

# TA8428K

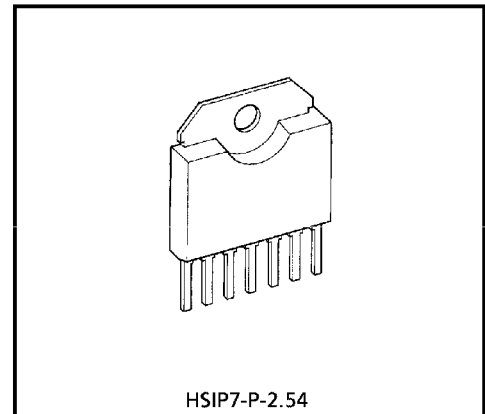
## 1.5 A FULL BRIDGE DRIVER

The TA8428K is Full Bridge Driver IC for Brush Motor Rotation Control that has current capability of up to 1.5 A (AVE).

Thermal Shutdown and Short Current Protector are provided.

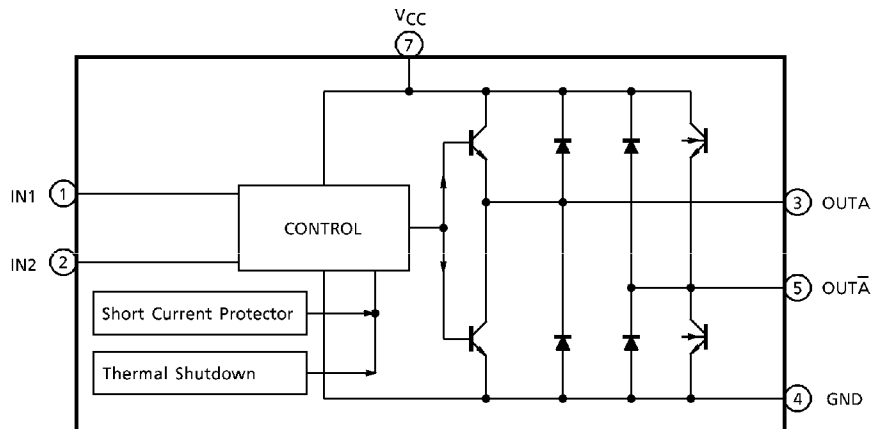
### FEATURES

- 1.5 A (AVE.) full bridge driver
- 4 modes (forward / reverse / short brake and stop) are available with 2 TTL compatible inputs control.
- H-SIP 7 compact SIP package sealed.
- Free wheeling diodes are equipped.
- Multi protection system driver (Thermal shutdown and short current protector)



Weight : 1.88 g (Typ.)

### BLOCK DIAGRAM



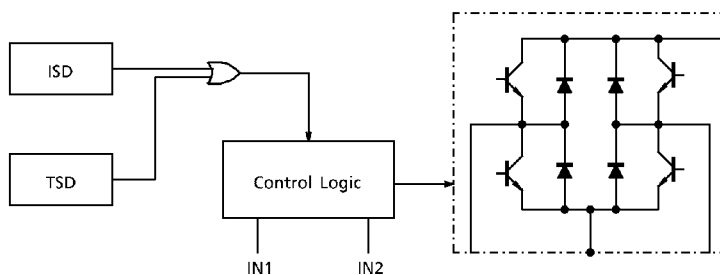
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**PIN FUNCTION**

PIN No.	SYMBOL	FUNCTIONAL DESCRIPTION
1	IN1	TTL compatible control inputs.
2	IN2	(PNP type low active comparator inputs)
3	OUTA	Output terminals and free wheeling diodes are connected between each output to GND and V <sub>CC</sub> .
4	GND	GND terminal
5	OUTA <sup>̄</sup>	Output terminals and free wheeling diodes are connected between each output to GND and V <sub>CC</sub> .
6	N.C	Non connection
7	V <sub>CC</sub>	Supply voltage terminal for control and motor drive.

TA8428K has 2 build-in protective functions which work independently. These circuit operations are as follows.



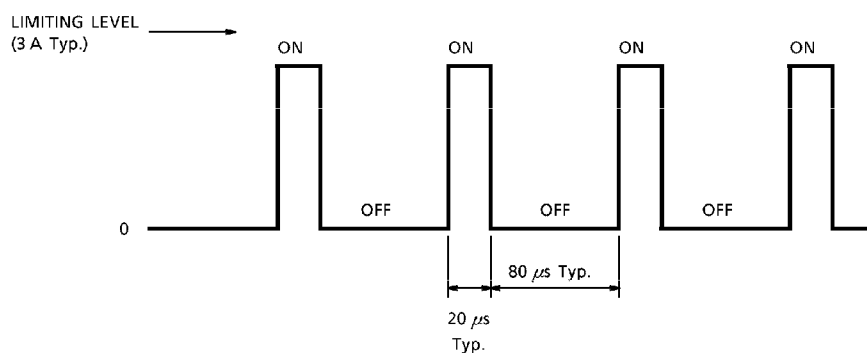
- Thermal shutdown (TSD)

If junction temperature of TA8428K is over the specified temperature (150°C Typ.) by excess power dissipation or abnormal ambient temperature change, thermal Shutdown circuit turn "ON" and output 4 transistors become High impedance. (All transistors turn "OFF")

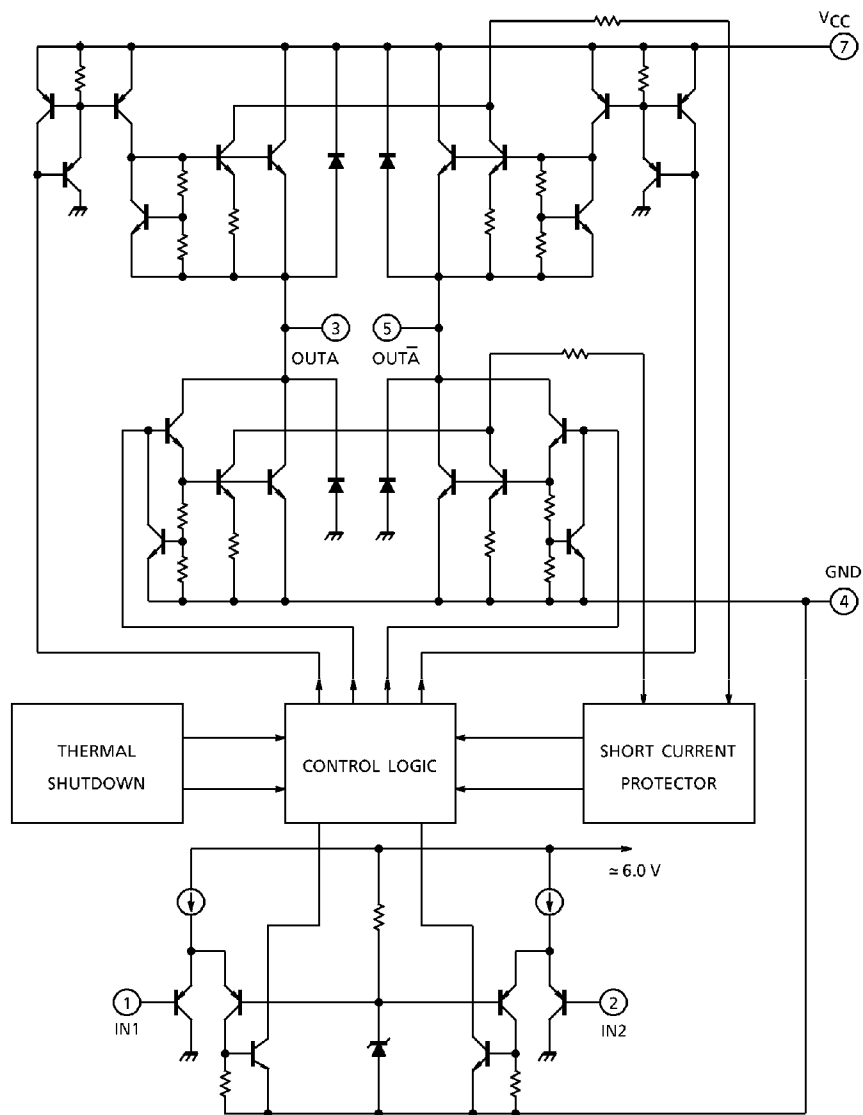
- Short current protector (ISD)

Short current protector circuit senses all output transistor current. If output transistor current is over the specified limiting current value (3 A Typ.), short current protector operates and all output transistors periodically turn "OFF" (High Impedance Mode) in a period of approximately 80  $\mu$ s.

This state is continued until the release of over current mode.



**INTERNAL CIRCUIT**



**MAXIMUM RATINGS (Ta = 25°C)**

CHARACTERISTIC	SYMBOL	RATING	UNIT
Supply Voltage	V <sub>CC</sub>	30	V
Input Voltage	V <sub>IN</sub>	- 0.3~V <sub>CC</sub>	V
Output Current	AVE.	I <sub>O</sub> (AVE.)	1.5
	PEAK	I <sub>O</sub> (PEAK)	3.0 (Note 1)
Power Dissipation	P <sub>D</sub>	1.25 (Note 2)	W
		10.0 (Note 3)	
Operating Temperature	T <sub>opr</sub>	- 30~85	°C
Storage Temperature	T <sub>stg</sub>	- 55~150	°C

(Note 1) t = 100 ms

(Note 2) No heat sink

(Note 3) T<sub>c</sub> = 85°C

**ELECTRICAL CHARACTERISTICS (V<sub>CC</sub> = 24 V, Ta = 25°C)**

CHARACTERISTIC	SYMBOL	TEST CIR-CUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Quiescent Current	I <sub>CC1</sub>	1	Stop mode	—	8	15	mA
	I <sub>CC2</sub>		Forward / reverse mode	—	35	85	
	I <sub>CC3</sub>		Brake mode	—	16	30	
Input Voltage	V <sub>IL</sub>	2	—	—	—	0.8	V
	V <sub>IH</sub>		—	2.0	—	—	
Input Current	I <sub>IL</sub>	2	V <sub>IN</sub> = GND	—	—	50	μA
	I <sub>IH</sub>		V <sub>IN</sub> = V <sub>CC</sub>	—	—	10	
Output Saturation Voltage	V <sub>sat</sub> (total)	3	I <sub>O</sub> = 1.5 A, T <sub>c</sub> = 25°C	—	2.2	2.9	V
Output Leakage Current	I <sub>LU</sub>	4	V <sub>L</sub> = 25 V	—	—	50	μA
	I <sub>LL</sub>			—	—	50	
Diode Forward Voltage	V <sub>FU</sub>	5	I <sub>F</sub> = 1.5 A	—	2.6	—	V
	V <sub>FL</sub>			—	1.5	—	
Limiting Current	I <sub>SD</sub>	—	—	—	3	—	A
Thermal Shutdown Operating Temperature	T <sub>SD</sub>	—	—	—	150	—	°C
Propagation Delay Time	t <sub>pLH</sub>	2	—	—	1	10	μs
	t <sub>pHL</sub>	2	—	—	1	10	

**FUNCTION**

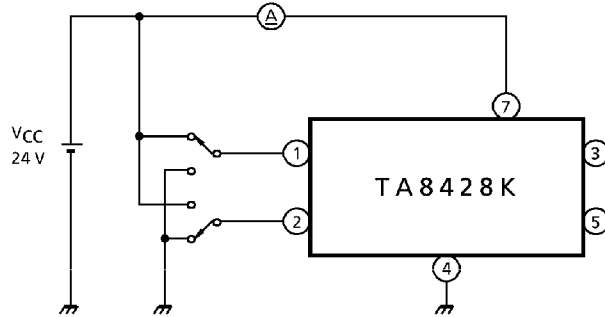
INPUT		OUTPUT		MODE
IN1	IN2	OUTA	OUT $\bar{A}$	
H	H	L	L	Brake
L	H	L	H	CW / CCW
H	L	H	L	CCW / CW
L	L	OFF (high impedance)		Stop

(Note) PIN  $\text{\textcircled{C}}$  is non connection.

(Note) Heat fin is connected with GND with low impedance.

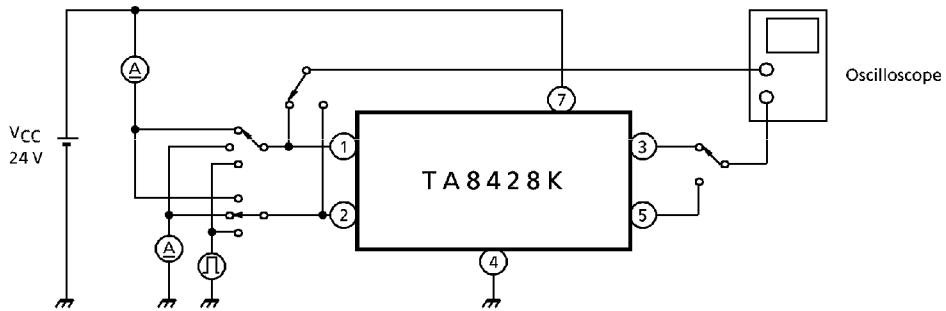
**TEST CIRCUIT 1.**

$I_{CC1}$ ,  $I_{CC2}$ ,  $I_{CC3}$



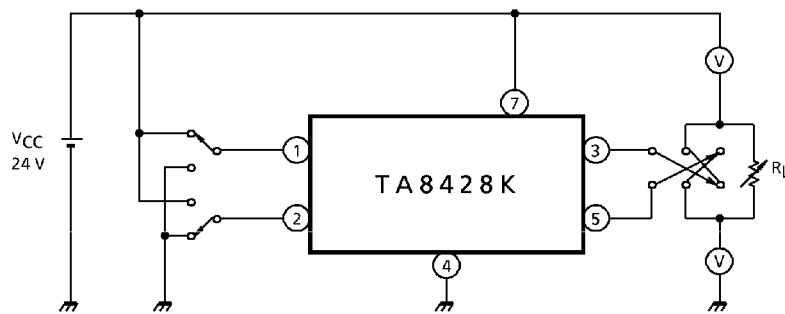
**TEST CIRCUIT 2.**

$V_{IL}$ ,  $V_{IH}$ ,  $I_{IL}$ ,  $I_{IH}$ ,  $t_{pLH}$ ,  $t_{pHL}$



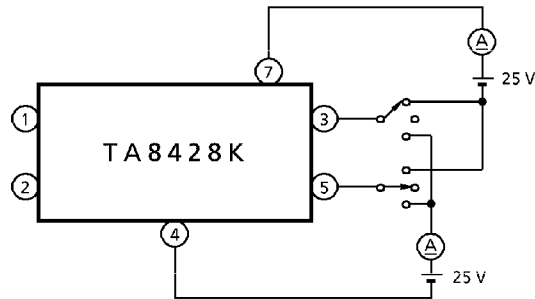
**TEST CIRCUIT 3.**

$V_{sat}$



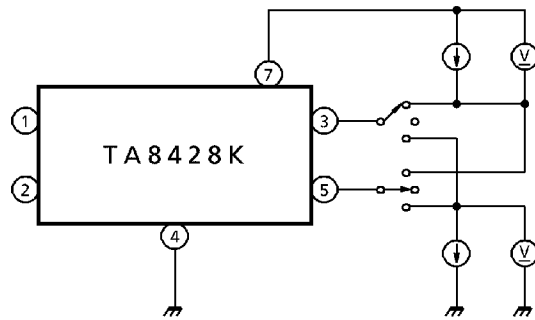
**TEST CIRCUIT 4.**

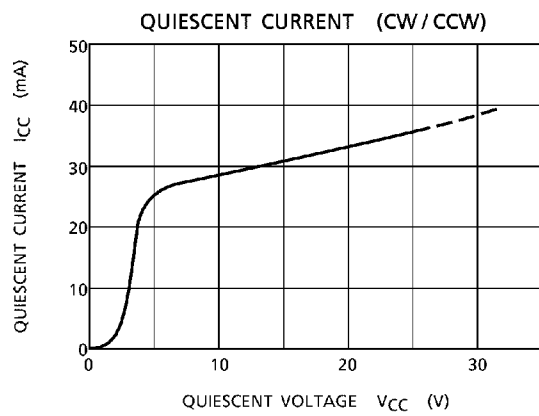
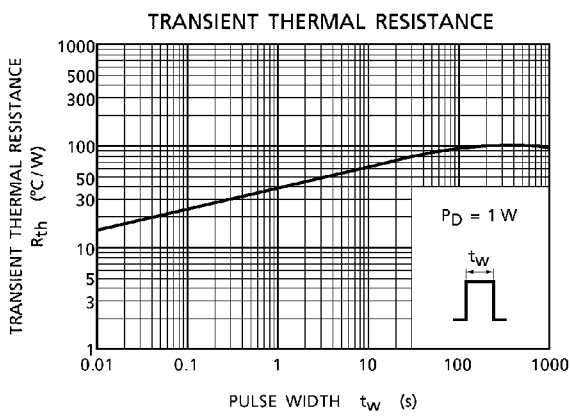
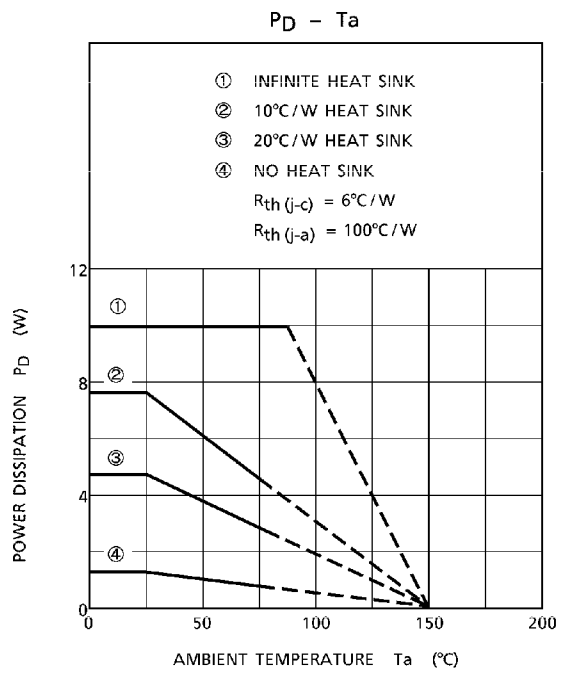
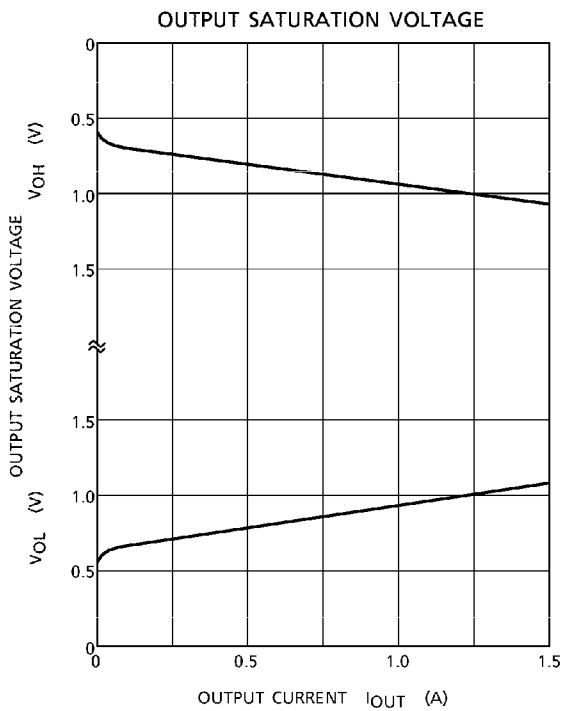
$I_{LH}, I_{LL}$



**TEST CIRCUIT 5.**

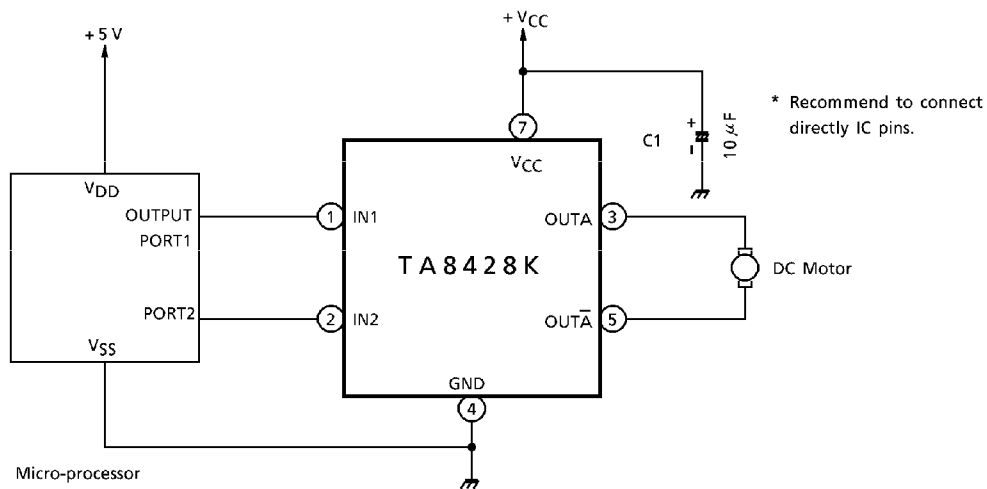
$V_{FU}, V_{FL}$



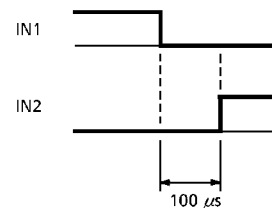




APPLICATION CIRCUIT



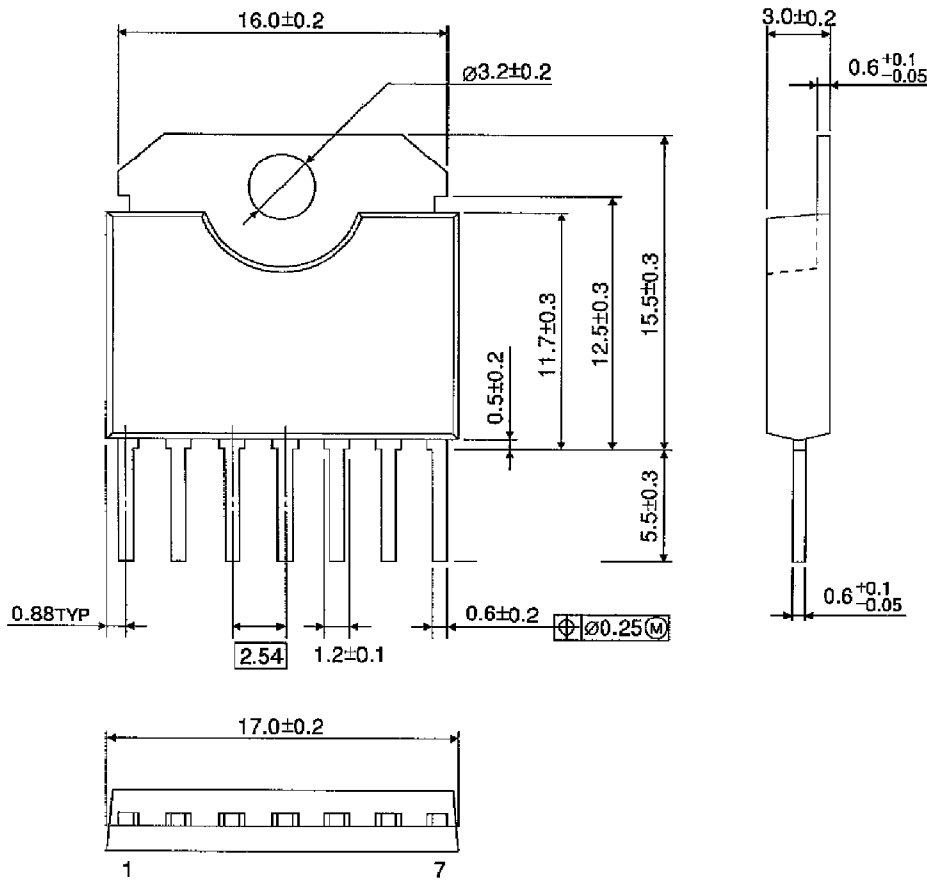
(Note) Recommend to take approximately  $100\ \mu\text{s}$  of input dead time for reliable operations.



(Note) Utmost care is necessary in the design of the output line,  $V_{CC}$  and GND line since IC may be destroyed due to short-circuit between outputs, air contamination fault, or fault by improper grounding.

**OUTLINE DRAWING**  
HSIP7-P-2.54

Unit : mm



Weight : 1.88 g (Typ.)