TOSHIBA TA8002S/AS

TOSHIBA BIPOLAR LINEAR INTEGRATED CIRCUIT SILICON MONOLITHIC

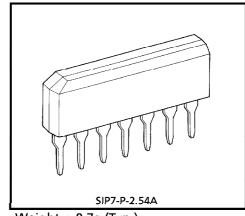
TA8002S, TA8002AS

5V VOLTAGE REGULATOR WITH RESET TIMER

The TA8002S is an IC specially designed for automotive microcomputer systems. It produces an output voltage of $5\pm0.5V$ 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.

The TA8002AS produces an output voltage of 5 ± 0.25 V.



Weight: 0.7g (Typ.)

FEATURES

 $: 5 \pm 0.5 \text{V} (TA8002AS : 5 \pm 0.25 \text{V})$ Accurate output

Standby output : 3.5V

Low bias current : 150 μA (Typ.)

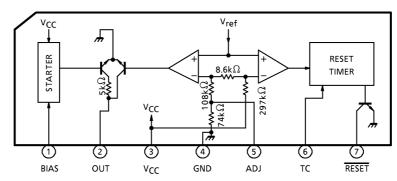
Power-on reset timer

: from -40 to 85°C Operating temperature range

Wide operating voltage range : 40V (max.)

Small SIP-7 pin

BLOCK DIAGRAM AND PIN LAYOUT



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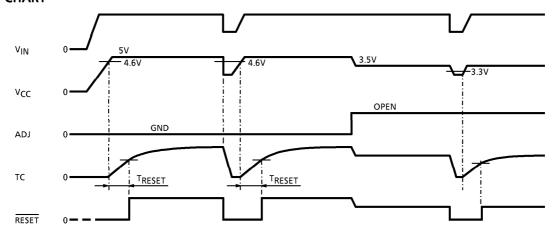
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PIN DESCRIPTION

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 : $I_{OUT}(\text{pin 1}) \geq 30 \times (V_{IN} - 0.7)/(200 + R_1) (\text{mA}) \\ \text{where } R_1 \text{ is the external resistance attached to pin 1 } (k\Omega) .$ When V_{CC} rises above 2.7V, the starting current is absorbed in the internal circuit; instead, the output current OUT is supplied via V_{CC} .					
2	OUT	Connected to the base of an external PNP transistor so that the output voltage is stabilized.					
3	VCC	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} . Mode ADJ Pin Output Voltage V _{REG} Standby OPEN 3.5V Normal GND 5.0V					
6	TC	Time setting pin for reset timer					
7	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)

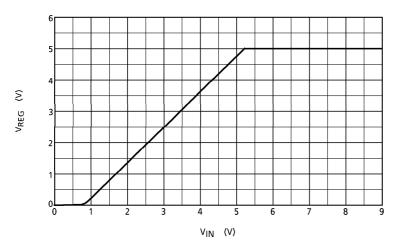
CHARACTERISTIC	SYMBOL	RATING	UNIT
Input Voltage	VIN	40	V
Output Current	lOUT1	0.5	mA
Output Current	IOUT2	1	mA
Output Voltage	V _{OUT1}	40	V
Output Voltage	V _{OUT2}	16	V
Power Dissipation	PD	500	mW
Operating Temperature	T _{opr}	- 40∼85	°C
Storage Temperature	T _{stg}	- 55~150	°C
Lead Temperature-time	T _{sol}	260 (10s)	°C

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

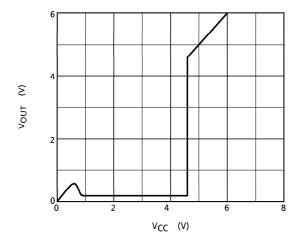
. 114					, LOAD ,				
CHARACTERISTIC	SYMBOL	PIN	TEST CIR- CUIT	TEST (CONDITION	MIN.	TYP.	MAX.	UNIT
Output Valtage	V _{REG}	VCC	1	_	TA8002S	4.5	5.0	5.5	- v
Output Voltage			1		TA8002AS	4.75	5.0	5.25	
Line Regulation	_	Vcc	_	V _{IN} = 7~40V		_	0.1	0.5	%
Load Regulation	_	Vcc	_	I _{LOAD} = 2~10mA		_	0.1	0.5	%
Temperature Coefficient	_	Vcc	_	_		_	0.01	_	% /°C
Output Voltage	V _{OL}	RESET	2	I _{OL} = 300μA		_	_	0.4	V
Output Leakage Current	ILEAK	RESET	3	V _{OUT} = 10V		_	_	5	μΑ
Input Current	IN	TC	4	V _{IN} = 0~V _{REG}		- 2	_	2	μΑ
Threshold Voltage	V _{TH}	TC	5	TC: Low to High		_	1.7	_	٧
Reset Detect Voltage		Vcc	5	V _{REG} = 5V		_	4.6	_	V
Standby Voltage	VS	Vcc	6	_		3.1	3.5	3.9	V
Standby Current	lς	Vcc	7	V _{IN} = 14V		_	150	300	μΑ
Reset Timer	r T _{RESET} F	RESET	5	_		_	0.4×		
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TYPICAL CHARACTERISTICS

1. Input-Output Characteristic (RL = 500 Ω , external transistor 2SA817A)

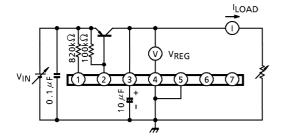


2. Reset Characteristic

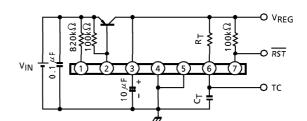


TEST CIRCUIT

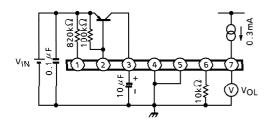
1. V_{REG}

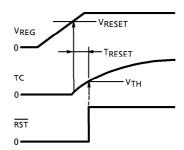


5. V_{RESET}, V_{TH}, T_{RESET}

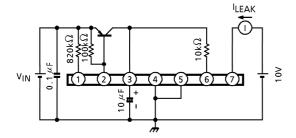


2. VOL (RESET)

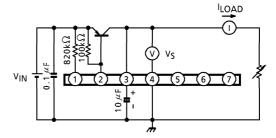




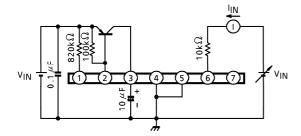
3. ILEAK (RESET)



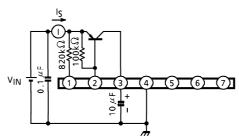
6. V_S



4. I_{IN} (TC)



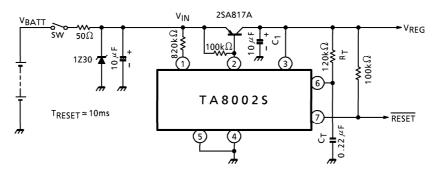
7. Is



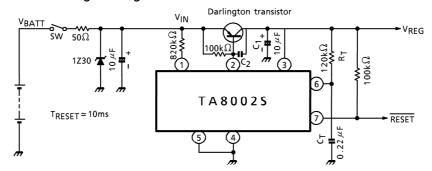
EXAMPLE OF APPLICATION CIRCUIT

 $I_{LOAD} = 10$ mA Max. $V_{BATT} = 6 \sim 17V$ (LOAD DUMP 120Vpeak, 200ms)

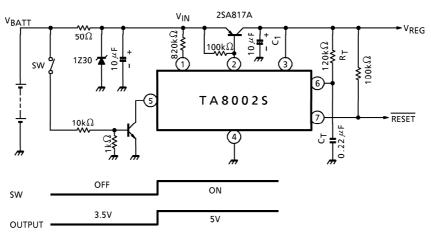
1. 5V Standard Circuit



2. Application Circuit Using Darlington Transistor



- * Select a C₂ value according to the working condition -- typically above 2000pF.
- 3. Backup Circuit

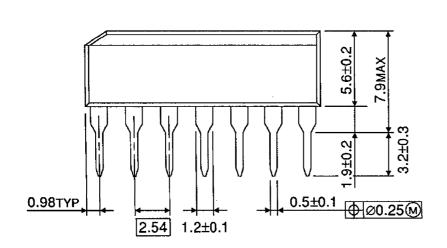


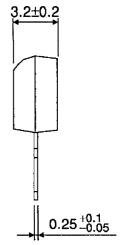
* Use an output capacitor C₁ which has a low temperature dependence (such as a tantalum capacitor). Connect it as close to the IC as possible.

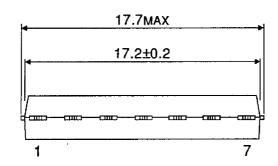
OUTLINE DRAWING

SIP7-P-2.54A









Weight: 0.7g (Typ.)