

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.

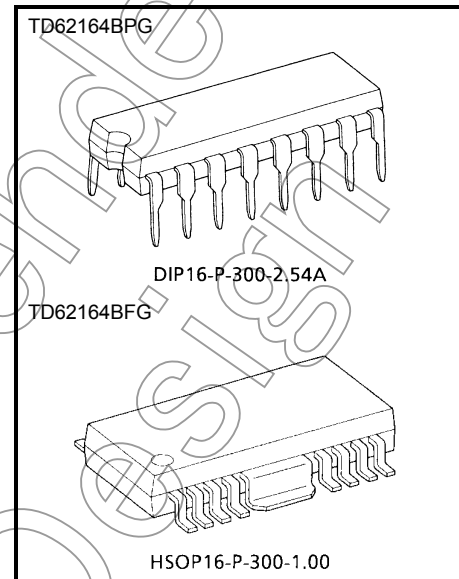
Applications include relay, hammer, lamp and stepping motor drivers.

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): IOUT = 700 mA/ch (max)
- Output clamp diodes
- Input compatible with TTL and 5-V CMOS
- GND and SUB terminal heat sink



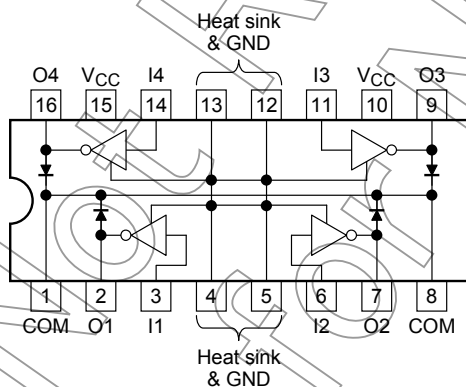
Weight

DIP16-P-300-2.54A: 1.11 g (typ.)

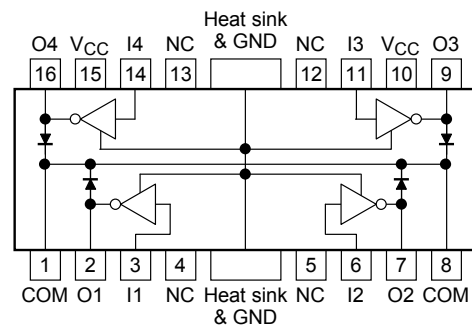
HSOP16-P-300-1.00: 0.50 g (typ.)

Pin Connection (top view)

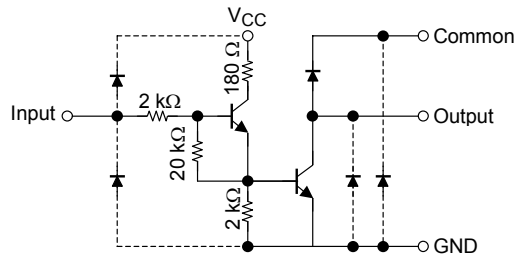
TD62164BPG



TD62164BFG



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
		Tpw = 25 ms	0	—	570	
		4 circuits	0	—	520	
		Ta = 85°C	0	—	570	
Input voltage	VIN	Tj = 120°C	0	—	270	V
			0	—	15	
		Output on	10.0	—	15	
		Output 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	—	—	1.4	W
	BFG				0.7	
		Ta = 85°C (Note 1)				
		Ta = 85°C (Note 2)				

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

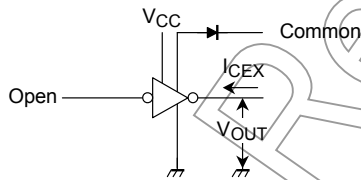
Note 2: On glass epoxy PCB (60 × 30 × 1.6 mm Cu 30%)

Electrical Characteristics (Ta = 25°C)

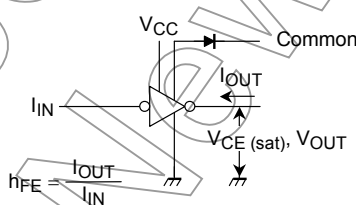
Characteristics		Symbol	Test Circuit	Test Condition	Min	Typ.	Max	Unit
Output leakage current		ICEX	1	VCE = 80 V, Ta = 25°C	—	—	50	μA
				VCE = 80 V, Ta = 85°C	—	—	100	
Output saturation voltage		VCE (sat)	2	IOUT = 500 mA, VCC = 5 V	—	—	0.8	V
				IOUT = 200 mA, VCC = 5 V	—	—	0.45	
DC current transfer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

Test Circuit

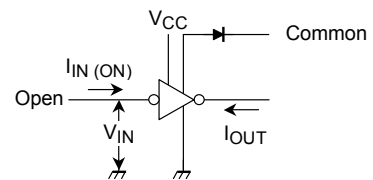
1. ICEX



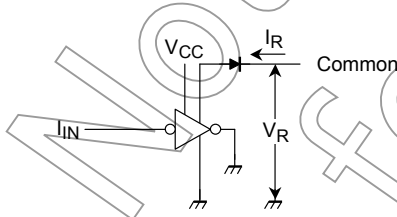
2. hFE, VCE (sat)



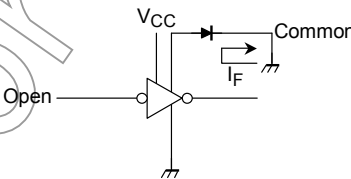
3. VIN (ON)



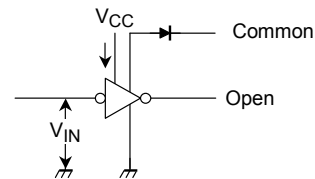
4. IR



5. VF



6. ICC (ON), ICC (OFF)



Note 2: C_L includes probe and jig capacitance.

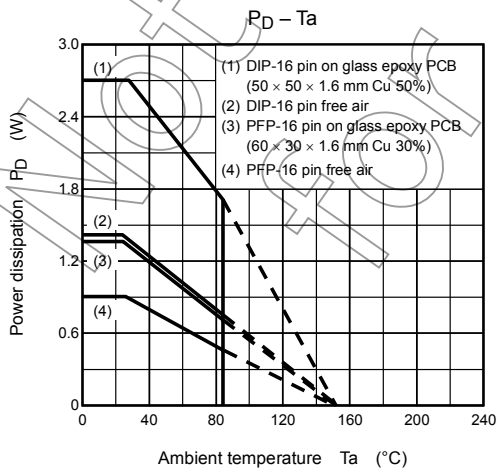
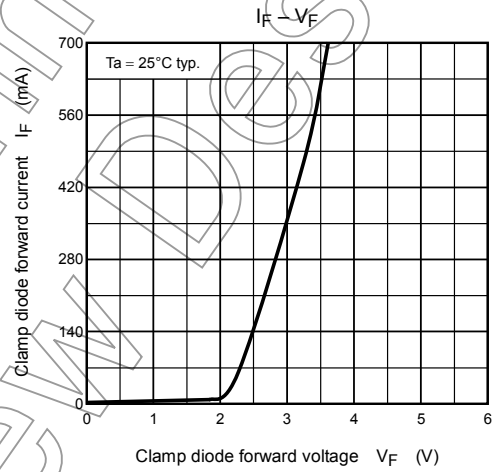
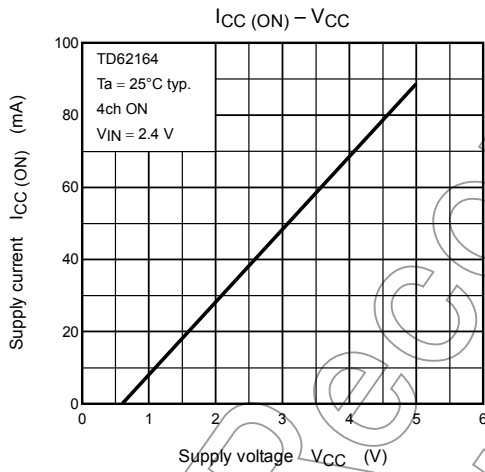
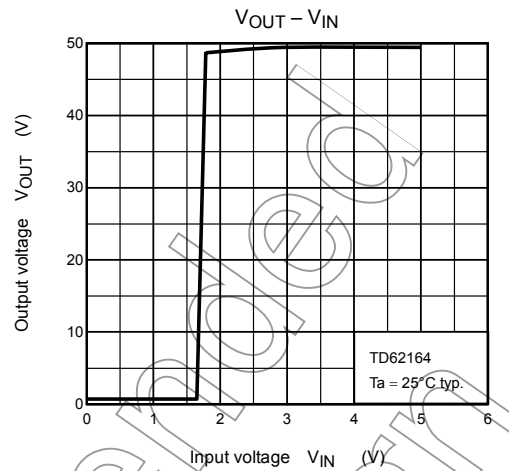
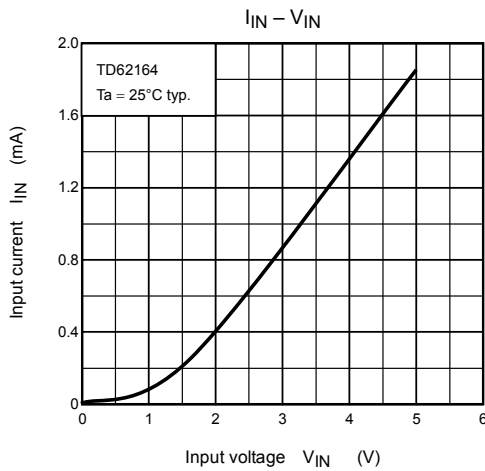
Precautions for Using

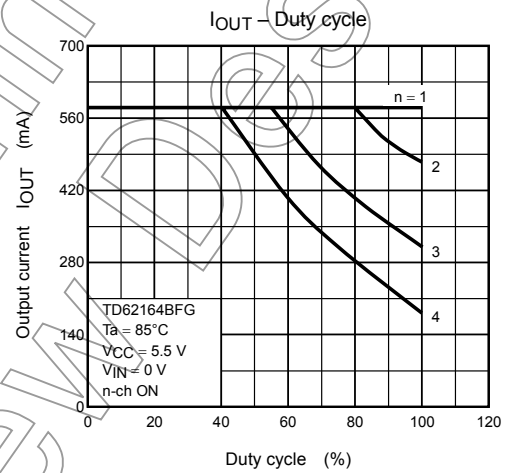
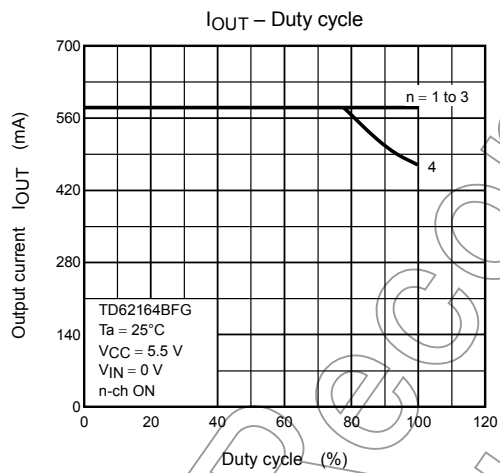
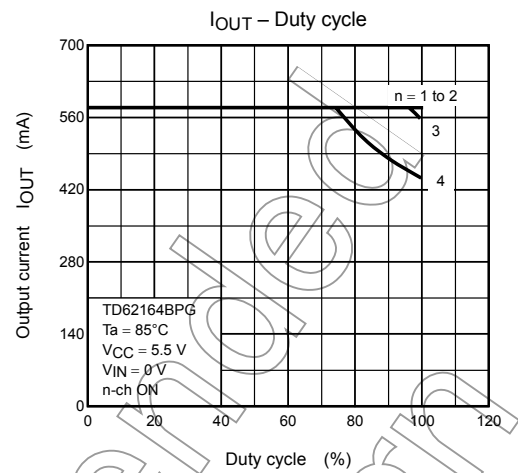
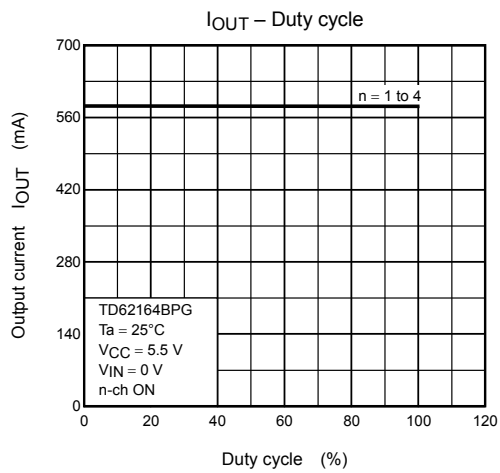
This IC does not include built-in protection circuits for excess current or overvoltage.

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.

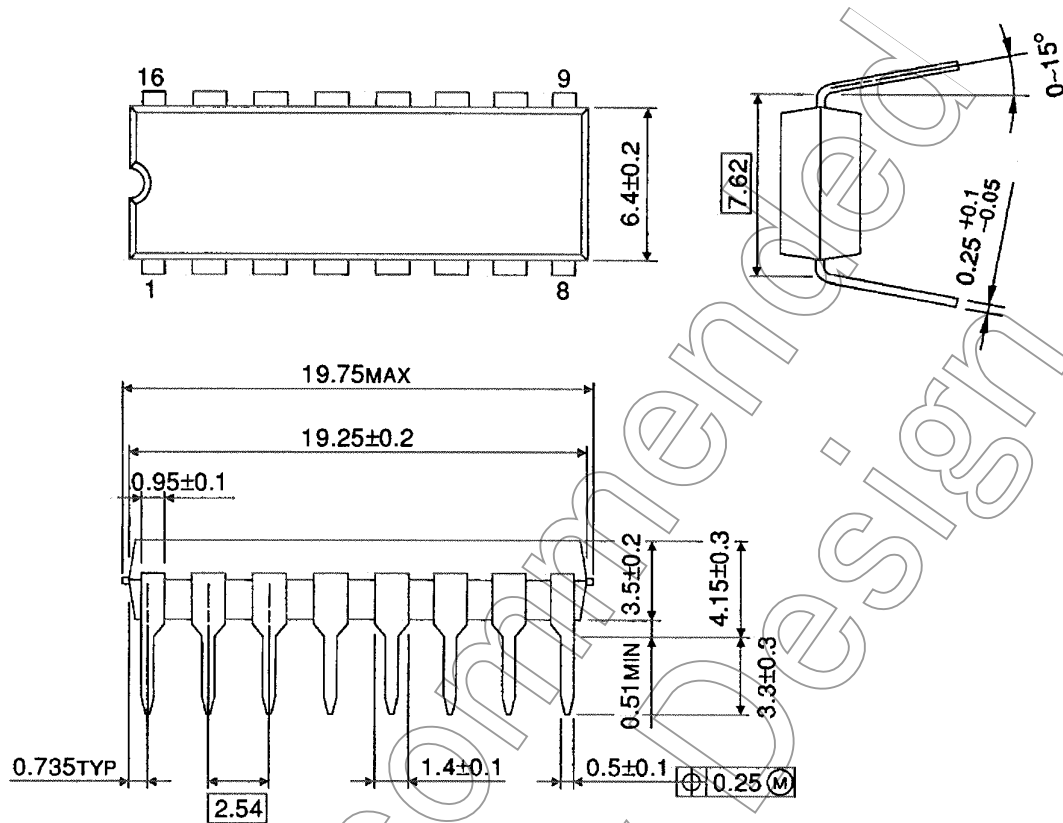




Package Dimensions

DIP16-P-300-2.54A

Unit : mm

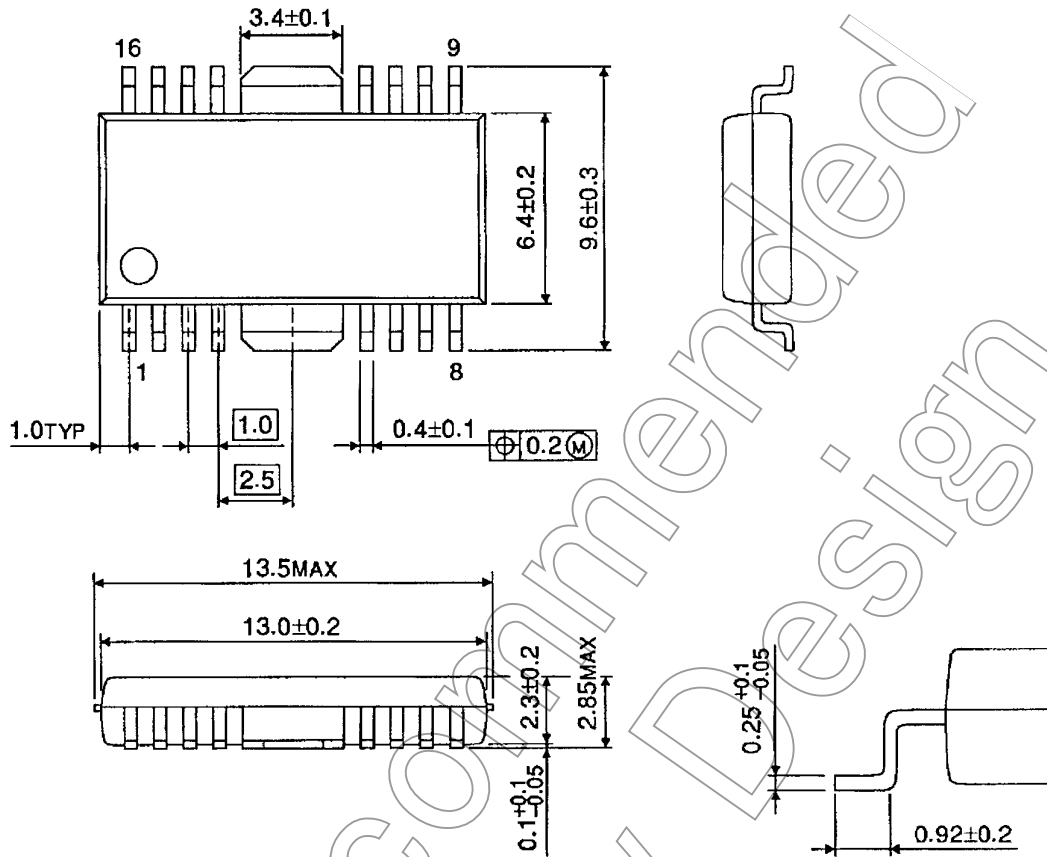


Weight: 1.11 g (typ.)

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

- The information contained herein is subject to change without notice. 021023_D
- TOSHIBA is continually working to improve the quality and reliability of its products. Nevertheless, semiconductor devices in general can malfunction or fail due to their inherent electrical sensitivity and vulnerability to physical stress. It is the responsibility of the buyer, when utilizing TOSHIBA products, to comply with the standards of safety in making a safe design for the entire system, and to avoid situations in which a malfunction or failure of such TOSHIBA products could cause loss of human life, bodily injury or damage to property.
In developing your designs, please ensure that TOSHIBA products are used within specified operating ranges as set forth in the most recent TOSHIBA products specifications. Also, please keep in mind the precautions and conditions set forth in the "Handling Guide for Semiconductor Devices," or "TOSHIBA Semiconductor Reliability Handbook" etc. 021023_A
- The TOSHIBA products listed in this document are intended for usage in general electronics applications (computer, personal equipment, office equipment, measuring equipment, industrial robotics, domestic appliances, etc.). These TOSHIBA products are neither intended nor warranted for usage in equipment that requires extraordinarily high quality and/or reliability or a malfunction or failure of which may cause loss of human life or bodily injury ("Unintended Usage"). Unintended Usage include atomic energy control instruments, airplane or spaceship instruments, transportation instruments, traffic signal instruments, combustion control instruments, medical instruments, all types of safety devices, etc. Unintended Usage of TOSHIBA products listed in this document shall be made at the customer's own risk. 021023_B
- The products described in this document shall not be used or embedded to any downstream products of which manufacture, use and/or sale are prohibited under any applicable laws and regulations. 060106_Q
- The information contained herein is presented only as a guide for the applications of our products. No responsibility is assumed by TOSHIBA for any infringements of patents or other rights of the third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of TOSHIBA or others. 021023_C
- The products described in this document are subject to the foreign exchange and foreign trade laws. 021023_E