# SURFACE MOUNT GLASS PASSIVATED SUPERFAST RECTIFIER

## Reverse Voltage 200 to 600V, Forward Current 1.0A

### DESCRIPTION:

The ALPMURS120B through ALPMURS160B is Surface Mount Glass Passivated Superfast Rectifier are Low profile package with Reverse Voltage 200 to 600V, Forward Current 1.0A. It is Ideal for very high frequency switching power supplies.

### FEATURES:

- Glass passivated chip junction
- Ultrafast recovery time for high efficiency
- For surface mounted application
- High Temp Soldering: 260℃ For 10seconds at Terminals
- Plastic package has Underwriters Laboratory Flammability Classification 94V-0
- RoHS Compliant
- REACH Compliant

### APPLICATIONS:

- Ideally suited for use in very high frequency switching power supplies, inverters and as a free-wheeling diode.

### MECHANICAL CHARACTERISTICS

- Terminals: Solder plated, solderable per MIL-STD-750, method 2026.
- Case: JEDEC DO-214AA (SMB) molded plastic body over glass passivated chip.
- Polarity: Indicated by cathode band.

## TYPICAL DEVICE CHARACTERISTICS

| MAXIMUM RATINGS ($T_A$ = 25 °C unless otherwise noted) | | | | | | |
|---|---|---|---|---|---|---|
| **PARAMETER** | | **SYMBOL** | **ALPMURS120B** | **ALPMURS140B** | **ALPMURS160B** | **UNIT** |
| Maximum repetitive peak reverse voltage | | $V_{RRM}$ | 200 | 400 | 600 | V |
| Working peak reverse voltage | | $V_{RWM}$ | 200 | 400 | 600 | V |
| Maximum DC blocking voltage | | $V_{DC}$ | 200 | 400 | 600 | V |
| Maximum average forward rectified current (See Fig.1) | @$T_L$=150°C | $I_{F(AV)}$ | 1.0 | | | A |
| | @$T_L$=125°C | | 2.0 | | | |
| Peak forward surge current 8.3 ms single half sine-wave superimposed on rated load | | $I_{FSM}$ | 40 | 35 | | A |
| Operating junction temperature range | | $T_J$ | -55 to +150 | | | °C |
| Storage temperature range | | $T_{STG}$ | -55 to +150 | | | °C |

| ELECTRICAL CHARACTERISTICS ($T_A$ = 25 °C unless otherwise noted) | | | | | | |
|---|---|---|---|---|---|---|
| **PARAMETER** | **TEST CONDITIONS** | **SYMBOL** | **ALPMURS120B** | **ALPMURS140B** | **ALPMURS160B** | **UNIT** |
| Maximum instantaneous forward voltage | $I_F$ = 1.0 A $T_J$ = 25 °C | $V_F$ | 0.875 | 1.25 | | V |
| | $I_F$ = 1.0 A $T_J$ = 150 °C | | 0.71 | 1.05 | | |
| Maximum DC reverse current at rated DC blocking voltage | $T_A$ = 25 °C | $I_R$ | 2.0 | 5.0 | | µA |
| | $T_A$ = 125 °C | | 50 | | | |
| Typical reverse recovery time | $I_F$ = 0.5A, $I_R$ = 1.0A, $I_{RR}$ = 0.25A | $t_{rr}$ | 25 | 50 | | nS |
| | $I_F$=1.0A, di/dt=50A/µS, $V_R$=30V $I_{rr}$=10% $I_{RM}$ | | 35 | 75 | | |
| | $I_F$=1.0A, di/dt=100A/µS, recovery to 1.0V | | 25 | 50 | | |

| THERMAL CHARACTERISTICS ($T_A$ = 25 °C unless otherwise noted) | | | | | | |
|---|---|---|---|---|---|---|
| **PARAMETER** | | **SYMBOL** | **ALPMURS120B** | **ALPMURS140B** | **ALPMURS160B** | **UNIT** |
| Typical thermal resistance (1) | junction to ambient | $R_{\theta JA}$ | 85 | | | °C/W |
| | junction to case | $R_{\theta JC}$ | 15 | | | |
| | junction to lead | $R_{\theta JL}$ | 20 | | | |

**Note:**
(1) The thermal resistance from junction to ambient and from junction to lead mounted on P.C.B with 8.0 x 8.0mm copper pads.

## TYPICAL DEVICE CHARACTERISTICS CURVES ($T_A$ = 25 °C unless otherwise noted)

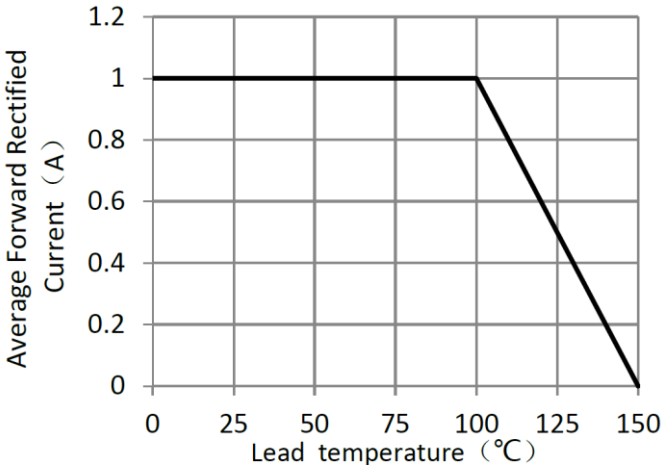



Fig1. Forward Current Derating Curve

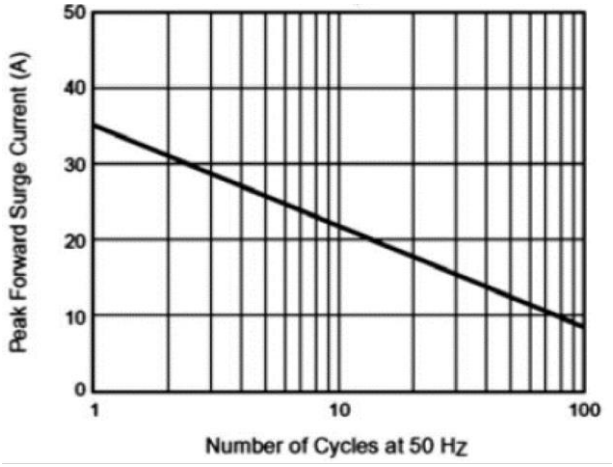



Fig2. Maximum Non-Repetitive Peak Forward Surge Current

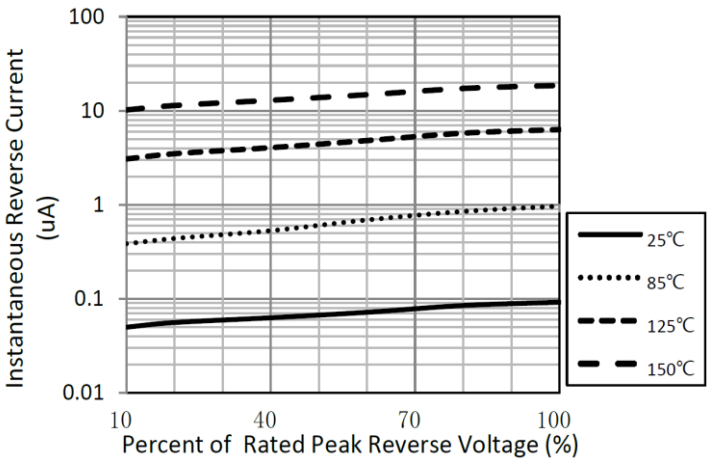



Fig3. Typical Reverse Characteristics

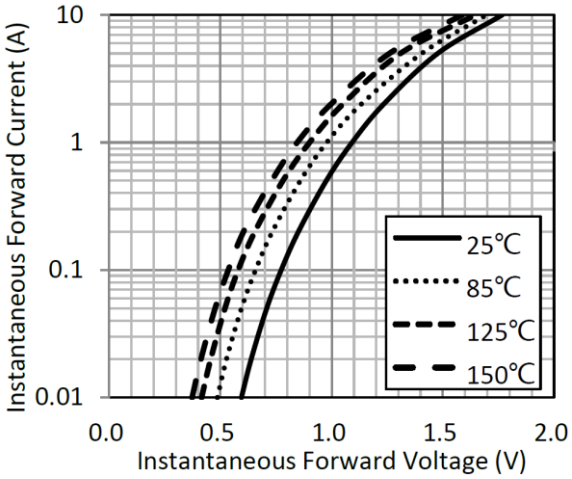



Fig4. Typical Instantaneous Forward Characteristics

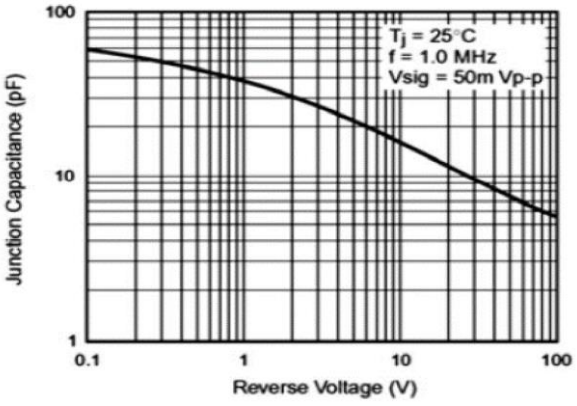
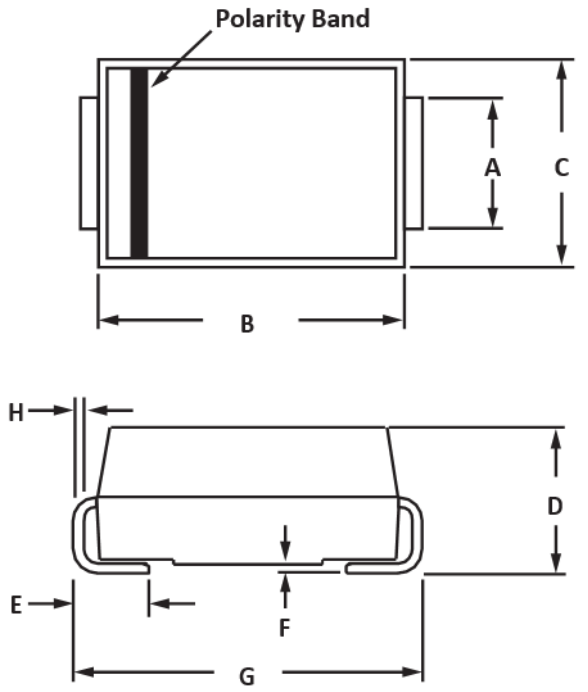



Fig.5 Typical Junction Capacitance

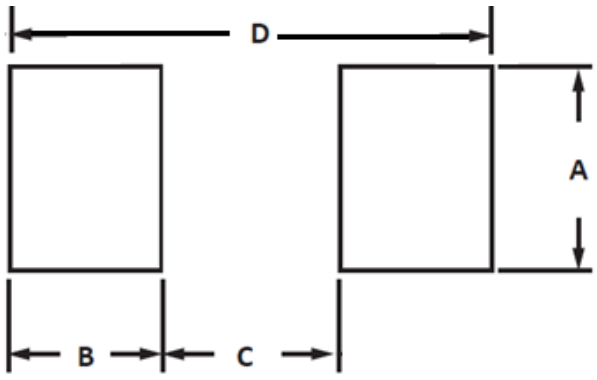
## PACKAGE INFORMATION

**DO-214AA (SMB)**




| OUTLINE DIMENSIONS | | | | |
|---|---|---|---|---|
| DIM | MILLIMETERS | | INCHES | |
| | MIN | MAX | MIN | MAX |
| A | 1.93 | 2.08 | 0.076 | 0.082 |
| B | 4.25 | 4.75 | 0.167 | 0.187 |
| C | 3.48 | 3.73 | 0.137 | 0.147 |
| D | 1.99 | 2.61 | 0.078 | 0.103 |
| E | 0.90 | 1.41 | 0.035 | 0.056 |
| F | 0.05 | 0.20 | 0.002 | 0.008 |
| G | 5.26 | 5.46 | 0.207 | 0.215 |
| H | 0.15 | 0.31 | 0.006 | 0.012 |

**NOTES**
1. Dimensions are exclusive of mold flash and metal burrs.

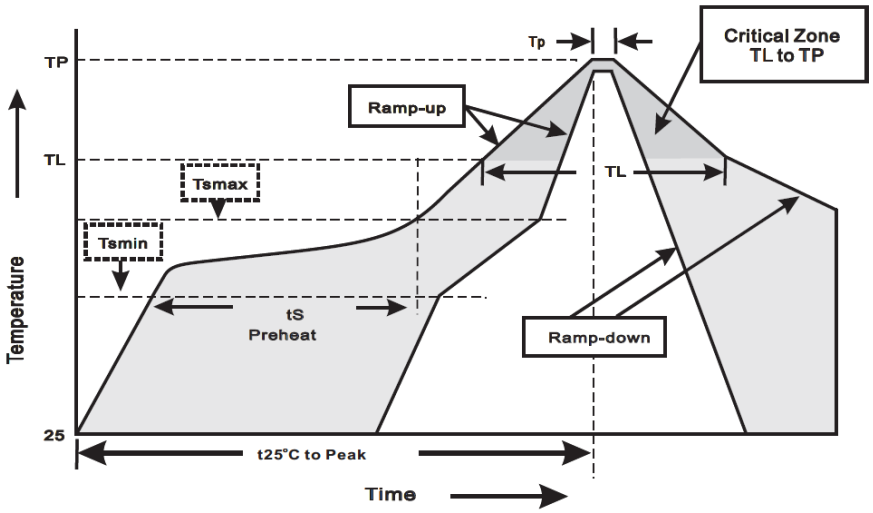



| PAD LAYOUT DIMENSIONS | | |
|---|---|---|
| DIM | MILLIMETERS | INCHES |
| | REF. | REF. |
| A | 2.30 | 0.091 |
| B | 1.60 | 0.063 |
| C | 2.90 | 0.114 |
| D | 6.10 | 0.24 |

## SOLDERING PARAMETERS

### SUGGESTED THERMAL PROFILES FOR SOLDERING PROCESSES

1. Storage environment: Temperature=5 °C~40 °C Humidity=55% ±25%
2. Reflow soldering of surface-mount devices




3. Reflow soldering

| PROFILE FEATURE | SOLDERING CONDITION |
|---|---|
| Average ramp-up rate ($T_L$ to $T_P$) | <3 °C/sec |
| Preheat<br>- Temperature Min ($T_{smin}$)<br>- Temperature Max ($T_{smax}$)<br>- Time (min to max) ($t_s$) | <br>150 °C<br>200 °C<br>60 ~ 120 sec |
| $T_{smax}$ to $T_L$<br>- Ramp-upRate | <br><3 °C/sec |
| Time maintained above:<br>- Temperature ($T_L$)<br>- Time(tL) | <br>217 °C<br>60 ~ 260 sec |
| Peak Temperature ($T_P$) | 255 °C-0/+5 °C |
| Time within 5 °C of actual Peak Temperature(tP) | 10 ~ 30 sec |
| Ramp-down Rate | <6 °C/sec |
| Time 25 °C to Peak Temperature | <6 minutes |

## PRODUCT HIGH RELIABLITY TEST CAPABILITIES

| ITEM | TEST CONDITIONS | STANDARD |
|---|---|---|
| Solder Resistance | At 260±5°C for 10±Sec. | MIL-STD-750D METHOD-2031 |
| Solderability | At 245±5°C for 5 sec. | MIL-STD-202F METHOD-208 |
| High Temperature Reverse Bias | $V_{BR}$= $V_{BR}$ $N_{OM}$*80% at $T_J$=150° for 168 hrs. | MIL-STD-750D METHOD-1038 |
| Pressure Cooker | 15$P_{SIG}$ at $T_A$=121°C for 4Hrs | JESD22-A102 |
| Temperature Cycling | -55°C to +125°C dwelled for 30min and transferred for 5min. total 10 cycles. | MIL-STD-750D METHOD-1051 |
| Humidity | At $T_A$=85°C, RH=85% for 1000hrs. | MIL-STD-750D METHOD-1021 |
| High Temperature Storage Life | At 175°C for 1000hrs. | MIL-STD-750D METHOD-1031 |

## CUSTOMER NOTE:

### DISCLAIMER

The product information and the selection guide facilitates the selection of the ALPINESEMI™'s Semiconductor Device(s) best suited for application in your product(s) as per your requirement. It is recommended that you completely review the Data sheet(s) so as to confirm that the Device(s) meets functionality parameters for your application. The information furnished on the Data Sheet and the ALPINESEMI™'s Web Site is believed to be accurate and reliable at the time of preparation of this document. ALPINESEMI™ however, does not assume any inaccuracies that may arise when the components are mounted and removed. Furthermore, ALPINESEMI™ does not assume liability whatsoever, arising out of the application or the use of any of ALPINESEMI™'s product(s). Neither, does it convey any license under its patent rights nor the rights of others. These products are not guaranteed for use in life saving/support appliances or systems. ALPINESEMI™'s customers using these products (either as individual Semiconductor Devices or incorporated in their end products), in any life saving/support appliances or systems or applications do so at their own risk and ALPINESEMI™ will not be responsible in any way(s) for any damage(s) resulting from such use.

Please check the website **www.alpinesemi.com** for continues updates and revision of datasheets.

DESIGN CHANGES: ALPINESEMI™ strives for continuous improvement and reserves the right to change the specifications of its products without prior notice. ALPINESEMI™ reserves the right to discontinue product lines without prior notice. Any product selection is a recommendation based on best understanding of such product(s) by our engineers. However, buyers are advised to rely on their own judgment for such selection of the products.

ALPINESEMI™ makes no warranty, representation or guarantee regarding the suitability of its products for any particular applications. Neither does ALPINESEMI™ assume any liability arising out of the applications nor the use of such products. ALPINESEMI™ specifically disclaims all liabilities either consequential or incidental.



All logos and information provided in the datasheets are for reference only. Any registered and/or trademark/logos belonging to respective companies be the property of those companies. ALPINESEMI™ extends the courtesy to them, if any of the information found in its datasheet.

**Component Disposal Instructions**

1. ALPINESEMI™ Semiconductor Devices are RoHS compliant and hence customers are requested to dispose as per the prevailing Environmental Legislation put forth in their specific country.

2. In Europe, please dispose as per EU Directive 2002/96/EC on Waste Electrical and Electronic Equipment (WEEE).

ALPINESEMI®

sales@alpinesemi.com
www.alpinesemi.com