



October 2015

# 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
  - 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**  
COLOR BAND DENOTES CATHODE



### Ordering Information

Part Number	Top Mark	Package	Packing Method
US1AFA	UAL	SOD-123FA	Tape and Reel
US1BFA	UBL	SOD-123FA	Tape and Reel
US1DFA	UDL	SOD-123FA	Tape and Reel
US1FFA	UFL	SOD-123FA	Tape and Reel
US1GFA	UGL	SOD-123FA	Tape and Reel
US1JFA	UJL	SOD-123FA	Tape and Reel
US1KFA	UKL	SOD-123FA	Tape and Reel
US1MFA	UML	SOD-123FA	Tape and Reel

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## 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	32	$^\circ\text{C}/\text{W}$
$R_{\theta JA}$	Typical Thermal Resistance, Junction-to-Ambient	105	$^\circ\text{C}/\text{W}$

### Note:

- Device mounted on 5 mm x 5 mm Cu pad PCB.

## 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:

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

## Typical Performance Characteristics

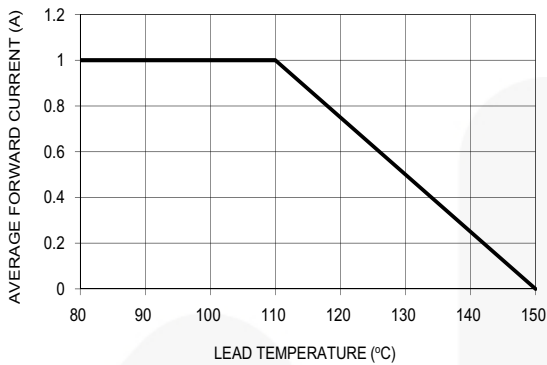


Figure 1. Maximum Forward Current Derating Voltage

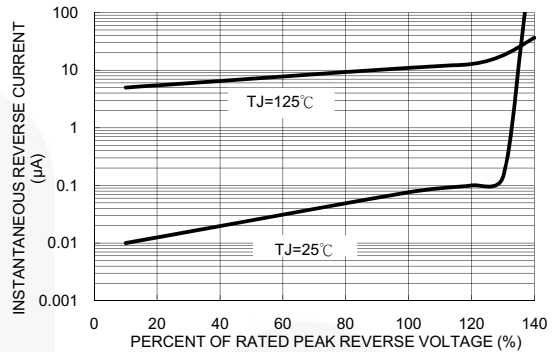


Figure 2. Typical Reverse Characteristics

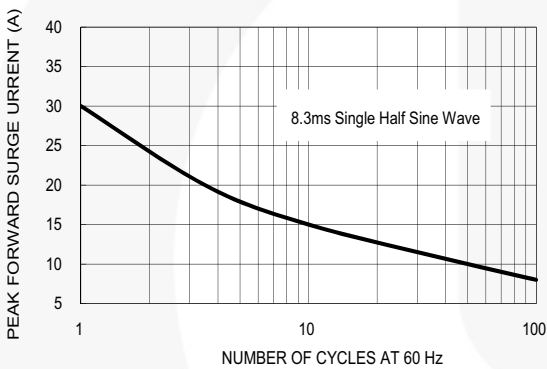


Figure 3. Maximum Non-Repetitive Forward Surge Current

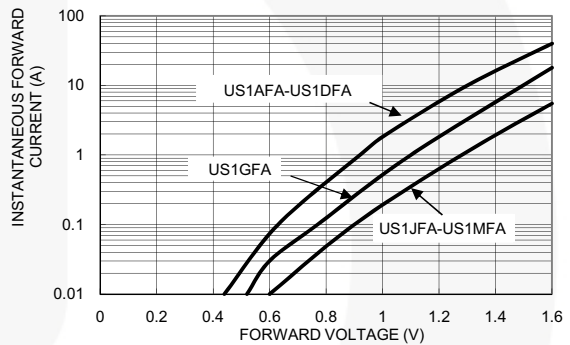


Figure 4. Typical Instantaneous Forward Characteristics

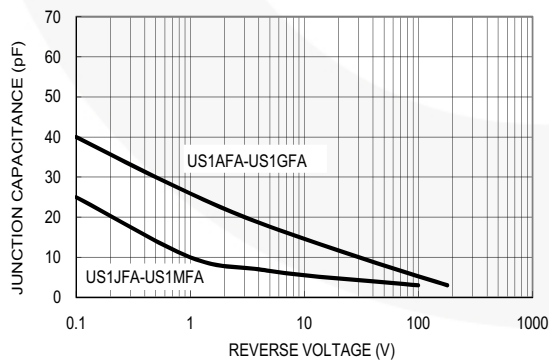


Figure 5. Typical Junction Capacitance

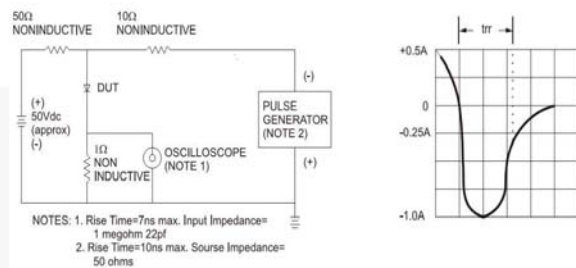
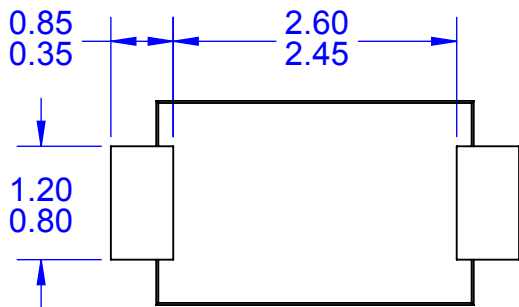
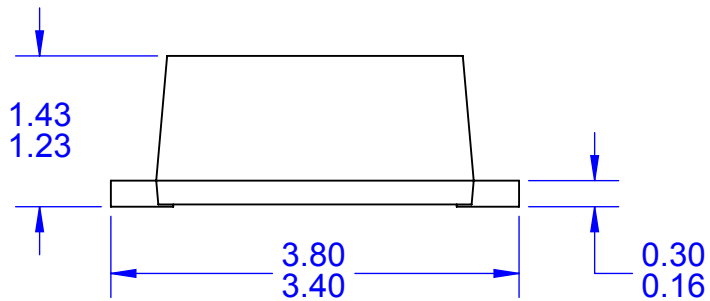
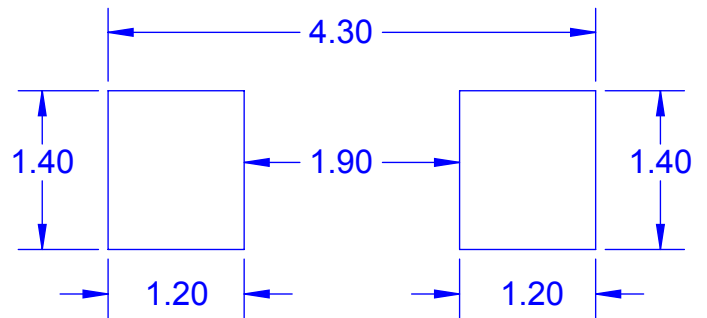
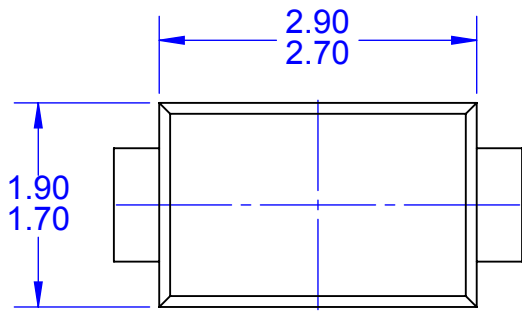


Figure 6. Reverse Recovery Time Characteristic and Test Circuit Diagram



NOTES:

- A. THIS PACKAGE DOES NOT CONFORM TO ANY STANDARDS.
- B. ALL DIMENSIONS ARE IN MILLIMETERS.
- C. DIMENSIONS ARE EXCLUSIVE OF BURRS, MOLD FLASH AND TIE BAR PROTRUSIONS.
- D. DRAWING FILE NAME: MKT-MA02Drev2





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| EfficientMax™            | MicroPak™                                      | SPM®                                  | Ultra FRFET™     |
| ESBC™                    | MicroPak2™                                     | STEALTH™                              | UniFET™          |
| F <sup>®</sup>           | MillerDrive™                                   | SuperFET®                             | VCX™             |
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| FastvCore™               | MVN®   | SyncFET™                              | 仙童®              |
| FETBench™                | mWSaver®                                       | Sync-Lock™                            |                  |
| FPS™                     | OptoHiT™                                       |                                       |                  |
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