PRELIMINARY

# HIGH PRECISION AND HIGH OUTPUT CURRENT
# C-MOS 3-TERMINAL VOLTAGE REGULATOR

## ■ GENERAL DESCRIPTION

The **NJU7222 series** is a high precision output voltage (±2%) and high output current C-MOS 3-terminal positive voltage regulator which contains internal accurate voltage reference, error amplifier, control transistor, output voltage setting resistor and short current protection circuit.

The regulation voltage is fixed by internal circuits and the following line-up of different output voltage versions are available.

The short current protection circuit prevents destruction of a element by careless great current output in short circuit.

The **NJU7222 series** is suitable for battery operated items and battery back-up systems because of low operating current and low dropout voltage.
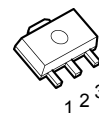
## ■ FEATURES

- High Precision Output Voltage ±2%
- High Output Current $I_O$ = 100mA
- Low Operating Current 20μA typ
- Low Dropout Voltage $\Delta V_{IO}$ < 0.6V @$I_O$ = 100mA
- Wide Operating Voltage Range
- Small Temperature Coefficient of Output Voltage
- Short Current Protection Circuit
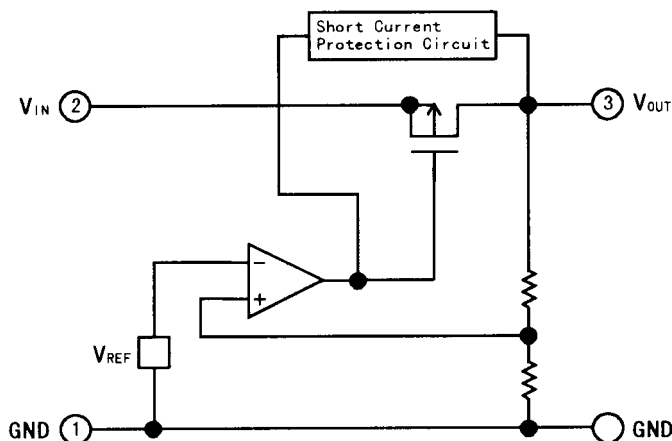- Package Outline SOT-89
- C-MOS Technology

## ■ OUTPUT VOLTAGE LINE-UP

| Output Voltage | SOT-89 Type |
|---|---|
| +3.0V | NJU7222U30 |
| +3.3V | NJU7222U33 |
| +5.0V | NJU7222U50 |

Note1) The SOT-89 type name is different from the marking, so it refer to attached paper correspondence table.

## ■ PACKAGE OUTLINE



**NJU7222U** (SOT-89)

## ■ TERMINAL DESCRIPTION

| No. | Description |
|---|---|
| 1 | GND |
| 2 | Input |
| 3 | Output |

## ■ EQUIVALENT CIRCUIT

# NJU7222 Series

## ■ ABSOLUTE MAXIMUM RATINGS ($T_a$ = 25°C)

| PARAMETER | SYMBOL | RATINGS | UNIT |
|---|---|---|---|
| Input Voltage | $V_{IN}$ | 15 | V |
| Output Voltage | $V_{OUT}$ | GND-0.3 to $V_{IN}$+0.3 | V |
| Output Current | $I_{OUT}$ | 200 | mA |
| Power Dissipation | $P_D$ | 300 (SOT-89) | mW |
| Operating Temperature Range | $T_{opr}$ | -25 to + 75 | °C |
| Storage Temperature Range | $T_{stg}$ | -40 to +125 | °C |

## ■ ELECTRICAL CHARACTERISTICS

### +3.0V Version ($C_{IN}$ = $C_O$ = 0.1µF, $T_a$ = 25°C)

| PARAMETER | SYMBOL | CONDITION | MIN. | TYP. | MAX. | UNIT |
|---|---|---|---|---|---|---|
| Output Voltage | $V_{OUT}$ | $V_{IN}$ = 5.0V, $I_{OUT}$ = 70mA | 2.85 | 3.00 | 3.15 | V |
| Dropout Voltage | $\Delta V_{IO}$ | $I_{OUT}$ = 50mA | - | 0.4 | 0.6 | V |
| Input Voltage | $V_{IN}$ | | - | - | 14 | V |
| Operating Current | $I_{DD1}$ | $V_{IN}$ = 5.0V | - | 20 | 30 | µA |
| Load Regulation | $\dfrac{\Delta V_{OUT}}{\Delta I_{OUT}}$ | $V_{IN}$ = 5.0V, $I_{OUT}$ = 1 to 100mA | - | 120 | 160 | mV |
| Line Regulation | $\dfrac{\Delta V_{OUT}}{\Delta V_{IN} \cdot V_{OUT}}$ | $V_{IN}$ = 4.0 to 12.0V | - | 0.1 | - | %/V |

### +3.3V Version ($C_{IN}$ = $C_O$ = 0.1µF, $T_a$ = 25°C)

| PARAMETER | SYMBOL | CONDITION | MIN. | TYP. | MAX. | UNIT |
|---|---|---|---|---|---|---|
| Output Voltage | $V_{OUT}$ | $V_{IN}$ = 5.3V, $I_{OUT}$ = 70mA | 3.135 | 3.300 | 3.465 | V |
| Dropout Voltage | $\Delta V_{IO}$ | $I_{OUT}$ = 50mA | - | 0.4 | 0.6 | V |
| Input Voltage | $V_{IN}$ | | - | - | 14 | V |
| Operating Current | $I_{DD1}$ | $V_{IN}$ = 5.3V | - | 20 | 30 | µA |
| Load Regulation | $\dfrac{\Delta V_{OUT}}{\Delta I_{OUT}}$ | $V_{IN}$ = 5.3V, $I_{OUT}$ = 1 to 100mA | - | 120 | 160 | mV |
| Line Regulation | $\dfrac{\Delta V_{OUT}}{\Delta V_{IN} \cdot V_{OUT}}$ | $V_{IN}$ = 4.3 to 12.0V | - | 0.1 | - | %/V |

### +5.0V Version ($C_{IN}$ = $C_O$ = 0.1µF, $T_a$ = 25°C)

| PARAMETER | SYMBOL | CONDITION | MIN. | TYP. | MAX. | UNIT |
|---|---|---|---|---|---|---|
| Output Voltage | $V_{OUT}$ | $V_{IN}$ = 7.0V, $I_{OUT}$ = 70mA | 4.75 | 5.00 | 5.25 | V |
| Dropout Voltage | $\Delta V_{IO}$ | $I_{OUT}$ = 100mA | - | 0.3 | 0.6 | V |
| Input Voltage | $V_{IN}$ | | - | - | 14 | V |
| Operating Current | $I_{DD1}$ | $V_{IN}$ = 7.0V | - | 20 | 30 | µA |
| Load Regulation | $\dfrac{\Delta V_{OUT}}{\Delta I_{OUT}}$ | $V_{IN}$ = 7.0V, $I_{OUT}$ = 1 to 100mA | - | 120 | 160 | mV |
| Line Regulation | $\dfrac{\Delta V_{OUT}}{\Delta V_{IN} \cdot V_{OUT}}$ | $V_{IN}$ = 6.0 to 12.0V | - | 0.1 | - | %/V |

## ■ MEASUREMENT CIRCUIT
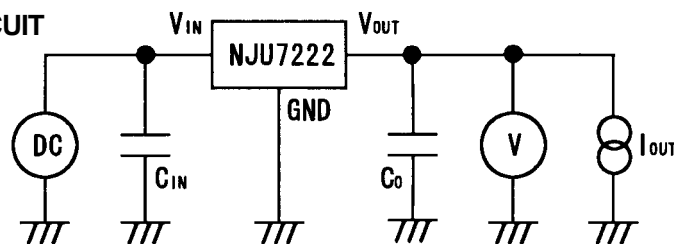


[CAUTION]
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