

DATA SHEET

74ALS38A

Quad 2-Input NAND buffer
(open collector)

Product specification

1991 Feb 08

IC05 Data Handbook

Quad 2-input NAND buffer (open collector)

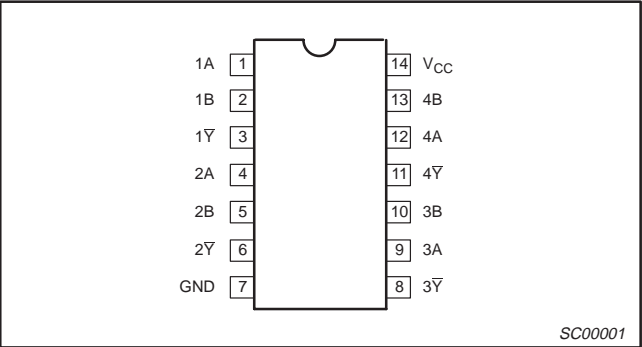
74ALS38A

TYPE	TYPICAL PROPAGATION DELAY	TYPICAL SUPPLY CURRENT (TOTAL)
74ALS38A	7.0ns	3.5mA

ORDERING INFORMATION

DESCRIPTION	ORDER CODE	DRAWING NUMBER
	COMMERCIAL RANGE V _{CC} = 5V ±10%, T _{amb} = 0°C to +70°C	
14-pin plastic DIP	74ALS38AN	SOT27-1
14-pin plastic SO	74ALS38AD	SOT108-1

PIN CONFIGURATION

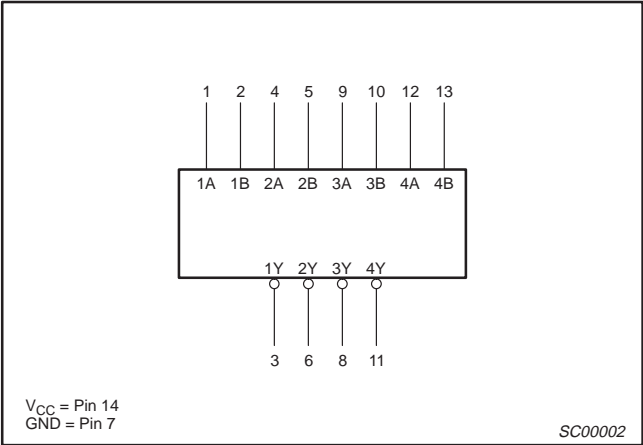


INPUT AND OUTPUT LOADING AND FAN-OUT TABLE

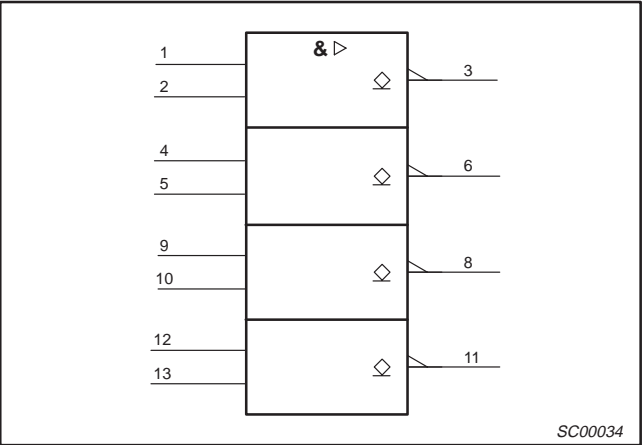
PINS	DESCRIPTION	74ALS (U.L.) HIGH/LOW	LOAD VALUE HIGH/LOW
nA, nB	Data inputs	1.0/1.0	20μA/0.1mA
nY	Data outputs	20/80	0.4mA/8mA

NOTE: One (1.0) ALS unit load is defined as: 20μA in the High state and 0.1mA in the Low state.

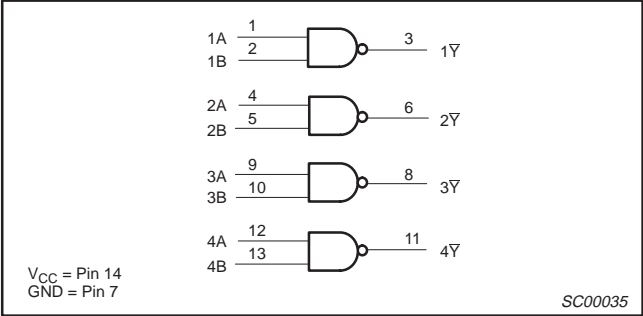
LOGIC SYMBOL



IEC/IEEE SYMBOL



LOGIC DIAGRAM



FUNCTION TABLE

INPUTS		OUTPUT
nA	nB	nY
L	L	H
L	H	H
H	L	H
H	H	L

H = High voltage level
L = Low voltage level
X = Don't care

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ABSOLUTE MAXIMUM RATINGS

(Operation beyond the limit set forth in this table may impair the useful life of the device.
Unless otherwise noted these limits are over the operating free-air temperature range.)

SYMBOL	PARAMETER	RATING	UNIT
V_{CC}	Supply voltage	−0.5 to +7.0	V
V_{IN}	Input voltage	−0.5 to +7.0	V
I_{IN}	Input current	−30 to +5	mA
V_{OUT}	Voltage applied to output in High output state	−0.5 to V_{CC}	V
I_{OUT}	Current applied to output in Low output state	48	mA
T_{amb}	Operating free-air temperature range	0 to +70	°C
T_{stg}	Storage temperature range	−65 to +150	°C

RECOMMENDED OPERATING CONDITIONS

SYMBOL	PARAMETER	LIMITS			UNIT
		MIN	NOM	MAX	
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 clamp current			−18	mA
V_{OH}	High-level output voltage			5.5	V
I_{OL}	Low-level output current			24	mA
T_{amb}	Operating free-air temperature range	0		+70	°C

DC ELECTRICAL CHARACTERISTICS

(Over recommended operating free-air temperature range unless otherwise noted.)

SYMBOL	PARAMETER	TEST CONDITIONS ¹	LIMITS			UNIT
			MIN	TYP ²	MAX	
I_{OH}	High-level output current	$V_{CC} = \text{MIN}, V_{IL} = \text{MAX}, V_{IH} = \text{MIN}, V_{OH} = \text{MAX}$			100	μA
V_{OL}	Low-level output voltage	$V_{CC} = \text{MIN}, V_{IL} = \text{MAX}, V_{IH} = \text{MIN}$	$I_{OL} = 12\text{mA}$	0.25	0.40	V
			$I_{OL} = 24\text{mA}$	0.35	0.50	V
V_{IK}	Input clamp voltage	$V_{CC} = \text{MIN}, I_I = I_{IK}$		−0.73	−1.5	V
I_I	Input current at maximum input voltage	$V_{CC} = \text{MAX}, V_I = 7.0\text{V}$			0.1	mA
I_{IH}	High-level input current	$V_{CC} = \text{MAX}, V_I = 2.7\text{V}$			20	μA
I_{IL}	Low-level input current	$V_{CC} = \text{MAX}, V_I = 0.5\text{V}$			−0.1	mA
I_{CC}	Supply current (total)	I_{CCH} $V_{CC} = \text{MAX}$ $V_I = \text{GND}$		0.65	1.6	mA
		I_{CCL} $V_I = 4.5\text{V}$		6.5	9.0	mA

NOTES:

- For conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions for the applicable type.
- All typical values are at $V_{CC} = 5\text{V}$, $T_{amb} = 25^\circ\text{C}$.

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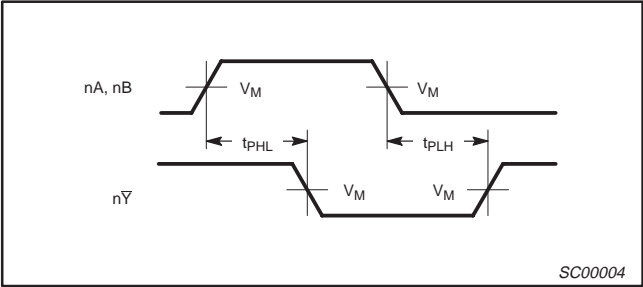
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AC ELECTRICAL CHARACTERISTICS

SYMBOL	PARAMETER	TEST CONDITION	LIMITS		UNIT
			$T_{amb} = 0^{\circ}C \text{ to } +70^{\circ}C$ $V_{CC} = +5.0V \pm 10\%$ $C_L = 50pF, R_L = 500\Omega$		
			MIN	MAX	
t_{PLH} t_{PHL}	Propagation delay nA or nB to nY	Waveform 1	3.0 3.0	11.0 11.0	ns

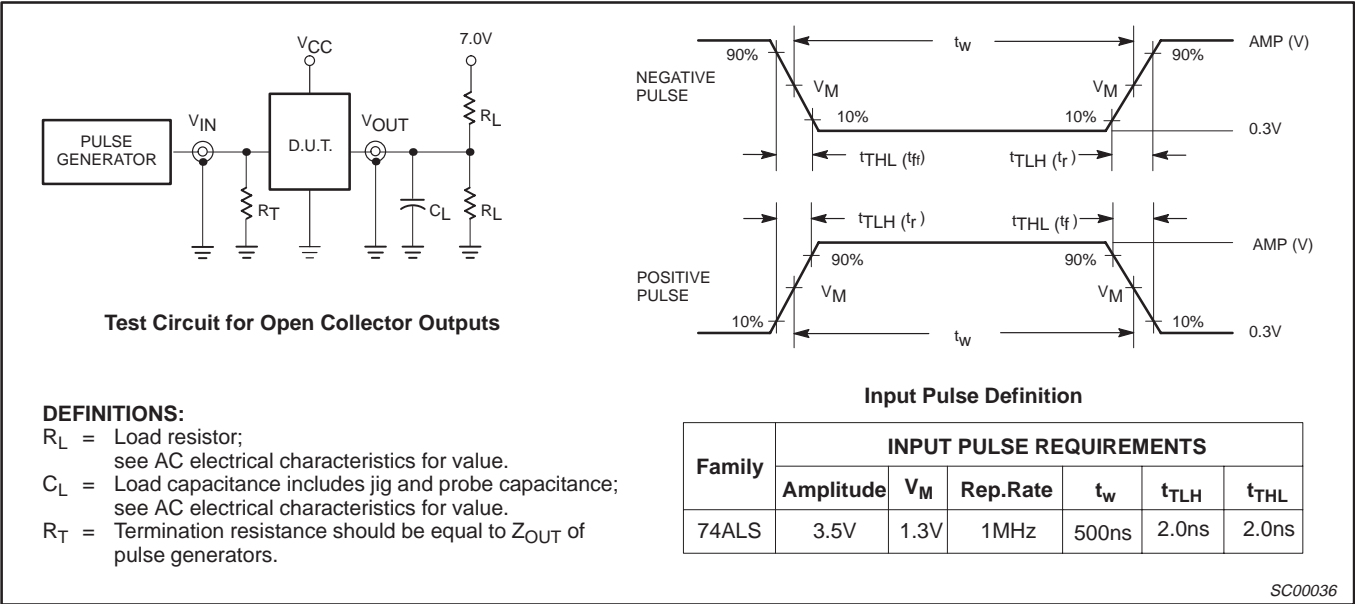
AC WAVEFORMS

For all waveforms, $V_M = 1.3V$.



Waveform 1. Propagation Delay for Data to Output

TEST CIRCUIT AND WAVEFORMS

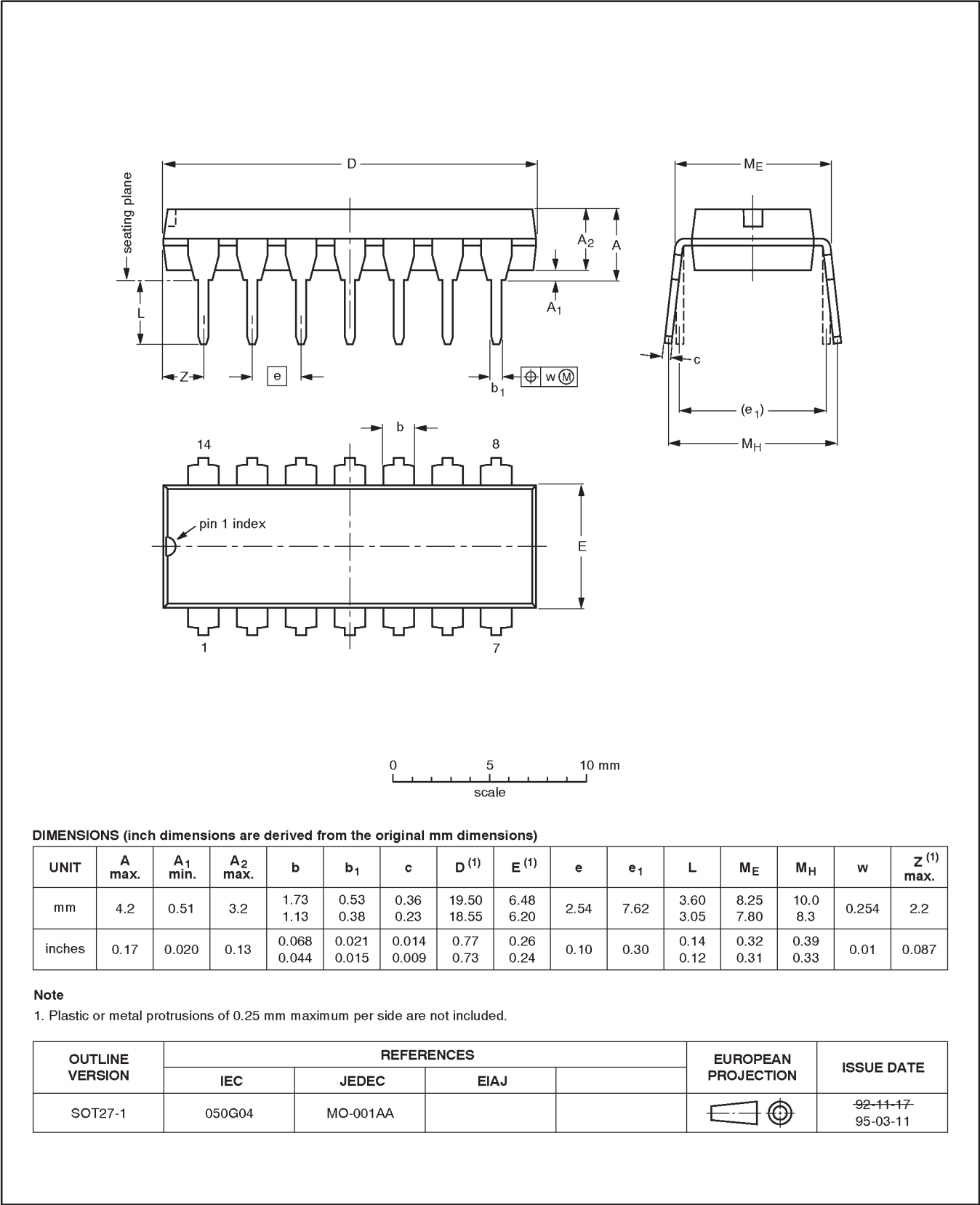


Quad 2-input NAND buffer (open collector)

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DIP14: plastic dual in-line package; 14 leads (300 mil)

SOT27-1

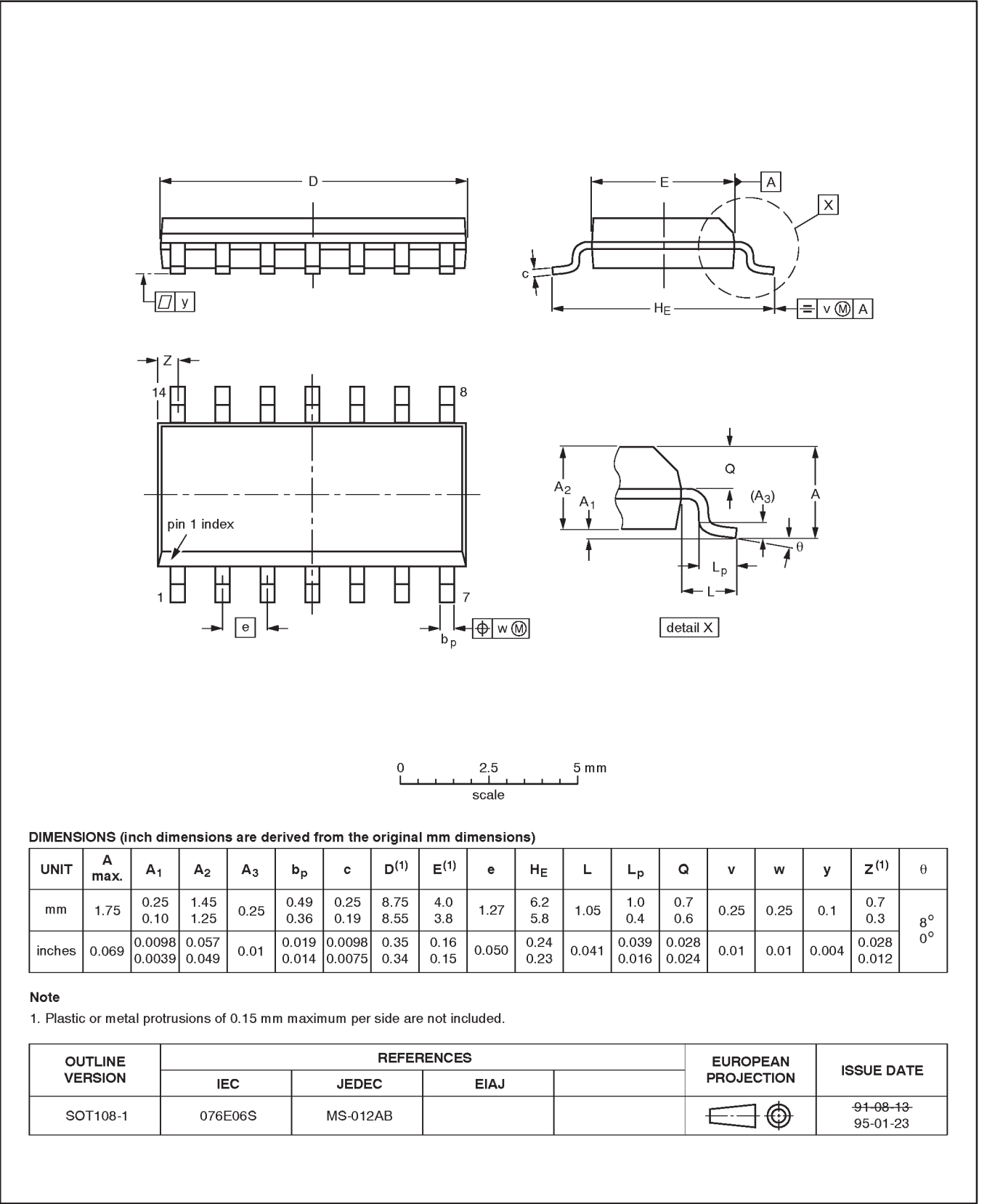


Quad 2-input NAND buffer (open collector)

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SO14: plastic small outline package; 14 leads; body width 3.9 mm

SOT108-1



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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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Philips Semiconductors
811 East Arques Avenue
P.O. Box 3409
Sunnyvale, California 94088-3409
Telephone 800-234-7381

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