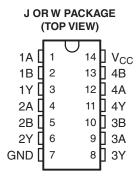


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RAD-TOLERANT CLASS V, QUADRUPLE 2-INPUT POSITIVE-NAND GATE

FEATURES

- 2-V to 6-V V_{CC} Operation
- Inputs Accept Voltages to 6 V
- Max t_{pd} of 7 ns at 5 V
- Rad-Tolerant: 50 KRad(Si) TID (1)
 - TID Dose Rate < 2 mRad/sec
- QML-V Qualified, SMD 5962-87549
- (1) Radiation tolerance is a typical value based upon initial device qualification. Radiation Lot Acceptance Testing is available contact factory for details.



DESCRIPTION/ORDERING INFORMATION

The SN54AC00 device contains four independent 2-input NAND gates. Each gate performs the Boolean function of $Y = \overline{A} \cdot \overline{B}$ or $Y = \overline{A} + \overline{B}$ in positive logic.

ORDERING INFORMATION

	T _A	PACKA	GE ⁽¹⁾⁽²⁾	ORDERABLE PART NUMBER	TOP-SIDE MARKING
	–55°C to 125°C	CDIP – J	Tube	5962-8754903VCA	5962-8754903VCA
-55	-55 C to 125 C	CFP – W	Tube	5962-8754903VDA	5962-8754903VDA

- (1) Package drawings, thermal data, and symbolization are available at www.ti.com/packaging.
- (2) For the most current package and ordering information, see the Package Option Addendum at the end of this document, or see the TI website at www.ti.com.

FUNCTION TABLE (Each Gate)

INP	OUTPUT	
Α	В	Y
Н	Н	L
L	Χ	Н
X	L	Н

LOGIC DIAGRAM (POSITIVE LOGIC)





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ABSOLUTE MAXIMUM RATINGS(1)

over operating free-air temperature range (unless otherwise noted)

			MIN	MAX	UNIT
V_{CC}	Supply voltage range		-0.5	7	V
VI	Input voltage range ⁽²⁾		-0.5	V _{CC} + 0.5	V
Vo	Output voltage range ⁽²⁾		-0.5	V _{CC} + 0.5	V
I _{IK}	Input clamp current	$V_I < 0$ or $V_I > V_{CC}$		±20	mA
I _{OK}	Output clamp current	$V_O < 0$ or $V_O > V_{CC}$		±20	mA
Io	Continuous output current	$V_O = 0$ to V_{CC}		±50	mA
	Continuous current through V _{CC} or GND			±200	mA
0	Package thermal impedance (3)	J package			°C/W
θ_{JA}	rackage mermai impedance (**)	W package			C/VV
T _{stg}	Storage temperature range		-65	150	°C

⁽¹⁾ Stresses beyond those listed under "absolute maximum ratings" 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.

RECOMMENDED OPERATING CONDITIONS

			MIN	MAX	UNIT	
V _{CC}	Supply voltage		2	6	V	
		V _{CC} = 3 V	2.1			
V_{IH}	High-level input voltage	V _{CC} = 4.5 V	3.15		V	
		V _{CC} = 5.5 V	3.85			
		V _{CC} = 3 V		0.9		
V_{IL}	Low-level input voltage	V _{CC} = 4.5 V		1.35	V	
		V _{CC} = 5.5 V		1.65		
VI	Input voltage		0	V _{CC}	V	
Vo	Output voltage		0	V _{CC}	V	
		V _{CC} = 3 V		12		
I _{OH}	High-level output current	V _{CC} = 4.5 V		24	mA	
		V _{CC} = 5.5 V		24		
	Low-level output current	V _{CC} = 3 V		12		
I_{OL}		V _{CC} = 4.5 V		24	mA	
		V _{CC} = 5.5 V		24		
Δt/Δν	Input transition rise or fall rate			8	ns/V	
T _A	Operating free-air temperature		-55	125	°C	

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The input and output voltage ratings may be exceeded if the input and output current ratings are observed.

The package thermal impedance is calculated in accordance with JESD 51-7.

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ELECTRICAL CHARACTERISTICS

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

PARAMETER	TEST CONDITIONS	V	$T_A = 25^{\circ}C$			MIN MAX	MAY	UNIT
PARAMETER		V _{cc}	MIN	TYP	MAX	IVIIIN	IVIAA	UNII
		3 V	2.9			2.9		
	$I_{OH} = -50 \mu A$	4.5 V	4.4			4.4		
		5.5 V	5.4			5.4		
V _{OH}	$I_{OH} = -12 \text{ mA}$	3 V	2.56			2.4		V
	1 24 mA	4.5 V	3.86			3.7		
	$I_{OH} = -24 \text{ mA}$	5.5 V	4.86			4.7		
	$I_{OH} = -50 \text{ mA}^{(1)}$	5.5 V				3.85		
	$I_{OL} = 50 \ \mu A$ $3 \ V$ $4.5 \ V$ $5.5 \ V$	3 V			0.1		0.1	
		4.5 V			0.1		0.1	
				0.1		0.1		
V _{OL}	I _{OL} = 12 mA	3 V			0.36		0.5	V
	1 24 mA	4.5 V			0.36		0.5	
	I _{OL} = 24 mA	5.5 V			0.36		0.5	
	I _{OL} = 50 mA ⁽¹⁾	5.5 V					1.65	
I _I	V _I = V _{CC} or GND	5.5 V			±0.1		±1	μΑ
I _{cc}	$V_I = V_{CC}$ or GND, $I_O = 0$	5.5 V			4		40	μΑ
C _i	V _I = V _{CC} or GND	5 V	,	2.6				pF

⁽¹⁾ Not more than one output should be tested at a time, and the duration of the test should not exceed 2 ms.

SWITCHING CHARACTERISTICS

over recommended operating free-air temperature range, $V_{CC} = 3.3 \text{ V} \pm 0.3 \text{ V}$ (unless otherwise noted) (see Figure 1)

PARAMETER	FROM	то	Т	A = 25°C		MINI	MAX	UNIT
PARAMETER	(INPUT) (OUTPUT)	(OUTPUT)	MIN	TYP	MAX	MIN	IVIAA	UNII
t _{PLH}	A D	V	2	7	9.5	1	11	20
t _{PHL}	A or B	Y	1.5	5.5	8	1	9	ns

SWITCHING CHARACTERISTICS

over recommended operating free-air temperature range, V_{CC} = 5 V ± 0.5 V (unless otherwise noted) (see Figure 1)

PARAMETER	PARAMETER FROM TO		T,	_A = 25°C		MINI	MAX	UNIT
FARAWEIER	(INPUT)	(OUTPUT)	MIN	TYP	MAX	MIN	WAX	UNII
t _{PLH}	A or P	V	1.5	6	8	1	8.5	no
t _{PHL}	A or B	Y	1.5	4.5	6.5	1	7	ns

OPERATING CHARACTERISTICS

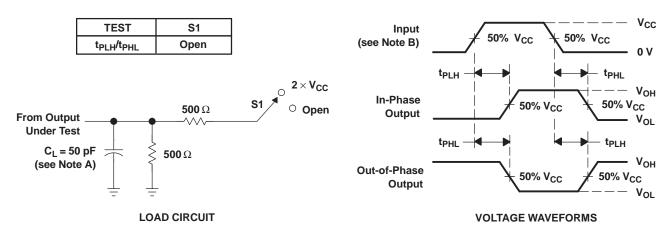
 $V_{CC} = 5 \text{ V}, T_A = 25^{\circ}\text{C}$

	PARAMETER	TEST CONDITIONS	TYP	UNIT
C_{pd}	Power dissipation capacitance	C _L = 50 pF, f = 1 MHz	40	pF

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PARAMETER MEASUREMENT INFORMATION



NOTES: A. C_L includes probe and jig capacitance.

- B. All input pulses are supplied by generators having the following characteristics: PRR \leq 1 MHz, $Z_Q = 50 \Omega$, $t_f \leq$ 2.5 ns, $t_f \leq$ 2.5 ns.
- C. The outputs are measured one at a time with one input transition per measurement.

Figure 1. Load Circuit and Voltage Waveforms

14 LEADS SHOWN

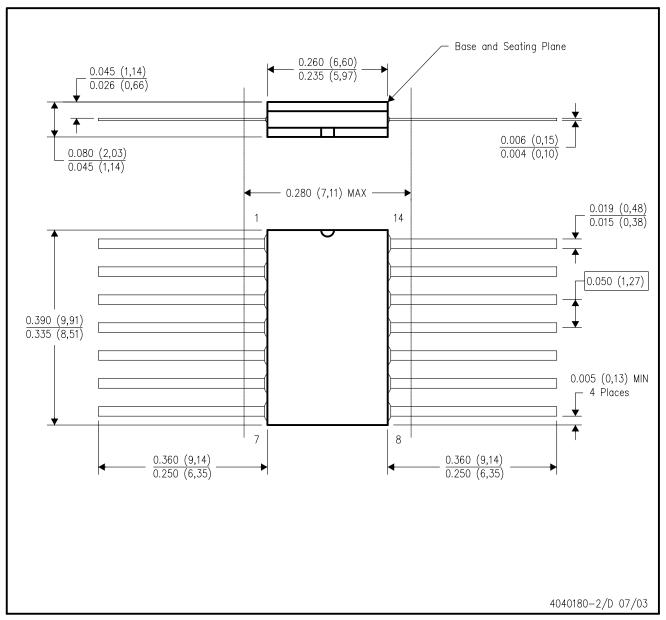


NOTES:

- A. All linear dimensions are in inches (millimeters).
- B. This drawing is subject to change without notice.
- C. This package is hermetically sealed with a ceramic lid using glass frit.
- D. Index point is provided on cap for terminal identification only on press ceramic glass frit seal only.
- E. Falls within MIL STD 1835 GDIP1-T14, GDIP1-T16, GDIP1-T18 and GDIP1-T20.

W (R-GDFP-F14)

CERAMIC DUAL FLATPACK



NOTES:

- A. All linear dimensions are in inches (millimeters).
- B. This drawing is subject to change without notice.
- C. This package can be hermetically sealed with a ceramic lid using glass frit.
- D. Index point is provided on cap for terminal identification only.
- E. Falls within MIL STD 1835 GDFP1-F14 and JEDEC MO-092AB



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