

ES5AC THRU ES5MC

SURFACE MOUNT SUPER FAST RECOVERY RECTIFIERS



VOLTAGE: 50~1000 Volts

CURRENT: 5.0 Amperes

SMC(DO-214AB)

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. 0.254 grams (0.009 ounce)

TYPICAL APPLICATIONS

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



Remark:

- ①. NH=niuhang trademark
- ②. FF=Product line, According to actual changes;
YWW=Periodic code, According to actual changes;
- ③. ES5xC=Module, x=A,B,D,G,J,K,M
- ④. White band denotes cathode

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

Parameter	Symbol	ES5AC	ES5BC	ES5DC	ES5GC	ES5JC	ES5KC	ES5MC	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)	$I_{F(AV)}$	5.0							A
Peak forward surge current 8.3ms single half sine-wave superimposed on rated load (JEDEC method at rated T_L) (see fig.5)	I_{FSM}	150					120		A
Current Squared Time Per Diode ($t < 8.3ms$)	I^2t	93.38					59.76		A ² sec

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

Parameter	Test Conditions			Symbol	ES5AC	ES5BC	ES5DC	ES5GC	ES5JC	ES5KC	ES5MC	Unit
Maximum instantaneous forwardvoltage (see fig.2) (Note 1)	T _A =25℃	IF= 5.0	A	V _F	0.95			1.25	1.68	1.95	3.50	V
	T _A =125℃	IF= 5.0	A		0.90			1.20	1.60	1.90	3.40	
Maximum instantaneous reveESecurrent at rated DC blockingvoltage (see fig.3)(Note 1)	T _A =25℃	VR= V _{RRM}		I _R	5							uA
	T _A =125℃	VR= 80%*V _{RRM}			100							
Maximum ReveESe Recovery Time	IF=0.5A, IR=1.0A, IRR=0.25A			T _{RR}	35							ns
Typical junction capacitance(see fig.4)	4V,1MHz			C _J	80					35		pF

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

Parameter	Symbol	ES5AC	ES5BC	ES5DC	ES5GC	ES5JC	ES5KC	ES5MC	Unit
Operating junction	T _J	-55 to 150							°C
Storage temperature range	T _{STG}	-55 to 150							
Typical thermal resistance (Note 2)	R _{θJA}	45							°C/W
	R _{θJC}	10							

Note: 1. Pulse width < 300 uS, Duty cycle < 2%

2. Mounted on P.C.B. with 0.6" x 0.6" (15.24 mm x 15.24 mm) copper pad areas

ES5AC THRU ES5MC

SURFACE MOUNT SUPER FAST RECOVERY RECTIFIERS



RATING AND CHARACTERISTIC CURVES

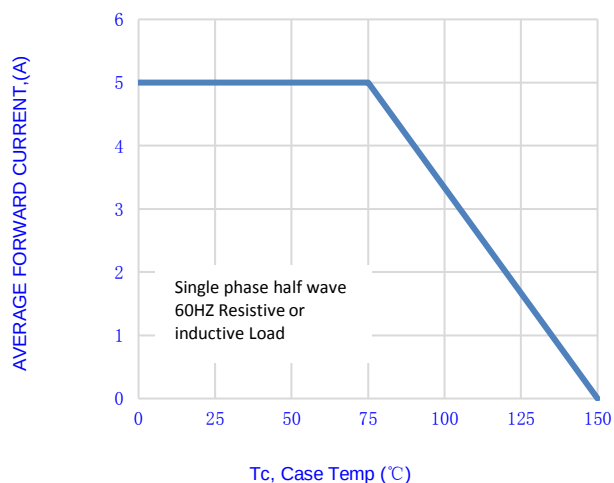


Fig.1- FORWARD CURRENT DERATING CURVE

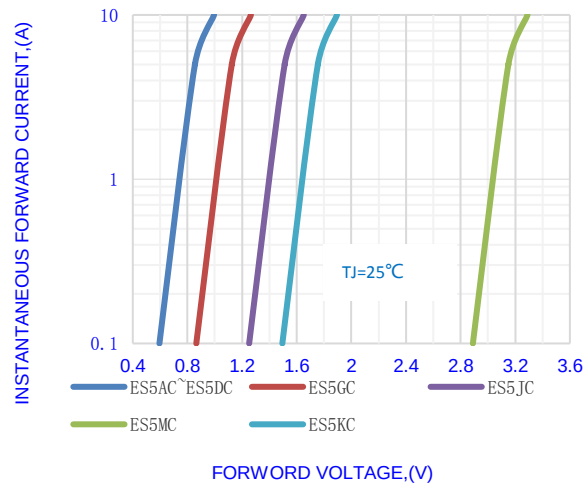


Fig.2-TYPICAL INSTANTANEOUS FORWARD

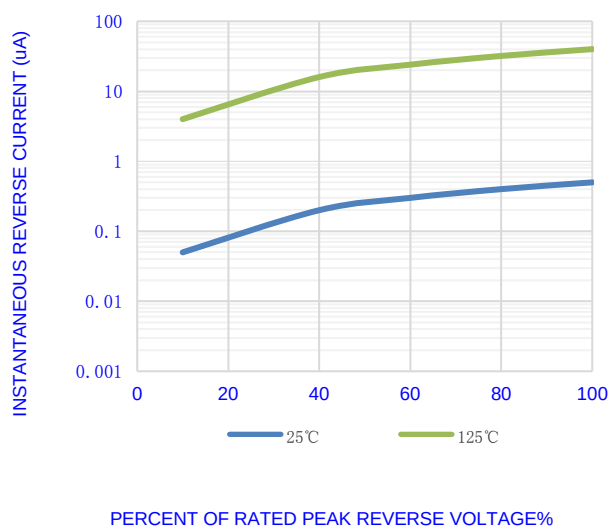


Fig.3-TYPICAL REVERSE CHARACTERISTICS

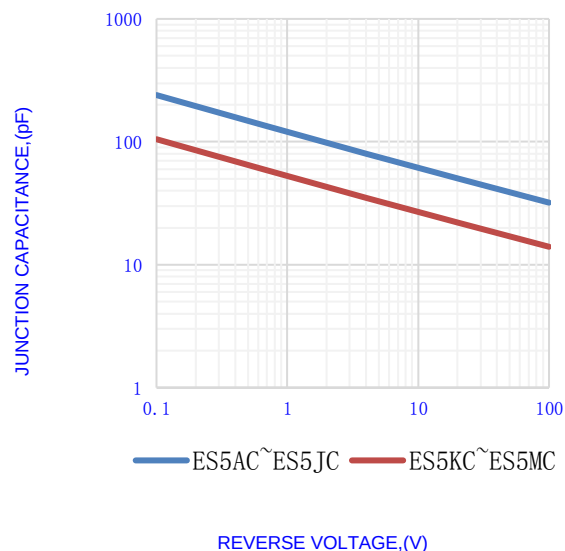


Fig.4- TYPICAL JUNCTION CAPACITANCE

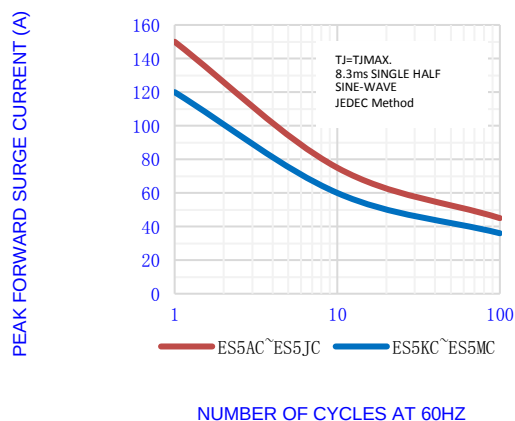
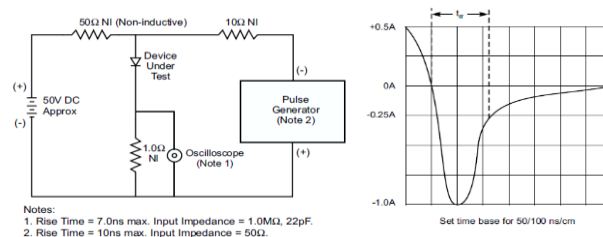


Fig.5-MAX. NON-REPETITIVE SURGE CURRENT



Notes:
1. Rise Time = 7.0ns max. Input Impedance = 1.0MΩ, 22pF.
2. Rise Time = 10ns max. Input Impedance = 50Ω.

Fig.6-REVERSE RECOVERY TIME CHARACTERISTIC AND TEST CIRCUIT

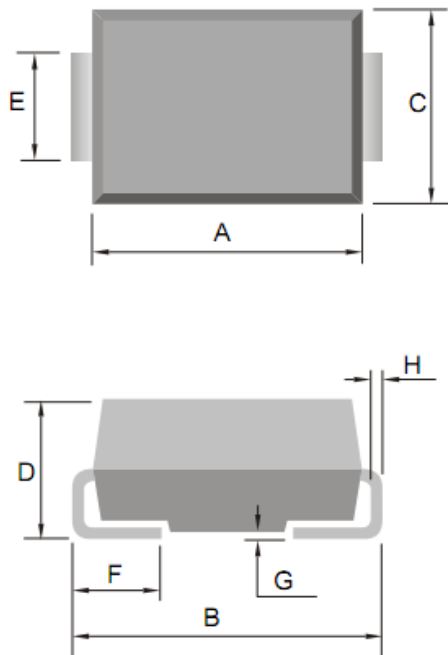
ES5AC THRU ES5MC

SURFACE MOUNT SUPER FAST RECOVERY RECTIFIERS



OUTLINE DRAWINGS

SMC(DO-214AB)

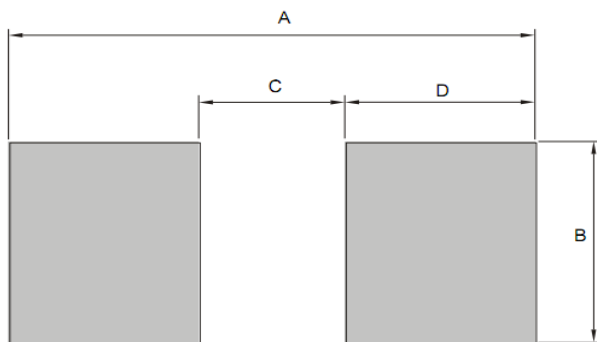


OUTLINE DIMENSIONS

Dim.	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	6.600	-	7.110	0.260	-	0.280
B	7.750	-	8.130	0.305	-	0.320
C	5.590	-	6.220	0.220	-	0.245
D	2.000	-	2.620	0.079	-	0.103
E	2.750	-	3.250	0.108	-	0.128
F	0.760	-	1.520	0.030	-	0.060
G	0.051	-	0.203	0.002	-	0.008
H	0.152	-	0.305	0.006	-	0.012

RECOMMENDED LAYOUT DRAWINGS

SMC(DO-214AB)



RECOMMENDED MOUNTING PAD DIMENSIONS

Dim.	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	-	9.900	-	-	0.390	-
B	-	3.820	-	-	0.150	-
C	-	3.840	-	-	0.151	-
D	-	3.030	-	-	0.119	-

PACKING INFORMATION

SMC(DO-214AB)

Package Method	Reel Size (mm)	Quantity (pcs/reel)	Inner Box Size L×W×H(mm)	Quantity (pcs/Inner Box)	Carton Size L×W×H(mm)	Quantity (pcs/carton)
Tape Reel	Φ330	3000	340×340×45	6000	360×360×470	60000

ES5AC THRU ES5MC

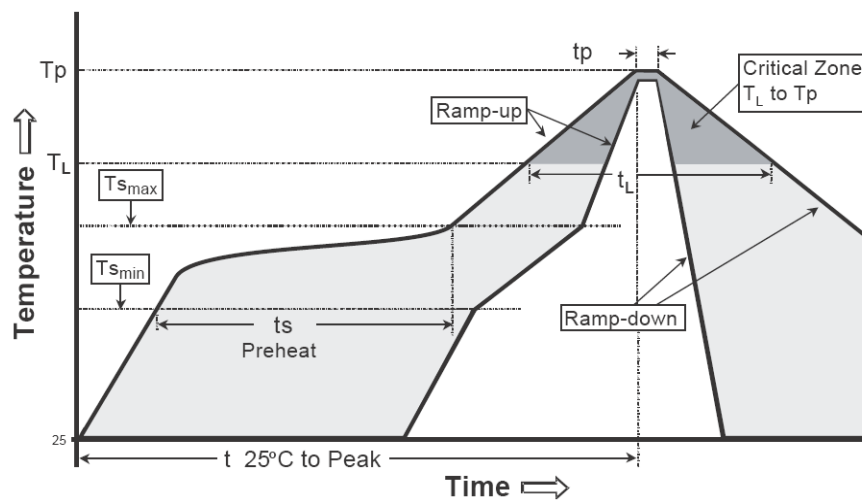
SURFACE MOUNT SUPER FAST RECOVERY RECTIFIERS



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.

ES5AC THRU ES5MC

SURFACE MOUNT SUPER FAST RECOVERY RECTIFIERS



Disclaimer

- Reproducing and modifying information of the document is prohibited without permission from niuhang Electronics co., LTD
- Niuhan Electronics co., LTD. reserves the rights to make changes of the content herein the document anytime without notification.
- Niuhan Electronics co., LTD. disclaims any and all liability arising out of the application or use of any product including damages incidentally and consequentially occurred.
- Niuhan Electronics co., LTD. does not assume any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.
- Applications shown on the herein document are examples of standard use and operation. Customers are responsible in comprehending the suitable use in particular applications. Niuhan Electronics co., LTD. makes no representation or warranty that such applications will be suitable for the specified use without further testing or modification.
- The products shown herein are not designed and authorized for equipments requiring high level of reliability or relating to human life and for any applications concerning life-saving or life-sustaining, such as medical instruments, transportation equipment, aerospace machinery et cetera. Customers using or selling these products for use in such applications do so at their own risk and agree to fully indemnify Niuhan Electronics co., LTD. for any damages resulting from such improper use or sale.
- When the appearance of the product and chip size does not change, in order to product the customer quality, change the internal structure and the production process Niuhan can not notify