

TOSHIBA BIPOLAR DIGITAL INTEGRATED CIRCUIT SILICON MONOLITHIC

TD62003FB, TD62004FB

7CH DARLINGTON SINK DRIVER

The TD62003FB series are high-voltage, high-current darlington drivers comprised of seven NPN darlington pairs.

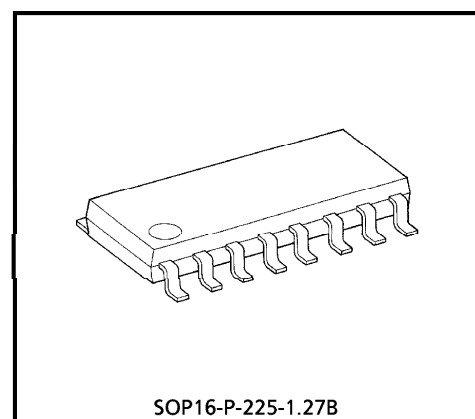
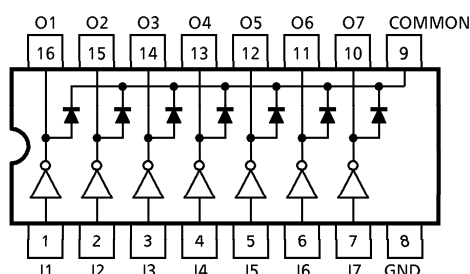
All units feature integral clamp diodes for switching inductive loads.

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

FEATURES

- Output current (single output) : 500mA / ch (Max.)
- High sustaining voltage output : 35V (Min.)
- Output clamp diodes
- Inputs compatible with various types of logic.
TD62003FB : $R_{IN} = 2.7k\Omega$
TD62004FB : $R_{IN} = 10.5k\Omega$
- Package SOP-16 pin

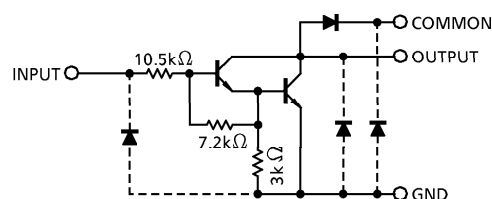
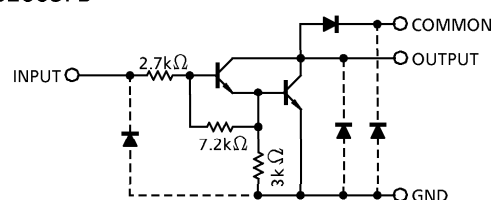
PIN CONNECTION (TOP VIEW)



Weight : 0.16g (Typ.)

SCHEMATICS (EACH DRIVER)

TD62003FB



(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
Output Sustaining Voltage	V _{CE (SUS)}	– 0.5~35	V
Output Current	I _{OUT}	500	mA / ch
Input Voltage	V _{IN}	– 0.5~30	V
Clamp Diode Reverse Voltage	V _R	35	V
Clamp Diode Forward Current	I _F	500	mA
Power Dissipation	P _D	0.54 / 0.625 (Note)	W
Operating Temperature	T _{opr}	– 40~85	°C
Storage Temperature	T _{stg}	– 55~150	°C

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

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

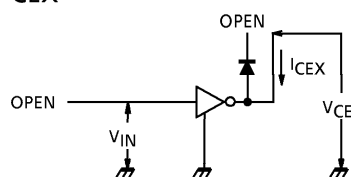
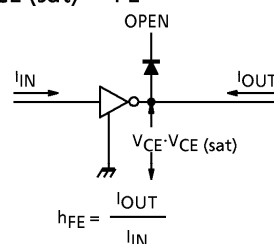
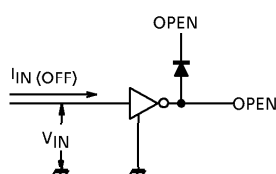
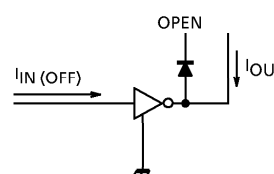
CHARACTERISTIC	SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT
Output Sustaining Voltage	V _{CE (SUS)}	—	0	—	35	V
Output Current	I _{OUT}	DC 1 Circuit	0	—	350	mA / ch
		T _{pw} = 25ms T _j = 120°C 7 Circuits	0	—	275	
		Ta = 85°C Duty = 50%	0	—	90	
Input Voltage	V _{IN}	—	0	—	24	V
Input Voltage (Output On)	TD62003	V _{IN (ON)} I _{OUT} = 400mA, h _{FE} = 800	2.8	—	24	V
	TD62004		6.2	—	24	
Input Voltage (Output Off)	TD62003	V _{IN (OFF)}	0	—	0.7	V
	TD62004		0	—	1.0	
Clamp Diode Reverse Voltage	V _R	—	—	—	35	V
Clamp Diode Forward Current	I _F	—	—	—	350	mA
Power Dissipation	P _D	(Note) Ta = 85°C	—	—	0.325	W

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

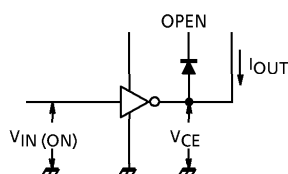
ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	TEST CIR-CUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Output Leakage Current	I_{CEX}	1	$V_{CE} = 35V, T_a = 25^\circ C$	—	—	50	μA
			$V_{CE} = 35V, T_a = 85^\circ C$	—	—	100	
Collector-Emitter Saturation Voltage	$V_{CE(sat)}$	2	$I_{OUT} = 350mA, I_{IN} = 500\mu A$	—	1.3	1.6	V
			$I_{OUT} = 200mA, I_{IN} = 350\mu A$	—	1.1	1.3	
			$I_{OUT} = 100mA, I_{IN} = 250\mu A$	—	0.9	1.1	
DC Current Transfer Ratio	h_{FE}	2	$V_{CE} = 2V, I_{OUT} = 350mA$	1000	—	—	
Input Current (Output On)	TD62003 TD62004	$I_{IN(ON)}$	$V_{IN} = 2.4V, I_{OUT} = 350mA$	—	0.4	0.7	mA
			$V_{IN} = 9.5V, I_{OUT} = 350mA$	—	0.8	1.2	
Input Current (Output Off)		$I_{IN(OFF)}$	$I_{OUT} = 500\mu A, T_a = 85^\circ C$	50	65	—	μA
Input Voltage (Output On)	TD62003 TD62004	$V_{IN(ON)}$	$V_{CE} = 2V$ $h_{FE} = 800$			$I_{OUT} = 350mA$ 2.6	V
						$I_{OUT} = 200mA$ 2.0	
						$I_{OUT} = 350mA$ 4.7	
						$I_{OUT} = 200mA$ 4.4	
Clamp Diode Reverse Current	I_R	6	$V_R = 35V, T_a = 25^\circ C$	—	—	50	μA
			$V_R = 35V, T_a = 85^\circ C$	—	—	100	
Clamp Diode Forward Voltage	V_F	7	$I_F = 350mA$	—	—	2.0	V
Input Capacitance	C_{IN}	8	—	—	15	—	pF
Turn-On Delay	t_{ON}	9	$V_{OUT} = 35V, R_L = 87.5\Omega$ $C_L = 15pF$	—	0.1	—	μs
Turn-Off Delay	t_{OFF}	9	$V_{OUT} = 35V, R_L = 87.5\Omega$ $C_L = 15pF$	—	0.2	—	

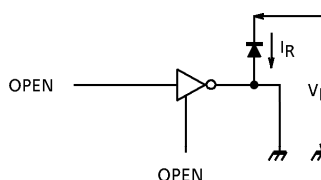
TEST CIRCUIT

1. I_{CEX} 2. $V_{CE(sat)}, h_{FE}$ 3. $I_{IN(ON)}$ 4. $I_{IN(OFF)}$ 

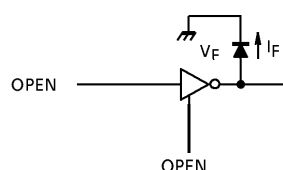
5. $V_{IN(ON)}$



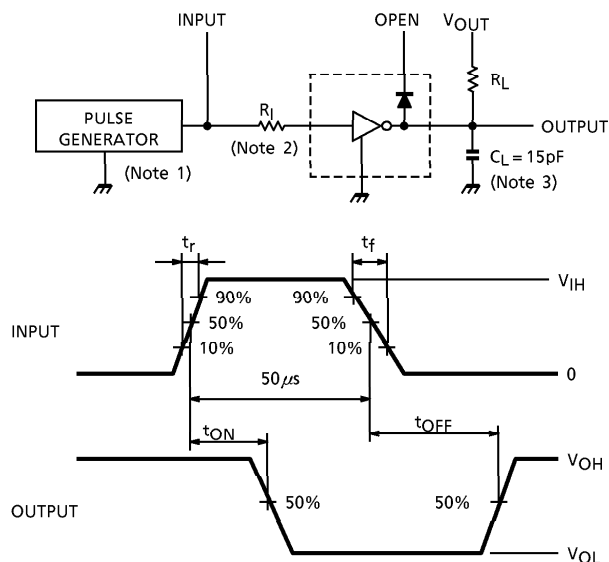
6. I_R



7. V_F



8. t_{ON} , t_{OFF}



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

(Note 2) See below.

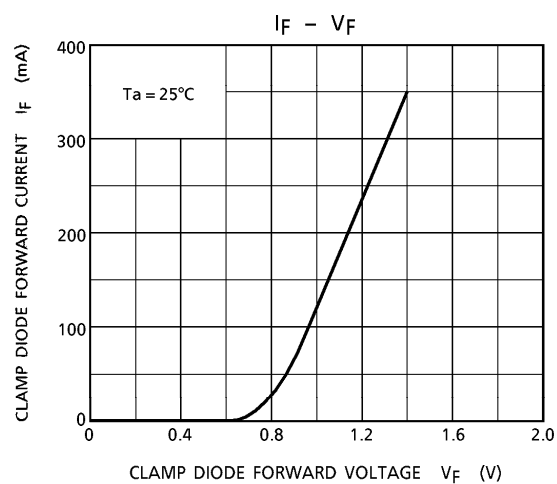
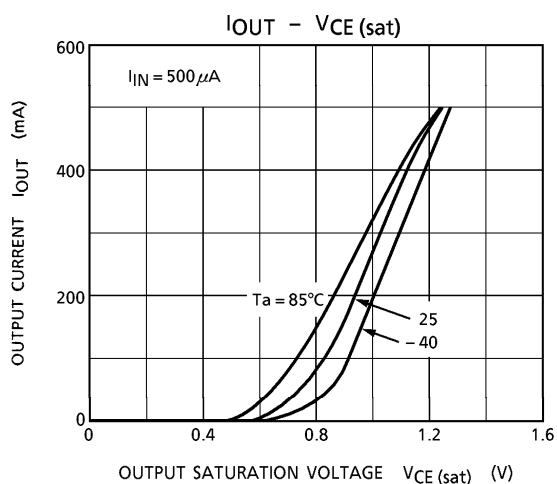
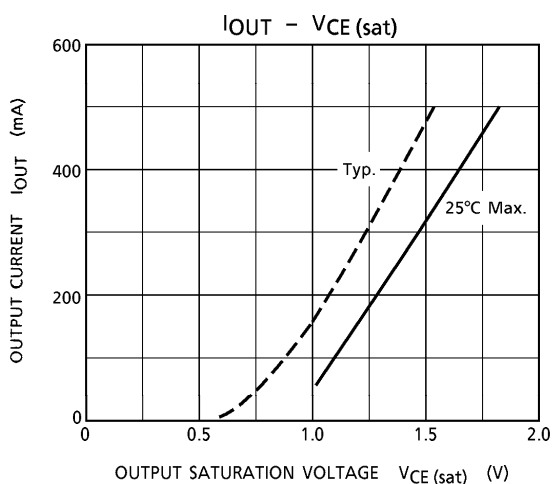
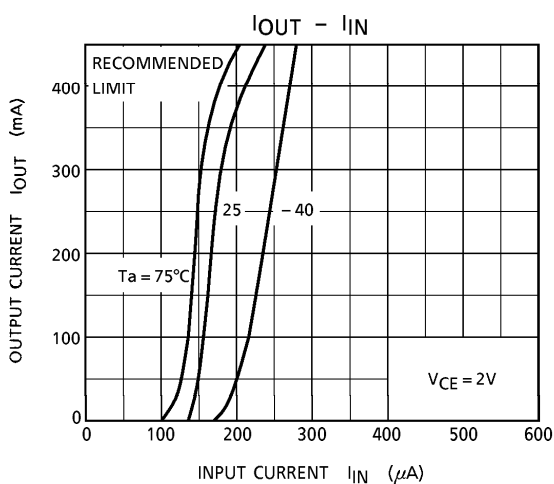
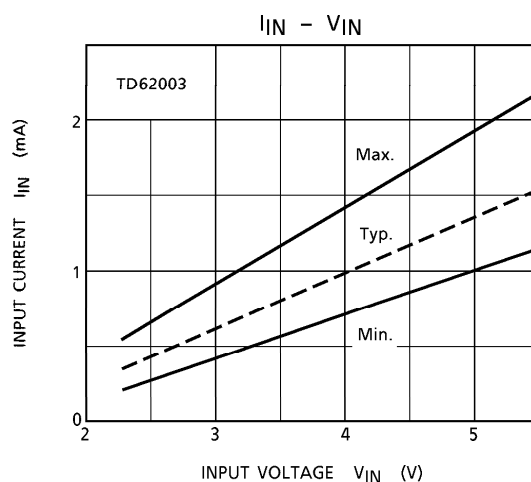
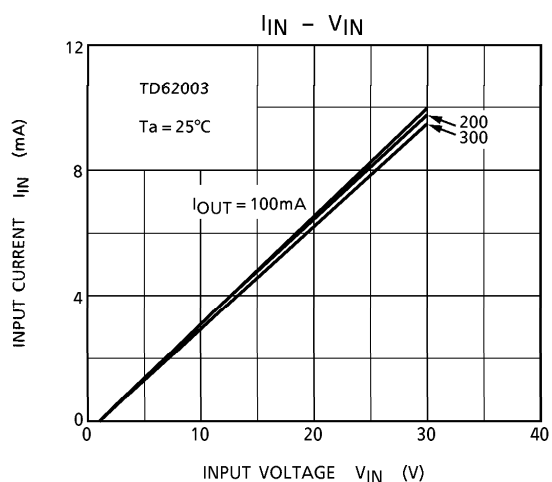
INPUT CONDITION

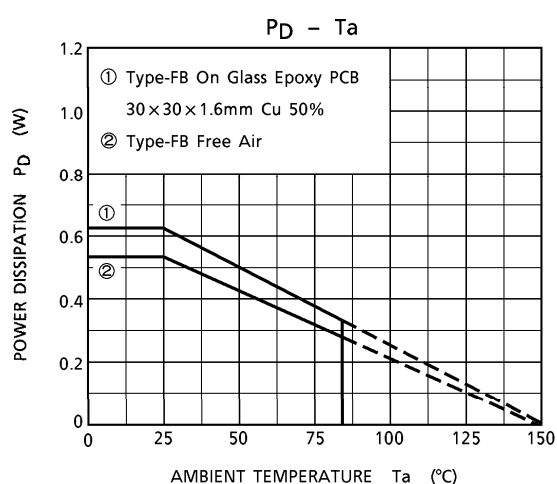
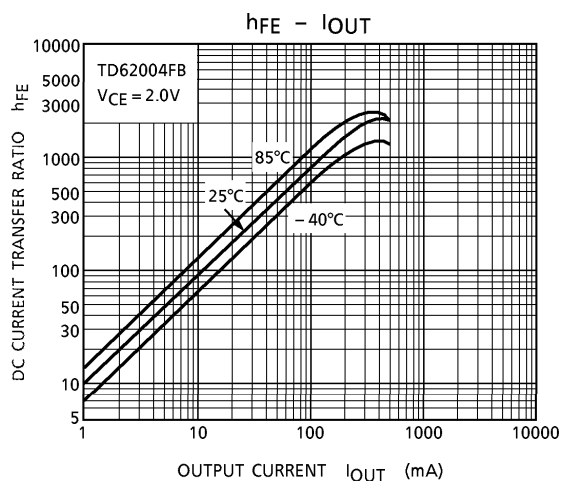
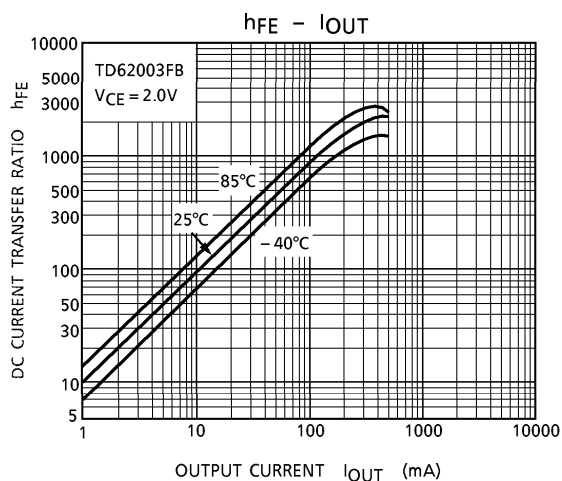
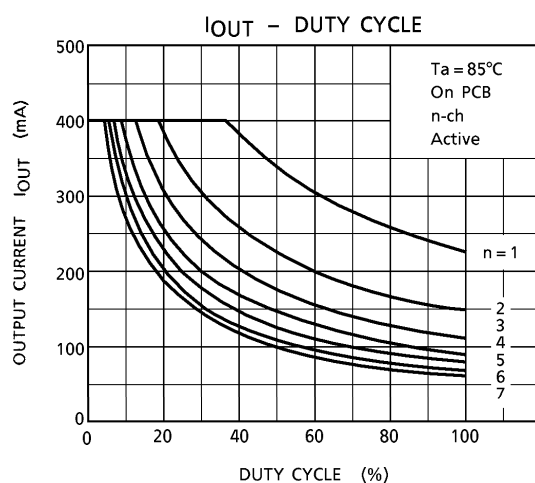
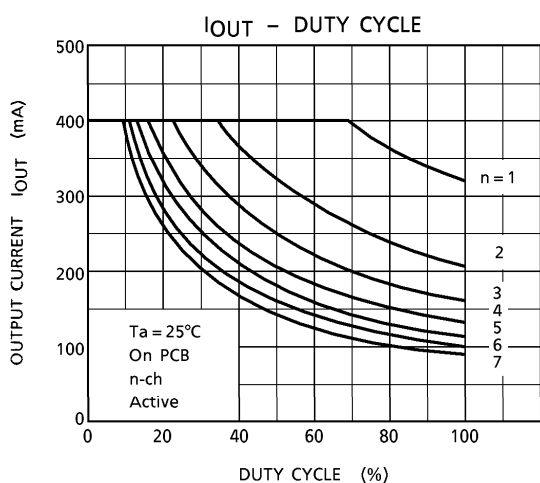
TYPE NUMBER	R_I	V_{IH}
TD620003FB	0	3V
TD620004FB	0	8V

(Note 3) C_L includes probe and jig capacitance.

PRECAUTIONS for USING

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.

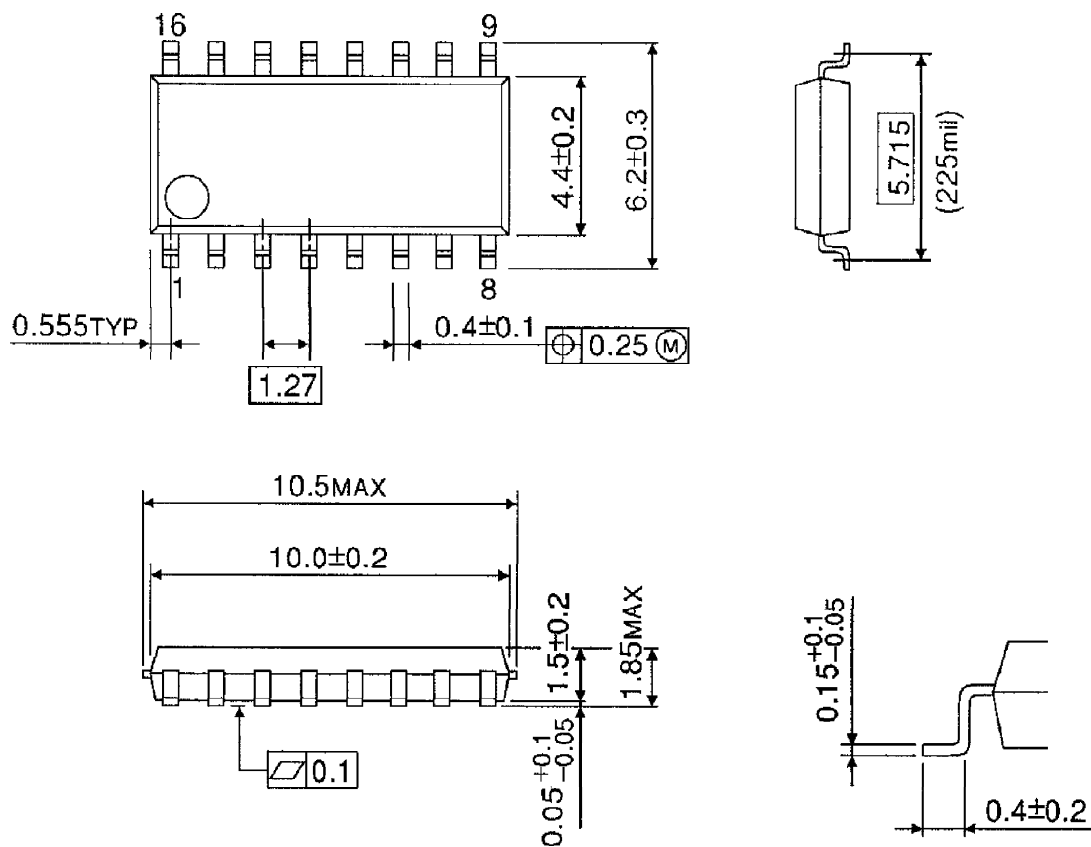




OUTLINE DRAWING

SOP16-P-225-1.27B

Unit : mm



Weight : 0.16g (Typ.)