

TOSHIBA BIPOLAR DIGITAL INTEGRATED CIRCUIT SILICON MONOLITHIC

**TD62601P, TD62601F, TD62602P, TD62602F
TD62603P, TD62603F, TD62604P, TD62604F**

6CH THRESHOLD FREE DRIVER

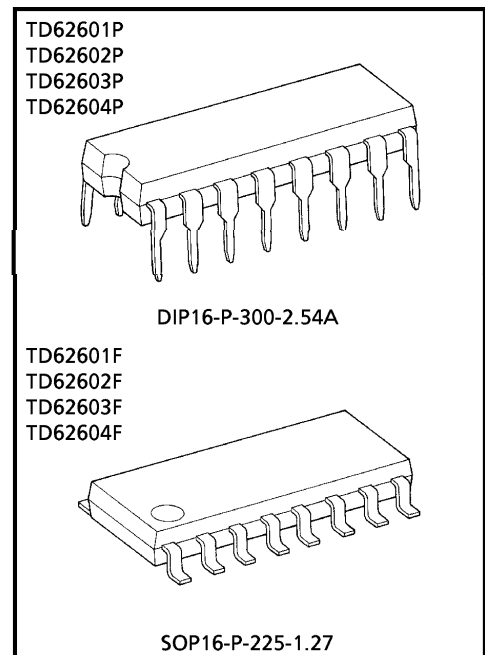
TD62601P, TD62601F INVERTER
TD62602P, TD62602F INVERTER / OPEN COLLECTOR
TD62603P, TD62603F NON-INVERTER
TD62604P, TD62604F NON-INVERTER / OPEN COLLECTOR

The TD62601P, TD62601F series are threshold free drivers which are comprised of six NPN transistor output stages and comparator input stages.

The TD62601P, TD62601F series are pin compatible with CMOS 4049B and 4050B type except V_{ref} terminal.

V_{ref} is set at $1/2 V_{CC}$ with internal resistors and it is change able using external resistors.

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



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

FEATURES

- Wide supply voltage range $V_{CC} = 4 \sim 18V$
- $V_{ref} = 1/2 V_{CC}$ @16 pin is non-connected
- Pin compatible with CMOS logic 4049B, 4050B type
 - TD62601P, TD62601F (4049B type)
 - TD62602P, TD62602F (4049B type open-collector)
 - TD62603P, TD62603F (4050B type)
 - TD62604P, TD62604F (4050B type open-collector)
- Package type-P : DIP-16 pin
- Package type-F : SOP-16 pin

961001EBA2

● TOSHIBA is continually working to improve the quality and the 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 observe standards of safety, and to avoid situations in which a malfunction or failure of a TOSHIBA product 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 products specifications. Also, please keep in mind the precautions and conditions set forth in the TOSHIBA Semiconductor Reliability Handbook.

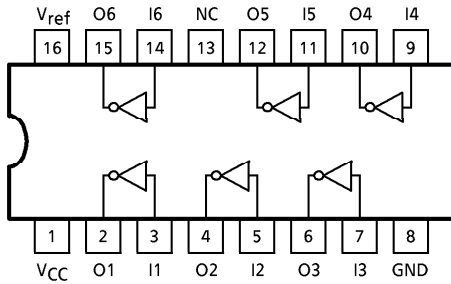
● The products described in this document are subject to foreign exchange and foreign trade control laws.

● 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.

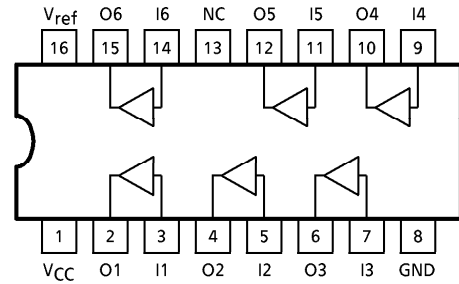
● The information contained herein is subject to change without notice.

PIN CONNECTION (TOP VIEW)

TD62601P, TD62601F, TD62602P, TD62602F

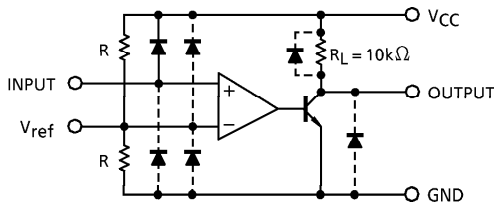


TD62603P, TD62603F, TD62604P, TD62604F



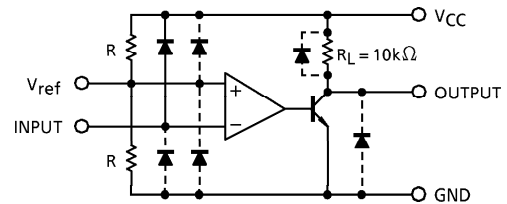
SCHEMATICS (EACH DRIVER)

TD62601P, TD62601F, TD62602P, TD62602F



TD62601P, TD62601F : With R_L
 TD62602P, TD62602F : Without R_L

TD62603P, TD62603F, TD62604P, TD62604F



TD62603P, TD62603F : With R_L
 TD62604P, TD62604F : Without R_L

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

MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Supply Voltage	V_{CC}	20	V
Output Sustaining Voltage	V_{OUT}	-0.5~20	V
Output Current	I_{OUT}	10	mA / ch
Input Voltage	V_{IN}	-0.5~ $V_{CC} + 0.5$	V
Power Dissipation	P F	P_D (Note 2)	1.0
			0.625 (Note 1)
Operating Temperature	T_{opr}	-40~85	°C
Storage Temperature	T_{stg}	-55~150	°C

(Note 1) On PCB (30×30×1.6mm Cu 50%)

(Note 2) Delated above 25°C in the proportion of 8.0mW/°C (P Type), 5.0mW/°C (F Type).

RECOMMENDED OPERATING CONDITIONS ($T_a = -40\sim 85^\circ\text{C}$, $V_{CC} = 0\text{V}$)

CHARACTERISTIC		SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT
Supply Voltage		V_{CC}	—	4.0	—	18	V
Output Sustaining Voltage	62602P, 62602F 62604P, 62604F	V_{OUT}	—	0	—	18	V
Output Current		I_{OUT}	$V_{CC} = 5\text{V}$	0	—	8	mA / ch
Input Voltage		V_{IN}	—	0	—	V_{CC}	V
REF, Input Voltage		V_{ref}	$T_a = 25^\circ\text{C}$	0.4	—	$V_{CC} - 1.6$	V
Power Dissipation	P	P_D	—	—	—	0.36	W
	F		On PCB	—	—	0.325	

ELECTRICAL CHARACTERISTICS ($T_a = 25^\circ\text{C}$)

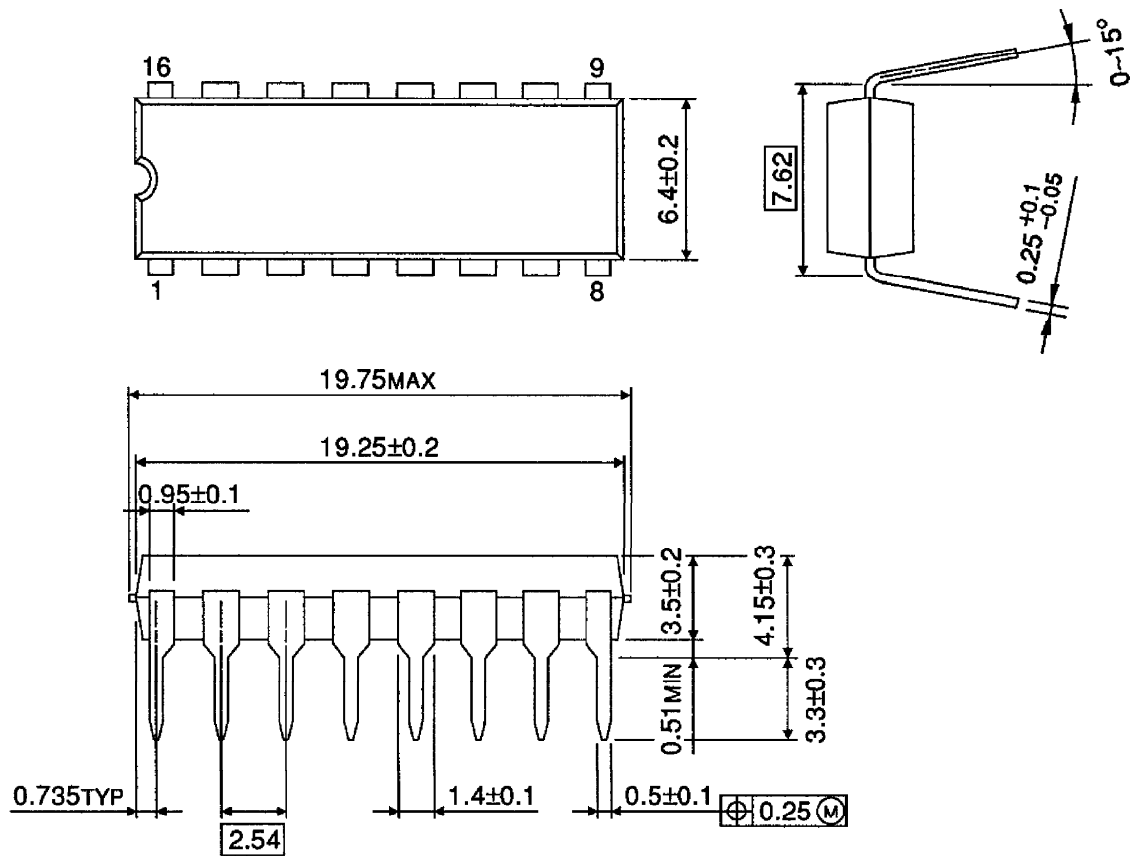
CHARACTERISTIC		SYMBOL	TEST CIRCUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Input Voltage	"H" Level	V_{IH}	—	—	$V_{ref} + 0.1$	—	—	V
	"L" Level	V_{IL}	—	—	—	—	$V_{ref} - 0.1$	
Output Current	"H" Level TD62602P TD62602F TD62604P TD62604F	I_{OH}	—	$V_{CC} = 4.5\text{V}$, $V_O = 18\text{V}$	—	—	10	μA
Output Voltage	"H" Level TD62601P TD62601F TD62603P TD62603F	V_{OH}	—	$V_{CC} = 4.5\text{V}$, $I_O = -10\mu\text{A}$	4.0	—	—	V
	"L" Level	V_{OL}	—	$V_{CC} = 4.5\text{V}$, $I_O = 8\text{mA}$	—	0.1	0.4	
Input Current	"H" Level	I_{IH}	—	—	—	—	2	μA
	"L" Level	I_{IL}	—	—	—	-0.2	-1.5	
V_{ref} Terminal Voltage		$V_{ref}(\text{OUT})$	—	—	$1/2 V_{CC} - 0.1$	—	$1/2 V_{CC} + 0.1$	V
V_{ref} Resistor		R_{ref}	—	—	3.5	5	6.5	k Ω
Supply Current		I_{CC}	—	—	—	—	12	mA
	TD62601P TD62601F TD62603P TD62603F	I_{CCL}	—	—	—	—	27	
Turn-On Delay		t_{ON}	—	$V_{CC} = 5\text{V}$, $V_{OUT} = 18\text{V}$ $R_L = 2\text{k}\Omega$	—	0.5	—	μs
Turn-Off Delay		t_{OFF}	—		—	0.2	—	

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.

OUTLINE DRAWING
DIP16-P-300-2.54A

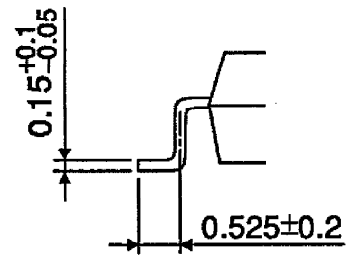
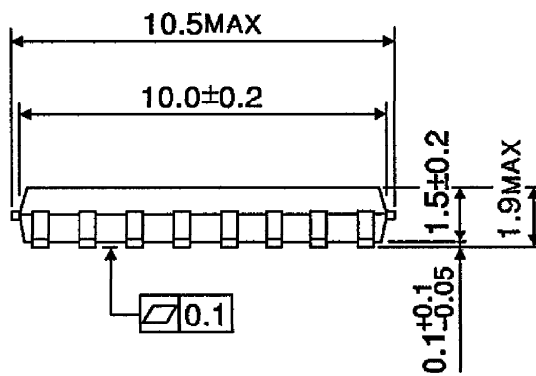
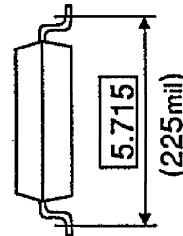
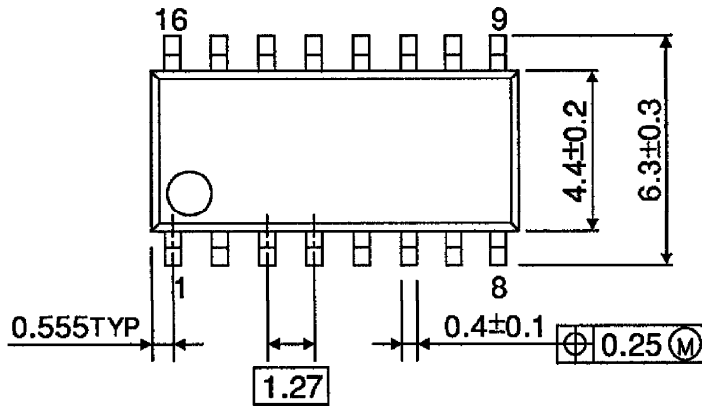
Unit : mm



Weight : 1.11g (Typ.)

OUTLINE DRAWING
SOP16-P-225-1.27

Unit : mm



Weight : 0.16g (Typ.)