Surface Mount Ultrafast Plastic Rectifier



DO-214AB (SMC)

FEATURES

- Oxide planar chip junction
- Ultrafast recovery time
- 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

RoHS COMPLIANT
HALOGEN FREE

TYPICAL APPLICATIONS

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

MECHANICAL DATA

Case: DO-214AB (SMC)
Molding compound meets UL 94 V-0 flammability rating
Base P/N-M3 - RoHS-compliant, 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	
$I_{F(AV)}$	3.0 A
V_{RRM}	100 V, 150 V, 200 V
I_{FSM}	100 A
t_{rr}	20 ns
V_F at I_F = 3.0 A	0.74 V
T_J max.	150 °C
Package	DO-214AB (SMC)
Diode variations	Single die

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

PARAMETER		SYMBOL	U3B	U3C	U3D	UNIT
Device marking code			U3B	U3C	U3D	
Maximum repetitive peak reverse voltage		V_{RRM}	100	150	200	V
Maximum average forward rectified current (fig. 1)	T_M = 134 °C	$I_{F(AV)}$ (1)	2.0			A
	T_M = 125 °C	$I_{F(AV)}$ (2)	3.0			
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load		I_{FSM}	100			A
Operating junction and storage temperature range		T_J, T_{STG}	-55 to +150			°C

Notes

(1) Free air, mounted on recommended copper pad area
(2) Units mounted on PCB with 0.47" x 0.47" (12 mm x 12 mm) copper pad areas

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ELECTRICAL CHARACTERISTICS (T_A = 25 °C unless otherwise noted)						
PARAMETER	**TEST CONDITIONS**		**SYMBOL**	**TYP.**	**MAX.**	**UNIT**
Instantaneous forward voltage	I_F = 3.0 A	T_A = 25 °C	V_F (1)	0.85	0.90	V
		T_A = 100 °C		0.74	0.83	
Reverse current	Rated V_R	T_A = 25 °C	I_R (2)	-	10	µA
		T_A = 100 °C		250	500	
Reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 A	T_A = 25 °C	t_{rr}	-	20	ns
	I_F = 3.0 A, dI/dt = 50 A/µs, V_R = 30 V, I_{rr} = 0.1 I_{RM}	T_A = 25 °C		25	30	
		T_A = 100 °C		35	50	
Storage charge	I_F = 3.0 A, dI/dt = 50 A/µs, V_R = 30 V, I_{rr} = 0.1 I_{RM}	T_A = 25 °C	Q_{rr}	9	15	nC
		T_A = 100 °C		22	35	
Typical junction capacitance	4.0 V, 1 MHz		C_J	25	-	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**	**U3B**	**U3C**	**U3D**	**UNIT**
Typical thermal resistance	$R_{\theta JA}$ (1)	92			°C/W
	$R_{\theta JM}$ (1)	10			

Note

(1) Free air, mounted on recommended copper pad area. Thermal resistance $R_{\theta JA}$ - junction to ambient, $R_{\theta JM}$ - junction to mount

ORDERING INFORMATION (Example)				
PREFERRED P/N	**UNIT WEIGHT (g)**	**PREFERRED PACKAGE CODE**	**BASE QUANTITY**	**DELIVERY MODE**
U3D-M3/57T	0.239	57T	850	7" diameter plastic tape and reel
U3D-M3/9AT	0.239	9AT	3500	13" diameter plastic tape and reel

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

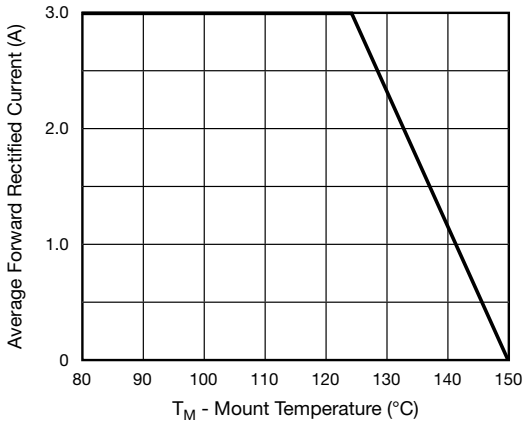


Fig. 1 - Maximum Forward Current Derating Curve

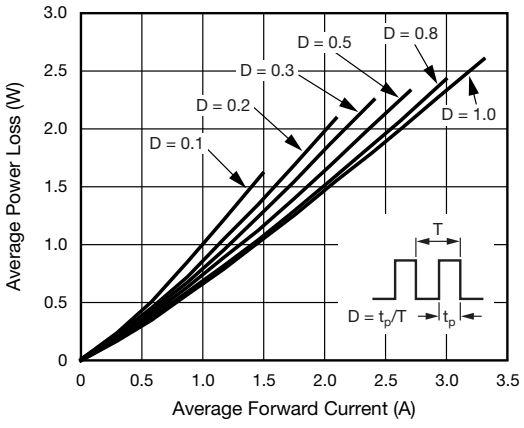


Fig. 2 - Forward Power Loss Characteristics

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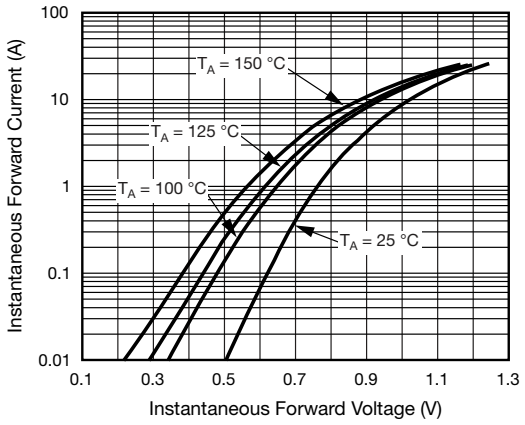


Fig. 3 - Typical Instantaneous Forward Characteristics

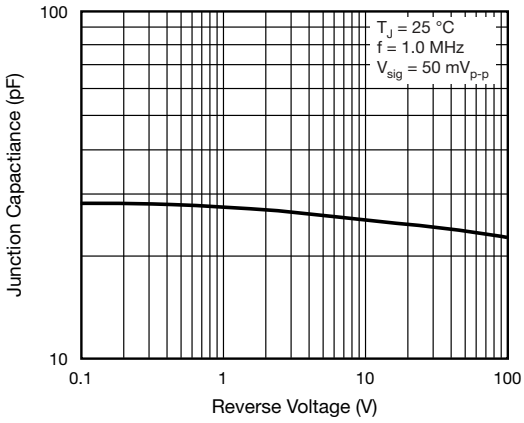


Fig. 5 - Typical Junction Capacitance

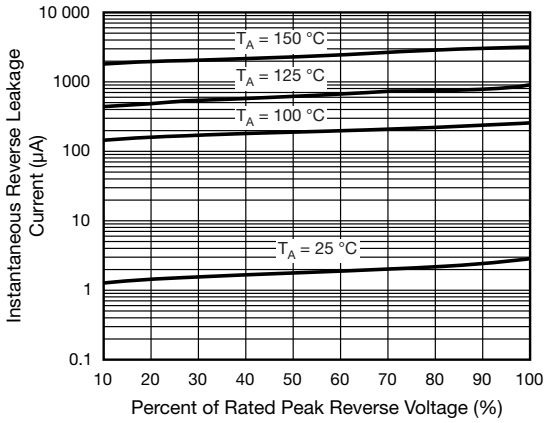


Fig. 4 - Typical Reverse Leakage Characteristics

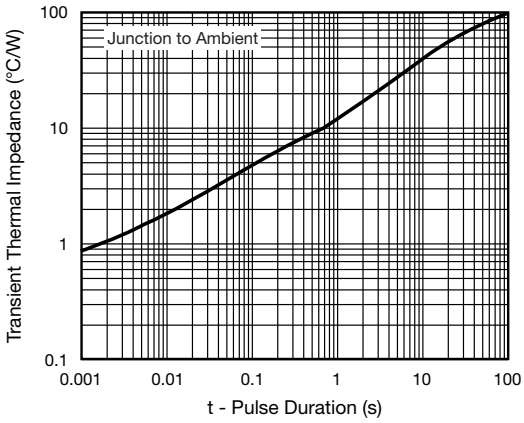
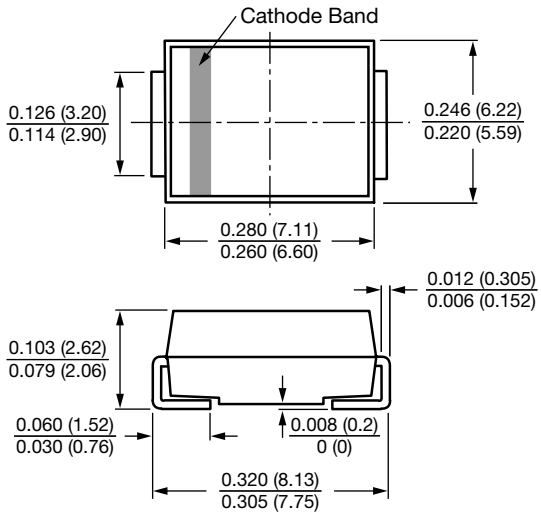


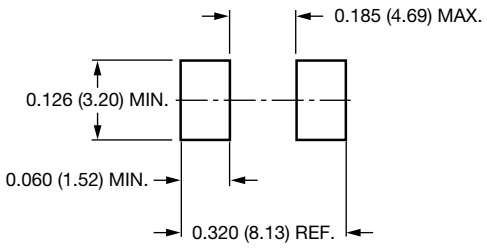
Fig. 6 - Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-214AB (SMC)



Mounting Pad Layout



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