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Stocking Distributor

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[20BQ030](#)

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sales@integrated-circuit.com

Bulletin PD-20787 rev. A 09/05

International
IOR Rectifier

20BQ030PbF

SCHOTTKY RECTIFIER

2 Amp

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

Major Ratings and Characteristics

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

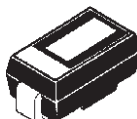
Description/ Features

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



Cathode Anode

SMB

20BQ030PbF

Bulletin PD-20787 rev. A 09/05

International
IOR Rectifier

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	A	5 μs Sine or 3 μs 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 μsec 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°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/ μs	

(1) Pulse Width < 300 μs , 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	$^\circ\text{C/W}$	DC operation
R_{thJA} Max. Thermal Resistance Junction to Ambient	80	$^\circ\text{C/W}$	
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

International
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20BQ030PbF

Bulletin PD-20787 rev. A 09/05

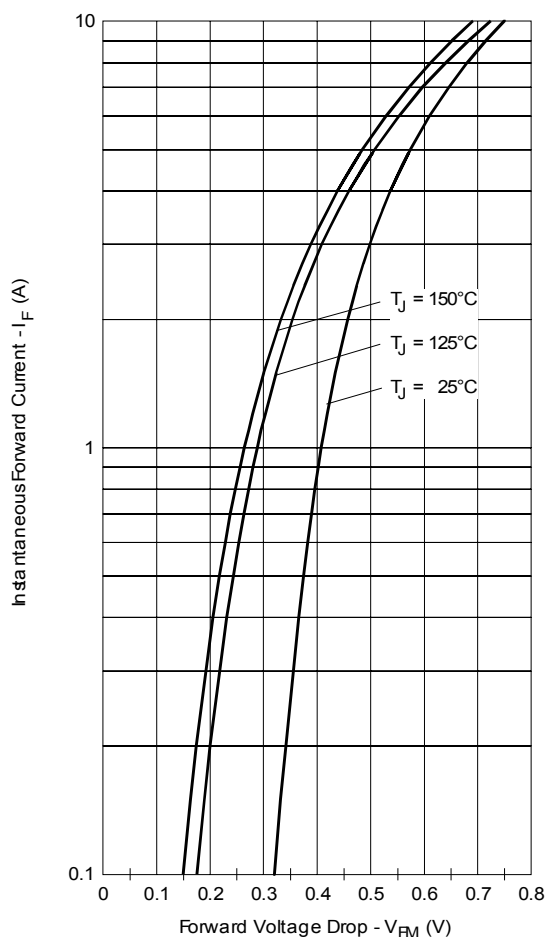


Fig. 1 - Maximum Forward Voltage Drop Characteristics

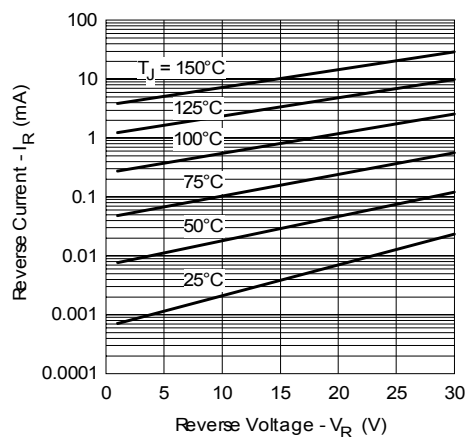


Fig. 2 - Typical Peak Reverse Current Vs. Reverse Voltage

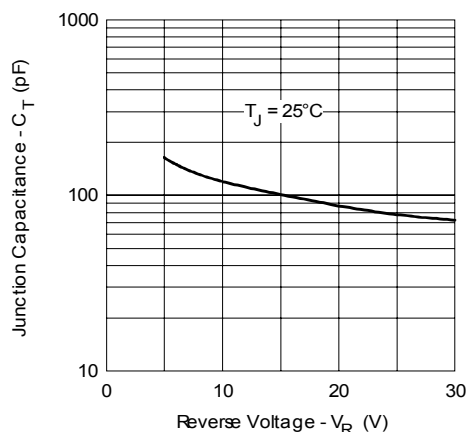


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage

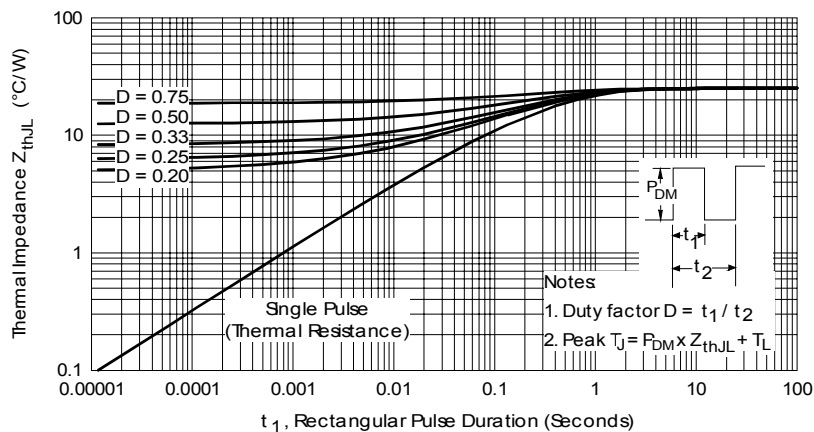


Fig. 4 - Maximum Thermal Impedance Z_{thJL} Characteristics

20BQ030PbF

Bulletin PD-20787 rev. A 09/05

International
IOR Rectifier

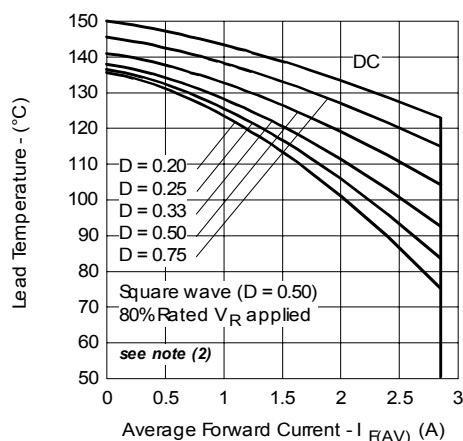


Fig. 5 - Maximum Average Forward Current Vs. Allowable Lead Temperature

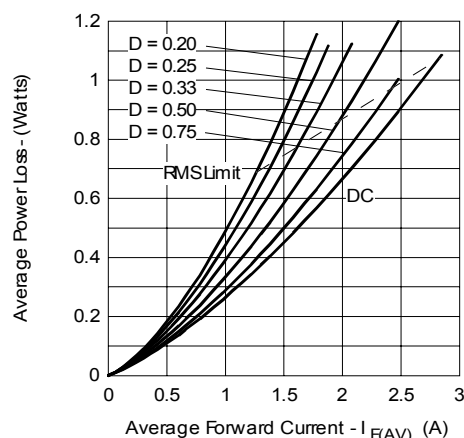


Fig. 6 - Maximum Average Forward Dissipation Vs. Average Forward Current

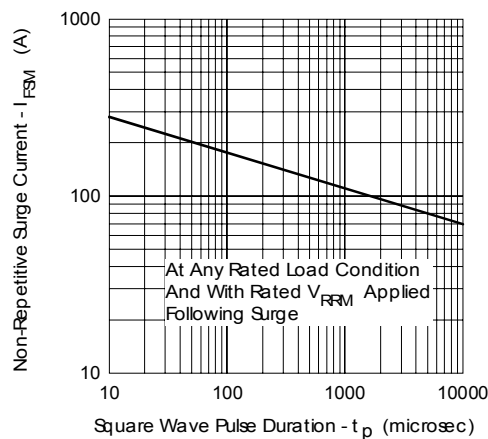


Fig. 7 - Maximum Peak Surge Forward Current Vs. Pulse Duration

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

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

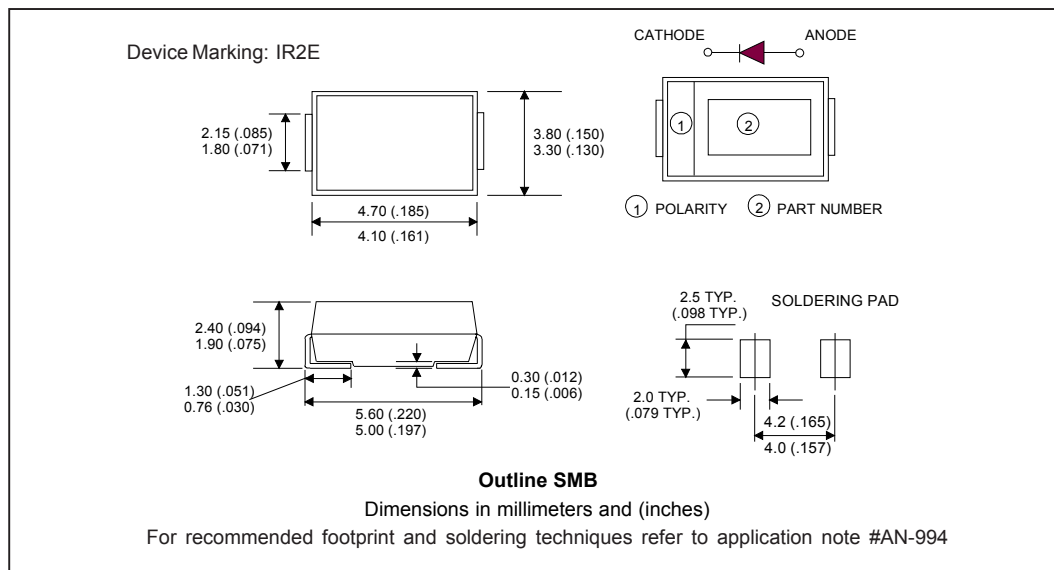
$P_{d_{REV}}$ = Inverse Power Loss = $V_{R1} \times I_{R1} (1-D)$; $I_{R1} @ V_{R1} = 80\% \text{ rated } V_R$

International
IOR Rectifier

20BQ030PbF

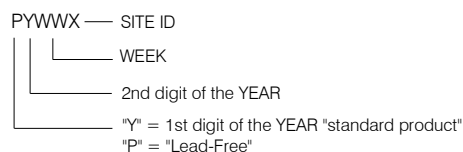
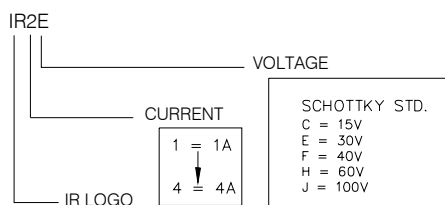
Bulletin PD-20787 rev. A 09/05

Outline Table



Marking & Identification

Each device has 2 rows for identification. The first row designates the device as manufactured by International Rectifier, indicated by the letters "IR", and the Part Number (indicates the current, the voltage rating and Schottky Generation). The second row indicates the year, the week of manufacturing and the Site ID.

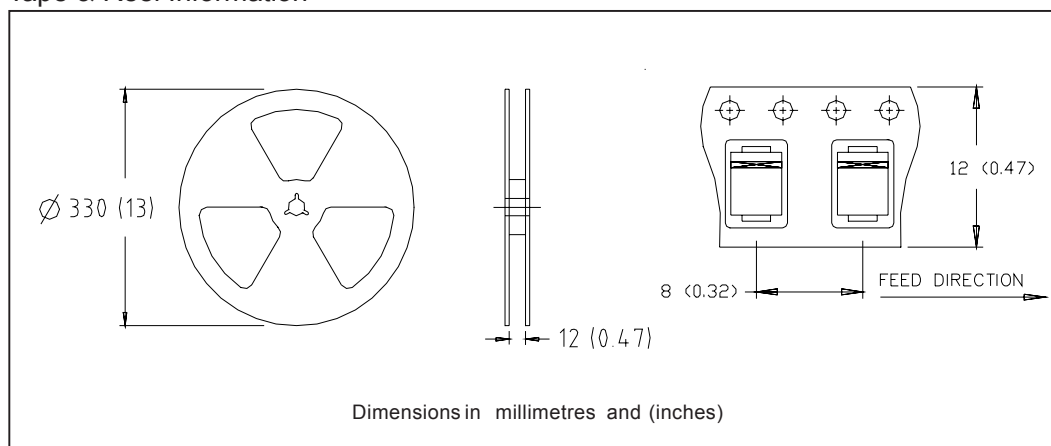


20BQ030PbF

Bulletin PD-20787 rev. A 09/05

International
IOR Rectifier

Tape & Reel Information



Ordering Information Table

Device Code					
20	B	Q	030	TR	PbF
1	2	3	4	5	6
1	- Current Rating				
2	- B = Single Lead Diode				
3	- Q = Schottky Q Series				
4	- Voltage Rating (030 = 30V)				
5	- • none = Box (1000 pieces) • TR = Tape & Reel (3000 pieces)				
6	- • none = Standard Production • PbF = Lead-Free				

International
IOR Rectifier

20BQ030PbF

Bulletin PD-20787 rev. A 09/05

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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

R THERM1      5      4      1.00E-07
R THERM2      4      3      1.45E+01
R THERM1      3      2      9.17E+00
R THERM1      2      1      1.26E+00

.ENDS 20BQ030

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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.

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IR WORLD HEADQUARTERS: 233 Kansas St., El Segundo, California 90245, USA Tel: (310) 252-7105
TAC Fax: (310) 252-7309
09/05



Legal Disclaimer Notice

Vishay

Notice

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