

TOSHIBA BIPOLAR LINEAR INTEGRATED CIRCUIT SILICON MONOLITHIC

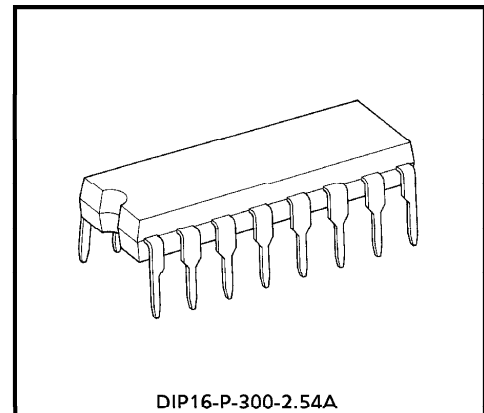
# TA8400P

## 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.

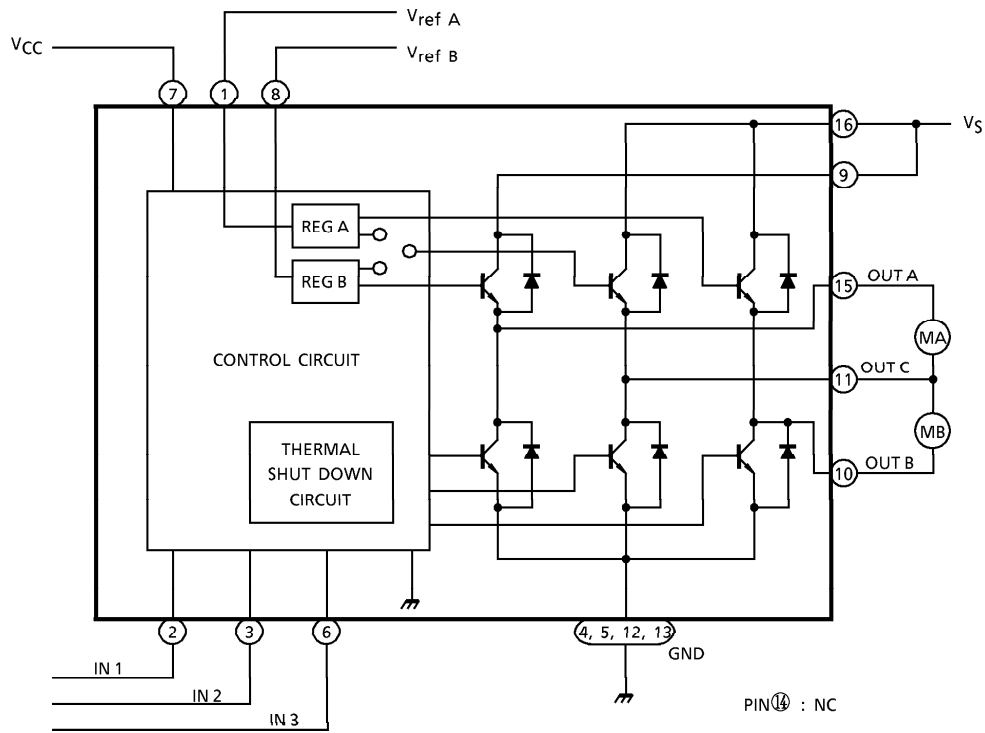


Weight : 1.11g (Typ.)

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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	A
	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

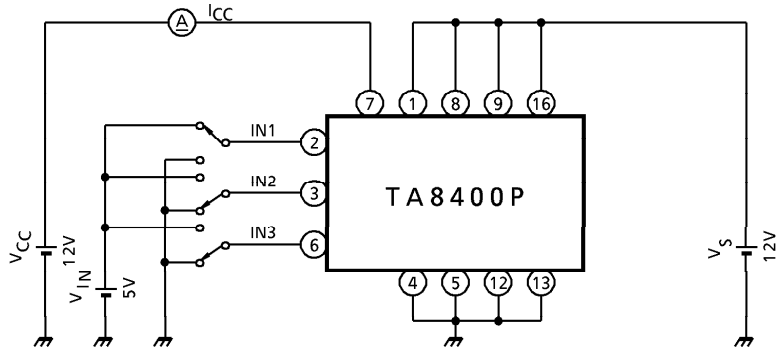
(Note 2) No heat sink

**ELECTRICAL CHARACTERISTICS** (Unless otherwise specified, Ta = 25°C, VCC = 12V, VS = 12V)

CHARACTERISTIC		SYMBOL	TEST CIR-CUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Supply Current		ICC1	1	Output open, CW / CCW mode	—	25	38	mA
		ICC2	1	Output open, brake mode	—	25	38	
		ICC3	1	Output open, STOP mode	—	10	20	
Input Voltage	1 (High)	VIN1	2	Tj = 25°C, pin②, ③, ⑥	3.5	—	5.5	V
	2 (Low)	VIN2	2	Tj = 25°C, pin②, ③, ⑥	GND	—	1.2	
Input Current		IIN	2	VIN = GND, source mode	6	12	60	μA
Input Hysteresis Voltage		ΔVT	2		—	0.7	—	V
Saturation Voltage	Upper	VSAT U-1	3	Vref = VS, IO = 0.4A	—	1.0	1.5	V
	Lower	VSAT L-1	3	Vref = VS, IO = 0.4A	—	0.3	—	
	Upper	VSAT U-2	3	Vref = VS, IO = 1.0A, ON LOAD : 20ms	—	2.0	2.5	
	Lower	VSAT L-2	3	Vref = VS, IO = 1.0A, ON LOAD : 20ms	—	0.8	1.3	
Output Voltage		VSAT U-1'	3	Vref = 8V, IO = 0.4A	8.2	8.8	9.3	V
		VSAT U-2'	3	Vref = 8V, IO = 1.0A ON LOAD : 20ms	8.1	8.6	9.2	
Output Transistor Leakage Current	Upper	ILU	—	VS = 25V	—	—	200	μA
	Lower	ILL	—	VS = 25V	—	—	200	
Diode Forward Voltage	Upper	VFU	4	IF = 1.0A	—	3.6	—	V
	Lower	VFL	4	IF = 1.0A	—	0.9	—	
Reference Current		Iref	2	Vref = 8V, source mode	—	0.45	0.7	mA
Thermal Shut Down Operating Temperature		TSD	—	Tj	110	130	150	°C

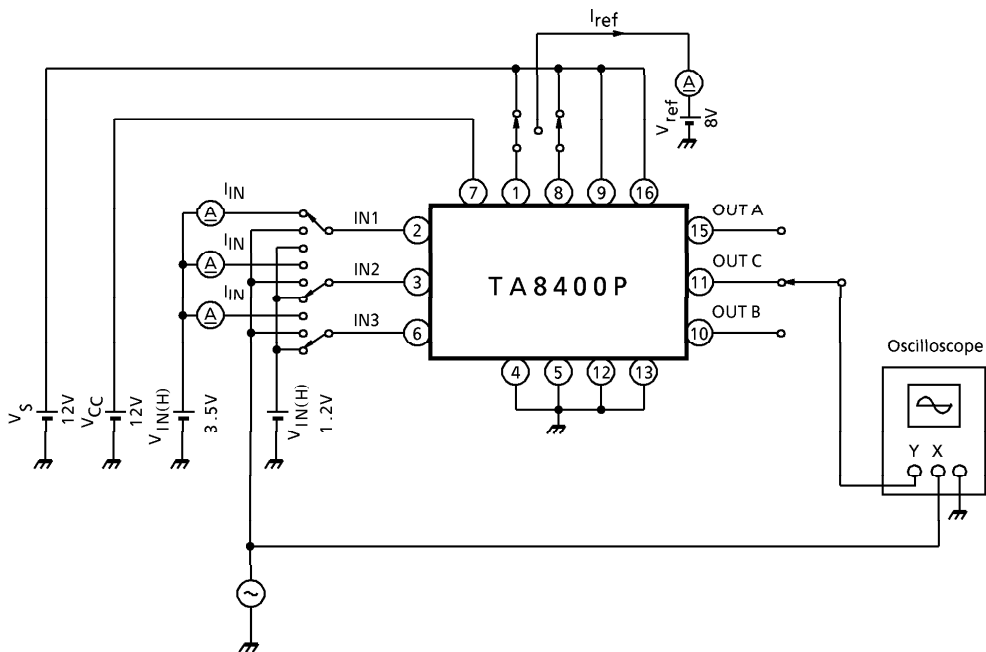
**TEST CIRCUIT 1**

$I_{CC1, 2, 3}$



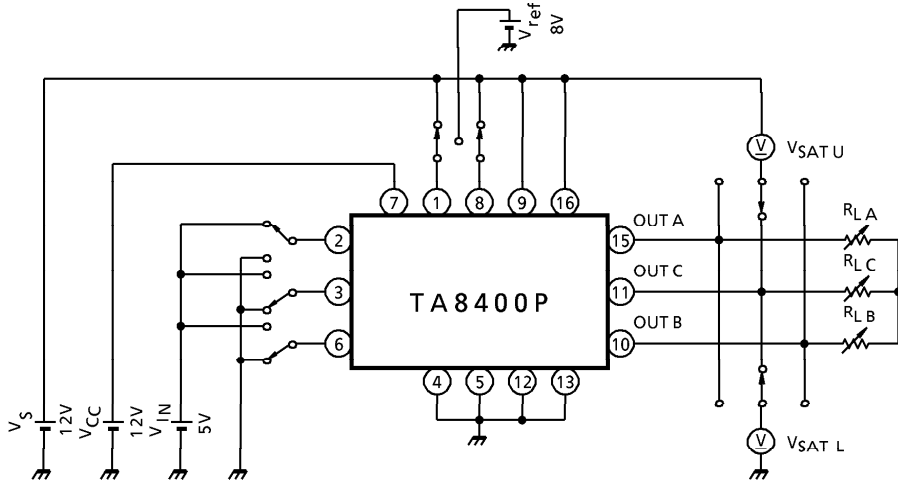
**TEST CIRCUIT 2**

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



TEST CIRCUIT 3

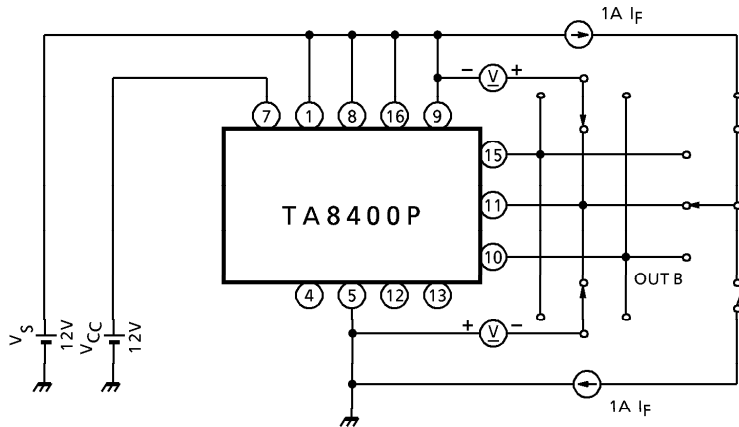
$V_{SAT U-1, L-1, U-2, L-2, U-1', U-2'}$

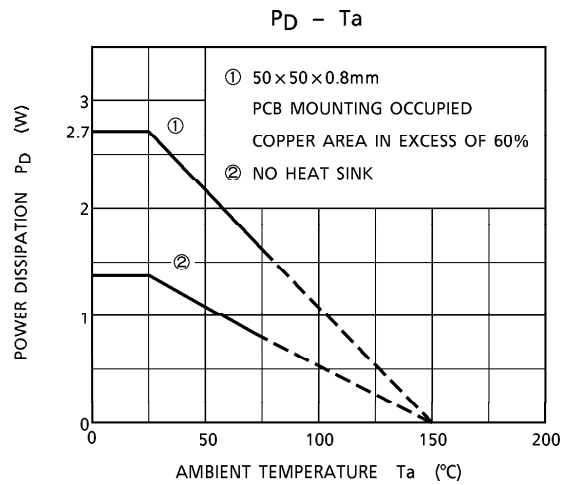


(Note) Calibrate  $I_{OUT}$  to 0.4/1.0A by  $R_{LA}$ ,  $R_{LB}$  and  $R_{LC}$ .

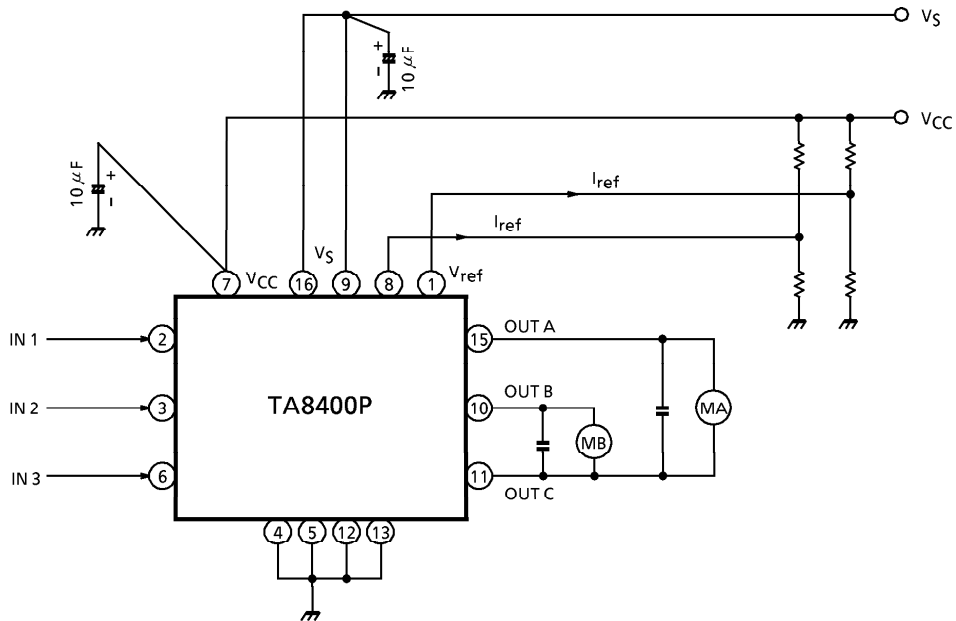
TEST CIRCUIT 4

$V_{FU, L}$





**APPLICATION CIRCUIT**

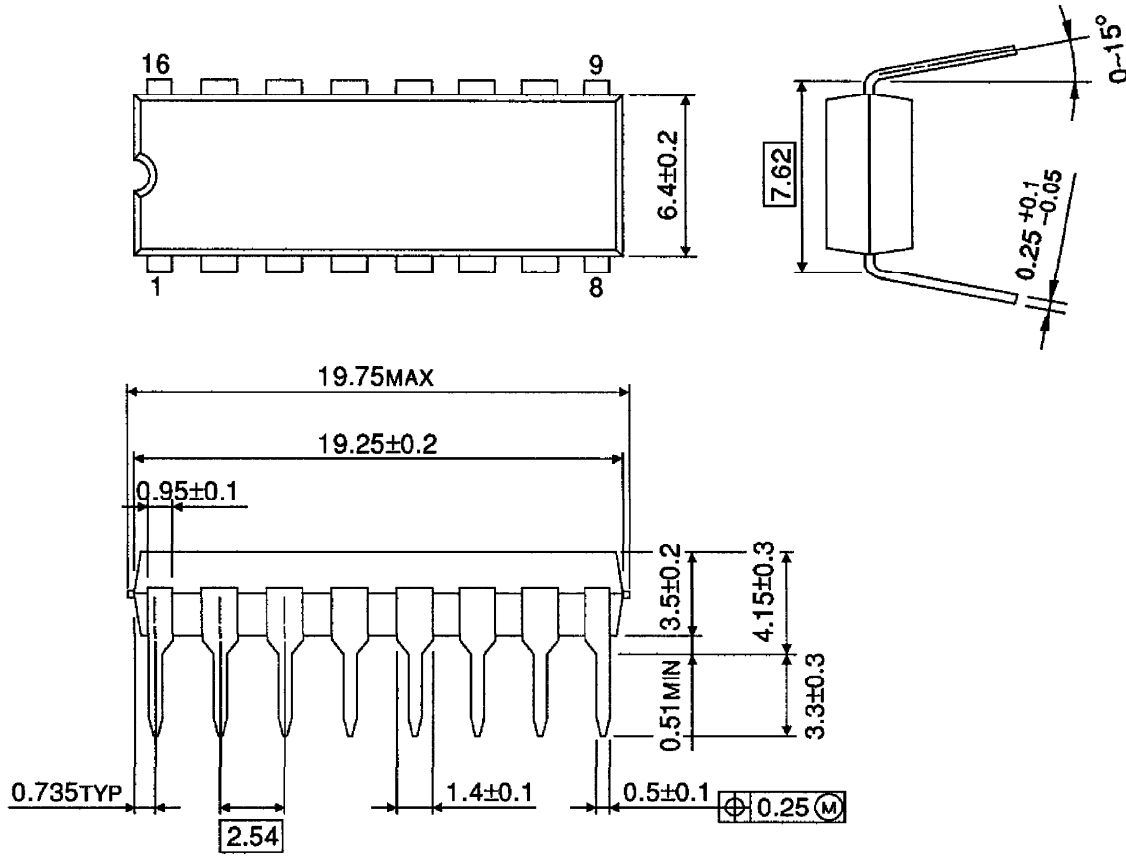


Pin⑩ is required to connect to pin⑨.

(Note) Utmost care is necessary in the design of the output line, Vs 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.)