

High Performance Schottky Rectifier, 100 A



PowerTab®



FEATURES

- Ultralow forward voltage drop
- Optimized for OR-ing applications
- Guard ring for enhanced ruggedness and long term reliability
- Screw mounting only
- Designed and qualified according to JEDEC®-JESD47
- 125 °C max. operating junction temperature ($V_R < 5\text{ V}$)
- High frequency operation
- Continuous high current operation
- PowerTab® package
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912


RoHS
COMPLIANT

PRODUCT SUMMARY	
Package	PowerTab®
$I_{F(AV)}$	100 A
V_R	15 V
V_F at I_F	0.45 V
I_{RM}	870 mA at 100 °C
T_J max.	125 °C
Diode variation	Single die
E_{AS}	9 mJ

DESCRIPTION

The VS-100BGQ015 Schottky rectifier has been optimized for ultralow forward voltage drop specifically for the OR-ing of parallel power supplies. The proprietary barrier technology allows for reliable operation up to 125 °C junction temperature. Typical applications are in parallel switching power supplies, converters, reverse battery protection, and redundant power subsystems.

MAJOR RATINGS AND CHARACTERISTICS			
SYMBOL	CHARACTERISTICS	VALUES	UNITS
$I_{F(AV)}$	Rectangular waveform	100	A
	T_C	88	°C
V_{RRM}		15	V
I_{FSM}	$t_p = 5\ \mu\text{s}$ sine	5000	A
V_F	100 A_{pk} (typical)	0.39	V
	T_J	125	°C
T_J	Range	-55 to +125	°C

VOLTAGE RATINGS				
PARAMETER	SYMBOL	TEST CONDITIONS	VS-100BGQ015	UNITS
Maximum DC reverse voltage	V_R	$T_J = 100\ \text{°C}$	15	V
		$T_J = 125\ \text{°C}$	5	

ABSOLUTE MAXIMUM RATINGS					
PARAMETER	SYMBOL	TEST CONDITIONS		VALUES	UNITS
Maximum average forward current	$I_{F(AV)}$	50 % duty cycle at $T_C = 88\ \text{°C}$, rectangular waveform		100	A
Maximum peak one cycle non-repetitive surge current	I_{FSM}	5 μs sine or 3 μs rect. pulse	Following any rated load condition and with rated V_{RRM} applied	5000	A
		10 ms sine or 6 ms rect. pulse		1000	
Non-repetitive avalanche energy	E_{AS}	$T_J = 25\ \text{°C}$, $I_{AS} = 2\ \text{A}$, $L = 4.5\ \text{mH}$		9	mJ
Repetitive avalanche current	I_{AR}	Current decaying linearly to zero in 1 μs Frequency limited by T_J maximum $V_A = 3 \times V_R$ typical		2	A



ELECTRICAL SPECIFICATIONS						
PARAMETER	SYMBOL	TEST CONDITIONS	TYP.	MAX.	UNITS	
Forward voltage drop	$V_{FM}^{(1)}$	50 A	$T_J = 25\text{ }^\circ\text{C}$	0.36	0.4	V
		100 A		0.45	0.52	
		50 A	$T_J = 125\text{ }^\circ\text{C}$	0.27	0.31	
		100 A		0.39	0.45	
Maximum reverse leakage current	$I_{RM}^{(1)}$	$T_J = 100\text{ }^\circ\text{C}, V_R = 12\text{ V}$	480	700	mA	
		$T_J = 125\text{ }^\circ\text{C}, V_R = 5\text{ V}$	1	1.2	A	
		$T_J = 25\text{ }^\circ\text{C}$	$V_R = \text{Rated } V_R$	7	18	mA
		$T_J = 100\text{ }^\circ\text{C}$		580	870	
Maximum junction capacitance	C_T	$V_R = 5 V_{DC}$, (test signal range 100 kHz to 1 MHz), $25\text{ }^\circ\text{C}$	3800		pF	
Typical series inductance	L_S	Measured from tab to mounting plane	3.5		nH	
Maximum voltage rate of change	dV/dt	Rated V_R	10 000		V/ μs	

Note(1) Pulse width < 300 μs , duty cycle < 2 %

THERMAL - MECHANICAL SPECIFICATIONS				
PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Maximum junction temperature range	T_J		-55 to +125	$^\circ\text{C}$
Maximum storage temperature range	T_{Stg}		-55 to +150	
Maximum thermal resistance, junction to case	R_{thJC}	DC operation	0.50	$^\circ\text{C/W}$
Maximum thermal resistance, case to heatsink	R_{thCS}	Mounting surface, smooth and greased	0.30	
Approximate weight			5	g
			0.18	oz.
Mounting torque	minimum		1.2 (10)	N · m (lbf · in)
	maximum		2.4 (20)	
Marking device		Case style PowerTab®	100BGQ015	

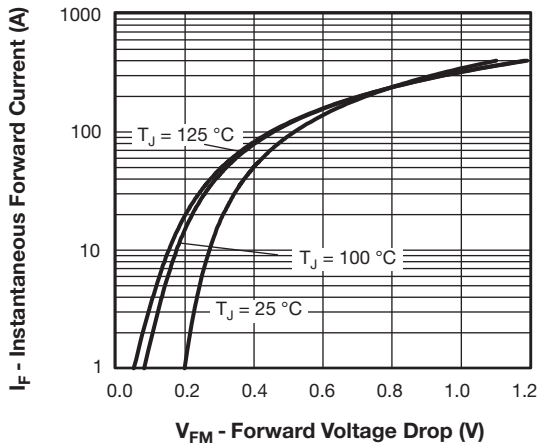


Fig. 1 - Maximum Forward Voltage Drop Characteristics

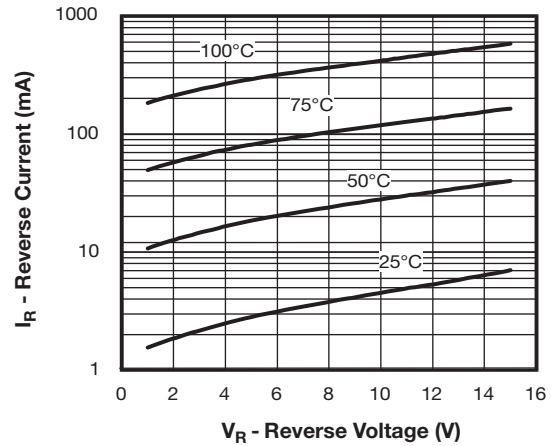


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage

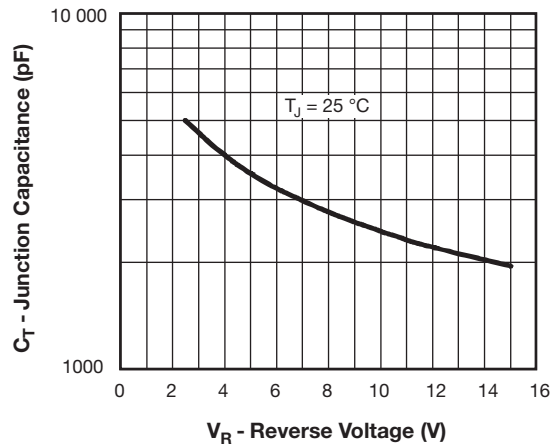


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage

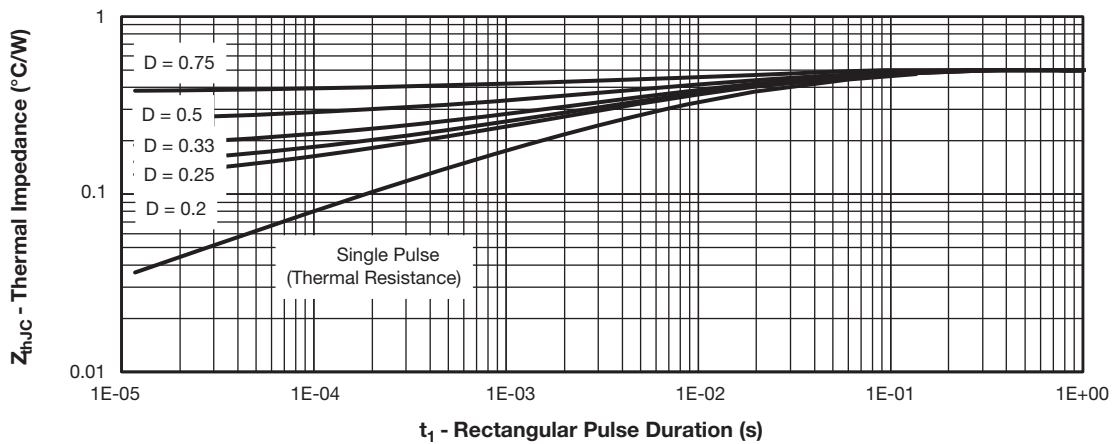


Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics

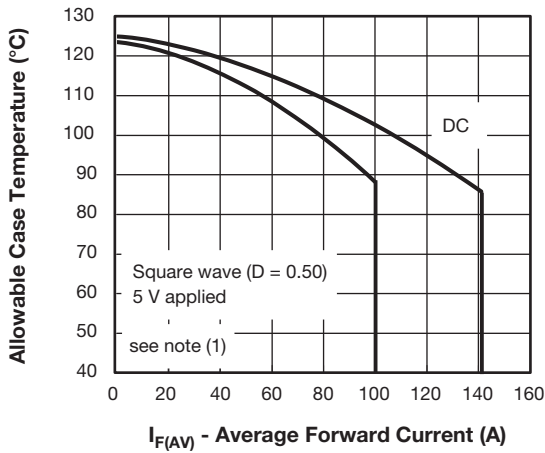


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current

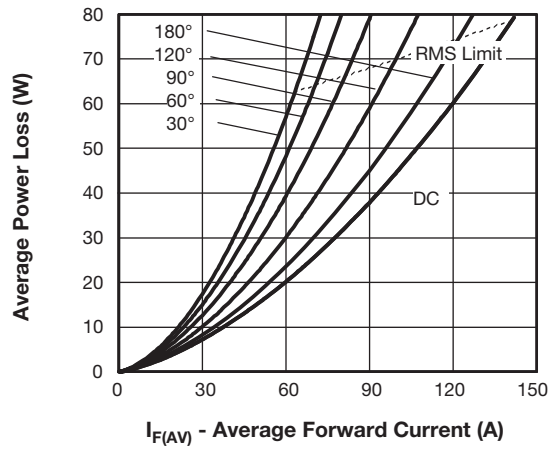


Fig. 6 - Forward Power Loss Characteristics

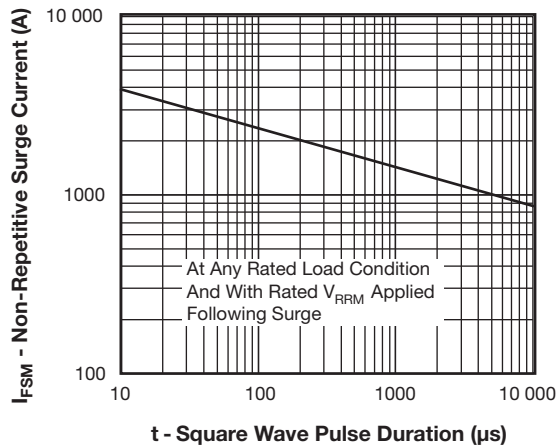


Fig. 7 - Maximum Non-Repetitive Surge Current

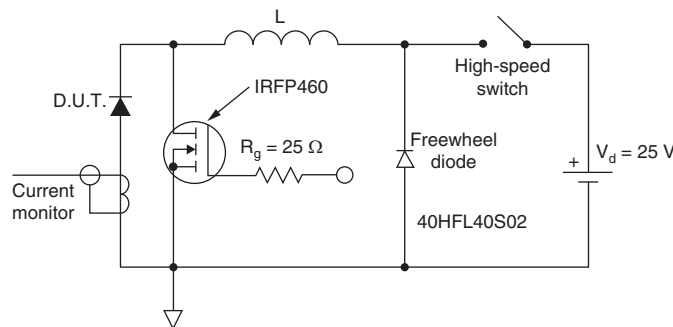


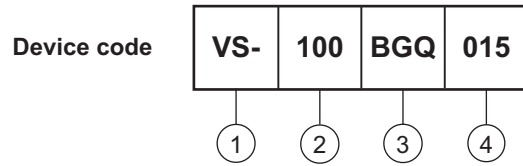
Fig. 8 - Unclamped Inductive Test Circuit

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 $V_{R1} = 5 V$



ORDERING INFORMATION TABLE



- 1** - Vishay Semiconductors product
- 2** - Current rating
- 3** - Essential part number
- 4** - Voltage code = V_{RRM}

LINKS TO RELATED DOCUMENTS	
Dimensions	www.vishay.com/doc?95240
Part marking information	www.vishay.com/doc?95370
SPIICE model	www.vishay.com/doc?95428
Application note	www.vishay.com/doc?95179



PowerTab®

DIMENSIONS in millimeters (inches)





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