

# International IOR Rectifier

## 30WQ10FNPbF

SCHOTTKY RECTIFIER

3.5 Amp

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

$$V_R = 100\text{V}$$

### Major Ratings and Characteristics

Characteristics	Values	Units
$I_{F(AV)}$ Rectangular waveform	3.5	A
$V_{RRM}$	100	V
$I_{FSM}$ @tp = 5 $\mu$ s sine	440	A
$V_F$ @3 Apk, $T_J = 125^\circ\text{C}$	0.63	V
$T_J$	-40 to 150	$^\circ\text{C}$

### Description/ Features

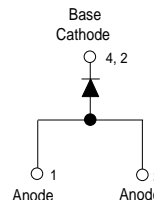
The 30WQ10FNPbF surface mount Schottky rectifier has been designed for applications requiring low forward drop and small foot prints on PC board. Typical applications are in disk drives, switching power supplies, converters, free-wheeling diodes, battery charging, and reverse battery protection.

- 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	30WQ10FNPbF
$V_R$ Max. DC Reverse Voltage (V)	100
$V_{RWM}$ Max. Working Peak Reverse Voltage (V)	

## Absolute Maximum Ratings

Parameters	30WQ...	Units	Conditions
$I_{F(AV)}$ Max. Average Forward Current * See Fig. 5	3.5	A	50% duty cycle @ $T_C = 135^\circ\text{C}$ , rectangular wave form
$I_{FSM}$ Max. Peak One Cycle Non-Repetitive Surge Current * See Fig. 7	440	A	Following any rated load condition and with rated $V_{RRM}$ applied
	70		
$E_{AS}$ Non-Repetitive Avalanche Energy	5.0	mJ	$T_J = 25^\circ\text{C}$ , $I_{AS} = 1$ Amp, $L = 10$ mH
$I_{AR}$ Repetitive Avalanche Current	0.5	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	30WQ...	Units	Conditions
$V_{FM}$ Max. Forward Voltage Drop * See Fig. 1 (1)	0.81	V	@ 3A $T_J = 25^\circ\text{C}$
	0.96	V	@ 6A
	0.63	V	@ 3A $T_J = 125^\circ\text{C}$
	0.74	V	@ 6A
$I_{RM}$ Max. Reverse Leakage Current * See Fig. 2 (1)	1	mA	$T_J = 25^\circ\text{C}$ $V_R = \text{rated } V_R$
	4.9	mA	$T_J = 125^\circ\text{C}$
$V_{F(TO)}$ Threshold Voltage	0.48	V	$T_J = T_J$ max.
$r_t$ Forward Slope Resistance	30.89	m $\Omega$	
$C_T$ Typical Junction Capacitance	92	pF	$V_R = 5V_{DC}$ (test signal range 100Khz to 1Mhz) $25^\circ\text{C}$
$L_S$ Typical Series Inductance	5.0	nH	Measured lead to lead 5mm from package body
dv/dt Max. Voltage Rate of Change	10000	V/ $\mu\text{s}$	(Rated $V_R$ )

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

## Thermal-Mechanical Specifications

Parameters	30WQ...	Units	Conditions
$T_J$ Max. Junction Temperature Range(*)	-40 to 150	$^\circ\text{C}$	
$T_{stg}$ Max. Storage Temperature Range	-40 to 150	$^\circ\text{C}$	
$R_{thJC}$ Max. Thermal Resistance Junction to Case	4.7	$^\circ\text{C/W}$	DC operation * See Fig. 4
wt Approximate Weight	0.3(0.01)	g(oz.)	
Case Style	D-PAK		Similar to TO-252AA
Marking Device	30WQ10FN		

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

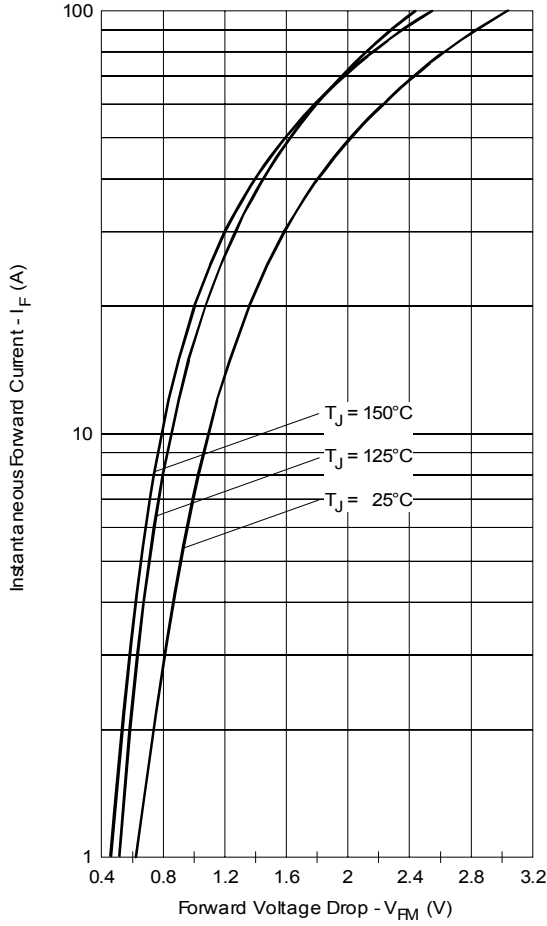


Fig. 1 - Maximum Forward Voltage Drop Characteristics

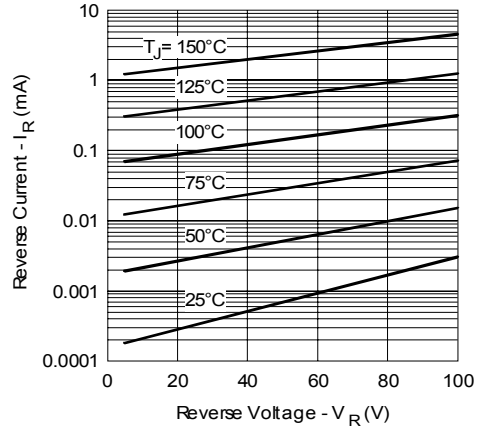


Fig. 2 - Typical Values of Reverse Current Vs. Reverse Voltage

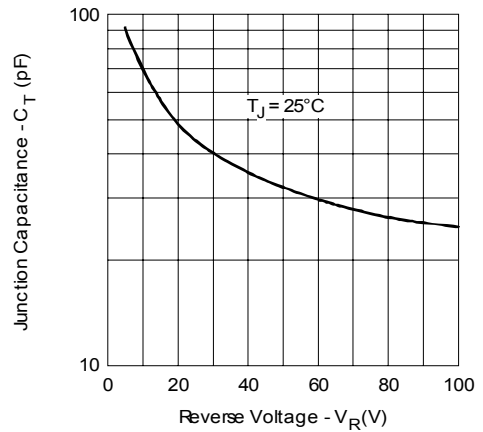


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage

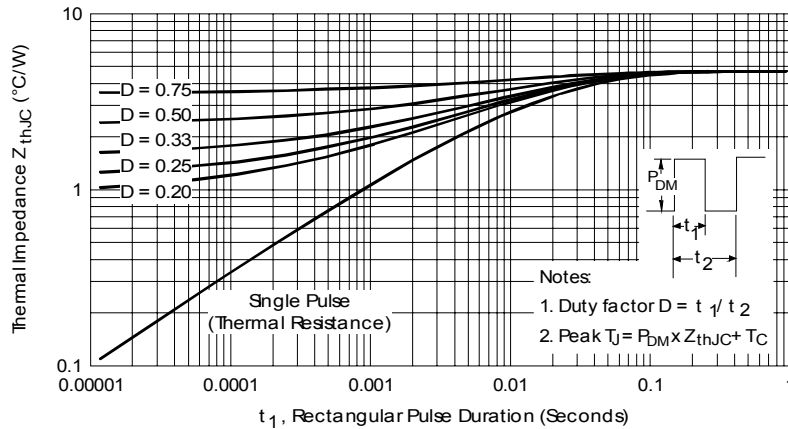


Fig. 4 - Maximum Thermal Impedance  $Z_{thJC}$  Characteristics

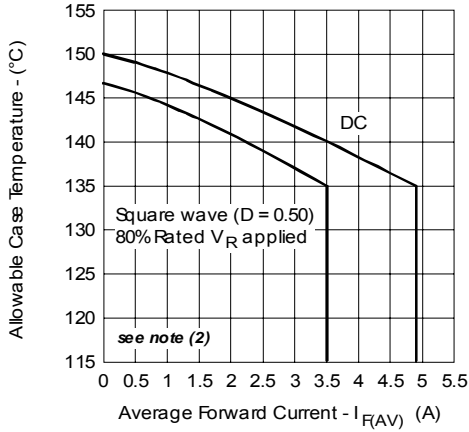


Fig. 5 - Maximum Allowable Case Temperature Vs. Average Forward Current

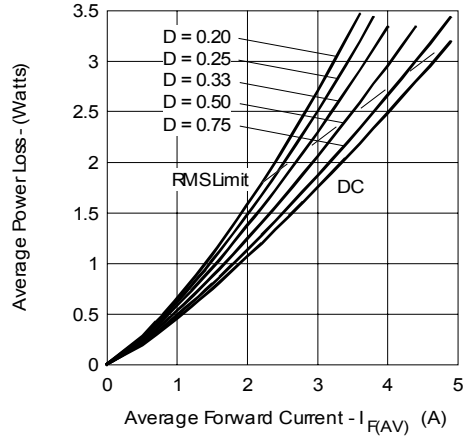


Fig. 6 - Forward Power Loss Characteristics

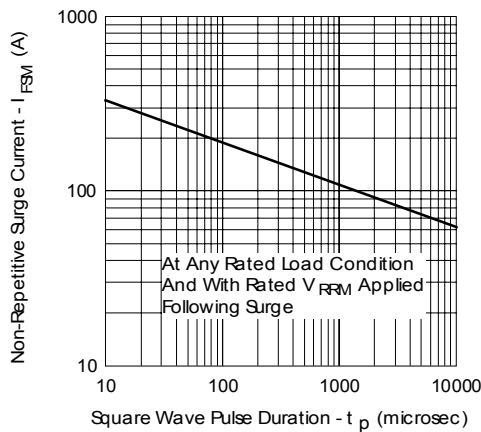


Fig. 7 - Maximum Non-Repetitive Surge Current

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

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

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

Outline Table

**NOTES:**  
 1- DIMENSIONING AND TOLERANCING PER ASME Y14.5M-1994  
 2- DIMENSIONS ARE SHOWN IN INCHES (MILLIMETERS)  
 3- LEAD DIMENSION UNCONTROLLED IN U.S.  
 4- DIMENSION D1, E1, L3 & S1 ESTABLISH A MINIMUM MOUNTING SURFACE FOR THERMAL PAD  
 5- SECTION C-C DIMENSIONING APPLIES TO THE FLAT SECTION OF THE LEAD BETWEEN .008 AND 0.10 [0.13 AND 0.25] FROM THE LEAD TIP.  
 6- DIMENSION D & E DO NOT INCLUDE MOLD FLASH. MOLD FLASH SHALL NOT EXCEED .008 [0.13] PER SIDE. THESE DIMENSIONS ARE MEASURED AT THE OUTMOST EXTREMES OF THE PLASTIC BODY.  
 7- DIMENSION S1 & S2 APPLIED TO BASE METAL ONLY.  
 8- DATUM A & B TO BE DETERMINED AT DATUM PLANE A.  
 9- OUTLINE CONFORMS TO JEDEC OUTLINE TO-252AA.

DIMENSION	MILLIMETERS		INCHES		TYP.
	MIN.	MAX.	MIN.	MAX.	
A	2.18	2.39	.086	.094	
A1	-	0.15	-	.006	
B	0.64	0.89	.025	.035	7
b1	0.65	0.79	.025	.031	7
B2	0.76	1.14	.030	.045	4
B3	4.95	5.46	.195	.215	
C	0.48	0.61	.018	.024	
c1	0.41	0.56	.016	.022	7
c2	0.46	0.89	.018	.035	
D	0.97	6.22	.038	.245	6
D1	5.21	-	.205	-	4
E	0.35	6.73	.014	.265	6
E1	4.32	-	.170	-	4
H	2.29 BSC		.090 BSC		
H1	8.40	10.41	.330	.410	
L	1.40	1.78	.055	.070	
L1	2.74 BSC		.108 BSC		
L2	0.51 BSC		.020 BSC		
L3	0.89	1.27	.035	.050	4
L4	-	1.02	-	.040	
L5	1.14	1.82	.045	.070	3
#1	0°	10°	0°	10°	
#2	0°	35°	0°	35°	
#3	25°	35°	.25°	.35°	

**LEAD ASSIGNMENTS**  
 1.- GATE  
 2.- DRAIN  
 3.- SOURCE  
 4.- DRAIN

**IR & CoPbAK**  
 1.- GATE  
 2.- COLLECTOR  
 3.- EMITTER  
 4.- COLLECTOR

**Modified JEDEC outline TO-252AA**  
 Dimensions in millimeters and (inches)

Part Marking Information

EXAMPLE: THIS IS A 30WQ10FN  
 LOT CODE 8024  
 ASSEMBLED ON WW 02, 2000

INTERNATIONAL  
 RECTIFIER  
 LOGO

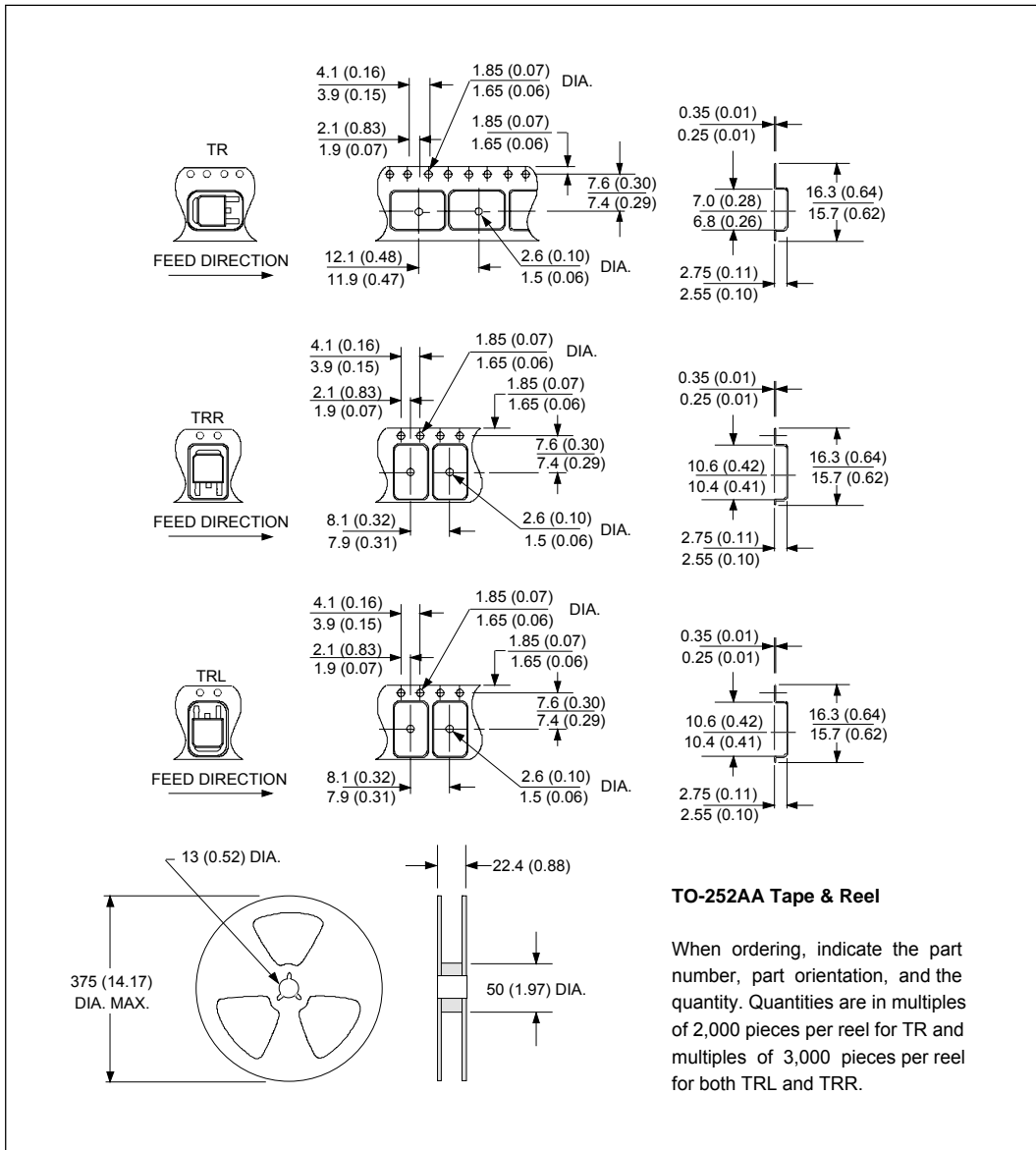
ASSEMBLY  
 LOT CODE

30WQ10FN  
**IR** P002X  
 80 24

PART NUMBER

DATE CODE  
 P = LEAD-FREE  
 YEAR 0 = 2000  
 WEEK 02  
 X = SITE ID

Tape & Reel Information



Ordering Information Table

Device Code								
	<table border="1" style="margin: auto;"> <tr> <td style="padding: 5px;">30</td> <td style="padding: 5px;">W</td> <td style="padding: 5px;">Q</td> <td style="padding: 5px;">10</td> <td style="padding: 5px;">FN</td> <td style="padding: 5px;">TRL</td> <td style="padding: 5px;">PbF</td> </tr> </table>	30	W	Q	10	FN	TRL	PbF
30	W	Q	10	FN	TRL	PbF		
	<table style="margin: auto;"> <tr> <td style="text-align: center;">①</td> <td style="text-align: center;">②</td> <td style="text-align: center;">③</td> <td style="text-align: center;">④</td> <td style="text-align: center;">⑤</td> <td style="text-align: center;">⑥</td> <td style="text-align: center;">⑦</td> </tr> </table>	①	②	③	④	⑤	⑥	⑦
①	②	③	④	⑤	⑥	⑦		
<b>1</b>	- Current Rating (3.5A)							
<b>2</b>	- Package Identifier W = D-Pak							
<b>3</b>	- Schottky "Q" Series							
<b>4</b>	- Voltage Rating (10 = 100V)							
<b>5</b>	- FN = TO-252AA (D-Pak)							
<b>6</b>	- <ul style="list-style-type: none"> <li>• none = Tube (50 pieces)</li> <li>• TR = Tape &amp; Reel</li> <li>• TRL = Tape &amp; Reel (Left Oriented)</li> <li>• TRR = Tape &amp; Reel (Right Oriented)</li> </ul>							
<b>7</b>	- <ul style="list-style-type: none"> <li>• none = Standard Production</li> <li>• PbF = Lead-Free</li> </ul>							

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.