COMPLIANT

HALOGEN

FREE



Vishay Semiconductors

High Performance Schottky Rectifier, 3 A



SMC (DO-214AB)

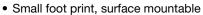
LINKS TO ADDITIONAL RESOURCES



PRIMARY CHARACTERISTICS				
I _{F(AV)}	3.0 A			
V_{R}	100 V			
V _F at I _F	0.62 V			
I _{RM}	5 mA at 125 °C			
T _J max.	175 °C			
E _{AS}	3.0 mJ			
Package	SMC (DO-214AB)			
Circuit configuration	Single			

FEATURES

- · Low forward voltage drop
- Guard ring for enhanced ruggedness and long term reliability



- High frequency operation
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Material categorization: for definitions of compliance please see <u>www.vishay.com/doc?99912</u>

DESCRIPTION

The VS-30BQ100-M3 surface mount Schottky rectifier has been designed for applications requiring low forward drop and small foot prints on PC boards. Typical applications are in disk drives, switching power supplies, converters, freewheeling diodes, battery charging, and reverse battery protection.

MECHANICAL DATA

Case: SMC (DO-214AB)

Molding compound meets UL 94 V-0 flammability rating **Terminals:** matte tin plated leads, solderable per

J-STD-002

Polarity: color band denotes cathode end

MAJOR RATINGS AND CHARACTERISTICS			
SYMBOL	CHARACTERISTICS	VALUES	UNITS
I _{F(AV)}	Rectangular waveform	3.0	Α
V _{RRM}		100	V
I _{FSM}	$t_p = 5 \mu s sine$	800	Α
V _F	3.0 A _{pk} , T _J = 125 °C	0.62	V
TJ	Range	-55 to +175	°C

VOLTAGE RATINGS			
PARAMETER	SYMBOL	VS-30BQ100-M3	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	Maximum average femulated average		50 % duty cycle at T _L = 148 °C, rectangular waveform		
Maximum average forward current	I _{F(AV)}	50 % duty cycle at T _L = 138 °C, rectangular waveform		4.0	
Maximum peak one cycle	1	5 μs sine or 3 μs rect. pulse	Following any rated load condition and with rated	800	A
non-repetitive surge current	IFSM	10 ms sine or 6 ms rect. pulse	V _{RRM} applied	70	
Non-repetitive avalanche energy	E _{AS}	$T_J = 25 ^{\circ}\text{C}, I_{AS} = 1.0 \text{A}, L = 6 \text{mH}$		3.0	mJ
Repetitive avalanche current	I _{AR}	Current decaying linearly to zero in 1 μ s Frequency limited by T_J maximum $V_A = 1.5$ x V_R typical		0.5	А



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ELECTRICAL SPECIFICATIONS					
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS
	V _{FM} ⁽¹⁾	3 A	T _J = 25 °C	0.79	V
Maximum forward voltage drap		6 A		0.90	
Maximum forward voltage drop		3 A	T _J = 125 °C	0.62	
		6 A		0.70	
Maximum reverse leakage current		T _J = 25 °C	V_{R} = Rated V_{R}	0.5	mA
Maximum reverse leakage current	I _{RM}	T _J = 125 °C	v _R = nateu v _R	5.0	IIIA
Maximum junction capacitance	C _T	$V_R = 5 V_{DC}$ (test signal range 100 kHz to 1 MHz), 25 °C		115	pF
Typical series inductance	L _S	Measured lead to lead 5 mm from package body		3.0	nH
Maximum voltage rate of change	dV/dt	Rated V _R 10 000 V/μ		V/µs	

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}		-55 to +175	°C
Maximum thermal resistance, junction to lead	R _{thJL} ⁽²⁾	DC anavation	12	°C/W
Maximum thermal resistance, junction to ambient	R _{thJA}	DC operation	46	
Approximate weight			0.24	g
Approximate weight			0.008	oz.
Marking device		Case style SMC (DO-214AB)	3	J

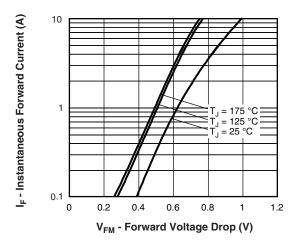
Notes

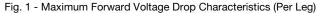
 $[\]frac{dP_{tot}}{dT_J} < \frac{1}{R_{thJA}}$ thermal runaway condition for a diode on its own heatsink

⁽²⁾ Mounted 1" square PCB









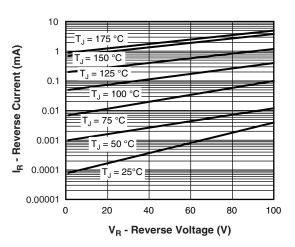


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage (Per Leg)

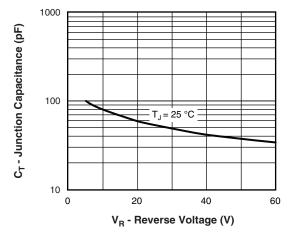


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage (Per Leg)

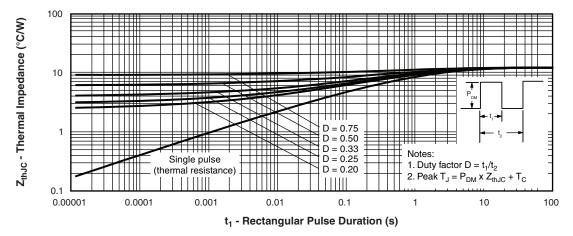


Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics (Per Leg)

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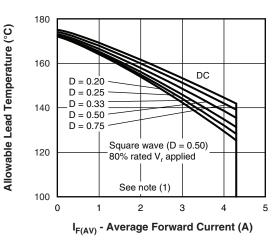


Fig. 5 - Maximum Average Forward Current vs.
Allowable Lead Temperature

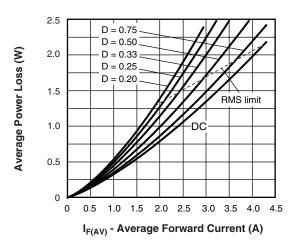


Fig. 6 - Maximum Average Forward Dissipation vs. Average Forward Current

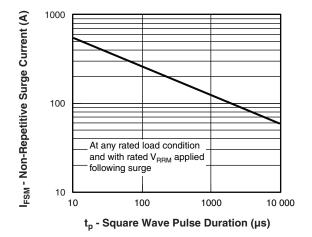


Fig. 7 - Maximum Peak Surge Forward Current vs. Pulse Duration

Note

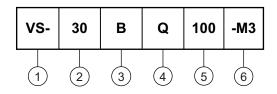
Formula used: $T_C = T_J - (Pd + Pd_{REV}) \times R_{th,JC}$; $Pd = forward power loss = I_{F(AV)} \times V_{FM}$ at $(I_{F(AV)}/D)$ (see fig. 6); $Pd_{REV} = inverse power loss = V_{R1} \times I_R (1 - D)$; I_R at $V_{R1} = 80 \%$ rated V_R



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ORDERING INFORMATION TABLE

Device code



1 - Vishay Semiconductors product

2 - Current rating

3 - B = SMC

4 - Q = Schottky "Q" series

5 - Voltage rating (100 = 100 V)

6 - Environmental digit:

-M3 = Halogen-free, RoHS-compliant, and terminations lead (Pb)-free

ORDERING INFORMATION (Example)					
PREFERRED P/N	PREFERRED PACKAGE CODE	MINIMUM ORDER QUANTITY	PACKAGING DESCRIPTION		
VS-30BQ100-M3/9AT	9AT	3500	13" diameter plastic tape and reel		

LINKS TO RELATED DOCUMENTS				
Dimensions <u>www.vishay.com/doc?95402</u>				
Part marking information	www.vishay.com/doc?95403			
Packaging information	www.vishay.com/doc?95404			
SPICE model	www.vishay.com/doc?96932			

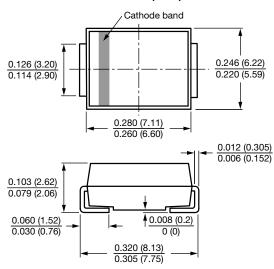


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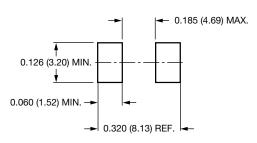
SMC

DIMENSIONS in inches (millimeters)

DO-214AB (SMC)



Mounting Pad Layout





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