# 10A, 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
- RoHS Compliant
- Halogen-free according to IEC 61249-2-21

## APPLICATIONS

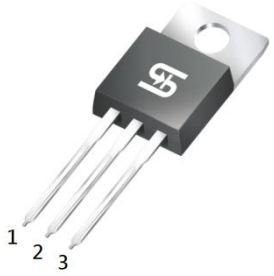
- DC to DC converters
- Switching mode converters and inverters
- Freewheeling application

## MECHANICAL DATA

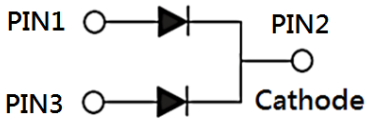
- Case: TO-220AB
- Molding compound meets UL 94V-0 flammability rating
- Terminal: Matte tin plated leads, solderable per J-STD-002
- Mounting torque: 0.56 N·m maximum
- Meet JESD 201 class 2 whisker test
- Polarity: As marked
- Weight: 1.82g (approximately)

| KEY PARAMETERS | | |
|---|---|---|
| **PARAMETER** | **VALUE** | **UNIT** |
| $I_F$ | 10 | A |
| $V_{RRM}$ | 50 - 600 | V |
| $I_{FSM}$ | 125 | A |
| $T_{J\ MAX}$ | 150 | °C |
| Package | TO-220AB | |
| Configuration | Dual dies | |

Pb-Free RoHS COMPLIANT HALOGEN FREE




**TO-220AB**




**ABSOLUTE MAXIMUM RATINGS** ($T_A$ = 25°C unless otherwise noted)

| PARAMETER | SYMBOL | SF 1001G | SF 1002G | SF 1003G | SF 1004G | SF 1005G | SF 1006G | SF 1007G | SF 1008G | UNIT |
|---|---|---|---|---|---|---|---|---|---|---|
| Marking code on the device | | SF 1001G | SF 1002G | SF 1003G | SF 1004G | SF 1005G | SF 1006G | SF 1007G | SF 1008G | |
| 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 | $I_F$ | 10 | | | | | | | | A |
| Surge peak forward current, 8.3ms single half sine wave superimposed on rated load | $I_{FSM}$ | 125 | | | | | | | | 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 | $R_{\Theta JC}$ | 3.5 | °C/W |

## ELECTRICAL SPECIFICATIONS ($T_A$ = 25°C unless otherwise noted)

| PARAMETER | | CONDITIONS | SYMBOL | TYP | MAX | UNIT |
|---|---|---|---|---|---|---|
| Forward voltage per diode[1] | SF1001G<br>SF1002G<br>SF1003G<br>SF1004G | $I_F$ = 5A, $T_J$ = 25°C | $V_F$ | - | 0.975 | V |
| | SF1005G<br>SF1006G | | | - | 1.300 | V |
| | SF1007G<br>SF1008G | | | - | 1.700 | V |
| Reverse current @ rated $V_R$ per diode[2] | | $T_J$ = 25°C | $I_R$ | - | 10 | μA |
| | | $T_J$ = 100°C | | - | 400 | μA |
| Junction capacitance per diode | SF1001G<br>SF1002G<br>SF1003G<br>SF1004G | 1MHz, $V_R$ = 4.0V | $C_J$ | 70 | - | pF |
| | SF1005G<br>SF1006G<br>SF1007G<br>SF1008G | | | 50 | - | pF |
| Reverse recovery time | | $I_F$ = 0.5A, $I_R$ = 1.0A, $I_{rr}$ = 0.25A | $t_{rr}$ | - | 35 | ns |

**Notes:**

1. Pulse test with PW = 0.3ms
2. Pulse test with PW = 30ms

## ORDERING INFORMATION

| ORDERING CODE[1][2] | PACKAGE | PACKING |
|---|---|---|
| SF10xG | TO-220AB | 50 / Tube |
| SF10xGH | TO-220AB | 50 / Tube |

**Notes:**

1. "x" defines voltage from 50V(SF1001G) to 600V(SF1008G)
2. "H" means AEC-Q101 qualified

## CHARACTERISTICS CURVES

($T_A$ = 25°C unless otherwise noted)

**Fig.1 Forward Current Derating Curve**

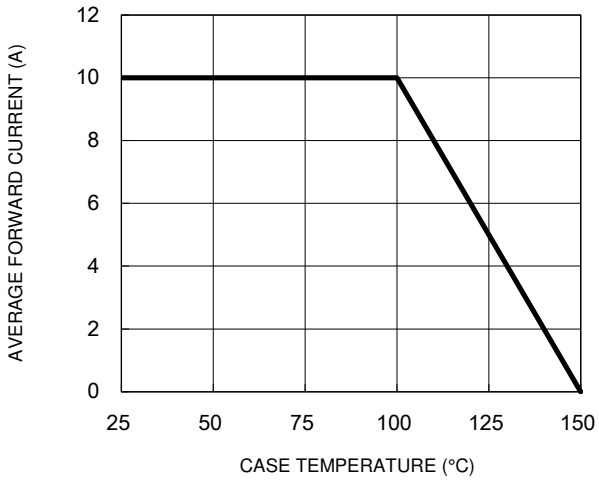



**Fig.2 Typical Junction Capacitance**

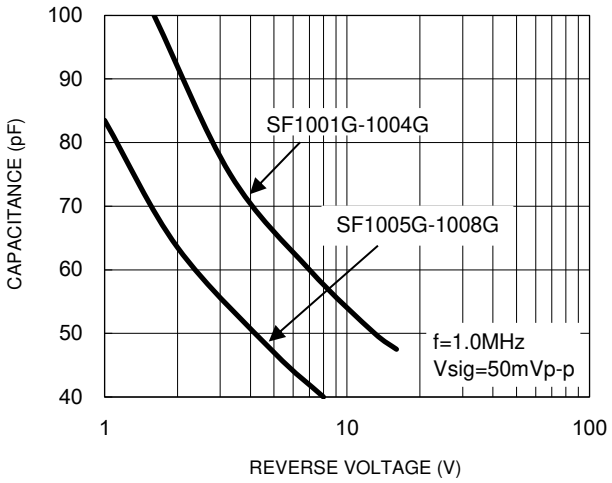



**Fig.3 Typical Reverse Characteristics**

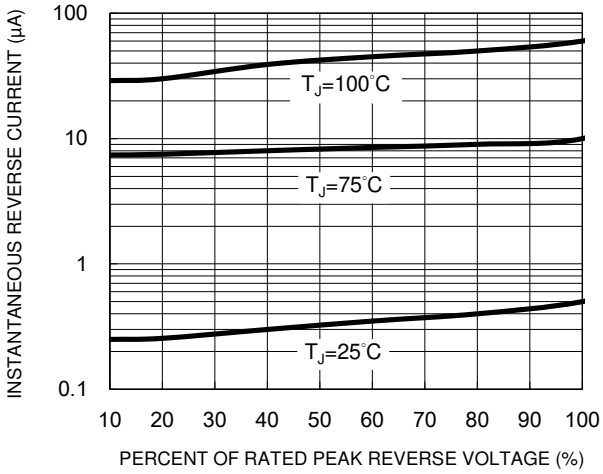



**Fig.4 Typical Forward Characteristics**

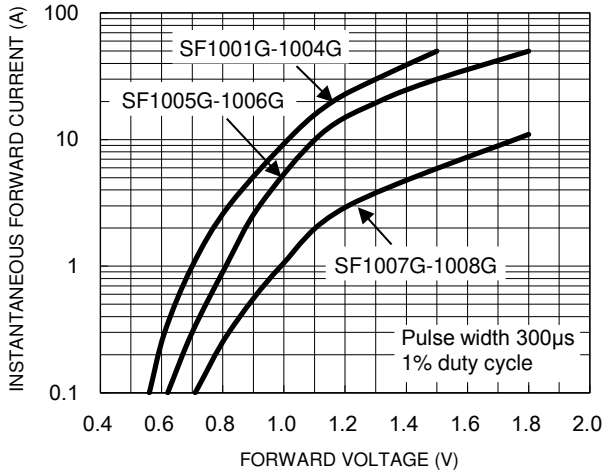
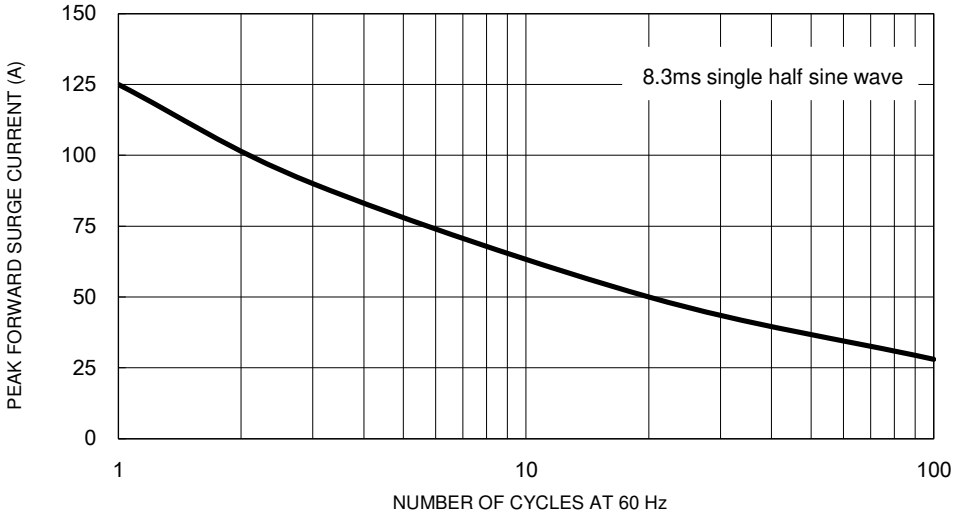


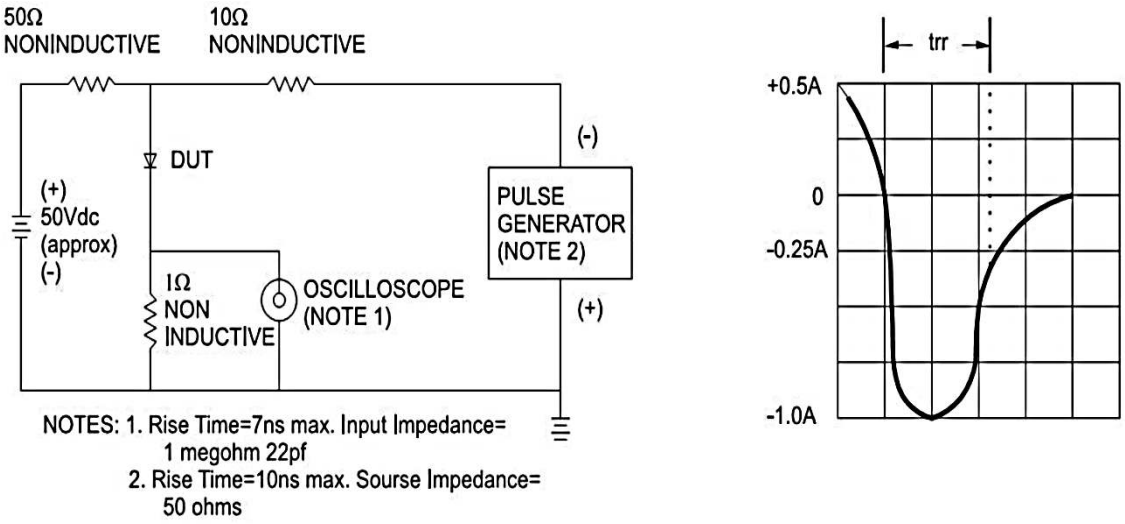

**Fig.5 Maximum Non-Repetitive Forward Surge Current**



## CHARACTERISTICS CURVES

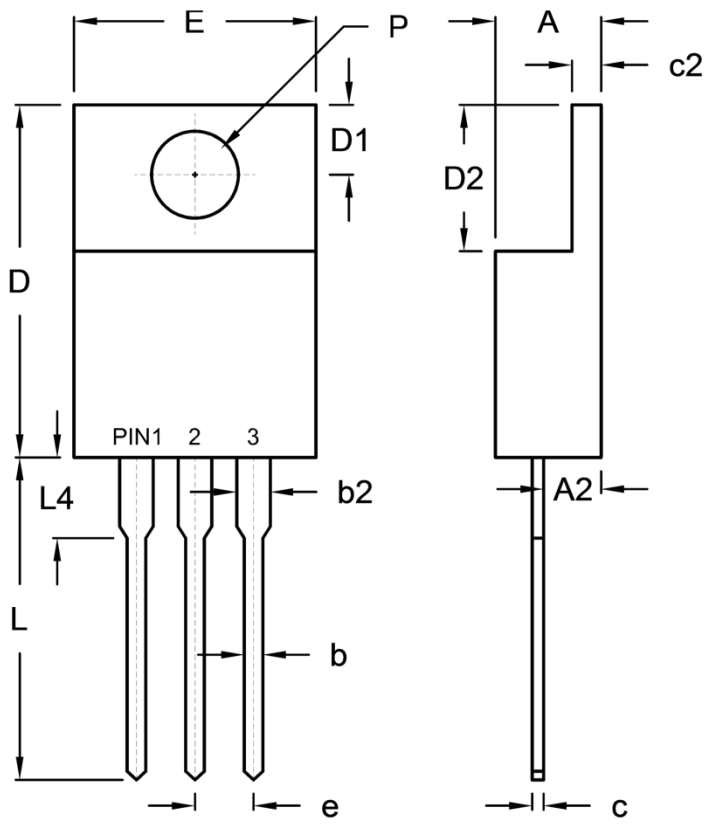
($T_A$ = 25°C unless otherwise noted)

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



## PACKAGE OUTLINE DIMENSIONS

TO-220AB




| DIM. | Unit (mm) | | Unit (inch) | |
|---|---|---|---|---|
| | Min. | Max. | Min. | Max. |
| A | 4.42 | 4.76 | 0.174 | 0.187 |
| A2 | 2.20 | 2.80 | 0.087 | 0.110 |
| b | 0.68 | 0.94 | 0.027 | 0.037 |
| b2 | 1.14 | 1.77 | 0.045 | 0.070 |
| c | 0.35 | 0.64 | 0.014 | 0.025 |
| c2 | 1.14 | 1.40 | 0.045 | 0.055 |
| D | 14.60 | 16.00 | 0.575 | 0.630 |
| D1 | 2.62 | 3.44 | 0.103 | 0.135 |
| D2 | 5.84 | 6.86 | 0.230 | 0.270 |
| E | - | 10.50 | - | 0.413 |
| e | 2.41 | 2.67 | 0.095 | 0.105 |
| L | 13.19 | 14.79 | 0.519 | 0.582 |
| L4 | 2.80 | 4.20 | 0.110 | 0.165 |
| P | 3.54 | 4.00 | 0.139 | 0.157 |

## MARKING DIAGRAM


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

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