TOSHIBA BIPOLAR LINEAR INTEGRATED CIRCUIT SILICON MONOLITHIC

TA7262P,TA7262P(LB),TA7262F

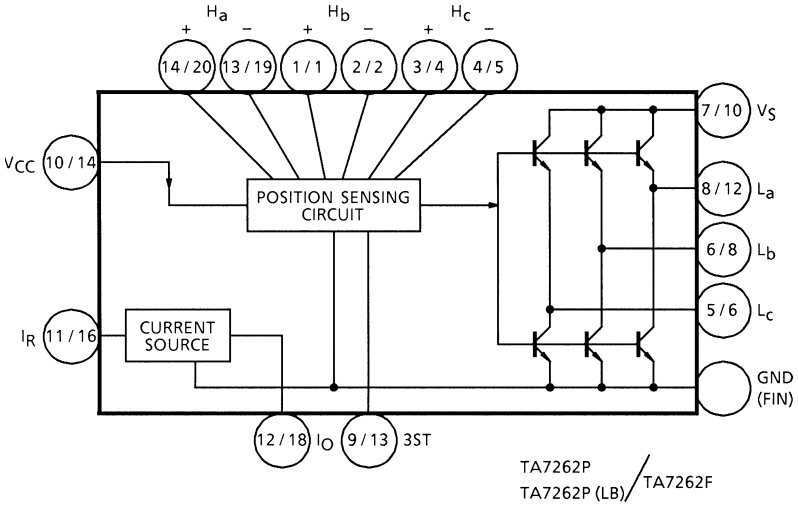
DC MOTOR DRIVER (3 PHASE Bi−DIRECTIONAL)

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.

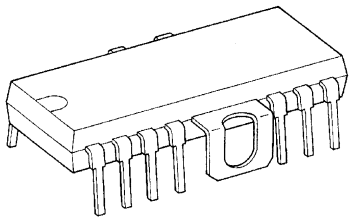
FEATURES

- 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

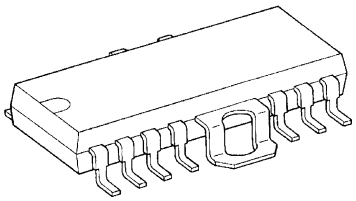


TA7262P



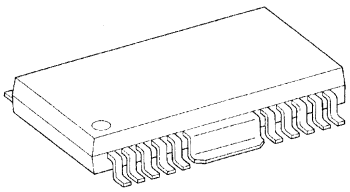
HDIP14-P-500-2.54A

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.)

980910EBA2

PIN FUNCTION

PIN No.		SYMBOL	FUNCTION 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 motter 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)

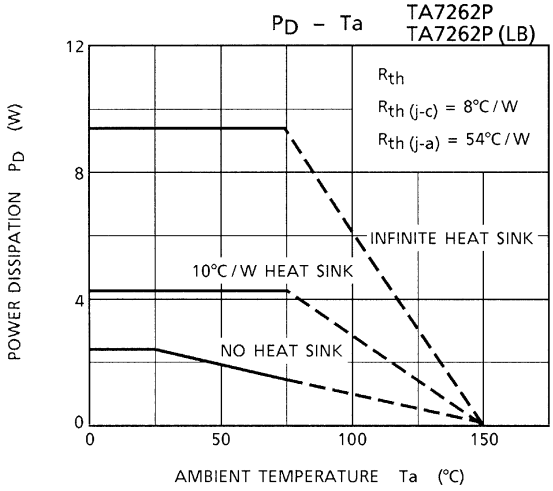
CHARACTERISTIC		SYMBOL	RATING	UNIT
Supply Voltage (MOTOR)		V_S	25	V
Supply Voltage (CONTROL)		V_{CC}	25	V
Output Current (MOTOR)		I_O	1.5	A
Output Current		I_{CS}	40	mA
Position Sensing Input Voltage		V_H	400	mV_{p-p}
Power Dissipation	TA7262P	P_D (Note)	2.3	W
	TA7262P (LB)		2.3	
	TA7262F		1.0	
Operating Temperature		Topr	−30~75	°C
Storage Temperature		T_{stg}	−55~150	°C

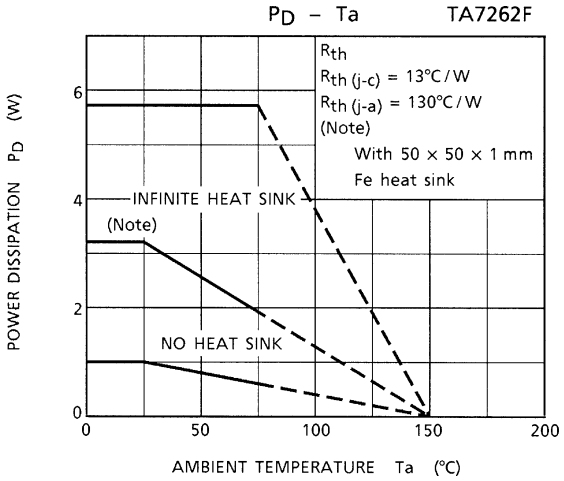
Note: No heat sink

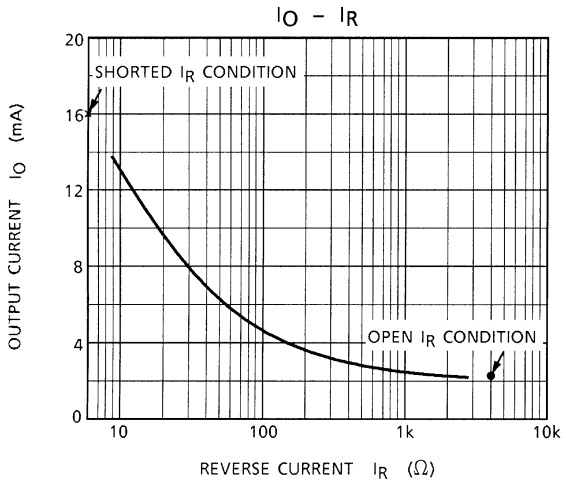
ELECTRICAL CHARACTERISTICS

(Unless otherwise specified, V_{CC} = 9 V, V_S = 12.8 V, 3ST = 5 V, V_H = ±20 mV, R_L = 6 Ω, Ta = 25°C)

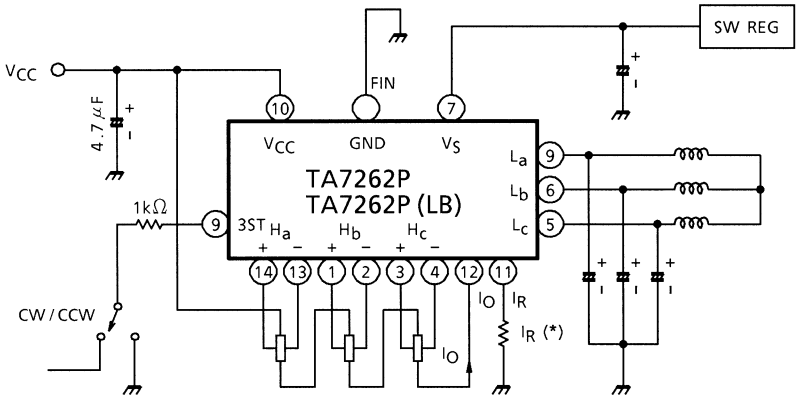
CHARACTERISTIC		SYMBOL	TEST CIR-CUIT	TEST CONDITION (TA7262P, TA7262P (LB))	MIN	TYP.	MAX	UNIT
Quiescent Current		I_{CC-1}	—	V_{CC} = 9 V, 3 ST GND, V_S open	—	5.7	6.5	mA
		I_{CC-2}		V_{CC} = 25 V, 3 ST GND, V_S open	—	8.0	11.0	
		I_{CC-3}		Stop (3 ST = V_{CC})	—	—	4	
Saturation Voltage		V_{SAT}	—	I_O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


P_D – Ta
TA7262P
TA7262P (LB)
R_{th}
$R_{th\ (j-c)}$ = 8°C / W
$R_{th\ (j-a)}$ = 54°C / W
INFINITE HEAT SINK
10°C / W HEAT SINK
NO HEAT SINK
POWER DISSIPATION P_D (W)
AMBIENT TEMPERATURE Ta (°C)
0
4
8
12
0
50
100
150


P_D – Ta
TA7262F
R_{th}
$R_{th\ (j-c)}$ = 13°C / W
$R_{th\ (j-a)}$ = 130°C / W
(Note)
With 50 × 50 × 1 mm
Fe heat sink
INFINITE HEAT SINK
(Note)
NO HEAT SINK
POWER DISSIPATION P_D (W)
AMBIENT TEMPERATURE Ta (°C)
0
2
4
6
0
50
100
150
200

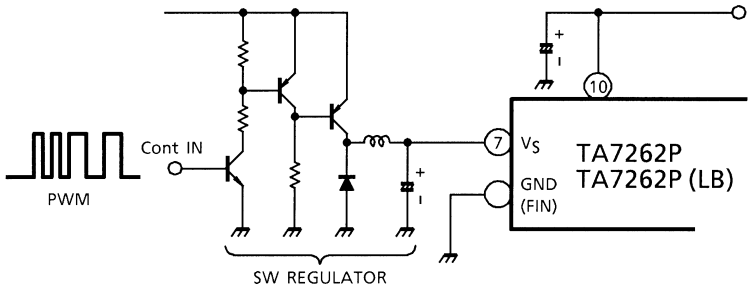

I_O – I_R
SHORTED I_R CONDITION
OPEN I_R CONDITION
OUTPUT CURRENT I_O (mA)
REVERSE CURRENT I_R (Ω)
0
4
8
12
16
20
10
100
1k
10k

APPLICATION CIRCUIT 1

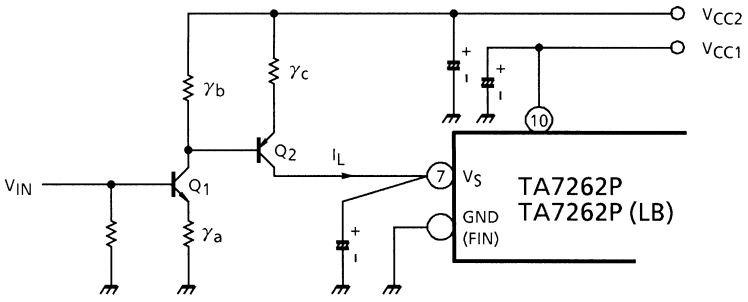


*: Hall sensor driving current (I_O) can be changed by I_R.
Refer to I_R vs I_O characteristics.

APPLICATION CIRCUIT 2



APPLICATION CIRCUIT 3



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

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

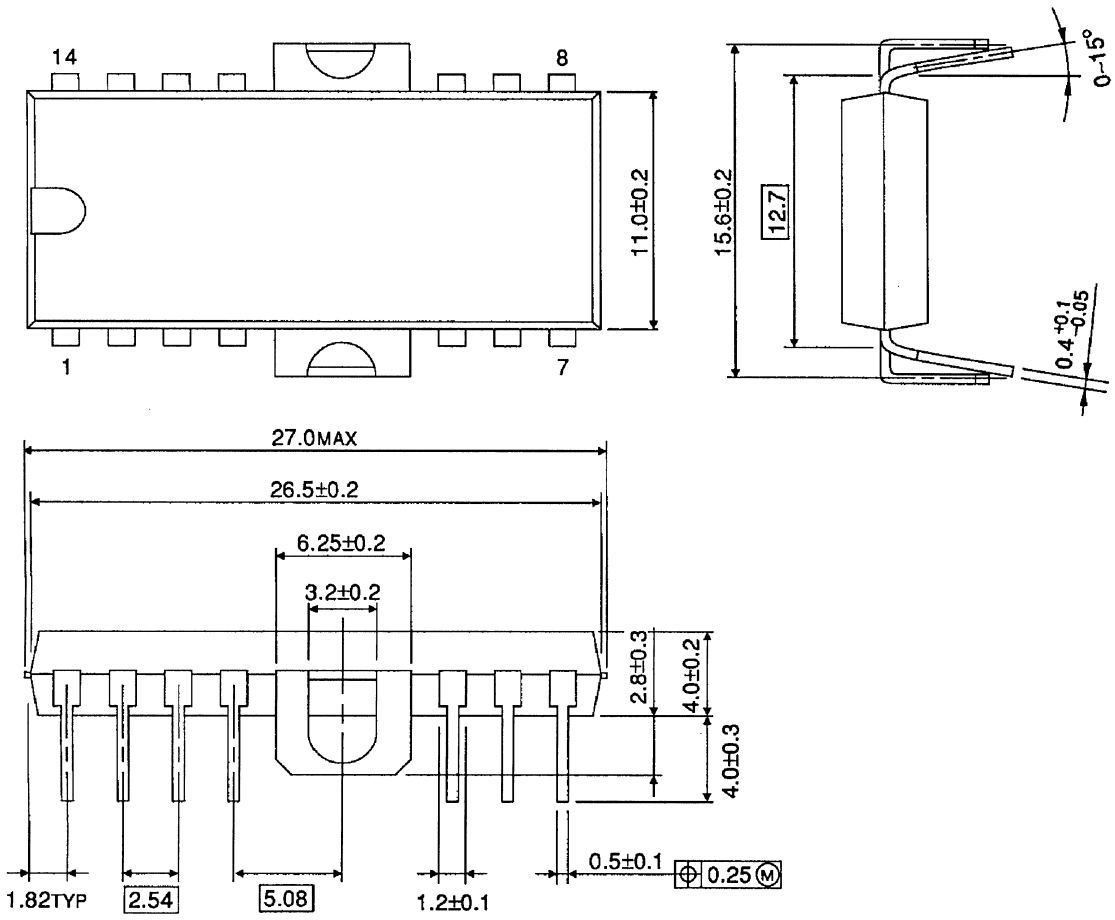
Q_2 works as a Current Regulator for Output Coil. Therefore, Collector to Emitter Voltage of Q_2 is varied in accordance with required coil current.

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 3 ST terminal open.

OUTLINE DRAWING

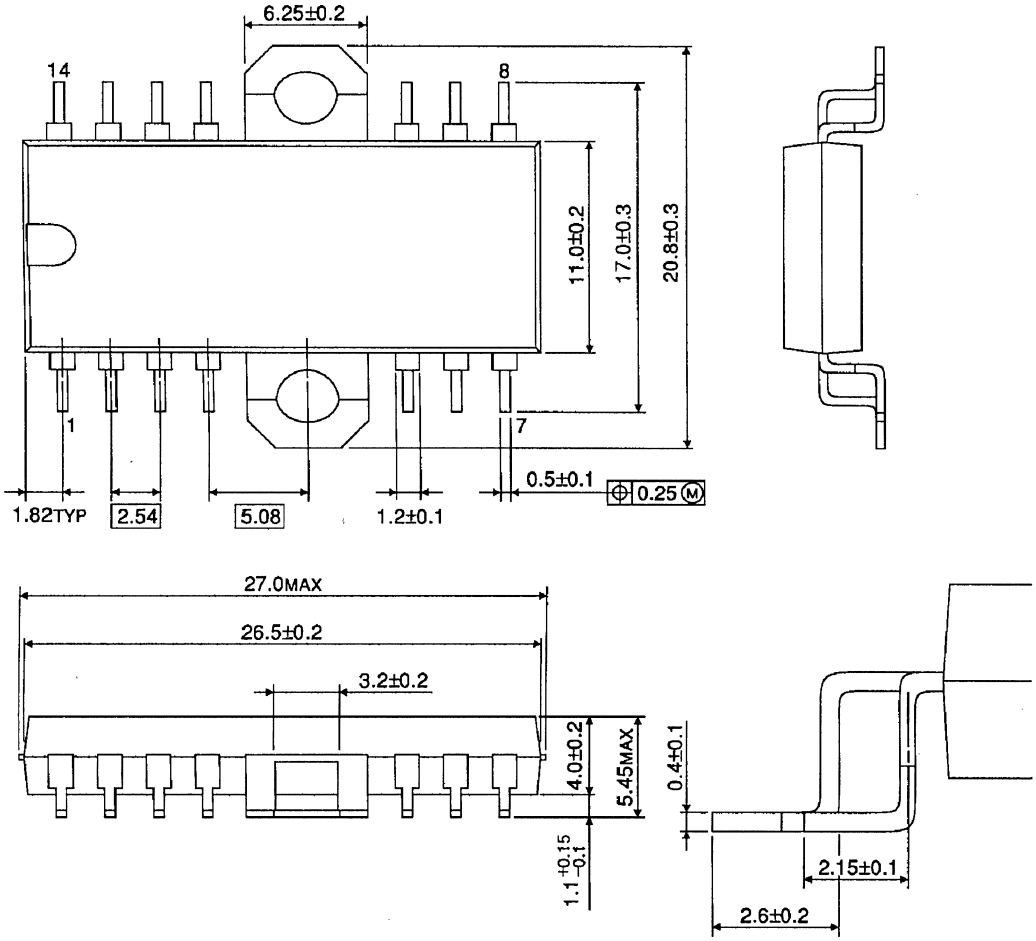
HDIP14−P−500−2.54A Unit: mm



Weight: 3.00 g (Typ.)

OUTLINE DRAWING

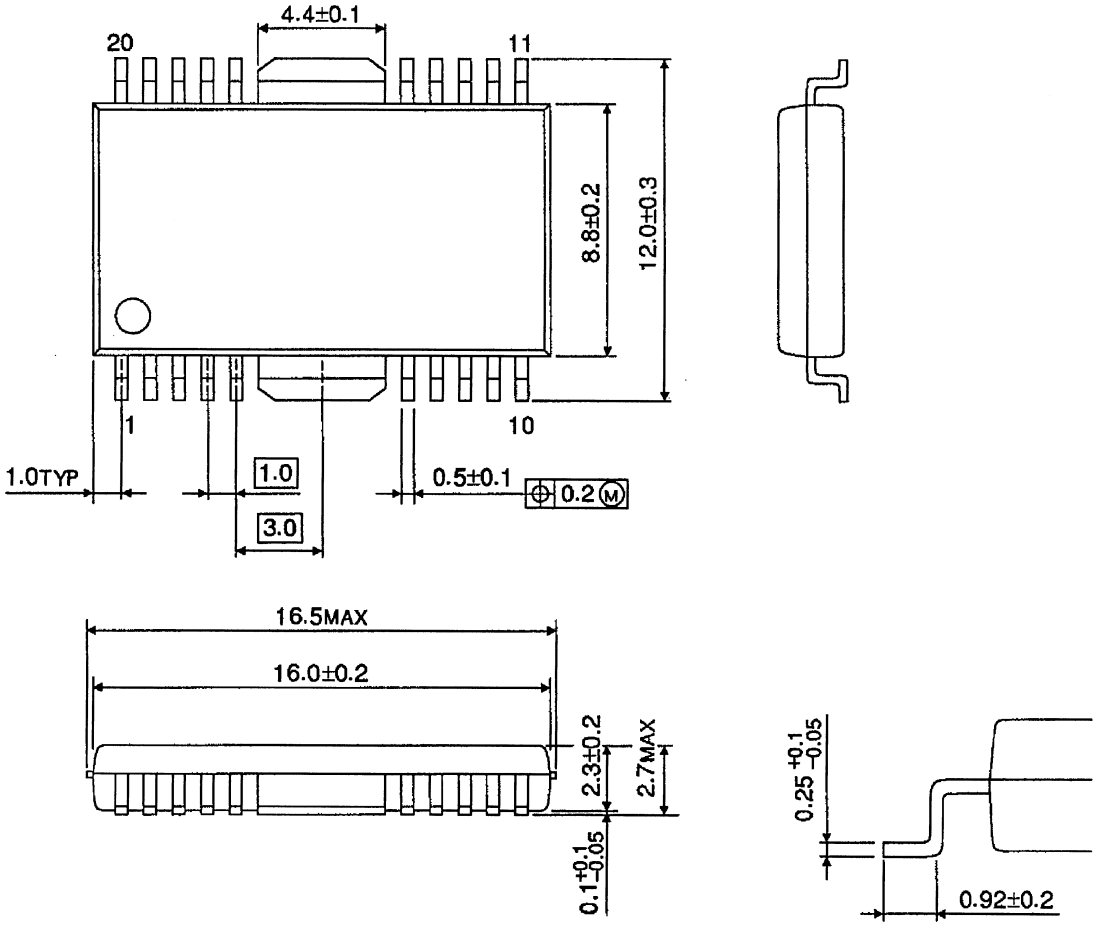
HSOP14−P−2.54 Unit: mm



Weight: 3.00 g (Typ.)

OUTLINE DRAWING

HSOP20-P-450-1.00 Unit: mm



Weight: 0.79 g (Typ.)