

# ES1DAF, ES1JAF

## Surface Mount Ultrafast Rectifier

### 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)

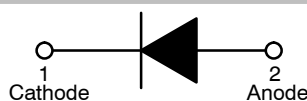
Symbol	Parameter	Value		Unit
		ES1DAF	ES1JAF	
$V_{RRM}$	Recurrent Peak Reverse Voltage	200	600	V
$V_{RMS}$	RMS Voltage	140	420	V
$V_R$	DC Blocking Voltage	200	600	V
$I_{F(AV)}$	Average Forward Current	1		A
$I_{FSM}$	Peak Forward Surge Current: 8.3 ms Single Half Sine-Wave Superimposed on Rated Load	30		A
$T_J$	Operating Junction Temperature Range	-55 to +150		$^\circ\text{C}$
$T_{STG}$	Storage Temperature Range	-55 to +150		$^\circ\text{C}$

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.

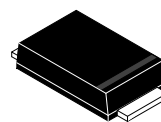


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Ultrafast Rectifier



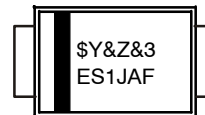
DO-214AD  
(SMAF)  
CASE 403AD

### MARKING DIAGRAMS



Band Indicates Cathode

\$Y = ON Semiconductor Logo  
&Z = Assembly Plant Code  
&3 = Data Code (Year & Week)  
ES1DAF = Specific Device Code



Band Indicates Cathode

\$Y = ON Semiconductor Logo  
&Z = Assembly Plant Code  
&3 = Data Code (Year & Week)  
ES1JAF = Specific Device Code

### ORDERING INFORMATION

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

## ES1DAF, ES1JAF

### 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)	24	$^\circ\text{C/W}$
$R_{\theta JA}$	Typical Thermal Resistance, Junction-to-Ambient (Note 2)	150	$^\circ\text{C/W}$

1. Mounted on an FR4 PCB, single-sided copper, with 48 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	$I_F = 1\text{ A}$	ES1DAF	-	-	0.95	V
			ES1JAF	-	-	1.70	
$I_R$	Reverse Current	$V_R = V_{DC}$	-	-	1	$\mu\text{A}$	
$t_{rr}$	Reverse Recovery Time	$I_F = 0.5\text{ A}$ , $I_R = 1\text{ A}$ , $I_{rr} = 0.25\text{ A}$	-	-	34	ns	
$C_J$	Junction Capacitance	$V_R = 4\text{ V}$ , $f = 1\text{ MHz}$	-	15	-	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 <sup>†</sup>
ES1DAF	ES1DAF	DO-214AD (SMAF) (Pb-Free/Halogen Free)	10000 / Tape & Reel
ES1JAF	ES1JAF	DO-214AD (SMAF) (Pb-Free/Halogen Free)	10000 / Tape & Reel

<sup>†</sup>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

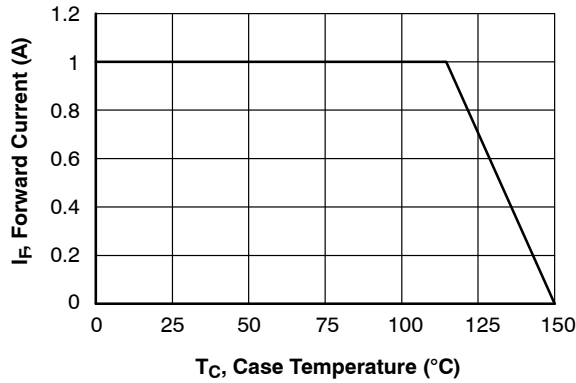


Figure 1. Forward Current Derating Curve

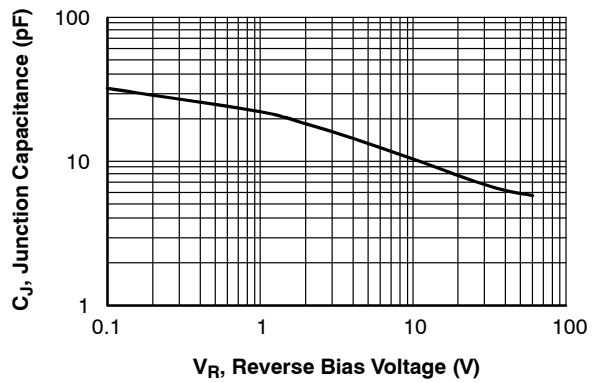


Figure 2. Typical Junction Capacitance

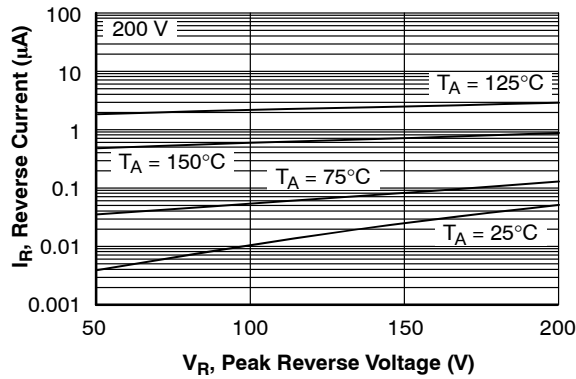


Figure 3. Typical Reverse Characteristics

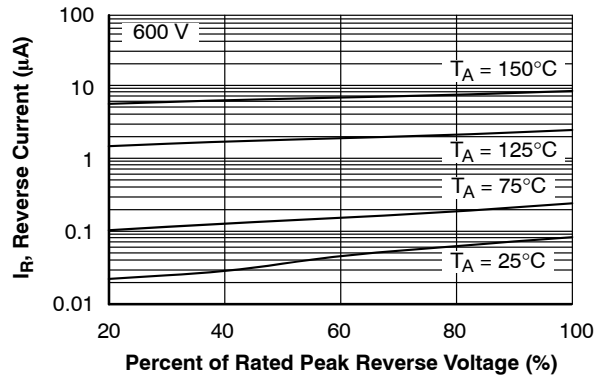


Figure 4. Typical Reverse Characteristics

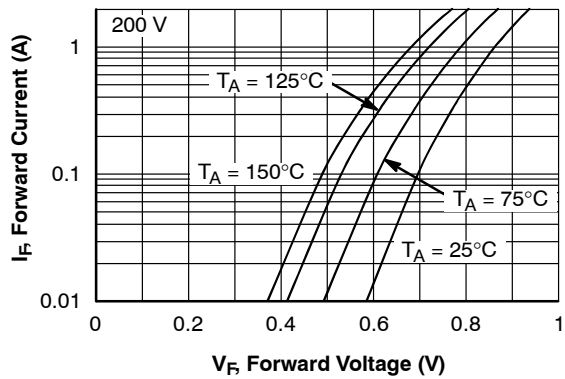


Figure 5. Typical Forward Characteristics

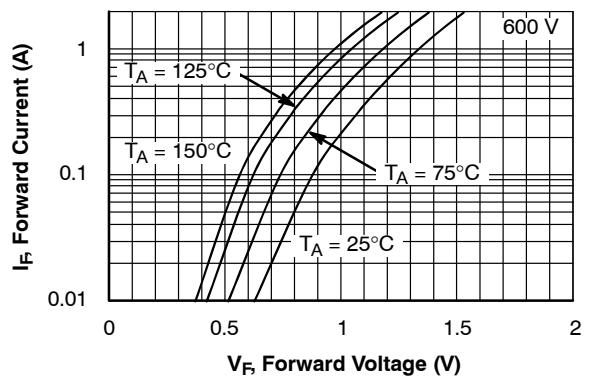
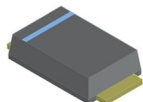


Figure 6. Typical Forward Characteristics

# MECHANICAL CASE OUTLINE

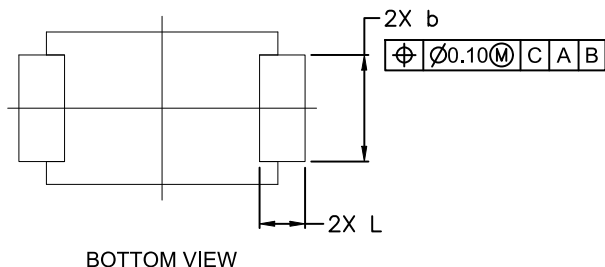
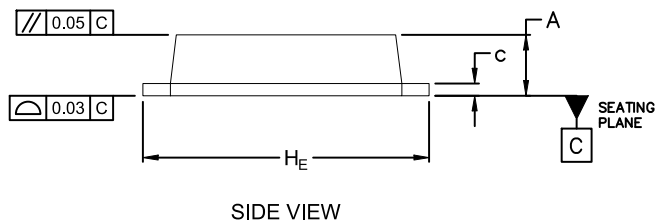
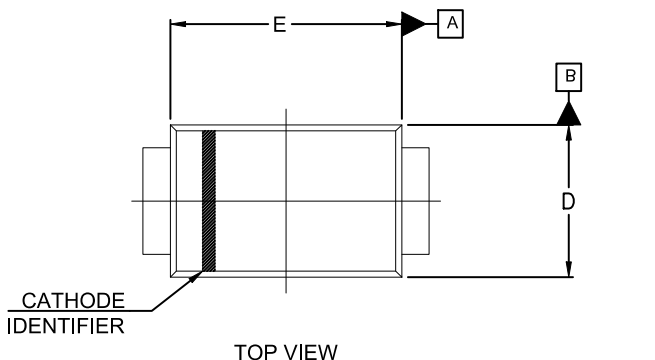
## PACKAGE DIMENSIONS

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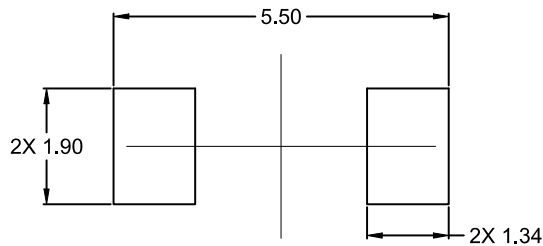
### SMA-FL CASE 403AD ISSUE A

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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