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May 2016

# US1AFA - US1MFA

## Super Fast Surface Mount Rectifiers

### 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
  - RoHS Compliant / Green Molding Compound
  - Industrial Device Qualified per AEC-Q101 Standards
- \* See authorized use policy



SOD-123FA



### Ordering Information

Part Number	Top Mark	Package	Packing Method
US1AFA	HAL	SOD-123FA	Tape and Reel
US1BFA	HBL	SOD-123FA	Tape and Reel
US1DFA	HDL	SOD-123FA	Tape and Reel
US1FFA	HFL	SOD-123FA	Tape and Reel
US1GFA	HGL	SOD-123FA	Tape and Reel
US1JFA	HJL	SOD-123FA	Tape and Reel
US1KFA	HKL	SOD-123FA	Tape and Reel
US1MFA	HML	SOD-123FA	Tape and Reel

US1AFA - US1MFA — Super Fast Surface Mount Rectifiers

## Absolute Maximum Ratings

Stresses exceeding the absolute maximum ratings may damage the device. The device may not function or be operable above the recommended operating conditions and stressing the parts to these levels is not recommended. In addition, extended exposure to stresses above the recommended operating conditions may affect device reliability. The absolute maximum ratings are stress ratings only. Values are at  $T_A = 25^\circ\text{C}$  unless otherwise noted.

Symbol	Parameter	Value								Unit
		US1 AFA	US1 BFA	US1 DFA	US1 FFA	US1 GFA	US1 JFA	US1 KFA	US1 MFA	
$V_{RRM}$	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								$^\circ\text{C}$

## Thermal Characteristics

Values are at  $T_A = 25^\circ\text{C}$  unless otherwise noted.

Symbol	Parameter	Value	Unit
$\psi_{JL}$	Typical Thermal Characteristics, 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:

1. Device mounted at minimum pad.

## Electrical Characteristics

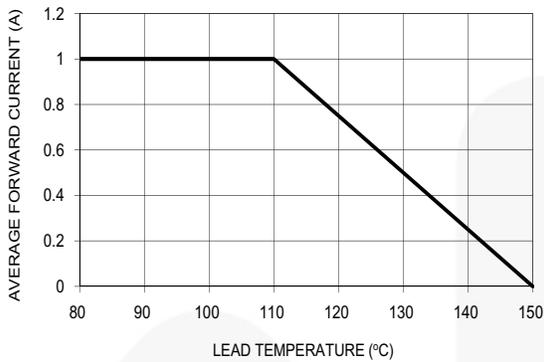
Values are at  $T_A = 25^\circ\text{C}$  unless otherwise noted.

Symbol	Parameter	Conditions	Value								Unit
			US1 AFA	US1 BFA	US1 DFA	US1 FFA	US1 GFA	US1 JFA	US1 KFA	US1 MFA	
$V_F$	Maximum Instantaneous Forward Voltage <sup>(2)</sup>	$I_F = 1\text{ A}$	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	$V_R = 4\text{ V}$ , $f = 1\text{ MHz}$	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

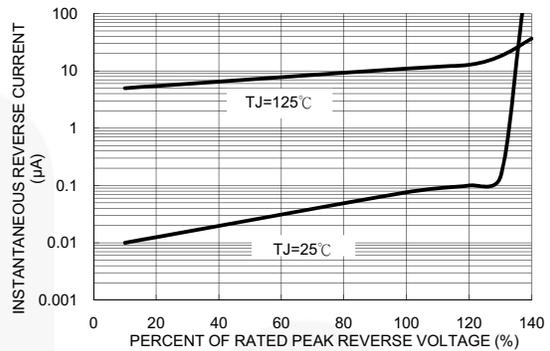
### Note:

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

## Typical Performance Characteristics



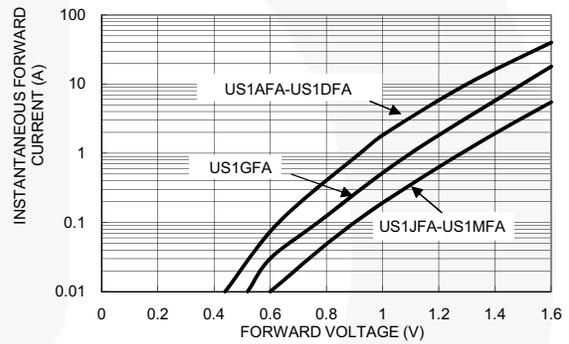
**Figure 1. Maximum Forward Current Derating Voltage**



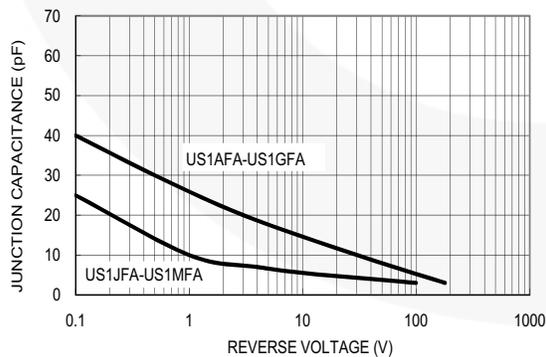
**Figure 2. Typical Reverse Characteristics**



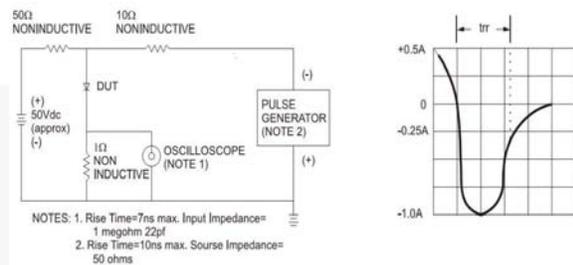
**Figure 3. Maximum Non-Repetitive Forward Surge Current**



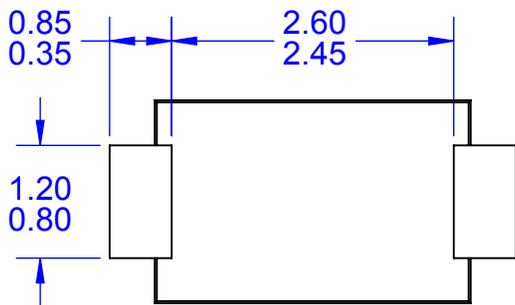
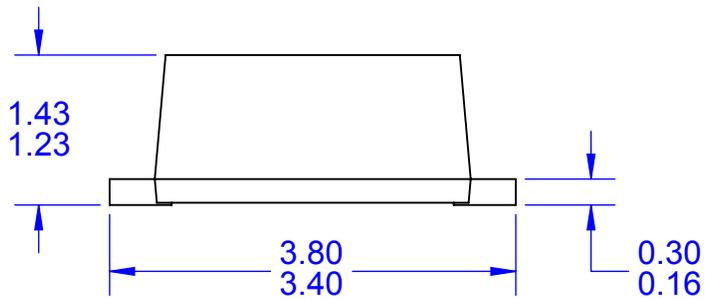
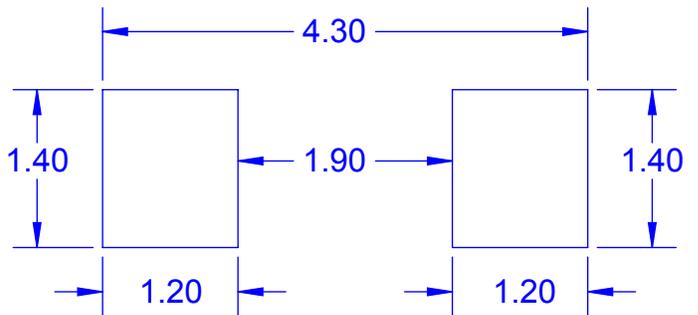
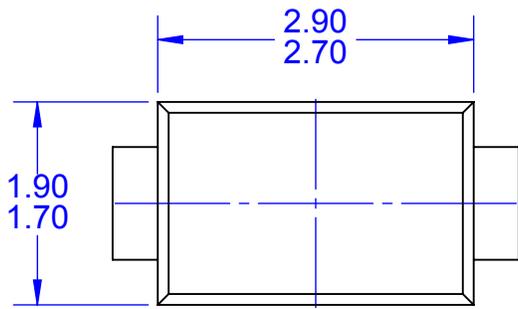
**Figure 4. Typical Instantaneous Forward Characteristics**



**Figure 5. Typical Junction Capacitance**



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



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