

# Fast Rectifiers

## ES2A-ES2D



SMB  
CASE 403AF

### Features

- For Surface Mount Applications
- Glass–Passivated Junction
- Low–Profile Package
- Easy Pick and Place
- Built–in Strain Relief
- Superfast Recovery Times for High Efficiency
- These are Pb–Free Devices

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

| Symbol      | Parameter                                                                             | Value                   | Unit             |
|-------------|---------------------------------------------------------------------------------------|-------------------------|------------------|
| $V_{RRM}$   | Maximum Repetitive Reverse Voltage<br>ES2A<br>ES2B<br>ES2C<br>ES2D                    | 50<br>100<br>150<br>200 | V                |
| $I_{F(AV)}$ | Average Rectified Forward Current,<br>0.375" Lead Length at $T_L = 115^\circ\text{C}$ | 2.0                     | A                |
| $I_{FSM}$   | Non–Repetitive Peak Forward Surge<br>Current, 8.3 ms Single Half–Sine Wave            | 50                      | A                |
| $T_{STG}$   | Storage Temperature Range                                                             | –55 to +150             | $^\circ\text{C}$ |
| $T_J$       | Operating Junction 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 ( $T_A = 25^\circ\text{C}$ unless otherwise noted)

| Symbol          | Parameter                                           | Value | Unit                      |
|-----------------|-----------------------------------------------------|-------|---------------------------|
| $P_D$           | Power Dissipation                                   | 1.66  | W                         |
| $R_{\theta JA}$ | Thermal Resistance,<br>Junction to Ambient (Note 1) | 75    | $^\circ\text{C}/\text{W}$ |
| $R_{\theta JL}$ | Thermal Resistance,<br>Junction to Lead (Note 1)    | 20    | $^\circ\text{C}/\text{W}$ |

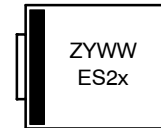
1. Device mounted on FR–4 PCB 0.013 mm.

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

| Symbol   | Parameter                              | Test Conditions                                                           | Value     |      |      |      | Unit          |
|----------|----------------------------------------|---------------------------------------------------------------------------|-----------|------|------|------|---------------|
|          |                                        |                                                                           | ES2A      | ES2B | ES2C | ES2D |               |
| $V_F$    | Maximum Forward Voltage                | $I_F = 2.0\text{ A}$                                                      | 0.90      |      |      |      | V             |
| $t_{rr}$ | Reverse Recovery Time                  | $I_F = 0.5\text{ A}$ , $I_R = 1.0\text{ A}$ ,<br>$I_{RR} = 0.25\text{ A}$ | 20        |      |      |      | ns            |
| $I_R$    | Maximum Reverse Current at Rated $V_R$ | $T_A = 25^\circ\text{C}$<br>$T_A = 100^\circ\text{C}$                     | 10<br>350 |      |      |      | $\mu\text{A}$ |
| $C_T$    | Total Capacitance                      | $V_R = 4.0\text{ V}$ , $f = 1.0\text{ MHz}$                               | 18        |      |      |      | 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.

### MARKING DIAGRAM



(COLOR BAND DENOTES CATHODE)

Z = Assembly Plant Code  
Y = Year  
WW = Work Week  
ES2x = Specific Device Code  
x = A, B, C, D

### ORDERING INFORMATION

See detailed ordering and shipping information on page 3 of this data sheet.

TYPICAL PERFORMANCE CHARACTERISTICS

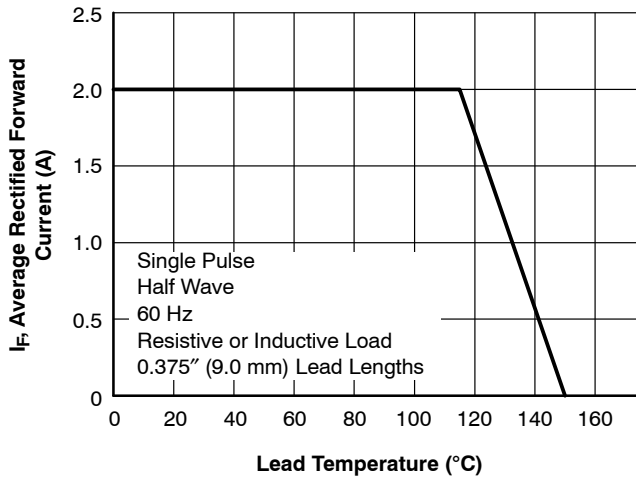


Figure 1. Forward Current Derating Curve

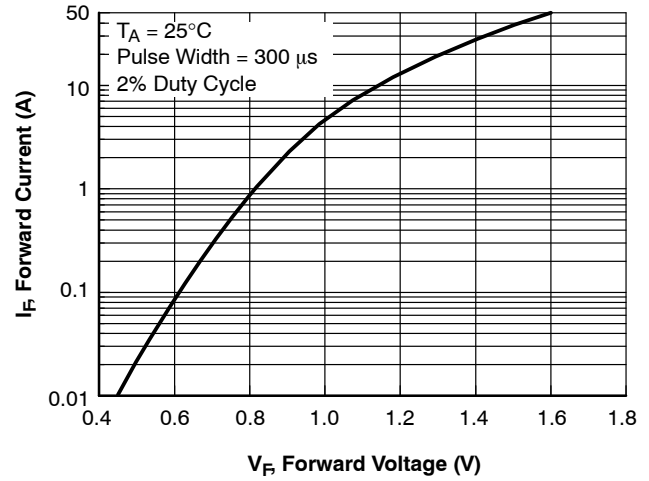


Figure 2. Forward Voltage Characteristics

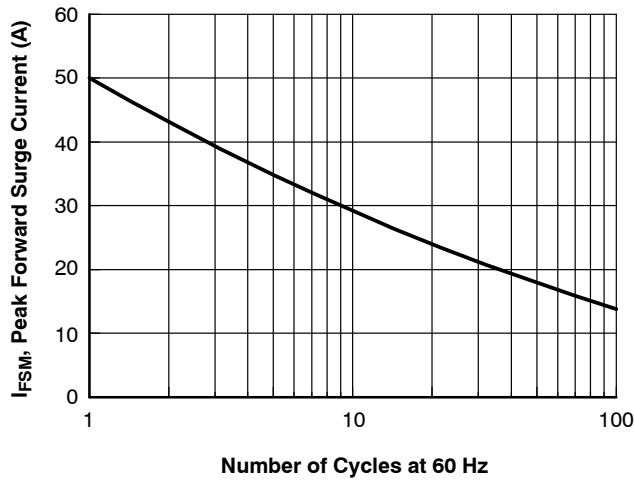


Figure 3. Non-Repetitive Surge Current

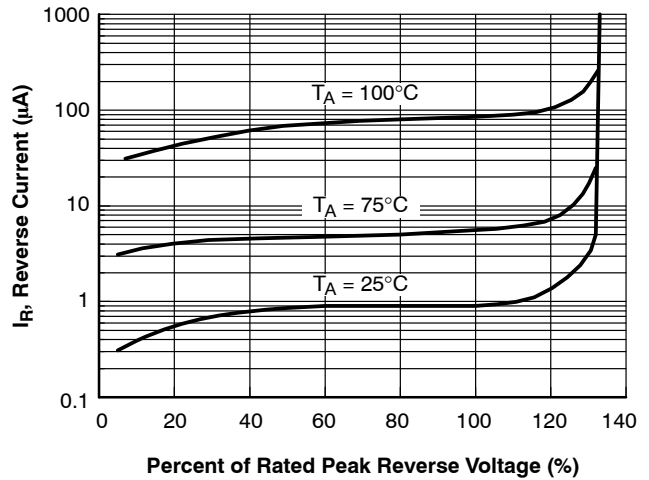


Figure 4. Reverse Current vs. Reverse Voltage

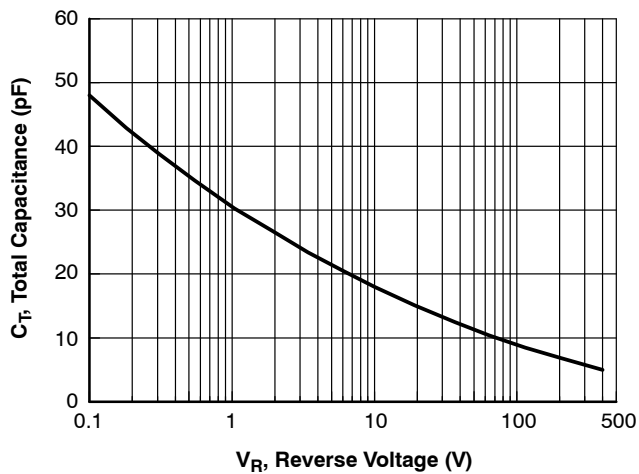
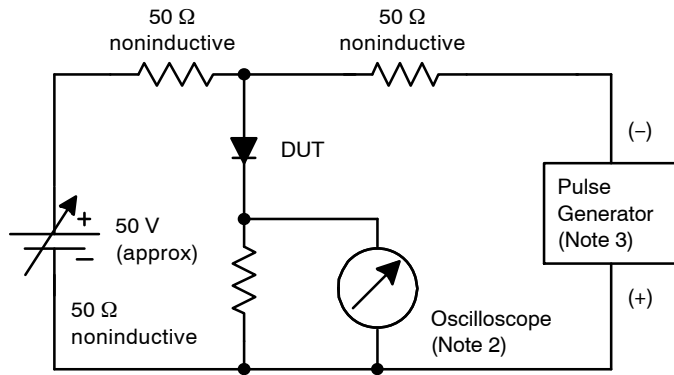


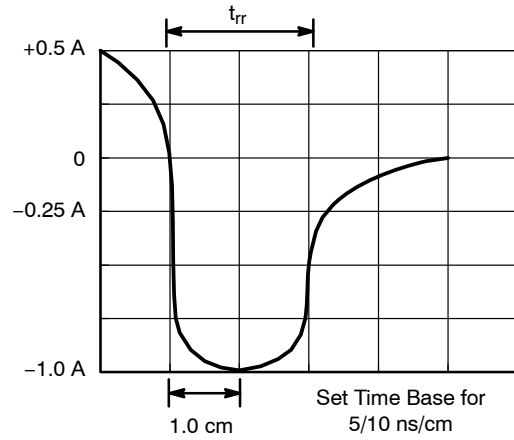
Figure 5. Total Capacitance

## ES2A–ES2D



### NOTES:

2. Rise time = 7.0 ns max; Input impedance = 1.0 MΩ 22 pF.
3. Rise time = 10 ns max; Source impedance = 50 Ω.



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

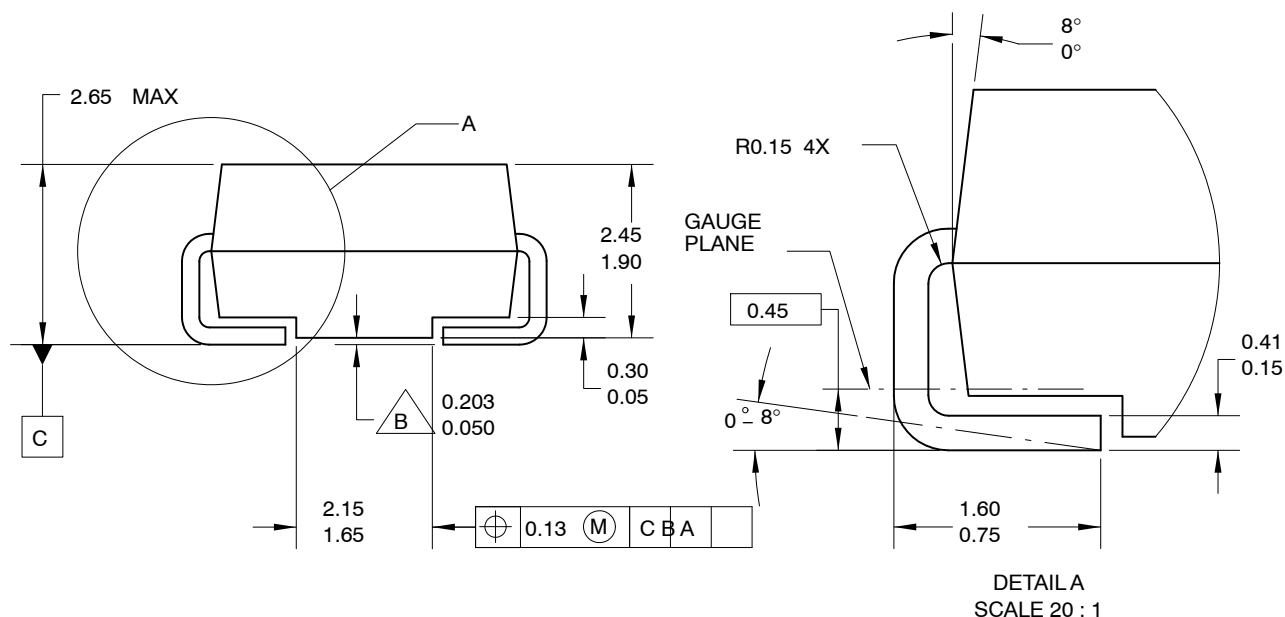
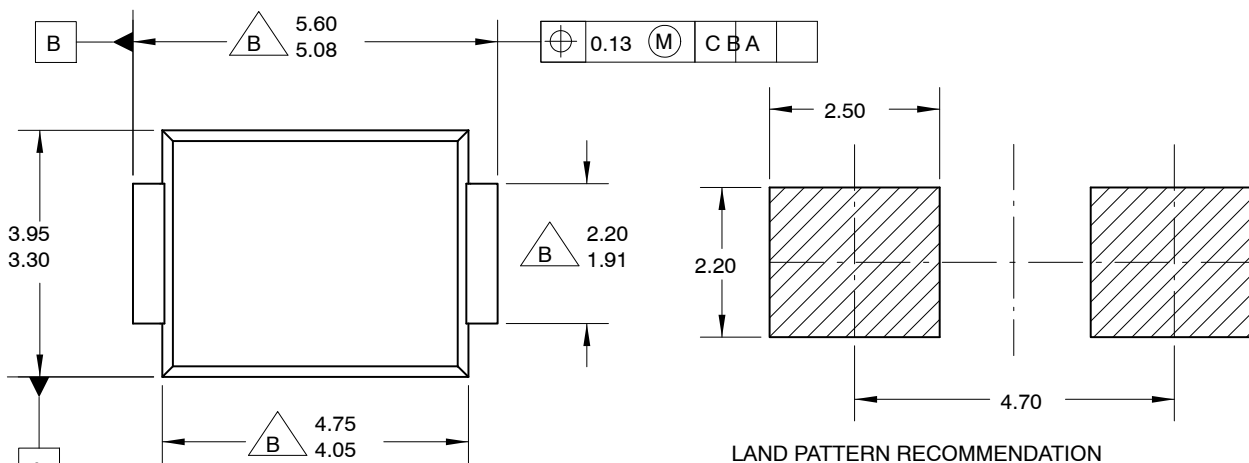
### ORDERING INFORMATION

| Part Number | Device Code Marking | Package Type     | Shipping†          |
|-------------|---------------------|------------------|--------------------|
| ES2A        | ES2A                | SMB<br>(Pb-Free) | 3000 / Tape & Reel |
| ES2B        | ES2B                | SMB<br>(Pb-Free) | 3000 / Tape & Reel |
| ES2C        | ES2C                | SMB<br>(Pb-Free) | 3000 / Tape & Reel |
| ES2D        | ES2D                | SMB<br>(Pb-Free) | 3000 / 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](#).

**SMB**  
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**NOTES:**

- A. EXCEPT WHERE NOTED CONFORMS TO JEDEC DO214 VARIATION AA.
- B. DOES NOT COMPLY JEDEC STD. VALUE.
- C. ALL DIMENSIONS ARE IN MILLIMETERS.
- D. DIMENSIONS ARE EXCLUSIVE OF BURRS, MOLD FLASH AND TIE BAR PROTRUSIONS.
- E. DIMENSION AND TOLERANCE AS PER ASME Y14.5-1994.
- F. LAND PATTERN STD. DIOM5336X240M.

|                         |                    |                                                                                                                                                                                     |
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