DATA SHEET

74F367
Hex buffer/driver

Product data

2004 Jan 30

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

Philips
Semiconductors

PHILIPS

Hex buffer/driver 74F367

FEATURES

- High-impedance NPN base inputs for reduced loading (20 μA 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 ± 10%; T_{amb} = 0 °C to +70 °C

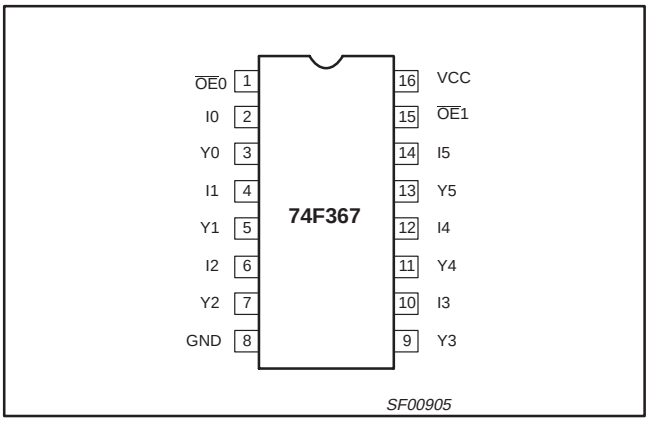
Type number	Package		
	Name	Description	Version
N74F367N	DIP16	plastic dual in-line package; 16 leads (300 mil)	SOT38-4
N74F367D	SO16	plastic small outline package; 16 leads; body width 3.9 mm	SOT109-1

INPUT AND OUTPUT LOADING AND FAN-OUT TABLE

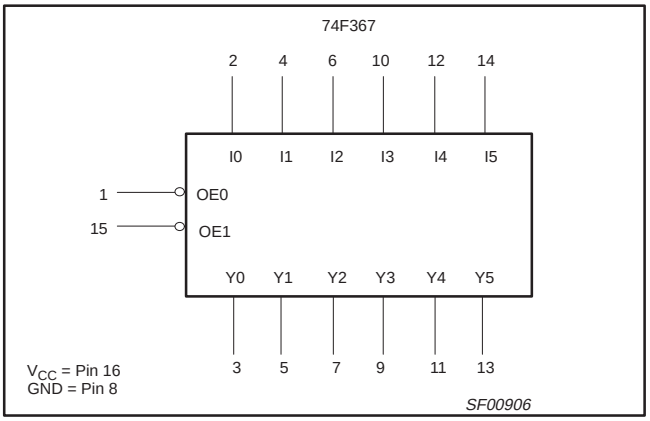
PINS	DESCRIPTION	74F(U.L.) HIGH / LOW	LOAD VALUE HIGH / LOW
I0 - I5	Inputs	1.0 / 0.033	20 μA / 20 μA
$\overline{OE}$0, $\overline{OE}$1	Output enable inputs (active-LOW)	1.0 / 0.033	20 μA / 20 μA
Y0 - Y5	Data Outputs	750 / 106.7	15 mA / 64 mA

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

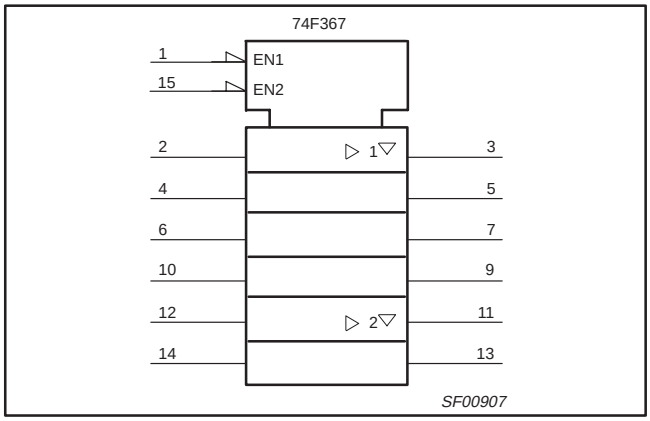
PIN CONFIGURATION



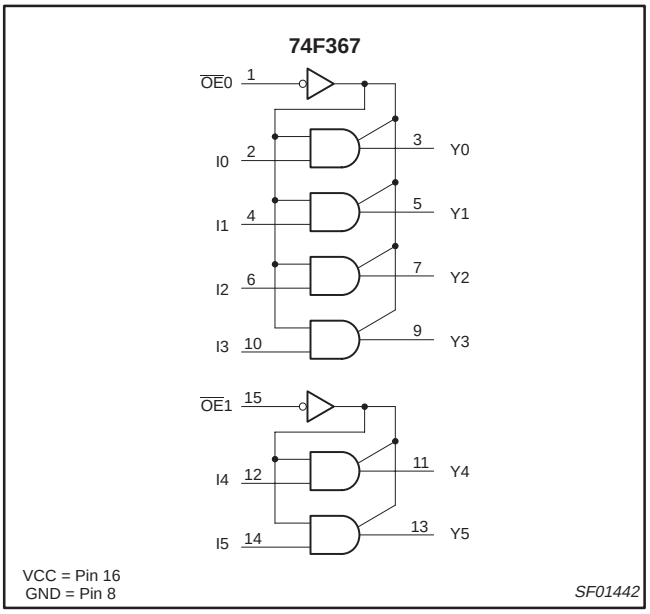
LOGIC SYMBOL



LOGIC SYMBOL (IEEE/IEC)



LOGIC DIAGRAM



FUNCTION TABLE

INPUTS		OUTPUTS
$\overline{OE}n$	In	Yn
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

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

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)	I_{CCH}	V_{CC} = MAX		–	25	35	mA
		I_{CCL}			–	47	62	mA
		I_{CCZ}			–	35	48	mA

NOTES:

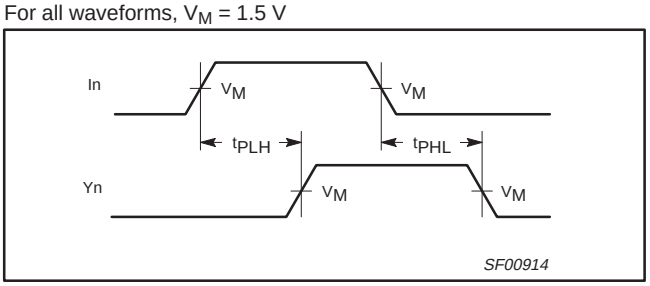
1. For conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions for the applicable type.
2. All typical values are at V_{CC} = 5 V, T_{amb} = 25 °C.
3. Not more than one output should be shorted at a time. For testing I_{OS}, the use of high-speed test 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

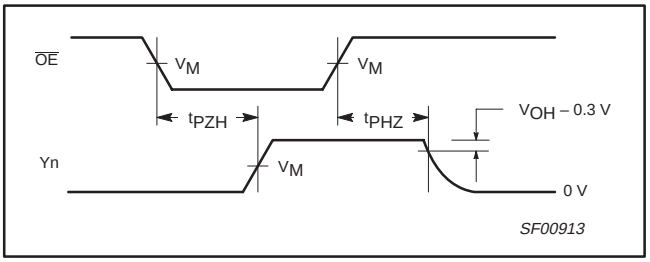
SYMBOL	PARAMETER	TEST CONDITIONS	LIMITS					UNIT
			T_{amb} = +25 °C; V_{CC} = +5.0 V; C_L = 50 pF; R_L = 500 Ω			T_{amb} = –55 °C to +125 °C; V_{CC} = +5.0 V ± 10%; C_L = 50 pF; R_L = 500 Ω		
			MIN	TYP	MAX	MIN	MAX	
t_{PLH} t_{PHL}	Propagation delay I_n to Y_n	Waveform 1	2.5 2.5	4.5 5.5	6.5 7.0	2.0 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

AC WAVEFORMS

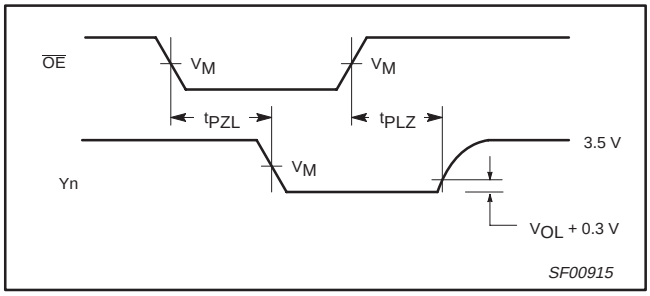
For all waveforms, V_M = 1.5 V



Waveform 1. For non-inverting outputs

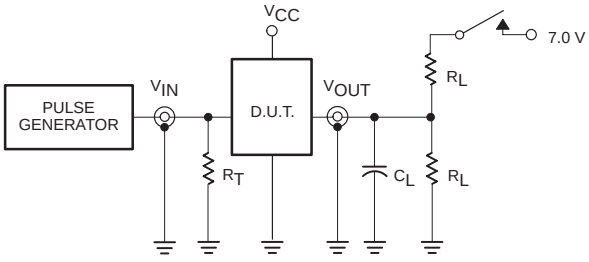


Waveform 2. 3-State Output Enable time to HIGH level and Output Disable time from HIGH level

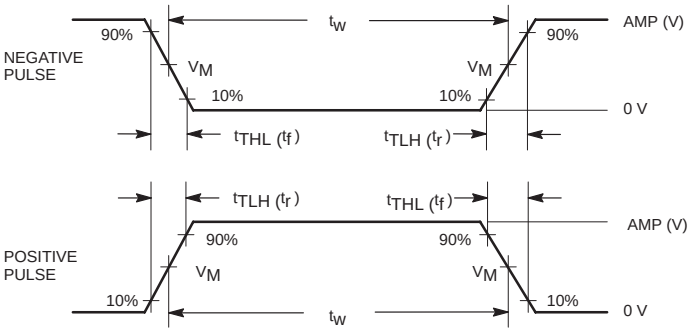


Waveform 3. 3-State Output Enable time to LOW level and Output Disable time from LOW level

TEST CIRCUIT AND WAVEFORM



Test Circuit for 3-State Outputs



Input Pulse Definition

SWITCH POSITION

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

DEFINITIONS:

R_L = Load resistor; see AC electrical characteristics for value.

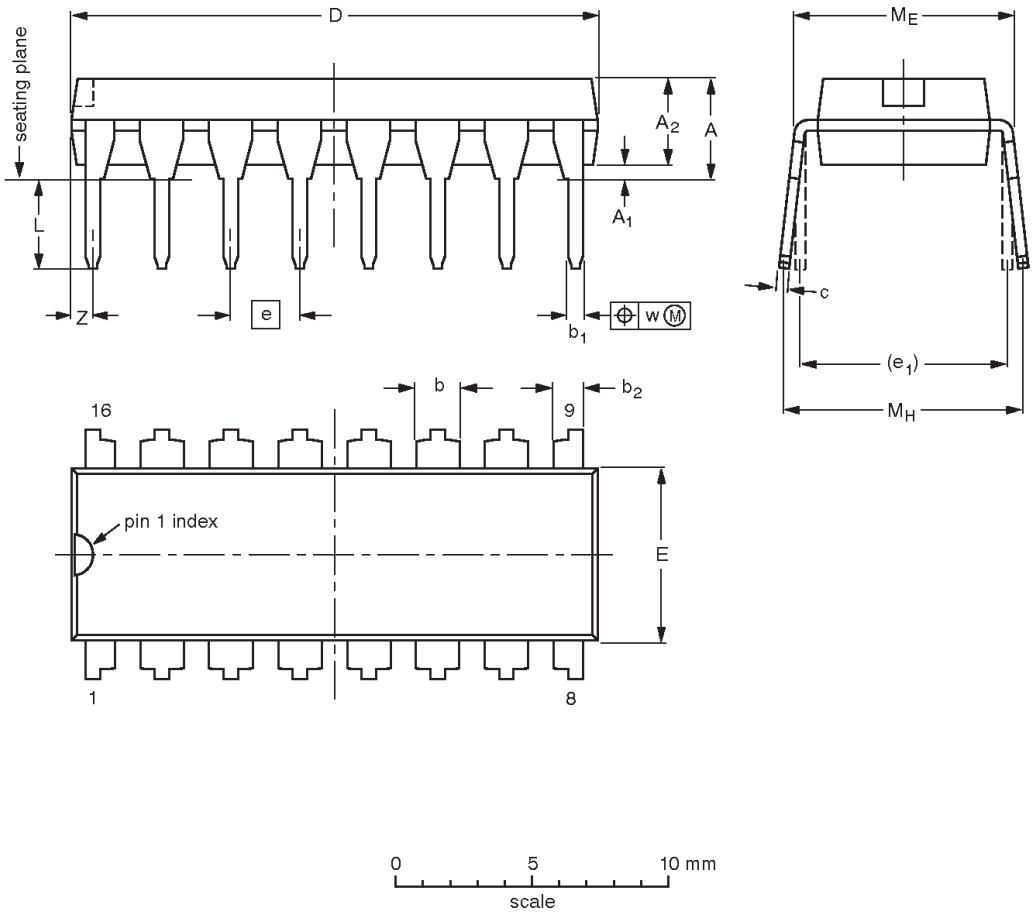
C_L = Load capacitance includes jig and probe capacitance; see AC electrical characteristics for value.

R_T = Termination resistance should be equal to Z_{OUT} of pulse generators.

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

DIP16: plastic dual in-line package; 16 leads (300 mil) SOT38-4



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

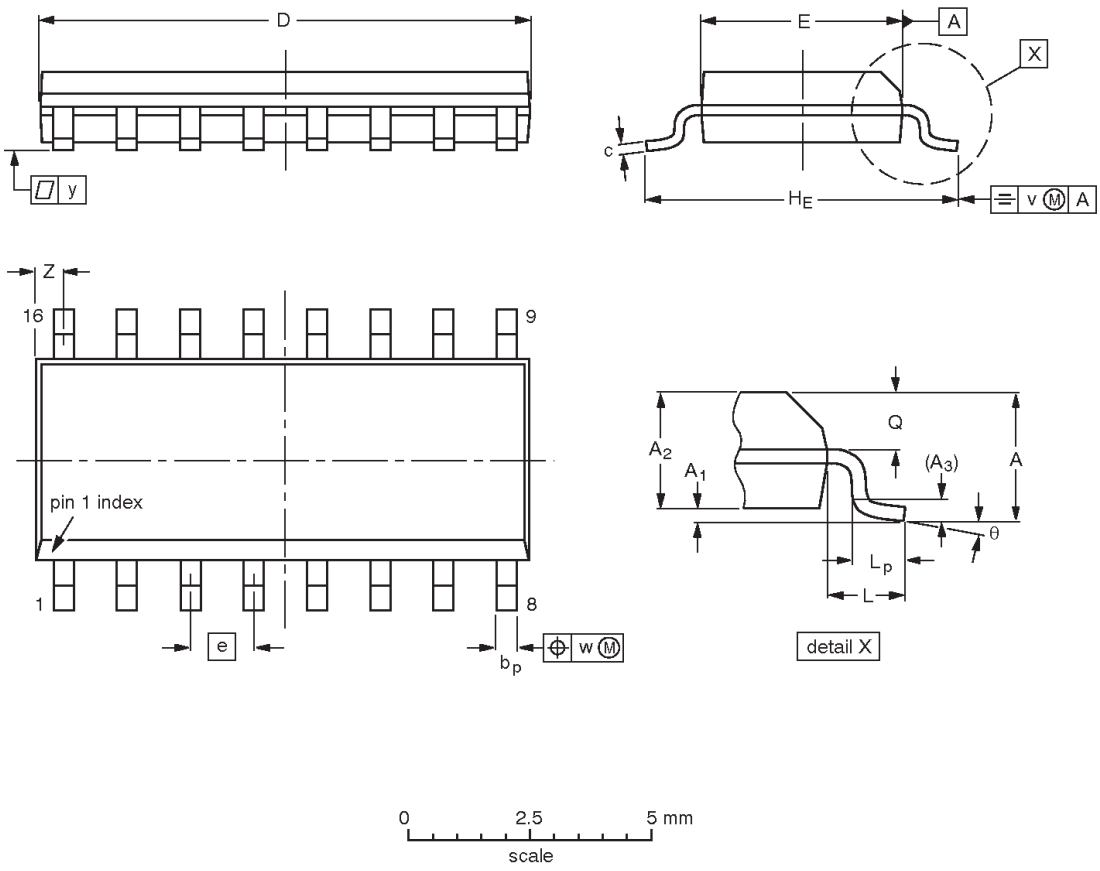
UNIT	A max.	A_1 min.	A_2 max.	b	b_1	b_2	c	D (1)	E (1)	e	e_1	L	M_E	M_H	w	Z (1) max.
mm	4.2	0.51	3.2	1.73 1.30	0.53 0.38	1.25 0.85	0.36 0.23	19.50 18.55	6.48 6.20	2.54	7.62	3.60 3.05	8.25 7.80	10.0 8.3	0.254	0.76
inches	0.17	0.02	0.13	0.068 0.051	0.021 0.015	0.049 0.033	0.014 0.009	0.77 0.73	0.26 0.24	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

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^o 0^o
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

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: • 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.
II	Preliminary data	Qualification	This data sheet contains data from the preliminary specification. Supplementary data will be published at a later date. Philips Semiconductors reserves the right to change the specification without notice, in order to improve the design and supply the best possible product.
III	Product data	Production	This data sheet contains data from the product specification. Philips Semiconductors reserves the right to make changes at any time in order to improve the design, manufacturing and supply. Relevant changes will be communicated via a Customer Product/Process Change Notification (CPCN).

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

[2] The product status of the device(s) described in this data sheet may have changed since this data sheet was published. The latest information is available on the Internet at URL http://www.semiconductors.philips.com.

[3] For data sheets describing multiple type numbers, the highest-level product status determines the data sheet status.

Definitions

Short-form specification — The data in a short-form specification is extracted from a full data sheet with the same type number and title. For detailed information see the relevant data sheet or data handbook.

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

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

Disclaimers

Life support — These products are not designed for use in life support appliances, devices, or systems where malfunction of these products can reasonably be expected to result in personal injury. Philips Semiconductors customers using or selling these products for use in such applications do so at their own risk and agree to fully indemnify Philips Semiconductors for any damages resulting from such application.

Right to make changes — Philips Semiconductors reserves the right to make changes in the products—including circuits, standard cells, and/or software—described or contained herein in order to improve design and/or performance. When the product is in full production (status 'Production'), relevant changes will be communicated via a Customer Product/Process Change Notification (CPCN). Philips Semiconductors assumes no responsibility or liability for the use of any of these products, conveys no license or title under any patent, copyright, or mask work right to these products, and makes no representations or warranties that these products are free from patent, copyright, or mask work right infringement, unless otherwise specified.

Contact information

For additional information please visit
http://www.semiconductors.philips.com. Fax: **+31 40 27 24825**

For sales offices addresses send e-mail to:
sales.addresses@www.semiconductors.philips.com.

Date of release: 01-04

Document order number: 9397 750 12742

Let's make things better.

Philips Semiconductors

PHILIPS

Mouser Electronics

Authorized Distributor

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

Nexperia:

N74F367D,602 N74F367D,623

NXP:

N74F367D N74F367N N74F367N,602