

## 3A, 50V - 600V Surface Mount Super Fast Rectifier

### FEATURES

- Glass passivated junction chip
- Ideal for automated placement
- Low profile package
- Super fast recovery time for high efficiency
- Compliant to RoHS Directive 2011/65/EU and in accordance to WEEE 2002/96/EC
- Halogen-free according to IEC 61249-2-21

### APPLICATIONS

- Switching mode power supply (SMPS)
- Adapters
- Lighting application
- Converter

### MECHANICAL DATA

- Case: DO-214AA (SMB)
- Molding compound meets UL 94V-0 flammability rating
- Part no. with suffix "H" means AEC-Q101 qualified
- Packing code with suffix "G" means green compound (halogen-free)
- Moisture sensitivity level: level 1, per J-STD-020
- Terminal: Matte tin plated leads, solderable per J-STD-002
- Meet JESD 201 class 2 whisker test
- Polarity: As marked
- Weight: 0.11 g (approximately)

KEY PARAMETERS		
PARAMETER	VALUE	UNIT
$I_{F(AV)}$	3	A
$V_{RRM}$	50 - 600	V
$I_{FSM}$	100	A
$T_{JMAX}$	150	°C
Package	DO-214AA (SMB)	
Configuration	Single die	



**DO-214AA (SMB)**

ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$ unless otherwise noted)										
PARAMETER	SYMBOL	ES 3AB	ES 3BB	ES 3CB	ES 3DB	ES 3FB	ES 3GB	ES 3HB	ES 3JB	UNIT
Marking code on the device		ES 3AB	ES 3BB	ES 3CB	ES 3DB	ES 3FB	ES 3GB	ES 3HB	ES 3JB	
Repetitive peak reverse voltage	$V_{RRM}$	50	100	150	200	300	400	500	600	V
Reverse voltage, total rms value	$V_{R(RMS)}$	30	70	105	140	210	280	350	420	V
Forward current	$I_{F(AV)}$	3								A
Surge peak forward current, 8.3 ms single half sine-wave superimposed on rated load per diode	$I_{FSM}$	100								A
Junction temperature	$T_J$	- 55 to +150								°C
Storage temperature	$T_{STG}$	- 55 to +150								°C

<b>THERMAL PERFORMANCE</b>			
<b>PARAMETER</b>	<b>SYMBOL</b>	<b>LIMIT</b>	<b>UNIT</b>
Junction-to-lead thermal resistance	$R_{\theta JL}$	24	$^{\circ}C/W$
Junction-to-ambient thermal resistance	$R_{\theta JA}$	84	$^{\circ}C/W$
Junction-to-case thermal resistance	$R_{\theta JC}$	26	$^{\circ}C/W$

**Thermal Performance Note:** Units mounted on recommended PCB (10mm x 10mm Cu pad test board)

**ELECTRICAL SPECIFICATIONS** ( $T_A = 25^{\circ}C$  unless otherwise noted)

<b>PARAMETER</b>		<b>CONDITIONS</b>	<b>SYMBOL</b>	<b>TYP</b>	<b>MAX</b>	<b>UNIT</b>		
Forward voltage per diode <sup>(1)</sup>	ES3AB ES3BB ES3CB ES3DB	$I_F = 1.5A, T_J = 25^{\circ}C$	$V_F$	0.80	0.92	V		
	ES3FB ES3GB			0.90	1.04	V		
	ES3HB ES3JB			1.11	1.30	V		
	ES3AB ES3BB ES3CB ES3DB	$I_F = 3.0A, T_J = 25^{\circ}C$	$V_F$	0.86	1.00	V		
	ES3FB ES3GB			0.98	1.13	V		
	ES3HB ES3JB			1.24	1.45	V		
	Reverse current @ rated $V_R$ per diode <sup>(2)</sup>	ES3AB ES3BB ES3CB ES3DB	$T_J = 25^{\circ}C$	$I_R$	-	10	$\mu A$	
			$T_J = 125^{\circ}C$		-	100	$\mu A$	
		ES3FB ES3GB	$I_F = 1.5A, T_J = 125^{\circ}C$		$V_F$	0.66	0.75	V
						0.73	0.85	V
						0.85	0.98	V
		ES3HB ES3JB				$I_F = 3.0A, T_J = 125^{\circ}C$	$V_F$	0.73
0.83	0.95			V				
0.99	1.13			V				
Junction capacitance	1 MHz, $V_R = 4.0V$	$C_J$	46	-	pF			
			41	-	pF			
			34	-	pF			
Reverse recovery time		$I_F = 0.5A, I_R = 1.0A$ $I_{RR} = 0.25A$	$t_{rr}$	-	35	ns		

**Notes:**

1. Pulse test with  $PW = 0.3$  ms
2. Pulse test with  $PW = 30$  ms

<b>ORDERING INFORMATION</b>					
<b>PART NO.</b>	<b>PART NO. SUFFIX</b>	<b>PACKING CODE</b>	<b>PACKING CODE SUFFIX</b>	<b>PACKAGE</b>	<b>PACKING</b>
ES3xB (Note 1, 2)	H	R5	G	SMB	850 / 7" Plastic reel
		R4		SMB	3,000 / 13" Paper reel
		M4		SMB	3,000 / 13" Plastic reel

**Notes:**

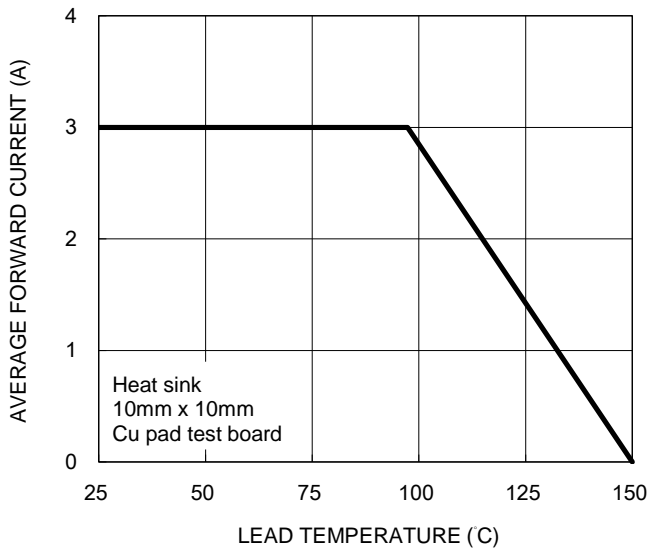
1. "x" defines voltage from 50V (ES3AB) to 600V (ES3JB)
2. Whole series with green compound (halogen-free)

<b>EXAMPLE P/N</b>					
<b>EXAMPLE P/N</b>	<b>PART NO.</b>	<b>PART NO. SUFFIX</b>	<b>PACKING CODE</b>	<b>PACKING CODE SUFFIX</b>	<b>DESCRIPTION</b>
ES3JBHR5G	ES3JB	H	R5	G	AEC-Q101 qualified Green compound

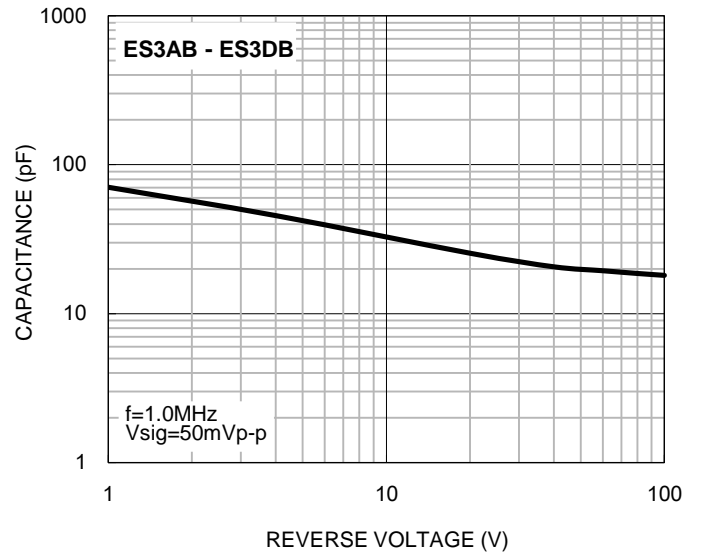
**CHARACTERISTICS CURVES**

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

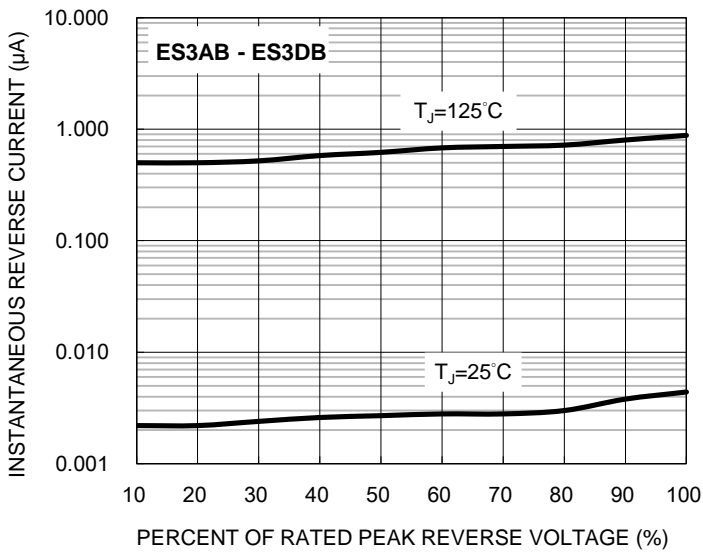
**Fig.1 Forward Current Derating Curve**



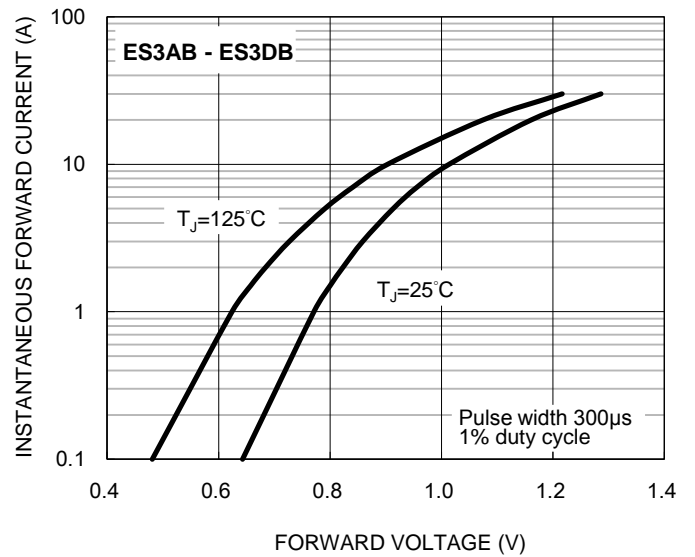
**Fig.2 Typical Junction Capacitance**



**Fig.3 Typical Reverse Characteristics**



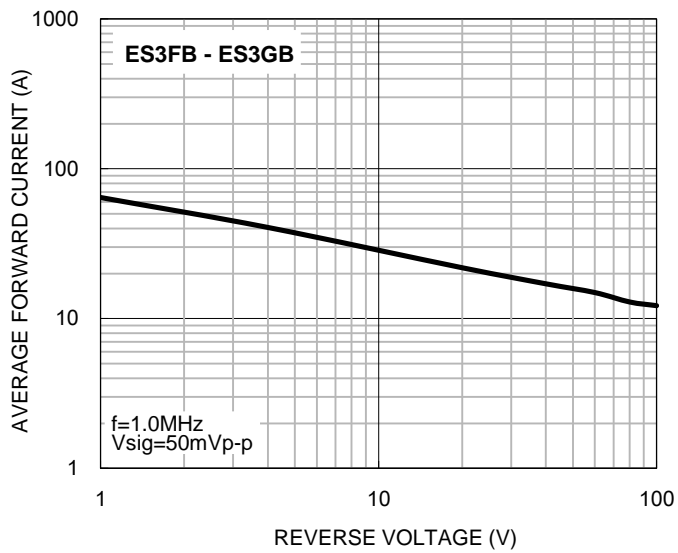
**Fig.4 Typical Forward Characteristics**



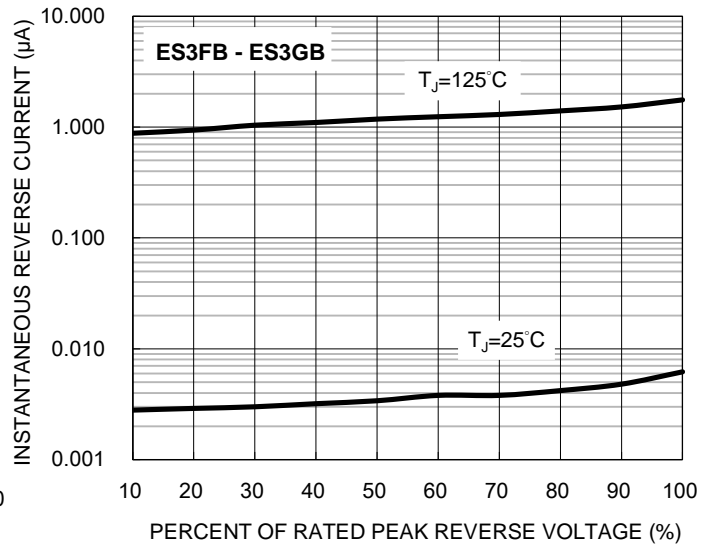
**CHARACTERISTICS CURVES**

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

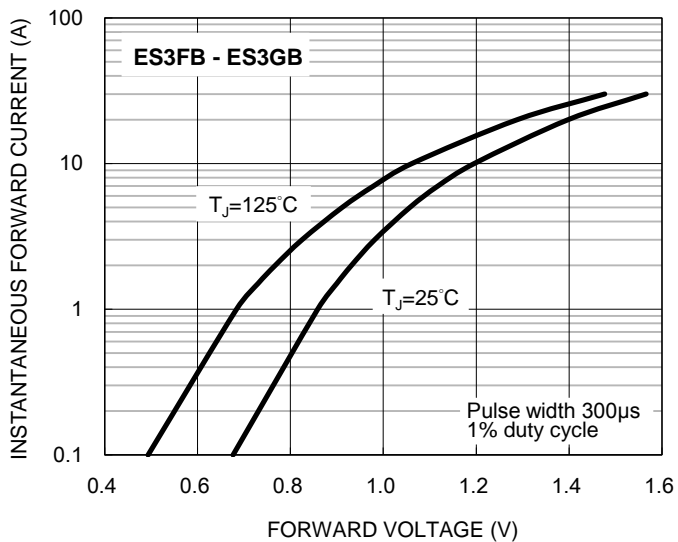
**Fig.5 Typical Junction Capacitance**



**Fig.6 Typical Reverse Characteristics**



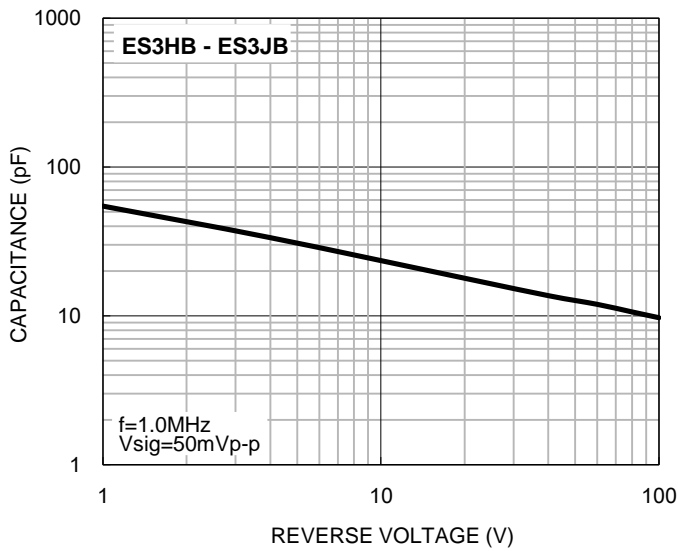
**Fig.7 Typical Forward Characteristics**



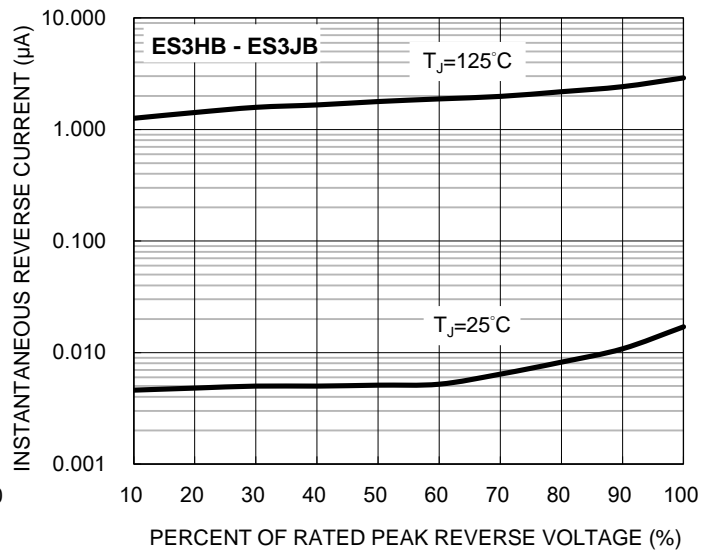
**CHARACTERISTICS CURVES**

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

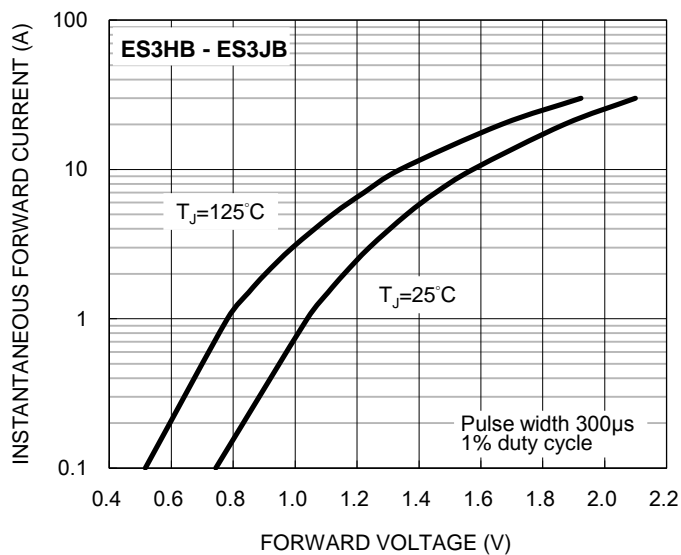
**Fig.8 Typical Junction Capacitance**



**Fig.9 Typical Reverse Characteristics**

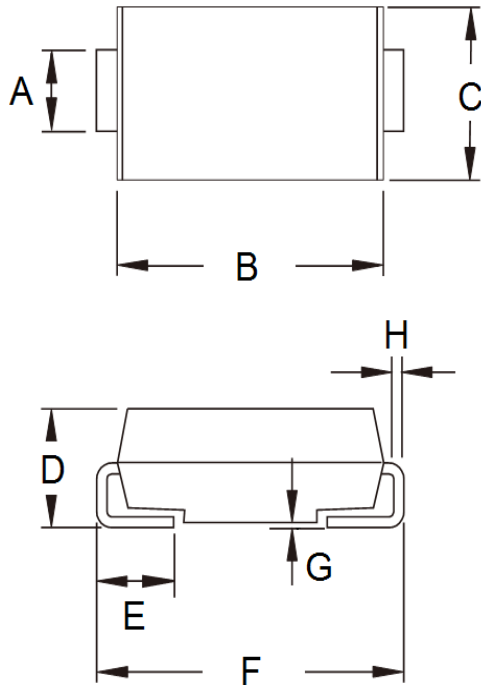


**Fig.10 Typical Forward Characteristics**



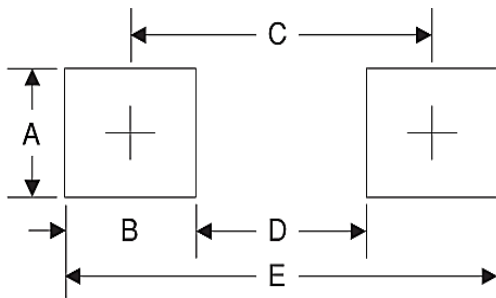
**PACKAGE OUTLINE DIMENSIONS**

DO-214AA (SMB)



DIM.	Unit (mm)		Unit (inch)	
	Min	Max	Min	Max
A	1.95	2.20	0.077	0.087
B	4.05	4.60	0.159	0.181
C	3.30	3.95	0.130	0.156
D	1.95	2.65	0.077	0.104
E	0.75	1.60	0.030	0.063
F	5.10	5.60	0.201	0.220
G	0.05	0.20	0.002	0.008
H	0.15	0.31	0.006	0.012

**SUGGESTED PAD LAYOUT**



Symbol	Unit (mm)	Unit (inch)
A	2.3	0.091
B	2.5	0.098
C	4.3	0.169
D	1.8	0.071
E	6.8	0.268

**MARKING DIAGRAM**



P/N = Marking Code  
 G = Green Compound  
 YW = Date Code  
 F = Factory Code

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