

TOSHIBA BIPOLAR LINEAR INTEGRATED CIRCUIT SILICON MONOLITHIC

# TA7262P, TA7262P(LB), TA7262F

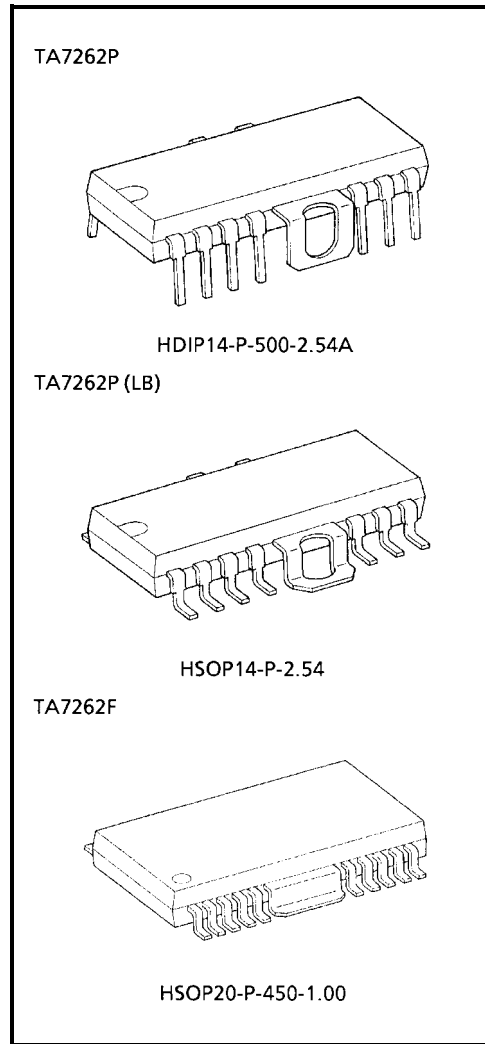
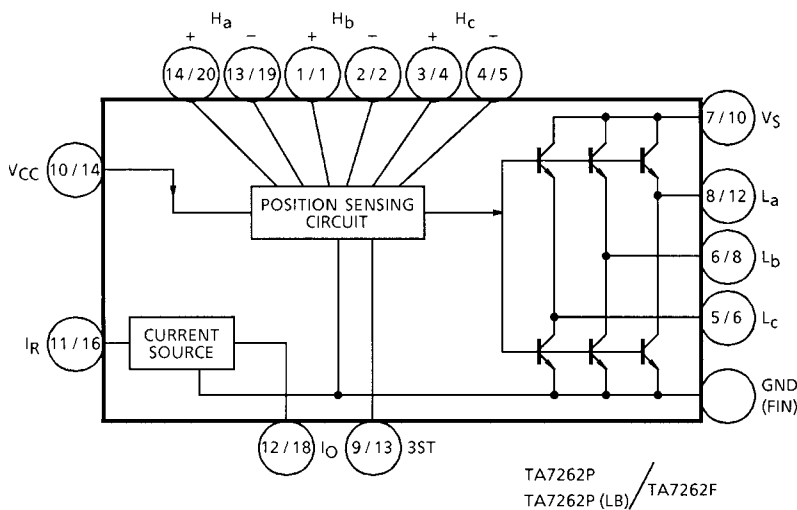
## DC MOTOR DRIVER (3 PHASE Bi-DIRECTIONAL)

The TA7262P / P (LB) / F are 3 Phase Bi-Directional supply-voltage-control Motor Driver IC. It's designed especially for energy saving Motor Control System. It contains Power Drivers, CW / CCW control circuit position sensing amplifiers and current regulator for external connected position sensing elements.

### FEATURES

- Output Current is Up to 1.5 A (AVE).
- Supply Voltage Control Motor Driver.
- Variable Current Source for Hall Sensor Including.
- Few External Parts Required.
- High Sensitivity of Position Sensing Inputs.

### BLOCK DIAGRAM



Weight  
 HDIP14-P-500-2.54A: 3.00 g (Typ.)  
 HSOP14-P-2.54 : 3.00 g (Typ.)  
 HSOP20-P-450-1.00 : 0.79 g (Typ.)

## PIN FUNCTION

PIN No.		SYMBOL	FUNCTION DESCRIPTION
P TYPE	F TYPE		
1	1	H <sub>b</sub> +	b-phase Hall Amp. positive input terminal
2	2	H <sub>b</sub> -	b-phase Hall Amp. negative input terminal
3	4	H <sub>c</sub> +	c-phase Hall Amp. positive input terminal
4	5	H <sub>c</sub> -	c-phase Hall Amp. negative input terminal
5	6	L <sub>c</sub>	c-phase drive output terminal
6	8	L <sub>b</sub>	b-phase drive output terminal
7	10	V <sub>S</sub>	Supply voltage terminal for motor driver
8	12	L <sub>a</sub>	a-phase drive output terminal
9	13	3ST	Forward rotation / Reverse rotation / Stop switch terminal
10	14	V <sub>CC</sub>	Power supply input terminal for small signal
11	16	I <sub>R</sub>	Hall element bias current control terminal
12	18	I <sub>O</sub>	Hall element bias negative-side connector terminal
13	19	H <sub>a</sub> -	a-phase Hall Amp. negative input terminal
14	20	H <sub>a</sub> +	a-phase Hall Amp. positive input terminal
Fin	Fin	GND	—

F Type: Pin (3), (7), (9), (11), (15), (17) N. C.

## FUNCTION

FRS INPUT	POSITION SENSING INPUT			COIL OUTPUT		
	H <sub>a</sub>	H <sub>b</sub>	H <sub>c</sub>	L <sub>a</sub>	L <sub>b</sub>	L <sub>c</sub>
CW	1	0	1	H	L	M
	1	0	0	H	M	L
	1	1	0	M	H	L
	0	1	0	L	H	M
	0	1	1	L	M	H
	0	0	1	M	L	H
CCW	1	0	1	L	H	M
	1	0	0	L	M	H
	1	1	0	M	L	H
	0	1	0	H	L	M
	0	1	1	H	M	L
	0	0	1	M	H	L
STOP	1	0	1	High Impedance		
	1	0	0			
	1	1	0			
	0	1	0			
	0	1	1			
	0	0	1			

## MAXIMUM RATINGS (Ta = 25°C)

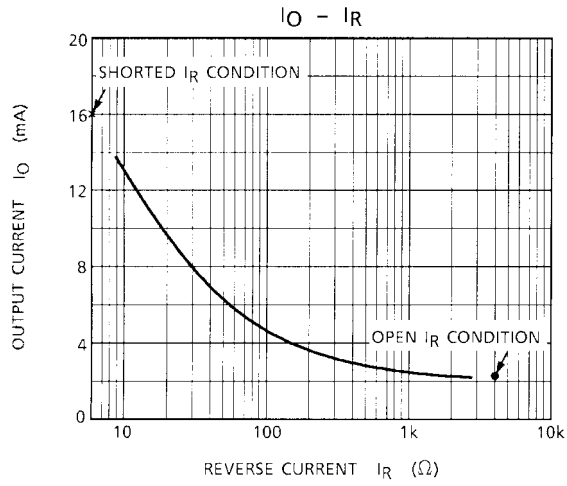
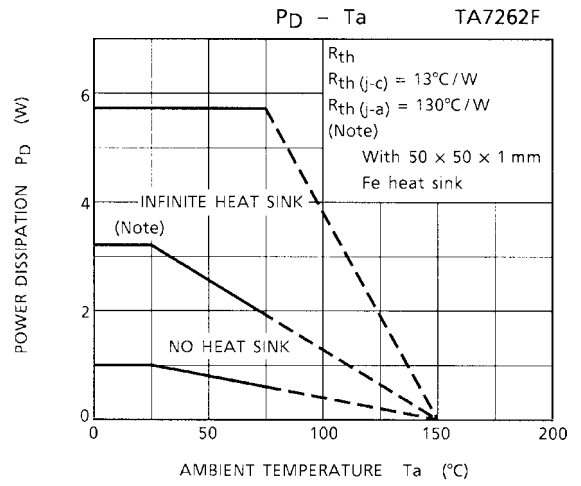
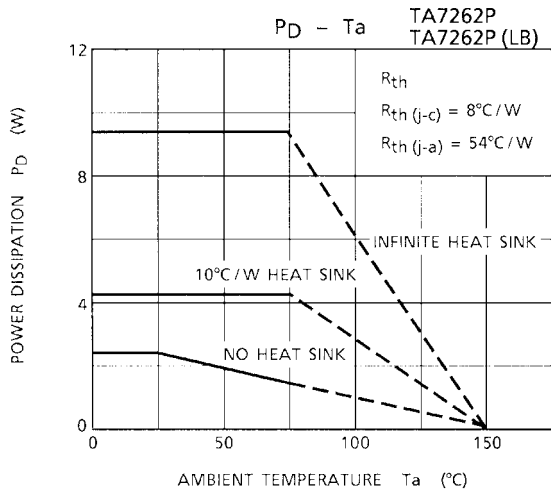
CHARACTERISTIC		SYMBOL	RATING	UNIT
Supply Voltage (MOTOR)		V <sub>S</sub>	25	V
Supply Voltage (CONTROL)		V <sub>CC</sub>	25	V
Output Current (MOTOR)		I <sub>O</sub>	1.5	A
Output Current		I <sub>CS</sub>	40	mA
Position Sensing Input Voltage		V <sub>H</sub>	400	mV <sub>p-p</sub>
Power Dissipation	TA7262P	P <sub>D</sub> (Note)	2.3	W
	TA7262P (LB)		2.3	
	TA7262F		1.0	
Operating Temperature		T <sub>opr</sub>	-30~75	°C
Storage Temperature		T <sub>stg</sub>	-55~150	°C

Note: No heat sink

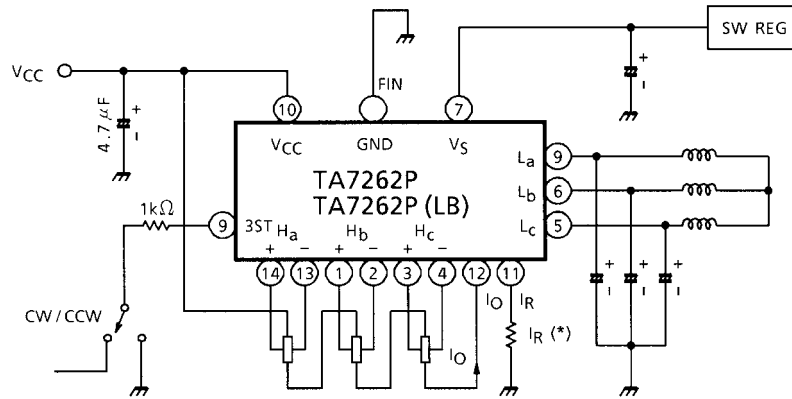
## ELECTRICAL CHARACTERISTICS

(Unless otherwise specified, V<sub>CC</sub> = 9 V, V<sub>S</sub> = 12.8 V, 3ST = 5 V, V<sub>H</sub> = ±20 mV, R<sub>L</sub> = 6 Ω, Ta = 25°C)

CHARACTERISTIC		SYMBOL	TEST CIR-CUIT	TEST CONDITION (TA7262P, TA7262P (LB))	MIN	TYP.	MAX	UNIT	
Quiescent Current		I <sub>CC-1</sub>	—	V <sub>CC</sub> = 9 V, 3 ST GND, V <sub>S</sub> open	—	5.7	6.5	mA	
		I <sub>CC-2</sub>		V <sub>CC</sub> = 25 V, 3 ST GND, V <sub>S</sub> open	—	8.0	11.0		
		I <sub>CC-3</sub>		Stop (3 ST = V <sub>CC</sub> )	—	—	4		
Saturation Voltage		V <sub>SAT</sub>	—	I <sub>O</sub> = 1 A, (total)	—	—	2.0	V	
Saturation Voltage Differential		D-V <sub>SAT</sub>	—	I <sub>O</sub> = 1 A	—	100	180	mV	
Cut-off Current	Upper	I <sub>CC-U</sub>	—	V <sub>S</sub> = 22 V	—	—	50	μA	
	Lower	I <sub>CC-L</sub>		V <sub>S</sub> = 22 V	—	—	50		
Position Sensing Input Voltage	Input Sensitivity	V <sub>H</sub>	—	—	—	20	—	mV <sub>p-p</sub>	
	Input Offset	V <sub>OFST</sub>		—	—	—	0	5	mV
	Operating DC Level	CMR		—	—	2	—	V <sub>CC</sub> - 2.5	V
CW / CCW Control Operating Voltage	CW	V <sub>FW</sub>	—	—	1.2	—	7.8	V	
	Stop	V <sub>STP</sub>		—	—	8.6	V <sub>CC</sub>		—
	CCW	V <sub>RV</sub>		—	—	—	0		0.4
Output Current of Current Source		I <sub>CS-1</sub>	—	I <sub>R</sub> open	1.5	2.2	3.0	mA	
		I <sub>CS-2</sub>		I <sub>R</sub> = 100 Ω	3.0	4.4	5.5		

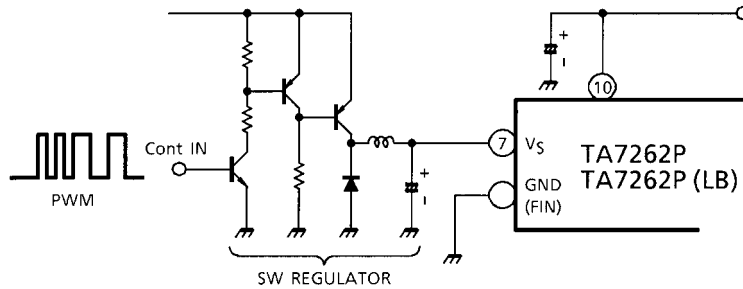


**APPLICATION CIRCUIT 1**

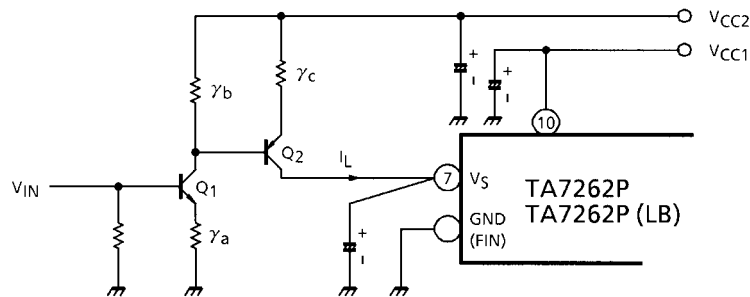


\*: Hall sensor driving current ( $I_O$ ) can be changed by  $I_R$ .  
Refer to  $I_R$  vs  $I_O$  characteristics.

**APPLICATION CIRCUIT 2**



**APPLICATION CIRCUIT 3**



$$I_L \approx \frac{\gamma_b}{\gamma_a \cdot \gamma_c} \cdot V_{IN} - \frac{1}{\gamma_c} \left( \frac{\gamma_b}{\gamma_c} \cdot V_{BE1} + V_{BE2} \right)$$

$$\approx K_1 \cdot V_{IN} + K_2 \quad (K_1, K_2 = \text{Constant})$$

Q<sub>2</sub> works as a Current Regulator for Output Coil. Therefore, Collector to Emitter Voltage of Q<sub>2</sub> is varied in accordance with required coil current.

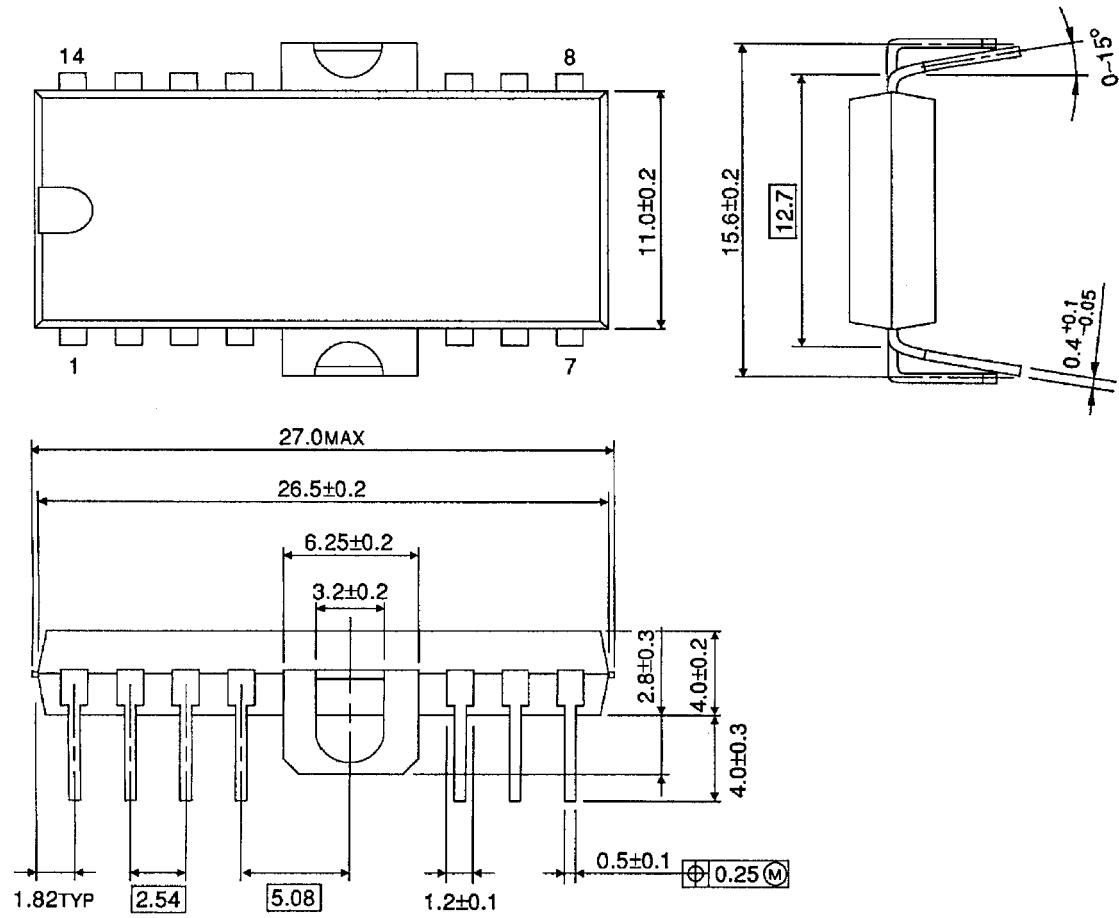
Note 1: Utmost care is necessary in the design of the output line,  $V_S$  and GND line since IC may be destroyed due to short-circuit between outputs, air contamination fault, or fault by improper grounding.

Note 2: Don't keep 3 ST terminal open.

## PACKAGE DIMENSIONS

HDIP14-P-500-2.54A

Unit: mm

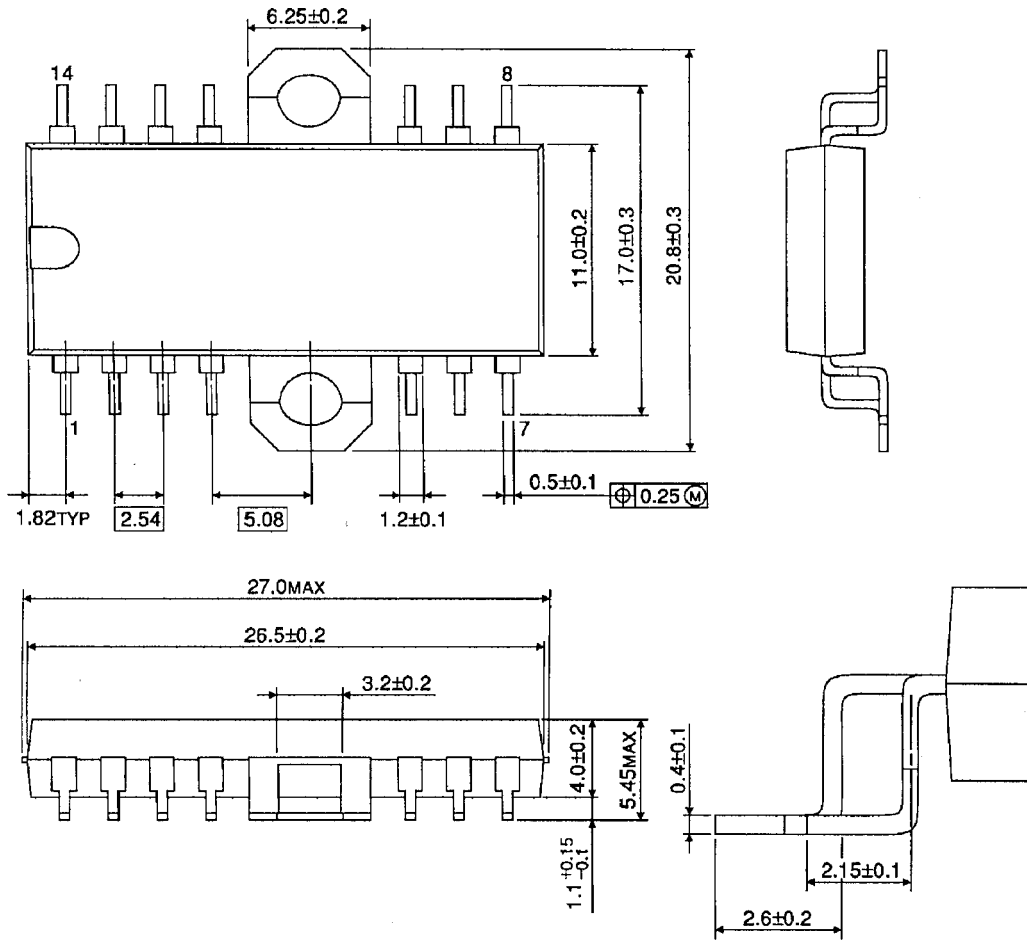


Weight: 3.00 g (Typ.)

**PACKAGE DIMENSIONS**

HSOP14-P-2.54

Unit: mm

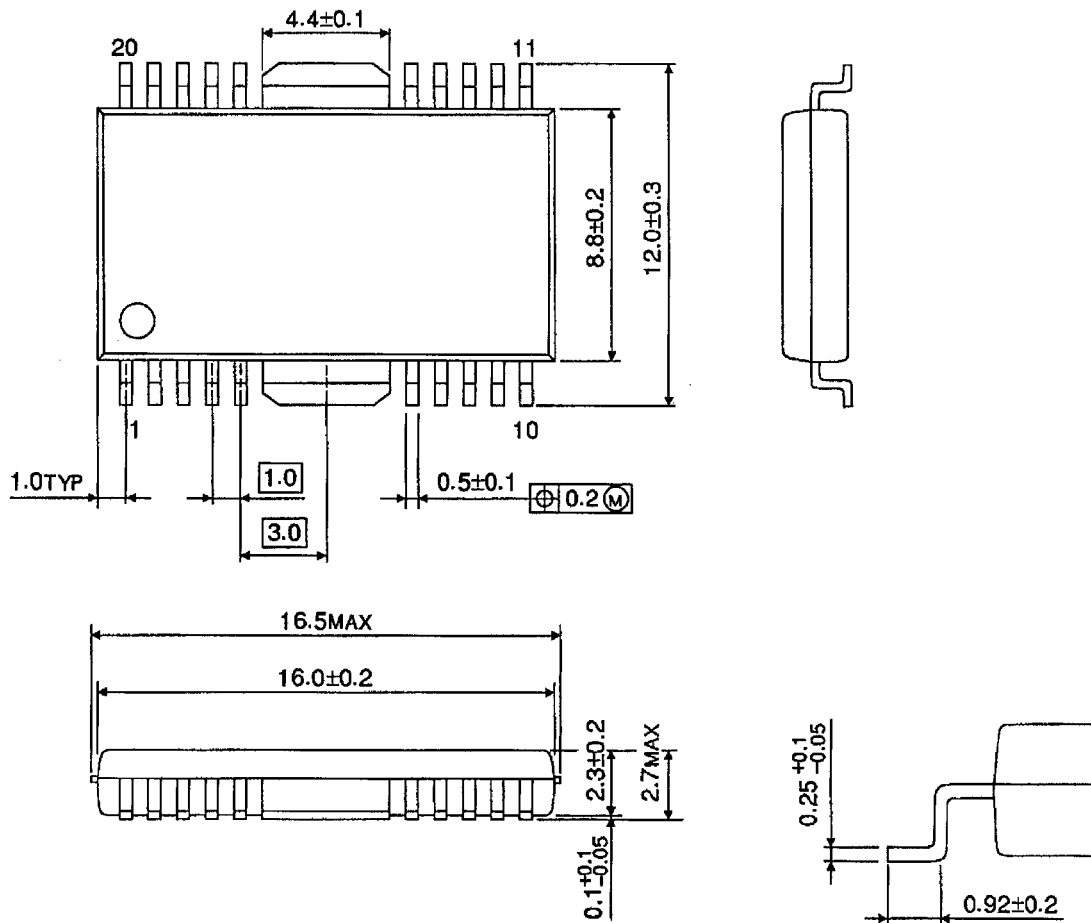


Weight: 3.00 g (Typ.)

**PACKAGE DIMENSIONS**

HSOP20-P-450-1.00

Unit: mm



Weight: 0.79 g (Typ.)



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000707EBA

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