

## 3A, 200V Ultra Fast Surface Mount Rectifier

### FEATURES

- AEC-Q101 qualified
- Glass passivated chip junction
- Ideal for automated placement
- Low profile package
- Ultra Fast recovery time for high efficiency
- Moisture sensitivity level: level 1, per J-STD-020
- RoHS Compliant
- Halogen-free according to IEC 61249-2-21

### APPLICATIONS

- High frequency rectification
- Freewheeling application
- Switching mode converters and inverters in automotive

### MECHANICAL DATA

- Case: SOD-128
- Molding compound meets UL 94V-0 flammability rating
- Terminal: Mattle tin plated leads, solderable per J-STD-002
- Meet JESD 201 class 2 whisker test
- Polarity: Indicated by cathode band
- Weight: 0.027g (approximately)

| KEY PARAMETERS |            |      |
|----------------|------------|------|
| PARAMETER      | VALUE      | UNIT |
| $I_F$          | 3          | A    |
| $V_{RRM}$      | 200        | V    |
| $I_{FSM}$      | 132        | A    |
| $T_{J\ MAX}$   | 175        | °C   |
| Package        | SOD-128    |      |
| Configuration  | Single die |      |



**SOD-128**



| ABSOLUTE MAXIMUM RATINGS ( $T_A = 25^\circ\text{C}$ unless otherwise noted) |                    |              |      |
|-----------------------------------------------------------------------------|--------------------|--------------|------|
| PARAMETER                                                                   | SYMBOL             | ESH3DFSH     | UNIT |
| Marking code on the device                                                  |                    | H3DFSH       |      |
| Repetitive peak reverse voltage                                             | $V_{RRM}$          | 200          | V    |
| Reverse voltage, total rms value                                            | $V_{R(RMS)}$       | 140          | V    |
| Forward current                                                             | $I_F$              | 3            | A    |
| Surge peak forward current single half sine-wave superimposed on rated load | $t = 8.3\text{ms}$ | 132          | A    |
|                                                                             | $t = 1.0\text{ms}$ | 224          | A    |
| Junction temperature                                                        | $T_J$              | - 55 to +175 | °C   |
| Storage temperature                                                         | $T_{STG}$          | - 55 to +175 | °C   |

**THERMAL PERFORMANCE**

| PARAMETER                              | SYMBOL          | TYP | UNIT |
|----------------------------------------|-----------------|-----|------|
| Junction-to-lead thermal resistance    | $R_{\theta JL}$ | 12  | °C/W |
| Junction-to-ambient thermal resistance | $R_{\theta JA}$ | 65  | °C/W |
| Junction-to-case thermal resistance    | $R_{\theta JC}$ | 11  | °C/W |

**Thermal Performance Note:** Units mounted on PCB (5mm x 5mm Cu pad test board)

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

| PARAMETER                                    | CONDITIONS                                                        | SYMBOL   | TYP  | MAX  | UNIT          |
|----------------------------------------------|-------------------------------------------------------------------|----------|------|------|---------------|
| Forward voltage <sup>(1)</sup>               | $I_F = 1.5\text{A}, T_J = 25^\circ\text{C}$                       | $V_F$    | 0.83 | -    | V             |
|                                              | $I_F = 3.0\text{A}, T_J = 25^\circ\text{C}$                       |          | 0.85 | 0.95 | V             |
|                                              | $I_F = 1.5\text{A}, T_J = 125^\circ\text{C}$                      |          | 0.66 | -    | V             |
|                                              | $I_F = 3.0\text{A}, T_J = 125^\circ\text{C}$                      |          | 0.74 | 0.85 | V             |
| Reverse current @ rated $V_R$ <sup>(2)</sup> | $T_J = 25^\circ\text{C}$                                          | $I_R$    | -    | 5    | $\mu\text{A}$ |
|                                              | $T_J = 125^\circ\text{C}$                                         |          | -    | 60   | $\mu\text{A}$ |
| Junction capacitance                         | 1MHz, $V_R = 4.0\text{V}$                                         | $C_J$    | 42   | -    | pF            |
| Reverse recovery time                        | $I_F = 0.5\text{A}, I_R = 1.0\text{A}$<br>$I_{rr} = 0.25\text{A}$ | $t_{rr}$ | -    | 25   | ns            |

**Notes:**

1. Pulse test with PW = 0.3ms
2. Pulse test with PW = 30ms

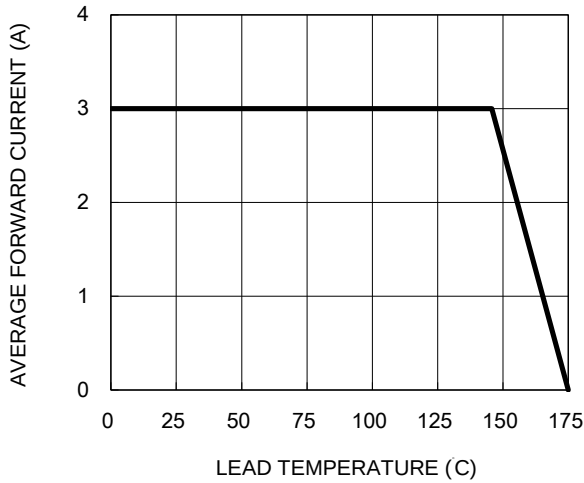
**ORDERING INFORMATION**

| ORDERING CODE | PACKAGE | PACKING              |
|---------------|---------|----------------------|
| ESH3DFSH      | SOD-128 | 14,000 / Tape & Reel |

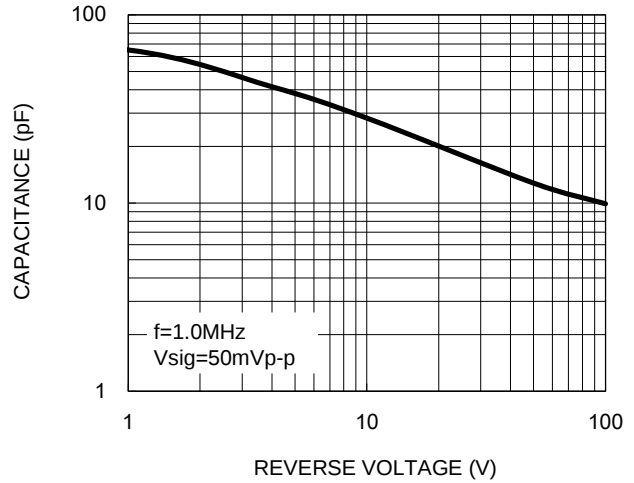
## CHARACTERISTICS CURVES

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

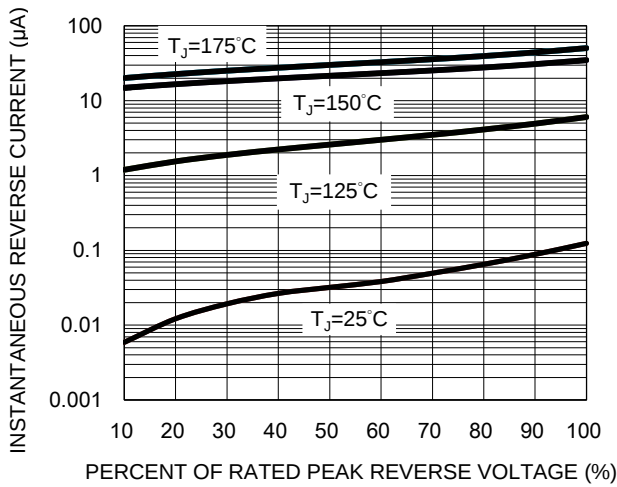
**Fig.1 Forward Current Derating Curve**



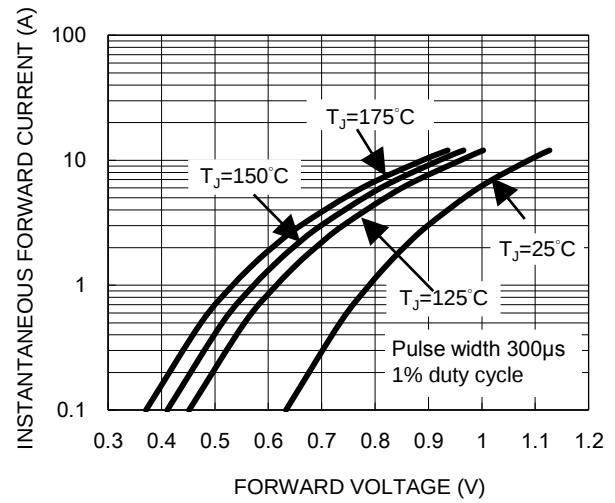
**Fig.2 Typical Junction Capacitance**



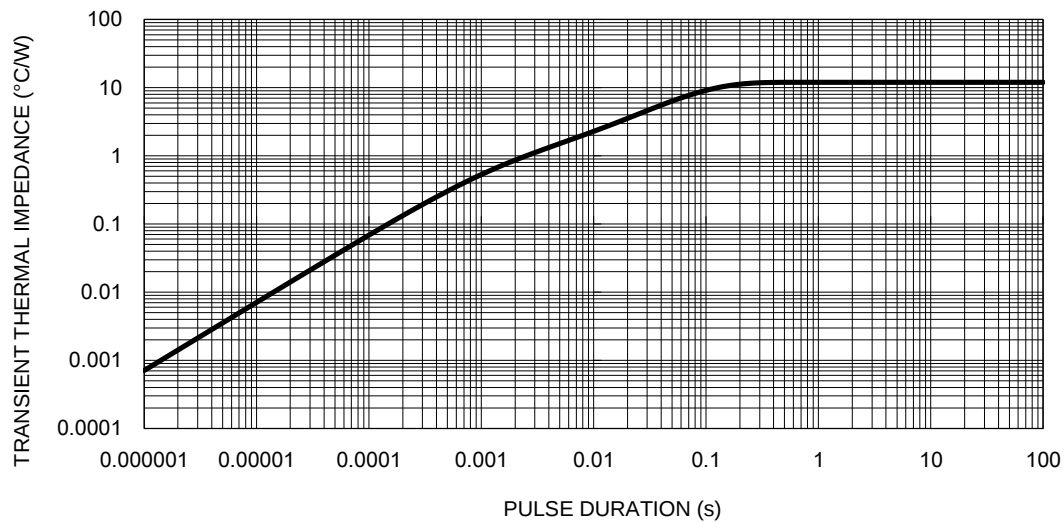
**Fig.3 Typical Reverse Characteristics**



**Fig.4 Typical Forward Characteristics**

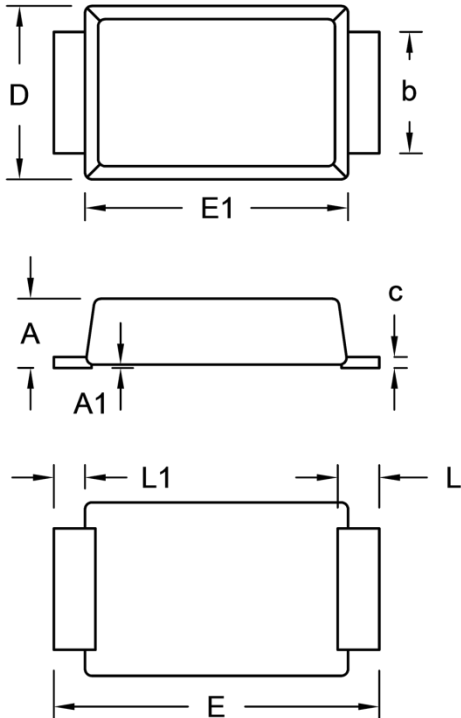


**Fig.5 Typical Transient Thermal Impedance**



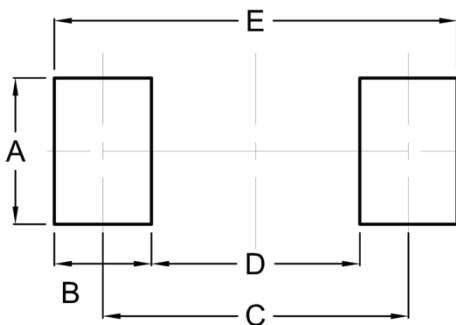
## PACKAGE OUTLINE DIMENSIONS

SOD-128



| DIM. | Unit (mm) |      | Unit (inch) |       |
|------|-----------|------|-------------|-------|
|      | Min.      | Max. | Min.        | Max.  |
| A    | 0.90      | 1.10 | 0.035       | 0.043 |
| A1   | 0.00      | 0.10 | 0.000       | 0.004 |
| b    | 1.60      | 1.90 | 0.063       | 0.075 |
| c    | 0.10      | 0.22 | 0.004       | 0.009 |
| D    | 2.30      | 2.70 | 0.091       | 0.106 |
| E    | 4.40      | 5.00 | 0.173       | 0.197 |
| E1   | 3.60      | 4.00 | 0.142       | 0.157 |
| L    | 0.40      | 0.80 | 0.016       | 0.031 |
| L1   | 0.30      | 0.60 | 0.012       | 0.024 |

## SUGGESTED PAD LAYOUT



| Symbol | Unit (mm) | Unit (inch) |
|--------|-----------|-------------|
| A      | 2.10      | 0.083       |
| B      | 1.40      | 0.055       |
| C      | 4.40      | 0.173       |
| D      | 3.00      | 0.118       |
| E      | 5.80      | 0.228       |

## MARKING DIAGRAM



P/N = Marking Code  
 YW = Date Code  
 F = Factory Code

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