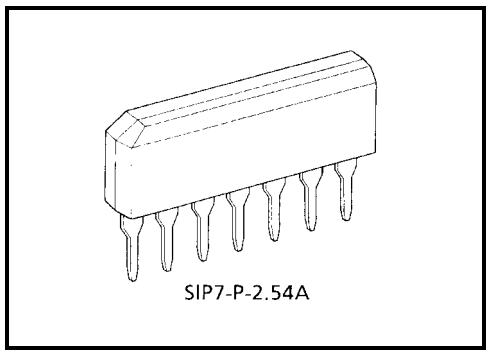
TOSHIBA BIPOLAR LINEAR INTEGRATED CIRCUIT SILICON MONOLITHIC

TA8052S

0.3A MOTOR DRIVER WITH BRAKE FUNCTION

The TA8052S is a full−bridge driver which directly drives a bidirectional DC motor. Inputs DI1 and DI2 are combined to select one of forward, reverse, stop, and brake modes.
Since the inputs are TTL-compatible, the IC can be directly controlled from a CPU or other control system. The IC also has various protective functions

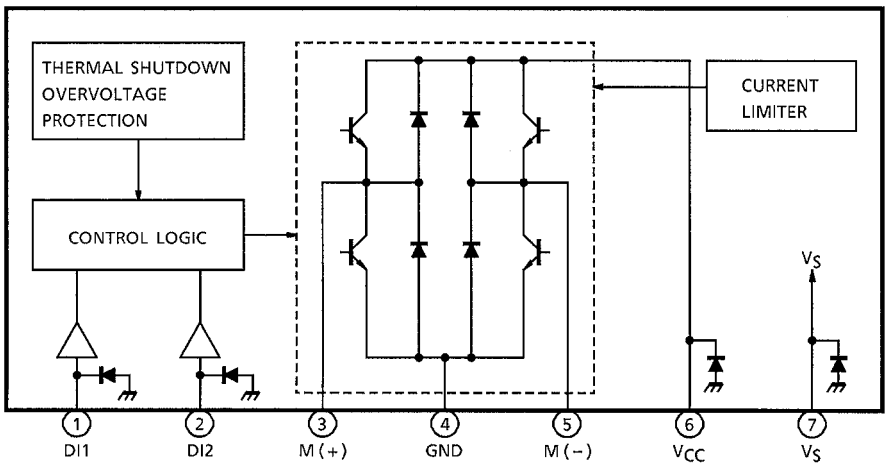


Weight: 0.7 g (typ.)

FEATURES

- Output current : 300mA (max.)
- Four modes : Forward, reverse, stop, and brake
- Multiple protective functions
  : Thermal shutdown, current limiter, and overvoltage shut down.
- Bulit-in diode for counteracting counter electromotive force
- Small SIP-7 pin

BLOCK DIAGRAM AND PIN LAYOUT



PIN DESCRIPTION

PIN No.	SYMBOL	DESCRIPTION
1	DI1	Output status control pin. Connects to a PNP-type voltage comparator.
2	DI2	
3	M (+)	Connects to the DC motor. Diodes for absorbing counter electromotive force are contained on the V_{CC} and GND sides.
4	GND	Grounded
5	M (−)	Connects to the DC motor together with pin 3 and has the same function as pin 3. This pin is controlled by the inputs from pins 1 and 2.
6	V_{CC}	Power supply pin. This pin has a function to turn off the output when the applied voltage exceeds 30V, thus protecting the IC and the load.
7	V_S	Power supply pin for the control section. This pin is completely separated from the V_{CC} pin.

TRUTH TABLE

Input		Output		Output Mode
DI1	DI2	M (+)	M (−)	
H	H	L	L	BRAKE
L	H	L	H	REVERSE
H	L	H	L	FORWARD
L	L	OFF (high impedance)		STOP

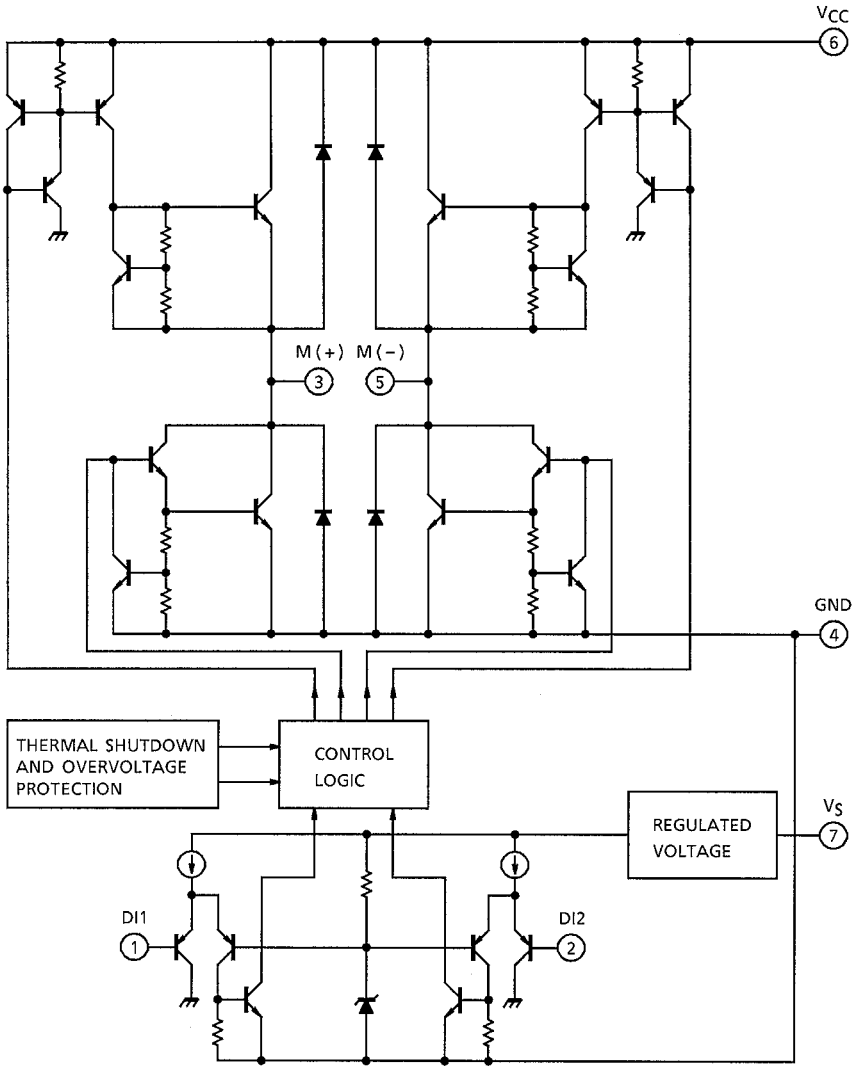
MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Supply Voltage	V_{CC}	50 (1s)	V
Input Voltage	V_{IN}	−0.3~V_{CC}+0.3	V
Output Current	I_{OUT}	300	mA
Power Dissipation	P_D	0.92	W
Operating Temperature	T_{opr}	−40~85	°C
Storage Temperature	T_{stg}	−55~150	°C
Lead Temperature Time	T_{sol}	260 (10s)	°C

ELECTRICAL CHARACTERISTICS (V_S, V_{CC} = 8~16V, Ta = −40~85°C)

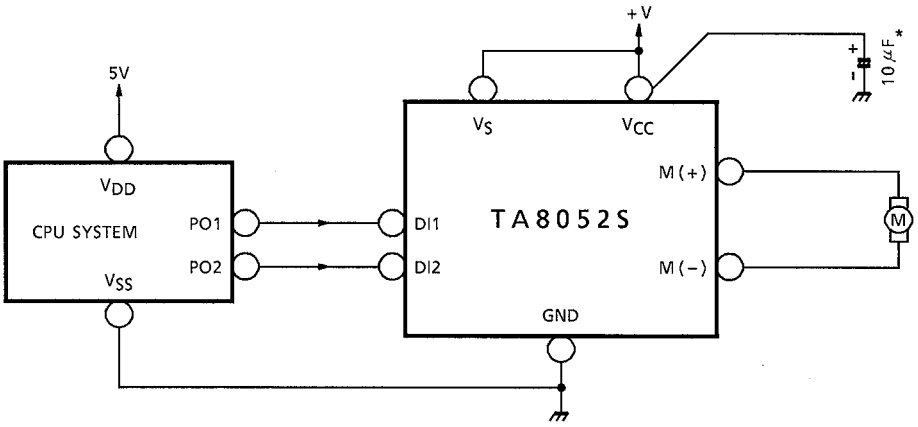
CHARACTERISTIC	SYMBOL	PIN	TEST CIR-CUIT	TEST CONDITION	MIN	TYP.	MAX	UNIT
Current Consumption (I)	I_{S1}	V_S	—	Stop	—	2.5	5	mA
	I_{S2}		—	Forward / Reverse	—	4	8	
	I_{S3}		—	Brake	—	4	8	
Current Consumption (II)	I_{CC1}	V_{CC}	—	Stop	—	—	1	mA
	I_{CC2}		—	Forward / Reverse	—	7.5	15	
	I_{CC3}		—	Brake	—	—	1	
Input Voltage	V_{IL}	DI1 / DI2	—		—	—	0.8	V
	V_{IH}				2.0	—	—	
Input Current	I_{IL}	DI1 / DI2	—	V_{IN} = 0.4V	—	—	−20	μA
	I_{IH}		—	V_{IN} = V_{CC}	—	—	10	
Output Saturation Voltage	V_{sat}(total)	M (+) / M (−)	—	I_O = 200mA	—	1.8	2.5	V
Output Leakage Current	I_{LEAK-U}	M (+) / M (−)	—	V_O = 0V	—	—	−100	μA
	I_{LEAK-L}		—	V_O = V_{CC}	—	—	100	
Diode Forward Voltage	V_{F-U}	M (+) / M (−)	—	I_F = 200mA	—	1.1	—	V
	V_{F-L}		—	I_F = 200mA	—	1.1	—	
Output Limit Current	I_{SC}		—	Ta = 25°C	0.3	0.55	—	A
Shutdown Temperature	T_{SD-H}		—	ON → OFF	—	150	—	°C
	T_{SD-L}		—	OFF → ON	—	130	—	
Overvoltage Detection	V_{SD}		—		27	30	33	V
Transfer Delay Time	t_{pLH}		—		—	1	10	μs
	t_{pHL}		—		—	1	10	

I / O EQUIVALENT CIRCUIT



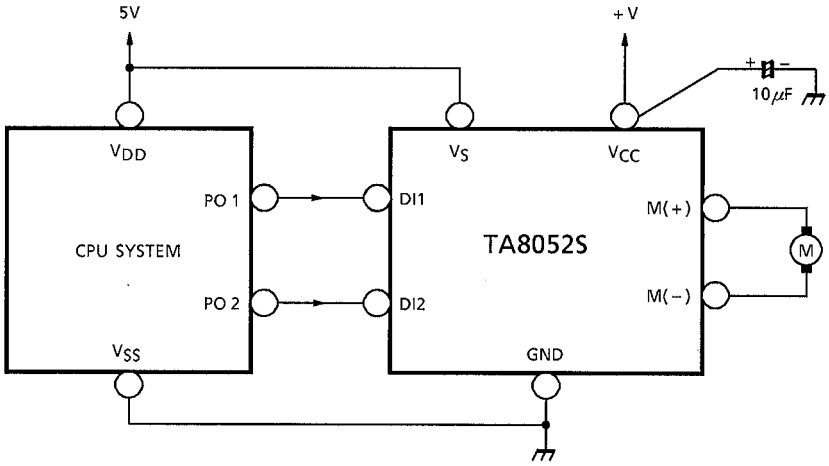
EXAMPLE OF APPLICATION CIRCUIT

1. Standard Circuit



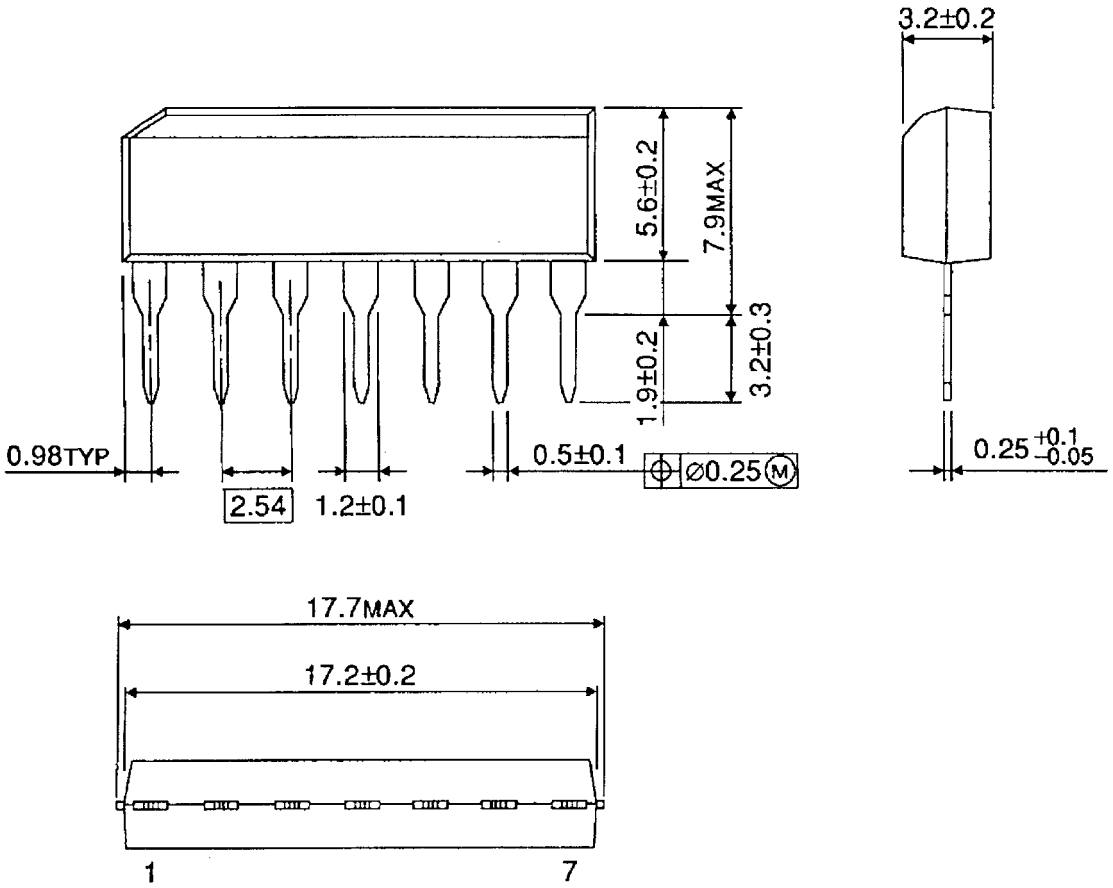
*: Connect this capacitor as close to the IC as Possible.

2. Power Supply Separation Circuit



PACKAGE DIMENSIONS

SIP7-P-2.54A Unit : mm



Weight: 0.7g (Typ.)

RESTRICTIONS ON PRODUCT USE

000707EAA_S

- TOSHIBA is continually working to improve the quality and 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 comply with the standards of safety in making a safe design for the entire system, and to avoid situations in which a malfunction or failure of such TOSHIBA products 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 TOSHIBA products specifications. Also, please keep in mind the precautions and conditions set forth in the “Handling Guide for Semiconductor Devices,” or “TOSHIBA Semiconductor Reliability Handbook” etc..
- 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.