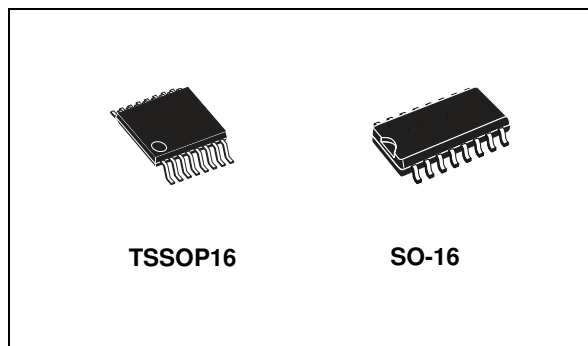


CMOS quad 3-state differential line receiver

Datasheet - production data



The ST26C32AB has an input sensitivity of 200 mV over the common mode input voltage range of ± 7 V. The ST26C32AB features internal pull-up and pull-down resistors which prevent output oscillation on unused channels. The ST26C32AB provides an enable and disable function to all four receivers and features 3-state output with 6 mA source and sink capability.

Features

- CMOS design for low power
- ± 0.2 V sensitivity over input common mode voltage range
- Typical propagation delay: 19 ns
- Typical input hysteresis: 60 mV
- Input will not load line when $V_{CC} = 0$ V
- Meets the requirements of EIA standard RS-422, RS-423
- 3-state outputs for connection to system buses
- Available in surface mount

Description

The ST26C32AB is a quad differential line receiver designed to meet the RS-422, RS-423 standards for balanced and unbalanced digital data transmission, while retaining the low power characteristics of CMOS.

Table 1. Device summary

| Order codes | Temperature range | Package | Packaging |
|-------------|-------------------|-------------------------|---------------------|
| ST26C32ABDR | -40 to 85 °C | SO-16 (tape and reel) | 2500 parts per reel |
| ST26C32ABTR | -40 to 85 °C | TSSOP16 (tape and reel) | 2500 parts per reel |

Contents

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1 Pin configuration

Figure 1. Pin connections

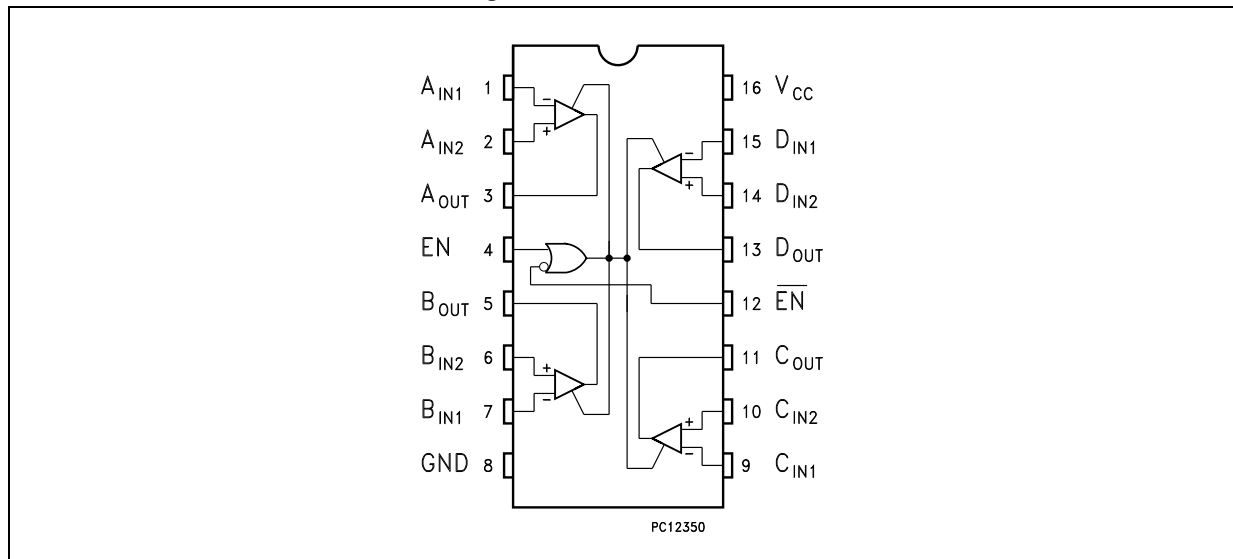


Table 2. Pin description

| Pin n° | Symbol | Name and function |
|--------|-----------|-------------------|
| 1 | A_{IN1} | Input A1 |
| 2 | A_{IN2} | Input A2 |
| 3 | A_{OUT} | Channel A Output |
| 4 | EN | ENABLE |
| 5 | B_{OUT} | Channel B Output |
| 6 | B_{IN2} | Input B2 |
| 7 | B_{IN1} | Input B1 |
| 8 | GND | Ground |
| 9 | C_{IN1} | Input C1 |
| 10 | C_{IN2} | Input C2 |
| 11 | C_{OUT} | Channel C output |
| 12 | EN | ENABLE |
| 13 | D_{OUT} | Channel D output |
| 14 | D_{IN2} | Input D2 |
| 15 | D_{IN1} | Input D1 |
| 16 | V_{CC} | Supply voltage |

Table 3. Truth table

| Enable | Enable | Input | Output |
|---|--------|---------------------------|--------|
| L | H | X | Z |
| All other combinations of enable inputs | | $V_{ID} \geq V_{TH(MAX)}$ | H |
| | | $V_{ID} \leq V_{TH(MIN)}$ | L |
| | | Open | H |

Note: *L = Low voltage state*
H = High logic state
X = Don't care
Z = High impedance

2 Maximum ratings

Table 4. Absolute maximum ratings (1) (2)

| Symbol | Parameter | Value | Unit |
|------------|----------------------------|-------------|------|
| V_{CC} | Supply voltage | 7 | V |
| V_{CM} | Input common mode range | ± 14 | V |
| V_{DIFF} | Differential input voltage | ± 14 | V |
| V_{IN} | Enable input voltage | 7 | V |
| I_{OMAX} | Maximum current per output | ± 25 | mA |
| T_{STG} | Storage temperature range | -65 to +150 | °C |

1. Absolute maximum ratings are those values beyond which the safety of the device cannot be guaranteed. They are not meant to imply that the device should be operated at these limits. The table of electrical characteristics provide conditions for actual device operation.
2. Unless otherwise specified, all voltage are referenced to ground. All currents into the device pins are positive; all currents out of the device pins are negative.

Table 5. Recommended operating conditions

| Symbol | Parameter | Value | Unit |
|------------|---|------------|------|
| V_{CC} | Supply voltage | 4.5 to 5.5 | V |
| T_A | Operating temperature range | -40 to +85 | °C |
| t_r, t_f | Maximum enable input rise or fall times | 500 | ns |

3 Electrical characteristics

Table 6. Electrical characteristics ($V_{CC} = 5\text{ V} \pm 10\%$, unless otherwise specified ⁽¹⁾)

| Symbol | Parameter | Test conditions | Value | | | Unit |
|------------|---|--|-------|-----------|---------|---------------|
| | | | Min. | Typ. | Max. | |
| V_{TH} | Minimum differential input voltage | $V_{OUT} = V_{OH}$ or V_{OL} , $-7\text{V} < V_{CM} < 7\text{V}$ | -200 | 35 | 200 | mV |
| R_{IN} | Input resistance | $V_{IN} = -7\text{V}$, 7V , other input = GND | 5 | 6.8 | 10 | k Ω |
| I_{IN} | Input current | $V_{IN} = 10\text{V}$, other input = GND | | 1.1 | 1.5 | mA |
| | | $V_{IN} = -10\text{V}$, other input = GND | | -2 | -2.5 | |
| V_{OH} | High level output voltage | $V_{DIFF} = 1\text{V}$, $I_{OUT} = -6\text{mA}$ | 3.8 | 4.2 | | V |
| V_{OL} | Low level output voltage | $V_{DIFF} = -1\text{V}$, $I_{OUT} = 6\text{mA}$ | | 0.2 | 0.3 | V |
| V_{IH} | Minimum enable high input level voltage | | 2 | | | V |
| V_{IL} | Minimum enable low input level voltage | | | | 0.8 | V |
| I_{OZ} | 3-state output leakage current | $V_{OUT} = V_{CC}$ or GND ENABLE = V_{IL} , ENABLE = V_{IH} | | ± 0.5 | ± 5 | μA |
| I_I | Maximum enable input current | $V_{IN} = V_{CC}$ or GND | | | ± 1 | μA |
| I_{CC} | Quiescent power supply current | $V_{CC} = \text{Max}$, $V_{(DIFF)} = 1\text{V}$ | | 16 | 23 | mA |
| V_{HYST} | Input hysteresis | $V_{CM} = 0\text{V}$ | | 60 | | mV |

1. Unless otherwise specified, min./max. limits apply across the recommended operating temperature range. All typical are given for $V_{CC} = 5\text{ V}$ and $T_A = 25\text{ }^\circ\text{C}$

Table 7. Switching characteristics ($V_{CC} = 5\text{ V} \pm 10\%$, ⁽¹⁾)

| Symbol | Parameter | Test conditions | Value | | | Unit |
|--------------------------|------------------------------------|--|-------|------|------|---------|
| | | | Min. | Typ. | Max. | |
| t_{PLH} t_{PHL} | Propagation delay input to output | $C_L = 50\text{pF}$, $V_{DIFF} = 2.5\text{V}$, $V_{CM} = 0\text{V}$ | | 19 | 30 | ns |
| t_{RISE} t_{FALL} | Output rise and fall times | $C_L = 50\text{pF}$, $V_{DIFF} = 2.5\text{V}$, $V_{CM} = 0\text{V}$ | | 4 | 9 | ns |
| t_{PZH} t_{PZL} | Propagation enable time to output | $C_L = 50\text{pF}$, $V_{DIFF} = 2.5\text{V}$, $R_L = 1000\Omega$ | | 13 | 23 | ns |
| t_{PHZ} t_{PLZ} | Propagation disable time to output | $C_L = 50\text{pF}$, $V_{DIFF} = 2.5\text{V}$, $R_L = 1000\Omega$ | | 13 | 22 | ns |
| D_R | Data rate | $C_L = 50\text{pF}$, $V_{DIFF} = 2.5\text{V}$ All outputs loaded and switching | 10 | 20 | | Mbits/s |

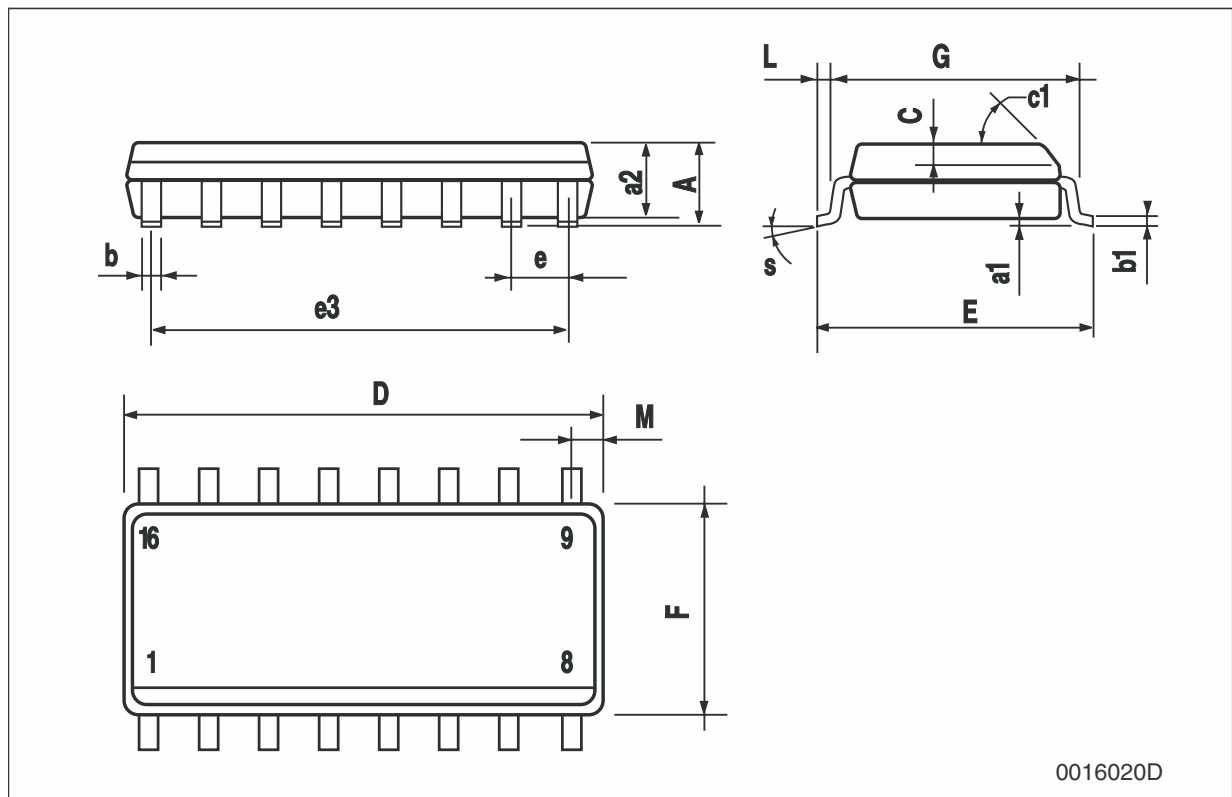
1. Unless otherwise specified, min./max. limits apply across the recommended operating temperature range. All typical are given for $V_{CC} = 5\text{ V}$ and $T_A = 25\text{ }^\circ\text{C}$

4 Package mechanical data

In order to meet environmental requirements, ST offers these devices in different grades of ECOPACK packages, depending on their level of environmental compliance. ECOPACK specifications, grade definitions and product status are available at: www.st.com. ECOPACK is an ST trademark.

SO-16 mechanical data

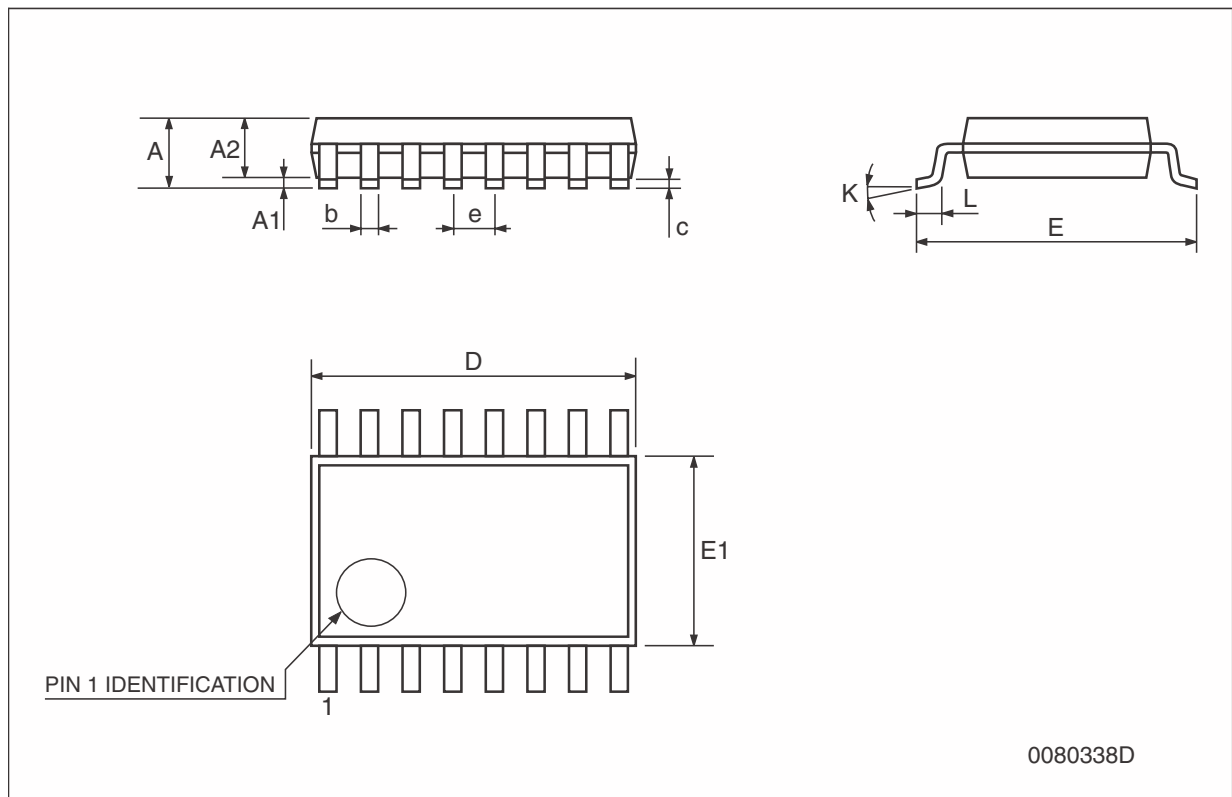
| Dim. | mm. | | | inch. | | |
|------|------------|------|------|-------|-------|-------|
| | Min. | Typ. | Max. | Min. | Typ. | Max. |
| A | | | 1.75 | | | 0.068 |
| a1 | 0.1 | | 0.25 | 0.004 | | 0.010 |
| a2 | | | 1.64 | | | 0.063 |
| b | 0.35 | | 0.46 | 0.013 | | 0.018 |
| b1 | 0.19 | | 0.25 | 0.007 | | 0.010 |
| C | | 0.5 | | | 0.019 | |
| c1 | 45° (typ.) | | | | | |
| D | 9.8 | | 10 | 0.385 | | 0.393 |
| E | 5.8 | | 6.2 | 0.228 | | 0.244 |
| e | | 1.27 | | | 0.050 | |
| e3 | | 8.89 | | | 0.350 | |
| F | 3.8 | | 4.0 | 0.149 | | 0.157 |
| G | 4.6 | | 5.3 | 0.181 | | 0.208 |
| L | 0.5 | | 1.27 | 0.019 | | 0.050 |
| M | | | 0.62 | | | 0.024 |
| S | 8° (max.) | | | | | |



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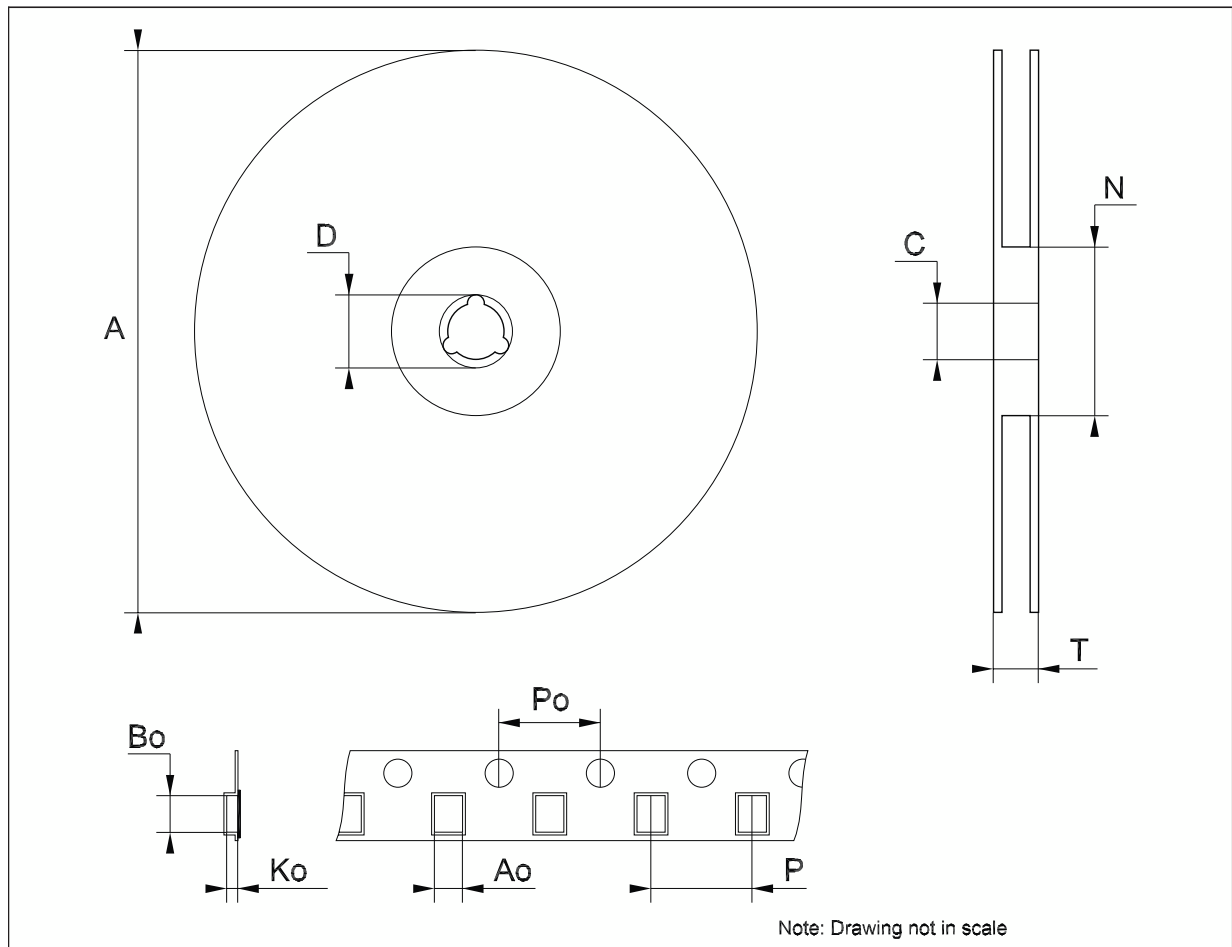
TSSOP16 mechanical data

| Dim. | mm. | | | inch. | | |
|------|------|----------|------|-------|------------|--------|
| | Min. | Typ. | Max. | Min. | Typ. | Max. |
| A | | | 1.2 | | | 0.047 |
| A1 | 0.05 | | 0.15 | 0.002 | 0.004 | 0.006 |
| A2 | 0.8 | 1 | 1.05 | 0.031 | 0.039 | 0.041 |
| b | 0.19 | | 0.30 | 0.007 | | 0.012 |
| c | 0.09 | | 0.20 | 0.004 | | 0.0079 |
| D | 4.9 | 5 | 5.1 | 0.193 | 0.197 | 0.201 |
| E | 6.2 | 6.4 | 6.6 | 0.244 | 0.252 | 0.260 |
| E1 | 4.3 | 4.4 | 4.48 | 0.169 | 0.173 | 0.176 |
| e | | 0.65 BSC | | | 0.0256 BSC | |
| K | 0° | | 8° | 0° | | 8° |
| L | 0.45 | 0.60 | 0.75 | 0.018 | 0.024 | 0.030 |



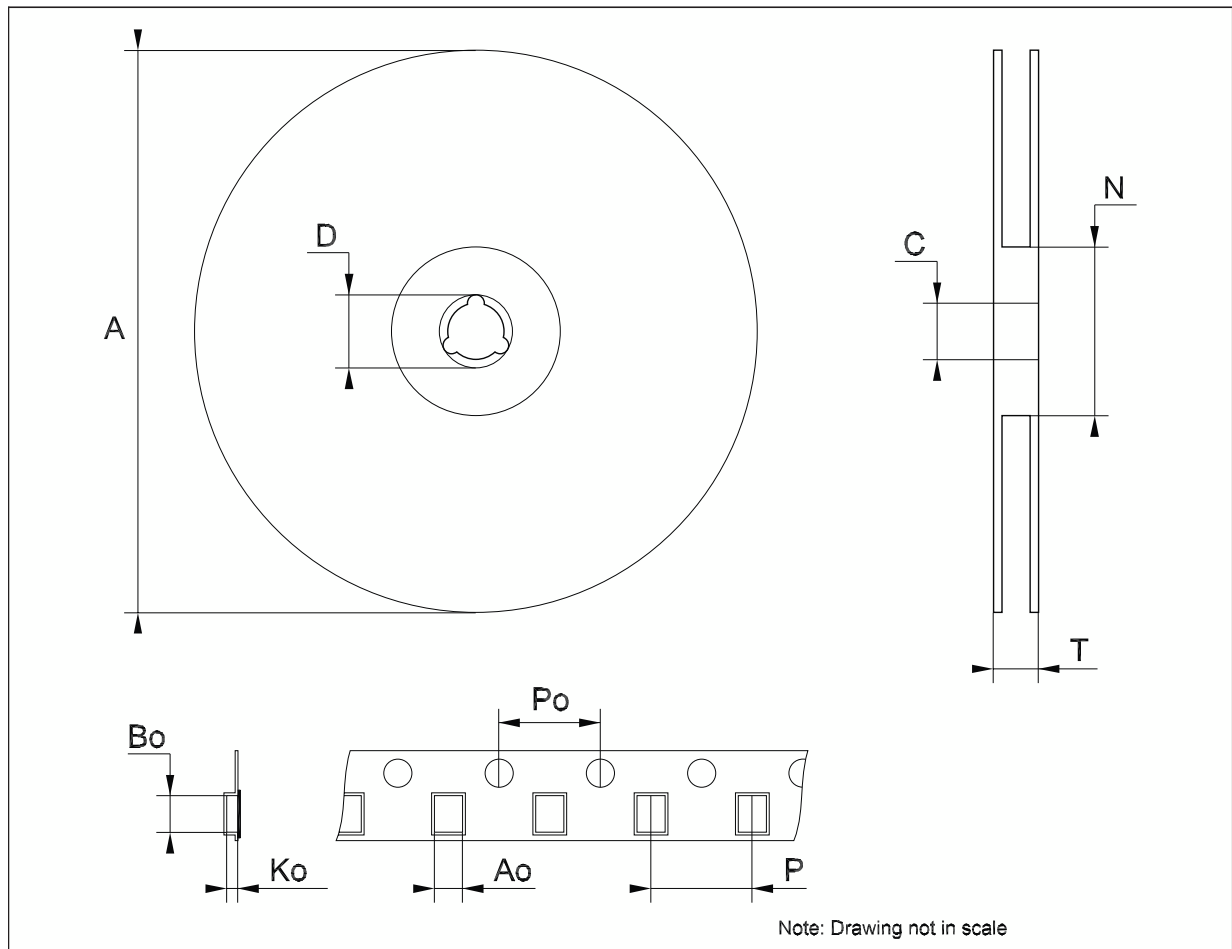
Tape & reel SO-16 mechanical data

| Dim. | mm. | | | inch. | | |
|------|------|------|------|-------|------|--------|
| | Min. | Typ. | Max. | Min. | Typ. | Max. |
| A | | | 330 | | | 12.992 |
| C | 12.8 | | 13.2 | 0.504 | | 0.519 |
| D | 20.2 | | | 0.795 | | |
| N | 60 | | | 2.362 | | |
| T | | | 22.4 | | | 0.882 |
| Ao | 6.45 | | 6.65 | 0.254 | | 0.262 |
| Bo | 10.3 | | 10.5 | 0.406 | | 0.414 |
| Ko | 2.1 | | 2.3 | 0.082 | | 0.090 |
| Po | 3.9 | | 4.1 | 0.153 | | 0.161 |
| P | 7.9 | | 8.1 | 0.311 | | 0.319 |



Tape & reel TSSOP16 mechanical data

| Dim. | mm. | | | inch. | | |
|------|------|------|------|-------|------|--------|
| | Min. | Typ. | Max. | Min. | Typ. | Max. |
| A | | | 330 | | | 12.992 |
| C | 12.8 | | 13.2 | 0.504 | | 0.519 |
| D | 20.2 | | | 0.795 | | |
| N | 60 | | | 2.362 | | |
| T | | | 22.4 | | | 0.882 |
| Ao | 6.7 | | 6.9 | 0.264 | | 0.272 |
| Bo | 5.3 | | 5.5 | 0.209 | | 0.217 |
| Ko | 1.6 | | 1.8 | 0.063 | | 0.071 |
| Po | 3.9 | | 4.1 | 0.153 | | 0.161 |
| P | 7.9 | | 8.1 | 0.311 | | 0.319 |



5 Revision history

Table 8. Document revision history

| Date | Revision | Changes |
|-------------|----------|--|
| 02-May-2006 | 3 | Order codes updated. |
| 12-Jun-2008 | 4 | Added: Table 1 on page 1 . |
| 02-Sep-2022 | 5 | Removed: DIP-16 package. Updated: Table 1 . |

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