

TA8428K

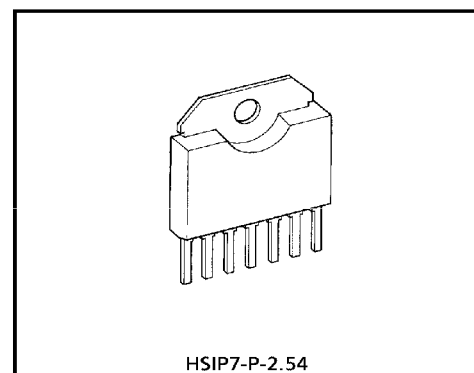
1.5 A FULL BRIDGE DRIVER

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

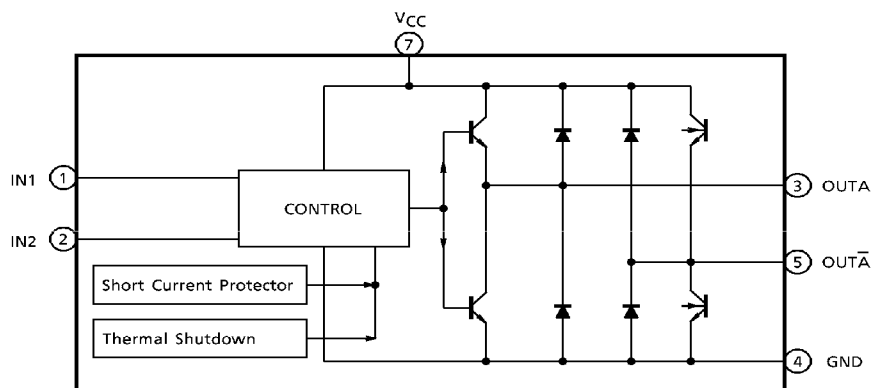
- 1.5 A (AVE.) full bridge driver
- 4 modes (forward / reverse / short brake and stop) are available with 2 TTL compatible inputs control.
- H-SIP 7 compact SIP package sealed.
- Free wheeling diodes are equipped.
- Multi protection system driver (Thermal shutdown and short current protector)



HSIP7-P-2.54

Weight : 1.88 g (Typ.)

BLOCK DIAGRAM



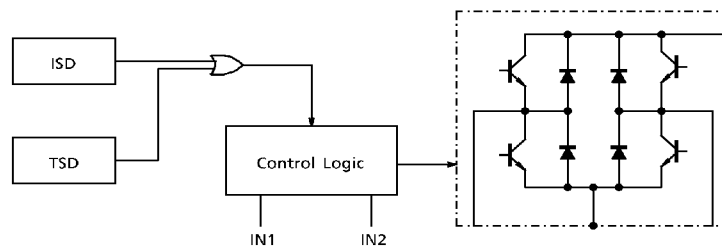
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PIN FUNCTION

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

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



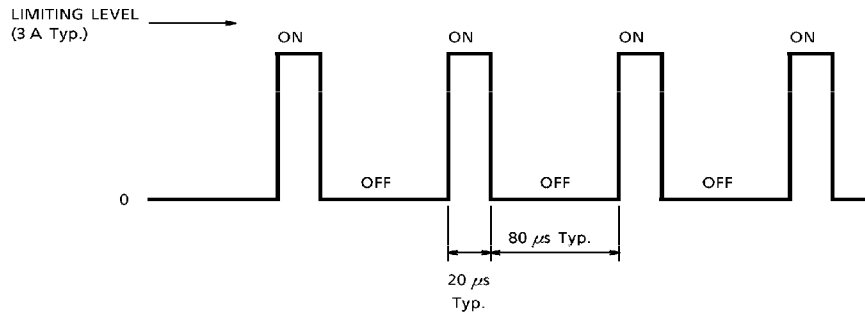
- Thermal shutdown (TSD)

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")

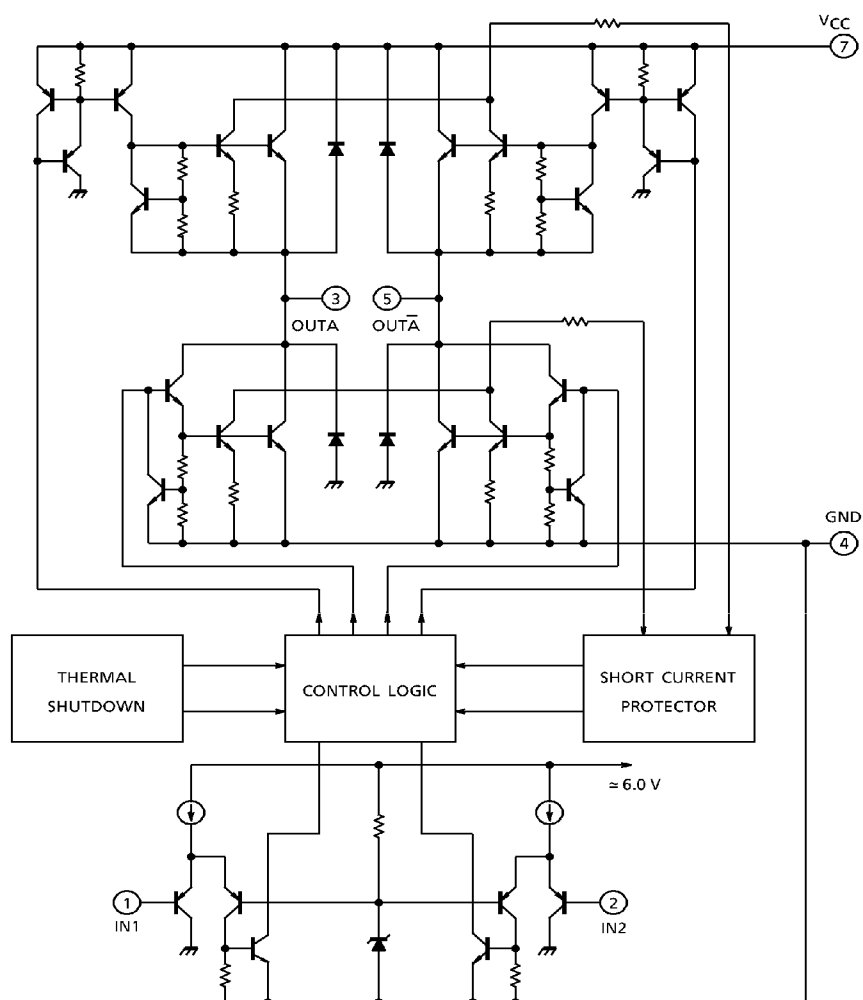
- Short current protector (ISD)

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 μs .

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



INTERNAL CIRCUIT



MAXIMUM RATINGS ($T_a = 25^\circ\text{C}$)

CHARACTERISTIC		SYMBOL	RATING	UNIT
Supply Voltage		V_{CC}	30	V
Input Voltage		V_{IN}	$-0.3 \sim V_{CC}$	V
Output Current	AVE.	I_O (AVE.)	1.5	A
	PEAK	I_O (PEAK)	3.0 (Note 1)	
Power Dissipation		P_D	1.25 (Note 2)	W
			10.0 (Note 3)	
Operating Temperature		T_{opr}	$-30 \sim 85$	$^\circ\text{C}$
Storage Temperature		T_{stg}	$-55 \sim 150$	$^\circ\text{C}$

(Note 1) $t = 100 \text{ ms}$

(Note 2) No heat sink

(Note 3) $T_c = 85^\circ\text{C}$ **ELECTRICAL CHARACTERISTICS** ($V_{CC} = 24 \text{ V}$, $T_a = 25^\circ\text{C}$)

CHARACTERISTIC	SYMBOL	TEST CIR-CUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Quiescent Current	I_{CC1}	1	Stop mode	—	8	15	mA
	I_{CC2}		Forward / reverse mode	—	35	85	
	I_{CC3}		Brake mode	—	16	30	
Input Voltage	V_{IL}	2	—	—	—	0.8	V
	V_{IH}		—	2.0	—	—	
Input Current	I_{IL}	2	$V_{IN} = \text{GND}$	—	—	50	μA
	I_{IH}		$V_{IN} = V_{CC}$	—	—	10	
Output Saturation Voltage	V_{sat} (total)	3	$I_O = 1.5 \text{ A}$, $T_c = 25^\circ\text{C}$	—	2.2	2.9	V
Output Leakage Current	I_{LU}	4	$V_L = 25 \text{ V}$	—	—	50	μA
	I_{LL}			—	—	50	
Diode Forward Voltage	V_{FU}	5	$I_F = 1.5 \text{ A}$	—	2.6	—	V
	V_{FL}			—	1.5	—	
Limiting Current	I_{SD}	—	—	—	3	—	A
Thermal Shutdown Operating Temperature	T_{SD}	—	—	—	150	—	$^\circ\text{C}$
Propagation Delay Time	t_{PLH}	2	—	—	1	10	μs
	t_{PHL}	2	—	—	1	10	

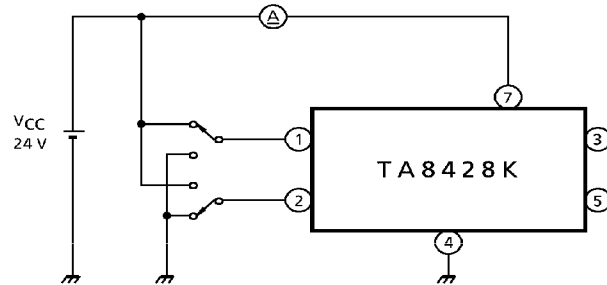
FUNCTION

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

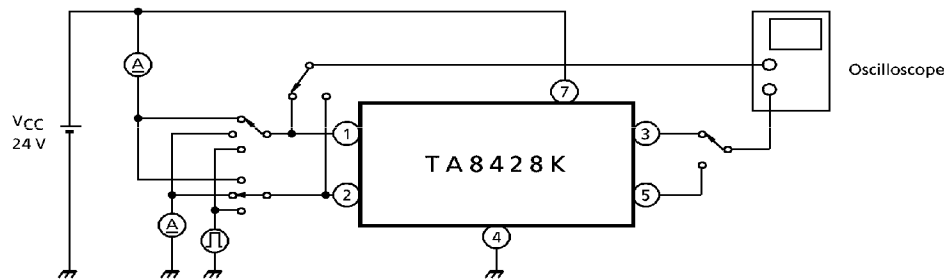
(Note) PIN ⑥ is non connection.

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

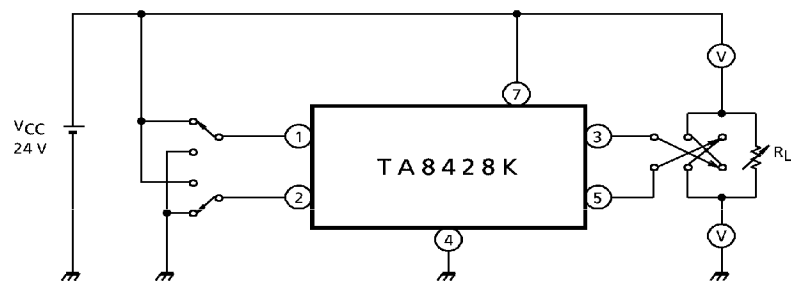
TEST CIRCUIT 1.

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

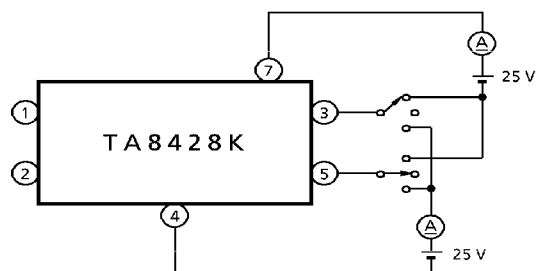
TEST CIRCUIT 2.

 V_{IL} , V_{IH} , I_{IL} , I_{IH} , t_{PLH} , t_{PHL} 

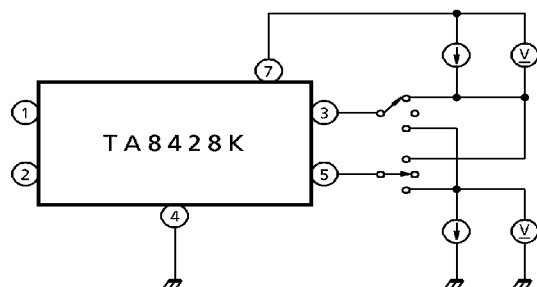
TEST CIRCUIT 3.

 V_{sat} 

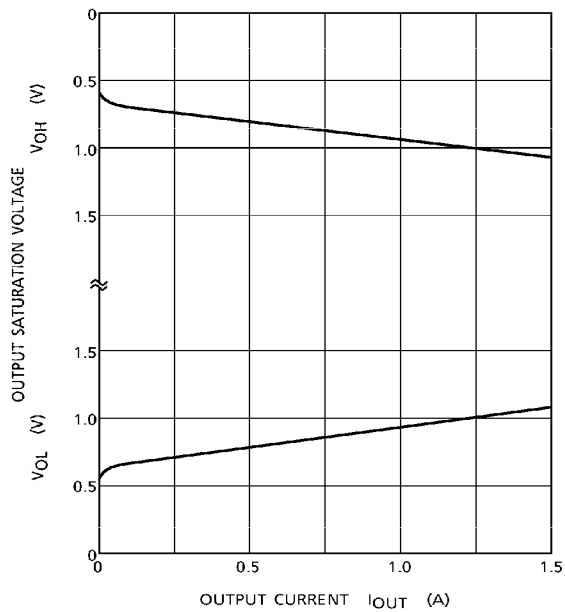
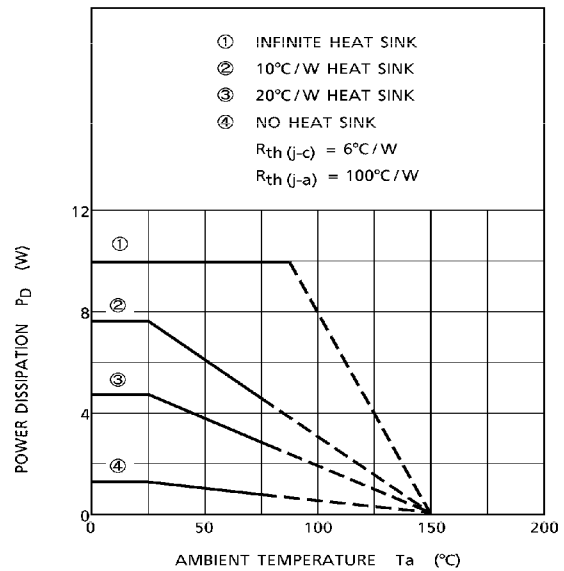
TEST CIRCUIT 4.

 I_{LH} , I_{LL} 

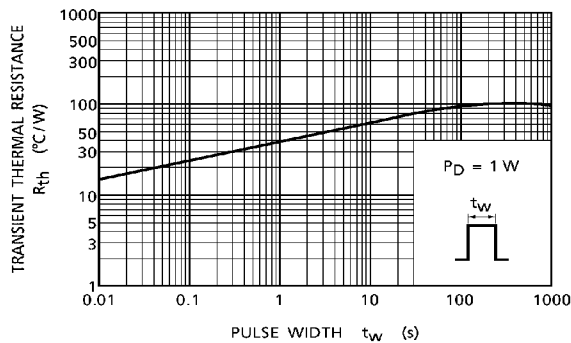
TEST CIRCUIT 5.

 V_{FU} , V_{FL} 

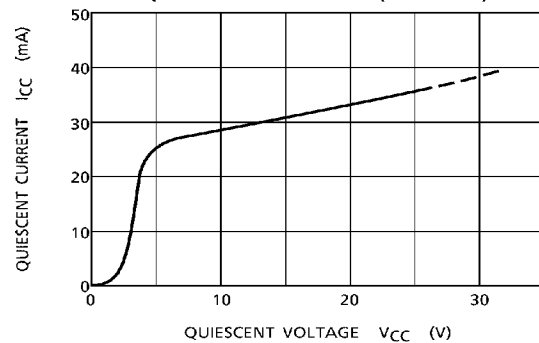
OUTPUT SATURATION VOLTAGE

 $P_D - T_a$ 

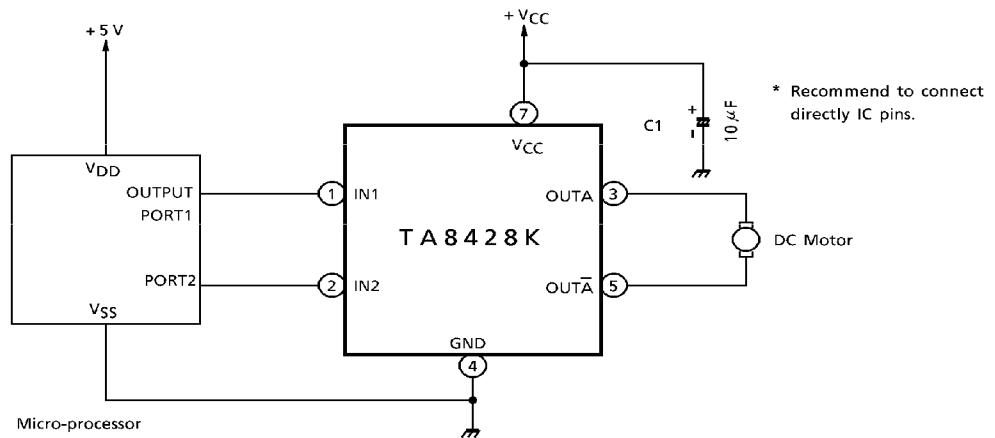
TRANSIENT THERMAL RESISTANCE



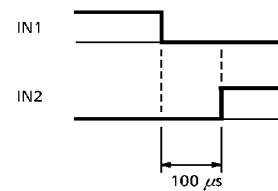
QUIESCENT CURRENT (CW/CCW)



APPLICATION CIRCUIT



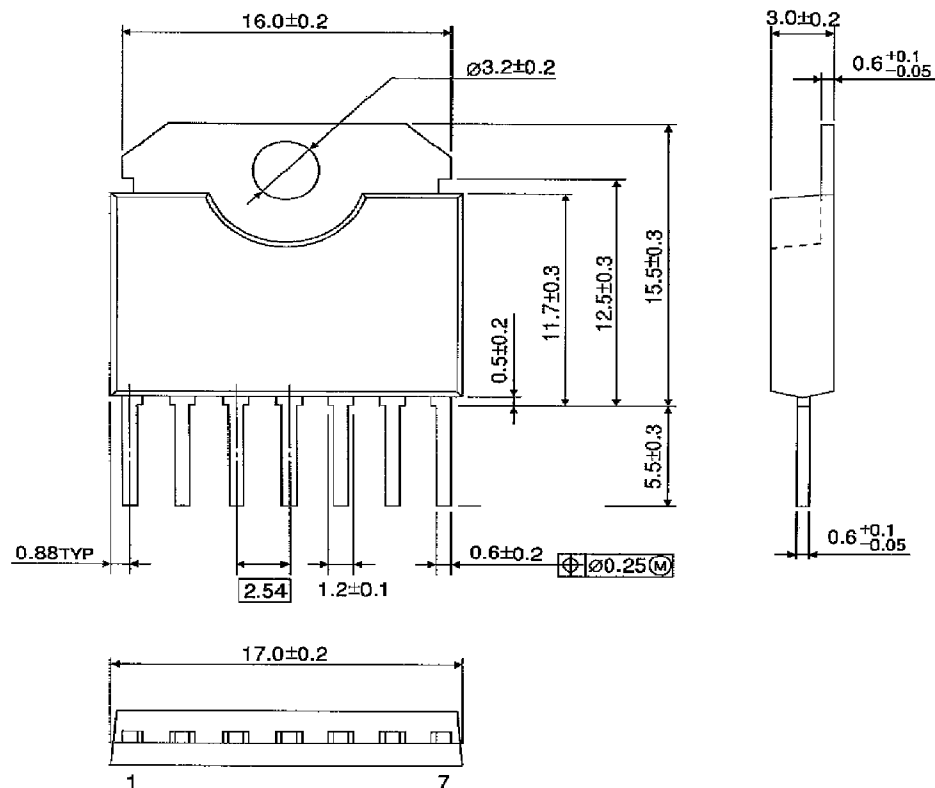
(Note) Recommend to take approximately $100\ \mu\text{s}$ of input dead time for reliable operations.



(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.)