

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.

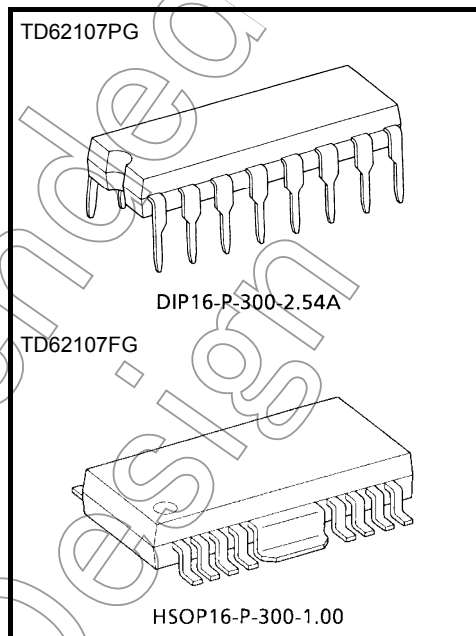
Application include relay, hammer, lamp and stepping moter drivers.

Please observe the thermal condition for using.

The suffix (G) appended to the part number represents a RoHS-compatible product.

Features

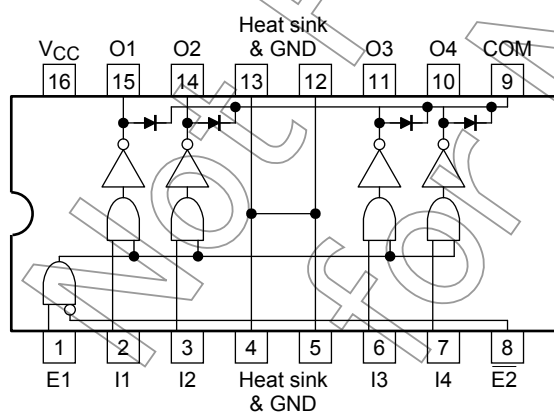
- Output current (single output) 750 mA (max)
- High sustaining voltage output: 45 V min (TD62107PG)
35 V min (TD62107FG)
- Output clamp diodes
- Enable inputs E1, E2
- Wide supply voltage range $V_{CC} = 4.75$ to 7 V
- Input compatible with TTL and 5-V CMOS
- GND terminal = heat sink
- Package type-PG: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



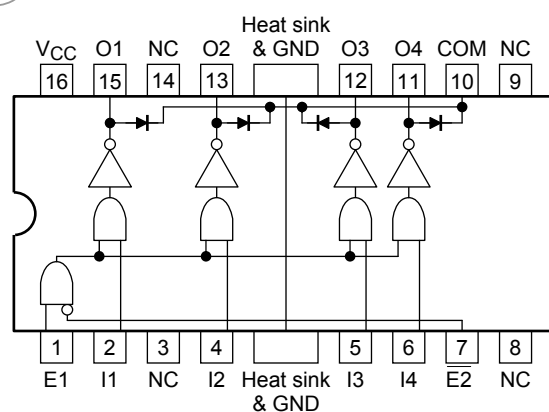
Weight
DIP16-P-300-2.54A: 1.11 g (typ.)
HSOP16-P-300-1.00: 0.50 g (typ.)

Pin Assignment (top-view)

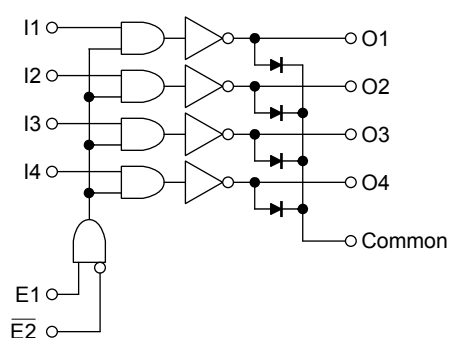
TD62107PG



TD62107FG



Schematics (each driver)

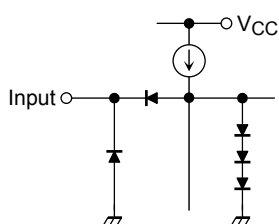


Truth Table

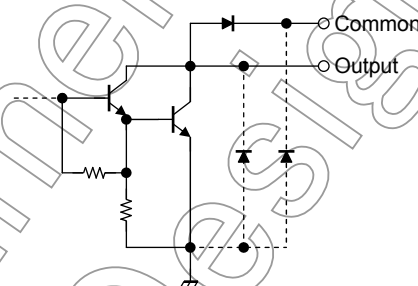
E1	$\overline{E2}$	I1 to I4	O1 to O4
L	L	L or H	Disable OFF
L	H	L or H	Disable OFF
H	L	L or H	Enable In
H	H	L or H	Disable OFF

$$I_n = I_1 \text{ to } I_4$$

Input Equivalent Circuit



Output Equivalent Circuit



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

Absolute 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 forward 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%)

Operating Conditions (Ta = -40 to 85°C)

Characteristics		Symbol	Test 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	PG	I _{OUT}	T _{pw} = 25 ms, Duty = 75%, 1 Circuit		0	—	500	mA
			T _{pw} = 25 ms, 4 Circuit	Duty = 30%	0	—	400	
				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	

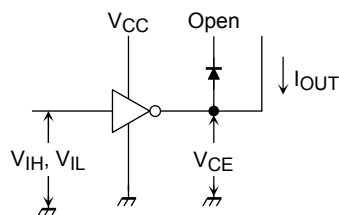
Note1: On Glass Epoxy PCB (60 × 30 × 1.6 mm Cu 30%)

Electrical Characteristics (Ta = 25°C)

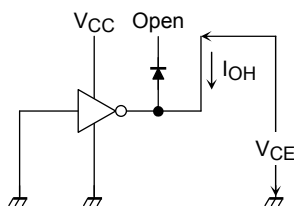
Characteristics		Symbol	Test Circuit	Test Condition	Min	Typ.	Max	Unit
Input voltage	High level	V _{IH}	1	—	2.0	—	V _{CC}	V
	Low level	V _{IL}			—	—	0.8	
Output current	High level	I _{OH}	2	V _{CE} = 45 V, Ta = 75°C	—	—	100	μA
	PG			V _{CE} = 35 V, Ta = 85°C	—	—	100	
Output voltage	Low level	V _{OL}	3	I _{OUT} = 50 mA	—	—	1.3	V
				I _{OUT} = 750 mA	—	—	1.6	
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}	4	V _{CC} = 13 V, V _{IN} = 0 V Output open	—	—	13	mA
	Output low		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

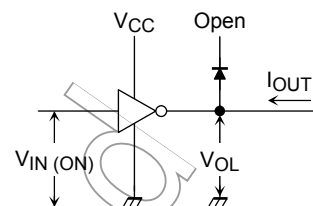
1. V_{IH} , V_{IL}



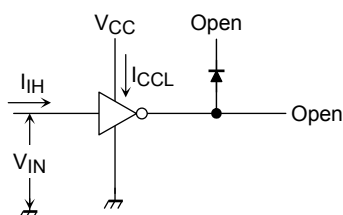
2. I_{OH}



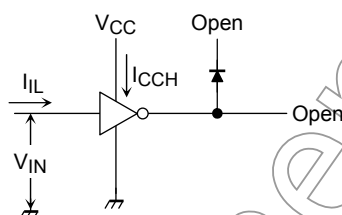
3. V_{OL}



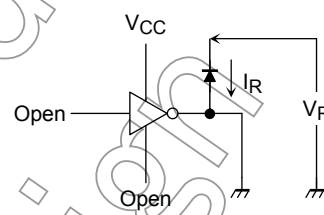
4. I_{IH} , I_{CCL}



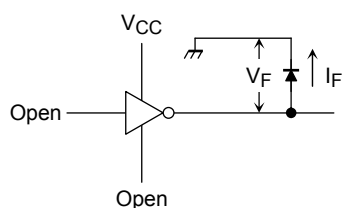
5. I_{IL} , I_{CCH}



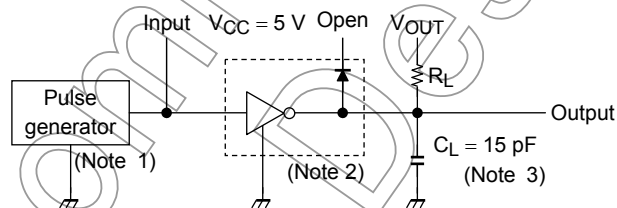
6. I_R



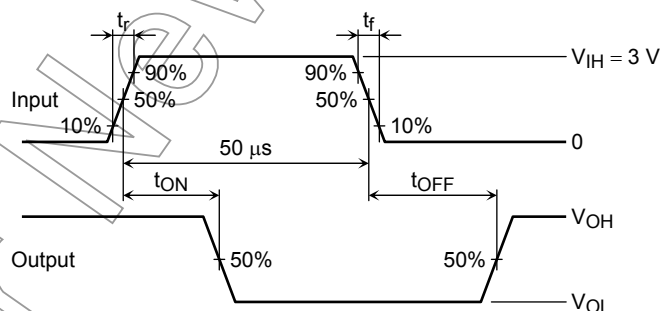
7. V_F



8. t_{ON} , t_{OFF}



Input Condition



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

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

Note 3: C_L includes probe and jig capacitance

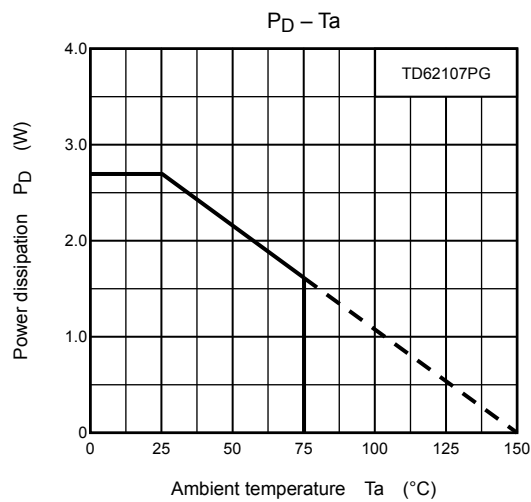
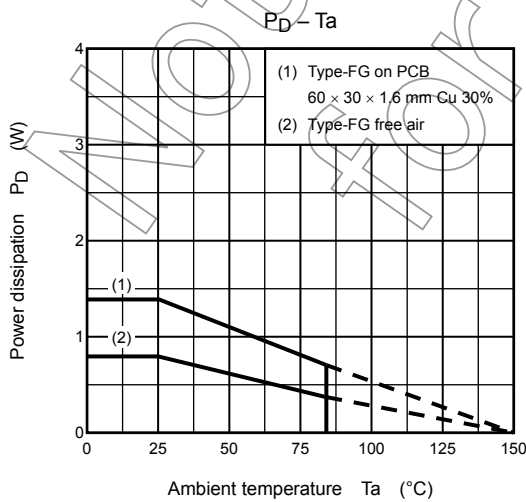
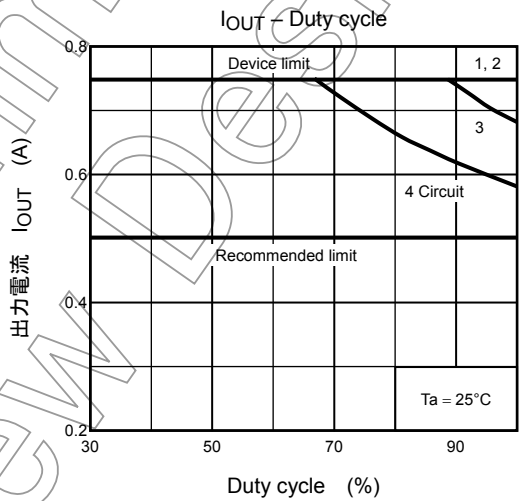
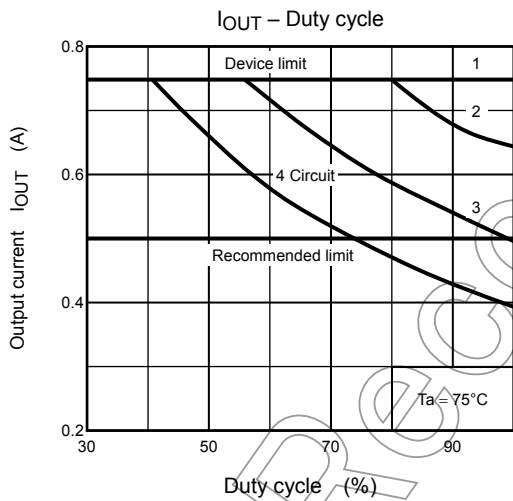
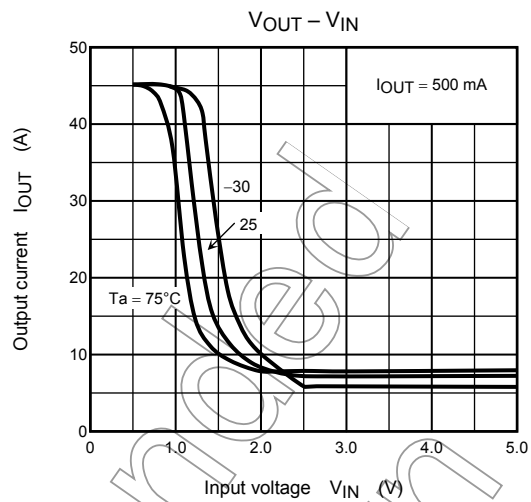
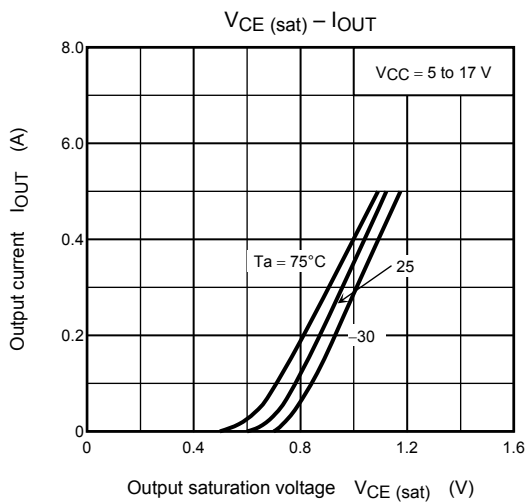
Precautions for Using

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.

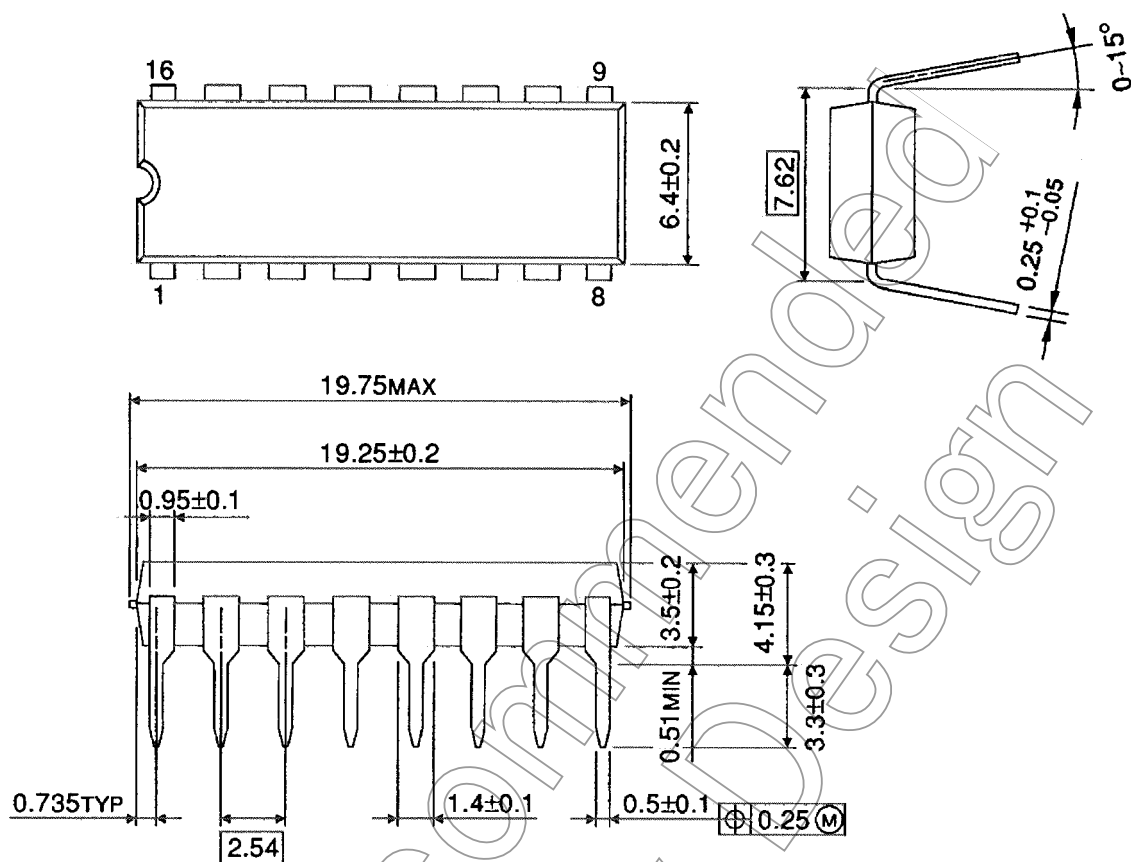
Utmost care is necessary in the design of the output line, V_{CC} , COMMON and GND line since IC may be destroyed due to short-circuit between outputs, air contamination fault, or fault by improper grounding.



Package Dimensions

DIP16-P-300-2.54A

Unit : mm

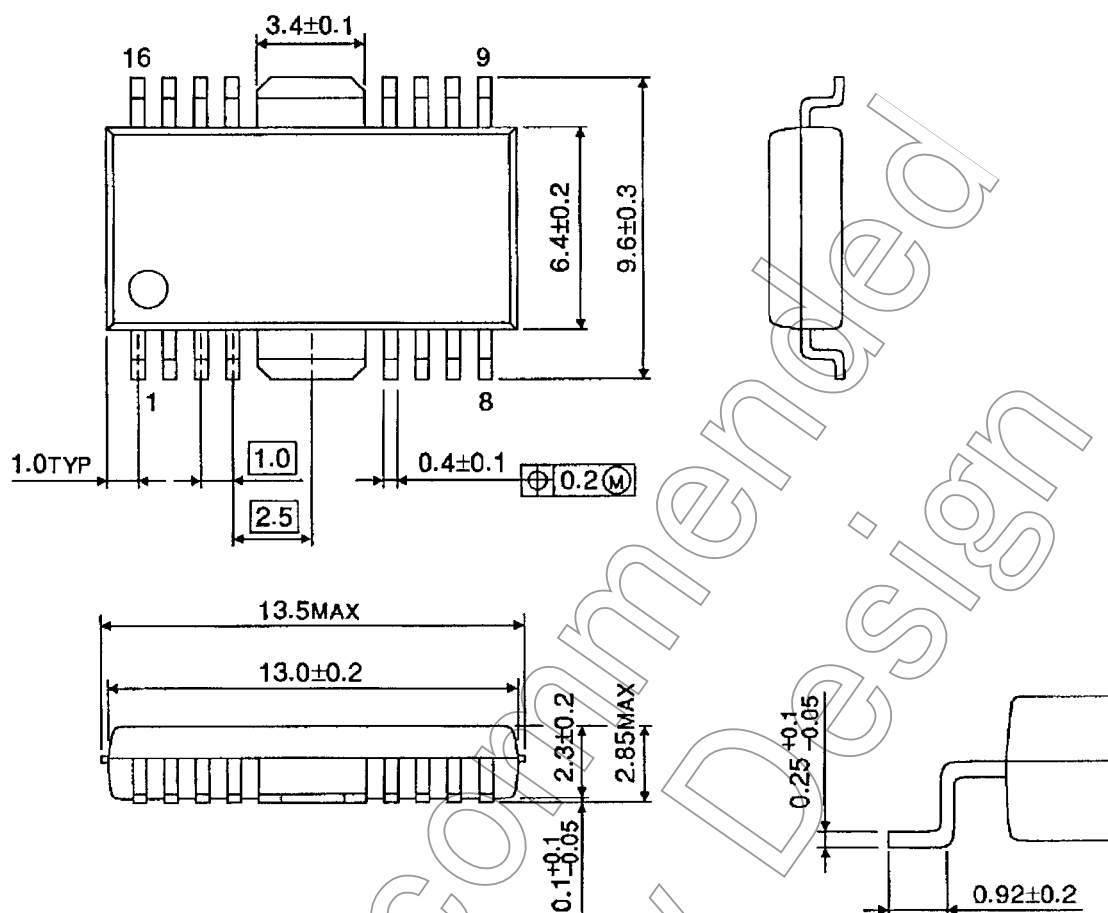


Weight: 1.11 g (typ.)

Package Dimensions

HSOP16-P-300-1.00

Unit : mm



Weight: 0.50 g (typ.)

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