TOSHIBA BIPOLAR LINEAR INTEGRATED CIRCUIT   SILICON MONOLITHIC

TA8080K

1.0A MOTOR DRIVER WITH BRAKE FUNCTION

The TA8080K is a 1.0A motor 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, this IC can be controlled directly from a CPU or other control system. The IC also has various protective functions.
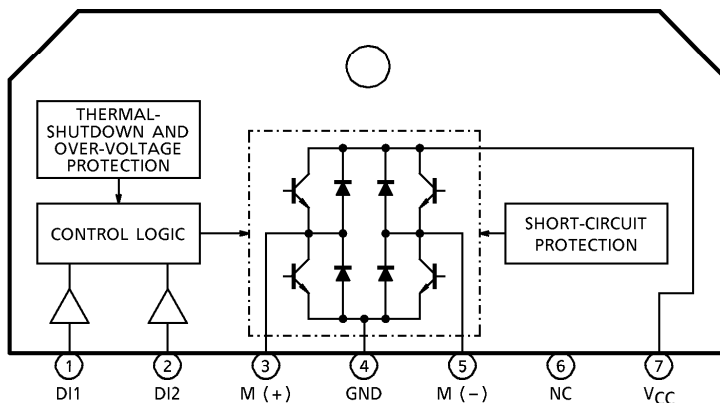
HSIP7-P-2.54A
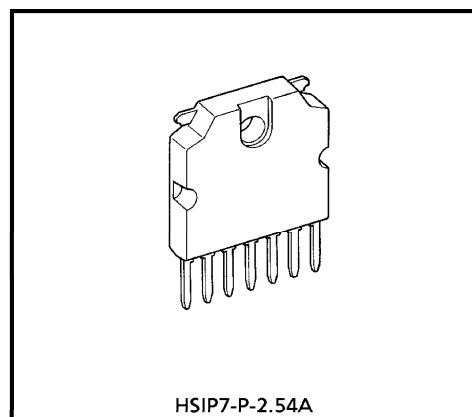
Weight : 2.2g (Typ.)

FEATURES

● Bidirectional DC motor driver.

● 1.0A current capacity.

● Four operation modes : Forward, reverse, stop, and brake.

● Protective functions   : Thermal-shutdown, short-circuit protection, and over-voltage shutdown.

● Built-in counter electromotive force absorption diodes.

● Plastic package HSIP-7pin.

BLOCK DIAGRAM AND PIN LAYOUT

961001EBA2

PIN DESCRIPTION

PIN No.	SYMBOL	DESCRIPTION
1	DI1	Output status control pin.
2	DI2	Connects to a PNP-type voltage comparator.
3	M (+)	Connects to the DC motor. Both the sink and the source have a current capacity of 1.0A. 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	NC	Not connected.
7	V_{CC}	Power supply pin. This pin has a function to turn off the output when the applied voltage exceeds 30.0V, thus protecting the IC and the load.

TRUTH TABLE

INPUT		OUTPUT		
DI1	DI2	M (+)	M (−)	
H	H	L	L	(Note)
L	H	L	H	
H	L	H	L	
L	L	OFF (high impedance)		(Note)

(Note) Brake mode comes into effect when both M (+) and M (−) go low, stopmode comes into effect when both M (+) and M (−) turn OFF.

MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Power Supply Voltage	V_{CC}	30	V
	V_{CC}	60 (1s)	
Input Voltage	V_{IN}	$-0.3 \sim V_{CC}$	V
Output Current	$I_{O\,AVE}$	1.0	A
Power Dissipation	P_D	12.5	W
Operating Temperature	T_{opr}	$-40 \sim 110$	°C
Storage Temperature	T_{stg}	$-55 \sim 150$	°C
Lead Temperature-time	T_{sol}	260 (10s)	°C

ELECTRICAL CHARACTERISTICS (V_{CC} = 6~16V, Tc = $-40 \sim 110$°C)

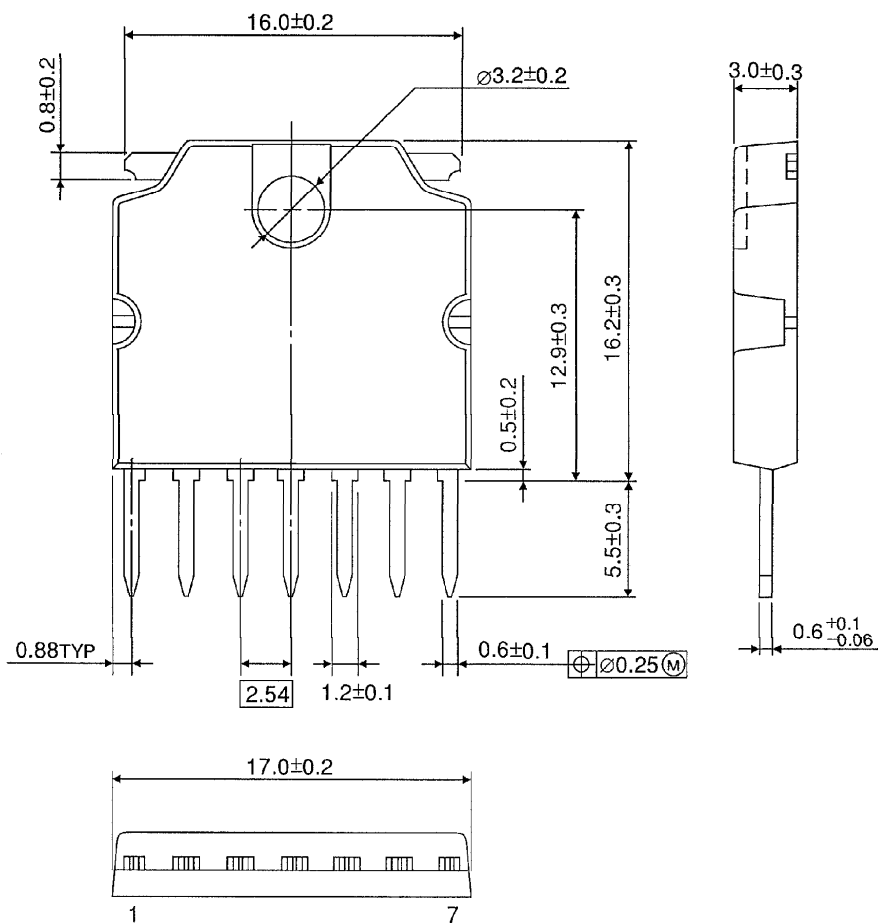| CHARACTERISTIC	SYMBOL	PIN	TEST CIR-CUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Power Supply Current	I_{CC1}	V_{CC}	—	Stop	—	8	15	mA
	I_{CC2}		—	Forward / Reverse	—	20	40	
	I_{CC3}		—	Brake	—	12	25	
Input Voltage	V_{IL}	DI1 / DI2	—	—	—	—	0.8	V
	V_{IH}		—	—	2.0	—	—	
Input Current	I_{IL}	DI1 / DI2	—	$V_{IN} = 0.4V$	-100	—	10	μA
	I_{IH}		—	$V_{IN} = V_{CC}$	-10	—	10	
Output Saturation Voltage	V_{sat} (total)	M (+) / M (−)	—	$I_O = 1.0A$, Tc = 25°C	—	2.0	2.5	V
			—	$I_O = 1.0A$, Tc = 110°C	—	2.0	2.5	
Output Leakage Current	$I_{LEAK \cdot U}$	M (+) / M (−)	—	$V_{OUT} = 0V$	—	—	-10	μA
	$I_{LEAK \cdot L}$		—	$V_{OUT} = V_{CC}$	—	—	10	
Diode Forward Voltage	$V_{F \cdot U}$	M (+) / M (−)	—	$I_F = 1.0A$	—	20	—	V
	$V_{F \cdot L}$		—		—	1.2	—	
Over-current Detection	I_{SD}	—	—	—	1.2	1.7	2.3	A
Shutdown Temperature	T_{SD}	—	—	—	—	150	—	°C
Over-voltage Detection	V_{SD}	—	—	—	27	30	33	V
Thermal Resistance	$R_{\theta j\text{-}c}$	—	—	—	—	4	—	°C / W
Transfer Delay Time	t_{pLH}	—	—	—	—	1	10	μs
	t_{pHL}	—	—	—	—	1	10	

I/O EQUIVALENT CIRCUIT
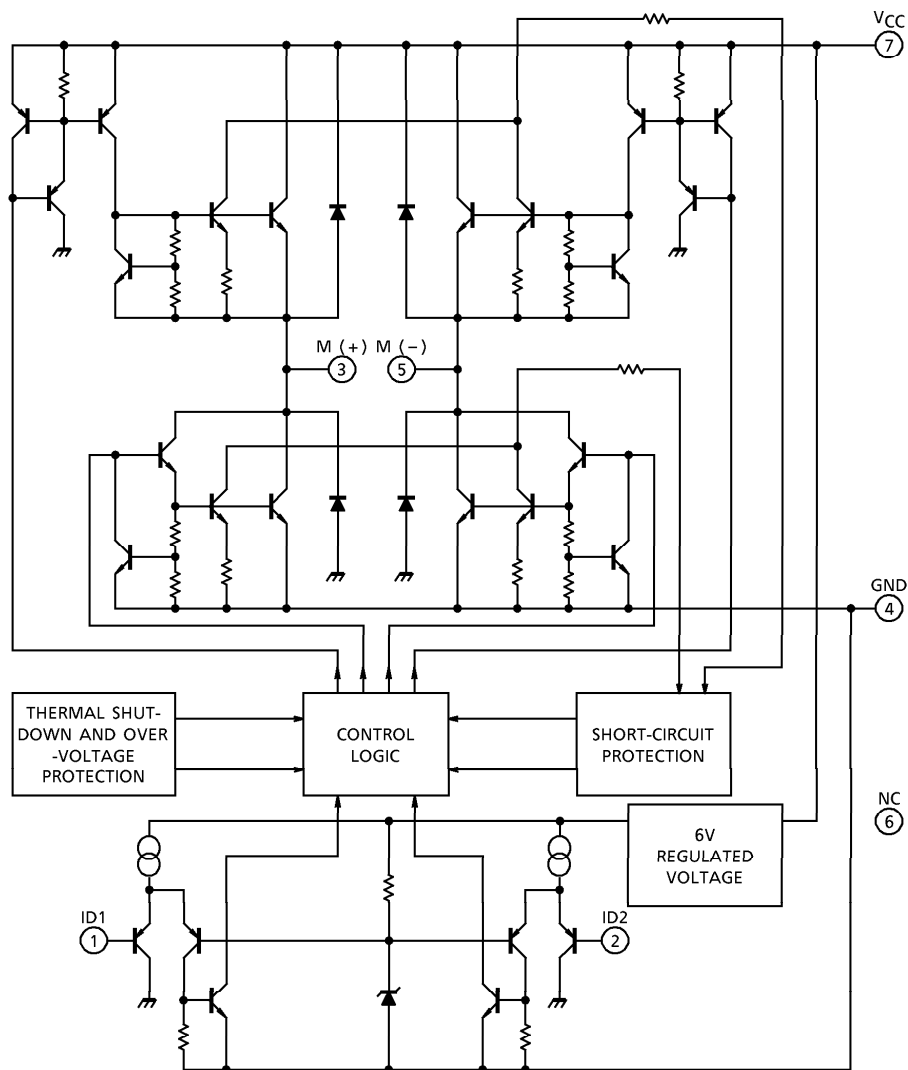
EXAMPLE OF APPLICATION CIRCUIT
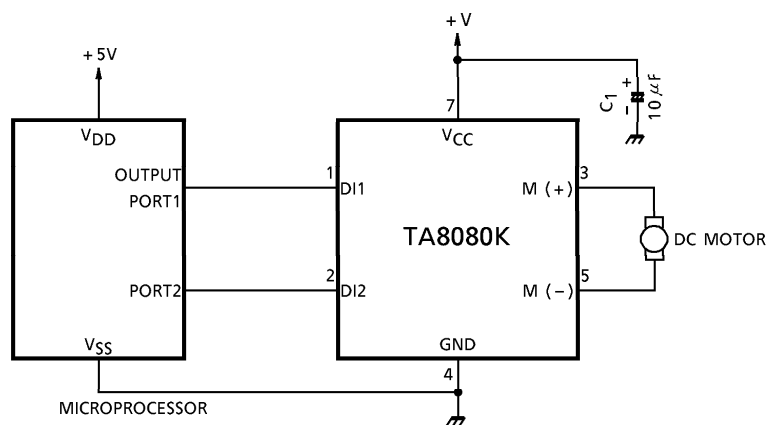
Cautions for Wiring : C_1 is for absorbing disturbance, noise etc.
Connect it as close to the IC as possible.

OUTLINE DRAWING
HSIP7-P-2.54A   Unit : mm

16.0±0.2

0.8±0.2

∅3.2±0.2

3.0±0.3

16.2±0.3

12.9±0.3

0.5±0.2

5.5±0.3

0.88TYP

2.54   1.2±0.1

0.6±0.1

⊕ ∅0.25 Ⓜ

0.6 $^{+0.1}_{-0.06}$

17.0±0.2

1   7

Weight : 2.2g (Typ.)