

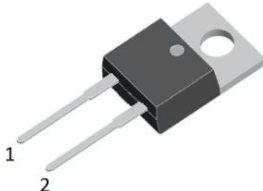
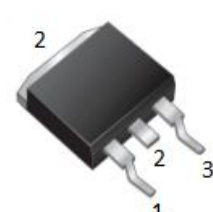
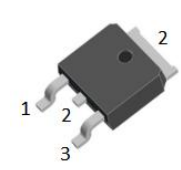
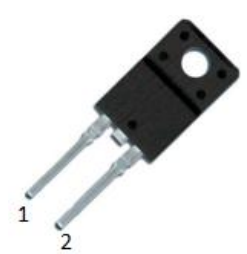
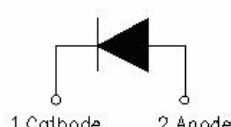
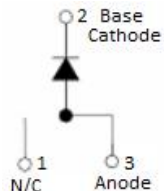
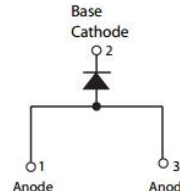
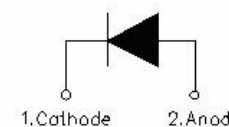
## ST5200/STB5200/STF5200/STD5200 SCHOTTKY RECTIFIER

### 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
- Trench MOS Schottky technology
- This is a Pb – Free Device
- All SMC parts are traceable to the wafer lot
- Additional testing can be offered upon request

| ST5200                                                                              | STB5200                                                                             | STD5200                                                                              | STF5200                                                                               |
|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|
|   |   |   |   |
|  |  |  |  |
| TO-220AC                                                                            | D <sup>2</sup> PAK                                                                  | DPAK                                                                                 | ITO-220AC                                                                             |

### Maximum Ratings:

| Characteristics                                                                        | Symbol                                                 | Condition                                                       | Max. | Units |
|----------------------------------------------------------------------------------------|--------------------------------------------------------|-----------------------------------------------------------------|------|-------|
| Peak Repetitive Reverse Voltage<br>Working Peak Reverse Voltage<br>DC Blocking Voltage | V <sub>RRM</sub><br>V <sub>RWM</sub><br>V <sub>R</sub> | -                                                               | 200  | V     |
| Average Rectified Forward Current                                                      | I <sub>F (AV)</sub>                                    | 50% duty cycle @T <sub>c</sub> =100°C,<br>rectangular wave form | 5    | A     |
| Peak One Cycle Non-Repetitive Surge Current                                            | I <sub>FSM</sub>                                       | 8.3ms, Half Sine pulse, T <sub>C</sub> = 25 °C                  | 120  | A     |

## Electrical Characteristics:

| Characteristics                 | Symbol   | Condition                                             | Typ.         | Max. | Units   |
|---------------------------------|----------|-------------------------------------------------------|--------------|------|---------|
| Breakdown Voltage               | $V_{BR}$ | @ $I_R = 1.0mA$ , $T_J = 25^\circ C$                  | 200(minimum) | -    | V       |
| Forward Voltage Drop (Note 1) * | $V_{F1}$ | @ 3A, Pulse, $T_J = 25^\circ C$                       | 0.76         | -    | V       |
|                                 |          | @ 5A, Pulse, $T_J = 25^\circ C$                       | 0.80         | 1.60 | V       |
|                                 | $V_{F2}$ | @ 3A, Pulse, $T_J = 125^\circ C$                      | 0.61         | -    | V       |
|                                 |          | @ 5A, Pulse, $T_J = 125^\circ C$                      | 0.68         | 0.73 | V       |
| Reverse Current(Note 2) *       | $I_{R1}$ | @ $V_R = 180V$ , $T_J = 25^\circ C$                   | 0.1          | -    | $\mu A$ |
|                                 |          | @ $V_R = 200V$ , $T_J = 25^\circ C$                   | 0.2          | 150  | $\mu A$ |
|                                 | $I_{R2}$ | @ $V_R = 180V$ , $T_J = 125^\circ C$                  | 0.3          | -    | mA      |
|                                 |          | @ $V_R = 200V$ , $T_J = 125^\circ C$                  | 0.4          | 10   | mA      |
| Junction Capacitance            | $C_T$    | @ $V_R = 5V$ , $T_C = 25^\circ C$<br>$f_{SIG} = 1MHz$ | 100          | -    | pF      |

Note: 1 Pulse test: Pulse Width < 300 $\mu s$ , Duty Cycle < 1%

2 Pulse test: Pulse Width < 40ms

## Thermal-Mechanical Specifications:

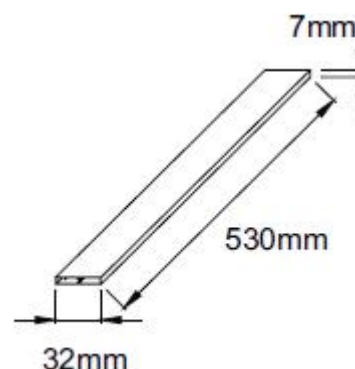
| Characteristics                                | Symbol                                        | ST5200      | STB5200 | STD5200 | STF5200 | Units        |
|------------------------------------------------|-----------------------------------------------|-------------|---------|---------|---------|--------------|
| Junction Temperature                           | $T_J$                                         | -55 to +150 |         |         |         | $^\circ C$   |
| Storage Temperature                            | $T_{stg}$                                     | -55 to +150 |         |         |         | $^\circ C$   |
| Typical Thermal Resistance<br>Junction to Case | $R_{\theta JC}$                               | 3.5         | 3.5     | 2.4     | 7.0     | $^\circ C/W$ |
| Case Style                                     | TO-220AC/ D <sup>2</sup> PAK/ DPAK/ ITO-220AC |             |         |         |         |              |

## Tube Specification

| Device  | Package            | Weight | Shipping       |
|---------|--------------------|--------|----------------|
| ST5200  | TO-220AC           | 1.6g   | 50pcs / tube   |
| STB5200 | D <sup>2</sup> PAK | 1.85g  | 800pcs / reel  |
| STD5200 | DPAK               | 0.39g  | 2500pcs / reel |
| STF5200 | ITO-220AC          | 1.6g   | 50pcs / tube   |

For information on tape and reel specifications, including part orientation and tape sizes, please refer to our tape and reel packaging specification.

## Tube Specification(TO-220AC/ITO-220AC)



## Ratings and Characteristics Curves

Figure 1  
Typical Forward Characteristics

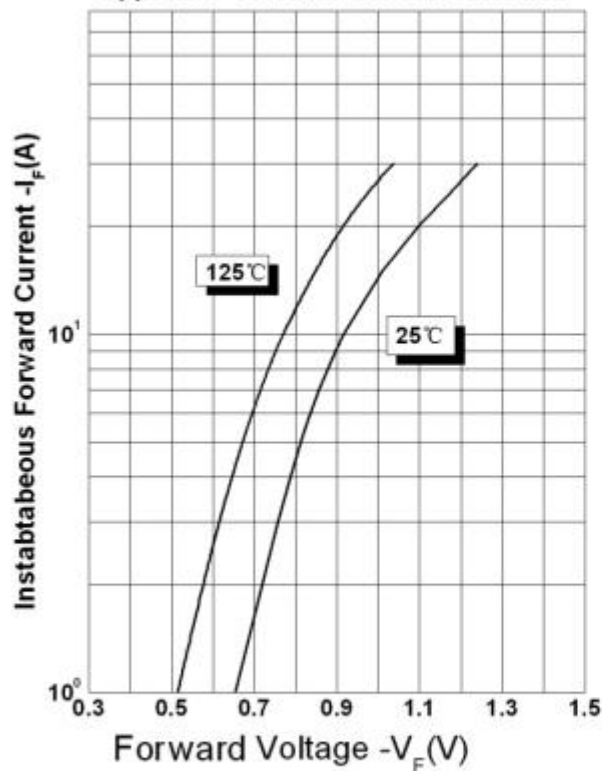


Figure 2  
Typical Reverse Characteristics

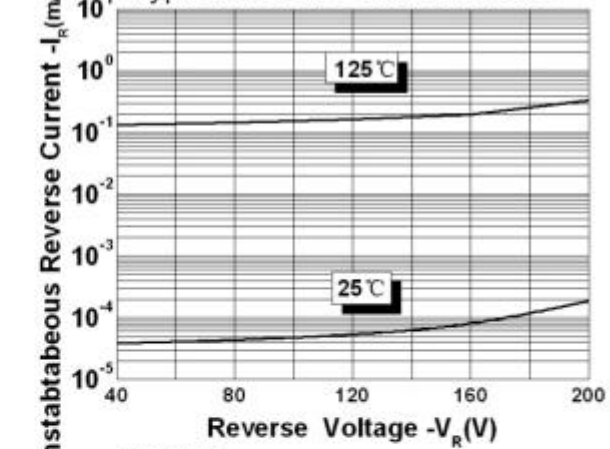
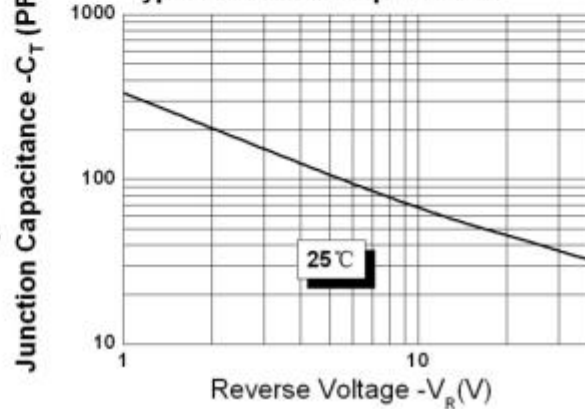
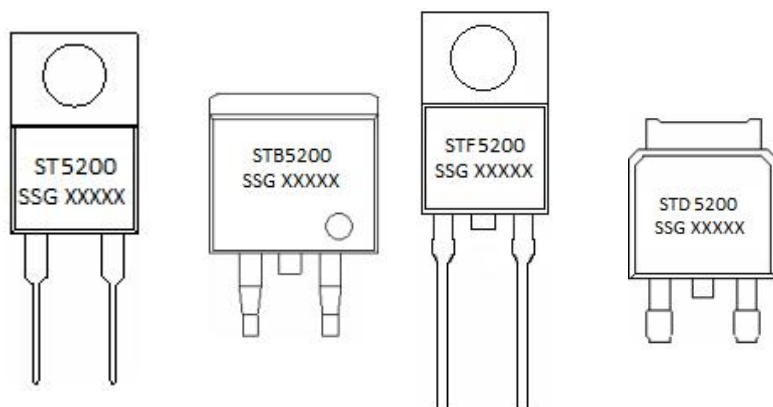


Figure 3  
Typical Junction Capacitance



## Marking Diagram

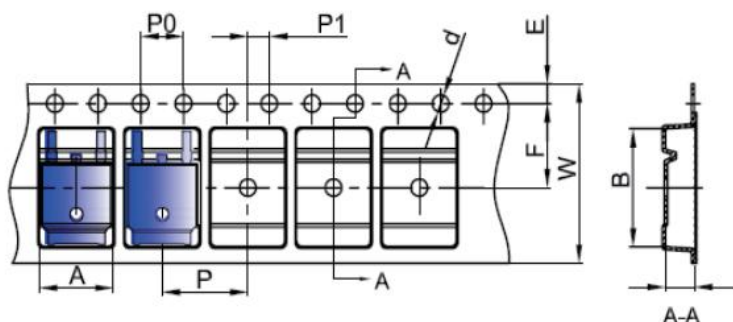


Where XXXXX is YYWWL

ST = Device Type  
B/D/F = Package type  
5 = Forward Current (5A)  
200 = Reverse Voltage (200V)  
SSG = SSG  
YY = Year  
WW = Week  
L = Lot Number

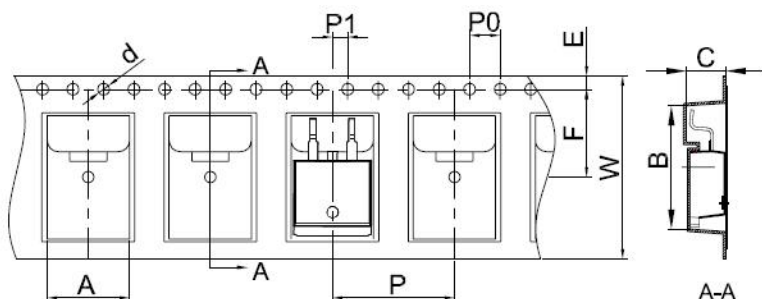
**Cautions:** Molding resin  
Epoxy resin UL:94V-0

## Carrier Tape Specification DPAK



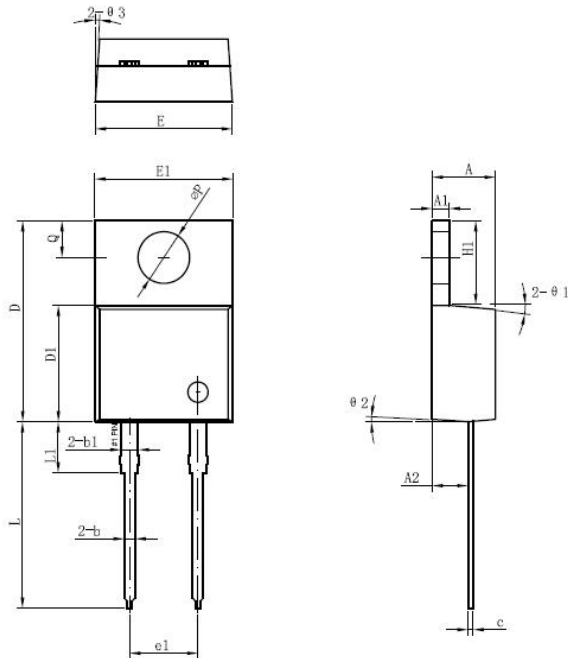
| SYMBOL | Millimeters |       |
|--------|-------------|-------|
|        | Min.        | Max.  |
| A      | 6.80        | 7.00  |
| B      | 10.40       | 10.60 |
| C      | 2.60        | 2.80  |
| d      | Φ1.45       | Φ1.65 |
| E      | 1.65        | 1.85  |
| F      | 7.40        | 7.60  |
| P0     | 3.90        | 4.10  |
| P      | 7.90        | 8.10  |
| P1     | 1.90        | 2.10  |
| W      | 15.90       | 16.30 |

## Carrier Tape Specification D<sup>2</sup>PAK



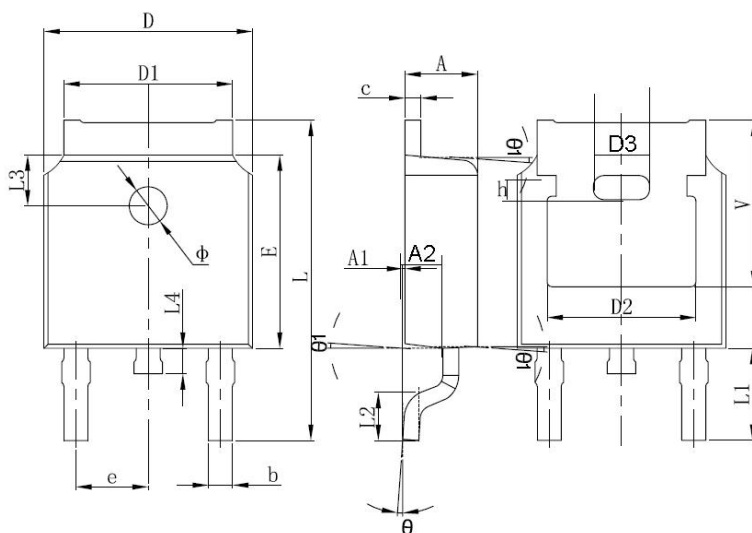
| SYMBOL | Millimeters |       |
|--------|-------------|-------|
|        | Min.        | Max.  |
| A      | 10.70       | 10.90 |
| B      | 16.03       | 16.23 |
| C      | 5.11        | 5.31  |
| d      | 1.45        | 1.65  |
| E      | 1.65        | 1.85  |
| F      | 11.40       | 11.60 |
| P0     | 3.90        | 4.10  |
| P      | 15.90       | 16.10 |
| P1     | 1.90        | 2.10  |
| W      | 23.90       | 24.30 |

## Mechanical Dimensions TO-220AC



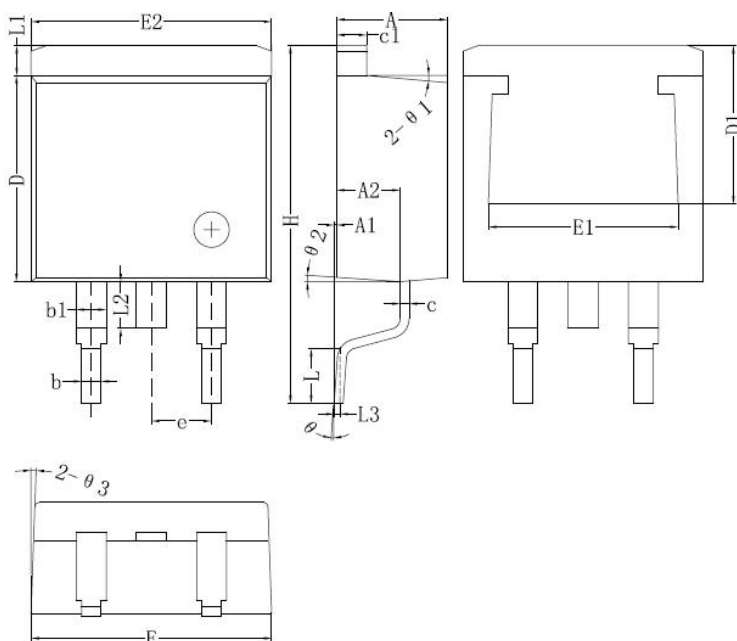
| Symbol | Dimensions in millimeters |         |       |
|--------|---------------------------|---------|-------|
|        | Min.                      | Typical | Max.  |
| A      | 4.47                      | 4.70    | 4.85  |
| A1     | 1.17                      | 1.27    | 1.37  |
| A2     | 2.52                      | 2.69    | 2.89  |
| b      | 0.71                      | 0.81    | 0.96  |
| b1     | 1.17                      | 1.27    | 1.37  |
| c      | 0.31                      | 0.38    | 0.61  |
| D      | 14.64                     | 14.94   | 15.24 |
| D1     | 8.50                      | 8.07    | 8.90  |
| E      | 10.01                     | 10.16   | 10.31 |
| E1     | 9.98                      | 10.18   | 10.38 |
| e1     | 4.98                      | 5.08    | 5.18  |
| H1     | 6.04                      | 6.24    | 6.44  |
| L      | 13.00                     | 13.86   | 14.08 |
| L1     | 3.56                      | 3.80    | 3.96  |
| ΦP     | 3.74                      | 3.84    | 4.04  |
| Q      | 2.54                      | 2.74    | 2.94  |
| Θ1     |                           | 5°      |       |
| Θ2     |                           | 4°      |       |
| Θ3     |                           | 4°      |       |

## Mechanical Dimensions DPAK



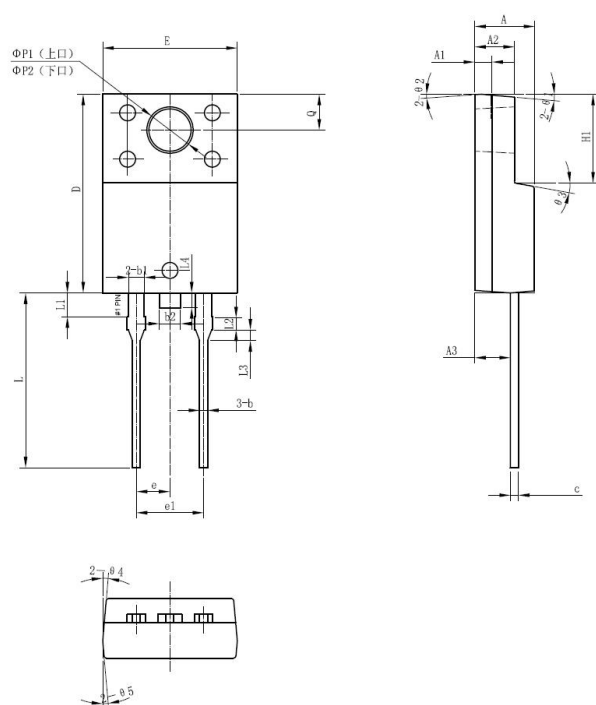
| SYMBOL | Millimeters |       | Inches     |       |
|--------|-------------|-------|------------|-------|
|        | Min.        | Max.  | Min.       | Max.  |
| A      | 2.20        | 2.40  | 0.087      | 0.094 |
| A1     | 0.00        | 0.127 | 0.000      | 0.005 |
| b      | 0.66        | 0.86  | 0.026      | 0.034 |
| c      | 0.46        | 0.60  | 0.018      | 0.024 |
| D      | 6.50        | 6.70  | 0.256      | 0.264 |
| D1     | 5.13        | 5.46  | 0.202      | 0.215 |
| D2     | 4.83 REF.   |       | 0.190 REF. |       |
| E      | 6.00        | 6.20  | 0.236      | 0.244 |
| e      | 2.186       | 2.386 | 0.086      | 0.094 |
| L      | 9.70        | 10.40 | 0.381      | 0.409 |
| L1     | 2.90 REF.   |       | 0.144 REF. |       |
| L2     | 1.40        | 1.70  | 0.055      | 0.067 |
| L3     | 1.60 REF.   |       | 0.063 REF. |       |
| L4     | 0.60        | 1.00  | 0.024      | 0.039 |
| Φ      | 1.10        | 1.30  | 0.043      | 0.051 |
| Θ      | 0°          | 8°    | 0°         | 8°    |
| h      | 0.00        | 0.30  | 0.000      | 0.012 |
| V      | 5.35 REF.   |       | 0.211 REF. |       |

## Mechanical Dimensions D<sup>2</sup>PAK



| Symbol | Dimensions in millimeters |         |       |
|--------|---------------------------|---------|-------|
|        | Min.                      | Typical | Max.  |
| A      | 4.47                      | 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     | 1.17                      | 1.27    | 1.37  |
| c      | 0.31                      | 0.38    | 0.61  |
| c1     | 1.17                      | 1.27    | 1.37  |
| D      | 8.50                      | 8.70    | 8.90  |
| D1     | 6.40                      |         |       |
| E      | 10.01                     | 10.16   | 10.31 |
| E1     | 7.6                       |         |       |
| E2     | 9.98                      | 10.08   | 10.31 |
| e      |                           | 2.54    |       |
| H      | 14.6                      | 15.1    | 15.6  |
| L      | 2.00                      | 2.30    | 2.74  |
| L1     | 1.12                      | 1.27    | 1.42  |
| L2     | 1.30                      |         | 2.20  |
| L3     |                           | 0.25BSC |       |
| e      | 0                         | -       | 8°    |
| e1     |                           | 5°      |       |
| e2     |                           | 4°      |       |
| e3     |                           | 4°      |       |

## Mechanical Dimensions ITO-220AC



| SYMBOL  | Dimensions in millimeters |         |       |
|---------|---------------------------|---------|-------|
|         | Min.                      | Typical | Max.  |
| A       | 4.30                      | 4.50    | 4.70  |
| A1      | 1.10                      | 1.30    | 1.50  |
| A2      | 2.80                      | 3.00    | 3.20  |
| A3      | 2.50                      | 2.70    | 2.90  |
| b       | 0.50                      | 0.60    | 0.75  |
| b1      | 1.10                      | 1.20    | 1.35  |
| b2      | 1.50                      | 1.60    | 1.75  |
| c       | 0.50                      | 0.60    | 0.75  |
| D       | 14.80                     | 15.00   | 15.20 |
| E       | 9.96                      | 10.16   | 10.36 |
| e       | -                         | 2.55    | -     |
| e1      | 5.00                      | 5.10    | 5.16  |
| H1      | 6.50                      | 6.70    | 6.90  |
| L       | 12.70                     | 13.20   | 13.70 |
| L1      | 1.60                      | 1.80    | 2.00  |
| L2      | 0.80                      | 1.00    | 1.20  |
| L3      | 0.60                      | 0.80    | 1.00  |
| L4      | -                         | 1.10    | 1.50  |
| ΦP1(上口) | 3.30                      | 3.50    | 3.70  |
| ΦP2(下口) | 2.99                      | 3.19    | 3.39  |
| Q       | 2.50                      | 2.70    | 2.90  |
| θ1      |                           | 5°      |       |
| θ2      |                           | 4°      |       |
| θ3      |                           | 10°     |       |
| θ4      |                           | 5°      |       |
| θ5      |                           | 5°      |       |



**ST5200**  
**STB5200**  
**STD5200**  
**STF5200**

**Technical Data**  
**Data Sheet N1427, Rev. B**



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