

TOSHIBA BIPOLAR DIGITAL INTEGRATED CIRCUIT SILICON MONOLITHIC

## TD62786AP, TD62786F, TD62786AF TD62787AP, TD62787F, TD62787AF

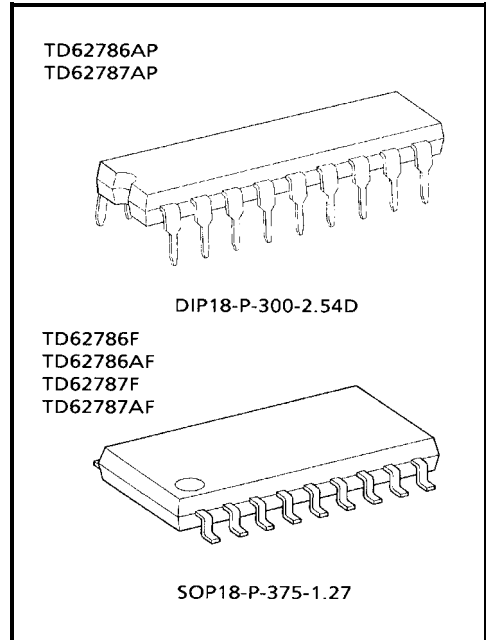
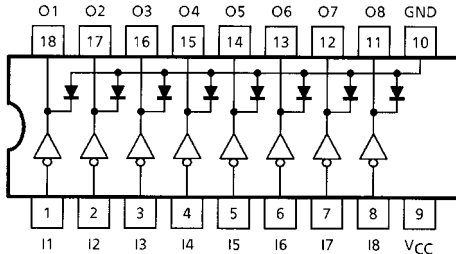
### 8CH HIGH-VOLTAGE SOURCE DRIVER

The TD62786AP / F / AF series are eight channel hux non-inverting source current transistor array. All units feature integral clamp diodes for switching inductive loads. Applications include relay, hammer and lamp drivers.

### FEATURES

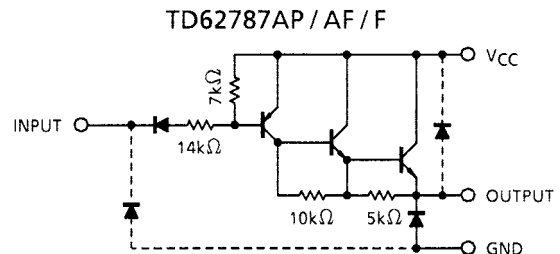
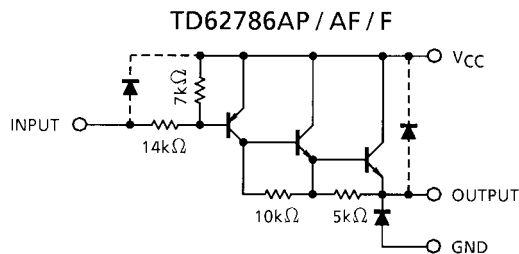
- High output voltage type-AP, AF :  $V_{CE(SUS)} = 50\text{ V (Min)}$   
type-F :  $V_{CE(SUS)} = 35\text{ V (Min)}$
- Output current (single output) :  $I_{OUT} = -500\text{ mA / ch (Max)}$
- Output clamp diodes
- Single supply voltage
- Input compatible with TTL, 5 V CMOS
- Low level active input
- Package type-AP : DIP-18 pin
- Package type-F, AF: SOP-18 pin

### PIN CONNECTION (TOP VIEW)



Weight  
 DIP18-P-300-2.54D : 1.47 g (Typ.)  
 SOP18-P-375-1.27 : 0.41 g (Typ.)

### 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
Supply Voltage	AP / AF	V <sub>CC</sub> -V <sub>GND</sub>	50	V
	F		35	
Output Sustaining Voltage	AP / AF	V <sub>OUT</sub>	-50	V
	F		-35	
Output Current		I <sub>OUT</sub>	-500	mA / ch
Input Voltage		V <sub>IN</sub> (Note 1)	-30~0.5	V
Input Voltage		V <sub>IN</sub> (Note 2)	V <sub>GND</sub> ~7	V
Clamp Diode Forward Current	AP / AF	V <sub>R</sub>	50	V
	F		35	
Clamp Diode Forward Current		I <sub>F</sub>	500	mA
Power Dissipation	AP	P <sub>D</sub> (Note 3)	1.47	W
	F / AF		0.96	
Operating Temperature		T <sub>opr</sub>	-40~85	°C
Storage Temperature		T <sub>stg</sub>	-55~150	°C

Note 1: Only TD62786AP / F / AF

Note 2: Only TD62787AP / F / AF

Note 3: Delated above 25°C in the proportion of 11.7 mW / °C (AP Type), 7.7 mW / °C (F, AF Type).

## RECOMMENDED OPERATING CONDITIONS (Ta = -40~85°C, V<sub>CC</sub> = 0 V)

CHARACTERISTIC		SYMBOL	CONDITION	MIN	TYP.	MAX	UNIT
Supply Voltage	AP / AF	V <sub>CC</sub> -V <sub>GND</sub>	—	—	—	50	V
	F		—	—	—	35	
Output Voltage	AP / AF	V <sub>OUT</sub>	—	—	—	-50	V
	F		—	—	—	-35	
Output Current		I <sub>OUT</sub>	—	—	—	-350	mA / ch
Input Voltage	TD62786	V <sub>IN</sub>	—	-30	—	0	V
	TD62787		—	V <sub>GND</sub>	—	7	
Clamp Diode Reverse Voltage	AP / AF	V <sub>R</sub>	—	—	—	50	V
	F		—	—	—	35	
Clamp Diode Forward Current		I <sub>F</sub>	—	—	—	350	mA
Power Dissipation	AP	P <sub>D</sub>	—	—	—	0.52	W
	AF / F		—	—	—	0.35	

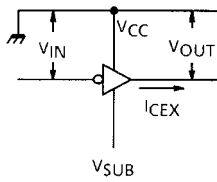
## ELECTRICAL CHARACTERISTICS (Ta = 25°C, VCC = 0 V)

CHARACTERISTIC		SYMBOL	TEST CIR-CUIT	TEST CONDITION	MIN	TYP.	MAX	UNIT
Output Leakage Current		$I_{CEX}$	1	$V_{OUT} = V_{GND} = -50\text{ V}$ $T_a = 85^\circ\text{C}$	—	—	-100	$\mu\text{A}$
Output Saturation Voltage		$V_{CE(sat)}$	2	$V_{IN} = V_{IL, MAX.}$ $I_{OUT} = -100\text{ mA}$	—	—	-1.8	V
				$V_{IN} = V_{IL, MAX.}$ $I_{OUT} = -350\text{ mA}$	—	—	-2.0	
DC Current transfer Ratio		$h_{FE}$	2	$V_{CC} = 0\text{ V}, V_{CE} = 3\text{ V}$ $I_{OUT} = -350\text{ mA}$	1000	—	—	—
Input Voltage	"H" Level	TD62786	4	—	-1.2	—	0	V
		TD62787			-1.6	—	5.5	
	"L" Level	TD62786			-30	—	-2.8	
		TD62787			$V_{GND}$	—	-3.7	
Input Current		$I_{IL}$	—	$V_{CC} = 5.5\text{ V}, V_{IN} = 0.4\text{ V}$	—	—	-0.4	mA
Clamp Diode Reverse Current		$I_R$	—	$V_R = V_{R, MAX.}, T_a = 85^\circ\text{C}$	—	—	100	$\mu\text{A}$
Clamp Diode Forward Voltage		$V_F$	—	—	—	—	2.0	V
Turn-On Delay		$t_{ON}$	5	$V_{OUT} = -50\text{ V}, R_L = 163\ \Omega$ $C_L = 15\text{ pF}$ (Note)	—	0.2	—	$\mu\text{s}$
Turn Off Delay		$t_{OFF}$			—	1.0	—	

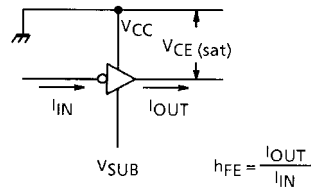
Note:  $V_{OUT} = -35\text{ V}, R_L = 116\ \Omega$  for Type-F

**TEST CIRCUIT**

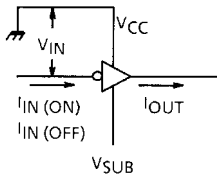
**1.  $I_{CEX}$**



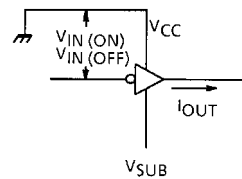
**2.  $V_{CE(sat)}$ ,  $h_{FE}$**



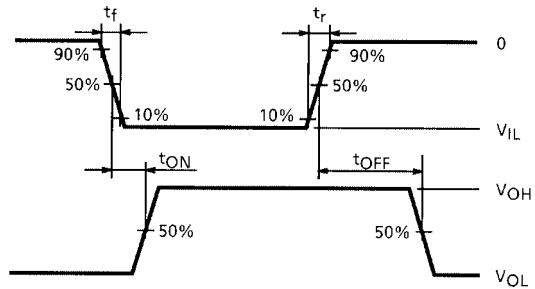
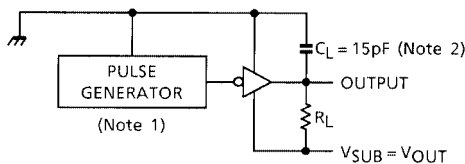
**3.  $I_{IN(ON)}$ ,  $I_{IN(OFF)}$**



**4.  $V_{IN(ON)}$ ,  $V_{IN(OFF)}$**



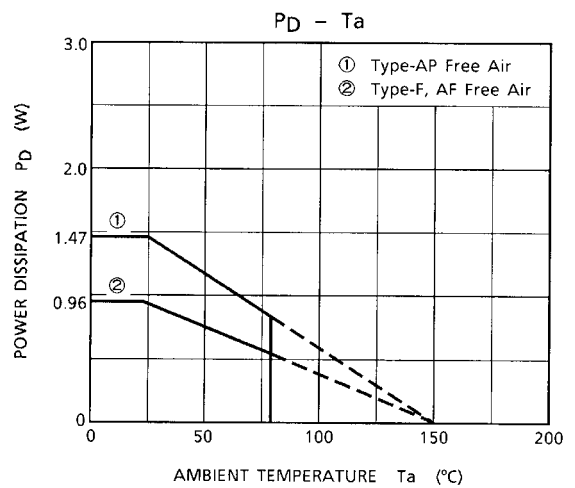
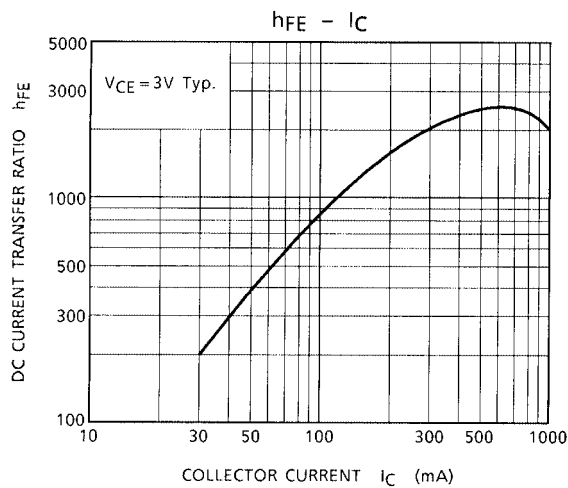
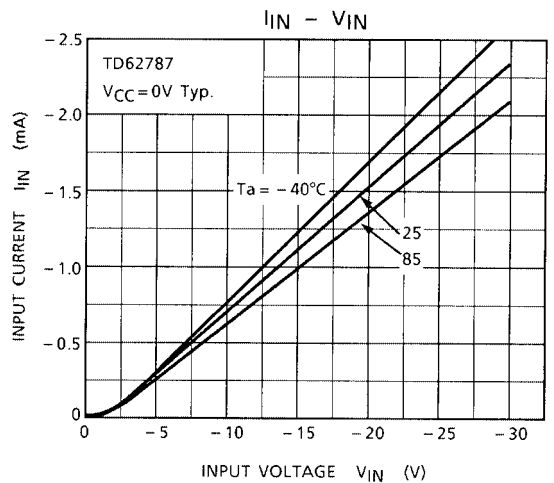
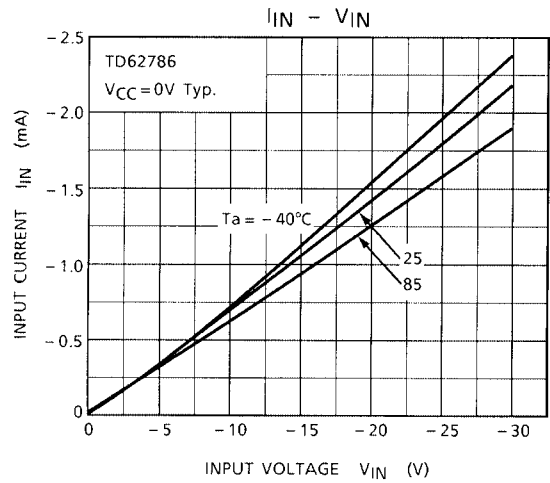
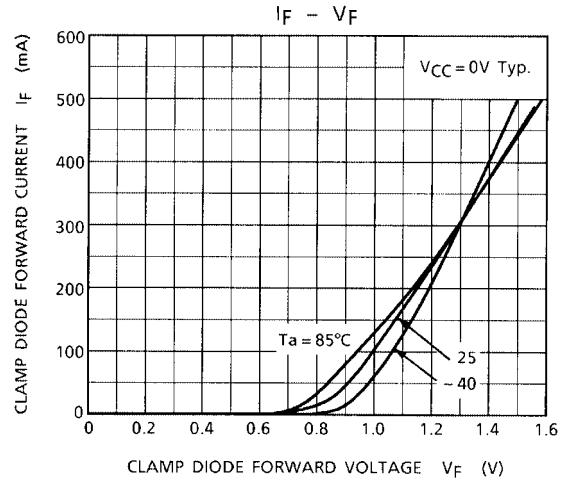
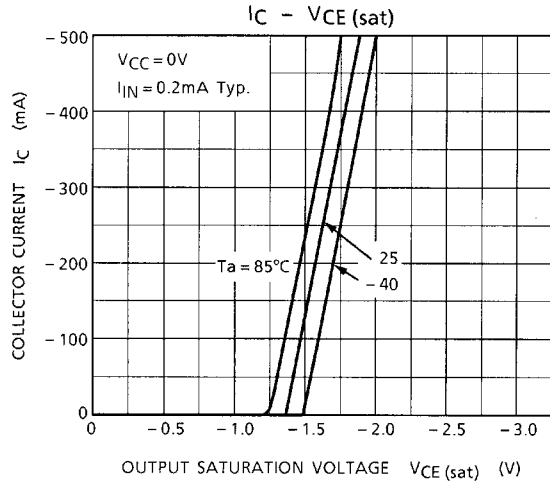
**5.  $t_{ON}$ ,  $t_{OFF}$**



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

**PRECAUTIONS for USING**

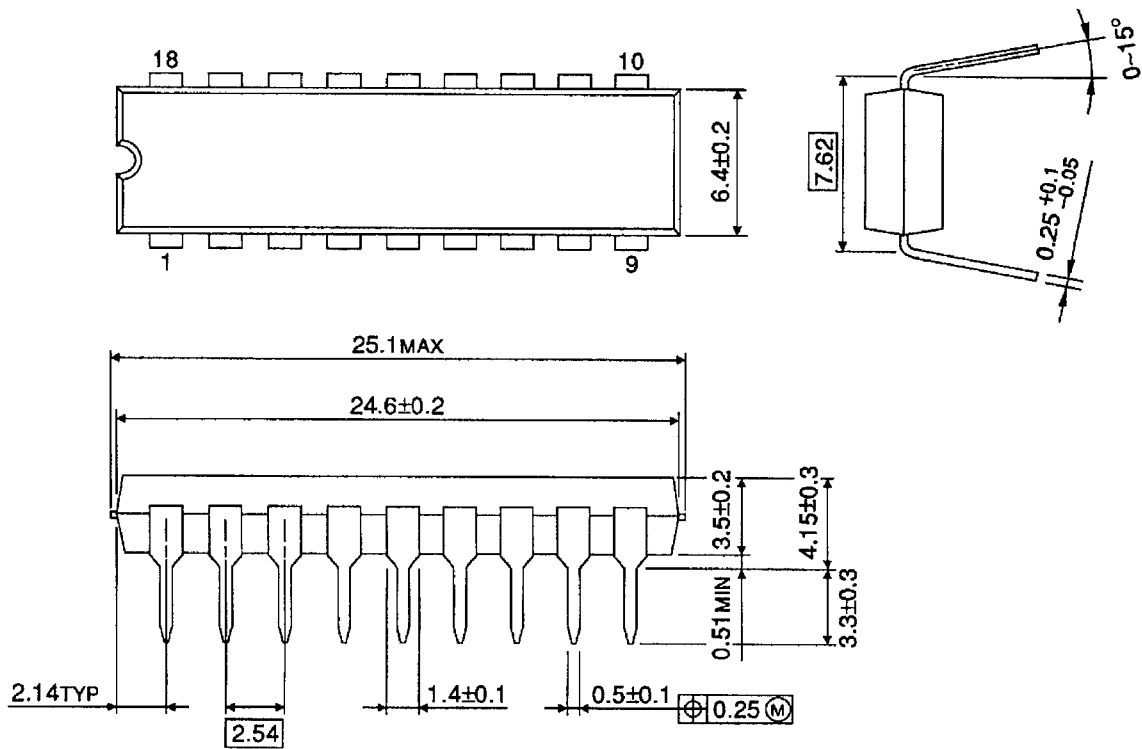
This IC does not integrate protection circuits such as overcurrent and overvoltage protectors. Thus, if excess current or voltage is applied to the IC, the IC may be damaged. Please design the IC so that excess current or voltage will not be applied to the IC. Utmost care is necessary in the design of the output line, V<sub>CC</sub> and GND line since IC may be destroyed due to short-circuit between outputs, air contamination fault, or fault by improper grounding.



## PACKAGE DIMENSIONS

DIP18-P-300-2.54D

Unit: mm

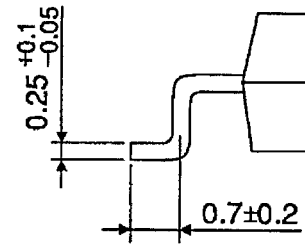
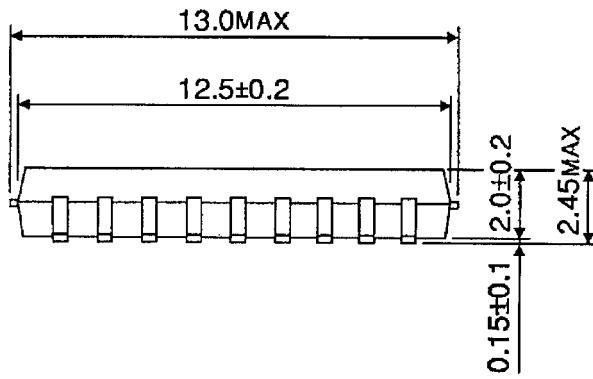
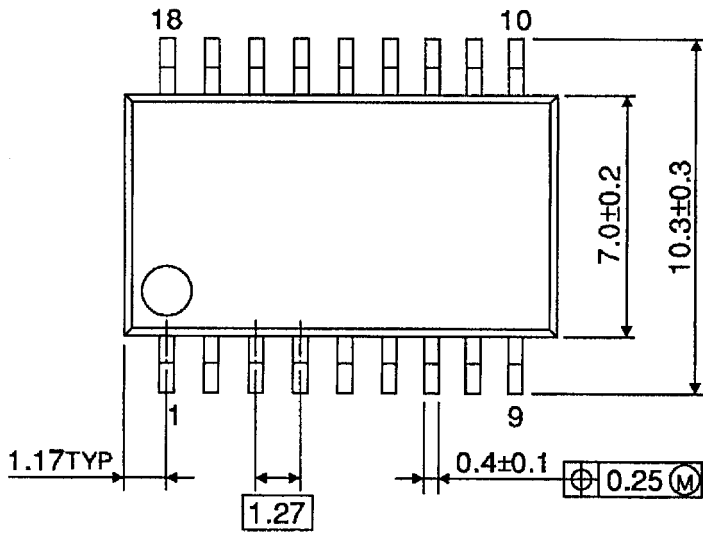


Weight: 1.47 g (Typ.)

## PACKAGE DIMENSIONS

SOP18-P-375-1.27

Unit: mm



Weight: 0.41 g (Typ.)

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000707EBA

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