

International
IR Rectifier

SCHOTTKY RECTIFIER

30WQ03FNPbF

3.5 Amp

$I_{F(AV)} = 3.5\text{Amp}$
 $V_R = 30\text{V}$

Major Ratings and Characteristics

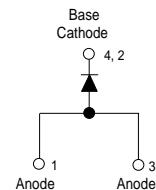
Characteristics	Values	Units
$I_{F(AV)}$ Rectangular waveform	3.5	A
V_{RRM}	30	V
I_{FSM} @ $t_p = 5\text{ }\mu\text{s}$ sine	535	A
V_F @ 3Apk , $T_J = 125^\circ\text{C}$	0.35	V
T_J range	-40 to 150	$^\circ\text{C}$

Description/ Features

The 30WQ03FNPbF surface mount Schottky rectifier has been designed for applications requiring low forward drop and small foot prints on PC board. Typical applications are in disk drives, switching power supplies, converters, free-wheeling diodes, battery charging, and reverse battery protection.

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

Case Styles



D-PAK (TO-252AA)

Voltage Ratings

Part number	30WQ03FNPbF		
V_R Max. DC Reverse Voltage (V)			
V_{RWM} Max. Working Peak Reverse Voltage (V)	30		

Absolute Maximum Ratings

Parameters	30WQ...	Units	Conditions
$I_{F(AV)}$ Max. Average Forward Current * See Fig. 5	3.5	A	50% duty cycle @ $T_c = 134^\circ\text{C}$, rectangular wave form
I_{FSM} Max. Peak One Cycle Non-Repetitive Surge Current * See Fig. 7	535	A	5μs Sine or 3μs Rect. pulse
	90		10ms Sine or 6ms Rect. pulse
E_{AS} Non-Repetitive Avalanche Energy	8	mJ	$T_j = 25^\circ\text{C}$, $I_{AS} = 2$ Amps, $L = 4$ 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	30WQ...	Units	Conditions
V_{FM} Max. Forward Voltage Drop * See Fig. 1 (1)	0.45	V	$T_j = 25^\circ\text{C}$
	0.52	V	
	0.35	V	$T_j = 125^\circ\text{C}$
	0.46	V	
I_{RM} Max. Reverse Leakage Current * See Fig. 2 (1)	2	mA	$V_R = \text{rated } V_R$
	50	mA	
$V_{F(TO)}$ Threshold Voltage	0.22	V	$T_j = T_j \text{ max.}$
r_t Forward Slope Resistance	32.86	mΩ	
C_T Typical Junction Capacitance	290	pF	$V_R = 5V_{DC}$ (test signal range 100Khz to 1Mhz) 25°C
L_s Typical Series Inductance	5.0	nH	Measured lead to lead 5mm from package body
dv/dt Max. Voltage Rate of Change	10000	V/μs	(Rated V_R)

(1) Pulse Width < 300μs, Duty Cycle < 2%

Thermal-Mechanical Specifications

Parameters	30WQ...	Units	Conditions
T_j Max. Junction Temperature Range (*)	-40 to 150	°C	
T_{stg} Max. Storage Temperature Range	-40 to 150	°C	
R_{thJC} Max. Thermal Resistance Junction to Case	4.7	°C/W	DC operation * See Fig. 4
wt Approximate Weight	0.3 (0.01)	g (oz.)	
Case Style	D-PAK		Similar to TO-252AA
Marking Device	30WQ03FN		

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

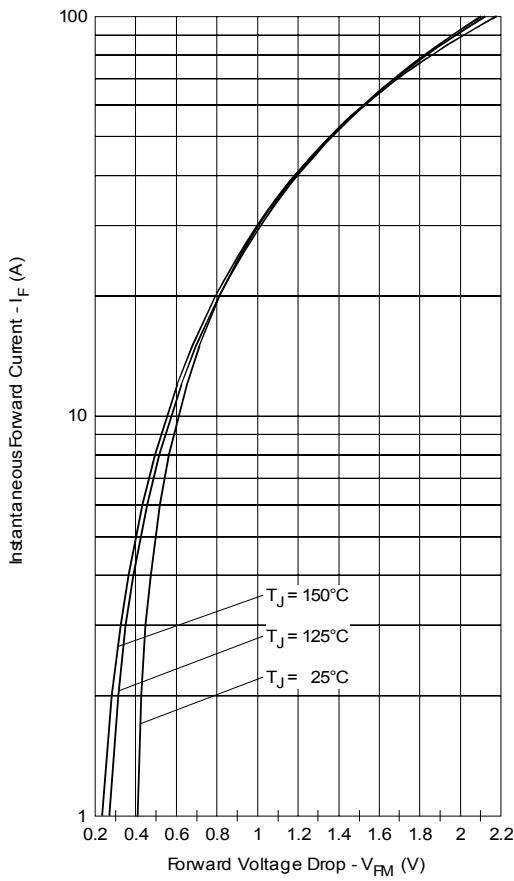


Fig. 1 - Maximum Forward Voltage Drop Characteristics

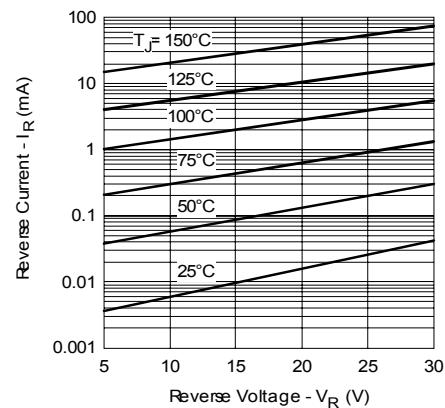


Fig. 2 - Typical Values of Reverse Current Vs. Reverse Voltage

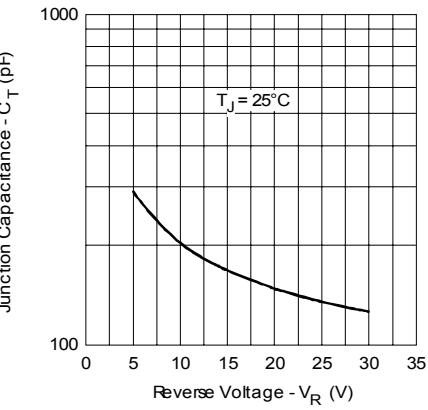


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage

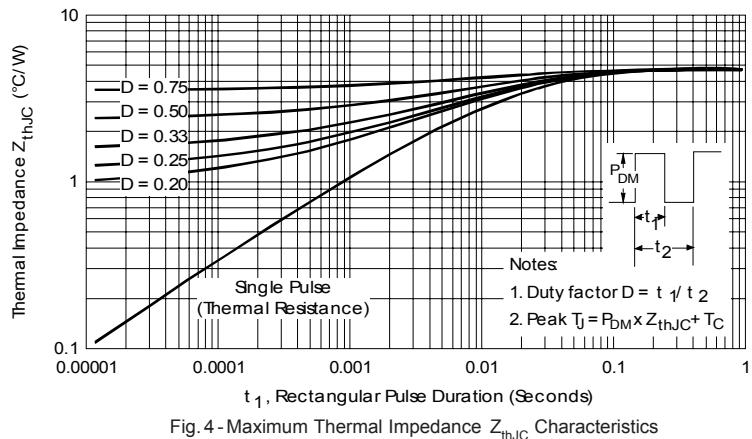


Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics

30WQ03FNPbF

Bulletin PD-21052 rev. B 08/06

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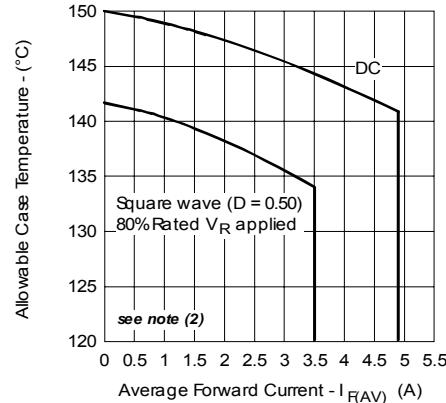


Fig. 5 - Maximum Allowable Case Temperature Vs. Average Forward Current

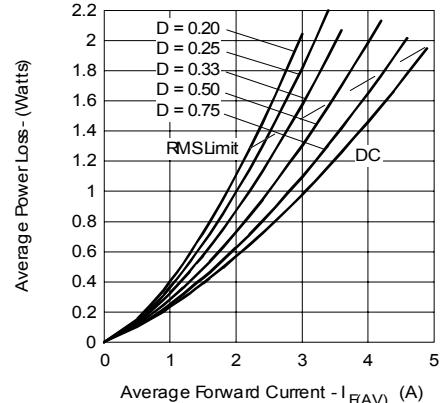


Fig. 6 - Forward Power Loss Characteristics

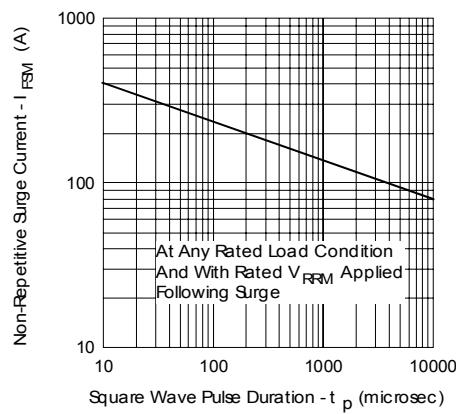
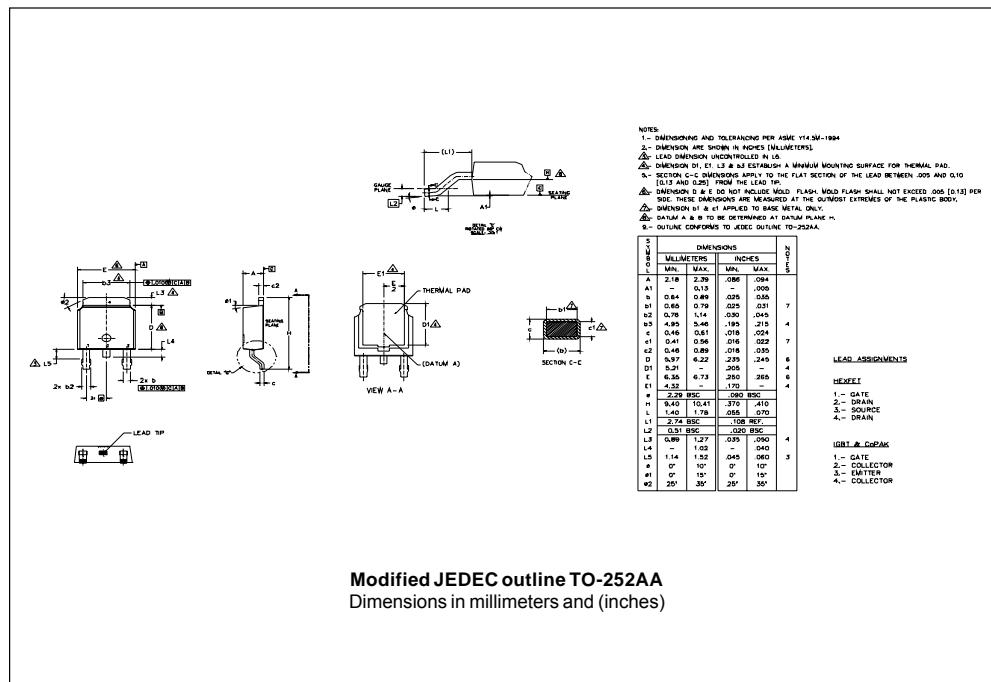


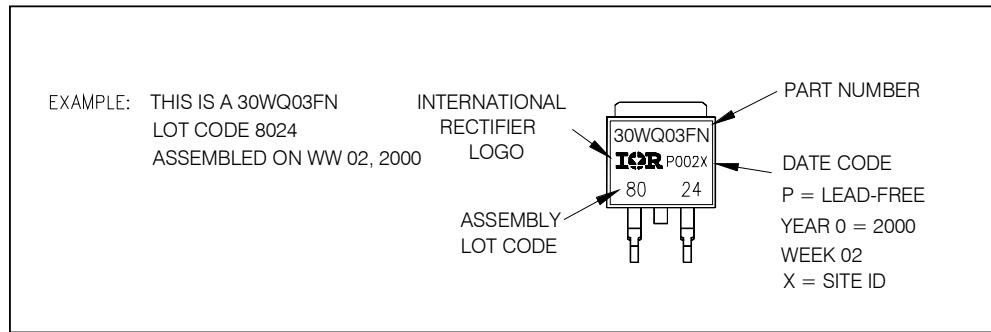
Fig. 7 - Maximum Non-Repetitive Surge Current

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

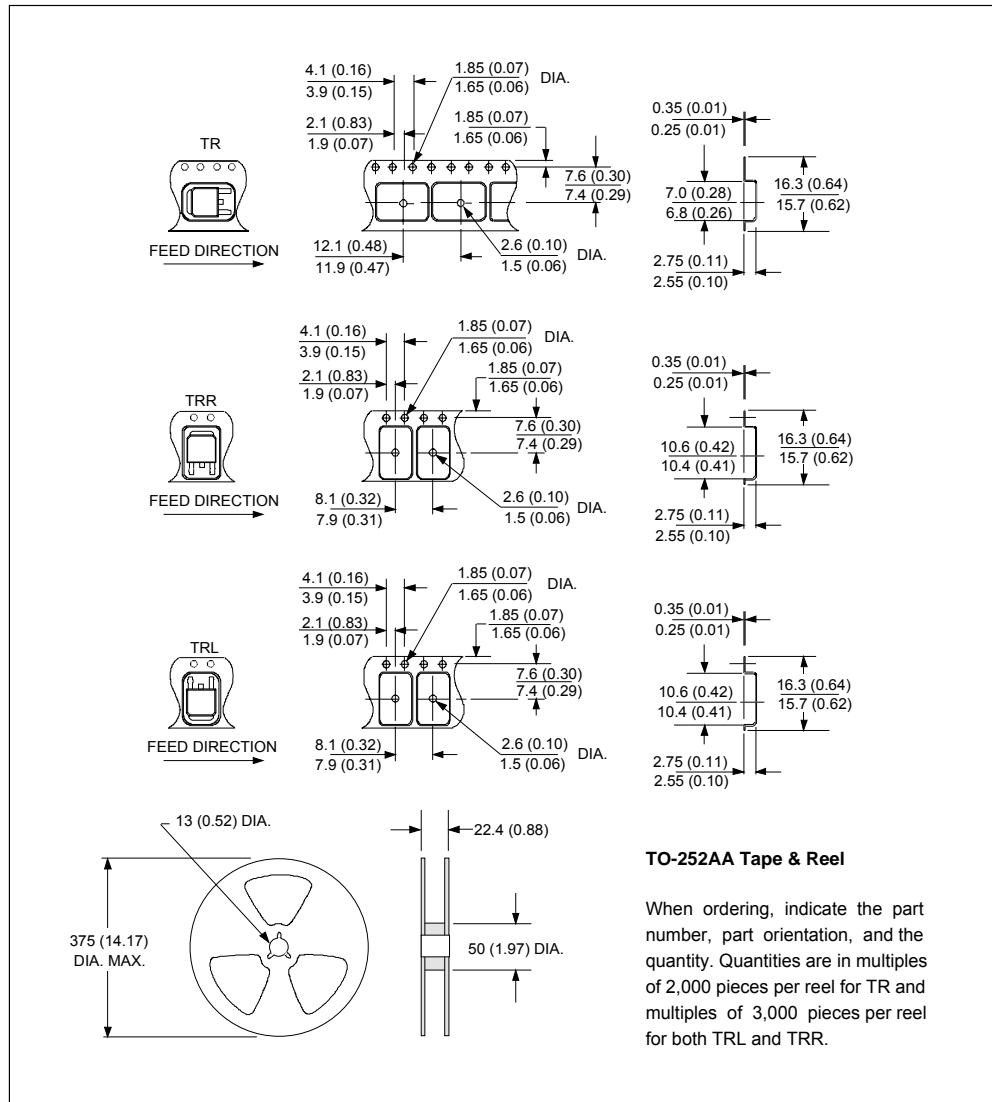
Outline Table



Part Marking Information



Tape & Reel Information



TO-252AA Tape & Reel

When ordering, indicate the part number, part orientation, and the quantity. Quantities are in multiples of 2,000 pieces per reel for TR and multiples of 3,000 pieces per reel for both TRL and TRR.

Ordering Information Table

Device Code	30	W	Q	03	FN	TRL	PbF
	1	2	3	4	5	6	7
1 - Current Rating (3.5A)							
2 - Package Identifier W = D-Pak							
3 - Schottky "Q" Series							
4 - Voltage Rating (03 = 30V)							
5 - FN = TO-252AA (D-Pak)							
6 - • none = Tube (50 pieces) • TR = Tape & Reel • TRL = Tape & Reel (Left Oriented) • TRR = Tape & Reel (Right Oriented)							
7 - • none = Standard Production • PbF = Lead-Free							

Data and specifications subject to change without notice.
This product has been designed and qualified for AEC Q101 Level and Lead-Free.
Qualification Standards can be found on IR's Web site.

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08/06



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