

TOSHIBA BIPOLAR DIGITAL INTEGRATED CIRCUIT SILICON MONOLITHIC

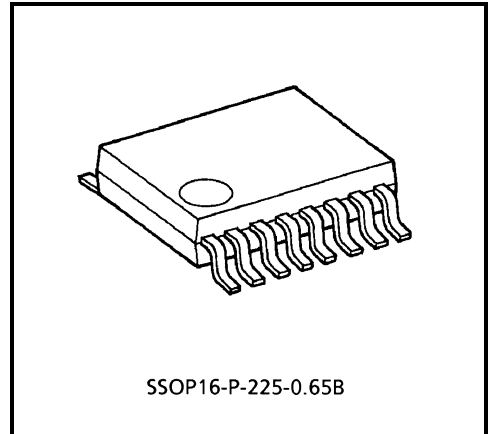
TD62304AFN,TD62305AFN

7CH LOW INPUT ACTIVE DARLINGTON SINK DRIVER

The TD62304AFN and TD62305AFN 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.

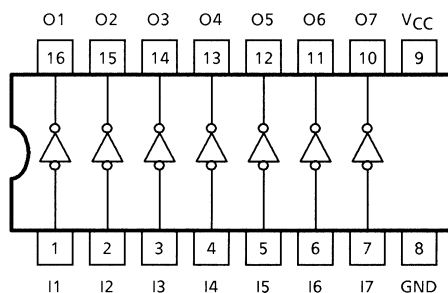
FEATURES

- 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



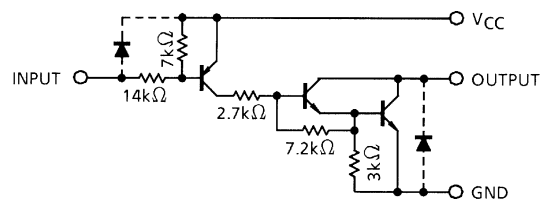
Weight: 0.07 g (Typ.)

PIN CONNECTION (TOP VIEW)

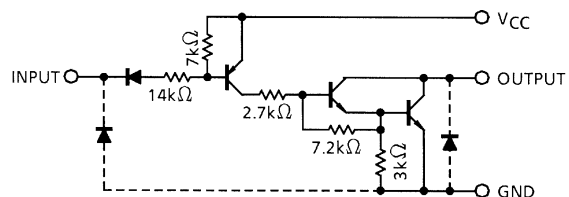


SCHEMATICS (EACH DRIVER)

TD62304AFN



TD62305AFN



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 _{CC}	-0.5~7.0	V
Output Sustaining Voltage		V _{CE (SUS)}	-0.5~50	V
Output Current		I _{OUT}	500	mA / ch
Input Voltage	TD62304	V _{IN}	-22~V _{CC} + 0.5	V
	TD62305		-0.5~7	
Input Current		I _{IN}	-10	mA
Power Dissipation		P _D	0.78 (Note 1)	W
Operating Temperature		T _{opr}	-40~85	°C
Storage Temperature		T _{stg}	-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 _{CC}			4.5	5.0	5.5	V
Output Sustaining Voltage		V _{CE (SUS)}			0	—	50	V
Output Current		I _{OUT (Note)}	DC 1 Circuit		0	—	400	mA / ch
			T _{pw} ≤ 25 ms 7 Circuit T _j = 120°C Ta = 85°C	Duty = 10%	0	—	260	
				Duty = 50%	0	—	65	
Input Voltage	TD62304	V _{IN}			-20	—	V _{CC}	V
	TD62305				0	—	5.5	
Input Voltage (Output On)	TD62304	V _{IN (ON)}			-22	—	V _{CC} -3.5	V
	TD62305				-0.5	—	V _{CC} -3.7	
Input Voltage (Output Off)	TD62304	V _{IN (OFF)}			V _{CC} -0.4	—	V _{CC}	V
	TD62305				V _{CC} -0.6	—	V _{CC}	
Power Dissipation		P _D	Ta = 85°C (Note)		—	—	0.325	W

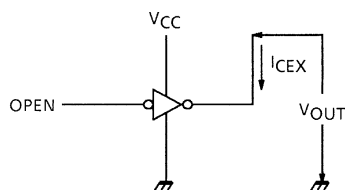
Note: On Glass Epoxy PCB (50 × 50 × 1.6 mm Cu 40%)

ELECTRICAL CHARACTERISTICS (Ta = 25°C)

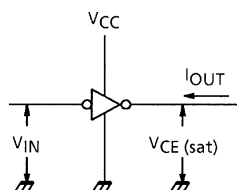
CHARACTERISTIC		SYMBOL	TEST CIR-CUIT	TEST CONDITION	MIN	TYP.	MAX	UNIT
Output Leakage Current		I_{CEX}	1	$V_{CC} = 5.5 \text{ V}$, $V_{OUT} = 50 \text{ V}$ $T_a = 85^\circ\text{C}$, $I_{IN} = 0$	—	—	100	μA
Output Saturation Voltage		$V_{CE} \text{ (sat)}$	2	$V_{CC} = 4.5 \text{ V}$, $I_{OUT} = 350 \text{ mA}$	$V_{IN} = V_{IN} \text{ (ON) MAX.}$	—	1.4	2.0
					$V_{IN} = 0.8 \text{ V}$	—	1.4	2.2
Input Current		$I_{IN} \text{ (ON)}$	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		$I_{IN} \text{ (OFF)}$	4		—	—	-40	μA
Output Voltage	TD62304	$V_{IN} \text{ (ON)}$	5		—	—	$V_{CC} - 2.8$	V
	TD62305				—	—	$V_{CC} - 3.7$	
Supply Current		$I_{CC} \text{ (ON)}$	6	$V_{CC} = 5.5 \text{ V}$, $V_{IN} = 0 \text{ V}$	—	17	22	mA
Supply Current		$I_{CC} \text{ (OFF)}$		$V_{CC} = V_{IN} = 5.5 \text{ V}$	—	—	100	μA
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	—	μs
Turn-Off Delay		t_{OFF}			—	3	—	

TEST CIRCUIT

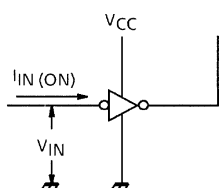
1. I_{CEX}



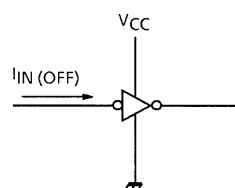
2. $V_{CE(sat)}$



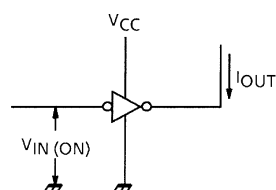
3. $I_{IN(ON)}$



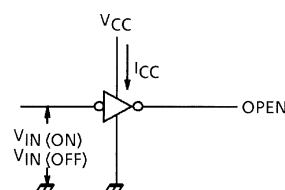
4. $I_{IN(OFF)}$



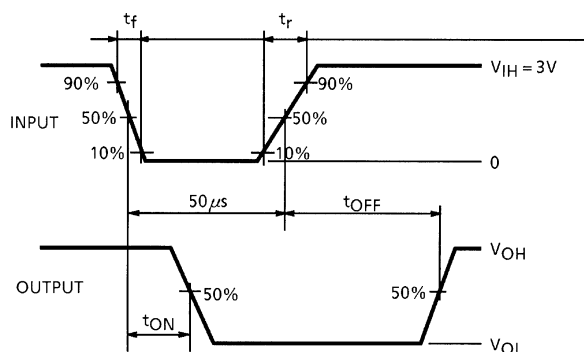
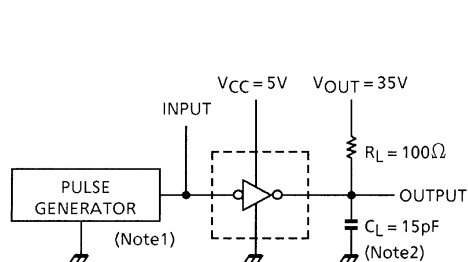
5. $V_{IN(ON)}$



6. I_{CC}



7. t_{ON} , t_{OFF}



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

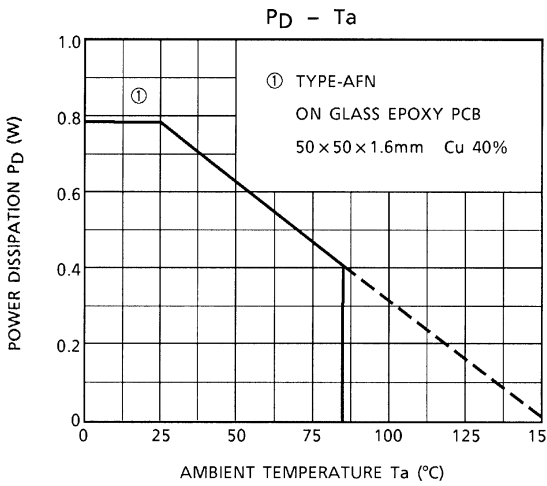
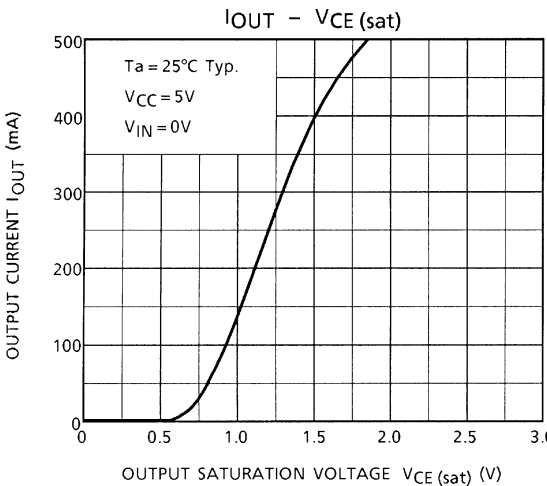
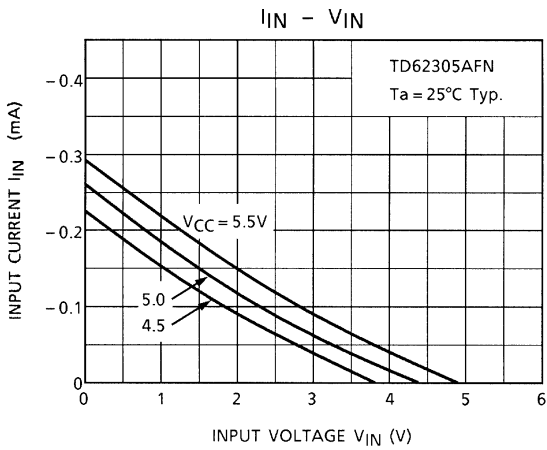
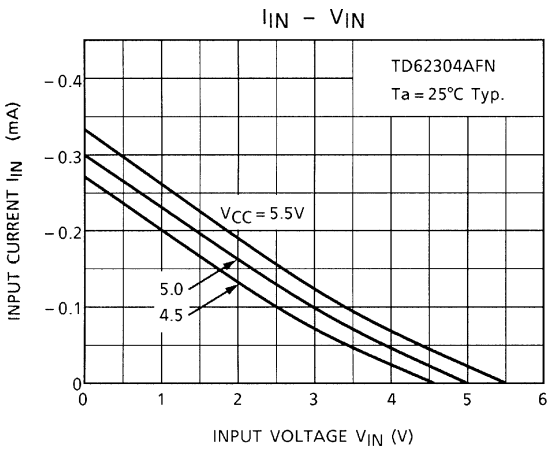
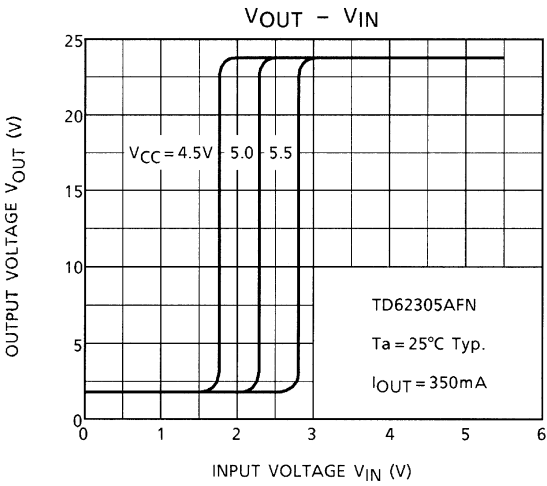
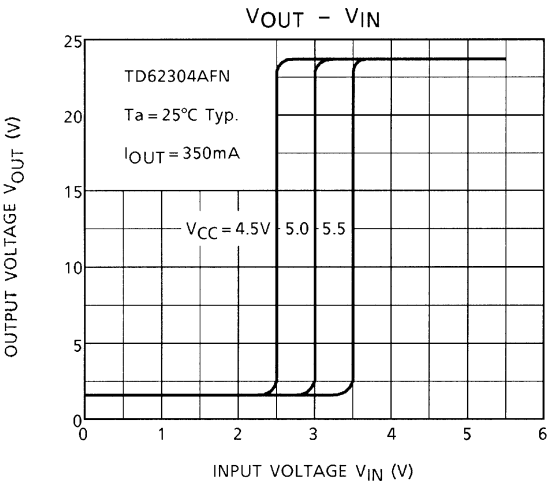
PRECAUTIONS for USING

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.

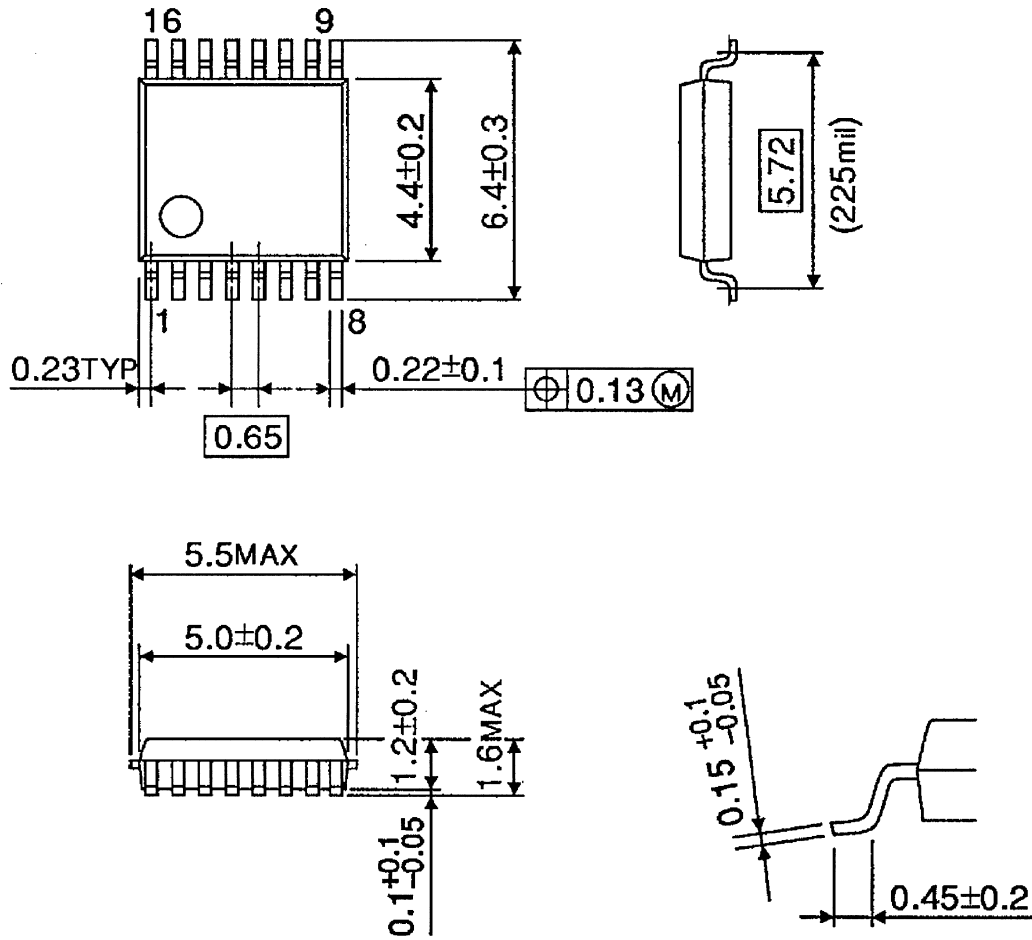
Utmost care is necessary in the design of the output line, VCC and GND line since IC may be destroyed due to short-circuit between outputs, air contamination fault, or fault by improper grounding.



PACKAGE DIMENSIONS

SSOP16-P-225-0.65B

Unit : mm



Weight: 0.07 g (Typ.)

RESTRICTIONS ON PRODUCT USE

000707EBA

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