

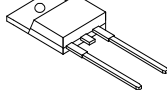
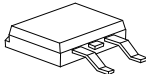
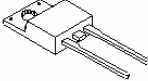
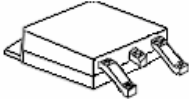
## ST5120/STB5120/STF5120/STD5120 SCHOTTKY RECTIFIER

### Applications:

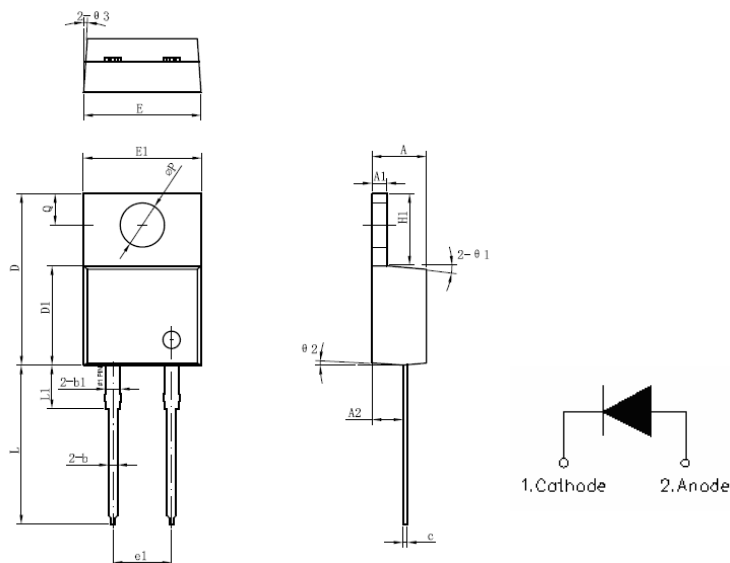
- Switching power supply
- Converters
- Free-Wheeling diodes
- Reverse battery protection

### Features:

- 150 °C T<sub>J</sub> operation
- Center tap configuration
- Ultralow forward voltage drop
- High purity, high temperature epoxy encapsulation for enhanced mechanical strength and moisture resistance
- High frequency operation
- Guard ring for enhanced ruggedness and long term reliability
- This is a Pb – Free Device
- All SMC parts are traceable to the wafer lot
- Additional testing can be offered upon request

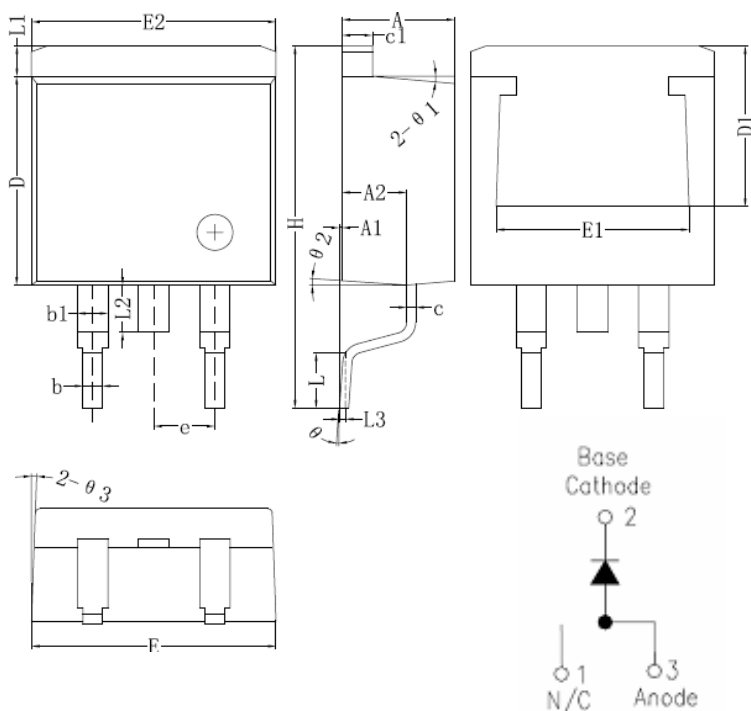
| Case styles   |  |  |  |
|---|--|--|--|
| <br><b>ST5120</b><br><b>TO-220AC</b> | <br><b>STB5120</b><br><b>D<sup>2</sup>PAK</b> | <br><b>STF5120</b><br><b>ITO-220AC</b> | <br><b>STD5120</b><br><b>DPAK</b> |

Mechanical Dimensions: In Inches / mm



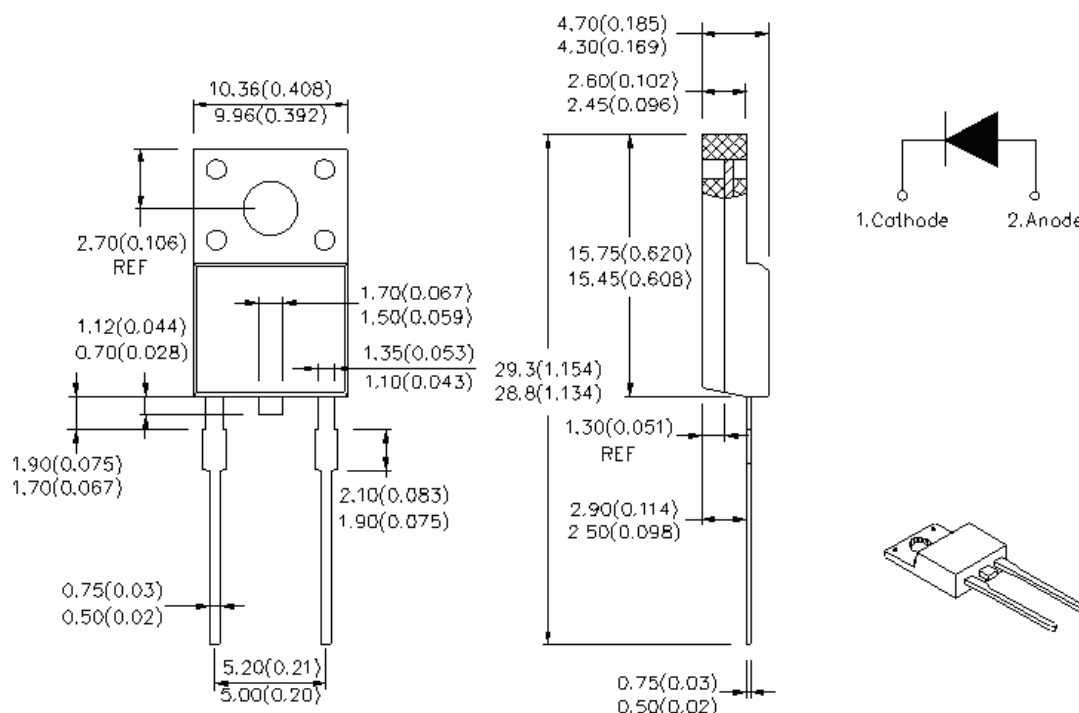
TO-220AC

| Symbol | Dimensions in millimeters |         |       |
|--------|---------------------------|---------|-------|
|        | Min.                      | Typical | Max.  |
| A      | 4.55                      | 4.70    | 4.85  |
| A1     | 1.17                      | 1.27    | 1.37  |
| A2     | 2.59                      | 2.69    | 2.89  |
| b      | 0.71                      | 0.81    | 0.96  |
| b1     |                           | 1.27    |       |
| c      | 0.36                      | 0.38    | 0.61  |
| D      | 14.64                     | 14.94   | 15.24 |
| D1     | 8.55                      | 8.07    | 8.85  |
| E      | 10.01                     | 10.16   | 10.31 |
| E1     | 9.98                      | 10.18   | 10.38 |
| e1     |                           | 5.08    |       |
| H1     | 6.04                      | 6.24    | 6.44  |
| L      | 13.00                     | 13.86   | 14.08 |
| L1     |                           | 3.80    |       |
| ΦP     | 3.74                      | 3.84    | 4.04  |
| Q      | 2.54                      | 2.74    | 2.94  |
| Θ1     |                           | 5°      |       |
| Θ2     |                           | 4°      |       |
| Θ3     |                           | 4°      |       |

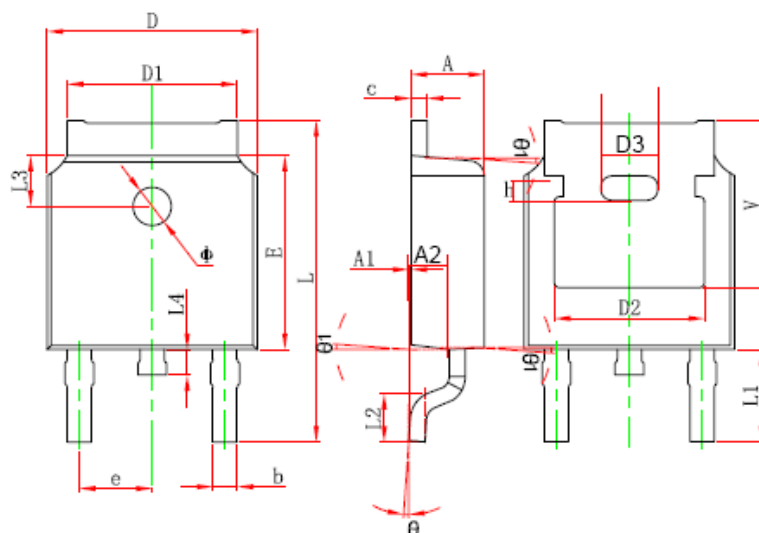


| Symbol | Dimensions in millimeters |         |       |
|--------|---------------------------|---------|-------|
|        | Min.                      | Typical | Max.  |
| A      | 4.55                      | 4.70    | 4.85  |
| A1     | 0                         | 0.10    | 0.25  |
| A2     | 2.59                      | 2.69    | 2.89  |
| b      | 0.71                      | 0.81    | 0.96  |
| b1     |                           | 1.27    |       |
| c      | 0.36                      | 0.38    | 0.61  |
| c1     | 1.17                      | 1.27    | 1.37  |
| D      | 8.55                      | 8.70    | 8.85  |
| D1     | 6.40                      |         |       |
| E      | 10.01                     | 10.16   | 10.31 |
| E1     | 7.6                       |         |       |
| E2     | 9.98                      | 10.08   | 10.18 |
| e      |                           | 2.54    |       |
| H      | 14.6                      | 15.1    | 15.6  |
| L      | 2.00                      | 2.30    | 2.70  |
| L1     | 1.17                      | 1.27    | 1.40  |
| L2     |                           |         | 2.20  |
| L3     |                           | 0.25BSC |       |
| e      | 0                         | -       | 8°    |
| e1     |                           | 5°      |       |
| e2     |                           | 4°      |       |
| e3     |                           | 4°      |       |

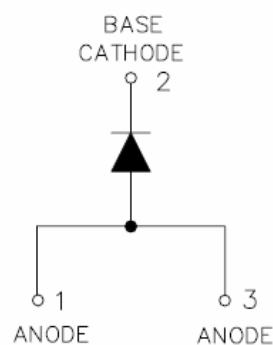
D<sup>2</sup>PAK



**ITO-220AC**

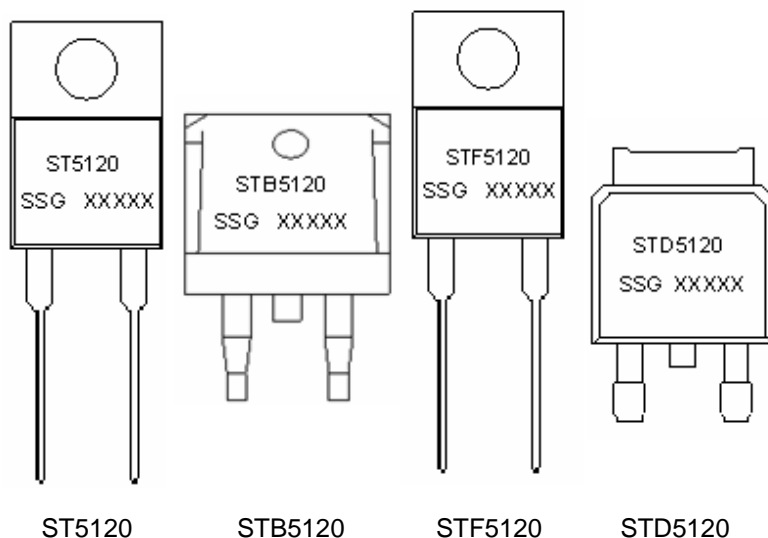


| Symbol | Dimensions In Millimeters |        | Dimensions In Inches |       |
|--------|---------------------------|--------|----------------------|-------|
|        | Min.                      | Max.   | Min.                 | Max.  |
| A      | 2.200                     | 2.380  | 0.087                | 0.094 |
| A1     | 0.000                     | 0.100  | 0.000                | 0.004 |
| b      | 0.710                     | 0.810  | 0.028                | 0.032 |
| c      | 0.460                     | 0.560  | 0.018                | 0.022 |
| D      | 6.500                     | 6.700  | 0.256                | 0.264 |
| D1     | 5.130                     | 5.460  | 0.202                | 0.215 |
| D2     | 4.830 REF.                |        | 0.190 REF.           |       |
| E      | 6.000                     | 6.200  | 0.236                | 0.244 |
| e      | 2.186                     | 2.386  | 0.086                | 0.094 |
| L      | 9.800                     | 10.400 | 0.386                | 0.409 |
| L1     | 2.900 REF.                |        | 0.114 REF.           |       |
| L2     | 1.400                     | 1.700  | 0.055                | 0.067 |
| L3     | 1.600 REF.                |        | 0.063 REF.           |       |
| L4     | 0.600                     | 1.000  | 0.024                | 0.039 |
| Φ      | 1.100                     | 1.300  | 0.043                | 0.051 |
| θ      | 0°                        | 8°     | 0°                   | 8°    |
| A2     | 0.910                     | 1.110  | 0.036                | 0.044 |
| V      | 5.350 REF.                |        | 0.211 REF.           |       |
| D3     | 1.778 REF.                |        | 0.070 REF.           |       |
| h      | 0.762 REF.                |        | 0.030 REF.           |       |
| θ1     | 7°                        |        | 7°                   |       |



**DPAK**

**Marking Diagram:**



Where XXXXX is YYWWL

ST = Device Type  
B/F/D = Package type  
5 = Forward Current (5A)  
120 = Reverse Voltage (120V)  
SSG = SSG  
YY = Year  
WW = Week  
L = Lot Number

**Cautions:** Molding resin  
Epoxy resin UL: 94V-0

**Ordering Information:**

| Device  | Package                     | Shipping       |
|---------|-----------------------------|----------------|
| ST5120  | TO-220AC(Pb-Free)           | 50pcs / tube   |
| STB5120 | D <sup>2</sup> PAK(Pb-Free) | 800pcs / reel  |
| STF5120 | ITO-220AC(Pb-Free)          | 50pcs / tube   |
| STD5120 | DPAK(Pb-Free)               | 2500pcs / reel |

For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specification.

**Maximum Ratings:**

| Characteristics   | Symbol      | Condition   | Max. | Units |
|---|-------------|---|------|-------|
| Peak Inverse Voltage  | $V_{RWM}$   | -   | 120  | V     |
| Average Forward Current                                     | $I_{F(AV)}$ | 50% duty cycle @ $T_C=100^\circ\text{C}$ ,<br>rectangular wave form | 5    | A     |
| Peak One Cycle<br>Non-Repetitive Surge Current<br>(per leg) | $I_{FSM}$   | 8.3 ms, half Sine pulse   | 120  | A     |

**Electrical Characteristics:**

| Characteristics                | Symbol          | Condition   | Max.   | Units |
|--------------------------------|-----------------|---|--------|-------|
| Forward Voltage Drop*          | V <sub>F1</sub> | @ 5A, Pulse, T <sub>J</sub> = 25 °C                                     | 0.88   | V     |
|                                | V <sub>F2</sub> | @ 5A, Pulse, T <sub>J</sub> = 125 °C                                    | 0.71   | V     |
| Reverse Current*               | I <sub>R1</sub> | @V <sub>R</sub> = rated V <sub>R</sub><br>T <sub>J</sub> = 25 °C        | 0.5    | mA    |
|                                | I <sub>R2</sub> | @V <sub>R</sub> = rated V <sub>R</sub><br>T <sub>J</sub> = 125 °C       | 35     | mA    |
| Junction Capacitance (per leg) | C <sub>T</sub>  | @V <sub>R</sub> = 5V, T <sub>C</sub> = 25 °C<br>f <sub>SIG</sub> = 1MHz | 300    | pF    |
| Voltage Rate of Change         | dv/dt           | -   | 10,000 | V/μs  |

\* Pulse Width < 300μs, Duty Cycle <2%

**Thermal-Mechanical Specifications:**

| Characteristics                                       | Symbol  | ST5120      | STB5120 | STD5120 | STF5120 | Units |
|---|---|-------------|---------|---------|---------|-------|
| Junction Temperature                                  | T <sub>J</sub>                                | -55 to +150 |         |         |         | °C    |
| Storage Temperature                                   | T <sub>stg</sub>                              | -55 to +150 |         |         |         | °C    |
| Maximum Thermal Resistance Junction to Case(per leg)* | R <sub>θJC</sub>                              | 3.0         | 3.0     | 2.4     | 5.5     | °C/W  |
| Approximate Weight                                    | wt  | 1.8         | 1.85    | 0.39    | 1.8     | g     |
| Case Style  | TO-220AC/ D <sup>2</sup> PAK/ DPAK/ ITO-220AC |             |         |         |         |       |

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