

**FR201 THRU FR207**  
FAST RECOVERY RECTIFIERS



**VOLTAGE:** 50~1000 Volts

**CURRENT:** 2.0 Amperes

DO-15

Marking and Polarity

**FEATURES**

- Plastic package has Underwriters Laboratory Flammability Classification 94V-0
- Metal silicon junction ,majority carrier conduction
- Guard ring for overvoltage protection
- Low power loss ,high efficiency
- High current capability ,ultra low forward voltage drop
- High surge capability
- High temperature soldering guaranteed:260°C/10 seconds at terminals
- Component in accordance to RoHS 2011/65/EU

**MECHANICAL DATA**

- Case: JEDEC DO-15 molded plastic body
- Terminals: Plated axial leads, solderable per MIL-STD-750,method 2026
- Polarity: color band denotes cathode end
- Mounting Position: Any
- Weight: App.0.33 grams

**TYPICAL APPLICATIONS**

- For use in low voltage ,high frequency inverters ,DC/DC converters, free wheeling ,and polarity protection applications

Remark:

- ①. NH=niuhang trademark
- ②. FR20x=Modle,x=1,2,3,4,5,6,7
- ③. FF=Production line,According to actual changes

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

Parameter	Symbol	FR 201	FR 202	FR 203	FR 204	FR 205	FR 206	FR 207	Unit
Maximum repetitive peak reverse voltage	$V_{RRM}$	50	100	200	400	600	800	1000	V
Maximum RMS voltage	$V_{RMS}$	35	70	140	280	420	560	700	V
Maximum DC blocking voltage	$V_{DC}$	50	100	200	400	600	800	1000	V
Maximum average forward rectified current(see fig.1)	$I_{F(AV)}$	2.0							A
Peak forward surge current 8.3ms single half sine-wave superimposed on rated load (JEDEC method at rated TL)	$I_{FSM}$	70							A

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

Parameter	Symbol	FR 201	FR 202	FR 203	FR 204	FR 205	FR 206	FR 207	Unit
Maximum instantaneous forward voltage (Note 1)	$V_F$	1.3							V
Maximum instantaneous reversecurrent at rated DC blockingvoltage (Note 1)	$I_{RRM}$	5							uA
		100							
Maximum Reverse Recovery Time (Note 2)	$T_{RR}$	150			250		500		ns
Typical junction capacitance (Note 3)	$C_J$	40							pF

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

Parameter	Symbol	FR 201	FR 202	FR 203	FR 204	FR 205	FR 206	FR 207	Unit
Operating junction	$T_J$	-65 to 150							°C
Storage temperature range	$T_{STG}$	-65 to 150							
Typical thermal resistance (Note 4)	$R_{\theta JA}$	50							°C/W
	$R_{\theta JC}$	17							

- Note:
1. Pulse width < 300 uS, Duty cycle < 2%
  2. Reverse Recovery Time test condition: IF=0.5A, IR=1.0A, IRR=0.25A
  3. Measured at 1MHz and applied reverse voltage of 4.0V D.C.
  4. Thermal resistance from junction to lead vertical P.C.B. mounted , 0.375"(9.5mm)lead length,Polymide PCB, 2 oz Copper.  
Cathode pad dimensions 18.8x14.4mm , Anode pad dimensions- (5.6x14.4mm)

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RATING AND CHARACTERISTIC CURVES

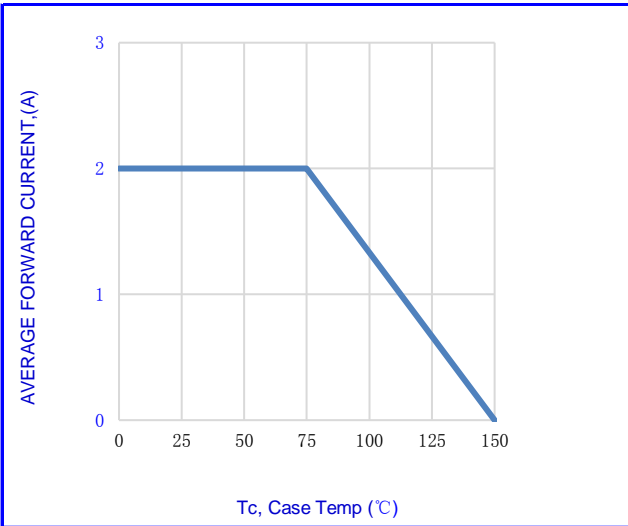


Fig.1-FORWARD CURRENT DERATING CURVE

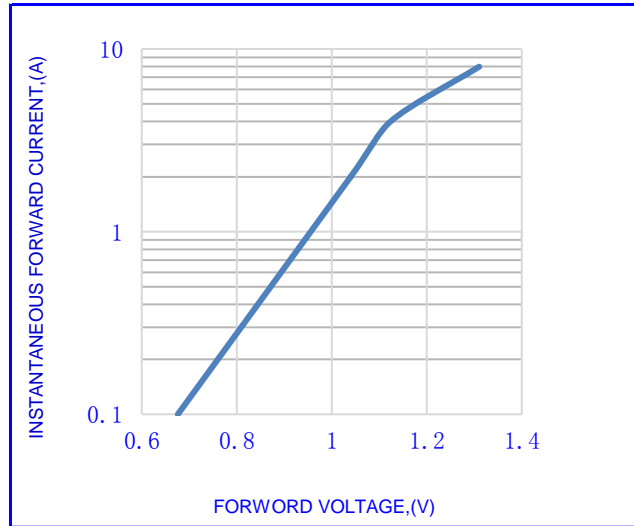


Fig.2-TYPICAL INSTANTANEOUS FORWARD

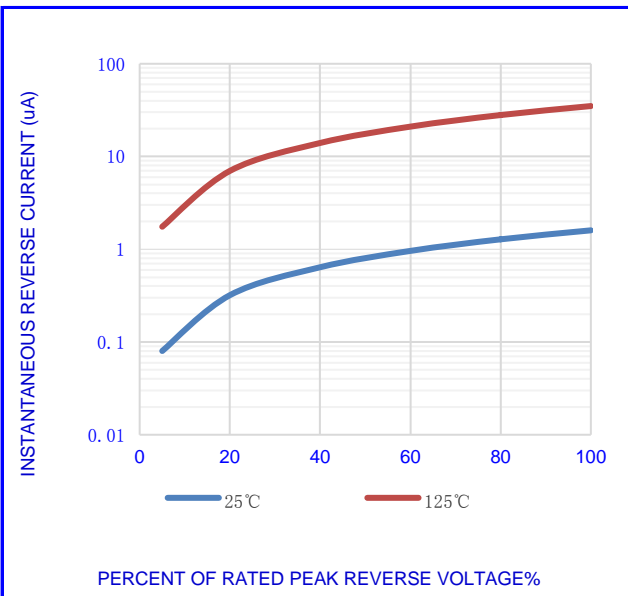


Fig.3-TYPICAL REVERSE CHARACTERISTICS

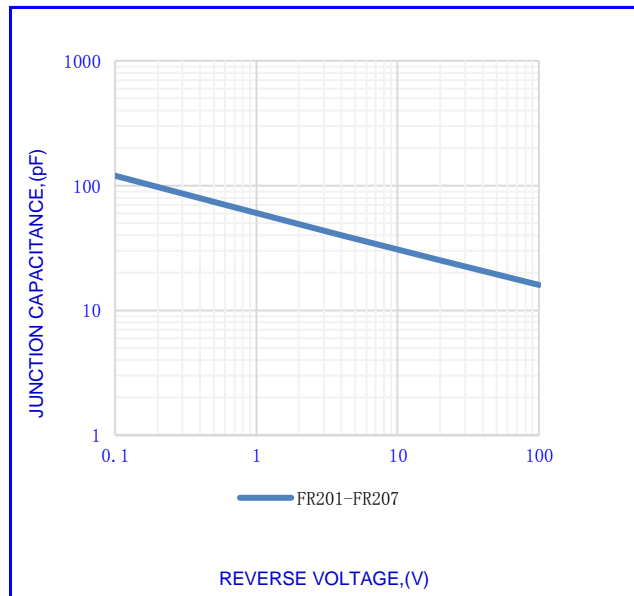


Fig.4-TYPICAL JUNCTION CAPACITANCE

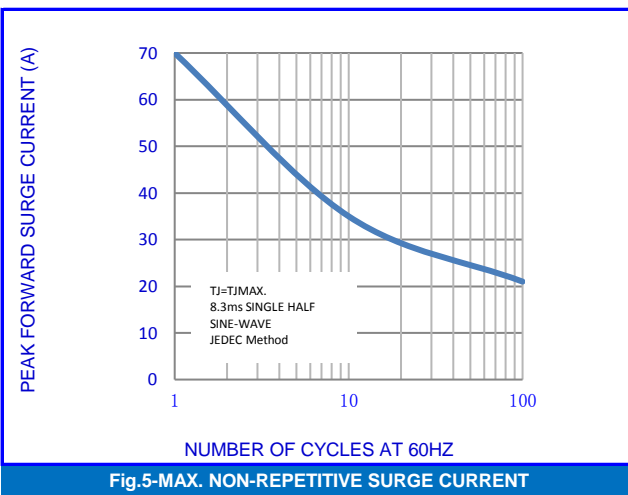


Fig.5-MAX. NON-REPETITIVE SURGE CURRENT

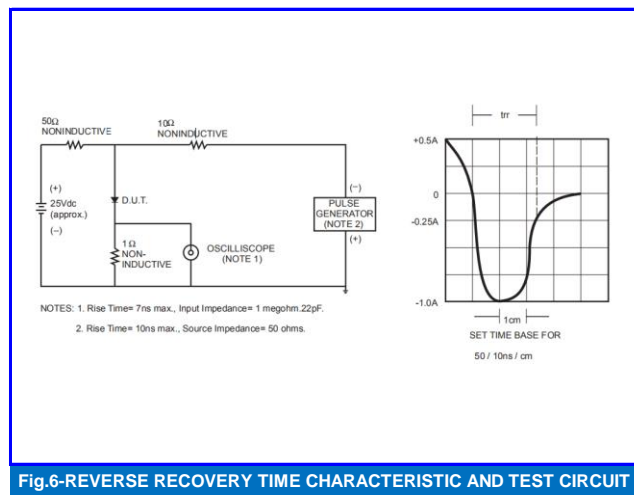


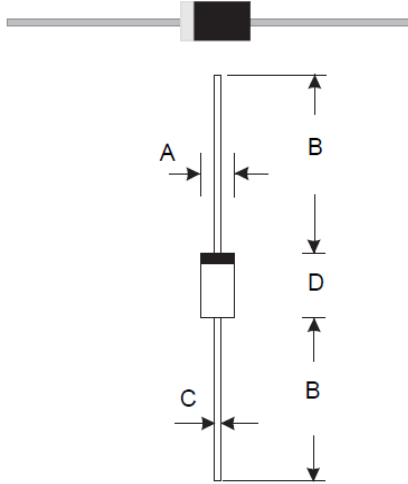
Fig.6-REVERSE RECOVERY TIME CHARACTERISTIC AND TEST CIRCUIT

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**OUTLINE DRAWINGS**

**DO-15**



**OUTLINE DIMENSIONS**

Dim.	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	2.6	-	3.6	0.104	-	0.140
B	24.0	-	27.0	0.945	-	1.063
C	0.7	-	0.9	0.028	-	0.035
D	5.8	-	7.6	0.230	-	0.300

**Packing Information**

Package	Pack	Box Size L×W×H(mm)	Quantity (pcs/box)	Carton Size L×W×H(mm)	Quantity (pcs/carton)
DO-15	B/G	250*75*140	3000	420*280*310	30000

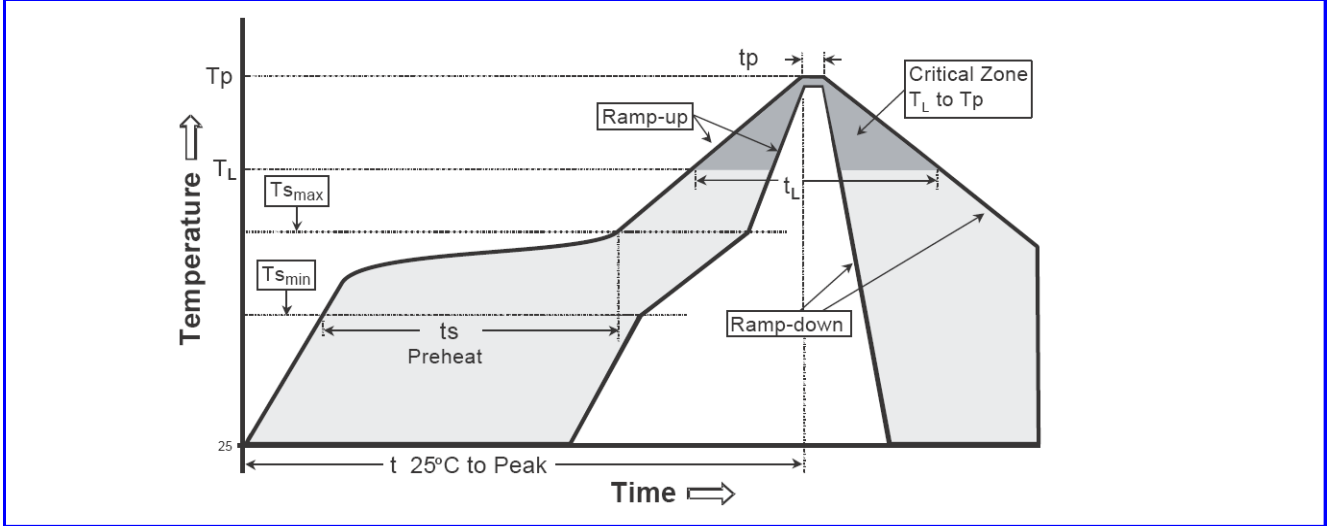
**FR201 THRU FR207**  
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**Recommended wave soldering condition**

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 (T <sub>smax</sub> to T <sub>p</sub> )	3°C/second max.	3°C/second max.
Preheat -Temperature Min(T <sub>S</sub> min) -Temperature Max(T <sub>S</sub> max) -Time(t <sub>s</sub> min to t <sub>s</sub> max)	100°C 150°C 60-120 seconds	150°C 200°C 60-180 seconds
Time maintained above: -Temperature (T <sub>L</sub> ) - Time (t <sub>L</sub> )	183°C 60-150 seconds	217°C 60-150 seconds
Peak Temperature(T <sub>P</sub> )	240 +0/-5 °C	260 +0/-5 °C
Time within 5°C of actual peak temperature(t <sub>p</sub> )	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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