

TOSHIBA BIPOLAR DIGITAL INTEGRATED CIRCUIT SILICON MONOLITHIC

TD62502FN, TD62503FN, TD62504FN

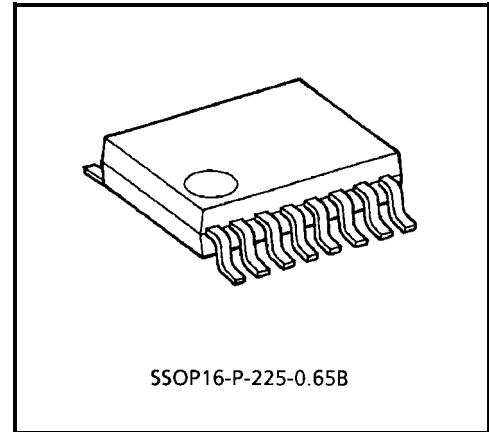
7CH SINGLE DRIVER: COMMON EMITTER

TD62502, 503, 504FN : COMMON EMITTER

The TD62502FN, TD62503FN and TD62504FN are comprised of seven or five NPN Transistor Arrays.
Applications include relay, hammer, Lamp and display (LED) drivers.

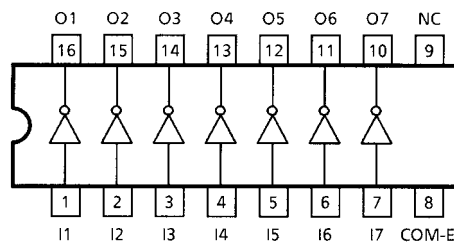
FEATURES

- Output Current (Single Output) 200mA MAX.
- High Sustaining Voltage Output 35V MIN.
- Inputs Compatible with Various Types of Logic.
- TD62502FN : $R_{IN} = 10.5\text{ k}\Omega + 7\text{V}$
Zener Diode...14~25 V P-MOS
- TD62503FN : $R_{IN} = 2.7\text{ k}\Omega$...TTL, 5 V C-MOS
- TD62504FN : $R_{IN} = 10.5\text{ k}\Omega$...6~15 V P-MOS, C-MOS
- Package Type : SSOP-16 pin (0.65 mm pitch)



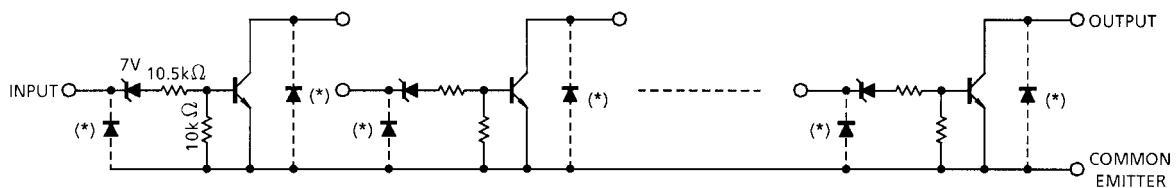
Weight: 0.07 g (Typ.)

PIN CONNECTION (Top view)

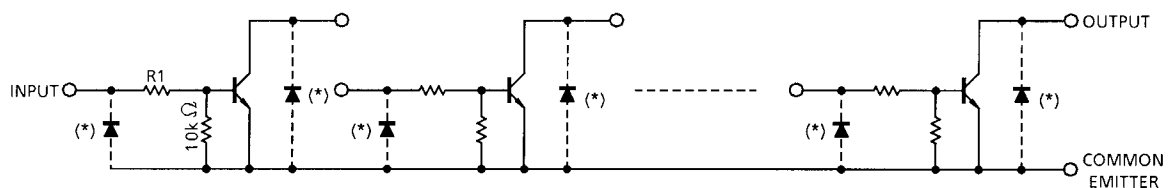


SCHEMATICS (Each driver)

TD62502FN



TD62503FN
TD62504FN



TD62503FN $R_1 = 2.7\text{ k}\Omega$
TD62504FN $R_1 = 10.5\text{ k}\Omega$

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

MAXIMUM RATINGS (Ta = 25°C Unless otherwise noted)

| CHARACTERISTIC | SYMBOL | RATING | UNIT |
|---------------------------|----------------|---------|---------|
| Collector-Emitter Voltage | V_{CEO} | 35 | V |
| Collector-Base Voltage | V_{CBO} | 50 | V |
| Collector Current | I_C | 200 | mA / ch |
| Input Voltage | V_{IN} | -0.5~30 | V |
| Power Dissipation | P_D (Note 1) | 0.78 | W |
| Operating Temperature | T_{opr} | -40~85 | °C |
| Storage Temperature | T_{stg} | -55~150 | °C |

Note 1: On Glass Epoxy PCB (50 × 50 × 1.6 mm, Cu 40%)

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

| CHARACTERISTIC | SYMBOL | CONDITION | MIN | TYP. | MAX | UNIT |
|---------------------------|----------------|-----------|-----|------|-------|---------|
| Collector-Emitter Voltage | V_{CEO} | | 0 | — | 35 | V |
| Collector-Base Voltage | V_{CBO} | | 0 | — | 50 | V |
| Collector Current | I_C | | 0 | — | 150 | mA / ch |
| Input Voltage | V_{IN} | | 0 | — | 25 | V |
| Power Dissipation | P_D (Note 1) | On PCB | — | — | 0.325 | W |

Note 1: On Glass Epoxy PCB (50 × 50 × 1.6 mm, Cu 40%)

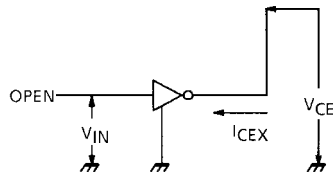
ELECTRICAL CHARACTERISTICS (Ta = 25°C Unless otherwise noted)

| CHARACTERISTIC | SYMBOL | TEST CIR-CUIT | TEST CONDITION | MIN | TYP. | MAX | UNIT |
|--------------------------------------|---------------|---------------|--|-----|------|-----|------|
| Output Leakage Current | I_{CEX} | 1 | $V_{CE} = 35V, V_{IN} = 0V$ | — | — | 10 | μA |
| Collector-Emitter Saturation Voltage | $V_{CE(sat)}$ | 2 | $I_{IN} = 1mA, I_C = 10mA$ | — | — | 0.2 | V |
| | | | $I_{IN} = 3mA, I_C = 150mA$ (Note 1) | — | — | 0.8 | |
| DC Current Transfer Ration | h_{FE} | 2 | $V_{CE} = 10V, I_C = 10mA$ | 50 | — | — | |
| Input Voltage | TD62502FN | 3 | $I_{IN} = 1mA, I_C = 10mA$ | 13 | 17 | 23 | V |
| | TD62503FN | | | 2.4 | 3.4 | 4.2 | |
| | TD62504FN | | | 7.5 | 11.5 | 15 | |
| Turn-On Delay | t_{ON} | 4 | $V_{OUT} = 35V, R_L = 220\Omega$ $C_L = 15pF$ | — | 50 | — | ns |
| Turn-Off Delay | t_{OFF} | | | — | 200 | — | |

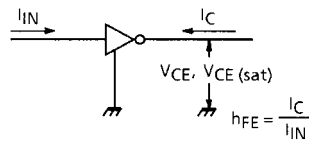
Note 1: Except TD62502FN

TEST CIRCUIT

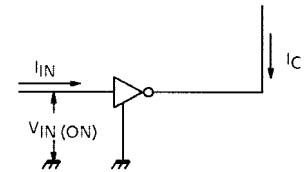
1. I_{CEX}



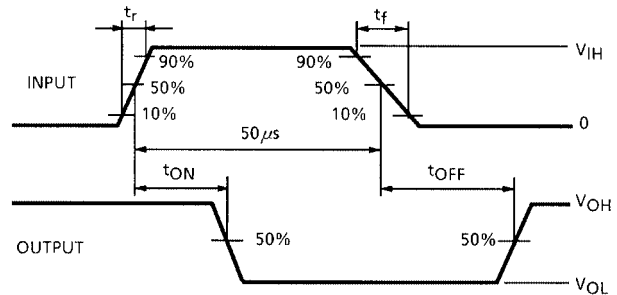
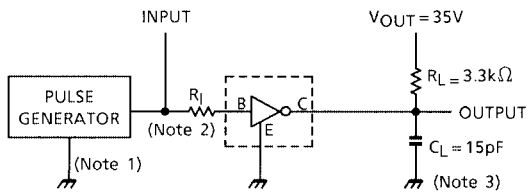
2. h_{FE} , $V_{CE} (sat)$



3. $V_{IN} (ON)$



4. t_{ON} , t_{OFF}



Note 1: Pulse Width 50 μ s, Duty Cycle 10%
Output Impedance 50 Ω , $t_r \leq 5$ ns, $t_f \leq 10$ ns
Note 2: See below

INPUT CONDITION

| TYPE NUMBER | R_I | V_{IH} |
|-------------|------------|----------|
| TD62502FN | 0 Ω | 15 V |
| TD62503FN | 0 Ω | 3 V |
| TD62504FN | 0 Ω | 10 V |

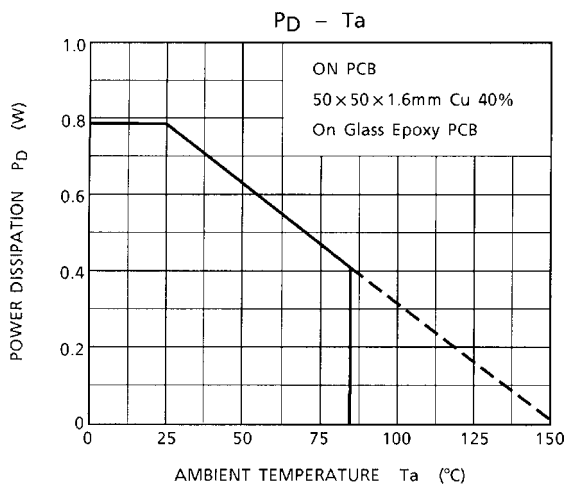
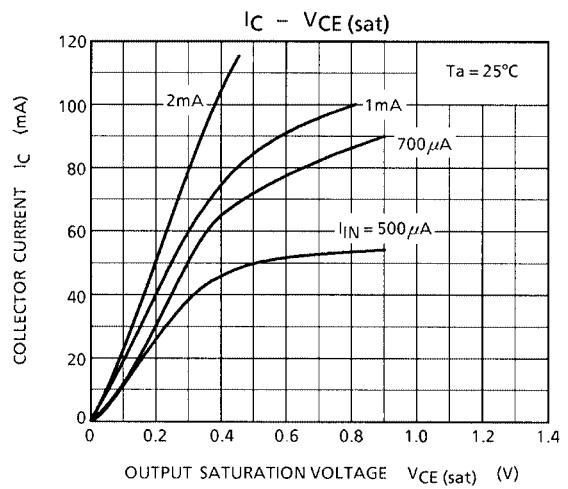
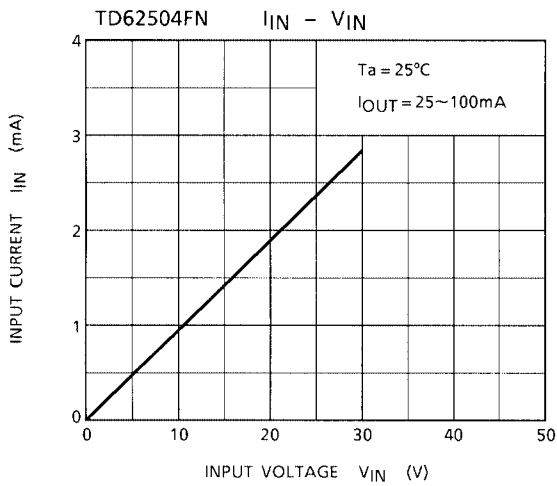
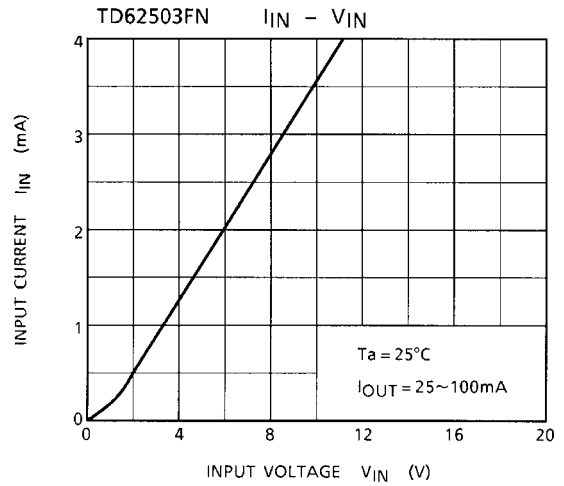
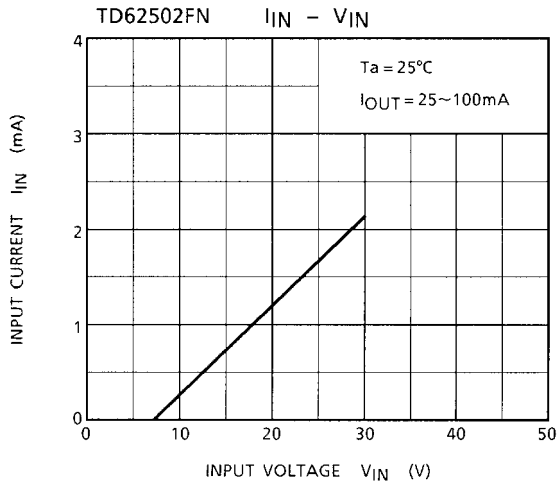
Note 3: C_L includes probe and jig capacitance

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.

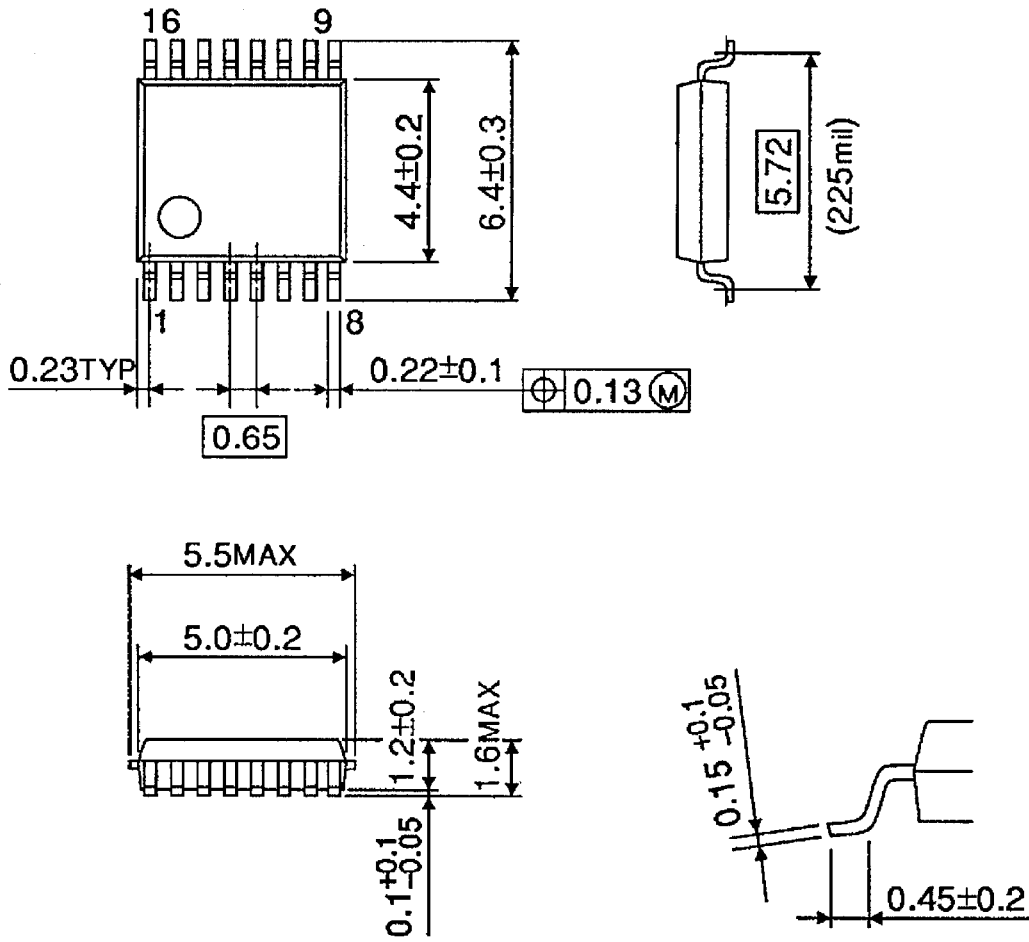
Utmost care is necessary in the design of the output line, VCC and GND line since IC may be destroyed due to short-circuit between outputs, air contamination fault, or fault by improper grounding.



PACKAGE DIMENSIONS

SSOP16-P-225-0.65B

Unit: mm



Weight: 0.07 g (Typ.)

RESTRICTIONS ON PRODUCT USE

000707EBA

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