

High Performance Schottky Rectifier, 100 A



PowerTab®



FEATURES

- 175 °C max. operating junction temperature
- High frequency operation
- Low 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


RoHS
COMPLIANT

PRIMARY CHARACTERISTICS

$I_{F(AV)}$	100 A
V_R	100 V
V_F at I_F	0.82 V
I_{RM}	180 mA at 125 °C
E_{AS}	9 mJ
T_J max.	175 °C
Package	PowerTab®
Circuit configuration	Single

DESCRIPTION

The VS-100BGQ100HF4 Schottky rectifier has been optimized for low reverse leakage at high temperature. The proprietary barrier technology allows for reliable operation up to 175 °C junction temperature. Typical applications are in 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	124	°C
V_{RRM}		100	V
I_{FSM}	$t_p = 5 \mu s$ sine	6300	A
V_F	100 A _{pk} (typical)	0.77	V
	T_J	125	°C
T_J	Range	-55 to +175	°C

VOLTAGE RATINGS

PARAMETER	SYMBOL	VS-100BGQ100HF4	UNITS
Maximum DC reverse voltage	V_R	100	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 $T_C = 124$ °C, rectangular waveform	100	A
Maximum peak one cycle non-repetitive surge current	I_{FSM}	5 μs sine or 3 μs rect. pulse	6300	A
		10 ms sine or 6 ms rect. pulse	800	
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 $V_A = 1.5 \times V_R$ typical	2	A

**ELECTRICAL SPECIFICATIONS**

PARAMETER	SYMBOL	TEST CONDITIONS		VALUES		UNITS
				TYP.	MAX.	
Forward voltage drop	V _{FM} ⁽¹⁾	50 A	T _J = 25 °C	0.83	0.86	V
		100 A		1.01	1.08	
		50 A	T _J = 125 °C	0.66	0.7	
		100 A		0.77	0.82	
Reverse leakage current	I _{RM} ⁽¹⁾	T _J = 25 °C	V _R = Rated V _R	22	300	μA
		T _J = 125 °C		14	18	mA
Maximum junction capacitance	C _T	V _R = 5 V _{DC} , (test signal range 100 kHz to 1 MHz) 25 °C			1320	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 +175	°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®	100BGQ100H	

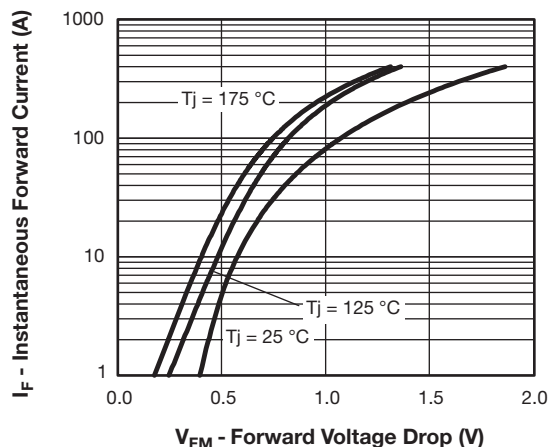


Fig. 1 - Maximum Forward Voltage Drop Characteristics

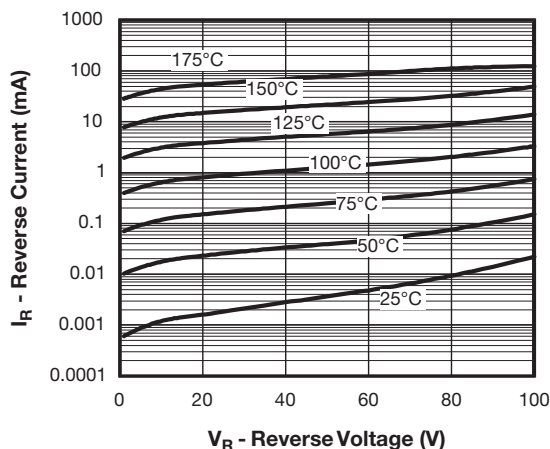


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage

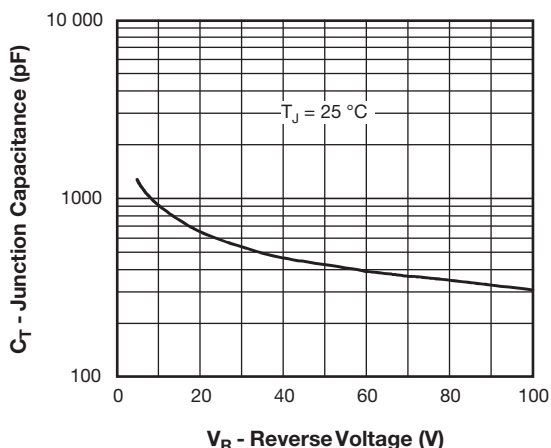


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage

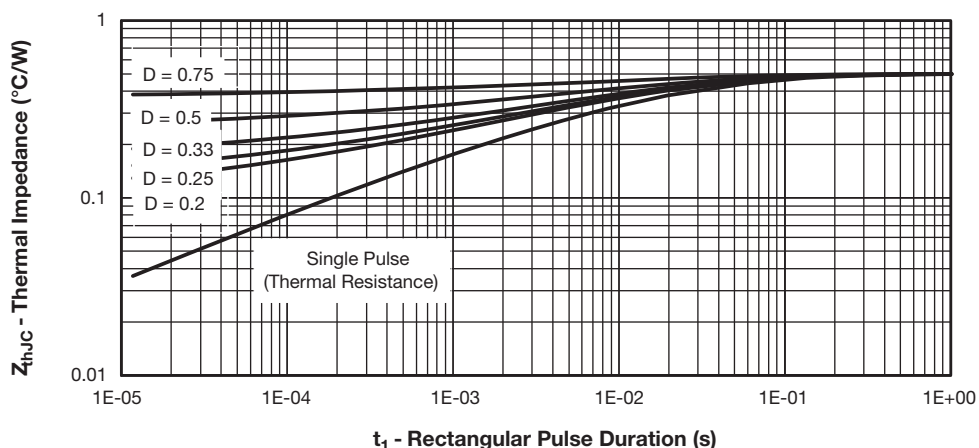
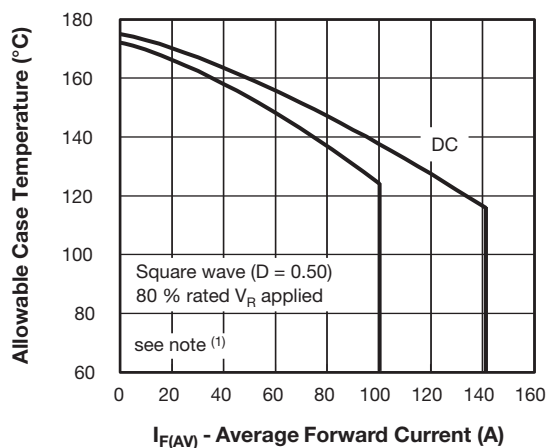

Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics


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

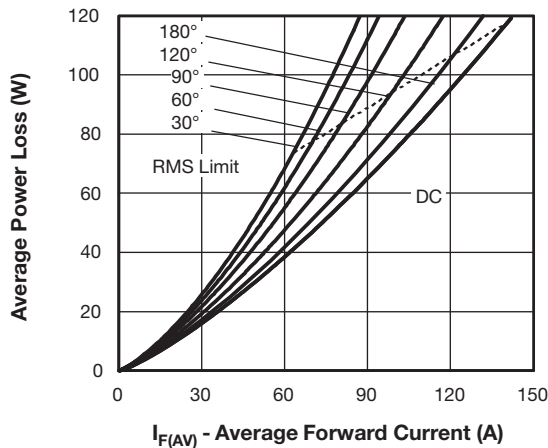


Fig. 6 - Forward Power Loss Characteristics

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 $V_{R1} = 80\%$ rated V_R

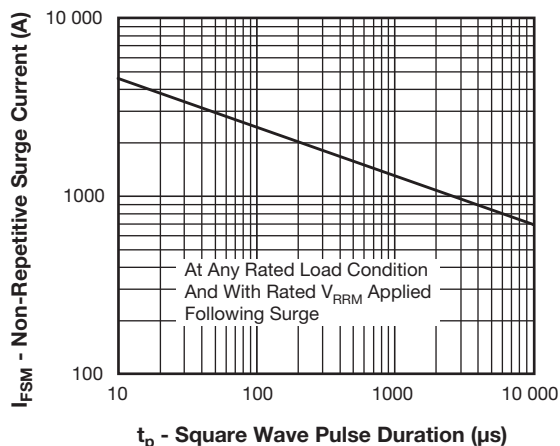


Fig. 7 - Maximum Non-Repetitive Surge Current

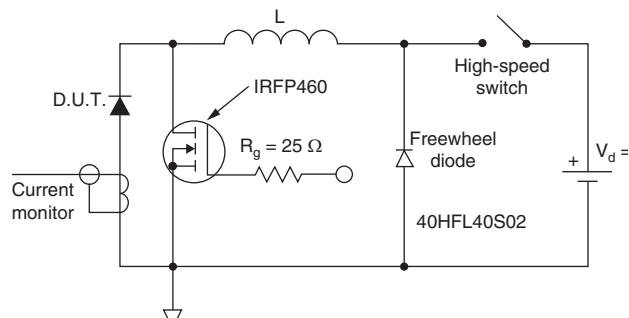


Fig. 8 - Unclamped Inductive Test Circuit

ORDERING INFORMATION TABLE

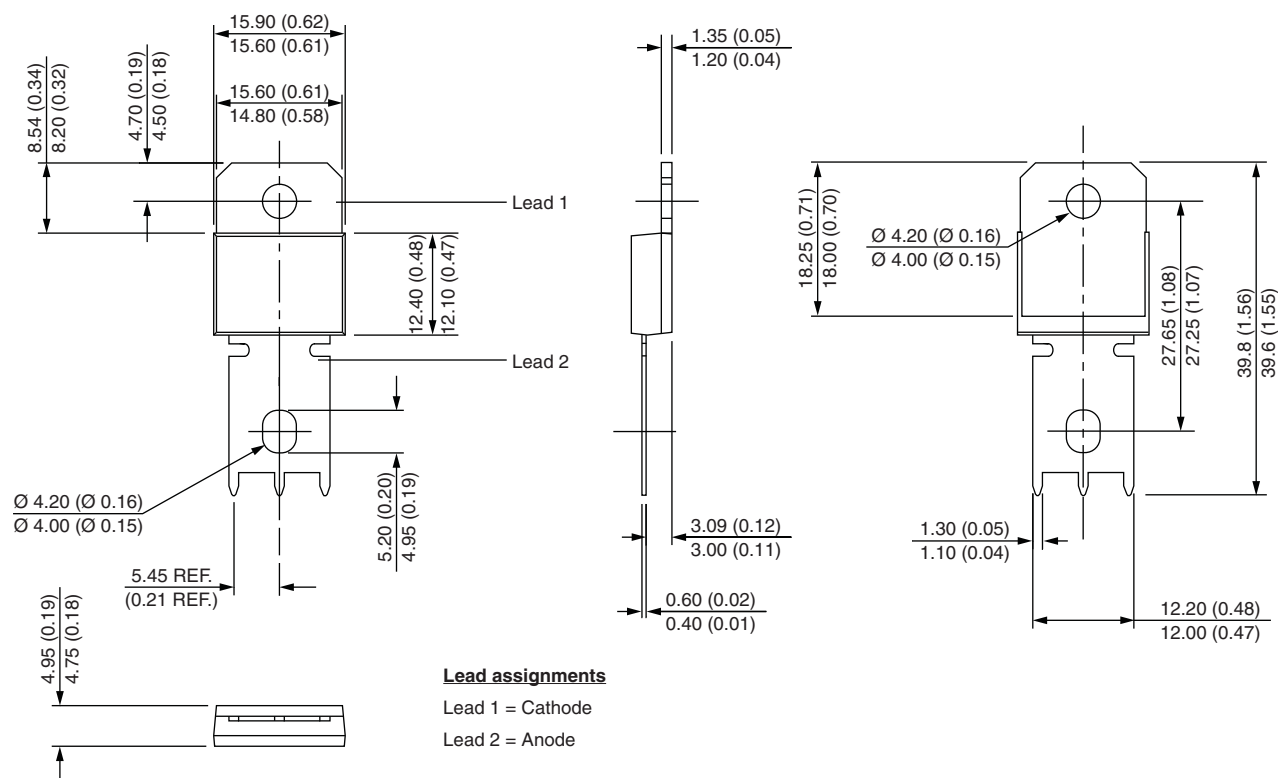
Device code	VS-	100	BGQ	100	H	F4
	①	②	③	④	⑤	⑥
①	- Vishay Semiconductors product					
②	- Current rating (100 = 100 A)					
③	- Essential part number					
④	- Voltage rating (100 = 100 V)					
⑤	- H = AEC-Q101 qualified					
⑥	- Environmental digit:					
	- F4 = RoHS compliant and totally lead (Pb)-free					

ORDERING INFORMATION (Example)			
PREFERRED P/N	QUANTITY PER T/R	MINIMUM ORDER QUANTITY	PACKAGING DESCRIPTION
VS-100BGQ100HF4	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
SPIICE model	www.vishay.com/doc?96588

PowerTab®

DIMENSIONS in millimeters (inches)





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