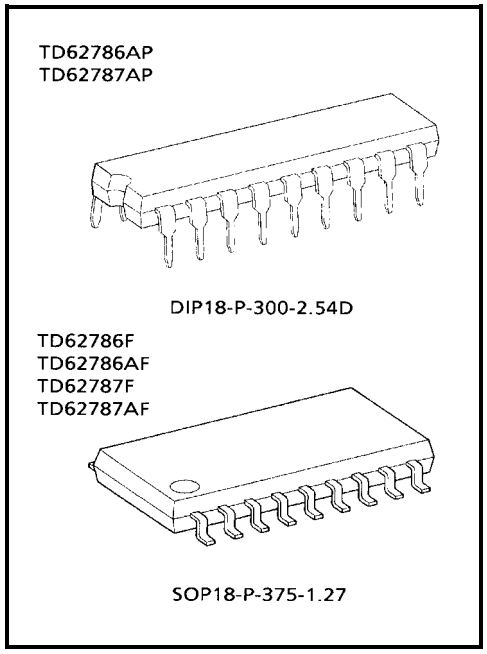
TOSHIBA BIPOLAR DIGITAL INTEGRATED CIRCUIT SILICON MONOLITHIC

TD62786AP,TD62786F,TD62786AF
TD62787AP,TD62787F,TD62787AF

8CH HIGH−VOLTAGE SOURCE DRIVER

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

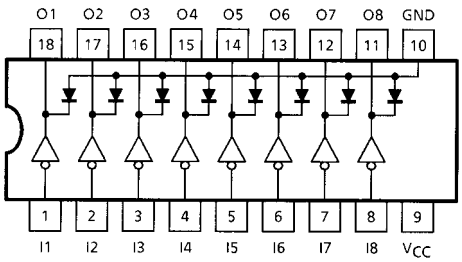


Weight
DIP18−P−300−2.54D : 1.47 g (Typ.)
SOP18−P−375−1.27 : 0.41 g (Typ.)

FEATURES

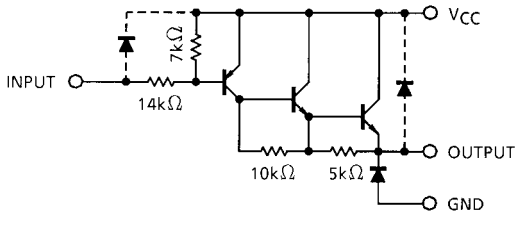
- High output voltage type−AP, AF : $V_{CE\ (SUS)}$ = 50 V (Min)
  type−F : $V_{CE\ (SUS)}$ = 35 V (Min)
- Output current (single output) : I_{OUT} = −500 mA / ch (Max)
- Output clamp diodes
- Single supply voltage
- Input compatible with TTL, 5 V CMOS
- Low level active input
- Package type−AP : DIP−18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

PIN CONNECTION (TOP VIEW)

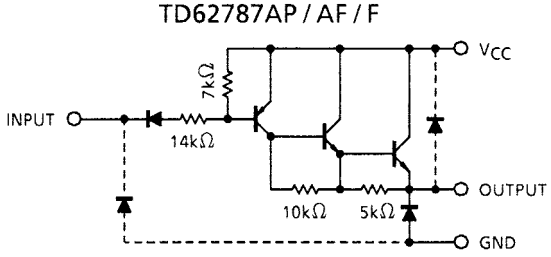


SCHEMATICS (EACH DRIVER)

TD62786AP / AF / F



TD62787AP / AF / F



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_{CC}−V_{GND}	50	V
	F		35	
Output Sustaining Voltage	AP / AF	V_{OUT}	−50	V
	F		−35	
Output Current		I_{OUT}	−500	mA / ch
Input Voltage		V_{IN} (Note 1)	−30~0.5	V
Input Voltage		V_{IN} (Note 2)	V_{GND}~7	V
Clamp Diode Forward Current	AP / AF	V_R	50	V
	F		35	
Clamp Diode Forward Current		I_F	500	mA
Power Dissipation	AP	P_D (Note 3)	1.47	W
	F / AF		0.96	
Operating Temperature		T_{opr}	−40~85	°C
Storage Temperature		T_{stg}	−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_{CC} = 0 V)

CHARACTERISTIC		SYMBOL	CONDITION	MIN	TYP.	MAX	UNIT
Supply Voltage	AP / AF	V_{CC}−V_{GND}	—	—	—	50	V
	F		—	—	—	35	
Output Voltage	AP / AF	V_{OUT}	—	—	—	−50	V
	F		—	—	—	−35	
Output Current		I_{OUT}	—	—	—	−350	mA / ch
Input Voltage	TD62786	V_{IN}	—	−30	—	0	V
	TD62787		—	V_{GND}	—	7	
Clamp Diode Reverse Voltage	AP / AF	V_R	—	—	—	50	V
	F		—	—	—	35	
Clamp Diode Forward Current		I_F	—	—	—	350	mA
Power Dissipation	AP	P_D	—	—	—	0.52	W
	AF / F		—	—	—	0.35	

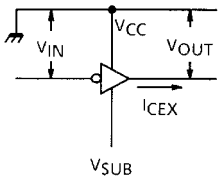
ELECTRICAL CHARACTERISTICS (Ta = 25°C, V_{CC} = 0 V)

CHARACTERISTIC			SYMBOL	TEST CIR-CUIT	TEST CONDITION	MIN	TYP.	MAX	UNIT
Output Leakage Current			I_{CEX}	1	V_{OUT} = V_{GND} = −50 V Ta = 85°C	—	—	−100	μA
Output Saturation Voltage			$V_{CE\ (sat)}$	2	V_{IN} = $V_{IL\ \ MAX.}$ I_{OUT} = −100 mA	—	—	−1.8	V
					V_{IN} = $V_{IL\ \ MAX.}$ I_{OUT} = −350 mA	—	—	−2.0	
DC Current transfer Ratio			h_{FE}	2	V_{CC} = 0 V, V_{CE} = 3 V I_{OUT} = −350 mA	1000	—	—	—
Input Voltage	"H" Level	TD62786	V_{IN}	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 V, V_{IN} = 0.4 V	—	—	−0.4	mA
Clamp Diode Reverse Current			I_R	—	V_R = $V_{R\ \ MAX.}$, Ta = 85°C	—	—	100	μA
						—	—		
Clamp Diode Forward Voltage			V_F	—	—	—	—	2.0	V
Turn−On Delay			t_{ON}	5	V_{OUT} = −50 V, R_L = 163 Ω C_L = 15 pF (Note)	—	0.2	—	μs
Turn Off Delay			t_{OFF}			—	1.0	—	

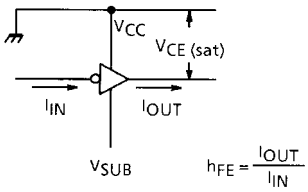
Note: V_{OUT} = −35 V, R_L = 116 Ω for Type−F

TEST CIRCUIT

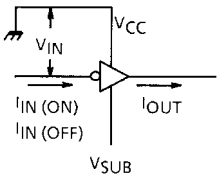
1. I_{CEX}



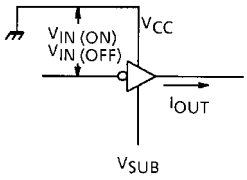
2. $V_{CE\ (sat)}$, h_{FE}



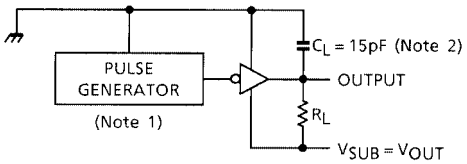
3. $I_{IN\ (ON)}$, $I_{IN\ (OFF)}$

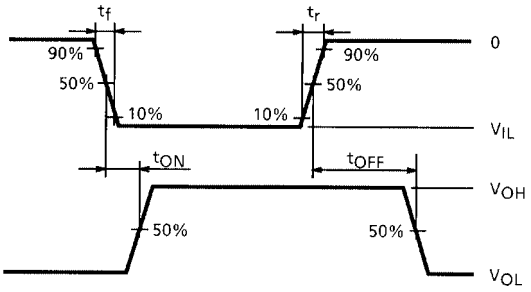


4. $V_{IN\ (ON)}$, $V_{IN\ (OFF)}$



5. t_{ON}, t_{OFF}



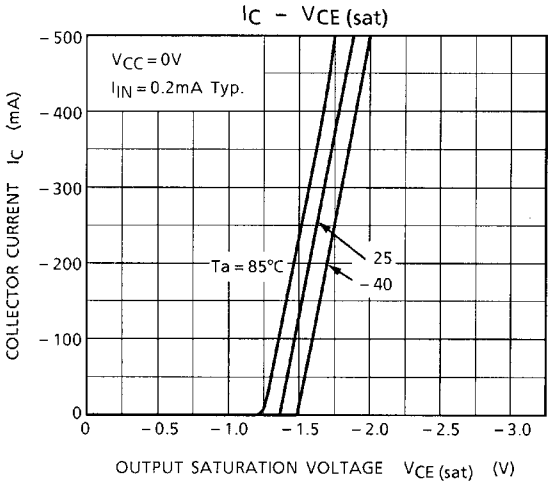


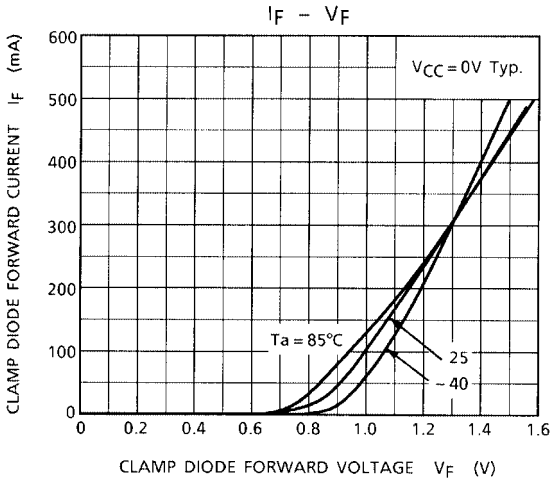
Note 1: Pulse Width 50 μs, Duty Cycle 10%
Output Impedance 50 Ω, $t_r \leq 10$ ns, $t_f \leq 5$ ns

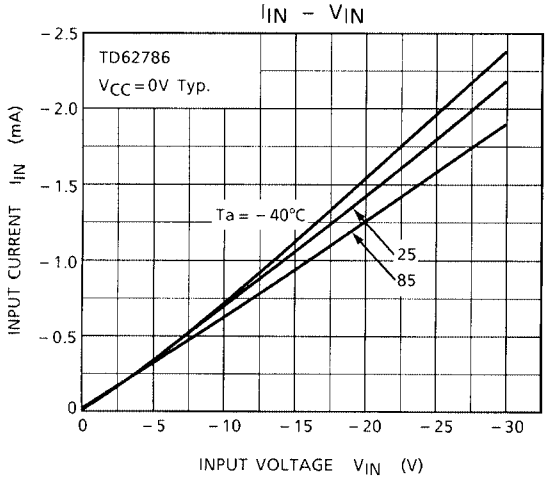
Note 2: C_L includes probe and jig capacitance.

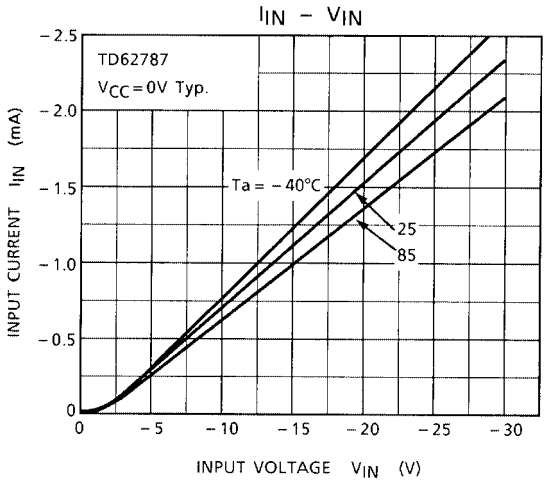
PRECAUTIONS for USING

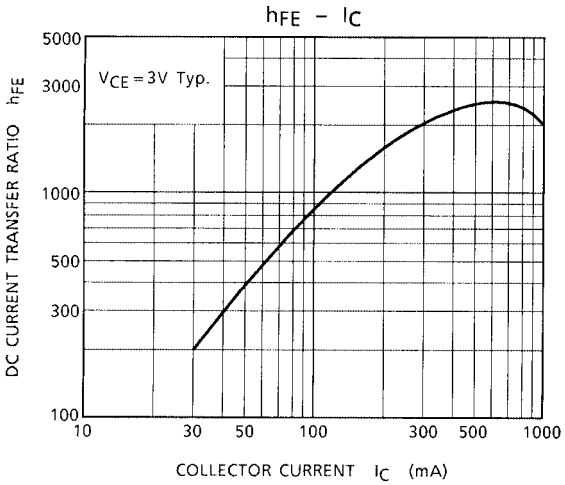
This IC does not integrate protection circuits such as overcurrent and overvoltage protectors.
Thus, if excess current or voltage is applied to the IC, the IC may be damaged. Please design the IC so that excess current or voltage will not be applied to the IC.
Utmost care is necessary in the design of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

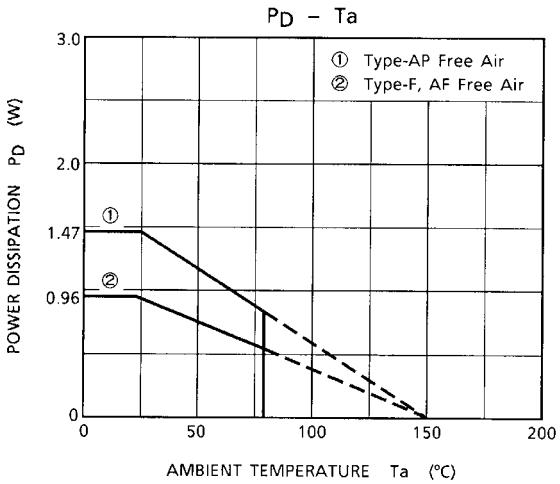

I_C – $V_{CE\,(sat)}$
V_{CC} = 0V
I_{IN} = 0.2mA Typ.
Ta = 85°C
25
– 40
COLLECTOR CURRENT I_C (mA)
OUTPUT SATURATION VOLTAGE $V_{CE\,(sat)}$ (V)


I_F – V_F
V_{CC} = 0V Typ.
Ta = 85°C
25
– 40
CLAMP DIODE FORWARD CURRENT I_F (mA)
CLAMP DIODE FORWARD VOLTAGE V_F (V)


I_{IN} – V_{IN}
TD62786
V_{CC} = 0V Typ.
Ta = – 40°C
25
85
INPUT CURRENT I_{IN} (mA)
INPUT VOLTAGE V_{IN} (V)

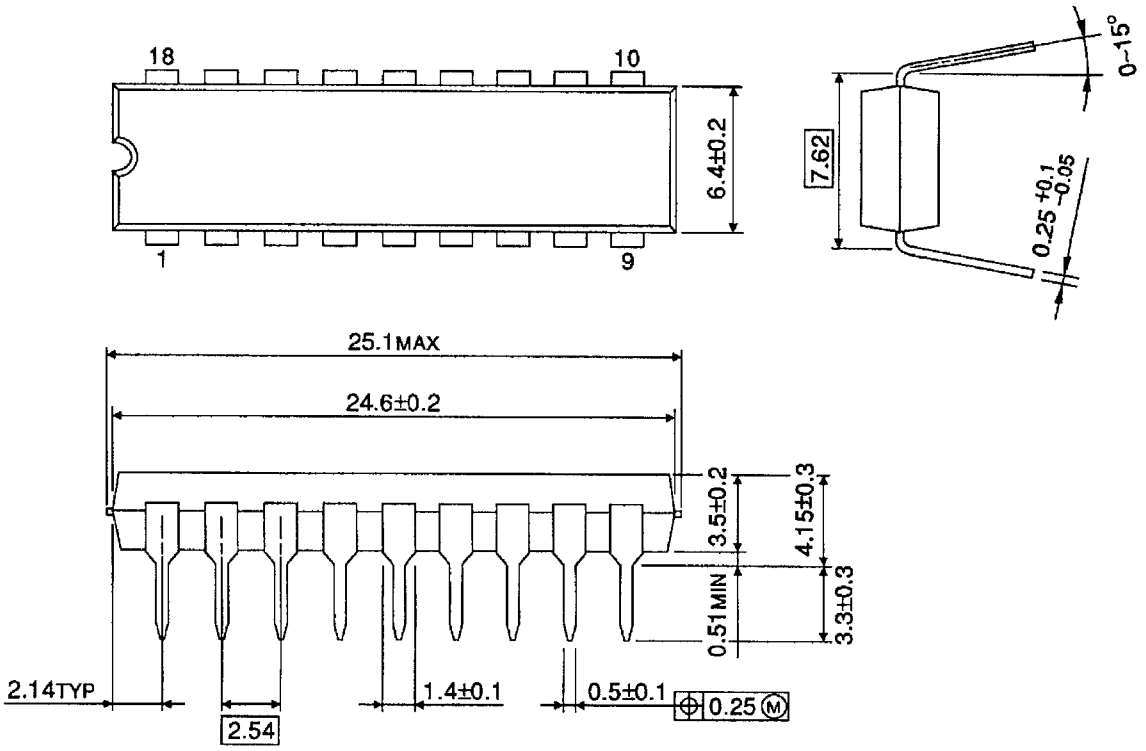

I_{IN} – V_{IN}
TD62787
V_{CC} = 0V Typ.
Ta = – 40°C
25
85
INPUT CURRENT I_{IN} (mA)
INPUT VOLTAGE V_{IN} (V)


h_{FE} – I_C
V_{CE} = 3V Typ.
DC CURRENT TRANSFER RATIO h_{FE}
COLLECTOR CURRENT I_C (mA)


P_D – Ta
① Type-AP Free Air
② Type-F, AF Free Air
1.47
0.96
POWER DISSIPATION P_D (W)
AMBIENT TEMPERATURE Ta (°C)

PACKAGE DIMENSIONS

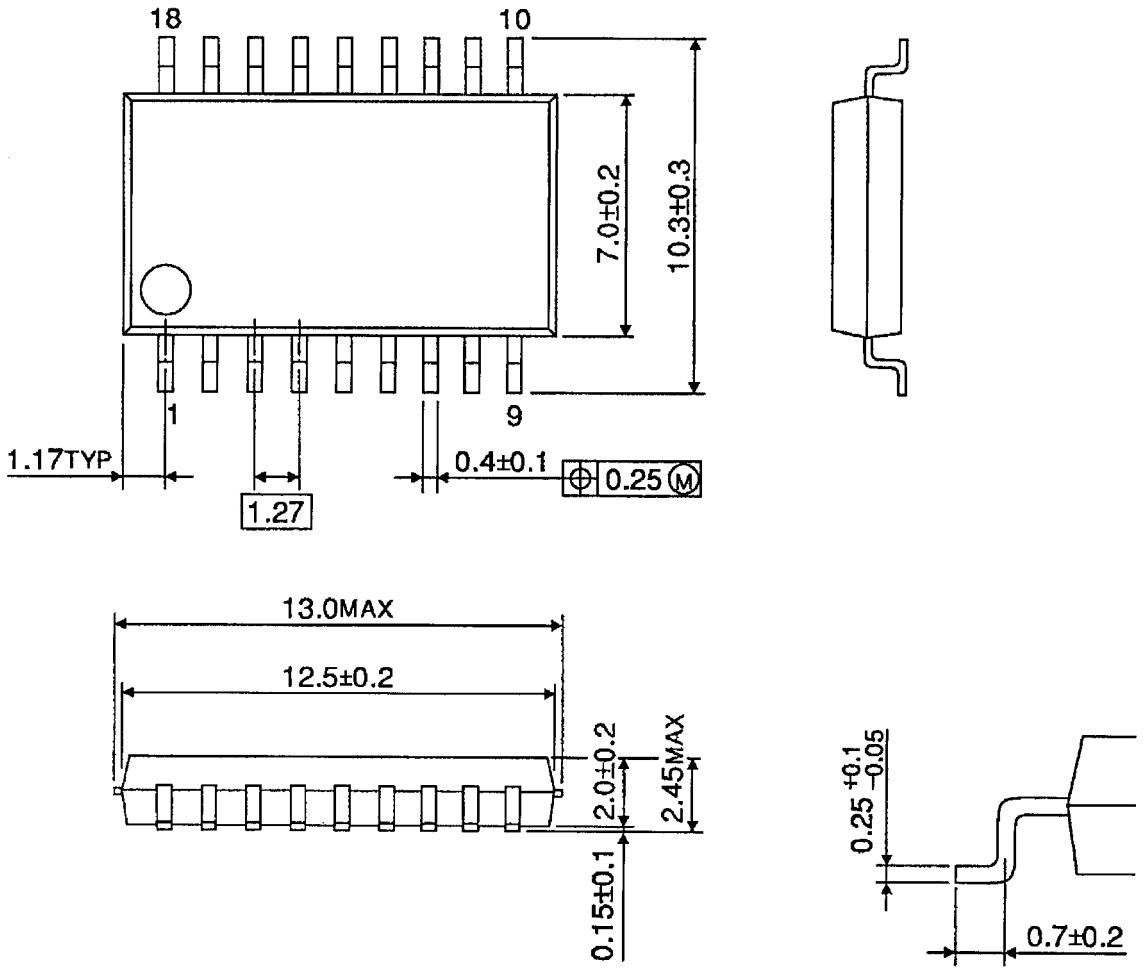
DIP18−P−300−2.54D Unit: mm



Weight: 1.47 g (Typ.)

PACKAGE DIMENSIONS

SOP18−P−375−1.27 Unit: mm



Weight: 0.41 g (Typ.)

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