DATA SHEET

74ABT827

10-bit buffer/line driver, non-inverting
(3-State)

Philips
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74ABT827

FEATURES

- Ideal where high speed, light loading, or increased fan-in are required
- Flow through pinout architecture for microprocessor oriented applications
- Output capability: +64mA/−32mA
- Slim 300 mil-wide plastic 24-pin package
- Latch-up protection exceeds 500mA per Jedec Std 17
- ESD protection exceeds 2000 V per MIL STD 883 Method 3015 and 200 V per Machine Model
- Power-up 3-State
- Inputs are disabled during 3-State mode

DESCRIPTION

The 74ABT827 high-performance BiCMOS device combines low static and dynamic power dissipation with high speed and high output drive.

The 74ABT827 10-bit buffers provide high performance bus interface buffering for wide data/address paths or buses carrying parity. They have NOR Output Enables ($\overline{OE}0$, $\overline{OE}1$) for maximum control flexibility.

QUICK REFERENCE DATA

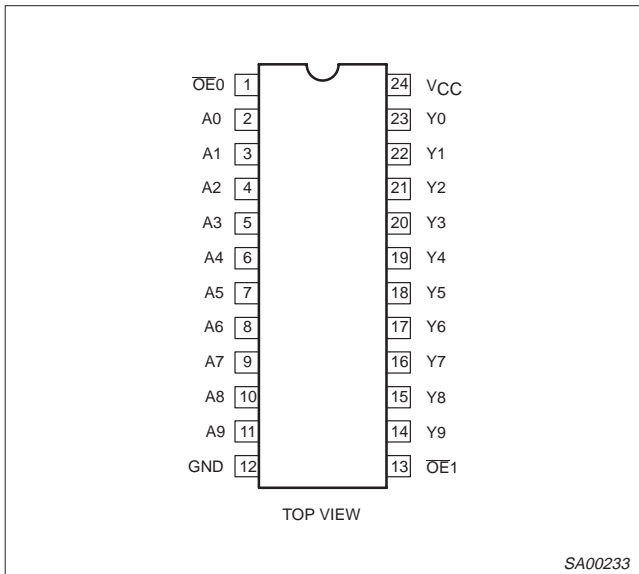| SYMBOL	PARAMETER	CONDITIONS T_{amb} = 25°C; GND = 0V	TYPICAL	UNIT
t_{PLH} t_{PHL}	Propagation delay An to Yn	C_L = 50pF; V_{CC} = 5V	3.0	ns
C_{IN}	Input capacitance	V_I = 0V or V_{CC}	4	pF
C_{OUT}	Output capacitance	Outputs disabled; V_O = 0V or V_{CC}	7	pF
I_{CCZ}	Total supply current	Outputs disabled; V_{CC} = 5.5V	500	nA

ORDERING INFORMATION

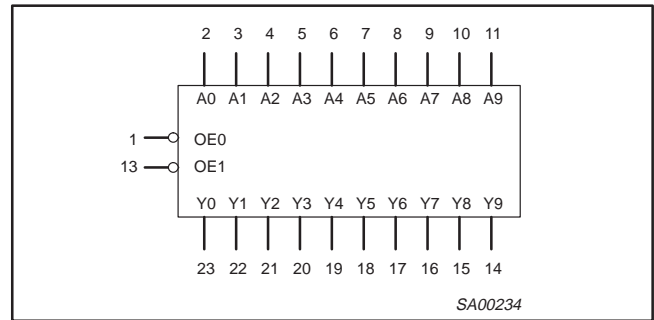| PACKAGES	TEMPERATURE RANGE	OUTSIDE NORTH AMERICA	NORTH AMERICA	DWG NUMBER
24-Pin Plastic DIP	−40°C to +85°C	74ABT827 N	74ABT827 N	SOT222-1
24-Pin plastic SO	−40°C to +85°C	74ABT827 D	74ABT827 D	SOT137-1
24-Pin Plastic SSOP Type II	−40°C to +85°C	74ABT827 DB	74ABT827 DB	SOT340-1
24-Pin Plastic TSSOP Type I	−40°C to +85°C	74ABT827 PW	74ABT827PW DH	SOT355-1

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PIN CONFIGURATION

$\overline{OE}0$	1	24	V$_{CC}$
A0	2	23	Y0
A1	3	22	Y1
A2	4	21	Y2
A3	5	20	Y3
A4	6	19	Y4
A5	7	18	Y5
A6	8	17	Y6
A7	9	16	Y7
A8	10	15	Y8
A9	11	14	Y9
GND	12	13	$\overline{OE}1$

TOP VIEW

SA00233

PIN DESCRIPTION

PIN NUMBER	SYMBOL	FUNCTION
1, 13	$\overline{OE}0$, $\overline{OE}1$	Output enable input (active-Low)
2, 3, 4, 5, 6, 7, 8, 9, 10, 11	A0-A9	Data inputs
23, 22, 21, 20, 19, 18, 17, 16, 15, 14	Y0-Y9	Data outputs
10	GND	Ground (0V)
20	V$_{CC}$	Positive supply voltage

LOGIC SYMBOL (IEEE/IEC)

SA00235

LOGIC SYMBOL

SA00234

FUNCTION TABLE

INPUTS		OUTPUTS	OPERATING
$\overline{OE}n$	An	Yn	MODE
L	L	L	Transparent
L	H	H	Transparent
H	X	Z	High impedance

H = High voltage level
L = Low voltage level
X = Don't care
Z = High impedance "off" state
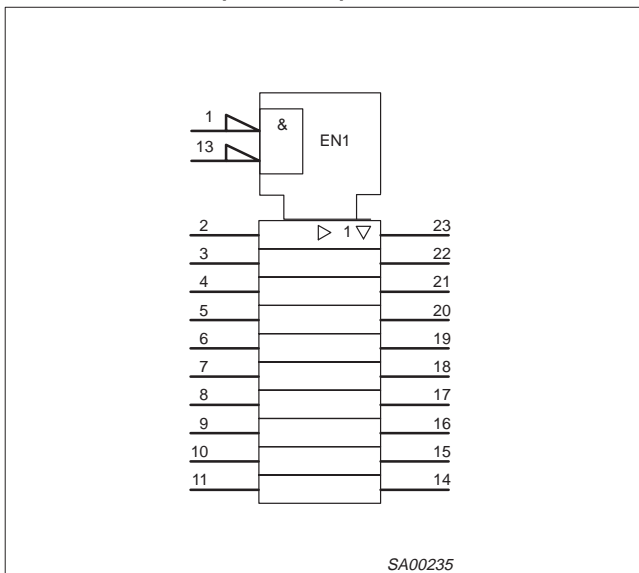
10-bit buffer/line driver, non-inverting (3-State)

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LOGIC DIAGRAM

SA00236
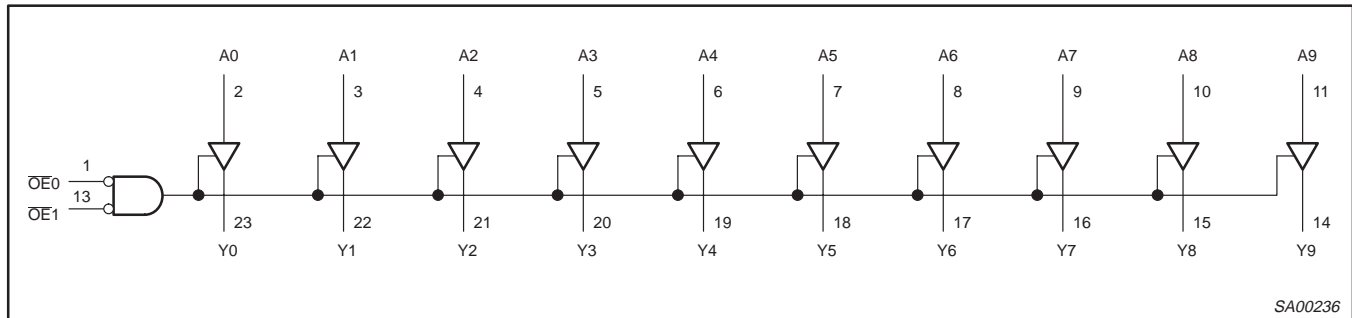
ABSOLUTE MAXIMUM RATINGS[1, 2]

SYMBOL	PARAMETER	CONDITIONS	RATING	UNIT
V_{CC}	DC supply voltage		−0.5 to +7.0	V
I_{IK}	DC input diode current	$V_I < 0$	−18	mA
V_I	DC input voltage[3]		−1.2 to +7.0	V
I_{OK}	DC output diode current	$V_O < 0$	−50	mA
V_{OUT}	DC output voltage[3]	output in Off or High state	−0.5 to +5.5	V
I_{OUT}	DC output current	output in Low state	128	mA
T_{stg}	Storage temperature range		−65 to 150	°C

NOTES:
1. Stresses beyond those listed may cause permanent damage to the device. These are stress ratings only and functional operation of the device at these or any other conditions beyond those indicated under "recommended operating conditions" is not implied. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.
2. The performance capability of a high-performance integrated circuit in conjunction with its thermal environment can create junction temperatures which are detrimental to reliability. The maximum junction temperature of this integrated circuit should not exceed 150°C.
3. The input and output voltage ratings may be exceeded if the input and output current ratings are observed.

RECOMMENDED OPERATING CONDITIONS

SYMBOL	PARAMETER	LIMITS		UNIT
		Min	Max	
V_{CC}	DC supply voltage	4.5	5.5	V
V_I	Input voltage	0	V_{CC}	V
V_{IH}	High-level input voltage	2.0		V
V_{IL}	Low-level input voltage		0.8	V
I_{OH}	High-level output current		−32	mA
I_{OL}	Low-level output current		64	mA
$\Delta t/\Delta v$	Input transition rise or fall rate	0	5	ns/V
T_{amb}	Operating free-air temperature range	−40	+85	°C

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DC ELECTRICAL CHARACTERISTICS

SYMBOL	PARAMETER	TEST CONDITIONS	LIMITS					UNIT
			T_{amb} = +25°C			T_{amb} = −40°C to +85°C		
			Min	Typ	Max	Min	Max	
V_{IK}	Input clamp voltage	V_{CC} = 4.5V; I_{IK} = −18mA		−0.9	−1.2		−1.2	V
V_{OH}	High-level output voltage	V_{CC} = 4.5V; I_{OH} = −3mA; V_I = V_{IL} or V_{IH}	2.5	2.9		2.5		V
		V_{CC} = 5.0V; I_{OH} = −3mA; V_I = V_{IL} or V_{IH}	3.0	3.4		3.0		V
		V_{CC} = 4.5V; I_{OH} = −32mA; V_I = V_{IL} or V_{IH}	2.0	2.4		2.0		V
V_{OL}	Low-level output voltage	V_{CC} = 4.5V; I_{OL} = 64mA; V_I = V_{IL} or V_{IH}		0.42	0.55		0.55	V
I_I	Input leakage current	V_{CC} = 5.5V; V_I = GND or 5.5V		±0.01	±1.0		±1.0	µA
I_{OFF}	Power-off leakage current	V_{CC} = 0.0V; V_O or V_I ≤ 4.5V		±5.0	±100		±100	µA
I_{PU}/I_{PD}	Power-up/down 3-State output current[3]	V_{CC} = 2.0V; V_O = 0.5V; V_I = GND or V_{CC}; V_{OE} = V_{CC}		±5.0	±50		±50	µA
I_{OZH}	3-State output High current	V_{CC} = 5.5V; V_O = 2.7V; V_I = V_{IL} or V_{IH}		5.0	50		50	µA
I_{OZL}	3-State output Low current	V_{CC} = 5.5V; V_O = 0.5V; V_I = V_{IL} or V_{IH}		−5.0	−50		−50	µA
I_{CEX}	Output HIgh leakage current	V_{CC} = 5.5V; V_O = 5.5V; V_I = GND or V_{CC}		5.0	50		50	µA
I_O	Output current[1]	V_{CC} = 5.5V; V_O = 2.5V	−50	−80	−180	−50	−180	mA
I_{CCH}	Quiescent supply current	V_{CC} = 5.5V; Outputs High, V_I = GND or V_{CC}		0.5	250		250	µA
I_{CCL}		V_{CC} = 5.5V; Outputs Low, V_I = GND or V_{CC}		25	38		38	mA
I_{CCZ}		V_{CC} = 5.5V; Outputs 3–State; V_I = GND or V_{CC}		0.5	250		250	µA
ΔI_{CC}	Additional supply current per input pin[2]	Outputs enabled, one input at 3.4V, other inputs at V_{CC} or GND; V_{CC} = 5.5V		0.5	1.5		1.5	mA
		Outputs 3-State, one data input at 3.4V, other inputs at V_{CC} or GND; V_{CC} = 5.5V		0.01	50		50	mA
		Outputs 3–State, one enable input at 3.4V, other inputs at V_{CC} or GND; V_{CC} = 5.5V		0.5	1.5		1.5	mA

NOTES:
1. Not more than one output should be tested at a time, and the duration of the test should not exceed one second.
2. This is the increase in supply current for each input at 3.4V.
3. This parameter is valid for any V_{CC} between 0V and 2.1V with a transition time of up to 10msec. For V_{CC} = 2.1V to V_{CC} = 5V ± 10%, a transition time of up to 100µsec is permitted.

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AC CHARACTERISTICS

GND = 0V, t_R = t_F = 2.5ns, C_L = 50pF, R_L = 500Ω

SYMBOL	PARAMETER	WAVEFORM	LIMITS					UNIT
			T_{amb} = +25°C V_{CC} = +5.0V			T_{amb} = -40 to +85°C V_{CC} = +5.0V ±0.5V		
			Min	Typ	Max	Min	Max	
t_{PLH} t_{PHL}	Propagation delay An to Yn	1	1.1 1.1	3.0 2.9	4.4 4.1	1.1 1.1	4.8 4.7	ns
t_{PZH} t_{PZL}	Output enable time to High and Low level	2	1.6 2.6	3.7 4.6	5.1 5.9	1.6 2.6	5.9 6.9	ns
t_{PHZ} t_{PLZ}	Output disable time from High and Low level	2	2.0 2.5	4.8 5.1	6.3 6.6	2.0 2.5	6.8 6.9	ns

AC WAVEFORMS

V_M = 1.5V, V_{IN} = GND to 3.0V
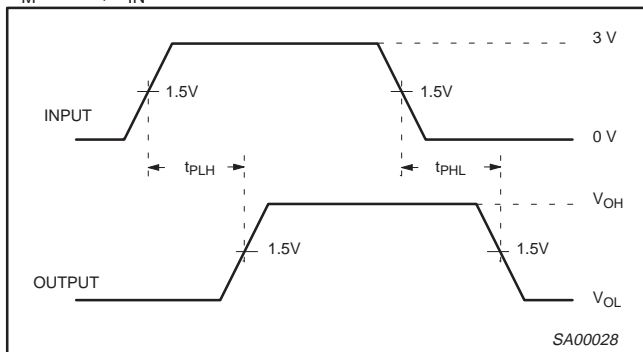
Waveform 1. Waveforms Showing the Input (An) to Output (Yn) Propagation Delays
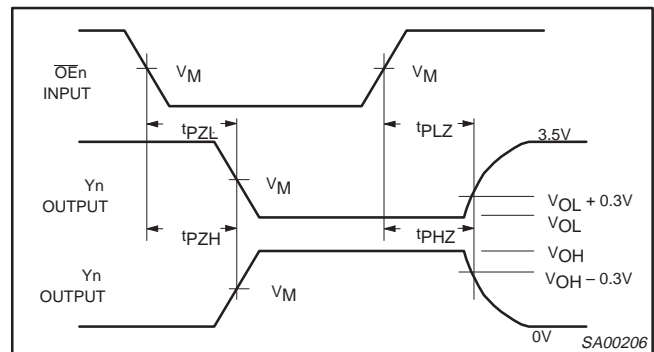
Waveform 2. Waveforms Showing the 3-State Output Enable and Disable Times

TEST CIRCUIT AND WAVEFORM

Load Circuit

TEST	S1
t_{pd}	open
t_{PLZ}/t_{PZL}	7 V
t_{PHZ}/t_{PZH}	open

DEFINITIONS

C_L = Load capacitance includes jig and probe capacitance; see AC CHARACTERISTICS for value.
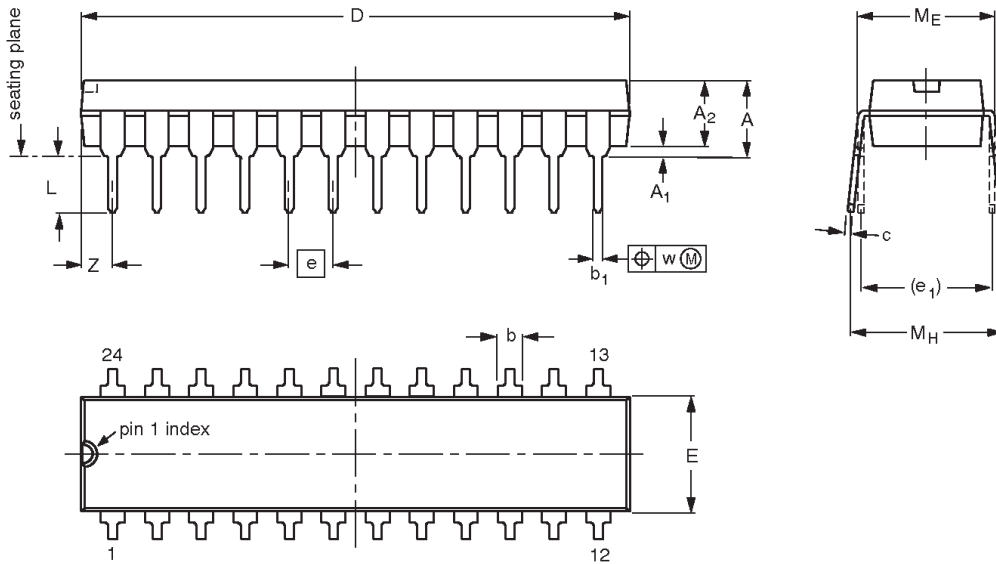
SA00012

10-bit buffer/line driver, non-inverting (3-State)

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DIP24:   plastic dual in-line package; 24 leads (300 mil)   **SOT222-1**

DIMENSIONS (millimetre dimensions are derived from the original inch dimensions)

UNIT	A max.	A₁ min.	A₂ max.	b	b₁	c	D [1]	E [1]	e	e₁	L	M_E	M_H	w	Z [1] max.
mm	4.70	0.38	3.94	1.63 1.14	0.56 0.43	0.36 0.25	31.9 31.5	6.73 6.48	2.54	7.62	3.51 3.05	8.13 7.62	10.03 7.62	0.25	2.05
inches	0.185	0.015	0.155	0.064 0.045	0.022 0.017	0.014 0.010	1.256 1.240	0.265 0.255	0.100	0.300	0.138 0.120	0.32 0.30	0.395 0.300	0.01	0.081

Note

1. Plastic or metal protrusions of 0.01 inches maximum per side are not included.

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	EIAJ			
SOT222-1		MS-001AF				95-03-11

10-bit buffer/line driver, non-inverting (3-State)

SO24: plastic small outline package; 24 leads; body width 7.5 mm

SOT137-1
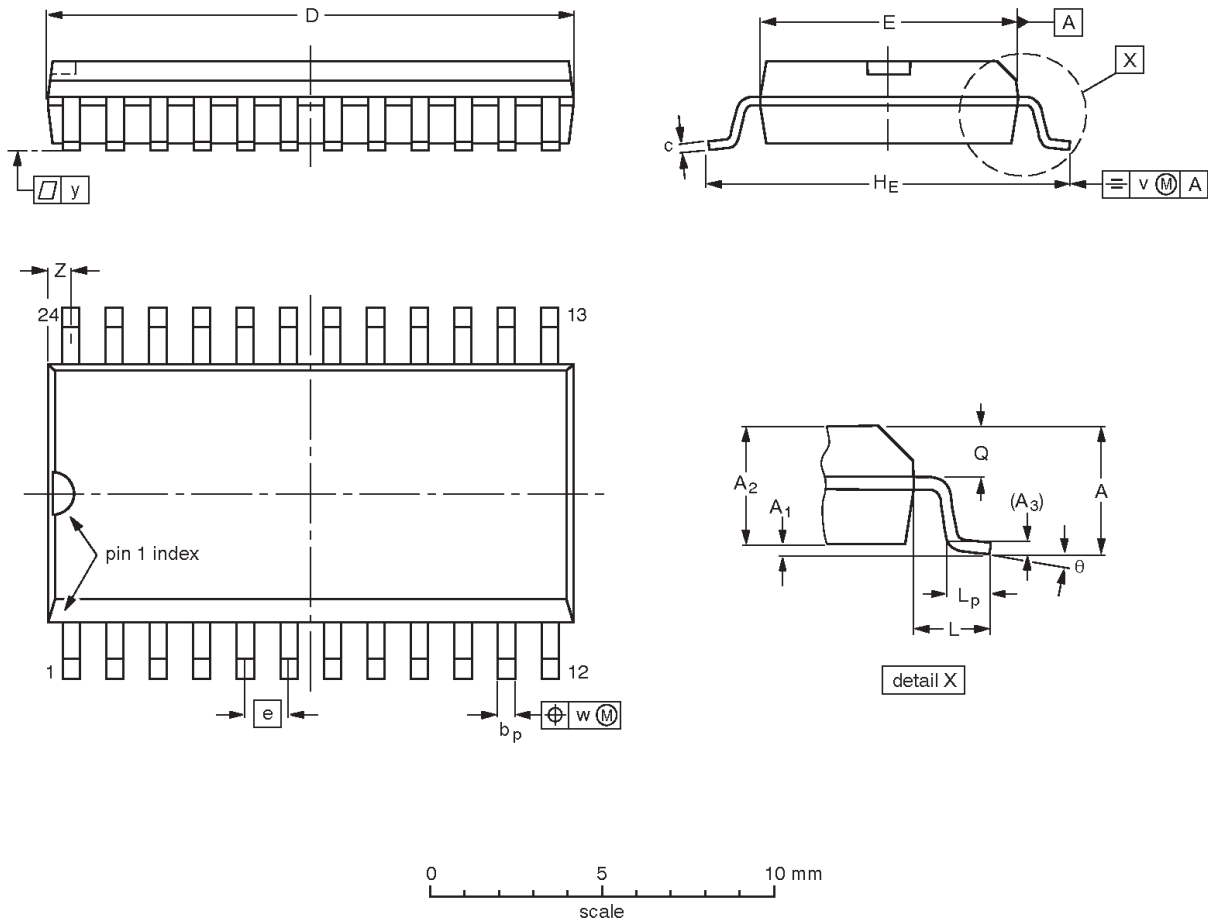
DIMENSIONS (inch dimensions are derived from the original mm dimensions)

UNIT	A max.	A₁	A₂	A₃	b_p	c	D(1)	E(1)	e	H_E	L	L_p	Q	v	w	y	Z(1)	θ
mm	2.65	0.30 0.10	2.45 2.25	0.25	0.49 0.36	0.32 0.23	15.6 15.2	7.6 7.4	1.27	10.65 10.00	1.4	1.1 0.4	1.1 1.0	0.25	0.25	0.1	0.9 0.4	8° 0°
inches	0.10	0.012 0.004	0.096 0.089	0.01	0.019 0.014	0.013 0.009	0.61 0.60	0.30 0.29	0.050	0.419 0.394	0.055	0.043 0.016	0.043 0.039	0.01	0.01	0.004	0.035 0.016	

Note

1. Plastic or metal protrusions of 0.15 mm maximum per side are not included.

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	EIAJ			
SOT137-1	075E05	MS-013AD				~~95-01-24~~ 97-05-22

10-bit buffer/line driver, non-inverting (3-State)

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SSOP24: plastic shrink small outline package; 24 leads; body width 5.3 mm

SOT340-1
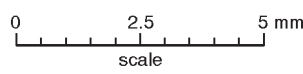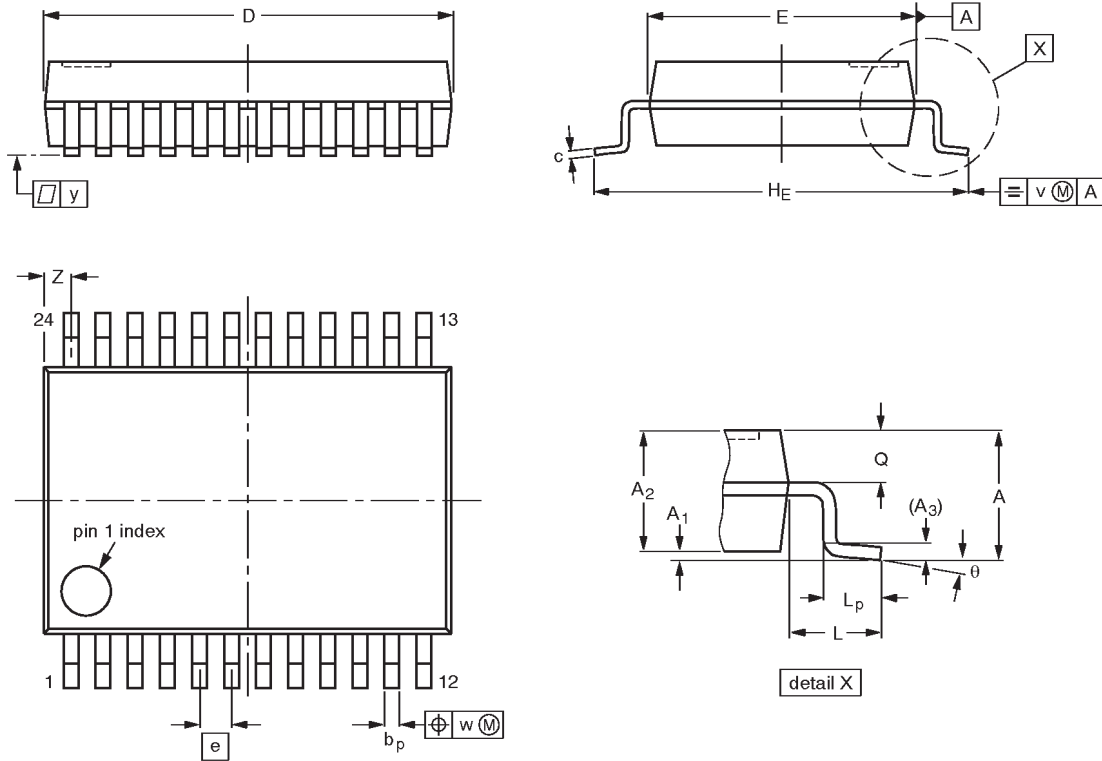

```
0        2.5        5 mm
|--|--|--|--|--|--|--|--|
         scale
```

DIMENSIONS (mm are the original dimensions)

UNIT	A max.	A_1	A_2	A_3	b_p	c	$D^{(1)}$	$E^{(1)}$	e	H_E	L	L_p	Q	v	w	y	$Z^{(1)}$	θ
mm	2.0	0.21 0.05	1.80 1.65	0.25	0.38 0.25	0.20 0.09	8.4 8.0	5.4 5.2	0.65	7.9 7.6	1.25	1.03 0.63	0.9 0.7	0.2	0.13	0.1	0.8 0.4	8° 0°

Note

1. Plastic or metal protrusions of 0.20 mm maximum per side are not included.

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	EIAJ			
SOT340-1		MO-150AG				~~93-09-08~~ 95-02-04

10-bit buffer/line driver, non-inverting (3-State)

74ABT827

TSSOP24:   plastic thin shrink small outline package; 24 leads; body width 4.4 mm

SOT355-1

pin 1 index

detail X

0   2.5   5 mm
scale
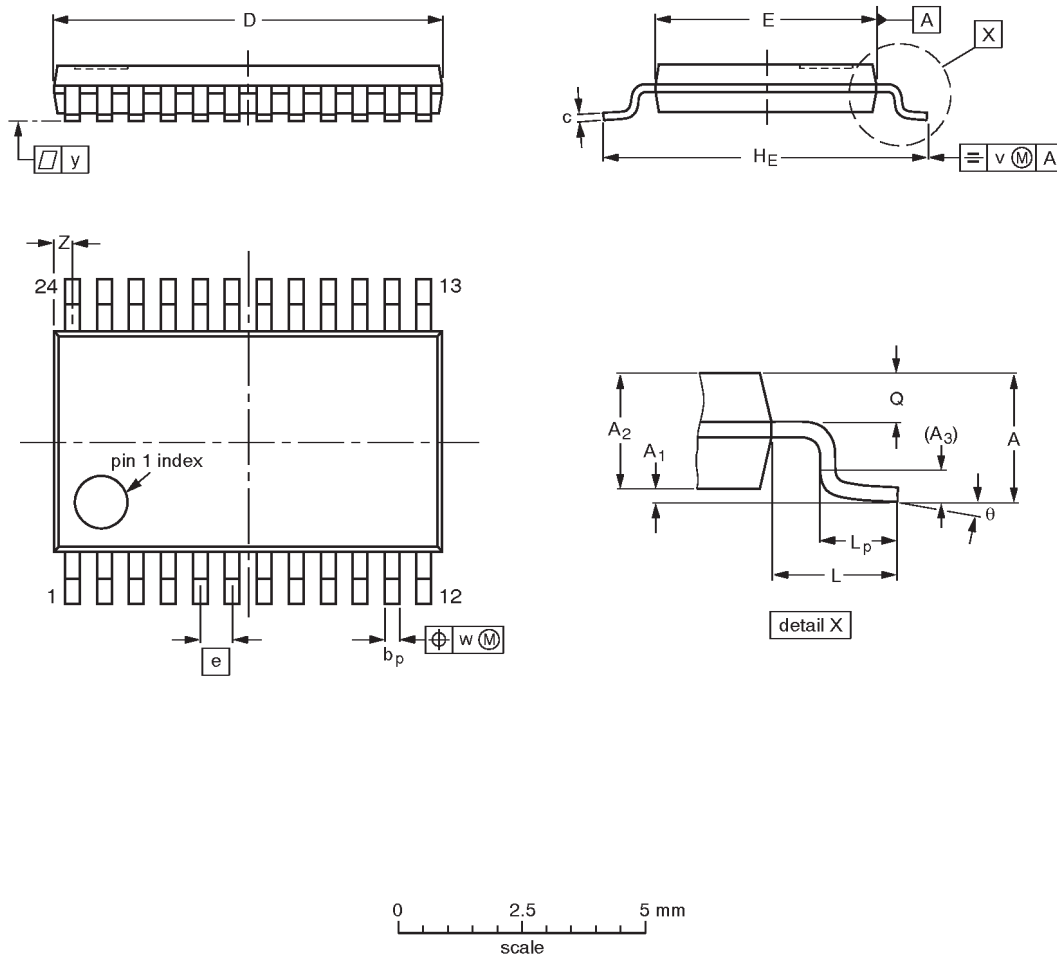
DIMENSIONS (mm are the original dimensions)

UNIT	A max.	A₁	A₂	A₃	b_p	c	D(1)	E(2)	e	H_E	L	L_p	Q	v	w	y	Z(1)	θ
mm	1.10	0.15 0.05	0.95 0.80	0.25	0.30 0.19	0.2 0.1	7.9 7.7	4.5 4.3	0.65	6.6 6.2	1.0	0.75 0.50	0.4 0.3	0.2	0.13	0.1	0.5 0.2	8° 0°

Notes

1. Plastic or metal protrusions of 0.15 mm maximum per side are not included.

2. Plastic interlead protrusions of 0.25 mm maximum per side are not included.

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	EIAJ			
SOT355-1		MO-153AD				~~93-06-16~~ 95-02-04

DEFINITIONS

Data Sheet Identification	Product Status	Definition
Objective Specification	**Formative or in Design**	This data sheet contains the design target or goal specifications for product development. Specifications may change in any manner without notice.
Preliminary Specification	**Preproduction Product**	This data sheet contains preliminary data, and supplementary data will be published at a later date. Philips Semiconductors reserves the right to make changes at any time without notice in order to improve design and supply the best possible product.
Product Specification	**Full Production**	This data sheet contains Final Specifications. Philips Semiconductors reserves the right to make changes at any time without notice, in order to improve design and supply the best possible product.

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