

International  
**IR** Rectifier

# 30BQ060PbF

## SCHOTTKY RECTIFIER

## 3 Amp

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

$$V_R = 60\text{V}$$

### Major Ratings and Characteristics

Characteristics	Value	Units
$I_{F(AV)}$ Rectangular waveform	3.0	A
$V_{RRM}$	60	V
$I_{FSM}$ @ $t_p = 5\mu\text{s}$ sine	1200	A
$V_F$ @ 3.0A pk, $T_J = 125^\circ\text{C}$	0.52	V
$T_J$ range	- 55 to 150	$^\circ\text{C}$

### Description/ Features

The 30BQ060PbF 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.

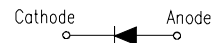
- Small foot print, surface mountable
- Very low forward voltage drop
- High frequency operation
- Guard ring for enhanced ruggedness and long term reliability
- Lead-Free ("PbF" suffix)

### Case Styles

30BQ060PbF



SMC



## Voltage Ratings

Part number	30BQ060PbF
$V_R$ Max. DC Reverse Voltage (V)	60
$V_{RWM}$ Max. Working Peak Reverse Voltage (V)	

## Absolute Maximum Ratings

Parameters	30BQ	Units	Conditions
$I_{F(AV)}$ Max. Average Forward Current	3.0	A	50% duty cycle @ $T_L = 123^\circ\text{C}$ , rectangular wave form
	4.0		50% duty cycle @ $T_L = 113^\circ\text{C}$ , rectangular wave form
$I_{FSM}$ Max. Peak One Cycle Non-Repetitive Surge Current @ $T_C = 25^\circ\text{C}$	1200	A	5 $\mu\text{s}$ Sine or 3 $\mu\text{s}$ Rect. pulse
	130		10ms Sine or 6ms Rect. pulse
$E_{AS}$ Non Repetitive Avalanche Energy	5.0	mJ	$T_J = 25^\circ\text{C}$ , $I_{AS} = 1.0\text{A}$ , $L = 10\text{mH}$
$I_{AR}$ Repetitive Avalanche Current	1.0	A	Current decaying linearly to zero in 1 $\mu\text{sec}$ Frequency limited by $T_J$ max. $V_a = 1.5 \times V_r$ typical

## Electrical Specifications

Parameters	30BQ	Units	Conditions
$V_{FM}$ Max. Forward Voltage Drop (1)	0.58	V	@ 3A
	0.76	V	@ 6A
	0.52	V	@ 3A
	0.66	V	@ 6A
$I_{RM}$ Max. Reverse Leakage Current (1)	0.5	mA	$T_J = 25^\circ\text{C}$
	20	mA	$T_J = 125^\circ\text{C}$
$C_T$ Max. Junction Capacitance	180	pF	$V_R = 5V_{DC}$ (test signal range 100KHz to 1Mhz) $25^\circ\text{C}$
$L_S$ Typical Series Inductance	3.0	nH	Measured lead to lead 5mm from package body
dv/dt Max. Voltage Rate of Change	10000	V/ $\mu\text{s}$	(Rated $V_R$ )

(1) Pulse Width < 300 $\mu\text{s}$ , Duty Cycle < 2%

## Thermal-Mechanical Specifications

Parameters	30BQ	Units	Conditions
$T_J$ Max. Junction Temperature Range (*)	-55 to 150	$^\circ\text{C}$	
$T_{stg}$ Max. Storage Temperature Range	-55 to 150	$^\circ\text{C}$	
$R_{thJL}$ Max. Thermal Resistance Junction to Lead (**)	12	$^\circ\text{C}/\text{W}$	DC operation
$R_{thJA}$ Max. Thermal Resistance Junction to Ambient	46	$^\circ\text{C}/\text{W}$	DC operation
wt Approximate Weight	0.24(0.008)	g(oz.)	
Case Style	SMC		Similar to DO-214AB
Device Marking	IR3H		

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

(\*\*) Mounted 1 inch square PCB

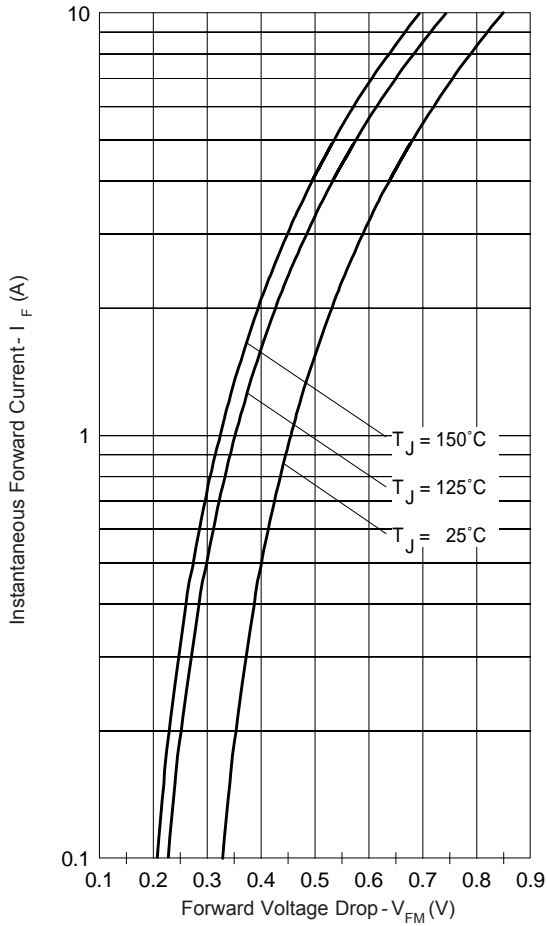


Fig. 1 - Max. Forward Voltage Drop Characteristics (Per Leg)

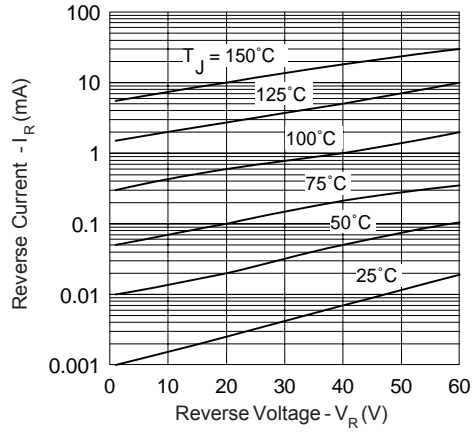


Fig. 2 - Typical Values Of Reverse Current Vs. Reverse Voltage (Per Leg)

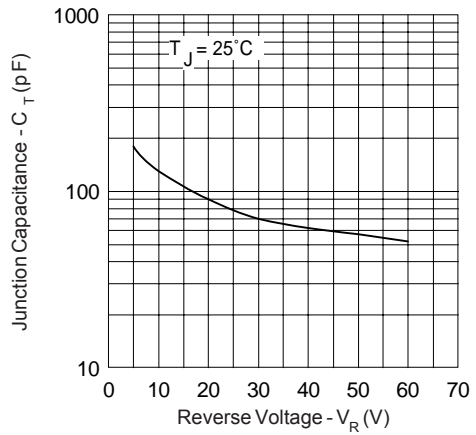


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage (Per Leg)

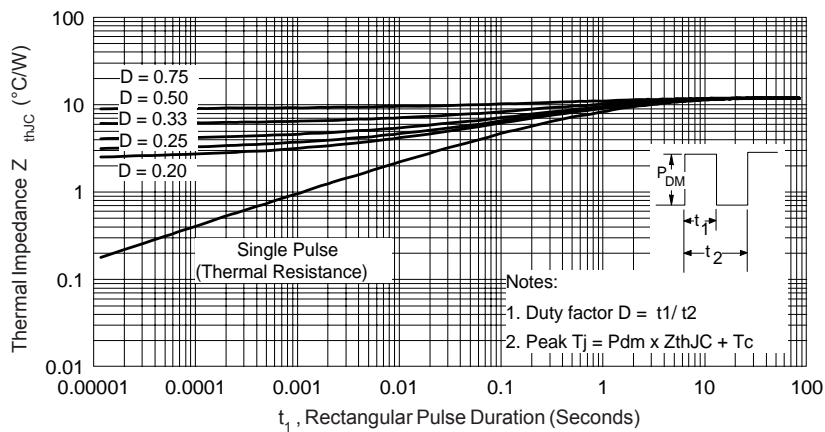


Fig. 4 - Max. Thermal Impedance  $Z_{thJC}$  Characteristics (Per Leg)

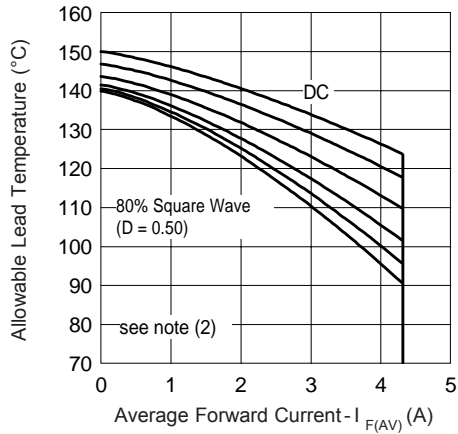


Fig. 4 - Maximum Average Forward Current Vs. Allowable Lead Temperature

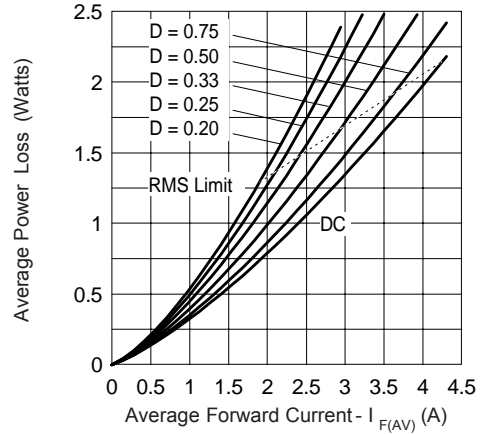


Fig. 5 - Maximum Average Forward Dissipation Vs. Average Forward Current

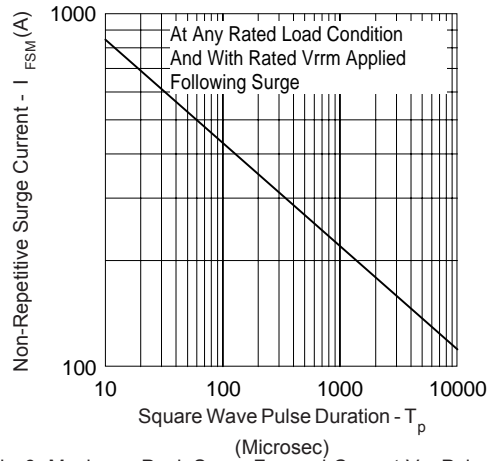
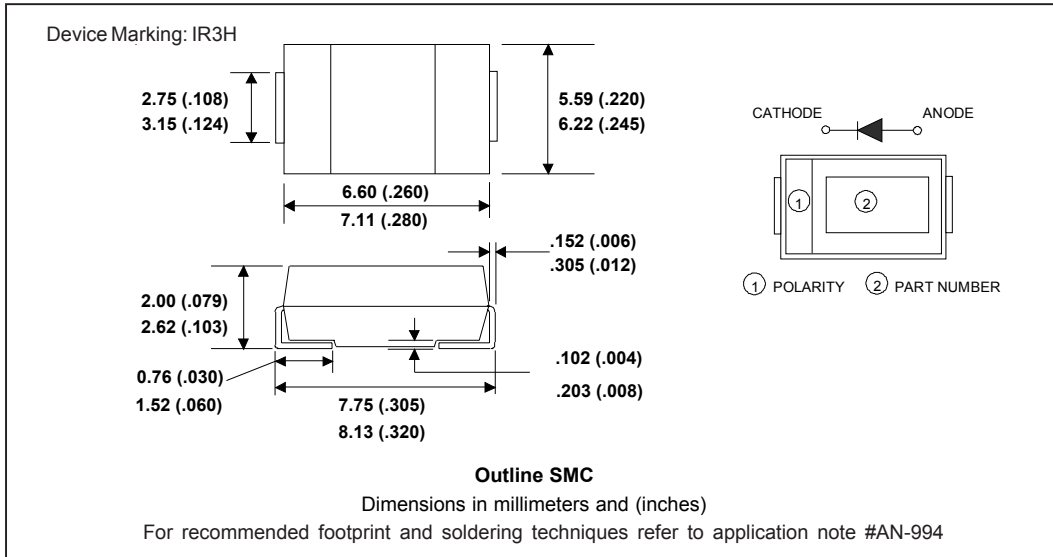


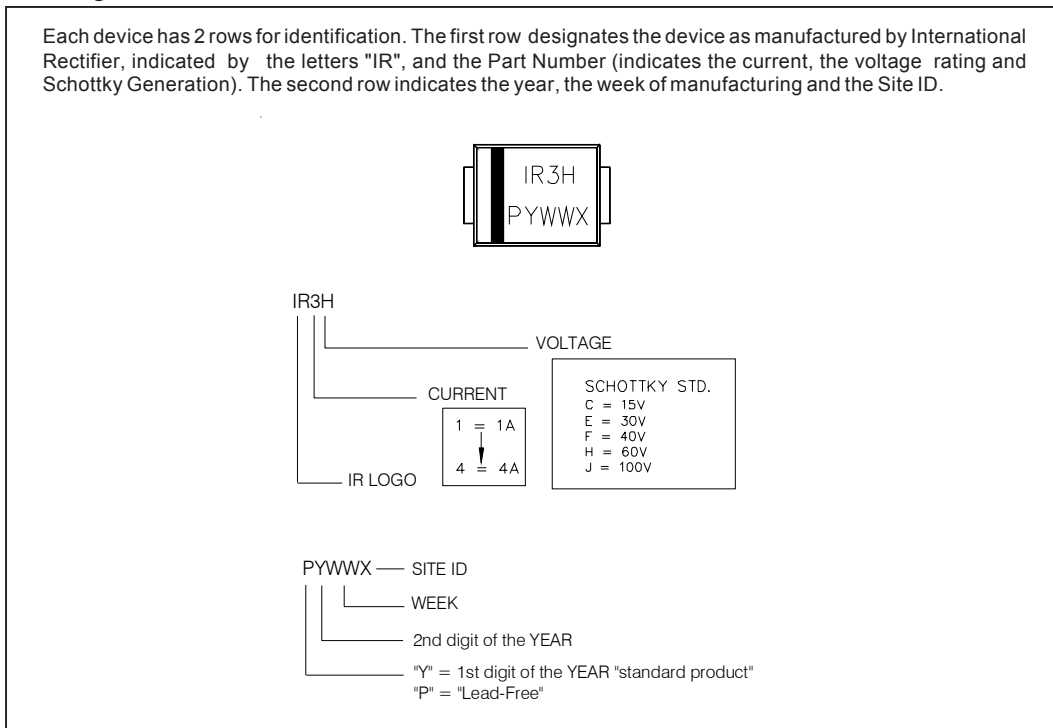
Fig. 6 - Maximum Peak Surge Forward Current Vs. Pulse Duration

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

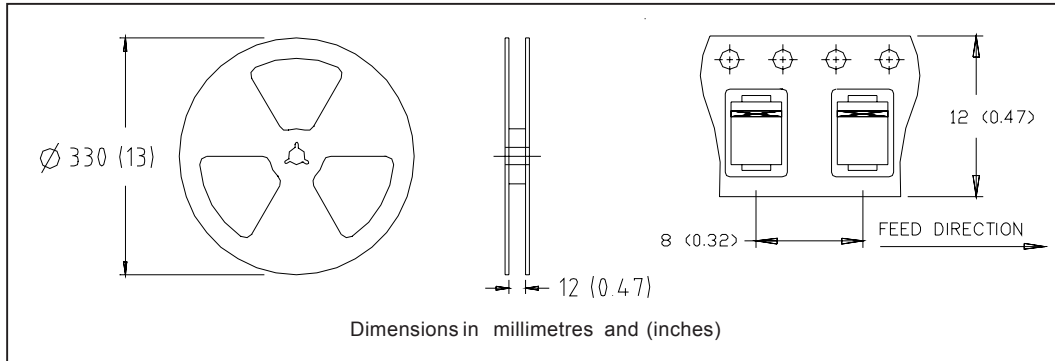
Outline Table



Marking & Identification



Tape & Reel Information



Ordering Information Table

Device Code	30	B	Q	060	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 (060 = 60V)				
<b>5</b>	-	• none = Box (1000 pieces)				
		• TR = Tape & Reel (3000 pieces)				
<b>6</b>	-	• none = Standard Production				
		• PbF = Lead-Free				

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.