Surface-Mount Ultrafast Rectifier

SMA (DO-214AC)

Cathode ○—|▶|—○ Anode

LINKS TO ADDITIONAL RESOURCES

Design Tools | Related Documents | 3D Models | Models | Application Notes | Marking

FEATURES

- Low profile package
- Ideal for automated placement
- Glass passivated pallet 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 available
  - Automotive ordering code: base P/NHE3 or P/NHM3
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912

AUTOMOTIVE GRADE Available

RoHS COMPLIANT

HALOGEN FREE Available

TYPICAL APPLICATIONS

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

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	SMA (DO-214AC)
Circuit configurations	Single

MECHANICAL DATA

Case: SMA (DO-214AC)
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, commercial grade
Base P/NHE3_X - RoHS-compliant and AEC-Q101 qualified
Base P/NHM3_X - halogen-free, 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, M3, HE3, and HM3 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	V
Maximum average forward rectified current at T_L = 110 °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 °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	I_R	10							µA
		T_A = 100 °C		50							
Maximum reverse recovery time	I_F = 0.5 A, I_R = 1.0 A, I_{rr} = 0.25 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 °C unless otherwise noted)										
PARAMETER	**SYMBOL**	**US1A**	**US1B**	**US1D**	**US1G**	**US1J**	**US1K**	**US1M**	**UNIT**
Maximum thermal resistance	$R_{\theta JA}$ (1)	75							°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_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
US1J-M3/61T	0.064	61T	1800	7" diameter plastic tape and reel
US1J-M3/5AT	0.064	5AT	7500	13" diameter plastic tape and reel
US1JHM3_A/H (1)	0.064	H	1800	7" diameter plastic tape and reel
US1JHM3_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 °C unless otherwise noted)

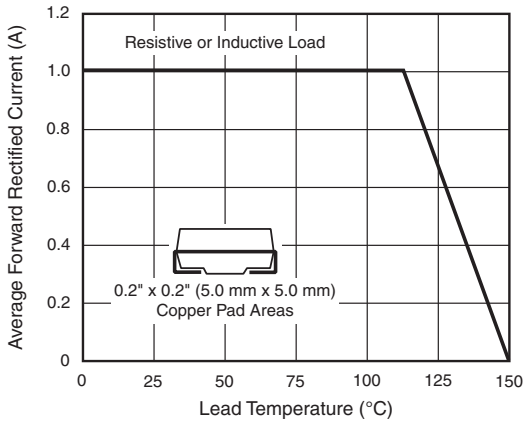


Fig. 1 - Forward Current Derating Curve

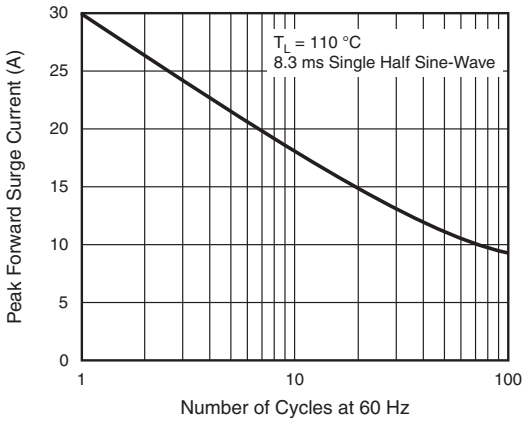


Fig. 2 - Maximum Non-Repetitive Peak Forward Surge Current

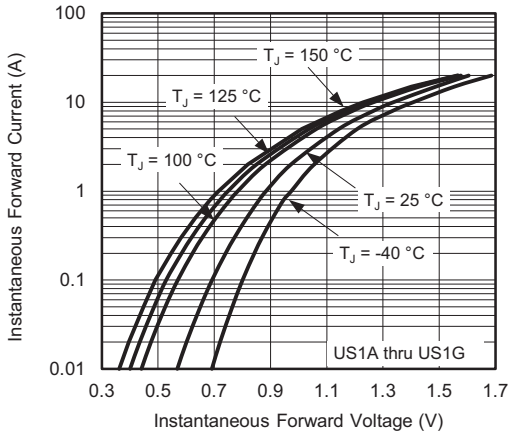


Fig. 3 - Typical Instantaneous Forward Characteristics

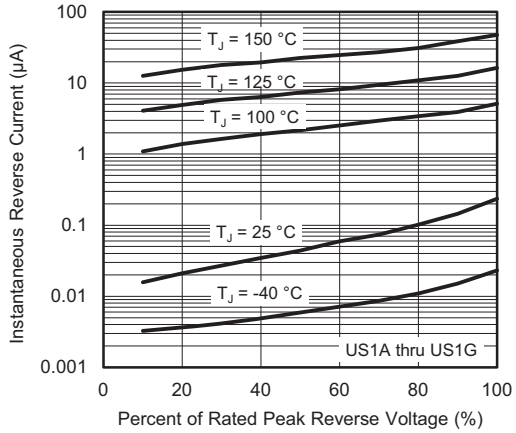


Fig. 4 - Typical Reverse Leakage Characteristics

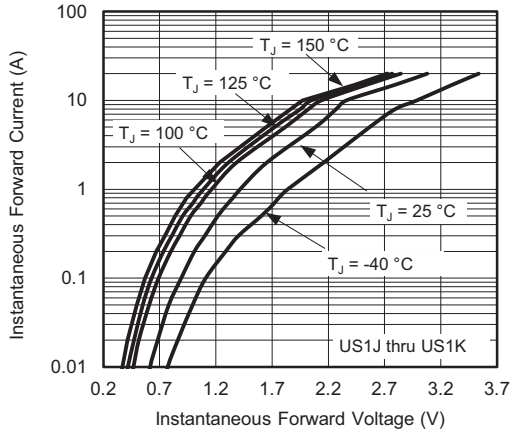


Fig. 5 - Typical Instantaneous Forward Characteristics

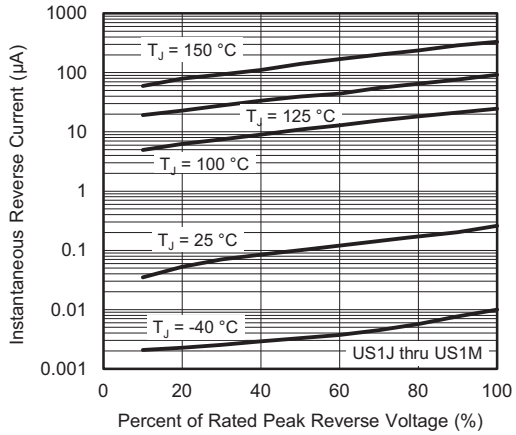


Fig. 6 - Typical Reverse Leakage Characteristics

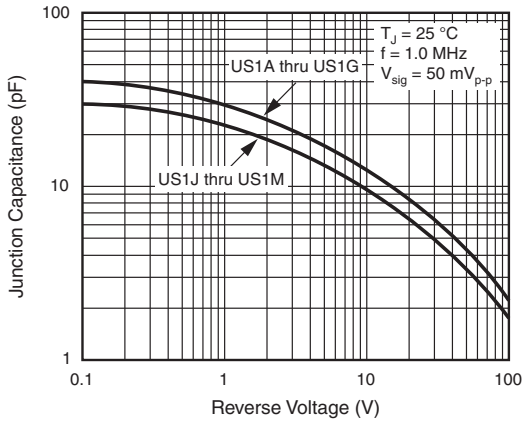


Fig. 7 - Typical Junction Capacitance

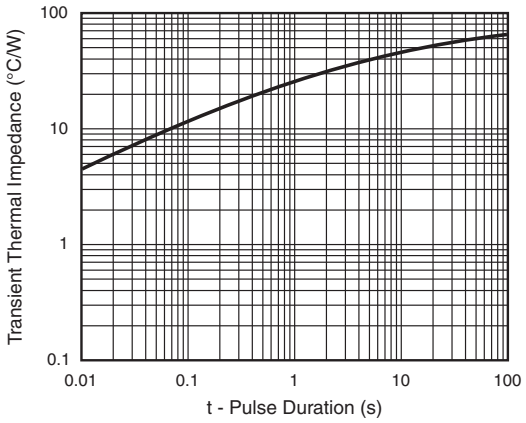
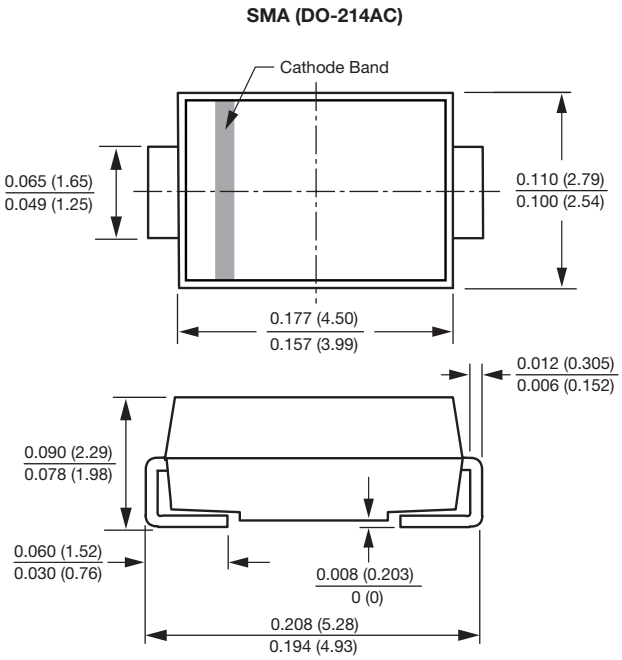
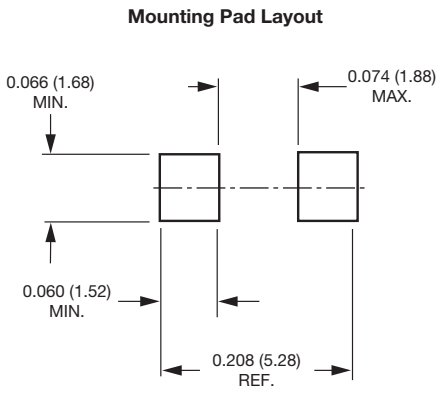


Fig. 8 - Typical Transient Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)





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