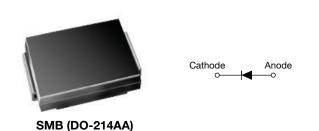
COMPLIANT

HALOGEN FREE



Vishay Semiconductors

High Performance Schottky Rectifier, 1.0 A



PRIMARY CHARACTERISTICS				
I _{F(AV)}	1.0 A			
V_R	15 V			
V _F at I _F	0.21 V			
I _{RM}	35 mA at 100 °C			
T _J max.	125 °C			
E _{AS}	1.0 mJ			
Package	SMB (DO-214AA)			
Circuit configuration	Single			

FEATURES

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



- · Optimized for OR-ing applications
- High frequency operation
- High purity, high temperature epoxy encapsulation for enhanced mechanical strength and moisture resistance
- 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-10BQ015-M3 surface mount Schottky rectifier has been designed for applications requiring low forward drop and very small foot prints on PC boards. The proprietary barrier technology allows for reliable operation up to 125 °C junction temperature. 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	1.0	Α
V _{RRM}		15	V
I _{FSM}	t _p = 5 μs sine	140	Α
V _F	1.0 A _{pk} , T _J = 125 °C	0.21	V
T _J	Range	-55 to +125	°C

VOLTAGE RATINGS			
PARAMETER	SYMBOL	VS-10BQ015-M3	UNITS
Maximum DC reverse voltage	V _R	15	V
Maximum working peak reverse voltage	V _{RWM}	25	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 _L = 134 °C	, rectangular waveform	1.0	Α
Maximum peak one cycle		5 μs sine or 3 μs rect. pulse	Following any rated load	140	
non-repetitive surge current See fig. 7	I _{FSM}	10 ms sine or 6 ms rect. pulse	condition and with rated V _{RRM} applied	40	Α
Non-repetitive avalanche energy	E _{AS}	$T_J = 25 ^{\circ}\text{C}, I_{AS} = 1 \text{A}, L = 2 \text{mH}$		1.0	mJ
Repetitive avalanche current	I _{AR}	Current decaying linearly to zer Frequency limited by T _J maxim	•	1.0	Α



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ELECTRICAL SPECIFICATIONS					
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS
Maximum forward voltage drop	V _{FM} ⁽¹⁾	1 A	T _J = 25 °C	0.33	V
		2 A		0.39	
See fig. 1		1 A	T _J = 125 °C	0.21	
		2 A		0.29	
Maximum reverse leakage current	1	T _J = 25 °C	V Datad V	0.5	A
See fig. 2	I _{RM}	$T_J = 100 ^{\circ}\text{C}$ $V_R = \text{Rated } V_R$		35	- mA
Threshold voltage	V _{F(TO)}	$T_{J} = T_{J}$ maximum		-	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		390	pF
Typical series inductance	L _S	Measured lead to lead 5 mm from package body 2.		2.0	nH
Maximum voltage rate of change	dV/dt	Rated V _R 10 00		10 000	V/µs

Note

 $^{^{(1)}\,}$ Pulse width = 300 $\mu s,$ duty cycle = 2 %

THERMAL - MECHANICAL SPECIFICATIONS				
PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Maximum junction temperature range	T _J ⁽¹⁾		-55 to +125	°C
Maximum storage temperature range	T _{Stg}		-55 to +150	C
Maximum thermal resistance, junction to lead	R _{thJL} (2)	DC operation See fig. 4	36	°C/W
Maximum thermal resistance, junction to ambient	R _{thJA}	DC operation	80	C/VV
Approximate weight			0.10	g
Approximate weight			0.003	OZ.
Marking device		Case style SMB (DO-214AA)	1	С

Notes

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

(2) Mounted 1" square PCB



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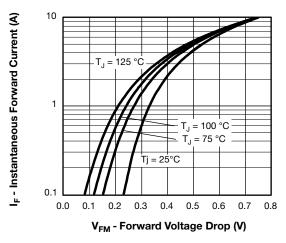


Fig. 1 - Maximum Forward Voltage Drop Characteristics

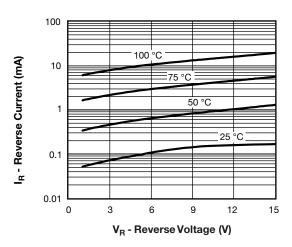


Fig. 2 - Typical Peak Reverse Current vs. Reverse Voltage

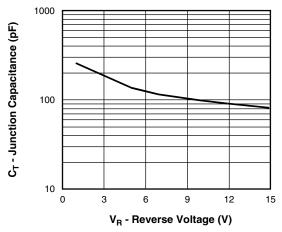


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage

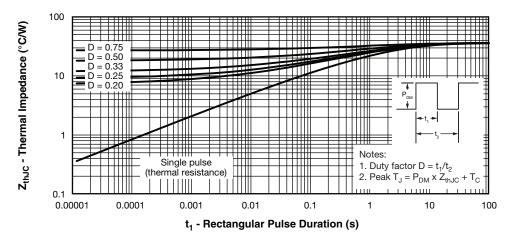


Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics (Per Leg)

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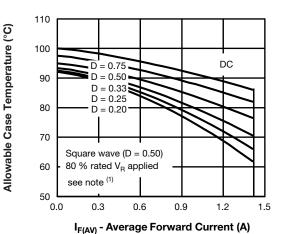


Fig. 5 - Maximum Average Forward Current vs.
Allowable Lead Temperature

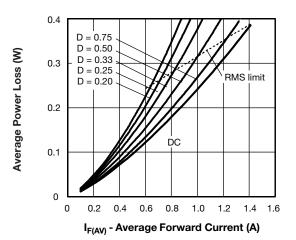


Fig. 6 - Maximum Average Forward Dissipation vs. Average Forward Current

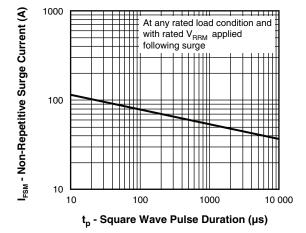


Fig. 7 - Maximum Non-Repetitive Surge Current

Note

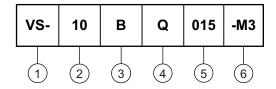
(1) Formula used: $T_C = T_J - (Pd + Pd_{REV}) \times R_{th,JC}$; $Pd = forward power loss = I_{F(AV)} \times V_{FM}$ at $(I_{F(AV)}/D)$ (see fig. 6); $Pd_{REV} = inverse power loss = V_{R1} \times I_R (1 - D)$; I_R at $V_{R1} = 80 \%$ rated V_R



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ORDERING INFORMATION TABLE





- 1 Vishay Semiconductors product
- 2 Current rating
- 3 B = SMB
- 4 Q = Schottky "Q" series
- 5 Voltage rating (015 = 15 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 DESCRIPTIO			
VS-10BQ015-M3/5BT	5BT	3200	13" diameter plastic tape and reel	

LINKS TO RELATED DOCUMENTS			
Dimensions	www.vishay.com/doc?95401		
Part marking information	www.vishay.com/doc?95403		
Packaging information	www.vishay.com/doc?95404		
SPICE model	www.vishay.com/doc?95666		



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