

TOSHIBA BIPOLAR LINEAR INTEGRATED CIRCUIT SILICON MONOLITHIC

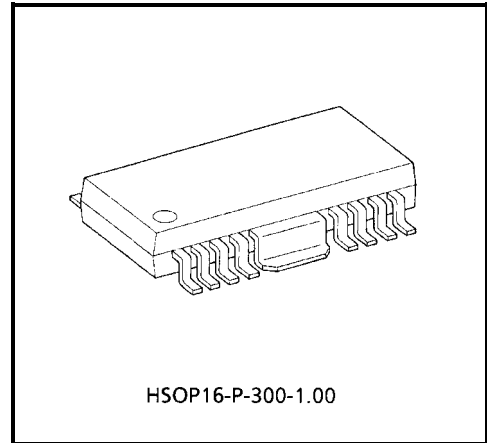
TA8466AF

3 PHASE FULL WAVE BRUSHLESS DC MOTOR DRIVER IC

TA8466AF is a semi-linear type 3 Phase Full Wave Brushless DC Motor Driver IC, developed as a cylinder motor driver for stationary VTRs.

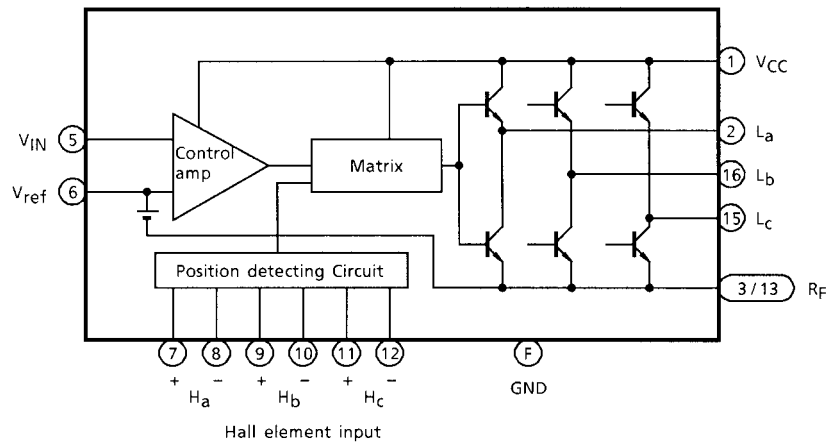
FEATURES

- Low Noise Soft Switching Drive
- One direction Drive
- Small Outer Capacitance
- Operating Supply Voltage : $V_{CC} = 7\sim 17\text{ V}$
- Hall Input Sensitivity : $V_H = 30\text{ mV}_{p-p}$
- Built-in Protective Diodes for All Input Pins
- Built-in Control Amp Reference Voltage (with Output Pins)
- Built-in Thermal Shutdown Circuit



Weight : 0.50 g (Typ.)

BLOCK DIAGRAM

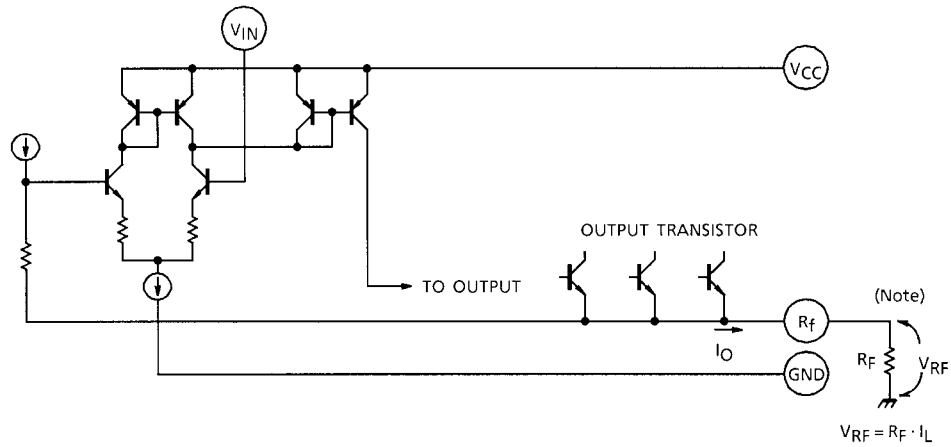


Pins (4) and (14) are NC.
Keep Pin (6) open.

PIN FUNCTION

PIN No.	SYMBOL	FUNCTIONAL
1	V _{CC}	Supply voltage input pin
2	L _a	a-phase drive output pin
3	R _F	Output current detecting pin
4	N.C.	N.C. pin
5	V _{IN}	Control amp positive input pin
6	V _{ref}	Control amp reference voltage output pin
7	H _a ⁺	a-phase Hall amp positive input pin
8	H _a ⁻	a-phase Hall amp negative input pin
9	H _b ⁺	b-phase Hall amp positive input pin
10	H _b ⁻	b-phase Hall amp negative input pin
11	H _c ⁺	c-phase Hall amp positive input pin
12	H _c ⁻	c-phase Hall amp negative input pin
13	R _F	Output current detecting pin
14	N.C.	N.C. pin
15	L _c	c-phase drive output pin
16	L _b	b-phase drive output pin
F	FIN	(Connect to GND)

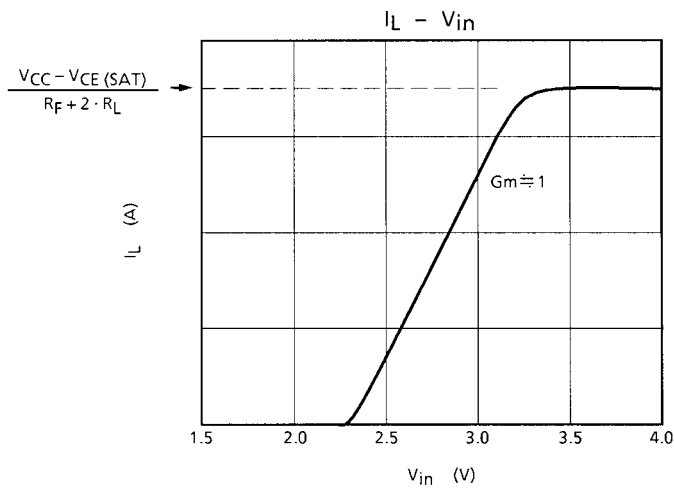
1. Control input circuit



Feedback circuit of output currents is built into IC, that is, the voltage feedback is proportional to the output current in R_F .

Note: The common impedance inside IC is taken into consideration in providing two R_F terminals. Short two pins ((3) and (13)) in using them.

INPUT / OUTPUT CHARACTERISTICS



R_L : Output coil resistance
 $V_{CE(SAT)}$: Output transistor saturation voltage (upper / lower total)

MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Supply Voltage	V _{CC}	18	V
Output Current	I _O (MAX.)	0.7	A
Power Dissipation	P _D	0.9 (Note 1)	W
		8.3 (Note 2)	
Operating Temperature	T _{opr}	-30~75	°C
Storage Temperature	T _{stg}	-55~150	°C

Note 1: Single body

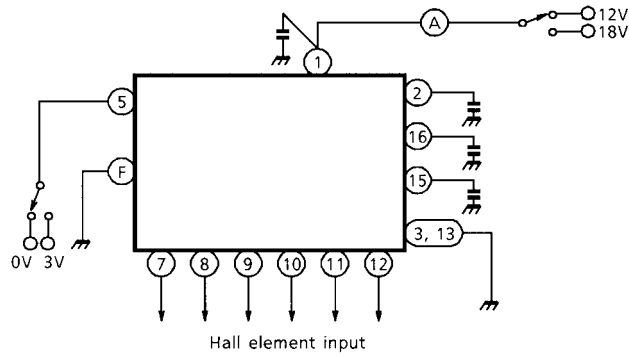
Note 2: Infinite heat sink mounting

ELECTRICAL CHARACTERISTICS (V_{CC} = 12 V, Ta = 25°C)

CHARACTERISTIC		SYMBOL	TEST CIR-CUIT	TEST CONDITION	MIN	TYP.	MAX	UNIT
Supply Current		I _{CC1}	1	Output open, V _{IN} = 0 V	1.5	3.0	4.5	mA
		I _{CC2}		Output open, V _{IN} = 3 V	18	50	95	
		I _{CC3}		Output open, V _{CC} = 18 V, V _{IN} = 3 V	18	55	110	
Control Amp	Reference Voltage	V _{ref}	2		2.25	2.35	2.45	V
	Control Gain	G _m		R _F = 0.47Ω, V _{IN} = 2.45 V / 2.6 V	—	1.0	—	A / V
	Input Current	I _{in}		V _{IN} = 3.5 V	—	2.5	10	μA
	Reference Voltage Ripple Compression Rate	R _r		V _{CC} = 7 V / 18 V	-53	-64	—	dB
Leak Current	Upper Side	I _{OL} (U)	3	V _{CC} = 18 V	—	—	50	μA
	Lower Side	I _{OL} (L)		V _{CC} = 18 V	—	—	50	
Saturation Voltage	Upper Side	V _{sat} (U)	4	I _L = 0.7 A	—	1.2	1.6	V
	Lower Side	V _{sat} (L)		I _L = 0.7 A	—	0.5	0.85	
Residual Output Voltage		V _{OR}	2	V _{IN} = 0 V	—	0	12	mV
Hall Amp	Difference Input Voltage Range	V _H	6		30	—	200	mV _{p-p}
	Common-Mode Input Voltage Range	V _{CMRH}	5		2.0	—	V _{CC} -3	V
Thermal Shutdown Operating Temperature		TSD	—		—	175	—	°C

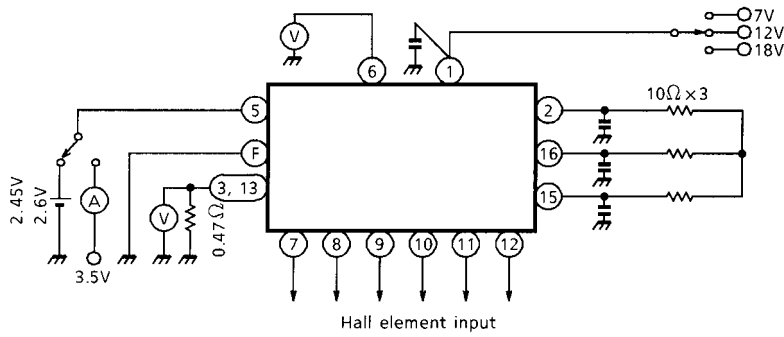
TEST CIRCUIT 1

I_{cc1} , I_{cc2} , I_{cc3}



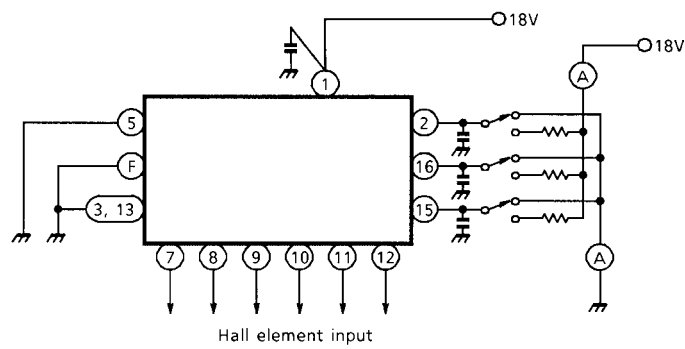
TEST CIRCUIT 2

V_{ref} , G_V , I_{in} , R_r , V_{or}



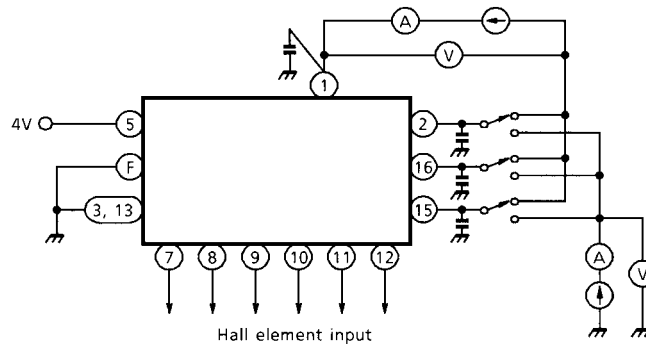
TEST CIRCUIT 3

$I_{oL(U)}$, $I_{oL(L)}$



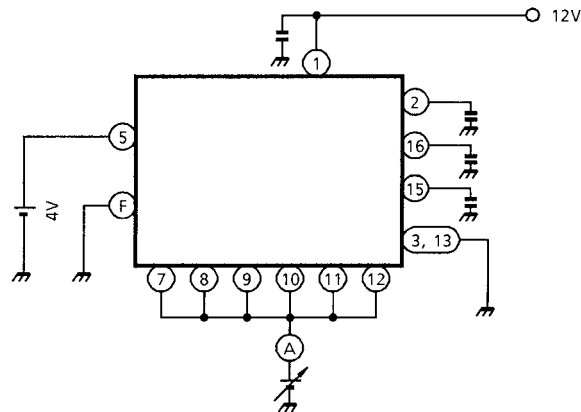
TEST CIRCUIT 4

$V_{sat}(U)$, $V_{sat}(L)$



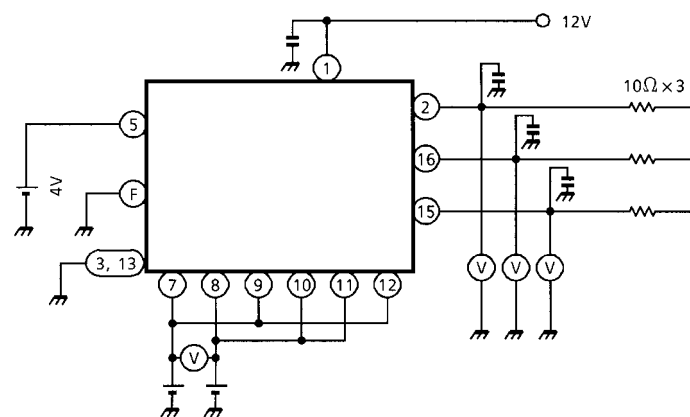
TEST CIRCUIT 5

V_{CMRH}



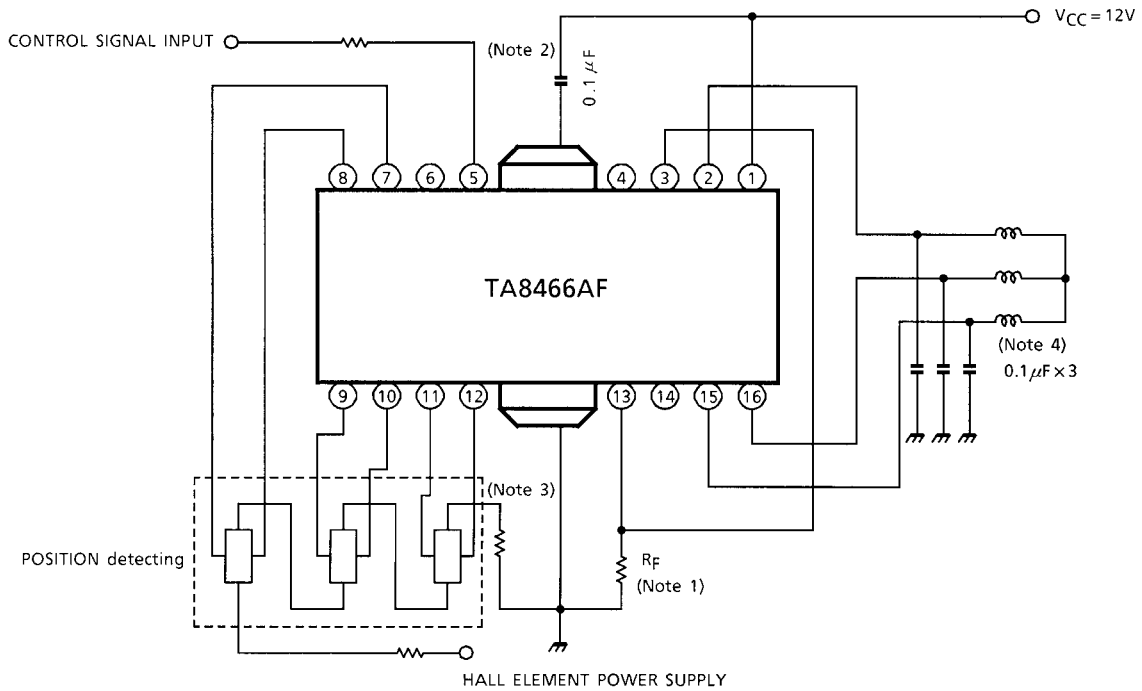
TEST CIRCUIT 6

V_H



V_H : Functional check to be made at 30 mV_{p-p} / 200 mV_{p-p}.

APPLICATION CIRCUIT

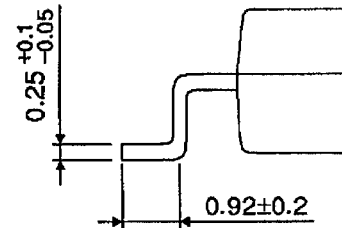
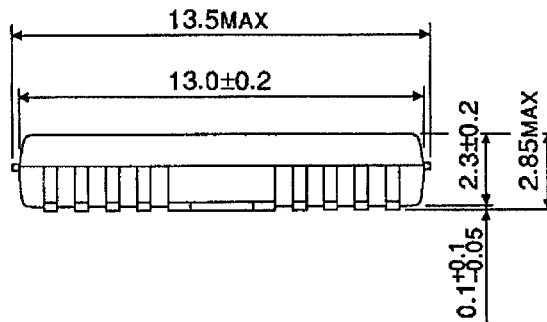
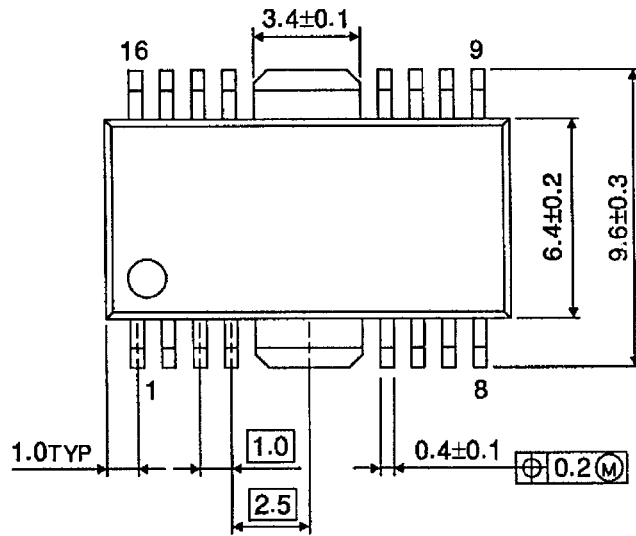


- Note 1: R_F value is determined by coil impedance, F / V conversion voltage (control input), and necessary activation torque. But determine it at about 0.3~5 Ω .
- Note 2: Connect this condenser directly to IC fin (GND). Still larger capacity may be necessary depending upon common impedance among supply lines.
- Note 3: Write Hall sensor GND line and coil current R_F line without common impedance.
- Note 4: It may be necessary to change condenser capacity depending upon motor type, to prevent noise and oscillation.
- Note 5: Utmost care is necessary in the design of the output line, V_{CC} and GND line since IC may be destroyed due to short-circuit between outputs, air contamination fault, or fault by improper grounding.

PACKAGE DIMENSIONS

HSOP16-P-300-1.00

Unit : mm



Weight : 0.50 g (Typ.)

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000707EBA

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