

International
IOR Rectifier

30WQ06FNPbF

SCHOTTKY RECTIFIER

3.5 Amp

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

$$V_R = 60\text{V}$$

Major Ratings and Characteristics

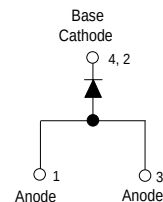
Characteristics	Values	Units
$I_{F(AV)}$ Rectangular waveform	3.5	A
V_{RRM}	60	V
I_{FSM} @ $t_p = 5\mu\text{s}$ sine	490	A
V_F @ 3Apk , $T_J = 125^\circ\text{C}$	0.53	V
T_J	-40 to 150	$^\circ\text{C}$

Description/ Features

The 30WQ06FNPbF 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	30WQ06FNPbF
V_R Max. DC Reverse Voltage (V)	60
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 @ $T_C = 133^\circ\text{C}$, rectangular wave form
I_{FSM} Max. Peak One Cycle Non-Repetitive Surge Current * See Fig. 7	490	A	5 μs Sine or 3 μs Rect. pulse
	70		10ms Sine or 6ms Rect. pulse
E_{AS} Non-Repetitive Avalanche Energy	6.0	mJ	$T_J = 25^\circ\text{C}$, $I_{AS} = 1\text{ Amp}$, $L = 12\text{ mH}$
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	30WQ...	Units	Conditions
V_{FM} Max. Forward Voltage Drop * See Fig. 1 (1)	0.61	V	@ 3A
	0.76	V	@ 6A
	0.53	V	@ 3A
	0.65	V	@ 6A
I_{RM} Max. Reverse Leakage Current * See Fig. 2 (1)	2	mA	$T_J = 25^\circ\text{C}$
	30	mA	$T_J = 125^\circ\text{C}$
$V_{F(TO)}$ Threshold Voltage	0.38	V	$T_J = T_J \text{ max.}$
r_t Forward Slope Resistance	34.31	m Ω	
C_T Typical Junction Capacitance	145	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 < 300 μs , Duty Cycle < 2%

Thermal-Mechanical Specifications

Parameters	30WQ...	Units	Conditions
T_J Max. Junction Temper. 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	30WQ06FN		

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

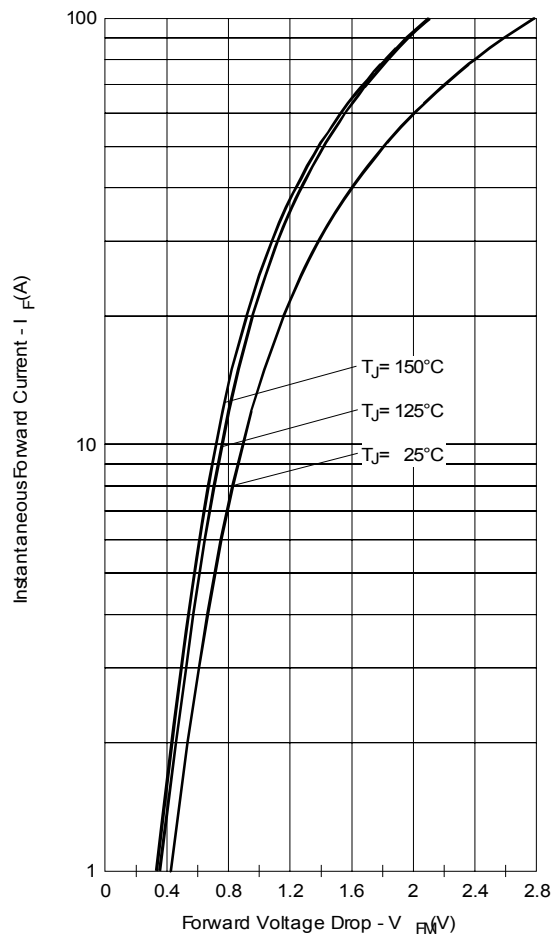


Fig. 1 - Maximum Forward Voltage Drop Characteristics

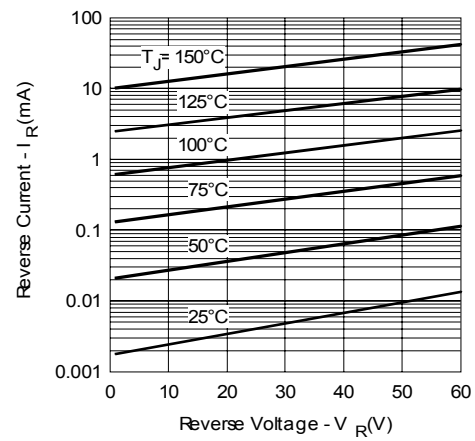


Fig. 2 - Typical Values of Reverse Current Vs. Reverse Voltage

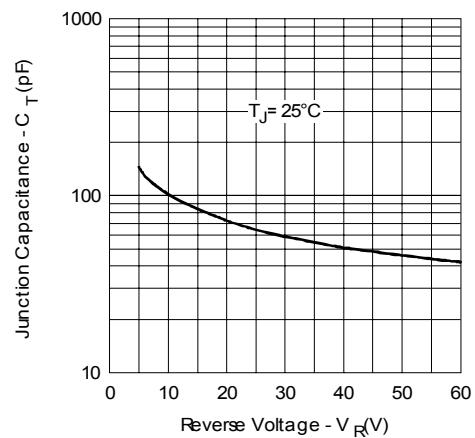


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage

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

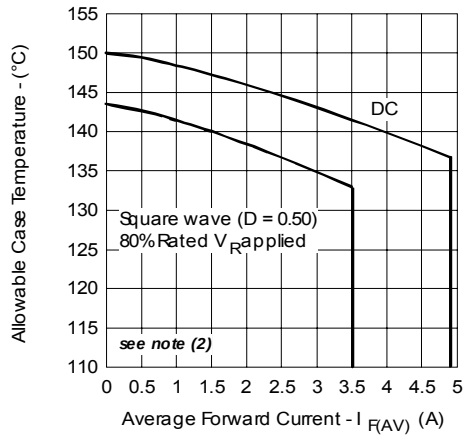


Fig. 5 - Maximum Allowable Case Temperature Vs. Average Forward Current

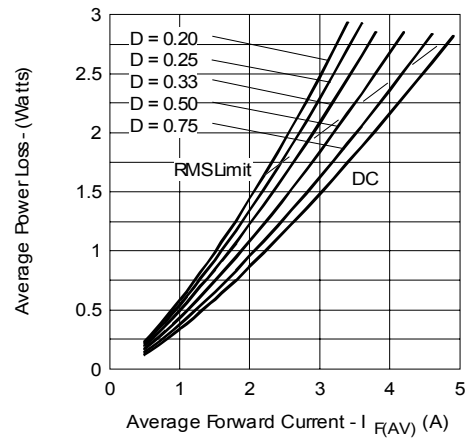


Fig. 6 - Forward Power Loss Characteristics

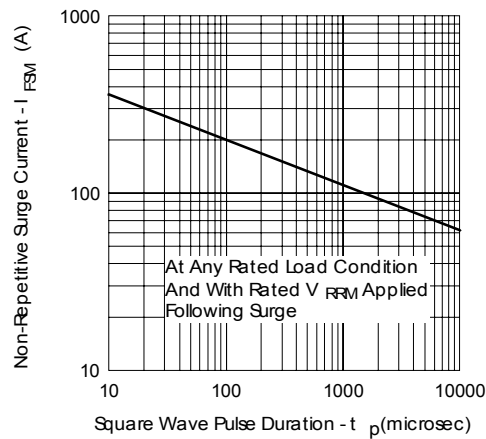


Fig. 7 - Maximum Non-Repetitive Surge Current

(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

NOTES:
1 - DIMENSIONS AND TOLERANCING PER ASME Y14.5M-1994

2 - DIMENSIONS A & E DO NOT INCLUDE MOLD FLASH. MOLD FLASH SHALL NOT EXCEED .005 [0.13] PER SIDE. THESE DIMENSIONS ARE MEASURED AT THE OUTMOST EXTREMES OF THE PLASTIC BODY.



S E C T I O N	DIMENSIONS				N O T E
	MILLIMETERS		INCHES		
	MIN.	MAX.	MIN.	MAX.	
A	2.18	2.39	.086	.094	
A1	-	0.15	-	.006	
b	0.84	0.89	.035	.036	7
b1	0.69	0.79	.025	.031	
c2	0.76	1.14	.030	.045	7
b3	4.95	5.40	.195	.215	4
c	0.40	0.61	.016	.024	
a1	0.41	0.56	.016	.022	7
c2	0.40	0.89	.016	.035	
D	9.97	9.22	.395	.245	6
D1	9.27	-	.365	-	
E	6.36	6.73	.250	.266	6
E1	6.32	-	.170	-	
#	2.59	8.95	.090	.350	
L	1.40	1.78	.055	.070	
L1	-	-	-	-	
L2	-	-	-	-	
L3	8.89	1.27	.035	.050	

LEAD ASSIGNMENTS

HEXCEL
1 - DATE
2 - DRAIN
3 - SOURCE
4 - DRAIN

UGBT & CoPAK

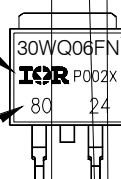
1 - DATE
2 - COLLECTOR
3 - EMITTER
4 - COLLECTOR

Part Marking Information

EXAMPLE: THIS IS A 30WQ06FN
LOT CODE 8024
ASSEMBLED ON WW 02, 2000

INTERNATIONAL
RECTIFIER
LOGO

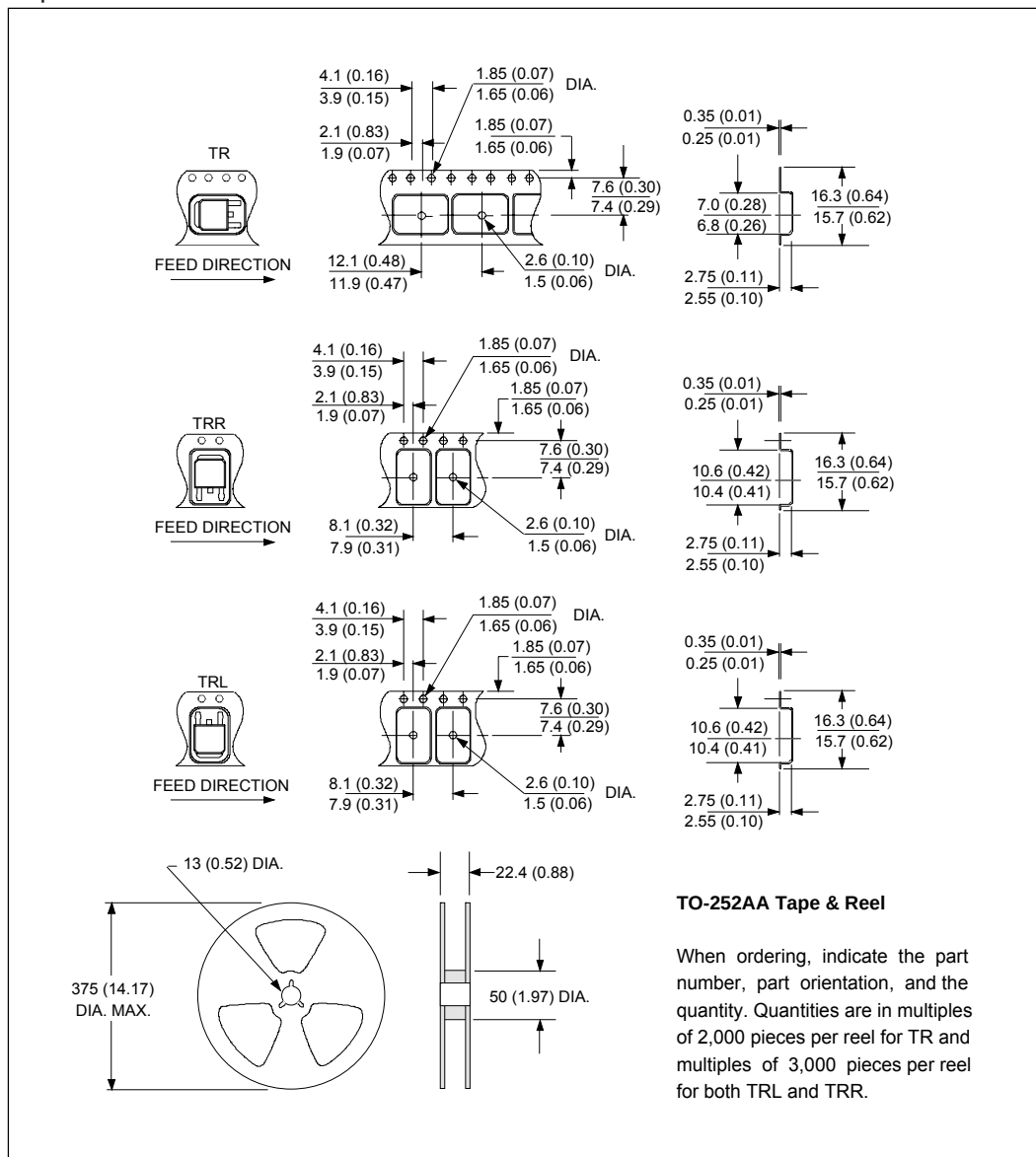
ASSEMBLY
LOT CODE



PART NUMBER

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

Tape & Reel Information



Ordering Information Table

Device Code						
	30	W	Q	06	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 (06 = 60V)					
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.