TOSHIBA Bipolar Digital Integrated Circuit Silicon Monolithic

TD62601PG,TD62601FG,TD62602PG,TD62602FG TD62603PG,TD62603FG,TD62604PG,TD62604FG

6ch Threshold Free Driver

TD62601PG, TD62601FG Inverter

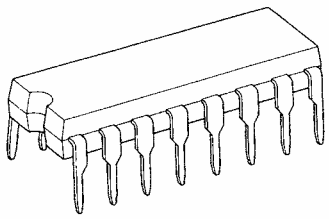
TD62602PG, TD62602FG Inverter/Open Collector

TD62603PG, TD62603FG Non-Inverter

TD62604PG, TD62604FG Non-Inverter/Open Collector

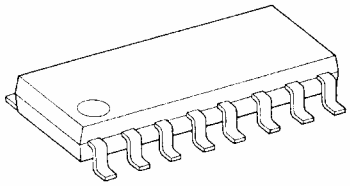
The TD62601PG, TD62601FG series are threshold free drivers which are comprised of six NPN transistor output stages and comparator input stages.
The TD62601PG, TD62601FG series are pin compatible with CMOS 4049B and 4050B type except V_{ref} terminal.
V_{ref} is set at 1/2 V_{CC} with internal resistors and it is changeable using external resistors.
Applications include relay, hammer, lamp and display (LED) drivers.

TD62601PG, TD62602PG, TD62603PG, TD62604PG



DIP16-P-300-2.54A

TD62601FG, TD62602FG, TD62603FG, TD62604FG



SOP16-P-225-1.27

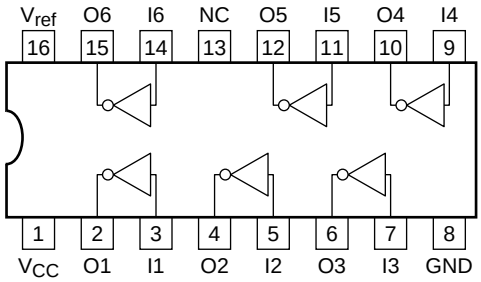
Weight
DIP16-P-300-2.54A : 1.11 g (typ.)
SOP16-P-225-1.27 : 0.16 g (typ.)

Features

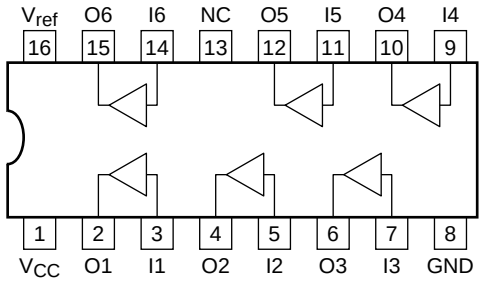
- Wide supply voltage range V_{CC} = 4 to 18 V
- V_{ref} = 1/2 V_{CC} @16 pin is non-connected
- Pin compatible with CMOS logic 4049B, 4050B type
  TD62601PG, TD62601FG (4049B type)
  TD62602PG, TD62602FG (4049B type open-collector)
  TD62603PG, TD62603FG (4050B type)
  TD62604PG, TD62604FG (4050B type open-collector)
- Package type-PG: DIP-16 pin
- Package type-FG: SOP-16 pin

Pin Connection (top view)

TD62601PG, TD62601FG, TD62602PG, TD62602FG

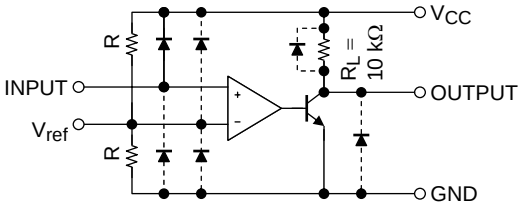


TD62603PG, TD62603FG, TD62604PG, TD62604FG



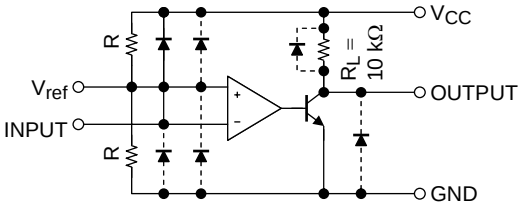
Schematics (each driver)

TD62601PG, TD62601FG, TD62602PG, TD62602FG



TD62601PG, TD62601FG: With R_L
TD62602PG, TD62602FG: Without R_L

TD62603PG, TD62603FG, TD62604PG, TD62604FG



TD62603PG, TD62603FG: With R_L
TD62604PG, TD62604FG: Without R_L

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

Maximum Ratings (Ta = 25°C)

Characteristics		Symbol	Rating	Unit
Supply voltage		V_{CC}	20	V
Output sustaining voltage		V_{OUT}	−0.5 to 20	V
Output current		I_{OUT}	10	mA/ch
Input voltage		V_{IN}	−0.5 to V_{CC} + 0.5	V
Power dissipation	PG	P_D (Note 2)	1.0	W
	FG		0.625 (Note 1)	
Operating temperature		T_{opr}	−40 to 85	°C
Storage temperature		T_{stg}	−55 to 150	°C

Note 1: On PCB (30 × 30 × 1.6 mm Cu 50%)

Note 2: Delated above 25°C in the proportion of 8.0 mW/°C (PG type), 5.0 mW/°C (FG type).

Recommended Operating Conditions (Ta = −40 to 85°C, V_{CC} = 0 V)

Characteristics		Symbol	Condition	Min	Typ.	Max	Unit
Supply voltage		V_{CC}	—	4.0	—	18	V
Output sustaining voltage	62602PG, 62602FG 62604PG, 62604FG	V_{OUT}	—	0	—	18	V
Output current		I_{OUT}	V_{CC} = 5 V	0	—	8	mA/ch
Input voltage		V_{IN}	—	0	—	V_{CC}	V
REF, input voltage		V_{ref}	Ta = 25°C	0.4	—	V_{CC} − 1.6	V
Power dissipation	PG	P_D	—	—	—	0.36	W
	FG		On PCB	—	—	0.325	

Electrical Characteristics (Ta = 25°C)

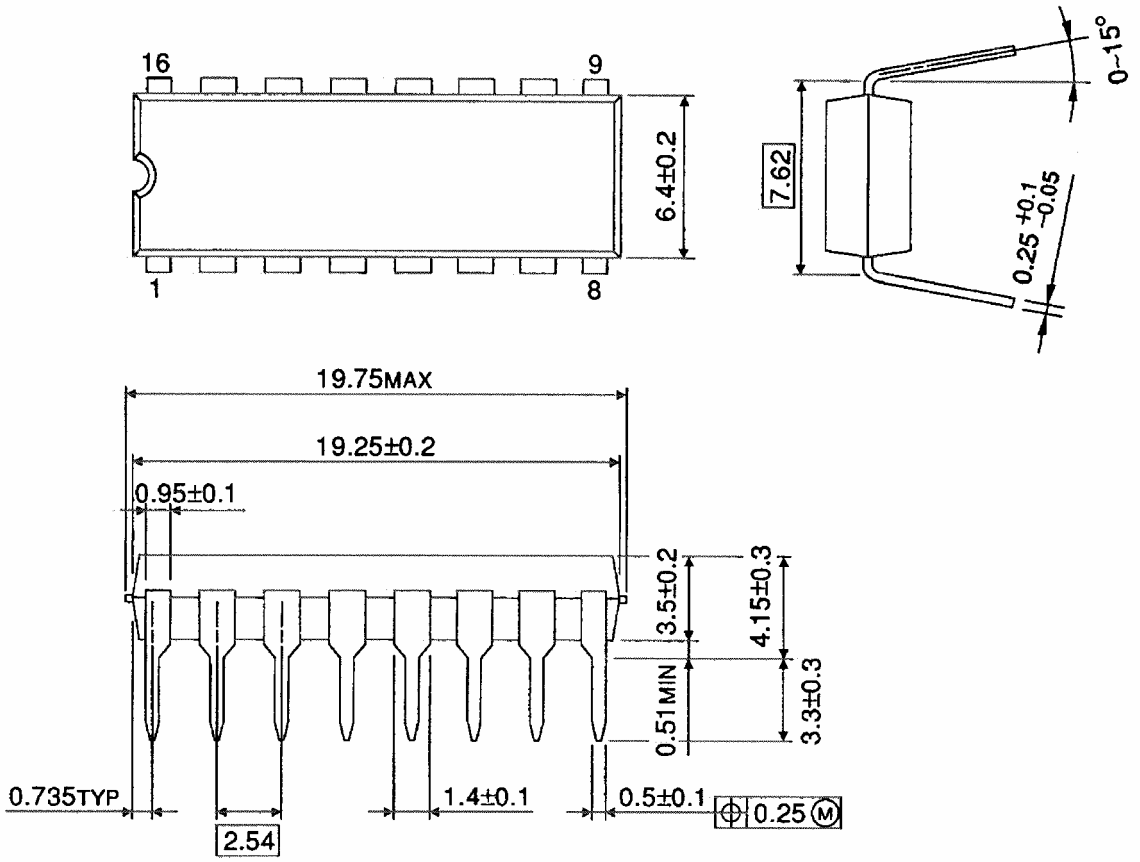
Characteristics			Symbol	Test Circuit	Test Condition	Min	Typ.	Max	Unit
Input voltage		High level	V_{IH}	—	—	V_{ref} + 0.1	—	—	V
		Low level	V_{IL}	—	—	—	—	V_{ref} − 0.1	
Output current	High level	TD62602PG TD62602FG TD62604PG TD62604FG	I_{OH}	—	V_{CC} = 4.5 V, V_O = 18 V	—	—	10	μA
Output voltage	High level	TD62601PG TD62601FG TD62603PG TD62603FG	V_{OH}	–	V_{CC} = 4.5 V, I_O = −10 μA	4.0	—	—	V
	Low level		V_{OL}	—	V_{CC} = 4.5 V, I_O = 8 mA	—	0.1	0.4	
Input current		High level	I_{IH}	—	—	—	—	2	μA
		Low level	I_{IL}	—	—	—	−0.2	−1.5	
Vref terminal voltage			$V_{ref\ (OUT)}$	—	—	1/2 V_{CC} − 0.1	—	1/2 V_{CC} + 0.1	V
Vref resistor			R_{ref}	—	—	3.5	5	6.5	kΩ
Supply current			I_{CC}	—	—	—	—	12	mA
		TD62601PG TD62601FG TD62603PG TD62603FG	I_{CCL}	—	—	—	—	27	mA
Turn-on delay			t_{ON}	—	V_{CC} = 5 V, V_{OUT} = 18 V R_L = 2 kΩ	—	0.5	—	μs
Turn-off delay			t_{OFF}	—		—	0.2	—	μs

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.

Package Dimensions

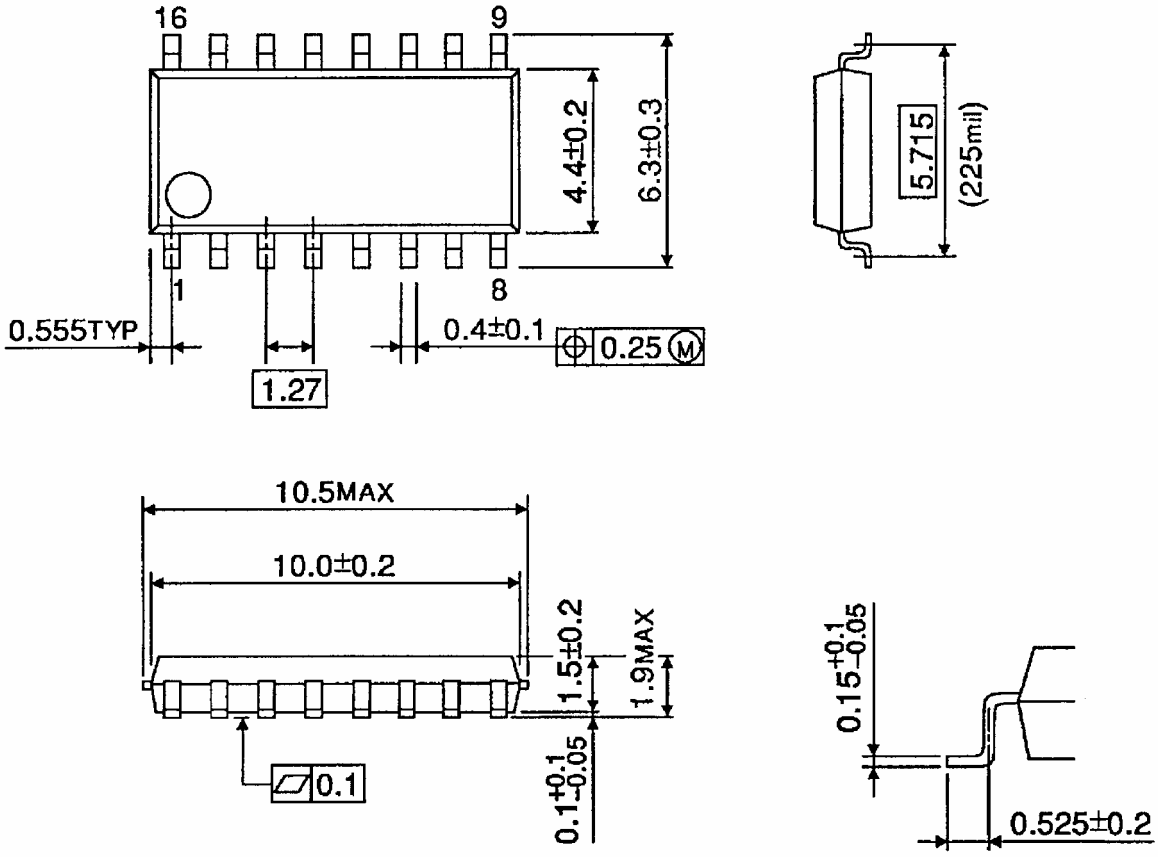
DIP16-P-300-2.54A Unit : mm



Weight: 1.11 g (typ.)

Package Dimensions

SOP16-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

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