

74F827

10-bit buffer/line driver; non-inverting; 3-state

Rev. 04 — 29 January 2010

Product data sheet

1. General description

The 74F827 10-bit buffer, provides high performance bus interface buffering for wide data/address paths or buses carrying parity. The device has NOR output enables ($\overline{OE}0$, $\overline{OE}1$) for maximum control flexibility.

2. Features

- High impedance NPN base inputs for reduced loading (20 μ A input current in HIGH and LOW states)
- $I_{IL} = 20 \mu$ A compared to 600 μ A in FAST family specification
- Ideal for high speed, light bus loading with increased fan-in
- Controlled rise and fall times to minimize ground bounce
- Glitch-free power-up in 3-state
- Flow-through pinout architecture for microprocessor oriented applications
- Output sink capability, $I_{OL} = 64$ mA

3. Ordering information

Table 1. Ordering information

Type number	Package			
	Temperature range	Name	Description	Version
N74F827D	0 °C to 70 °C	SO24	plastic small outline package; 24 leads; body width 7.5 mm	SOT137-1
N74F827DB	0 °C to 70 °C	SSOP24	plastic shrink small outline package; 24 leads; body width 5.3 mm	SOT340-1

4. Functional diagram

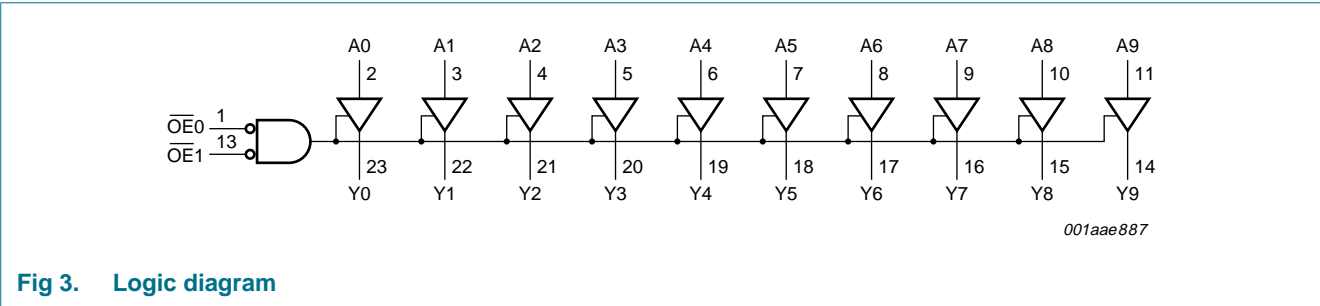
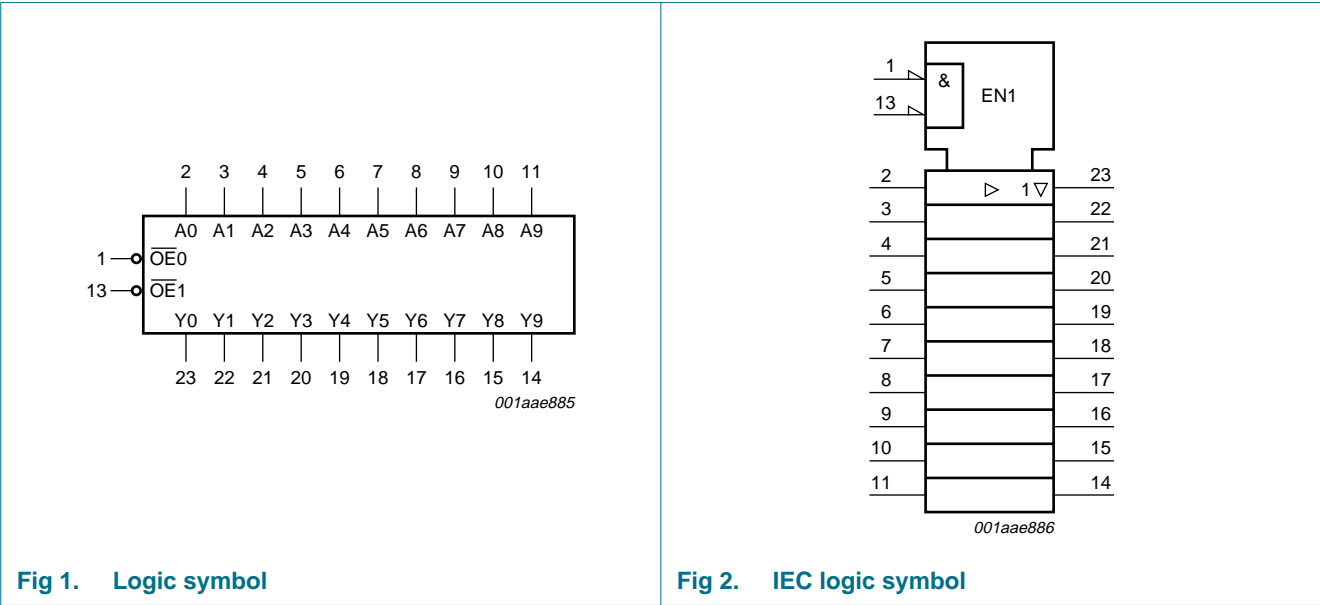


Fig 3. Logic diagram

5. Pinning information

5.1 Pinning

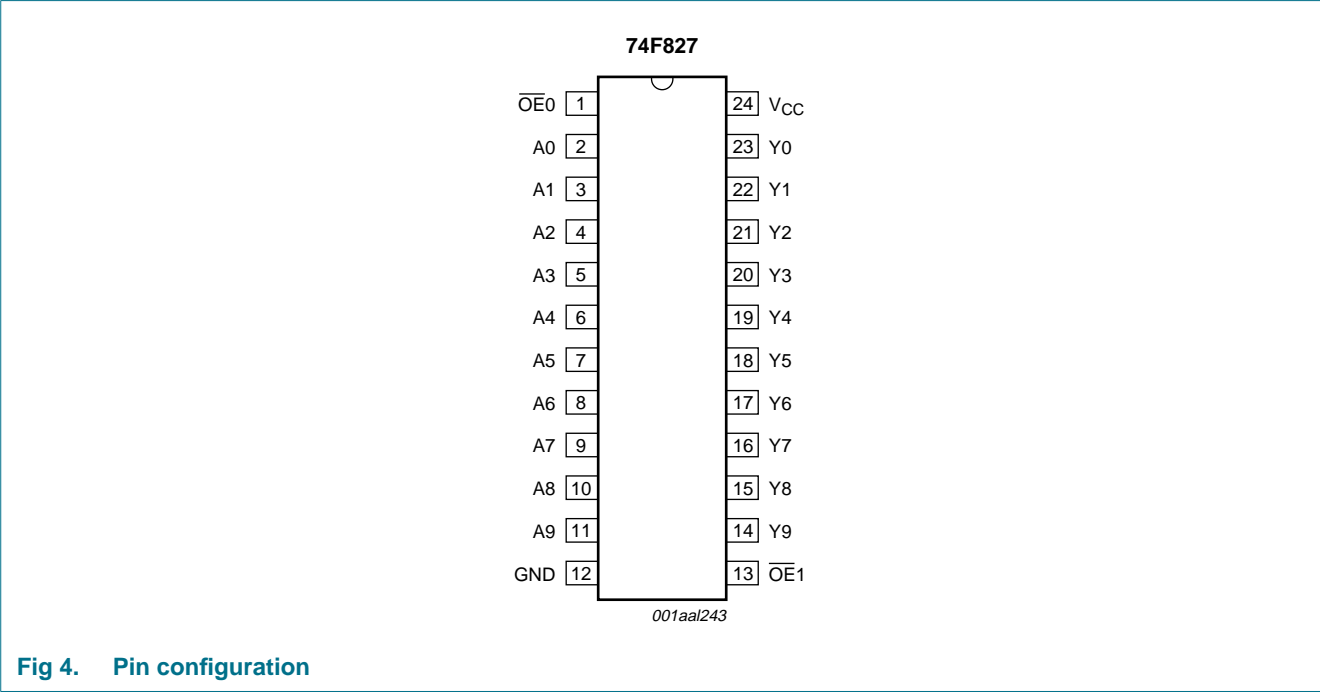


Fig 4. Pin configuration

5.2 Pin description

Table 2. Pin description

Symbol	Pin	Description	Unit load HIGH/LOW	Load value ^[1] HIGH/LOW
$\overline{OE}0$	1	output enable input (active LOW)	1.0/0.033	20 μ A/20 μ A
A0 to A9	2, 3, 4, 5, 6, 7, 8, 9, 10, 11	data input	1.0/0.033	20 μ A/20 μ A
GND	12	ground (0 V)	-	-
$\overline{OE}1$	13	output enable input (active LOW)	1.0/0.033	20 μ A/20 μ A
Y0 to Y9	23, 22, 21, 20, 19, 18, 17, 16, 15, 14	data output	1200/106.7	24 mA/64 mA
V_{CC}	24	supply voltage	-	-

[1] One FAST Unit Load (UL) is defined as 20 μ A in HIGH state, 0.6 μ A in LOW state.

6. Functional description

6.1 Function table

Table 3. Function selection^[1]

Input		Output	Status
OEn	An	Yn	
L	L	L	transparent
L	H	H	
H	X	Z	disabled

- [1] H = HIGH voltage level;
 L = LOW voltage level;
 X = don't care;
 Z = high-impedance OFF-state.

7. Limiting values

Table 4. Limiting values

In accordance with the Absolute Maximum Rating System (IEC 60134).

Symbol	Parameter	Conditions	Min	Max	Unit
V _{CC}	supply voltage		−0.5	+7.0	V
V _I	input voltage		^[1] −0.5	+7.0	V
V _O	output voltage	output in HIGH-state	^[1] −0.5	+7.0	V
I _{IK}	input clamping current	V _I < 0 V	−30	+5	mA
I _O	output current	output in LOW-state	-	128	mA
T _{amb}	ambient temperature	in free-air	^[2] 0	70	°C
T _{stg}	storage temperature		−65	+150	°C

- [1] The input and output voltage ratings may be exceeded if the input and output current ratings are observed.
 [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.

8. Recommended operating conditions

Table 5. Recommended operating conditions

Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V _{CC}	supply voltage		4.5	5.0	5.5	V
V _{IH}	HIGH-level input voltage		2.0	-	-	V
V _{IL}	LOW-level input voltage		-	-	0.8	V
I _{IK}	input clamping current		−18	-	-	mA
I _{OH}	HIGH-level output current		−24	-	-	mA
I _{OL}	LOW-level output current		-	-	64	mA

9. Static characteristics

Table 6. Static characteristics

Symbol	Parameter	Conditions	25 °C			0 °C to 70 °C		Unit
			Min	Typ ^[1]	Max	Min	Max	
V _{IK}	input clamping voltage	V _{CC} = 4.5 V; I _{IK} = -18 mA	-1.2	-0.73	-	-1.2	-	V
V _{OH}	HIGH-level output voltage	V _{CC} = 4.5 V; V _{IL} = 0.8 V; V _{IH} = 2.0 V I _{OH} = -15 mA						
		V _{CC} = ±10 %	-	-	-	2.4	-	V
		V _{CC} = ±5 %	-	3.3	-	2.4	-	V
		I _{OH} = -24 mA						
		V _{CC} = ±10 %	-	-	-	2.0	-	V
		V _{CC} = ±5 %	-	-	-	2.0	-	V
V _{OL}	LOW-level output voltage	V _{CC} = 4.5 V; V _{IL} = 0.8 V; V _{IH} = 2.0 V I _{OL} = 64 mA						
		V _{CC} = ±10 %	-	-	-	-	0.55	V
		V _{CC} = ±5 %	-	0.42	-	-	0.55	V
I _I	input leakage current	V _{CC} = 0 V; V _I = 7.0 V	-	-	-	-	100	μA
I _{IH}	HIGH-level input current	V _{CC} = 5.5 V; V _I = 2.7 V	-	-	-	-	20	μA
I _{IL}	LOW-level input current	V _{CC} = 5.5 V; V _I = 0.5 V	-	-	-	-	-20	μA
I _{OZ}	OFF-state output current	V _{CC} = 5.5 V						
		V _O = 2.7 V	-	-	-	-	50	μA
		V _O = 0.5 V	-	-	-	-	-50	μA
I _O	output current	V _{CC} = 5.5 V ^[2]	-	-	-	-100	-225	mA
I _{CC}	supply current	V _{CC} = 5.5 V; V _I = GND or V _{CC}						
		outputs HIGH-state	-	50	-	-	70	mA
		outputs LOW-state	-	70	-	-	100	mA
		outputs OFF-state	-	60	-	-	90	mA

[1] All typical values are measured at V_{CC} = 5 V.

[2] Not more than one output should be tested at a time, and the duration of the test should not exceed one second.

10. Dynamic characteristics

Table 7. Dynamic characteristics

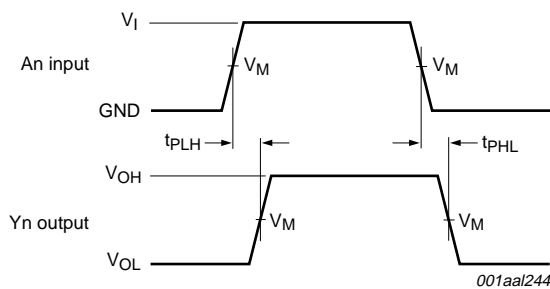
GND = 0 V; for test circuit, see [Figure 7](#).

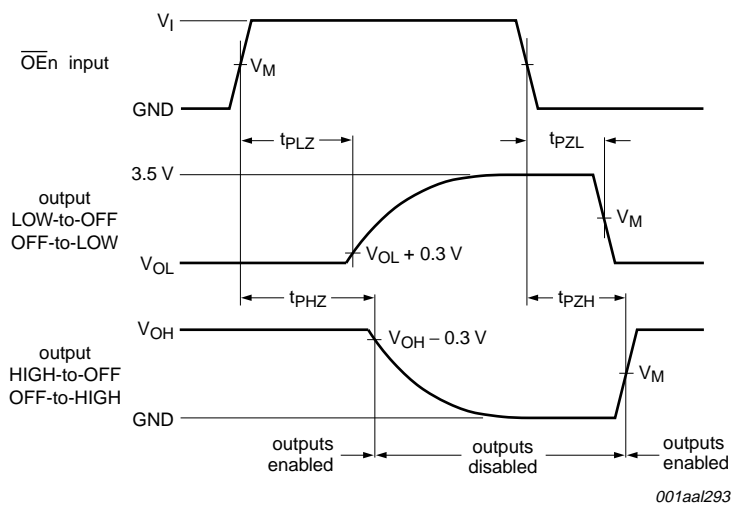
Symbol	Parameter	Conditions	25 °C; V _{CC} = 5.0 V			0 °C to 70 °C; V _{CC} = 5.0 V ± 0.5 V		Unit
			Min	Typ	Max	Min	Max	
t _{PLH}	LOW to HIGH propagation delay	An to Yn; see Figure 5						
		C _L = 50 pF	2.0	5.5	8.5	2.0	9.0	ns
		C _L = 300 pF, 1 output switching	-	9.5	13.0	-	14.0	ns
		C _L = 300 pF, 10 outputs switching	-	12.0	16.0	-	17.0	ns

Table 7. Dynamic characteristics ...continuedGND = 0 V; for test circuit, see [Figure 7](#).

Symbol	Parameter	Conditions	25 °C; V _{CC} = 5.0 V			0 °C to 70 °C; V _{CC} = 5.0 V ± 0.5 V		Unit
			Min	Typ	Max	Min	Max	
t _{PHL}	HIGH to LOW propagation delay	An to Yn; see Figure 5						
		C _L = 50 pF	2.0	4.5	8.5	2.0	9.0	ns
		C _L = 300 pF, 1 output switching	-	7.5	10.0	-	11.0	ns
		C _L = 300 pF, 10 outputs switching	-	14.0	17.0	-	18.0	ns
t _{PZH}	OFF-state to HIGH propagation delay	$\overline{\text{OEn}}$ to Yn; see Figure 6						
		C _L = 50 pF	5.0	8.0	12.0	4.5	14.0	ns
		C _L = 300 pF, 1 output switching	-	15.0	20.0	-	21.0	ns
		C _L = 300 pF, 10 outputs switching	-	15.0	20.0	-	21.0	ns
t _{PZL}	OFF-state to LOW propagation delay	$\overline{\text{OEn}}$ to Yn; see Figure 6						
		C _L = 50 pF	4.0	6.0	10.5	4.0	11.5	ns
		C _L = 300 pF, 1 output switching	-	9.5	13.0	-	14.0	ns
		C _L = 300 pF, 10 outputs switching	-	17.0	21.0	-	21.5	ns
t _{PHZ}	HIGH to OFF-state propagation delay	$\overline{\text{OEn}}$ to Yn; see Figure 6						
		C _L = 50 pF	2.5	5.0	8.0	2.0	8.5	ns
		C _L = 300 pF, 1 output switching	-	15.0	19.0	-	20.0	ns
		C _L = 300 pF, 10 outputs switching	-	15.0	19.0	-	20.0	ns
t _{PLZ}	LOW to OFF-state propagation delay	$\overline{\text{OEn}}$ to Yn; see Figure 6						
		C _L = 50 pF	2.5	5.0	8.0	2.0	8.5	ns
		C _L = 300 pF, 1 output switching	-	9.5	13.5	-	14.0	ns
		C _L = 300 pF, 10 outputs switching	-	12.5	15.5	-	16.0	ns

11. Waveforms

V_M = 1.5 VV_{OL} and V_{OH} are typical voltage output levels that occur with the output load.**Fig 5. Propagation delay input (An) to output (Yn)**



$V_M = 1.5 V$
 V_{OL} and V_{OH} are typical voltage output levels that occur with the output load.

Fig 6. Propagation delay 3-state output enable time to LOW-level and output disable time from LOW-level

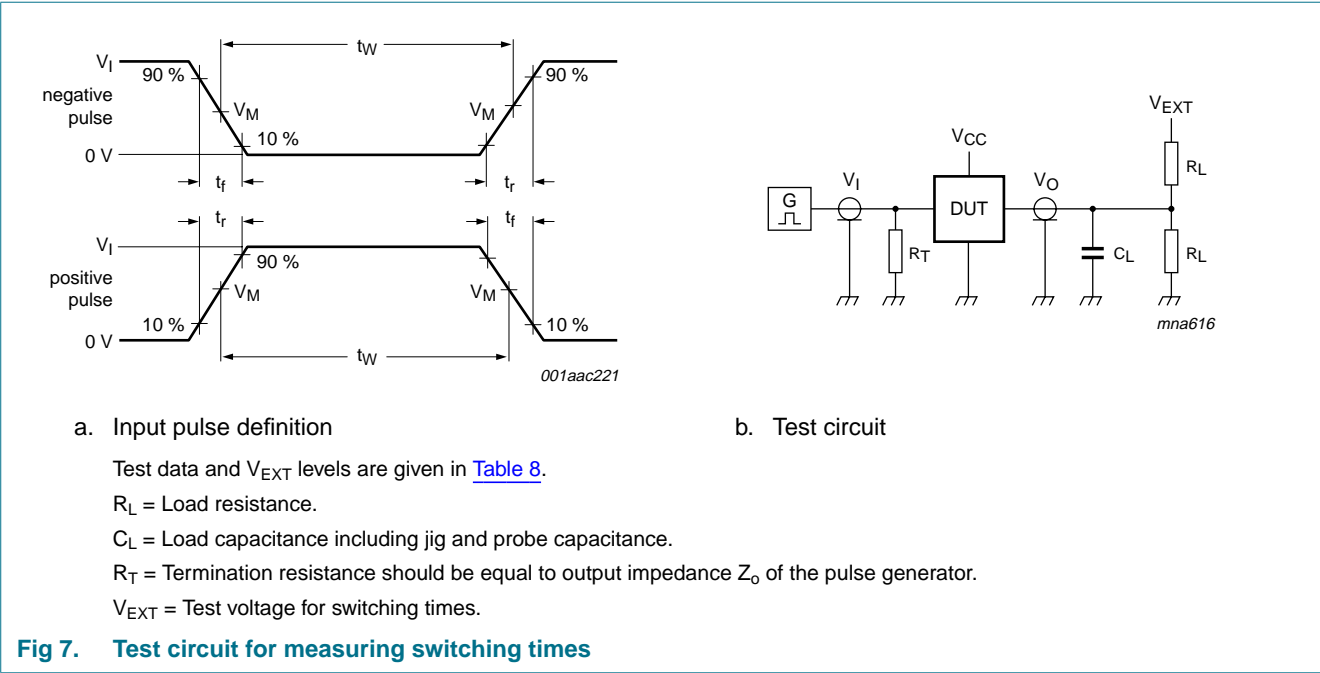


Fig 7. Test circuit for measuring switching times

Table 8. Test data

Input				Load		V_{EXT}		
V_I	f_I	t_W	t_r, t_f	C_L	R_L	t_{PHL}, t_{PLH}	t_{PZH}, t_{PHZ}	t_{PZL}, t_{PLZ}
3.0 V	1 MHz	500 ns	≤ 2.5 ns	50 pF	500 Ω	open	open	7.0 V

12. Package outline

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

SOT137-1

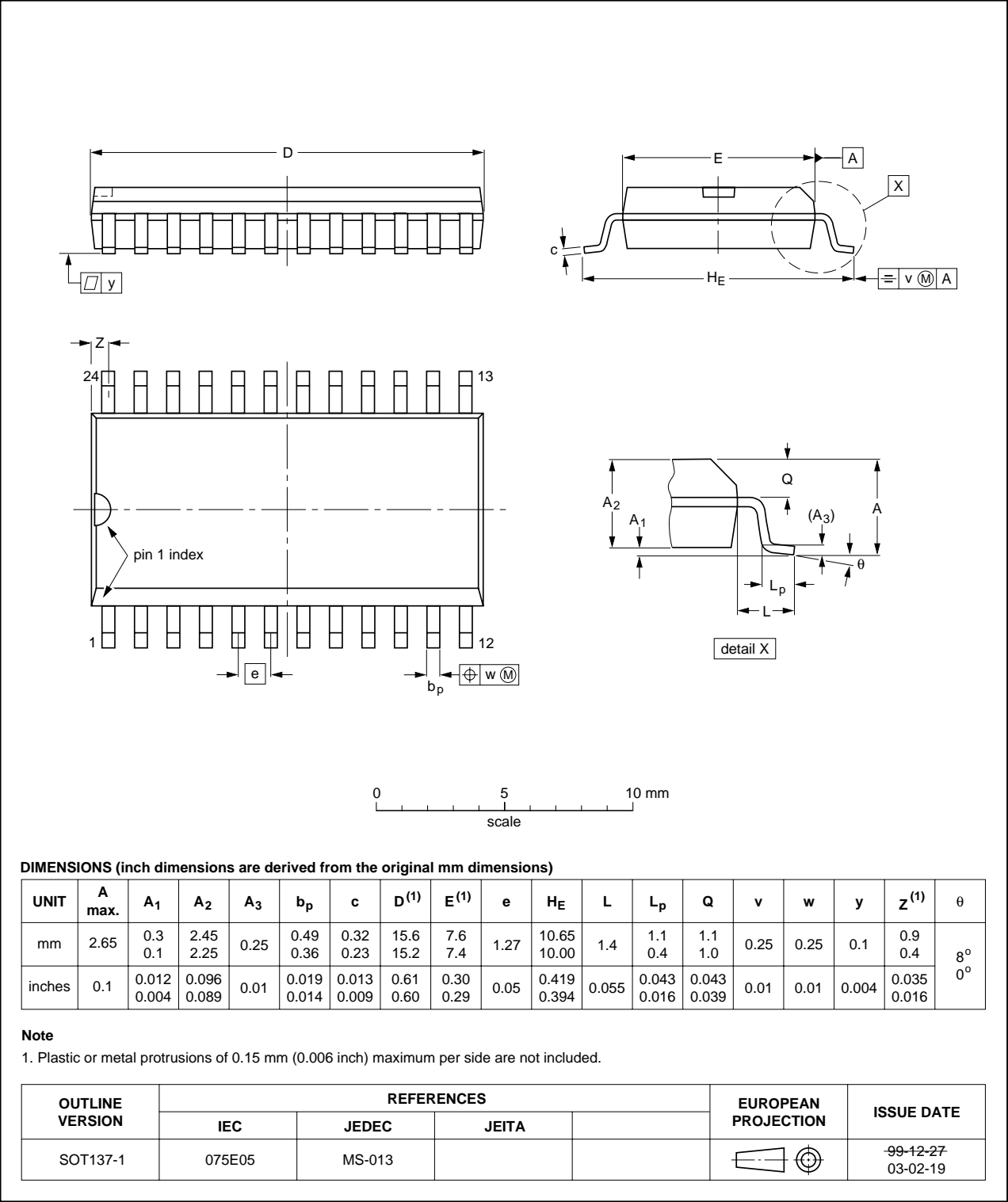


Fig 8. Package outline SOT137-1 (SO24)

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

SOT340-1

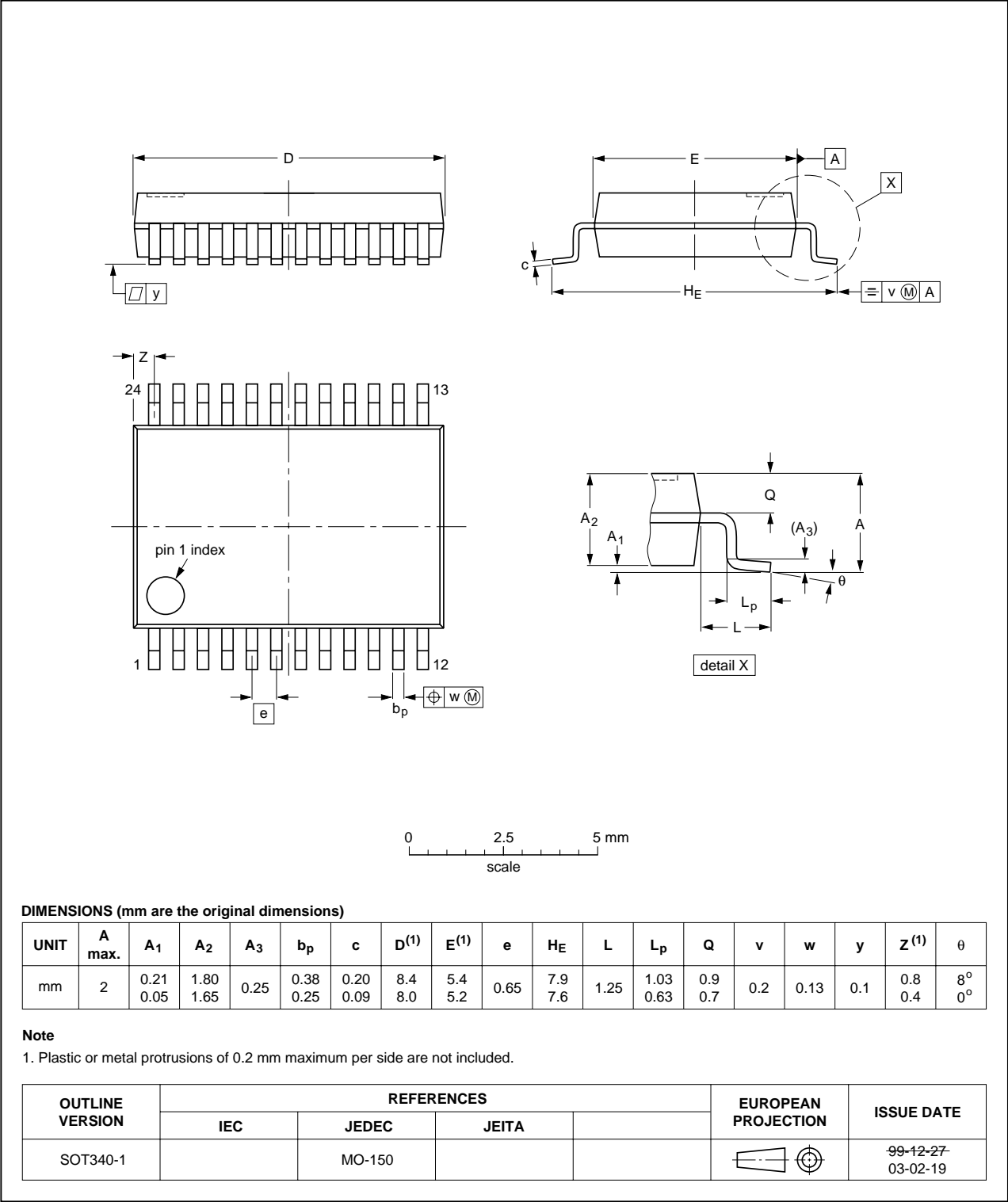


Fig 9. Package outline SOT340-1 (SSOP24)

13. Abbreviations

Table 9. Abbreviations

Acronym	Description
DUT	Device Under Test
ESD	ElectroStatic Discharge
HBM	Human Body Model
MM	Machine Model

14. Revision history

Table 10. Revision history

Document ID	Release date	Data sheet status	Change notice	Supersedes
74F827_4	20100129	Product data sheet	-	74F827_3
Modifications:	<ul style="list-style-type: none">• The format of this data sheet has been redesigned to comply with the new identity guidelines of NXP Semiconductors.• Legal texts have been adapted to the new company name where appropriate.• DIP 24 (SOT222-1) package removed from Section 3 “Ordering information” and Section 12 “Package outline”			
74F827_3	20040121	Product specification	-	74F827_74F828_2
74F827_74F828_2	19941205	Product specification	-	-

15. Legal information

15.1 Data sheet status

Document status ^{[1][2]}	Product status ^[3]	Definition
Objective [short] data sheet	Development	This document contains data from the objective specification for product development.
Preliminary [short] data sheet	Qualification	This document contains data from the preliminary specification.
Product [short] data sheet	Production	This document contains the product specification.

[1] Please consult the most recently issued document before initiating or completing a design.

[2] The term 'short data sheet' is explained in section "Definitions".

[3] The product status of device(s) described in this document may have changed since this document was published and may differ in case of multiple devices. The latest product status information is available on the Internet at URL <http://www.nxp.com>.

15.2 Definitions

Draft — The document is a draft version only. The content is still under internal review and subject to formal approval, which may result in modifications or additions. NXP Semiconductors does not give any representations or warranties as to the accuracy or completeness of information included herein and shall have no liability for the consequences of use of such information.

Short data sheet — A short data sheet is an extract from a full data sheet with the same product type number(s) and title. A short data sheet is intended for quick reference only and should not be relied upon to contain detailed and full information. For detailed and full information see the relevant full data sheet, which is available on request via the local NXP Semiconductors sales office. In case of any inconsistency or conflict with the short data sheet, the full data sheet shall prevail.

15.3 Disclaimers

General — Information in this document is believed to be accurate and reliable. However, NXP Semiconductors does not give any representations or warranties, expressed or implied, as to the accuracy or completeness of such information and shall have no liability for the consequences of use of such information.

Right to make changes — NXP Semiconductors reserves the right to make changes to information published in this document, including without limitation specifications and product descriptions, at any time and without notice. This document supersedes and replaces all information supplied prior to the publication hereof.

Suitability for use — NXP Semiconductors products are not designed, authorized or warranted to be suitable for use in medical, military, aircraft, space or life support equipment, nor in applications where failure or malfunction of an NXP Semiconductors product can reasonably be expected to result in personal injury, death or severe property or environmental

damage. NXP Semiconductors accepts no liability for inclusion and/or use of NXP Semiconductors products in such equipment or applications and therefore such inclusion and/or use is at the customer's own risk.

Applications — Applications that are described herein for any of these products are for illustrative purposes only. NXP Semiconductors makes no representation or warranty that such applications will be suitable for the specified use without further testing or modification.

Limiting values — Stress above one or more limiting values (as defined in the Absolute Maximum Ratings System of IEC 60134) may cause permanent damage to the device. Limiting values are stress ratings only and operation of the device at these or any other conditions above those given in the Characteristics sections of this document is not implied. Exposure to limiting values for extended periods may affect device reliability.

Terms and conditions of sale — NXP Semiconductors products are sold subject to the general terms and conditions of commercial sale, as published at <http://www.nxp.com/profile/terms>, including those pertaining to warranty, intellectual property rights infringement and limitation of liability, unless explicitly otherwise agreed to in writing by NXP Semiconductors. In case of any inconsistency or conflict between information in this document and such terms and conditions, the latter will prevail.

No offer to sell or license — Nothing in this document may be interpreted or construed as an offer to sell products that is open for acceptance or the grant, conveyance or implication of any license under any copyrights, patents or other industrial or intellectual property rights.

Export control — This document as well as the item(s) described herein may be subject to export control regulations. Export might require a prior authorization from national authorities.

15.4 Trademarks

Notice: All referenced brands, product names, service names and trademarks are the property of their respective owners.

16. Contact information

For more information, please visit: <http://www.nxp.com>

For sales office addresses, please send an email to: salesaddresses@nxp.com

17. Contents

1	General description	1
2	Features	1
3	Ordering information	1
4	Functional diagram	2
5	Pinning information	3
5.1	Pinning	3
5.2	Pin description	3
6	Functional description	4
6.1	Function table	4
7	Limiting values	4
8	Recommended operating conditions	4
9	Static characteristics	5
10	Dynamic characteristics	5
11	Waveforms	6
12	Package outline	9
13	Abbreviations	11
14	Revision history	11
15	Legal information	12
15.1	Data sheet status	12
15.2	Definitions	12
15.3	Disclaimers	12
15.4	Trademarks	12
16	Contact information	12
17	Contents	13

Please be aware that important notices concerning this document and the product(s) described herein, have been included in section 'Legal information'.

founded by

PHILIPS

© NXP B.V. 2010.

All rights reserved.

For more information, please visit: <http://www.nxp.com>

For sales office addresses, please send an email to: salesaddresses@nxp.com

Date of release: 29 January 2010

Document identifier: 74F827_4

Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

NXP:

[N74F827D](#) [N74F827D-T](#) [N74F827DB](#) [N74F827DB-T](#)