

# High Performance Schottky Rectifier, 100 A



PowerTab®



## 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/doc299912](http://www.vishay.com/doc299912)


RoHS  
COMPLIANT

## 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

## 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.

## 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 <sub>pk</sub> (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 $\mu s$ sine or 3 $\mu s$ rect. pulse	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 $\mu s$ 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/ $\mu$ s

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

PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Maximum junction and storage temperature range	T <sub>J</sub> , T <sub>Stg</sub>		-55 to +150	°C
Maximum thermal resistance, junction to case	R <sub>thJC</sub>	DC operation	0.50	°C/W
Typical thermal resistance, case to heatsink	R <sub>thCS</sub>	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	

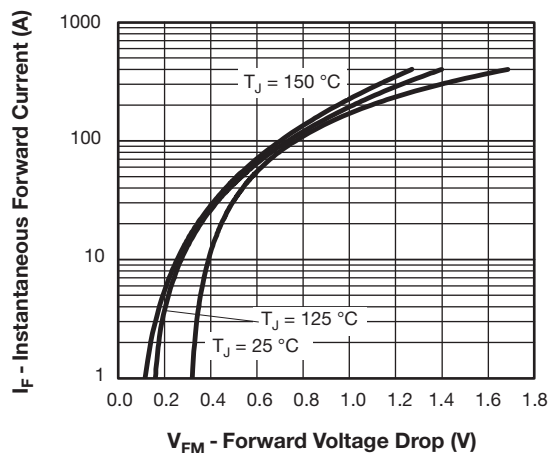


Fig. 1 - Maximum Forward Voltage Drop Characteristics

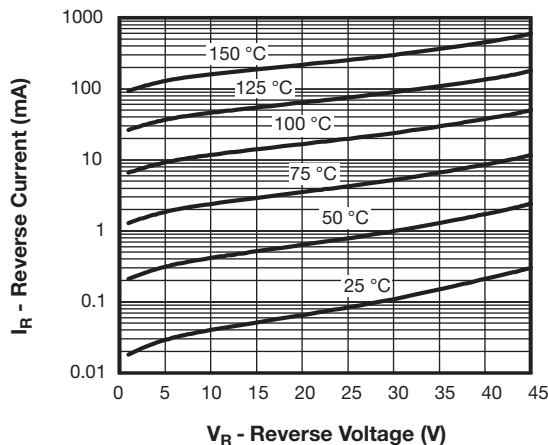


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage

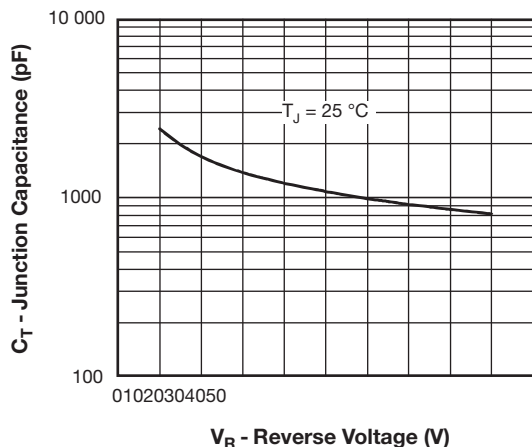
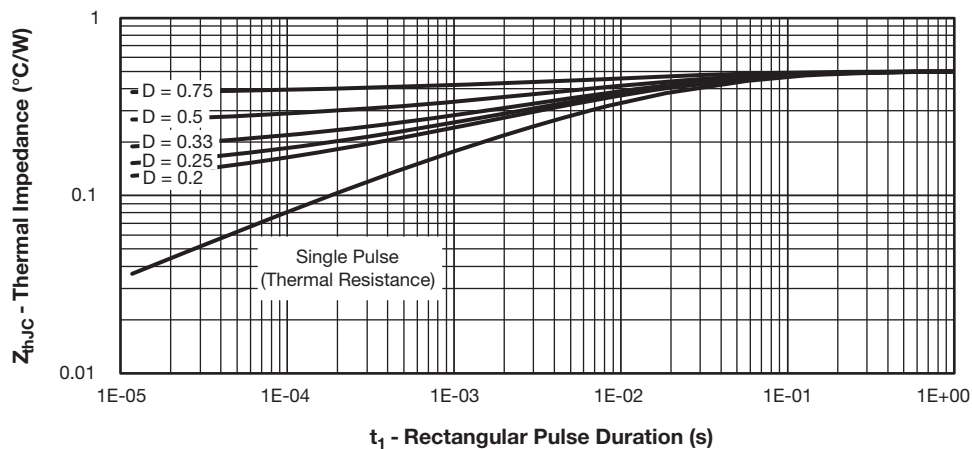


Fig. 1 - Typical Junction Capacitance vs. Reverse Voltage


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

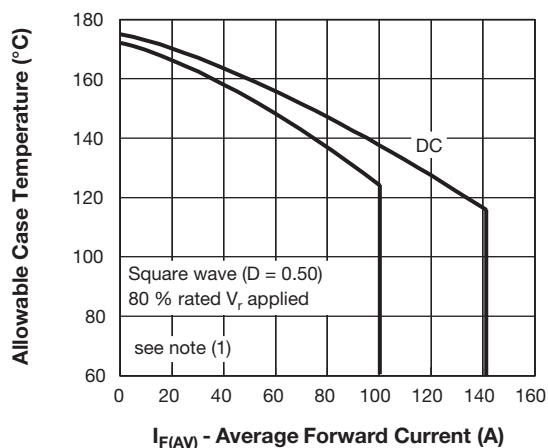


Fig. 4 - Maximum Allowable Case Temperature vs. Average Forward Current

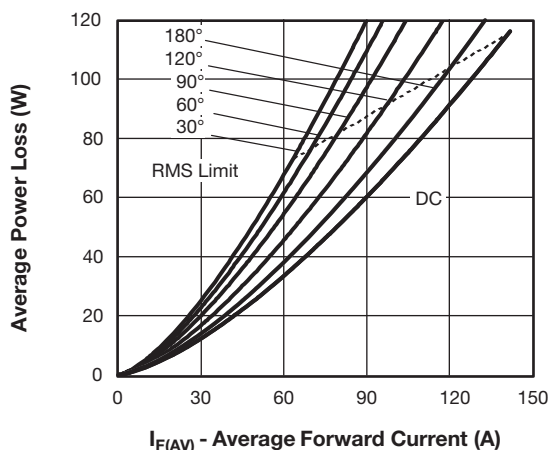


Fig. 5 - Forward Power Loss Characteristics

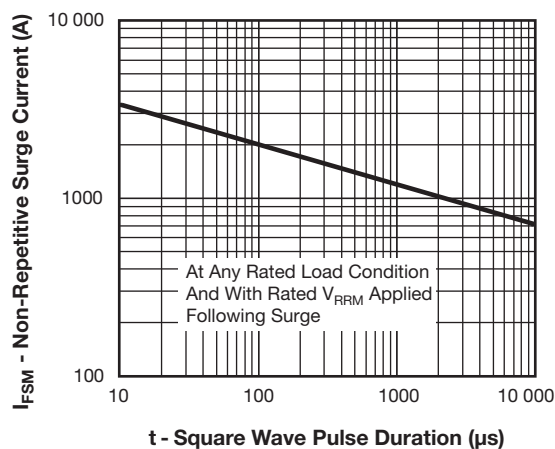


Fig. 6 - Maximum Non-Repetitive Surge Current

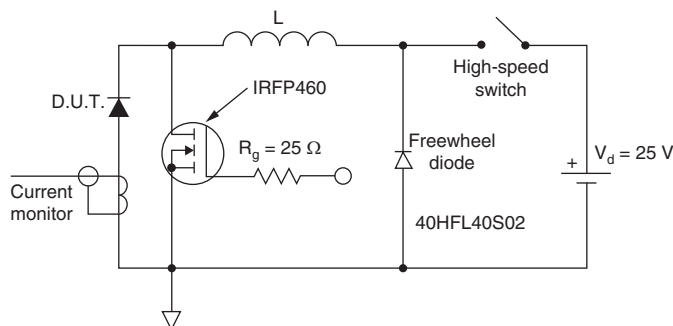


Fig. 7 - Unclamped Inductive Test Circuit

#### Note

- (1) Formula used:  $T_C = T_J - (P_d + P_{dREV}) \times R_{thJC}$ ;  
 $P_d$  = 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  $V_R$



## ORDERING INFORMATION TABLE

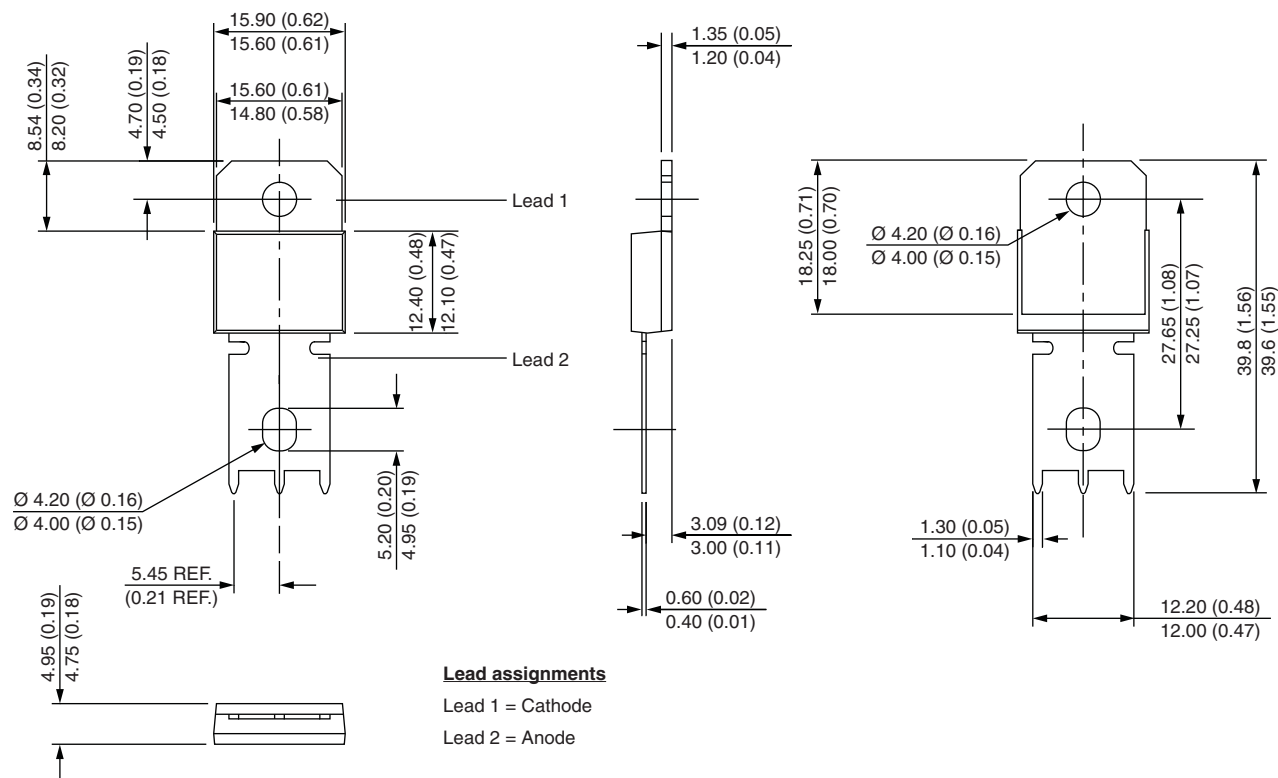
Device code	VS-	100	BGQ	045	H	F4
	①	②	③	④	⑤	⑥
①	- Vishay Semiconductors product					
②	- Current rating (100 = 100 A)					
③	- Essential part number					
④	- Voltage rating (045 = 45 V)					
⑤	- H = AEC-Q101 qualified					
⑥	- Environmental digit: F4 = RoHS-compliant and totally lead (Pb)-free					

ORDERING INFORMATION (Example)			
PREFERRED P/N	QUANTITY PER T/R	MINIMUM ORDER QUANTITY	PACKAGING DESCRIPTION
VS-100BGQ045HF4	25	375	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>
Application note	<a href="http://www.vishay.com/doc?95179">www.vishay.com/doc?95179</a>

# PowerTab®

**DIMENSIONS** in millimeters (inches)





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