}$	$T_J = 25 \text{ }^\circ\text{C}$	$V_R = \text{Rated } V_R$	0.55	mA	
		$T_J = 125 \text{ }^\circ\text{C}$		7.0		
Maximum junction capacitance per leg	C_T	$V_R = 5 \text{ V}_{DC}$ (test signal range 100 kHz to 1 MHz), $25 \text{ }^\circ\text{C}$		500	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 175	$^\circ\text{C}$	
Maximum thermal resistance, junction to case per leg	R_{thJC}	DC operation		3.25	$^\circ\text{C/W}$	
				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	minimum			6 (5)	kgf · cm (lbf · in)	
	maximum			12 (10)		
Marking device		Case style D ² PAK		30CTQ100S		
		Case style TO-262		30CTQ100-1		

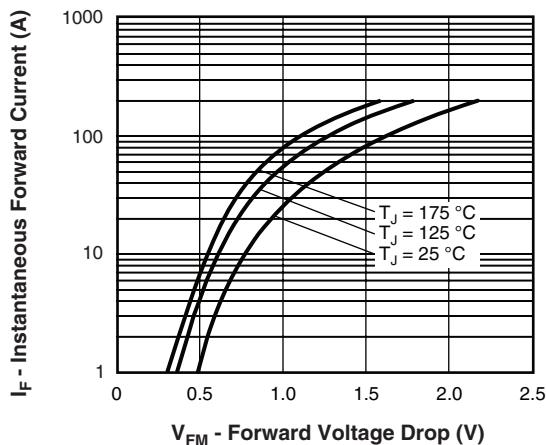


Fig. 1 - Maximum Forward Voltage Drop Characteristics
(Per Leg)

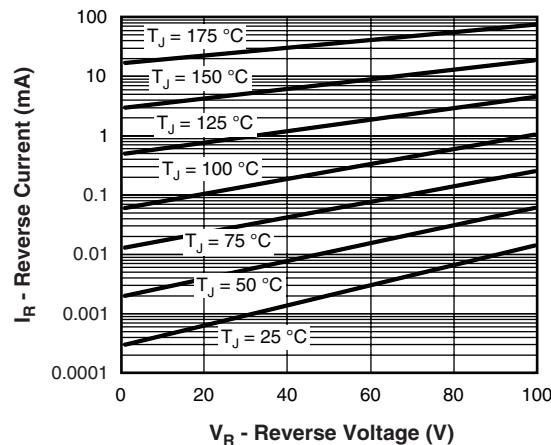


Fig. 2 - Typical Values of Reverse Current vs.
Reverse Voltage (Per Leg)

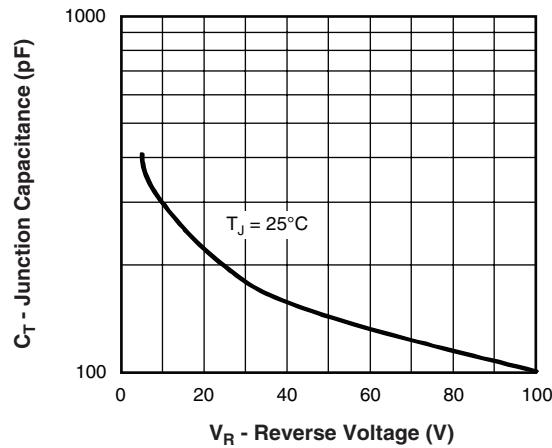


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage (Per Leg)

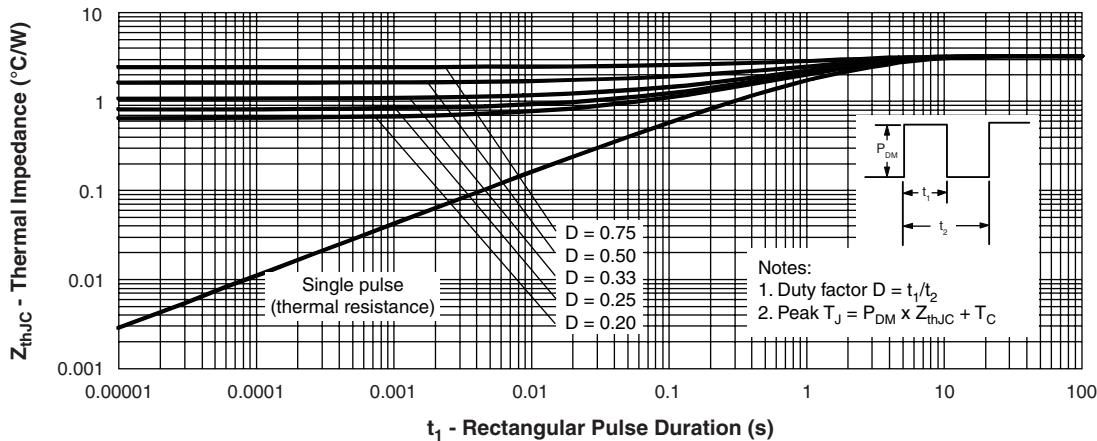


Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics (Per Leg)

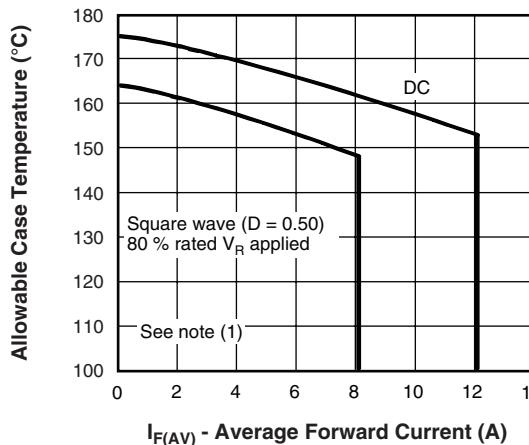


Fig. 5 - Maximum Allowable Case Temperature vs.
Average Forward Current (Per Leg)

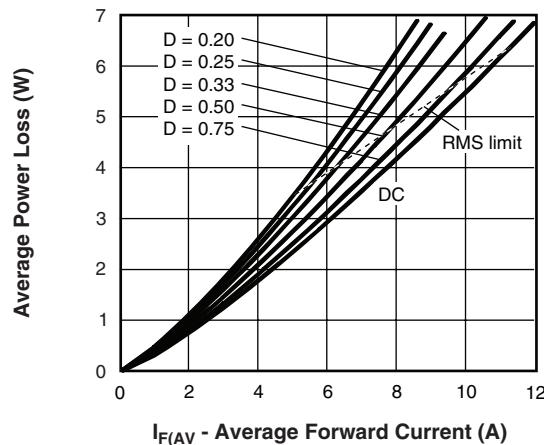


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

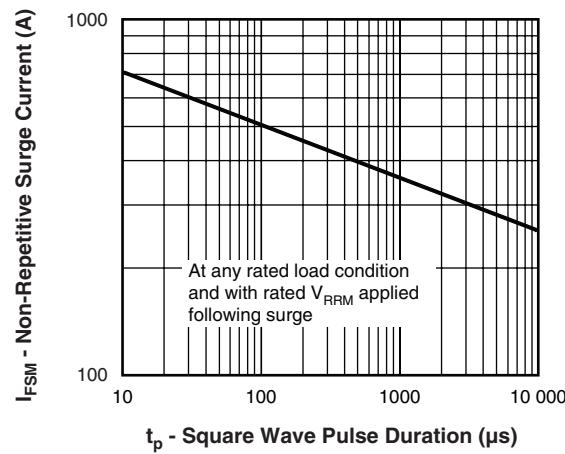


Fig. 7 - Maximum Non-Repetitive Surge Current (Per Leg)

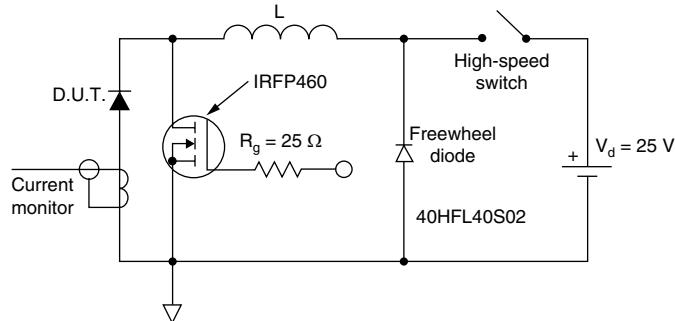


Fig. 8 - Unclamped Inductive Test Circuit

Note

⁽¹⁾ Formula used: $T_C = T_J - (P_d + P_{d,REV}) \times R_{thJC}$;
 $P_d = \text{Forward power loss} = I_{F(AV)} \times V_{FM} \text{ at } (I_{F(AV)}/D) \text{ (see fig. 6);}$
 $P_{d,REV} = \text{Inverse power loss} = V_{R1} \times I_R (1 - D); I_R \text{ at } V_{R1} = 10 \text{ V}$

ORDERING INFORMATION TABLE

Device code	VS-	30	C	T	Q	100	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				080 = 80 V				
						100 = 100 V			
7	- • S = D ² PAK								
					• -1 = TO-262				
8	- • None = Tube (50 pieces)								
					• TRL = Tape and reel (left oriented - for D ² PAK only)				
					• TRR = Tape and reel (right oriented - for D ² PAK 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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