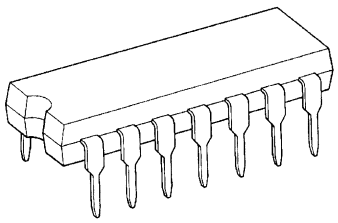
TOSHIBA BIPOLAR DIGITAL INTEGRATED CIRCUIT SILICON MONOLITHIC

TD62703PG, TD62703FG

6CH HIGH VOLTAGE SOURCE DRIVER

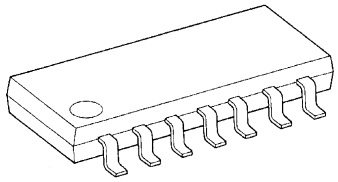
The TD62703PG, TD62703FG is comprised of six source current Transistor Array.
These drivers are specifically designed for fluorescent display applications.
For proper operation, the substrate (SUB) must be connected to the most negative voltage.
This devices are a product for the Pb free(Sn-Ag).

TD62703PG



DIP14-P-300-2.54

TD62703FG



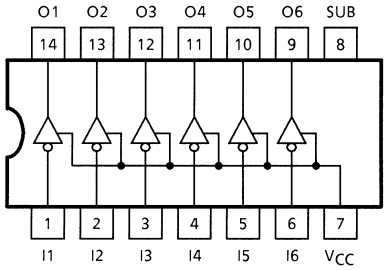
SOP14-P-225-1.27

Weight
DIP14−P−300−2.54 : 1.11 g (Typ.)
SOP14−P−225−1.27 : 0.16 g (Typ.)

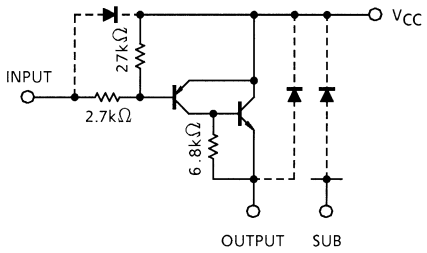
FEATURES

- High output voltage : V_{CC}, V_{OUT} = 60 V (Min)
- Output current (single output) : I_{OUT} = −50 mA (Max)
- Input resistor : R_{IN} = 2.7 kΩ
- Package type−PG : DIP−14 pin
- Package type−FG : SOP−14 pin

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}	V_{CC} − 60	V
Output Sustaining Voltage		V_{OUT}	V_{CC} − 60	V
Input Voltage		V_{IN}	−30~0.5	V
Output Current		I_{OUT}	−50	mA / ch
Input Current		I_{IN}	10	mA
Power Dissipation	PG	P_D (Note 2)	1.0	W
	FG		0.625 (Note 1)	
Operating Temperature		T_{opr}	−40~85	°C
Storage Temperature		T_{stg}	−55~150	°C

Note 1: On Glass Epoxy PCB (50 × 50 ×1.6 mm Cu 50%)
Note 2: Delated above 25°C in the proportion 8.0mW / °C (PG Type), 5.0mW / °C (FG Type).

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

CHARACTERISTIC		SYMBOL	CONDITION	MIN	TYP.	MAX	UNIT
Supply Voltage		V_{SUB}	V_{CC} = 0 V	V_{OUT}	—	−55	V
Output Sustaining Voltage		V_{OUT}		0	—	V_{SUB}	V
Output Current		I_{OUT}		0	—	−40	mA / ch
Input Voltage		V_{IN}		0	—	−7.0	V
Power Dissipation	PG	P_D	—	—	—	0.36	W
	FG		On PCB (Note)	—	—	0.325	

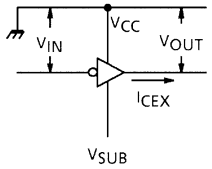
Note: On Glass Epoxy PCB (50 × 50 ×1.6 mm Cu 30%)

ELECTRICAL CHARACTERISTICS (Ta = 25°C)

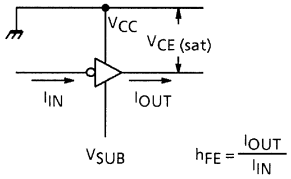
CHARACTERISTIC		SYMBOL	TEST CIR-CUIT	TEST CONDITION	MIN	TYP.	MAX	UNIT
Output Leakage Current		I_{CEX}	1	V_{CC} = 0 V, V_{IN} = 0 V V_{OUT} = −55 V	—	—	−100	μA
Collector−Emitter Saturation Voltage		$V_{CE\ (sat)}$	2	I_{IN} = −1 mA, I_{OUT} = −40 mA	—	—	−2.5	V
DC Current Transfer Ratio		h_{FE}	2	V_{CE} = −5.0 V, I_{OUT} = −40 mA	100	—	—	—
Input Current	Output On	$V_{IN\ (ON)}$	3	V_{CC} = 0 V, V_{IN} = −5.1 V	—	−1.7	−2.4	mA
	Output Off	$V_{IN\ (OFF)}$		—	—	—	10	μA
Input Voltage	Output On	$V_{IN\ (ON)}$	4	V_{CC} = 0 V	−3.0	—	—	V
	Output Off	$V_{IN\ (OFF)}$			—	—	−0.44	
Turn−On Delay	PG	t_{ON}	5	V_{CC} = 0 V, V_{SUB} = V_{OUT} = −55 V R_L = 1.4 kΩ, C_L = 15 pF	—	1	—	μs
	FG				—	0.5	—	
Turn−Off Delay	PG	t_{ON}			—	2	—	μs
	FG				—	1	—	

TEST CIRCUIT

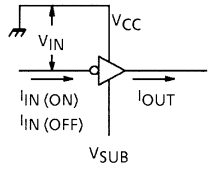
1. I_{CEX}



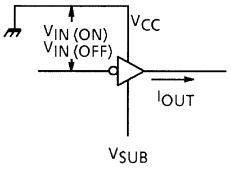
2. $V_{CE\ (sat)}$, h_{FE}



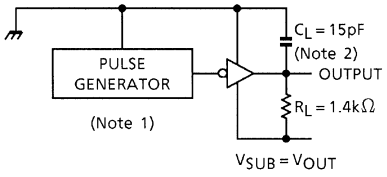
3. $I_{IN\ (ON)}$, $I_{IN\ (OFF)}$

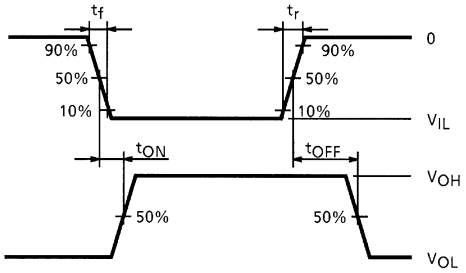


4. $V_{IN\ (ON)}$, $I_{IN\ (OFF)}$



5. t_{ON}, t_{OFF}



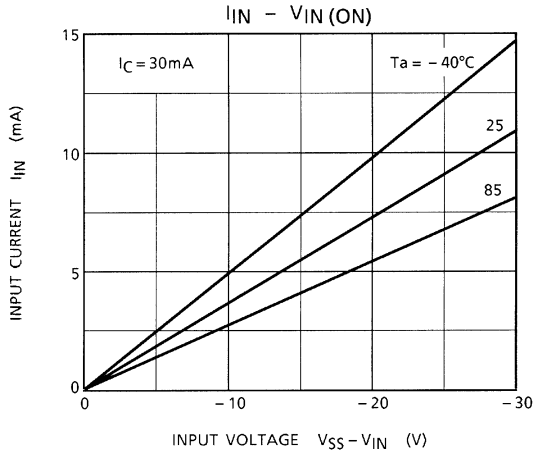


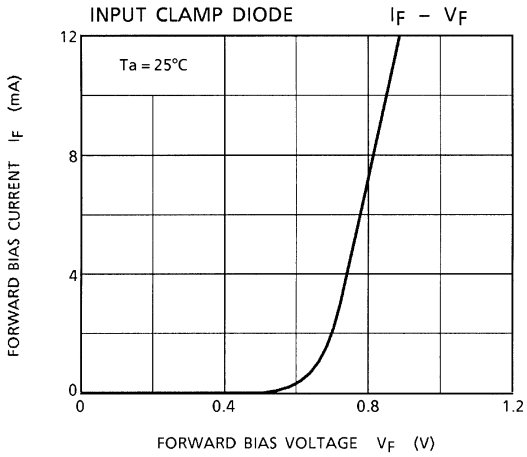
Note 1: Pulse width 50 μs, Duty Cycle 10%
Output Impedance 50 Ω, $t_r \leq 10$ ns, $t_f \leq 5$ ns

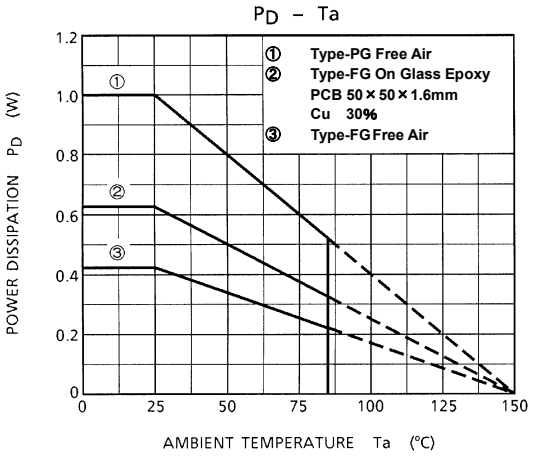
Note 2: C_L includes probe and jig capacitance.

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 (SUB) line since IC may be destroyed due to short−circuit between outputs, air contamination fault, or fault by improper grounding.

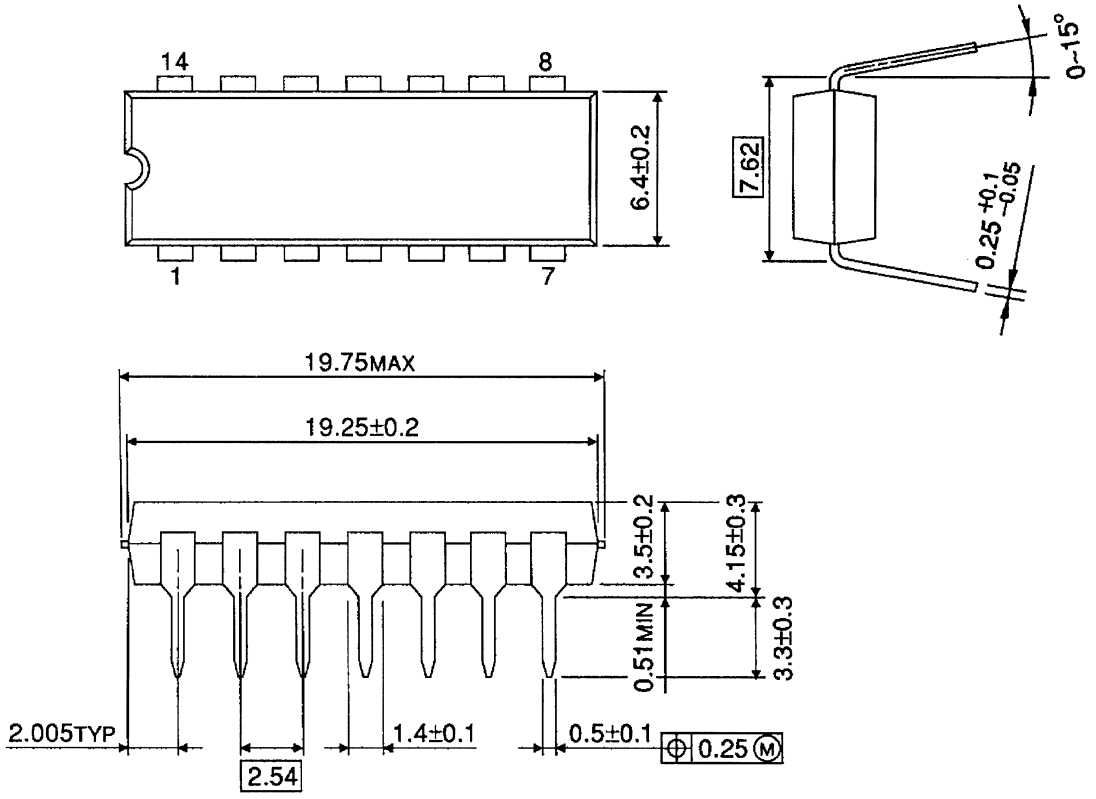

I_{IN} – V_{IN} (ON)
I_C = 30mA
Ta = – 40°C
25
85
INPUT CURRENT I_{IN} (mA)
INPUT VOLTAGE V_{SS} – V_{IN} (V)
0
5
10
15
– 10
– 20
– 30


INPUT CLAMP DIODE
I_F – V_F
Ta = 25°C
FORWARD BIAS CURRENT I_F (mA)
FORWARD BIAS VOLTAGE V_F (V)
0
4
8
12
0.4
0.8
1.2


P_D – Ta
① Type-PG Free Air
② Type-FG On Glass Epoxy
PCB 50 × 50 × 1.6mm
Cu 30%
③ Type-FG Free Air
POWER DISSIPATION P_D (W)
AMBIENT TEMPERATURE Ta (°C)
0
0.2
0.4
0.6
0.8
1.0
1.2
25
50
75
100
125
150

PACKAGE DIMENSIONS

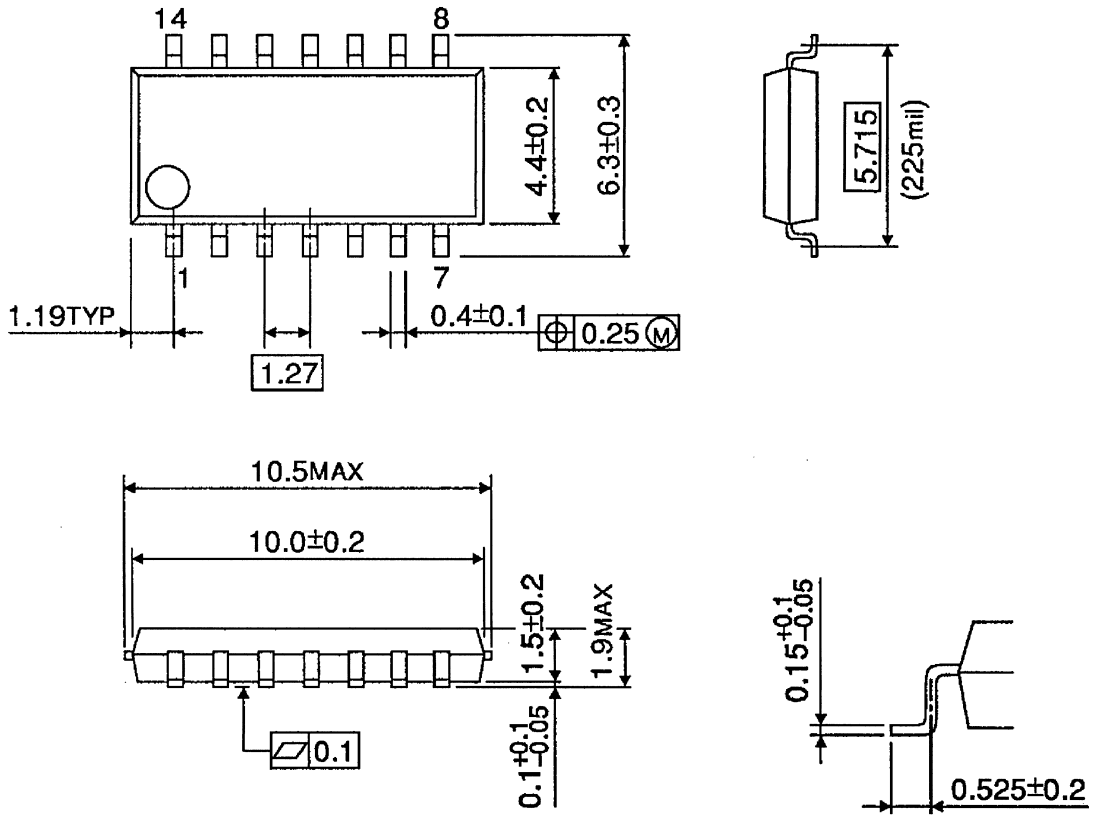
DIP14−P−300−2.54 Unit: mm



Weight: 1.11 g (Typ.)

PACKAGE DIMENSIONS

SOP14−P−225−1.27 Unit: mm



Weight: 0.16 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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