

TA8440H

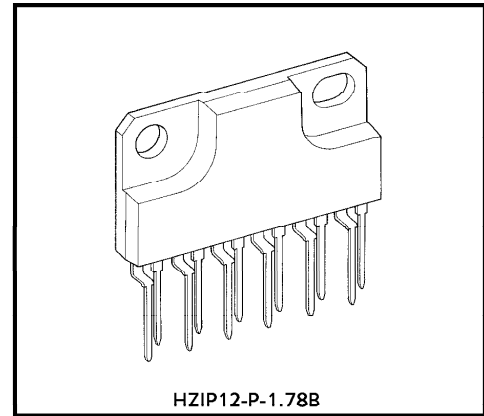
DC MOTOR FULL BRIDGE DRIVER

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.

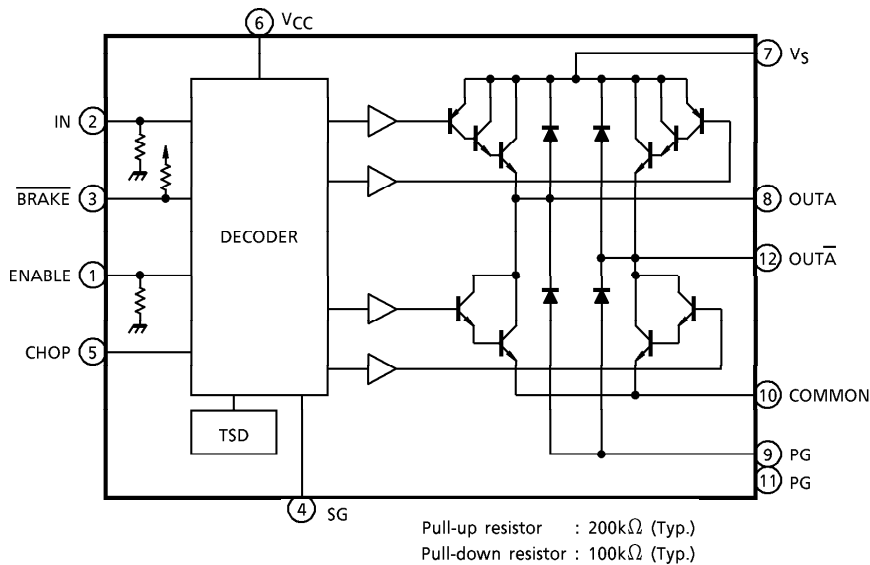
FEATURES

- 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 = 200kΩ (Typ.)
- Built-in input pull-down resistor. IN, ENABLE = 100kΩ (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
	PEAK	I _O (PEAK)	3.0 (Note 1)
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

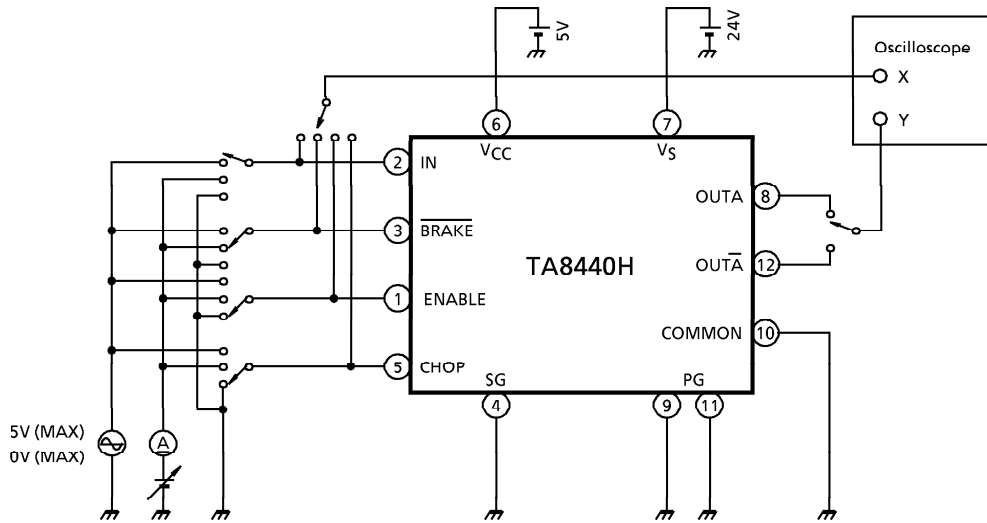
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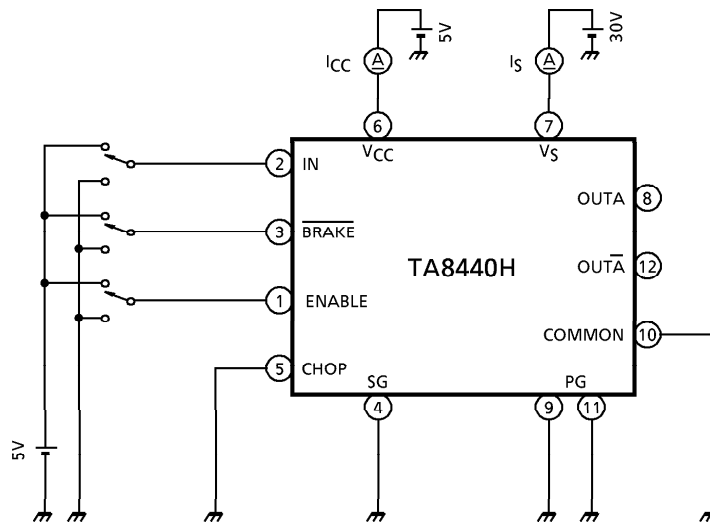
ELECTRICAL CHARACTERISTICS ($V_{CC} = 5V$, $V_S = 24V$, $T_a = 25^\circ C$)

CHARACTERISTIC		SYMBOL	TEST CIR-CUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Input Voltage	High	$V_{IN(H)}$	1	IN, CHOP, ENABLE, \overline{BRAKE}	3.5	—	V_{CC}	V
	Low	$V_{IN(L)}$			GND	—	1.5	
Input Current	High	$I_{IN-1(H)}$	1	CHOP	—	5	52	μA
		$I_{IN-2(H)}$		IN, ENABLE		40	60	
		$I_{IN-3(H)}$		\overline{BRAKE}		0	5.5	
Input Current	Low	$I_{IN-1(L)}$	1	CHOP	—	0	5.5	μA
		$I_{IN-2(L)}$		IN, ENABLE		0	5.5	
		$I_{IN-3(L)}$		\overline{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	—	$^\circ C$
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{BRAKE} -OUT	—	45	—	
		t_{pHL}			—	45	—	

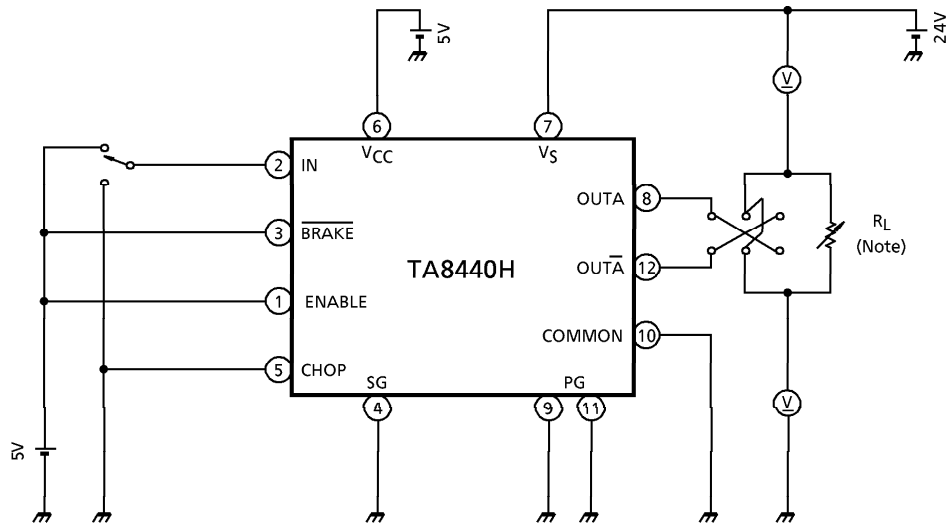
TEST CIRCUIT 1. $V_{IN}(H)$, $V_{IN}(L)$, $I_{IN}(H)$, $I_{IN}(L)$



TEST CIRCUIT 2. I_{CC1} , I_{CC2} , I_{CC3} , I_{S1} , I_{S2} , I_{S3}

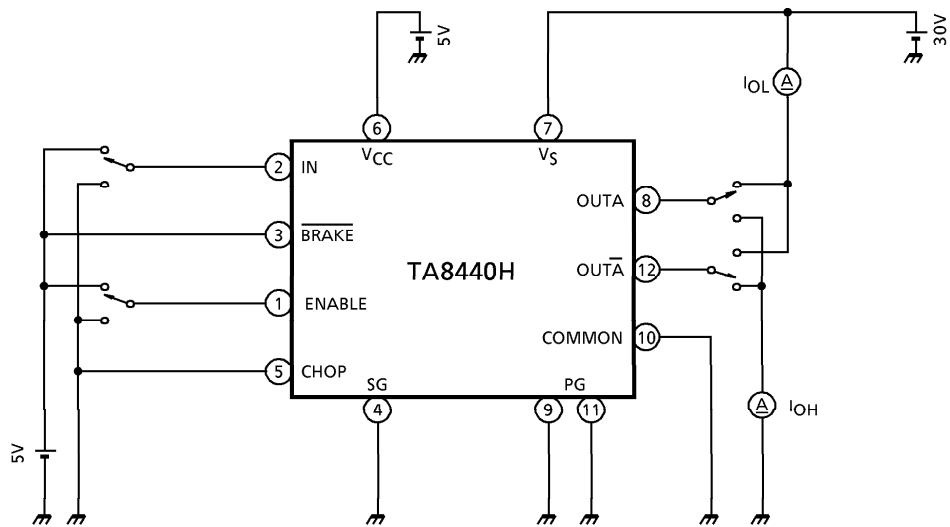


TEST CIRCUIT 3. V_{sat-L} , V_{sat-U}

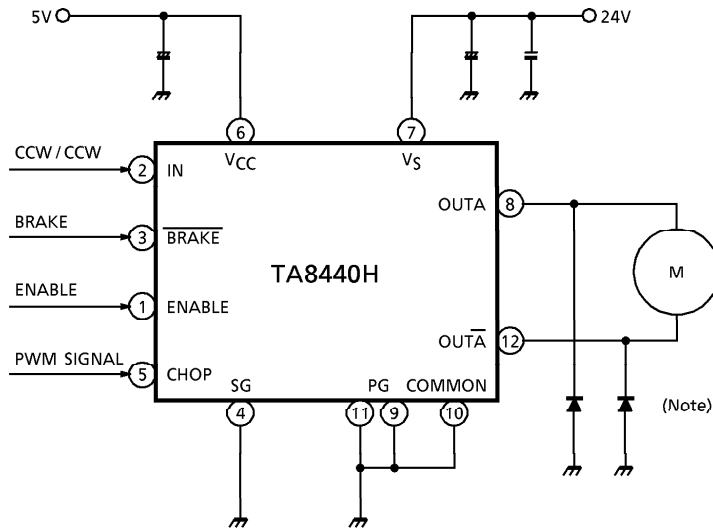


(Note) Calibrate I_{OUT} to 1.5/3.0A by R_L .

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



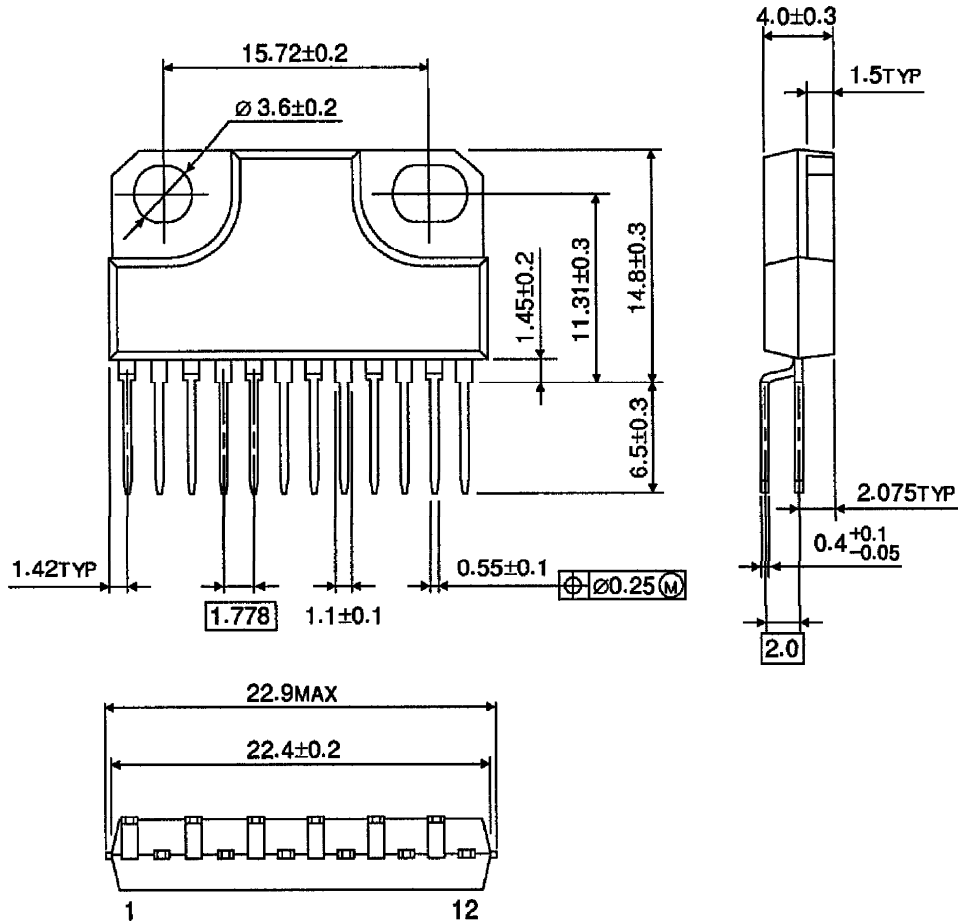
APPLICATION CIRCUIT



- (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.

OUTLINE DRAWING
HZIP12-P-1.78B

Unit : mm



Weight : 4.04g (Typ.)