

Surface-Mount Ultrafast Plastic Rectifier


SMB (DO-214AA)

Anode  Cathode

FEATURES

- Glass passivated pellet 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 or P/NHM3
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

AUTOMOTIVE
GRADE
Available

RoHS
COMPLIANT
HALOGEN
FREE

LINKS TO ADDITIONAL RESOURCES



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
$T_J \text{ max.}$	150 °C
Package	SMB (DO-214AA)
Circuit configuration	Single

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: SMB (DO-214AA)

Molding compound meets UL 94 V-0 flammability rating

Base P/N-E3 - RoHS-compliant, commercial grade

Base P/N-M3 - halogen-free, RoHS-compliant, commercial grade

Base P/NHE3_X - RoHS-compliant and AEC-Q101 qualified

Base P/NHME3_X - halogen-free, 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, M3, HE3, and HM3 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	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 $T_L = 110\text{ °C}$	$I_{F(AV)}$	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** ($T_A = 25\text{ }^{\circ}\text{C}$ 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 ($T_A = 25\text{ }^{\circ}\text{C}$ 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_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
ES2D-M3/52T	0.096	52T	750	7" diameter plastic tape and reel
ES2D-M3/5BT	0.096	5BT	3200	13" diameter plastic tape and reel
ES2DHM3_A/H ⁽¹⁾	0.096	H	750	7" diameter plastic tape and reel
ES2DHM3_A/I ⁽¹⁾	0.096	I	3200	13" diameter plastic tape and reel

Note

(1) AEC-Q101 qualified

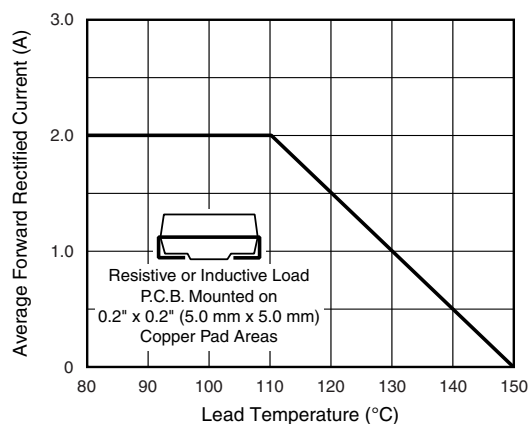
RATINGS AND CHARACTERISTICS CURVES ($T_A = 25\text{ }^{\circ}\text{C}$ unless otherwise noted)


Fig. 1 - Maximum Forward Current Derating Curve

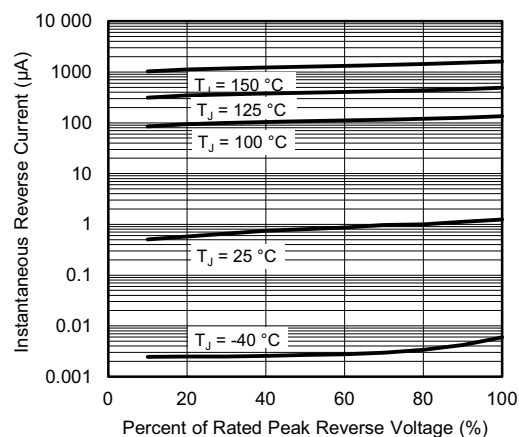


Fig. 4 - Typical Reverse Leakage Characteristics

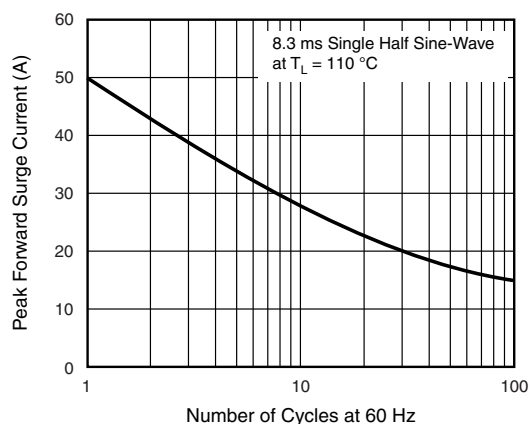


Fig. 2 - Maximum Non-Repetitive Peak Forward Surge Current

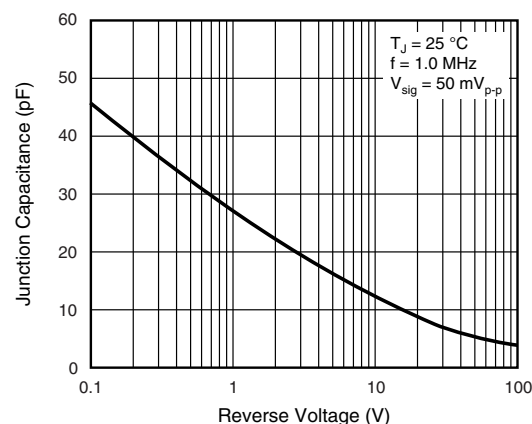


Fig. 5 - Typical Junction Capacitance

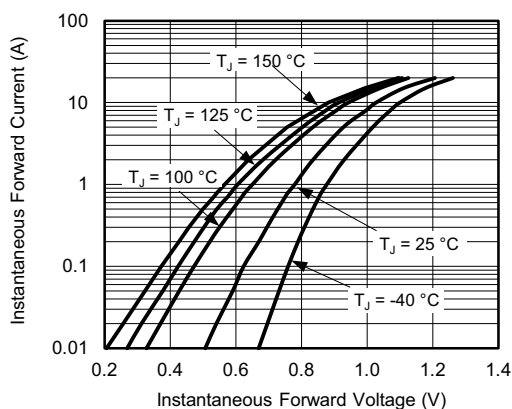


Fig. 3 - Typical Instantaneous Forward Characteristics

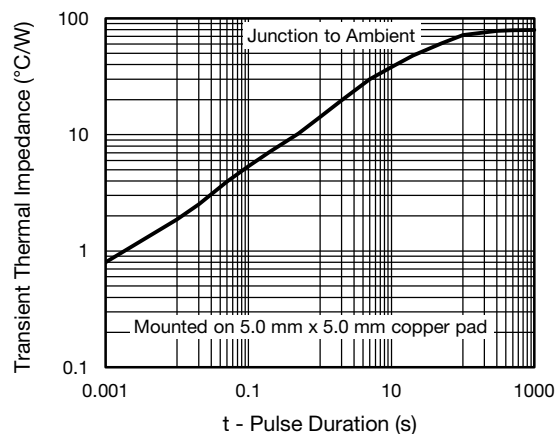
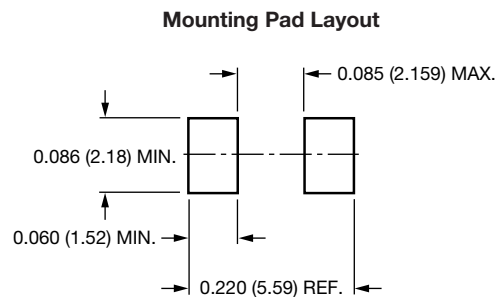
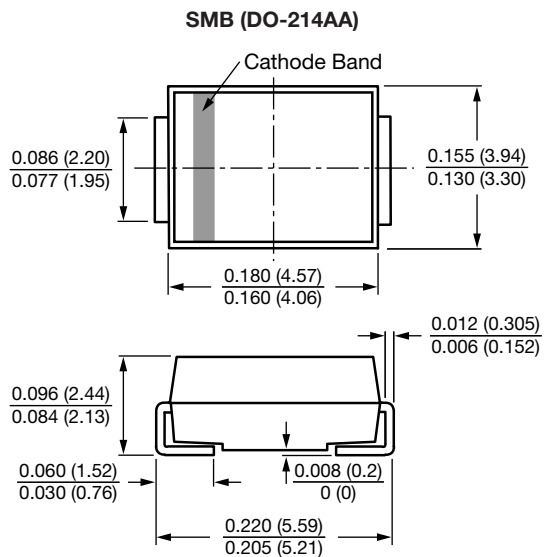


Fig. 6 - Transient Thermal Impedance



PACKAGE OUTLINE DIMENSIONS in inches (millimeters)





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