TOSHIBA Bipolar Digital Integrated Circuit Silicon Monolithic

TD62107PG,TD62107FG

4ch High-current Darlington Sink Driver

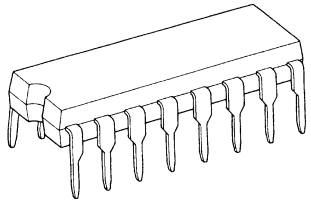
The TD62107PG/FG are high-voltage, high-current darlington drivers and enable inputs which can gate the outputs. All units feature integral clamp diodes for switching inductive loads.

The TD62107PG/FG have a wide supply voltage range and all input are compatible with TTL and 5-V CMOS.

Application include relay, hammer, lamp and stepping moter drivers.

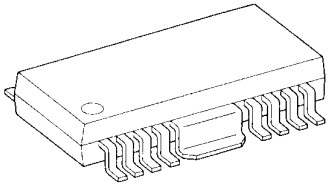
Please observe the thermal condition for using.
This devices are a product for the Pb free(Sn-Ag).

TD62107PG



DIP16-P-300-2.54A

TD62107FG



HSOP16-P-300-1.00

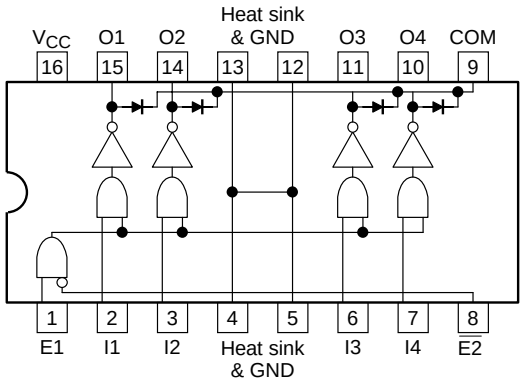
Weight
DIP16-P-300-2.54A: 1.11 g (typ.)
HSOP16-P-300-1.00: 0.50 g (typ.)

Features

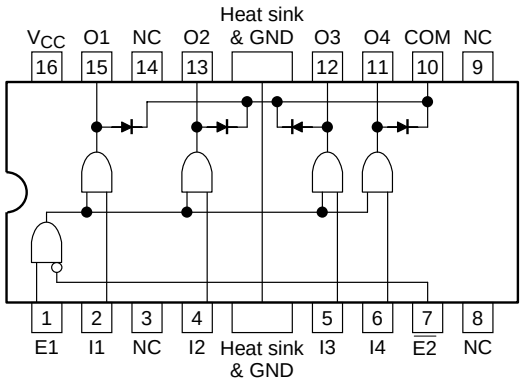
- Output current (single output) 750 mA (max)
- High sustaining voltage output: 45 V min (TD62107PG)
  35 V min (TD62107FG)
- Output clamp diodes
- Enable inputs E1, E2
- Wide supply voltage range V_{CC} = 4.75 to 7 V
- Input compatible with TTL and 5-V CMOS
- GND terminal = heat sink
- Package type-PG: DIP-16pin
- Package type-FG: HSOP-16pin

Pin Assignment (top view)

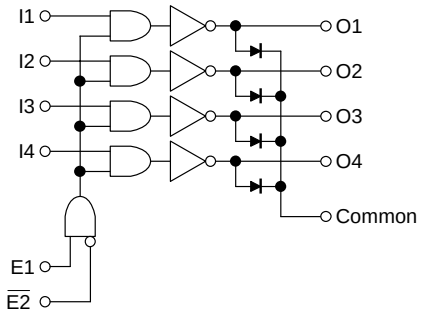
TD62107PG



TD62107FG



Schematics (each driver)

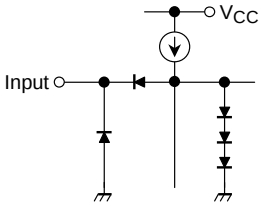


Truth Table

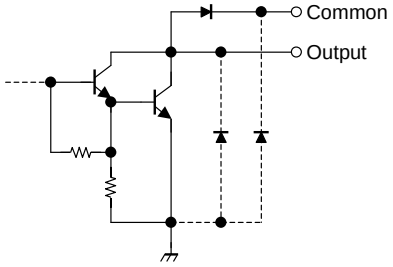
E1	$\overline{E2}$	I1 to I4	O1 to O4
L	L	L or H	Disable OFF
L	H	L or H	Disable OFF
H	L	L or H	Enable In
H	H	L or H	Disable OFF

In = I1~I4

Input Equivalent Circuit



Output Equivalent Circuit



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

Maximum Ratings (Ta = 25°C)

Characteristics		Symbol	Rating	Unit
Supply voltage		V_{CC}	−0.5 to 17	V
Output sustaining voltage	PG	$V_{CE\ (SUS)}$	−0.5 to 45	V
	FG		−0.5 to 35	
Output current		I_{OUT}	750	mA
Input voltage		V_{IN}	−0.5 to V_{CC} + 0.5	V
Clamp diode reverse voltage	PG	V_R	45	V
	FG		35	
Clamp diode forword current		I_F	500	mA
Power dissipation	PG	P_D	2.7 (Note 1)	W
	FG		1.4 (Note 2)	
Operating temperature		T_{opr}	−40 to 85	°C
Storage temperature		T_{stg}	−55 to 150	°C

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

Note 2: On glass epoxy PCB (60 × 30 × 1.6 mm Cu 30%)

Recommended Operating Conditions (Ta = –40 to 85°C)

Characteristics		Symbol	Condition		Min	Typ.	Max	Unit
Supply voltage		V_{CC}	—		4.75	—	15	V
Output sustaining voltage	PG	$V_{CE\ (SUS)}$	—		0	—	45	V
	FG				0	—	35	
Output current		I_{OUT}	T_{pw} = 25 ms, Duty = 75%, 1 Circuit		0	—	500	mA
	PG		T_{pw} = 25 ms, 4 Circuit	Duty = 30%	0	—	400	
	FG			Duty = 40%	—	—	300	
Input voltage		V_{IN}	—		0	—	V_{CC}	V
Clamp diode reverse voltage	PG	V_R	—		—	—	45	V
	FG				—	—	35	
Clamp diode forward current		I_F	—		—	—	500	mA
Power dissipation	PG	P_D	—		—	—	1.0	W
	FG		Ta = 85°C	(Note 1)	—	—	0.7	

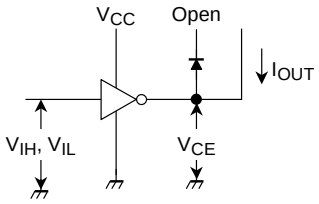
Note1: On Glass Epoxy PCB (60 × 30 × 1.6 mm Cu 30%)

Electrical Characteristics (Ta = 25°C)

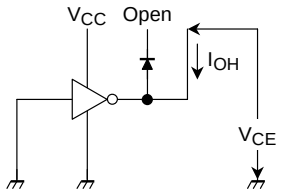
Characteristics			Symbol	Test Circuit	Test Condition	Min	Typ.	Max	Unit
Input voltage	High level		V_{IH}	1		2.0	—	V_{CC}	V
	Low level		V_{IL}			—	—	0.8	
Output current	High level	PG	I_{OH}	2	V_{CE} = 45 V, Ta = 75°C	—	—	100	μA
		FG			V_{CE} = 35 V, Ta = 85°C	—	—	100	
Output voltage	Low level		V_{OL}	3	I_{OUT} = 50 mA	—	—	1.3	V
Input current	High level		I_{IH}	4	V_{IN} = 13 V	—	—	100	μA
	Low level		I_{IL}	5	V_{IN} = 0.4 V	—	—	–0.3	mA
Clamp diode reverse current		PG	I_R	6	V_R = 45 V	—	—	100	μA
		FG			V_R = 35 V	—	—	100	
Clamp diode forward voltage			V_F	7	I_F = 500 mA	—	—	2.0	V
Supply current	Output high	I_{CC}	I_{CCH}	4	V_{CC} = 13 V, V_{IN} = 0 V Output open	—	—	13	mA
	Output low		I_{CCL}	5	V_{CC} = 13 V, V_{IN} = 5 V Output open	—	—	17	
Turn-on delay		PG	t_{ON}	8	V_{CC} = 5 V, R_L = 90 Ω C_L = 15 pF, V_{OUT} = 45 V	—	5	—	μs
		FG			V_{CC} = 5 V, R_L = 70 Ω C_L = 15 pF, V_{OUT} = 35 V	—	5	—	
Turn-off delay		PG	t_{OFF}	8	V_{CC} = 5 V, R_L = 90 Ω C_L = 15 pF, V_{OUT} = 45 V	—	5	—	μs
		FG			V_{CC} = 5 V, R_L = 70 Ω C_L = 15 pF, V_{OUT} = 35 V	—	5	—	

Test Circuit

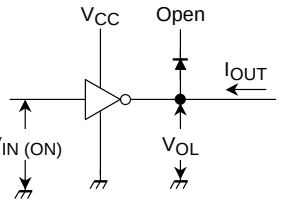
1. V_{IH}, V_{IL}



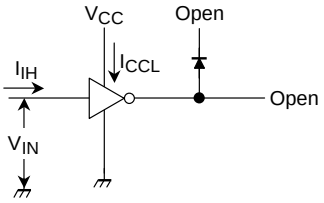
2. I_{OH}



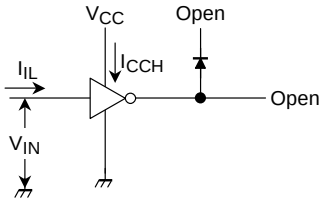
3. V_{OL}



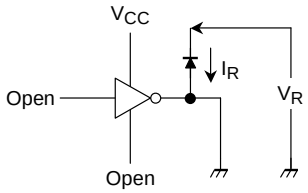
4. I_{IH}, I_{CCL}



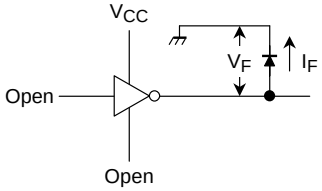
5. IIL, I_{CCL}



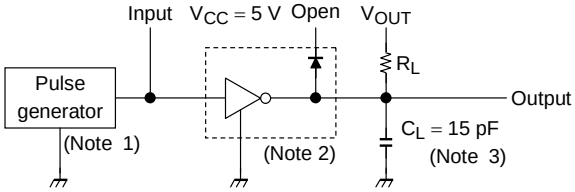
6. I_R



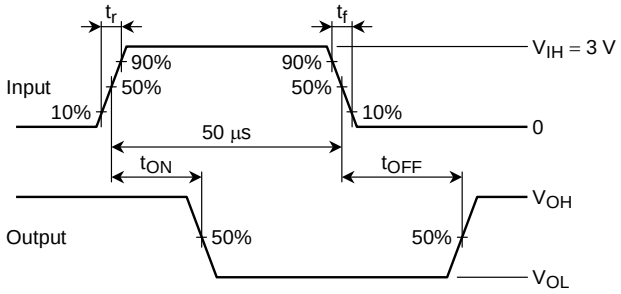
7. V_F



8. t_{ON}, t_{OFF}



Input Condition



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

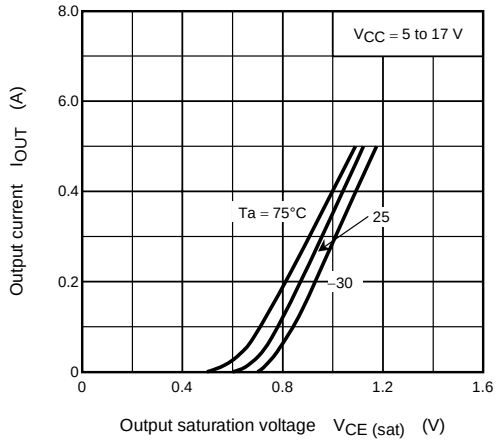
Note 2: $V_{IH} = 3$ V, E1 = V_{IH}, $\overline{E2}$ = GND, $V_{CC} = 5$ V

Note 3: C_L includes probe and jig capacitance

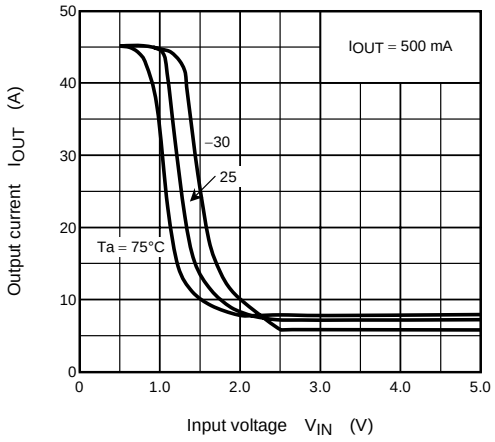
Precautions for Using

This IC does not include built-in protection circuits for excess current or overvoltage.
If this IC is subjected to excess current or overvoltage, it may be destroyed.
Hence, the utmost care must be taken when systems which incorporate this IC are designed.
Utmost care is necessary in the design of the output line, V_{CC}, COMMON and GND line since IC may be destroyed due to short-circuit between outputs, air contamination fault, or fault by improper grounding.

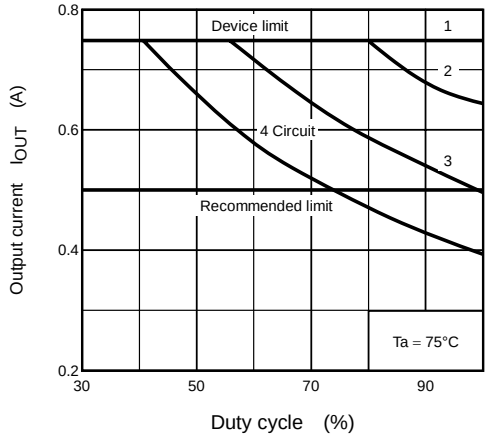
$V_{CE\ (sat)} – I_{OUT}$



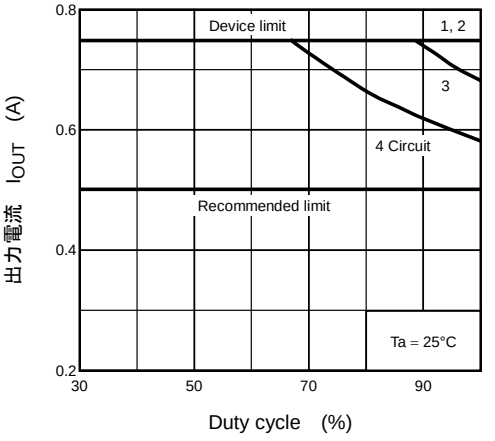
$V_{OUT} – V_{IN}$



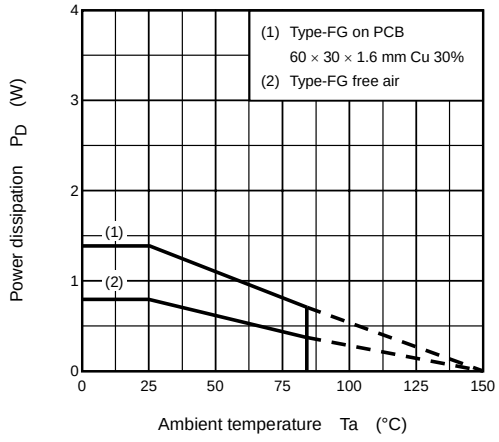
I_{OUT} – Duty cycle



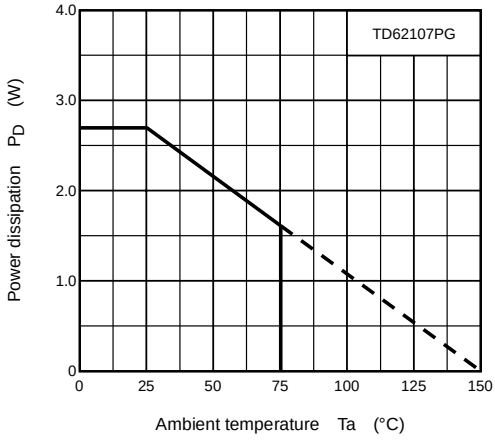
I_{OUT} – Duty cycle



P_D – Ta

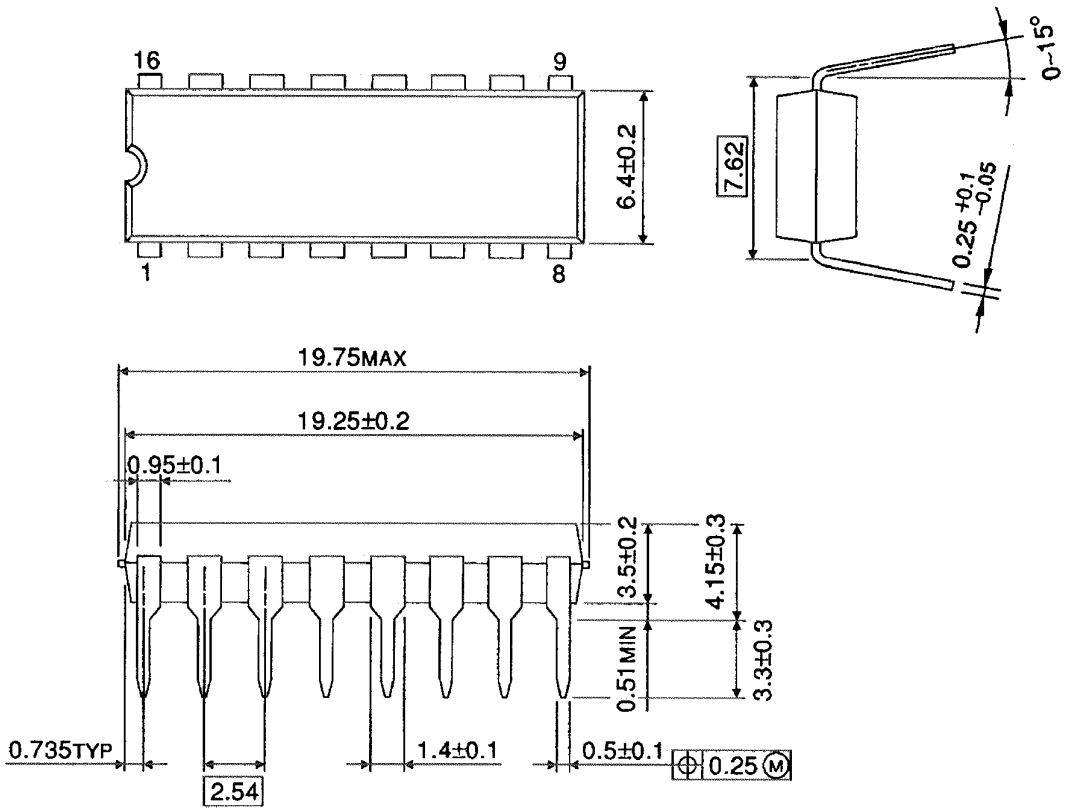


P_D – Ta



Package Dimensions

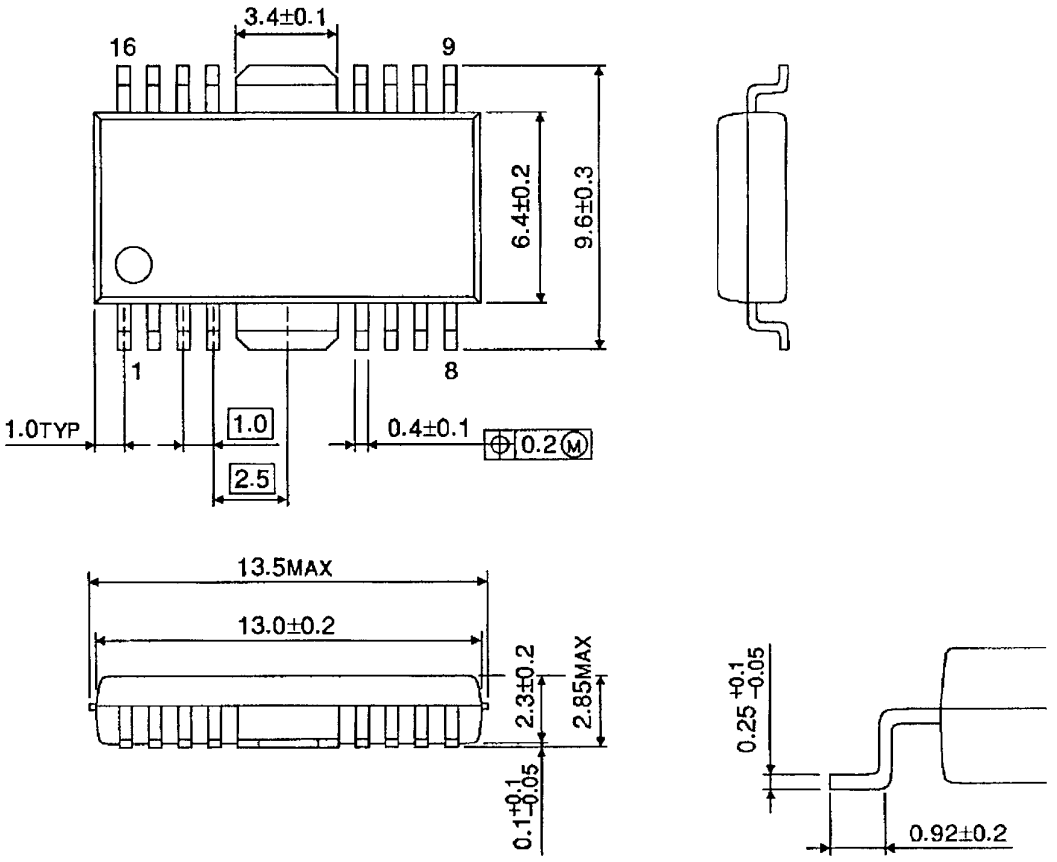
DIP16-P-300-2.54A Unit : mm



Weight: 1.11 g (typ.)

Package Dimensions

HSOP16-P-300-1.00 Unit : mm



Weight: 0.50 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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030619EBA

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