

TOSHIBA Bipolar Digital Integrated Circuit Silicon Monolithic

TD62164BPG, TD62164BFG

4ch High-Current Darlington Sink Driver

The TD62164BPG and TD62164BFG are high-voltage, high-current darlington drivers comprised of four NPN darlington pairs.

All units feature integral clamp diodes for switching inductive loads.

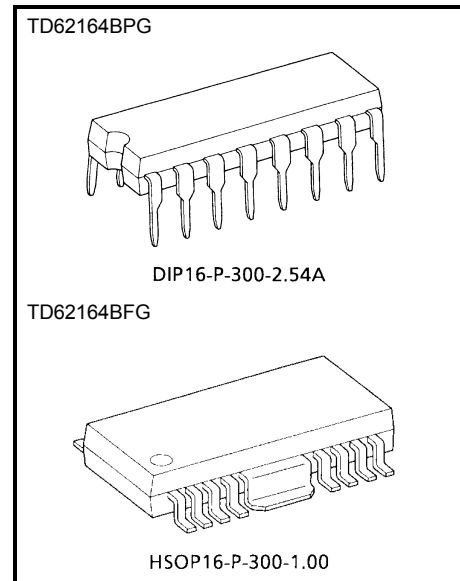
Applications include relay, hammer, lamp and stepping motor drivers.

Please observe the thermal condition for using.

The suffix (G) appended to the part number represents a Lead (Pb)-Free product.

Features

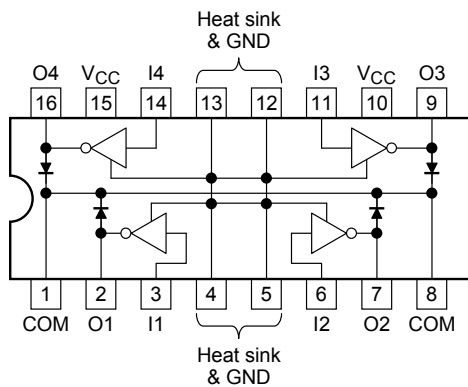
- Two VCC terminals (Separated)
- Package type BPG : DIP16 pin
BFG : HSOP16 pin
- High sustaining voltage output: VCE (SUS) = 80 V (min)
- Output current (single output): IO_{UT} = 700 mA/ch (max)
- Output clamp diodes
- Input compatible with TTL and 5-V CMOS
- GND and SUB terminal heat sink



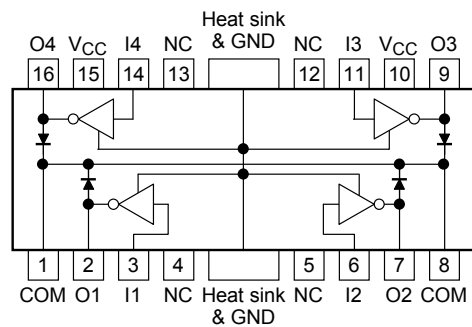
Weight
 DIP16-P-300-2.54A: 1.11 g (typ.)
 HSOP16-P-300-1.00: 0.50 g (typ.)

Pin Connection (top view)

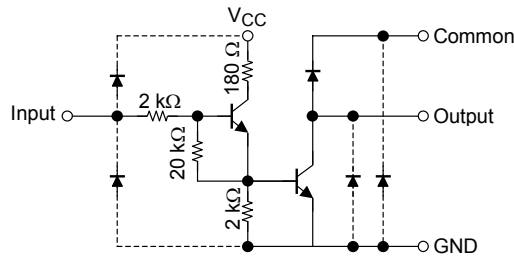
TD62164BPG



AD62164BFG



Schematics (each driver)



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

Absolute Maximum Ratings (Ta = 25°C)

| Characteristics | Symbol | Rating | Unit |
|-----------------------------|-----------|-------------------|-------|
| Supply voltage | VCC | -0.5 to 17 | V |
| Output sustaining voltage | VCE (SUS) | -0.5 to 80 | V |
| Output current | IOUT | 700 | mA/ch |
| Input current | IIN | 50 | mA |
| Input voltage | VIN | 17 | V |
| Clamp diode reverse voltage | VR | 80 | V |
| Clamp diode forward current | IF | 700 | mA |
| Power dissipation | BPG | PD | W |
| | BFG | | |
| | | 1.47/2.7 (Note 1) | |
| | | 0.9/1.4 (Note 2) | |
| Operating temperature | Topr | -40 to 85 | °C |
| Storage temperature | Tstg | -55 to 150 | °C |

Note 1: On glass epoxy PCB (50 × 50 × 1.6 mm Cu 50%)

Note 2: On glass epoxy PCB (60 × 30 × 1.6 mm Cu 30%)

Recommended Operating Conditions (Ta = -40 to 85°C)

| Characteristics | Symbol | Condition | Min | Typ. | Max | Unit | | |
|-----------------------------|-----------|-------------------------|---------------|------------|------|-------|-----|----------|
| Supply voltage | VCC | | 4.5 | — | 5.5 | V | | |
| Output sustaining voltage | VCE (SUS) | | 0 | — | 80 | V | | |
| Output current | IOUT | DC 1 circuit, Ta = 25°C | 0 | — | 570 | mA/ch | | |
| | | Tp _w = 25 ms | Duty = 10% | 0 | — | | 570 | |
| | | | Duty = 50% | 0 | — | | 520 | |
| | | 4 circuits | Duty = 10% | 0 | — | | 570 | |
| Duty = 50% | 0 | | — | 270 | | | | |
| | | Ta = 85°C | | | | | | |
| | | Tj = 120°C | | | | | | |
| Input voltage | VIN | | 0 | — | 15 | V | | |
| | Output on | VIN (ON) | IOUT = 500 mA | hFE = 150 | 10.0 | — | 15 | V |
| | | | | hFE = 2000 | 2.4 | — | 15 | |
| Output off | VIN (OFF) | | 0 | — | 0.4 | | | |
| Input current | IIN | | 0 | — | 20 | mA | | |
| Clamp diode reverse voltage | VR | | — | — | 80 | V | | |
| Clamp diode forward voltage | IF | | — | — | 700 | mA | | |
| Power dissipation | BPG | PD | Ta = 85°C | (Note 1) | — | 1.4 | W | |
| | BFG | | | | | | | (Note 2) |

Note 1: On glass epoxy PCB (50 × 50 × 1.6 mm Cu 50%)

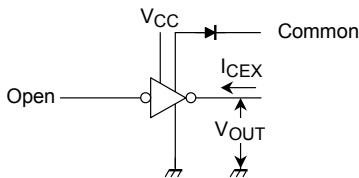
Note 2: On glass epoxy PCB (60 × 30 × 1.6 mm Cu 30%)

Electrical Characteristics (Ta = 25°C)

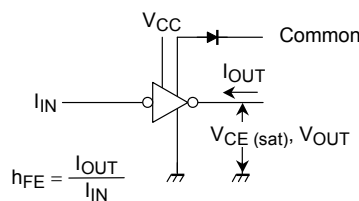
| Characteristics | | Symbol | Test Circuit | Test Condition | Min | Typ. | Max | Unit |
|-----------------------------|------------|-----------|--------------|--|------|------|------|-------|
| Output leakage current | ICEX | 1 | 1 | VCE = 80 V, Ta = 25°C | — | — | 50 | μA |
| | | | | VCE = 80 V, Ta = 85°C | — | — | 100 | |
| Output saturation voltage | VCE (sat) | 2 | 2 | IOUT = 500 mA, VCC = 5 V | — | — | 0.8 | V |
| | | | | IOUT = 200 mA, VCC = 5 V | — | — | 0.45 | |
| DC current transfer ratio | hFE | 2 | 2 | VCE = 2 V, IOUT = 500 mA | 2000 | — | — | |
| Input voltage (Output on) | VIN (ON) | 3 | 3 | IOUT = 500 mA, hFE = 150 | 7.0 | — | 10.0 | V |
| | | | | IOUT = 500 mA, hFE = 2000 | 1.8 | — | 2.4 | |
| Clamp diode leakage current | IR | 4 | 4 | VR = 80 V, Ta = 25°C | — | — | 50 | μA |
| | | | | VR = 80 V, Ta = 85°C | — | — | 100 | |
| Clamp diode forward voltage | VF | 5 | 5 | IF = 500 mA | — | — | 2.0 | V |
| Supply current | Output on | ICC (ON) | 3 | VCC = 5.5 V, VIN = 2.4 V | — | 35 | 40 | mA/ch |
| | Output off | ICC (OFF) | | VCC = 5.5 V, VIN = 0.4 V | — | — | 10 | μA |
| Input capacitance | CIN | 6 | 6 | VIN = 0 V, f = 1 MHz | — | 15 | — | pF |
| Turn-on delay | tON | 7 | 7 | VOUT = 80 V, RL = 125 Ω Ta = 60°C, VCC = 5.0 V, CL = 15 pF | — | 0.2 | 0.4 | μs |
| Turn-off delay | tOFF | | | | — | 4.0 | 8.0 | |

Test Circuit

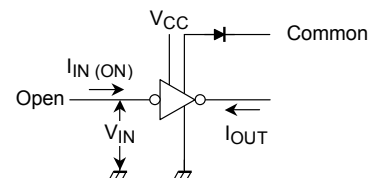
1. ICEX



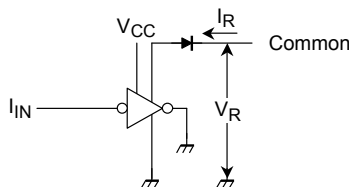
2. hFE, VCE (sat)



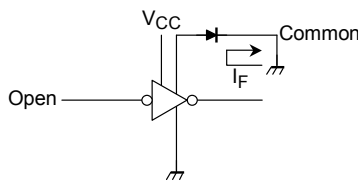
3. VIN (ON)



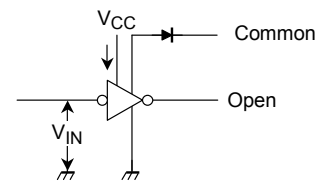
4. IR



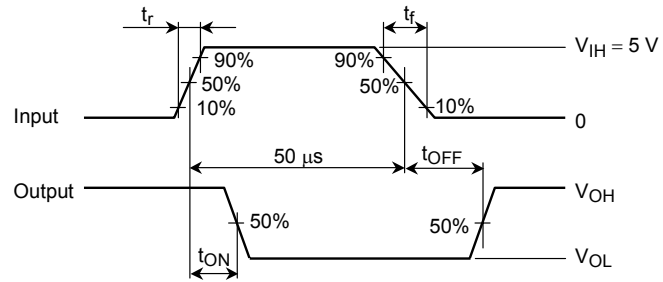
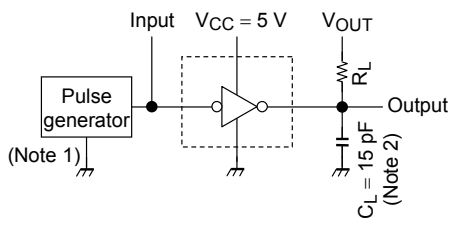
5. VF



6. ICC (ON), ICC (OFF)



7. 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: C_L includes probe and jig capacitance.

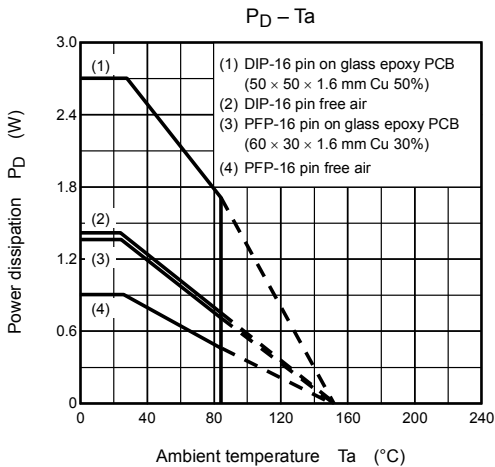
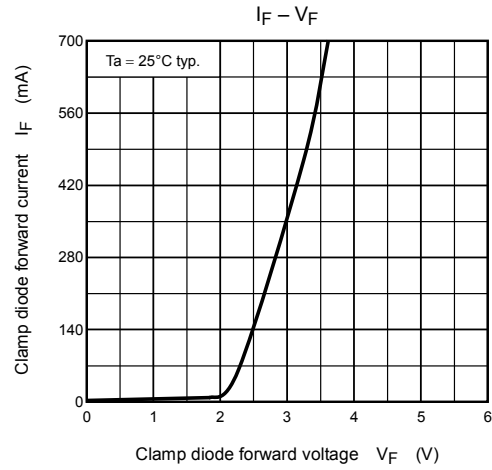
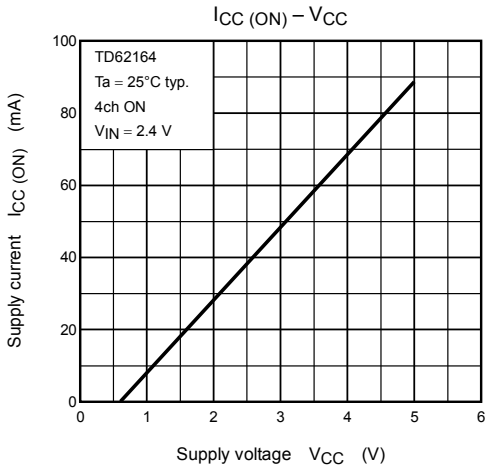
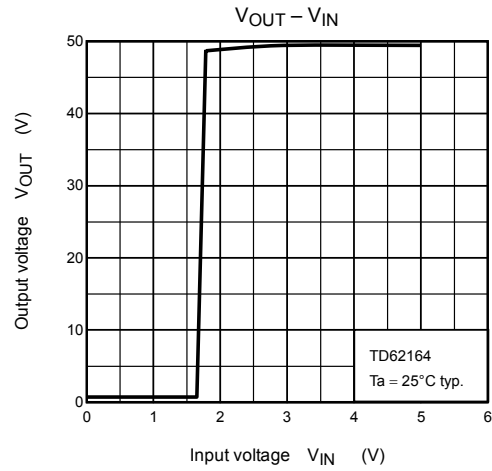
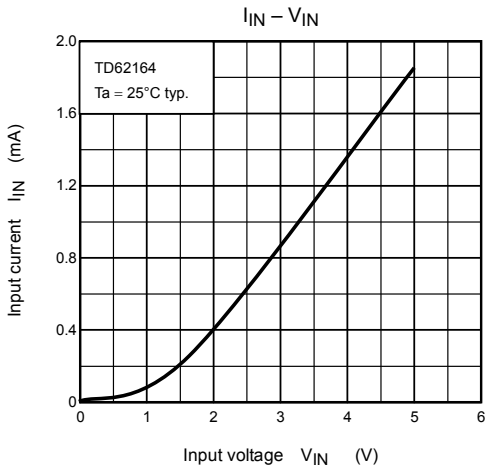
Precautions for Using

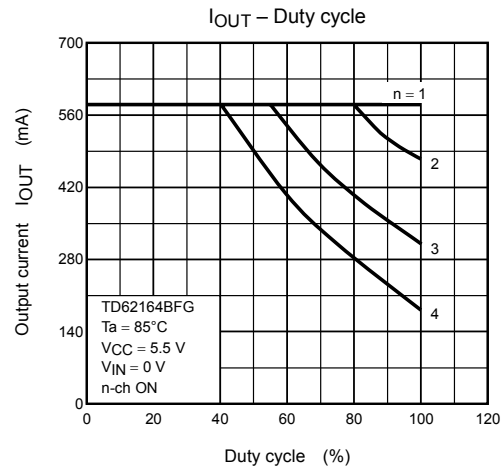
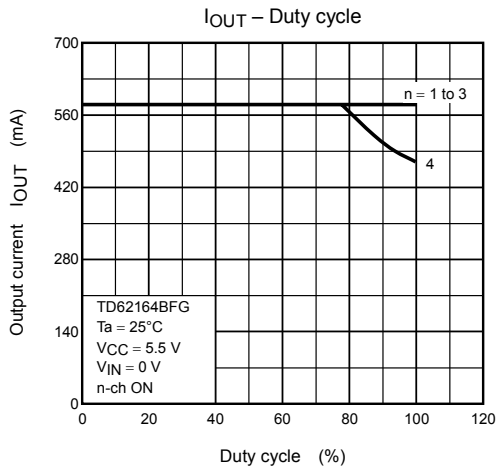
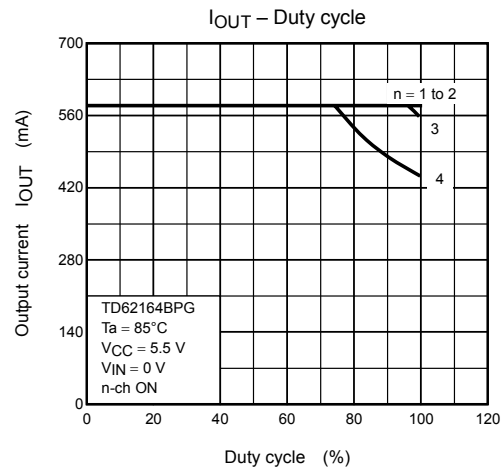
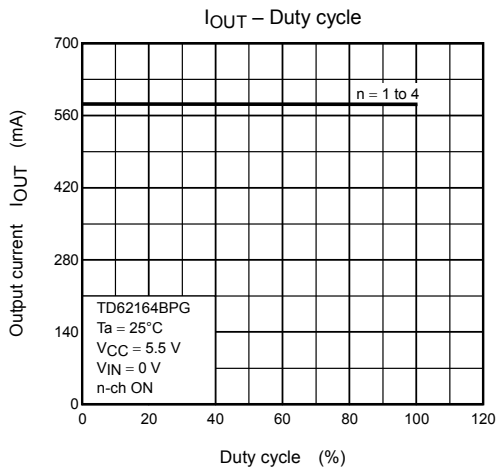
This IC does not include built-in protection circuits for excess current or overvoltage.

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, VCC, COMMON and GND line since IC may be destroyed due to short-circuit between outputs, air contamination fault, or fault by improper grounding.

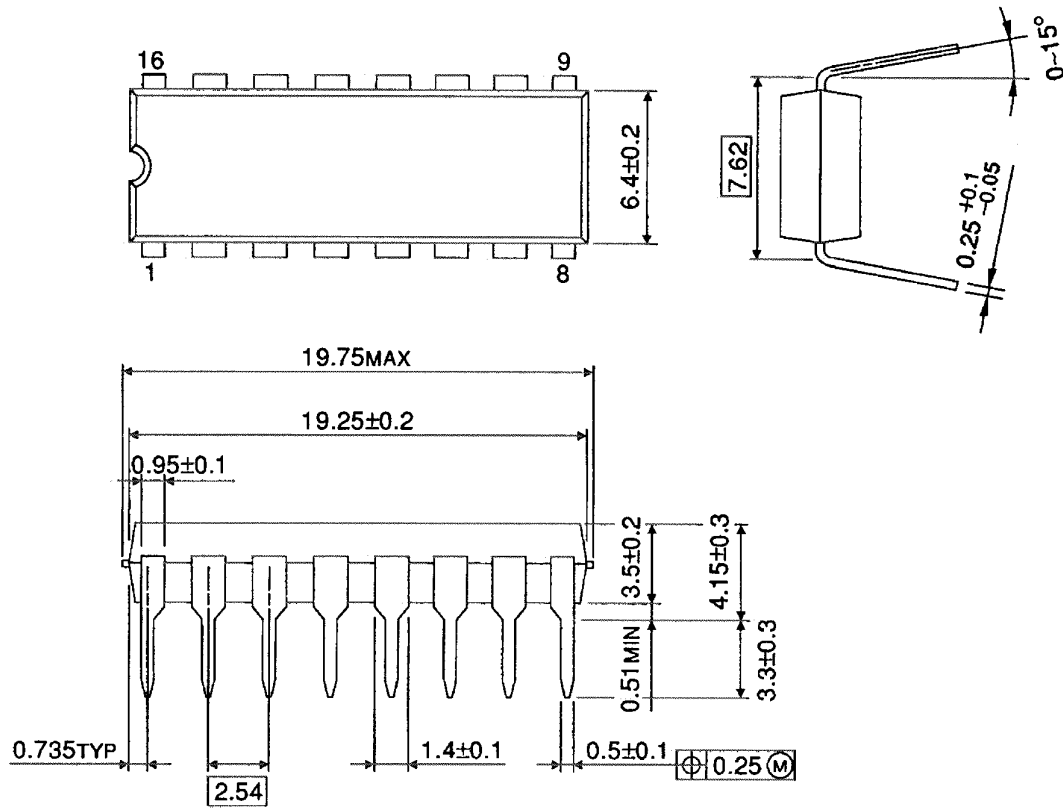




Package Dimensions

DIP16-P-300-2.54A

Unit : mm

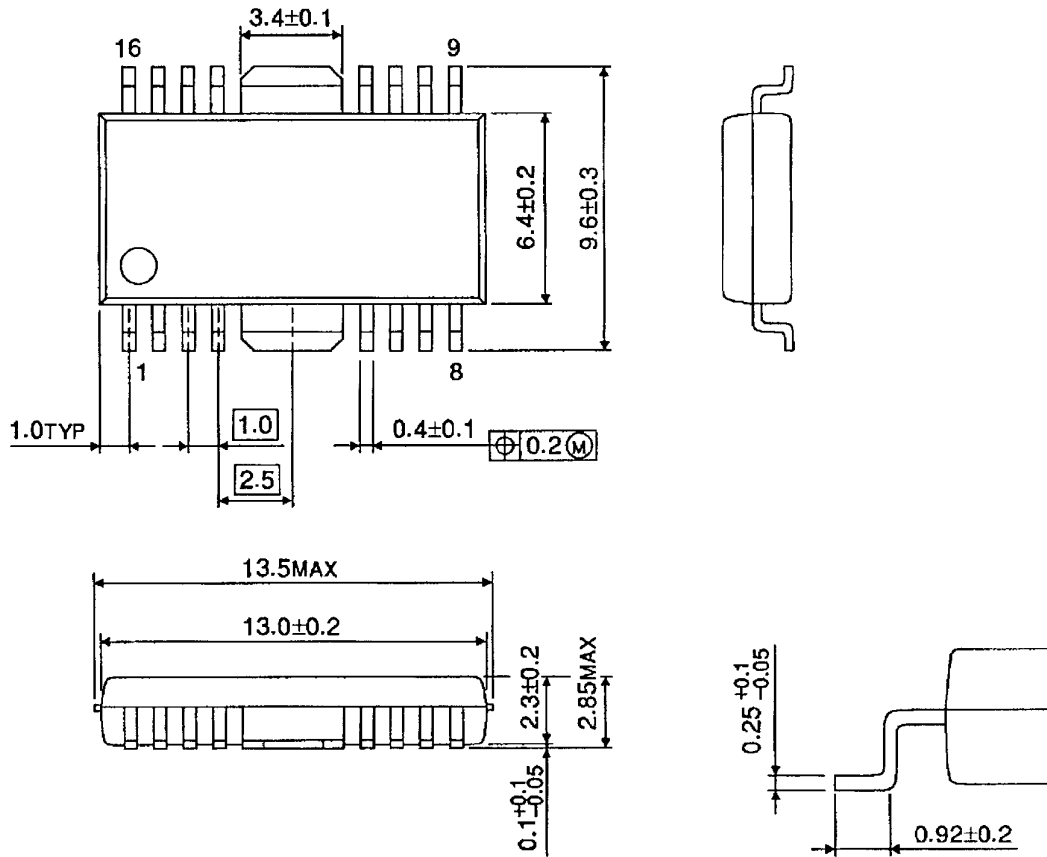


Weight: 1.11 g (typ.)

Package Dimensions

HSOP16-P-300-1.00

Unit : mm



Weight: 0.50 g (typ.)

About solderability, following conditions were confirmed

- Solderability
 - (1) Use of Sn-37Pb solder Bath
 - solder bath temperature = 230°C
 - dipping time = 5 seconds
 - the number of times = once
 - use of R-type flux
 - (2) Use of Sn-3.0Ag-0.5Cu solder Bath
 - solder bath temperature = 245°C
 - dipping time = 5 seconds
 - the number of times = once
 - use of R-type flux

RESTRICTIONS ON PRODUCT USE

060116EBA

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