

**SF802F THRU SF806F**

**Super Fast Recovery Rectifiers**



**Voltage:** 200~600 Volts

**Current:** 8 Amperes

**Package:** ITO-220AC

**Features**

- NH'S Super Fast Recovery Rectifiers Chip Technology
- Low Switching Loss For High Efficiency
- Low Leakage Current For High Reliability
- Super Fast Switching Speed

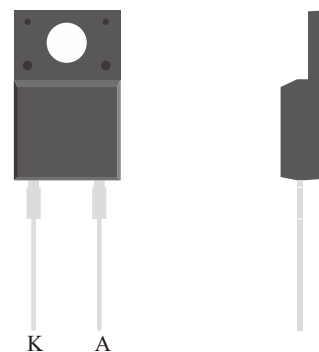
**Mechanical Data**

- **Case:** Molded With UL-94 ClassV-0 Recognized, RoHS-Compliant
- **Polarity:** Look At The Diagram And Polarity On The Right
- **Terminals:** Tin Plated Leads,Solderable Per J-STD-002 And JESD22-B102

**Typical Applications**

- Switch Mode Power Supplies (SMPS)
- Fast Chargers
- LED Driver And Monitor Lighting
- Automotive Electronics And Charging Posts

**Diagram:**



**Polarity:**



Single Phase,Half Wave,60Hz,Resistive Or Inductive Load.For Capacitive Load,Derate Current By 20%

**Maximum Ratings (Ta=25°C Unless Otherwise Specified)**

| Parameter                                 | Test Conditions                                       | Symbol      | SF 802F | SF 804F | SF 806F | Unit               |
|-------------------------------------------|-------------------------------------------------------|-------------|---------|---------|---------|--------------------|
| Maximum Repetitive Peak Reverse Voltage   |                                                       | $V_{RRM}$   | 200     | 400     | 600     | V                  |
| Maximum RMS Voltag                        |                                                       | $V_{RMS}$   | 140     | 280     | 420     | V                  |
| Maximum DC Blocking Voltage               |                                                       | $V_{DC}$    | 200     | 400     | 600     | V                  |
| Maximum Average Forward Rectified Current |                                                       | $I_{F(AV)}$ | 8       |         |         | A                  |
| Peak Forward Surge Current                | 8.3ms Single Half Sine-wave Superimposed On Rate Load | $I_{FSM}$   | 130     |         |         | A                  |
| Current Squared Time                      | $t < 8.3ms$                                           | $I^2t$      | 70.1    |         |         | A <sup>2</sup> sec |
| Maximum Mounting Torque                   | M3 screw                                              | $T_{MM}$    | 1.1     |         |         | N.m                |

**Electrical Characteristics (Ta=25°C Unless Otherwise Specified )**

| Parameter                                               | Test Conditions                                                | Symbol    | SF 802F  | SF 804F | SF 806F | Unit     |
|---------------------------------------------------------|----------------------------------------------------------------|-----------|----------|---------|---------|----------|
| Maximum Instantaneous Forward Voltage                   | $I_F = 8.0 A$                                                  | $V_F$     | 0.95     | 1.30    | 1.70    | V        |
| Maximum DC Reverse Current at Rated DC Blocking Voltage | Ta=25°C , $V_R = V_{RRM}$<br>Ta=125°C , $V_R = V_{RRM} * 80\%$ | $I_{RRM}$ | 5<br>200 |         |         | uA<br>uA |
| Typical Junction Capacitance                            | 4 V,1MHz                                                       | $C_J$     | 70       | 40      | 30      | pF       |
| Maximum Reverse Recovery Time                           | $I_F = 0.5A$ , $I_R = 1.0A$ , $IRR = 0.25A$                    | $T_{rr}$  | 35       |         |         | nS       |

**Thermal Characteristics (Ta=25°C Unless Otherwise Specified )**

| Parameter                                                   | Test Conditions                                     | Symbol           | SF<br>802F | SF<br>804F | SF<br>806F | Unit |
|-------------------------------------------------------------|-----------------------------------------------------|------------------|------------|------------|------------|------|
| Operating Junction Temperature Range                        |                                                     | T <sub>J</sub>   | -55~150    |            |            | ℃    |
| Storage Temperature Range                                   |                                                     | T <sub>STD</sub> | -55~150    |            |            |      |
| Thermal Resistance Junction To Ambient<br>With Steady-State | Still Air Environment<br>With Ta=25℃                | R <sub>θJA</sub> | 50.0       |            |            | ℃/W  |
| Thermal Resistance Junction-Case<br>With Steady-State       | Device Mounted On<br>75mm x 45mm x 2.5mm Alu. Heat. | R <sub>θJC</sub> | 4.0        |            |            |      |

Notes: 1.Pulse Test: 300 Us Pulse Width,1% Duty Cycle

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Typical Characteristics Curves

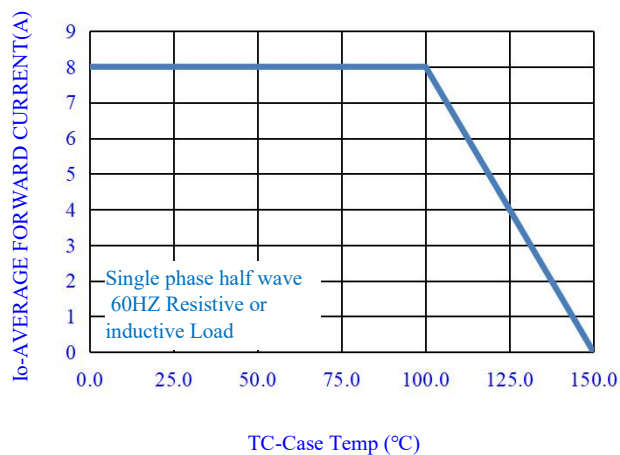


Fig.1-FORWARD CURRENT DERATING CURVE

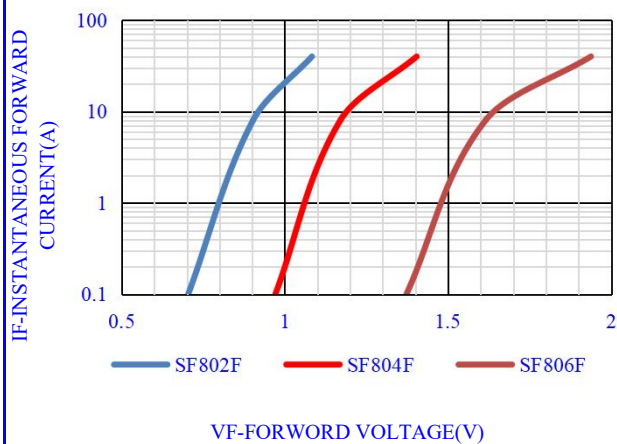


Fig.2- TYPICAL INSTANTANEOUS FORWARD

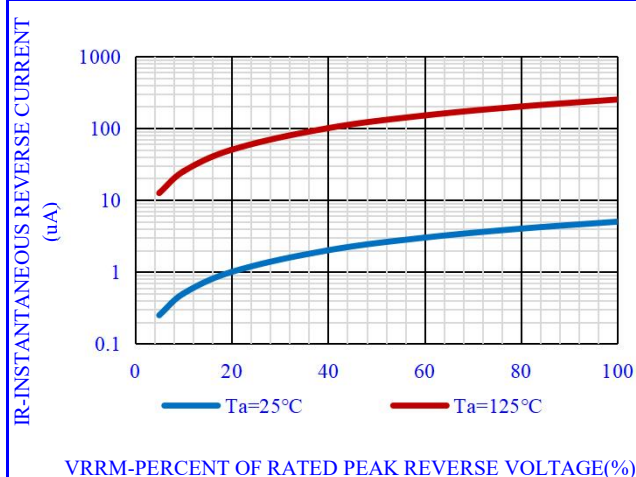


Fig.3- TYPICAL REVERSE CHARACTERISTICS

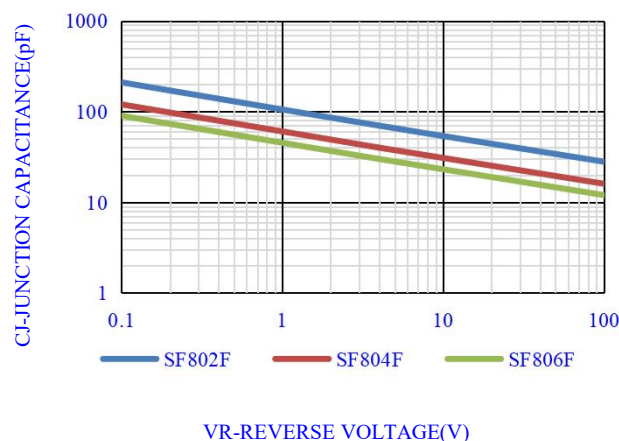


Fig.4- TYPICAL JUNCTION CAPACITANCE

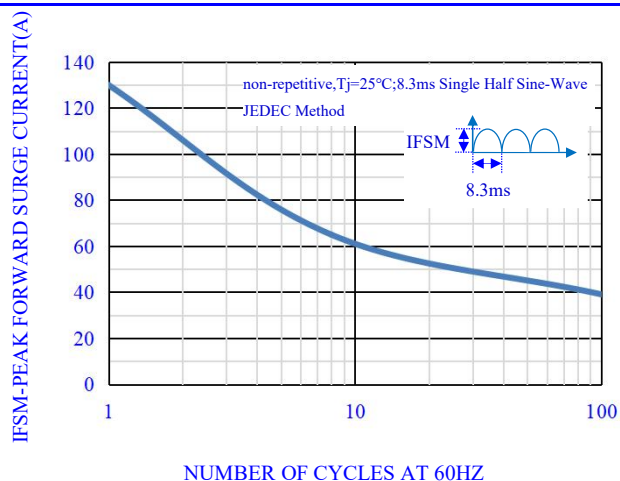


Fig.5-MAX. NON-REPETITIVE SURGE CURRENT

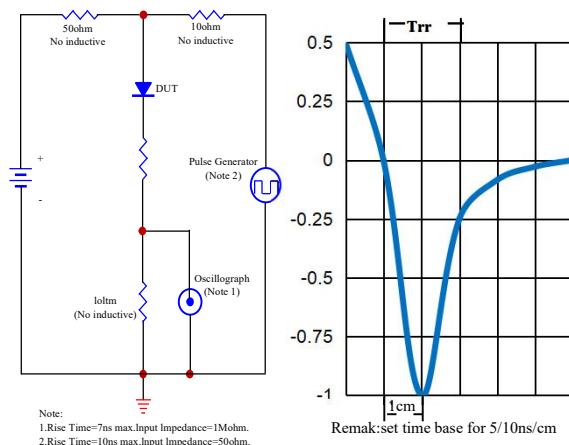
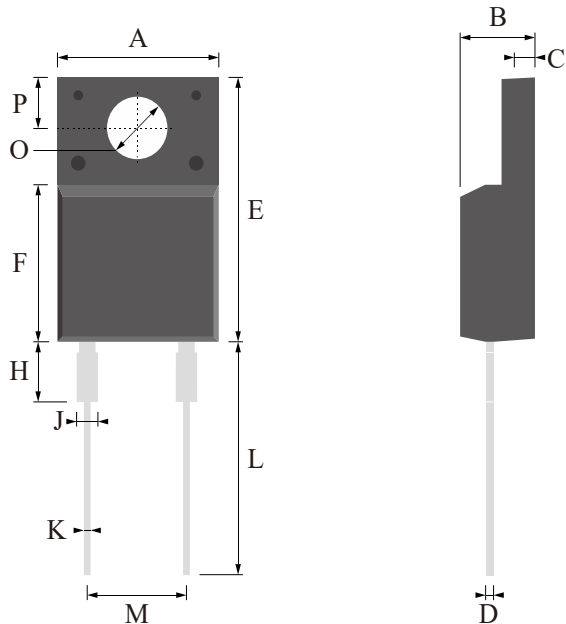


Fig.6-REVERSE RECOVERY TIME CHARACTERISTIC AND TEST CIRCUIT

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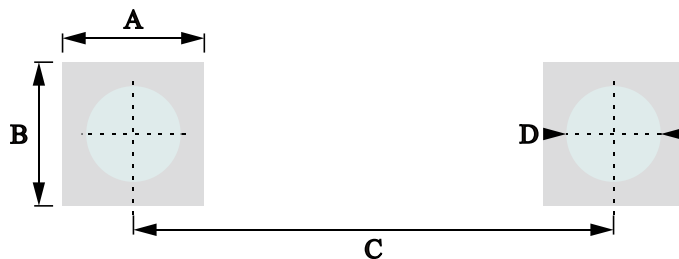
**OUTLINE DRAWINGS**



**ITO-220AC**

| OUTLINE DIMENSIONS |            |      |       |        |      |        |
|--------------------|------------|------|-------|--------|------|--------|
| Dim.               | Milimeters |      |       | Inches |      |        |
|                    | Min.       | Typ. | Max.  | Min.   | Typ. | Max.   |
| A                  | 9.25       | -    | 10.75 | 0.3642 | -    | 0.4232 |
| B                  | 2.50       | -    | 3.00  | 0.0984 | -    | 0.1181 |
| C                  | 4.10       | -    | 4.70  | 0.1614 | -    | 0.1850 |
| D                  | 0.45       | -    | 0.75  | 0.0177 | -    | 0.0295 |
| E                  | 14.20      | -    | 16.20 | 0.5591 | -    | 0.6378 |
| F                  | 7.95       | -    | 9.45  | 0.3130 | -    | 0.3720 |
| L                  | 12.50      | -    | 14.50 | 0.4921 | -    | 0.5709 |
| H                  | 3.70       | -    | 4.30  | 0.1457 | -    | 0.1693 |
| J                  | 1.15       | -    | 1.65  | 0.0453 | -    | 0.0650 |
| K                  | 0.45       | -    | 0.75  | 0.0177 | -    | 0.0295 |
| M                  | 4.80       | -    | 5.40  | 0.1890 | -    | 0.2126 |
| O                  | 2.90       | -    | 3.40  | 0.1142 | -    | 0.1339 |
| P                  | 3.00       | -    | 3.50  | 0.1181 | -    | 0.1378 |

**RECOMMEDND LAYOUT DRAWINGS**



**ITO-220AC**

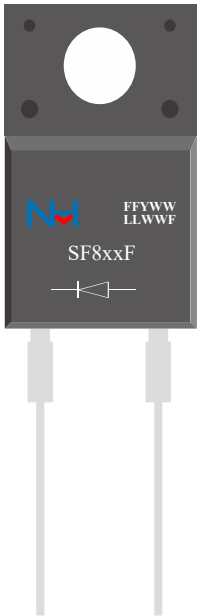
| OUTLINE DIMENSIONS |            |      |      |        |        |      |
|--------------------|------------|------|------|--------|--------|------|
| Dim.               | Milimeters |      |      | Inches |        |      |
|                    | Min.       | Typ. | Max. | Min.   | Typ.   | Max. |
| A                  | -          | 1.60 | -    | -      | 0.0630 | -    |
| B                  | -          | 1.60 | -    | -      | 0.0630 | -    |
| C                  | -          | 5.08 | -    | -      | 0.2000 | -    |
| D                  | -          | 1.00 | -    | -      | 0.0394 | -    |

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MARKING



MARKING INSTRUCTION

NH=Niuhang Trademark  
FF=Product Line Code,According To Actual Changes  
YWW=Date Code,According To Actual Changes  
LLWWF=Inernal Code,According To Actual Changes  
SF8xxF=Model,xx=02,04,06

PACKING INFORMATION

| Package Type | Package Code | Product Weight<br>Approx(g/Pcs) | Package Method | Quantity<br>(Pcs/Min. Pack.) | Quantity<br>(Pcs/Inner Box) | Quantity<br>(Pcs/Carton) |
|--------------|--------------|---------------------------------|----------------|------------------------------|-----------------------------|--------------------------|
| ITO-220AC    | P1           | 1.665                           | Tube           | 50                           | 1000                        | 5000                     |

**SF802F THRU SF806F**

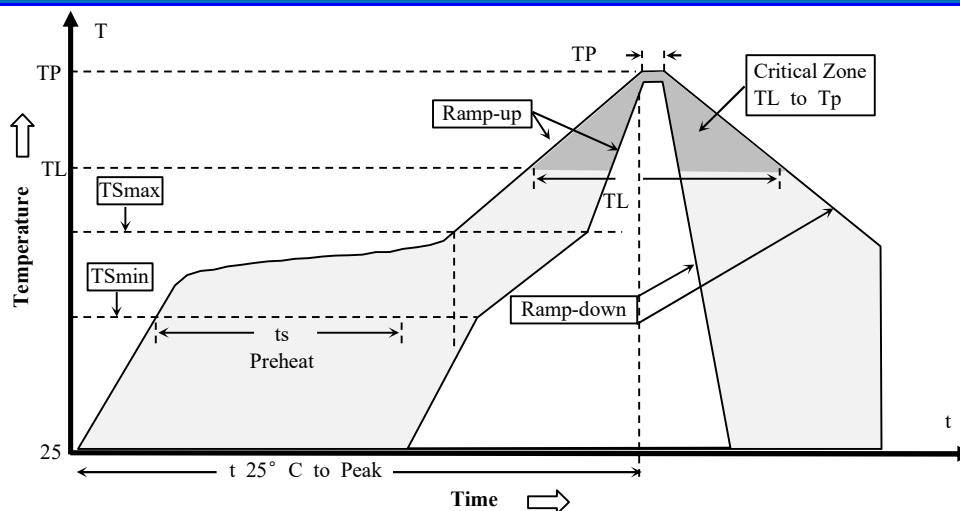
**Super Fast Recovery Rectifiers**



**Recommended wave soldering condition**

| Product         | Peak Temperature | Soldering Time  |
|-----------------|------------------|-----------------|
| Pb-free devices | 260 +0/-5 °C     | 5 +1/-1 seconds |

**Recommended temperature profile for IR reflow**



| Profile feature                                                                            | Sn-Pb eutectic Assembly          | Pb-free Assembly                 |
|--------------------------------------------------------------------------------------------|----------------------------------|----------------------------------|
| Average ramp-up rate<br>(T <sub>smax</sub> to T <sub>p</sub> )                             | 3°C/second max.                  | 3°C/second max.                  |
| Preheat<br>-Temperature Min(TS min)<br>-Temperature Max(TS max)<br>-Time(ts min to ts max) | 100°C<br>150°C<br>60-120 seconds | 150°C<br>200°C<br>60-180 seconds |
| Time maintained above:<br>-Temperature (TL)<br>- Time (tL)                                 | 183°C<br>60-150 seconds          | 217°C<br>60-150 seconds          |
| Peak Temperature(TP)                                                                       | 240 +0/-5 °C                     | 260 +0/-5 °C                     |
| Time within 5°C of actual peak<br>temperature(tp)                                          | 10-30 seconds                    | 20-40 seconds                    |
| Ramp down rate                                                                             | 6°C/second max.                  | 6°C/second max.                  |
| Time 25 °C to peak temperature                                                             | 6 minutes max.                   | 8 minutes max.                   |

Note : All temperatures refer to topside of the package, measured on the package body surface.

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