

High Performance Schottky Rectifier, 100 A



PowerTab®


RoHS
COMPLIANT

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 ($V_R < 5$ V)
- High frequency operation
- Continuous high current operation
- PowerTab® package
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

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.

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

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}	$t_p = 5$ µs 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	$T_J = 100$ °C	15	V
		$T_J = 125$ °C	5	

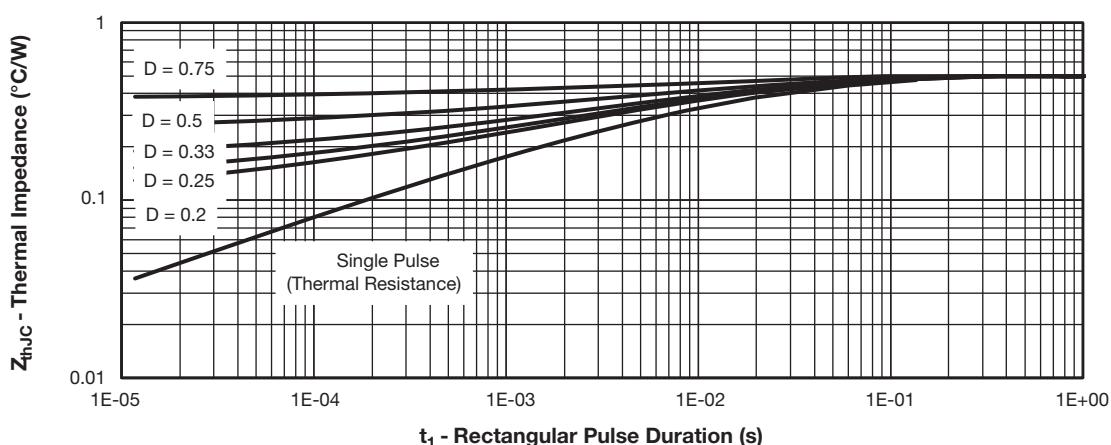
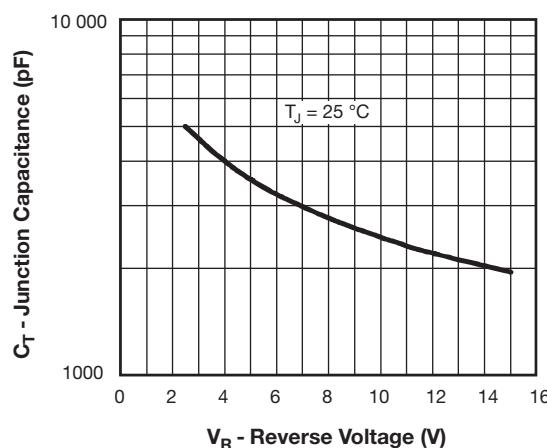
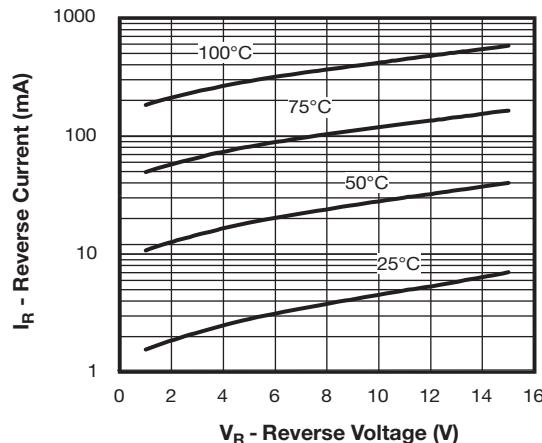
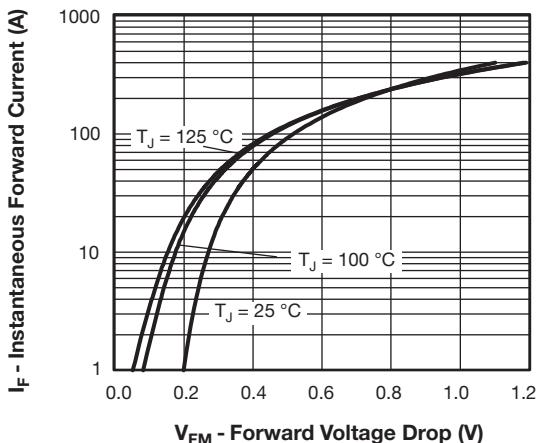
ABSOLUTE MAXIMUM RATINGS				
PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Maximum average forward current	$I_{F(AV)}$	50 % duty cycle at $T_C = 88$ °C, rectangular waveform	100	A
Maximum peak one cycle non-repetitive surge current	I_{FSM}	5 µs sine or 3 µs rect. pulse	5000	A
		10 ms sine or 6 ms rect. pulse	1000	
Non-repetitive avalanche energy	E_{AS}	$T_J = 25$ °C, $I_{AS} = 2$ A, $L = 4.5$ 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	$V_R = 5 \text{ V}_{DC}$, (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/ μ s	

Note

(1) Pulse width < 300 μ 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	$^\circ\text{C}/\text{W}$
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)	$\text{N} \cdot \text{m}$ (lbf · in)
	maximum		2.4 (20)	
Marking device		Case style PowerTab®	100BGQ015	



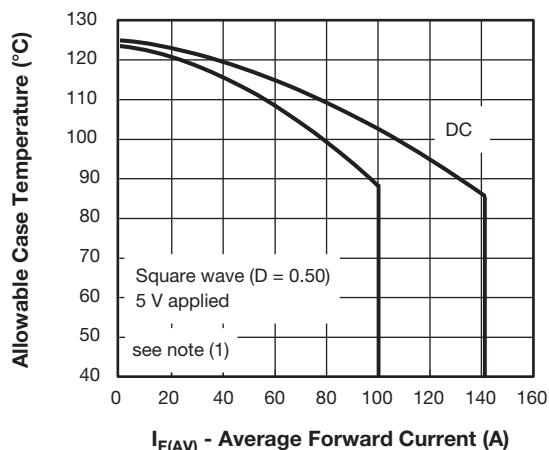


Fig. 5 - Maximum Allowable Case Temperature vs.
Average Forward Current

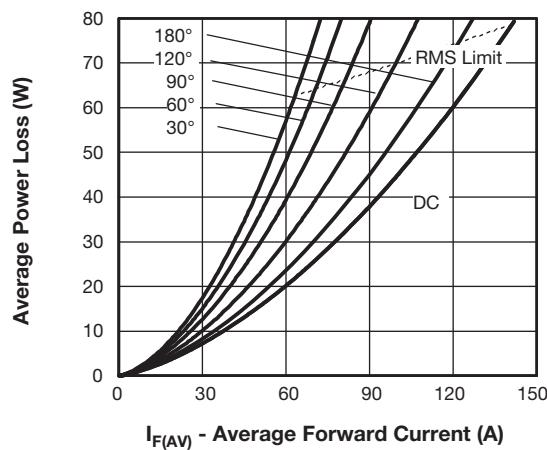


Fig. 6 - Forward Power Loss Characteristics

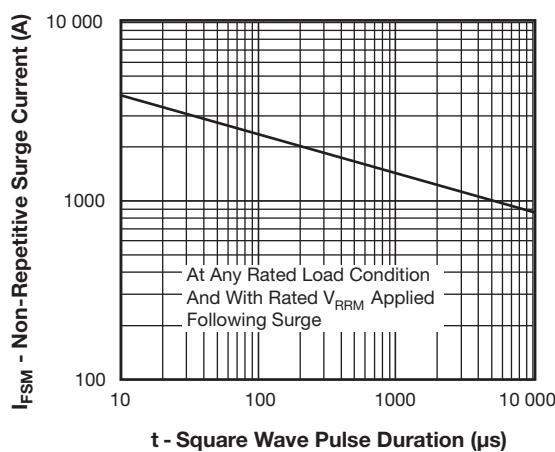


Fig. 7 - Maximum Non-Repetitive Surge Current

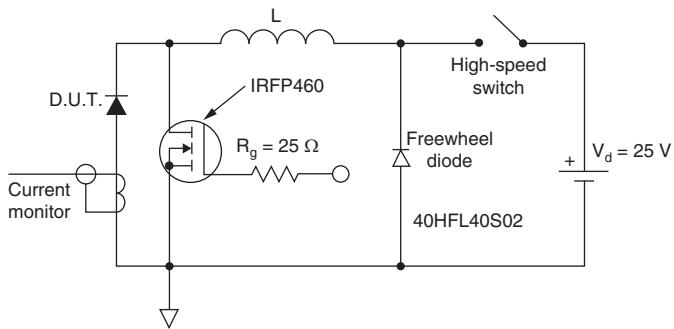
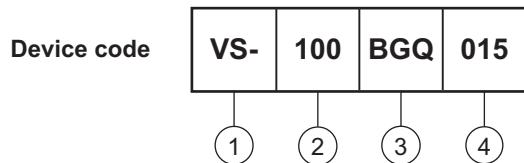


Fig. 8 - Unclamped Inductive Test Circuit

Note

(1) Formula used: $T_C = T_J - (P_d + P_{d,REV}) \times R_{th,JC}$
 $P_d = \text{Forward power loss} = I_{F(AV)} \times V_{FM}$ at $(I_{F(AV)}/D)$ (see fig. 6);
 $P_{d,REV} = \text{Inverse power loss} = V_{R1} \times I_R (1 - D)$; I_R at $V_{R1} = 5 \text{ V}$

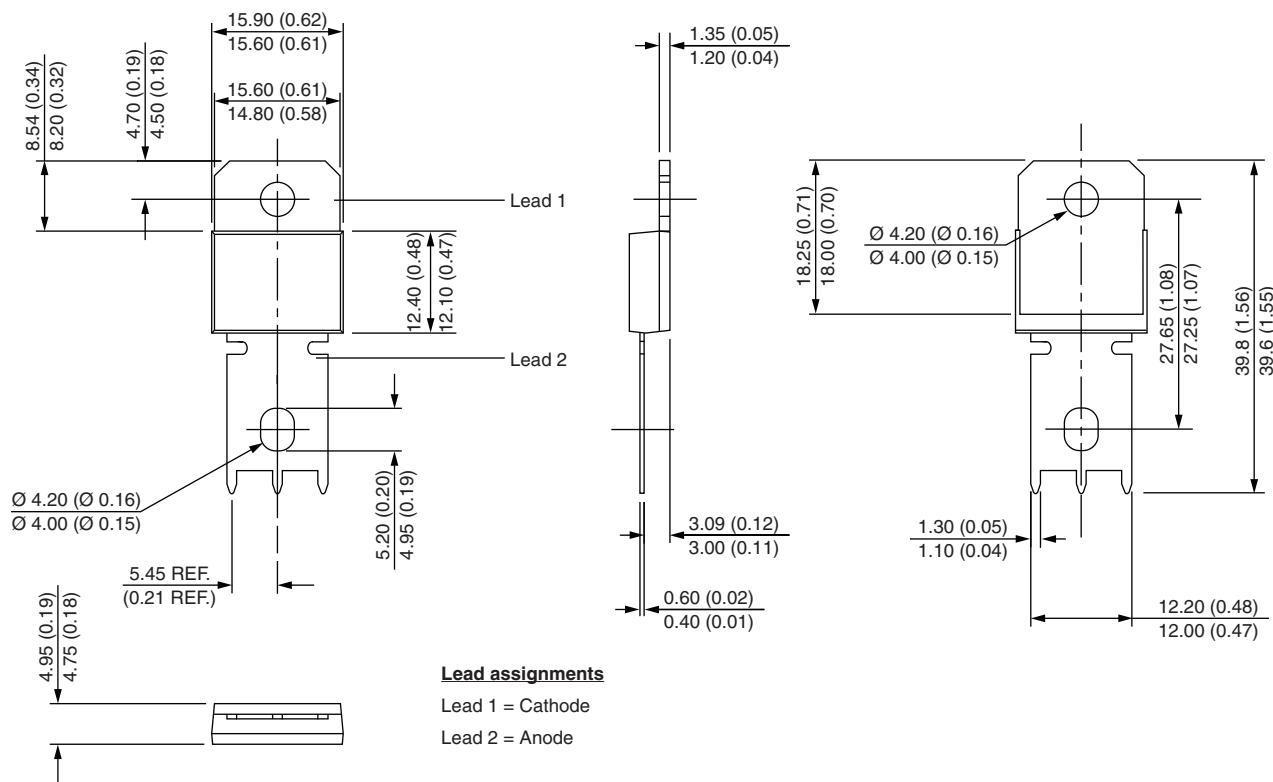
ORDERING INFORMATION TABLE

- 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
SPICE model	www.vishay.com/doc?95428
Application note	www.vishay.com/doc?95179

PowerTab®

DIMENSIONS in millimeters (inches)



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