

TOSHIBA BIPOLAR DIGITAL INTEGRATED CIRCUIT SILICON MONOLITHIC

# TD62503PA, TD62504PA

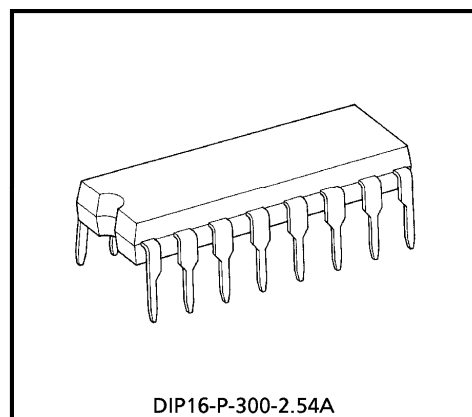
## 7CH SINGLE DRIVER : COMMON EMITTER

The TD62503PA and TD62504PA are comprised of seven or five NPN transistor arrays.

Applications include relay, hammer, lamp and display (LED) drivers.

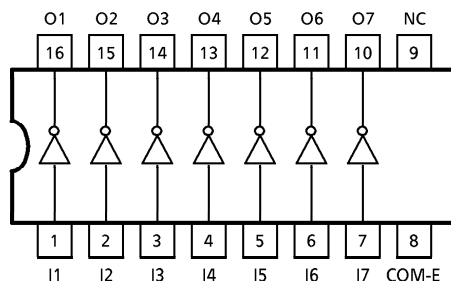
### FEATURES

- Output current (single output) 200mA / ch (Max.)
- High sustaining voltage output 35V (Min.)
- Low saturation voltage  $V_{CE(sat)} = 0.8V @ I_{OUT} = 150mA$
- Inputs compatible with various types of logic.
- TD62503PA :  $R_{IN} = 2.7k\Omega$  . . . . . TTL, 5V CMOS
- TD62504PA :  $R_{IN} = 10.5k\Omega$  . . . . . PMOS, CMOS
- Package type-PA : DIP-16 pin

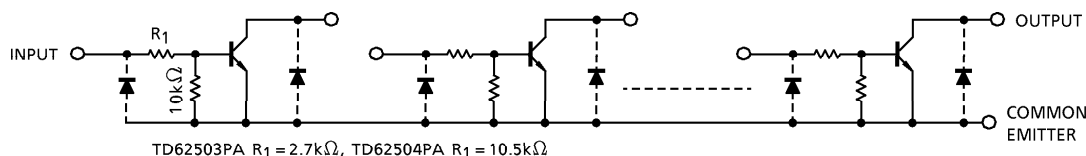


Weight : 1.11g (Typ.)

### PIN CONNECTION (TOP VIEW)



### SCHEMATICS (EACH DRIVER)



(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    |
|---------------------------|-----------------------|---------|---------|
| Collector-Emitter Voltage | V <sub>CEO</sub>      | 35      | V       |
| Collector-Base Voltage    | V <sub>CBO</sub>      | 50      | V       |
| Collector Current         | I <sub>C</sub>        | 200     | mA / ch |
| Input Voltage             | V <sub>IN</sub>       | -0.5~30 | V       |
| Power Dissipation         | P <sub>D</sub> (Note) | 1.0     | W       |
| Operating Temperature     | T <sub>opr</sub>      | -40~85  | °C      |
| Storage Temperature       | T <sub>stg</sub>      | -55~150 | °C      |

(Note) Delated above 25°C in the proportion of 8.0mW/°C.

## RECOMMENDED OPERATING CONDITIONS (Ta = -40~85°C)

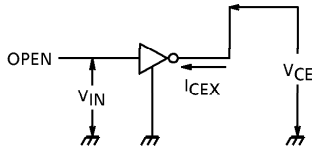
| CHARACTERISTIC            | SYMBOL           | CONDITION       | MIN. | TYP. | MAX.  | UNIT    |
|---------------------------|------------------|-----------------|------|------|-------|---------|
| Collector-Emitter Voltage | V <sub>CEO</sub> | —               | 0    | —    | 35    | V       |
| Collector-Base Voltage    | V <sub>CBO</sub> | —               | 0    | —    | 50    | V       |
| Collector Current         | I <sub>C</sub>   | —               | 0    | —    | 150   | mA / ch |
| Input Voltage             | TD62503PA        | V <sub>IN</sub> | 0    | —    | 25    | V       |
|                           | TD62504PA        |                 |      |      |       |         |
| Power Dissipation         | P <sub>D</sub>   | —               | —    | —    | 0.360 | W       |

## ELECTRICAL CHARACTERISTICS (Ta = 25°C unless otherwise noted)

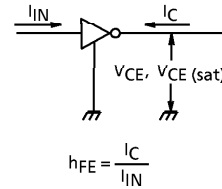
| CHARACTERISTIC                       | SYMBOL                | TEST CIR-CUIT | TEST CONDITION                                                          | MIN. | TYP. | MAX. | UNIT |
|--------------------------------------|-----------------------|---------------|-------------------------------------------------------------------------|------|------|------|------|
| Output Leakage Current               | I <sub>CEX</sub>      | 1             | V <sub>CE</sub> = 25V, V <sub>IN</sub> = 0                              | —    | —    | 10   | μA   |
| Collector-Emitter Saturation Voltage | V <sub>CE (sat)</sub> | 2             | I <sub>IN</sub> = 1mA, I <sub>C</sub> = 10mA                            | —    | —    | 0.2  | V    |
|                                      |                       |               | I <sub>IN</sub> = 3mA, I <sub>C</sub> = 150mA                           | —    | —    | 0.8  |      |
| DC Current Transfer Ratio            | h <sub>FE</sub>       | 2             | V <sub>CE</sub> = 10V, I <sub>C</sub> = 10mA                            | 50   | —    | —    | —    |
| Input Voltage (Output On)            | V <sub>IN (ON)</sub>  | 3             | I <sub>IN</sub> = 1mA, I <sub>C</sub> = 10mA                            | 2.4  | 3.4  | 4.2  | V    |
|                                      |                       |               |                                                                         | 7.5  | 11.5 | 15   |      |
| Input Voltage (Output Off)           | V <sub>IN (OFF)</sub> | —             | —                                                                       | 0.6  | 0.8  | 1.0  | V    |
|                                      |                       |               |                                                                         | 1.1  | 1.6  | 1.9  |      |
| Turn-On Delay                        | t <sub>ON</sub>       | 4             | V <sub>OUT</sub> = 35V, R <sub>L</sub> = 3.3kΩ<br>C <sub>L</sub> = 15pF | —    | 50   | —    | ns   |
| Turn-Off Delay                       | t <sub>OFF</sub>      |               |                                                                         | —    | 200  | —    |      |

**TEST CIRCUIT**

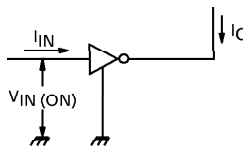
1.  $I_{CEX}$



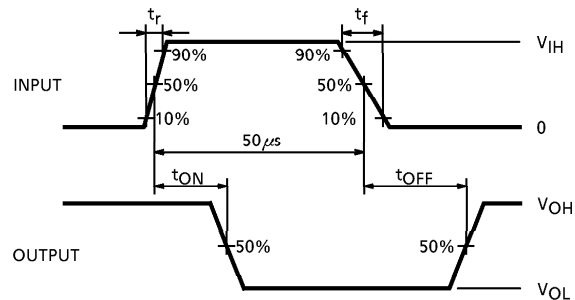
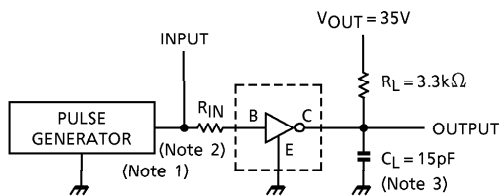
2.  $h_{FE}$ ,  $V_{CE(sat)}$



3.  $V_{IN(ON)}$



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



- (Note 1) Pulse Width  $50\mu s$ , Duty Cycle 10%  
Output Impedance  $50\Omega$ ,  $t_r \leq 5ns$ ,  $t_f \leq 10ns$
- (Note 2) See below.

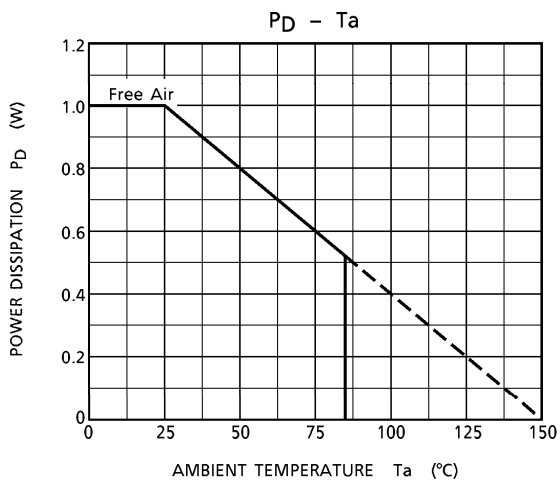
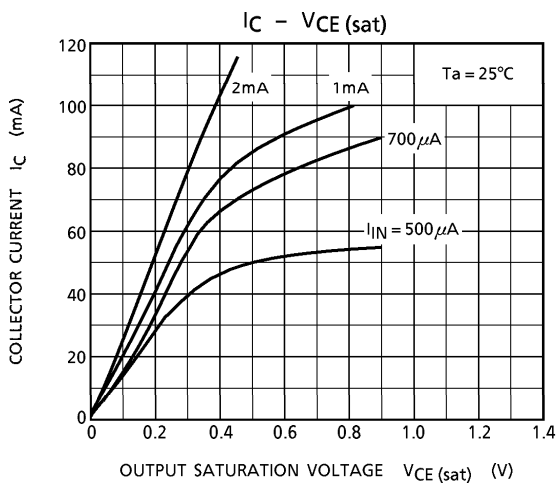
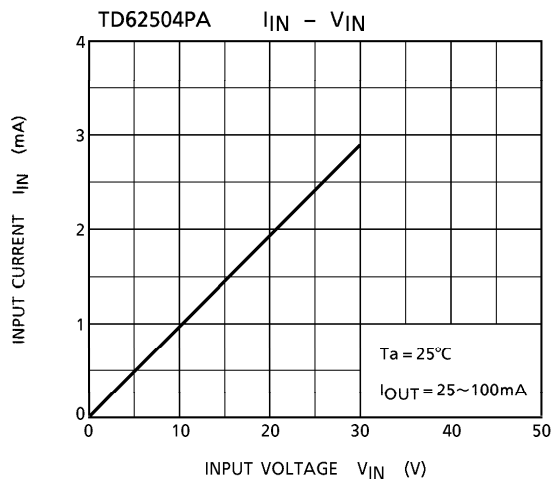
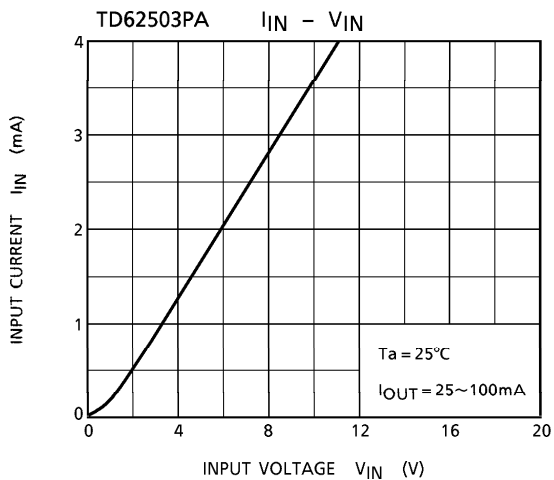
**INPUT CONDITION**

| TYPE NUMBER | $R_{IN}$  | $V_{IH}$ |
|-------------|-----------|----------|
| TD62503PA   | $0\Omega$ | 3V       |
| TD62504PA   | $0\Omega$ | 10V      |

- (Note 3)  $C_L$  includes probe and jig capacitance.

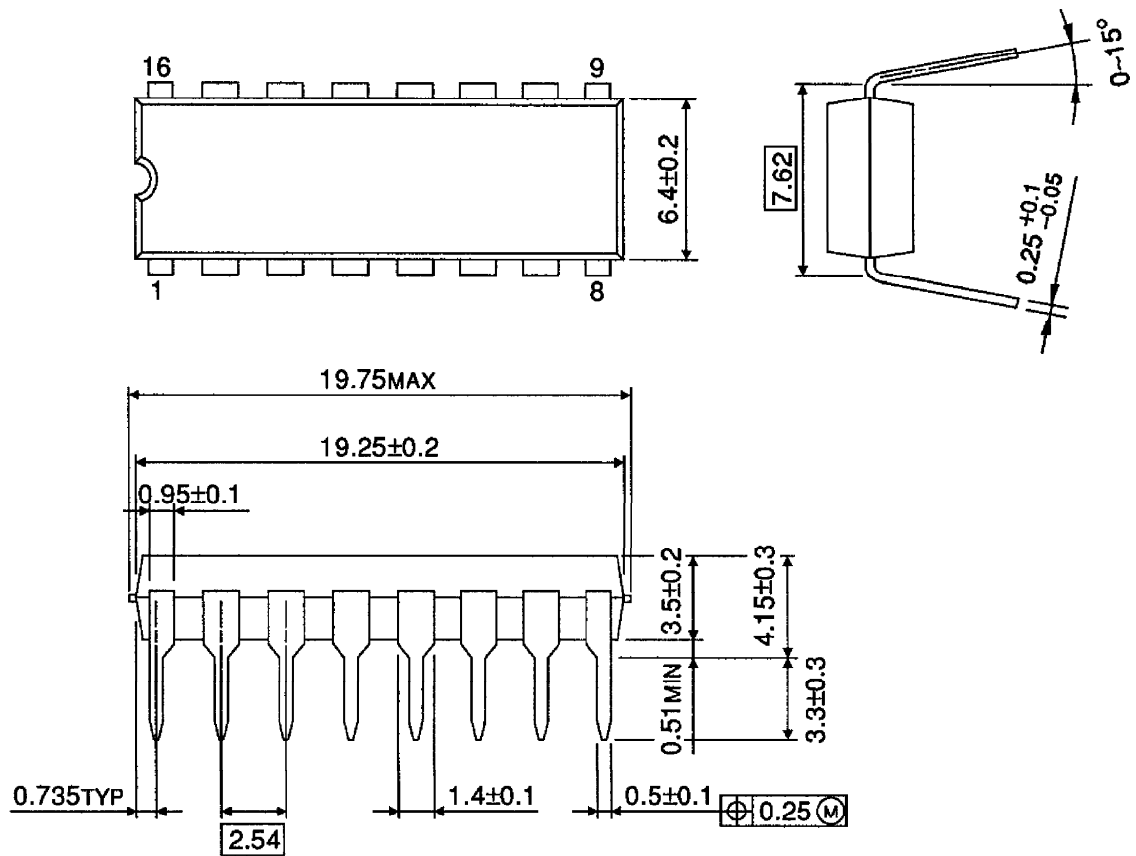
**PRECAUTIONS for USING**

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  
DIP16-P-300-2.54A

Unit : mm



Weight : 1.11g (Typ.)