

SF2003CT,SF2003FCT
SUPER FAST RECOVERY RECTIFIERS



VOLTAGE: 300 Volts

CURRENT: 20 Amperes

Marking and Polarity

FEATURES

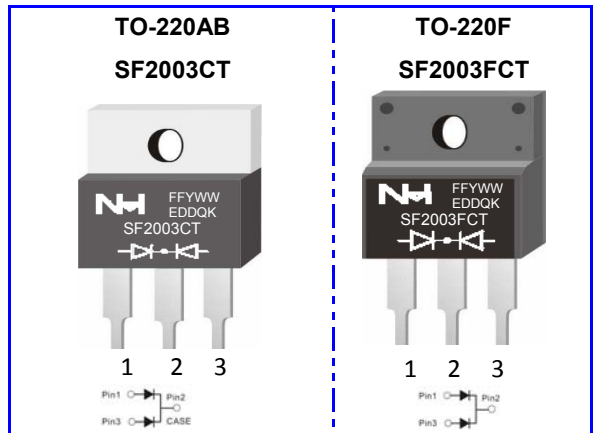
- Glass passivated chip junction
- Super fast reverse recovery time
- Low Forward Voltage Drop for high efficiency
- Low leakage current for high reliability
- High forward surge capability for high reliability

MECHANICAL DATA

- **Case:** JEDEC TO-220AB、TO-220F
- Molding compound meets UL94V-0 flammability rating
- **Terminals:** Lead solderable per J-STD-002 and JESD22-B102
- **Polarity:** As marked

TYPICAL APPLICATIONS

- For use in high frequency inverters ,AC/DC converters, DC/DC converters,LED driver etc. applications



Remark:

- ①. NH=niuhang trademark
- ②. FF=Product line code,According to actual changes
YWW=Date code,According to actual changes
EDDQK=Inernal code,According to actual changes
- ③. SF2003CT/SF2004FCT=Modle

Single phase,half wave,60Hz,resistive or inductive load.For capacitive load,derate current by 20%

Maximum Ratings (Ratings at 25°C ambient temperature unless otherwise specified)

Parameter	Symbol	SF2003CT,SF2003FCT	Unit
Maximum Repetitive Peak Reverse Voltage	V_{RRM}	300	V
Maximum RMS Voltag	V_{RMS}	210	V
Maximum DC Blocking Voltage	V_{DC}	300	V
Maximum Average Forward Rectified Current @ TC=100°C (see fig.1)	$I_{F(AV)}$	20	A
Peak Forward Surge Current 8.3ms Single Half Sine-wave Superimposed On Rate Load per Diode(JEDEC Method)	I_{FSM}	200	A
Current Squared Time Per Diode(t<8.3ms)	I^2t	166	A ² sec

Electrical Characteristics (Ratings at 25°C ambient temperature unless otherwise specified)

Parameter	Test Conditions	Symbol	SF2003CT,SF2003FCT			Unit
			Min.	Typ.	Max.	
Maximum Forward Voltage Per Diode (Note 1)	Ta=25°C IF= 10 A	V_{FM}	--	0.90	1.05	V
Maximum DC Reverse Current at Rated DC Blocking Voltage (Note 1)	Ta=25°C VR= V_{RRM}	I_{RRM}	--	1	5	uA
	Ta=125°C VR= 80%* V_{RRM}		--	50	500	
Maximum Reverse Recovery Time	IF=0.5A, IR=1.0A, IRR=0.25A	T_{RR}	--	35	50	nS
Typical Junction Capacitance Per Diode	4V,1MHz	C_J	--	50	--	pF

Thermal Characteristics (Ratings at 25°C ambient temperature unless otherwise specified)

Parameter	Symbol	SF2003CT,SF2003FCT		Unit
Operating Junction Temperature Range	T_J	-55	to 175	°C
Storage Temperature Range	T_{STD}	-55	to 175	°C
Typical thermal resistance (Note 2)	$R_{\theta JC}$	TO-220AB	TO-220F	°C/W
		2.5	4.5	

No 1. Pulse test: 300 μs pulse width,1% duty cycle

2. Device mounted on Device mounted on 75mm x 45mm x 2.5mm Aluminum Plate Heatsink.

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RATING AND CHARACTERISTIC CURVES

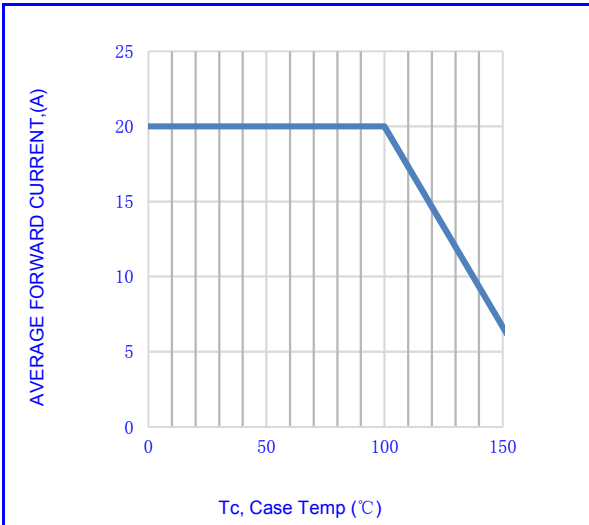


Fig.1-FORWARD CURRENT DERATING CURVE

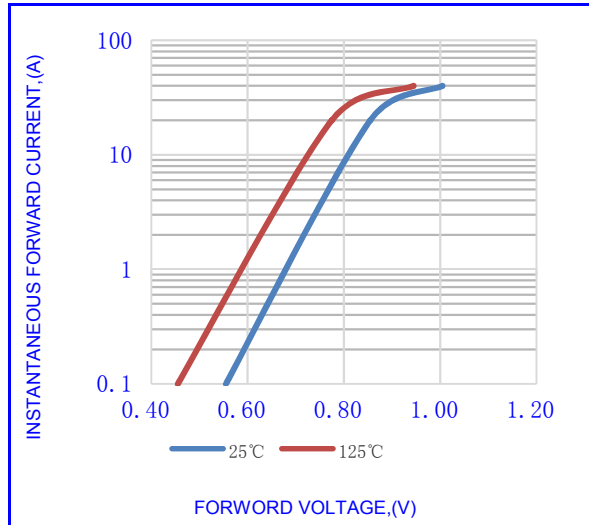


Fig.2- TYPICAL INSTANTANEOUS FORWARD

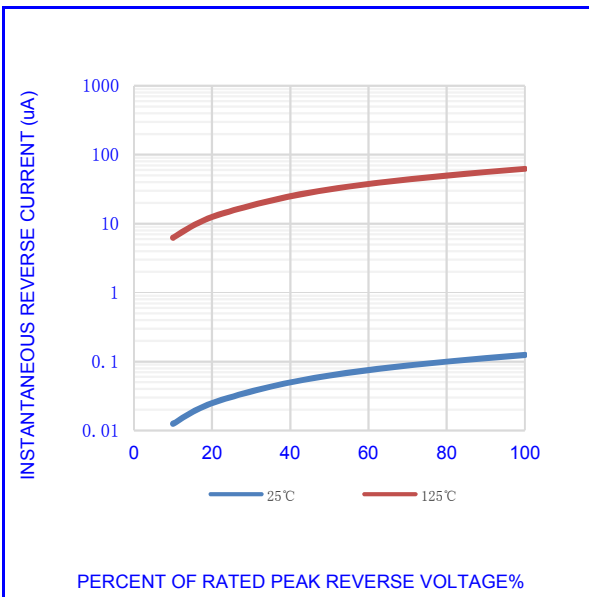


Fig.3- TYPICAL REVERSE CHARACTERISTICS

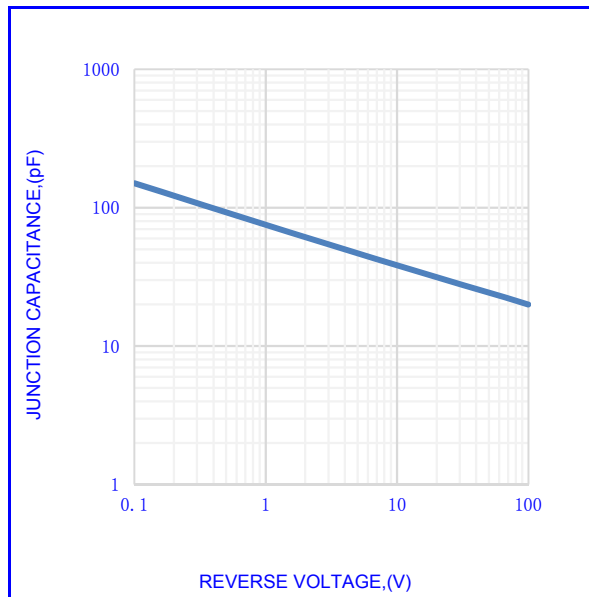


Fig.4- TYPICAL JUNCTION CAPACITANCE

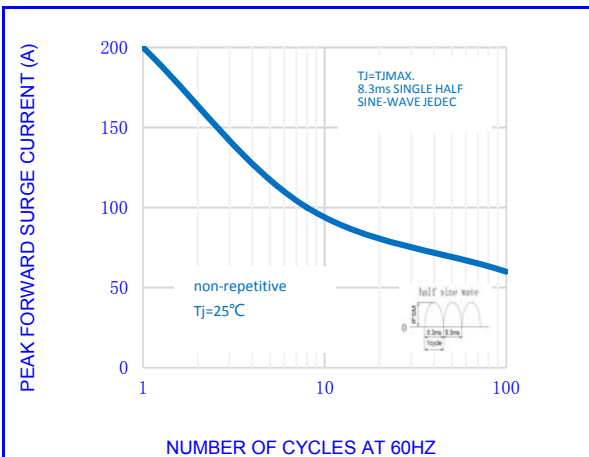


Fig.5-MAX. NON-REPETITIVE SURGE CURRENT

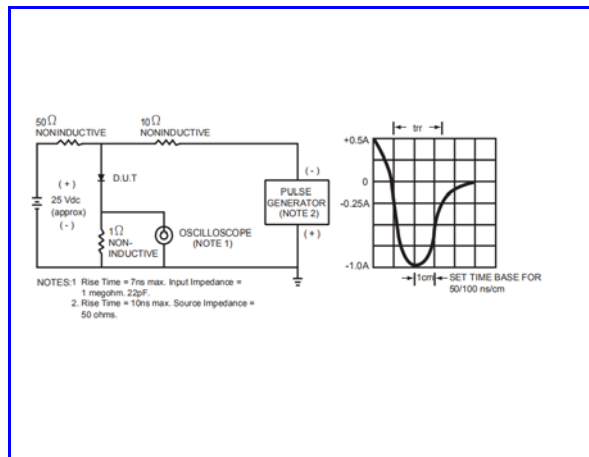
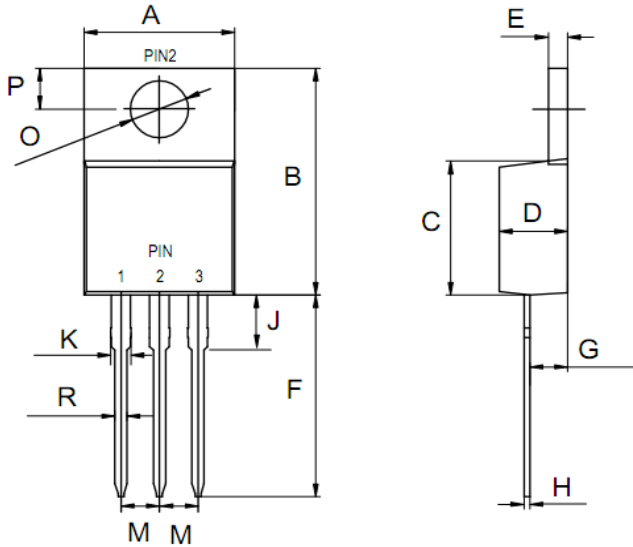


Fig.6- TEST CIRCUIT DIAGRAM AND REVERSE RECOVERY TIME CHARACTERISTIC

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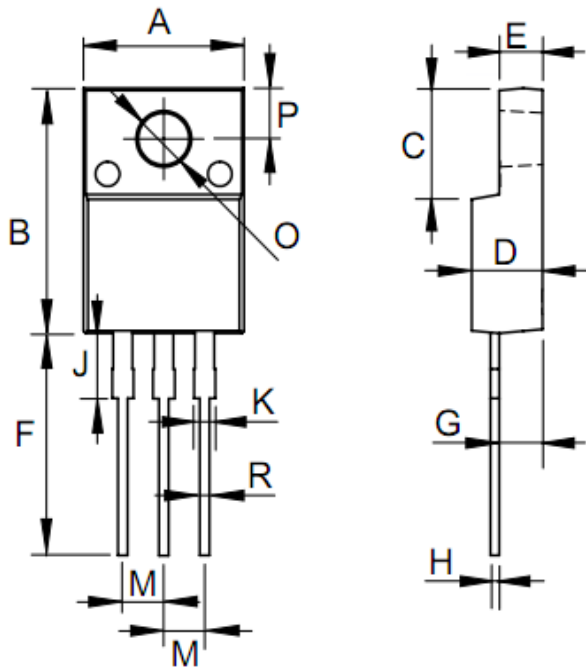
OUTLINE DRAWINGS



TO-220AB

Dim.	OUTLINE DIMENSIONS					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	9.80	-	10.40	0.3858	-	0.4094
B	14.95	-	15.35	0.5886	-	0.6043
C	8.40	-	9.40	0.3307	-	0.3701
D	4.20	-	4.70	0.1654	-	0.1850
E	1.15	-	1.45	0.0453	-	0.0571
F	12.50	-	-	0.4921	-	-
G	2.30	-	2.70	0.0906	-	0.1063
H	0.30	-	0.45	0.0118	-	0.0177
J	3.00	-	4.50	0.1181	-	0.1772
M	2.44	-	2.64	0.0961	-	0.1039
R	0.70	-	1.00	0.0276	-	0.0394
O	3.45	-	3.85	0.1358	-	0.1516
P	2.80	-	3.20	0.1102	-	0.1260

RECOMMENDED LAYOUT DRAWINGS



TO-220F

Dim.	RECOMMENDED LAYOUT DIMENSIONS					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	9.60	-	10.40	0.3780	-	0.4094
B	14.60	-	15.40	0.5748	-	0.6063
C	6.10	-	6.90	0.2402	-	0.2717
D	4.20	-	4.60	0.1654	-	0.1811
E	2.50	-	3.20	0.0984	-	0.1260
F	13.20	-	14.00	0.5197	-	0.5512
G	2.50	-	2.90	0.0984	-	0.1142
H	0.45	-	0.70	0.0177	-	0.0276
J	3.60	-	4.40	0.1417	-	0.1732
K	1.10	-	1.40	0.0433	-	0.0551
M	2.00	-	2.50	0.0787	-	0.0984
R	0.50	-	0.70	0.0197	-	0.0276
O	3.10	-	3.40	0.1220	-	0.1339
P	2.80	-	3.60	0.1102	-	0.1417

PACKING INFORMATION

Package Code	Package Method	Tube Size L×W×H(mm)	Quantity (pcs/Tube)	Inner Box Size L×W×H(mm)	Quantity (pcs/Inner Box)	Outer Carton Size L×W×H(mm)	Quantity (pcs/carton)
TO-220AB	Tube	530x35x8	50	560x155x55	1000	570×284×185	5000
TO-220F	Tube	530x35x8	50	560x155x55	1000	570×284×185	5000

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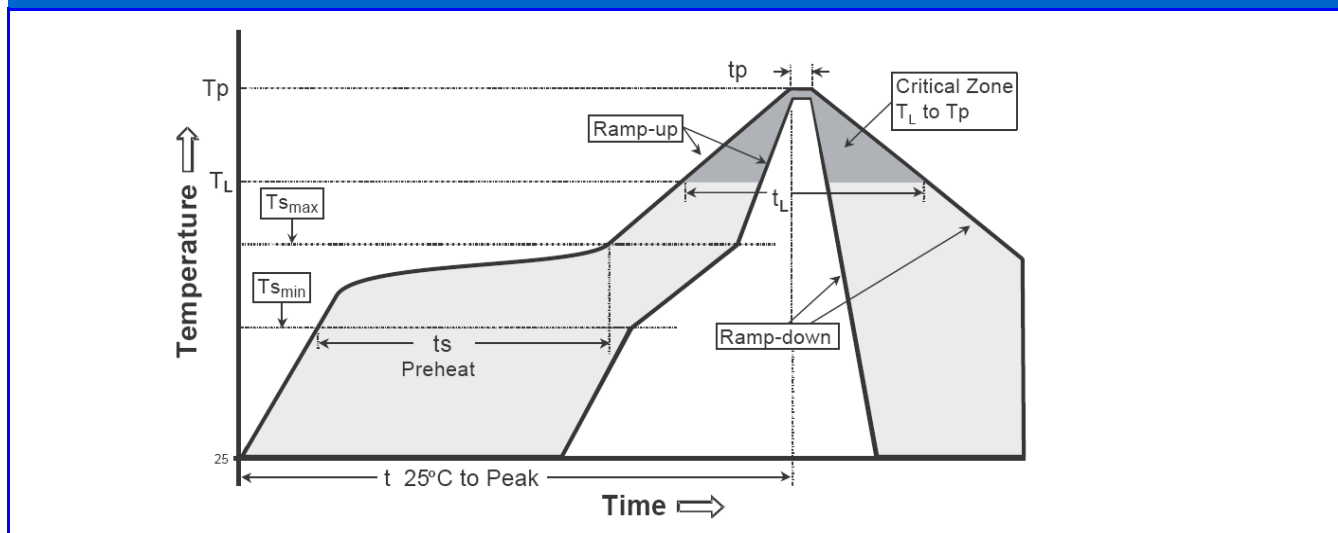
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Recommended wave soldering condition

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 (Tsmmax 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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