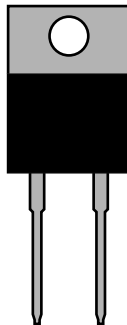
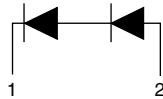


## Hyperfast Rectifier, 8 A FRED Pt®



2L TO-220



### FEATURES

- Hyperfast recovery time
- Low forward voltage drop
- Low leakage current
- 175 °C operating junction temperature
- Compliant to RoHS directive 2002/95/EC
- Halogen-free according to IEC 61249-2-21 definition
- Designed and qualified for industrial level



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

### DESCRIPTION

8S2TH06I-M 600 V series are the state of the art tandem hyperfast recovery rectifiers: the new insulated 2 pin TO-220 package provide benchmark thermal resistance that coupled with excellent switching performance and low forward voltage drop allow this device to provide 8 A DC at 120 °C case temperature.

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.

The new ceramic insulated package warranty insulation up to 2 kV and features easy mounting together with not insulated parts, with minimum effect on  $R_{thJC}$ .

### PRODUCT SUMMARY

|             |       |
|-------------|-------|
| $t_{rr}$    | 11 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, $T_C = 120\text{ °C}$ | 8           | A     |
| Non-repetitive peak surge current           | $I_{FSM}$      | $T_C = 25\text{ °C}$                                    | 140         |       |
| 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 | $V_{BR}, V_R$ | $I_R = 100\ \mu\text{A}$                      | 600  | -    | -    | V             |
| Forward voltage                     | $V_F$         | $I_F = 8\text{ A}$                            | -    | 2.7  | 3.1  |               |
|                                     |               | $I_F = 8\text{ A}, T_J = 125\text{ °C}$       | -    | 2.1  | 2.3  |               |
|                                     |               | $I_F = 8\text{ A}, T_J = 150\text{ °C}$       | -    | 1.9  | 2.1  |               |
| 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    | 50   |               |
|                                     |               | $T_J = 150\text{ °C}, V_R = V_R\text{ rated}$ | -    | 27   | 80   |               |
| Junction capacitance                | $C_T$         | $V_R = 600\text{ V}$                          | -    | 10.5 | -    | pF            |

## 8S2TH06I-M



Vishay High Power Products

Hyperfast Rectifier,  
8 A FRED Pt®

| DYNAMIC RECOVERY CHARACTERISTICS FOR BOTH DIODES ( $T_J = 25\text{ }^\circ\text{C}$ unless otherwise specified) |           |   |      |      |      |       |
|---|-----------|---|------|------|------|-------|
| PARAMETER   | SYMBOL    | TEST CONDITIONS   | MIN. | TYP. | MAX. | UNITS |
| Reverse recovery time   | $t_{rr}$  | $I_F = 1.0\text{ A}$ , $di_F/dt = -50\text{ A}/\mu\text{s}$ , $V_R = 30\text{ V}$ | -    | 13   | 20   | ns    |
|   |           | $T_J = 25\text{ }^\circ\text{C}$  | -    | 11   | 16   |       |
|   |           | $T_J = 125\text{ }^\circ\text{C}$   | -    | 23   | 30   |       |
| Peak recovery current   | $I_{RRM}$ | $T_J = 25\text{ }^\circ\text{C}$  | -    | 1.5  | 2.5  | A     |
|   |           | $T_J = 125\text{ }^\circ\text{C}$   | -    | 2.8  | 3.7  |       |
| Reverse recovery charge   | $Q_{rr}$  | $T_J = 25\text{ }^\circ\text{C}$  | -    | 7    | 15   | nC    |
|   |           | $T_J = 125\text{ }^\circ\text{C}$   | -    | 35   | 51   |       |

| 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        | $^\circ\text{C}$          |
| Thermal resistance, junction to case                | $R_{thJC}$     |  | -            | 2.30 | 2.85       | $^\circ\text{C}/\text{W}$ |
| Thermal resistance, case to heatsink                | $R_{thCS}$     | Mounting surface, flat, smooth and greased | -            | 0.1  | -          |                           |
| Approximate weight                                  |                |  | -            | 2.0  | -          | g                         |
|   |                |  | -            | 0.07 | -          | oz.                       |
| Mounting torque                                     |                |  | 6.0<br>(5.0) | -    | 12<br>(10) | kgf · cm<br>(lbf · in)    |
| Marking device                                      |                | Case style 2L TO-220                       | 8S2TH06I     |      |            |                           |



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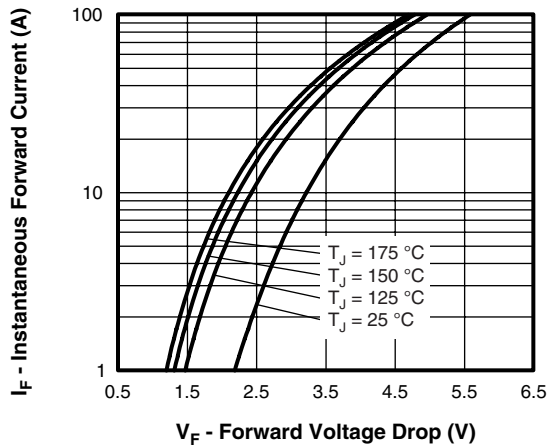


Fig. 1 - Typical Forward Voltage Drop Characteristics

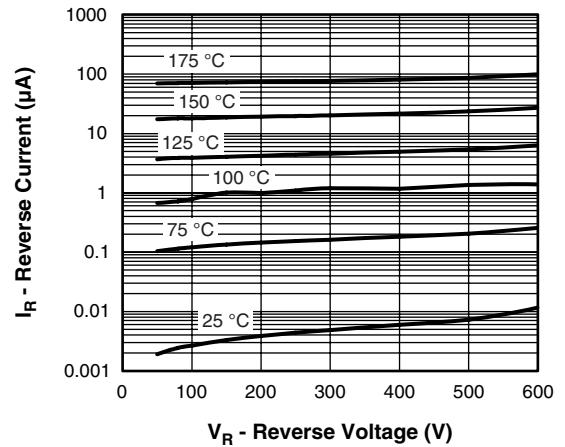


Fig. 2 - Typical Values of Reverse Current vs. Reverse Voltage

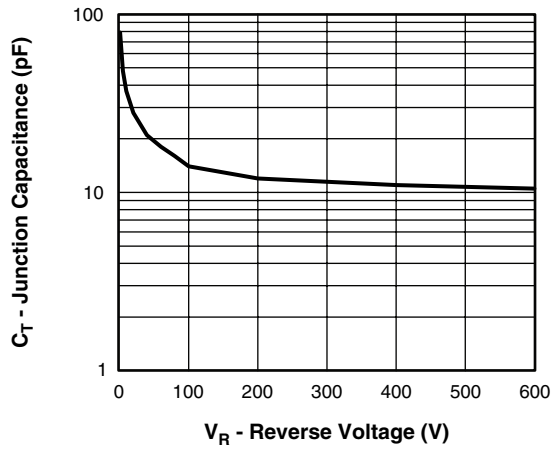


Fig. 3 - Typical Junction Capacitance vs. Reverse Voltage

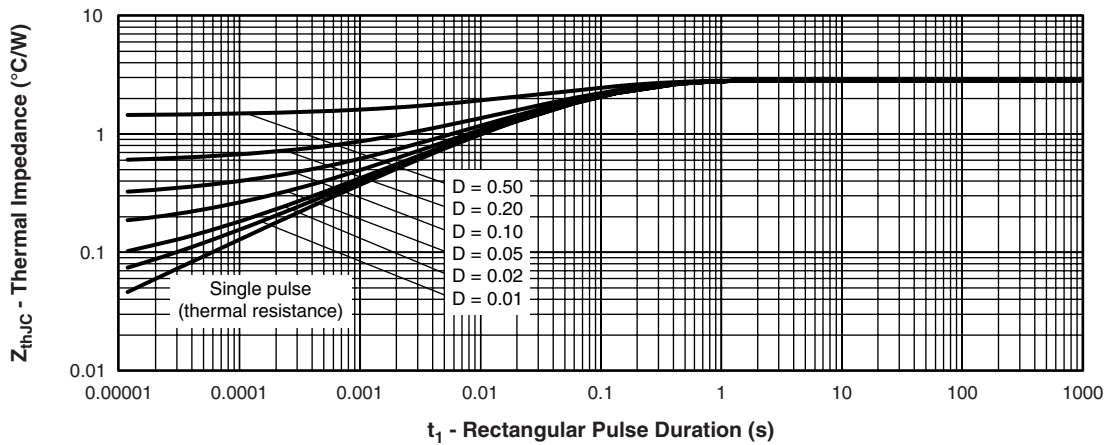


Fig. 4 - Maximum Thermal Impedance  $Z_{thJC}$  Characteristics

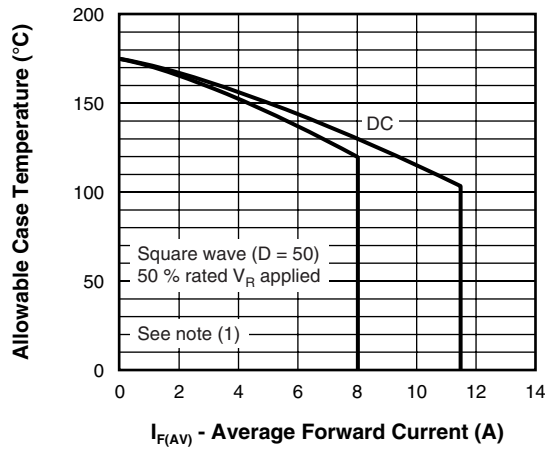


Fig. 5 - Maximum Allowable Case Temperature vs. Average Forward Current

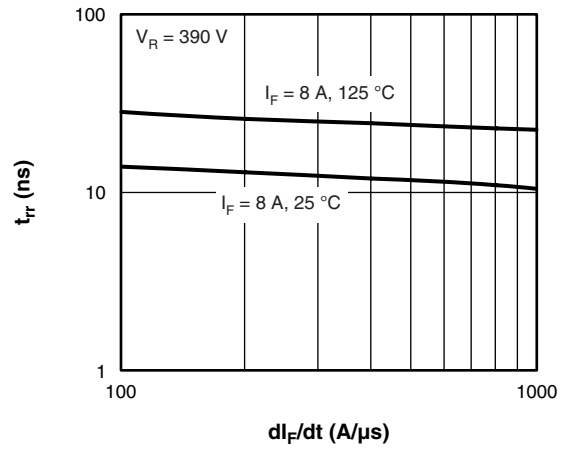


Fig. 7 - Typical Reverse Recovery Time vs.  $di_F/dt$

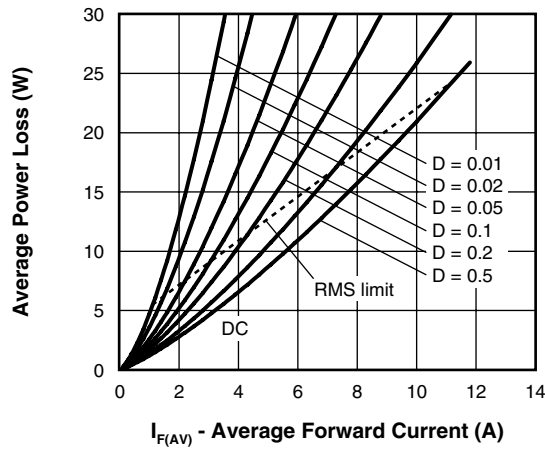


Fig. 6 - Forward Power Loss Characteristics

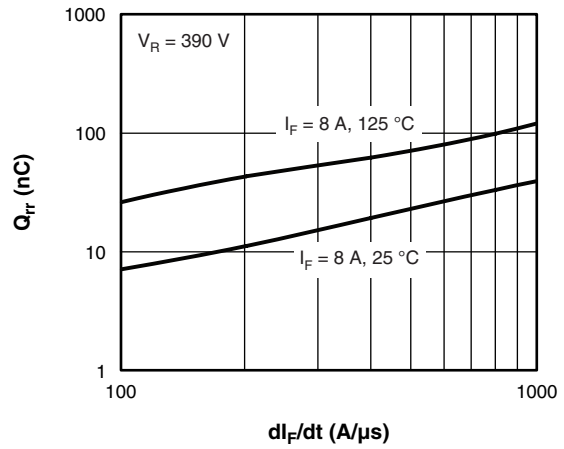


Fig. 8 - Typical Stored Charge vs.  $di_F/dt$

**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  $V_{R1} = 50\%$  rated  $V_R$

| LINKS TO RELATED DOCUMENTS |  |
|----------------------------|--|
| Dimensions                 | <a href="http://www.vishay.com/doc?95171">www.vishay.com/doc?95171</a> |
| Part marking information   | <a href="http://www.vishay.com/doc?95170">www.vishay.com/doc?95170</a> |



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