

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)

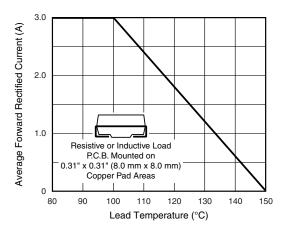
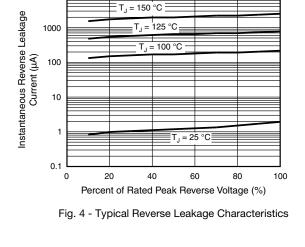


Fig. 1 - Maximum Forward Current Derating Curve



10 000

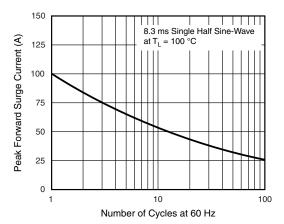


Fig. 2 - Maximum Non-Repetitive Peak Forward Surge Current

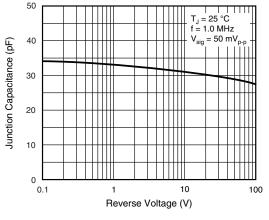


Fig. 5 - Typical Junction Capacitance

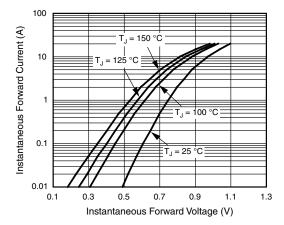


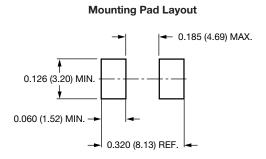
Fig. 3 - Typical Instantaneous Forward Characteristics



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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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