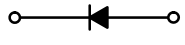
# Super Fast Surface Mount Rectifiers
# US1AFA-US1MFA


**SOD−123FL**
**CASE 425AB**



1 Cathode
2 Anode

### 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† |
|---|---|---|---|
| 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 | | |

†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

**ABSOLUTE MAXIMUM RATINGS** (Values are at $T_A$ = 25°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 | | | | | | | | °C |
| $T_{STG}$ | Storage Temperature Range | −55 to +150 | | | | | | | | °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°C unless otherwise noted)

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

NOTE: Device mounted at minimum pad.

**ELECTRICAL CHARACTERISTICS** (Values are at $T_A$ = 25°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 A | 0.95 | | | | 1.30 | 1.70 | | | V |
| $I_R$ | Maximum Reverse Current at Rated $V_R$ | $T_J$ = 25°C | 5 | | | | | | | | μA |
| | | $T_J$ = 125°C | 150 | | | | | | | | |
| $C_J$ | Typical Junction Capacitance | $V_R$ = 4.0 V, f = 1.0 MHz | 20 | | | | | 15 | | | pF |
| $T_{rr}$ | Maximum Reverse Recovery Time | $I_F$ = 0.5 A, $I_R$ = 1 A, $I_{rr}$ = 0.25 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 μs, 1% duty cycle.

## TYPICAL PERFORMANCE CHARACTERISTICS

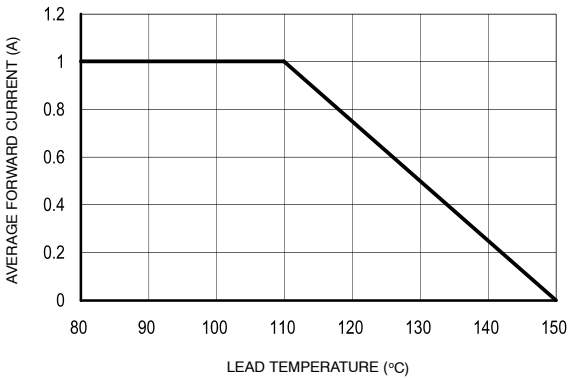



**Figure 1. Maximum Forward Current Derating Voltage**

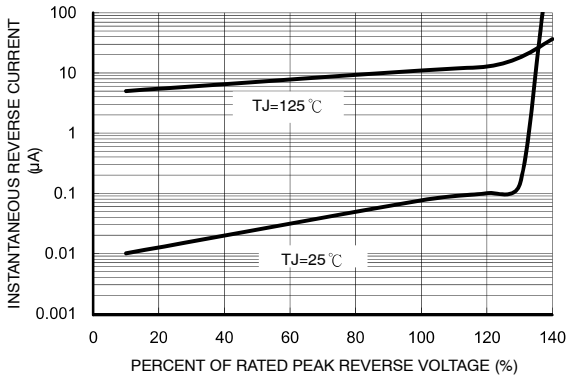



**Figure 2. Typical Reverse Characteristics**

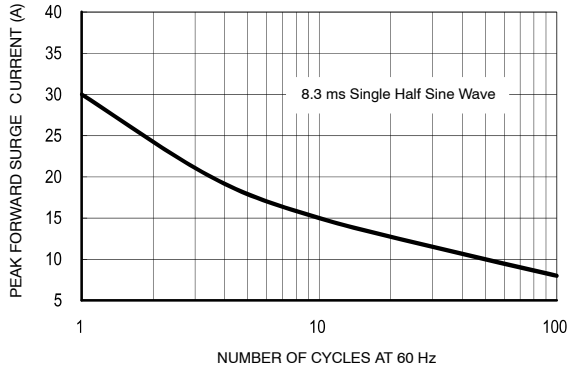



**Figure 3. Maximum Non−Repetitive Forward Surge Current**

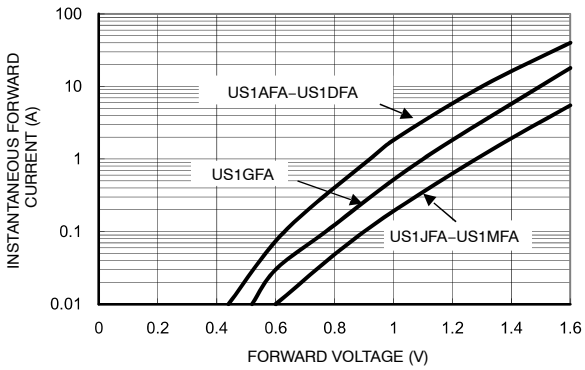



**Figure 4. Typical Instantaneous Forward Characteristics**

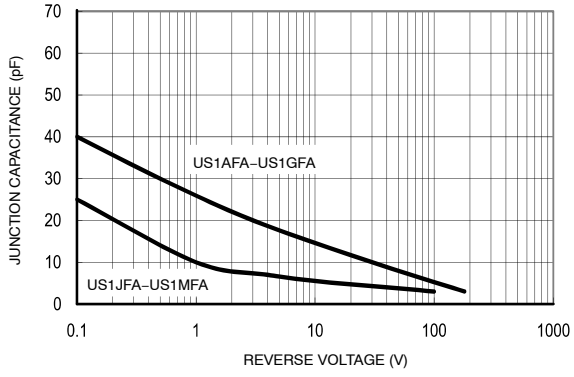



**Figure 5. Typical Junction Capacitance**

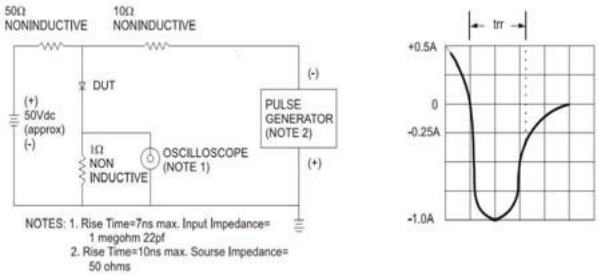
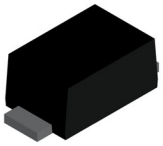
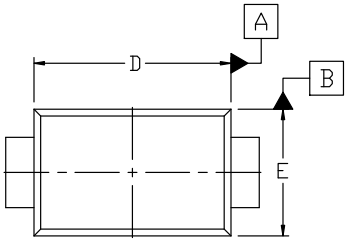



**Figure 6. Reverse Recovery Time Characteristic and Test Circuit Diagram**

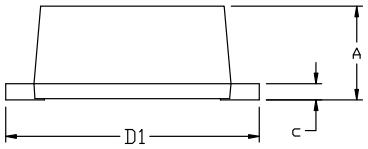


**SOD−123FA**
CASE 425AB
ISSUE A

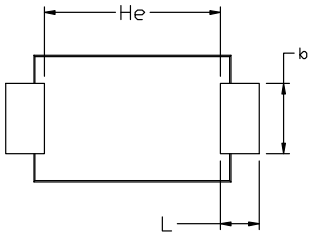
DATE 11 AUG 2022




TOP VIEW




FRONT VIEW

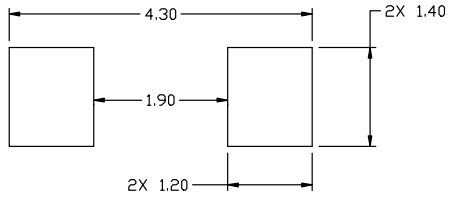



BOTTOM VIEW

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, SOLDERRM/D.

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| **DESCRIPTION:** | **SOD−123FA** | **PAGE 1 OF 1** |

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