

## Schottky Rectifier, 100 A


**PowerTab™**


### FEATURES

- 150 °C  $T_J$  operation
- High frequency operation
- Ultralow forward voltage drop
- Continuous high current operation
- Guard ring for enhanced ruggedness and long term reliability
- PowerTab™ package
- Lead (Pb)-free plating


**RoHS**  
COMPLIANT

### PRODUCT SUMMARY

$I_{F(AV)}$	100 A
$V_F$ at 100 A at 25 °C	0.77 V
$I_R$ at 125 °C	320 mA
$V_R$	45 V

### DESCRIPTION

The 100BGQ045 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
$I_{FSM}$	$t_p = 5 \mu\text{s}$ sine	4400	A
$V_F$	100 Apk (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 $T_C = 97 \text{ °C}$ , rectangular waveform	100	A
Maximum peak one cycle non-repetitive surge current	$I_{FSM}$	5 $\mu\text{s}$ sine or 3 $\mu\text{s}$ rect. pulse	Following any rated load condition and with rated $V_{RRM}$ applied	A
		10 ms sine or 6 ms rect. pulse		
Non-repetitive avalanche energy	$E_{AS}$	$T_J = 25 \text{ °C}$ , $I_{AS} = 6 \text{ A}$ , $L = 2 \text{ mH}$	40	mJ
Repetitive avalanche current	$I_{AR}$	Current decaying linearly to zero in 1 $\mu\text{s}$ 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	$T_J, T_{Stg}$		- 55 to 150	$^\circ\text{C}$
Maximum thermal resistance, junction to case	$R_{thJC}$	DC operation	0.50	$^\circ\text{C/W}$
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™	100BGQ045	

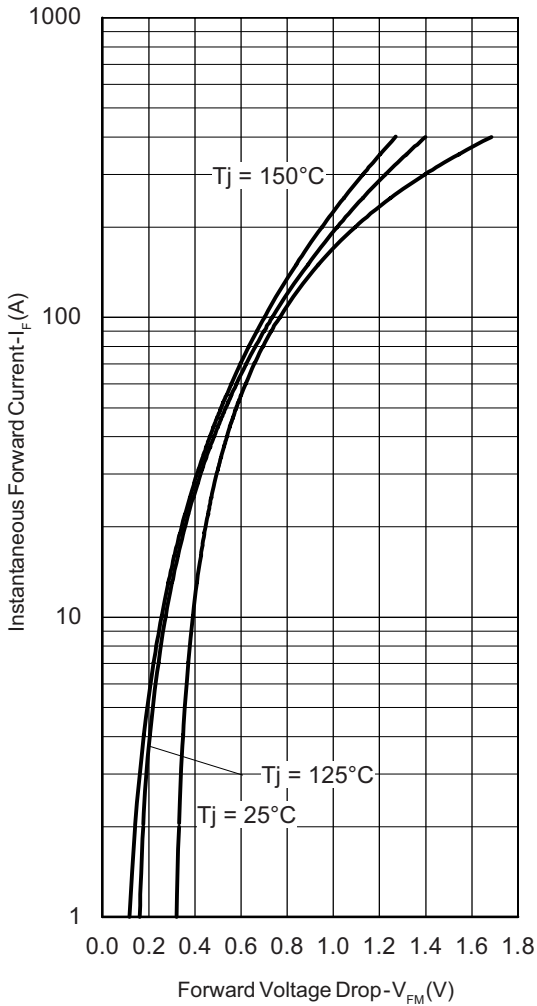


Fig. 1 - Maximum Forward Voltage Drop Characteristics

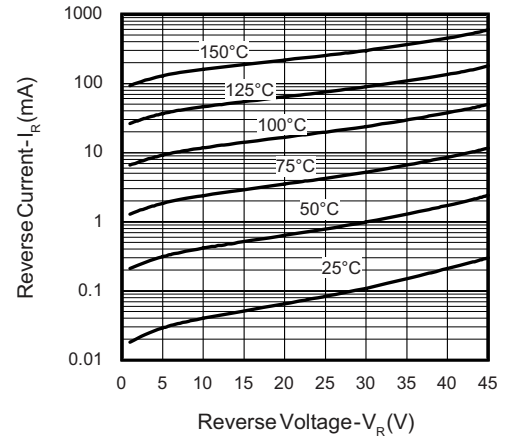


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage

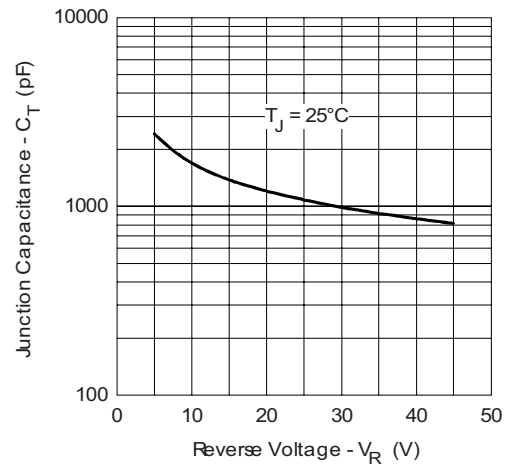
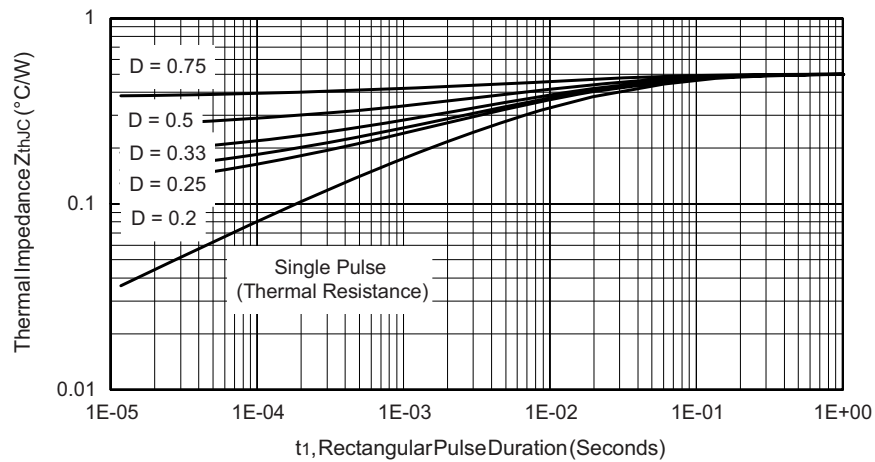


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage


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

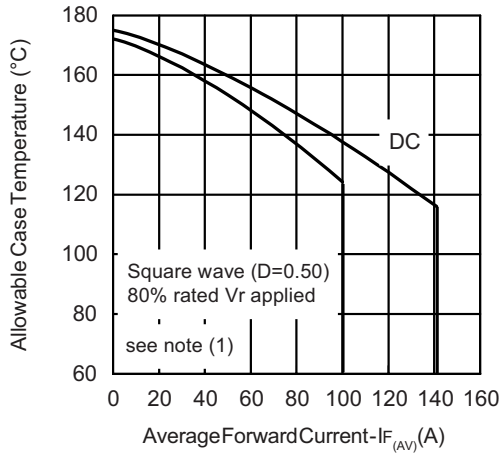


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current

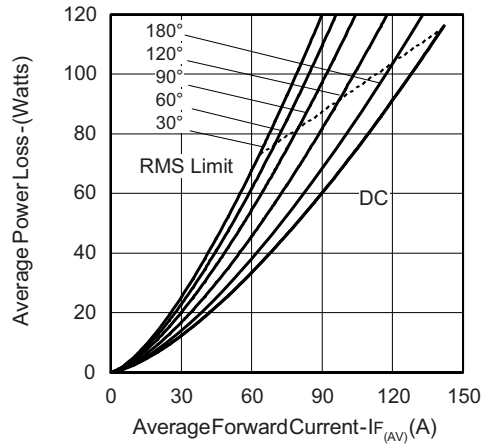


Fig. 6 - Forward Power Loss Characteristics

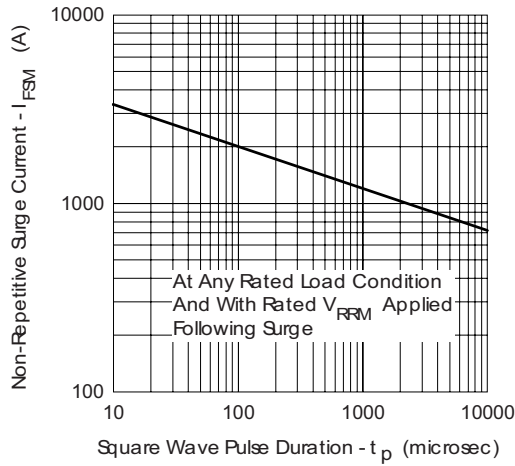


Fig. 7 - Maximum Non-Repetitive Surge Current

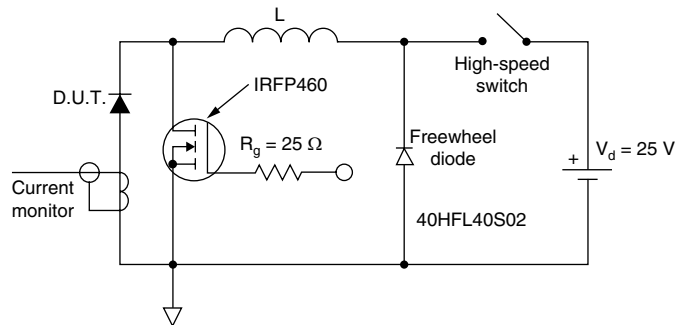


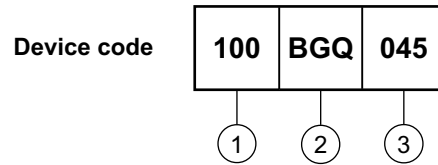
Fig. 8 - Unclamped Inductive Test Circuit

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



**ORDERING INFORMATION TABLE**



- 1** - Current rating
- 2** - Essential part number
- 3** - Voltage code =  $V_{RRM}$

LINKS TO RELATED DOCUMENTS	
Dimensions	<a href="http://www.vishay.com/doc?95240">http://www.vishay.com/doc?95240</a>
Part marking information	<a href="http://www.vishay.com/doc?95370">http://www.vishay.com/doc?95370</a>



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