

ES10J

Ultrafast Soft Recovery Rectifier



Voltage: 600 Volts

Current: 10 A

Package: SMC

Features

- NH'S Epiraxial Chip Technology
- Low Switching Loss For High Efficiency
- Low Leakage Current For High Reliability
- Ultra Fast Soft Switching Feature

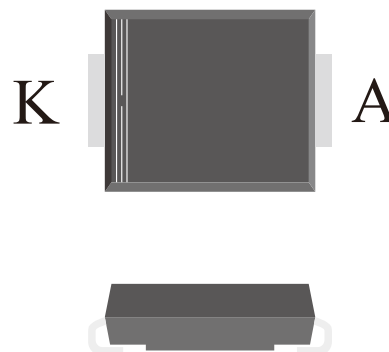
Mechanical Data

- **Case:** Molded With UL-94 ClassV-0 Recognized, RoHS-Compliant
- **Polarity:** Look At The Diagram And Polarity On The Right
- **Terminals:** Tin Plated Leads,Solderable Per J-STD-002 And JESD22-B102

Typical Applications

- Switch Mode Power Supplies (SMPS)
- Fast Chargers
- LED Driver And Monitor Lighting
- Automotive Electronics And Charging Posts

Diagram:



Polarity:



Single Phase,Half Wave,60Hz,Resistive Or Inductive Load.For Capacitive Load,Derate Current By 20%

Maximum Ratings (Ta=25°C Unless Otherwise Specified)

Parameter	Test Conditions	Symbol	Ratings	Unit
Maximum Repetitive Peak Reverse Voltage		V_{RRM}	600	V
Maximum RMS Voltag		V_{RMS}	420	V
Maximum DC Blocking Voltage		V_{DC}	600	V
Maximum Average Forward Rectified Current		$I_{F(AV)}$	10	A
Peak Forward Surge Current	8.3ms Single Half Sine-wave Superimposed On Rate Load	I_{FSM}	200	A
Current Squared Time	$t < 8.3ms$	I^2t	166.0	A ² sec

Electrical Characteristics (Ta=25°C Unless Otherwise Specified)

Parameter	Test Conditions	Symbol	Ratings			Unit
			Min.	Typ.	Max.	
Instaneous Forward Voltage Per Diode	$I_F = 10.0 A$	V_F	--	1.35	1.70	V
Maximum DC Reverse Current at Rated DC Blocking Voltage	Ta=25°C , $V_R = V_{RRM}$	I_{RRM}	--	1	5	uA
	Ta=125°C , $V_R = V_{RRM} * 80\%$		--	25	200	uA
Typical Junction Capacitance	4 V,1MHz	C_J	--	45	--	pF
Maximum Reverse Recovery Time	IF=0.5A, IR=1.0A, IRR=0.25A	T_{rr}	--	35	--	nS

Thermal Characteristics (Ta=25°C Unless Otherwise Specified)

Parameter	Test Conditions	Symbol	Ratings	Unit
Operating Junction Temperature Range		T_J	-55 to 150	°C
Storage Temperature Range		T_{STD}	-55 to 150	
Thermal Resistance Junction To Ambient With Steady-State	Still Air Environment With Ta=25°C	$R_{\theta JA}$	50.0	°C/W
Thermal Resistance Junction-Case With Steady-State	Device Mounted On 1 in2 FR-4 Board With 2oz. Copper	$R_{\theta JC}$	8.0	

Notes: 1.Pulse Test: 300 Us Pulse Width,1% Duty Cycle

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Typical Characteristics Curves

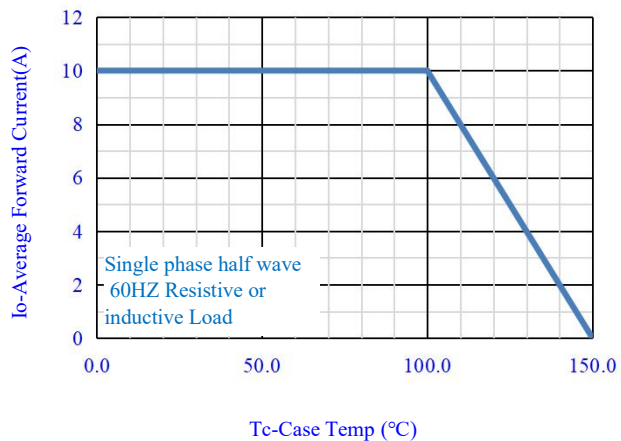


Fig.1-Forward Current Derating Curve

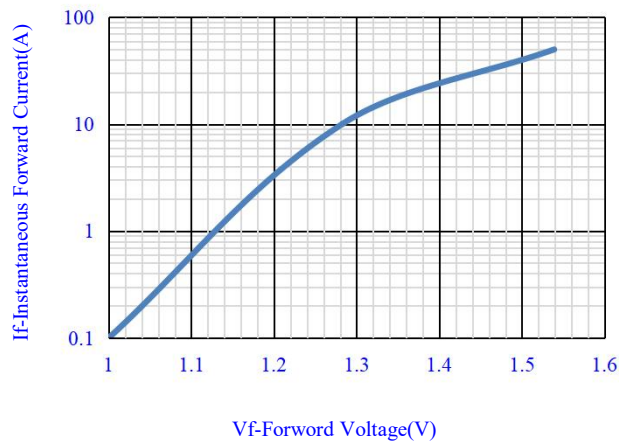


Fig.2-Typical Instantaneous Forward

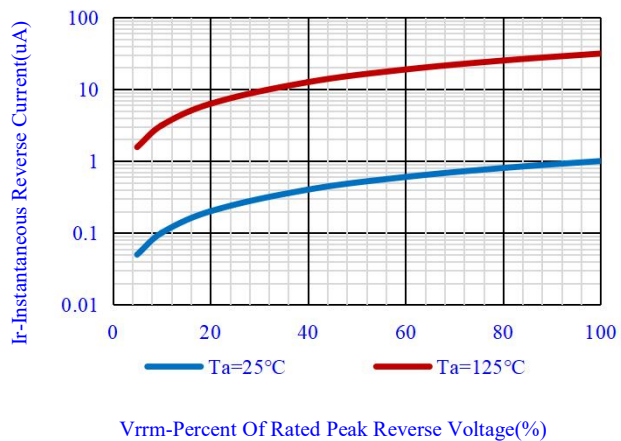


Fig.3-Typical Reverse Characteristics

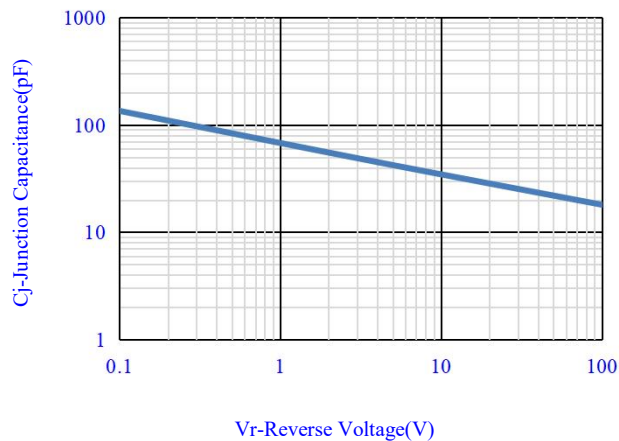


Fig.4-Typical Junction Capacitance

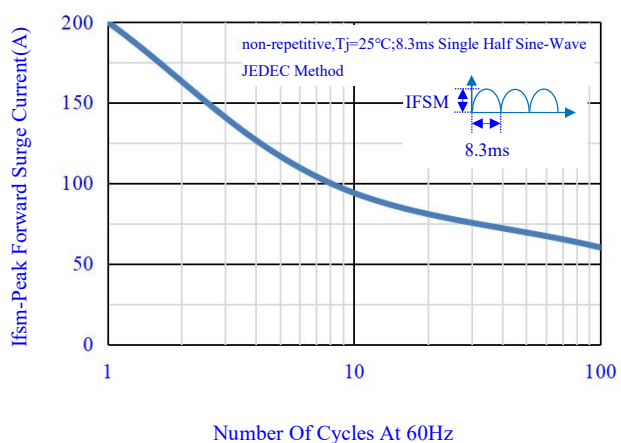


Fig.5-Max. Non-Repetitive Surge Current

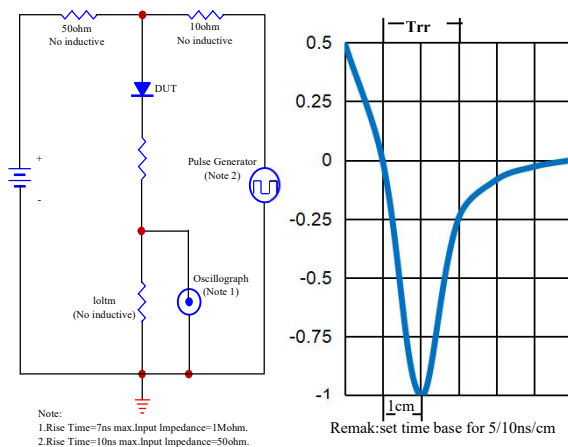


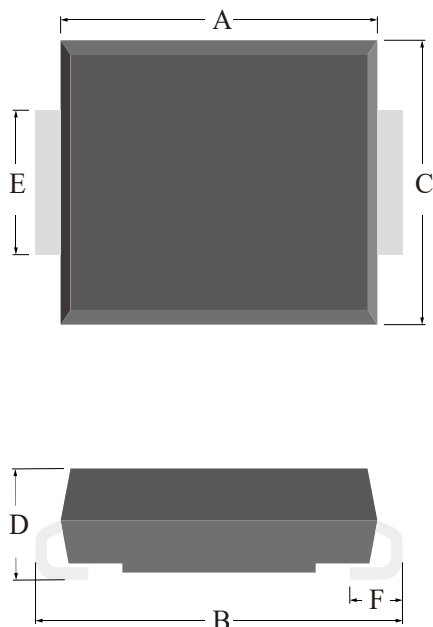
Fig.6-Reverse Recovery Time Characteristic And Test Circuit

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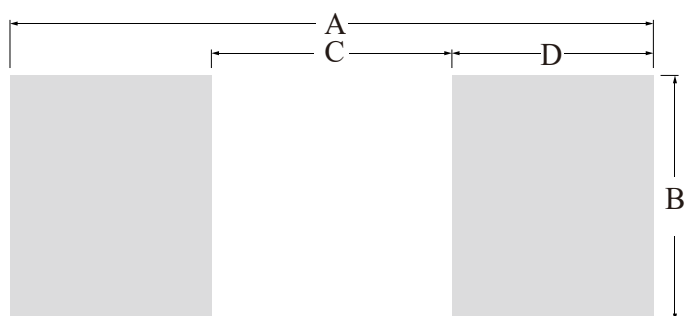
OUTLINE DRAWINGS



SMC

OUTLINE DIMENSIONS						
Dim.	Milimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	6.60	-	7.11	0.2598	-	0.2799
B	7.75	-	8.13	0.3051	-	0.3201
C	5.59	-	6.22	0.2201	-	0.2449
D	2.00	-	2.62	0.0787	-	0.1031
E	2.75	-	3.25	0.1083	-	0.1280
F	0.76	-	1.52	0.0299	-	0.0598

RECOMMENDED LAYOUT DRAWINGS



SMC

OUTLINE DIMENSIONS						
Dim.	Milimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	-	9.90	-	-	0.3898	-
B	-	3.82	-	-	0.1504	-
C	-	3.84	-	-	0.1512	-
D	-	3.03	-	-	0.1193	-

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MARKING



MARKING INSTRUCTION

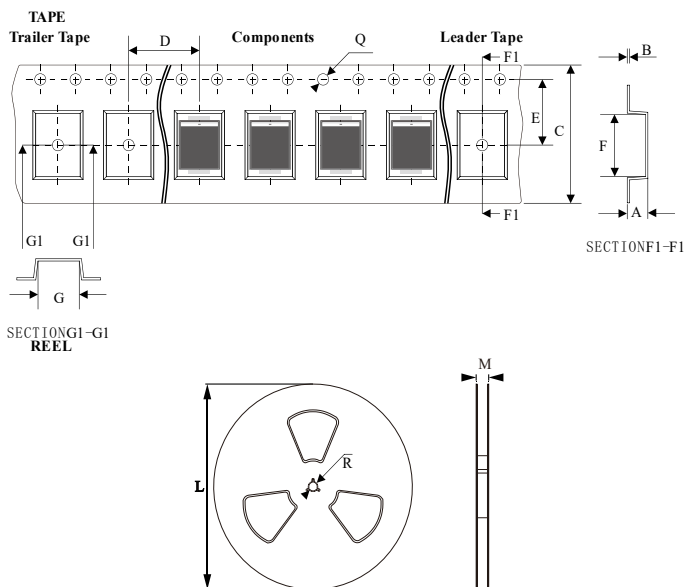
NH=Niuhan Trademark

FF=Product Line Code,According To Actual Changes

YW=Date Code,According To Actual Changes

ES10J=Model

PACKAGING



SMC

OUTLINE DIMENSIONS						
Dim.	Milimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
TAPE						
A	3.05	-	3.25	0.1201	-	0.1280
B	0.20	-	0.40	0.0079	-	0.0157
C	15.70	-	16.30	0.6181	-	0.6417
D	7.90	-	8.10	0.3110	-	0.3189
E	7.40	-	7.60	0.2913	-	0.2992
F	8.20	-	8.40	0.3228	-	0.3307
G	6.17	-	6.37	0.2429	-	0.2508
Q Φ	1.45	-	1.55	0.0571	-	0.0610
REEL						
L	328.00	-	332.00	12.913	-	13.071
R	13.00	-	14.00	0.5118	-	0.5512
M	15.00	-	17.00	0.5906	-	0.6693

PACKING INFORMATION

Package Type	Package Code	Product Weight Approx(g/Pcs)	Package Method	Quantity (Pcs/Min. Pack.)	Quantity (Pcs/Inner Box)	Quantity (Pcs/Carton)
SMC	P1	0.254	13" Reel	3000	6000	48000

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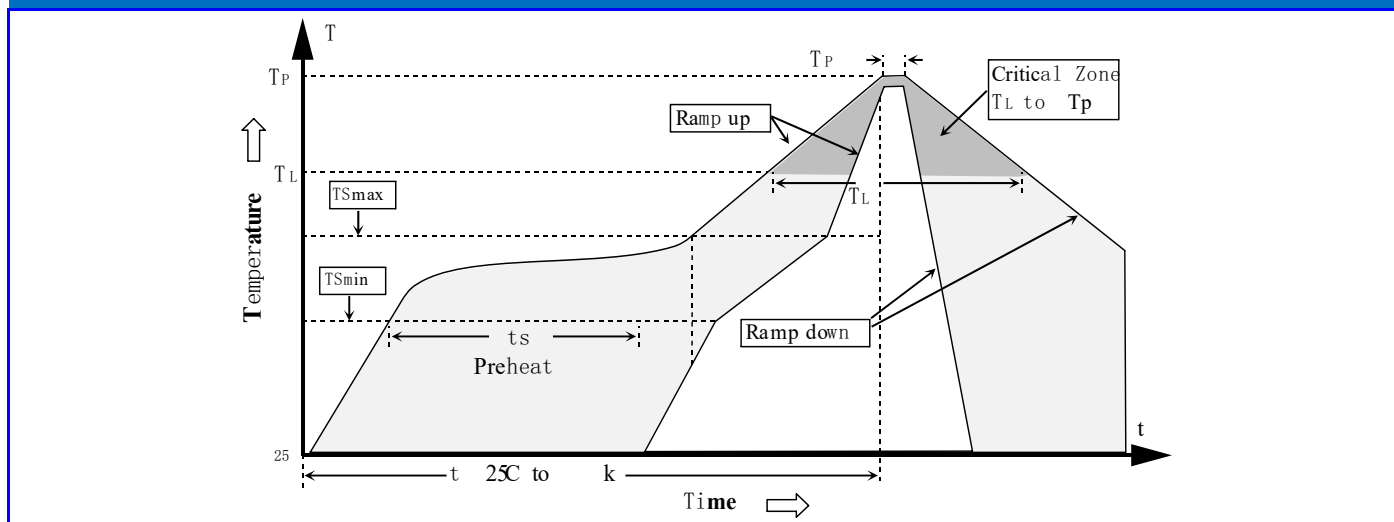
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Recommended wave soldering condition

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 (T _{smax} to T _p)	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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