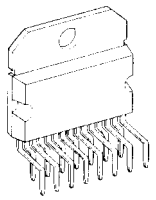
TOSHIBA BIPOLAR LINEAR INTEGRATED CIRCUIT SILICON MONOLITHIC

TA8082H

DUAL DC MOTOR DRIVER

The TA8082H contains two motor driver circuits with a current capacity of 1.5A for directly driving bidirectional DC motors. Inputs DI1A / B and DI2A / B 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. In addition, the IC also has a low standby current function, a self−diagnostic function, and various protective functions.



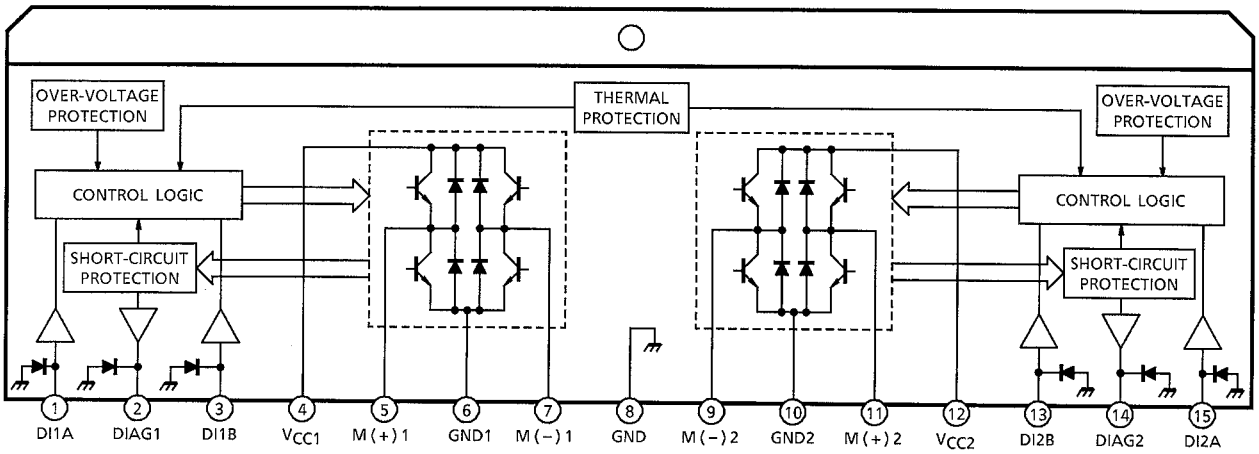
HZIP15-P-1.27A

Weight: 5.7 g (typ.)

FEATURES

- 1.5A bidirectional DC motor driver
- Two circuits contained (power supply, self-diagnostic, and protective functions provided for each)
- Low standby current : 0.1mA (Max.)
- Self−diagnostic output
  - Short−circuit : 3A
  - Open : 10mA
- Multiple protective functions : Short−circuit, thermal−shutdown, over−voltage protection
- Built-in counter electromotive force absorption diodes.
- Plastic HZIP−15pin

BLOCK DIAGRAM AND PIN LAYOUT



PIN DESCRIPTION

PIN No.		SYMBOL		DESCRIPTION
CH1	CH2	CH1	CH2	
1 3	15 13	DI1A DI1B	DI2A DI2B	Input pin. The signal from this pin controls the output state. (See TRUTH TABLE 1.)
2	14	DIAG1	DIAG2	Self-diagnosis output pin. (See TRUTH TABLE 2 and TIMING CHART.) This signal goes low when the output encounters over-current condition or is opened, whereas it goes high during normal operation or at the time of stop. This pin supplies an NPN open-collector output.
4	12	$V_{CC}1$	$V_{CC}2$	Power supply pin. This pin has a function to turn off the output when the applied voltage exceeds 32.5V, thus protecting the IC and the motor load.
5	11	M (+) 1	M (+) 2	Connects to the DC motor. Both the sink and the source have a current capacity of 1.5A. The circuit has a short-circuit protection function which protects the IC from load short-circuit, ground fault, or direct connection to high power. Diodes for absorbing counter electromotive force are contained on the V_{CC} and GND sides.
6	10	GND1	GND2	Grounded pin for output section.
7	9	M (−) 1	M (−) 2	A motor is connected between this pin and M (+) pin. This pin has the function equivalent to that of M (+) pin, and is controlled by input to the DIA and DIB pins.
8		GND		Grounded.

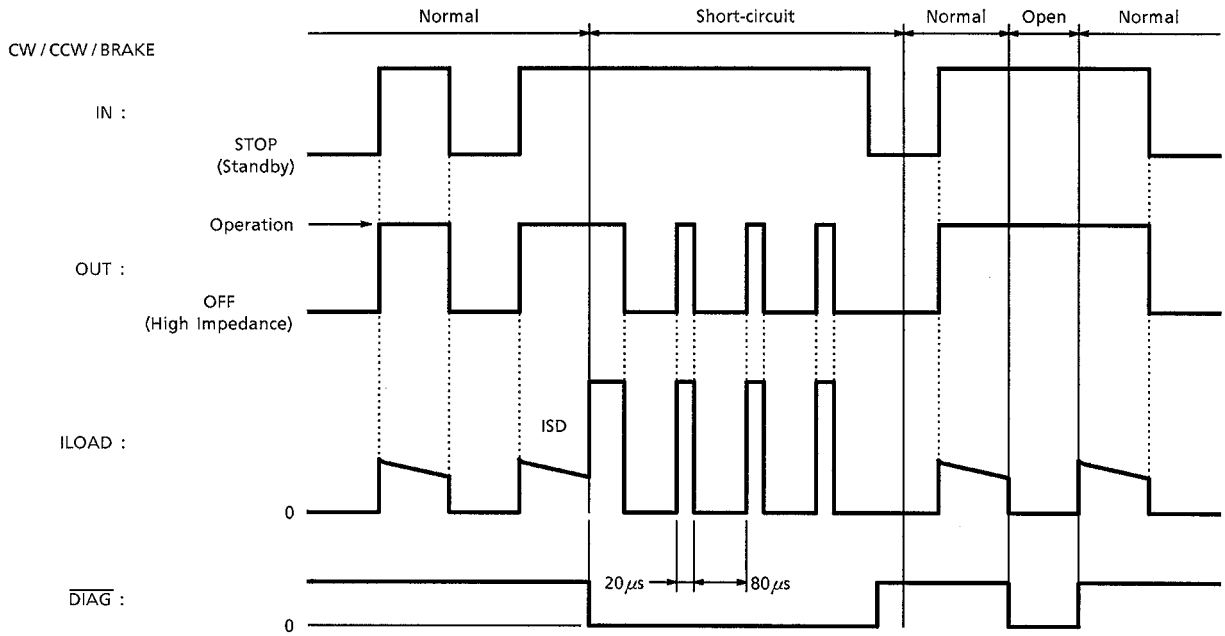
TRUTH TABLE 1 INPUT / OUTPUT

INPUT		OUTPUT		OPERATION MODE
DI1 / 2A	DI1 / 2B	M (+) 1 / 2	M (−) 1 / 2	
H	H	L	L	Brake
L	H	L	H	Reverse (CCW)
H	L	H	L	Forward (CW)
L	L	OFF (High impedance)		Stop (Standby)

TRUTH TABLE 2 SELF-DIAGNOSIS

INPUT		OUTPUT		DIAG
DI1 / 2A	DI1 / 2B	MODE	LOAD	
H	H	Brake	Normal	H
			Short	L
			Open	H
H / L	H / L	CCW / CW	Normal	H
			Short	L
			Open	L
L	L	Stop	—	H

SELF-DIAGNOSIS TIMING CHART



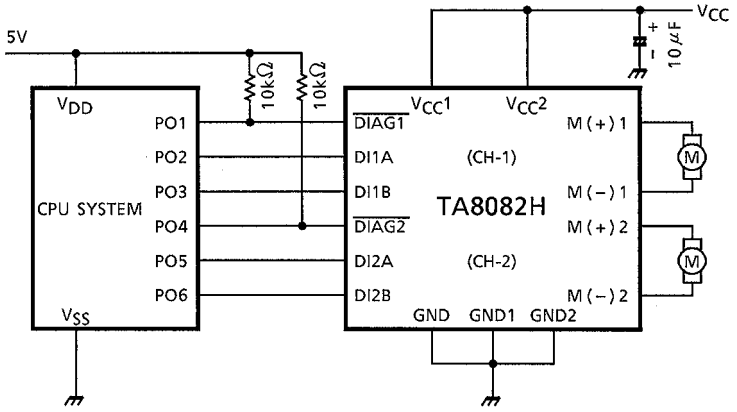
MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Power Supply Voltage	V_{CC}	30	V
	V_{CC}	60 (1s)	
Input Voltage	V_{IN}	−0.3~V_{CC}	V
Output Current	$I_{O\ AVE}$	1.5	A
Power Dissipation	P_D	25	W
Operating Temperature	T_{opr}	−40~110	°C
Storage Temperature	T_{stg}	−55~150	°C
Lead Temperature−time	T_{sol}	260 (10s)	°C

ELECTRICAL CHARACTERISTICS (V_{CC} = 6~16V, Tc = −40~110°C)

CHARACTERISTIC	SYMBOL	PIN	TEST CIR-CUIT	TEST CONDITION	MIN	TYP.	MAX	UNIT
Power Supply Current	$I_{CC}1$	$V_{CC}1$ / $V_{CC}2$	—	CH1 / 2 Stop	—	—	0.1	mA
	$I_{CC}2$		—	CH1 or 2 CW / CCW	—	20	40	
	$I_{CC}3$		—	CH1 / 2 CW / CCW	—	40	80	
	$I_{CC}4$		—	CH1 / 2 Brake	—	16	30	
Input Voltage	V_{IL}	DI1A / B DI2A / B	—	—	—	—	0.8	V
	V_{IH}		—	—	2.0	—	—	
Input Current	I_{IL}		—	V_{IN} = 0.4V	—	10	20	μA
	I_{IH}		—	V_{IN} = V_{CC}	—	140	300	
Output Saturation Voltage	V_{sat} (total)	M (+) / (−) 1 / M (+) / (−) 2	—	I_O = 1.5A, Tc = 25°C	—	2.2	2.9	V
			—	I_O = 1.5A, Tc = 110°C	—	2.2	2.8	
Output Leakage Current	I_{LEAK-U}		—	V_{OUT} = 0V	—	—	−10	μA
	I_{LEAK-L}		—	V_{OUT} = V_{CC}	—	—	10	
Diode Forward Voltage	V_{F-U}		—	I_F = 1.5A	—	2.6	—	V
	V_{F-L}		—		—	1.5	—	
Output Voltage	V_{OUT}	DIAG1 / 2	—	I_{OL} = 3mA	—	0.2	0.5	V
Output Leakage Current	I_{LEAK}		—	V_{OUT} = V_{CC}	—	—	5	μA
Over-current Detection	I_{SD}	—	—	—	2	3	4	A
Load-open Detection	I_{OS}	—	—	—	5	10	20	mA
Shutdown Temperature	T_{SD}	—	—	—	—	150	—	°C
Over-voltage Detection	V_{SD}	—	—	—	30	32.5	35	V
Thermal Resistance	$R\theta_{j-c}$	—	—	—	—	4	—	°C / W
Transfer Delay Time	t_{pLH}	—	—	—	—	1	10	μs
	t_{pHL}	—	—	—	—	1	10	

EXAMPLE OF APPLICATION CIRCUIT

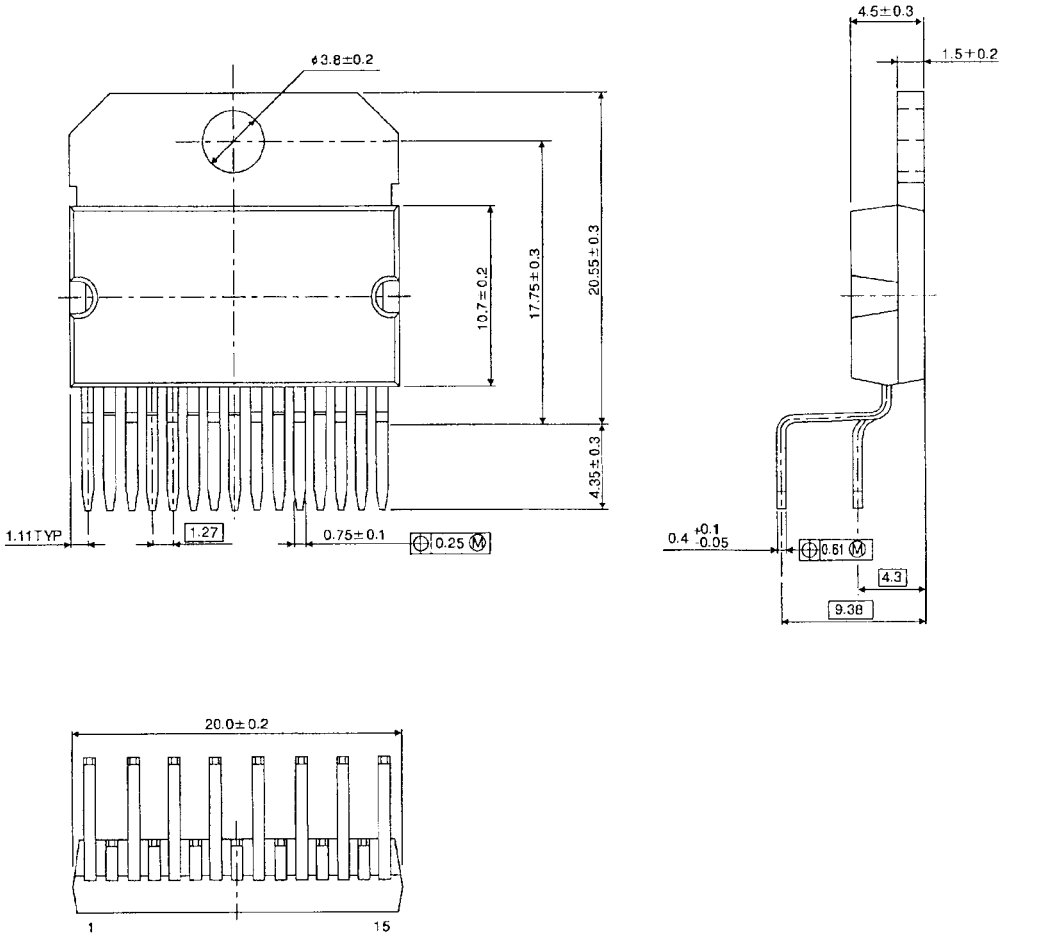


*: Cautions for wirings

C_1 is for absorbing disturbance, noise, etc. Connect it as close to the IC as possible.

Package Dimensions

HZIP15-P-1.27A Unit : mm



Weight: 5.7 g (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.