

TOSHIBA BIPOLAR DIGITAL INTEGRATED CIRCUIT SILICON MONOLITHIC

# TD62304FB, TD62305FB

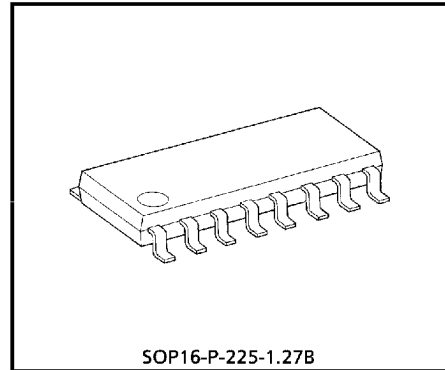
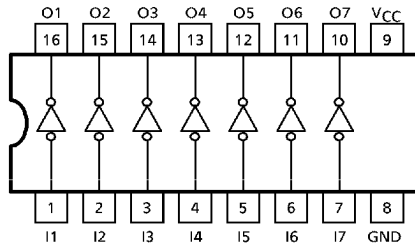
## 7CH LOW INPUT ACTIVE DARLINGTON SINK DRIVER

The TD62304FB and TD62305FB are non-inverting transistor arrays, which are comprised of seven NPN darlington output stages PNP input stages. These devices are Low Level input active drivers and are suitable for operations with TTL, 5V CMOS and 5V Microprocessor which have sink current output drivers. Applications include relay, hammer, lamp and LED driver.

### FEATURES

- Output current (single output) : 500mA (Max.)
- High sustaining voltage : 35V (Min.)
- Low level active input
- Standard supply voltage
- Input compatible with TTL and 5V CMOS
- Package type-FB : SOP-16pin

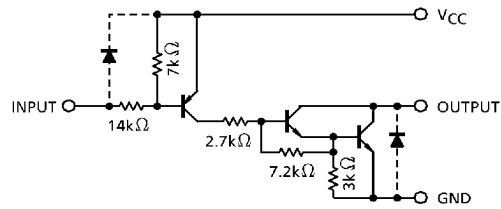
### PIN CONNECTION (TOP VIEW)



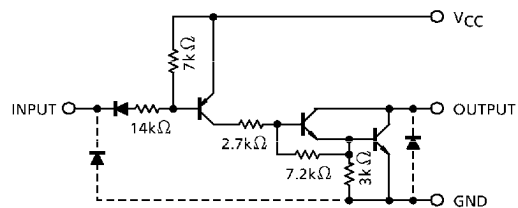
Weight : 0.16g (Typ.)

### SCHEMATICS (EACH DRIVER)

TD62304FB



TD62305FB



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

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**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>	-0.5~35	V
Output Current	I <sub>OUT</sub>	500	mA / ch
Input Voltage	V <sub>IN</sub>	-22~V <sub>CC</sub> + 0.5	V
		-0.5~7 (Note 1)	
Input Current	I <sub>IN</sub>	-10	mA
Power Dissipation	P <sub>D</sub>	0.625 (Note 2)	W
Operating Temperature	T <sub>opr</sub>	-40~85	°C
Storage Temperature	T <sub>stg</sub>	-50~150	°C

(Note 1) On glass epoxy PCB (30×30×1.6mm Cu 50%)

(Note 2) TD62305FB only

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

CHARACTERISTIC		SYMBOL	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	—	35	V	
Output Current		I <sub>OUT</sub>	DC 1 circuit	0	—	400	mA / ch	
			T <sub>pw</sub> ≤ 25ms 7 circuits T <sub>j</sub> = 120°C Ta = 85°C (Note)	Duty = 10%	0	—		240
				Duty = 50%	0	—		60
Input Voltage	TD62304FB	V <sub>IN</sub>	—	-20	—	V <sub>CC</sub>	V	
	TD62305FB			0	—	5.5		
Input Voltage (Output On)	TD62304FB	V <sub>IN (ON)</sub>	—	-22	—	V <sub>CC</sub> -3.5	V	
	TD62305FB			-0.5	—	V <sub>CC</sub> -3.7		
Input Voltage (Output Off)	TD62304FB	V <sub>IN (OFF)</sub>	—	V <sub>CC</sub> -0.4	—	V <sub>CC</sub>	V	
	TD62305FB			V <sub>CC</sub> -0.6	—	V <sub>CC</sub>		
Power Dissipation		P <sub>D</sub>	(Note)	—	—	0.325	W	

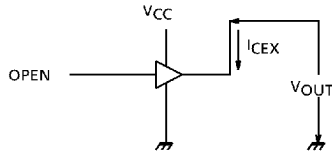
(Note) On glass epoxy PCB (30×30×1.6mm Cu 50%)

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

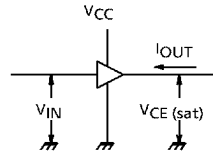
CHARACTERISTIC		SYMBOL	TEST CIR-CUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Output Leakage Current		$I_{CEX}$	1	$V_{CC} = 5.5V, V_{OUT} = 35V$ $T_a = 85^\circ C, I_{IN} = 0$	—	—	- 100	$\mu A$
Output Saturation Voltage		$V_{CE (sat)}$	2	$V_{CC} = 4.5V$ $I_{OUT} = 350mA$	—	1.4	2.0	V
				$V_{IN} = V_{IN (ON)}$ (Max.) $V_{IN} = 0.8V$				
Input Current	(Output On)	$I_{IN (ON)}$	3	$V_{CC} = 5.5V, V_{IN} = 0.4V$ $V_{CC} = 5.5V, V_{IN} = -20V$	—	- 0.32	- 0.45	mA
	(Output Off)	$I_{IN (OFF)}$	4	—	—	—	- 40	
Input Voltage (Output On)	TD62304FB	$V_{IN (ON)}$	5	—	—	—	$V_{CC} - 2.8$	V
	TD62305FB						$V_{CC} - 3.7$	
Supply Current	(Output On)	$I_{CC (ON)}$	6	$V_{CC} = 5.5V, V_{IN} = 0V$	—	17	22	mA
	(Output Off)	$I_{CC (OFF)}$		$V_{CC} = V_{IN} = 5.5V$	—	—	100	
Turn-On Delay	$t_{ON}$		7	$V_{CC} = 5V, C_L = 15pF$ $V_{OUT} = 35V, R_L = 87.5\Omega$	—	0.1	—	$\mu s$
Turn-Off Delay	$t_{OFF}$				—	3	—	

TEST CIRCUIT

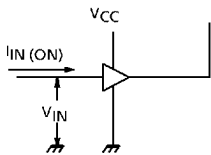
1.  $I_{CEX}$



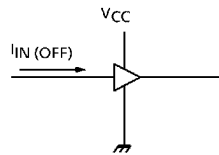
2.  $V_{CE(sat)}$



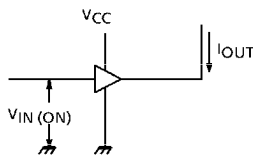
3.  $I_{IN(ON)}$



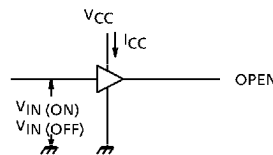
4.  $I_{IN(OFF)}$



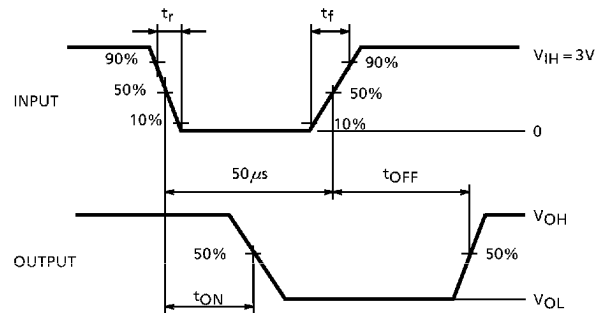
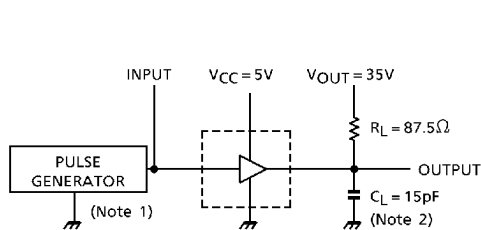
5.  $V_{IN(ON)}$



6.  $I_{CC}$



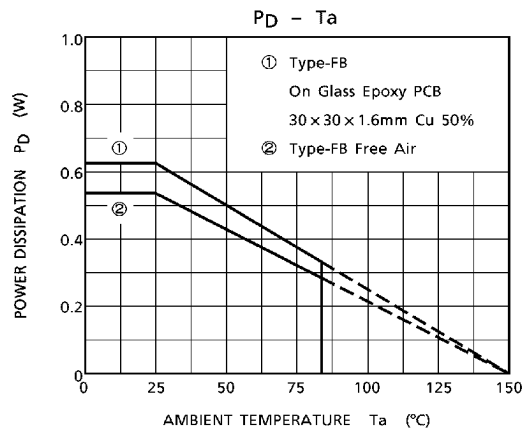
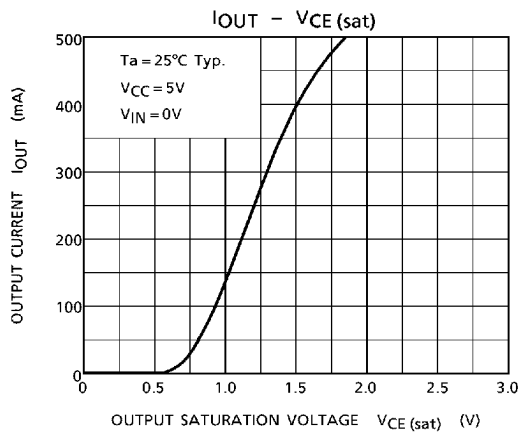
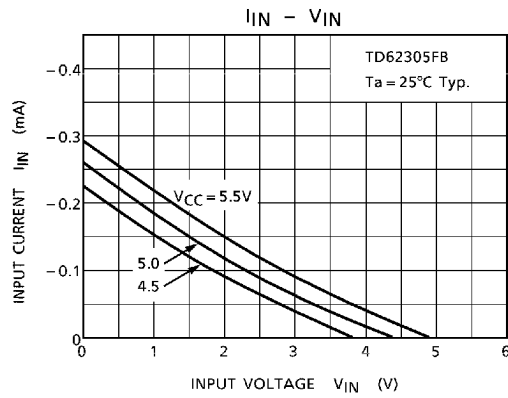
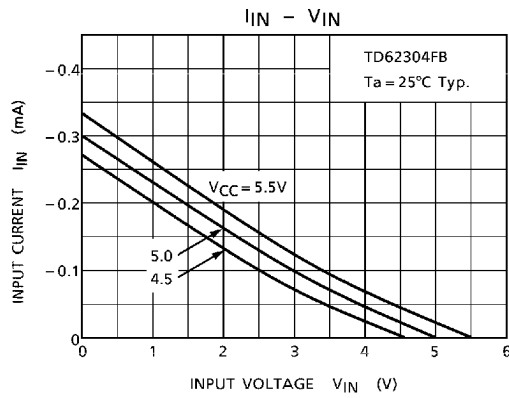
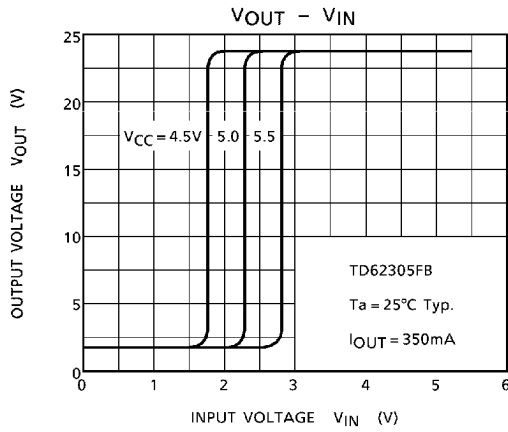
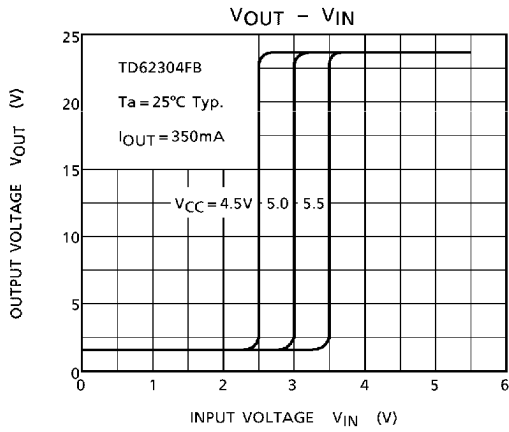
7.  $t_{ON}, t_{OFF}$



- (Note 1) Pulse width  $50\mu s$ , duty cycle 10%  
Output impedance  $50\Omega$ ,  $t_r \leq 10ns$ ,  $t_f \leq 5ns$
- (Note 2)  $C_L$  includes probe and jig capacitance

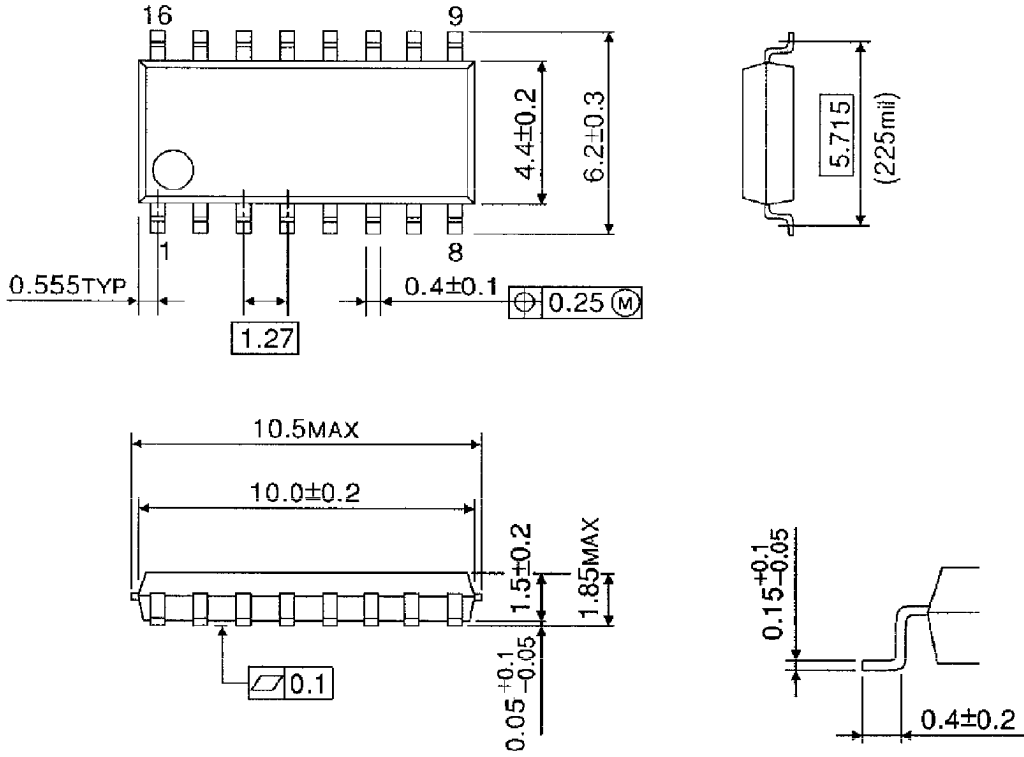
PRECAUTIONS for USING

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



**OUTLINE DRAWING**  
SOP16-P-225-1.27B

Unit : mm



Weight : 0.16g (Typ.)