DATA SHEET

74F365, 74F367
Hex buffers/drivers

Product specification
Supersedes data of 1999 Jan 08
IC15 Data Handbook

2000 Jun 30

Philips
Semiconductors

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FEATURES

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

TYPE	TYPICAL PROPAGATION DELAY	TYPICAL SUPPLY CURRENT (TOTAL)
74F365, 74F367	5.0ns	36mA

ORDERING INFORMATION

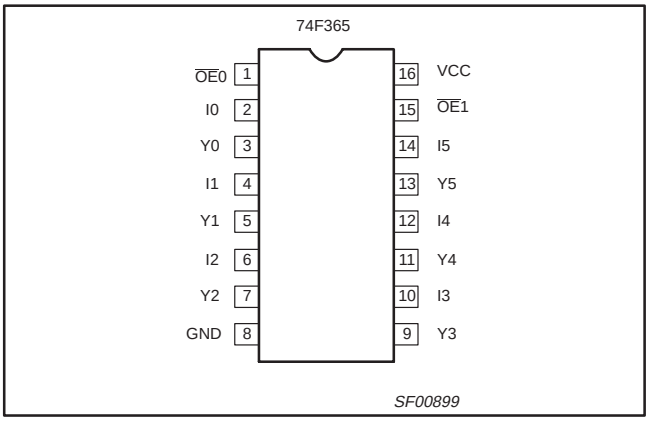
DESCRIPTION	COMMERCIAL RANGE V_{CC} = 5V ±10%, T_{amb} = 0°C to +70°C	PKG DWG #
16-pin plastic DIP	N74F365N, N74F367N	SOT38-4
16-pin plastic SO	N74F365D, N74F367D	SOT109-1

INPUT AND OUTPUT LOADING AND FAN-OUT TABLE

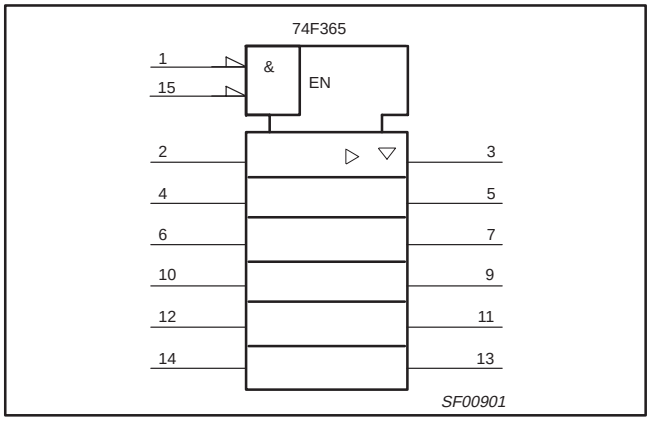
PINS	DESCRIPTION	74F(U.L.) HIGH/LOW	LOAD VALUE HIGH/LOW
I0 - I5	Inputs	1.0/0.033	20µA/20µA
$\overline{OE}0$, $\overline{OE}1$	Output enable inputs (active Low)	1.0/0.033	20µA/20µA
Y0 - Y5, $\overline{Y}0$ - $\overline{Y}5$	Data Outputs	750/106.7	15mA/64mA

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

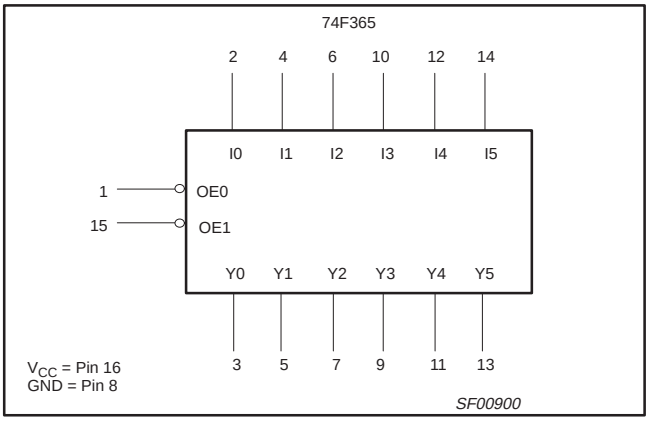
PIN CONFIGURATION



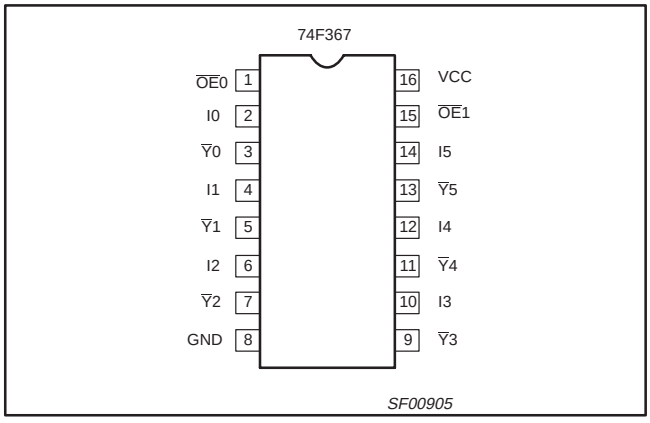
LOGIC SYMBOL (IEEE/IEC)



LOGIC SYMBOL



PIN CONFIGURATION



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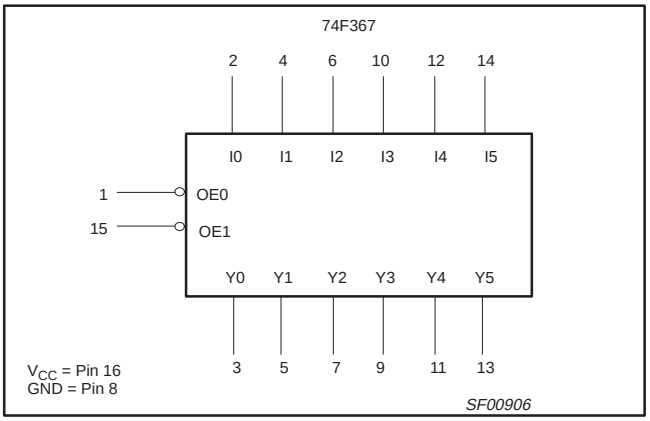

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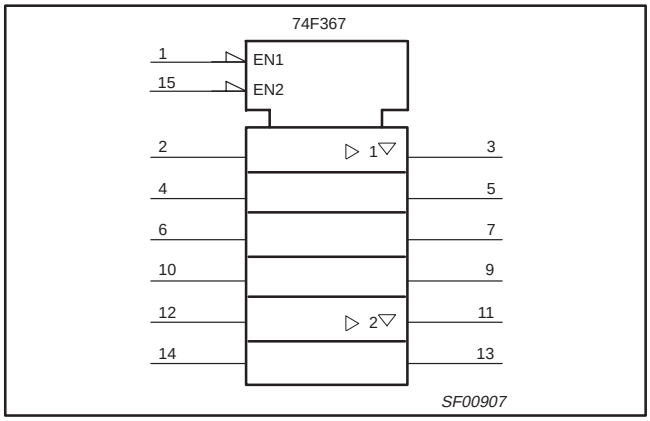
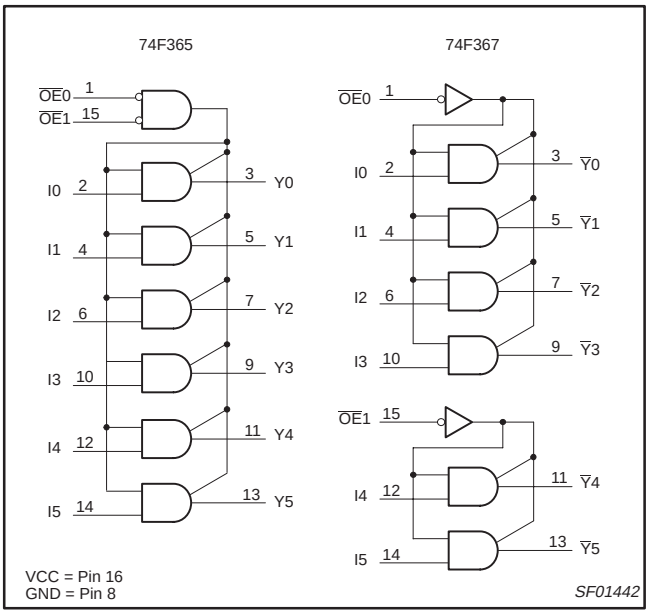


LOGIC DIAGRAMS



FUNCTION TABLE for 74F365

INPUTS			OUTPUTS	
$\overline{OE}0$	$\overline{OE}1$	In	Yn	$\overline{Y}n$
L	L	L	L	H
L	L	H	H	L
X	H	X	Z	Z
H	X	X	Z	Z

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

FUNCTION TABLE for 74F367

INPUTS		OUTPUTS	
$\overline{OE}n$	In	Yn	$\overline{Y}n$
L	L	L	H
L	H	H	L
H	X	Z	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} = –3mA	±10%Vcc	2.4			V
				±5%Vcc	2.7	3.3		V
			V_{CC} = MIN, V_{IL} = MAX, V_{IH} = MIN, I_{OH} = –15mA	±10%Vcc	2.0			V
				±5%Vcc	2.0			V
V_{OL}	Low-level output voltage		V_{CC} = MIN, V_{IL} = MAX, V_{IH} = MIN, I_{OL} = MAX	±10%Vcc			0.55	V
				±5%Vcc		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} = 0.0V, V_I = 7.0V				100	µA
I_{IH}	High-level input current		V_{CC} = MAX, V_I = 2.7V				20	µA
I_{IL}	Low-level input current		V_{CC} = MAX, V_I = 0.5V				–20	µA
I_{OZH}	Off-state output current, High-level voltage applied		V_{CC} = MAX, V_O = 2.7V				50	µA
I_{OZL}	Off-state output current, Low-level voltage applied		V_{CC} = MAX, V_O = 0.5V				–50	µA
I_{OS}	Short-circuit output current[3]		V_{CC} = MAX		–100		–225	mA
I_{CC}	Supply current (total)	74F365 74F367	I_{CCH}	V_{CC} = MAX		25	35	mA
			I_{CCL}			47	62	mA
			I_{CCZ}			35	48	mA

NOTES:

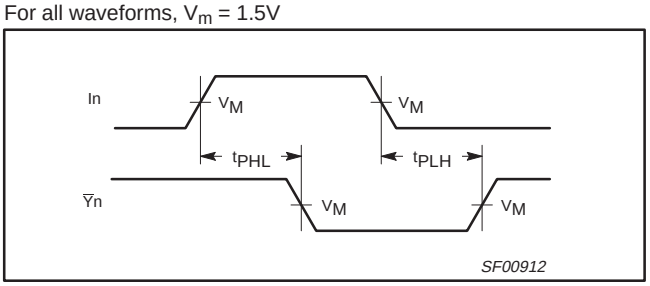
1. For conditions shown as MIN or MAX, use the appropriate value specified under recommended operating conditions for the applicable type.
2. All typical values are at V_{CC} = 5V, T_{amb} = 25°C.
3. Not more than one output should be shorted at a time. For testing I_{OS}, the use of high-speed test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

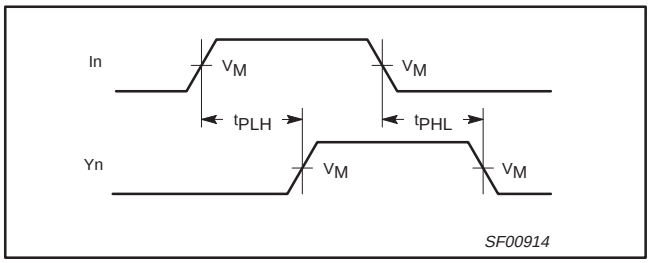
SYMBOL	PARAMETER		TEST CONDITIONS	LIMITS					UNIT
				T_A = +25°C, V_{CC} = +5.0V, C_L = 50pF, R_L = 500Ω			T_A = -55°C to +125°C, V_{CC} = +5.0V ± 10%, C_L = 50pF, R_L = 500Ω		
				MIN	TYP	MAX	MIN	MAX	
t_{PLH} t_{PHL}	Propagation delay I_n to Y_n	74F365, 74F367	Waveform 2	2.5 2.5	4.5 5.5	6.5 7.0	2.0 2.0	7.0 7.5	ns ns
t_{PZH} t_{PZL}	Output Enable time to High or Low level	74F365	Waveform 3 Waveform 4	2.5 2.5	4.0 5.0	6.5 8.0	2.5 2.5	7.5 8.5	ns ns
t_{PZH} t_{PZL}	Output Enable time to High or Low level	74F367	Waveform 3 Waveform 4	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 3 Waveform 4	2.0 2.0	4.5 4.0	6.5 6.5	2.0 2.0	7.0 7.0	ns ns

AC WAVEFORMS

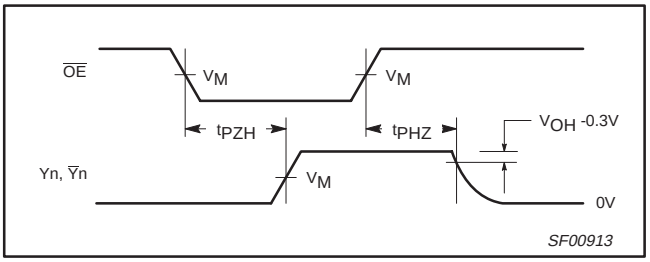
For all waveforms, V_m = 1.5V



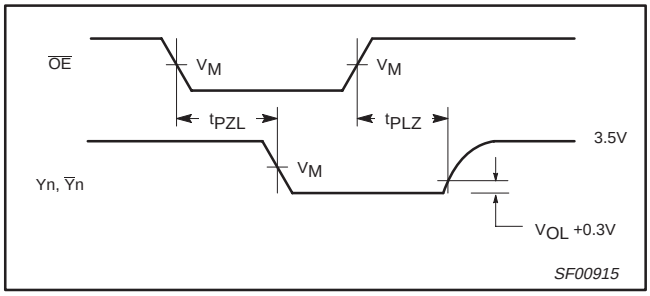
Waveform 1. For Inverting Outputs



Waveform 2. For Non-Inverting Outputs

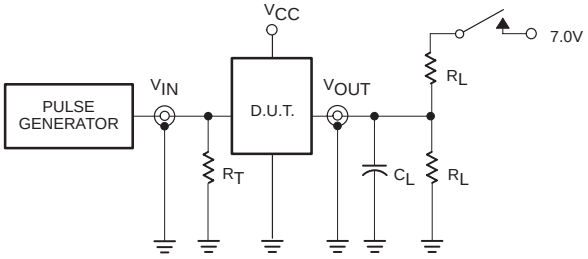


Waveform 3. 3-State Output Enable Time to High Level and Output Disable Time from High Level

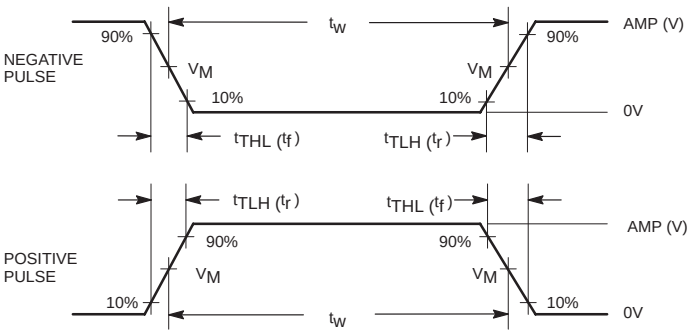


Waveform 4. 3-State Output Enable Time to Low Level and Output Disable Time from Low Level

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.

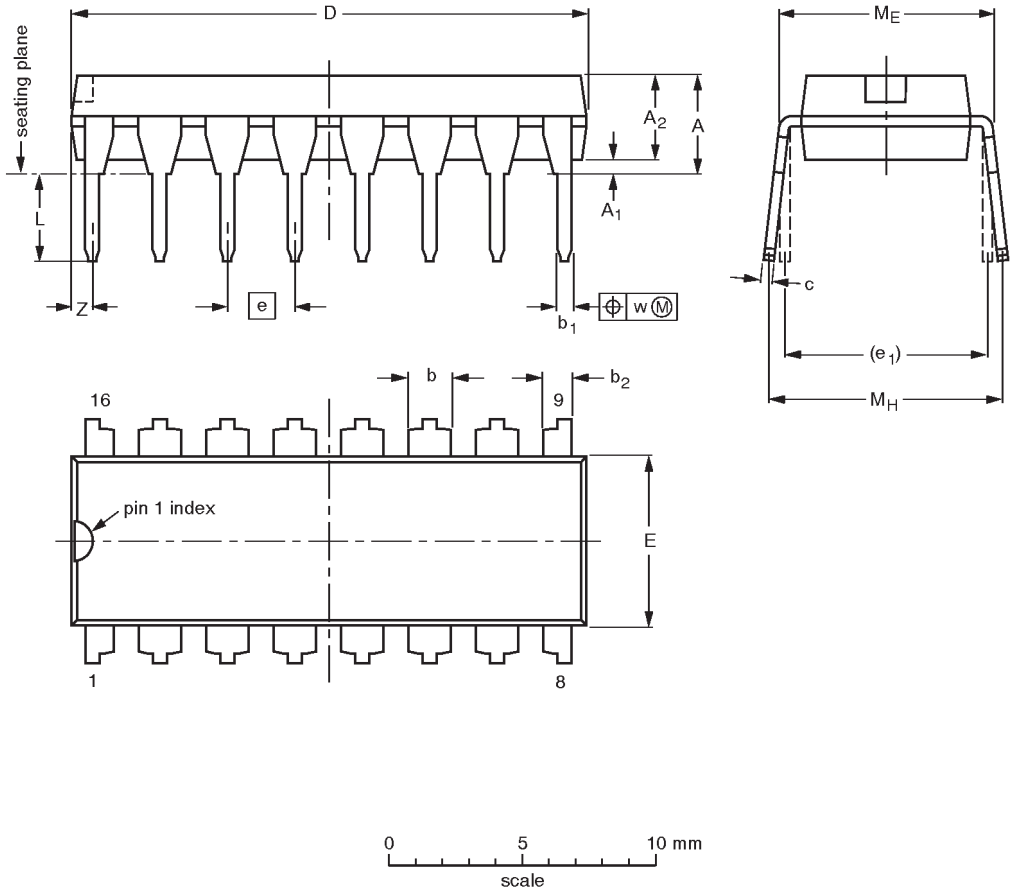
C_L = Load capacitance includes jig and probe capacitance; see AC electrical characteristics for value.

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	3.0V	1.5V	1MHz	500ns	2.5ns	2.5ns

SF00777

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



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

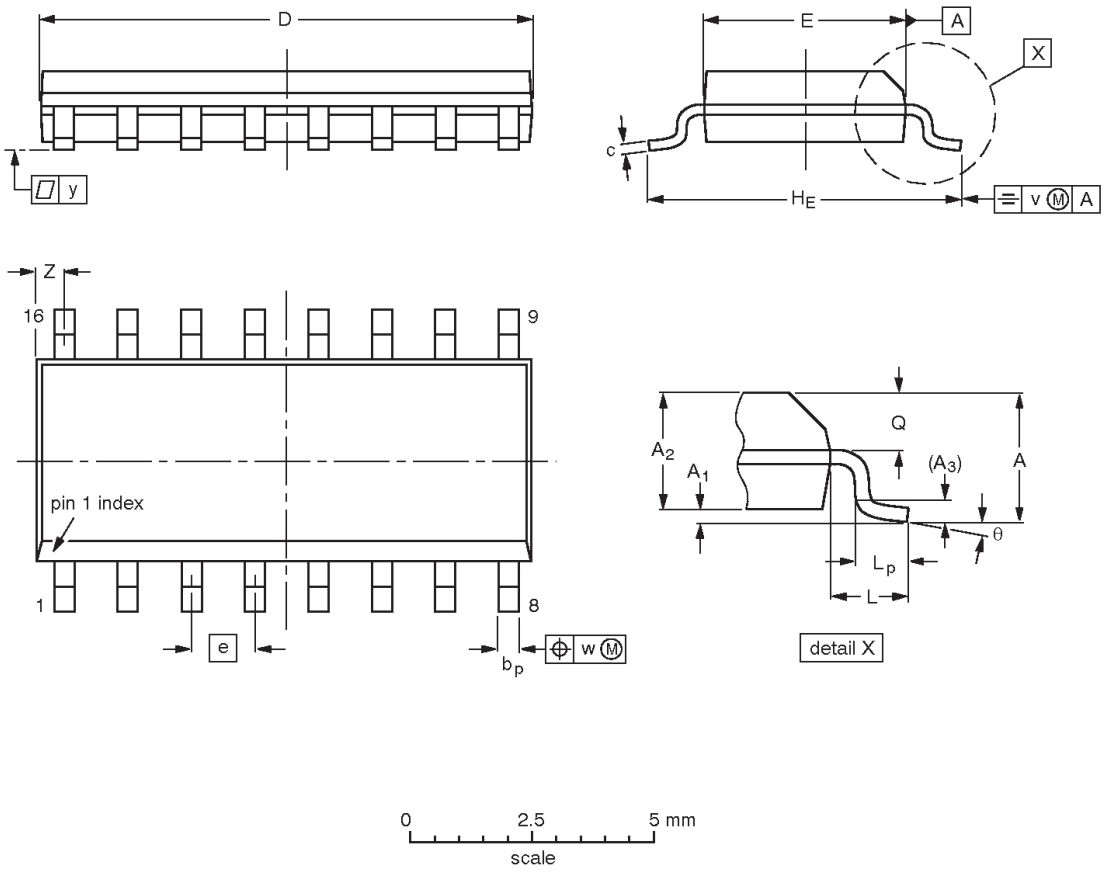
UNIT	A max.	A_1 min.	A_2 max.	b	b_1	b_2	c	D (1)	E (1)	e	e_1	L	M_E	M_H	w	Z (1) max.
mm	4.2	0.51	3.2	1.73 1.30	0.53 0.38	1.25 0.85	0.36 0.23	19.50 18.55	6.48 6.20	2.54	7.62	3.60 3.05	8.25 7.80	10.0 8.3	0.254	0.76
inches	0.17	0.020	0.13	0.068 0.051	0.021 0.015	0.049 0.033	0.014 0.009	0.77 0.73	0.26 0.24	0.10	0.30	0.14 0.12	0.32 0.31	0.39 0.33	0.01	0.030

Note

1. Plastic or metal protrusions of 0.25 mm maximum per side are not included.

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	EIAJ			
SOT38-4						~~92-11-17~~ 95-01-14

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	0.050	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 maximum per side are not included.

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	EIAJ			
SOT109-1	076E07S	MS-012AC				~~95-01-23~~ 97-05-22

NOTES

Data sheet status

Data sheet status	Product status	Definition [1]
Objective specification	Development	This data sheet contains the design target or goal specifications for product development. Specification may change in any manner without notice.
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Product specification	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.

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

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