Bulletin PD-20528 rev. G 05/06

International
IOR Rectifier

6CWQ06FN

SCHOTTKY RECTIFIER

7 Amp

$I_{F(AV)}$ = 7Amp
V_R = 60V

Major Ratings and Characteristics

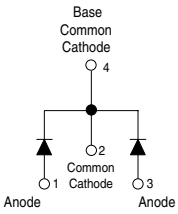
Characteristics		Values	Units
$I_{F(AV)}$	Rectangular waveform	7	A
V_{RRM}		60	V
I_{FSM}	@ tp = 5 µs sine	490	A
V_F	@3 Apk, T_J = 25°C (per leg)	0.61	V
T_J	range	-40 to 150	°C

Description/ Features

The 6CWQ06FN 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)

Voltage Ratings

	Part number	6CWQ06FN
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)	3.5	A	50% duty cycle @ T_C = 133°C, rectangular wave form	
	Current * See Fig. 5 (Per Device)	7			
I_{FSM}	Max. Peak One Cycle Non-Repetitive	490	A	5µs Sine or 3µs Rect. pulse	Following any rated load condition and with rated V_{RRM} applied
	Surge Current * See Fig. 7	70		10ms Sine or 6ms Rect. pulse	
E_{AS}	Non-Repet. Avalan. Energy (Per Leg)	6.0	mJ	T_J = 25 °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 x V_R typical	

Electrical Specifications

	Parameters	6CWQ...	Units	Conditions	
V_{FM}	Max. Forward Voltage Drop	0.61	V	@ 3A	T_J = 25 °C
	(Per Leg) * See Fig. 1 (1)	0.76	V	@ 6A	
		0.53	V	@ 3A	T_J = 125 °C
		0.65	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)	30	mA	T_J = 125 °C	
$V_{F(TO)}$	Threshold Voltage	0.38	V	T_J = T_J max.	
r_t	Forward Slope Resistance	34.31	mΩ		
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 < 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
	Marking Device	6CWQ06FN		

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

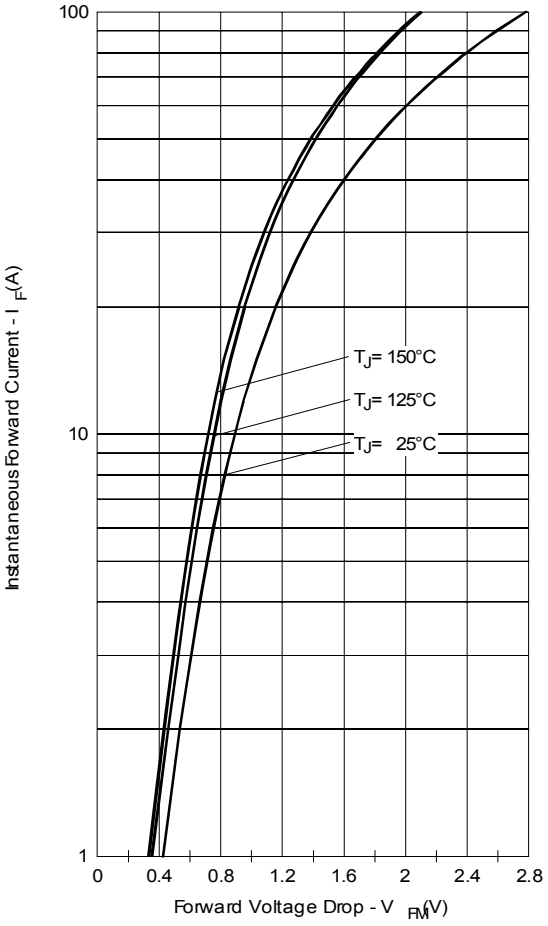


Fig. 1 - Max. Forward Voltage Drop Characteristics (Per Leg)

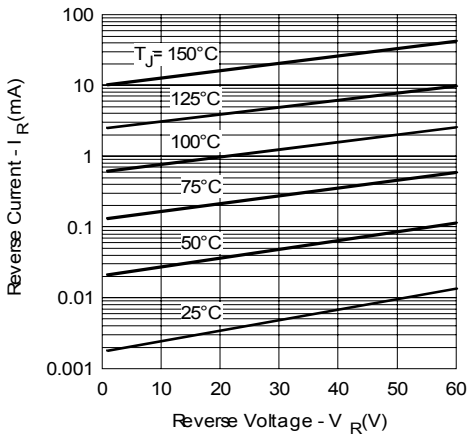


Fig. 2 - Typical Values Of Reverse Current Vs. Reverse Voltage (Per Leg)

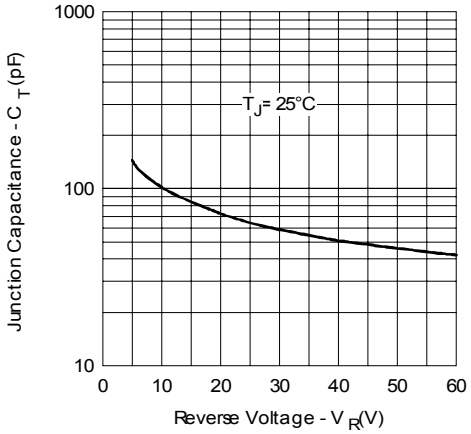


Fig. 3 - Typical Junction Capacitance Vs. Reverse Voltage (Per Leg)

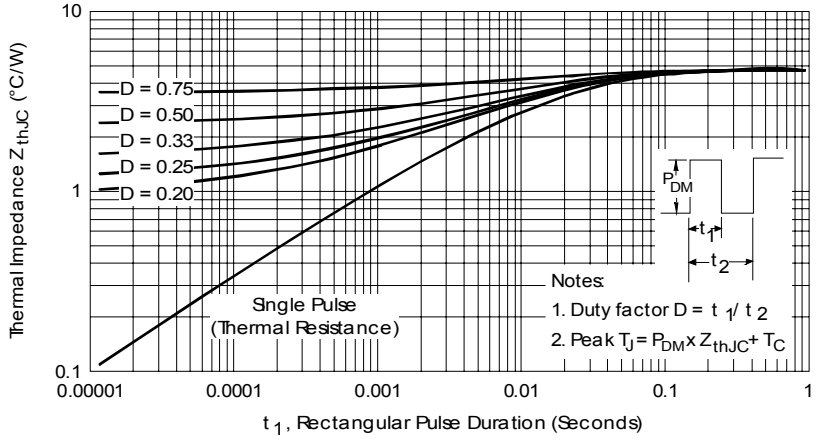


Fig. 4 - Max. Thermal Impedance Z_{thJC} Characteristics (Per Leg)

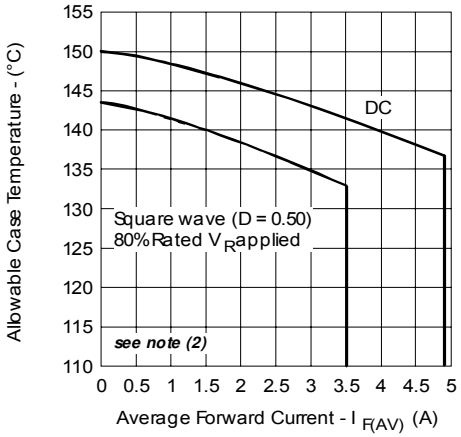


Fig. 5 - Max. Allowable Case Temperature Vs. Average Forward Current (Per Leg)

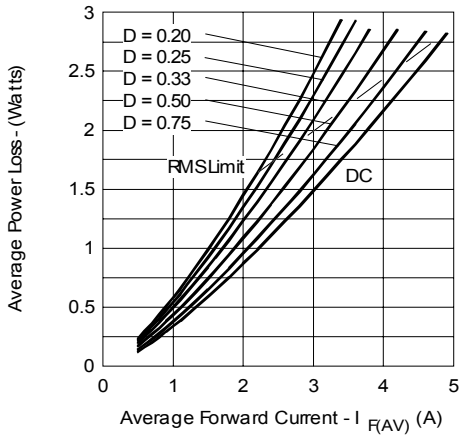


Fig. 6 - Forward Power Loss Characteristics (Per Leg)

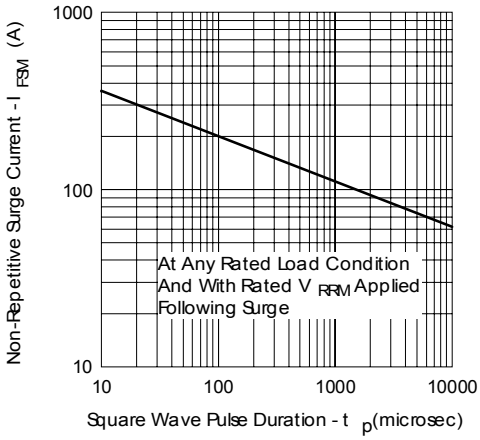
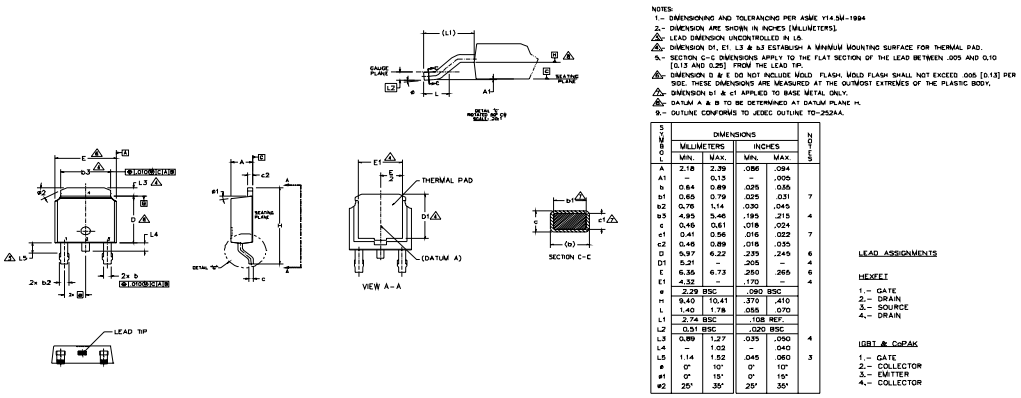


Fig. 7 - Max. Non-Repetitive Surge Current (Per Leg)

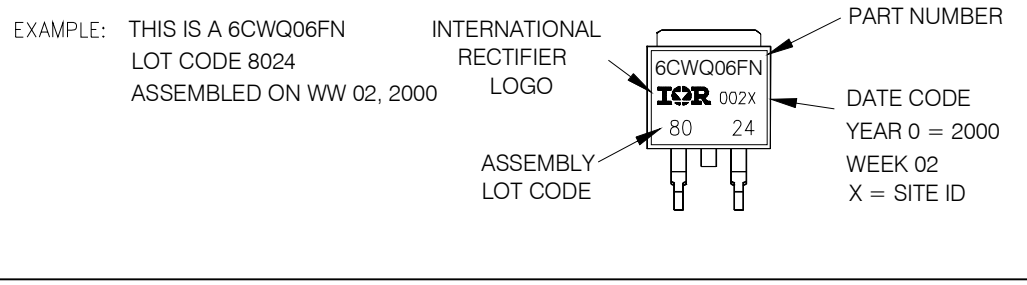
(2) Formula used: $T_C = T_J - (Pd + Pd_{REV}) \times R_{thJC}$;
Pd = Forward Power Loss = $I_{F(AV)} \times V_{FM} @ (I_{F(AV)} / D)$ (see Fig. 6);
Pd_{REV} = Inverse Power Loss = $V_{R1} \times I_R (1 - D)$; $I_R @ V_{R1}$ = 80% rated V_R

Outline Table

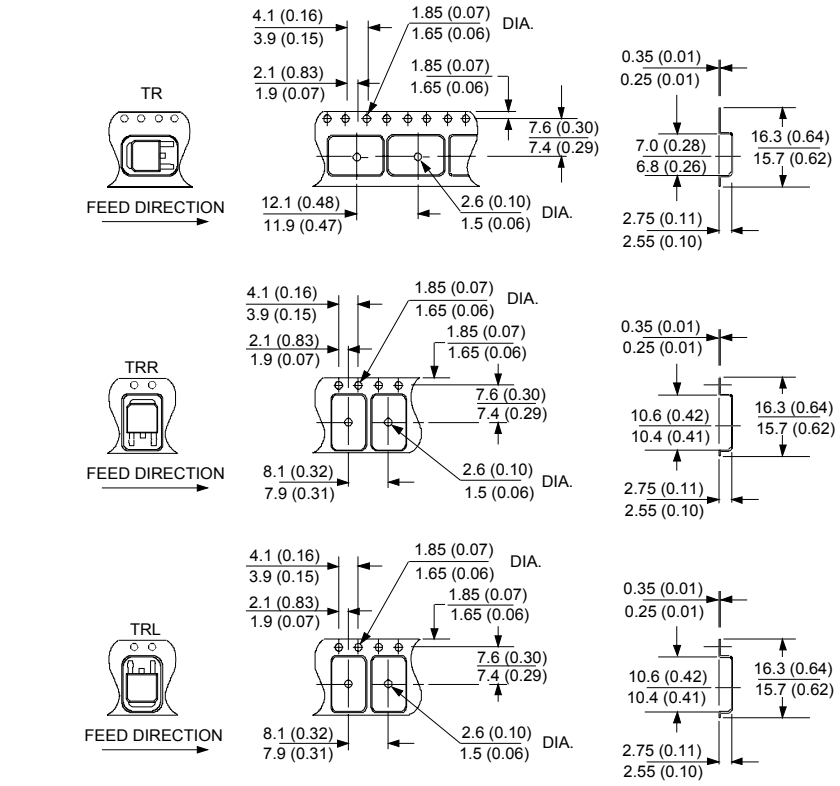


Modified JEDEC outline TO-252AA
Dimensions in millimeters and (inches)

Part Marking Information



Tape & Reel Information

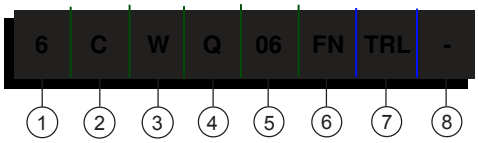


TO-252AA Tape & Reel

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



1	-	Current Rating (7A)
2	-	C = Center Tap Configuration
3	-	Package Identifier
4		W = D-Pak
4	-	Schottky "Q" Series
5	-	Voltage Rating (06 = 60V)
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.

International
IOR Rectifier

IR WORLD HEADQUARTERS: 233 Kansas St., El Segundo, California 90245, USA Tel: (310) 252-7105
TAC Fax: (310) 252-7309
05/06

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.