

ES1E

SURFACE MOUNT SUPER FAST RECOVERY RECTIFIERS



VOLTAGE: 300 Volts

CURRENT: 1.0 Amperes

SMA(DO-214AC)

Marking and Polarity

FEATURES

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

MECHANICAL DATA

- **Terminals:** Plated Leads Solderable per MIL-STD-202, Method 208
- **Mounting Position:** Any
- **Lead Free:** Lead Free Finish, RoHS Compliant
- **Weight:** App. 0.063 grams (0.0022 ounce)

TYPICAL APPLICATIONS

- For use in high frequency inverter, AC/DC converter, DC/DC converter, LED driver etc. applications



Remark:

- ①. ES1E=Model,
- ②. NH=niu hang trademark
- ③. FF=Product line, According to actual changes;
YWW=Periodic code, According to actual changes;
- ④. White band denotes cathode

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

Parameter	Symbol	ES1E	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 (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

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

Parameter	Test Conditions	Symbol	ES1E	Unit
Maximum instantaneous forward voltage (Note 1)	Ta=25°C IF= 1.0 A	V_F	1.25	V
Maximum instantaneous reverse current at rated DC blocking voltage (Note 1)	Ta=25°C @ V_{RRM}	I_{RRM}	5	uA
	Ta=125°C @ 80%* V_{RRM}		100	
Maximum reverse recovery time	$I_F=0.5A, I_R=1.0A, I_{RR}=0.25A$	T_{RR}	35	ns
Typical junction capacitance	4V, 1MHz	C_J	15	pF

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

Parameter	Symbol	ES1E	Unit
Operating junction and storage temperature range	T_J	-55 to 150	°C
Storage temperature range	T_{STG}	-55 to 150	
Typical thermal resistance (Note 2)	$R_{\theta JA}$	85	°C/W
	$R_{\theta JL}$	35	

Note: 1. Pulse width < 300 uS, Duty cycle < 2%
 2. Thermal resistance from junction to lead vertical P.C.B. mounted, 0.375"(9.5mm) lead length, Polyimide PCB, 2 oz Copper.
 Cathode pad dimensions 18.8x14.4mm, Anode pad dimensions- (5.6x14.4mm)

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RATING AND CHARACTERISTIC CURVES

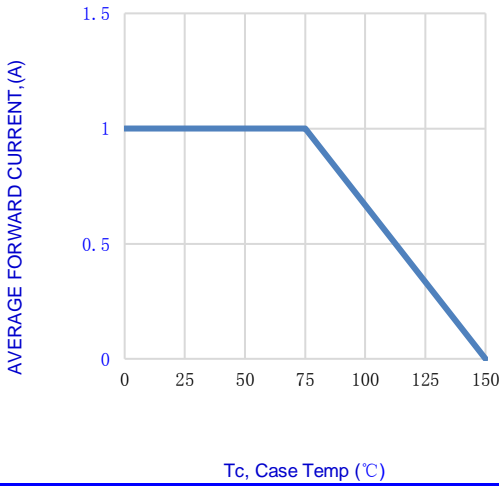


Fig.1-FORWARD CURRENT DERATING CURVE

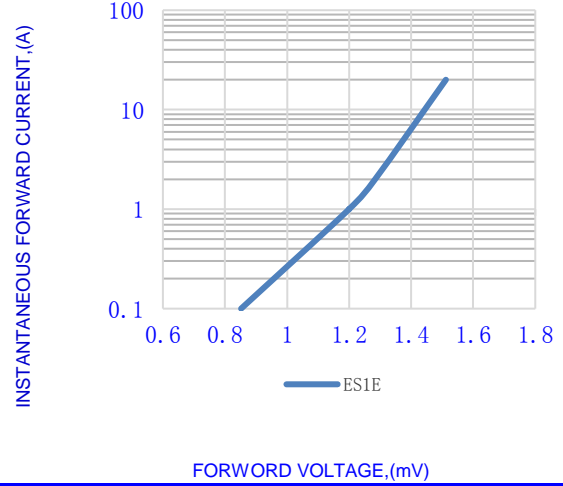


Fig.2-TYPICAL INSTANTANEOUS FORWARD

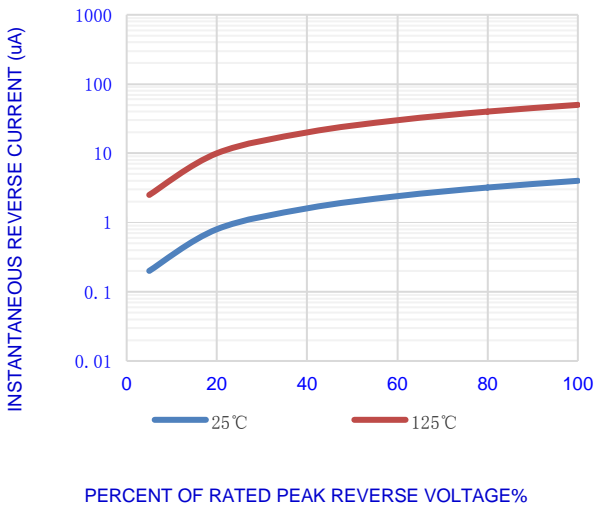


Fig.3-TYPICAL REVERSE CHARACTERISTICS

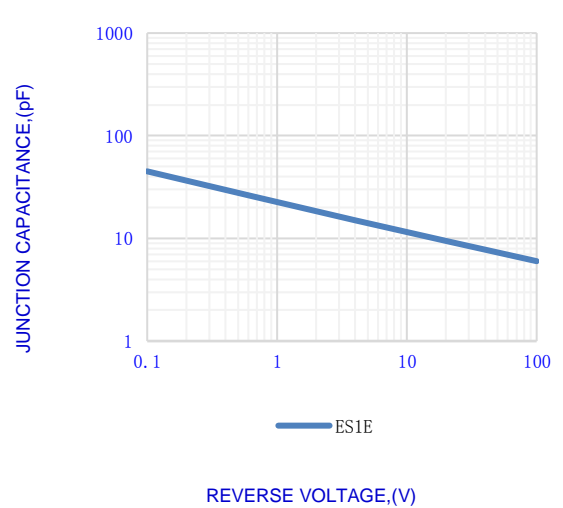


Fig.4-TYPICAL JUNCTION CAPACITANCE

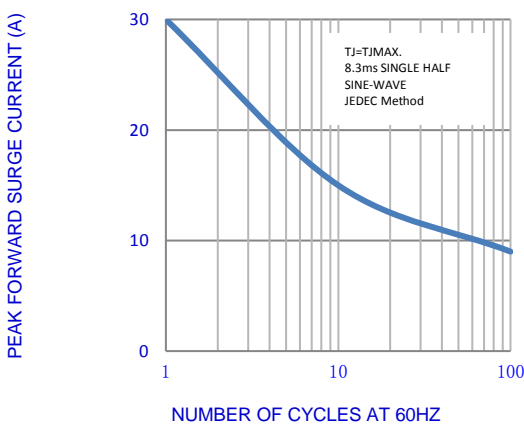


Fig.5-MAX. NON-REPETITIVE SURGE CURRENT

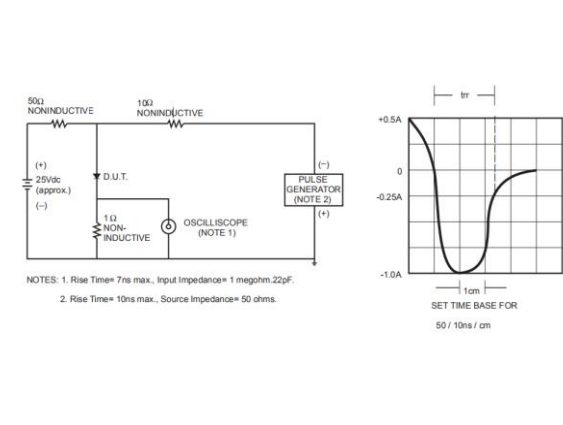


Fig.6-REVERSE RECOVERY TIME CHARACTERISTIC AND TEST CIRCUIT

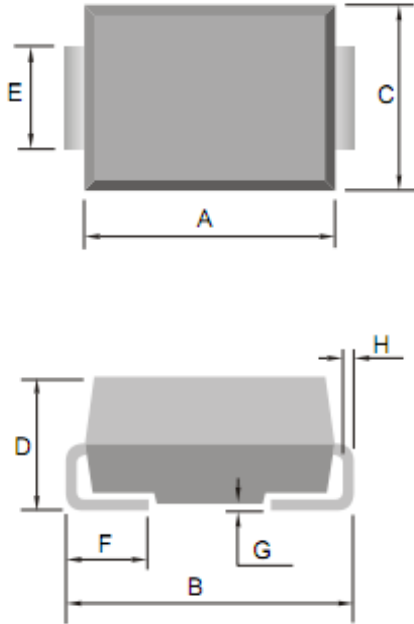
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OUTLINE DRAWINGS

SMA(DO-214AC)

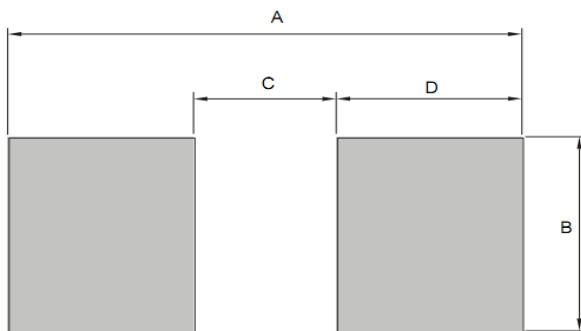


OUTLINE DIMENSIONS

Dim.	Millimeters			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.	Millimeters			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 LxWxH(mm)	Quantity (pcs/Inner Box)	Carton Size LxWxH(mm)	Quantity (pcs/carton)
Tape Reel	Φ330	5000	340x340x45	10000	360x360x470	100000

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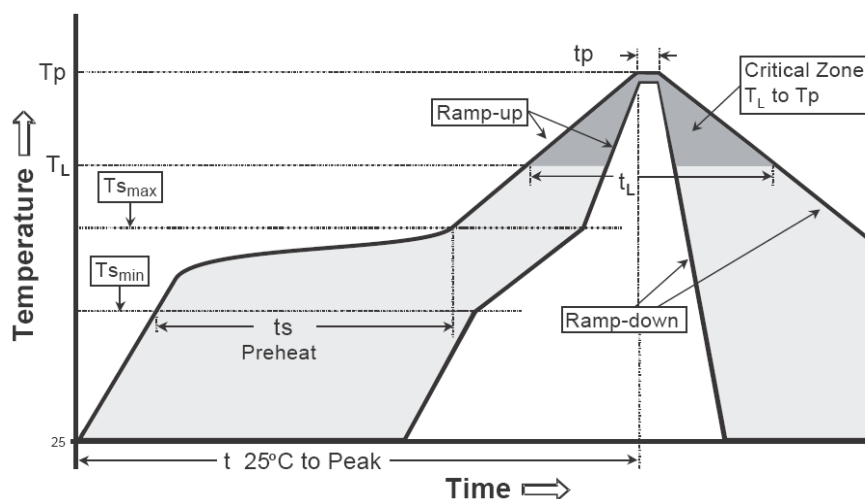


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Recommended wave soldering condition

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 (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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