

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 ($V_R < 5$ V)
- High frequency operation
- Continuous high current operation
- PowerTab® package
- Compliant to RoHS Directive 2002/95/EC


RoHS
COMPLIANT

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}	$t_p = 5$ μ 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	$T_J = 100$ °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 μ s sine or 3 μ s 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 μ 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	$V_R = 5\text{ V}_{DC}$, (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	°C
Maximum storage temperature range	T _{Stg}		- 55 to 150	
Maximum thermal resistance, junction to case	R _{thJC}	DC operation	0.50	°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	

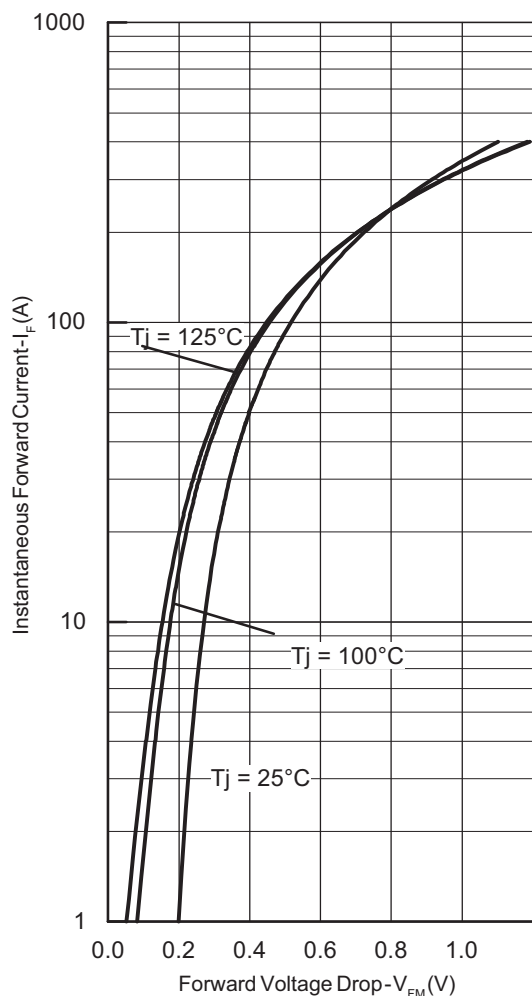


Fig. 1 - Maximum Forward Voltage Drop Characteristics

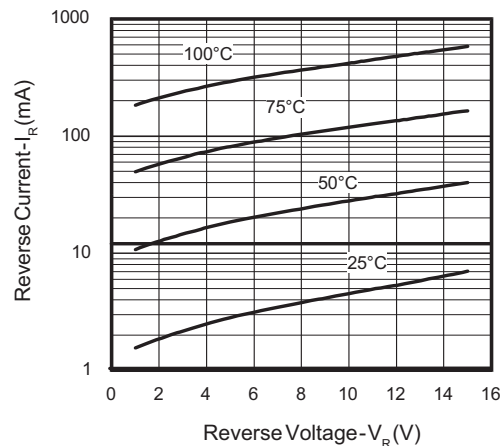


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage

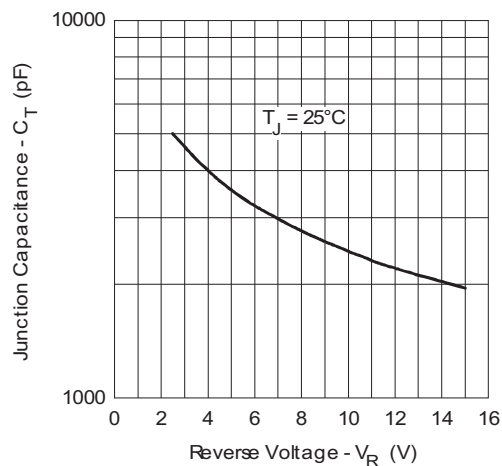
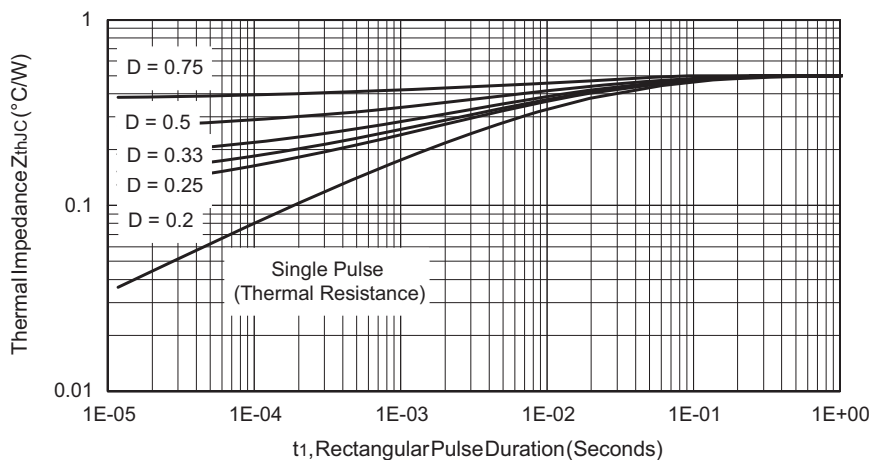


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage


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

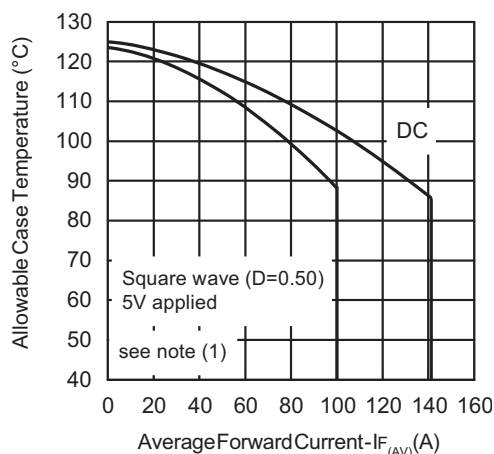


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current

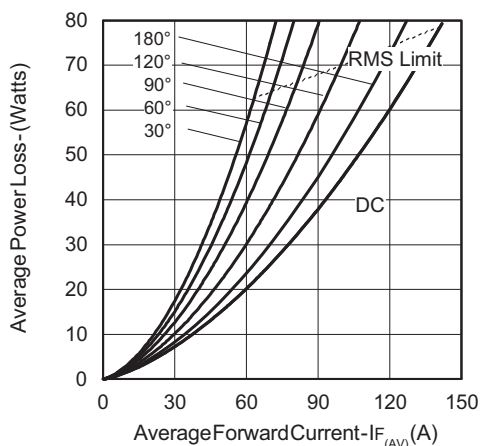


Fig. 6 - Forward Power Loss Characteristics

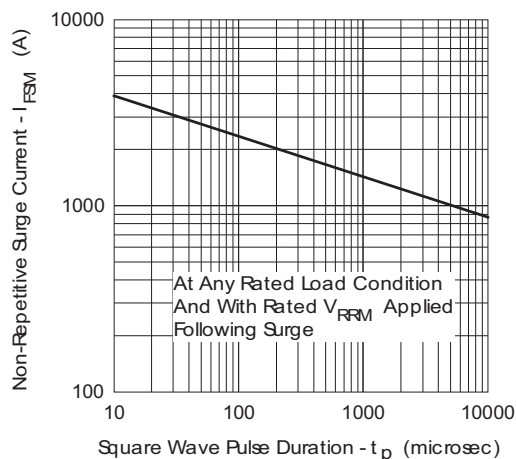


Fig. 7 - Maximum Non-Repetitive Surge Current

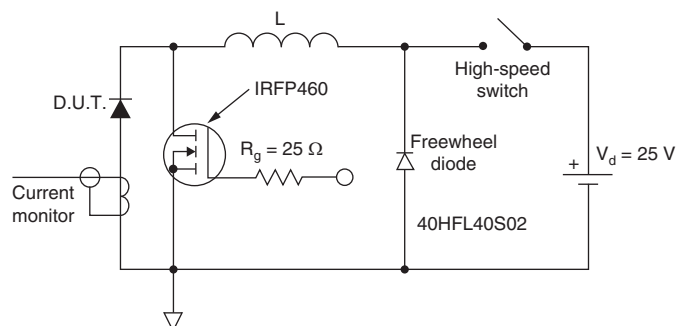


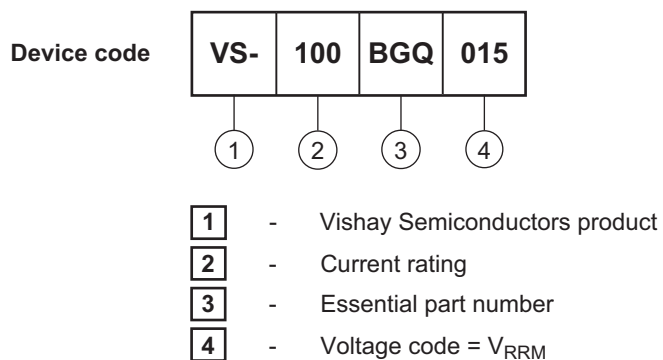
Fig. 8 - Unclamped Inductive Test Circuit

Note

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



ORDERING INFORMATION TABLE

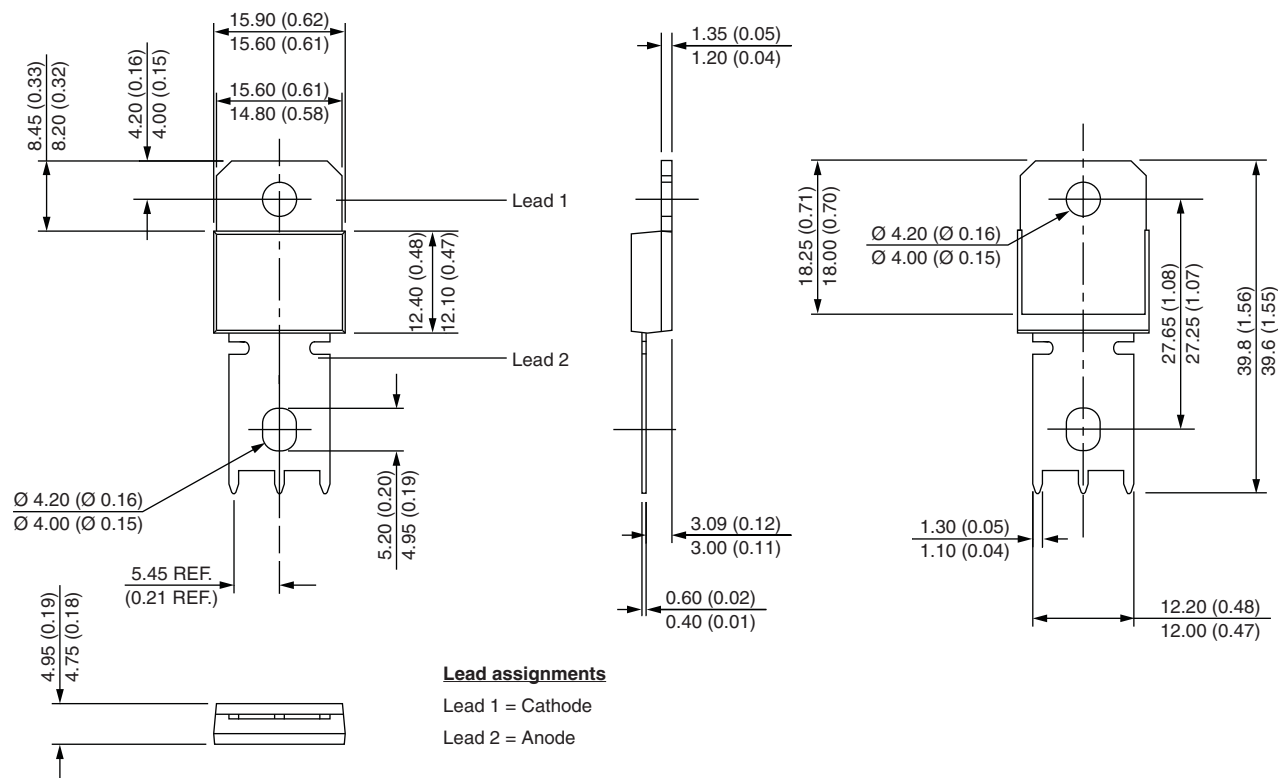


LINKS TO RELATED DOCUMENTS	
Dimensions	www.vishay.com/doc?95240
Part marking information	www.vishay.com/doc?95370
SPIICE model	www.vishay.com/doc?95428
Application note	www.vishay.com/doc?95179



PowerTab®

DIMENSIONS in millimeters (inches)





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