

Surface Mount Ultrafast Rectifier


DO-214AC (SMA)

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

Polarity: Color band denotes cathode end

PRIMARY CHARACTERISTICS	
$I_{F(AV)}$	1.0 A
V_{RRM}	50 V, 100 V, 200 V, 400 V, 600 V, 800 V, 1000 V
I_{FSM}	30 A
t_{rr}	50 ns, 75 ns
V_F at I_F	1.0 V, 1.7 V
T_J max.	150 °C
Package	DO-214AC (SMA)
Diode variations	Single die

MAXIMUM RATINGS ($T_A = 25\text{ °C}$ 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	V
Maximum average forward rectified current at $T_L = 110\text{ °C}$	$I_{F(AV)}$	1.0							A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	30							A
Operating and storage temperature range	T_J, T_{STG}	-55 to +150							°C

**ELECTRICAL CHARACTERISTICS** ($T_A = 25\text{ }^{\circ}\text{C}$ 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		$T_A = 25\text{ }^{\circ}\text{C}$	I_R	10							μA
		$T_A = 100\text{ }^{\circ}\text{C}$		50							
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		C_J	15				10			pF

Note

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

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

PARAMETER	SYMBOL	US1A	US1B	US1D	US1G	US1J	US1K	US1M	UNIT
Maximum thermal resistance	$R_{\theta JA}^{(1)}$	75							$^{\circ}\text{C/W}$
	$R_{\theta JL}^{(1)}$	27							

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	H	1800	7" diameter plastic tape and reel
US1JHE3_A/I ⁽¹⁾	0.064	I	7500	13" diameter plastic tape and reel

Note

⁽¹⁾ AEC-Q101 qualified

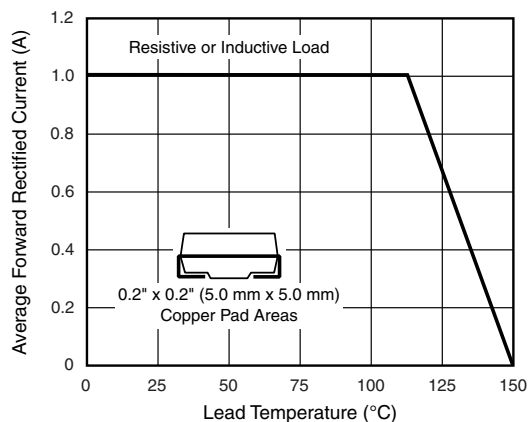
RATINGS AND CHARACTERISTICS CURVES ($T_A = 25\text{ }^{\circ}\text{C}$ unless otherwise noted)

Fig. 1 - Forward Current Derating Curve

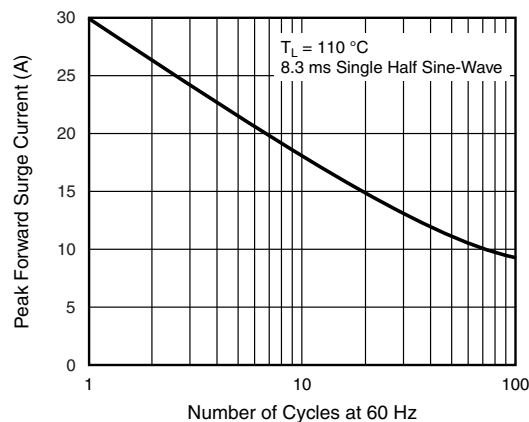


Fig. 2 - Maximum Non-Repetitive Peak Forward Surge Current

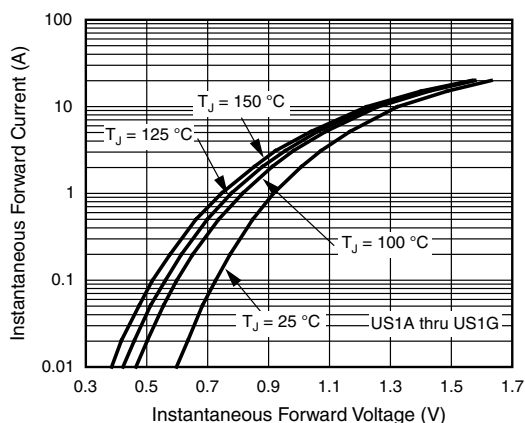


Fig. 3 - Typical Instantaneous Forward Characteristics

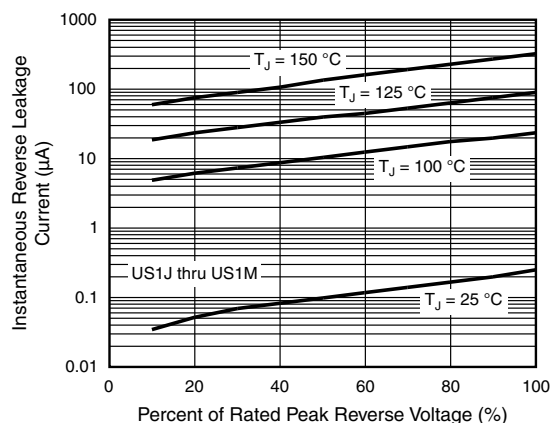


Fig. 6 - Typical Reverse Leakage Characteristics

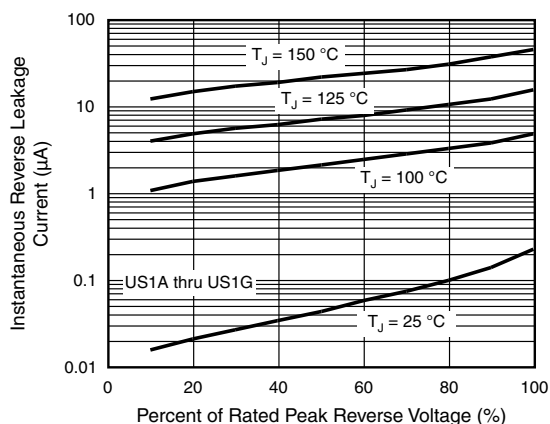


Fig. 4 - Typical Reverse Leakage Characteristics

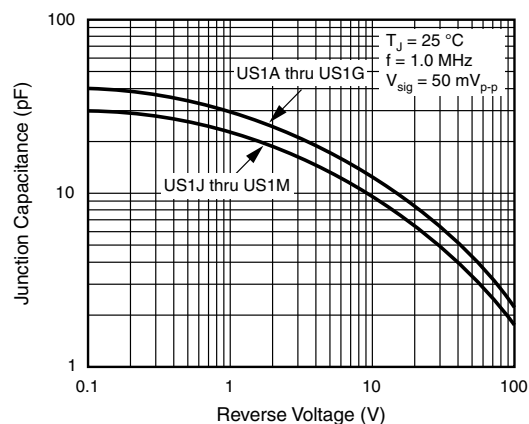


Fig. 7 - Typical Junction Capacitance

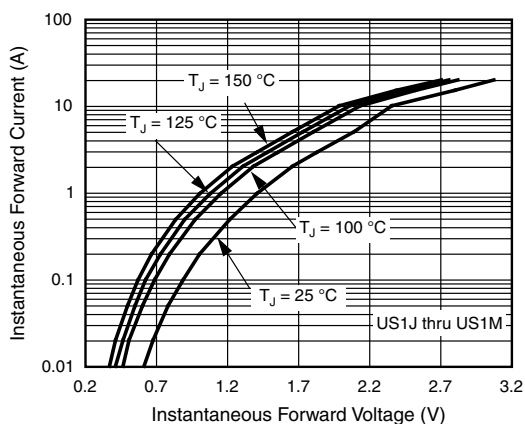


Fig. 5 - Typical Instantaneous Forward Characteristics

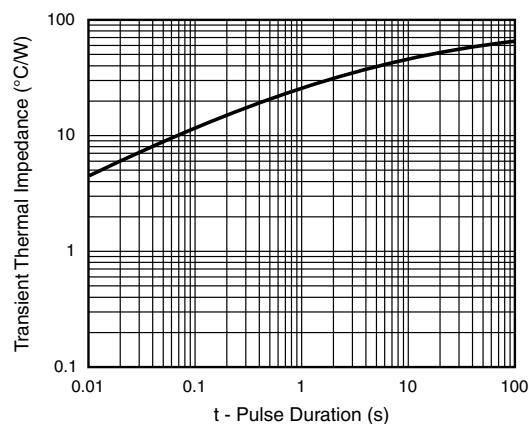
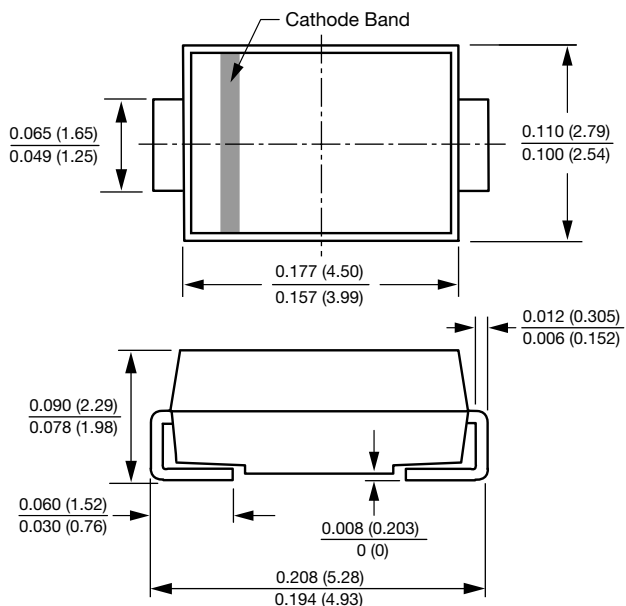


Fig. 8 - Typical Transient Thermal Impedance

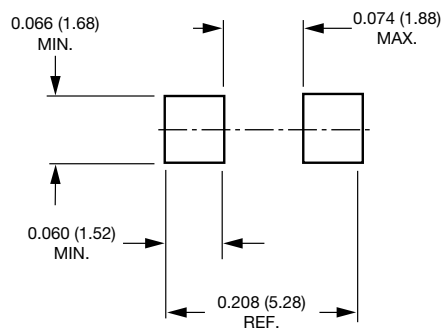


PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-214AC (SMA)



Mounting Pad Layout





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