

## Surface Mount Ultrafast Plastic Rectifier



DO-214AC (SMA)

### FEATURES

- Low profile package
- Ideal for automated placement
- Glass passivated chip junction
- 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-214AC (SMA)

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	
$I_{F(AV)}$	1.0 A
$V_{RRM}$	50 V to 200 V
$I_{FSM}$	30 A
$t_{rr}$	15 ns
$V_F$	0.92 V
$T_J \text{ max.}$	150 °C

MAXIMUM RATINGS ( $T_A = 25\text{ °C}$ unless otherwise noted)						
PARAMETER	SYMBOL	ES1A	ES1B	ES1C	ES1D	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 (Fig. 1)	$I_{F(AV)}$	1				A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	$I_{FSM}$	30				A
Operating junction and storage temperature range	$T_J, T_{STG}$	- 55 to + 150				°C

<b>ELECTRICAL CHARACTERISTICS</b> ( $T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted)					
PARAMETER	TEST CONDITIONS		SYMBOL	VALUE	UNIT
Maximum instantaneous forward voltage	$I_F = 0.6\text{ A}$ <sup>(1)</sup> $I_F = 1.0\text{ A}$		$V_F$	0.865 0.920	V
Maximum DC reverse current at rated DC blocking voltage		$T_A = 25\text{ }^\circ\text{C}$ $T_A = 100\text{ }^\circ\text{C}$	$I_R$	5.0 100	$\mu\text{A}$
Maximum reverse recovery time	$I_F = 0.5\text{ A}$ , $I_R = 1.0\text{ A}$ , $I_{rr} = 0.25\text{ A}$		$t_{rr}$	15	ns
Maximum reverse recovery time	$I_F = 0.6\text{ A}$ , $V_R = 30\text{ V}$ , $di/dt = 50\text{ A}/\mu\text{s}$ , $I_{rr} = 10\% I_{RM}$	$T_J = 25\text{ }^\circ\text{C}$ $T_J = 100\text{ }^\circ\text{C}$	$t_{rr}$	25 35	ns
Maximum stored charge	$I_F = 0.6\text{ A}$ , $V_R = 30\text{ V}$ , $di/dt = 50\text{ A}/\mu\text{s}$ , $I_{rr} = 10\% I_{RM}$	$T_J = 25\text{ }^\circ\text{C}$ $T_J = 100\text{ }^\circ\text{C}$	$Q_{rr}$	10 25	nC
Typical junction capacitance	4.0 V, 1 MHz		$C_J$	10	pF

**Note:**

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

<b>THERMAL CHARACTERISTICS</b> ( $T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted)						
PARAMETER	SYMBOL	ES1A	ES1B	ES1C	ES1D	UNIT
Typical thermal resistance <sup>(1)</sup>	$R_{\theta JA}$ $R_{\theta JL}$			85 35		$^\circ\text{C}/\text{W}$

**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	
ES1D-E3/61T	0.064	61T	1800	7" diameter plastic tape and reel	
ES1D-E3/5AT	0.064	5AT	7500	13" diameter plastic tape and reel	
ES1DHE3/61T <sup>(1)</sup>	0.064	61T	1800	7" diameter plastic tape and reel	
ES1DHE3/5AT <sup>(1)</sup>	0.064	5AT	7500	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)

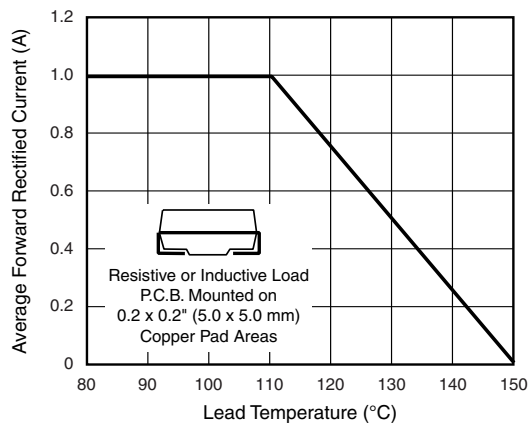


Figure 1. Maximum Forward Current Derating Curve

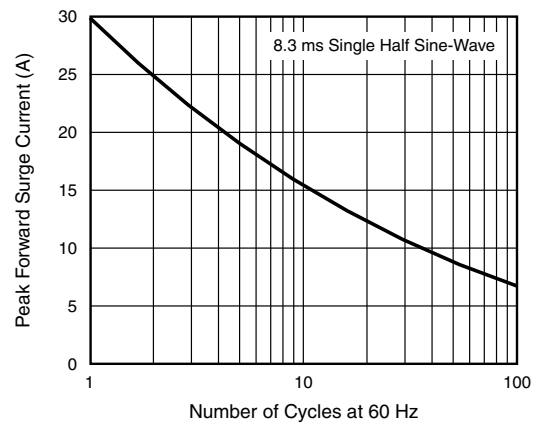


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current

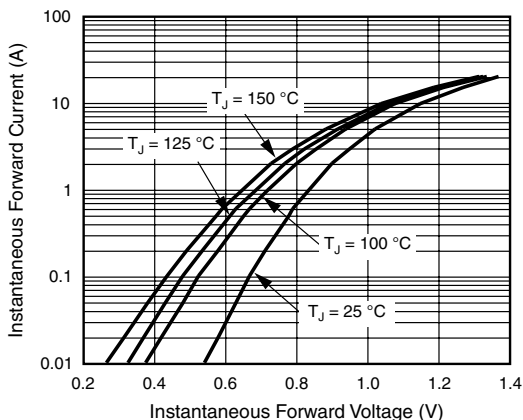


Figure 3. Typical Instantaneous Forward Characteristics

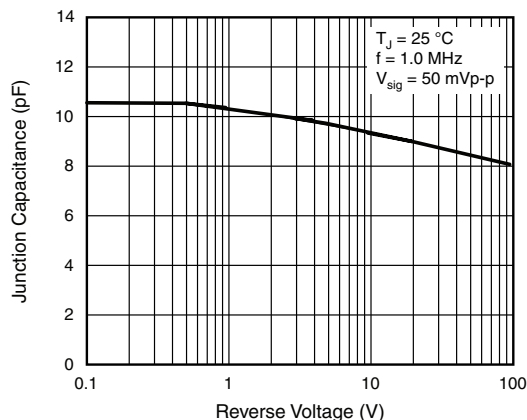


Figure 5. Typical Junction Capacitance

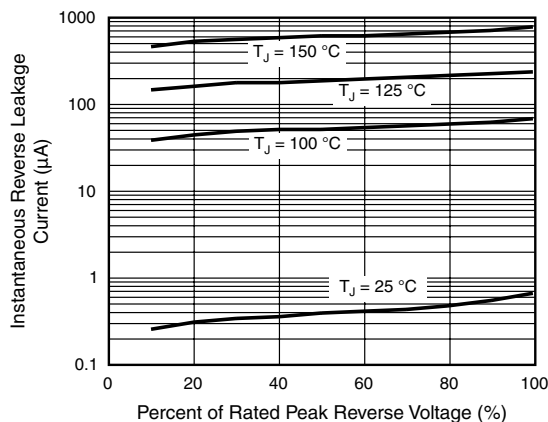


Figure 4. Typical Reverse Leakage Characteristics

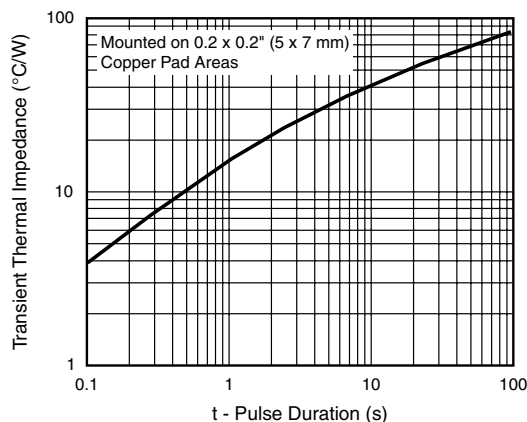
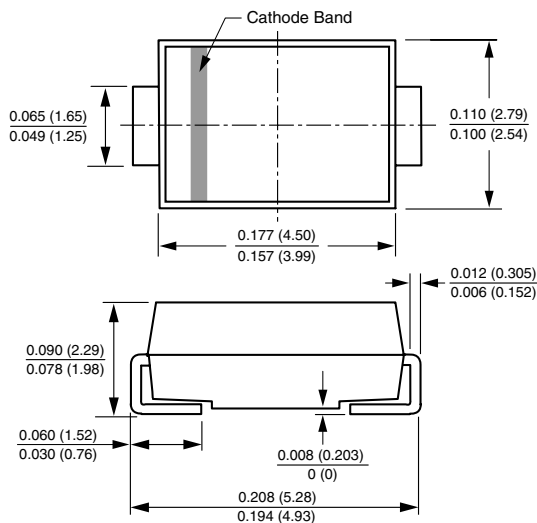


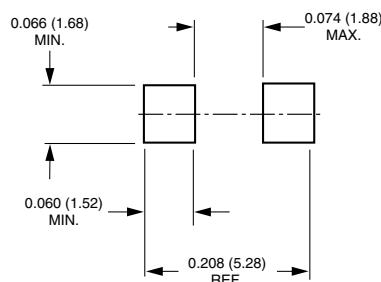
Figure 6. Typical Thermal Impedance

### PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

#### DO-214AC (SMA)



#### Mounting Pad Layout





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