

TOSHIBA BIPOLAR DIGITAL INTEGRATED CIRCUIT SILICON MONOLITHIC

# TD62107P, TD62107BP, TD62107F

## 4CH HIGH-CURRENT DARLINGTON SINK DRIVER

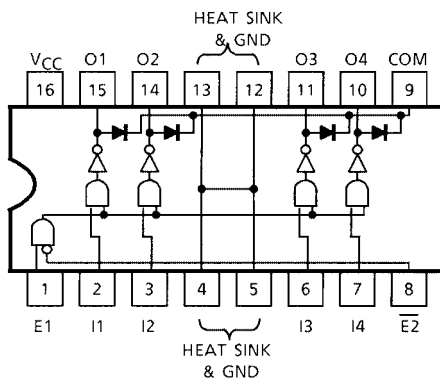
The TD62107P / BP / F are high-voltage, high-current darlington drivers and enable inputs which can gate the outputs. All units feature integral clamp diodes for switching inductive loads. The TD62107P / BP / F have a wide supply voltage range and all input are compatible with TTL and 5-V CMOS. Application include relay, hammer, lamp and stepping moter drivers. Please observe the thermal condition for using.

### FEATURES

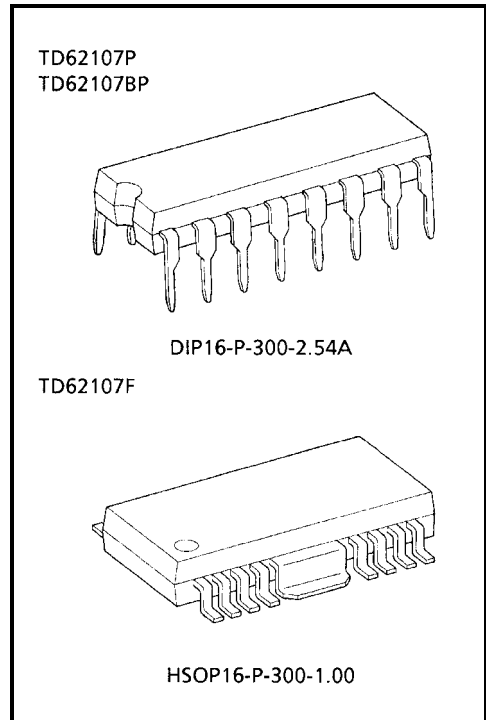
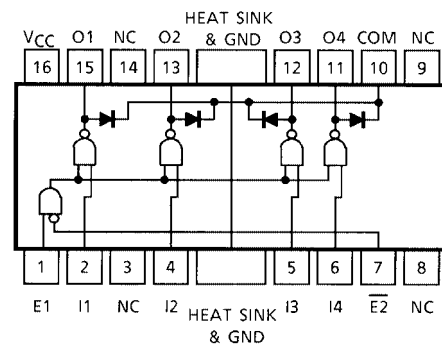
- Output current (single output) 750mA (MAX)
- High sustaining voltage output
  - 80 V MIN. (TD62107BP)
  - 45 V MIN. (TD62107P)
  - 35 V MIN. (TD62107F)
- Output clamp diodes
- Enable inputs E1, E2
- Wide supply voltage range  $V_{CC} = 4.75\sim 17$  V
- Input compatible with TTL and 5-V CMOS
- GND terminal = heat sink
- Package type-P, BP : DIP-16pin
- Package type-F : HSOP-16pin

### PIN CONNECTION (TOP VIEW)

TD62107P / TD62107BP

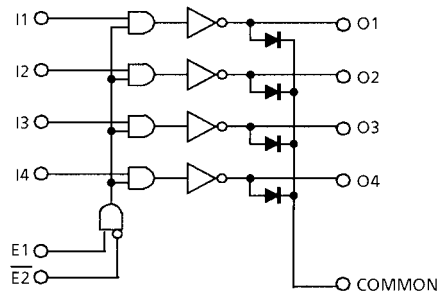


TD62107F



Weight  
 DIP16-P-300-2.54A : 1.11 g (Typ.)  
 HSOP16-P-300-1.00 : 0.50 g (Typ.)

## SCHEMATICS (EACH DRIVER)

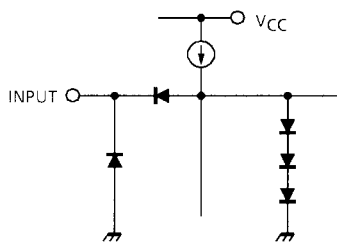


## TRUTH TABLE

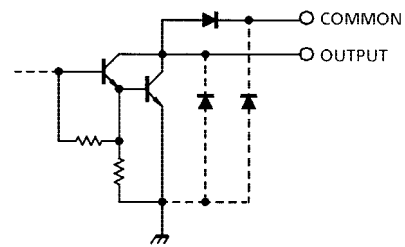
E1	$\overline{E2}$	I1 ~ I4	O1~O4
L	L	L or H	Disable OFF
L	H	L or H	Disable OFF
H	L	L or H	Enable In
H	H	L or H	Disable OFF

In = I1 ~ I4

## INPUT EQUIVALENT CIRCUIT



## OUTPUT EQUIVALENT CIRCUIT



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

## MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Supply Voltage	$V_{CC}$	-0.5~17	V
Output Sustaining Voltage	P	-0.5~45	V
	BP	-0.5~80	
	F	-0.5~35	
Output Current	$I_{OUT}$	750	mA
Input Voltage	$V_{IN}$	-0.5~ $V_{CC} + 0.5$	V
Clamp Diode Reverse Voltage	P	45	V
	BP	80	
	F	35	
Clamp Diode Forward Current	P, F	500	mA
	BP	750	
Power Dissipation	P, BP	2.7 (Note 1)	W
	F	1.4 (Note 2)	
Operating Temperature	$T_{opr}$	-40~85	°C
Storage Temperature	$T_{stg}$	-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>		4.75	—	15	V	
Output Sustaining Voltage	P	V <sub>CE (SUS)</sub>		0	—	45	V	
	BP			0	—	80		
	F			0	—	35		
Output Current	P, F	I <sub>OUT</sub>	T <sub>pw</sub> = 25ms, Duty = 75%, 1 Circuit	0	—	500	mA	
	BP		T <sub>pw</sub> = 25ms, Duty = 10%, 4 Circuits	0	—	750		
	P, BP		T <sub>pw</sub> = 25ms, 4 Circuits	Duty = 30%	0	—		400
				Duty = 40%	—	—		300
Input Voltage		V <sub>IN</sub>		0	—	V <sub>CC</sub>	V	
Clamp Diode Reverse Voltage	P	V <sub>R</sub>		—	—	45	V	
	BP			—	—	80		
	F			—	—	35		
Clamp Diode Forward Current	P, F	I <sub>F</sub>		—	—	500	mA	
	BP			—	—	750		
Power Dissipation	B, BP	P <sub>D</sub>		—	—	1.0	W	
	F			Ta = 85°C (Note)	—	—		0.7

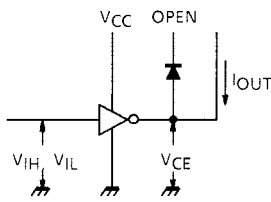
Note: On Glass Epoxy PCB (60 × 30 × 1.6 mm Cu 30%)

## ELECTRICAL CHARACTERISTICS (Ta = 25°C)

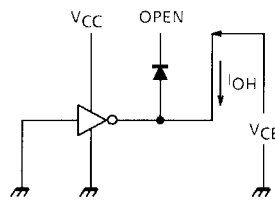
CHARACTERISTIC		SYMBOL	TEST CIR-CUIT	TEST CONDITION	MIN	TYP.	MAX	UNIT
Input Voltage	"H" Level	$V_{IH}$	1		2.0	—	$V_{CC}$	V
	"L" Level	$V_{IL}$			—	—	0.8	
Output Current	"H" Level	P	2	$V_{CE} = 45\text{ V}$ , $T_a = 75^\circ\text{C}$	—	—	100	$\mu\text{A}$
		BP		$V_{CE} = 80\text{ V}$ , $T_a = 85^\circ\text{C}$	—	—	100	
		F		$V_{CE} = 35\text{ V}$ , $T_a = 85^\circ\text{C}$	—	—	100	
Output Voltage	"L" Level	P, F	3	$I_{OUT} = 50\text{ mA}$	—	—	1.3	V
		BP		$I_{OUT} = 750\text{ mA}$	—	—	1.6	
Input Current	"H" Level	$I_{IH}$	4	$V_{IN} = 13\text{ V}$	—	—	100	$\mu\text{A}$
	"L" Level	$I_{IL}$	5	$V_{IN} = 0.4\text{ V}$	—	—	-0.3	mA
Clamp Diode Reverse Current	P	$I_R$	6	$V_R = 45\text{ V}$	—	—	100	$\mu\text{A}$
				$V_R = 80\text{ V}$	—	—	100	
				$V_R = 35\text{ V}$	—	—	100	
Clamp Diode Forward Voltage	P, F	$V_F$	7	$I_F = 500\text{ mA}$	—	—	2.0	V
				$I_F = 750\text{ mA}$	—	—	2.0	
Supply Current	Output "H"	$I_{CC}$	4	$V_{CC} = 13\text{ V}$ , $V_{IN} = 0\text{ V}$ , OUTPUT OPEN	—	—	13	mA
	Output "L"		5	$V_{CC} = 13\text{ V}$ , $V_{IN} = 5\text{ V}$ , OUTPUT OPEN	—	—	17	
Turn-On Delay	P	$t_{ON}$	8	$V_{CC} = 5\text{ V}$ , $R_L = 90\ \Omega$ $C_L = 15\text{ pF}$ , $V_{OUT} = 45\text{ V}$	—	5	—	$\mu\text{s}$
				$V_{CC} = 5\text{ V}$ , $V_{OUT} = 80\text{ V}$ $R_L = 160\ \Omega$	—	0.4	—	
				$V_{CC} = 5\text{ V}$ , $R_L = 70\ \Omega$ $C_L = 15\text{ pF}$ , $V_{OUT} = 35\text{ V}$	—	5	—	
Turn-Off Delay	P	$t_{OFF}$	8	$V_{CC} = 5\text{ V}$ , $R_L = 90\ \Omega$ $C_L = 15\text{ pF}$ , $V_{OUT} = 45\text{ V}$	—	5	—	$\mu\text{s}$
				$V_{CC} = 5\text{ V}$ , $V_{OUT} = 80\text{ V}$ $R_L = 160\ \Omega$	—	1.7	—	
				$V_{CC} = 5\text{ V}$ , $R_L = 70\ \Omega$ $C_L = 15\text{ pF}$ , $V_{OUT} = 35\text{ V}$	—	5	—	

## TEST CIRCUIT

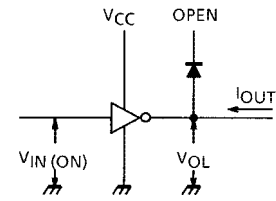
### 1. $V_{IH}$ , $V_{IL}$



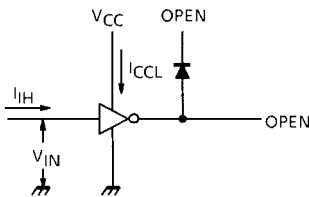
### 2. $I_{OH}$



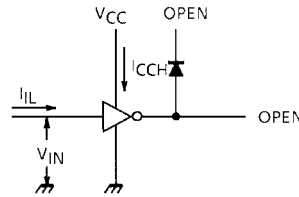
### 3. $V_{OL}$



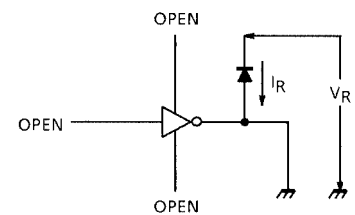
### 4. $I_{IH}$ , $I_{CCL}$



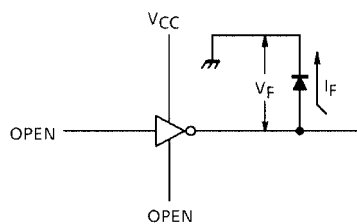
### 5. $I_{IL}$ , $I_{CCH}$



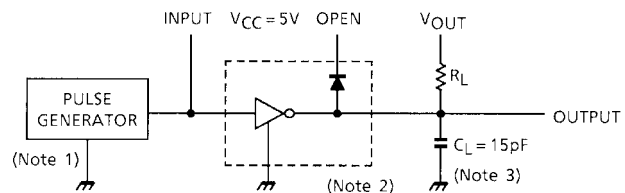
### 6. $I_R$



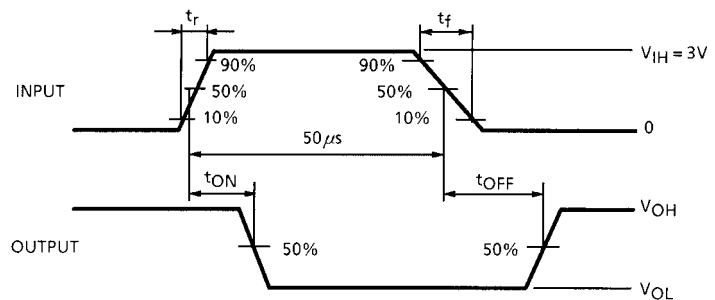
### 7. $V_F$



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



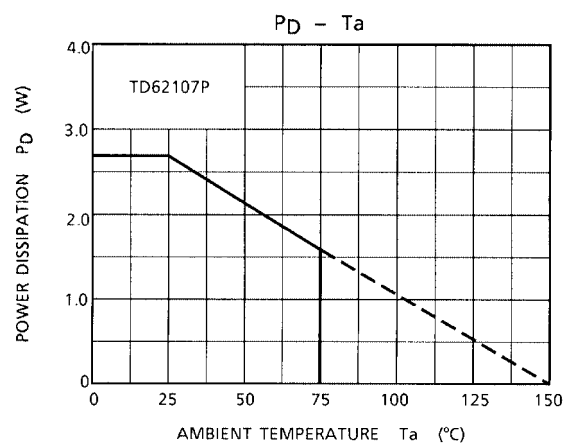
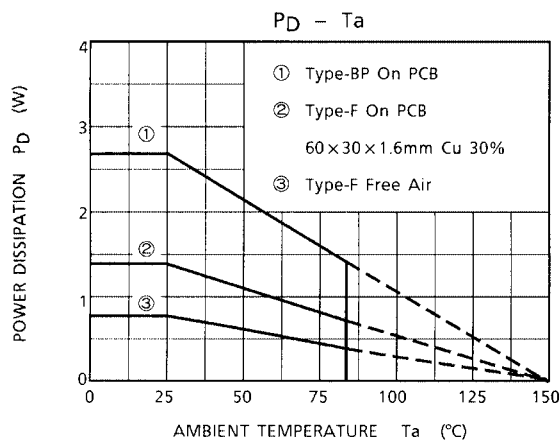
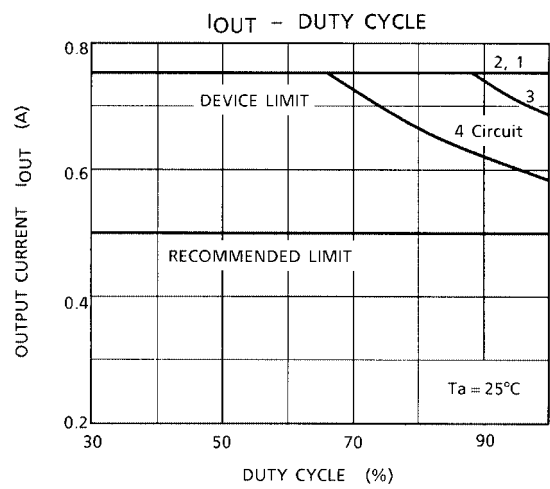
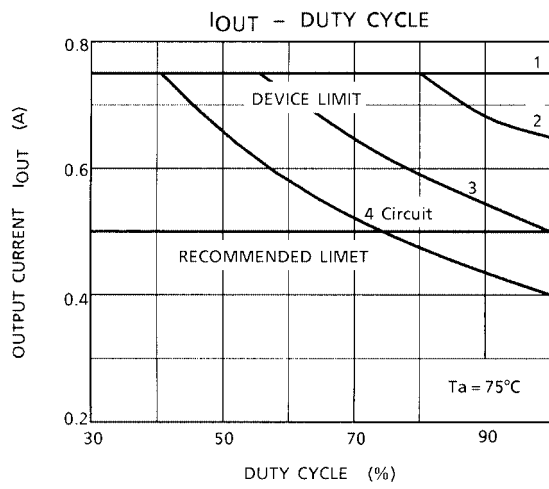
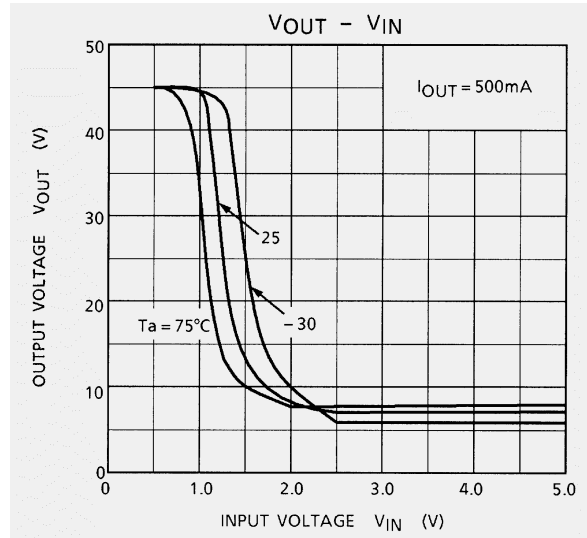
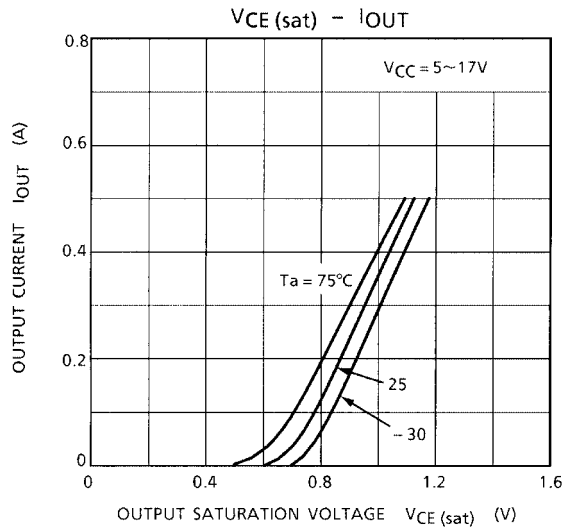
### Input condition



- 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:  $V_{IH} = 3$  V,  $E1 = V_{IH}$ ,  $\overline{E2} = \text{GND}$ ,  
 $V_{CC} = 5$  V
- Note 3:  $C_L$  includes probe and jig capacitance

## PRECAUTIONS for USING

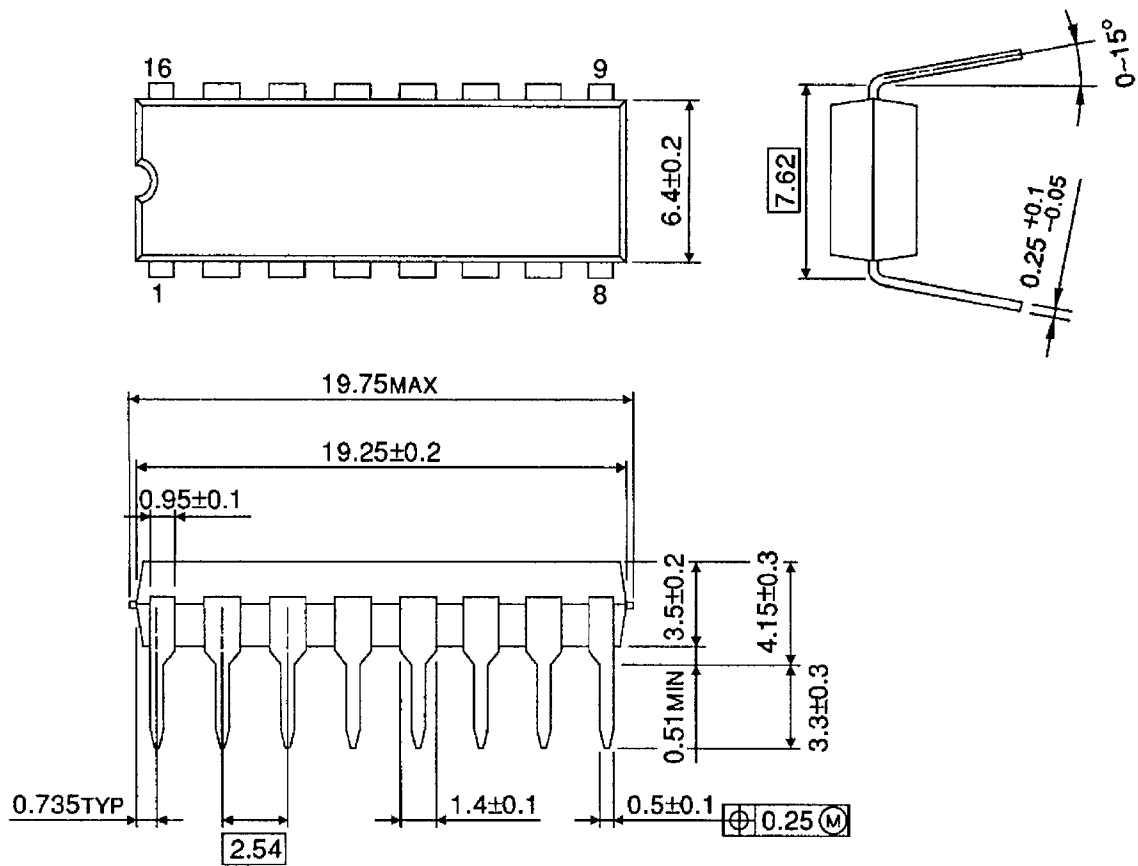
This IC does not include built-in protection circuits for excess current or overvoltage. If this IC is subjected to excess current or overvoltage, it may be destroyed. Hence, the utmost care must be taken when systems which incorporate this IC are designed. Utmost care is necessary in the design of the output line, VCC, 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

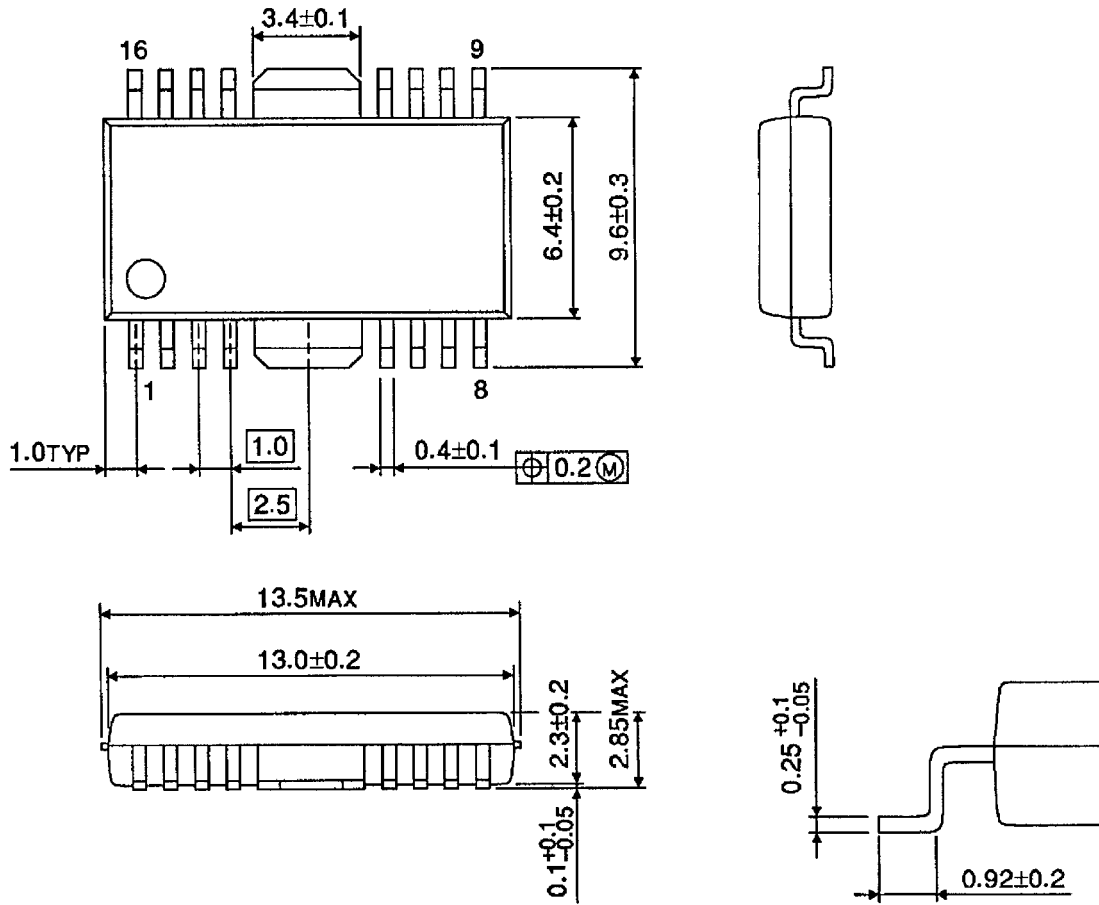


Weight: 1.11 g (Typ.)

## PACKAGE DIMENSIONS

HSOP16-P-300-1.00

Unit : mm



Weight: 0.50 g (Typ.)



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000707EBA

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