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$I_{F(AV)} = 7\text{Amp}$
 $V_R = 30\text{V}$

Major Ratings and Characteristics

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

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

Case Styles




D-PAK (TO-252AA)

6CWQ03FN

Bulletin PD-20560 rev. H 05/06



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 (Per Leg) Current * 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 |
| | 90 | | 10ms Sine or 6ms Rect. pulse |
| 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 |
| | 0.52 | V | @ 6A |
| | 0.35 | V | @ 3A |
| | 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 | $T_J = 125^\circ\text{C}$ |
| $V_{F(TO)}$ Threshold Voltage | 0.22 | V | $T_J = T_J$ 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 |
| Marking Device | 6CWQ03FN | | |

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

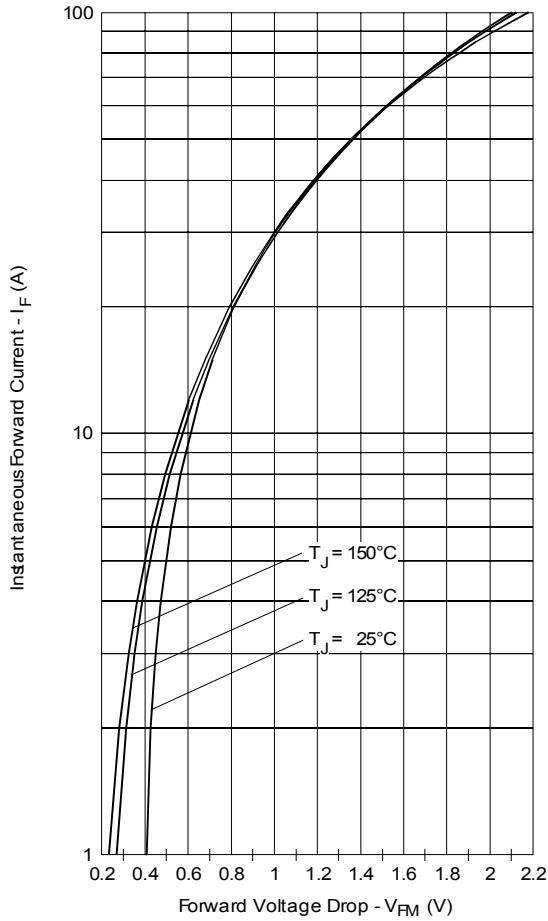


Fig. 1 - Max. Forward Voltage Drop Characteristics (Per Leg)

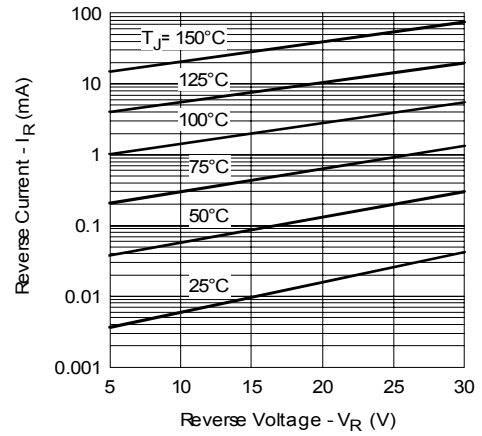


Fig. 2 - Typical Values Of Reverse Current Vs. Reverse Voltage (Per Leg)

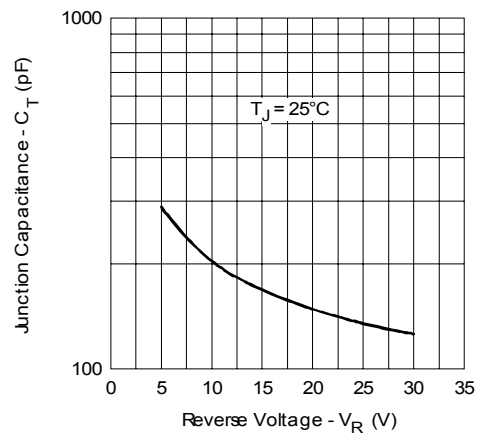


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage (Per Leg)

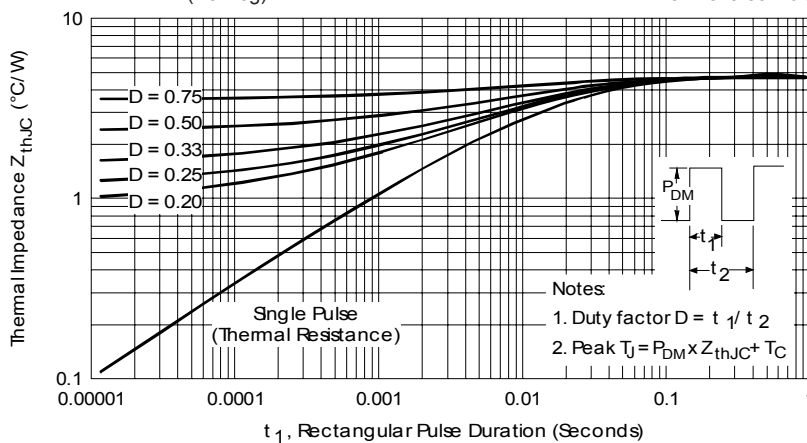


Fig. 4 - Max. Thermal Impedance Z_{thJC} Characteristics (Per Leg)

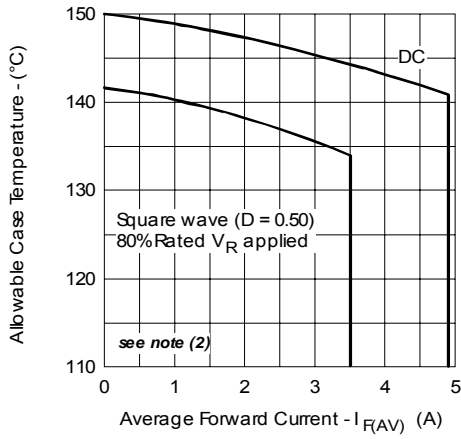


Fig. 5 - Max. Allowable Case Temperature Vs. Average Forward Current (Per Leg)

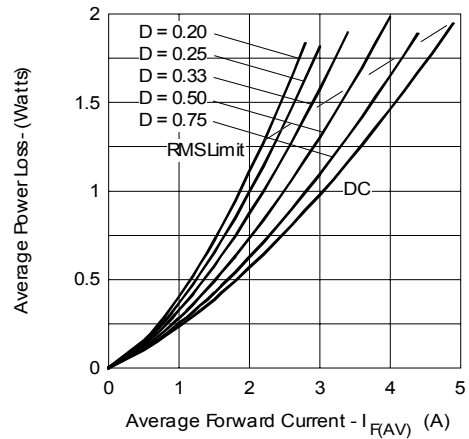


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

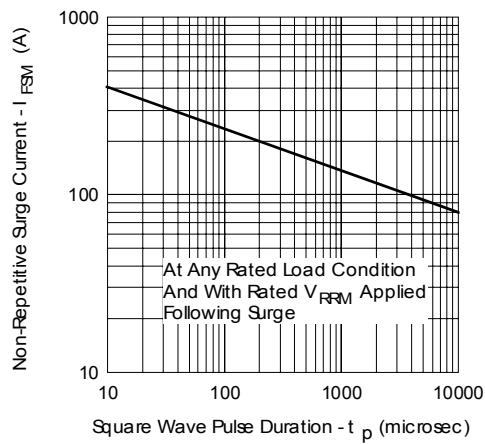


Fig. 7 - Max. Non-Repetitive Surge Current (Per Leg)

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

Outline Table

NOTES:

- 1- DIMENSIONING AND TOLERANCING PER ASME Y14.5M-1994
- 2- DIMENSION ARE SHOWN IN INCHES [MILLIMETERS]
- 3- LEAD DIMENSION UNCONTROLLED IN 15.
- 4- DIMENSION D1, E1, L3 & R3 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 [0.127 AND 0.254] FROM THE LEAD TIP.
- 6- DIMENSION D & E DO NOT INCLUDE MOLD FLASH. MOLD FLASH SHALL NOT EXCEED .008 [0.127] PER SIDE. THESE DIMENSIONS ARE MEASURED AT THE OUTMOST EXTREMES OF THE PLASTIC BODY.
- 7- DIMENSION S1 & S2 APPLIED TO BASE METAL ONLY.
- 8- DATUM A & B TO BE DETERMINED AT DATUM PLANE X.
- 9- OUTLINE CONFORMS TO JEDEC OUTLINE TO-252AA.

| SYMBOL | DIMENSIONS | | DIMENSIONS | | UNIT |
|--------|-------------|--------|-------------|--------|------|
| | MILLIMETERS | INCHES | MILLIMETERS | INCHES | |
| A | 2.18 | 2.29 | .086 | .084 | 7 |
| A1 | - | 0.15 | - | .006 | |
| b | 0.84 | 0.89 | .033 | .035 | 4 |
| b1 | 0.60 | 0.70 | .024 | .028 | |
| b2 | 0.78 | 1.14 | .030 | .045 | 7 |
| b3 | 4.95 | 5.46 | .195 | .215 | |
| e | 0.46 | 0.61 | .018 | .024 | 6 |
| e1 | 0.41 | 0.56 | .016 | .022 | |
| e2 | 0.48 | 0.69 | .019 | .030 | 4 |
| D | 5.97 | 6.22 | .235 | .245 | |
| D1 | 5.21 | - | .205 | - | 6 |
| E | 6.35 | 6.73 | .250 | .265 | |
| E1 | 4.32 | - | .170 | - | 4 |
| e | 2.29 | BSC | .090 | BSC | |
| H | 9.40 | 10.41 | .370 | .410 | 3 |
| L | 1.40 | 1.78 | .056 | .070 | |
| L1 | 2.74 | BSC | .108 | REF. | 4 |
| L2 | 0.31 | BSC | .010 | BSC | |
| L3 | 0.99 | 1.27 | .039 | .050 | 3 |
| L4 | - | 1.02 | - | .040 | |
| L5 | 1.14 | 1.52 | .045 | .060 | 3 |
| L6 | 0" | 10" | 0" | 10" | |
| W1 | 0" | 15" | 0" | 15" | 3 |
| W2 | 25" | 35" | 25" | 35" | |

LEAD ASSIGNMENTS

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

JEDEC

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

IBS1 & 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 6CWQ03FN
 LOT CODE 8024
 ASSEMBLED ON WW 02, 2000

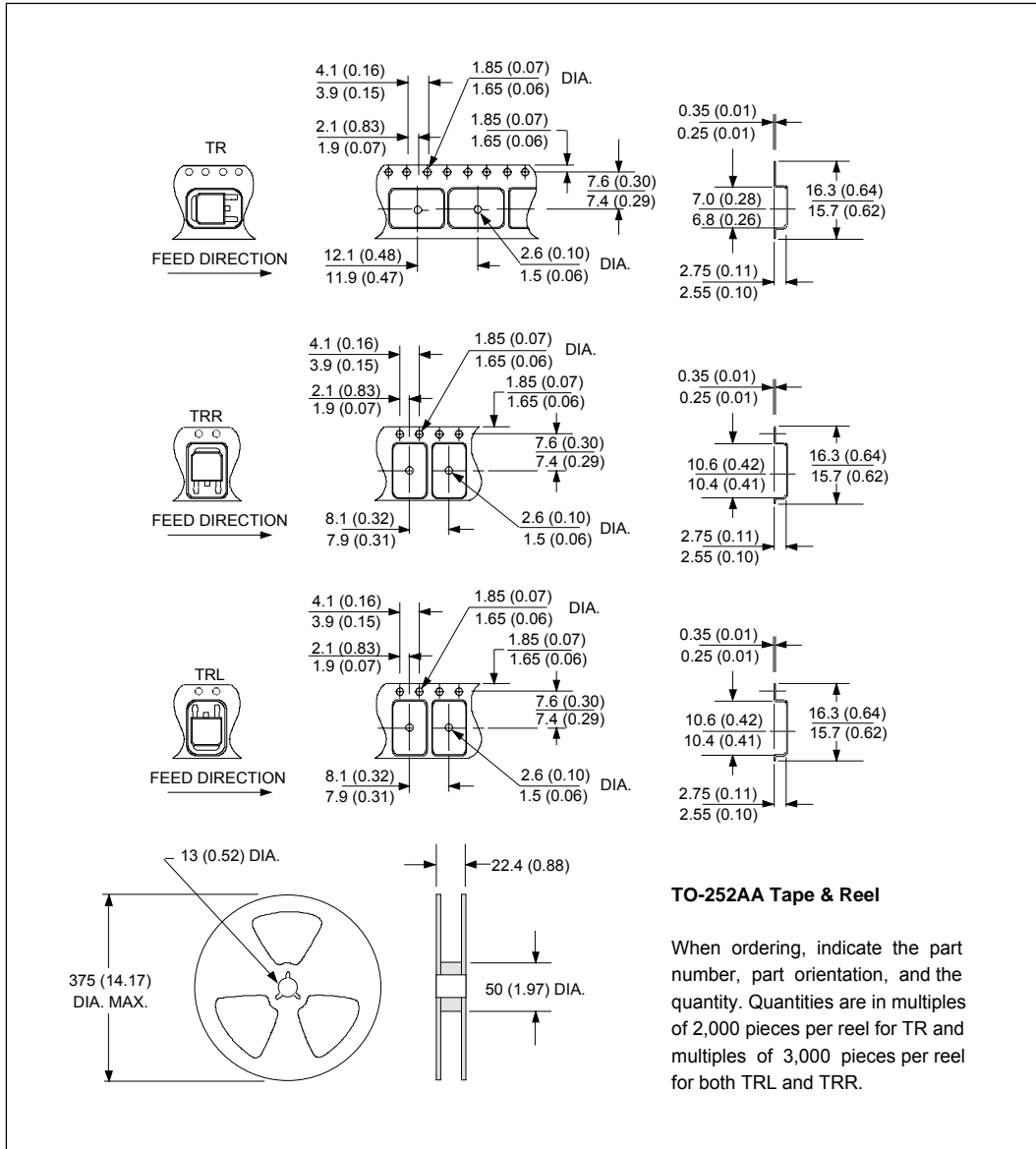
INTERNATIONAL
 RECTIFIER
 LOGO

ASSEMBLY
 LOT CODE

PART NUMBER

DATE CODE
 YEAR 0 = 2000
 WEEK 02
 X = SITE ID

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 | | | | | | | |
|-------------|--|---|---|----|----|-----|---|
| 6 | C | W | Q | 03 | FN | TRL | - |
| ① | ② | ③ | ④ | ⑤ | ⑥ | ⑦ | ⑧ |
| 1 | - Current Rating (7A) | | | | | | |
| 2 | - Center Tap Configuration | | | | | | |
| 3 | - Package Identifier W = D-Pak | | | | | | |
| 4 | - Schottky "Q" Series | | | | | | |
| 5 | - Voltage Rating (03 = 30V) | | | | | | |
| 6 | - FN = TO-252AA | | | | | | |
| 7 | - • none = Tube (50 pieces) • TR = Tape & Reel • TRL = Tape & Reel (Left Oriented) • TRR = Tape & Reel (Right Oriented) | | | | | | |
| 8 | - • 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.
 Qualification Standards can be found on IR's Web site.



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