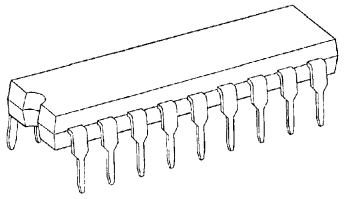
TOSHIBA BIPOLAR DIGITAL INTEGRATED CIRCUIT SILICON MONOLITHIC

TD62785PG,TD62785FG

8CH SOURCE DRIVER

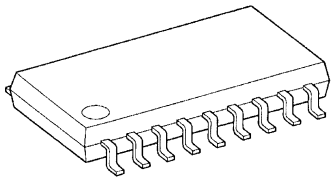
The TD62785PG, TD62785FG are eight Channel Non−Inverting Source current transistor Array.
All units feature input pull−up resistors and output pull−down resistors. These device are specifically designed for multiplexed digit driving of eight digit common−anode LED and also can be employed as a source drivers for multiplexed LED displays using with the TD62381PG, TD62381FG at standard supply voltage, 5 V.
Applications include relay, hammer and lamp drivers.
This devices are a product for the Pb free(Sn-Ag).

TD62785PG



DIP18-P-300-2.54D

TD62785FG



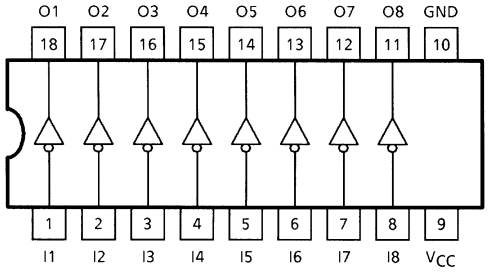
SOP18-P-375-1.27

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

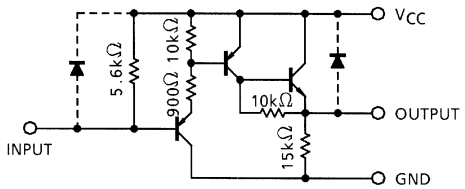
FEATURES

- Low saturation voltage $V_{CE\ (sat)}$ = 1.35 V MAX. @I_{OUT} = −500 mA
- Output current (single output) I_{OUT} = −500 mA MIN.
- Input pull−up resistor R_{IN} = 5.6 kΩ Typ.
- Output pull−down resistor R_{IN} = 15 kΩ Typ.
- Low level active inputs
- Package Type−PG : DIP−18 pin
- Package Type−FG : SOP−18 pin

PIN CONNECTION (TOP VIEW)



SCHEMATICS (EACH DRIVER)



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

MAXIMUM RATING (Ta = 25°C)

CHARACTERISTIC		SYMBOL	RATING	UNIT
Supply Voltage		V_{CC}	7.0	V
Output Voltage		V_{OUT}	V_{CC}	V
Output Current		I_{OUT}	−500	mA / ch
Input Voltage		V_{IN}	V_{CC}	V
Input Current		I_{IN}	−10	mA
Power Dissipation	PG	P_D (Note 1)	1.47	W
	FG		0.96	
Operating Temperature		T_{opr}	−40~85	°C
Storage Temperature		T_{stg}	−55~150	°C

Note 1: 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)

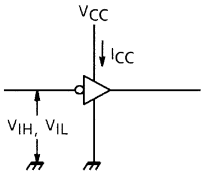
CHARACTERISTIC		SYMBOL	TEST CONDITION		MIN	TYP.	MAX	UNIT
Supply Voltage		V_{CC}	—		4.5	5.0	5.5	V
Output Voltage		V_{OUT}	—		0	—	$-V_{CC}$	V
Output Current	PG	I_{OUT}	DC 1 Circuit, Ta = 25°C		0	—	−400	mA / ch
	FG				0	—	−400	
	PG		T_{pw} ≤ 25 ms 8 Circuits On T_a = 85°C T_j = 120°C	Duty = 10%	0	—	−376	
				Duty = 50%	0	—	−67	
	FG			Duty = 10%	0	—	−248	
				Duty = 50%	0	—	−38	
Input Voltage		V_{IN}	—		0	—	V_{CC}	V
	Output On	$V_{IN\ (ON)}$	—		0	—	0.8	V
	Output Off	$V_{IN\ (OFF)}$	—		V_{CC} −1.0	—	V_{CC}	
Power Dissipation	PG	P_D	—		—	—	0.52	W
	FG		—		—	—	0.35	

ELECTRICAL CHARACTERISTICS (Ta = 25°C)

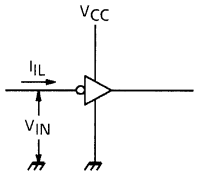
CHARACTERISTIC		SYMBOL	TEST CIR-CUIT	TEST CONDITION		MIN	TYP.	MAX	UNIT
Input Voltage	"H" Level	V_{IH}	1	—		V_{CC} −1.0	—	—	V
	"L" Level	V_{IL}		—		—	—	0.8	
Input Current	"L" Level	I_{IL}	2	V_{CC} = 5.5 V, V_{IN} = 0.8 V		—	−1.5	−2.3	mA
Input Pull−Up Resistor		R_{IP}	—	—		—	5.6	—	kΩ
Output Pull−Down Resistor		R_{OP}	—	—		—	15	—	kΩ
Output Voltage	"H" Level	V_{OH}	3	V_{CC} = 0 V GND = −4.5 V V_{IN} = GND	I_{OUT} = 500 mA	—	—	V_{CC} −1.35	V
					I_{OUT} = 500 mA	—	—	V_{CC} −1.30	
Supply Current		$I_{CC\ (ON)}$	1	V_{CC} = 55 V, V_{IN} = GND		—	—	12.5	mA / ch
		$I_{CC\ (OFF)}$		V_{CC} = 55 V, V_{IN} = OPEN		—	—	10	μA
Turn−On Delay		t_{ON}	4	V_{CC} = 5 V, R_L = 16 Ω C_L = 15 pF		—	0.1	—	μs
Turn−Off Delay		t_{OFF}				—	3.5	—	μs

TEST CIRCUIT

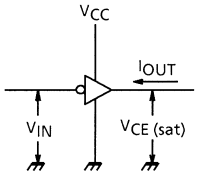
1. V_{IH}, V_{IL}, I_{CC}



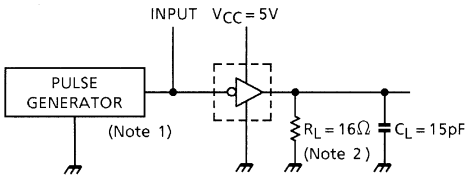
2. I_{IL}

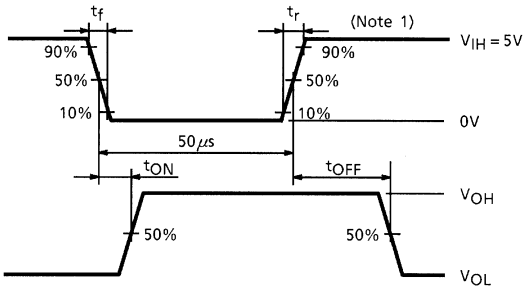


3. $V_{CE\ (sat)}$



4. t_{ON}, t_{OFF}



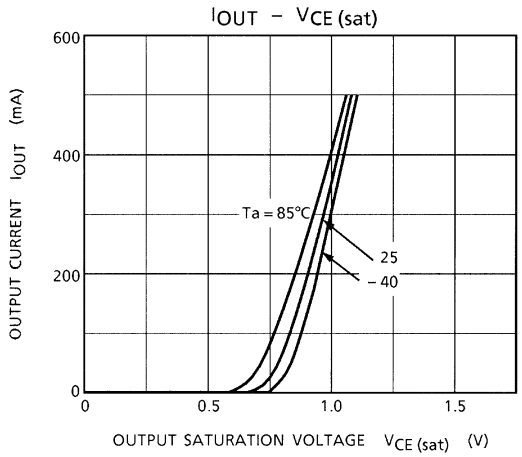


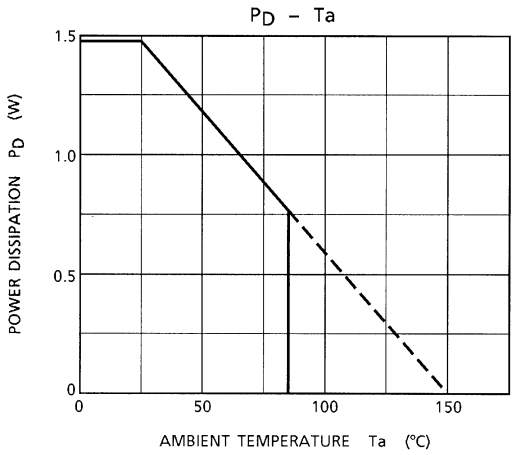
Note 1: Pulse width 50 μs, duty cycle 10%
Output impedance 50 Ω, $t_r \leq 5$ ns, $t_f \leq 10$ ns

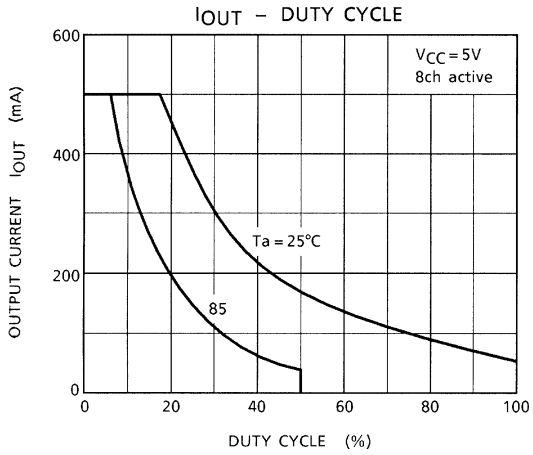
Note 2: C_L includes probe and jig capacitance

PRECAUTIONS for USING

This IC does not integrate protection circuits such as overcurrent and overvoltage protectors.
Thus, if excess current or voltage is applied to the IC, the IC may be damaged. Please design the IC so that excess current or voltage will not be applied to the IC.
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.

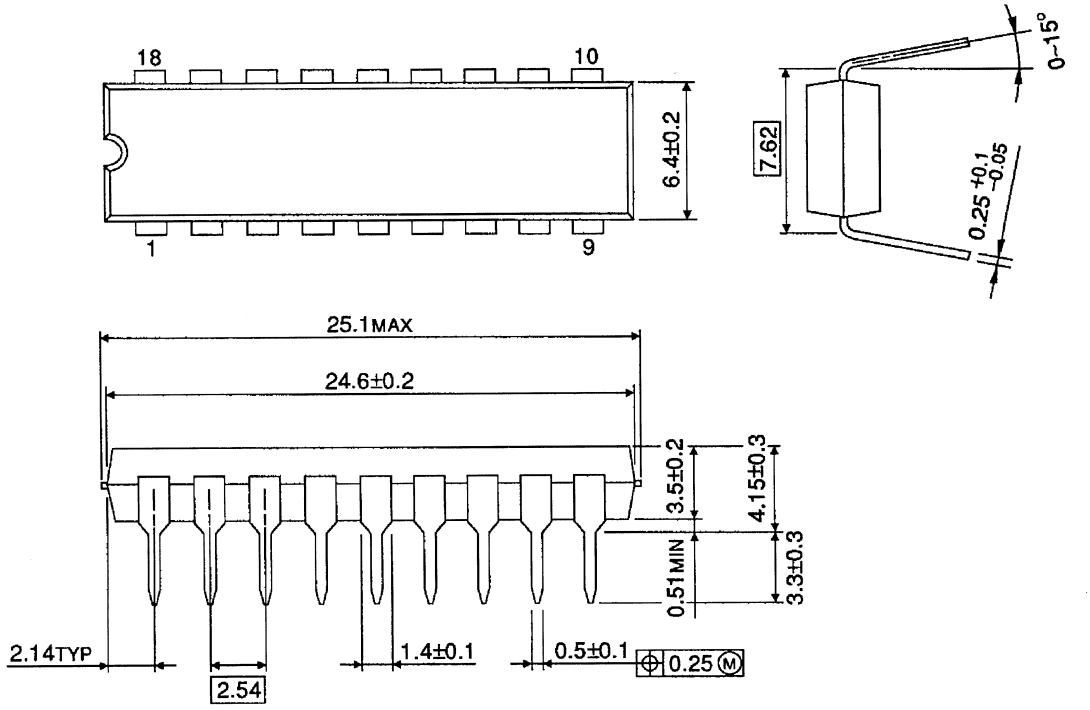

IOUT – VCE (sat)
OUTPUT CURRENT IOUT (mA)
600
400
200
0
Ta = 85°C
25
– 40
0
0.5
1.0
1.5
OUTPUT SATURATION VOLTAGE VCE (sat) (V)


PD – Ta
POWER DISSIPATION PD (W)
1.5
1.0
0.5
0
0
50
100
150
AMBIENT TEMPERATURE Ta (°C)


IOUT – DUTY CYCLE
VCC = 5V
8ch active
OUTPUT CURRENT IOUT (mA)
600
400
200
0
Ta = 25°C
85
0
20
40
60
80
100
DUTY CYCLE (%)

PACKAGE DIMENSIONS

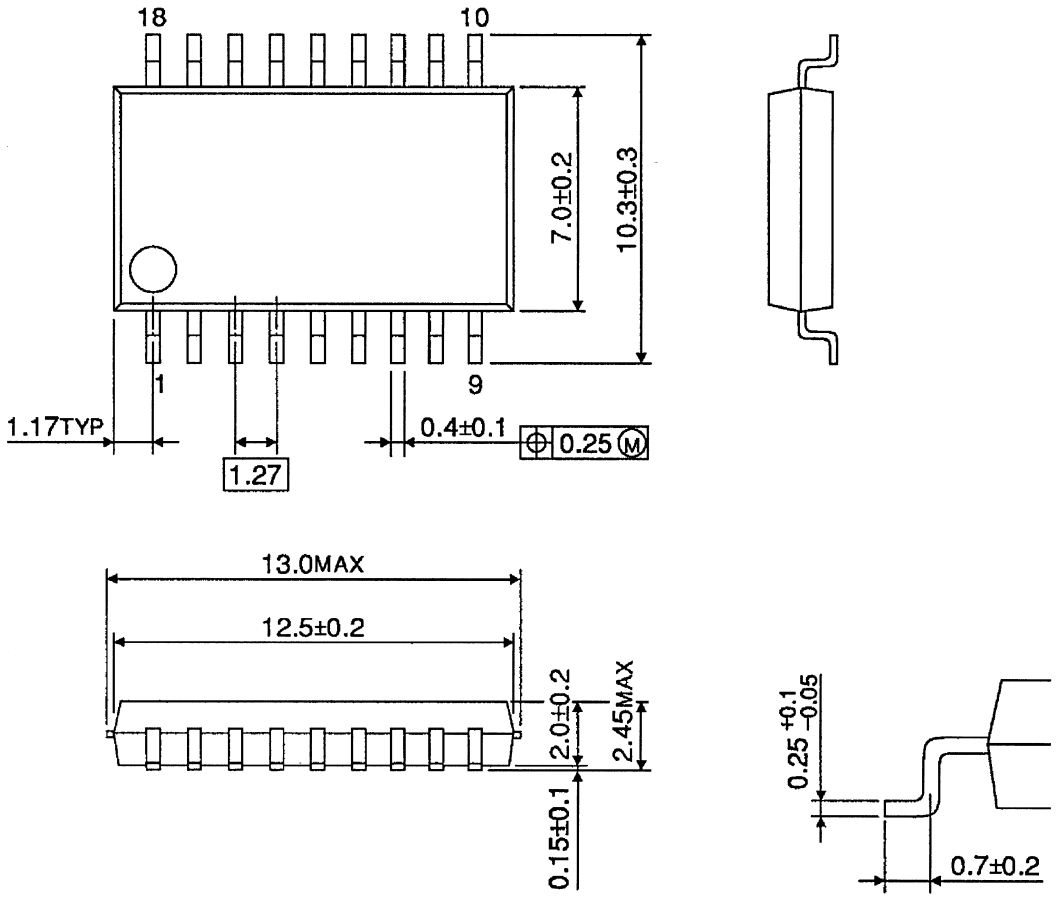
DIP18-P-300-2.54D Unit: mm



Weight: 1.47 g (Typ.)

PACKAGE DIMENSIONS

SOP18−P−375−1.27 Unit: mm



Weight: 0.41 g (Typ.)

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

- The information contained herein is subject to change without notice.
- The information contained herein is presented only as a guide for the applications of our products. No responsibility is assumed by TOSHIBA for any infringements of patents or other rights of the third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of TOSHIBA or others.
- TOSHIBA is continually working to improve the quality and reliability of its products. Nevertheless, semiconductor devices in general can malfunction or fail due to their inherent electrical sensitivity and vulnerability to physical stress. It is the responsibility of the buyer, when utilizing TOSHIBA products, to comply with the standards of safety in making a safe design for the entire system, and to avoid situations in which a malfunction or failure of such TOSHIBA products could cause loss of human life, bodily injury or damage to property.
  In developing your designs, please ensure that TOSHIBA products are used within specified operating ranges as set forth in the most recent TOSHIBA products specifications. Also, please keep in mind the precautions and conditions set forth in the “Handling Guide for Semiconductor Devices,” or “TOSHIBA Semiconductor Reliability Handbook” etc..
- The TOSHIBA products listed in this document are intended for usage in general electronics applications (computer, personal equipment, office equipment, measuring equipment, industrial robotics, domestic appliances, etc.). These TOSHIBA products are neither intended nor warranted for usage in equipment that requires extraordinarily high quality and/or reliability or a malfunction or failure of which may cause loss of human life or bodily injury (“Unintended Usage”). Unintended Usage include atomic energy control instruments, airplane or spaceship instruments, transportation instruments, traffic signal instruments, combustion control instruments, medical instruments, all types of safety devices, etc.. Unintended Usage of TOSHIBA products listed in this document shall be made at the customer’s own risk.
- The products described in this document are subject to the foreign exchange and foreign trade laws.
- TOSHIBA products should not be embedded to the downstream products which are prohibited to be produced and sold, under any law and regulations.