

## Micro-actuator Driver

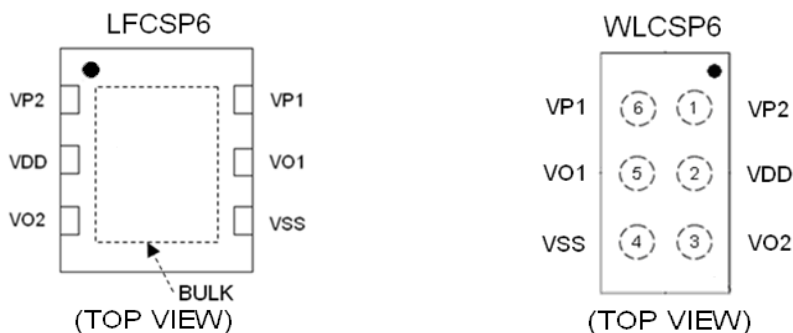
### General Specifications

SD306 is a micro-actuator driver IC with miniature package. It is one channel low voltage bi-directional motor driver IC. The design is optimal for driving different type micro-actuator, such as OIS motors, voice coil motors, piezo-actuators, or other DC motor actuators. It is suitable for camera module application or other portable device.

### Features and Benefits

- ◆ Low voltage operation ( $V_{DD\ Min} = 1.8\ V$ )
- ◆ Low input current
- ◆ Zero standby current
- ◆ High frequency switch (1MHz)
- ◆ Thin, small package (LFCSP6 / WLCSP6)

### Pin Assignment



| Pin Num. | Pin Name | Description         |
|----------|----------|---------------------|
| 1        | VP2      | Driver control pin2 |
| 2        | VDD      | Power supply        |
| 3        | VO2      | Driver output 2     |
| 4        | VSS      | Ground              |
| 5        | VO1      | Driver output 1     |
| 6        | VP1      | Driver control pin1 |
| BULK     |          | Ground              |

**Absolute Maximum Ratings ( Unless otherwise noted,  $T_A=25^{\circ}\text{C}$  )**

| Characteristic              | Symbol      | Rating       | Unit               |
|-----------------------------|-------------|--------------|--------------------|
| Supply Voltage              | $V_{DD}$    | 4.5          | V                  |
| Input Voltage               | $V_{P1}$    | $V_{DD}+0.4$ | V                  |
| $I_O$ Peak Current          | $I_{OPeak}$ | 400          | mA                 |
| $I_{ODC}$ Current           | $I_{ODC}$   | 280          | mA                 |
| Power Dissipation           | $P_D$       | 300 (LFCSP6) | mW                 |
|                             |             | 300(WLCSP6)  |                    |
| Operating Temperature Range | $T_{OPR}$   | -40 ~ 80     | $^{\circ}\text{C}$ |
| Storage Temperature Range   | $T_{STG}$   | -65 ~ 150    | $^{\circ}\text{C}$ |

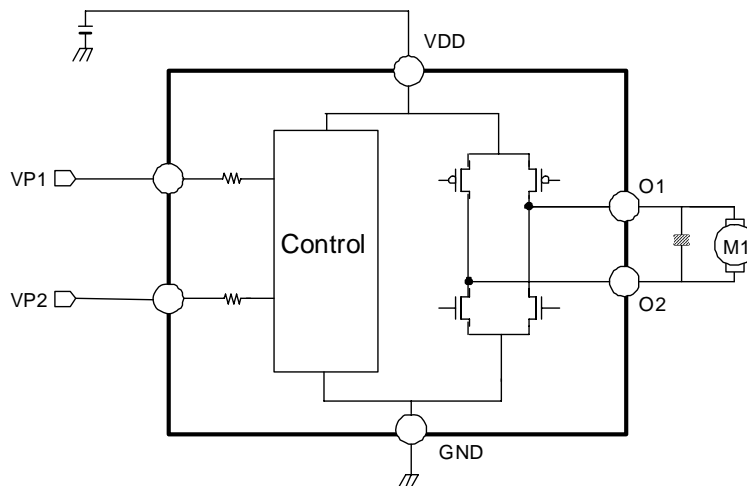
**Electrical Characteristic**
*(Unless otherwise noted,  $T_A=25^{\circ}\text{C}$  &  $V_{DD}=2.8\text{V}$ )*

| Characteristic   | Sym.     | Condition              | Limit              |      |                    | Unit          |
|--|----------|------------------------|--------------------|------|--------------------|---------------|
|  |          |                        | Min.               | Typ. | Max.               |               |
| Supply Voltage   | $V_{DD}$ |                        | 1.8                | 2.8  | 4.5                | V             |
| Standby Current  | $I_{DD}$ | No load                | -                  | -    | 3                  | $\mu\text{A}$ |
| VP1 VP2 and PD Input Terminal ( $T_J = 25^{\circ}\text{C}$ ) |          |                        |                    |      |                    |               |
| Input Voltage "H"  | $V_{IH}$ | -                      | $0.5 \cdot V_{DD}$ | -    | $V_{DD}+0.4$       | V             |
| Input Voltage "L"  | $V_{IL}$ | -                      | -0.4               | -    | $0.2 \cdot V_{DD}$ | V             |
| Input Current "H"  | $I_{IH}$ | $V_{IN} = V_{DD}$      | -                  | -    | $\pm 1$            | $\mu\text{A}$ |
| Input Current "L"  | $I_{IL}$ | $V_{IN} = 0\text{V}$   | -                  | -    | $\pm 1$            | $\mu\text{A}$ |
| Output Terminal (O1, O2)                                     |          |                        |                    |      |                    |               |
| Output Resistance (Upper)                                    | $R_{OH}$ | $I_{OUT}=200\text{mA}$ | -                  | 1.32 | 1.6                | Ohm           |
| Output Resistance (Low)                                      | $R_{OL}$ | $I_{OUT}=200\text{mA}$ | -                  | 0.73 | 0.9                | Ohm           |

**Truth Table**

| Input |     | Output |    |
|-------|-----|--------|----|
| VP1   | VP2 | O1     | O2 |
| L     | L   | H      | H  |
| L     | H   | H      | L  |
| H     | L   | L      | H  |
| H     | H   | L      | L  |

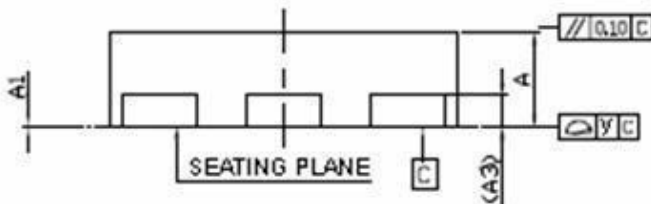
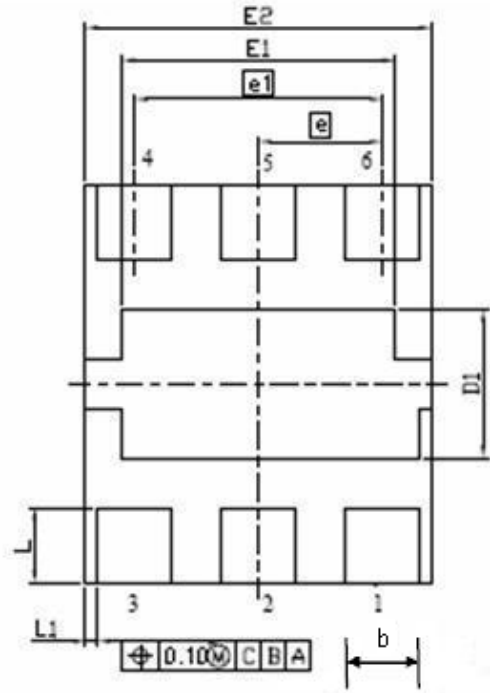
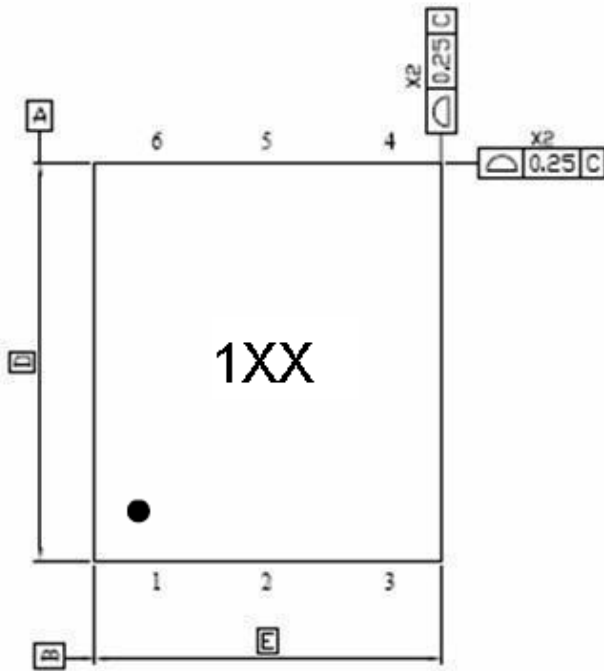
**Function Block**



**Application Notes**

- The O1/O2 output H/H or L/L will brake the motor. Though the active current of driver is near to zero, if the application is required to turn off driver, please turn off the driver's power from VDD.
- The capacitor connected between the output nodes O1/O2 will reduce the noise generating by motor when the motor is switched to opposed direction.

**Package Specifications ( LFCSP6 )**



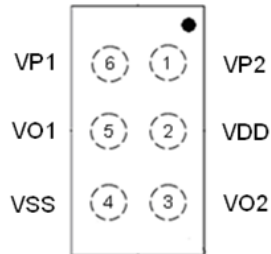
Note:

1 and XX of the "1XX" are the product number and lot numbers b

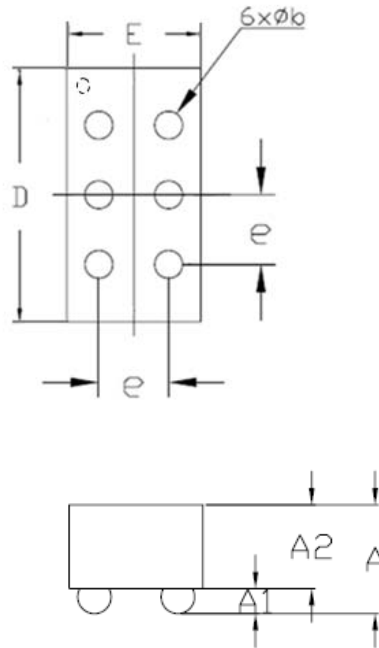
| SYMBOL | DIMENSION (mm) |      |      |
|--------|----------------|------|------|
|        | MIN.           | NOM. | MAX. |
| A      | 0.33           | 0.38 | 0.43 |
| A1     | 0.00           | 0.02 | 0.05 |
| A3     | 0.127 REF      |      |      |
| b      | 0.22           | 0.30 | 0.38 |
| D      | 1.50           | 1.60 | 1.70 |
| D1     | 0.50           | 0.60 | 0.70 |
| E      | 1.30           | 1.40 | 1.50 |
| E1     | 1.00           | 1.10 | 1.20 |
| E2     | 1.30           | 1.40 | 1.50 |
| e      | 0.50 BASIC     |      |      |
| e1     | 1.00 BASIC     |      |      |
| L      | 0.25           | 0.30 | 0.35 |
| L1     | 0.05 BASIC     |      |      |
| y      | -              | -    | 0.08 |

**Package Specifications(WLCSP): (0.450mm\*0.881mm\*0.325mm)**

**TOP VIEW**



**BOTTOM VIEW**



| SYMBOL | DIMENSION (mm) |       |       |
|--------|----------------|-------|-------|
|        | MIN.           | NOM.  | MAX.  |
| A      | 0.302          | 0.325 | 0.348 |
| A1     | 0.067          | 0.075 | 0.083 |
| A2     | 0.235          | 0.250 | 0.265 |
| D      | 0.860          | 0.881 | 0.903 |
| E      | 0.429          | 0.450 | 0.472 |
| b      | 0.090          | 0.100 | 0.110 |
| e      | 0.250          |       |       |