


ES1A THRU ES1M

SURFACE MOUNT SUPER FAST RECOVERY RECTIFIERS



VOLTAGE: 50~1000 Volts	CURRENT: 1.0 Amperes	SMA(DO-214AC)	Marking and Polarity
FEATURES		 <p>Remark:</p> <ul style="list-style-type: none"> ①. NH=niuhang trademark ②. FF=Product line,According to actual changes; YWW=Periodic code,According to actual changes; ③. ES1x=Modle,x=A,B,D,G,J,K,M ④. White band denotes cathode 	
<ul style="list-style-type: none"> ■ 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			
<ul style="list-style-type: none"> ■ 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			
<ul style="list-style-type: none"> ■ For use in high frequency inverter, AC/DC converter, DC/DC converter, LED driver etc. applications 			

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

Parameter	Symbol	ES1A	ES1B	ES1D	ES1G	ES1J	ES1K	ES1M	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)(see fig.5)	I_{FSM}	30					20		A
Current Squared Time Per Diode($t < 8.3ms$)	I^2t	3.74					1.66		A ² sec

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

Parameter	Test Conditions		Symbol	ES1A	ES1B	ES1D	ES1G	ES1J	ES1K	ES1M	Unit
Maximum instantaneous forward voltage (see fig.2) (Note 1)	$T_A=25^\circ C$	$I_F=1.0 A$	V_F	0.95			1.25	1.68	1.95	3.50	V
Maximum instantaneous reverse current at rated DC blocking voltage (see fig.3)(Note 1)	$T_A=25^\circ C$	$V_R=V_{RRM}$	I_R	5							uA
	$T_A=125^\circ C$	$V_R=80\%V_{RRM}$		100							
Maximum Reverse Recovery Time	$I_F=0.5A, I_R=1.0A, I_{RR}=0.25A$		T_{RR}	35							ns
Typical junction capacitance(see fig.4)	4V,1MHz		C_J	10					5		pF

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

Parameter	Symbol	ES1A	ES1B	ES1D	ES1G	ES1J	ES1K	ES1M	Unit	
Operating junction	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	
	$R_{\theta JC}$	35								

Note: 1.Pulse width < 300 uS, Duty cycle < 2%
2.Mounted on P.C.B. with 0.2" x 0.2" (5.08 mm x 5.08 mm) copper pad areas

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RATING AND CHARACTERISTIC CURVES

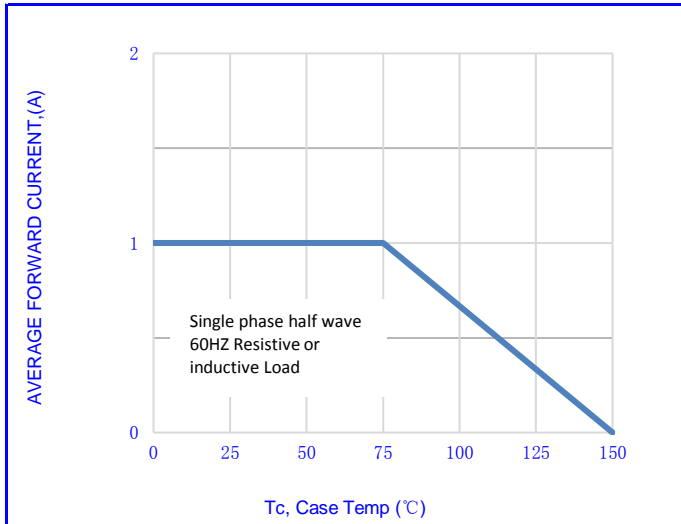


Fig.1- FORWARD CURRENT DERATING CURVE

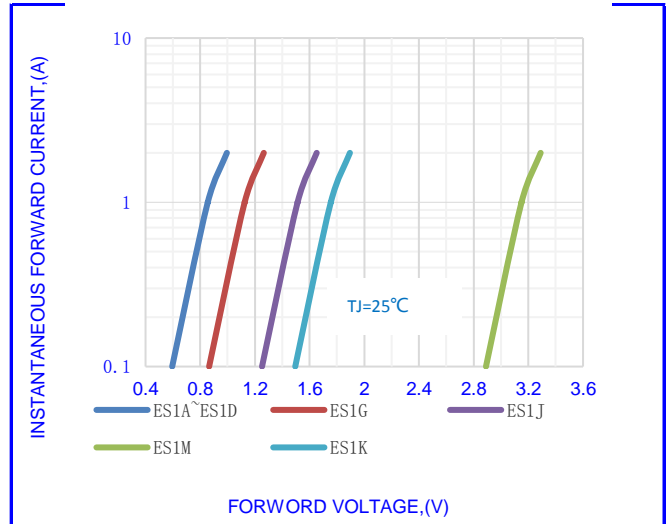


Fig.2-TYPICAL INSTANTANEOUS FORWARD

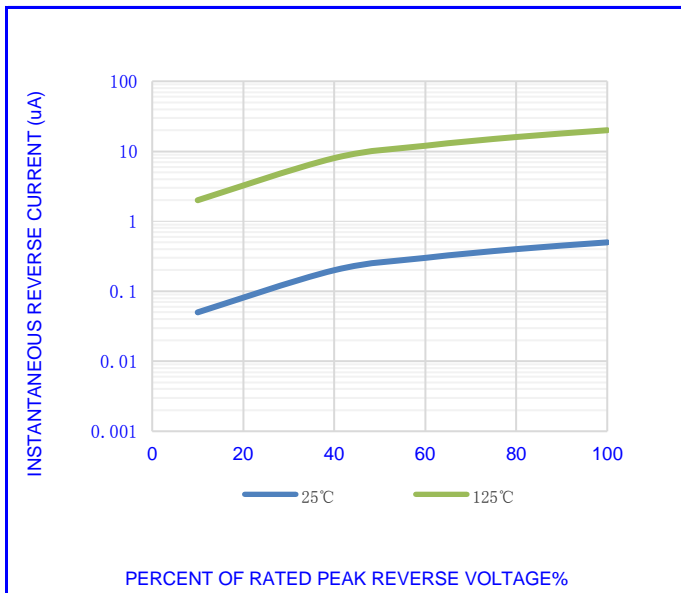


Fig.3-TYPICAL REVERSE CHARACTERISTICS

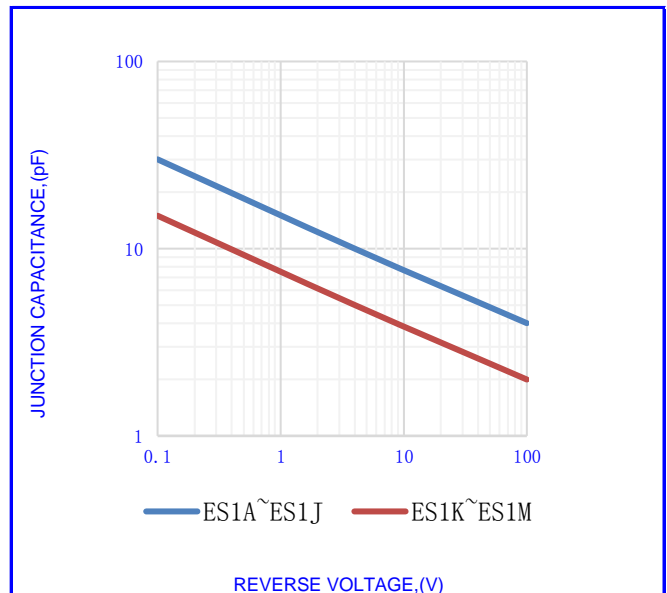


Fig.4- TYPICAL JUNCTION CAPACITANCE

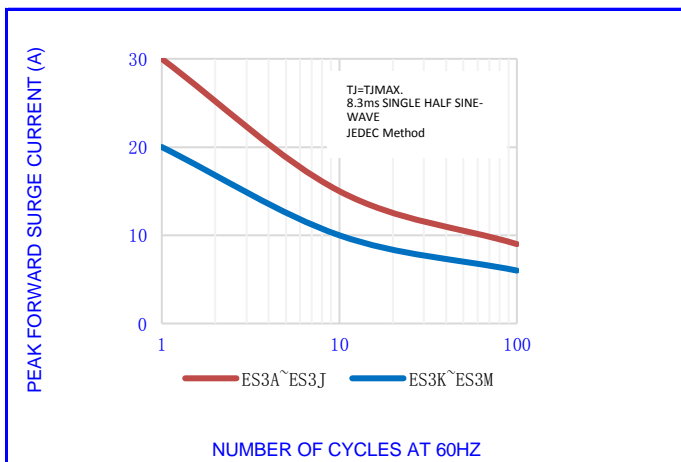


Fig.5-MAX. NON-REPETITIVE SURGE CURRENT

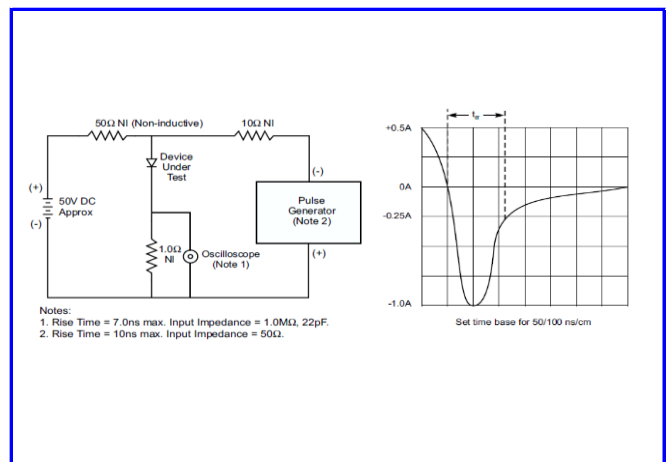


Fig.6-REVERSE RECOVERY TIME CHARACTERISTIC AND TEST CIRCUIT

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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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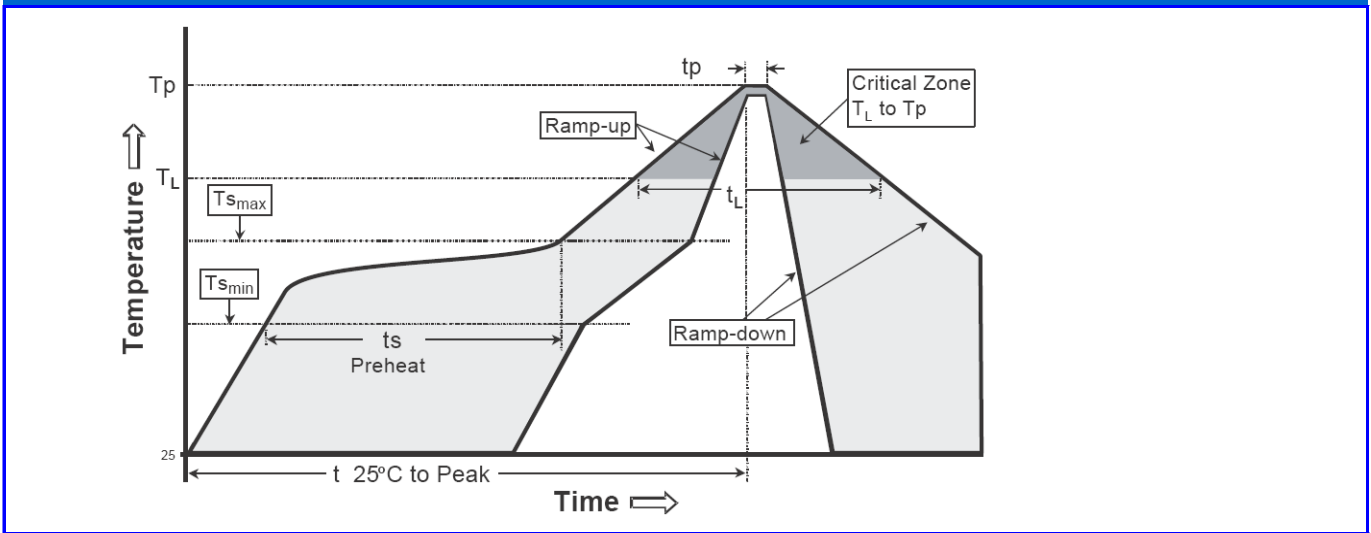
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Recommended wave soldering condition

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 (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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