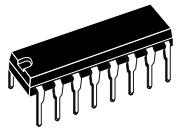
ST26C32A

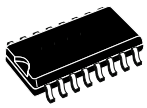
CMOS quad tri-state differential line receiver

General features

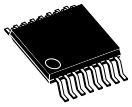
- CMOS design for low power
- ±0.2V sensitivity over input common mode voltage range
- Typical propagation delay: 19ns
- Typical input hysteresis: 60mV
- Input will not load line when V_{CC} = 0V
- Meets the requirements of EIA standard RS-422, RS-423
- 3-state outputs for connection to system buses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



DIP-16



SO-16



TSSOP16

Description

The ST26C32A 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.

The ST26C32A has an input sensitivity of 200mV over the common mode input voltage range of ±7V. The ST26C32A features internal pull-up and pull-down resistors which prevent output oscillation on unused channels. The ST26C32A provides an enable and disable function to all four receivers and features 3-STATE output with 6mA source and sink capability.

Order code

Part number	Temperature range	Package	Packaging
ST26C32ABN	-40 to 85 °C	DIP-16	25 parts per tube / 40 tube per box
ST26C32ABDR	-40 to 85 °C	SO-16 (Tape & Reel)	2500 parts per reel
ST26C32ABTR	-40 to 85 °C	TSSOP16 (Tape & Reel)	2500 parts per reel

Contents

1 Pin configuration

Figure 1. Pin connections

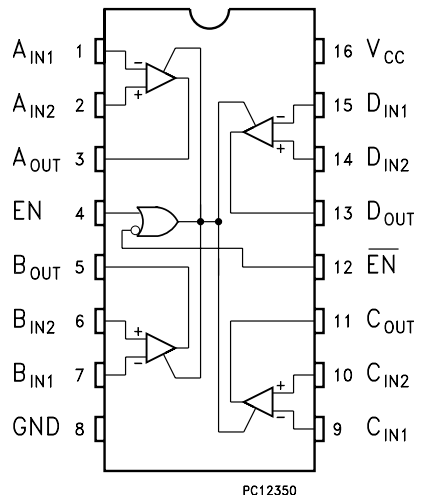


Table 1. Pin description

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 2. 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 3. Absolute maximum ratings (*Note: 1*, *Note 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

Note: 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 4. 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 5. Electrical characteristics
(V_{CC} = 5V ± 10%, unless otherwise specified, See *Note: 1*)

Symbol	Parameter	Test Conditions	Value			Unit
			Min.	Typ.	Max.	
V_{TH}	Minimum differential input voltage	$V_{OUT} = V_{OH}$ or V_{OL}, -7V < V_{CM} < 7V	-200	35	200	mV
R_{IN}	Input resistance	V_{IN} = -7V, 7V, other input = GND	5	6.8	10	KΩ
I_{IN}	Input current	V_{IN} = 10V, other input = GND		1.1	1.5	mA
		V_{IN} = -10V, other input = GND		-2	-2.5	
V_{OH}	High level output voltage	V_{DIFF} = 1V, I_{OUT} = -6mA	3.8	4.2		V
V_{OL}	Low level output voltage	V_{DIFF} = -1V, I_{OUT} = 6mA		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}, $\overline{\text{ENABLE}}$ = 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} = Max, $V_{(DIFF)}$ = 1V		16	23	mA
V_{HYST}	Input hysteresis	V_{CM} = 0V		60		mV

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

Table 6. Switching characteristics (V_{CC} = 5V ± 10%, see Note 1)

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

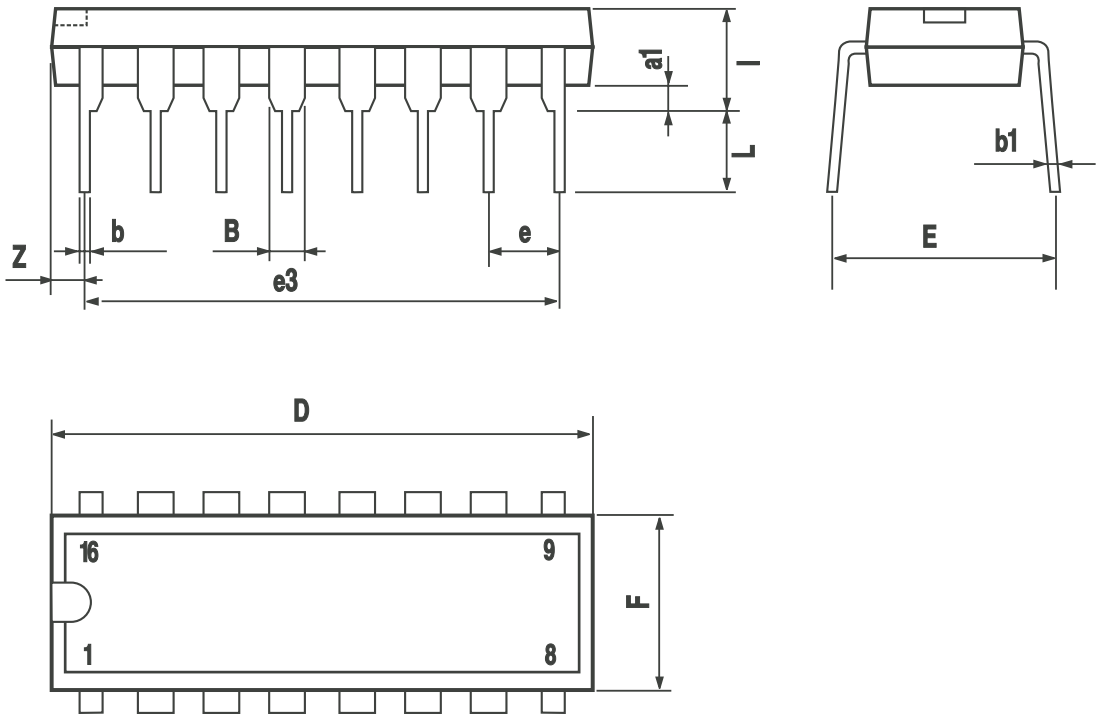
Note: 1 Unless otherwise specified, min/max limits apply across the recommended operating temperature range. All typical are given for V_{CC}=5V and T_A = 25°C

4 Package mechanical data

In order to meet environmental requirements, ST offers these devices in ECOPACK® packages. These packages have a Lead-free second level interconnect. The category of second level interconnect is marked on the package and on the inner box label, in compliance with JEDEC Standard JESD97. The maximum ratings related to soldering conditions are also marked on the inner box label. ECOPACK is an ST trademark. ECOPACK specifications are available at: www.st.com

Plastic DIP-16 (0.25) MECHANICAL DATA

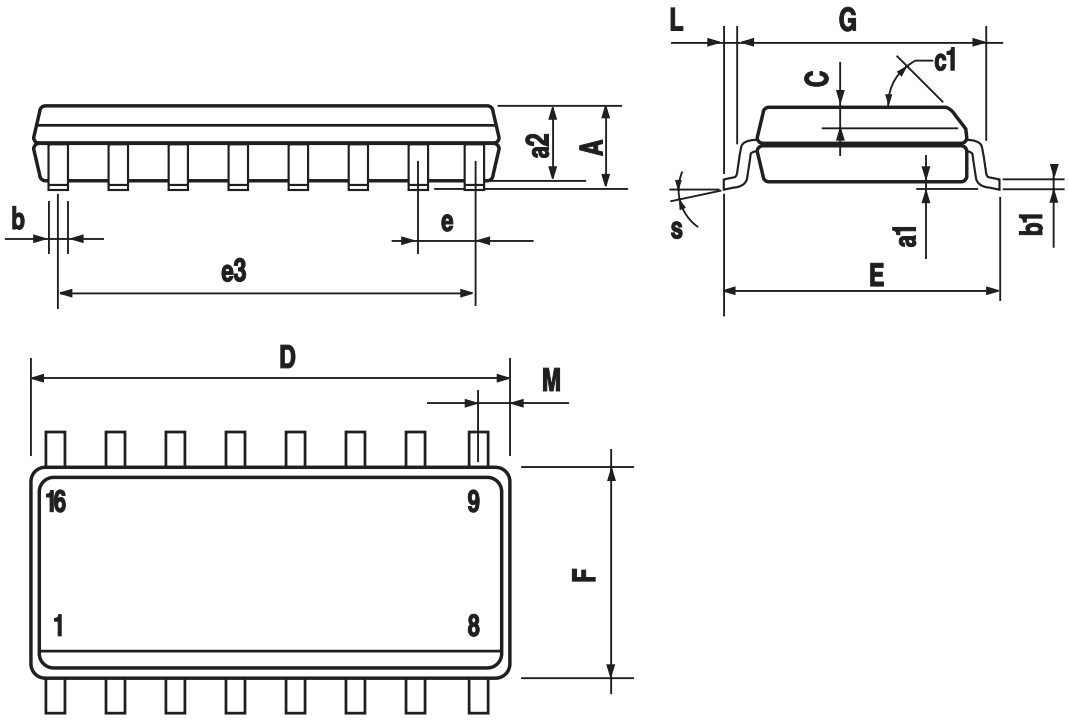
DIM.	mm.			inch		
	MIN.	TYP	MAX.	MIN.	TYP.	MAX.
a1	0.51			0.020		
B	0.77		1.65	0.030		0.065
b		0.5			0.020	
b1		0.25			0.010	
D			20			0.787
E		8.5			0.335	
e		2.54			0.100	
e3		17.78			0.700	
F			7.1			0.280
I			5.1			0.201
L		3.3			0.130	
Z			1.27			0.050



P001C

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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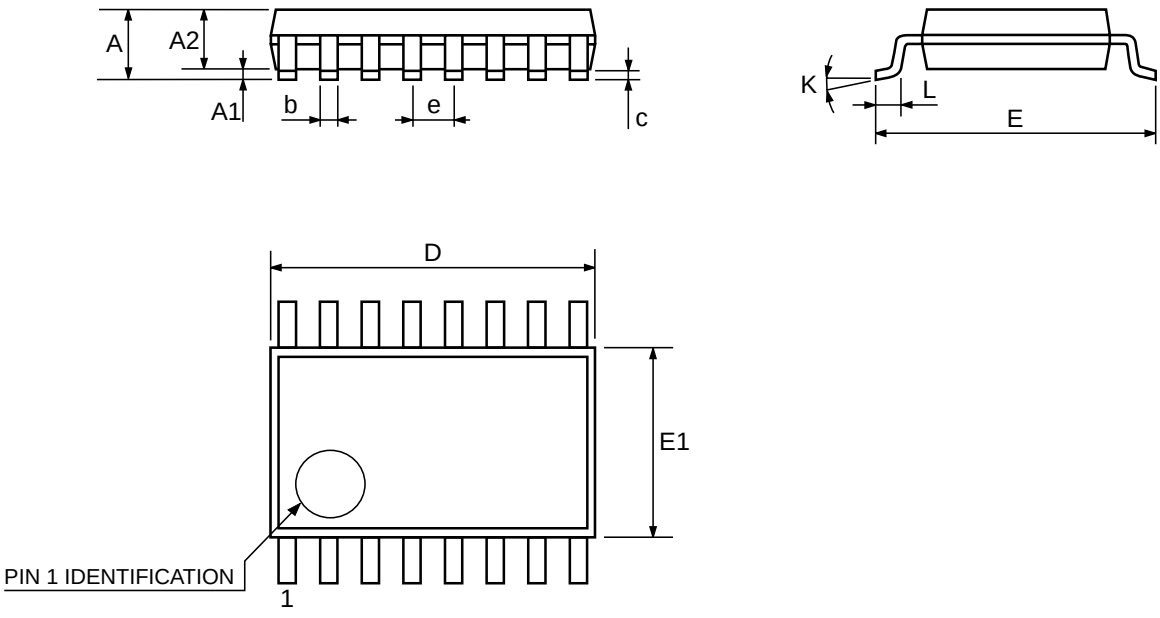
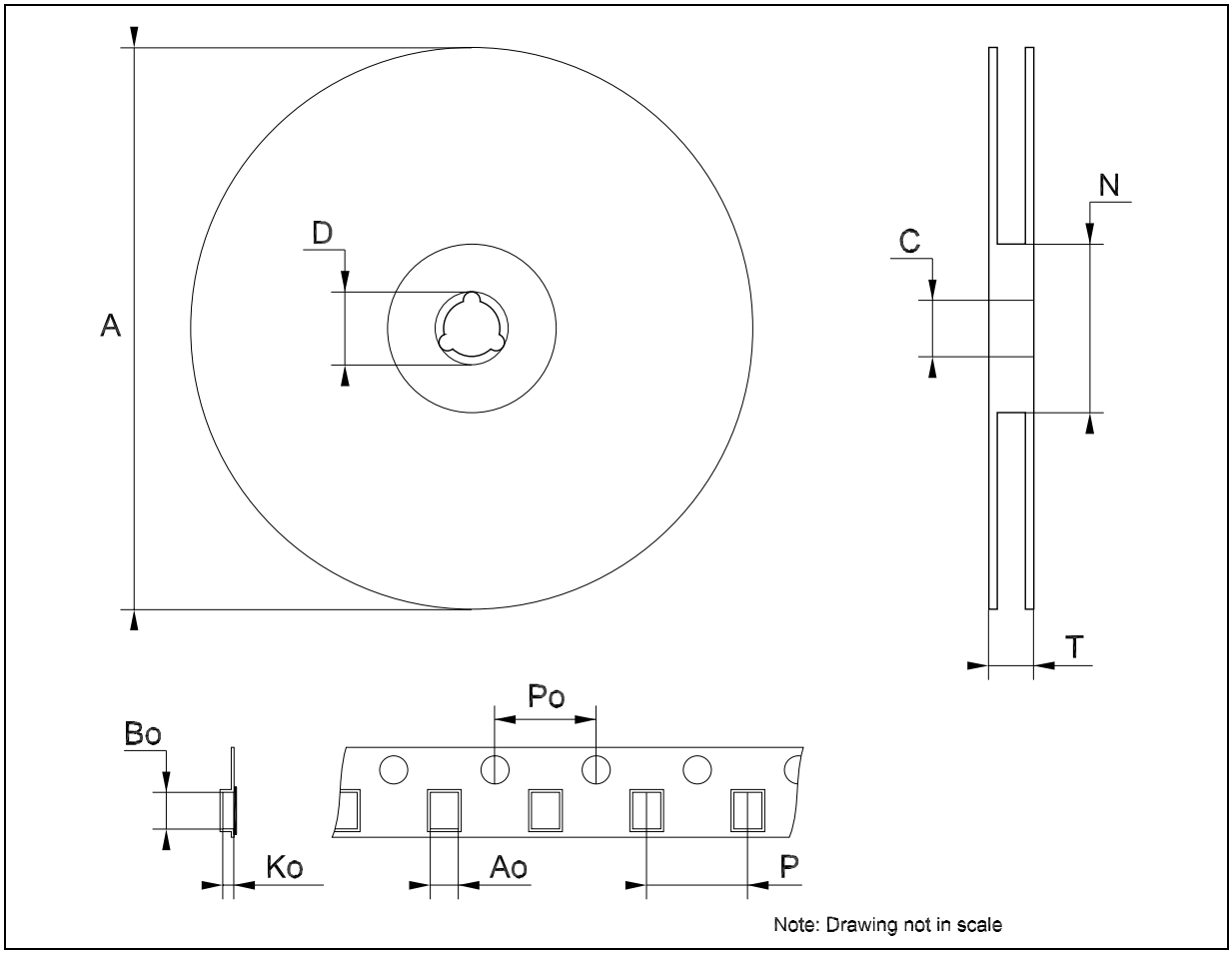
TSSOP16 MECHANICAL DATA

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

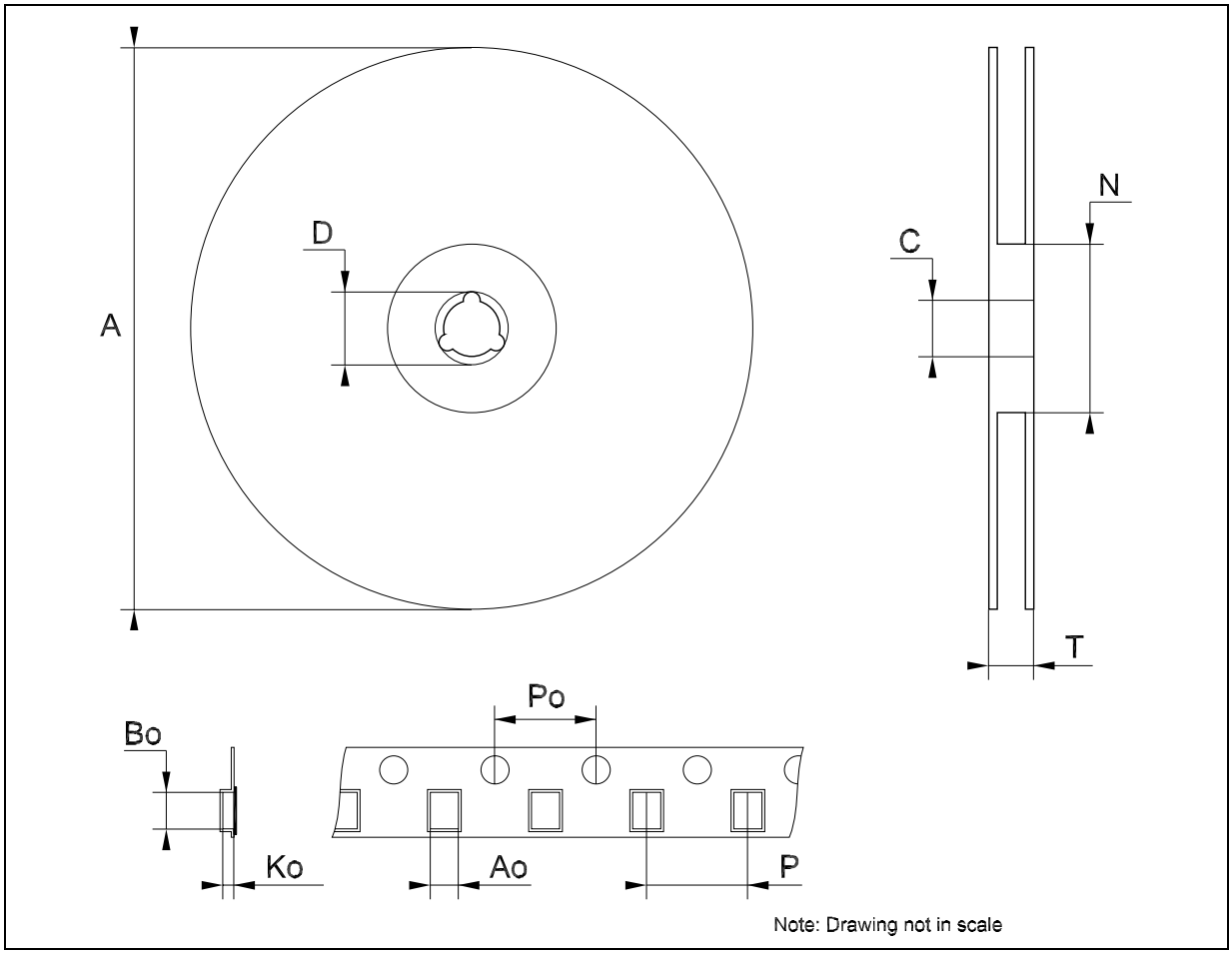
DIM.	mm.			inch		
	MIN.	TYP	MAX.	MIN.	TYP.	MAX.
A			330			12.992
C	12.8		13.2	0.504		0.519
D	20.2			0.795		
N	60			2.362		
T			22.4			0.882
Ao	6.45		6.65	0.254		0.262
Bo	10.3		10.5	0.406		0.414
Ko	2.1		2.3	0.082		0.090
Po	3.9		4.1	0.153		0.161
P	7.9		8.1	0.311		0.319



Note: Drawing not in scale

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



Note: Drawing not in scale

5 Revision history

Table 7. Revision history

Date	Revision	Changes
02-May-2006	3	Order codes has been updated and new template.

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