

International
IOR Rectifier

6CWQ06FNPbF

SCHOTTKY RECTIFIER

7 Amp

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

$$V_R = 60\text{V}$$

Major Ratings and Characteristics

Characteristics	Values	Units
$I_{F(AV)}$ Rectangular waveform	7	A
V_{RRM}	60	V
I_{FSM} @ $t_p = 5 \mu\text{s}$ sine	490	A
V_F @ 3 Apk, $T_J = 25^\circ\text{C}$ (per leg)	0.61	V
T_J range	-40 to 150	$^\circ\text{C}$

Description/ Features

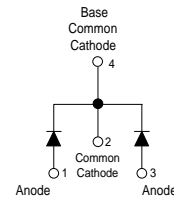
The 6CWQ06FNPbF surface mount, center tap, Schottky rectifier series has been designed for applications requiring low forward drop and small foot prints on PC board. Typical applications are in disk drives, switching power supplies, converters, free-wheeling diodes, battery charging, and reverse battery 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	6CWQ06FNPbF
V_R Max. DC Reverse Voltage (V)	60
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 7	A	50% duty cycle @ $T_C = 133^\circ\text{C}$, rectangular wave form
I_{FSM} Max. Peak One Cycle Non-Repetitive Surge Current * See Fig. 7	490 70	A	5 μs Sine or 3 μs Rect. pulse 10ms Sine or 6ms Rect. pulse Following any rated load condition and with rated V_{RWM} applied
E_{AS} Non-Rep. Avalan. Energy (Per Leg)	6.0	mJ	$T_J = 25^\circ\text{C}$, $I_{AS} = 1$ Amps, $L = 12$ 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)	0.61 0.76 0.53 0.65	V	@ 3A @ 6A @ 3A @ 6A $T_J = 25^\circ\text{C}$ $T_J = 125^\circ\text{C}$
I_{RM} Max. Reverse Leakage Current (Per Leg) * See Fig. 2 (1)	2 30	mA	$T_J = 25^\circ\text{C}$ $T_J = 125^\circ\text{C}$ $V_R = \text{rated } V_R$
$V_{F(TO)}$ Threshold Voltage	0.38	V	$T_J = T_J \text{ max.}$
r_f Forward Slope Resistance	34.31	$\text{m}\Omega$	
C_T Typ. Junction Capacitance (Per Leg)	145	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 2.35	$^\circ\text{C}/\text{W}$	DC operation * See Fig. 4
wt Approximate Weight	0.3 (0.01)	g (oz.)	
Case Style	D-Pak		Similar to TO-252AA
Marking Device	6CWQ06FN		

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

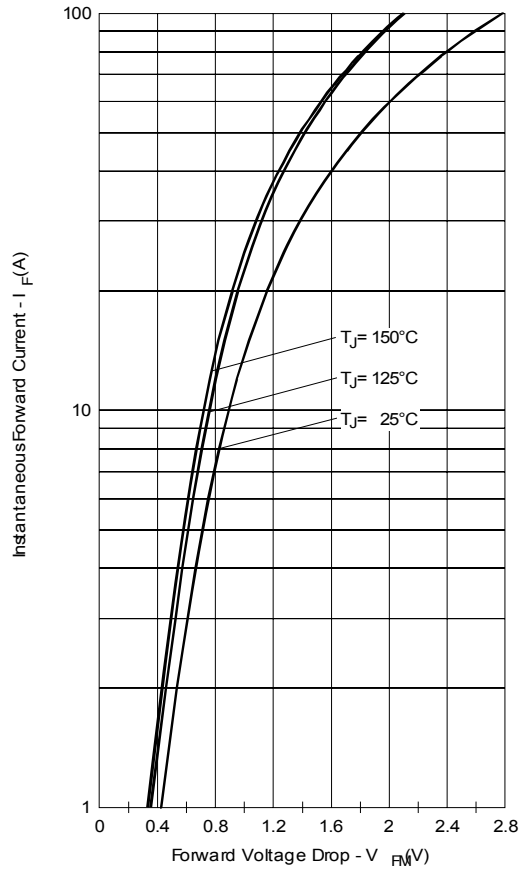


Fig. 1 - Max. Forward Voltage Drop Characteristics (Per Leg)

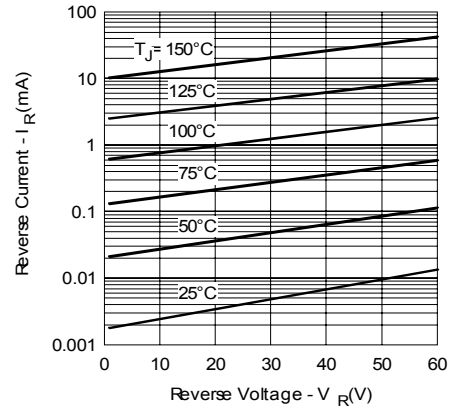


Fig. 2 - Typical Values Of Reverse Current Vs. Reverse Voltage (Per Leg)

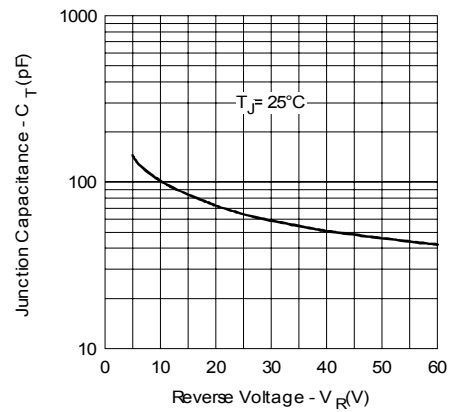


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage (Per Leg)

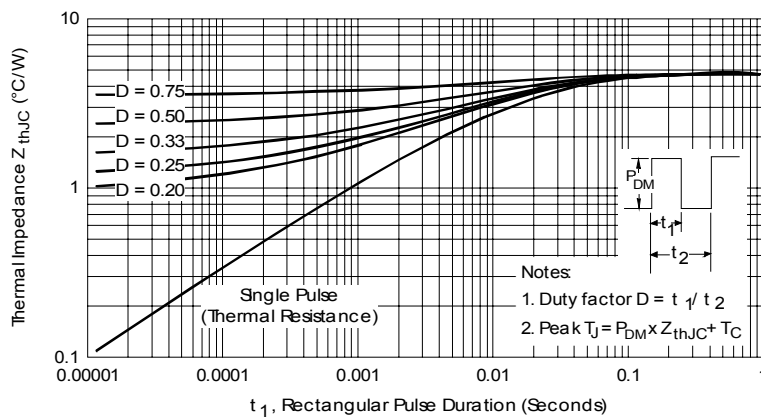


Fig. 4 - Max. Thermal Impedance Z_{thJC} Characteristics (Per Leg)

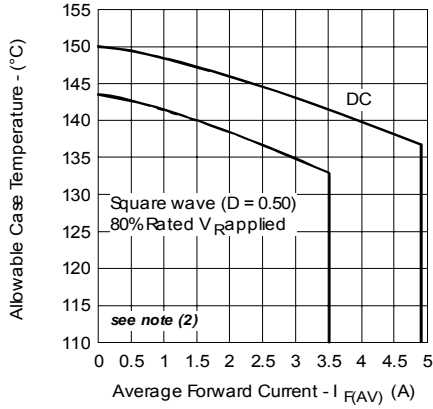


Fig. 5 - Max. Allowable Case Temperature Vs. Average Forward Current (Per Leg)

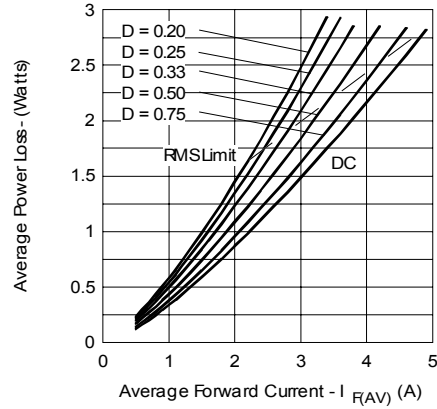


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

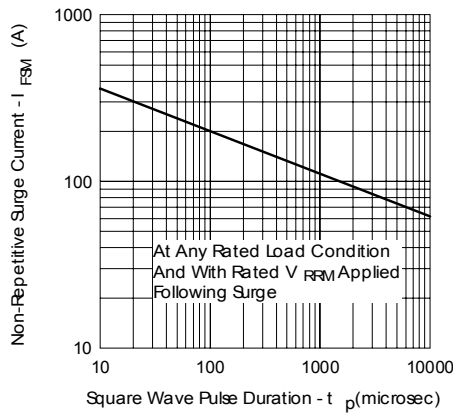


Fig. 7 - Max. Non-Repetitive Surge Current (Per Leg)

(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

NOTE:
 1.- DIMENSIONING AND TOLERANCING PER ASME Y14.5M-1994
 2.- DIMENSION ARE SHOWN IN INCHES [MILLIMETERS]
 3.- LEAD DIMENSION UNCONTROLLED IN LE
 4.- DIMENSION D1, L1, L3 & R2 ESTABLISH A MINIMUM MOUNTING SURFACE FOR THERMAL PAD.
 5.- SECTION C-C DIMENSIONED APPLIC TO THE FLAT SECTION OF THE LEAD BETWEEN .005 AND 0.10 [0.15 AND 0.25] FROM THE LEAD TIP.
 6.- DIMENSION D & E DO NOT INCLUDE MOUNT FLASH- MOUNT FLASH SHALL NOT EXCEED .005 [0.15] PER SIDE. THESE DIMENSIONS ARE MEASURED AT THE OUTMOST EXTREMES OF THE PLASTIC BODY.
 7.- DIMENSION D1 & E1 APPLIED TO BASE METAL ONLY.
 8.- DATUM A-B IS TO BE DETERMINED AT DATUM PLANE "A".
 9.- OUTLINE CONFORMS TO JEDEC OUTLINE TO-252AA.

DIM	DIMENSIONS			
	MILLIMETERS		INCHES	
	MIN.	MAX.	MIN.	MAX.
A	2.18	2.39	.086	.094
A1	-	0.18	-	.009
B1	0.64	0.89	.026	.036
B2	0.65	0.79	.026	.031
B3	0.76	1.14	.030	.045
B4	4.90	5.46	.193	.215
C	0.46	0.61	.018	.024
C1	0.41	0.56	.016	.022
C2	0.48	0.69	.019	.028
D	5.97	6.22	.235	.245
D1	6.21	-	.246	-
E	6.35	6.73	.250	.266
E1	4.32	-	.170	-
H	2.23 BSC	.090 BSC		
H1	9.40	10.41	.370	.410
H2	1.60	1.78	.063	.070
L1	2.74 BSC	.108 REF		
L3	0.51 BSC	.020 BSC		
L3	0.89	1.27	.035	.050
L4	-	1.02	-	.040
L5	1.14	1.62	.045	.063
R	0°	10°	0°	10°
R1	0°	10°	0°	10°
R2	20°	30°	20°	30°

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

IGBT & CARPAK
 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 6CWQ06FN
 LOT CODE 8024
 ASSEMBLED ON WW 02, 2000

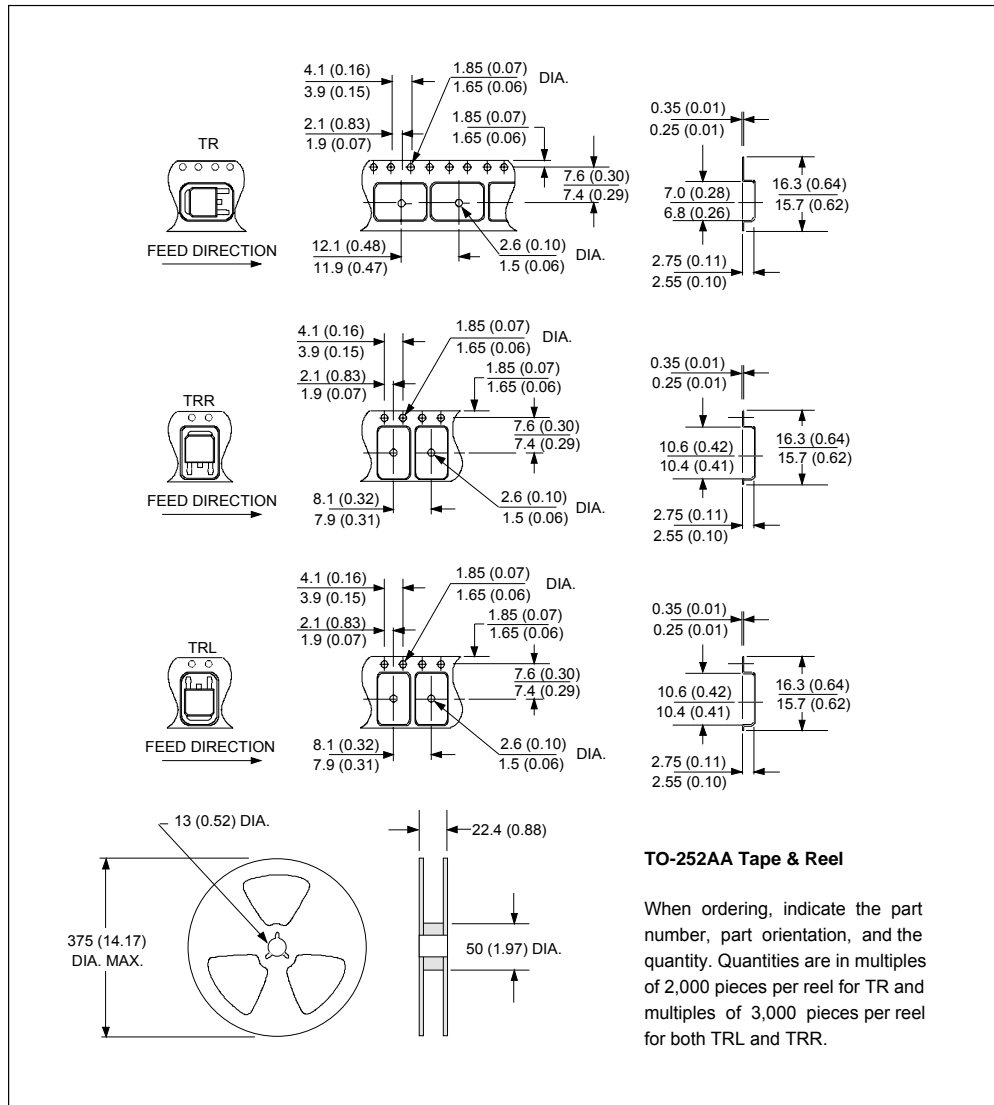
INTERNATIONAL
 RECTIFIER
 LOGO

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	06	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 (06 = 60V)						
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.



Notice

The products described herein were acquired by Vishay Intertechnology, Inc., as part of its acquisition of International Rectifier's Power Control Systems (PCS) business, which closed in April 2007. Specifications of the products displayed herein are pending review by Vishay and are subject to the terms and conditions shown below.

Specifications of the products displayed herein are subject to change without notice. Vishay Intertechnology, Inc., or anyone on its behalf, assumes no responsibility or liability for any errors or inaccuracies.

Information contained herein is intended to provide a product description only. No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document. Except as provided in Vishay's terms and conditions of sale for such products, Vishay assumes no liability whatsoever, and disclaims any express or implied warranty, relating to sale and/or use of Vishay products including liability or warranties relating to fitness for a particular purpose, merchantability, or infringement of any patent, copyright, or other intellectual property right.

The products shown herein are not designed for use in medical, life-saving, or life-sustaining applications. Customers using or selling these products for use in such applications do so at their own risk and agree to fully indemnify Vishay for any damages resulting from such improper use or sale.

International Rectifier®, IR®, the IR logo, HEXFET®, HEXSense®, HEXDIP®, DOL®, INTERO®, and POWIRTRAIN® are registered trademarks of International Rectifier Corporation in the U.S. and other countries. All other product names noted herein may be trademarks of their respective owners.