

TOSHIBA BIPOLAR DIGITAL INTEGRATED CIRCUIT SILICON MONOLITHIC

# TD62381P, TD62381F

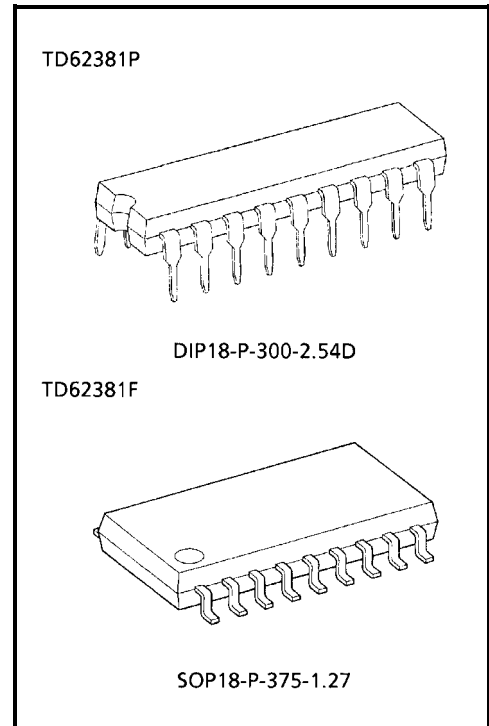
## 8CH LOW SATURATION SINK DRIVER

The TD62381P and TD62381F are comprised of eight NPN low saturation drivers. These devices are specifically designed for multiplexed digit driving of eight digit common-cathode LED and also can be employed as a sink driver for multiplexed LED displays using with the TD62785P and TD62785F at standard supply voltage, 5 V.

Applications include relay, hammer, lamp and LED display drivers.

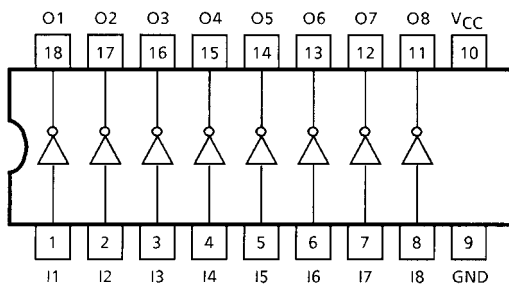
### FEATURES

- Low saturation output voltage:  $V_{CE(sat)} = 0.9\text{ V (Max.)}$   
@ $I_{out} = 500\text{ mA}$
- Output rating 15 V (Min.) / 500 mA (Max.)
- Input compatible with TTL and 5 V CMOS
- Low level active inputs
- Standard supply voltage
- Package type-P : DIP-18 pin
- Package type-F : SOP-18 pin

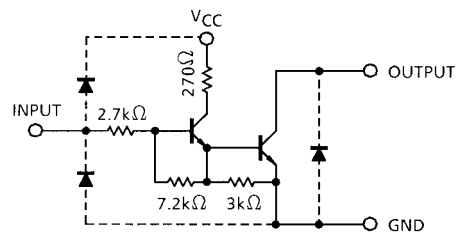


Weight  
 DIP18-P-300-2.54D : 1.47 g (Typ.)  
 SOP18-P-375-1.27 : 0.41 g (Typ.)

### 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 <sub>CC</sub>	7	V
Output Sustaining Voltage	V <sub>CE (SUS)</sub>	15	V
Output Current	I <sub>OUT</sub>	500	mA / ch
Input Voltage	V <sub>IN</sub>	7	V
Input Current	I <sub>IN</sub>	5	mA
Power Dissipation	P	P <sub>D</sub> (Note)	W
	F		
			0.96
Operating Temperature	T <sub>opr</sub>	-40~85	°C
Storage Temperature	T <sub>stg</sub>	-55~150	°C

Note: Delated above 25°C in the proportion of 11.7 mW / °C (P-Type), 7.7 mW / °C (F-Type).

## RECOMMENDED OPERATING CONDITIONS (Ta = -40~85°C)

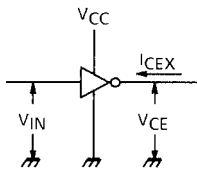
CHARACTERISTIC	SYMBOL	CONDITION	MIN	TYP.	MAX	UNIT			
Supply Voltage	V <sub>CC</sub>	—	4.5	5.0	5.5	V			
Output Voltage	V <sub>OUT</sub>	—	—	—	12	V			
Output Current	P	I <sub>OUT</sub>	DC 1 Circuit, Ta = 25°C	0	—	400	mA / ch		
				F	0	—		400	
	P			T <sub>pw</sub> ≤ 25 ms	Duty = 10%	0		—	400
				8 Circuit On	Duty = 50%	0		—	350
	F			Ta = 85°C	Duty = 10%	0		—	400
T <sub>j</sub> = 120°C		Duty = 50%	0	—	330				
Input Voltage	V <sub>IN</sub>	—	0	—	V <sub>CC</sub>	V			
	Output On	V <sub>IN (ON)</sub>	—	2.4	V <sub>CC</sub>				
	Output Off	V <sub>IN (OFF)</sub>	—	0	0.4				
Power Dissipation	P	P <sub>D</sub>	—	—	0.52	W			
	F		—	—	0.35				

## ELECTRICAL CHARACTERISTICS (Ta = 25°C, V<sub>CC</sub> = 5 V)

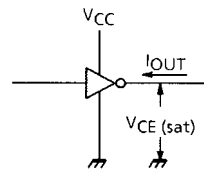
CHARACTERISTIC	SYMBOL	TEST CIR-CUIT	TEST CONDITION	MIN	TYP.	MAX	UNIT
Output Leakage Current	I <sub>CEX</sub>	1	V <sub>IN</sub> = OPEN V <sub>OUT</sub> = 12 V, Ta = 85°C	—	—	100	μA
Output Saturation Voltage	V <sub>CE (sat)</sub>	2	I <sub>OUT</sub> = 500 mA	—	—	0.9	V
			I <sub>OUT</sub> = 350 mA	—	—	0.7	
Input Current	I <sub>IN (ON)</sub>	3	V <sub>CC</sub> = 5 V, V <sub>IN</sub> = 2.4 V	—	0.4	0.7	mA
Input Voltage (Output on)	V <sub>IN (ON)</sub>	—	V <sub>CC</sub> = 5 V	—	—	2.4	V
Supply Current	I <sub>CC</sub>	4	V <sub>CC</sub> = V <sub>IN</sub> = 5 V	—	—	17	mA / ch
Turn-On Delay	t <sub>ON</sub>	5	V <sub>OUT</sub> = 10 V, R <sub>L</sub> = 20 Ω C <sub>L</sub> = 15 pF	—	0.1	—	μs
Turn-Off Delay	t <sub>OFF</sub>			—	1.2	—	μs

**TEST CIRCUIT**

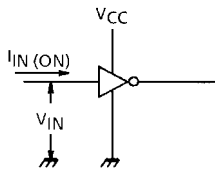
**1.  $I_{CEX}$**



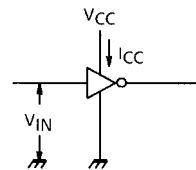
**2.  $V_{CE(sat)}$**



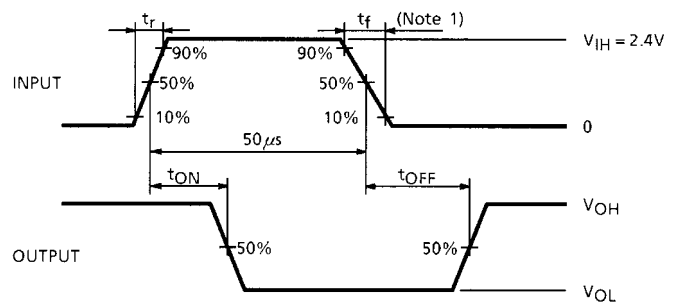
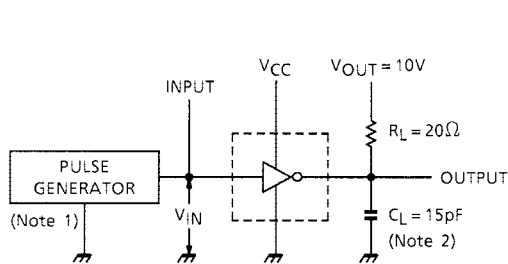
**3.  $I_{IN(ON)}$**



**4.  $I_{CC}$**



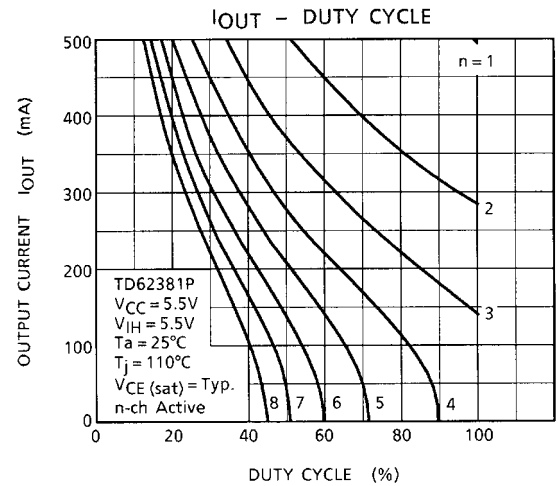
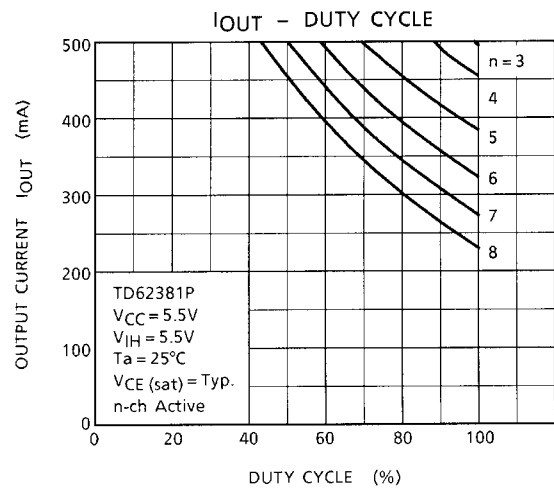
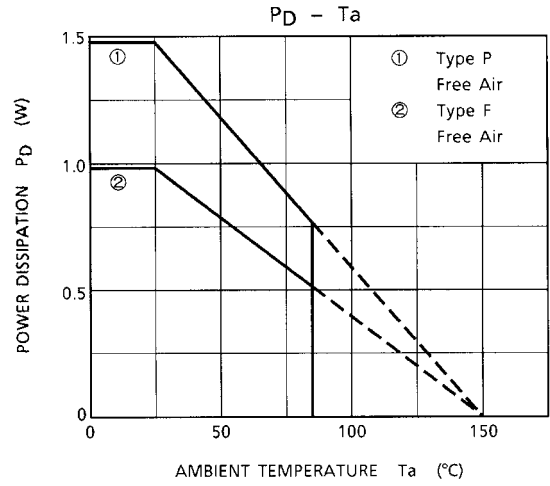
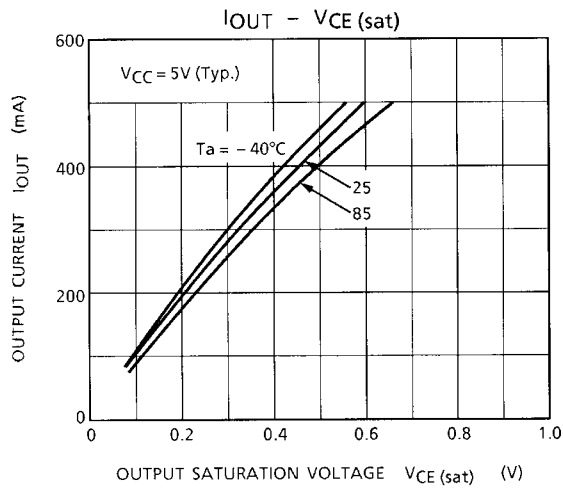
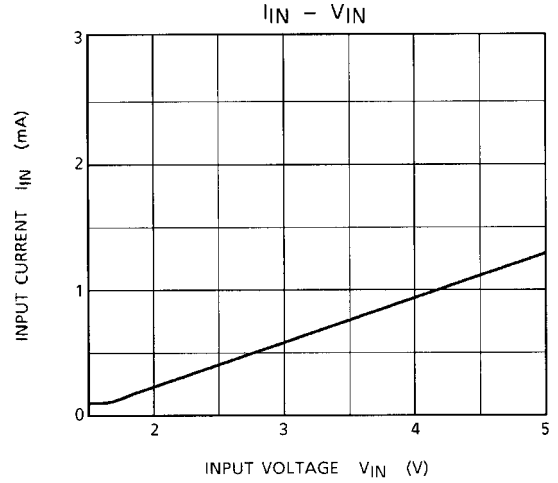
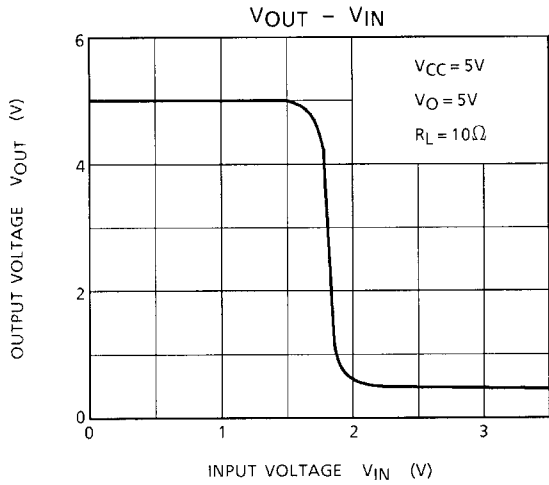
**5.  $t_{ON}, t_{OFF}$**

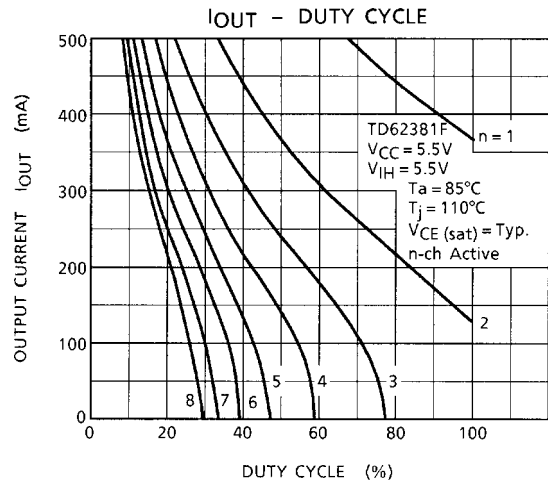
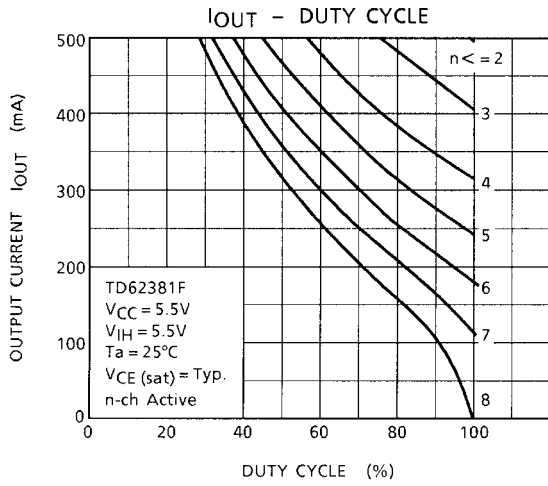


Note 1: Pulse Width 50  $\mu$ s, Duty Cycle 10%  
 Output Impedance 50  $\Omega$ ,  $t_r \leq 5$  ns,  $t_f \leq 10$  ns  
 Note 2:  $C_L$  includes probe and jig capacitance.

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

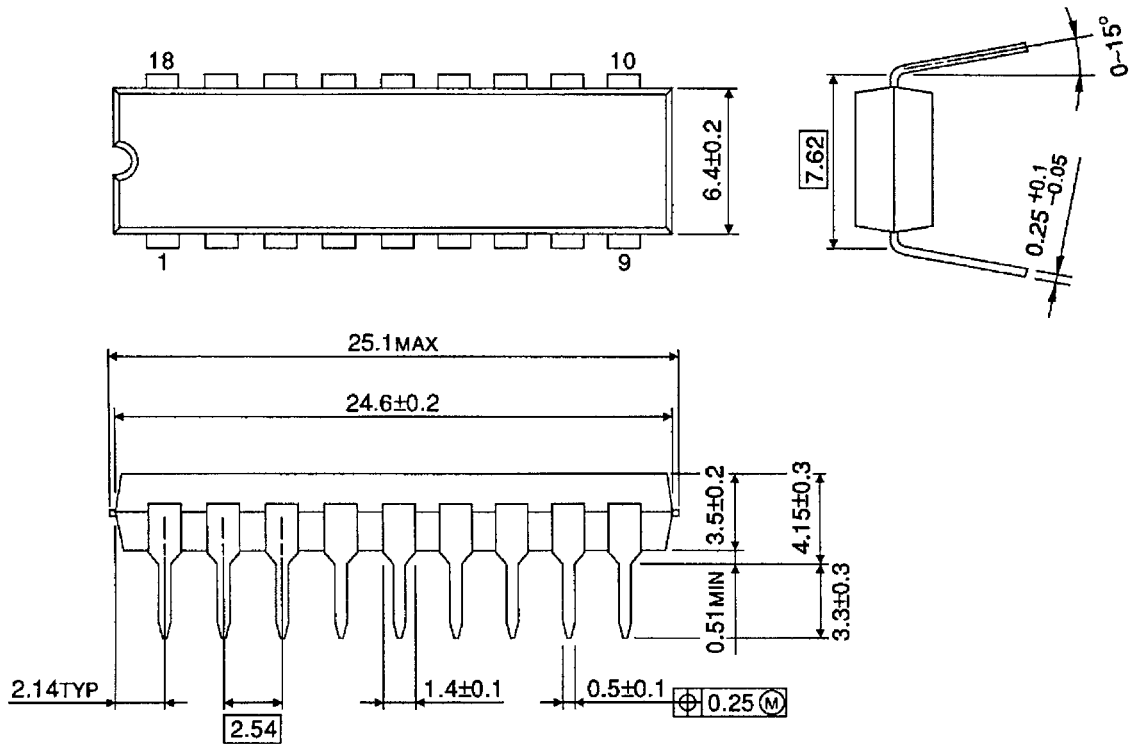




**PACKAGE DIMENSIONS**

DIP18-P-300-2.54D

Unit: mm

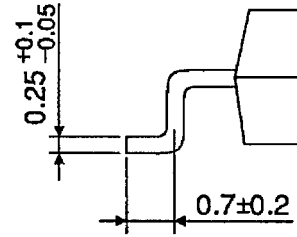
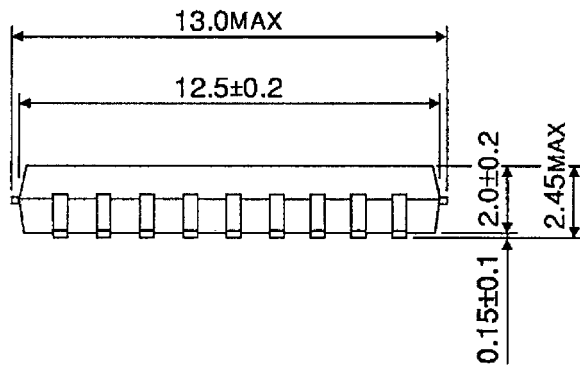
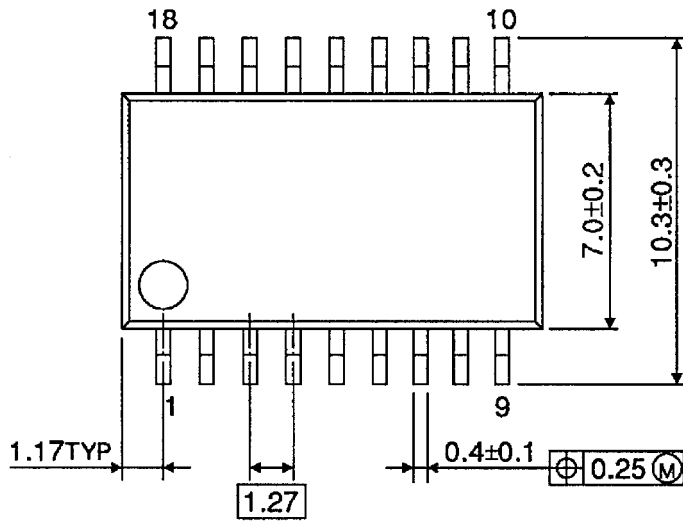


Weight: 1.47 g (Typ.)

## PACKAGE DIMENSIONS

SOP18-P-375-1.27

Unit: mm



Weight: 0.41 g (Typ.)

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000707EBA

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