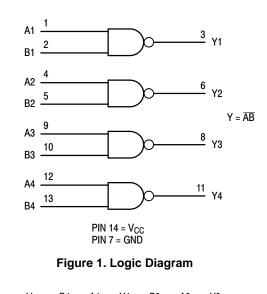
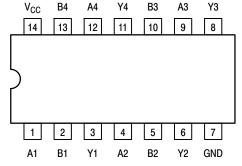
Quad 2-Input NAND Gate

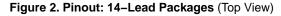
High–Performance Silicon–Gate CMOS

Features

- Output Drive Capability: ±24 mA
- Operating Voltage Range: 2 to 6 V AC00; 4.5 to 5.5 ACT00
- Low Input Current: 1.0 µA
- High Noise Immunity Characteristic of CMOS Devices
- In Compliance With the JEDEC Standard No. 7A Requirements
- Chip Complexity: 32 FETs
- These are Pb–Free Devices



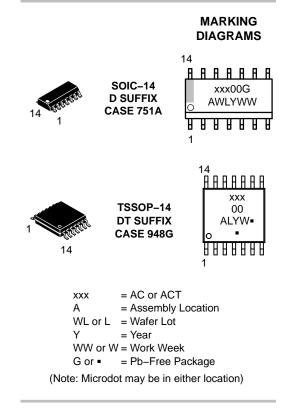






ON Semiconductor®

www.onsemi.com



FUNCTION TABLE

Inp	uts	Output
Α	в	Y
L	L	Н
L	Н	н
Н	L	н
н	Н	L

ORDERING INFORMATION

See detailed ordering and shipping information in the package dimensions section on page 5 of this data sheet.

MAXIMUM RATINGS

Symbol	Parameter		Value	Unit
V _{CC}	DC Supply Voltage		-0.5 to +7.0	V
VI	DC Input Voltage		$-0.5 \leq V_I \leq V_{CC} + 0.5$	V
V _O	DC Output Voltage	(Note 1)	$-0.5 \le V_O \le V_{CC} + 0.5$	V
I _{IK}	DC Input Diode Current		±20	mA
I _{OK}	DC Output Diode Current		±50	mA
I _O	DC Output Sink/Source Current		± 50	mA
I _{CC}	DC Supply Current per Output Pin		± 50	mA
I _{GND}	DC Ground Current per Output Pin		± 50	mA
T _{STG}	Storage Temperature Range		-65 to +150	°C
TL	Lead temperature, 1 mm from Case for 10 Se	econds	260	°C
TJ	Junction temperature under Bias		+ 150	°C
θ_{JA}	Thermal Resistance (Note 2)	SOIC TSSOP	125 170	°C/W
P _D	Power Dissipation in Still Air at 85°C	SOIC TSSOP	125 170	mW
MSL	Moisture Sensitivity		Level 1	
F _R	Flammability Rating	Oxygen Index: 30% – 35%	UL 94 V-0 @ 0.125 in	
V _{ESD}	Ŭ	uman Body Model (Note 3) Machine Model (Note 4) ged Device Model (Note 5)	> 2000 > 200 > 1000	V
ILatch-Up	Latch–Up Performance Above V _{CC} and Be	elow GND at 85°C (Note 6)	±100	mA

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

Io absolute maximum rating must be observed.
The package thermal impedance is calculated in accordance with JESD51–7.
Tested to EIA/JESD22–A114–A.

Tested to EIA/JESD22–A115–A.
Tested to JESD22–C101–A.

6. Tested to EIA/JESD78.

RECOMMENDED OPERATING CONDITIONS

Symbol	Parameter		Min	Тур	Max	Unit
V _{CC}	Supply Voltage	MC74AC00 MC74ACT00	2.0 4.5	5.0 5.0	6.0 5.5	V
V _{in} , V _{out}	DC Input Voltage, Output Voltage (Ref. to GND)		0	-	V _{CC}	V
t _r , t _f	Input Rise and Fall Time (Note 7) MC74AC00	V _{CC} @ 3.0 V V _{CC} @ 4.5 V V _{CC} @ 5.5 V	- - -	150 40 25	- - -	ns/V
t _r , t _f	Input Rise and Fall Time (Note 8) MC74ACT00	V _{CC} @ 4.5 V V _{CC} @ 5.5 V	_	10 8.0	-	ns/V
TJ	Junction Temperature		-	-	150	°C
T _A	Operating Ambient Temperature Range		-55	25	125	°C
I _{OH}	Output Current – High		-	-	-24	mA
I _{OL}	Output Current – Low		_	-	24	mA

Functional operation above the stresses listed in the Recommended Operating Ranges is not implied. Extended exposure to stresses beyond the Recommended Operating Ranges limits may affect device reliability. 7. V_{in} from 30% to 70% V_{CC} . 8. V_{in} from 0.8 V to 2.0 V.

DC CHARACTERISTICS

					MC74AC00				
		v _{cc}	T _A = +	-25°C	$T_A = -40^{\circ}C \text{ to } +85^{\circ}C$	T _A = −55°C + 125°C			
Symbol	Parameter	(V)	Тур		Guaranteed	imits	Unit	Conditions	
V _{IH}	Minimum High Level Input Voltage	3.0 4.5 5.5	1.5 2.25 2.75	2.1 3.15 3.85	2.1 3.15 3.85	2.1 3.15 3.85	V	$V_{OUT} = 0.1 V$ or V _{CC} - 0.1 V	
V _{IL}	Maximum Low Level Input Voltage	3.0 4.5 5.5	1.5 2.25 2.75	0.9 1.35 1.65	0.9 1.35 1.65	0.9 1.35 1.65	V	$V_{OUT} = 0.1 V$ or $V_{CC} - 0.1 V$	
V _{OH}	Minimum High Level Output Voltage	3.0 4.5 5.5	2.99 4.49 5.49	2.9 4.4 5.4	2.9 4.4 5.4	2.9 4.4 5.4	V	I _{OUT} = -50 μA	
		3.0 4.5 5.5	- - -	2.56 3.86 4.86	2.46 3.76 4.76	2.4 3.7 4.7	V	$\begin{tabular}{lllllllllllllllllllllllllllllllllll$	
V _{OL}	Maximum Low Level Output Voltage	3.0 4.5 5.5	0.002 0.001 0.001	0.1 0.1 0.1	0.1 0.1 0.1	0.1 0.1 0.1	V	I _{OUT} = 50 μA	
		3.0 4.5 5.5	- - -	0.36 0.36 0.36	0.44 0.44 0.44	0.5 0.5 0.5	V	$\begin{tabular}{lllllllllllllllllllllllllllllllllll$	
I _{IN}	Maximum Input Leakage Current	5.5	-	±0. 1	±1.0	±1.0	μA	$V_{I} = V_{CC}, GND$	
I _{OLD}	†Minimum Dynamic	5.5	-	-	75	50	mA	V _{OLD} = 1.65 V Max	
I _{OHD}	Output Current	5.5	-	-	-75	-50	mA	V _{OHD} = 3.85 V Min	
I _{CC}	Maximum Quiescent Supply Current	5.5	-	4.0	40	40	μΑ	$V_{IN} = V_{CC}$ or GND	

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions. *All outputs loaded; thresholds on input associated with output under test.

†Maximum test duration 2.0 ms, one output loaded at a time.

NOTE: I_{IN} and I_{CC} @ 3.0 V are guaranteed to be less than or equal to the respective limit @ 5.5 V V_{CC}.

AC CHARACTERISTICS ($t_r = t_f = 3.0 \text{ nS}$; $C_L = 50 \text{ pF}$; see Figures 3 and 4 for Waveforms)

				MC74AC00								
		v _{cc} *	T _A = +25°C		T _A = +25°C		T _A = +25°C T _A =		T _A = -40°C to +85°C		T _A = -55°C to + 125°C	
Symbol	Parameter	(V)	Min	Тур	Max	Min	Max	Min	Max	Unit		
t _{PLH}	Propagation Delay	3.3 5.0	2.0 1.5	7.0 6.0	9.5 8.0	2.0 1.5	10.0 8.5	1.0 1.0	11.0 8.5	ns		
t _{PHL}	Propagation Delay	3.3 5.0	1.5 1.5	5.5 4.5	8.0 6.5	1.0 1.0	8.5 7.0	1.0 1.0	9.0 7.0	ns		

*Voltage Range 3.3 V is 3.3 V \pm 0.3 V.

Voltage Range 5.0 V is 5.0 V \pm 0.5 V.

DC CHARACTERISTICS

					MC74ACT00			
		Vcc	T _A = +	-25°C	$T_A = -40^{\circ}C \text{ to } +85^{\circ}C$	T _A = −55°C to + 125°C	1	
Symbol	Parameter	(V)	Тур		Guaranteed	Limits	Unit	Conditions
V _{IH}	Minimum High Level Input Voltage	4.5 5.5	1.5 1.5	2.0 2.0	2.0 2.0	2.0 2.0	V	$V_{OUT} = 0.1 V$ or $V_{CC} - 0.1 V$
V _{IL}	Maximum Low Level Input Voltage	4.5 5.5	1.5 1.5	0.8 0.8	0.8 0.8	0.8 0.8	V	$V_{OUT} = 0.1 V$ or $V_{CC} - 0.1 V$
V _{OH}	Minimum High Level Output Voltage	4.5 5.5	4.49 5.49	4.4 5.4	4.4 5.4	4.4 5.4	V	I _{OUT} = -50 μA
		4.5 5.5		3.86 4.86	3.76 4.76	3.7 4.7	V	$V_{IN} = V_{IL} \text{ or } V_{IH}$ $I_{OH} -24 \text{ mA}$ -24 mA
V _{OL}	Maximum Low Level Output Voltage	4.5 5.5	0.001 0.001	0.1 0.1	0.1 0.1	0.1 0.1	V	I _{OUT} = 50 μA
		4.5 5.5	_ _	0.36 0.36	0.44 0.44	0.5 0.5	V	$V_{IN} = V_{IL} \text{ or } V_{IH}$ V_{OL} 24 mA 24 mA
I _{IN}	Maximum Input Leakage Current	5.5	-	±0.1	±1.0	±1.0	μΑ	$V_{I} = V_{CC}, GND$
ΔI_{CCT}	Additional Max. I _{CC} /Input	5.5	0.6	-	1.5	1.6	mA	$V_{I} = V_{CC} - 2.1 V$
I _{OLD}	†Minimum Dynamic	5.5	-	-	75	50	mA	V_{OLD} = 1.65 V Max
I _{OHD}	Output Current	5.5	-	-	-75	-50	mA	V _{OHD} = 3.85 V Min
I _{CC}	Maximum Quiescent Supply Current	5.5	-	4.0	40	40	μΑ	$V_{IN} = V_{CC}$ or GND

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions. *All outputs loaded; thresholds on input associated with output under test.

†Maximum test duration 2.0 ms, one output loaded at a time.

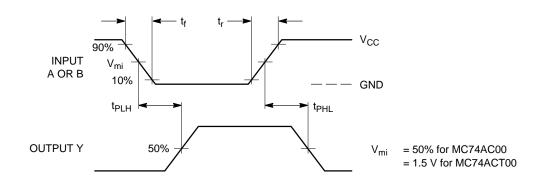
AC CHARACTERISTICS ($t_r = t_f = 3.0 \text{ nS}$; $C_L = 50 \text{ pF}$; see Figures 3 and 4 for Waveforms)

			MC74ACT00							
		V _{CC} *	T,	4 = +25°	С	$T_A = -40^{\circ}C$	c to +85°C	T _A = -55°C	to +125°C	
Symbol	Parameter	(V)	Min	Тур	Max	Min	Max	Min	Max	Unit
t _{PLH}	Propagation Delay	5.0	1.5	5.5	9.0	1.0	9.5	1.0	9.5	ns
t _{PHL}	Propagation Delay	5.0	1.5	4.0	7.0	1.0	8.0	1.0	8.0	ns

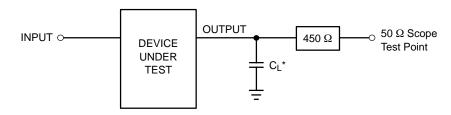
*Voltage Range 5.0 V is 5.0 V ± 0.5 V.

CAPACITANCE

Symbol	Parameter	Value Typ	Test Conditions	Unit
C _{IN}	Input Capacitance	4.5	V _{CC} = 5.0 V	pF
C _{PD}	Power Dissipation Capacitance	30	V _{CC} = 5.0 V	pF







*Includes all probe and jig capacitance

Figure 4. Test Circuit

ORDER INFORMATION

Device	Package	Shipping [†]
MC74AC00DG	SOIC-14 (Pb-Free)	55 Units / Rail
MC74AC00DR2G	SOIC-14 (Pb-Free)	
MC74AC00DTR2G	TSSOP-14 (Pb-Free)	2500 / Tape and Reel
MC74ACT00DG	SOIC-14 (Pb-Free)	55 Units / Rail
MC74ACT00DR2G	SOIC-14 (Pb-Free)	orgo / Tana and Daal
MC74ACT00DTR2G	TSSOP-14 (Pb-Free)	2500 / Tape and Reel

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.





*For additional information on our Pb–Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

STYLES ON PAGE 2

DOCUMENT NUMBER:	JMENT NUMBER: 98ASB42565B Electronic versions are uncontrolled except when accessed directly from the Documer Printed versions are uncontrolled except when stamped "CONTROLLED COPY" in red				
DESCRIPTION:	SOIC-14 NB		PAGE 1 OF 2		
ON Semiconductor reserves the right the suitability of its products for any pa	to make changes without further notice to an articular purpose, nor does ON Semiconducto	stries, LLC dba ON Semiconductor or its subsidiaries in the United States y products herein. ON Semiconductor makes no warranty, representation r assume any liability arising out of the application or use of any product o ncidental damages. ON Semiconductor does not convey any license under	or guarantee regarding or circuit, and specifically		

SOIC-14 CASE 751A-03 ISSUE L

DATE 03 FEB 2016

STYLE 1: PIN 1. COMMON CATHODE 2. ANODE/CATHODE 3. ANODE/CATHODE 4. NO CONNECTION 5. ANODE/CATHODE 6. NO CONNECTION 7. ANODE/CATHODE 8. ANODE/CATHODE 9. ANODE/CATHODE 10. NO CONNECTION 11. ANODE/CATHODE 12. ANODE/CATHODE 13. NO CONNECTION 14. COMMON ANODE	STYLE 2: CANCELLED	STYLE 3: PIN 1. NO CONNECTION 2. ANODE 3. ANODE 4. NO CONNECTION 5. ANODE 6. NO CONNECTION 7. ANODE 8. ANODE 9. ANODE 10. NO CONNECTION 11. ANODE 12. ANODE 13. NO CONNECTION 14. COMMON CATHODE	STYLE 4: PIN 1. NO CONNECTION 2. CATHODE 3. CATHODE 4. NO CONNECTION 5. CATHODE 6. NO CONNECTION 7. CATHODE 8. CATHODE 10. NO CONNECTION 11. CATHODE 12. CATHODE 13. NO CONNECTION 14. COMMON ANODE
STYLE 5: PIN 1. COMMON CATHODE 2. ANODE/CATHODE 3. ANODE/CATHODE 4. ANODE/CATHODE 5. ANODE/CATHODE 6. NO CONNECTION 7. COMMON ANODE 8. COMMON CATHODE 10. ANODE/CATHODE 11. ANODE/CATHODE 12. ANODE/CATHODE 13. NO CONNECTION 14. COMMON ANODE	STYLE 6: PIN 1. CATHODE 2. CATHODE 3. CATHODE 4. CATHODE 5. CATHODE 6. CATHODE 7. CATHODE 8. ANODE 9. ANODE 10. ANODE 11. ANODE 12. ANODE 13. ANODE 14. ANODE	STYLE 7: PIN 1. ANODE/CATHODE 2. COMMON ANODE 3. COMMON CATHODE 4. ANODE/CATHODE 5. ANODE/CATHODE 6. ANODE/CATHODE 8. ANODE/CATHODE 9. ANODE/CATHODE 10. ANODE/CATHODE 11. COMMON CATHODE 12. COMMON ANODE 13. ANODE/CATHODE 14. ANODE/CATHODE	STYLE 8: PIN 1. COMMON CATHODE 2. ANODE/CATHODE 3. ANODE/CATHODE 4. NO CONNECTION 5. ANODE/CATHODE 6. ANODE/CATHODE 7. COMMON ANODE 9. ANODE/CATHODE 10. ANODE/CATHODE 11. NO CONNECTION 12. ANODE/CATHODE 13. ANODE/CATHODE 14. COMMON CATHODE

DOCUMENT NUMBER:	98ASB42565B	Electronic versions are uncontrolled except when accessed directly from Printed versions are uncontrolled except when stamped "CONTROLLED (
DESCRIPTION:	SOIC-14 NB		PAGE 2 OF 2
ON Semiconductor and m are trac	lemarks of Semiconductor Components Indu	stries TLC dba ON Semiconductor or its subsidiaries in the United States	and/or other countries

ON Semiconductor and united states and/or other countries. LC dba ON Semiconductor or its subsidiaries in the United States and/or other countries. ON Semiconductor reserves the right to make changes without further notice to any products herein. ON Semiconductor makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does ON Semiconductor assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. ON Semiconductor does not convey any license under its patent rights nor the rights of others.





may or may not be present.

DOCUMENT NUMBER:	98ASH70246A	BASH70246A Electronic versions are uncontrolled except when accessed directly from the Document Repository. Printed versions are uncontrolled except when stamped "CONTROLLED COPY" in red.	
DESCRIPTION:	TSSOP-14 WB		PAGE 1 OF 1
ON Semiconductor and ()) are trademarks of Semiconductor Components Industries, LLC dba ON Semiconductor or its subsidiaries in the United States and/or other countries. ON Semiconductor reserves the right to make changes without further notice to any products herein. ON Semiconductor makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does ON Semiconductor assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. ON Semiconductor does not convey any license under its patent rights or the rights of others.			

DIMENSIONS: MILLIMETERS

© Semiconductor Components Industries, LLC, 2019

onsemi, ONSEMI, and other names, marks, and brands are registered and/or common law trademarks of Semiconductor Components Industries, LLC dba "onsemi" or its affiliates and/or subsidiaries in the United States and/or other countries. onsemi owns the rights to a number of patents, trademarks, copyrights, trade secrets, and other intellectual property. A listing of onsemi's product/patent coverage may be accessed at www.onsemi.com/site/pdf/Patent-Marking.pdf. onsemi reserves the right to make changes at any time to any products or information herein, without notice. The information herein is provided "as-is" and onsemi makes no warranty, representation or guarantee regarding the accuracy of the information, product features, availability, functionality, or suitability of its products for any particular purpose, nor does **onsemi** assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. Buyer is responsible for its products and applications using **onsemi** products, including compliance with all laws, regulations and safety requirements or standards, regardless of any support or applications information provided by **onsemi**. "Typical" parameters which may be provided in **onsemi** data sheets and/or specifications can and do vary in different applications and calcular performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. **onsemi** does not convey any license under any of its intellectual property rights nor the rights of others. **onsemi** products are not designed, intended, or authorized for use as a critical component in life support systems or any FDA Class 3 medical devices or medical devices with a same or similar classification in a foreign jurisdiction or any devices intended for implantation in the human body. Should Buyer purchase or use **onsemi** products for any such unintended or unauthorized application, Buyer shall indemnify and hold **onsemi** and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that **onsemi** was negligent regarding the design or manufacture of the part. **onsemi** is an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner.

PUBLICATION ORDERING INFORMATION

LITERATURE FULFILLMENT:

TECHNICAL SUPPORT

onsemi Website: www.onsemi.com

Email Requests to: orderlit@onsemi.com

North American Technical Support: Voice Mail: 1 800-282-9855 Toll Free USA/Canada Phone: 011 421 33 790 2910

Europe, Middle East and Africa Technical Support: Phone: 00421 33 790 2910 For additional information, please contact your local Sales Representative

Mouser Electronics

Authorized Distributor

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

onsemi:

MC74AC00D MC74AC00DG MC74AC00DR2 MC74AC00DR2G MC74AC00DTR2 MC74AC00DTR2G MC74AC00MEL MC74AC00MELG MC74AC00N MC74AC00NG MC74ACT00D MC74ACT00DG MC74ACT00DR2 MC74ACT00DR2G MC74ACT00DTR2 MC74ACT00DTR2G MC74ACT00MEL MC74ACT00MELG MC74ACT00N MC74ACT00NG NLV74ACT00DR2G NLV74AC00DR2G