

# **Surface Mount Ultrafast Rectifier**

# ES1DAF, ES1JAF

#### **Features**

- Fast Switching Speed Maximum T<sub>rr</sub> 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 Free and are RoHS Compliant

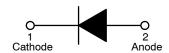
#### **Specifications**

#### ABSOLUTE MAXIMUM RATINGS (T<sub>A</sub> = 25°C unless otherwise noted)

		Value		
Symbol	Parameter	ES1DAF	ES1JAF	Unit
$V_{RRM}$	Recurrent Peak Reverse Voltage	200	600	V
V <sub>RMS</sub>	RMS Voltage	140	420	V
V <sub>R</sub>	DC Blocking Voltage	200	600	V
I <sub>F(AV)</sub>	Average Forward Current	1		Α
I <sub>FSM</sub>	Peak Forward Surge Current: 8.3 ms Single Half Sine-Wave Superimposed on Rated Load	30		Α
T <sub>J</sub>	Operating Junction Temperature Range	-55 to +150		°C
T <sub>STG</sub>	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.

1



**Ultrafast Rectifier** 



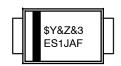
DO-214AD (SMAF) CASE 403AD

#### MARKING DIAGRAMS



Band Indicates Cathode

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



Band Indicates Cathode

\$Y = onsemi 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<sub>A</sub> = 25°C unless otherwise noted)

Symbol	Characteristic	Value	Unit
$\Psi_{\sf JL}$	Typical Thermal Characteristics, Junction-to-Lead (Note 1)	24	°C/W
$R_{\theta JA}$	Typical Thermal Resistance, Junction-to-Ambient (Note 2)	150	°C/W

<sup>1.</sup> Mounted on an FR4 PCB, single-sided copper, with 48  ${\rm cm^2}$  copper pad area.

# **ELECTRICAL CHARACTERISTICS** (T<sub>A</sub> = 25°C unless otherwise noted)

Symbol	Parameter	Conditions		Min	Тур	Max	Unit
V <sub>F</sub>	Forward Voltage	I <sub>F</sub> = 1 A	ES1DAF	-	-	0.95	V
			ES1JAF	-	=	1.70	
I <sub>R</sub>	Reverse Current	$V_R = V_{DC}$		-	-	1	μΑ
t <sub>rr</sub>	Reverse Recovery Time	I <sub>F</sub> = 0.5 A, I <sub>R</sub> = 1 A, I <sub>rr</sub> = 0.25 A		-	-	34	ns
CJ	Junction Capacitance	V <sub>R</sub> = 4 V, f = 1 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.

<sup>2.</sup> Mounted on an FR4 PCB, single-sided copper, mini pad.

# **ES1DAF, ES1JAF**

#### TYPICAL PERFORMANCE CHARACTERISTICS

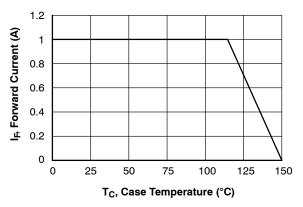


Figure 1. Forward Current Derating Curve

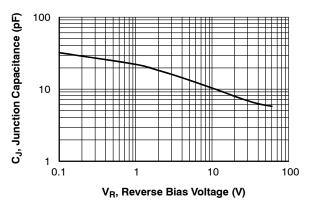


Figure 2. Typical Junction Capacitance

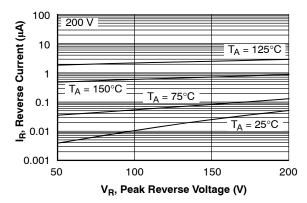


Figure 3. Typical Reverse Characteristics

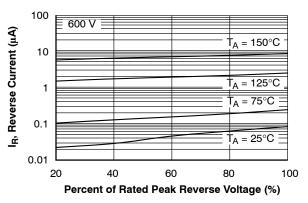


Figure 4. Typical Reverse Characteristics

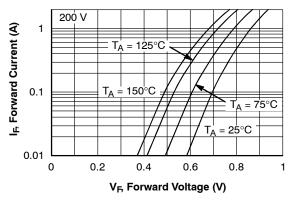


Figure 5. Typical Forward Characteristics

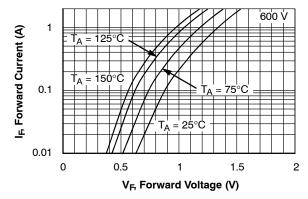


Figure 6. Typical Forward Characteristics



**CATHODE IDENTIFIER** 

// 0.05 C



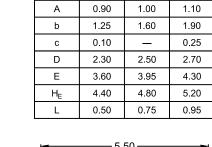
В

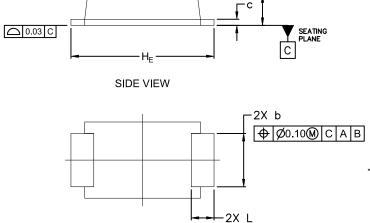
**DATE 14 JUL 2020** 



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

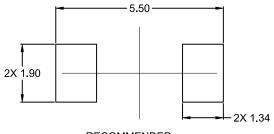
	MILLIMETERS			
DIM	MIN.	NOM.	MAX.	
Α	0.90	1.00	1.10	
b	1.25	1.60	1.90	
С	0.10	_	0.25	
D	2.30	2.50	2.70	
Е	3.60	3.95	4.30	
HE	4.40	4.80	5.20	
L	0.50	0.75	0.95	





TOP VIEW

**BOTTOM VIEW** 



#### 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.

DOCUMENT NUMBER:	98AON13439G	Electronic versions are uncontrolled except when accessed directly from the Document Repository. Printed versions are uncontrolled except when stamped "CONTROLLED COPY" in red.		
DESCRIPTION:	SMA-FL		PAGE 1 OF 1	

onsemi and ONSEMI are trademarks of Semiconductor Components Industries, LLC dba onsemi or its subsidiaries in the United States and/or other countries. onsemi reserves onsem and of 15GTI in are trademarks of Semiconductor Components industries, LLC due onsem or its substitutines in the Office States and/or other countries. Onsem reserves the right to make changes without further notice to any products herein. onsem makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does onsemi assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. onsemi does not convey any license under its patent rights nor the rights of others.

onsemi, Onsemi, and other names, marks, and brands are registered and/or common law trademarks of Semiconductor Components Industries, LLC dba "onsemi" or its affiliates and/or subsidiaries in the United States and/or other countries. onsemi owns the rights to a number of patents, trademarks, copyrights, trade secrets, and other intellectual property. A listing of onsemi's product/patent coverage may be accessed at <a href="www.onsemi.com/site/pdf/Patent-Marking.pdf">www.onsemi.com/site/pdf/Patent-Marking.pdf</a>. Onsemi reserves the right to make changes at any time to any products or information herein, without notice. The information herein is provided "as-is" and onsemi makes no warranty, representation or guarantee regarding the accuracy of the information, product features, availability, functionality, or suitability of its products for any particular purpose, nor does onsemi assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. Buyer is responsible for its products and applications using onsemi products, including compliance with all laws, regulations and safety requirements or standards, regardless of any support or applications information provided by onsemi. "Typical" parameters which may be provided in onsemi data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. onsemi does not convey any license under any of its intellectual property rights nor the rights of others. onsemi products are not designed, intended, or authorized for use as a critical component in life support systems or any FDA class 3 medical devices with a same or similar classification in a foreign jurisdiction or any devices intended for implantation in the human body. Should Buyer purchase

#### ADDITIONAL INFORMATION

**TECHNICAL PUBLICATIONS:** 

 $\textbf{Technical Library:} \ \underline{www.onsemi.com/design/resources/technical-documentation}$ 

onsemi Website: www.onsemi.com

ONLINE SUPPORT: www.onsemi.com/support

For additional information, please contact your local Sales Representative at

www.onsemi.com/support/sales