

# DATA SHEET

**74F06**

Inverter/buffer drivers

Product data  
Supersedes data of 1992 Jul 24

2004 Mar 12

Hex inverter/buffer drivers (open-collector)

74F06

FEATURES

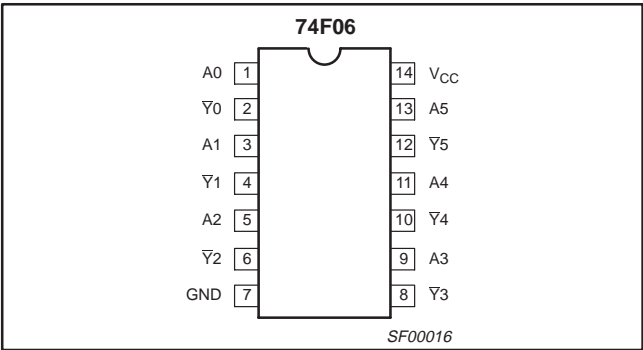
- Open Collector output drive 64mA
- High speed
- 12V output termination voltage

TYPE	TYPICAL PROPAGATION DELAY	TYPICAL SUPPLY CURRENT (TOTAL)
74F06	3.5ns	30mA

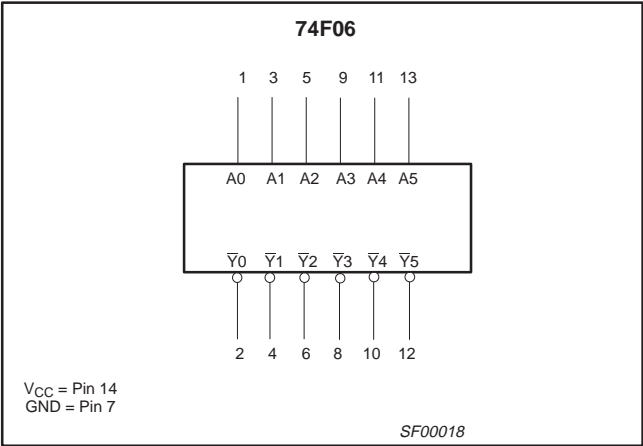
ORDERING INFORMATION

DESCRIPTION	TYPE NUMBER	PKG DWG #
14-pin plastic dual in-line package	N74F06N	SOT27-1
14-pin plastic small outline package	N74F06D	SOT108-1

PIN CONFIGURATIONS



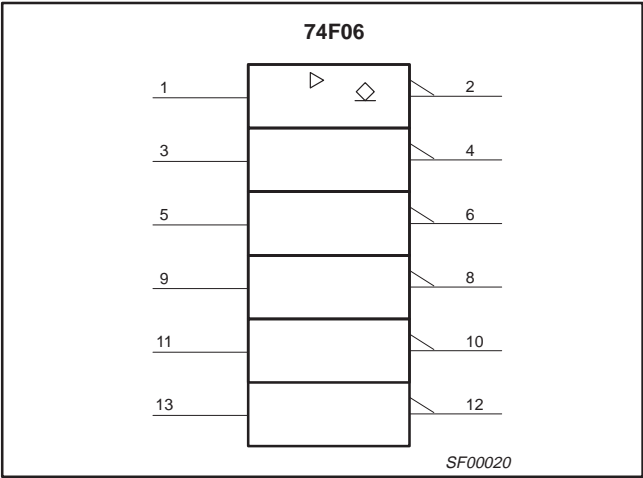
LOGIC SYMBOLS



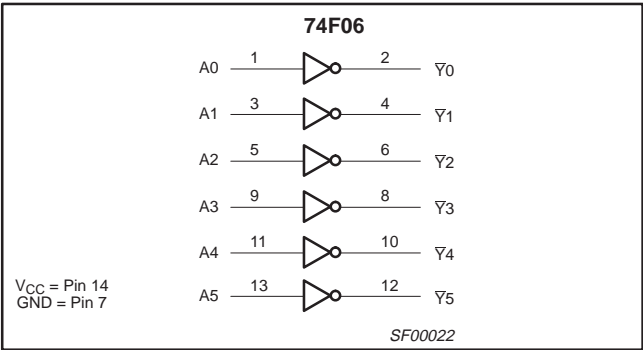
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IEC/IEEE SYMBOLS



LOGIC DIAGRAMS



INPUT AND OUTPUT LOADING AND FAN OUT TABLE

PINS	DESCRIPTION	74F (U.L.) HIGH/LOW	LOAD VALUE HIGH/LOW
$A_n$	Data inputs	1.0/1.0	20 $\mu$ A/0.6mA
$\bar{Y}_n$	Data outputs	OC/106.7	OC/64mA

- NOTES:
- One (1.0) FAST unit load is defined as: 20 $\mu$ A in the High state and 0.6mA in the Low state.
  - OC = Open Collector

FUNCTION TABLE

INPUTS	OUTPUTS
$A_n$	$\bar{Y}_n$
L	H
H	L

- NOTES:
- H = High voltage level
  - L = Low voltage level

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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 12	V
$I_{OUT}$	Current applied to output in Low output state	128	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			12	V
$I_{OL}$	Low-level output current			64	mA
$T_{amb}$	Operating free air temperature range	0		+70	°C

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**DC ELECTRICAL CHARACTERISTICS**

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

SYMBOL	PARAMETER		TEST CONDITIONS <sup>1</sup>			LIMITS			UNIT
						MIN	TYP <sup>2</sup>	MAX	
I <sub>OH</sub>	High-level output current		V <sub>CC</sub> = MIN, V <sub>IL</sub> = MAX, V <sub>OH</sub> = MAX, V <sub>IH</sub> = MIN					250	μA
V <sub>OL</sub>	Low-level output voltage		V <sub>CC</sub> = MIN, V <sub>IL</sub> = MAX, V <sub>IH</sub> = MIN	I <sub>OL</sub> = MAX	±10% V <sub>CC</sub>		0.30	0.50	V
					±5% V <sub>CC</sub>		0.30	0.50	V
V <sub>IK</sub>	Input clamp voltage		V <sub>CC</sub> = MIN, I <sub>I</sub> = I <sub>IK</sub>				−0.73	−1.2	V
I <sub>I</sub>	Input current at maximum input voltage		V <sub>CC</sub> = MAX, V <sub>I</sub> = 7.0V					100	μA
I <sub>IH</sub>	High-level input current		V <sub>CC</sub> = MAX, V <sub>I</sub> = 2.7V					20	μA
I <sub>IL</sub>	Low-level input current		V <sub>CC</sub> = MAX, V <sub>I</sub> = 0.5V					−0.6	mA
I <sub>CC</sub>	Supply current (total)	I <sub>CCH</sub>	V <sub>CC</sub> = MAX				5.0	8.0	mA
		I <sub>CCL</sub>					30	43	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  $V_{CC} = 5\text{V}$ ,  $T_{\text{amb}} = 25^\circ\text{C}$ .

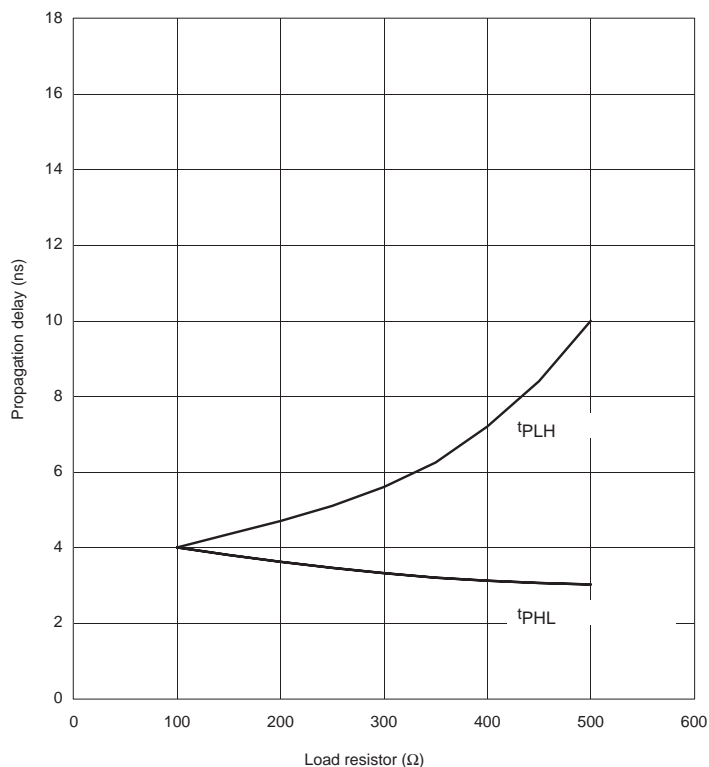
**AC ELECTRICAL CHARACTERISTICS**

SYMBOL	PARAMETER	TEST CONDITION	LIMITS					UNIT
			$V_{CC} = +5.0V$ $T_{amb} = +25^{\circ}C$ $C_L = 50pF, R_L = 100\Omega$			$V_{CC} = +5.0V \pm 10\%$ $T_{amb} = 0^{\circ}C \text{ to } +70^{\circ}C$ $C_L = 50pF, R_L = 100\Omega$		
			Min	Typ	Max	Min	Max	
$t_{PLH}$	Propagation delay	Waveform 1	2.0	3.5	6.0	1.5	6.5	ns
$t_{PHL}$	An to $\bar{Y}_n$		1.5	3.0	5.5	1.0	6.0	

## Hex inverter/buffer drivers (open-collector)

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## TYPICAL PROPAGATION DELAYS VERSUS LOAD FOR OPEN COLLECTOR OUTPUTS



SF00024

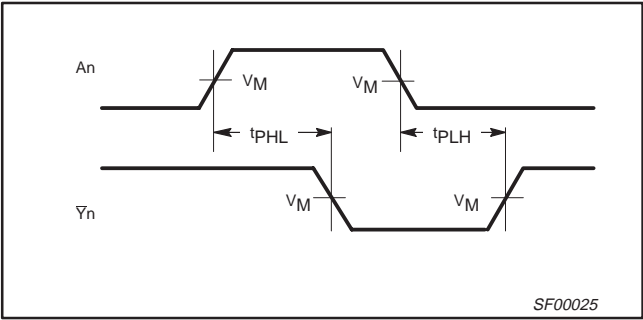
**NOTE:**

When using Open-Collector parts, the value of the pull-up resistor greatly affects the value of the  $t_{PLH}$ . For example, changing the specified pull-up resistor value from 500Ω to 100Ω will improve the  $t_{PLH}$  up to 50% with only a slight increase in the  $t_{PHL}$ . However, if the value of the pull-up resistor is changed, the user must make certain that the total  $I_{OL}$  current through the resistor and the total  $I_{IL}$ 's of the receivers does not exceed the  $I_{OL}$  maximum specification.

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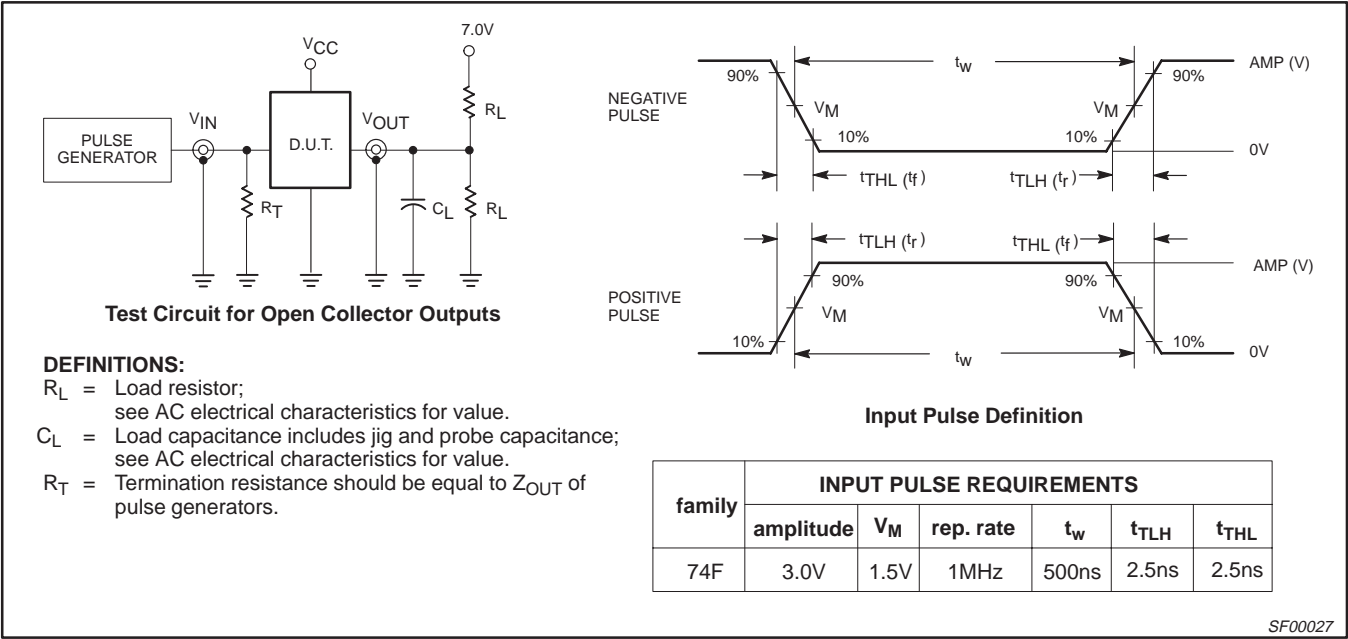
AC WAVEFORMS



Waveform 1. Propagation delay for inverting outputs

**NOTE:**  
For all waveforms,  $V_M = 1.5V$ .

TEST CIRCUIT AND WAVEFORMS

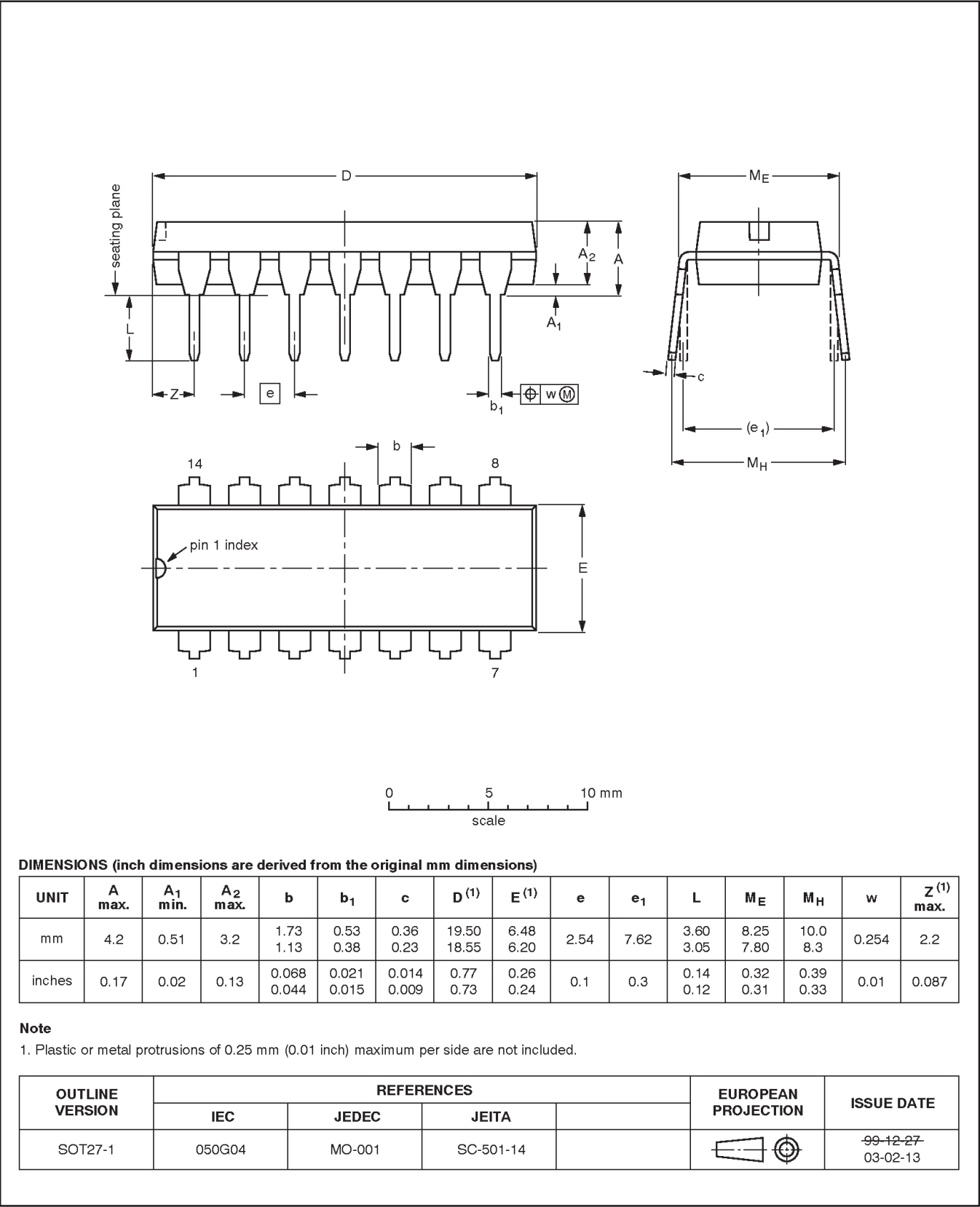


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DIP14: plastic dual in-line package; 14 leads (300 mil)

SOT27-1

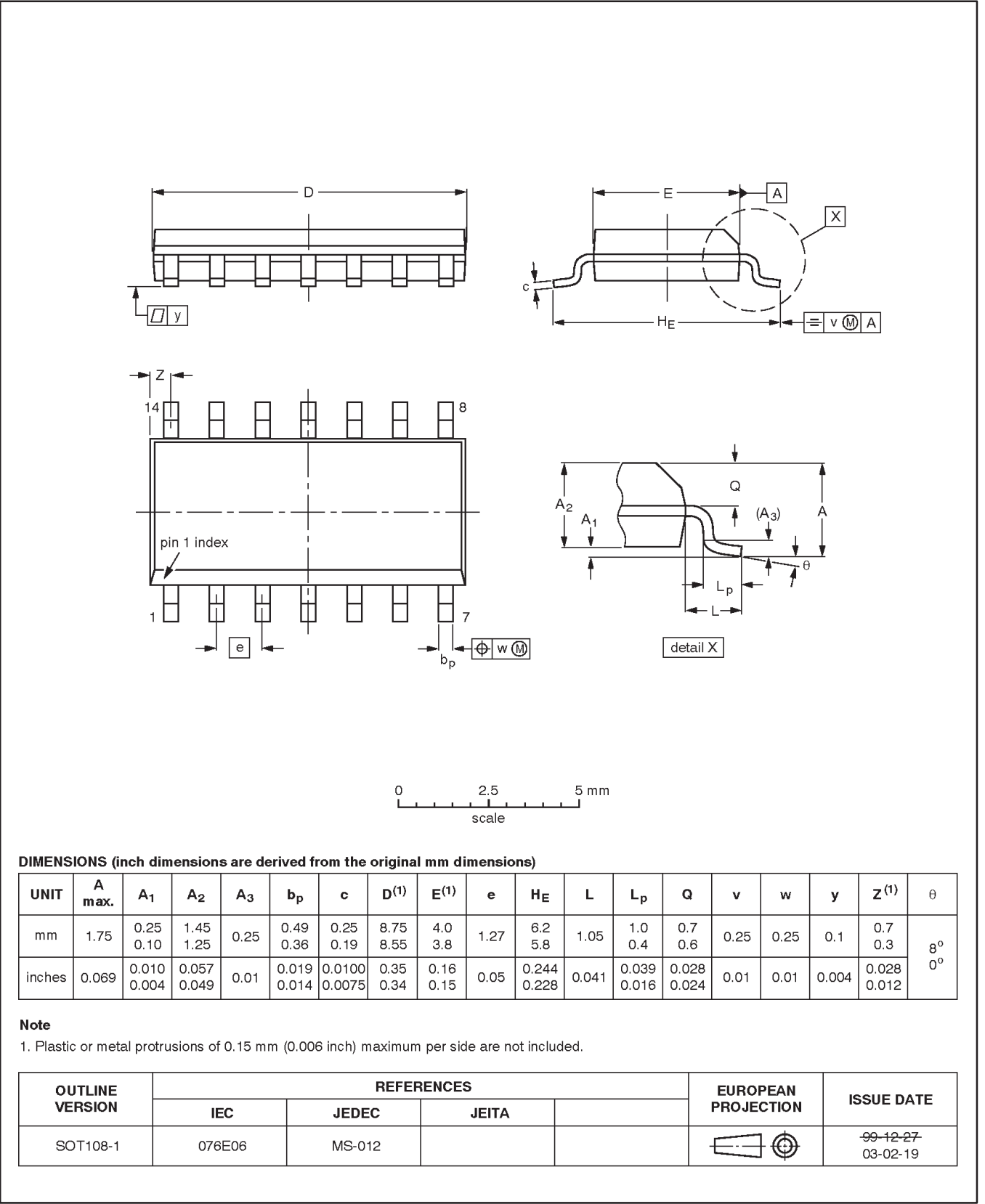


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SO14: plastic small outline package; 14 leads; body width 3.9 mm

SOT108-1



## Hex inverter/buffer drivers (open-collector)

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## REVISION HISTORY

Rev	Date	Description
_3	20040312	<b>Product data (9397 750 13034); supersedes data sheet 74F06_A_7_A_2 of 1992 Jul 24 (9397 750 05054).</b> Modifications: <ul style="list-style-type: none"><li>• Delete all references to 74F06A and 74F07A (product discontinued).</li><li>• Separate 74F06 and 74F07 into standalone data sheets.</li></ul>
_2	19920724	<b>Product data (9397 750 05054); supersedes previous version.</b>

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## Data sheet status

Level	Data sheet status <sup>[1]</sup>	Product status <sup>[2] [3]</sup>	Definitions
I	Objective data	Development	This data sheet contains data from the objective specification for product development. Philips Semiconductors reserves the right to change the specification in any manner without notice.
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