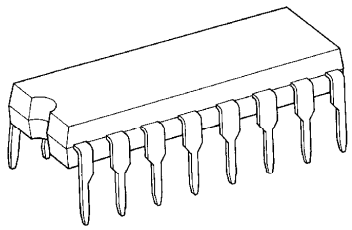
TOSHIBA BIPOLAR DIGITAL INTEGRATED CIRCUIT SILICON MONOLITHIC

TD62303P, TD62303F

6CH DIGIT DRIVER

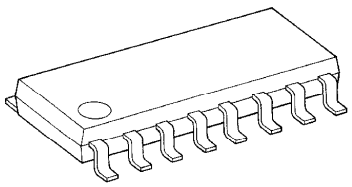
The TD62303P and TD62303F are comprised of six NPN low saturation drivers.
These devices are specifically designed for multiplexed digit driving of six digits common cathode LED displays.
This device is intented for use with TTL and 5V CMOS.

TD62303P



DIP16-P-300-2.54A

TD62303F



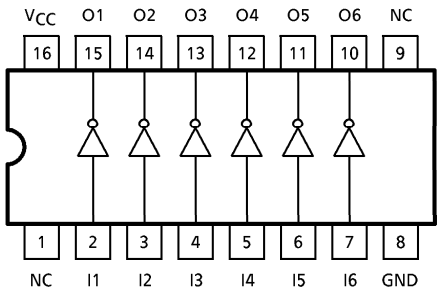
SOP16-P-225-1.27

Weight
DIP16-P-300-2.54A : 1.11g (Typ.)
SOP16-P-225-1.27 : 0.16g (Typ.)

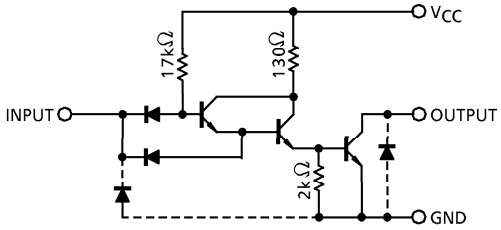
FEATURES

- Low saturation output : $V_{CE\ (sat)}$ = 0.8V (Max.)
- Output rating (single output) 17V (Min.) / 500mA (Max.)
- Input compatible with TTL and 5V CMOS
- Suitable for digit-driver of 6 digit common cathode LED displays.
- Package type-P : DIP-16pin
- Package type-F : SOP-16pin

PIN CONNECTION (TOP VIEW)



SCHEMATICS (EACH DRIVER)



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

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- The products described in this document are subject to foreign exchange and foreign trade control laws.
- The information contained herein is presented only as a guide for the applications of our products. No responsibility is assumed by TOSHIBA CORPORATION for any infringements of intellectual property or other rights of the third parties which may result from its use. No license is granted by implication or otherwise under any intellectual property or other rights of TOSHIBA CORPORATION or others.
- The information contained herein is subject to change without notice.

MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	RATING	UNIT
Supply Voltage		V_{CC}	−0.5~7.0	V
Output Sustaining Voltage		$V_{CE\ (SUS)}$	−0.5~17	V
Output Current		I_{OUT}	500	mA / ch
Input Voltage		V_{IN}	−0.5~V_{CC} + 0.5	V
Input Current		I_{IN}	−10	mA
Power Dissipation	P	P_D	1.0	W
	F		0.625 (Note)	
Operating Temperature	P	T_{opr}	−30~75	°C
	F		−40~85	
Storage Temperature		T_{stg}	−50~150	°C

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

RECOMMENDED OPERATING CONDITIONS (Ta = −30~75°C and Ta = −40~85°C for Type-F)

CHARACTERISTIC		SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT
Supply Voltage		V_{CC}	—	4.5	5.0	5.5	V
Output Sustaining Voltage		$V_{CE\ (SUS)}$	—	0	—	15	V
Output Current		I_{OUT}	DC 1 Circuit	0	—	350	mA / ch
Input Voltage		V_{IN}	—	0	—	V_{CC}	V
Power Dissipation	P	P_D	—	—	—	0.44	W
	F		(Note)	—	—	0.325	

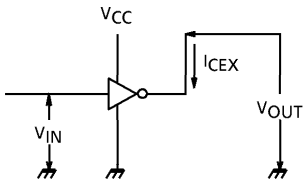
(Note) On Glass Epoxy PCB (30 × 30 × 1.6mm Cu 50%)

ELECTRICAL CHARACTERISTICS (Ta = 25°C)

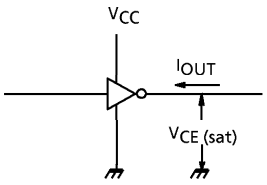
CHARACTERISTIC		SYMBOL	TEST CIR-CUIT	TEST CONDITION		MIN.	TYP.	MAX.	UNIT
Output Leakage Current	P	I_{CEX}	1	V_{CC} = 5.5V, V_{IN} = 0V, V_{OUT} = 15V	Ta = 75°C	—	—	100	μA
	F				Ta = 85°C				
Output Saturation Voltage		$V_{CE\ (sat)}$	2	V_{CC} = 4.5V, I_{OUT} = 150mA		—	0.3	0.4	V
				V_{CC} = 4.5V, I_{OUT} = 350mA		—	0.65	0.8	
Input Current	Output On	$I_{IN\ (ON)}$	3	V_{CC} = 5.5V, V_{IN} = 5.5V		—	—	40	μA
	Output Off	$I_{IN\ (OFF)}$	4	V_{CC} = 5.5V, V_{IN} = 0.4V		—	—	−0.36	mA
Input Voltage	Output On	$V_{IN\ (ON)}$	5	—		—	—	2.0	V
	Output Off	$V_{IN\ (OFF)}$	5	—		0.8	—	—	
Supply Current		I_{CC}	6	V_{CC} = 5.5V, V_{IN} = 5.5V		—	—	47	mA / Gate
Turn-On Delay		t_{ON}	7	V_{CC} = 5.0V, R_L = 37.5Ω, V_{OUT} = 15V, C_L = 15pF		—	0.1	—	μs
Turn-Off Delay		t_{OFF}				—	0.7	—	μs

TEST CIRCUIT

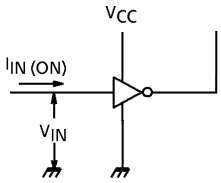
1. I_{CEX}



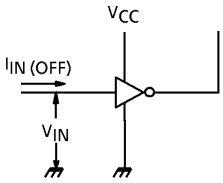
2. $V_{CE\ (sat)}$



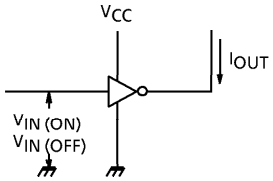
3. $I_{IN\ (ON)}$



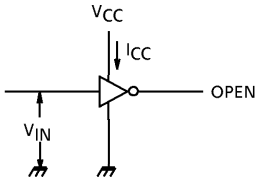
4. $I_{IN\ (OFF)}$



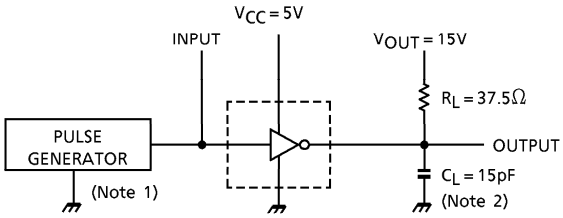
5. $V_{IN\ (ON)}$, $V_{IN\ (OFF)}$

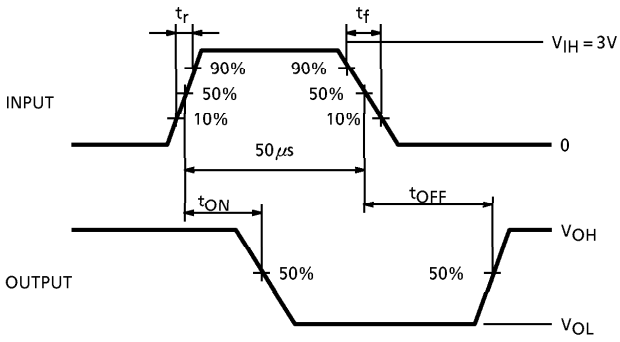


6. I_{CC}



7. t_{ON}, t_{OFF}



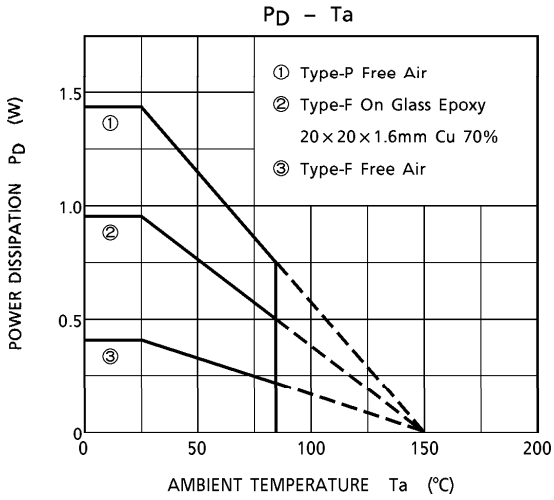


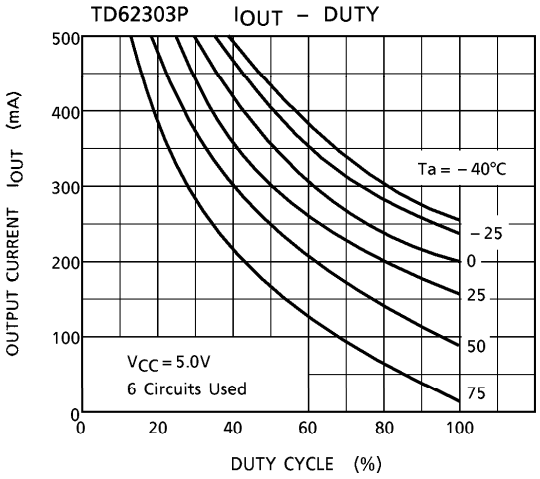
(Note 1) Pulse width 50μs, duty cycle 10%
Output impedance 50Ω, $t_r \leqq$ 5ns, $t_f \leqq$ 10ns

(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.

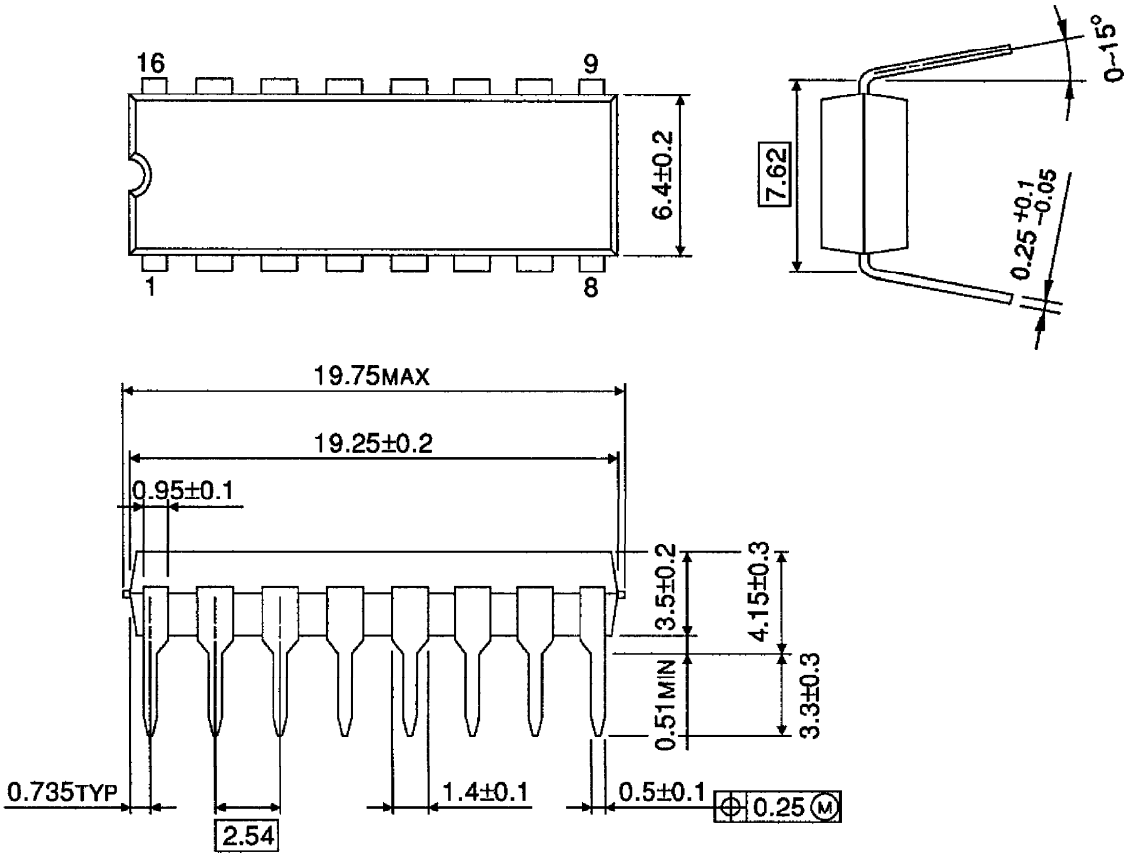

P_D – Ta
① Type-P Free Air
② Type-F On Glass Epoxy
20×20×1.6mm Cu 70%
③ Type-F Free Air
POWER DISSIPATION P_D (W)
1.5
1.0
0.5
0
①
②
③
0
50
100
150
200
AMBIENT TEMPERATURE Ta (°C)


TD62303P I_{OUT} – DUTY
OUTPUT CURRENT I_{OUT} (mA)
500
400
300
200
100
0
Ta = – 40°C
– 25
0
25
50
75
V_{CC} = 5.0V
6 Circuits Used
0
20
40
60
80
100
DUTY CYCLE (%)

OUTLINE DRAWING

DIP16-P-300-2.54A

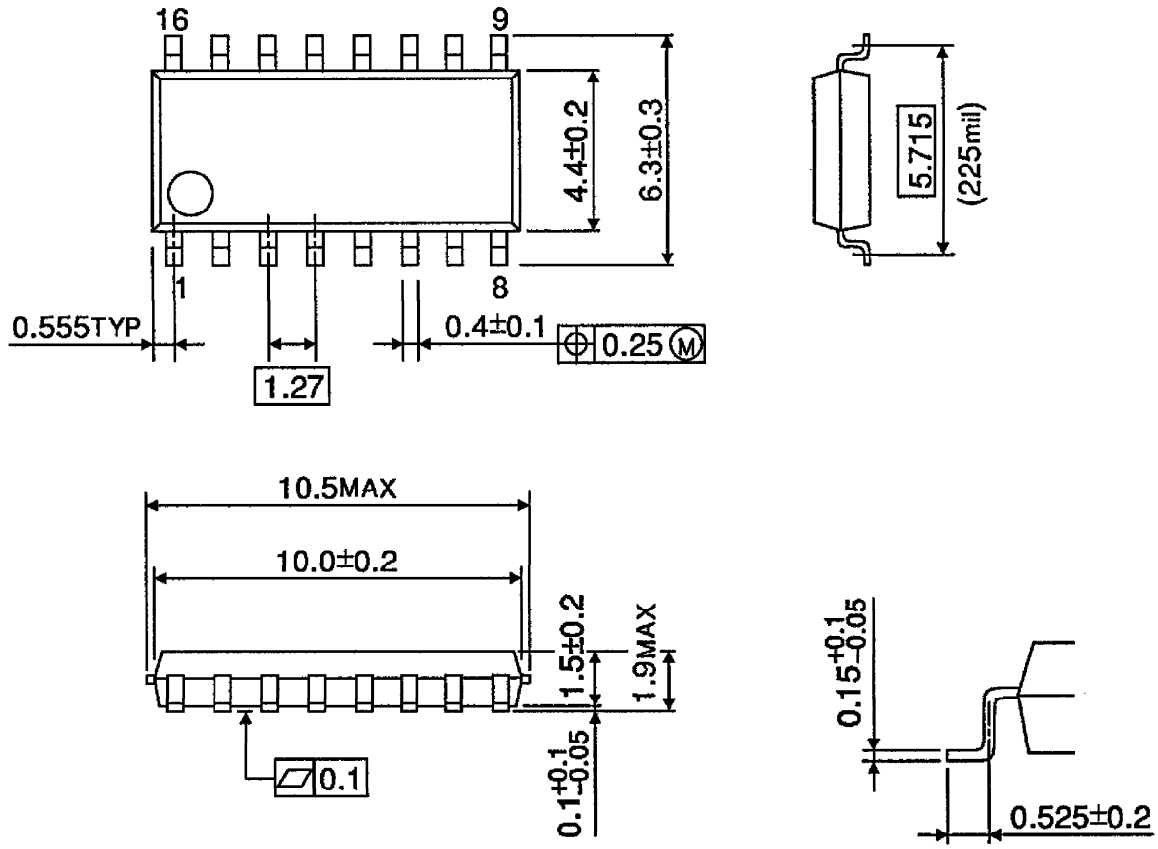
Unit : mm



Weight : 1.11g (Typ.)

OUTLINE DRAWING

SOP16-P-225-1.27 Unit : mm



Weight : 0.16g (Typ.)