阅读申明

- 1.本站收集的数据手册和产品资料都来自互联网,版权归原作者所有。如读者和版权方有任何异议请及时告之,我们将妥善解决。
- 2.本站提供的中文数据手册是英文数据手册的中文翻译,其目的是协助用户阅读,该译文无法自动跟随原稿更新,同时也可能存在翻译上的不当。建议读者以英文原稿为参考以便获得更精准的信息。
- 3.本站提供的产品资料,来自厂商的技术支持或者使用者的心得体会等,其内容可能存在描 叙上的差异,建议读者做出适当判断。
- 4.如需与我们联系,请发邮件到marketing@iczoom.com,主题请标有"数据手册"字样。

Read Statement

- 1. The datasheets and other product information on the site are all from network reference or other public materials, and the copyright belongs to the original author and original published source. If readers and copyright owners have any objections, please contact us and we will deal with it in a timely manner.
- 2. The Chinese datasheets provided on the website is a Chinese translation of the English datasheets. Its purpose is for reader's learning exchange only and do not involve commercial purposes. The translation cannot be automatically updated with the original manuscript, and there may also be improper translations. Readers are advised to use the English manuscript as a reference for more accurate information.
- 3. All product information provided on the website refer to solutions from manufacturers' technical support or users the contents may have differences in description, and readers are advised to take the original article as the standard.
- 4. If you have any questions, please contact us at marketing@iczoom.com and mark the subject with "Datasheets".

TOSHIBA CMOS Digital Integrated Circuit Silicon Monolithic

TC7W00F, TC7W00FU, TC7W00FK

Dual 2-Input NAND Gate

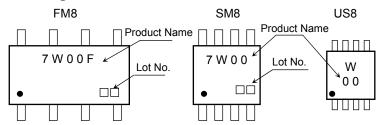
Features

High Speed : t_{pd} = 6ns (typ.) at V_{CC} = 5V
 Low power dissipation : I_{CC} = 1µA (max) at Ta = 25°C
 High noise immunity : V_{NIH} = V_{NIL} = 28% V_{CC} (min)

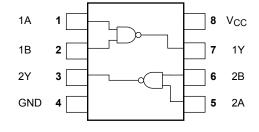
Output drive capability : 10 LSTTL Loads
 Symmetrical Output Impedance : |I_{OH}| = I_{OL} = 4mA (min)

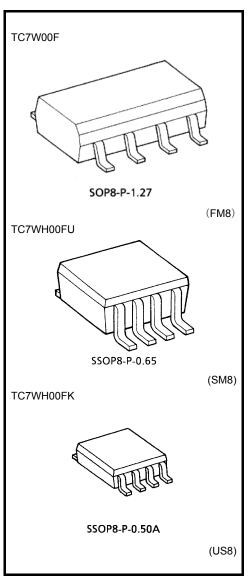
Balanced propagation delays : t_{pLH} ≒ t_{pHL}
 Wide operating voltage range : V_{CC} = 2 to 6 V

Marking



Pin Assignment (top view)





Weight

 SOP8-P-1.27
 : 0.05 g (typ.)

 SSOP8-P-0.65
 : 0.02 g (typ.)

 SSOP8-P-0.50A
 : 0.01 g (typ.)



Absolute Maximum Ratings (Ta = 25°C)

Characteristics	Symbol	Rating	Unit
Supply voltage	V _{CC}	-0.5 to 7.0	V
DC input voltage	V _{IN}	–0.5 to V _{CC} + 0.5	V
DC output voltage	Vout	−0.5 to V _{CC} + 0.5	V
Input diode current	lık	±20	mA
Output diode current	lok	±20	mA
DC output current	lout	±25	mA
DC V _{CC} /ground current	Icc	±25	mA
Power dissipation	D-	300 (FM8, SM8)	mW
	P _D	200 (US8)] '''۷
Storage temperature	T _{stg}	–65 to 150	°C
Lead temperature (10 s)	TL	260	°C

Note: Using continuously under heavy loads (e.g. the application of high temperature/current/voltage and the significant change in temperature, etc.) may cause this product to decrease in the reliability significantly even if the operating conditions (i.e. operating temperature/current/voltage, etc.) are within the absolute maximum ratings and the operating ranges.

Please design the appropriate reliability upon reviewing the Toshiba Semiconductor Reliability Handbook ("Handling Precautions"/"Derating Concept and Methods") and individual reliability data (i.e. reliability test report and estimated failure rate, etc).

IEC Logic Symbol



Truth Table

Α	В	Υ
L	L	Н
L	Н	Н
Н	L	Н
Н	Н	L

Operating Ranges

Characteristics	Symbol	Rating	Unit
Supply voltage	V _{CC}	2.0 to 6.0	V
Input voltage	V _{IN}	0 to V _{CC}	V
Output voltage	V _{OUT}	0 to V _{CC}	V
Operating temperature	T _{opr}	-40 to 85	°C
Input rise and fall time		0 to 1000 (V _{CC} = 2.0 V)	
	t_r , t_f	0 to 500 (V _{CC} = 4.5 V)	ns
		0 to 400 $(V_{CC} = 6.0 \text{ V})$	

2



Electrical Characteristics

DC Characteristics

Characteristics Symbol Test Condit		Condition	Condition		Ta = 25°C			Ta = -40 to 85°C		
		rest Condition		V _{CC} (V)	Min	Тур.	Max	Min	Max	Unit
				2.0	1.5	_	_	1.5	_	
High-level input voltage V _{IH}	V _{IH}			4.5	3.15	_	_	3.15	_	V
				6.0	4.2	1		4.2		
				2.0	_		0.5	_	0.5	V
Low-level input voltage V _{IL}	VIL	_		4.5	_		1.35	_	1.35	
				6.0	_	_	1.8	_	1.8	
	V _{ОН}	V _{IN} = V _{IH} or V _{IL}	I _{OH} = -20 μA	2.0	1.9	2.0	_	1.9		
				4.5	4.4	4.5	_	4.4	_	
High-level output voltage				6.0	5.9	6.0	_	5.9	_	
			$I_{OH} = -4 \text{ mA}$	4.5	4.18	4.31		4.13		
			$I_{OH} = -5.2 \text{ mA}$	6.0	5.68	5.80		5.63		V
Low-level output voltage V			I _{OL} = 20 μA	2.0	_	0.0	0.1	_	0.1	V
				4.5	_	0.0	0.1	_	0.1	
	V _{OL}	$V_{IN} = V_{IH}$		6.0	_	0.0	0.1	_	0.1	
			$I_{OL} = 4 \text{ mA}$	4.5	_	0.17	0.26	_	0.33	
			$I_{OL} = 5.2 \text{ mA}$	6.0	_	0.18	0.26	_	0.33	
Input leakage current	I _{IN}	V _{IN} = V _{CC} or GND		6.0	_	1	±0.1	_	±1.0	μΑ
Quiescent supply current	Icc	V _{IN} = V _{CC} or GND		6.0	_	_	1.0	_	10.0	μΑ



AC Characteristics (C_L= 15pF, V_{CC} = 5V, Ta = 25°C)

Characteristics	Symbol	Test Condition		Unit		
		rest condition	Min	Тур.	Max	Offic
Output Transition Time	t _{TLH}	_		4	8	no
	t _{THL}					ns
Propagation Delay Time	t _{pLH}	_	_	6	12	no
	t _{pLH}					ns

AC Characteristics ($C_L = 50 pF$, Input: $t_r = t_f = 6 ns$)

Characteristics	Symbol	Test Condition		Ta = 25°C			Ta = -40 to 85°C		Unit
		rest Condition	V _{CC} (V)	Min	Тур.	Max	Min	Max	Offic
Output Transition Time	t _{TLH} t _{THL}	_	2.0	_	25	75	_	95	
			4.5	_	7	15	_	19	ns
			6.0	_	6	13	_	16	
Propagation delay time	t _{рLH}	_	2.0	_	25	75	_	95	
			4.5	_	9	15	_	19	ns
			6.0	_	8	13	_	16	
Input capacitance	C _{IN}	_		_	5	10	_	10	pF
Power dissipation capacitance	C _{PD}		(Note 1)		20	_	_	_	pF

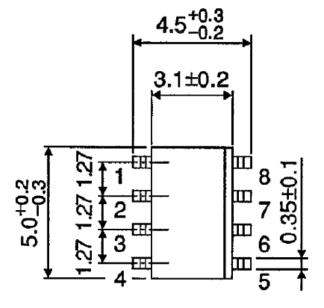
Note 1: C_{PD} is defined as the value of the internal equivalent capacitance which is calculated from the operating current consumption without load.

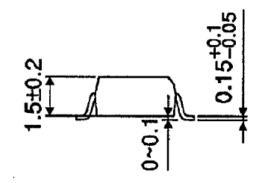
Average operating current can be obtained by the equation:

 $I_{CC \ (opr.)} = C_{PD} \cdot V_{CC} \cdot f_{IN} + I_{CC}/2$

Package Dimensions

SOP8-P-1.27 Unit: mm





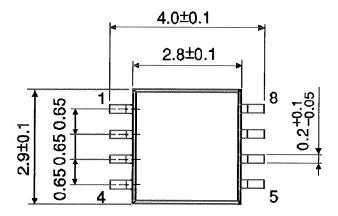
5

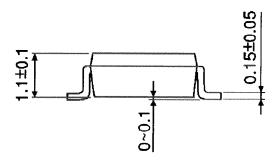
Weight: 0.05 g (typ.)



Package Dimensions

SSOP8-P-0.65 Unit: mm



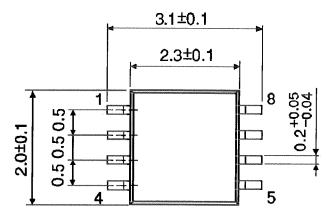


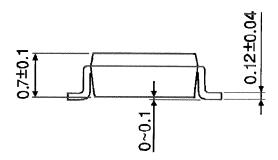
6

Weight: 0.02 g (typ.)

Package Dimensions

SSOP8-P-0.50A Unit: mm





7

Weight: 0.01 g (typ.)

RESTRICTIONS ON PRODUCT USE

- Toshiba Corporation, and its subsidiaries and affiliates (collectively "TOSHIBA"), reserve the right to make changes to the information in this document, and related hardware, software and systems (collectively "Product") without notice.
- This document and any information herein may not be reproduced without prior written permission from TOSHIBA. Even with TOSHIBA's written permission, reproduction is permissible only if reproduction is without alteration/omission.
- Though TOSHIBA works continually to improve Product's quality and reliability, Product can malfunction or fail. Customers are responsible for complying with safety standards and for providing adequate designs and safeguards for their hardware, software and systems which minimize risk and avoid situations in which a malfunction or failure of Product could cause loss of human life, bodily injury or damage to property, including data loss or corruption. Before customers use the Product, create designs including the Product, or incorporate the Product into their own applications, customers must also refer to and comply with (a) the latest versions of all relevant TOSHIBA information, including without limitation, this document, the specifications, the data sheets and application notes for Product and the precautions and conditions set forth in the "TOSHIBA Semiconductor Reliability Handbook" and (b) the instructions for the application with which the Product will be used with or for. Customers are solely responsible for all aspects of their own product design or applications, including but not limited to (a) determining the appropriateness of the use of this Product in such design or applications; (b) evaluating and determining the applicability of any information contained in this document, or in charts, diagrams, programs, algorithms, sample application circuits, or any other referenced documents; and (c) validating all operating parameters for such designs and applications. TOSHIBA ASSUMES NO LIABILITY FOR CUSTOMERS' PRODUCT DESIGN OR APPLICATIONS.
- Product is intended for use in general electronics applications (e.g., computers, personal equipment, office equipment, measuring equipment, industrial robots and home electronics appliances) or for specific applications as expressly stated in this document. Product is neither intended nor warranted for use in equipment or systems that require extraordinarily high levels of quality and/or reliability and/or a malfunction or failure of which may cause loss of human life, bodily injury, serious property damage or serious public impact ("Unintended Use"). Unintended Use includes, without limitation, equipment used in nuclear facilities, equipment used in the aerospace industry, medical equipment, equipment used for automobiles, trains, ships and other transportation, traffic signaling equipment, equipment used to control combustions or explosions, safety devices, elevators and escalators, devices related to electric power, and equipment used in finance-related fields. Do not use Product for Unintended Use unless specifically permitted in this document.
- · Do not disassemble, analyze, reverse-engineer, alter, modify, translate or copy Product, whether in whole or in part.
- Product shall not be used for or incorporated into any products or systems whose manufacture, use, or sale is prohibited under any
 applicable laws or regulations.
- The information contained herein is presented only as guidance for Product use. No responsibility is assumed by TOSHIBA for any infringement of patents or any other intellectual property rights of third parties that may result from the use of Product. No license to any intellectual property right is granted by this document, whether express or implied, by estoppel or otherwise.
- ABSENT A WRITTEN SIGNED AGREEMENT, EXCEPT AS PROVIDED IN THE RELEVANT TERMS AND CONDITIONS OF SALE
 FOR PRODUCT, AND TO THE MAXIMUM EXTENT ALLOWABLE BY LAW, TOSHIBA (1) ASSUMES NO LIABILITY
 WHATSOEVER, INCLUDING WITHOUT LIMITATION, INDIRECT, CONSEQUENTIAL, SPECIAL, OR INCIDENTAL DAMAGES OR
 LOSS, INCLUDING WITHOUT LIMITATION, LOSS OF PROFITS, LOSS OF OPPORTUNITIES, BUSINESS INTERRUPTION AND
 LOSS OF DATA, AND (2) DISCLAIMS ANY AND ALL EXPRESS OR IMPLIED WARRANTIES AND CONDITIONS RELATED TO
 SALE, USE OF PRODUCT, OR INFORMATION, INCLUDING WARRANTIES OR CONDITIONS OF MERCHANTABILITY, FITNESS
 FOR A PARTICULAR PURPOSE, ACCURACY OF INFORMATION, OR NONINFRINGEMENT.
- Do not use or otherwise make available Product or related software or technology for any military purposes, including without
 limitation, for the design, development, use, stockpiling or manufacturing of nuclear, chemical, or biological weapons or missile
 technology products (mass destruction weapons). Product and related software and technology may be controlled under the
 Japanese Foreign Exchange and Foreign Trade Law and the U.S. Export Administration Regulations. Export and re-export of Product
 or related software or technology are strictly prohibited except in compliance with all applicable export laws and regulations.
- Please contact your TOSHIBA sales representative for details as to environmental matters such as the RoHS compatibility of Product.
 Please use Product in compliance with all applicable laws and regulations that regulate the inclusion or use of controlled substances, including without limitation, the EU RoHS Directive. TOSHIBA assumes no liability for damages or losses occurring as a result of noncompliance with applicable laws and regulations.