

Surface Mount Ultrafast Plastic Rectifier



DO-214AC (SMA)



RoHS
COMPLIANT

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

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.

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



ELECTRICAL CHARACTERISTICS (T _A = 25 °C unless otherwise noted)					
PARAMETER	TEST CONDITIONS		SYMBOL	VALUE	UNIT
Maximum instantaneous forward voltage	I _F = 0.6 A		V _F ⁽¹⁾	0.865	V
	I _F = 1.0 A		V _F	0.920	
Maximum DC reverse current at rated DC blocking voltage	T _A = 25 °C		I _R	5.0	μA
	T _A = 100 °C			100	
Maximum reverse recovery time	I _F = 0.5 A, I _R = 1.0 A, I _{rr} = 0.25 A		t _{rr}	15	ns
Maximum reverse recovery time	I _F = 0.6 A, V _R = 30 V, dI/dt = 50 A/μs, I _{rr} = 10 % I _{RM}	T _J = 25 °C	t _{rr}	25	ns
		T _J = 100 °C		35	
Maximum stored charge	I _F = 0.6 A, V _R = 30 V, dI/dt = 50 A/μs, I _{rr} = 10 % I _{RM}	T _J = 25 °C	Q _{rr}	10	nC
		T _J = 100 °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 °C unless otherwise noted)						
PARAMETER	SYMBOL	ES1A	ES1B	ES1C	ES1D	UNIT
Typical thermal resistance	R _{θJA} ⁽¹⁾	85				°C/W
	R _{θJL} ⁽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-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 ⁽¹⁾	0.064	61T	1800	7" diameter plastic tape and reel
ES1DHE3/5AT ⁽¹⁾	0.064	5AT	7500	13" diameter plastic tape and reel
ES1DHE3_A/H ⁽¹⁾	0.064	H	1800	7" diameter plastic tape and reel
ES1DHE3_A/I ⁽¹⁾	0.064	I	7500	13" diameter plastic tape and reel

Note

(1) AEC_Q101 qualified

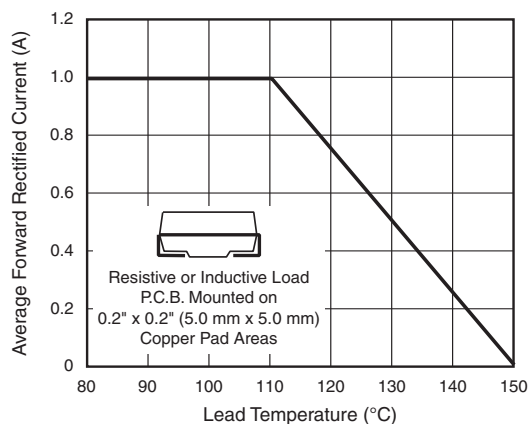
RATINGS AND CHARACTERISTICS CURVES
 $(T_A = 25\text{ }^{\circ}\text{C}$ unless otherwise noted)


Fig. 1 - Maximum Forward Current Derating Curve

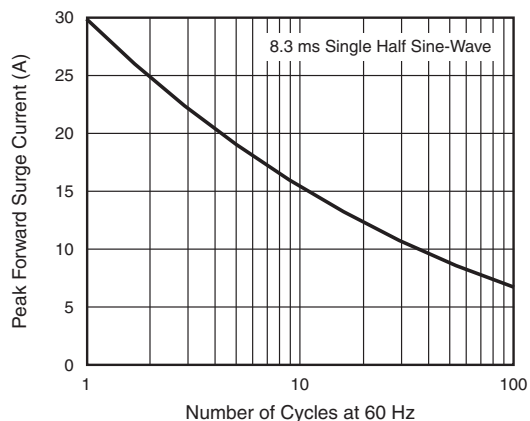


Fig. 2 - Maximum Non-Repetitive Peak Forward Surge Current

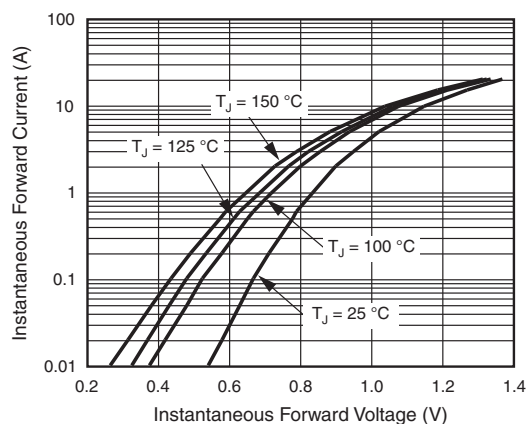


Fig. 3 - Typical Instantaneous Forward Characteristics

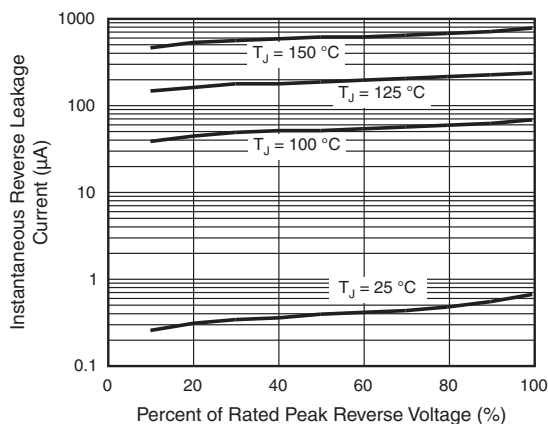


Fig. 4 - Typical Reverse Leakage Characteristics

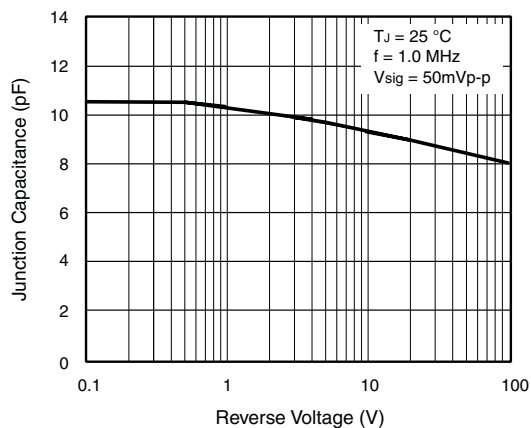


Fig. 5 - Typical Junction Capacitance

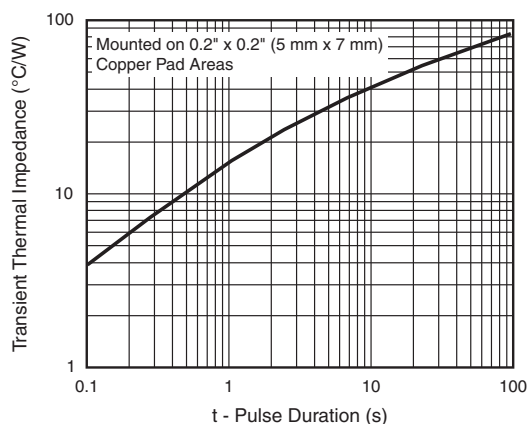
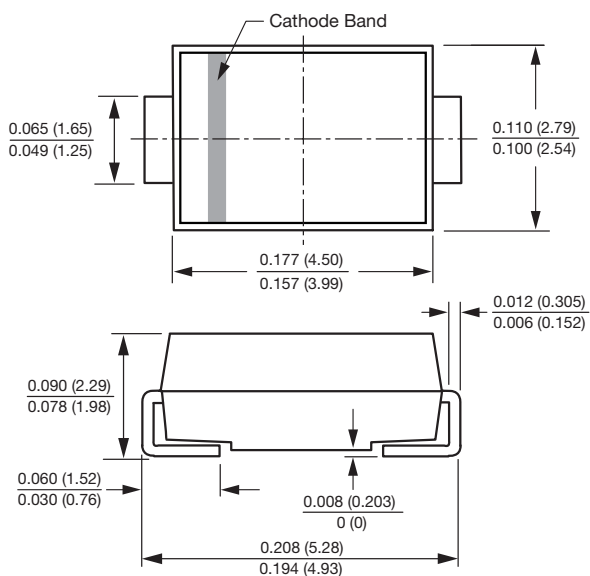


Fig. 6 - Typical Thermal Impedance

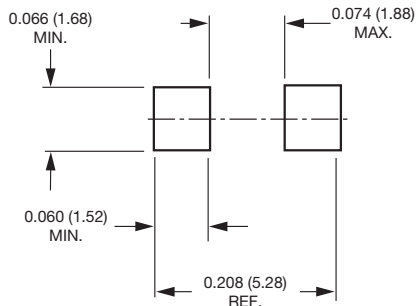


PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-214AC (SMA)



Mounting Pad Layout





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