

US1A THRU US1M

SURFACE MOUNT ULTRAFAST RECTIFIERS



VOLTAGE: 50~1000 Volts

CURRENT: 1.0 Amperes

SMA(DO-214AC)

Marking and Polarity

FEATURES

- The plastic package carries Underwriters Laboratory Flammability Classification 94V-0
- Idea for printed circuit board
- Glass passivated Junction chip
- Low reverse leakage
- High forward surge current capability
- High temperature soldering guaranteed 250°C/10 seconds at terminals

MECHANICAL DATA

- **Case:** Molded Plastic
- **Epoxy:** UL 94V-0 rate flame retardant
- **Polarity :** Polarity symbol marking on body
- **Mounting position:** Any
- **Weight:** App. 0.063 grams (0.0022 ounce)

TYPICAL APPLICATIONS

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



Remark:

- (1).NH=niuhang trademark;
- (2).FF=Production line,According to actual changes;
YMM=Period code,According to actual changes;
- (3).US1X=Modle;X=A,B,D,G,J,K,M
- (4).White edge=Polarity mark

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

Parameter	Symbol	US 1A	US 1B	US 1D	US 1G	US 1J	US 1K	US 1M	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)	$I_{F(AV)}$	1.0							A	
Peak forward surge current 8.3ms single half sine-wave superimposed on rated load (JEDEC method at rated TL)	I_{FSM}	30							A	
Maximum instantaneous forward voltage at 1.0 A (Note 1)	V_F	1	1.4		1.7				V	
Maximum instantaneous reversecurrent at rated DC blockingvoltage (Note 2)	I_{RRM}	5 100							uA	
Maximum Reverse Recovery Time (Note 3)	T_{RR}	50				75				nS
Typical junction capacitance (Note 4)	C_J	15							pF	
Operating junction and Storage temperature range	T_J	-55 to +150							°C	
Storage temperature range	T_{STG}	-55 to +150								

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

Parameter	Symbol	US1A THRU US1M	Unit
Typical thermal resistance (Note 5)	$R_{\theta JA}$	50	°C/W
	$R_{\theta JL}$	15	

Note: 1.Pulse test: 300 μs pulse width,1% duty cycle

2.Pulse test: pulse width≤40ms

3. Reverse Recovery Time test condition: IF=0.5A, IR=1.0A, IRR=0.25A

4.Measured at 1MHz and applied reverse voltage of 4.0V D.C.

5.Thermal resistance from junction to lead vertical P.C.B. mounted , 0.375"(9.5mm)lead length

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RATING AND CHARACTERISTIC CURVES

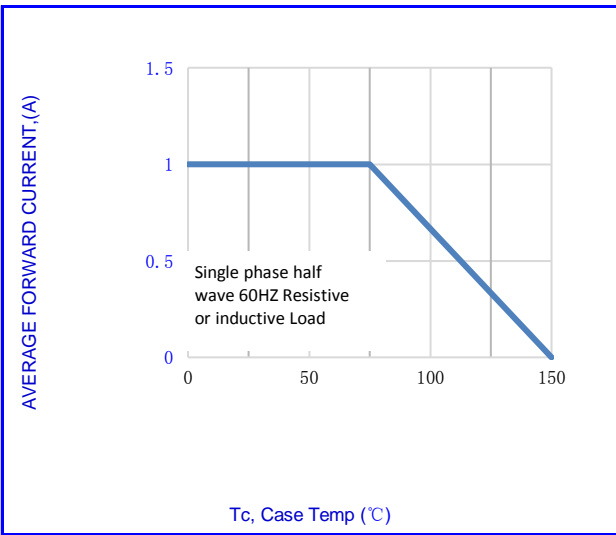


Fig.1-FORWARD CURRENT DERATING CURVE

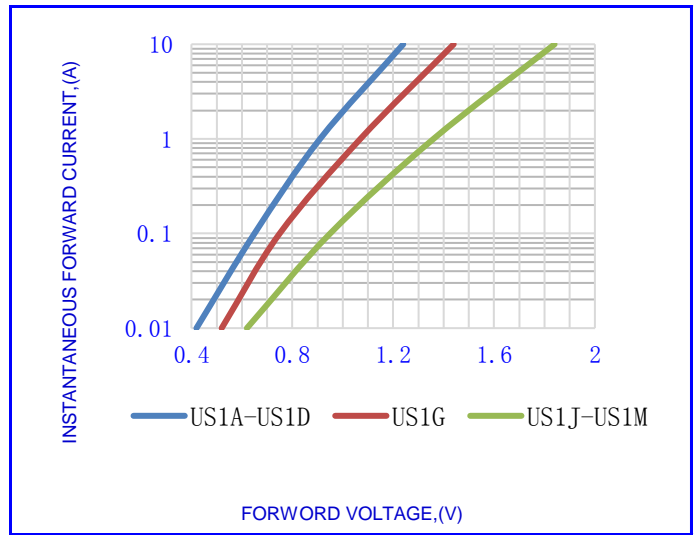


Fig.2- TYPICAL INSTANTANEOUS FORWARD

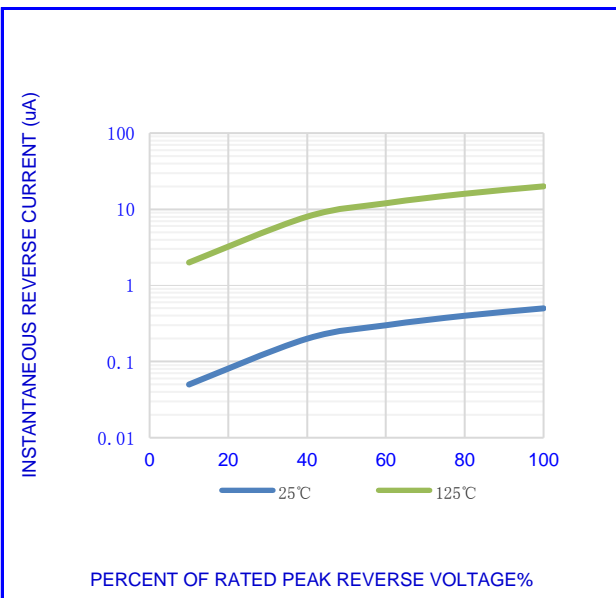


Fig.3- TYPICAL REVERSE CHARACTERISTICS

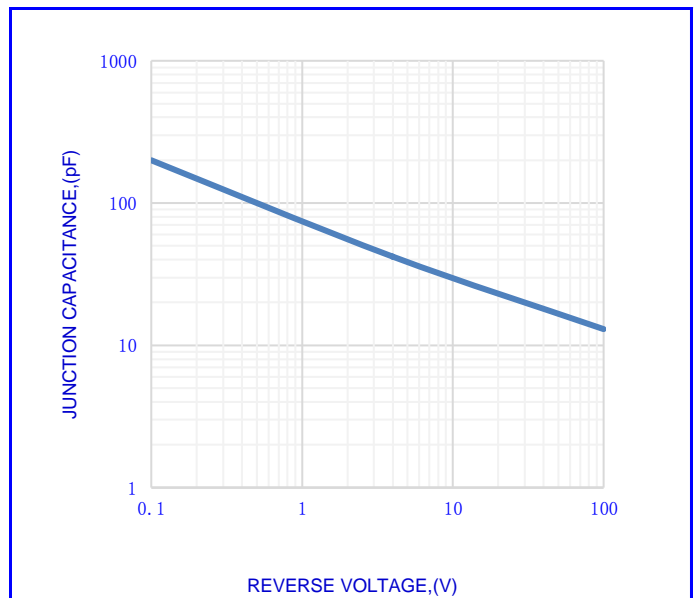


Fig.4- TYPICAL JUNCTION CAPACITANCE

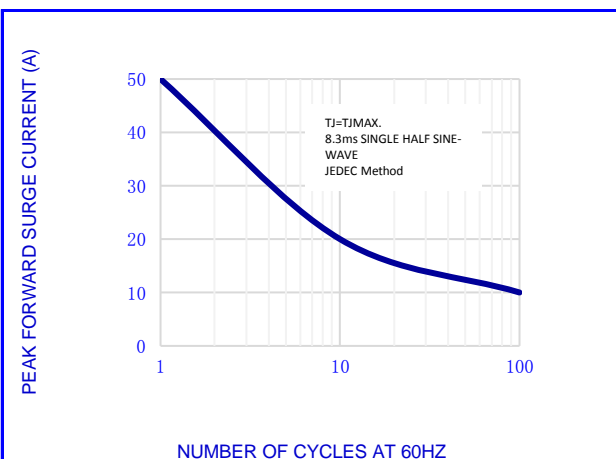


Fig.5-MAX. NON-REPETITIVE SURGE CURRENT

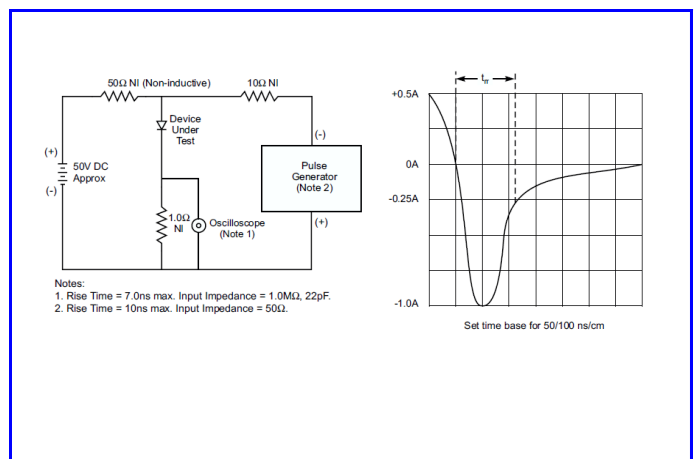


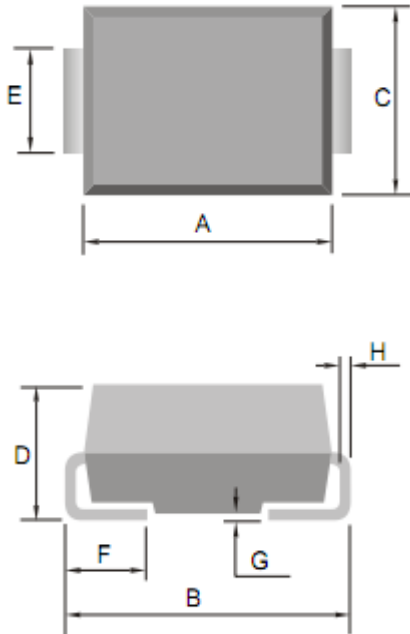
Fig.6-REVERSE RECOVERY TIME CHARACTERISTIC AND TEST CIRCUIT

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OUTLINE DRAWINGS

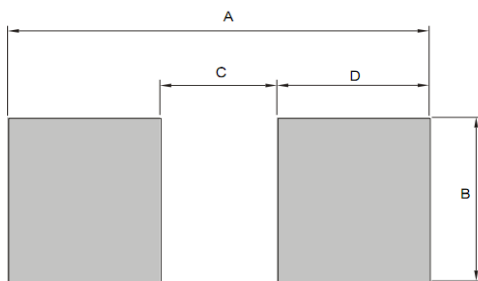
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OUTLINE DIMENSIONS						
Dim.	Milimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	4.000	-	4.600	0.181	-	0.157
B	4.700	-	5.280	0.185	-	0.208
C	2.400	-	2.800	0.094	-	0.110
D	1.900	-	2.400	0.075	-	0.094
E	1.300	-	1.500	0.051	-	0.059
F	0.760	-	1.520	0.030	-	0.060
G	0.100	-	0.250	0.004	-	0.010
H	0.150	-	0.305	0.006	-	0.012

RECOMMENDED LAYOUT DRAWINGS

SMA(DO-214AC)



RECOMMENDED MOUNTING PAD DIMENSIONS						
Dim.	Milimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	-	5.800	-	-	0.228	-
B	-	2.060	-	-	0.081	-
C	-	1.660	-	-	0.065	-
D	-	2.070	-	-	0.082	-

PACKING INFORMATION

SMA(DO-214AC)

Package Method	Reel Size (mm)	Quantity (pcs/reel)	Inner Box Size	Quantity (pcs/Inner Box)	Carton Size LxWxH(mm)	Quantity (pcs/carton)
Tape Reel	Φ330	5000	340x340x45	10000	360x360x470	100000

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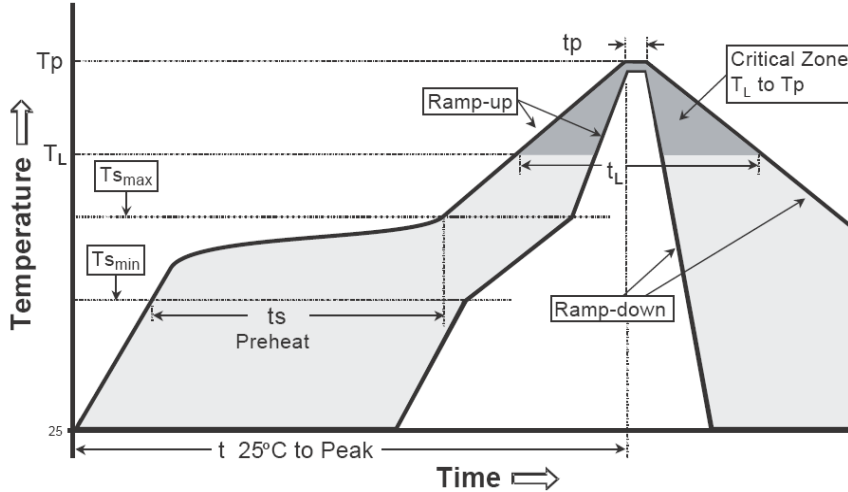
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Recommended wave soldering condition

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 (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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