

# Surface Mount Ultrafast Plastic Rectifier



SMC (DO-214AB)

## 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](http://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:** 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 <sub>A</sub> = 25 °C unless otherwise noted)						
PARAMETER		SYMBOL	U3B	U3C	U3D	UNIT
Device marking code			U3B	U3C	U3D	
Maximum repetitive peak reverse voltage		V <sub>RRM</sub>	100	150	200	V
Maximum average forward rectified current (fig. 1)	T <sub>M</sub> = 134 °C	I <sub>F(AV)</sub> <sup>(1)</sup>	2.0			A
	T <sub>M</sub> = 125 °C	I <sub>F(AV)</sub> <sup>(2)</sup>	3.0			
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load		I <sub>FSM</sub>	100			A
Operating junction and storage temperature range		T <sub>J</sub> , T <sub>STG</sub>	-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 <sub>A</sub> = 25 °C unless otherwise noted)						
PARAMETER	TEST CONDITIONS		SYMBOL	TYP.	MAX.	UNIT
Instantaneous forward voltage	I <sub>F</sub> = 3.0 A	T <sub>A</sub> = 25 °C	V <sub>F</sub> <sup>(1)</sup>	0.85	0.90	V
		T <sub>A</sub> = 100 °C		0.74	0.83	
Reverse current	Rated V <sub>R</sub>	T <sub>A</sub> = 25 °C	I <sub>R</sub> <sup>(2)</sup>	-	10	μA
		T <sub>A</sub> = 100 °C		250	500	
Reverse recovery time	I <sub>F</sub> = 0.5 A, I <sub>R</sub> = 1.0 A, I <sub>rr</sub> = 0.25 A	T <sub>A</sub> = 25 °C	t <sub>rr</sub>	-	20	ns
		T <sub>A</sub> = 25 °C		25	30	
		T <sub>A</sub> = 100 °C		35	50	
Storage charge	I <sub>F</sub> = 3.0 A, dI/dt = 50 A/μs, V <sub>R</sub> = 30 V, I <sub>rr</sub> = 0.1 I <sub>RM</sub>	T <sub>A</sub> = 25 °C	Q <sub>rr</sub>	9	15	nC
		T <sub>A</sub> = 100 °C		22	35	
Typical junction capacitance	4.0 V, 1 MHz		C <sub>J</sub>	25	-	pF

**Notes**

(1) Pulse test: 300  $\mu\text{s}$  pulse width, 1 % duty cycle

(2) Pulse test: Pulse width  $\leq 40\text{ ms}$ 

THERMAL CHARACTERISTICS (T <sub>A</sub> = 25 °C unless otherwise noted)					
PARAMETER	SYMBOL	U3B	U3C	U3D	UNIT
Typical thermal resistance	R <sub>θJA</sub> <sup>(1)</sup>	92			°C/W
	R <sub>θJM</sub> <sup>(1)</sup>	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

<b>ORDERING INFORMATION</b> (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

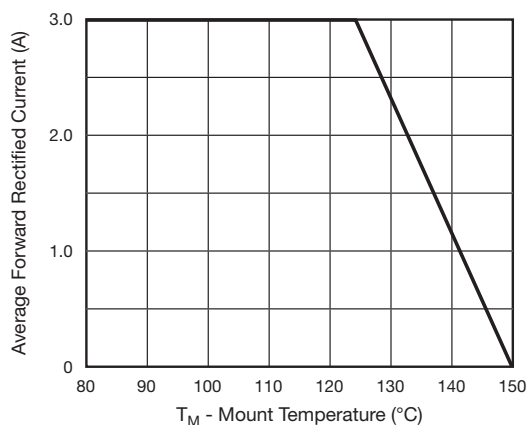
**RATINGS AND CHARACTERISTICS CURVES** ( $T_A = 25\text{ }^{\circ}\text{C}$  unless otherwise noted)


Fig. 1 - Maximum Forward Current Derating Curve

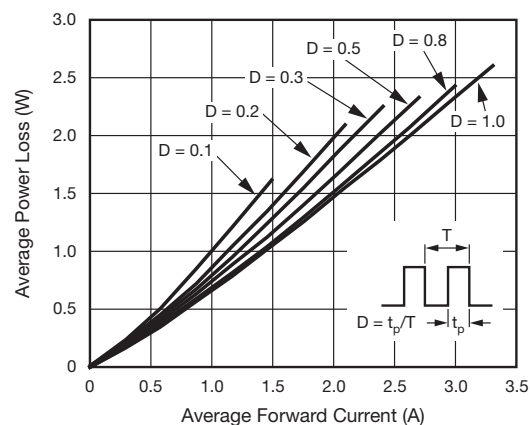


Fig. 2 - Forward Power Loss Characteristics

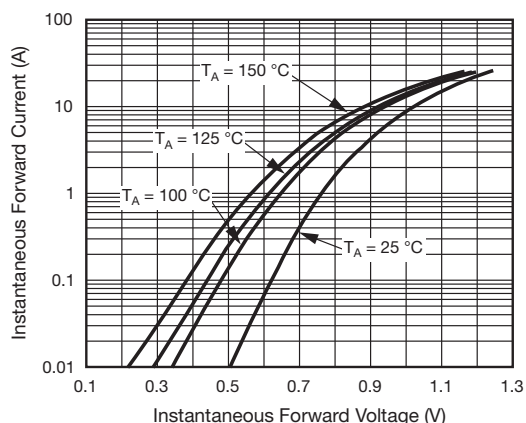


Fig. 3 - Typical Instantaneous Forward Characteristics

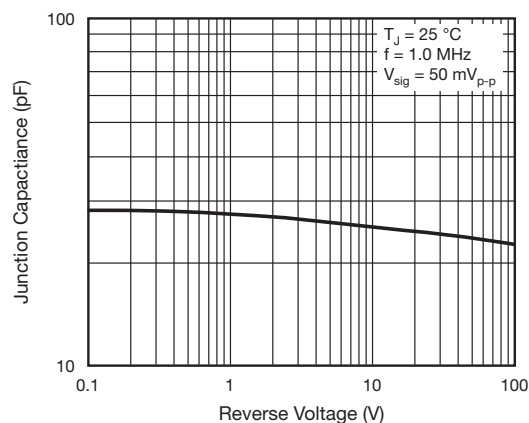


Fig. 5 - Typical Junction Capacitance

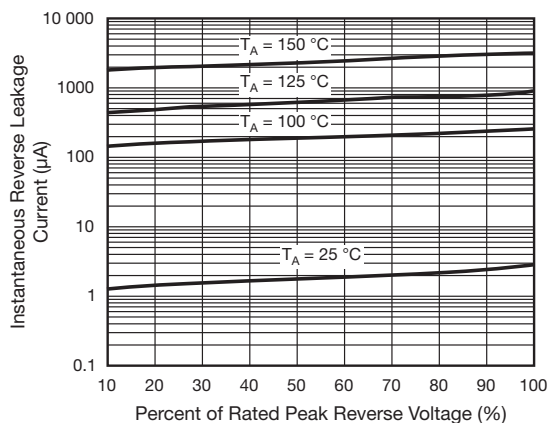


Fig. 4 - Typical Reverse Leakage Characteristics

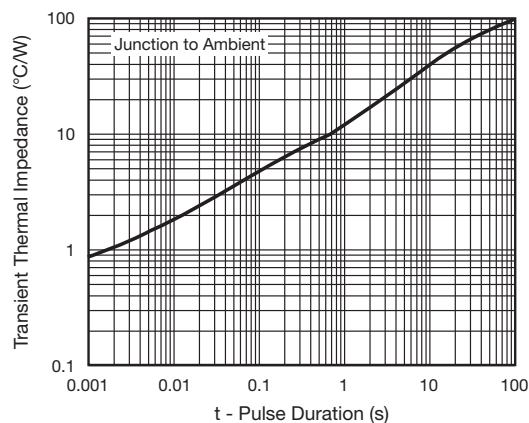
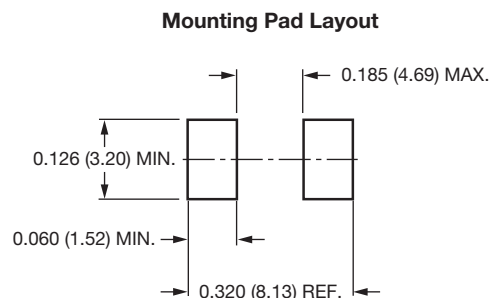
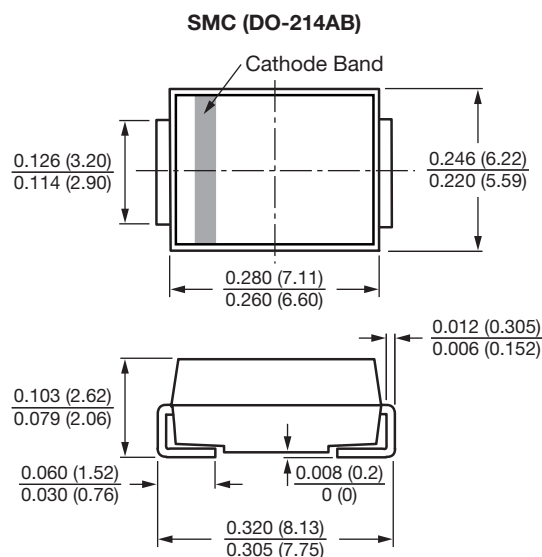


Fig. 6 - Typical Transient Thermal Impedance

## PACKAGE OUTLINE DIMENSIONS in inches (millimeters)





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