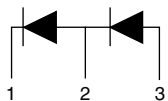


## Hyperfast Rectifier, 8 A FRED P<sub>t</sub><sup>™</sup>



3L TO-220 FULL-PAK



### FEATURES

- Hyperfast recovery time
- Low forward voltage drop
- Low leakage current
- 175 °C operating junction temperature
- Designed and qualified for industrial level


RoHS  
COMPLIANT

### DESCRIPTION

8STH06FP 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

$t_{rr}$	19 ns
$I_{F(AV)}$	8 A
$V_R$	600 V

### 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, $T_C = 93\text{ °C}$	8	A
Non-repetitive peak surge current	$I_{FSM}$	$T_C = 25\text{ °C}$	100	
Operating junction and storage temperatures	$T_J, T_{Stg}$		- 55 to 175	°C

### ELECTRICAL SPECIFICATIONS FOR BOTH DIODES ( $T_J = 25\text{ °C}$ unless otherwise specified)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNITS
Breakdown voltage, blocking voltage	$V_{BR}, V_R$	$I_R = 100\text{ }\mu\text{A}$	600	-	-	V
Forward voltage	$V_F$	$I_F = 8\text{ A}$	-	2.1	2.4	
		$I_F = 8\text{ A}, T_J = 125\text{ °C}$	-	1.7	2	
		$I_F = 8\text{ A}, T_J = 150\text{ °C}$	-	1.6	1.8	
Reverse leakage current	$I_R$	$V_R = V_R\text{ rated}$	-	< 1	10	$\mu\text{A}$
		$T_J = 125\text{ °C}, V_R = V_R\text{ rated}$	-	7	80	
		$T_J = 150\text{ °C}, V_R = V_R\text{ rated}$	-	27	100	
Junction capacitance	$C_T$	$V_R = 600\text{ V}$	-	12	-	pF

**DYNAMIC RECOVERY CHARACTERISTICS FOR BOTH DIODES** ( $T_J = 25\text{ °C}$  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
		$T_J = 25\text{ °C}$	-	19	-	
		$T_J = 125\text{ °C}$	-	35	-	
Peak recovery current	$I_{RRM}$	$T_J = 25\text{ °C}$	-	2.8	-	A
		$T_J = 125\text{ °C}$	-	4.6	5.5	
Reverse recovery charge	$Q_{rr}$	$T_J = 25\text{ °C}$	-	26	-	nC
		$T_J = 125\text{ °C}$	-	84	-	

**THERMAL - MECHANICAL SPECIFICATIONS FOR BOTH DIODES**

PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNITS
Maximum junction and storage temperature range	$T_J, T_{Stg}$		- 55	-	175	°C
Thermal resistance, junction to case	$R_{thJC}$		-	4.1	4.8	°C/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 3L TO-220 FULL-PAK	8STH06FP			

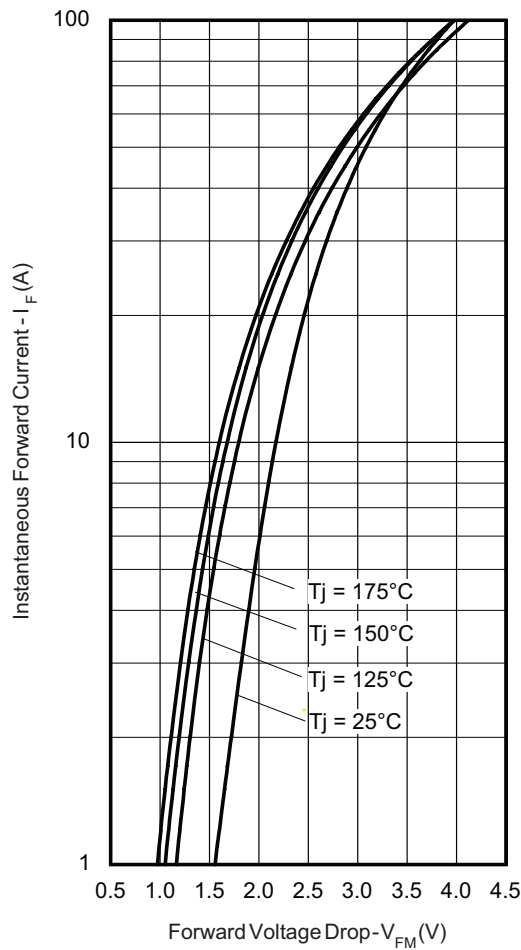


Fig. 1 - Maximum Forward Voltage Drop Characteristics

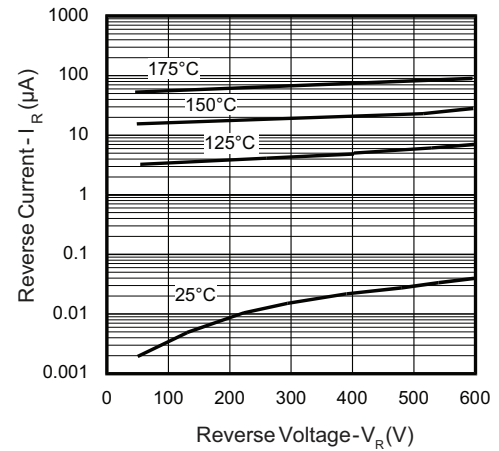


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage

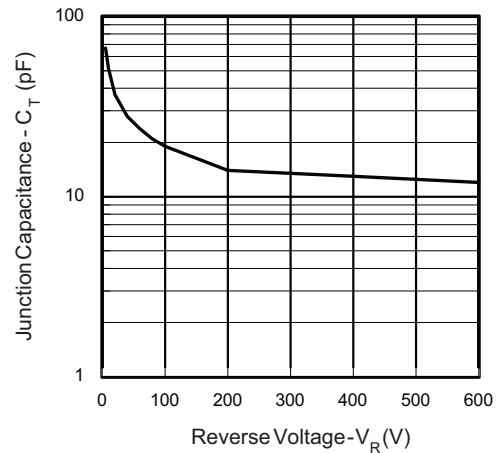


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage

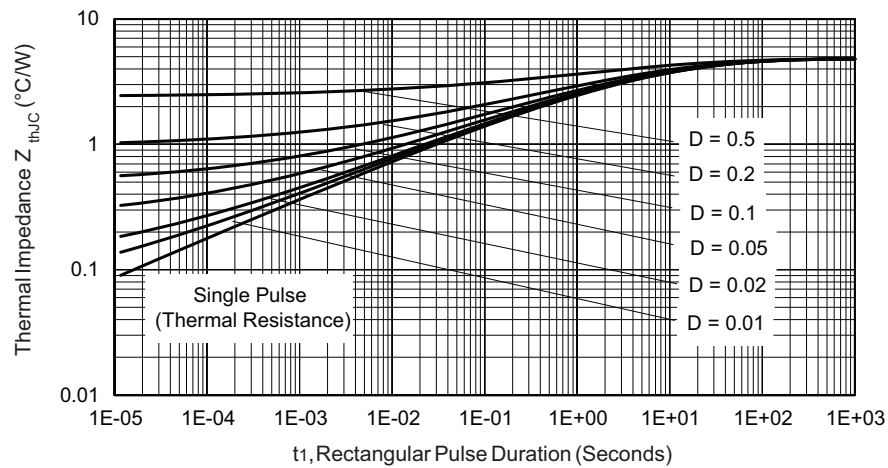


Fig. 4 - Maximum Thermal Impedance  $Z_{thJC}$  Characteristics

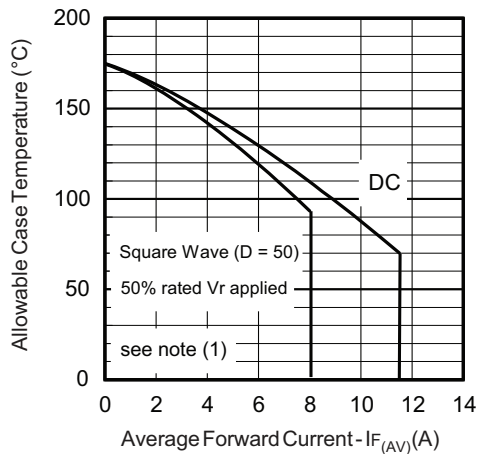


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current

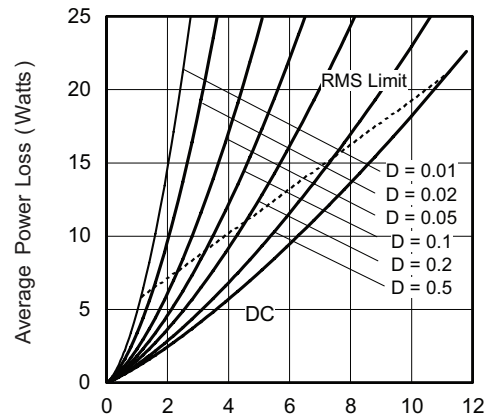
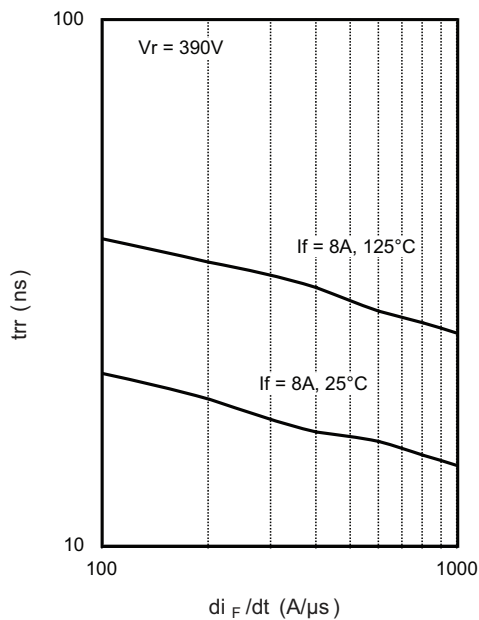
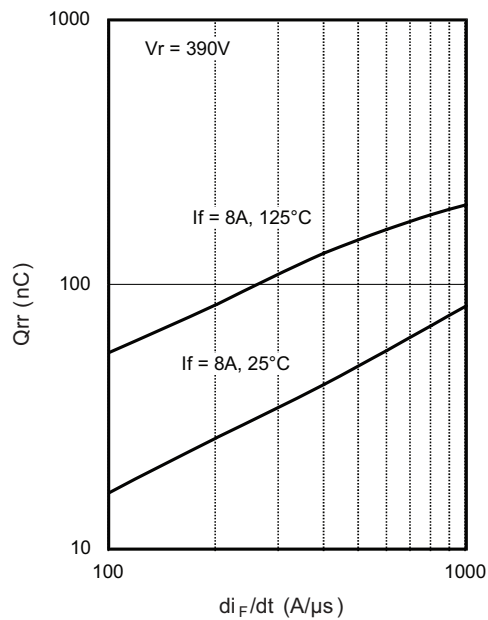


Fig. 6 - Forward Power Loss Characteristics

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  $V_R$

**LINKS TO RELATED DOCUMENTS**

Dimensions	<a href="http://www.vishay.com/doc?95264">http://www.vishay.com/doc?95264</a>
Part marking information	<a href="http://www.vishay.com/doc?95266">http://www.vishay.com/doc?95266</a>



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