

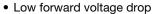
Vishay Semiconductors

Schottky Rectifier, 1.0 A



PRODUCT SUMMARY				
Package	SMB			
I _{F(AV)}	1.0 A			
V _R	60 V			
V _F at I _F	0.42 V			
I _{RM}	8 mA at 125 °C			
T _J max.	150 °C			
Diode variation	Single die			
E _{AS}	2.0 mJ			

FEATURES





Guard ring for enhanced ruggedness and long term reliability

• Small foot print, surface mountable

COMPLIANT HALOGEN FREE

- 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-10BQ060-M3 surface mount Schottky rectifier has been designed for applications requiring low forward drop and very small foot prints on PC boards. 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	A		
V_{RRM}		60	V		
I _{FSM}	t _p = 5 µs sine	700	А		
V _F	1.0 Apk, T _J = 125 °C	0.42	V		
T _J	Range	- 55 to 150	°C		

VOLTAGE RATINGS				
PARAMETER	SYMBOL	VS-10BQ060-M3	UNITS	
Maximum DC reverse voltage	V_{R}	60	V	
Maximum working peak reverse voltage	V_{RWM}	00	V	

ABSOLUTE MAXIMUM RATINGS					
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS
Maximum average forward current	I _{F(AV)}	50 % duty cycle at T _L = 116 °C, rectangular waveform		1.0	А
Maximum peak one cycle		5 µs sine or 3 µs rect. pulse	Following any rated load condition and with	700	
non-repetitive surge current	I _{FSM}	10 ms sine or 6 ms rect. pulse	rated V _{RRM} applied	42	A
Non-repetitive avalanche energy	E _{AS}	T _J = 25 °C, I _{AS} = 1 A, L = 4 mH		2.0	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		1.0	А



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ELECTRICAL SPECIFICATIONS					
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS
		1 A	T _{.1} = 25 °C	0.49	
Maximum forward voltage drop) (1)	2 A	1j=25 C	0.60	V
See fig. 1	V FM (')	V _{FM} ⁽¹⁾	T 105 °C	0.42	
		2 A	T _J = 125 °C	0.56	
Maximum reverse leakage current	1	T _J = 25 °C	V _R = Rated V _R	0.1	A
See fig. 2	I _{RM}	T _J = 125 °C		8.0	mA
Typical junction capacitance	C _T	$V_R = 5 V_{DC}$ (test signal range 100 kHz to 1 MHz), 25 °C		80	pF
Typical series inductance	L _S	Measured lead to lead 5 mm from package body		2.0	nH
Maximum voltage rate of charge	dV/dt	Rated V _R		10 000	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 150	°C
Maximum thermal resistance, junction to lead	R _{thJL} ⁽²⁾	DC operation	36	°C/W
Maximum thermal resistance, junction to ambient	R _{thJA}		80	C/VV
Approximate weight			0.10	g
Approximate weight			0.003	OZ.
Marking device		Case style SMB (similar DO-214AA)	11	H

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

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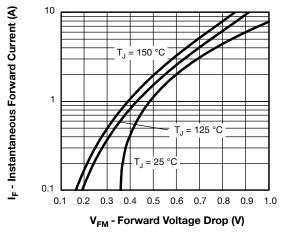


Fig. 1 - Maximum Forward Voltage Drop Characteristics

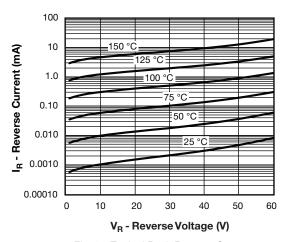


Fig. 2 - Typical Peak Reverse Current vs. Reverse Voltage

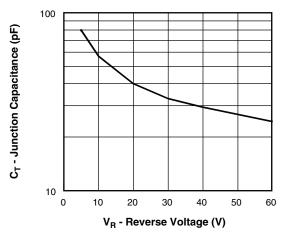


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage

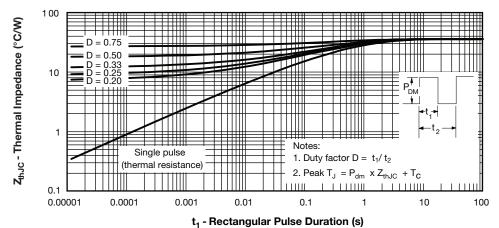


Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics (Per Leg)

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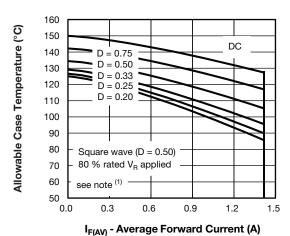
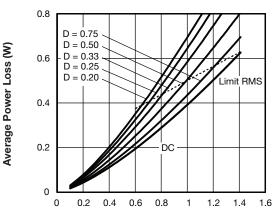


Fig. 5 - Maximum Average Forward Current vs.
Allowable Lead Temperature



I_{F(AV)} - Average Forward Current (A)

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

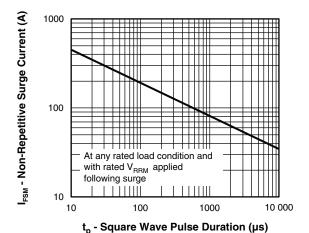


Fig. 7 - Maximum Peak Surge Forward Current vs. Pulse Duration

Note

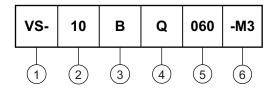
 $^{(1)}$ Formula used: T_C = T_J - (Pd + Pd_{REV}) x R_{thJC}; Pd = Forward power loss = I_{F(AV)} x V_{FM} at (I_{F(AV)}/D) (see fig. 6); Pd_{REV} = Inverse power loss = V_{R1} x I_R (1 - D); I_R at V_{R1} = 80 % rated V_R



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ORDERING INFORMATION TABLE

Device code



- 1 Vishay Semiconductors product
- 2 Current rating
- 3 B = SMB
- 4 Q = Schottky "Q" series
- 5 Voltage rating (060 = 60 V)
- 6 Environmental digit:

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

ORDERING INFORMATION (Example)					
PREFERRED P/N	RRED P/N PREFERRED PACKAGE CODE MINIMUM ORDER QUANTITY				
VS-10BQ060-M3/5BT	5BT	3200	13" diameter plastic tape and reel		

LINKS TO RELATED DOCUMENTS				
Dimensions <u>www.vishay.com/doc?95401</u>				
Part marking information	www.vishay.com/doc?95403			
Packaging information	www.vishay.com/doc?95404			



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