

## 5A, 200V - 1000V Fast Recovery Surface Mount Rectifier

### FEATURES

- Glass passivated chip junction
- Ideal for automated placement
- Low reverse leakage
- Moisture sensitivity level: level 1, per J-STD-020
- RoHS Compliant
- Halogen-free according to IEC 61249-2-21

### APPLICATIONS

- DC to DC converter
- Switching mode converters and inverters
- General purpose

### MECHANICAL DATA

- Case: DO-214AB (SMC)
- Molding compound meets UL 94V-0 flammability rating
- Terminal: Matte tin plated leads, solderable per J-STD-002
- Meet JESD 201 class 1 whisker test
- Polarity: Indicated by cathode band
- Weight: 0.250g (approximately)

| KEY PARAMETERS |                |      |
|----------------|----------------|------|
| PARAMETER      | VALUE          | UNIT |
| $I_F$          | 5              | A    |
| $V_{RRM}$      | 200 - 1000     | V    |
| $I_{FSM}$      | 164            | A    |
| $T_{J\ MAX}$   | 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             | RS5D-T        | RS5G-T | RS5J-T | RS5K-T | RS5M-T | UNIT |
| Marking code on the device                                                  |                    | RS5D          | RS5G   | RS5J   | RS5K   | RS5M   |      |
| Repetitive peak reverse voltage                                             | $V_{RRM}$          | 200           | 400    | 600    | 800    | 1000   | V    |
| Reverse voltage, total rms value                                            | $V_{R(RMS)}$       | 140           | 280    | 420    | 560    | 700    | V    |
| Forward current                                                             | $I_F$              | 5             |        |        |        |        | A    |
| Surge peak forward current single half sine-wave superimposed on rated load | $t = 8.3\text{ms}$ | $I_{FSM}$ 164 |        |        |        |        | A    |
|                                                                             | $t = 1.0\text{ms}$ | 364           |        |        |        |        | 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    | $R_{\theta JL}$ | 25  | °C/W |
| Junction-to-ambient thermal resistance | $R_{\theta JA}$ | 54  | °C/W |
| Junction-to-case thermal resistance    | $R_{\theta JC}$ | 18  | °C/W |

**Thermal Performance Note:** Units mounted on PCB (16mm x 16mm 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>                        | RS5D-T<br>RS5G-T | I <sub>F</sub> = 2.5A, T <sub>J</sub> = 25°C                             | V <sub>F</sub>  | 0.86 | -    | V    |
|                                                       |                  | I <sub>F</sub> = 5.0A, T <sub>J</sub> = 25°C                             |                 | 0.93 | 1.30 | V    |
|                                                       |                  | I <sub>F</sub> = 2.5A, T <sub>J</sub> = 125°C                            |                 | 0.72 | -    | V    |
|                                                       |                  | I <sub>F</sub> = 5.0A, T <sub>J</sub> = 125°C                            |                 | 0.79 | 0.91 | V    |
|                                                       | RS5J-T           | I <sub>F</sub> = 2.5A, T <sub>J</sub> = 25°C                             |                 | 0.91 | -    | V    |
|                                                       |                  | I <sub>F</sub> = 5.0A, T <sub>J</sub> = 25°C                             |                 | 0.98 | 1.30 | V    |
|                                                       |                  | I <sub>F</sub> = 2.5A, T <sub>J</sub> = 125°C                            |                 | 0.77 | -    | V    |
|                                                       |                  | I <sub>F</sub> = 5.0A, T <sub>J</sub> = 125°C                            |                 | 0.85 | 1.00 | V    |
|                                                       | RS5K-T<br>RS5M-T | I <sub>F</sub> = 2.5A, T <sub>J</sub> = 25°C                             |                 | 0.97 | -    | V    |
|                                                       |                  | I <sub>F</sub> = 5.0A, T <sub>J</sub> = 25°C                             |                 | 1.06 | 1.30 | V    |
|                                                       |                  | I <sub>F</sub> = 2.5A, T <sub>J</sub> = 125°C                            |                 | 0.82 | -    | V    |
|                                                       |                  | I <sub>F</sub> = 5.0A, T <sub>J</sub> = 125°C                            |                 | 0.91 | 1.04 | V    |
| Reverse current @ rated V <sub>R</sub> <sup>(2)</sup> |                  | T <sub>J</sub> = 25°C                                                    | I <sub>R</sub>  | -    | 10   | μA   |
|                                                       |                  | T <sub>J</sub> = 125°C                                                   |                 | -    | 200  | μA   |
| Reverse recovery time                                 | RS5D-T<br>RS5G-T | I <sub>F</sub> = 0.5A, I <sub>R</sub> = 1.0A,<br>I <sub>rr</sub> = 0.25A | t <sub>rr</sub> | -    | 150  | ns   |
|                                                       | RS5J-T           |                                                                          |                 | -    | 250  | ns   |
|                                                       | RS5K-T<br>RS5M-T |                                                                          |                 | -    | 500  | ns   |
| Junction capacitance                                  | RS5D-T<br>RS5G-T | 1MHz, V <sub>R</sub> = 4.0V                                              | C <sub>J</sub>  | 57   | -    | pF   |
|                                                       | RS5J-T           |                                                                          |                 | 46   | -    | pF   |
|                                                       | RS5K-T<br>RS5M-T |                                                                          |                 | 31   | -    | pF   |

**Notes:**

- Pulse test with  $PW = 0.3\text{ms}$
- Pulse test with  $PW = 30\text{ms}$

**ORDERING INFORMATION**

| ORDERING CODE <sup>(1)</sup> | PACKAGE        | PACKING             |
|------------------------------|----------------|---------------------|
| RS5x-T                       | DO-214AB (SMC) | 3,000 / Tape & Reel |

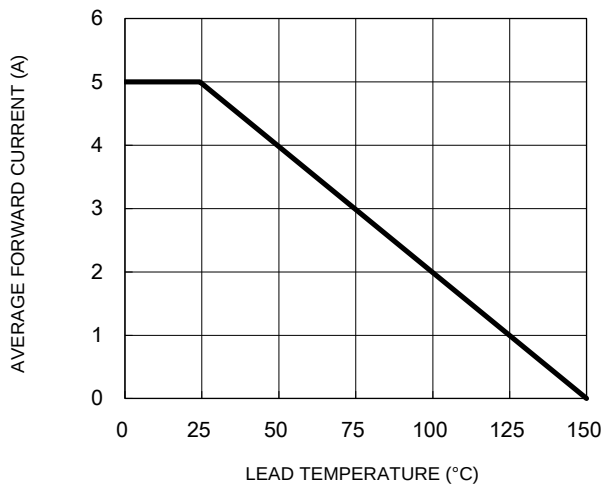
**Notes:**

- "x" defines voltage from 200V(RS5D-T) to 1000V(RS5M-T)

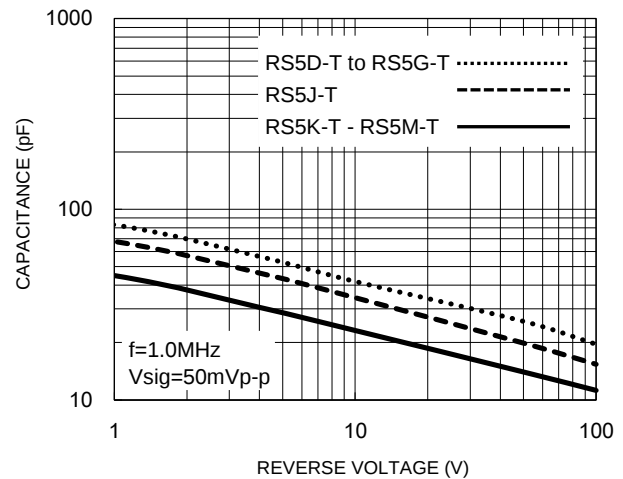
## CHARACTERISTICS CURVES

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

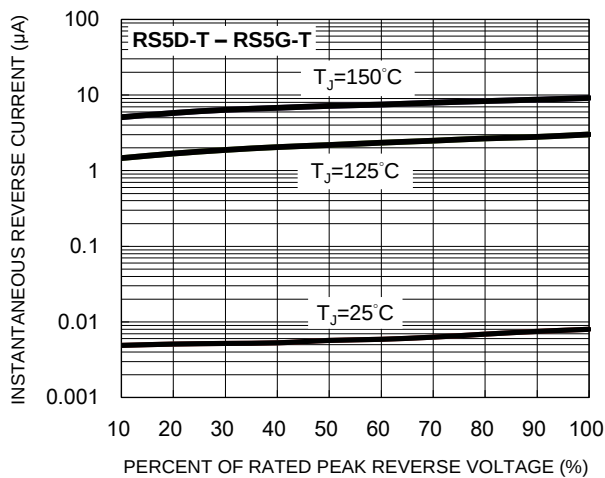
**Fig.1 Forward Current Derating Curve**



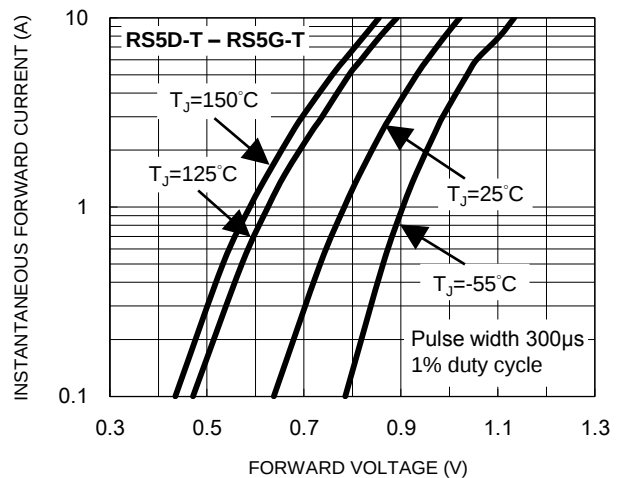
**Fig.2 Typical Junction Capacitance**



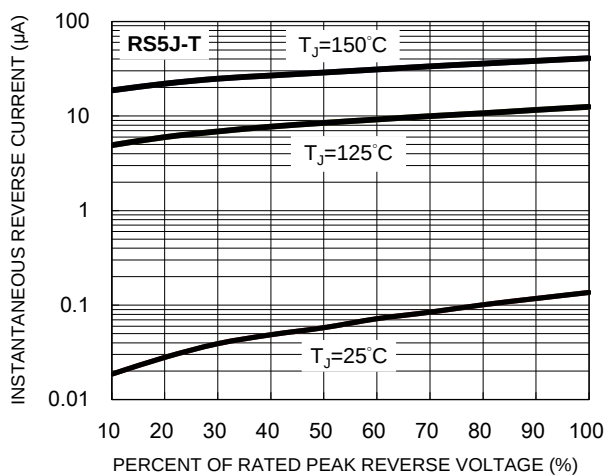
**Fig.3 Typical Reverse Characteristics**



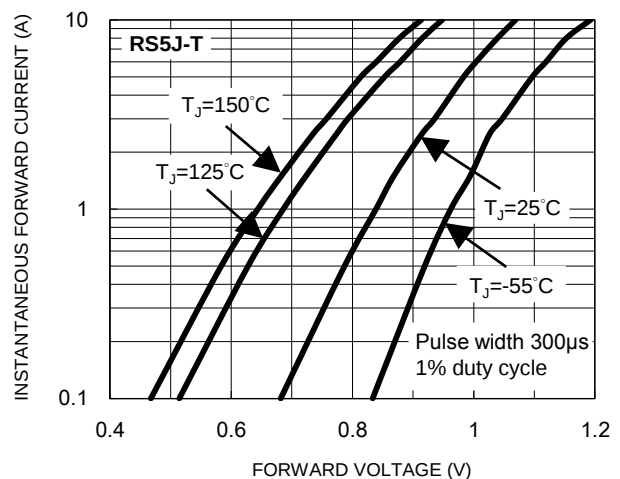
**Fig.4 Typical Forward Characteristics**



**Fig.5 Typical Reverse Characteristics**



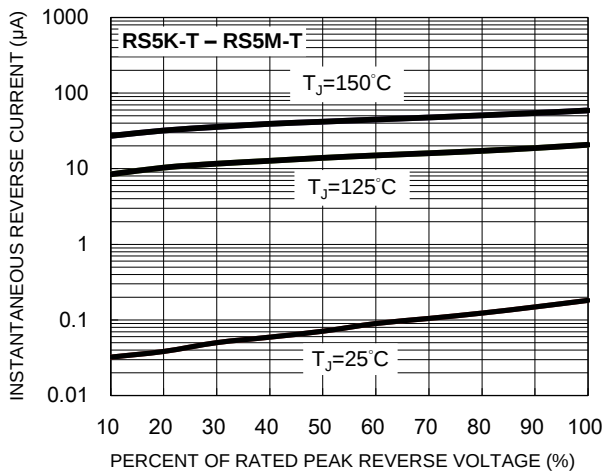
**Fig.6 Typical Forward Characteristics**



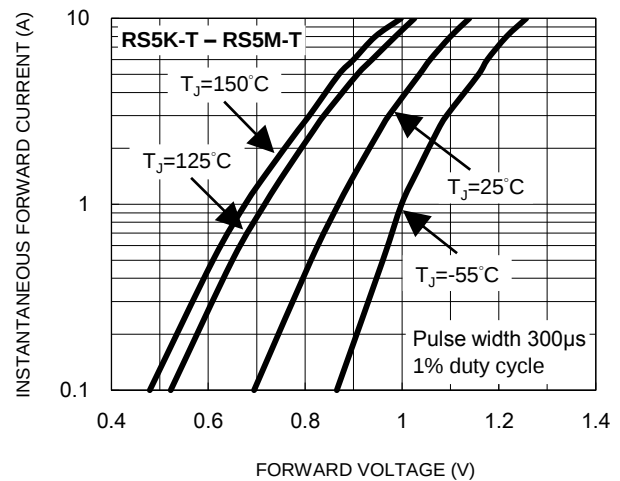
## CHARACTERISTICS CURVES

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

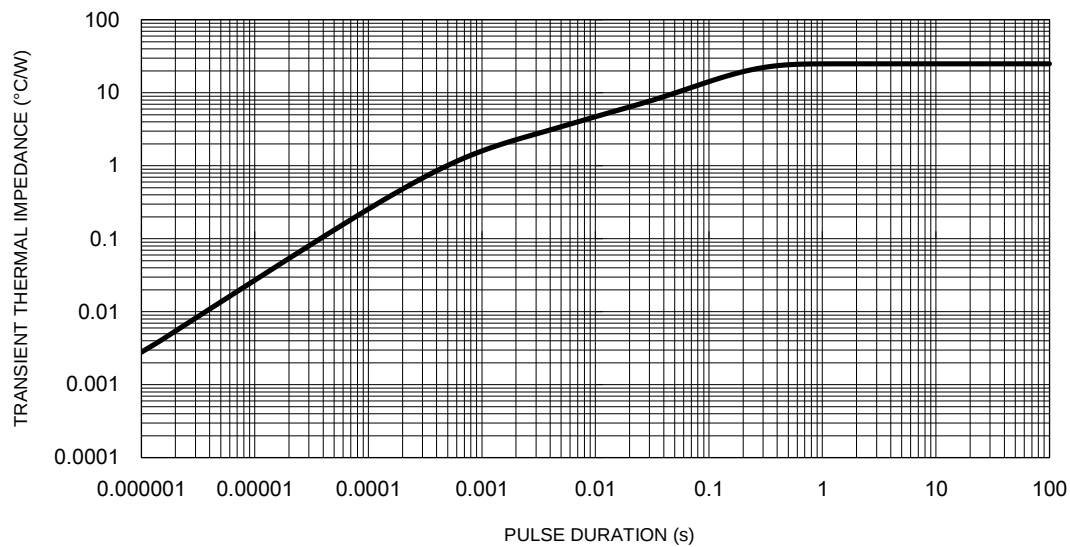
**Fig.7 Typical Reverse Characteristics**



**Fig.8 Typical Forward Characteristics**

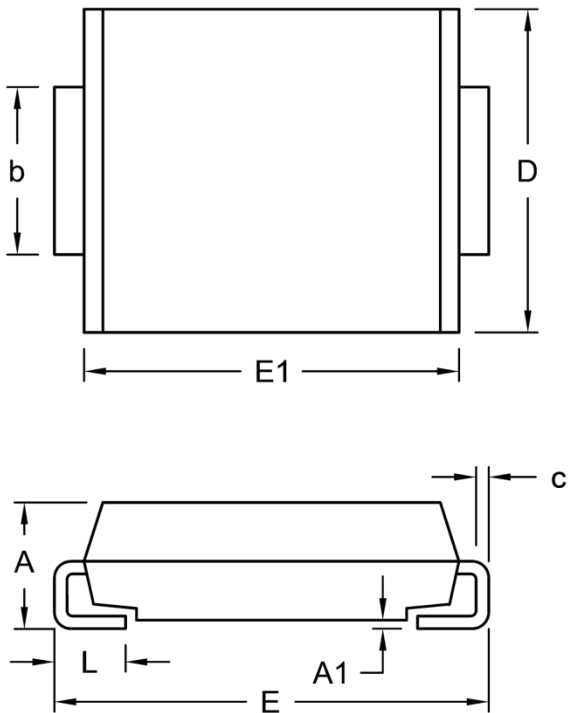


**Fig.9 Typical Transient Thermal Impedance**



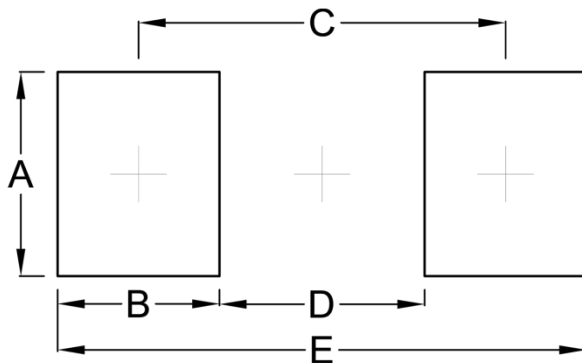
## PACKAGE OUTLINE DIMENSIONS

DO-214AB (SMC)



| DIM. | Unit (mm) |      | Unit (inch) |       |
|------|-----------|------|-------------|-------|
|      | Min.      | Max. | Min.        | Max.  |
| A    | 1.99      | 2.61 | 0.078       | 0.103 |
| A1   | 0.10      | 0.20 | 0.004       | 0.008 |
| b    | 2.85      | 3.27 | 0.112       | 0.129 |
| c    | 0.15      | 0.31 | 0.006       | 0.012 |
| D    | 5.59      | 6.22 | 0.220       | 0.245 |
| E    | 7.75      | 8.13 | 0.305       | 0.320 |
| E1   | 6.60      | 7.11 | 0.260       | 0.280 |
| L    | 0.76      | 1.52 | 0.030       | 0.060 |

## SUGGESTED PAD LAYOUT



| Symbol | Unit (mm) | Unit (inch) |
|--------|-----------|-------------|
| A      | 3.82      | 0.150       |
| B      | 3.03      | 0.119       |
| C      | 6.87      | 0.270       |
| D      | 3.84      | 0.151       |
| E      | 9.90      | 0.390       |

## MARKING DIAGRAM



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

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