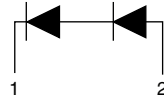


## Hyperfast Rectifier, 8 A FRED Pt®



2L TO-220 FULL-PAK



### FEATURES

- Hyperfast recovery time, extremely low  $Q_{rr}$
- 175 °C maximum operating junction temperature
- High frequency PFC CCM operation
- Low leakage current
- Halogen-free according to IEC 61249-2-21 definition
- Designed and qualified for industrial level



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

### DESCRIPTION

VS-8S2TH06FP 600 V series are the state of the art tandem hyperfast recovery rectifiers: excellent switching performance and extremely low forward voltage drop trade off is overcome, boosting overall application performance. Specially designed for CCM PFC application, these devices show incomparable performance in every current intensive hard switching application.

Optimized reverse recovery stored charge enables downsizing of boosting switch and cooling system, increased operating frequency make possible use of smaller reactive elements. Cost effective PFC application is then possible with high efficiency over wide input voltage range and loading factor.

Plastic insulated package features easy mounting together with not insulated parts.

### PRODUCT SUMMARY

Package	2L TO-220FP
$I_{F(AV)}$	8 A
$V_R$	600 V
$V_F$ at $I_F$	2.4 V
$t_{rr}$ (typ.)	See Recovery table
$T_J$ max.	175 °C
Diode variation	Doubler

### ABSOLUTE MAXIMUM RATINGS FOR BOTH DIODES

PARAMETER	SYMBOL	TEST CONDITIONS	MAX.	UNITS
Repetitive peak reverse voltage	$V_{RRM}$		600	V
DC forward current	$I_F$	50 % duty cycle, rect. waveforms, $T_C = 93$ °C	8	A
Non-repetitive peak surge current	$I_{FSM}$	$T_C = 25$ °C	100	
Operating junction and storage temperatures	$T_J, T_{Stg}$		- 55 to 175	°C

### ELECTRICAL SPECIFICATIONS FOR BOTH DIODES ( $T_J = 25$ °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	600	-	-	V
Forward voltage	$V_F$	$I_F = 8$ A	-	2.1	2.4	
		$I_F = 8$ A, $T_J = 125$ °C	-	1.7	2	
		$I_F = 8$ A, $T_J = 150$ °C	-	1.6	1.8	
Reverse leakage current	$I_R$	$V_R = V_R$ rated	-	< 1	10	$\mu$ A
		$T_J = 125$ °C, $V_R = V_R$ rated	-	7	80	
		$T_J = 150$ °C, $V_R = V_R$ rated	-	27	100	
Junction capacitance	$C_T$	$V_R = 600$ V	-	12	-	pF

<b>DYNAMIC RECOVERY CHARACTERISTICS FOR BOTH DIODES</b> ( $T_J = 25\text{ }^\circ\text{C}$ unless otherwise specified)							
PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNITS	
Reverse recovery time	$t_{rr}$	$I_F = 1.0\text{ A}$ , $di_F/dt = -50\text{ A}/\mu\text{s}$ , $V_R = 30\text{ V}$	-	-	25	ns	
		$T_J = 25\text{ }^\circ\text{C}$	-	19	-		
		$T_J = 125\text{ }^\circ\text{C}$	-	35	-		
Peak recovery current	$I_{RRM}$	$I_F = 8\text{ A}$ $di_F/dt = -200\text{ A}/\mu\text{s}$ $V_R = 390\text{ V}$	$T_J = 25\text{ }^\circ\text{C}$	-	2.8	-	A
			$T_J = 125\text{ }^\circ\text{C}$	-	4.6	5.5	
Reverse recovery charge	$Q_{rr}$	$T_J = 25\text{ }^\circ\text{C}$	$T_J = 25\text{ }^\circ\text{C}$	-	26	-	nC
			$T_J = 125\text{ }^\circ\text{C}$	-	84	-	

<b>THERMAL - MECHANICAL SPECIFICATIONS FOR BOTH DIODES</b>						
PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNITS
Maximum junction and storage temperature range	$T_J, T_{Stg}$		- 55	-	175	$^\circ\text{C}$
Thermal resistance, junction to case	$R_{thJC}$		-	4.1	4.8	$^\circ\text{C}/\text{W}$
Thermal resistance, case to heatsink	$R_{thCS}$	Mounting surface, flat, smooth and greased	-	0.2	-	
Weight			-	2.0	-	g
			-	0.07	-	oz.
Mounting torque			6.0 (5.0)	-	12 (10)	kgf · cm (lbf · in)
Marking device		Case style 2L TO-220 FULL-PAK	8S2TH06FP			

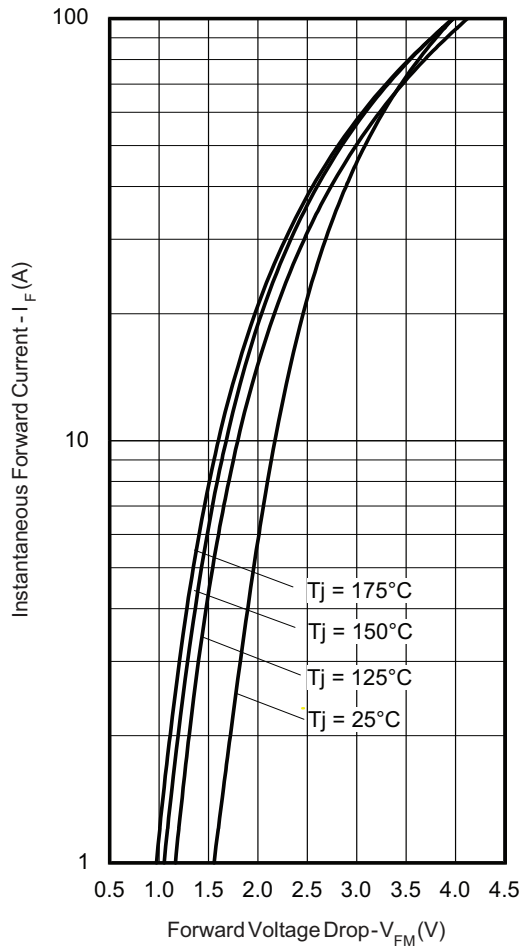


Fig. 1 - Maximum Forward Voltage Drop Characteristics

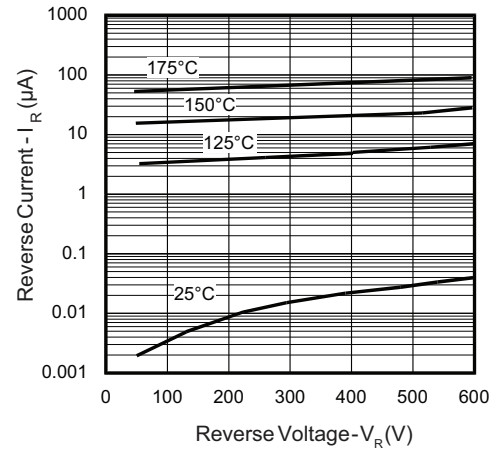


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage

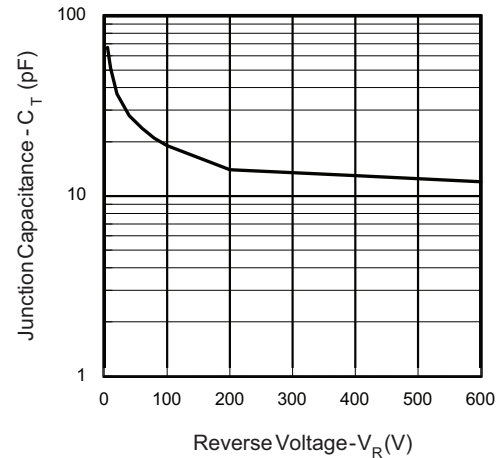
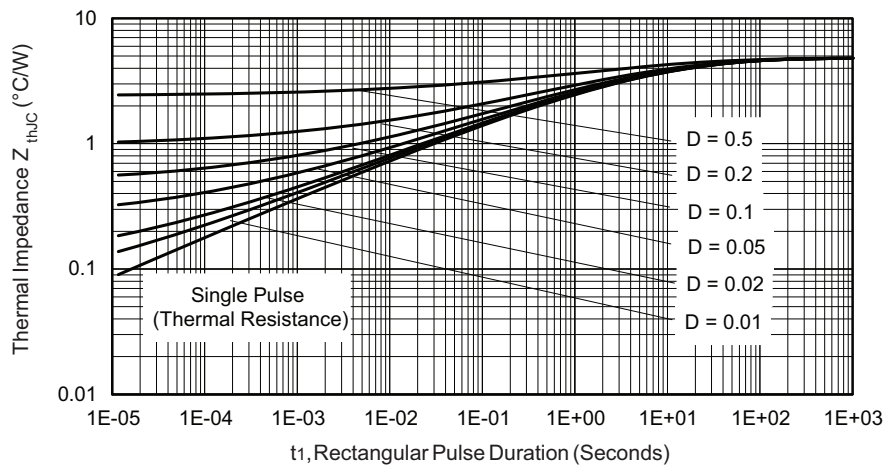


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage


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

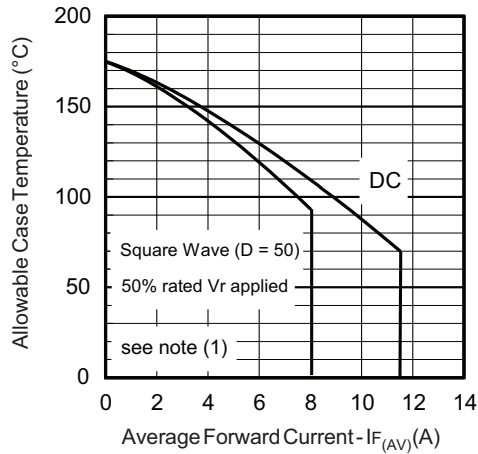


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current

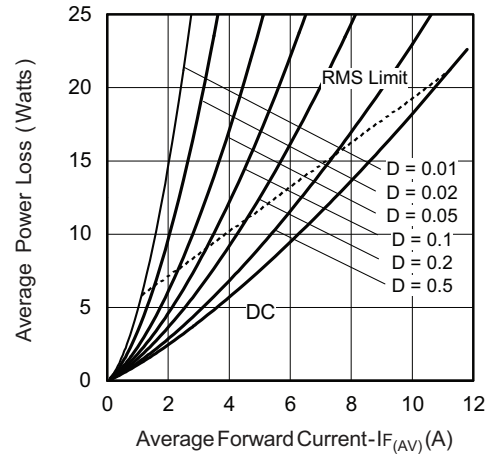


Fig. 6 - Forward Power Loss Characteristics

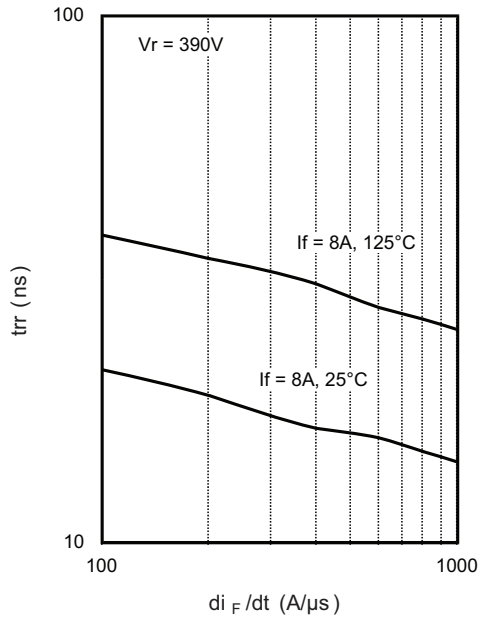


Fig. 7 - Typical Reverse Recovery Time vs.  $di_F/dt$

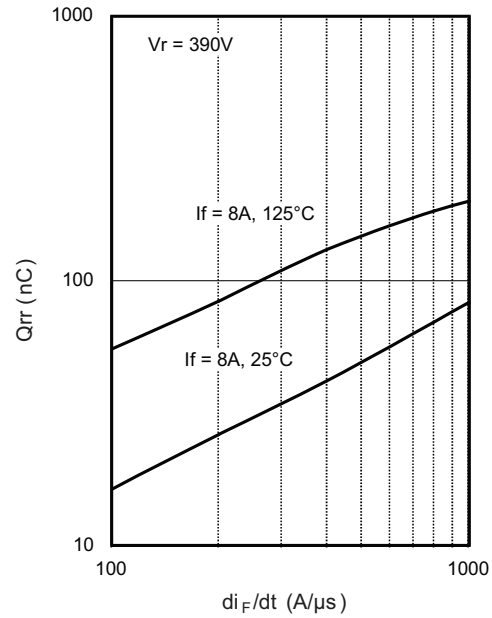


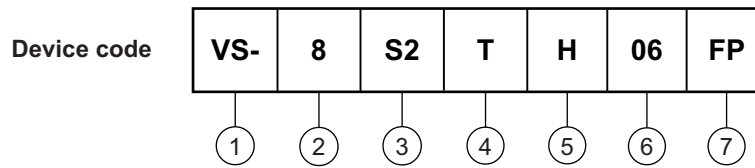
Fig. 8 - Typical Stored Charge vs.  $di_F/dt$

**Note**

- (1) Formula used:  $T_C = T_J - (P_d + P_{d_{REV}}) \times R_{thJC}$ ;  
 $P_d$  = Forward power loss =  $I_{F(AV)} \times V_{FM}$  at  $(I_{F(AV)}/D)$  (see fig. 6);  
 $P_{d_{REV}}$  = Inverse power loss =  $V_{R1} \times I_R (1 - D)$ ;  $I_R$  at  $V_{R1} = 50\%$  rated  $V_R$



**ORDERING INFORMATION TABLE**



- 1** - Vishay Semiconductors product suffix
- 2** - Current rating (8 = 8 A)
- 3** - S2 = Doubler true 2 pin
- 4** - T = TO-220
- 5** - H = Hyperfast recovery
- 6** - Voltage rating (06 = 600 V)
- 7** - FP = TO-220 FULL-PAK

LINKS TO RELATED DOCUMENTS	
Dimensions	<a href="http://www.vishay.com/doc?95263">www.vishay.com/doc?95263</a>
Part marking information	<a href="http://www.vishay.com/doc?95265">www.vishay.com/doc?95265</a>



## Disclaimer

All product specifications and data are subject to change without notice.

Vishay Intertechnology, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, "Vishay"), disclaim any and all liability for any errors, inaccuracies or incompleteness contained herein or in any other disclosure relating to any product.

Vishay disclaims any and all liability arising out of the use or application of any product described herein or of any information provided herein to the maximum extent permitted by law. The product specifications do not expand or otherwise modify Vishay's terms and conditions of purchase, including but not limited to the warranty expressed therein, which apply to these products.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document or by any conduct of Vishay.

The products shown herein are not designed for use in medical, life-saving, or life-sustaining applications unless otherwise expressly indicated. Customers using or selling Vishay products not expressly indicated for use in such applications do so entirely at their own risk and agree to fully indemnify Vishay for any damages arising or resulting from such use or sale. Please contact authorized Vishay personnel to obtain written terms and conditions regarding products designed for such applications.

Product names and markings noted herein may be trademarks of their respective owners.