

TOSHIBA BIPOLAR DIGITAL INTEGRATED CIRCUIT SILICON MONOLITHIC

TD62164BP, TD62164BF

4ch HIGH-CURRENT DARLINGTON SINK DRIVER

The TD62164BP and TD62164BF are high-voltage, high-current darlington drivers comprised of four NPN darlington pairs.

All units feature integral clamp diodes for switching inductive loads.

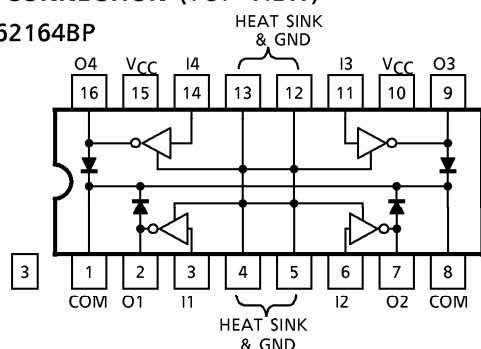
Applications include relay, hammer, lamp and stepping moter drivers.

FEATURES

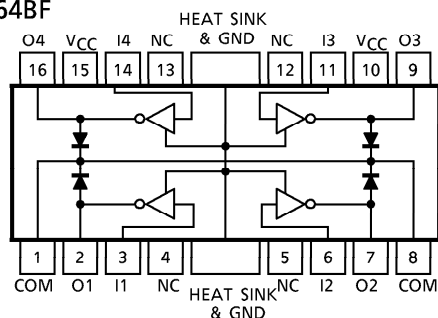
- Two V_{CC} Terminals (Separated)
- Package Type BP : DIP16 pin
BF : PFP16 pin
- High Sustaining Voltage output : $V_{CE(SUS)} = 80V$ (Min.)
- Output Current (Single Output) : $I_{OUT} = 700mA / ch$ (Max.)
- Output Clamp Diodes
- Input Compatible with TTL and 5V CMOS
- GND and SUB Terminal Heat Sink

PIN CONNECTION (TOP VIEW)

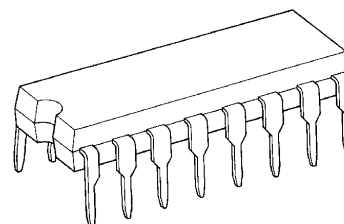
TD62164BP



TD62164BF

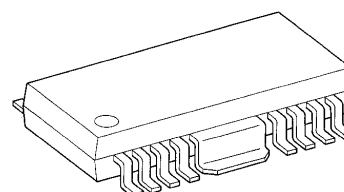


TD62164BP



DIP16-P-300-2.54A

TD62164BF

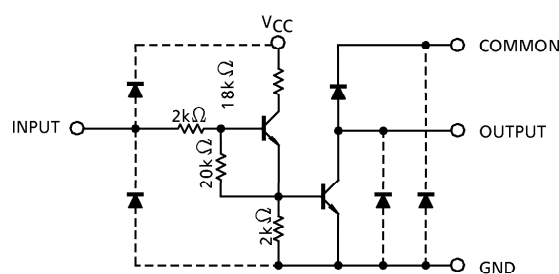


HSOP16-P-300-1.00

Weight

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

SCHEMATICS (EACH DRIVER)



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

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MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Supply Voltage	V _{CC}	− 0.5~17	V
Output Sustaining Voltage	V _{CE (SUS)}	− 0.5~80	V
Output Current	I _{OUT}	700	mA/ch
Input Current	I _{IN}	50	mA
Input Voltage	V _{IN}	17	V
Clamp Diode Reverse Voltage	V _R	80	V
Clamp Diode Forward Current	I _F	700	mA
Power Dissipation	BP	1.47 / 2.7 *1	W
	BF	0.9 / 1.4 *2	
Operating Temperature	T _{opr}	− 40~85	°C
Storage Temperature	T _{stg}	− 55~150	°C

*1 On Glass Epoxy PCB (50×50×1.6mm Cu 50%)

*2 On Glass Epoxy PCB (60×30×1.6mm Cu 30%)

RECOMMENDED OPERATING (Ta = − 40~85°C)

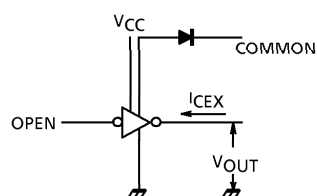
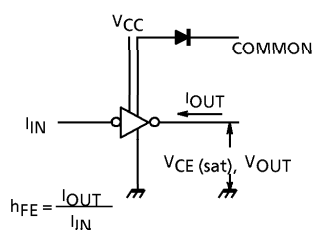
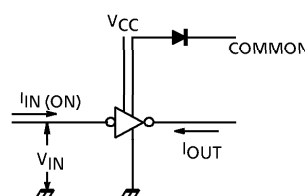
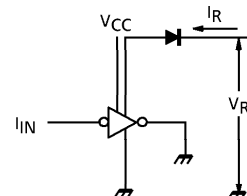
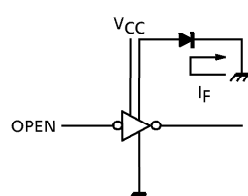
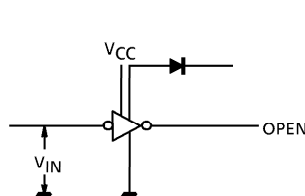
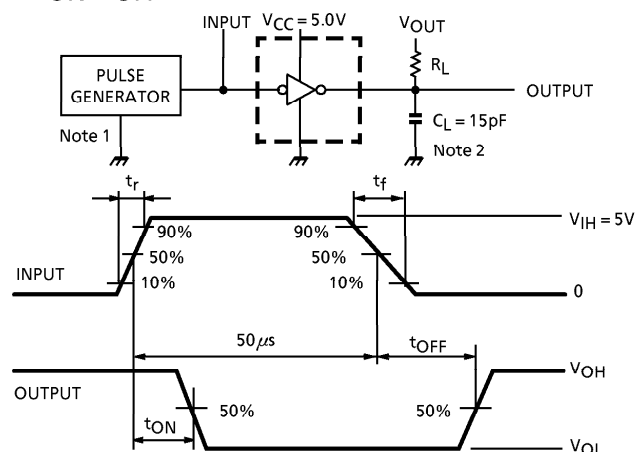
CHARACTERISTIC		SYMBOL	CONDITION		MIN.	TYP.	MAX	UNIT
Supply Voltage		V _{CC}			4.5	—	5.5	V
Output Sustaining Voltage		V _{CE (SUS)}			0	—	80	V
Output Current	BP *1	I _{OUT}	DC1 Circuit, Ta = 25°C		0	—	570	mA/ch
			Tp _w = 25ms 4 Circuits Ta = 85°C T _j = 120°C	Duty = 10%	0	—	570	
	Duty = 50%			0	—	520		
	Duty = 10%			0	—	570		
	Duty = 50%		0	—	270			
Input Voltage		V _{IN}			0	—	15	V
	Output On	V _{IN (ON)}	I _{OUT} = 500mA	hFE = 150	10.0	—	15	V
	Output Off	V _{IN (OFF)}		hFE = 2000	2.4	—	15	
Input Current		I _{IN}			0	—	20	mA
Clamp Diode Reverse Voltage		V _R			—	—	80	V
Clamp Diode Forward Voltage		I _F			—	—	700	mA
Power Dissipation	BP	P _D	Ta = 85°C *1		—	—	1.4	W
	BF		Ta = 85°C *2		—	—	0.7	

*1 On Glass Epoxy PCB (50×50×1.6mm Cu 50%)

*2 On Glass Epoxy PCB (60×30×1.6mm Cu 30%)

ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	TEST CIR-CUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Output Leakage Current		I_{CEX}	1	$V_{CE} = 80V, Ta = 25^{\circ}C$	—	—	50	μA
				$V_{CE} = 80V, Ta = 85^{\circ}C$	—	—	100	
Output Saturation Voltage		$V_{CE(sat)}$	2	$I_{OUT} = 500mA, V_{CC} = 5V$	—	—	0.8	V
				$I_{OUT} = 200mA, V_{CC} = 5V$	—	—	0.45	
DC Current Transfer Ratio		h_{FE}	2	$V_{CE} = 2V, I_{OUT} = 500mA$	2000	—	—	
Input Voltage (Output On)		$V_{IN(ON)}$	3	$I_{OUT} = 500mA, h_{FE} = 150$	7.0	—	10.0	V
				$I_{OUT} = 500mA, h_{FE} = 2000$	1.8	—	2.4	
Clamp Diode Leakage Current		I_R	4	$V_R = 80V, Ta = 25^{\circ}C$	—	—	50	μA
				$V_R = 80V, Ta = 85^{\circ}C$	—	—	100	
Clamp Diode Forward Voltage		V_F	5	$I_F = 500mA$	—	—	2.0	V
Supply Current	Output On	$I_{CC(ON)}$	3	$V_{CC} = 5.5V, V_{IN} = 2.4V$	—	35	40	mA/ch
	Output Off	$I_{CC(OFF)}$		$V_{CC} = 5.5V, V_{IN} = 0.4V$	—	—	10	μA
Input Capacitance		C_{IN}	6	$V_{IN} = 0, f = 1MHz$	—	15	—	pF
Turn-On Delay		t_{ON}	7	$V_{OUT} = 80V, R_L = 125\Omega$	—	0.2	0.4	μs
Turn-Off Delay		t_{OFF}		$Ta = 60^{\circ}C, V_{CC} = 5.0V, C_L = 15pF$	—	4.0	8.0	

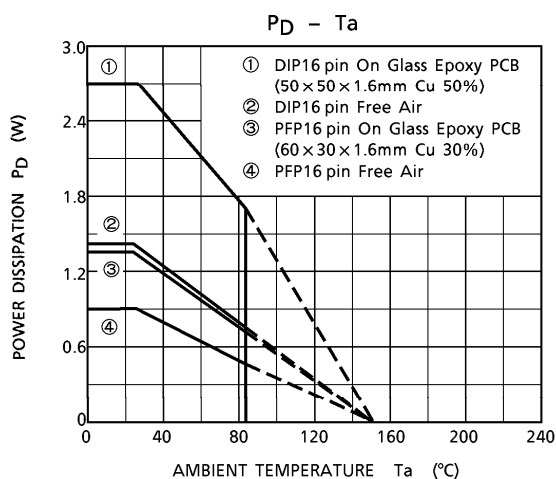
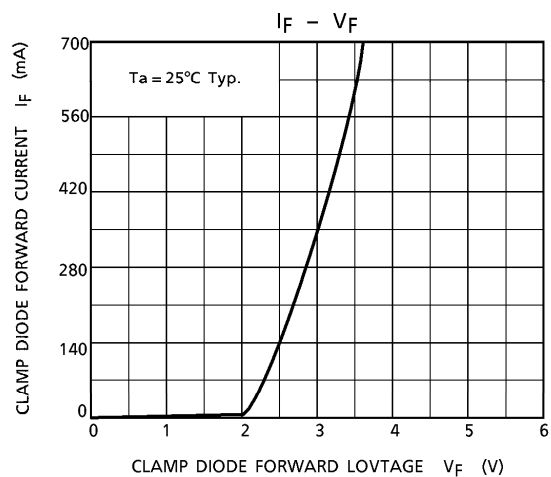
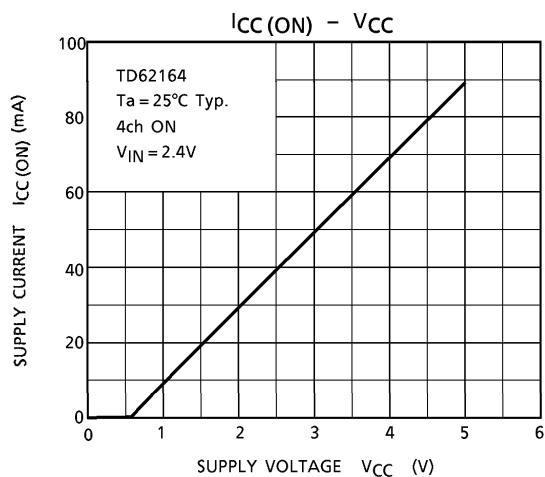
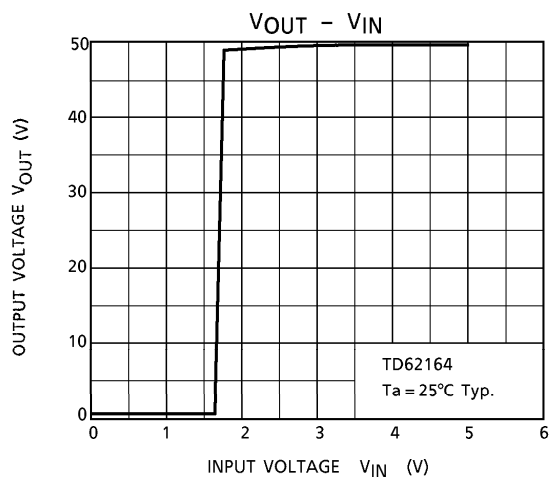
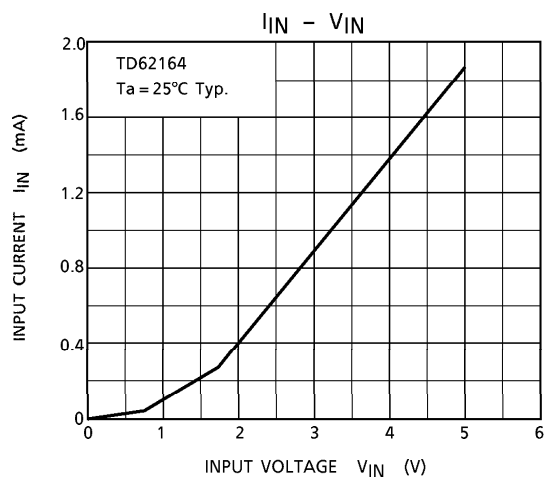
TEST CIRCUIT
1. I_{CEX}

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

3. $I_{IN(ON)}$

4. I_R

5. V_F

6. $I_{CC(ON)}$, $I_{CC(OFF)}$

7. t_{ON} , t_{OFF}


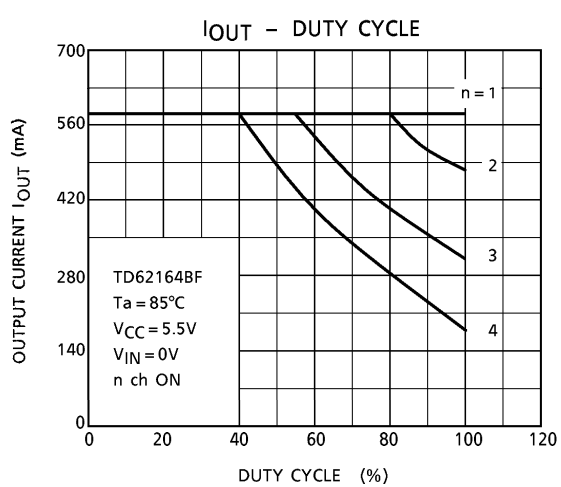
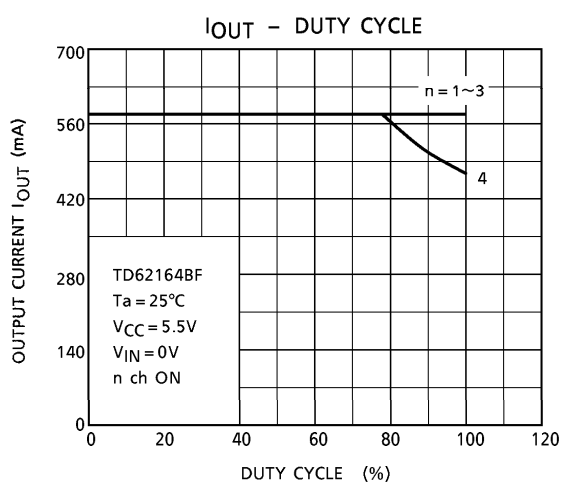
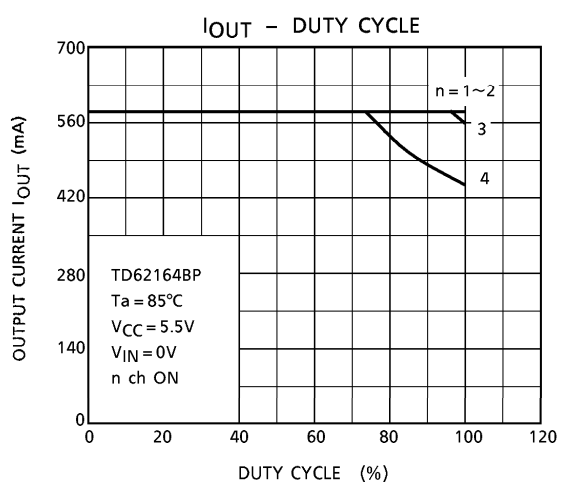
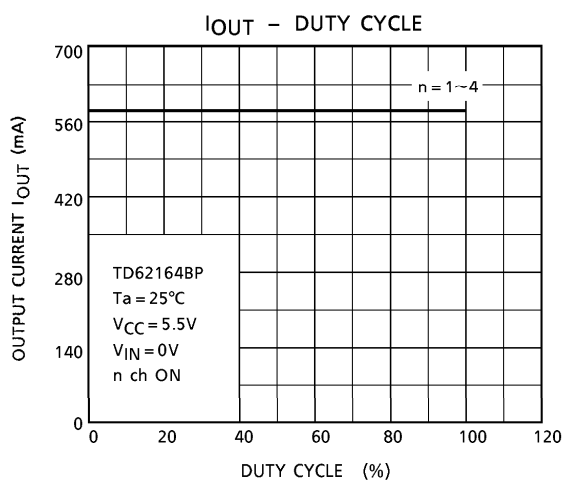
(Note 1) Pulse Width $50\mu s$, Duty Cycle 10%
Output Impedance 50Ω , $t_r \leq 5ns$, $t_f \leq 10ns$

(Note 2) C_L includes probe and jig capacitance

PRECAUTIONS for USING

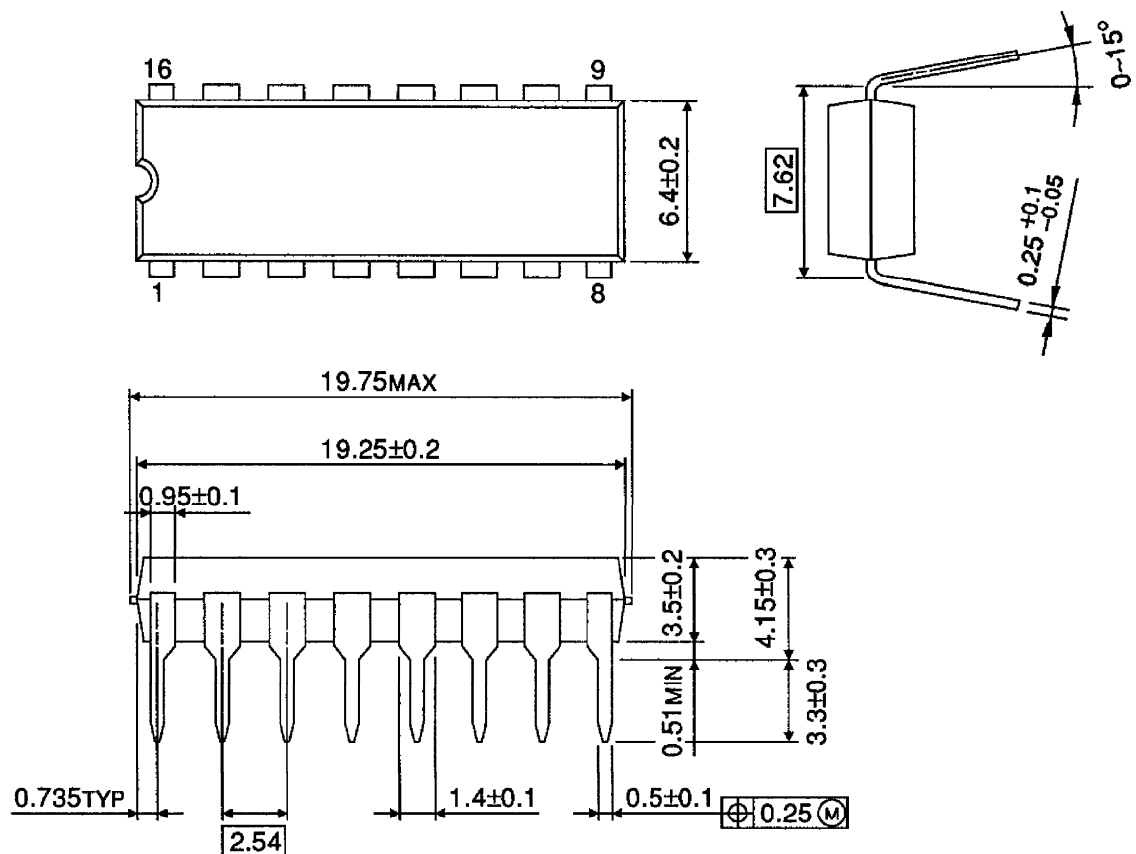
Utmost care is necessary in the design of the output line, V_{CC} , COMMON and GND line since IC may be destroyed due to short-circuit between outputs, air contamination fault, or fault by improper grounding.





OUTLINE DRAWING
DIP16-P-300-2.54A

Unit : mm

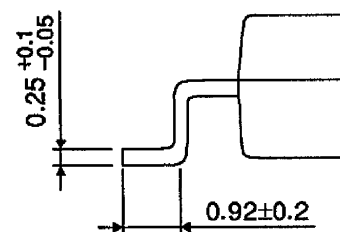
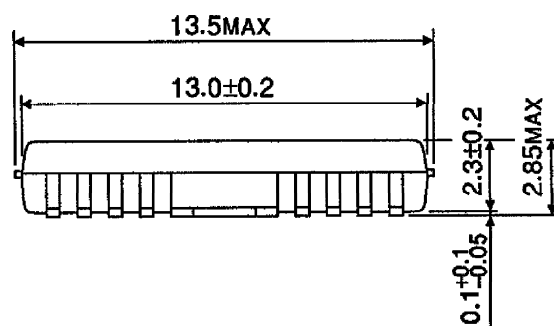
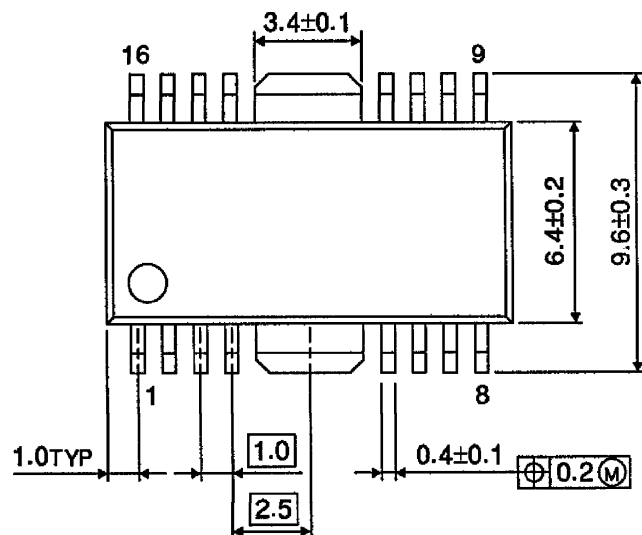


Weight : 1.11g (Typ.)

OUTLINE DRAWING

HSOP16-P-300-1.00

Unit : mm



Weight : 0.50g (Typ.)