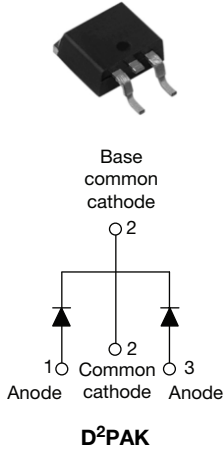
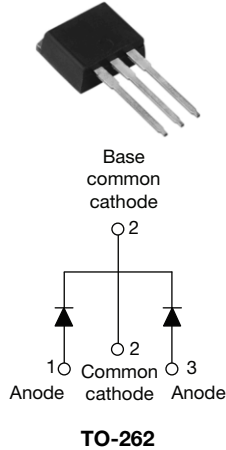


## Schottky Rectifier, 2 x 8 A

VS-16CTQ...SPbF



VS-16CTQ...-1PbF



### FEATURES

- 175 °C  $T_J$  operation
- Center tap configuration
- Low forward voltage drop
- High purity, high temperature epoxy encapsulation for enhanced mechanical strength and moisture resistance
- High frequency operation
- 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 8 A
$V_R$	60 V to 100 V

### MAJOR RATINGS AND CHARACTERISTICS

SYMBOL	CHARACTERISTICS	VALUES	UNITS
$I_{F(AV)}$	Rectangular waveform	16	A
$V_{RRM}$		60 to 100	V
$I_{FSM}$	$t_p = 5 \mu s$ sine	850	A
$V_F$	8 Apk, $T_J = 125 \text{ }^\circ\text{C}$ (per leg)	0.58	V
$T_J$	Range	- 55 to 175	$^\circ\text{C}$

### VOLTAGE RATINGS

PARAMETER	SYMBOL	VS-16CTQ060SPbF VS-16CTQ060-1PbF	VS-16CTQ080SPbF VS-16CTQ080-1PbF	VS-16CTQ100SPbF VS-16CTQ100-1PbF	UNITS
Maximum DC reverse voltage	$V_R$	60	80	100	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 $T_C = 148 \text{ }^\circ\text{C}$ , rectangular waveform	8	A
			16	
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	A
		10 ms sine or 6 ms rect. pulse		
Non-repetitive avalanche energy per leg	$E_{AS}$	$T_J = 25 \text{ }^\circ\text{C}$ , $I_{AS} = 0.50 \text{ A}$ , $L = 60 \text{ mH}$	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-16CTQ...SPbF, VS-16CTQ...-1PbF Series



Vishay High Power Products

Schottky Rectifier,  
2 x 8 A

ELECTRICAL SPECIFICATIONS					
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS
Maximum forward voltage drop per leg See fig. 1	$V_{FM}^{(1)}$	8 A	$T_J = 25\text{ }^\circ\text{C}$	0.72	V
		16 A		0.88	
		8 A	$T_J = 125\text{ }^\circ\text{C}$	0.58	
		16 A		0.69	
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	
Threshold voltage	$V_{F(TO)}$	$T_J = T_J \text{ maximum}$		0.415	V
Forward slope resistance	$r_t$			11.07	m $\Omega$
Maximum junction capacitance per leg	$C_T$	$V_R = 5 V_{DC}$ (test signal range 100 kHz to 1 MHz), 25 °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/ $\mu$ s

**Note**

(1) Pulse width < 300  $\mu$ 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	$^\circ\text{C/W}$
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
				12 (10)	(lbf · in)
Marking device		Case style D <sup>2</sup> PAK		16CTQ...S	
		Case style TO-262		16CTQ...-1	



# VS-16CTQ...SPbF, VS-16CTQ...-1PbF Series

Schottky Rectifier,  
2 x 8 A

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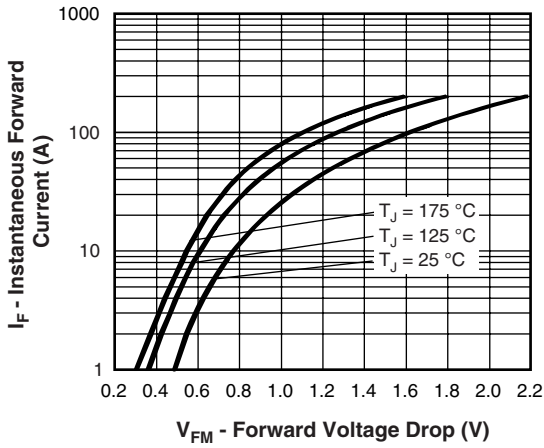


Fig. 1 - Maximum Forward Voltage Drop Characteristics (Per Leg)

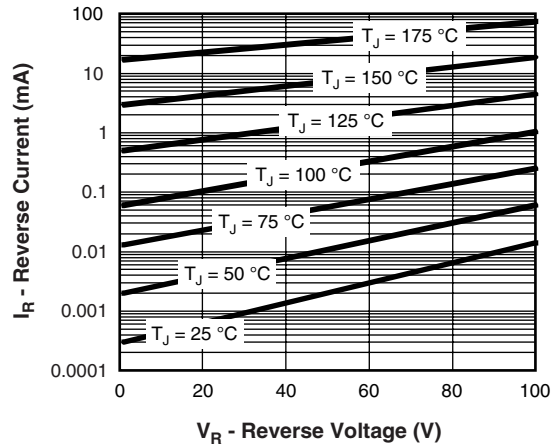


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage (Per Leg)

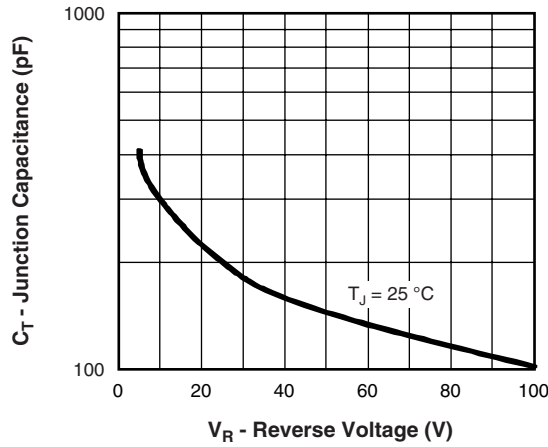


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage (Per Leg)

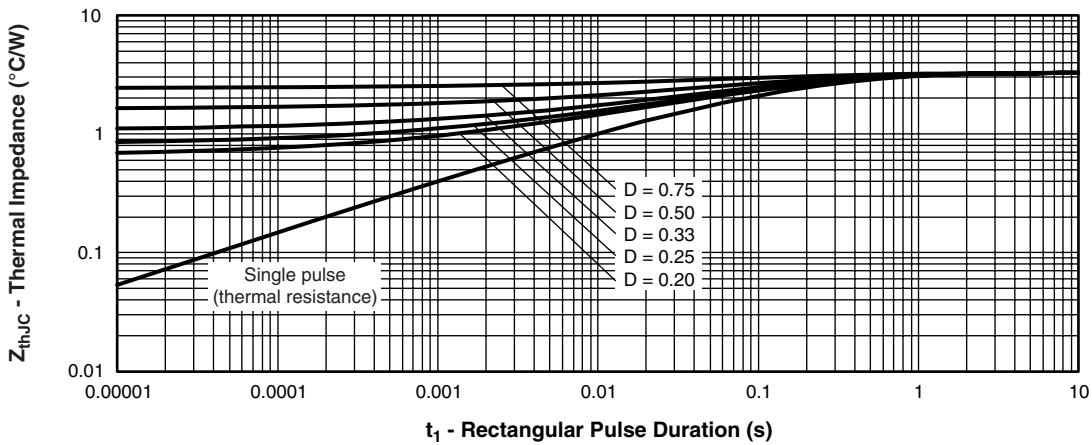


Fig. 4 - Maximum Thermal Impedance  $Z_{thJC}$  Characteristics (Per Leg)

# VS-16CTQ...SPbF, VS-16CTQ...-1PbF Series



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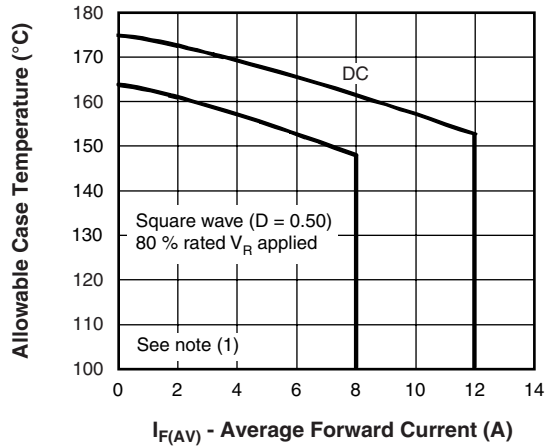


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current (Per Leg)

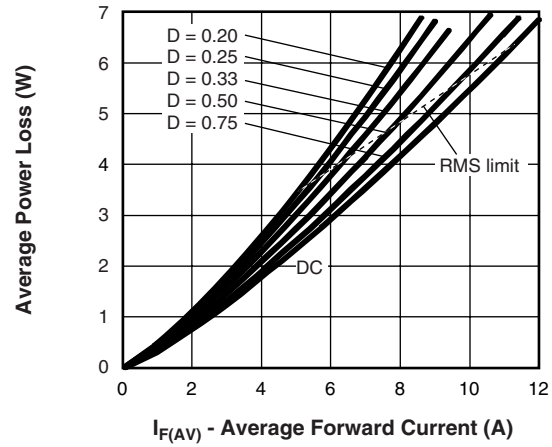


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

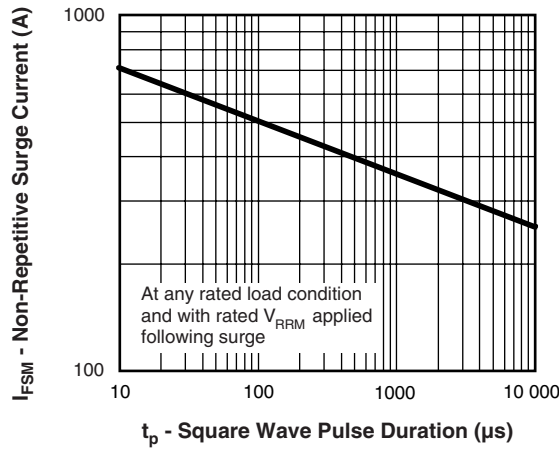


Fig. 7 - Maximum Non-Repetitive Surge Current (Per Leg)

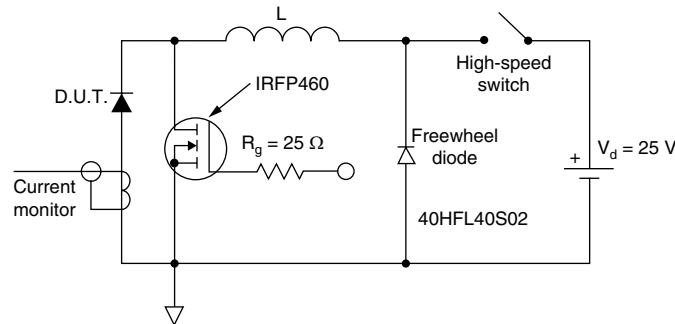


Fig. 8 - Unclamped Inductive Test Circuit

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



# VS-16CTQ...SPbF, VS-16CTQ...-1PbF Series

Schottky Rectifier,  
2 x 8 A

Vishay High Power Products

## ORDERING INFORMATION TABLE

Device code	<b>VS-</b>	<b>16</b>	<b>C</b>	<b>T</b>	<b>Q</b>	<b>100</b>	<b>S</b>	<b>TRL</b>	<b>PbF</b>
	①	②	③	④	⑤	⑥	⑦	⑧	⑨

- |   |   |  |   |
|---|---|--|---|
| 1 | - | HPP product suffix   |   |
| 2 | - | Current rating (16 A)  |   |
| 3 | - | Circuit configuration: C = Common cathode  |   |
| 4 | - | T = TO-220   |   |
| 5 | - | Schottky "Q" series  |   |
| 6 | - | Voltage ratings  | 060 = 60 V<br>080 = 80 V<br>100 = 100 V |
| 7 | - | <ul style="list-style-type: none"> <li>• S = D<sup>2</sup>PAK</li> <li>• -1 = TO-262</li> </ul>  |   |
| 8 | - | <ul style="list-style-type: none"> <li>• None = Tube (50 pieces)</li> <li>• TRL = Tape and reel (left oriented - for D<sup>2</sup>PAK only)</li> <li>• TRR = Tape and reel (right oriented - for D<sup>2</sup>PAK only)</li> </ul> |   |
| 9 | - | 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>
SPICE model	<a href="http://www.vishay.com/doc?95279">www.vishay.com/doc?95279</a>



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