

Surface Mount Ultrafast Plastic Rectifier


SMC (DO-214AB)

**RoHS
COMPLIANT
HALOGEN
FREE**

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

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: SMC (DO-214AB)

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, and commercial grade

Terminals: matte tin plated leads, solderable per J-STD-002 and JESD 22-B102

E3 and 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	SMC (DO-214AB)
Circuit configuration	Single

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

ELECTRICAL CHARACTERISTICS ($T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted)						
PARAMETER	TEST CONDITIONS	SYMBOL	TYP.	MAX.	UNIT	
Instantaneous forward voltage	$I_F = 3.0\text{ A}$	$T_A = 25\text{ }^\circ\text{C}$	$V_F^{(1)}$	0.85	0.90	V
		$T_A = 100\text{ }^\circ\text{C}$		0.74		
Reverse current	Rated V_R	$T_A = 25\text{ }^\circ\text{C}$	$I_R^{(2)}$	-	10	μA
		$T_A = 100\text{ }^\circ\text{C}$		250	500	
Reverse recovery time	$I_F = 0.5\text{ A}, I_R = 1.0\text{ A}, I_{rr} = 0.25\text{ A}$	$T_A = 25\text{ }^\circ\text{C}$	t_{rr}	-	20	ns
		$T_A = 25\text{ }^\circ\text{C}$		25	30	
		$T_A = 100\text{ }^\circ\text{C}$		35	50	
Storage charge	$I_F = 3.0\text{ A}, dI/dt = 50\text{ A}/\mu\text{s}, V_R = 30\text{ V}, I_{rr} = 0.1 I_{RM}$	$T_A = 25\text{ }^\circ\text{C}$	Q_{rr}	9	15	nC
		$T_A = 100\text{ }^\circ\text{C}$		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 $\leq 40\text{ ms}$

THERMAL CHARACTERISTICS ($T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted)					
PARAMETER	SYMBOL	U3B	U3C	U3D	UNIT
Typical thermal resistance	$R_{\theta JA}^{(1)}$	92			$^\circ\text{C}/\text{W}$
	$R_{\theta JM}^{(1)}$	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-E3/57T	0.239	57T	850	7" diameter plastic tape and reel
U3D-E3/9AT	0.239	9AT	3500	13" diameter plastic tape and reel
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

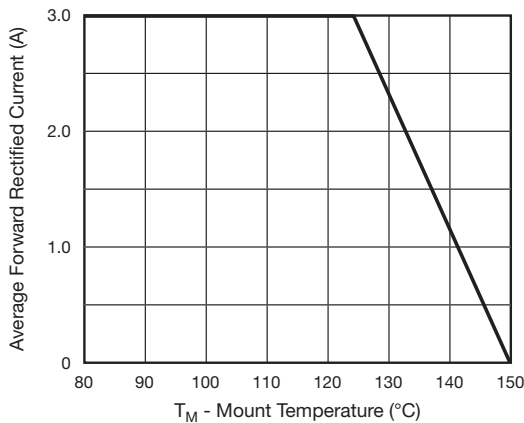
RATINGS AND CHARACTERISTICS CURVES ($T_A = 25\text{ }^\circ\text{C}$ unless otherwise noted)


Fig. 1 - Maximum Forward Current Derating Curve

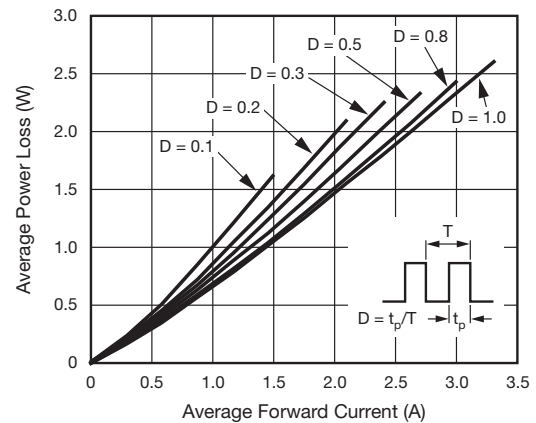


Fig. 2 - Forward Power Loss Characteristics

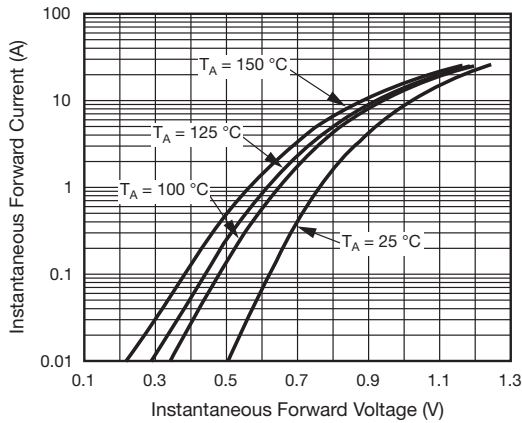


Fig. 3 - Typical Instantaneous Forward Characteristics

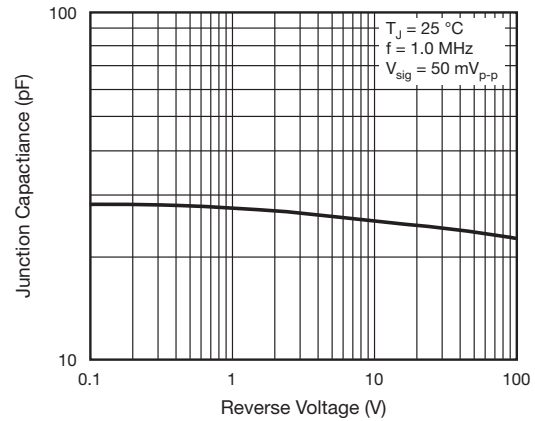


Fig. 5 - Typical Junction Capacitance

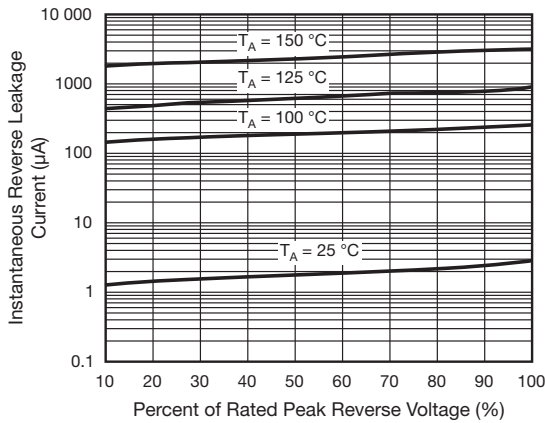


Fig. 4 - Typical Reverse Leakage Characteristics

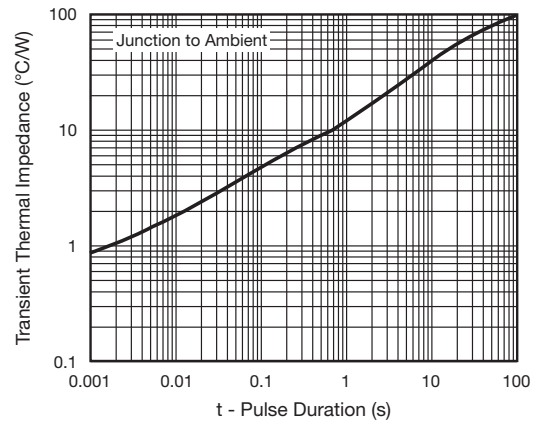
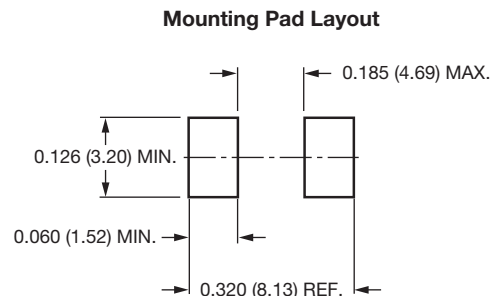
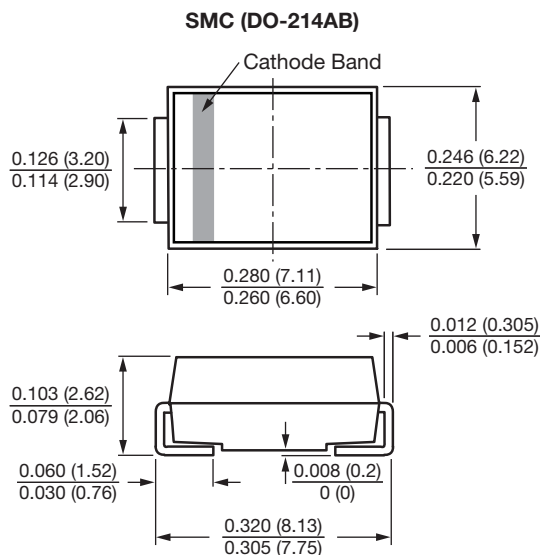


Fig. 6 - Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)





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