

# Surface-Mount Ultrafast Plastic Rectifier


**SMB (DO-214AA)**

Cathode  Anode

## LINKS TO ADDITIONAL RESOURCES



## FEATURES

- Glass passivated pellet 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](http://www.vishay.com/doc?99912)


**RoHS**  
COMPLIANT

## TYPICAL APPLICATIONS

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

## MECHANICAL DATA

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

Molding compound meets UL 94 V-0 flammability rating  
Base P/N-E3 - RoHS-compliant, commercial grade  
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

## PRIMARY CHARACTERISTICS

$I_{F(AV)}$	2.0 A
$V_{RRM}$	300 V, 400 V
$I_{FSM}$	50 A
$t_{rr}$	35 ns
$V_F$ at $I_F$	1.1 V
$T_J$ max.	150 °C
Package	SMB (DO-214AA)
Circuit configuration	Single

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

PARAMETER	SYMBOL	ES2F	ES2G	UNIT
Device marking code		EF	EG	
Maximum repetitive peak reverse voltage	$V_{RRM}$	300	400	V
Working peak reverse voltage	$V_{RWM}$	225	300	V
Maximum RMS voltage	$V_{RMS}$	210	280	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** ( $T_A = 25\text{ }^{\circ}\text{C}$  unless otherwise noted)

PARAMETER	TEST CONDITIONS	SYMBOL	ES2F	ES2G	UNIT
Maximum instantaneous forward voltage	2.0 A	$V_F^{(1)}$	1.1		V
Maximum reverse current at $V_{RRM}$	$T_A = 25\text{ }^{\circ}\text{C}$	$I_R$	10		$\mu\text{A}$
	$T_A = 100\text{ }^{\circ}\text{C}$		200		
Maximum reverse recovery time	$I_F = 0.5\text{ A}$ , $I_R = 1.0\text{ A}$ , $I_{rr} = 0.25\text{ A}$	$t_{rr}$	35		ns
Maximum reverse recovery time	$I_F = 1.0\text{ A}$ , $dI/dt = 100\text{ A}/\mu\text{s}$ , $V_R = 30\text{ V}$ , $I_{rr} = 0.1\text{ I}_{RM}$	$t_{rr}$	50		ns
Maximum reverse recovery current	$I_F = 1.0\text{ A}$ , $dI/dt = 100\text{ A}/\mu\text{s}$ , $V_R = 30\text{ V}$ , $I_{rr} = 0.1\text{ I}_{RM}$	$I_{RM}$	3.0		A
Maximum stored charge	$I_F = 1.0\text{ A}$ , $dI/dt = 100\text{ A}/\mu\text{s}$ , $V_R = 30\text{ V}$ , $I_{rr} = 0.1\text{ I}_{RM}$	$Q_{rr}$	50		nC
Typical junction capacitance	4.0 V, 1 MHz	$C_J$	15		pF

**Note**(1) Pulse test: 300  $\mu\text{s}$  pulse width, 1 % duty cycle**THERMAL CHARACTERISTICS** ( $T_A = 25\text{ }^{\circ}\text{C}$  unless otherwise noted)

PARAMETER	SYMBOL	ES2F	ES2G	UNIT
Maximum thermal resistance	$R_{\theta JA}^{(1)}$	75		$^{\circ}\text{C}/\text{W}$
	$R_{\theta JL}^{(1)}$	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_A/H <sup>(1)</sup>	0.096	H	750	7" diameter plastic tape and reel
ES2GHE3_A/I <sup>(1)</sup>	0.096	I	3200	13" diameter plastic tape and reel

**Note**

(1) AEC-Q101 qualified

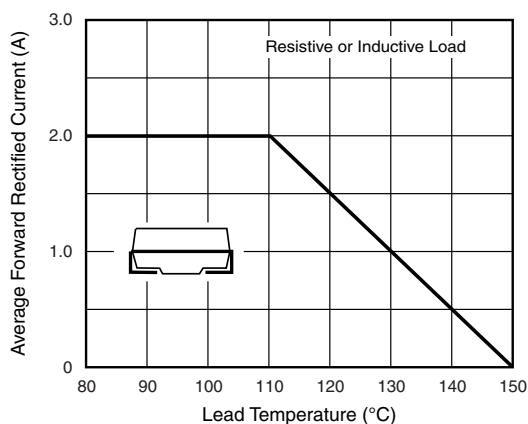
**RATINGS AND CHARACTERISTICS CURVES** ( $T_A = 25\text{ }^{\circ}\text{C}$  unless otherwise noted)


Fig. 1 - Maximum Forward Current Derating Curve

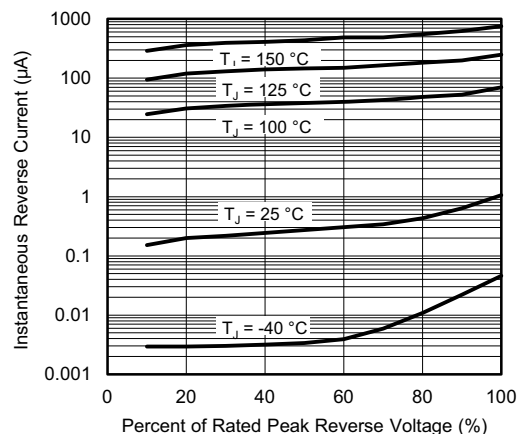


Fig. 4 - Typical Reverse Leakage Characteristics

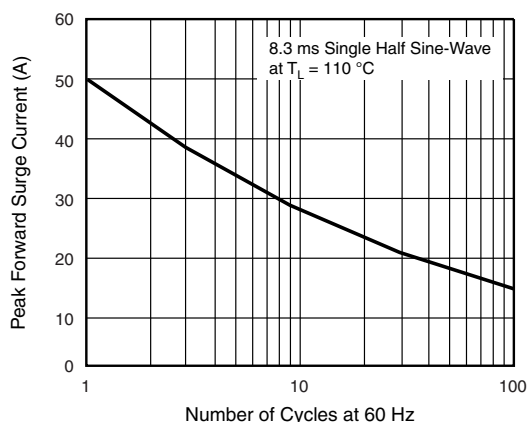


Fig. 2 - Maximum Non-Repetitive Peak Forward Surge Current

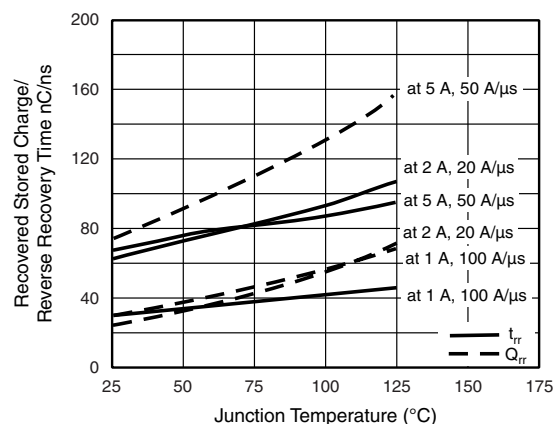


Fig. 5 - Reverse Switching Characteristics

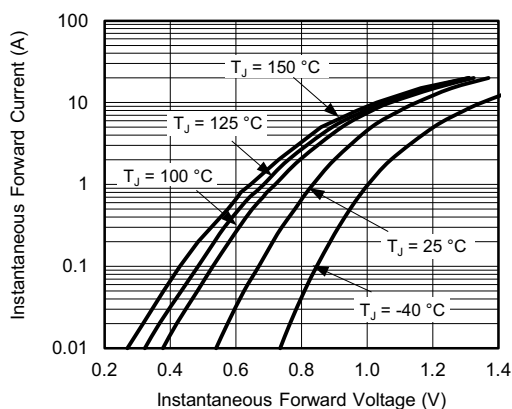


Fig. 3 - Typical Instantaneous Forward Characteristics

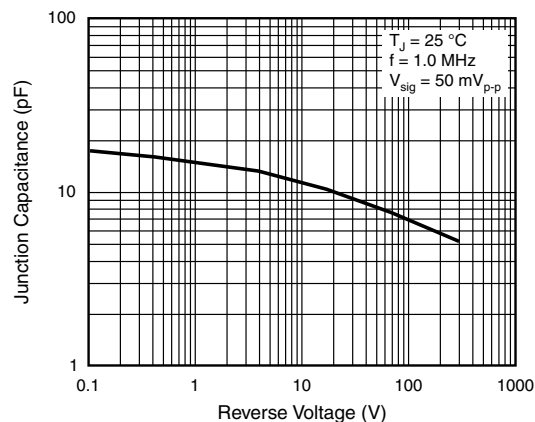
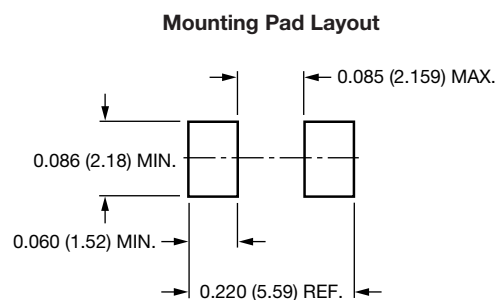
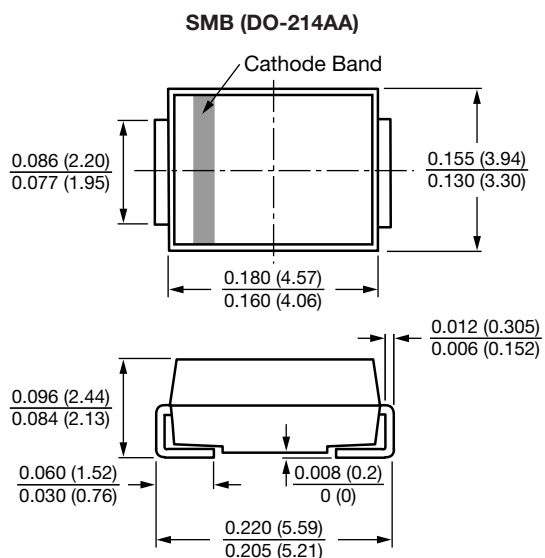


Fig. 6 - Typical Junction Capacitance

**PACKAGE OUTLINE DIMENSIONS** in inches (millimeters)




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