

TOSHIBA

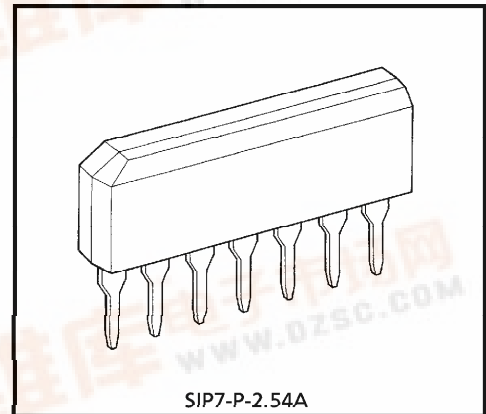
TA8030S

TOSHIBA BIPOLAR LINEAR INTEGRATED CIRCUIT SILICON MONOLITHIC

TA8030S

WATCHDOG TIMER

The TA8030S is a system reset IC supplied with 5V power. It is specially designed for microcomputer systems. It incorporates a watchdog timer for monitoring microcomputer operation and has many reset functions, including a reset timer output which will be given at power-on and another reset output which will be given when the supply voltage drops. With these functions, it helps build up a reliable system.

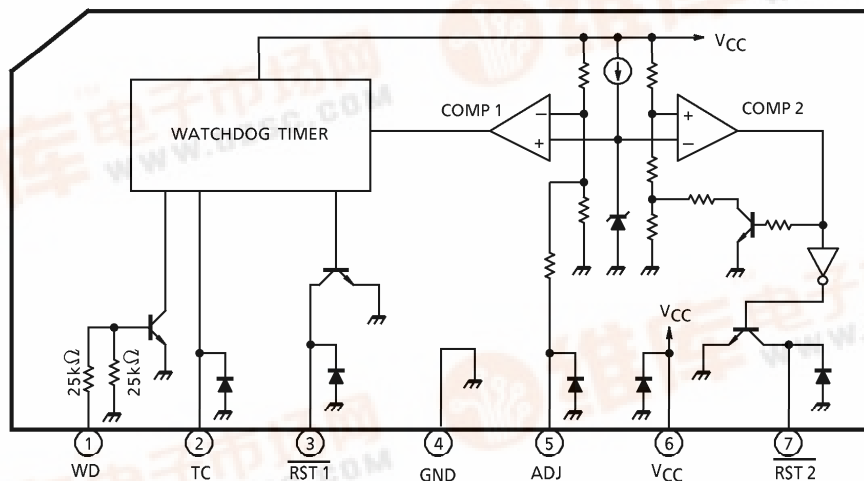


Weight : 0.7g (Typ.)

FEATURES

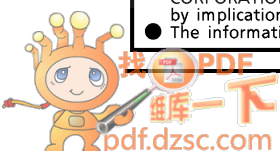
- Watchdog timer
- Power-on reset timer
- Dual-reset output
- Small SIP-7 pin

BLOCK DIAGRAM AND PIN LAYOUT



961001EBA2

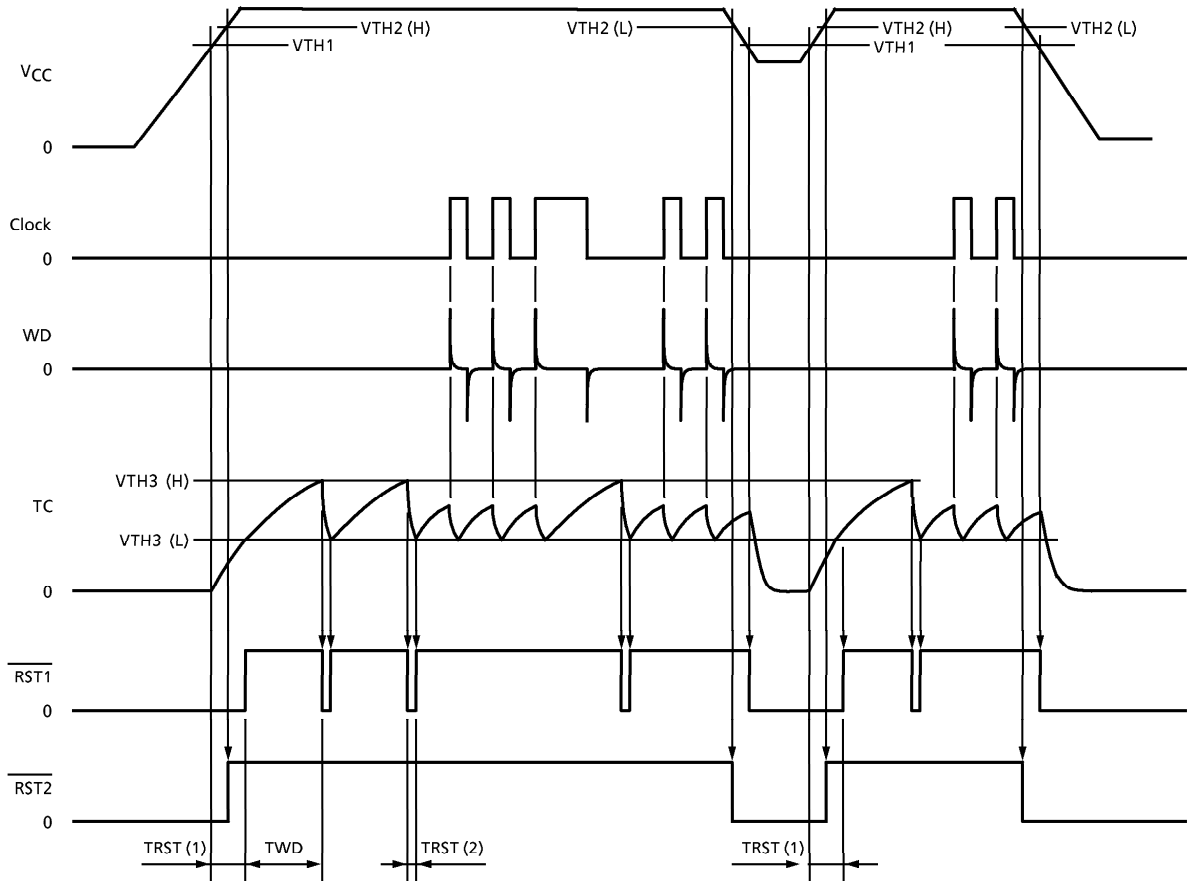
- TOSHIBA is continually working to improve the quality and the reliability of its products. Nevertheless, semiconductor devices in general can malfunction or fail due to their inherent electrical sensitivity and vulnerability to physical stress. It is the responsibility of the buyer, when utilizing TOSHIBA products, to observe standards of safety, and to avoid situations in which a malfunction or failure of a TOSHIBA product could cause loss of human life, bodily injury or damage to property. In developing your designs, please ensure that TOSHIBA products are used within specified operating ranges as set forth in the most recent products specifications. Also, please keep in mind the precautions and conditions set forth in the TOSHIBA Semiconductor Reliability Handbook.
- The products described in this document are subject to foreign exchange and foreign trade control laws.
- The information contained herein is presented only as a guide for the applications of our products. No responsibility is assumed by TOSHIBA CORPORATION for any infringements of intellectual property or other rights of the third parties which may result from its use. No license is granted by implication or otherwise under any intellectual property or other rights of TOSHIBA CORPORATION or others.
- The information contained herein is subject to change without notice.



PIN DESCRIPTION

PIN No.	SYMBOL	DESCRIPTION
1	WD	Clock input pin for watchdog timer. If this IC is only used as a power-on reset timer, this pin is connected to $\overline{RST1}$.
2	TC	Time setting pin for the reset and watchdog timers. R ₁ leads to V _{CC} , and C ₁ leads to GND.
3	$\overline{RST1}$	Supplies an NPN transistor open-collector output. <ul style="list-style-type: none">• Generates a reset signal determined by the CR combination connected to the TC pin.• Supplies reset pulses intermittently if no clock is given to the WD pin.
4	GND	Grounded
5	ADJ	V _{CC} detect voltage (1) adjusting pin. The detection voltage is 4.6V when this pin is grounded ; it is 3.5V when this pin is directly connected to V _{CC} .
6	V _{CC}	Power supply pin for internal circuit. The output voltage can also be detected at this pin.
7	$\overline{RST2}$	Supplies an NPN transistor open-collector output. It is the output pin for V _{CC} detect voltage (2) . The detect voltage has a hysteresis of 0.17V.

TIMING CHART



MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Supply Voltage	V _{CC}	17	V
Input Voltage	V _{IN}	-7 to 7	V
Output Voltage	V _{OUT}	7	V
Output Current	I _{OUT}	10	mA
Power Dissipation	P _D	300	mW
Operating Temperature	T _{opr}	-40 to 85	°C
Storage Temperature	T _{stg}	-55 to 150	°C
Lead Temperature-time	T _{sol}	260 (10s)	°C

ELECTRICAL CHARACTERISTICS (V_{CC} = 5V, Ta = -40 to 85°C)

(1) DC CHARACTERISTICS

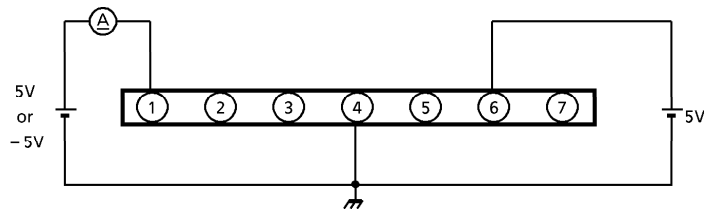
CHARACTERISTIC	SYMBOL	PIN	TEST CIR-CUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Input Current	I _{IH}	WD	1	V _{IN} = 5V	0.1	0.17	0.35	mA
	I _{IL}		1	V _{IN} = -5V	-0.06	-0.1	-0.2	
Input Voltage	V _{IH}	WD	2	—	2.2	—	—	V
	V _{IL}		2	—	—	—	0.6	
Input Current	I _{IIN}	TC	4	V _{IN} = 1.5V	-2	—	2	μA
Output Current	I _{OUT}	TC	4	V _{OUT} = 4.2V	2.4	4	7.7	mA
Watchdog Timer Threshold Voltage	V _{TH3 (H)}	TC	3	—	3.5	4	4.5	V
	V _{TH3 (L)}		3	—	1.75	2	2.25	
Output Voltage	V _{OL}	RST1	5	I _{OUT} = 2mA	—	—	0.5	V
Output Leakage Current	I _{LEAK}	RST2	6	V _{OUT} = 7V	—	—	5	μA
V _{CC} Detect Voltage (1)	V _{TH1}	V _{CC}	—	—	4.0	4.25	4.5	V
	V _{TH1 (H)}		3	ADJ = GND	4.3	4.6	4.9	
	V _{TH1 (L)}		3	ADJ = V _{CC}	3.25	3.5	3.75	
V _{CC} Detect Voltage (2)	V _{TH2 (H)}	V _{CC}	3	—	4.4	4.65	4.9	V
	ΔV _{TH2}		3	—	—	0.17	0.3	
Current Consumption	I _{CC}	V _{CC}	7	—	—	2.5	4.5	mA

(2) AC CHARACTERISTICS

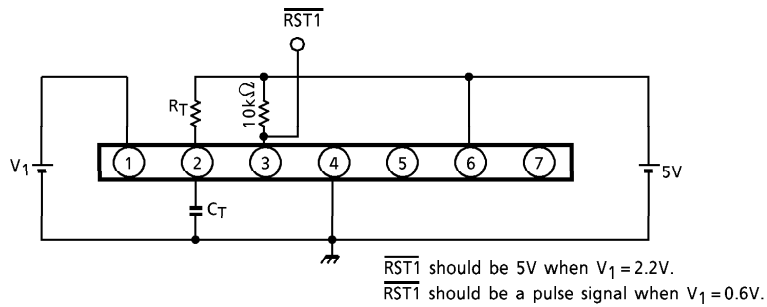
CHARACTERISTIC	SYMBOL	PIN	TEST CIR-CUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Watchdog Timer	T _{WD}	RST1	3	—	0.9 × C ₁ R ₁	1.1 × C ₁ R ₁	1.3 × C ₁ R ₁	s
Reset Timer (1)	T _{RST (1)}	RST1	3	—	0.4 × C ₁ R ₁	0.5 × C ₁ R ₁	0.6 × C ₁ R ₁	s
Reset Timer (2)	T _{RST (2)}	RST1	3	—	350 × C ₁	750 × C ₁	1500 × C ₁	s
Input Pulse Width	T _W	WD	3	—	3	—	—	μs
Transfer Delay Time	t _{d1}	RST1	3	t _{dHL} (C ₁ = 0μF)	—	3	10	μs
	t _{d2}	RST2	3	t _{dHL} , t _{dLH}	—	3	10	μs

TEST CIRCUIT

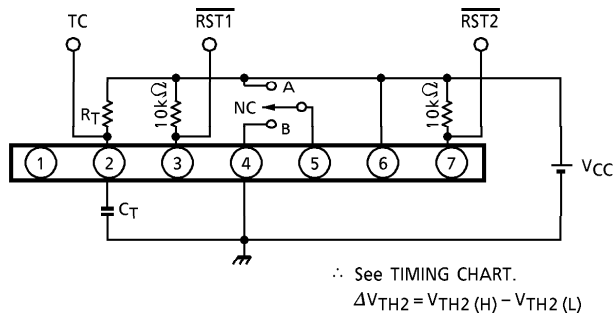
1. I_{IH} , I_{IL} (WD)



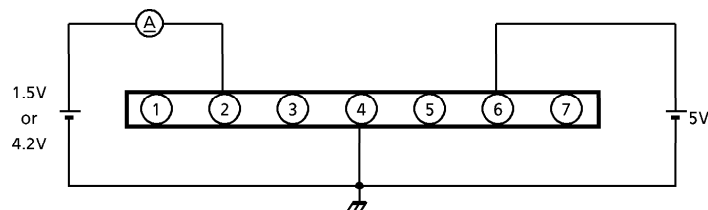
2. V_{IH} , V_{IL} (WD)



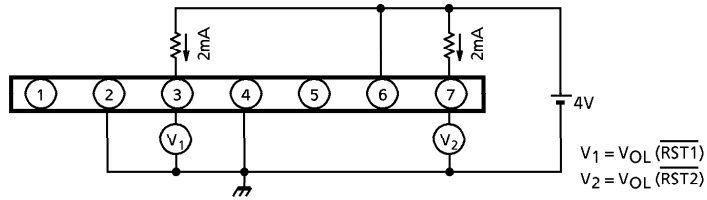
3. V_{TH3} (H), (L) (TC), V_{TH1} , V_{TH1} (H), (L), V_{TH2} (H), ΔV_{TH2} , AC CHARACTERISTICS



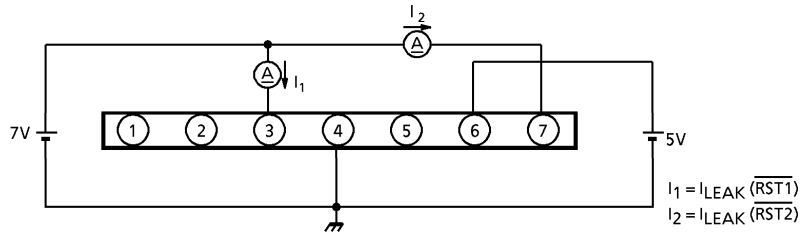
4. I_{IN} , I_{OUT} (TC)



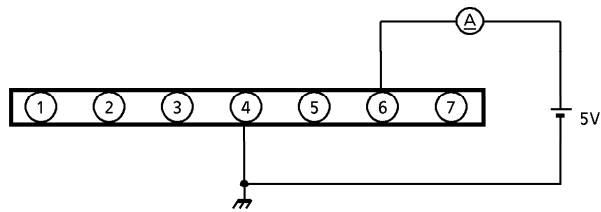
5. $V_{OL}(\overline{RST1}) (\overline{RST2})$



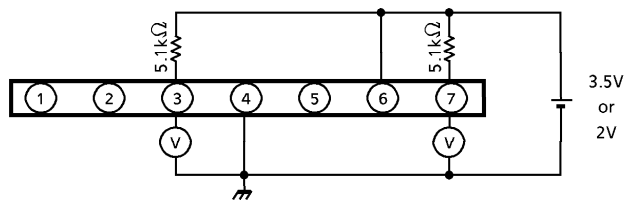
6. $V_{LEAK}(\overline{RST1}) (\overline{RST2})$



7. I_{CC}

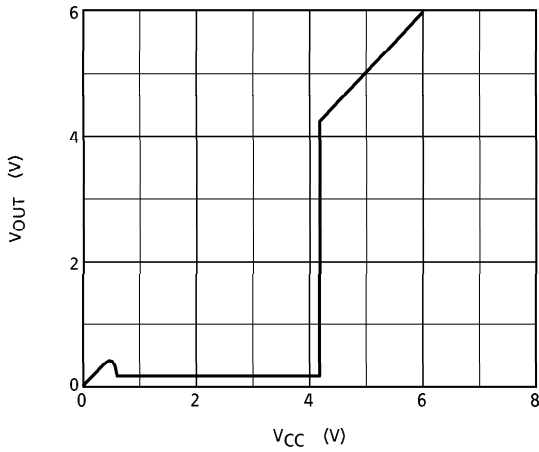


8. $V_{OL}(1), (2) (\overline{RST1}) (\overline{RST2})$

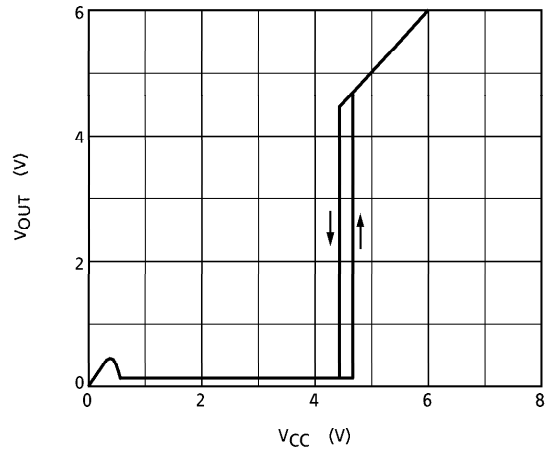


RESET OUTPUT STANDARD CHARACTERISTICS

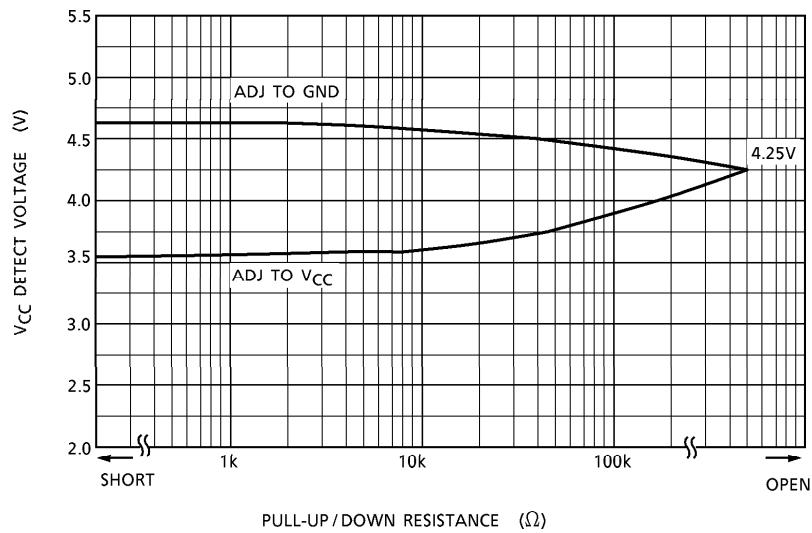
1. $\overline{\text{RST1}}$



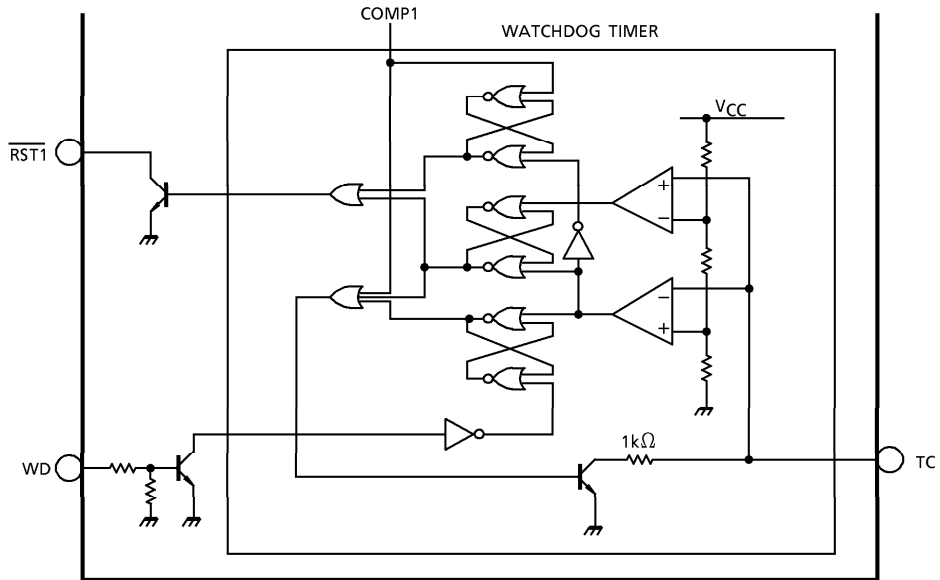
2. $\overline{\text{RST2}}$



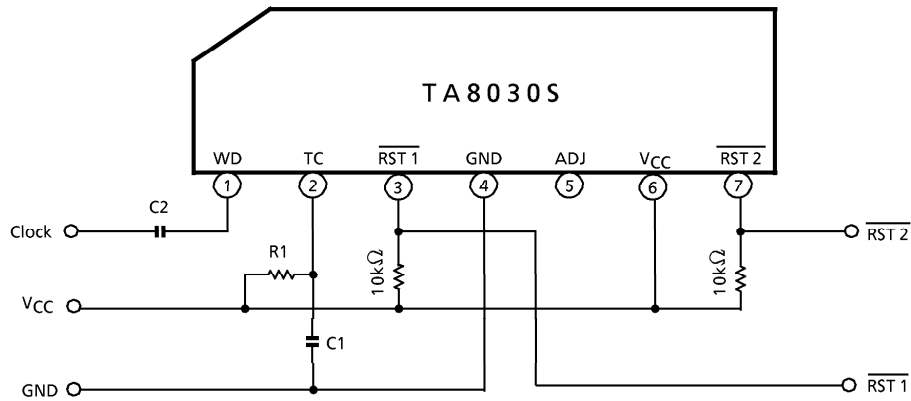
ADJ PIN PULL-UP / DOWN RESISTANCE VS V_{CC} DETECT VOLTAGE



EQUIVALENT CIRCUIT DIAGRAM (WATCHDOG TIMER)



EXAMPLE OF APPLICATION CIRCUIT

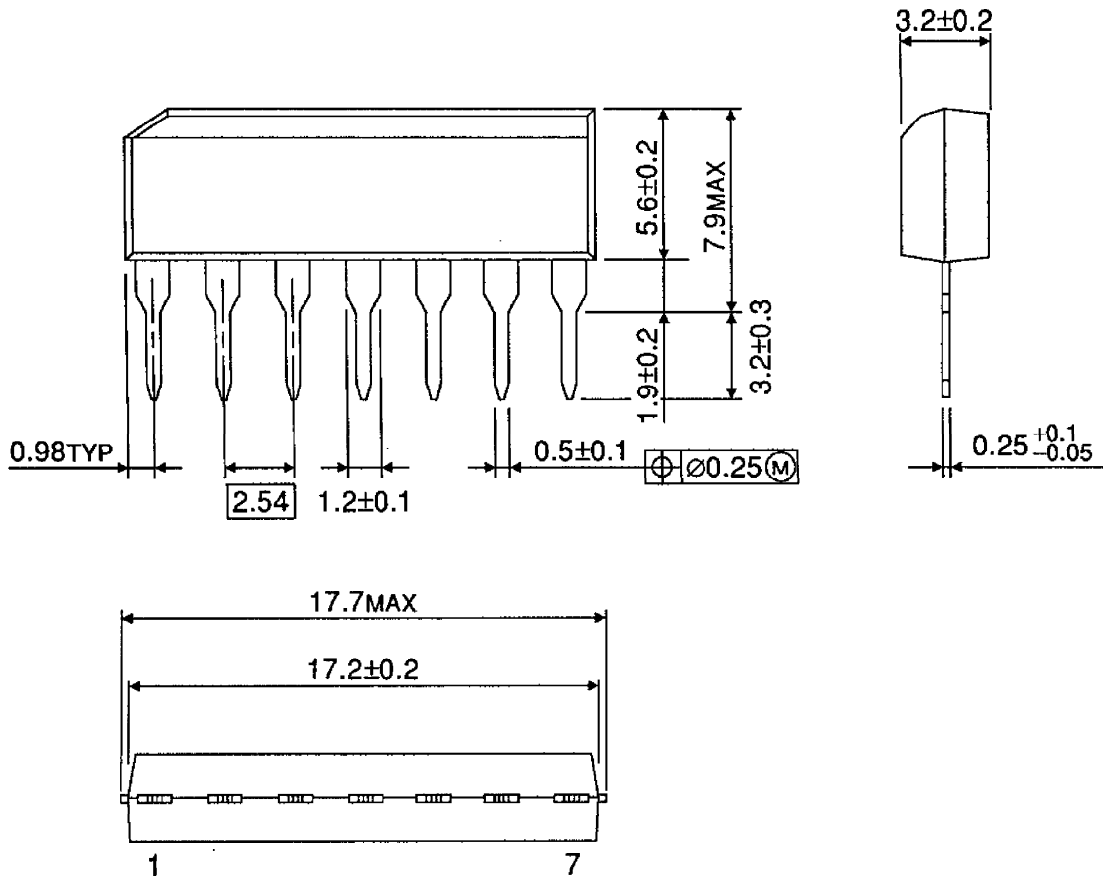


RECOMMENDED CONDITIONS

PART NAME	MIN.	TYP.	MAX.	UNIT
C ₁	0.01	—	100	μF
R ₁	10	—	100	kΩ
C ₂	—	2200	—	pF

OUTLINE DRAWING
SIP7-P-2.54A

Unit : mm



Weight : 0.7g (Typ.)