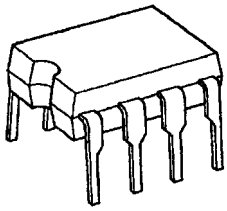
TOSHIBA BIPOLAR DIGITAL INTEGRATED CIRCUIT SILICON MONOLITHIC

# TD62476P,TD62477P,TD62478P,TD62479P

## 2CH PERIPHERAL AND / NAND / OR / NOR DRIVERS

The TD62476P, TD62477P, TD62478P, TD62479P are comprised of two NPN single output stages and control inputs which can gate the outputs.
All units feature integral clamp diodes for switching inductive loads.
Applications include relay, hammer, lamp and display (LED) drivers.



DIP8-P-300-2.54

Weight: 0.45 g (Typ.)

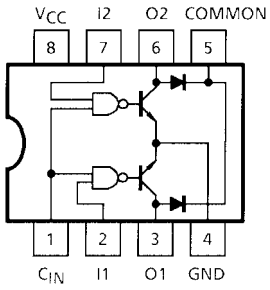
## FEATURES

- Output current (single output) 350 mA (Max)
- High sustaining voltage output 35 V (Min)
- Output clamp diodes
- Inputs compatible with TTL and 5 V CMOS
- Standard supply voltage
- Package type−P: DIP−8 pin

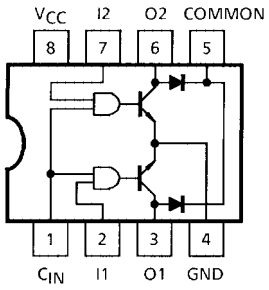
| TD62476P | | | TD62477P | | | TD62478P | | | TD62479P | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| INPUT | | OUTPUT | INPUT | | OUTPUT | INPUT | | OUTPUT | INPUT | | OUTPUT |
| $C_{IN}$ | I | | $C_{IN}$ | I | | $C_{IN}$ | I | | $C_{IN}$ | I | |
| 0 | 0 | ON | 0 | 0 | OFF | 0 | 0 | ON | 0 | 0 | OFF |
| 0 | 1 | OFF | 0 | 1 | OFF | 0 | 1 | OFF | 0 | 1 | ON |
| 1 | 0 | OFF | 1 | 0 | OFF | 1 | 0 | OFF | 1 | 0 | ON |
| 1 | 1 | OFF | 1 | 1 | ON | 1 | 1 | OFF | 1 | 1 | ON |

## PIN CONNECTION (TOP VIEW)

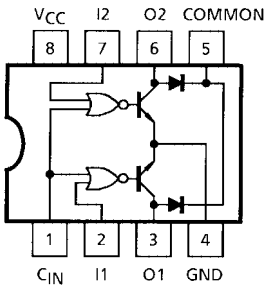
TD62476P



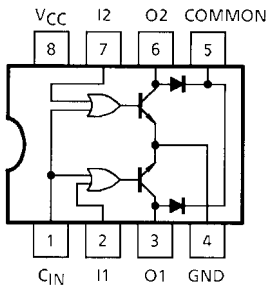

TD62477P




TD62478P

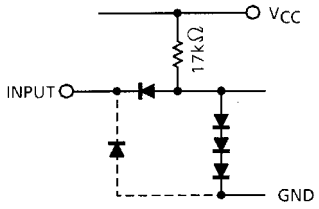



TD62479P

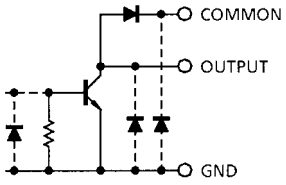


## EQUIVALENT OF INPUTS AND OUTPUTS

Equivalent of inputs




Equivalent of outputs




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

## MAXIMUM RATINGS (Ta = 25°C)

| CHARACTERISTICS | SYMBOL | RATING | UNIT |
|---|---|---|---|
| Supply Voltage | $V_{CC}$ | −0.5~7.0 | V |
| Input Voltage | $V_{IN}$ | −0.5~5.5 | V |
| Output Sustaining Voltage | $V_{CE\ (SUS)}$ | −0.5~35 | V |
| Output Current | $I_{OUT}$ | 350 | mA / ch |
| Clamp Diode Reverse Voltage | $V_R$ | 35 | V |
| Clamp Diode Forward Current | $I_F$ | 300 | mA |
| Power Dissipation | $P_D$ (Note) | 0.9 | W |
| Operating Temperature | $T_{opr}$ | −30~75 | °C |
| Storage Temperature | $T_{stg}$ | −55~150 | °C |

Note: Delated above 25°C in the proportion of 7.2 mW / °C.

## RECOMMENDED OPERATING CONDITIONS (Ta = −30~75°C)

| CHARACTERISTIC | SYMBOL | CONDITION | MIN | TYP. | MAX | UNIT |
|---|---|---|---|---|---|---|
| Supply Voltage | $V_{CC}$ | — | 4.5 | 5.0 | 5.5 | V |
| Output Sustaining Voltage | $V_{CE\ (SUS)}$ | — | 0 | — | 35 | V |
| Output Current | $I_{OUT}$ | DC 1 Circuit | 0 | — | 300 | mA / ch |
| | | DC 2 Circuits | 0 | — | 200 | |
| Input Voltage | $V_{IN}$ | — | 4.5 | — | $V_{CC}$ | V |
| Clamp Diode Reverse Voltage | $V_R$ | — | — | — | 35 | V |
| Clamp Diode Forward Current | $I_F$ | — | — | — | 300 | mA |
| Power Dissipation | $P_D$ | — | — | — | 0.4 | W |

## ELECTRICAL CHARACTERISTICS (Ta = 25°C)

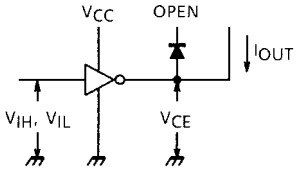
| CHARACTERISTIC | | | SYMBOL | TEST CIR-CUIT | TEST CONDITION | | MIN | TYP. | MAX | UNIT |
|---|---|---|---|---|---|---|---|---|---|---|
| Input Voltage | "H" Level | | $V_{IH}$ | 1 | — | | 2.0 | — | — | V |
| | "L" Level | | $V_{IL}$ | 1 | — | | — | — | 0.8 | |
| Output Current | "H" Level | | $I_{OH}$ | 2 | $V_{CC}$ = 4.5V, $V_{IH}$ = 2.0 V<br>$V_{IL}$ = 0.8V, $V_{OH}$ = 35 V | | — | — | 10 | μA |
| Output Voltage | "L" Level | | $V_{OL}$ | 3 | $V_{CC}$ = 4.5 V<br>$V_{IH}$ = 2.0 V<br>$V_{IL}$ = 0.8 V | $I_{OUT}$ = 100 mA | — | 0.15 | 0.30 | V |
| | | | | | | $I_{OUT}$ = 200 mA | — | 0.28 | 0.45 | |
| | | | | | | $I_{OUT}$ = 300 mA | — | 0.45 | 0.60 | |
| Input Current | "H" Level | | $I_{IH}$ | 4 | $V_{CC}$ = 5.5 V, $V_{IN}$ = 5.5 V | | — | — | 10 | μA |
| | "L" Level | I | $I_{IL}$ | 5 | $V_{CC}$ = 5.5 V, $V_{IN}$ = 0.4 V | | — | −0.26 | −0.4 | mA |
| | | $C_{IN}$ | | | | | — | −0.52 | −0.8 | |
| Clamp Diode Reverse Current | | | $I_R$ | 6 | $V_{CC}$ = 4.5 V, $V_R$ = 35 V | | — | — | 10 | μA |
| Clamp Diode Forward Voltage | | | $V_F$ | 7 | $V_{CC}$ = 4.5 V, $I_F$ = 300 mA | | — | 1.5 | 1.75 | V |
| Supply Current | Output Off | TD62476P | $I_{CCH}$ | 5 | $V_{CC}$ = 5.5 V | $V_{IN}$ = 5 V | — | 8.4 | 14 | mA |
| | | TD62477P | | | | $V_{IN}$ = 0 V | — | 0.6 | 0.85 | |
| | | TD62478P | | | | $V_{IN}$ = 5 V | — | 9 | 14 | |
| | | TD62479P | | | | $V_{IN}$ = 0 V | — | 1.1 | 1.8 | |
| | Output On | TD62476P | $I_{CCL}$ | 4 | | $V_{IN}$ = 5 V | — | 38 | 55 | |
| | | TD62477P | | | | $V_{IN}$ = 0 V | — | 36 | 53 | |
| | | TD62478P | | | | $V_{IN}$ = 5 V | — | 39 | 56 | |
| | | TD62479P | | | | $V_{IN}$ = 0 V | — | 36 | 63 | |

## SWITCHING CHARACTERISTICS (Ta = 25°C)

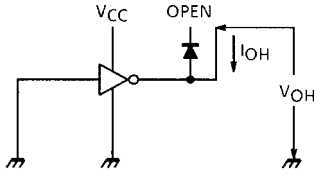
| CHARACTERISTIC | | SYMBOL | TEST CIR-CUIT | CONDITION | MIN | TYP. | MAX | UNIT |
|---|---|---|---|---|---|---|---|---|
| Propagation Delay Time | "H" Level | $t_{pLH}$ | — | $C_L$ = 15 pF, $R_L$ = 120Ω | — | 0.7 | — | μs |
| | "L" Level | $t_{pHL}$ | — | | — | 0.2 | — | |

## TEST CIRCUIT

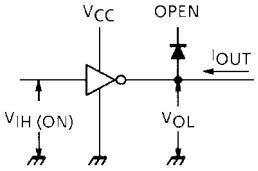
### 1. $V_{IH}$, $V_{IL}$



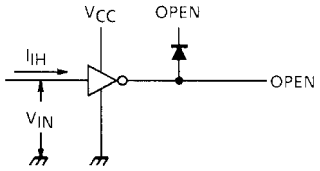

### 2. $I_{OH}$



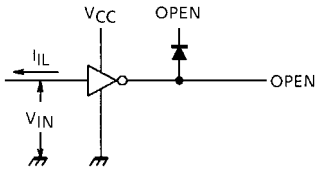

### 3. $V_{OL}$



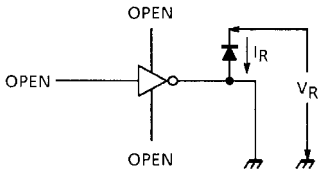

### 4. $I_{IH}$, $I_{CCL}$



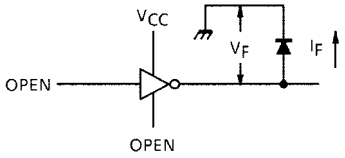

### 5. $I_{IL}$, $I_{CCH}$



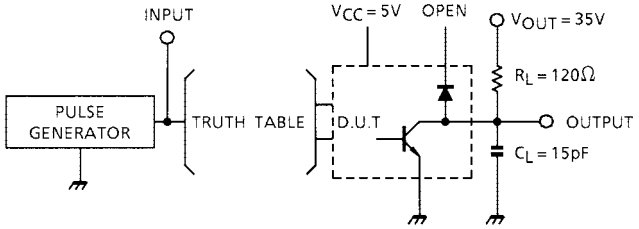

### 6. $I_R$



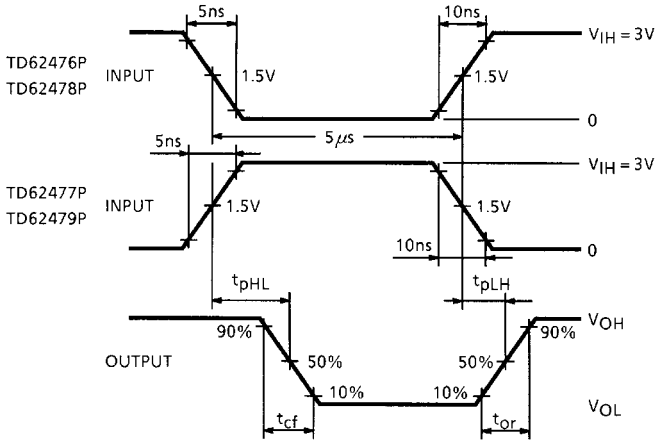

### 7. $V_F$




## TEST CIRCUIT OF SWITCHING CHARACTERISTIC




## TEST WAVEFORM

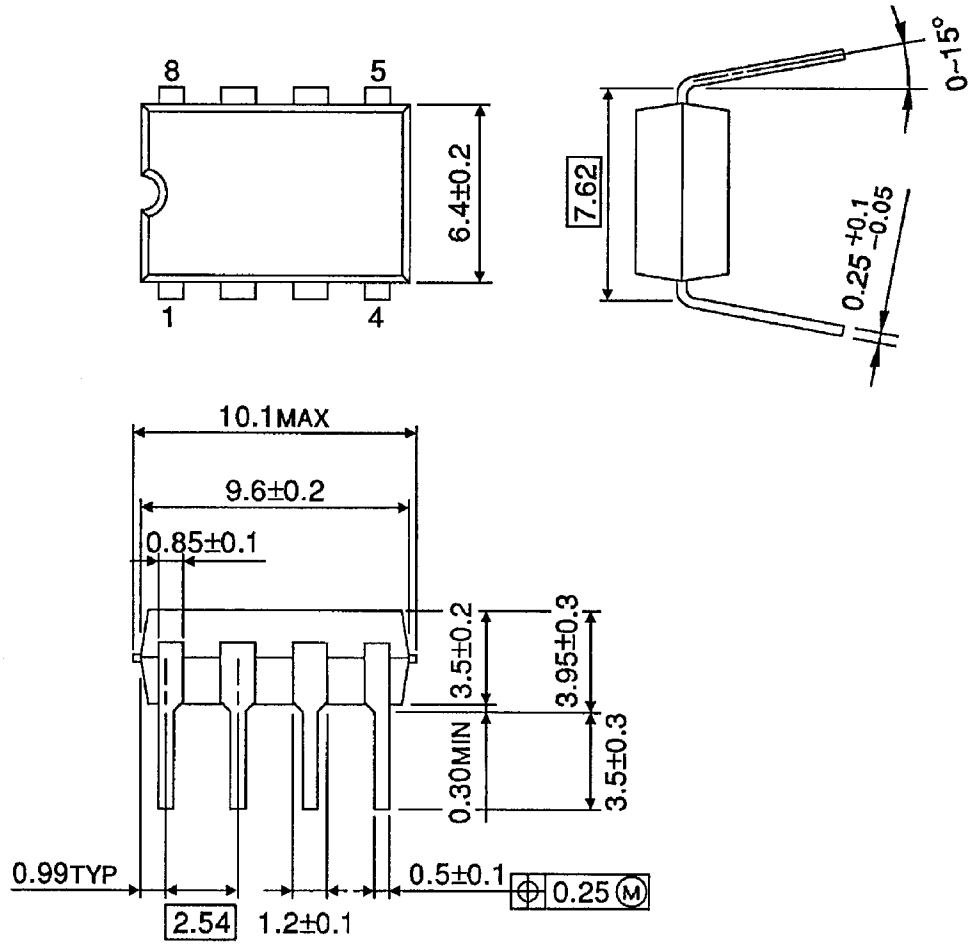



## PRECAUTIONS for USING

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, $V_{CC}$, COMMON and GND line since IC may be destroyed due to short−circuit between outputs, air contamination fault, or fault by improper grounding

## PACKAGE DIMENSIONS

DIP8−P−300−2.54 Unit: mm




Weight: 0.45 g (Typ.)

## RESTRICTIONS ON PRODUCT USE

000707EBA

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