

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
- 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


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-100BGQ015HF4 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}	$t_p = 5 \mu s$ 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-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 μs sine or 3 μs 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}	$T_J = 25$ °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	$V_R = 5 V_{DC}$, (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/ μs

Note(1) Pulse width < 300 μs , 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®	100BGQ015H	

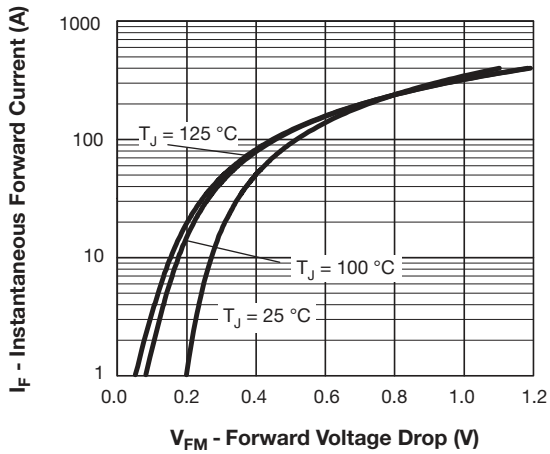


Fig. 1 - Maximum Forward Voltage Drop Characteristics

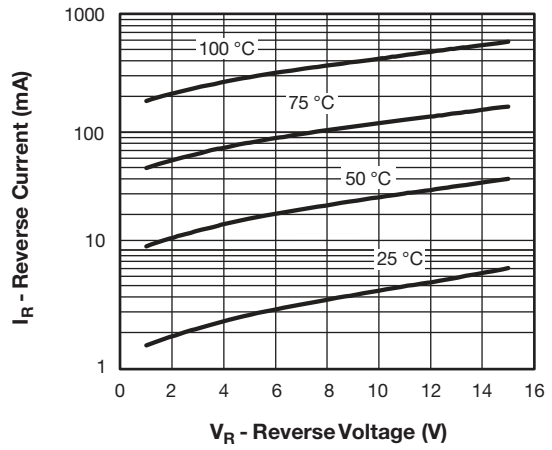


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage

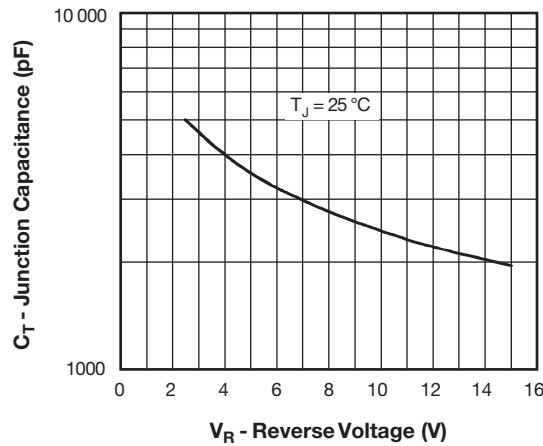


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage

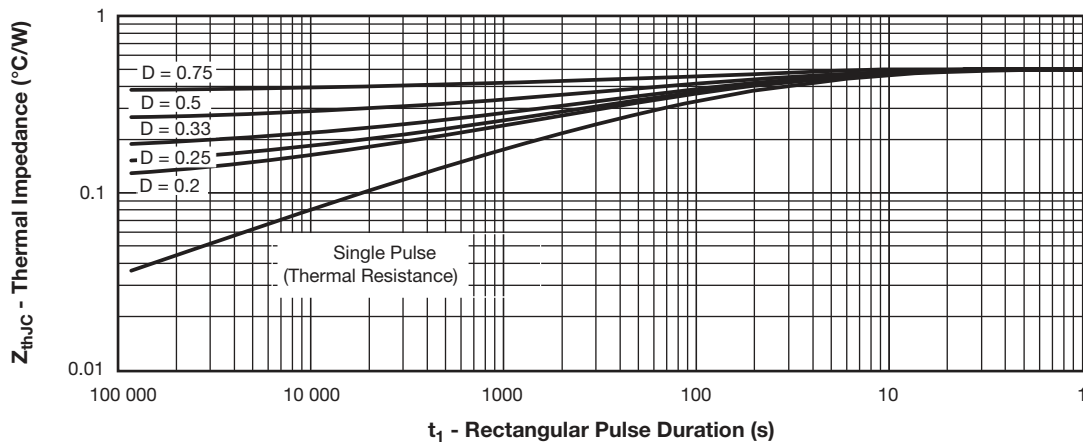


Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics

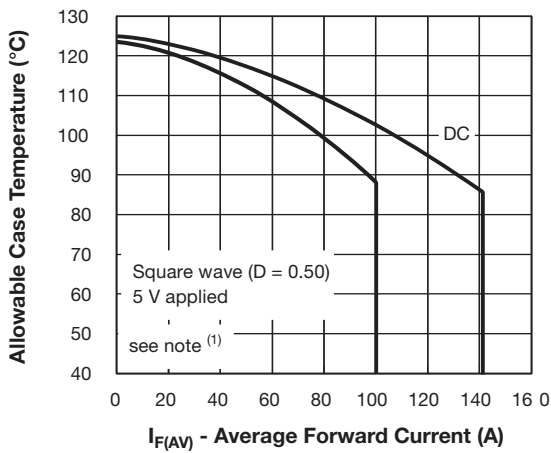


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current

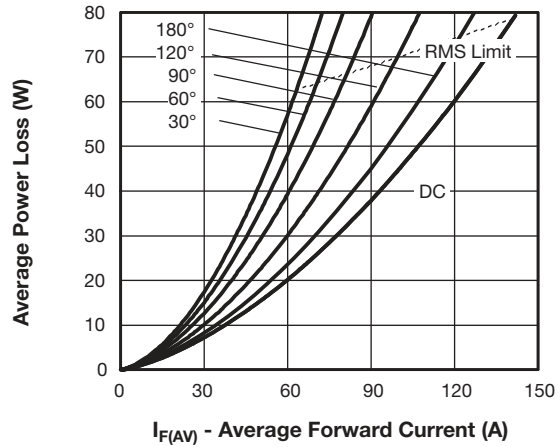


Fig. 6 - Forward Power Loss Characteristics

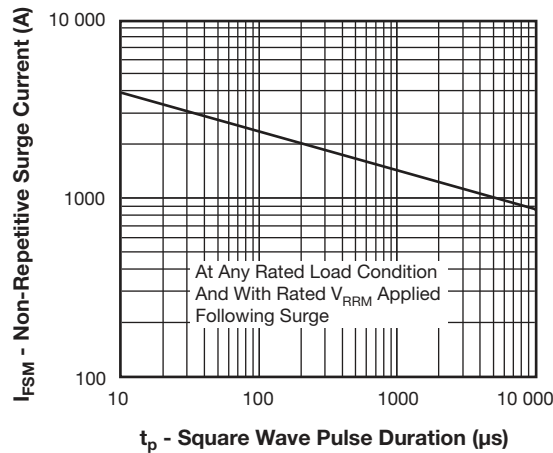


Fig. 7 - Maximum Non-Repetitive Surge Current

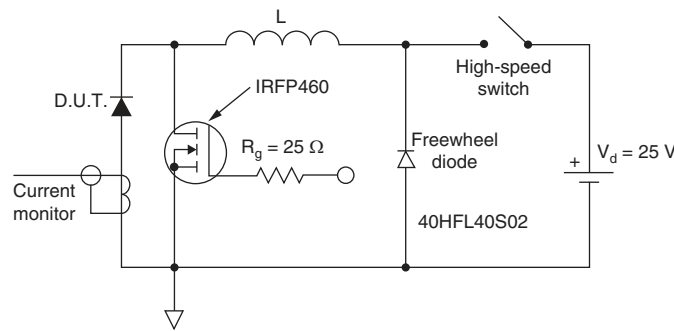


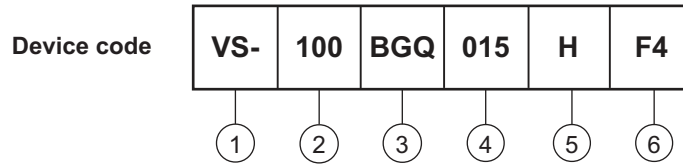
Fig. 8 - Unclamped Inductive Test Circuit

Note

- (1) Formula used: $T_C = T_J - (P_d + P_{d_{REV}}) \times R_{thJC}$;
- 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 (100 = 100 A)
- 3** - Essential part number
- 4** - Voltage rating (015 = 15 V)
- 5** - H = AEC-Q101 qualified
- 6** - Environmental digit:
- F4 = RoHS compliant and totally lead (Pb)-free

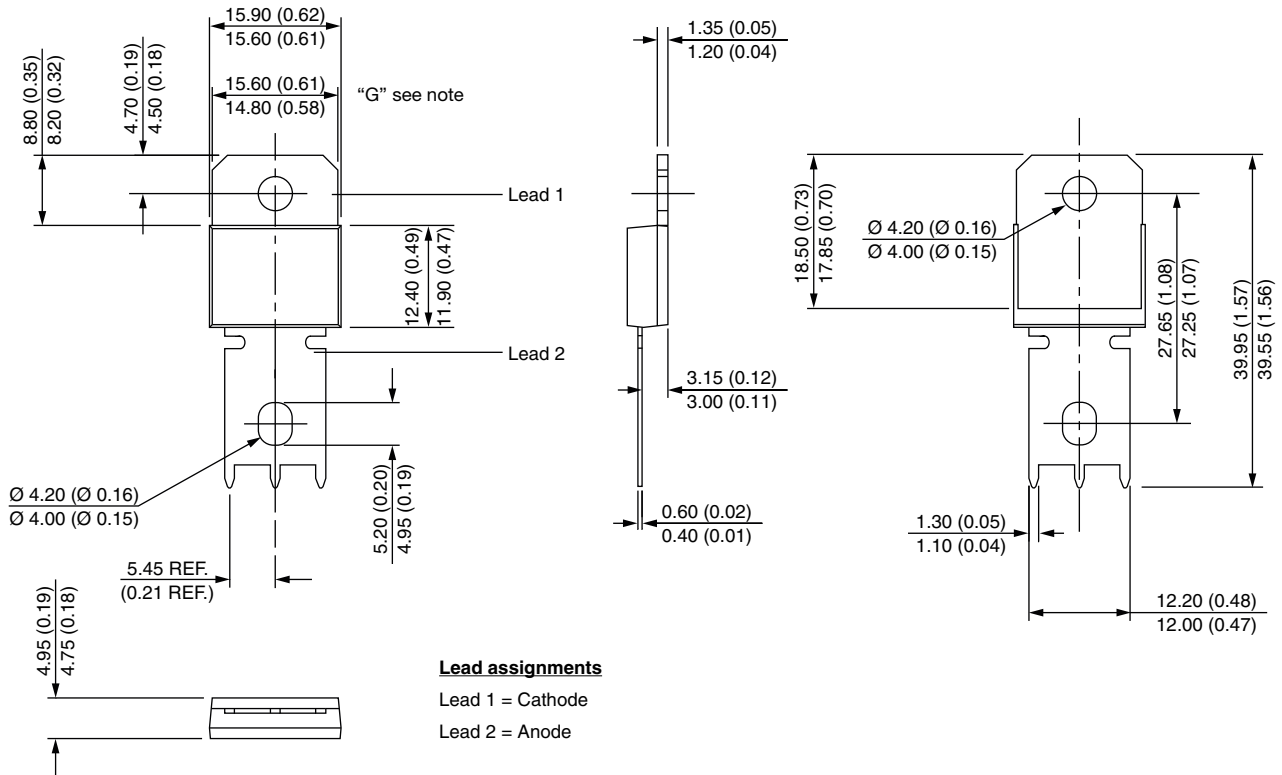
ORDERING INFORMATION (Example)			
PREFERRED P/N	QUANTITY PER T/R	MINIMUM ORDER QUANTITY	PACKAGING DESCRIPTION
VS-100BGQ015HF4	25	375	Antistatic plastic tube

LINKS TO RELATED DOCUMENTS	
Dimensions	www.vishay.com/doc?95240
Part marking information	www.vishay.com/doc?95467
SPICE model	www.vishay.com/doc?95428
Application note	www.vishay.com/doc?95179



PowerTab®

DIMENSIONS in millimeters (inches)



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



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