

## Surface Mount Ultrafast Plastic Rectifier


**DO-214AA (SMB)**

### FEATURES

- Glass passivated chip junction
- Ideal for automated placement
- Ultrafast recovery times for high efficiency
- Low forward voltage, low power losses
- High forward surge capability
- Meets MSL level 1, per J-STD-020, LF maximum peak of 260 °C
- AEC-Q101 qualified
- Material categorization: For definitions of compliance please see [www.vishay.com/doc?99912](http://www.vishay.com/doc?99912)


**RoHS**  
COMPLIANT

### TYPICAL APPLICATIONS

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

### MECHANICAL DATA

**Case:** DO-214AA (SMB)

Molding compound meets UL 94 V-0 flammability rating  
Base P/N-E3 - RoHS-compliant, commercial grade  
Base P/NHE3 - RoHS-compliant, AEC-Q101 qualified

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

E3 suffix meets JESD 201 class 2 whisker test, HE3 suffix meets JESD 201 class 2 whisker test

**Polarity:** Color band denotes cathode end

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	2.0 A
$V_{RRM}$	600 V
$I_{FSM}$	90 A
$t_{rr}$	30 ns
$V_F$ at $I_F$	1.0 V
$T_J$ max.	150 °C
Package	DO-214AA (SMB)
Diode variations	Single die

MAXIMUM RATINGS ( $T_A = 25\text{ °C}$ unless otherwise noted)			
PARAMETER	SYMBOL	USB260	UNIT
Device marking code		U60	
Maximum repetitive peak reverse voltage	$V_{RRM}$	600	V
Maximum RMS voltage	$V_{RMS}$	420	V
Maximum DC blocking voltage	$V_{DC}$	600	V
Maximum average forward rectified current (fig. 1)	$I_{F(AV)}$	2.0	A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	$I_{FSM}$	90	A
Non-repetitive avalanche energy at $I_{AS} = 2.0\text{ A}$ , $L = 10\text{ mH}$ , $T_J = 25\text{ °C}$	$E_{AS}$	20	mJ
Operating junction and storage temperature range	$T_J, T_{STG}$	-55 to +150	°C

<b>ELECTRICAL CHARACTERISTICS</b> ( $T_A = 25\text{ }^{\circ}\text{C}$ unless otherwise noted)					
PARAMETER	TEST CONDITIONS		SYMBOL	TYP.	MAX.
Breakdown voltage	$I_R = 10\text{ }\mu\text{A}$	$T_J = 25\text{ }^{\circ}\text{C}$	$V_{BR}$	600 (minimum)	
Instantaneous forward voltage	$I_F = 2.0\text{ A}$	$T_J = 25\text{ }^{\circ}\text{C}$	$V_F^{(1)}$	1.25	-
		$T_J = 25\text{ }^{\circ}\text{C}$		1.5	1.6
		$T_J = 125\text{ }^{\circ}\text{C}$		1.0	1.1
Maximum reverse current	$V_R = 600\text{ V}$	$T_J = 25\text{ }^{\circ}\text{C}$	$I_R^{(2)}$	-	5.0
		$T_J = 125\text{ }^{\circ}\text{C}$		30	100
Maximum reverse recovery time	$I_F = 0.5\text{ A}$ , $I_R = 1.0\text{ A}$ , $I_{rr} = 0.25\text{ A}$		$t_{rr}$	30	
Typical junction capacitance	4.0 V, 1 MHz		$C_J$	45	

**Notes**

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

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

<b>THERMAL CHARACTERISTICS</b> ( $T_A = 25\text{ }^{\circ}\text{C}$ unless otherwise noted)			
PARAMETER	SYMBOL	USB260	UNIT
Typical thermal resistance	$R_{\theta JA}^{(1)}$	45	$^{\circ}\text{C/W}$
	$R_{\theta JL}^{(1)}$	10	

**Note**

(1) Units mounted on PCB with 2.0" x 2.0" copper pad areas

<b>ORDERING INFORMATION</b> (Example)				
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
USB260-E3/52T	0.096	52T	750	7" diameter plastic tape and reel
USB260-E3/5BT	0.096	5BT	3200	13" diameter plastic tape and reel
USB260HE3/52T <sup>(1)</sup>	0.096	52T	750	7" diameter plastic tape and reel
USB260HE3/5BT <sup>(1)</sup>	0.096	5BT	3200	13" diameter plastic tape and reel

**Note**

(1) AEC-Q101 qualified

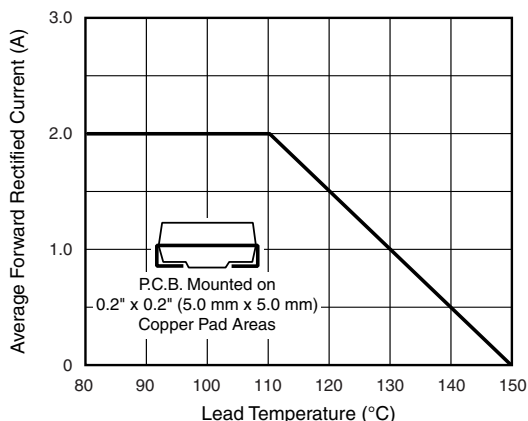
**RATINGS AND CHARACTERISTICS CURVES** ( $T_A = 25\text{ }^{\circ}\text{C}$  unless otherwise noted)


Fig. 1 - Maximum Forward Current Derating Curve

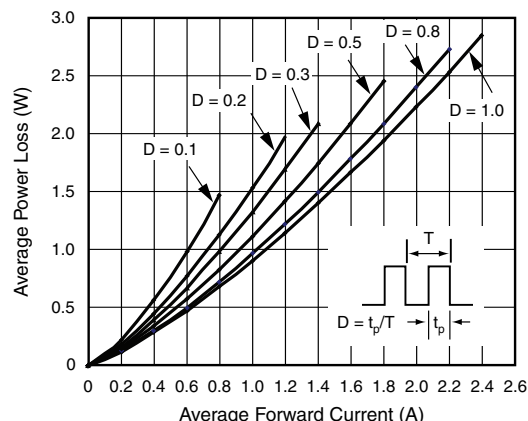


Fig. 2 - Forward Power Loss Characteristics

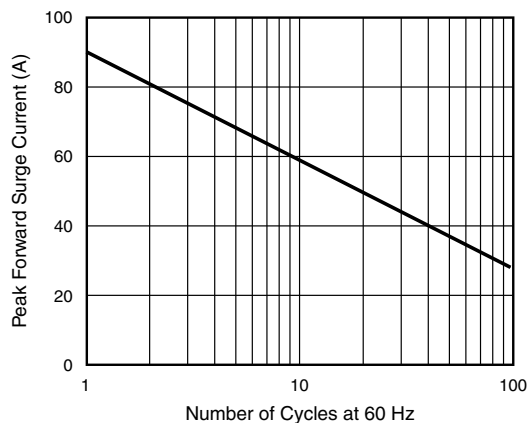


Fig. 3 - Maximum Non-Repetitive Peak Forward Surge Current

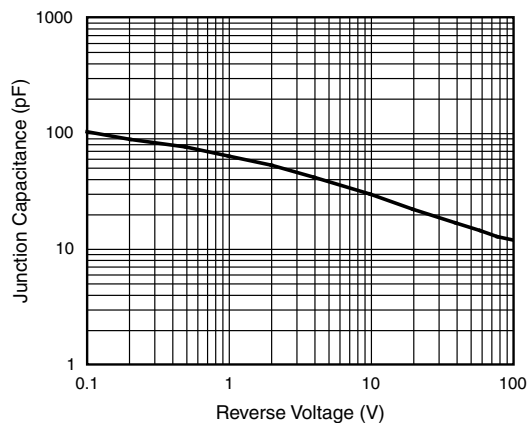


Fig. 6 - Typical Junction Capacitance

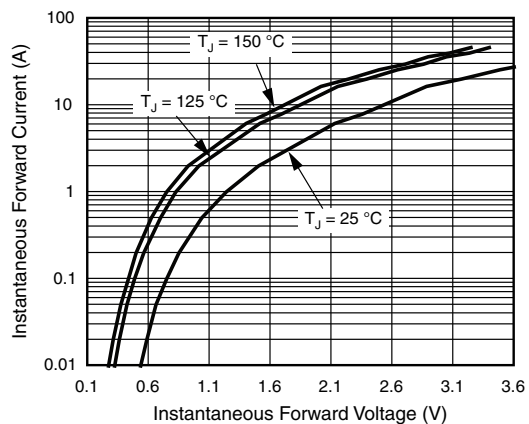


Fig. 4 - Typical Instantaneous Forward Characteristics

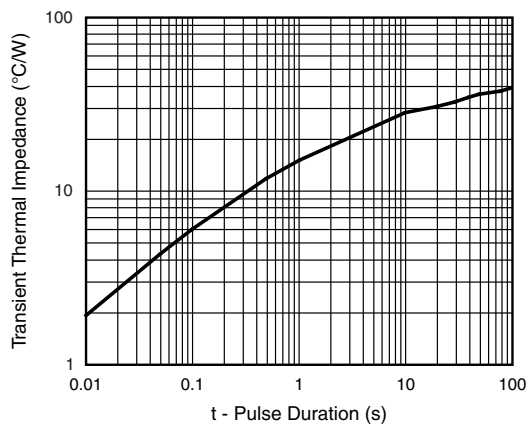


Fig. 7 - Typical Transient Thermal Impedance

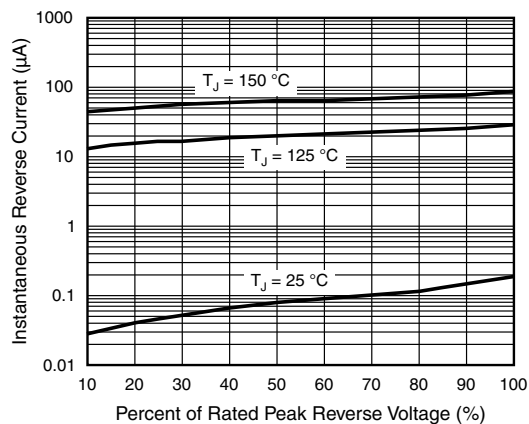
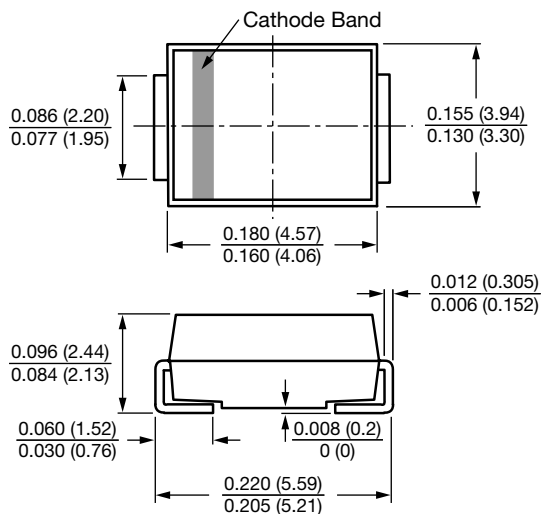
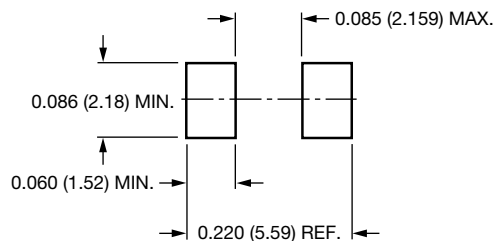


Fig. 5 - Typical Reverse Leakage Characteristics

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

**DO-214AA (SMB)**

**Mounting Pad Layout**




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