

# Surface Mount Ultrafast Rectifier

## ES2DAF

### Features

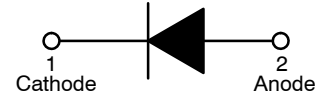
- Fast Switching Speed – Maximum  $T_{rr}$  35 ns
- Ultra Thin Profile – Maximum Height of 1.0 mm
- Glass Passivated Junction
- UL Flammability 94V-0 Classification
- MSL 1
- Green Mold Compound
- These Devices are Pb-Free, Halogen Free and are RoHS Compliant

### Specifications

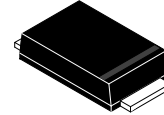
#### ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$ unless otherwise noted)

| Symbol      | Parameter  | Value       | Unit             |
|-------------|--|-------------|------------------|
| $V_{RRM}$   | Recurrent Peak Reverse Voltage   | 200         | V                |
| $V_{RMS}$   | RMS Reverse Voltage  | 140         | V                |
| $V_R$       | DC Blocking Voltage  | 200         | V                |
| $I_{F(AV)}$ | Average Forward Current  | 2           | A                |
| $I_{FSM}$   | Peak Forward Surge Current: 8.3 ms Single Half Sine-Wave Superimposed on Rated Load (JEDEC Method) | 50          | 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.

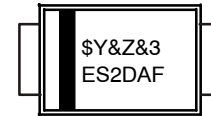


Ultrafast Rectifier



DO-214AD  
(SMAF)  
CASE 403AD

### MARKING DIAGRAM



Band Indicates Cathode

- \$Y = onsemi Logo
- &Z = Assembly Plant Code
- &3 = Data Code (Year & Week)
- ES2DAF = Specific Device Code

### ORDERING INFORMATION

See detailed ordering and shipping information on page 2 of this data sheet.

# ES2DAF

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

| Symbol          | Characteristic   | Value | Unit                      |
|-----------------|--|-------|---------------------------|
| $\Psi_{JL}$     | Typical Thermal Characteristics, Junction-to-Lead (Note 1) | 25    | $^\circ\text{C}/\text{W}$ |
| $R_{\theta JA}$ | Typical Thermal Resistance, Junction-to-Ambient (Note 2)   | 150   | $^\circ\text{C}/\text{W}$ |

1. Mounted on an FR4 PCB, single-sided copper, with 100 cm<sup>2</sup> copper pad area.
2. Mounted on an FR4 PCB, single-sided copper, mini pad.

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

| Symbol   | Parameter             | Conditions  | Min | Typ | Max  | Unit          |
|----------|-----------------------|---|-----|-----|------|---------------|
| $V_F$    | Forward Voltage       | $I_F = 2.0 \text{ A}$   | –   | –   | 0.95 | V             |
| $I_R$    | Reverse Current       | $V_R = 200 \text{ V}$   | –   | –   | 1    | $\mu\text{A}$ |
| $t_{rr}$ | Reverse Recovery Time | $I_F = 0.5 \text{ A}, I_R = 1.0 \text{ A}, I_{rr} = 0.25 \text{ A}$ | –   | –   | 35   | ns            |
| $C_J$    | Junction Capacitance  | $V_R = 4 \text{ V}, f = 1 \text{ MHz}$                              | –   | 30  | –    | pF            |

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.

## ORDERING INFORMATION

| Part Number | Top Mark | Package                                   | Shipping†           |
|-------------|----------|---|---------------------|
| ES2DAF      | ES2DAF   | DO-214AD (SMAF)<br>(Pb-Free/Halogen Free) | 10000 / Tape & Reel |

†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.

TYPICAL PERFORMANCE CHARACTERISTICS

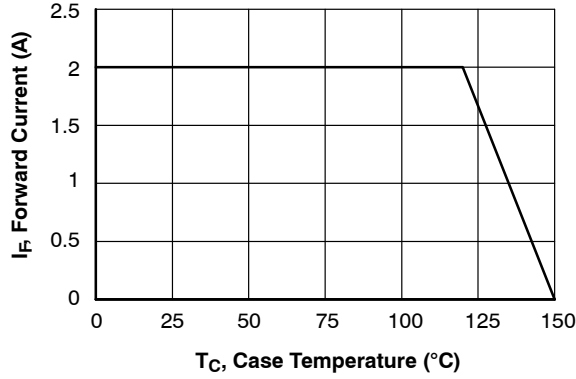


Figure 1. Forward Current Derating Curve

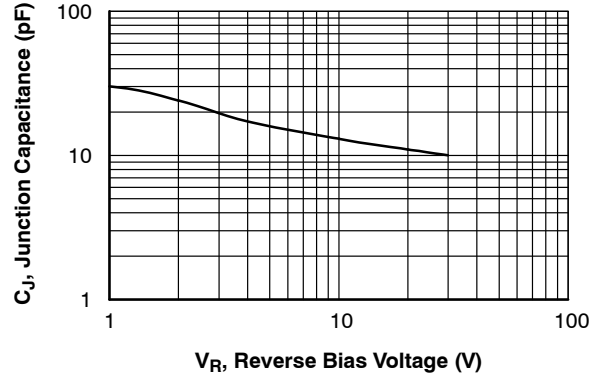


Figure 2. Typical Junction Capacitance

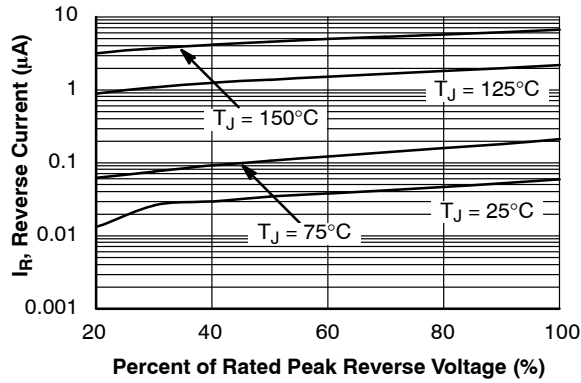


Figure 3. Typical Reverse Characteristics

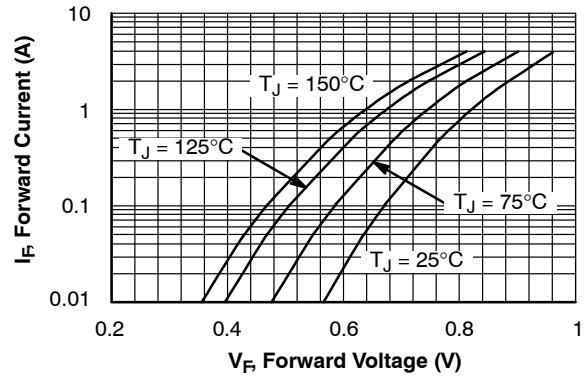
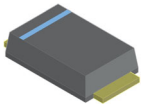
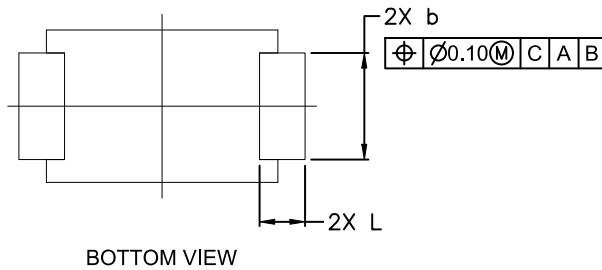
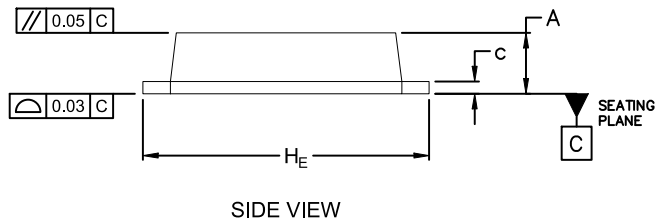
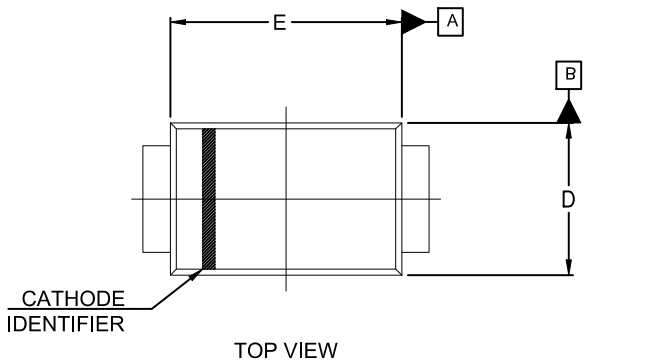


Figure 4. Typical Forward Characteristics



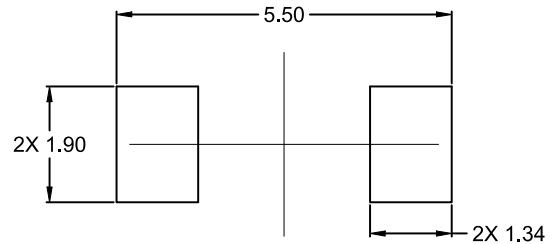
**SMA-FL**  
**CASE 403AD**  
**ISSUE A**

DATE 14 JUL 2020



- NOTES:
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 2009.
  2. CONTROLLING DIMENSION: MILLIMETERS
  3. DIMENSIONS D & E ARE EXCLUSIVE OF BURRS, MOLD FLASH AND TIE BAR EXTRUSIONS.

| DIM            | MILLIMETERS |      |      |
|----------------|-------------|------|------|
|                | MIN.        | NOM. | MAX. |
| A              | 0.90        | 1.00 | 1.10 |
| b              | 1.25        | 1.60 | 1.90 |
| c              | 0.10        | —    | 0.25 |
| D              | 2.30        | 2.50 | 2.70 |
| E              | 3.60        | 3.95 | 4.30 |
| H <sub>E</sub> | 4.40        | 4.80 | 5.20 |
| L              | 0.50        | 0.75 | 0.95 |



**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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