

TOSHIBA BIPOLAR DIGITAL INTEGRATED CIRCUIT SILICON MONOLITHIC

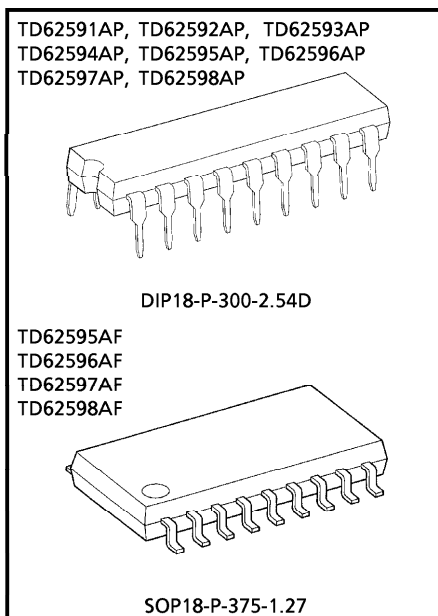
TD62591AP, TD62592AP, TD62593AP, TD62594AP
TD62595AP, TD62595AF, TD62596AP, TD62596AF
TD62597AP, TD62597AF, TD62598AP, TD62598AF

8CH SINGLE DRIVER

The TD62591AP, TD62591AF Series are comprised of eight NPN Transistor Arrays.
 Applications include relay, hammer, lamp and display (LED) drivers.

FEATURES

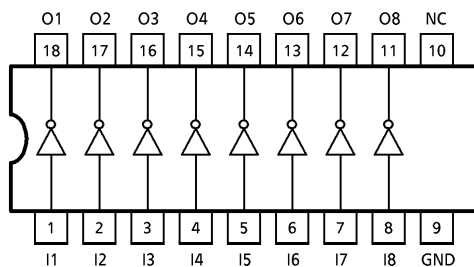
- Output current (single output) 200mA (Max.)
- High sustaining voltage output 50V (Min.)
- Low saturation voltage $V_{CE(sat)} = 0.8V$
- @I_{out} = 150mA-inputs compatible with various type logic.
 - TD62591, TD62595AP, TD62595AF : external.
 - general purpose
 - TD62592, TD62596AP, TD62596AF : 10.5kΩ + 7V zener diode 14~25V PMOS
 - TD62593, TD62597AP, TD62597AF : 2.7kΩ TTL, 5V CMOS
 - TD62594, TD62598AP, TD62598AF : 10.5kΩ 6~15V PMOS, CMOS
- Package type-AP : DIP-18pin
- Package type-AF : SOP-18pin



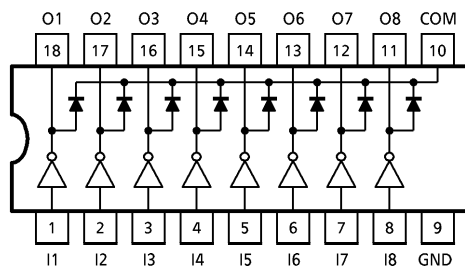
Weight
 DIP18-P-300-2.54D : 1.47g (Typ.)
 SOP18-P-375-1.27 : 0.5g (Typ.)

PIN CONNECTION (TOP VIEW)

TD62591AP, TD62592AP, TD62593AP, TD62594AP



TD62595AP, TD62595AF, TD62596AP, TD62596AF
 TD62597AP, TD62597AF, TD62598AP, TD62598AF

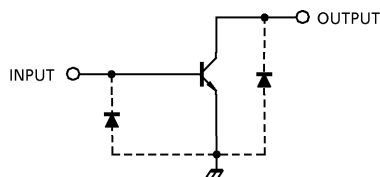


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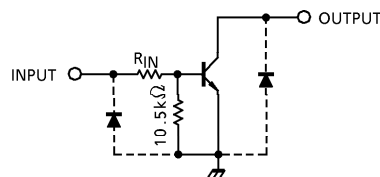
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SCHEMATICS (EACH DRIVER)

TD62591AP

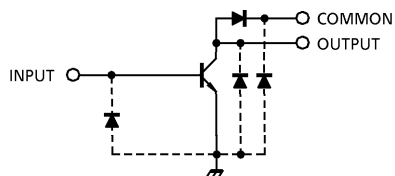


TD62592AP, TD62593AP, TD62594AP

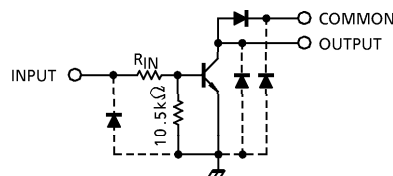


TD62592AP $R_{IN} = 10.5k\Omega + V_Z = 7V$
 TD62593AP $R_{IN} = 2.7k\Omega$
 TD62594AP $R_{IN} = 10.5k\Omega$

TD62595AP, TD62595AF



TD62596AP, TD62596AF, TD62597AP, TD62597AF, TD62598AP, TD62598AF



TD62596AP $R_{IN} = 10.5k\Omega + V_Z = 7V$
 TD62597AP $R_{IN} = 2.7k\Omega$
 TD62598AP $R_{IN} = 10.5k\Omega$

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

MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Collector-Emitter Voltage	V_{CEO}	50	V
Collector-Base Voltage	V_{CBO}	50	V
Clamp Diode Reverse Voltage	V_R (Note 1)	50	V
Collector Current	I_C	200	mA / ch
Input Voltage	V_{IN} (Note 2)	- 0.5~30	V
Input Current	I_{IN} (Note 3)	25	mA
Power Dissipation	P_D (Note 4)	0.96 (Note 5) / 1.47	W
Operating Temperature	T_{opr}	- 40~85	°C
Storage Temperature	T_{stg}	- 55~150	°C

(Note 1) Except TD62591~TD62594AP

(Note 2) Except TD62591AP, TD62595AP, TD62595AF

(Note 3) Only TD62591AP, TD62595AP, TD62595AF

(Note 4) Delated above 25°C in the proportion of 11.7mW/°C (AP-Type), 7.7mW/°C (F, AF-Type)

(Note 5) SOP-18pin

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

CHARACTERISTIC		SYMBOL	CONDITION	MIN.	TYP.	MAX.	UNIT
Collector-Emitter Voltage		V _{CEO}	—	0	—	50	V
Collector-Base Voltage		V _{CBO}	—	0	—	50	V
Collector Current		I _C	—	0	—	150	mA / ch
Clamp Diode Reverse Voltage		V _R	(Note 1)	7	—	50	V
Input Voltage		V _{IN}	(Note 2)	0	—	25	V
Input Current		I _{IN}	(Note 3)	0	—	10	mA
Input Voltage (Output On)	TD62592 TD62596	V _{IN (ON)}	—	14.0	—	25	V
	TD62593 TD62597			2.4	—	25	
	TD62594 TD62598			7.0	—	25	
Power Dissipation	AP	P _D	—	—	—	0.52	W
	AF		—	—	—	0.355	

ELECTRICAL CHARACTERISTICS (Ta = 25°C unless otherwise noted)

CHARACTERISTIC		SYMBOL	TEST CIR-CUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Output Leakage Current		I _{CEX}	1	V _{CE} = 50V, V _{IN} = 0	—	—	10	μA
Collector-Emitter Saturation Voltage		V _{CE (sat)}	2	I _C = 10mA, I _{IN} = 0.4mA	—	—	0.2	V
				I _C = 150mA, I _{IN} = 3.0mA	—	—	0.8	
DC Current Transfer Ratio		h _{FE}	2	V _{CE} = 10V I _C = 10mA	(Note 3) 70	—	—	—
				(Note 2) 50	—	—	—	
Input Current	TD62591 TD62595	I _{IN (ON)}	3	I _C = 50mA	—	—	0.65	mA
	TD62592 TD62596			V _{IN} = 14V, I _C = 50mA	—	—	0.9	
	TD62593 TD62597			V _{IN} = 2.4V, I _C = 50mA	—	—	0.9	
	TD62594 TD62598			V _{IN} = 7.0V, I _C = 50mA	—	—	0.9	
Turn-On Delay		t _{ON}	4	V _{OUT} = 50V, R _L = 330Ω	—	0.1	—	μs
Turn-Off Delay		t _{OFF}			—	0.3	—	μs

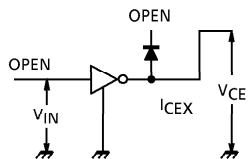
(Note 1) Except TD62591~TD62594AP

(Note 2) Except TD62591AP, TD62595AP, TD62595AF

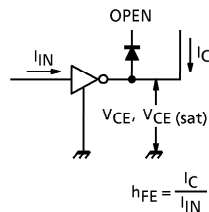
(Note 3) Only TD62591AP, TD62595AP, TD62595AF

TEST CIRCUIT

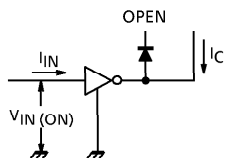
1. I_{CEX}



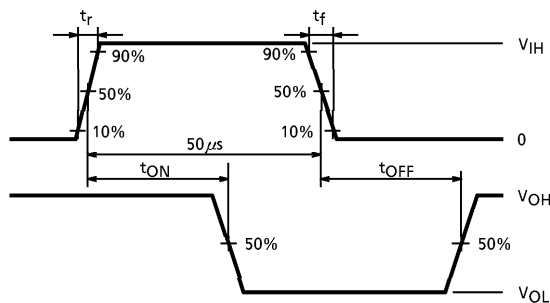
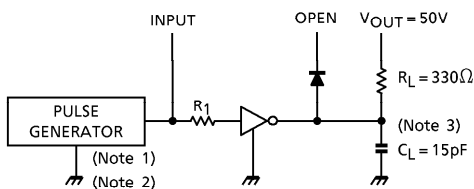
2. $h_{FE}, V_{CE(sat)}$



3. $V_{IN(ON)}$



4. 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

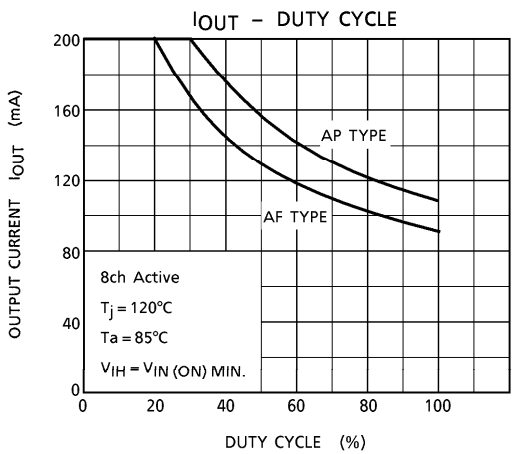
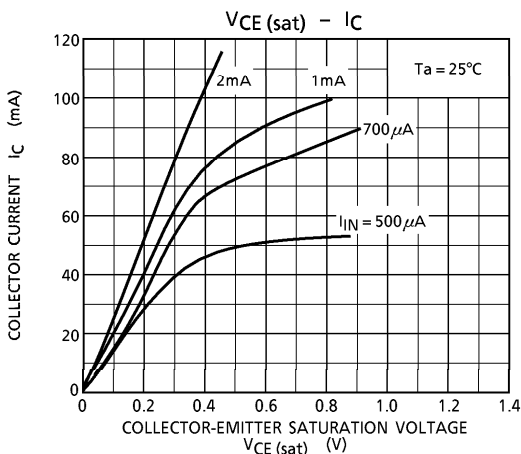
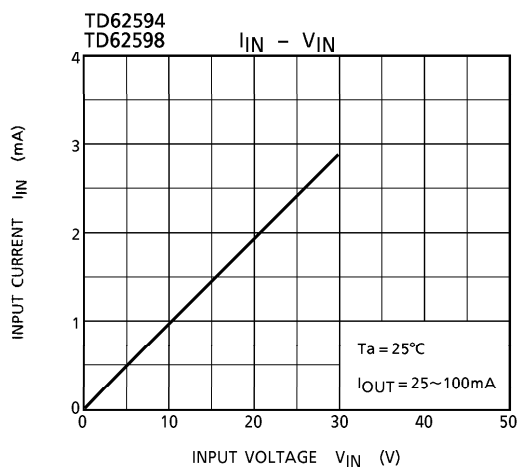
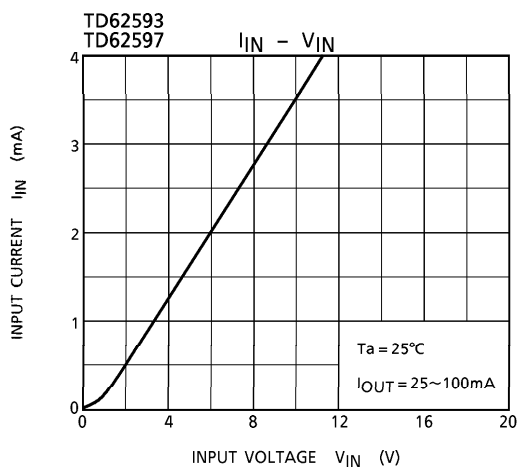
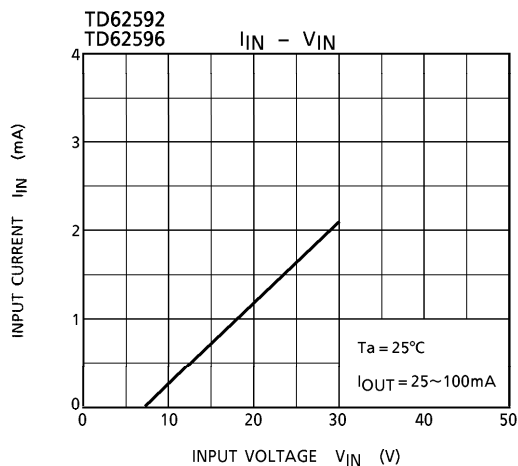
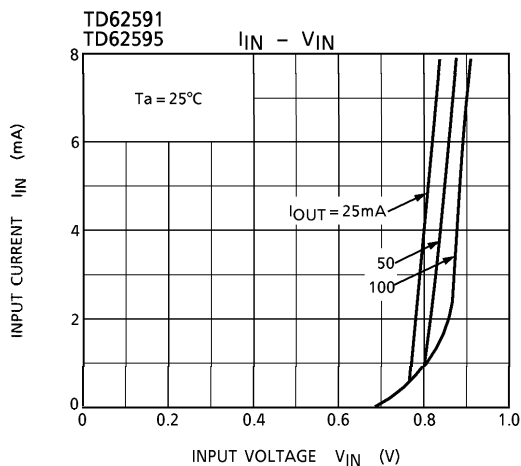
Input Condition

TYPE NUMBER	R_{IN}	V_{IH}
TD62591AP, TD62595AP, TD62595AF	$2.7k\Omega$	3V
TD62592AP, TD62596AP, TD62596AF	0Ω	15V
TD62593AP, TD62597AP, TD62597AF	0Ω	3V
TD62594AP, TD62598AP, TD62598AF	0Ω	10V

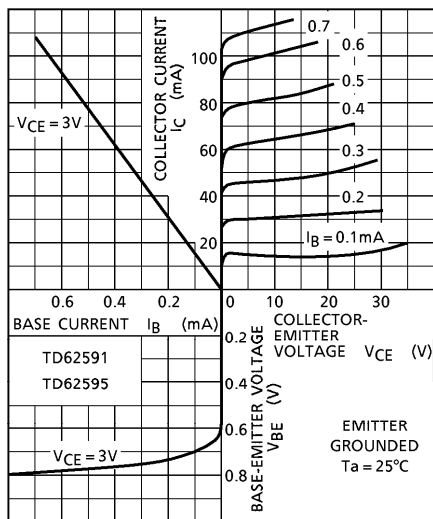
(Note 3) C_L includes probe and jig capacitance

PRECAUTIONS for USING

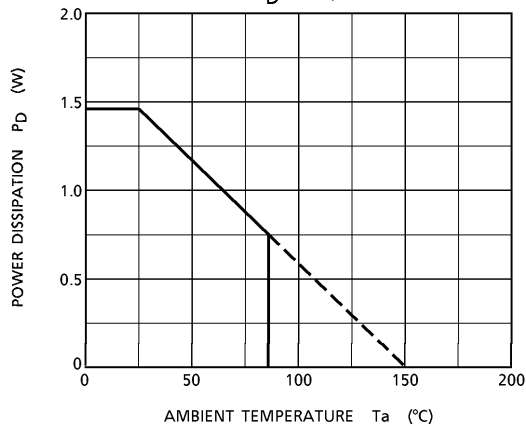
Utmost care is necessary in the design of the output line, V_{CC} and GND line since IC may be destroyed due to short-circuit between outputs, air contamination fault, or fault by improper grounding.



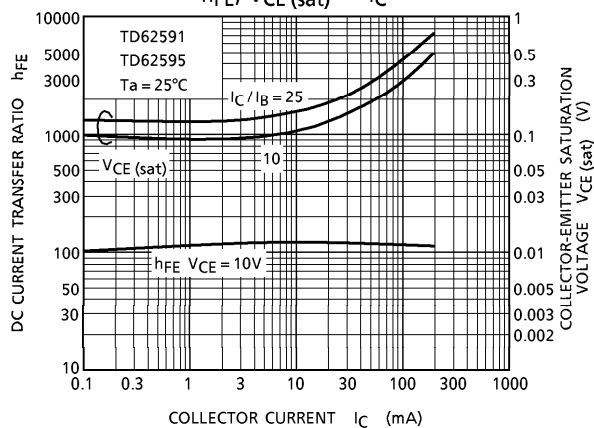
STATIC CHARACTERISTICS



$P_D - T_a$

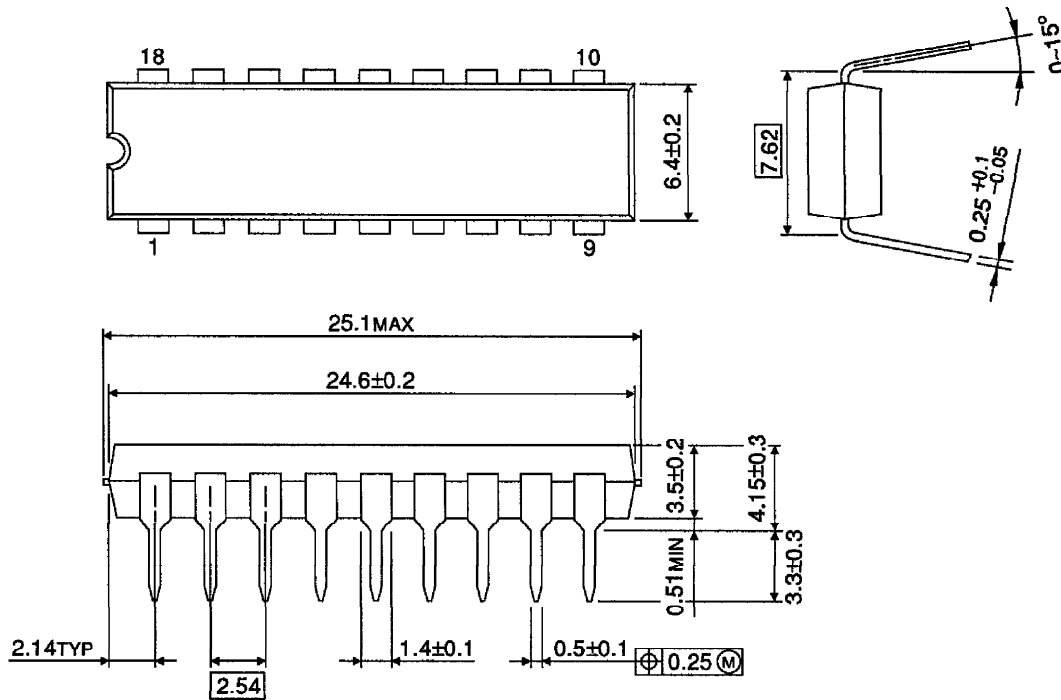


$h_{FE}, V_{CE(sat)} - I_C$



OUTLINE DRAWING
DIP18-P-300-2.54D

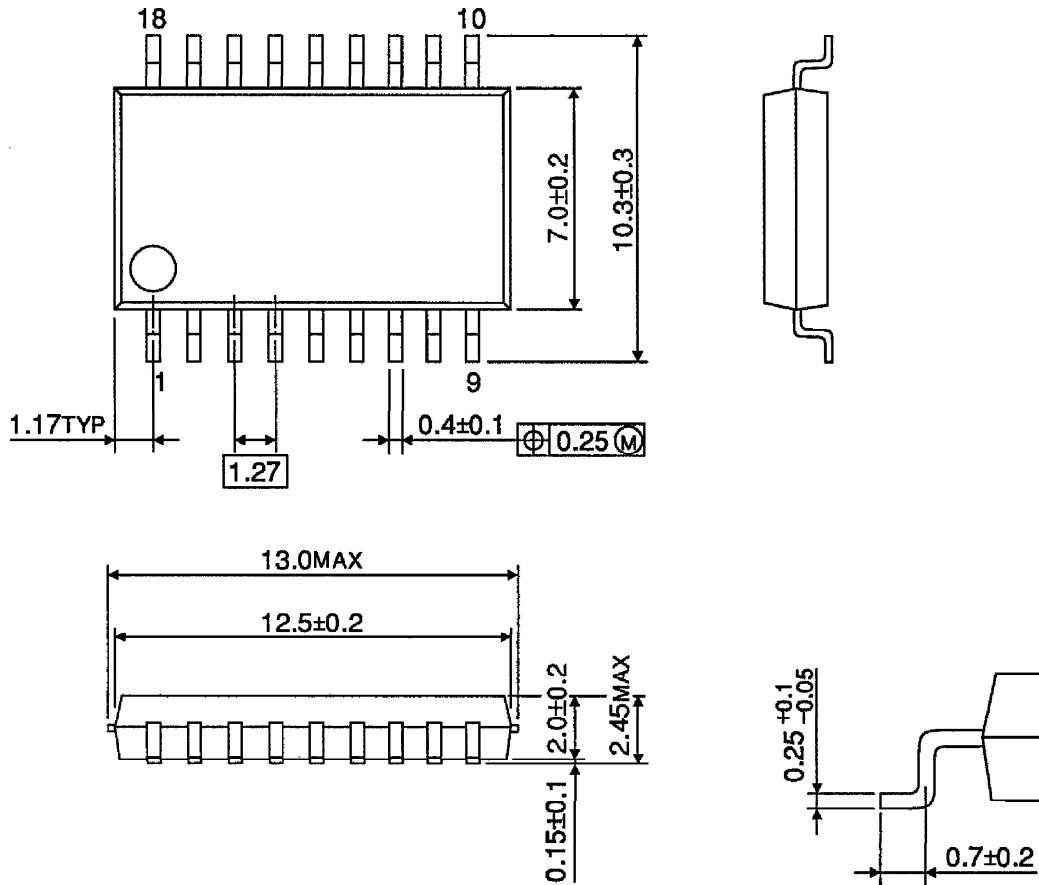
Unit : mm



Weight : 1.47g (Typ.)

OUTLINE DRAWING
SOP18-P-375-1.27

Unit : mm



Weight : 0.50g (Typ.)