

## Surface Mount Ultrafast Plastic Rectifier


**DO-214AC (SMA)**

**RoHS**  
 COMPLIANT  
 HALOGEN  
**FREE**

### FEATURES

- Low profile package
- Ideal for automated placement
- Glass passivated pellet chip junction
- Ultrafast recovery times for high efficiency
- Low forward voltage, low power loss
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- Material categorization: for definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)

### TYPICAL APPLICATIONS

For use in secondary rectification and freewheeling for ultrafast switching speeds AC/AC and DC/DC converters in high temperature conditions for both consumer applications.

### MECHANICAL DATA

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

Molding compound meets UL 94 V-0 flammability rating  
 Base P/N-M3 - halogen-free, RoHS-compliant, and commercial grade

**Terminals:** Matte tin plated leads, solderable per J-STD-002 and JEDEC 22-B102

M3 suffix meets JEDEC 201 class 2 whisker test

**Polarity:** Color band denotes cathode end

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	1.0 A
$V_{RRM}$	100 V, 150 V, 200 V
$t_{rr}$	25 ns
$V_F$	0.90 V
$T_J$ max.	175 °C
Package	DO-214AC (SMA)
Diode variations	Single die

MAXIMUM RATINGS ( $T_A = 25\text{ °C}$ unless otherwise noted)					
PARAMETER	SYMBOL	ESH1B	ESH1C	ESH1D	UNIT
Device marking code		EHB	EHC	EHD	
Maximum repetitive peak reverse voltage	$V_{RRM}$	100	150	200	V
Maximum RMS voltage	$V_{RMS}$	70	105	140	V
Maximum DC blocking voltage	$V_{DC}$	100	150	200	V
Maximum average forward rectified current at $T_L = 150\text{ °C}$	$I_{F(AV)}$	1.0			A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load (JEDEC method)	$I_{FSM}$	50			A
Operating junction and storage temperature range	$T_J, T_{STG}$	-55 to +175			°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	$I_F = 0.7\text{ A}$	$V_F^{(1)}$	0.87	V	
	$I_F = 1\text{ A}$	$V_F$	0.90		
Maximum DC reverse current at rated DC blocking voltage		$I_R$	$T_A = 25\text{ }^\circ\text{C}$	1.0	$\mu\text{A}$
			$T_A = 125\text{ }^\circ\text{C}$	25	
Maximum reverse current	$V_R = 20\text{ V}, T_J = 150\text{ }^\circ\text{C}$	$I_R$	50	$\mu\text{A}$	
Maximum reverse recovery time	$I_F = 0.5\text{ A}, I_R = 1\text{ A}, I_{rr} = 0.25\text{ A}$	$t_{rr}$	25	ns	
Typical 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	
Typical 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
			$T_J = 100\text{ }^\circ\text{C}$	15	
Typical junction capacitance	$4.0\text{ V}, 1\text{ MHz}$	$C_J$	25	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	ESH1B	ESH1C	ESH1D	UNIT
Typical thermal resistance	$R_{\theta JA}^{(1)}$	85			$^\circ\text{C}/\text{W}$
	$R_{\theta JL}^{(1)}$	30			

**Note**

(1) Units mounted on PCB with 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
ESH1D-M3/61T	0.064	61T	1800	7" diameter plastic tape and reel
ESH1D-M3/5AT	0.064	5AT	7500	13" diameter plastic tape and reel



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

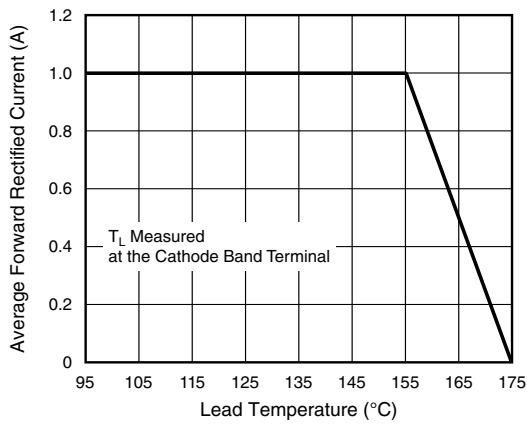


Fig. 1 - Maximum Forward Current Derating Curve

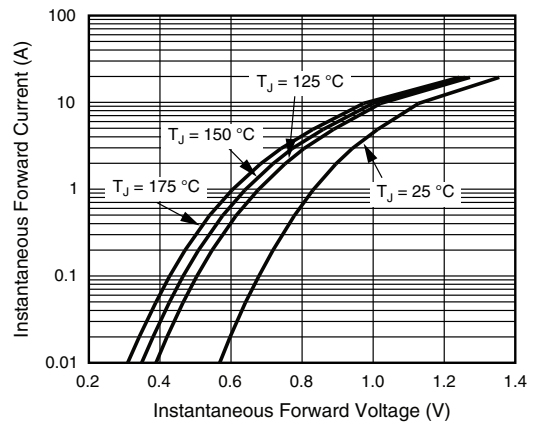


Fig. 4 - Typical Instantaneous Forward Characteristics

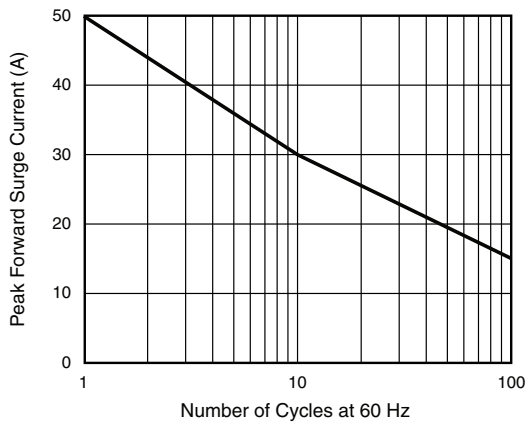


Fig. 2 - Maximum Non-Repetitive Peak Forward Surge Current

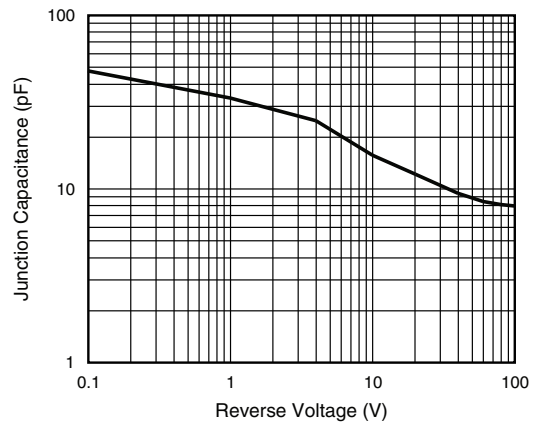


Fig. 5 - Typical Junction Capacitance

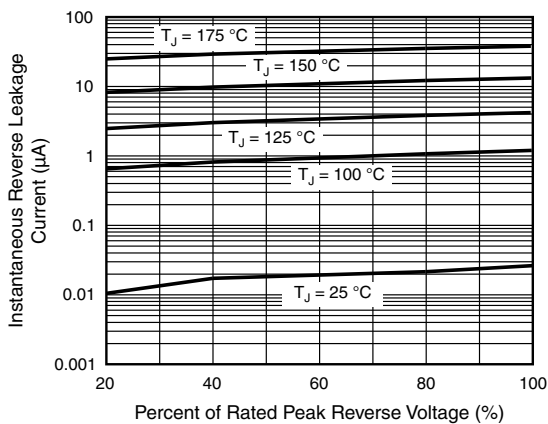


Fig. 3 - Typical Reverse Leakage Characteristics

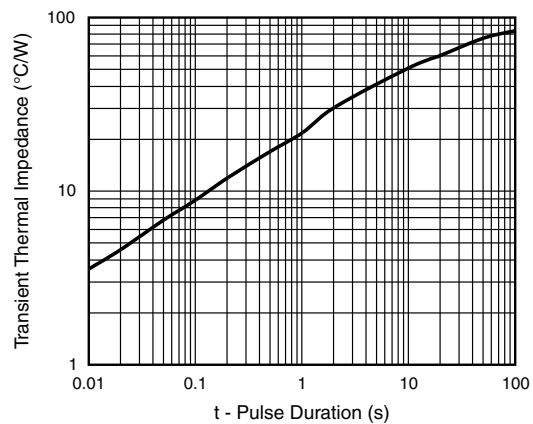
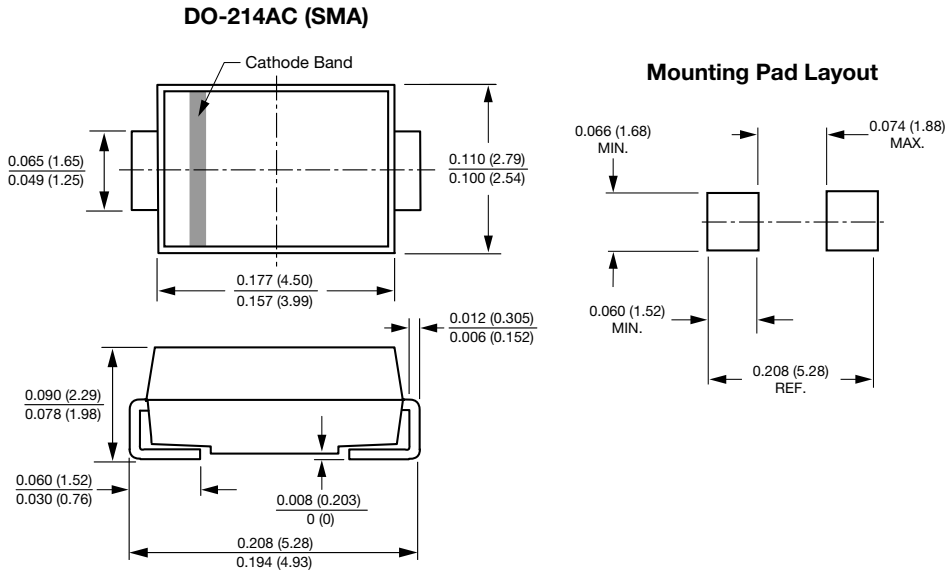


Fig. 6 - Typical Transient Thermal Impedance



## PACKAGE OUTLINE DIMENSIONS in inches (millimeters)





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