Surface Mount Ultrafast Plastic Rectifier

DO-214AC (SMA)

FEATURES

- Low profile package
- Ideal for automated placement
- Glass passivated chip junction
- 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

Pb

e3

RoHS COMPLIANT

PRIMARY CHARACTERISTICS

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$I_{F(AV)}$	1.0 A
V_{RRM}	50 V to 200 V
I_{FSM}	30 A
t_{rr}	15 ns
V_F	0.92 V
T_J max.	150 °C

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, AEC-Q101 qualified
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

TYPICAL APPLICATIONS

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

MAXIMUM RATINGS (T_A = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	ES1A	ES1B	ES1C	ES1D	UNIT
Device marking code		EA	EB	EC	ED	
Maximum repetitive peak reverse voltage	V_{RRM}	50	100	150	200	V
Maximum RMS voltage	V_{RMS}	35	70	105	140	V
Maximum DC blocking voltage	V_{DC}	50	100	150	200	V
Maximum average forward rectified current (fig. 1)	$I_{F(AV)}$	1.0				A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I_{FSM}	30				A
Operating junction 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	VALUE	UNIT
Maximum instantaneous forward voltage	I$_F$ = 0.6 A		V$_F$ [1]	0.865	V
	I$_F$ = 1.0 A		V$_F$	0.920	
Maximum DC reverse current at rated DC blocking voltage		T$_A$ = 25 °C	I$_R$	5.0	μA
		T$_A$ = 100 °C		100	
Maximum reverse recovery time	I$_F$ = 0.5 A, I$_R$ = 1.0 A, I$_{rr}$ = 0.25 A		t$_{rr}$	15	ns
Maximum reverse recovery time	I$_F$ = 0.6 A, V$_R$ = 30 V, dI/dt = 50 A/μs, I$_{rr}$ = 10 % I$_{RM}$	T$_J$ = 25 °C	t$_{rr}$	25	ns
		T$_J$ = 100 °C		35	
Maximum stored charge	I$_F$ = 0.6 A, V$_R$ = 30 V, dI/dt = 50 A/μs, I$_{rr}$ = 10 % I$_{RM}$	T$_J$ = 25 °C	Q$_{rr}$	10	nC
		T$_J$ = 100 °C		25	
Typical junction capacitance	4.0 V, 1 MHz		C$_J$	10	pF

Note

[1] Pulse test: 300 μs pulse width, 1 % duty cycle

THERMAL CHARACTERISTICS (T$_A$ = 25 °C unless otherwise noted)

PARAMETER	SYMBOL	ES1A	ES1B	ES1C	ES1D	UNIT
Typical thermal resistance	R$_{θJA}$ [1]	85				°C/W
	R$_{θJL}$ [1]	35				

Note

[1] Units mounted on PCB 5.0 mm x 5.0 mm (0.013 mm thick) land areas

ORDERING INFORMATION (Example)

PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
ES1D-E3/61T	0.064	61T	1800	7" diameter plastic tape and reel
ES1D-E3/5AT	0.064	5AT	7500	13" diameter plastic tape and reel
ES1DHE3/61T [1]	0.064	61T	1800	7" diameter plastic tape and reel
ES1DHE3/5AT [1]	0.064	5AT	7500	13" diameter plastic tape and reel
ES1DHE3_A/H [1]	0.064	H	1800	7" diameter plastic tape and reel
ES1DHE3_A/I [1]	0.064	I	7500	13" diameter plastic tape and reel

Note

[1] AEC_Q101 qualified

RATINGS AND CHARACTERISTICS CURVES

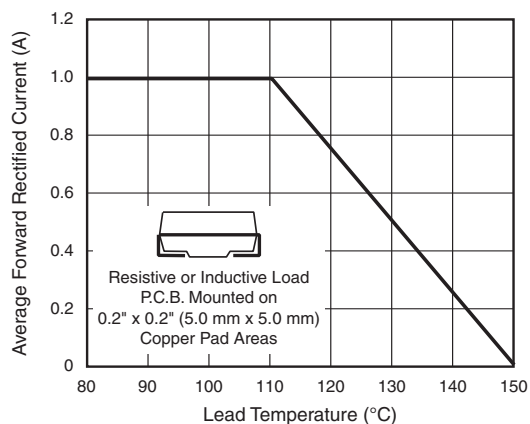(T_A = 25 °C unless otherwise noted)

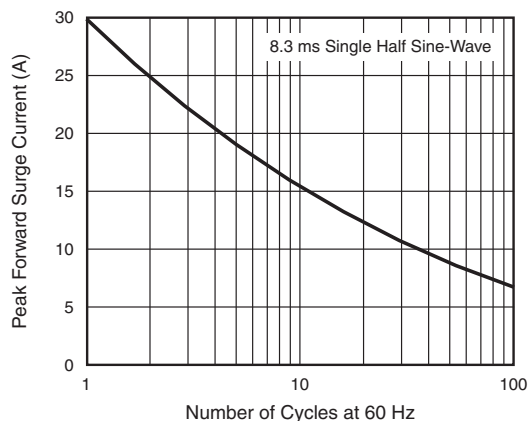Fig. 1 - Maximum Forward Current Derating Curve

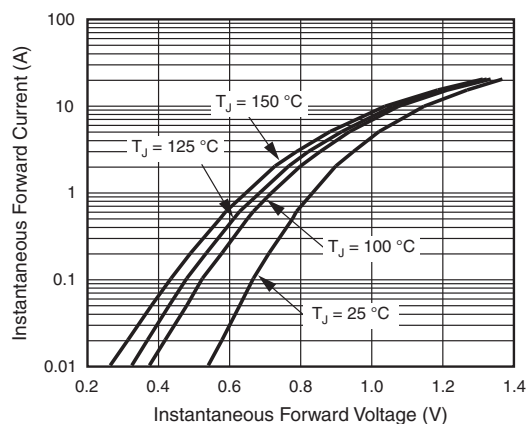Fig. 2 - Maximum Non-Repetitive Peak Forward Surge Current

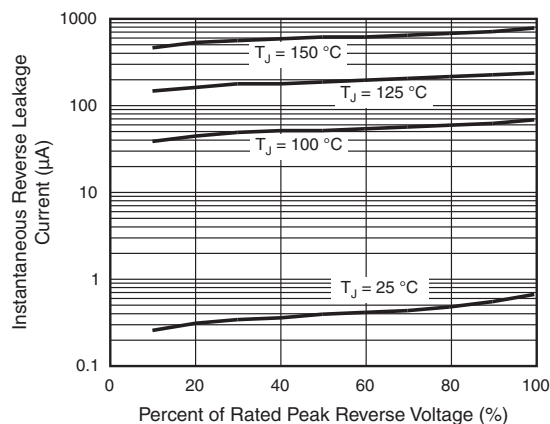
Fig. 3 - Typical Instantaneous Forward Characteristics

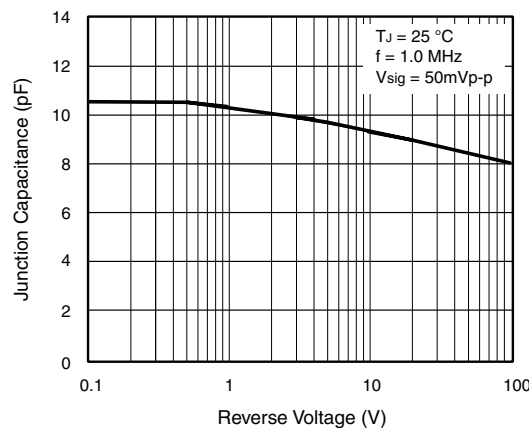Fig. 4 - Typical Reverse Leakage Characteristics
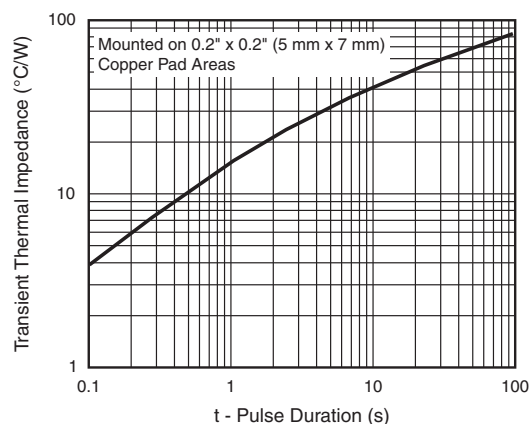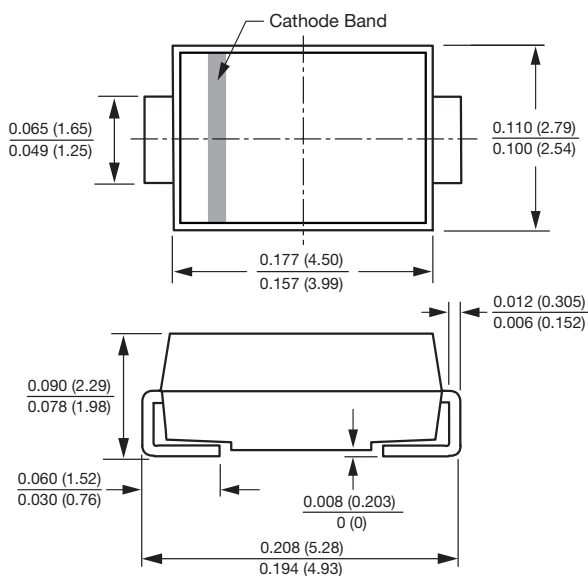

Fig. 5 - Typical Junction Capacitance

Fig. 6 - Typical Thermal Impedance

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

DO-214AC (SMA)

Cathode Band

0.065 (1.65)
0.049 (1.25)

0.110 (2.79)
0.100 (2.54)

0.177 (4.50)
0.157 (3.99)

0.012 (0.305)
0.006 (0.152)

0.090 (2.29)
0.078 (1.98)

0.060 (1.52)
0.030 (0.76)

0.008 (0.203)
0 (0)

0.208 (5.28)
0.194 (4.93)

Mounting Pad Layout

0.066 (1.68)
MIN.

0.074 (1.88)
MAX.

0.060 (1.52)
MIN.

0.208 (5.28)
REF.
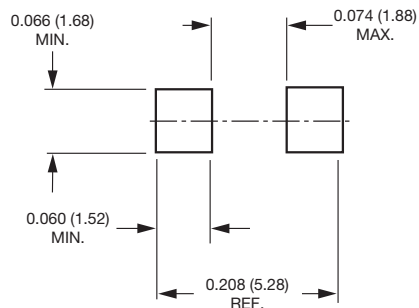
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