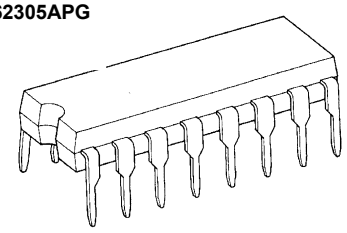
TOSHIBA BIPOLAR DIGITAL INTEGRATED CIRCUIT SILICON MONOLITHIC

TD62304APG,TD62304AFG
TD62305APG,TD62305AFG

7CH LOW ACTIVE DARLINGTON SINK DRIVER

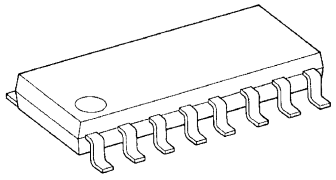
The TD62304APG/AFG and TD62305APG/AFG are non−inverting transistor arrays, which are comprised of eight NPN darlington buffer-transistor output stages and PNP input stages.
These devices can be operated by source input voltage and are suitable for operations with a 5-V general purposed logic IC such 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).

TD62304APG
TD62305APG



DIP16-P-300-2.54A

TD62304AFG
TD62305AFG



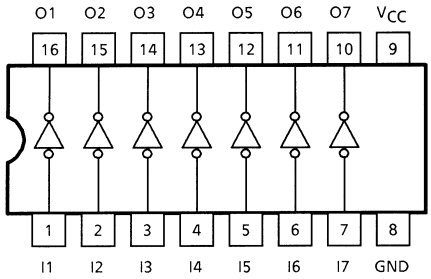
SOP16-P-225-1.27

Weight
DIP16−P−300−2.54A : 1.11 g (Typ.)
SOP16−P−225−1.27 : 0.16 g (Typ.)

FEATURES

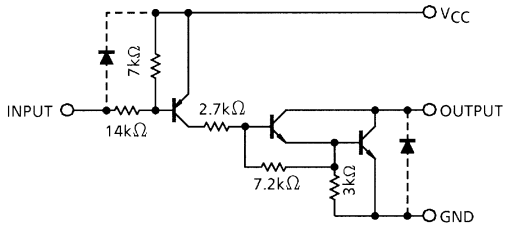
- Output current (single output) 500 mA (Max.)
- High sustaining voltage 50 V (Min.)
- Low level active input
- Input compatible with 5-V TTL and 5-V CMOS
- Package type- APG: DIP-16 pin
- Package type- AFG: SOP-18 pin

PIN CONNECTION (TOP VIEW)

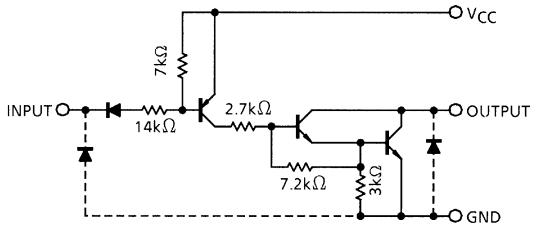


SCHEMATICS (EACH DRIVER)

TD62304APG/AFG



TD62305APG/AFG



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

MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTICS		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}	−22~V_{CC} +0.5	V
			−0.5~7 (Note 1)	
Input Current		I_{IN}	−10	mA
Power Dissipation	APG	P_D	1.47	W
	AFG		0.625 (Note 2)	
Operating Temperature		T_{opr}	−40~85	°C
Storage Temperature		T_{stg}	−55~150	°C

Note 1: TD62305APG / AFG

Note 2: On glass epoxy PCB (30 × 30 × 1.6 mm Cu 50%)

RECOMMENDED OPERATING CONDITIONS
(Ta = −40~85°C and Ta = −30~75°C for only Type−P)

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			I_{OUT}	DC 1 Circuit		0	—	400	mA / ch
		APG		T_{pw} = 25 ms, duty = 10% 7 circuits		0	—	350	
		APG		T_{pw} = 25 ms, duty = 20% 7 circuits		0	—	200	
		AFG		$T_{pw} \leq$ 25 ms 7 circuits T_j = 120°C Ta = 85°C (Note 1)	duty = 10%	0	—	240	
		AFG			duty = 50%	0	—	60	
Input Voltage	TD62304APG / AFG		V_{IN}	—		−20	—	V_{CC}	V
	TD62305APG / AFG					0	—	5.5	
Power Dissipation		APG	P_D	—		—	—	0.52	W
		AFG		(Note 1)		—	—	0.325	

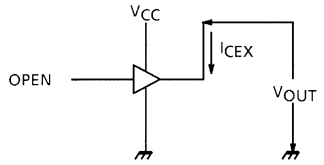
Note 1: On glass epoxy PCB (30 × 30 × 1.6 mm Cu 50%)

ELECTRICAL CHARACTERISTICS (Ta = 25°C)

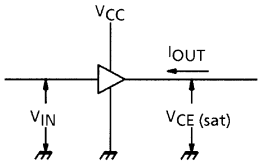
CHARACTERISTIC		SYMBOL	TEST CIR−CUIT	TEST CONDITION		MIN	TYP.	MAX	UNIT
Output Leakage Current		I_{CEX}	1	V_{CC} = 5.5 V V_{IN} = 0 V	V_{OUT} = 50 V Ta = 85°C	—	—	−100	μA
Output Saturation Voltage		$V_{CE\ (sat)}$	2	V_{CC} = 4.5 V I_{OUT} = 350 mA	V_{IN} = $V_{IN\ (ON)}$ MAX.	—	1.4	2.0	V
Input Current	(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	—		—	—	−40	μA
Input Voltage (Output On)	TD62304	$V_{IN\ (ON)}$	5	—		—	—	V_{CC} −2.8	V
	TD62305					—	—	V_{CC} −3.7	
Supply Current	(Output On)	$I_{CC\ (ON)}$	6	V_{CC} = 5.5 V, V_{IN} = 0 V		—	17	22	mA
	(Output Off)	$I_{CC\ (OFF)}$	6	V_{CC} = V_{IN} = 5.5 V		—	—	100	μA
Turn−On Delay		t_{ON}	7	V_{CC} = 5 V, C_L = 15 pF	V_{OUT} = 50 V R_L = 125 Ω	—	0.1	—	μs
Turn−Off Delay		t_{OFF}			V_{OUT} = 50 V R_L = 125 Ω	—	3	—	

TEST CIRCUIT

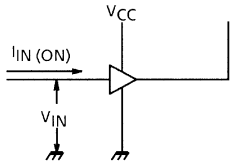
1. I_{CEX}



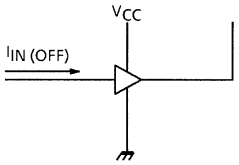
2. h_{FE}, $V_{CE\ (sat)}$



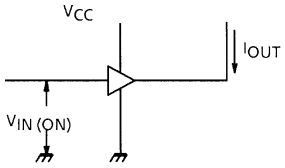
3. $I_{IN\ (ON)}$



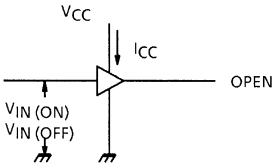
4. $I_{IN\ (OFF)}$



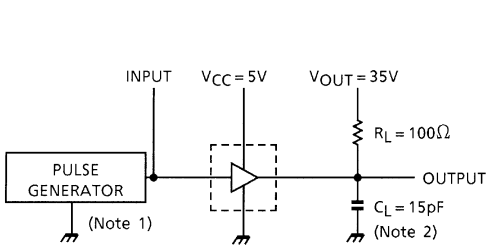
5. $V_{IN\ (ON)}$

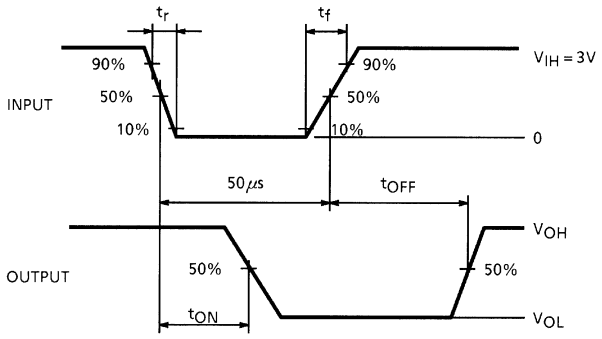


6. I_{CC}



7. t_{ON}, t_{OFF}





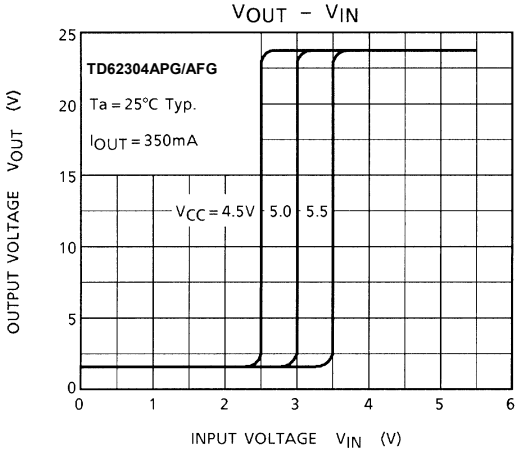
Note 1: Pulse Width 50 μs, duty cycle 10%
Output impedance 50 Ω, $t_r \leq 10$ ns, $t_f \leq 5$ ns

Note 2: C_L includes probe and jig capacitance.

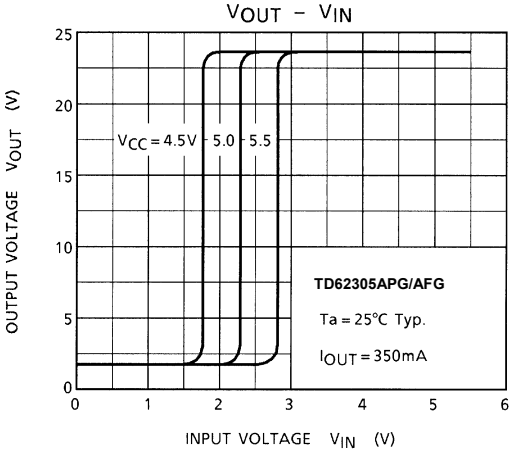
PRECAUTIONS for USING

This IC does not include built-in protection circuits for excess current or overvoltage.
If this IC is subjected to excess current or overvoltage, it may be destroyed.
Hence, the utmost care must be taken when systems which incorporate this IC are designed. 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.

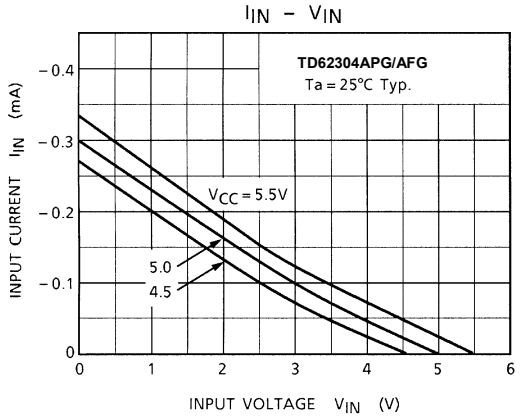
V_{OUT} – V_{IN}



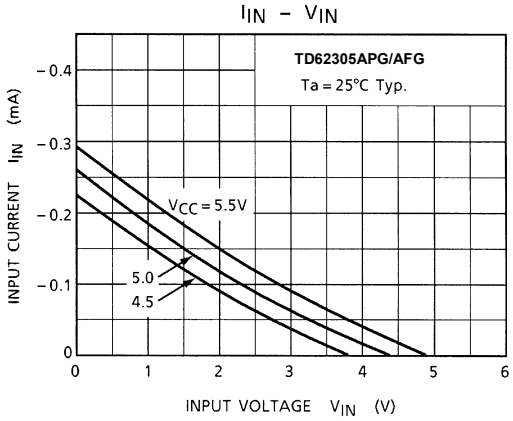
V_{OUT} – V_{IN}



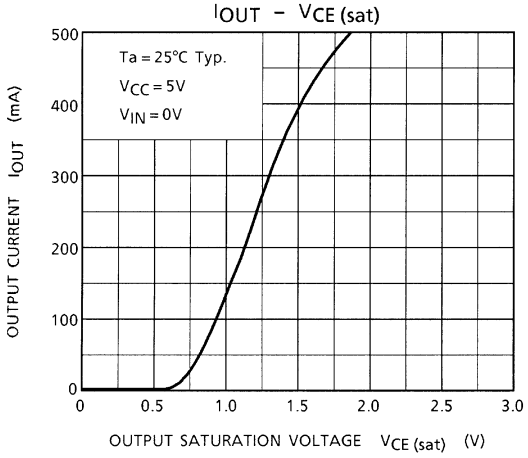
I_{IN} – V_{IN}



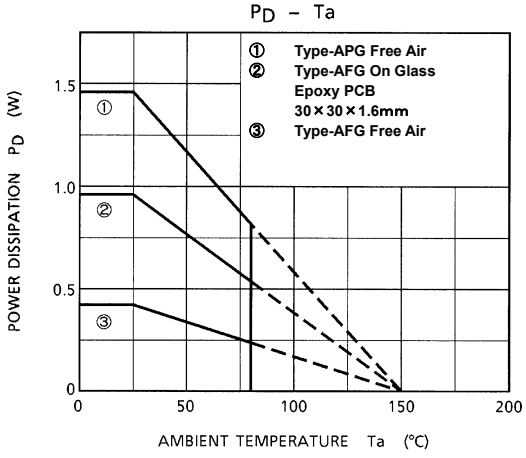
I_{IN} – V_{IN}



I_{OUT} – $V_{CE\ (sat)}$

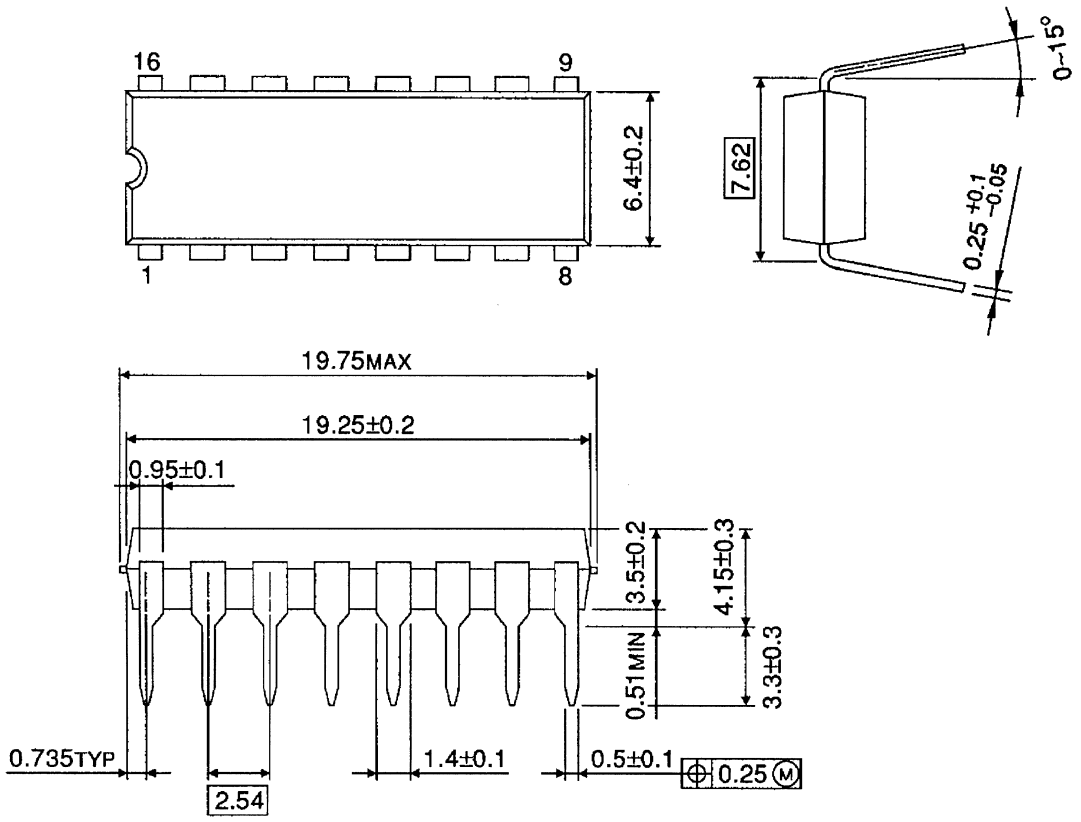


P_D – Ta



PACKAGE DIMENSIONS

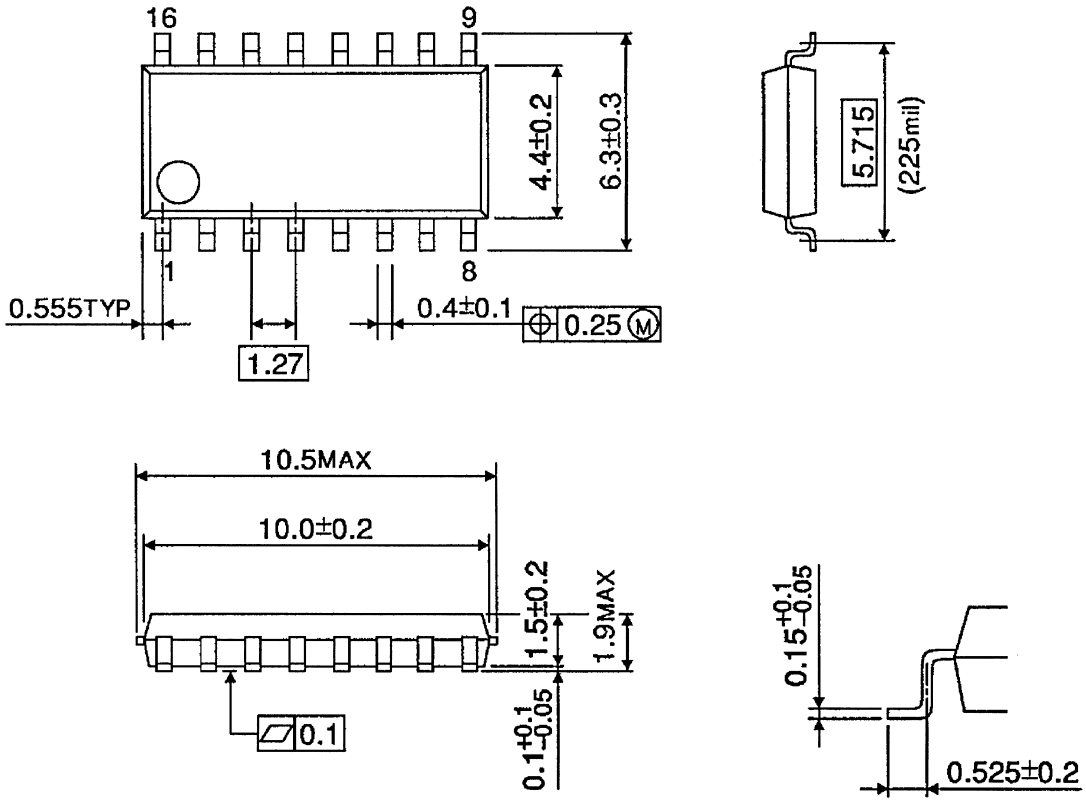
DIP16−P−300−2.54A Unit : mm



Weight: 1.11 g (Typ.)

PACKAGE DIMENSIONS

SOP16−P−225−1.27 Unit : mm



Weight: 0.16 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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