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ES1A-M3, ES1B-M3, ES1C-M3, ES1D-M3

Vishay General Semiconductor

Surface Mount Ultrafast Plastic Rectifier



DO-214AC (SMA)

FEATURES

- Low profile package
- Ideal for automated placement
- Glass passivated pellet 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
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912



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 JESD 22-B102

M3 suffix 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, 100 V, 150 V, 200 V
I _{FSM}	30 A
t _{rr}	15 ns
V _F at I _F = 1.0 A	0.92 V
T _J max.	150 °C
Package	DO-214AC (SMA)
Diode variations	Single die

TYPICAL APPLICATIONS

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

MAXIMUM RATINGS (T _A = 25 °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



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ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ 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		$T_A = 25^\circ\text{C}$	5.0	μA
		$T_A = 100^\circ\text{C}$	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	$I_F = 0.6 \text{ A}, V_R = 30 \text{ V}, dI/dt = 50 \text{ A}/\mu\text{s}, I_{rr} = 10\% I_{RM}$	$T_J = 25^\circ\text{C}$	25	ns
		$T_J = 100^\circ\text{C}$	35	
Maximum stored charge	$I_F = 0.6 \text{ A}, V_R = 30 \text{ V}, dI/dt = 50 \text{ A}/\mu\text{s}, I_{rr} = 10\% I_{RM}$	$T_J = 25^\circ\text{C}$	10	nC
		$T_J = 100^\circ\text{C}$	25	
Typical junction capacitance	4.0 V, 1 MHz	C_J	10	pF

Note

⁽¹⁾ Pulse test: 300 μs pulse width, 1 % duty cycle

THERMAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise noted)						
PARAMETER	SYMBOL	ES1A	ES1B	ES1C	ES1D	UNIT
Typical thermal resistance	$R_{0JA}^{(1)}$	85				$^\circ\text{C}/\text{W}$
	$R_{0JL}^{(1)}$	35				

Note

⁽¹⁾ Units mounted on PCB 5.0 mm x 5.0 mm (0.013 mm thick) land areas

ORDERING INFORMATION (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
ES1D-M3/61T	0.064	61T	1800	7" diameter plastic tape and reel
ES1D-M3/5AT	0.064	5AT	7500	13" diameter plastic tape and reel



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

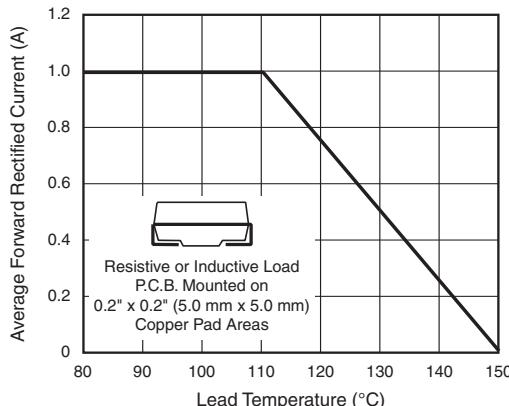


Fig. 1 - Maximum Forward Current Derating Curve

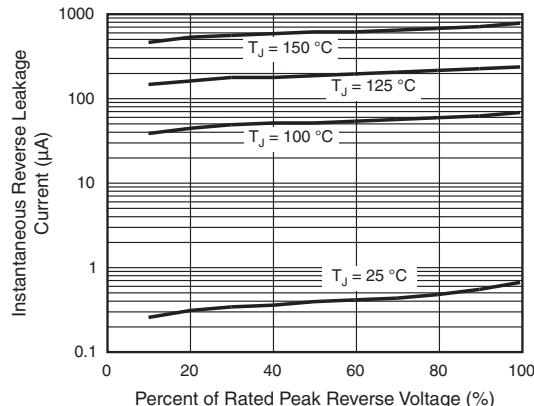


Fig. 4 - Typical Reverse Leakage Characteristics

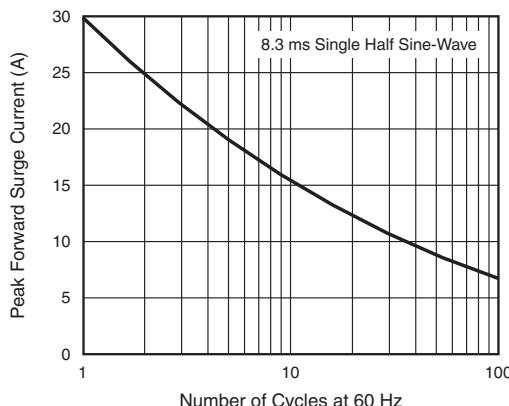


Fig. 2 - Maximum Non-Repetitive Peak Forward Surge Current

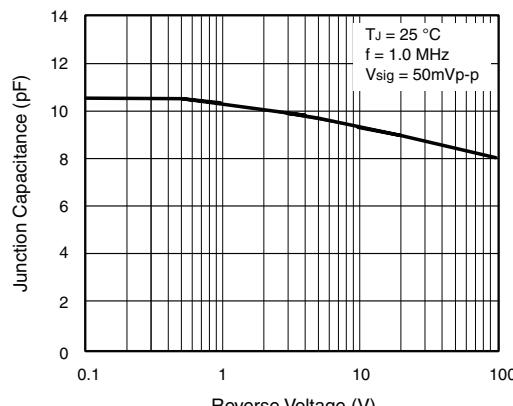


Fig. 5 - Typical Junction Capacitance

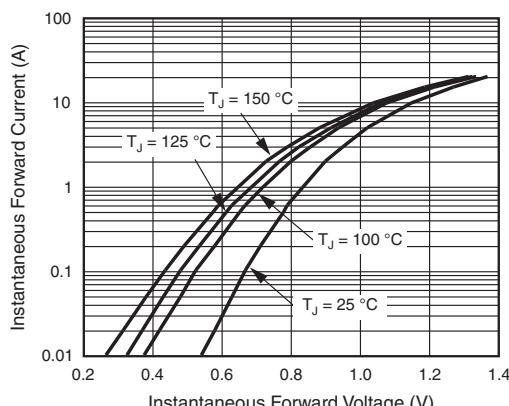


Fig. 3 - Typical Instantaneous Forward Characteristics

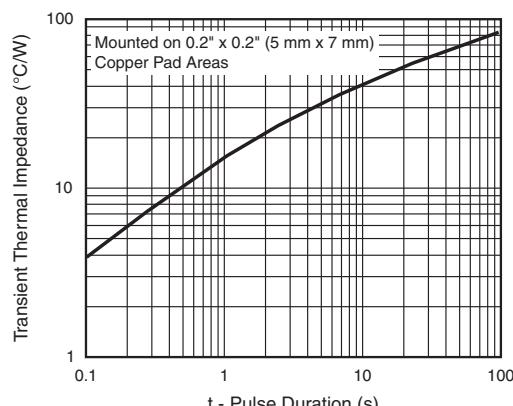


Fig. 6 - Typical Thermal Impedance



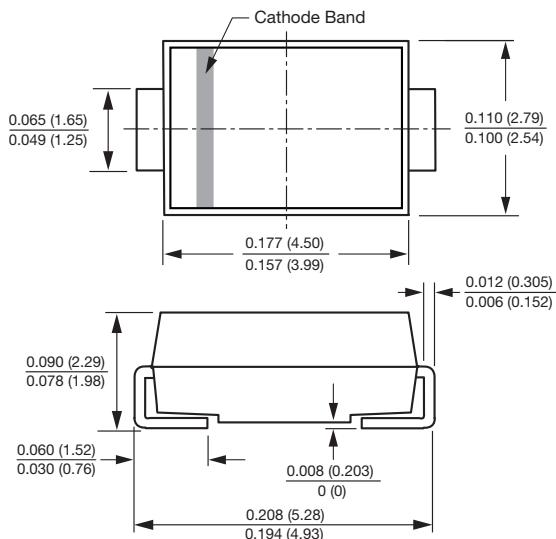
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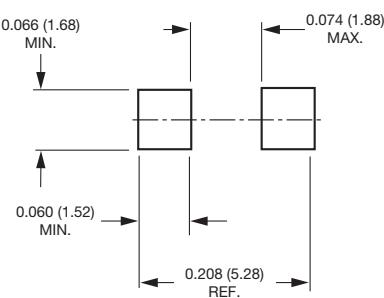
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PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-214AC (SMA)



Mounting Pad Layout



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