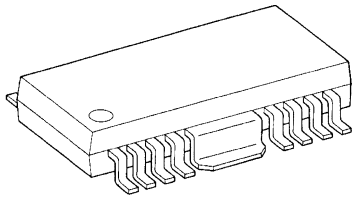
TOSHIBA BIPOLAR LINEAR INTEGRATED CIRCUIT SILICON MONOLITHIC

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.



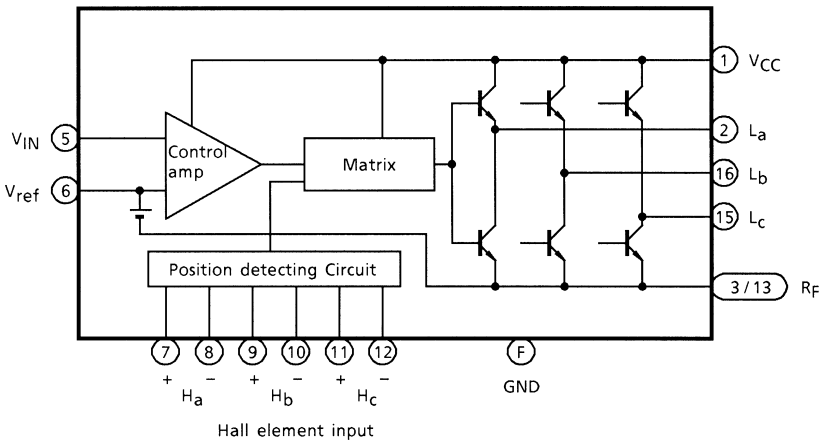
HSOP16-P-300-1.00

Weight : 0.50 g (Typ.)

FEATURES

- Low Noise Soft Switching Drive
- One direction Drive
- Small Outer Capacitance
- Operating Supply Voltage : V_{CC} = 7~17 V
- Hall Input Sensitivity : V_H = 30 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

BLOCK DIAGRAM

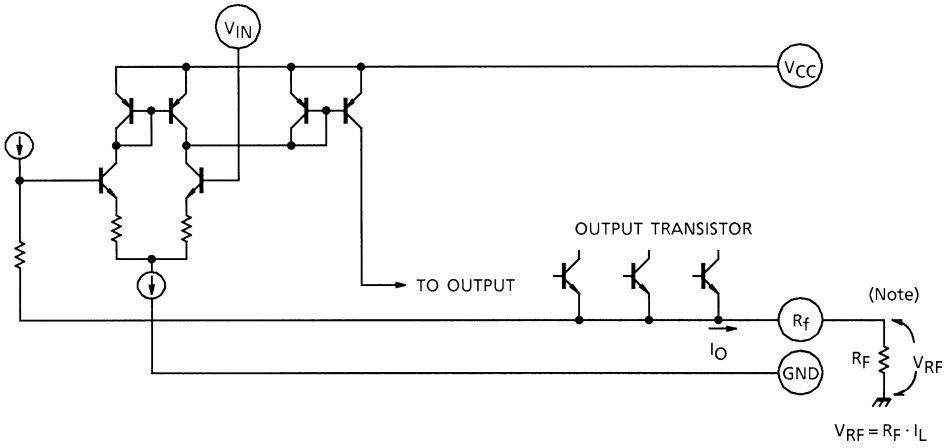


Pins (4) and (14) are NC.
Keep Pin (6) open.

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)

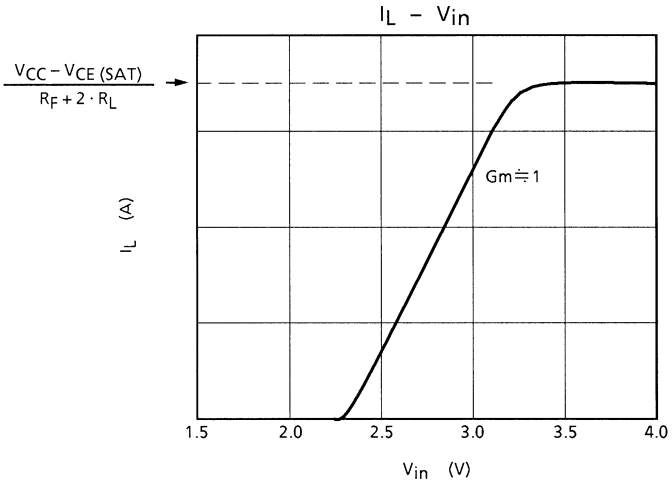
1. Control input circuit



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



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

MAXIMUM RATINGS (Ta = 25°C)

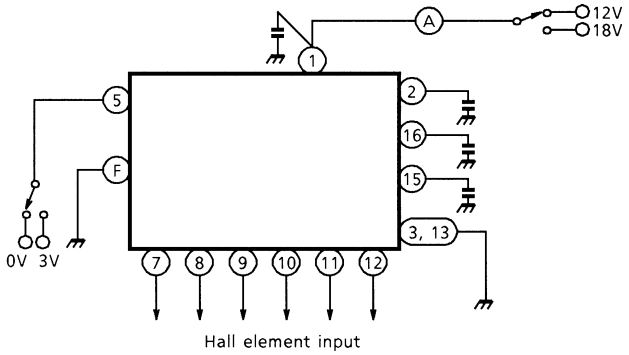
CHARACTERISTIC	SYMBOL	RATING	UNIT
Supply Voltage	V_{CC}	18	V
Output Current	$I_{O\ (MAX.)}$	0.7	A
Power Dissipation	P_D	0.9 (Note 1)	W
		8.3 (Note 2)	
Operating Temperature	T_{opr}	−30~75	°C
Storage Temperature	T_{stg}	−55~150	°C

Note 1: Single body
Note 2: Infinite heat sink mounting

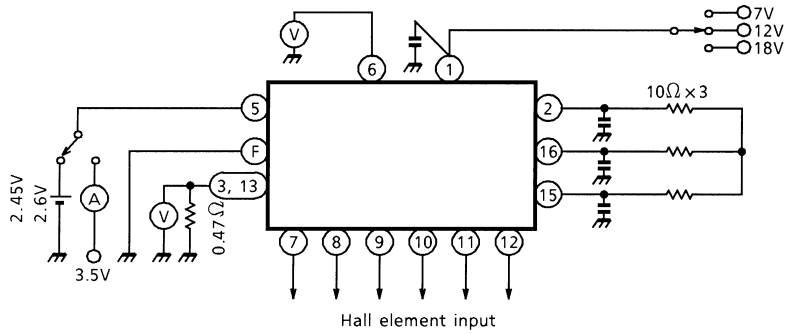
ELECTRICAL CHARACTERISTICS (V_{CC} = 12 V, Ta = 25°C)

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

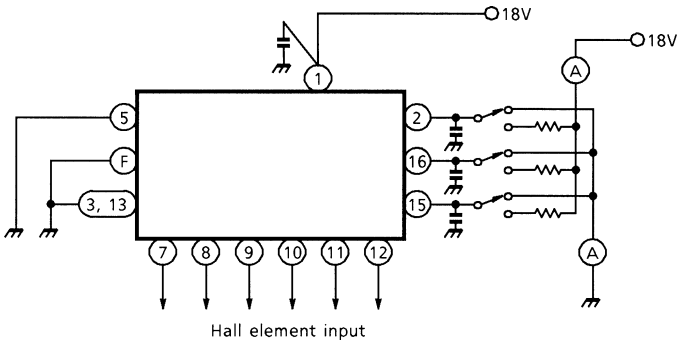
TEST CIRCUIT 1 I_{CC1}, I_{CC2}, I_{CC3}



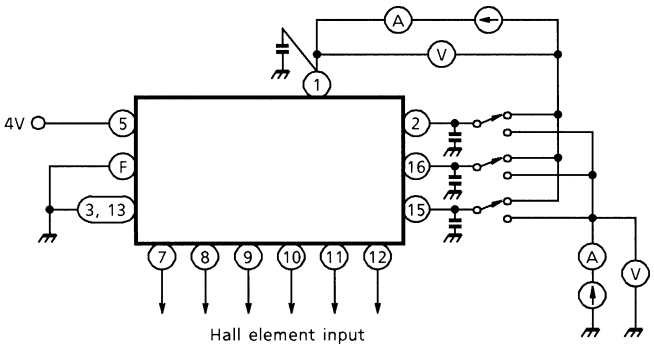
TEST CIRCUIT 2 V_{ref}, G_V, I_{in}, R_r, V_{or}



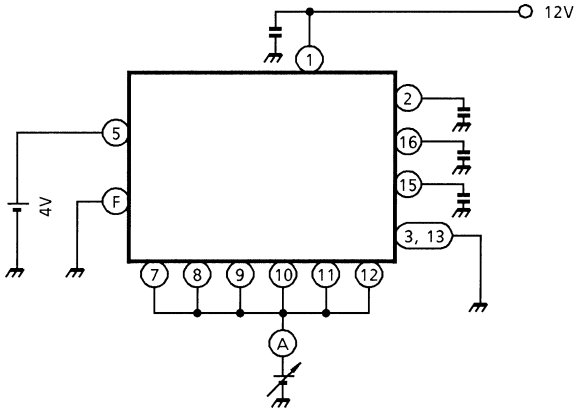
TEST CIRCUIT 3 $I_{OL\ (U)}$, $I_{OL\ (L)}$



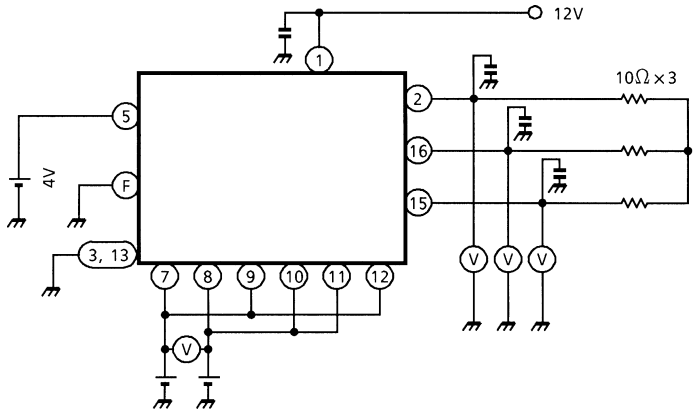
TEST CIRCUIT 4 $V_{sat\ (U)}$, $V_{sat\ (L)}$



TEST CIRCUIT 5 V_{CMRH}

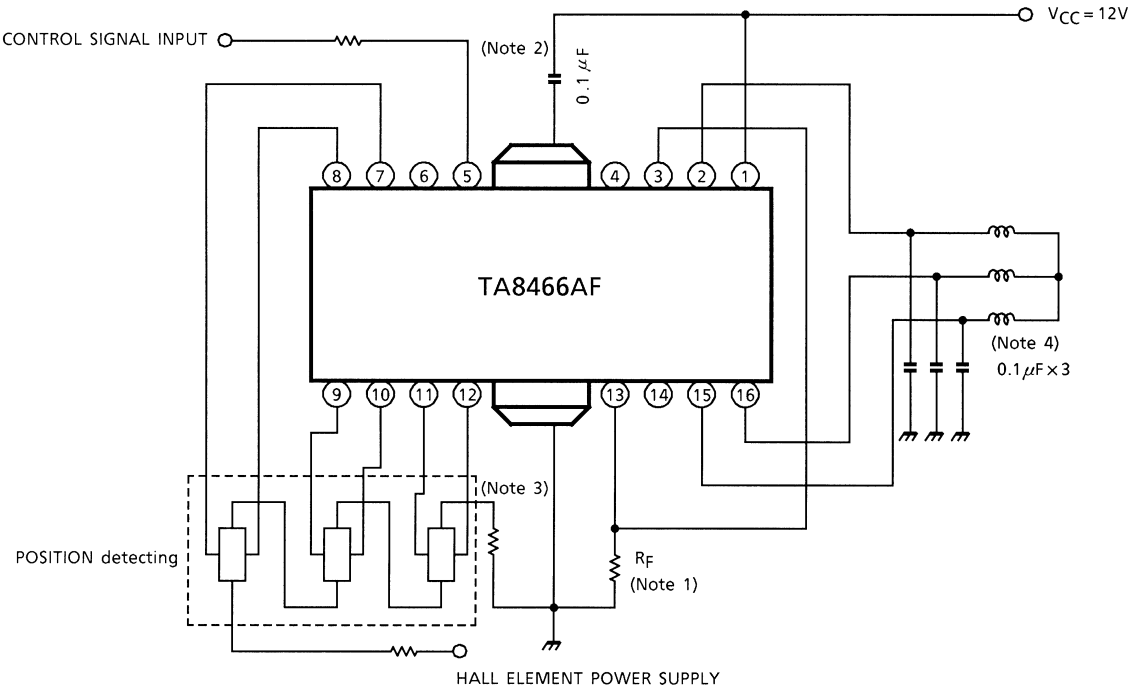


TEST CIRCUIT 6 V_H



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.

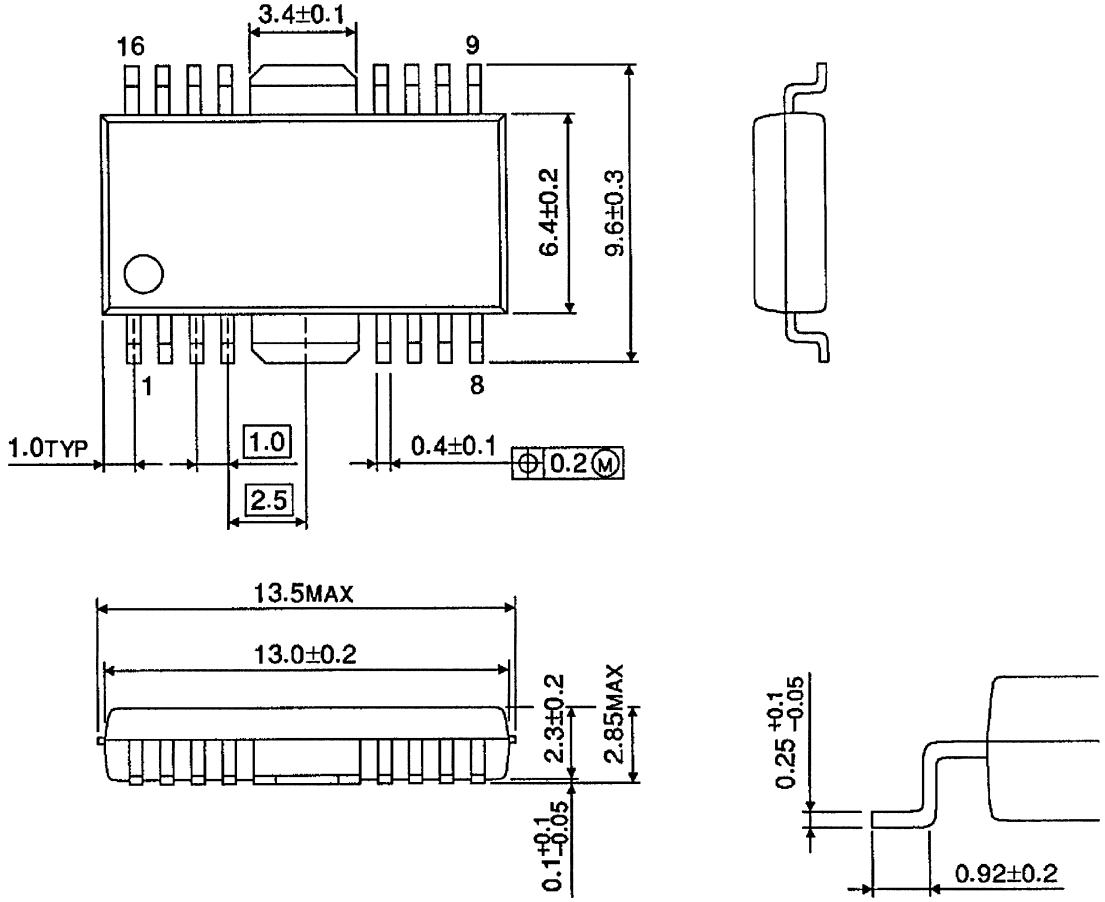
Note 3: Write Hall sensor GND line and coil current R_F line without common impedance.

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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