Bulletin PD-20527 rev. F 03/03

International
IOR Rectifier

6CWQ04FN

SCHOTTKY RECTIFIER

7 Amp



D-Pak (TO-252AA)

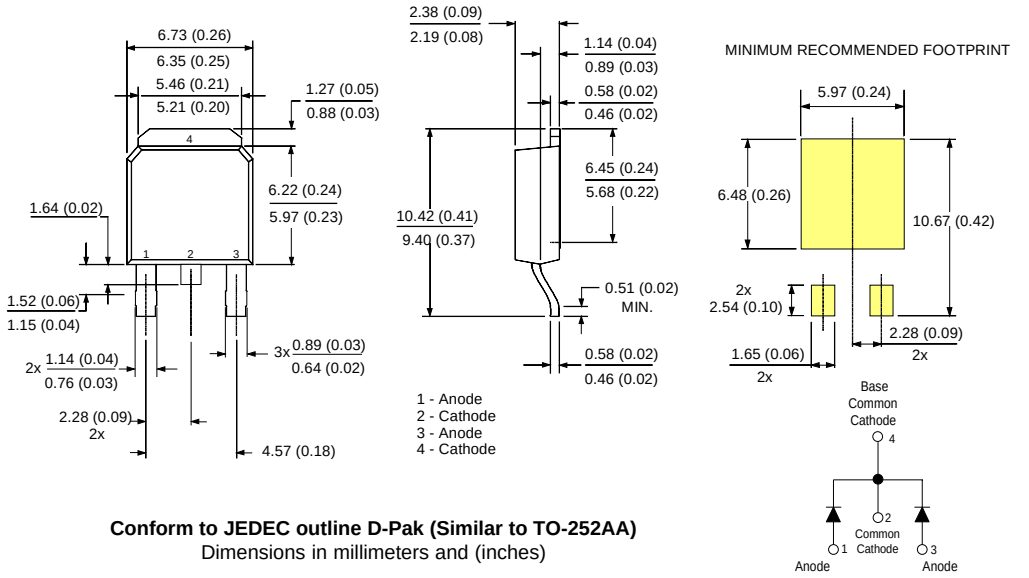
Major Ratings and Characteristics

Characteristics		6CWQ04FN	Units
$I_{F(AV)}$	Rectangular waveform	7	A
V_{RRM}		40	V
I_{FSM}	@ tp = 5 µs sine	500	A
V_F	@3 Apk, T_J = 125°C (per leg)	0.49	V
T_J	range	-40 to 150	°C

Description/ Features

The 6CWQ04FN 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



Conform to JEDEC outline D-Pak (Similar to TO-252AA)
Dimensions in millimeters and (inches)

Voltage Ratings

	Part number	6CWQ04FN
V_R	Max. DC Reverse Voltage (V)	40
V_{RWM}	Max. Working Peak Reverse Voltage (V)	

Absolute Maximum Ratings

	Parameters	6CWQ...	Units	Conditions	
$I_{F(AV)}$	Max. Average Forward (Per Leg)	3.5	A	50% duty cycle @ T_C = 135°C, rectangular wave form	
	Current * See Fig. 5 (Per Device)	7			
I_{FSM}	Max. Peak One Cycle Non-Repetitive	500	A	5µs Sine or 3µs Rect. pulse	Following any rated load condition and with rated V_{RRM} applied
	Surge Current (Per Leg) * See Fig. 7	80		10ms Sine or 6ms Rect. pulse	
E_{AS}	Non-Repet. Avalan. Energy (Per Leg)	8.0	mJ	T_J = 25 °C, I_{AS} = 1 Amp, L = 16 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 x V_R typical	

Electrical Specifications

	Parameters	6CWQ...	Units	Conditions	
V_{FM}	Max. Forward Voltage Drop	0.53	V	@ 3A	T_J = 25 °C
	(Per Leg) * See Fig. 1 (1)	0.67	V	@ 6A	
		0.49	V	@ 3A	T_J = 125 °C
		0.62	V	@ 6A	
I_{RM}	Max. Reverse Leakage Current	2	mA	T_J = 25 °C	V_R = rated V_R
	(Per Leg) * See Fig. 2 (1)	24	mA	T_J = 125 °C	
$V_{F(TO)}$	Threshold Voltage	0.34	V	T_J = T_J max.	
r_t	Forward Slope Resistance	37.33	mΩ		
C_T	Typ. Junction Capacitance (Per Leg)	189	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 < 300µs, Duty Cycle <2%

Thermal-Mechanical Specifications

	Parameters	6CWQ...	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 (Per Leg)	4.70	°C/W	DC operation * See Fig. 4
	Junction to Case (Per Device)	2.35		
wt	Approximate Weight	0.3 (0.01)	g (oz.)	
	Case Style	D-Pak		Similar to TO-252AA

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

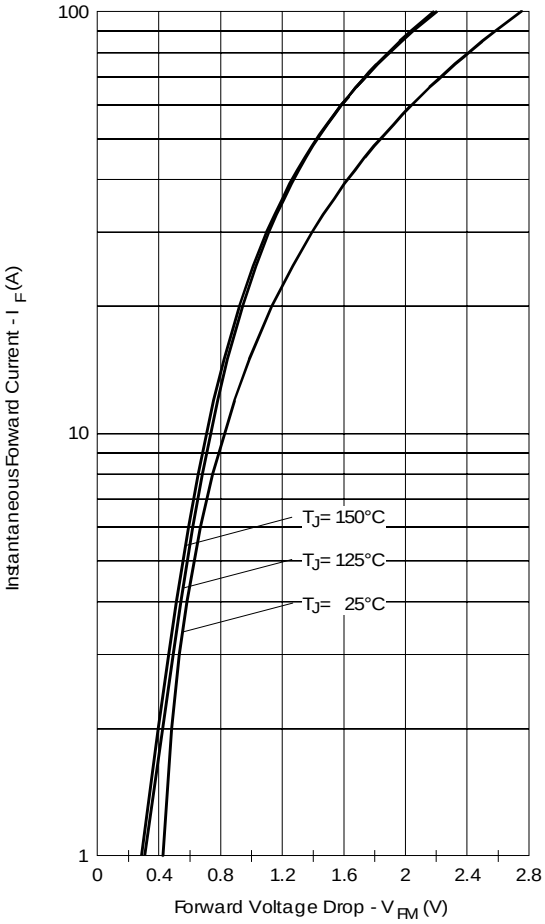


Fig. 1 - Max. Forward Voltage Drop Characteristics (Per Leg)

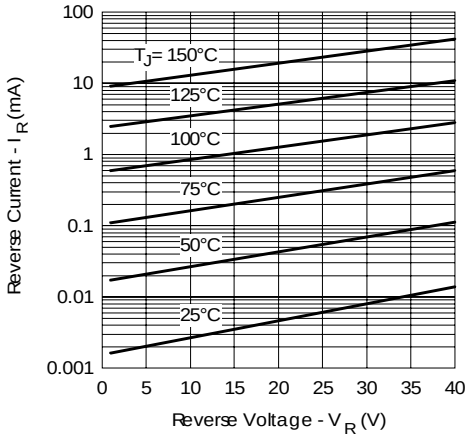


Fig. 2 - Typical Values Of Reverse Current Vs. Reverse Voltage (Per Leg)

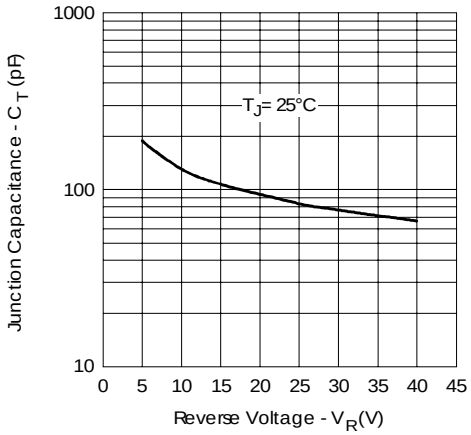


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage (Per Leg)

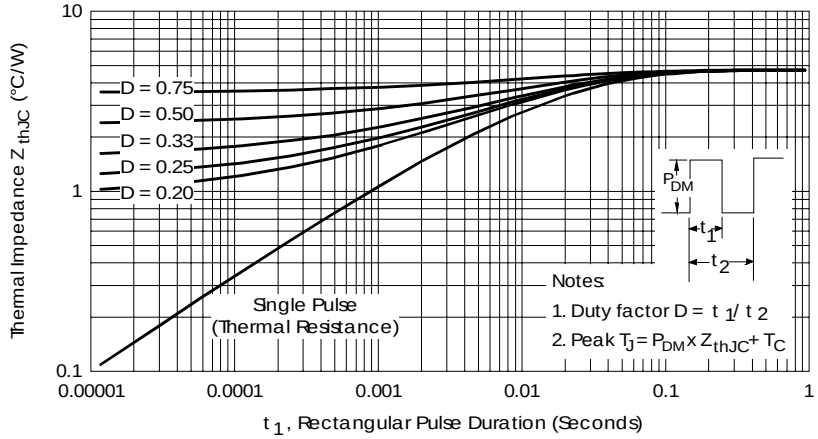


Fig. 4 - Max. Thermal Impedance Z_{thJC} Characteristics (Per Leg)

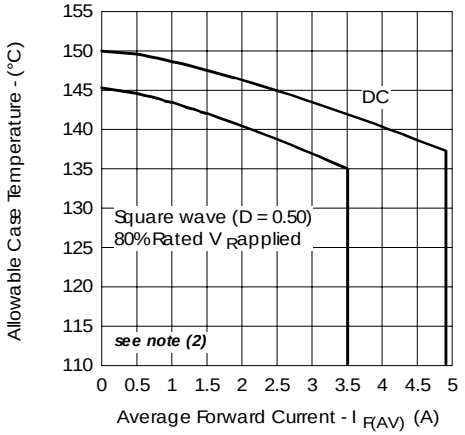


Fig. 5 - Max. Allowable Case Temperature Vs. Average Forward Current (Per Leg)

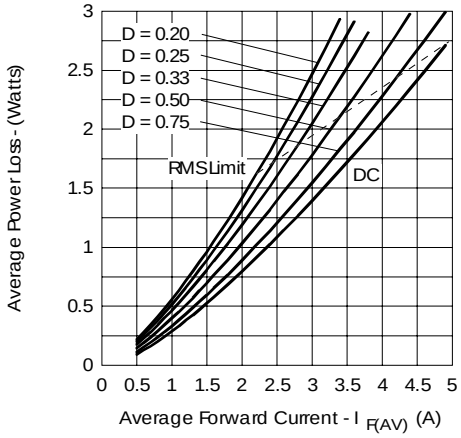


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

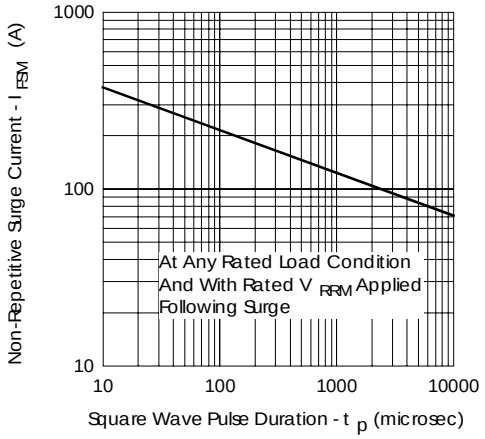
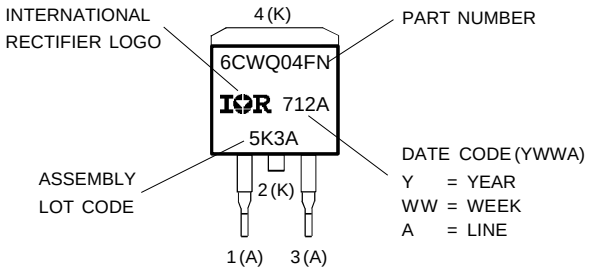


Fig. 7 - Max. Non-Repetitive Surge Current (Per Leg)

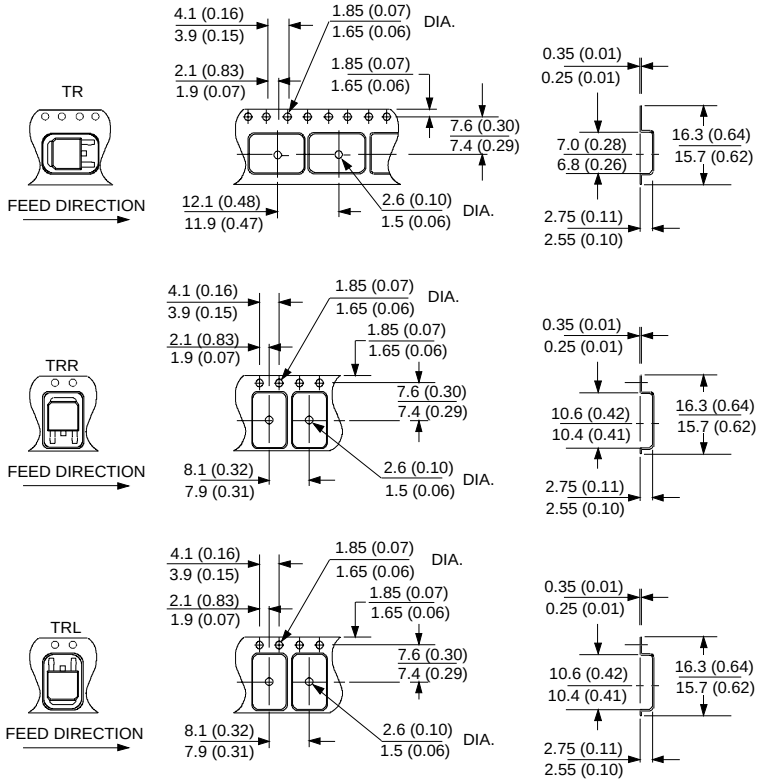
(2) Formula used: $T_C = T_J - (Pd + Pd_{REV}) \times R_{thJC}$;
Pd = Forward Power Loss = $I_{F(AV)} \times V_{FM} @ (I_{F(AV)} / D)$ (see Fig. 6);
Pd_{REV} = Inverse Power Loss = $V_{R1} \times I_R (1 - D)$; $I_R @ V_{R1}$ = 80% rated V_R

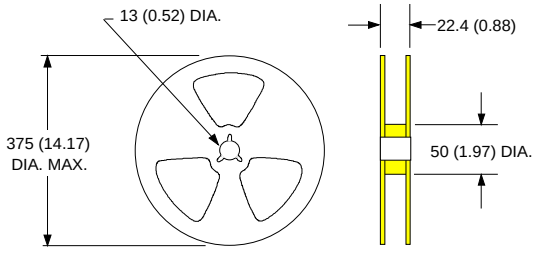
Marking Information

EXAMPLE: THIS IS A 6CWQ04FN



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.

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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