

TOSHIBA BIPOLAR DIGITAL INTEGRATED CIRCUIT SILICON MONOLITHIC

TD62381PG,TD62381FG

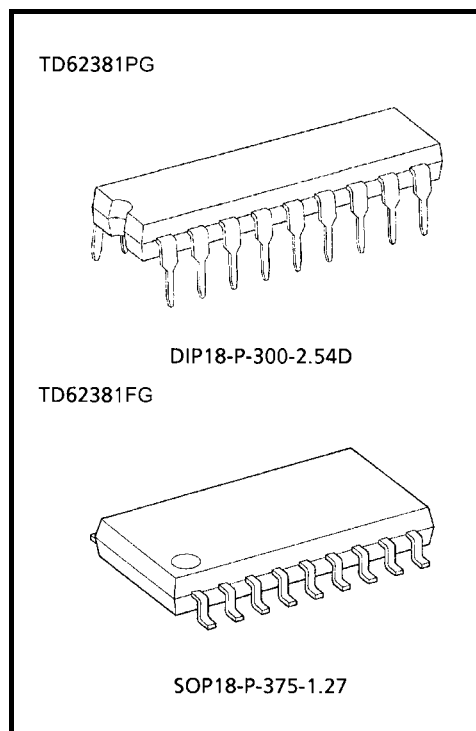
8CH LOW SATURATION SINK DRIVER

The TD62381PG and TD62381FG 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-PG: DIP-18 pin
- Package type-FG: SOP-18 pin

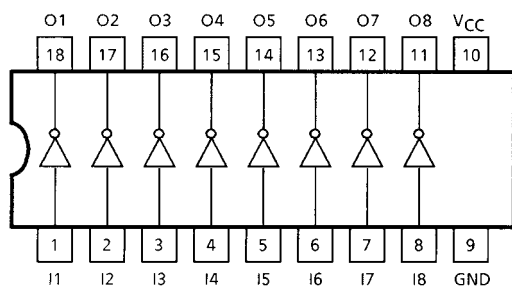


Weight

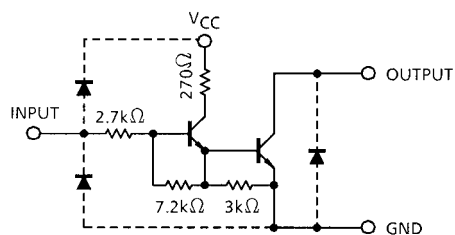
DIP18-P-300-2.54D: 1.47 g (Typ.)

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 _{CC}	7	V
Output Sustaining Voltage		V _{CE (SUS)}	15	V
Output Current		I _{OUT}	500	mA / ch
Input Voltage		V _{IN}	7	V
Input Current		I _{IN}	5	mA
Power Dissipation	PG	P _D (Note)	1.47	W
	FG		0.96	
Operating Temperature		T _{opr}	−40~85	°C
Storage Temperature		T _{stg}	−55~150	°C

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

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

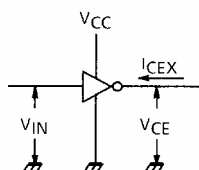
CHARACTERISTIC		SYMBOL	CONDITION		MIN	TYP.	MAX	UNIT	
Supply Voltage		V _{CC}	—		4.5	5.0	5.5	V	
Output Voltage		V _{OUT}	—		—	—	12	V	
Output Current	PG	I _{OUT}	DC 1 Circuit, Ta = 25°C		0	—	400	mA / ch	
	FG				0	—	400		
	PG		T _{pw} ≤ 25 ms 8 Circuit On	Duty = 10%	0	—	400		
				Duty = 50%	0	—	350		
	FG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

ELECTRICAL CHARACTERISTICS (Ta = 25°C, V_{CC} = 5 V)

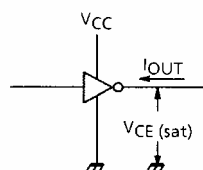
CHARACTERISTIC	SYMBOL	TEST CIR-CUIT	TEST CONDITION	MIN	TYP.	MAX	UNIT
Output Leakage Current	I _{CEX}	1	V _{IN} = OPEN V _{OUT} = 12 V, Ta = 85°C	—	—	100	μA
Output Saturation Voltage	V _{CE (sat)}	2	I _{OUT} = 500 mA	—	—	0.9	V
			I _{OUT} = 350 mA	—	—	0.7	
Input Current	I _{IN (ON)}	3	V _{CC} = 5 V, V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

TEST CIRCUIT

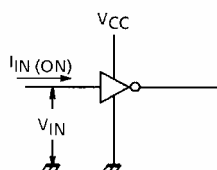
1. I_{CEX}



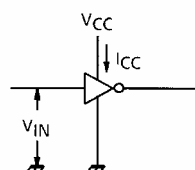
2. $V_{CE(sat)}$



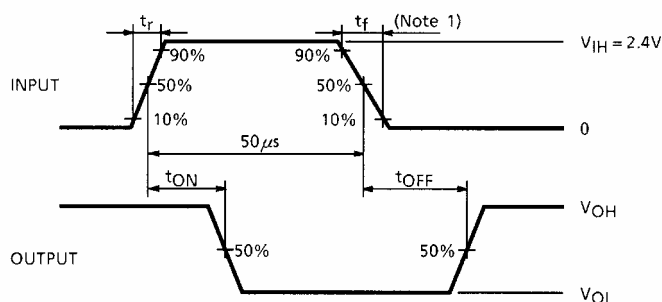
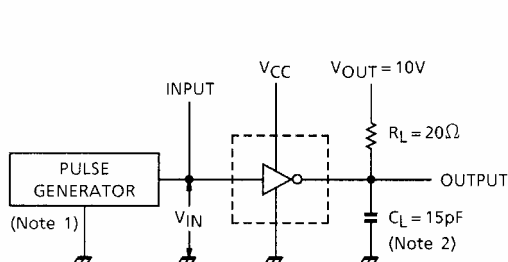
3. $I_{IN(ON)}$



4. I_{CC}



5. t_{ON}, t_{OFF}



Note 1: Pulse Width 50 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.

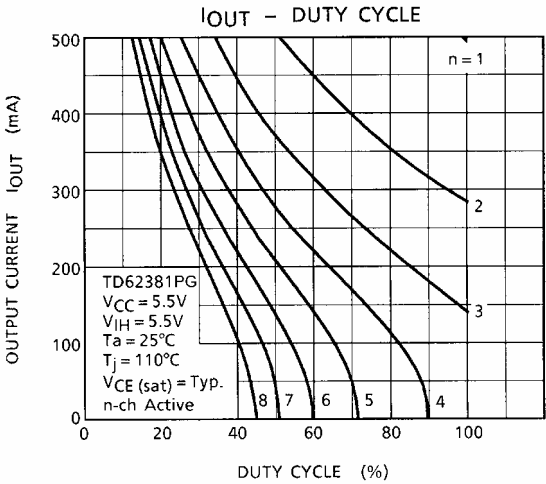
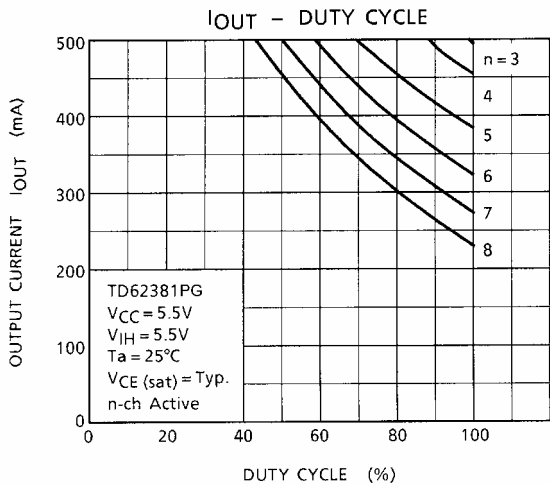
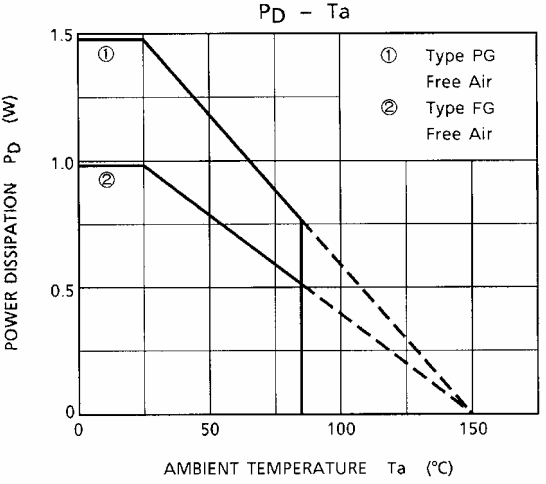
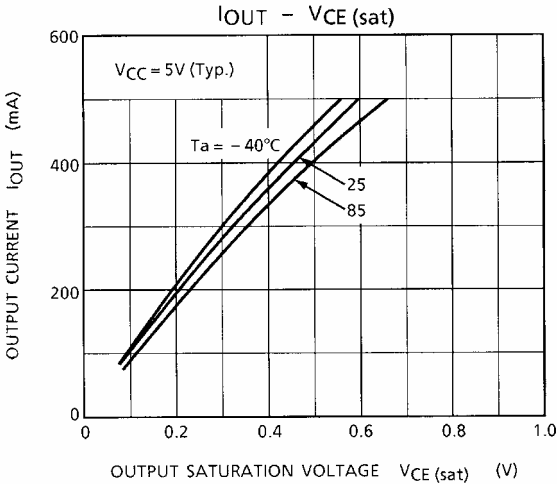
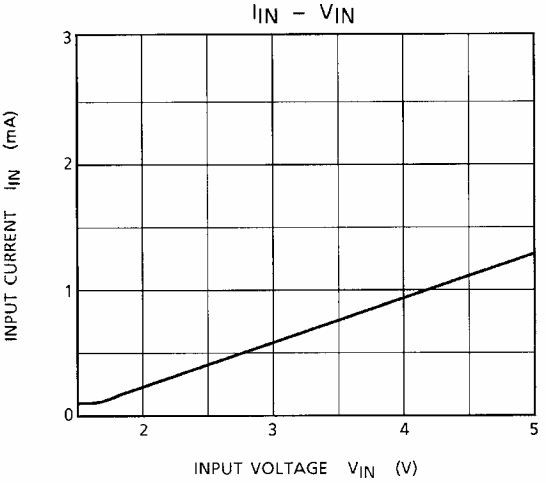
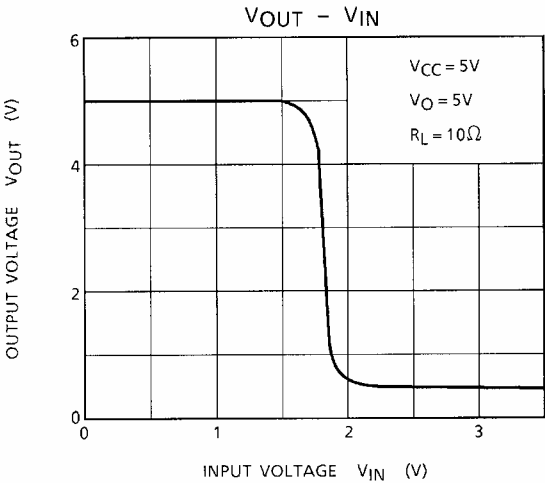
PRECAUTIONS for USING

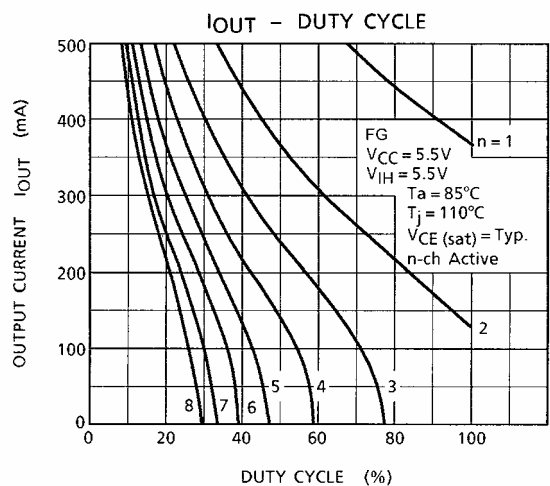
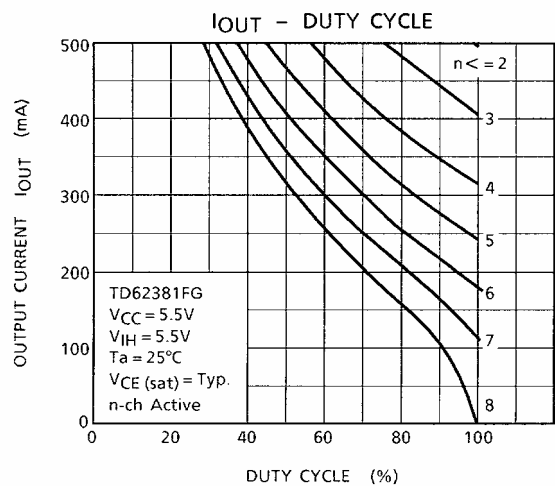
This IC does not include built-in protection circuits for excess current or overvoltage.

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





DIP18-P-300-2.54D

The drawing includes three views of the connector:

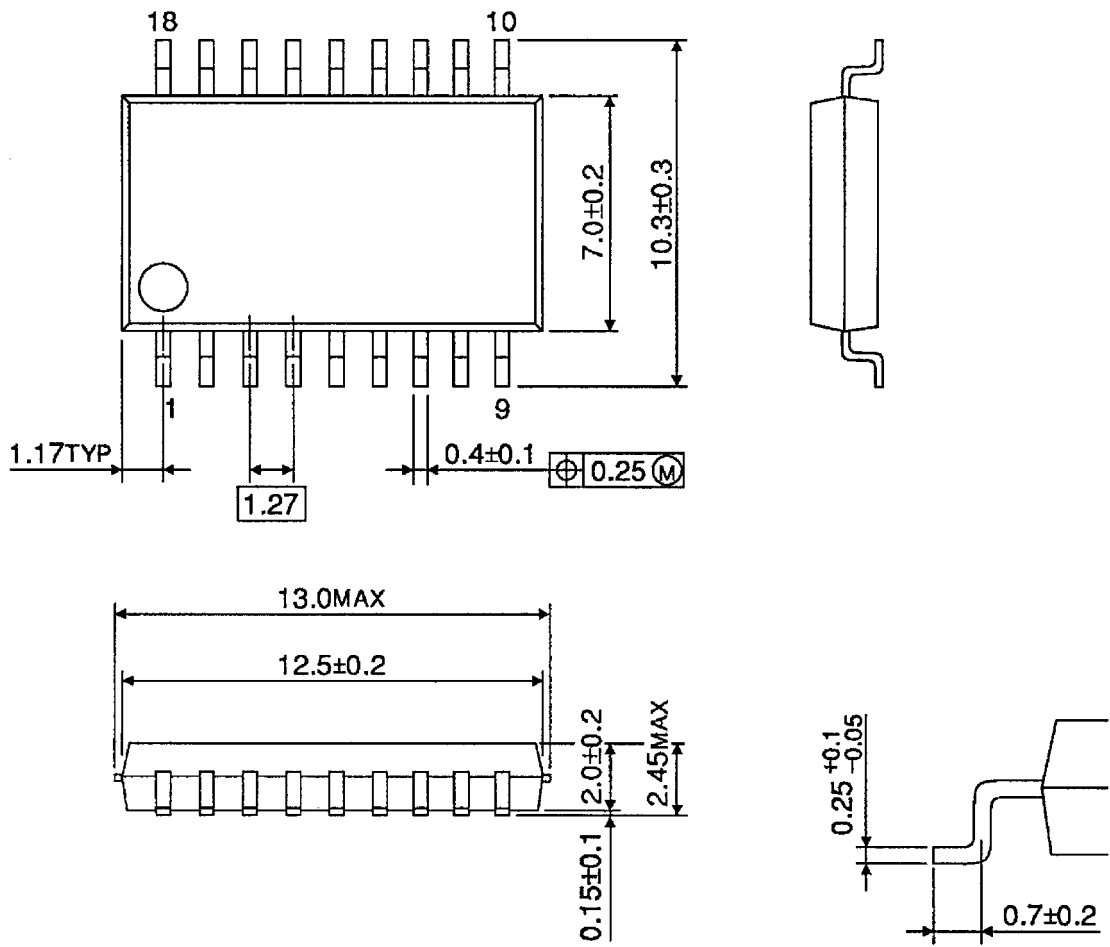
- Top View:** Shows a rectangular connector with 24 pins. Pin 1 is at the bottom left, and pin 18 is at the top left. Pin 9 is at the bottom right, and pin 10 is at the top right. The width is 6.4 ± 0.2 .
- Side View:** Shows the profile of the connector. The height is 7.62 . The pins are angled at $0 \sim 15^\circ$. The pin thickness is 0.25 ± 0.1 with a tolerance of -0.05 .
- Pin Detail View:** Shows the dimensions of the pins. The total length is 25.1 MAX . The length of the main body is 24.6 ± 0.2 . The pin height is 3.5 ± 0.2 . The distance from the base to the top of the pin is 4.15 ± 0.3 . The minimum pin height is 0.51 MIN . The distance from the base to the bottom of the pin is 3.3 ± 0.3 . The pin pitch is 2.54 . The distance between the first and second pins is 2.14 TYP . The distance between the last two pins is 1.4 ± 0.1 . The distance between the last pin and the edge is 0.5 ± 0.1 . The hole diameter is $\phi 0.25 \text{ (M)}$.

Weight: 1.47 g (Typ.)

PACKAGE DIMENSIONS

SOP18-P-375-1.27

Unit: mm



Weight: 0.41 g (Typ.)

About solderability, following conditions were confirmed

- Solderability

- (1) Use of Sn-63Pb 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

030619EBA

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