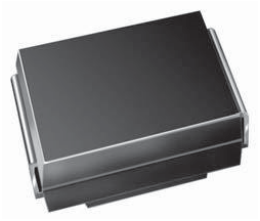
Surface Mount Ultrafast Plastic Rectifier



DO-214AA (SMB)

FEATURES

- Glass passivated chip junction
- Ideal for automated placement
- 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 available
  - Automotive ordering code: base P/NHE3
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

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.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	2.0 A
V_{RRM}	50 V, 100 V, 150 V, 200 V
I_{FSM}	50 A
t_{rr}	20 ns
V_F	0.90 V
T_J max.	150 °C
Package	DO-214AA (SMB)
Diode variations	Single die

MECHANICAL DATA

Case: DO-214AA (SMB)
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, 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 2 whisker test, HE3 suffix meets JESD 201 class 2 whisker test

Polarity: Color band denotes cathode end

MAXIMUM RATINGS (TA = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	ES2A	ES2B	ES2C	ES2D	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 at T_L = 110 °C	$I_{F(AV)}$	2.0				A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	50				A
Operating junction and storage temperature range	T_J, T_{STG}	-55 to +150				°C

ELECTRICAL CHARACTERISTICS (TA = 25 °C unless otherwise noted)								
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**ES2A**	**ES2B**	**ES2C**	**ES2D**	**UNIT**
Maximum instantaneous forward voltage	2.0 A		V_F (1)	0.90				V
Maximum DC reverse current at rated DC blocking voltage		T_A = 25 °C	I_R	10				µA
		T_A = 100 °C		350				
Max. reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A		t_{rr}	20				ns
Maximum reverse recovery time	I_F = 2.0 A, V_R = 30 V, dI/dt = 50 A/µs, I_r = 10 % I_{RM}	T_J = 25 °C	t_{rr}	30				ns
		T_J = 100 °C		50				
Maximum stored charge	I_F = 2.0 A, V_R = 30 V, dI/dt = 50 A/µs, I_r = 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	18				pF

Note

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

THERMAL CHARACTERISTICS (TA = 25 °C unless otherwise noted)						
PARAMETER	**SYMBOL**	**ES2A**	**ES2B**	**ES2C**	**ES2D**	**UNIT**
Typical thermal resistance	$R_{\theta JA}$ (1)	75				°C/W
	$R_{\theta JL}$ (1)	20				

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**
ES2D-E3/52T	0.096	52T	750	7" diameter plastic tape and reel
ES2D-E3/5BT	0.096	5BT	3200	13" diameter plastic tape and reel
ES2DHE3/52T (1)	0.096	52T	750	7" diameter plastic tape and reel
ES2DHE3/5BT (1)	0.096	5BT	3200	13" diameter plastic tape and reel
ES2DHE3_A/H (1)	0.096	H	750	7" diameter plastic tape and reel
ES2DHE3_A/I (1)	0.096	I	3200	13" diameter plastic tape and reel

Note

(1) AEC-Q101 qualified

RATINGS AND CHARACTERISTICS CURVES (T_A = 25 °C unless otherwise noted)

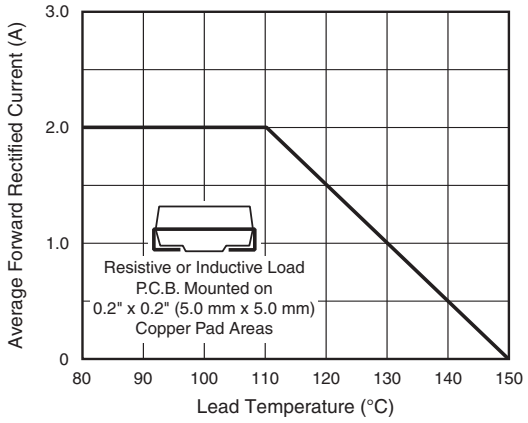


Fig. 1 - Maximum Forward Current Derating Curve

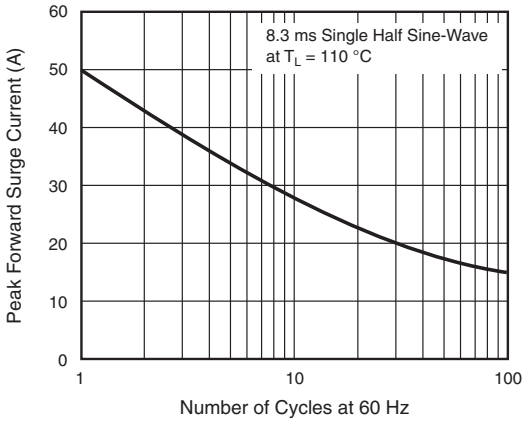


Fig. 2 - Maximum Non-Repetitive Peak Forward Surge Current

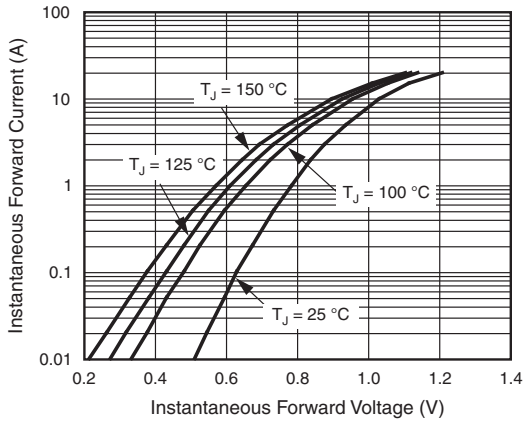


Fig. 3 - Typical Instantaneous Forward Characteristics

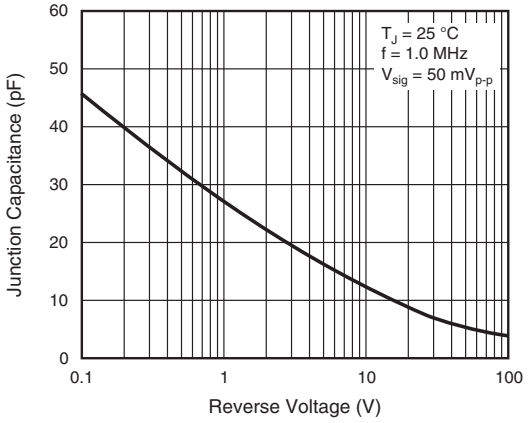


Fig. 5 - Typical Junction Capacitance

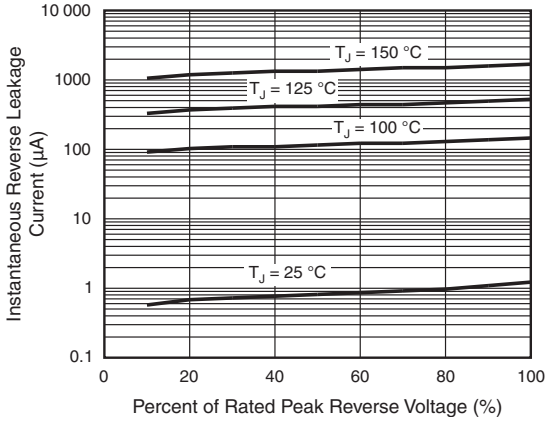


Fig. 4 - Typical Reverse Leakage Characteristics

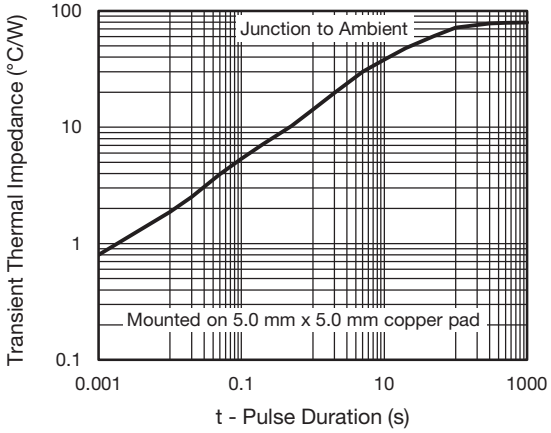
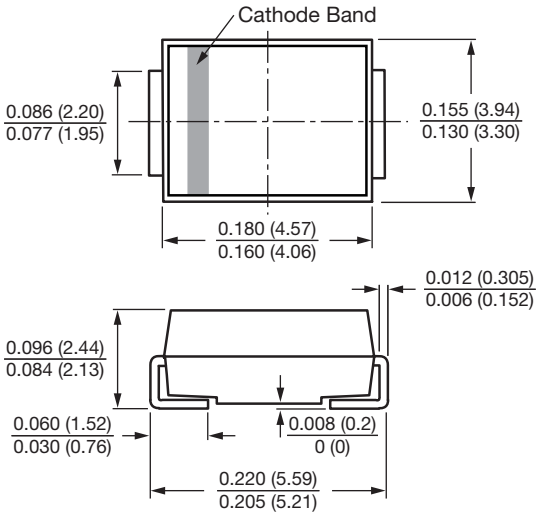


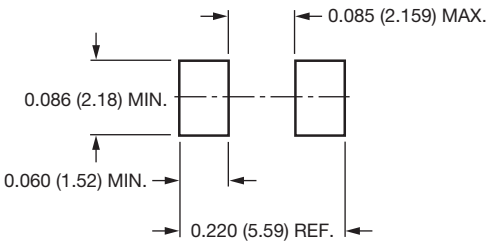
Fig. 6 - Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-214AA (SMB)



Mounting Pad Layout



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