

$$I_{F(AV)} = 3.0\text{Amp}$$

$$V_R = 100\text{V}$$

**Major Ratings and Characteristics**

Characteristics	Values	Units
$I_{F(AV)}$ Rectangular waveform	3.0	A
$V_{RRM}$	100	V
$I_{FSM}$ @ $t_p=5\mu\text{s}$ sine	800	A
$V_F$ @3.0Apk, $T_J=125^\circ\text{C}$	0.62	V
$T_J$ range	- 55 to 175	$^\circ\text{C}$

**Description/ Features**

The 30BQ100PbF surface-mount Schottky rectifier has been designed for applications requiring low forward drop and small foot prints on PC boards. Typical applications are in disk drives, switching power supplies, converters, free-wheeling diodes, battery charging, and reverse battery protection.

- Small foot print, surface mountable
- Very low forward voltage drop
- High frequency operation
- Guard ring for enhanced ruggedness and long term reliability
- Lead-Free ("PbF" suffix)

**Case Styles**



SMC

## Voltage Ratings

Part number	30BQ100PbF
V <sub>R</sub> Max. DC Reverse Voltage (V)	100
V <sub>RWM</sub> Max. Working Peak Reverse Voltage (V)	

## Absolute Maximum Ratings

Parameters	30BQ	Units	Conditions
I <sub>F(AV)</sub> Max. Average Forward Current	3.0	A	50% duty cycle @ T <sub>L</sub> = 148 °C, rectangular wave form
	4.0		50% duty cycle @ T <sub>L</sub> = 138 °C, rectangular wave form
I <sub>FSM</sub> Max. Peak One Cycle Non-Repetitive Surge Current	800	A	5µs Sine or 3µs Rect. pulse
	70		10ms Sine or 6ms Rect. pulse
E <sub>AS</sub> Non Repetitive Avalanche Energy	3.0	mJ	T <sub>J</sub> = 25 °C, I <sub>AS</sub> = 1.0A, L = 6mH
I <sub>AR</sub> Repetitive Avalanche Current	0.5	A	Current decaying linearly to zero in 1 µsec Frequency limited by T <sub>J</sub> max. Va = 1.5 x Vr typical

## Electrical Specifications

Parameters	30BQ	Units	Conditions
V <sub>FM</sub> Max. Forward Voltage Drop (1)	0.79	V	@ 3A T <sub>J</sub> = 25 °C
	0.90	V	@ 6A
	0.62	V	@ 3A T <sub>J</sub> = 125 °C
	0.70	V	@ 6A
I <sub>RM</sub> Max. Reverse Leakage Current (1)	0.5	mA	T <sub>J</sub> = 25 °C V <sub>R</sub> = rated V <sub>R</sub>
	5.0	mA	T <sub>J</sub> = 125 °C
C <sub>T</sub> Max. Junction Capacitance	115	pF	V <sub>R</sub> = 5V <sub>DC</sub> (test signal range 100KHz to 1Mhz) 25°C
L <sub>S</sub> Typical Series Inductance	3.0	nH	Measured lead to lead 5mm from package body
dv/dt Max. Voltage Rate of Change	10000	V/µs	(Rated V <sub>R</sub> )

(1) Pulse Width &lt; 300µs, Duty Cycle &lt; 2%

## Thermal-Mechanical Specifications

Parameters	30BQ	Units	Conditions
T <sub>J</sub> Max. Junction Temperature Range (*)	-55 to 175	°C	
T <sub>stg</sub> Max. Storage Temperature Range	-55 to 175	°C	
R <sub>thJL</sub> Max. Thermal Resistance Junction to Lead (**)	12	°C/W	DC operation
R <sub>thJA</sub> Max. Thermal Resistance Junction to Ambient	46	°C/W	DC operation
wt Approximate Weight	0.24 (0.008)	g (oz.)	
Case Style	SMC		Similar to DO-214AB
Device Marking	IR3J		

(\*)  $\frac{dP_{tot}}{dT_J} < \frac{1}{R_{th(j-a)}}$  thermal runaway condition for a diode on its own heatsink

(\*\*) Mounted 1 inch square PCB

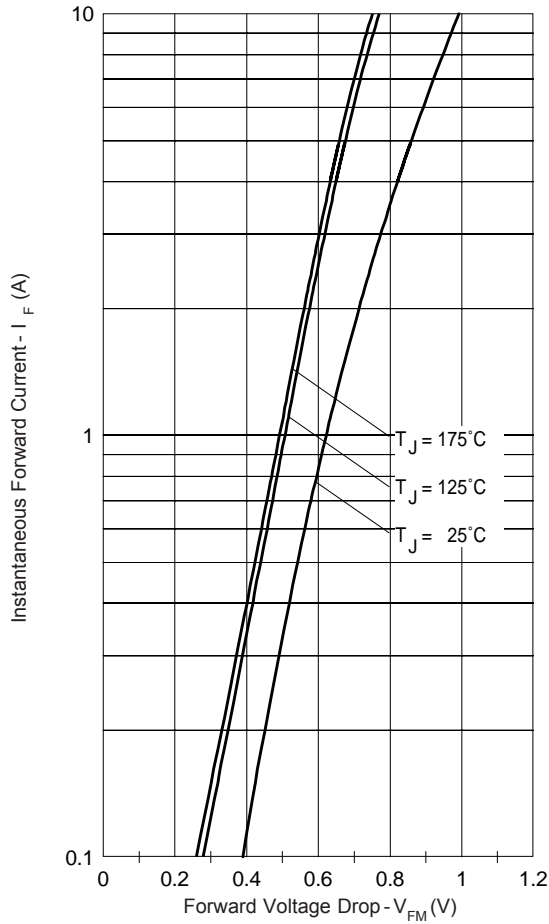


Fig. 1 - Max. Forward Voltage Drop Characteristics (Per Leg)

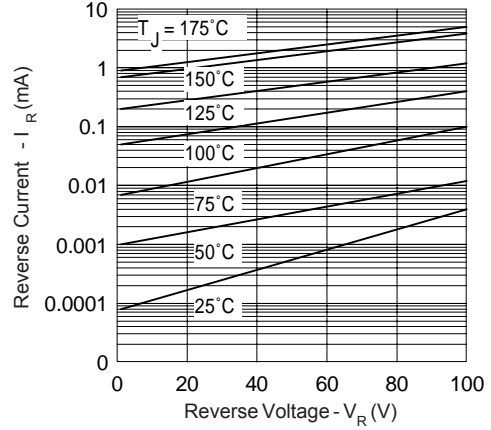


Fig. 2 - Typical Values Of Reverse Current Vs. Reverse Voltage (Per Leg)

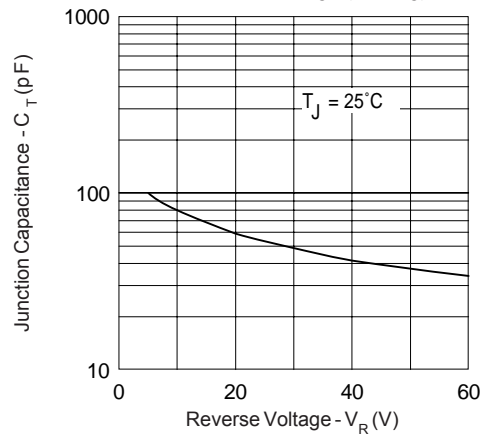


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage (Per Leg)

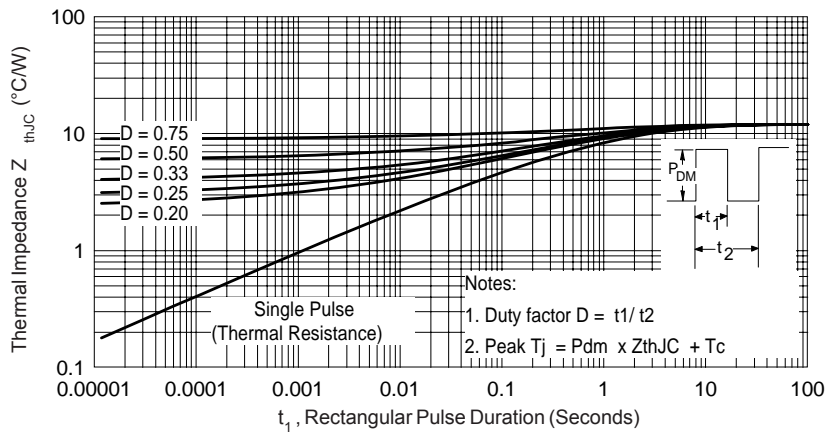


Fig. 4 - Max. Thermal Impedance  $Z_{thJC}$  Characteristics (Per Leg)

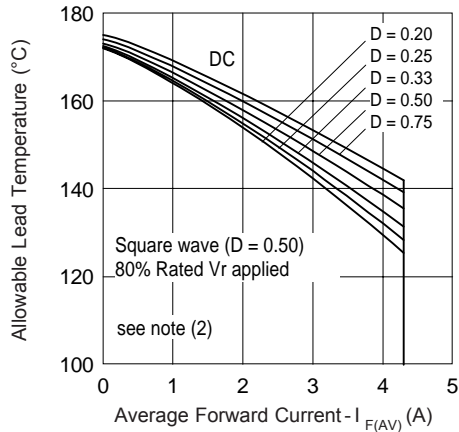


Fig. 4 - Maximum Average Forward Current Vs. Allowable Lead Temperature

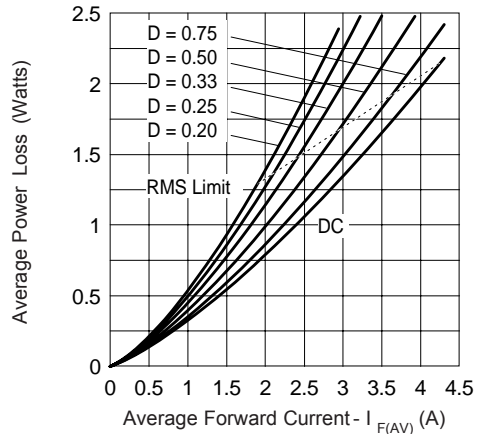


Fig. 5 - Maximum Average Forward Dissipation Vs. Average Forward Current

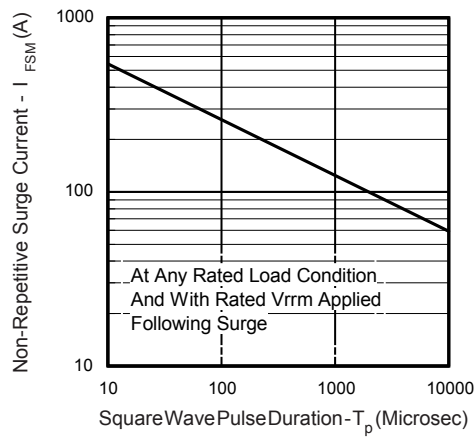
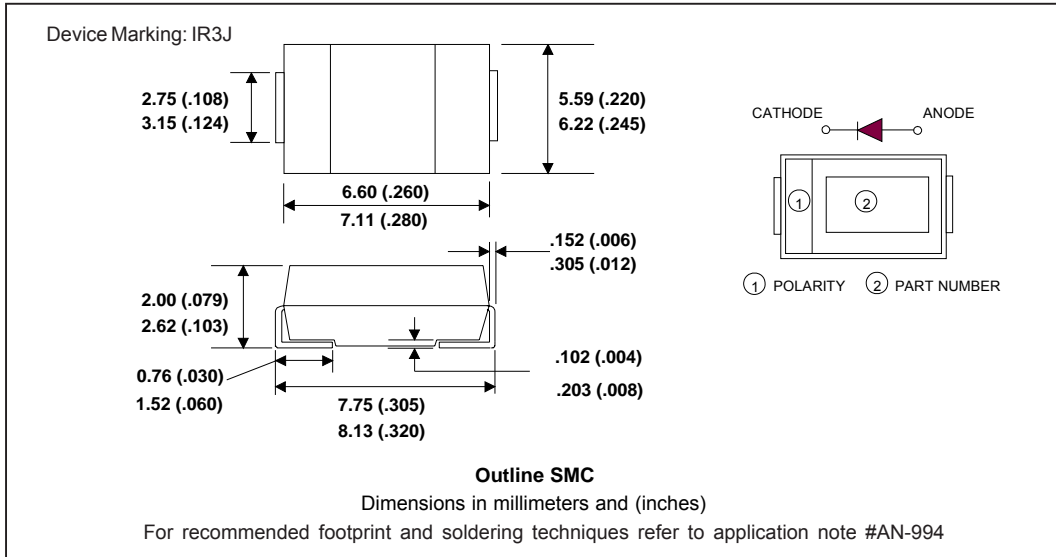


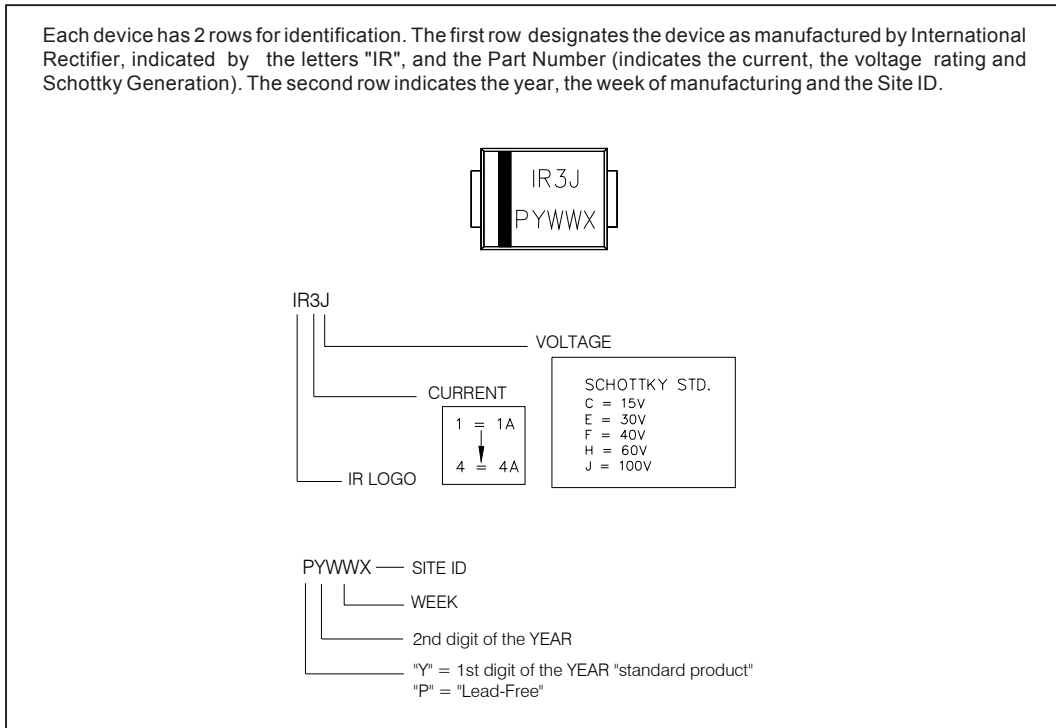
Fig. 6 - Maximum Peak Surge Forward Current Vs. Pulse Duration

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

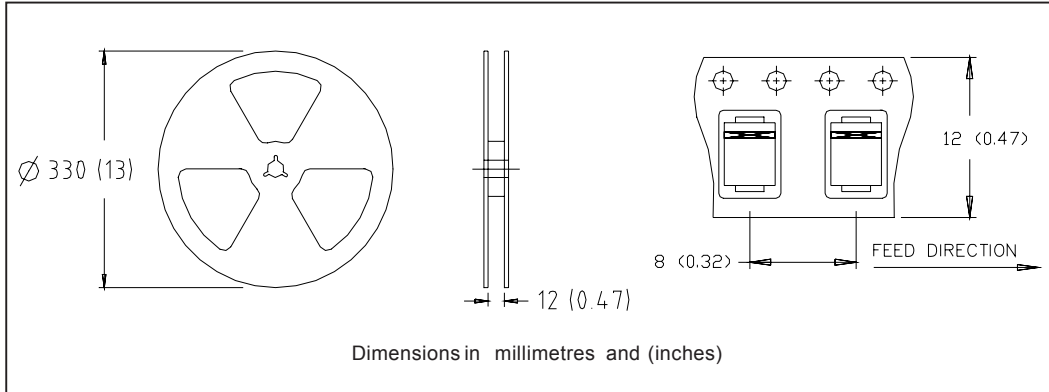
Outline Table



Marking & Identification



Tape & Reel Information



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30BQ100
*****
* SPICE Model Diode *
*****
.SUBCKT 30BQ100 ANO CAT
D1 ANO 1 CAT
*Define diode model
.MODEL DMOD D (IS=100N, N=1.34718, BV=120, RS=40.3878M, CJO=158.574P, VJ=3.61795,
M=526.488M, EG=1.11, XTI=2, RL=25.6436MEG).

*****

.ENDS 30BQ100

Thermal Model Subcircuit
.SUBCKT 30BQ100 5 1

CTHERM1      5      4      6.42E-01
CTHERM2      4      3      1.03E+01
CTHERM3      3      2      1.66E+02
CTHERM4      2      1      6.78E+03

R THERM1      5      4      3.34E+00
R THERM2      4      3      4.97E+00
R THERM1      3      2      2.84E+00
R THERM1      2      1      7.75E-01

.ENDS 30BQ100
    
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Ordering Information Table

Device Code													
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30	B	Q	100	TR	PbF								
①	②	③	④	⑤	⑥								
<b>1</b>	- Current Rating												
<b>2</b>	- B = Single Lead Diode												
<b>3</b>	- Q = Schottky Q Series												
<b>4</b>	- Voltage Rating (100 = 100V)												
<b>5</b>	- <ul style="list-style-type: none"> <li>• none = Box (1000 pieces)</li> <li>• TR = Tape &amp; Reel (3000 pieces)</li> </ul>												
<b>6</b>	- <ul style="list-style-type: none"> <li>• none = Standard Production</li> <li>• PbF = Lead-Free</li> </ul>												

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