Preliminary Data Sheet PD-20999 rev. A 10/99

International
IOR Rectifier

100BGQ100
100BGQ100J

SCHOTTKY RECTIFIER

100 Amp

Major Ratings and Characteristics

Characteristics		Values	Units
$I_{F(AV)}$	Rectangular waveform	100	A
	@ T_C	129	°C
I_{DC}	Maximum	141	A
V_{RRM}		100	V
I_{FSM}	@ tp = 5 µs sine	6300	A
V_F	@ 100 Apk typical	0.74	V
	@ T_J	125	°C
T_J	range	-55 to 175	°C

Description/Features

This NEW Schottky rectifier has been optimized for low reverse leakage at high temperature
The proprietary barrier technology allows for reliable operation up to 175°C junction temperature. Typical applications are in switching power supplies, converters, reverse battery protection, and redundant power subsystems.

- 175°C T_J operation
- High Frequency Operation
- Low forward voltage drop
- Continuous High Current operation
- Guard ring for enhanced ruggedness and long term reliability
- ***PowIRtab™ package***

Case Styles	
100BGQ100	100BGQ100J
	

Voltage Ratings

	Part number	100BGQ100, 100BGQ100J
V_R	Max. DC Reverse Voltage (V)	100
V_{RWM}	Max. Working Peak Reverse Voltage (V)	

Absolute Maximum Ratings

	Parameters	Values	Units	Conditions	
$I_{F(AV)}$	Max. Average Forward Current	100	A	50% duty cycle @ T_C = 129°C, rectangular wave form	
$I_{F(RMS)}$	RMS Forward Current	141	A	T_C = 120°C	
I_{FSM}	Max. Peak One Cycle Non-Repetitive Surge Current	6300	A	5µs Sine or 3µs Rect. pulse	Following any rated load condition and with rated V_{RRM} applied
		800		10ms Sine or 6ms Rect. pulse	
E_{AS}	Non-Repetitive Avalanche Energy	9	mJ	T_J = 25 °C, I_{AS} = 2 Amps, L = 4.5 mH	
I_{AR}	Repetitive Avalanche Current	2	A	Current decaying linearly to zero in 1 µsec Frequency limited by T_J max. V_A = 1.5 x V_R typical	

Electrical Specifications

	Parameters	Values Typ.	Values Max.	Units	Conditions	
V_{FM}	Forward Voltage Drop (1) (2)	0.80	0.84	V	@ 50A	T_J = 25 °C
		0.96	1.04	V	@ 100A	
		0.64	0.66	V	@ 50A	T_J = 125 °C
		0.74	0.77	V	@ 100A	
I_{RM}	Reverse Leakage Current (1)	22	300	µA	T_J = 25 °C	V_R = rated V_R
		14	18	mA	T_J = 125°C	
$V_{F(TO)}$	Threshold Voltage	0.484		V	T_J = T_J max.	
r_t	Forward Slope Resistance	2.0		mΩ		
C_T	Max. Junction Capacitance	1320		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)	10,000		V/ µs		

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

Thermal-Mechanical Specifications

	Parameters		Values	Units	Conditions
T_J	Max. Junction Temperature Range		-55 to 175	°C	
T_{stg}	Max. Storage Temperature Range		-55 to 175	°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*™		

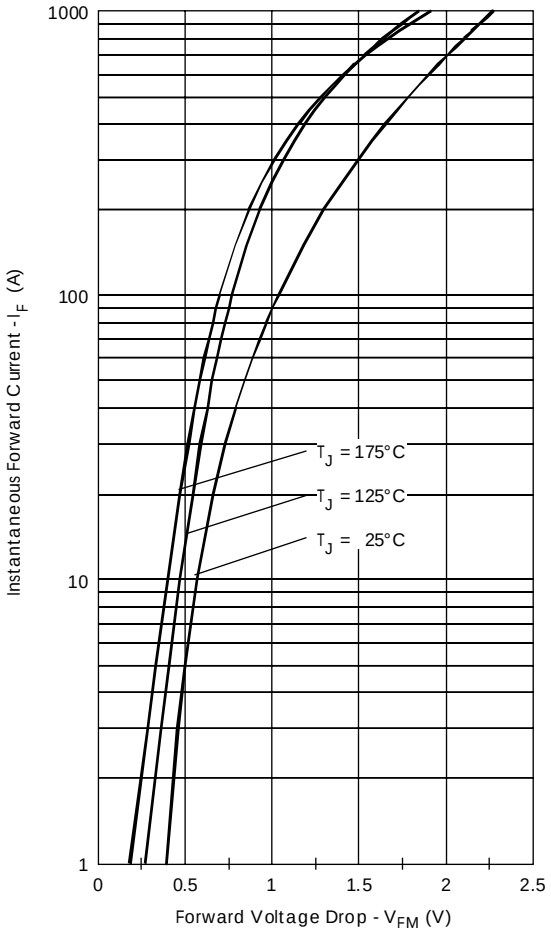


Fig. 1 - Maximum Forward Voltage Drop Characteristics

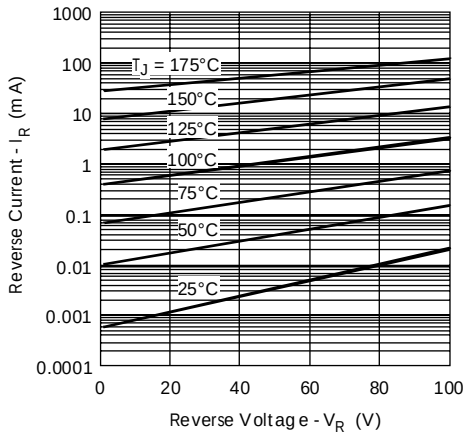


Fig. 2 - Typical Values of Reverse Current Vs. Reverse Voltage

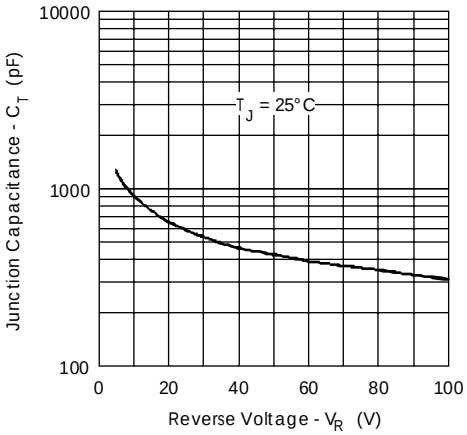


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage

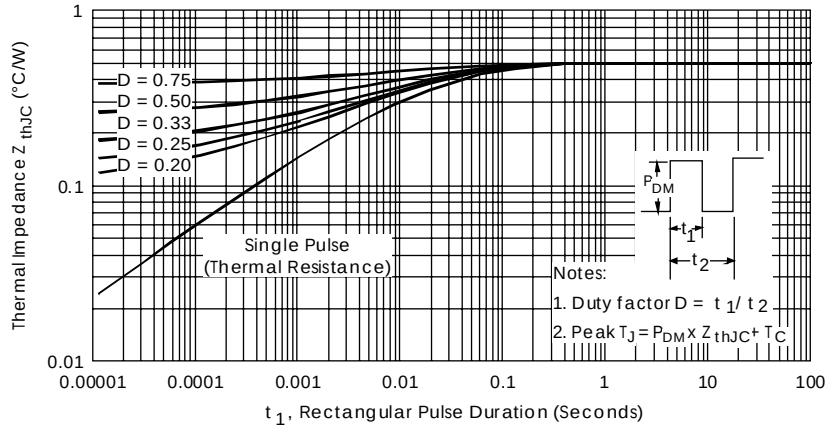


Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics

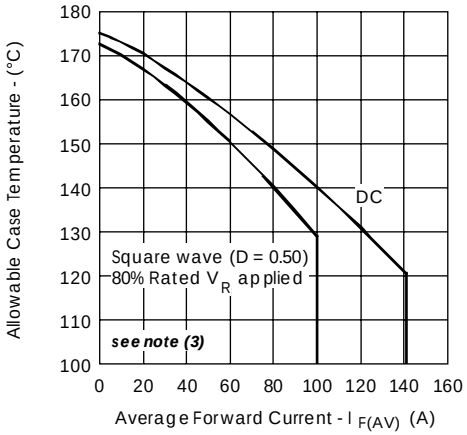


Fig. 5 - Maximum Allowable Case Temperature Vs. Average Forward Current

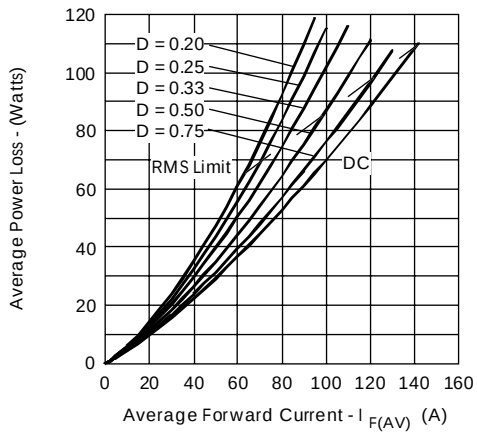


Fig. 6 - Forward Power Loss Characteristics

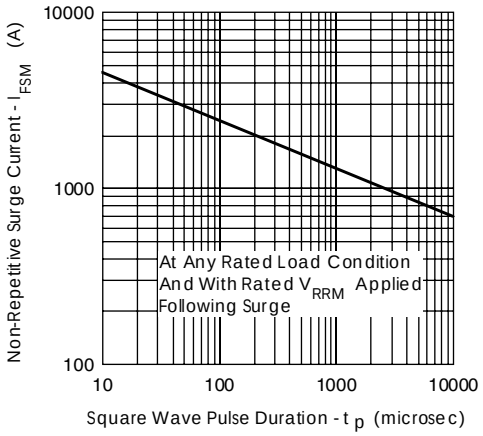


Fig. 7 - Maximum Non-Repetitive Surge Current

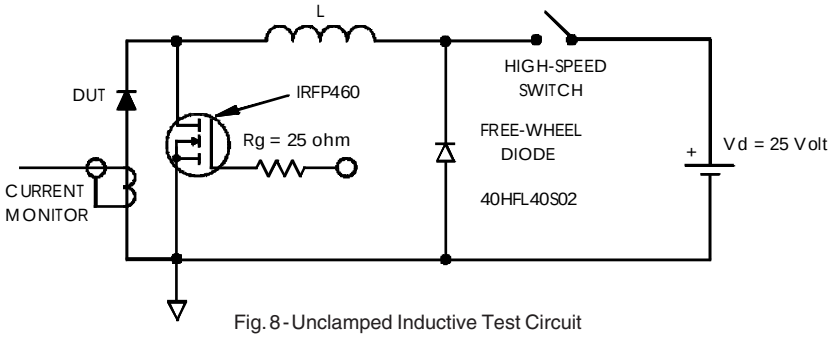
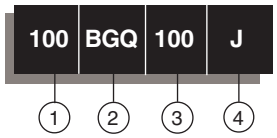


Fig. 8 - Unclamped Inductive Test Circuit

(3) Formula used: $T_C = T_J - (Pd + Pd_{REV}) \times R_{thJC}$;
Pd = Forward Power Loss = $I_{F(AV)} \times V_{FM}$ @ ($I_{F(AV)}$ / D) (see Fig. 6);
Pd_{REV} = Inverse Power Loss = $V_{R1} \times I_R (1 - D)$; I_R @ V_{R1} = 80% rated V_R

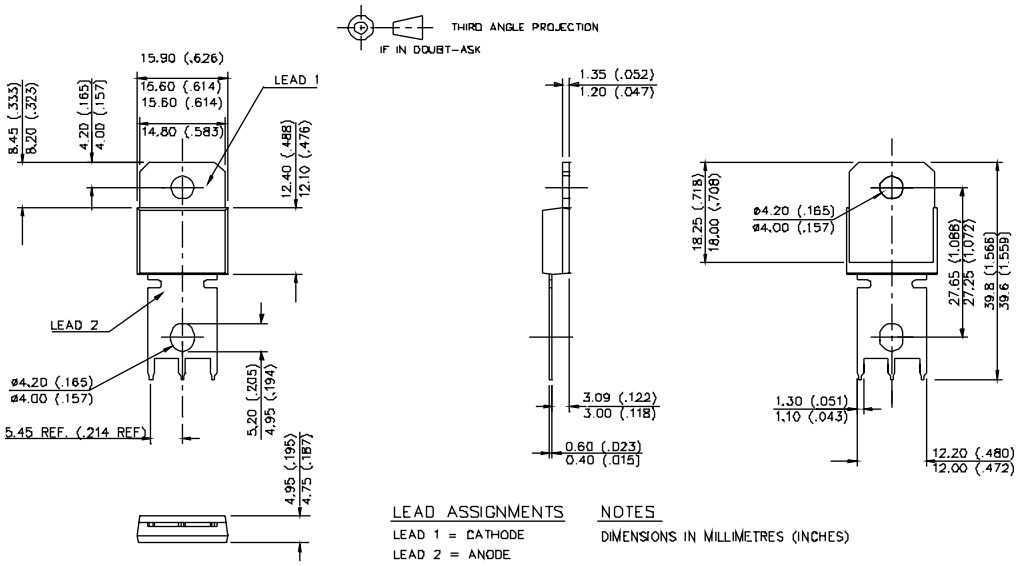
Ordering Information Table

Device Code



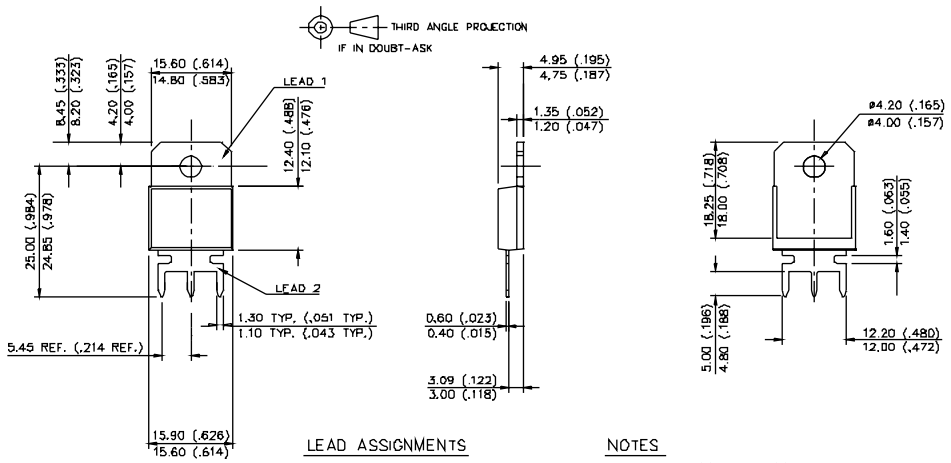
1	-	Current Rating
2	-	Essential Part Number
3	-	Voltage code: Code = V_{RRM}
4	-	none = PowIRtab™ standard
		J = Short Lead Version

Outline Table



Case Style *PowIRtab*™
Dimensions in millimeters

Outline Table



Dimensions in millimeters

International
IOR Rectifier

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