

US1A TO US1M
High Efficiency Rectifier



Voltage:	50~1000 Volts	Current:	1 Amperes	Polarity And Marking	Package:	SMA
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Features

- NH'S High Efficiency Rectifier Chip Technology
- Low Switching Loss For High Efficiency
- Low Leakage Current For High Reliability
- Ultra Fast Switching Speed

Mechanical Data

- Case:** Molded With UL-94 Class V-0 Recognized, RoHS-Compliant
- Polarity:** Look At The Polarity And Marking On The Right
- Terminals:** Tin Plated Leads, Solderable Per J-STD-002 And JESD22-B102
- Weight:** App. 0.063 Grams (0.06049 Ounce)

Typical Applications

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



Remark:

- NH=Niuhang Trademark
- FF=Product Line Code, According To Actual Changes
YWW=Date Code, According To Actual Changes
- US1x=Model, x=A, B, D, G, J, K, M
- White band denotes cathode

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	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	@TC= 100 °C	$I_{F(AV)}$	1							A
Peak Forward Surge Current	8.3ms Single Half Sine-wave Superimposed On Rate Load	I_{FSM}	30							A
Current Squared Time	t< 8.3 ms	I^2t	3.7							A ² sec

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

Parameter	Test Conditions	Symbol	US 1A	US 1B	US 1D	US 1G	US 1J	US 1K	US 1M	Unit
Maximum Instantaneous Forward Voltage	Ta=25°C Ta=125°C If= 1.0 A	V_F	1.00			1.30	1.70			V
			0.96			1.26	1.66			
Maximum DC Reverse Current at Rated DC Blocking Voltage	Ta=25°C Ta=125°C $V_R = V_{RRM}$ $V_R = V_{RRM}$	I_{RRM}	5			200				uA
Typical Junction Capacitance	4 V, 1MHz	C_J	18			12	8			pF
Maximum Reverse Recovery Time	IF=0.5A, IR=1.0A, IRR=0.25A	T_{rr}	50				75			nS

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

Parameter	Test Conditions	Symbol	US 1A	US 1B	US 1D	US 1G	US 1J	US 1K	US 1M	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	$R_{\theta JA}$	78.0							°C/W
Thermal Resistance Junction-Case With Steady-State	Device Mounted On 1 in2 FR-4 Board With 2oz. Copper	$R_{\theta JC}$	22.0							

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

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Typical Characteristics Curves

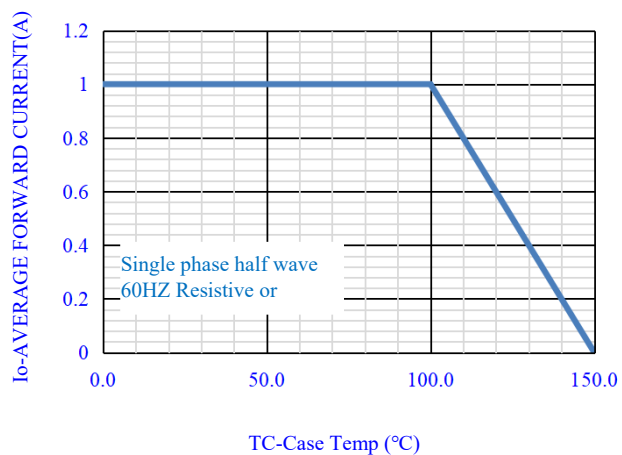


Fig.1-FORWARD CURRENT DERATING CURVE

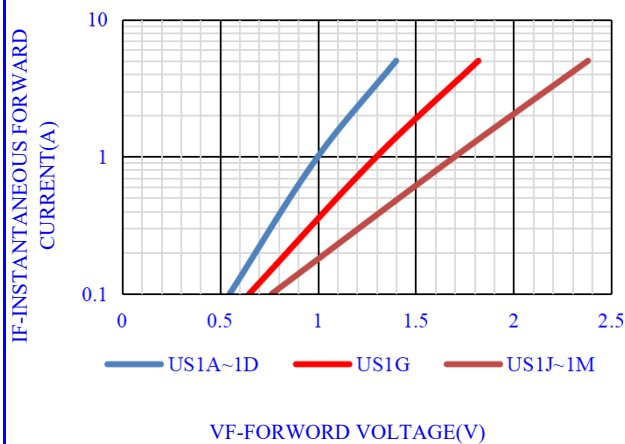


Fig.2- TYPICAL INSTANTANEOUS FORWARD

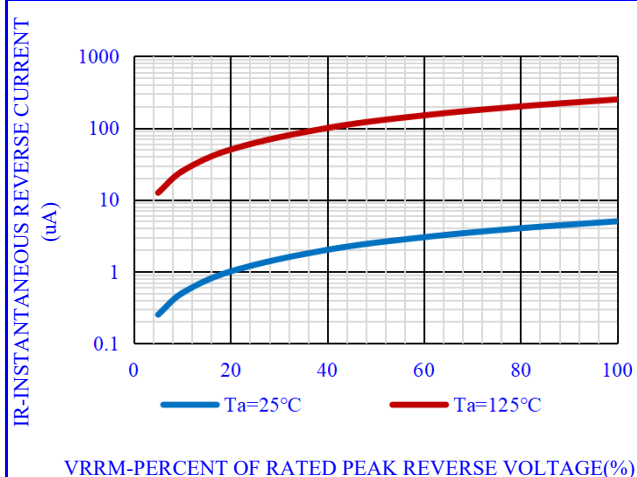


Fig.3- TYPICAL REVERSE CHARACTERISTICS

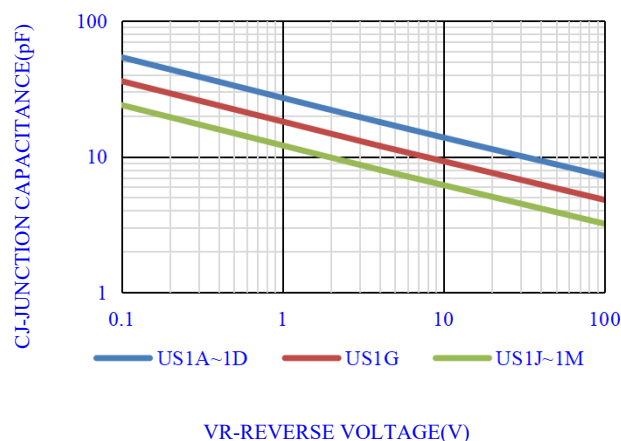


Fig.4- TYPICAL JUNCTION CAPACITANCE

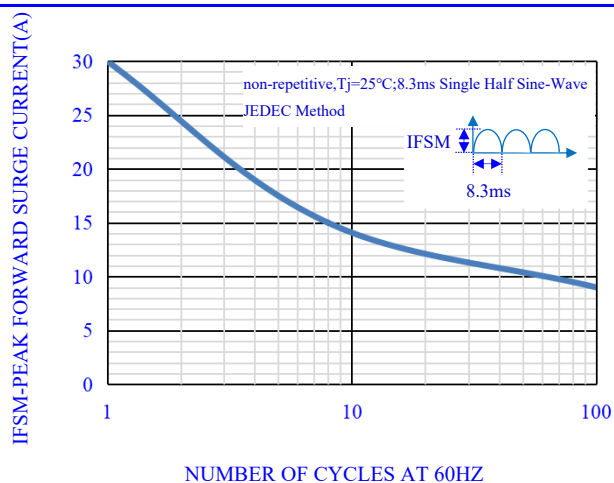


Fig.5-MAX. NON-REPETITIVE SURGE CURRENT

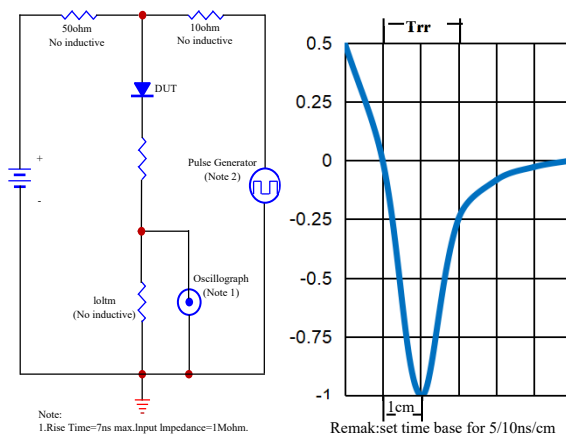
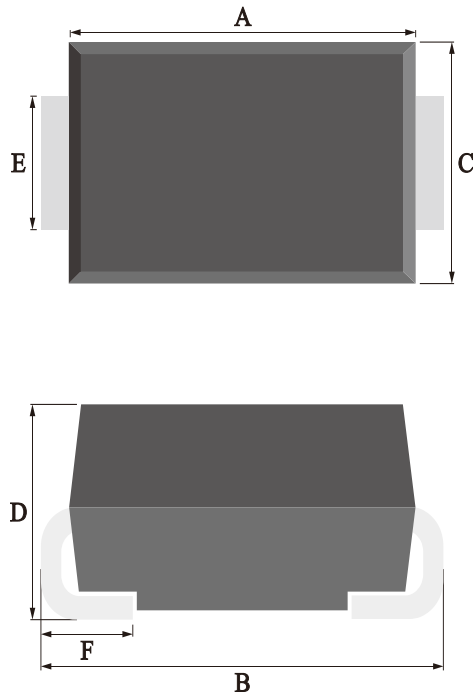


Fig.6-REVERSE RECOVERY TIME CHARACTERISTIC AND TEST CIRCUIT

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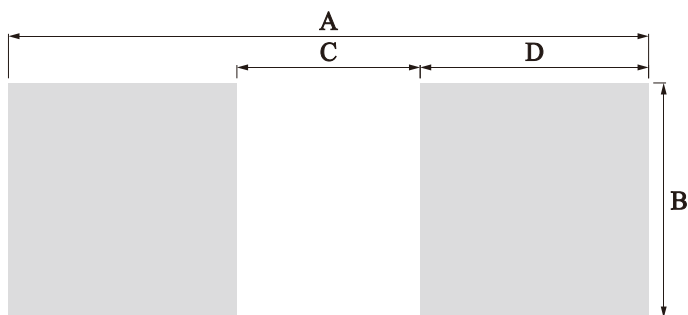
OUTLINE DRAWINGS



SMA

OUTLINE DIMENSIONS						
Dim.	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	4.00	-	4.60	0.1575	-	1.8110
B	4.70	-	5.28	1.8504	-	2.0787
C	2.40	-	2.85	0.9449	-	1.1220
D	1.90	-	2.58	0.7480	-	1.0157
E	1.30	-	1.60	0.5118	-	0.6299
F	0.76	-	1.52	0.2992	-	0.5984

RECOMMENDED LAYOUT DRAWINGS



SMA

OUTLINE DIMENSIONS						
Dim.	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	-	5.80	-	-	2.2835	-
B	-	2.06	-	-	0.8110	-
C	-	1.66	-	-	0.6535	-
D	-	2.07	-	-	0.8150	-

PACKING INFORMATION

Package Code	Package Method	Min. Pack. Size (mm)	Quantity (Pcs/Min. Pack.)	Inner Box Size L×W×H(mm)	Quantity (Pcs/Inner Box)	Outer Carton Size L×W×H(mm)	Quantity (Pcs/Carton)
SMA	T/R	Φ330	5000	340×340×42	10000	365x365x360	80000

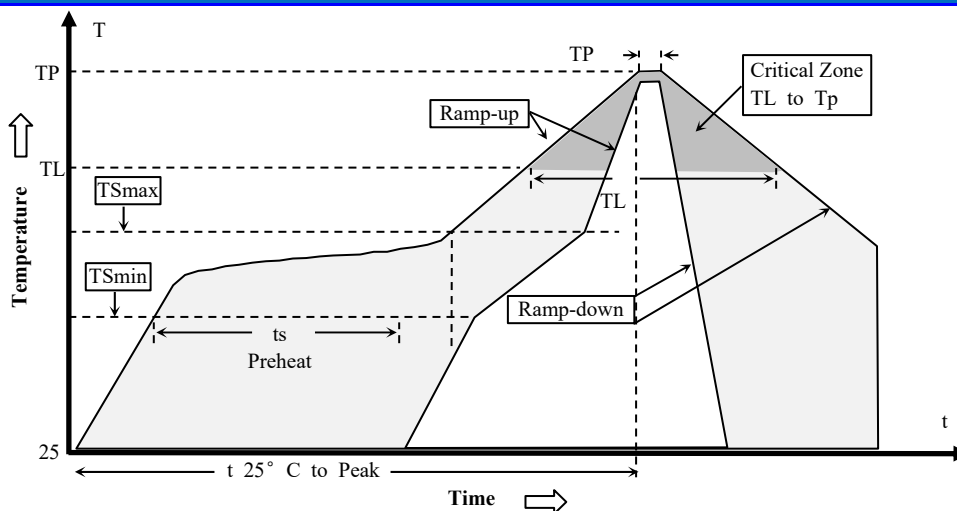
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Recommended wave soldering condition

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(T _S min) -Temperature Max(T _S max) -Time(t _s min to t _s max)	100°C 150°C 60-120 seconds	150°C 200°C 60-180 seconds
Time maintained above: -Temperature (T _L) - Time (t _L)	183°C 60-150 seconds	217°C 60-150 seconds
Peak Temperature(T _P)	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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