

$I_{F(AV)} = 2.0\text{Amp}$   
 $V_R = 30\text{V}$

**Major Ratings and Characteristics**

Characteristics	Values	Units
$I_{F(AV)}$ Rectangular waveform	2.0	A
$V_{RRM}$	30	V
$I_{FSM}$ @tp = 5 $\mu$ s sine	350	A
$V_F$ @2.0 Apk, $T_J = 125^\circ\text{C}$	0.37	V
$T_J$ range	-55 to 150	$^\circ\text{C}$

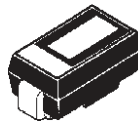
**Description/ Features**

The 20BQ030PbF 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**

20BQ030PbF



SMB



## Voltage Ratings

Part number	20BQ030PbF
$V_R$ Max. DC Reverse Voltage (V)	30
$V_{RWM}$ Max. Working Peak Reverse Voltage (V)	

## Absolute Maximum Ratings

Parameters	20BQ	Units	Conditions
$I_{F(AV)}$ Max. Average Forward Current	2.0	A	50% duty cycle @ $T_L = 119^\circ\text{C}$ , rectangular wave form.
$I_{FSM}$ Max. Peak One Cycle Non-Repetitive Surge Current	350		5 $\mu\text{s}$ Sine or 3 $\mu\text{s}$ Rect. pulse
	80		10ms Sine or 6ms Rect. pulse
$E_{AS}$ Non-Repetitive Avalanche Energy	3.0	mJ	$T_J = 25^\circ\text{C}$ , $I_{AS} = 1\text{A}$ , $L = 6\text{mH}$
$I_{AR}$ 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	20BQ	Units	Conditions
$V_{FM}$ Max. Forward Voltage Drop (1)	0.470	V	@ 2A
	0.550	V	@ 4A
$V_{FM}$ Max. Forward Voltage Drop (1)	0.370	V	@ 2A
	0.470	V	@ 4A
$I_{RM}$ Max. Reverse Leakage Current (1)	0.5	mA	$T_J = 25^\circ\text{C}$
	15	mA	$T_J = 125^\circ\text{C}$
$C_T$ Max. Junction Capacitance	200	pF	$V_R = 5V_{DC}$ , (test signal range 100KHz to 1Mhz) $25^\circ\text{C}$
$L_S$ Typical Series Inductance	2.0	nH	Measured lead to lead 5mm from package body
$dv/dt$ Max. Voltage Rate of Change (Rated $V_R$ )	10000	V/ $\mu\text{s}$	

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

## Thermal-Mechanical Specifications

Parameters	20BQ	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 (**)	25	$^\circ\text{C}/\text{W}$	DC operation
$R_{thJA}$ Max. Thermal Resistance Junction to Ambient	80	$^\circ\text{C}/\text{W}$	
wt Approximate Weight	0.10(0.003)	g (oz.)	
Case Style	SMB		Similar DO-214AA
Device Marking	IR2E		

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

(\*\*) Mounted 1 inch square PCB

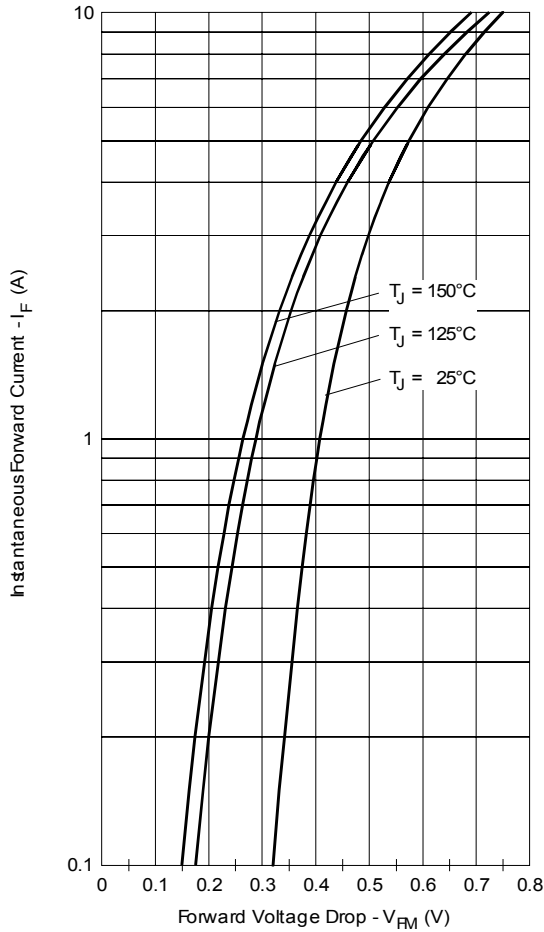


Fig. 1 - Maximum Forward Voltage Drop Characteristics

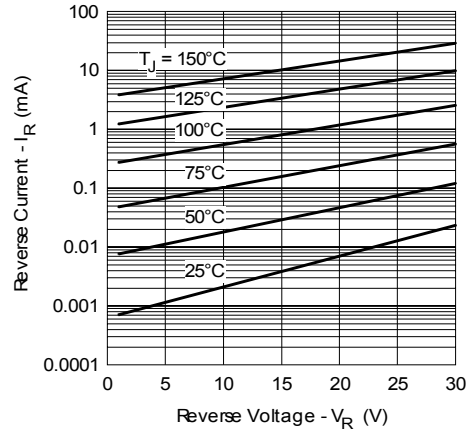


Fig. 2 - Typical Peak Reverse Current Vs. Reverse Voltage

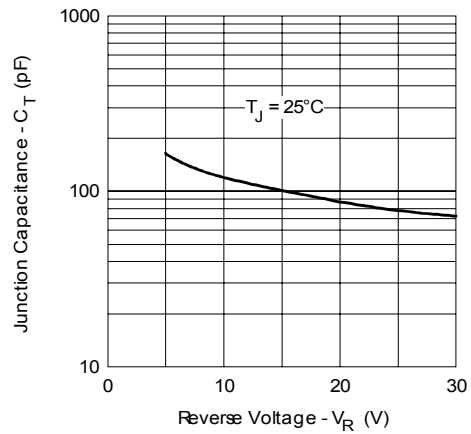


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage

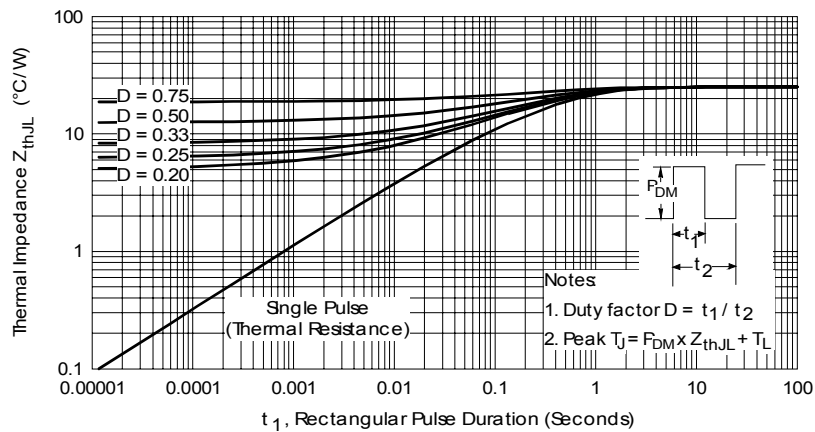


Fig. 4 - Maximum Thermal Impedance  $Z_{thJL}$  Characteristics

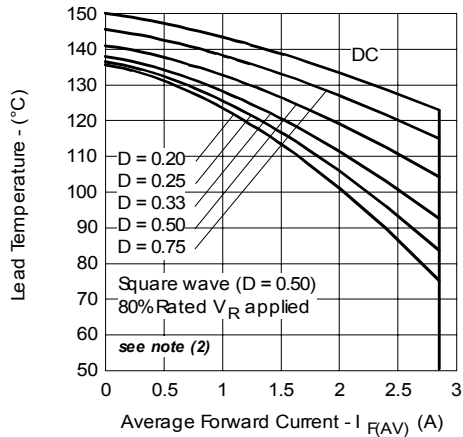


Fig. 5 - Maximum Average Forward Current Vs. Allowable Lead Temperature

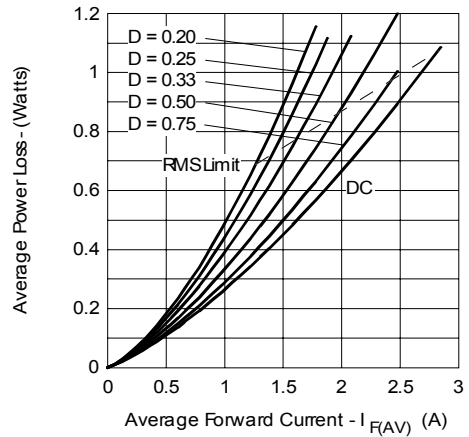


Fig. 6 - Maximum Average Forward Dissipation Vs. Average Forward Current

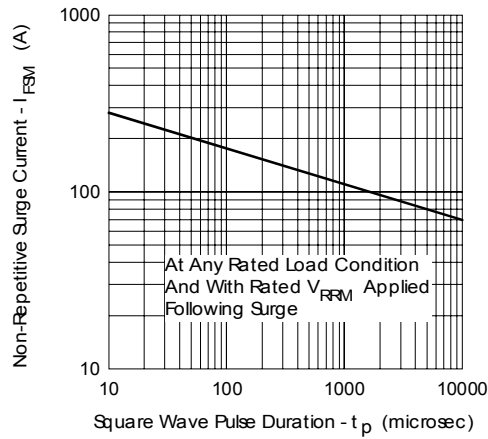


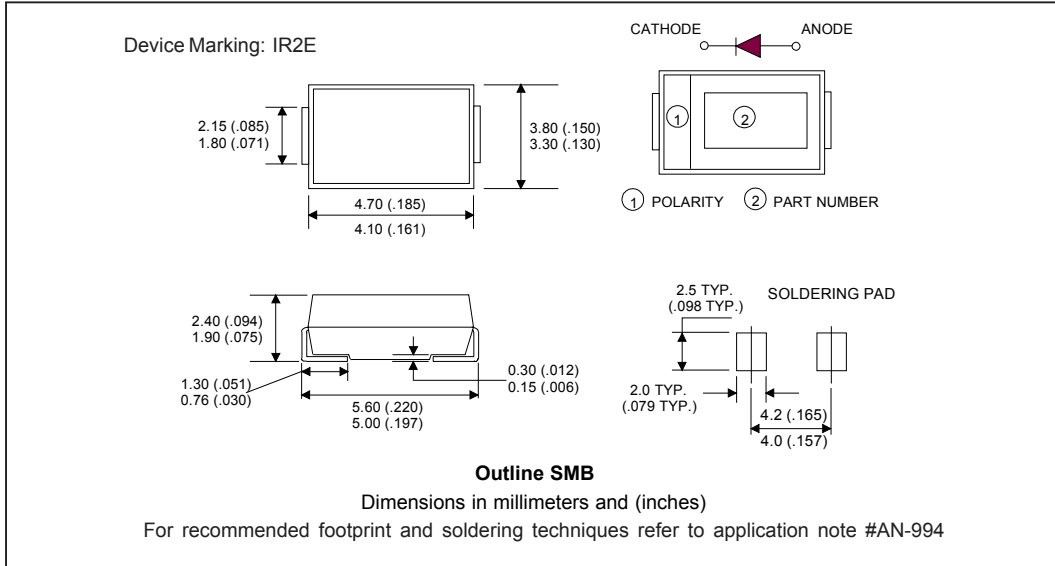
Fig. 7 - Maximum Peak Surge Forward Current Vs. Pulse Duration

(2) Formula used:  $T_L = T_J - (Pd + Pd_{REV}) \times R_{thJL}$ ;

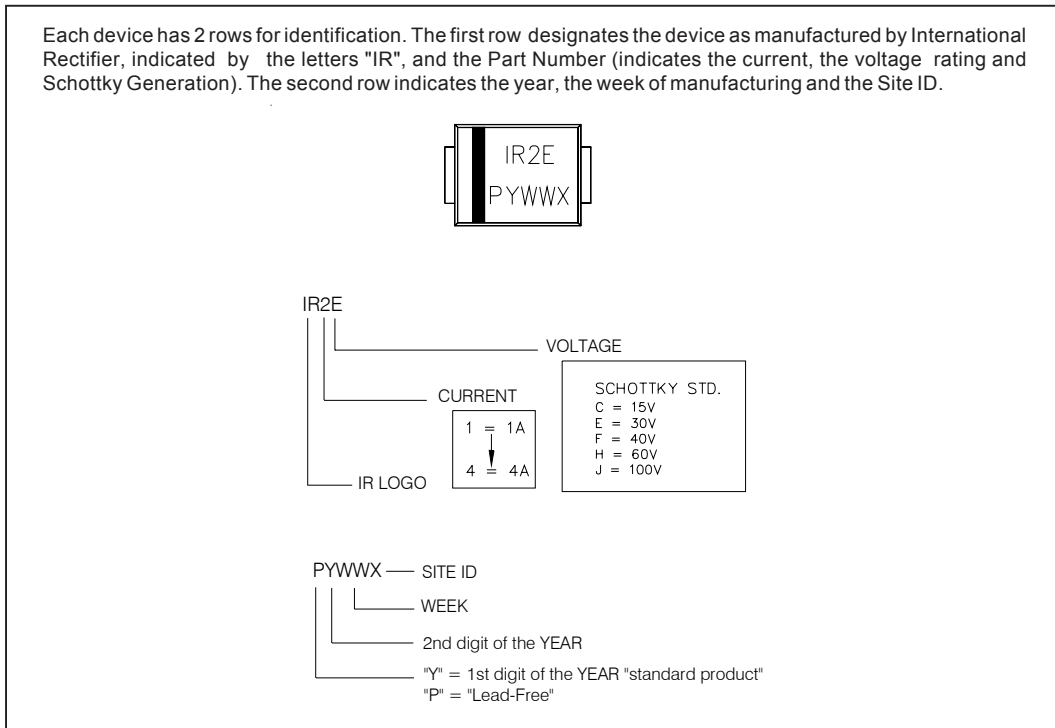
$Pd$  = Forward Power Loss =  $I_{F(AV)} \times V_{FM} @ (I_{F(AV)} / D)$  (see Fig. 6);

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

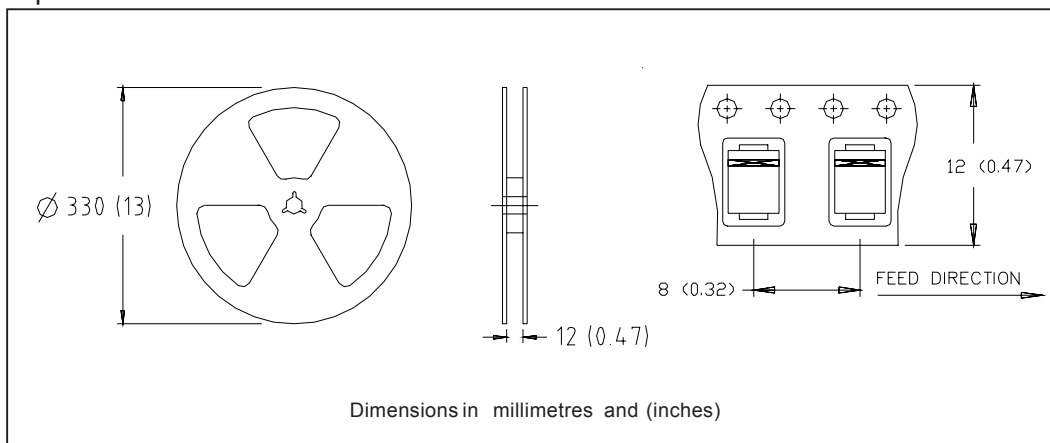
Outline Table



Marking & Identification



**Tape & Reel Information**



**Ordering Information Table**

<b>Device Code</b>	<table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td style="width: 25px; text-align: center; color: green;">20</td> <td style="width: 25px; text-align: center; color: green;">B</td> <td style="width: 25px; text-align: center; color: green;">Q</td> <td style="width: 25px; text-align: center; color: green;">030</td> <td style="width: 25px; text-align: center; color: green;">TR</td> <td style="width: 25px; text-align: center; color: green;">PbF</td> </tr> </table>	20	B	Q	030	TR	PbF
20	B	Q	030	TR	PbF		
	<table style="margin-left: auto; margin-right: auto;"> <tr> <td style="width: 25px; text-align: center;">①</td> <td style="width: 25px; text-align: center;">②</td> <td style="width: 25px; text-align: center;">③</td> <td style="width: 25px; text-align: center;">④</td> <td style="width: 25px; text-align: center;">⑤</td> <td style="width: 25px; text-align: center;">⑥</td> </tr> </table>	①	②	③	④	⑤	⑥
①	②	③	④	⑤	⑥		
	■	-	Current Rating				
	■	-	B = Single Lead Diode				
	■	-	Q = Schottky Q Series				
	■	-	Voltage Rating (030 = 30V)				
	■	-	• none = Box (1000 pieces)				
			• TR = Tape & Reel (3000 pieces)				
	■	-	• none = Standard Production				
			• PbF = Lead-Free				

```

20BQ030
*****
* SPICE Model Diode
*****
.SUBCKT 20BQ030 ANO CAT
D1 ANO 1 CAT
*Define diode model
.MODEL part0 D (IS=19.5547N N=812.929M BV=37 IBV=100P RS=33.136M
+ CJO=453.263P VJ=720.525M M=491.184M EG=1.11 XTI=2 RL=1.94758MEG)
*****

.ENDS 20BQ030

Thermal Model Subcircuit
.SUBCKT 20BQ030 5 1

CTHERM1      5  4      8.74E-04
CTHERM2      4  3      2.26E+01
CTHERM3      3  2      1.96E+02
CTHERM4      2  1      4.20E+03

RTHERM1      5  4      1.00E-07
RTHERM2      4  3      1.45E+01
RTHERM1      3  2      9.17E+00
RTHERM1      2  1      1.26E+00

.ENDS 20BQ030

```

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.



## Notice

The products described herein were acquired by Vishay Intertechnology, Inc., as part of its acquisition of International Rectifier's Power Control Systems (PCS) business, which closed in April 2007. Specifications of the products displayed herein are pending review by Vishay and are subject to the terms and conditions shown below.

Specifications of the products displayed herein are subject to change without notice. Vishay Intertechnology, Inc., or anyone on its behalf, assumes no responsibility or liability for any errors or inaccuracies.

Information contained herein is intended to provide a product description only. No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document. Except as provided in Vishay's terms and conditions of sale for such products, Vishay assumes no liability whatsoever, and disclaims any express or implied warranty, relating to sale and/or use of Vishay products including liability or warranties relating to fitness for a particular purpose, merchantability, or infringement of any patent, copyright, or other intellectual property right.

The products shown herein are not designed for use in medical, life-saving, or life-sustaining applications. Customers using or selling these products for use in such applications do so at their own risk and agree to fully indemnify Vishay for any damages resulting from such improper use or sale.