

Bulletin PD-20996 rev. E 12/02

International
IR Rectifier

100BGQ030
100BGQ030J

SCHOTTKY RECTIFIER

100 Amp

Major Ratings and Characteristics

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

Case Styles	
100BGQ030 	100BGQ030J 



100BGQ030, 100BGQ030J

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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 @ $T_C = 110^\circ\text{C}$, rectangular waveform
$I_{F(RMS)}$ RMS Forward Current	141	A	$T_C = 107^\circ\text{C}$
I_{FSM} Max. Peak One Cycle Non-Repetitive Surge Current	4500	A	5 μs Sine or 3 μs Rect. pulse
	850		10ms Sine or 6ms Rect. pulse
E_{AS} Non-Repetitive Avalanche Energy	36	mJ	Following any rated load condition and with rated V_{RWM} applied
I_{AR} Repetitive Avalanche Current	8	A	$T_J = 25^\circ\text{C}$, $I_{AS} = 8\text{ Amps}$, $L = 1.12\text{ mH}$ Current decaying linearly to zero in 1 μsec 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)	0.46	0.48	V	@ 50A	$T_J = 25^\circ\text{C}$
	0.55	0.58	V	@ 100A	
	0.35	0.37	V	@ 50A	$T_J = 150^\circ\text{C}$
	0.48	0.51	V	@ 100A	
I_{RM} Reverse Leakage Current (1)	0.6	2.4	mA	$T_J = 25^\circ\text{C}$	$V_R = \text{rated } V_R$
	260	460	mA	$T_J = 125^\circ\text{C}$	
	80	160	mA	$T_J = 125^\circ\text{C}$	$V_R = 15\text{V}$
	800	1100	mA	$T_J = 150^\circ\text{C}$	$V_R = 30\text{V}$
$V_{F(TO)}$ Threshold Voltage	0.252		V	$T_J = T_J \text{ max.}$	
r_t Forward Slope Resistance	2.4		m Ω		
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 < 300 μs , 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	-55to150	°C	
T _{stg}	Max. Storage Temperature Range	-55to150	°C	
R _{thJC}	Max. Thermal Resistance Junction to Case	0.50	°C/W	DCoperation
R _{thCS}	Typical Thermal Resistance, Case to Heatsink	0.20	°C/W	Mountingsurface, smoothandgreased
wt	ApproximateWeight	5(0.18)	g(oz.)	
T	MountingTorque	Min.	1.2(10)	N*m (lbf-in)
		Max.	2.4(20)	
Case Style		PowIRtab™		

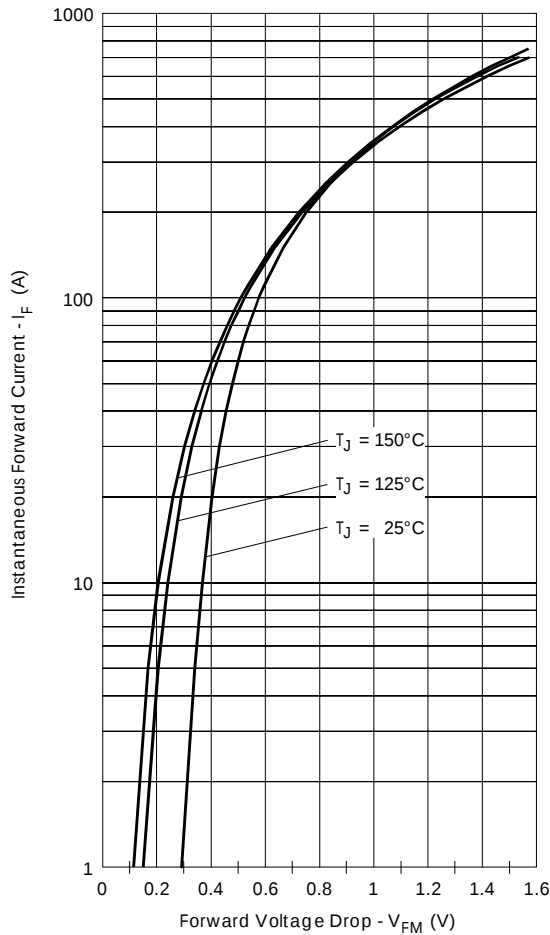


Fig. 1 - Maximum Forward Voltage Drop Characteristics

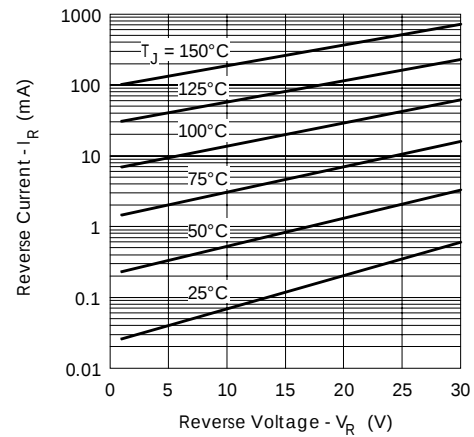


Fig. 2 - Typical Values of Reverse Current Vs. Reverse Voltage

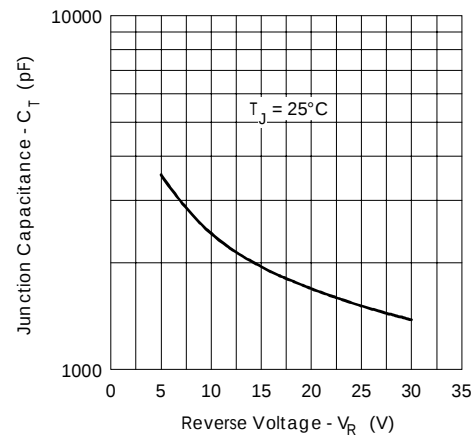


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage

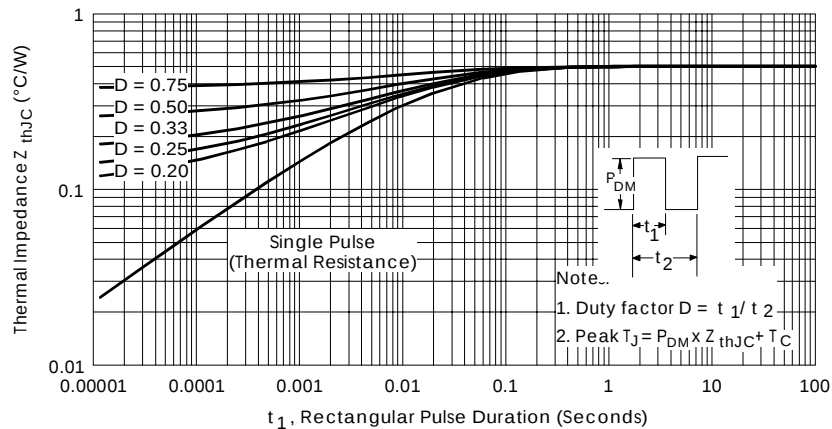


Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics

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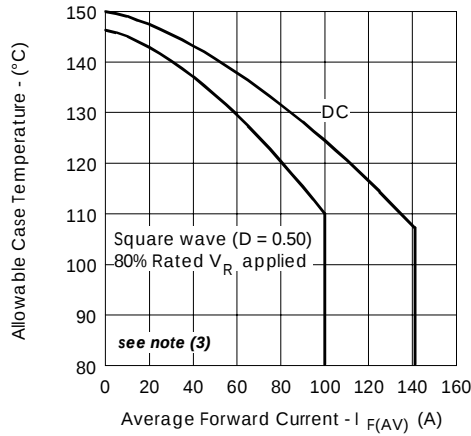


Fig. 5 - Maximum Allowable Case Temperature Vs. Average Forward Current

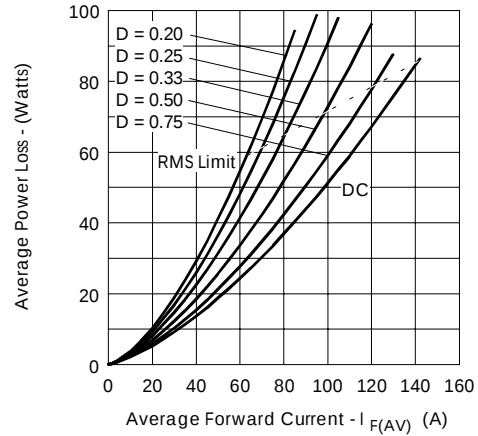


Fig. 6 - Forward Power Loss Characteristics

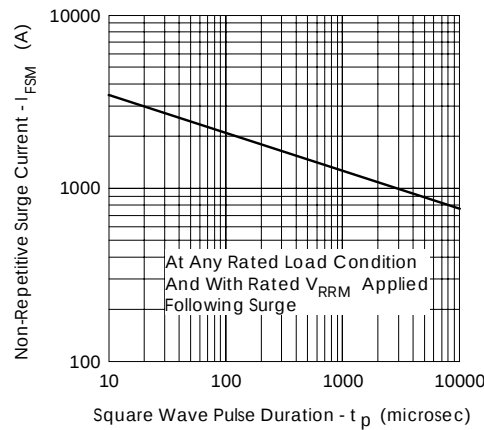


Fig. 7 - Maximum Non-Repetitive Surge Current

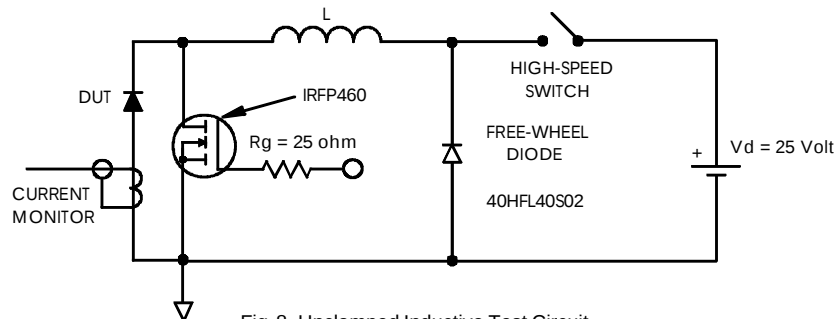


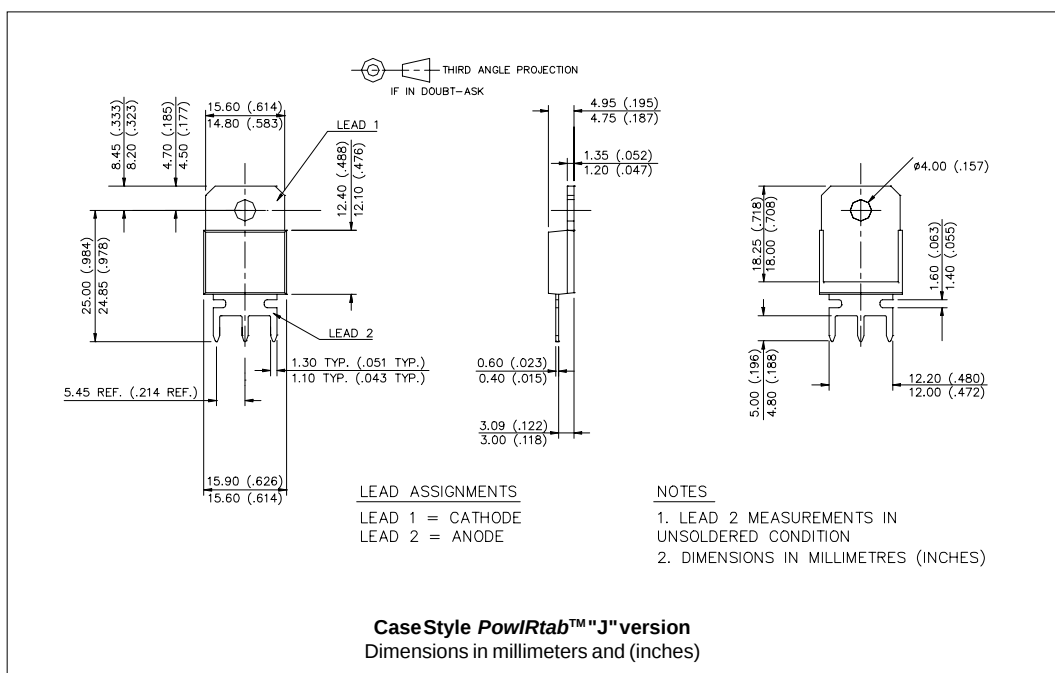
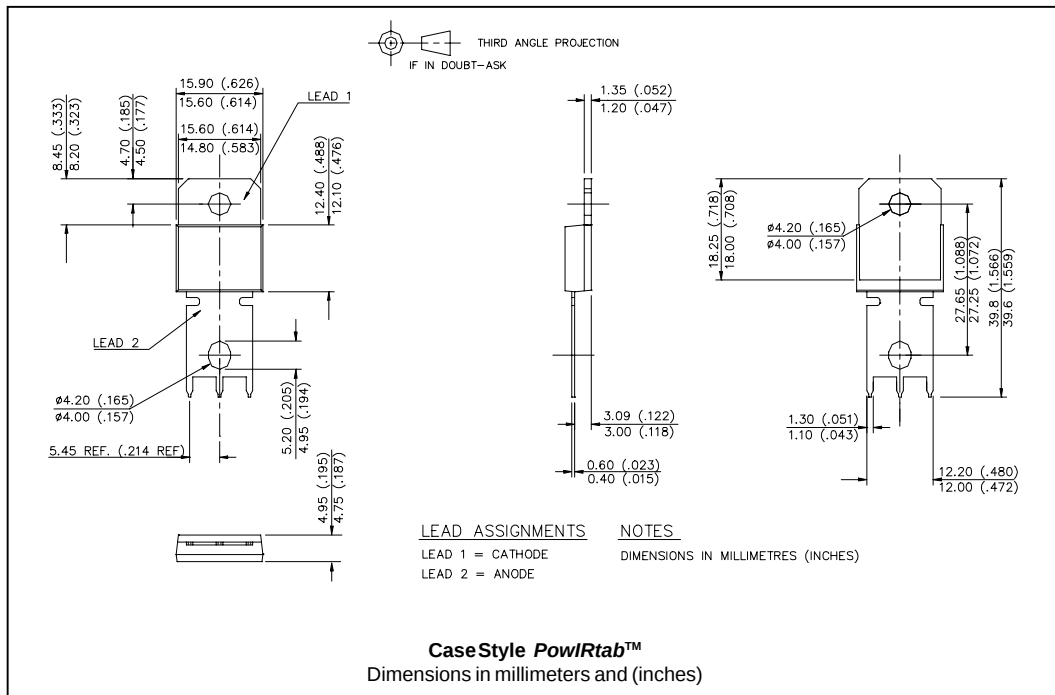
Fig. 8 - Unclamped Inductive Test Circuit

(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
1	-	Current Rating	
2	-	Essential Part Number	
3	-	Voltage code: Code = V_{RRM}	
4	-	none = PowIRtab™ standard	
	J	= Short Lead Version	

 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 paralalled 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

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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
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.ENDS100bgq30T

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.

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