

## VOLTAGE REGULATORS RX5RA Series

### ■ OUTLINE

The RX5RA series, developed with C-MOS processing technology, are highly accurate, low-power-consumption, fixed three terminal voltage regulators. They include reference voltage supply, error amplifier, control transistor, and resistor network to control the output voltage. The output voltage is fixed in the IC.

The RX5RA series are both available in two different types of package : mini-power-mold and TO-92.

### ■ FEATURES

- Extremely low power consumption ..... TYP.  $1.0\mu\text{A}$        $V_{\text{out}} = 3.0\text{V}$
- Small input-output voltage difference ..... TYP.  $60\text{mV}$        $I_{\text{out}} = 1.0\text{mA}$
- Low temperature coefficient for output voltage ..... TYP.  $\pm 100\text{PPM}/^{\circ}\text{C}$
- Stable input rate ..... TYP.  $0.1\%/V$
- Accurate output voltage .....  $\pm 2.5\%$
- Variety of output voltage levels .....  $0.1\text{V}$  step
- Compact package ..... TO-92, mini power mold

### ■ APPLICATIONS

- Constant-voltage power supply for battery-powered devices
- Constant-voltage power supply for camera, communication, and video equipment
- Stable standard voltage supply

### ■ BLOCK DIAGRAMS

Type RX5RAXXXX  
( positive-voltage regulator)

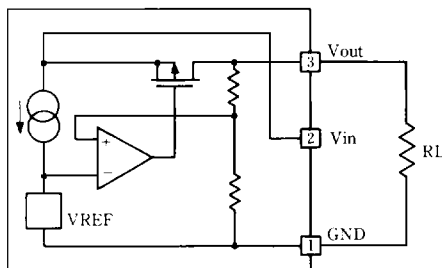


Figure 1

■ SELECTION GUIDE

You can define the output voltage and package of the RX5RA series.  
 The devices are defined by the following characters.

R X 5 R A XXXX ← Type number  
 ↑        ↑ ↑ ↑  
 a        b c d

| No. | Meaning   |
|-----|---|
| a   | Defines the packaging type<br>E : TO-92<br>H : Mini power mold (SOT-89)   |
| b   | Defines output voltage (Vout)<br>The range for Vout is 2.0V to 6.0V in units of 0.1V,<br>with an accuracy of ±2.5%.   |
| c   | Defines the output current type<br>A : Standard type  |
| d   | Defines the packaging method for shipment<br>A-T1 : Taping-T1 type (See Fig.2)<br>A-T2 : Taping-T2 type (See Fig.2)<br>A-RF : Taping-RF type (See Fig.2)<br>A-RR : Taping-RR type (See Fig.2)<br>B : Gluing (Gluing is for mini power mold package<br>as a sample)<br>C : Electric conductive bagging (for TO-92) |

Table 1



## ■ ABSOLUTE MAXIMUM RATINGS

| PARAMETER                   | SYMBOL  | RATINGS           | UNITS |
|-----------------------------|---------|-------------------|-------|
| Input Voltage               | Vin     | +12               | V     |
| Output Current              | Iout    | 150               | mA    |
| Output Voltage              | Vout    | Vin + 0.3 ~ - 0.3 | V     |
| Power Dissipation           | Pd      | 300               | mW    |
| Operating Temperature Range | ToPr    | -30 ~ +80         | °C    |
| Storage Temperature Range   | Tstg    | -40 ~ +125        |       |
| Soldering Temperature       | Tsolder | 260°C 10Sec       |       |

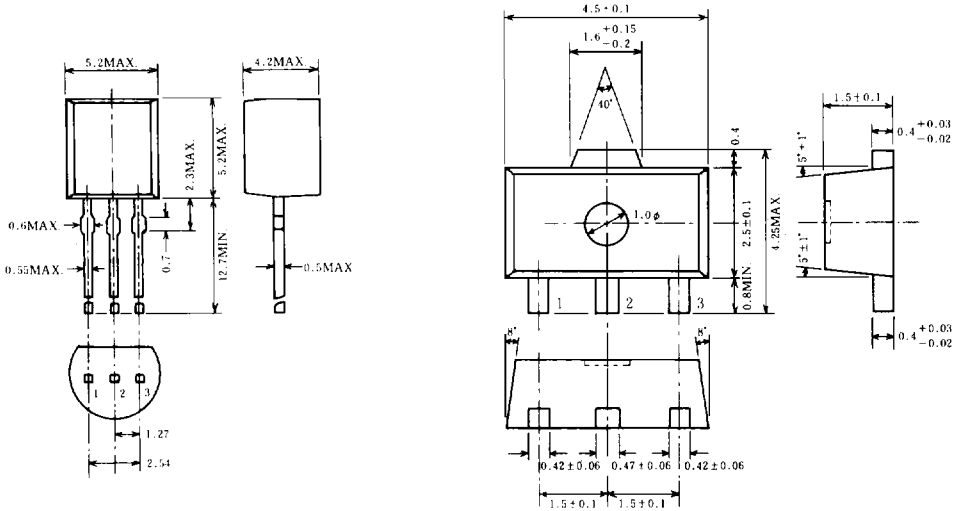
## ■ ELECTRICAL CHARACTERISTICS

ToPr : 25°C

| PARAMETER                       | SYMBOL           | CONDITION   | MIN.              | TYP.     | MAX.              | UNIT |
|---------------------------------|------------------|---|-------------------|----------|-------------------|------|
| Output Voltage                  | Vout             | Iout = 10mA   | (Vout)<br>× 0.975 |          | (Vout)<br>× 1.025 | V    |
| Output Current                  | Iout             | Vin - Vout = 2.0V<br>Vout = 3.0V<br>Vout = 5.0V   |                   | 40<br>60 |                   | mA   |
| Load Regulation                 | $\Delta V_{out}$ | Vin - Vout = 2.0V<br>Vout = 3.0V<br>1mA ≤ Iout ≤ 20mA<br>Vout = 5.0V<br>1mA ≤ Iout ≤ 40mA |                   | 60<br>40 |                   | mV   |
| Input-Output Voltage Difference | Vdif             | Iout = 1mA<br>Vout = 3.0V<br>= 5.0V   |                   | 60<br>30 |                   | mV   |

| PARAMETER               | SYMBOL   | CONDITION  | MIN. | TYP.       | MAX.       | UNIT             |
|-------------------------|--|--|------|------------|------------|------------------|
| Quiescent Current       | $I_{ss}$   | $V_{in} - V_{out} = 2.0V$<br>$V_{out} = 3.0V$<br>$\angle = 5.0V$ |      | 1.1<br>1.3 | 3.3<br>3.9 | $\mu A$          |
| Line Regulation         | $\frac{\Delta V_{out}}{V_{out} \cdot \Delta V_{in}}$ | $I_{out} = 1mA$<br>$V_{out} + 0.5V \leq V_{in} \leq 10V$         |      | 0.1        |            | %/V              |
| Input Voltage           | $V_{in}$   |  |      |            | 10         | V                |
| Temperature Coefficient | $\Delta V_{out} / \Delta T_{opr}$                    | $I_{out} = 10mA$<br>$-30^{\circ}C \leq T_{opr} \leq 80^{\circ}C$ |      | $\pm 100$  |            | PPM/ $^{\circ}C$ |

■ PACKAGE INFORMATION



TO-92

mini-power-mold

|   |           |
|---|-----------|
| 1 | GND       |
| 2 | $V_{in}$  |
| 3 | $V_{out}$ |

