

### Features

- Wide supply voltage range from 0.8V to 3.6V
- Inputs accept voltages up to 3.6V
- $I_{OFF}$  supports partial-power-down mode
- Low static power consumption;  $I_{CC}=0.5\mu A$  (Max.)
- ESD Protection Exceeds JESD 22
  - 2000-V Human-Body Model (A114-A)
  - 200-V Machine Model (A115-A)
  - 1000-V Charged-Device Model (C101)

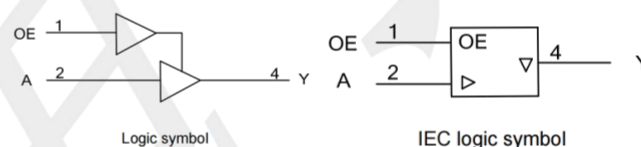
### General Description

The SN74AUP1G126 is a single bus buffer/line driver with 3-state output. When the output enable (OE) is high the output will be disabled. In contrast, when the OE is low, true data will pass from A input to the Y output.

### Applications

- AV Receiver
- Audio Dock: Portable
- Blu-ray Player and Home Theater
- Embedded PC
- Personal Digital Assistant (PDA)
- Power: Telecom/Server AC/DC Supply: Single Controller: Analog and Digital
- Solid State Drive (SSD): Client and Enterprise
- Wireless Headset, Keyboard, and Mouse

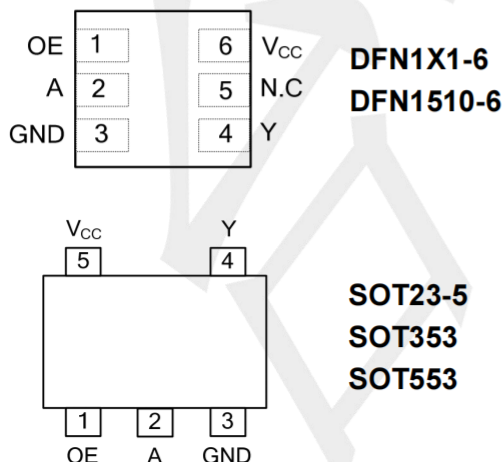
### Logic Diagram



### Ordering Information

| ORDER NUMBER        | PACKAGE DESCRIPTION | PACKAGE OPTION      |
|---------------------|---------------------|---------------------|
| SN74AUP1G126DBVR-TP | SOT23-5             | Tape and Reel, 3000 |
| SN74AUP1G126DCKR-TP | SOT353              | Tape and Reel, 3000 |
| SN74AUP1G126DRLR-TP | SOT553              | Tape and Reel, 4000 |
| SN74AUP1G126DSFR-TP | DFN1X1-6            | Tape and Reel, 5000 |
| SN74AUP1G126DRYR-TP | DFN1510-6           | Tape and Reel, 5000 |

### Pin Configuratio (TOP VIEW)



### Function Table (each gate)

| INPUT(OE) | INPUT(A) | OUTPUT(Y) |
|-----------|----------|-----------|
| H         | H        | H         |
| H         | L        | L         |
| L         | X        | Z         |

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

### Absolute Maximum Ratings

| PARAMETER                      | SYMBOL           | CONDITIONS                          | RATINGS                       | UNIT |
|--------------------------------|------------------|-------------------------------------|-------------------------------|------|
| Supply Voltage                 | V <sub>CC</sub>  |                                     | -0.5 ~ +4.6                   | V    |
| Input Voltage                  | V <sub>IN</sub>  |                                     | -0.5 ~ +4.6                   | V    |
| Output Voltage                 | V <sub>OUT</sub> | Output in the high or low state     | -0.5 ~ +V <sub>CC</sub> +0.5V | V    |
|                                |                  | Output in the power-off state       | -0.5 ~ +4.6                   | V    |
| V <sub>CC</sub> or GND Current | I <sub>CC</sub>  |                                     | ±50                           | mA   |
| Continuous Output Current      | I <sub>OUT</sub> | V <sub>OUT</sub> =0~V <sub>CC</sub> | ±20                           | mA   |
| Input Clamp Current            | I <sub>IK</sub>  | V <sub>IN</sub> <0                  | -50                           | mA   |
| Output Clamp Current           | I <sub>OK</sub>  | V <sub>OUT</sub> <0                 | -50                           | mA   |
| Storage Temperature Range      | T <sub>STG</sub> |                                     | -65 ~ +150                    | °C   |
| Junction to Ambient            | θ <sub>JA</sub>  | SOT-23-5                            | 230                           | °C/W |
|                                |                  | SOT353                              | 280                           | °C/W |
|                                |                  | SOT553                              | 250                           | °C/W |
|                                |                  | DFN1X1-6                            | 460                           | °C/W |
|                                |                  | DFN1510-6                           | 440                           | °C/W |

Note: Absolute maximum ratings are those values beyond which the device could be permanently damaged. Absolute maximum ratings are stress ratings only and functional device operation is not implied.

### Recommended Operating Conditions

| PARAMETER                          | SYMBOL           | TEST CONDITIONS              | MIN | TYP | MAX             | UNIT |
|------------------------------------|------------------|------------------------------|-----|-----|-----------------|------|
| Supply Voltage                     | V <sub>CC</sub>  | Operating                    | 0.8 | --  | 3.6             | V    |
| Input Voltage                      | V <sub>IN</sub>  |                              | 0   | --  | 3.6             | V    |
| Output Voltage                     | V <sub>OUT</sub> | High or low state            | 0   | --  | V <sub>CC</sub> | V    |
| Input Transition Rise or Fall Rate | Δt/Δv            | V <sub>CC</sub> =0.8V ~ 3.6V | --  | --  | 200             | ns/V |
| Operating Temperature              | T <sub>A</sub>   |                              | -40 | --  | +125            | °C   |

### Electrical Characteristics (T<sub>A</sub>=25°C ,unless otherwise specified)

| PARAMETER                                         | SYMBOL               | TEST CONDITIONS                                                                           | MIN                     | TYP  | MAX                  | UNIT |
|---------------------------------------------------|----------------------|-------------------------------------------------------------------------------------------|-------------------------|------|----------------------|------|
| High-level Input Voltage                          | V <sub>IH</sub>      | V <sub>CC</sub> =0.8V                                                                     | 0.7×V <sub>CC</sub>     | --   | --                   | V    |
|                                                   |                      | V <sub>CC</sub> =0.9V ~ 1.95V                                                             | 0.65×V <sub>CC</sub>    | --   | --                   | V    |
|                                                   |                      | V <sub>CC</sub> =2.3V ~ 2.7V                                                              | 1.6                     | --   | --                   | V    |
|                                                   |                      | V <sub>CC</sub> =3V ~ 3.6V                                                                | 2                       | --   | --                   | V    |
| Low-level Input Voltage                           | V <sub>IL</sub>      | V <sub>CC</sub> =0.8V                                                                     | --                      | --   | 0.3×V <sub>CC</sub>  | V    |
|                                                   |                      | V <sub>CC</sub> =1.1V ~ 1.95V                                                             | --                      | --   | 0.35×V <sub>CC</sub> | V    |
|                                                   |                      | V <sub>CC</sub> =2.3V ~ 2.7V                                                              | --                      | --   | 0.7                  | V    |
|                                                   |                      | V <sub>CC</sub> =3V ~ 3.6V                                                                | --                      | --   | 0.9                  | V    |
| High-Level Output Voltage                         | V <sub>OH</sub>      | V <sub>CC</sub> =0.8 ~ 3.6V, I <sub>OH</sub> =-20μA                                       | V <sub>CC</sub> -0.1    | --   | --                   | V    |
|                                                   |                      | V <sub>CC</sub> =1.1V, I <sub>OH</sub> =-1.1mA                                            | 0.75×V <sub>CC</sub>    | --   | --                   | V    |
|                                                   |                      | V <sub>CC</sub> =1.4V, I <sub>OH</sub> =-1.7mA                                            | 1.11                    | --   | --                   | V    |
|                                                   |                      | V <sub>CC</sub> =1.65V, I <sub>OH</sub> =-1.9mA                                           | 1.32                    | --   | --                   | V    |
|                                                   |                      | V <sub>CC</sub> =2.3V                                                                     | I <sub>OH</sub> =-2.3mA | 2.05 | --                   | V    |
|                                                   |                      |                                                                                           | I <sub>OH</sub> =-3.1mA | 1.9  | --                   | V    |
|                                                   |                      | V <sub>CC</sub> =3V                                                                       | I <sub>OH</sub> =-2.7mA | 2.72 | --                   | V    |
|                                                   |                      |                                                                                           | I <sub>OH</sub> =-4mA   | 2.6  | --                   | V    |
| Low-Level Output Voltage                          | V <sub>OL</sub>      | V <sub>CC</sub> =0.8 ~ 3.6V, I <sub>OL</sub> =20μA                                        | --                      | --   | 0.1                  | V    |
|                                                   |                      | V <sub>CC</sub> =1.1V, I <sub>OL</sub> =1.1mA                                             | --                      | --   | 0.3×V <sub>CC</sub>  | V    |
|                                                   |                      | V <sub>CC</sub> =1.4V, I <sub>OL</sub> =1.7mA                                             | --                      | --   | 0.31                 | V    |
|                                                   |                      | V <sub>CC</sub> =1.65V, I <sub>OL</sub> =1.9mA                                            | --                      | --   | 0.31                 | V    |
|                                                   |                      | V <sub>CC</sub> =2.3V                                                                     | I <sub>OL</sub> =2.3mA  | --   | 0.31                 | V    |
|                                                   |                      |                                                                                           | I <sub>OL</sub> =3.1mA  | --   | 0.44                 | V    |
|                                                   |                      | V <sub>CC</sub> =3V                                                                       | I <sub>OL</sub> =2.7mA  | --   | 0.31                 | V    |
|                                                   |                      |                                                                                           | I <sub>OL</sub> =4mA    | --   | 0.44                 | V    |
| Input Leakage Current                             | I <sub>I(LEAK)</sub> | V <sub>CC</sub> =0 ~ 3.6V, V <sub>IN</sub> =GND ~ 3.6V                                    | --                      | --   | ±0.1                 | μA   |
| Power OFF Leakage Current                         | I <sub>off</sub>     | V <sub>CC</sub> =0 V, V <sub>IN</sub> or V <sub>OUT</sub> =0 ~ 3.6V                       | --                      | --   | ±0.2                 | μA   |
| Additional Power OFF Leakage Current              | ΔI <sub>off</sub>    | V <sub>CC</sub> =0 V~0.2V, V <sub>IN</sub> or V <sub>OUT</sub> =0 ~ 3.6V                  | --                      | --   | ±0.2                 | μA   |
| Quiescent Supply Current                          | I <sub>CC</sub>      | V <sub>CC</sub> =0.8 ~ 3.6V, V <sub>IN</sub> =V <sub>CC</sub> or GND, I <sub>OUT</sub> =0 | --                      | --   | 0.5                  | μA   |
| Additional Quiescent Supply Current Per Input Pin | ΔI <sub>CC</sub>     | V <sub>CC</sub> =3.3 V, V <sub>IN</sub> =V <sub>CC</sub> -0.6V, I <sub>OUT</sub> =0       | --                      | --   | 40                   | μA   |
| Input Capacitance                                 | C <sub>I</sub>       | V <sub>CC</sub> =0V-3.6V, V <sub>IN</sub> =V <sub>CC</sub> or GND                         | --                      | 1.5  | --                   | pF   |
| Output Capacitance                                | C <sub>OUT</sub>     | V <sub>CC</sub> =0V, V <sub>OUT</sub> =GND                                                | --                      | 3.0  | --                   | pF   |

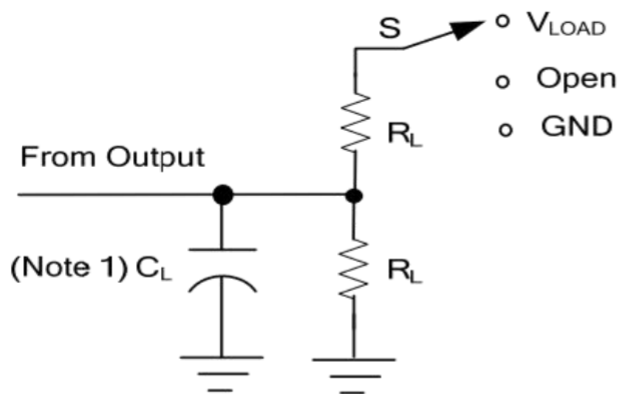
### OPERATING CHARACTERISTICS (f=10MHz, TA =25°C , unless otherwise specified)

| PARAMETER                     | SYMBOL          | TEST CONDITIONS            | MIN | TYP | MAX | UNIT |
|-------------------------------|-----------------|----------------------------|-----|-----|-----|------|
| Power Dissipation Capacitance | C <sub>PD</sub> | V <sub>CC</sub> =0.8V      | --  | 3.8 | --  | pF   |
|                               |                 | V <sub>CC</sub> =1.2±0.1V  | --  | 3.7 | --  | pF   |
|                               |                 | V <sub>CC</sub> =1.5±0.1V  | --  | 3.7 | --  | pF   |
|                               |                 | V <sub>CC</sub> =1.8±0.15V | --  | 3.7 | --  | pF   |
|                               |                 | V <sub>CC</sub> =2.5±0.2V  | --  | 3.9 | --  | pF   |
|                               |                 | V <sub>CC</sub> =3.3±0.3V  | --  | 4.0 | --  | pF   |

### SWITCHING CHARACTERISTICS (TA =25°C, unless otherwise specified)

| PARAMETER                                      | SYMBOL          | TEST CONDITIONS |                            | MIN | TYP  | MAX | UNIT |
|------------------------------------------------|-----------------|-----------------|----------------------------|-----|------|-----|------|
| Propagation delay from inputs (A) to output(Y) | t <sub>PD</sub> | CL=5pF, RL=1MΩ  | V <sub>CC</sub> =0.8V      | --  | 18.1 | --  | ns   |
|                                                |                 |                 | V <sub>CC</sub> =1.2±0.1V  | 4.3 | 7.4  | --  | ns   |
|                                                |                 |                 | V <sub>CC</sub> =1.5±0.1V  | 3.3 | 5.2  | --  | ns   |
|                                                |                 |                 | V <sub>CC</sub> =1.8±0.15V | 2.6 | 4.1  | --  | ns   |
|                                                |                 |                 | V <sub>CC</sub> =2.5±0.2V  | 2   | 2.9  | --  | ns   |
|                                                |                 |                 | V <sub>CC</sub> =3.3±0.3V  | 1.7 | 2.4  | --  | ns   |
|                                                |                 | CL=10pF, RL=1MΩ | V <sub>CC</sub> =0.8V      | --  | 20.5 | --  | ns   |
|                                                |                 |                 | V <sub>CC</sub> =1.2±0.1V  | 4.6 | 8.4  | --  | ns   |
|                                                |                 |                 | V <sub>CC</sub> =1.5±0.1V  | 3.5 | 5.9  | --  | ns   |
|                                                |                 |                 | V <sub>CC</sub> =1.8±0.15V | 3.9 | 4.7  | --  | ns   |
|                                                |                 |                 | V <sub>CC</sub> =2.5±0.2V  | 2.3 | 3.4  | --  | ns   |
|                                                |                 |                 | V <sub>CC</sub> =3.3±0.3V  | 2.1 | 2.8  | --  | ns   |
|                                                |                 | CL=15pF, RL=1MΩ | V <sub>CC</sub> =0.8V      | --  | 22.5 | --  | ns   |
|                                                |                 |                 | V <sub>CC</sub> =1.2±0.1V  | 5.8 | 9.3  | --  | ns   |
|                                                |                 |                 | V <sub>CC</sub> =1.5±0.1V  | 4.4 | 6.6  | --  | ns   |
|                                                |                 |                 | V <sub>CC</sub> =1.8±0.15V | 3.5 | 5.3  | --  | ns   |
|                                                |                 |                 | V <sub>CC</sub> =2.5±0.2V  | 2.7 | 3.9  | --  | ns   |
|                                                |                 |                 | V <sub>CC</sub> =3.3±0.3V  | 2.4 | 3.2  | --  | ns   |
|                                                |                 | CL=30pF, RL=1MΩ | V <sub>CC</sub> =0.8V      | --  | 29   | --  | ns   |
|                                                |                 |                 | V <sub>CC</sub> =1.2±0.1V  | 7.4 | 12   | --  | ns   |
|                                                |                 |                 | V <sub>CC</sub> =1.5±0.1V  | 5.7 | 8.6  | --  | ns   |
|                                                |                 |                 | V <sub>CC</sub> =1.8±0.15V | 4.8 | 6.9  | --  | ns   |
|                                                |                 |                 | V <sub>CC</sub> =2.5±0.2V  | 3.9 | 5.1  | --  | ns   |
|                                                |                 |                 | V <sub>CC</sub> =3.3±0.3V  | 3.5 | 4.8  | --  | ns   |

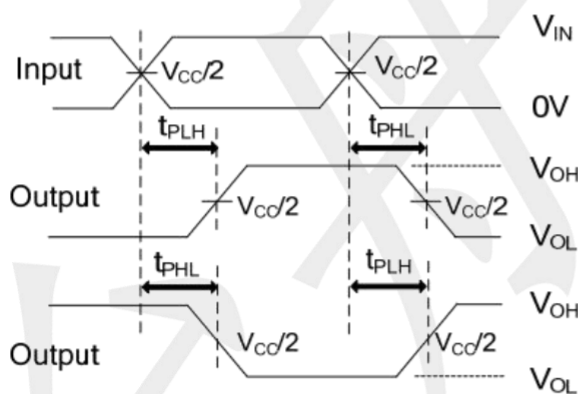
### TEST CIRCUIT AND WAVEFORMS



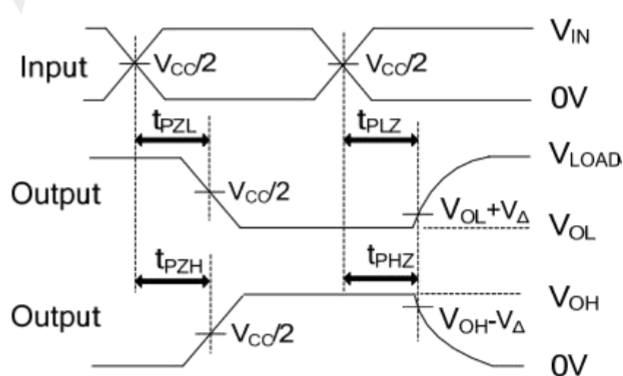
TEST CIRCUIT

| TEST              | S                 |
|-------------------|-------------------|
| $t_{PLH}/t_{PHL}$ | Open              |
| $t_{PHZ}/t_{PZH}$ | GND               |
| $t_{PLZ}/t_{PZL}$ | $2 \times V_{CC}$ |

| $V_{CC}$        | $V_{IN}$ | $t_R / t_F$ | $V_M$      | $V_{LOAD}$        | $C_L$           | $R_L$       | $V_{\Delta}$ |
|-----------------|----------|-------------|------------|-------------------|-----------------|-------------|--------------|
| 0.8             | $V_{CC}$ | 3ns         | $V_{CC}/2$ | $2 \times V_{CC}$ | 5, 10, 15, 30pF | 5k $\Omega$ | 0.1V         |
| $1.2 \pm 0.1V$  | $V_{CC}$ | 3ns         | $V_{CC}/2$ | $2 \times V_{CC}$ | 5, 10, 15, 30pF | 5k $\Omega$ | 0.1V         |
| $1.5 \pm 0.1V$  | $V_{CC}$ | 3ns         | $V_{CC}/2$ | $2 \times V_{CC}$ | 5, 10, 15, 30pF | 5k $\Omega$ | 0.1V         |
| $1.8 \pm 0.15V$ | $V_{CC}$ | 3ns         | $V_{CC}/2$ | $2 \times V_{CC}$ | 5, 10, 15, 30pF | 5k $\Omega$ | 0.15V        |
| $2.5 \pm 0.2V$  | $V_{CC}$ | 3ns         | $V_{CC}/2$ | $2 \times V_{CC}$ | 5, 10, 15, 30pF | 5k $\Omega$ | 0.15V        |
| $3.3 \pm 0.3V$  | $V_{CC}$ | 3ns         | $V_{CC}/2$ | $2 \times V_{CC}$ | 5, 10, 15, 30pF | 5k $\Omega$ | 0.3V         |



PROPAGATION DELAY TIMES



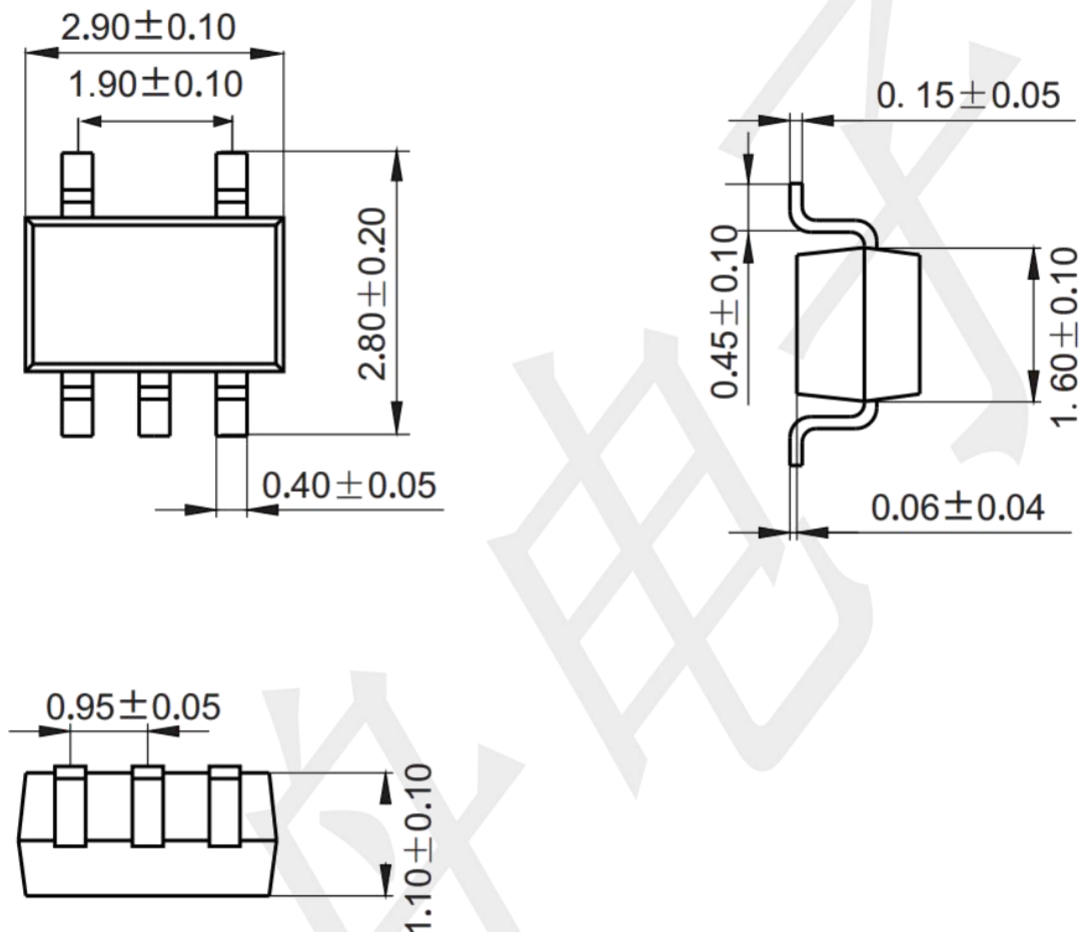
ENABLE AND DISABLE TIMES

#### Notes:

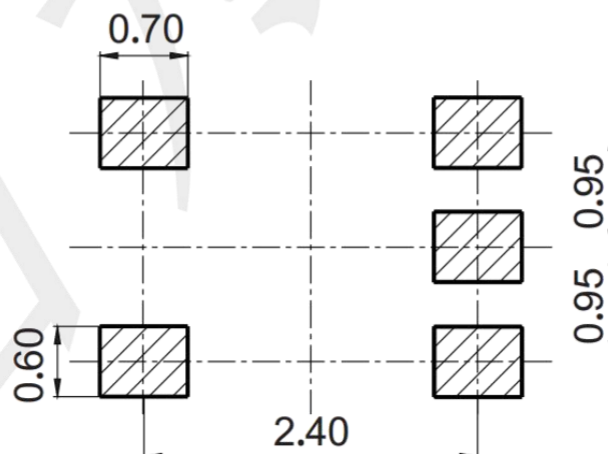
- CL includes probe and jig capacitance.
- All input pulses are supplied by generators having the following characteristics: PRR  $\leq 10\text{MHz}$ ,  $Z_O = 50\Omega$ .

**Package information (Unit: mm)**

**SOT23-5**

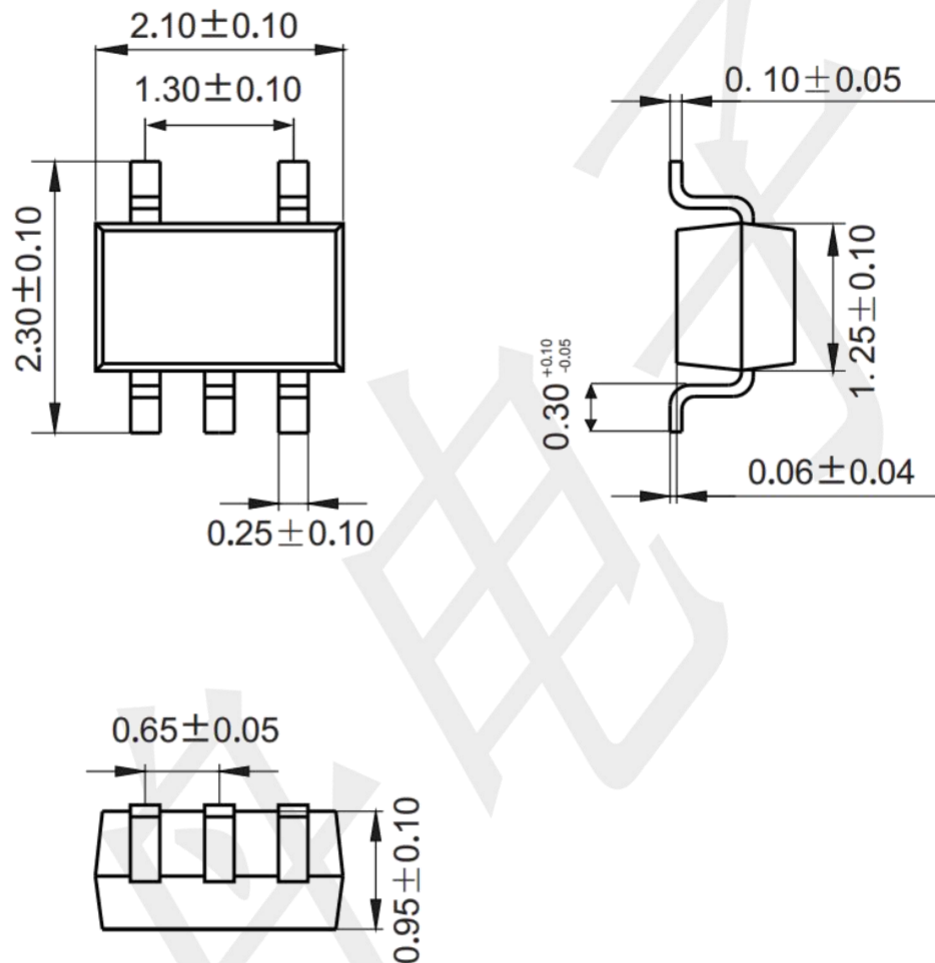


**Mounting Pad Layout (unit: mm)**

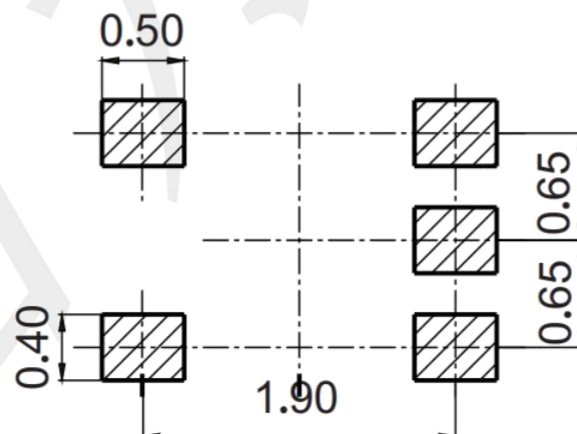


**Package information (Unit: mm)**

**SOT353**

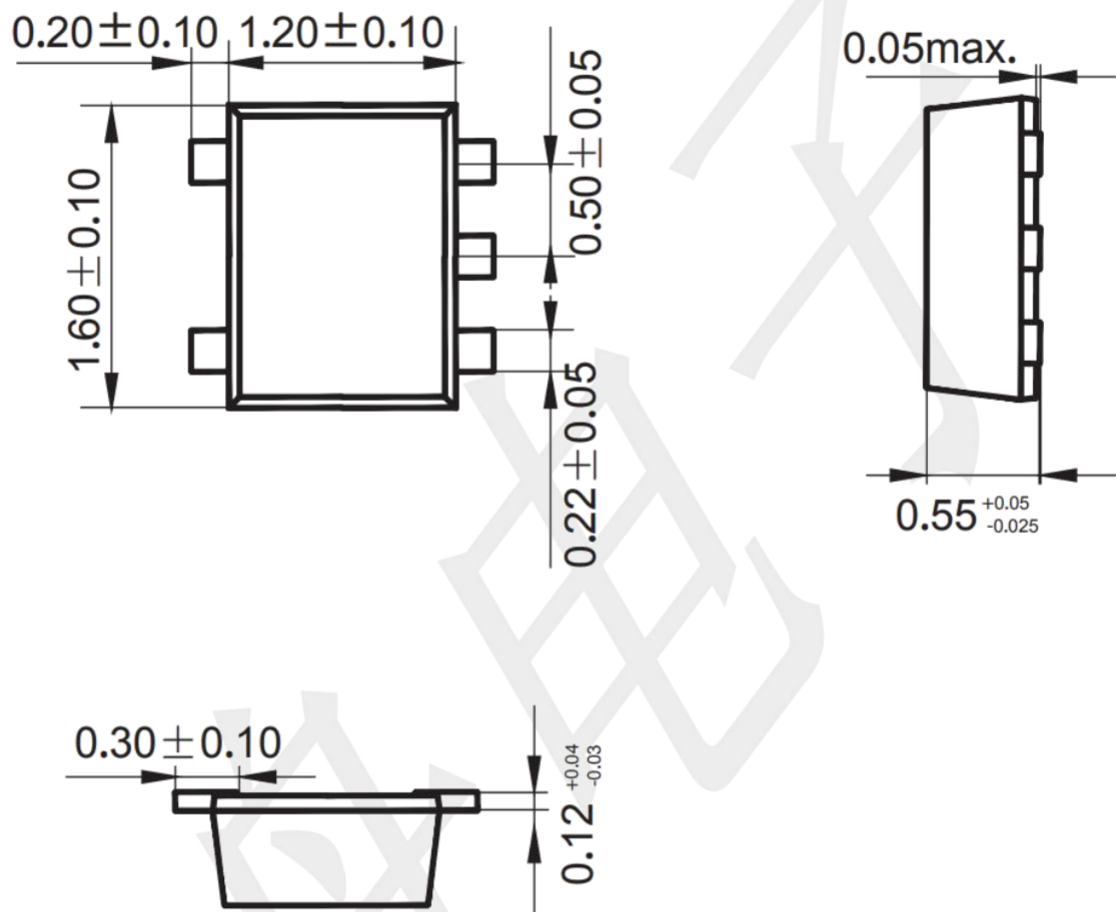


**Mounting Pad Layout (unit: mm)**

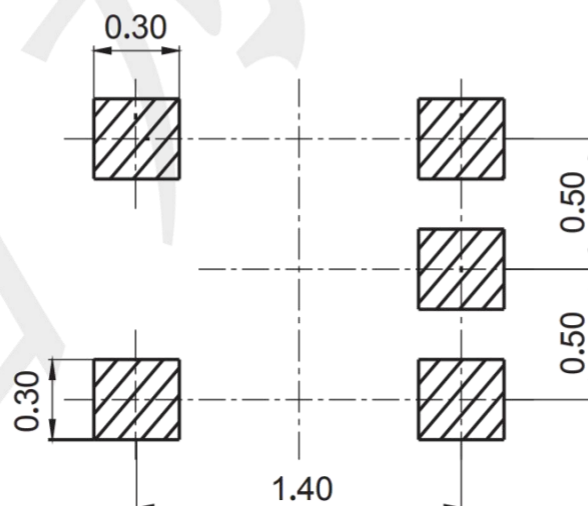


**Package information (unit: mm)**

**SOT553**

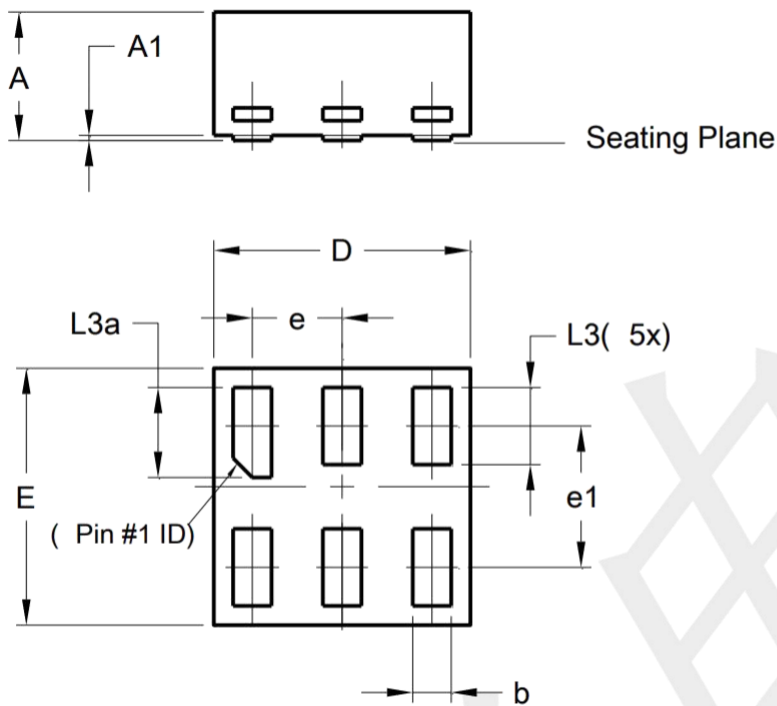


**Mounting Pad Layout (unit: mm)**



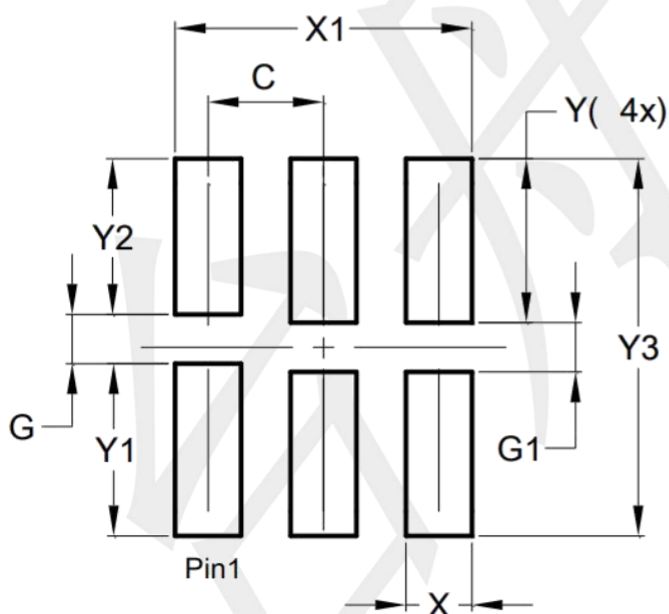
**Package information (unit: mm)**

**DFN1X1-6**

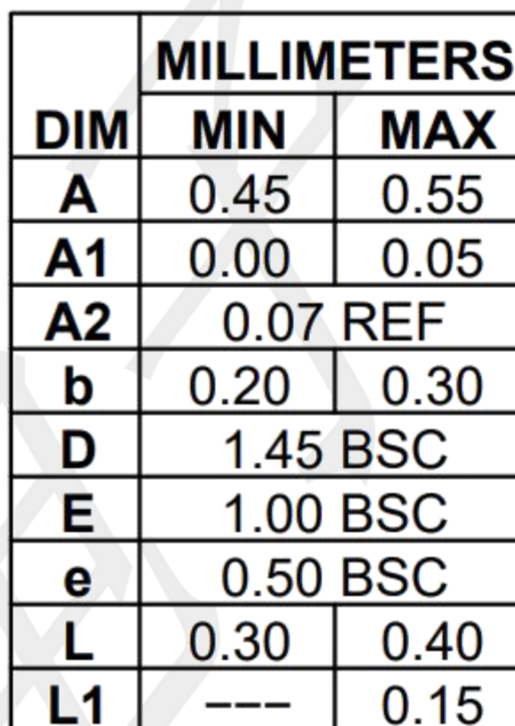


| DFN1010-6<br>(Type B) |          |       |      |
|-----------------------|----------|-------|------|
| Dim                   | Min      | Max   | Typ  |
| A                     | -        | 0.50  | 0.39 |
| A1                    | -        | 0.04  | -    |
| b                     | 0.12     | 0.20  | 0.15 |
| D                     | 0.95     | 1.050 | 1.00 |
| E                     | 0.95     | 1.050 | 1.00 |
| e                     | 0.35 BSC |       |      |
| e1                    | 0.55 BSC |       |      |
| L3                    | 0.27     | 0.30  | 0.30 |
| L3a                   | 0.32     | 0.40  | 0.35 |
| All Dimensions in mm  |          |       |      |

**Mounting Pad Layout (unit: mm)**



| Dimensions | Value<br>(in mm) |
|------------|------------------|
| C          | 0.350            |
| G          | 0.150            |
| G1         | 0.150            |
| X          | 0.200            |
| X1         | 0.900            |
| Y          | 0.500            |
| Y1         | 0.525            |
| Y2         | 0.475            |
| Y3         | 1.150            |

**DFN1510-6**

## MOUNTING FOOTPRINT

