

DATA SHEET

74F367

Hex buffer/driver

Product data

Replaces Product specification 74F365/74F367 of 2000 Jun 30

2004 Jan 30

Hex buffer/driver

74F367

FEATURES

- High-impedance NPN base inputs for reduced loading (20 μ A in HIGH and LOW states)
- High-speed
- Bus oriented
- 3-State buffer outputs sink 64 mA

TYPE	TYPICAL PROPAGATION DELAY	TYPICAL SUPPLY CURRENT (TOTAL)
74F367	5.0 ns	36 mA

ORDERING INFORMATION

COMMERCIAL RANGE: $V_{CC} = 5 V \pm 10\%$; $T_{amb} = 0^{\circ}C$ to $+70^{\circ}C$

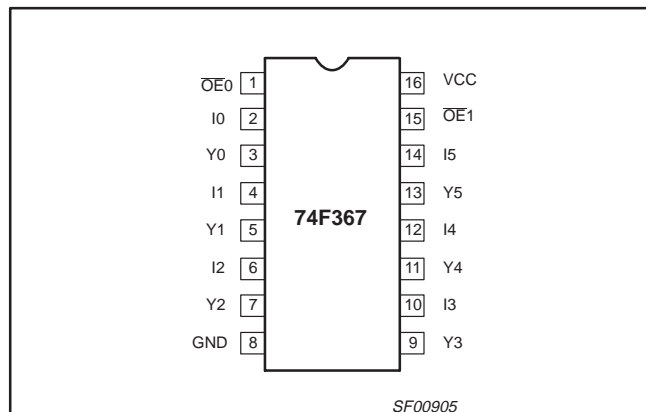
Type number	Package		
	Name	Description	Version
N74F367N	DIP16	plastic dual in-line package; 16 leads (300 mil)	SOT38-4
N74F367D	SO16	plastic small outline package; 16 leads; body width 3.9 mm	SOT109-1

INPUT AND OUTPUT LOADING AND FAN-OUT TABLE

PINS	DESCRIPTION	74F(U.L.) HIGH / LOW	LOAD VALUE HIGH / LOW
I0 - I5	Inputs	1.0 / 0.033	20 μ A / 20 μ A
$\overline{OE}0, \overline{OE}1$	Output enable inputs (active-LOW)	1.0 / 0.033	20 μ A / 20 μ A
Y0 - Y5	Data Outputs	750 / 106.7	15 mA / 64 mA

NOTE: One (1.0) FAST Unit Load (U.L.) is defined as: 20 μ A in the HIGH state and 0.6 mA in the LOW state.

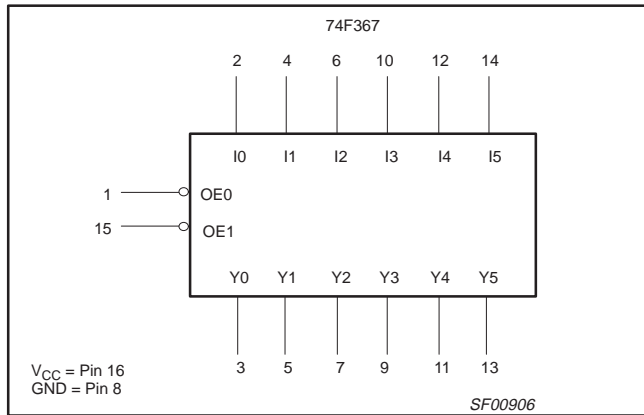
PIN CONFIGURATION



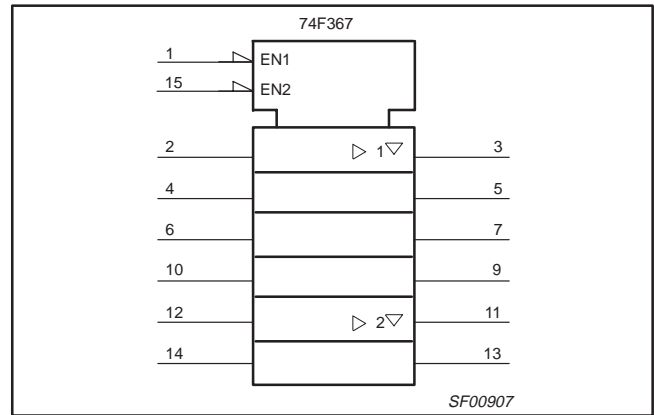
Hex buffer/driver

74F367

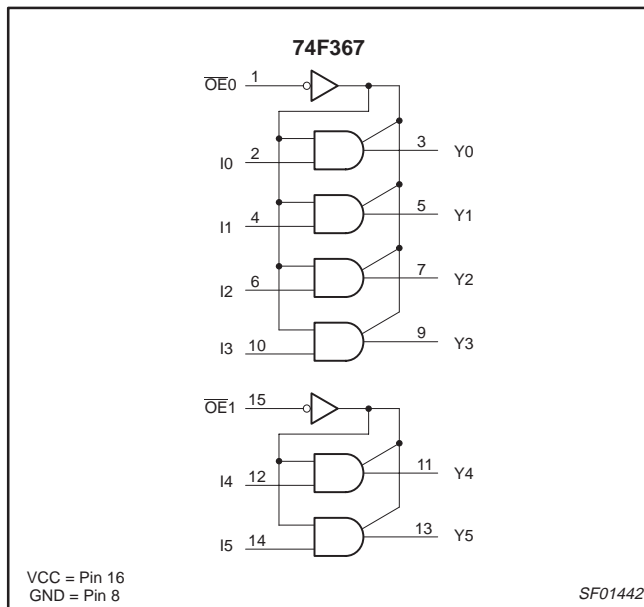
LOGIC SYMBOL



LOGIC SYMBOL (IEEE/IEC)



LOGIC DIAGRAM



FUNCTION TABLE

INPUTS		OUTPUTS
OE _n	I _n	Y _n
L	L	L
L	H	H
H	X	Z

H = HIGH voltage level
L = LOW voltage level
X = Don't care
Z = High impedance "off" state

Hex buffer/driver

74F367

ABSOLUTE MAXIMUM RATINGS

Operation beyond the limits 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 range	-0.5 to +7.0	V
V_{IN}	Input voltage range	-0.5 to +7.0	V
I_{IN}	Input current range	-30 to +5	mA
V_{OUT}	Voltage applied to output in HIGH output state range	-0.5 to 5.5	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	TYP	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
I_{OH}	HIGH-level output current	-	-	-15	mA
I_{OL}	LOW-level output current	-	-	64	mA
T_{amb}	Operating free-air temperature range	0	-	70	°C

Hex buffer/driver

74F367

DC ELECTRICAL CHARACTERISTICS

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

SYMBOL	PARAMETER	TEST CONDITIONS ¹	LIMITS			UNIT	
			MIN	TYP ²	MAX		
V _{OH}	HIGH-level output voltage	V _{CC} = MIN; V _{IL} = MAX; V _{IH} = MIN; I _{OH} = -3 mA	± 10% V _{CC}	2.4	-	-	V
			± 5% V _{CC}	2.7	3.3	-	V
		V _{CC} = MIN; V _{IL} = MAX; V _{IH} = MIN; I _{OH} = -15 mA	± 10% V _{CC}	2.0	-	-	V
			± 5% V _{CC}	2.0	-	-	V
V _{OL}	Low-level output voltage	V _{CC} = MIN; V _{IL} = MAX; V _{IH} = MIN; I _{OL} = MAX	± 10% V _{CC}	-	-	0.55	V
			± 5% V _{CC}	-	0.42	0.55	V
V _{IK}	Input clamp voltage	V _{CC} = MIN; I _I = I _{IK}	-	-0.73	-1.2	V	
I _I	Input current at maximum input voltage	V _{CC} = 0 V; V _I = 7.0 V	-	-	100	μA	
I _{IH}	HIGH-level input current	V _{CC} = MAX; V _I = 2.7 V	-	-	20	μA	
I _{IL}	LOW-level input current	V _{CC} = MAX; V _I = 0.5 V	-	-	-20	μA	
I _{OZH}	Off-state output current, HIGH-level voltage applied	V _{CC} = MAX; V _O = 2.7 V	-	-	50	μA	
I _{OZL}	Off-state output current, LOW-level voltage applied	V _{CC} = MAX; V _O = 0.5 V	-	-	-50	μA	
I _{OS}	Short-circuit output current ³	V _{CC} = MAX	-100	-	-225	mA	
I _{CC}	Supply current (total)	V _{CC} = MAX	I _{CCH}	-	25	35	mA
			I _{CCL}	-	47	62	mA
			I _{CCZ}	-	35	48	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 V, T_{amb} = 25 °C.
- Not more than one output should be shorted at a time. For testing I_{OS}, the use of high-speed test apparatus and/or sample-and-hold techniques are preferable in order to minimize internal heating and more accurately reflect operational values. Otherwise, prolonged shorting of a HIGH output may raise the chip temperature well above normal and thereby cause invalid readings in other parameter tests. In any sequence of parameter tests, I_{OS} tests should be performed last.

AC ELECTRICAL CHARACTERISTICS

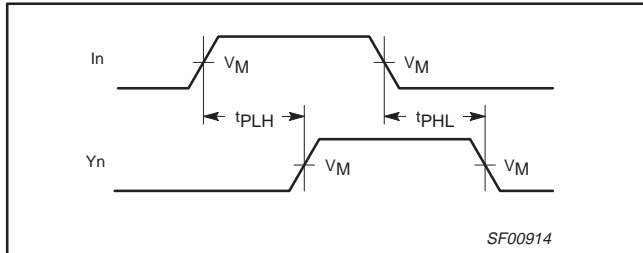
SYMBOL	PARAMETER	TEST CONDITIONS	LIMITS					UNIT
			T _{amb} = +25 °C V _{CC} = +5.0 V C _L = 50 pF; R _L = 500 Ω			T _{amb} = -55 °C to +125 °C V _{CC} = +5.0 V ± 10% C _L = 50 pF; R _L = 500 Ω		
			MIN	TYP	MAX	MIN	MAX	
t _{PLH} t _{PHL}	Propagation delay I _n to Y _n	Waveform 1	2.5 2.5	4.5 5.5	6.5 7.0	2.0 2.0	7.0 7.5	ns ns
t _{PZH} t _{PZL}	Output Enable time to HIGH or LOW level	Waveform 2 Waveform 3	3.0 3.0	5.5 6.5	7.5 8.5	3.0 3.0	8.5 9.0	ns ns
t _{PHZ} t _{PLZ}	Output Disable time from HIGH to LOW level	Waveform 2 Waveform 3	2.0 2.0	4.5 4.0	6.5 6.5	2.0 2.0	7.0 7.0	ns ns

Hex buffer/driver

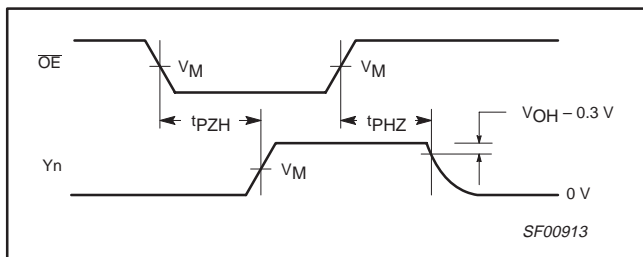
74F367

AC WAVEFORMS

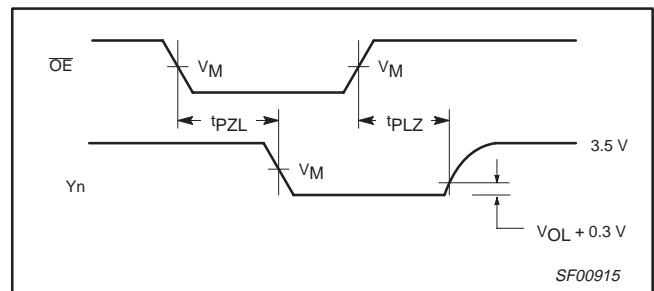
For all waveforms, $V_M = 1.5\text{ V}$



Waveform 1. For non-inverting outputs



Waveform 2. 3-State Output Enable time to HIGH level and Output Disable time from HIGH level



Waveform 3. 3-State Output Enable time to LOW level and Output Disable time from LOW level

TEST CIRCUIT AND WAVEFORM

Test Circuit for 3-State Outputs

SWITCH POSITION	
TEST	SWITCH
t_{PLZ}	closed
t_{PZL}	closed
All other	open

DEFINITIONS:
 R_L = Load resistor; see AC electrical characteristics for value.
 C_L = Load capacitance includes jig and probe capacitance; see AC electrical characteristics for value.
 R_T = Termination resistance should be equal to Z_{OUT} of pulse generators.

Input Pulse Definition

family	INPUT PULSE REQUIREMENTS					
	amplitude	V_M	rep. rate	t_w	t_{TLH}	t_{THL}
74F	3.0 V	1.5 V	1 MHz	500 ns	2.5 ns	2.5 ns

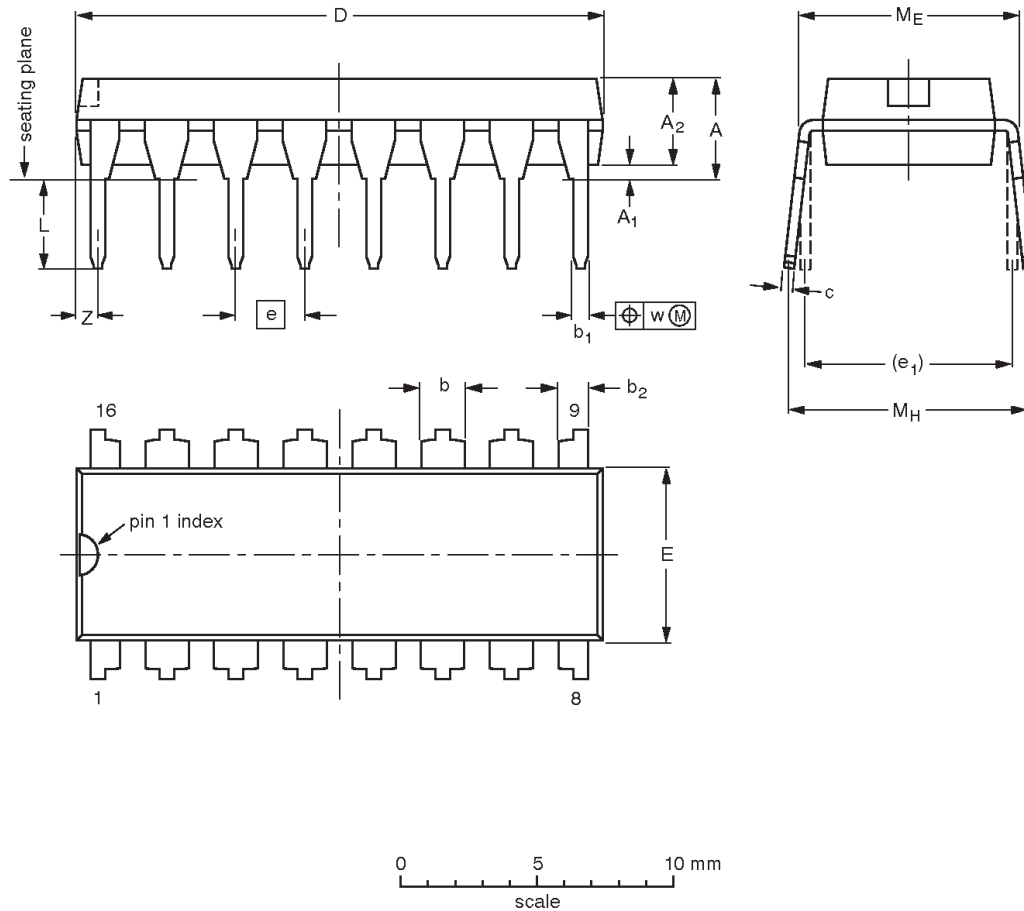
SF00777

Hex buffer/driver

74F367

DIP16: plastic dual in-line package; 16 leads (300 mil)

SOT38-4



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

UNIT	A max.	A ₁ min.	A ₂ max.	b	b ₁	b ₂	c	D ⁽¹⁾	E ⁽¹⁾	e	e ₁	L	M _E	M _H	w	Z ⁽¹⁾ max.
mm	4.2	0.51	3.2	1.73 1.30	0.53 0.38	1.25 0.85	0.36 0.23	19.50 18.55	6.48 6.20	2.54	7.62	3.60 3.05	8.25 7.80	10.0 8.3	0.254	0.76
inches	0.17	0.02	0.13	0.068 0.051	0.021 0.015	0.049 0.033	0.014 0.009	0.77 0.73	0.26 0.24	0.1	0.3	0.14 0.12	0.32 0.31	0.39 0.33	0.01	0.03

Note

1. Plastic or metal protrusions of 0.25 mm (0.01 inch) maximum per side are not included.

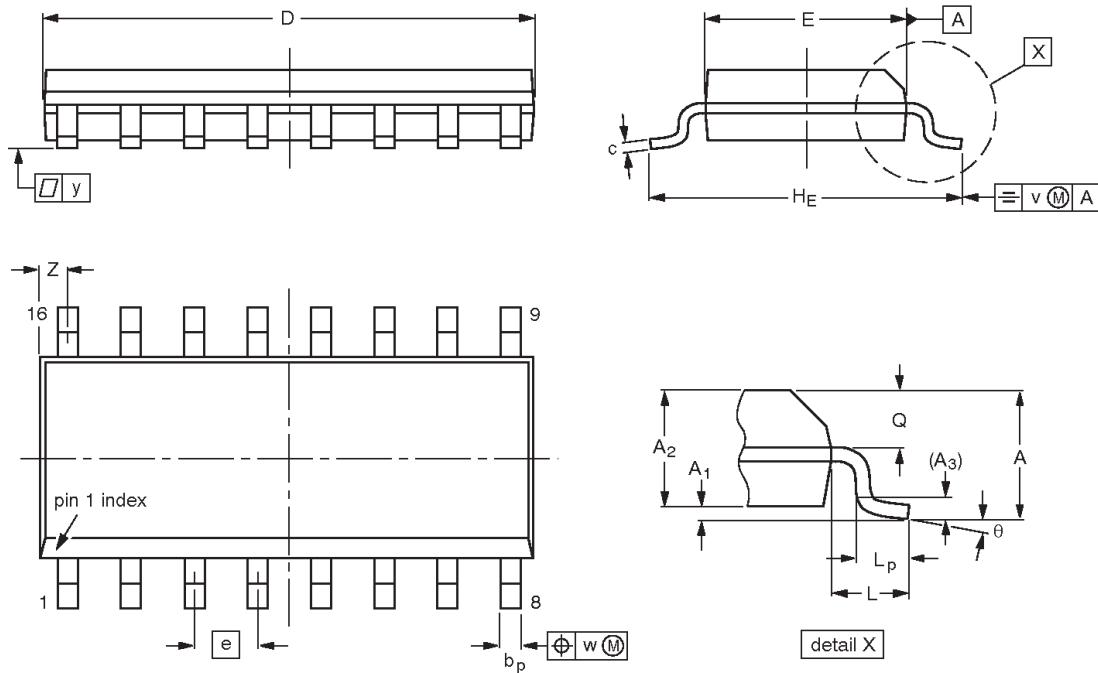
OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA			
SOT38-4						95-01-14 03-02-13

Hex buffer/driver

74F367

SO16: plastic small outline package; 16 leads; body width 3.9 mm

SOT109-1



DIMENSIONS (inch dimensions are derived from the original mm 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	1.75	0.25 0.10	1.45 1.25	0.25	0.49 0.36	0.25 0.19	10.0 9.8	4.0 3.8	1.27	6.2 5.8	1.05	1.0 0.4	0.7 0.6	0.25	0.25	0.1	0.7 0.3	8° 0°
inches	0.069	0.010 0.004	0.057 0.049	0.01	0.019 0.014	0.0100 0.0075	0.39 0.38	0.16 0.15	0.05	0.244 0.228	0.041	0.039 0.016	0.028 0.020	0.01	0.01	0.004	0.028 0.012	

Note

1. Plastic or metal protrusions of 0.15 mm (0.006 inch) maximum per side are not included.

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	JEITA			
SOT109-1	076E07	MS-012				99-12-27 03-02-19

Hex buffer/driver

74F367

REVISION HISTORY

Rev	Date	Description
_4	20040130	Product data (9397 750 12742). 853-0042 ECN 01-A15335 of 21 January 2004. Replaces 74F365_74F367_3 dated 2000 Jun 30 (9397 750 07283). Modifications: <ul style="list-style-type: none"> • Delete all references to 74F365 (product discontinued).
_3	20000630	Product specification (9397 750 07283). ECN 853-0042 24024 of 30 June 2000. Supersedes data of 1999 Jan 08.

Data sheet status

Level	Data sheet status ^[1]	Product status ^{[2] [3]}	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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