

## 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
- Solder dip 260 °C, 40 s
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC



RoHS  
COMPLIANT

### 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)

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

**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
$t_{tr}$	20 ns
$V_F$ at $I_F = 3.0$ A	0.74 V
$T_J$ max.	150 °C

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 $T_M = 125$ °C	$I_{F(AV)}$	2.0 <sup>(1)</sup> 3.0 <sup>(2)</sup>		A
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 P.C.B. with 0.47 x 0.47" (12 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 <sup>(1)</sup>	I <sub>F</sub> = 3.0 A	T <sub>A</sub> = 25 °C T <sub>A</sub> = 100 °C	V <sub>F</sub>	0.85 0.74	0.90 0.83	V
Reverse current <sup>(2)</sup>	rated V <sub>R</sub>	T <sub>A</sub> = 25 °C T <sub>A</sub> = 100 °C	I <sub>R</sub>	- 250	10 500	μA
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
	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 T <sub>A</sub> = 100 °C	t <sub>rr</sub>	25 35	30 50	ns
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 T <sub>A</sub> = 100 °C	Q <sub>rr</sub>	9 22	15 35	nC
Typical junction capacitance	4.0 V, 1 MHz		C <sub>J</sub>	25	-	pF

**Notes:**

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

THERMAL CHARACTERISTICS (T <sub>A</sub> = 25 °C unless otherwise noted)					
PARAMETER	SYMBOL	U3B	U3C	U3D	UNIT
Typical thermal resistance <sup>(1)</sup>	R <sub>θJA</sub>	92			°C/W
	R <sub>θJM</sub>	10			

**Note:**

- (1) Free air, mounted on recommended copper pad area. Thermal resistance R<sub>θJA</sub> - junction to ambient, R<sub>θJM</sub> - 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

**RATINGS AND CHARACTERISTICS CURVES**

(T<sub>A</sub> = 25 °C unless otherwise noted)

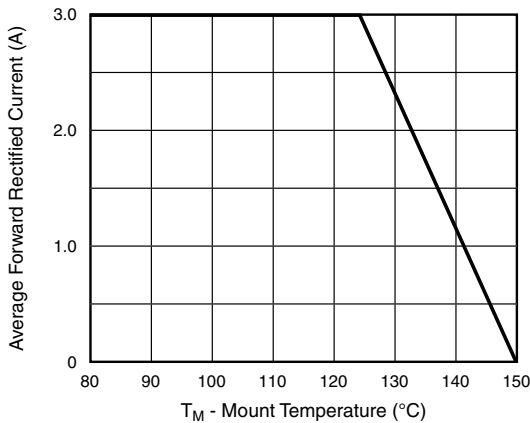


Figure 1. Maximum Forward Current Derating Curve

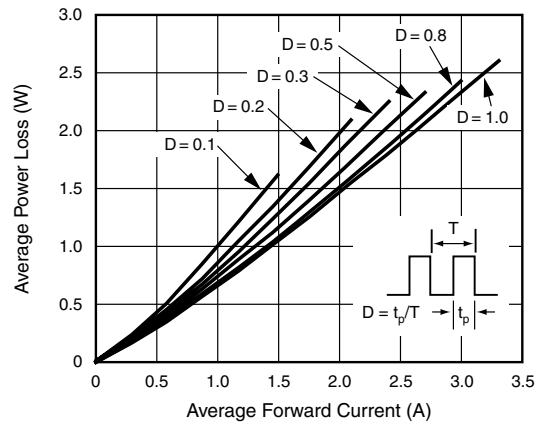


Figure 2. Forward Power Loss Characteristics

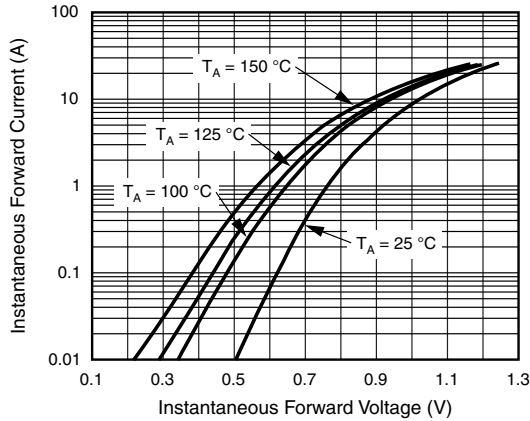


Figure 3. Typical Instantaneous Forward Characteristics

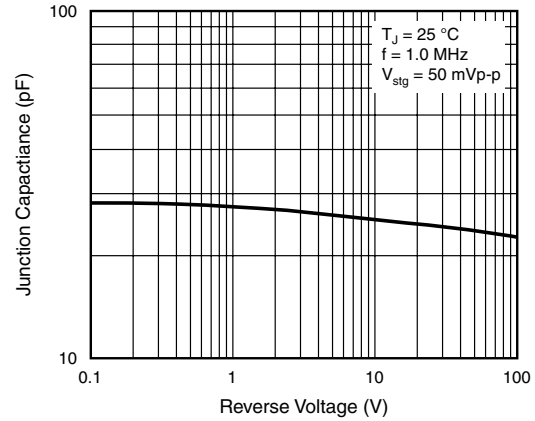


Figure 5. Typical Junction Capacitance

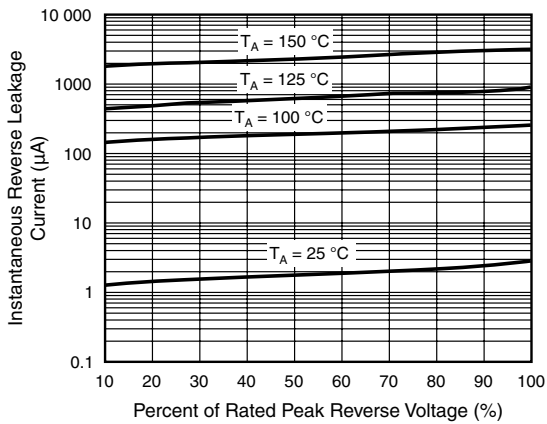


Figure 4. Typical Reverse Leakage Characteristics

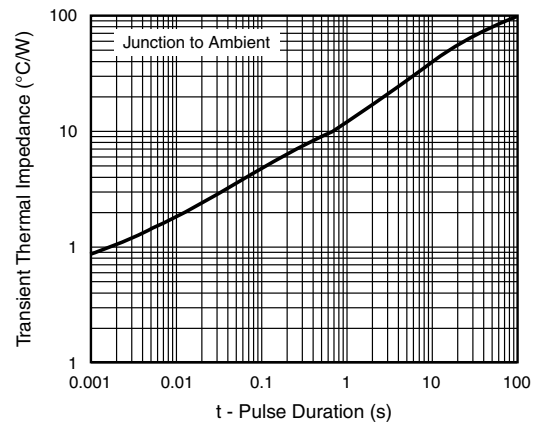
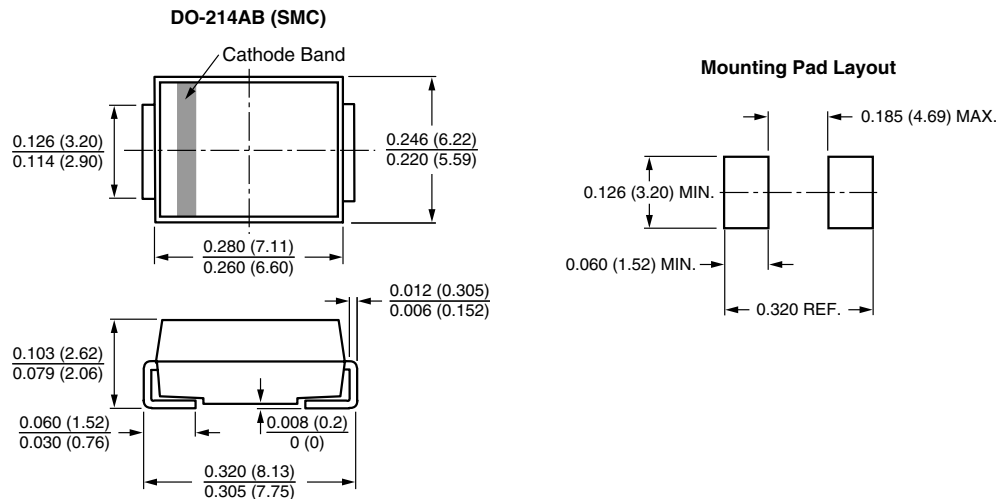


Figure 6. Typical Transient Thermal Impedance

**PACKAGE OUTLINE DIMENSIONS** in inches (millimeters)





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