

# SF10A05FW1 THRU SF10A60FW1

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# SF10A05FW1 THRU SF10A60FW1

## 10A Power Super Fast Recovery Rectifiers 50V-600V

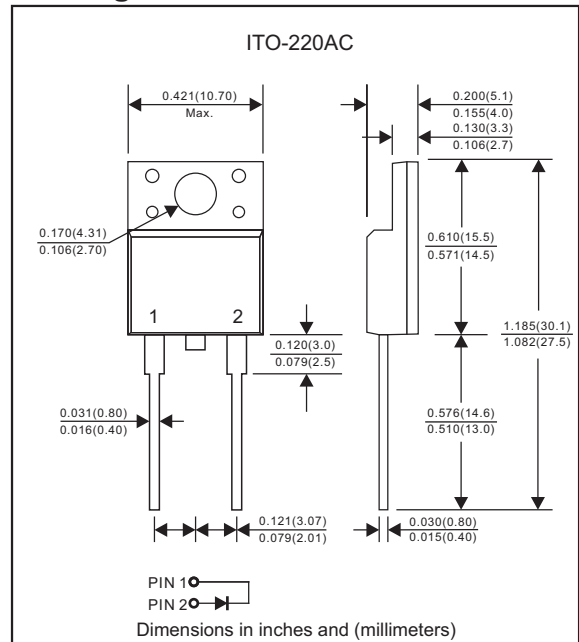
### Features

- Dual rectifier construction, positive centetap, offer 5.0A half wave and 10.0A full wave rectification
- High surge current capability.
- Super fast recovery time for switching mode application.
- Low power loss.
- Glass passivated chip junctions.
- Lead-free parts meet environmental standards of MIL-STD-19500/228
- Suffix "-H" indicates Halogen-free parts, ex. SF10A05FW1-H.

### Mechanical data

- Epoxy : UL94-V0 rated flame retardant
- Case : JEDEC ITO-220AC molded plastic body over passivated chip
- Lead : Axial leads, solderable per MIL-STD-202, Method 208 guaranteed
- Polarity: As marked
- Mounting Position : Any
- Weight : Approximated 1.70 gram

### Package outline



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

| PARAMETER                                                             | SYMBOLS   | SF10A05FW1  | SF10A10FW1 | SF10A20FW1 | SF10A40FW1 | SF10A60FW1 | UNIT               |
|-----------------------------------------------------------------------|-----------|-------------|------------|------------|------------|------------|--------------------|
| Maximum repetitive peak reverse voltage                               | $V_{RRM}$ | 50          | 100        | 200        | 400        | 600        | V                  |
| Maximum RMS voltage                                                   | $V_{RMS}$ | 35          | 70         | 140        | 280        | 420        | V                  |
| Maximum DC blocking voltage                                           | $V_{DC}$  | 50          | 100        | 200        | 400        | 600        | V                  |
| Maximum average forward rectified current                             | $I_o$     | 10          |            |            |            |            | A                  |
| Peak forward surge current 8.3ms single half sine-wave (JEDEC method) | $I_{FSM}$ | 125         |            |            |            |            | A                  |
| Operating junction temperature range                                  | $T_J$     | -55 to +150 |            |            |            |            | $^{\circ}\text{C}$ |
| Storage temperature range                                             | $T_{STG}$ | -55 to +150 |            |            |            |            | $^{\circ}\text{C}$ |

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

| PARAMETER                                                                                                                | SYMBOLS  | SF10A05FW1 | SF10A10FW1 | SF10A20FW1 | SF10A40FW1 | SF10A60FW1 | UNIT          |
|--------------------------------------------------------------------------------------------------------------------------|----------|------------|------------|------------|------------|------------|---------------|
| Maximum forward voltage per leg at $I_F=10\text{A}$                                                                      | $V_F$    | 1.0        |            |            | 1.3        | 1.7        | V             |
| Maximum DC reverse current at $T_A=25^{\circ}\text{C}$ at rated DC blocking voltage per leg at $T_A=125^{\circ}\text{C}$ | $I_R$    | 10<br>500  |            |            |            |            | $\mu\text{A}$ |
| Maximum reverse recovery time per leg (Note 1)                                                                           | $t_{rr}$ | 35         |            |            |            |            | ns            |

### Thermal Characteristics

| PARAMETER                                           | SYMBOLS         | SF10A05FW1 | SF10A10FW1 | SF10A20FW1 | SF10A40FW1 | SF10A60FW1 | UNIT                 |
|-----------------------------------------------------|-----------------|------------|------------|------------|------------|------------|----------------------|
| Typical thermal resistance junction to case per leg | $R_{\theta JC}$ | 3.5        |            |            |            |            | $^{\circ}\text{C/W}$ |

Note 1: Reverse recovery time test condition,  $I_F=0.5\text{A}$ ,  $I_R=1.0\text{A}$ ,  $I_{RR}=0.25\text{A}$

## Rating and characteristic curves (SF10A05FW1 THRU SF10A60FW1)

FIG.1-DERATING CURVE OUTPUT RECTIFIED CURRENT

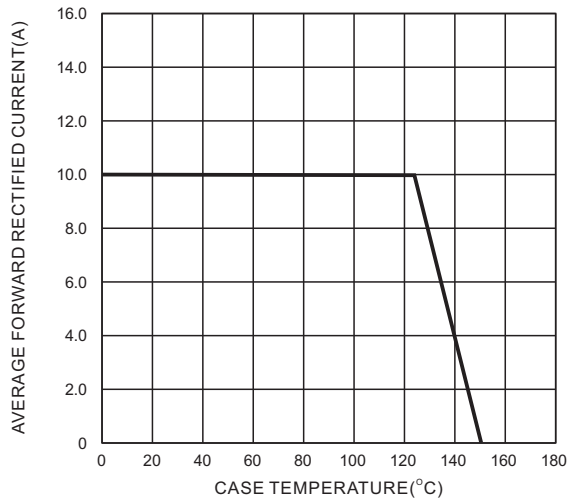


FIG.2-MAXIMUM NON-REPETITIVE PEAK FORWARD SURGE CURRENT

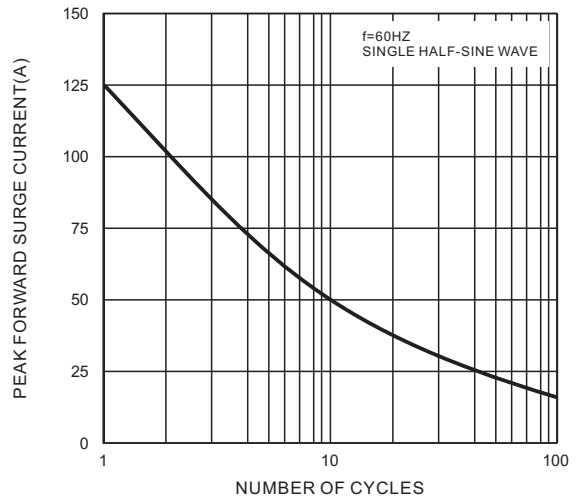


FIG.3-TYPICAL REVERSE LEAKAGE CHARACTERISTICS

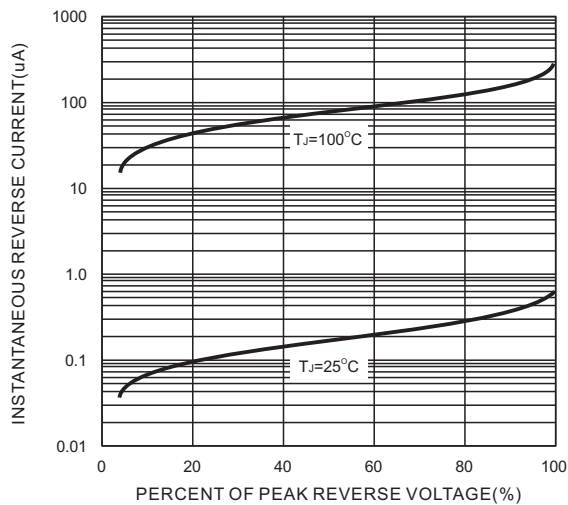


FIG.4-TYPICAL FORWARD VOLTAGE CHARACTERISTICS

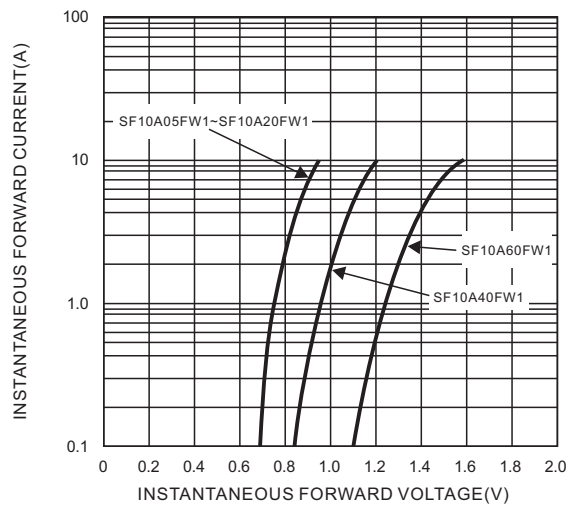
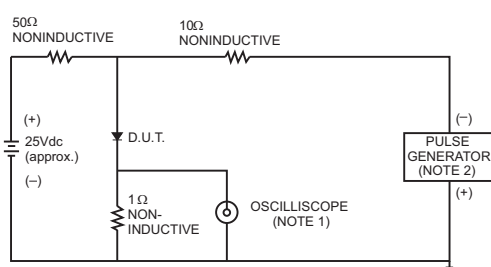
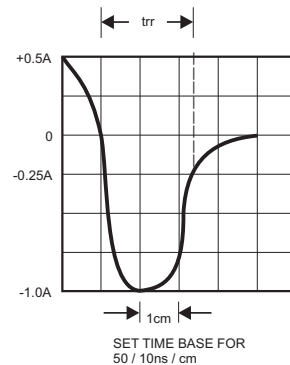


FIG.5- TEST CIRCUIT DIAGRAM AND REVERSE RECOVERY TIME CHARACTERISTICS



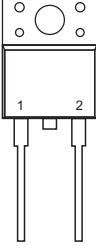
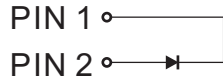
NOTES:

1. Rise Time = 7ns max., Input Impedance = 1 megohm, 22pF.
2. Rise Time = 10ns max., Source Impedance = 50 ohms.



## SF10A05FW1 THRU SF10A60FW1

## Pinning information

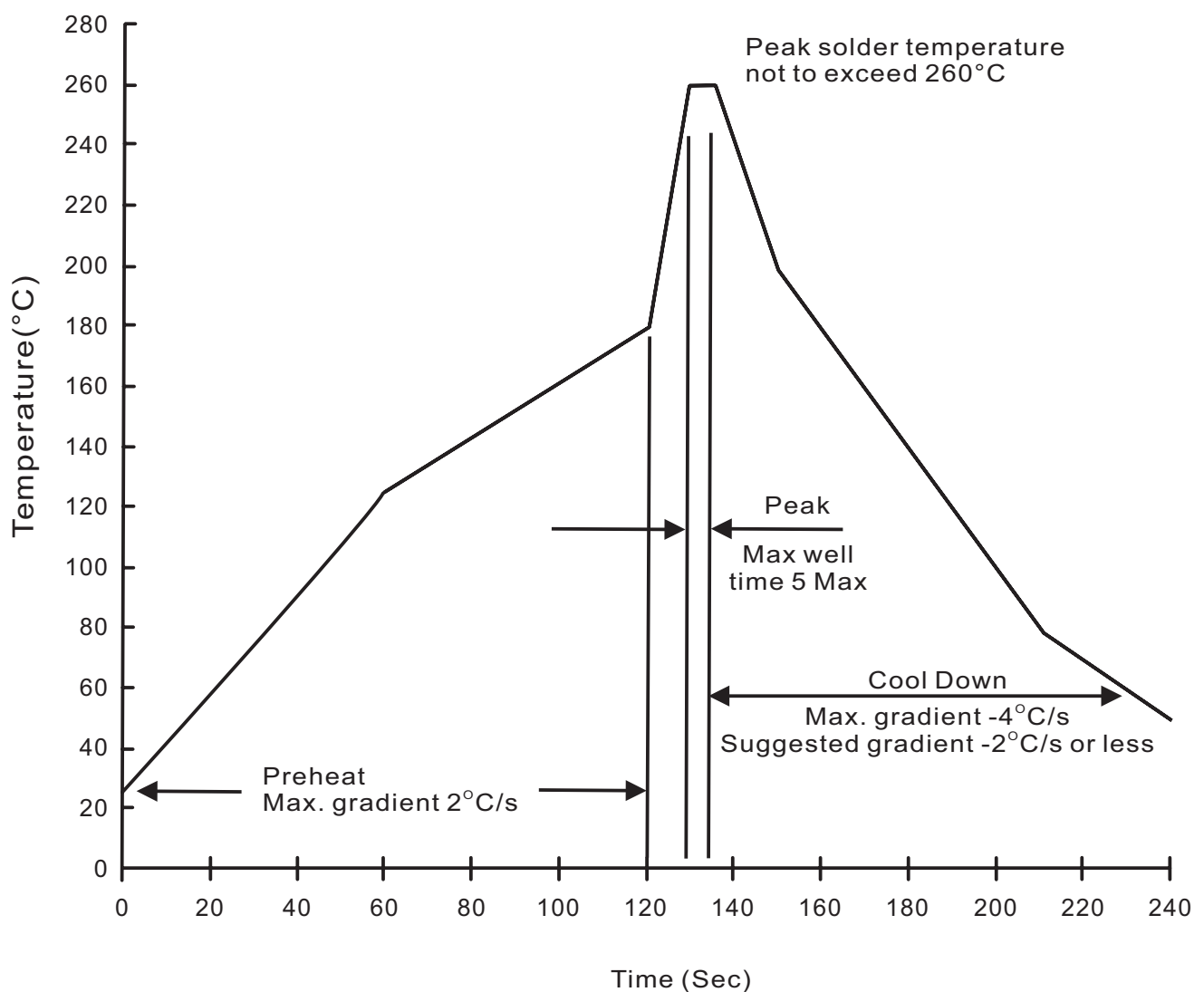
| Pin                        | Simplified outline                                                                | Symbol                                                                              |
|----------------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Pin1 Cathode<br>Pin2 Anode |  |  |

## Marking

| Type number | Marking code       |
|-------------|--------------------|
| SF10A05FW1  | SF10A05FW, SF1005F |
| SF10A10FW1  | SF10A10FW, SF1010F |
| SF10A20FW1  | SF10A20FW, SF1020F |
| SF10A40FW1  | SF10A40FW, SF1040F |
| SF10A60FW1  | SF10A60FW, SF1060F |

## Tube packing

| PACKAGE   | TUBE (pcs) | TUBE SIZE (m/m) | BOX (pcs) | INNER BOX (m/m) | CARTON SIZE (m/m) | CARTON (pcs) | APPROX. GROSS WEIGHT (kg) |
|-----------|------------|-----------------|-----------|-----------------|-------------------|--------------|---------------------------|
| ITO-220AC | 50         | 525*319*6.4     | 1000      | 545*150*45      | 575*245*170       | 5,000        | 15.0                      |

**SF10A05FW1 THRU SF10A60FW1****Suggested thermal profiles for soldering processes****1. Lead free temperature profile wave-soldering**

# SF10A05FW1 THRU SF10A60FW1

## High reliability test capabilities

| Item Test                         | Conditions                                                                                                                               | Reference                     |
|-----------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|
| 1. Solder Resistance              | at $260 \pm 5^\circ\text{C}$ for $10 \pm 2\text{sec.}$<br>immerse body into solder $1/16" \pm 1/32"$                                     | MIL-STD-750D<br>METHOD-2031   |
| 2. Solderability                  | at $245 \pm 5^\circ\text{C}$ for 5 sec.                                                                                                  | MIL-STD-202F<br>METHOD-208    |
| 3. High Temperature Reverse Bias  | $V_R = 80\%$ rate at $T_J = 150^\circ\text{C}$ for 168 hrs.                                                                              | MIL-STD-750D<br>METHOD-1038   |
| 4. Forward Operation Life         | Rated average rectifier current at $T_A = 25^\circ\text{C}$ for 500hrs.                                                                  | MIL-STD-750D<br>METHOD-1027   |
| 5. Intermittent Operation Life    | $T_A = 25^\circ\text{C}$ , $I_F = I_O$<br>On state: power on for 5 min.<br>off state: power off for 5 min.<br>on and off for 500 cycles. | MIL-STD-750D<br>METHOD-1036   |
| 6. Pressure Cooker                | $15P_{SIG}$ at $T_A = 121^\circ\text{C}$ for 4 hrs.                                                                                      | JESD22-A102                   |
| 7. Temperature Cycling            | $-55^\circ\text{C}$ to $+125^\circ\text{C}$ dwelled for 30 min.<br>and transferred for 5min. total 10 cycles.                            | MIL-STD-750D<br>METHOD-1051   |
| 8. Forward Surge                  | 8.3ms single half sine-wave , one surge.                                                                                                 | MIL-STD-750D<br>METHOD-4066-2 |
| 9. Humidity                       | at $T_A = 85^\circ\text{C}$ , RH=85% for 1000hrs.                                                                                        | MIL-STD-750D<br>METHOD-1021   |
| 10. High Temperature Storage Life | at $175^\circ\text{C}$ for 1000 hrs.                                                                                                     | MIL-STD-750D<br>METHOD-1031   |