

Octal Buffers/Drivers with 3-state Outputs

CJ74AHC/AHCT244 Logic

1 Introduction

The CJ74AHC/AHCT244 is an octal buffer/line driver with 3-state outputs.

2 Available Packages

PART NUMBER	PACKAGE
CJ74AHC244	SOP20
	TSSOP20
CJ74AHCT244	SOP20
	TSSOP20

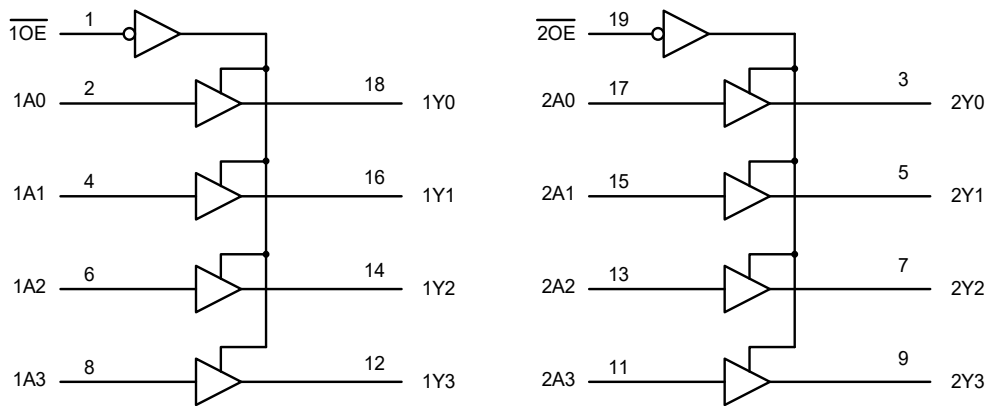
Note: If the physical information is inconsistent with the ordering information, please refer to the actual product.

3 Features

- Supply voltage range:
 - CJ74AHC244: 2.0V to 5.5V
 - CJ74AHCT244: 4.5V to 5.5V
- Input levels:
 - CJ74AHC244: CMOS level
 - CJ74AHCT244: TTL level
- Temperature range: -40°C to +125°C

4 Applications

- Network Switches
- Power Infrastructures
- PCs and Notebooks
- Wearable Health and Fitness Devices
- Tests and Measurements



Block diagram

5 Orderable Information

DEVICE	PACKAGE	OP TEMP	ECO PLAN	MSL	PACKING OPTION	SORT
CJ74AHC244AGN	SOP20	-40~125°C	RoHS & Green	Level 3 168HR	Tape and Reel 2000 Units / Reel	Active
CJ74AHCT244AGN	SOP20	-40~125°C	RoHS & Green	Level 3 168HR	Tape and Reel 2000 Units / Reel	Active
CJ74AHC244BGN	TSSOP20	-40~125°C	RoHS & Green	Level 3 168HR	Tape and Reel 4000 Units / Reel	Active
CJ74AHCT244BGN	TSSOP20	-40~125°C	RoHS & Green	Level 3 168HR	Tape and Reel 4000 Units / Reel	Active

Note:

ECO PLAN: For the RoHS and Green certification standards of this product, please refer to the official report provided by JSCJ.

MSL: Moisture Sensitivity Level. Determined according to JEDEC industry standard classification.

SORT: Specifically defined as follows:

Active: Recommended for new products;

Customized: Products manufactured to meet the specific needs of customers;

Preview: The device has been released and has not been fully mass produced. The sample may or may not be available;

NoRD: It is not recommended to use the device for new design. The device is only produced for the needs of existing customers;

Obsolete: The device has been discontinued.

6 Pin Configuration and Marking Information

6.1 Pin Configuration

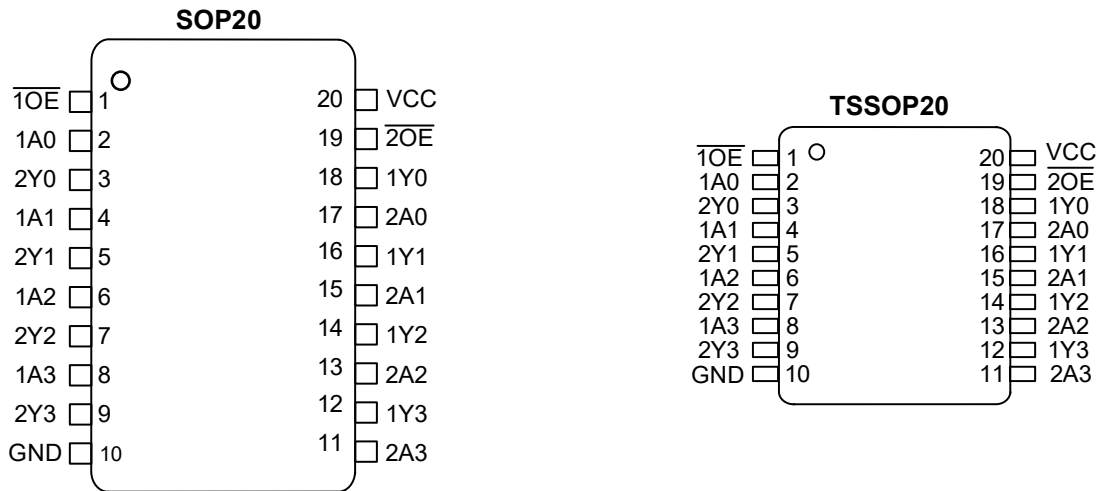


Figure 6-1 Pin configuration

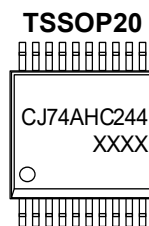
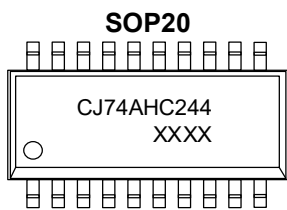
6.2 Pin Function

PIN		I/O ⁽¹⁾	DESCRIPTION
No.	NAME		
1	1OE	I	Output enable input (active LOW)
2	1A0	I	Data input
3	2Y0	O	Bus output
4	1A1	I	Data input
5	2Y1	O	Bus output
6	1A2	I	Data input
7	2Y2	O	Bus output
8	1A3	I	Data input
9	2Y3	O	Bus output
10	GND	G	Ground (0V)
11	2A3	I	Data input
12	1Y3	O	Bus output
13	2A2	I	Data input
14	1Y2	O	Bus output
15	2A1	I	Data input
16	1Y1	O	Bus output
17	2A0	I	Data input
18	1Y0	O	Bus output
19	2OE	I	Output enable input (active LOW)
20	VCC	P	Supply voltage

(1) I-Input, O-Output, P-Power, G-Ground.

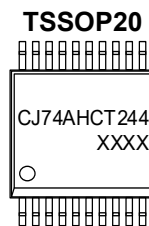
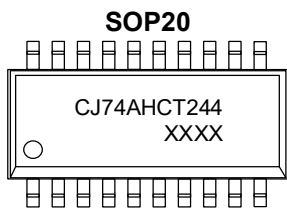
6.3 Marking Information

6.3.1 CJ74AHC244



XXXX: Code, indicates weekly record information.

6.3.2 CJ74AHCT244



XXXX: Code, indicates weekly record information.

7 Specifications

7.1 Absolute Maximum Ratings

Voltages are referenced to GND(ground=0V), unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
V _{CC}	Supply voltage	-	-0.5	+7	V
I _{CC}	Supply current	-	-	75	mA
I _{GND}	Ground current	-	-75	-	mA
I _{IK}	Input clamping current	V _I < -0.5V	-	±20	mA
I _{OK}	Output clamping current	V _O < -0.5V or V _O > V _{CC} +0.5V	-	±20	mA
I _O	Output current	-0.5V < V _O < V _{CC} +0.5V	-	±25	mA
T _{stg}	Storage temperature	-	-65	+150	°C
T _L	Soldering temperature	10s		260	°C
					SOP/TSSOP

Note: Absolute maximum ratings indicate sustained limits beyond which damage to the device may occur. All voltage parameters are absolute voltages referenced to GND. The thermal resistance and power dissipation ratings are measured under board mounted and still air conditions.

7.2 Recommended Operating Conditions

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
CJ74AHC244						
V _{CC}	Supply voltage	-	2.0	5.0	6.0	V
V _I	Input voltage	-	0	-	V _{CC}	V
V _O	Output voltage	-	0	-	V _{CC}	V
T _{amb}	Ambient temperature	-	-40	-	+125	°C
CJ74AHCT244						
V _{CC}	Supply voltage	-	4.5	5.0	5.5	V
V _I	Input voltage	-	0	-	V _{CC}	V
V _O	Output voltage	-	0	-	V _{CC}	V
T _{amb}	Ambient temperature	-	-40	-	+125	°C

7.3 Electrical Characteristics
7.3.1 DC Characteristics 1
 $T_{amb} = -40^{\circ}\text{C}$ to $+85^{\circ}\text{C}$, voltages are referenced to GND (ground=0V), unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
CJ74AHC244						
V_{IH}	HIGH-level input voltage	$V_{CC}=2.0\text{V}$	1.5	-	-	V
		$V_{CC}=3.0\text{V}$	2.1	-	-	V
		$V_{CC}=5.5\text{V}$	3.85	-	-	V
V_{IL}	LOW-level input voltage	$V_{CC}=2.0\text{V}$	-	-	0.5	V
		$V_{CC}=3.0\text{V}$	-	-	0.9	V
		$V_{CC}=5.5\text{V}$	-	-	1.65	V
V_{OH}	HIGH-level output voltage	$I_o=-50\mu\text{A}; V_{CC}=2.0\text{V}$	1.9	2.0	-	V
		$I_o=-50\mu\text{A}; V_{CC}=3.0\text{V}$	2.9	3.0	-	V
		$I_o=-50\mu\text{A}; V_{CC}=4.5\text{V}$	4.4	4.5	-	V
		$I_o=-4.0\text{mA}; V_{CC}=3.0\text{V}$	2.48	-	-	V
		$I_o=-8.0\text{mA}; V_{CC}=4.5\text{V}$	3.8	-	-	V
V_{OL}	LOW-level output voltage	$I_o=50\mu\text{A}; V_{CC}=2.0\text{V}$	-	0	0.1	V
		$I_o=50\mu\text{A}; V_{CC}=3.0\text{V}$	-	0	0.1	V
		$I_o=50\mu\text{A}; V_{CC}=4.5\text{V}$	-	0	0.1	V
		$I_o=4.0\text{mA}; V_{CC}=3.0\text{V}$	-	-	0.44	V
		$I_o=8.0\text{mA}; V_{CC}=4.5\text{V}$	-	-	0.44	V
I_i	Input leakage current	$V_{CC}=0$ to $5.5\text{V}; V_i=5.5\text{V}$ or GND	-	-	± 2	μA
I_{oz}	OFF-state output current	$V_{CC}=5.5\text{V}; V_i=V_{IH}$ or $V_{IL}; V_o=V_{CC}$ or GND	-	-	± 2	μA
I_{CC}	Supply current	$V_{CC}=5.5\text{V}; V_i=V_{CC}$ or GND; $I_o=0\text{A}$	-	-	2	μA
CJ74AHCT244						
V_{IH}	HIGH-level input voltage	$V_{CC}=4.5$ to 5.5V	2.0	-	-	V
V_{IL}	LOW-level input voltage	$V_{CC}=4.5$ to 5.5V	-	-	0.8	V
V_{OH}	HIGH-level output voltage	$I_o=-50\mu\text{A}; V_{CC}=4.5\text{V}$	4.4	4.5	-	V
		$I_o=-8.0\text{mA}; V_{CC}=4.5\text{V}$	3.8	-	-	V
V_{OL}	LOW-level output voltage	$I_o=50\mu\text{A}; V_{CC}=4.5\text{V}$	-	-	0.1	V
		$I_o=8.0\text{mA}; V_{CC}=4.5\text{V}$	-	-	0.44	V
I_i	Input leakage current	$V_{CC}=0$ to $5.5\text{V}; V_i=V_{CC}$ or GND	-	-	± 2	μA
I_{oz}	OFF-state output current	$V_{CC}=5.5\text{V}; V_i=V_{IH}$ or $V_{IL}; V_o=V_{CC}$ or GND	-	-	± 2	μA
I_{CC}	Supply current	$V_{CC}=5.5\text{V}; V_i=V_{CC}$ or GND; $I_o=0\text{A}$	-	-	2	μA
ΔI_{CC}	Additional supply current	$V_{CC}=4.5$ to $5.5\text{V};$ One input at $3.4\text{V};$ Other inputs at V_{CC} or GND; $I_o=0\text{A}$	-	-	1.5	mA

7.3.2 DC Characteristics 2
 $T_{amb} = -40^{\circ}\text{C}$ to $+125^{\circ}\text{C}$, voltages are referenced to GND (ground=0V), unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT
CJ74AHC244						
V_{IH}	HIGH-level input voltage	$V_{CC}=2.0\text{V}$	1.5	-	-	V
		$V_{CC}=3.0\text{V}$	2.1	-	-	V
		$V_{CC}=5.5\text{V}$	3.85	-	-	V
V_{IL}	LOW-level input voltage	$V_{CC}=2.0\text{V}$	-	-	0.5	V
		$V_{CC}=3.0\text{V}$	-	-	0.9	V
		$V_{CC}=5.5\text{V}$	-	-	1.65	V
V_{OH}	HIGH-level output voltage	$I_o=-50\mu\text{A}; V_{CC}=2.0\text{V}$	1.9	-	-	V
		$I_o=-50\mu\text{A}; V_{CC}=3.0\text{V}$	2.9	-	-	V
		$I_o=-50\mu\text{A}; V_{CC}=4.5\text{V}$	4.4	-	-	V
		$I_o=-4.0\text{mA}; V_{CC}=3.0\text{V}$	2.48	-	-	V
		$I_o=-8.0\text{mA}; V_{CC}=4.5\text{V}$	3.8	-	-	V
V_{OL}	LOW-level output voltage	$I_o=50\mu\text{A}; V_{CC}=2.0\text{V}$	-	-	0.1	V
		$I_o=50\mu\text{A}; V_{CC}=3.0\text{V}$	-	-	0.1	V
		$I_o=50\mu\text{A}; V_{CC}=4.5\text{V}$	-	-	0.1	V
		$I_o=4.0\text{mA}; V_{CC}=3.0\text{V}$	-	-	0.44	V
		$I_o=8.0\text{mA}; V_{CC}=4.5\text{V}$	-	-	0.44	V
I_i	Input leakage current	$V_{CC}=0$ to $5.5\text{V}; V_i=5.5\text{V}$ or GND	-	-	± 4	μA
I_{oz}	OFF-state output current	$V_{CC}=5.5\text{V}; V_i=V_{IH}$ or $V_{IL}; V_o=V_{CC}$ or GND	-	-	± 4	μA
I_{CC}	Supply current	$V_{CC}=5.5\text{V}; V_i=V_{CC}$ or GND; $I_o=0\text{A}$	-	-	4	μA
CJ74AHCT244						
V_{IH}	HIGH-level input voltage	$V_{CC}=4.5$ to 5.5V	2.0	-	-	V
V_{IL}	LOW-level input voltage	$V_{CC}=4.5$ to 5.5V	-	-	0.8	V
V_{OH}	HIGH-level output voltage	$I_o=-50\mu\text{A}; V_{CC}=4.5\text{V}$	4.4	-	-	V
		$I_o=-8.0\text{mA}; V_{CC}=4.5\text{V}$	3.8	-	-	V
V_{OL}	LOW-level output voltage	$I_o=50\mu\text{A}; V_{CC}=4.5\text{V}$	-	-	0.1	V
		$I_o=8.0\text{mA}; V_{CC}=4.5\text{V}$	-	-	0.44	V
I_i	Input leakage current	$V_{CC}=0$ to $5.5\text{V}; V_i=V_{CC}$ or GND	-	-	± 4	μA
I_{oz}	OFF-state output current	$V_{CC}=5.5\text{V}; V_i=V_{IH}$ or $V_{IL}; V_o=V_{CC}$ or GND	-	-	± 4	μA
I_{CC}	Supply current	$V_{CC}=5.5\text{V}; V_i=V_{CC}$ or GND; $I_o=0\text{A}$	-	-	4	μA
ΔI_{CC}	Additional supply current	$V_{CC}=4.5$ to $5.5\text{V};$ One input at $3.4\text{V};$ Other inputs at V_{CC} or GND; $I_o=0\text{A}$	-	-	1.5	mA

7.3.3 AC Characteristics 1

T_{amb}=-40°C to +85°C, voltages are referenced to GND (ground=0V), unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT	
CJ74AHC244							
t _{PLH} , t _{PHL}	nAn to nYn propagation delay	See Figure 8-3	V _{CC} =3.0 to 3.6V; C _L =15pF	-	5.0	10.0	ns
			V _{CC} =3.0 to 3.6V; C _L =50pF	-	7.0	13.5	ns
			V _{CC} =4.5 to 5.5V; C _L =15pF	-	3.4	6.5	ns
			V _{CC} =4.5 to 5.5V; C _L =50pF	-	5.0	8.5	ns
t _{en}	nOE to nYn enable time	See Figure 8-4	V _{CC} =3.0 to 3.6V; C _L =15pF	-	6.5	12.5	ns
			V _{CC} =3.0 to 3.6V; C _L =50pF	-	7.5	16.0	ns
			V _{CC} =4.5 to 5.5V; C _L =15pF	-	4.0	8.5	ns
			V _{CC} =4.5 to 5.5V; C _L =50pF	-	5.5	10.5	ns
t _{dis}	nOE to nYn disable time	See Figure 8-4	V _{CC} =3.0 to 3.6V; C _L =15pF	-	5.5	11.0	ns
			V _{CC} =3.0 to 3.6V; C _L =50pF	-	10.0	16.0	ns
			V _{CC} =4.5 to 5.5V; C _L =15pF	-	4.8	8.5	ns
			V _{CC} =4.5 to 5.5V; C _L =50pF	-	7.0	10.5	ns
CJ74AHCT244							
t _{PLH} , t _{PHL}	nAn to nYn propagation delay	See Figure 8-3	V _{CC} =4.5 to 5.5V; C _L =15pF	-	3.5	9.5	ns
			V _{CC} =4.5 to 5.5V; C _L =50pF	-	5.0	9.5	ns
t _{en}	nOE to nYn enable time	See Figure 8-4	V _{CC} =4.5 to 5.5V; C _L =15pF	-	3.5	12.0	ns
			V _{CC} =4.5 to 5.5V; C _L =50pF	-	5.5	13.0	ns
t _{dis}	nOE to nYn disable time	See Figure 8-4	V _{CC} =4.5 to 5.5V; C _L =50pF	-	5.0	10.0	ns
			V _{CC} =4.5 to 5.5V; C _L =15pF	-	7.0	13.0	ns

7.3.4 AC Characteristics 2

T_{amb}=-40°C to +125°C, voltages are referenced to GND (ground=0V), unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	TYP.	MAX.	UNIT	
CJ74AHC244							
t _{PLH} , t _{PHL}	nAn to nYn propagation delay	See Figure 8-3	V _{CC} =3.0 to 3.6V; C _L =15pF	-	-	10.5	ns
			V _{CC} =3.0 to 3.6V; C _L =50pF	-	-	15.0	ns
			V _{CC} =4.5 to 5.5V; C _L =15pF	-	-	7.0	ns
			V _{CC} =4.5 to 5.5V; C _L =50pF	-	-	9.5	ns
t _{en}	nOE to nYn enable time	See Figure 8-4	V _{CC} =3.0 to 3.6V; C _L =15pF	-	-	13.5	ns
			V _{CC} =3.0 to 3.6V; C _L =50pF	-	-	18.0	ns
			V _{CC} =4.5 to 5.5V; C _L =15pF	-	-	9.5	ns
			V _{CC} =4.5 to 5.5V; C _L =50pF	-	-	12.0	ns
t _{dis}	nOE to nYn disable time	See Figure 8-4	V _{CC} =3.0 to 3.6V; C _L =15pF	-	-	12.5	ns
			V _{CC} =3.0 to 3.6V; C _L =50pF	-	-	17.5	ns
			V _{CC} =4.5 to 5.5V; C _L =15pF	-	-	9.0	ns
			V _{CC} =4.5 to 5.5V; C _L =50pF	-	-	11.5	ns
CJ74AHCT244							
t _{PLH} , t _{PHL}	nAn to nYn propagation delay	See Figure 8-3	V _{CC} =5.5V; C _L =15pF	-	-	9.5	ns
			V _{CC} =5.5V; C _L =50pF	-	-	10.5	ns
t _{en}	nOE to nYn enable time	See Figure 8-4	V _{CC} =5.5V; C _L =15pF	-	-	13.0	ns
			V _{CC} =5.5V; C _L =50pF	-	-	14.5	ns
t _{dis}	nOE to nYn disable time	See Figure 8-4	V _{CC} =5.5V; C _L =50pF	-	-	12.0	ns
			V _{CC} =5.5V; C _L =15pF	-	-	14.5	ns

8 Detailed Description

8.1 Overview

The CJ74AHC/AHCT244 is an octal buffer/line driver with 3-state outputs.

8.2 Functional Block Diagram

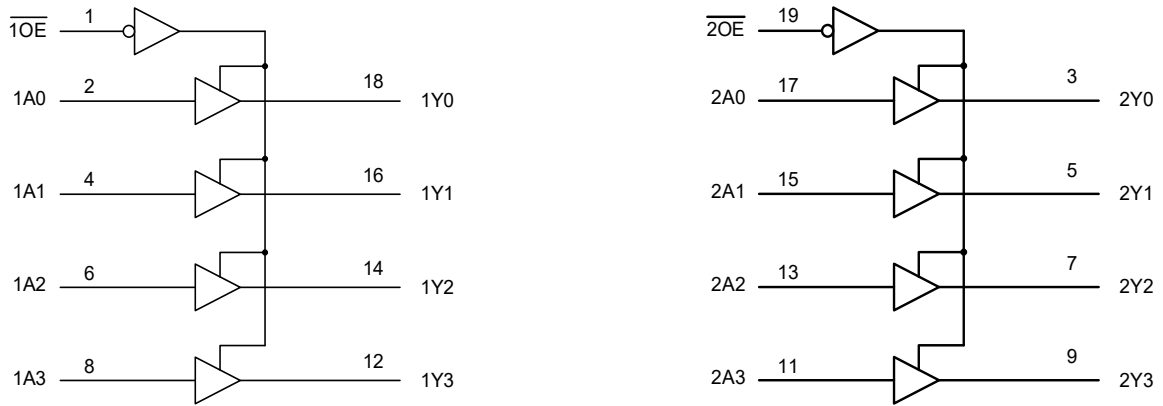


Figure 8-1 Block diagram

8.3 Function Table⁽¹⁾

INPUT		OUTPUT
\overline{nOE}	nAn	nYn
L	L	L
L	H	H
H	X	Z

(1) H=HIGH voltage level; L=LOW voltage level; X=don't care; Z=high-impedance OFF-state.

8.4 Testing Circuit

8.4.1 AC Testing Circuit

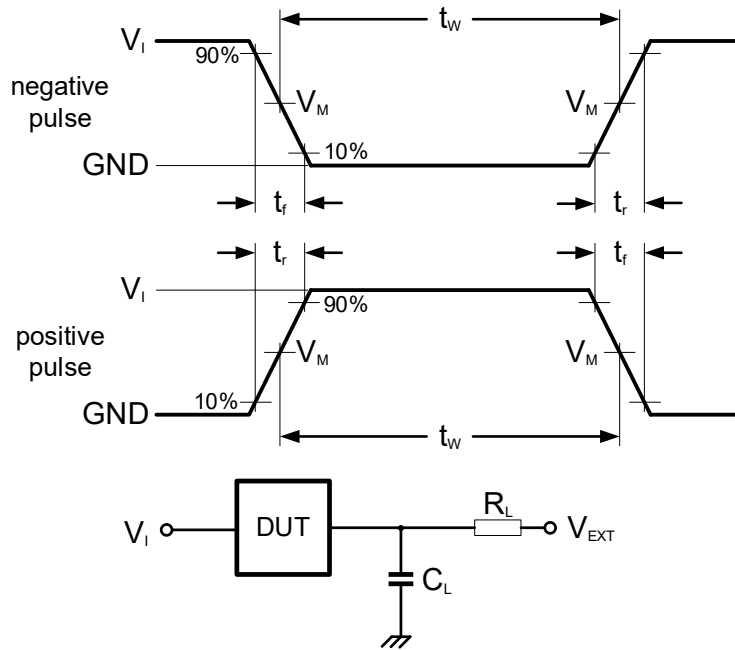


Figure 8-2 Test circuit for measuring switching times

Definitions for test circuit:

C_L includes probe and jig capacitance.

8.4.2 AC Testing Waveforms

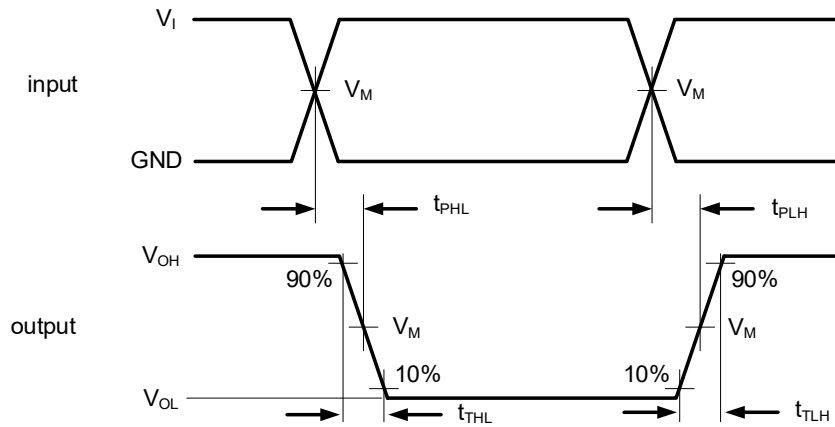


Figure 8-3 Propagation delay, output transition time

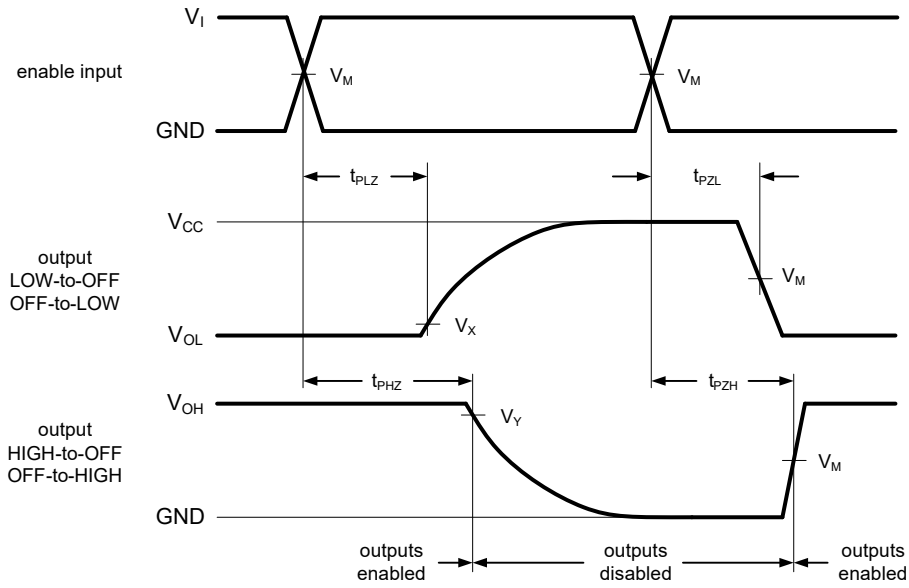


Figure 8-4 3-state enable and disable times

8.4.3 Measurement Points

TYPE	INPUT		OUTPUT	
	V_M	V_M	V_X	V_Y
CJ74AHC244	$0.5 \times V_{CC}$	$0.5 \times V_{CC}$	$V_{OL} + 0.3V$	$V_{OH} - 0.3V$
CJ74AHCT244	1.3V	1.3V	$V_{OL} + 0.3V$	$V_{OH} - 0.3V$

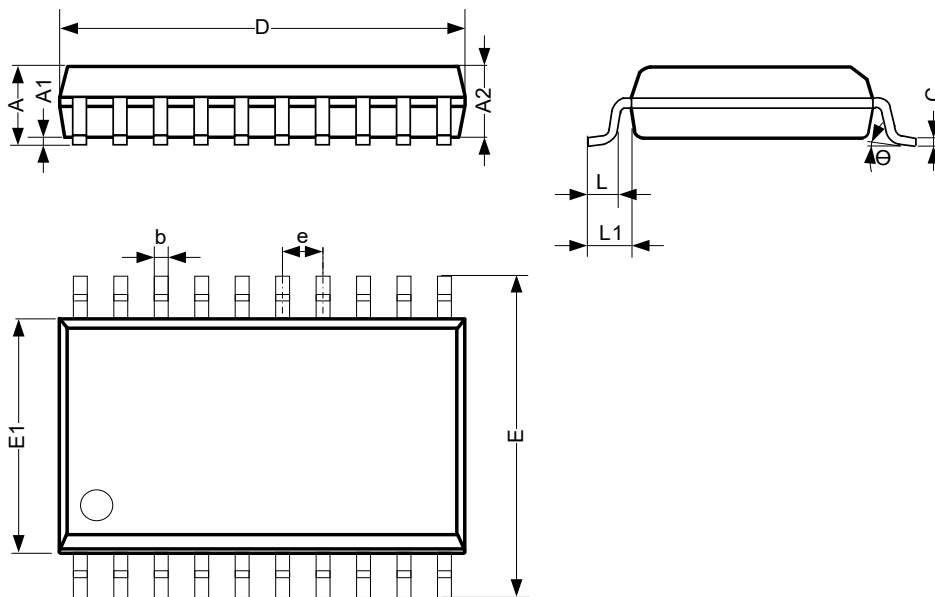
8.4.4 Test Data

TYPE	INPUT		LOAD		V_{EXT}		
	V_I	$t_r = t_f$	C_L	R_L	t_{PLH}, t_{PHL}	t_{PLZ}, t_{PZL}	t_{PHZ}, t_{PZH}
CJ74AHC244	V_{CC}	3.0ns	15pF, 50pF	1k Ω	Open	V_{CC}	GND
CJ74AHCT244	3.0V	3.0ns	15pF, 50pF	1k Ω	Open	V_{CC}	GND

9 Mechanical Information

9.1 SOP20 Mechanical Information

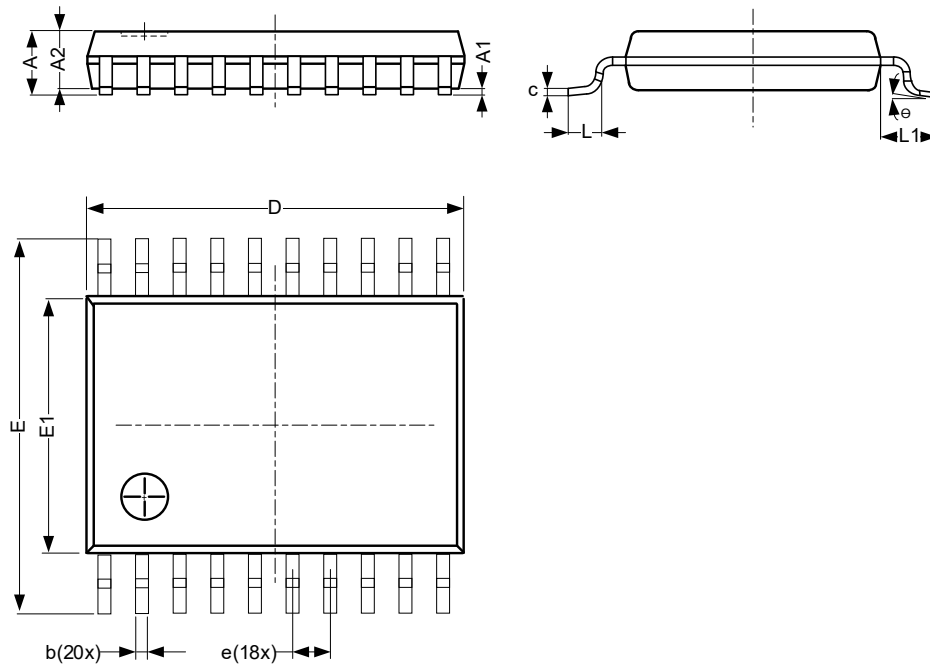
9.1.1 SOP20 Outline Dimensions



SYMBOL	Dimensions In Millimeters		
	Min.	Typ.	Max.
A	2.47	-	2.65
A1	0.05	-	0.30
A2	2.20	-	2.44
b	0.35	-	0.50
c	0.15	-	0.30
D	12.54	-	12.94
E	10.00	-	10.60
E1	7.30	-	7.70
e	1.27 BSC		
L	0.40	-	1.05
L1	1.30	-	1.50
Θ	0°	-	8°
Unit: mm			

9.2 TSSOP20 Mechanical Information

9.2.1 TSSOP20 Outline Dimensions



SYMBOL	Dimensions In Millimeters		
	Min.	Typ.	Max.
A	-	-	1.20
A1	0.05	-	0.15
A2	0.80	-	1.05
b	0.19	-	0.30
c	0.09	-	0.20
D	6.40	-	6.60
E	6.20	-	6.60
E1	4.30	-	4.50
e	0.65 BSC		
L	0.45	-	0.75
L1	-	1.00	-
θ	0°	-	8°
Unit: mm			

10 Notes and Revision History

10.1 Associated Product Family and Others

To view other products of the same type or IC products of other types, click the official website of JSCJ -- <https://www.jscj-elec.com> for more details.

10.2 Notes

Electrostatic Discharge Caution



This IC may be damaged by ESD. Relevant personnel shall comply with correct installation and use specifications to avoid ESD damage to the IC. If appropriate measures are not taken to prevent ESD damage, the hazards caused by ESD include but are not limited to degradation of integrated circuit performance or complete damage of integrated circuit. For some precision integrated circuits, a very small parameter change may cause the whole device to be inconsistent with its published specifications.

DISCLAIMER

IMPORTANT NOTICE, PLEASE READ CAREFULLY

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