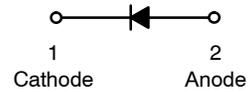


# Super Fast Surface Mount Rectifiers

## US1AFA-US1MFA



SOD-123FL  
CASE 425AB



### Features

- Glass Passivated Chip Junction
- Low Power Loss, High Efficiency
- Fast Switching Reverse Recovery Time: 50~75 ns Maximum
- High Surge Capacity
- UL Flammability 94V-0 Classification
- MSL 1 per J-STD-020
- NRV Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC-Q101 Qualified and PPAP Capable
- These Devices are Pb-Free, Halogen Free and are RoHS Compliant

### MARKING DIAGRAM



- YYYY = Binary Calendar Year Code Scheme
- Z = Assembly Plant Code
- XXX = Specific Device Code
- W = Single Digit Week Code

### ORDERING INFORMATION

Part Number	Device Code Marking	Package	Shipping <sup>†</sup>
US1AFA, NRVUS1AFA*	HAL	SOD-123FL (Pb-Free / Halogen Free)	3,000 / Tape & Reel
US1BFA, NRVUS1BFA*	HBL		
US1DFA, NRVUS1DFA*	HDL		
US1FFA, NRVUS1FFA*	HFL		
US1GFA, NRVUS1GFA*	HGL		
US1JFA, NRVUS1JFA*	HJL		
US1KFA, NRVUS1KFA*	HKL		
US1MFA, NRVUS1MFA*	HML		

<sup>†</sup>For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

\*NRV Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC-Q101 Qualified and PPAP Capable

# US1AFA-US1MFA

## ABSOLUTE MAXIMUM RATINGS (Values are at $T_A = 25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter	US1 AFA	US1 BFA	US1 DFA	US1 FFA	US1 GFA	US1 JFA	US1 KFA	US1 MFA	Unit
$V_{RRM}$	Repetitive Peak Reverse Voltage	50	100	200	300	400	600	800	1000	V
$V_{RMS}$	RMS Reverse Voltage	35	70	140	210	280	420	560	700	V
$V_R$	DC Blocking Voltage	50	100	200	300	400	600	800	1000	V
$I_{F(AV)}$	Average Forward Rectified Current	1								A
$I_{FSM}$	Peak Forward Surge Current: 8.3 ms Single Half Sine-Wave Superimposed on Rated Load	30								A
$T_J$	Operating Junction Temperature Range	-55 to +150								$^\circ\text{C}$
$T_{STG}$	Storage Temperature Range	-55 to +150								$^\circ\text{C}$

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

## THERMAL CHARACTERISTICS (Values are at $T_A = 25^\circ\text{C}$ unless otherwise noted)

Symbol	Parameter	Value	Unit
$\Psi_{JL}$	Typical Thermal Resistance, Junction to Lead	21	$^\circ\text{C}/\text{W}$
$R_{\theta JA}$	Typical Thermal Resistance, Junction to Ambient	153	$^\circ\text{C}/\text{W}$

NOTE: Device mounted at minimum pad.

## ELECTRICAL CHARACTERISTICS (Values are at $T_A = 25^\circ\text{C}$ unless otherwise noted)

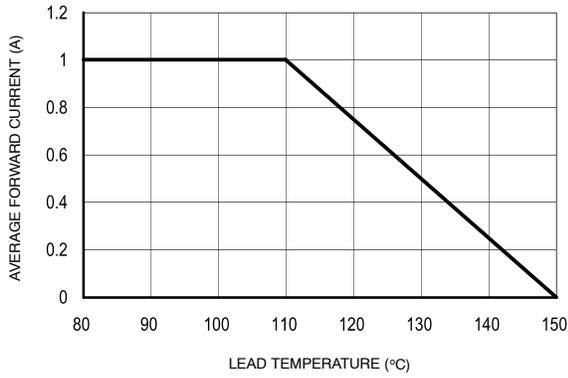
Symbol	Parameter	Conditions	US1 AFA	US1 BFA	US1 DFA	US1 FFA	US1 GFA	US1 JFA	US1 KFA	US1 MFA	Unit
$V_F$	Maximum Instantaneous Forward Voltage (Note 1)	$I_F = 1\text{ A}$	0.95				1.30	1.70			V
$I_R$	Maximum Reverse Current at Rated $V_R$	$T_J = 25^\circ\text{C}$	5								$\mu\text{A}$
		$T_J = 125^\circ\text{C}$	150								
$C_J$	Typical Junction Capacitance	$V_R = 4.0\text{ V}$ , $f = 1.0\text{ MHz}$	20					15			pF
$T_{rr}$	Maximum Reverse Recovery Time	$I_F = 0.5\text{ A}$ , $I_R = 1\text{ A}$ , $I_{rr} = 0.25\text{ A}$	50					75			ns

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

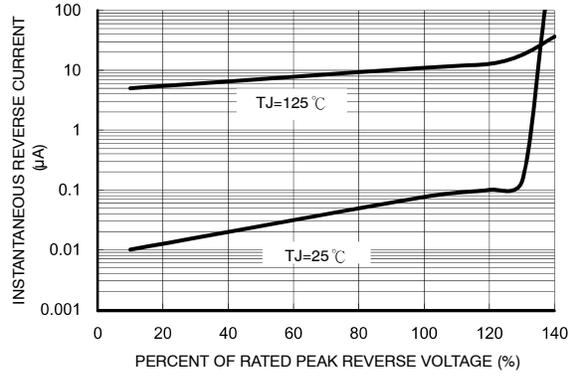
1. Pulse test with  $PW = 300\ \mu\text{s}$ , 1% duty cycle.

# US1AFA-US1MFA

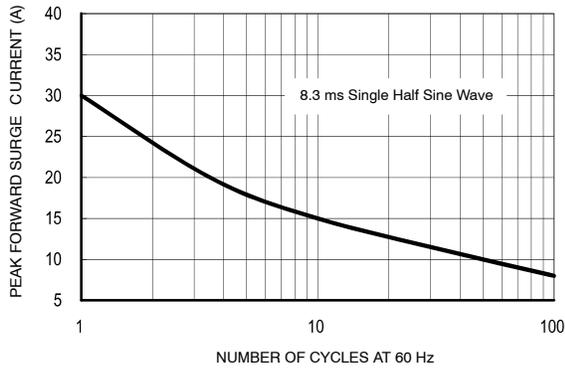
## TYPICAL PERFORMANCE CHARACTERISTICS



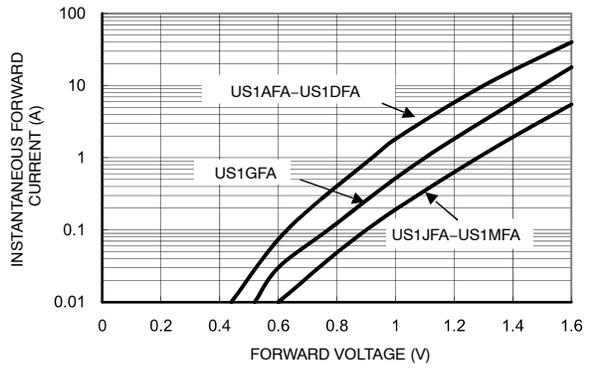
**Figure 1. Maximum Forward Current Derating Voltage**



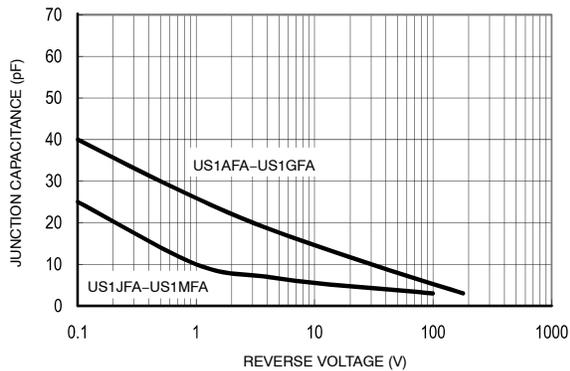
**Figure 2. Typical Reverse Characteristics**



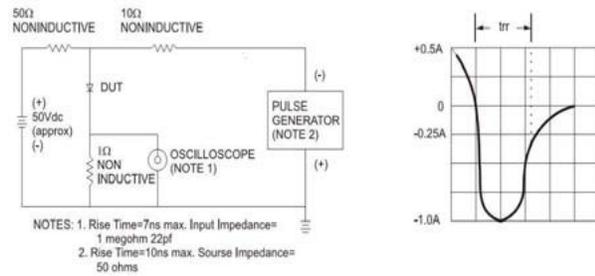
**Figure 3. Maximum Non-Repetitive Forward Surge Current**



**Figure 4. Typical Instantaneous Forward Characteristics**



**Figure 5. Typical Junction Capacitance**

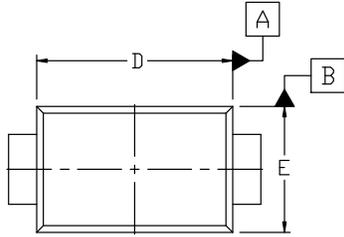


**Figure 6. Reverse Recovery Time Characteristic and Test Circuit Diagram**

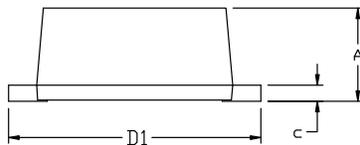


**SOD-123FA**  
**CASE 425AB**  
**ISSUE A**

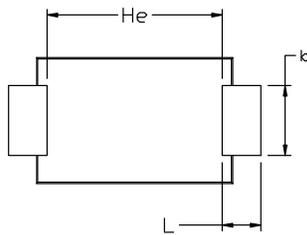
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TOP VIEW



FRONT VIEW

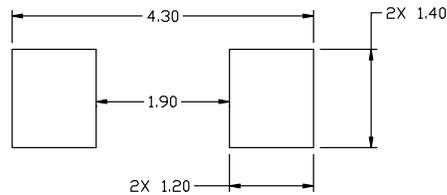


BOTTOM VIEW

NOTES:

1. NO INDUSTRY STANDARD APPLIES TO THIS PACKAGE.
2. ALL DIMENSIONS ARE IN MILLIMETERS.
3. DIMENSIONS ARE EXCLUSIVE OF BURRS, MOLD FLASH AND THE BAR PROTRUSIONS.

DIM	MILLIMETERS		
	MIN.	NOM.	MAX.
A	1.23	1.33	1.43
b	0.80	1.00	1.20
c	0.16	0.23	0.30
D	2.70	2.80	2.90
D1	3.40	3.60	3.80
E	1.70	1.80	1.90
He	2.45	---	2.60
L	0.35	0.60	0.85



**RECOMMENDED MOUNTING FOOTPRINT\***

\* For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERM/D.

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