

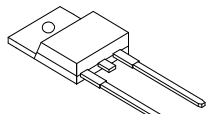
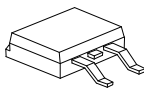
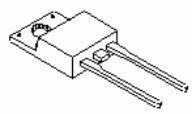
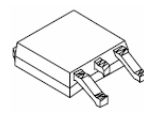
## ST2045/STB2045/STF2045/STD2045 SCHOTTKY RECTIFIER

### Applications:

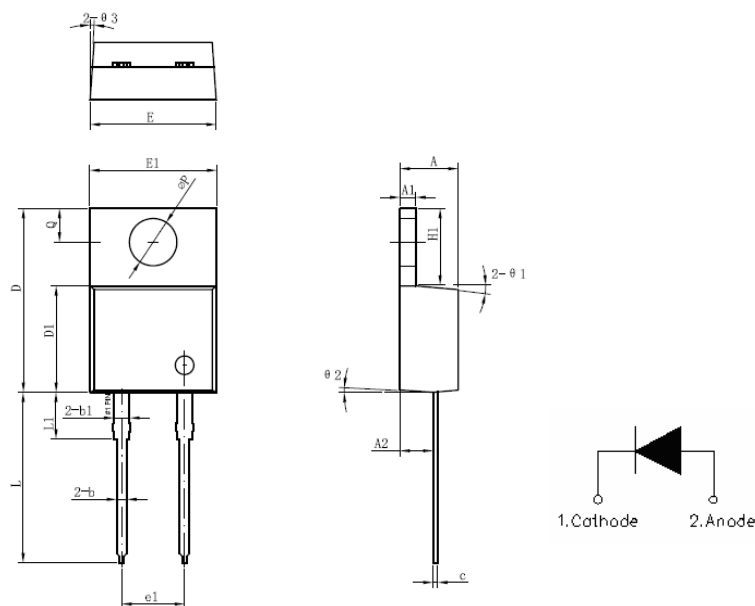
- Switching power supply
- Converters
- Free-Wheeling diodes
- Reverse battery protection
- Center tap configuration

### Features:

- 200 °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

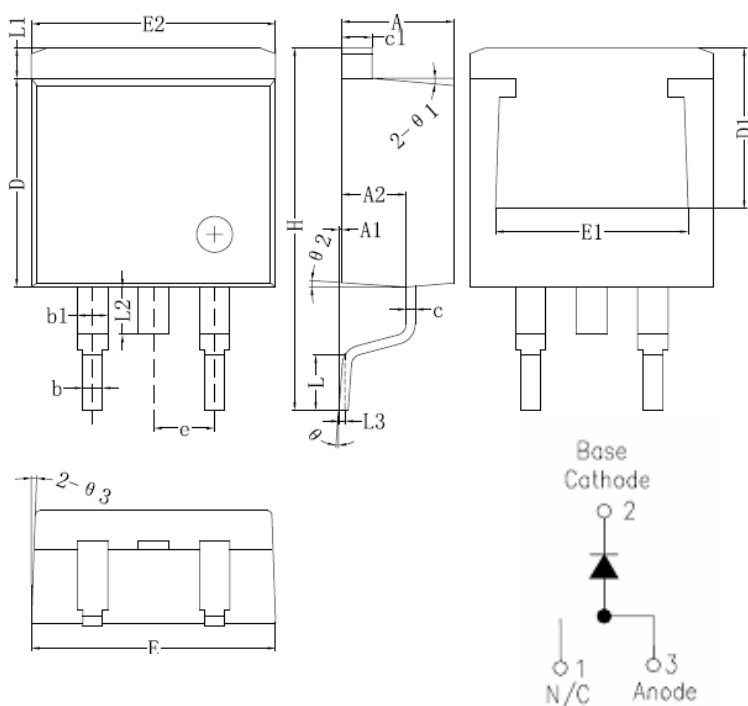
|   |   |  |  |
|---|---|--|--|
| <br><b>ST2045</b><br><b>TO-220AC</b> | <br><b>STB2045</b><br><b>D<sup>2</sup> PAK</b> | <br><b>STF2045</b><br><b>ITO-220AC</b> | <br><b>STD2045</b><br><b>DPAK</b> |
|---|---|--|--|

Mechanical Dimensions: In Inches / mm



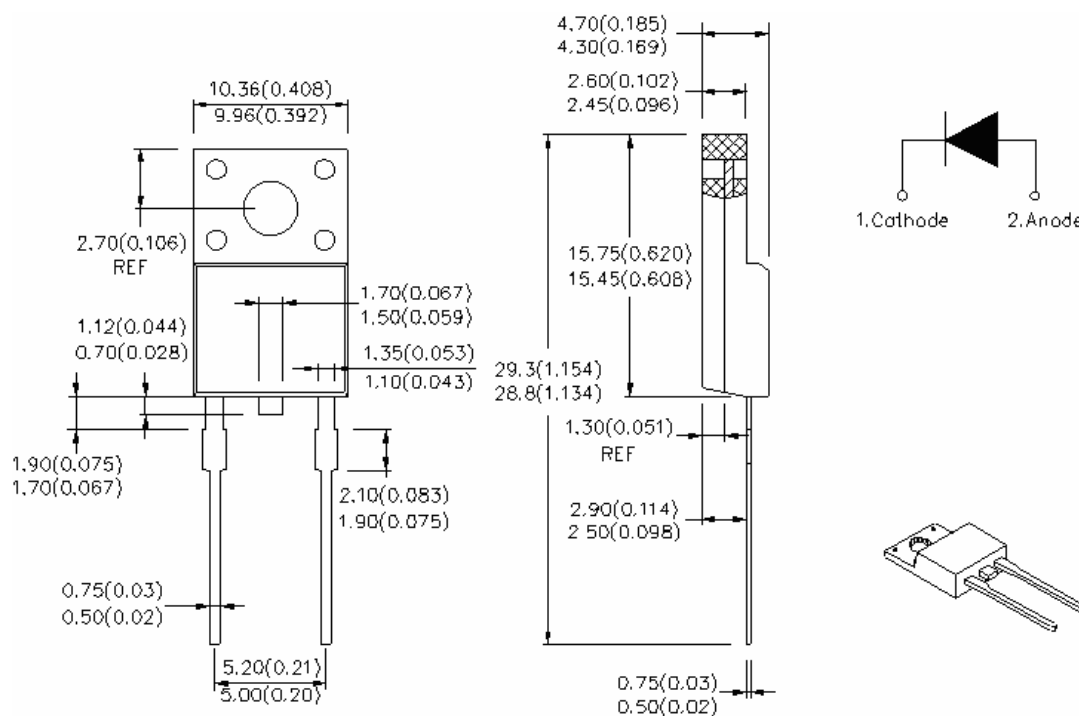
| Symbol | Dimensions in millimeters |         |       |
|--------|---------------------------|---------|-------|
|        | Min.                      | Typical | Max.  |
| A      | 4.55                      | 4.70    | 4.85  |
| A1     | 1.17                      | 1.27    | 1.37  |
| A2     | 2.59                      | 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  |
| Ø1     |                           | 5°      |       |
| Ø2     |                           | 4°      |       |
| Ø3     |                           | 4°      |       |

### TO-220AC

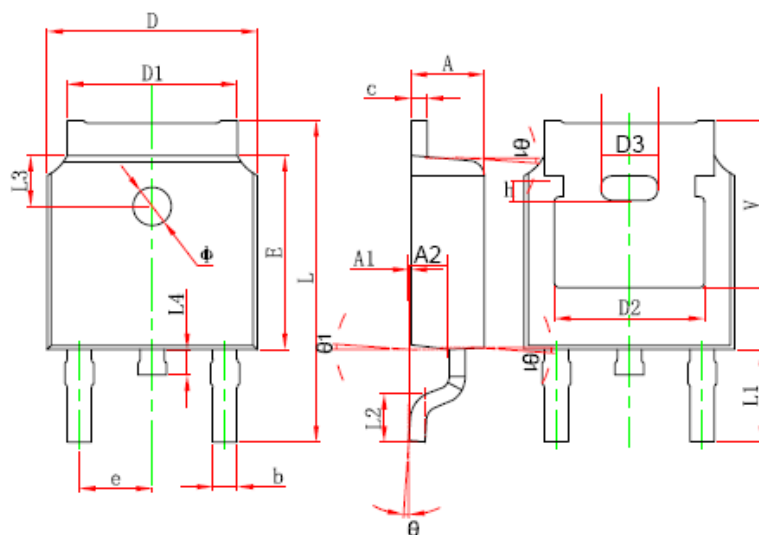


| Symbol | Dimensions in millimeters |         |       |
|--------|---------------------------|---------|-------|
|        | Min.                      | Typical | Max.  |
| A      | 4.55                      | 4.70    | 4.85  |
| A1     | 0                         | 0.10    | 0.25  |
| A2     | 2.59                      | 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°      |       |

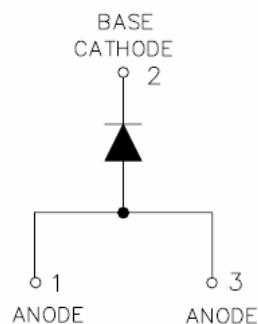
**D<sup>2</sup>PAK**



**ITO-220AC**

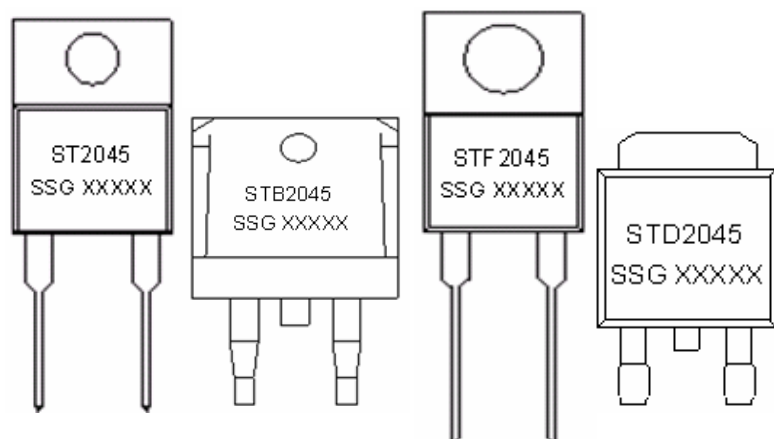


| Symbol | Dimensions In Millimeters |        | Dimensions In Inches |       |
|--------|---------------------------|--------|----------------------|-------|
|        | Min.                      | Max.   | Min.                 | Max.  |
| A      | 2.200                     | 2.380  | 0.087                | 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     | 1.778REF.                 |        | 0.070REF.            |       |
| h      | 0.762REF.                 |        | 0.030REF.            |       |
| θ1     | 7°                        |        | 7°                   |       |



**DPAK**

**Marking Diagram:**



ST2045      STB2045      STF2045      STD2045

Where XXXXX is YYWWL

ST = Device Type  
 B/F/D = Package type  
 20 = Forward Current (20A)  
 45 = Reverse Voltage (45V)  
 SSG = SSG  
 YY = Year  
 WW = Week  
 L = Lot Number

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

**Ordering Information:**

| Device  | Package                      | Shipping       |
|---------|------------------------------|----------------|
| ST2045  | TO-220AC(Pb-Free)            | 50pcs/ tube    |
| STB2045 | D <sup>2</sup> PAK (Pb-Free) | 800pcs / reel  |
| STF2045 | ITO-220AC(Pb-Free)           | 50pcs/ tube    |
| STD2045 | 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   | $V_{RWM}$   | -  | 45   | V     |
| Max. Average Forward   | $I_{F(AV)}$ | 50% duty cycle @ $T_C = 80^\circ\text{C}$ ,<br>rectangular wave form | 20   | A     |
| Max. Peak One Cycle<br>Non-Repetitive Surge Current<br>(per leg) | $I_{FSM}$   | 8.3 ms, half Sine pulse  | 250  | A     |

**Electrical Characteristics:**

| Characteristics                     | Symbol   | Condition   | Max.   | Units            |
|-------------------------------------|----------|---|--------|------------------|
| Max. Forward Voltage Drop*          | $V_{F1}$ | @ 20A, Pulse, $T_J = 25\text{ }^\circ\text{C}$                                    | 0.66   | V                |
|                                     | $V_{F2}$ | @ 20A, Pulse, $T_J = 125\text{ }^\circ\text{C}$                                   | 0.63   | V                |
| Max. Reverse Current (per leg)*     | $I_{R1}$ | @ $V_R = \text{rated } V_R$<br>$T_J = 25\text{ }^\circ\text{C}$                   | 2      | mA               |
|                                     | $I_{R2}$ | @ $V_R = \text{rated } V_R$<br>$T_J = 125\text{ }^\circ\text{C}$                  | 30     | mA               |
| Max. Junction Capacitance (per leg) | $C_T$    | @ $V_R = 5\text{V}$ , $T_C = 25\text{ }^\circ\text{C}$<br>$f_{SIG} = 1\text{MHz}$ | 1000   | pF               |
| Max. Voltage Rate of Change         | dv/dt    | -   | 10,000 | V/ $\mu\text{s}$ |

\* Pulse Width < 300 $\mu\text{s}$ , Duty Cycle <2%

**Thermal-Mechanical Specifications:**

| Characteristics                             | Symbol                                     | Condition    | Specification     | Units              |
|---|--|--------------|-------------------|--------------------|
| Max. Junction Temperature                   | $T_J$                                      | -            | -55 to +200       | $^\circ\text{C}$   |
| Max. Storage Temperature                    | $T_{stg}$                                  | -            | -55 to +200       | $^\circ\text{C}$   |
| Maximum Thermal Resistance Junction to Case | $R_{\theta JC}$                            | DC operation | 4.5               | $^\circ\text{C/W}$ |
| Approximate Weight                          | wt   | -            | 1.8/1.85/1.8/0.39 | g                  |
| Case Style                                  | TO-220AC/D <sup>2</sup> PAK/ITO-220AC/DPAK |              |                   |                    |

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