

# TD62304AFNG,TD62305AFNG

## 7CH LOW INPUT ACTIVE DARLINGTON SINK DRIVER

The TD62304AFNG and TD62305AFNG are non-inverting transistor arrays, which are comprised of seven NPN darlington buffer-transistor output stages PNP input stages.

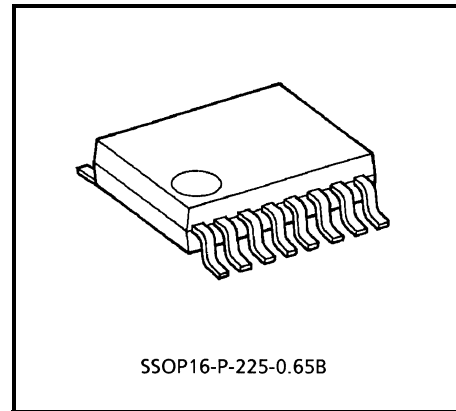
These devices are Low Level input active drivers and are suitable for operations with a 5-V general purposed logic IC such as 5-V TTL, 5-V CMOS and 5-V Microprocessor which have sink current output drivers.

Please observe the thermal condition for using.

This devices are a product for the Pb free(Sn-Ag).

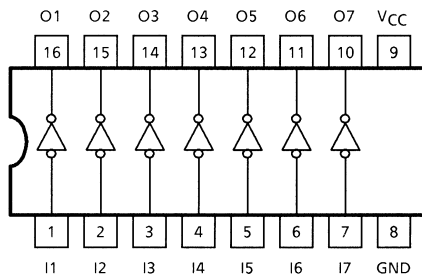
### FEATURES

- Package Type : SSOP16 pin
- High Sustaining Voltage :  $V_{CE(SUS)} = 50\text{ V (MIN.)}$
- Output Current (Single Output):  $I_{OUT} = 500\text{ mA / ch (MAX.)}$
- Low Level Active Input
- Input compatible with 5-V TTL and 5-V CMOS



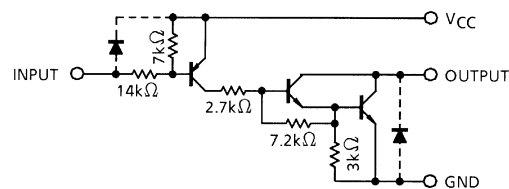
Weight: 0.07 g (Typ.)

### PIN CONNECTION (TOP VIEW)

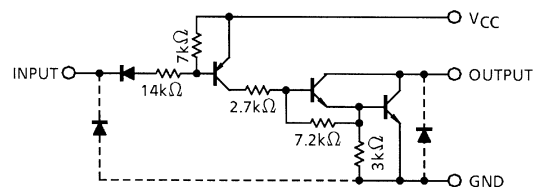


### SCHEMATICS (EACH DRIVER)

#### TD62304AFNG



#### TD62305AFNG



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

**MAXIMUM RATINGS (Ta = 25°C)**

CHARACTERISTIC		SYMBOL	RATING	UNIT
Supply Voltage		V <sub>CC</sub>	-0.5~7.0	V
Output Sustaining Voltage		V <sub>CE (SUS)</sub>	-0.5~50	V
Output Current		I <sub>OUT</sub>	500	mA / ch
Input Voltage	TD62304	V <sub>IN</sub>	-22~V <sub>CC</sub> + 0.5	V
	TD62305		-0.5~7	
Input Current		I <sub>IN</sub>	-10	mA
Power Dissipation		P <sub>D</sub>	0.78 (Note 1)	W
Operating Temperature		T <sub>opr</sub>	-40~85	°C
Storage Temperature		T <sub>stg</sub>	-55~150	°C

Note 1: On Glass Epoxy PCB (50 × 50 × 1.6 mm Cu 40%)

**RECOMMENDED OPERATING CONDITIONS (Ta = -40~85°C)**

CHARACTERISTIC		SYMBOL	TEST CONDITION		MIN	TYP.	MAX	UNIT
Supply Voltage		V <sub>CC</sub>			4.5	5.0	5.5	V
Output Sustaining Voltage		V <sub>CE (SUS)</sub>			0	—	50	V
Output Current		I <sub>OUT (Note)</sub>	DC 1 Circuit		0	—	400	mA / ch
			T <sub>pw</sub> ≤ 25 ms 7 Circuit T <sub>j</sub> = 120°C Ta = 85°C	Duty = 10%	0	—	260	
				Duty = 50%	0	—	65	
Input Voltage	TD62304	V <sub>IN</sub>			-20	—	V <sub>CC</sub>	V
	TD62305				0	—	5.5	
Input Voltage (Output On)	TD62304	V <sub>IN (ON)</sub>			-22	—	V <sub>CC</sub> -3.5	V
	TD62305				-0.5	—	V <sub>CC</sub> -3.7	
Input Voltage (Output Off)	TD62304	V <sub>IN (OFF)</sub>			V <sub>CC</sub> -0.4	—	V <sub>CC</sub>	V
	TD62305				V <sub>CC</sub> -0.6	—	V <sub>CC</sub>	
Power Dissipation		P <sub>D</sub>	Ta = 85°C (Note )		—	—	0.325	W

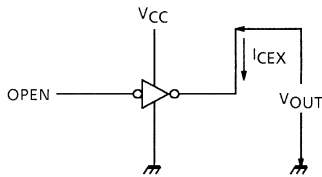
Note: On Glass Epoxy PCB (50 × 50 × 1.6 mm Cu 40% )

**ELECTRICAL CHARACTERISTICS (Ta = 25°C)**

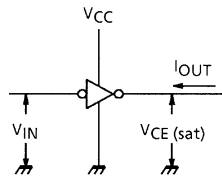
CHARACTERISTIC		SYMBOL	TEST CIR-CUIT	TEST CONDITION	MIN	TYP.	MAX	UNIT
Output Leakage Current		$I_{CEX}$	1	$V_{CC} = 5.5 \text{ V}$ , $V_{OUT} = 50 \text{ V}$ $T_a = 85^\circ\text{C}$ , $I_{IN} = 0$	—	—	100	$\mu\text{A}$
Output Saturation Voltage		$V_{CE (sat)}$	2	$V_{CC} = 4.5 \text{ V}$ , $I_{OUT} = 350 \text{ mA}$	$V_{IN} = V_{IN (ON)} \text{ MAX.}$	—	1.4	2.0
					$V_{IN} = 0.8 \text{ V}$	—	1.4	2.2
Input Current		$I_{IN (ON)}$	3	$V_{CC} = 5.5 \text{ V}$ , $V_{IN} = 0.4 \text{ V}$	—	-0.32	-0.45	mA
				$V_{CC} = 5.5 \text{ V}$ , $V_{IN} = -20 \text{ V}$	—	—	2.6	
Output Current		$I_{IN (OFF)}$	4		—	—	-40	$\mu\text{A}$
Output Voltage	TD62304	$V_{IN (ON)}$	5		—	—	$V_{CC} - 2.8$	V
	TD62305				—	—	$V_{CC} - 3.7$	
Supply Current		$I_{CC (ON)}$	6	$V_{CC} = 5.5 \text{ V}$ , $V_{IN} = 0 \text{ V}$	—	17	22	mA
Supply Current		$I_{CC (OFF)}$		$V_{CC} = V_{IN} = 5.5 \text{ V}$	—	—	100	$\mu\text{A}$
Turn-On Delay		$t_{ON}$	7	$V_{CC} = 5 \text{ V}$ , $C_L = 15 \text{ pF}$ $V_{OUT} = 50 \text{ V}$ , $R_L = 125 \Omega$	—	0.1	—	$\mu\text{s}$
Turn-Off Delay		$t_{OFF}$			—	3	—	

## TEST CIRCUIT

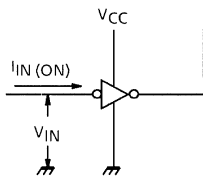
### 1. $I_{CEX}$



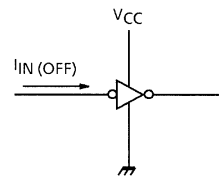
### 2. $V_{CE(sat)}$



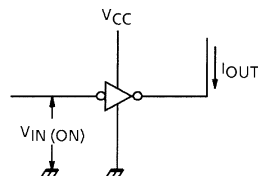
### 3. $I_{IN(ON)}$



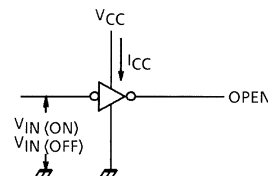
### 4. $I_{IN(OFF)}$



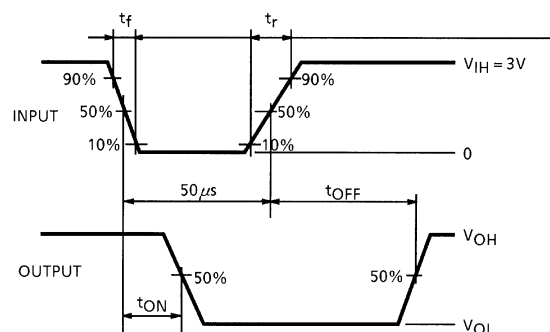
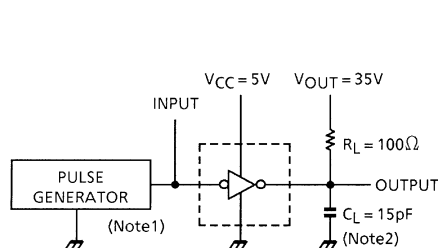
### 5. $V_{IN(ON)}$



### 6. $I_{CC}$



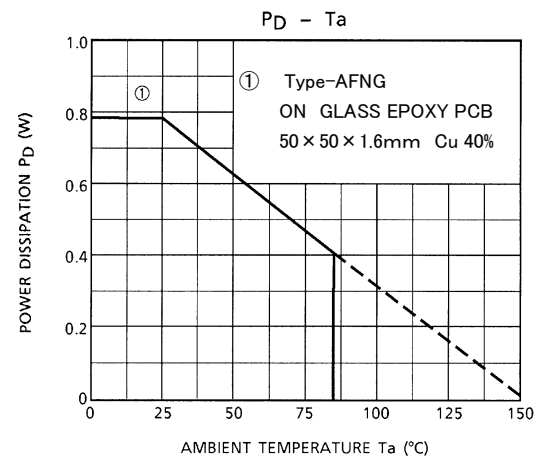
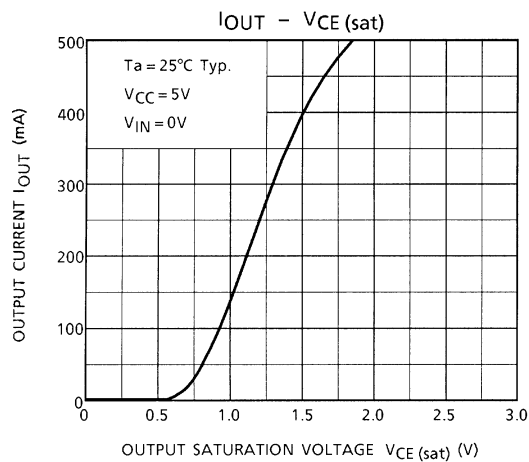
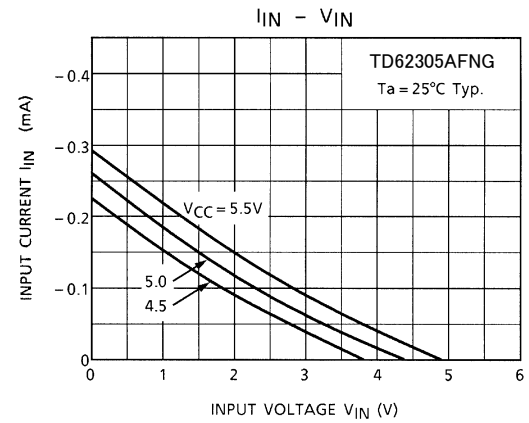
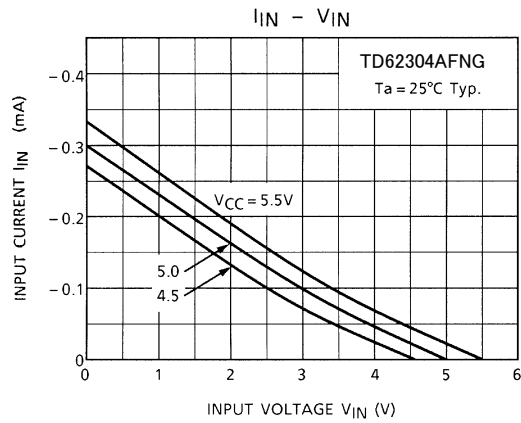
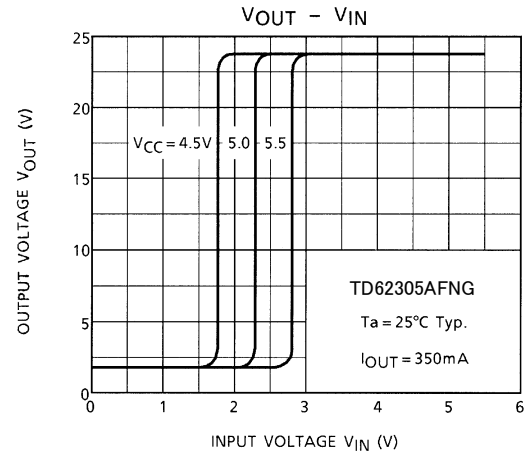
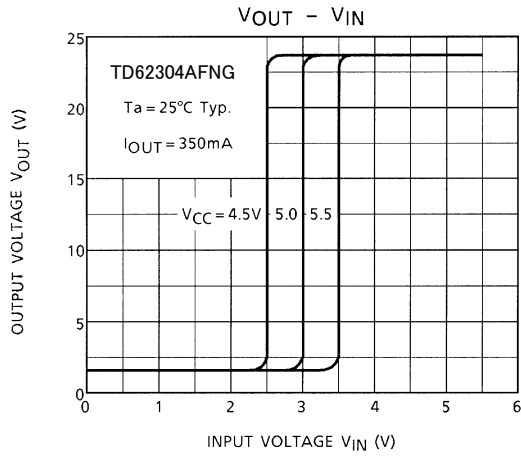
### 7. $t_{ON}$ , $t_{OFF}$



Note 1 Pulse Width 50  $\mu$ s, Duty Cycle 10%  
Output Impedance 50  $\Omega$ ,  $t_r \leq 10$  ns,  $t_f \leq 5$  ns  
Note 2:  $C_L$  includes probe and jig capacitance.

## PRECAUTIONS for USING

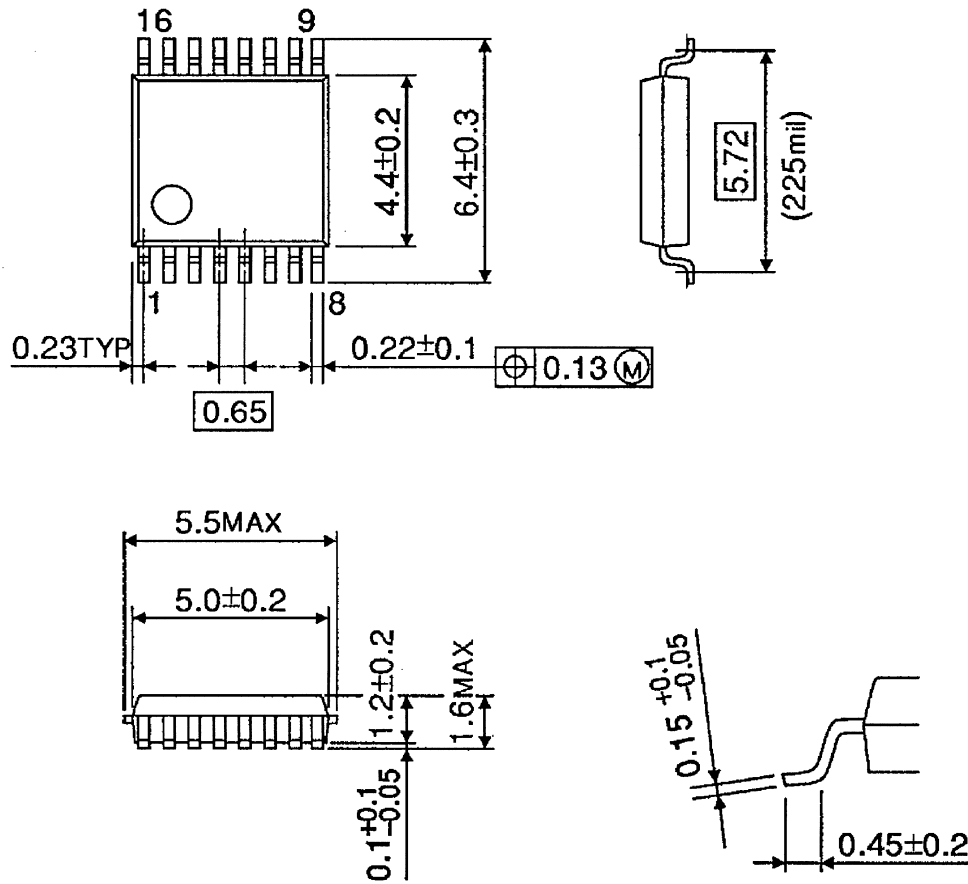
This IC does not include built-in protection circuits for excess current or overvoltage.  
If this IC is subjected to excess current or overvoltage, it may be destroyed.  
Hence, the utmost care must be taken when systems which incorporate this IC are designed.  
Utmost care is necessary in the design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



**PACKAGE DIMENSIONS**

SSOP16-P-225-0.65B

Unit : mm



Weight: 0.07 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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