

International  
**IR** Rectifier

**30BQ040**

SCHOTTKY RECTIFIER

3 Amp

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

$$V_R = 40\text{V}$$

#### Major Ratings and Characteristics

Characteristics	30BQ040	Units
$I_{F(AV)}$ Rectangular waveform	3.0	A
$V_{RRM}$	40	V
$I_{FSM}$ @ $t_p=5\mu\text{s}$ sine	2000	A
$V_F$ @ 3.0A pk, $T_J=125^\circ\text{C}$	0.43	V
$T_J$ range	- 55 to 150	$^\circ\text{C}$

#### Description/ Features

The 30BQ040 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

30BQ040



SMC



### Voltage Ratings

Part number	30BQ040
V <sub>R</sub> Max. DC Reverse Voltage (V)	40
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> = 118 °C, rectangular wave form
	4.0		50% duty cycle @ T <sub>L</sub> = 110 °C, rectangular wave form
I <sub>FSM</sub> Max. Peak One Cycle Non-Repetitive Surge Current	2000	A	5µs Sine or 3µs Rect. pulse
	110		10ms Sine or 6ms Rect. pulse
E <sub>AS</sub> Non Repetitive Avalanche Energy	6.0	mJ	T <sub>J</sub> = 25 °C, I <sub>AS</sub> = 1.0A, L = 12mH
I <sub>AR</sub> Repetitive Avalanche Current	1.0	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)	0.53	V	@ 3A T <sub>J</sub> = 25 °C
	0.68	V	@ 6A
	0.43	V	@ 3A T <sub>J</sub> = 125 °C
	0.57	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>
	30	mA	T <sub>J</sub> = 125 °C
C <sub>T</sub> Max. Junction Capacitance	230	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 < 300µs, Duty Cycle < 2%

### Thermal-Mechanical Specifications

Parameters	30BQ	Units	Conditions
T <sub>J</sub> Max. Junction Temperature Range (*)	-55 to 150	°C	
T <sub>stg</sub> Max. Storage Temperature Range	-55 to 150	°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	IR3F		

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

(\*\*) Mounted 1 inch square PCB

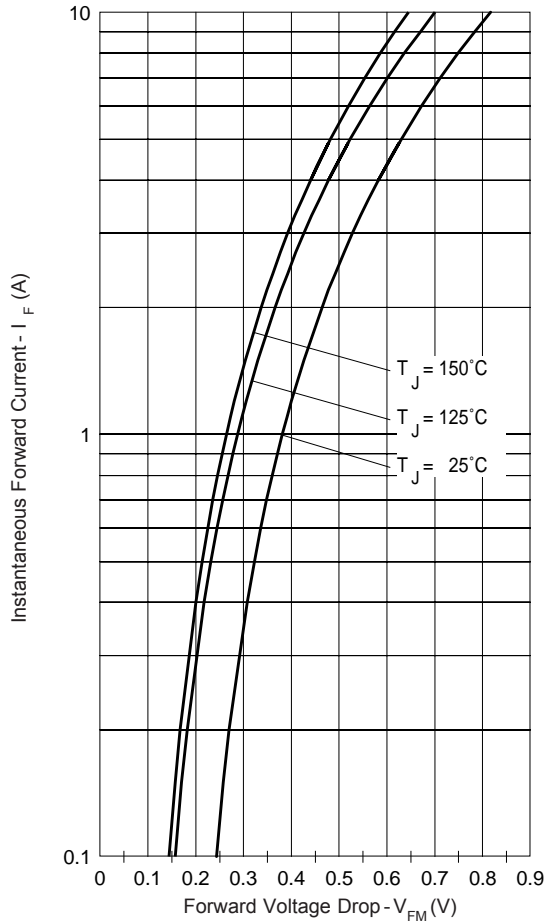


Fig. 1 - Max. Forward Voltage Drop Characteristics (Per Leg)

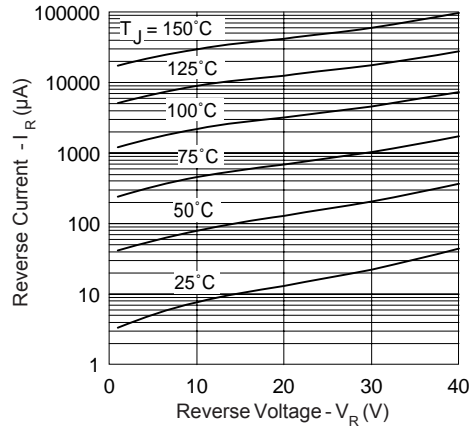


Fig. 2 - Typical Values Of Reverse Current Vs. Reverse Voltage (Per Leg)

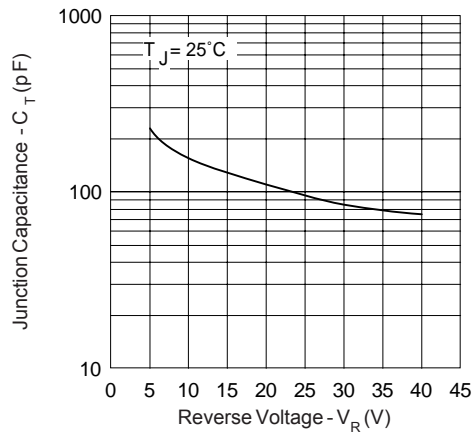


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage (Per Leg)

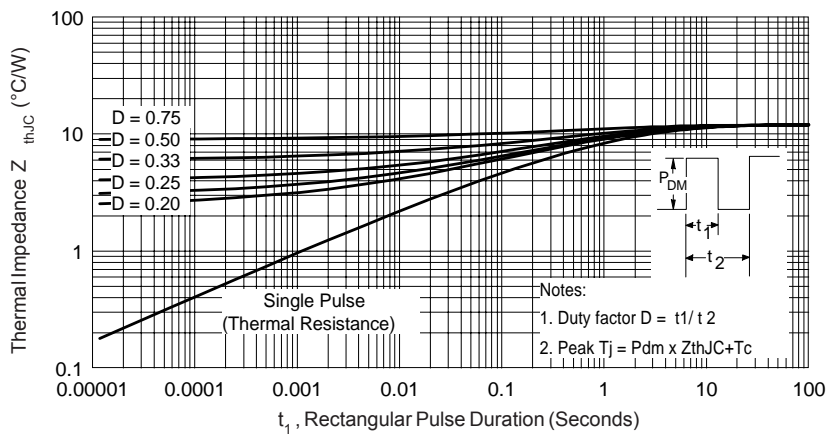


Fig. 4 - Max. Thermal Impedance  $Z_{thJC}$  Characteristics (Per Leg)

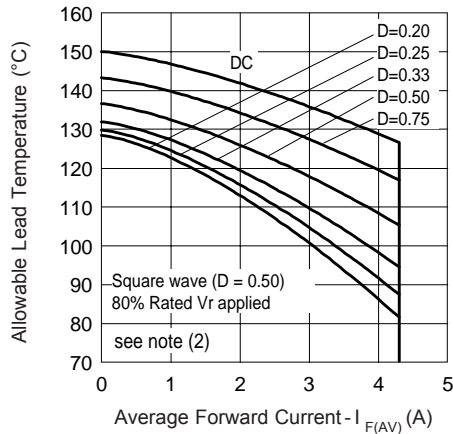


Fig. 4 - Maximum Average Forward Current Vs. Allowable Lead Temperature

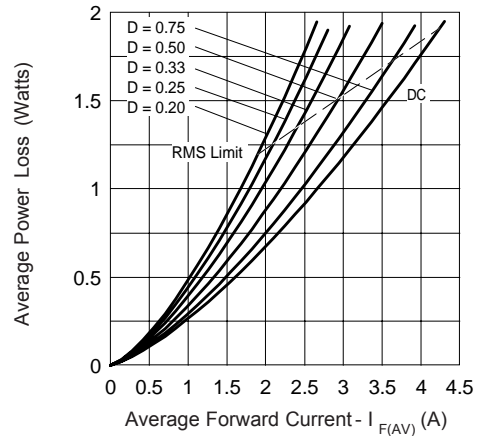


Fig. 5 - Maximum Average Forward Dissipation Vs. Average Forward Current

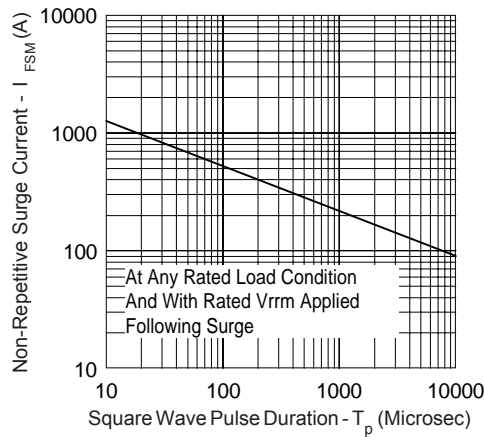


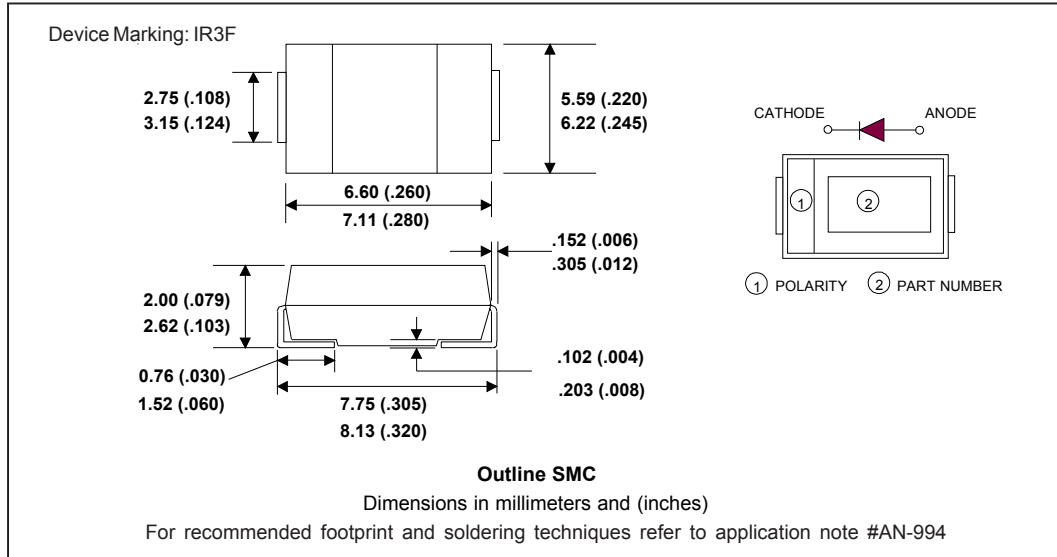
Fig. 6 - Maximum Peak Surge Forward Current Vs. Pulse Duration

(2) Formula used:  $T_c = T_j - (Pd + Pd_{REV}) \times R_{thJC}$ ;

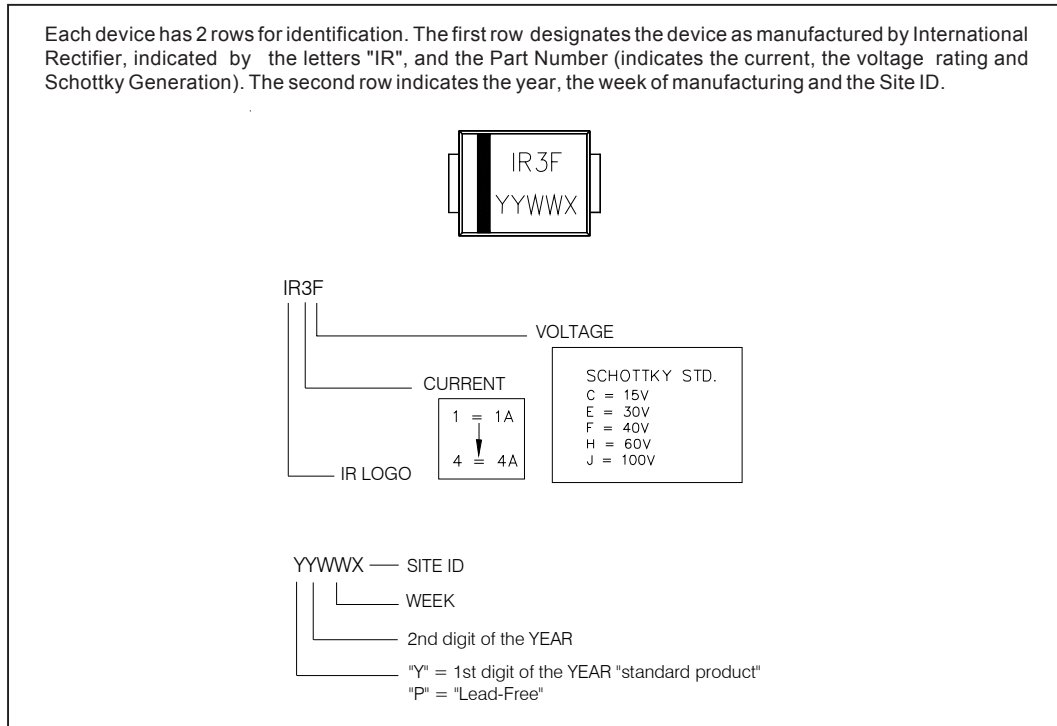
$Pd$  = Forward Power Loss =  $I_{F(AV)} \times V_{FM} @ (I_{F(AV)} / D)$  (see Fig. 6);

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

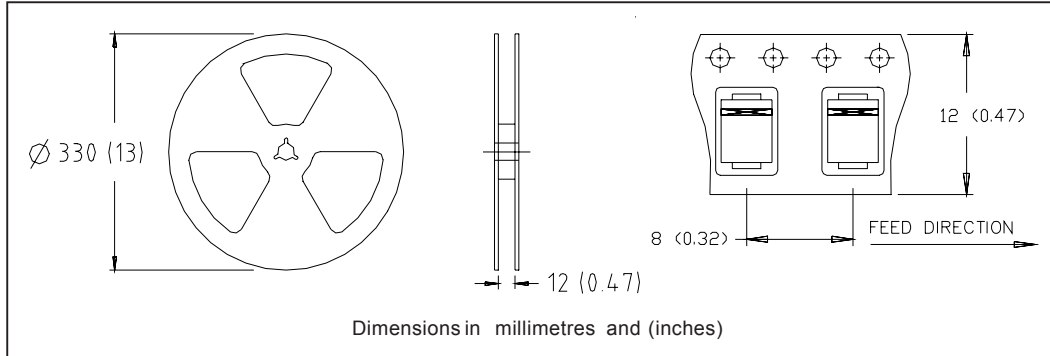
Outline Table



Marking & Identification



**Tape & Reel Information**



**Ordering Information Table**

Device Code	30	B	Q	040	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 (040 = 40V)				
<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.  
 Qualification Standards can be found on IR's Web site.