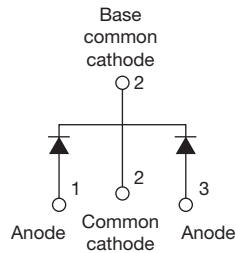


## Hyperfast Rectifier, 2 x 4 A FRED Pt<sup>®</sup>



### FEATURES

- Hyperfast recovery time
- 175 °C max. operating junction temperature
- Output rectification freewheeling
- Low forward voltage drop reduced  $Q_{rr}$  and soft recovery
- Low leakage current
- AEC-Q101 qualified
- Meets JESD 201 class 1A whisker test
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Material categorization: For definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)



**RoHS**  
COMPLIANT  
HALOGEN  
**FREE**

### PRODUCT SUMMARY

Package	D-PAK (TO-252AA)
$I_{F(AV)}$	2 x 4 A
$V_R$	200 V
$V_F$ at $I_F$	0.95 V
$t_{rr}$ (typ.)	23 ns
$T_J$ max.	175 °C
Diode variation	Common cathode

### DESCRIPTION/APPLICATIONS

State of the art hyperfast recovery rectifiers designed with optimized performance of forward voltage drop, hyperfast recovery time, and soft recovery.

The planar structure and the platinum doped life time control guarantee the best overall performance, ruggedness and reliability characteristics.

These devices are intended for use in PFC boost stage in the AC/DC section of SMPS inverters or as freewheeling diodes. Their extremely optimized stored charge and low recovery current minimize the switching losses and reduce over dissipation in the switching element and snubbers.

### ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS
Peak repetitive reverse voltage	$V_{RRM}$		200	V
Average rectified forward current	$I_{F(AV)}$	$T_C = 164$ °C	8	A
Non-repetitive peak surge current per leg	$I_{FSM}$	$T_J = 25$ °C	80	
Operating junction and storage temperatures	$T_J, T_{Stg}$		- 65 to 175	°C

### ELECTRICAL SPECIFICATIONS ( $T_J = 25$ °C unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNITS
Breakdown voltage, blocking voltage	$V_{BR}, V_R$	$I_R = 100$ $\mu$ A	200	-	-	V
Forward voltage per leg	$V_F$	$I_F = 4$ A	-	0.87	0.95	
		$I_F = 8$ A	-	0.95	1.10	
		$I_F = 4$ A, $T_J = 150$ °C	-	0.71	0.80	
		$I_F = 8$ A, $T_J = 150$ °C	-	0.8	1.0	
Reverse leakage current per leg	$I_R$	$V_R = V_R$ rated	-	-	4	$\mu$ A
		$T_J = 125$ °C, $V_R = V_R$ rated	-	-	40	
		$T_J = 150$ °C, $V_R = V_R$ rated	-	-	80	
Junction capacitance per leg	$C_T$	$V_R = 200$ V	-	17	-	pF
Series inductance	$L_S$	Measured lead to lead 5 mm from package body	-	8	-	nH



DYNAMIC RECOVERY CHARACTERISTICS ( $T_J = 25\text{ }^\circ\text{C}$ unless otherwise specified)						
PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNITS
Reverse recovery time	$t_{rr}$	$I_F = 1\text{ A}$ , $di_F/dt = 100\text{ A}/\mu\text{s}$ , $V_R = 30\text{ V}$	-	23	27	ns
		$T_J = 25\text{ }^\circ\text{C}$	-	20	-	
		$T_J = 125\text{ }^\circ\text{C}$	-	27	-	
Peak recovery current	$I_{RRM}$	$T_J = 25\text{ }^\circ\text{C}$	-	2	-	A
		$T_J = 125\text{ }^\circ\text{C}$	-	3.4	-	
Reverse recovery charge	$Q_{rr}$	$T_J = 25\text{ }^\circ\text{C}$	-	20	-	nC
		$T_J = 125\text{ }^\circ\text{C}$	-	46	-	

THERMAL - MECHANICAL SPECIFICATIONS						
PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNITS
Maximum junction and storage temperature range	$T_J$ , $T_{Stg}$		- 65	-	175	$^\circ\text{C}$
Thermal resistance, _____ per leg junction to case _____ per device	$R_{thJC}$		-	2.7	3.2	$^\circ\text{C}/\text{W}$
			-	1.35	1.6	
Approximate weight			0.3			g
			0.01			oz.
Marking device		Case style D-PAK	8CWH02FNH			

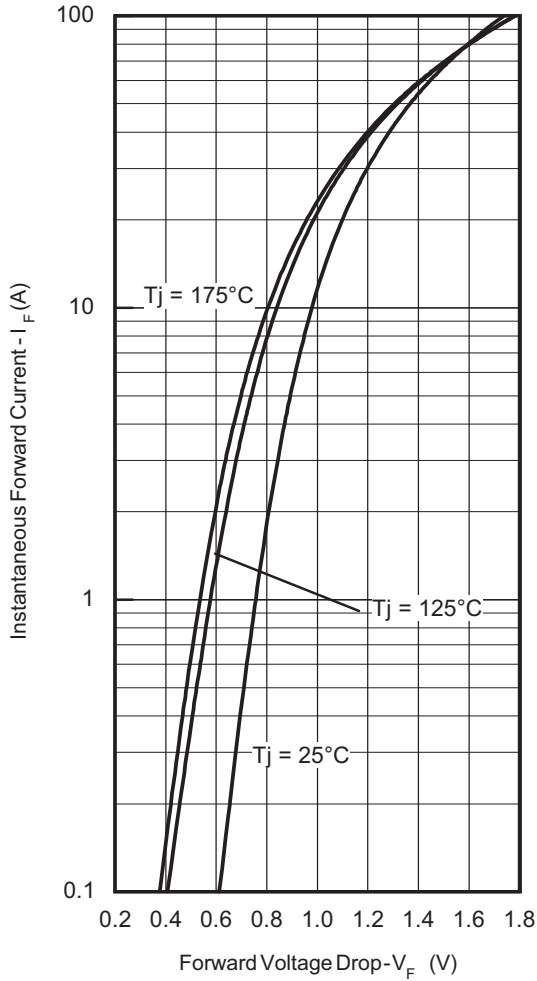


Fig. 1 - Typical Forward Voltage Drop Characteristics

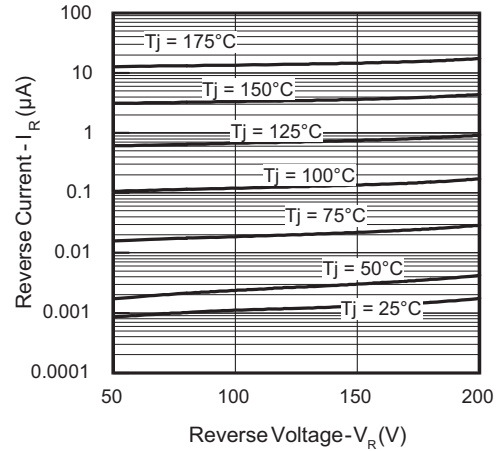


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage

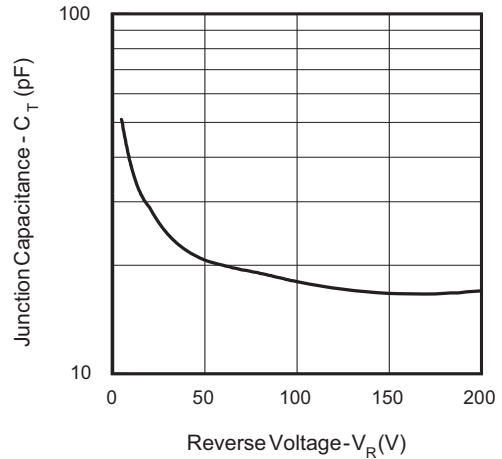


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage

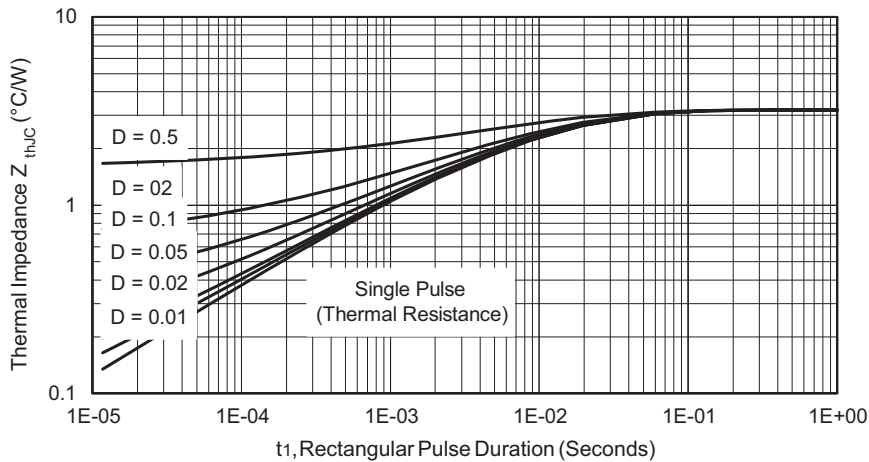


Fig. 4 - Maximum Thermal Impedance  $Z_{thJC}$  Characteristics

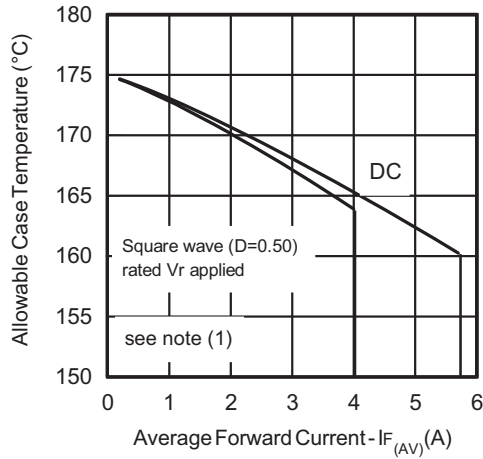


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current

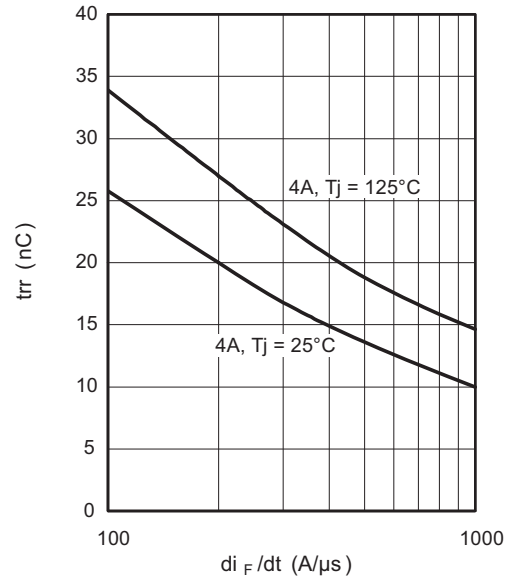


Fig. 7 - Typical Reverse Recovery Time vs.  $di_F/dt$

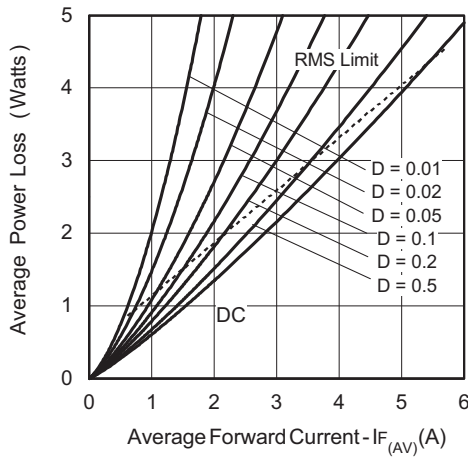


Fig. 6 - Forward Power Loss Characteristics

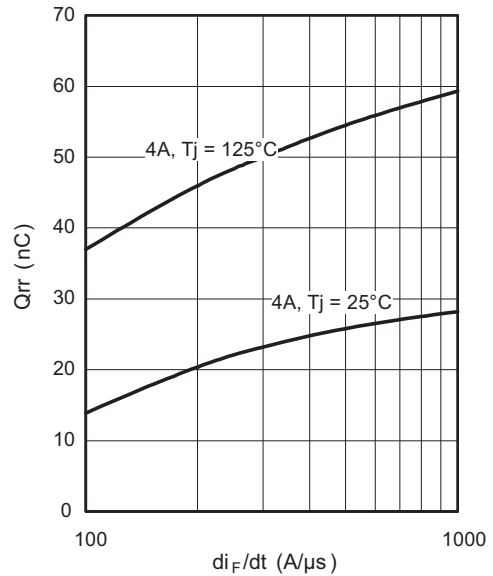


Fig. 8 - Typical Stored Charge vs.  $di_F/dt$

**Note**

- (1) Formula used:  $T_C = T_J - (Pd + Pd_{REV}) \times R_{thJC}$ ;  
 $Pd$  = Forward power loss =  $I_{F(AV)} \times V_{FM}$  at  $(I_{F(AV)}/D)$  (see fig. 6);  
 $Pd_{REV}$  = Inverse power loss =  $V_{R1} \times I_R (1 - D)$ ;  $I_R$  at  $V_{R1}$  = Rated  $V_R$

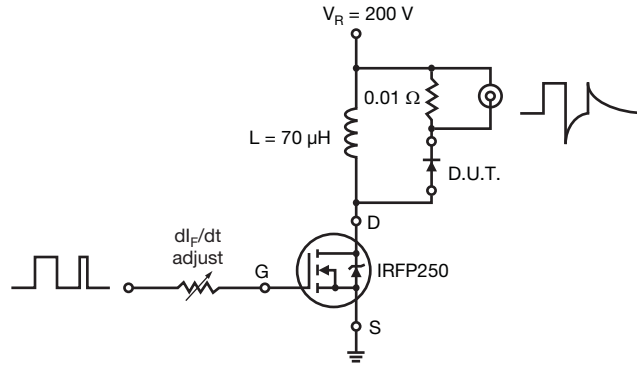
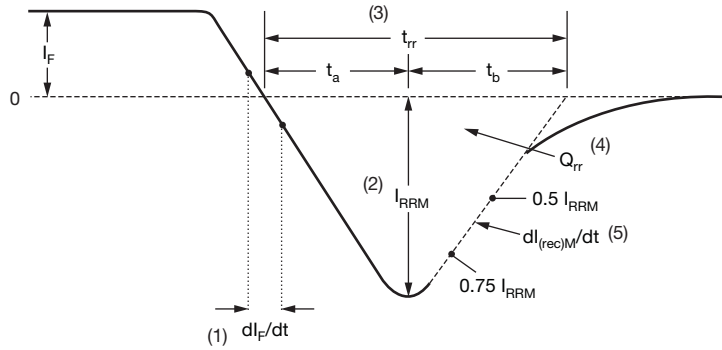


Fig. 9 - Reverse Recovery Parameter Test Circuit



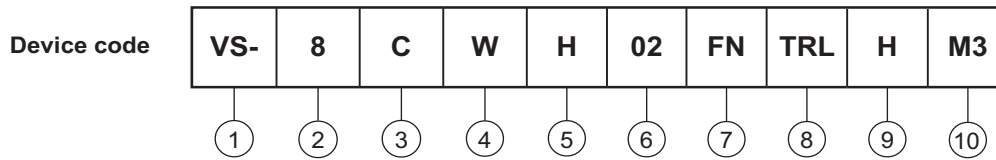
- (1)  $di_F/dt$  - rate of change of current through zero crossing
- (2)  $I_{RRM}$  - peak reverse recovery current
- (3)  $t_{rr}$  - reverse recovery time measured from zero crossing point of negative going  $I_F$  to point where a line passing through  $0.75 I_{RRM}$  and  $0.50 I_{RRM}$  extrapolated to zero current.
- (4)  $Q_{rr}$  - area under curve defined by  $t_{rr}$  and  $I_{RRM}$
- (5)  $di_{(rec)M}/dt$  - peak rate of change of current during  $t_b$  portion of  $t_{rr}$

$$Q_{rr} = \frac{t_{rr} \times I_{RRM}}{2}$$

Fig. 10 - Reverse Recovery Waveform and Definitions



ORDERING INFORMATION TABLE



- 1** - Vishay Semiconductors product
- 2** - Current rating (8 = 8 A)
- 3** - Circuit configuration:  
C = Common cathode
- 4** - Package identifier:  
W = D-PAK
- 5** - H = Hyperfast recovery
- 6** - Voltage rating (02 = 200 V)
- 7** - FN = TO-252AA
- 8** -
  - None = Tube
  - TR = Tape and reel
  - TRL = Tape and reel (left oriented)
  - TRR = Tape and reel (right oriented)
- 9** - H = AEC-Q101 qualified
- 10** - Environmental digit:  
M3 = Halogen-free, RoHS-compliant, and terminations lead (Pb)-free

ORDERING INFORMATION (Example)			
PREFERRED P/N	QUANTITY PER T/R	MINIMUM ORDER QUANTITY	PACKAGING DESCRIPTION
VS-8CWH02FNHM3	75	3000	Antistatic plastic tube
VS-8CWH02FNTRHM3	2000	2000	13" diameter reel
VS-8CWH02FNTRRHM3	3000	3000	13" diameter reel
VS-8CWH02FNTRLHM3	3000	3000	13" diameter reel

LINKS TO RELATED DOCUMENTS	
Dimensions	<a href="http://www.vishay.com/doc?95519">www.vishay.com/doc?95519</a>
Part marking information	<a href="http://www.vishay.com/doc?95518">www.vishay.com/doc?95518</a>
Packaging information	<a href="http://www.vishay.com/doc?95033">www.vishay.com/doc?95033</a>



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**Vishay Intertechnology, Inc. hereby certifies that all its products that are identified as RoHS-Compliant fulfill the definitions and restrictions defined under Directive 2011/65/EU of The European Parliament and of the Council of June 8, 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment (EEE) - recast, unless otherwise specified as non-compliant.**

**Please note that some Vishay documentation may still make reference to RoHS Directive 2002/95/EC. We confirm that all the products identified as being compliant to Directive 2002/95/EC conform to Directive 2011/65/EU.**



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- Поставка более 17-ти миллионов наименований электронных компонентов;
- Поставка сложных, дефицитных, либо снятых с производства позиций;
- Оперативные сроки поставки под заказ (от 5 рабочих дней);
- Экспресс доставка в любую точку России;
- Техническая поддержка проекта, помощь в подборе аналогов, поставка прототипов;
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- Лицензия ФСБ на осуществление работ с использованием сведений, составляющих государственную тайну;
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- Подбор аналогов;
- Консультации по применению компонента;
- Поставка образцов и прототипов;
- Техническая поддержка проекта;
- Защита от снятия компонента с производства.



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