

## Surface Mount Ultrafast Plastic Rectifier


**DO-214AC (SMA)**

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

### TYPICAL APPLICATIONS

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

### 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
- AEC-Q101 qualified
- Material categorization: For definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)


**RoHS**  
COMPLIANT

### MECHANICAL DATA

**Case:** DO-214AC (SMA)

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 and 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 1A whisker test, HE3 suffix meets JESD 201 class 2 whisker test

**Polarity:** Color band denotes cathode end

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)	$I_{F(AV)}$	1.0				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	$I_F = 0.6\text{ A}$	$V_F^{(1)}$	0.865	V	
	$I_F = 1.0\text{ A}$	$V_F$	0.920		
Maximum DC reverse current at rated DC blocking voltage		$I_R$	$T_A = 25\text{ }^\circ\text{C}$	5.0	$\mu\text{A}$
			$T_A = 100\text{ }^\circ\text{C}$	100	
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	$I_F = 0.6\text{ A}, V_R = 30\text{ V}, dI/dt = 50\text{ A}/\mu\text{s}, I_{rr} = 10\% I_{RM}$	$t_{rr}$	$T_J = 25\text{ }^\circ\text{C}$	25	ns
			$T_J = 100\text{ }^\circ\text{C}$	35	
Maximum stored charge	$I_F = 0.6\text{ A}, V_R = 30\text{ V}, dI/dt = 50\text{ A}/\mu\text{s}, I_{rr} = 10\% I_{RM}$	$Q_{rr}$	$T_J = 25\text{ }^\circ\text{C}$	10	nC
			$T_J = 100\text{ }^\circ\text{C}$	25	
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	$R_{\theta JA}^{(1)}$	85				$^\circ\text{C}/\text{W}$
	$R_{\theta JL}^{(1)}$	35				

**Note**

(1) Units mounted on PCB 5.0 mm 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
ES1DHE3_A/H <sup>(1)</sup>	0.064	H	1800	7" diameter plastic tape and reel
ES1DHE3_A/I <sup>(1)</sup>	0.064	I	7500	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)

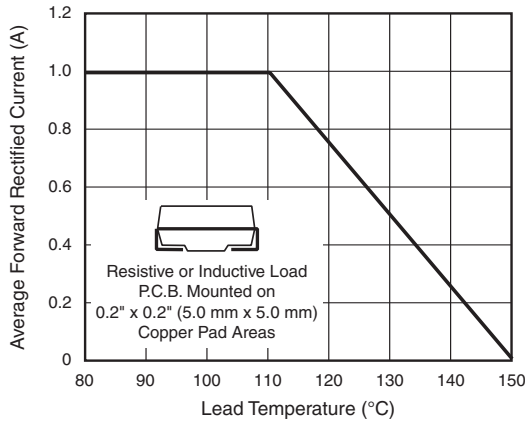


Fig. 1 - Maximum Forward Current Derating Curve

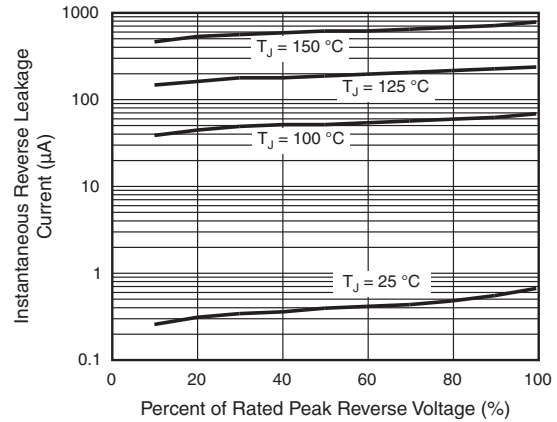


Fig. 4 - Typical Reverse Leakage Characteristics

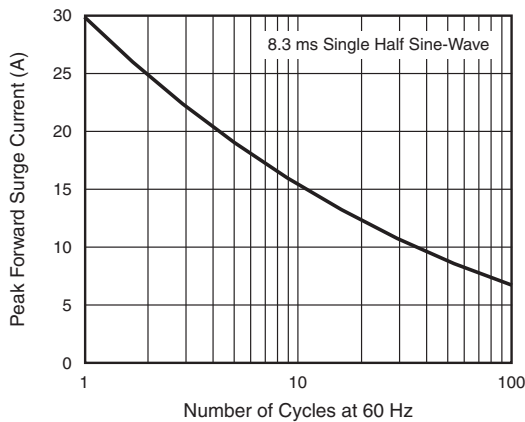


Fig. 2 - Maximum Non-Repetitive Peak Forward Surge Current

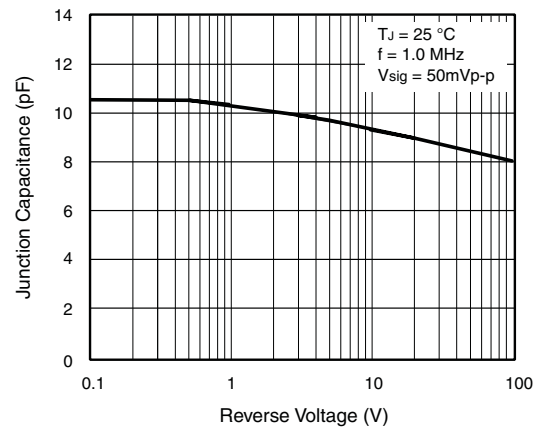


Fig. 5 - Typical Junction Capacitance

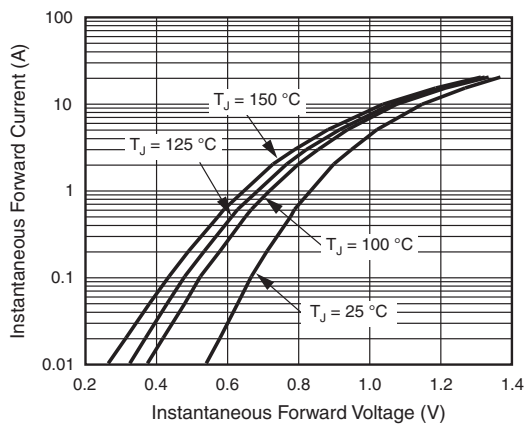


Fig. 3 - Typical Instantaneous Forward Characteristics

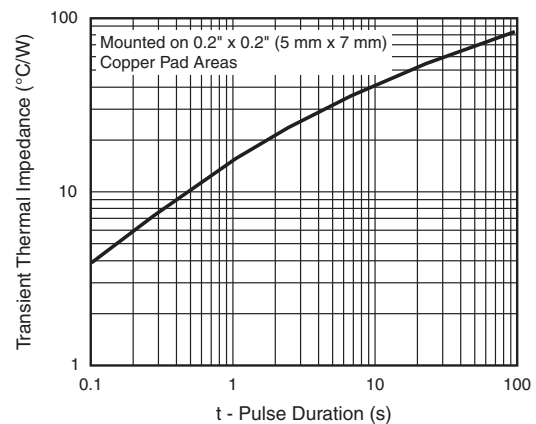
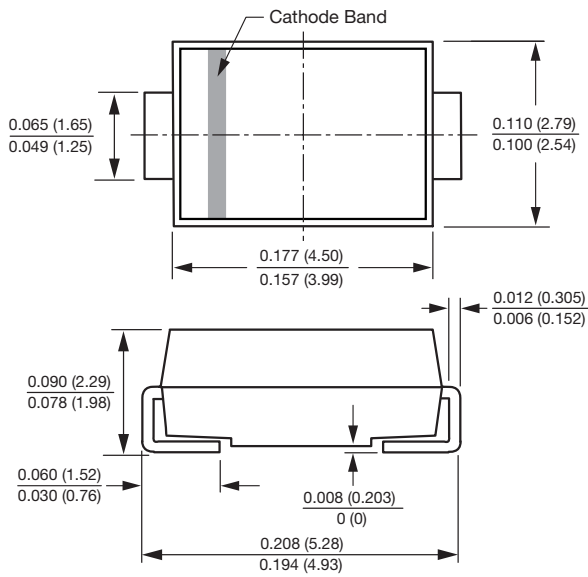


Fig. 6 - Typical Thermal Impedance

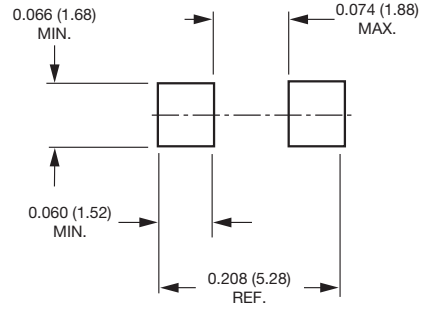


### PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

#### DO-214AC (SMA)



#### Mounting Pad Layout





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