

Surface-Mount Ultrafast Plastic Rectifier


SMA (DO-214AC)

Cathode  Anode

LINKS TO ADDITIONAL RESOURCES


RoHS
COMPLIANT
HALOGEN
FREE
Available

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 www.vishay.com/doc?99912

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

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

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

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		A
Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load (JEDEC® method)	I_{FSM}		50		A
Operating junction and storage temperature range	T_J, T_{STG}		-55 to +175		°C

ELECTRICAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise noted)

PARAMETER	TEST CONDITIONS	SYMBOL	VALUE	UNIT
Maximum instantaneous forward voltage	$I_F = 0.7 \text{ A}$	V_F ⁽¹⁾	0.87	V
	$I_F = 1 \text{ A}$	V_F	0.90	
Maximum DC reverse current at rated DC blocking voltage		I_R	1.0	μA
			25	
Maximum reverse current	$V_R = 20 \text{ V}$, $T_J = 150^\circ\text{C}$	I_R	50	μA
Maximum reverse recovery time	$I_F = 0.5 \text{ A}$, $I_R = 1 \text{ A}$, $I_{rr} = 0.25 \text{ A}$	t_{rr}	25	ns
Typical reverse recovery time	$I_F = 0.6 \text{ A}$, $V_R = 30 \text{ V}$, $dI/dt = 50 \text{ A}/\mu\text{s}$, $I_{rr} = 10\% I_{RM}$	t_{rr}	25	ns
			35	
Typical stored charge	$I_F = 0.6 \text{ A}$, $V_R = 30 \text{ V}$, $dI/dt = 50 \text{ A}/\mu\text{s}$, $I_{rr} = 10\% I_{RM}$	Q_{rr}	10	nC
			15	
Typical junction capacitance	4.0 V, 1 MHz	C_J	25	pF

Note

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

THERMAL CHARACTERISTICS ($T_A = 25^\circ\text{C}$ unless otherwise noted)

PARAMETER	SYMBOL	ESH1B	ESH1C	ESH1D	UNIT
Typical thermal resistance	$R_{\theta JA}$ ⁽¹⁾		85		$^\circ\text{C}/\text{W}$
	$R_{\theta JL}$ ⁽¹⁾		30		

Note

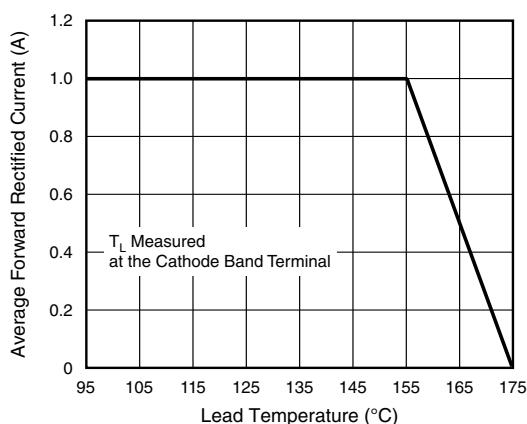
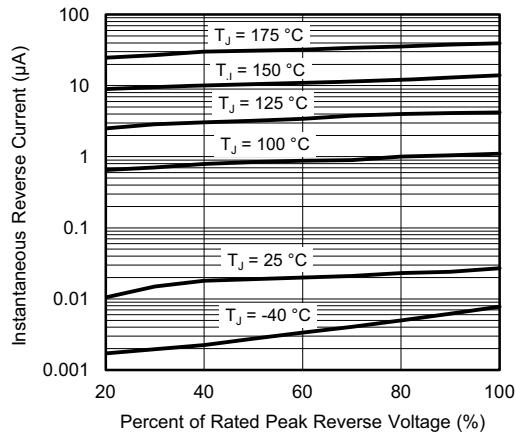
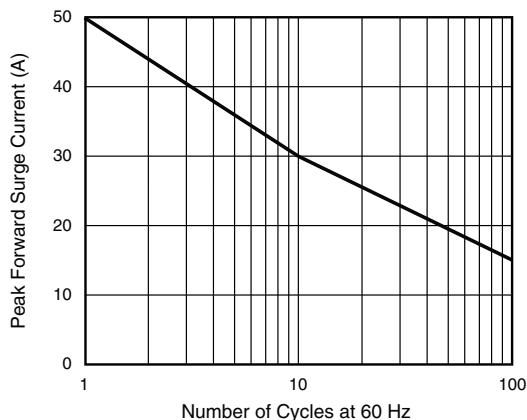
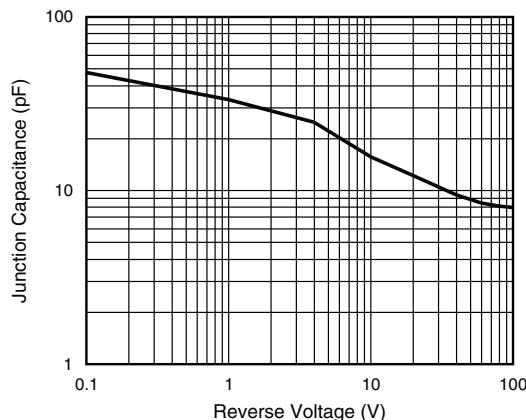
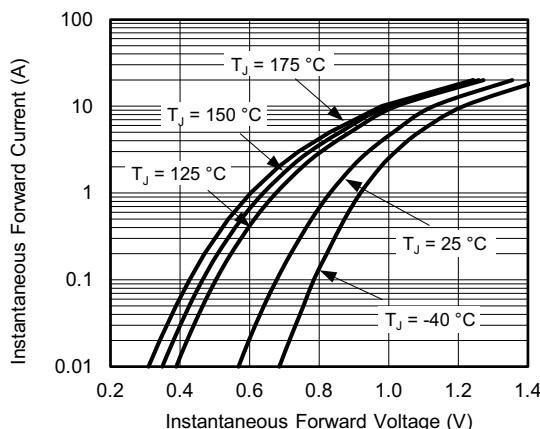
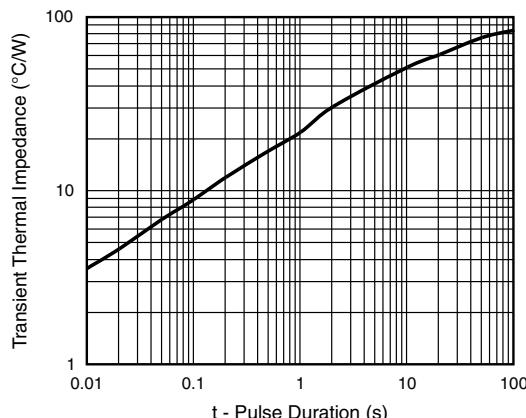
(1) Units mounted on PCB with 5.0 mm x 5.0 mm (0.013 mm thick) land areas

ORDERING INFORMATION (Example)

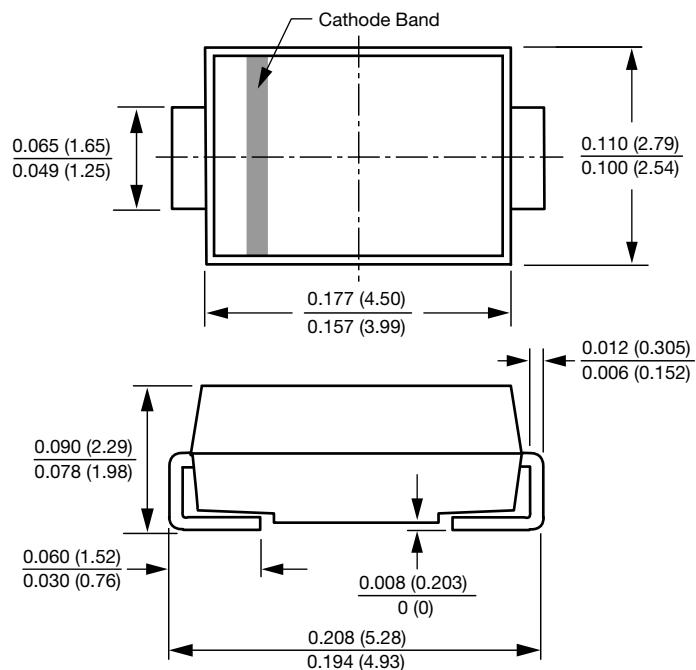
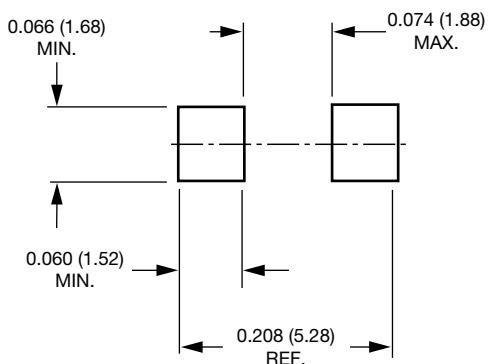
PREFERRED P/N	UNIT WEIGHT (g)	PREFERRED PACKAGE CODE	BASE QUANTITY	DELIVERY MODE
ESH1D-E3/61T	0.064	61T	1800	7" diameter plastic tape and reel
ESH1D-E3/5AT	0.064	5AT	7500	13" diameter plastic tape and reel
ESH1DHE3_A/H ⁽¹⁾	0.064	H	1800	7" diameter plastic tape and reel
ESH1DHE3_A/I ⁽¹⁾	0.064	I	7500	13" 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	H	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

RATINGS AND CHARACTERISTICS CURVES ($T_A = 25^\circ\text{C}$ unless otherwise noted)

Fig. 1 - Maximum Forward Current Derating Curve

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

PACKAGE OUTLINE DIMENSIONS in inches (millimeters)

SMA (DO-214AC)

Mounting Pad Layout


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