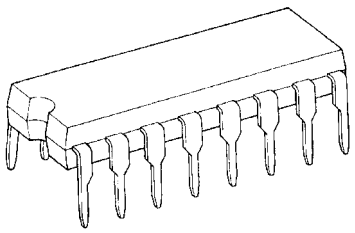
TOSHIBA BIPOLAR DIGITAL INTEGRATED CIRCUIT SILICON MONOLITHIC

TD62007P,TD62007F

7CH DARLINGTON SINK DRIVER

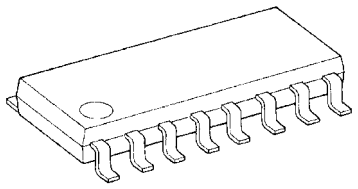
The TD62007P/TD62007F Series are high−voltage, high−current darlington drivers comprised of seven NPN darlington pairs.
All units feature integral clamp diodes for switching inductive loads and protective diodes against a negative input voltage. The TD62007P and TD62007F are suitable for interfaces from 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.

TD62007P



DIP16-P-300-2.54A

TD62007F



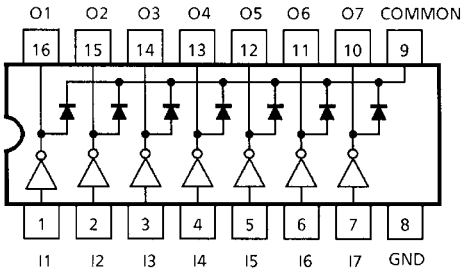
SOP16-P-225-1.27

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

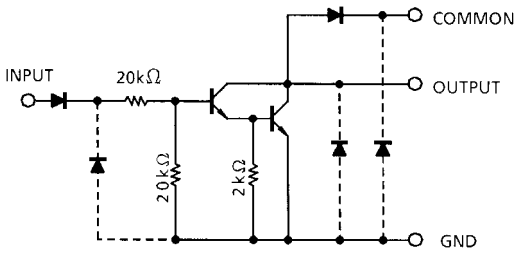
FEATURES

- Output current (single output) : 150 mA (Max)
- High sustaining voltage output : 22 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−P : DIP−16 pin
- Package type−F : 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		$V_{CE\ (SUS)}$	−0.5~22	V
Output Current		I_{OUT}	150	mA / ch
Input Voltage		V_{IN}	−37~22	V
Clamp Diode Reverse Voltage		V_R	22	V
Clamp Diode Forward Current		I_F	150	mA
Power Dissipation	P	P_D	1.0	W
	F		0.625 (Note)	
Operating Temperature	P	T_{opr}	−30~75	°C
	F			
Storage Temperature		T_{stg}	−55~150	°C

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

RECOMMENDED OPERATING CONDITIONS (Ta = −30~75°C)

CHARACTERISTIC		SYMBOL	CONDITION	MIN	TYP.	MAX	UNIT
Output Sustaining Voltage		$V_{CE\ (SUS)}$		0	—	20	V
Output Current		I_{OUT}	1 Circuit	0	—	120	mA
			T_{pw} = 25 ms, Duty = 10%, 7 Circuits	0	—	100	
Input Voltage		V_{IN}		−35	—	20	V
Clamp Diode Reverse Voltage		V_R		—	—	20	V
Clamp Diode Forward Current		I_F		—	—	120	mA
Power Dissipation	P	P_D		—	—	0.44	W
	F		Ta = 85°C (Note)	—	—	0.325	

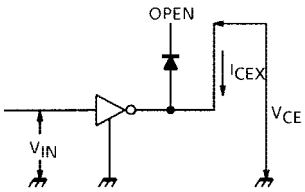
Note: On Glass Epoxy PCB (30 × 30 × 1.6 mm Cu 50%)

ELECTRICAL CHARACTERISTICS (Ta = 25°C)

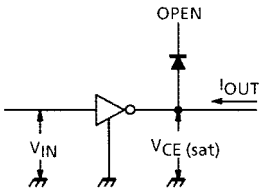
CHARACTERISTIC		SYMBOL	TEST CIR-CUIT	TEST CONDITION	MIN	TYP.	MAX	UNIT
Output Leakage Current		I_{CEX}	1	Ta = 75°C, V_{OUT} = 20 V, V_{IN} = 1.0 V	—	—	100	μA
Collector−Emitter Saturation Voltage		$V_{CE\ (sat)}$	2	V_{IN} = 7.5 V, I_{OUT} = 120 mA	—	—	1.6	V
DC Current Transfer Ratio		h_{FE}	3	V_{CE} = 2.0 V, I_{OUT} = 120 mA	800	—	—	
Input Current	"H" Level	$I_{IN\ (ON)}$	4	V_{IN} = 7.5 V	—	—	0.7	mA
	"L" Level	$I_{IN\ (OFF)}$		V_{IN} = −35 V	—	—	−10	μA
Input Voltage	"H" Level	$V_{IN\ (ON)}$	5	I_{OUT} = 120 mA	—	—	7.5	V
	"L" Level	$V_{IN\ (OFF)}$			1	—	—	
Clamp Diode Reverse Current		I_R	6	V_R = 20 V	—	—	30	μA
Clamp Diode Forward Voltage		V_F	7	I_F = 120 mA	—	—	1.6	V
Turn−On Delay		t_{ON}	8	V_{OUT} = 20 V, R_L = 167 Ω, C_L = 15 pF	—	0.1	—	μs
Turn−OFF Delay		t_{OFF}			—	0.4	—	

TEST CIRCUIT

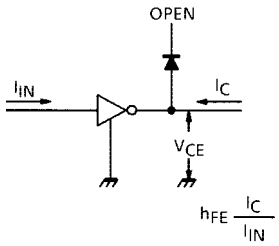
1. I_{CEX}



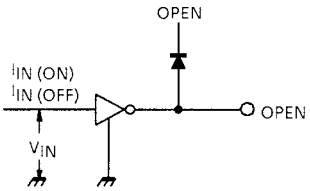
2. $V_{CE\ (sat)}$



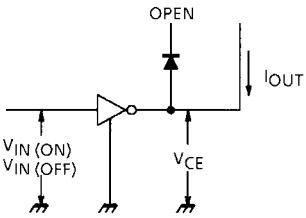
3. h_{FE}



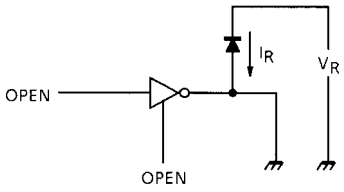
4. $I_{IN\ (ON)}$, $I_{IN\ (OFF)}$



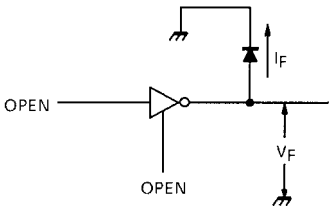
5. $V_{IN\ (ON)}$, $V_{IN\ (OFF)}$



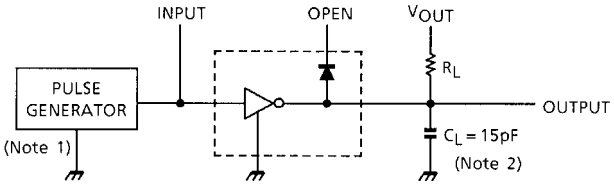
6. I_R

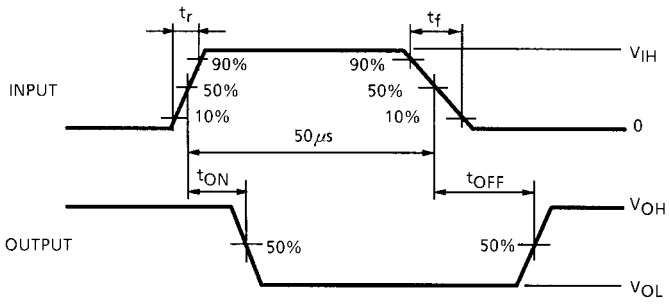


7. V_F



8. t_{ON}, t_{OFF}





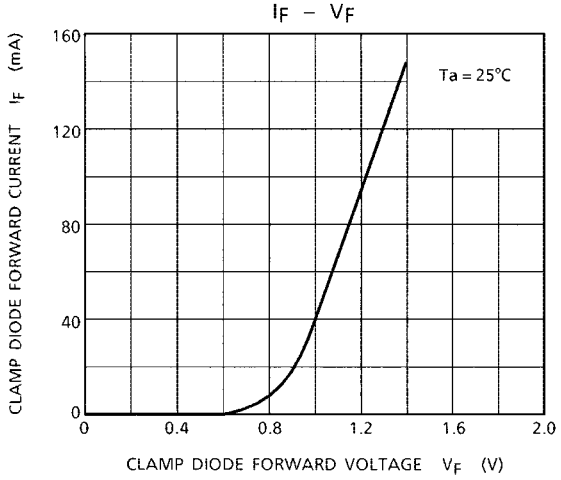
Note 1: Pulse Width 50 μs, Duty Cycle 10%
Output Impedance 50 Ω, $t_r \leq 5$ns, $t_f \leq 10$ns

Note 2: C_L includes probe and jig capacitance.

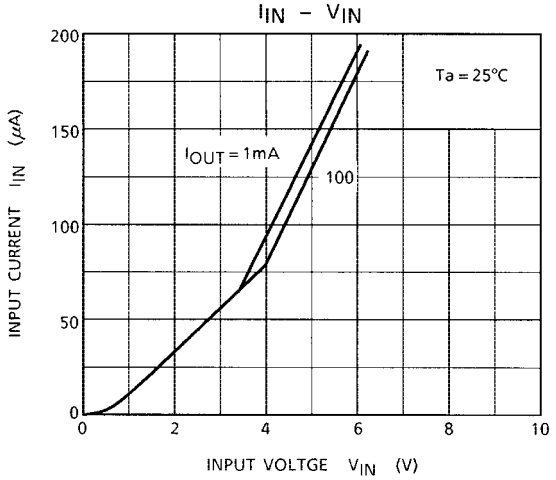
PRECAUTIONS for USING

This IC does not 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.

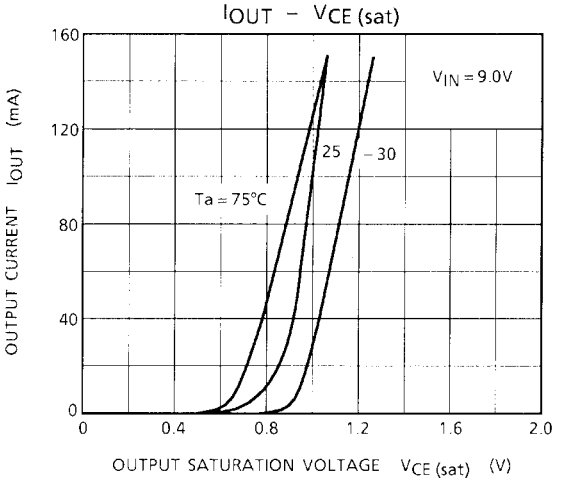
$I_F - V_F$



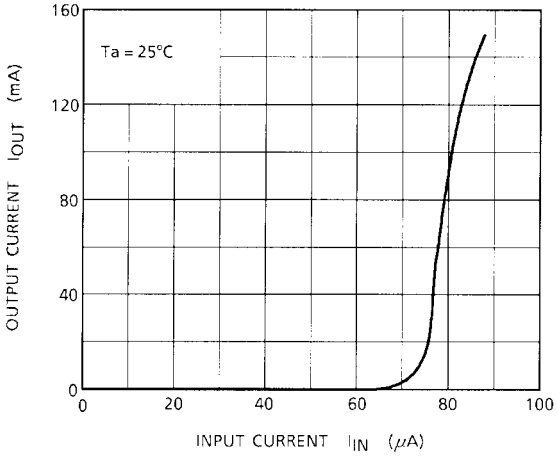
$I_{IN} - V_{IN}$



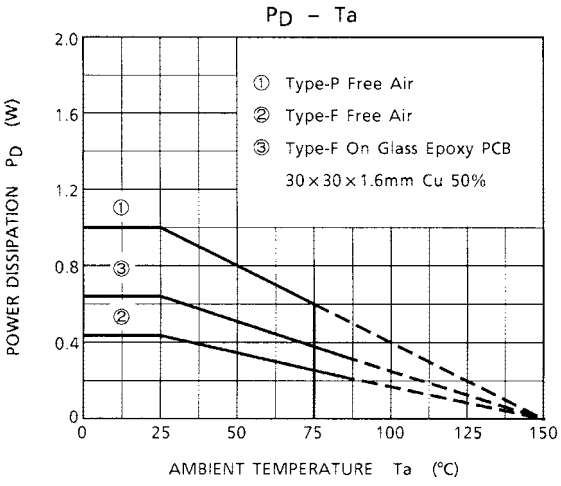
$I_{OUT} - V_{CE\,(sat)}$



$I_{OUT} - I_{IN}$

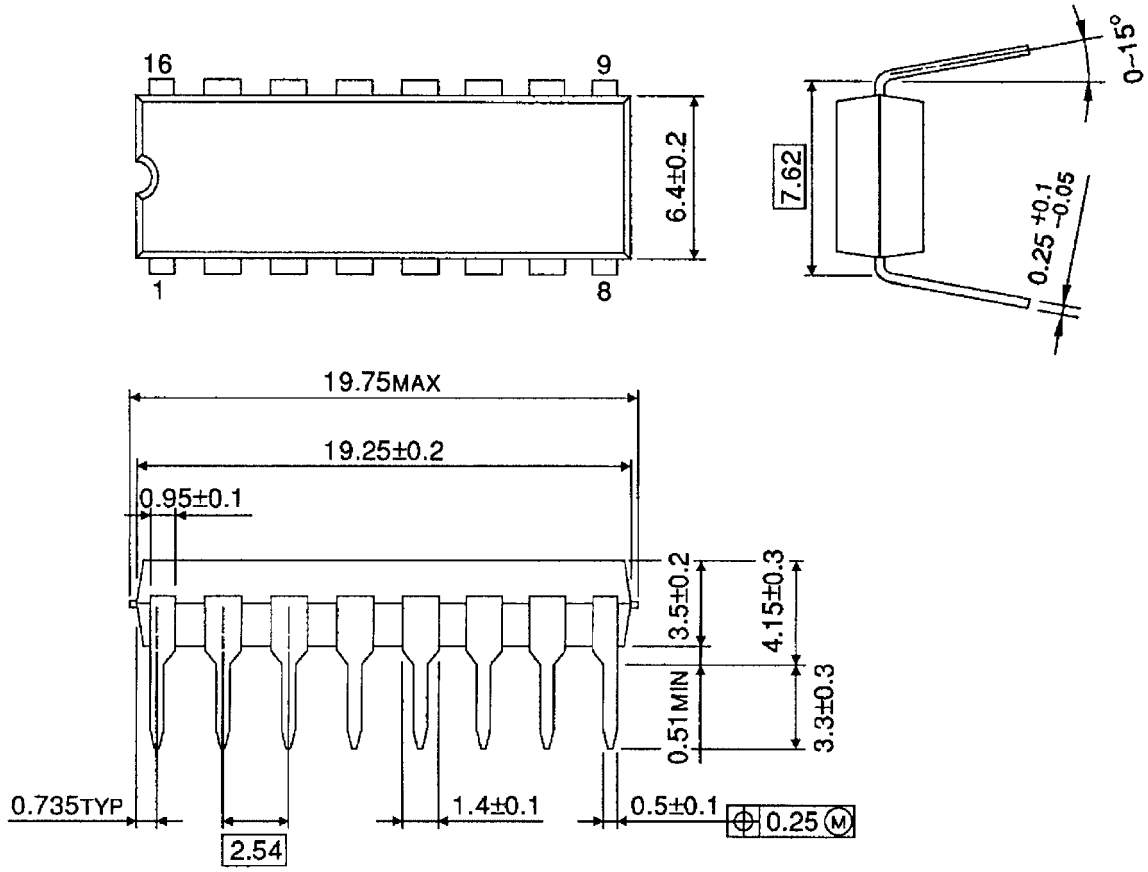


$P_D - Ta$



PACKAGE DIMENSIONS

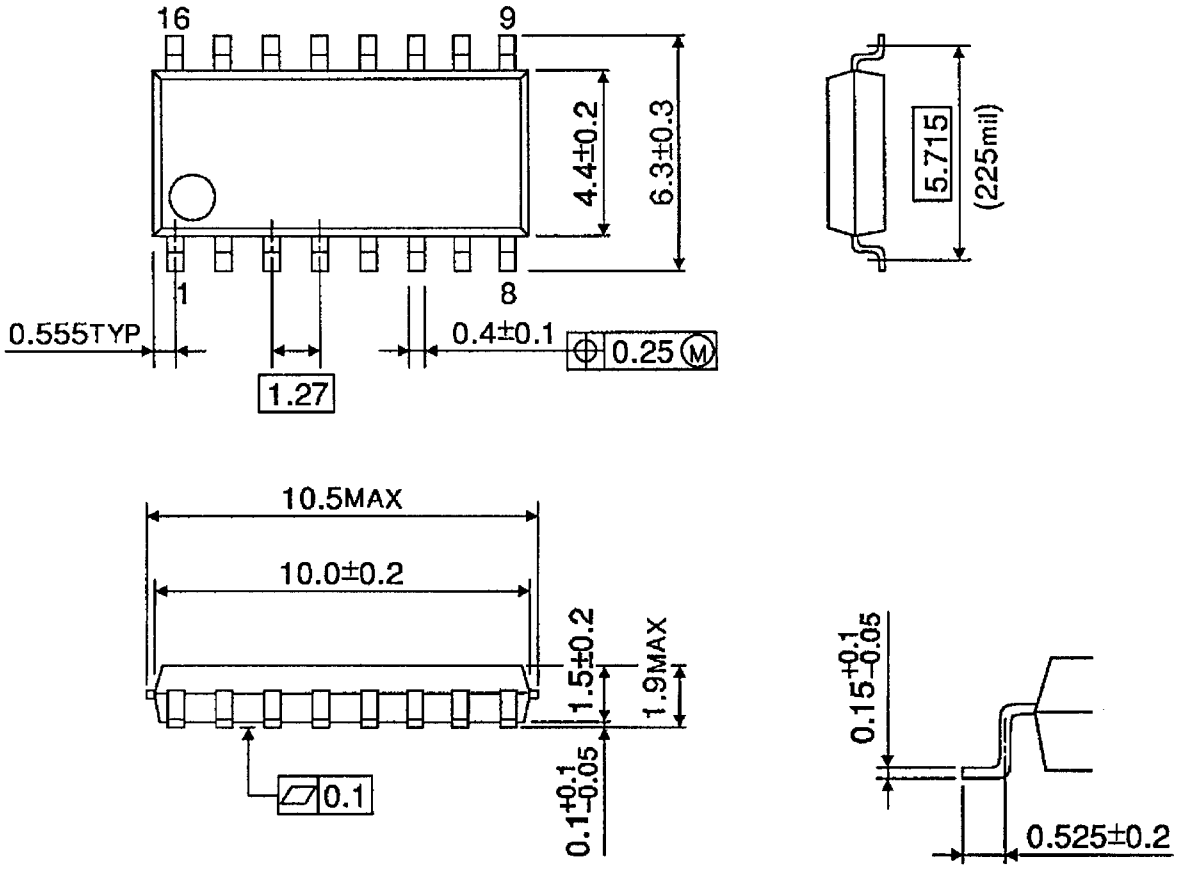
DIP16−P−300−2.54A Unit : mm



Weight: 1.11 g (Typ.)

PACKAGE DIMENSIONS

SOP16−P−225−1.27 Unit : mm



Weight: 0.16 g (Typ.)

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000707EBA

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