

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

### FEATURES

- Glass passivated chip junction
- Ideal for automated placement
- 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

- High frequency rectification
- Freewheeling application
- Switching mode converters and inverters in computer, automotive and telecommunication.

### MECHANICAL DATA

- Case: DO-214AB (SMC)
- 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: 0.21 g (approximately)

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



**DO-214AB (SMC)**

ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$ unless otherwise noted)										
PARAMETER	SYMBOL	ES3A	ES3B	ES3C	ES3D	ES3F	ES3G	ES3H	ES3J	UNIT
Marking code on the device		ES3A	ES3B	ES3C	ES3D	ES3F	ES3G	ES3H	ES3J	
Repetitive peak reverse voltage	$V_{RRM}$	50	100	150	200	300	400	500	600	V
Reverse voltage, total rms value	$V_{R(RMS)}$	35	70	105	140	210	280	350	420	V
Maximum DC blocking voltage	$V_{DC}$	50	100	150	200	300	400	500	600	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 per diode	$R_{\theta JL}$	12	$^{\circ}C/W$
Junction-to-ambient thermal resistance per diode	$R_{\theta JA}$	47	$^{\circ}C/W$

<b>ELECTRICAL SPECIFICATIONS</b> ( $T_A = 25^{\circ}C$ 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>	ES3A ES3B ES3C ES3D	$I_F = 3A, T_J = 25^{\circ}C$	$V_F$	-	0.95	V
	ES3F ES3G			-	1.30	V
	ES3H ES3J			-	1.70	V
Reverse current @ rated $V_R$ per diode <sup>(2)</sup>		$T_J = 25^{\circ}C$	$I_R$	-	10	$\mu A$
		$T_J = 100^{\circ}C$		-	500	$\mu A$
Junction capacitance	ES3A ES3B ES3C ES3D	1 MHz, $V_R = 4.0V$	$C_J$	45	-	pF
	ES3F ES3G ES3H ES3J			30	-	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>
ES3x (Note 1)	H	R7	G	SMC	850 / 7" Plastic reel
		R6		SMC	3,000 / 13" Paper reel
		M6		SMC	3,000 / 13" Plastic reel
		V7		Matrix SMC	850 / 7" Plastic reel
		V6		Matrix SMC	3,000 / 13" Plastic reel

**Note :**

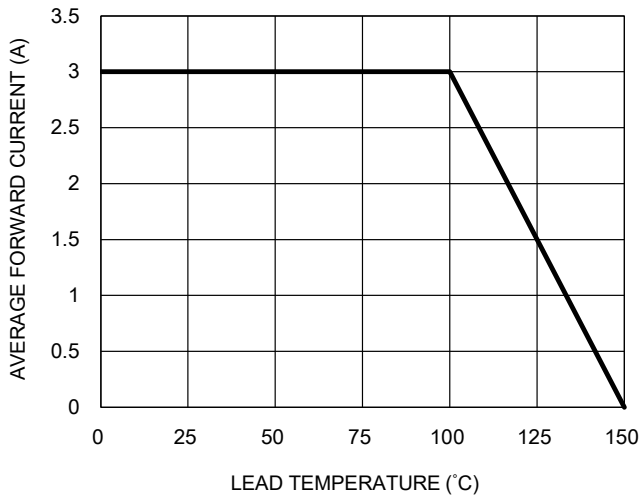
- "x" defines voltage from 50V (ES3A) to 600V (ES3J)

<b>EXAMPLE</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>
ES3AHR7G	ES3A	H	R7	G	AEC-Q101 qualified Green compound

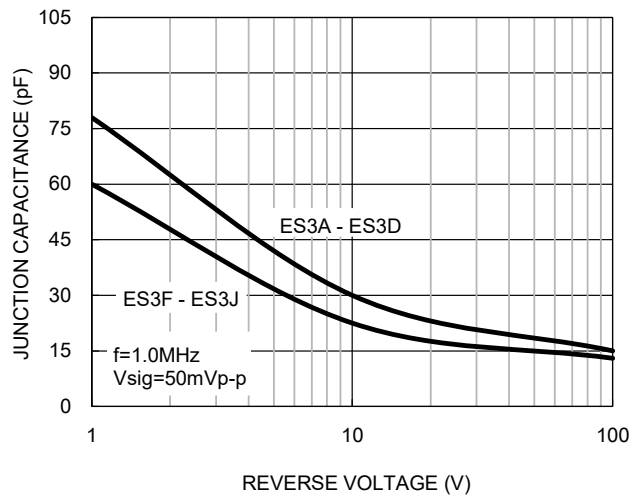
**CHARACTERISTICS CURVES**

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

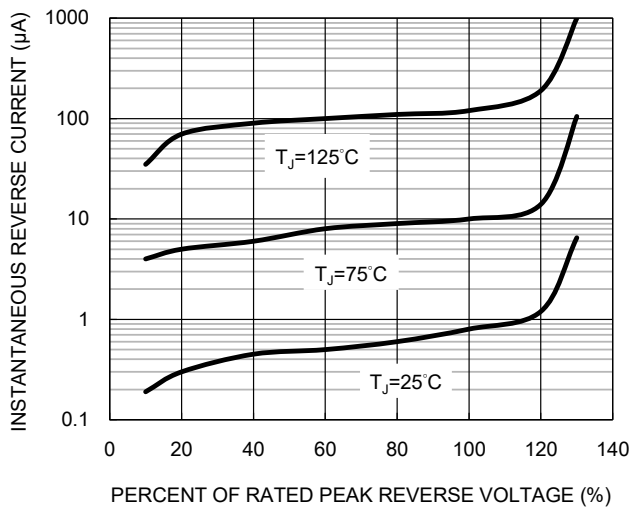
**Fig.1 Forward Current Derating Curve**



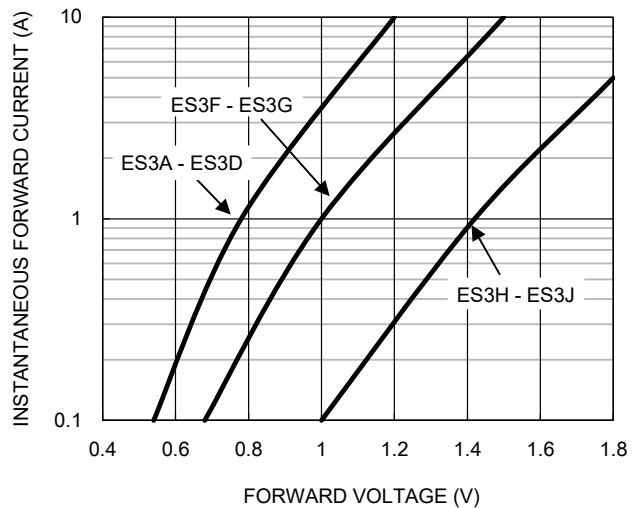
**Fig.2 Typical Junction Capacitance**



**Fig.3 Typical Reverse Characteristics**



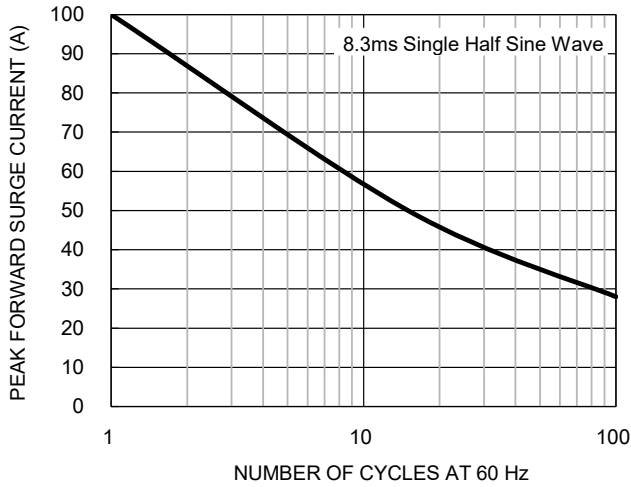
**Fig.4 Typical Forward Characteristics**



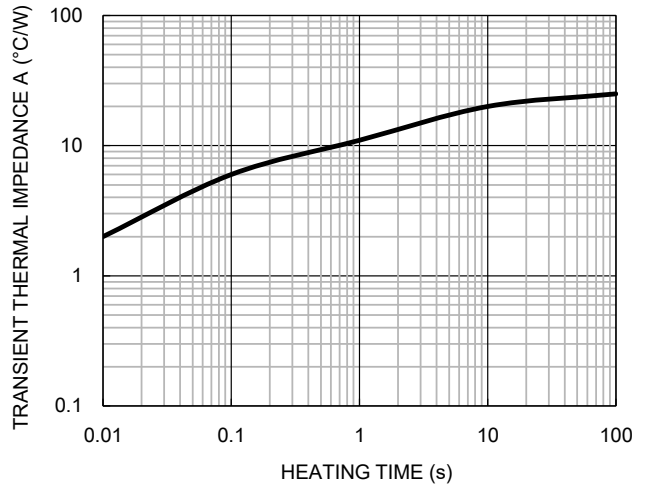
**CHARACTERISTICS CURVES**

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

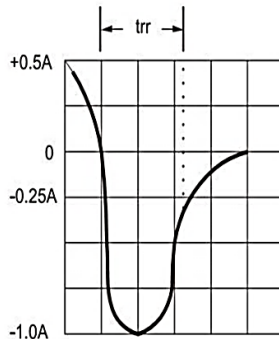
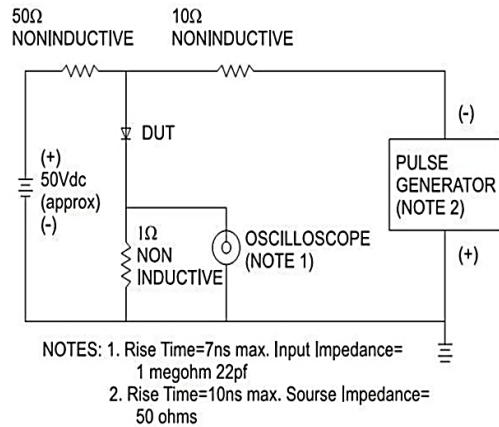
**Fig.5 Maximum Non-repetitive Forward Surge Current**



**Fig.6 Typical Transient Thermal Characteristics**

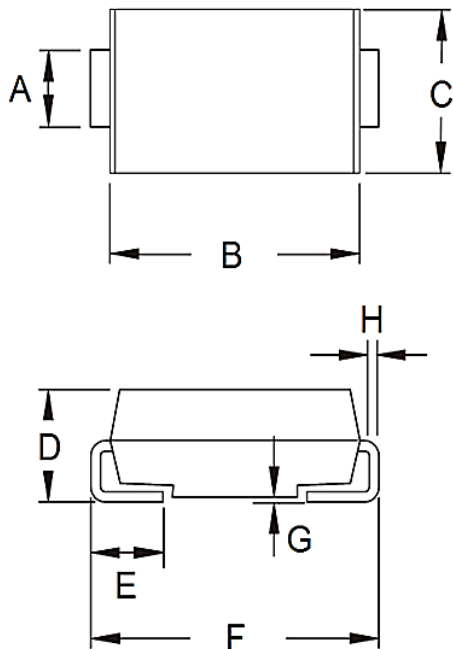


**Fig.7 Reverse Recovery Time Characteristic And Test Circuit Diagram**



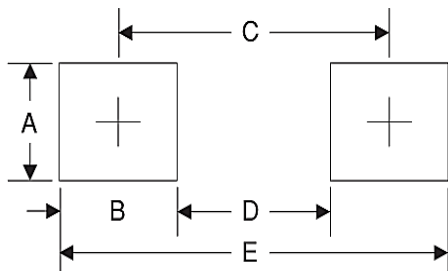
**PACKAGE OUTLINE DIMENSIONS**

DO-214AB (SMC)



DIM.	Unit (mm)		Unit (inch)	
	Min.	Max.	Min.	Max.
A	2.90	3.20	0.114	0.126
B	6.60	7.11	0.260	0.280
C	5.59	6.22	0.220	0.245
D	2.00	2.62	0.079	0.103
E	1.00	1.60	0.039	0.063
F	7.75	8.13	0.305	0.320
G	0.10	0.20	0.004	0.008
H	0.15	0.31	0.006	0.012

**SUGGESTED PAD LAYOUT**



Symbol	Unit (mm)	Unit (inch)
A	3.30	0.130
B	2.50	0.098
C	6.80	0.268
D	4.40	0.173
E	9.40	0.370

**MARKING DIAGRAM**



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

## Notice

Specifications of the products displayed herein are subject to change without notice. TSC or anyone on its behalf, assumes no responsibility or liability for any errors or inaccuracies.

Information contained herein is intended to provide a product description only. No license, express or implied, to any intellectual property rights is granted by this document. Except as provided in TSC's terms and conditions of sale for such products, TSC assumes no liability whatsoever, and disclaims any express or implied warranty, relating to sale and/or use of TSC products including liability or warranties relating to fitness for a particular purpose, merchantability, or infringement of any patent, copyright, or other intellectual property right.

The products shown herein are not designed for use in medical, life-saving, or life-sustaining applications. Customers using or selling these products for use in such applications do so at their own risk and agree to fully indemnify TSC for any damages resulting from such improper use or sale.

# Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

## Taiwan Semiconductor:

[ES3G](#) [ES3B](#) [ES3J](#) [ES3D](#) [ES3A](#) [ES3C](#) [ES3F](#) [ES3H](#) [ES3C R6](#) [ES3D R7](#) [ES3A R7](#) [ES3A R6](#) [ES3C R7](#) [ES3B R6](#) [ES3BHR6G](#) [ES3DHR6G](#) [ES3C R7G](#) [ES3H R7G](#) [ES3CHR7](#) [ES3GHR6G](#) [ES3JHR7](#) [ES3G R7G](#) [ES3CHR7G](#) [ES3J R7G](#) [ES3GHR7G](#) [ES3DHR7G](#) [ES3G R6](#) [ES3AHR7](#) [ES3G R6G](#) [ES3F R6G](#) [ES3BHR6](#) [ES3B R6G](#) [ES3HHR7G](#) [ES3JHR7G](#) [ES3AHR7G](#) [ES3F R7G](#) [ES3A R6G](#) [ES3HHR6](#) [ES3CHR6G](#) [ES3H R6G](#) [ES3JHR6G](#) [ES3FHR6G](#) [ES3D R7G](#) [ES3AHR6G](#) [ES3BHR7G](#) [ES3HHR7](#) [ES3JHR6](#) [ES3FHR7](#) [ES3HHR6G](#) [ES3F R6](#) [ES3GHR7](#) [ES3DHR6](#) [ES3J R6G](#) [ES3C R6G](#) [ES3DHR7](#) [ES3D R6G](#) [ES3GHR6](#) [ES3CHR6](#) [ES3H R6](#) [ES3A R7G](#) [ES3FHR6](#) [ES3AHR6](#) [ES3J R6](#) [ES3B R7G](#) [ES3BHR7](#) [ES3FHR7G](#) [ES3H R7](#) [ES3F R7](#) [ES3B R7](#) [ES3D R6](#) [ES3J R7](#)