

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

Major Ratings and Characteristics

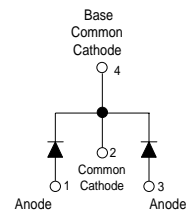
Characteristics	Values	Units
$I_{F(AV)}$ Rectangular waveform	7	A
V_{RRM}	30	V
I_{FSM} @ tp = 5 μ s sine	535	A
V_F @ 3Apk, $T_J = 125^\circ\text{C}$ (per leg)	0.35	V
T_J range	-40 to 150	$^\circ\text{C}$

Description/ Features

The 6CWQ03FNPbF 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
- Lead-Free ("PbF" suffix)

Case Styles



D-PAK (TO-252AA)

Voltage Ratings

Part number	6CWQ03FNPbF
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

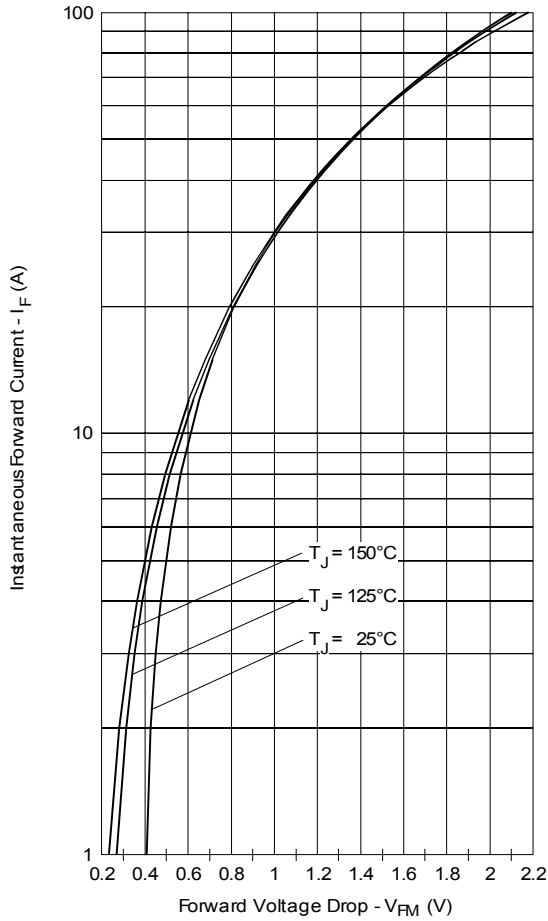


Fig. 1 - Max. Forward Voltage Drop Characteristics (Per Leg)

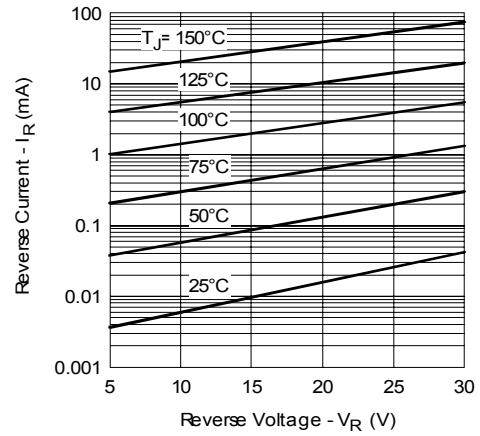


Fig. 2 - Typical Values Of Reverse Current Vs. Reverse Voltage (Per Leg)

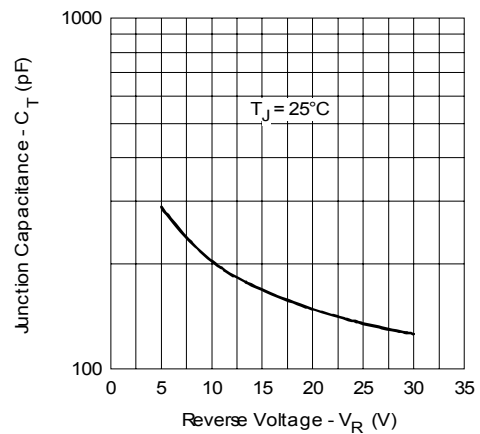


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage (Per Leg)

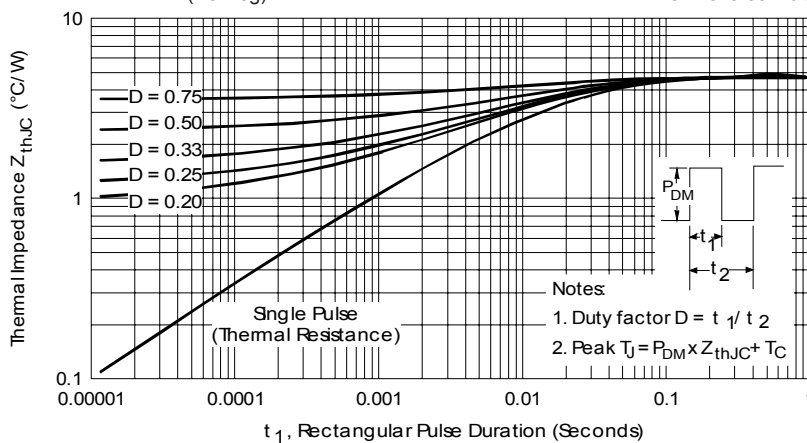


Fig. 4 - Max. Thermal Impedance Z_{thJC} Characteristics (Per Leg)

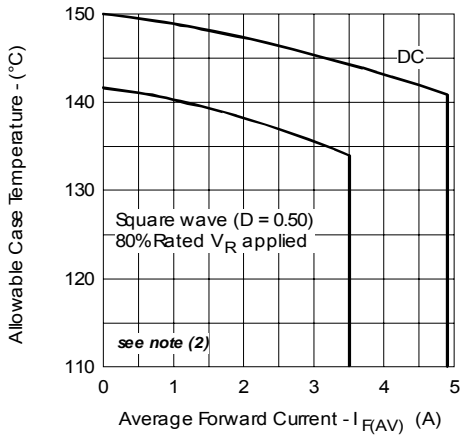


Fig. 5 - Max. Allowable Case Temperature Vs. Average Forward Current (Per Leg)

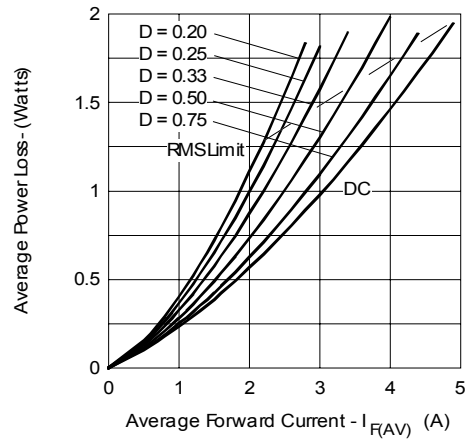


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

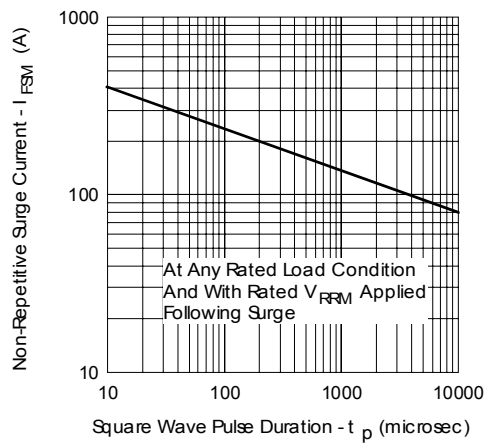


Fig. 7 - Max. Non-Repetitive Surge Current (Per Leg)

(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.- DIMENSIONS ARE SHOWN IN INCHES [MILLIMETERS]
- 3.- LEAD DIMENSION UNCONTROLLED IN U.S.
- 4.- DIMENSION D1, E1, L3 & S0 ESTABLISH A MINIMUM MOUNTING SURFACE FOR THERMAL PAD.
- 5.- SECTION C-C DIMENSIONS APPLY TO THE FLAT SECTION OF THE LEAD BETWEEN .025 AND 0.10 [0.15 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 #1 & #1 APPLIED TO BASE METAL ONLY.
- 8.- DATUM A & B TO BE DETERMINED AT DATUM PLANE H.
- 9.- OUTLINE CONFORMS TO AECQ OUTLINE TO-252AA.

SYMBOL	DIMENSIONS				NOMINAL VALUE
	MILLIMETERS		INCHES		
A	2.18	2.39	.086	.094	7
A1	-	0.15	-	.005	
B	0.64	0.89	.025	.035	4
B1	0.65	0.79	.025	.031	
B2	0.76	1.14	.030	.045	7
B3	4.90	0.46	.190	.215	
C	0.46	0.61	.018	.024	7
C1	0.41	0.56	.016	.022	
C2	0.46	0.69	.018	.025	6
D	5.97	6.22	.235	.245	
D1	0.21	-	.205	-	4
E	6.35	6.73	.250	.265	
E1	4.32	-	.170	-	4
H	2.29	BSC	.090	BSC	
H1	8.40	10.41	.370	.410	3
L1	1.40	1.78	.055	.070	
L2	2.74	BSC	108	REF.	4
L3	0.51	BSC	.020	BSC	
L4	0.80	1.27	.031	.050	3
L5	1.14	1.52	.045	.060	
#	07	107	07	107	3
#1	07	157	07	157	
#2	257	357	257	357	3
#3	07	107	07	107	

LEAD ASSIGNMENTS

HEXFEET

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

ISBT & CoPAK

- 1.- DATE
- 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

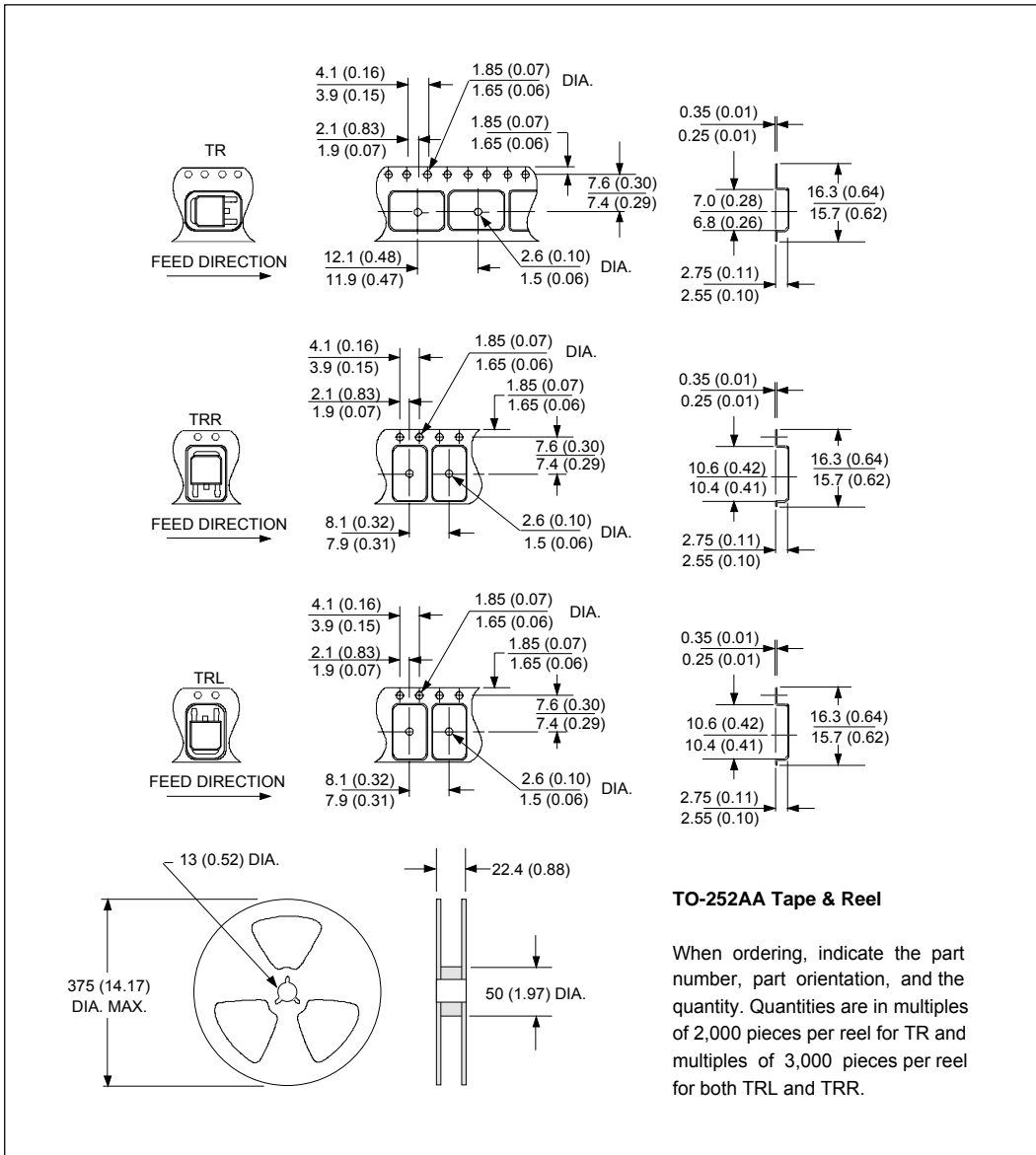
INTERNATIONAL
RECTIFIER
LOGO

ASSEMBLY
LOT CODE

PART NUMBER

DATE CODE
P = LEAD-FREE
YEAR 0 = 2000
WEEK 02
X = SITE ID

Tape & Reel Information



Ordering Information Table

Device Code	
6	C
W	Q
03	FN
TRL	PbF
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 (D-Pak)
7	- <ul style="list-style-type: none"> • none = Tube (50 pieces) • TR = Tape & Reel • TRL = Tape & Reel (Left Oriented) • TRR = Tape & Reel (Right Oriented)
8	- <ul style="list-style-type: none"> • 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 and Lead-Free.
 Qualification Standards can be found on IR's Web site.