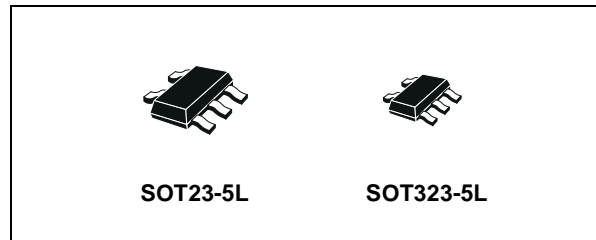




## SINGLE HIGH SPEED BUS SWITCH

- HIGH SPEED:  $t_{PD} = 0.5ns$  (TYP.) at  $V_{CC} = 5V$
- LOW POWER DISSIPATION:  
 $I_{CC} = 1\mu A$ (MAX.) at  $T_A=25^\circ C$
- LOW "ON" RESISTANCE at  $V_{CC}=5.0V$ :  
 $R_{ON} = 7\Omega$  (TYP),  $V_{IN}=0V$ ,  $I_{I/O}=30mA$   
 $R_{ON} = 14\Omega$  (TYP),  $V_{IN}=2.4V$ ,  $I_{I/O}=15mA$
- OPERATING VOLTAGE RANGE:  
 $V_{CC}$  (OPR.) = 4.0V TO 5.5V
- 5V TOLERANT ON CONTROL PIN
- COMPATIBLE WITH TTL OUTPUTS:  
 $V_{IH} = 2V$  (MIN),  $V_{IL} = 0.8V$  (MAX)



### DESCRIPTION

The 74V1T384 is an advanced high-speed CMOS SINGLE HIGH SPEED BUS SWITCH fabricated in silicon gate C<sup>2</sup>MOS technology. It's designed to operate from 4V to 5.5V, making this device ideal for portable applications. It's offers 7Ω Resistance typical value at  $V_{CC}=5V$ . Additional key feature are fast switching speed ( $t_{ON}=3.8ns$ ,  $t_{OFF}=3.3ns$  Typical) and Low Power Consumption.

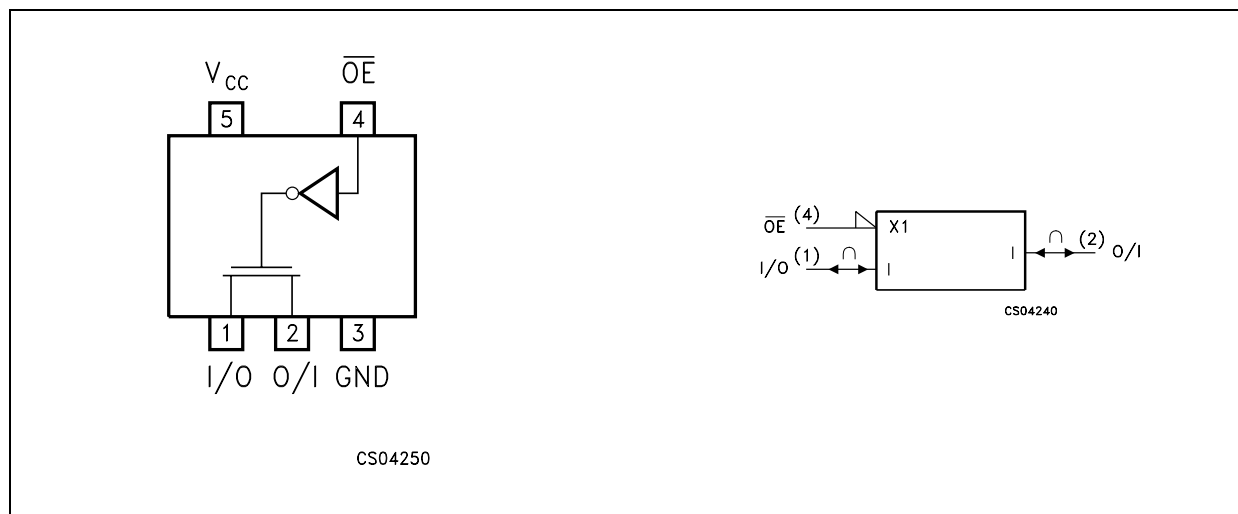
The  $\overline{OE}$  input is provided to control the switch; the switch is ON when the  $\overline{OE}$  input is held low and OFF when  $\overline{OE}$  is held high.

### ORDER CODES

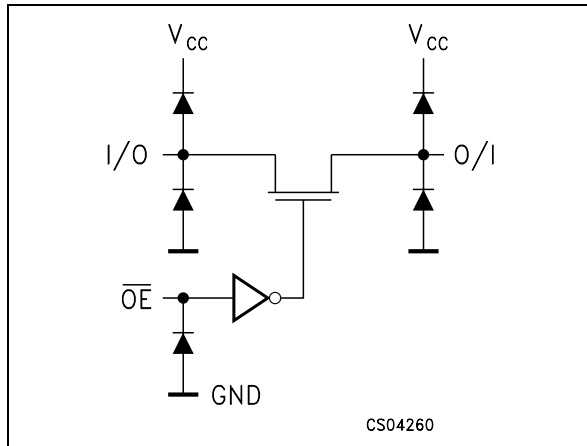
| PACKAGE   | T & R       |
|-----------|-------------|
| SOT23-5L  | 74V1T384STR |
| SOT323-5L | 74V1T384CTR |

It's available in the commercial and extended temperature range in SOT23-5L and SC-70-5L package.

### PIN CONNECTION AND IEC LOGIC SYMBOLS



## INPUT EQUIVALENT CIRCUIT



## PIN DESCRIPTION

| PIN No | SYMBOL          | NAME AND FUNCTION          |
|--------|-----------------|----------------------------|
| 1      | I/O             | Independent Input/Output   |
| 2      | O/I             | Independent Output/Input   |
| 4      | $\overline{OE}$ | Enable Input (Active HIGH) |
| 3      | GND             | Ground (0V)                |
| 5      | $V_{CC}$        | Positive Supply Voltage    |

## TRUTH TABLE

| $\overline{OE}$ | SWITCH FUNCTION |
|-----------------|-----------------|
| L               | ON              |
| H               | OFF *           |

\* High Impedance State

## ABSOLUTE MAXIMUM RATINGS

| Symbol                | Parameter                      | Value                  | Unit |
|-----------------------|--------------------------------|------------------------|------|
| $V_{CC}$              | Supply Voltage                 | -0.5 to +7.0           | V    |
| $V_I$                 | DC Input Voltage               | -0.5 to $V_{CC} + 0.5$ | V    |
| $V_{IC}$              | DC Control Input Voltage       | -0.5 to +7.0           | V    |
| $V_O$                 | DC Output Voltage              | -0.5 to $V_{CC} + 0.5$ | V    |
| $I_{IK}$              | DC Input Diode Current         | $\pm 20$               | mA   |
| $I_{IK}$              | DC Control Input Diode Current | - 20                   | mA   |
| $I_{OK}$              | DC Output Diode Current        | $\pm 20$               | mA   |
| $I_O$                 | DC Output Current              | $\pm 50$               | mA   |
| $I_{CC}$ or $I_{GND}$ | DC $V_{CC}$ or Ground Current  | $\pm 50$               | mA   |
| $T_{stg}$             | Storage Temperature            | -65 to +150            | °C   |
| $T_L$                 | Lead Temperature (10 sec)      | 300                    | °C   |

Absolute Maximum Ratings are those values beyond which damage to the device may occur. Functional operation under these conditions is not implied.

## RECOMMENDED OPERATING CONDITIONS

| Symbol   | Parameter   | Value         | Unit |
|----------|---|---------------|------|
| $V_{CC}$ | Supply Voltage                                    | 4.0 to 5.5    | V    |
| $V_I$    | Input Voltage                                     | 0 to $V_{CC}$ | V    |
| $V_{IC}$ | Control Input Voltage                             | 0 to 5.5      | V    |
| $V_O$    | Output Voltage                                    | 0 to $V_{CC}$ | V    |
| $T_{op}$ | Operating Temperature                             | -55 to 125    | °C   |
| dt/dv    | Input Rise and Fall Time (note 1) $V_{CC} = 5.0V$ | 0 to 20       | ns/V |

1)  $V_{IN}$  from 0.8V to 2V on control pin

## DC SPECIFICATIONS

| Symbol            | Parameter                                 | Test Condition         |   | Value                 |      |       |             |       |              | Unit  |      |
|-------------------|---|------------------------|---|-----------------------|------|-------|-------------|-------|--------------|-------|------|
|                   |   | V <sub>CC</sub><br>(V) |   | T <sub>A</sub> = 25°C |      |       | -40 to 85°C |       | -55 to 125°C |       |      |
|                   |   |                        |   | Min.                  | Typ. | Max.  | Min.        | Max.  | Min.         |       | Max. |
| V <sub>IH</sub>   | High Level Input Voltage                  | 5.0(*)                 |   | 2                     |      |       | 2           |       | 2            |       | V    |
| V <sub>IL</sub>   | Low Level Input Voltage                   | 5.0(*)                 |   |                       |      | 0.8   |             | 0.8   |              | 0.8   | V    |
| V <sub>IH</sub>   | High Level Input Voltage                  | 4.0                    |   | 2                     |      |       | 2           |       | 2            |       | V    |
| V <sub>IL</sub>   | Low Level Input Voltage                   | 4.0                    |   |                       |      | 0.8   |             | 0.8   |              | 0.8   | V    |
| R <sub>ON</sub>   | ON Resistance                             | 4.5                    | V <sub>IC</sub> = V <sub>IL</sub><br>V <sub>I/O</sub> = GND<br>I <sub>I/O</sub> ≤ 30 mA                                   |                       | 7    |       |             | 10    |              | 15    | Ω    |
| R <sub>ON</sub>   | ON Resistance                             | 4.5                    | V <sub>IC</sub> = V <sub>IL</sub><br>V <sub>I/O</sub> = 2.4V<br>I <sub>I/O</sub> ≤ 10 mA                                  |                       | 20   |       |             | 40    |              | 60    | Ω    |
| I <sub>OFF</sub>  | Input/Output Leakage Current (SWITCH OFF) | 5.5                    | V <sub>OS</sub> = V <sub>CC</sub> to GND<br>V <sub>IS</sub> = V <sub>CC</sub> to GND<br>V <sub>IC</sub> = V <sub>IH</sub> |                       |      | ±0.1  |             | ± 1   |              | ± 10  | μA   |
| I <sub>IN</sub>   | Control Input Leakage Current             | 0 to 5.5               | V <sub>IC</sub> = 5.5V or GND   |                       |      | ± 0.1 |             | ± 1.0 |              | ± 1.0 | μA   |
| I <sub>CC</sub>   | Quiescent Supply Current                  | 5.5                    | V <sub>I</sub> = V <sub>CC</sub> or GND   |                       |      | 1     |             | 10    |              | 20    | μA   |
| Δ I <sub>CC</sub> | Additional Worst Case Supply Current      | 5.5                    | $\bar{C}$ Input at 3.4V   |                       |      | 1.35  |             | 1.5   |              | 1.5   | mA   |

(\*) Voltage range is 5V ± 0.5V

AC ELECTRICAL CHARACTERISTICS (C<sub>L</sub> = 50pF, Input t<sub>r</sub> = t<sub>f</sub> = 3ns)

| Symbol                               | Parameter           | Test Condition         |   | Value                 |      |      |             |      |              | Unit |      |
|--------------------------------------|---------------------|------------------------|---|-----------------------|------|------|-------------|------|--------------|------|------|
|                                      |                     | V <sub>CC</sub><br>(V) |   | T <sub>A</sub> = 25°C |      |      | -40 to 85°C |      | -55 to 125°C |      |      |
|                                      |                     |                        |   | Min.                  | Typ. | Max. | Min.        | Max. | Min.         |      | Max. |
| t <sub>PD</sub>                      | Delay Time          | 5.0(*)                 | t <sub>r</sub> = t <sub>f</sub> = 6ns                                     |                       | 0.5  | 0.8  |             | 1.0  |              | 2.0  | ns   |
| t <sub>PLZ</sub><br>t <sub>PHZ</sub> | Output Disable Time | 5.0(*)                 | C <sub>L</sub> = 50pF<br>R <sub>1</sub> = 500 Ω<br>V <sub>IN</sub> = 2.4V |                       | 3.8  | 6.5  |             | 9.0  |              | 10.0 | ns   |
| t <sub>PZL</sub><br>t <sub>PZH</sub> | Output Enable Time  | 5.0(*)                 | C <sub>L</sub> = 50pF<br>R <sub>1</sub> = 1KΩ<br>V <sub>IN</sub> = 2.4V   |                       | 3.3  | 5.0  |             | 7.5  |              | 8.5  | ns   |

(\*) Voltage range is 5.0V ± 0.5V

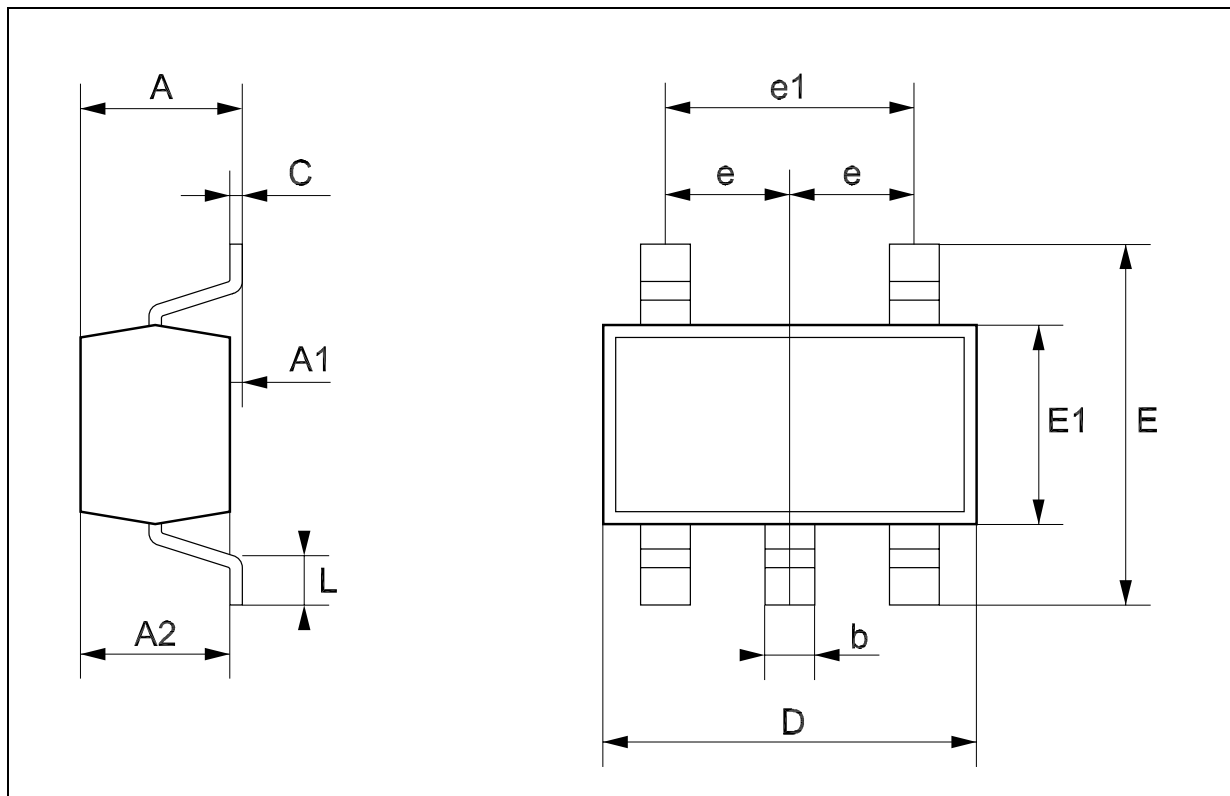
## CAPACITIVE CHARACTERISTICS

| Symbol           | Parameter                              | Test Condition | Value                 |      |      |             |      |              | Unit |      |
|------------------|--|----------------|-----------------------|------|------|-------------|------|--------------|------|------|
|                  |  |                | T <sub>A</sub> = 25°C |      |      | -40 to 85°C |      | -55 to 125°C |      |      |
|                  |  |                | Min.                  | Typ. | Max. | Min.        | Max. | Min.         |      | Max. |
| C <sub>IN</sub>  | Input Capacitance                      |                |                       | 4    | 10   |             |      | 10           |      | pF   |
| C <sub>I/O</sub> | Output Capacitance                     |                |                       | 7    |      |             |      |              |      | pF   |
| C <sub>PD</sub>  | Power Dissipation Capacitance (note 1) |                |                       | 3    |      |             |      |              |      | pF   |

1) C<sub>PD</sub> is defined as the value of the IC's internal equivalent capacitance which is calculated from the operating current consumption without load. (Refer to Test Circuit). Average operating current can be obtained by the following equation.  $I_{CC(oper)} = C_{PD} \times V_{CC} \times f_{IN} + I_{CC}$

## SOT23-5L MECHANICAL DATA

| DIM. | mm.  |      |      | mils  |      |       |
|------|------|------|------|-------|------|-------|
|      | MIN. | TYP. | MAX. | MIN.  | TYP. | MAX.  |
| A    | 0.90 |      | 1.45 | 35.4  |      | 57.1  |
| A1   | 0.00 |      | 0.15 | 0.0   |      | 5.9   |
| A2   | 0.90 |      | 1.30 | 35.4  |      | 51.2  |
| b    | 0.35 |      | 0.50 | 13.7  |      | 19.7  |
| C    | 0.09 |      | 0.20 | 3.5   |      | 7.8   |
| D    | 2.80 |      | 3.00 | 110.2 |      | 118.1 |
| E    | 2.60 |      | 3.00 | 102.3 |      | 118.1 |
| E1   | 1.50 |      | 1.75 | 59.0  |      | 68.8  |
| e    |      | 0.95 |      |       | 37.4 |       |
| e1   |      | 1.9  |      |       | 74.8 |       |
| L    | 0.35 |      | 0.55 | 13.7  |      | 21.6  |



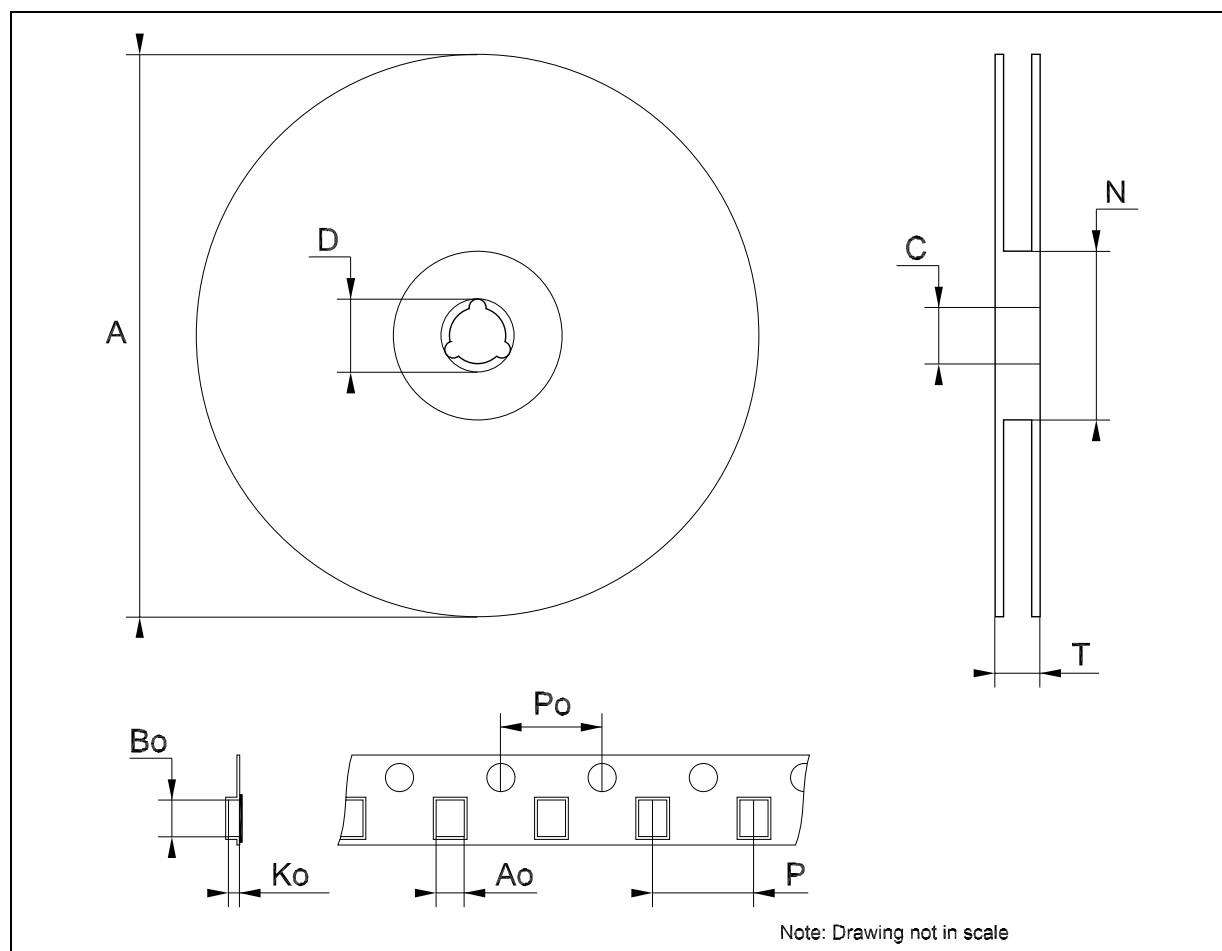
## SOT323-5L MECHANICAL DATA

| DIM. | mm.  |      |      | mils |      |      |
|------|------|------|------|------|------|------|
|      | MIN. | TYP. | MAX. | MIN. | TYP. | MAX. |
| A    | 0.80 |      | 1.10 | 31.5 |      | 43.3 |
| A1   | 0.00 |      | 0.10 | 0.0  |      | 3.9  |
| A2   | 0.80 |      | 1.00 | 31.5 |      | 39.4 |
| b    | 0.15 |      | 0.30 | 5.9  |      | 11.8 |
| C    | 0.10 |      | 0.18 | 3.9  |      | 7.1  |
| D    | 1.80 |      | 2.20 | 70.9 |      | 86.6 |
| E    | 1.80 |      | 2.40 | 70.9 |      | 94.5 |
| E1   | 1.15 |      | 1.35 | 45.3 |      | 53.1 |
| e    |      | 0.65 |      |      | 25.6 |      |
| e1   |      | 1.3  |      |      | 51.2 |      |
| L    | 0.10 |      | 0.30 | 3.9  |      | 11.8 |



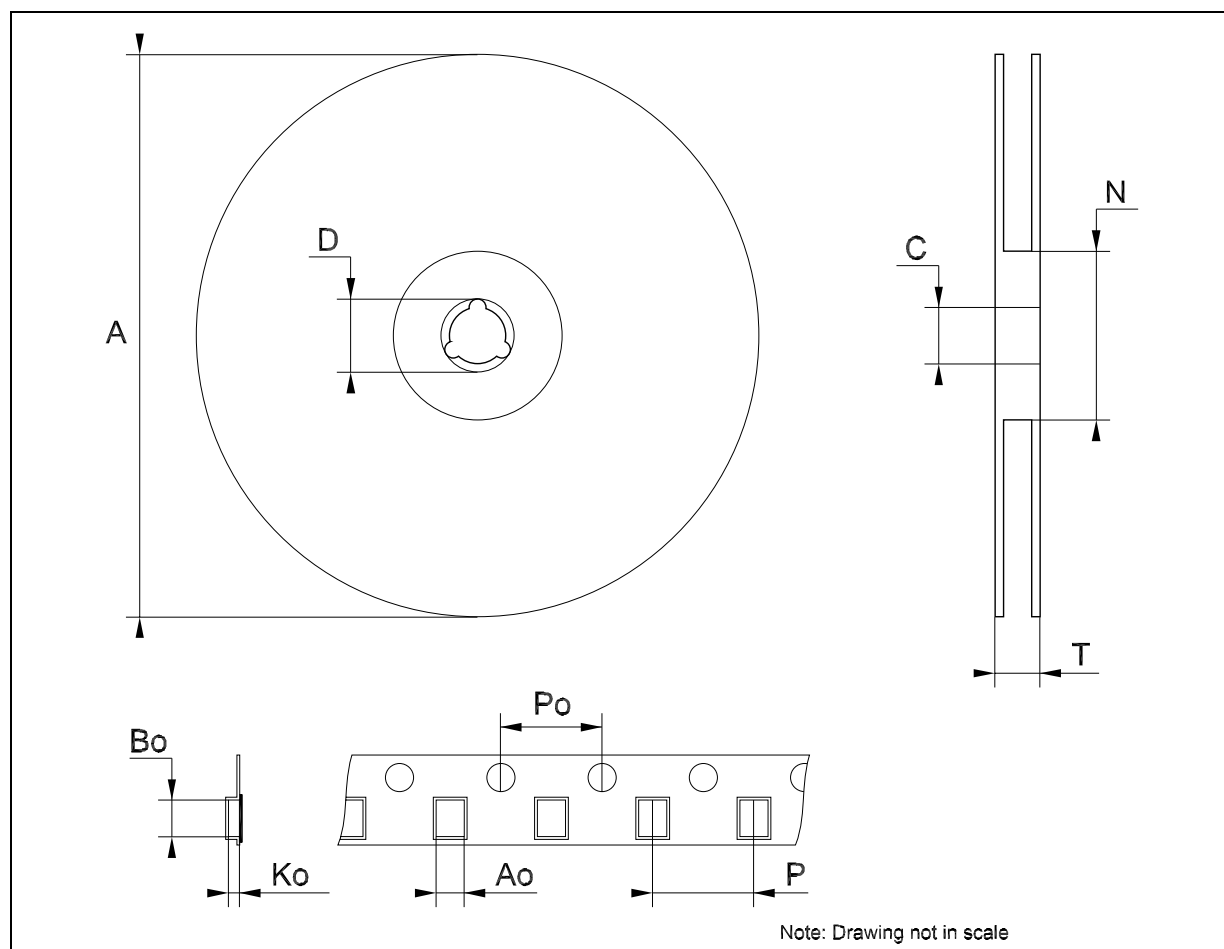
## Tape &amp; Reel SOT23-xL MECHANICAL DATA

| DIM. | mm.  |      |      | inch  |       |       |
|------|------|------|------|-------|-------|-------|
|      | MIN. | TYP  | MAX. | MIN.  | TYP.  | MAX.  |
| A    |      |      | 180  |       |       | 7.086 |
| C    | 12.8 | 13.0 | 13.2 | 0.504 | 0.512 | 0.519 |
| D    | 20.2 |      |      | 0.795 |       |       |
| N    | 60   |      |      | 2.362 |       |       |
| T    |      |      | 14.4 |       |       | 0.567 |
| Ao   | 3.13 | 3.23 | 3.33 | 0.123 | 0.127 | 0.131 |
| Bo   | 3.07 | 3.17 | 3.27 | 0.120 | 0.124 | 0.128 |
| Ko   | 1.27 | 1.37 | 1.47 | 0.050 | 0.054 | 0.058 |
| Po   | 3.9  | 4.0  | 4.1  | 0.153 | 0.157 | 0.161 |
| P    | 3.9  | 4.0  | 4.1  | 0.153 | 0.157 | 0.161 |



## Tape &amp; Reel SOT323-xL MECHANICAL DATA

| DIM. | mm.  |      |      | inch  |       |       |
|------|------|------|------|-------|-------|-------|
|      | MIN. | TYP  | MAX. | MIN.  | TYP.  | MAX.  |
| A    | 175  | 180  | 185  | 6.889 | 7.086 | 7.283 |
| C    | 12.8 | 13   | 13.2 | 0.504 | 0.512 | 0.519 |
| D    | 20.2 |      |      | 0.795 |       |       |
| N    | 59.5 | 60   | 60.5 |       | 2.362 |       |
| T    |      |      | 14.4 |       |       | 0.567 |
| Ao   |      | 2.25 |      |       | 0.088 |       |
| Bo   |      | 2.7  |      |       | 0.106 |       |
| Ko   |      | 1.2  |      |       | 0.047 |       |
| Po   | 3.98 | 4    | 4.2  | 0.156 | 0.157 | 0.165 |
| P    | 3.98 | 4    | 4.2  | 0.156 | 0.157 | 0.165 |





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