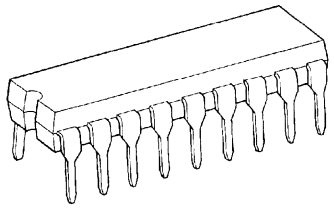
TOSHIBA BIPOLAR DIGITAL INTEGRATED CIRCUIT SILICON MONOLITHIC

TD62083APA

8CH DARLINGTON SINK DRIVER

The TD62083APA is 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.



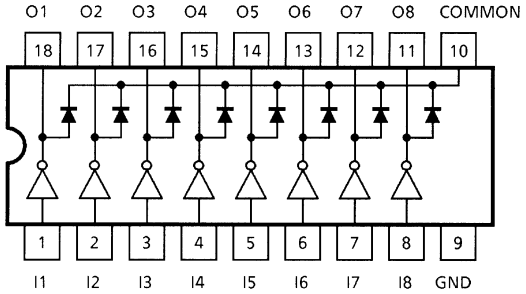
DIP18-P-300-2.54F

Weight: 1.478 g (Typ.)

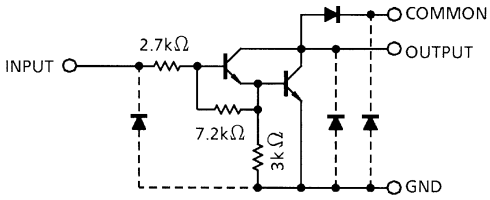
FEATURES

- Output current (single output) 500 mA MAX.
- High sustaining voltage output 50 V MIN.
- Output clamp diodes
- Inputs resistor : R_{IN} = 2.7 kΩ Typ.
- Inputs compatible with TTL, 5 V CMOS
- Package Type−AP : DIP−18 pin.

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	$V_{CE\ (SUS)}$	−0.5~50	V
Output Current	I_{OUT}	500	mA / ch
Input Voltage	V_{IN}	−0.5~30	V
Clamp Diode Reverse Voltage	V_R	50	V
Clamp Diode Forward Current	I_F	500	mA
Power Dissipation	P_D	1.47	W
Operating Temperature	T_{opr}	−40~85	°C
Storage Temperature	T_{stg}	−55~150	°C

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

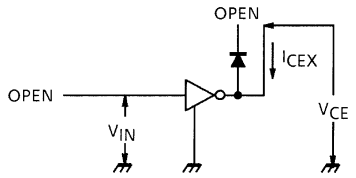
CHARACTERISTIC		SYMBOL	TEST CONDITION		MIN	TYP.	MAX	UNIT
Output Sustaining Voltage		$V_{CE\ (SUS)}$			0	—	50	V
Output Current		I_{OUT}	DC 1 Circuit, Ta = 25°C		0	—	400	mA / ch
			T_{pw} = 25 ms 8 Circuits Ta = 85°C T_j = 120°C	Duty = 10%	0	—	347	
				Duty = 50%	0	—	123	
Input Voltage		V_{IN}			0	—	30	V
Input Voltage	Output On	$V_{IN\ (ON)}$			2.5	—	30	V
	Output Off	$V_{IN\ (OFF)}$			0	—	0.5	
Clamp Diode Reverse Voltage		V_R			—	—	50	V
Clamp Diode Forward Current		I_F			—	—	400	mA
Power Dissipation		P_D			—	—	0.52	W

ELECTRICAL CHARACTERISTICS (Ta = 25°C)

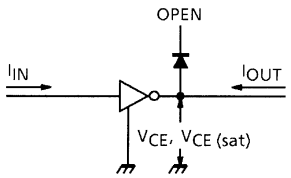
CHARACTERISTIC		SYMBOL	TEST CIR-CUIT	TEST CONDITION	MIN	TYP.	MAX	UNIT
Output Leakage Current		I_{CEX}	1	V_{CE} = 50 V, Ta = 25°C	—	—	50	μA
				V_{CE} = 50 V, Ta = 85°C	—	—	100	
Collector−Emitter Saturation Voltage		$V_{CE\ (sat)}$	2	I_{OUT} = 350 mA, I_{IN} = 500 μA	—	1.3	1.6	V
				I_{OUT} = 200 mA, I_{IN} = 350 μA	—	1.1	1.3	
				I_{OUT} = 100 mA, I_{IN} = 250 μA	—	0.9	1.1	
DC Current Transfer Ratio		h_{FE}	2	V_{CE} = 2 V, I_{OUT} = 350 mA	1000	—	—	
Input Current	Output On	$I_{IN\ (ON)}$	3	V_{IN} = 3.85 V	—	0.93	1.35	mA
	Output Off	$I_{IN\ (OFF)}$	4	I_{OUT} = 500 μA, Ta = 85°C	50	65	—	μA
Input Voltage	Output On	$V_{IN\ (ON)}$	5	V_{CE} = 2 V, I_{OUT} = 250 mA	—	—	2.7	V
				V_{CE} = 2 V, I_{OUT} = 300 mA	—	—	3.0	
Clamp Diode Reverse Current		I_R	6	V_R = 50 V, Ta = 25°C	—	—	50	μA
				V_R = 50 V, Ta = 85°C	—	—	100	
Clamp Diode Forward Voltage		V_F	7	I_F = 350 mA	—	—	2.0	V
Input Capacitance		C_{IN}	—		—	15	—	pF
Turn−On Delay		t_{ON}	8	V_{OUT} = 50 V, R_L = 125 Ω, C_L = 15 pF	—	0.1	—	μs
Turn−Off Delay		t_{OFF}	8		—	0.2	—	

TEST CIRCUIT

1. I_{CEX}

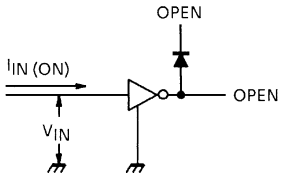


2. $V_{CE\ (sat)}$, h_{FE}

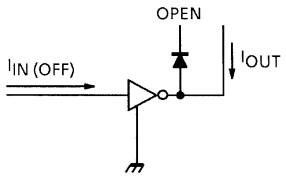


$$h_{FE} = \frac{I_{OUT}}{I_{IN}}$$

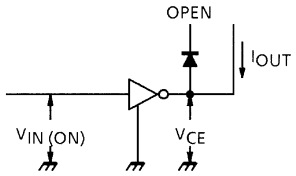
3. $I_{IN\ (ON)}$



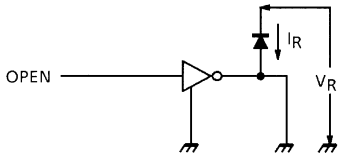
4. $I_{IN\ (OFF)}$



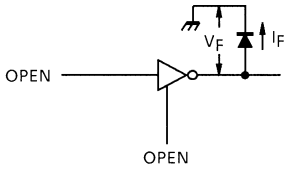
5. $V_{IN\ (ON)}$



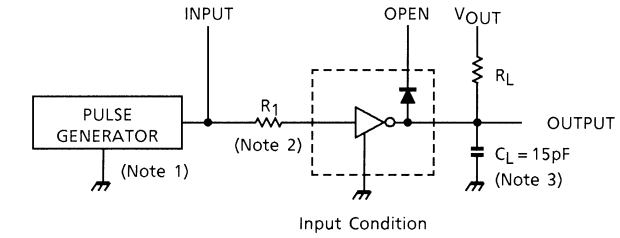
6. I_R

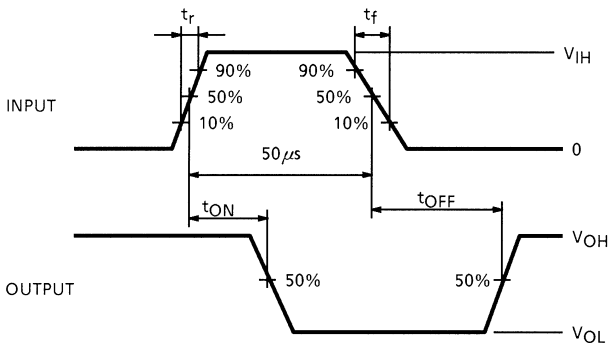


7. V_F



8. t_{ON}, t_{OFF}





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

Note 2: See below
INPUT CONDITION

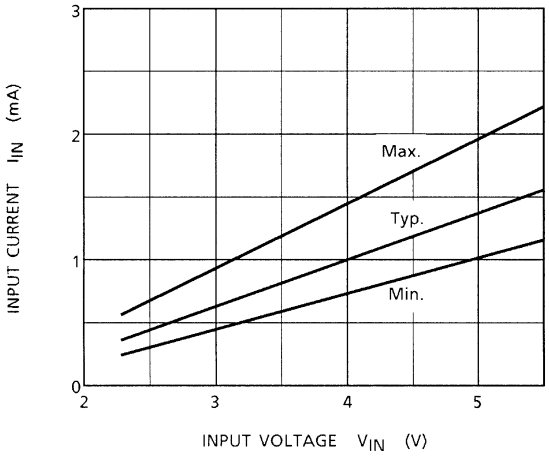
TYPE NUMBER	R_{IN}	V_{IH}
TD62083APA	0	3 V

Note 3: C_L includes probe and jig capacitance.

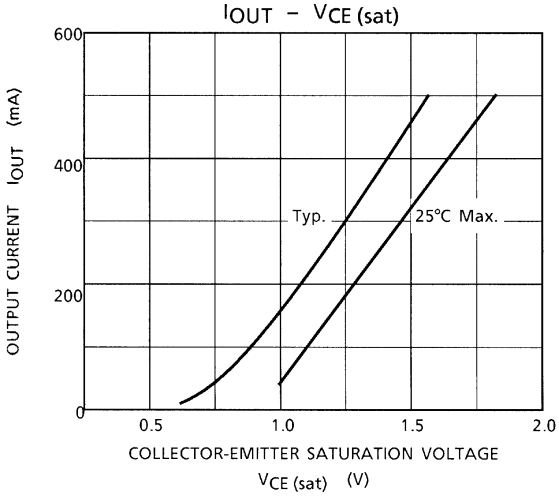
PRECAUTIONS for USING

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, COMMON and GND line since IC may be destroyed due to short−circuit between outputs, air contamination fault, or fault by improper grounding.

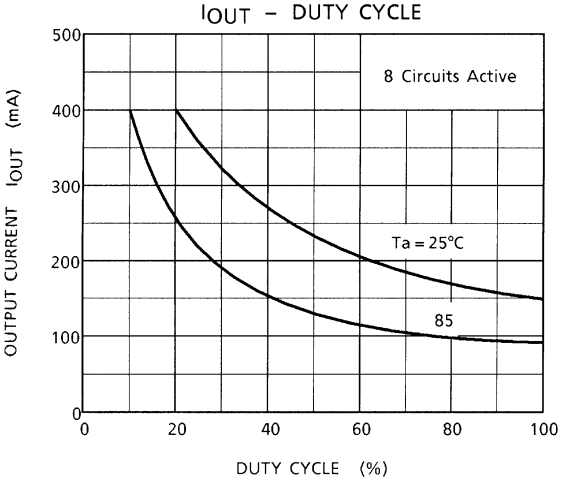
I_{IN} – V_{IN}



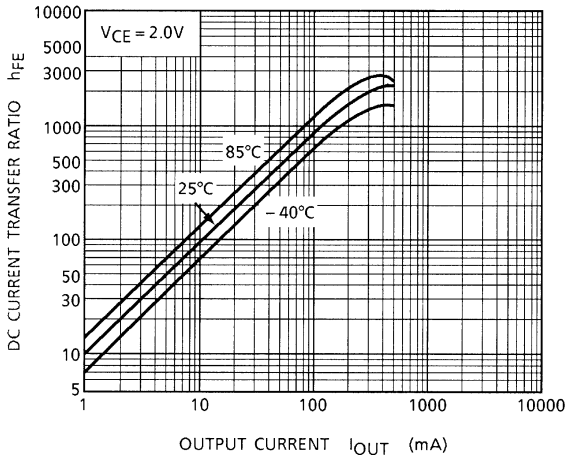
I_{OUT} – $V_{CE\ (sat)}$



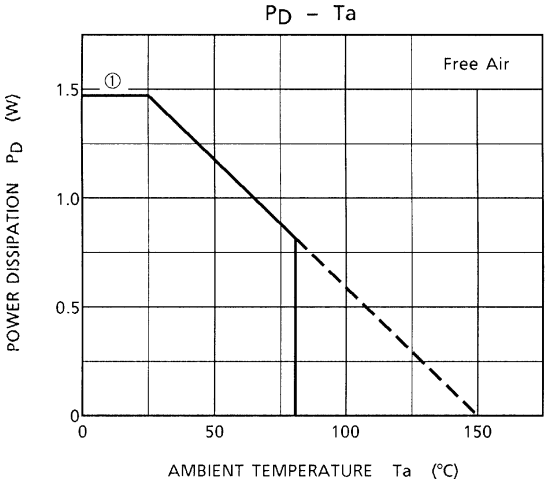
I_{OUT} – DUTY CYCLE



h_{FE} – I_{OUT}

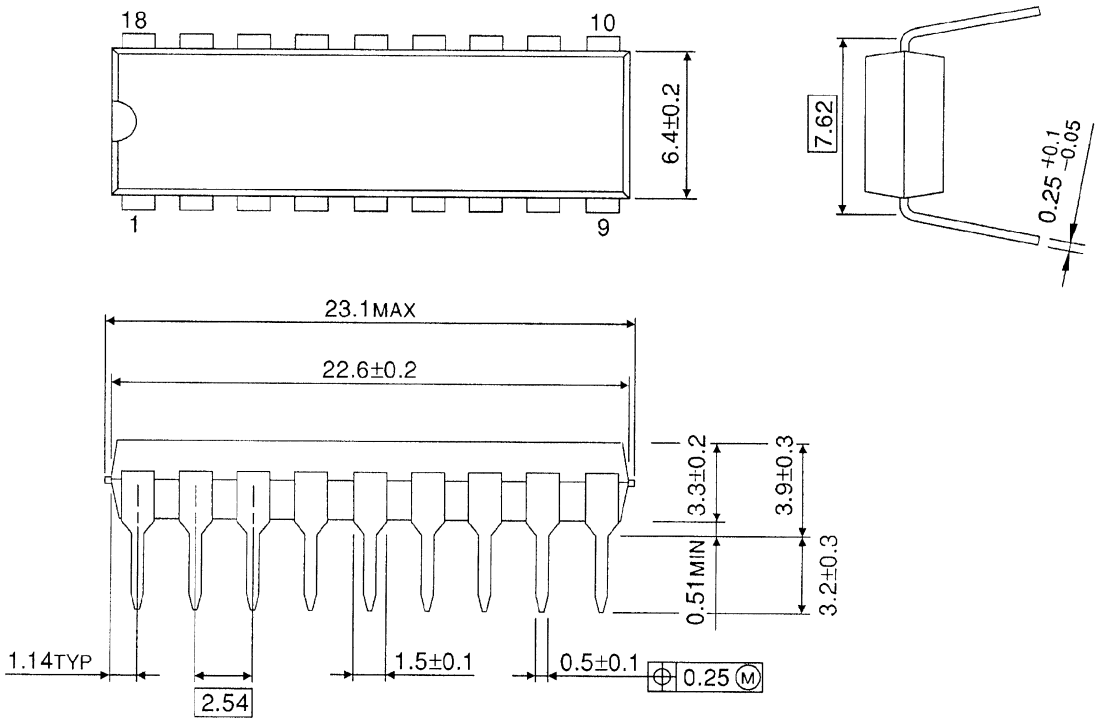


P_D – Ta



PACKAGE DIMENSIONS

DIP18−P−300−2.54F Unit : mm



Weight: 1.478 g (Typ.)

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