

TOSHIBA BIPOLAR LINEAR INTEGRATED CIRCUIT SILICON MONOLITHIC

# TA7262P, TA7262P(LB), TA7262F

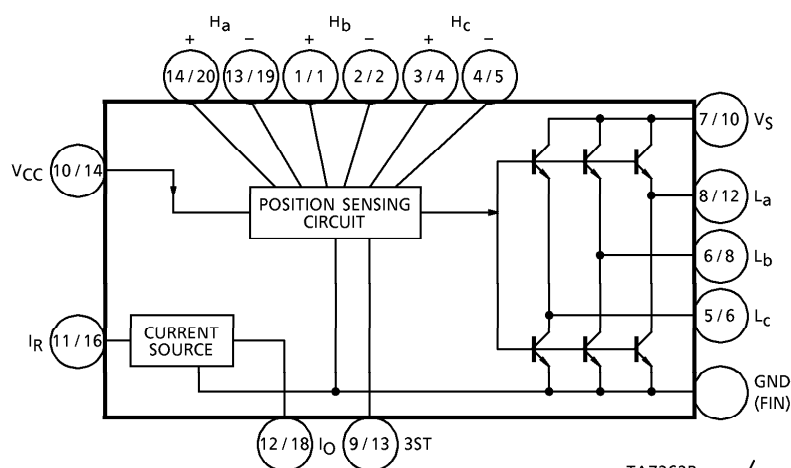
## DC MOTOR DRIVER (3 PHASE Bi-DIRECTIONAL)

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

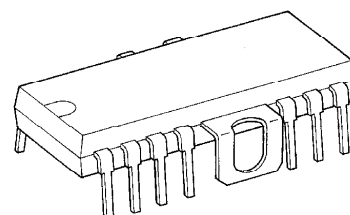
- Output Current is Up to 1.5 A (AVE).
- Supply Voltage Control Motor Driver.
- Variable Current Source for Hall Sensor Including.
- Few External Parts Required.
- High Sensitivity of Position Sensing Inputs.

### BLOCK DIAGRAM



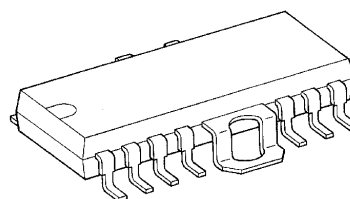
TA7262P  
TA7262P (LB) / TA7262F

TA7262P



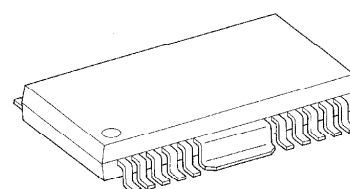
HDIP14-P-500-2.54A

TA7262P (LB)



HSOP14-P-2.54

TA7262F



HSOP20-P-450-1.00

### 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.)

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## PIN FUNCTION

PIN No.		SYMBOL	FUNCTIONAL DESCRIPTION
P TYPE	F TYPE		
1	1	$H_b +$	b-phase Hall Amp. positive input terminal
2	2	$H_b -$	b-phase Hall Amp. negative input terminal
3	4	$H_c +$	c-phase Hall Amp. positive input terminal
4	5	$H_c -$	c-phase Hall Amp. negative input terminal
5	6	$L_c$	c-phase drive output terminal
6	8	$L_b$	b-phase drive output terminal
7	10	$V_S$	Supply voltage terminal for motor driver
8	12	$L_a$	a-phase drive output terminal
9	13	3ST	Forward rotation / Reverse rotation / Stop switch terminal
10	14	$V_{CC}$	Power supply input terminal for small signal
11	16	$I_R$	Hall element bias current control terminal
12	18	$I_O$	Hall element bias negative-side connector terminal
13	19	$H_a -$	a-phase Hall Amp. negative input terminal
14	20	$H_a +$	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		
	$H_a$	$H_b$	$H_c$	$L_a$	$L_b$	$L_c$
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)

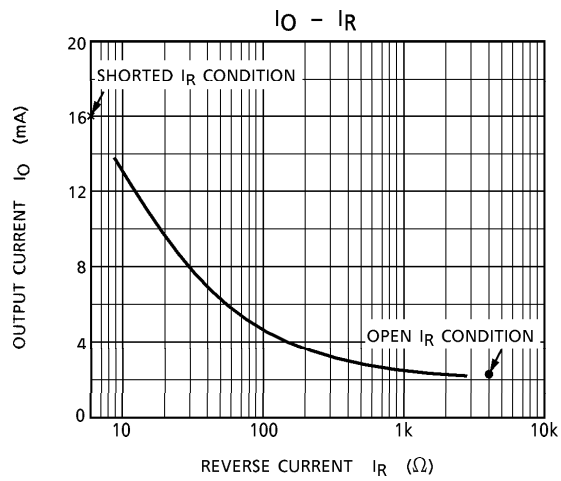
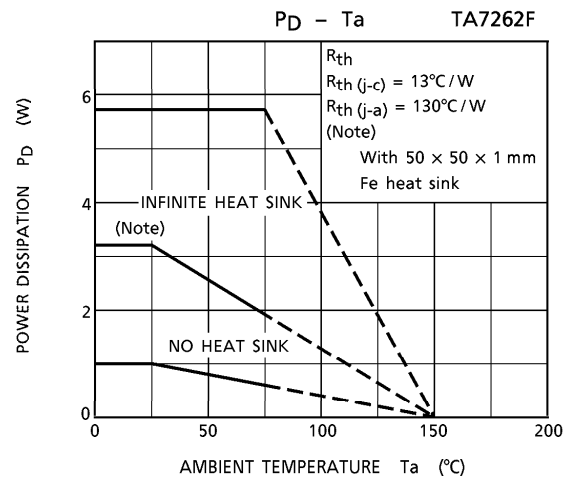
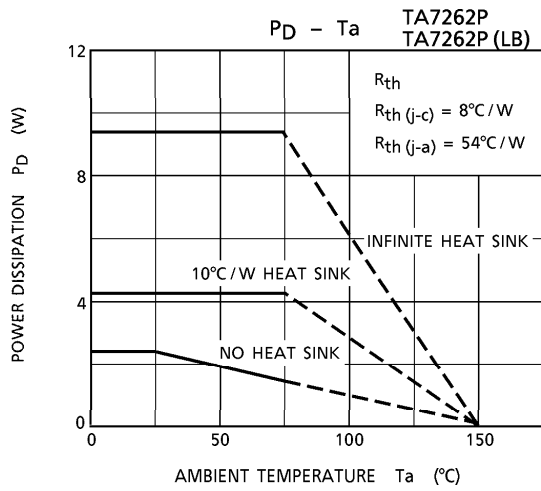
CHARACTERISTIC	SYMBOL	RATING	UNIT
Supply Voltage (MOTOR)	V <sub>S</sub>	25	V
Supply Voltage (CONTROL)	V <sub>CC</sub>	25	V
Output Current (MOTOR)	I <sub>O</sub>	1.5	A
Output Current	I <sub>CS</sub>	40	mA
Position Sensing Input Voltage	V <sub>H</sub>	400	mV <sub>p-p</sub>
Power Dissipation	TA7262P	P <sub>D</sub> (Note)	2.3
	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

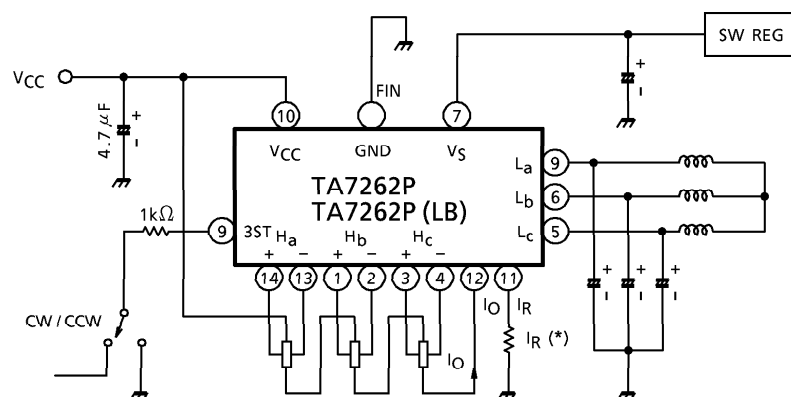
## ELECTRICAL CHARACTERISTICS

(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	

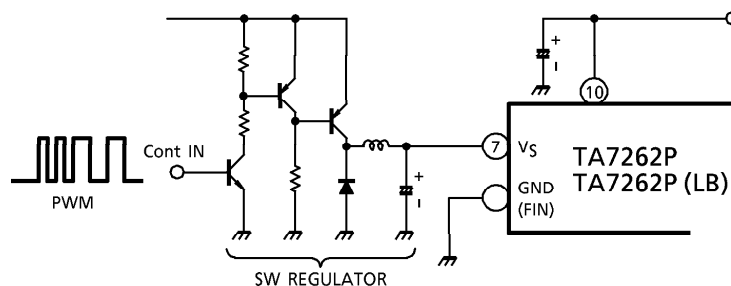


### APPLICATION CIRCUIT 1

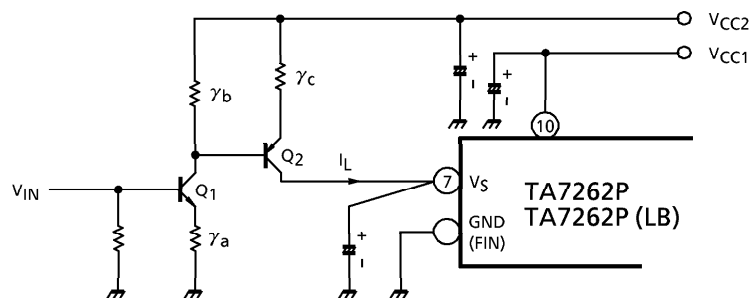


(\*) Hall sensor driving current ( $I_O$ ) can be changed by  $I_R$ .  
Refer to  $I_R$  vs  $I_O$  characteristics.

### APPLICATION CIRCUIT 2



### APPLICATION CIRCUIT 3



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

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

$Q_2$  works as a Current Regulator for Output Coil. Therefore, Collector to Emitter Voltage of  $Q_2$  is varied in accordance with required coil current.

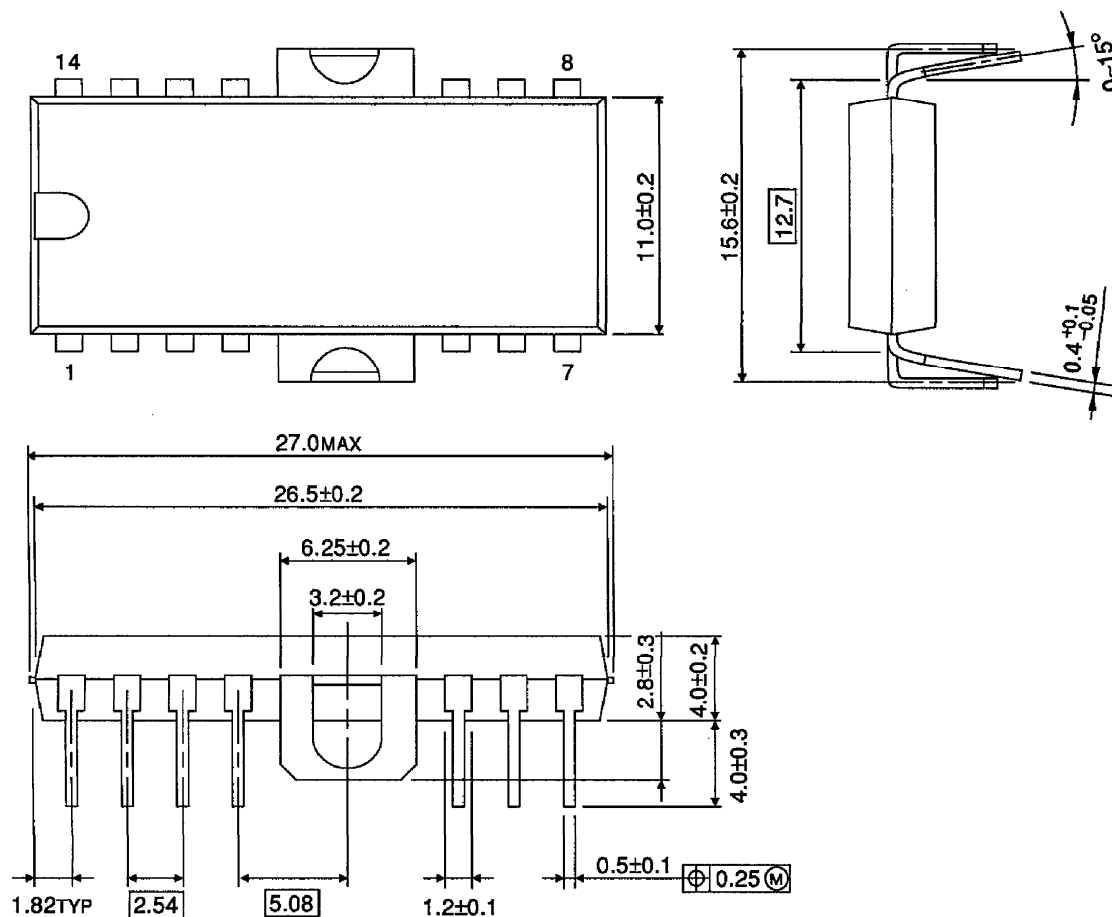
(Note 1) Utmost care is necessary in the design of the output line,  $V_S$  and GND line since IC may be destroyed due to short-circuit between outputs, air contamination fault, or fault by improper grounding.

(Note 2) Don't keep 3ST terminal open.

**OUTLINE DRAWING**

HDIP14-P-500-2.54A

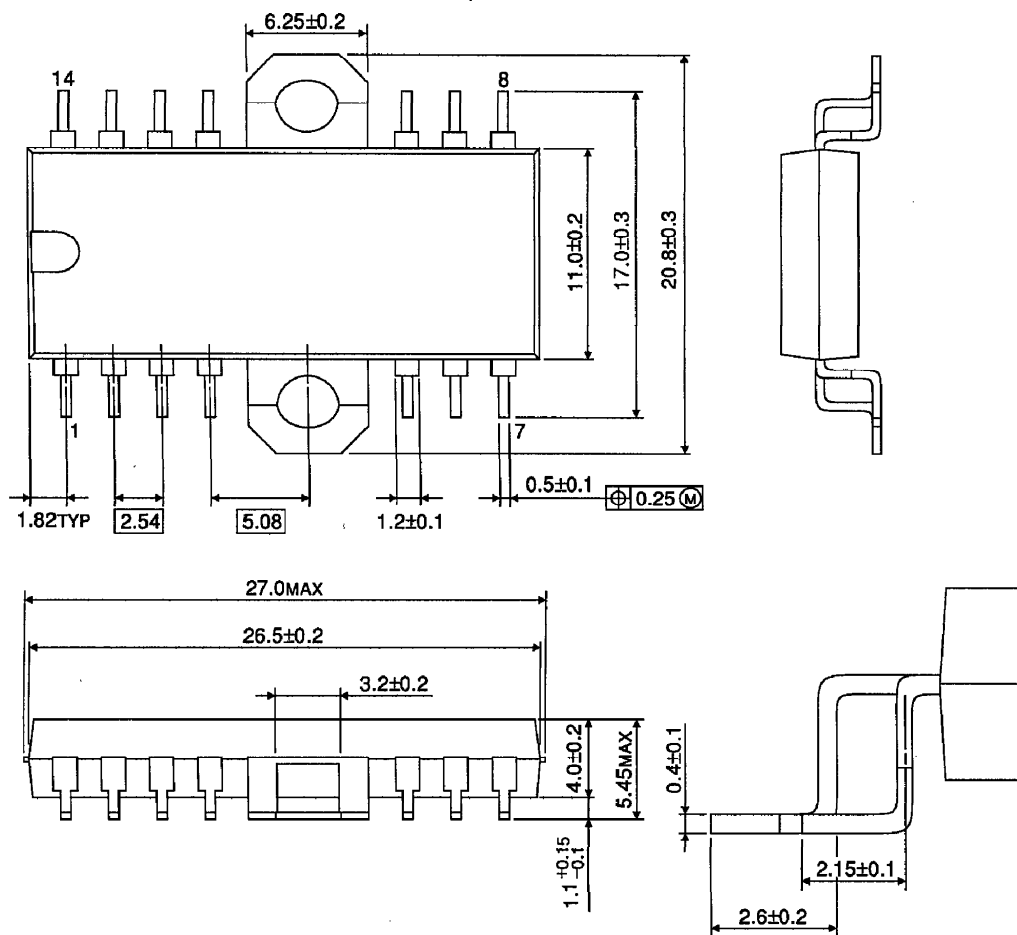
Unit : mm



Weight : 3.00 g (Typ.)

**OUTLINE DRAWING**  
HSOP14-P-2.54

Unit : mm

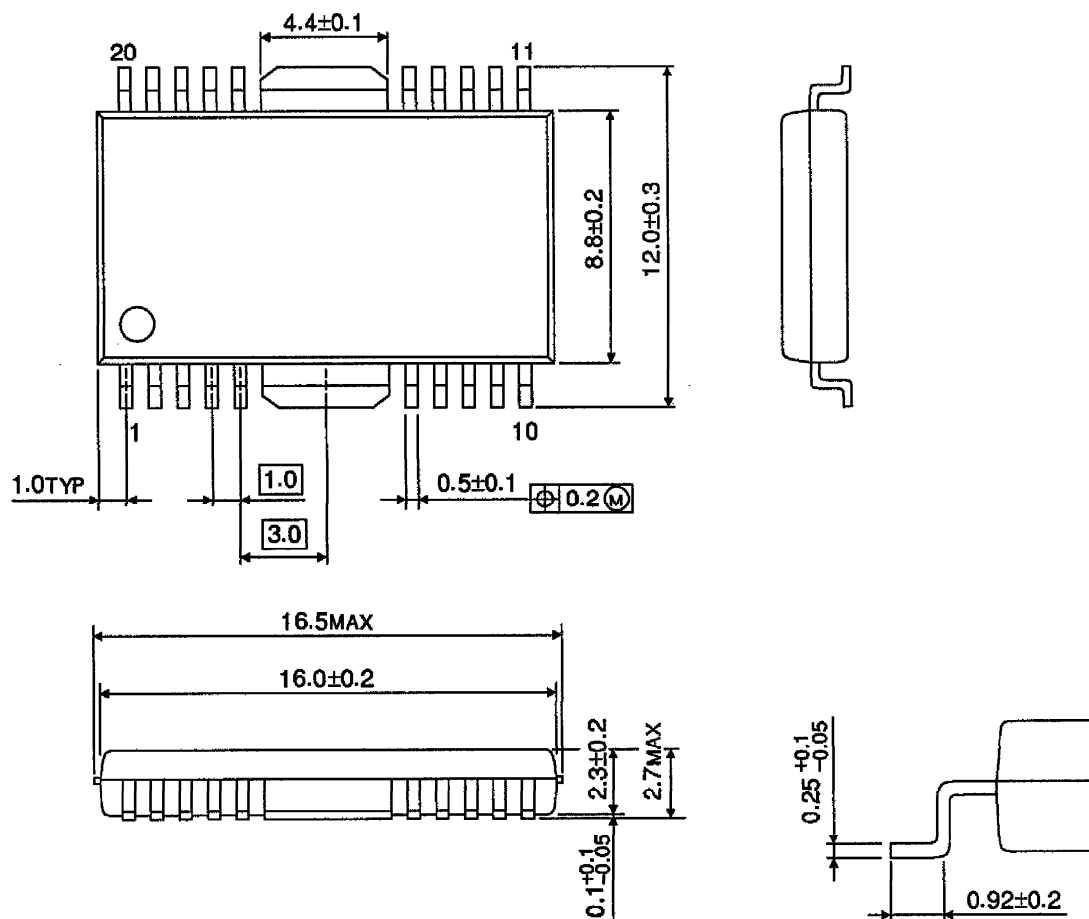


Weight : 3.00 g (Typ.)

**OUTLINE DRAWING**

HSOP20-P-450-1.00

Unit : mm



Weight : 0.79 g (Typ.)