

# TO-220-3L/TO-220F Plastic-Encapsulate Diodes

## SBD30120TCTB、SBDF30120TCTB

SCHOTTKY BARRIER RECTIFIER

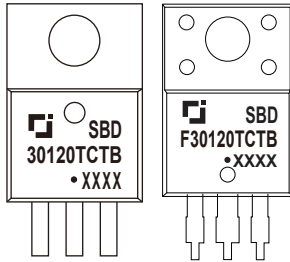
### MAIN CHARACTERISTICS

|              |                               |
|--------------|-------------------------------|
| $I_o$        | 30 (2×15) A                   |
| $V_{RRM}$    | 120 V                         |
| $T_j$        | 150 °C                        |
| $V_{F(typ)}$ | 0.68V (@ $T_j=125^{\circ}C$ ) |

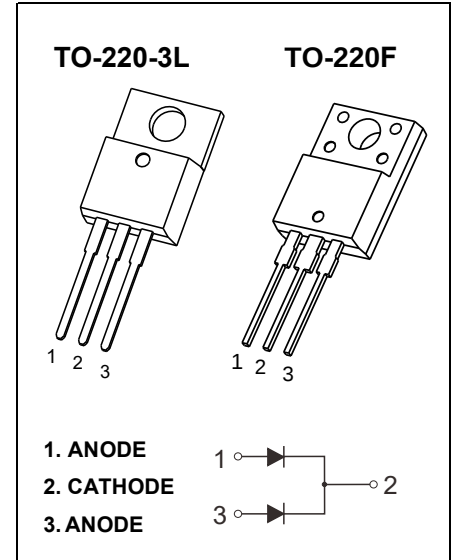
### FEATURES

- Low Power Loss,High Efficiency
- Guard Ring Die Construction for Transient Protection
- High Current Capability and Low Forward Voltage Drop

### MARKING



SBD(F)30120TCTB = Device code  
Solid dot = Green molding compound device  
if none, the normal device  
XXXX = Code



### MAXIMUM RATINGS ( $T_a=25^{\circ}C$ unless otherwise noted )

| Symbol          | Parameter                                                        | SBD       |            | Unit          |
|-----------------|------------------------------------------------------------------|-----------|------------|---------------|
|                 |                                                                  | 30120TCTB | F30120TCTB |               |
| $V_{RRM}$       | Peak repetitive reverse voltage                                  | 120       |            | V             |
| $V_{RWM}$       | Working peak reverse voltage                                     |           |            |               |
| $V_R$           | DC blocking voltage                                              |           |            |               |
| $V_{R(RMS)}$    | RMS reverse voltage                                              | 84        |            | V             |
| $I_o$           | Average rectified output current                                 | 30        |            | A             |
| $I_{FSM}$       | Non-Repetitive peak forward surge current (8.3ms half sine wave) | 200       |            | A             |
| $R_{\theta Jc}$ | Thermal resistance from junction to case , $T_c=25^{\circ}C$     | 2.0       | 3.0        | $^{\circ}C/W$ |
| $R_{\theta JA}$ | Thermal resistance from junction to ambient                      | 62.5      |            | $^{\circ}C/W$ |
| $T_j$           | Junction temperature                                             | 150       |            | $^{\circ}C$   |
| $T_{stg}$       | Storage temperature                                              | -55~+150  |            | $^{\circ}C$   |

### ELECTRICAL CHARACTERISTICS ( $T_a=25^{\circ}C$ unless otherwise specified)

| Parameter       | Symbol     | Test conditions | Min                | Typ  | Max  | Unit    |
|-----------------|------------|-----------------|--------------------|------|------|---------|
| Reverse voltage | $V_{(BR)}$ | $I_R=0.1mA$     | 120                |      |      | V       |
| Reverse current | $I_R$      | $V_R=120V$      | $T_j=25^{\circ}C$  | 10   | 100  | $\mu A$ |
|                 |            |                 | $T_j=125^{\circ}C$ | 10   |      | mA      |
| Forward voltage | $V_F$      | $I_F=10A$       | $T_j=25^{\circ}C$  | 0.69 |      | V       |
|                 |            |                 | $T_j=125^{\circ}C$ | 0.61 |      | V       |
|                 |            | $I_F=15A$       | $T_j=25^{\circ}C$  | 0.83 | 0.89 | V       |
|                 |            |                 | $T_j=125^{\circ}C$ | 0.68 |      | V       |

\*Pulse test: pulse width  $\leq 300\mu s$ , duty cycles  $\leq 2.0\%$ .

# Typical Characteristics

FIG.1: FORWARD CURRENT DERATING CURVE

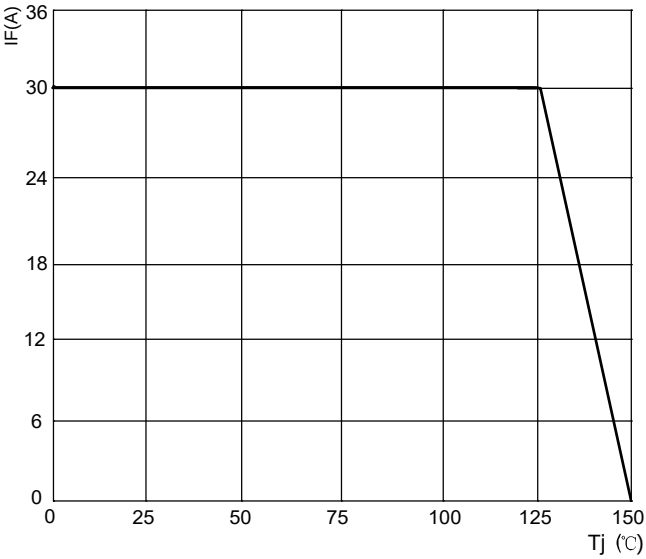


FIG.2: TYPICAL FORWARD CHARACTERISTICS

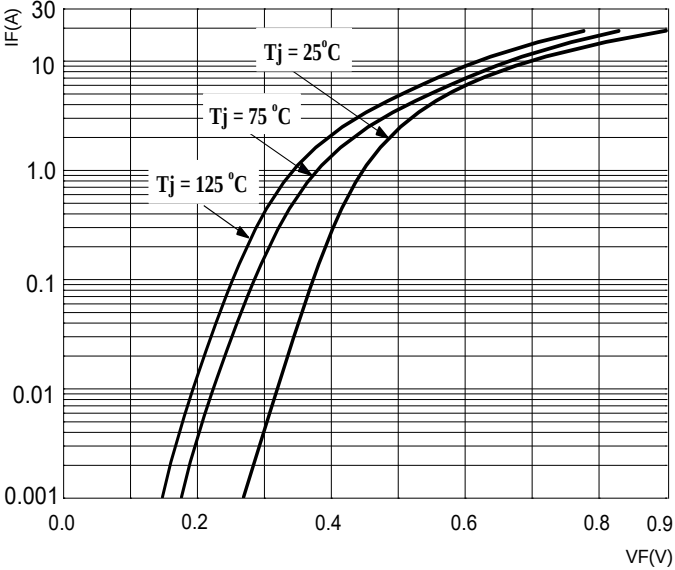


FIG.3: TOTAL CAPACITANCE DERATING CURVE

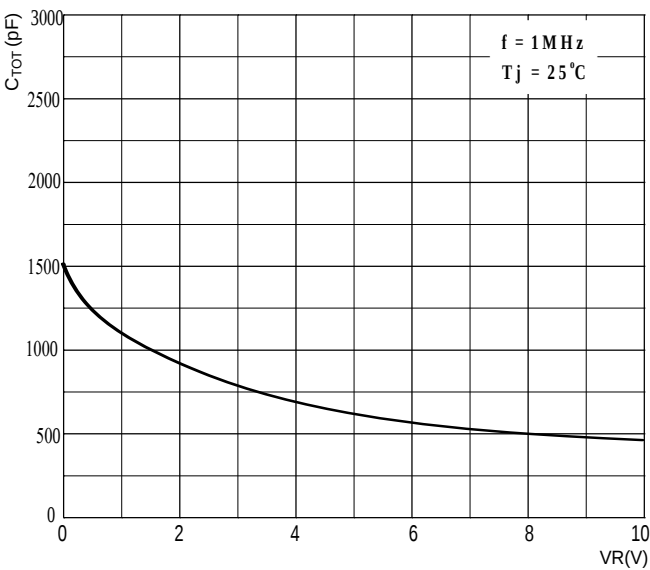
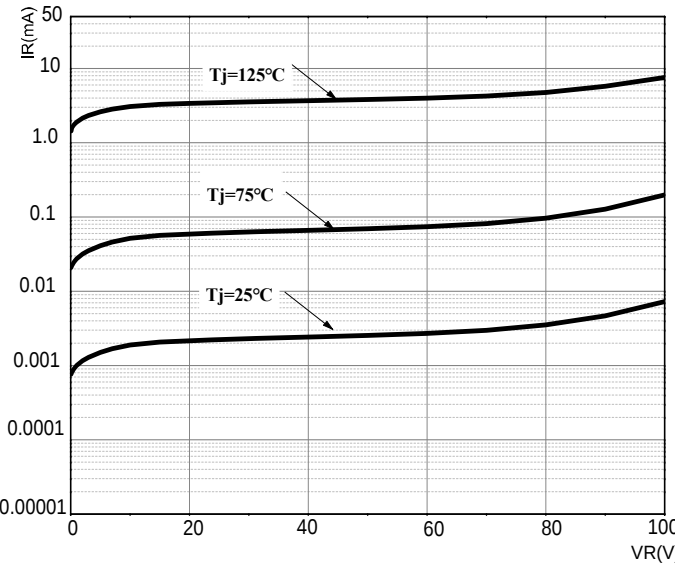


FIG.4: TYPICAL REVERSE CHARACTERISTICS



## TO-220-3L Package Outline Dimensions



| Symbol | Dimensions In Millimeters |        | Dimensions In Inches |       |
|--------|---------------------------|--------|----------------------|-------|
|        | Min                       | Max    | Min                  | Max   |
| A      | 4.450                     | 4.750  | 0.175                | 0.187 |
| A1     | 2.520                     | 2.820  | 0.099                | 0.111 |
| b      | 0.710                     | 0.910  | 0.028                | 0.036 |
| b1     | 1.170                     | 1.370  | 0.046                | 0.054 |
| c      | 0.300                     | 0.500  | 0.012                | 0.020 |
| c1     | 1.170                     | 1.370  | 0.046                | 0.054 |
| D      | 9.830                     | 10.330 | 0.387                | 0.407 |
| E      | 8.500                     | 8.900  | 0.335                | 0.350 |
| E1     | 12.050                    | 12.650 | 0.474                | 0.498 |
| e      | 2.540 TYP                 |        | 0.100 TYP            |       |
| e1     | 4.900                     | 5.200  | 0.192                | 0.205 |
| F      | 2.540                     | 2.940  | 0.100                | 0.116 |
| h      | 0.100 TYP                 |        | 0.004 TYP            |       |
| L      | 13.300                    | 13.800 | 0.523                | 0.543 |
| L1     | 3.540                     | 3.940  | 0.139                | 0.155 |
| Φ      | 3.735                     | 3.935  | 0.147                | 0.155 |

## TO-220F Package Outline Dimensions



| Symbol | Dimensions In Millimeters |        | Dimensions In Inches |       |
|--------|---------------------------|--------|----------------------|-------|
|        | Min.                      | Max.   | Min.                 | Max.  |
| A      | 4.300                     | 4.700  | 0.169                | 0.185 |
| A1     | 1.300 REF.                |        | 0.051 REF.           |       |
| A2     | 2.800                     | 3.200  | 0.110                | 0.126 |
| A3     | 2.500                     | 2.900  | 0.098                | 0.114 |
| b      | 0.500                     | 0.750  | 0.020                | 0.030 |
| b1     | 1.100                     | 1.350  | 0.043                | 0.053 |
| b2     | 1.500                     | 1.750  | 0.059                | 0.069 |
| c      | 0.500                     | 0.750  | 0.020                | 0.030 |
| D      | 9.960                     | 10.360 | 0.392                | 0.408 |
| E      | 14.800                    | 15.200 | 0.583                | 0.598 |
| e      | 2.540 TYP.                |        | 0.100 TYP.           |       |
| F      | 2.700 REF.                |        | 0.106 REF.           |       |
| $\Phi$ | 3.500 REF.                |        | 0.138 REF.           |       |
| h      | 0.000                     | 0.300  | 0.000                | 0.012 |
| h1     | 0.800 REF.                |        | 0.031 REF.           |       |
| h2     | 0.500 REF.                |        | 0.020 REF.           |       |
| L      | 28.000                    | 28.400 | 1.102                | 1.118 |
| L1     | 1.700                     | 1.900  | 0.067                | 0.075 |
| L2     | 1.900                     | 2.100  | 0.075                | 0.083 |