

TA8440H

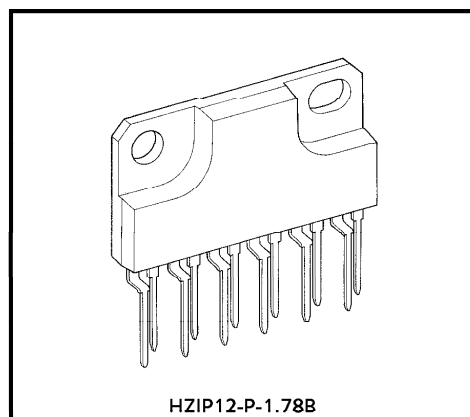
DC MOTOR FULL BRIDGE DRIVER

The TA8440H is a full-bridge driver for selecting the forward and reverse running of a motor with brushes and is able to control 4 modes of forward, reverse, stop and braking.

The motor driving unit and the control unit have a separate power supply line, independently and the TA8440H is also usable as a stepping motor driver.

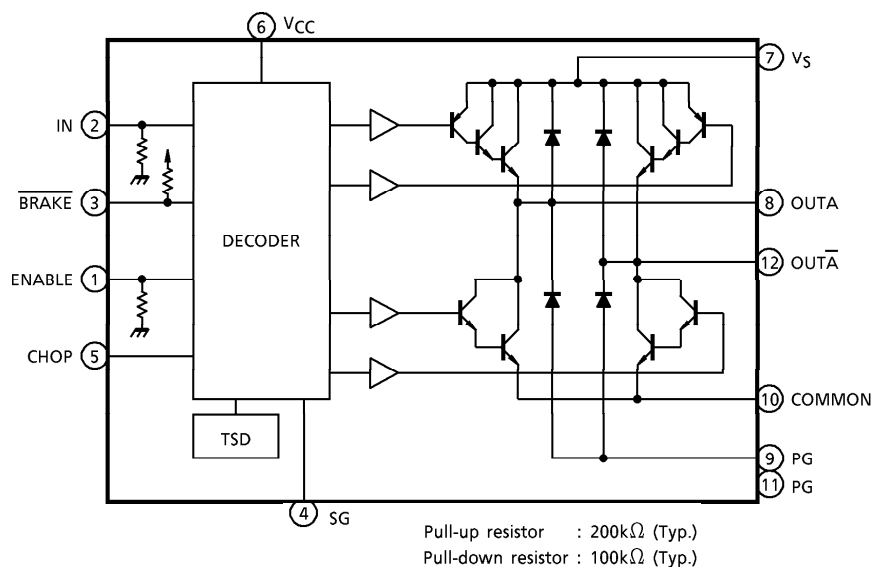
FEATURES

- Output current is as large as 1.5A (AVE) and 3.0A (PEAK).
- 4 modes of forward, reverse, stop, and braking are available and a counter-electromotive force absorbing diode has been built-in.
- Thermal shutdown circuit incorporated.
- Input is compatible with CMOS.
- Built-in input pull-up resistor. BRAKE = 200k Ω (Typ.)
- Built-in input pull-down resistor. IN, ENABLE = 100k Ω (Typ.)



Weight : 4.04g (Typ.)

BLOCK DIAGRAM



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PIN FUNCTION

PIN No.	SYMBOL	FUNCTIONAL DESCRIPTION
1	ENABLE	ENABLE terminal
2	IN	Forward rotation / reverse rotation switch terminal
3	BRAKE	BRAKE terminal
4	SG	Signal GND
5	CHOP	PWM signal input terminal
6	V _{CC}	Power voltage supply terminal for control
7	V _S	Power voltage supply terminal for motor driver
8	OUTA	Output terminal
9	PG	Power GND
10	COMMON	COMMON terminal
11	PG	Power GND
12	OUTA _̄	Output terminal

FUNCTION

INPUT				OUTPUT		MODE
IN	BRAKE	ENABLE	CHOP	OUTA	OUTA _̄	MOTOR
H	H	H	L	H	L	CW / CCW
L	H	H	L	L	H	CCW / CW
(*)	(*)	L	(*)	∞	∞	Stop
(*)	L	H	(*)	L	L	Brake
H	H	H	H	∞	L	Chop
L	H	H	H	L	∞	Chop

(*) Don't care (∞) High impedance

MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	RATING	UNIT
Supply Voltage		V _{CC}	7	V
		V _S	50	
Input Voltage		V _{IN}	− 0.3~V _{CC}	V
Output Current	AVE.	I _O (AVE.)	1.5	A
	PEAK	I _O (PEAK)	3.0 (Note 1)	A
Power Dissipation		P _D	2.52 (Note 2)	W
			25.0 (Note 3)	
Operating Temperature		T _{opr}	− 30~75	°C
Storage Temperature		T _{stg}	− 55~150	°C

(Note 1) t = 100ms

(Note 2) No heat sink

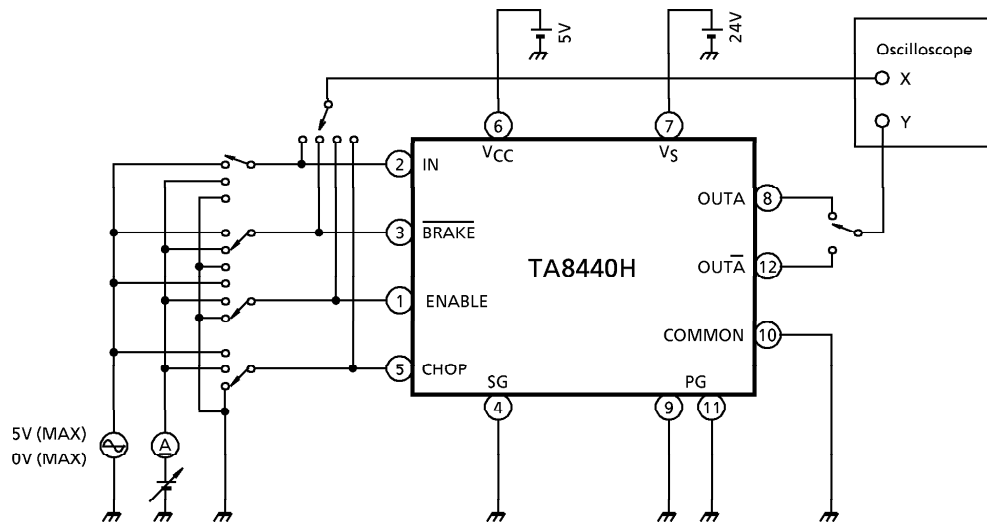
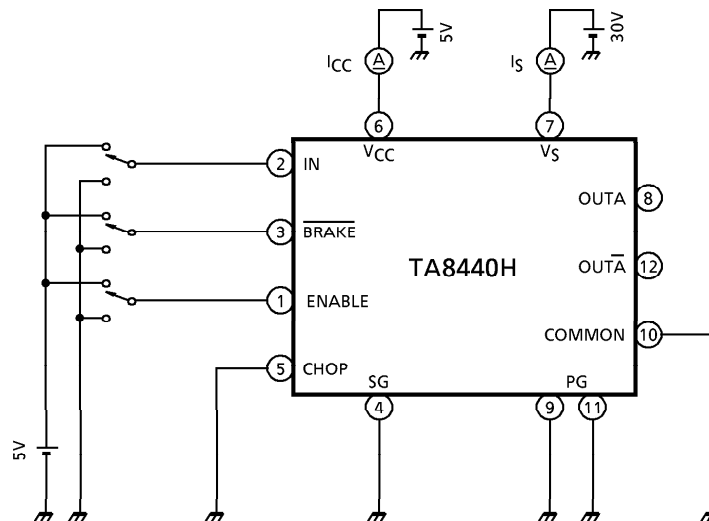
(Note 3) T_c = 75°C

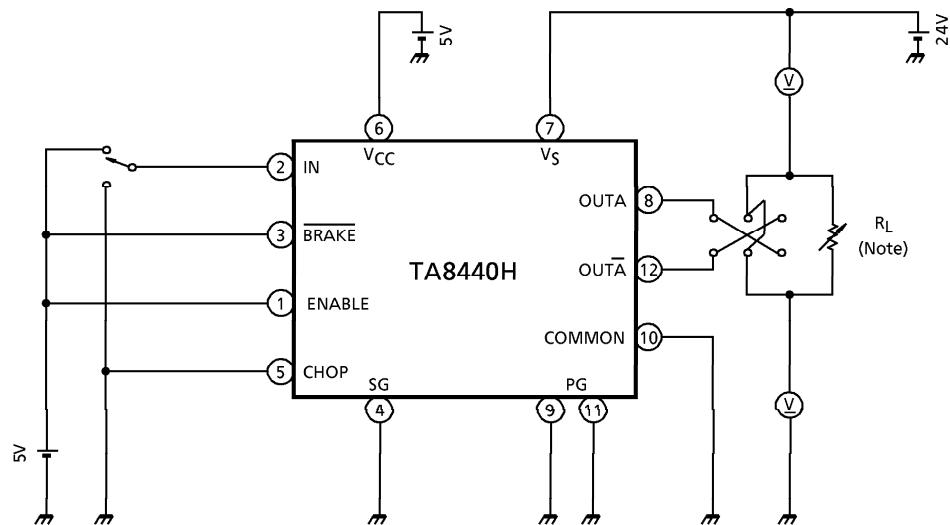
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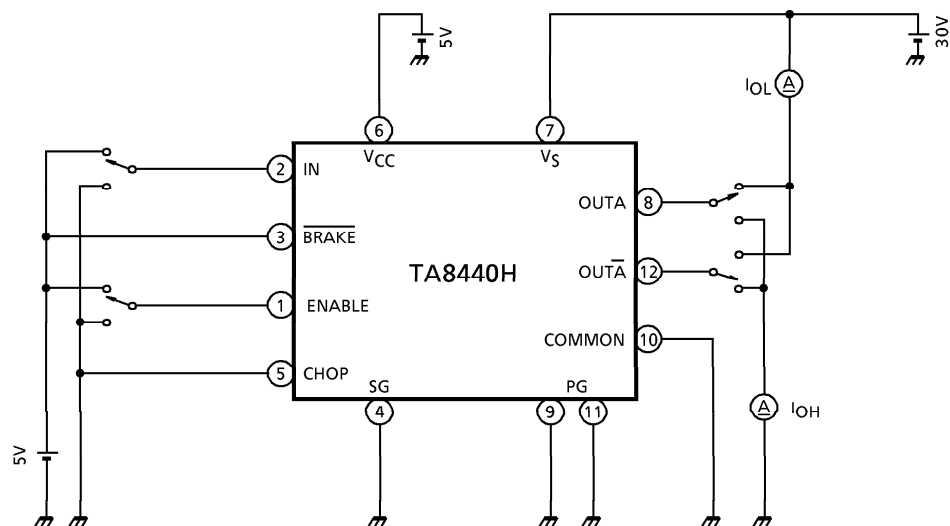
ELECTRICAL CHARACTERISTICS ($V_{CC} = 5V$, $V_S = 24V$, $T_a = 25^\circ C$)

CHARACTERISTIC		SYMBOL	TEST CIR- CUIT	TEST CONDITION		MIN.	TYP.	MAX.	UNIT
Input Voltage	High	V _{IN} (H)	1	IN, CHOP, ENABLE, $\overline{\text{BRAKE}}$		3.5	—	V _{CC}	V
	Low	V _{IN} (L)				GND	—	1.5	
Input Current	High	I _{IN-1} (H)	1	CHOP	V _{IN} = 5V	—	5	52	μA
		I _{IN-2} (H)		IN, ENABLE		—	40	60	
		I _{IN-3} (H)		$\overline{\text{BRAKE}}$		—	0	5.5	
Input Current	Low	I _{IN-1} (L)		CHOP	V _{IN} = 0V Source type	—	0	5.5	
		I _{IN-2} (L)		IN, ENABLE		—	0	5.5	
		I _{IN-3} (L)		$\overline{\text{BRAKE}}$		—	25	52	
Current Consumption (I)		I _{CC1}	2	Stop		—	6	10.5	mA
		I _{CC2}		Forward / reverse		—	10	14.5	
		I _{CC3}		Brake		—	14	18.5	
Current Consumption (II)		I _{S1}	2	Stop		—	2	4.2	mA
		I _{S2}		Forward / reverse		—	3.5	5.0	
		I _{S3}		Brake		—	2.5	3.7	
Output Saturation Voltage	Upper Side	V _{sat-U1}	3	I _{OUT} = 1.5A		1.5	2.0	2.7	V
	Under Side	V _{sat-L1}				0.7	1.25	1.9	
	Upper Side	V _{sat-U2}		I _{OUT} = 3.0A		2.7	3.0	3.9	
	Under Side	V _{sat-L2}				1.7	2.0	2.9	
Diode Forward Orientation Voltage	Upper Side	V _{F-U1}	—	I _{OUT} = 1.5A		—	3.5	—	V
	Under Side	V _{F-L1}				—	1.3	—	
Output Leakage Current	Upper Side	I _{OH}	4	V _S = 30V		—	—	200	μA
	Under Side	I _{OL}				—	—	100	
Shut Down Temperature		T _{SD}	—	—		—	170	—	°C
Transfer Time		t _{pLH}	—	IN-OUT		—	2.7	—	μs
		t _{pHL}				—	1.2	—	
		t _{pLH}		CHOP-OUT		—	0.7	—	
		t _{pHL}				—	2.5	—	
		t _{pLH}		ENABLE-OUT		—	2.9	—	
		t _{pHL}				—	1.1	—	
		t _{pLH}		$\overline{\text{BRAKE}}$ -OUT		—	45	—	
		t _{pHL}				—	45	—	

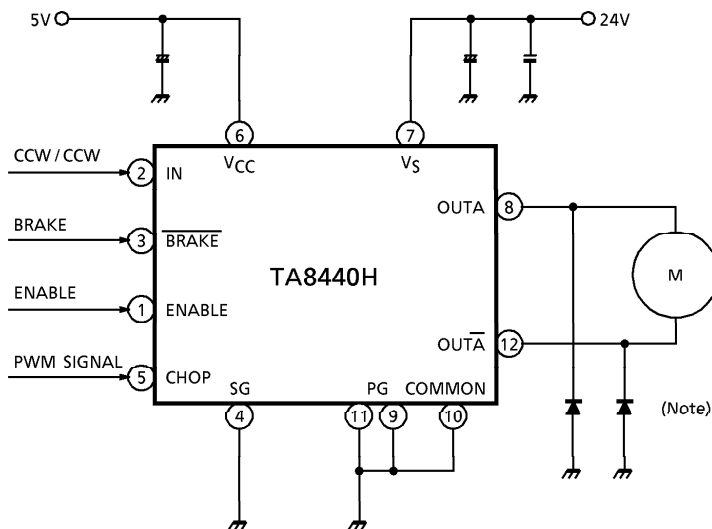
TEST CIRCUIT 1. $V_{IN}(H)$, $V_{IN}(L)$, $I_{IN}(H)$, $I_{IN}(L)$ TEST CIRCUIT 2. I_{CC1} , I_{CC2} , I_{CC3} , I_{S1} , I_{S2} , I_{S3} 

TEST CIRCUIT 3. $V_{\text{sat-L}}$, $V_{\text{sat-U}}$ 

(Note) Calibrate I_{OUT} to 1.5/3.0A by R_L .

TEST CIRCUIT 4. I_{OH} , I_{OL} 

APPLICATION CIRCUIT



(Note 1) Schottky diode (2GWJ42) to be connected additionally between each output (pin 16/19/20/23) and GND for preventing Punch-Through Current.

(Note 2) 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.

Unit : mm

