

Vishay General Semiconductor

# **Surface Mount Ultrafast Plastic Rectifier**



DO-214AA (SMB)

PRIMARY CHARACTERISTICS					
I <sub>F(AV)</sub>	2.0 A				
V <sub>RRM</sub>	300 V, 400 V				
I <sub>FSM</sub>	50 A				
t <sub>rr</sub>	35 ns				
V <sub>F</sub> at I <sub>F</sub>	1.1 V				
T <sub>J</sub> max.	150 °C				
Package	DO-214AA (SMB)				
Diode variations	Single die				

### **TYPICAL APPLICATIONS**

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

### **FEATURES**

- Glass passivated pallet chip junction
- · Ideal for automated placement
- Ultrafast reverse recovery time
- · Low switching losses, high efficiency
- High forward surge capability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- AEC-Q101 qualified available - Automotive ordering code: base P/NHE3
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

### **MECHANICAL DATA**

Case: DO-214AA (SMB)

Molding compound meets UL 94 V-0 flammability rating Base P/N-E3 - RoHS-compliant, commercial grade Base P/NHE3 - RoHS-compliant, AEC-Q101 qualified Base P/NHE3\_X - RoHS-compliant, AEC-Q101 qualified ("\_X" denotes revision code e.g. A, B,....)

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD 22-B102

E3 suffix meets JESD 201 class 2 whisker test, HE3 suffix meets JESD 201 class 2 whisker test

Polarity: Color band denotes cathode end

<b>MAXIMUM RATINGS</b> ( $T_A = 25 \text{ °C}$ unless otherwise noted)						
PARAMETER	SYMBOL	ES2F	ES2G	UNIT		
Device marking code		EF	EG			
Maximum repetitive peak reverse voltage	V <sub>RRM</sub>	300	400	V		
Working peak reverse voltage	V <sub>RWM</sub>	225	300	V		
Maximum RMS voltage	V <sub>RMS</sub>	210	280	V		
Maximum average forward rectified current at $T_L$ = 110 $^\circ\text{C}$	I <sub>F(AV)</sub>	2.0		A		
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I <sub>FSM</sub>	50		A		
Operating junction and storage temperature range	T <sub>J</sub> , T <sub>STG</sub>	-55 to +150		°C		

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# ES2F, ES2G

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<b>ELECTRICAL CHARACTERISTICS</b> ( $T_A = 25 \text{ °C}$ unless otherwise noted)							
PARAMETER	TEST CONDITIONS		SYMBOL	ES2F	ES2G	UNIT	
Maximum instantaneous forward voltage	2.0 A		V <sub>F</sub> <sup>(1)</sup>	1.1		V	
Maximum reverse current at $V_{\text{RRM}}$		T <sub>A</sub> = 25 °C	10		۵		
		T <sub>A</sub> = 100 °C	I <sub>R</sub>	200		μΑ	
Maximum reverse recovery time	$I_F = 0.5 \text{ A}, I_R = 1.0 \text{ A}, I_{rr} = 0.25 \text{ A}$		t <sub>rr</sub>	35		ns	
Maximum reverse recovery time	$I_F = 1.0 \text{ A}, \text{ dl/dt} = 100 \text{ A/}\mu\text{s}, V_R = 30 \text{ V}, I_{rr} = 0.1 I_{RM}$		t <sub>rr</sub>	50		ns	
Maximum reverse recovery current	$I_F = 1.0 \text{ A}, \text{ dI/dt} = 100 \text{ A/}\mu\text{s}, \\ V_R = 30 \text{ V}, I_{rr} = 0.1 \text{ I}_{RM}$		I <sub>RM</sub>	3.0		А	
Maximum stored charge	$ I_F = 1.0 \text{ A},  dI/dt = 100 \text{ A}/\mu\text{s}, \\ V_R = 30 \text{ V},  I_{rr} = 0.1 I_{RM} $		Q <sub>rr</sub>	Q <sub>rr</sub> 50		nC	
Typical junction capacitance	4.0 V, 1 MHz		CJ	15		pF	

#### Note

 $^{(1)}\,$  Pulse test: 300  $\mu s$  pulse width, 1 % duty cycle

<b>THERMAL CHARACTERISTICS</b> ( $T_A = 25 \text{ °C}$ unless otherwise noted)					
PARAMETER	SYMBOL	ES2F	ES2G	UNIT	
Maximum thermal resistance	R <sub>0JA</sub> <sup>(1)</sup>	75		°C/W	
	R <sub>0JL</sub> <sup>(1)</sup>	25			

#### Note

 $^{(1)}$  Units mounted on PCB 5.0 mm x 5.0 mm (0.013 mm thick) land areas

ORDERING INFORMATION (Example)						
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE		
ES2G-E3/52T	0.096	52T	750	7" diameter plastic tape and reel		
ES2G-E3/5BT	0.096	5BT	3200	13" diameter plastic tape and reel		
ES2GHE3/52T (1)	0.096	52T	750	7" diameter plastic tape and reel		
ES2GHE3/5BT (1)	0.096	5BT	3200	13" diameter plastic tape and reel		
ES2GHE3_A/H <sup>(1)</sup>	0.096	н	750	7" diameter plastic tape and reel		
ES2GHE3_A/I (1)	0.096		3200	13" diameter plastic tape and reel		

#### Note

(1) AEC-Q101 qualified



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### **RATINGS AND CHARACTERISTICS CURVES** ( $T_A = 25$ °C unless otherwise noted)

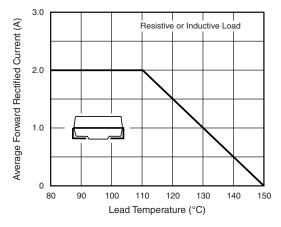


Fig. 1 - Maximum Forward Current Derating Curve

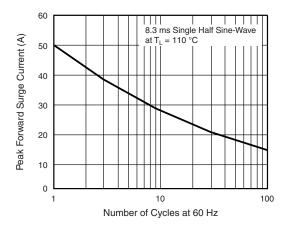


Fig. 2 - Maximum Non-Repetitive Peak Forward Surge Current

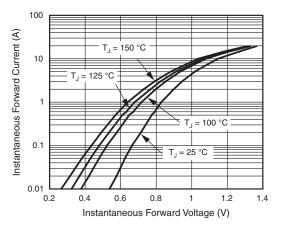


Fig. 3 - Typical Instantaneous Forward Characteristics

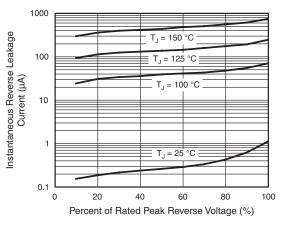


Fig. 4 - Typical Reverse Leakage Characteristics

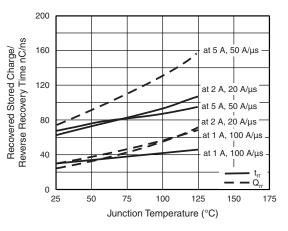


Fig. 5 - Reverse Switching Characteristics

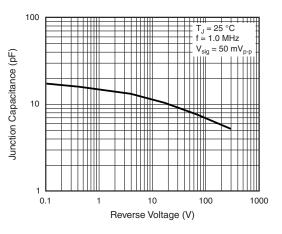


Fig. 6 - Typical Junction Capacitance

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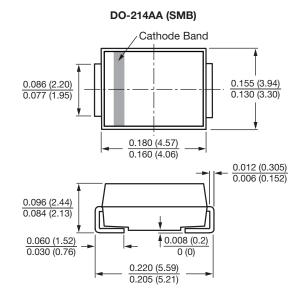
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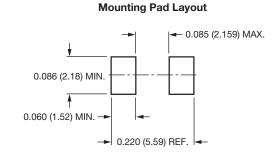
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### PACKAGE OUTLINE DIMENSIONS in inches (millimeters)







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