High Current Density Surface Mount Ultrafast Rectifiers

eSMP™ Series

DO-220AA (SMP)

FEATURES

- Very low profile - typical height of 1.0 mm
- Ideal for automated placement
- Glass passivated chip junction
- Ultrafast recovery times for high frequency
- Low forward voltage drop, low power loss
- Low thermal resistance
- Meets MSL level 1 per J-STD-020, LF maximum peak of 260 °C
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

RoHS COMPLIANT

TYPICAL APPLICATIONS

For use in secondary rectification and freewheeling for ultrafast switching speeds of ac-to-ac and dc-to-dc converters in high temperature conditions for both consumer and automotive applications.

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	2 A
V_{RRM}	100 V, 150 V, 200 V
t_{rr}	25 ns
V_F at I_F = 2 A	0.75 V
T_J max.	175 °C

MECHANICAL DATA

Case: DO-220AA (SMP)

Epoxy meets UL 94V-0 flammability rating

Terminals: Matte tin plated leads, solderable per J-STD-002 and JESD22-B102

E3 suffix for consumer grade, meets JESD 201 class 1A whisker test, HE3 suffix for high reliability grade (AEC Q101 qualified), meets JESD 201 class 2 whisker test

Polarity: Color band denotes cathode end

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)					
PARAMETER	**SYMBOL**	**ESH2PB**	**ESH2PC**	**ESH2PD**	**UNIT**
Device marking code		P2B	P2C	P2D	
Maximum repetitive peak reverse voltage	V_{RRM}	100	150	200	V
Maximum average forward rectified current (Fig. 1)	$I_{F(AV)}$	2.0			A
Peak forward surge current 10 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 + 175			°C

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**TYP.**	**MAX.**	**UNIT**
Maximum instantaneous forward voltage (1)	I_F = 2 A	T_J = 25 °C T_J = 125 °C	V_F	0.90 0.75	0.98 0.82	V
Maximum reverse current (2)	rated V_R	T_J = 25 °C T_J = 125 °C	I_R	0.2 12.6	1.0 25	µA

ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**TYP.**	**MAX.**	**UNIT**
Maximum reverse recovery time	I_F = 0.5 A, I_R = 1 A, I_{rr} = 0.25 A		t_{rr}	-	25 ns	
Typical reverse recovery time	I_F = 1.0 A, V_R = 30 V, dI/dt = 50 A/µs, I_{rr} = 10 % I_{RM}	T_J = 25 °C T_J = 100 °C	t_{rr}	- -	25 35	ns
Typical stored charge			Q_{rr}	- -	10 15	nC
Typical junction capacitance	4.0 V, 1 MHz		C_J -2		5	pF

Notes:
(1) Pulse test: 300 µs pulse width, 1 % duty cycle
(2) Pulse test: Pulse width ≤ 40 ms

THERMAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)					
PARAMETER	**SYMBOL**	**ESH2PB**	**ESH2PC**	**ESH2PD**	**UNIT**
Typical thermal resistance (1)	$R_{\theta JA}$ $R_{\theta JL}$ $R_{\theta JC}$	80 15 22			°C/W

Note:
(1) Thermal resistance from junction to ambient and junction to lead mounted on P.C.B. with 6.0 x 6.0 mm copper pad areas. $R_{\theta JL}$ is measured at the terminal of cathode band. $R_{\theta JC}$ is measured at the top centre of the body

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
ESH2PB-E3/84A	0.024	84A	3000	7" diameter plastic tape and reel
ESH2PB-E3/85A	0.024	85A	10 000	13" diameter plastic tape and reel
ESH2PBHE3/84A (1)	0.024	84A	3000	7" diameter plastic tape and reel
ESH2PBHE3/85A (1)	0.024	85A	10 000	13" diameter plastic tape and reel

Note:
(1) Automotive grade AEC Q101 qualified

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

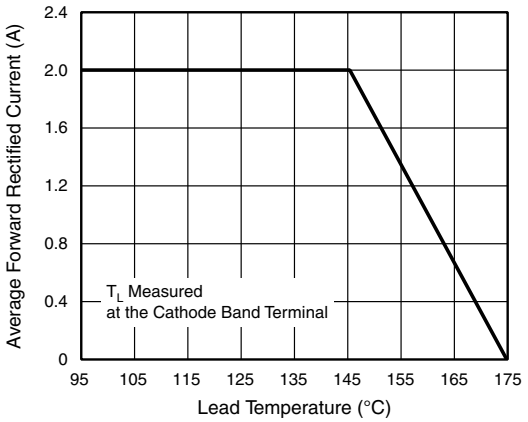


Figure 1. Forward Current Derating Curve

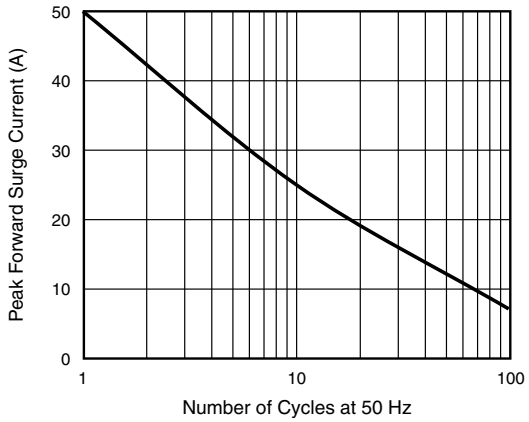


Figure 2. Maximum Non-Repetitive Peak Forward Surge Current

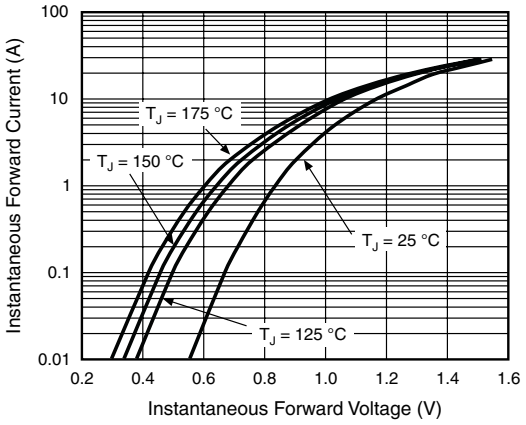


Figure 3. Typical Instantaneous Forward Characteristics

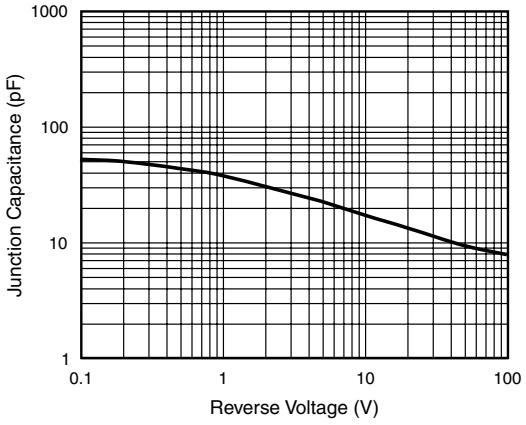


Figure 5. Typical Junction Capacitance

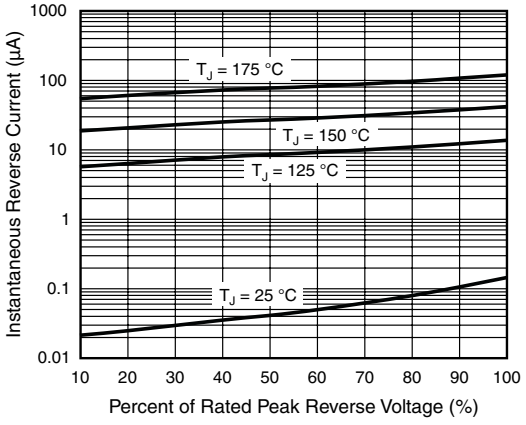
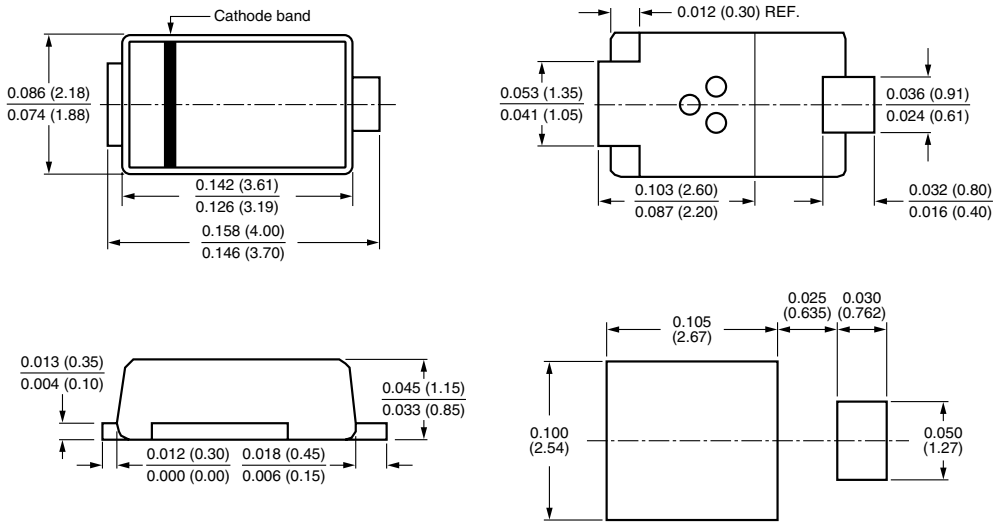


Figure 4. Typical Reverse Leakage Characteristics

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-220AA (SMP)



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