

TD62301P, TD62301F, TD62302P, TD62302F

7CH LOW SATURATION SINK DRIVER

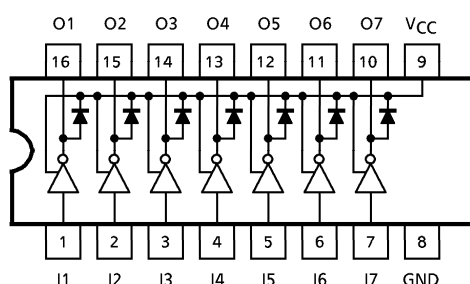
The TD62301P/F and TD62302P/F are comprised of seven NPN low saturation drivers.

All units feature integral clamp diodes for switching inductive loads. Applications include relay, hammer, lamp and LED drive in low voltage system.

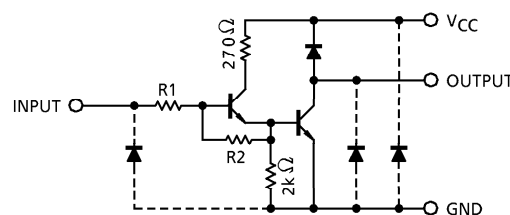
FEATURES

- Low saturation output $V_{CE(sat)} = 0.7V$ (Max.)
- Output rating (single output) 15V (Min.) / 200mA (Max.)
- High DC transfer ratio 1000 (Min.)
- Output clamp diodes
- Input register : TD62301P/F $R1 = 2k\Omega$, $R2 = 20k\Omega$
: TD62302P/F $R1 = 8.4k\Omega$, $R2 = 15k\Omega$
- Inputs compatible with TTL and 3~6V CMOS
- Package type-P : DIP-16 pin
- Package type-F : SOP-16 pin

PIN CONNECTION (TOP VIEW)



SCHEMATICS (EACH DRIVER)



TD62301P : $R1 = 2k\Omega$, $R2 = 20k\Omega$
 TD62302P : $R1 = 8.4k\Omega$, $R2 = 15k\Omega$

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

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MAXIMUM RATINGS ($T_a = 25^\circ\text{C}$)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Supply Voltage	V_{CC}	$-0.5 \sim 15$	V
Output Sustaining Voltage	$V_{CE(SUS)}$	$-0.5 \sim V_{CC} + 0.5$	V
Output Current	I_{OUT}	200	mA / ch
Input Voltage	V_{IN}	$-0.5 \sim 15$	V
Input Current	I_{IN}	15	mA
Clamp Diode Reverse Voltage	V_R	15	V
Clamp Diode Forward Current	I_F	200	mA
Power Dissipation	P	1.0	W
	F	0.625 (Note)	
Operating Temperature	P	$-30 \sim 75$	$^\circ\text{C}$
	F	$-40 \sim 85$	
Storage Temperature	T_{stg}	$-55 \sim 150$	$^\circ\text{C}$

(Note) On Glass Epoxy PCB ($30 \times 30 \times 1.6\text{mm}$ Cu 50%)**RECOMMENDED OPERATING CONDITIONS** ($T_a = -40 \sim 85^\circ\text{C}$ and $T_a = -30 \sim 75^\circ\text{C}$ for Type-P)

CHARACTERISTIC	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT
Supply Voltage	V_{CC}		3	—	6	V
Output Current	P	I_{OUT}	0	—	180	mA
		DC 1 Circuit $T_{pw} = 25\text{ms}$, Duty = 50%, 4 Circuits	0	—	150	
Input Voltage	V_{IN}		—	—	V_{CC}	V
Clamp Diode Reverse Voltage	V_R		—	—	V_{CC}	V
Clamp Diode Forward Current	I_F		—	—	180	mA
Power Dissipation	P	P_D	—	—	0.44	W
	F	(Note)	—	—	0.325	

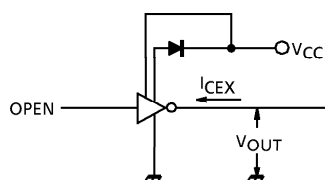
(Note) On Glass Epoxy PCB ($30 \times 30 \times 1.6\text{mm}$ Cu 50%)

ELECTRICAL CHARACTERISTICS (Ta = 25°C)

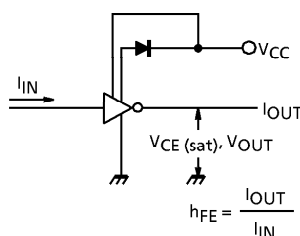
CHARACTERISTIC			SYMBOL	TEST CIR- CUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Output Leakage Current			I _{CEX}	1	V _{CC} = 6V, V _{OUT} = 6V Ta = 50°C	—	—	7	μA
					V _{CC} = 6V, V _{OUT} = 6V Ta = 25°C	—	—	1	
Output Saturation Voltage			V _{CE (sat)}	2	V _{CC} = 5V, I _{IN} = 0.14mA I _{OUT} = 70mA	—	—	0.5	V
					V _{CC} = 5V, I _{IN} = 0.3mA I _{OUT} = 150mA	—	—	0.7	
DC Current Transfer Ratio			h _{FE}	2	V _{CC} = 5V, V _{OUT} = 2V I _{OUT} = 120mA	1000	2000	—	
Input Current	Output On	TD62301P / F	I _{IN (ON)}	3	V _{CC} = 5V, V _{IN} = 2.4V I _{OUT} = 120mA	—	—	0.60	mA
		TD62302P / F				—	—	0.14	
Input Voltage	Output On	TD62301P / F	V _{IN (ON)}	4	V _{CC} = 5V, I _{IN} = 0.2mA I _{OUT} = 120mA	—	—	2.3	V
		TD62302P / F				—	—	4.0	
Clamp Diode Forward Voltage			V _F	5	I _F = 120mA	—	—	2.0	V
Supply Current			I _{CC}	6	I _F = 120mA	—	15	22	mA / Gate
Input Capacitance			C _{IN}	—	V _{IN} = 0, f = 1MHz	—	15	—	pF
Turn-On Delay			t _{ON}	7	V _{CC} = 6V, R _L = 33Ω C _L = 15pF	—	0.1	—	μs
Turn-Off Delay			t _{OFF}			—	0.2	—	μs

TEST CIRCUIT

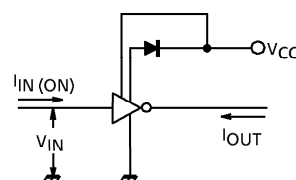
1. I_{CEX}



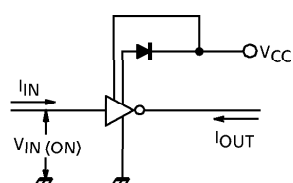
2. h_{FE} , $V_{CE(sat)}$



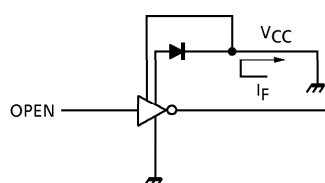
3. $I_{IN(ON)}$



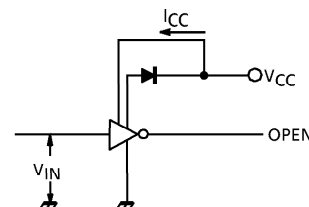
4. $V_{IN(ON)}$



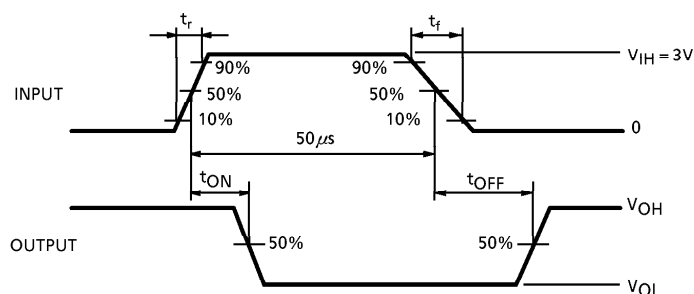
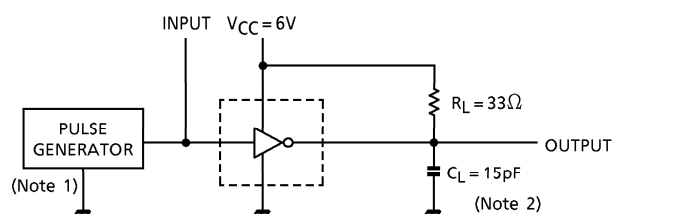
5. V_F



6. I_{CC}



7. t_{ON} , t_{OFF}

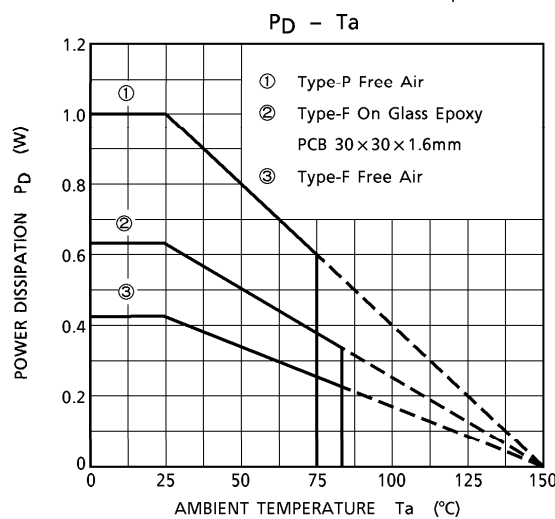
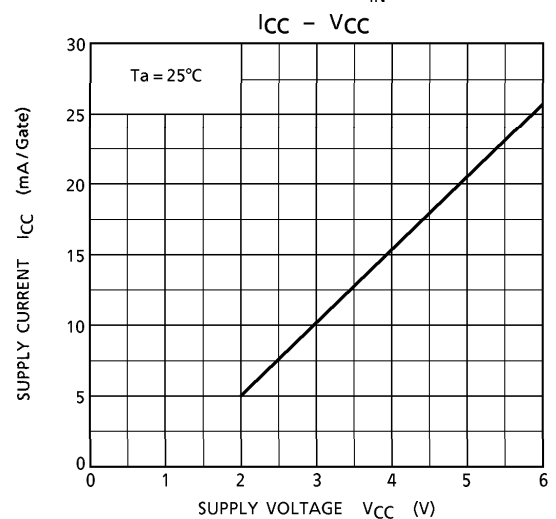
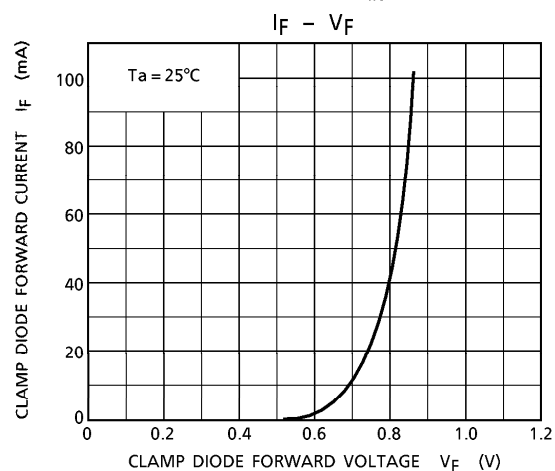
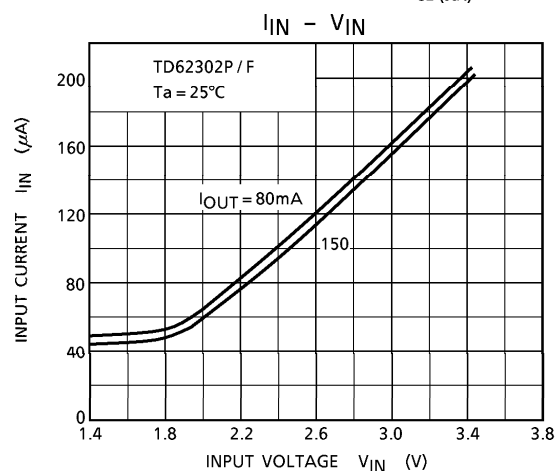
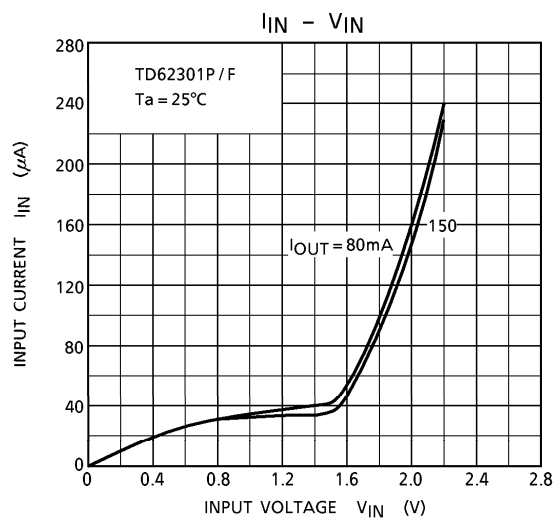
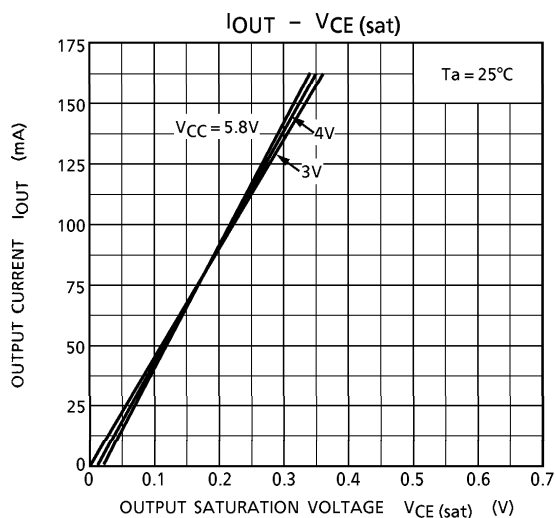


(Note 1) Pulse Width $50\mu s$
Duty Cycle 10%
Output Impedance 50Ω
 $t_r \leq 5ns$, $t_f \leq 10ns$

(Note 2) C_L includes probe and jig capacitance.

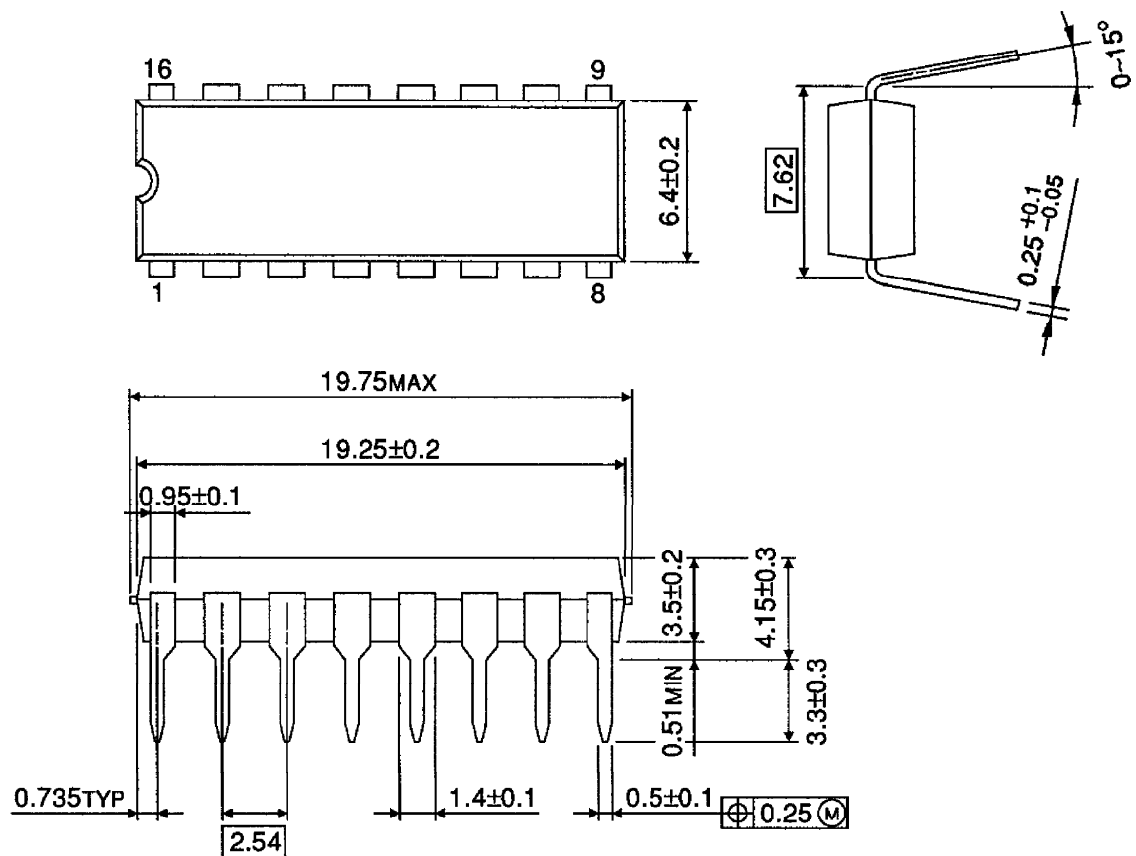
PRECAUTIONS for USING

Utmost care is necessary in the design of the output line, V_{CC} 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

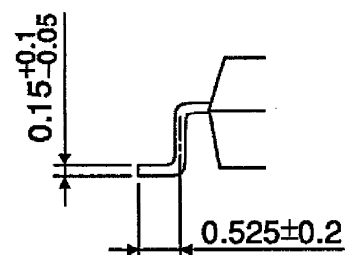
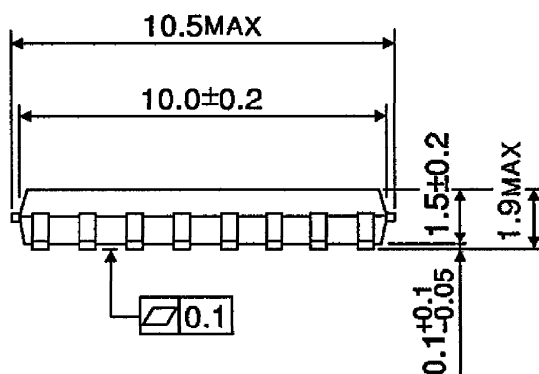
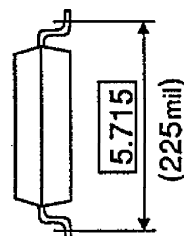
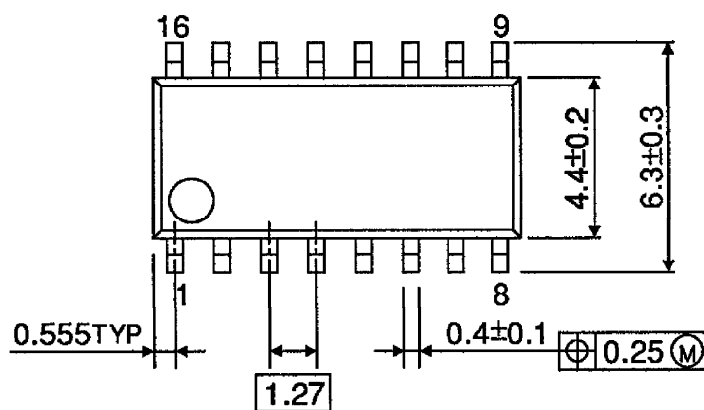
Unit : mm



Weight : 1.11g (Typ.)

OUTLINE DRAWING
SOP16-P-225-1.27

Unit : mm



Weight : 0.16g (Typ.)