AiP74LV164
8-bit Serial-in/Parallel-out Shift Register

Product Specification

Specification Revision History:

Version	Date	Description
2017-09-A1	2017-09	New
2023-04-B1	2023-04	Update the template

Contents

1、General Description

The AiP74LV164 is a low-voltage, Si-gate CMOS device and is pin and function compatible with the AiP74HC164 and AiP74HCT164.

The AiP74LV164 is an 8-bit edge-triggered shift register with serial data entry and an output from each of the eight stages. Data is entered serially through one of two inputs (DSA or DSB) and either input can be used as an active HIGH enable for data entry through the other input. Both inputs must be connected together or an unused input must be tied HIGH.

Data shifts one place to the right on each LOW-to-HIGH transition of the clock input (CP) and enters into Q0, which is the logical AND-function of the two data inputs (DSA and DSB) that existed one set-up time prior to the rising clock edge.

A LOW on the master reset input (MR) overrides all other inputs and clears the register asynchronously, forcing all outputs LOW.

Features:

- Operating voltage: 1.0V to 5.5V
- 5.5V tolerant inputs/outputs
- Power-down mode
- Specified from -40℃ to +125℃
- Packaging information: DIP14/SOP14/TSSOP14

Ordering Information:

Tube packing specifications:

Part number	Packaging form	Marking code	Tube quantity	Boxed tube quantity	Boxed quantity	Notes
AiP74LV164DA14.TB	DIP14	74LV164	25 PCS/tube	40 tube/box	1000 PCS/box	Dimensions of plastic enclosure: 19.0mm×6.4mm Pin spacing: 2.54mm
AiP74LV164SA14.TB	SOP14	74LV164	50 PCS/tube	200 tube/box	10000 PCS/box	Dimensions of plastic enclosure: 8.7mm×3.9mm Pin spacing: 1.27mm
AiP74LV164TA14.TB	TSSOP14	74LV164	96 PCS/tube	200 tube/box	19200 PCS/box	Dimensions of plastic enclosure: 5.0mm×4.4mm Pin spacing: 0.65mm

Reel packing specifications:

Part number	Packaging form	Marking code	Reel quantity	Boxed reel quantity	Notes
AiP74LV164SA14.TR	SOP14	74LV164	4000 PCS/reel	8000 PCS/box	Dimensions of plastic enclosure: 8.7mm×3.9mm Pin spacing: 1.27mm
AiP74LV164TA14.TR	TSSOP14	74LV164	5000 PCS/reel	10000 PCS/box	Dimensions of plastic enclosure: 5.0mm×4.4mm Pin spacing: 0.65mm

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

2、Block Diagram And Pin Description

2.1、Block Diagram

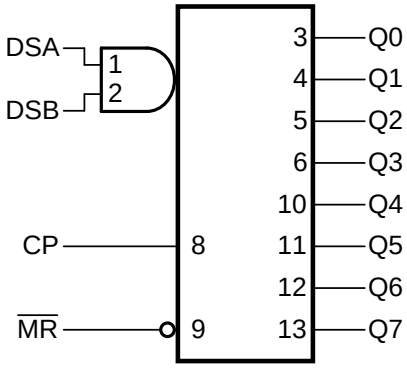


Figure 1. Logic symbol

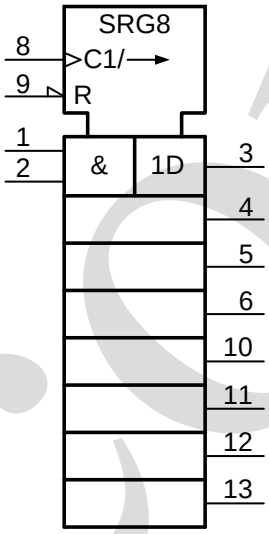


Figure 2. IEC logic symbol

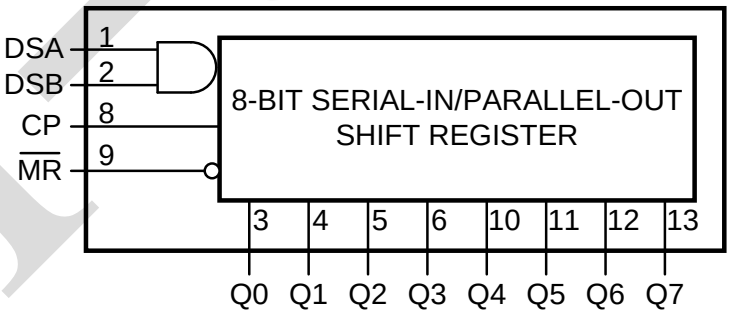
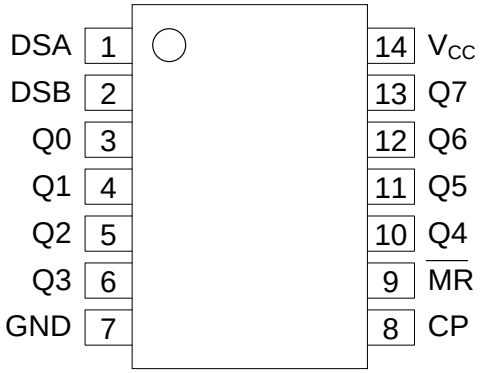


Figure 3. Functional diagram

2.2、Pin Configurations



2.3、Pin Description

Pin No.	Pin Name	Description
1	DSA	data input SA
2	DSB	data input SB
3	Q0	output 0
4	Q1	output 1
5	Q2	output 2
6	Q3	output 3
7	GND	ground (0V)
8	CP	clock input (edge triggered LOW-to-HIGH)
9	$\overline{MR}$	master reset input (active LOW)
10	Q4	output 4
11	Q5	output 5
12	Q6	output 6
13	Q7	output 7
14	V_{CC}	supply voltage

2.4、Function table

Operating mode	Input				Output	
	$\overline{MR}$	CP	DSA	DSB	Q0	Q1 to Q7
Reset (clear)	L	X	X	X	L	L to L
Shift	H	↑	l	l	L	q0 to q6
	H	↑	l	h	L	q0 to q6
	H	↑	h	l	L	q0 to q6
	H	↑	h	h	H	q0 to q6

Note:

H=HIGH voltage level; L=LOW voltage level;

↑=LOW-to-HIGH clock transition;

h=HIGH voltage level one set-up time prior to the LOW-to-HIGH CP transition;

l=LOW voltage level one set-up time prior to the LOW-to-HIGH CP transition;

q=lower case letter indicates the state of referenced input one set-up time prior to the LOW-to-HIGH CP transition.

3、Electrical Parameter

3.1、Absolute Maximum Ratings

(T_{amb}=25℃, voltages are referenced to GND (ground=0V), unless otherwise specified)

Characteristic	Symbol	Conditions		Min.	Max.	Unit
supply voltage	V_{CC}	-		-0.5	+7.0	V
input clamping current	I_{IK}	V_I<-0.5V or V_I>V_{CC}+0.5V[1]		-	±20	mA
output clamping current	I_{OK}	V_O<-0.5V or V_O>V_{CC}+0.5V[1]		-	±50	mA
output current	I_O	V_O=-0.5V to (V_{CC}+0.5V)		-	±25	mA
supply current	I_{CC}	-		-	50	mA
ground current	I_{GND}	-		-50	-	mA
operating temperature	T_{amb}	-		-40	+125	℃
storage temperature	T_{stg}	-		-65	+150	℃
total power dissipation	P_{tot}	-		-	500	mW
soldering temperature	T_L	10s	DIP	245		℃
			SOP/TSSOP	260		℃

Note:

[1] The input and output voltage ratings may be exceeded if the input and output current ratings are observed.

3.2、Recommended Operating Conditions

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

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
supply voltage	V_{CC}	-[1]	1.0	3.3	5.5	V
input voltage	V_I	-	0	-	V_{CC}	V
output voltage	V_O	-	0	-	V_{CC}	V
ambient temperature	T_{amb}	-	-40	-	+125	℃
input transition rise and fall rate	Δt/ΔV	V_{CC}=1.0V to 2.0V	-	-	500	ns/V
		V_{CC}=2.0V to 2.7V	-	-	200	ns/V
		V_{CC}=2.7V to 3.6V	-	-	100	ns/V
		V_{CC}=3.6V to 5.5V	-	-	50	ns/V

Note:

[1] The static characteristics are guaranteed from V_{CC}=1.2V to V_{CC}=5.5V, but LV devices are guaranteed to function down to V_{CC}=1.0V (with input levels GND or V_{CC}).

3.3、Electrical Characteristics

3.3.1、DC Characteristics 1

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

Parameter	Symbol	Conditions		Min.	Typ.[1]	Max.	Unit
HIGH-level input voltage	V_{IH}	V_{CC}=1.2V		0.9	-	-	V
		V_{CC}=2.0V		1.4	-	-	V
		V_{CC}=2.7V to 3.6V		2.0	-	-	V
		V_{CC}=4.5V to 5.5V		$0.7V_{CC}$	-	-	V
LOW-level input voltage	V_{IL}	V_{CC}=1.2V		-	-	0.3	V
		V_{CC}=2.0V		-	-	0.6	V
		V_{CC}=2.7V to 3.6V		-	-	0.8	V
		V_{CC}=4.5V to 5.5V		-	-	$0.3V_{CC}$	V
HIGH-level output voltage	V_{OH}	V_I=V_{IH} or V_{IL}	I_O=-100uA; V_{CC}=1.2V	-	1.2	-	V
			I_O=-100uA; V_{CC}=2.0V	1.8	2.0	-	V
			I_O=-100uA; V_{CC}=2.7V	2.5	2.7	-	V
			I_O=-100uA; V_{CC}=3.0V	2.8	3.0	-	V
			I_O=-100uA; V_{CC}=4.5V	4.3	4.5	-	V
			I_O=-6mA; V_{CC}=3.0V	2.4	2.82	-	V
			I_O=-12mA; V_{CC}=4.5V	3.6	4.2	-	V
LOW-level output voltage	V_{OL}	V_I=V_{IH} or V_{IL}	I_O=100uA; V_{CC}=1.2V	-	0	-	V
			I_O=100uA; V_{CC}=2.0V	-	0	0.2	V
			I_O=100uA; V_{CC}=2.7V	-	0	0.2	V
			I_O=100uA; V_{CC}=3.0V	-	0	0.2	V
			I_O=100uA; V_{CC}=4.5V	-	0	0.2	V
			I_O=6mA; V_{CC}=3.0V	-	0.25	0.40	V
			I_O=12mA; V_{CC}=4.5V	-	0.35	0.55	V
input leakage current	I_I	V_I=V_{CC} or GND; V_{CC}=5.5V		-	-	1.0	uA
supply current	I_{CC}	V_I=V_{CC} or GND; I_O=0A; V_{CC}=5.5V		-	-	20.0	uA
additional supply current	ΔI_{CC}	per input; V_I=V_{CC}-0.6V; V_{CC}=2.7V to 3.6V		-	-	500	uA
input capacitance	C_I	-		-	3.5	-	pF

Note: [1] Typical values are measured at T_{amb}=25℃.

3.3.1、DC Characteristics 1

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

Parameter	Symbol	Conditions		Min.	Typ.[1]	Max.	Unit
HIGH-level input voltage	V_{IH}	V_{CC}=1.2V		0.9	-	-	V
		V_{CC}=2.0V		1.4	-	-	V
		V_{CC}=2.7V to 3.6V		2.0	-	-	V
		V_{CC}=4.5V to 5.5V		0.7V_{CC}	-	-	V
LOW-level input voltage	V_{IL}	V_{CC}=1.2V		-	-	0.3	V
		V_{CC}=2.0V		-	-	0.6	V
		V_{CC}=2.7V to 3.6V		-	-	0.8	V
		V_{CC}=4.5V to 5.5V		-	-	0.3V_{CC}	V
HIGH-level output voltage	V_{OH}	V_I=V_{IH} or V_{IL}	I_O=-100uA; V_{CC}=1.2V	-	1.2	-	V
			I_O=-100uA; V_{CC}=2.0V	1.8	2.0	-	V
			I_O=-100uA; V_{CC}=2.7V	2.5	2.7	-	V
			I_O=-100uA; V_{CC}=3.0V	2.8	3.0	-	V
			I_O=-100uA; V_{CC}=4.5V	4.3	4.5	-	V
			I_O=-6mA; V_{CC}=3.0V	2.4	2.82	-	V
			I_O=-12mA; V_{CC}=4.5V	3.6	4.2	-	V
LOW-level output voltage	V_{OL}	V_I=V_{IH} or V_{IL}	I_O=100uA; V_{CC}=1.2V	-	0	-	V
			I_O=100uA; V_{CC}=2.0V	-	0	0.2	V
			I_O=100uA; V_{CC}=2.7V	-	0	0.2	V
			I_O=100uA; V_{CC}=3.0V	-	0	0.2	V
			I_O=100uA; V_{CC}=4.5V	-	0	0.2	V
			I_O=6mA; V_{CC}=3.0V	-	0.25	0.40	V
			I_O=12mA; V_{CC}=4.5V	-	0.35	0.55	V
input leakage current	I_I	V_I=V_{CC} or GND; V_{CC}=5.5V		-	-	1.0	uA
supply current	I_{CC}	V_I=V_{CC} or GND; I_O=0A; V_{CC}=5.5V		-	-	20.0	uA
additional supply current	ΔI_{CC}	per input; V_I=V_{CC}-0.6V; V_{CC}=2.7V to 3.6V		-	-	500	uA
input capacitance	C_I	-		-	3.5	-	pF

Note: [1] Typical values are measured at T_{amb}=25℃.

3.3.2、DC Characteristics 2

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

Parameter	Symbol	Conditions		Min.	Typ.[1]	Max.	Unit
HIGH-level input voltage	V_{IH}	V_{CC}=1.2V		0.9	-	-	V
		V_{CC}=2.0V		1.4	-	-	V
		V_{CC}=2.7V to 3.6V		2.0	-	-	V
		V_{CC}=4.5V to 5.5V		0.7V_{CC}	-	-	V
LOW-level input voltage	V_{IL}	V_{CC}=1.2V		-	-	0.3	V
		V_{CC}=2.0V		-	-	0.6	V
		V_{CC}=2.7V to 3.6V		-	-	0.8	V
		V_{CC}=4.5V to 5.5V		-	-	0.3V_{CC}	V
HIGH-level output voltage	V_{OH}	V_I=V_{IH} or V_{IL}	I_O=-100uA; V_{CC}=2.0V	1.8	-	-	V
			I_O=-100uA; V_{CC}=2.7V	2.5	-	-	V
			I_O=-100uA; V_{CC}=3.0V	2.8	-	-	V
			I_O=-100uA; V_{CC}=4.5V	4.3	-	-	V
			I_O=-6mA; V_{CC}=3.0V	2.2	-	-	V
			I_O=-12mA; V_{CC}=4.5V	3.5	-	-	V
LOW-level output voltage	V_{OL}	V_I=V_{IH} or V_{IL}	I_O=100uA; V_{CC}=2.0V	-	-	0.2	V
			I_O=100uA; V_{CC}=2.7V	-	-	0.2	V
			I_O=100uA; V_{CC}=3.0V	-	-	0.2	V
			I_O=100uA; V_{CC}=4.5V	-	-	0.2	V
			I_O=6mA; V_{CC}=3.0V	-	-	0.50	V
			I_O=12mA; V_{CC}=4.5V	-	-	0.65	V
input leakage current	I_I	V_I=V_{CC} or GND; V_{CC}=5.5V		-	-	1.0	uA
supply current	I_{CC}	V_I=V_{CC} or GND; I_O=0A; V_{CC}=5.5V		-	-	160	uA
additional supply current	ΔI_{CC}	per input; V_I=V_{CC}-0.6V; V_{CC}=2.7V to 3.6V		-	-	850	uA

Note: [1] Typical values are measured at T_{amb}=25℃.

3.3.3、AC Characteristics 1

(T_{amb}= -40℃ to +85℃, GND=0V, unless otherwise specified)

Parameter	Symbol	Conditions		Min.	Typ.[1]	Max.	Unit
propagation delay	t_{pd}	CP to Qn; see Figure 5[2]	V_{CC}=1.2V	-	75	-	ns
			V_{CC}=2.0V	-	26	39	ns
			V_{CC}=2.7V	-	19	29	ns
			V_{CC}=3.3V; C_L=15pF	-	12	-	ns
			V_{CC}=3.0V to 3.6V[3]	-	14	23	ns
			V_{CC}=4.5V to 5.5V[3]	-	12	19	ns
HIGH to LOW propagation delay	t_{PHL}	$\overline{MR}$ to Qn; see Figure 6	V_{CC}=1.2V	-	75	-	ns
			V_{CC}=2.0V	-	26	39	ns
			V_{CC}=2.7V	-	19	29	ns
			V_{CC}=3.3V; C_L=15pF	-	12	-	ns
			V_{CC}=3.0V to 3.6V[3]	-	14	23	ns
			V_{CC}=4.5V to 5.5V[3]	-	12	19	ns
pulse width	t_W	CP; see Figure 5	V_{CC}=2.0V	34	9	-	ns
			V_{CC}=2.7V	25	6	-	ns
			V_{CC}=3.0V to 3.6V[3]	20	5	-	ns
			V_{CC}=4.5V to 5.5V[3]	13	4	-	ns
		$\overline{MR}$; see Figure 6	V_{CC}=2.0V	34	10	-	ns
			V_{CC}=2.7V	25	8	-	ns
			V_{CC}=3.0V to 3.6V[3]	20	6	-	ns
			V_{CC}=4.5V to 5.5V[3]	13	5	-	ns
recovery time	t_{rec}	$\overline{MR}$ to CP; see Figure 6	V_{CC}=1.2V	-	30	-	ns
			V_{CC}=2.0V	19	10	-	ns
			V_{CC}=2.7V	14	8	-	ns
			V_{CC}=3.0V to 3.6V[3]	11	6	-	ns
			V_{CC}=4.5V to 5.5V[3]	8	5	-	ns
set-up time	t_{su}	Dn to CP; see Figure 7	V_{CC}=1.2V	-	15	-	ns
			V_{CC}=2.0V	22	5	-	ns
			V_{CC}=2.7V	16	4	-	ns
			V_{CC}=3.0V to 3.6V[3]	13	3	-	ns
			V_{CC}=4.5V to 5.5V[3]	9	2	-	ns
hold time Dn to CP	t_h	see Figure 7	V_{CC}=1.2V	-	-10	-	ns
			V_{CC}=2.0V	5	-3	-	ns
			V_{CC}=2.7V	5	-2	-	ns
			V_{CC}=3.0V to 3.6V[3]	5	-2	-	ns
			V_{CC}=4.5V to 5.5V[3]	5	-1	-	ns
maximum frequency	f_{max}	see Figure 5	V_{CC}=2.0V	14	40	-	MHz
			V_{CC}=2.7V	19	58	-	MHz
			V_{CC}=3.3V; C_L=15pF	-	78	-	MHz
			V_{CC}=3.0V to 3.6V[3]	24	70	-	MHz
			V_{CC}=4.5V to 5.5V[3]	36	100	-	MHz
power dissipation capacitance	C_{PD}	V_{CC}=3.3V; C_L=50pF; f_i=1MHz; V_I=GND to V_{CC}[4]		-	40	-	pF

Note:

[1] All typical values are measured at T_{amb}=25℃.

[2] t_{pd} is the same as t_{PLH} and t_{PHL}.

[3] Typical values are measured at nominal supply voltage (V_{CC}=3.3V and V_{CC}=5.0V).

[4] C_{PD} is used to determine the dynamic power dissipation (P_D in uW).

$P_D=C_{PD}\times V_{CC}^2\times f_i\times N+\sum(C_L\times V_{CC}^2\times f_o)$ where:

f_i=input frequency in MHz, f_o=output frequency in MHz

C_L=output load capacitance in pF

V_{CC}=supply voltage in V

N=number of inputs switching

$\sum(C_L\times V_{CC}^2\times f_o)$=sum of the outputs.

3.3.4、AC Characteristics 2

(T_{amb}= -40℃ to +125℃, GND=0V, unless otherwise specified)

Parameter	Symbol	Conditions		Min.	Typ.[1]	Max.	Unit
propagation delay	t_{pd}	CP to Qn; see Figure 5[2]	V_{CC}=2.0V	-	-	49	ns
			V_{CC}=2.7V	-	-	36	ns
			V_{CC}=3.0V to 3.6V[3]	-	-	29	ns
			V_{CC}=4.5V to 5.5V[3]	-	-	24	ns
HIGH to LOW propagation delay	t_{PHL}	$\overline{MR}$ to Qn; see Figure 6	V_{CC}=2.0V	-	-	49	ns
			V_{CC}=2.7V	-	-	36	ns
			V_{CC}=3.0V to 3.6V[3]	-	-	29	ns
			V_{CC}=4.5V to 5.5V[3]	-	-	24	ns
pulse width	t_W	CP; see Figure 5	V_{CC}=2.0V	41	-	-	ns
			V_{CC}=2.7V	30	-	-	ns
			V_{CC}=3.0V to 3.6V[3]	24	-	-	ns
			V_{CC}=4.5V to 5.5V[3]	16	-	-	ns
		$\overline{MR}$; see Figure 6	V_{CC}=2.0V	41	-	-	ns
			V_{CC}=2.7V	30	-	-	ns
			V_{CC}=3.0V to 3.6V[3]	24	-	-	ns
			V_{CC}=4.5V to 5.5V[3]	16	-	-	ns
recovery time	t_{rec}	$\overline{MR}$ to CP; see Figure 6	V_{CC}=2.0V	24	-	-	ns
			V_{CC}=2.7V	18	-	-	ns
			V_{CC}=3.0V to 3.6V[3]	14	-	-	ns
			V_{CC}=4.5V to 5.5V[3]	10	-	-	ns
set-up time	t_{su}	Dn to CP; see Figure 7	V_{CC}=2.0V	26	-	-	ns
			V_{CC}=2.7V	19	-	-	ns
			V_{CC}=3.0V to 3.6V[3]	15	-	-	ns
			V_{CC}=4.5V to 5.5V[3]	10	-	-	ns
hold time Dn to CP	t_h	see Figure 7	V_{CC}=2.0V	5	-	-	ns
			V_{CC}=2.7V	5	-	-	ns
			V_{CC}=3.0V to 3.6V[3]	5	-	-	ns
			V_{CC}=4.5V to 5.5V[3]	5	-	-	ns
maximum frequency	f_{max}	see Figure 5	V_{CC}=2.0V	12	-	-	MHz
			V_{CC}=2.7V	16	-	-	MHz
			V_{CC}=3.0V to 3.6V[3]	20	-	-	MHz

			V_{CC}=4.5V to 5.5V[3]	30	-	-	MHz

Note:

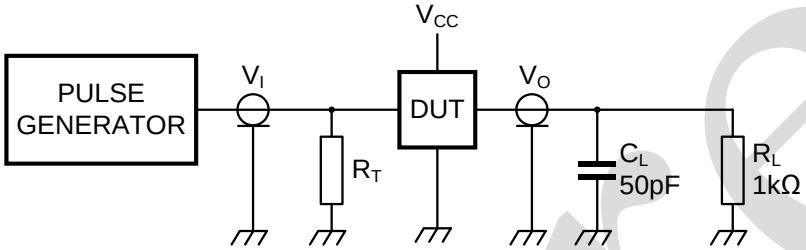
[1] All typical values are measured at T_{amb}=25℃.

[2] t_{pd} is the same as t_{PLH} and t_{PHL}.

[3] Typical values are measured at nominal supply voltage (V_{CC}=3.3V and V_{CC}=5.0V).

4、Testing Circuit

4.1、AC Testing Circuit



Definitions for test circuit:

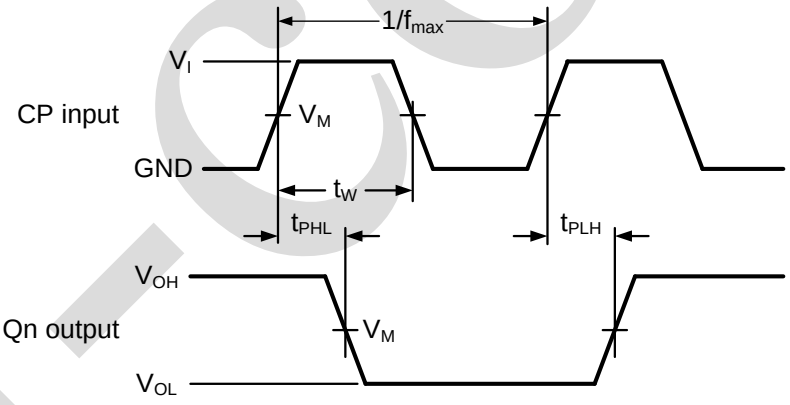
R_L=Load resistance.

C_L=Load capacitance including jig and probe capacitance.

R_T=Termination resistance should be equal to output impedance Z_o of the pulse generator.

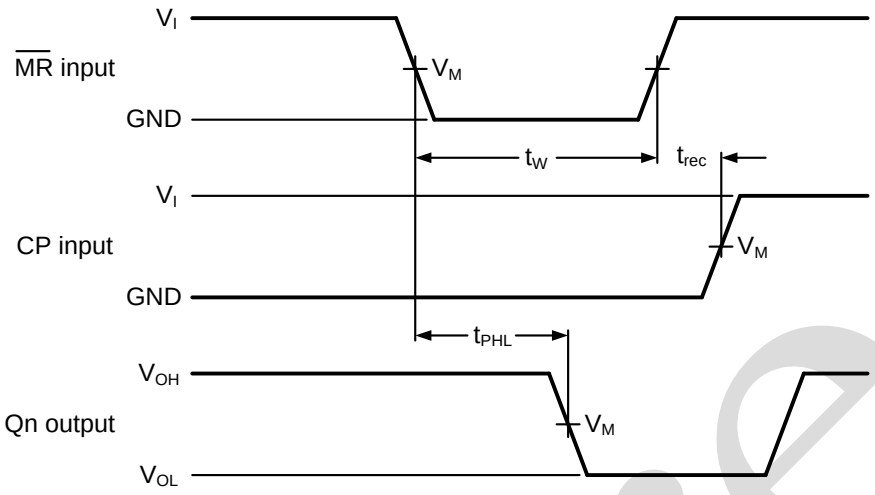
Figure 4. Test circuit for measuring switching times

4.2、AC Testing Waveforms



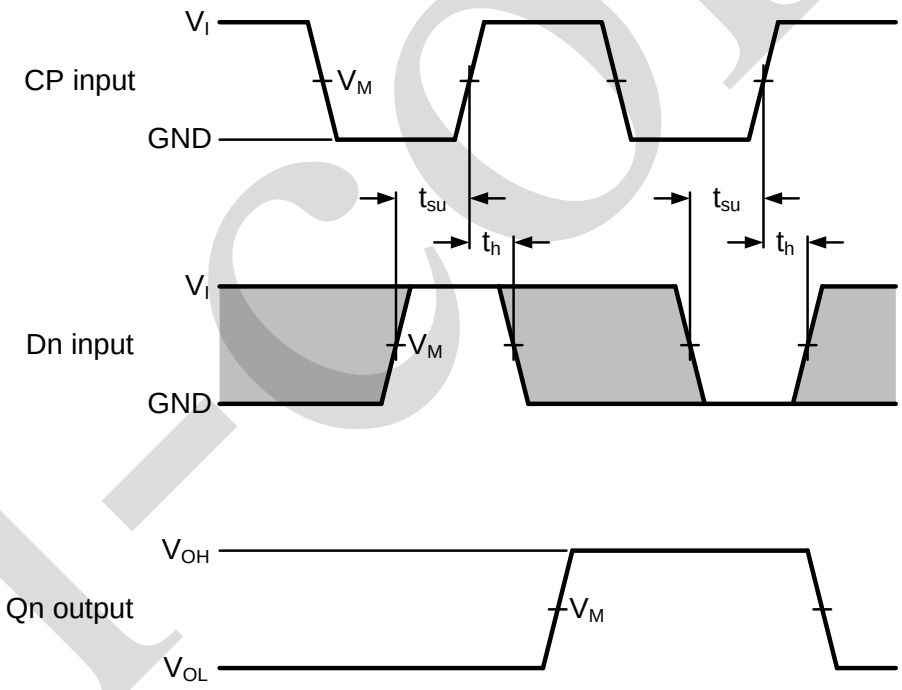
V_{OL} and V_{OH} are typical output voltage levels that occur with the output load.

Figure 5. Propagation delay clock (CP) to output (Qn), clock pulse width and maximum clock frequency



V_{OL} and V_{OH} are typical output voltage levels that occur with the output load.

Figure 6. Pulse width master reset ($\overline{MR}$), propagation delay master reset ($\overline{MR}$) to output (Qn) and the master reset ($\overline{MR}$) to clock (CP) recovery time



V_{OL} and V_{OH} are typical output voltage levels that occur with the output load.

The shaded areas indicate when the input is permitted to change for predictable output performance.

Figure 7. Data set-up and hold times inputs (Dn) to clock (CP)

4.3、Measurement Points

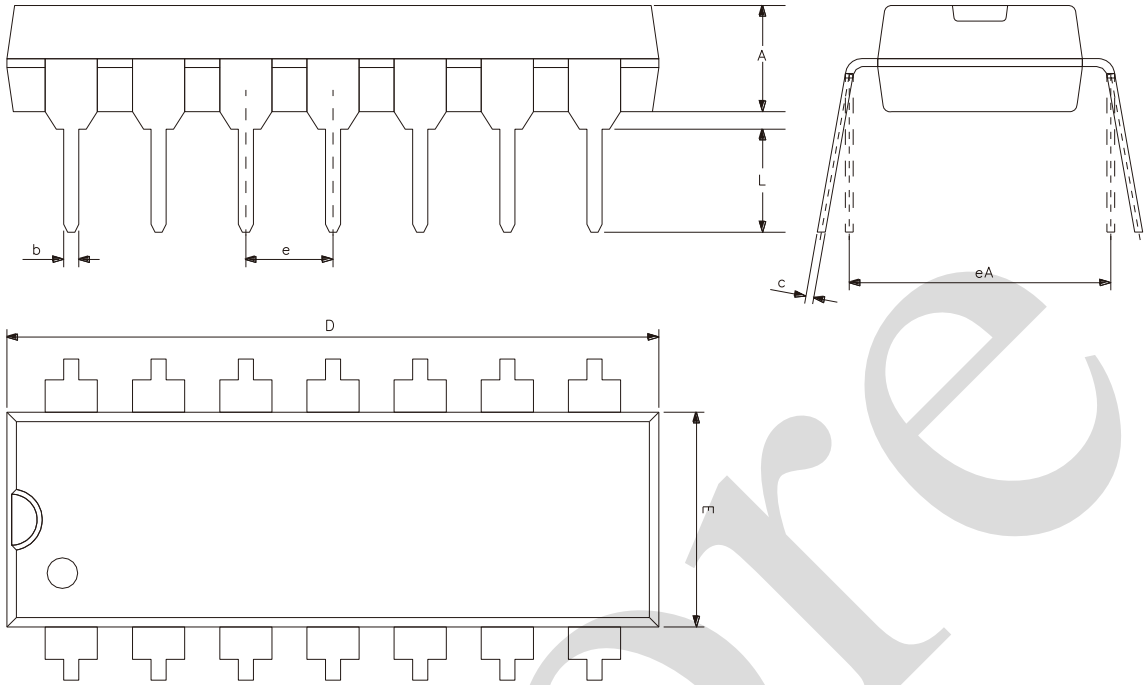
Supply voltage	Input	Output
V_{CC}	V_M	V_M
1.2V	$0.5\times V_{CC}$	$0.5\times V_{CC}$
2.0V	$0.5\times V_{CC}$	$0.5\times V_{CC}$
2.7V	1.5V	1.5V
3.0V to 3.6V	1.5V	1.5V
4.5V to 5.5V	$0.5\times V_{CC}$	$0.5\times V_{CC}$

4.4、Test Data

Supply voltage	Input		Load		Test
V_{CC}	V_I	t_r, t_f	C_L	R_L	
1.2V	V_{CC}	≤2.5ns	50pF	1kΩ	t_{PHL}, t_{PLH}
2.0V	V_{CC}	≤2.5ns	50pF	1kΩ	t_{PHL}, t_{PLH}
2.7V	2.7V	≤2.5ns	50pF	1kΩ	t_{PHL}, t_{PLH}
3.0V to 3.6V	2.7V	≤2.5ns	50pF, 15pF	1kΩ	t_{PHL}, t_{PLH}
4.5V to 5.5V	V_{CC}	≤2.5ns	50pF	1kΩ	t_{PHL}, t_{PLH}

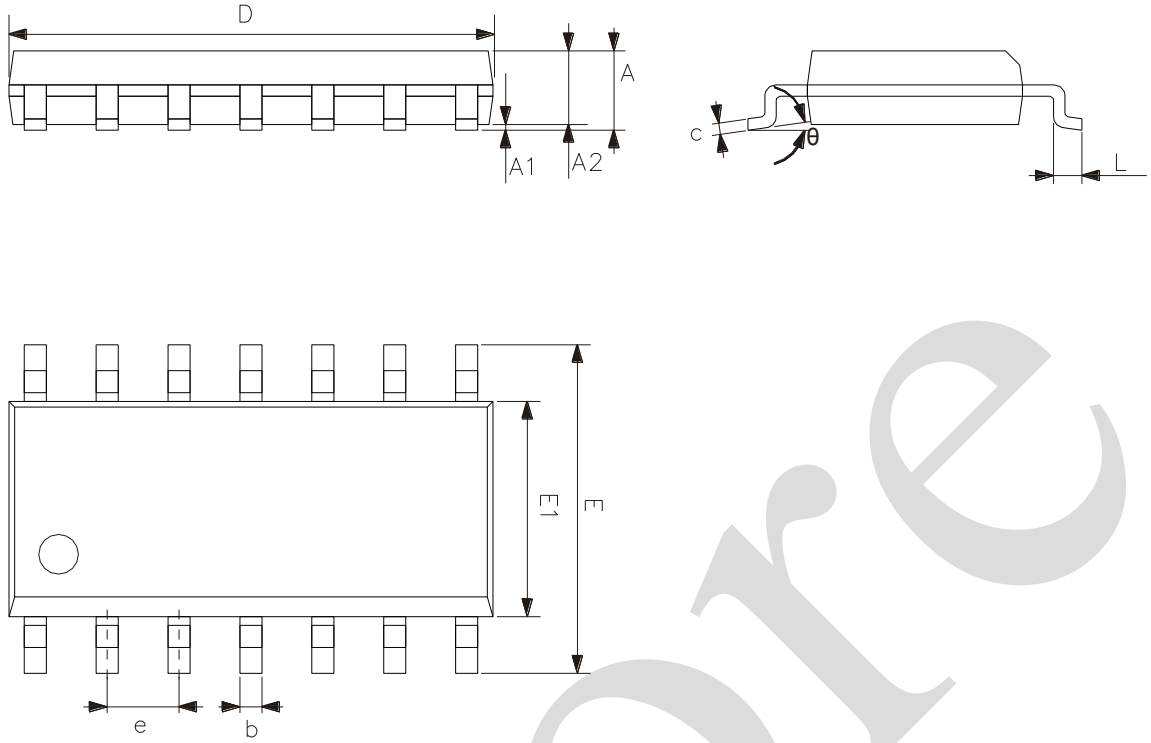
5、Package Information

5.1、DIP14



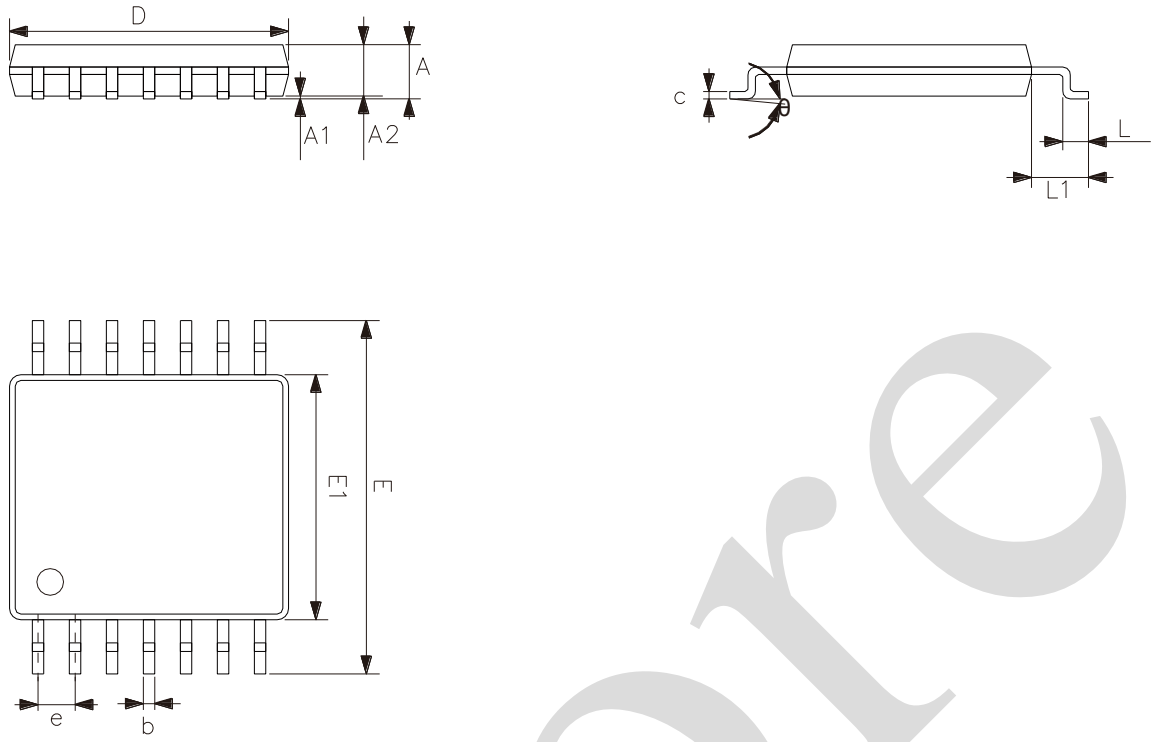
Symbol	Dimensions (mm)	
	Min.	Max.
A	3.05	3.60
b	0.33	0.56
c	0.20	0.36
D	18.80	19.40
E	6.20	6.60
e	2.54	
eA	7.62	10.90
L	2.92	-

5.2、SOP14



Symbol	Dimensions (mm)	
	Min.	Max.
A	1.50	1.75
A1	0.05	0.25
A2	1.30	-
b	0.33	0.50
c	0.19	0.25
D	8.43	8.76
E	5.80	6.25
E1	3.75	4.00
e	1.27	
L	0.40	0.89
θ	0 °	8 °

5.3、TSSOP14



Symbol	Dimensions (mm)	
	Min.	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	4.90	5.10
E1	4.30	4.50
E	6.20	6.60
e	0.65	
L	0.45	0.75
L1	1.00	
θ	0°	8°

6、Statements And Notes

6.1、The name and content of Hazardous substances or Elements in the product

Part name	Hazardous substances or Elements									
	Lead and lead compounds	Mercury and mercury compounds	Cadmium and cadmium compounds	Hexavalent chromium compounds	Polybrominated biphenyls	Polybrominated biphenyl ethers	Dibutyl phthalate	Butylbenzyl phthalate	Di-2-ethylhexyl phthalate	Diisobutyl phthalate
Lead frame	○	○	○	○	○	○	○	○	○	○
Plastic resin	○	○	○	○	○	○	○	○	○	○
Chip	○	○	○	○	○	○	○	○	○	○
The lead	○	○	○	○	○	○	○	○	○	○
Plastic sheet installed	○	○	○	○	○	○	○	○	○	○
explanation	○：Indicates that the content of hazardous substances or elements in the detection limit of the following the SJ/T11363-2006 standard. ×：Indicates that the content of hazardous substances or elements exceeding the SJ/T11363-2006 Standard limit requirements.									

6.2、Notes

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