

# Switching regulator for DC / DC converters

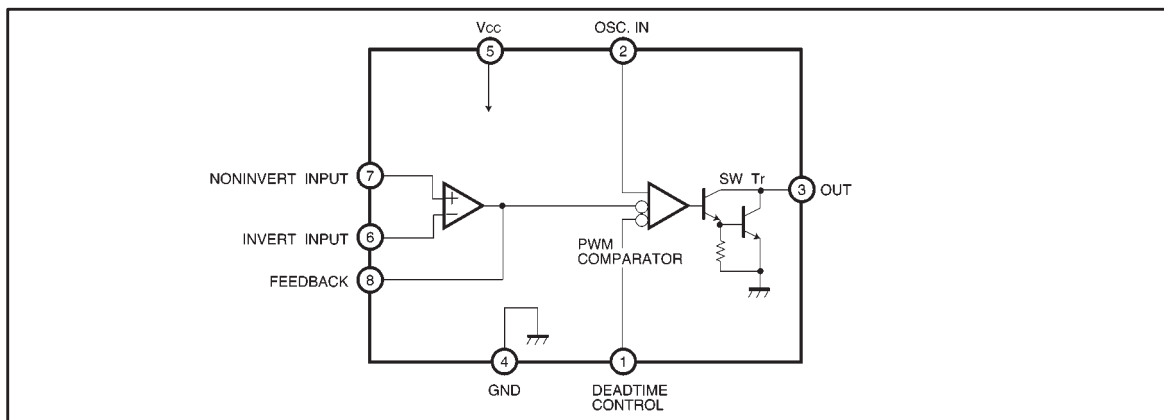
## BA9701 / BA9701F

The BA9701 and BA9701F are DC / DC converter switching regulators that use a pulse width modulation (PWM) system. With an error amplifier, PWM comparator, and output driver, the ICs operate by receiving reference voltage and triangular wave oscillation from the BA9700A-series regulator.

### ●Features

- 1) The slave IC operates by receiving reference voltage and triangular waves from a BA9700-series regulator.
- 2) Contains error amplifier and PWM comparator ; the BA9701 is in an 8-pin dual-inline package, and the BA9701F is in an 8-pin SOP package.
- 3) Suited for multiple output power supply; superb cost performance in combination with BA9700A-series regulators.
- 4) Voltage output can step up, step down, or invert at an arbitrary level.

### ●Block diagram



### ●Absolute maximum ratings (Ta = 25°C)

| Parameter                 | Symbol            | Limits     | Unit |
|---------------------------|-------------------|------------|------|
| Power supply voltage      | V <sub>CC</sub>   | 7.5        | V    |
| Output transistor voltage | BV <sub>ceo</sub> | 24         | V    |
| Power dissipation         | P <sub>d</sub>    | *500 (350) | mW   |
| Operating temperature     | T <sub>opr</sub>  | -20~+75    | °C   |
| Storage temperature       | T <sub>stg</sub>  | -55~+150   | °C   |

\* Reduced by 5.0 mW (3.5 mW for SOP package) for each increase in Ta of 1°C over 25°C.

●Electrical characteristics (unless otherwise noted,  $T_a = 25^\circ\text{C}$  and  $V_{CC} = 2.5\text{V}$ )

| Parameter                         | Symbol     | Min. | Typ. | Max. | Unit          | Conditions          |
|-----------------------------------|------------|------|------|------|---------------|---------------------|
| 〈Error amplifier section〉         |            |      |      |      |               |                     |
| Input offset voltage              | $V_{IO}$   | -6   | -    | 6    | mV            |                     |
| Input offset current              | $I_{IO}$   | -150 | -    | 150  | nA            |                     |
| Maximum input voltage             | $V_{ICR}$  | 1.5  | 1.8  | -    | V             |                     |
| Open loop gain                    | $A_v$      | 60   | 80   | -    | dB            |                     |
| Common-mode rejection ratio       | CMRR       | 60   | 80   | -    | dB            |                     |
| Input bias current                | $I_{IB}$   | -    | 180  | 600  | nA            |                     |
| 〈PWM comparator section〉          |            |      |      |      |               |                     |
| Duty cycle                        |            | 0    | -    | 100  | %             |                     |
| 〈Output section〉                  |            |      |      |      |               |                     |
| Output transistor leakage current | $I_{LEAK}$ | -    | -    | 20   | $\mu\text{A}$ | $V_o = 24\text{V}$  |
| Output saturation voltage         | $V_{sat}$  | -    | 1.5  | 2.5  | V             | $I_o = 50\text{mA}$ |
| 〈Total device〉                    |            |      |      |      |               |                     |
| Standby current                   | $I_{CCS}$  | -    | 0.8  | 1.5  | mA            |                     |

Recommended range of input voltage:  $V_{CC} = 2.5\text{--}7.5\text{ V}$

●Timing chart

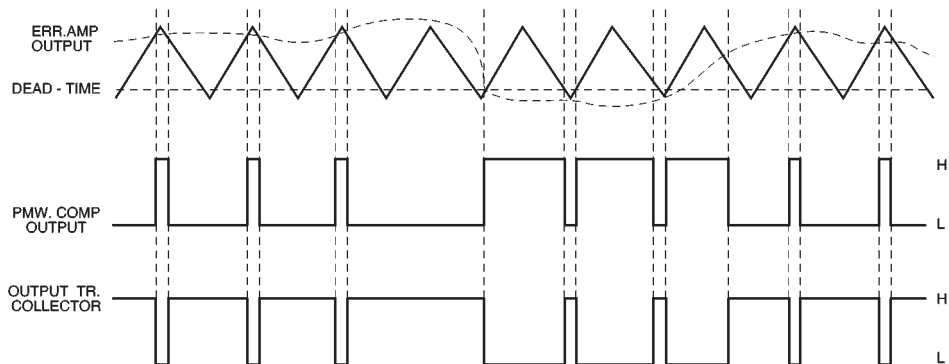


Fig.1

●Application example

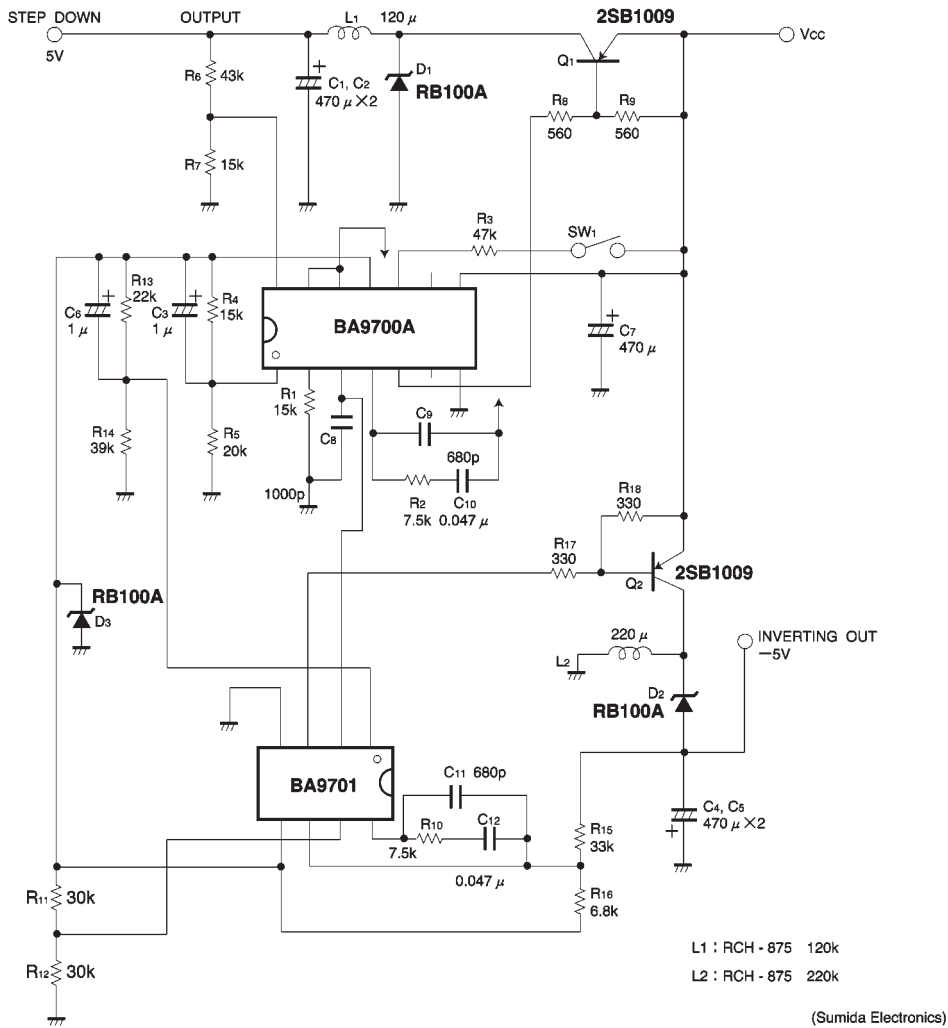


Fig.2

● Basic application board patterns and component arrangement

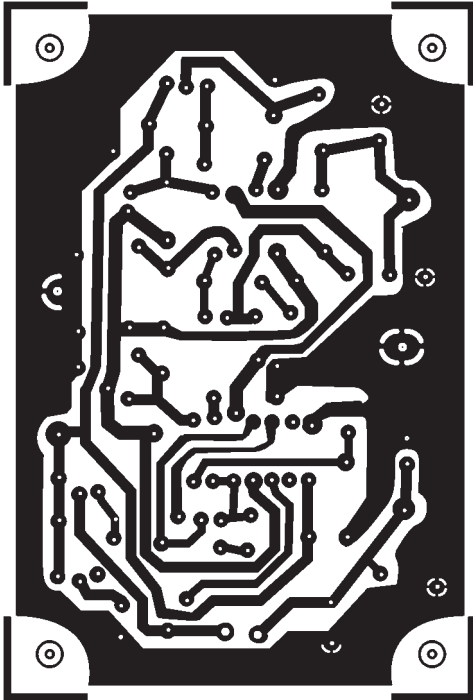


Fig.3 Basic application of PCB pattern (BA9701)

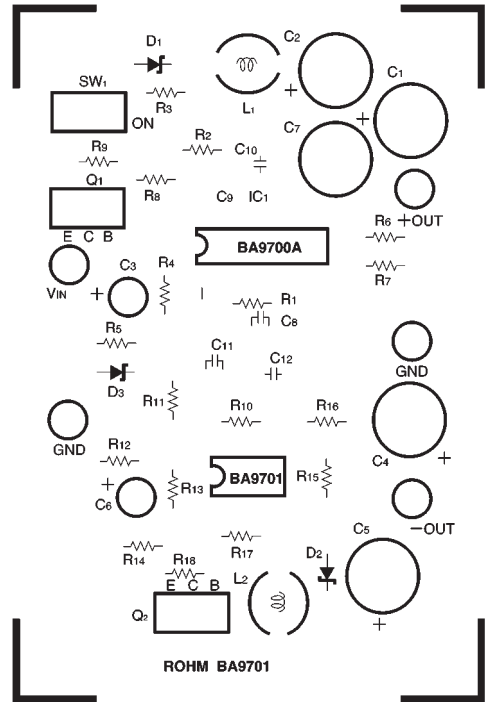


Fig.4 Basic application of PCB parts arrangement (BA9701)

● External dimensions (Units: mm)

