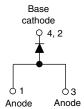


Schottky Rectifier, 5.5 A





D-PAK (TO-252AA)

PRODUCT SUMMARY			
Package	D-PAK (TO-252AA)		
I _{F(AV)}	5.5 A		
V_{R}	100 V		
V _F at I _F	See Electrical table		
I _{RM}	4 mA at 125 °C		
T _J max.	150 °C		
Diode variation	Single die		
Eas	6 mJ		

FEATURES

- Popular D-PAK outline
- Small foot print, surface mountable



- Low forward voltage drop
- High frequency operation
- Guard ring for enhanced ruggedness and long term reliability
- \bullet Meets MSL level 1, per J-STD-020, LF maximum peak of 260 $^{\circ}\text{C}$
- Material categorization: For definitions of compliance please see <u>www.vishay.com/doc?99912</u>

DESCRIPTION

The VS-50WQ10FNPbF surface mount Schottky rectifier has been designed for applications requiring low forward drop and small foot prints on PC board. Typical applications are in disk drives, switching power supplies, converters, freewheeling diodes, battery charging, and reverse battery protection.

MAJOR RATINGS AND CHARACTERISTICS				
SYMBOL	CHARACTERISTICS	VALUES	UNITS	
I _{F(AV)}	Rectangular waveform	5.5	А	
V_{RRM}		100	V	
I _{FSM}	t _p = 5 μs sine	330	А	
V _F	5 A _{pk} , T _J = 125 °C	0.63	V	
T _J	Range	- 40 to 150	°C	

VOLTAGE RATINGS				
PARAMETER SYMBOL		VS-50WQ10FNPbF	UNITS	
Maximum DC reverse voltage	V_{R}	100	V	
Maximum working peak reverse voltage	V_{RWM}	100	V	

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 = 135 °C, rectangular waveform		5.5	
Maximum peak one cycle non-repetitive surge current I _{ESM}	5 μs sine or 3 μs rect. pulse	Following any rated load condition and with rated	330	Α	
See fig. 7	IFSM	10 ms sine or 6 ms rect. pulse	V _{RRM} applied	110	
Non-repetitive avalanche energy	E _{AS}	T _J = 25 °C, I _{AS} = 0.5 A, L = 40 mH		6.0	mJ
Repetitive avalanche current	I _{AR}	Current decaying linearly to zero in 1 μ s Frequency limited by T_J maximum $V_A = 1.5 \times V_R$ typical		0.5	Α



ELECTRICAL SPECIFICATIONS					
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS
Maximum forward voltage drop See fig. 1		5 A	T _J = 25 °C	0.77	
	V _{FM} ⁽¹⁾	10 A		0.91	V
	VFM ('')	5 A	T _J = 125 °C	0.63	v
		10 A		0.74	
Maximum reverse leakage current	. (1)	T _J = 25 °C	V _R = Rated V _R	1	mA
See fig. 2	I _{RM} ⁽¹⁾	T _J = 125 °C		4	IIIA
Threshold voltage	V _{F(TO)}	$T_{\rm J} = T_{\rm J} {\rm maximum}$ 0.47 21.46		0.47	V
Forward slope resistance	r _t			mΩ	
Typical junction capacitance	C _T	V _R = 5 V _{DC} (test signal range 100 kHz to 1 MHz), 25 °C 183		pF	
Typical series inductance	L _S	Measured lead to lead 5 mm from package body 5.0		nΗ	

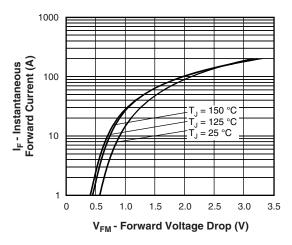
Note

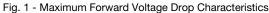
 $^{(1)}$ Pulse width < 300 μ s, duty cycle < 2 %

THERMAL - MECHANICAL SPECIFICATIONS				
PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Maximum junction and storage temperature range	T _J ⁽¹⁾ , T _{Stg}		- 40 to 150	°C
Maximum thermal resistance, junction to case	R_{thJC}	DC operation See fig. 4	3.0	°C/W
Approximate weight			0.3	g
Approximate weight			0.01	OZ.
Marking device		Case style D-PAK (similar to TO-252AA)	50WQ10FN	

Note

$$\frac{dP_{tot}}{dT_J} < \frac{1}{R_{thJA}} \quad \text{thermal runaway condition for a diode on its own heatsink}$$





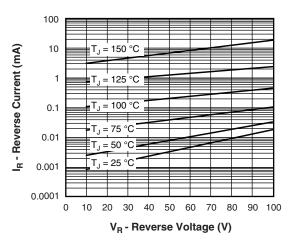


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage

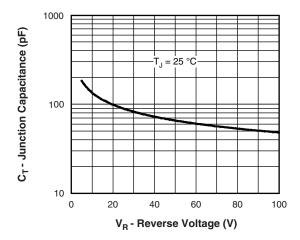


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage

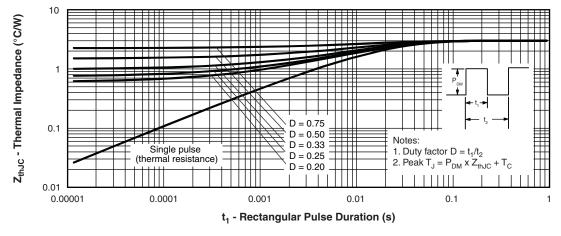
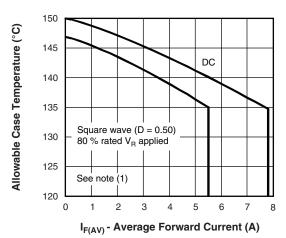


Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics



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

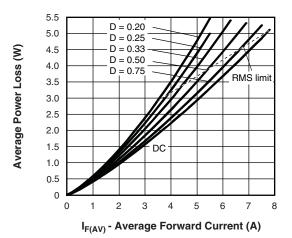


Fig. 6 - Forward Power Loss Characteristics

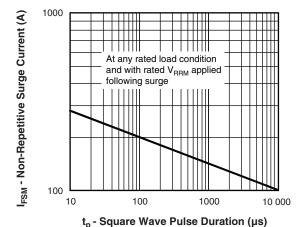


Fig. 7 - Maximum Non-Repetitive Surge Current

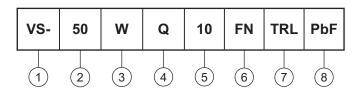
Note

 $^{(1)}$ Formula used: T_C = T_J - (Pd + Pd_{REV}) x R_{th,JC}; Pd = Forward power loss = I_{F(AV)} x V_{FM} at (I_{F(AV)}/D) (see fig. 6); Pd_{REV} = Inverse power loss = V_{R1} x I_R (1 - D); I_R at V_{R1} = 80 % rated V_R



ORDERING INFORMATION TABLE

Device code



1 - Vishay Semiconductors product

2 - Current rating (5.5 A)

Package identifier:

W = D-PAK

4 - Schottky "Q" series

Voltage rating (10 = 100 V)

- FN = TO-252AA (D-PAK)

7 - • None = Tube (50 pieces)

• TR = Tape and reel

• TRL = Tape and reel (left oriented)

• TRR = Tape and reel (right oriented)

8 - PbF = Lead (Pb)-free

LINKS TO RELATED DOCUMENTS			
Dimensions	www.vishay.com/doc?95016		
Part marking information	www.vishay.com/doc?95059		
Packaging information	www.vishay.com/doc?95033		
SPICE model	www.vishay.com/doc?95549		



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