

### Introduction of Toshiba Bus Switch products

Bus switches are optimized for transmitting high-speed digital signals and are used for high-speed interfaces in PCs, servers, etc.

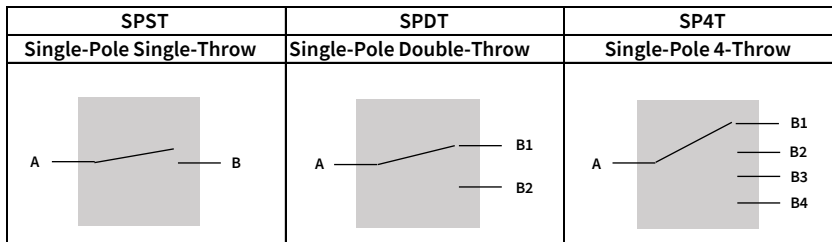
#### Wide range of support from general-purpose bus lines to high-speed bus lines!

Toshiba's bus switch IC is the most suitable switch for high-speed switching and disconnection of bus lines. In addition to 3V, 5V products with low on-resistance, we are also offering a range of level shift types that can accommodate different power supply systems.

The bus switch can be selected from a variety of characteristics, so you can choose the most suitable bus switch product for your operating environment.

#### Switch-type

This line includes a switch (SPST) for disconnecting the bus line, and a multiplexer (SPDT, SP4T) for switching the bus line.



#### Main applications of each series

Series Name	Highspeed bus switch	Highspeed bus switch	Standard bus switch	Dual power supply level shift bus switch
		TDS4A, TDS4B	TC7PCI, TC7USB	TC7SB/SBL, WB/WBL, TC7MBL
Main applications	High-speed signaling lines such as USB4 <sup>®</sup> PCIe <sup>®</sup> Gen4	High-speed signaling lines such as USB 2/3 PCIe <sup>®</sup> Gen3	5V/3.3V general-purpose signaling lines	Bus lines that require voltage conversion
Signaling rate	1Gbps~20Gbps	500Mbps~10Gbps	Less than 350Mbps	Less than 20Mbps

### New product: High-speed bus switch TDS4A/4B series compatible with PCIe<sup>®</sup> Gen5 and USB4<sup>®</sup> Ver.2

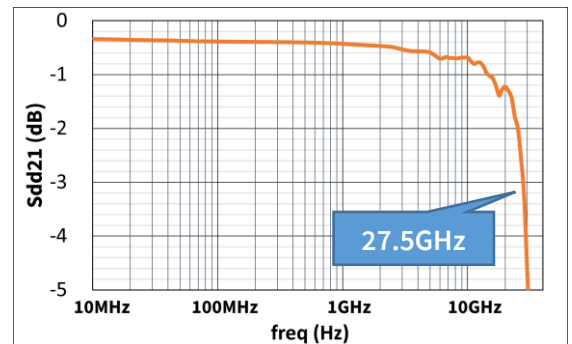
#### Good frequency characteristics over 26GHz!

Toshiba's latest high-speed bus switch has a wide Frequency characteristic (-3dB) of 26.2GHz high-quality design is facilitated by low signal attenuation when used in high-speed interfaces (See figure on the right).

#### It is possible to transmit signals with high quality!

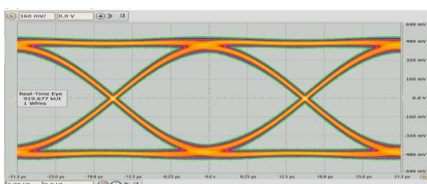
In addition to its frequency characteristics, Toshiba's bus switch has excellent signal quality. The results of eye-pattern comparisons also show superior signal-quality. We have also verified the quality of high-speed signals, such as USB4<sup>®</sup>, PCIe<sup>®</sup> Gen4 and USB3.2 Gen2x2.

■ Frequency Characteristics of Toshiba High-Speed Bus Switches (Toshiba TDS4B212MX)

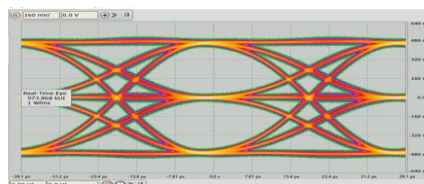


#### ■ Signal quality test results by Eye- Pattern

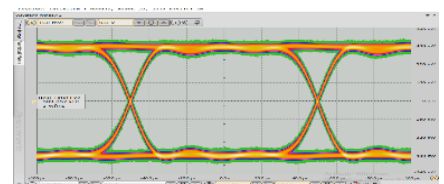
PCIe<sup>®</sup> Gen5: 32Gbps



USB4<sup>®</sup> Ver.2 : 40Gbps



USB3.2 Gen2x2: 10Gbps









## Features of each series





You can easily select from the list of characteristics.

Series	Switch type	Num of Circuit	Product Name	Control	Vcc(V)	Ron(Ω)	Con(pF)	BW(-3dB)	Package Name	ご購入	
						(typ.)	(typ.)	(typ.)			
High Speed Differential	SPDT	Dual	<a href="#">TDS4A212MX</a>	Low Active	1.6 to 3.6	8.5 (*)	-	26.2GHz	XQFN16	<a href="#">Buy Online</a>	
			<a href="#">TDS4B212MX</a>	Low Active		7.9(*)		27.5GHz		<a href="#">Buy Online</a>	
	SPDT	Dual	<a href="#">TC7PCI3212MT</a>	Low Active	2.7 to 3.6	7.5	1.5	11.5GHz	TQFN20	<a href="#">Buy Online</a>	
			<a href="#">TC7PCI3215MT</a>	Low Active						<a href="#">Buy Online</a>	
		Single	<a href="#">TC7USB40MU</a>	Low Active	2.3 to 4.3	4.5	5	1.5GHz	UQFN10B	<a href="#">Buy Online</a>	
			<a href="#">TC7USB40FT</a>	Low Active					TSSOP14	<a href="#">Buy Online</a>	
			<a href="#">TC7USB42MU</a>	Low Active					UQFN10B	<a href="#">Buy Online</a>	
			<a href="#">TC7USB42FT</a>	Low Active					TSSOP14	<a href="#">Buy Online</a>	
	Low voltage Standard	SPST	Single	<a href="#">TC7SBL66CFU</a>	High Active	1.65 to 3.6	5.5	7	510MHz	USV	<a href="#">Buy Online</a>
				<a href="#">TC7SBL384CFU</a>	Low Active					<a href="#">Buy Online</a>	
Dual			<a href="#">TC7WBL3305CFK</a>	High Active	6		7	US8		<a href="#">Buy Online</a>	
			<a href="#">TC7WBL3306CFK</a>	Low Active				<a href="#">Buy Online</a>			
Quad			<a href="#">TC7MBL3125CFT</a>	Low Active	6.5		7.5	TSSOP14		<a href="#">Buy Online</a>	
			<a href="#">TC7MBL3125CFK</a>	Low Active				US14		<a href="#">Buy Online</a>	
			<a href="#">TC7MBL3126CFT</a>	High Active				TSSOP14		<a href="#">Buy Online</a>	
			<a href="#">TC7MBL3126CFK</a>	High Active				US14		<a href="#">Buy Online</a>	
Octal			<a href="#">TC7MBL3245CFT</a>	Low Active	6.5		7.5	TSSOP20		<a href="#">Buy Online</a>	
			<a href="#">TC7MBL3245CFK</a>	Low Active				US20		<a href="#">Buy Online</a>	
SPDT		Quad	<a href="#">TC7MBL3257CFT</a>	Low Active	8.5	8	TSSOP16	<a href="#">Buy Online</a>			
			<a href="#">TC7MBL3257CFK</a>	Low Active			US16	<a href="#">Buy Online</a>			
SP4T		Dual	<a href="#">TC7MBL3253CFT</a>	Low Active	9	13	TSSOP16	<a href="#">Buy Online</a>			
			<a href="#">TC7MBL3253CFK</a>	Low Active			US16	<a href="#">Buy Online</a>			
5V Standard		SPST	Single	<a href="#">TC7SB66CFU</a>	High Active	1.65 to 5.5	4	10	480MHz	USV	<a href="#">Buy Online</a>
				<a href="#">TC7SB67CFU</a>	Low Active					<a href="#">Buy Online</a>	
	Dual		<a href="#">TC7WB66CFK</a>	High Active	4		10	US8		<a href="#">Buy Online</a>	
			<a href="#">TC7WB67CFK</a>	Low Active				<a href="#">Buy Online</a>			
	SPDT	Single	<a href="#">TC7SB3157CFU</a>	-	4		15	US6		<a href="#">Buy Online</a>	
			<a href="#">TC7SB3157DL6X</a>	-	4		15	XSON6		<a href="#">Buy Online</a>	
Level Shift	SPST	Single	<a href="#">TC7SPB9306TU</a>	High Active	VccA: 1.65 to 5.0 VccB: 2.3 to 5.5	5	14	-	UF6	<a href="#">Buy Online</a>	
			<a href="#">TC7SPB9307TU</a>	Low Active					<a href="#">Buy Online</a>		
		Dual	<a href="#">TC7WPB9306FK</a>	High Active		5	14		US8	<a href="#">Buy Online</a>	
			<a href="#">TC7WPB9307FK</a>	Low Active					<a href="#">Buy Online</a>		
		Quad	<a href="#">TC7QPB9306FT</a>	High Active		5	14		TSSOP14	<a href="#">Buy Online</a>	
			<a href="#">TC7QPB9306FK</a>	High Active					US14	<a href="#">Buy Online</a>	
			<a href="#">TC7QPB9307FT</a>	Low Active					TSSOP14	<a href="#">Buy Online</a>	
			<a href="#">TC7QPB9307FK</a>	Low Active					US14	<a href="#">Buy Online</a>	
		Octal	<a href="#">TC7MPB9307FT</a>	High Active		5	14		TSSOP20	<a href="#">Buy Online</a>	
			<a href="#">TC7MPB9307FK</a>	High Active					US20	<a href="#">Buy Online</a>	
	SPDT	Dual	<a href="#">TC7MPB9326FT</a>	High Active	5	14	TSSOP14	<a href="#">Buy Online</a>			
			<a href="#">TC7MPB9326FK</a>	High Active			US14	<a href="#">Buy Online</a>			
			<a href="#">TC7MPB9327FT</a>	Low Active			TSSOP14	<a href="#">Buy Online</a>			
			<a href="#">TC7MPB9327FK</a>	Low Active			US14	<a href="#">Buy Online</a>			

\*:Maximum value

USV(SOT-353)	XSON6(MP6D)	US6(SOT-363)	UF6(SOT-363F)	US8(SOT-765)
				
W : 2.0 mm L : 2.1 mm H : 0.9 mm	W : 1.45 mm L : 1.0 mm H : 0.48 mm	W : 2.0 mm L : 2.1 mm H : 0.9 mm	W : 2.0 mm L : 2.1 mm H : 0.7 mm	W : 2.0 mm L : 3.1 mm H : 0.7 mm

UQFN10B	XQFN16	TSSOP14	US14	TSSOP16
				
W : 1.4 mm L : 1.8 mm H : 0.48mm	W : 2.4 mm L : 1.6 mm H : 0.4 mm	W : 5.4 mm L : 6.4 mm H : 1.0 mm	W : 4.0 mm L : 4.0 mm H : 0.8 mm	W : 5.4 mm L : 6.4 mm H : 1.0 mm

US16	TSSOP20	US20	TQFN20
			
W : 4.0 mm L : 4.0 mm H : 0.8 mm	W : 6.5 mm L : 6.4 mm H : 1.0 mm	W : 5.0 mm L : 4.0 mm H : 0.8 mm	W : 4.5 mm L : 2.5 mm H : 0.55 mm

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