

TOSHIBA BIPOLAR DIGITAL INTEGRATED CIRCUIT SILICON MONOLITHIC

# TD62083AFN, TD62084AFN

## 8CH DARLINGTON SINK DRIVER

The TD62083AFN and TD62084AFN are high-voltage, high-current darlington drivers comprised of eight NPN darlington pairs.

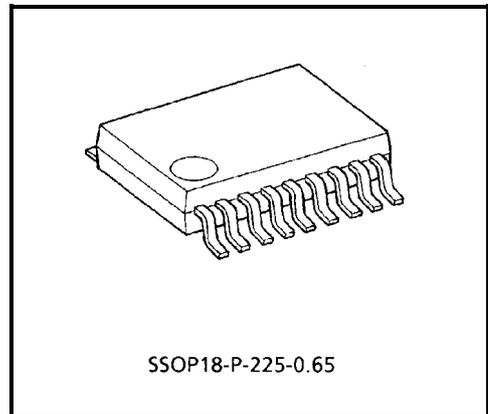
All units feature integral clamp diodes for switching inductive loads.

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

Please observe the thermal condition for using.

### FEATURES

- Package Type : SSOP18 pin
- High Sustaining Voltage Output : 50 V (Min)
- Output Current (Single Output) : 500 mA / ch (Max)
- Output Clamp Diodes
- Inputs compatible with Various Types of Logic.

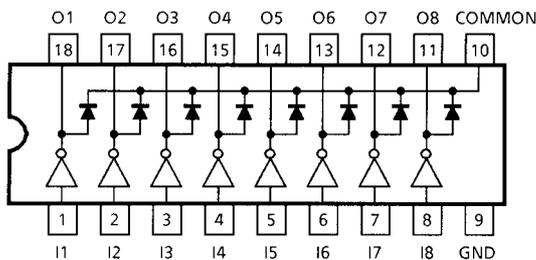


SSOP18-P-225-0.65

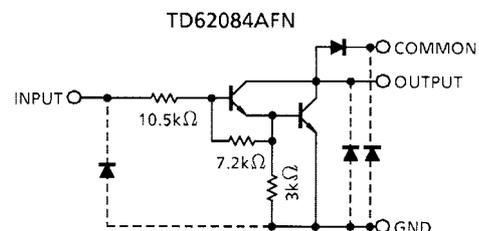
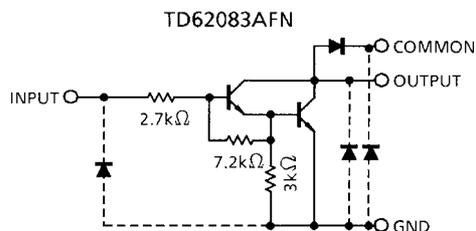
Weight: 0.09 g (Typ.)

TYPE	INPUT BASE RESISTOR	DESIGNATION
TD62083AFN	2.7 kΩ	TTL, 5-V CMOS
TD62084AFN	10.5 kΩ	6~15-V P-MOS, CMOS

### 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>	-0.5~50	V
Output Current	I <sub>OUT</sub>	500	mA / ch
Input Voltage	V <sub>IN</sub>	-0.5~30	V
Clamp Diode Reverse Voltage	V <sub>R</sub>	50	V
Clamp Diode Forward Current	I <sub>F</sub>	500	mA
Power Dissipation	P <sub>D</sub> (Note)	0.96	W
Operating Temperature	T <sub>opr</sub>	-40~85	°C
Storage Temperature	T <sub>stg</sub>	-55~150	°C

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

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

CHARACTERISTIC	SYMBOL	CONDITION	MIN	TYP.	MAX	UNIT	
Output Sustaining Voltage	V <sub>CE (SUS)</sub>		0	—	50	V	
Output Current	I <sub>OUT</sub> (Note)	DC 1 Circuit	—	—	350	mA / ch	
		T <sub>pw</sub> = 25 ms, 8 Circuits Ta = 85°C, T <sub>j</sub> = 120°C	Duty = 10%	0	—		260
			Duty = 50%	0	—		90
Input Voltage	V <sub>IN</sub>		0	—	30	V	
Input Voltage (Output ON)	TD62083	V <sub>IN(ON)</sub>	2.5	—	30	V	
	TD62084		8	—	30		
Clamp Diode Reverse Voltage	V <sub>R</sub>		—	—	50	V	
Clamp Diode Forward Current	I <sub>F</sub>		—	—	400	mA	
Power Dissipation	P <sub>D</sub>	Ta = 85°C (Note)	—	—	0.4	W	

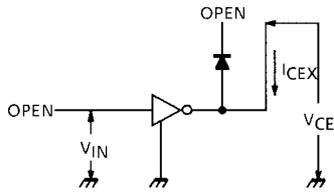
Note: On Glass Epoxy PCB (50 × 50 × 1.6 mm Cu 40%)

## ELECTRICAL CHARACTERISTICS (Ta = 25°C)

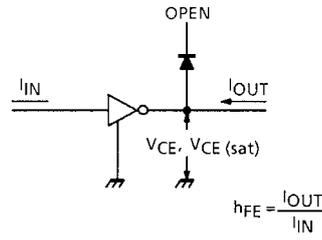
CHARACTERISTIC		SYMBOL	TEST CIR-CUIT	TEST CONDITION	MIN	TYP.	MAX	UNIT
Output Leakage Current	TD62083	I <sub>CEX</sub>	1	V <sub>CE</sub> = 50 V, Ta = 25°C	—	—	50	μA
				V <sub>CE</sub> = 50 V, Ta = 85°C	—	—	100	
	TD62084			V <sub>CE</sub> = 50 V, V <sub>IN</sub> = 1 V	—	—	500	
Output Saturation Voltage		V <sub>CE (sat)</sub>	2	I <sub>OUT</sub> = 350 mA, I <sub>IN</sub> = 500 μA	—	1.3	1.6	V
				I <sub>OUT</sub> = 200 mA, I <sub>IN</sub> = 350 μA	—	1.1	1.3	
				I <sub>OUT</sub> = 100 mA, I <sub>IN</sub> = 250 μA	—	0.9	1.1	
Input Current	TD62083	I <sub>IN (ON)</sub>	3	V <sub>IN</sub> = 3.85 V	—	0.93	1.35	mA
	TD62084			V <sub>IN</sub> = 5 V	—	0.35	0.5	
				V <sub>IN</sub> = 12 V	—	1.0	1.45	
		I <sub>IN (OFF)</sub>	4	I <sub>OUT</sub> = 500 μA, Ta = 85°C	50	65	—	μA
Input Voltage	TD62083	V <sub>IN (ON)</sub>	5	V <sub>CE</sub> = 2 V, I <sub>OUT</sub> = 200 mA	—	—	2.4	V
				V <sub>CE</sub> = 2 V, I <sub>OUT</sub> = 250 mA	—	—	2.7	
				V <sub>CE</sub> = 2 V, I <sub>OUT</sub> = 300 mA	—	—	3.0	
	TD62084			V <sub>CE</sub> = 2 V, I <sub>OUT</sub> = 125 mA	—	—	5.0	
				V <sub>CE</sub> = 2 V, I <sub>OUT</sub> = 200 mA	—	—	6.0	
				V <sub>CE</sub> = 2 V, I <sub>OUT</sub> = 275 mA	—	—	7.0	
				V <sub>CE</sub> = 2 V, I <sub>OUT</sub> = 350 mA	—	—	8.0	
DC Current Transfer Ratio		h <sub>FE</sub>	2	V <sub>CE</sub> = 2 V, I <sub>OUT</sub> = 350 mA	1000	—	—	
Clamp Diode Reverse Current		I <sub>R</sub>	6	Ta = 25°C, V <sub>R</sub> = 50 V	—	—	50	μA
				Ta = 85°C, V <sub>R</sub> = 50 V	—	—	100	
Clamp Diode Forward Voltage		V <sub>F</sub>	7	I <sub>F</sub> = 350 mA	—	—	2.0	V
Input Capacitance		C <sub>IN</sub>	—		—	15	—	pF
Turn-On Delay		t <sub>ON</sub>	8	R <sub>L</sub> = 125 Ω, V <sub>OUT</sub> = 50 V	—	0.1	—	μs
Turn-Off Delay		t <sub>OFF</sub>		R <sub>L</sub> = 125 Ω, V <sub>OUT</sub> = 50 V	—	0.2	—	

**TEST CIRCUIT**

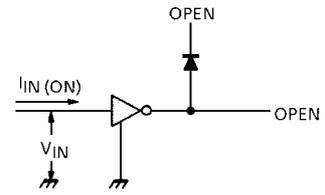
**1.  $I_{CEX}$**



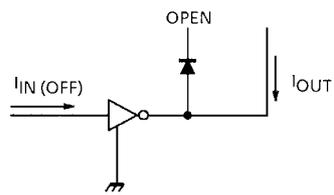
**2.  $V_{CE} (sat), h_{FE}$**



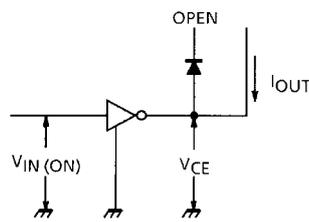
**3.  $I_{IN} (ON)$**



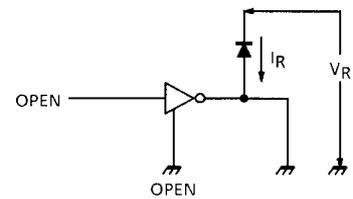
**4.  $I_{IN} (OFF)$**



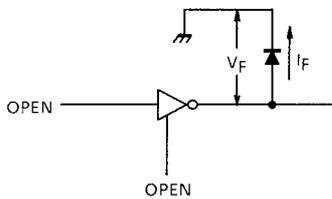
**5.  $V_{IN} (ON)$**



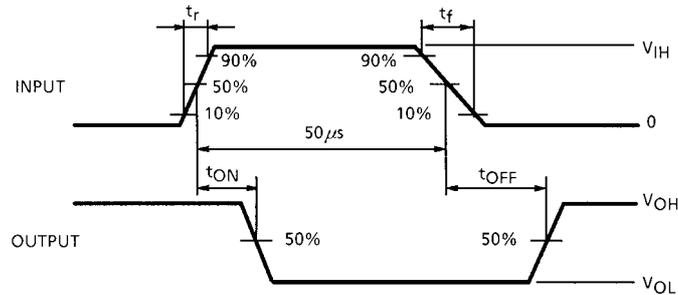
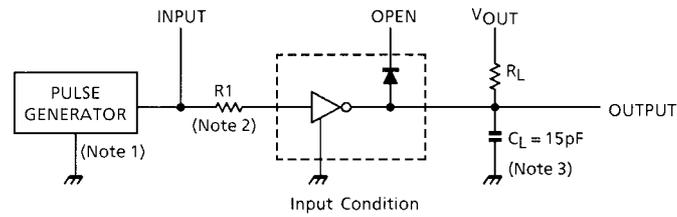
**6.  $I_R$**



**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: See below

Input Condition

TYPE NUMBER	R1	$V_{IH}$
TD62083AFN	0	3 V
TD62084AFN	0	8 V

Note 3: CL includes probe and jig capacitance

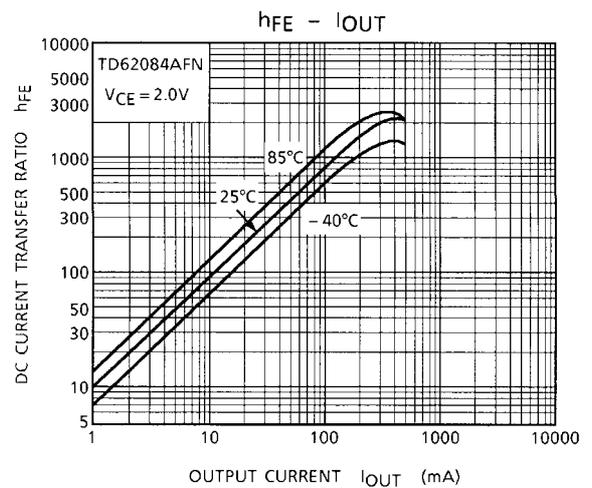
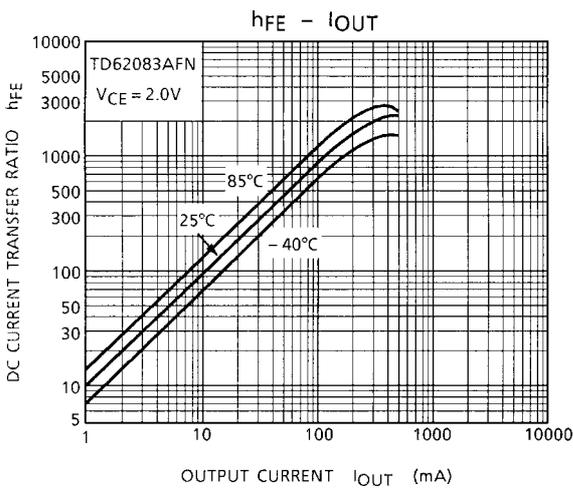
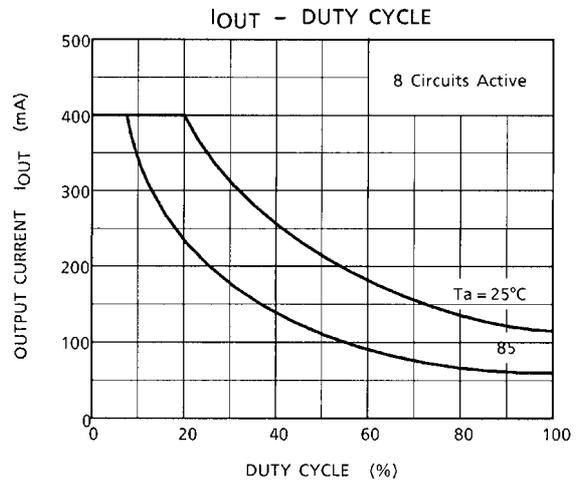
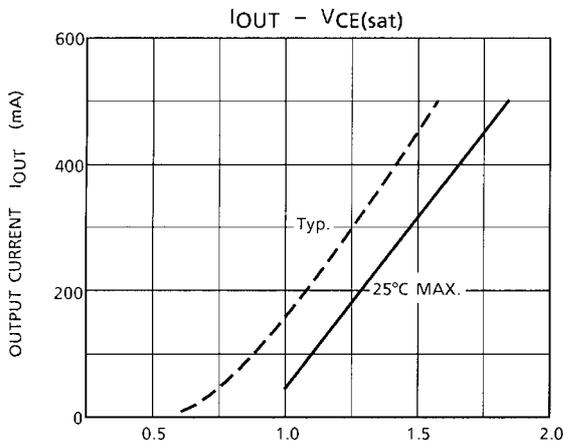
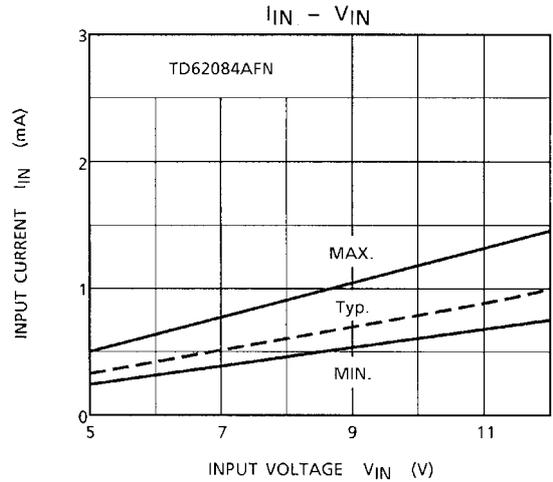
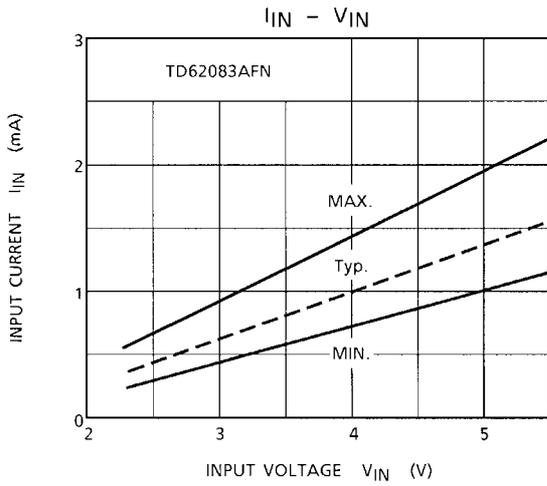
**PRECAUTIONS for USING**

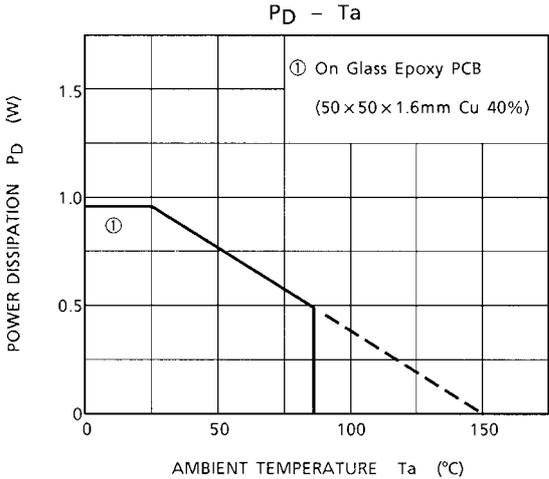
This IC does not include built-in protection circuits for excess current or overvoltage.

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.

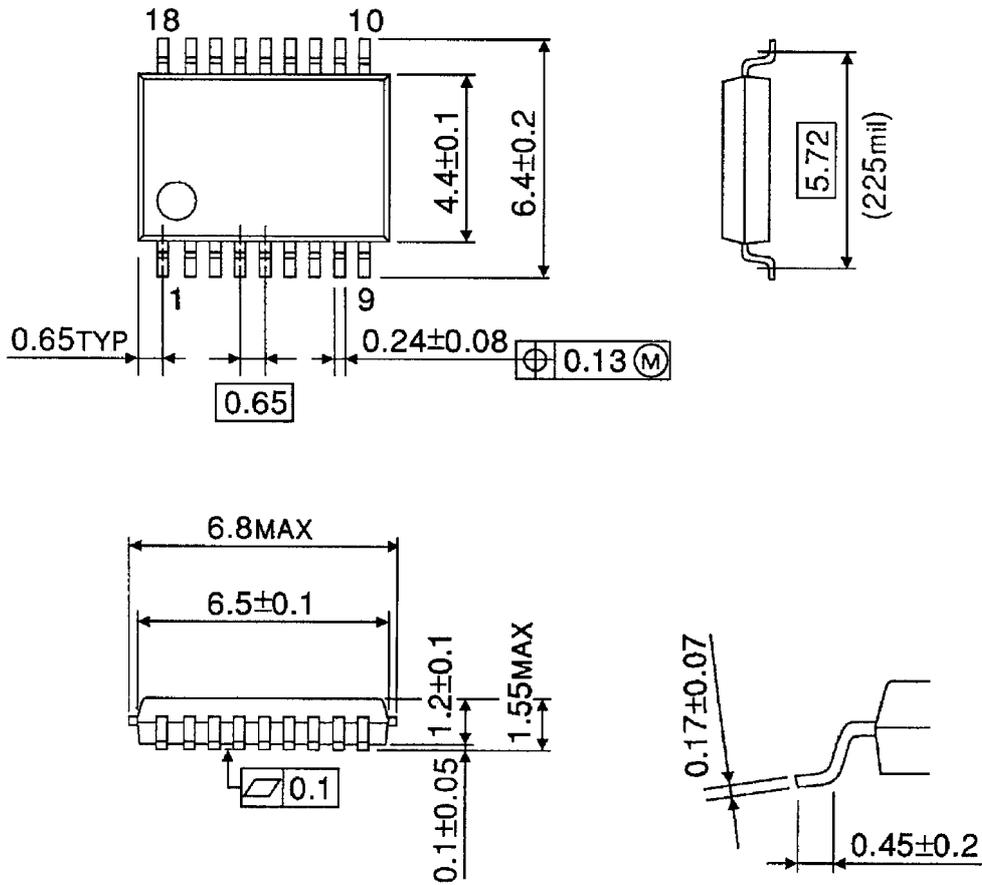




## PACKAGE DIMENSIONS

SSOP18-P-225-0.65

Unit : mm



Weight: 0.09 g (Typ.)

**RESTRICTIONS ON PRODUCT USE**

000707EBA

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