

International  
**IR** Rectifier

100BGQ030  
 100BGQ030J

SCHOTTKY RECTIFIER

100 Amp

#### Major Ratings and Characteristics

Characteristics	100BGQ030	Units
$I_{F(AV)}$ Rectangular waveform	100	A
$\bar{\quad}$ @ $T_C$	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
$\bar{\quad}$ @ $T_J$	150	°C
$T_J$ range	-55 to 150	°C

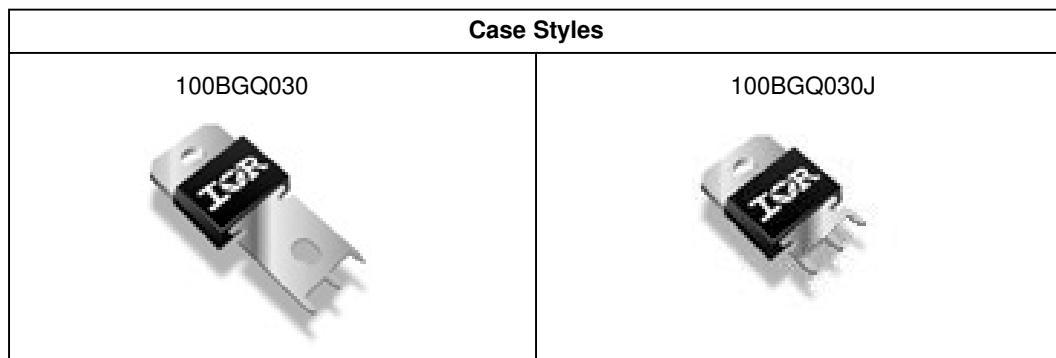
#### Description/ Features

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

Bulletin PD-20996 rev. E 12/02



Voltage Ratings

Part number	100BGQ030
V <sub>R</sub> Max. DC Reverse Voltage (V)	30
V <sub>RWM</sub> Max. Working Peak Reverse Voltage (V)	

Absolute Maximum Ratings

Parameters	100BGQ	Units	Conditions
I <sub>F(AV)</sub> Max. Average Forward Current	100	A	50% duty cycle @ T <sub>C</sub> = 110°C, rectangular wave form
I <sub>F(RMS)</sub> RMS Forward Current	141	A	T <sub>C</sub> = 107°C
I <sub>FSM</sub> Max. Peak One Cycle Non-Repetitive Surge Current	4500	A	5µs Sine or 3µs Rect. pulse
	850		10ms Sine or 6ms Rect. pulse
E <sub>AS</sub> Non-Repetitive Avalanche Energy	36	mJ	T <sub>J</sub> = 25°C, I <sub>AS</sub> = 8 Amps, L = 1.12 mH
I <sub>AR</sub> Repetitive Avalanche Current	8	A	Current decaying linearly to zero in 1µsec Frequency limited by T <sub>J</sub> max. V <sub>A</sub> = 1.5 x V <sub>R</sub> typical

Electrical Specifications

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

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

(2) V<sub>FM</sub> = V<sub>F(TO)</sub> + r<sub>t</sub> x I<sub>F</sub>

Thermal-Mechanical Specifications

Parameters	100BGQ	Units	Conditions
T <sub>J</sub> Max. Junction Temperature Range	-55 to 150	°C	
T <sub>stg</sub> Max. Storage Temperature Range	-55 to 150	°C	
R <sub>thJC</sub> Max. Thermal Resistance Junction to Case	0.50	°C/W	DC operation
R <sub>thCS</sub> 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™		

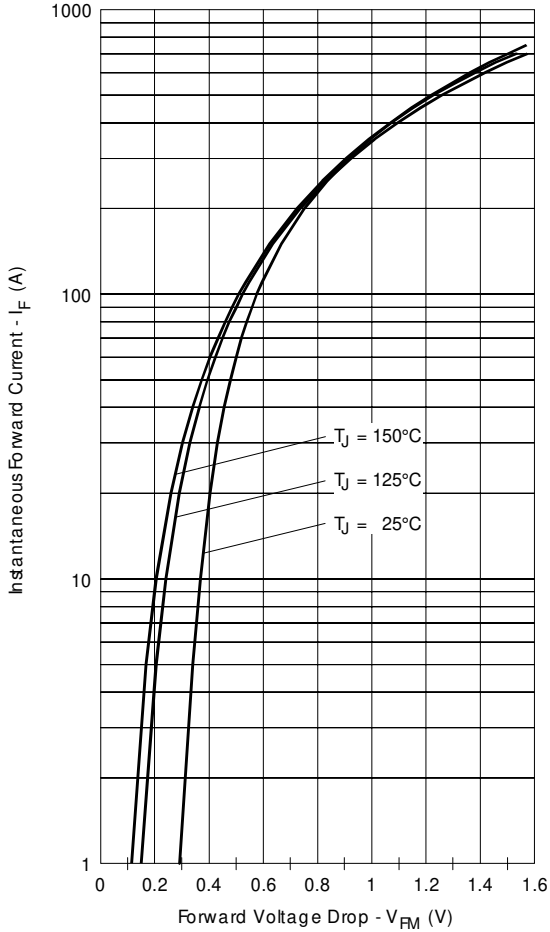


Fig. 1 - Maximum Forward Voltage Drop Characteristics

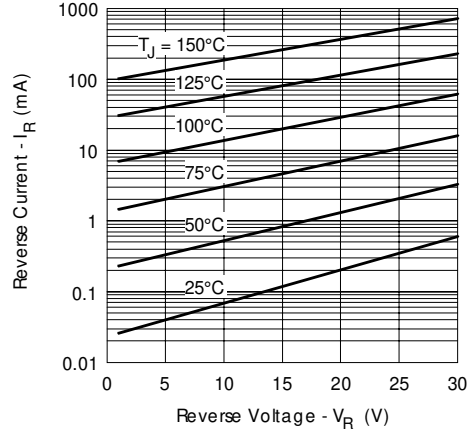


Fig. 2 - Typical Values of Reverse Current Vs. Reverse Voltage

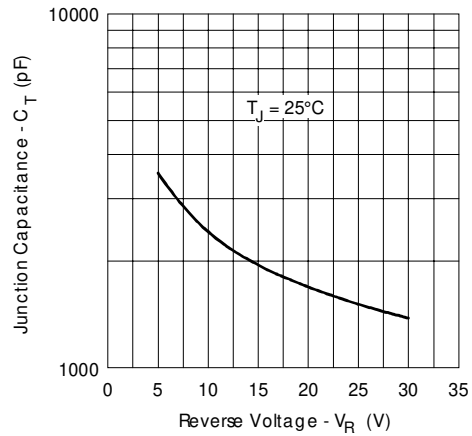


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage

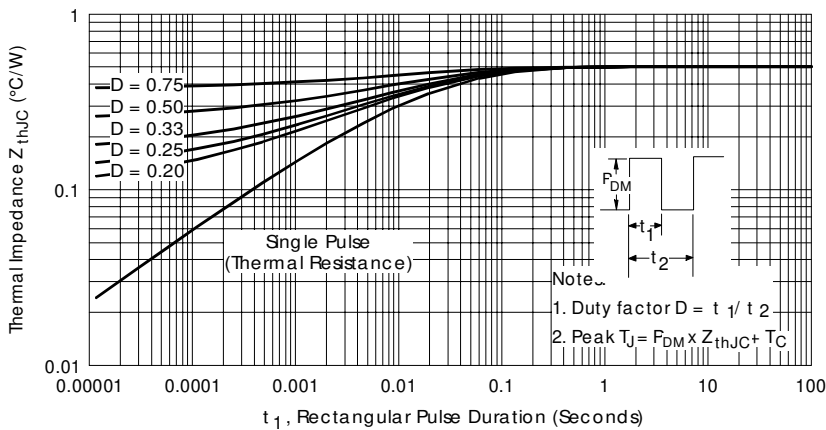


Fig. 4 - Maximum Thermal Impedance  $Z_{thJC}$  Characteristics

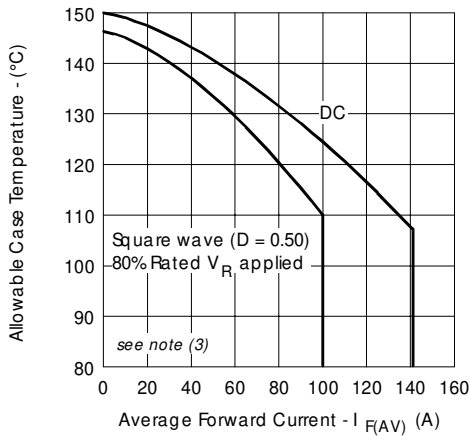


Fig.5- Maximum Allowable Case Temperature Vs. Average Forward Current

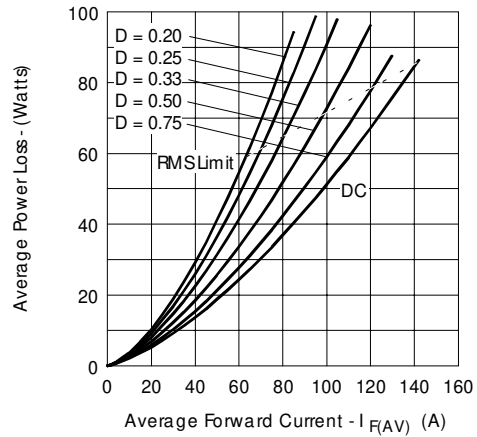


Fig.6- Forward Power Loss Characteristics

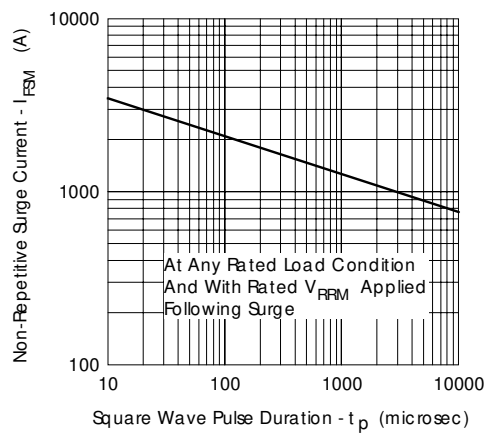


Fig.7- Maximum Non-Repetitive Surge Current

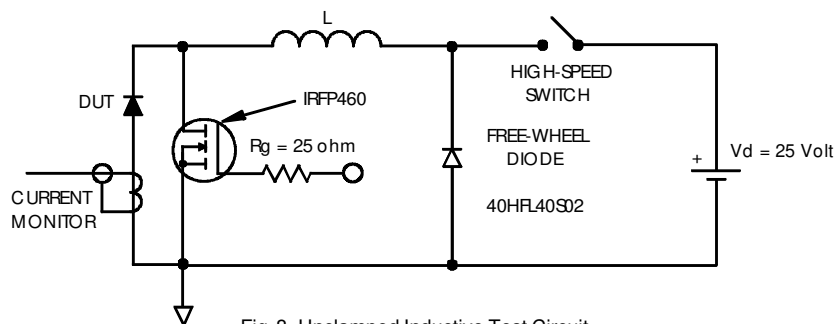


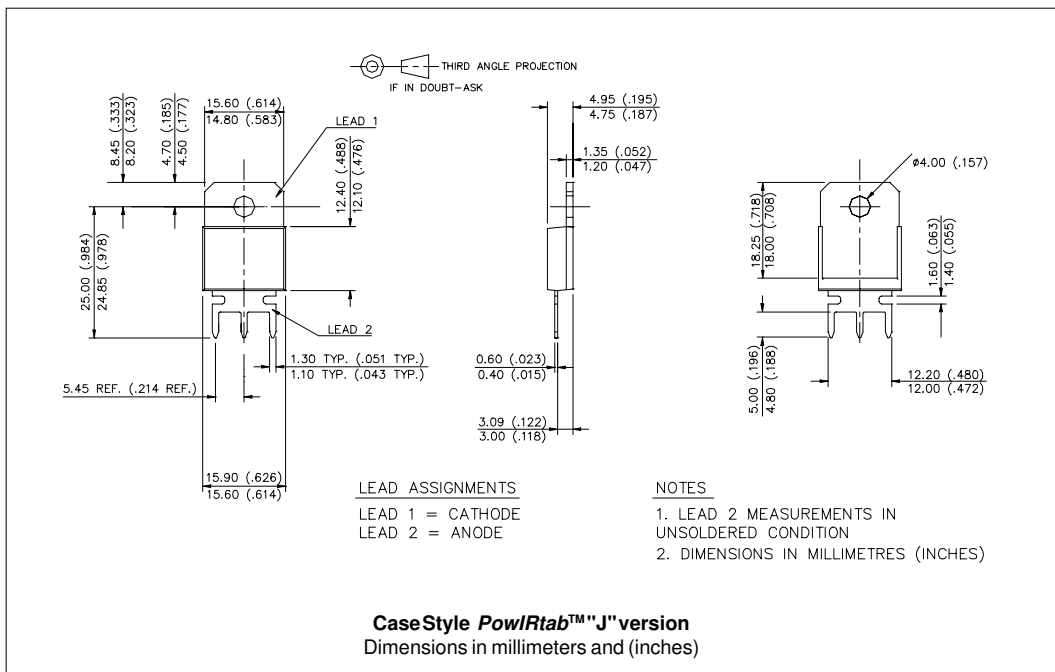
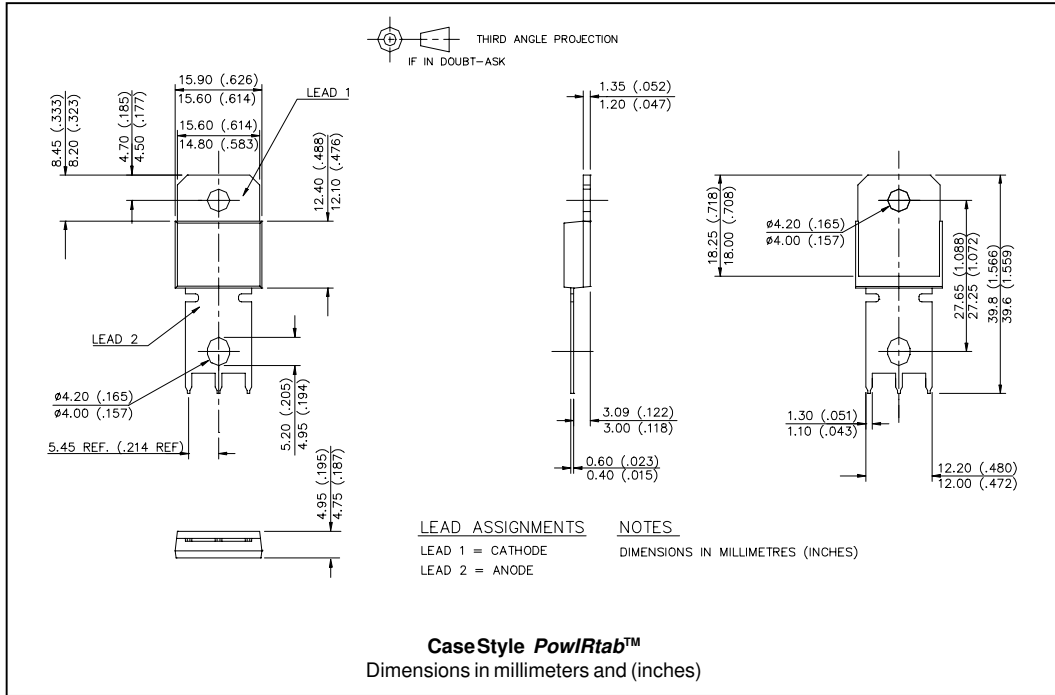
Fig.8- Unclamped Inductive Test Circuit

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

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

$P_{d_{REV}}$  = 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 030 J
1	2 3 4
■	- Current Rating
2	- Essential Part Number
3	- Voltage code: Code = $V_{RRM}$
4	- none = PowIRtab™ standard
6	J = Short Lead Version

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*****
This model has been developed by This model
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)}
*****
.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

RTHERM1 5 4 1.02E-1
RTHERM2 4 3 3.83E-1
RTHERM3 3 2 6.09E-2
RTHERM4 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

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