10A 600V Fast Recovery Epitaxial Diode(FRED)

Features

VOLTAGE	600 V
CURRENT	10A

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

PIN DESCRIPTION

TO-220AB

TO-220F

Mechanical Data

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

Package	ROHS Status	Packing	Part No.
TO-220AB	Pb-Free	Box (Tube)	SI10U600
TO-220F	Pb-Free	Box (Tube)	SI10U600F

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

PARAMETER	SYMBOL	VALUE	UNITS
Maximum Recurrent Peak Reverse Voltage	V_{RRM}	**600**	V
Maximum rms voltage	V_{RMS}	**420**	V
Maximum dc blocking voltage	V_R	**600**	V
Average Rectified Forward Current	$I_{F(AV)}$	**10**	A
Peak forward surge current : 8.3ms single half sine-Wave superimposed on rated load	I_{FSM}	**75**	A
Operating Juniction Temperature	T_J	**-55 to175**	℃
Operating Junction and Storage Temperature Range	T_{STG}	**-55 to175**	℃

Note : 1. Device mounted on a infinite heatsink , then measured the center of the marking side.
2. Device mounted on a 10cm*10cm*1mm copper pad area, then measured the center of the marking Side.

ELECTRICAL CHARACTERISTICS (T_A=25 °C unless otherwise noted)

Symbol	Parameter	Test Conditions	Min	TYP	Max	Unit
Static Characteristics						
V_{BR}	Reverse Breakdown Voltage	I_R=100uA	600	-	-	V
V_F	Instantaneous forward voltage per diode	I_F=10A ,T_a=25 °C	-	2.2	2.4	V
		I_F=10A ,Ta=125 °C	-	1.74	-	V
I_R	Reverse current per diode	V_R=600V,T_a=25 °C	-	-	1.2	uA
T_{rr}	Reverse Recovery Time	I_F=0.5A, I_R=1A, I_{rr}=0.25A	-	-	25	ns
		I_F=1A,V_R=30V, di/dt=-100A/us	-	-	20	ns
		I_F=1A,V_R=30V, di/dt=-200A/us	-	32	-	ns
I_{RRM}	Peak recovery current	I_F=10A,V_R=400V, di/dt=-200A/us	-	2	-	A
Q_{RR}	Reverse recovery charge	I_F=10A,V_R=400V, di/dt=-200A/us	-	32	-	nC

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 Trr could be different, customer might take secondary test to evaluate if necessary.

4.Customer might choose the bonding wire material and diameter according to acutal sitatuation ,while no less than our recommendation.

Typical Operating Characteristics

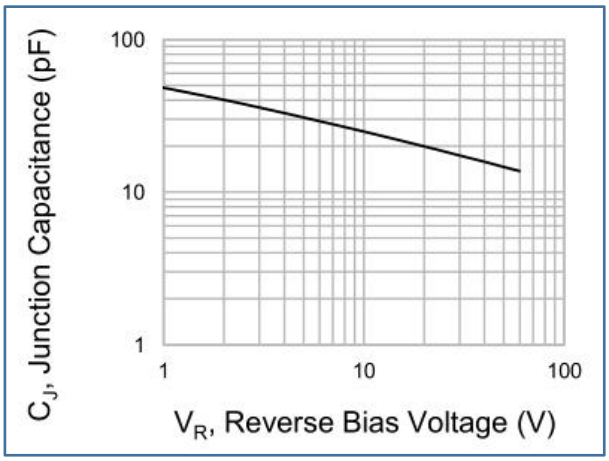


Fig.1 Typical Junction Capacitance

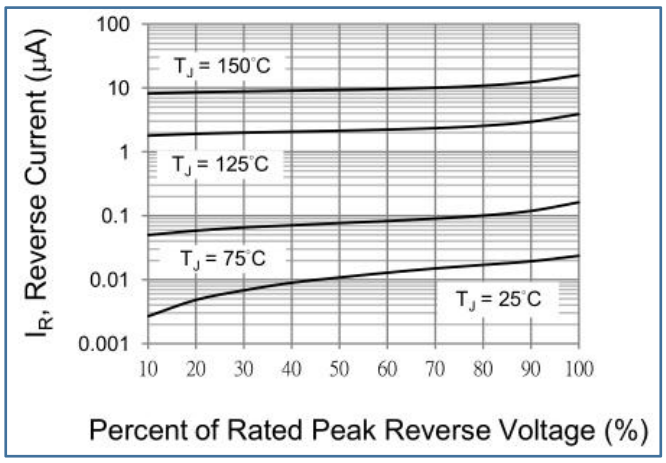


Fig.2 Typical Reverse Characteristics

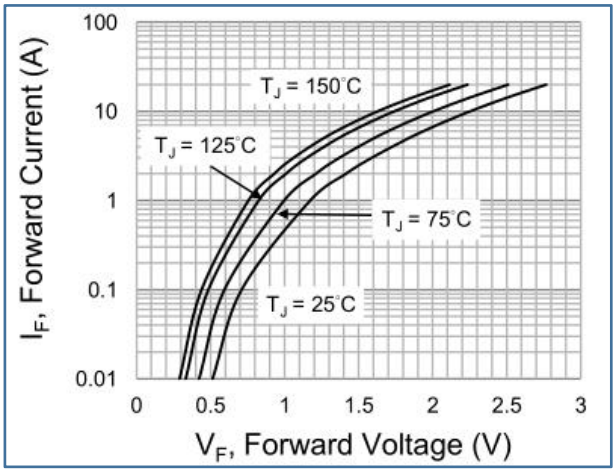


Fig.3 Typical Forward Characteristics

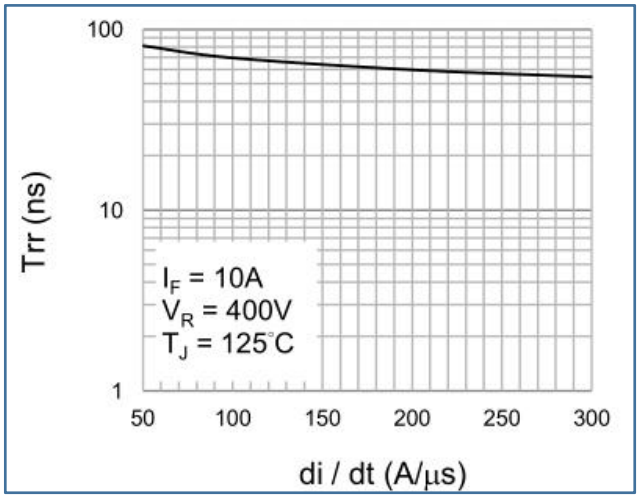


Fig.4 Typical Reverse recovery time versus di/dt

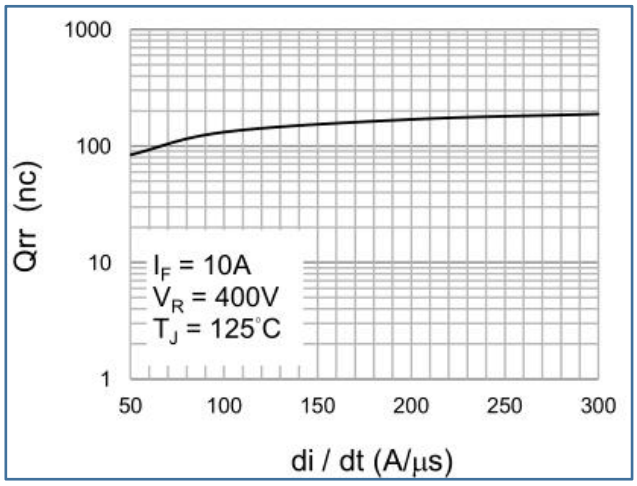
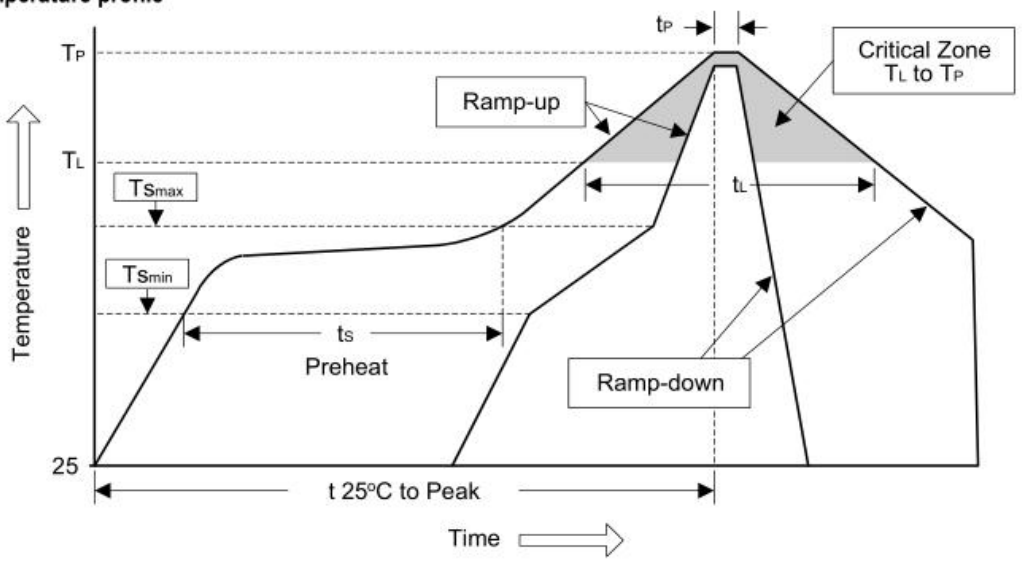


Fig.5 Typical Reverse recovery charges versus di/dt

Soldering Methods for Products

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

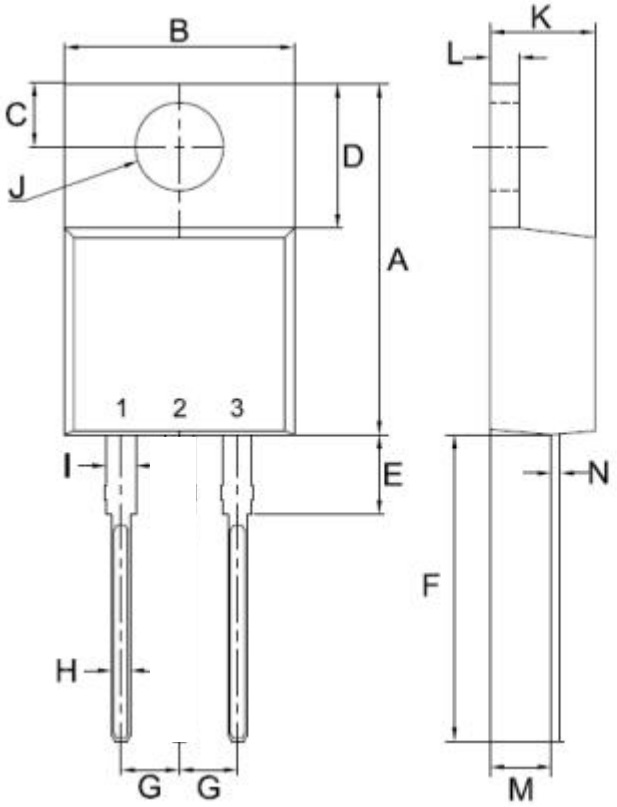
Figure 1: Temperature profile



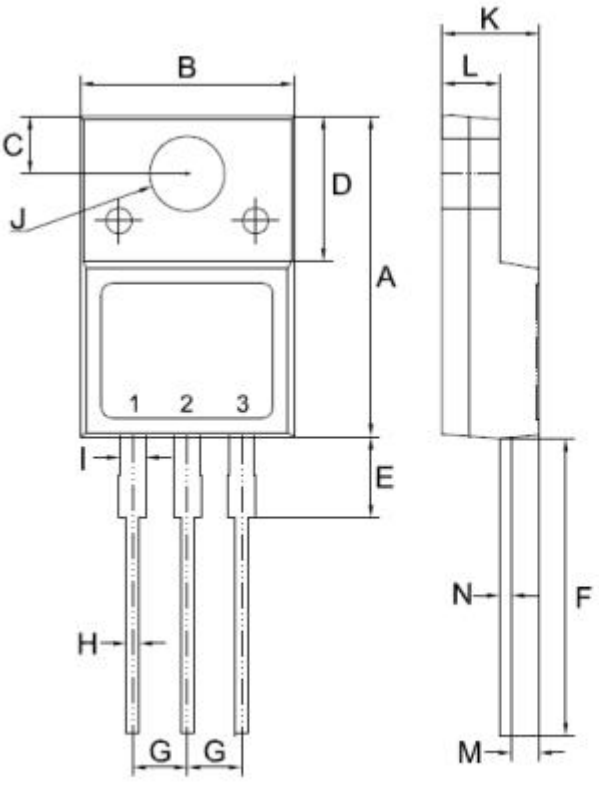
Note :1.Storage environment: Temperature=10℃ to 35@Humidity=45%±15%
2.Reflow soldering of surface-mount devices
3.Flow(wave) soldering(solder dipping)

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

Package Outline



TO-220AB Unit:mm		
DIM	MIN	MAX
A	14.80	15.80
B	9.57	10.57
C	2.54	2.94
D	5.80	6.80
E	2.95	3.95
F	12.70	13.40
G	2.34	2.74
H	0.51	1.11
I	0.97	1.57
J	3.54Φ	4.14Φ
K	4.27	4.87
L	1.07	1.47
M	2.03	2.92
N	0.30	0.64



TO-220F Unit:mm		
DIM	MIN	MAX
A	14.50	15.50
B	9.50	10.50
C	2.50	2.90
D	6.30	7.30
E	3.30	4.30
F	13.00	14.00
G	2.35	2.75
H	0.30	0.90
I	0.90	1.50
J	3.20Φ	3.80Φ
K	4.24	4.84
L	2.52	2.92
M	1.09	1.49
N	0.47	0.64

Important Notice

Si-Trend reserves the right to change all product、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
20160626	A.0	original	6