

Bulletin PD-20560 rev.F 03/03

International IOR Rectifier

6CWQ03FN

SCHOTTKY RECTIFIER

7 Amp



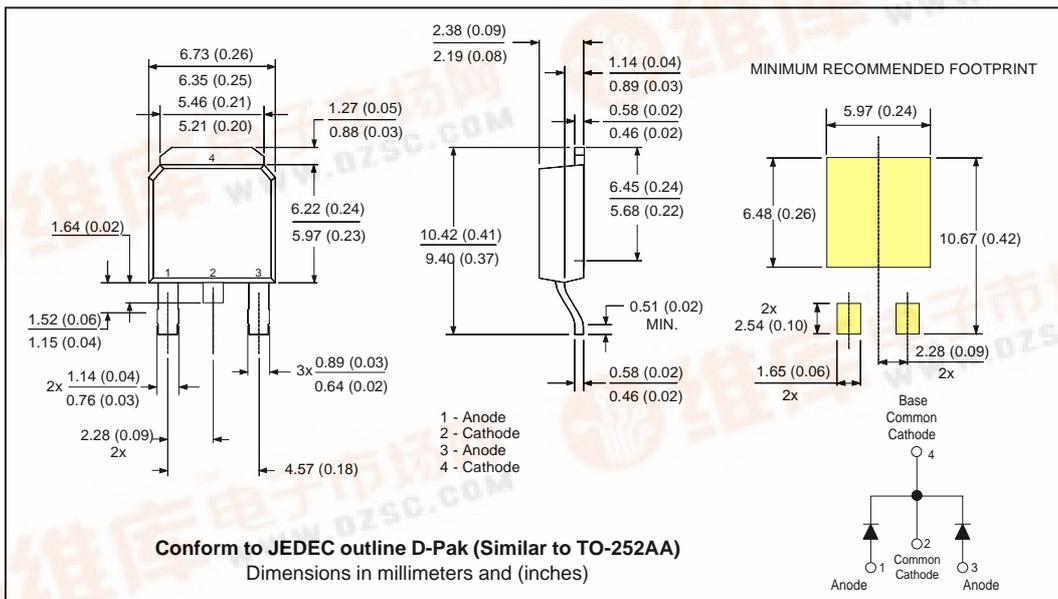
Major Ratings and Characteristics

Characteristics	6CWQ03FN	Units
$I_{F(AV)}$ Rectangular waveform	7	A
V_{RRM}	30	V
I_{FSM} @ $t_p=5\mu s$ sine	535	A
V_F @ 3 Apk, $T_J = 125^\circ C$ (per leg)	0.35	V
T_J range	-40 to 150	$^\circ C$

Description/ Features

The 6CWQ03FN surface mount, center tap, Schottky rectifier series 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
- Center tap configuration
- Small foot print, surface mountable
- Low forward voltage drop
- High frequency operation
- Guard ring for enhanced ruggedness and long term reliability



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Voltage Ratings

Part number	6CWQ03FN
V_R Max. DC Reverse Voltage (V)	30
V_{RWM} Max. Working Peak Reverse Voltage (V)	

Absolute Maximum Ratings

Parameters	6CWQ...	Units	Conditions
$I_{F(AV)}$ Max. Average Forward Current (Per Leg) * See Fig. 5 (Per Device)	3.5	A	50% duty cycle @ $T_C = 134^\circ\text{C}$, rectangular wave form
	7		
I_{FSM} Max. Peak One Cycle Non-Repetitive Surge Current (Per Leg) * See Fig. 7	535	A	5 μs Sine or 3 μs Rect. pulse 10ms Sine or 6ms Rect. pulse
	90		
E_{AS} Non-Repet. Avalan. Energy (Per Leg)	8	mJ	$T_J = 25^\circ\text{C}$, $I_{AS} = 2$ Amps, $L = 4$ mH
I_{AR} Repetitive Avalanche Current (Per Leg)	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	6CWQ...	Units	Conditions
V_{FM} Max. Forward Voltage Drop (Per Leg) * See Fig. 1 (1)	0.45	V	@ 3A $T_J = 25^\circ\text{C}$
	0.52	V	@ 6A
	0.35	V	@ 3A $T_J = 125^\circ\text{C}$
	0.46	V	@ 6A
I_{RM} Max. Reverse Leakage Current (Per Leg) * See Fig. 2 (1)	2	mA	$T_J = 25^\circ\text{C}$
	50	mA	$T_J = 125^\circ\text{C}$ $V_R = \text{rated } V_R$
$V_{F(TO)}$ Threshold Voltage	0.22	V	$T_J = T_J \text{ max.}$
r_t Forward Slope Resistance	32.86	m Ω	
C_T Typ. Junction Capacitance (Per Leg)	290	pF	$V_R = 5V_{DC}$, (test signal range 100Khz to 1Mhz) 25°C
L_S Typical Series Inductance (Per Leg)	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	6CWQ...	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 (Per Leg) Junction to Case (Per Device)	4.70	$^\circ\text{C}/\text{W}$	DC operation * See Fig. 4
	2.35		
wt Approximate Weight	0.3(0.01)	g(oz.)	
Case Style	D-Pak		Similar to TO-252AA

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

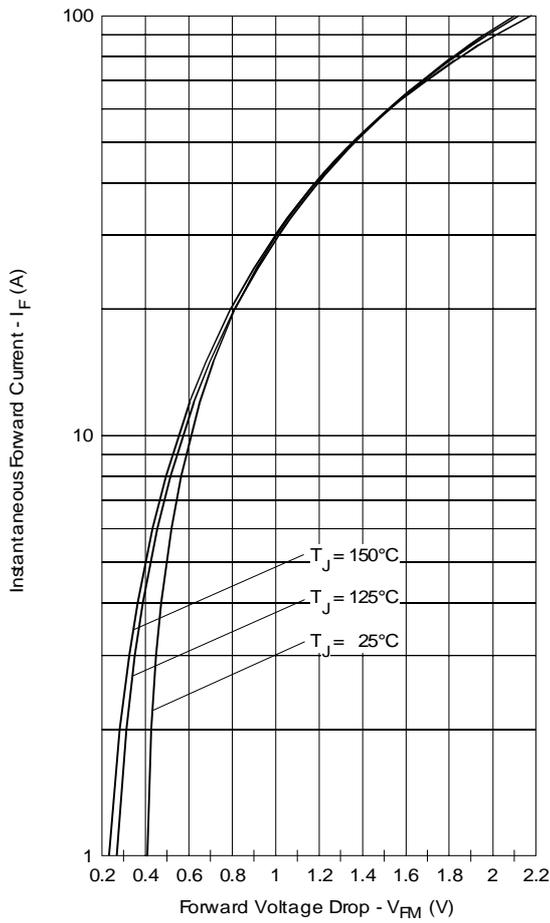


Fig. 1 - Max. Forward Voltage Drop Characteristics (Per Leg)

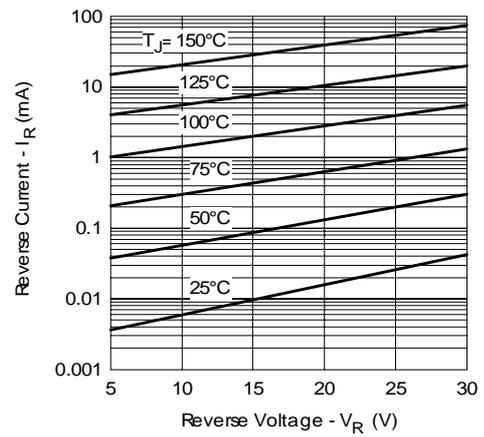


Fig. 2 - Typical Values Of Reverse Current Vs. Reverse Voltage (Per Leg)

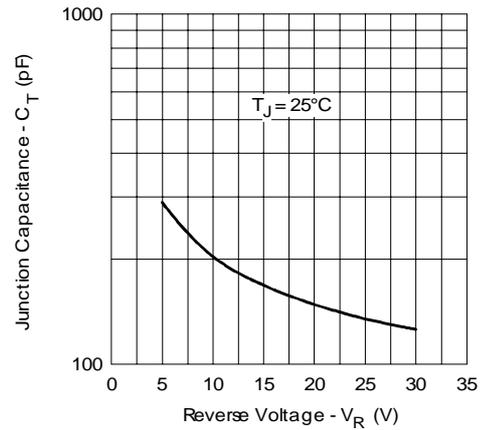


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage (Per Leg)

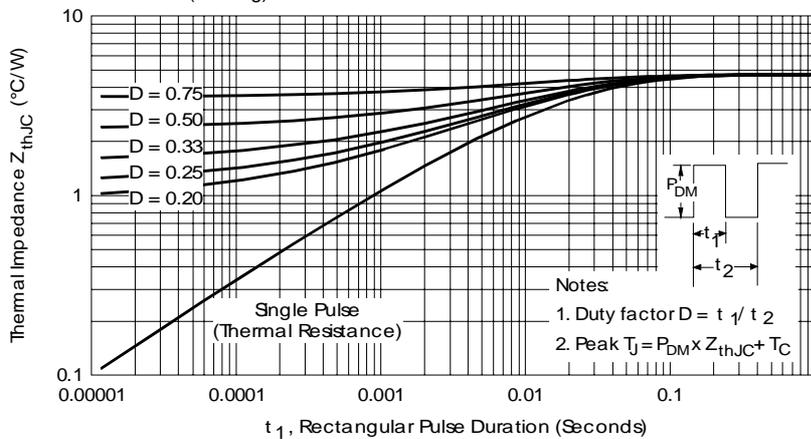


Fig. 4 - Max. Thermal Impedance Z_{thJC} Characteristics (Per Leg)

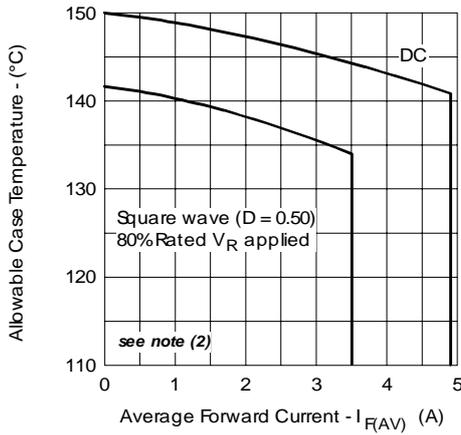


Fig. 5 - Max. Allowable Case Temperature Vs. Average Forward Current (Per Leg)

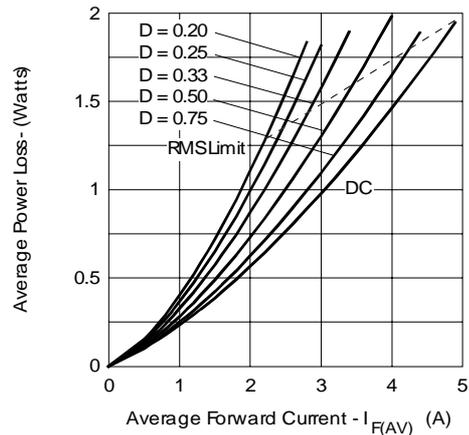


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

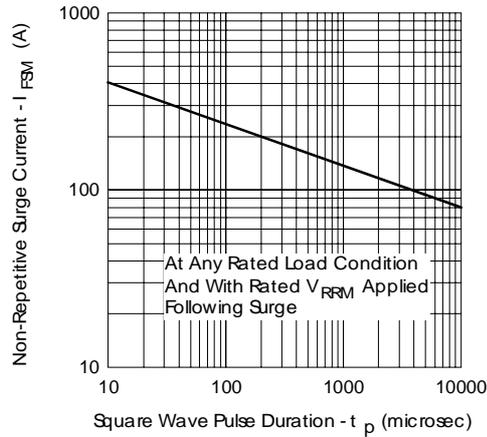


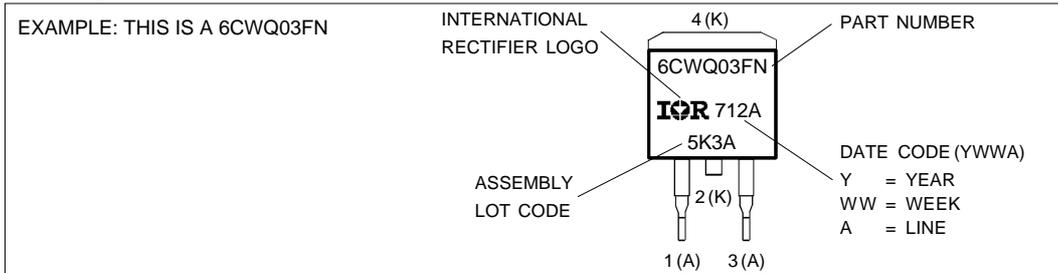
Fig. 7 - Max. Non-Repetitive Surge Current (Per Leg)

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

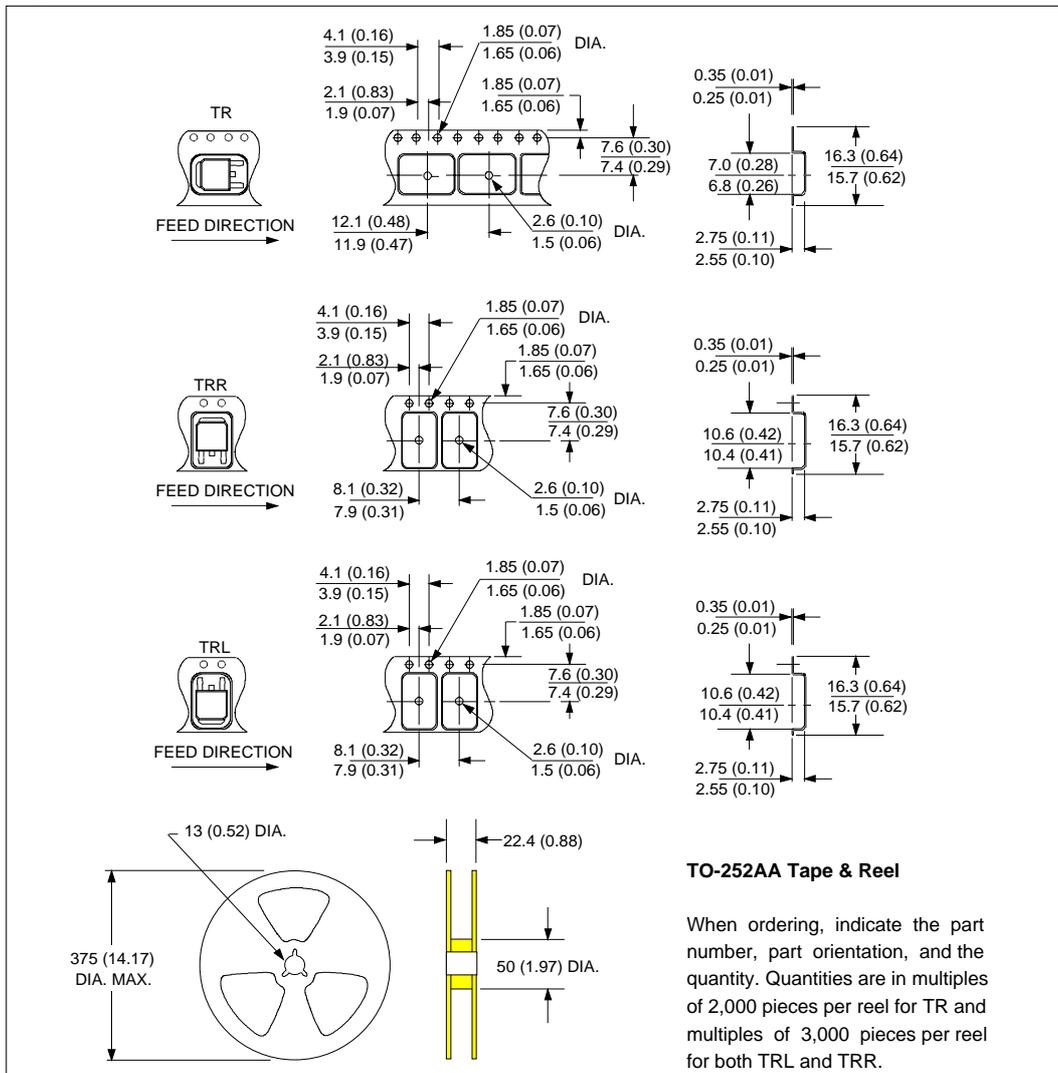
P_d = Forward Power Loss = $I_{F(AV)} \times V_{FM} @ (I_{F(AV)} / D)$ (see Fig. 6);

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

Marking Information



Tape & Reel Information



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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.

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