

# SF31G THRU SF38G

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# SF31G THRU SF38G

## 3.0A Axial Leaded Super Fast Rectifiers-50-600V

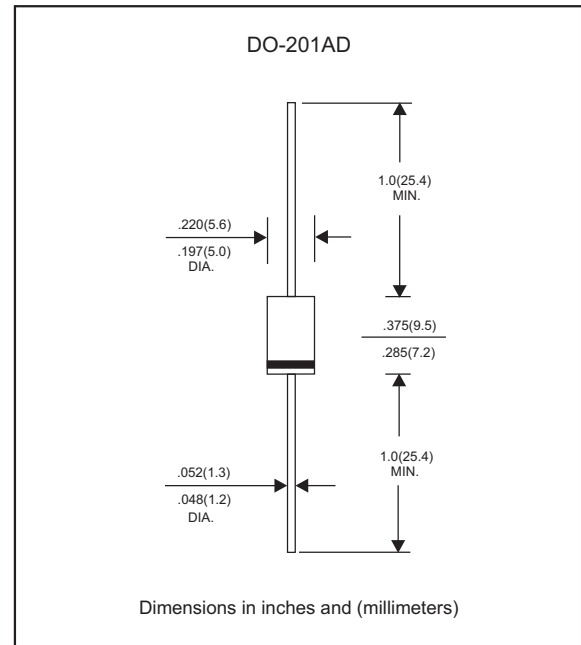
### Features

- Axial lead type devices for through hole design
- High current capability.
- Superfast recovery time for switching mode application,
- High surge capability.
- Glass passivated chip junction structure.
- Lead-free parts meet RoHS requirements.
- Suffix "-H" indicates Halogen free parts, ex. SF31G-H.

### Mechanical data

- Epoxy : UL94-V0 rated flame retardant
- Case : Molded plastic, DO-201AD
- Lead : Axial leads, solderable per MIL-STD-202, Method 208 guaranteed
- Polarity: Color band denotes cathode end
- Mounting Position : Any
- Weight : Approximated 1.10 gram

### Package outline



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

| PARAMETER                  | CONDITIONS                                  | Symbol          | MIN. | TYP. | MAX. | UNIT               |
|----------------------------|---|-----------------|------|------|------|--------------------|
| Forward rectified current  | Ambient temperature = $55^\circ\text{C}$    | $I_o$           |      |      | 3.0  | A                  |
| Forward surge current      | 8.3ms single half sine-wave (JEDEC methode) | $I_{FSM}$       |      |      | 125  | A                  |
| Reverse current            | $V_R = V_{RRM}$ $T_J = 25^\circ\text{C}$    | $I_R$           |      |      | 5.0  | $\mu\text{A}$      |
|                            | $V_R = V_{RRM}$ $T_J = 125^\circ\text{C}$   |                 |      |      | 100  |                    |
| Thermal resistance         | Junction to ambient                         | $R_{\theta JA}$ |      | 20   |      | $^\circ\text{C/W}$ |
|                            | Junction to case                            | $R_{\theta JC}$ |      | 12   |      | $^\circ\text{C/W}$ |
|                            | Junction to lead                            | $R_{\theta JL}$ |      | 8    |      | $^\circ\text{C/W}$ |
| Diode junction capacitance | f=1MHz and applied 4V DC reverse voltage    | $C_J$           |      | 50   |      | pF                 |
| Storage temperature        |   | $T_{STG}$       | -65  |      | +175 | $^\circ\text{C}$   |

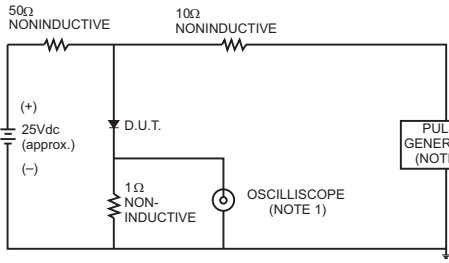
| SYMBOLS | $V_{RRM}^{*1}$<br>(V) | $V_{RMS}^{*2}$<br>(V) | $V_R^{*3}$<br>(V) | $V_F^{*4}$<br>(V) | $t_{rr}^{*5}$<br>(ns) | Operating temperature<br>$T_J, (^\circ\text{C})$ |
|---------|-----------------------|-----------------------|-------------------|-------------------|-----------------------|--|
| SF31G   | 50                    | 35                    | 50                | 0.95              | 35                    | -55 to +150                                      |
| SF32G   | 100                   | 70                    | 100               |                   |                       |  |
| SF33G   | 150                   | 105                   | 150               |                   |                       |  |
| SF34G   | 200                   | 140                   | 200               |                   |                       |  |
| SF35G   | 300                   | 210                   | 300               | 1.25              | 35                    | -55 to +150                                      |
| SF36G   | 400                   | 280                   | 400               |                   |                       |  |
| SF37G   | 500                   | 350                   | 500               |                   |                       |  |
| SF38G   | 600                   | 420                   | 600               | 1.70              | 35                    | -55 to +150                                      |

- \*1 Repetitive peak reverse voltage
- \*2 RMS voltage
- \*3 Continuous reverse voltage
- \*4 Maximum forward voltage@ $I_F=3.0\text{A}$
- \*5 Maximum Reverse recovery time, note 1

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 (SF31G THRU SF38G)

FIG.1- TEST CIRCUIT DIAGRAM AND REVERSE RECOVERY TIME CHARACTERISTIC



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

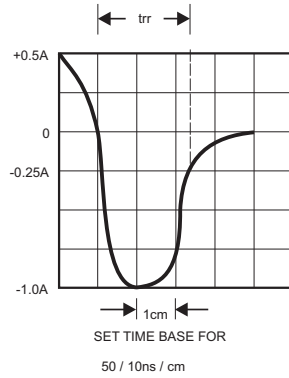


FIG.2-TYPICAL FORWARD CURRENT DERATING CURVE

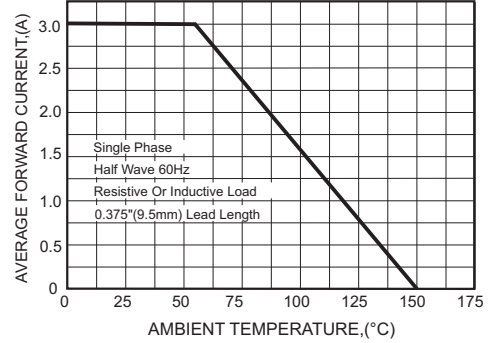


FIG.3-TYPICAL FORWARD CHARACTERISTICS

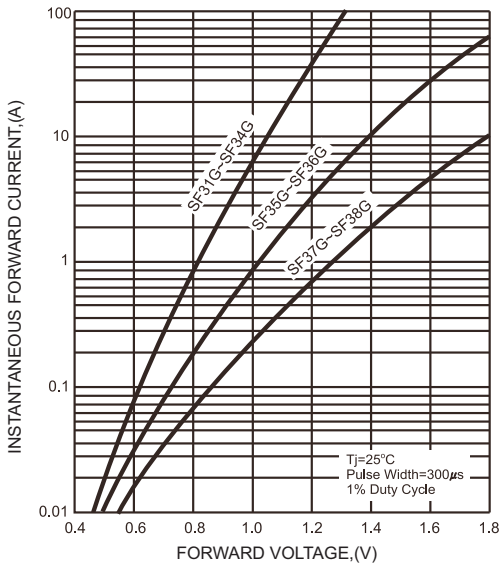


FIG.4-TYPICAL REVERSE CHARACTERISTICS

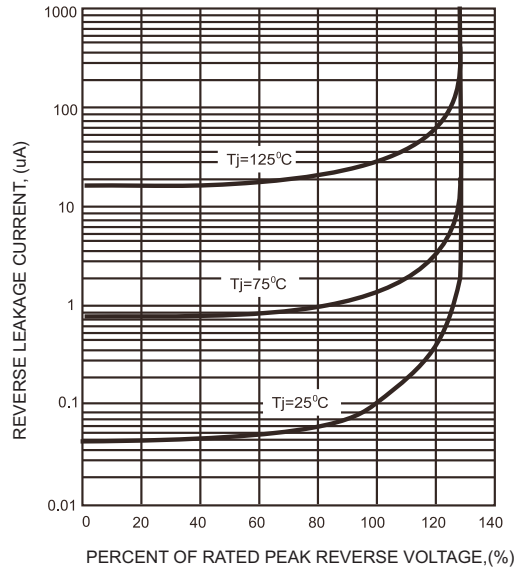


FIG.5-MAXIMUM NON-REPETITIVE FORWARD SURGE CURRENT

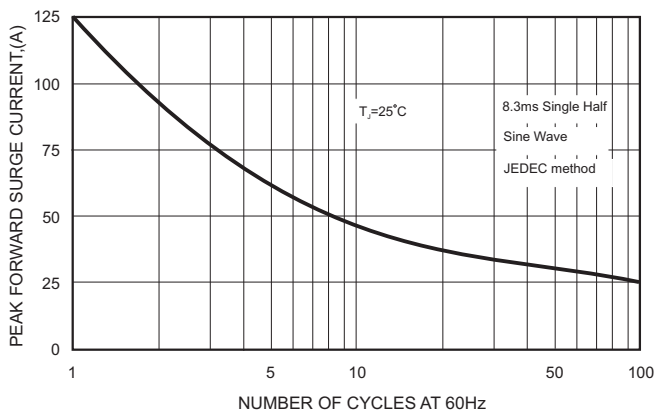
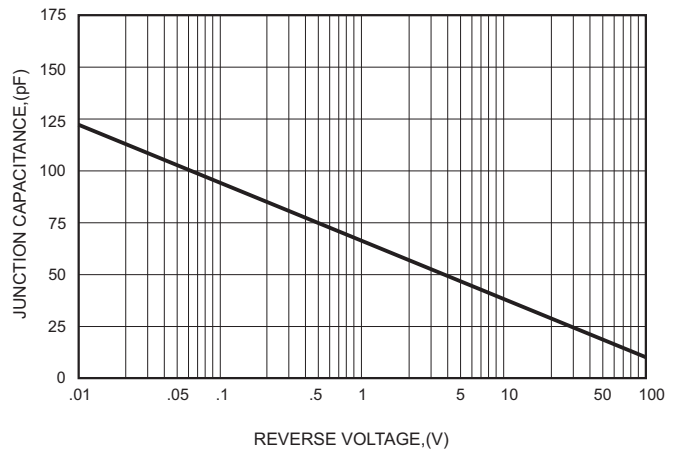




FIG.6-TYPICAL JUNCTION CAPACITANCE



# SF31G THRU SF38G

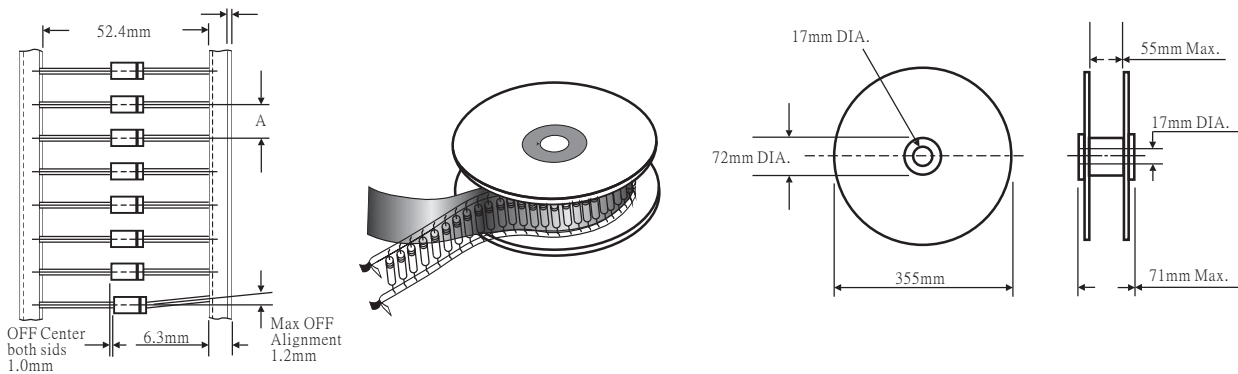
## Pinning information

| Pin                        | Simplified outline   | Symbol  |
|----------------------------|--|---|
| Pin1 cathode<br>Pin2 anode |  |  |

## Marking

| Type number | Marking code |
|-------------|--------------|
| SF31G       | SF31G        |
| SF32G       | SF32G        |
| SF33G       | SF33G        |
| SF34G       | SF34G        |
| SF35G       | SF35G        |
| SF36G       | SF36G        |
| SF37G       | SF37G        |
| SF38G       | SF38G        |

## Taping & bulk specifications for AXIAL devices



### REEL PACKING

| DEVICE CASE TYPE | Q'TY 1 (PCS / REEL) | COMPONENT SPACING "A" in FIG. A | CARTON SIZE (m/m) | Q'TY 2 (PCS / CARTON) | APPROX. CROSS WEIGHT(kg) |
|------------------|---------------------|---------------------------------|-------------------|-----------------------|--------------------------|
| DO-201AD         | 1,200               | 10 mm                           | 380 * 340 * 370   | 4,800                 | 9.1                      |

### AMMO PACKING

| DEVICE CASE TYPE | Q'TY 1 (PCS / BOX) | INNER BOX SIZE (m/m) | CARTON SIZE (m/m) | Q'TY 2 (PCS / CARTON) | APPROX. CROSS WEIGHT(kg) |
|------------------|--------------------|----------------------|-------------------|-----------------------|--------------------------|
| DO-201AD         | 1,200              | 260 * 83 * 160       | 440 * 270 * 340   | 12,000                | 17.0                     |

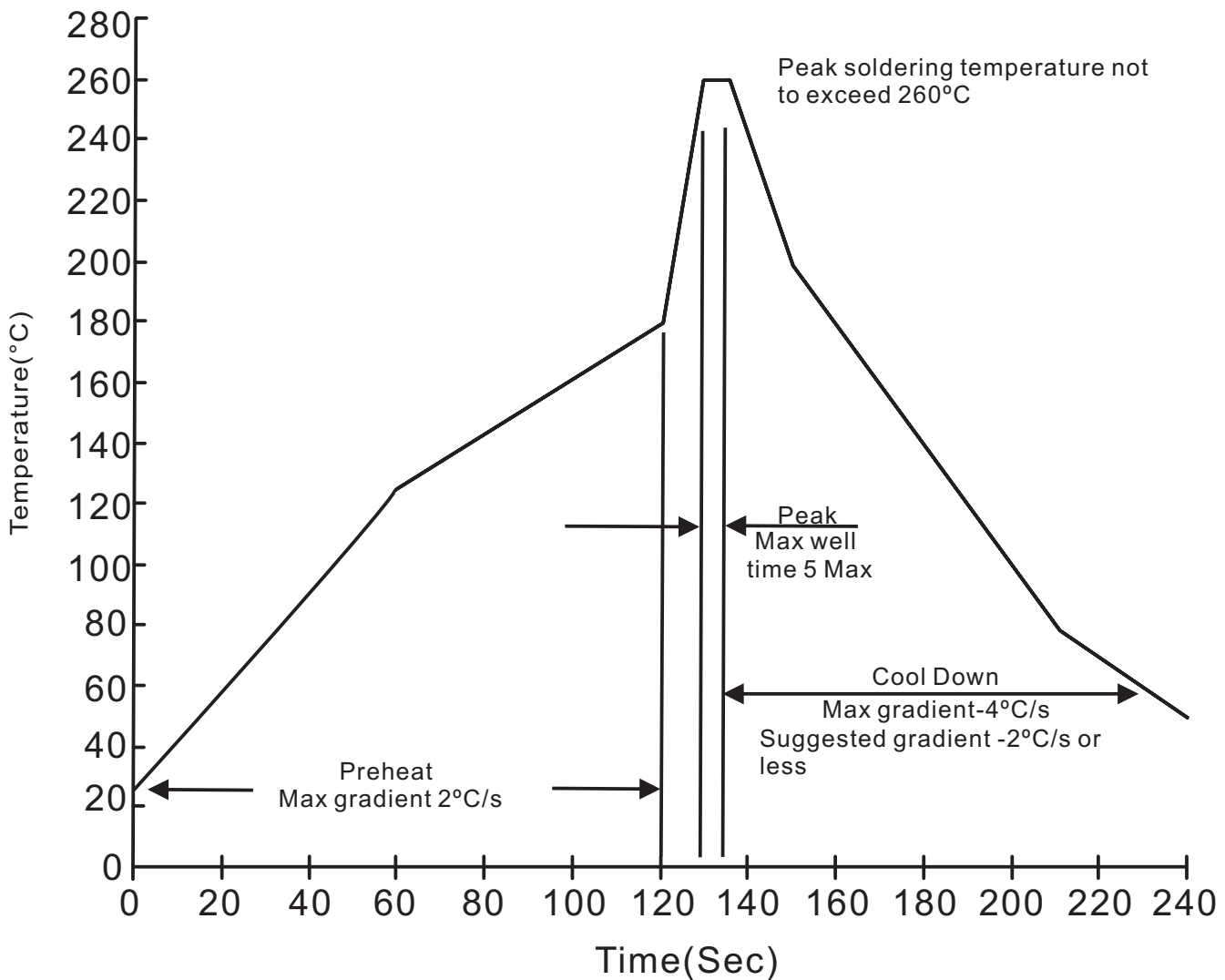
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BULK PACKING

| DEVICE CASE TYPE | Q'TY 1 (PCS / BOX) | INNER BOX SIZE (m/m) | CARTON SIZE (m/m) | Q'TY 2 (PCS / CARTON) | APPROX. CROSS WEIGHT(kg) |
|------------------|--------------------|----------------------|-------------------|-----------------------|--------------------------|
| DO-201AD         | 500                | 305 * 73 * 40        | 347 * 320 * 271   | 12,000                | 16.4                     |

**Suggested thermal profiles for soldering processes**

1. Lead free temperature profile wave-soldering



**SF31G THRU SF38G****High reliability test capabilities**

| Item Test                         | Conditions  | Reference                     |
|-----------------------------------|---|-------------------------------|
| 1. Solder Resistance              | at 260±5°C for 10±2sec.<br>immerse body into solder 1/16"±1/32"   | MIL-STD-750D<br>METHOD-2031   |
| 2. Solderability                  | at 245±5°C for 5 sec.   | MIL-STD-202F<br>METHOD-208    |
| 3. Pull Test                      | 2.0kg in axial lead direction for 10 sec.<br>$I_F = I_O$  | MIL-STD-202F<br>METHOD-211A   |
| 4. Bend Lead                      | 2.0kg weight applied to each lead bending<br>arc 90°±5° for 3 times   | MIL-STD-202F<br>METHOD-211A   |
| 5. High Temperature Reverse Bias  | $V_R = 80\%$ rate at $T_J = 150^\circ\text{C}$ for 168 hrs.   | MIL-STD-750D<br>METHOD-1038   |
| 6. Forward Operation Life         | Rated average rectifier current at $T_A = 25^\circ\text{C}$ for 500hrs.<br>$T_A = 25^\circ\text{C}$ , $I_F = I_O$ | MIL-STD-750D<br>METHOD-1027   |
| 7. Intermittent Operation Life    | 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   |
| 8. Pressure Cooker                | 15P <sub>sig</sub> at $T_A = 121^\circ\text{C}$ for 4 hrs.  | JESD22-A102                   |
| 9. Temperature Cycling            | -55°C to +125°C dwelled for 30 min.<br>and transferred for 5min. total 10 cycles.                                 | MIL-STD-750D<br>METHOD-1051   |
| 10. Forward Surge                 | 8.3ms single half sine-wave one surge.  | MIL-STD-750D<br>METHOD-4066-2 |
| 11. Humidity                      | at $T_A = 85^\circ\text{C}$ , RH=85% for 1000hrs.   | MIL-STD-750D<br>METHOD-1021   |
| 12. High Temperature Storage Life | at 175°C for 1000 hrs.  | MIL-STD-750D<br>METHOD-1031   |