TOSHIBA

Mini catalog

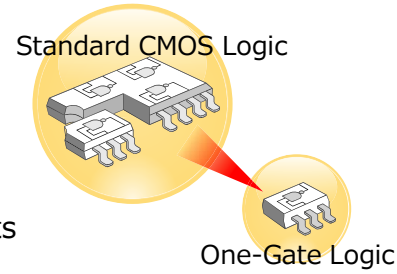
Introduction to Toshiba One-Gate Logic (L-MOS)

We are a pioneer of one-gate logic (L-MOS) products, which commercialized one-gate logic for the first time in the world(*). We will continue to expand our lineup for small, thin, and low-voltage operation products.

(*) Based on our survey
(as of Sep 13,2021)

・What is One-Gate Logic?

One-gate logic is a product which 1 to 3 gates of standard logic ICs are mounted in a small package.

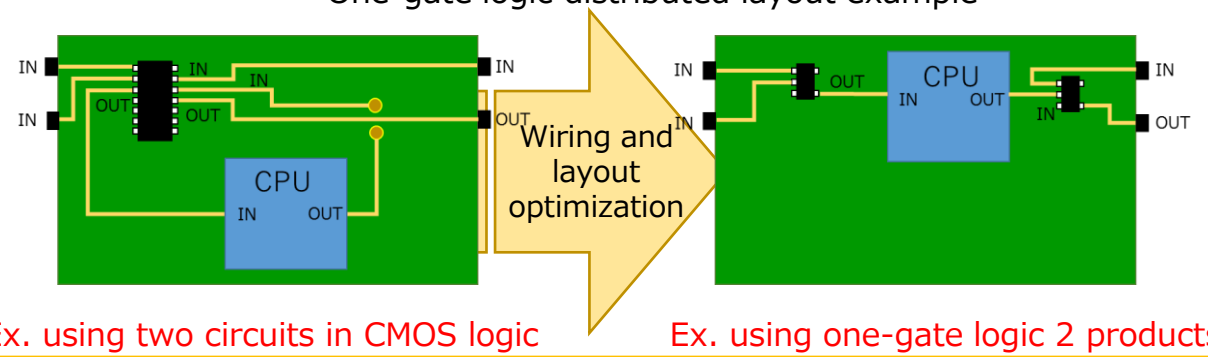


・Advantages of One-Gate Logic

One-gate logic can be used as follows, by taking advantage of its small and single function.

・When circuit correction of the board is required, it is possible to carry out correction easily with space saving.
・Buffering and waveform shaping of signals can be performed in a space-saving manner.
・The layout can be optimized by distributing the one-gate logic.
Refer to the following.

One-gate logic distributed layout example

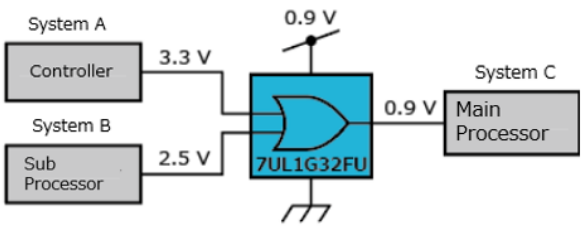


Ex. using two circuits in CMOS logic　　Ex. using one-gate logic 2 products

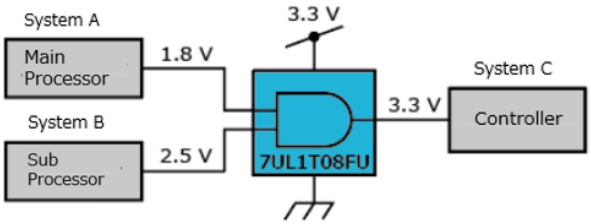
・Lineup of one-gate logic

In addition to the current 5V and 3V lineups, we will expand a lineup of super low-voltage series that supports future low-voltage operation.
In particular, the use of 7UL Series operable at a low voltage, can achieve the signal level changes and the logical conversion between different voltage systems a single product.

Ex. Level down + logical conversion using 7UL1G series.



Ex. Level up + logical conversion using 7UL1T series .

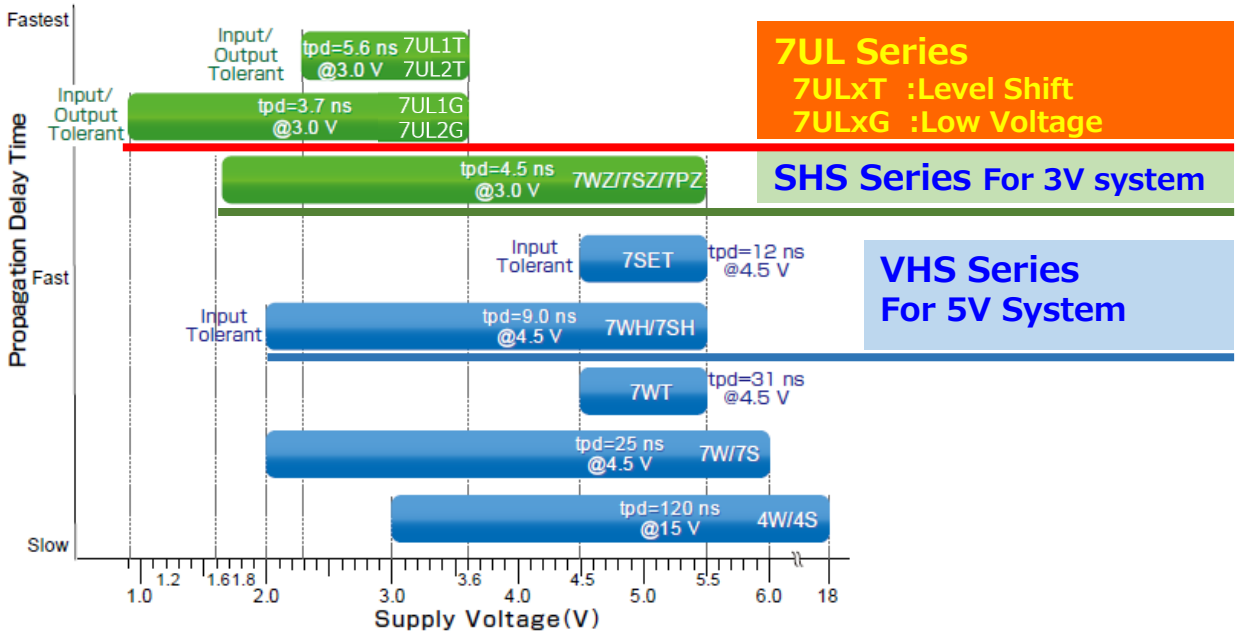


We realize the function by taking advantage of the features of the product.

We are expanding the lineup that supports an operating temperature of 125 deg C according to the customer's usage environment.

TOSHIBA

・One-Gate Logic(L-MOS) Line-up

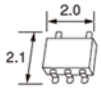
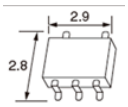
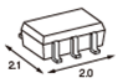
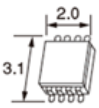
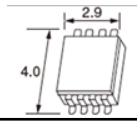


・One-Gate Logic(L-MOS) Recommended product summary

Features	Series	Product family	Number of Function	Supply voltage (V)	Tpd (ns)	Output Current (mA)	Input torerant (V)	Output powerdown protection (V)	Package	Buy Online
Low voltage system	7UL (LVP)	7UL1G	25	0.9～3.6	2.5 (@3.0V)	±8.0 (@3.0V)	0～3.6	0～3.6	fSV,USV	Buy Online
		7UL2G	7						US8	Buy Online
		7UL1T	18	2.3～3.6	3.6 (@3.0V)	±8.0 (@3.0V)	0～3.6	0～3.6	fSV,USV	Buy Online
		7UL2T	7						US8	Buy Online
3V system	SHS	TC7SZ	56	1.65～5.5	4.5 (@3.0V)	±24 (@3.0V)	0～5.5	0～5.5	USV,SMV, ESV, fSV	Buy Online
		TC7PZ	6						US6	Buy Online
		TC7WZ	30						US8,SM8	Buy Online
5V system	VHS (Very High Speed)	TC7SH	26	2～5.5	9 (@4.5V)	±8.0 (@4.5V)	0～5.5	—	USV,SMV	Buy Online
		TC7WH	26						SM8、US8	Buy Online
		TC7SET	20	4.5～5.5	12 (@4.5V)				USV,SMV	Buy Online

TOSHIBA

Pakage line-up

Type	Surface Mount			
Pich	0.35mm	0.5mm	0.65mm	0.95mm
5pin				
	fSV(SOT-953)	ESV(SOT-553)	USV(SOT-353)	SMV(SOT-25)
6pin				
			US6(SOT-363)	
8pin				
		US8(SOT-765)	SM8(SOT-505)	
Code	FS	5pin:FE, 8pin:FK	FU	F

Please also refer to the following documents for related explanations.

- **To perform a parametric search of Logic ICs :**
  - **CMOS logic ICs** Click
  - **One-Gate logic ICs** Click
  - **Bus Switches** Click
- **Application notes** Click
- **FAQs of Logic ICs** Click
- **Stock Check & Purchase** Click
- **Cross Reference Search page** Click

RESTRICTIONS ON PRODUCT USE

Toshiba Corporation and its subsidiaries and affiliates are collectively referred to as “TOSHIBA”.
Hardware, software and systems described in this document are collectively referred to as “Product”.

- TOSHIBA reserves the right to make changes to the information in this document and related 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 NEITHER INTENDED NOR WARRANTED FOR USE IN EQUIPMENTS 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 AND/OR SERIOUS PUBLIC IMPACT ("UNINTENDED USE"). Except for specific applications as expressly stated in this document, Unintended Use includes, without limitation, equipment used in nuclear facilities, equipment used in the aerospace industry, lifesaving and/or life supporting 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, and devices related to power plant. IF YOU USE PRODUCT FOR UNINTENDED USE, TOSHIBA ASSUMES NO LIABILITY FOR PRODUCT. For details, please contact your TOSHIBA sales representative or contact us via our website.
- 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 applicable export laws and regulations including, without limitation, 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.

Toshiba Electronic Devices & Storage Corporation

https://toshiba.semicon-storage.com/