



100BGQ045  
100BGQ045J

SCHOTTKY RECTIFIER

100 Amp

**Major Ratings and Characteristics**

Characteristics	100BGQ045	Units
$I_{F(AV)}$ Rectangular waveform	100	A
@ $T_C$	100	°C
$I_{DC}$ Maximum	141	A
$V_{RRM}$	45	V
$I_{FSM}$ @ $t_p=5\mu s$ sine	4400	A
$V_F$ @100Apk typical	0.63	V
@ $T_J$	150	°C
$T_J$ range	-55 to 150	°C

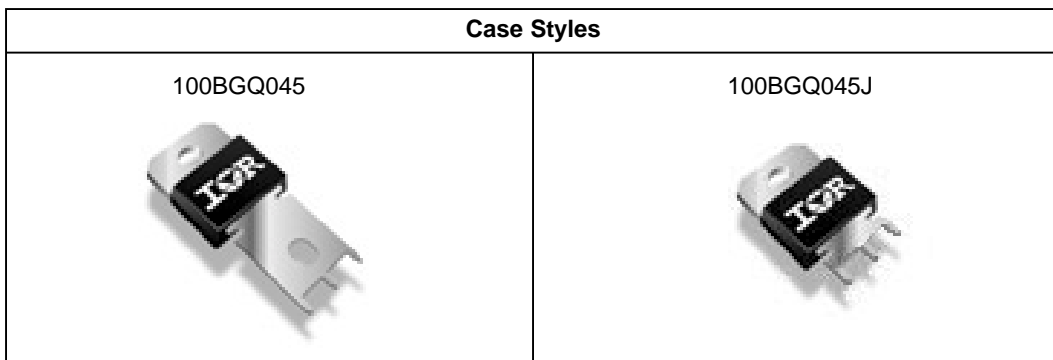
**Description/ Features**

The 100BGQ045 Schottky rectifier has been optimized for ultra low 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.

- 150°C  $T_J$  operation
- High Frequency Operation
- Ultra low forward voltage drop
- Continuous High Current operation
- Guard ring for enhanced ruggedness and long term reliability
- **PowIRtab™ package**

**Case Styles**



## Voltage Ratings

Part number	100BGQ045
$V_R$ Max. DC Reverse Voltage (V)	45
$V_{RWM}$ Max. Working Peak Reverse Voltage (V)	

## Absolute Maximum Ratings

Parameters	100BGQ	Units	Conditions
$I_{F(AV)}$ Max. Average Forward Current	100	A	50% duty cycle @ $T_C = 100^\circ\text{C}$ , rectangular wave form
$I_{F(RMS)}$ RMS Forward Current	141	A	$T_C = 95^\circ\text{C}$
$I_{FSM}$ Max. Peak One Cycle Non-Repetitive Surge Current	4400	A	5 $\mu\text{s}$ Sine or 3 $\mu\text{s}$ Rect. pulse
	830		10ms Sine or 6ms Rect. pulse
$E_{AS}$ Non-Repetitive Avalanche Energy	40	mJ	$T_J = 25^\circ\text{C}$ , $I_{AS} = 6$ Amps, $L = 2.0$ mH
$I_{AR}$ Repetitive Avalanche Current	6	A	Current decaying linearly to zero in 1 $\mu\text{sec}$ Frequency limited by $T_J$ max. $V_A = 1.5 \times V_R$ typical

## Electrical Specifications

Parameters	100BGQ		Units	Conditions	
	Typ.	Max.			
$V_{FM}$ Forward Voltage Drop (1) (2)	0.52	0.56	V	@ 50A	$T_J = 25^\circ\text{C}$
	0.67	0.73	V	@ 100A	
	0.47	0.52	V	@ 50A	$T_J = 150^\circ\text{C}$
	0.63	0.68	V	@ 100A	
$I_{RM}$ Reverse Leakage Current (1)	0.3	1	mA	$T_J = 25^\circ\text{C}$	$V_R = \text{rated } V_R$
	180	320	mA	$T_J = 125^\circ\text{C}$	
	600	1000	mA	$T_J = 150^\circ\text{C}$	
$V_{F(TO)}$ Threshold Voltage	0.379		V	$T_J = T_J$ max.	
$r_t$ Forward Slope Resistance	2.7		m $\Omega$		
$C_T$ Max. Junction Capacitance	2700		pF	$V_R = 5V_{DC}$ (test signal range 100Khz to 1Mhz) $25^\circ\text{C}$	
$L_S$ Typical Series Inductance	3.5		nH	Measured from tab to mounting plane	
dv/dt Max. Voltage Rate of Change	10000		V/ $\mu\text{s}$	(Rated $V_R$ )	

(1) Pulse Width < 300 $\mu\text{s}$ , Duty Cycle < 2%(2)  $V_{FM} = V_{F(TO)} + r_t \times I_F$ 

## Thermal-Mechanical Specifications

Parameters	100BGQ	Units	Conditions
$T_J$ Max. Junction Temperature Range	-55 to 150	$^\circ\text{C}$	
$T_{stg}$ Max. Storage Temperature Range	-55 to 150	$^\circ\text{C}$	
$R_{thJC}$ Max. Thermal Resistance Junction to Case	0.50	$^\circ\text{C/W}$	DC operation
$R_{thCS}$ Typical Thermal Resistance, Case to Heatsink	0.20	$^\circ\text{C/W}$	Mounting surface, smooth and greased
wt Approximate Weight	5(0.18)	g(oz.)	
T Mounting Torque	Min.	1.2(10)	N*m (lbf-in)
	Max.	2.4(20)	
Case Style	PowIRtab™		

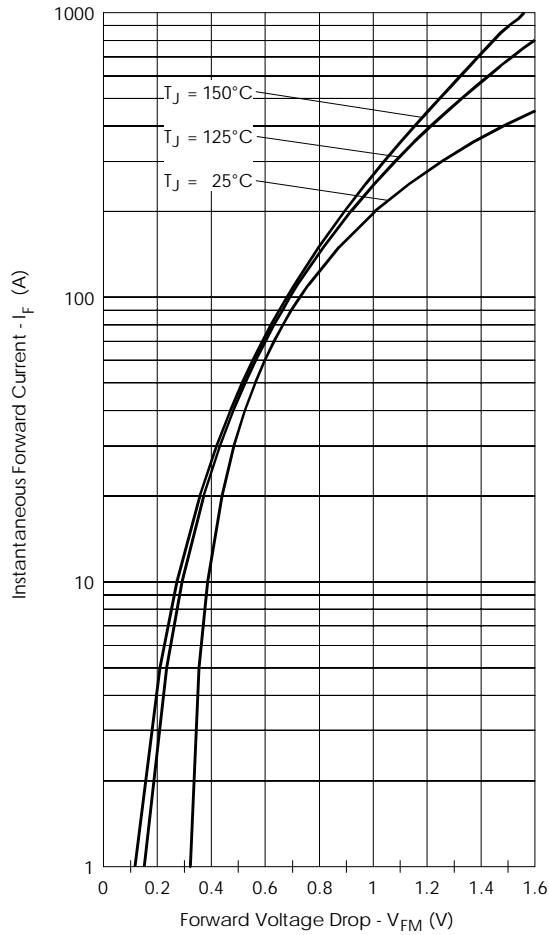


Fig. 1 - Maximum Forward Voltage Drop Characteristics

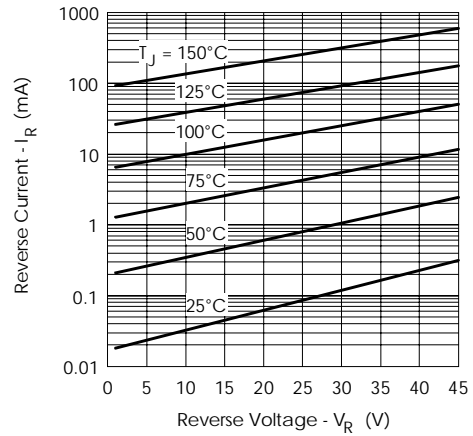


Fig. 2 - Typical Values of Reverse Current Vs. Reverse Voltage

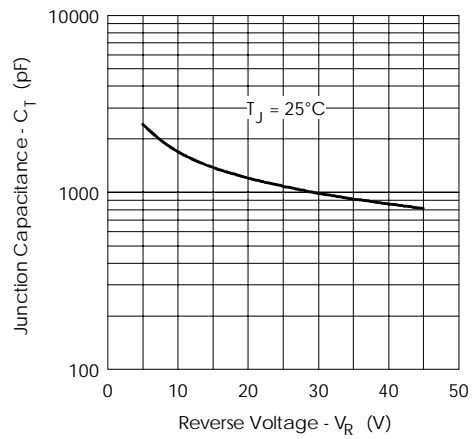


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage

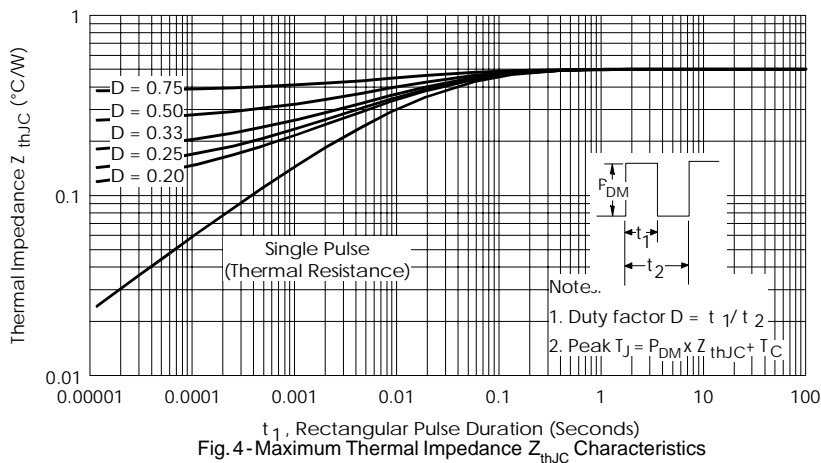


Fig. 4 - Maximum Thermal Impedance  $Z_{thJC}$  Characteristics

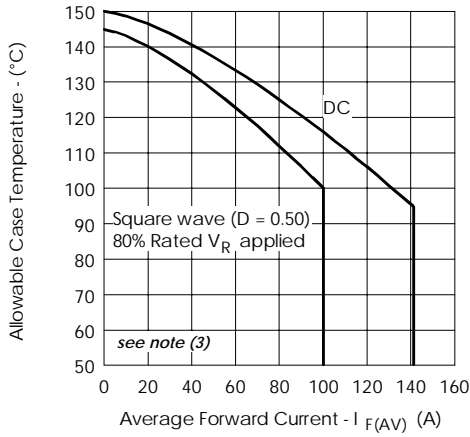


Fig.5- Maximum Allowable Case Temperature Vs. Average Forward Current

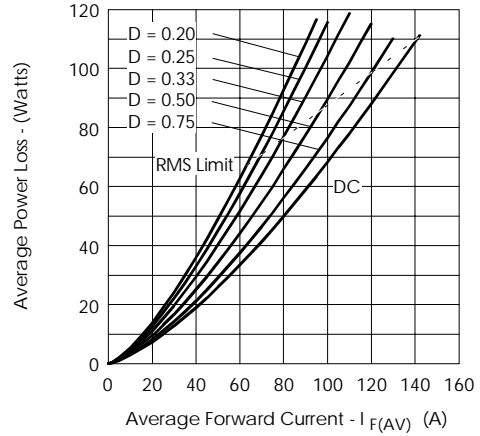


Fig.6- Forward Power Loss Characteristics

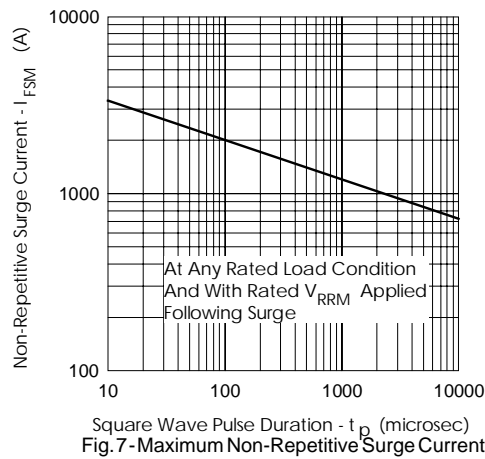


Fig.7- Maximum Non-Repetitive Surge Current

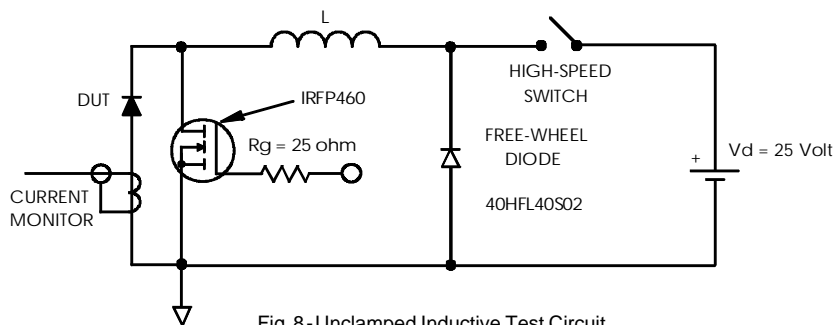


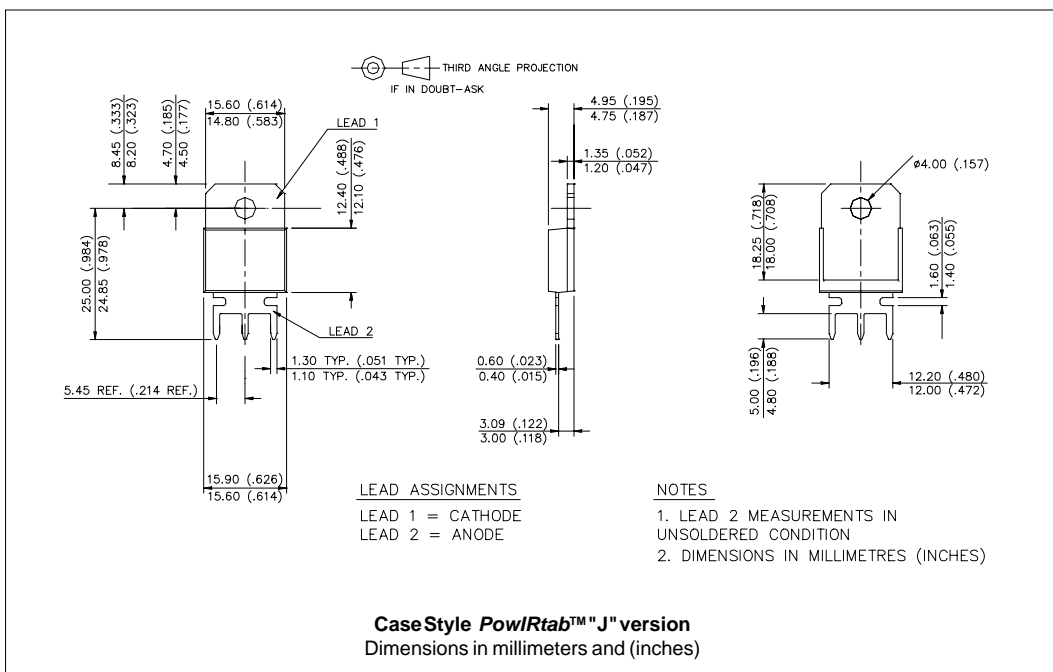
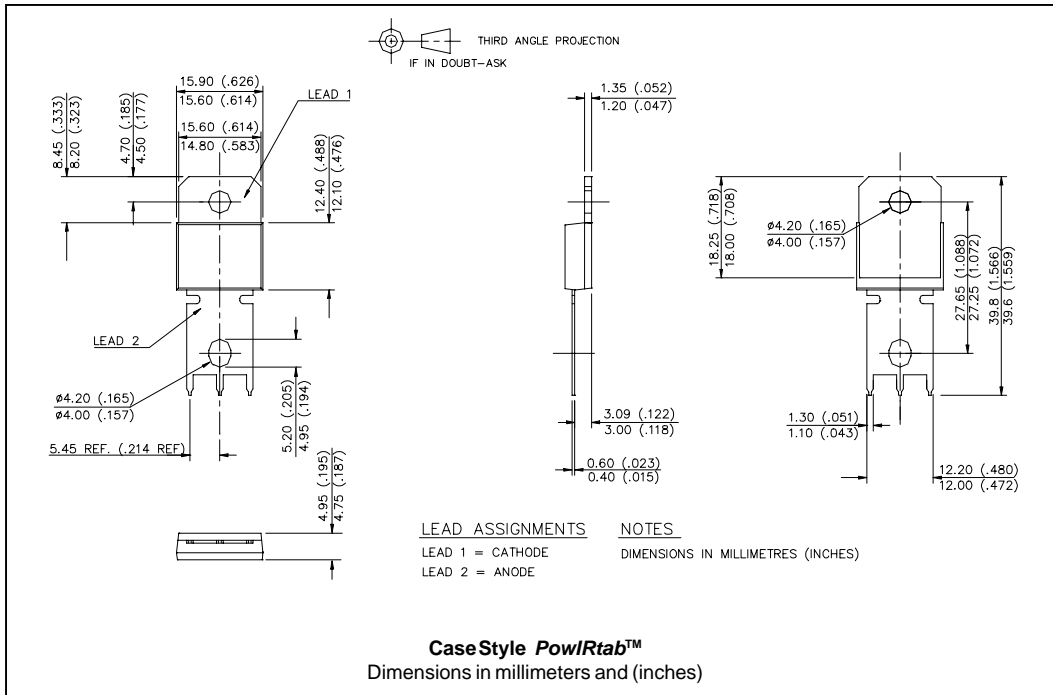
Fig.8- Unclamped Inductive Test Circuit

(3) Formula used:  $T_c = T_j - (P_d + P_{d_{REV}}) \times R_{thJC}$ ;

$P_d = \text{Forward Power Loss} = I_{F(AV)} \times V_{FM} @ (I_{F(AV)} / D)$  (see Fig. 6);

$P_{d_{REV}} = \text{Inverse Power Loss} = V_{R1} \times I_R (1 - D)$ ;  $I_R @ V_{R1} = 80\%$  rated  $V_R$

Outline Table



Ordering Information Table

Device Code			
100	BGQ	045	J
①	②	③	④
<b>1</b>	-	Current Rating	
<b>2</b>	-	Essential Part Number	
<b>3</b>	-	Voltage code: Code = $V_{RRM}$	
<b>4</b>	-	none = PowIRtab™ standard	
	J	=	Short Lead Version

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*****
This model has been developed by
Wizard SPICE MODEL GENERATOR(1999)
(International Rectifier Corporation)
contains Proprietary Information

*****
SPICE Model Diode is composed by a
simple diode plus paralld VCG2T
*****

.SUBCKT 100bgq45 ANO CAT
D1 ANO 1 DMOD (0.24359)
*Define diode model
.MODEL DMOD D(IS=6.61799286342482E-05A,N=1.0212796726385,BV=45V,
+IBV=0.115140026620575A,RS=0.0005748724,CJO=3.31930927290723E-08,
+VJ=0.456112448442971,XTI=2,EG=0.721992455742664)
*****
*Implementation of VCG2T
VX 1 2 DC 0V
R1 2 CAT TRES 1E-6
.MODEL TRES RES(R=1,TC1=9.83346387011944)
GP1 ANO CAT VALUE={-ABS(I(VX))*(EXP(((((-2.949174E-03/
9.833464)*((V(2,CAT)*1E6)/(I(VX)+1E-6)-1))+1)*6.600191E-2*ABS(V(ANO,CAT)))-1)}

*****
.ENDS 100bgq45

Thermal Model Subcircuit
.SUBCKT 100bgq45T 5 1

CTHERM1 5 4 1.66E+3
CTHERM2 4 3 2.22E+2
CTHERM3 3 2 1.48E+5
CTHERM4 2 1 3.12E+5

R THERM1 5 4 3.42E-2
R THERM2 4 3 2.55E-1
R THERM3 3 2 8.41E-2
R THERM4 2 1 1.81E-4

.ENDS 100bgq45T
    
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Data and specifications subject to change without notice.  
This product has been designed and qualified for Industrial Level.  
Qualification Standards can be found on IR's Web site.

International  
**IR** Rectifier

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