

TOSHIBA BIPOLAR LINEAR INTEGRATED CIRCUIT SILICON MONOLITHIC

TA8068L

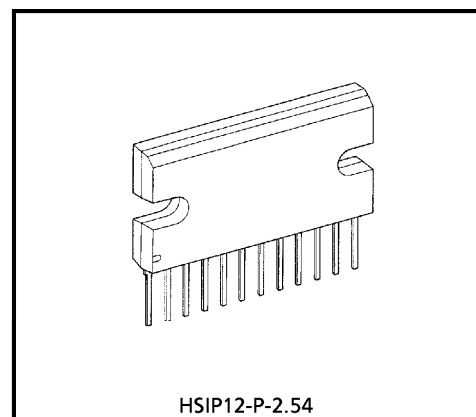
INTELLIGENT STEPPING MOTOR DRIVER

The TA8068L is a stepping motor driver with a current capacity of 1.5A. Inputs INA and INB are combined to control the four outputs.

Since the inputs are TTL-compatible, this IC can be controlled directly from a CPU or other control system. The IC also incorporates various protective functions as well as a self-diagnostic function for diagnostic function for diagnostic output.

FEATURES

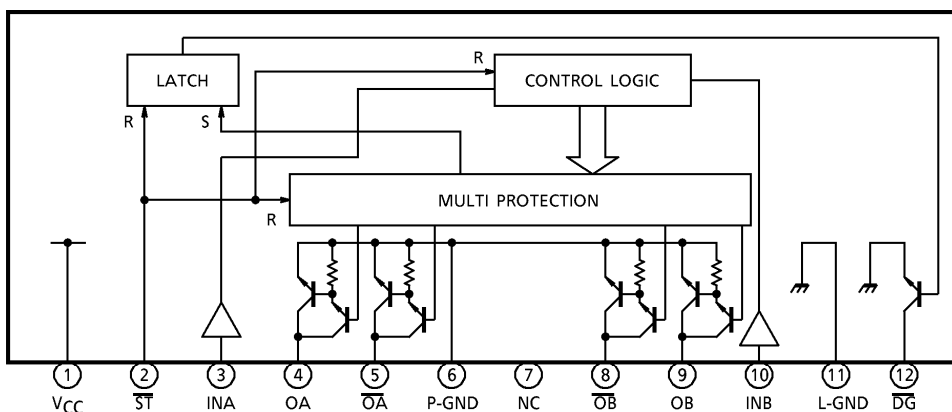
- Output current capacity : 1.5A (Max.)
- Low standby current : 100 μ A (Max.)
- Built-in Protective Functions : Over-Voltage Protection / Short-Circuit Protection (latch) / Thermal-Shutdown
- Self-diagnostic Output : On Short-Circuit Detection
- Separate GND for output and logic control sections
- Plastic package HSIP-12pin



HSIP12-P-2.54

Weight : 7.95g (Typ.)

BLOCK DIAGRAM AND PIN LAYOUT



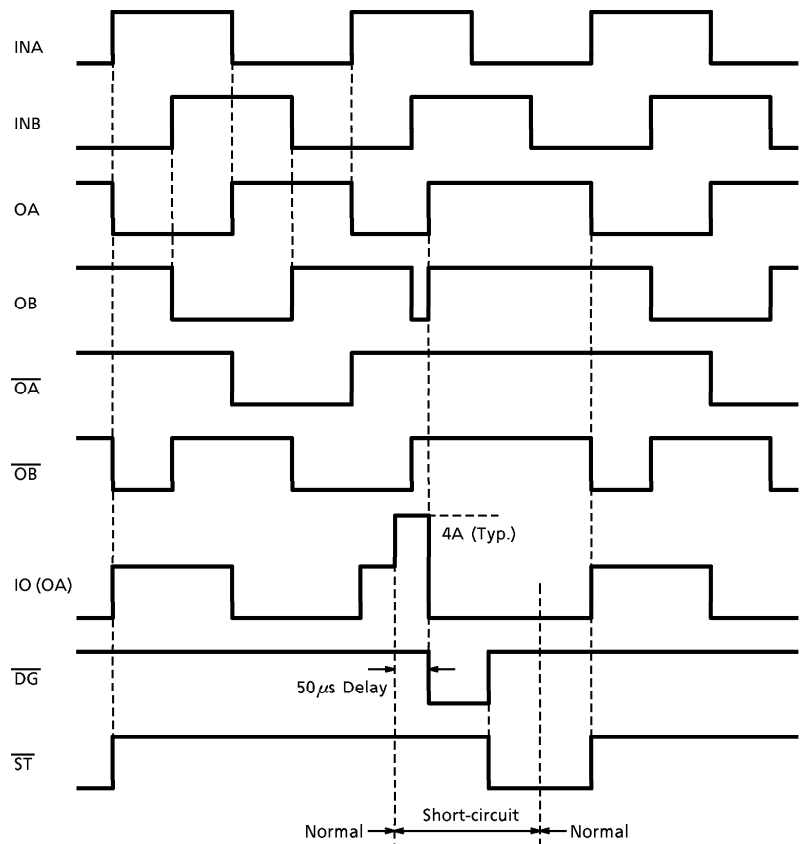
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PIN DESCRIPTION

PIN No.	SYMBOL	DESCRIPTION
1	V _{CC}	Power supply pin. This pin has a function to turn off the output when the applied voltage exceeds 30V (Typ.), thus protecting the IC and the motor load.
2	\overline{ST}	When this pin is opened or grounded, the output turns off, thus reducing the current consumption to 100 μ A or less. If standby mode is not needed, the pin is connected to V _{CC} .
3	INA	This is input terminal which controls output condition of pin 4 and pin 5. PNP-type voltage comparator is built in.
4	OA	PNP-type complementary output pin with a current capacity of 1.5A. This pin is controlled by the input from pin 3. When the output is supplied with a current exceeding the detection current (4A Typ.) because of load short-circuit, the output is latched to the OFF state after a 50 μ s (Typ.) delay in order to protect the IC.
5	\overline{OA}	Output pin of the inversion of pin 4. This terminal has the same function as pin 4 and is controlled by pin 3.
6	P-GND	Ground terminal of output section which is usually connected with pin 11.
7	(NC)	Not connected.
8	\overline{OB}	Output pin of the inversion of pin 9. This terminal has the same function as pin 4 and is controlled by pin 10.
9	OB	This terminal has the same function as pin 4 and is controlled by pin 10.
10	INB	This is input terminal which controls output condition of pin 8 and pin 9. PNP-type voltage comparator is built in.
11	L-GND	Ground terminal of logic control section which is usually connected with pin 6.
12	\overline{DG}	Self-diagnostic output pin. This signal goes low when the output is short-circuited while the input is on (high). The output will be latched after a 50 μ s (Typ.) delay when the load is short-circuited. This pin supplies an NPN open-collector output.

TIMING CHART



TRUTH TABLE INPUT / OUTPUT

INPUT			OUTPUT				
INA	INB	\overline{ST}	OA	\overline{OA}	OB	\overline{OB}	\overline{DG}
L	L	H	OFF	ON	OFF	ON	OFF
L	H	H	OFF	ON	ON	OFF	OFF
H	L	H	ON	OFF	OFF	ON	OFF
H	H	H	ON	OFF	ON	OFF	OFF
—	—	L	OFF	OFF	OFF	OFF	OFF
—	—	OPEN	OFF	OFF	OFF	OFF	OFF

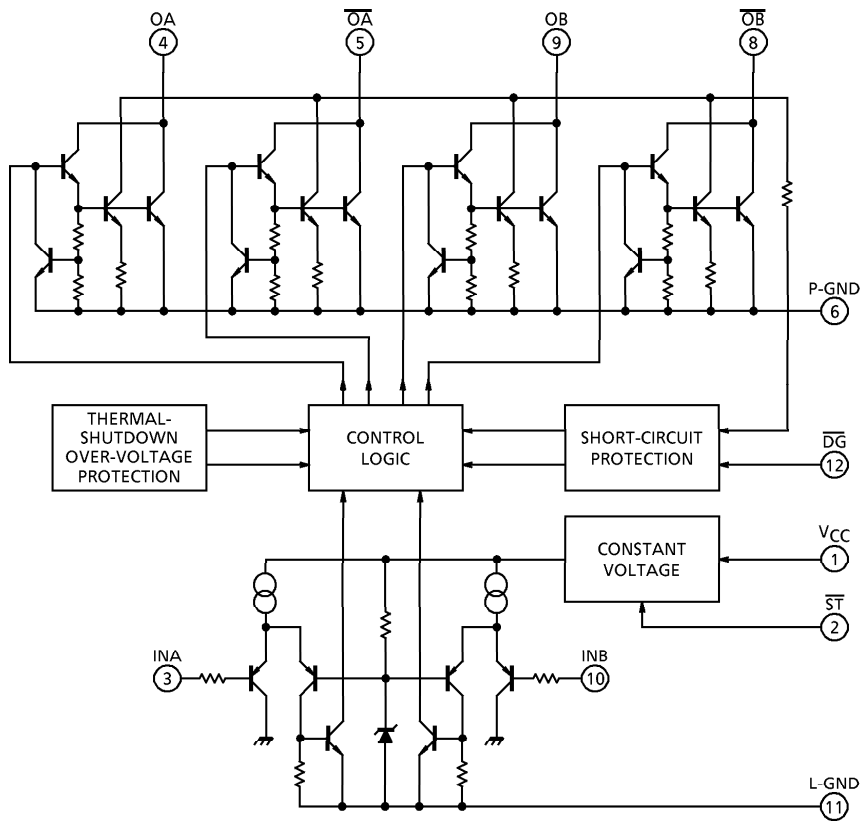
MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Supply Voltage	V _{CC}	30	V
	V _{CC}	60 (1s)	
Input Voltage	V _{IN}	-0.3~7	V
Output Voltage	V _{CC}	-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

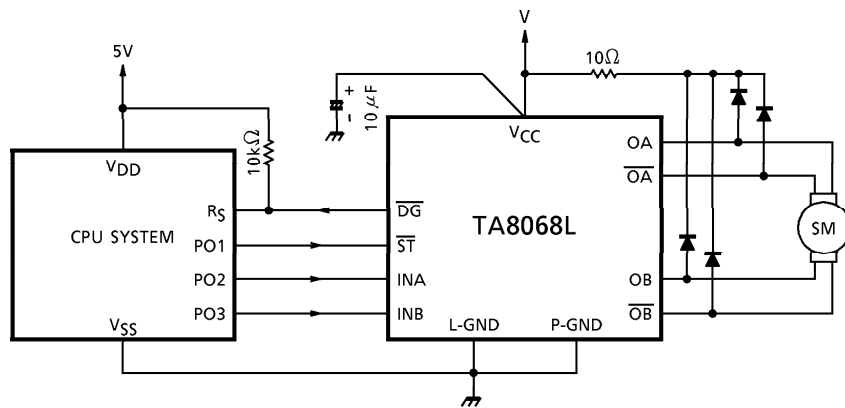
ELECTRICAL CHARACTERISTICS (V_{CC} = 8~16V, Ta = -40~85°C)

CHARACTERISTIC	SYMBOL	PIN	TEST CIRCUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Current Consumption	I _{CC}	V _{CC}	—	—	12	25	40	mA
Input Voltage	V _{IL}	INA / INB	—	—	—	—	0.8	V
	V _{IH}		—	—	2.4	—	—	
Input Current	I _{IL}	INA / INB	—	V _{IN} = 0.4V	-50	—	—	μA
	I _{IH}		—	V _{IN} = 5V	—	—	10	
Input Voltage	V _{IL}	ST	—	—	—	—	0.8	V
	V _{IH}		—	—	3.0	—	—	
Output Saturation Voltage	V _{SAT}	OA, \overline{OA} OB, \overline{OB}	—	I _O = 1.5A / Ta = 25°C	—	1.25	1.5	V
Output Leakage Current	I _{LEAK}	OA, \overline{OA} OB, \overline{OB}	—	V _O = V _{CC}	—	—	10	μA
Output Voltage	V _{OL}	\overline{DG}	—	I _{OL} = 3mA	—	—	0.3	V
Output Leakage Current	I _{LEAK}		—	V _O = V _{CC}	—	—	10	μA
Over-current Detection	ISD	—	—	—	1.8	4	6	A
Shutdown Temperature	TSD-H	—	—	OUT = ON→OFF	—	160	—	°C
	TSD-L	—	—	OUT = OFF→ON	—	130	—	
Over-voltage Detection	VSD	—	—	—	27.5	30	33	V
Standby Current	IST	V _{CC}	—	\overline{ST} = GND	—	—	100	μA
Thermal Resistance	R _{θj-c}	—	—	—	—	3	—	°C/W
Transfer Delay Time	t _{pLH}	—	—	—	—	1	10	μs
	t _{pHL}	—	—	—	—	1	10	

EQUIVALENT CIRCUIT

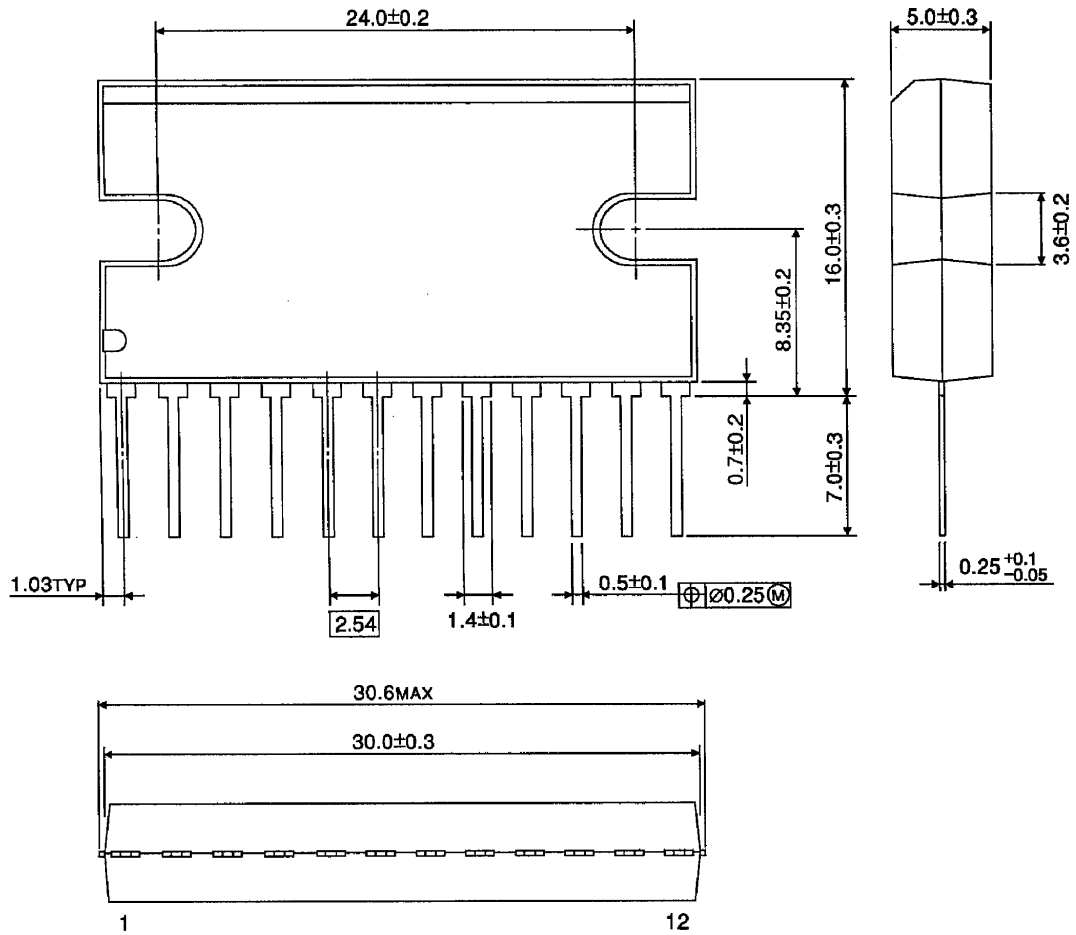


APPLICATION CIRCUIT



OUTLINE DRAWING
HSIP12-P-2.54

Unit : mm



Weight : 7.95g (Typ.)