

Vishay General Semiconductor

COMPLIANT

HALOGEN

FREE

Surface Mount Ultrafast Plastic Rectifier



SMA (DO-214AC)

PRIMARY CHARACTERISTICS						
I _{F(AV)} 1.0 A						
V _{RRM}	50 V, 100 V, 150 V, 200 V					
I _{FSM}	I _{FSM} 30 A					
t _{rr}	15 ns					
V _F at I _F	0.92 V					
T _J max.	150 °C					
Package	SMA (DO-214AC)					
Diode variations	Single					

FEATURES

- Low profile package
- · Ideal for automated placement
- · Glass passivated pellet 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 available
 - Automotive ordering code: P/NHE3 or P/NHM3
- Material categorization: for definitions of compliance please see <u>www.vishav.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: 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	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				Α
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I _{FSM}	30				А
Operating junction and storage temperature range	T _J , T _{STG}	-55 to +150				°C

ES1A, ES1B, ES1C, ES1D

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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
waxiinum instantaneous forward voitage	I _F = 1.0 A		V_{F}	0.920	
Maximum DC reverse current at rated DC		T _A = 25 °C		5.0	μΑ
blocking voltage		T _A = 100 °C	I _R	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}	15	ns	
Maximum reverse recovery time	I_F = 0.6 A, V_R = 30 V, dl/dt = 50 A/ μ s, I_{rr} = 10 % I_{RM}	T _J = 25 °C	- t _{rr}	25	- ns
waximum reverse recovery time		T _J = 100 °C		35	
Maximum stored charge	$I_F = 0.6 \text{ A}, V_R = 30 \text{ V}, dI/dt = 50 \text{ A/}\mu\text{s},$	T _J = 25 °C	Q _{rr}	10	nC
	I _{rr} = 10 % I _{RM}	T _J = 100 °C		25	
Typical junction capacitance	4.0 V, 1 MHz		CJ	10	pF

Note

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

THERMAL CHARACTERISTICS (T _A = 25 °C unless otherwise noted)						
PARAMETER	SYMBOL	L ES1A ES1B ES1C ES1D UN				
Typical thermal resistance	R _{0JA} (1)	85				°C/W
Typical trieffial resistance	R ₀ JL (1)		3	5		C/VV

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_A/H (1)	0.064	Н	1800	7" diameter plastic tape and reel			
ES1DHE3_A/I (1)	0.064	I	7500	13" diameter plastic tape and reel			
ES1D-M3/61T	0.064	61T	1800	7" diameter plastic tape and reel			
ES1D-M3/5AT	0.064	5AT	7500	13" diameter plastic tape and reel			
ES1DHM3_A/H (1)	0.064	Н	1800	7" diameter plastic tape and reel			
ES1DHM3_A/I (1)	0.064	I	7500	13" diameter plastic tape and reel			

Note

(1) AEC-Q101 qualified

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RATINGS AND CHARACTERISTICS CURVES (T_A = 25 °C unless otherwise noted)

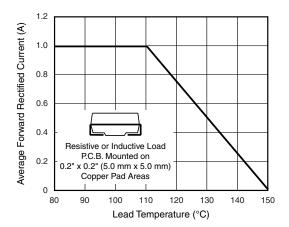


Fig. 1 - Maximum Forward Current Derating Curve

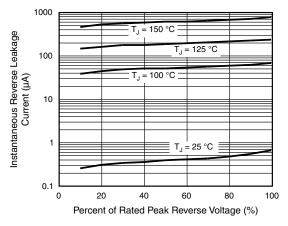


Fig. 4 - Typical Reverse Leakage Characteristics

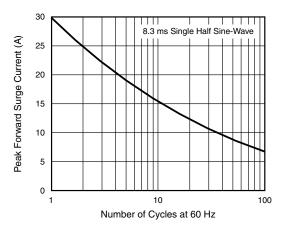


Fig. 2 - Maximum Non-Repetitive Peak Forward Surge Current

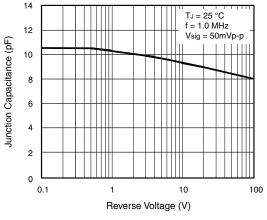


Fig. 5 - Typical Junction Capacitance

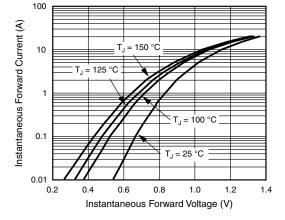


Fig. 3 - Typical Instantaneous Forward Characteristics

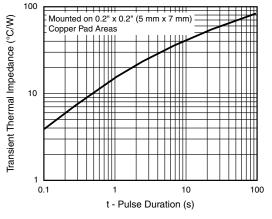


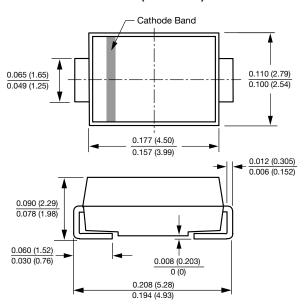
Fig. 6 - Typical Thermal Impedance

ES1A, ES1B, ES1C, ES1D

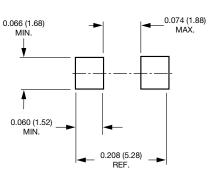
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PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

SMA (DO-214AC)



Mounting Pad Layout





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