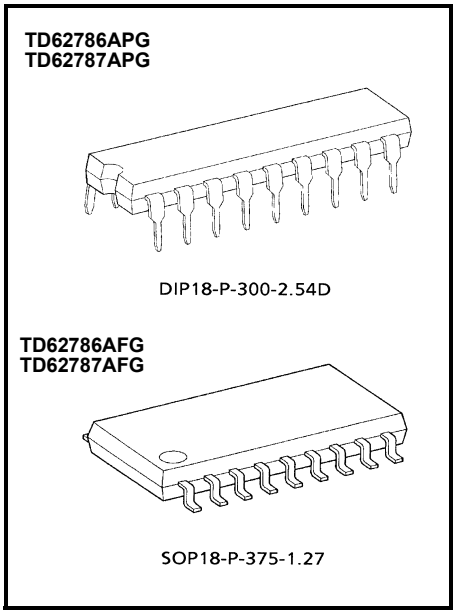
TOSHIBA BIPOLAR DIGITAL INTEGRATED CIRCUIT SILICON MONOLITHIC

TD62786APG, TD62786AFG
TD62787APG, TD62787AFG

8CH HIGH−VOLTAGE SOURCE DRIVER

The TD62786APG / AFG 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.
This devices are a product for the Pb free(Sn-Ag).

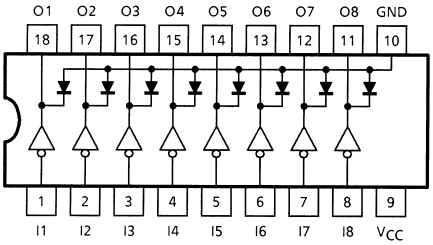


Weight
DIP18−P−300−2.54D : 1.47 g (Typ.)
SOP18−P−375−1.27 : 0.41 g (Typ.)

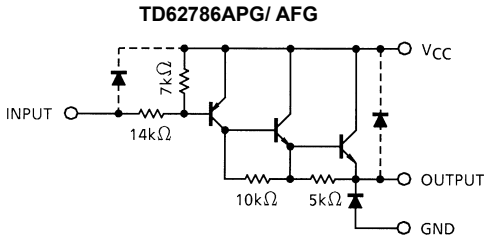
FEATURES

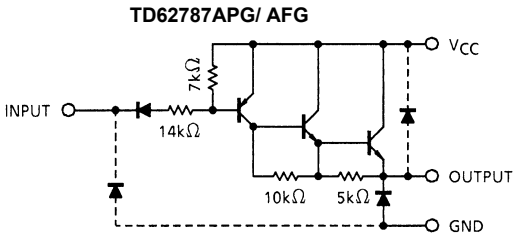
- High output voltage $V_{CE\ (SUS)}$ = 50 V (Min)
- Output current (single output) : I_{OUT} = −500 mA / ch (Max)
- Output clamp diodes
- Single supply voltage
- Input compatible with TTL, 5 V CMOS
- Low level active input
- Package type−APG : DIP−18 pin
- Package type−AFG : SOP−18 pin

PIN CONNECTION (TOP VIEW)



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		$V_{CC}-V_{GND}$	50	V
Output Sustaining Voltage		V_{OUT}	−50	V
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		V_R	50	V
Clamp Diode Forward Current		I_F	500	mA
Power Dissipation	APG	P_D (Note 3)	1.47	W
	AFG		0.96	
Operating Temperature		T_{opr}	−40~85	°C
Storage Temperature		T_{stg}	−55~150	°C

Note 1: Only TD62786APG / AFG
Note 2: Only TD62787APG / AFG
Note 3: Delated above 25°C in the proportion of 11.7 mW / °C (APG Type), 7.7 mW / °C (AFG Type).

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

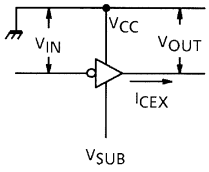
CHARACTERISTIC		SYMBOL	CONDITION	MIN	TYP.	MAX	UNIT
Supply Voltage		$V_{CC}-V_{GND}$	—	—	—	50	V
Output Voltage		V_{OUT}	—	—	—	−50	V
Output Current		I_{OUT}	—	—	—	−350	mA / ch
Input Voltage	TD62786	V_{IN}	—	−30	—	0	V
	TD62787		—	V_{GND}	—	7	
Clamp Diode Reverse Voltage		V_R	—	—	—	50	V
Clamp Diode Forward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

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

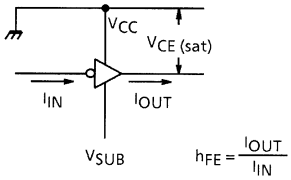
CHARACTERISTIC			SYMBOL	TEST CIR-CUIT	TEST CONDITION	MIN	TYP.	MAX	UNIT
Output Leakage Current			I_{CEX}	1	$V_{OUT} = V_{GND} = -50$ V Ta = 85°C	—	—	−100	μA
Output Saturation Voltage			$V_{CE\ (sat)}$	2	$V_{IN} = V_{IL\ MAX.}$ $I_{OUT} = -100$ mA	—	—	−1.8	V
					$V_{IN} = V_{IL\ MAX.}$ $I_{OUT} = -350$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

TEST CIRCUIT

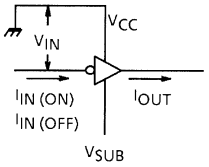
1. I_{CEX}



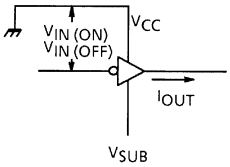
2. $V_{CE\ (sat)}$, h_{FE}



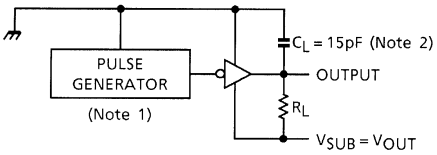
3. $I_{IN\ (ON)}$, $I_{IN\ (OFF)}$

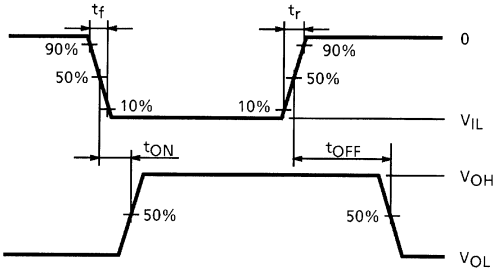


4. $V_{IN\ (ON)}$, $V_{IN\ (OFF)}$



5. t_{ON}, t_{OFF}

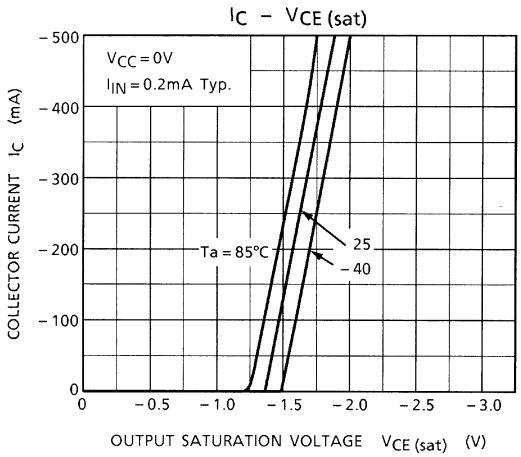


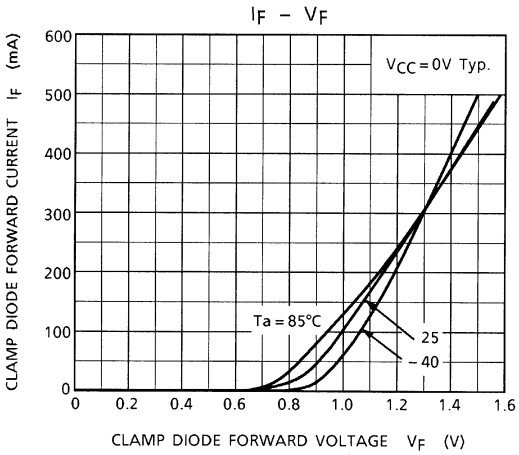


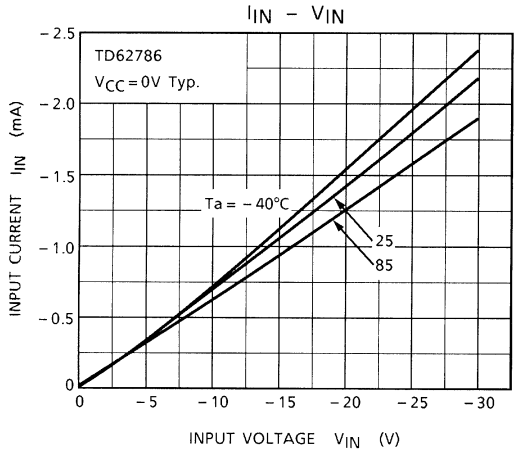
Note 1: Pulse Width 50 μs, Duty Cycle 10%
Output Impedance 50 Ω, $t_r \leq 10$ ns, $t_f \leq 5$ ns
Note 2: C_L includes probe and jig capacitance.

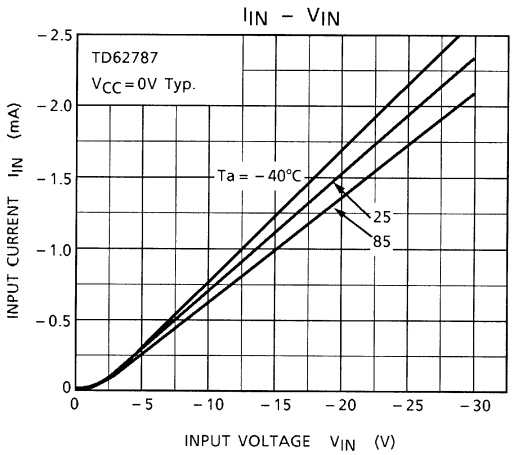
PRECAUTIONS for USING

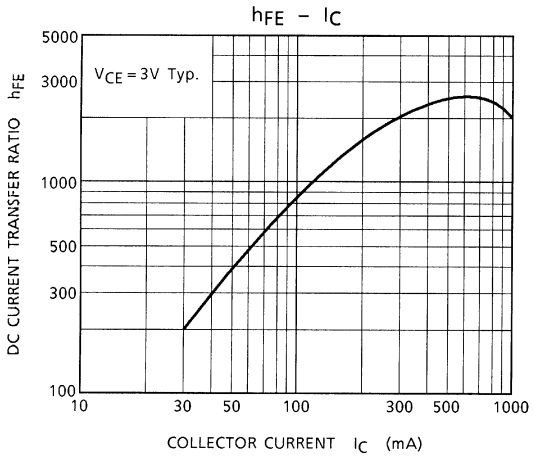
This IC does not integrate protection circuits such as overcurrent and overvoltage protectors.
Thus, if excess current or voltage is applied to the IC, the IC may be damaged. Please design the IC so that excess current or voltage will not be applied to the IC.
Utmost care is necessary in the design of 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.

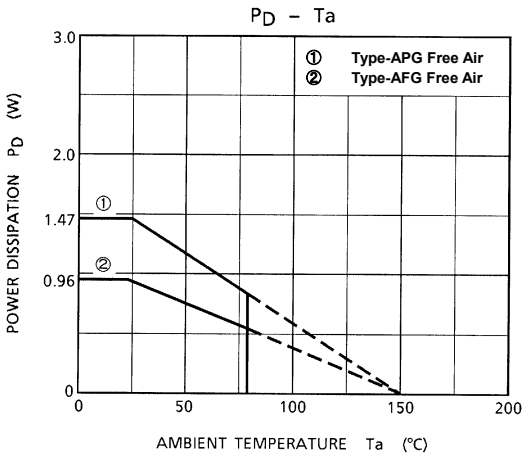

IC – VCE (sat)
VCC = 0V
IIN = 0.2mA Typ.
Ta = 85°C
25
– 40
COLLECTOR CURRENT IC (mA)
OUTPUT SATURATION VOLTAGE VCE (sat) (V)


IF – VF
VCC = 0V Typ.
Ta = 85°C
25
– 40
CLAMP DIODE FORWARD CURRENT IF (mA)
CLAMP DIODE FORWARD VOLTAGE VF (V)


IIN – VIN
TD62786
VCC = 0V Typ.
Ta = – 40°C
25
85
INPUT CURRENT IIN (mA)
INPUT VOLTAGE VIN (V)

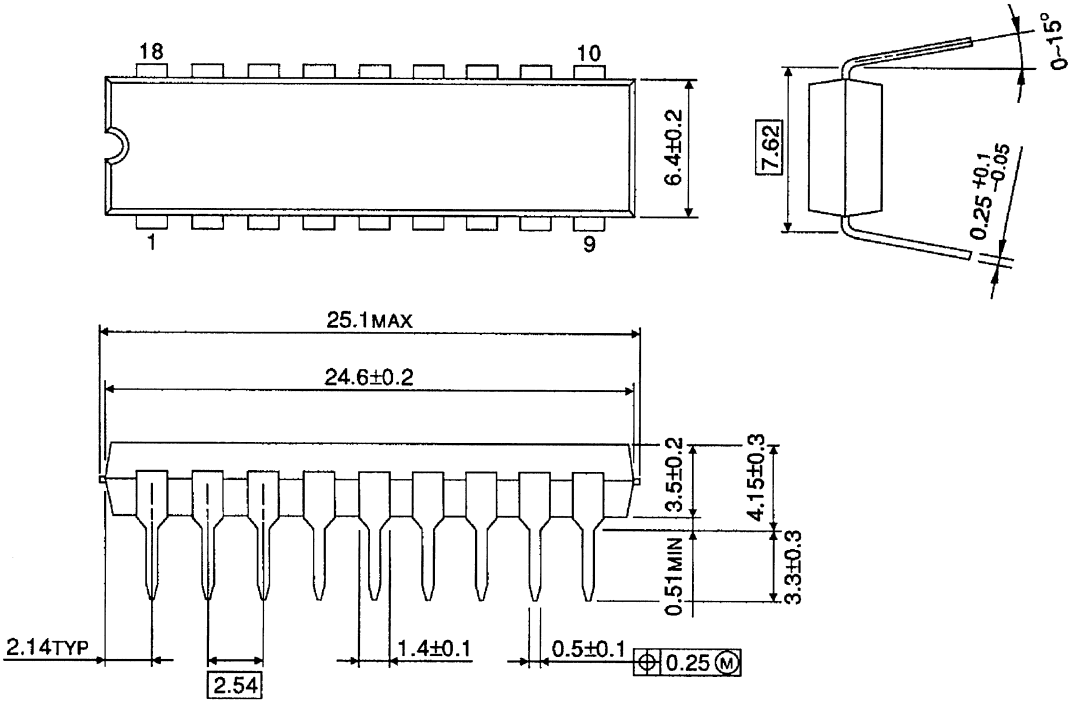

IIN – VIN
TD62787
VCC = 0V Typ.
Ta = – 40°C
25
85
INPUT CURRENT IIN (mA)
INPUT VOLTAGE VIN (V)


hFE – IC
VCE = 3V Typ.
DC CURRENT TRANSFER RATIO hFE
COLLECTOR CURRENT IC (mA)


PD – Ta
① Type-APG Free Air
② Type-AFG Free Air
POWER DISSIPATION PD (W)
AMBIENT TEMPERATURE Ta (°C)

PACKAGE DIMENSIONS

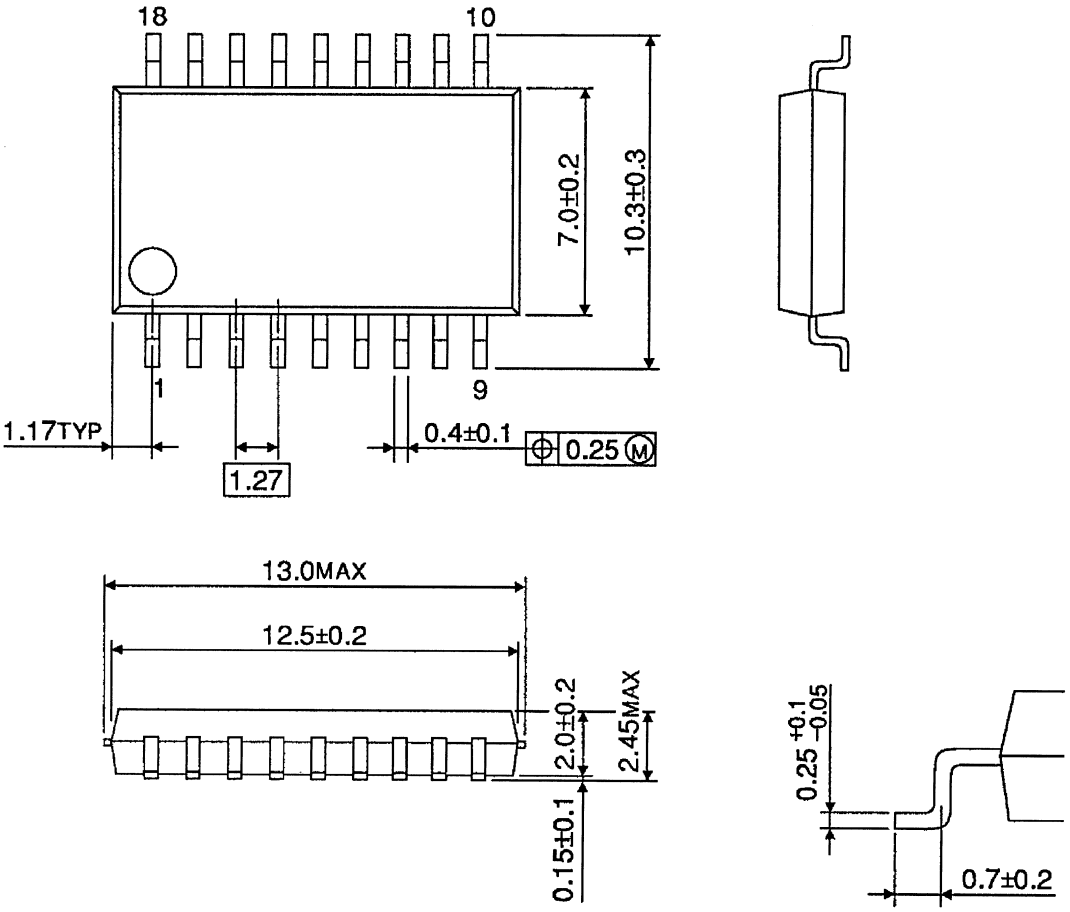
DIP18−P−300−2.54D Unit: mm



Weight: 1.47 g (Typ.)

PACKAGE DIMENSIONS

SOP18−P−375−1.27 Unit: mm



Weight: 0.41 g (Typ.)

About solderability, following conditions were confirmed

- Solderability

(1) Use of Sn-63Pb solder Bath
- solder bath temperature = 230°C
- dipping time = 5 seconds
- the number of times = once
- use of R-type flux

(2) Use of Sn-3.0Ag-0.5Cu solder Bath
- solder bath temperature = 245°C
- dipping time = 5 seconds
- the number of times = once
- use of R-type flux

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030619EBA

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