

# TD62308AP, TD62308F, TD62308AF

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

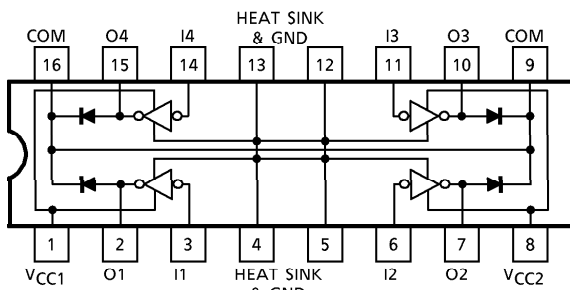
The TD62308AP/F/AF are non-inverting transistor array which are comprised of four NPN darlington output stages and PNP input stages. These devices are low level input active driver and are suitable for operation with TTL, 5V CMOS and 5V Microprocessor which have sink current output drivers. Applications include relay, hammer, lamp and stepping motor drivers.

### FEATURES

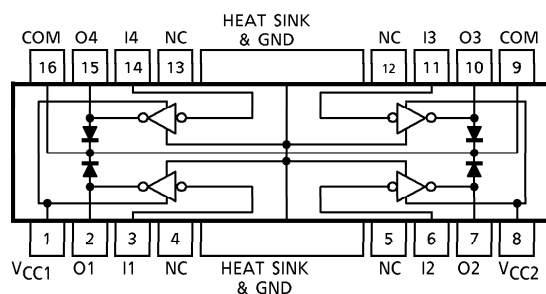
- Output current (single output) 1.5A (Max.)
- High sustaining voltage output 35V (Min.) (TD62308F)  
50V (Min.) (TD62308AP, TD62308AF)
- Output clamp diodes
- Input compatible with TTL and 5V CMOS
- Low level active inputs
- Standard supply voltage
- Two  $V_{CC}$  terminals  $V_{CC1}$ ,  $V_{CC2}$  (separated)
- GND and SUB terminal = heat sink
- Package type-AP : DIP-16pin
- Package type-F, AF : PFP-16pin

### PIN CONNECTION (TOP VIEW)

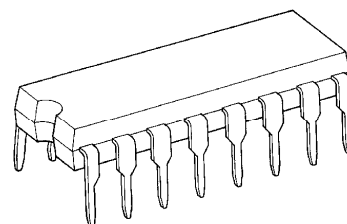
TD62308AP



TD62308F, TD62308AF

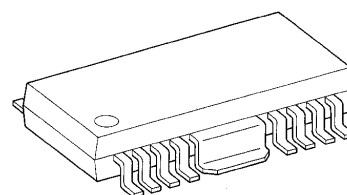


TD62308AP



DIP16-P-300-2.54A

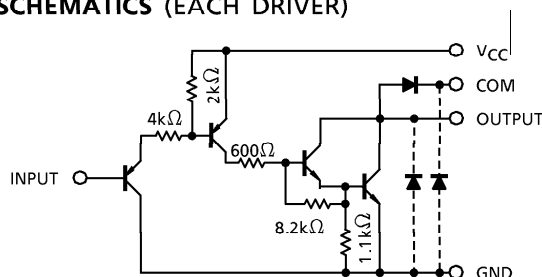
TD62308F  
TD62308AF



HSOP16-P-300-1.00

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

### SCHEMATICS (EACH DRIVER)



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

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## MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Supply Voltage	V <sub>CC</sub>	- 0.5~10	V
Output Sustaining Voltage	F AP, AF	V <sub>CE</sub> (SUS) - 0.5~35 - 0.5~50	V
Output Current	I <sub>OUT</sub>	1.5	A / ch
Input Current	I <sub>IN</sub>	- 10	mA
Input Voltage	V <sub>IN</sub>	- 0.5~30	V
Clamp Diode Reverse Voltage	F AP, AF	V <sub>R</sub> 35 50	V
Clamp Diode Forward Current	I <sub>F</sub>	1.5	A
Power Dissipation	AP F, AF	P <sub>D</sub> 1.47 / 2.7 (Note 1) 0.9 / 1.4 (Note 2)	W
Operating Temperature	T <sub>opr</sub>	- 40~85	°C
Storage Temperature	T <sub>stg</sub>	- 55~150	°C

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

(Note 2) On Glass Epoxy (60 × 30 × 1.6mm 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	F AP, AF	V <sub>CE</sub> (SUS) — —	0 0	— —	35 50	V
Output Current	AP F, AF	I <sub>OUT</sub> DC 1 circuit, Ta = 25°C T <sub>pw</sub> = 25ms 4 circuits Ta = 85°C T <sub>j</sub> = 120°C Duty = 10% Duty = 50% Duty = 10% Duty = 50%	0 0 0 0 0	— — — — —	1250 1250 700 1250 390	mA / ch
Input Voltage	V <sub>IN</sub>	—	0	—	25	V
Input Voltage	Output On Output Off	V <sub>IN</sub> (ON) V <sub>IN</sub> (OFF)	— —	0 V <sub>CC</sub> - 1.0	V <sub>CC</sub> - 3.6 V <sub>CC</sub>	V
Clamp Diode Reverse Voltage	F AP, AF	V <sub>R</sub> — —	— —	— —	35 50	V
Clamp Diode Forward Current	I <sub>F</sub>	—	—	—	1.25	A
Power Dissipation	AP F, AF	P <sub>D</sub> Ta = 85°C (Note 1) Ta = 85°C (Note 2)	— —	— —	1.4 0.7	W

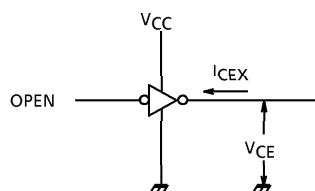
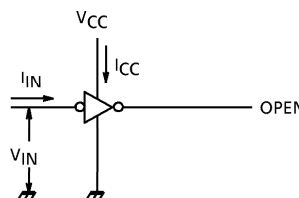
(Note 1) On Glass Epoxy (50 × 50 × 1.6mm Cu 50%)

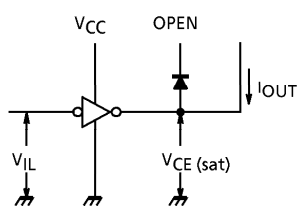
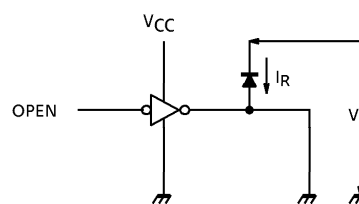
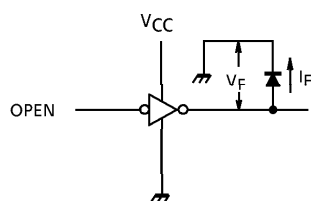
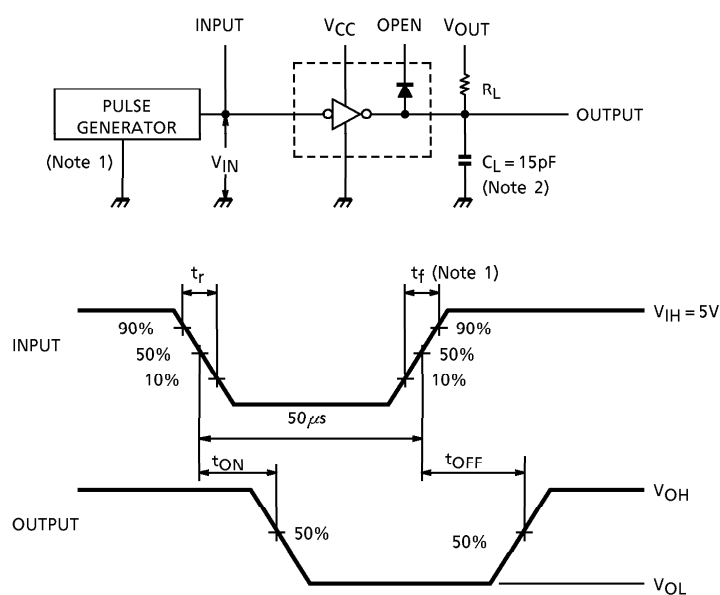
(Note 2) On Glass Epoxy (60 × 30 × 1.6mm Cu 30%)

## ELECTRICAL CHARACTERISTICS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	TEST CIR- CUIT	TEST CONDITION		MIN.	TYP.	MAX.	UNIT
Output Leakage Current	AP, AF	I <sub>CEX</sub>	1	V <sub>CE</sub> = 50V, Ta = 25°C		—	—	50	μA
				V <sub>CE</sub> = 50V, Ta = 85°C		—	—	100	
	F			V <sub>CE</sub> = 35V, Ta = 25°C		—	—	50	
				V <sub>CE</sub> = 35V, Ta = 85°C		—	—	100	
Output Saturation Voltage		V <sub>CE (sat)</sub>	3	I <sub>OUT</sub> = 1.25A		—	—	1.8	V
				I <sub>OUT</sub> = 0.7A		—	—	1.3	
Input Voltage	"H" Level	V <sub>IH</sub>	—	—		V <sub>CC</sub> - 1.6	—	25	V
	"L" Level	V <sub>IL</sub>	—	—		—	—	V <sub>CC</sub> - 3.6	
Input Current	"H" Level	I <sub>IH</sub>	—	—		—	—	10	μA
	"L" Level	I <sub>IL</sub>				—	- 0.05	- 0.36	mA
Clamp Diode Reverse Current	AP, AF	I <sub>R</sub>	4	V <sub>R</sub> = 50V, Ta = 25°C		—	—	50	μA
	F			V <sub>R</sub> = 35V, Ta = 25°C		—	—	50	
Clamp Diode Forward Voltage		V <sub>F</sub>	5	I <sub>F</sub> = 1.25A		—	1.5	2.0	V
Supply Current	Output On	I <sub>CC (ON)</sub>	2	V <sub>CC</sub> = 5.5V, V <sub>IN</sub> = 0V		—	8.5	12.5	mA / ch
	Output Off	I <sub>CC (OFF)</sub>		V <sub>CC</sub> = 5.5V, V <sub>IN</sub> = V <sub>CC</sub>		—	—	1.0	μA
Turn-On Delay	F	t <sub>ON</sub>	6	C <sub>L</sub> = 15pF	V <sub>OUT</sub> = 35V R <sub>L</sub> = 28Ω	—	0.2	—	μs
	AP, AF				V <sub>OUT</sub> = 50V R <sub>L</sub> = 40Ω				
Turn-Off Delay	F	t <sub>OFF</sub>			V <sub>OUT</sub> = 35V R <sub>L</sub> = 28Ω	—	5.0	—	
	AP, AF				V <sub>OUT</sub> = 35V R <sub>L</sub> = 40Ω				

## TEST CIRCUIT

1.  $I_{CEX}$ 2.  $I_{CC}$ 

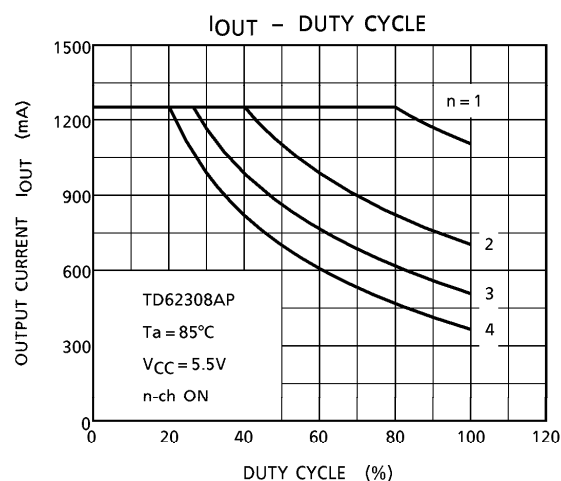
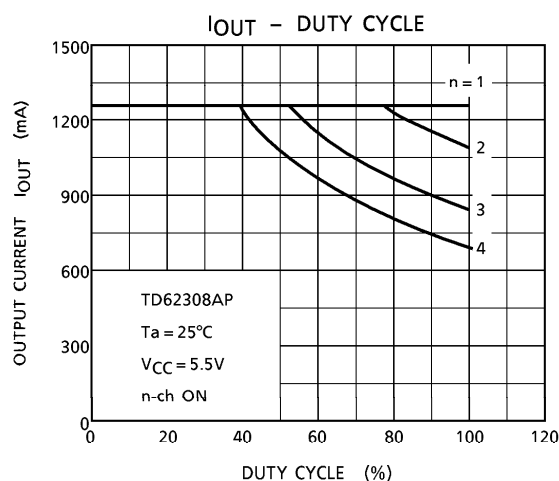
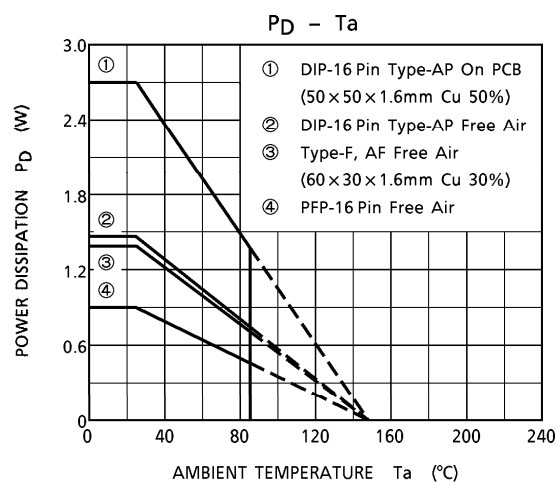
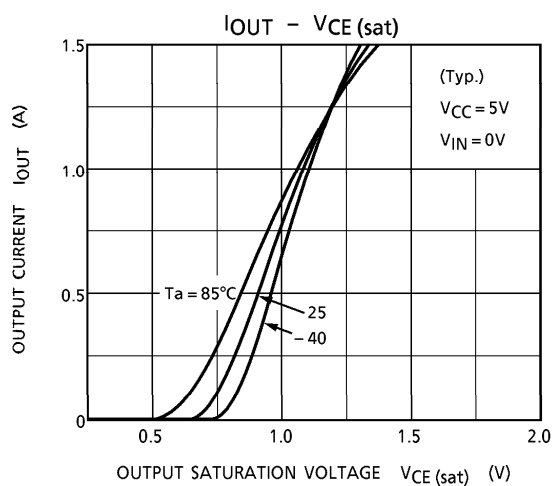
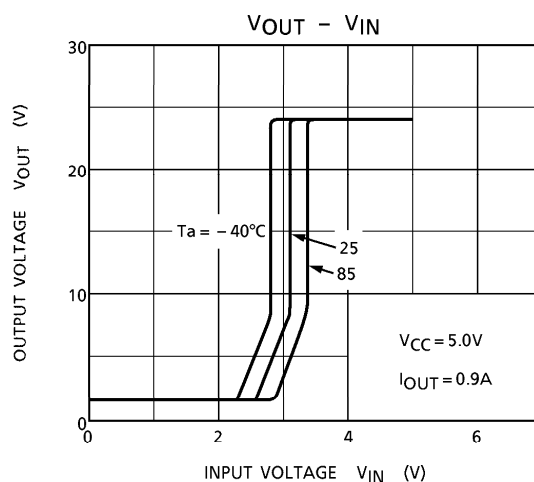
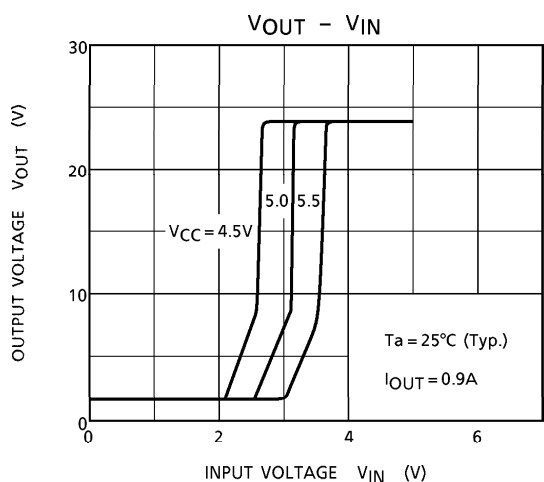
**3.  $V_{CE(sat)}$** 

**4.  $I_R$** 

**5.  $V_F$** 

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


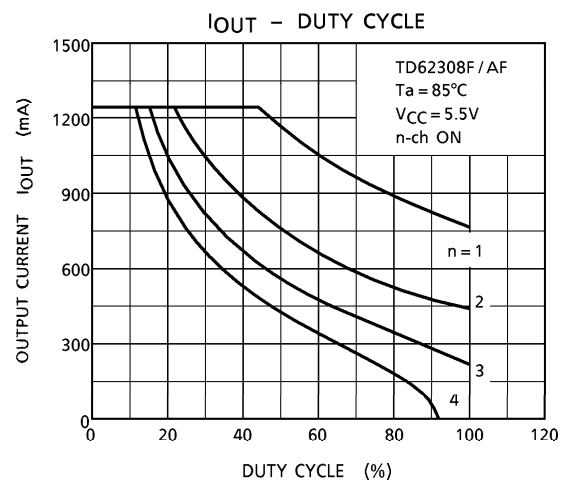
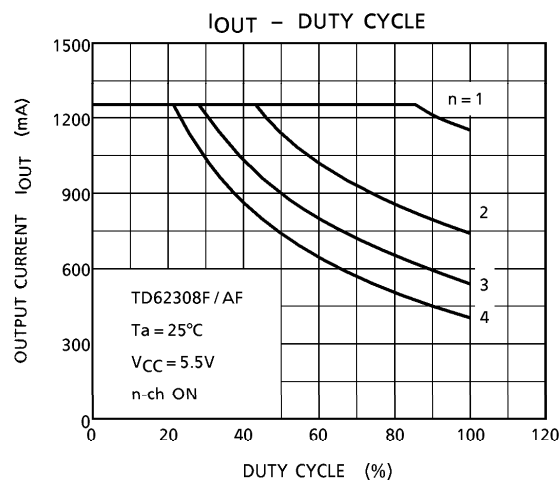
(Note 1) Pulse width  $50\mu s$ , duty cycle 10%  
Output impedance  $50\Omega$   $t_r \leq 5ns$ ,  $t_f \leq 10ns$

(Note 2)  $C_L$  includes probe and jig capacitance.

**PRECAUTIONS for USING**

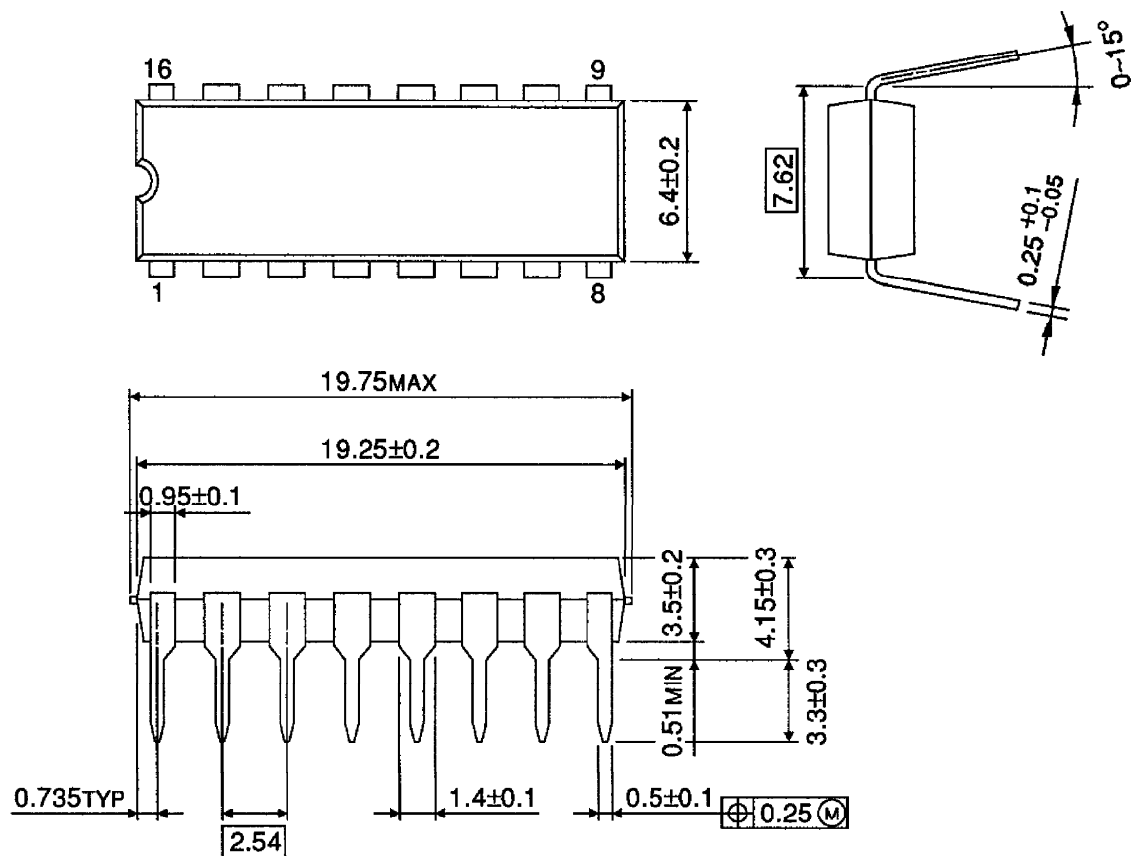
Utmost care is necessary in the design of the output line,  $V_{CC}$ , COMMON and GND line since IC may be destroyed due to short-circuit between outputs, air contamination fault, or fault by improper grounding.





**OUTLINE DRAWING**  
DIP16-P-300-2.54A

Unit : mm

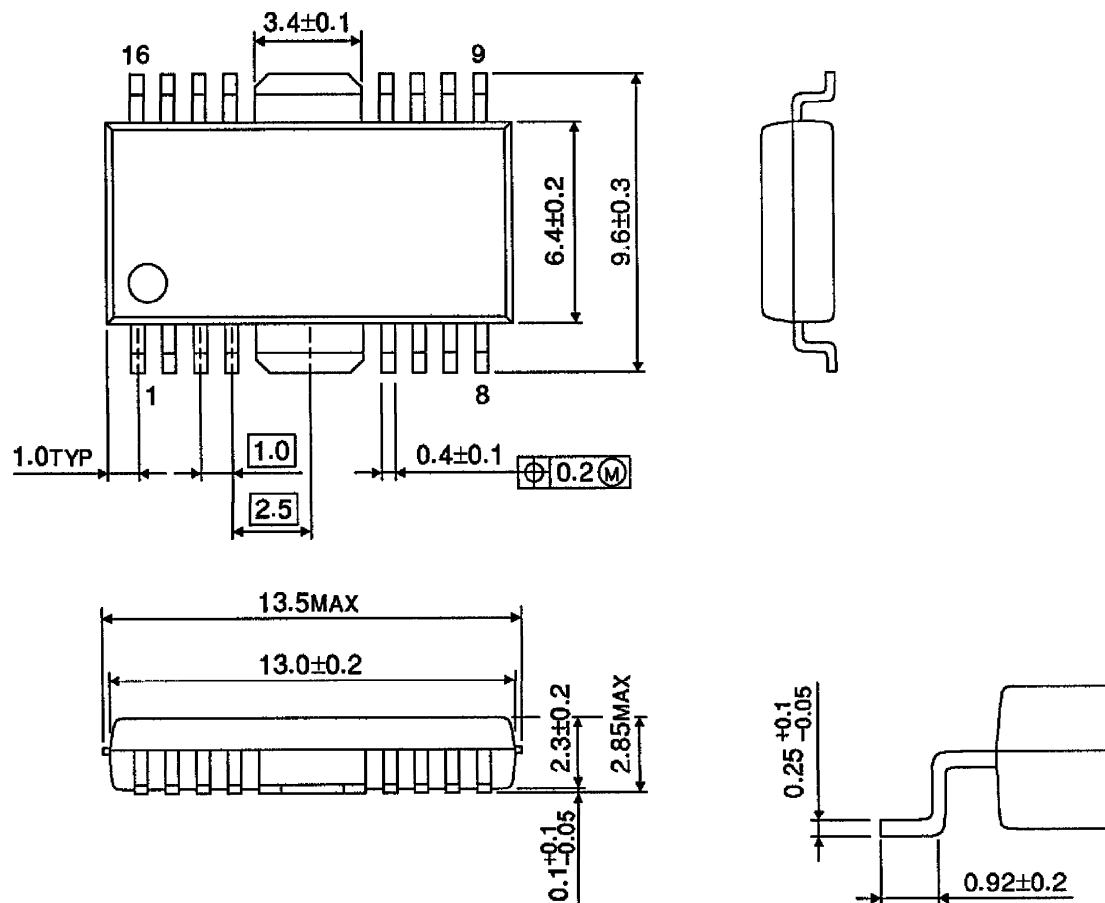


Weight : 1.11g (Typ.)

**OUTLINE DRAWING**

HSOP16-P-300-1.00

Unit : mm



Weight : 0.50g (Typ.)