TOSHIBA BIPOLAR DIGITAL INTEGRATED CIRCUIT SILICON MONOLITHIC

TD62501P,TD62501F,TD62502P,TD62502F,TD62503P,TD62503F,TD62504P TD62504F,TD62505P,TD62505F,TD62506P,TD62506F,TD62507P,TD62507F

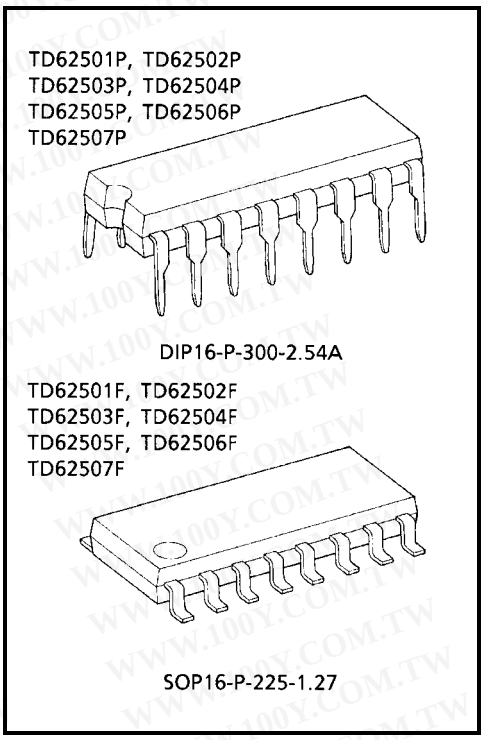
7CH SINGLE DRIVER

TD62501, 502, 503, 504P / F : COMMON EMITTER

TD62505, 506P / F : COMMON COLLECTOR

TD62507P / F : ISOLATED

The TD62501P / F Series are comprised of seven or five NPN Transistor Arrays.
For proper operation, the substrate (SUB) must be connected to the most negative voltage.
Applications include relay, hammer, Lamp and display (LED) drivers.



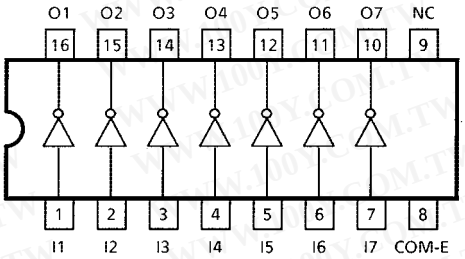
Weight
DIP16−P−300−2.54A : 1.11 g (Typ.)
SOP16−P−225−1.27 : 0.16 g (Typ.)

FEATURES

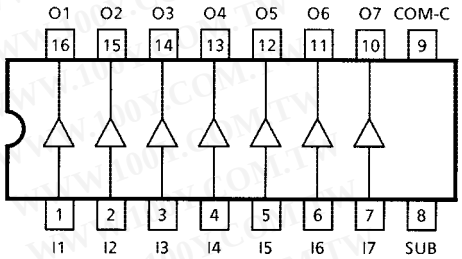
- Output Current (Single Output) 200 mA MAX.
- High Sustaining Voltage Output 35 V MIN.
- Inputs Compatible with Various Types of Logic.
- TD62501P / F, TD62505P / F and TD62507P / F: Using external resistor···General Purpose
- TD62502P / F
  : RIN = 10.5 kΩ + 7V Zener Diode···14~25 V P−MOS
- TD62503P / F, TD62506P / F
  : R_{IN} = 2.7 kΩ···TTL, 5 V C−MOS
- TD62504P / F, : R_{IN} = 10.5 kΩ···6~15 V P−MOS, C−MOS
- Package Type−P : DIP−16 pin
- Package Type−F : SOP−16 pin

PIN CONNECTION (Top view)

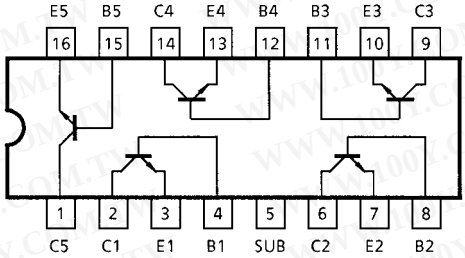
TD62501P / F, TD62502P / F
TD62503P / F, TD62504P / F



TD62505P / F, TD62506P / F

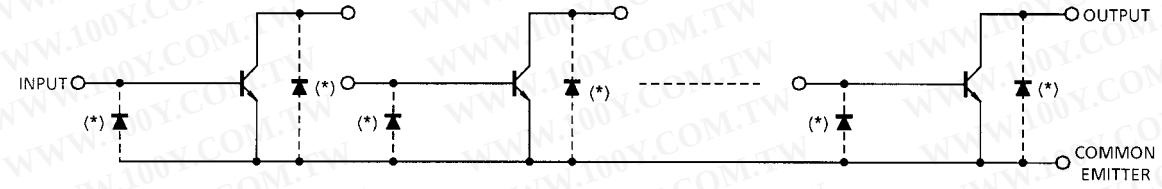


TD62507P / F

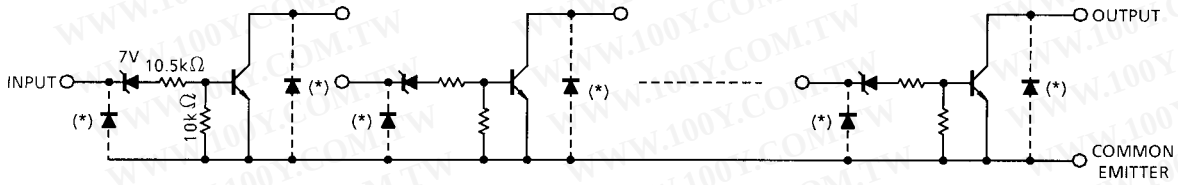


SCHEMATICS (Each driver)

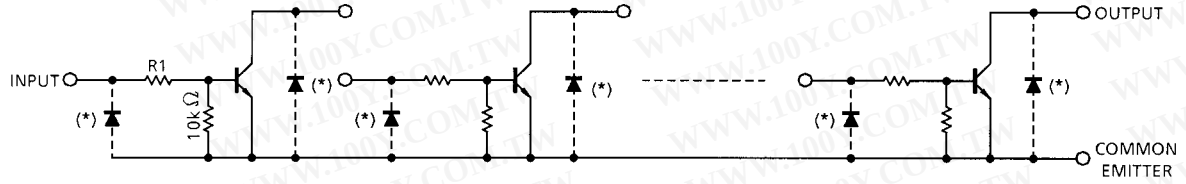
TD62501P / F



TD62502P / F



TD62503P / F
TD62504P / F

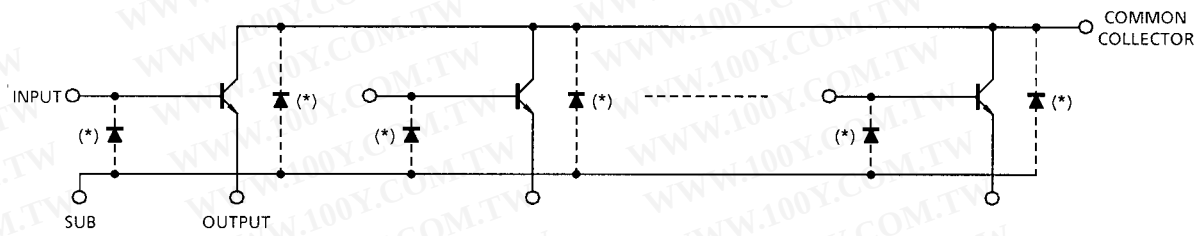


TD62503P / F R1 = 2.7 kΩ, TD62504P / F R1 = 10.5 kΩ

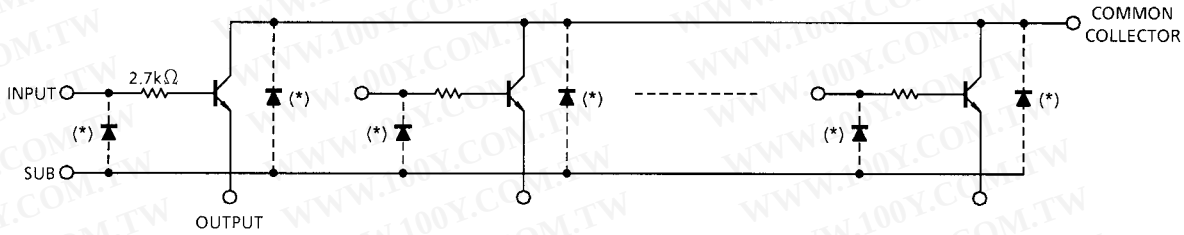
*: Parasitic Diodes

SCHEMATICS (Each driver)

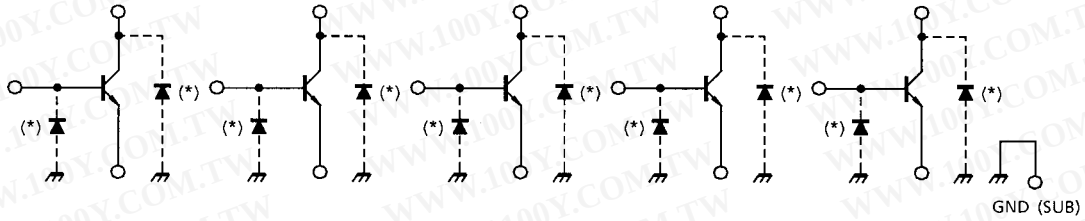
TD62505P / F



TD62506P / F



TD62507P / F



*: Parasitic Diodes

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

MAXIMUM RATINGS (Ta = 25°C Unless otherwise noted)

CHARACTERISTIC		SYMBOL	RATING	UNIT
Collector−Emitter Voltage		V_{CEO}	35	V
Collector−Base Voltage		V_{CBO}	50	V
Collector Current		I_C	200	mA / ch
Input Voltage		V_{IN} (Note 1)	−0.5~45	V
		V_{IN} (Note 2)	−0.5~30	
Input Current		I_{IN} (Note 3)	25	mA
Isolation Voltage		V_{SUB}	35	V
Power Dissipation	P	P_D	1.0	W
	F		0.625 (Note 4)	
Operating Temperature		T_{opr}	−40~85	°C
Storage Temperature		T_{stg}	−55~150	°C

Note 1: TD62506P / F

Note 2: TD62502P / F, TD62503P / F, TD62504P / F

Note 3: TD62501P / F, TD62505P / F, TD62507P / F

Note 4: 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
Collector−Emitter Voltage		V_{CEO}		0	—	35	V
Collector−Base Voltage		V_{CBO}		0	—	50	V
Collector Current		I_C		0	—	150	mA / ch
Input Voltage	TD62506P / F	V_{IN}		0	—	35	V
	TD62502P / F			0	—	25	
	TD62503P / F						
	TD62504P / F						
Input Current	TD62501P / F	I_{IN}		0	—	10	mA
	TD62505P / F						
	TD62507P / F						
Power Dissipation	P	P_D		—	—	0.360	W
	F		On PCB (Note)	—	—	0.325	

Note: 30 × 30 × 1.6 mm, Cu 50%

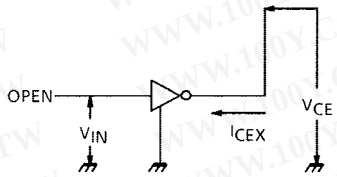
ELECTRICAL CHARACTERISTICS (Ta = 25°C Unless otherwise noted)

CHARACTERISTIC		SYMBOL	TEST CIR−CUIT	TEST CONDITION	MIN	TYP.	MAX	UNIT
Output Leakage Current		I_{CEX}	1	V_{CE} = 25 V, V_{IN} = 0	—	—	10	μA
Collector−Emitter Saturation Voltage		$V_{CE\ (sat)}$	2	I_{IN} = 1 mA, I_C = 10 mA	—	—	0.2	V
				I_{IN} = 3 mA, I_C = 150 mA (Note 1)	—	—	0.8	
DCCurrent Transfer Ratio	(Note 2)	h_{FE}	2	V_{CE} = 10 V, I_C = 10 mA	70	—	—	
	(Note 3)				50	—	—	
Input Voltage	TD62502P / F	$V_{IN\ (ON)}$	3	I_{IN} = 1 mA I_C = 10 mA	13	17	23	V
	TD62503P / F				2.4	3.4	4.2	
	TD62504P / F				7.5	11.5	15	
Turn−On Delay		t_{ON}	4	V_{OUT} = 35 V, R_L = 3.3 kΩ C_L = 15 pF	—	50	—	ns
Turn−Off Delay		t_{OFF}			—	200	—	

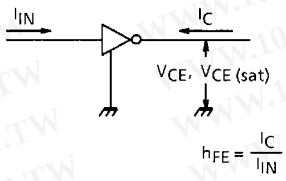
Note 1: Except TD62502P / F Only
Note 2: Only TD62501P / F, TD62505P / F, TD62506P / F, TD62507P / F
Note 3: Only TD62502P / F, TD62503P / F, TD62504P / F

TEST CIRCUIT

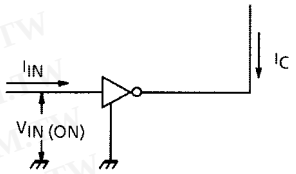
1. I_{CEX}



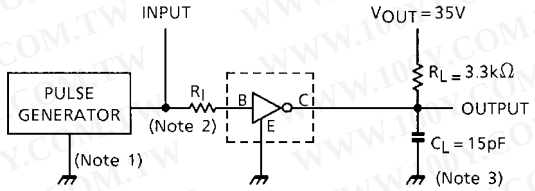
2. h_{FE}, $V_{CE\ (sat)}$

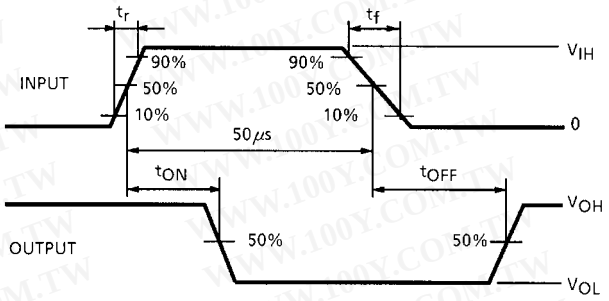


3. $V_{IN\ (ON)}$



4. 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: See below

INPUT CONDITION

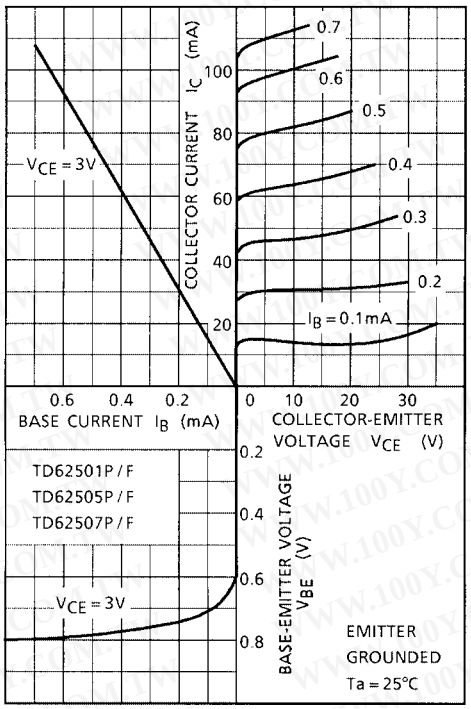
TYPE NUMBER	R_I	V_{IH}
TD62501P / F	2.7 kΩ	3 V
TD62502P / F	0 Ω	15 V
TD62503P / F	0 Ω	3 V
TD62504P / F	0 Ω	10 V
TD62505P / F	2.7 kΩ	3 V
TD62506P / F	0 Ω	3 V
TD62507P / F	2.7 kΩ	3 V

Note 3: C_L includes probe and jig capacitance

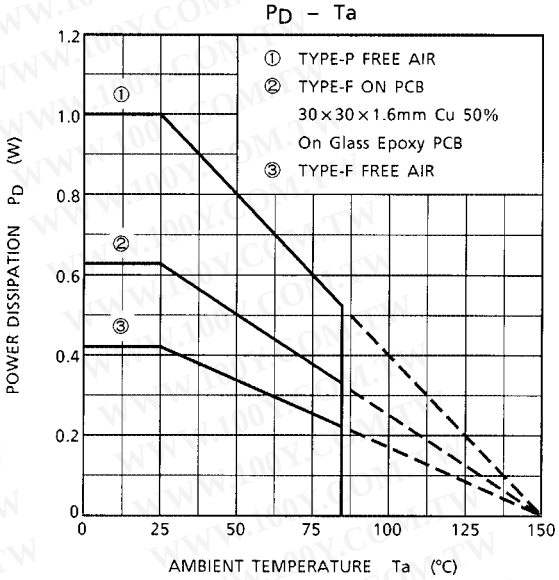
PRECAUTIONS for USING

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.

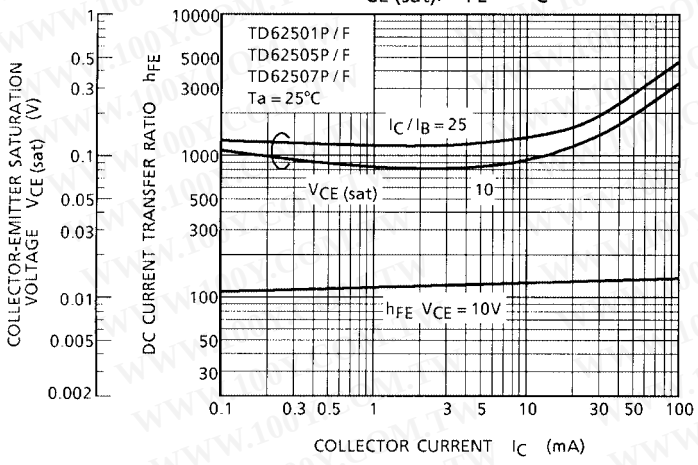
STATIC CHARACTERISTICS



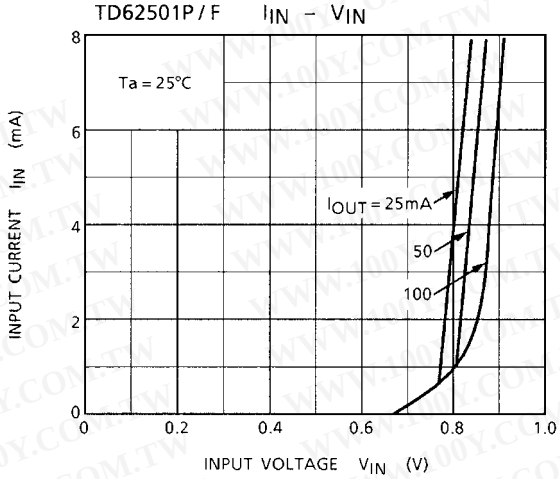
P_D – Ta



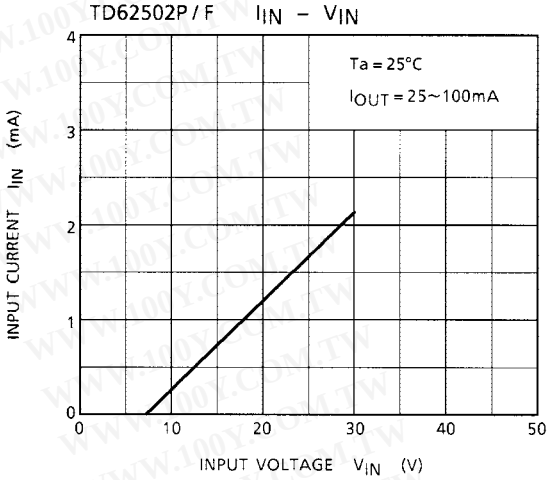
$V_{CE\,(sat)}$, h_{FE} – I_C



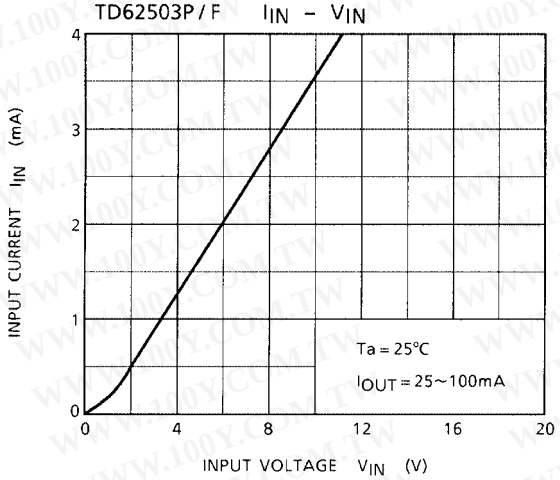
TD62501P / F I_{IN} – V_{IN}



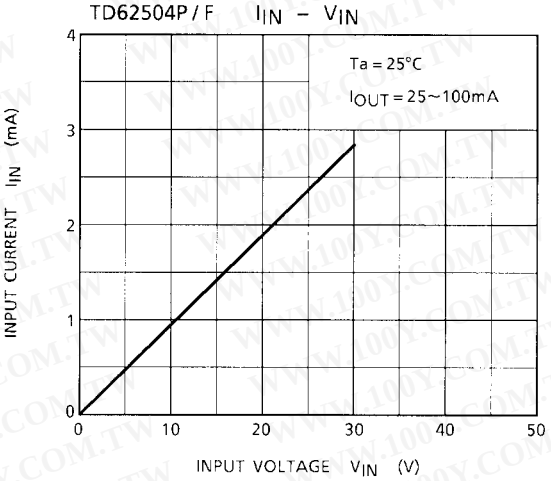
TD62502P / F I_{IN} – V_{IN}



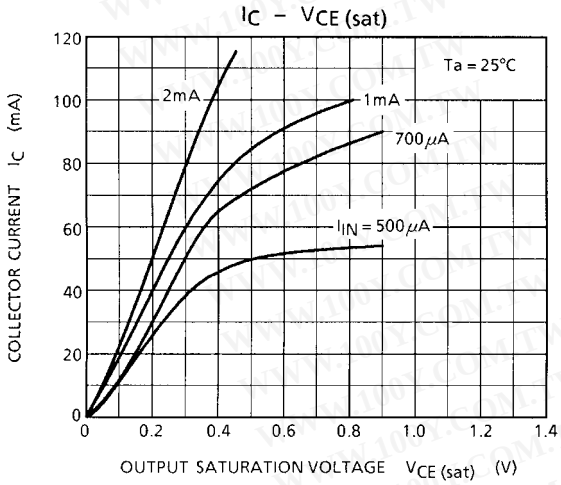
TD62503P / F I_{IN} – V_{IN}



TD62504P / F I_{IN} – V_{IN}

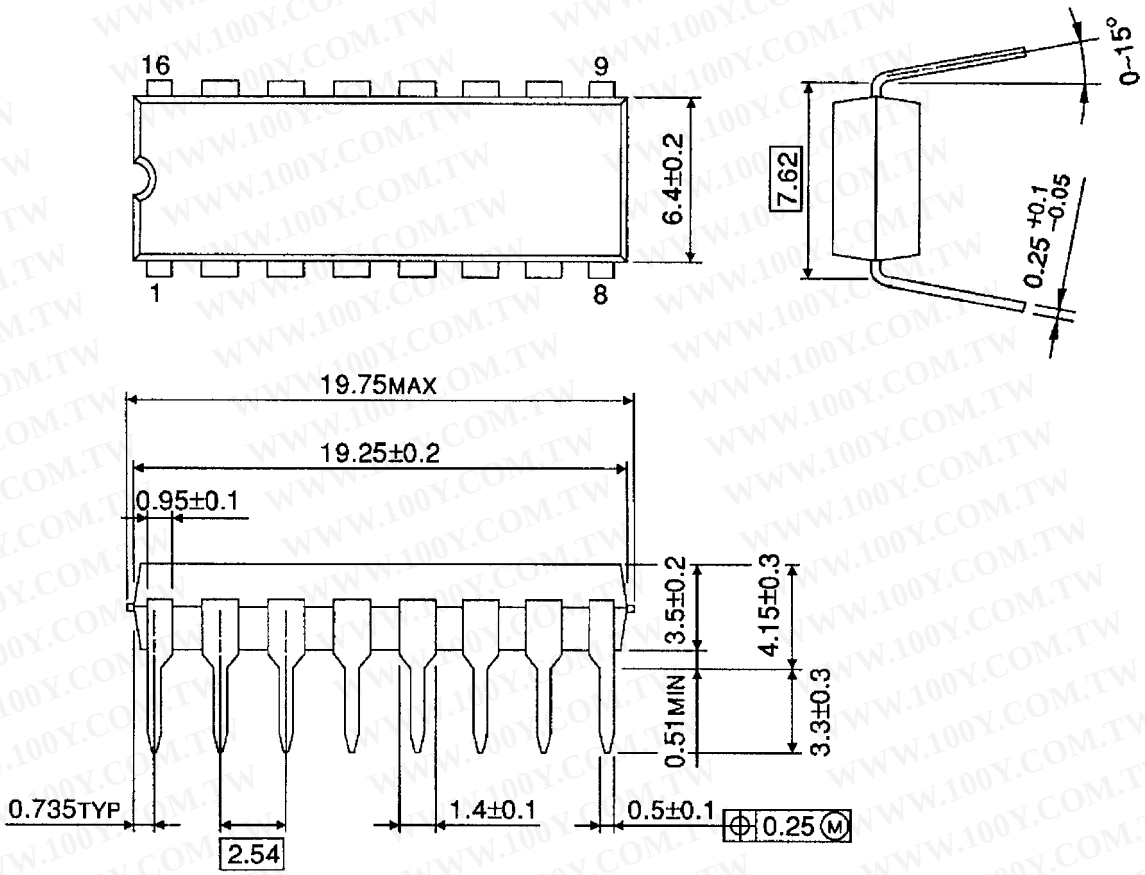


I_C – $V_{CE\ (sat)}$



PACKAGE DIMENSIONS

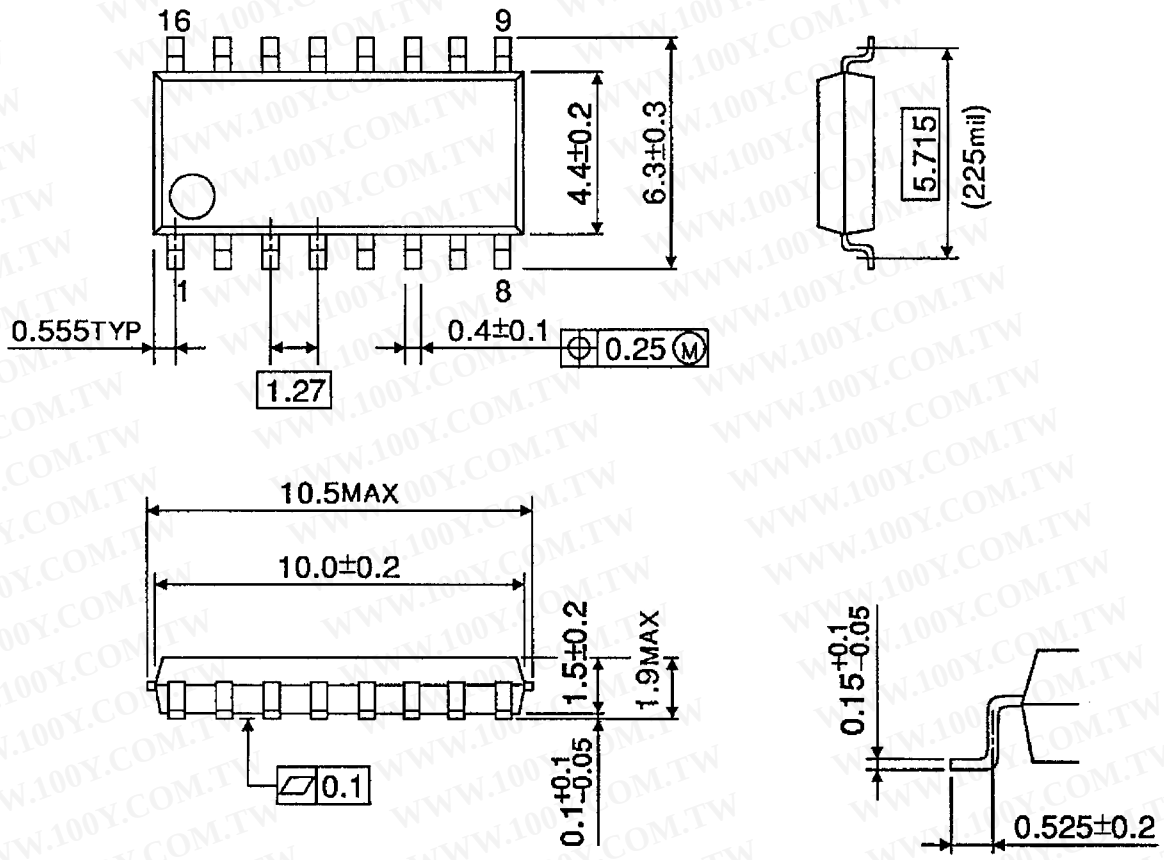
DIP16-P-300-2.54A Unit: mm



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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