Bulletin PD-20523 rev. G 05/06

International
IOR Rectifier

30WQ10FN

SCHOTTKY RECTIFIER

3.5 Amp

$I_{F(AV)}$ = 3.5Amp
V_R = 100V

Major Ratings and Characteristics

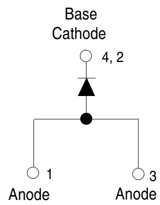
Characteristics	Values	Units
$I_{F(AV)}$ Rectangular waveform	3.5	A
V_{RRM}	100	V
I_{FSM} @ tp = 5 μs sine	440	A
V_F @ 3 Apk, T_J = 125°C	0.63	V
T_J	-40 to 150	°C

Description/ Features

The 30WQ10FN 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

Case Styles



D-PAK (TO-252AA)

Voltage Ratings

	Part number	30WQ10FN
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°C, rectangular wave form	
I_{FSM}	Max. Peak One Cycle Non-Repetitive	440	A	5µs Sine or 3µs Rect. pulse	Following any rated load condition and with rated V_{RRM} applied
	Surge Current * See Fig. 7	70		10ms Sine or 6ms Rect. pulse	
E_{AS}	Non-Repetitive Avalanche Energy	5.0	mJ	T_J = 25 °C, I_{AS} = 1 Amp, L = 10 mH	
I_{AR}	Repetitive Avalanche Current	0.5	A	Current decaying linearly to zero in 1 µsec Frequency limited by T_J max. V_A = 1.5 x V_R typical	

Electrical Specifications

	Parameters	30WQ...	Units	Conditions	
V_{FM}	Max. Forward Voltage Drop	0.81	V	@ 3A	T_J = 25 °C
	* See Fig. 1 (1)	0.96	V	@ 6A	
		0.63	V	@ 3A	T_J = 125 °C
		0.74	V	@ 6A	
I_{RM}	Max. Reverse Leakage Current	1	mA	T_J = 25 °C	V_R = rated V_R
	* See Fig. 2 (1)	4.9	mA	T_J = 125 °C	
$V_{F(TO)}$	Threshold Voltage	0.48	V	T_J = T_J max.	
r_t	Forward Slope Resistance	30.89	mΩ		
C_T	Typical Junction Capacitance	92	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	30WQ10FN		

(*) $\frac{dPtot}{dTj} < \frac{1}{Rth(j\text{-}a)}$ thermal runaway condition for a diode on its own heatsink

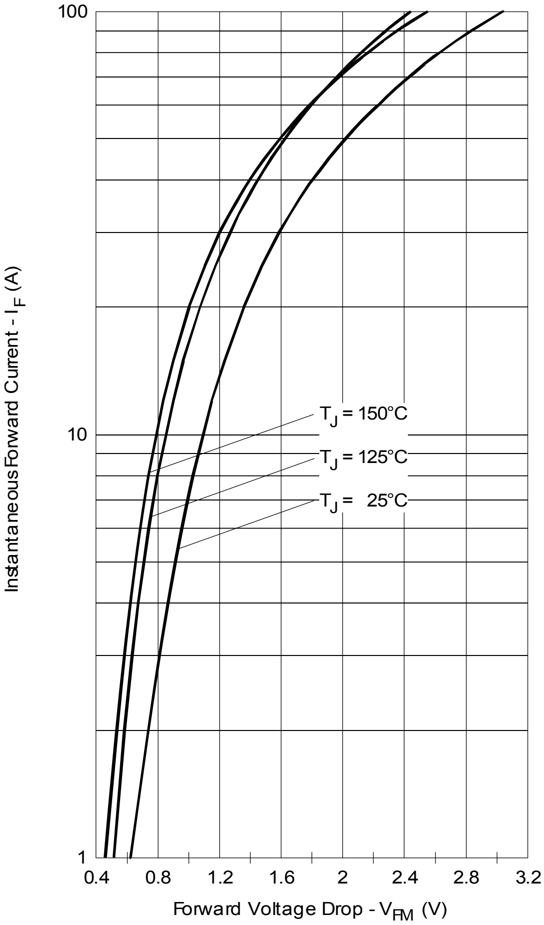


Fig. 1 - Maximum Forward Voltage Drop Characteristics

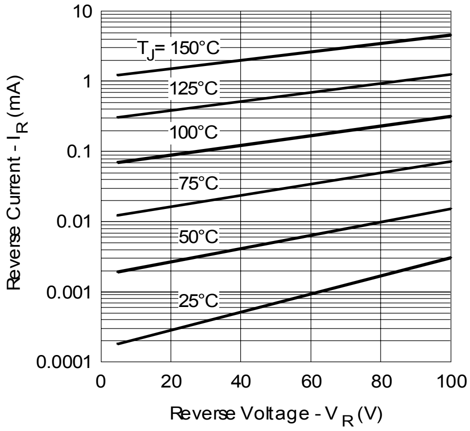


Fig. 2 - Typical Values of Reverse Current Vs. Reverse Voltage

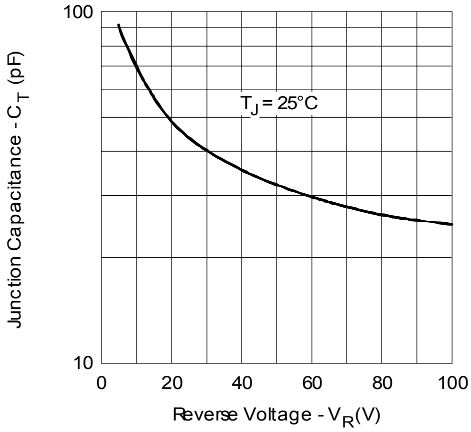


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage

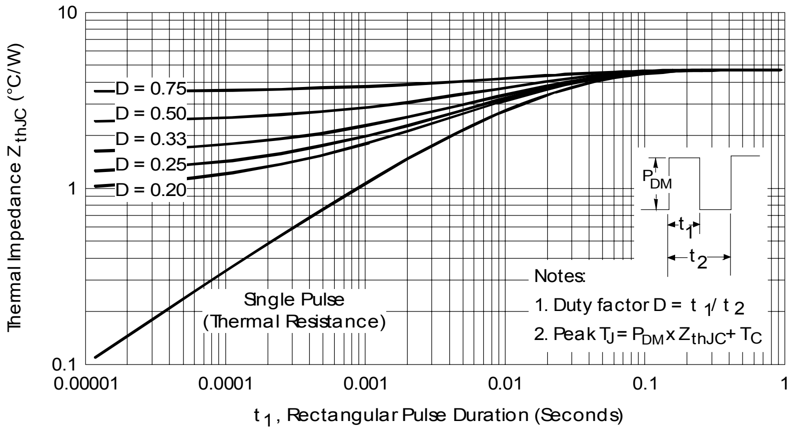


Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics

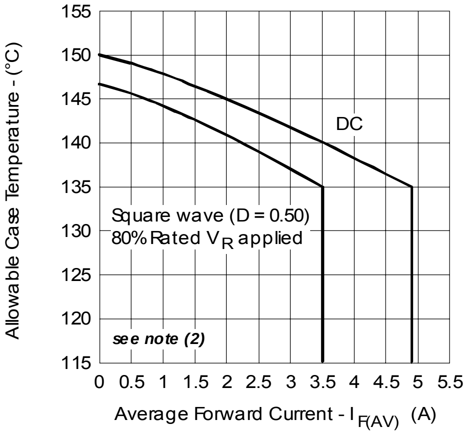


Fig. 5 - Maximum Allowable Case Temperature Vs. Average Forward Current

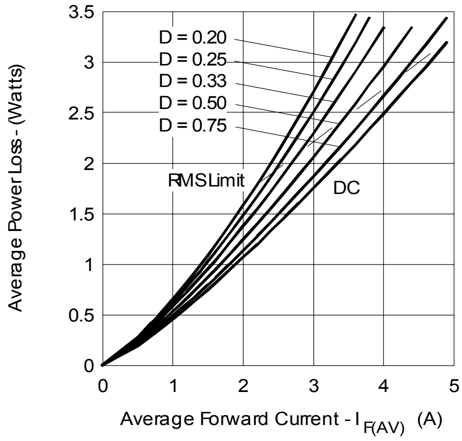


Fig. 6 - Forward Power Loss Characteristics

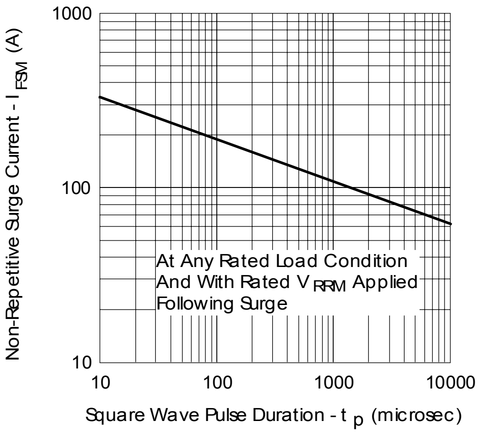
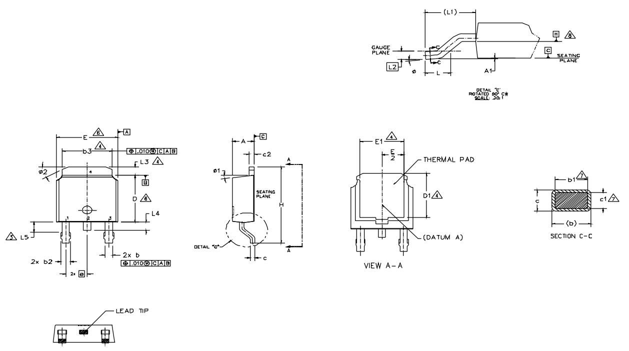


Fig. 7 - Maximum Non-Repetitive Surge Current

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



NOTES:
1.- DIMENSIONING AND TOLERANCING PER ASME Y14.5M-1994
2.- DIMENSION ARE SHOWN IN INCHES [MILLIMETERS].
3.- LEAD DIMENSION UNCONTROLLED IN L5.
4.- DIMENSION D1, E1, L3 & b3 ESTABLISH A MINIMUM MOUNTING SURFACE FOR THERMAL PAD.
5.- SECTION C-C DIMENSIONS APPLY TO THE FLAT SECTION OF THE LEAD BETWEEN .005 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 .005 [0.13] PER SIDE. THESE DIMENSIONS ARE MEASURED AT THE OUTMOST EXTREMES OF THE PLASTIC BODY.
7.- DIMENSION b1 & c1 APPLIED TO BASE METAL ONLY.
8.- DATUM A & B TO BE DETERMINED AT DATUM PLANE H.
9.- OUTLINE CONFORMS TO JEDEC OUTLINE TO-252AA.

SYMBOL	DIMENSIONS				NOTES
	MILLIMETERS		INCHES		
	MIN.	MAX.	MIN.	MAX.	
A	2.18	2.39	.086	.094	
A1	–	0.13	–	.005	
b	0.64	0.89	.025	.035	
b1	0.65	0.79	.025	.031	7
b2	0.76	1.14	.030	.045	
b3	4.95	5.46	.195	.215	4
c	0.46	0.61	.018	.024	
c1	0.41	0.56	.016	.022	7
c2	0.46	0.89	.018	.035	
D	5.97	6.22	.235	.245	6
D1	5.21	–	.205	–	4
E	6.35	6.73	.250	.265	6
E1	4.32	–	.170	–	4
e	2.29 BSC		.090 BSC		
H	9.40	10.41	.370	.410	
L	1.40	1.78	.055	.070	
L1	2.74 BSC		.108 REF.		
L2	0.51 BSC		.020 BSC		
L3	0.89	1.27	.035	.050	4
L4	–	1.02	–	.040	
L5	1.14	1.52	.045	.060	3
ø	0°	10°	0°	10°	
ø1	0°	15°	0°	15°	
ø2	25°	35°	25°	35°	

LEAD ASSIGNMENTS

HEXFET

1.- GATE
2.- DRAIN
3.- SOURCE
4.- DRAIN

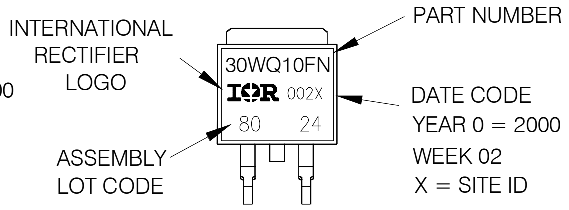
IGBT & CoPAK

1.- GATE
2.- COLLECTOR
3.- EMITTER
4.- COLLECTOR

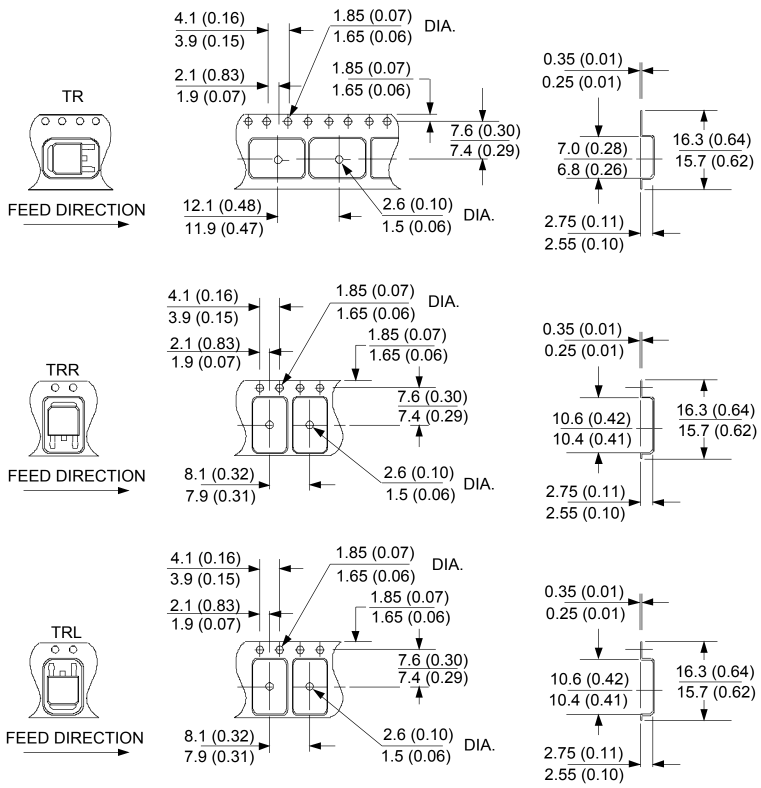
Modified JEDEC outline TO-252AA
Dimensions in millimeters and (inches)

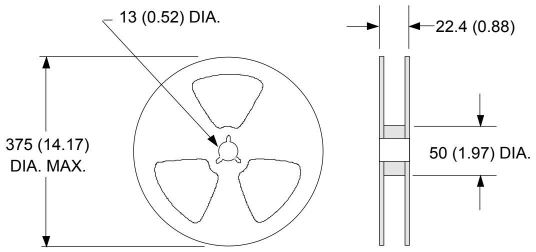
Part Marking Information

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



Tape & Reel Information



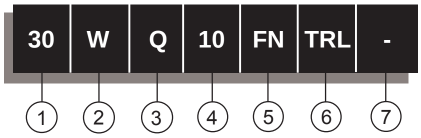


TO-252AA Tape & Reel

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



1	-	Current Rating (3.5A)
2	-	Package Identifier
		W = D-Pak
3	-	Schottky "Q" Series
4	-	Voltage Rating (10 = 100V)
5	-	FN = TO-252AA
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

This product has been designed and qualified for AEC Q101 Level.
Qualification Standards can be found on IR's Web site.

International
IOR Rectifier

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05/06

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