

TOSHIBA BIPOLAR DIGITAL INTEGRATED CIRCUIT SILICON MONOLITHIC

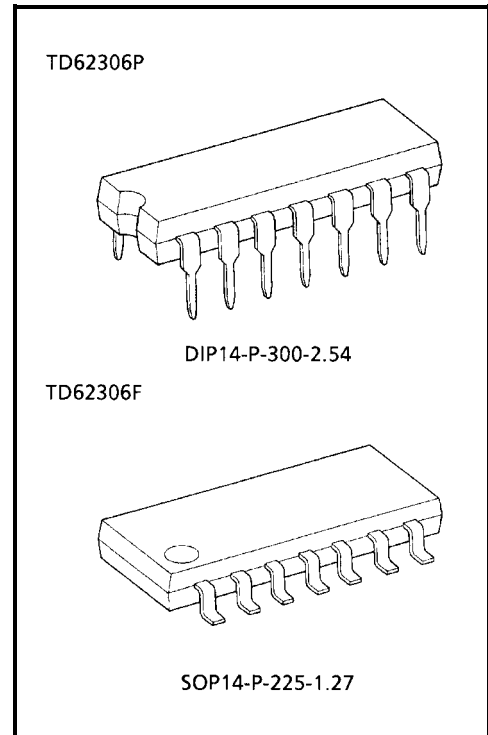
TD62306P, TD62306F

6CH LOW SATURATION SINK DRIVER

The TD62306P, TD62306F are comprised of six NPN low saturation drivers. All units feature integral clamp diodes for switching inductive loads and protective diodes against a negative input voltage. Applications include relay, hammer, lamp and LED driver.

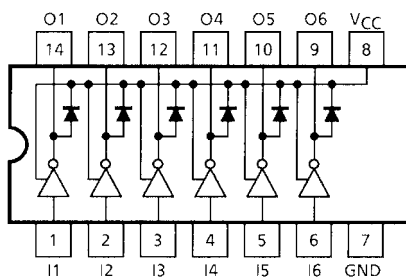
FEATURES

- Low saturation output voltage : $V_{CE(sat)} = 0.6\text{ V (Max.)}$
@ $I_{OUT} = 120\text{ mA}$
- Output rating (single output) 20 V (Min.) / 150 mA (Max.)
- Inputs compatible with 5~15 V PMOS, CMOS
- Input protective diodes against a negative input voltage
- Package type-P : DIP-14 pin
- Package type-F : SOP-14 pin

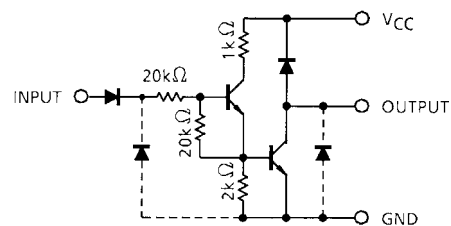


Weight
 DIP14-P-300-2.54 : 1.11 g (Typ.)
 SOP14-P-225-1.27 : 0.16 g (Typ.)

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}	-0.5~20	V	
Output Sustaining Voltage	V _{CE(SUS)}	-0.5~V _{CC} + 0.5	V	
Output Current	I _{OUT}	150	mA / ch	
Input Voltage	V _{IN}	-37~20	V	
Input Current	I _{IN}	1.5	mA	
Clamp Diode Reverse Voltage	V _R	20	V	
Clamp Diode Forward Current	I _F	120	mA	
Power Dissipation	P	P _D	1.0	W
	F		0.625 (Note)	
Operating Temperature	P	T _{opr}	-30~75	°C
	F		-40~85	
Storage Temperature	T _{stg}	-55~150	°C	

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

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

CHARACTERISTIC	SYMBOL	CONDITION	MIN	TYP.	MAX	UNIT
Supply Voltage	V _{CC}	—	4.75	—	18	V
Output Current	I _{OUT}	DC 1 Circuit	0	—	120	mA / ch
		T _{pw} = 25 ms, Duty = 10% 6 Circuits	0	—	100	
Input Voltage	V _{IN}	—	-35	—	V _{CC}	V
Clamp Diode Reverse Voltage	V _R	—	—	—	18	V
Clamp Diode Forward Current	I _F	—	—	—	120	mA
Power Dissipation	P	P _D	—	—	0.44	W
	F		(Note)	—	—	

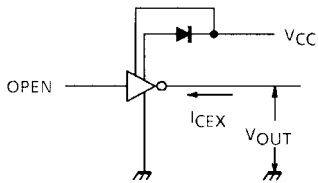
Note: On Glass Epoxy PCB (50 × 50 × 1.6 mm Cu 30%)

ELECTRICAL CHARACTERISTICS (Ta = 25°C)

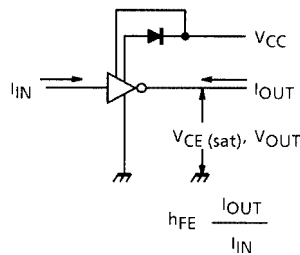
CHARACTERISTIC		SYMBOL	TEST CIR-CUIT	TEST CONDITION	MIN	TYP.	MAX	UNIT
Output Leakage Current	P	I _{CEX}	1	V _{CC} = 18 V V _{OUT} = 18 V	—	—	100	μA
	F			Ta = 75°C Ta = 85°C			100	
Output Saturation Voltage		V _{CE (sat)}	2	V _{CC} = 5 V, I _{IN} = 0.2 mA I _{OUT} = 120 mA	—	0.45	0.6	V
DC Forward Current Transfer Ratio		h _{FE}	2	V _{CC} = 5 V, V _{OUT} = 2 V I _{OUT} = 120 mA	1000	—	—	—
Input Current	Output On	I _{IN (ON)}	3	V _{IN} = 5 V, I _{OUT} = 120 mA	—	0.16	0.23	mA
	Output Off	I _{IN (OFF)}		4	V _{IN} = 15 V, I _{OUT} = 120 mA	—	0.66	
Clamp Diode Forward Voltage		V _F	5	I _F = 120 mA	—	1.25	1.6	V
Supply Current	Output On	I _{CC (ON)}	6	V _{CC} = V _{IN} = 5 V	—	4.0	6.0	mA / Gate
	Output Off	I _{CC (OFF)}		6	V _{CC} = V _{IN} = 15 V	—	14.0	
Turn-On Delay		t _{ON}	7	V _{CC} = 18 V, R _L = 150 Ω C _L = 15 pF	—	0.1	—	μs
Turn-Off Delay		t _{OFF}			—	0.8	—	μs

TEST CIRCUIT

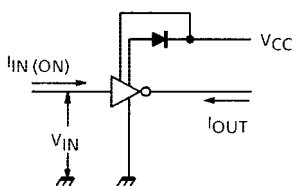
1. I_{CEX}



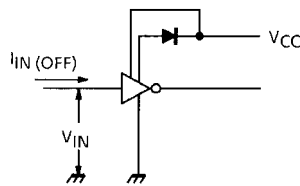
2. h_{FE}, V_{CE (sat)}



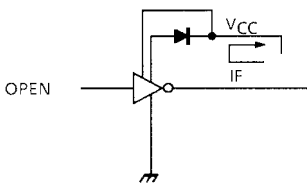
3. I_{IN (ON)}



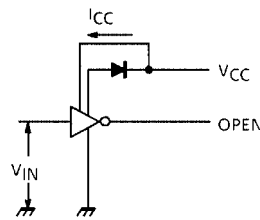
4. I_{IN (OFF)}



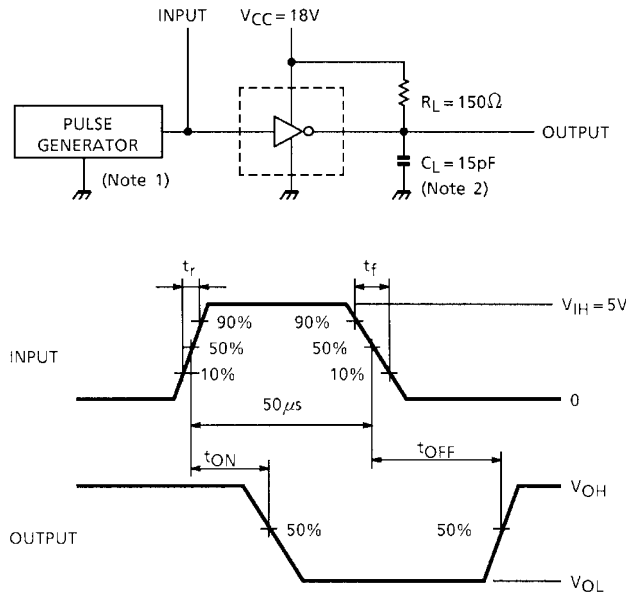
5. V_F



6. I_{CC}



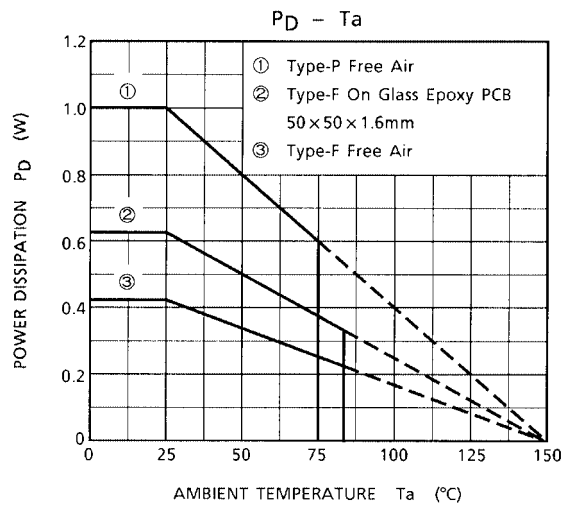
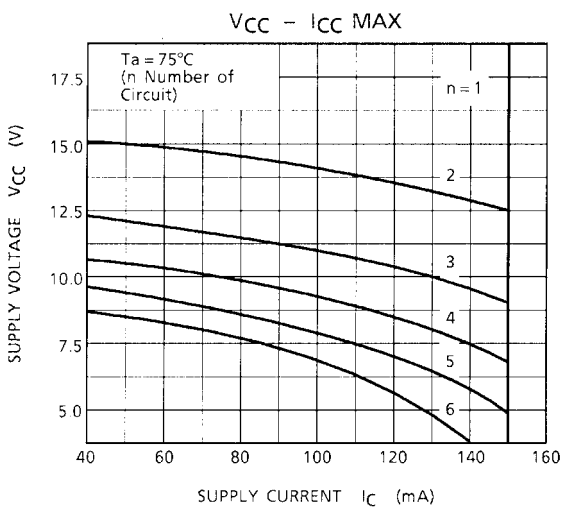
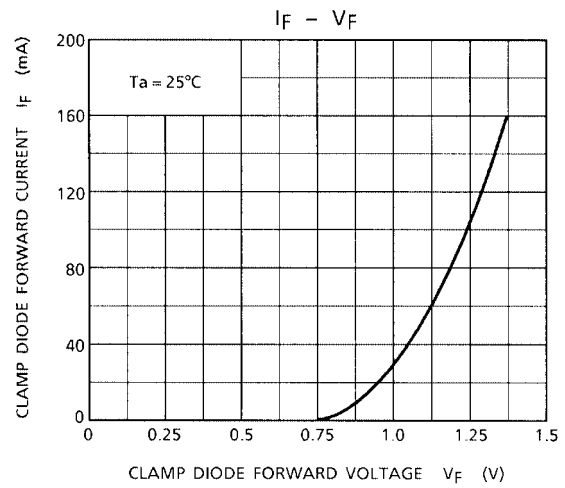
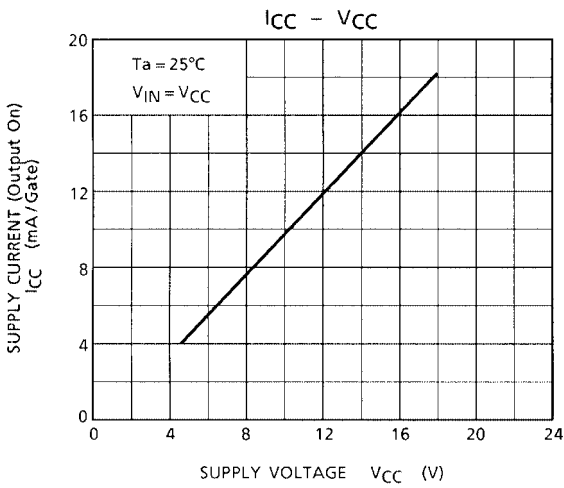
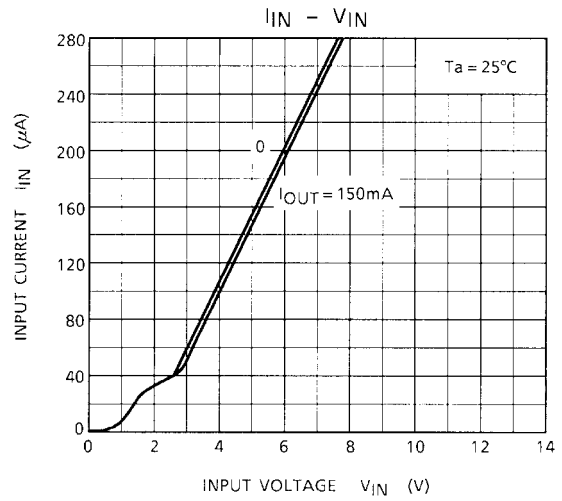
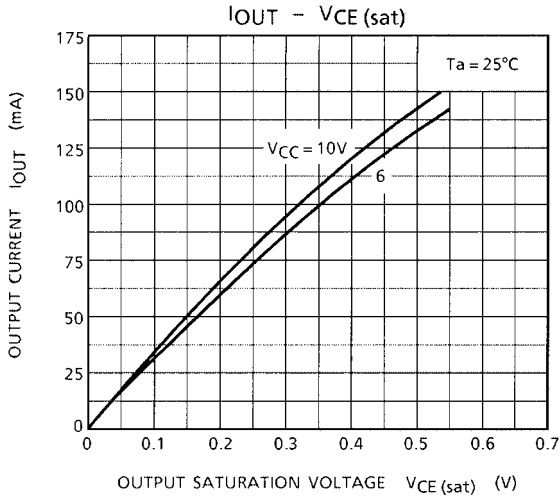
7. t_{ON} , t_{OFF}



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

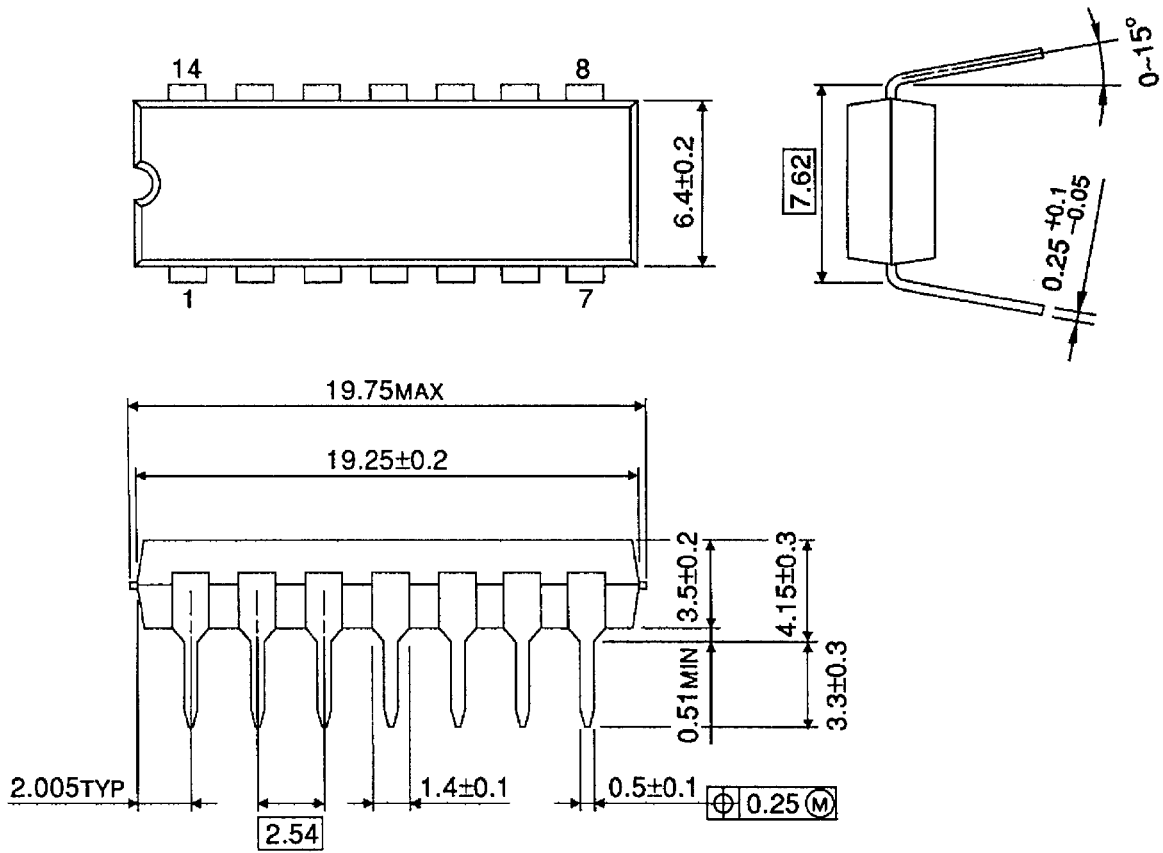
This IC does not include built-in protection circuits for excess current or overvoltage. If this IC is subjected to excess current or overvoltage, it may be destroyed. Hence, the utmost care must be taken when systems which incorporate this IC are designed. Utmost care is necessary in the design of the output line, VCC and GND line since IC may be destroyed due to short-circuit between outputs, air contamination fault, or fault by improper grounding.



PACKAGE DIMENSIONS

DIP14-P-300-2.54A

Unit: mm

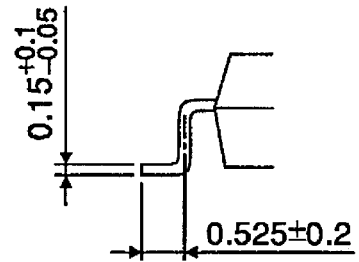
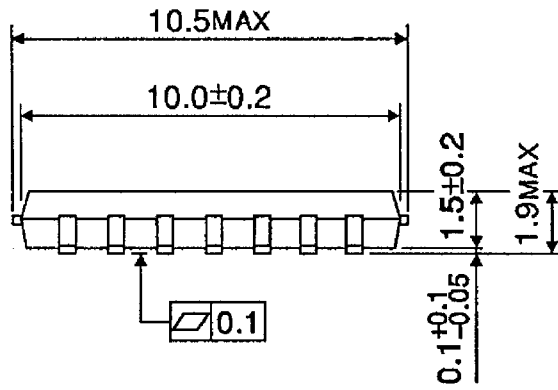
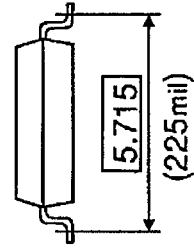
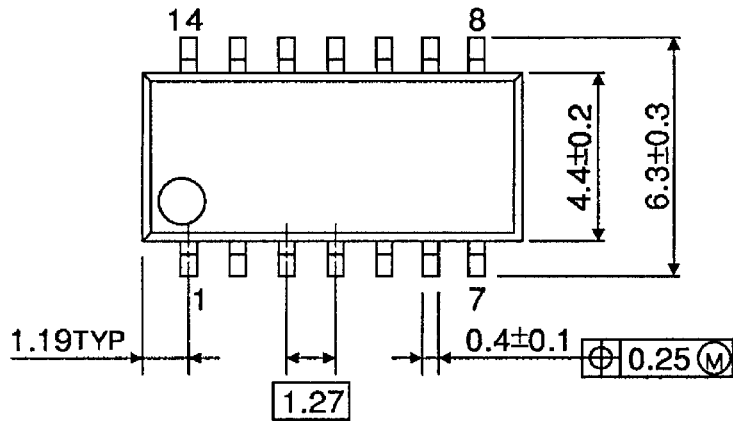


Weight: 1.11 g (Typ.)

PACKAGE DIMENSIONS

SOP14-P-225-1.27

Unit: mm



Weight: 0.16 g (Typ.)

RESTRICTIONS ON PRODUCT USE

000707EBA

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