

TOSHIBA BIPOLAR LINEAR INTEGRATED CIRCUIT SILICON MONOLITHIC

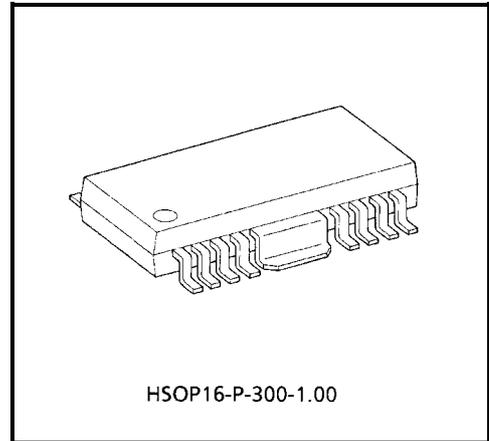
# TA8466AF

## 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.

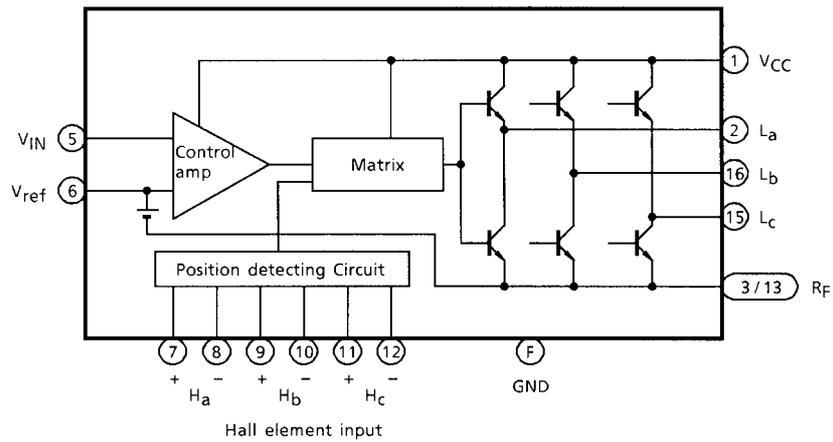
### FEATURES

- 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

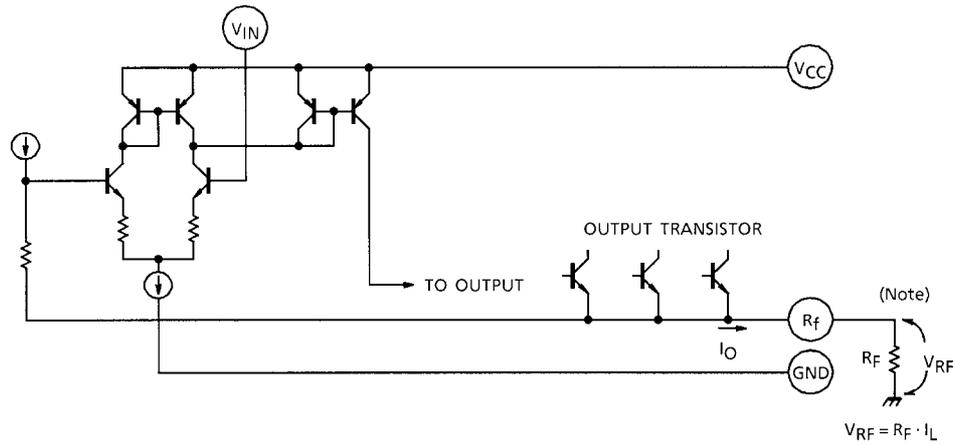


Pins (4) and (14) are NC.  
Keep Pin (6) open.

## PIN FUNCTION

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

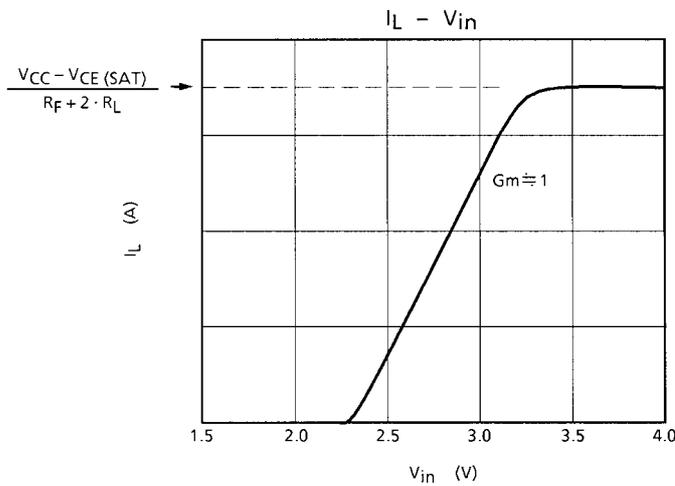
**1. Control input circuit**



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 <sub>CC</sub>	18	V
Output Current	I <sub>O</sub> (MAX.)	0.7	A
Power Dissipation	P <sub>D</sub>	0.9 (Note 1)	W
		8.3 (Note 2)	
Operating Temperature	T <sub>opr</sub>	-30~75	°C
Storage Temperature	T <sub>stg</sub>	-55~150	°C

Note 1: Single body

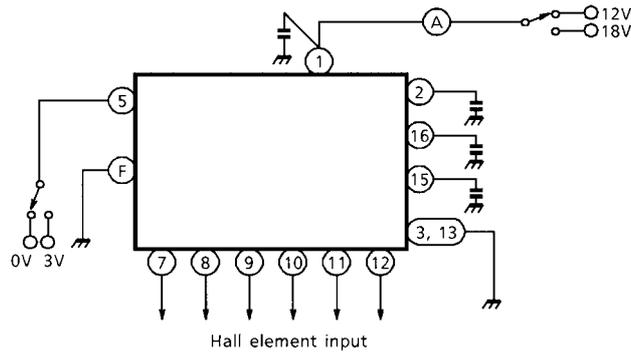
Note 2: Infinite heat sink mounting

## ELECTRICAL CHARACTERISTICS (V<sub>CC</sub> = 12 V, Ta = 25°C)

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

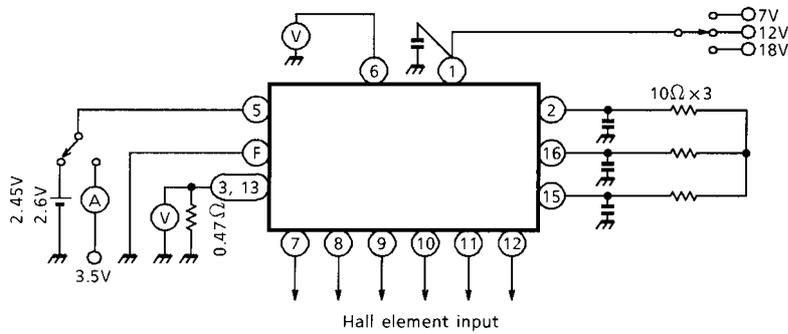
## TEST CIRCUIT 1

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



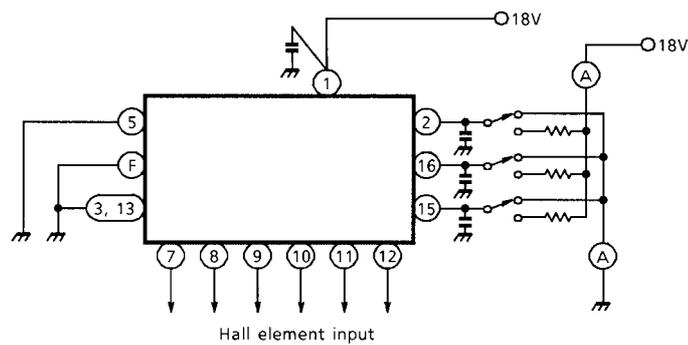
## TEST CIRCUIT 2

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



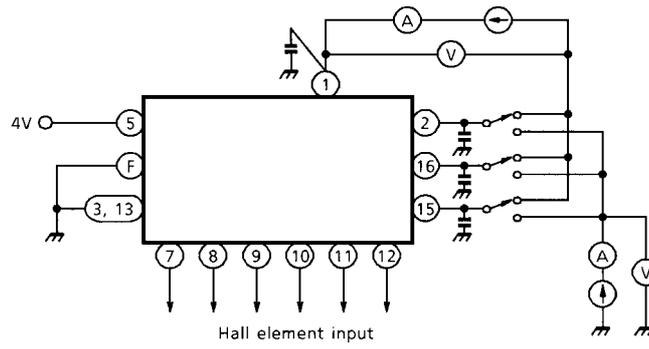
## TEST CIRCUIT 3

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



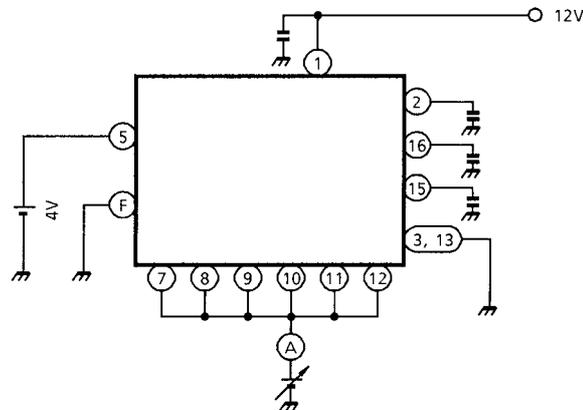
**TEST CIRCUIT 4**

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



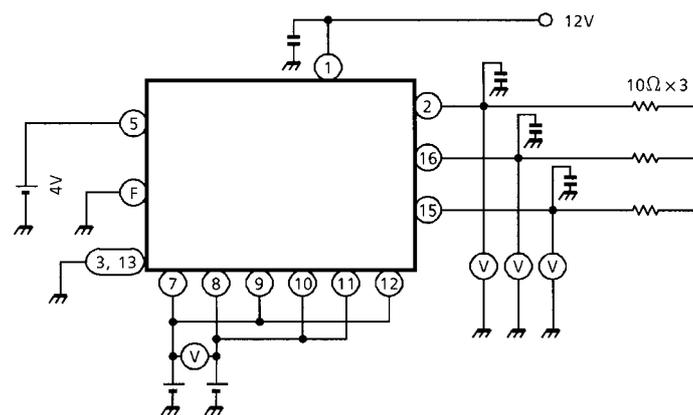
**TEST CIRCUIT 5**

$V_{CMRH}$



**TEST CIRCUIT 6**

$V_H$



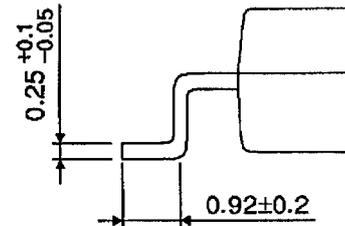
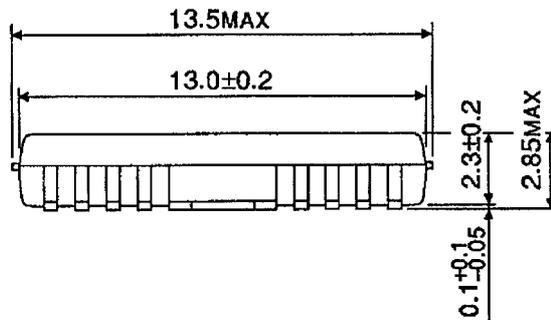
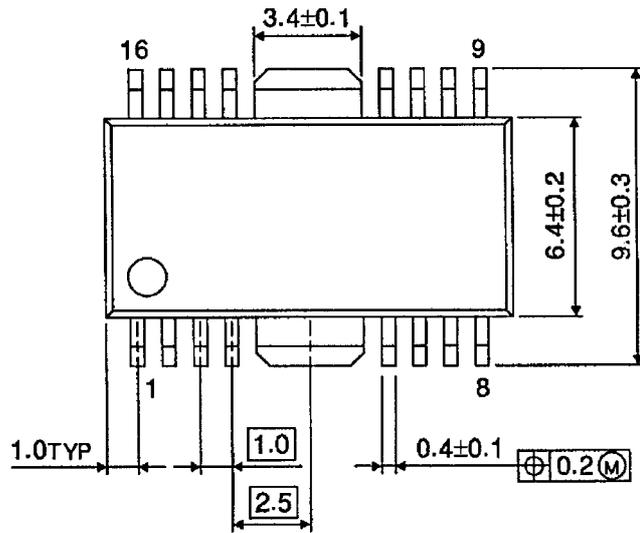
$V_H$ : Functional check to be made at 30 mV<sub>p-p</sub> / 200 mV<sub>p-p</sub>.



## PACKAGE DIMENSIONS

HSOP16-P-300-1.00

Unit : mm



Weight : 0.50 g (Typ.)

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