DATA SHEET 74LVT32 3.3 V Quad 2-input OR gate

INTEGRATED CIRCUITS

Product data Supersedes data of 1996 Aug 28 2002 Sep 06







74LVT32

QUICK REFERENCE DATA

SYMBOL	PARAMETER	PARAMETER $T_{amb} = 25 \degree C;$ GND = 0 V		UNIT
t _{PLH} t _{PHL}	Propagation delay An, Bn to Yn	C _L = 50 pF; V _{CC} = 3.3 V	2.6 3.2	ns
C _{IN}	Input capacitance	$V_{I} = 0 V \text{ or } 3.0 V$	3	pF
I _{CCL}	Total supply current	Outputs Low; $V_{CC} = 3.6 V$	1	mA

PIN CONFIGURATION



PIN DESCRIPTION

PIN NUMBER	PIN JMBER SYMBOL NAME AND FUNCTION			
1, 2, 4, 5, 9, 10, 12, 13	An, Bn	Data inputs		
3, 6, 8, 11	Yn	Data outputs		
7	GND	Ground (0 V)		
14	V _{CC}	Positive supply voltage		

LOGIC DIAGRAM



1

LOGIC SYMBOL



LOGIC SYMBOL (IEEE/IEC)



FUNCTION TABLE

INP	JTS	OUTPUT
Dna	Dnb	Qn
L	L	L
L	Н	Н
Н	L	Н
Н	Н	Н

NOTES:

H = High voltage level L = Low voltage level

ORDERING INFORMATION

PACKAGES	TEMPERATURE RANGE	OUTSIDE NORTH AMERICA	NORTH AMERICA	DWG NUMBER
14-Pin Plastic SO	–40 °C to +85 °C	74LVT32D	74LVT32D	SOT108-1
14-Pin Plastic SSOP	–40 °C to +85 °C	74LVT32DB	74LVT32DB	SOT337-1
14-Pin Plastic TSSOP	–40 °C to +85 °C	74LVT32PW	74LVT32PWDH	SOT402-1

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ABSOLUTE MAXIMUM RATINGS^{1, 2}

SYMBOL	PARAMETER	PARAMETER CONDITIONS			
V _{CC}	DC supply voltage		-0.5 to +4.6	V	
I _{IK}	DC input diode current	V ₁ < 0	-50	mA	
VI	DC input voltage ³		-0.5 to +7.0	V	
I _{OK}	DC output diode current	V _O < 0	-50	mA	
V _{OUT}	DC output voltage ³	Output in Off or High state	-0.5 to +7.0	V	
I _{OUT}		Output in High state	-32	4	
	IOUT		Output in Low state	64	ma
T _{stg}	Storage temperature range		–65 to 150	°C	

NOTES:

1. Stresses beyond those listed may cause permanent damage to the device. These are stress ratings only and functional operation of the device at these or any other conditions beyond those indicated under "recommended operating conditions" is not implied. Exposure to absolute-maximum-rated conditions for extended periods may affect device reliability.

The performance capability of a high-performance integrated circuit in conjunction with its thermal environment can create junction 2. temperatures which are detrimental to reliability. The maximum junction temperature of this integrated circuit should not exceed 150°C. The input and output negative voltage ratings may be exceeded if the input and output clamp current ratings are observed.

3.

RECOMMENDED OPERATING CONDITIONS

SVMROI	DADAMETED	LIM	ITS			
STWDOL	FARAWETER	MIN	MAX			
V _{CC}	DC supply voltage	2.7	3.6	V		
VI	Input voltage	0	5.5	V		
VIH	High-level input voltage	2.0		V		
V _{IL}	Low-level Input voltage		0.8	V		
I _{ОН}	High-level output current		-20	mA		
I _{OL}	Low-level output current		32	mA		
Δt/Δv	Input transition rise or fall rate; Outputs enabled		10	ns/V		
T _{amb}	Operating free-air temperature range	-40	+85	°C		

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DC ELECTRICAL CHARACTERISTICS

Over recommended operating conditions Voltages are referenced to GND (ground = 0 V)

			L	IMITS			
SYMBOL	PARAMETER	TEST CONDITIONS	Temp = -	40°C to	+85°C	UNIT	
			MIN	TYP ¹	MAX		
V _{IK}	Input clamp voltage	$V_{CC} = 2.7 \text{ V}; \text{ I}_{IK} = -18 \text{ mA}$			-1.2	V	
		V_{CC} = 2.7 to 3.6 V; I_{OH} = –100 μA	V _{CC} -0.2				
V _{OH}	High-level output voltage	$V_{CC} = 2.7 \text{ V}; I_{OH} = -6 \text{ mA}$	2.4			V	
		$V_{CC} = 3.0 \text{ V}; \text{ I}_{OH} = -20 \text{ mA}$	2.0				
V _{OL}		$V_{CC} = 2.7 \text{ V}; I_{OL} = 100 \ \mu\text{A}$			0.2		
	Low-level output voltage	$V_{CC} = 2.7 \text{ V}; I_{OL} = 24 \text{ mA}$			0.5	V	
		$V_{CC} = 3.0 \text{ V}; \text{ I}_{OL} = 32 \text{ mA}$	0.5				
l.	Input leakage current	$V_{CC} = 0 \text{ or } 3.6 \text{ V}; \text{ V}_{I} = 5.5 \text{ V}$			10	ν μΑ	
Ч	input leakage current	V_{CC} = 3.6 V; V_{I} = V_{CC} or GND			±1	μΑ	
I _{OFF}	Output off current	$V_{CC} = 0$ V; V _I or V _O = 0 to 4.5 V			±100	μA	
I _{CCH}	Quiescent supply current	V_{CC} = 3.6 V; Outputs High, V _I = GND or V _{CC} , I _O = 0			0.02	mΑ	
I _{CCL}		V_{CC} = 3.6 V; Outputs Low, V_{I} = GND or $V_{CC,\ I_{O}}$ = 0		1	2	mA	
ΔI _{CC}	Additional supply current per input pin ²	V_{CC} = 3 V to 3.6 V; One input at V _{CC} -0.6 V, Other inputs at V _{CC} or GND			0.2	μΑ	
CI	Input capacitance	$V_{I} = 3 V \text{ or } 0$		3		pF	

NOTES:

1. All typical values are at V_{CC} = 3.3 V and T_{amb} = 25 °C. 2. This is the increase in supply current for each input at the specificed voltage level other than V_{CC} or GND.

AC CHARACTERISTICS

GND = 0 V; t_R = t_F = 2.5 ns; C_L = 50 pF, R_L = 500 Ω ; T_{amb} = -40 °C to +85 °C.

				LI	MITS		
SYMBOL	PARAMETER	WAVEFORM	V _{CC}	= 3.3 V \pm 0	.3 V	V _{CC} = 2.7 V	
			MIN	TYP ¹	MAX	MAX	
t _{PLH} t _{PHL}	Propagation delay An, Bn to Yn	1	1.0 1.0	2.6 3.2	3.8 4.6	4.5 4.9	ns

NOTE:

1. All typical values are at V_{CC} = 3.3 V and T_{amb} = 25 °C.

AC WAVEFORMS

 V_{M} = 1.5 V, V_{IN} = GND to 2.7 V



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TEST CIRCUIT AND WAVEFORMS



SV00022



Note

1. Plastic or metal protrusions of 0.15 mm maximum per side are not included.

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SOT108-1 076E06 MS-012	VERSION	IEC	JEDEC	EIAJ	PROJECTION	1550E DATE	
99-12-27	SOT108-1	076E06	MS-012			97-05-22 99-12-27	

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detail X

 \oplus w (b)

bp

DIMENSIONS (mm are the original dimensions)

е

UNIT	A max.	Α ₁	A ₂	A ₃	bp	с	D ⁽¹⁾	E ⁽¹⁾	е	Η _E	L	Lp	Q	v	w	У	Z ⁽¹⁾	θ
mm	2.0	0.21 0.05	1.80 1.65	0.25	0.38 0.25	0.20 0.09	6.4 6.0	5.4 5.2	0.65	7.9 7.6	1.25	1.03 0.63	0.9 0.7	0.2	0.13	0.1	1.4 0.9	8° 0°

Note

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

OUTLINE		REFER	ENCES			
VERSION	IEC	JEDEC	EIAJ	PROJECTION	ISSUE DATE	
SOT337-1		MO-150			-96-01-18 99-12-27	

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REVISION HISTORY

Rev	Date	Description
_2	2002 Sep 06	Product data (9397 750 10298); supersedes Product specification 74LVT32 of 1996 Aug 28.
		Modifications: There are no changes to any data. Document re-issued to improve quality of package outline drawings display only.
-	1996 Aug 28	Product specification; initial version. Engineering Change Notice: 853-1873 17244 (date: 1996 Aug 28).

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Data sheet status

Data sheet status ^[1]	Product status ^[2]	Definitions
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.
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.
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. Changes will be communicated according to the Customer Product/Process Change Notification (CPCN) procedure SNW-SQ-650A.

[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.

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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.

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For additional information please visit http://www.semiconductors.philips.com.

Fax: +31 40 27 24825

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