

TOSHIBA BIPOLAR LINEAR INTEGRATED CIRCUIT SILICON MONOLITHIC

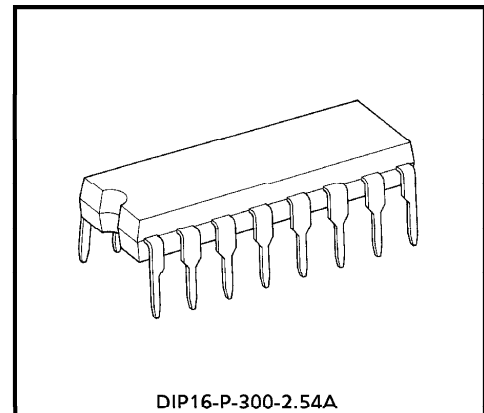
# TA8400P

## DUAL BRIDGE DRIVER

The TA8400P is Dual Bridge Driver designed especially for VCR cassette and tape loading motor drives.

### FEATURES

- 4 modes available (CW / CCW / STOP / BRAKE)
- Output current up to 0.4A (AVE.) and 1.0A (PEAK)
- Wide range of operating voltage :  $V_{CC}(\text{opr.}) = 4.5\sim 18\text{V}$   
 $V_S(\text{opr.}) = 0\sim 22\text{V}$   
 $V_{\text{ref}}(\text{opr.}) = 0\sim 22\text{V}$
- Built-in thermal shutdown, over current protector and punch-through current restriction circuit.
- Hysteresis for all inputs.

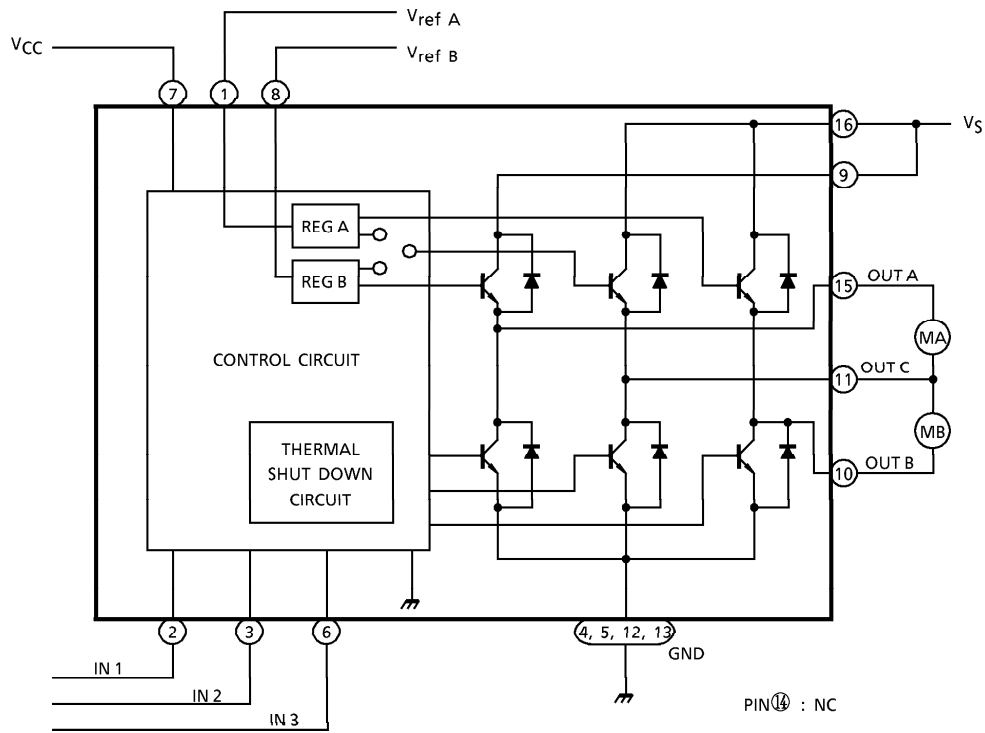


Weight : 1.11g (Typ.)

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BLOCK DIAGRAM



PIN FUNCTION

PIN No.	SYMBOL	FUNCTIONAL DESCRIPTION
1	$V_{ref A}$	Supply voltage terminal for control circuit
2	IN 1	Logic input terminal
3	IN 2	Logic input terminal
4	GND	GND terminal
5	GND	GND terminal
6	IN 3	Logic input terminal
7	$V_{CC}$	Supply voltage terminal for logic
8	$V_{ref B}$	Supply voltage terminal for control circuit
9	$V_S$	Supply voltage terminal for motor driver
10	OUT B	Output terminal
11	OUT C	Output terminal
12	GND	GND terminal
13	GND	GND terminal
14	NC	Non connection
15	OUT A	Output terminal
16	$V_S$	Supply voltage terminal for motor driver

**FUNCTION**

INPUT			OUTPUT			MODE	
IN 1	IN 2	IN 3	OUT C	OUT A	OUT B	MA	MB
0	0	1/0	∞	∞	∞	STOP	STOP
1	0	0	H	L	∞	CW / CCW	STOP
1	0	1	L	H	∞	CCW / CW	STOP
0	1	0	H	∞	L	STOP	CW / CCW
0	1	1	L	∞	H	STOP	CCW / CW
1	1	1/0	L	L	L	BRAKE	BRAKE

(∞) High impedance

(Note) Inputs are all low active type.

**MAXIMUM RATINGS (Ta = 25°C)**

CHARACTERISTIC	SYMBOL	RATING	UNIT
Supply Voltage	V <sub>CC</sub>	25	V
Motor Drive Voltage	V <sub>S</sub>	25	V
Reference Voltage	V <sub>ref</sub>	25	V
Output Current	PEAK	I <sub>O</sub> (PEAK)	(Note 1) 1.0
	AVE.	I <sub>O</sub> (AVE.)	0.4
Power Dissipation	P <sub>D</sub>	(Note 2) 1.4	W
Operating Temperature	T <sub>opr</sub>	- 30~75	°C
Storage Temperature	T <sub>stg</sub>	- 55~150	°C

(Note 1) Duty 1 / 10, 100ms

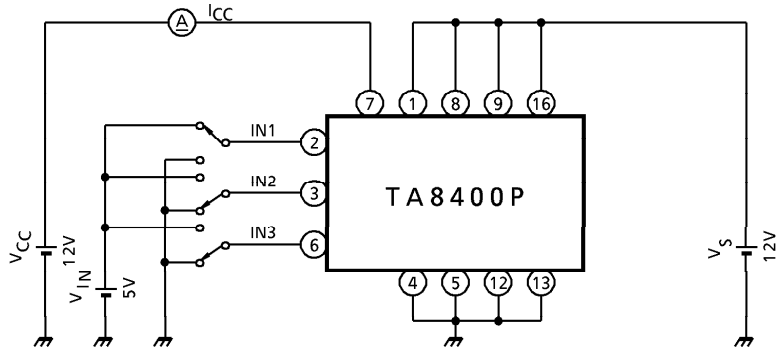
(Note 2) No heat sink

ELECTRICAL CHARACTERISTICS (Unless otherwise specified,  $T_a = 25^\circ\text{C}$ ,  $V_{CC} = 12\text{V}$ ,  $V_S = 12\text{V}$ )

CHARACTERISTIC		SYMBOL	TEST CIR-CUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT	
Supply Current		$I_{CC1}$	1	Output open, CW / CCW mode	—	25	38	mA	
		$I_{CC2}$	1	Output open, brake mode	—	25	38		
		$I_{CC3}$	1	Output open, STOP mode	—	10	20		
Input Voltage	1 (High)	$V_{IN1}$	2	$T_j = 25^\circ\text{C}$ , pin②, ③, ⑥	3.5	—	5.5	V	
	2 (Low)	$V_{IN2}$	2	$T_j = 25^\circ\text{C}$ , pin②, ③, ⑥	GND	—	1.2		
Input Current		$I_{IN}$	2	$V_{IN} = \text{GND}$ , source mode	6	12	60	$\mu\text{A}$	
Input Hysteresis Voltage		$\Delta V_T$	2		—	0.7	—	V	
Saturation Voltage		Upper	$V_{SAT U-1}$	3	$V_{ref} = V_S$ , $I_O = 0.4\text{A}$	—	1.0	1.5	V
		Lower	$V_{SAT L-1}$	3	$V_{ref} = V_S$ , $I_O = 0.4\text{A}$	—	0.3	—	
		Upper	$V_{SAT U-2}$	3	$V_{ref} = V_S$ , $I_O = 1.0\text{A}$ , ON LOAD : 20ms	—	2.0	2.5	
		Lower	$V_{SAT L-2}$	3	$V_{ref} = V_S$ , $I_O = 1.0\text{A}$ , ON LOAD : 20ms	—	0.8	1.3	
Output Voltage			$V_{SAT U-1}'$	3	$V_{ref} = 8\text{V}$ , $I_O = 0.4\text{A}$	8.2	8.8	9.3	V
			$V_{SAT U-2}'$	3	$V_{ref} = 8\text{V}$ , $I_O = 1.0\text{A}$ ON LOAD : 20ms	8.1	8.6	9.2	
Output Transistor Leakage Current	Upper	$I_{LU}$	—	$V_S = 25\text{V}$	—	—	200	$\mu\text{A}$	
	Lower	$I_{LL}$	—	$V_S = 25\text{V}$	—	—	200		
Diode Forward Voltage	Upper	$V_{FU}$	4	$I_F = 1.0\text{A}$	—	3.6	—	V	
	Lower	$V_{FL}$	4	$I_F = 1.0\text{A}$	—	0.9	—		
Reference Current		$I_{ref}$	2	$V_{ref} = 8\text{V}$ , source mode	—	0.45	0.7	mA	
Thermal Shut Down Operating Temperature		$T_{SD}$	—	$T_j$	110	130	150	$^\circ\text{C}$	

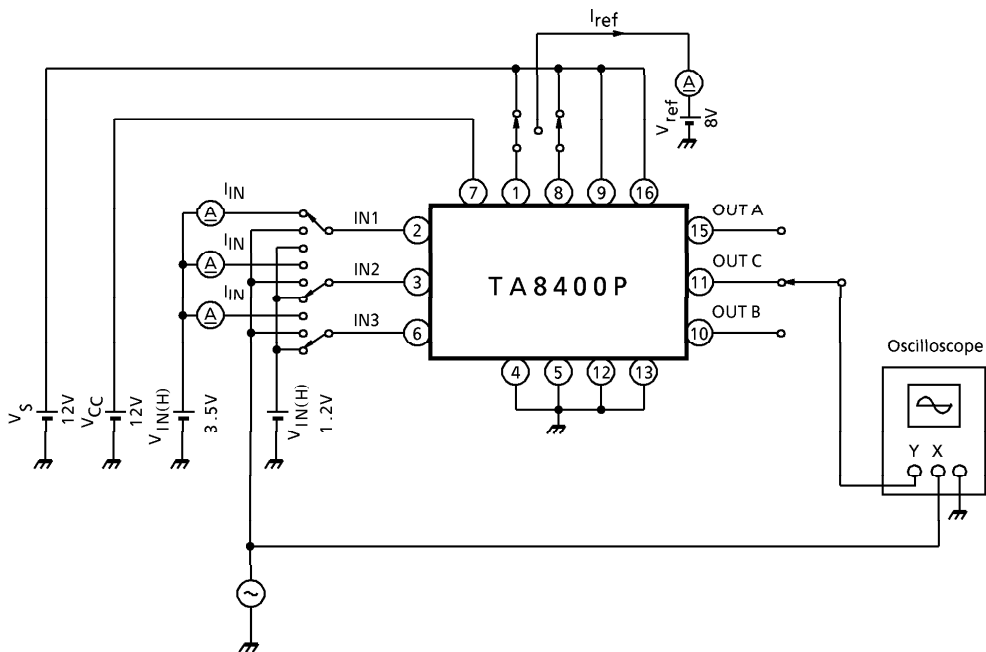
TEST CIRCUIT 1

$I_{CC1, 2, 3}$



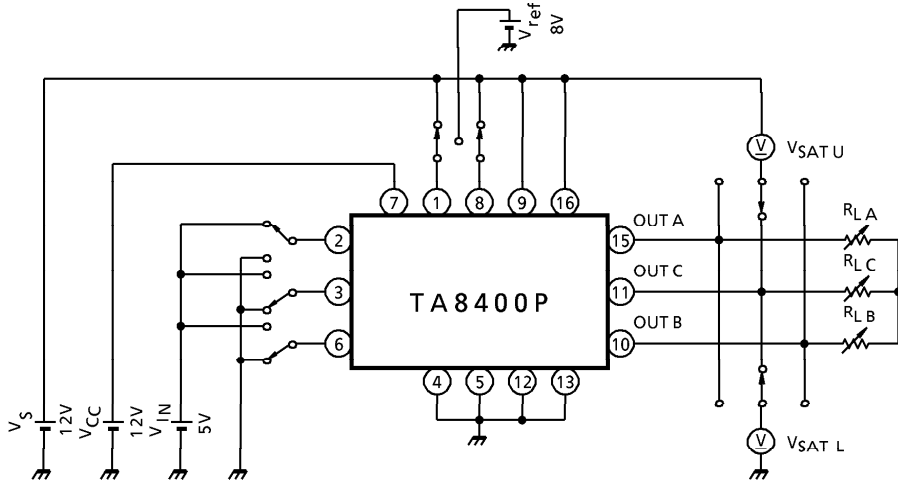
TEST CIRCUIT 2

$V_{IN1, 2}, I_{IN}, \Delta V_T, I_{ref}$



TEST CIRCUIT 3

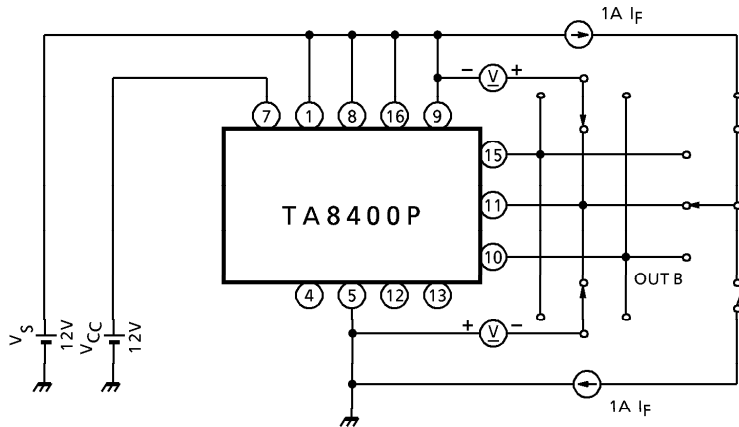
$V_{SAT U-1, L-1, U-2, L-2, U-1', U-2'}$

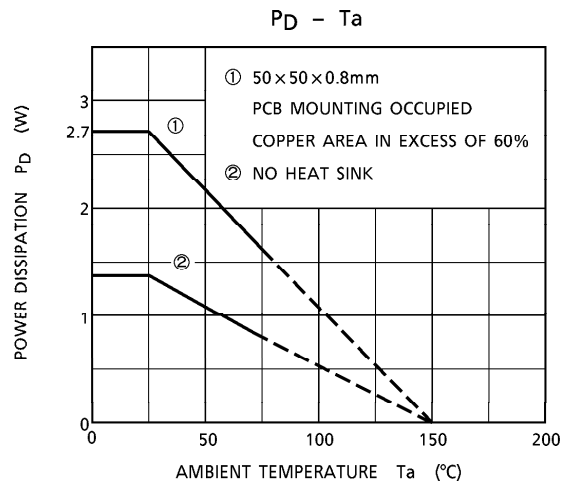


(Note) Calibrate  $I_{OUT}$  to 0.4/1.0A by  $R_{LA}$ ,  $R_{LB}$  and  $R_{LC}$ .

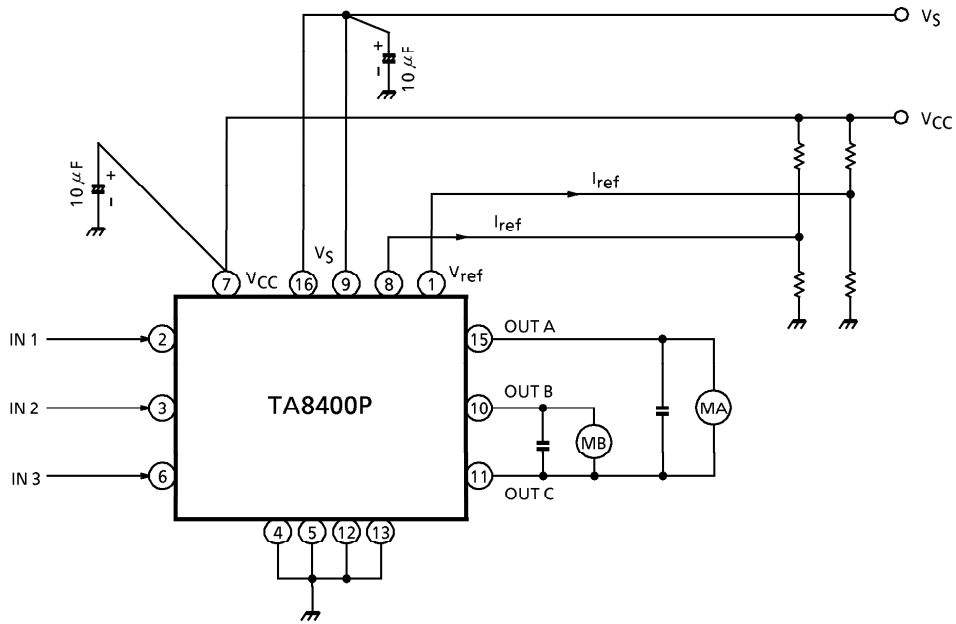
TEST CIRCUIT 4

$V_{FU, L}$





**APPLICATION CIRCUIT**

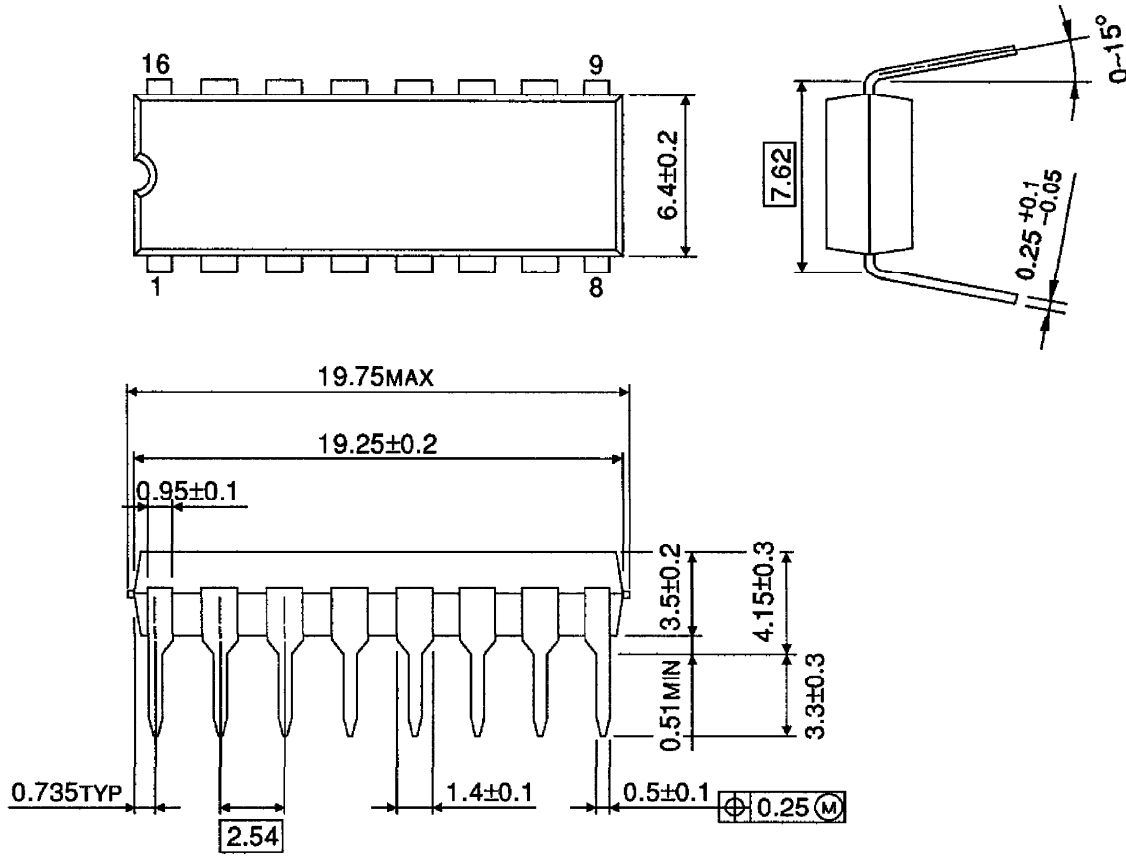


Pin⑩ is required to connect to pin⑨.

(Note) Utmost care is necessary in the design of the output line, V<sub>S</sub> and GND line since IC may be destroyed due to short-circuit between outputs, air contamination fault, or fault by improper grounding.

OUTLINE DRAWING  
DIP16-P-300-2.54A

Unit : mm



Weight : 1.11g (Typ.)