

# TD62006P, TD62006F

## 6CH DARLINGTON SINK DRIVER

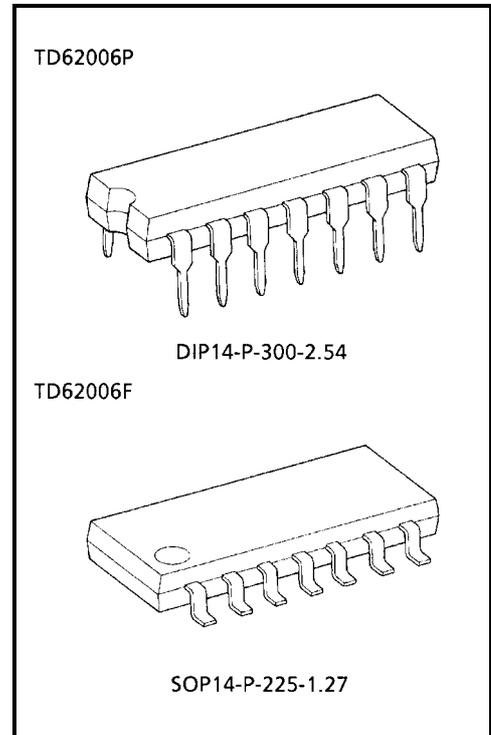
The TD62006P/TD62006F Series are high-voltage, high-current darlington drivers comprised of six NPN darlington pairs. All units feature integral clamp diodes for switching inductive loads and protective diodes against a negative input voltage. The TD62006P and TD62006F are suitable for interfaces from minus and plus dual supply voltage system to plus single supply voltage system.

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

Please observe the thermal condition for using.

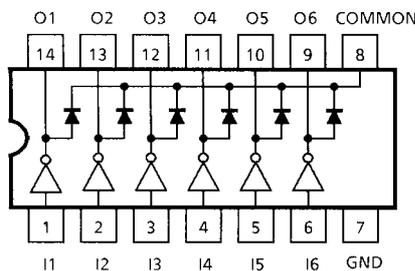
### FEATURES

- Output current (single output) : 150 mA (Max)
- High sustaining voltage output : 22V (Min)
- Output clamp diodes
- Protective diodes against a negative input voltage
- Inputs base resistor :  $R_{IN} = 20\text{ k}\Omega$
- Inputs compatible with 9~15 V PMOS, CMOS.
- Package type-P : DIP-14 pin
- Package type-F : SOP-14 pin

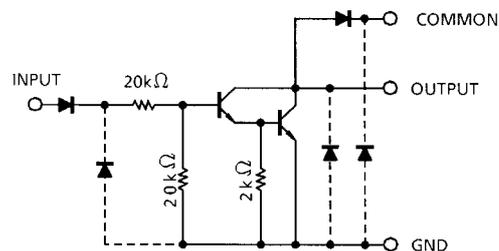


Weight  
 DIP14-P-300-2.54 : 1.11 g (Typ.)  
 SOP14-P-225-1.27 : 0.16 g (Typ.)

### PIN CONNECTION (TOP VIEW)



### SCHEMATICS (EACH DRIVER)



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

**MAXIMUM RATINGS (Ta = 25°C)**

CHARACTERISTIC		SYMBOL	RATING	UNIT
Output Sustaining Voltage		V <sub>CE (SUS)</sub>	-0.5~22	V
Output Current		I <sub>OUT</sub>	150	mA / ch
Input Voltage		V <sub>IN</sub>	-37~22	V
Clamp Diode Reverse Voltage		V <sub>R</sub>	22	V
Clamp Diode Forward Current		I <sub>F</sub>	150	mA
Power Dissipation	P	P <sub>D</sub>	1.0	W
	F		0.625 (Note)	
Operating Temperature	P	T <sub>opr</sub>	-30~75	°C
	F		-40~85	
Storage Temperature		T <sub>stg</sub>	-50~150	°C

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

**RECOMMENDED OPERATING CONDITIONS  
(Ta = -40~85°C and Ta = -30~75°C for Type-P)**

CHARACTERISTIC		SYMBOL	CONDITION	MIN	TYP.	MAX	UNIT
Output Sustaining Voltage		V <sub>CE (SUS)</sub>		0	—	20	V
Output Current		I <sub>OUT</sub>	1 Circuit	0	—	120	mA / ch
			T <sub>pw</sub> = 25ms, Duty = 10%, 6 Circuits	0	—	100	
Input Voltage		V <sub>IN</sub>		-35	—	20	V
Clamp Diode Reverse Voltage		V <sub>R</sub>		—	—	20	V
Clamp Diode Forward Current		I <sub>F</sub>		—	—	120	mA
Power Dissipation	P	P <sub>D</sub>		—	—	0.44	W
	F		Ta = 85°C (Note)	—	—	0.325	

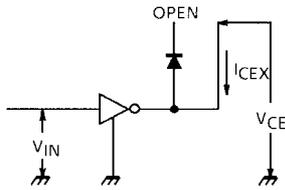
Note: On Glass Epoxy PCB (50 × 50 × 1.6 mm Cu 30%)

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

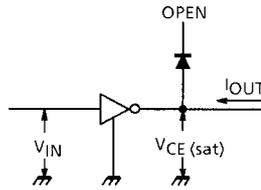
CHARACTERISTIC		SYMBOL	TEST CIR-CUIT	TEST CONDITION	MIN	TYP.	MAX	UNIT
Output Leakage Current	P	I <sub>CEX</sub>	1	V <sub>OUT</sub> = 20 V V <sub>IN</sub> = 1.0 V	—	—	100	μA
	F							
Collector-Emitter Saturation Voltage		V <sub>CE (sat)</sub>	2	V <sub>IN</sub> = 7.5V, I <sub>OUT</sub> = 120mA	—	—	1.6	V
DC Current Transfer Ratio		h <sub>FE</sub>	3	V <sub>CE</sub> = 2.0V, I <sub>OUT</sub> = 120mA	800	—	—	mA
Input Current	"H" Level	I <sub>IN (ON)</sub>	4	V <sub>IN</sub> = 7.5V	—	—	0.7	—
	"L" Level	I <sub>IN (OFF)</sub>		V <sub>IN</sub> = -35V	—	—	-10	μA
Input Voltage	"H" Level	V <sub>IN (ON)</sub>	5	I <sub>OUT</sub> = 120mA	—	—	7.5	V
	"L" Level	V <sub>IN (OFF)</sub>			1	—	—	
Clamp Diode Reverse Current		I <sub>R</sub>	6	V <sub>R</sub> = 20V	—	—	30	μA
Clamp Diode Forward Voltage		V <sub>F</sub>	7	I <sub>F</sub> = 120mA	—	—	1.6	V
Turn-On Delay		t <sub>ON</sub>	8	V <sub>OUT</sub> = 20V, R <sub>L</sub> = 167 Ω C <sub>L</sub> = 15pF	—	0.1	—	μs
Turn-Off Delay		t <sub>OFF</sub>			—	0.4	—	

## TEST CIRCUIT

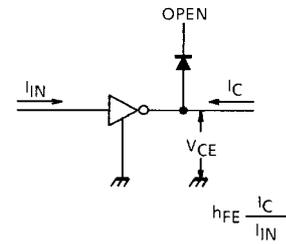
### 1. $I_{CEX}$



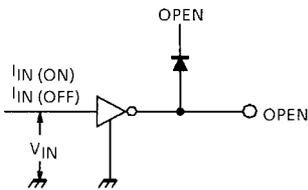
### 2. $V_{CE(sat)}$



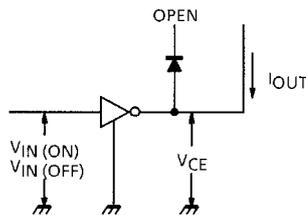
### 3. $h_{FE}$



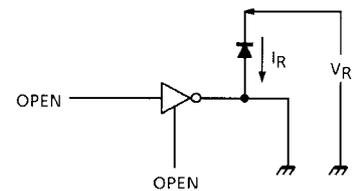
### 4. $I_N$ (ON), $I_{IN}$ (OFF)



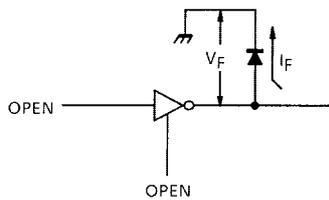
### 5. $V_{IN}$ (ON), $V_{IN}$ (OFF)



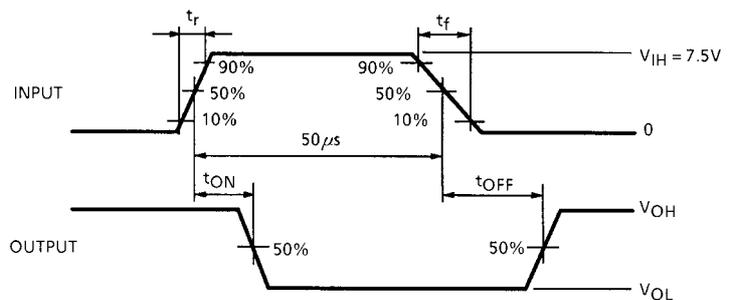
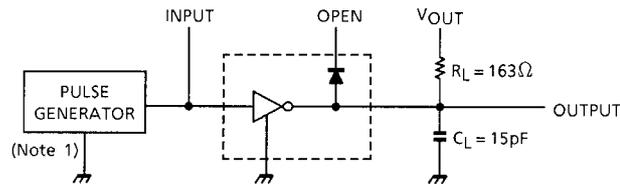
### 6. $I_R$



### 7. $V_F$



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



Note 1: Pulse Width 50  $\mu$ s, Duty Cycle 10%  
Output Impedance 50  $\Omega$ ,  $t_r \leq 5$  ns,  
 $t_f \leq 10$  ns

Note 2:  $C_L$  includes probe and jig capacitance.

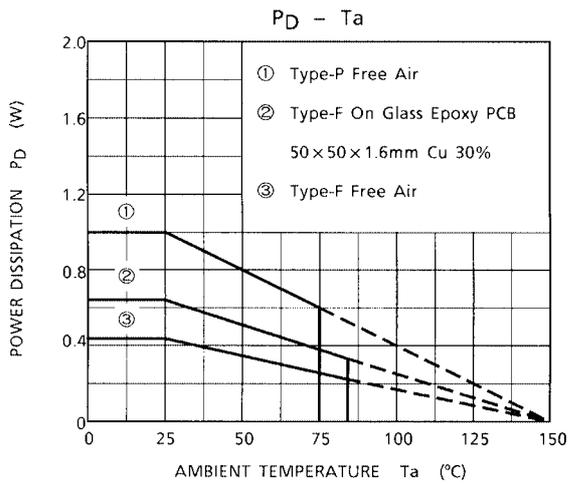
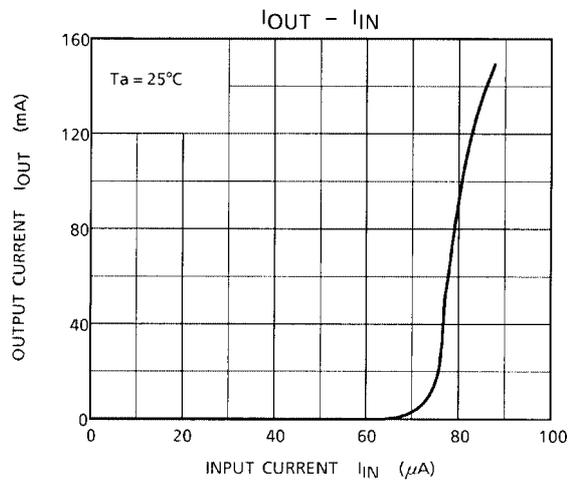
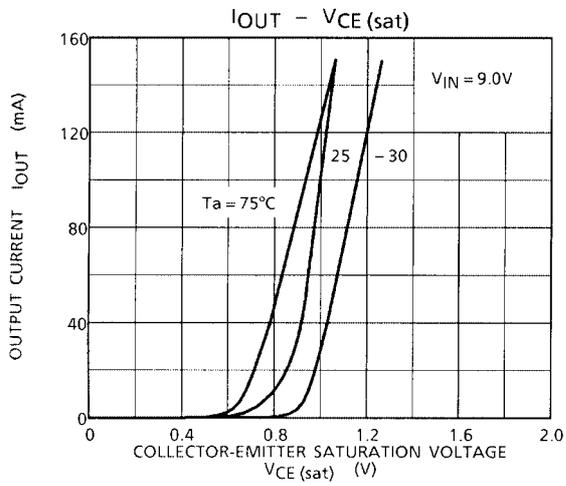
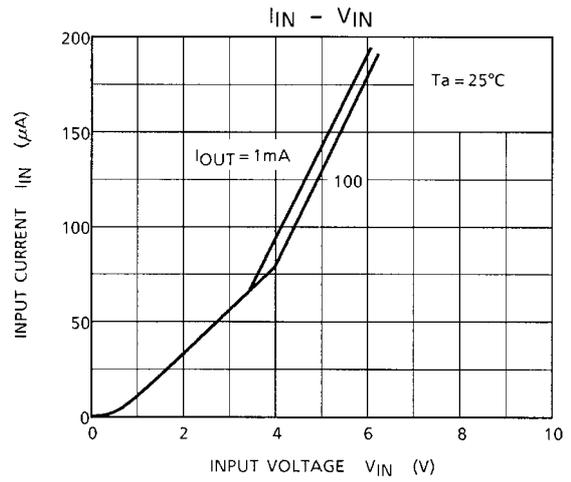
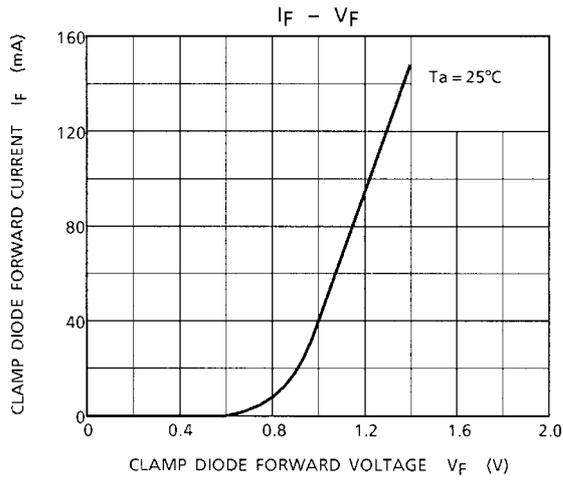
## PRECAUTIONS for USING

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.

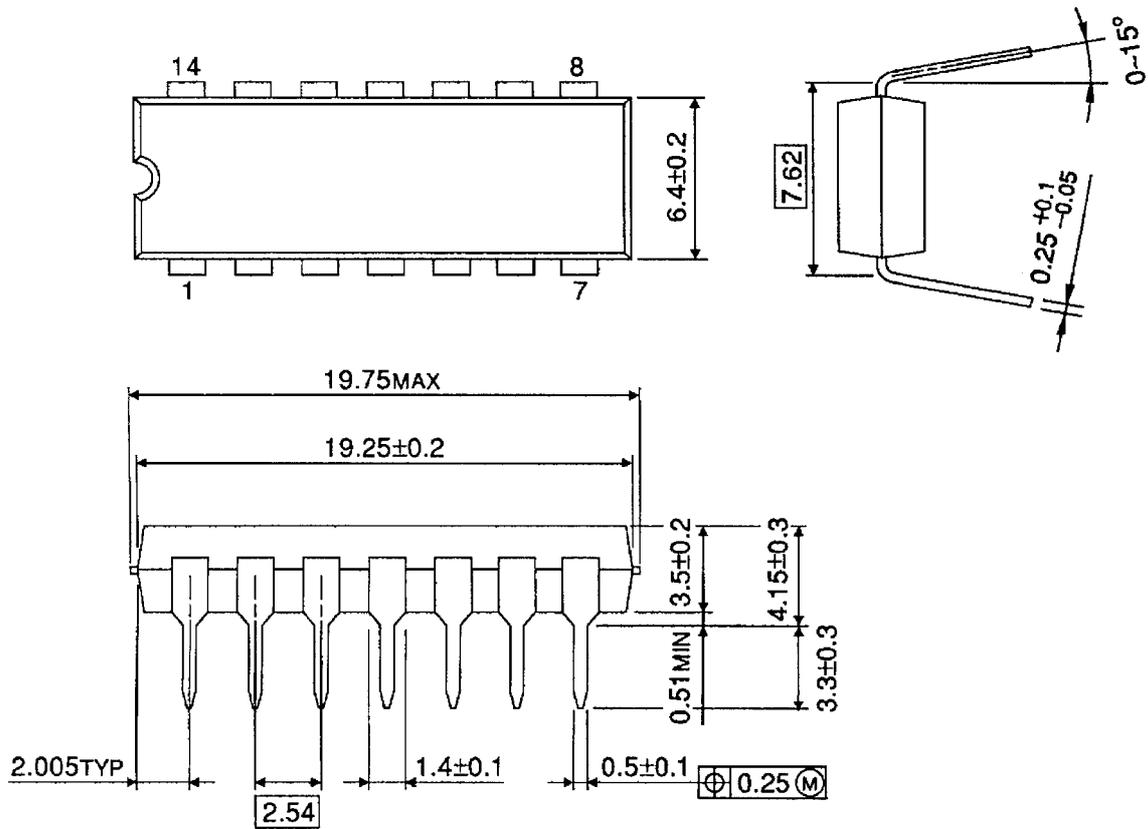
Utmost care is necessary in the design of the output line, COMMON and GND line since IC may be destroyed due to short-circuit between outputs, air contamination fault, or fault by improper grounding.



## PACKAGE DIMENSIONS

DIP14-P-300-2.54

Unit : mm

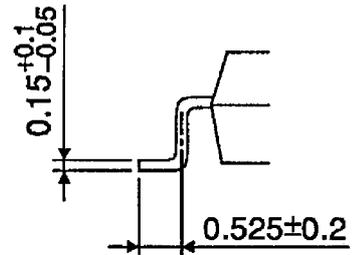
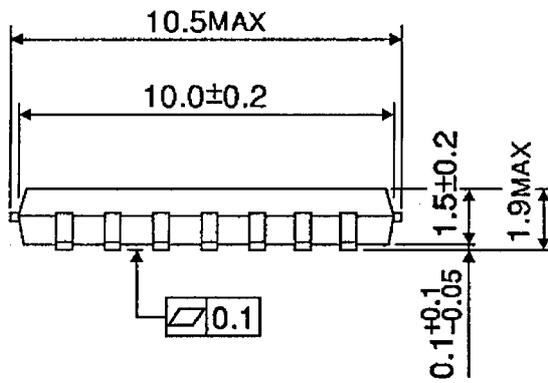
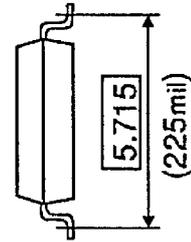
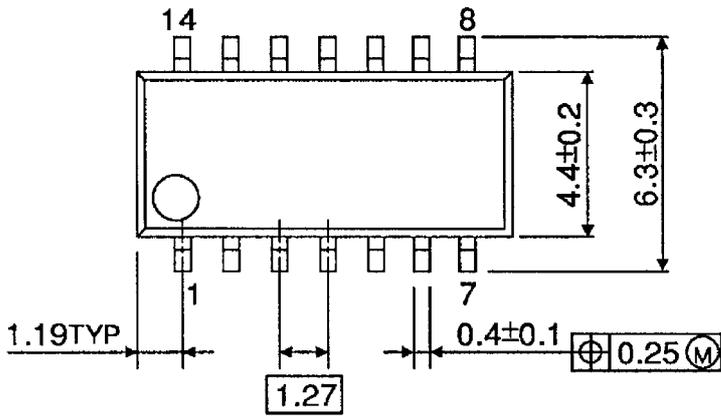


Weight: 1.11 g (Typ.)

## PACKAGE DIMENSIONS

SOP14-P-225-1.27

Unit : mm



Weight: 0.16 g (Typ.)

**RESTRICTIONS ON PRODUCT USE**

000707EBA

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