



AiP74LV164

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

Product Specification

Specification Revision History:

Version	Date	Description
2017-09-A1	2017-09	New
2021-12-A2	2021-12	Modify Ordering Information
2022-02-A3	2022-02	Modify ambient temperature to -40℃~+105℃ and add electrical characteristics of -40℃~+105℃



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:

- Wide operating voltage: 1.0V to 5.5V
- Optimized for low-voltage applications: 1.0V to 3.6V
- Accepts TTL input levels between $V_{CC}=2.7V$ and $V_{CC}=3.6V$
- Typical V_{OLP} (output ground bounce): $<0.8V$ at $V_{CC}=3.3V$ and $T_{amb}=25^{\circ}C$
- Typical V_{OHV} (output V_{OH} undershoot): $>2V$ at $V_{CC}=3.3V$ and $T_{amb}=25^{\circ}C$
- Gated serial data inputs
- Asynchronous master reset
- Specified from $-40^{\circ}C$ to $+105^{\circ}C$
- 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	94 PCS/tube	200 tube/box	18800 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

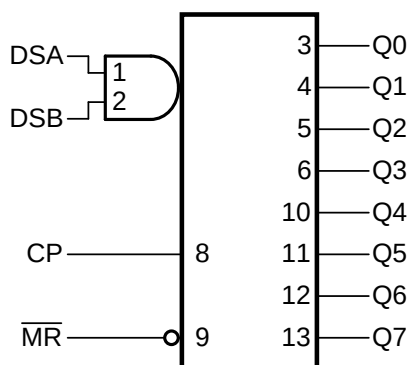


Figure 1. Logic symbol

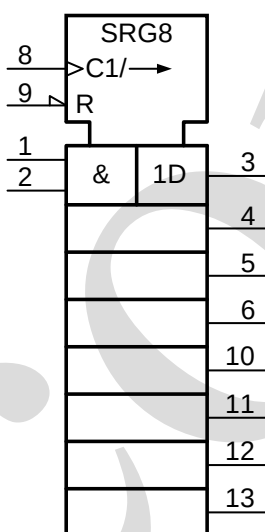


Figure 2. IEC logic symbol

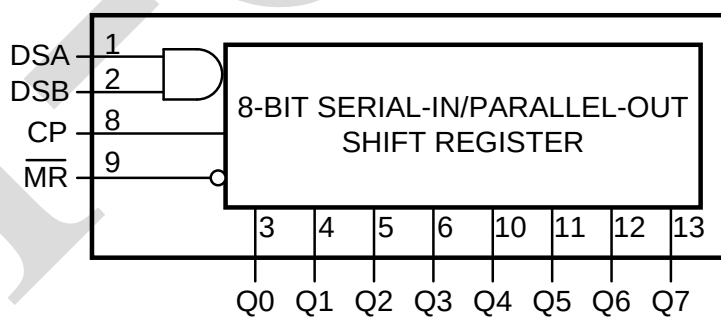
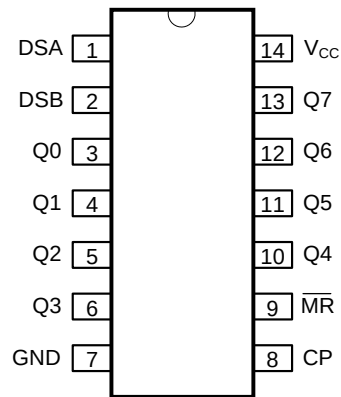


Figure 3. Functional diagram



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	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	
	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

($T_{amb}=25^{\circ}\text{C}$, 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}	$V_I < -0.5\text{V}$ or $V_I > V_{CC} + 0.5\text{V}^{[1]}$	-	± 20	mA
output clamping current	I_{OK}	$V_O < -0.5\text{V}$ or $V_O > V_{CC} + 0.5\text{V}^{[1]}$	-	± 50	mA
output current	I_O	$V_O = -0.5\text{V}$ to $(V_{CC} + 0.5\text{V})$	-	± 25	mA
supply current	I_{CC}	-	-	50	mA
ground current	I_{GND}	-	-50	-	mA
operating temperature	T_{amb}	-	-40	+105	$^{\circ}\text{C}$
storage temperature	T_{stg}	-	-65	+150	$^{\circ}\text{C}$
total power dissipation	P_{tot}	$T_{amb} = -40^{\circ}\text{C}$ to $+105^{\circ}\text{C}^{[2]}$	-	500	mW
soldering temperature	T_L	10s	DIP	245	$^{\circ}\text{C}$
			SOP	250	$^{\circ}\text{C}$

Note:

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

[2] For DIP14 package: P_{tot} derates linearly with 12mW/K above 70°C .

For SOP14 package: P_{tot} derates linearly with 8mW/K above 70°C .

For (T)SSOP14 package: P_{tot} derates linearly with 5.5mW/K above 60°C .

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	-	+105	$^{\circ}\text{C}$
input transition rise and fall rate	$\Delta t/\Delta V$	$V_{CC}=1.0\text{V}$ to 2.0V	-	-	500	ns/V
		$V_{CC}=2.0\text{V}$ to 2.7V	-	-	200	ns/V
		$V_{CC}=2.7\text{V}$ to 3.6V	-	-	100	ns/V
		$V_{CC}=3.6\text{V}$ to 5.5V	-	-	50	ns/V

Note:

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



3.3、Electrical Characteristics

3.3.1、DC Characteristics 1

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

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 $T_{amb}=25^{\circ}\text{C}$.



3.3.1、DC Characteristics 1

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

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 $T_{amb}=25^{\circ}\text{C}$.

**3.3.2、DC Characteristics 2**(T_{amb}= -40℃ to +105℃, 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}	$\overline{\text{MR}}$ 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
		$\overline{\text{MR}}$; 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}	$\overline{\text{MR}}$ 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 $T_{amb}=25^{\circ}\text{C}$.[2] t_{pd} is the same as t_{PLH} and t_{PHL} .[3] Typical values are measured at nominal supply voltage ($V_{CC}=3.3\text{V}$ and $V_{CC}=5.0\text{V}$).[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°C to +105°C, GND=0V, unless otherwise specified)

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



			$V_{CC}=4.5V \text{ to } 5.5V^{[3]}$	30	-	-	MHz
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Note:

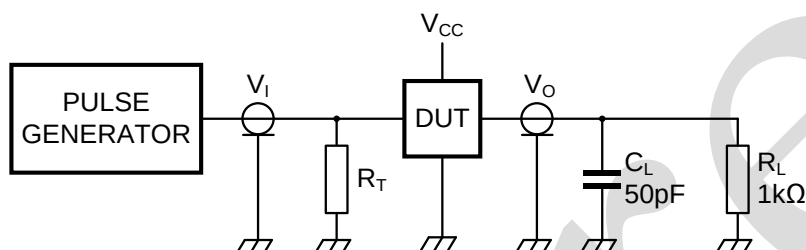
[1] All typical values are measured at $T_{amb}=25^{\circ}C$.

[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:

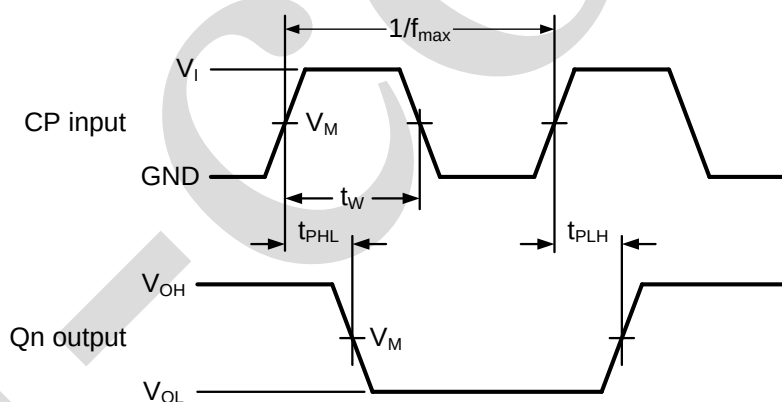
R_L =Load resistance.

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.

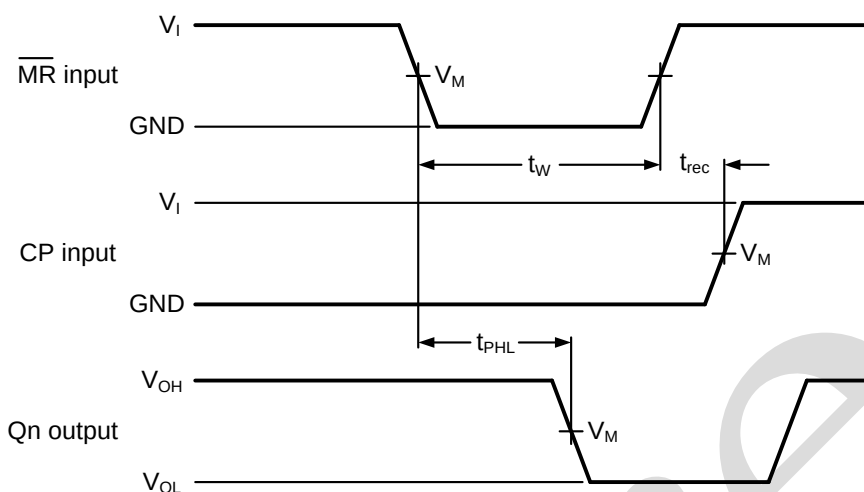
Figure 4. Test circuit for measuring switching times

4.2、AC Testing Waveforms



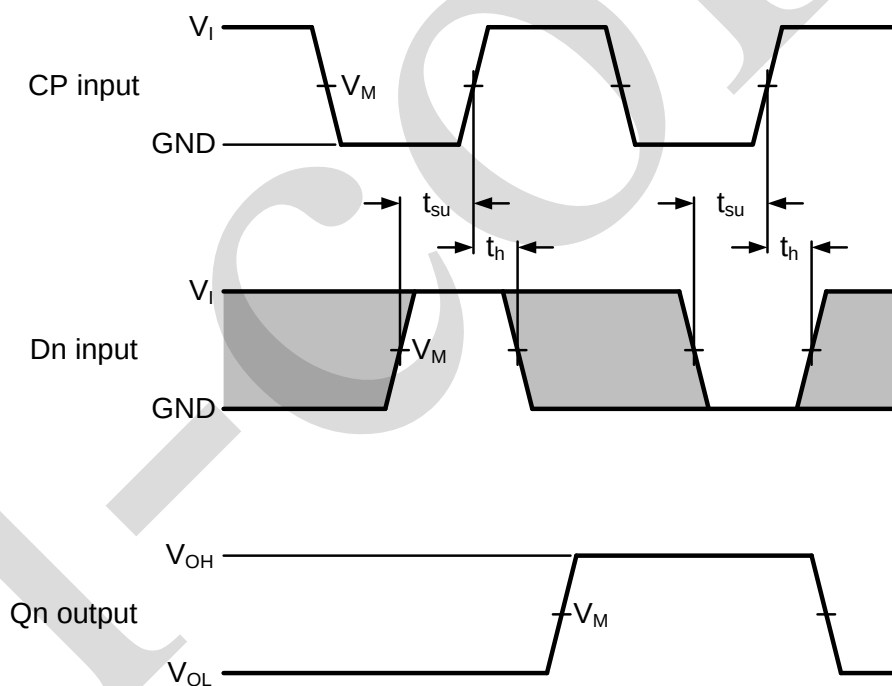
V_{OL} and V_{OH} are typical output voltage levels that occur with the output load.

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	$0.5 \times V_{CC}$	$0.5 \times V_{CC}$

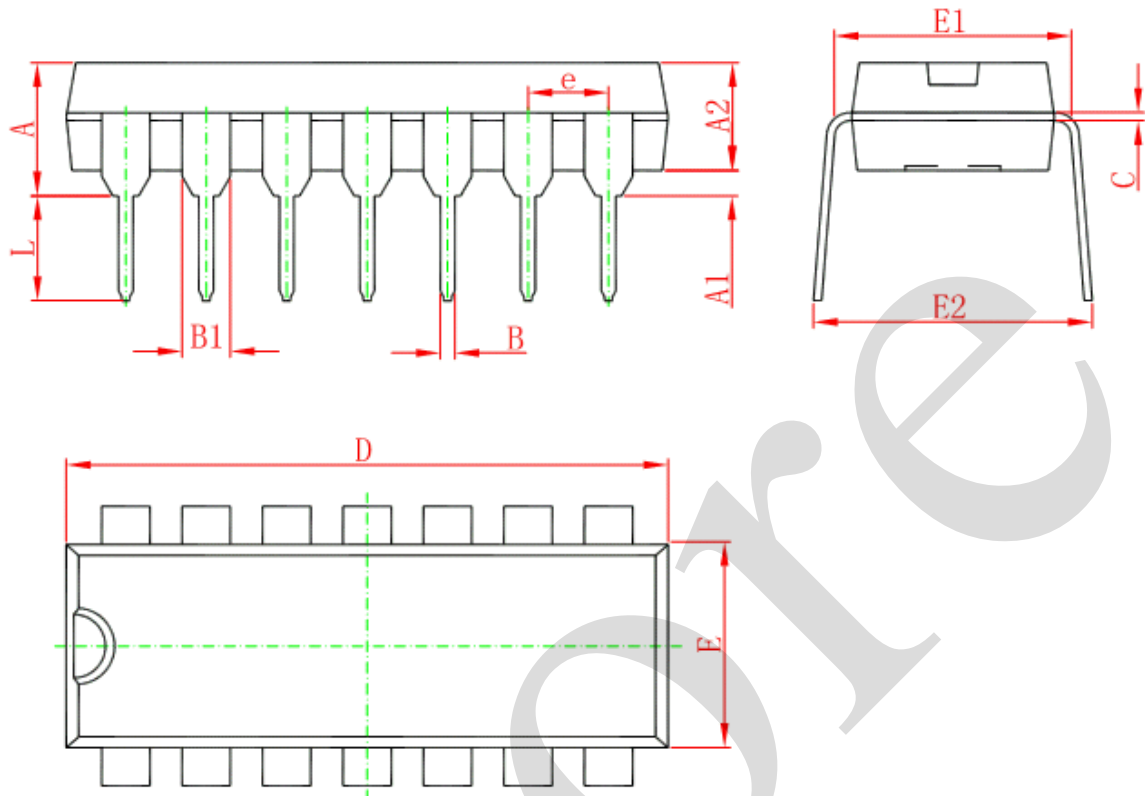
4.4、Test Data

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



5、Package Information

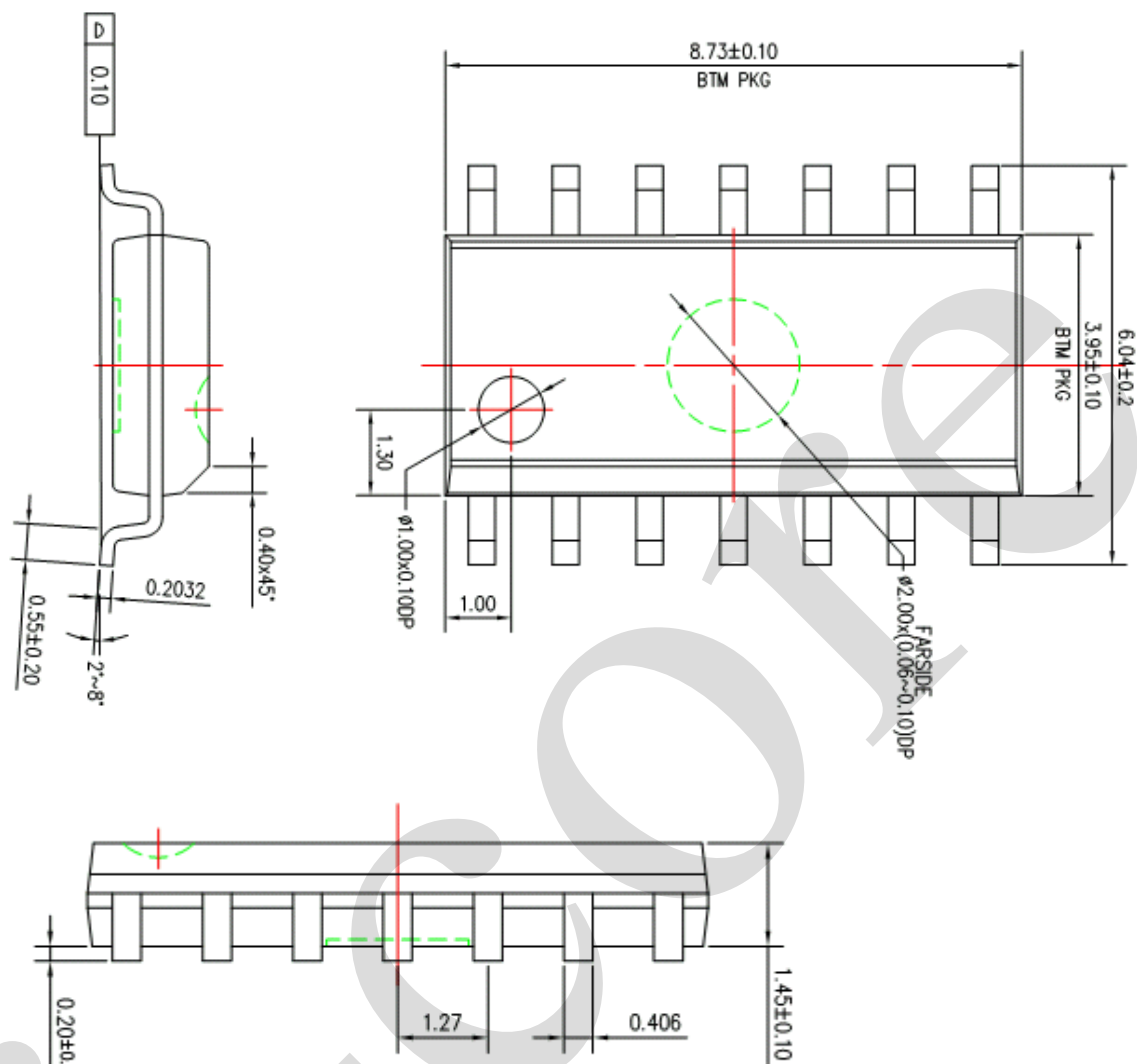
5.1、DIP14



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	3.710	4.310	0.146	0.170
A1	0.510		0.020	
A2	3.200	3.600	0.126	0.142
B	0.380	0.570	0.015	0.022
B1	1.524 (BSC)		0.060 (BSC)	
C	0.204	0.360	0.008	0.014
D	18.800	19.200	0.740	0.756
E	6.200	6.600	0.244	0.260
E1	7.320	7.920	0.288	0.312
e	2.540 (BSC)		0.100 (BSC)	
L	3.000	3.600	0.118	0.142
E2	8.400	9.000	0.331	0.354

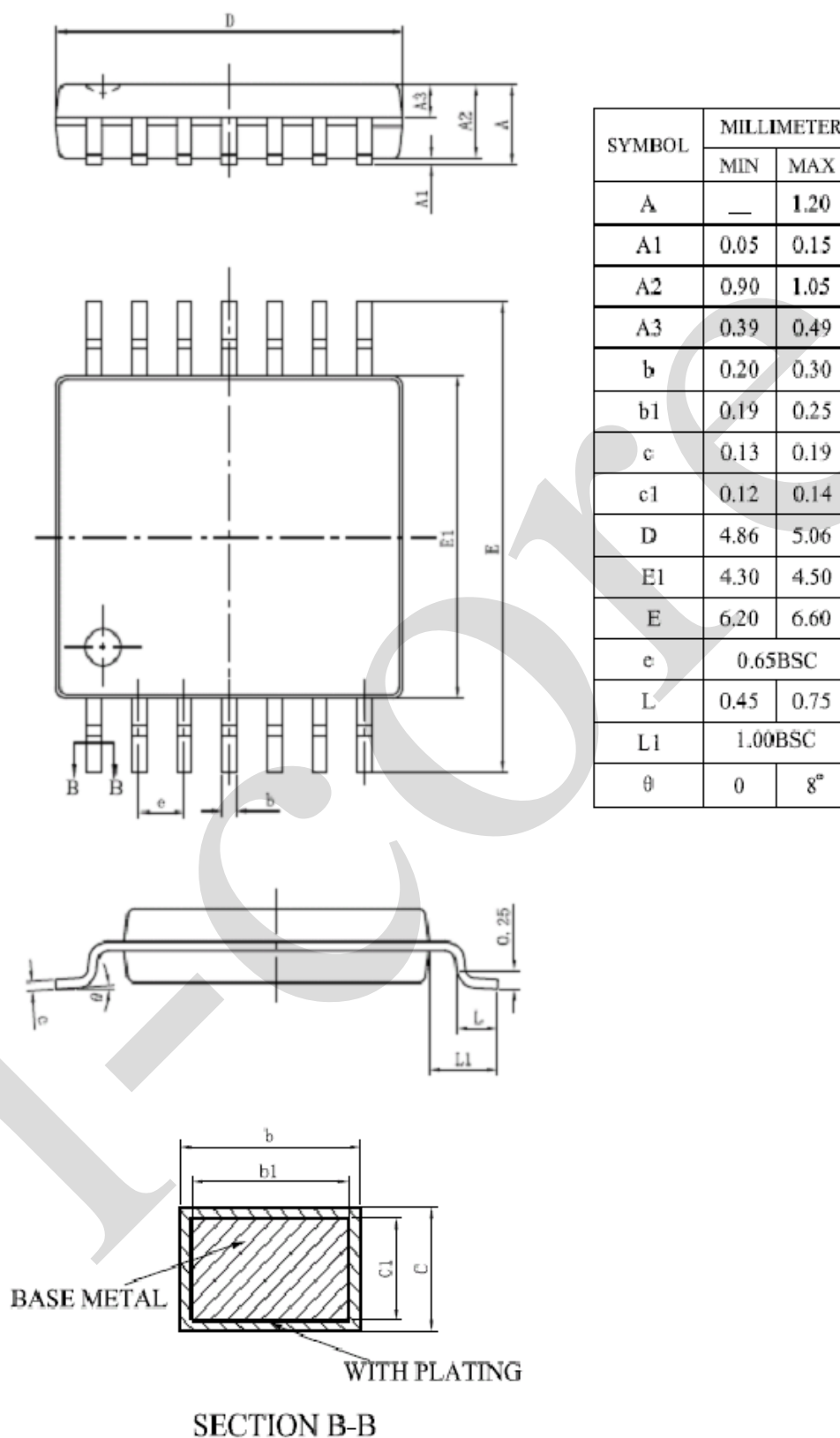


5.2、SOP14





5.3、TSSOP14





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、Notion

Recommended carefully reading this information before the use of this product;

The information in this document are subject to change without notice;

This information is using to the reference only, the company is not responsible for any loss;

The company is not responsible for the any infringement of the third party patents or other rights of the responsibility.