

Toshiba General Purpose CMOS Logic / One-gate Logic IC

The CMOS logic IC / one-gate logic IC with production results for about half a century!
 New lineup of CMOS Logic products with extended operating temperature range up to $T_a = 125^\circ\text{C}$

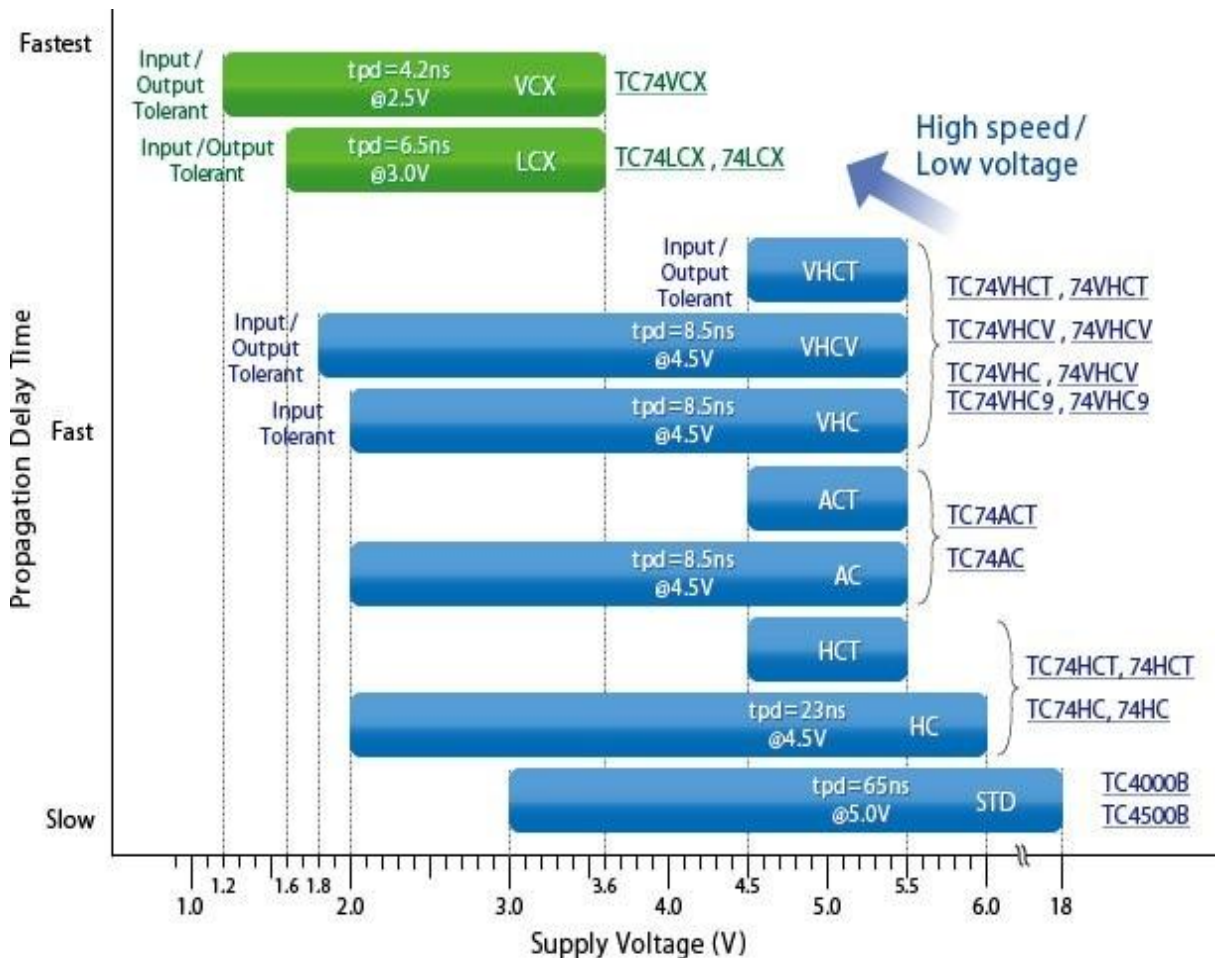
•Approximately 50 years of CMOS logic and one-gate logic production results

Toshiba's CMOS Logic Products began production in the 1970s, and we are continuing to supply high-quality products through our production bases in Japan and the Philippines, while developing series and packages.

We will continue to supply high-quality, long-term CMOS logic ICs and one-gate logic (LMOS) products so that everyone can use our products with peace of mind.

•Comprehensive lineup

Almost all of Toshiba's mass-produced lineup can be selected. It is especially recommended for users who are considering the future and those who are already using it but want to proceed with the 2nd source review. We would like to ask you to review the package lineup and cross-references of other companies according to characteristics so that you can select them more easily.



- **Extended of the lineup of CMOS Logic and One-gate Logic products with extended operating temperature range up to $T_a = 125\text{ }^\circ\text{C}$**

Although some products are already compatible with the operating temperature range $T_a = -40\text{ }^\circ\text{C}$, to $125\text{ }^\circ\text{C}$, we will expand the products for temperature expansion to meet the customer's temperature expansion requirements.

In addition, Toshiba plans to increase not only general-purpose CMOS logic products but also high-temperature guaranteed One-gate Logic(L-MOS), bus switch, Level-shifter products.

This expands the range of Toshiba's general-purpose CMOS logic products that you can adopt without worrying about temperature conditions when you consider adopting it.

•Lineup of CMOS Logic products

You can easily select from the list of characteristics.

Type	Series	Product Number	Temperature-expanded products ○: existence —: nonexistence	Operating voltage range (V)	Propagation delay (ns)	Output current (mA)	Input tolerance (V)	Output power-down protection (V)	Package	(Note) Where to buy
Compatibility with 5 V Systems	Standard	TC4000B	—	3 to 18	65 (@5.0V)	±0.51 (@5.0V)	—	—	DIP14,16 SOP14,16 TSSOP14	Buy Online
	High-speed	TC74HC	○	2 to 6	23 (@4.5V)	±4.0 or ±6.0 (@4.5V)	—	—	DIP14,16,20 SOP14,16,20 TSSOP14,16	Buy Online
		74HC	○							Buy Online
		TC74HCT	—	4.5 to 5.5						Buy Online
		74HCT	○	5.5						Buy Online
	Advanced	TC74AC	○	2 to 5.5	8.5 (@4.5V)	±24 (@4.5V)	—	—	DIP14,16,20 SOP14,16,20 TSSOP14,16,20	Buy Online
		TC74ACT	○	4.5 to 5.5						Buy Online
	Very High-speed	74VHC	○	2 to 5.5	8.5 (@4.5V)	±8.0 (@4.5V)	0 to 5.5	—	DIP14,20 SOP14,16,20 TSSOP14,16,20 US14,16,20	Buy Online
		74VHCT	○	4.5 to 5.5						Buy Online
		74VHCV	○	1.8 to 5.5						±16 (@4.5V)
Compatible with low-voltage systems	Low-voltage	TC74LCX	○	1.65 to 3.6	6.5 (@3.0V)	±24 (@3.0V)	0 to 5.5	0 to 5.5	SOP14,16,20 TSSOP14,16,20 ,48,US14,16,20	Buy Online
		74LCX	○	3.6					Buy Online	
	Very Low-voltage	TC74VCX	○	1.2 to 3.6	4.2 (@2.3V)	±24 (@3.0V)	0 to 3.6	0 to 3.6	TSSOP14,16,20 ,48 US14,16,20	Buy Online





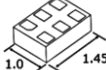



•Lineup of One-Gate logic products

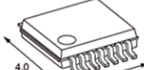
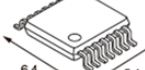
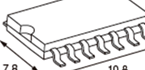


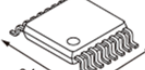



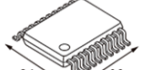



Type	Series	Product Number	Temperature-expanded products ○: existence —: nonexistence	Operating voltage range (V)	Propagation delay (ns)	Output current (mA)	Input tolerance (V)	Output power-down protection (V)	Package	(Note) Where to buy
Compatibility with 5 V Systems	Very High-speed	TC7SH	○	2 to 5.5	9 (@4.5V)	±8.0 (@4.5V)	0 to 5.5	—	USV,SMV	Buy Online
		TC7WH	○						SM8,US8	Buy Online
		TC7SET	○	4.5 to 5.5	12 (@4.5V)	—	USV,SMV	Buy Online		
Compatible with low-voltage systems	Low-voltage	TC7SZ	○	1.8 to 5.5	4.5 (@3.0V)	±24 (@3.0V)	0 to 5.5	0 to 5.5	USV,SMV,E SV,fSV	Buy Online
		TC7PZ	○						US6,	Buy Online
		TC7WZ	○						US8,SM8	Buy Online
	Very Low-voltage	7UL1G	○	0.9 to 3.6	2.5 (@3.0V)	±8.0 (@4.5V)	0 to 3.6	0 to 3.6	USV,fSV, XSON6	Buy Online
		7UL2G	○						US8	Buy Online
		7UL3G	○	US8	Buy Online					
		7UL1T	○	2.3 to 3.6	3.6 (@3.0V)				USV,fSV, XSON6	Buy Online
		7UL2T	○	US8	Buy Online					
		7UL3T	○	US8	Buy Online					

(Note): These items are for sale by an online distributor. They includes operating temperature ranges from -40 °C to + 85 °C.

Package lineup

If you click an image for each package, the image is linked to the corresponding product.

Type	Surface Mount			
Pin Pitch	0.35mm	0.5mm	0.65mm	0.95mm
5pin				
	fSV(SOT-953)	ESV(SOT-553)	USV(SOT-353)	SMV(SOT-25)
6pin				
		XSON6	US6(SOT-363)	
8pin				
		US8(SOT-765)	SM8(SOT-505)	
Code	FS	5pin:FE 6pin:NX 8pin:FK	FU	F

Type	Surface mount type				Through-hole type
Pin pitch	0.5mm	0.5mm	0.65mm	1.27mm	2.54mm
14pin					
		US14	TSSOP14	SOP14	DIP14
16pin					
		US16	TSSOP16	SOP16	DIP16
20pin					
		US20	TSSOP20	SOP20	DIP20
48pin					
		TSSOP48			
Package symbol	FK	FT	FT	F	P
Third-party packages symbol	-	DCG, DCG,MTD, DT	PW, MTC,DT	NS, T, SJ, F	N, P

Features of each series and quick cross reference

You can easily select from the characteristic list. To search from other companies' standard logic ICs, refer to the column for other companies' compatible series names.

Standard Logic

Type	Series	Product Number	Temperature-expanded products ○: existence —: nonexistence	Operating voltage range (V)	Propagation delay (ns)	Output current (mA)	Input tolerance (V)	Output power-down protection (V)	Other companies compatible series name	(Note2) Where to buy					
Compatibility with 5 V Systems	Standard	TC4000B	—	3 to 18	65 (@5.0V)	±0.51 (@5.0V)	-	-	CD4000B, HEF4000, MC14000	Buy Online					
	High-speed	TC74HC	○	2 to 6	23 (@4.5V)	±4.0 or ±6.0 (@4.5V)	-	-	SN74HC, MM74HC, MC74HC	Buy Online					
		74HC (Note1)	○							Buy Online					
		TC74HCT	—	4.5 to 5.5						8.5 (@4.5V)	±24 (@4.5V)	-	-	SN74HCT, MM74HCT, MC74HCT	Buy Online
		74HCT (Note1)	○												Buy Online
	Advanced	TC74AC	○	2 to 5.5	8.5 (@4.5V)	±24 (@4.5V)	-	-	SN74AC, 74AC, MC74AC						Buy Online
		TC74ACT	○	4.5 to 5.5											SN74ACT, 74ACT, MC74ACT
	Very High-speed	TC74VHC	—	2 to 5.5	8.5 (@4.5V)	±8.0 (@4.5V)	0 to 5.5	0 to 5.5	SN74AHC, 74AHC, MC74VHC	Buy Online					
		74VHC	○							Buy Online					
		TC74VHCT	—	4.5 to 5.5						±16 (@4.5V)	0 to 5.5	SN74AHCT, 74AHCT, MC74VHCT	Buy Online		
		74VHCT	○										Buy Online		
		TC74VHCV	—	1.8 to 5.5									SN74LV-A	Buy Online	
74VHCV		○	Buy Online												
Compatibility with low-voltage systems	Low-voltage	TC74LCX	○	1.65 to 3.6	6.5 (@3.0V)	±24 (@3.0V)	0 to 5.5	0 to 5.5	SN74LVC, 74LVC, MC74LCX					Buy Online	
		74LCX	○											Buy Online	
	Very Low-voltage	TC74VCX	○	1.2 to 3.6	4.2 (@2.3V)	±24 (@3.0V)	0 to 3.6	0 to 3.6	SN74ALVC/ALVT, 74ALVC/ALVT	Buy Online					

(Note1): 74HC/HCT is a lineup of TSSOP only.

(Note2): These items are for sale by an online distributor. They includes operating temperature ranges from -40 ° C to + 85 ° C.

Lineup of Bus Switch

Type	Function	Number of circuits	Product number	Operating temperature range (°C)	Vcc(V)	Ron(Ω)	Con(pF)	BW(-3dB)	Package	Where to buy	
						(typ.)	(typ.)	(typ.)	Name		
High Speed Differential	SPDT	Dual	TDS5C212MX	-40 to 125	1.6 to 3.6	8.5(※)	-	34GHz	XQFN16		
			TDS5B212MX			8.5(※)		29GHz			
			TDS4B212MX	-40 to 105	1.6 to 3.6	7.9(※)	-	27.5GHz			
			TDS4A212MX			8.4(※)		26.2GHz			
		Dual	TC7PCI3212MT	-40 to 85	2.7 to 3.6	7.5	1.5	11.5GHz	TQFN20		
			TC7PCI3215MT								
		Single	TC7USB40MU	-40 to 85	2.3 to 4.3	4.5	5	1.5GHz	UQFN10B		
			TC7USB40FT						TSSOP14		
	TC7USB42MU		-40 to 85	2.3 to 4.3	4.5	5	1.5GHz	UQFN10B			
	TC7USB42FT							TSSOP14			
	Single	TC7SBL66CFU	-40 to 125	1.65 to 3.6	5.5	7	510MHz	USV			
		TC7SBL384CFU									
	Dual	TC7WBL3305CFK	-40 to 125	1.65 to 3.6	6	7	510MHz	US8			
		TC7WBL3306CFK									
SPST	Quad	TC7MBL3125CFT	-40 to 125	1.65 to 3.6	6.5	7.5	510MHz	TSSOP14			
		TC7MBL3125CFK	-40 to 85					US14			
		TC7MBL3126CFT	-40 to 125					TSSOP14			
		TC7MBL3126CFK	-40 to 85					US14			
	Octal	TC7MBL3245CFT	-40 to 125	1.65 to 3.6	6.5	7.5	510MHz	TSSOP20			
		TC7MBL3245CFK	-40 to 85					US20			
	SPDT	Quad	TC7MBL3257CFT	-40 to 125	1.65 to 3.6	8.5	8	510MHz	TSSOP16		
			TC7MBL3257CFK	-40 to 85					US16		
SP4T	Dual	TC7MBL3253CFT	-40 to 125	1.65 to 3.6	9	13	510MHz	TSSOP16			
		TC7MBL3253CFK	-40 to 85					US16			
5V Standard	SPST	Single	TC7SB66CFU	-40 to 125	1.65 to 5.5	4	10	480MHz	USV		
			TC7SB67CFU								
		Dual	TC7WB66CFK	-40 to 125		4	10		480MHz	US8	
			TC7WB67CFK								
	SPDT	Single	TC7SB3157CFU	-40 to 85	1.65 to 5.5	4	15	480MHz	US6		
			TC7SB3157DL6X	-40 to 125					4	15	XSON6
Level Shift	SPST	Single	TC7SPB9306TU	-40 to 85	VccA: 1.65 to 5.0 VccB: 2.3 to 5.5	5	14	-	UF6		
			TC7SPB9307TU								
		Dual	TC7WPB9306FK	-40 to 125		5	14		-	US8	
			TC7WPB9307FK								
		Quad	TC7QPB9306FT	-40 to 125		5	14		-	TSSOP14	
			TC7QPB9306FK	-40 to 85						US14	
			TC7QPB9307FT	-40 to 125						TSSOP14	
			TC7QPB9307FK	-40 to 85						US14	
	Octal	TC7MPB9307FT	-40 to 125	5	14	-	TSSOP20				
		TC7MPB9307FK	-40 to 85				US20				
	SPDT	Dual	TC7MPB9326FT	-40 to 125	5	14	-	TSSOP14			
			TC7MPB9326FK	-40 to 85				US14			
			TC7MPB9327FT	-40 to 125				TSSOP14			
			TC7MPB9327FK	-40 to 85				US14			

※ : Maximum value

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](#)

Company names, product names, and service names may be trademarks of their respective companies.

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/>