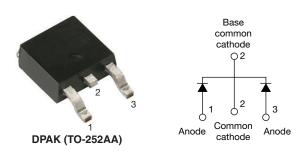
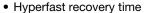


Hyperfast Rectifier, 2 x 5 A FRED Pt®



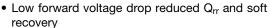
PRIMARY CHARACTERISTICS						
I _{F(AV)}	2 x 5 A					
V_{R}	200 V					
V _F at I _F	0.74 V					
t _{rr} (typ.)	23 ns					
T _J max.	175 °C					
Package	DPAK (TO-252AA)					
Circuit configuration	Common cathode					

FEATURES











FREE

· Low leakage current

- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Material categorization: for definitions of compliance please see <u>www.vishay.com/doc?99912</u>

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.

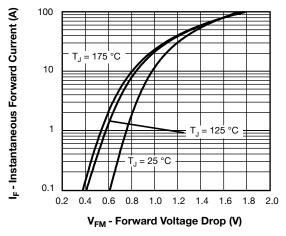
ABSOLUTE MAXIMUM RATINGS							
PARAMETER	SYMBOL	TEST CONDITIONS	VALUES	UNITS			
Peak repetitive reverse voltage	V_{RRM}		200	V			
Average rectified forward current	I _{F(AV)}	T _C = 160 °C	10	۸			
Non-repetitive peak surge current	I _{FSM}	T _J = 25 °C	80	A			
Operating junction and storage temperatures	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 μA	200	-	-			
		I _F = 5 A	-	0.90	0.98] ,,		
Forward voltage	V _F	I _F = 10 A	-	0.98	1.15	V		
		I _F = 5 A, T _J = 150 °C	-	0.74	0.84			
		I _F = 10 A, T _J = 150 °C	-	0.84	1.05			
		$V_R = V_R$ rated	-	-	4			
Reverse leakage current per leg	I _R	$T_J = 125 ^{\circ}\text{C}, V_R = V_R \text{rated}$	-	-	40	μΑ		
		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 °C unless otherwise specified)								
PARAMETER	SYMBOL	TEST CONDITIONS MIN. TYP. MAX. U						
		$I_F = 1 A, dI_F/dt =$	= 100 A/ μ s, V _R = 30 V	-	23	27		
Reverse recovery time	t _{rr}	T _J = 25 °C		-	21	ı	ns	
		T _J = 125 °C		-	26	-		
Dook receives augreent	I _{RRM}	T _J = 25 °C	$I_F = 5 A$	-	2	-	۸	
Peak recovery current		T _J = 125 °C	dl _F /dt = 200 A/μs V _R = 160 V	-	3.1	-	A	
Poverne recovery charge	0	T _J = 25 °C	'''	-	20	-	nC	
Reverse recovery charge	Q _{rr}	T _J = 125 °C		-	41	-	IIC	

THERMAL - MECHANICAL SPECIFICATIONS									
PARAMETER		SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNITS		
Maximum junction and storage tempe	rature range	T _J , T _{Stg}		-65	-	175	°C		
Thermal resistance, junction to case	per leg	R _{thJC}		-	2.7	3.2	°C/W		
	per device			-	1.35	1.6			
Approximate weight					0.3		g		
					0.01		oz.		
Marking device			Case style DPAK (TO-252AA)	10CWH02FN					





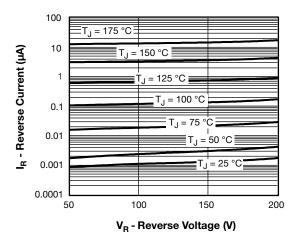


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage

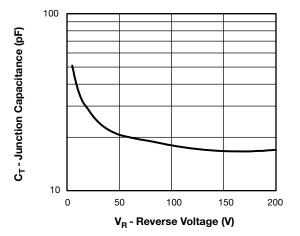


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage



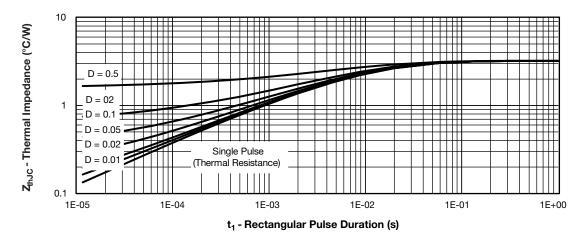


Fig. 4 - Maximum Thermal Impedance Z_{thJC} Characteristics

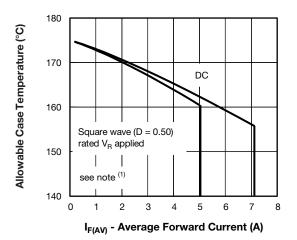


Fig. 5 - Maximum Allowable Case Temperature vs.
Average Forward Current

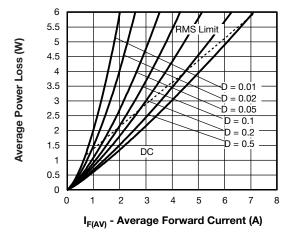


Fig. 6 - Forward Power Loss Characteristics

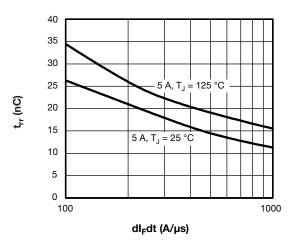


Fig. 7 - Typical Reverse Recovery Time vs. dl_F/dt

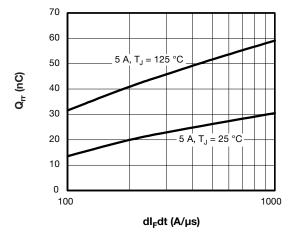


Fig. 8 - Typical Stored Charge vs. dI_F/dt

Note

⁽¹⁾ Formula used: T_C = T_J - (Pd + Pd_{REV}) x R_{thJC}; Pd = forward power loss = I_{F(AV)} x V_{FM} at (I_{F(AV)}/D) (see fig. 6); Pd_{REV} = inverse power loss = V_{R1} x I_R (1 - D); I_R at V_{R1} = rated V_R

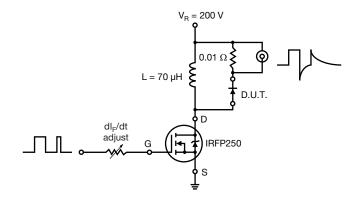
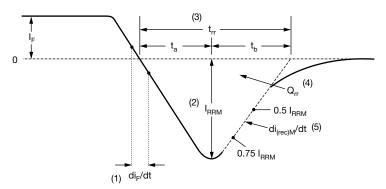


Fig. 9 - Reverse Recovery Parameter Test Circuit



- (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) $\mathbf{Q}_{\rm rr}$ area under curve defined by $\mathbf{t}_{\rm rr}$ and $\mathbf{I}_{\rm RRM}$

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

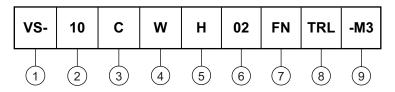
(5) $di_{(rec)M}/dt$ - peak rate of change of current during t_b portion of t_{rr}

Fig. 10 - Reverse Recovery Waveform and Definitions



ORDERING INFORMATION TABLE





1 - Vishay Semiconductors product

2 - Current rating (10 = 10 A)

Circuit configuration:

C = common cathode

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 - Environmental digit:

-M3 = halogen-free, RoHS-compliant and terminations lead (Pb)-free

ORDERING INFORMATION (Example)							
PREFERRED P/N	BASE QUANTITY	PACKAGING DESCRIPTION					
VS-10CWH02FN-M3	75	Antistatic plastic tube					
VS-10CWH02FNTR-M3	2000	13" diameter reel					
VS-10CWH02FNTRL-M3	3000	13" diameter reel					
VS-10CWH02FNTRR-M3	3000	13" diameter reel					

LINKS TO RELATED DOCUMENTS						
Dimensions	www.vishay.com/doc?95627					
Part marking information	www.vishay.com/doc?95176					
Packaging information	www.vishay.com/doc?95033					
SPICE model	www.vishay.com/doc?95376					



D-PAK (TO-252AA) "M"

DIMENSIONS in millimeters and inches



SYMBOL	MILLIN	IETERS	INC	INCHES	
STIVIBUL	MIN.	MAX.	MIN.	MAX.	NOTES
Α	2.18	2.39	0.086	0.094	
A1	-	0.13	-	0.005	
b	0.64	0.89	0.025	0.035	
b2	0.76	1.14	0.030	0.045	
b3	4.95	5.46	0.195	0.215	3
С	0.46	0.61	0.018	0.024	
c2	0.46	0.89	0.018	0.035	
D	5.97	6.22	0.235	0.245	5
D1	5.21	-	0.205	1	3
Е	6.35	6.73	0.250	0.265	5
E1	4.32	-	0.170	-	3

SYMBOL	MILLIN	IETERS	INCHES		NOTES
STINIBOL	MIN.	MAX.	MIN.	MAX.	NOTES
е	2.29	BSC	0.090	BSC	
Н	9.40	10.41	0.370	0.410	
L	1.40	1.78	0.055	0.070	
L1	2.74 BSC		0.108 REF.		
L2	0.51	BSC	0.020 BSC		
L3	0.89	1.27	0.035	0.050	3
L4	-	1.02	-	0.040	
L5	1.14	1.52	0.045	0.060	2
Ø	0°	10°	0°	10°	
Ø1	0°	15°	0°	15°	
Ø2	25°	35°	25°	35°	

Notes

- (1) Dimensioning and tolerancing as per ASME Y14.5M-1994
- (2) Lead dimension uncontrolled in L5
- (3) Dimension D1, E1, L3 and b3 establish a minimum mounting surface for thermal pad
- (4) Section C C dimension apply to the flat section of the lead between 0.13 and 0.25 mm (0.005 and 0.10") from the lead tip
- (5) Dimension D, and E do not include mold flash. Mold flash shall not exceed 0.127 mm (0.005") per side. These dimensions are measured at the outermost extremes of the plastic body
- (6) Dimension b1 and c1 applied to base metal only
- (7) Datum A and B to be determined at datum plane H
- (8) Outline conforms to JEDEC® outline TO-252AA



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