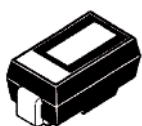


Schottky Rectifier, 1.0 A


SMB


FEATURES

- Small foot print, surface mountable
- Very low forward voltage drop
- High frequency operation
- Guard ring for enhanced ruggedness and long term reliability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Compliant to RoHS directive 2002/95/EC
- Designed and qualified for industrial level


RoHS
COMPLIANT

PRODUCT SUMMARY

$I_{F(AV)}$	1.0 A
V_R	30 V

DESCRIPTION

The VS-10BQ030PbF 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.

MAJOR RATINGS AND CHARACTERISTICS

SYMBOL	CHARACTERISTICS	VALUES	UNITS
$I_{F(AV)}$	Rectangular waveform	1.0	A
V_{RRM}		30	V
I_{FSM}	$t_p = 5$ ms sine	430	A
V_F	1.0 Apk, $T_J = 125$ °C	0.30	V
T_J	Range	- 55 to 150	°C

VOLTAGE RATINGS

PARAMETER	SYMBOL	VS-10BQ030PbF	UNITS
Maximum DC reverse voltage	V_R	30	V
Maximum working peak reverse voltage	V_{RWM}		

ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Maximum average forward current	$I_{F(AV)}$	50 % duty cycle at $T_L = 106$ °C, rectangular waveform	1.0	A
Maximum peak one cycle non-repetitive surge current See fig. 6	I_{FSM}	5 μ s sine or 3 μ s rect. pulse	430	A
		10 ms sine or 6 ms rect. pulse	90	
Non-repetitive avalanche energy	E_{AS}	$T_J = 25$ °C, $I_{AS} = 1$ A, $L = 6$ mH	3.0	mJ
Repetitive avalanche current	I_{AR}	Current decaying linearly to zero in 1 μ s Frequency limited by T_J maximum $V_A = 1.5 \times V_R$ typical	1.0	A

ELECTRICAL SPECIFICATIONS						
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS	
Maximum forward voltage drop	$V_{\text{FM}}^{(1)}$	1 A	$T_{\text{J}} = 25\text{ }^{\circ}\text{C}$	0.420	V	
		2 A		0.470		
		1 A	$T_{\text{J}} = 125\text{ }^{\circ}\text{C}$	0.300		
		2 A		0.370		
Maximum reverse leakage current	$I_{\text{RM}}^{(1)}$	$T_{\text{J}} = 25\text{ }^{\circ}\text{C}$	$V_{\text{R}} = \text{Rated } V_{\text{R}}$	0.5	mA	
		$T_{\text{J}} = 100\text{ }^{\circ}\text{C}$		5.0		
		$T_{\text{J}} = 125\text{ }^{\circ}\text{C}$		15		
Maximum junction capacitance	C_{T}	$V_{\text{R}} = 5\text{ }V_{\text{DC}}$ (test signal range 100 kHz to 1 MHz), $25\text{ }^{\circ}\text{C}$		200	pF	
Typical series inductance	L_{S}	Measured lead to lead 5 mm from package body		2.0	nH	
Maximum voltage rate of change	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	25	°C/W
Maximum thermal resistance, junction to ambient	R _{thJA}		80	
Approximate weight			0.10	g
			0.003	oz.
Marking device		Case style SMB (similar DO-214AA)	V1E	

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

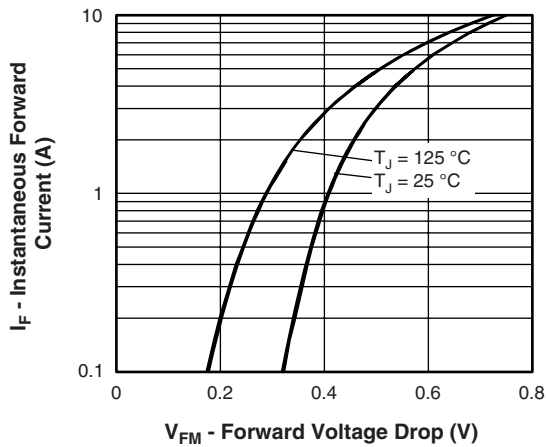


Fig. 1 - Maximum Forward Voltage Drop Characteristics

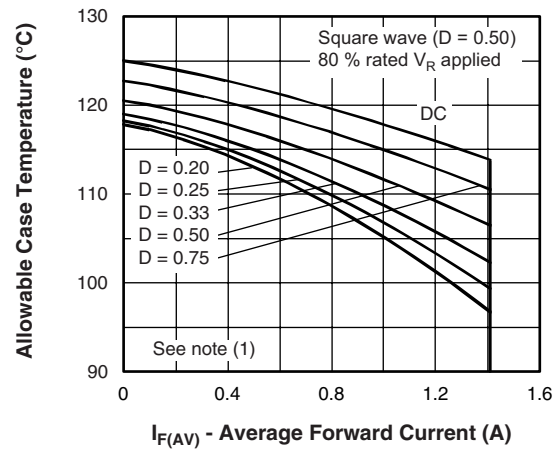


Fig. 4 - Maximum Average Forward Current vs. Allowable Lead Temperature

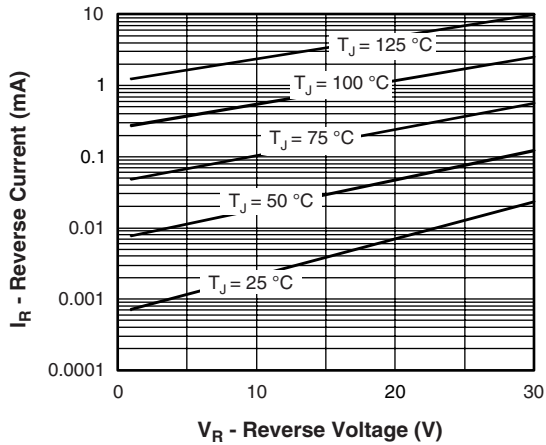


Fig. 2 - Typical Peak Reverse Current vs. Reverse Voltage

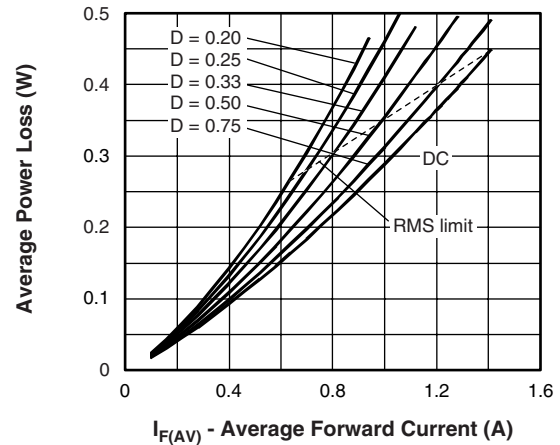


Fig. 5 - Maximum Average Forward Dissipation vs. Average Forward Current

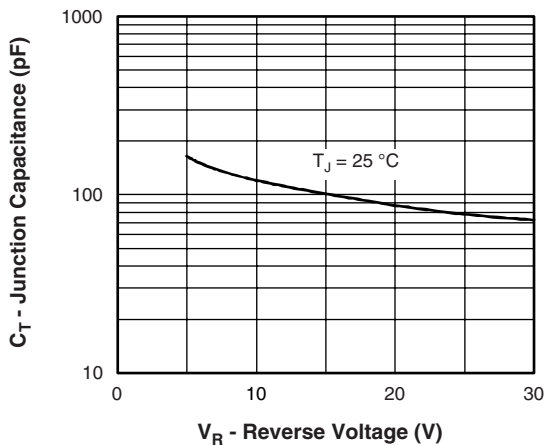


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage

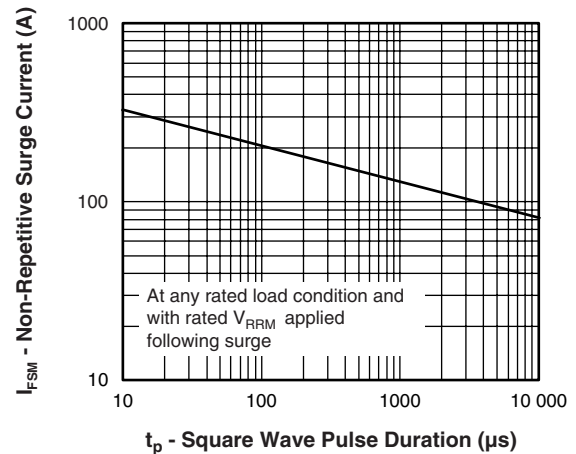


Fig. 6 - Maximum Peak Surge Forward Current vs. Pulse Duration

Note

(1) Formula used: $T_C = T_J - (P_d + P_{d_{REV}}) \times R_{thJC}$;

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

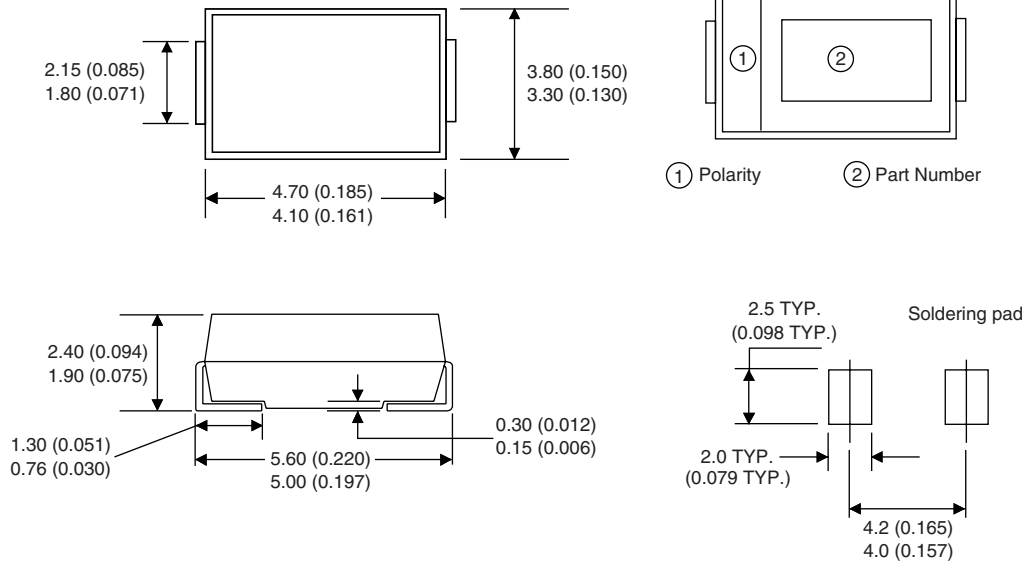
Device code	VS-	10	B	Q	030	TR	PbF
	1	2	3	4	5	6	7
1							- HPP product suffix
2							- Current rating
3							- B = Single lead diode
4							- Q = Schottky "Q" series
5							- Voltage rating (030 = 30 V)
6							- • None = Box (1000 pieces) • TR = Tape and reel (3000 pieces)
7							- PbF = Lead (Pb)-free

LINKS TO RELATED DOCUMENTS		
Dimensions		www.vishay.com/doc?95017
Part marking information		www.vishay.com/doc?95029
Packaging information	Tape and reel	www.vishay.com/doc?95034
	Bulk	www.vishay.com/doc?95397



SMB

DIMENSIONS in millimeters (inches)





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