AUTOMOTIVE GRADE

RoHS

COMPLIANT

HALOGEN FREE



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Vishay General Semiconductor

Surface-Mount Ultrafast Plastic Rectifier



SMA (DO-214AC)



LINKS TO ADDITIONAL RESOURCES



PRIMARY CHARACTERISTICS					
$I_{F(AV)}$	1.0 A				
V_{RRM}	100 V, 150 V, 200 V				
t _{rr}	25 ns				
V _F at I _F	0.90 V				
T _J max.	175 °C				
Package	SMA (DO-214AC)				
Circuit configurations	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 loss
- 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 <u>www.vishay.com/doc?99912</u>

TYPICAL APPLICATIONS

For use in secondary rectification and freewheeling for ultrafast switching speeds AC/AC and DC/DC converters in high temperature conditions for both consumer and automotive applications.

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

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	ESH1B	ESH1C	ESH1D	UNIT	
Device marking code		EHB	EHC	EHD		
Maximum repetitive peak reverse voltage	V_{RRM}	100	150	200	V	
Maximum RMS voltage	V _{RMS}	70	105	140	V	
Maximum DC blocking voltage	V_{DC}	100	150	200	V	
Maximum average forward rectified current at T _L = 150 °C	I _{F(AV)}	1.0			Α	
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load (JEDEC® method)	I _{FSM}	50			А	
Operating junction and storage temperature range	T_J, T_{STG}	-55 to +175			°C	

ESH1B, ESH1C, ESH1D

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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 = 0.7 A		V _F ⁽¹⁾	0.87	V	
Maximum instantaneous forward voltage	I _F = 1 A		V_{F}	0.90		
Maximum DC reverse current at rated DC		T _A = 25 °C	I_	1.0	μΑ	
blocking voltage		T _A = 125 °C	I _R	25		
Maximum reverse current	V _R = 20 V, T _J = 150 °C		I _R	50	μΑ	
Maximum reverse recovery time	I _F = 0.5 A, I _R = 1 A, I _{rr} = 0.25 A		t _{rr}	25	ns	
Typical valvages vacalyan, time	I _F = 0.6 A, V _B = 30 V,	T _J = 25 °C	- t _{rr}	25	ns	
Typical reverse recovery time	$dI/dt = 50 \text{ A/}\mu\text{s}, I_{rr} = 10 \% I_{RM}$	T _J = 100 °C		35		
Typical stored charge	$I_F = 0.6 \text{ A}, V_B = 30 \text{ V},$	T _J = 25 °C	Q _{rr}	10	nC	
	$dI/dt = 50 A/\mu s, I_{rr} = 10 \% I_{RM}$	T _J = 100 °C		15		
Typical junction capacitance	4.0 V, 1 MHz		CJ	25	pF	

Note

 $^{^{(1)}\,}$ Pulse test: 300 μs pulse width, 1 % duty cycle

THERMAL CHARACTERISTICS (T _A = 25 °C unless otherwise noted)					
PARAMETER	SYMBOL	ESH1B	ESH1C	ESH1D	UNIT
Typical thermal resistance	R _{0JA} (1)	85			°C/W
	R _{0JL} (1)	30			

Note

⁽¹⁾ Units mounted on PCB with 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	
ESH1D-E3/61T	0.064	61T	1800	7" diameter plastic tape and reel	
ESH1D-E3/5AT	0.064	5AT	7500	13" diameter plastic tape and reel	
ESH1DHE3_A/H (1)	0.064	Н	1800	7" diameter plastic tape and reel	
ESH1DHE3_A/I (1)	0.064	I	7500	13" diameter plastic tape and reel	
ESH1D-M3/61T	0.064	61T	1800	7" diameter plastic tape and reel	
ESH1D-M3/5AT	0.064	5AT	7500	13" diameter plastic tape and reel	
ESH1DHM3_A/H (1)	0.064	Н	1800	7" diameter plastic tape and reel	
ESH1DHM3_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)

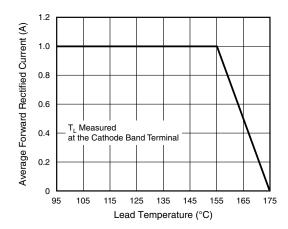
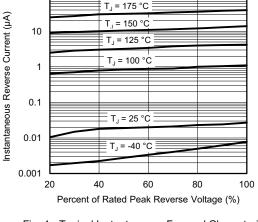


Fig. 1 - Maximum Forward Current Derating Curve



100

Fig. 4 - Typical Instantaneous Forward Characteristics

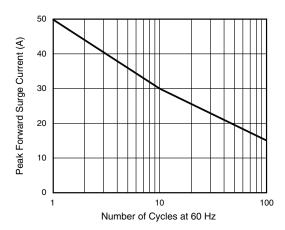


Fig. 2 - Maximum Non-Repetitive Peak Forward Surge Current

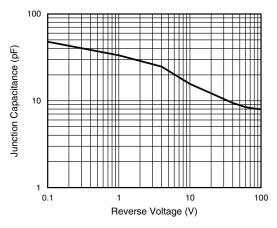


Fig. 5 - Typical Junction Capacitance

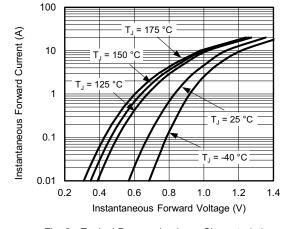


Fig. 3 - Typical Reverse Leakage Characteristics

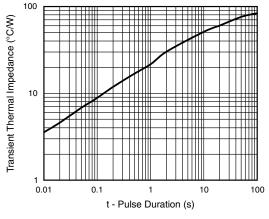


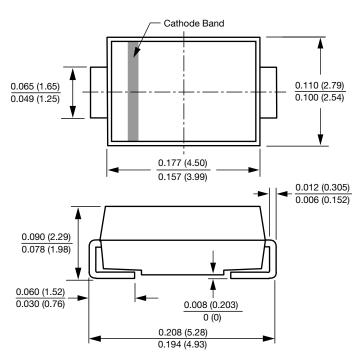
Fig. 6 - Typical Transient Thermal Impedance

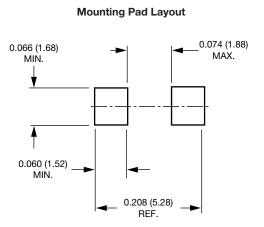


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PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

SMA (DO-214AC)







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