

International  
**IR** Rectifier

**20BQ030**

SCHOTTKY RECTIFIER

2 Amp

$$I_{F(AV)} = 2 \text{ Amp}$$

$$V_R = 30V$$

#### Major Ratings and Characteristics

Characteristics	20BQ030	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	$^\circ\text{C}$

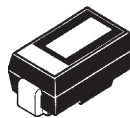
#### Description/ Features

The 20BQ030 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

#### Case Styles

20BQ030



SMB



## Voltage Ratings

Part number	20BQ030
$V_R$ 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

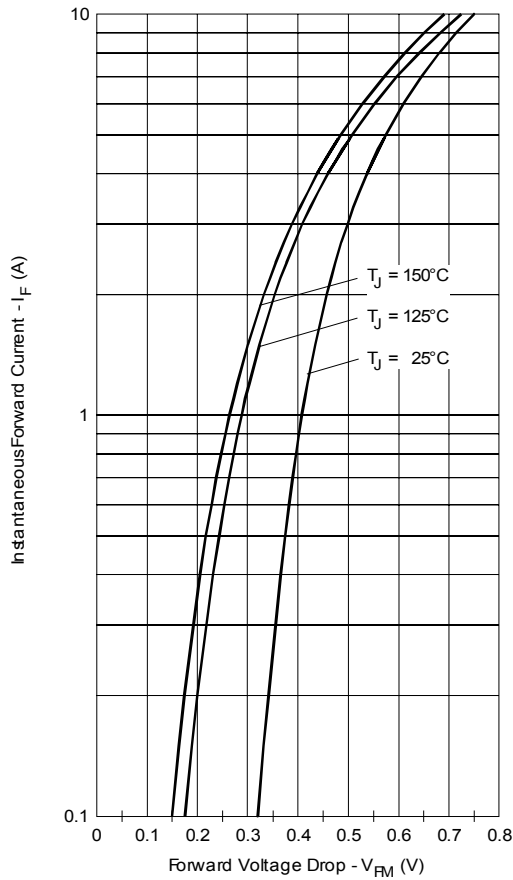


Fig. 1 - Maximum Forward Voltage Drop Characteristics

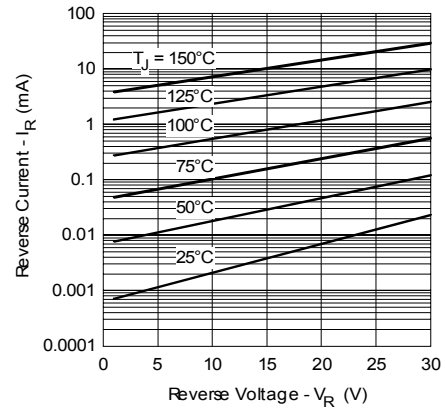


Fig. 2 - Typical Peak Reverse Current Vs. Reverse Voltage

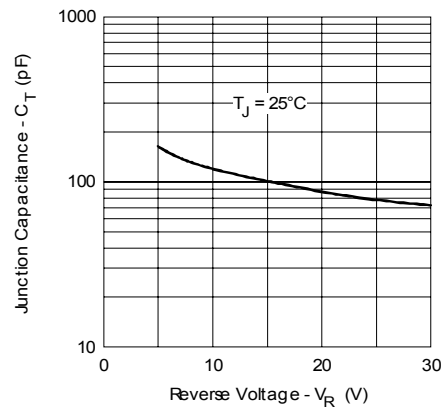


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage

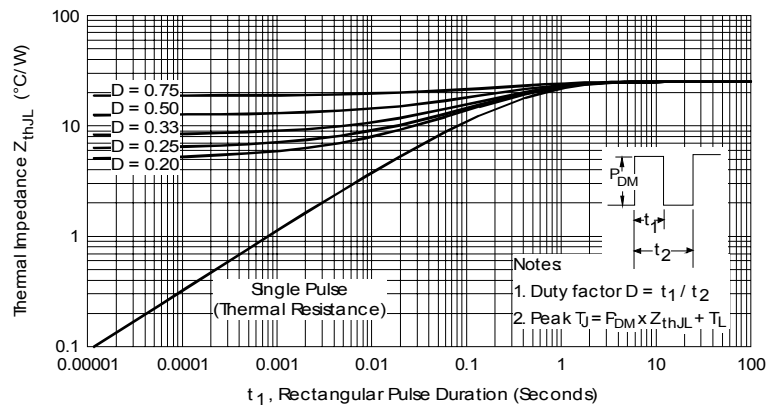


Fig. 4 - Maximum Thermal Impedance  $Z_{thJL}$  Characteristics

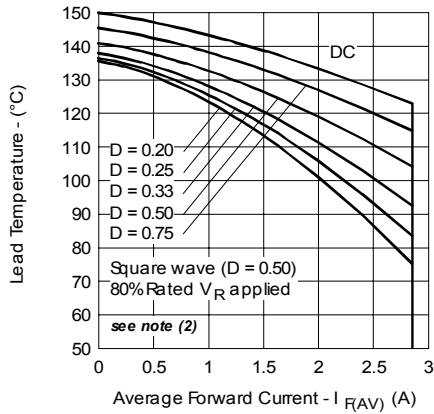


Fig. 5 - Maximum Average Forward Current Vs. Allowable Lead Temperature

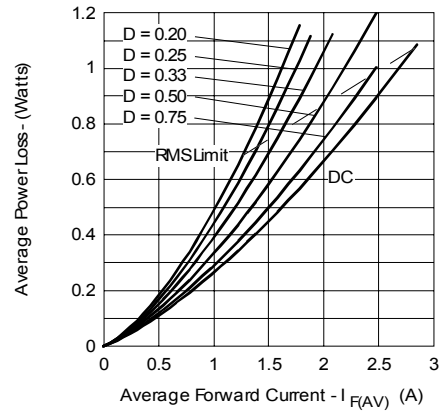


Fig. 6 - Maximum Average Forward Dissipation Vs. Average Forward Current

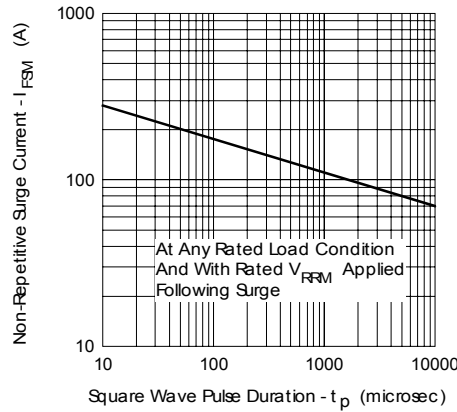
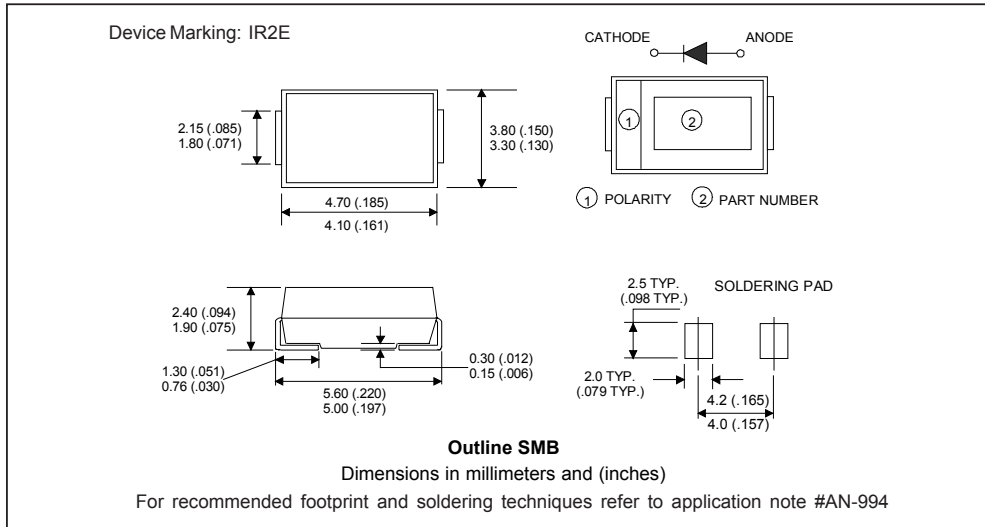


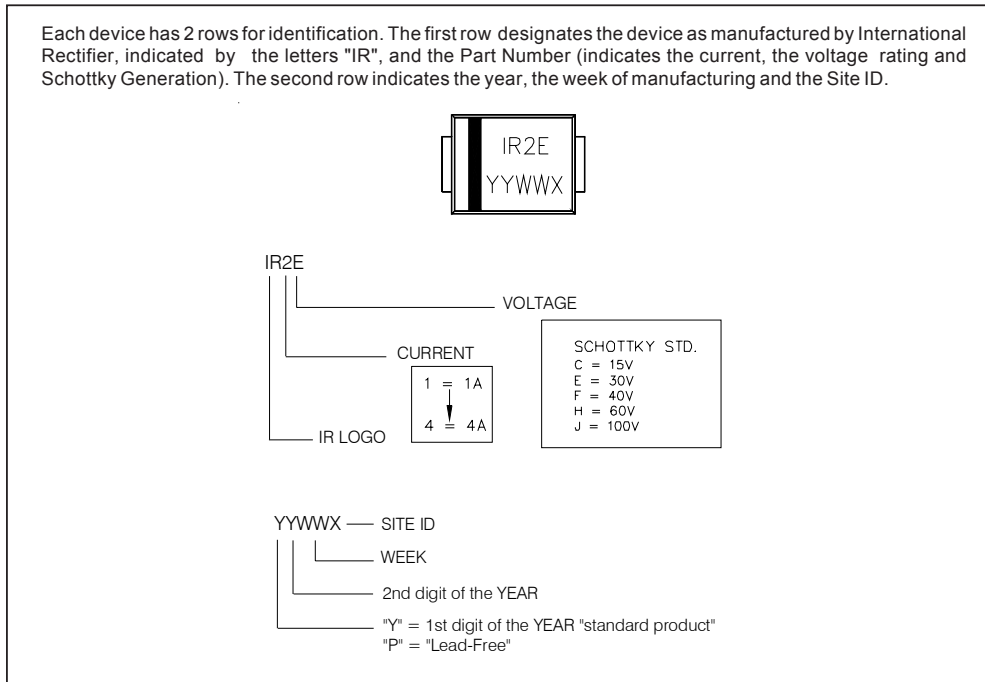
Fig. 7 - Maximum Peak Surge Forward Current Vs. Pulse Duration

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

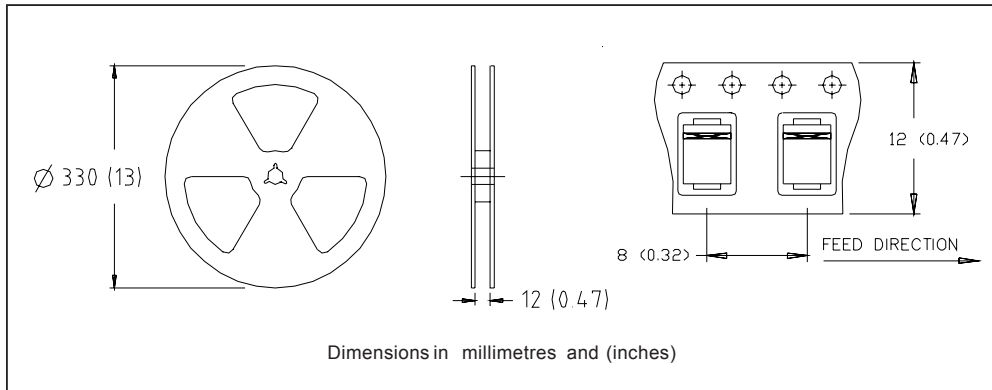
Outline Table



Marking & Identification



Tape & Reel Information



Ordering Information Table

Device Code					
20	B	Q	030	TR	-
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 (030 = 30V)				
<b>5</b>	- • none = Box (1000 pieces) • TR = Tape & Reel (3000 pieces)				
<b>6</b>	- • 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.  
Qualification Standards can be found on IR's Web site.