

## 20A, 50V - 600V Super Fast Rectifier

### FEATURES

- AEC-Q101 qualified available
- High efficiency, low  $V_F$
- High current capability
- High surge current capability
- Low power loss
- UL Recognized File # E-326243
- RoHS Compliant
- Halogen-free according to IEC 61249-2-21

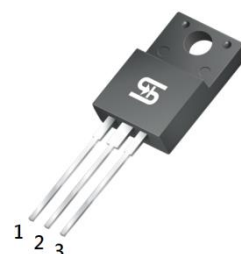
### APPLICATIONS

- DC to DC converter
- Switching mode converters and inverters
- Freewheeling application

### MECHANICAL DATA

- Case: ITO-220AB
- Molding compound meets UL 94V-0 flammability rating
- Terminal: Matte tin plated leads, solderable per J-STD-002
- Mounting torque: 0.56 N·m maximum
- Meet JESD 201 class 2 whisker test
- Polarity: As marked
- Weight: 1.82g (approximately)

| KEY PARAMETERS |           |      |
|----------------|-----------|------|
| PARAMETER      | VALUE     | UNIT |
| $I_F$          | 20        | A    |
| $V_{RRM}$      | 50 - 600  | V    |
| $I_{FSM}$      | 150       | A    |
| $T_{J\ MAX}$   | 150       | °C   |
| Package        | ITO-220AB |      |
| Configuration  | Dual dies |      |



ITO-220AB



| ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$ unless otherwise noted)        |              |              |              |              |              |              |              |              |              |      |
|--|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|------|
| PARAMETER  | SYMBOL       | SFF<br>2001G | SFF<br>2002G | SFF<br>2003G | SFF<br>2004G | SFF<br>2005G | SFF<br>2006G | SFF<br>2007G | SFF<br>2008G | UNIT |
| Marking code on the device   |              | SFF<br>2001G | SFF<br>2002G | SFF<br>2003G | SFF<br>2004G | SFF<br>2005G | SFF<br>2006G | SFF<br>2007G | SFF<br>2008G |      |
| Repetitive peak reverse voltage  | $V_{RRM}$    | 50           | 100          | 150          | 200          | 300          | 400          | 500          | 600          | V    |
| Reverse voltage, total rms value   | $V_{R(RMS)}$ | 35           | 70           | 105          | 140          | 210          | 280          | 350          | 420          | V    |
| Forward current  | $I_F$        | 20           |              |              |              |              |              |              |              | A    |
| Surge peak forward current, 8.3ms single half sine wave superimposed on rated load | $I_{FSM}$    | 150          |              |              |              |              |              |              |              | A    |
| Junction temperature   | $T_J$        | -55 to +150  |              |              |              |              |              |              |              | °C   |
| Storage temperature  | $T_{STG}$    | -55 to +150  |              |              |              |              |              |              |              | °C   |

**THERMAL PERFORMANCE**

| PARAMETER                           | SYMBOL          | TYP | UNIT |
|-------------------------------------|-----------------|-----|------|
| Junction-to-case thermal resistance | $R_{\theta JC}$ | 2.5 | °C/W |

**ELECTRICAL SPECIFICATIONS** ( $T_A = 25^\circ\text{C}$  unless otherwise noted)

| PARAMETER  | CONDITIONS   | SYMBOL   | TYP | MAX   | UNIT          |
|--|--|----------|-----|-------|---------------|
| Forward voltage per diode <sup>(1)</sup>               | SFF2001G   | $V_F$    | -   | 0.975 | V             |
|  | SFF2002G   |          |     |       |               |
|  | SFF2003G   |          |     |       |               |
|  | SFF2004G   |          | -   | 1.300 | V             |
|  | SFF2005G   |          |     |       |               |
|  | SFF2006G   |          |     |       |               |
|  | SFF2007G   |          | -   | 1.700 | V             |
|  | SFF2008G   |          |     |       |               |
| Reverse current @ rated $V_R$ per diode <sup>(2)</sup> | $T_J = 25^\circ\text{C}$   | $I_R$    | -   | 10    | $\mu\text{A}$ |
|  | $T_J = 125^\circ\text{C}$  |          | -   | 400   | $\mu\text{A}$ |
| Junction capacitance per diode                         | 1MHz, $V_R = 4.0\text{V}$  | $C_J$    | 90  | -     | pF            |
| Reverse recovery time                                  | $I_F = 0.5\text{A}$ , $I_R = 1.0\text{A}$<br>$I_{rr} = 0.25\text{A}$ | $t_{rr}$ | -   | 35    | ns            |

**Notes:**

1. Pulse test with  $PW = 0.3\text{ms}$
2. Pulse test with  $PW = 30\text{ms}$

**ORDERING INFORMATION**

| ORDERING CODE <sup>(1)(2)</sup> | PACKAGE   | PACKING   |
|---------------------------------|-----------|-----------|
| SFF20xG                         | ITO-220AB | 50 / Tube |
| SFF20xGH                        | ITO-220AB | 50 / Tube |

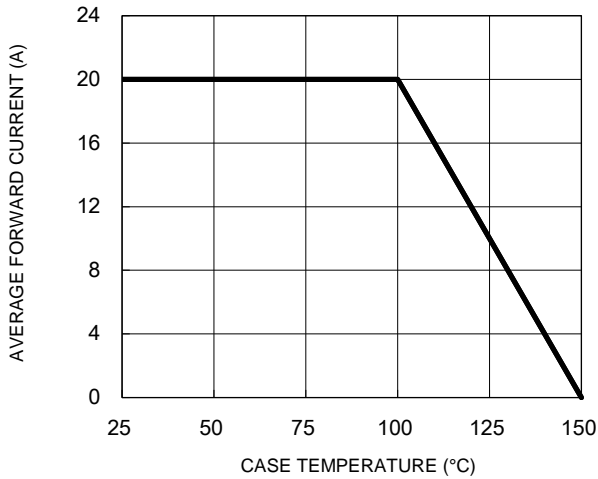
**Notes:**

1. "x" defines voltage from 50V(SFF2001G) to 600V(SFF2008G)
2. "H" means AEC-Q101 qualified

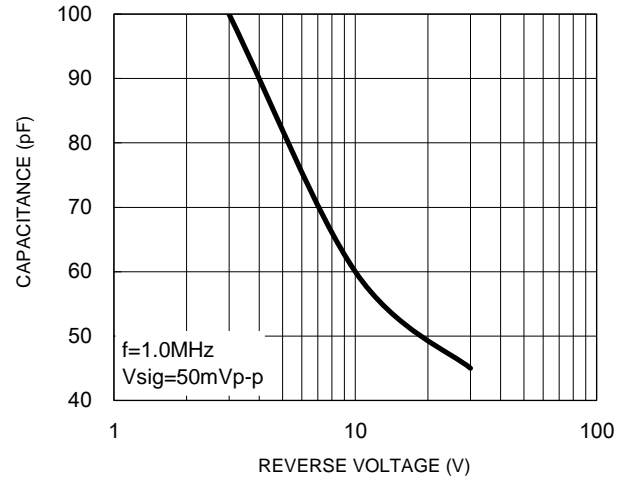
## CHARACTERISTICS CURVES

( $T_A = 25^\circ\text{C}$  unless otherwise noted)

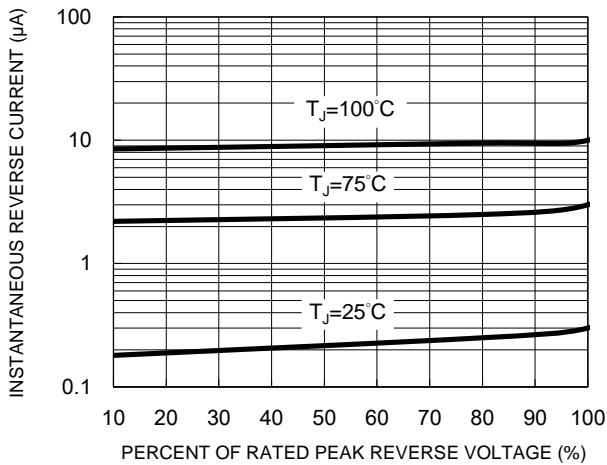
**Fig.1 Forward Current Derating Curve**



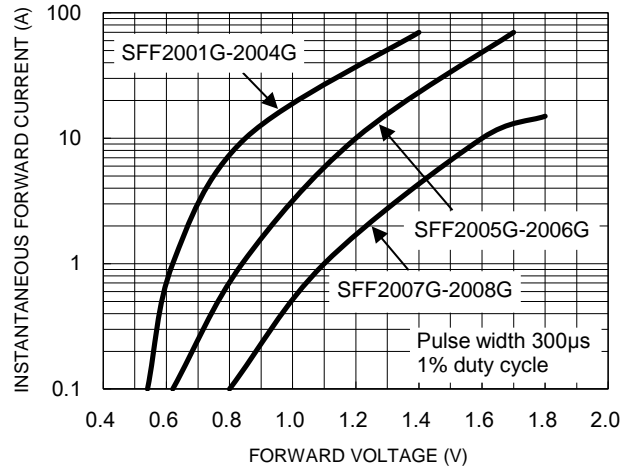
**Fig.2 Typical Junction Capacitance**



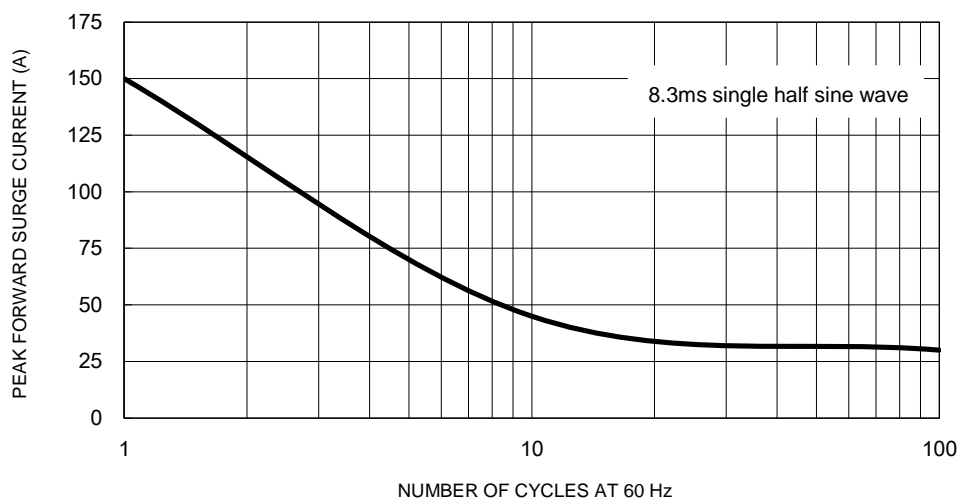
**Fig.3 Typical Reverse Characteristics**



**Fig.4 Typical Forward Characteristics**



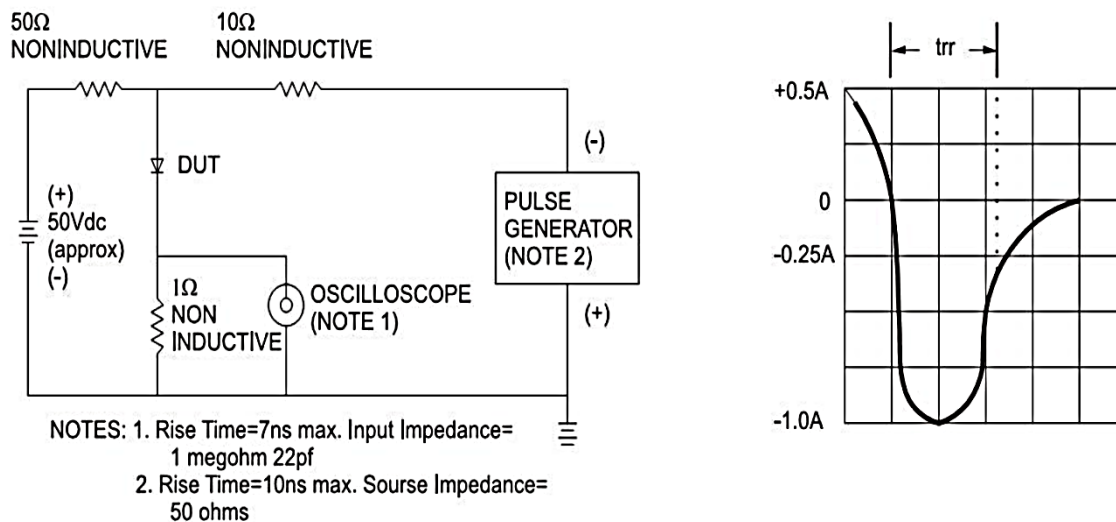
**Fig.5 Maximum Non-Repetitive Forward Surge Current**



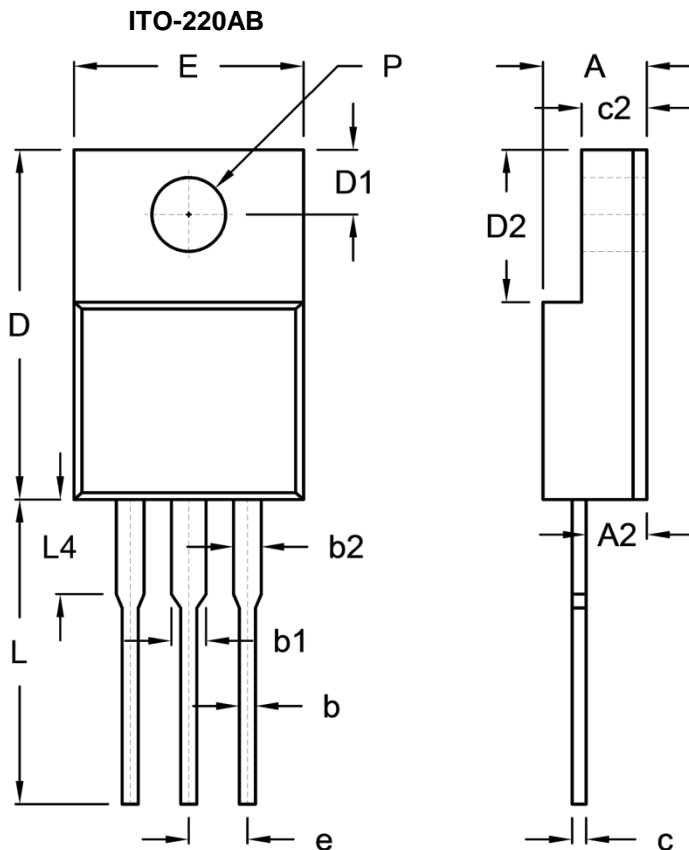
## CHARACTERISTICS CURVES

( $T_A = 25^\circ\text{C}$  unless otherwise noted)

**Fig.6 Reverse Recovery Time Characteristic and Test Circuit Diagram**



## PACKAGE OUTLINE DIMENSIONS



| DIM. | Unit (mm) |       | Unit (inch) |       |
|------|-----------|-------|-------------|-------|
|      | Min.      | Max.  | Min.        | Max.  |
| A    | 4.30      | 4.70  | 0.169       | 0.185 |
| A2   | 2.30      | 2.96  | 0.091       | 0.117 |
| b    | 0.50      | 0.90  | 0.020       | 0.035 |
| b1   | -         | 1.80  | -           | 0.071 |
| b2   | 0.95      | 1.45  | 0.037       | 0.057 |
| c    | 0.46      | 0.76  | 0.018       | 0.030 |
| c2   | 2.50      | 3.16  | 0.098       | 0.124 |
| D    | 14.80     | 15.50 | 0.583       | 0.610 |
| D1   | 2.40      | 3.20  | 0.094       | 0.126 |
| D2   | 6.30      | 6.90  | 0.248       | 0.272 |
| E    | 9.60      | 10.30 | 0.378       | 0.406 |
| e    | 2.41      | 2.67  | 0.095       | 0.105 |
| L    | 12.60     | 13.80 | 0.496       | 0.543 |
| L4   | -         | 4.10  | -           | 0.161 |
| P    | 3.00      | 3.40  | 0.118       | 0.134 |

## MARKING DIAGRAM



P/N = Marking Code  
 G = Green Compound  
 YWW = Date Code  
 F = Factory Code

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