# 4A, 200V - 600V Surface Mount Ultrafast Power Rectifier

## FEATURES

- Glass passivated junction
- Ideal for automated placement
- Built-in strain relief
- Ultrafast 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

| KEY PARAMETERS | | |
|---|---|---|
| **PARAMETER** | **VALUE** | **UNIT** |
| $I_{F(AV)}$ | 4 | A |
| $V_{RRM}$ | 200 - 600 | V |
| $I_{FSM}$ | 75 | A |
| $T_{J\ MAX}$ | 175 | °C |
| Package | DO-214AB (SMC) | |
| Configuration | Single die | |

## 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: 0.25 g (approximately)

**DO-214AB (SMC)**

## ABSOLUTE MAXIMUM RATINGS ($T_A$ = 25°C unless otherwise noted)

| PARAMETER | SYMBOL | MUR420S | MUR440S | MUR460S | UNIT |
|---|---|---|---|---|---|
| Marking code on the device | | MUR420S | MUR440S | MUR460S | |
| Repetitive peak reverse voltage | $V_{RRM}$ | 200 | 400 | 600 | V |
| Reverse voltage, total rms value | $V_{R(RMS)}$ | 140 | 280 | 420 | V |
| Maximum DC blocking voltage | $V_{DC}$ | 200 | 400 | 600 | V |
| Forward current | $I_{F(AV)}$ | 4 | | | A |
| Surge peak forward current, 8.3 ms single half sine-wave superimposed on rated load per diode | $I_{FSM}$ | 75 | | | A |
| Junction temperature | $T_J$ | - 55 to +175 | | | °C |
| Storage temperature | $T_{STG}$ | - 55 to +175 | | | °C |

## THERMAL PERFORMANCE

| PARAMETER | SYMBOL | LIMIT | UNIT |
|---|---|---|---|
| Junction-to-ambient thermal resistance per diode | $R_{\Theta JA}$ | 45 | °C/W |
| Junction-to-case thermal resistance per diode | $R_{\Theta JC}$ | 8.5 | °C/W |

## ELECTRICAL SPECIFICATIONS ($T_A$ = 25°C unless otherwise noted)

| PARAMETER | | CONDITIONS | SYMBOL | TYP. | MAX. | UNIT |
|---|---|---|---|---|---|---|
| Forward voltage per diode (1) | MUR420S | $I_F$ = 4A, $T_J$ = 25°C | $V_F$ | - | 0.875 | V |
| | MUR440S MUR460S | | | - | 1.250 | V |
| | MUR420S | $I_F$ = 4A, $T_J$ = 150°C | $V_F$ | - | 0.710 | V |
| | MUR440S MUR460S | | | - | 1.050 | V |
| Reverse current @ rated $V_R$ per diode (2) | MUR420S | $T_J$ = 25°C | $I_R$ | - | 5 | μA |
| | MUR440S MUR460S | | | - | 10 | μA |
| | MUR420S | $T_J$ = 150°C | $I_R$ | - | 150 | μA |
| | MUR440S MUR460S | | | - | 250 | μA |
| Junction capacitance | | 1 MHz, $V_R$=4.0V | $C_J$ | 65 | - | pF |
| Reverse recovery time | MUR420S | $I_F$=0.5A , $I_R$=1.0A $I_{RR}$=0.25A | $t_{rr}$ | - | 25 | ns |
| | MUR440S MUR460S | | | - | 50 | 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 |
|---|---|---|---|---|---|
| MUR4xxS (Note 1) | 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. "xx" defines voltage from 50V (MUR42S) to 600V (MUR460S)

## EXAMPLE

| EXAMPLE P/N | PART NO. | PART NO. SUFFIX | PACKING CODE | PACKING CODE SUFFIX | DESCRIPTION |
|---|---|---|---|---|---|
| MUR420SHR7G | MUR420S | H | R7 | G | AEC-Q101 qualified<br>Green compound |

## CHARACTERISTICS CURVES

($T_A$ = 25°C unless otherwise noted)

**Fig.1 Forward Current Derating Curve**

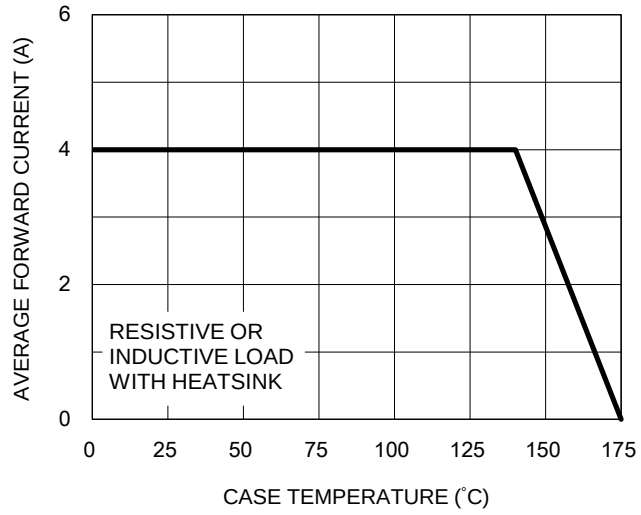



**Fig.2 Typical Junction Capacitance**

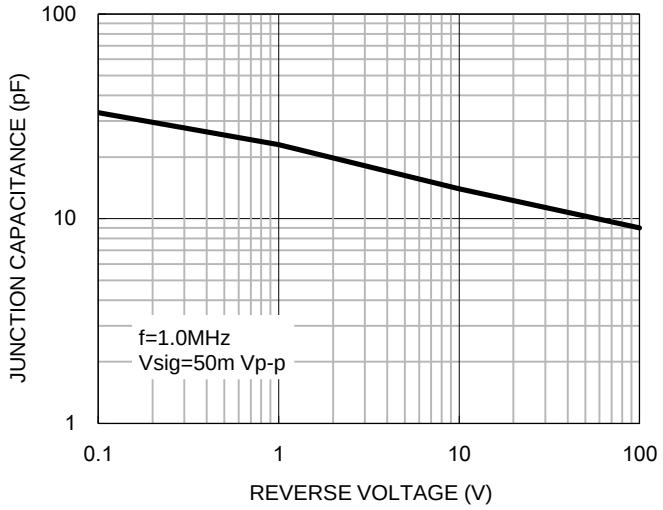



**Fig.3 Typical Reverse Characteristics**

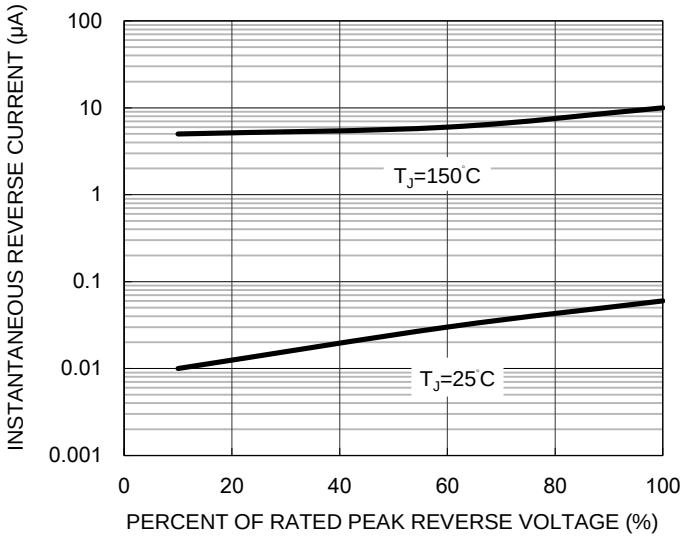
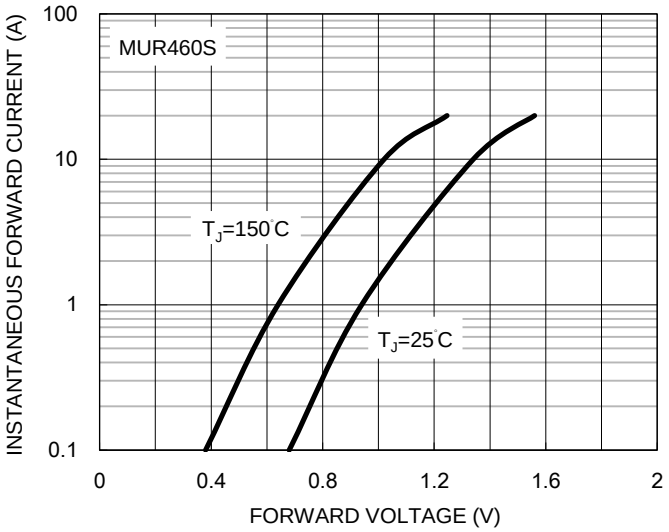



**Fig.4 Typical Forward Characteristics**



## CHARACTERISTICS CURVES

($T_A$ = 25°C unless otherwise noted)

**Fig.5 Maximum Non-repetitive Forward Surge Current**

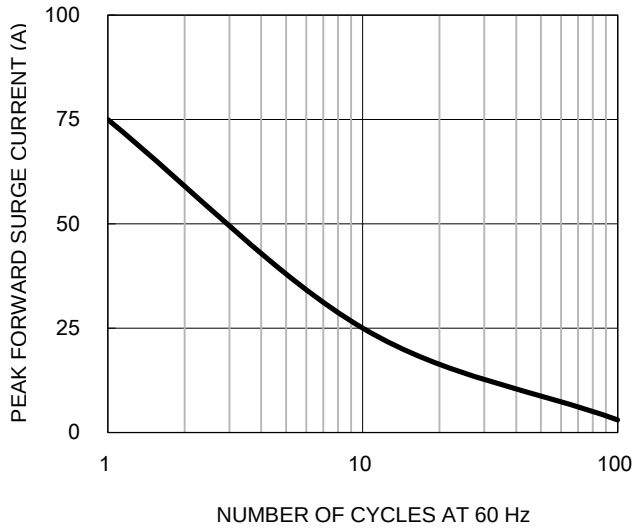
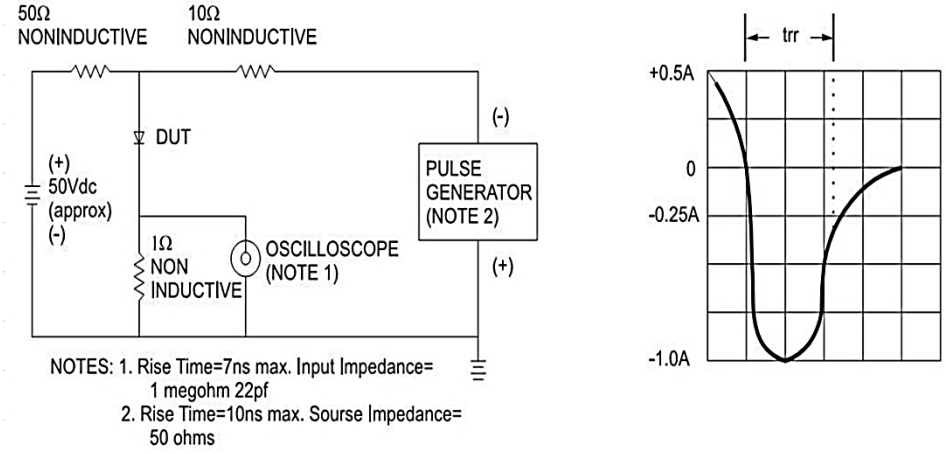
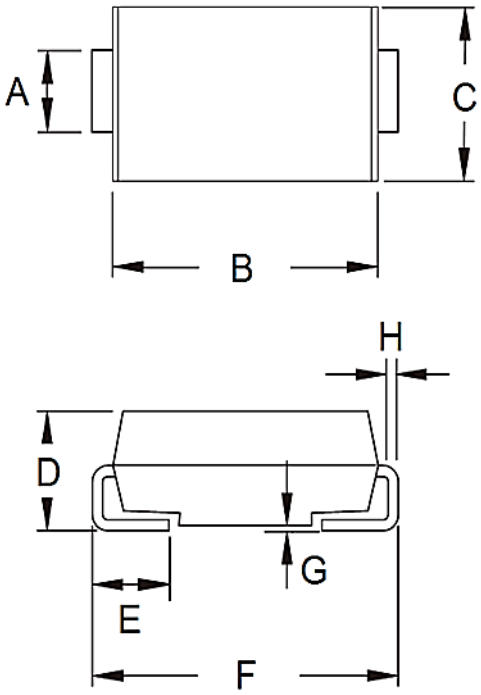



**Fig.6 Reverse Recovery Time Characteristic And Test Circuit Diagram**



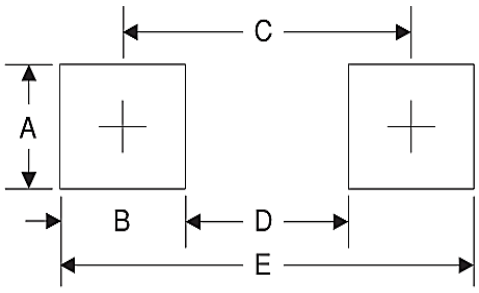
## PACKAGE OUTLINE DIMENSIONS

**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

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

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