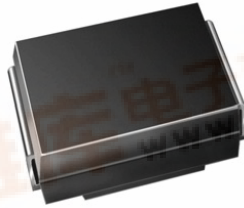




# ES2A thru ES2D

Vishay General Semiconductor

## Surface Mount Ultrafast Plastic Rectifier



DO-214AA (SMB)

### FEATURES

- Glass passivated chip junction
- Ideal for automated placement
- Ultrafast recovery times for high efficiency
- Low forward voltage, low power losses
- High forward surge capability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC



RoHS COMPLIANT

### TYPICAL APPLICATIONS

For use in high frequency rectification and freewheeling application in switching mode converters and inverters for consumer, computer, automotive and telecommunication.

### MECHANICAL DATA

**Case:** DO-214AA (SMB)

Epoxy meets UL 94V-0 flammability rating

**Terminals:** Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test, HE3 suffix for high reliability grade (AEC Q101 qualified), meets JESD 201 class 2 whisker test

**Polarity:** Color band denotes cathode end

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	2.0 A
$V_{RRM}$	50 V to 200 V
$I_{FSM}$	50 A
$t_{rr}$	20 ns
$V_F$	0.90 V
$T_J \text{ max.}$	150 °C

MAXIMUM RATINGS ( $T_A = 25\text{ °C}$ unless otherwise noted)						
PARAMETER	SYMBOL	ES2A	ES2B	ES2C	ES2D	UNIT
Device marking code		EA	EB	EC	ED	
Maximum repetitive peak reverse voltage	$V_{RRM}$	50	100	150	200	V
Maximum RMS voltage	$V_{RMS}$	35	70	105	140	V
Maximum DC blocking voltage	$V_{DC}$	50	100	150	200	V
Maximum average forward rectified current at $T_L = 110\text{ °C}$	$I_{F(AV)}$	2.0				A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	$I_{FSM}$	50				A
Operating junction and storage temperature range	$T_J, T_{STG}$	- 55 to + 150				°C

ELECTRICAL CHARACTERISTICS ( $T_A = 25\text{ °C}$ unless otherwise noted)							
PARAMETER	TEST CONDITIONS	SYMBOL	ES2A	ES2B	ES2C	ES2D	UNIT
Maximum instantaneous forward voltage <sup>(1)</sup>	2.0 A	$V_F$	0.90				V
Maximum DC reverse current at rated DC blocking voltage	$T_A = 25\text{ °C}$ $T_A = 100\text{ °C}$	$I_R$		10	350		$\mu\text{A}$

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<b>ELECTRICAL CHARACTERISTICS</b> ( $T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted)							
PARAMETER	TEST CONDITIONS	SYMBOL	ES2A	ES2B	ES2C	ES2D	UNIT
Max. reverse recovery time	$I_F = 0.5\text{ A}$ , $I_R = 1.0\text{ A}$ , $t_{rr} = 0.25\text{ A}$	$t_{rr}$			20		ns
Maximum reverse recovery time	$I_F = 2.0\text{ A}$ , $V_R = 30\text{ V}$ , $di/dt = 50\text{ A}/\mu\text{s}$ , $I_r = 10\% I_{RM}$	$t_{rr}$			30 50		ns
Maximum stored charge	$I_F = 2.0\text{ A}$ , $V_R = 30\text{ V}$ , $di/dt = 50\text{ A}/\mu\text{s}$ , $I_r = 10\% I_{RM}$	$Q_{rr}$			10 25		nC
Typical junction capacitance	4.0 V, 1 MHz	$C_J$			18		pF

**Note:**

(1) Pulse test: 300 ms pulse width, 1 % duty cycle

<b>THERMAL CHARACTERISTICS</b> ( $T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted)							
PARAMETER	SYMBOL	ES2A	ES2B	ES2C	ES2D	UNIT	
Typical thermal resistance <sup>(1)</sup>	$R_{\theta JA}$ $R_{\theta JL}$			75 20		$^\circ\text{C}/\text{W}$	

**Note:**

(1) Units mounted on P.C.B. 5.0 x 5.0 mm (0.013 mm thick) land areas

<b>ORDERING INFORMATION</b> (Example)					
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE	
ES2D-E3/52T	0.096	52T	750	7" diameter plastic tape and reel	
ES2D-E3/5BT	0.096	5BT	3200	13" diameter plastic tape and reel	
ES2DHE3/52T <sup>(1)</sup>	0.096	52T	750	7" diameter plastic tape and reel	
ES2DHE3/5BT <sup>(1)</sup>	0.096	5BT	3200	13" diameter plastic tape and reel	

**Note:**

(1) Automotive grade AEC Q101 qualified

## RATINGS AND CHARACTERISTICS CURVES

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

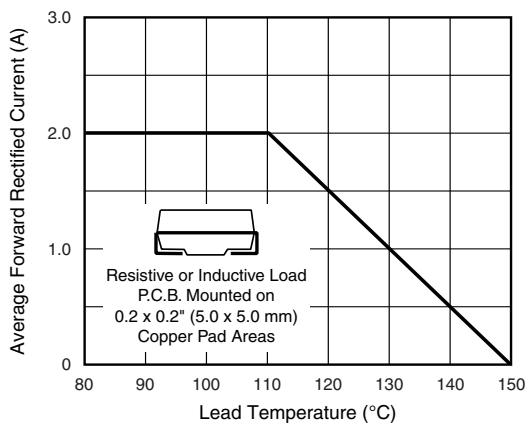


Figure 1. Maximum Forward Current Derating Curve

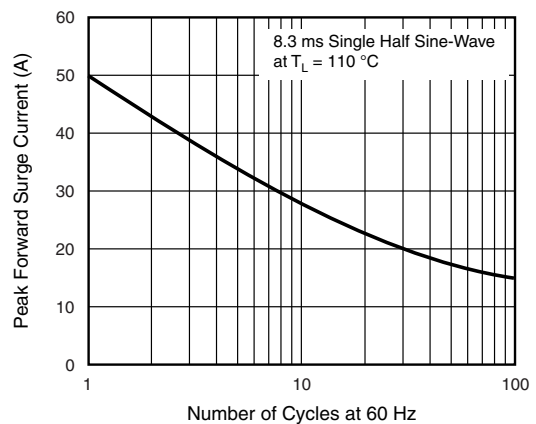


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current



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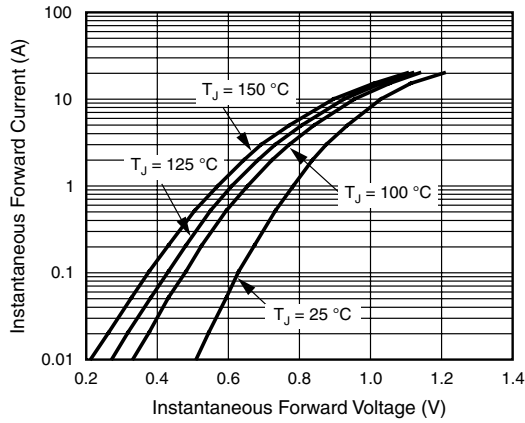


Figure 3. Typical Instantaneous Forward Characteristics

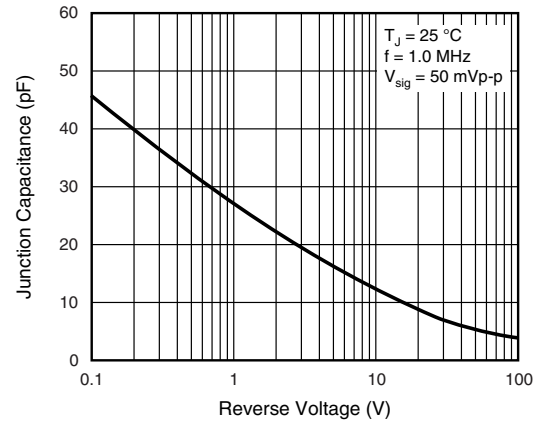


Figure 5. Typical Junction Capacitance

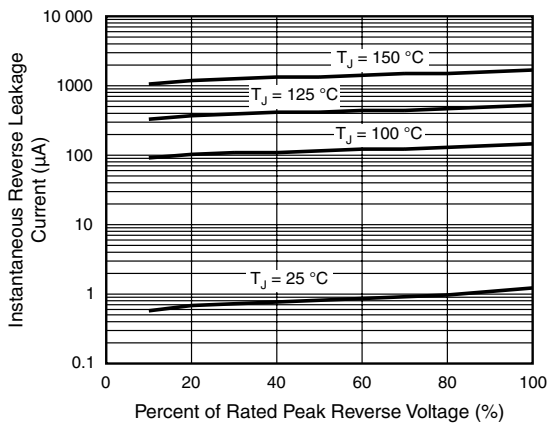
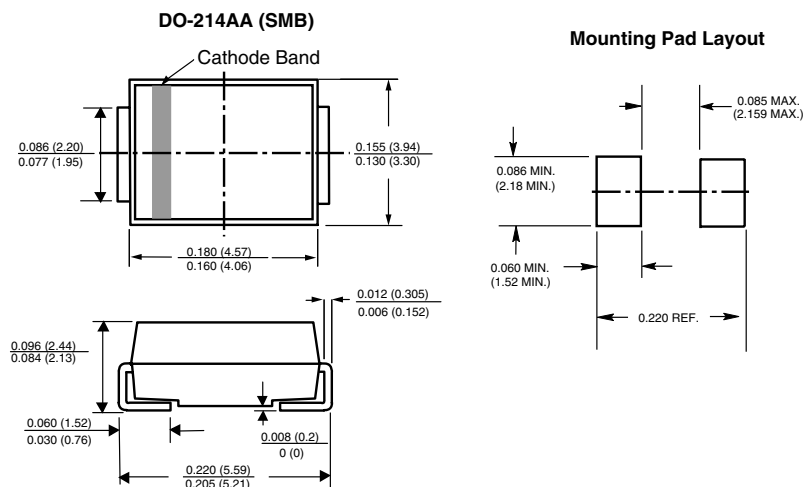


Figure 4. Typical Reverse Leakage Characteristics

## PACKAGE OUTLINE DIMENSIONS in inches (millimeters)





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