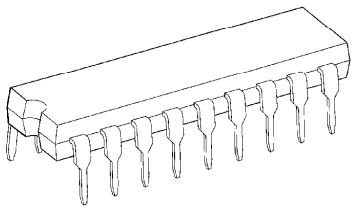
TOSHIBA BIPOLAR DIGITAL INTEGRATED CIRCUIT SILICON MONOLITHIC

TD62786AP, TD62786F, TD62786AF
TD62787AP, TD62787F, TD62787AF

8CH HIGH-VOLTAGE SOURCE DRIVER

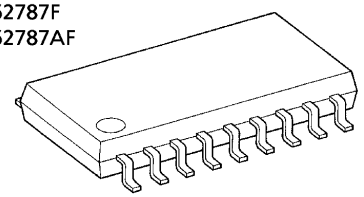
The TD62786AP / F / AF series are eight channel huyx non-inverting source current transistor array. All units feature integral clamp diodes for switching inductive loads. Applications include relay, hammer and lamp drivers.

TD62786AP
TD62787AP



DIP18-P-300-2.54D

TD62786F
TD62786AF
TD62787F
TD62787AF



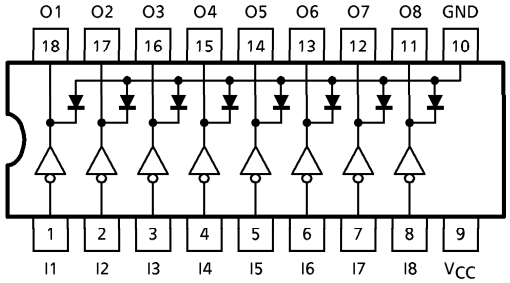
SOP18-P-375-1.27

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

FEATURES

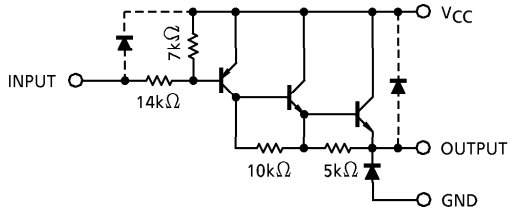
- High output voltage type-AP, AF : $V_{CE\ (SUS)} = 50V$ (Min.)
  type-F : $V_{CE\ (SUS)} = 35V$ (Min.)
- Output current (single output) : $I_{OUT} = -500mA$ / ch (Max.)
- Output clamp diodes
- Single supply voltage
- Input compatible with TTL, 5V CMOS
- Low level active input
- Package type-AP : DIP-18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

PIN CONNECTION (TOP VIEW)

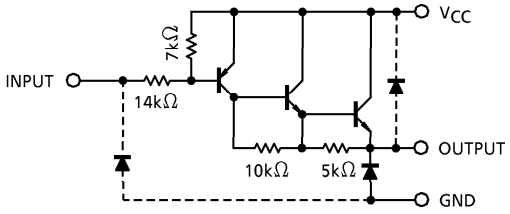


SCHEMATICS (EACH DRIVER)

TD62786AP / AF / F



TD62787AP / AF / F



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

961001EBA2

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 11.7mW / °C (AP Type), 7.7mW / °C (F, AF Type).

RECOMMENDED OPERATING CONDITIONS (Ta = − 40~85°C, V_{CC} = 0V)

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	

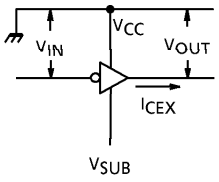
ELECTRICAL CHARACTERISTICS (Ta = 25°C, V_{CC} = 0V)

CHARACTERISTIC			SYMBOL	TEST CIR-CUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Output Leakage Current			I_{CEX}	1	$V_{OUT} = V_{GND} = -50V$ Ta = 85°C	—	—	−100	μA
Output Saturation Voltage			$V_{CE\ (sat)}$	2	$V_{IN} = V_{IL}$ MAX. $I_{OUT} = -100mA$	—	—	−1.8	V
					$V_{IN} = V_{IL}$ MAX. $I_{OUT} = -350mA$	—	—	−2.0	
DC Current transfer Ratio			h_{FE}	2	V_{CC} = 0V, V_{CE} = 3V $I_{OUT} = -350mA$	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} = 5.5V, V_{IN} = 0.4V	—	—	−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	$V_{OUT} = -50V$, $R_L = 163\Omega$ C_L = 15pF (Note)	—	0.2	—	μs
Turn Off Delay			t_{OFF}			—	1.0	—	

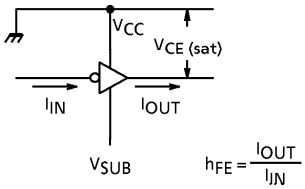
(Note) $V_{OUT} = -35V$, $R_L = 116\Omega$ for Type-F

TEST CIRCUIT

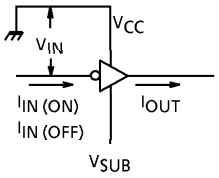
1. I_{CEX}



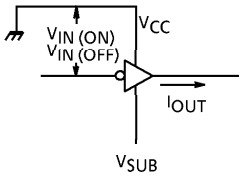
2. $V_{CE\ (sat)}$, h_{FE}



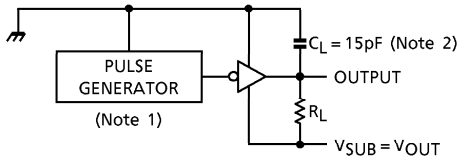
3. $I_{IN\ (ON)}$, $I_{IN\ (OFF)}$

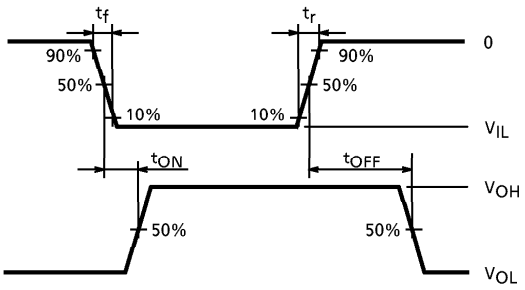


4. $V_{IN\ (ON)}$, $V_{IN\ (OFF)}$



5. t_{ON}, t_{OFF}



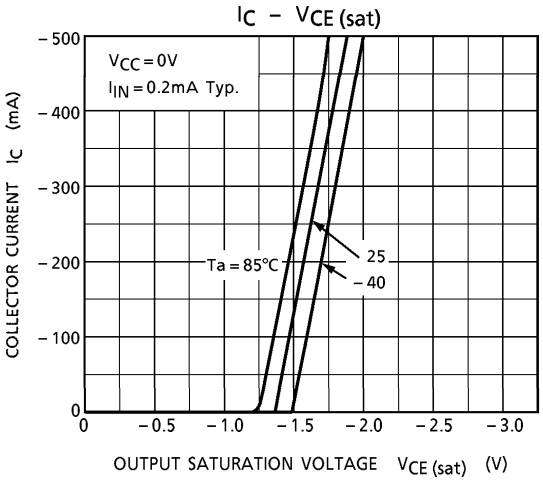


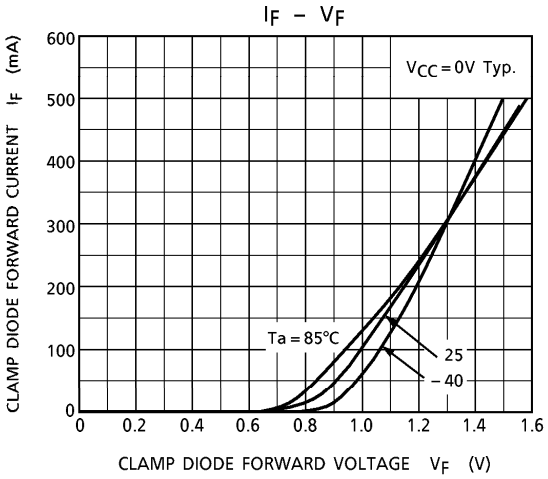
(Note 1) Pulse Width 50μs, Duty Cycle 10%
Output Impedance 50Ω, $t_r \leqq$ 10ns, $t_f \leqq$ 5ns

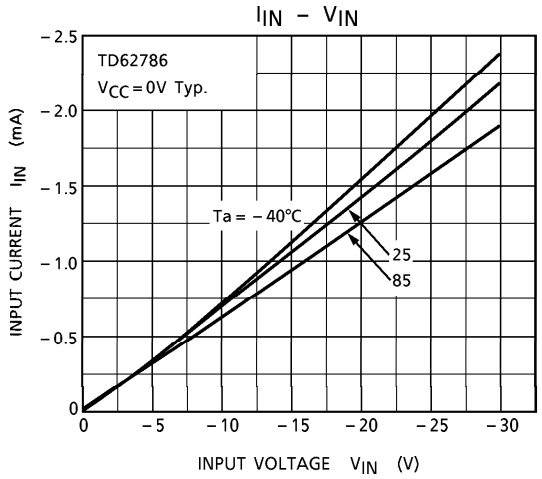
(Note 2) C_L includes probe and jig capacitance.

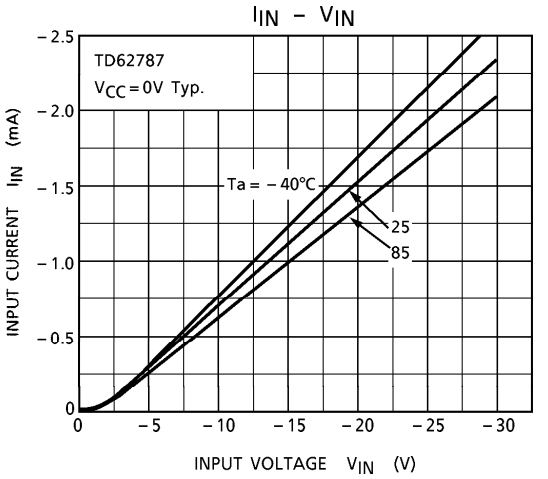
PRECAUTIONS for USING

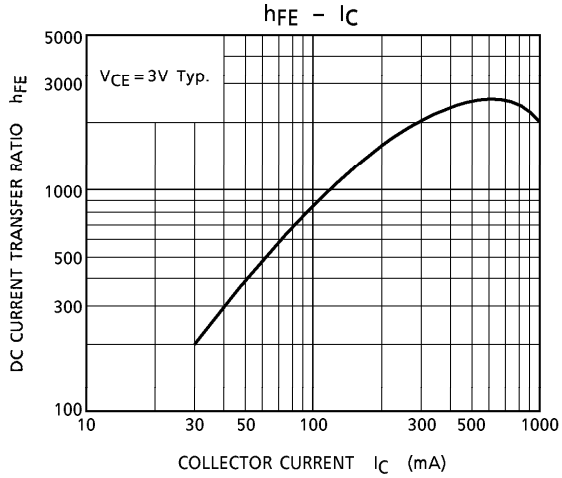
Utmost care is necessary in the design of the output line, V_{CC} and GND line since IC may be destroyed due to short-circuit between outputs, air contamination fault, or fault by improper grounding.

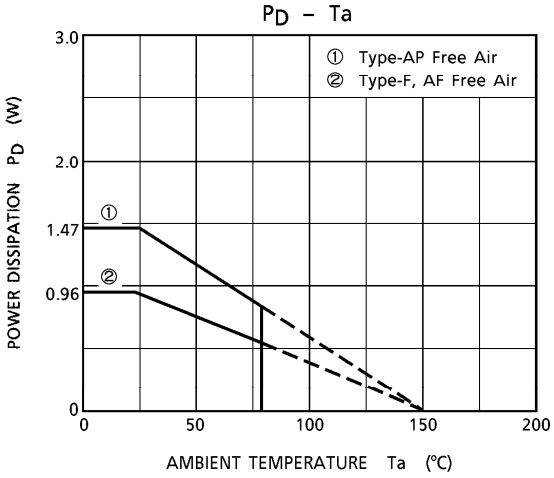

I_C – $V_{CE\,(sat)}$
V_{CC} = 0V
I_{IN} = 0.2mA Typ.
Ta = 85°C
25
– 40
COLLECTOR CURRENT I_C (mA)
OUTPUT SATURATION VOLTAGE $V_{CE\,(sat)}$ (V)


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)

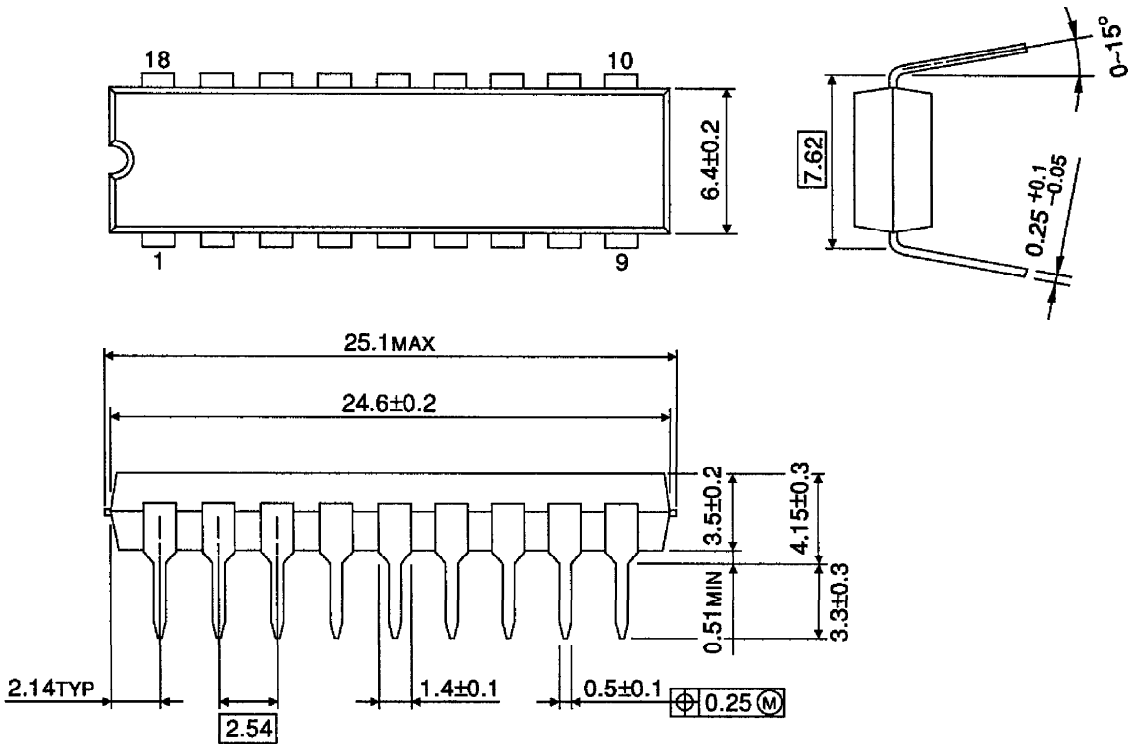

h_{FE} – I_C
V_{CE} = 3V Typ.
DC CURRENT TRANSFER RATIO h_{FE}
COLLECTOR CURRENT I_C (mA)


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

OUTLINE DRAWING

DIP18-P-300-2.54D

Unit : mm

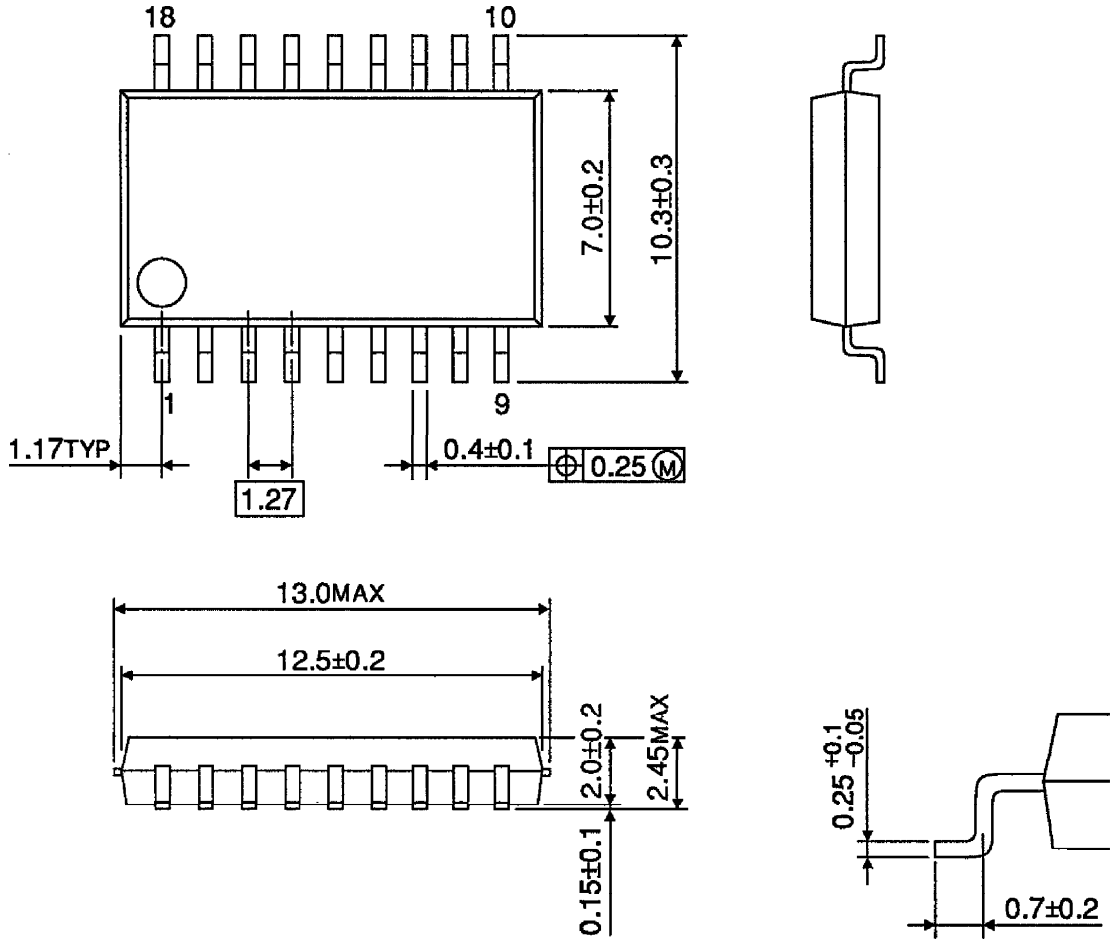


Weight : 1.47g (Typ.)

OUTLINE DRAWING

SOP18-P-375-1.27

Unit : mm



Weight : 0.41g (Typ.)