

SF1602CT, SF1602FCT
SUPER FAST RECOVERY RECTIFIERS



VOLTAGE: 200 Volts

CURRENT: 16.0 Amperes

Marking and Polarity

FEATURES

- Glass passivated chip junction
- Ultrafast reverse recovery time
- Low leakage current for high reliability
- Low forward voltage drop for high efficiency
- High surge capability for high reliability
- High temperature soldering guaranteed: 260°C max./10 seconds at terminals

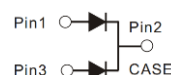
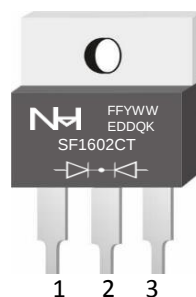
MECHANICAL DATA

- **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
- **Mounting Torque:** 10 in-lbs maximum

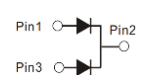
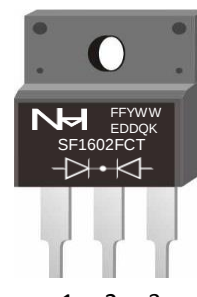
TYPICAL APPLICATIONS

- For use in switching power supplies, high frequency inverters and LED Driver applications

**TO-220AB
SF1602CT**



**TO-220F
SF1602FCT**



Remark:

- ①. NH=niuhang trademark;
- ②. FF=Product line code, According to actual changes
YWW=Data code, According to actual changes
EDDQK=Internal code, According to actual changes
- ③. SF1602CT/FCT=Model.

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

Parameter	Symbol	SF1602CT, SF1602FCT	Unit
Maximum repetitive peak reverse voltage	V_{RRM}	200	V
Maximum average forward rectified current (see fig.1)	$I_{F(AV)}$	16	A
Peak forward surge current 8.3ms single half sine-wave superimposed on rated load (JEDEC method at rated TL)	I_{FSM}	200	A
Peak repetitive reverse current per diode at $t_p=2\mu s$ 1KHz	I_{RRM}	5	μA

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

Parameter	Test Conditions		Symbol	SF1602CT, SF1602FCT			Unit
				Min.	Typ.	Max.	
Instantaneous forward voltage per diode (note1)	$T_A=25^\circ C$	$I_F=8A$	V_F	--	1.05	1.15	V
	$T_A=125^\circ C$			--	1.01	1.08	
Reverse current per diode (note2)	$T_A=25^\circ C$	$V_R=V_{RRM}$	I_R	--	--	5	μA
	$T_A=125^\circ C$	$V_R=80\%V_{RRM}$		--	--	100	
Maximum Reverse Recovery Time	$I_F=0.5A, I_R=1.0A, I_{RR}=0.25A$		T_{RR}	--	35	50	ns
Typical junction capacitance	4V, 1MHz		C_J	--	80		pF

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

Parameter	Symbol	SF1602CT,SF1602FCT		Unit
Operating junction	T _J	150		°C
Storage temperature range	T _{STD}	-55 to +150		
Typical thermal resistance (note3)	R _{θJC}	TO-220AB	TO-220F	°C/W
		2.5	4.5	

- Notes:
1. Pulse test: 300 μs pulse width, 1% duty cycle
 2. Pulse test: pulse width $\leq 40ms$
 3. Device mounted on 75mm x 45mm x 2.5mm Aluminum Plate Heatsink.

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RATING AND CHARACTERISTIC CURVES

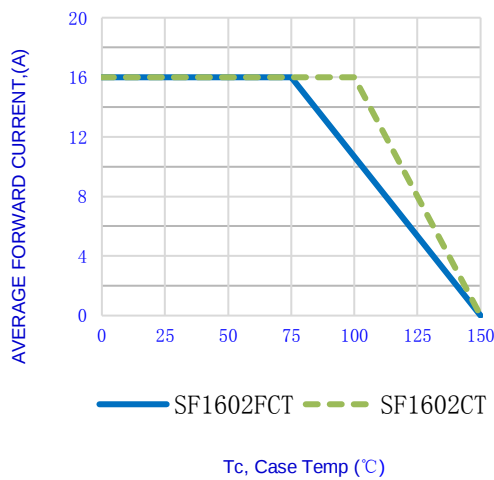


Fig.1-FORWARD CURRENT DERATING CURVE

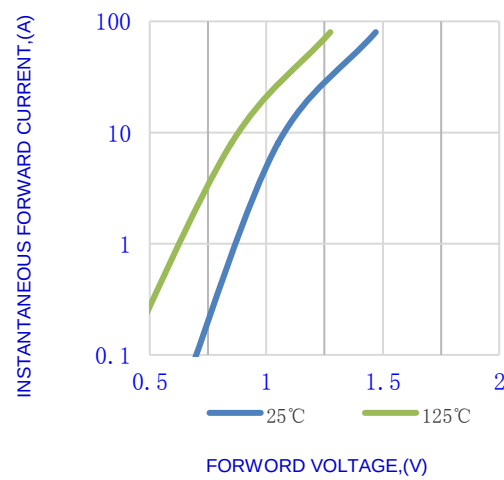


Fig.2- TYPICAL INSTANTANEOUS FORWARD

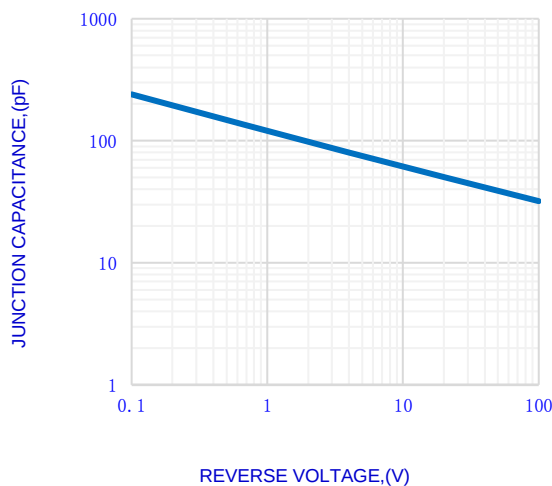


Fig.3- TYPICAL JUNCTION CAPACITANCE

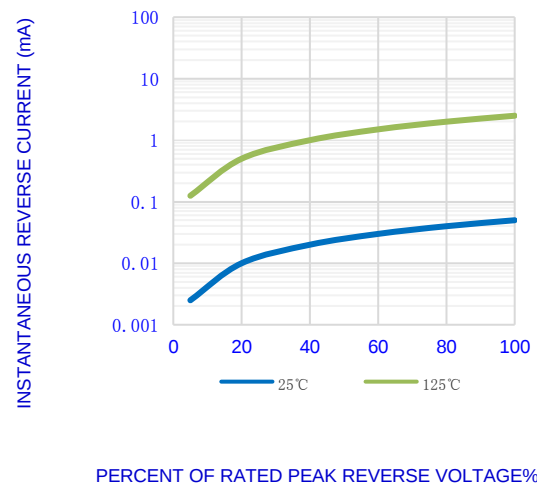


Fig.4- TYPICAL REVERSE CHARACTERISTICS

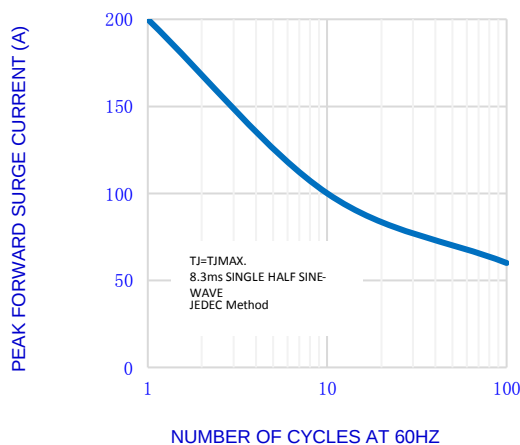


Fig.5-MAX. NON-REPETITIVE SURGE CURRENT

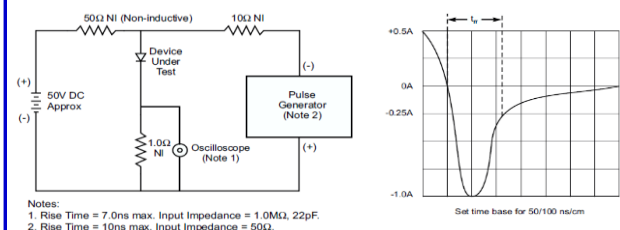


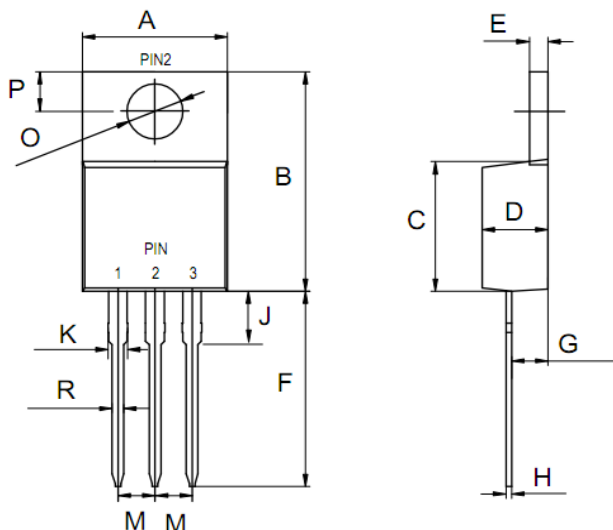
Fig.6-REVERSE RECOVERY TIME CHARACTERISTIC AND TEST CIRCUIT

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OUTLINE DRAWINGS

TO-220AB

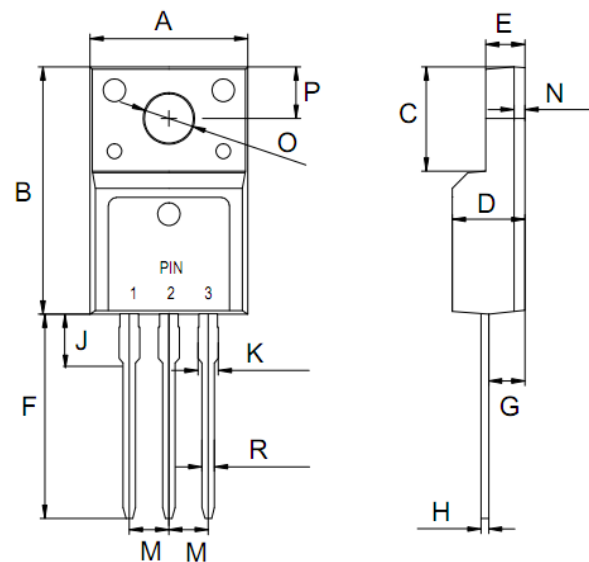


OUTLINE DIMENSIONS(Units:mm)

Dim.	Milimeters			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

OUTLINE DRAWINGS

TO-220F



OUTLINE DIMENSIONS(MILI METERS)

Dim.	Milimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	9.91	10.21	10.41	0.3902	0.4020	0.4098
B	28.10	29.22	29.50	1.1063	1.1504	1.1614
C	6.20	6.75	7.20	0.2441	0.2657	0.2835
D	4.44	4.70	4.80	0.1748	0.1850	0.1890
E	2.45	2.57	3.55	0.0965	0.1012	0.1398
F	13.10	13.22	14.22	0.5157	0.5205	0.5598
G	2.25	2.40	2.60	0.0886	0.0945	0.1024
H	0.35	0.50	0.58	0.0138	0.0197	0.0228
J	2.60	2.88	4.00	0.1024	0.1134	0.1575
M	2.41	2.50	2.67	0.0949	0.0984	0.1051
N	4.88	5.00	5.28	0.1921	0.1969	0.2079
R	0.58	0.82	0.94	0.0228	0.0323	0.0370
O	3.25	3.55	3.75	0.1280	0.1398	0.1476
P	2.15	3.30	3.50	0.0846	0.1299	0.1378

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

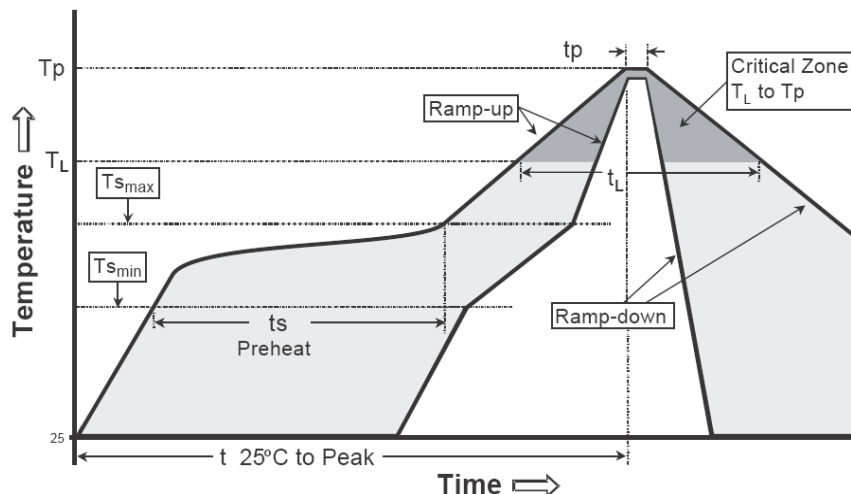
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Recommended wave soldering condition

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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