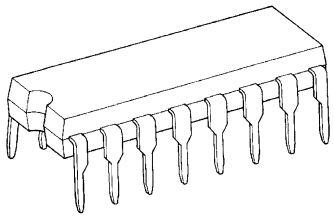
TOSHIBA BIPOLAR DIGITAL INTEGRATED CIRCUIT SILICON MONOLITHIC

TD62008APG,TD62008AFG

7CH DARLINGTON SINK DRIVER

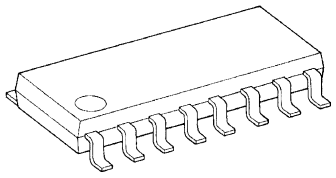
The TD62008APG / AFG are high−voltage, high−current darlington drivers comprised of seven NPN darlington pairs. All units feature integral clamp diodes for switching inductive loads and protective diodes against a negative input voltage. The TD62008APG / AFG are suitable for interfaces from minus and plus dual supply voltage system to plus single supply voltage system.
Applications include relay, hammer, lamp and display (LED) drivers.
Please observe the thermal condition for using.
This devices are a product for the Pb free(Sn-Ag).

TD62008APG



DIP16-P-300-2.54A

TD62008AFG



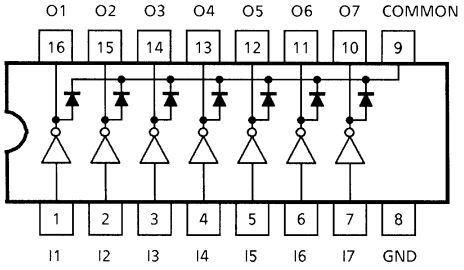
SOP16-P-225-1.27

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

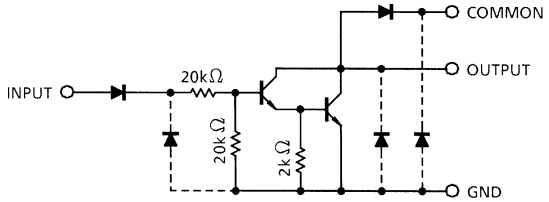
FEATURES

- Output current (single output) 400 mA (Max)
- High sustaining voltage output 50 V (Min)
- Output clamp diodes
- Protective diodes against a negative input voltage
- Inputs base resistor R_{IN} = 20 kΩ
- Inputs compatible with 9~15 V PMOS, CMOS.
- Package type−AP : DIP−16 pin
- Package type−F, AF: SOP−16 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
Output Sustaining Voltage		$V_{CE\ (SUS)}$	−0.5 ~ 50	V
Output Current		I_{OUT}	400	mA / ch
Input Voltage		V_{IN}	−40 ~ 40	V
Clamp Diode Reverse Voltage		V_R	50	V
Clamp Diode Forward Current		I_F	400	mA
Power Dissipation	AP	P_D	1.47	W
	F / AF		0.625 (Note)	
Operating Temperature		T_{opr}	−40 ~ 85	°C
Storage Temperature		T_{stg}	−55 ~ 150	°C

Note: On Glass Epoxy PCB (30 × 30 × 1.6 mm Cu 50%)

RECOMMENDED OPERATING CONDITIONS (Ta = −40 ~ 85°C)

CHARACTERISTIC		SYMBOL	CONDITION	MIN	TYP.	MAX	UNIT
Output Sustaining Voltage		$V_{CE\ (SUS)}$		0	—	50	V
Output Current		I_{OUT}	DC 1 Circuit, T_{pw} = 25%, Duty = 40%	0	—	400	mA
			T_{pw} = 25 ms, Duty = 10%, 7 Circuits	0	—	200	
Input Voltage		V_{IN}		−35	—	35	V
Clamp Diode Reverse Voltage		V_R		—	—	50	V
Clamp Diode Forward Current		I_F		—	—	400	mA
Power Dissipation	AP	P_D		—	—	0.52	W
	AF		Ta = 85°C (Note)	—	—	0.325	

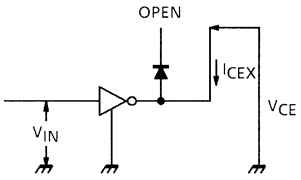
Note: On Glass Epoxy PCB (30 × 30 × 1.6 mm Cu 50%)

ELECTRICAL CHARACTERISTICS (Ta = 25°C)

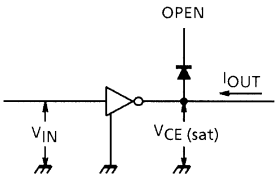
CHARACTERISTIC		SYMBOL	TEST CIR-CUIT	TEST CONDITION		MIN	TYP.	MAX	UNIT
Output Leakage Current		I_{CEX}	1	V_{OUT} = 50 V		—	—	100	μA
Collector−Emitter Saturation Voltage		$V_{CE\ (sat)}$	2	I_{OUT} = 400 mA		—	1.3	2.4	V
				I_{OUT} = 200 mA		—	1.0	1.6	
Input Current	"H" Level	$I_{IN\ (ON)}$	4	V_{IN} = 18 V		—	0.85	1.8	mA
				V_{IN} = 35 V		—	—	3.8	
	"L" Level	$I_{IN\ (OFF)}$	4	V_{IN} = −35 V		—	—	−20	μA
DC Current Transfer Ratio		h_{FE}	3	V_{CE} = 4 V, I_{OUT} = 350 mA		1000	3000	—	
Clamp Diode Reverse Current		I_R	5	V_R = 50 V, V_R = 35 V (Type−F)		—	—	100	μA
Clamp Diode Forward Voltage		V_F	6	I_F = 400 mA		—	1.5	2.4	V
Turn−On Delay		t_{ON}	7	C_L = 15 pF	V_{OUT} = 50 V, R_L = 156 Ω	—	0.1	—	μs
Turn−Off Delay		t_{OFF}			V_{OUT} = 50 V, R_L = 156 Ω	—	0.2	—	μs

TEST CIRCUIT

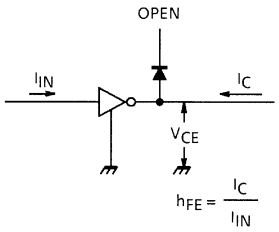
1. I_{CEX}



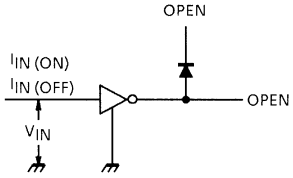
2. $V_{CE\ (sat)}$



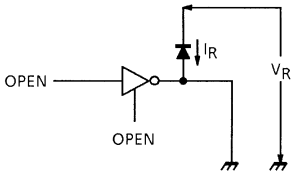
3. h_{FE}



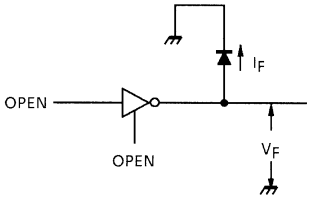
4. $I_{IN\ (ON)}$, $I_{IN\ (OFF)}$



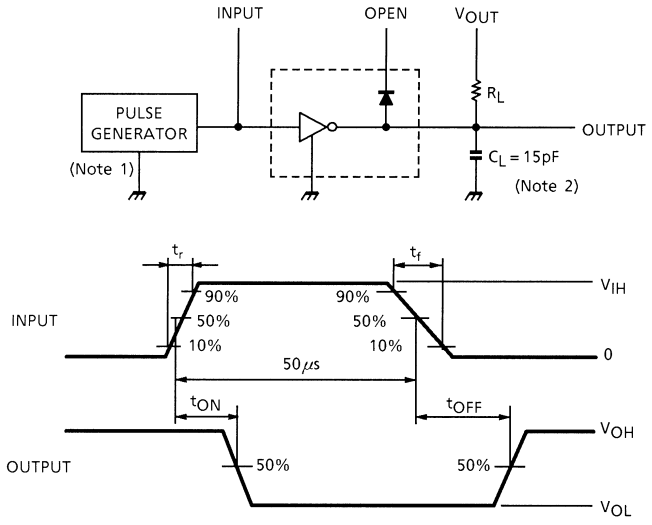
5. I_R



6. V_F



7. t_{ON}, t_{OFF}



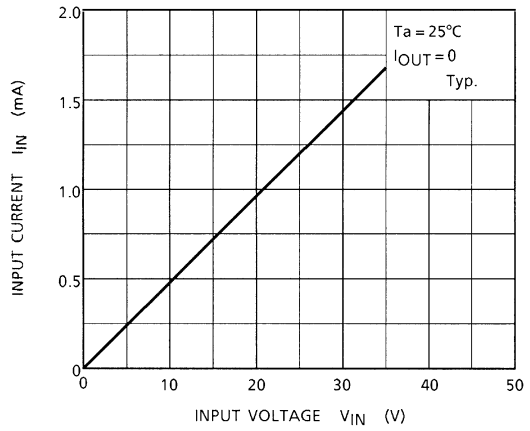
Note 1: Pulse Width 50 μs
Duty Cycle 10%
Output Impedance 50 Ω
tr ≤ 5 ns, tf ≤ 10 ns

Note 2: CL includes probe and jig capacitance

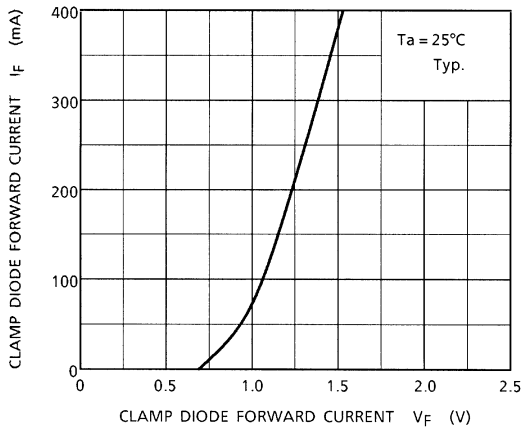
PRECAUTIONS for USING

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, COMMON and GND line since IC may be destroyed due to short−circuit between outputs, air contamination fault, or fault by improper grounding.

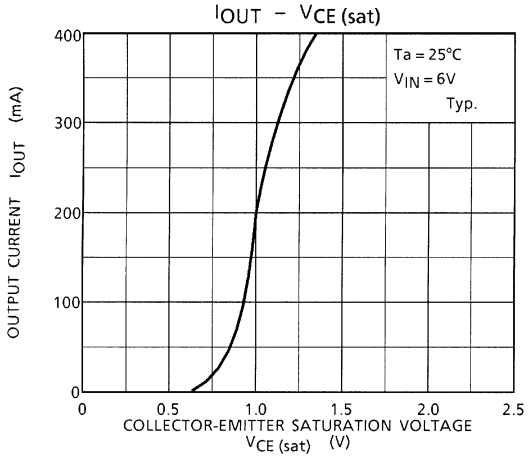
I_{IN} – V_{IN}



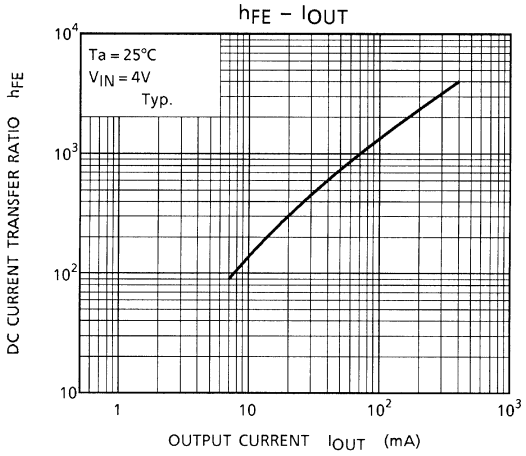
I_F – V_F



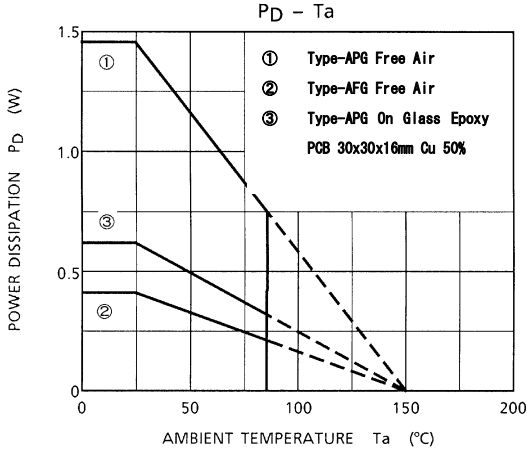
I_{OUT} – $V_{CE\ (sat)}$



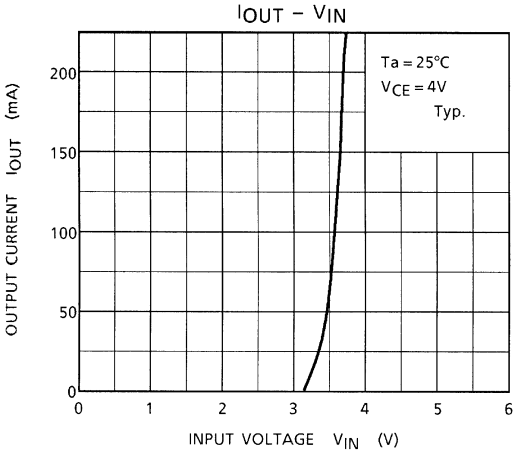
h_{FE} – I_{OUT}



P_D – Ta

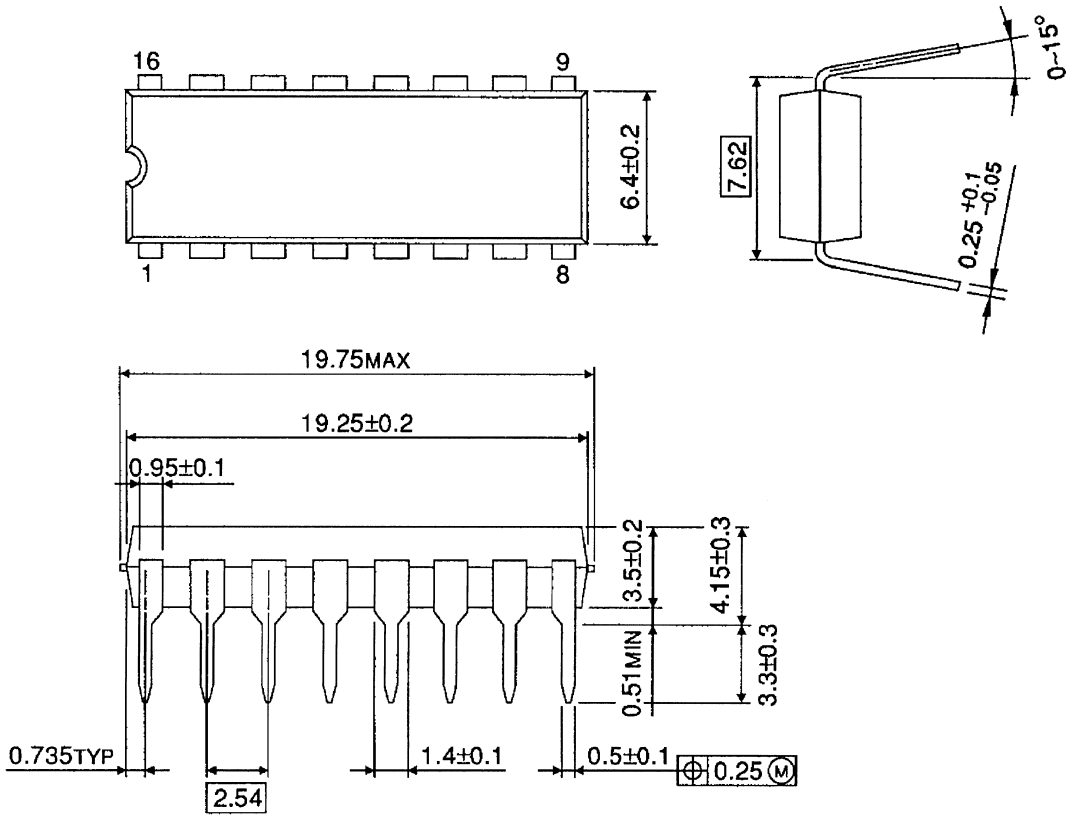


I_{OUT} – V_{IN}



PACKAGE DIMENSIONS

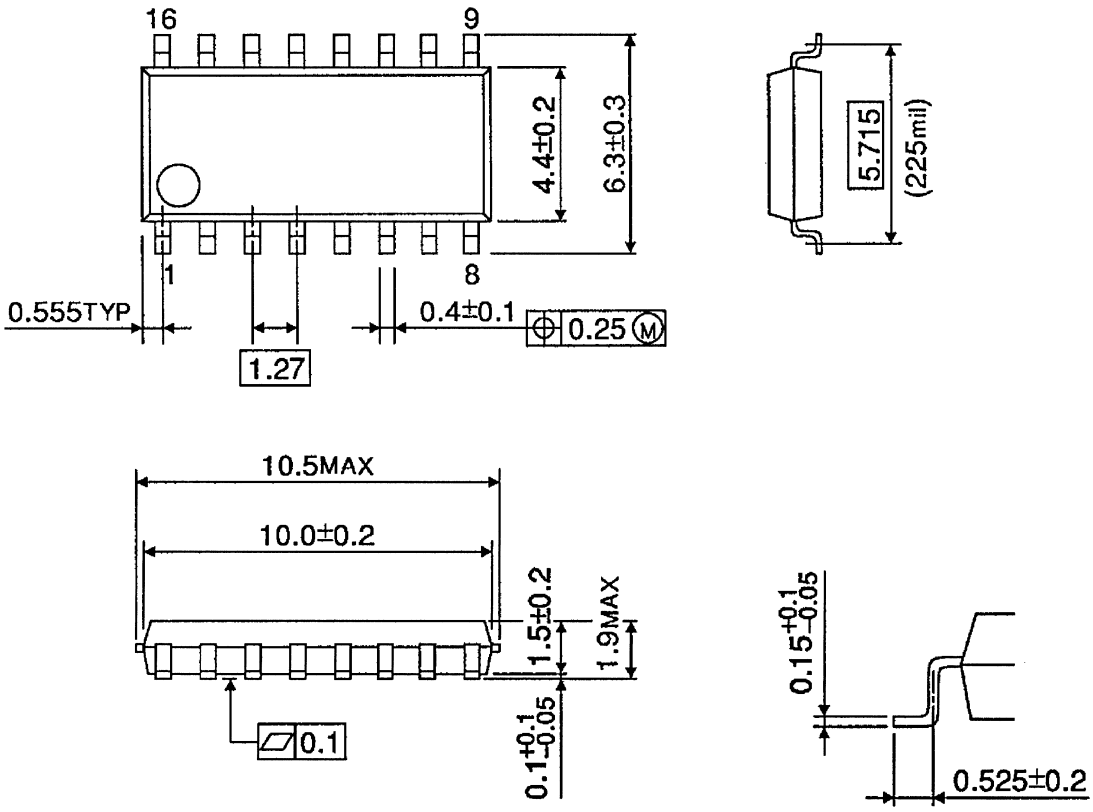
DIP16−P−300−2.54A Unit : mm



Weight: 1.11 g (Typ.)

PACKAGE DIMENSIONS

SOP16−P−225−1.27 Unit : mm



Weight: 0.16 gTyp.)

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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