

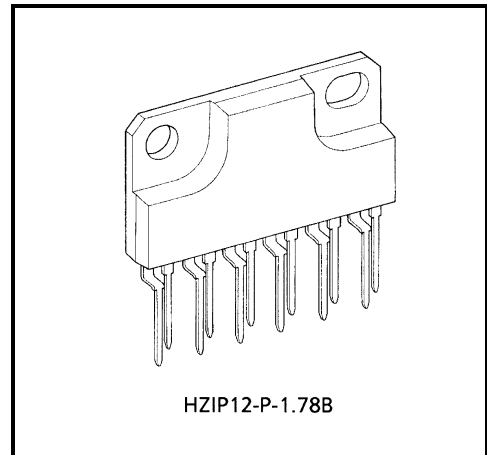
# TA8429H

## 3.0A FULL BRIDGE DRIVER

The TA8429H is full bridge driver IC for brush motor rotation control that has current capability of up to 3.0 A (AVE.). Thermal shutdown and short current protector are provided. And also stand-by function available.

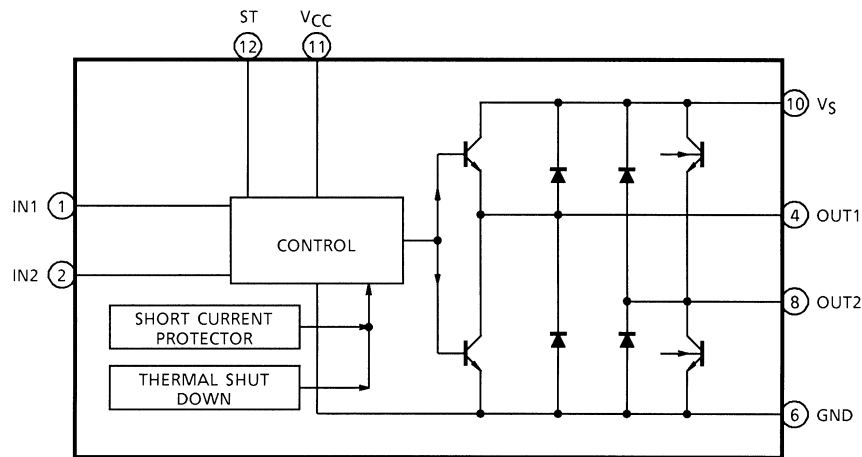
### FEATURES

- Output current is as large as 3.0 A (AVE.) and 4.5 A (PEAK.)
- Stand-by mode available:  $I_{ST} \leq 100 \mu A$  (MAX.)
- Thermal shutdown and short circuit protector circuit are provided.
- 4 modes (Forward / reverse / short brake and stop) are available with 2 low active TTL compatible inputs control.
- Free wheeling diodes are equipped.
- HZIP power package sealed.
- Wide range of operating voltage:  $V_{CC} = 7\sim 27 V$   
 $V_{S (opr.)} = 0\sim 27 V$



Weight : 4.04 g (Typ.)

### BLOCK DIAGRAM



Note 1: Pin (3), (5), (7), and (9) are non connection.

Note 2: Heat fin is connected with GND with low impedance.

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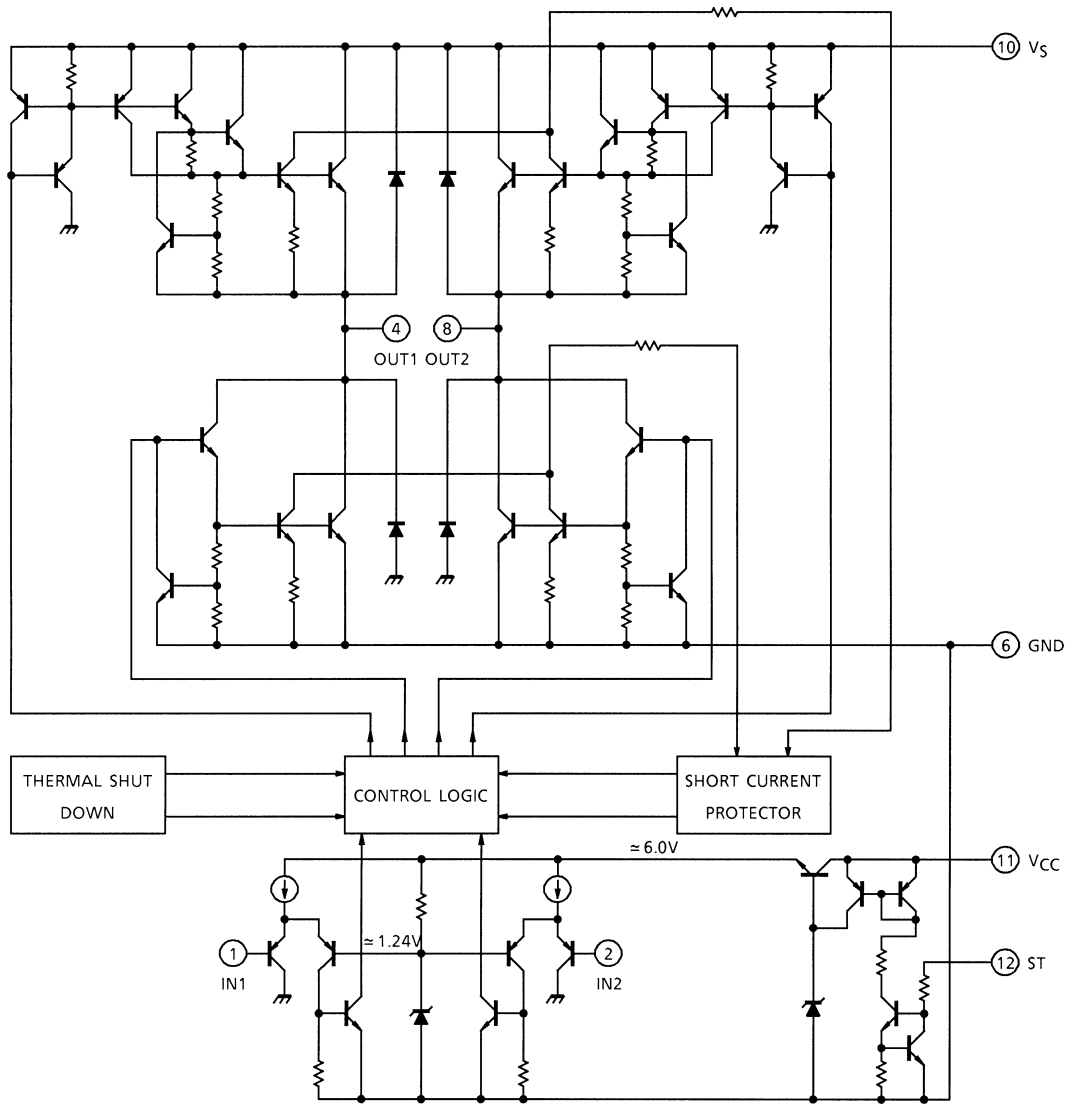
## PIN FUNCTION

PIN No.	SYMBOL	FUNCTIONAL DESCRIPTION
1	IN 1	TTL compatible control inputs (PNP type low active comparator inputs)
2	IN 2	
3	N.C	Non connection
4	OUT1	Output terminals, free wheeling diodes are connected between each output with GND and $V_S$ .
5	N.C	Non connection
6	GND	GND terminal
7	N.C	Non connection
8	OUT2	Output terminals, free wheeling diodes are connected between each output with GND and $V_S$ .
9	N.C	Non Connection
10	$V_S$	Supply voltage terminal for Motor Drive
11	$V_{CC}$	Supply voltage terminal for control circuit
12	ST	Stand-by terminal. Stand-by state is obtained with this terminal connected with GND (or Open).

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**INTERNAL CIRCUIT**



**FUNCTION**

INPUT		ST	OUTPUT		MODE
IN1	IN2		OUT1	OUT2	MOTOR
H	H	H	L	L	Short brake
L	H	H	L	H	CW / CCW
H	L	H	H	L	CCW / CW
L	L	H	OFF (high impedance)		Stop
H / L	H / L	L	OFF (high impedance)		Stand-by

## MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC		SYMBOL	RATING	UNIT
Supply Voltage		$V_{CC}, V_S$	30	V
Input Voltage		$V_{IN}$	-0.3~ $V_{CC}$	V
Output Current	AVE.	$I_O$ (AVE.)	3.0	A
	PEAK	$I_O$ (PEAK)	4.5 (Note 1)	
Power Dissipation		$P_D$	2.25 (Note 2)	W
			21.6 (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:  $T_c = 85^\circ\text{C}$

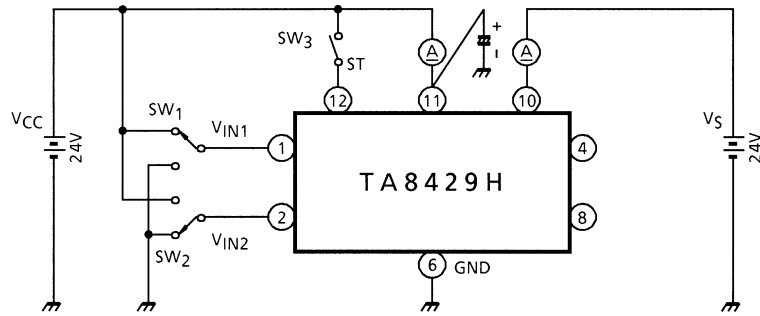
## ELECTRICAL CHARACTERISTICS ( $V_{CC} = 24$ V, $V_S = 24$ V, $T_a = 25^\circ\text{C}$ )

CHARACTERISTIC	SYMBOL	TEST CIRCUIT	TEST CONDITION	MIN	TYP.	MAX	UNIT
Quiescent Current (I) ( $V_{CC}$ Line)	$I_{CC1}$	1	Stop mode	—	6	12	mA
	$I_{CC2}$		Forward / reverse mode	—	20	40	
	$I_{CC3}$		Brake mode	—	20	40	
Quiescent Current (II) ( $V_S$ Line)	$I_{S1}$	1	Stop mode	—	3	8	mA
	$I_{S2}$		Forward / reverse mode	—	16	40	
	$I_{S3}$		Brake mode	—	3	8	
Input Voltage	$V_{INL}$	2	—	—	—	0.8	V
	$V_{INH}$		—	2.0	—	—	
Input Current	$I_{INL}$	2	$V_{IN} = \text{GND}$	—	—	12	$\mu\text{A}$
	$I_{INH}$		$V_{IN} = V_{CC}$	—	—	10	
Output Saturation Voltage (Note)	$V_{sat1}$	3	$I_O = 1.5$ A	—	2.1	2.8	V
	$V_{sat2}$		$I_O = 3.0$ A	—	3.3	4.1	
Output Leakage Current	$I_{LU}$	4	$V_L = 25$ V	—	—	50	$\mu\text{A}$
	$I_{LL}$		$V_L = 25$ V	—	—	50	
Diode Forward Voltage	$V_{FU}$	5	$I_F = 3.0$ A	—	5.0	—	V
	$V_{FL}$		$I_F = 3.0$ A	—	1.5	—	
Limiting Current	$I_{SD}$	—	—	—	5	—	A
Thermal Shutdown Circuit Operating Temperature	$T_{SD}$	—	—	—	150	—	°C
Stand-by Current	$I_{ST}$	1	—	—	—	100	$\mu\text{A}$
Propagation Delay Time	$t_{pLH}$	2	—	—	1	10	$\mu\text{s}$
	$t_{pHL}$	2	—	—	1	10	

Note: Upper and lower side total

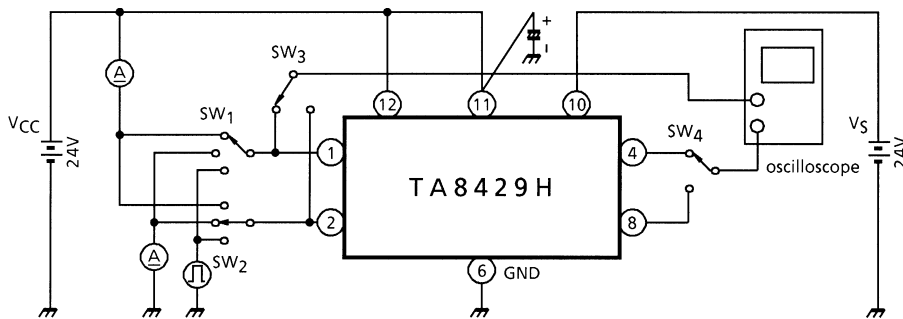
## TEST CIRCUIT 1

$I_{S1}$ ,  $I_{S2}$ ,  $I_{S3}$ ,  $I_{CC1}$ ,  $I_{CC2}$ ,  $I_{CC3}$ ,  $I_{ST}$



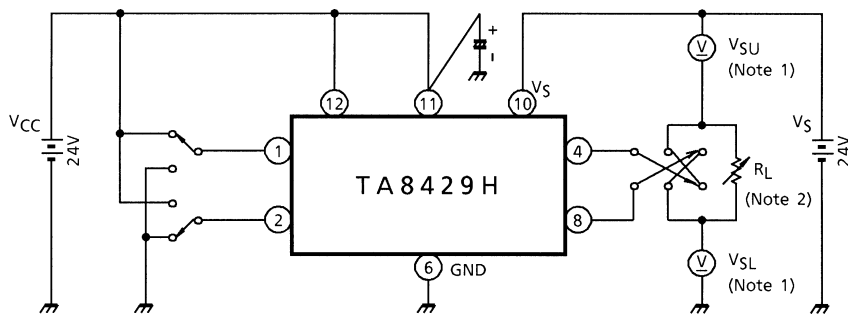
## TEST CIRCUIT 2

$V_{INH}$ ,  $V_{INL}$ ,  $I_{INH}$ ,  $I_{INL}$ ,  $t_{pHL}$ ,  $t_{pLH}$



## TEST CIRCUIT 3

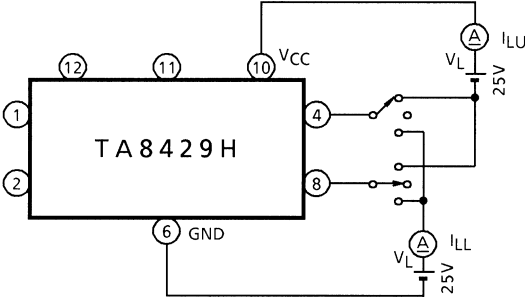
$V_{sat}$



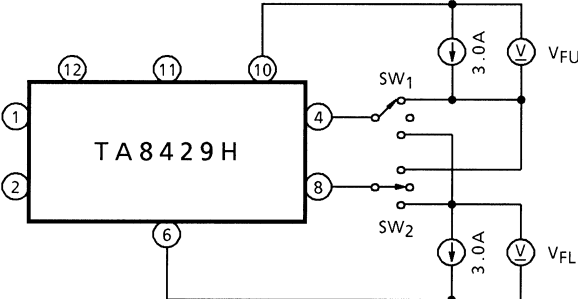
Note 1:  $V_{sat} = V_{SU} + V_{SL}$

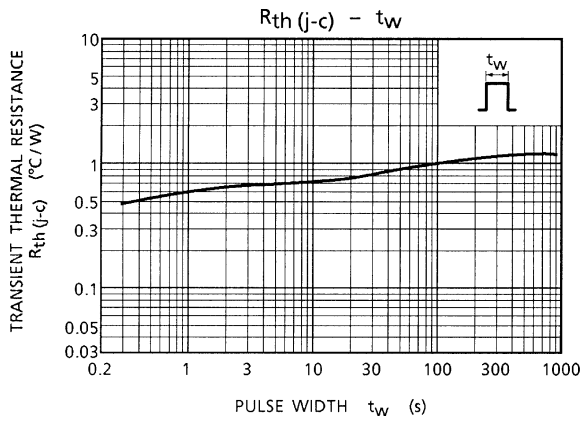
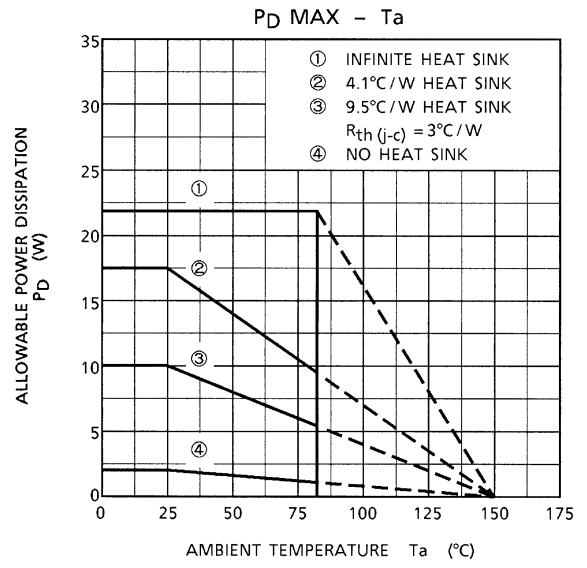
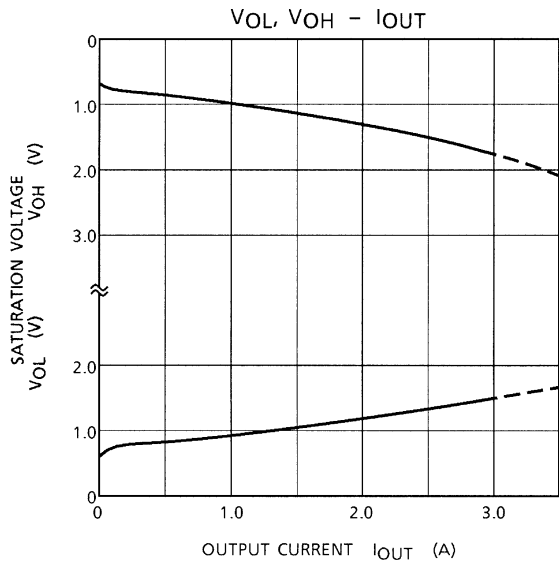
Note 2: Calibrate  $I_O$  to 1.5 / 3.0 A by  $R_L$

**TEST CIRCUIT 4**  
 $I_{LU}, I_{LL}$

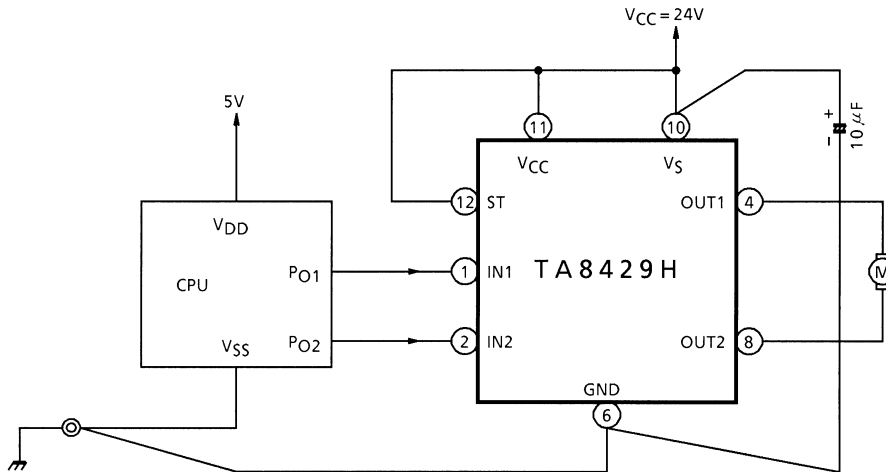


**TEST CIRCUIT 5**  
 $V_{FU}, V_{FL}$

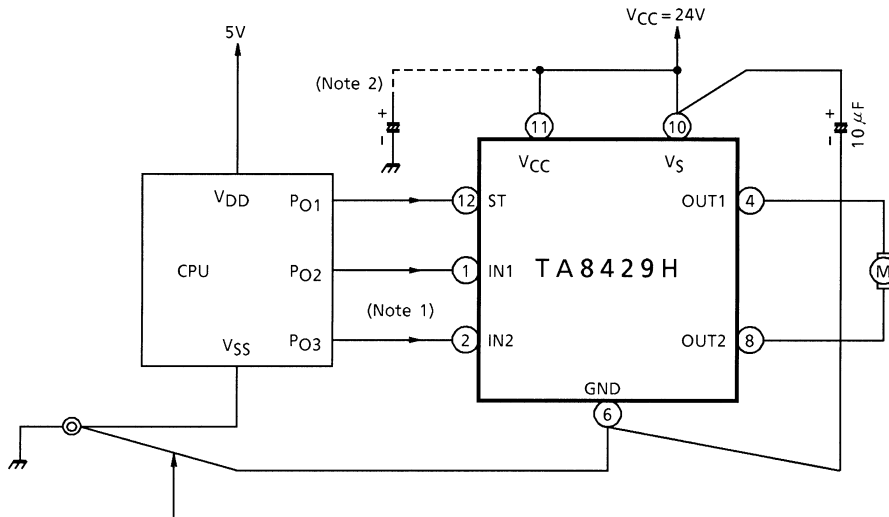




**APPLICATION CIRCUIT 1. (Single power supply operation)**



**APPLICATION CIRCUIT 2. (Dual power supply (Control and Motor) operation)**

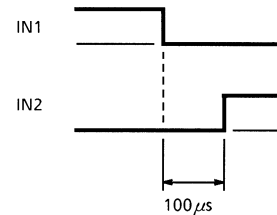


Not to have a common impedance with other lines and use low impedance wire.

Note 1: Recommend to take approximately 100 µs of input dead time for reliable operations.

Note 2: Connect if required.

Note 3: Utmost care is necessary in the design of the output line, VS and GND line since IC may be destroyed due to short-circuit between outputs, air contamination fault, or fault by improper grounding.

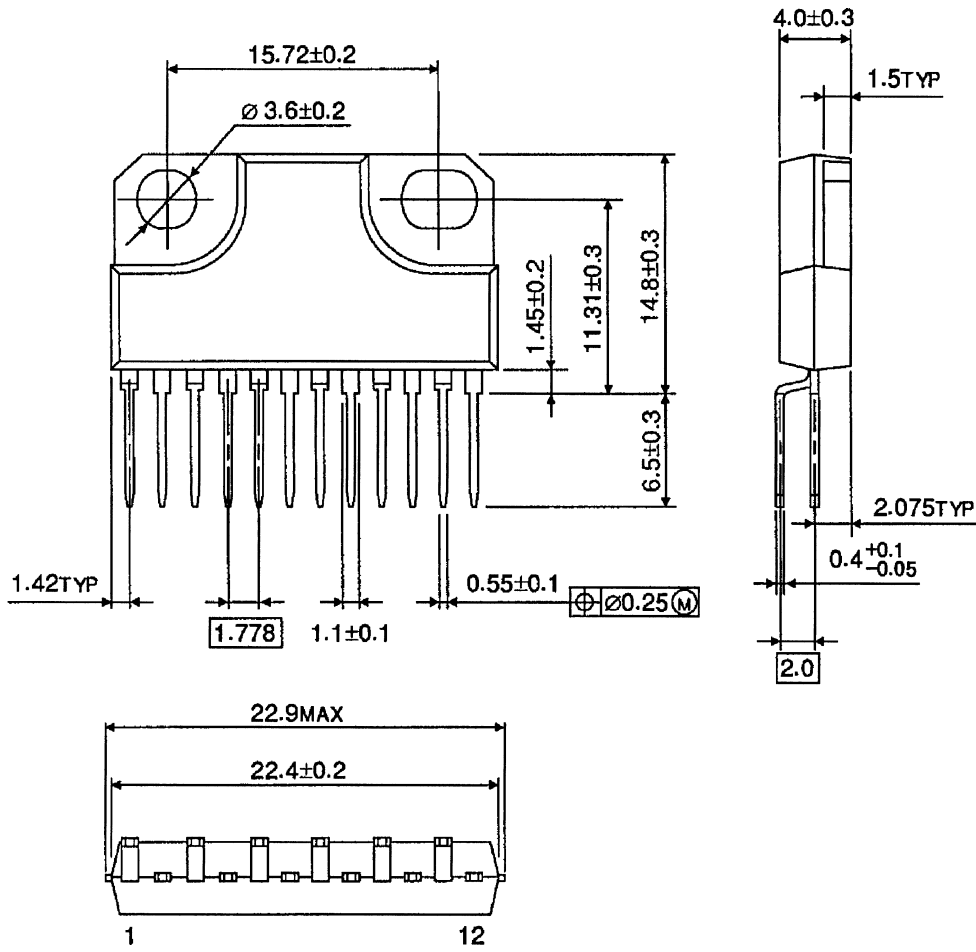




## OUTLINE DRAWING

HZIP12-P-1.78B

Unit : mm



Weight : 4.04 g (Typ.)