

High Performance Schottky Rectifier, 100 A



PowerTab®

Cathode ————— Anode


RoHS
COMPLIANT

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
- AEC-Q101 qualified
- PowerTab® package
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

DESCRIPTION

The VS-100BGQ045HF4 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.

PRODUCT SUMMARY	
Package	PowerTab®
$I_{F(AV)}$	100 A
V_R	45 V
V_F at I_F	0.71 V
I_{RM}	320 mA at 125 °C
T_J max.	150 °C
Diode variation	Single die
E_{AS}	40 mJ

MAJOR RATINGS AND CHARACTERISTICS			
SYMBOL	CHARACTERISTICS	VALUES	UNITS
$I_{F(AV)}$	Rectangular waveform	100	A
	T_C	97	°C
V_{RRM}		45	V
I_{FSM}	$t_p = 5 \mu s$ sine	4400	A
V_F	100 A _{pk} (typical)	0.65	V
	T_J	150	°C
T_J	Range	-55 to +150	°C

VOLTAGE RATINGS			
PARAMETER	SYMBOL	100BGQ045	UNITS
Maximum DC reverse voltage	V_R	45	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 $T_C = 97$ °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	4400	A	
		10 ms sine or 6 ms rect. pulse		830		
Non-repetitive avalanche energy	E_{AS}	$T_J = 25$ °C, $I_{AS} = 6$ A, $L = 2$ mH		40	mJ	
Repetitive avalanche current	I_{AR}	Current decaying linearly to zero in 1 μs Frequency limited by T_J maximum $V_A = 1.5 \times V_R$ typical		6	A	

ELECTRICAL SPECIFICATIONS							
PARAMETER	SYMBOL	TEST CONDITIONS		TYP.	MAX.	UNITS	
Forward voltage drop	$V_{FM}^{(1)}$	50 A	$T_J = 25 \text{ }^\circ\text{C}$	0.54	0.58	V	
		100 A		0.69	0.77		
		50 A	$T_J = 150 \text{ }^\circ\text{C}$	0.48	0.52		
		100 A		0.65	0.71		
Reverse leakage current	$I_{RM}^{(1)}$	$T_J = 150 \text{ }^\circ\text{C}, V_R = 45 \text{ V}$		600	1000	mA	
		$T_J = 25 \text{ }^\circ\text{C}$	$V_R = \text{Rated } V_R$	0.3	1		
		$T_J = 125 \text{ }^\circ\text{C}$		180	320		
Maximum junction capacitance	C_T	$V_R = 5 \text{ V}_{DC}$, (test signal range 100 kHz to 1 MHz) $25 \text{ }^\circ\text{C}$			2700	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 and storage temperature range	T_J, T_{Stg}		-55 to +150	°C
Maximum thermal resistance, junction to case	R_{thJC}	DC operation	0.50	°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®	100BGQ045H	

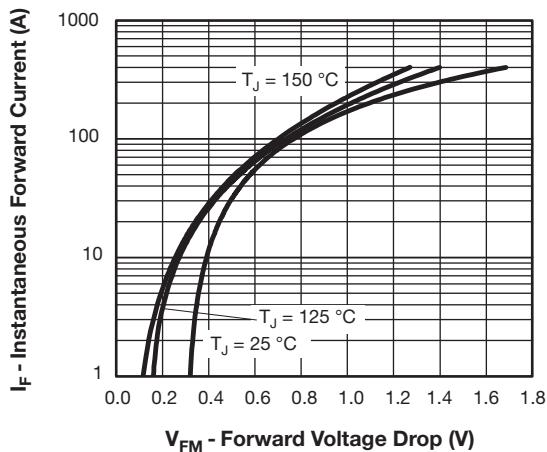


Fig. 1 - Maximum Forward Voltage Drop Characteristics

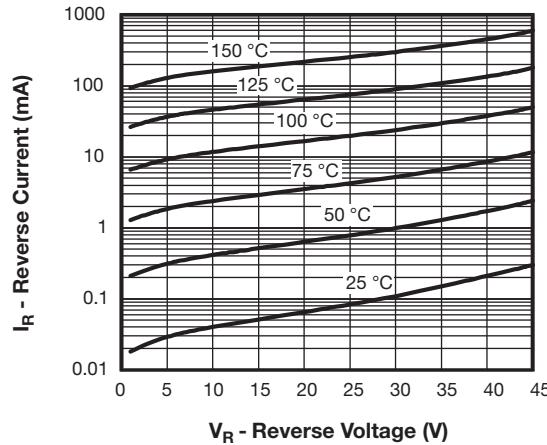


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage

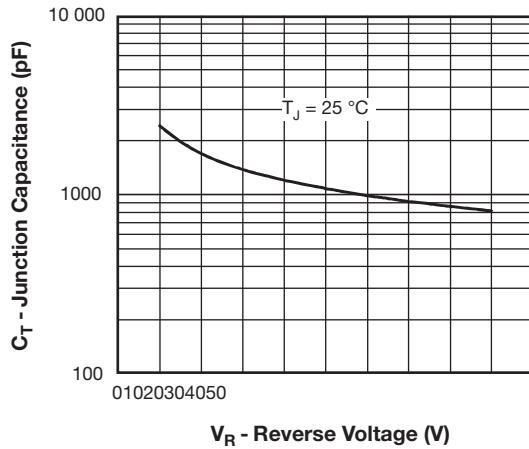


Fig. 1 - - Typical Junction Capacitance vs. Reverse Voltage

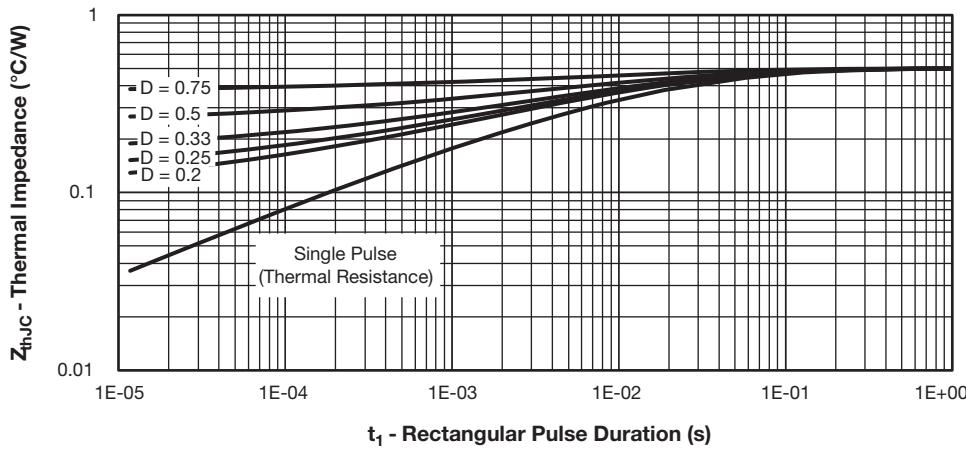


Fig. 3 - Maximum Thermal Impedance Z_{thJC} Characteristics

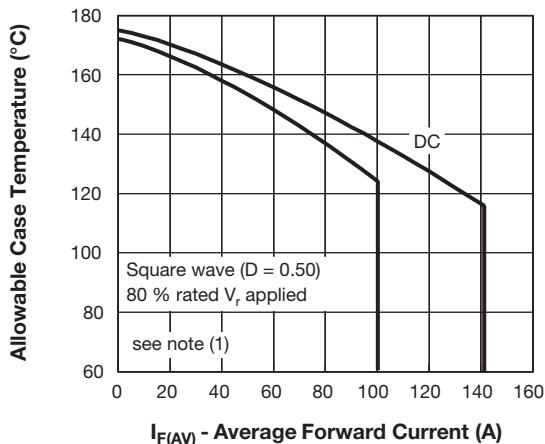


Fig. 4 - Maximum Allowable Case Temperature vs.
Average Forward Current

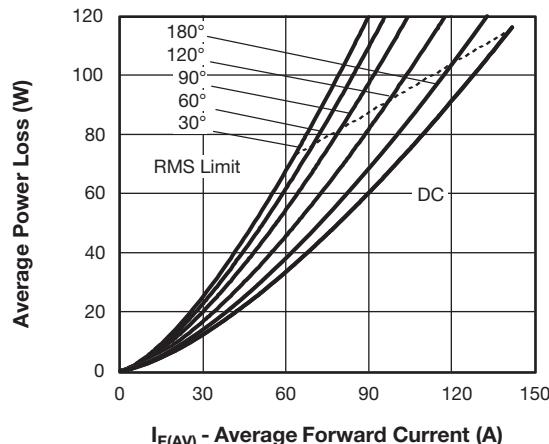


Fig. 5 - Forward Power Loss Characteristics

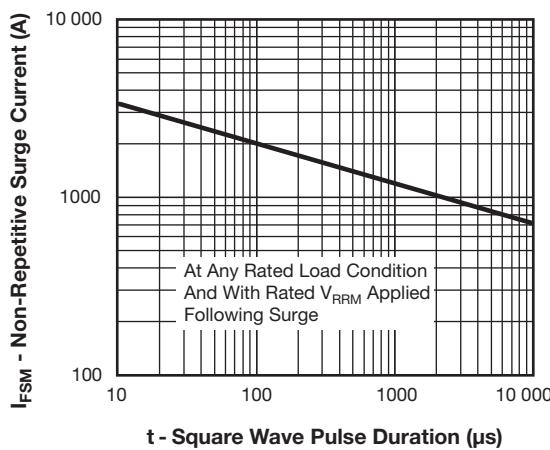


Fig. 6 - Maximum Non-Repetitive Surge Current

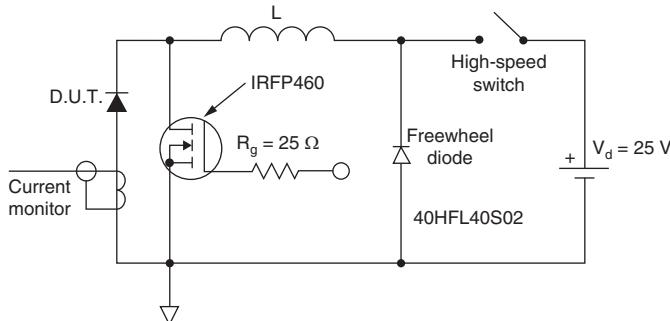


Fig. 7 - Unclamped Inductive Test Circuit

Note

(1) Formula used: $T_C = T_J - (P_d + P_{dREV}) \times R_{thJC}$
 $P_d = \text{Forward power loss} = I_{F(AV)} \times V_{FM}$ at $(I_{F(AV)}/D)$ (see fig. 6);
 $P_{dREV} = \text{Inverse power loss} = V_{R1} \times I_R (1 - D)$; I_R at $V_{R1} = 80\%$ rated V_R

ORDERING INFORMATION TABLE

Device code	VS-	100	BGQ	045	H	F4
	1	2	3	4	5	6

1
2
3
4
5
6

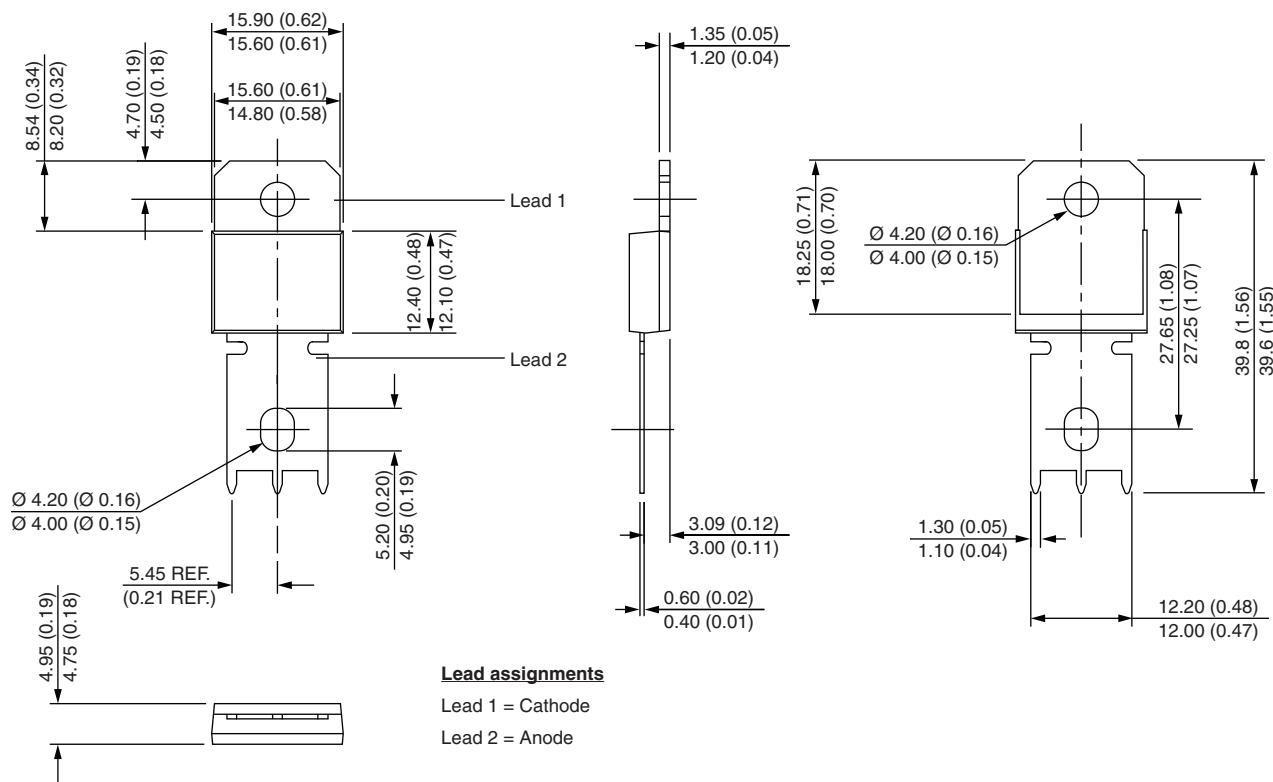
- Vishay Semiconductors product
- Current rating (100 = 100 A)
- Essential part number
- Voltage rating (045 = 45 V)
- H = AEC-Q101 qualified
- Environmental digit:
F4 = RoHS-compliant and totally lead (Pb)-free

ORDERING INFORMATION (Example)			
PREFERRED P/N	QUANTITY PER T/R	MINIMUM ORDER QUANTITY	PACKAGING DESCRIPTION
VS-100BGQ045HF4	25	375	Antistatic plastic tube

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

PowerTab®

DIMENSIONS in millimeters (inches)



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