Vishay General Semiconductor

Surface Mount Ultrafast Rectifier



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DO-214AC (SMA)

1.0 A

50 V to 1000 V

30 A

50 ns, 75 ns

1.0 V, 1.7 V

150 °C

PRIMARY CHARACTERISTICS

I_{F(AV)}

 V_{RRM}

IFSM

t_{rr}

 V_{F}

T_{.1} max.

FEATURES

- Low profile package
- Ideal for automated placement
- Glass passivated chip junction
- Ultrafast reverse recovery time
- Low switching losses, high efficiency
- 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 <u>www.vishay.com/doc?99912</u>

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-214AC (SMA)

Molding compound meets UL 94 V-0 flammability rating Base P/N-E3 - RoHS-compliant, commercial grade Base P/NHE3 - RoHS-compliant, automotive grade Base P/NHE3_X - RoHS-compliant and AEC-Q101 qualified ("_X" denotes revision code e.g. A, B,)

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

E3 suffix meets JESD 201 class 1A whisker test, HE3 suffix meets JESD 201 class 2 whisker test

Polarity: Color band denotes cathode end

MAXIMUM RATINGS (T _A = 25 °C unless otherwise noted)									
PARAMETER	SYMBOL	US1A	US1B	US1D	US1G	US1J	US1K	US1M	UNIT
Device marking code		UA	UB	UD	UG	UJ	UK	UM	
Maximum repetitive peak reverse voltage	V _{RRM}	50	100	200	400	600	800	1000	V
Maximum RMS voltage	V _{RMS}	35	70	140	280	420	560	700	V
Maximum DC blocking voltage	V _{DC}	50 100 200 400 600 800 1000		1000	V				
Maximum average forward rectified current at T_L = 110 °C	I _{F(AV)}	1.0						Α	
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I _{FSM}	30					А		
Operating and storage temperature range	T _J , T _{STG}	- 55 to + 150					°C		



US1A thru US1M



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ELECTRICAL CHARACTERISTICS (T _A = 25 °C unless otherwise noted)										
PARAMETER	TEST CONDITIONS	SYMBOL	US1A	US1B	US1D	US1G	US1J	US1K	US1M	UNIT
Maximum instantaneous forward voltage	1.0 A	V _F ⁽¹⁾	1.0			1.7			V	
Maximum DC reverse current at rated DC blocking voltage	T _A = 25 °C T _A = 100 °C	- I _R	10 50					μA		
Maximum reverse recovery time	$I_F = 0.5 \text{ A}, I_R = 1.0 \text{ A}, I_{rr} = 0.25 \text{ A}$	t _{rr}	50				75			ns
Typical junction capacitance	4.0 V, 1 MHz	CJ	15			10			pF	

Note

⁽¹⁾ Pulse test: 300 µs pulse width, 1 % duty cycle

THERMAL CHARACTERISTICS ($T_A = 25 \text{ °C}$ unless otherwise noted)									
PARAMETER	R SYMBOL US1A US1B US1D US1G US1J US1K US		US1M	UNIT					
Maximum thermal resistance	$R_{\theta JA}$ ⁽¹⁾	75							°C/W
	R _{0JL} ⁽¹⁾	27							0/11

Note

 $^{(1)}\,$ PCB mounted on 0.2" x 0.2" (5.0 mm x 5.0 mm) copper pad area

ORDERING INFORMATION (Example)									
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE					
US1J-E3/61T	0.064	61T	1800	7" diameter plastic tape and reel					
US1J-E3/5AT	0.064	5AT	7500	13" diameter plastic tape and reel					
US1JHE3/61T (1)	0.064	61T	1800	7" diameter plastic tape and reel					
US1JHE3/5AT ⁽¹⁾	0.064	5AT	7500	13" diameter plastic tape and reel					
US1JHE3_A/H ⁽¹⁾	0.064	Н	1800	7" diameter plastic tape and reel					
US1JHE3_A/I ⁽¹⁾	0.064		7500	13" diameter plastic tape and reel					

Note

(1) AEC-Q101 gualified

RATINGS AND CHARACTERISTICS CURVES

(T_A = 25 °C unless otherwise noted)

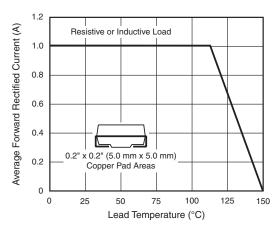


Fig. 1 - Forward Current Derating Curve

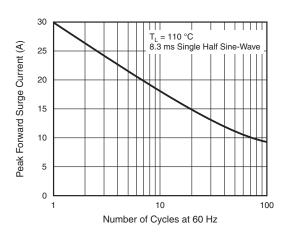


Fig. 2 - Maximum Non-Repetitive Peak Forward Surge Current

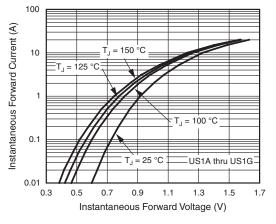
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Fig. 3 - Typical Instantaneous Forward Characteristics

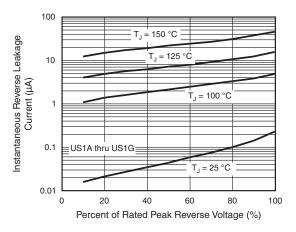


Fig. 4 - Typical Reverse Leakage Characteristics

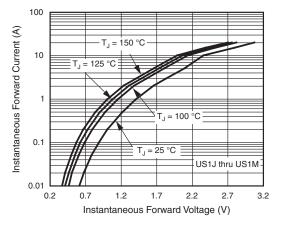


Fig. 5 - Typical Instantaneous Forward Characteristics

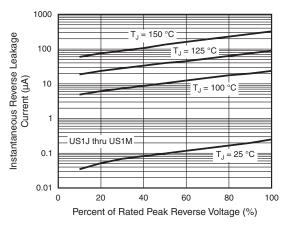


Fig. 6 - Typical Reverse Leakage Characteristics

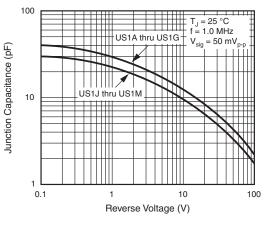


Fig. 7 - Typical Junction Capacitance

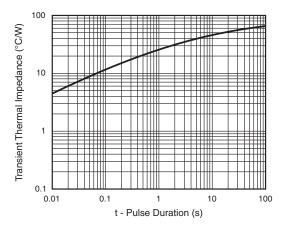


Fig. 8 - Typical Transient Thermal Impedance

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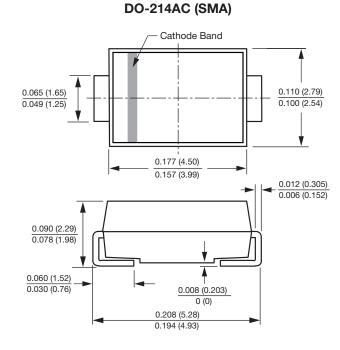
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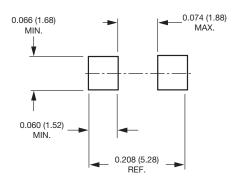
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PACKAGE OUTLINE DIMENSIONS in inches (millimeters)





Mounting Pad Layout

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