

# High Performance Schottky Rectifier, 100 A


**PowerTab®**

**FEATURES**

- 150 °C max. operating junction temperature
- High frequency operation
- Ultralow forward voltage drop
- Continuous high current operation
- Guard ring for enhanced ruggedness and long term reliability
- Screw mounting only
- Designed and qualified according to JEDEC®-JESD 47
- 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
$V_R$	30 V
$V_F$ at $I_F$	0.56 V
$I_{RM}$	460 mA at 125 °C
$T_J$ max.	150 °C
Diode variation	Single die
$E_{AS}$	9 mJ

**DESCRIPTION**

The VS-100BGQ030 Schottky rectifier has been optimized for ultralow forward voltage drop specifically for low voltage output in high current AC/DC power supplies. The proprietary barrier technology allows for reliable operation up to 150 °C junction temperature. Typical applications are in 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
	$T_C$	106	°C
$V_{RRM}$		30	V
$I_{FSM}$	$t_p = 5 \mu s$ sine	4500	A
$V_F$	100 A <sub>pk</sub> (typical)	0.49	V
	$T_J$	150	°C
$T_J$	Range	-55 to +150	°C

VOLTAGE RATINGS			
PARAMETER	SYMBOL	100BGQ030	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 $T_C = 106$ °C, rectangular waveform		100	A
Maximum peak one cycle non-repetitive surge current	$I_{FSM}$	5 $\mu s$ sine or 3 $\mu s$ rect. pulse	Following any rated load condition and with rated $V_{RRM}$ applied	4500	A
		10 ms sine or 6 ms rect. pulse		850	
Non-repetitive avalanche energy	$E_{AS}$	$T_J = 25$ °C, $I_{AS} = 8$ A, $L = 1.12$ mH		36	mJ
Repetitive avalanche current	$I_{AR}$	Current decaying linearly to zero in 1 $\mu s$ Frequency limited by $T_J$ maximum $V_A = 1.5 \times V_R$ typical		8	A

ELECTRICAL SPECIFICATIONS						
PARAMETER	SYMBOL	TEST CONDITIONS	TYP.	MAX.	UNITS	
Forward voltage drop	$V_{FM}^{(1)}$	50 A	$T_J = 25\text{ }^\circ\text{C}$	0.47	0.5	V
		100 A		0.56	0.63	
		50 A	$T_J = 150\text{ }^\circ\text{C}$	0.36	0.4	
		100 A		0.49	0.56	
Reverse leakage current	$I_{RM}^{(1)}$	$T_J = 125\text{ }^\circ\text{C}, V_R = 15\text{ V}$	$V_R = \text{Rated } V_R$	80	160	mA
		$T_J = 150\text{ }^\circ\text{C}, V_R = 30\text{ V}$		800	1100	
		$T_J = 25\text{ }^\circ\text{C}$	0.6	2.4		
		$T_J = 125\text{ }^\circ\text{C}$	260	460		
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 and storage temperature range	$T_J, T_{Stg}$		-55 to +150	$^\circ\text{C}$
Maximum thermal resistance, junction to case	$R_{thJC}$	DC operation	0.50	$^\circ\text{C/W}$
Typical 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 <sup>®</sup>	100BGQ030	

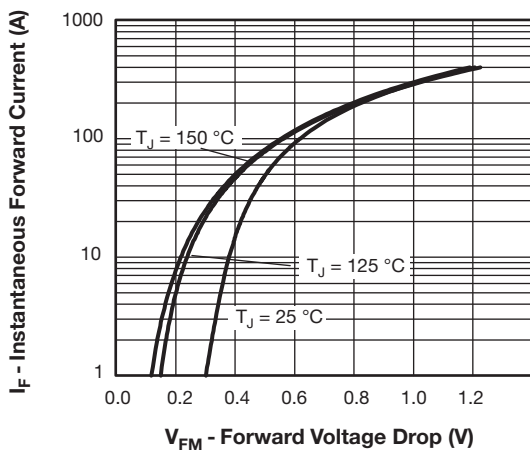


Fig. 1 - Maximum Forward Voltage Drop Characteristics

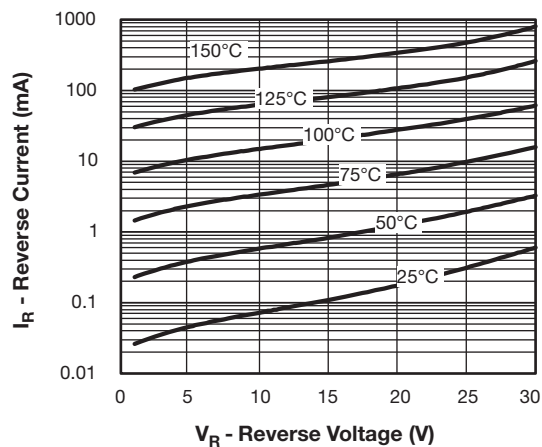


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage

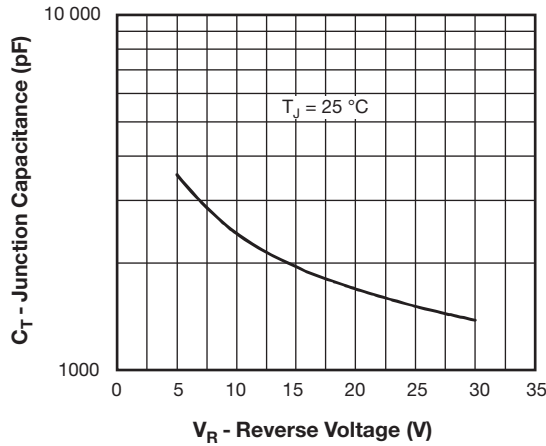


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage

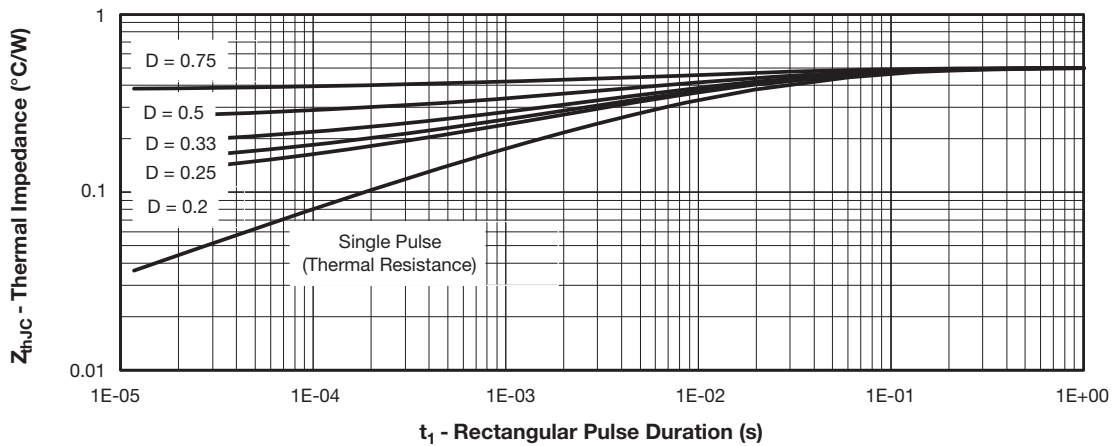


Fig. 4 - Maximum Thermal Impedance  $Z_{thJC}$  Characteristics

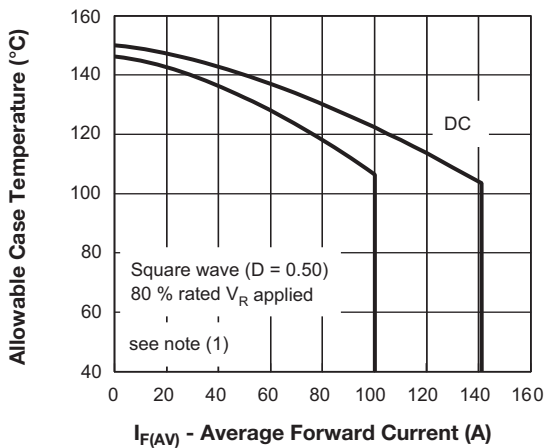


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current

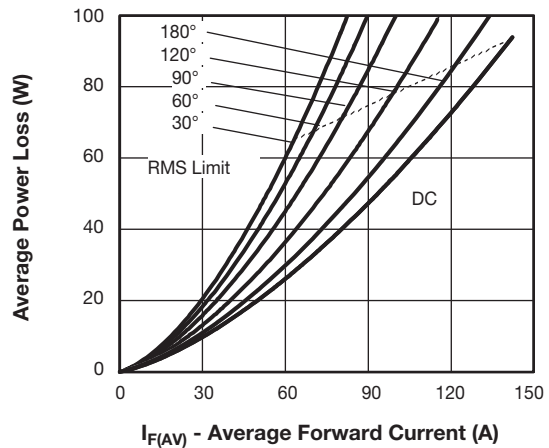


Fig. 6 - Forward Power Loss Characteristics

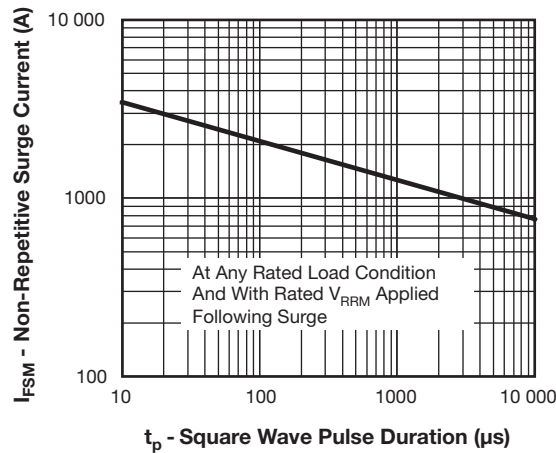


Fig. 7 - Maximum Non-Repetitive Surge Current

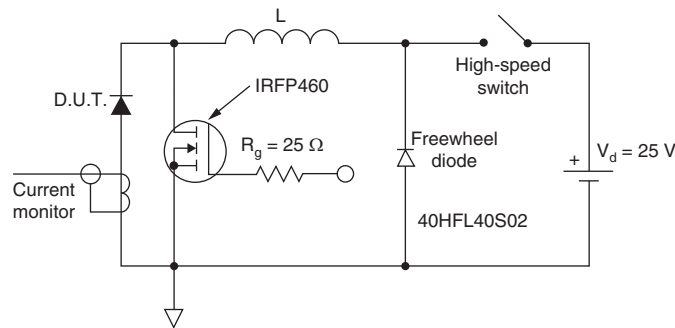


Fig. 8 - Unclamped Inductive Test Circuit

**Note**

- (2) 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  $V_R$

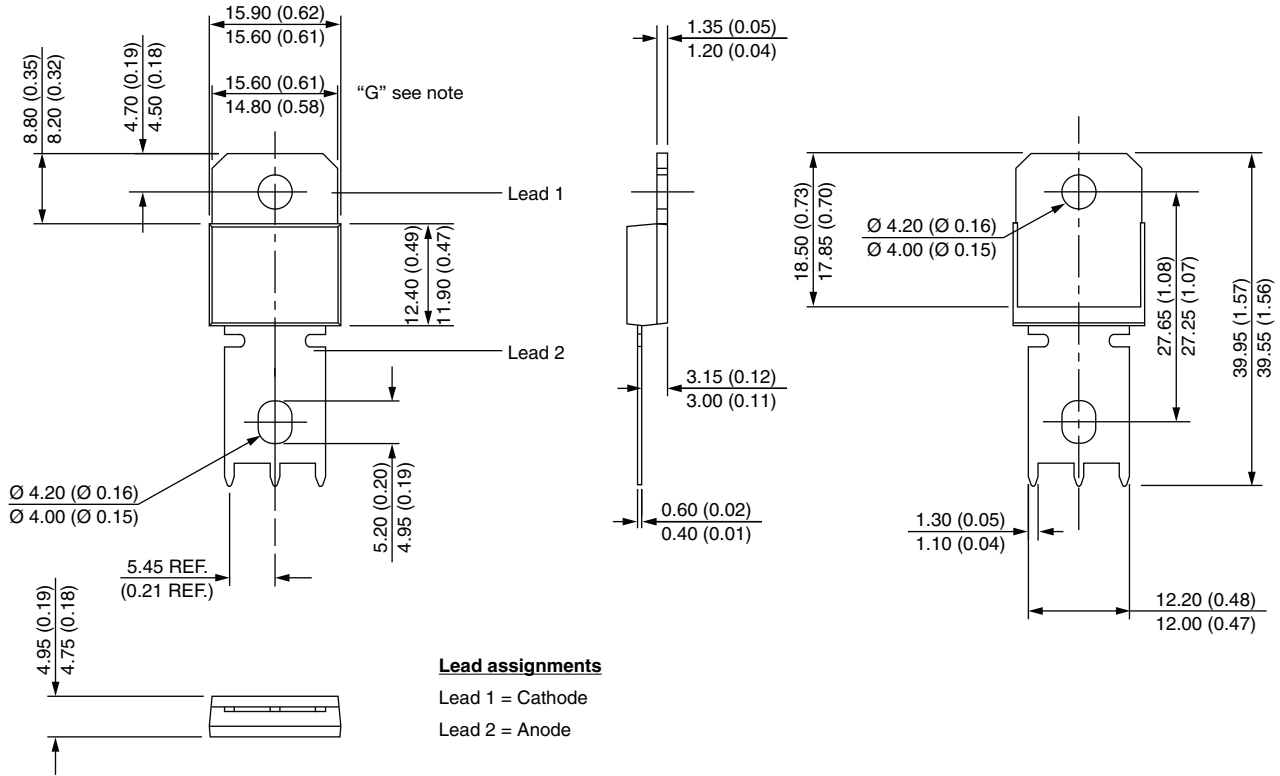
**ORDERING INFORMATION TABLE**

Device code	<b>VS-</b>	<b>100</b>	<b>BGQ</b>	<b>030</b>
	①	②	③	④
	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
	- Vishay Semiconductors product	- Current rating	- Essential part number	- 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>
Application note	<a href="http://www.vishay.com/doc?95179">www.vishay.com/doc?95179</a>

## PowerTab®

**DIMENSIONS** in millimeters (inches)



**Note:**  
 Outline conform to JEDEC® TO-275, except for dimension "G" only



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