

TOSHIBA BIPOLAR DIGITAL INTEGRATED CIRCUIT SILICON MONOLITHIC

# TD62300P, TD62300F

## 2CH LOW $V_{CC}$ SINK DRIVER

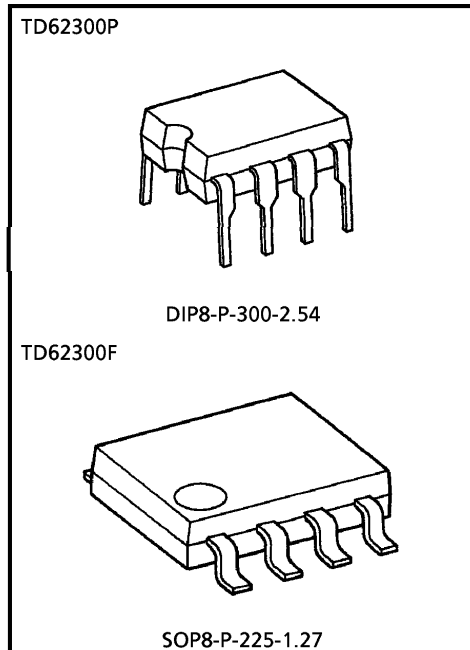
The TD62300P, TD62300F are comprised of two Low  $V_{CC}$  drivers.

These devices can operate from  $V_{CC} = 1.0V$ , and suitable for various types of battery system.

Applications include relay, hammer, lamp and stepping motor drivers.

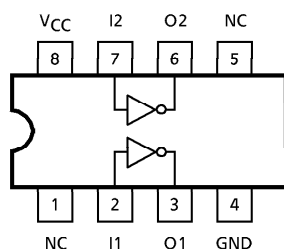
### FEATURES

- Wide supply voltage range :  $V_{CC} = 1.0 \sim 6.5V$
- High output current (single output) : 200mA (Max.)
- Low supply current :  $I_{CC} (OFF) = 1\mu A$  (Max.)
- Input resistor :  $R_{IN} = 33k\Omega$  (Typ.)
- Package type-P : DIP-8 pin
- Package type-F : SOP-8 pin



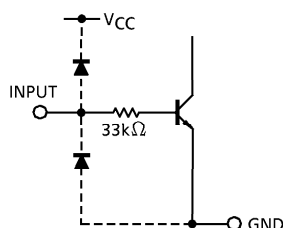
Weight  
DIP8-P-300-2.54 : 0.52g (Typ.)  
SOP8-P-225-1.27 : 0.08g (Typ.)

### PIN CONNECTION (TOP VIEW)

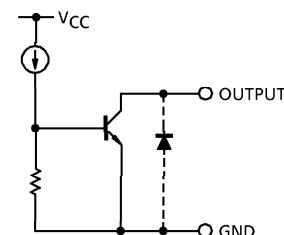


### OUTPUT-INPUT EQUIVALENT CIRCUIT

Equivalent of input



Equivalent of output



(Note) The input and output parasitic diodes cannot be used as clamp diodes.

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**MAXIMUM RATINGS** (Ta = 25°C)

| CHARACTERISTIC            | SYMBOL                | RATING          | UNIT       |
|---------------------------|-----------------------|-----------------|------------|
| Supply Voltage            | V <sub>CC</sub>       | 7.0             | V          |
| Output Sustaining Voltage | V <sub>CE (SUS)</sub> | 8.0             | V          |
| Output Current            | I <sub>OUT</sub>      | 200             | mA / ch    |
| Input Voltage             | V <sub>IN</sub>       | V <sub>CC</sub> | V          |
| Power Dissipation         | TD62300P              | P <sub>D</sub>  | 900        |
|                           | TD62300F              |                 | 480 (Note) |
| Operating Temperature     | T <sub>opr</sub>      | 0 ~ 70          | °C         |
| Storage Temperature       | T <sub>stg</sub>      | - 55 ~ 150      | °C         |

(Note) On Glass Epoxy (20×20×1.6mm Cu 50%)

**RECOMMENDED OPERATING CONDITIONS** (Ta = 0~70°C)

| CHARACTERISTIC            | SYMBOL                | CONDITION      | MIN. | TYP. | MAX.            | UNIT |
|---------------------------|-----------------------|----------------|------|------|-----------------|------|
| Supply Voltage            | V <sub>CC</sub>       |                | 1.0  | —    | 6.5             | V    |
| Output Sustaining Voltage | V <sub>CE (SUS)</sub> |                | —    | —    | 8               | V    |
| Output Current            | I <sub>OUT</sub>      |                | —    | —    | 150             | mA   |
| Input Voltage             | V <sub>IN</sub>       |                | 0    | —    | V <sub>CC</sub> | V    |
| Power Dissipation         | TD62300P              | P <sub>D</sub> | —    | —    | 430             | mW   |
|                           | TD62300F              | (Note)         | —    | —    | 230             |      |

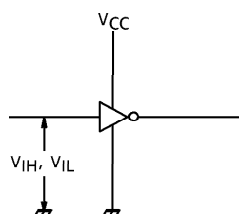
(Note) On Glass Epoxy (20×20×1.6mm Cu 50%)

**ELECTRICAL CHARACTERISTICS** (Ta = 25°C)

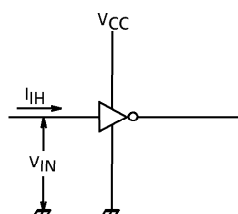
| CHARACTERISTIC | SYMBOL                | TEST CIR-<br>CUIT | TEST CONDITION                                  | MIN.                                             | TYP. | MAX. | UNIT |
|----------------|-----------------------|-------------------|-------------------------------------------------|--------------------------------------------------|------|------|------|
| Input Voltage  | "H" Level             | V <sub>IH</sub>   | 1                                               | 0.85                                             | —    | —    | V    |
|                | "L" Level             | V <sub>IL</sub>   | 1                                               | —                                                | —    | 0.45 |      |
| Input Current  | "H" Level             | I <sub>IH</sub>   | 2                                               | V <sub>IN</sub> = 0.85V                          | —    | 4.9  | μA   |
| Output Current | "H" Level             | I <sub>OH</sub>   | 3                                               | V <sub>CC</sub> = V <sub>OUT</sub> = 5.0V        | —    | 10   | μA   |
| Output Voltage | "L" Level             | V <sub>OL</sub>   | 4                                               | V <sub>CC</sub> = 1.4V, I <sub>OUT</sub> = 140mA | —    | 0.2  | 0.6  |
| Supply Current | I <sub>CC (ON)</sub>  | 5                 | V <sub>CC</sub> = 1.4V, V <sub>IN</sub> = 0.85V | —                                                | 6.4  | 9.0  | mA   |
|                | I <sub>CC (OFF)</sub> |                   | V <sub>CC</sub> = 5.0V, V <sub>IN</sub> = 0V    | —                                                | —    | 1.0  |      |
| Turn-On Delay  | t <sub>ON</sub>       | 6                 | V <sub>CC</sub> = 1.7V, R <sub>L</sub> = 10Ω    | —                                                | 0.1  | —    | μs   |
| Turn-Off Delay | t <sub>OFF</sub>      |                   | C <sub>L</sub> = 15pF                           | —                                                | 2.3  | —    | μs   |

## TEST CIRCUIT

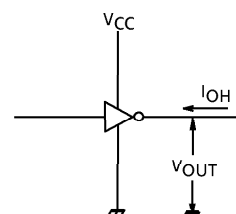
1.  $V_{IH}$ ,  $V_{IL}$



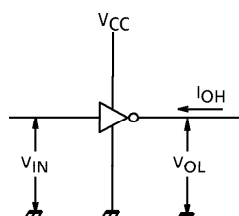
2.  $I_{IH}$



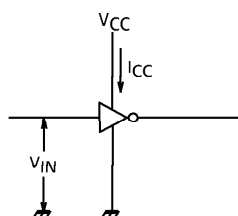
3.  $I_{OH}$



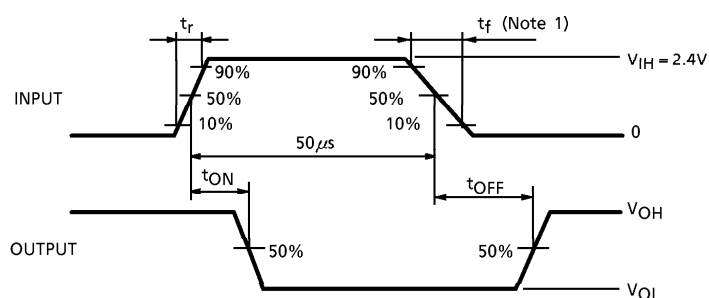
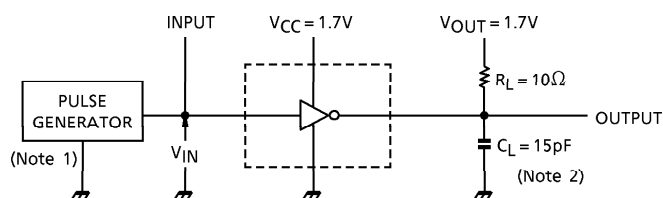
4.  $V_{OL}$



5.  $I_{CC(ON)}$ ,  $I_{CC(OFF)}$



6.  $t_{ON}$ ,  $t_{OFF}$

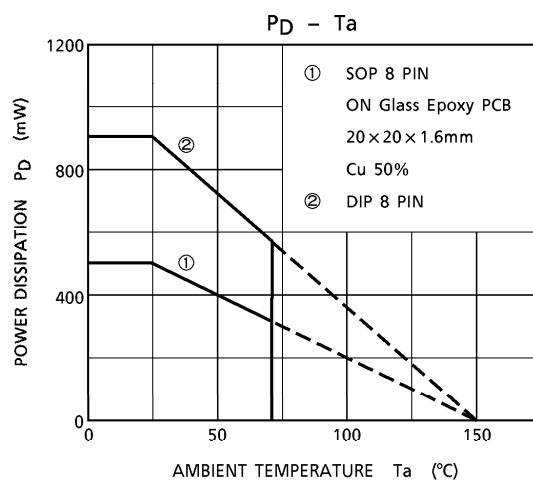
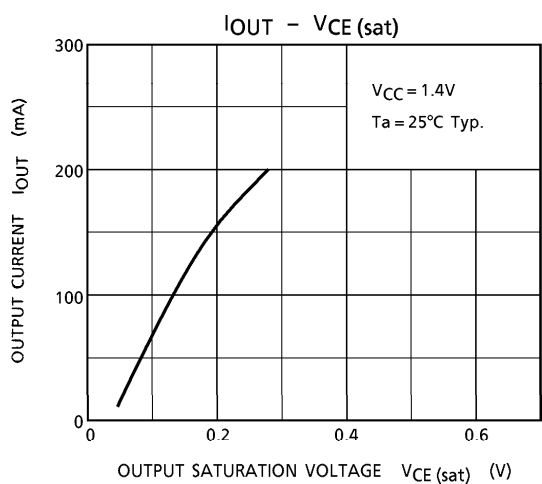
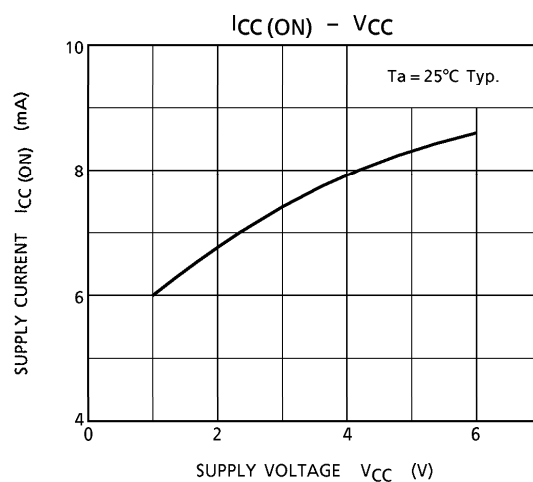
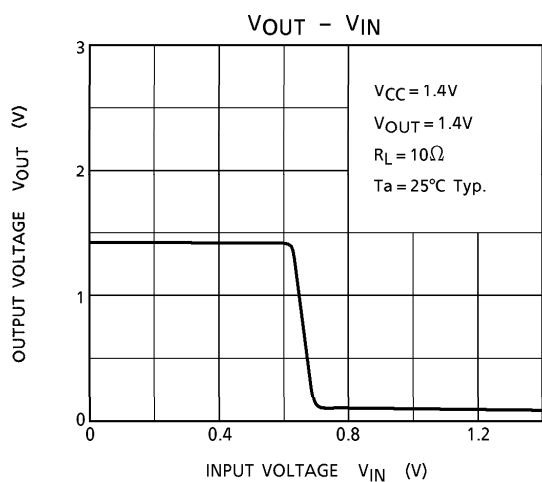


(Note 1) Pulse Width  $50\mu s$   
Duty Cycle 10%  
Output Impedance  $50\Omega$   
 $t_r \leq 5ns$ ,  $t_f \leq 10ns$

(Note 2)  $C_L$  includes probe and jig capacitance.

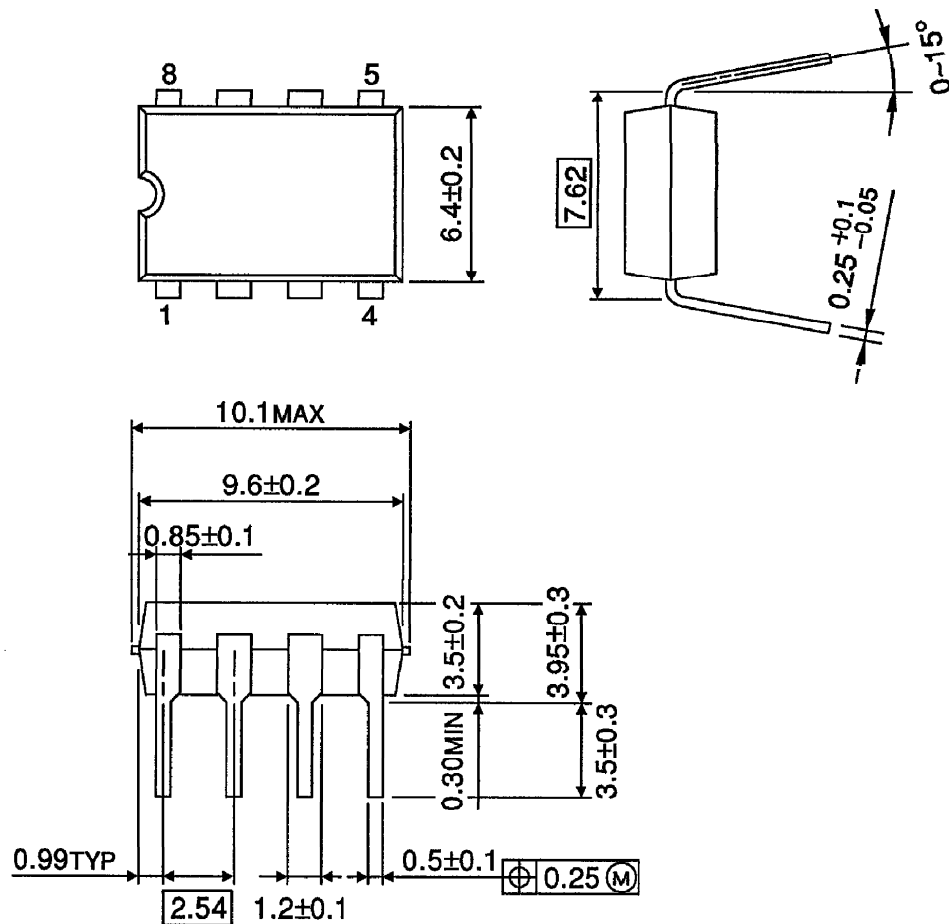
## PRECAUTIONS for USING

Utmost care is necessary in the design of the output line,  $V_{CC}$  and GND line since IC may be destroyed due to short-circuit between outputs, air contamination fault, or fault by improper grounding.



**OUTLINE DRAWING**  
**DIP8-P-300-2.54**

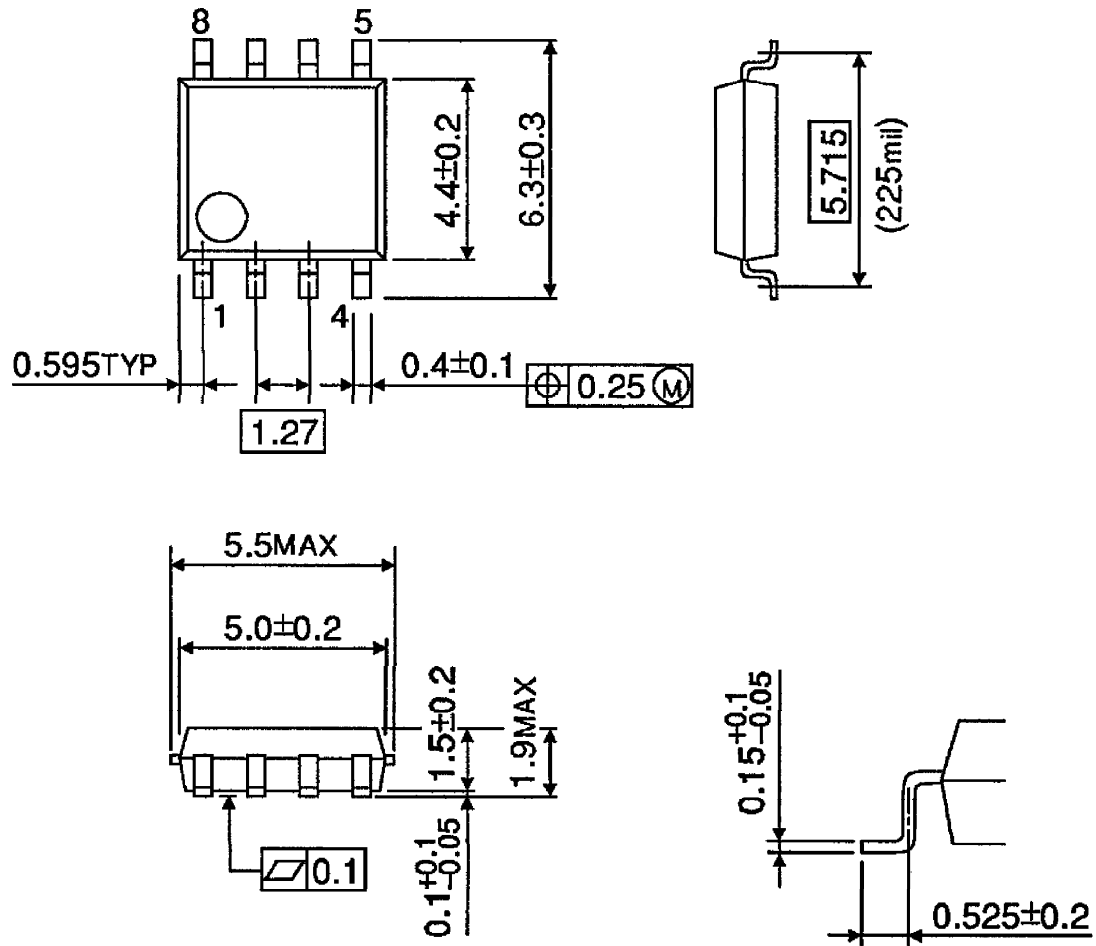
Unit : mm



Weight : 0.52g (Typ.)

**OUTLINE DRAWING**  
SOP8-P-225-1.27

Unit : mm



Weight : 0.08g (Typ.)