

TOSHIBA BIPOLAR LINEAR INTEGRATED CIRCUIT SILICON MONOLITHIC

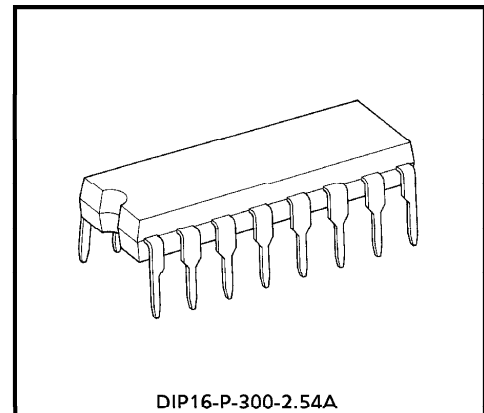
TA8400P

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.

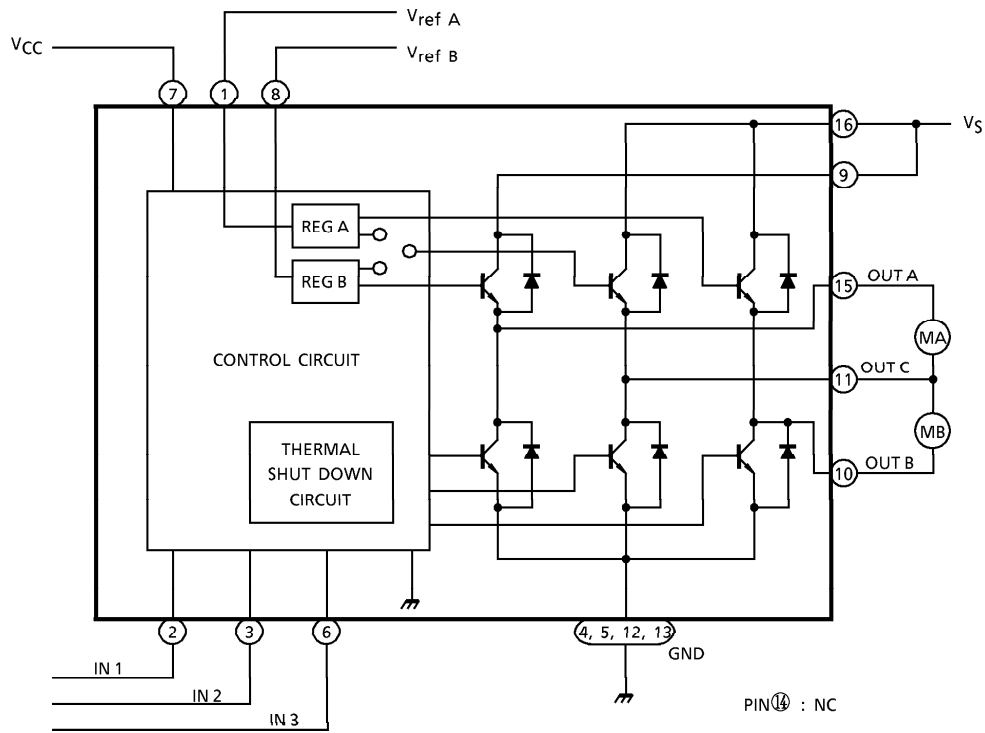


Weight : 1.11g (Typ.)

961001EBA2

- TOSHIBA is continually working to improve the quality and the reliability of its products. Nevertheless, semiconductor devices in general can malfunction or fail due to their inherent electrical sensitivity and vulnerability to physical stress. It is the responsibility of the buyer, when utilizing TOSHIBA products, to observe standards of safety, and to avoid situations in which a malfunction or failure of a TOSHIBA product could cause loss of human life, bodily injury or damage to property. In developing your designs, please ensure that TOSHIBA products are used within specified operating ranges as set forth in the most recent products specifications. Also, please keep in mind the precautions and conditions set forth in the TOSHIBA Semiconductor Reliability Handbook.
- The products described in this document are subject to foreign exchange and foreign trade control laws.
- The information contained herein is presented only as a guide for the applications of our products. No responsibility is assumed by TOSHIBA CORPORATION for any infringements of intellectual property or other rights of the third parties which may result from its use. No license is granted by implication or otherwise under any intellectual property or other rights of TOSHIBA CORPORATION or others.
- The information contained herein is subject to change without notice.

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 _{CC}	25	V
Motor Drive Voltage	V _S	25	V
Reference Voltage	V _{ref}	25	V
Output Current	PEAK	I _O (PEAK) (Note 1) 1.0	A
	AVE.	I _O (AVE.) 0.4	
Power Dissipation	P _D	(Note 2) 1.4	W
Operating Temperature	T _{opr}	- 30~75	°C
Storage Temperature	T _{stg}	- 55~150	°C

(Note 1) Duty 1 / 10, 100ms

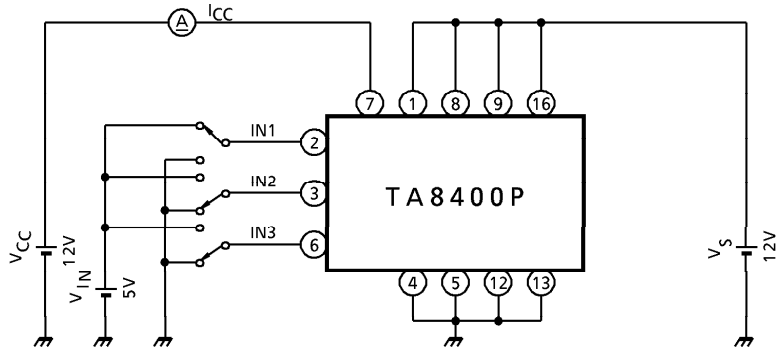
(Note 2) No heat sink

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	

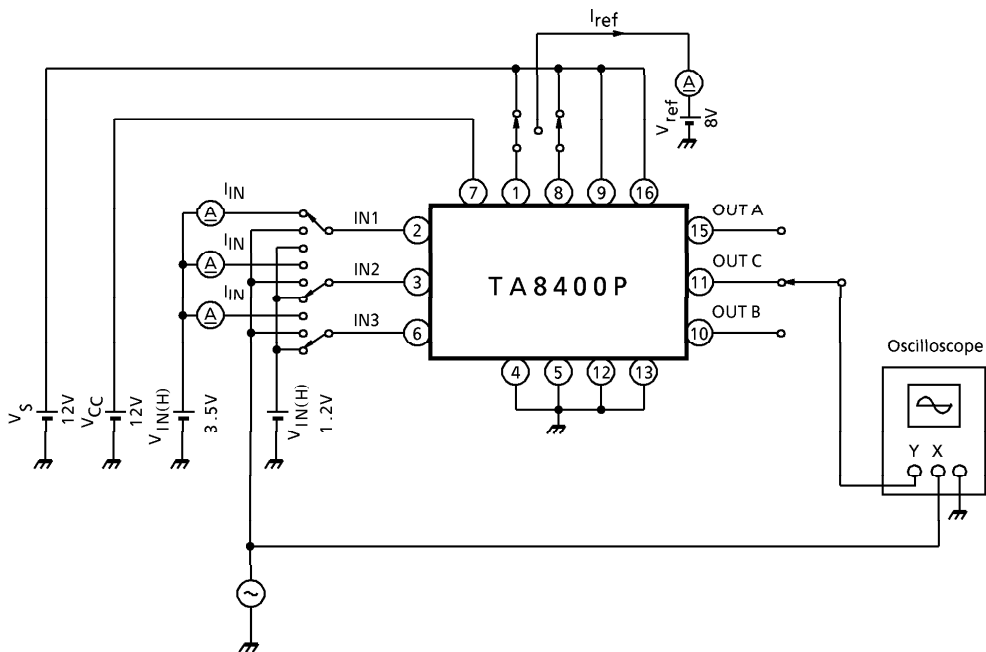
TEST CIRCUIT 1

$I_{CC1, 2, 3}$



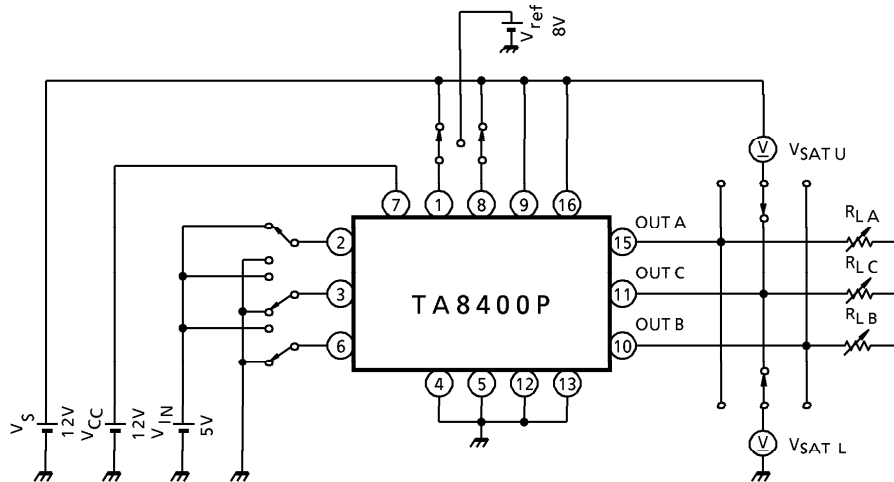
TEST CIRCUIT 2

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



TEST CIRCUIT 3

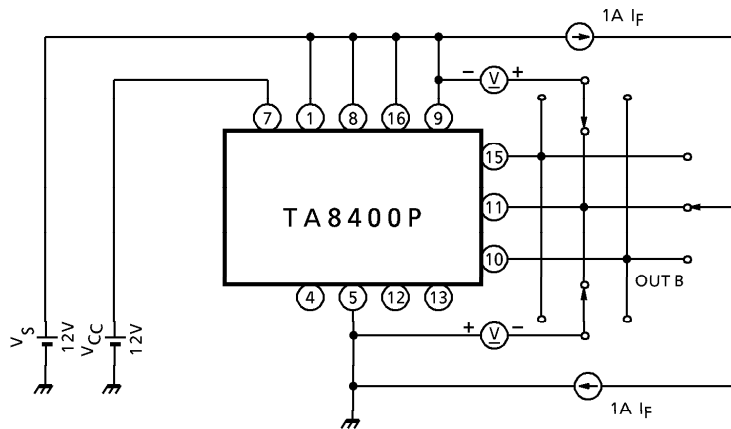
$V_{SAT U-1, L-1, U-2, L-2, U-1', U-2'}$

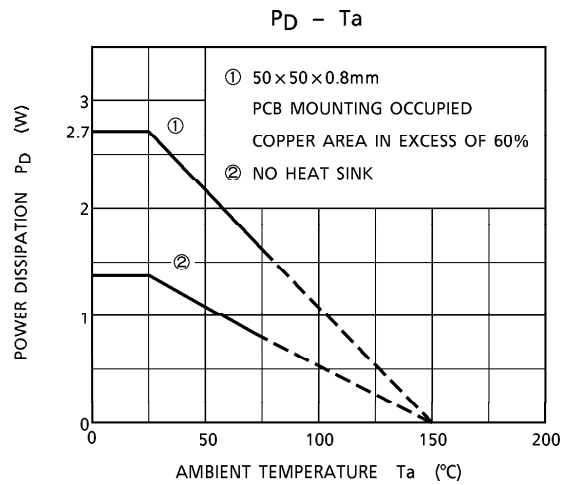


(Note) Calibrate I_{OUT} to 0.4/1.0A by R_{LA} , R_{LB} and R_{LC} .

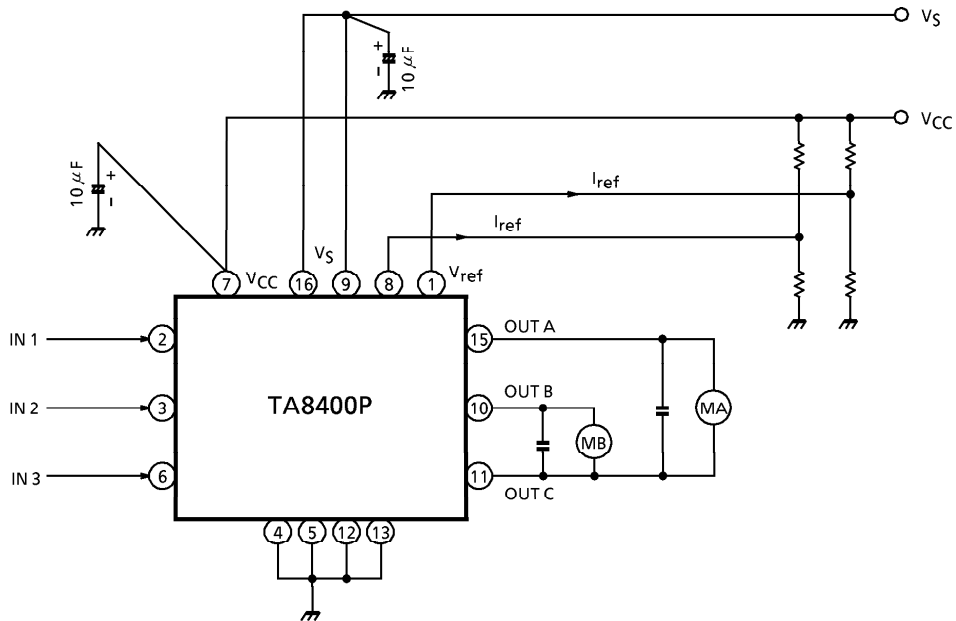
TEST CIRCUIT 4

$V_{FU, L}$





APPLICATION CIRCUIT

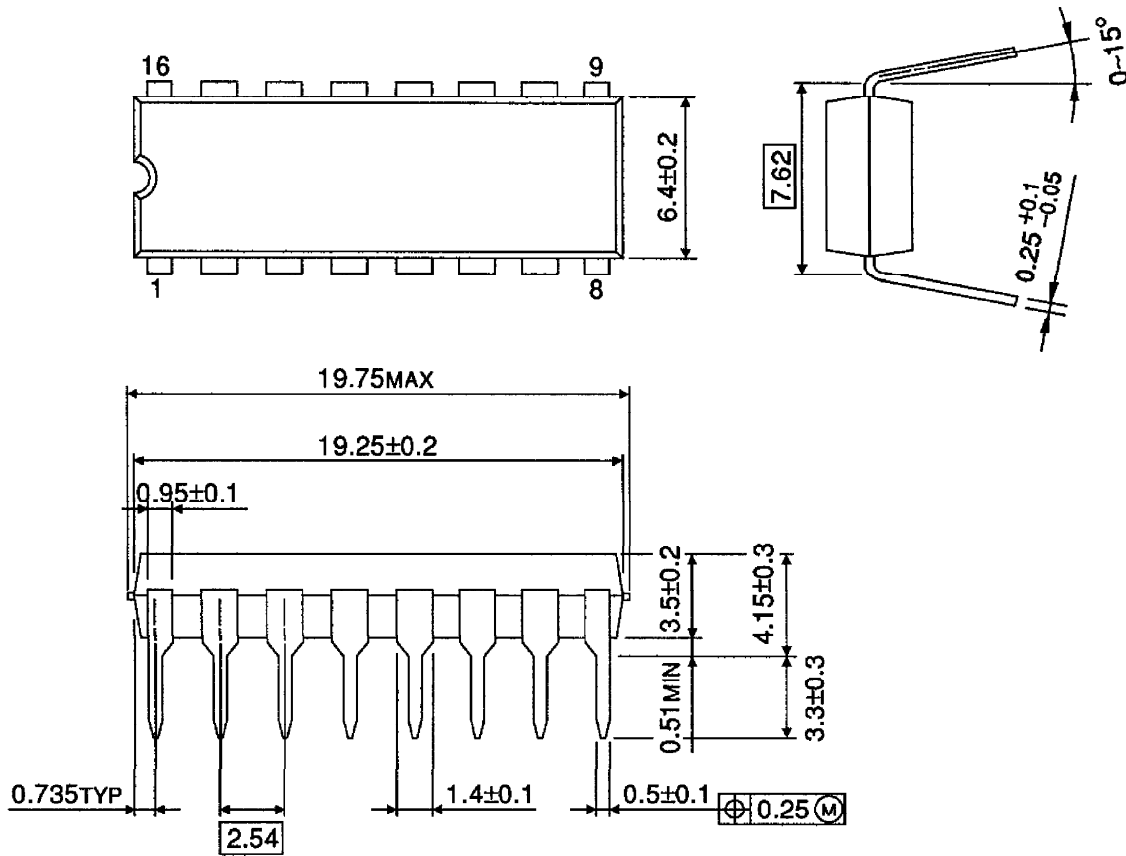


Pin⑯ is required to connect to pin⑨.

(Note) 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
DIP16-P-300-2.54A

Unit : mm



Weight : 1.11g (Typ.)