

# TA8004AS

## 5 V LOW DROPOUT REGULATOR WITH RESET TIMER

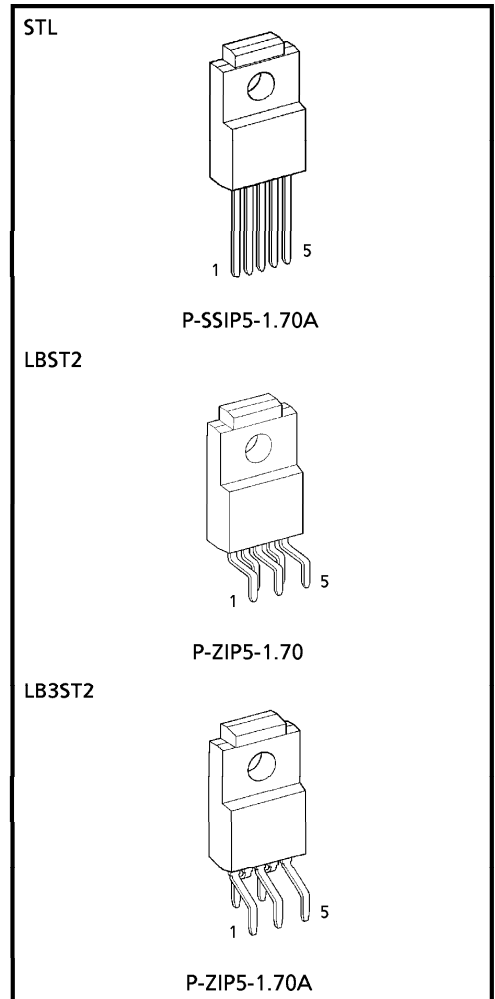
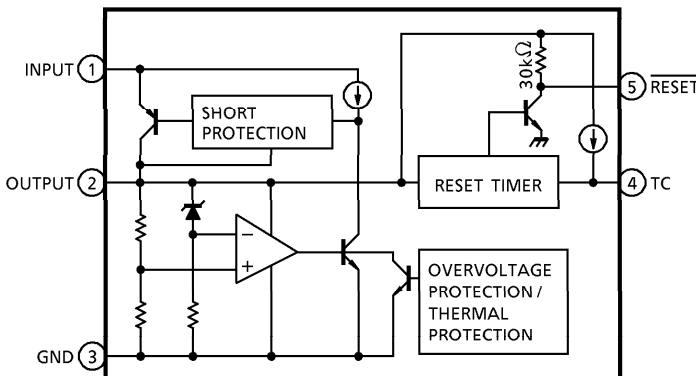
The TA8004AS is a 5 V regulator which handles 400mA Max. of output current.

This IC generates a reset signal to reset the system when power is supplied or the 5V output voltage lowers to 85% or less of normal output voltage due to the external disturbances.

### FEATURES

- Maximum Output Current : 400 mA (Max.)
- Low Input-Output Dropout Voltage : 0.6 V (Max.)
- Multi Protection
  - Power supply reverse connection
  - Function for over voltage
  - Thermal protection
  - Short protection
- Internal Power ON Reset Timer
- TO-220 (IS) 5 Pin Package

### BLOCK DIAGRAM



|               |                |
|---------------|----------------|
| <b>Weight</b> |                |
| P-SSIP5-1.70A | : 2.2 g (Typ.) |
| P-ZIP5-1.70   | : 2.2 g (Typ.) |
| P-ZIP5-1.70A  | : 2.2 g (Typ.) |

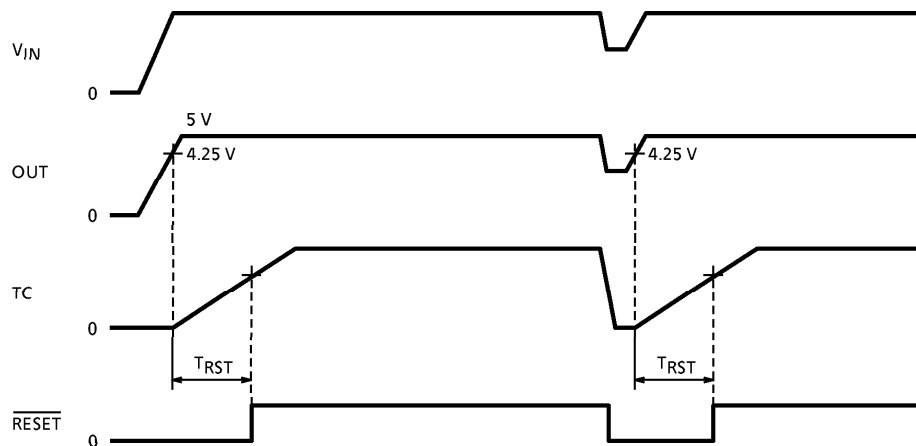
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**PIN DESCRIPTIONS**

| PIN No. | SYMBOL                    | DESCRIPTION  |
|---------|---------------------------|--|
| 1       | IN                        | Power supply terminal.   |
| 2       | OUT                       | The 5 V output terminal with maximum output current 400 mA.  |
| 3       | GND                       | Ground terminal.   |
| 4       | TC                        | Terminal to set the reset timer. A capacitor is connected between this terminal and GND.   |
| 5       | $\overline{\text{RESET}}$ | Collector output of an NPN transistor with built-in pull-up resistor. This pin is put at LOW level at output voltage below 85% of a prescribed level and after output voltage becomes above 85% of a prescribed level, a reset signal for the time set at the TC terminal. |

**TIMING CHART**

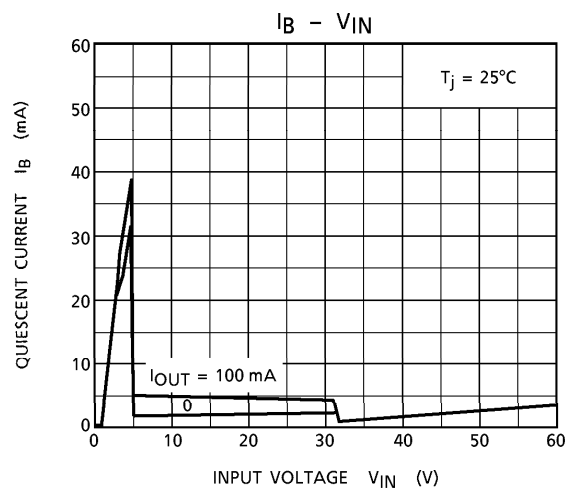
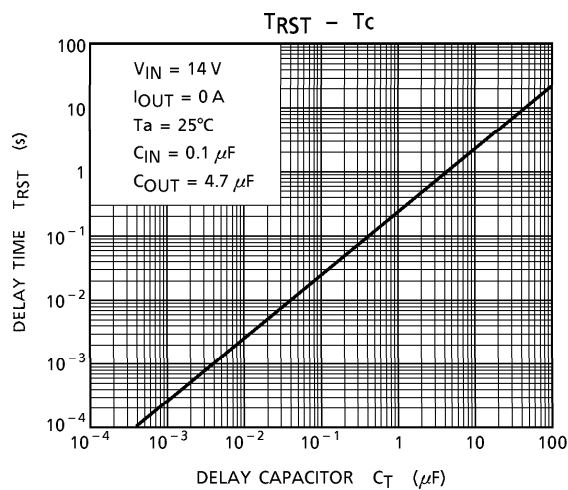
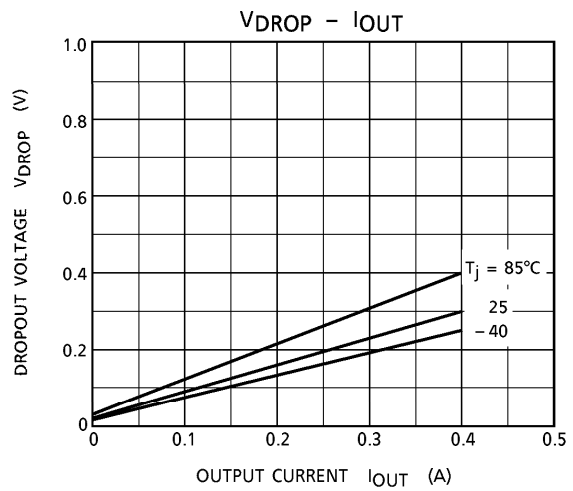
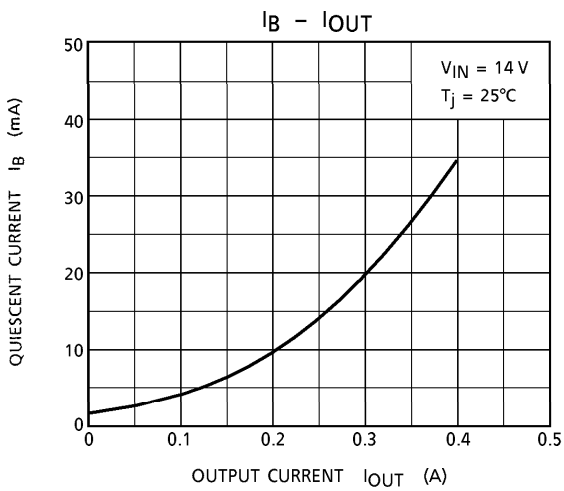
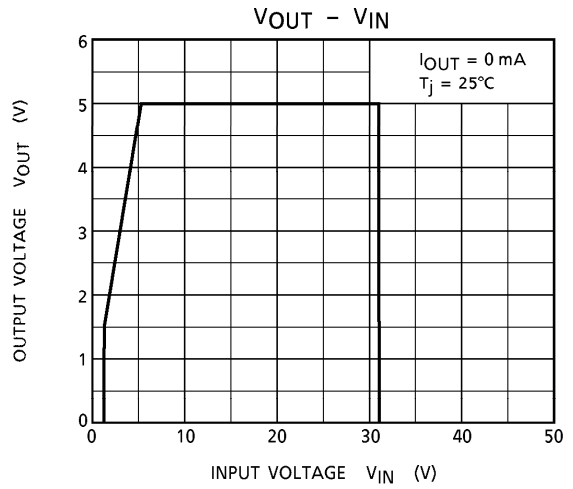
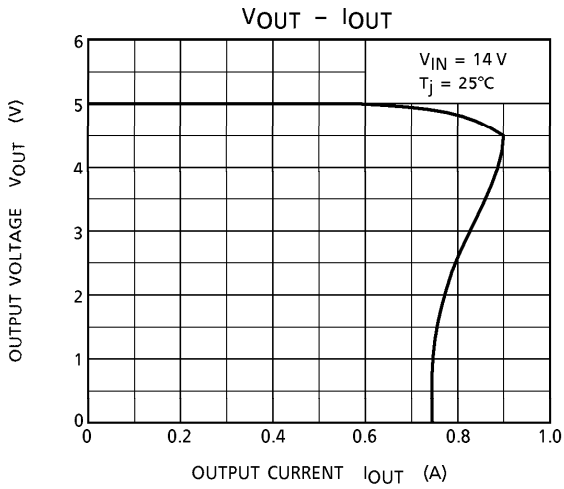


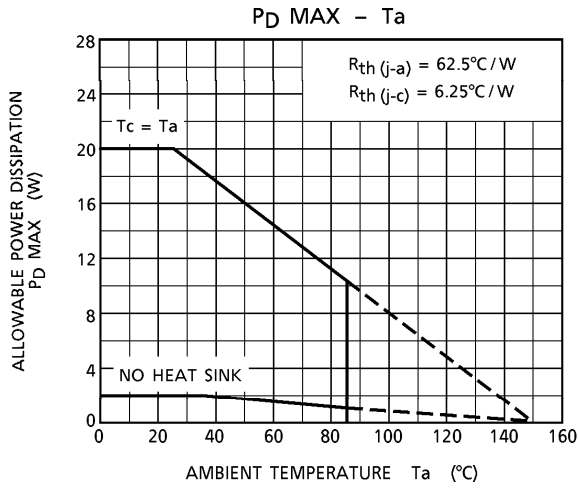
**MAXIMUM RATINGS ( $T_a = 25^\circ\text{C}$ )**

| CHARACTERISTIC             | SYMBOL        | RATING                       | UNIT                        |
|----------------------------|---------------|------------------------------|-----------------------------|
| Input Voltage              | $V_{IN}$      | -20~60                       | V                           |
| Power Dissipation          | $P_D$         | ( $T_a = 25^\circ\text{C}$ ) | 2                           |
|                            |               | ( $T_c = 25^\circ\text{C}$ ) | 20                          |
| Operating Temperature      | $T_{opr}$     | -40~85                       | $^\circ\text{C}$            |
| Storage Temperature        | $T_{stg}$     | -55~150                      | $^\circ\text{C}$            |
| Soldering Temperature·Time | $T_{sol}$     | 260 (10 s)                   | $^\circ\text{C}$            |
| Thermal Resistance         | $R_{th(j-c)}$ | 6.25                         | $^\circ\text{C} / \text{W}$ |
|                            | $R_{th(j-a)}$ | 62.5                         |                             |

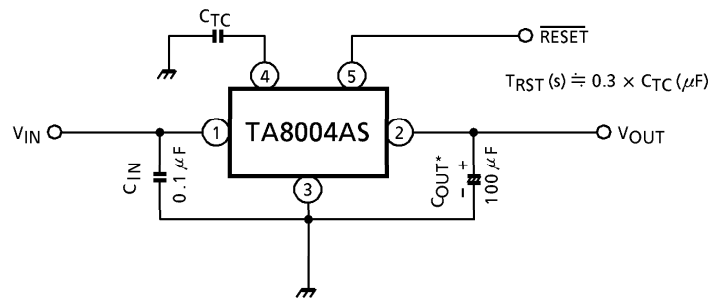
**ELECTRICAL CHARACTERISTICS** (Unless otherwise specified,  $V_{IN} = 14\text{ V}$ ,  $I_{OUT} = 10\text{ mA}$ ,  $T_j = 25^\circ\text{C}$ )

| CHARACTERISTIC               | SYMBOL        | PIN      | TEST CIR-CUIT | TEST CONDITION   | MIN. | TYP.                              | MAX. | UNIT          |
|------------------------------|---------------|----------|---------------|--|------|-----------------------------------|------|---------------|
| Output Voltage               | $V_{OUT}$     | OUT      | —             | $5.35\text{ V} \leq V_{IN} \leq 26\text{ V}$<br>$I_{OUT} = 10\text{ mA}$   | 4.8  | 5.0                               | 5.2  | V             |
|                              |               |          |               | $5.35\text{ V} \leq V_{IN} \leq 26\text{ V}$<br>$I_{OUT} = 10\text{ mA}$<br>$-40^\circ\text{C} \leq T_a \leq 85^\circ\text{C}$ | 4.5  | 5.0                               | 5.5  |               |
| Line Regulation              | Reg-Line      | OUT      | —             | $10\text{ V} \leq V_{IN} \leq 17\text{ V}$<br>$I_{OUT} = 200\text{ mA}$  | —    | 4                                 | 50   | mV            |
|                              |               |          |               | $7\text{ V} \leq V_{IN} \leq 26\text{ V}$<br>$I_{OUT} = 200\text{ mA}$   | —    | 10                                | 70   |               |
| Load Regulation              | Reg-Load      | OUT      | —             | $10\text{ mA} \leq I_{OUT} \leq 200\text{ mA}$   | —    | 35                                | 150  | mV            |
| Quiescent Current            | $I_B$         | GND      | —             | $6\text{ V} \leq V_{IN} \leq 26\text{ V}$ ,<br>$I_{OUT} = 0$   | —    | 1.7                               | 3    | mA            |
|                              |               |          |               | $V_{IN} = 14\text{ V}$ ,<br>$I_{OUT} = 200\text{ mA}$  | —    | 10                                | —    |               |
| Dropout Voltage              | $V_{DROP}$    | IN / OUT | —             | $I_{OUT} = 50\text{ mA}$   | —    | 0.08                              | 0.2  | V             |
|                              |               |          |               | $I_{OUT} = 400\text{ mA}$  | —    | 0.3                               | 0.6  |               |
| Max. Operating Input Voltage | $V_{IN}$      | IN       | —             | —  | 29   | 32                                | —    | V             |
| Reset Voltage (H)            | $V_{RST (H)}$ | RST      | —             | —  | 4.5  | 5                                 | 5.5  | V             |
| Reset Voltage (L)            | $V_{RST (L)}$ | RST      | —             | $I_{SINK} = 2.5\text{ mA}$   | —    | 0.15                              | 0.4  | V             |
| Delay Time                   | $T_{RST}$     | RST      | —             | —  | —    | $0.3 \times C_{TC} (\mu\text{F})$ | —    | s             |
| TC Threshold                 | $V_{TH}$      | TC       | —             | —  | —    | $V_{out} \times 60\%$             | —    | V             |
| Delay Current                | $I_{TC}$      | TC       | —             | —  | 5    | 12                                | 25   | $\mu\text{A}$ |
| $V_{OUT}$ Threshold          | $V_{TH}$      | OUT      | —             | —  | —    | $V_{out} \times 85\%$             | —    | V             |





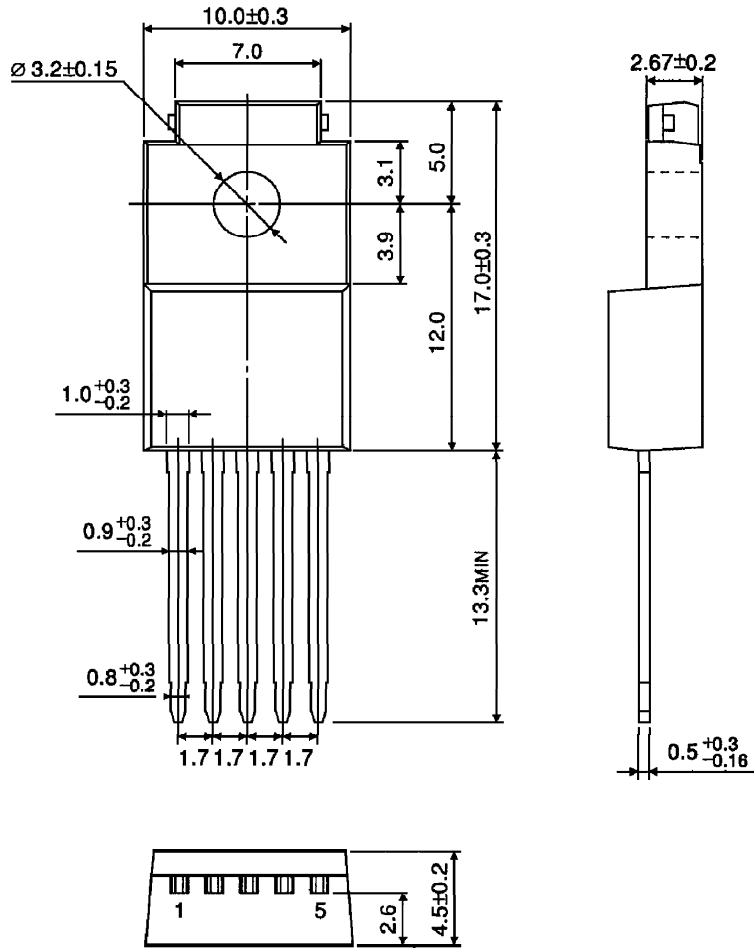
**APPLICATION CIRCUIT**



(\*) : Capacitor  $C_{OUT}$  must be guaranteed to operate of the temperature range that the regulator should be operated correctly.  
 100  $\mu F$  is a suitable value to suppress the oscillation phenomenon at the output terminal.

**PACKAGE DIMENSIONS**  
P-SSIP5-1.70A (STL)

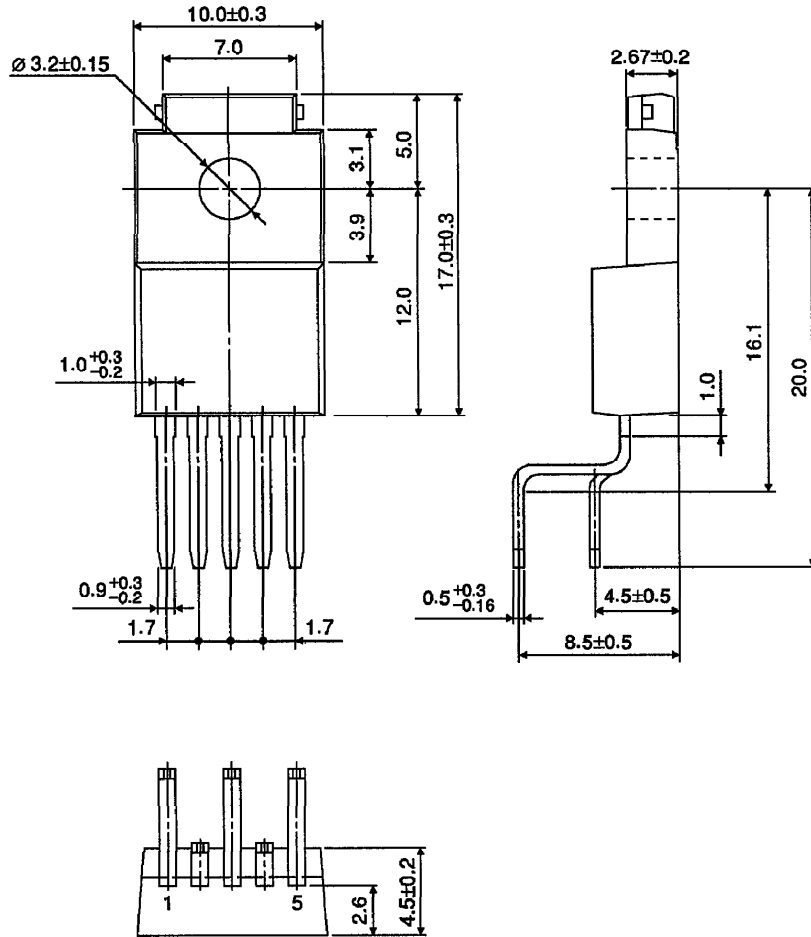
Unit : mm



Weight : 2.2 g (Typ.)

PACKAGE DIMENSIONS  
P-ZIP5-1.70 (LBST2)

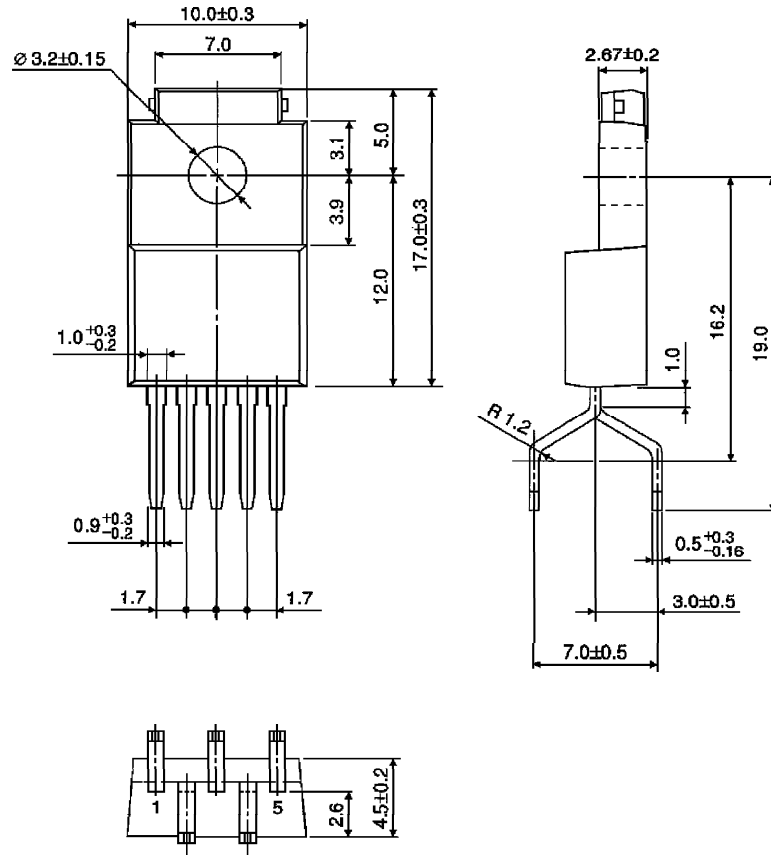
Unit : mm



Weight : 2.2 g (Typ.)

PACKAGE DIMENSIONS  
P-ZIP5-1.70A (LB3ST2)

Unit : mm



Weight : 2.2g (Typ.)