

TOSHIBA BIPOLAR DIGITAL INTEGRATED CIRCUIT SILICON MONOLITHIC

TD62307P,TD62307F

7CH LOW SATURATION SINK DRIVER

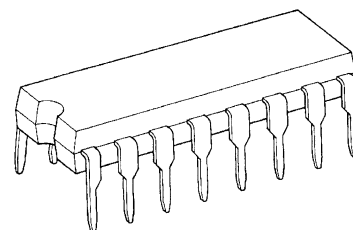
The TD62307P, TD62307F are comprised of seven NPN low saturation drivers.

All units feature integral clamp diodes for switching inductive loads and protective diodes against a negative input voltage. Applications include relay, hammer, lamp and LED driver.

FEATURES

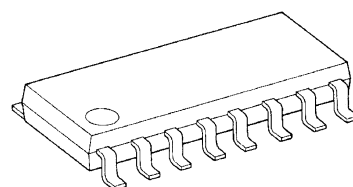
- Low saturation output $V_{CE(sat)} = 0.6 \text{ V (Max.)}$
@ $I_{OUT} = 120 \text{ mA}$
- Output rating (single output) $20 \text{ V (Min.)} / 150 \text{ mA (Max.)}$
- Inputs compatible with 5~15 V PMOS, CMOS
- Input protective diodes against a negative input voltage
- Package type-P : DIP-16 pin
- Package type-F : SOP-16 pin

TD62307P



DIP16-P-300-2.54A

TD62307F



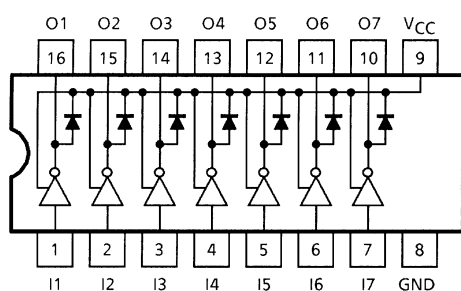
SOP16-P-225-1.27

Weight

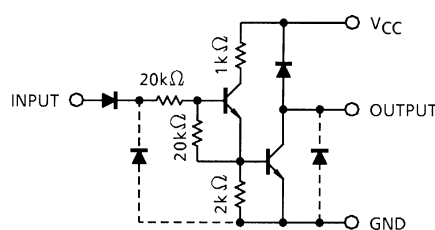
DIP16-P-300-2.54A : 1.11 g (Typ.)

SOP16-P-225-1.27 : 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
Supply Voltage		V _{CC}	-0.5~20	V
Output Sustaining Voltage		V _{CE(SUS)}	-0.5~V _{CC} +0.5	V
Output Current		I _{OUT}	150	mA / ch
Input Voltage		V _{IN}	-37~20	V
Input Current		I _{IN}	1.5	mA
Clamp Diode Reverse Voltage		V _R	20	V
Clamp Diode Forward Current		I _F	120	mA
Power Dissipation	P	P _D	1.0	W
	F		0.625 (Note)	
Operating Temperature	P	T _{opr}	-30~75	°C
	F		-40~85	
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 for Type-F and Ta = -30~75°C for Type-P)

CHARACTERISTIC		SYMBOL	CONDITION	MIN	TYP.	MAX	UNIT
Supply Voltage		V _{CC}	—	4.75	—	18	V
Output Current		I _{OUT}	DC 1 Circuit	0	—	120	mA / ch
			T _{pw} = 25 ms, Duty = 10% 7 Circuits	0	—	100	
Input Voltage		V _{IN}	—	−35	—	V _{CC}	V
Clamp Diode Reverse Voltage		V _R	—	—	—	18	V
Clamp Diode Forward Current		I _F	—	—	—	120	mA
Power Dissipation	P	P _D	—	—	—	0.44	W
	F		(Note)	—	—	0.325	

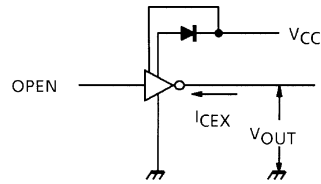
Note: On Glass Epoxy PCB (30 × 30 × 1.6 mm Cu 50%)

ELECTRICAL CHARACTERISTICS (Ta = 25°C)

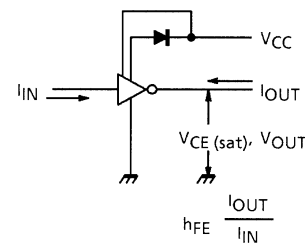
CHARACTERISTIC		SYMBOL	TEST CIR-CUIT	TEST CONDITION		MIN	TYP.	MAX	UNIT
Output Leakage Current	P	I_{CEX}	1	$V_{CC} = 18\text{ V}$ $V_{OUT} = 18\text{ V}$	$T_a = 75^\circ\text{C}$	—	—	100	μA
	F				$T_a = 85^\circ\text{C}$	—	—	100	
Output Saturation Voltage		$V_{CE(sat)}$	2	$V_{CC} = 5\text{ V}$, $I_{IN} = 0.2\text{ mA}$ $I_{OUT} = 120\text{ mA}$		—	0.45	0.6	V
DC Forward Current Transfer Ratio		h_{FE}	2	$V_{CC} = 5\text{ V}$, $V_{OUT} = 2\text{ V}$ $I_{OUT} = 120\text{ mA}$		1000	—	—	—
Input Current	Output On	$I_{IN(ON)}$	3	$V_{IN} = 5\text{ V}$, $I_{OUT} = 120\text{ mA}$		—	0.16	0.23	mA
	Output Off	$I_{IN(OFF)}$		$V_{IN} = 15\text{ V}$, $I_{OUT} = 120\text{ mA}$		—	0.66	0.94	
			4	$V_{IN} = -35\text{ V}$		—	—	-10	μA
Clamp Diode Forward Voltage		V_F	5	$I_F = 120\text{ mA}$		—	1.25	1.6	V
Supply Current	Output On	$I_{CC(ON)}$	6	$V_{CC} = V_{IN} = 5\text{ V}$		—	4.0	6.0	mA / Gate
	Output Off	$I_{CC(OFF)}$		$V_{CC} = V_{IN} = 15\text{ V}$		—	14.0	22	
			6	$V_{CC} = 18\text{ V}$, $V_{IN} = 0\text{ V}$		—	—	10	μA
Turn-On Delay		t_{ON}	7	$V_{CC} = 18\text{ V}$, $R_L = 150\ \Omega$ $C_L = 15\text{ pF}$		—	0.1	—	μs
Turn-Off Delay		t_{OFF}				—	0.8	—	μs

TEST CIRCUIT

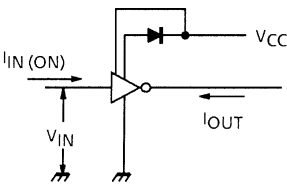
1. I_{CEX}



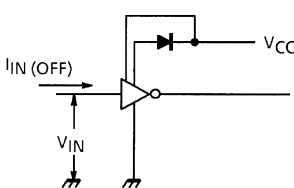
2. h_{FE} , $V_{CE(sat)}$



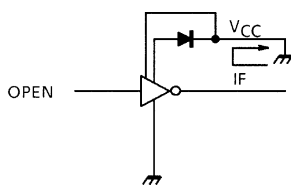
3. $I_{IN(ON)}$



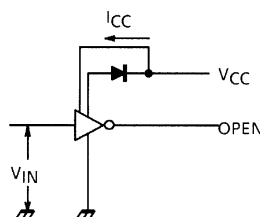
4. $I_{IN(OFF)}$



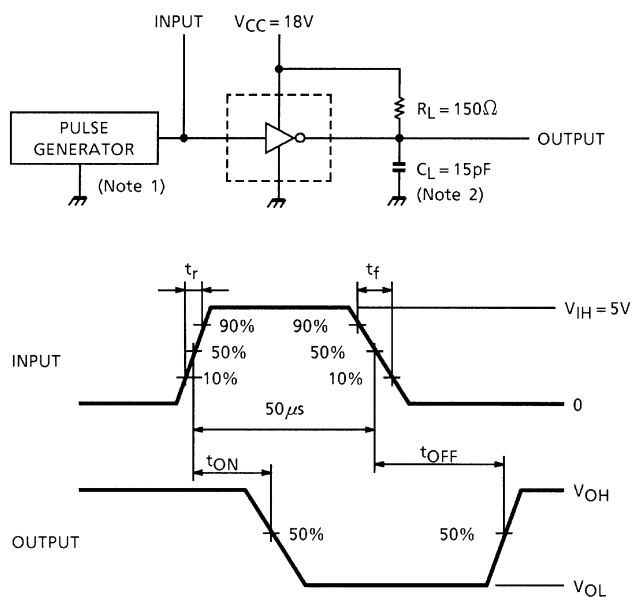
5. V_F



6. I_{CC}



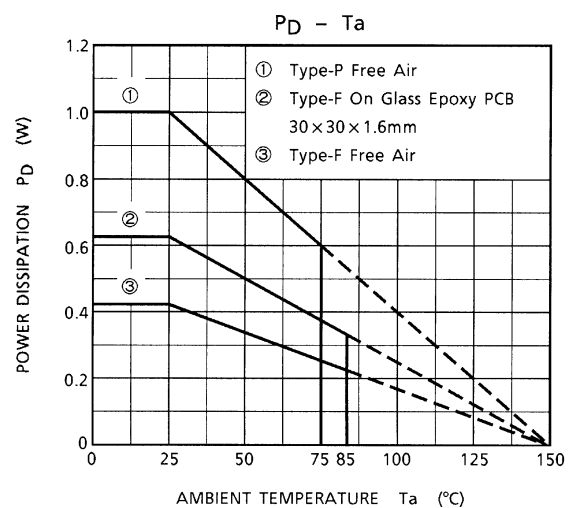
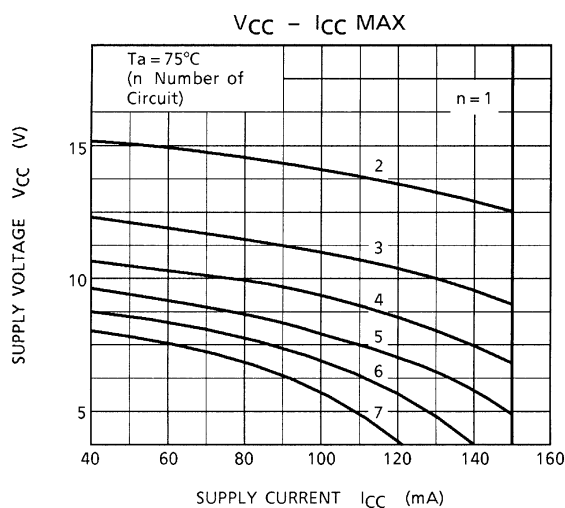
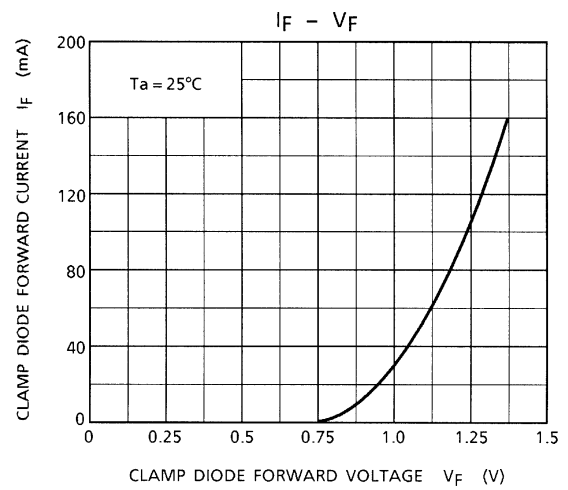
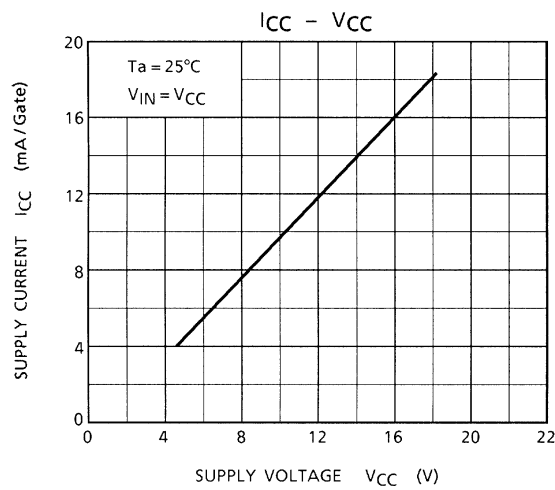
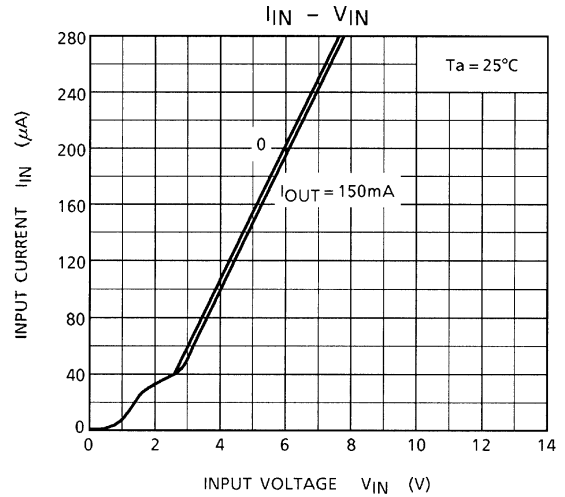
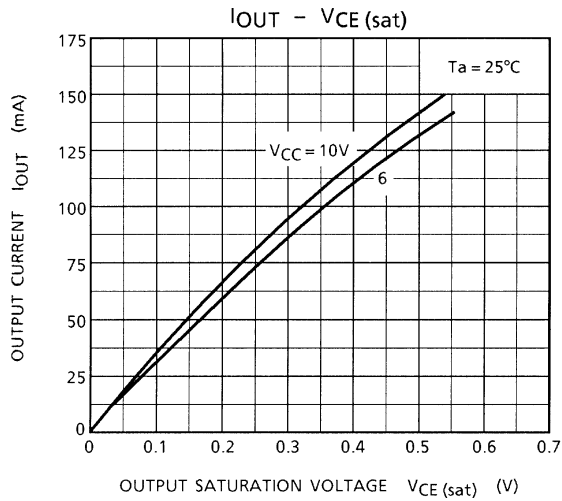
7. t_{ON} , t_{OFF}



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

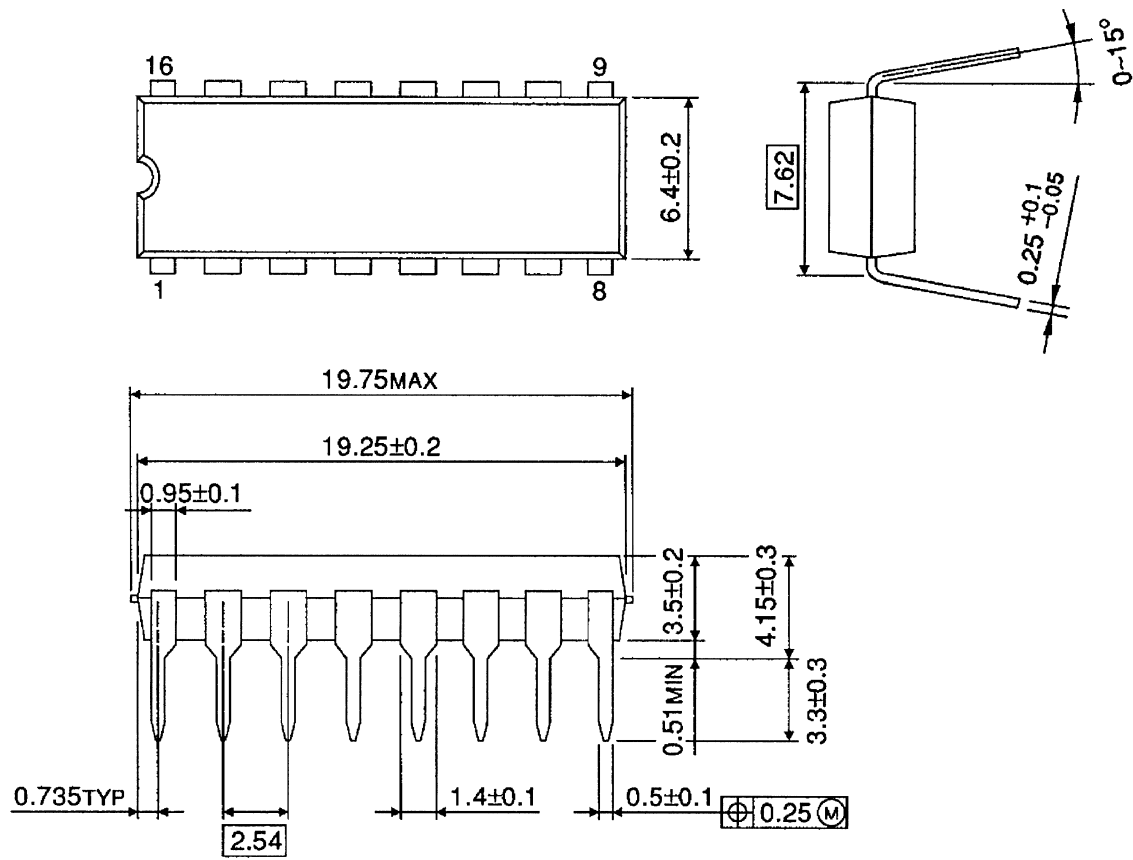
This IC does not include built-in protection circuits for excess current or overvoltage. If this IC is subjected to excess current or overvoltage, it may be destroyed. Hence, the utmost care must be taken when systems which incorporate this IC are designed. Utmost care is necessary in the design of the output line, V_{CC} 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

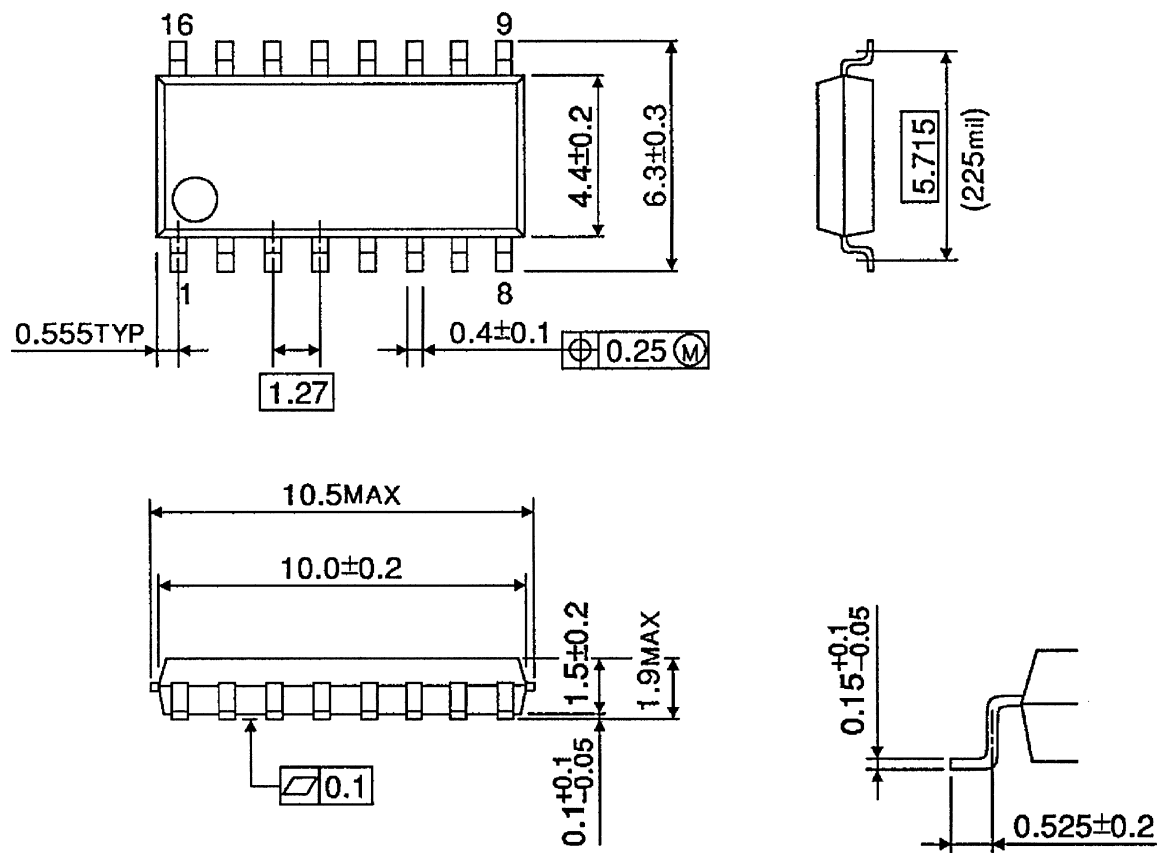


Weight: 1.11 g (Typ.)

PACKAGE DIMENSIONS

SOP16-P-225-1.27

Unit: mm



Weight: 0.16 g (Typ.)

RESTRICTIONS ON PRODUCT USE

000707EBA

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