

International
IR Rectifier

100BGQ030
 100BGQ030J

SCHOTTKY RECTIFIER

100 Amp

Major Ratings and Characteristics

Characteristics	100BGQ030	Units
$I_{F(AV)}$ Rectangular waveform	100	A
@ T_C	110	°C
I_{DC} Maximum	141	A
V_{RRM}	30	V
I_{FSM} @ $t_p = 5 \mu s$ sine	4500	A
V_F @ 100Apk typical	0.48	V
@ T_J	150	°C
T_J range	-55 to 150	°C



Description/ Features

The 100BGQ030 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

100BGQ030	100BGQ030J
	

100BGQ030, 100BGQ030J

Bulletin PD-20996 rev. E 12/02



Voltage Ratings

Part number	100BGQ030
V _R Max. DC Reverse Voltage (V)	30
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 = 110°C, rectangular wave form
I _{F(RMS)} RMS Forward Current	141	A	T _C = 107°C
I _{FSM} Max. Peak One Cycle Non-Repetitive Surge Current	4500	A	5µs Sine or 3µs Rect. pulse
	850		10ms Sine or 6ms Rect. pulse
E _{AS} Non-Repetitive Avalanche Energy	36	mJ	T _J = 25°C, I _{AS} = 8 Amps, L = 1.12 mH
I _{AR} Repetitive Avalanche Current	8	A	Current decaying linearly to zero in 1µsec Frequency limited by T _J max. V _A = 1.5 x V _R typical

Electrical Specifications

Parameters	100BGQ		Units	Conditions	
	Typ.	Max.			
V _{FM} Forward Voltage Drop (1) (2)	0.46	0.48	V	@ 50A	T _J = 25°C
	0.55	0.58	V	@ 100A	
	0.35	0.37	V	@ 50A	T _J = 150°C
	0.48	0.51	V	@ 100A	
I _{RM} Reverse Leakage Current (1)	0.6	2.4	mA	T _J = 25°C	V _R = rated V _R
	260	460	mA	T _J = 125°C	
	80	160	mA	T _J = 125°C	V _R = 15V
	800	1100	mA	T _J = 150°C	V _R = 30V
V _{F(TO)} Threshold Voltage	0.252		V	T _J = T _J max.	
r _t Forward Slope Resistance	2.4		mΩ		
C _T Max. Junction Capacitance	3800		pF	V _R = 5V _{DC} , (test signal range 100Khz to 1Mhz) 25°C	
L _S Typical Series Inductance	3.5		nH	Measured from tab to mounting plane	
dv/dt Max. Voltage Rate of Change (Rated V _R)	10000		V/µs		

(1) Pulse Width < 300µs, Duty Cycle < 2%

(2) V_{FM} = V_{F(TO)} + r_t x I_F

Thermal-Mechanical Specifications

Parameters	100BGQ	Units	Conditions
T _J Max. Junction Temperature Range	-55 to 150	°C	
T _{stg} Max. Storage Temperature Range	-55 to 150	°C	
R _{thJC} Max. Thermal Resistance Junction to Case	0.50	°C/W	DC operation
R _{thCS} Typical Thermal Resistance, Case to Heatsink	0.20	°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™		

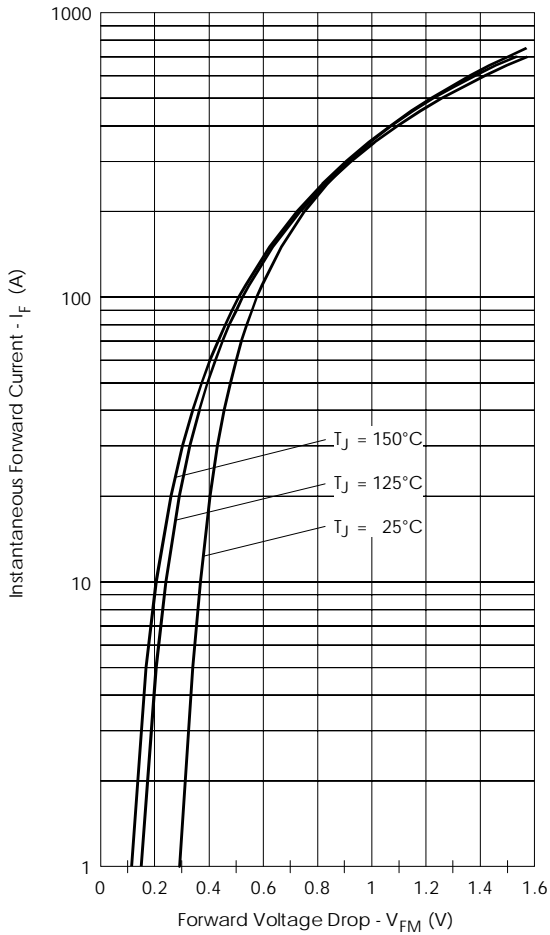


Fig. 1 - Maximum Forward Voltage Drop Characteristics

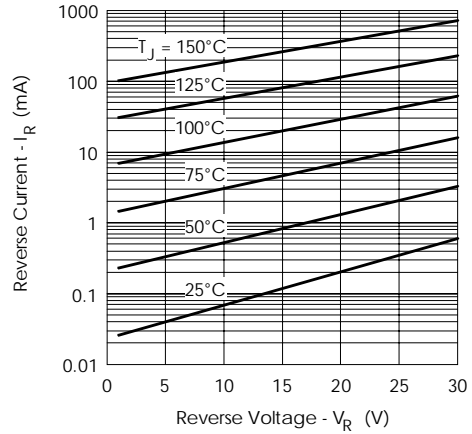


Fig. 2 - Typical Values of Reverse Current Vs. Reverse Voltage

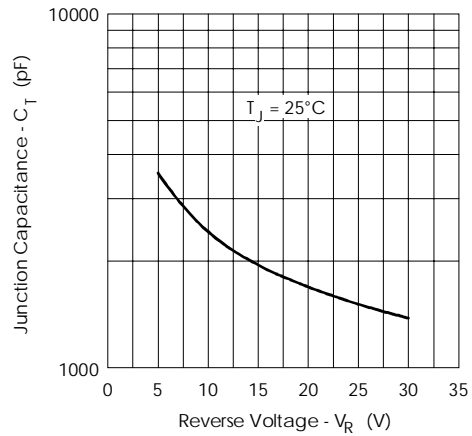


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage

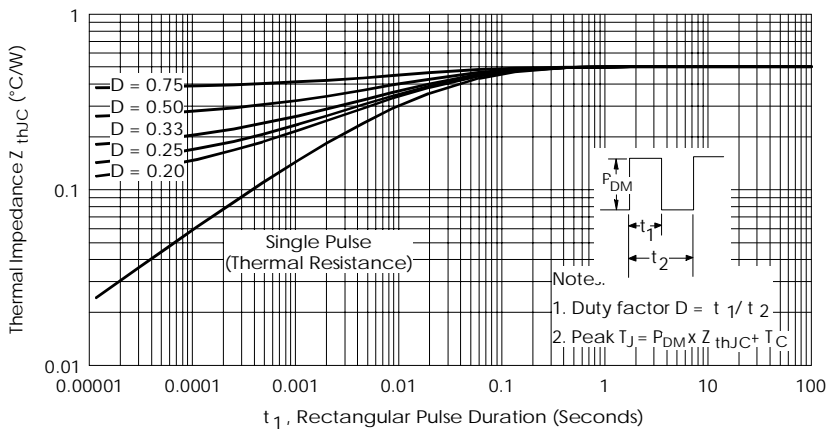


Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics

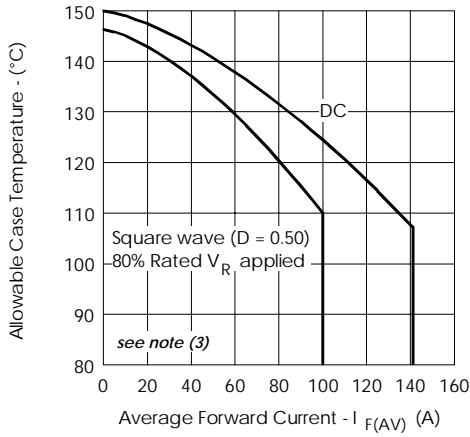


Fig.5- Maximum Allowable Case Temperature Vs. Average Forward Current

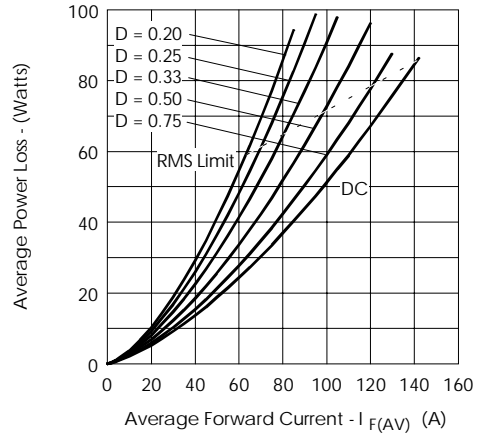


Fig.6- Forward Power Loss Characteristics

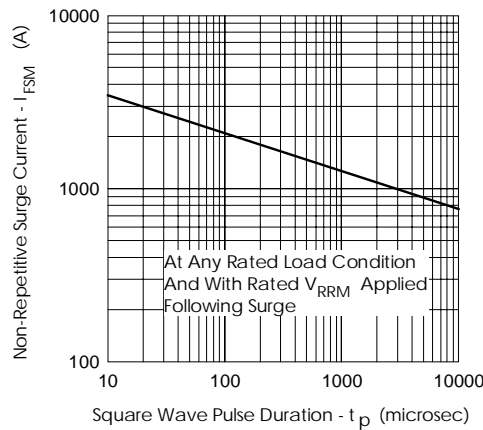


Fig.7- Maximum Non-Repetitive Surge Current

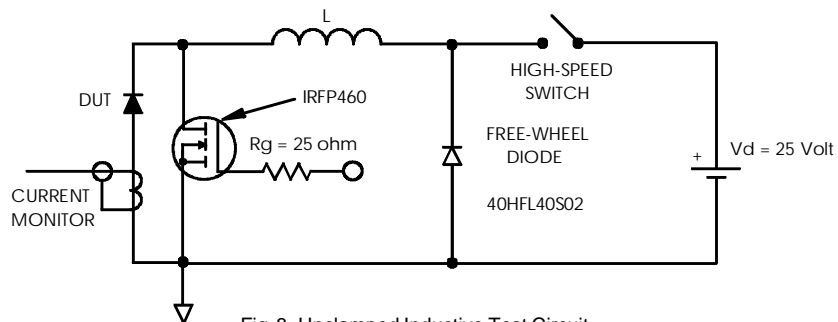


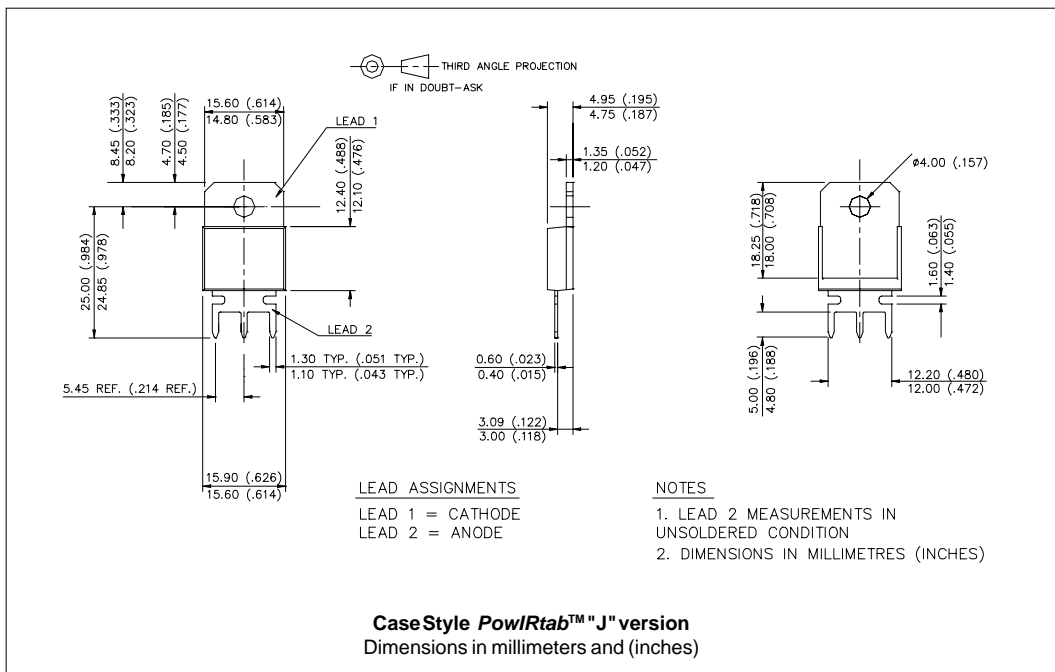
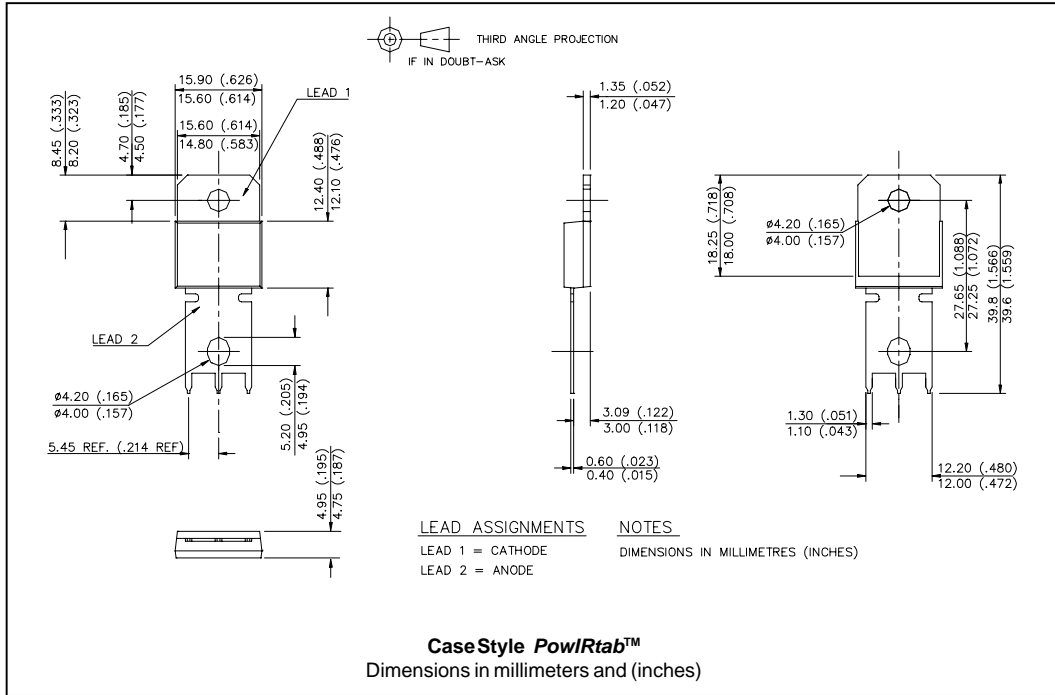
Fig.8- Unclamped Inductive Test Circuit

(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);

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

Outline Table



Ordering Information Table

Device Code			
100	BGQ	030	J
①	②	③	④
1	- Current Rating		
2	- Essential Part Number		
3	- Voltage code: Code = V_{RRM}		
4	- 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 100bgq30 ANO CAT
D1 ANO 1 DMOD (0.24359)
*Define diode model
.MODEL DMOD D(IS=1.07823961851333E-04A,N=1.0394338412755,BV=30V,
+IBV=0.125061622097042A,RS=0.000316667,CJO=2.88578786999339E-08,
+VJ=1.30385147429609,XTI=2,EG=0.697469117594151)
*****
*Implementation of VCG2T
VX 1 2 DC 0V
R1 2 CAT TRES 1E-6
.MODEL TRES RES(R=1,TC1=6.48759701319255)
GP1 ANO CAT VALUE={-ABS(I(VX))*(EXP(((((-2.690102E-03/
6.487597)*(V(2,CAT)*1E6)/(I(VX)+1E-6)-1))+1)*9.995116E-02*ABS(V(ANO,CAT))))-1)}

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.ENDS100bgq30

Thermal Model Subcircuit
.SUBCKT 100bgq30T 5 1
CTHERM1 5 4 3.02E+3
CTHERM2 4 3 4.96E+1
CTHERM3 3 2 3.84E+4
CTHERM4 2 1 3.02E+6

R THERM1 5 4 1.02E-1
R THERM2 4 3 3.83E-1
R THERM3 3 2 6.09E-2
R THERM4 2 1 1.00E-5

.ENDS 100bgq30T
    
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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
IOR Rectifier

IR WORLD HEADQUARTERS: 233 Kansas St., El Segundo, California 90245, USA Tel: (310) 252-7105

TAC Fax: (310) 252-7309

Visit us at www.irf.com for sales contact information. 12/02