

# 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](http://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 <sub>pk</sub> (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 $\mu\text{s}$ sine or 3 $\mu\text{s}$ 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 $\mu\text{s}$ 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/ $\mu\text{s}$

**Note**(1) Pulse width < 300  $\mu\text{s}$ , 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	

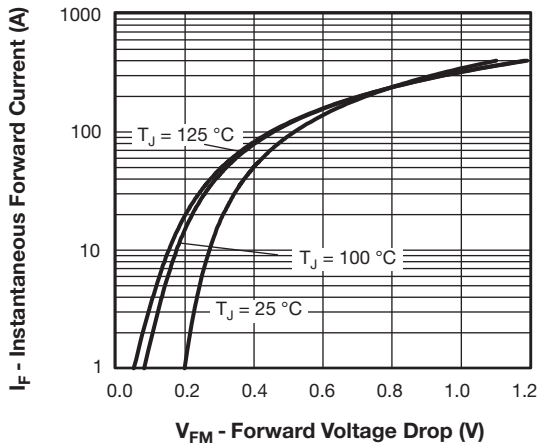


Fig. 1 - Maximum Forward Voltage Drop Characteristics

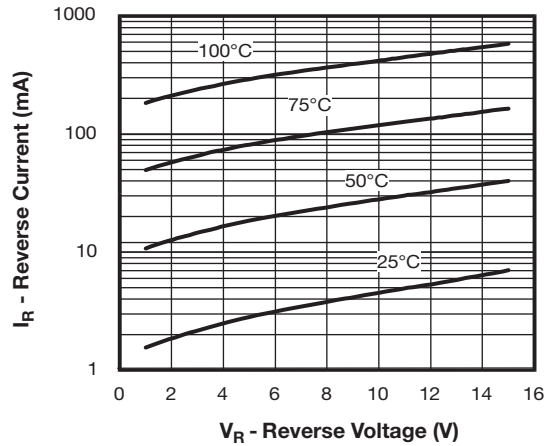


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage

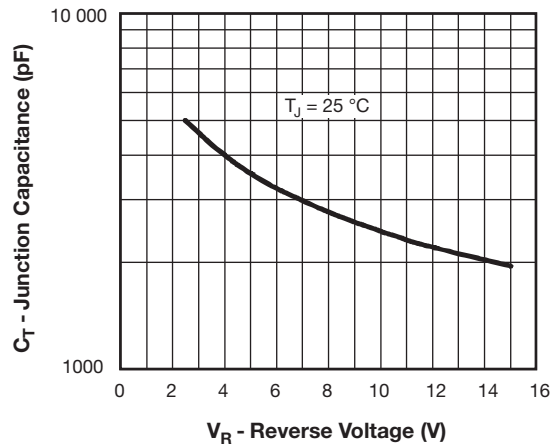


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage

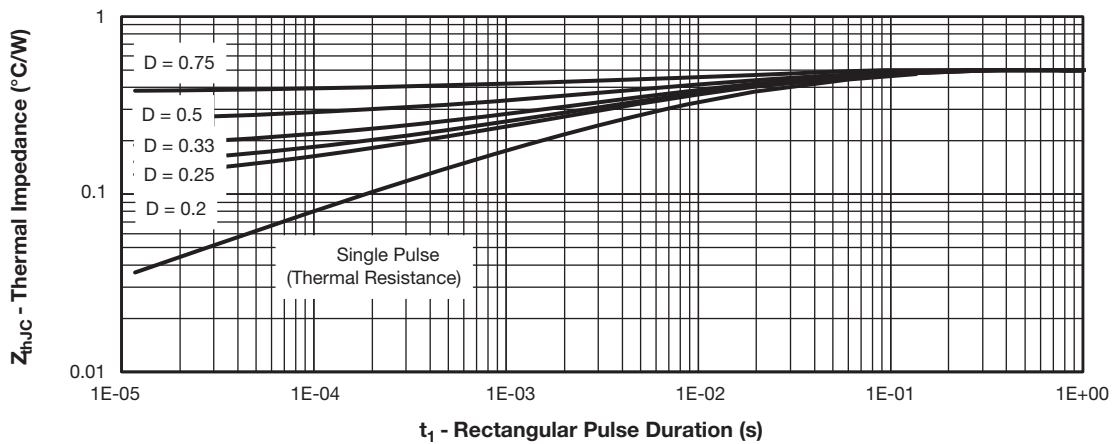


Fig. 4 - Maximum Thermal Impedance  $Z_{thJC}$  Characteristics

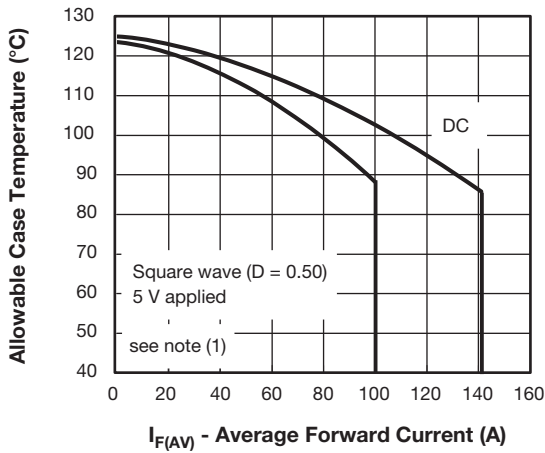


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current

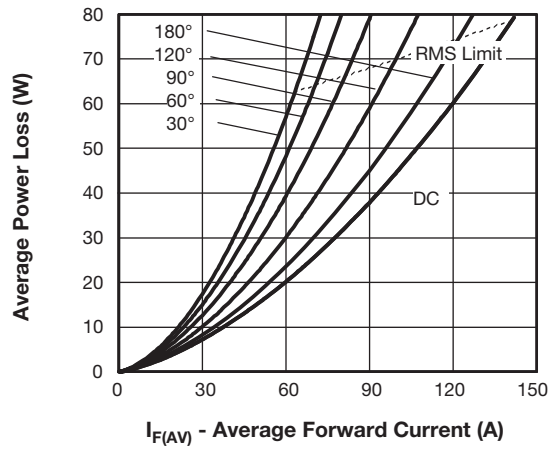


Fig. 6 - Forward Power Loss Characteristics

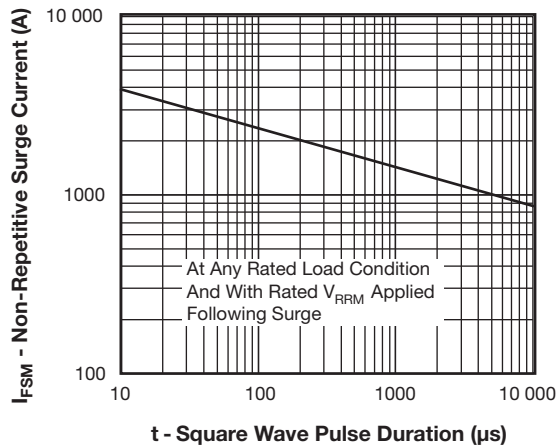


Fig. 7 - Maximum Non-Repetitive Surge Current

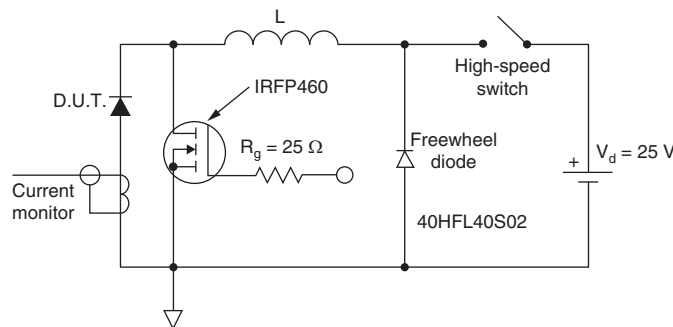


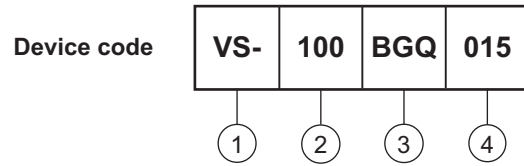
Fig. 8 - Unclamped Inductive Test Circuit

**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



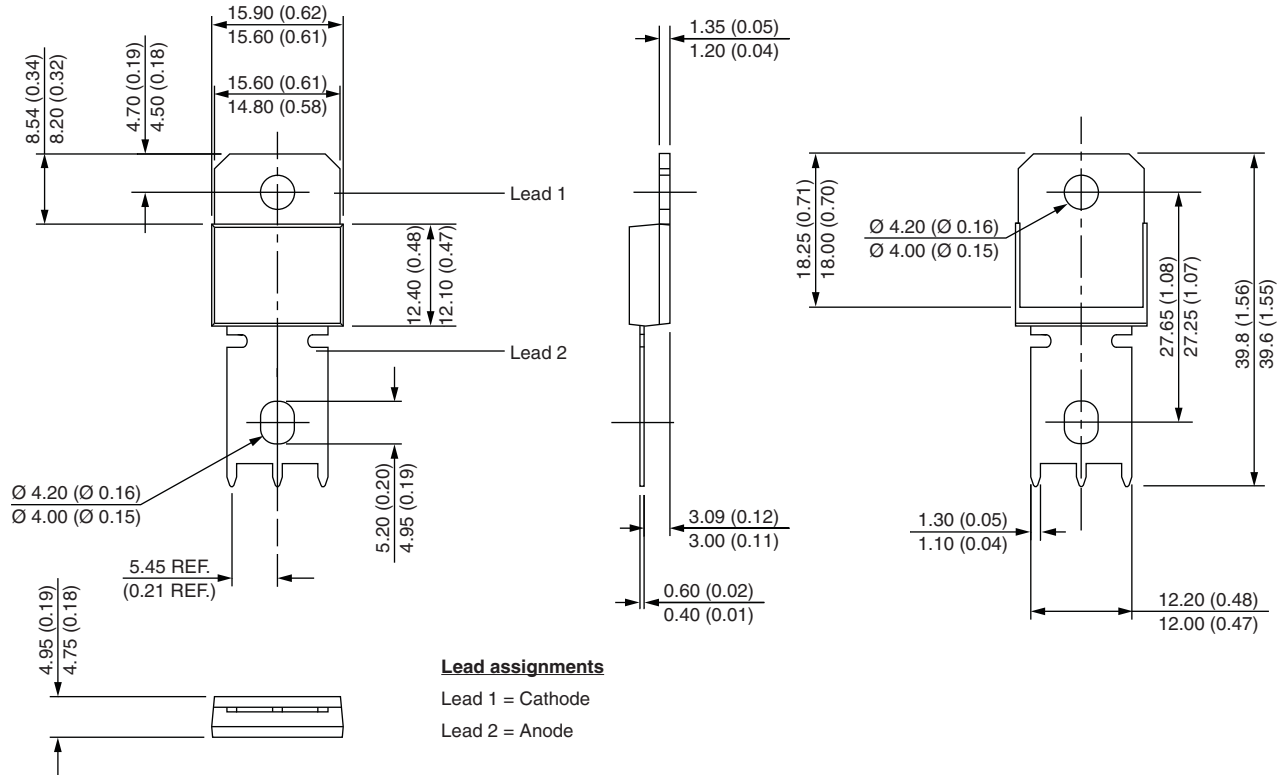
- 1** - Vishay Semiconductors product
- 2** - Current rating
- 3** - Essential part number
- 4** - Voltage code =  $V_{RRM}$

LINKS TO RELATED DOCUMENTS	
Dimensions	<a href="http://www.vishay.com/doc?95240">www.vishay.com/doc?95240</a>
Part marking information	<a href="http://www.vishay.com/doc?95370">www.vishay.com/doc?95370</a>
SPIICE model	<a href="http://www.vishay.com/doc?95428">www.vishay.com/doc?95428</a>
Application note	<a href="http://www.vishay.com/doc?95179">www.vishay.com/doc?95179</a>



## PowerTab®

**DIMENSIONS** in millimeters (inches)





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