

## 30A 300V Fast Recovery Epitaxial Diode(FRED)

### Features

VOLTAGE	300 V
CURRENT	30A

- Ultrafast Recovery Time
- Soft Recovery Characteristics
- Low Forward Voltage
- Low stored Charge
- Low Leakage Current
- Low Recovery Loss

### PIN DESCRIPTION



TO-220F

### Mechanical Data

- Case: TO-220F
- Freewheeling, Snubber, Clamp
- Snubber Diode
- Switch Power Supplies
- Motor control
- Inverters Converters
- PFC



Package	Part No.	ROHS Status	Packing
TO-220F	SI30U300F	Pb-Free	Box (Tube)

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

PARAMETER	SYMBOL	VALUE	UNITS
Maximum Recurrent Peak Reverse Voltage	$V_{RRM}$	<b>300</b>	V
Maximum RMS voltage	$V_{RMS}$	<b>220</b>	V
Maximum DC blocking voltage	$V_{DC}$	<b>300</b>	V
Average Rectified Forward Current	$I_{F(AV)}$	<b>30</b>	A
Peak forward surge current, 8.3ms single half sine-wave superimposed on rated load	$I_{FSM}$	<b>300</b>	A
Operating Junction Temperature	$T_J$	<b>-55 to150</b>	$^\circ\text{C}$
Operating Junction and Storage Temperature Range	$T_{STG}$	<b>-55 to150</b>	$^\circ\text{C}$

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

Symbol	Parameter	Test Conditions	Min	TYP	Max	Unit
<b>Static Characteristics</b>						
$V_{BR}$	Reverse Breakdown Voltage	$I_R=50\mu\text{A}$	300	-	-	V
$V_F$	Instantaneous forward voltage per diode	$I_F=30\text{A}, T_a=25\text{ }^\circ\text{C}$	-	-	1.15	V
		$I_F=30\text{A}, T_a=125\text{ }^\circ\text{C}$	-	-	1.10	V
$I_R$	Reverse current per diode	$V_R=300\text{V}, T_a=25\text{ }^\circ\text{C}$	-	-	2	$\mu\text{A}$
$T_{rr}$	Reverse Recovery Time	$I_F=0.5\text{A}, I_R=1\text{A}, I_{rr}=0.25\text{A}$	-	37	45	ns
		$I_F=1\text{A}, V_R=30\text{V}, di/dt=-200\text{A}/\mu\text{s}$	-	28	-	ns

**Remark:**

- 1.Customer should obtain the latest version of datasheet before placing order, and verify the relevant information.
- 2.Cutting damage and chipping area can't beyond scribe line in given size range.
- 3.Testing system of  $T_{rr}$  could be different, customer might take secondary test to evaluate if necessary.
- 4.Customer might choose the bonding wire material and diameter according to actual situation, while no less than our recommendation.

## Typical Operating Characteristics

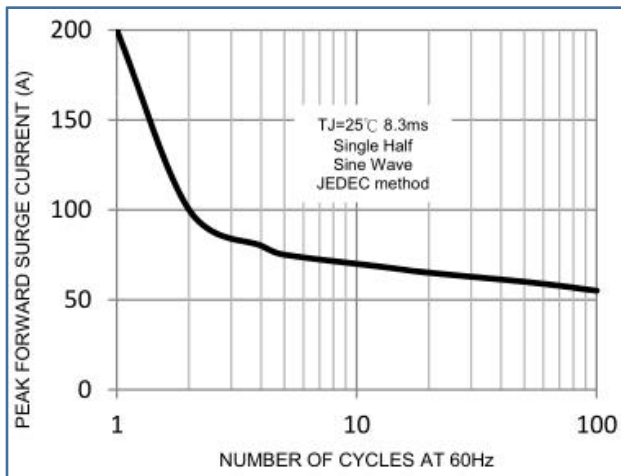


FIG.1-Maximum Non-Repetitive Forward Surge Current

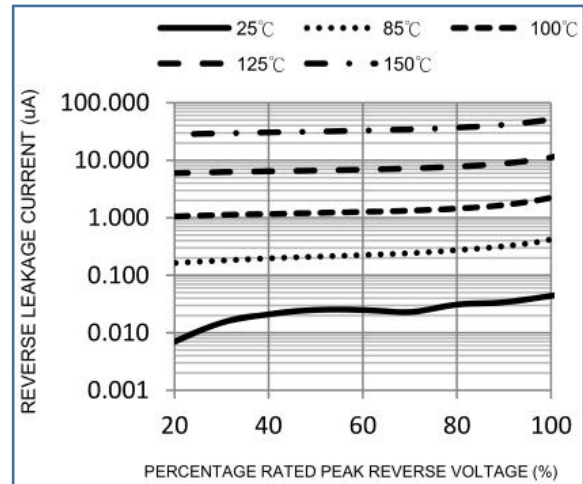


FIG.2-Typical Reverse Characteristics

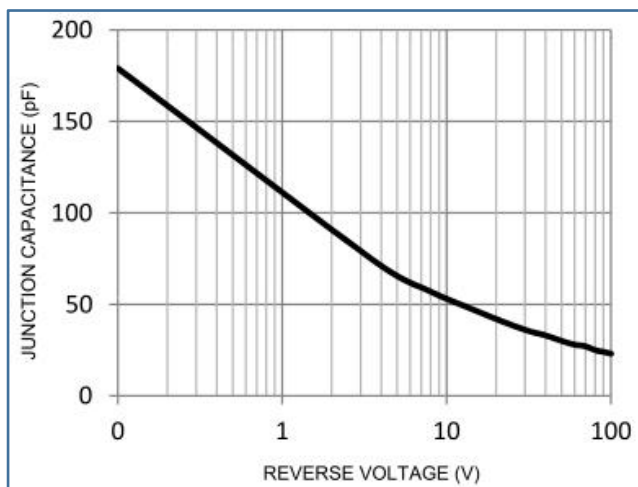


FIG.3 Typical Junction Capacitance

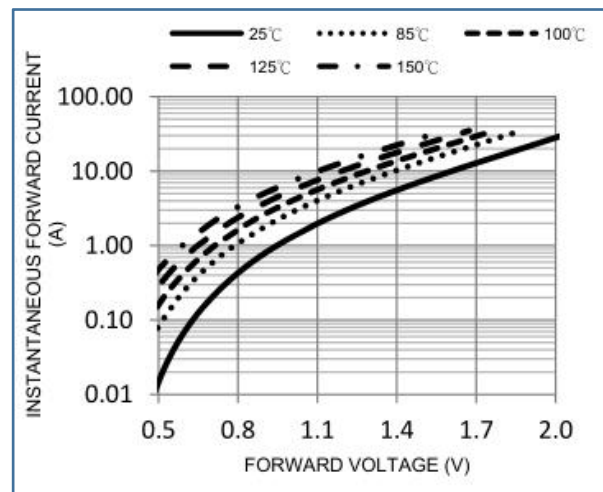
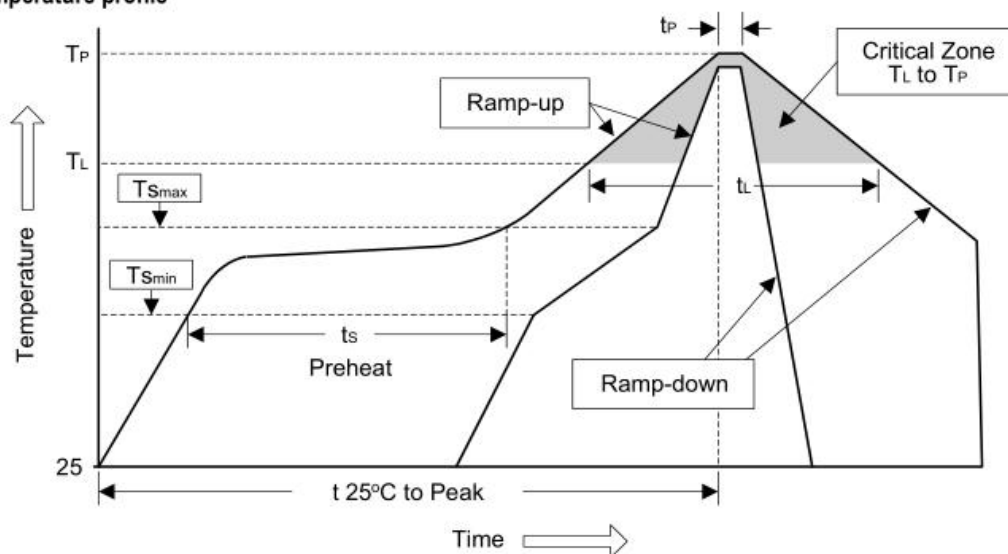


FIG.4 Typical Forward Characteristics

## Soldering Methods for Products

Profile Feature	Sn-Pb Eutectic Assembly	Pb-Free Assembly
Average ramp-up rate(TL to TP)	<3°C/sec	<3°C/sec
Preheat		
-Temperature Min(Ts min)	100°C	150°C
-Temperature Max(Ts max)	150°C	200°C
-Time(min to max)(ts)	60 to 120 sec	60 to 180 sec
Ts max to TL		
- ramp-up rate	<3°C/sec	<3°C/sec
Time maintained above:		
-Temperature(TL)	183°C	217°C
-Time(t L)	60 to 150 sec	60 to 150 sec
Peak Temperature(T p)	240°C+0/-5°C	250°C+0/-5°C
Time within 5°C of actual Peak Temperature	10 to 30 sec	20 to 40 sec
Ramp-down Rate	<6°C/sec	<6°C/sec
Time 25 °C to Peak Temperature	<6 minutes	<8 minutes

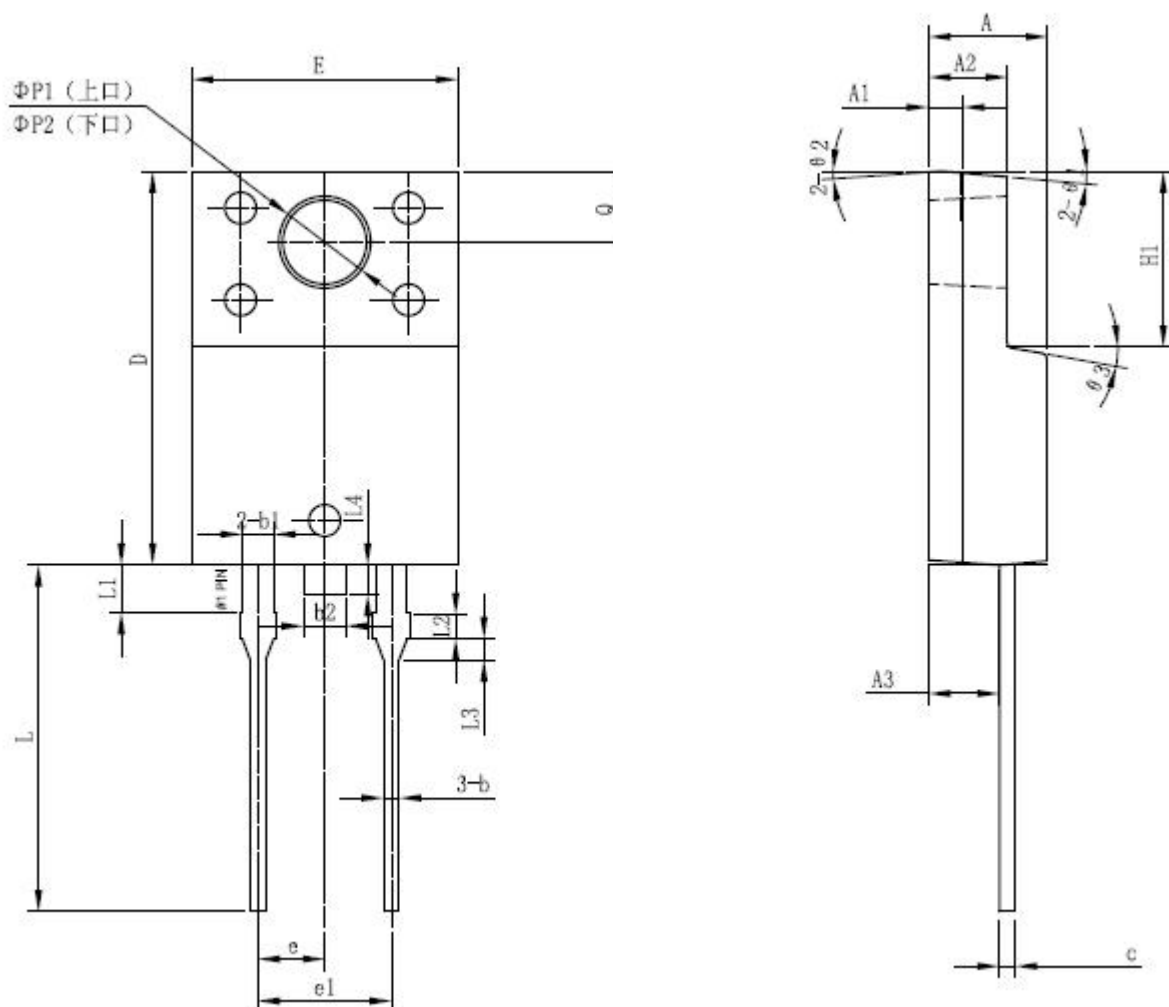
Figure 1: Temperature profile



- Note :**
- 1.Storage environment: Temperature=10°C to 35@Humidity=45%±15%
  - 2.Reflow soldering of surface-mount devices
  - 3.Flow(wave) soldering(solder dipping)

Products	Peak Temperature	Dipping Time
Pb devices	245°C±5°C	5sec±1sec
Pb-free devices	250°C+0/-5°C	5sec±1sec

## Package Outline



Millimeter(mm)					
Symbol	Min	Max	Symbol	Min	Max
A	4.30	4.70	D	14.80	15.20
A1	1.30Typ		E	9.96	10.36
A2	2.80	3.20	e	2.55Typ	
A3	2.50	2.90	e1	5.10Typ	
b	0.5	0.75	H1	6.50	6.90
b1	1.20Typ		L	12.70	13.70
b2	1.60Typ		L1	1.80Typ	
c	0.55	0.75	L2	1.00Typ	

**■ Important Notice**

Si-Trend reserves the right to change all product specifications and data without prior notice ; Our customer Please confirm to place an order confirmation before make the integrity of information complete and up-to-date ◦

Any semiconductor under specific conditions are possible to certain failure or malfunction rate ; Customers are responsible in the use of Si-Trend products to system design and manufacturing in compliance with safety standards and adopting safety measures ◦ To avoid the potential risk of failure may cause the personal safety and property loss ◦

Si-Trend Always refine on to provide more excellent products

**■ Modify record**

Date	Version	Description	Pagination
20170826	A.0	original	6