

3A, 50V - 600V Surface Mount Super Fast Rectifier

FEATURES

- Glass passivated chip junction
- Ideal for automated placement
- Super fast recovery time for high efficiency
- Compliant to RoHS Directive 2011/65/EU and in accordance to WEEE 2002/96/EC
- Halogen-free according to IEC 61249-2-21

APPLICATIONS

- High frequency rectification
- Freewheeling application
- Switching mode converters and inverters in computer, automotive and telecommunication.

MECHANICAL DATA

- Case: DO-214AB (SMC)
- Molding compound meets UL 94V-0 flammability rating
- Part no. with suffix "H" means AEC-Q101 qualified
- Packing code with suffix "G" means green compound (halogen-free)
- Moisture sensitivity level: level 1, per J-STD-020
- Terminal: Matte tin plated leads, solderable per J-STD-002
- Meet JESD 201 class 2 whisker test
- Polarity: As marked
- Weight: 0.21 g (approximately)

| KEY PARAMETERS | | |
|----------------|----------------|------|
| PARAMETER | VALUE | UNIT |
| $I_{F(AV)}$ | 3 | A |
| V_{RRM} | 50 - 600 | V |
| I_{FSM} | 100 | A |
| T_{JMAX} | 150 | °C |
| Package | DO-214AB (SMC) | |
| Configuration | Single die | |



DO-214AB (SMC)

| ABSOLUTE MAXIMUM RATINGS ($T_A = 25^\circ\text{C}$ unless otherwise noted) | | | | | | | | | | |
|---|--------------|--------------|------|------|------|------|------|------|------|------|
| PARAMETER | SYMBOL | ES3A | ES3B | ES3C | ES3D | ES3F | ES3G | ES3H | ES3J | UNIT |
| Marking code on the device | | ES3A | ES3B | ES3C | ES3D | ES3F | ES3G | ES3H | ES3J | |
| Repetitive peak reverse voltage | V_{RRM} | 50 | 100 | 150 | 200 | 300 | 400 | 500 | 600 | V |
| Reverse voltage, total rms value | $V_{R(RMS)}$ | 35 | 70 | 105 | 140 | 210 | 280 | 350 | 420 | V |
| Maximum DC blocking voltage | V_{DC} | 50 | 100 | 150 | 200 | 300 | 400 | 500 | 600 | V |
| Forward current | $I_{F(AV)}$ | 3 | | | | | | | | A |
| Surge peak forward current, 8.3 ms single half sine-wave superimposed on rated load per diode | I_{FSM} | 100 | | | | | | | | A |
| Junction temperature | T_J | - 55 to +150 | | | | | | | | °C |
| Storage temperature | T_{STG} | - 55 to +150 | | | | | | | | °C |

THERMAL PERFORMANCE

| PARAMETER | SYMBOL | TYP | UNIT |
|--|-----------------|-----|---------------|
| Junction-to-lead thermal resistance per diode | $R_{\theta JL}$ | 12 | $^{\circ}C/W$ |
| Junction-to-ambient thermal resistance per diode | $R_{\theta JA}$ | 47 | $^{\circ}C/W$ |

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

| PARAMETER | CONDITIONS | SYMBOL | TYP. | MAX. | UNIT |
|--|--|----------|------|------|---------|
| Forward voltage per diode ⁽¹⁾ | $I_F = 3A, T_J = 25^{\circ}C$ | V_F | - | 0.95 | V |
| | | | - | 1.30 | V |
| | | | - | 1.70 | V |
| Reverse current @ rated V_R per diode ⁽²⁾ | $T_J = 25^{\circ}C$ | I_R | - | 10 | μA |
| | $T_J = 100^{\circ}C$ | | - | 500 | μA |
| Junction capacitance | 1 MHz, $V_R = 4.0V$ | C_J | 45 | - | pF |
| | | | 30 | - | pF |
| Reverse recovery time | $I_F = 0.5A, I_R = 1.0A$ $I_{RR} = 0.25A$ | t_{rr} | - | 35 | ns |

Notes:

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

ORDERING INFORMATION

| PART NO. | PART NO. SUFFIX | PACKING CODE | PACKING CODE SUFFIX | PACKAGE | PACKING |
|--------------------|------------------------|---------------------|----------------------------|----------------|--------------------------|
| ES3x (Note 1,2) | H | R7 | G | SMC | 850 / 7" Plastic reel |
| | | R6 | | SMC | 3,000 / 13" Paper reel |
| | | M6 | | SMC | 3,000 / 13" Plastic reel |
| | | V7 | | Matrix SMC | 850 / 7" Plastic reel |
| | | V6 | | Matrix SMC | 3,000 / 13" Plastic reel |

Note :

1. "x" defines voltage from 50V (ES3A) to 600V (ES3J)
2. Only V6 and V7 are all green compound (halogen free)

EXAMPLE

| EXAMPLE P/N | PART NO. | PART NO. SUFFIX | PACKING CODE | PACKING CODE SUFFIX | DESCRIPTION |
|--------------------|-----------------|------------------------|---------------------|----------------------------|--------------------------------------|
| ES3AHR7G | ES3A | H | R7 | G | AEC-Q101 qualified Green compound |

CHARACTERISTICS CURVES

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

Fig.1 Forward Current Derating Curve

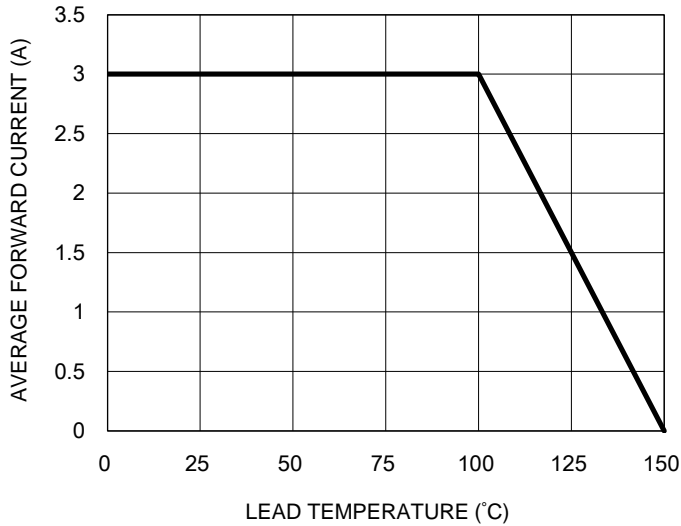


Fig.2 Typical Junction Capacitance

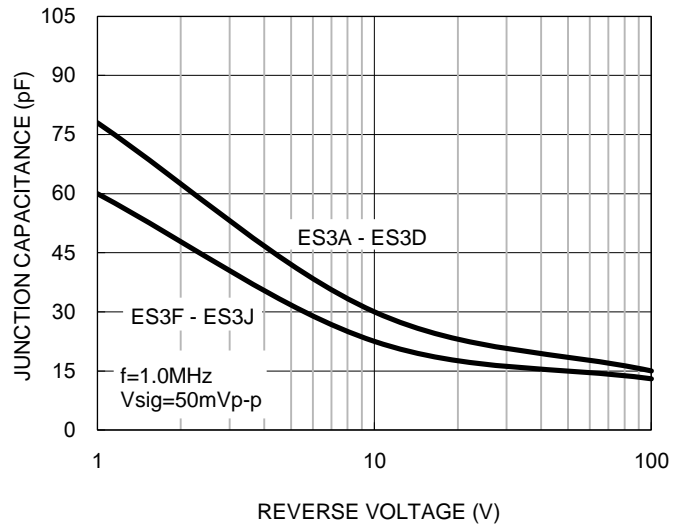


Fig.3 Typical Reverse Characteristics

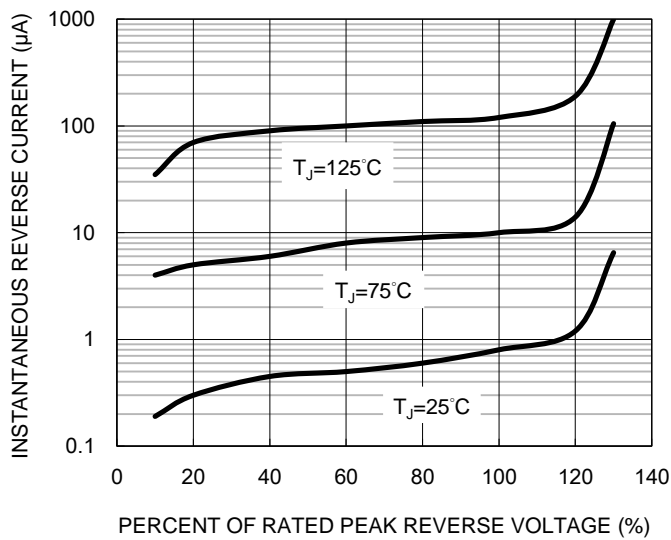
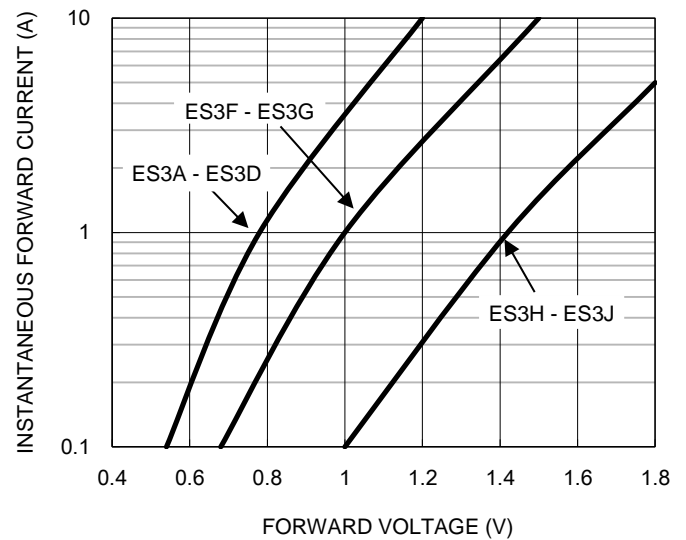


Fig.4 Typical Forward Characteristics



CHARACTERISTICS CURVES

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

Fig.5 Maximum Non-repetitive Forward Surge Current



Fig.6 Typical Transient Thermal Characteristics

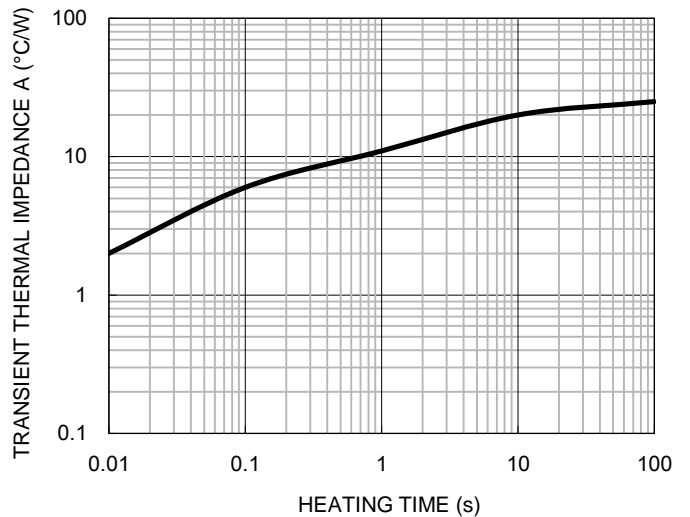


Fig.7 Reverse Recovery Time Characteristic And Test Circuit Diagram



PACKAGE OUTLINE DIMENSIONS

DO-214AB (SMC)



| DIM. | Unit (mm) | | Unit (inch) | |
|------|-----------|------|-------------|-------|
| | Min. | Max. | Min. | Max. |
| A | 2.90 | 3.20 | 0.114 | 0.126 |
| B | 6.60 | 7.11 | 0.260 | 0.280 |
| C | 5.59 | 6.22 | 0.220 | 0.245 |
| D | 2.00 | 2.62 | 0.079 | 0.103 |
| E | 1.00 | 1.60 | 0.039 | 0.063 |
| F | 7.75 | 8.13 | 0.305 | 0.320 |
| G | 0.10 | 0.20 | 0.004 | 0.008 |
| H | 0.15 | 0.31 | 0.006 | 0.012 |

SUGGESTED PAD LAYOUT



| Symbol | Unit (mm) | Unit (inch) |
|--------|-----------|-------------|
| A | 3.30 | 0.130 |
| B | 2.50 | 0.098 |
| C | 6.80 | 0.268 |
| D | 4.40 | 0.173 |
| E | 9.40 | 0.370 |

MARKING DIAGRAM

Matrix SMC

SMC



- P/N =Marking Code
- G =Green Compound
- YW =Date Code
- F =Factory Code

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