# CD4052H
# Dual 4-channel Analog Multiplexer/Demultiplexer

# Product Specification

**Specification Revision History：**

| Version | Date | Description |
|---|---|---|
| 2022-04-A1 | 2022-04 | New |
| | | |
| | | |
| | | |

# Contents

## 1、General Description

The CD4052H is a dual 4-channel analogue multiplexer/demultiplexer with common channel select logic. Each multiplexer/demultiplexer has four independent inputs/outputs (nY0 to nY3) and a common input/output (nZ). The common channel select logic includes two select inputs (S1 and S2) and an active LOW enable input ($\overline{E}$). Both multiplexers/demultiplexers contain four bidirectional analog switches, each with one side connected to an independent input/output (nY0 to nY3) and the other side connected to a common input/output (nZ). With $\overline{E}$ LOW, one of the four switches is selected (low-impedance ON-state) by S1 and S2. With $\overline{E}$ HIGH, all switches are in the high-impedance OFF-state, independent of S1 and S2. If break before make is needed, then it is necessary to use the enable input.

$V_{DD}$ and $V_{SS}$ are the supply voltage connections for the digital control inputs (S1 and S2, and $\overline{E}$). The $V_{DD}$ to $V_{SS}$ range is 3V to 18V. The analog inputs/outputs (nY0 to nY3, and nZ) can swing between $V_{DD}$ as a positive limit and $V_{EE}$ as a negative limit. $V_{DD}$-$V_{EE}$ may not exceed 18V. Unused inputs must be connected to $V_{DD}$, $V_{SS}$, or another input. For operation as a digital multiplexer/demultiplexer, $V_{EE}$ is connected to $V_{SS}$ (typically ground). $V_{EE}$ and $V_{SS}$ are the supply voltage connections for the switches.

**Features:**

- Wide supply voltage range from 3V to 18V
- Fully static operation
- 5V, 10V and 18V parametric ratings
- Standardized symmetrical output characteristics
- Specified from -40℃ to +105℃
- Packaging information: DIP16/SOP16/TSSOP16

**Ordering Information:**

**Tube packing specifications:**

| Part number | Packaging form | Marking code | Tube quantity | Boxed tube quantity | Boxed quantity | Notes |
|---|---|---|---|---|---|---|
| CD4052HDA16.TB | DIP16 | CD4052H | 25 PCS/tube | 40 tube/box | 1000 PCS/box | Dimensions of plastic enclosure: 19.0mm×6.4mm Pin spacing: 2.54mm |
| CD4052HSA16.TB | SOP16(1) | CD4052H | 50 PCS/tube | 200 tube/box | 10000 PCS/box | Dimensions of plastic enclosure: 10.0mm×3.9mm Pin spacing: 1.27mm |
| CD4052HSA16.TB | SOP16(2) | CD4052H | 50 PCS/tube | 100 tube/box | 5000 PCS/box | Dimensions of plastic enclosure: 10.0mm×3.9mm Pin spacing: 1.27mm |
| CD4052HTA16.TB | TSSOP16 | CD4052H | 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 |
|---|---|---|---|---|---|
| CD4052HSA16.TR | SOP16 | CD4052H | 4000 PCS/reel | 8000 PCS/box | Dimensions of plastic enclosure: 10.0mm×3.9mm Pin spacing:1.27mm |
| CD4052HTA16.TR | TSSOP16 | CD4052H | 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

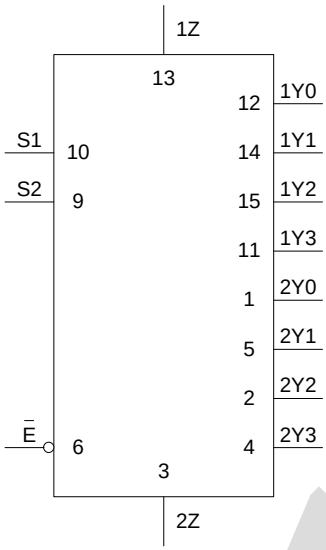



Figure 1. Logic symbol

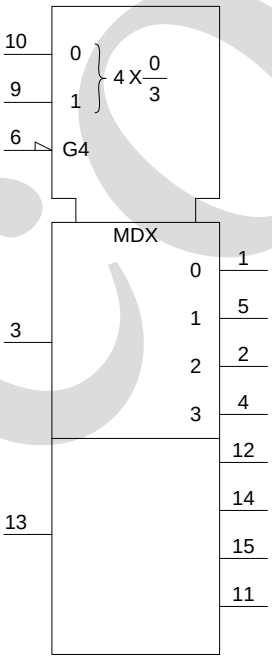



Figure 2. IEC logic symbol

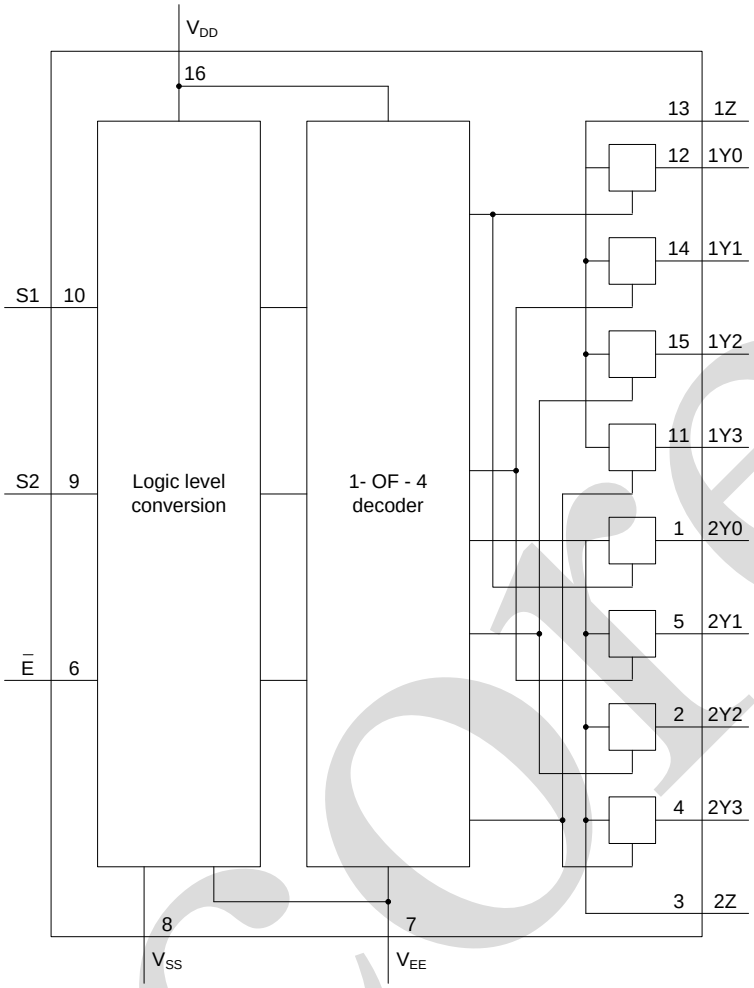



Figure 3. Functional diagram

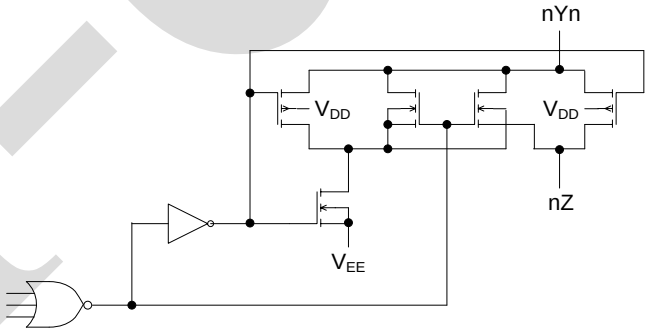



Figure 4. Schematic diagram (one switch)

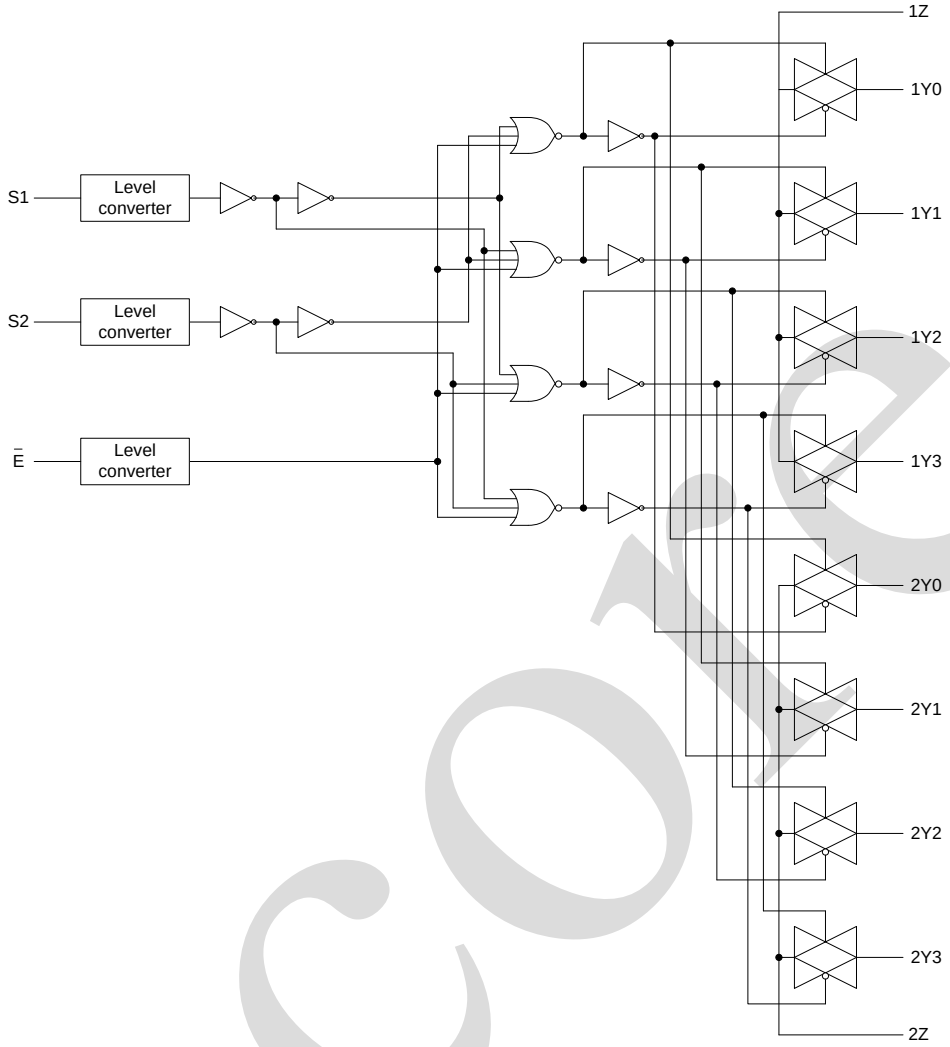
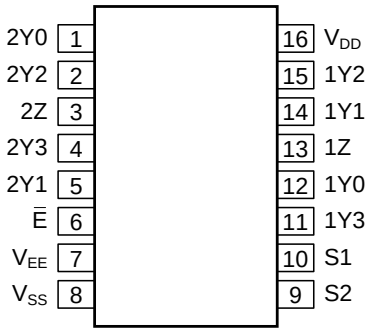



Figure 5. Logic diagram

## 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 | $V_{SS}$ | ground (0V) |
| 9 | S2 | select input |
| 10 | S1 | 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 | $V_{DD}$ | supply voltage |

### 2.4、Function Table

| Input | | | Channel ON |
|---|---|---|---|
| $\overline{E}$ | S2 | S1 | |
| 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 | switches off |

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

## 3、Electrical Parameter

### 3.1、Absolute Maximum Ratings

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

| Parameter | Symbol | Conditions | | Min. | Max. | Unit |
|---|---|---|---|---|---|---|
| supply voltage | $V_{DD}$ | - | | -0.5 | +21 | V |
| supply voltage | $V_{EE}$ | referenced to $V_{DD}$ | | -21 | +0.5 | V |
| input voltage | $V_I$ | - | | -0.5 | $V_{DD}$+0.5 | V |
| input clamping current | $I_{IK}$ | $V_I$<-0.5V or $V_I$>$V_{DD}$+0.5V | | - | ±10 | mA |
| Input/output current | $I_{IO}$ | - | | - | ±10 | mA |
| supply current | $I_{DD}$ | - | | - | 50 | mA |
| storage temperature | $T_{stg}$ | - | | -65 | +150 | ℃ |
| ambient temperature | $T_{amb}$ | - | | -40 | +105 | ℃ |
| total power dissipation | $P_{tot}$ | - | | - | 500 | mW |
| device dissipation | P | per output transistor | | - | 100 | mW |
| Soldering temperature | $T_L$ | 10s | DIP | 245 | | ℃ |
| | | | SOP | 250 | | ℃ |

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

($T_{amb}$=25℃; $R_L$=10kΩ; $C_L$=50pF; $\overline{E}$=$V_{DD}$; Vis=$V_{DD}$=5V.)

| Parameter | Symbol | Conditions | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|
| supply voltage | $V_{DD}$ | - | 3 | - | 18 | V |
| supply voltage | $V_{EE}$ | - | -15 | - | 0 | V |
| supply voltage | $V_{DD}$-$V_{EE}$ | - | 3 | - | 18 | V |
| input voltage | $V_I$ | - | 0 | - | $V_{DD}$ | V |
| ambient temperature | $T_{amb}$ | in free air | -40 | - | +105 | ℃ |
| input transition rise and fall rate | Δt/ΔV | $V_{DD}$=5V | - | - | 3.75 | us/V |
| | | $V_{DD}$=10V | - | - | 0.5 | us/V |
| | | $V_{DD}$=18V | - | - | 0.08 | us/V |

### 3.3、Electrical Characteristics

#### 3.3.1、DC Characteristics 1

($T_{amb}$=25℃, $V_{SS}$=$V_{EE}$=0V; $V_I$=$V_{SS}$ or $V_{DD}$, $I_{SW}$=200uA, unless otherwise specified.)

| Parameter | Symbol | Conditions (V) | | $T_{amb}$=25℃ | | | Unit |
|---|---|---|---|---|---|---|---|
| | | | | Min. | Typ. | Max. | |
| HIGH-level input voltage | $V_{IH}$ | $\|I_O\|$<1uA | $V_{DD}$=5V | 3.5 | - | - | V |
| | | | $V_{DD}$=10V | 7.0 | - | - | V |
| | | | $V_{DD}$=18V | 12.6 | - | - | V |
| LOW-level input voltage | $V_{IL}$ | $\|I_O\|$<1uA | $V_{DD}$=5V | - | - | 1.5 | V |
| | | | $V_{DD}$=10V | - | - | 3.0 | V |
| | | | $V_{DD}$=18V | - | - | 5.4 | V |
| supply current | $I_{DD}$ | $I_O$=0A | $V_{DD}$=5V | - | - | 5 | uA |
| | | | $V_{DD}$=10V | - | - | 10 | uA |
| | | | $V_{DD}$=18V | - | - | 20 | uA |
| input leakage current | $I_I$ | $V_{DD}$=18V | | - | - | ±0.1 | uA |
| OFF-state leakage current | $I_{S(OFF)}$ | $V_{DD}$=18V | Z port; all channels OFF; see Figure 6 | - | - | 1000 | nA |
| | | | Y port; per channel; see Figure 7 | - | - | 200 | nA |
| ON resistance (peak) | $R_{ON(peak)}$ | $V_I$=0V to $V_{DD}$-$V_{EE}$; see Figure 8 and Figure 9 | $V_{DD}$-$V_{EE}$=5V | - | 117 | 836 | Ω |
| | | | $V_{DD}$-$V_{EE}$=10V | - | 58 | 178 | Ω |
| | | | $V_{DD}$-$V_{EE}$=15V | - | 41 | 120 | Ω |
| | | | $V_{DD}$-$V_{EE}$=20V | - | 36 | 105 | Ω |
| ON resistance (rail) | $R_{ON(rail)}$ | $V_I$=0V; see Figure 8 and Figure 9 | $V_{DD}$-$V_{EE}$=5V | - | 44 | 130 | Ω |
| | | | $V_{DD}$-$V_{EE}$=10V | - | 29 | 93 | Ω |
| | | | $V_{DD}$-$V_{EE}$=15V | - | 24 | 69 | Ω |
| | | | $V_{DD}$-$V_{EE}$=20V | - | 22 | 63 | Ω |
| | | $V_I$=$V_{DD}$-$V_{EE}$; see Figure 8 and Figure 9 | $V_{DD}$-$V_{EE}$=5V | - | 82 | 249 | Ω |
| | | | $V_{DD}$-$V_{EE}$=10V | - | 51 | 157 | Ω |
| | | | $V_{DD}$-$V_{EE}$=15V | - | 41 | 127 | Ω |
| | | | $V_{DD}$-$V_{EE}$=20V | - | 36 | 112 | Ω |
| ON resistance mismatch between channels | $\Delta R_{ON}$ | $V_I$=0V to $V_{DD}$-$V_{EE}$; see Figure 8 | $V_{DD}$-$V_{EE}$=5V | - | 25 | - | Ω |
| | | | $V_{DD}$-$V_{EE}$=10V | - | 10 | - | Ω |
| | | | $V_{DD}$-$V_{EE}$=15V | - | 5 | - | Ω |
| | | | $V_{DD}$-$V_{EE}$=20V | - | 5 | - | Ω |
| input capacitance | $C_I$ | Sn, $\overline{E}$ inputs | | - | - | 7.5 | pF |

### 3.3.2、DC Characteristics 2

($T_{amb}$=-40℃ to +105℃, $V_{SS}$=$V_{EE}$=0V; $V_I$=$V_{SS}$ or $V_{DD}$, unless otherwise specified.)

| Parameter | Symbol | Conditions (V) | | $T_{amb}$=-40℃ | | $T_{amb}$=+85℃ | | $T_{amb}$=+105℃ | | Unit |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | Min. | Min. | Min. | Max. | Min. | Max. | |
| HIGH-level input voltage | $V_{IH}$ | $\|I_O\|$<1uA | $V_{DD}$=5V | 3.5 | - | 3.5 | - | 3.5 | - | V |
| | | | $V_{DD}$=10V | 7.0 | - | 7.0 | - | 7.0 | - | V |
| | | | $V_{DD}$=18V | 12.6 | - | 12.6 | - | 12.6 | - | V |
| LOW-level input voltage | $V_{IL}$ | $\|I_O\|$<1uA | $V_{DD}$=5V | - | 1.5 | - | 1.5 | - | 1.5 | V |
| | | | $V_{DD}$=10V | - | 3.0 | - | 3.0 | - | 3.0 | V |
| | | | $V_{DD}$=18V | - | 5.4 | - | 5.4 | - | 5.4 | V |
| supply current | $I_{DD}$ | $I_O$=0A | $V_{DD}$=5V | - | 5 | - | 150 | - | 150 | uA |
| | | | $V_{DD}$=10V | - | 10 | - | 300 | - | 300 | uA |
| | | | $V_{DD}$=18V | - | 20 | - | 600 | - | 600 | uA |
| input leakage current | $I_I$ | $V_{DD}$=18V | | - | ±0.1 | - | ±1.0 | - | ±1.0 | uA |

### 3.3.3、AC Characteristics 1

($T_{amb}$=25℃, $V_{EE}$=$V_{SS}$=0V, unless otherwise specified.)

| Parameter | Symbol | Conditions | | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|---|
| HIGH to LOW propagation delay time | $t_{PHL}$ | nYn, nZ to nZ, nYn; see Figure 11 | $V_{DD}$=5V | - | 10 | 20 | ns |
| | | | $V_{DD}$=10V | - | 5 | 10 | ns |
| | | | $V_{DD}$=18V | - | 5 | 10 | ns |
| | | Sn to nYn, nZ; see Figure 12 | $V_{DD}$=5V | - | 150 | 305 | ns |
| | | | $V_{DD}$=10V | - | 65 | 135 | ns |
| | | | $V_{DD}$=18V | - | 50 | 100 | ns |
| LOW to HIGH propagation delay | $t_{PLH}$ | nYn, nZ to nZ, nYn; ssee Figure 11 | $V_{DD}$=5V | - | 10 | 20 | ns |
| | | | $V_{DD}$=10V | - | 5 | 10 | ns |
| | | | $V_{DD}$=18V | - | 5 | 10 | ns |
| | | Sn to nYn, nZ; see Figure 12 | $V_{DD}$=5V | - | 150 | 300 | ns |
| | | | $V_{DD}$=10V | - | 75 | 150 | ns |
| | | | $V_{DD}$=18V | - | 50 | 100 | ns |
| HIGH to OFF-state propagation delay | $t_{PHZ}$ | $\overline{E}$ to nYn, nZ; see Figure 13 | $V_{DD}$=5V | - | 95 | 190 | ns |
| | | | $V_{DD}$=10V | - | 90 | 180 | ns |
| | | | $V_{DD}$=18V | - | 85 | 180 | ns |
| LOW to OFF-state propagation delay | $t_{PLZ}$ | $\overline{E}$ to nYn, nZ; see Figure 13 | $V_{DD}$=5V | - | 100 | 205 | ns |
| | | | $V_{DD}$=10V | - | 90 | 180 | ns |
| | | | $V_{DD}$=18V | - | 90 | 180 | ns |
| OFF-state to HIGH propagation delay | $t_{PZH}$ | $\overline{E}$ to nYn, nZ; see Figure 13 | $V_{DD}$=5V | - | 130 | 260 | ns |
| | | | $V_{DD}$=10V | - | 55 | 115 | ns |
| | | | $V_{DD}$=18V | - | 45 | 85 | ns |
| OFF-state to LOW propagation delay | $t_{PZL}$ | $\overline{E}$ to nYn, nZ; see Figure 13 | $V_{DD}$=5V | - | 120 | 240 | ns |
| | | | $V_{DD}$=10V | - | 50 | 100 | ns |
| | | | $V_{DD}$=18V | - | 35 | 75 | ns |

### 3.3.4、AC Characteristics 2

($T_{amb}$=25℃, $V_{EE}$=$V_{SS}$=0V, $V_I$=0.5$V_{DD}$ (p-p), unless otherwise specified.)

| Parameter | Symbol | Conditions | | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|---|---|
| total harmonic distortion | THD | see Figure 14; $R_L$=10kΩ; $C_L$=15pF; channel ON; $f_i$=1kHz | $V_{DD}$=5V | - | 0.25 | - | % |
| | | | $V_{DD}$=10V | - | 0.04 | - | % |
| | | | $V_{DD}$=18V | - | 0.04 | - | % |
| -3dB frequency response | $f_{(-3dB)}$ | see Figure 15; $R_L$=1kΩ; $C_L$=5pF; channel ON; | $V_{DD}$=5V | - | 13 | - | MHz |
| | | | $V_{DD}$=10V | - | 40 | - | MHz |
| | | | $V_{DD}$=18V | - | 70 | - | MHz |
| isolation (OFF-state) | $\alpha_{iso}$ | see Figure 16; $f_i$=1MHz; $R_L$=1kΩ; $C_L$=5pF; channel OFF; $V_{DD}$=10V | | - | -50 | - | dB |
| crosstalk voltage | $V_{ct}$ | digital inputs to switch; see Figure 17; $R_L$=10kΩ; $C_L$=15pF; $\overline{E}$ or Sn=$V_{DD}$ (square-wave); $V_{DD}$=10V | | - | 50 | - | mV |
| crosstalk | Xtalk | between switches; see Figure 18; $f_i$=1MHz; $R_L$=1kΩ; $V_{DD}$=10V | | - | -50 | - | dB |

Note:

[1] $f_i$ is biased at 0.5$V_{DD}$; $V_I$=0.5$V_{DD}$ (p-p).

## 4、Testing Circuit

### 4.1、DC Testing Circuit

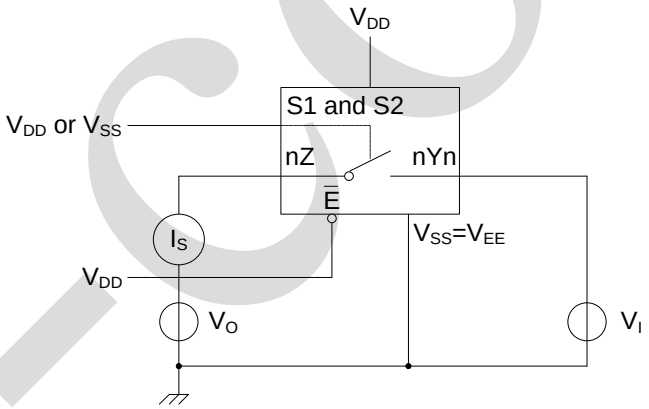



Figure 6. Test circuit for measuring OFF-state leakage current Z port

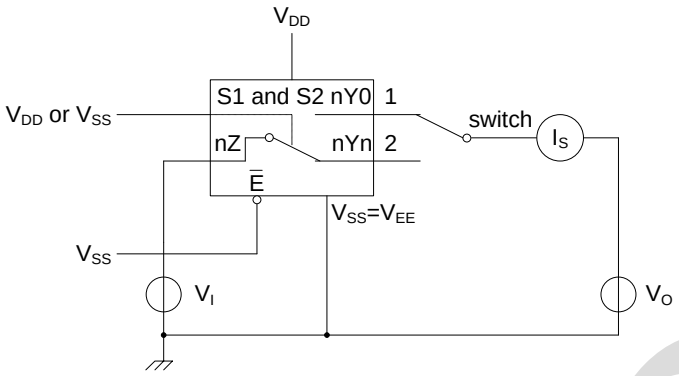
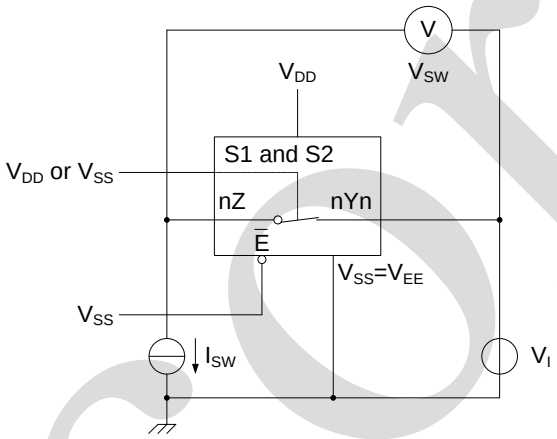



Figure 7. Test circuit for measuring OFF-state leakage current nYn port

### 4.2、ON resistance Testing Circuit




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

Figure 8. Test circuit for measuring $R_{ON}$

### 4.3、ON resistance Waveforms

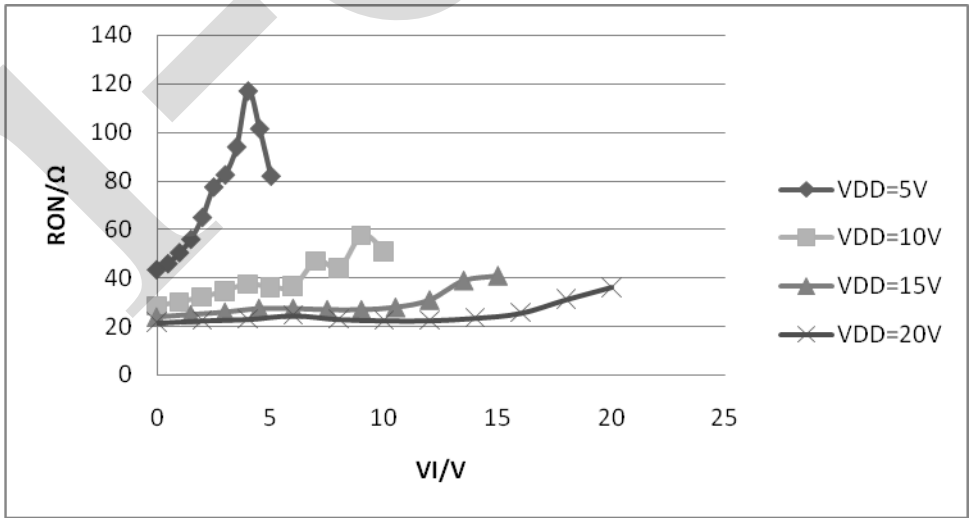



Figure 9. Typical $R_{ON}$ as a function of input voltage

### 4.4、AC Testing Circuit 1

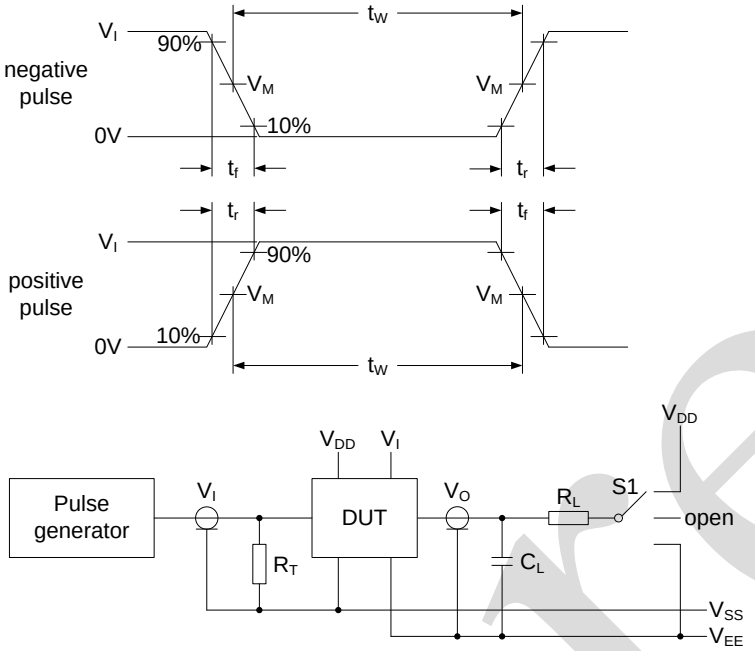



Figure 10. Test circuit for switching times

Definitions for test circuit:

DUT=Device Under Test.

$C_L$=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.

### 4.5、AC Testing Waveforms

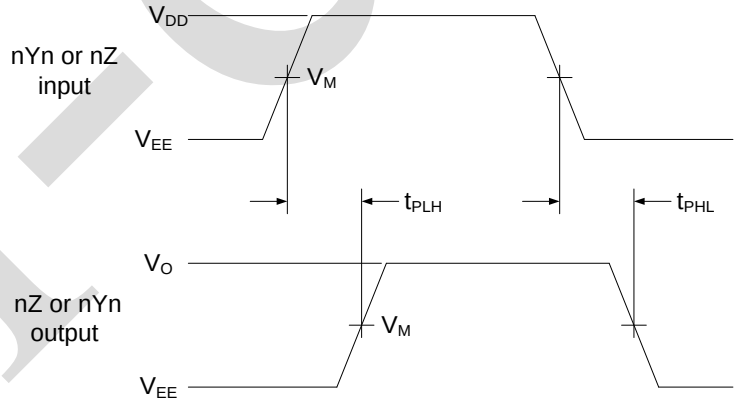



Figure 11. nYn, nZ to nZ, nYn propagation delays

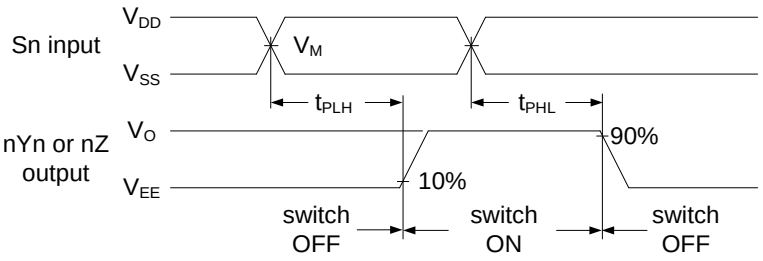



Figure 12. Sn to nYn, nZ propagation delays

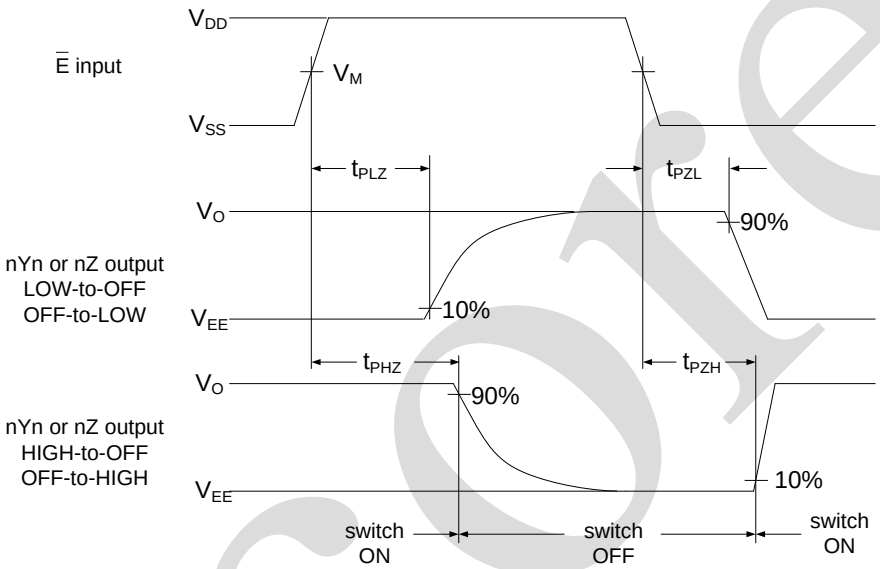



Figure 13. Enable and disable times

### 4.6、AC Testing Circuit 2

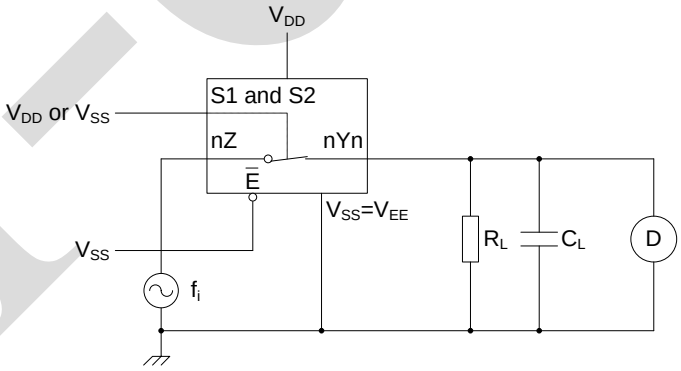



Figure 14. Test circuit for measuring total harmonic distortion

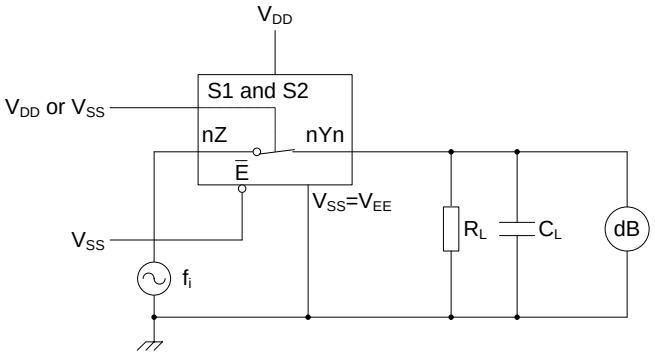



Figure 15. Test circuit for measuring frequency response

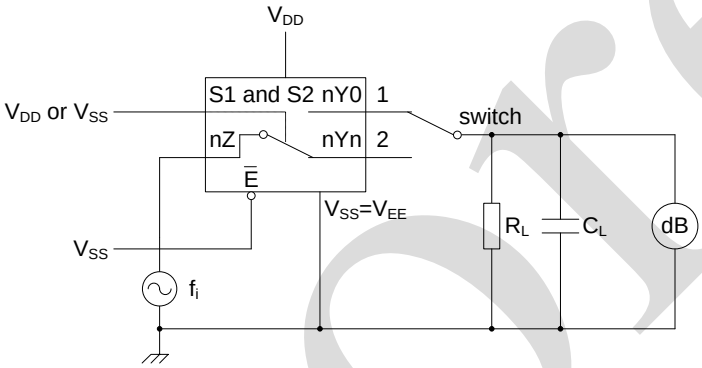
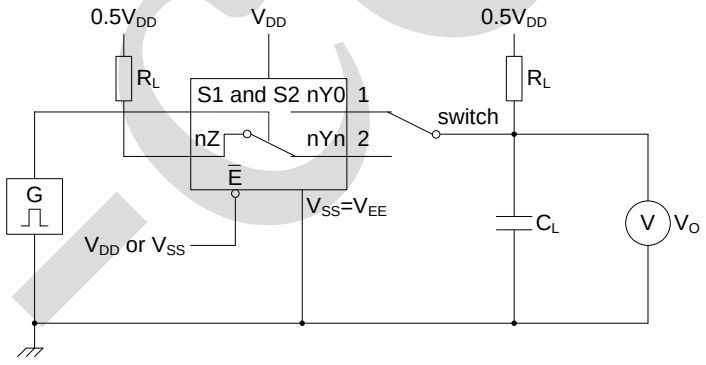
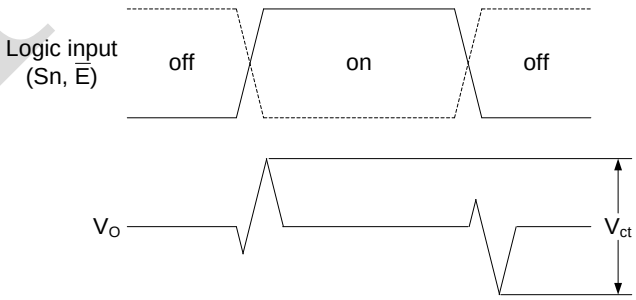



Figure 16. Test circuit for measuring isolation (OFF-state)

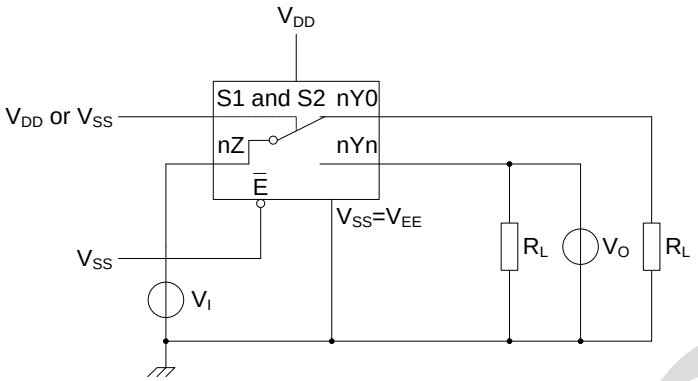



a. Test circuit

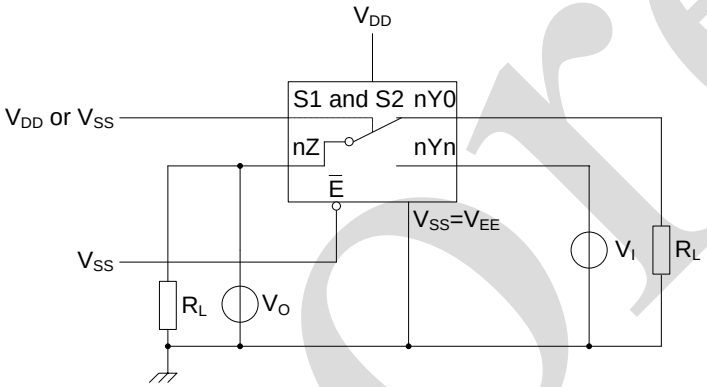



b. Input and output pulse definitions

Figure 17. Test circuit for measuring crosstalk voltage between digital inputs and switch




a. Switch closed condition




b. Switch open condition

Figure 18. Test circuit for measuring crosstalk between switches

### 4.7、Measurement Points

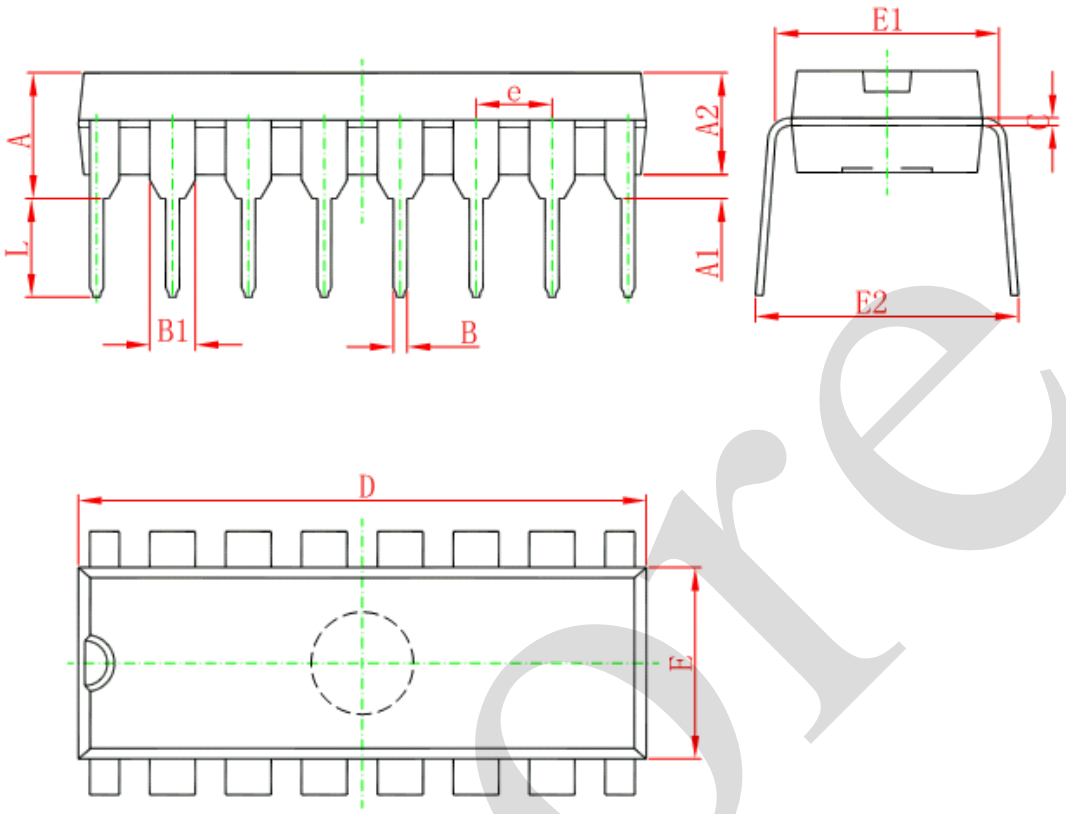
| Supply voltage | Input | Output |
|---|---|---|
| $V_{DD}$ | $V_M$ | $V_M$ |
| 5V to 18V | 0.5×$V_{DD}$ | 0.5×$V_{DD}$ |

### 4.8、Test Data

| Input | | | | Load | | S1 position | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| nYn, nZ | Sn and $\bar{E}$ | $t_r$, $t_f$ | $V_M$ | $C_L$ | $R_L$ | $t_{PHL}$ [1] | $t_{PLH}$ | $t_{PZH}$, $t_{PHZ}$ | $t_{PZL}$, $t_{PLZ}$ | other |
| $V_{DD}$ or $V_{EE}$ | $V_{DD}$ or $V_{SS}$ | ≤20ns | 0.5× $V_{DD}$ | 50pF | 10kΩ | $V_{DD}$ or $V_{EE}$ | $V_{EE}$ | $V_{EE}$ | $V_{DD}$ | $V_{EE}$ |

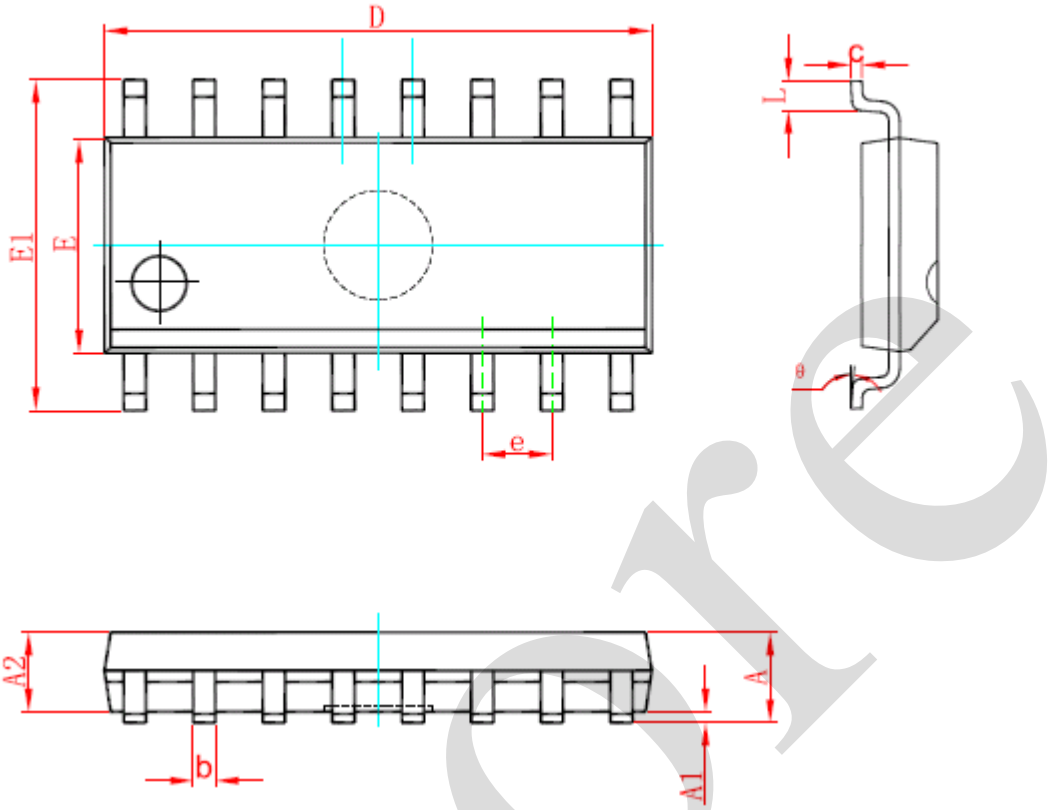
## 5、Package Information

### 5.1、DIP16



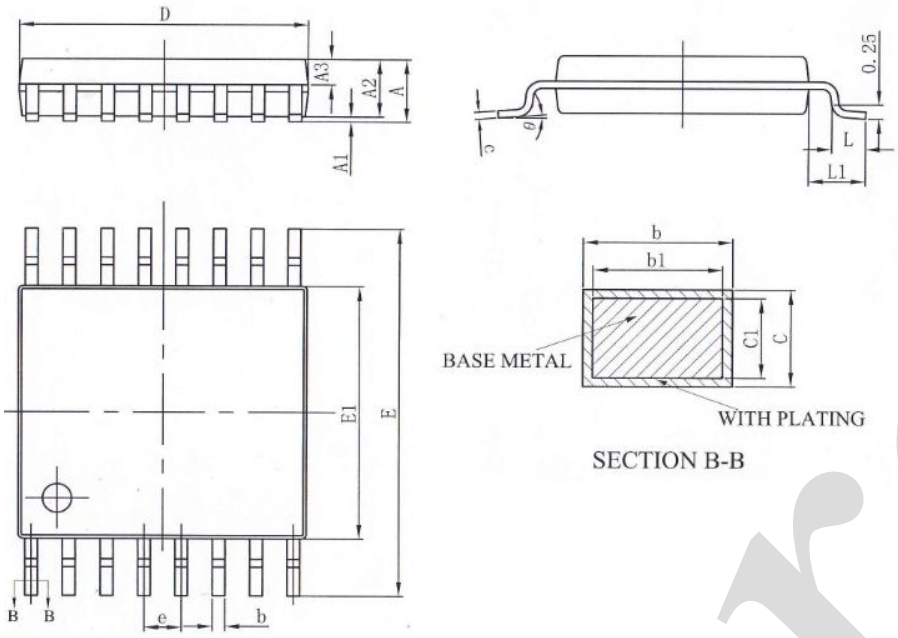

| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|---|---|---|---|---|
| | Min | Max | Min | Max |
| A | 3.710 | 4.310 | 0.146 | 0.170 |
| A1 | 0.510 | | 0.020 | |
| A2 | 3.200 | 3.600 | 0.126 | 0.142 |
| B | 0.380 | 0.570 | 0.015 | 0.022 |
| B1 | 1.524 (BSC) | | 0.060 (BSC) | |
| C | 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、SOP16**




| Symbol | Dimensions In Millimeters | | Dimensions In Inches | |
|---|---|---|---|---|
| | Min | Max | Min | Max |
| A | 1.350 | 1.750 | 0.053 | 0.069 |
| A1 | 0.100 | 0.250 | 0.004 | 0.010 |
| A2 | 1.350 | 1.550 | 0.053 | 0.061 |
| b | 0.330 | 0.510 | 0.013 | 0.020 |
| c | 0.170 | 0.250 | 0.007 | 0.010 |
| D | 9.800 | 10.200 | 0.386 | 0.402 |
| E | 3.800 | 4.000 | 0.150 | 0.157 |
| E1 | 5.800 | 6.200 | 0.228 | 0.244 |
| e | 1.270(BSC) | | 0.050(BSC) | |
| L | 0.400 | 1.270 | 0.016 | 0.050 |
| θ | 0° | 8° | 0° | 8° |

**5.3、TSSOP16**




| SYMBOL | MILLIMETER | | |
|---|---|---|---|
| | MIN | NOM | MAX |
| A | — | — | 1.20 |
| A1 | 0.05 | — | 0.15 |
| A2 | 0.90 | 1.00 | 1.05 |
| A3 | 0.39 | 0.44 | 0.49 |
| b | 0.20 | — | 0.28 |
| b1 | 0.19 | 0.22 | 0.25 |
| c | 0.13 | — | 0.17 |
| c1 | 0.12 | 0.13 | 0.14 |
| D | 4.90 | 5.00 | 5.10 |
| E | 6.20 | 6.40 | 6.60 |
| E1 | 4.30 | 4.40 | 4.50 |
| e | 0.65BSC | | |
| L | 0.45 | 0.60 | 0.75 |
| L1 | 1.00BSC | | |
| 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.<br>×：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；

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