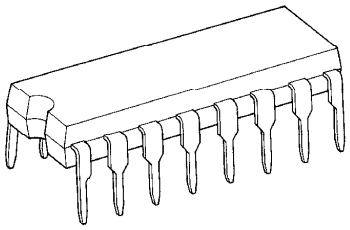
TOSHIBA BIPOLAR LINEAR INTEGRATED CIRCUIT SILICON MONOLITHIC

TA8400P

DUAL BRIDGE DRIVER

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



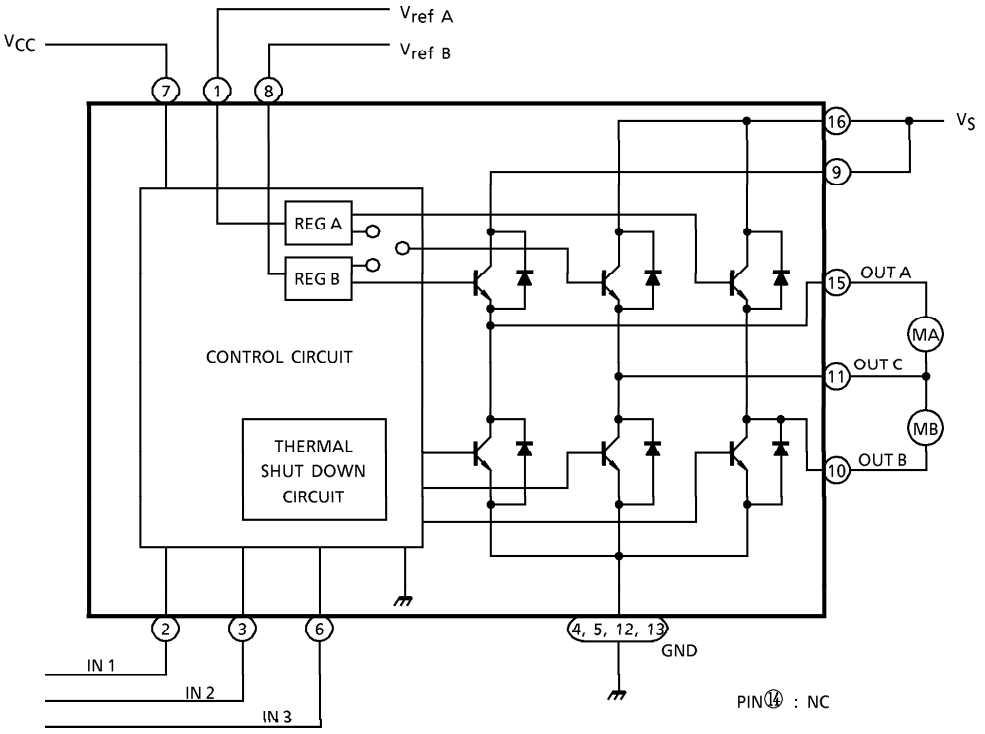
DIP16-P-300-2.54A

Weight : 1.11g (Typ.)

FEATURES

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

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

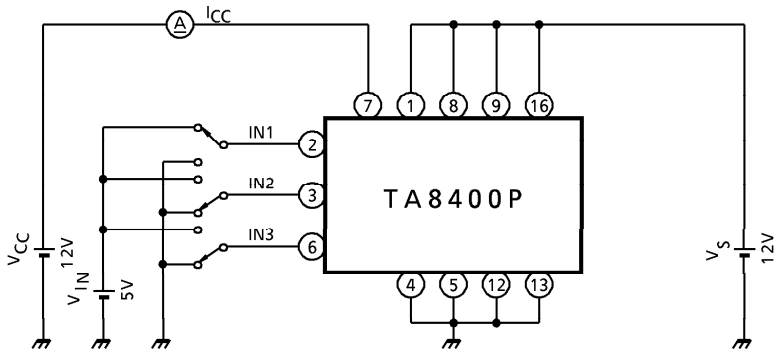
(Note 1) Duty 1 / 10, 100ms
(Note 2) No heat sink

ELECTRICAL CHARACTERISTICS (Unless otherwise specified, Ta = 25°C, V_{CC} = 12V, V_S = 12V)

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°C, pin②, ③, ⑥	3.5	—	5.5	V
	2 (Low)	V_{IN2}	2	T_j = 25°C, pin②, ③, ⑥	GND	—	1.2	
Input Current		I_{IN}	2	V_{IN} = GND, source mode	6	12	60	μA
Input Hysteresis Voltage		ΔV_T	2		—	0.7	—	V
Saturation Voltage	Upper	$V_{SAT\ U-1}$	3	$V_{ref} = V_S$, I_O = 0.4A	—	1.0	1.5	V
	Lower	$V_{SAT\ L-1}$	3	$V_{ref} = V_S$, I_O = 0.4A	—	0.3	—	
	Upper	$V_{SAT\ U-2}$	3	$V_{ref} = V_S$, I_O = 1.0A, ON LOAD : 20ms	—	2.0	2.5	
	Lower	$V_{SAT\ L-2}$	3	$V_{ref} = V_S$, I_O = 1.0A, ON LOAD : 20ms	—	0.8	1.3	
Output Voltage		$V_{SAT\ U-1'}$	3	V_{ref} = 8V, I_O = 0.4A	8.2	8.8	9.3	V
		$V_{SAT\ U-2'}$	3	V_{ref} = 8V, I_O = 1.0A ON LOAD : 20ms	8.1	8.6	9.2	
Output Transistor Leakage Current	Upper	$I_{L\ U}$	—	V_S = 25V	—	—	200	μA
	Lower	$I_{L\ L}$	—	V_S = 25V	—	—	200	
Diode Forward Voltage	Upper	$V_{F\ U}$	4	I_F = 1.0A	—	3.6	—	V
	Lower	$V_{F\ L}$	4	I_F = 1.0A	—	0.9	—	
Reference Current		I_{ref}	2	V_{ref} = 8V, source mode	—	0.45	0.7	mA
Thermal Shut Down Operating Temperature		T_{SD}	—	T_j	110	130	150	°C

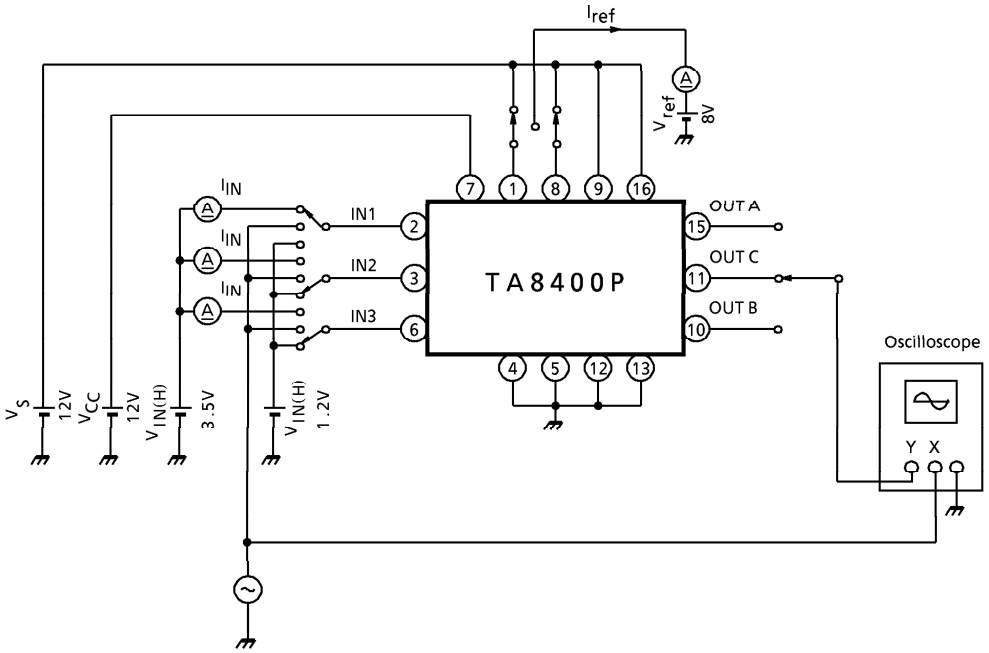
TEST CIRCUIT 1

$I_{CC1, 2, 3}$



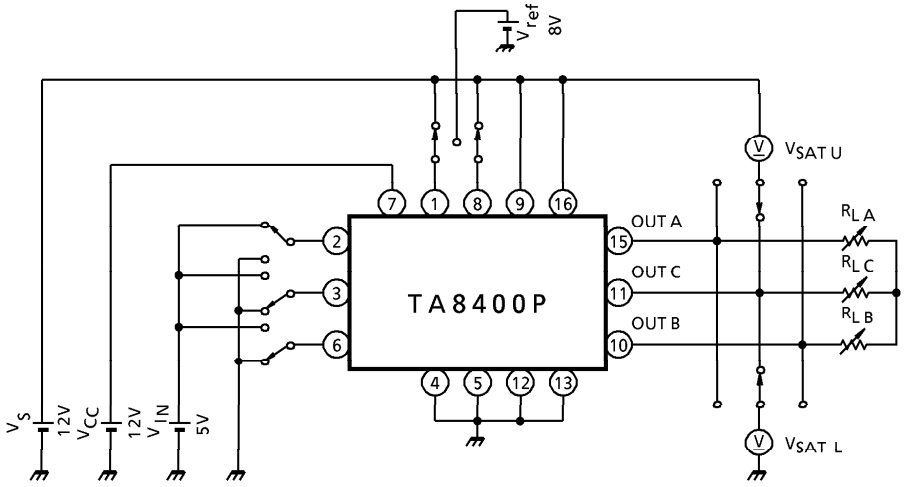
TEST CIRCUIT 2

$V_{IN1, 2}$, I_{IN}, ΔV_T, I_{ref}



TEST CIRCUIT 3

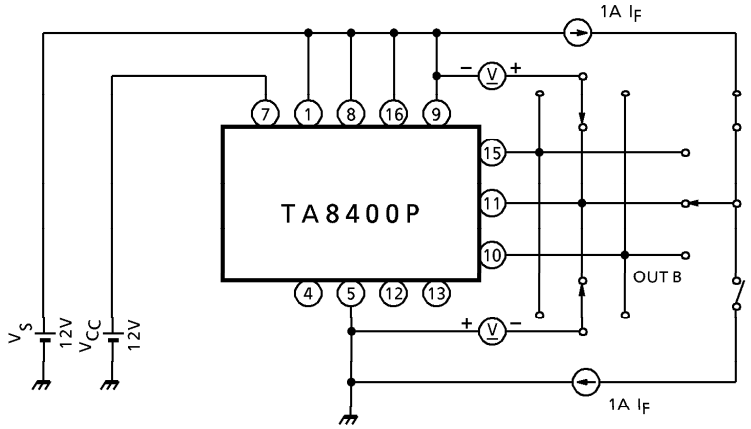
V_{SAT} U-1, L-1, U-2, L-2, U-1', U-2'

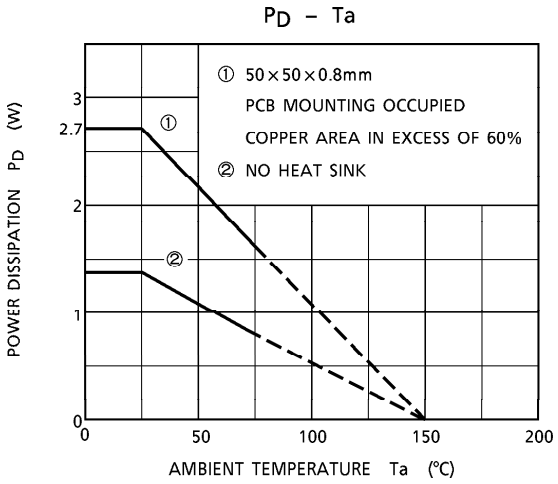


(Note) Calibrate I_{OUT} to 0.4 / 1.0A by R_{LA}, R_{LB} and R_{LC}.

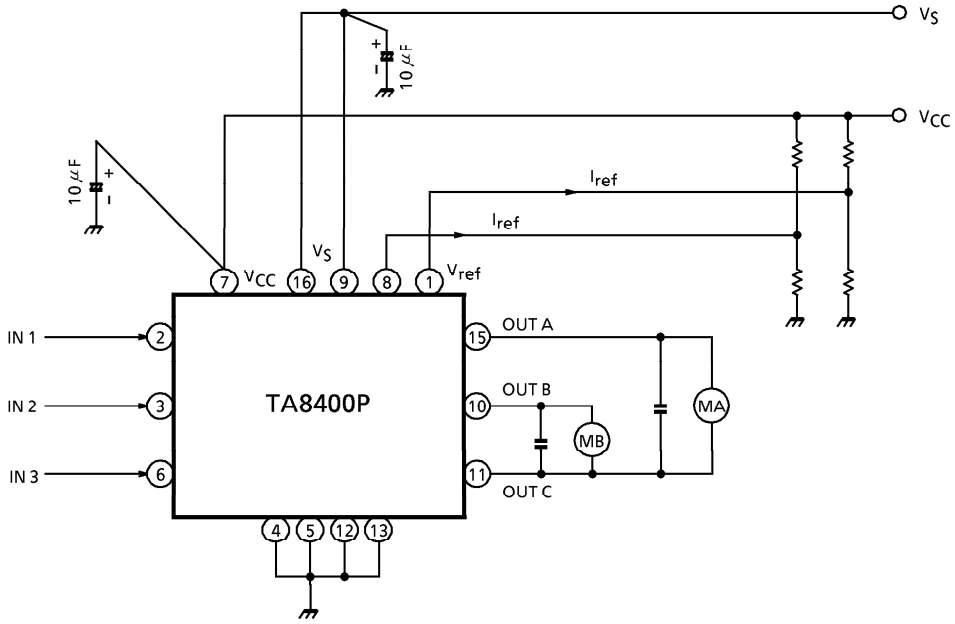
TEST CIRCUIT 4

V_{F} U, L





APPLICATION CIRCUIT



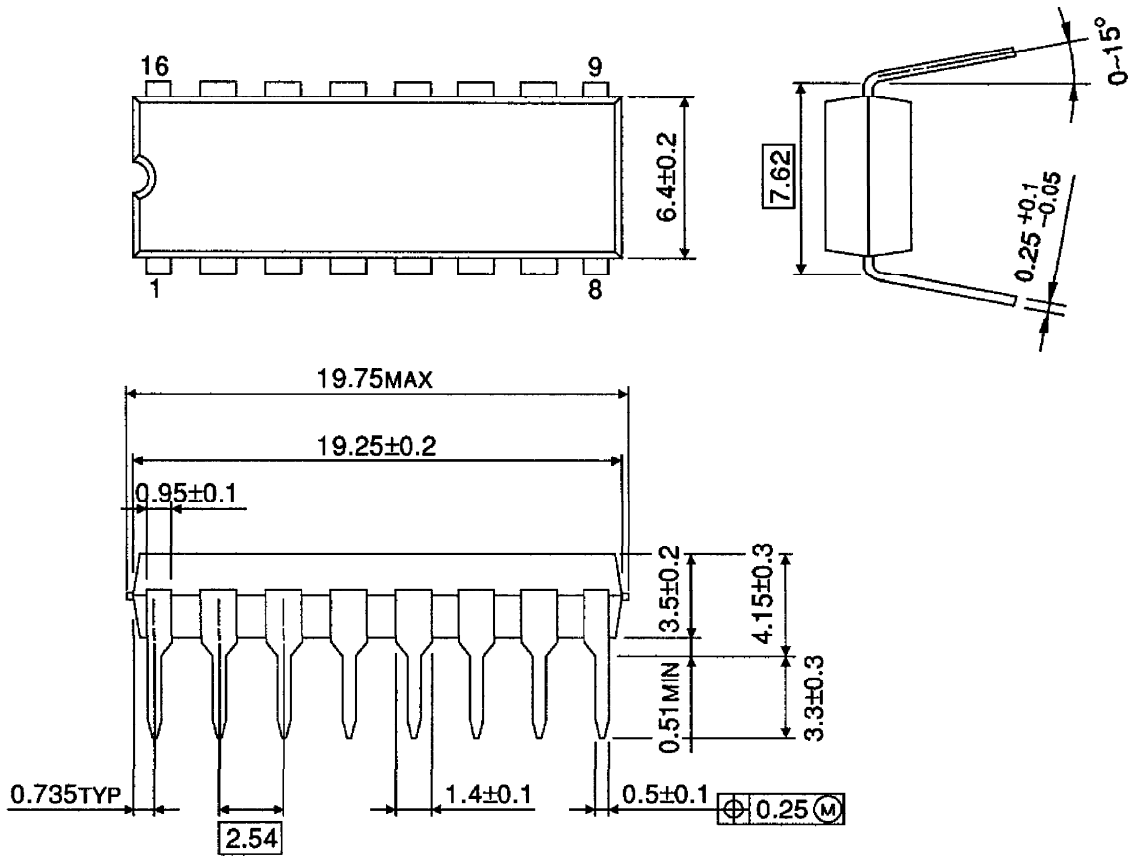
Pin⑯ is required to connect to pin⑨.

(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



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