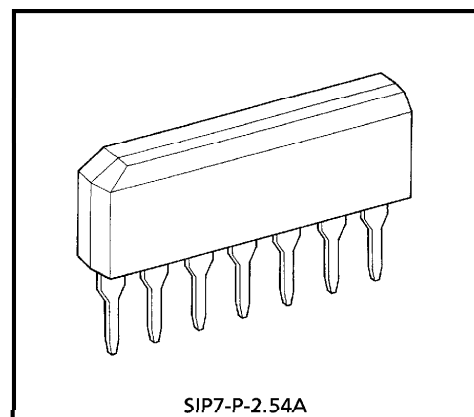


TA8001S

5V VOLTAGE REGULATOR WITH RESET TIMER

The TA8001S is an IC specially designed for automotive microcomputer systems. It produces an output voltage of $5 \pm 0.5V$ without need for adjustment from its accurate reference voltage and amplifier circuit.

At power-on, it outputs a reset signal to reset the system. It will also output a reset signal when the 5V output voltage drops below 92% because of external disturbance or other problem. Since it is also designed to have a small bias current, power consumption on the system can be reduced.



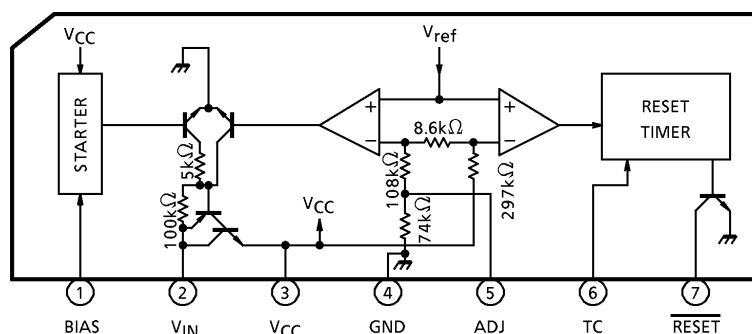
SIP7-P-2.54A

Weight : 0.7g (Typ.)

FEATURES

- Accurate output : $5 \pm 0.5V$
- Standby output : 3.5V
- Low bias current : $150 \mu A$ (Typ.)
- Power-on reset timer
- Operating temperature range : from -40 to $85^{\circ}C$
- Wide operating voltage range : 30V (max.)
- Small SIP-7 pin

BLOCK DIAGRAM AND PIN LAYOUT



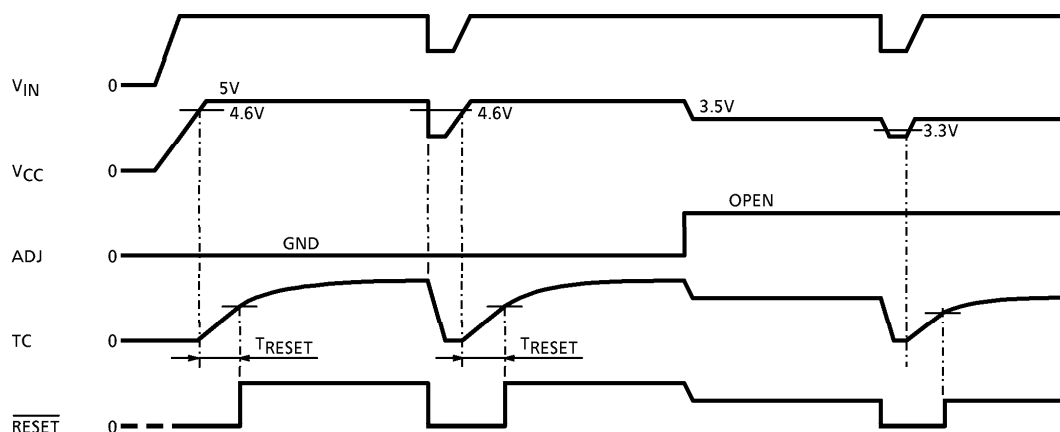
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PIN DESCRIPTION

PIN No.	SYMBOL	DESCRIPTION									
1	BIAS	Power supply starting pin. The starting current is supplied through a resistor to which the input voltage is applied. The output current from this starting current is as follows : $I_{OUT}(\text{pin } 1) \geq 3000 \times (V_{IN} - 0.6) / (200 + R_1) \text{ (mA)}$ where R_1 is the external resistance attached to pin 1 (k Ω). When the output voltage rises above 2.7V, its control is transferred from the starting circuit to the internal control circuit.									
2	V_{IN}	Power supply input pin.									
3	V_{CC}	Power supply pin for internal circuit. The output voltage can also be detected at this pin.									
4	GND	Grounded									
5	ADJ	The output voltage can be adjusted by inserting a resistor between ADJ and GND or between ADJ and V_{CC} . <table border="1"> <thead> <tr> <th>Mode</th><th>ADJ Pin</th><th>Output Voltage V_{REG}</th></tr> </thead> <tbody> <tr> <td>Standby</td><td>OPEN</td><td>3.5V</td></tr> <tr> <td>Normal</td><td>GND</td><td>5.0V</td></tr> </tbody> </table>	Mode	ADJ Pin	Output Voltage V_{REG}	Standby	OPEN	3.5V	Normal	GND	5.0V
Mode	ADJ Pin	Output Voltage V_{REG}									
Standby	OPEN	3.5V									
Normal	GND	5.0V									
6	TC	Time setting pin for reset timer									
7	$\overline{\text{RESET}}$	NPN transistor open-collector output. This pin supplies a reset signal when the output drops below 92% of the specified level. After the output voltage increases above 92% of the specified level, the reset signal will be output for a period of time set at the TC pin.									

TIMING CHART



MAXIMUM RATINGS (Ta = 25°C)

CHARACTERISTIC	SYMBOL	RATING	UNIT
Input Voltage	V _{IN}	30	V
Output Current	I _{OUT1}	20	mA
	I _{OUT2}	1	mA
Output Voltage	V _{OUT2}	16	V
Power Dissipation	P _D	500	mW
Operating Temperature	T _{opr}	– 40~85	°C
Storage Temperature	T _{stg}	– 55~150	°C
Lead Temperature-time	T _{sol}	260 (10s)	°C

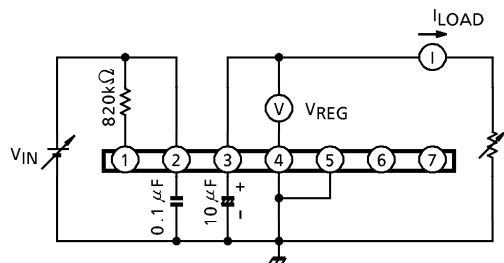
Note : V_{IN} : BIAS input
I_{OUT1}, V_{OUT1} : OUT output
I_{OUT2}, V_{OUT2} : $\overline{\text{RESET}}$ output

ELECTRICAL CHARACTERISTICS (V_{IN} = 7 to 17V, Ta = – 40 to 85°C, I_{LOAD} = 5mA)

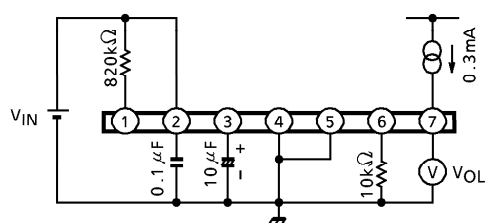
CHARACTERISTIC	SYMBOL	PIN	TEST CIRCUIT	TEST CONDITION	MIN.	TYP.	MAX.	UNIT
Output Voltage	V _{REG}	V _{CC}	1	—	4.5	5.0	5.5	V
Line Regulation	—	V _{CC}	—	V _{IN} = 7~30V	—	0.2	1.0	%
Load Regulation	—	V _{CC}	—	I _{LOAD} = 2~10mA	—	0.5	2.0	%
Temperature Coefficient	—	V _{CC}	—	—	—	0.01	—	% / °C
Output Voltage	V _{OL}	$\overline{\text{RESET}}$	2	I _{OL} = 300μA	—	—	0.4	V
Output Leakage Current	I _{LEAK}	$\overline{\text{RESET}}$	3	V _{OUT} = 10V	—	—	5	μA
Input Current	I _{IN}	TC	4	V _{IN} = 0~V _{REG}	– 2	—	2	μA
Threshold Voltage	V _{TH}	TC	5	TC : Low to High	—	1.7	—	V
Reset Detect Voltage	—	V _{CC}	—	V _{REG} = 5V	—	4.6	—	V
Standby Voltage	V _S	V _{CC}	6	—	3.1	3.5	3.9	V
Standby Current	I _S	V _{CC}	7	V _{IN} = 14V	—	150	300	μA
Reset Timer	T _{RESET}	$\overline{\text{RESET}}$	5	—	—	0.4 × C _{TRT}	—	—

TEST CIRCUIT

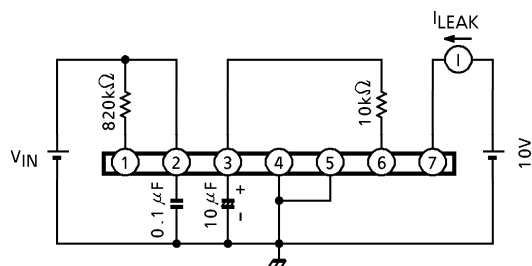
1. V_{REG}



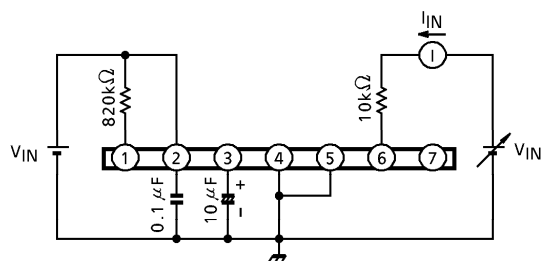
2. $V_{OL}(\overline{RESET})$



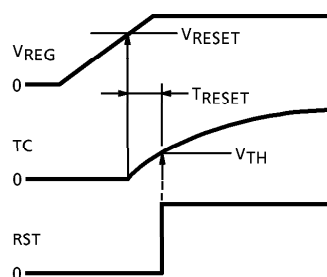
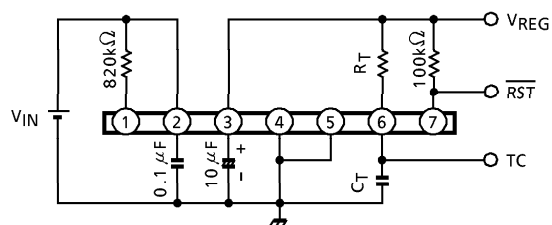
3. $I_{LEAK}(\overline{RESET})$



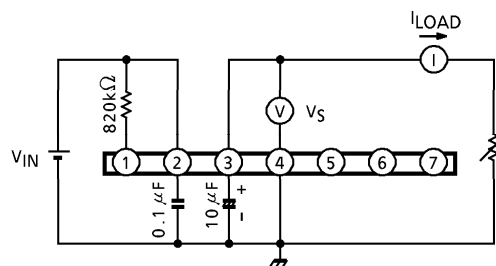
4. $I_{IN}(TC)$



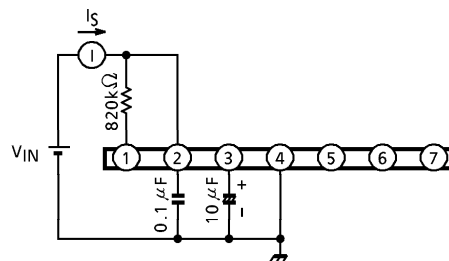
5. V_{RESET} , V_{TH} , T_{RESET}



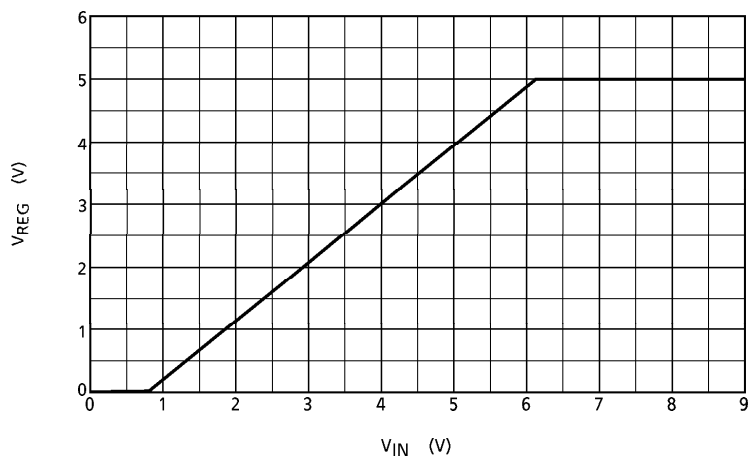
6. V_S



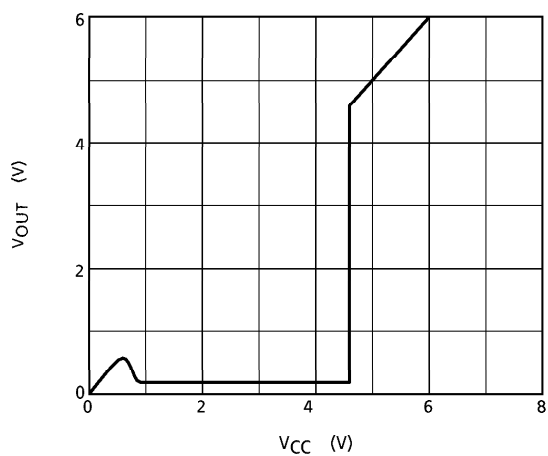
7. I_S



TYPICAL CHARACTERISTICS

1. Input-Output Characteristic ($R_L = 500\Omega$)

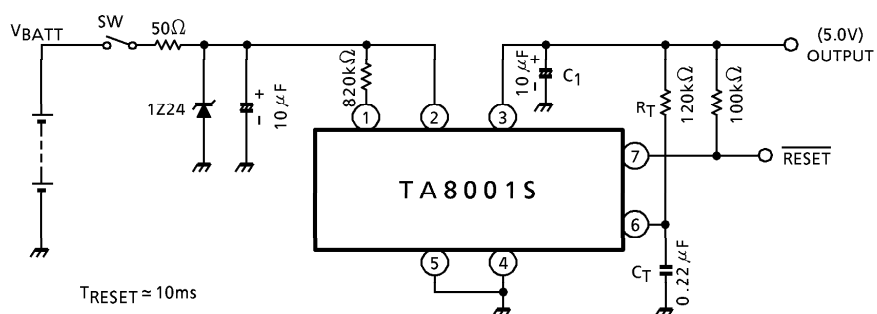
2. Reset Characteristic



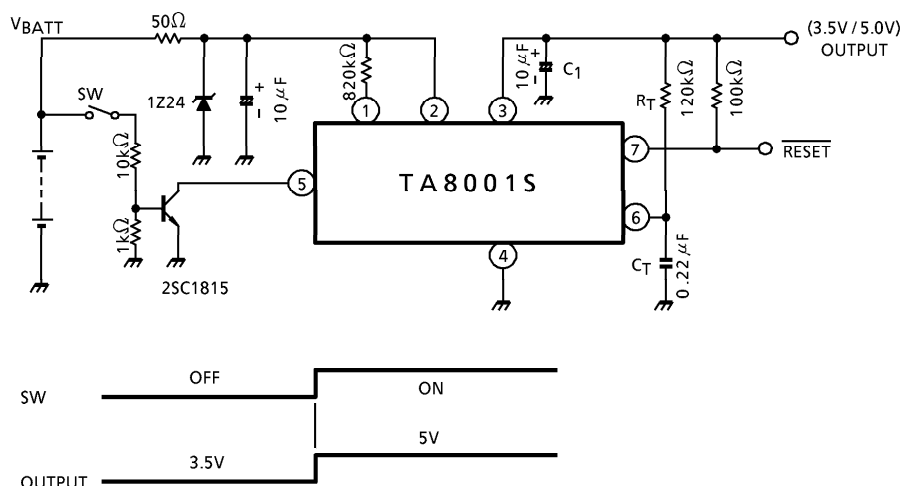
EXAMPLE OF APPLICATION CIRCUIT

$I_{LOAD} = 10\text{mA Max.}$ $V_{BATT} = 7\sim 17\text{V}$ (LOAD DUMP 120Vpeak, 200ms)

1. 5V Standard Circuit



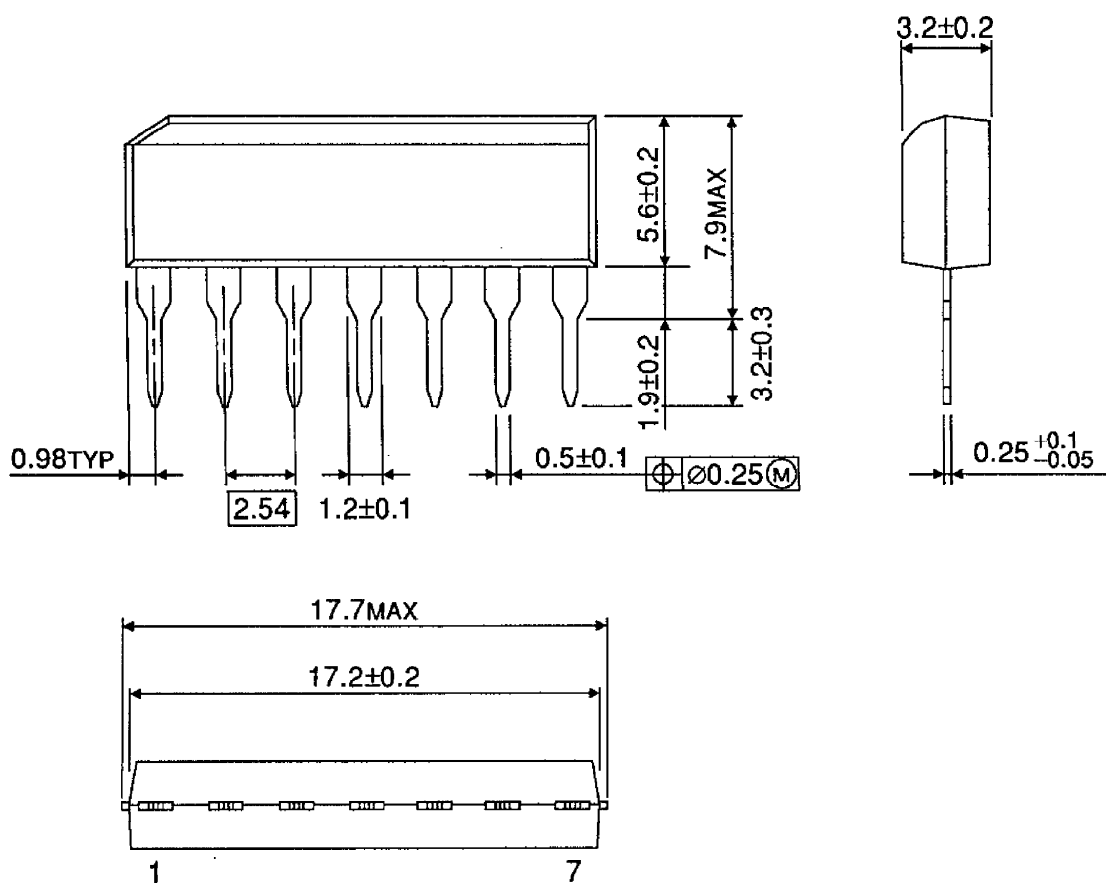
2. Backup Circuit



- * Use an output capacitor C_1 which has a low temperature dependence (such as a tantalum capacitor). Connect it as close to the IC as possible.

OUTLINE DRAWING
SIP7-P-2.54A

Unit : mm



Weight : 0.7g (Typ.)