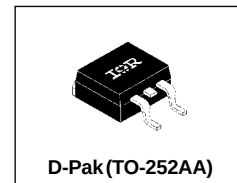


## 6CWQ04FN

### SCHOTTKY RECTIFIER

7 Amp



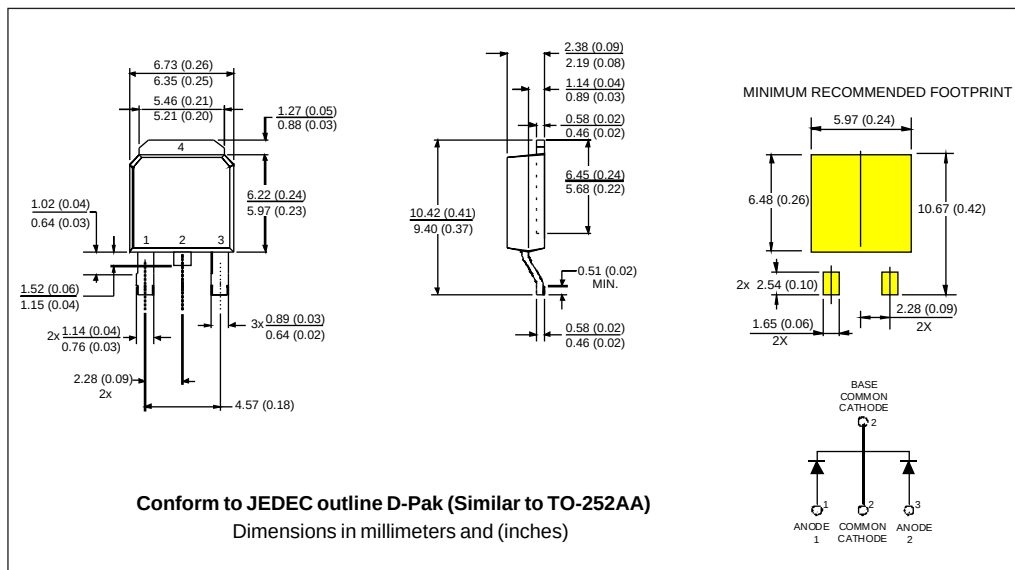
#### Major Ratings and Characteristics

| Characteristics                                   | 6CWQ04FN   | Units      |
|---------------------------------------------------|------------|------------|
| $I_{F(AV)}$ Rectangular waveform                  | 7          | A          |
| $V_{RRM}$                                         | 40         | V          |
| $I_{FSM}$ @ $t_p = 5 \mu s$ sine                  | 500        | A          |
| $V_F$ @ $3 A_p k$ , $T_J = 125^\circ C$ (per leg) | 0.49       | V          |
| $T_J$ range                                       | -40 to 150 | $^\circ C$ |

#### 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



## 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 Current (Per Leg) * See Fig. 5 (Per Device)      | 3.5     | A     | 50% duty cycle @ $T_C = 135^\circ\text{C}$ , rectangular wave form |
|                                                                                   | 7       |       |                                                                    |
| $I_{FSM}$ Max. Peak One Cycle Non-Repetitive Surge Current (Per Leg) * See Fig. 7 | 500     | A     | 5 $\mu\text{s}$ Sine or 3 $\mu\text{s}$ Rect. pulse                |
|                                                                                   | 80      |       | 10ms Sine or 6ms Rect. pulse                                       |

Following any rated load condition and with rated  $V_{RRM}$  applied

## Electrical Specifications

| Parameters                                                       | 6CWQ... | Units            | Conditions                                                              |
|------------------------------------------------------------------|---------|------------------|-------------------------------------------------------------------------|
| $V_{FM}$ Max. Forward Voltage Drop (Per Leg) * See Fig. 1 (1)    | 0.53    | V                | @ 3A                                                                    |
|                                                                  | 0.67    | V                | @ 6A                                                                    |
|                                                                  | 0.49    | V                | @ 3A                                                                    |
|                                                                  | 0.62    | V                | @ 6A                                                                    |
| $I_{RM}$ Max. Reverse Leakage Current (Per Leg) * See Fig. 2 (1) | 2       | mA               | $T_J = 25^\circ\text{C}$                                                |
|                                                                  | 24      | mA               | $T_J = 125^\circ\text{C}$                                               |
| $V_{F(TO)}$ Threshold Voltage                                    | 0.34    | V                | $T_J = T_{J \text{ max.}}$                                              |
| $r_t$ Forward Slope Resistance                                   | 37.33   | m $\Omega$       |                                                                         |
| $C_T$ Typ. Junction Capacitance (Per Leg)                        | 189     | pF               | $V_R = 5V_{DC}$ , (test signal range 100Khz to 1Mhz) $25^\circ\text{C}$ |
| $L_S$ Typical Series Inductance (Per Leg)                        | 5.0     | nH               | Measured lead to lead 5mm from package body                             |
| $dv/dt$ Max. Voltage Rate of Change (Rated $V_R$ )               | 10,000  | V/ $\mu\text{s}$ |                                                                         |

(1) Pulse Width < 300 $\mu\text{s}$ , 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)<br>Junction to Case (Per Device) | 4.70       | $^\circ\text{C/W}$ | DC operation * See Fig. 4 |
|                                                                               | 2.35       |                    |                           |
| wt Approximate Weight                                                         | 0.3(0.01)  | g(oz.)             |                           |
| Case Style                                                                    | D-Pak      |                    | Similar to TO-252AA       |

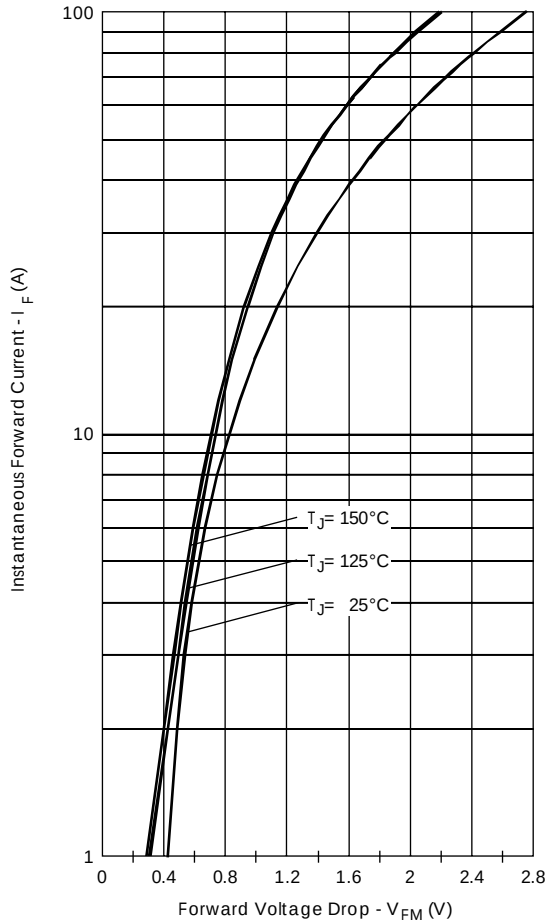


Fig. 1 - Max. Forward Voltage Drop Characteristics (Per Leg)

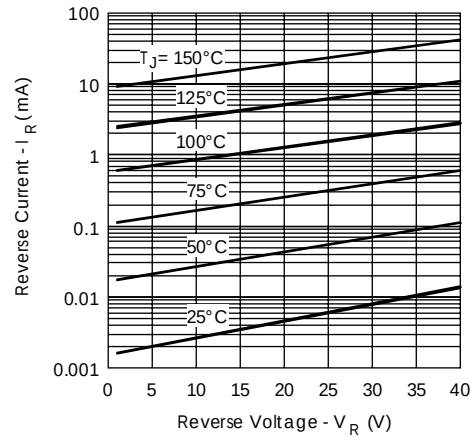


Fig. 2 - Typical Values Of Reverse Current Vs. Reverse Voltage (Per Leg)

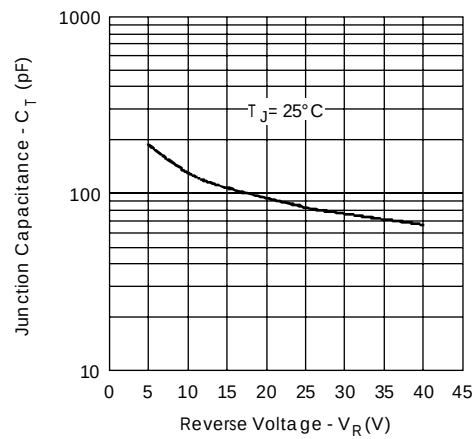


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage (Per Leg)

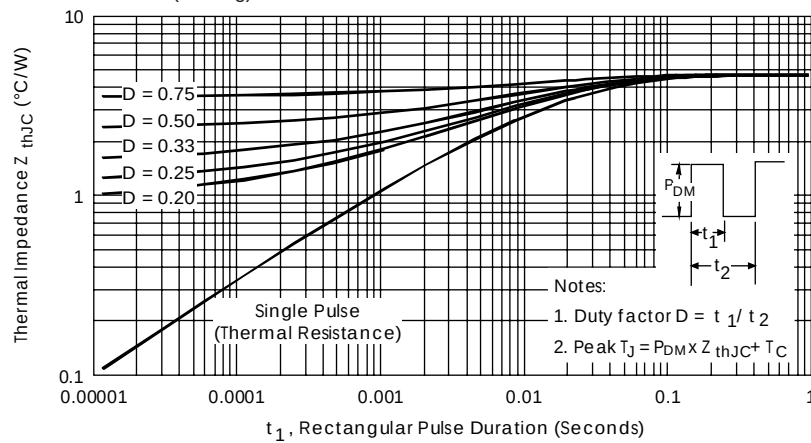


Fig. 4 - Max. Thermal Impedance  $Z_{thJC}$  Characteristics (Per Leg)

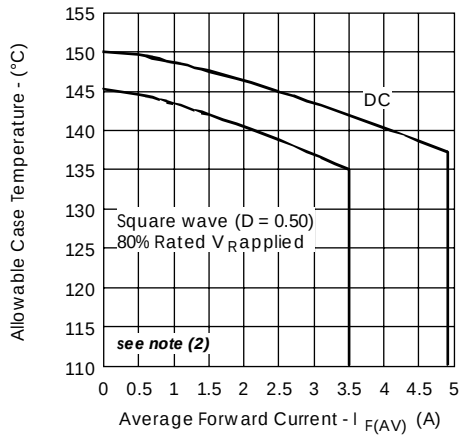


Fig. 5 - Max. Allowable Case Temperature Vs. Average Forward Current (Per Leg)

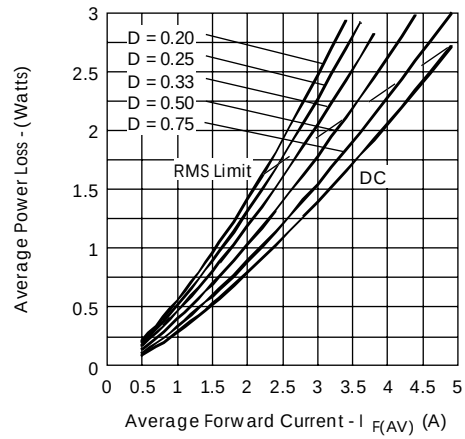


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

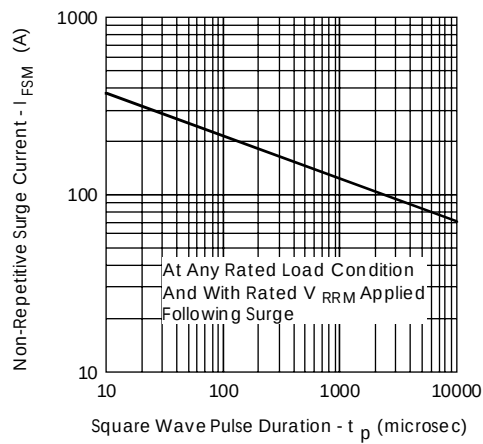


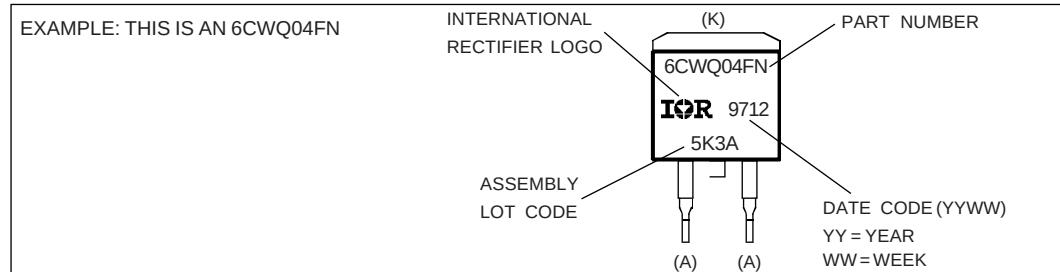
Fig. 7 - Max. Non-Repetitive Surge Current (Per Leg)

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

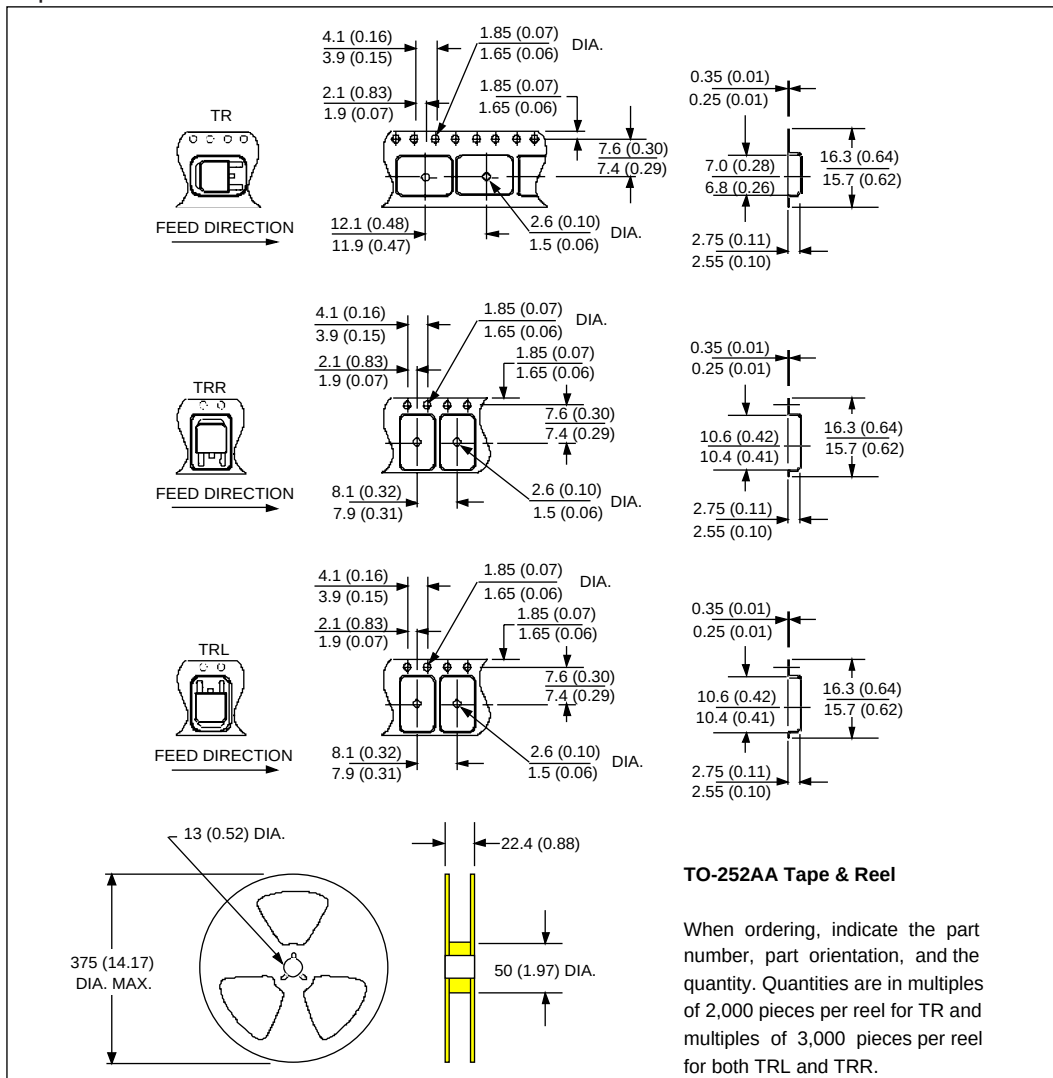
$P_d$  = Forward Power Loss =  $I_{F(AV)} \times V_{FM}$  @  $(I_{F(AV)} / D)$  (see Fig. 6);

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

## Marking Information



## Tape & Reel Information



International  
**IOR** Rectifier

**WORLDHEADQUARTERS:** 233 Kansas St., El Segundo, California 90245 U.S.A Tel: (310) 322-3331. Fax: (310) 322-3332.  
**EUROPEANHEADQUARTERS:** Hurst Green, Oxted, Surrey RH8 9BB, U.K. Tel: ++ 44 1883 732020. Fax: ++ 44 1883 733408.  
**IR CANADA:** 7231 Victoria Park Ave., Suite #201, Markham, Ontario L3R 2Z8. Tel: (905) 475 1897. Fax: (905) 475 8801.  
**IR GERMANY:** Saalburgstrasse 157, 61350 Bad Homburg. Tel: ++ 49 6172 96590. Fax: ++ 49 6172 965933.  
**IR ITALY:** Via Liguria 49, 10071 Borgaro, Torino. Tel: ++ 39 11 4510111. Fax: ++ 39 11 4510220.  
**IR FAR EAST:** K&H Bldg., 2F, 30-4 Nishi-Ikebukuro 3-Chome, Toshima-Ku, Tokyo, Japan 171 Tel: 81 3 3983 0086 Fax: 81 3 3983 0642.  
**IR SOUTHEAST ASIA:** 315 Outram Road, # 10-02 Tan Boon Liat Building, SINGAPORE 0316. Tel: 65 221 8371. Fax: 65 221 8372.

<http://www.irf.com>

Fax-On-Demand: +44 1883 733420

Data and specifications subject to change without notice

08/98