

SF2003CT,SF2003FCT
SUPER FAST RECOVERY DIODE



VOLTAGE: 300 Volts

CURRENT: 20 Amperes

Package: TO-220AB

Package: TO-220F

FEATURES

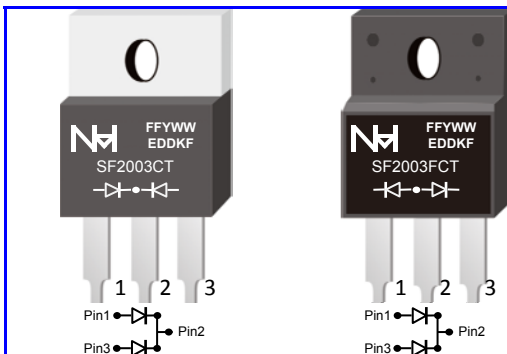
- Glass Passivated Chip Junction
- Low Forward Voltage Drop For High Efficiency
- Low Leakage Current For High Reliability
- High Forward Surge Capability For High Reliability
- Fast Reverse Recovery Time

MECHANICAL DATA

- **Package:** Molding Compound Meets UL 94 V-0 Flammability Rating, RoHS-Compliant
- **Polarity:** As Marked On Case
- **Mounting Position:** Any
- **TO-220AB:Weight:App. 1.892 Grams (0.06673 Ounce)**
- **TO-220F:Weight:App. 2.048 Grams (0.07224 Ounce)**

TYPICAL APPLICATIONS

- Typical Applications Are In Switching Power Supplies, High Frequency Converter, UPS, Freewheeling Diodes, PFC Boost And LED Driver Etc.



Remark:

- ①. NH=niuhang trademark
- ②. FF=Product line code,According to actual changes
YWW=Date code,According to actual changes
EDDKF=Internal code,According to actual changes
- ③. SF2003CT,SF2003FCT=Model

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	SF2003CT,SF2003FCT	Unit
Maximum Repetitive Peak Reverse Voltage		V_{RRM}	300	V
Maximum RMS Voltage		V_{RMS}	210	V
Maximum DC Blocking Voltage		V_{DC}	300	V
Maximum Average Forward Rectified Current	@TC= 100 °C	$I_{F(AV)}$	20	A
Peak Forward Surge Current	8.3ms Single Half Sine-wave Superimposed On Rate Load	I_{FSM}	150	A
Current Squared Time Per Diode	t<8.3ms	I^2t	93.4	A ² sec
Maximum Mounting torque	M3 screw	T_{MM}	1.1	N.m

Electrical Characteristics (Ta=25°C Unless otherwise specified)

Parameter	Test Conditions		Symbol	SF2003CT,SF2003FCT			Unit
				Min.	Typ.	Max.	
Instaneous forward voltage per diode (note1)	Ta=25°C	$I_F = 10.0 A$	V_F	--	1.05	1.30	V
	Ta=125°C			--	0.97	1.20	
Maximum DC Reverse Current at Rated DC Blocking Voltage (Note 1)	Ta=25°C	$V_R = V_{RRM}$	I_{RRM}	--	1	5	uA
	Ta=125°C	$V_R = 80\% \cdot V_{RRM}$		--	50	500	
Typical Junction Capacitance Per Diode	4.0 V,1MHz		C_J	--	50	--	pF
Maximum Reverse Recovery Time	$I_F=0.5A, I_R=1.0A, I_{RR}=0.25A$		T_{RR}	--	--	50	nS

Thermal Characteristics (Ta=25°C Unless otherwise specified)

Parameter	Symbol	SF2003CT,SF2003FCT		Unit
Operating Junction Temperature Range	T_J	-55	to 150	°C
Storage Temperature Range	T_{STD}	-55	to 150	
Typical thermal resistance (Note 2)	$R_{\theta JC}$	TO-220AB	TO-220F	°C/W
		2.5	4.5	

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

2.Device Mounted On Device Mounted On 75mm x 45mm x 5.5mm Aluminum Plate Heatsink.

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Typical Characteristics Curves

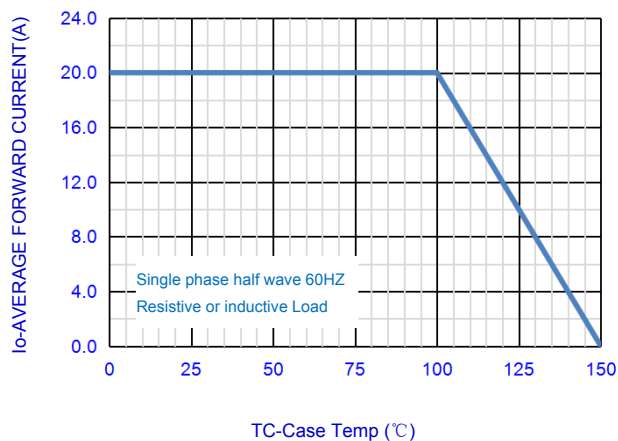


Fig.1-FORWARD CURRENT DERATING CURVE

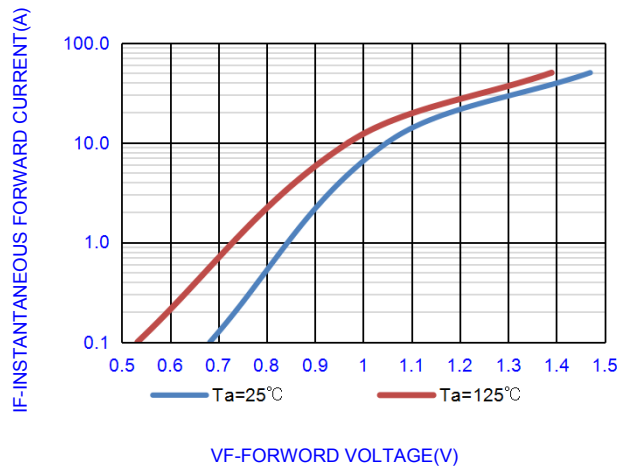


Fig.2- TYPICAL INSTANTANEOUS FORWARD

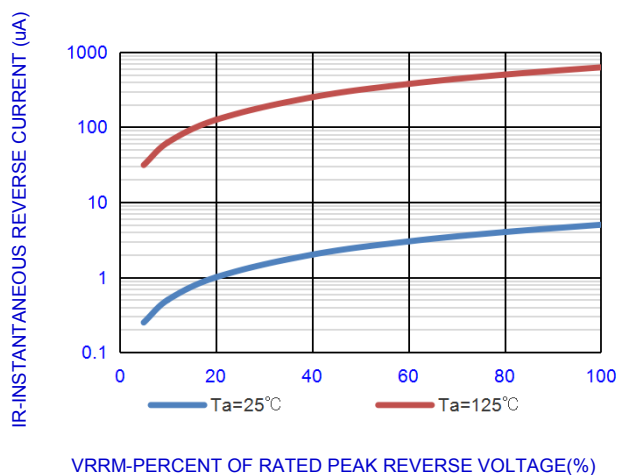


Fig.3- TYPICAL REVERSE CHARACTERISTICS

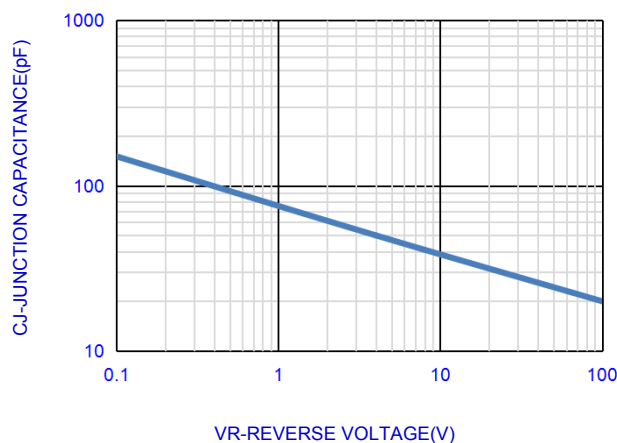


Fig.4- TYPICAL JUNCTION CAPACITANCE

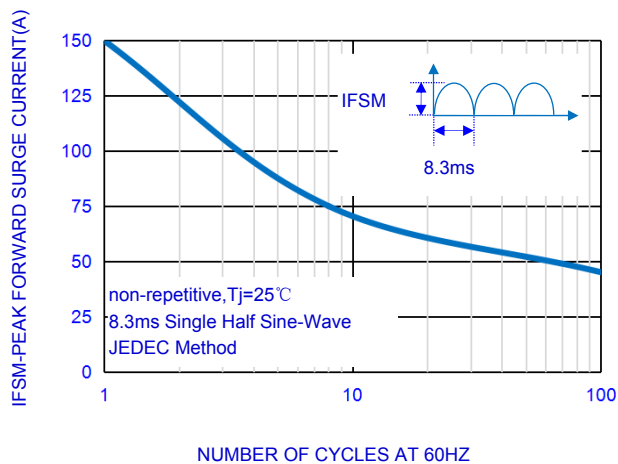


Fig.5-MAX. NON-REPETITIVE SURGE CURRENT

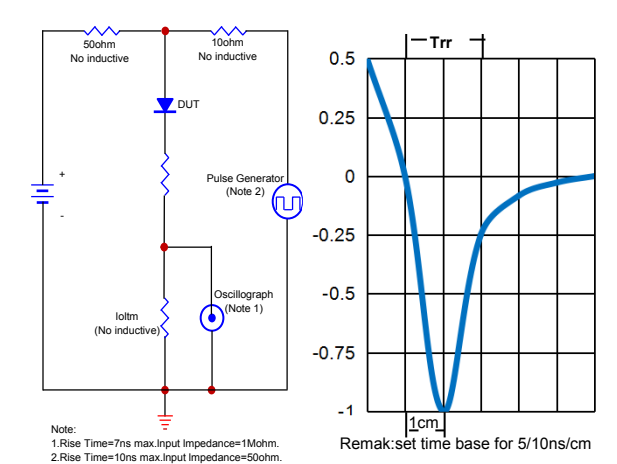


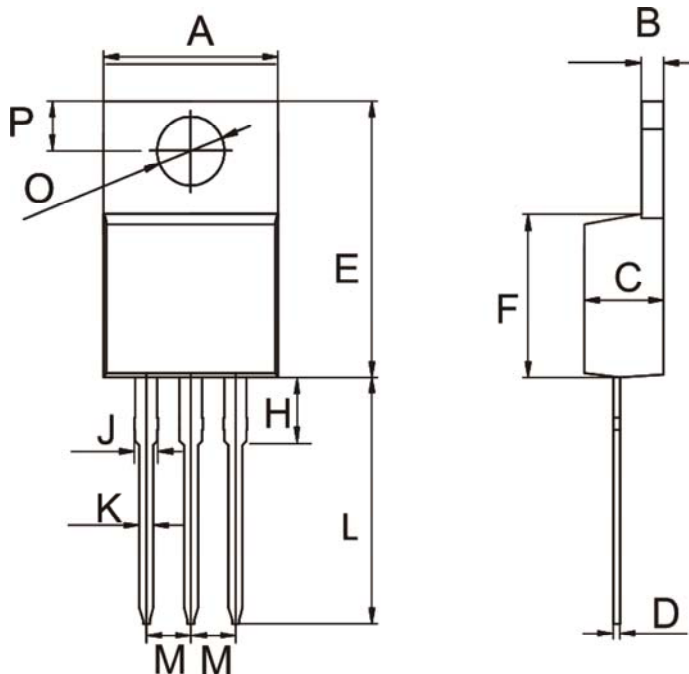
Fig.6-REVERSE RECOVERY TIME CHARACTERISTIC AND TEST CIRCUIT

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OUTLINE DRAWINGS

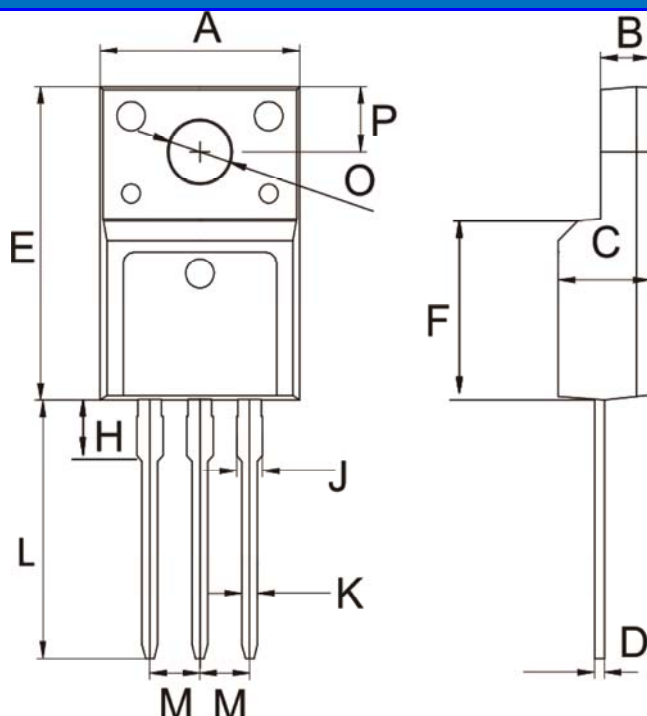
TO-220AB



OUTLINE DIMENSIONS						
Dim.	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	9.25	-	10.75	0.36	-	0.42
B	1.10	-	1.65	0.04	-	0.06
C	4.15	-	4.95	0.16	-	0.19
D	0.25	-	0.65	0.01	-	0.03
E	14.50	-	16.70	0.57	-	0.66
F	8.40	-	9.95	0.33	-	0.39
L	12.15	-	14.30	0.48	-	0.56
H	3.00	-	3.80	0.12	-	0.15
J	1.05	-	1.60	0.04	-	0.06
K	0.65	-	0.95	0.03	-	0.04
M	2.10	-	2.90	0.08	-	0.11
O	3.20	-	4.10	0.13	-	0.16
P	2.45	-	3.10	0.10	-	0.12

OUTLINE DRAWINGS

TO-220F



OUTLINE DIMENSIONS						
Dim.	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	9.25	-	10.75	0.36	-	0.42
B	2.30	-	2.90	0.09	-	0.11
C	4.20	-	5.20	0.17	-	0.20
D	0.35	-	0.75	0.01	-	0.03
E	14.80	-	16.80	0.58	-	0.66
F	8.25	-	9.75	0.32	-	0.38
L	12.15	-	14.15	0.48	-	0.56
H	2.40	-	3.00	0.09	-	0.12
J	1.10	-	1.50	0.04	-	0.06
K	0.60	-	1.00	0.02	-	0.04
M	2.20	-	3.00	0.09	-	0.12
O	2.70	-	3.50	0.11	-	0.14
P	2.25	-	2.85	0.09	-	0.11

PACKING INFORMATION

Package Code	Package Method	Inner Box Size L×W×H(mm)	Quantity (pcs/Inner Box)	Outer Carton Size L×W×H(mm)	Quantity (pcs/carton)
TO-220AB	T/P	560x155x55	1000	570×284×185	5000
TO-220F	T/P	560x155x55	1000	570×284×185	5000

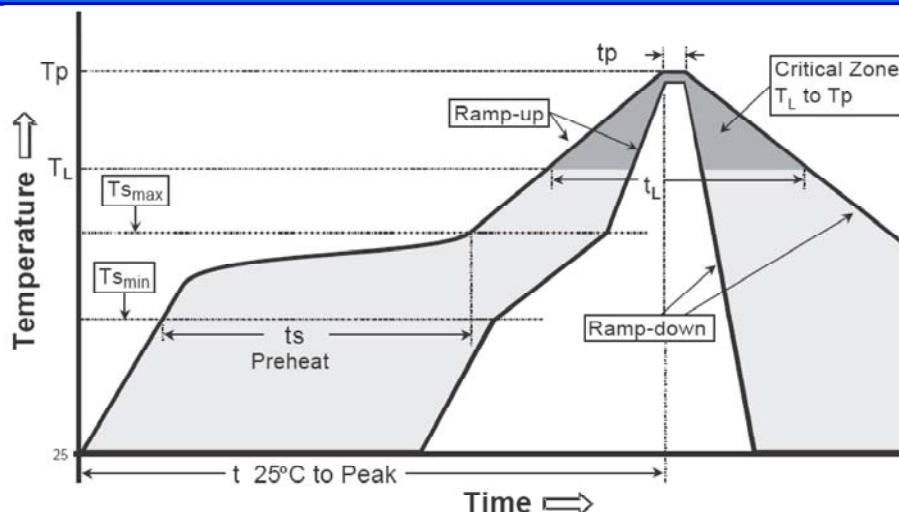
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Recommended wave soldering condition

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 (Tsmax to Tp)	3°C/second max.	3°C/second max.
Preheat -Temperature Min(TS min) -Temperature Max(TS max) -Time(ts min to ts max)	100°C 150°C 60-120 seconds	150°C 200°C 60-180 seconds
Time maintained above: -Temperature (TL) - Time (tL)	183°C 60-150 seconds	217°C 60-150 seconds
Peak Temperature(TP)	240 +0/-5 °C	260 +0/-5 °C
Time within 5°C of actual peak 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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