

US1AF THRU US1MF

High Efficiency Rectifier



Voltage: 50~1000 Volts

Current: 1.0 Amperes

Package: SMAF

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 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	US 1AF	US 1BF	US 1DF	US 1GF	US 1JF	US 1KF	US 1MF	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		$I_{F(AV)}$	1.0							A
Peak Forward Surge Current	8.3ms Single Half Sine-wave Superimposed On Rate Load	I_{FSM}	30							A
Current Squared Time	$t < 8.3ms$	I^2t	3.7							A ² sec

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

Parameter	Test Conditions	Symbol	US 1AF	US 1BF	US 1DF	US 1GF	US 1JF	US 1KF	US 1MF	Unit
Maximum Instantaneous Forward Voltage	$I_F = 1.0 A$	V_F	1.0			1.3	1.7			V
Maximum DC Reverse Current at Rated DC Blocking Voltage	Ta=25°C, $V_R = V_{RRM}$ Ta=125°C, $V_R = V_{RRM} * 80\%$	I_{RRM}	5			200				uA
Typical Junction Capacitance	4 V, 1MHz	C_J	15			10	8			pF
Maximum Reverse Recovery Time	$I_F = 0.5A$, $I_R = 1.0A$, $IRR = 0.25A$	T_{rr}	50			75			nS	

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

Parameter	Test Conditions	Symbol	US 1AF	US 1BF	US 1DF	US 1GF	US 1JF	US 1KF	US 1MF	Unit
Operating Junction Temperature Range		T _J	-55~150							℃
Storage Temperature Range		T _{STD}	-55~150							
Thermal Resistance Junction To Ambient With Steady-State	Still Air Environment With Ta=25℃	R _{θJA}	70.0							℃/W
Thermal Resistance Junction-Case With Steady-State	Device Mounted On 1 in2 FR-4 Board With 2oz. Copper	R _{θJC}	20.0							

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

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High Efficiency Rectifier



Typical Characteristics Curves

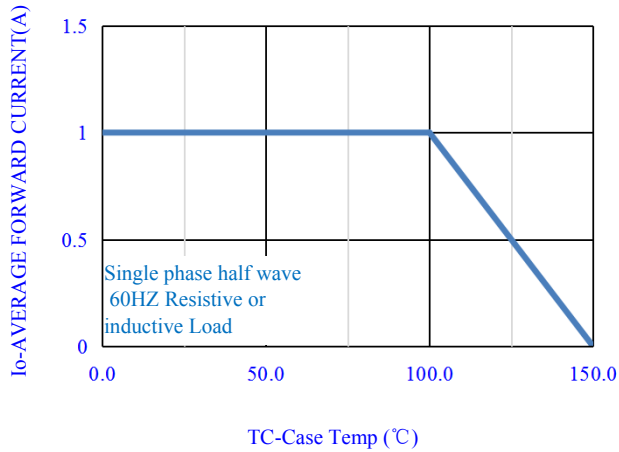


Fig.1-FORWARD CURRENT DERATING CURVE

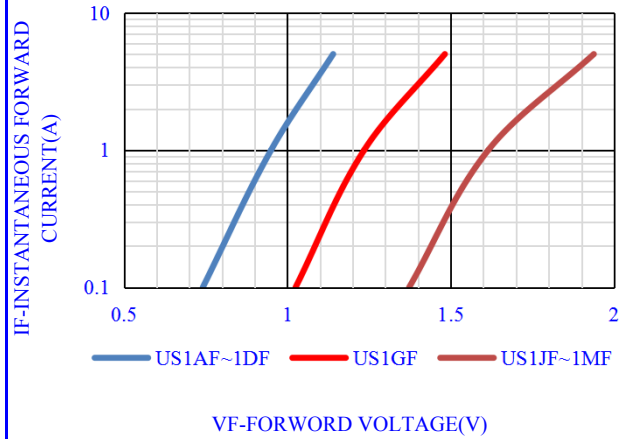


Fig.2- TYPICAL INSTANTANEOUS FORWARD

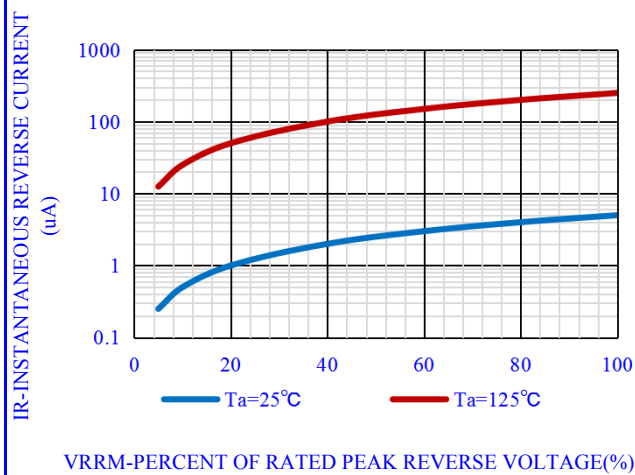


Fig.3- TYPICAL REVERSE CHARACTERISTICS

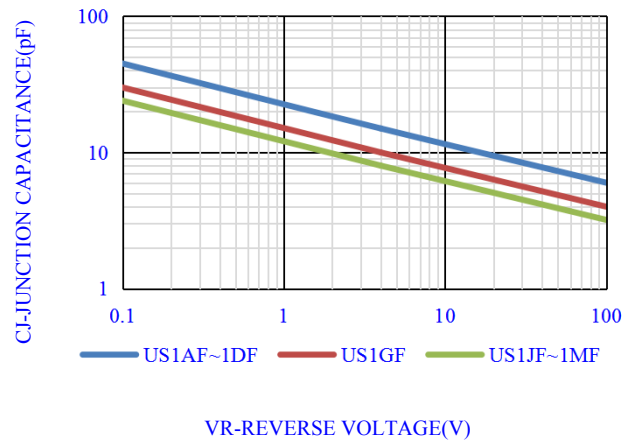


Fig.4- TYPICAL JUNCTION CAPACITANCE

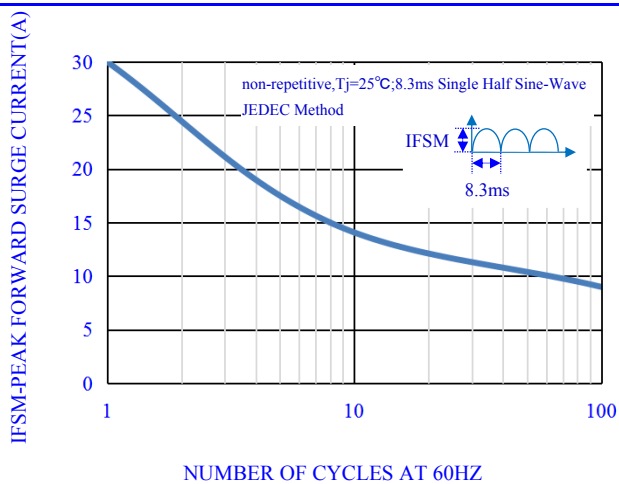


Fig.5-MAX. NON-REPETITIVE SURGE CURRENT

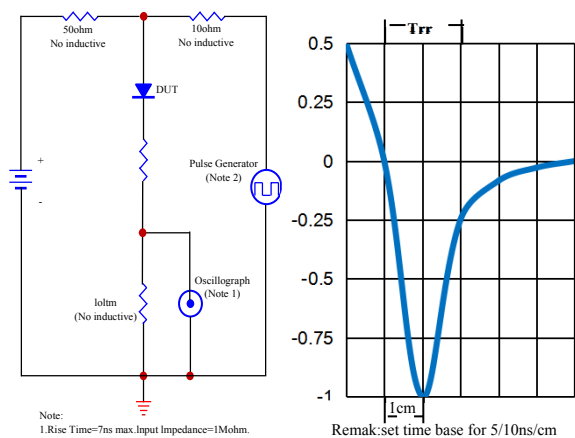
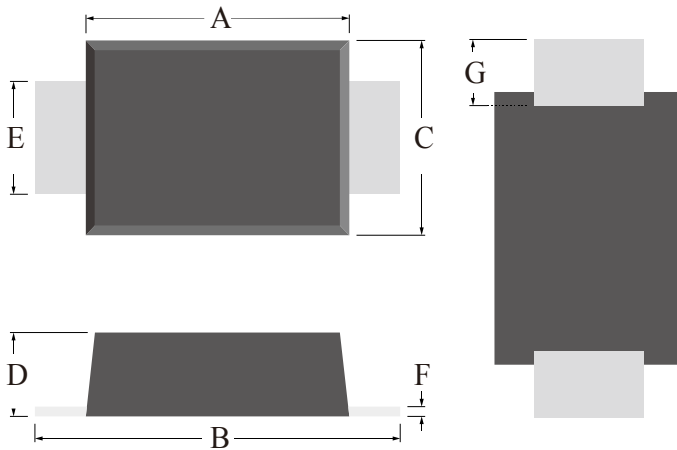


Fig.6-REVERSE RECOVERY TIME CHARACTERISTIC AND TEST CIRCUIT

US1AF THRU US1MF
High Efficiency Rectifier



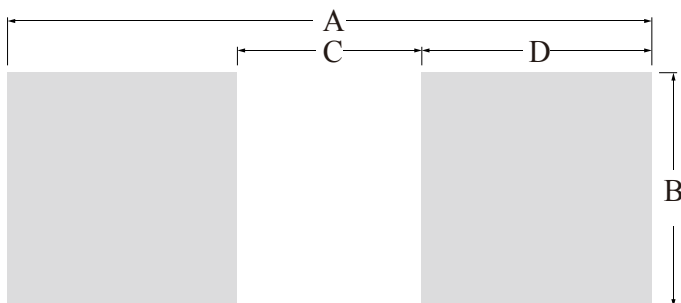
OUTLINE DRAWINGS



SMAF

OUTLINE DIMENSIONS						
Dim.	Milimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	3.20	-	3.80	0.1260	-	0.1496
B	4.40	-	5.30	0.1732	-	0.2087
C	2.30	-	2.70	0.0906	-	0.1063
D	0.95	-	1.20	0.0374	-	0.0472
E	1.30	-	1.60	0.0512	-	0.0630
F	0.08	-	0.17	0.0031	-	0.0067
G	0.50	-	1.20	0.0197	-	0.0472

RECOMMEDND LAYOUT DRAWINGS



SMAF

OUTLINE DIMENSIONS						
Dim.	Milimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	-	5.30	-	-	0.2087	-
B	-	2.06	-	-	0.0811	-
C	-	1.66	-	-	0.0654	-
D	-	2.07	-	-	0.0815	-

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MARKING

MARKING INSTRUCTION



NH=Niuhan Trademark
 FF=Product Line Code,According To Actual Changes
 YWW=Date Code,According To Actual Changes
 US1xF=Model,x=A,B,D,G,J,K,M
 White band denotes cathode

PACKING INFORMATION

Package Type	Package Code	Product Weight Approx(g/Pcs)	Package Method	Quantity (Pcs/Min. Pack.)	Quantity (Pcs/Inner Box)	Quantity (Pcs/Carton)
SMAF	P1	0.026	13" Reel	5000	10000	80000
SMAF	P1	0.026	13" Reel	5000	10000	100000

US1AF THRU US1MF

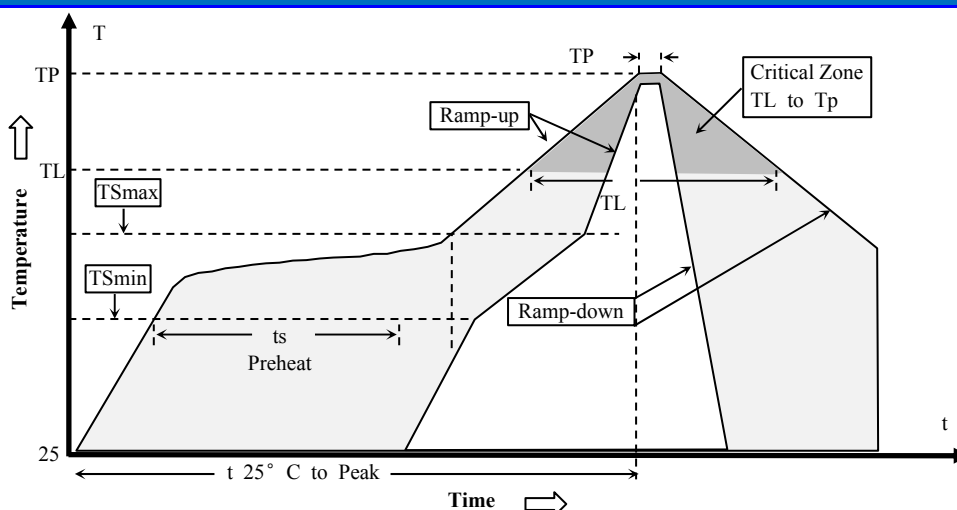
High Efficiency Rectifier



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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