

TOSHIBA BIPOLAR LINEAR INTEGRATED CIRCUIT SILICON MONOLITHIC

TA8428K

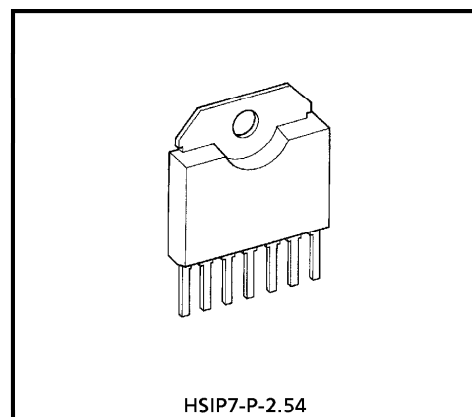
1.5 A FULL BRIDGE DRIVER

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.

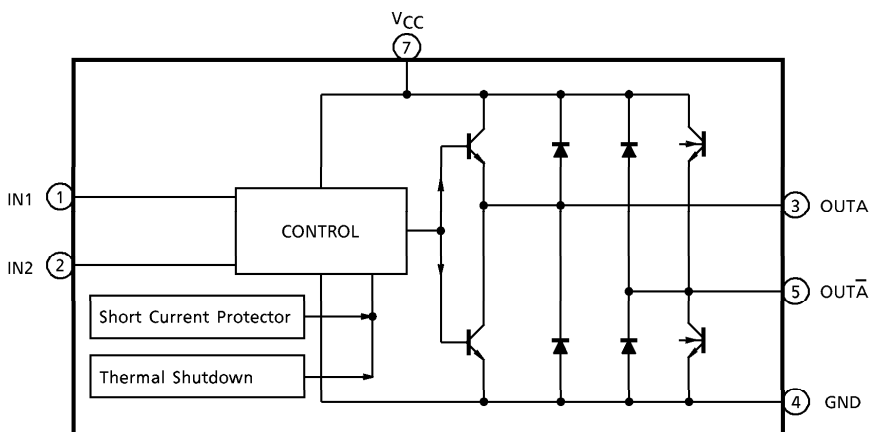
FEATURES

- 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



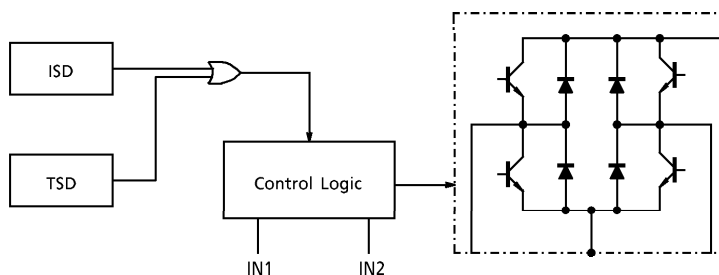
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PIN FUNCTION

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 _{CC} .
4	GND	GND terminal
5	OUT \bar{A}	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.



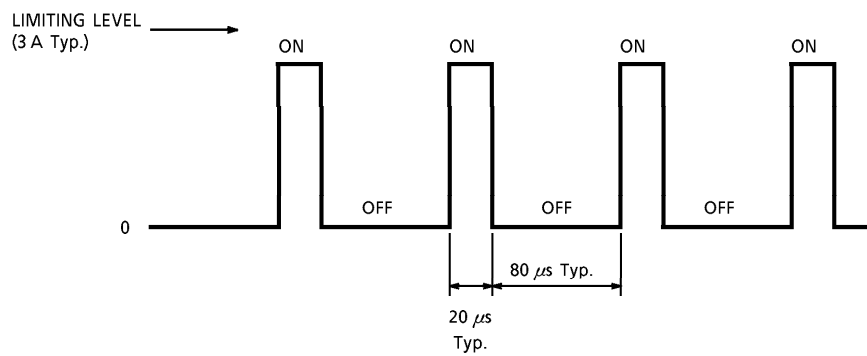
- Thermal shutdown (TSD)

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")

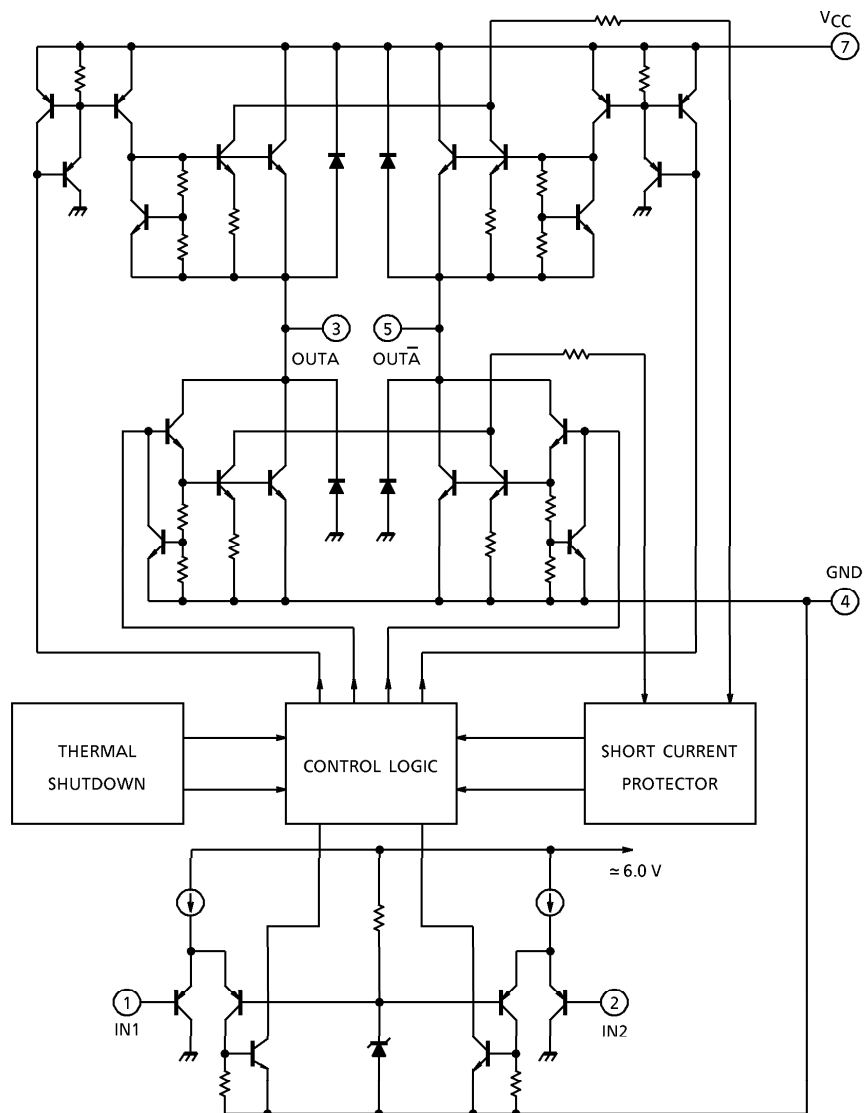
- Short current protector (ISD)

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 μ 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 _{CC}	30	V
Input Voltage		V _{IN}	-0.3~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}	-30~85	°C
Storage Temperature		T _{stg}	-55~150	°C

(Note 1) t = 100 ms

(Note 2) No heat sink

(Note 3) T_c = 85°C

ELECTRICAL CHARACTERISTICS (V_{CC} = 24 V, Ta = 25°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} = GND	—	—	50	μA
	I _{IH}		V _{IN} = V _{CC}	—	—	10	
Output Saturation Voltage	V _{sat} (total)	3	I _O = 1.5 A, T _c = 25°C	—	2.2	2.9	V
Output Leakage Current	I _{LU}	4	V _L = 25 V	—	—	50	μA
	I _{LL}			—	—	50	
Diode Forward Voltage	V _{FU}	5	I _F = 1.5 A	—	2.6	—	V
	V _{FL}			—	1.5	—	
Limiting Current	I _{SD}	—	—	—	3	—	A
Thermal Shutdown Operating Temperature	T _{SD}	—	—	—	150	—	°C
Propagation Delay Time	t _{pLH}	2	—	—	1	10	μs
	t _{pHL}	2	—	—	1	10	

FUNCTION

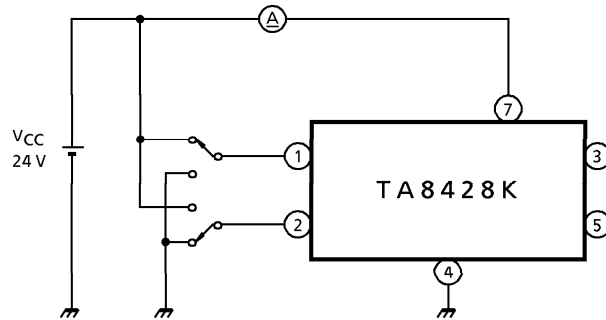
INPUT		OUTPUT		MODE
IN1	IN2	OUTA	OUTĀ	
H	H	L	L	Brake
L	H	L	H	CW / CCW
H	L	H	L	CCW / CW
L	L	OFF (high impedance)		Stop

(Note) PIN ⑥ is non connection.

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

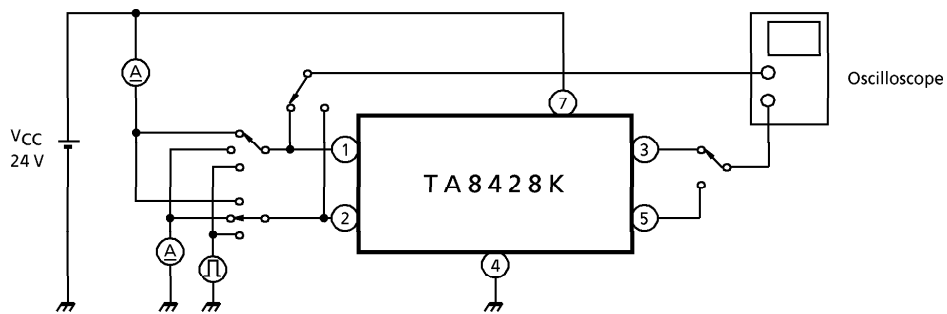
TEST CIRCUIT 1.

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



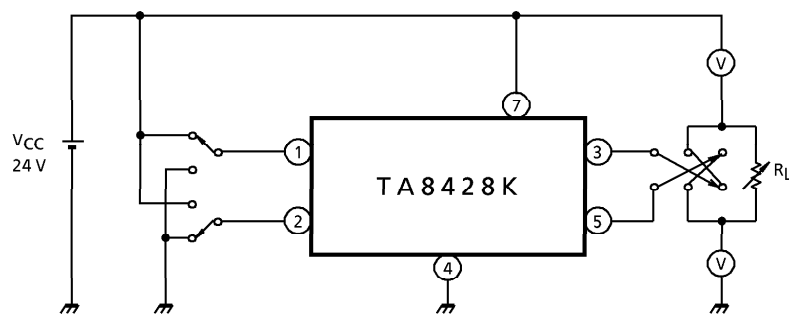
TEST CIRCUIT 2.

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



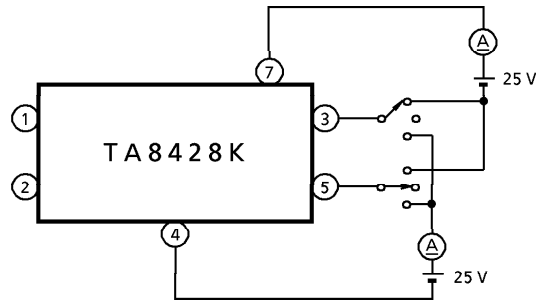
TEST CIRCUIT 3.

V_{sat}



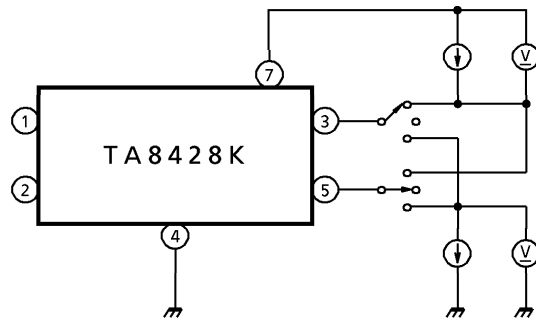
TEST CIRCUIT 4.

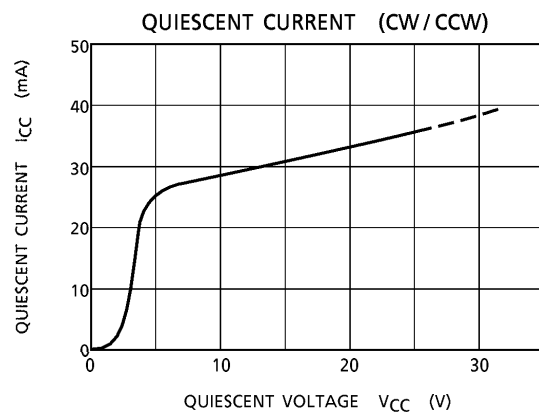
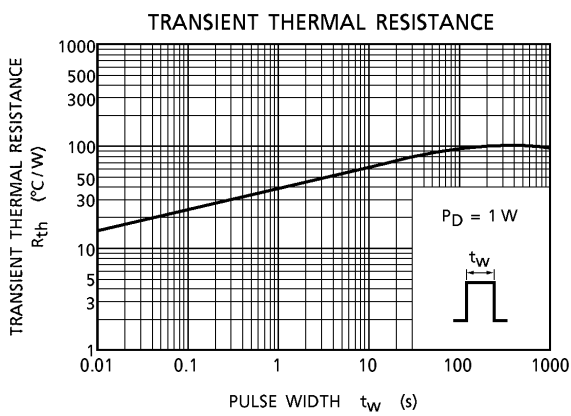
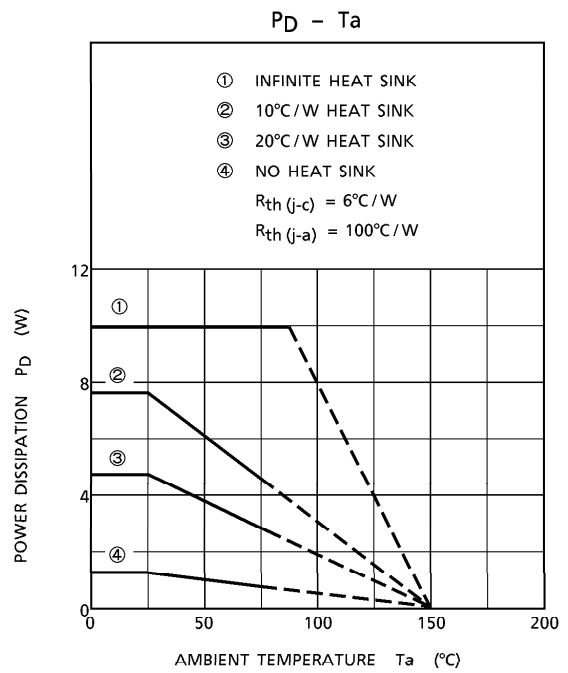
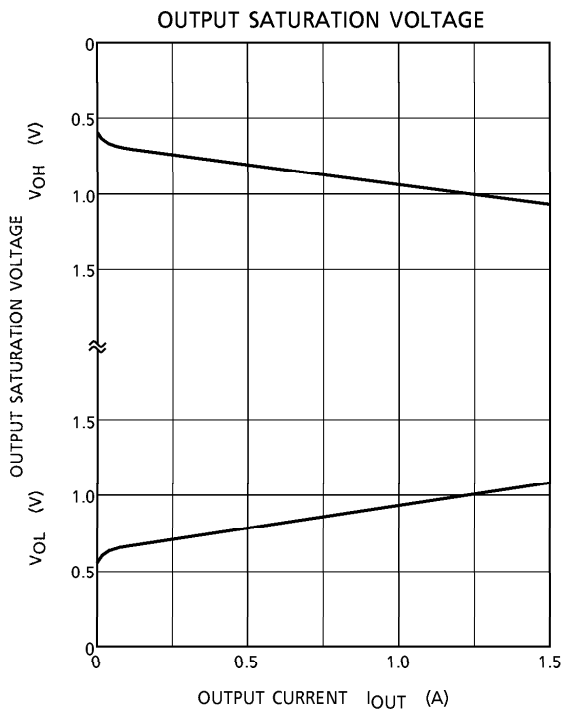
I_{LH}, I_{LL}



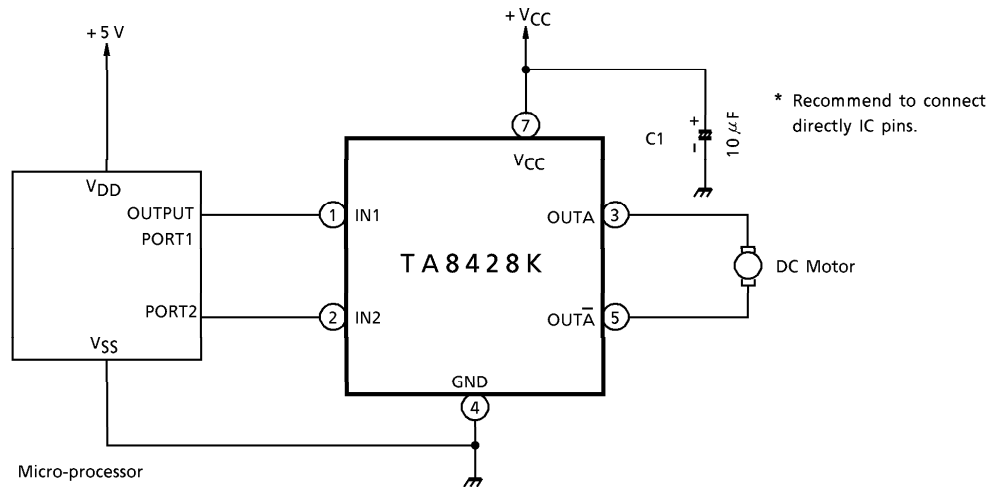
TEST CIRCUIT 5.

V_{FU}, V_{FL}

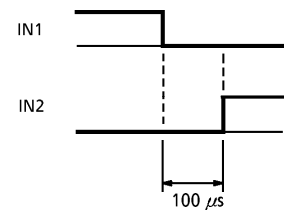




APPLICATION CIRCUIT



(Note) Recommend to take approximately 100 μ s of input dead time for reliable operations.

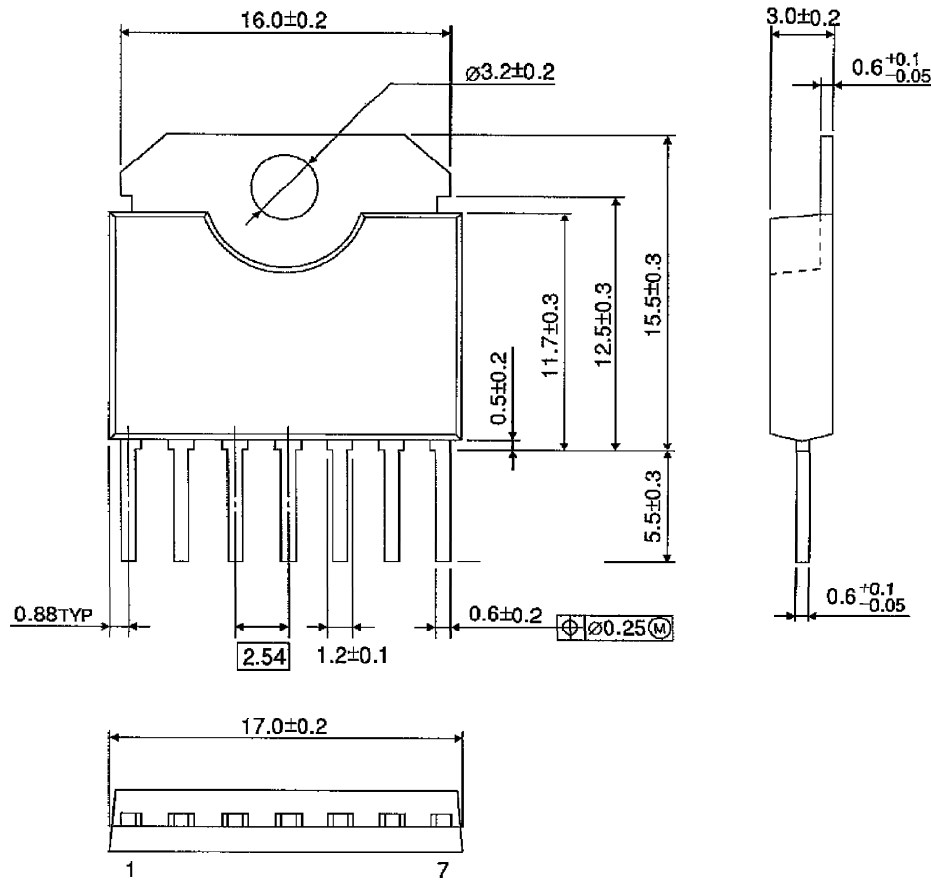


(Note) Utmost care is necessary in the design of the output line, V_{CC} and GND line since IC may be destroyed due to short-circuit between outputs, air contamination fault, or fault by improper grounding.

(Note) In case of mounted on radiators, do not use silicon rubber.

OUTLINE DRAWING
HSIP7-P-2.54

Unit : mm



Weight : 1.88 g (Typ.)