

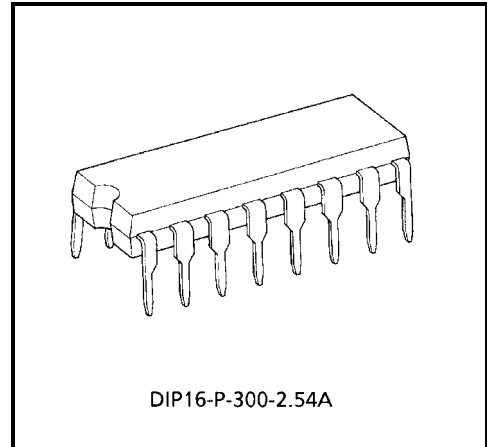
# TD62504P-H

## 7CH SINGLE DRIVER : COMMON EMITTER

The TD62504P-H is comprised of seven or five NPN Transistor Arrays.  
Applications include relay, hammer, lamp and display (LED) drivers.

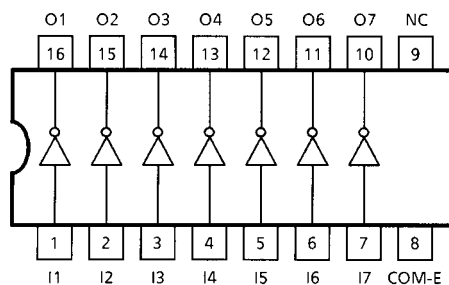
### FEATURES

- Package Type : DIP16 pin
- $R_{IN} = 10.5 \text{ k}\Omega$
- High Sustaining Voltage Output :  $V_{CEO} = 35 \text{ V (Min)}$
- Output Current (Single Output) :  $200 \text{ mA (Max)}$
- Low Saturation Voltage :  $V_{CE(sat)} = 0.8 \text{ V}$   
@  $I_{out} = 150 \text{ mA}$
- Inputs Compatible with Various Types of Logic.
- Wide operating temperature range:  $-40 \sim 105^\circ\text{C}$

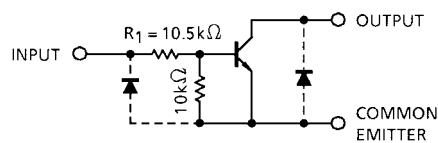


Weight: 0.11 g (Typ.)

### PIN CONNECTION (TOP VIEW)



### SCHEMATICS (EACH DRIVER)



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

**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>   | 1.0     | W       |
| Operating Temperature     | T <sub>opr</sub> | -40~105 | °C      |
| Storage Temperature       | T <sub>stg</sub> | -55~150 | °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             | V <sub>IN</sub>      | —                      | 0    | —    | 25   | V       |
|                           | V <sub>IN (ON)</sub> | I <sub>IN</sub> = 1 mA | 15.0 | —    | 25   |         |
| Power Dissipation         | P <sub>D</sub>       | Ta = 85°C              | —    | —    | 0.52 | W       |

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

| CHARACTERISTIC                       | SYMBOL                | TEST CIR-CUIT | TEST CONDITION                                                            | MIN | TYP. | MAX  | UNIT |
|--------------------------------------|-----------------------|---------------|---------------------------------------------------------------------------|-----|------|------|------|
| Output Leakage Current               | I <sub>CEX</sub>      | 1             | V <sub>CE</sub> = 35 V, V <sub>IN</sub> = 0 V                             | —   | —    | 10   | μA   |
| Collector-Emitter Saturation Voltage | V <sub>CE (sat)</sub> | 2             | I <sub>IN</sub> = 1 mA, I <sub>C</sub> = 10 mA                            | —   | —    | 0.2  | V    |
|                                      |                       |               | I <sub>IN</sub> = 3 mA, I <sub>C</sub> = 150 mA                           | —   | —    | 0.8  |      |
| DC Current Transfer Ratio            | h <sub>FE</sub>       | 2             | V <sub>CE</sub> = 10 V, I <sub>C</sub> = 10 mA                            | 50  | —    | —    | —    |
| Input Voltage                        | V <sub>IN (ON)</sub>  | 3             | I <sub>IN</sub> = 1 mA, I <sub>C</sub> = 10 mA                            | 7.5 | 11.5 | 15.0 | V    |
| Turn-On Delay                        | t <sub>ON</sub>       | 4             | V <sub>CEO</sub> = 35 V, R <sub>L</sub> = 220 Ω<br>C <sub>L</sub> = 15 pF | —   | 50   | —    | ns   |
| Turn-Off Delay                       | t <sub>OFF</sub>      |               |                                                                           | —   | 200  | —    |      |

**RECOMMENDED OPERATING CONDITIONS (Ta = -40~105°C)**

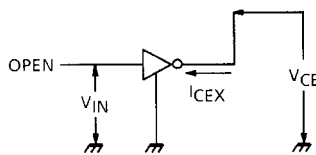
| CHARACTERISTIC            | SYMBOL                | CONDITION              | MIN  | TYP. | MAX  | UNIT    |
|---------------------------|-----------------------|------------------------|------|------|------|---------|
| Collector-Emitter Voltage | V <sub>CEO</sub>      | —                      | 0    | —    | 35   | V       |
| Collector-Base Voltage    | V <sub>CBO</sub>      | —                      | 0    | —    | 50   | V       |
| Collector Current         | I <sub>C</sub>        | DC 1 circuits          | 0    | —    | 150  | mA / ch |
|                           |                       | 7 circuits             | 0    | —    | 100  |         |
| Input Voltage             | V <sub>IN</sub>       | —                      | 0    | —    | 25   | V       |
|                           | V <sub>IN (ON)</sub>  | I <sub>IN</sub> = 1 mA | 15.0 | —    | 25   |         |
|                           | V <sub>IN (OFF)</sub> | —                      | 0    | —    | 0.50 |         |
| Power Dissipation         | P <sub>D</sub>        | Ta = 105°C             | —    | —    | 0.36 | W       |

## ELECTRICAL CHARACTERISTICS (Ta = 105°C)

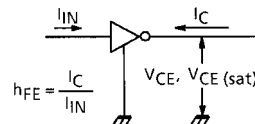
| CHARACTERISTIC                       | SYMBOL        | TEST CIR-CUIT | TEST CONDITION                                                        | MIN | TYP. | MAX  | UNIT          |
|--------------------------------------|---------------|---------------|-----------------------------------------------------------------------|-----|------|------|---------------|
| Output Leakage Current               | $I_{CEX}$     | 1             | $V_{CE} = 35\text{ V}$ , $V_{IN} = 0\text{ V}$                        | —   | —    | 300  | $\mu\text{A}$ |
| Collector-Emitter Saturation Voltage | $V_{CE(sat)}$ | 2             | $I_{IN} = 1\text{ mA}$ , $I_C = 10\text{ mA}$                         | —   | —    | 0.3  | V             |
|                                      |               |               | $I_{IN} = 3\text{ mA}$ , $I_C = 150\text{ mA}$                        | —   | —    | 0.9  |               |
| DC Current Transfer Ratio            | $h_{FE}$      | 2             | $V_{CE} = 10\text{ V}$ , $I_C = 10\text{ mA}$                         | 50  | —    | —    | —             |
| Input Voltage                        | $V_{IN(ON)}$  | 3             | $I_{IN} = 1\text{ mA}$ , $I_C = 10\text{ mA}$                         | 6.5 | 11.5 | 16.0 | V             |
| Turn-On Delay                        | $t_{ON}$      | 4             | $V_{CEO} = 35\text{ V}$ , $R_L = 220\ \Omega$<br>$C_L = 15\text{ pF}$ | —   | 100  | —    | ns            |
| Turn-Off Delay                       | $t_{OFF}$     |               |                                                                       | —   | 500  | —    |               |

## TEST CIRCUIT

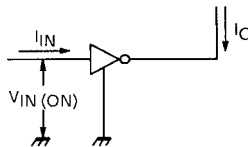
### 1. $I_{CEX}$



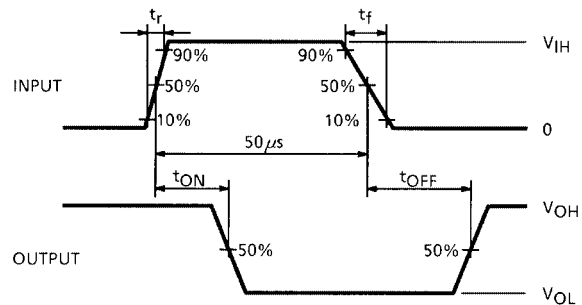
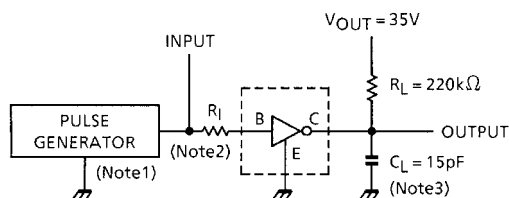
### 2. $h_{FE}$ , $V_{CE(sat)}$



### 3. $V_{IN(ON)}$



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



Note 1: Pulse Width 50  $\mu\text{s}$ , Duty Cycle 10%  
Output Impedance 50  $\Omega$ ,  $t_r \leq 5\text{ ns}$ ,  $t_f \leq 10\text{ ns}$   
Note 2: See below

Input Condition

| TYPE NUMBER | $R_I$      | $V_{IH}$ |
|-------------|------------|----------|
| TD62504P-H  | 0 $\Omega$ | 10 V     |

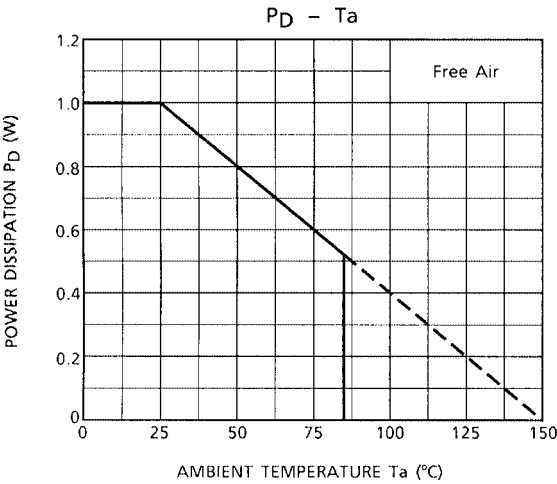
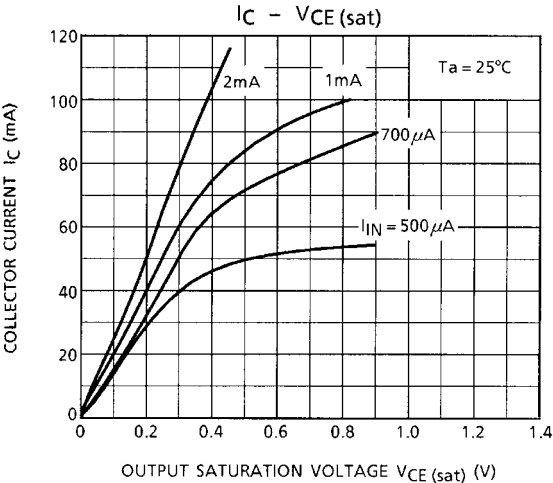
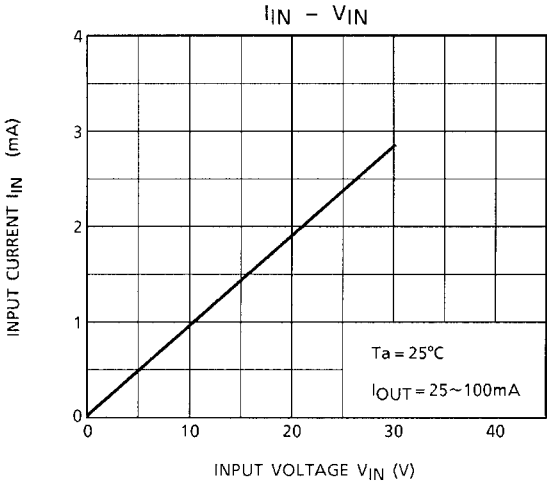
Note 3:  $C_L$  includes probe and jig capacitance

## PRECAUTIONS for USING

This IC does not integrate protection circuits such as overcurrent and overvoltage protectors.

Thus, if excess current or voltage is applied to the IC, the IC may be damaged. Please design the IC so that excess current or voltage will not be applied to the IC.

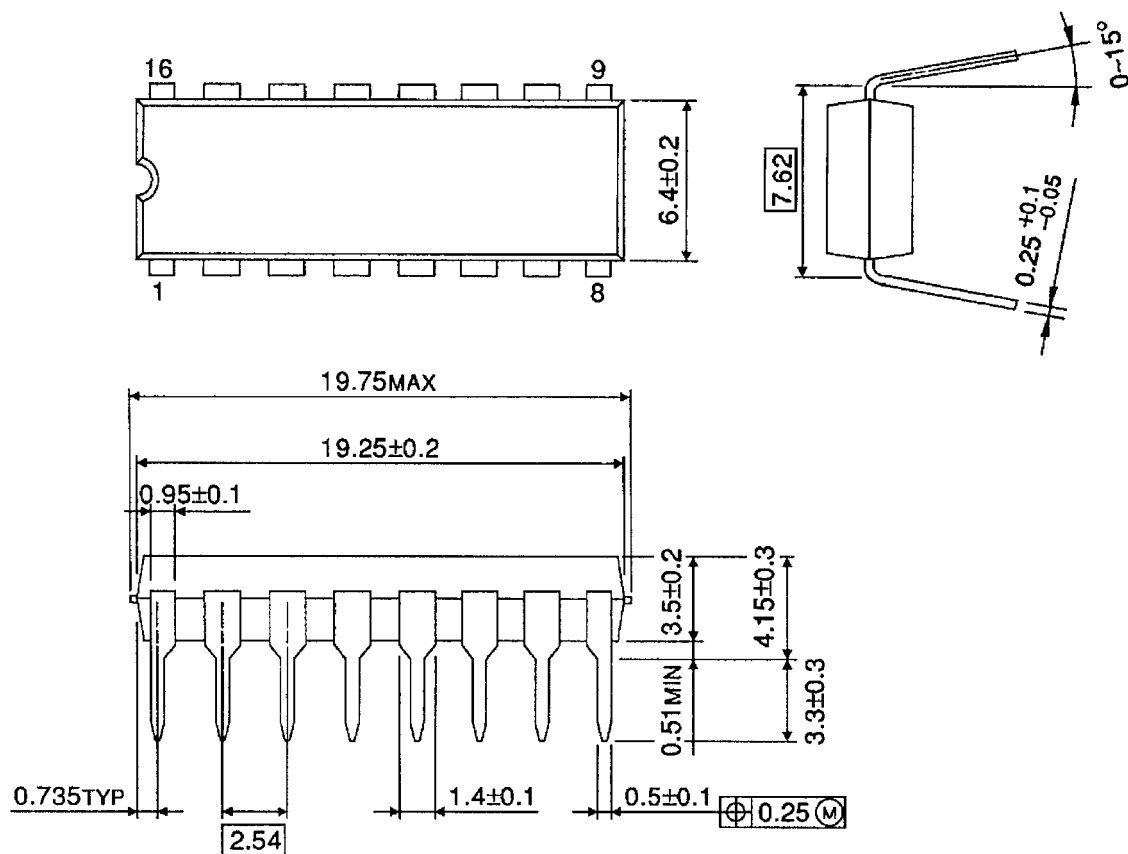
Utmost care is necessary in the design of the output line,  $V_{CC}$  and GND line since IC may be destroyed due to short-circuit between outputs, air contamination fault, or fault by improper grounding.



## PACKAGE DIMENSIONS

DIP16-P-300-2.54A

Unit: mm



Weight: 1.11 g (Typ.)

**RESTRICTIONS ON PRODUCT USE**

000707EBA

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