

TOSHIBA BIPOLAR DIGITAL INTEGRATED CIRCUIT SILICON MONOLITHIC

TD62384APG, TD62384AFG TD62385APG, TD62385AFG

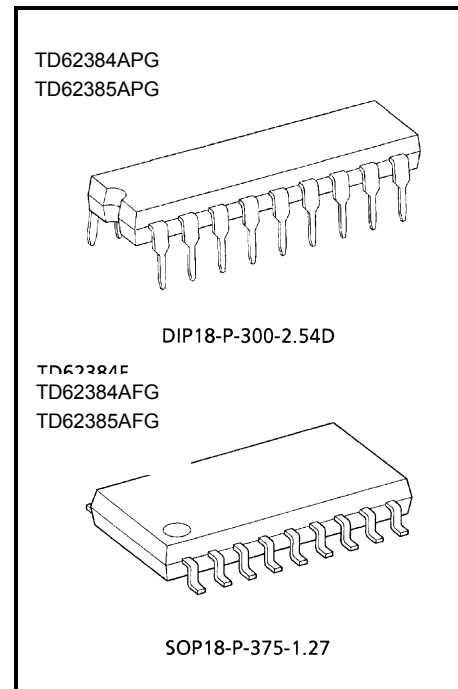
8CH LOW INPUT ACTIVE DARLINGTON SINK DRIVER

The TD62384APG / AFG and TD62385APG / AFG are non-inverting transistor arrays, which are comprised of eight NPN darlington output stages and PNP input stages. These devices can be operated by source input voltage and are suitable for operations with a 5-V general purposed logic IC such as 5-V TTL, 5-V CMOS and 5-V Microprocessor which have sink current output drivers. Please observe the thermal condition for using. This devices are a product for the Pb free(Sn-Ag).

FEATURES

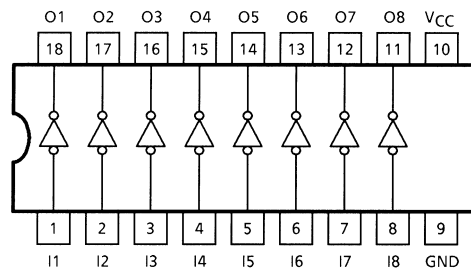
- Output current (single output) 500 mA (Max)
- High sustaining voltage 50 V (Min)
- Low level active input
- Inputs compatible with 5-V TTL and 5-V CMOS
- Package type-APG : DIP-18 pin
- Package type-AFG : SOP-18 pin

TYPE	$V_{IN(ON)}$
TD62384APG / AFG	$-20\text{ V} \sim V_{CC} - 2.8\text{ V}$
TD62385APG / AFG	$0\text{ V} \sim V_{CC} - 3.7\text{ V}$

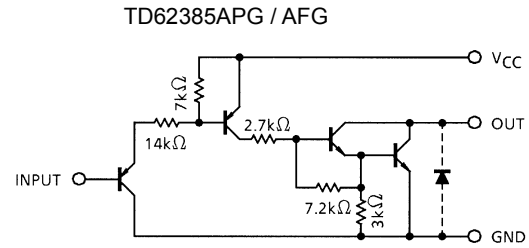
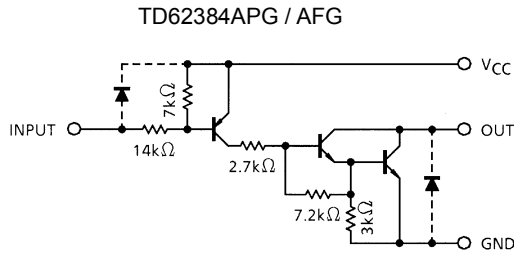


Weight
DIP18-P-300-2.54D : 1.47 g (Typ.)
SOP18-P-375-1.27 : 0.41 g (Typ.)

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}	-0.5~7.0	V
Output Sustaining Voltage		$V_{CE(SUS)}$	-0.5~50	V
Output Current		I_{OUT}	500	mA / ch
Input Voltage		V_{IN} (Note 1)	-22~ $V_{CC} + 0.5$	V
		V_{IN} (Note 2)	-0.5~7	
Input Current		I_{IN}	-10	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: TD62384APG / AFG

Note 2: TD62385APG/ 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)

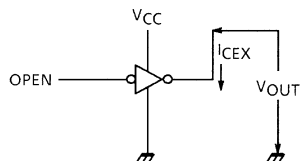
CHARACTERISTIC		SYMBOL	CONDITION	MIN	TYP.	MAX	UNIT
Supply Voltage		V_{CC}	—	4.5	5.0	5.5	V
Output Sustaining Voltage		$V_{CE(SUS)}$	—	0	—	50	V
Output Current	APG	I_{OUT}	$T_{pw} = 25 \text{ ms}$, Duty = 50% 8 Circuits, $T_a = 85^\circ\text{C}$, $T_j = 120^\circ\text{C}$	0	—	115	mA / ch
	AFG			0	—	78	
			$T_{pw} = 25 \text{ ms}$, Duty = 10% 1 Circuit	0	—	400	
Input Voltage	TD62384	V_{IN}	—	-20	—	V_{CC}	V
	TD62385			0	—	5.5	
Power Dissipation	APG	P_D	—	—	—	0.52	W
	AFG		—	—	—	0.35	

ELECTRICAL CHARACTERISTIC (Ta = 25°C)

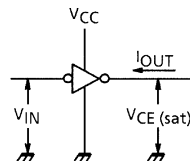
CHARACTERISTIC			SYMBOL	TEST CIR- CUIT	TEST CONDITION		MIN	TYP.	MAX	UNIT
Output Leakage Current			I _{CEX}	1	V _{CC} = 5.5 V, I _{IN} = 0 T _a = 85°C	V _{OUT} = 50 V	—	—	100	μA
Output Saturation Voltage			V _{CE (sat)}	2	V _{CC} = 4.5 V, I _{OUT} = 350 mA V _{IN} = V _{IN (ON)} MAX.		—	1.4	2.0	V
Input Current		(Output On)	I _{IN (ON)}	3	V _{CC} = 5.5 V, V _{IN} = 0.4 V		—	-0.32	-0.45	mA
		V _{CC} = 5.5 V, V _{IN} = -20 V			—	—	-2.6			
		(Output Off)	I _{IN (OFF)}	4	—		—	—	-4.0	μA
Input Voltage	(Output on)	TD62384	V _{IN (ON)}	5	—		—	—	V _{CC} - 2.8	V
		TD62385			—		—	—	V _{CC} - 3.7	
Supply Current			I _{CC (ON)}	6	V _{CC} = 5.5 V, V _{IN} = 0		—	17	22	mA
			I _{CC (OFF)}		V _{CC} = 5.5 V, V _{IN} = V _{CC}		—	—	100	μA
Turn-On Delay			t _{ON}	7	V _{CC} = 5 V, V _{OUT} = 50 V R _L = 163 Ω, C _L = 15 pF		—	0.1	—	μs
Turn-Off Delay			t _{OFF}				—	3	—	

TEST CIRCUIT

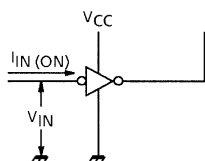
1. I_{CEX}



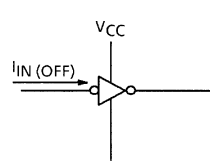
2. $V_{CE(sat)}$



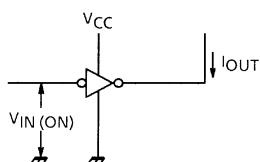
3. $I_{IN(ON)}$



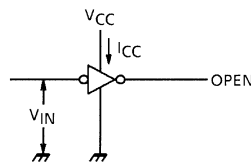
4. $I_{IN(OFF)}$



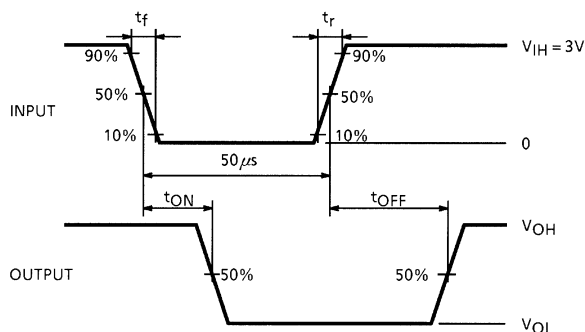
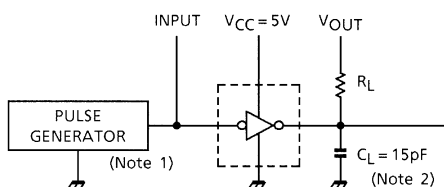
5. $V_{IN(ON)}$



6. I_{CC}



7. t_{ON}, t_{OFF}



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

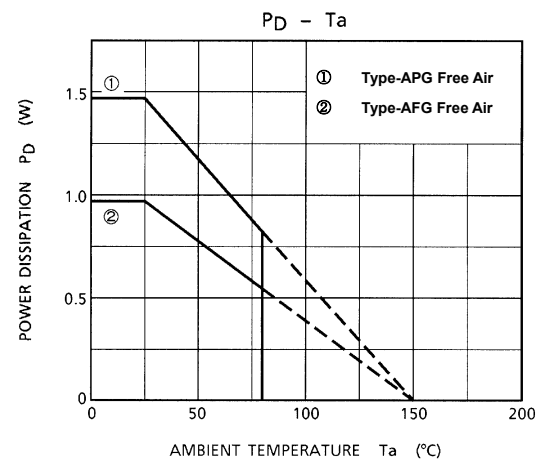
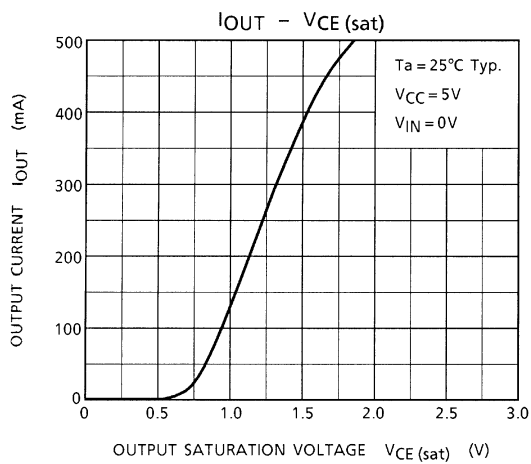
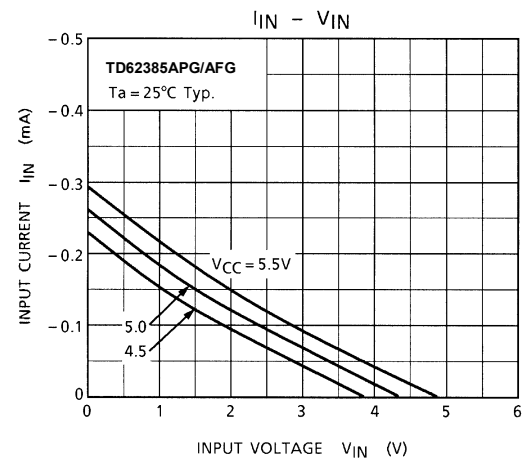
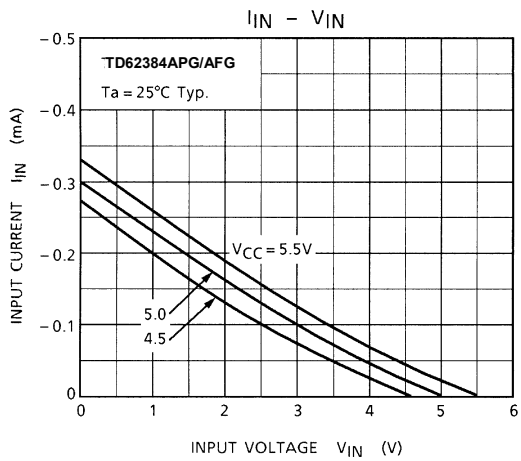
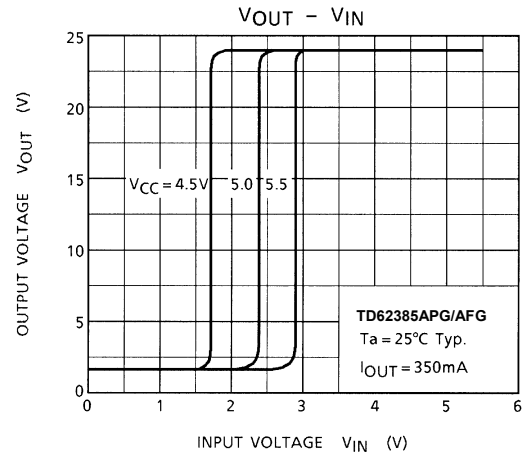
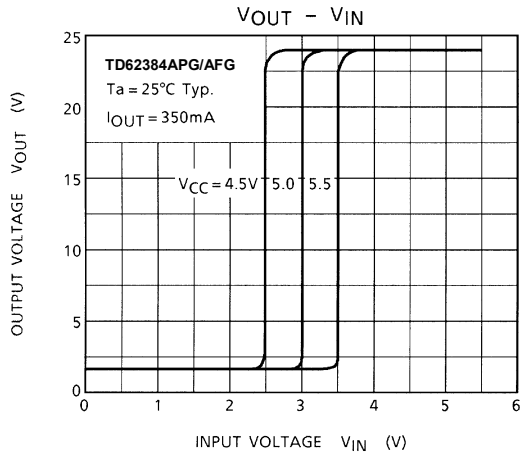
Note 2: C_L includes probe and jig capacitance.

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.

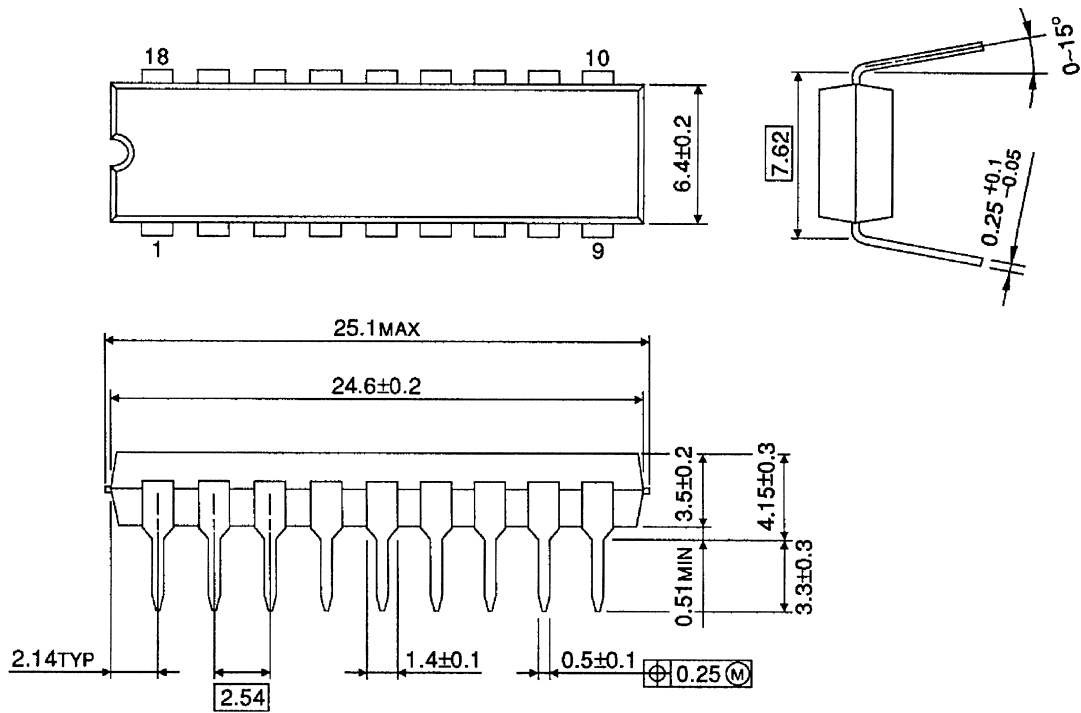
Utmost care is necessary in the design of the output line, V_{CC} and GND line since IC may be destroyed due to short-circuit between outputs, air contamination fault, or fault by improper grounding.



PACKAGE DIMENSIONS

DIP18-P-300-2.54D

Unit: mm

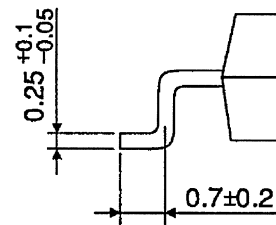
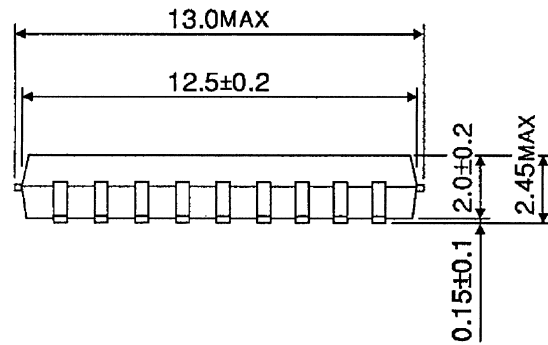
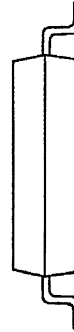
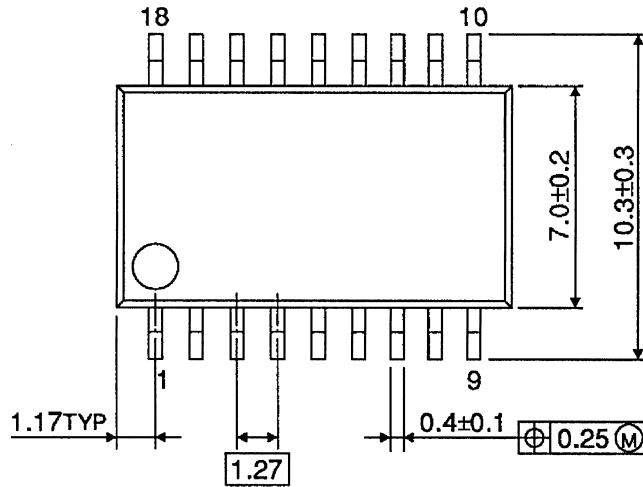


Weight: 1.47 g (Typ.)

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

RESTRICTIONS ON PRODUCT USE

030619EBA

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