

74AVC1T45FU

1. Functional Description

- 1-Bit Dual-Supply Bus Transceiver with Configurable Power Supply

2. General

The 74AVC1T45FU is a dual-supply, high-speed CMOS 1-bit bus transceiver that can interface between two systems with supply voltages from 0.8 V to 3.6 V. The two supply voltages can be user-configurable within the operating range and the sequence of supply voltage ON/OFF can be freely set.

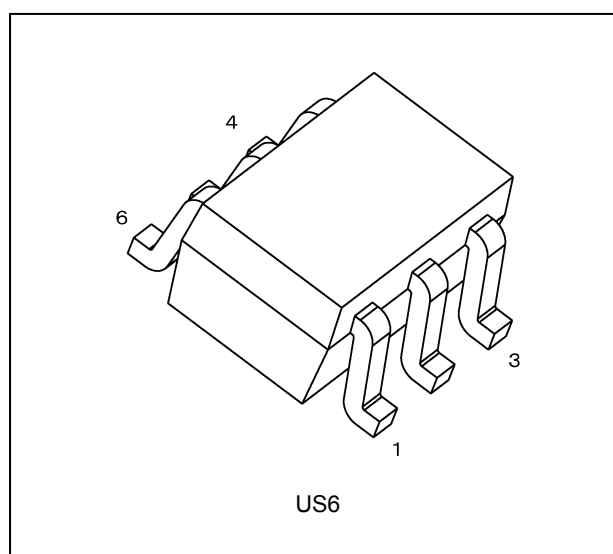
When the transmission direction switching input DIR is set to "H", bus A becomes an input and bus B becomes an output, and when set to "L", bus A becomes an output and bus B becomes an input. The input (DIR) has a tolerant function that allows input of up to 3.6 V regardless of the supply voltage. When either power supply is at the GND level, the bus terminals are placed in a high impedance mode and a voltage of up to 3.6 V is allowed to be applied. This feature allows for partial power-down interface applications.

All inputs are equipped with protection circuits to protect the devices from electrostatic discharge damage.

3. Features

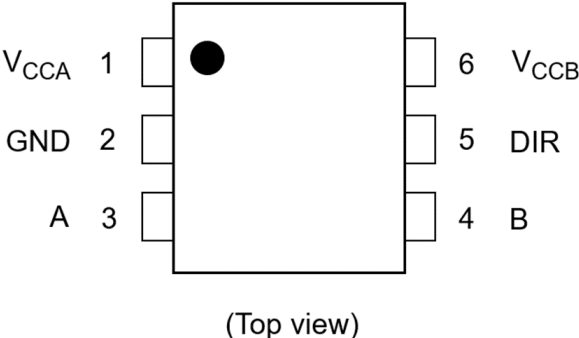
- (1) Wide operating temperature range: $T_{opr} = -40$ to 125 °C
- (2) Wide supply voltage value: $V_{CCA} = 0.8$ to 3.6 V, $V_{CCB} = 0.8$ to 3.6 V
- (3) Bidirectional interface
- (4) High-speed operation: $t_{pd} = 4.1$ ns (max) ($V_{CCA} = 3.3 \pm 0.3$ V, $V_{CCB} = 3.3 \pm 0.3$ V)
- (5) Output current: $|I_{OH}|/|I_{OL}| = \pm 12$ mA (min) ($V_{CC} = 3.0$ V)
 $|I_{OH}|/|I_{OL}| = \pm 9$ mA (min) ($V_{CC} = 2.3$ V)
 $|I_{OH}|/|I_{OL}| = \pm 6$ mA (min) ($V_{CC} = 1.65$ V)
 $|I_{OH}|/|I_{OL}| = \pm 4$ mA (min) ($V_{CC} = 1.4$ V)
 $|I_{OH}|/|I_{OL}| = \pm 2$ mA (min) ($V_{CC} = 1.1$ V)
- (6) Small package: US6 (Package code: SOT-363)
- (7) Low power dissipation: Suitable for battery-driven applications such as PDAs and cellular phones.
- (8) 3.6 V tolerance and power-down protection are provided to all inputs and outputs.

4. Packaging

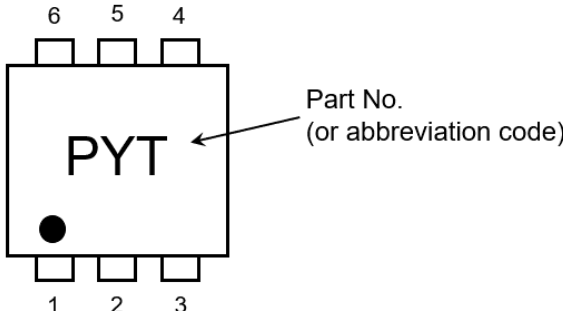


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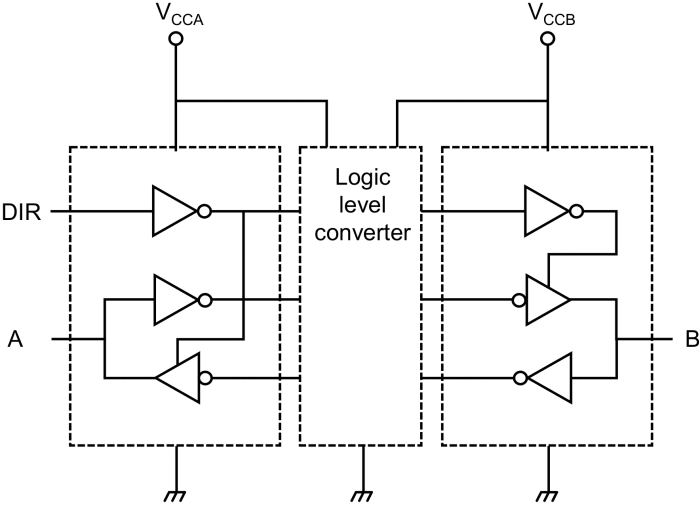
5. Pin Assignment



6. Marking



7. Block Diagram



8. Truth Table

Supply voltage V_{CCA}	Supply voltage V_{CCB}	Input DIR	Input/Output Bus A	Input/Output Bus B	Function
0.8 to 3.6 V	0.8 to 3.6 V	L	Output	Input	A = B
0.8 to 3.6 V	0.8 to 3.6 V	H	Input	Output	B = A
GND	0.8 to 3.6 V	X	Z	Z	Z
0.8 to 3.6 V	GND	X	Z	Z	Z
GND	GND	X	Z	Z	Z

X: Don't care

Z: High impedance

9. Absolute Maximum Ratings (Note) (Unless otherwise specified, $T_a = 25\text{ °C}$)

Characteristics	Symbol	Note	Rating	Unit
Supply voltage	V_{CCA}		-0.5 to 4.6	V
	V_{CCB}		-0.5 to 4.6	
Input voltage (DIR)	V_{IN}		-0.5 to 4.6	V
Bus I/O voltage	$V_{I/OA}$	(Note 1)	-0.5 to 4.6	V
		(Note 2)	-0.5 to $V_{CCA} + 0.5$	
	$V_{I/OB}$	(Note 1)	-0.5 to 4.6	
		(Note 2)	-0.5 to $V_{CCB} + 0.5$	
Input diode current	I_{IK}		-50	mA
I/O diode current	$I_{I/OK}$	(Note 3)	-50	mA
Output current	I_{OUTA}		± 50	mA
	I_{OUTB}		± 50	
V_{CC} /ground current per supply pin	I_{CCA}		100	mA
	I_{CCB}		100	
Power dissipation	P_D		200	mW
Storage temperature	T_{stg}		-65 to 150	$^{\circ}\text{C}$

Note: Exceeding any of the absolute maximum ratings, even briefly, lead to deterioration in IC performance or even destruction.

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).

Note 1: Input state or high impedance state.

Note 2: Output state. I_{OUT} absolute maximum rating must be observed.

Note 3: $V_{OUT} < \text{GND}$

10. Operating Ranges (Note)

Characteristics	Symbol	Note	Test Condition	Rating	Unit
Supply voltage	V_{CCA}		—	0.8 to 3.6	V
	V_{CCB}		—	0.8 to 3.6	
Input voltage (DIR)	V_{IN}		—	0 to 3.6	V
Bus I/O voltage	V_{IOA}	(Note 1)	—	0 to 3.6	V
		(Note 2)	—	0 to V_{CCA}	
	V_{IOB}	(Note 1)	—	0 to 3.6	
		(Note 2)	—	0 to V_{CCB}	
Output current	I_{OUTA}		$V_{CCA} = 3.0$ to 3.6 V	± 12	mA
			$V_{CCA} = 2.3$ to 2.7 V	± 9	
			$V_{CCA} = 1.65$ to 1.95 V	± 6	
			$V_{CCA} = 1.4$ to 1.6 V	± 4	
			$V_{CCA} = 1.1$ to 1.2 V	± 2	
			$V_{CCA} = 0.95$ to 1.05 V	± 1	
			$V_{CCA} = 0.85$ to 0.95 V	± 0.5	
	I_{OUTB}		$V_{CCB} = 3.0$ to 3.6 V	± 12	
			$V_{CCB} = 2.3$ to 2.7 V	± 9	
			$V_{CCB} = 1.65$ to 1.95 V	± 6	
			$V_{CCB} = 1.4$ to 1.6 V	± 4	
			$V_{CCB} = 1.1$ to 1.2 V	± 2	
			$V_{CCB} = 0.95$ to 1.05 V	± 1	
			$V_{CCB} = 0.85$ to 0.95 V	± 0.5	
Operating temperature	T_{opr}		—	-40 to 125	$^{\circ}\text{C}$
Input rise and fall times	dt/dv	(Note 3)	$V_{CC} = 0.8$ V	0 to 20	ns/V
			$V_{CC} = 1.2$ V	0 to 20	
			$V_{CC} = 1.65$ to 1.95 V	0 to 20	
			$V_{CC} = 2.3$ to 2.7 V	0 to 20	
			$V_{CC} = 3.0$ to 3.6 V	0 to 10	

Note: The operating ranges must be maintained to ensure the normal operation of the device.

Unused inputs and bus inputs must be tied to either V_{CC} or GND.

Note 1: Input state or high impedance state.

Note 2: Output state. I_{OUT} absolute maximum rating must be observed.

Note 3: $V_{CC} = V_{CCA}, V_{CCB}$

11. Electrical Characteristics

11.1. DC Characteristics (Unless otherwise specified, $T_a = -40$ to 85 °C)

Characteristics	Symbol	Test Condition	V_{CCA} (V)	V_{CCB} (V)	Min	Max	Unit	
High-level input voltage	V_{IHA}	A, DIR	0.8 to 1.95	0.8 to 3.6	$V_{CCA} \times 0.70$	—	V	
			2.3 to 2.7	0.8 to 3.6	1.6	—		
			3.0 to 3.6	0.8 to 3.6	2.0	—		
	V_{IHB}	B	0.8 to 3.6	0.8 to 1.95	$V_{CCB} \times 0.70$	—		
			0.8 to 3.6	2.3 to 2.7	1.6	—		
			0.8 to 3.6	3.0 to 3.6	2.0	—		
Low-level input voltage	V_{ILA}	A, DIR	0.8 to 1.95	0.8 to 3.6	—	$V_{CCA} \times 0.30$	V	
			2.3 to 2.7	0.8 to 3.6	—	0.7		
			3.0 to 3.6	0.8 to 3.6	—	0.9		
	V_{ILB}	B	0.8 to 3.6	0.8 to 1.95	—	$V_{CCB} \times 0.30$		
			0.8 to 3.6	2.3 to 2.7	—	0.7		
			0.8 to 3.6	3.0 to 3.6	—	0.9		
High-level output voltage	V_{OH}	A, B Output H	$I_{OH} = -0.1$ mA	0.8 to 3.6	0.8 to 3.6	$V_{CCO} - 0.1$	—	V
			$I_{OH} = -0.5$ mA	0.85	0.85	0.65	—	
			$I_{OH} = -1$ mA	0.95	0.95	0.75	—	
			$I_{OH} = -2$ mA	1.1	1.1	0.85	—	
			$I_{OH} = -4$ mA	1.4	1.4	1.05	—	
			$I_{OH} = -6$ mA	1.65	1.65	1.2	—	
			$I_{OH} = -9$ mA	2.3	2.3	1.75	—	
			$I_{OH} = -12$ mA	3.0	3.0	2.3	—	
Low-level output voltage	V_{OL}	A, B Output L	$I_{OL} = 0.1$ mA	0.8 to 3.6	0.8 to 3.6	—	0.1	V
			$I_{OL} = 0.5$ mA	0.85	0.85	—	0.2	
			$I_{OL} = 1$ mA	0.95	0.95	—	0.2	
			$I_{OL} = 2$ mA	1.1	1.1	—	0.25	
			$I_{OL} = 4$ mA	1.4	1.4	—	0.35	
			$I_{OL} = 6$ mA	1.65	1.65	—	0.45	
			$I_{OL} = 9$ mA	2.3	2.3	—	0.55	
			$I_{OL} = 12$ mA	3.0	3.0	—	0.7	

Characteristics	Symbol	Test Condition	V _{CCA} (V)	V _{CCB} (V)	Min	Max	Unit
3-state output OFF-state leakage current	I _{OZA}	Function OFF State, V _{OA} = 0 V or 3.6 V	0.8 to 3.6	0.8 to 3.6	—	±1	μA
		V _{OA} = 0 V or 3.6 V	0.8 to 3.6	0	—	±1	
	I _{OZB}	Function OFF State, V _{OB} = 0 V or 3.6 V	0.8 to 3.6	0.8 to 3.6	—	±1	
		V _{OB} = 0 V or 3.6 V	0	0.8 to 3.6	—	±1	
Input leakage current	I _{IN}	V _{IN(DIR)} = 0 V to 3.6 V	0.8 to 3.6	0 to 3.6	—	±1	μA
Power-OFF leakage current	I _{OFFA}	V _{OA} = 0 V to 3.6 V	0	0.8 to 3.6	—	±1	μA
	I _{OFFB}	V _{OB} = 0 V to 3.6 V	0.8 to 3.6	0	—	±1	
Quiescent supply current	I _{CCA}	Fix the input to V _{CC} or GND.	0.8 to 3.6	0.8 to 3.6	—	2	μA
			3.6	0	—	2	
	I _{CCB}	Fix the input to V _{CC} or GND.	0.8 to 3.6	0.8 to 3.6	—	2	
			0	3.6	—	2	
	I _{CCTA}	V _{IN(DIR)} = V _{CCA} , V _{IOA} = V _{CCA} - 0.6 V	3.0 to 3.6	0.8 to 3.6	—	500	
	I _{CCTB}	V _{IN(DIR)} = V _{CCB} , V _{IOB} = V _{CCB} - 0.6 V	0.8 to 3.6	3.0 to 3.6	—	500	

11.2. DC Characteristics (Unless otherwise specified, $T_a = -40$ to 125 °C)

Characteristics	Symbol	Test Condition	V_{CCA} (V)	V_{CCB} (V)	Min	Max	Unit	
High-level input voltage	V_{IHA}	A, DIR	0.8 to 1.95	0.8 to 3.6	$V_{CCA} \times 0.70$	—	V	
			2.3 to 2.7	0.8 to 3.6	1.6	—		
			3.0 to 3.6	0.8 to 3.6	2.0	—		
	V_{IHB}	B	0.8 to 3.6	0.8 to 1.95	$V_{CCB} \times 0.70$	—		
			0.8 to 3.6	2.3 to 2.7	1.6	—		
			0.8 to 3.6	3.0 to 3.6	2.0	—		
Low-level input voltage	V_{ILA}	A, DIR	0.8 to 1.95	0.8 to 3.6	—	$V_{CCA} \times 0.30$	V	
			2.3 to 2.7	0.8 to 3.6	—	0.7		
			3.0 to 3.6	0.8 to 3.6	—	0.9		
	V_{ILB}	B	0.8 to 3.6	0.8 to 1.95	—	$V_{CCB} \times 0.30$		
			0.8 to 3.6	2.3 to 2.7	—	0.7		
			0.8 to 3.6	3.0 to 3.6	—	0.9		
High-level output voltage	V_{OH}	A, B Output H	$I_{OH} = -0.1$ mA	0.8 to 3.6	0.8 to 3.6	$V_{CCO} - 0.1$	—	V
			$I_{OH} = -0.5$ mA	0.85	0.85	0.65	—	
			$I_{OH} = -1$ mA	0.95	0.95	0.75	—	
			$I_{OH} = -2$ mA	1.1	1.1	0.85	—	
			$I_{OH} = -4$ mA	1.4	1.4	1.05	—	
			$I_{OH} = -6$ mA	1.65	1.65	1.2	—	
			$I_{OH} = -9$ mA	2.3	2.3	1.75	—	
			$I_{OH} = -12$ mA	3.0	3.0	2.3	—	
Low-level output voltage	V_{OL}	A, B Output L	$I_{OL} = 0.1$ mA	0.8 to 3.6	0.8 to 3.6	—	0.1	V
			$I_{OL} = 0.5$ mA	0.85	0.85	—	0.2	
			$I_{OL} = 1$ mA	0.95	0.95	—	0.2	
			$I_{OL} = 2$ mA	1.1	1.1	—	0.25	
			$I_{OL} = 4$ mA	1.4	1.4	—	0.35	
			$I_{OL} = 6$ mA	1.65	1.65	—	0.45	
			$I_{OL} = 9$ mA	2.3	2.3	—	0.55	
			$I_{OL} = 12$ mA	3.0	3.0	—	0.7	

Characteristics	Symbol	Test Condition	V _{CCA} (V)	V _{CCB} (V)	Min	Max	Unit
3-state output OFF-state leakage current	I _{OZA}	Function OFF State, V _{OA} = 0 V or 3.6 V	0.8 to 3.6	0.8 to 3.6	—	±4	μA
		V _{OA} = 0 V or 3.6 V	0.8 to 3.6	0	—	±4	
	I _{OZB}	Function OFF State, V _{OB} = 0 V or 3.6 V	0.8 to 3.6	0.8 to 3.6	—	±4	
		V _{OB} = 0 V or 3.6 V	0	0.8 to 3.6	—	±4	
Input leakage current	I _{IN}	V _{IN} (DIR) = 0 V to 3.6 V	0.8 to 3.6	0 to 3.6	—	±2.5	μA
Power-OFF leakage current	I _{OFFA}	V _{IOA} = 0 V to 3.6 V	0	0.8 to 3.6	—	±4	μA
	I _{OFFB}	V _{IOB} = 0 V to 3.6 V	0.8 to 3.6	0	—	±4	
Quiescent supply current	I _{CCA}	Fix the input to V _{CC} or GND.	0.8 to 3.6	0.8 to 3.6	—	6	μA
			3.6	0	—	6	
	I _{CCB}	Fix the input to V _{CC} or GND.	0.8 to 3.6	0.8 to 3.6	—	6	
			0	3.6	—	6	
	I _{CCTA}	V _{IN} (DIR) = V _{CCA} , V _{IOA} = V _{CCA} - 0.6 V	3.0 to 3.6	0.8 to 3.6	—	500	
	I _{CCTB}	V _{IN} (DIR) = GND, V _{IOB} = V _{CCB} - 0.6 V	0.8 to 3.6	3.0 to 3.6	—	500	

11.3. AC Characteristics (Note) (V_{CCA} = 0.8 V, T_a = 25 °C)

Characteristics	Symbol	V _{CCB}	V _{CCB}	V _{CCB}	V _{CCB}	V _{CCB}	V _{CCB}	V _{CCB}	Unit
		0.8 V Typ.	0.9 V Typ.	1.0 V Typ.	1.2 V Typ.	1.5 V Typ.	1.8 V Typ.	2.5 V Typ.	
Propagation delay time (A → B)	t _{PLH} /t _{PHL}	11.4	10.4	9.8	9.8	9.2	9.0	9.7	ns
Propagation delay time (B → A)		11.4	10.0	9.1	8.0	7.2	6.8	6.2	
3-state output disable time (DIR → A)	t _{PLZ} /t _{PHZ}	18.7	18.7	18.7	18.6	18.6	18.6	18.7	ns
3-state output disable time (DIR → B)		22.0	19.7	17.8	12.4	10.8	10.7	9.9	
3-state output enable time (DIR → A)	t _{PZL} /t _{PZH} (Note 1)	33.4	29.7	26.9	20.4	18.0	17.5	16.1	ns
3-state output enable time (DIR → B)		30.1	29.1	28.5	28.4	27.8	27.6	28.4	

Note: See Figure 12.1, 13.1, 13.2, table 12.1.1, 12.1.2, 13.1.1 for the measurement circuit.

Note1: Output enable time is obtained from the following formula.

Output enable time (DIR → A) = Output disable time (DIR → B) + Propagation delay time (B → A)

Output enable time (DIR → B) = Output disable time (DIR → A) + Propagation delay time (A → B)

11.4. AC Characteristics (Note) (V_{CCB} = 0.8 V, T_a = 25 °C)

Characteristics	Symbol	V _{CCA}	V _{CCA}	V _{CCA}	V _{CCA}	V _{CCA}	V _{CCA}	V _{CCA}	Unit
		0.8 V Typ.	0.9 V Typ.	1.0 V Typ.	1.2 V Typ.	1.5 V Typ.	1.8 V Typ.	2.5 V Typ.	
Propagation delay time (A → B)	t _{PLH} /t _{PHL}	11.4	10.0	9.1	8.0	7.2	6.8	6.2	ns
Propagation delay time (B → A)		11.4	10.4	9.8	9.8	9.2	9.0	9.7	
3-state output disable time (DIR → A)	t _{PLZ} /t _{PHZ}	18.7	15.1	12.8	6.9	5.1	4.8	3.3	ns
3-state output disable time (DIR → B)		22.0	20.0	19.0	18.6	19.3	19.3	20.6	
3-state output enable time (DIR → A)	t _{PZL} /t _{PZH} (Note 1)	33.4	30.4	28.8	28.4	28.5	28.3	30.3	ns
3-state output enable time (DIR → B)		30.1	25.1	21.9	14.9	12.3	11.6	9.5	

Note: See Figure 12.1, 13.1, 13.2, table 12.1.1, 12.1.2, 13.1.1 for the measurement circuit.

Note 1: Output enable time is obtained from the following formula.

Output enable time (DIR → A) = Output disable time (DIR → B) + Propagation delay time (B → A)

Output enable time (DIR → B) = Output disable time (DIR → A) + Propagation delay time (A → B)

11.5. AC Characteristics (Note) ($V_{CCA} = 0.9 \pm 0.045 \text{ V}$, $T_a = -40 \text{ to } 85 \text{ }^\circ\text{C}$)

Characteristics	Symbol	V_{CCB}	V_{CCB}	V_{CCB}	V_{CCB}	V_{CCB}	V_{CCB}	V_{CCB}	Unit
		$0.9 \pm 0.045 \text{ V}$ Max	$1.0 \pm 0.05 \text{ V}$ Max	$1.2 \pm 0.1 \text{ V}$ Max	$1.5 \pm 0.1 \text{ V}$ Max	$1.8 \pm 0.15 \text{ V}$ Max	$2.5 \pm 0.2 \text{ V}$ Max	$3.3 \pm 0.3 \text{ V}$ Max	
Propagation delay time (A → B)	t_{PLH}/t_{PHL}	17.7	15.8	15.2	13.8	13.2	13.5	16.7	ns
Propagation delay time (B → A)		17.7	15.2	13.1	11.7	10.7	10.1	10.4	
3-state output disable time (DIR → A)	t_{PLZ}/t_{PHZ}	24.7	24.7	24.7	24.7	24.7	24.8	25.8	
3-state output disable time (DIR → B)		28.1	24.8	18.6	16.1	15.4	13.9	14.6	
3-state output enable time (DIR → A)	t_{PZL}/t_{PZH} (Note 1)	45.8	40.0	31.7	27.8	26.1	24.0	25.0	
3-state output enable time (DIR → B)		42.4	40.5	39.9	38.5	37.9	38.3	42.5	

Note: See Figure 12.1, 13.1, 13.2, table 12.1.1, 12.1.2, 13.1.1 for the measurement circuit.

Note 1: Output enable time is obtained from the following formula.

Output enable time (DIR → A) = Output disable time (DIR → B) + Propagation delay time (B → A)

Output enable time (DIR → B) = Output disable time (DIR → A) + Propagation delay time (A → B)

11.6. AC Characteristics (Note) ($V_{CCA} = 1.0 \pm 0.05 \text{ V}$, $T_a = -40 \text{ to } 85 \text{ }^\circ\text{C}$)

Characteristics	Symbol	V_{CCB}	V_{CCB}	V_{CCB}	V_{CCB}	V_{CCB}	V_{CCB}	V_{CCB}	Unit
		$0.9 \pm 0.045 \text{ V}$ Max	$1.0 \pm 0.05 \text{ V}$ Max	$1.2 \pm 0.1 \text{ V}$ Max	$1.5 \pm 0.1 \text{ V}$ Max	$1.8 \pm 0.15 \text{ V}$ Max	$2.5 \pm 0.2 \text{ V}$ Max	$3.3 \pm 0.3 \text{ V}$ Max	
Propagation delay time (A → B)	t_{PLH}/t_{PHL}	15.2	13.6	12.8	11.6	11.4	10.9	11.1	ns
Propagation delay time (B → A)		15.8	13.6	11.2	10.1	9.1	8.6	8.7	
3-state output disable time (DIR → A)	t_{PLZ}/t_{PHZ}	19.6	19.6	19.6	19.6	19.6	19.6	19.6	
3-state output disable time (DIR → B)		25.8	22.6	16.2	14.0	13.3	12.0	12.3	
3-state output enable time (DIR → A)	t_{PZL}/t_{PZH} (Note 1)	41.6	36.2	27.4	24.1	22.4	20.6	21.0	
3-state output enable time (DIR → B)		34.8	33.2	32.4	31.2	31.0	30.5	30.7	

Note: See Figure 12.1, 13.1, 13.2, table 12.1.1, 12.1.2, 13.1.1 for the measurement circuit.

Note 1: Output enable time is obtained from the following formula.

Output enable time (DIR → A) = Output disable time (DIR → B) + Propagation delay time (B → A)

Output enable time (DIR → B) = Output disable time (DIR → A) + Propagation delay time (A → B)

11.7. AC Characteristics (Note) ($V_{CCA} = 1.2 \pm 0.1 \text{ V}$, $T_a = -40 \text{ to } 85 \text{ }^\circ\text{C}$)

Characteristics	Symbol	V_{CCB}	V_{CCB}	V_{CCB}	V_{CCB}	V_{CCB}	V_{CCB}	V_{CCB}	Unit
		$0.9 \pm 0.045 \text{ V}$ Max	$1.0 \pm 0.05 \text{ V}$ Max	$1.2 \pm 0.1 \text{ V}$ Max	$1.5 \pm 0.1 \text{ V}$ Max	$1.8 \pm 0.15 \text{ V}$ Max	$2.5 \pm 0.2 \text{ V}$ Max	$3.3 \pm 0.3 \text{ V}$ Max	
Propagation delay time (A → B)	t_{PLH}/t_{PHL}	13.1	11.2	10.7	9.3	8.7	8.7	8.6	ns
Propagation delay time (B → A)		15.2	12.8	10.7	9.1	8.5	7.8	7.6	
3-state output disable time (DIR → A)	t_{PLZ}/t_{PHZ}	12.2	12.2	12.2	12.2	12.2	12.2	12.2	
3-state output disable time (DIR → B)		24.3	20.2	14.9	12.0	11.4	9.7	9.8	
3-state output enable time (DIR → A)	t_{PZL}/t_{PZH} (Note 1)	39.5	33.0	25.6	21.1	19.9	17.5	17.4	
3-state output enable time (DIR → B)		25.3	23.4	22.9	21.5	20.9	20.9	20.8	

Note: See Figure 12.1, 13.1, 13.2, table 12.1.1, 12.1.2, 13.1.1 for the measurement circuit.

Note 1: Output enable time is obtained from the following formula.

Output enable time (DIR → A) = Output disable time (DIR → B) + Propagation delay time (B → A)

Output enable time (DIR → B) = Output disable time (DIR → A) + Propagation delay time (A → B)

11.8. AC Characteristics (Note) ($V_{CCA} = 1.5 \pm 0.1 \text{ V}$, $T_a = -40 \text{ to } 85 \text{ }^\circ\text{C}$)

Characteristics	Symbol	V_{CCB}	V_{CCB}	V_{CCB}	V_{CCB}	V_{CCB}	V_{CCB}	V_{CCB}	Unit
		$0.9 \pm 0.045 \text{ V}$ Max	$1.0 \pm 0.05 \text{ V}$ Max	$1.2 \pm 0.1 \text{ V}$ Max	$1.5 \pm 0.1 \text{ V}$ Max	$1.8 \pm 0.15 \text{ V}$ Max	$2.5 \pm 0.2 \text{ V}$ Max	$3.3 \pm 0.3 \text{ V}$ Max	
Propagation delay time (A → B)	t_{PLH}/t_{PHL}	11.7	10.1	9.1	7.4	6.9	6.6	6.5	ns
Propagation delay time (B → A)		13.8	11.6	9.3	7.4	6.8	5.9	5.7	
3-state output disable time (DIR → A)	t_{PLZ}/t_{PHZ}	8.5	8.4	8.4	8.4	8.4	8.3	8.2	
3-state output disable time (DIR → B)		24.2	19.7	11.6	10.1	9.6	7.8	7.9	
3-state output enable time (DIR → A)	t_{PZL}/t_{PZH} (Note 1)	38.0	31.3	20.9	17.5	16.4	13.7	13.6	
3-state output enable time (DIR → B)		20.2	18.5	17.5	15.8	15.3	14.9	14.7	

Note: See Figure 12.1, 13.1, 13.2, table 12.1.1, 12.1.2, 13.1.1 for the measurement circuit.

Note 1: Output enable time is obtained from the following formula.

Output enable time (DIR → A) = Output disable time (DIR → B) + Propagation delay time (B → A)

Output enable time (DIR → B) = Output disable time (DIR → A) + Propagation delay time (A → B)

11.9. AC Characteristics (Note) ($V_{CCA} = 1.8 \pm 0.15 \text{ V}$, $T_a = -40 \text{ to } 85 \text{ }^\circ\text{C}$)

Characteristics	Symbol	V_{CCB}	V_{CCB}	V_{CCB}	V_{CCB}	V_{CCB}	V_{CCB}	V_{CCB}	Unit
		$0.9 \pm 0.045 \text{ V}$ Max	$1.0 \pm 0.05 \text{ V}$ Max	$1.2 \pm 0.1 \text{ V}$ Max	$1.5 \pm 0.1 \text{ V}$ Max	$1.8 \pm 0.15 \text{ V}$ Max	$2.5 \pm 0.2 \text{ V}$ Max	$3.3 \pm 0.3 \text{ V}$ Max	
Propagation delay time (A → B)	t_{PLH}/t_{PHL}	10.7	9.1	8.5	6.8	6.2	5.8	5.7	ns
Propagation delay time (B → A)		13.2	11.4	8.7	6.9	6.2	5.3	4.7	
3-state output disable time (DIR → A)	t_{PLZ}/t_{PHZ}	7.3	7.3	7.3	7.3	7.3	7.3	7.2	
3-state output disable time (DIR → B)		25.2	21.6	11.0	8.9	8.6	7.0	7.0	
3-state output enable time (DIR → A)	t_{PZL}/t_{PZH} (Note 1)	38.4	33.0	19.7	15.8	14.8	12.3	11.7	
3-state output enable time (DIR → B)		18.0	16.4	15.8	14.1	13.5	13.1	12.9	

Note: See Figure 12.1, 13.1, 13.2, table 12.1.1, 12.1.2, 13.1.1 for the measurement circuit.

Note 1: Output enable time is obtained from the following formula.

Output enable time (DIR → A) = Output disable time (DIR → B) + Propagation delay time (B → A)

Output enable time (DIR → B) = Output disable time (DIR → A) + Propagation delay time (A → B)

11.10. AC Characteristics (Note) ($V_{CCA} = 2.5 \pm 0.2 \text{ V}$, $T_a = -40 \text{ to } 85 \text{ }^\circ\text{C}$)

Characteristics	Symbol	V_{CCB}	V_{CCB}	V_{CCB}	V_{CCB}	V_{CCB}	V_{CCB}	V_{CCB}	Unit
		$0.9 \pm 0.045 \text{ V}$ Max	$1.0 \pm 0.05 \text{ V}$ Max	$1.2 \pm 0.1 \text{ V}$ Max	$1.5 \pm 0.1 \text{ V}$ Max	$1.8 \pm 0.15 \text{ V}$ Max	$2.5 \pm 0.2 \text{ V}$ Max	$3.3 \pm 0.3 \text{ V}$ Max	
Propagation delay time (A → B)	t_{PLH}/t_{PHL}	10.1	8.6	7.8	5.9	5.3	4.7	4.5	ns
Propagation delay time (B → A)		13.5	10.9	8.7	6.6	5.8	4.7	4.1	
3-state output disable time (DIR → A)	t_{PLZ}/t_{PHZ}	5.6	5.6	5.6	5.6	5.6	5.6	5.6	
3-state output disable time (DIR → B)		28.5	22.9	10.9	7.6	7.1	5.9	6.1	
3-state output enable time (DIR → A)	t_{PZL}/t_{PZH} (Note 1)	42.0	33.8	19.6	14.2	12.9	10.6	10.2	
3-state output enable time (DIR → B)		15.7	14.2	13.4	11.5	10.9	10.3	10.1	

Note: See Figure 12.1, 13.1, 13.2, table 12.1.1, 12.1.2, 13.1.1 for the measurement circuit.

Note 1: Output enable time is obtained from the following formula.

Output enable time (DIR → A) = Output disable time (DIR → B) + Propagation delay time (B → A)

Output enable time (DIR → B) = Output disable time (DIR → A) + Propagation delay time (A → B)

11.11. AC Characteristics (Note) ($V_{CCA} = 3.3 \pm 0.3 \text{ V}$, $T_a = -40 \text{ to } 85 \text{ }^\circ\text{C}$)

Characteristics	Symbol	V_{CCB}	V_{CCB}	V_{CCB}	V_{CCB}	V_{CCB}	V_{CCB}	V_{CCB}	Unit
		$0.9 \pm 0.045 \text{ V}$ Max	$1.0 \pm 0.05 \text{ V}$ Max	$1.2 \pm 0.1 \text{ V}$ Max	$1.5 \pm 0.1 \text{ V}$ Max	$1.8 \pm 0.15 \text{ V}$ Max	$2.5 \pm 0.2 \text{ V}$ Max	$3.3 \pm 0.3 \text{ V}$ Max	
Propagation delay time (A → B)	t_{PLH}/t_{PHL}	10.4	8.7	7.6	5.7	4.7	4.1	3.9	ns
Propagation delay time (B → A)		16.7	11.1	8.6	6.5	5.7	4.5	3.9	
3-state output disable time (DIR → A)	t_{PLZ}/t_{PHZ}	5.7	5.7	5.7	5.7	5.7	5.7	5.7	
3-state output disable time (DIR → B)		27.6	24.6	11.5	6.7	6.3	5.4	5.6	
3-state output enable time (DIR → A)	t_{PZL}/t_{PZH} (Note 1)	44.3	35.7	20.1	13.2	12.0	9.9	9.5	
3-state output enable time (DIR → B)		16.1	14.4	13.3	11.4	10.4	9.8	9.6	

Note: See Figure 12.1, 13.1, 13.2, table 12.1.1, 12.1.2, 13.1.1 for the measurement circuit.

Note 1: Output enable time is obtained from the following formula.

Output enable time (DIR → A) = Output disable time (DIR → B) + Propagation delay time (B → A)

Output enable time (DIR → B) = Output disable time (DIR → A) + Propagation delay time (A → B)

11.12. AC Characteristics (Note) ($V_{CCA} = 0.9 \pm 0.045 \text{ V}$, $T_a = -40 \text{ to } 125 \text{ }^\circ\text{C}$)

Characteristics	Symbol	V_{CCB}	V_{CCB}	V_{CCB}	V_{CCB}	V_{CCB}	V_{CCB}	V_{CCB}	Unit
		$0.9 \pm 0.045 \text{ V}$ Max	$1.0 \pm 0.05 \text{ V}$ Max	$1.2 \pm 0.1 \text{ V}$ Max	$1.5 \pm 0.1 \text{ V}$ Max	$1.8 \pm 0.15 \text{ V}$ Max	$2.5 \pm 0.2 \text{ V}$ Max	$3.3 \pm 0.3 \text{ V}$ Max	
Propagation delay time (A → B)	t_{PLH}/t_{PHL}	17.7	15.8	15.3	13.9	13.4	13.6	16.7	ns
Propagation delay time (B → A)		17.7	15.2	13.1	11.7	10.7	10.1	10.4	
3-state output disable time (DIR → A)	t_{PLZ}/t_{PHZ}	24.7	24.7	24.7	24.7	24.7	24.8	25.8	
3-state output disable time (DIR → B)		28.1	24.8	18.8	16.3	15.6	13.9	14.6	
3-state output enable time (DIR → A)	t_{PZL}/t_{PZH} (Note 1)	45.8	40.0	31.9	28.0	26.3	24.0	25.0	
3-state output enable time (DIR → B)		42.4	40.5	40.0	38.6	38.1	38.4	42.5	

Note: See Figure 12.1, 13.1, 13.2, table 12.1.1, 12.1.2, 13.1.1 for the measurement circuit.

Note 1: Output enable time is obtained from the following formula.

Output enable time (DIR → A) = Output disable time (DIR → B) + Propagation delay time (B → A)

Output enable time (DIR → B) = Output disable time (DIR → A) + Propagation delay time (A → B)

11.13. AC Characteristics (Note) ($V_{CCA} = 1.0 \pm 0.05 \text{ V}$, $T_a = -40 \text{ to } 125 \text{ }^\circ\text{C}$)

Characteristics	Symbol	V_{CCB}	V_{CCB}	V_{CCB}	V_{CCB}	V_{CCB}	V_{CCB}	V_{CCB}	Unit
		$0.9 \pm 0.045 \text{ V}$ Max	$1.0 \pm 0.05 \text{ V}$ Max	$1.2 \pm 0.1 \text{ V}$ Max	$1.5 \pm 0.1 \text{ V}$ Max	$1.8 \pm 0.15 \text{ V}$ Max	$2.5 \pm 0.2 \text{ V}$ Max	$3.3 \pm 0.3 \text{ V}$ Max	
Propagation delay time (A → B)	t_{PLH}/t_{PHL}	15.2	13.7	13.1	11.9	11.7	11.2	11.3	ns
Propagation delay time (B → A)		15.8	13.7	11.4	10.4	9.3	8.8	8.9	
3-state output disable time (DIR → A)	t_{PLZ}/t_{PHZ}	19.8	19.8	19.8	19.8	19.8	20.2	19.9	
3-state output disable time (DIR → B)		25.8	23.0	16.6	14.4	13.7	12.3	12.5	
3-state output enable time (DIR → A)	t_{PZL}/t_{PZH} (Note 1)	41.6	36.7	28.0	24.8	23.0	21.1	21.4	
3-state output enable time (DIR → B)		35.0	33.5	32.9	31.7	31.5	31.4	31.2	

Note: See Figure 12.1, 13.1, 13.2, table 12.1.1, 12.1.2, 13.1.1 for the measurement circuit.

Note 1: Output enable time is obtained from the following formula.

Output enable time (DIR → A) = Output disable time (DIR → B) + Propagation delay time (B → A)

Output enable time (DIR → B) = Output disable time (DIR → A) + Propagation delay time (A → B)

11.14. AC Characteristics (Note) ($V_{CCA} = 1.2 \pm 0.1 \text{ V}$, $T_a = -40 \text{ to } 125 \text{ }^\circ\text{C}$)

Characteristics	Symbol	V_{CCB}	V_{CCB}	V_{CCB}	V_{CCB}	V_{CCB}	V_{CCB}	V_{CCB}	Unit
		$0.9 \pm 0.045 \text{ V}$ Max	$1.0 \pm 0.05 \text{ V}$ Max	$1.2 \pm 0.1 \text{ V}$ Max	$1.5 \pm 0.1 \text{ V}$ Max	$1.8 \pm 0.15 \text{ V}$ Max	$2.5 \pm 0.2 \text{ V}$ Max	$3.3 \pm 0.3 \text{ V}$ Max	
Propagation delay time (A → B)	t_{PLH}/t_{PHL}	13.1	11.4	11.1	9.7	9.1	9.1	9.0	ns
Propagation delay time (B → A)		15.3	13.1	11.1	9.6	8.9	8.2	8.0	
3-state output disable time (DIR → A)	t_{PLZ}/t_{PHZ}	12.6	12.6	12.6	12.6	12.6	12.6	12.6	
3-state output disable time (DIR → B)		24.3	20.9	15.9	12.5	11.8	10.1	10.2	
3-state output enable time (DIR → A)	t_{PZL}/t_{PZH} (Note 1)	39.6	34.0	27.0	22.1	20.7	18.3	18.2	
3-state output enable time (DIR → B)		25.7	24.0	23.7	22.3	21.7	21.7	21.6	

Note: See Figure 12.1, 13.1, 13.2, table 12.1.1, 12.1.2, 13.1.1 for the measurement circuit.

Note 1: Output enable time is obtained from the following formula.

Output enable time (DIR → A) = Output disable time (DIR → B) + Propagation delay time (B → A)

Output enable time (DIR → B) = Output disable time (DIR → A) + Propagation delay time (A → B)

11.15. AC Characteristics (Note) ($V_{CCA} = 1.5 \pm 0.1 \text{ V}$, $T_a = -40 \text{ to } 125 \text{ }^\circ\text{C}$)

Characteristics	Symbol	V_{CCB}	V_{CCB}	V_{CCB}	V_{CCB}	V_{CCB}	V_{CCB}	V_{CCB}	Unit
		$0.9 \pm 0.045 \text{ V}$ Max	$1.0 \pm 0.05 \text{ V}$ Max	$1.2 \pm 0.1 \text{ V}$ Max	$1.5 \pm 0.1 \text{ V}$ Max	$1.8 \pm 0.15 \text{ V}$ Max	$2.5 \pm 0.2 \text{ V}$ Max	$3.3 \pm 0.3 \text{ V}$ Max	
Propagation delay time (A → B)	t_{PLH}/t_{PHL}	11.7	10.4	9.6	7.8	7.3	7.0	6.9	ns
Propagation delay time (B → A)		13.9	11.9	9.7	7.8	7.2	6.3	6.0	
3-state output disable time (DIR → A)	t_{PLZ}/t_{PHZ}	8.8	8.8	8.8	8.8	8.8	8.7	8.7	
3-state output disable time (DIR → B)		24.8	19.9	12.0	10.6	10.1	8.3	8.3	
3-state output enable time (DIR → A)	t_{PZL}/t_{PZH} (Note 1)	38.7	31.8	21.7	18.4	17.3	14.6	14.3	
3-state output enable time (DIR → B)		20.5	19.2	18.4	16.6	16.1	15.7	15.6	

Note: See Figure 12.1, 13.1, 13.2, table 12.1.1, 12.1.2, 13.1.1 for the measurement circuit.

Note 1: Output enable time is obtained from the following formula.

Output enable time (DIR → A) = Output disable time (DIR → B) + Propagation delay time (B → A)

Output enable time (DIR → B) = Output disable time (DIR → A) + Propagation delay time (A → B)

11.16. AC Characteristics (Note) ($V_{CCA} = 1.8 \pm 0.15 \text{ V}$, $T_a = -40 \text{ to } 125 \text{ }^\circ\text{C}$)

Characteristics	Symbol	V_{CCB}	V_{CCB}	V_{CCB}	V_{CCB}	V_{CCB}	V_{CCB}	V_{CCB}	Unit
		$0.9 \pm 0.045 \text{ V}$ Max	$1.0 \pm 0.05 \text{ V}$ Max	$1.2 \pm 0.1 \text{ V}$ Max	$1.5 \pm 0.1 \text{ V}$ Max	$1.8 \pm 0.15 \text{ V}$ Max	$2.5 \pm 0.2 \text{ V}$ Max	$3.3 \pm 0.3 \text{ V}$ Max	
Propagation delay time (A → B)	t_{PLH}/t_{PHL}	10.7	9.3	8.9	7.2	6.5	6.1	6.0	ns
Propagation delay time (B → A)		7.7	11.7	9.1	7.3	6.5	5.7	5.0	
3-state output disable time (DIR → A)	t_{PLZ}/t_{PHZ}	7.7	7.7	7.7	7.7	7.6	7.6	7.5	
3-state output disable time (DIR → B)		25.8	21.8	11.4	9.4	9.1	7.5	7.4	
3-state output enable time (DIR → A)	t_{PZL}/t_{PZH} (Note 1)	39.2	33.5	20.5	16.7	15.6	13.2	12.4	
3-state output enable time (DIR → B)		18.4	17.0	16.6	14.9	14.1	13.7	13.5	

Note: See Figure 12.1, 13.1, 13.2, table 12.1.1, 12.1.2, 13.1.1 for the measurement circuit.

Note 1: Output enable time is obtained from the following formula.

Output enable time (DIR → A) = Output disable time (DIR → B) + Propagation delay time (B → A)

Output enable time (DIR → B) = Output disable time (DIR → A) + Propagation delay time (A → B)

11.17. AC Characteristics (Note) ($V_{CCA} = 2.5 \pm 0.2 \text{ V}$, $T_a = -40 \text{ to } 125 \text{ }^\circ\text{C}$)

Characteristics	Symbol	V_{CCB}	V_{CCB}	V_{CCB}	V_{CCB}	V_{CCB}	V_{CCB}	V_{CCB}	Unit
		$0.9 \pm 0.045 \text{ V}$ Max	$1.0 \pm 0.05 \text{ V}$ Max	$1.2 \pm 0.1 \text{ V}$ Max	$1.5 \pm 0.1 \text{ V}$ Max	$1.8 \pm 0.15 \text{ V}$ Max	$2.5 \pm 0.2 \text{ V}$ Max	$3.3 \pm 0.3 \text{ V}$ Max	
Propagation delay time (A → B)	t_{PLH}/t_{PHL}	10.1	8.8	8.2	6.3	5.7	5.0	4.7	ns
Propagation delay time (B → A)		13.6	11.2	9.1	7.0	6.1	5.0	4.4	
3-state output disable time (DIR → A)	t_{PLZ}/t_{PHZ}	5.8	5.8	5.8	5.8	5.8	5.8	5.8	
3-state output disable time (DIR → B)		29.1	23.1	11.3	8.0	7.5	6.4	6.5	
3-state output enable time (DIR → A)	t_{PZL}/t_{PZH} (Note 1)	42.7	34.3	20.4	15.0	13.6	11.4	10.9	
3-state output enable time (DIR → B)		15.9	14.6	14.0	12.1	11.5	10.8	10.5	

Note: See Figure 12.1, 13.1, 13.2, table 12.1.1, 12.1.2, 13.1.1 for the measurement circuit.

Note 1: Output enable time is obtained from the following formula.

Output enable time (DIR → A) = Output disable time (DIR → B) + Propagation delay time (B → A)

Output enable time (DIR → B) = Output disable time (DIR → A) + Propagation delay time (A → B)

11.18. AC Characteristics (Note) ($V_{CCA} = 3.3 \pm 0.3 \text{ V}$, $T_a = -40 \text{ to } 125 \text{ }^\circ\text{C}$)

Characteristics	Symbol	V_{CCB}	V_{CCB}	V_{CCB}	V_{CCB}	V_{CCB}	V_{CCB}	V_{CCB}	Unit
		$0.9 \pm 0.045 \text{ V}$ Max	$1.0 \pm 0.05 \text{ V}$ Max	$1.2 \pm 0.1 \text{ V}$ Max	$1.5 \pm 0.1 \text{ V}$ Max	$1.8 \pm 0.15 \text{ V}$ Max	$2.5 \pm 0.2 \text{ V}$ Max	$3.3 \pm 0.3 \text{ V}$ Max	
Propagation delay time (A → B)	t_{PLH}/t_{PHL}	10.4	8.9	8.0	6.0	5.0	4.4	4.1	ns
Propagation delay time (B → A)		16.7	11.3	9.0	6.9	6.0	4.7	4.1	
3-state output disable time (DIR → A)	t_{PLZ}/t_{PHZ}	6.0	6.0	6.0	6.0	6.0	6.0	5.9	
3-state output disable time (DIR → B)		27.6	24.7	11.8	7.3	6.8	5.7	6.0	
3-state output enable time (DIR → A)	t_{PZL}/t_{PZH} (Note 1)	44.3	36.0	20.8	14.2	12.8	10.4	10.1	
3-state output enable time (DIR → B)		16.4	14.9	14.0	12.0	11.0	10.4	10.0	

Note: See Figure 12.1, 13.1, 13.2, table 12.1.1, 12.1.2, 13.1.1 for the measurement circuit.

Note 1: Output enable time is obtained from the following formula.

Output enable time (DIR → A) = Output disable time (DIR → B) + Propagation delay time (B → A)

Output enable time (DIR → B) = Output disable time (DIR → A) + Propagation delay time (A → B)

11.19. Capacitive Characteristics (Unless otherwise specified, $T_a = 25 \text{ }^\circ\text{C}$)

Characteristics	Symbol	Note	Test Condition	$V_{CCA},$	$V_{CCA},$	$V_{CCA},$	$V_{CCA},$	$V_{CCA},$	$V_{CCA},$	$V_{CCA},$	$V_{CCA},$	Unit
				0.8 V Typ.	0.9 V Typ.	1.0 V Typ.	1.2 V Typ.	1.5 V Typ.	1.8 V Typ.	2.5 V Typ.	3.3 V Typ.	
Input capacitance	C_{IN}		$V_{IN} = 0 \text{ V or } 3.3 \text{ V}$	—	—	—	—	—	—	—	4	pF
Bus I/O capacitance	C_{IOA}		A = OFF, $V_{IOA} = 0 \text{ V or } 3.3 \text{ V}$	—	—	—	—	—	—	—	5	pF
	C_{IOB}		B = OFF, $V_{IOB} = 0 \text{ V or } 3.3 \text{ V}$	—	—	—	—	—	—	—	5	
Power dissipation capacitance	C_{PDA}	(Note 1)	A → B	1.5	1.5	1.5	1.5	2	2	2	2.5	pF
			B → A	13	13	13	13.5	13.5	14	14.5	15	
	C_{PDB}	(Note 1)	A → B	13	13	13	13.5	13.5	14	14.5	15	
			B → A	1.5	1.5	1.5	1.5	2	2	2	2.5	

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.

$$I_{CC(opr)} = C_{PD} \times V_{CC} \times f_{IN} + I_{CC}$$

12. AC Test Circuit

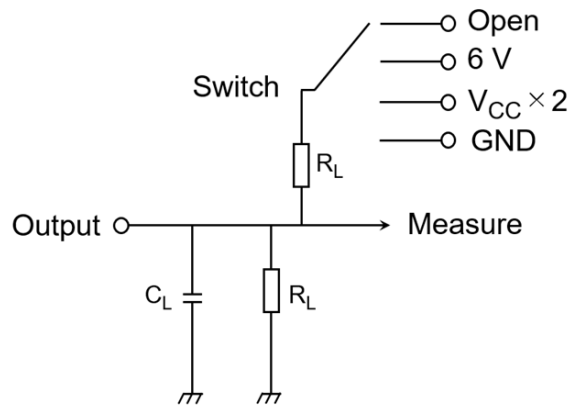


Fig. 12.1 AC Test Circuit

Table 12.1.1 Parameter for AC Test Circuit

Parameter	Switch
t_{PLH} , t_{PHL}	Open
t_{PLZ} , t_{PZL}	$V_{CC} \times 2$
t_{PHZ} , t_{PZH}	GND

Table 12.1.2 Parameter for AC Test Circuit

Symbol	$V_{CC} = 0.8 \text{ V}$	$V_{CC} = 0.9 \pm 0.045 \text{ V}$ $V_{CC} = 1.0 \pm 0.05 \text{ V}$	$V_{CC} = 1.2 \pm 0.1 \text{ V}$ $V_{CC} = 1.5 \pm 0.1 \text{ V}$	$V_{CC} = 1.8 \pm 0.15 \text{ V}$ $V_{CC} = 2.5 \pm 0.2 \text{ V}$	$V_{CC} = 3.3 \pm 0.3 \text{ V}$
R_L	10 k Ω	10 k Ω	2 k Ω	2 k Ω	2 k Ω
C_L	5 pF	5 pF	15 pF	15 pF	15 pF

13. AC Waveform

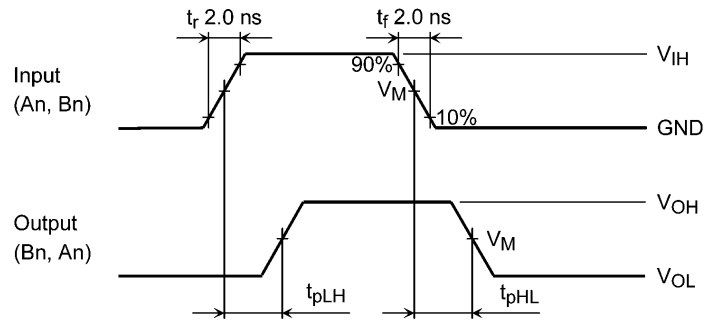


Fig. 13.1 t_{pLH} , t_{pHL}

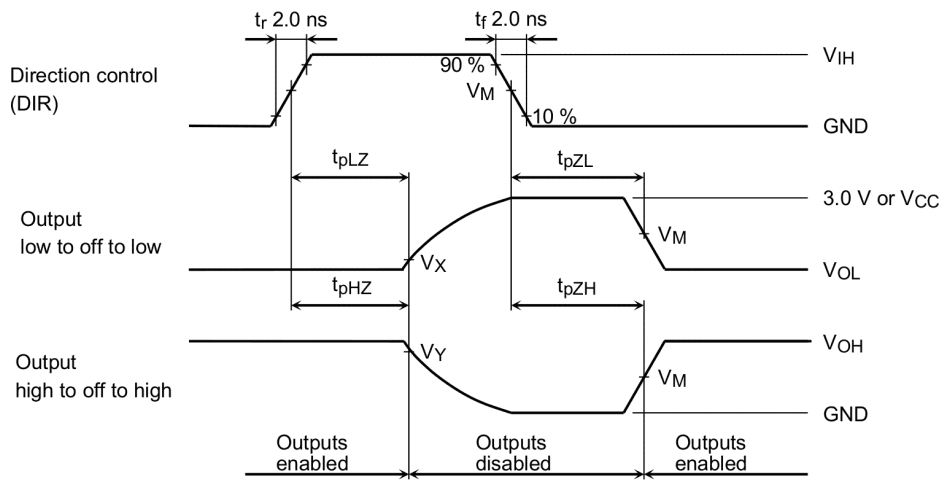


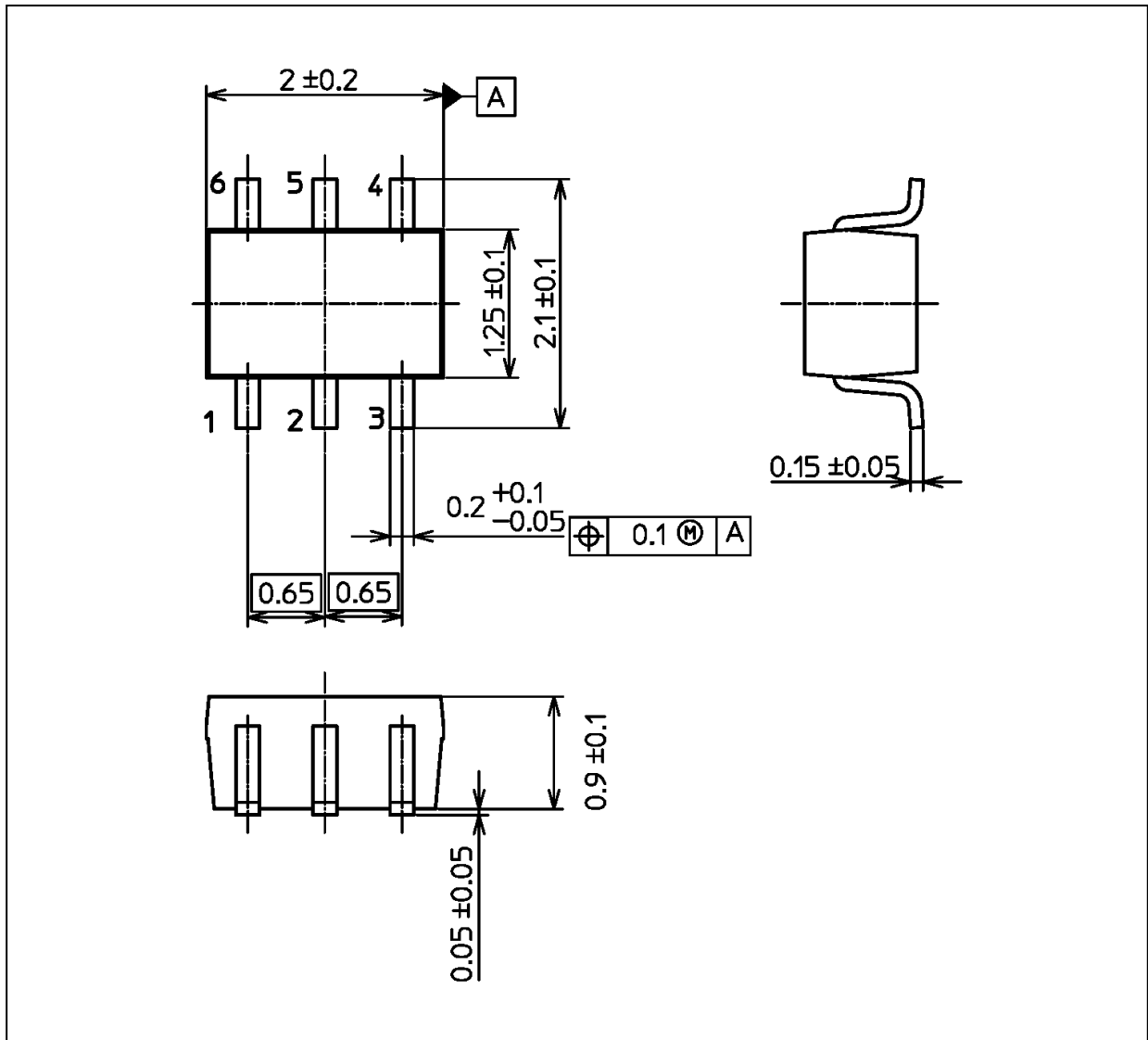
Fig. 13.2 t_{pLZ} , t_{pHZ} , t_{pZL} , t_{pZH}

Table 13.1.1 AC Waveform Symbols

Symbol	$V_{CC} = 0.8 \text{ V}$	$V_{CC} = 1.0 \pm 0.05 \text{ V}$ $V_{CC} = 0.9 \pm 0.045 \text{ V}$	$V_{CC} = 1.5 \pm 0.1 \text{ V}$ $V_{CC} = 1.2 \pm 0.1 \text{ V}$	$V_{CC} = 2.5 \pm 0.2 \text{ V}$ $V_{CC} = 1.8 \pm 0.15 \text{ V}$	$V_{CC} = 3.3 \pm 0.3 \text{ V}$
V_{IH}	V_{CC}	V_{CC}	V_{CC}	V_{CC}	V_{CC}
V_M	$V_{CC} / 2$	$V_{CC} / 2$	$V_{CC} / 2$	$V_{CC} / 2$	$V_{CC} / 2$
V_X	$V_{OL} + 0.1 \text{ V}$	$V_{OL} + 0.1 \text{ V}$	$V_{OL} + 0.1 \text{ V}$	$V_{OL} + 0.15 \text{ V}$	$V_{OL} + 0.3 \text{ V}$
V_Y	$V_{OH} - 0.1 \text{ V}$	$V_{OH} - 0.1 \text{ V}$	$V_{OH} - 0.1 \text{ V}$	$V_{OH} - 0.15 \text{ V}$	$V_{OH} - 0.3 \text{ V}$

Package Dimensions

Unit: mm



Weight: 0.007 g (typ.)

Package Name(s)
JEDEC: SOT-363
Nickname: US6

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