

Vishay General Semiconductor

RoHS COMPLIANT

HALOGEN

FREE

Surface Mount Ultrafast Plastic Rectifier



SMC (DO-214AB)

PRIMARY CHARACTERISTICS					
I _{F(AV)}	3.0 A				
V_{RRM}	50 V, 100 V, 150 V, 200 V				
I _{FSM}	100 A				
t _{rr}	20 ns				
V _F	0.90 V				
T _J max. 150 °C					
Package SMC (DO-214AB)					
Diode variations	Single				

FEATURES

- Glass passivated pellet chip junction
- · Ideal for automated placement
- 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: base P/NHE3 or P/NHM3
- · Material categorization: for definitions of compliance please see www.vishav.com/doc?99912

TYPICAL APPLICATIONS

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

MECHANICAL DATA

Case: SMC (DO-214AB)

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 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	ES3A	ES3B	ES3C	ES3D	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 at $T_L = 100 ^{\circ}\text{C}$	I _{F(AV)}	3.0				
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load	I _{FSM}	100				А
Operating junction and storage temperature range	T _J , T _{STG}	-55 to +150				

ES3A, ES3B, ES3C, ES3D

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ELECTRICAL CHARACTERISTICS (T _A = 25 °C unless otherwise noted)								
PARAMETER	TEST CONDITIONS		SYMBOL	ES3A	ES3B	ES3C	ES3D	UNIT
Maximum instantaneous forward voltage	3.0 A	V _F ⁽¹⁾	0.90				V	
Maximum DC reverse current at rated DC blocking voltage		$T_A = 25 \degree C$ $T_A = 100 \degree C$ I_R		10 500				μΑ
Maximum reverse recovery time	I _F = 0.5 A, I _R = 1.0 A, I _{rr} = 0.25 A		t _{rr}	20				ns
Maximum reverse recovery time	$I_F = 3.0 \text{ A}, V_R = 30 \text{ V},$	T _J = 25 °C 30				ns		
Maximum reverse recovery time	$dI/dt = 50 A/\mu s$, $I_{rr} = 10 \% I_{RM}$	T _J = 100 °C	t _{rr} 50				115	
Maximum stored charge	$I_F = 3.0 \text{ A}, V_R = 30 \text{ V},$	T _J = 25 °C	Q _{rr}		15			nC
Maximum stored charge	$dI/dt = 50 \text{ A/}\mu\text{s}, I_{rr} = 10 \% I_{RM}$	T _J = 100 °C	Vrr	35			110	
Typical junction capacitance	4.0 V, 1 MHz		CJ	45			рF	

Note

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

THERMAL CHARACTERISTICS (T _A = 25 °C unless otherwise noted)						
PARAMETER	SYMBOL	L ES3A ES3B ES3C ES3D				UNIT
Typical thermal resistance	R _{0JA} (1)	47				
Typical trieffilal resistance	R ₀ JL (1)	12				°C/W

Note

 $^{^{(1)}}$ Units mounted on PCB with 0.31" x 0.31" (8.0 mm x 8.0 mm) copper pad areas

ORDERING INFORMATION (Example)							
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE			
ES3D-E3/57T	0.211	57T	850	7" diameter plastic tape and reel			
ES3D-E3/9AT	0.211	9AT	3500	13" diameter plastic tape and reel			
ES3DHE3_A/H (1)	0.211	Н	850	7" diameter plastic tape and reel			
ES3DHE3_A/I (1)	0.211	I	3500	13" diameter plastic tape and reel			
ES3D-M3/57T	0.211	57T	850	7" diameter plastic tape and reel			
ES3D-M3/9AT	0.211	9AT	3500	13" diameter plastic tape and reel			
ES3DHM3_A/H (1)	0.211	Н	850	7" diameter plastic tape and reel			
ES3DHM3_A/I (1)	0.211	I	3500	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)

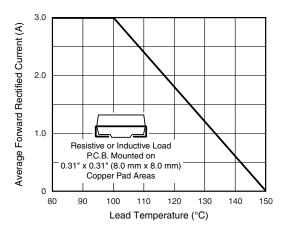
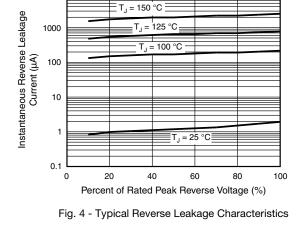


Fig. 1 - Maximum Forward Current Derating Curve



10 000

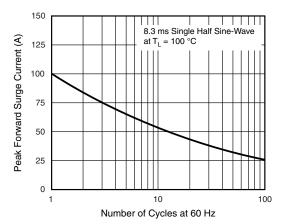


Fig. 2 - Maximum Non-Repetitive Peak Forward Surge Current

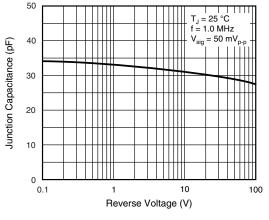


Fig. 5 - Typical Junction Capacitance

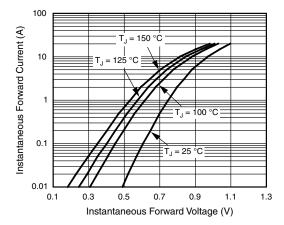


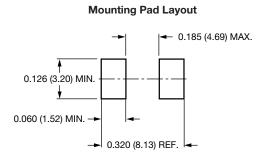
Fig. 3 - Typical Instantaneous Forward Characteristics



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PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

0.126 (3.20) 0.114 (2.90) 0.280 (7.11) 0.260 (6.60) 0.012 (0.305) 0.006 (0.152) 0.006 (1.52) 0.008 (0.2) 0.008 (0.2) 0.008 (0.2) 0.008 (0.152)





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