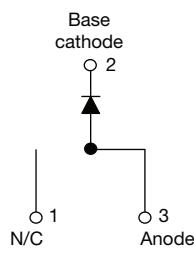


## High Performance Schottky Rectifier, 8 A


**D<sup>2</sup>PAK (TO-263AB)**

### FEATURES

- 175 °C T<sub>J</sub> 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
- Meets MSL level 1, per J-STD-020, LF maximum peak of 245 °C
- Designed and qualified according to JEDEC®-JESD 47
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)


**RoHS**  
COMPLIANT  
**HALOGEN**  
**FREE**

### DESCRIPTION

The VS-8TQ... 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.

PRIMARY CHARACTERISTICS	
I <sub>F(AV)</sub>	8 A
V <sub>R</sub>	80 V, 100 V
V <sub>F</sub> at I <sub>F</sub>	0.58 V
I <sub>RM</sub>	7 mA at 125 °C
T <sub>J</sub> max.	175 °C
E <sub>AS</sub>	7.5 mJ
Package	D <sup>2</sup> PAK (TO-263AB)
Circuit configuration	Single

MAJOR RATINGS AND CHARACTERISTICS			
SYMBOL	CHARACTERISTICS	VALUES	UNITS
I <sub>F(AV)</sub>	Rectangular waveform	8	A
V <sub>RRM</sub>	Range	80/100	V
I <sub>FSM</sub>	t <sub>p</sub> = 5 µs sine	850	A
V <sub>F</sub>	8 A <sub>pk</sub> , T <sub>J</sub> = 125 °C	0.58	V
T <sub>J</sub>	Range	-55 to +175	°C

VOLTAGE RATINGS				
PARAMETER	SYMBOL	VS-8TQ080S-M3	VS-8TQ100S-M3	UNITS
Maximum DC reverse voltage	V <sub>R</sub>	80	100	V
Maximum working peak reverse voltage	V <sub>RWM</sub>			

ABSOLUTE MAXIMUM RATINGS						
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS	
Maximum average forward current See fig. 5	I <sub>F(AV)</sub>	50 % duty cycle at T <sub>C</sub> = 157 °C, rectangular waveform		8	A	
Maximum peak one cycle non-repetitive surge current See fig. 7	I <sub>FSM</sub>	5 µs sine or 3 µs rect. pulse	Following any rated load condition and with rated V <sub>RRM</sub> applied	850	A	
		10 ms sine or 6 ms rect. pulse		230		
Non-repetitive avalanche energy	E <sub>AS</sub>	T <sub>J</sub> = 25 °C, I <sub>AS</sub> = 0.50 A, L = 60 mH		7.50	mJ	
Repetitive avalanche current	I <sub>AR</sub>	Current decaying linearly to zero in 1 µs Frequency limited by T <sub>J</sub> maximum V <sub>A</sub> = 1.5 x V <sub>R</sub> typical		0.50	A	

**ELECTRICAL SPECIFICATIONS**

PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS	
Maximum forward voltage drop See fig. 1	$V_{FM}^{(1)}$	8 A	$T_J = 25^\circ C$	0.72	V	
		16 A		0.88		
		8 A	$T_J = 125^\circ C$	0.58		
		16 A		0.69		
Maximum reverse leakage current See fig. 2	$I_{RM}^{(1)}$	$T_J = 25^\circ C$	$V_R = \text{Rated } V_R$	0.55	mA	
		$T_J = 125^\circ C$		7		
Maximum junction capacitance	$C_T$	$V_R = 5 V_{DC}$ (test signal range 100 kHz to 1 MHz), $25^\circ C$		500	pF	
Typical series inductance	$L_S$	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**

<sup>(1)</sup> Pulse width < 300 μs, 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	°C
Maximum thermal resistance, junction to case	$R_{thJC}$	DC operation See fig. 4		2.0	°C/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)	kgf · cm (lbf · in)
	maximum			12 (10)	
Marking device		Case style D <sup>2</sup> PAK (TO-263AB)		8TQ080S	
				8TQ100S	

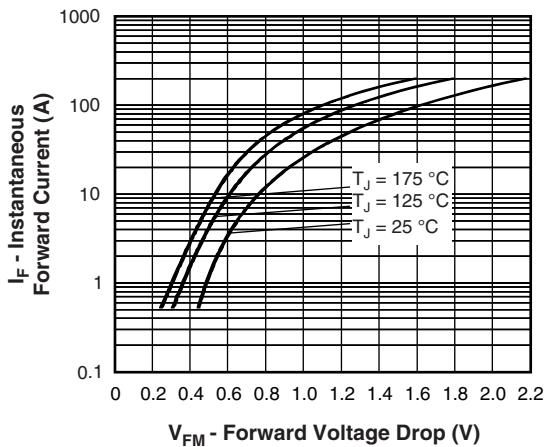


Fig. 1 - Maximum Forward Voltage Drop Characteristics

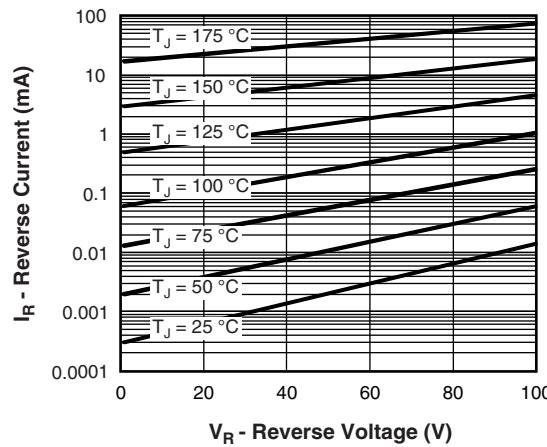


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage

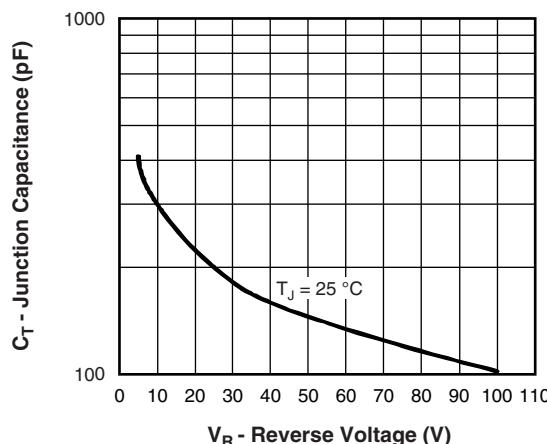


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage

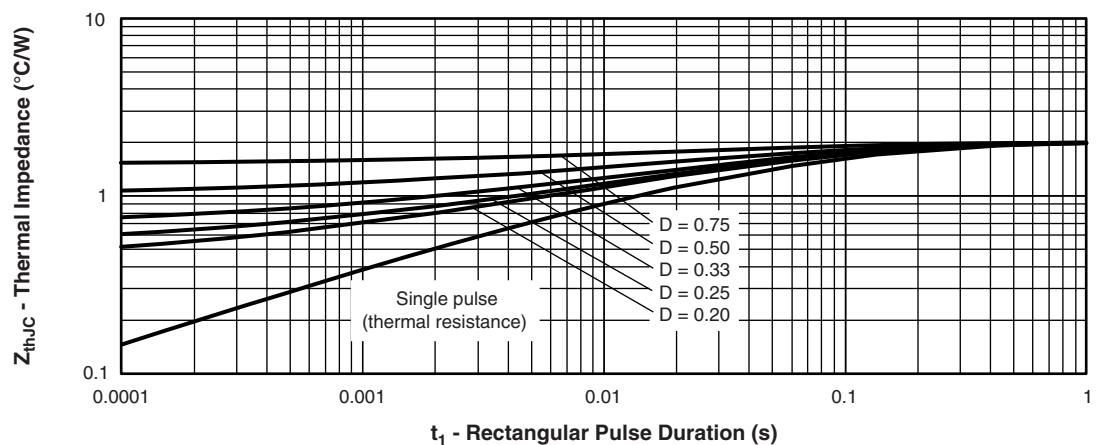


Fig. 4 - Maximum Thermal Impedance  $Z_{thJC}$  Characteristics

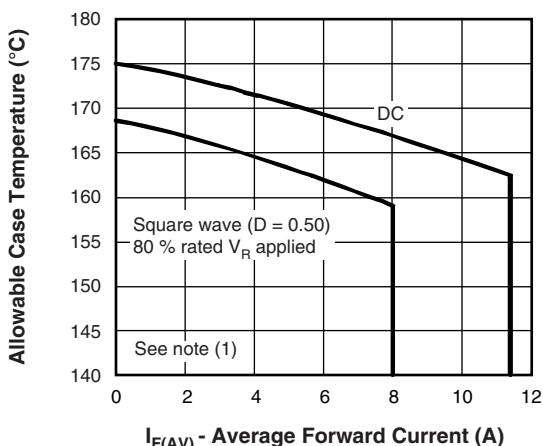


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current

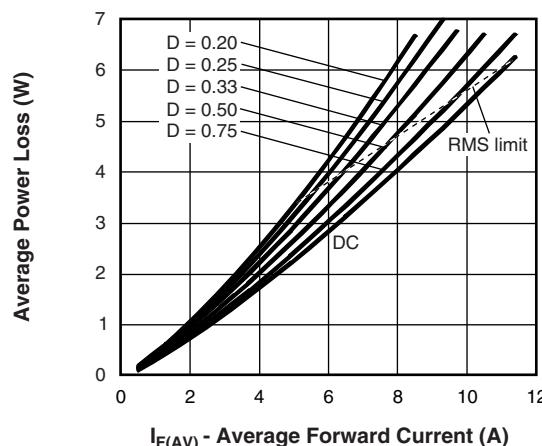


Fig. 6 - Forward Power Loss Characteristics

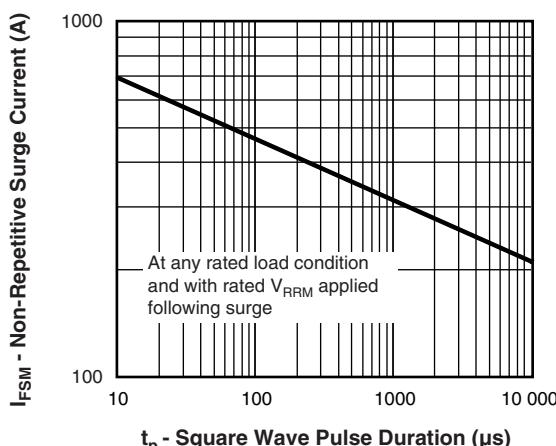


Fig. 7 - Maximum Non-Repetitive Surge Current

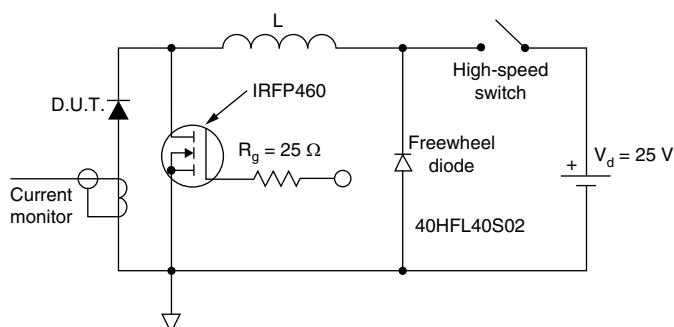


Fig. 8 - Unclamped Inductive Test Circuit

#### Note

(1) Formula used:  $T_C = T_J - (P_d + P_{d,REV}) \times R_{th,JC}$   
 $P_d$  = 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

Device code	VS-	8	T	Q	100	S	TRL	-M3
	1	2	3	4	5	6	7	8

1	- Vishay Semiconductors product
2	- Current rating (8 A)
3	- Circuit configuration: T = TO-220
4	- Schottky "Q" series
5	- Voltage ratings
6	- S = D <sup>2</sup> PAK (TO-263AB)
7	<ul style="list-style-type: none"> <li>• None = tube</li> <li>• TRL = tape and reel (left oriented)</li> <li>• TRR = tape and reel (right oriented)</li> </ul>
8	- -M3 = halogen-free, RoHS-compliant, and termination lead (Pb)-free

080 = 80 V  
100 = 100 V

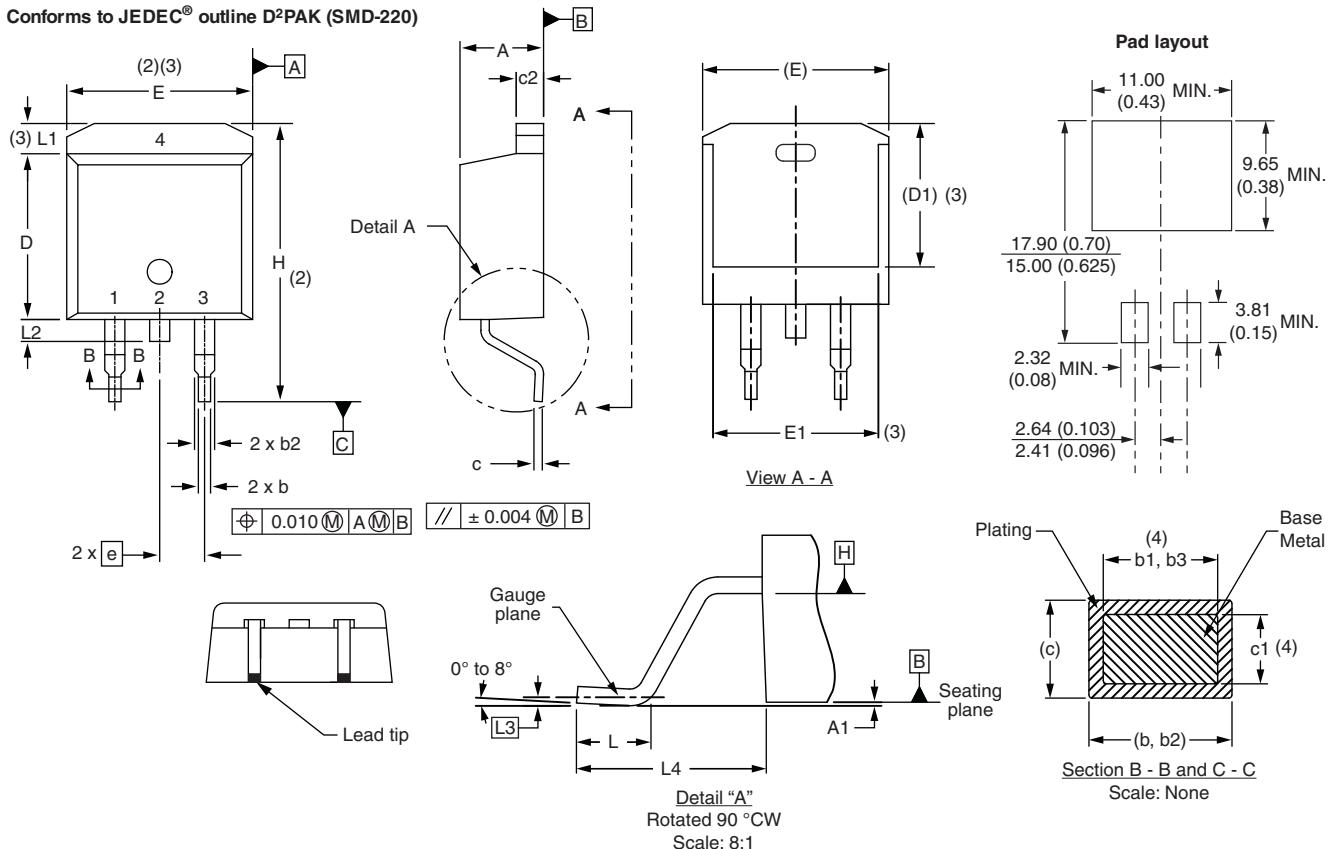
<b>ORDERING INFORMATION</b>			
<b>PREFERRED P/N</b>	<b>QUANTITY PER T/R</b>	<b>MINIMUM ORDER QUANTITY</b>	<b>PACKAGING DESCRIPTION</b>
VS-8TQ080S-M3	50	1000	Antistatic plastic tubes
VS-8TQ080STRR-M3	800	800	13" diameter reel
VS-8TQ080STRL-M3	800	800	13" diameter reel
VS-8TQ100S-M3	50	1000	Antistatic plastic tubes
VS-8TQ100STRR-M3	800	800	13" diameter reel
VS-8TQ100STRL-M3	800	800	13" diameter reel

<b>LINKS TO RELATED DOCUMENTS</b>	
Dimensions	<a href="http://www.vishay.com/doc?96164">www.vishay.com/doc?96164</a>
Part marking information	<a href="http://www.vishay.com/doc?95444">www.vishay.com/doc?95444</a>
Packaging information	<a href="http://www.vishay.com/doc?96424">www.vishay.com/doc?96424</a>
SPICE model	<a href="http://www.vishay.com/doc?96227">www.vishay.com/doc?96227</a>

### D<sup>2</sup>PAK

**DIMENSIONS** in millimeters and inches

Conforms to JEDEC® outline D<sup>2</sup>PAK (SMD-220)



SYMBOL	MILLIMETERS		INCHES		NOTES		SYMBOL	MILLIMETERS		INCHES		NOTES
	MIN.	MAX.	MIN.	MAX.				MIN.	MAX.	MIN.	MAX.	
A	4.06	4.83	0.160	0.190			D1	6.86	8.00	0.270	0.315	3
A1	0.00	0.254	0.000	0.010			E	9.65	10.67	0.380	0.420	2, 3
b	0.51	0.99	0.020	0.039			E1	7.90	8.80	0.311	0.346	3
b1	0.51	0.89	0.020	0.035	4		e	2.54 BSC		0.100 BSC		
b2	1.14	1.78	0.045	0.070			H	14.61	15.88	0.575	0.625	
b3	1.14	1.73	0.045	0.068	4		L	1.78	2.79	0.070	0.110	
c	0.38	0.74	0.015	0.029			L1	-	1.65	-	0.066	3
c1	0.38	0.58	0.015	0.023	4		L2	1.27	1.78	0.050	0.070	
c2	1.14	1.65	0.045	0.065			L3	0.25 BSC		0.010 BSC		
D	8.51	9.65	0.335	0.380	2		L4	4.78	5.28	0.188	0.208	

#### Notes

- (1) Dimensioning and tolerancing per ASME Y14.5 M-1994
- (2) Dimension D and E do not include mold flash. Mold flash shall not exceed 0.127 mm (0.005") per side. These dimensions are measured at the outmost extremes of the plastic body
- (3) Thermal pad contour optional within dimension E, L1, D1 and E1
- (4) Dimension b1 and c1 apply to base metal only
- (5) Datum A and B to be determined at datum plane H
- (6) Controlling dimension: inch
- (7) Outline conforms to JEDEC® outline TO-263AB

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