

TD62003FB, TD62004FB

7CH DARLINGTON SINK DRIVER

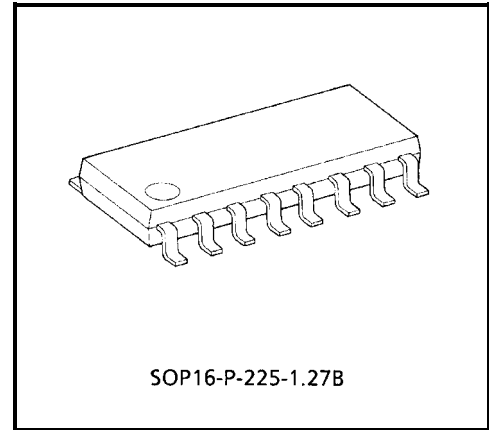
The TD62003FB series are high-voltage, high-current darlington drivers comprised of seven NPN darlington pairs. All units feature integral clamp diodes for switching inductive loads.

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

Please observe the thermal condition for using.

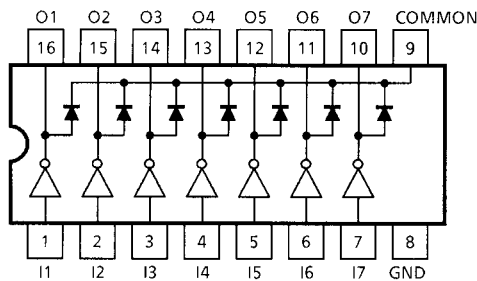
FEATURES

- Output current (single output) : 500 mA / ch (Max)
- High sustaining voltage output : 35 V (Min)
- Output clamp diodes
- Inputs compatible with various types of logic.
 TD62003FB : $R_{IN} = 2.7\text{ k}\Omega$
 TD62004FB : $R_{IN} = 10.5\text{ k}\Omega$
- Package SOP-16 pin

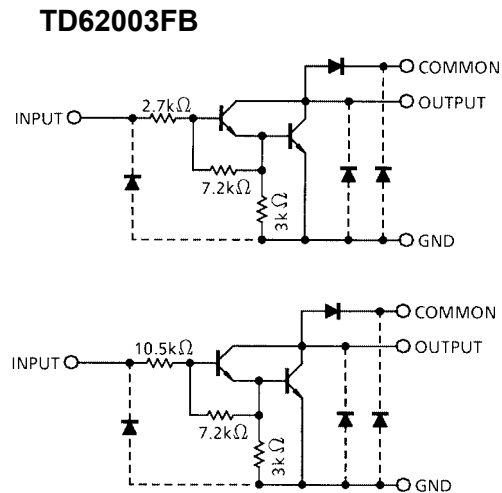


Weight: 0.16 g (Typ.)

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 |
|-----------------------------|-----------------------|------------------------|---------|
| Output Sustaining Voltage | V _{CE (SUS)} | -0.5~35 | V |
| Output Current | I _{OUT} | 500 | mA / ch |
| Input Voltage | V _{IN} | -0.5~30 | V |
| Clamp Diode Reverse Voltage | V _R | 35 | V |
| Clamp Diode Forward Current | I _F | 500 | mA |
| Power Dissipation | P _D | 0.54 / 0.625 (Note) | W |
| Operating Temperature | T _{opr} | -40~85 | °C |
| Storage Temperature | T _{stg} | -55~150 | °C |

Note: On Glass Epoxy PCB (30 × 30 × 1.6 mm Cu 50%)

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

| CHARACTERISTIC | | SYMBOL | CONDITION | MIN | TYP. | MAX | UNIT | |
|-------------------------------|---------|-----------------------|--|------------|------|-------|---------|-----|
| Output Sustaining Voltage | | V _{CE (SUS)} | — | 0 | — | 35 | V | |
| Output Current | | I _{OUT} | DC 1 Circuit | 0 | — | 350 | mA / ch | |
| | | | T _{pw} = 25 ms T _j = 120°C 7 Circuits Ta = 85°C | Duty = 10% | 0 | — | | 275 |
| | | | | Duty = 50% | 0 | — | | 90 |
| Input Voltage | | V _{IN} | — | 0 | — | 24 | V | |
| Input Voltage (Output On) | TD62003 | V _{IN (ON)} | I _{OUT} = 400 mA, h _{FE} = 800 | 2.8 | — | 24 | V | |
| | TD62004 | | | 6.2 | — | 24 | | |
| Input Voltage (Output Off) | TD62003 | V _{IN (OFF)} | — | 0 | — | 0.7 | V | |
| | TD62004 | | | 0 | — | 1.0 | | |
| Clamp Diode Reverse Voltage | | V _R | — | — | — | 35 | V | |
| Clamp Diode Forward Current | | I _F | — | — | — | 350 | mA | |
| Power Dissipation | | P _D | Ta = 85°C (Note) | — | — | 0.325 | W | |

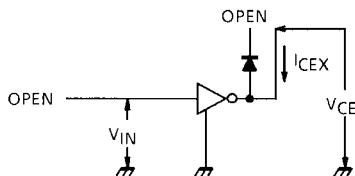
Note: On Glass Epoxy PCB (30 × 30 × 1.6 mm Cu 50%)

ELECTRICAL CHARACTERISTICS (Ta = 25°C)

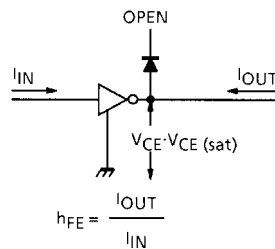
| CHARACTERISTIC | SYMBOL | TEST CIR-CUIT | TEST CONDITION | MIN | TYP. | MAX | UNIT | |
|--------------------------------------|-----------------------|---------------|--|---------------------------|------|-----|------|---|
| Output Leakage Current | I _{CEX} | 1 | V _{CE} = 35 V, Ta = 25°C | — | — | 50 | μA | |
| | | | V _{CE} = 35 V, Ta = 85°C | — | — | 100 | | |
| Collector-Emitter Saturation Voltage | V _{CE (sat)} | 2 | I _{OUT} = 350 mA, I _{IN} = 500 μA | — | 1.3 | 1.6 | V | |
| | | | I _{OUT} = 200 mA, I _{IN} = 350 μA | — | 1.1 | 1.3 | | |
| | | | I _{OUT} = 100 mA, I _{IN} = 250 μA | — | 0.9 | 1.1 | | |
| DC Current Transfer Ratio | h _{FE} | 2 | V _{CE} = 2 V, I _{OUT} = 350 mA | 1000 | — | — | | |
| Input Current (Output On) | TD62003 | 3 | V _{IN} = 2.4 V, I _{OUT} = 350 mA | — | 0.4 | 0.7 | mA | |
| | TD62004 | | V _{IN} = 9.5 V, I _{OUT} = 350 mA | — | 0.8 | 1.2 | | |
| Input Current (Output Off) | I _{IN (OFF)} | 4 | I _{OUT} = 500 μA, Ta = 85°C | 50 | 65 | — | μA | |
| Input Voltage (Output On) | V _{IN (ON)} | 5 | V _{CE} = 2 V h _{FE} = 800 | I _{OUT} = 350 mA | — | — | 2.6 | V |
| | | | | I _{OUT} = 200 mA | — | — | 2.0 | |
| | | | | I _{OUT} = 350 mA | — | — | 4.7 | |
| | | | | I _{OUT} = 200 mA | — | — | 4.4 | |
| Clamp Diode Reverse Current | I _R | 6 | V _R = 35 V, Ta = 25°C | — | — | 50 | μA | |
| | | | V _R = 35 V, Ta = 85°C | — | — | 100 | | |
| Clamp Diode Forward Voltage | V _F | 7 | I _F = 350 mA | — | — | 2.0 | V | |
| Input Capacitance | C _{IN} | 8 | — | — | 15 | — | pF | |
| Turn-On Delay | t _{ON} | 9 | V _{OUT} = 35 V, R _L = 87.5 Ω C _L = 15 pF | — | 0.1 | — | μs | |
| Turn-Off Delay | t _{OFF} | 9 | V _{OUT} = 35 V, R _L = 87.5 Ω C _L = 15 pF | — | 0.2 | — | | |

TEST CIRCUIT

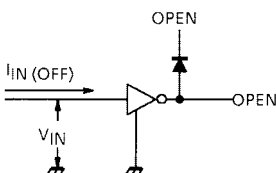
1. I_{CEX}



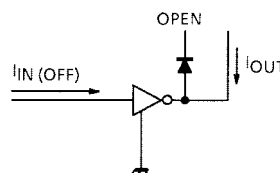
2. V_{CE (sat)}, h_{FE}



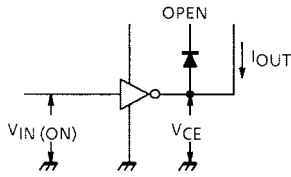
3. I_{IN (ON)}



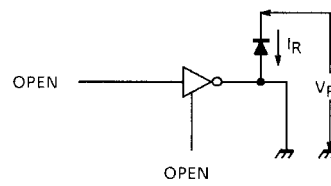
4. I_{IN (OFF)}



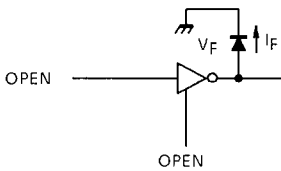
5. $V_{IN(ON)}$



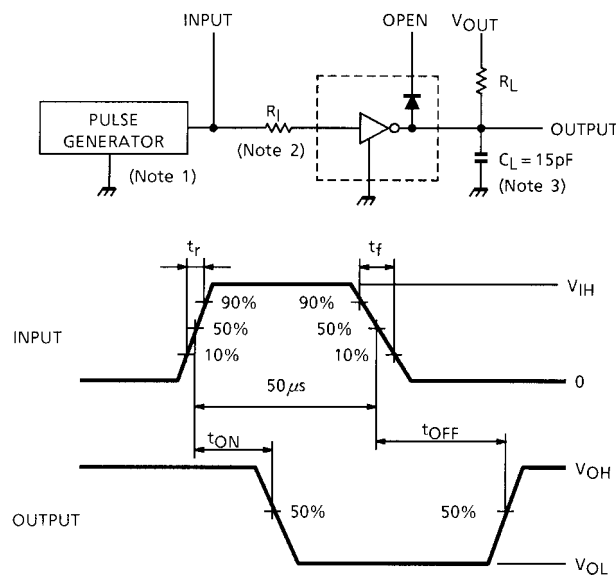
6. I_R



7. V_F



8. 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} |
|-------------|-------|----------|
| TD620003FB | 0 | 3 V |
| TD620004FB | 0 | 8 V |

Note 3: C_L includes probe and jig capacitance.

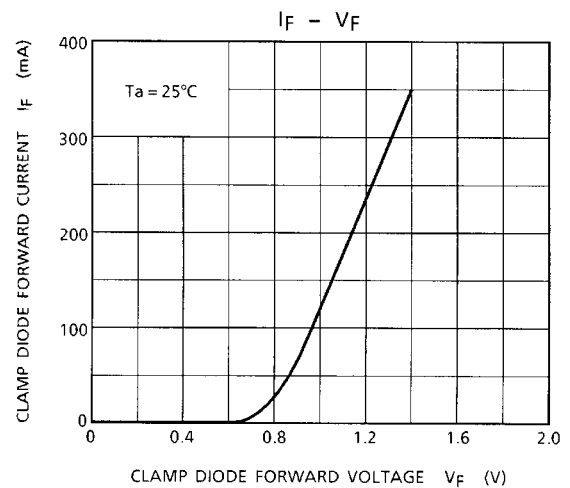
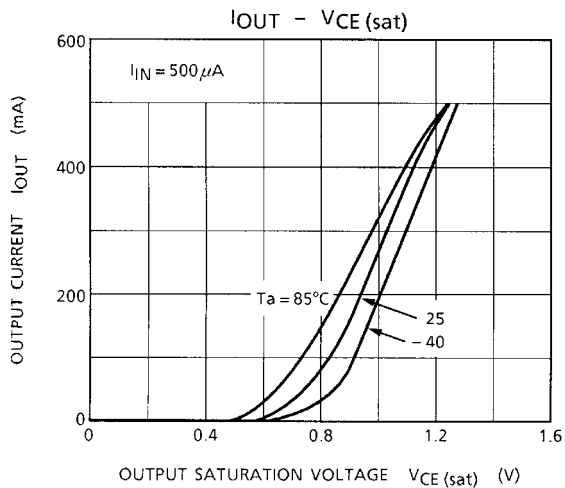
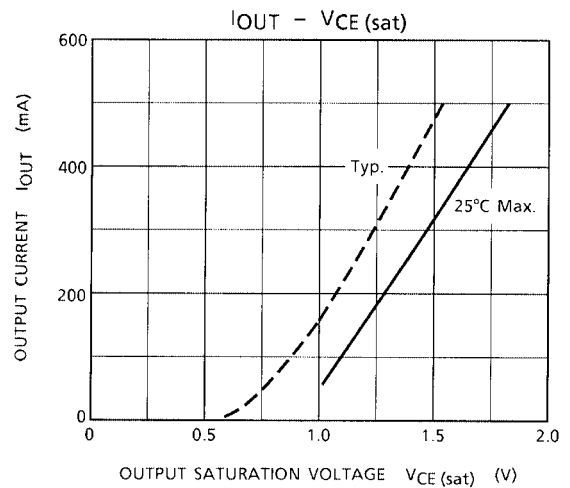
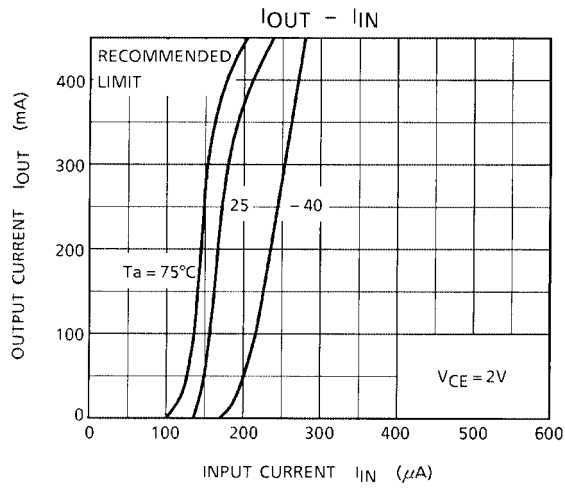
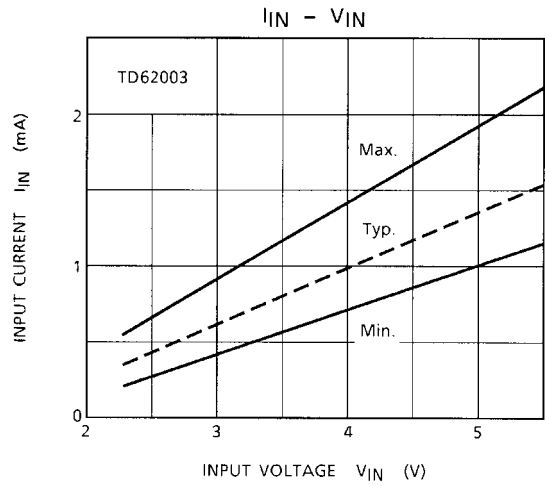
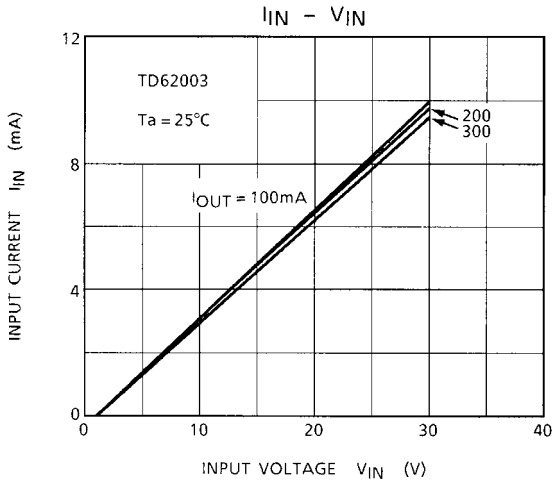
PRECAUTIONS for USING

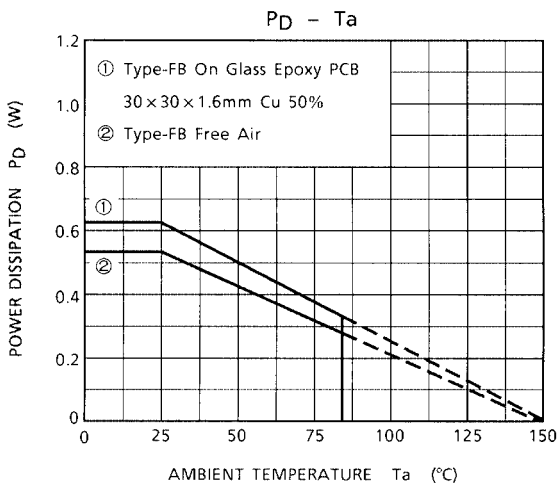
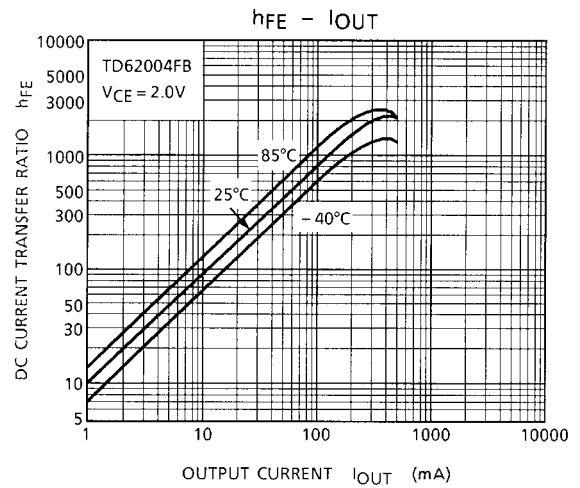
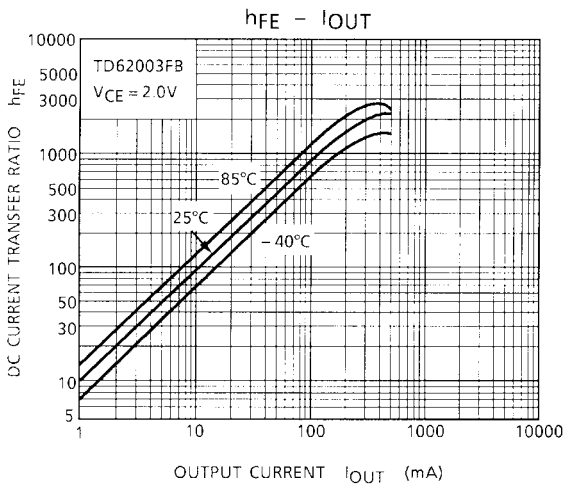
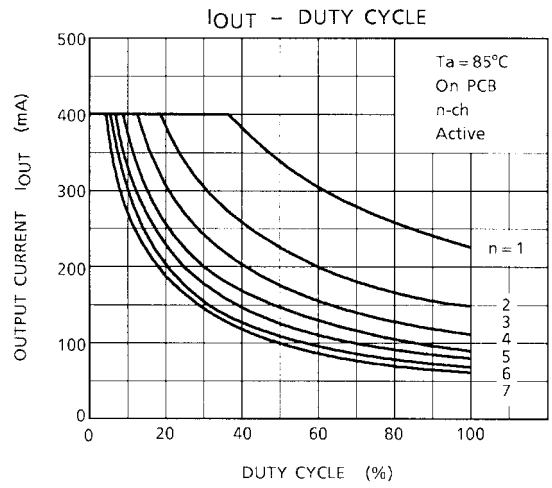
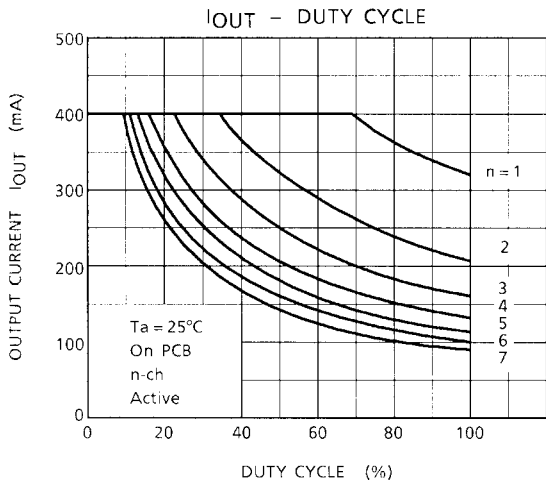
This IC does not include built-in protection circuits for excess current or overvoltage.

If this IC is subjected to excess current or overvoltage, it may be destroyed.

Hence, the utmost care must be taken when systems which incorporate this IC are designed.

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

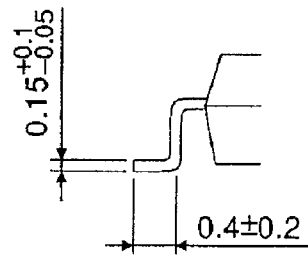
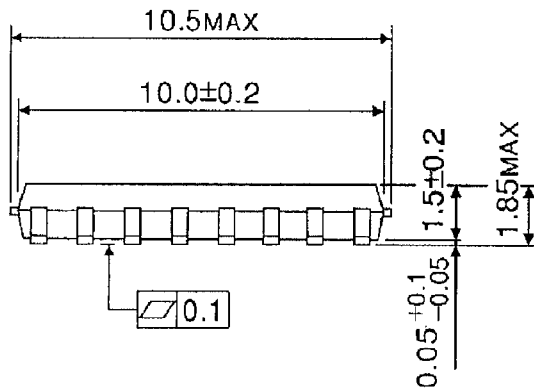
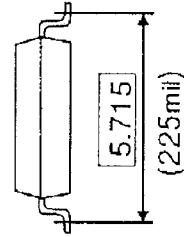
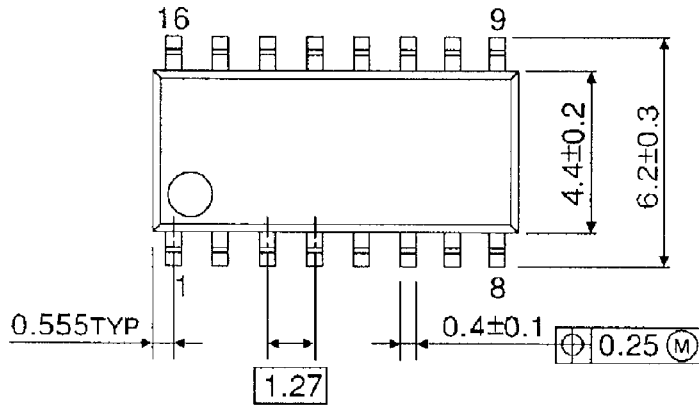




PACKAGE DIMENSIONS

SOP16-P-225-1.27B

Unit : mm



Weight: 0.16 g (Typ.)

RESTRICTIONS ON PRODUCT USE

000707EBA

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