

# High Performance Schottky Rectifier, 100 A


**PowerTab®**

**RoHS**  
COMPLIANT  
HALOGEN  
**FREE**

## LINKS TO ADDITIONAL RESOURCES



PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	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
$E_{AS}$	9 mJ
Package	PowerTab®
Circuit configuration	Single

## FEATURES

- Ultralow forward voltage drop
- Optimized for OR-ing applications
- Guard ring for enhanced ruggedness and long term reliability
- Screw mounting only
- AEC-Q101 qualified
- 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](http://www.vishay.com/doc?99912)

## DESCRIPTION

The VS-100BGQ015HN4 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.

## MECHANICAL DATA

**Case:** PowerTab®

Molding compound meets UL 94 V-0 flammability rating

**Terminal:** nickel plated, screwable

MAJOR RATINGS AND CHARACTERISTICS			
SYMBOL	CHARACTERISTICS	VALUES	UNITS
$I_{F(AV)}$	Rectangular waveform	100	A
	$T_C$	88	°C
$V_{RRM}$		15	V
$I_{FSM}$	$t_p = 5 \mu s$ 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-100BGQ015HF4	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 $\mu s$ sine or 3 $\mu s$ rect. pulse	5000	A
		10 ms sine or 6 ms rect. pulse	900	
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 $\mu s$ 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	1.23	A
		$T_J = 25\text{ }^{\circ}\text{C}$	$V_R = \text{Rated } V_R$	7	20	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/ $\mu$ s

**Note**(1) Pulse width < 300  $\mu$ s, duty cycle < 2 %**THERMAL - MECHANICAL SPECIFICATIONS**

PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Maximum junction temperature range	T <sub>J</sub>		-55 to +125	°C
Maximum storage temperature range	T <sub>Stg</sub>		-55 to +150	
Maximum thermal resistance, junction to case	R <sub>thJC</sub>	DC operation	0.50	°C/W
Maximum thermal resistance, case to heatsink	R <sub>thCS</sub>	Mounting surface, smooth and greased	0.30	
Approximate weight			5	g
Mounting torque	minimum		1.2 (10)	N · m (lbf · in)
	maximum		2.4 (20)	
Marking device		Case style PowerTab®	100BGQ015H	

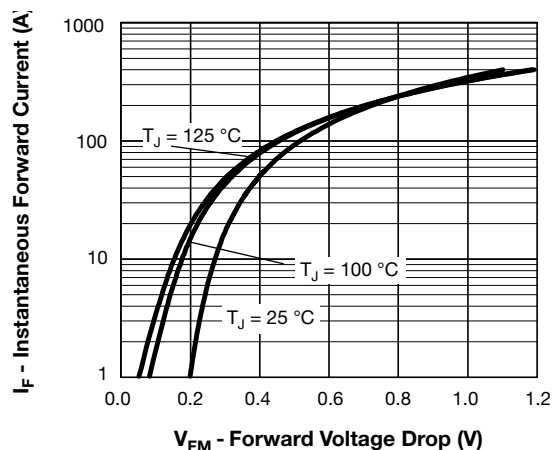


Fig. 1 - Maximum Forward Voltage Drop Characteristics

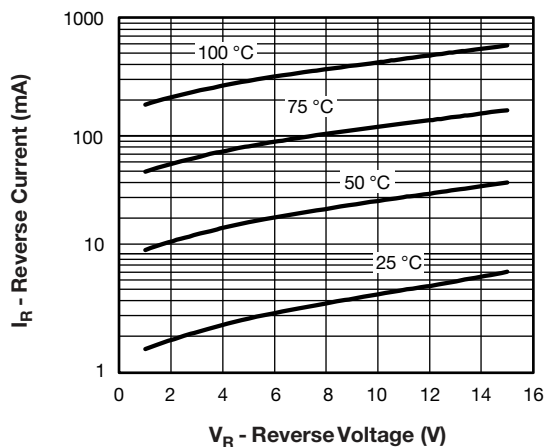


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage

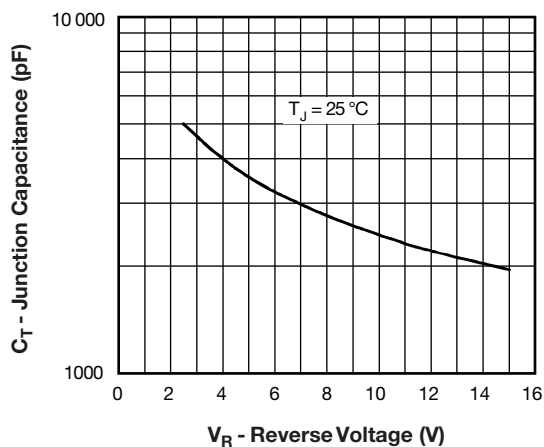
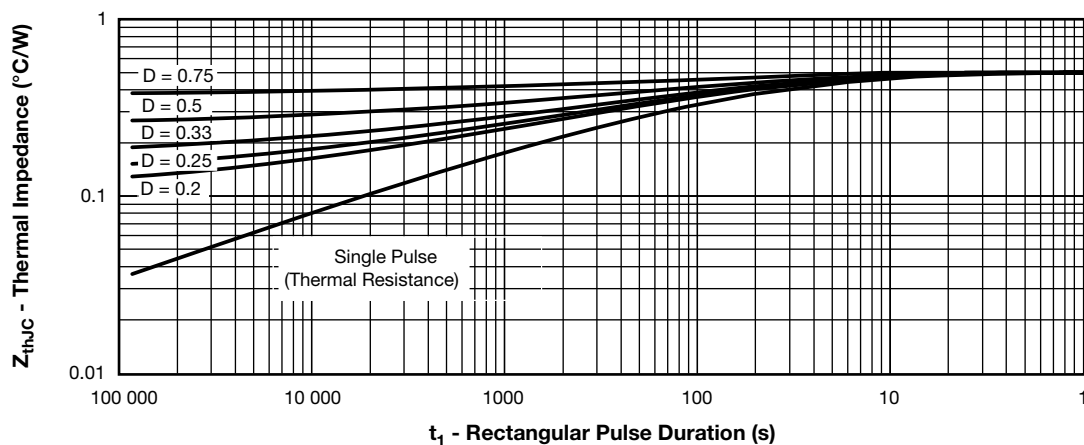


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage


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

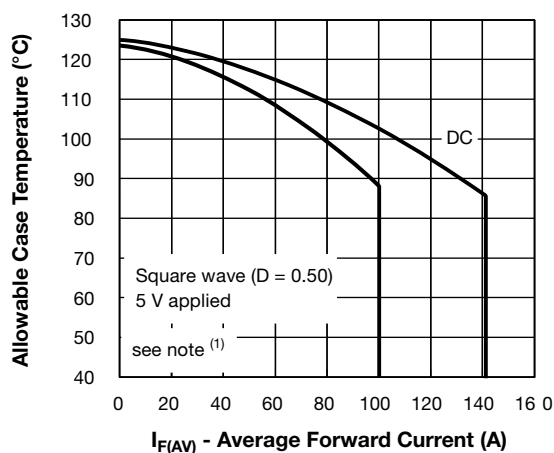


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current

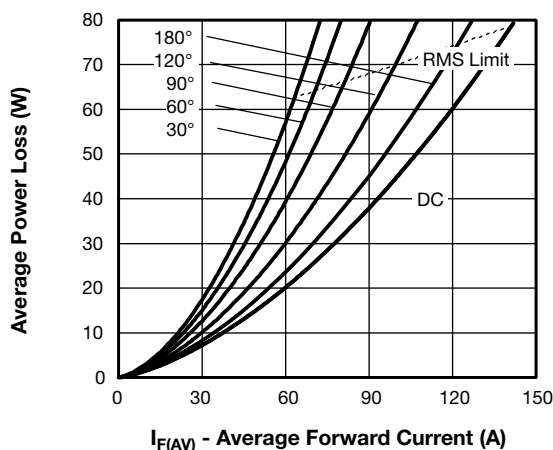


Fig. 6 - Forward Power Loss Characteristics

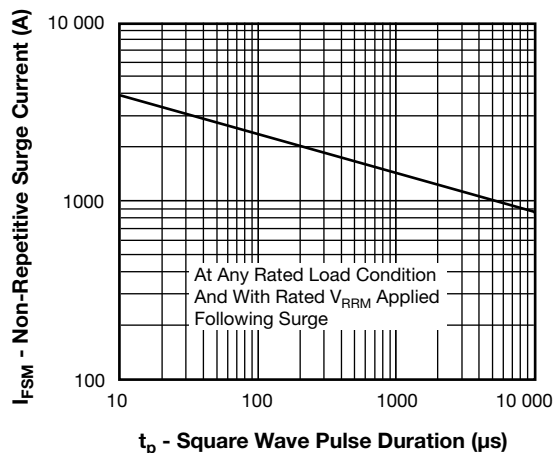


Fig. 7 - Maximum Non-Repetitive Surge Current

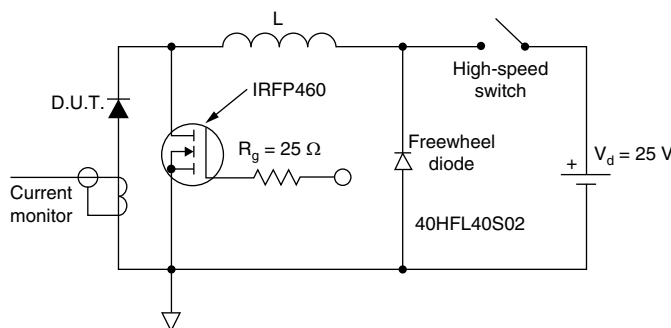


Fig. 8 - Unclamped Inductive Test Circuit

#### 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  $V_{R1} = 5$  V

**ORDERING INFORMATION TABLE**

Device code	<b>VS-</b>	<b>100</b>	<b>BGQ</b>	<b>015</b>	<b>H</b>	<b>N4</b>
	①	②	③	④	⑤	⑥

- |          |   |  |
|----------|---|--|
| <b>1</b> | - | Vishay Semiconductors product                                |
| <b>2</b> | - | Current rating (100 = 100 A)                                 |
| <b>3</b> | - | Essential part number  |
| <b>4</b> | - | Voltage rating (015 = 15 V)                                  |
| <b>5</b> | - | H = AEC-Q101 qualified                                       |
| <b>6</b> | - | Environmental digit:   |
|          | - | N4 = Halogen-free, RoHS compliant and totally lead (Pb)-free |

**ORDERING INFORMATION** (Example)

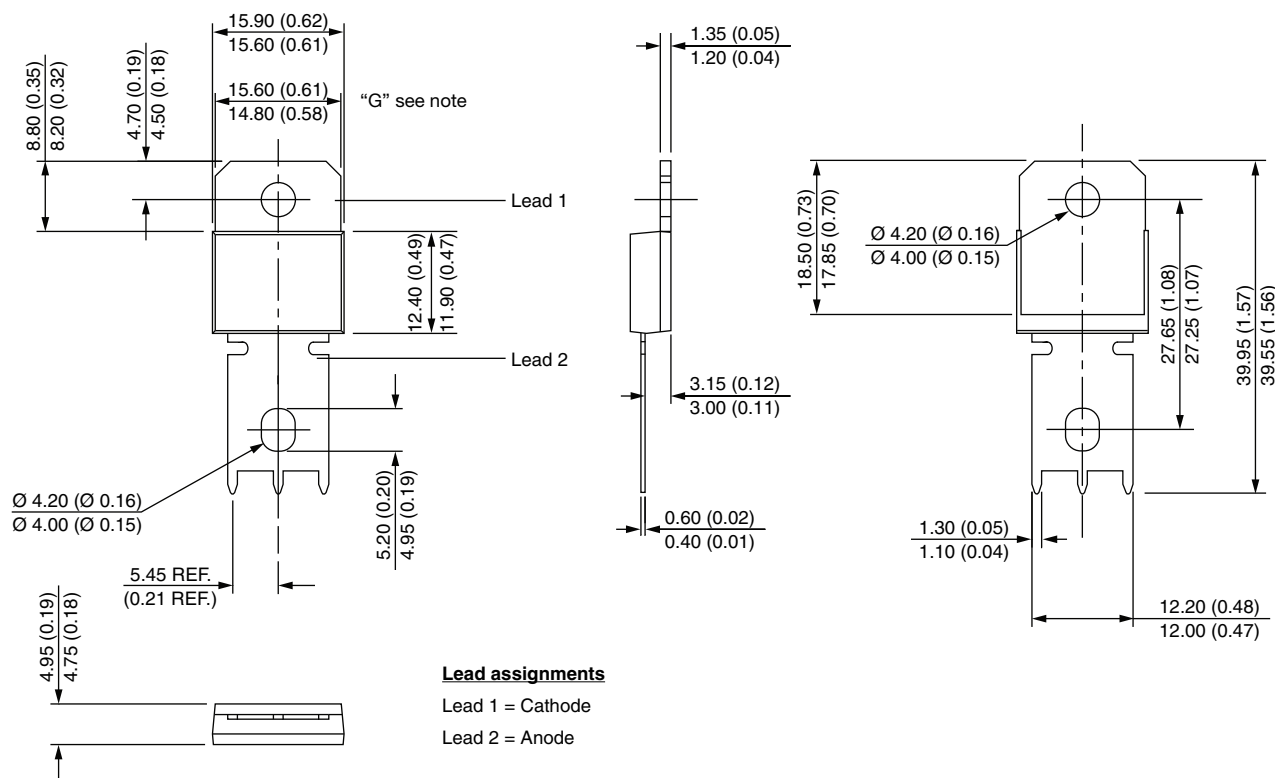
PREFERRED P/N	BASE QUANTITY	PACKAGING DESCRIPTION
VS-100BGQ015HN4	25/tube	Antistatic plastic tube

**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?95467">www.vishay.com/doc?95467</a>
SPICE 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)



**Note:**

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



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