AiP74LV4052
Dual 4-channel Analog Multiplexer/Demultiplexer

Product Specification

Specification Revision History:

Version	Date	Description
2019-06-A1	2019-06	New
2021-12-A2	2021-12	Modify Ordering Information
2022-03-A3	2022-03	Modify ambient temperature to -40℃~+105℃ and add electrical characteristics of -40℃~+105℃
2023-11-A4	2023-11	Modify ambient temperature to -40℃~+125℃ and modify Ordering Information

1、General Description

The AiP74LV4052 is a low-voltage CMOS device and is pin and function compatible with the AiP74HC/HCT4052.

The AiP74LV4052 is a dual 4-channel analog multiplexer/demultiplexer with a common select logic. Each multiplexer has four independent inputs/outputs (nY0 to nY3) and a common input/output (nZ). The common channel select logics include two digital select inputs (S0 and S1) and an active LOW enable input ($\overline{E}$). With $\overline{E}$ LOW, one of the four switches is selected (low impedance ON-state) by S0 and S1. With $\overline{E}$ HIGH, all switches are in the high impedance OFF-state, independent of S0 and S1. V_{CC} and GND are the supply voltage pins for the digital control inputs (S0, S1 and $\overline{E}$). The V_{CC} to GND ranges are 1.0V to 6.0V. The analog inputs/outputs (nY0, to nY3, and nZ) can swing between V_{CC} as a positive limit and V_{EE} as a negative limit. V_{CC}-V_{EE} may not exceed 6.0V. For operation as a digital multiplexer/demultiplexer, V_{EE} is connected to GND (typically ground).

Features:

- Optimized for low-voltage applications: 1.0V to 6.0V
- Accepts TTL input levels between V_{CC}=2.7V and V_{CC}=3.6V
- Low ON resistance:
  - 145Ω (typical) at V_{CC}-V_{EE}=2.0V
  - 90Ω (typical) at V_{CC}-V_{EE}=3.0V
  - 60Ω (typical) at V_{CC}-V_{EE}=4.5V
- Logic level translation: to enable 3V logic to communicate with ±3V analog signals
- Typical ‘break before make’ built in
- Specified from -40℃ to +125℃
- Packaging information: DIP16/SOP16/TSSOP16

Ordering Information:

Tube packing specifications:

Part number	Packaging form	Marking code	Tube quantity	Boxed tube quantity	Boxed quantity	Notes
AiP74LV4052DA16.TB	DIP16	74LV4052	25 PCS/tube	40 tube/box	1000 PCS/box	Dimensions of plastic enclosure: 19.0mm×6.4mm Pin spacing: 2.54mm
AiP74LV4052SA16.TB	SOP16	74LV4052	50 PCS/tube	200 tube/box	10000 PCS/box	Dimensions of plastic enclosure: 10.0mm×3.9mm Pin spacing: 1.27mm
AiP74LV4052TA16.TB	TSSOP16	74LV4052	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
AiP74LV4052SA16.TR	SOP16	74LV4052	4000 PCS/reel	8000 PCS/box	Dimensions of plastic enclosure: 10.0mm×3.9mm Pin spacing:1.27mm
AiP74LV4052TA16.TR	TSSOP16	74LV4052	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

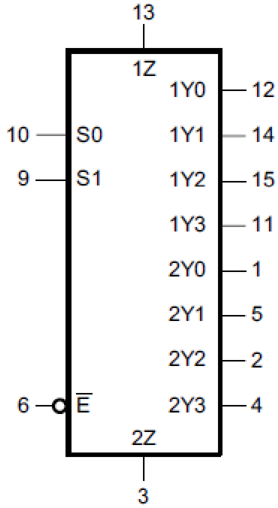


Figure 1. Logic symbol

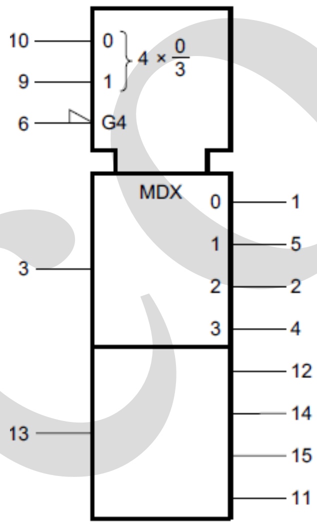


Figure 2. IEC logic symbol

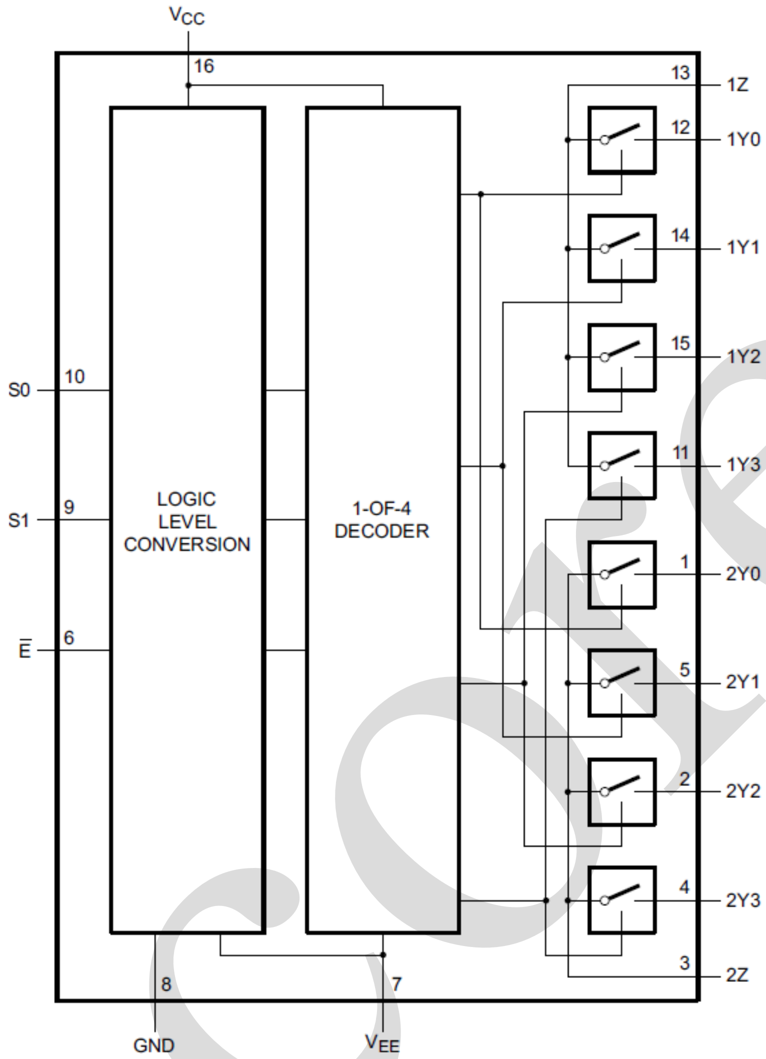


Figure 3. Functional diagram

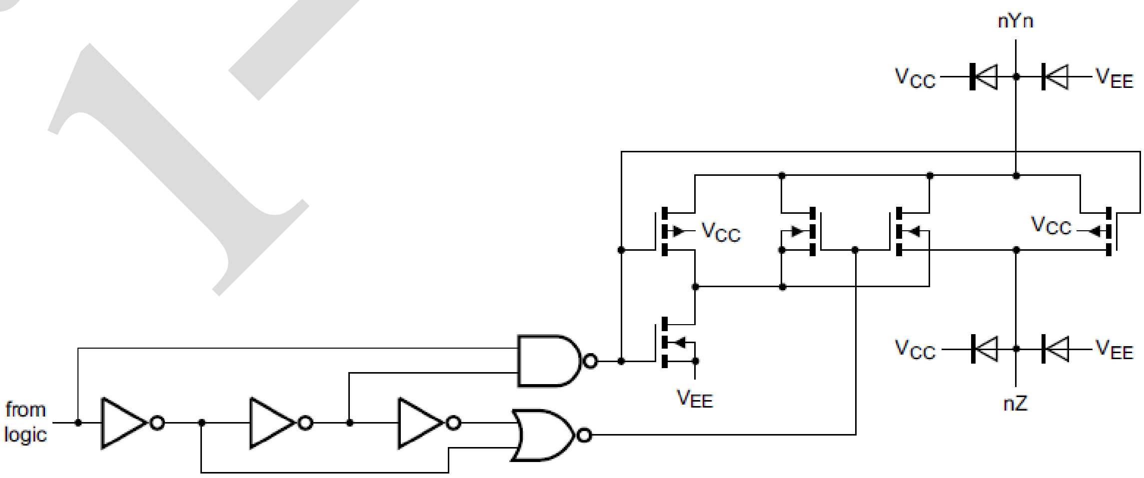
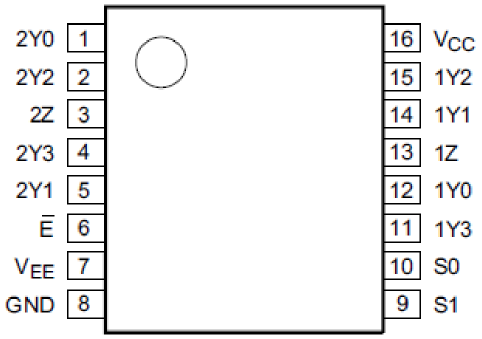


Figure 4. Schematic diagram (one switch)

2.2、Pin Configurations



2.3、Pin Description

Pin No.	Pin Name	Description
1	2Y0	independent input or output
2	2Y2	independent input or output
3	2Z	common output or input
4	2Y3	independent input or output
5	2Y1	independent input or output
6	$\overline{E}$	enable input (active LOW)
7	V_{EE}	supply voltage
8	GND	ground (0V)
9	S1	select input
10	S0	select input
11	1Y3	independent input or output
12	1Y0	independent input or output
13	1Z	common output or input
14	1Y1	independent input or output
15	1Y2	independent input or output
16	V_{CC}	supply voltage

2.4、Function Table

Input			Channel ON
$\overline{E}$	S1	S0	
L	L	L	nY0 to nZ
L	L	H	nY1 to nZ
L	H	L	nY2 to nZ
L	H	H	nY3 to nZ
H	X	X	none

Note: H=HIGH voltage level; L=LOW voltage level; X=don’t care.

3、Electrical Parameter

3.1、Absolute Maximum Ratings

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

Parameter	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		-	±20	mA
switch clamping current	I_{SK}	V_{SW}< -0.5V or V_{SW}>V_{CC}+0.5V		-	±20	mA
switch current	I_{SW}	V_{SW}> -0.5V or V_{SW}<V_{CC}+0.5V; source or sink current		-	±25	mA
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] For DIP16 packages: above 70℃ the value of P_{tot} derates linearly with 12mW/K.

[2] For SOP16 packages: above 70℃ the value of P_{tot} derates linearly with 8mW/K.

[3] For (T)SSOP16 packages: above 60℃ the value of P_{tot} derates linearly with 5.5mW/K.

3.2、Recommended Operating Conditions

Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
supply voltage	V_{CC}	-	1	3.3	6	V
input voltage	V_I	-	0	-	V_{CC}	V
switch voltage	V_{SW}	-	0	-	V_{CC}	V
ambient temperature	T_{amb}	in free air	-40	-	+125	℃
input transition rise and fall rate	$\Delta t/\Delta V$	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 6.0V	-	-	100	ns/V

Note: The static characteristics are guaranteed from V_{CC}=1.2V to 6.0V. However, 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 (V)	Min.	Typ.	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	3.15	-	-	V
		V_{CC}=6.0V	4.20	-	-	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	-	-	1.35	V
		V_{CC}=6.0V	-	-	1.80	V
input leakage current	I_I	V_I=V_{CC} or GND; V_{CC}=3.6V	-	-	1.0	uA
		V_I=V_{CC} or GND; V_{CC}=6.0V	-	-	2.0	uA
OFF-state leakage current	$I_{S(OFF)}$	V_I=V_{IH} or V_{IL}; see Figure 15; V_{CC}=3.6V	-	-	1.0	uA
		V_I=V_{IH} or V_{IL}; see Figure 15; V_{CC}=6.0V	-	-	2.0	uA
ON-state leakage current	$I_{S(ON)}$	V_I=V_{IH} or V_{IL}; see Figure 16; V_{CC}=3.6V	-	-	1.0	uA
		V_I=V_{IH} or V_{IL}; see Figure 16; V_{CC}=6.0V	-	-	2.0	uA
supply current	I_{CC}	V_I=V_{CC} or GND; I_O=0A; V_{CC}=3.6V	-	-	20	uA
		V_I=V_{CC} or GND; I_O=0A; V_{CC}=6.0V	-	-	40	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
switch capacitance	C_{sw}	independent pins nYn	-	5	-	pF
		common pins nZ	-	12	-	pF
ON resistance (peak)	$R_{ON(peak)}$	V_I=0V to V_{CC}-V_{EE}; V_{CC}=2.0V; I_{SW}=1000uA	-	145	325	Ω
		V_I=0V to V_{CC}-V_{EE}; V_{CC}=2.7V; I_{SW}=1000uA	-	90	200	Ω
		V_I=0V to V_{CC}-V_{EE}; V_{CC}=3.0V to 3.6V; I_{SW}=1000uA	-	80	180	Ω
		V_I=0V to V_{CC}-V_{EE}; V_{CC}=4.5V; I_{SW}=1000uA	-	60	135	Ω
		V_I=0V to V_{CC}-V_{EE}; V_{CC}=6.0V; I_{SW}=1000uA	-	55	125	Ω
ON resistance mismatch between channels	ΔR_{ON}	V_I=0V to V_{CC}-V_{EE}; V_{CC}=2.0V; I_{SW}=1000uA	-	5	-	Ω
		V_I=0V to V_{CC}-V_{EE}; V_{CC}=2.7V; I_{SW}=1000uA	-	4	-	Ω
		V_I=0V to V_{CC}-V_{EE}; V_{CC}=3.0V to 3.6V; I_{SW}=1000uA	-	4	-	Ω
		V_I=0V to V_{CC}-V_{EE}; V_{CC}=4.5V;	-	3	-	Ω

			I_{SW}=1000uA				
			V_{CC}=6.0V; I_{SW}=1000uA	-	2	-	Ω
ON resistance (rail)	$R_{ON(rail)}$	V_I=GND	V_{CC}=1.2V; I_{SW}=100uA	-	225	-	Ω
			V_{CC}=2.0V; I_{SW}=1000uA	-	110	235	Ω
			V_{CC}=2.7V; I_{SW}=1000uA	-	70	145	Ω
			V_{CC}=3.0V to 3.6V; I_{SW}=1000uA	-	60	130	Ω
			V_{CC}=4.5V; I_{SW}=1000uA	-	45	100	Ω
			V_{CC}=6.0V; I_{SW}=1000uA	-	40	85	Ω
		V_I=V_{CC}-V_{EE}	V_{CC}=1.2V; I_{SW}=100uA	-	250	-	Ω
			V_{CC}=2.0V; I_{SW}=1000uA	-	120	320	Ω
			V_{CC}=2.7V; I_{SW}=1000uA	-	75	195	Ω
			V_{CC}=3.0V to 3.6V; I_{SW}=1000uA	-	70	175	Ω
			V_{CC}=4.5V; I_{SW}=1000uA	-	50	130	Ω
			V_{CC}=6.0V; I_{SW}=1000uA	-	45	120	Ω

Note:

[1] Typical values are measured at T_{amb}=25°C.

[2] When supply voltages (V_{CC}-V_{EE}) near 1.2V the analog switch ON resistance becomes extremely non-linear. When using a supply of 1.2V, only use these devices for transmitting digital signals.

[3] On resistance waveform and test circuit see Figure 13 and Figure 14.

3.3.2、DC Characteristics 2

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

Parameter	Symbol	Conditions (V)		Min.	Typ.	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		3.15	-	-	V
		V_{CC}=6.0V		4.20	-	-	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		-	-	1.35	V
		V_{CC}=6.0V		-	-	1.80	V
input leakage current	I_I	V_I=V_{CC} or GND	V_{CC}=3.6V	-	-	1.0	uA
			V_{CC}=6.0V	-	-	2.0	uA
OFF-state leakage current	$I_{S(OFF)}$	V_I=V_{IH} or V_{IL}; see Figure 15	V_{CC}=3.6V	-	-	1.0	uA
			V_{CC}=6.0V	-	-	2.0	uA
ON-state leakage current	$I_{S(ON)}$	V_I=V_{IH} or V_{IL}; see Figure 16	V_{CC}=3.6V	-	-	1.0	uA
			V_{CC}=6.0V	-	-	2.0	uA
supply current	I_{CC}	V_I=V_{CC} or GND; I_O=0A	V_{CC}=3.6V	-	-	40	uA
			V_{CC}=6.0V	-	-	80	uA
additional supply current	ΔI_{CC}	per input; V_I=V_{CC}-0.6V; V_{CC}=2.7V to 3.6V		-	-	850	uA
ON resistance (peak)	$R_{ON(peak)}$	V_I=0V to V_{CC}-V_{EE}	V_{CC}=2.0V; I_{SW}=1000uA	-	-	375	Ω
			V_{CC}=2.7V; I_{SW}=1000uA	-	-	235	Ω
			V_{CC}=3.0V to 3.6V; I_{SW}=1000uA	-	-	210	Ω
			V_{CC}=4.5V; I_{SW}=1000uA	-	-	160	Ω
			V_{CC}=6.0V; I_{SW}=1000uA	-	-	145	Ω
ON resistance (rail)	$R_{ON(rail)}$	V_I=GND	V_{CC}=2.0V; I_{SW}=1000uA	-	-	270	Ω
			V_{CC}=2.7V; I_{SW}=1000uA	-	-	165	Ω
			V_{CC}=3.0V to 3.6V; I_{SW}=1000uA	-	-	150	Ω
			V_{CC}=4.5V; I_{SW}=1000uA	-	-	115	Ω
			V_{CC}=6.0V; I_{SW}=1000uA	-	-	100	Ω
		V_I=V_{CC}-V_{EE}	V_{CC}=2.0V;	-	-	370	Ω

			I_{SW}=1000uA				
			V_{CC}=2.7V; I_{SW}=1000uA	-	-	225	Ω
			V_{CC}=3.0V to 3.6V; I_{SW}=1000uA	-	-	205	Ω
			V_{CC}=4.5V; I_{SW}=1000uA	-	-	150	Ω
			V_{CC}=6.0V; I_{SW}=1000uA	-	-	135	Ω

Note:

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

[2] When supply voltages (V_{CC}-V_{EE}) near 1.2V the analog switch ON resistance becomes extremely non-linear. When using a supply of 1.2V, only use these devices for transmitting digital signals.

[3] On resistance waveform and test circuit see Figure 13 and Figure 14.

3.3.3、AC Characteristics 1

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

Parameter	Symbol	Conditions		Min.	Typ.	Max.	Unit
propagation delay	t_{pd}	nYn to nZ, nZ to nYn; see Figure 6	V_{CC}=1.2V	-	25	-	ns
			V_{CC}=2.0V	-	9	17	ns
			V_{CC}=2.7V	-	6	13	ns
			V_{CC}=3.0V to 3.6V	-	5	10	ns
			V_{CC}=4.5V	-	4	9	ns
			V_{CC}=6.0V	-	3	7	ns
enable time	t_{en}	$\overline{E}$, Sn to nYn, nZ; see Figure 7	V_{CC}=1.2V	-	190	-	ns
			V_{CC}=2.0V	-	65	121	ns
			V_{CC}=2.7V	-	48	89	ns
			V_{CC}=3.0V to 3.6V; C_L=15pF	-	30	-	ns
			V_{CC}=3.0V to 3.6V	-	36	71	ns
			V_{CC}=4.5V	-	32	60	ns
			V_{CC}=6.0V	-	25	46	ns
disable time	t_{dis}	$\overline{E}$, Sn to nYn, nZ; see Figure 7	V_{CC}=1.2V	-	125	-	ns
			V_{CC}=2.0V	-	43	80	ns
			V_{CC}=2.7V	-	33	59	ns
			V_{CC}=3.0V to 3.6V; C_L=15pF	-	22	-	ns
			V_{CC}=3.0V to 3.6V	-	26	48	ns
			V_{CC}=4.5V	-	23	41	ns
			V_{CC}=6.0V	-	28	32	ns
power dissipation capacitance	C_{PD}	C_L=50pF; f_i=1MHz; V_I=GND to V_{CC}		-	57	-	pF

Note:

[1] Typical values are measured at T_{amb}=25°C.

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

t_{en} is the same as t_{PZL} and t_{PZH}.

t_{dis} is the same as t_{PLZ} and t_{PHZ}.

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

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

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

f_i=input frequency in MHz;

f_o=output frequency in MHz;

C_L=output load capacitance in pF;

C_{sw}=maximum switch capacitance in pF;

V_{CC}=supply voltage in Volts;

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 +125°C, voltages are referenced to GND (ground=0V), unless otherwise specified.)

Parameter	Symbol	Conditions		Min.	Typ.	Max.	Unit
propagation delay	t_{pd}	nYn to nZ, nZ to nYn; see Figure 6	V_{CC}=2.0V	-	-	20	ns
			V_{CC}=2.7V	-	-	15	ns
			V_{CC}=3.0V to 3.6V	-	-	12	ns
			V_{CC}=4.5V	-	-	10	ns
			V_{CC}=6.0V	-	-	8	ns
enable time	t_{en}	$\overline{E}$, Sn to nYn, nZ; see Figure 7	V_{CC}=2.0V	-	-	146	ns
			V_{CC}=2.7V	-	-	108	ns
			V_{CC}=3.0V to 3.6V	-	-	86	ns
			V_{CC}=4.5V	-	-	73	ns
			V_{CC}=6.0V	-	-	56	ns
disable time	t_{dis}	$\overline{E}$, Sn to nYn, nZ; see Figure 7	V_{CC}=2.0V	-	-	95	ns
			V_{CC}=2.7V	-	-	71	ns
			V_{CC}=3.0V to 3.6V	-	-	57	ns
			V_{CC}=4.5V	-	-	49	ns
			V_{CC}=6.0V	-	-	38	ns

Note:

[1] Typical values are measured at T_{amb}=25°C.

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

t_{en} is the same as t_{PZL} and t_{PZH}.

t_{dis} is the same as t_{PLZ} and t_{PHZ}.

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

3.3.5、AC Characteristics 3

(T_{amb}=25℃, GND=0V, t_r=t_f≤6.0ns, V_I=GND or V_{CC}, unless otherwise specified.)

Parameter	Symbol	Conditions		Min.	Typ.	Max.	Unit
total harmonic distortion	THD	f_i=1kHz; C_L=50pF; R_L=10kΩ; see Figure 10	V_{CC}=3.0V; V_I=2.75V(p-p)	-	0.8	-	%
			V_{CC}=6.0V; V_I=5.5V(p-p)	-	0.4	-	%
		f_i=10kHz; C_L=50pF; R_L=10kΩ; see Figure 10	V_{CC}=3.0V; V_I=2.75V(p-p)	-	2.4	-	%
			V_{CC}=6.0V; V_I=5.5V(p-p)	-	1.2	-	%
-3dB frequency response	$f_{(-3dB)}$	C_L=50pF; R_L=50Ω; see Figure 8	V_{CC}=3.0V	-	180	-	MHz
			V_{CC}=6.0V	-	200	-	MHz
isolation (OFF-state)	α_{iso}	f_i=1MHz; C_L=50pF; R_L=600Ω; see Figure 9	V_{CC}=3.0V	-	-50	-	dB
			V_{CC}=6.0V	-	-50	-	dB
crosstalk voltage	V_{ct}	between digital inputs and switch; f_i=1MHz; C_L=50pF; R_L=600Ω; see Figure 11	V_{CC}=3.0V	-	0.11	-	V
			V_{CC}=6.0V	-	0.12	-	V
crosstalk	Xtalk	between switches; f_i=1MHz; C_L=50pF; R_L=600Ω; see Figure 12	V_{CC}=3.0V	-	-60	-	dB
			V_{CC}=6.0V	-	-60	-	dB

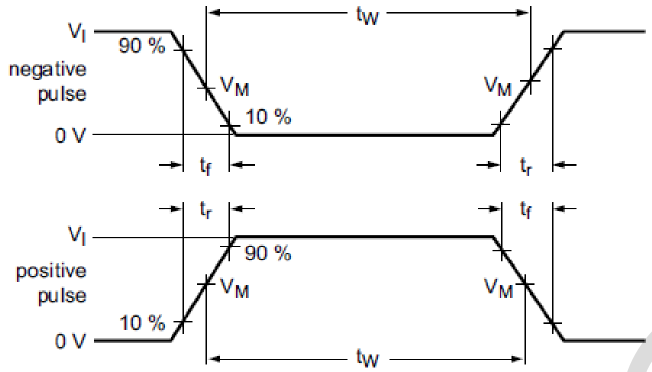
Note:

[1] To obtain 0dBm level at output for 1MHz (0dBm=1mW into 50Ω), adjust f_i voltage.

[2] To obtain 0dBm level at output for 1MHz (0dBm=1mW into 600Ω), adjust f_i voltage.

4、Testing Circuit

4.1、AC Testing Circuit 1



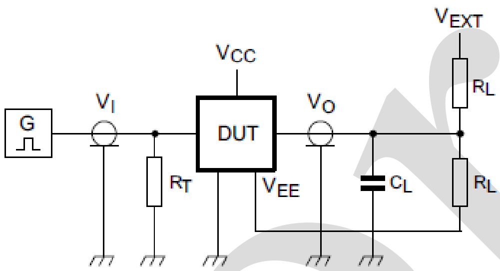


Figure 5. Test circuit for switching times

Definitions for test circuit:

C_L=Load capacitance including jig and probe capacitance.

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

R_L=Load resistance.

V_{EXT}=External voltage for measuring switching times.

4.2、AC Testing Waveforms

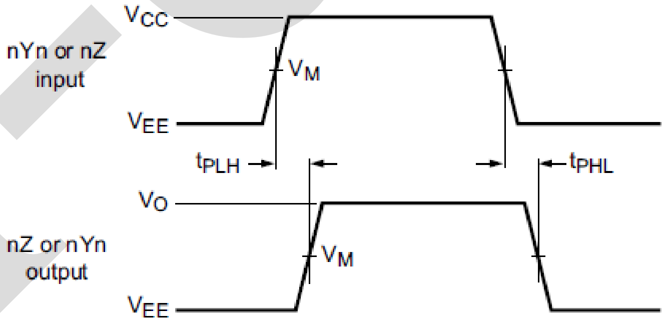


Figure 6. nYn, nZ to nZ, nYn propagation delays

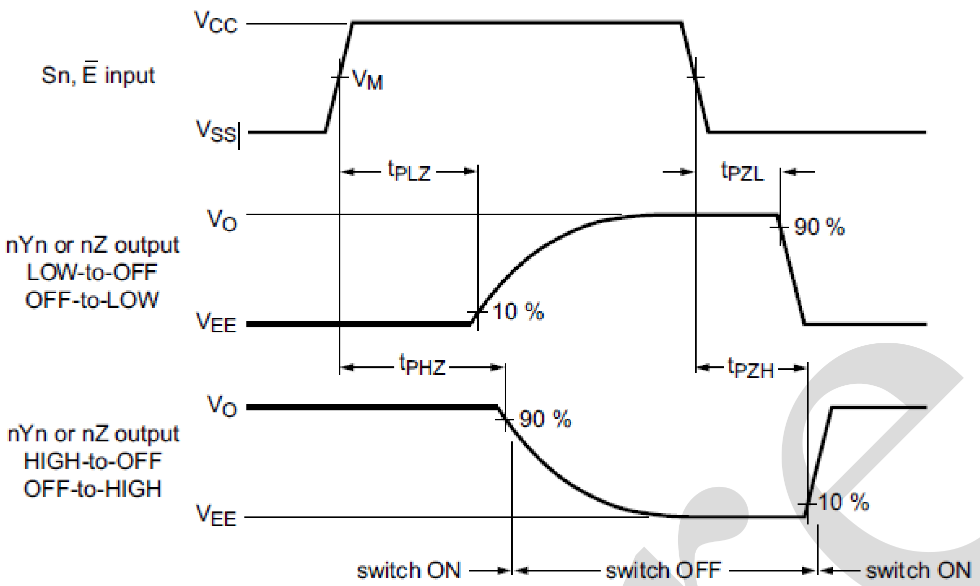


Figure 7. Enable and disable times

4.3、AC Testing Circuit 2

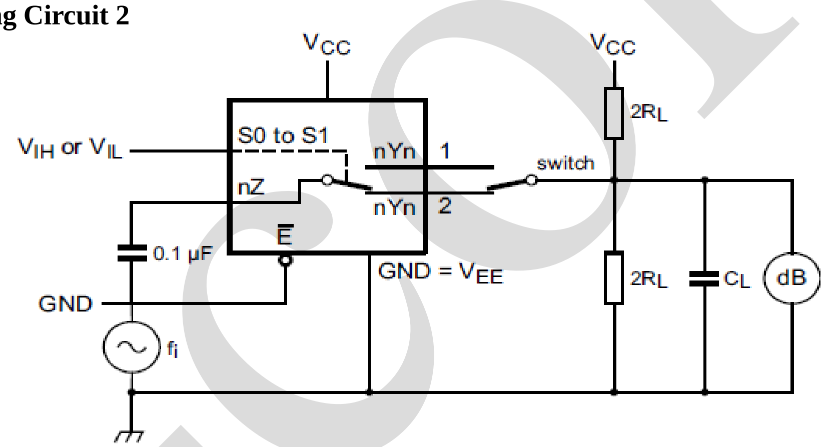


Figure 8. Test circuit for measuring frequency response

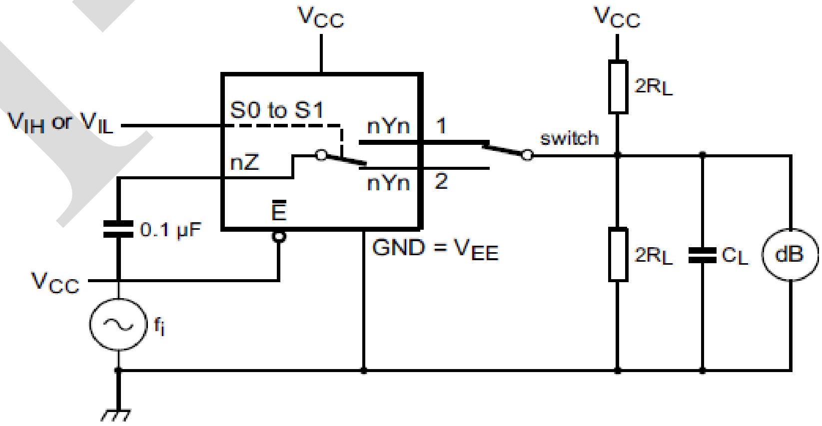


Figure 9. Test circuit for measuring isolation (OFF-state)

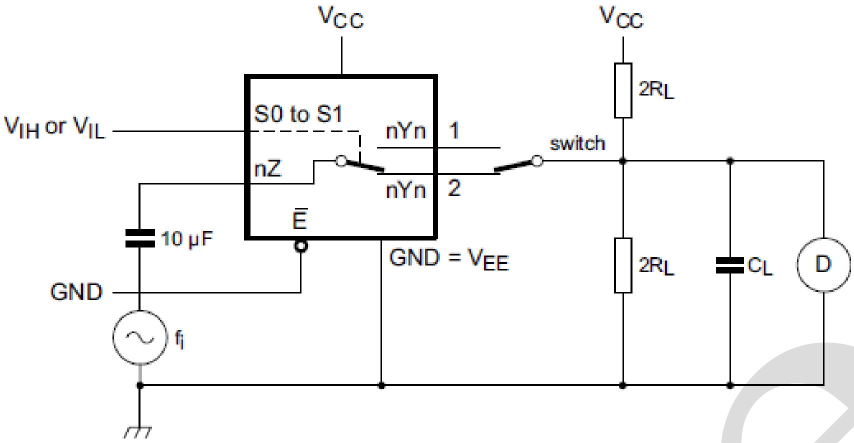
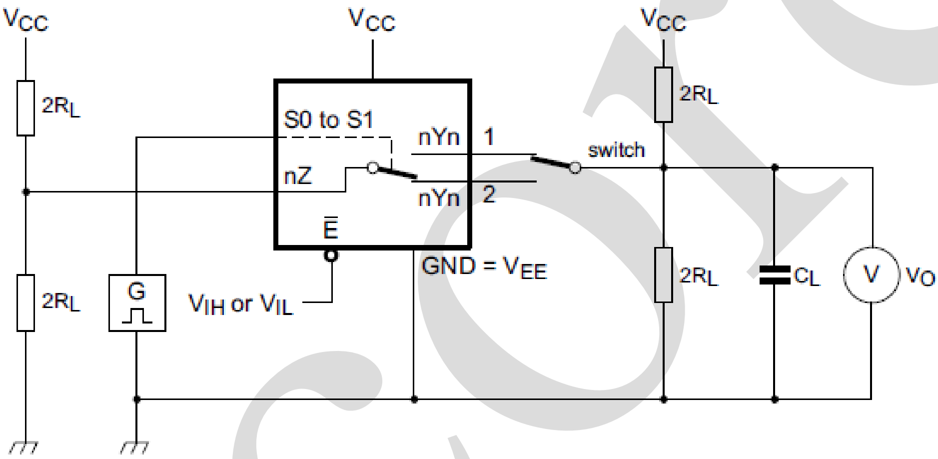
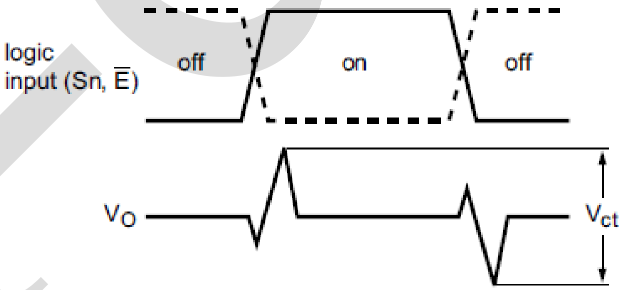


Figure 10. Test circuit for measuring total harmonic distortion



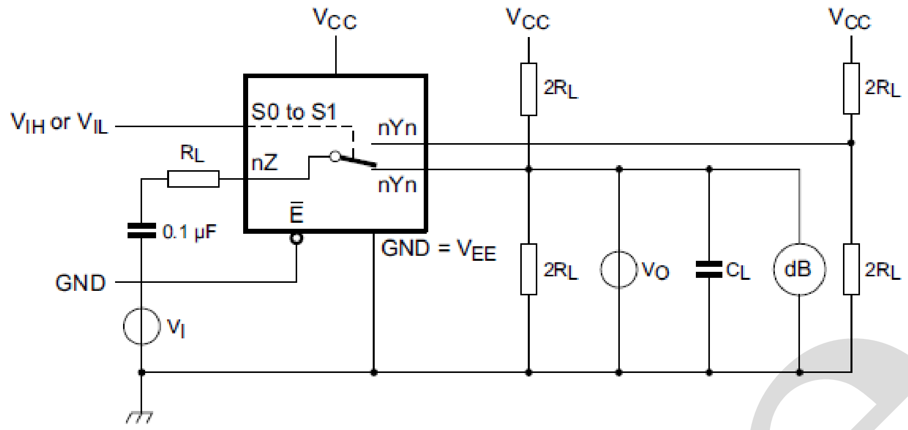
a. Test circuit



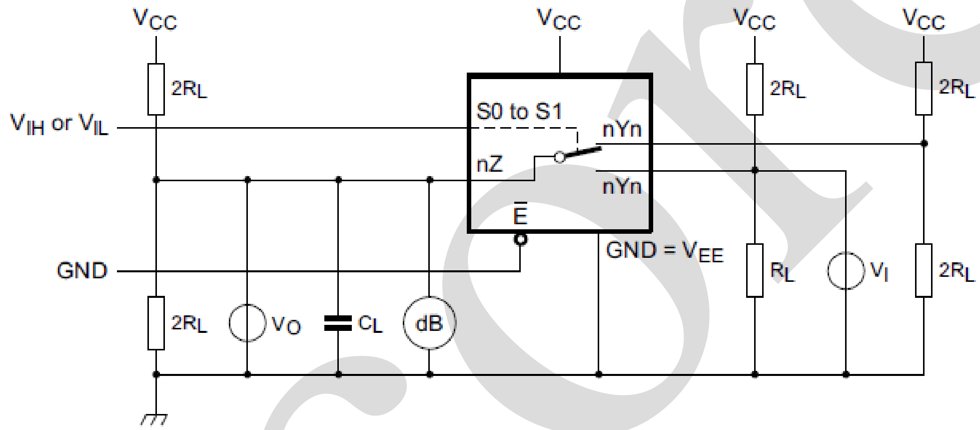
b. Input and output pulse definitions

V_I may be connected to Sn or $\bar{E}$.

Figure 11. Test circuit for measuring crosstalk voltage between digital inputs and switch



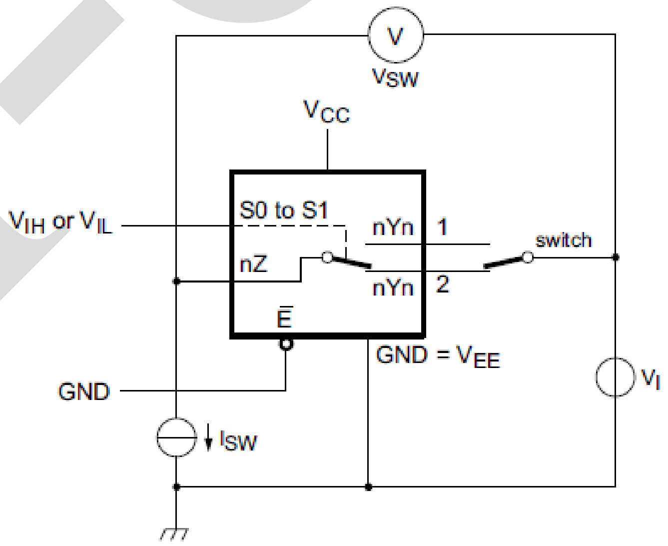
a. Switch on channel.



b. Switch off channel

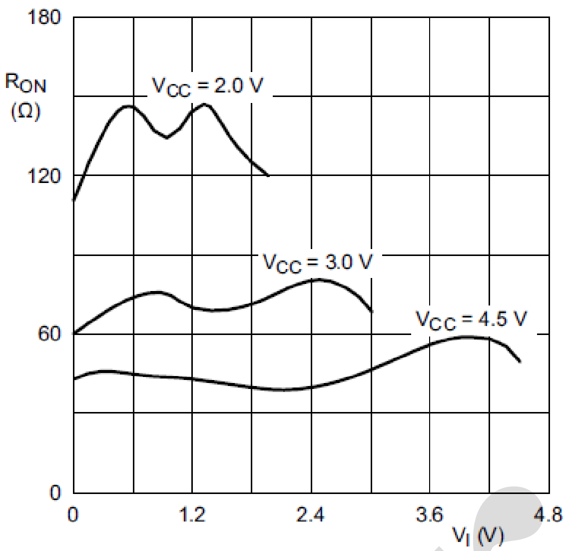
Figure 12. Test circuit for measuring crosstalk between switches

4.4、On Resistance Waveform And Test Circuit



$R_{ON}=V_{SW}/I_{SW}$

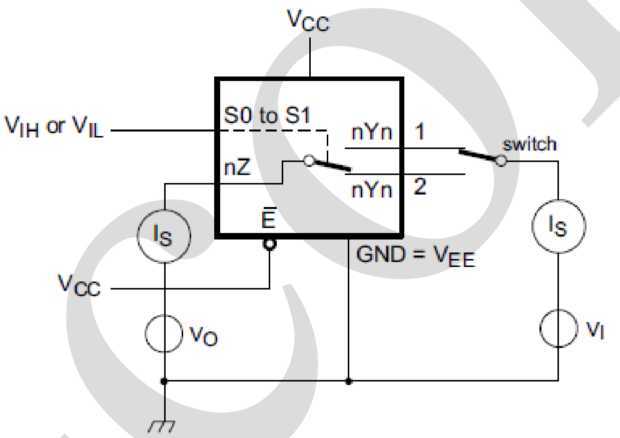
Figure 13. Test circuit for measuring R_{ON}



V_I=0V to V_{CC}-V_{EE}

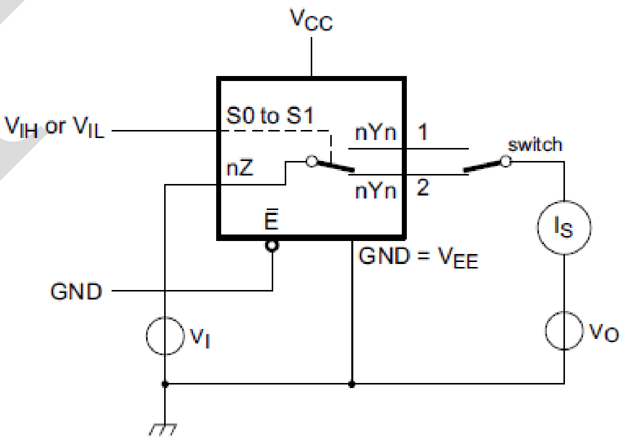
Figure 14. Typical R_{ON} as a function of input voltage

4.5、DC Testing Circuit



V_I=V_{CC} or V_{EE} and V_O=V_{EE} or V_{CC}

Figure 15. Test circuit for measuring OFF-state leakage current



V_I=V_{CC} or V_{EE} and V_O=open circuit

Figure 16. Test circuit for measuring ON-state leakage current

4.6、Measurement Points

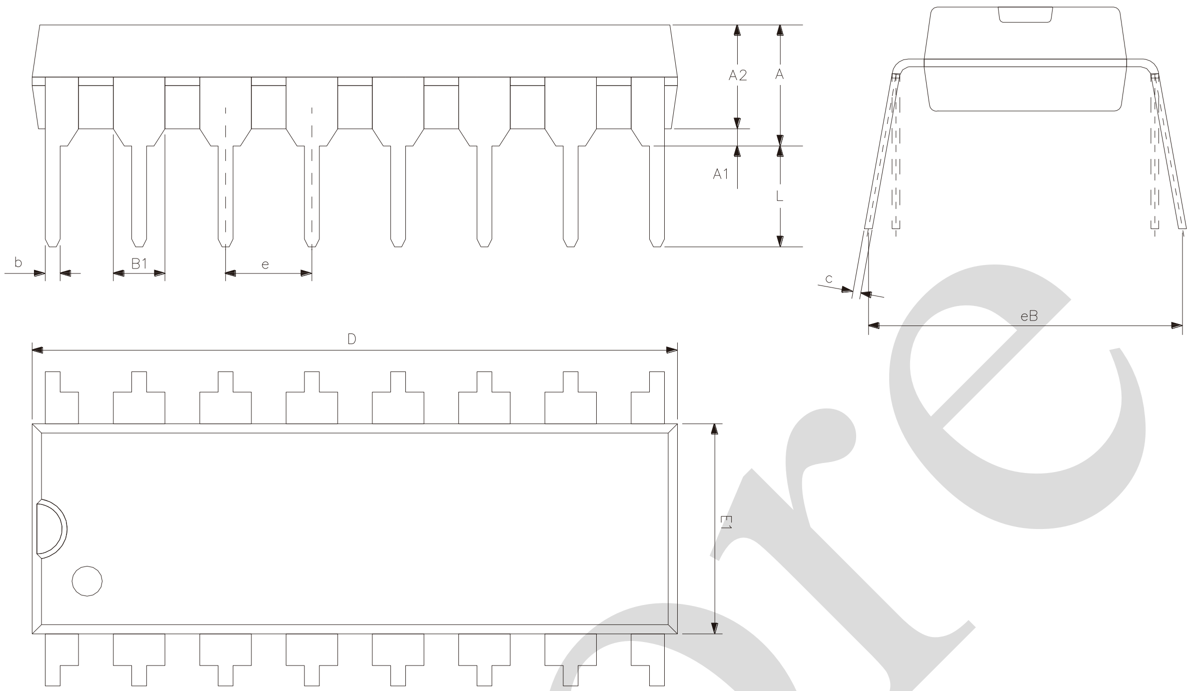
Supply voltage	Input	Output
V_{CC}	V_M	V_M
<2.7V	0.5×V_{CC}	0.5×V_{CC}
2.7V to 3.6V	1.5V	1.5V
>3.6V	0.5×V_{CC}	0.5×V_{CC}

4.7、Test Data

Supply voltage	Input		Load		V_{EXT}		
V_{CC}	V_I	t_r, t_f	C_L	R_L	t_{PHL}, t_{PLH}	t_{PZH}, t_{PHZ}	t_{PZL}, t_{PLZ}
<2.7V	V_{CC}	≤6ns	50pF	1kΩ	open	V_{EE}	2×V_{CC}
2.7V to 3.6V	2.7V	≤6ns	15 pF, 50pF	1kΩ	open	V_{EE}	2×V_{CC}
>3.6V	V_{CC}	≤6ns	50pF	1kΩ	open	V_{EE}	2×V_{CC}

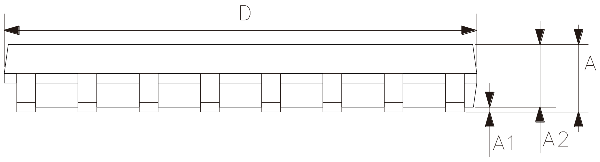
5、Package Information

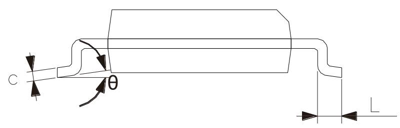
5.1、DIP16

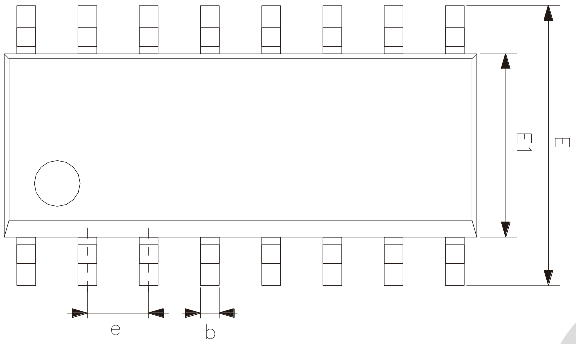


Symbol	Dimensions (mm)	
	Min.	Max.
A2	3.20	3.60
A1	0.51	-
A	3.60	5.33
L	3.00	3.60
b	0.36	0.56
B1	1.52	
D	18.80	19.94
E1	6.20	6.60
e	2.54	
c	0.20	0.36
eB	7.62	9.30

5.2、SOP16

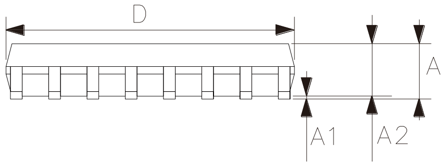


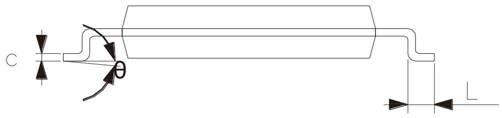


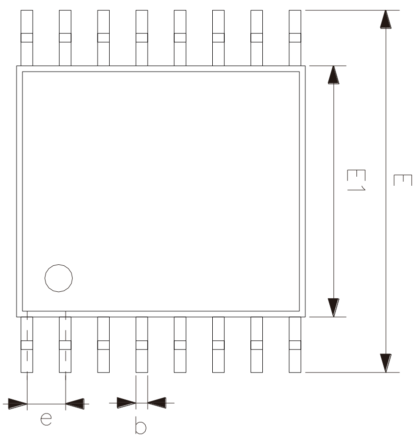


Symbol	Dimensions (mm)	
	Min.	Max.
A	1.35	1.80
A1	0.10	0.25
A2	1.25	1.55
b	0.33	0.51
c	0.19	0.25
D	9.50	10.10
E	5.80	6.30
E1	3.70	4.10
e	1.27	
L	0.35	0.89
θ	0°	8°

5.3、TSSOP16







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
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、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.