

TOSHIBA BIPOLAR DIGITAL INTEGRATED CIRCUIT SILICON MONOLITHIC

# TD62318BP, TD62318BF

## 4CH LOW INPUT ACTIVE HIGH-CURRENT DARLINGTON SINK DRIVER

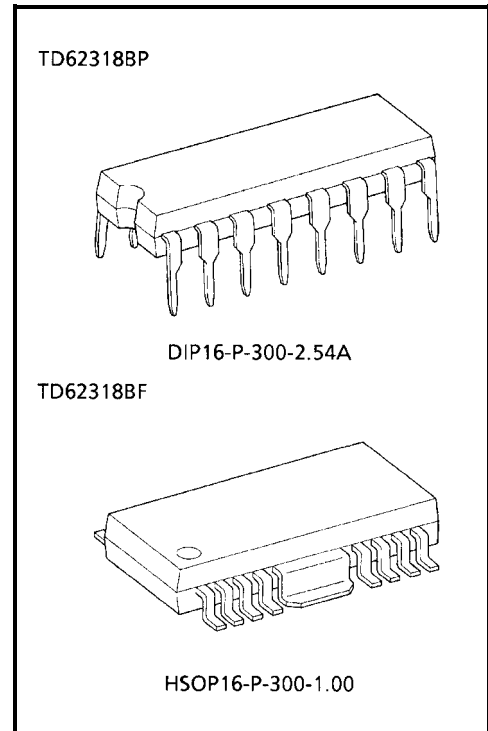
The TD62318BP and TD62318BF are non-inverting transistor array which are comprised of four NPN darlington output stages and PNP input stages.

This device is low level input active driver and are suitable for operation with TTL, 5 V CMOS and 5 V Microprocessor which have sink current output drivers.

Applications include relay, hammer, lamp and stepping motor drivers.

### FEATURES

- Two VCC Terminals VCC1, VCC2 (Separated)
- Package Type BP: DIP-16 pin  
BF: HSOP-16 pin
- High Sustaining Voltage Output :  $V_{CE(SUS)} = 80\text{ V (Min.)}$
- Output Current (Single Output) :  $I_{OUT} = 700\text{ mA / ch (Max.)}$
- Output Clamp Diodes
- Input Compatible with TTL and 5 V CMOS
- GND and SUB Terminal = Heat Sink
- Low Level Active Input
- Standard Supply Voltage



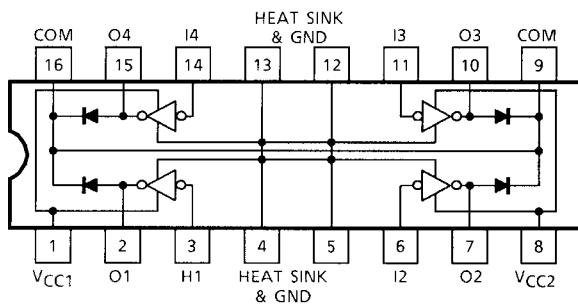
Weight

DIP16-P-300-2.54A : 1.11 g (Typ.)

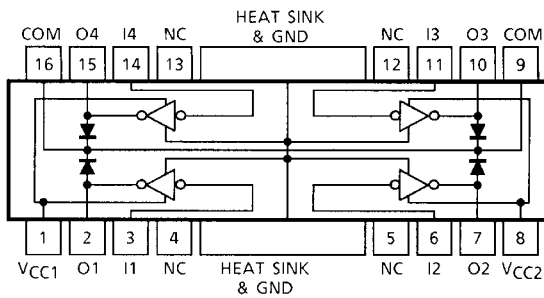
HSOP16-P-300-1.00 : 0.50 g (Typ.)

## PIN CONNECTION (TOP VIEW)

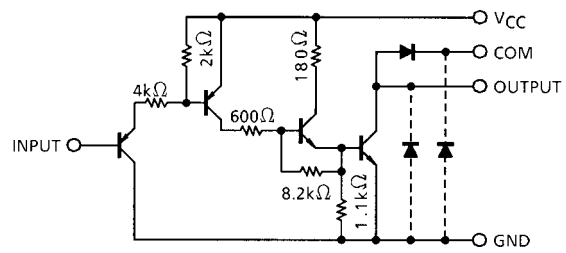
TD62318BP



TD62318BF



## SCHEMATICS (EACH DRIVER)



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

## MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	RATING	UNIT	
Supply Voltage	V <sub>CC</sub>	-0.5~17	V	
Output Sustaining Voltage	V <sub>CE (SUS)</sub>	-0.5~80	V	
Output Current	I <sub>OUT</sub>	700	mA / ch	
Input Current	I <sub>IN</sub>	-10	mA	
Input Voltage	V <sub>IN</sub>	-0.5~17	V	
Clamp Diode Reverse Voltage	V <sub>R</sub>	80	V	
Clamp Diode Forward Current	I <sub>F</sub>	700	mA	
Power Dissipation	BP	P <sub>D</sub>	1.47 / 2.7 (Note 1)	W
	BF		0.9 / 1.4 (Note 2)	
Operating Temperature	T <sub>opr</sub>	-40~85	°C	
Storage Temperature	T <sub>stg</sub>	-55~150	°C	

Note 1: On Glass Epoxy PCB (50 × 50 × 1.6 mm Cu 50%)

Note 2: On Glass Epoxy PCB (60 × 30 × 1.6 mm Cu 30%)

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

CHARACTERISTIC		SYMBOL	CONDITION	MIN	TYP.	MAX	UNIT
Supply Voltage		V <sub>CC</sub>		4.5	—	5.5	V
Output Sustaining Voltage		V <sub>CE (SUS)</sub>		0	—	50	V
Output Current	BP (Note 1)	I <sub>OUT</sub>	DC 1 circuit, Ta = 25°C	0	—	570	mA / ch
			T <sub>pw</sub> = 25 ms 4 circuits T <sub>j</sub> = 120°C Ta = 85°C	Duty = 10%	0	—	
	Duty = 50%			0	—	330	
	BP (Note 2)		Duty = 10%	0	—	570	
Duty = 50%		0	—	100			
Input Voltage		V <sub>IN</sub>		0	—	15	V
		Output On	V <sub>IN (ON)</sub>	0	—	V <sub>CC</sub> -3.6	V
		Output Off	V <sub>IN (OFF)</sub>	V <sub>CC</sub> -3.6	—	5.5	
Clamp Diode Reverse Voltage		V <sub>R</sub>		—	—	80	V
Clamp Diode Forward Current		I <sub>F</sub>		—	—	700	mA
Power Dissipation	BP	P <sub>D</sub>	Ta = 85°C (Note 1)	—	—	1.4	W
	BF		Ta = 85°C (Note 2)	—	—	0.7	

Note 1: On Glass Epoxy PCB (50 × 50 × 1.6 mm Cu 50%)

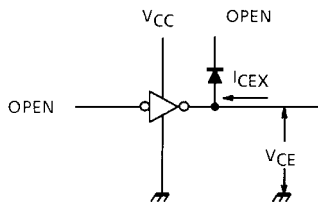
Note 2: On Glass Epoxy PCB (60 × 30 × 1.6 mm Cu 30%)

## ELECTRICAL CHARACTERISTICS (Ta = 25°C)

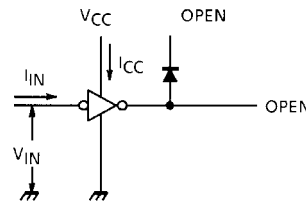
CHARACTERISTIC		SYMBOL	TEST CIR-CUIT	TEST CONDITION	MIN	TYP.	MAX	UNIT
Input Voltage	"H" Level	V <sub>IH</sub>	—		V <sub>CC</sub> -1.6	—	15	V
	"L" Level	V <sub>IL</sub>			0	—	V <sub>CC</sub> -3.6	
Input Current	"H" Level	I <sub>IH</sub>	2		—	—	10	μA
	"L" Level	I <sub>IL</sub>			—	-0.05	-0.36	mA
Output Leakage Current		I <sub>CEX</sub>	1	V <sub>CE</sub> = 80 V, Ta = 25°C	—	—	50	μA
				V <sub>CE</sub> = 80 V, Ta = 85°C	—	—	100	
Output Saturation Voltage		V <sub>CE (sat)</sub>	3	I <sub>OUT</sub> = 0.5 A, V <sub>CC</sub> = 4.5 V	—	—	0.8	V
				I <sub>OUT</sub> = 0.2 A, V <sub>CC</sub> = 4.5 V	—	—	0.45	
Clamp Diode Reverse Current		I <sub>R</sub>	4	V <sub>R</sub> = 80 V, Ta = 25°C	—	—	50	μA
				V <sub>R</sub> = 80 V, Ta = 85°C	—	—	100	
Clamp Diode Forward Voltage		V <sub>F</sub>	5	I <sub>F</sub> = 500 mA	—	—	2.0	V
Supply Current	Output On	I <sub>CC (ON)</sub>	2	V <sub>CC</sub> = 5.5 V, V <sub>IN</sub> = 0 V	—	35	40	mA / ch
	Output Off	I <sub>CC (OFF)</sub>	2	V <sub>CC</sub> = 5.5 V, V <sub>IN</sub> = V <sub>CC</sub>	—	—	10	μA
Turn-On Delay		t <sub>ON</sub>	6	V <sub>OUT</sub> = 80 V, R <sub>L</sub> = 142 Ω V <sub>CC</sub> = 5.0 V, C <sub>L</sub> = 15 pF	—	0.4	0.8	μs
Turn-Off Delay		t <sub>OFF</sub>			—	8.0	16.0	

## TEST CIRCUIT

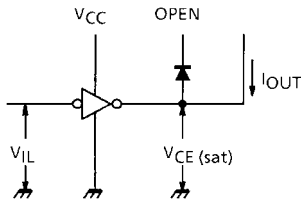
### 1. $I_{CEX}$



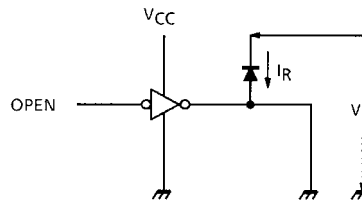
### 2. $I_{IH}, I_{IL}$



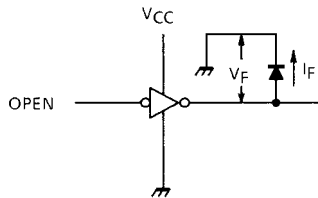
### 3. $V_{CE(sat)}$



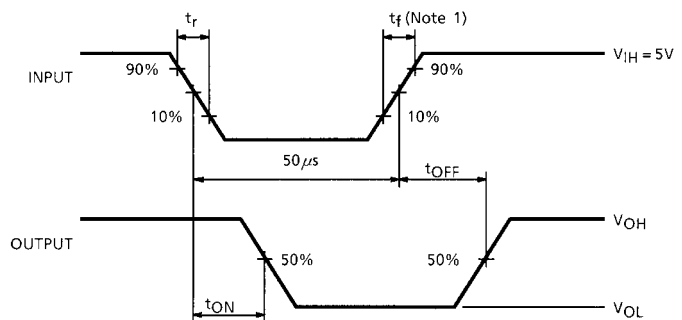
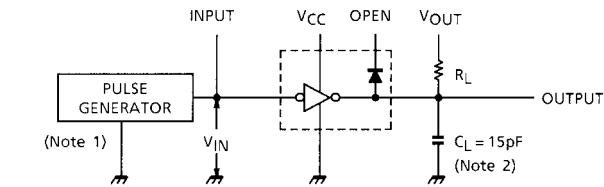
### 4. $I_R$



### 5. $V_F$



### 6. $t_{ON}, t_{OFF}$



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

Note 2:  $C_L$  includes probe and jig capacitance.

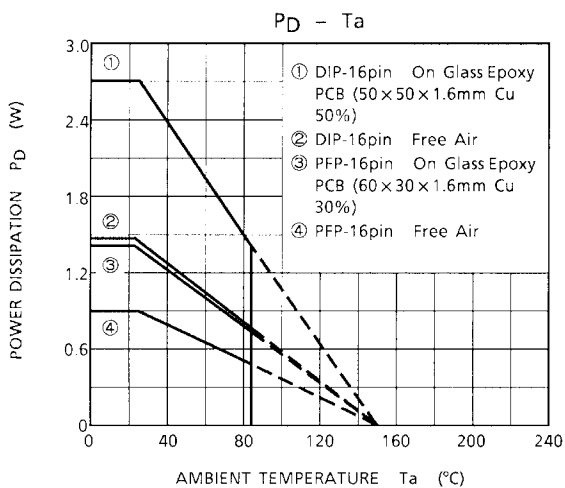
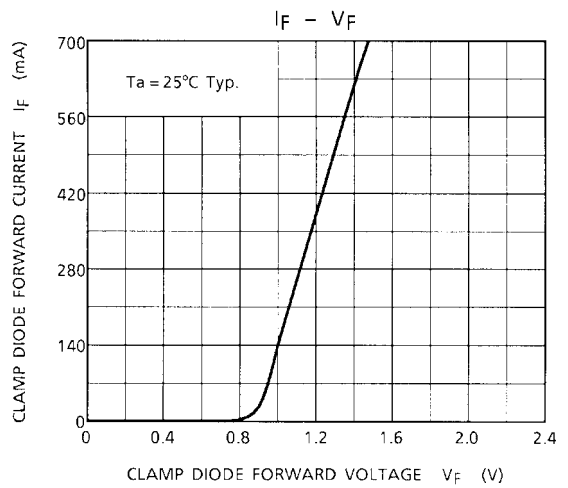
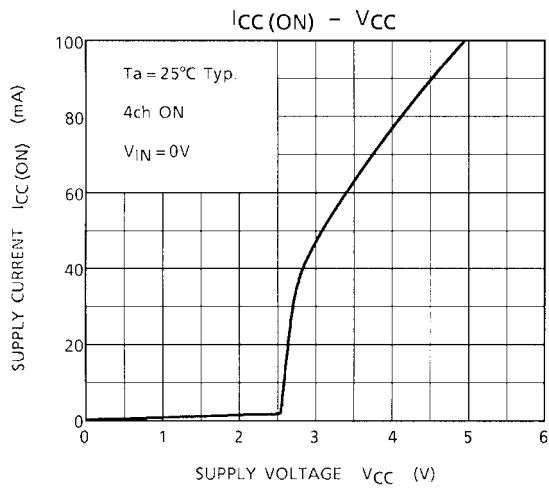
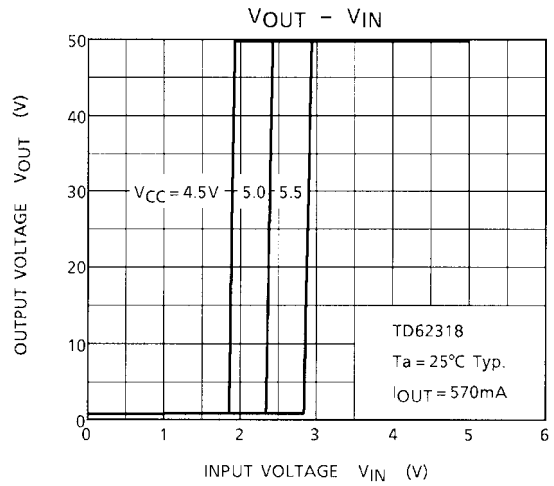
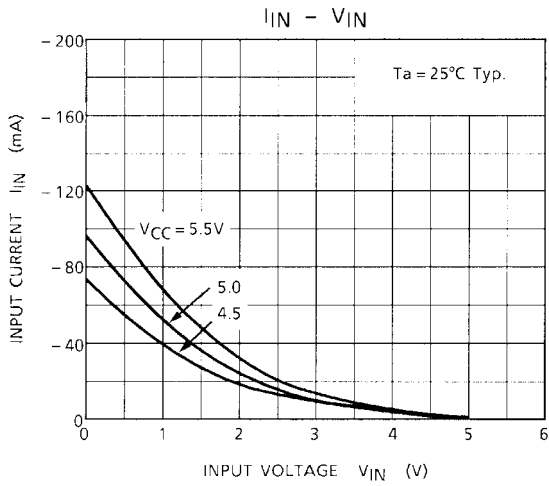
## PRECAUTIONS for USING

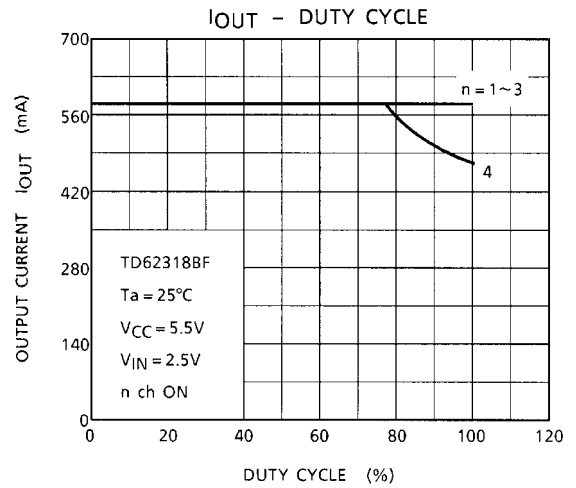
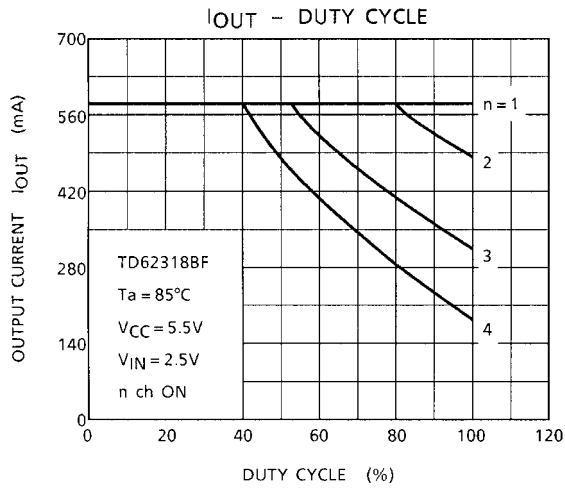
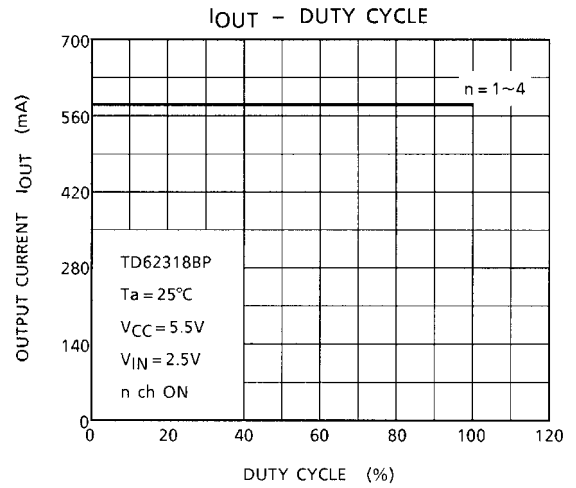
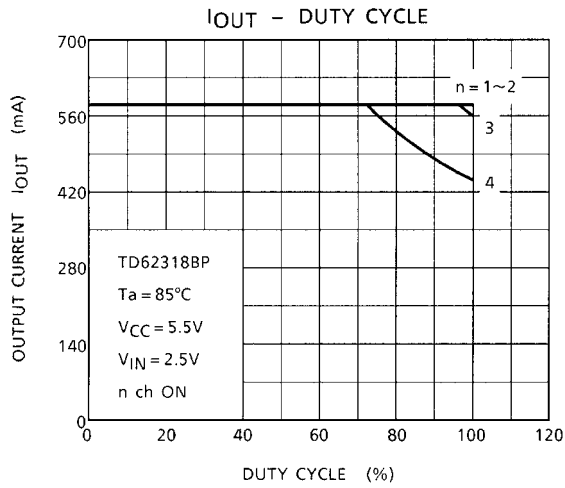
This IC does not include built-in protection circuits for excess current or overvoltage.

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,  $V_{CC}$ , COMMON and GND line since IC may be destroyed due to short-circuit between outputs, air contamination fault, or fault by improper grounding.

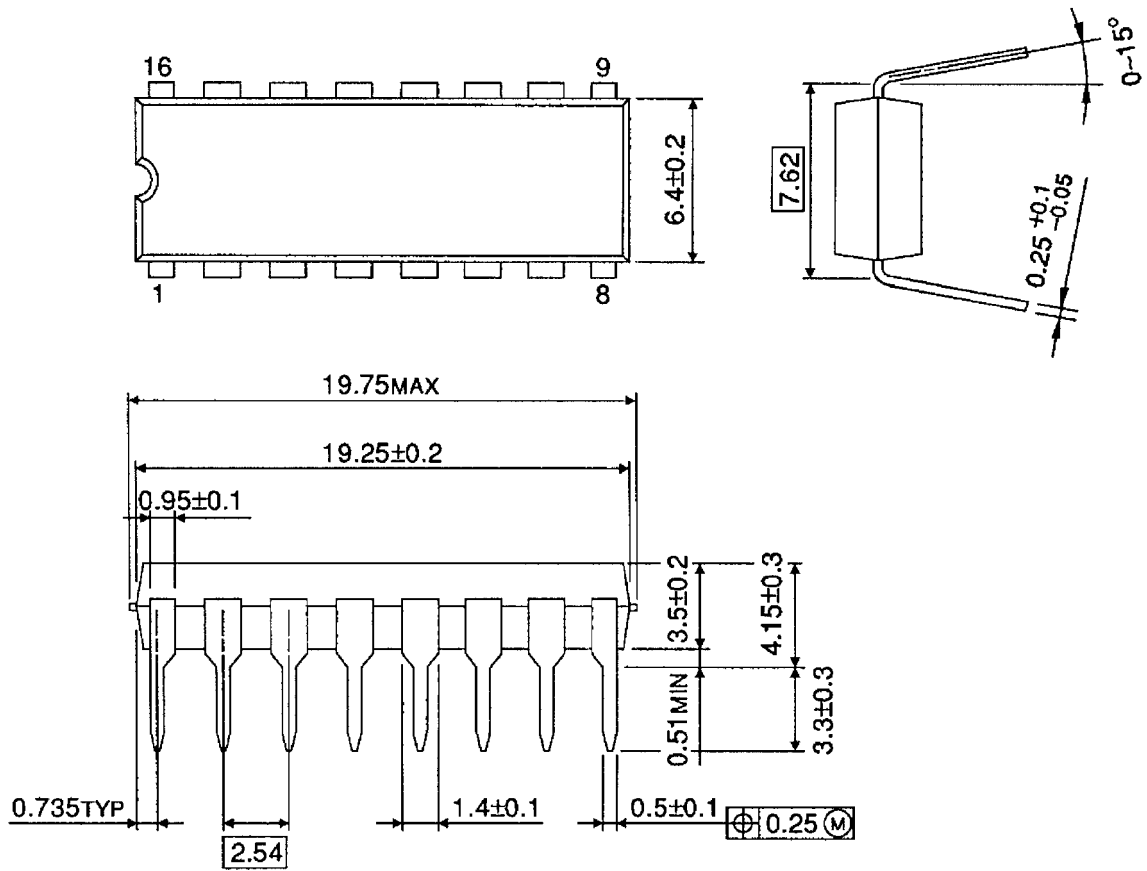




## PACKAGE DIMENSIONS

DIP16-P-300-2.54A

Unit: mm

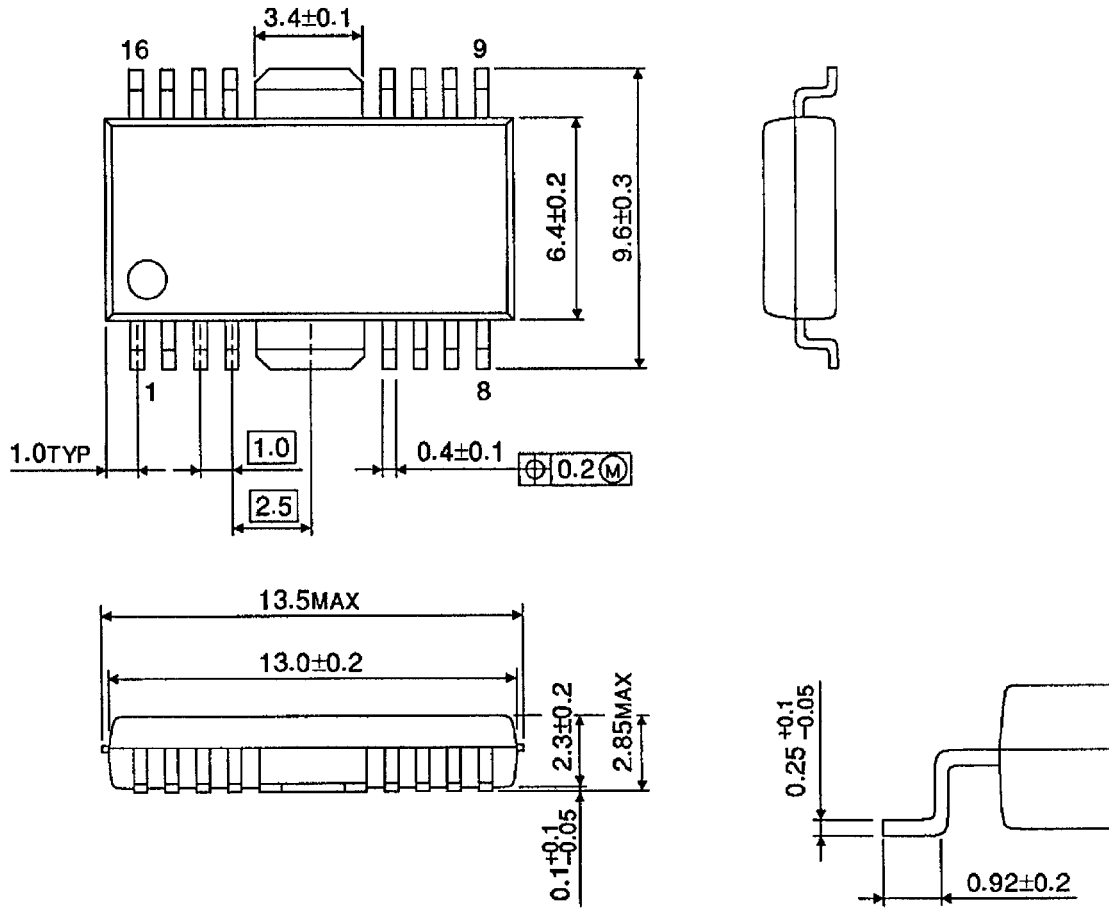


Weight: 1.11 g (Typ.)

**PACKAGE DIMENSIONS**

HSOP16-P-300-1.00

Unit: mm



Weight: 0.50 g (Typ.)



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000707EBA

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